Joy of innovation

nuvoTon 新唐科技

2021 Product Selection Guide

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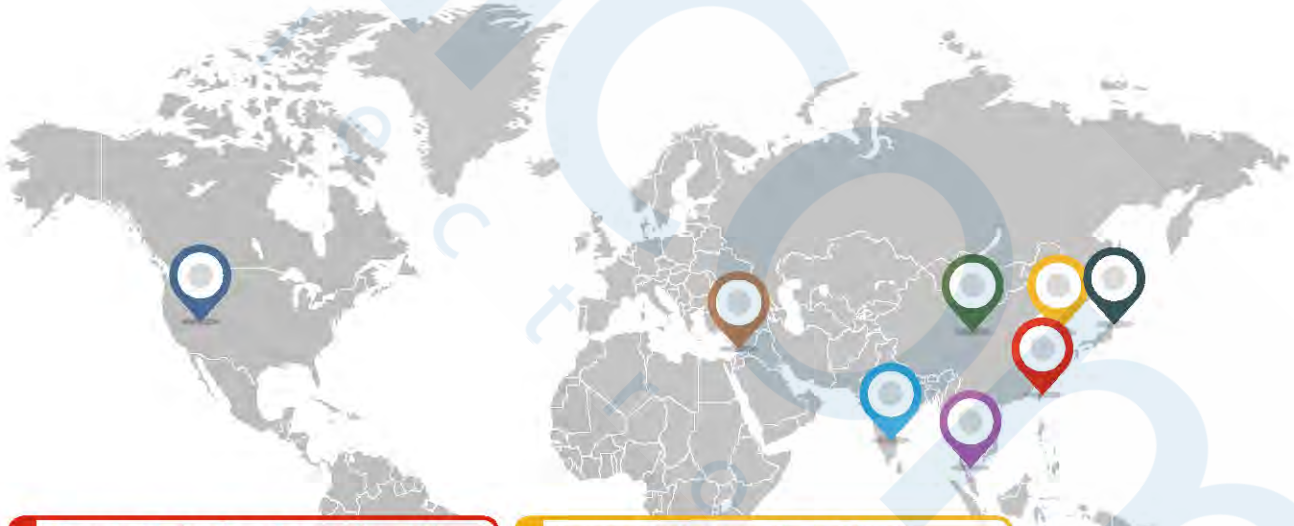
nuvoTon
新唐科技

Nuvoton Technology Corporation (NTC) was founded to bring innovative semiconductor solutions to the market. NTC was spun-off as a Winbond Electronics affiliate in July 2008 and went public in September 2010 on the Taiwan Stock Exchange (TSE). Nuvoton Technology focuses on the developments of microcontroller, microprocessor, smart home and cloud security IC and has strong market share in Industrial, Consumer and Computer markets. Nuvoton owns a wafer fab, featuring customized processes for analog and power products. Besides in-house IC products, the wafer fab also provides part of its capacity for foundry services. Nuvoton Technology provides products with a high performance/cost ratio for its customers by leveraging flexible technology, advanced design capability, and integration of digital and analog technologies. Nuvoton values long term relationships with its partners and customers and is dedicated to continuous innovation of its products, processes, and services. The company has established subsidiaries in the USA, China, Israel, and India, Singapore, Korea and Japan to strengthen regional customer support and global management. For more information, please visit https://www.nuvoton.com



Nuvoton Technology Corporation (HQ)
· Location: Hsinchu Science Park, Taiwan

Nuvoton Tech. Corp. America (NTCA)
· Location: San Jose. CA,U.S.A.

Nuvoton Tech. Israel Ltd. (NTIL)
· Location: Herzlia, Israel

Nuvoton Tech, Korea Limited (NTKL)
· Location: Seoul, South Korea

Nuvoton Tech. Singapore Pte. Ltd (NTSPL)
· Location: Singapore

Nuvoton Tech. India Private Limited (NTIPL)
· Location: Bangalore, Karnataka, India

Nuvoton Elect. Tech. (NTSH) / Nuvoton Elect. Tech. (NTSZ) / Nuvoton Elect. Tech. (NTHK)
· Location: Shanghai (SH)/ Shenzhen (SZ) / Hong Kong (HK)

Nuvoton Technology Corporation Japan (NTCJ) / Miraxia Edge Technology Corporation (METC) / Atfields Manufacturing Technology Corporation (AMTC)
· Location: Japan

Nuvoton Technology Corporation certifies that semiconductor products designated by Nuvoton are compliant with the requirements of the European Union's Restriction on Use of Hazardous Substances ("RoHS") Directive, 2011/65/EU & Commission Delegated Directive (EU) 2015/863.

nuvoTon

Microcontrollers

NuMicro® Ecosystem

Microcontroller Platform

- Key Feature Selection: Automotive / Industrial Control / Security / Low Power

IoT Platform

GUI Platform

Development Platform

Digital Platform

NuMicro® Product Selection Guide

NuMicro® Automotive Family

- M0A21 Series NEW
- M0A23 Series NEW
- NUC131U Series NEW

NuMicro® Family Arm® Cortex®-M23 MCUs

- M2351 Series
- M2354 Series NEW
- M251 Series
- M252 Series
- M253 Series NEW
- M254 / M256 / M258 Series NEW
- M261/ M262/ M263 Series

NuMicro® Family Arm® Cortex®-M0 MCUs

- M030G/M031G Series NEW
- M031 Series
- M032 Series
- M031BT Series NEW
- M032BT Series NEW
- M071 Series NEW
- Mini51 Series
- M051 Series
- NUC029 Series
- NUC121 Series
- NUC130 CAN Series
- Nano100 Series

NuMicro® Family Arm® Cortex®-M4 MCUs

- M451 Series
- M471 Series NEW
- M480 Series
- NUC505 Series

NuMicro® Family Arm9 MPUs

- NUC970/ 980 Series
- N9H Series
- N329 Series

NuMicro® Family 8051 MCUs

- MS51 Industrial Control Series (1T)
- ML51 Low Power Series (1T) NEW
- ML54 Low Power LCD Series (1T) NEW
- ML56 Low Power Touch Key Series (1T) NEW
- N76 Series (1T)
- N79 Series (4T)
- Standard 8051

Nuvoton - a Leading Microcontroller Platform Provider

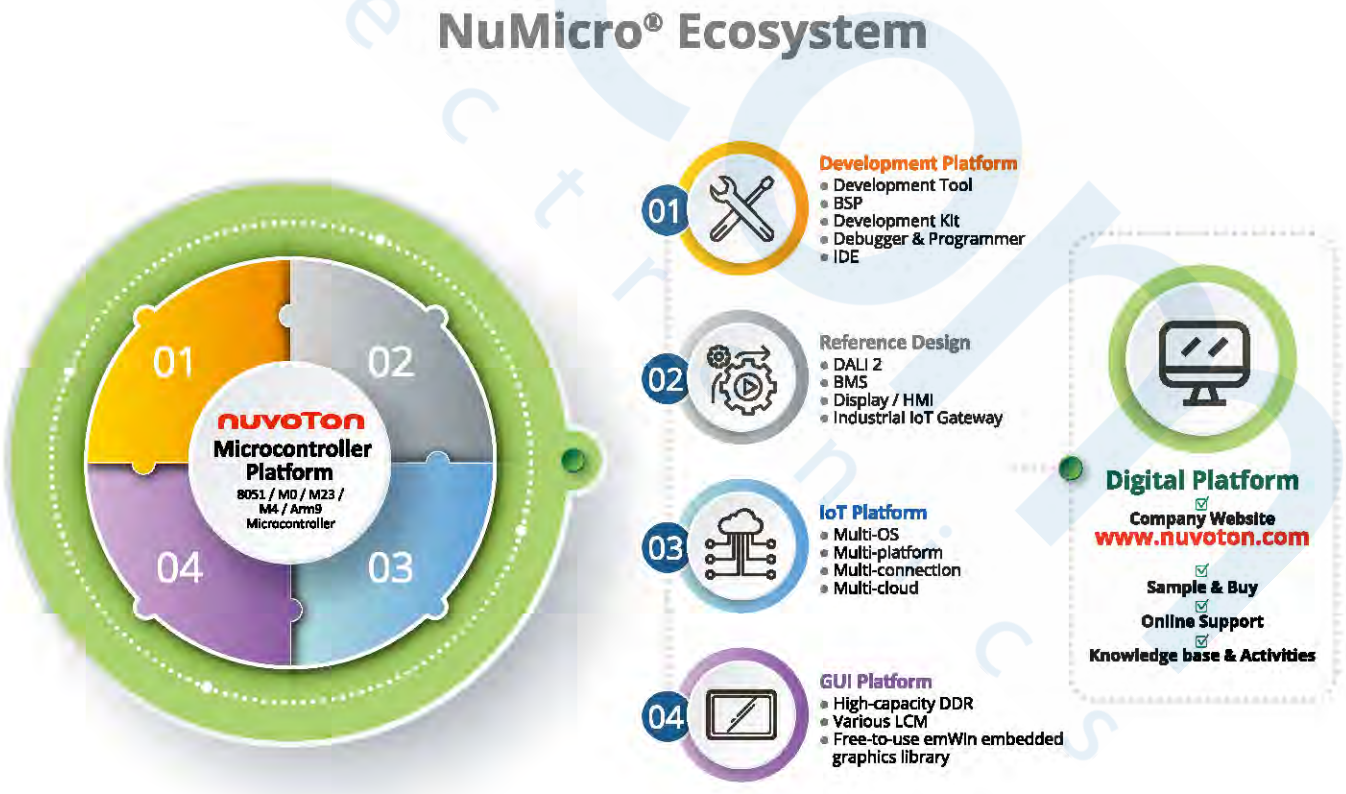
Nuvoton provides a comprehensive ecosystem from product selection and development to mass production, to shorten our partner's design cycles and accelerate time-to-market.

From the core of NuMicro ecosystem, Nuvoton provides a rich product portfolio from 8051, Cortex-M0/ M23/ M4 to Arm9-based microcontroller, offering over 600 parts for selection.

To provide an easy development experience, Nuvoton builds a development platform with multiple IDEs including Arm Keil, IAR Embedded Workbench and NuEclipse. The development tools, BSPs, development kits, debuggers and programmers are also included to boost project development.

Nuvoton offers rich reference designs and an integral IoT platform to realize innovative ideas in various fields. Customers could easily implement IoT projects with the Nuvoton low-power or IoT secure microcontroller on Nuvoton IoT platform, which supports multi-OS with multi-platform, and available for multi-connection to multi-cloud.

As a microcontroller platform provider, Nuvoton has been devoted to supporting our customers worldwide by our digital platform. Nuvoton's digital platform can meet various needs including but not limited to product selection, product resources, product purchasing, sales/technical support, and knowledge-based learning.



NuMicro® Ecosystem - Microcontroller Platform

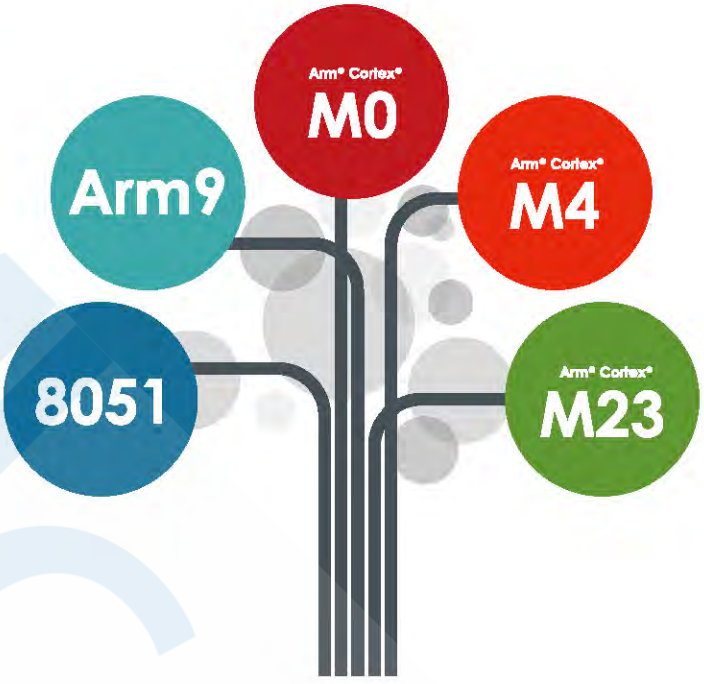
Cortex® M23
IoT Security

Cortex® M4
High Performance
Low Power
Security

Cortex® M0
High Performance
Ultra Low Power
General

Arm 9™
Industrial Control
HMI

8051
Industrial Control
Low Power



Frequency	8051	Cortex®-M0	Cortex®-M23	Cortex®-M4	Arm9™
300 MHz					NCU970/NUC980 E N9H N329
192 MHz			M2354 L	M480 C E U M471 U M451/M4521 U	
72 MHz		NUC029 M032 U M031BT M031 NUC230 C NUC131 C NUC131U E NUC123 U M0A23 C M0A21 M051 Nano Mini51	M2351 M261 M258 U T L M256 T L M254 L M252 U M251		
64 MHz					
48 MHz	ML56 T L ML54 L				
	ML51 MS51				
24 MHz	N79E				
16 MHz	N76E				

Over 600 parts ready for selection

Operating Voltage: 1.8V-3.6V | 1.8V-5.5V | 2.5V-5.5V

Connectivity: U USB | C CAN | E Ethernet | L LCD | T Touch Key

Automotive | Low Power | TrustZone

Key Feature Selection: **Automotive Microcontroller**

Microcontroller for vehicles are subjected to stress and dynamic conditions. To this, Nuvoton launched the AEC-Q100 grade 2 qualified NuMicro NUC131U microcontroller for automotive applications.

Besides, since the CAN Bus is a robust vehicle bus standard excellence for the communication under a heavy noise interference environment, Nuvoton also offers a series of microcontroller with CAN Bus to fulfill the automotive applications. Such microcontroller embedded with Cortex-M0 to M4 and the operating frequency ranged from 48 to 192 MHz; the Flash sized from 32 to 512 Kbytes and up to three CAN Bus interfaces.

	M0A23	NUC1311	NUC131U	NUC230/240	M453	M483	M487
Core	Cortex-M0	Cortex-M0	Cortex-M0	Cortex-M0	Cortex-M4	Cortex-M4	Cortex-M4
Speed (MHz)	48	50	50	50	72	192	192
Flash (Kbytes)	32	68	68	128	256	256	512
LIN	2	-	3	3			
CAN	1	1	1	2	1	3	2
AEC-Q100	-	-	✔	-	-	-	-
Operating Temperature (°C)	-40 ~ 125	-40 ~ 105	-40 ~ 105	-40 ~ 105	-40 ~ 105	-40 ~ 105	-40 ~ 105

Key Feature Selection: **Industrial Control Microcontroller**

Nuvoton technology is a leading microcontroller provider in industrial control industry. With the high quality and longevity, Nuvoton is an indispensable partner of industrial control customers.

- **Longevity:** Full commitment to ensuring supply continuity and stability for as long as 10 years.
- **High manufacturing quality & supply stability:** NuMicro products are made by tier-one foundry, package, and testing partners with multiple sources.
- **Extended operating temperature grades:** from -40 to 105°C for all new microcontroller product and -40 to 85°C for all new MPU product.
- **IEC60730 class B software library supported**

8051 Family
ESD (HBM) : 8 kV / EFT : 4.4 kV

Cortex-M0 Family
ESD (HBM) : 6 kV / EFT : 4.4 kV

Cortex-M4 Family
Operating Frequency : up to 192 MHz

Arm9 Family
Operating Frequency : up to 300 MHz

Industrial Control Field	NuMicro Series Recommendation (Key Feature)
 **Home Appliances**	[Arm9] N9H (TFT-LCD) [M4] M480 (2 sets ADC), M471 (White Goods Control) [M23] M26x (Low Power), M254 (LCD), M256 (Touch Key), M235x (Security) [M0] M071 (Control), M031(Control), M031BT (BLE 5.0), NUC029 (Control) [8051] MS51 (Control), ML51 (Low Power), ML54 (LCD), ML56 (Touch Key)
 **Grid Infrastructure**	[Arm9] NUC980 (Data Collection), N9H (TFT-LCD) [M4] M480 (Smart Circuit Breaker & Industrial Meter), M471/M451(Smart Capacitor) [M23] M2351/M2354 (AMI 2.0 Smart Meter) [8051] MS51 (Traditional Circuit Breaker)
 **Smart Building**	[Arm9] NUC980 (Gateway & Fire Controller), N9H (TFT-LCD) [M4] M480 (Gateway & Fire Controller) [M23] M2351 (Wireless Speaker, Security) [M0] M031BT (BLE 5.0), NDA102 (DALI) [8051] ML51 (Smoke Detecter)
 **Industrial Connectivity**	[Arm9] NUC980 (Ethernet & CAN) [M4] M480 (Ethernet & CAN) [M23] M2351/M2354 (Security), M263 (CAN) [M0] NUC131 (CAN) [8051] MS51 (UART)
 **Industrial Automation**	[Arm9] N9H (TFT-LCD) [M4] M480 (Control) [M23] M2351/M2354 (Security) [M0] M0A21(Control) , M031(Control), M032(Control), NUC029 (Control) [8051] MS51 (Control)
 **Medical**	[Arm9] N9H (TFT-LCD) [M4] M480 (Thermometer) [M23] M251 (Low-Power Control), M254 (LCD), M256 (Touch Key), M261 (Low-Power Control) [M0] M031BT (BLE 5.0) [8051] ML54 (Con-Seg LCD), ML56 (Thouch Key)
 **5V MCU**	[M4] M451, M471 [M23] M251, M254, M256 [M0] M0A21, M071, NUC029, NUC121, NUC130, M051, Mini51 [8051] MS51, ML51

Key Feature Selection: **Microcontroller with Security**

Nuvoton has dedicated to enhancing for the security of microcontrollers, the NuMicro® M2351 series is the first Arm® Cortex®-M23 based MCUs that has been both **PSA Certified™ Level 1** (Feb. 2019), **Level 2** (Jul. 2020) and **PSA Functional API Certified** (Feb. 2019).

To strengthen the security of microcontroller with execution security, storage security, and connectivity security, Nuvoton has been developing a series of hardware and software mixture technologies to achieve the security targets of NuMicro products, which covers:

- All valuable attests in a microcontroller for protection are well identified.
- All potential security threats in a microcontroller for mitigation are well addressed.
- All potential security flaws in a microcontroller in terms of hardware and software are well avoided.

Targeted Applications: Smart Home, Smart City, Smart Building, Smart Transportation,Smart Agriculture, Environment Surveillance (CCTV), Mobile POS, IoT Devices.

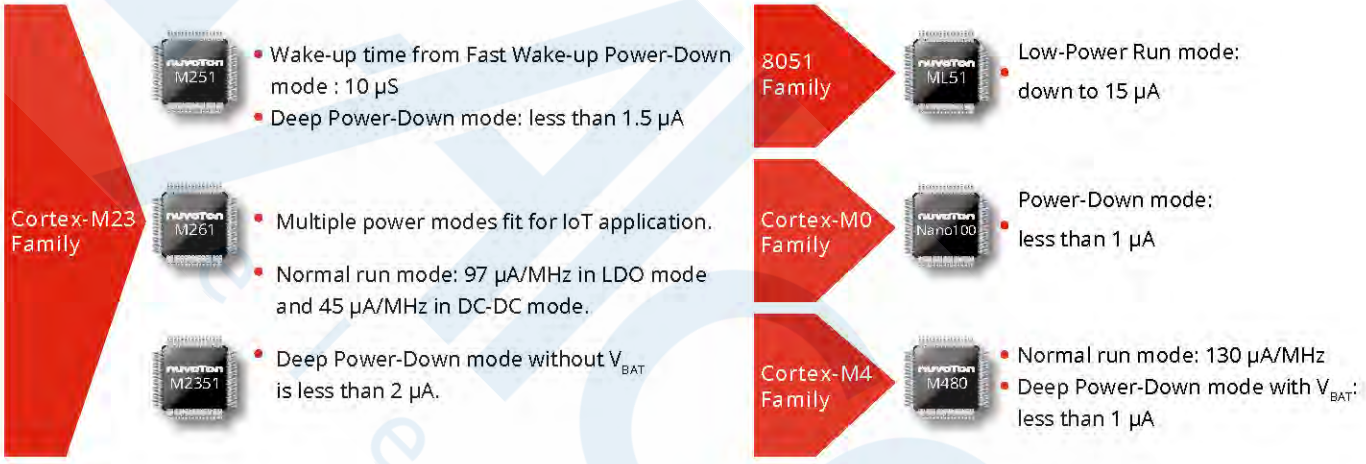
Security Technology	Item	NuMicro Series Recommendation				
		M251	M261	M2351	M2354*	M480
Secure Boot ROM	Secure Bootloader (based on ECDSA signature)		✓	✓	✓	✓
	Secure firmware update (OTA)		✓	✓	✓	
	Driver APIs		✓	✓	✓	✓
Security Reference Code / Lib /Tool	Debug Authentication (temporarily unlock)			✓	✓	
	TrustZone reference code			✓	✓	
	Key Generation Tool		✓	✓	✓	✓
	Firware Image Singing Tool		✓	✓	✓	✓
	Key/Certificate provisioning service		✓	✓	✓	
Isolation	Peripheral privileged mode			✓	✓	
	TrustZone partition for Cortex-M			✓	✓	
Flash Memory Protection	Flash Lock (read protection)	✓	✓	✓	✓	✓
	eXecute Only Memory	✓	✓	✓	✓	✓
	Dual bank (with bank swap)		✓	✓	✓	
	Flash Write Protection		✓	✓	✓	✓
Crypto Processors	DES/3DES		✓	✓		
	AES-256	✓	✓	✓	✓	✓
	AES CCM, GCM and GMAC				✓	
	ECC (Key generation, ECDH-ECDSA)		✓	✓	✓	✓
	RSA-4096				✓	
	Side Channel Attacks mitigation of AES, RSA, ECC				✓	
	SHA1/SHA2-384		✓	✓	✓	✓
	SHA2-512, HMAC-512				✓	
	SM2/3/4 (Chinese national cryptography standard)				✓	
	TRNG		✓	✓	✓	✓
	Cryptographic key store with chip level Active Shield				✓	
Device Identity	Unique ID	✓	✓	✓	✓	✓
	Customer Unique ID	✓	✓	✓	✓	✓
Anti-Tamper	Tamper Pin Detection	✓	✓	✓	✓	✓
	RTC backup registers	✓	✓	✓	✓	✓
Environment Sensor	Temperature sensors	✓	✓	✓	✓	✓
	Clock monitor	✓	✓	✓	✓	✓
	Voltage glitch detection				✓	
Platform Security	Booting Status Monitor			✓	✓	
	Life Cycle Management			✓	✓	
	Firmware Version Counter			✓	✓	
	Debug Port Management (DPM)			✓	✓	

*2020 Q4 End

Key Feature Selection: **Low Power Microcontroller**

Power consumption is a significant factor for microcontroller selection especially in a battery-powered application as IoT devices. In addition to consider the power consumption in different power modes, the wake-up time is also vital for the application in power mode switching.

Nuvoton devotes to offer the low-power microcontroller solutions with robust security for various application scenarios. The ML51 series has exclusive low-power run mode with less than 15 µA; the Power-Down mode of Nano100 series is less than 1 µA; the wake-up time from Fast Wake-up Power-Down mode of M251 series is 10 µS; the Deep Power-Down mode of M251 is less than 1.5 µA and less than 1 µA of M480 Series. Furthermore, there are additional DC-DC mode for M261 and M2351 series to halve the power consumption in LDO mode.



Low-power Application	NuMicro Series Recommendation				
	ML51	Nano 100	M251	M261/ M2351	M480
Core	8051	Cortex-M0	Cortex-M23	Cortex-M23	Cortex-M4
Operating Frequency (MHz)	24	32 ~ 42	48	64	192
Flash (Kbytes)	16 ~ 64	16 ~ 128	32 ~ 256	512	128 ~ 512
SRAM (Kbytes)	1 ~ 4	4 ~ 16	8 ~ 32	96	64 ~ 160
Smoke Sensor	○	△	△		
Glucose Meter	△	○	○	○	
GPS Tracker	△	○	○		
Handheld Meter	△	○	○	○	○
Wireless Keyboard/ Mouse	△	○	○		
Smart Lock	○	○	○	○	○
Oximeter		○	○		

NuMicro® Ecosystem - IoT Platform

Support multi-OS with multi-platform; Provide multi-connection to multi-cloud.

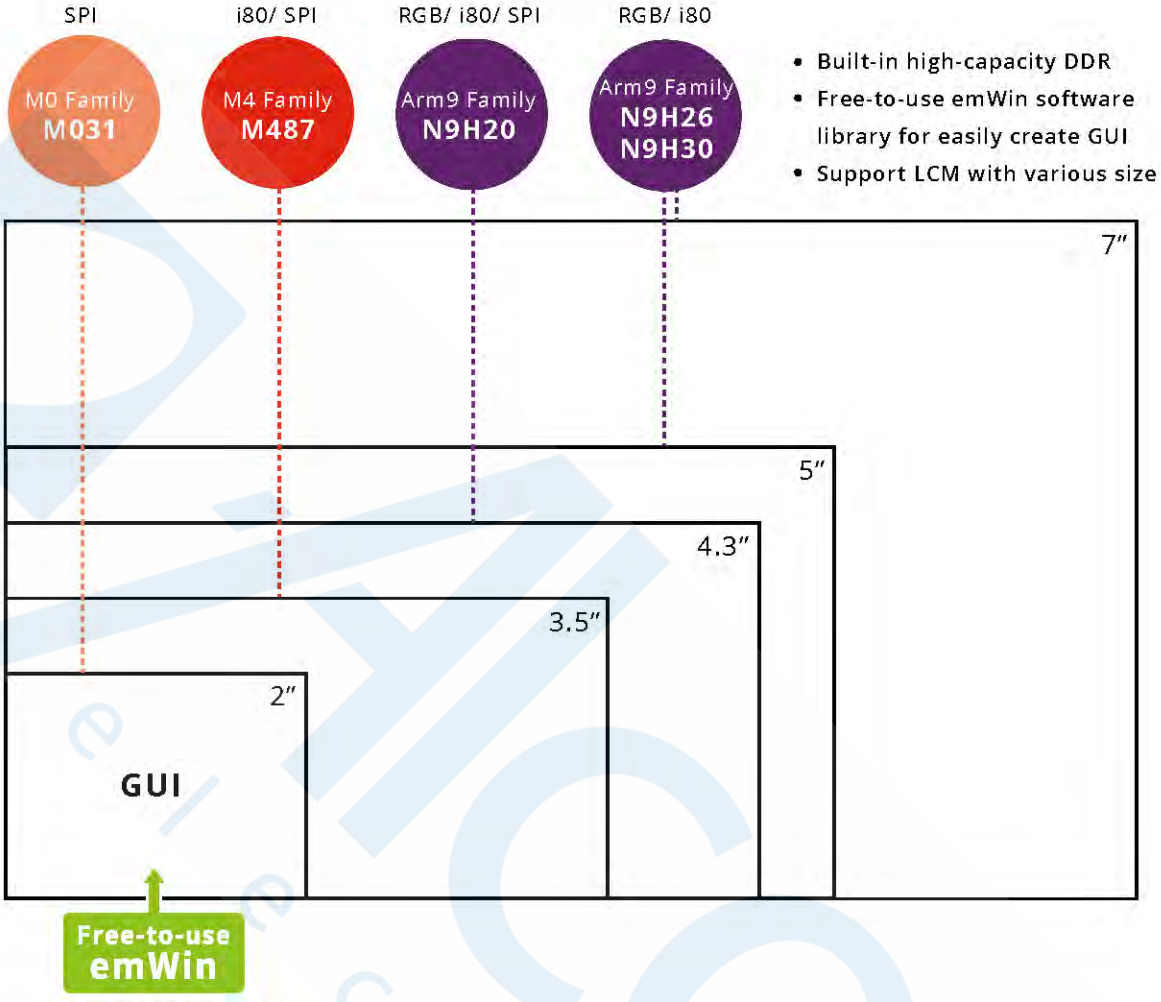
Nuvoton offers a comprehensive IoT platform, which supports multi-OS with multi-platform and provides multi-connection to multi-cloud. The NuMaker-IoT-M487, NuMaker-PFM-M2351, and NuMaker-PFM-M263A are excellent for being a node device with sensor and connectivity. Besides, the NuMaker-NUC980-IIoT and NuMaker-IoT-M487 are fit for being a gateway.

Nuvoton links all aspects of the IoT platform to facilitate IoT innovation. NuMicro IoT platform supports Linux, Arm MbedOS, Amazon FreeRTOS, and AliOS Things RTOS on selected NuMaker platform with embedded crypto accelerators to boost communication performance and strengthen connectivity security. Besides, the NuMaker platform can connect to various cloud services, such as Amazon Web Service (AWS), Arm Pelion, Alibaba Cloud, and Microsoft Azure via various connectivity options including Ethernet, Wi-Fi, NB-IoT, and LTE.

NuMaker Platform	OS/RTOS	Connectivity							Clouds				
		Ethernet	Wi-Fi	NB-IoT	LTE	LoRa Gateway	LoRa Device*	BLE	Arm Pelion	AWS	Aliyun	Azure	TTN
IIoT-NUC980	Linux	v	v	v	v				v	v	v		v
LoRaG-NUC980	Linux	v	v	v	v	v			v	v	v		v
RTU-NUC980 (Chili Board)	Linux	v	v	v	v				v	v	v		
300 MHz	MbedOS	v	v	v	v		v		v	v	v	v	
	Amazon FreeRTOS	v	v							v			
IoT-M487	AliOS Things	v	v								v		
	RT-Thread	v	v										
192 MHz	Azure RTOS		v									v	
PFM-M2351	MbedOS		v	v	v				v				
IoT-M263A	MbedOS		v	v	v		v		v	v			
64 MHz	Non-OS							v					

*LoRa devices must be connected to clouds via the LoRa gateway

NuMicro® Ecosystem - GUI Platform



NuMaker Platform	CPU Core (MHz)	Hardware Accelerator	Onboard LCD Size (resolution)	Storage	Peripheral
RDK-N9H30	Arm9 300MHz	2D GFx/JPEG	7″ (800x480)	SPI NOR/NAND	Ethernet/ UART/ RS485/ SDCard/ CAN
NK-N9H30	Arm9 300MHz	2D GFx/JPEG	7″ (800x480)	SPI NOR/NAND	Ethernet/ UART/ RS485/ SDCard/ CAN
NK-N9H26	Arm9 260MHz	2D GFx/JPEG H.264	5″ (800x480)	SPI NOR/NAND	UART/ RS485/ SD Card
RDK-N9H20	Arm9 200MHz	2D GFx/JPEG	4.3″ (480x272)	SPI NOR/NAND	UART
NK-N9H20	Arm9 200MHz	2D GFx/JPEG	4.3″ (480x272)	SPI NOR/NAND	UART
NK-M487D	Cortex-M4 192MHz		2.4″ (320x240)	SPI NOR	Ethernet/ UART / RS485/ SD Card/ CAN
NK-M032	Cortex-M0 72MHz		2.4″ (320x240)	SPI NOR	UART/ RS485

NuMicro® Ecosystem - Development Platform

Nuvoton provides a comprehensive development platform to assist our customer to achieve rapid development, high-capacity mass production, and easy upgrade.

Development Kit

- **NuMaker Series**
  Comprehensive peripherals, rapid practice your idea.
  - Designed for IoT/ HMI development: NuMaker-IoT, NuMaker-emWin, RDK,...
  - Designed for general purpose development: NuMaker-IC Part No.
- **NuTiny Series**
  - Simple board design with high flexibility.

Board Support Package (BSP)

Offers rich sample code: Device usage, USB Device Classes, CAN, Ethernet, etc. With the unified API names of all NuMicro products and Nuvoton Code Generator, customer could easily start or migrate a NuMicro project.

IDE

arm KEIL IAR Embedded Workbench NuEclipse

Offers multiple IDEs for customers, including free-to-use Arm Keil (for M0/ M23 project, and $385/yr for M4 project), IAR Embedded Workbench (32 KB free), and NuEclipse within the GNU Eclipse framework which can be free-to-use in NuMicro M0/ M4/ M23 projects.

Debugger & Programmer

- **Nu-Link2-Pro**
  Nu-Link2-Pro Debug Adapter is a USB debugger/ programmer and can be applied to the development of NuMicro products. The original feature of Nu-Link is supported with higher performance. Furthermore, it supports embedded trace microcell (ETM) function, multi-path bridge communication, and signal monitor for advanced debugging requirements. Besides, it supports off-line programming which can be triggered by a button or the automatic IC programming system.
- **Nu-Link-Gang**
  The Nu-Link-Gang Programmer is designed for mass-production in the customer site. With flexible programming option which can offline programming 4 chips simultaneously or individually, fit for automatic IC programing system.

Development Tool (NuTool)

- **PinConfig Tool**
  To configure I/O with multi-functions and generate OrCAD library.
- **PinView Tool**
  A monitoring and visualization tool that can immediately show the current status of I/O pins.
- **Clock Configure Tool**
  Check the clock tree and generate the clock initiate code.
- **ICP Tool**
  Mass-production programming tool with code encryption, protect IP of customer.
- **ISP Tool**
  Provides sample code for end-product firmware update.
- **CodeGenerator**
  Code generating for NuMicro M251/M252 projects with the initial peripheral, pin, and clock configurations.

NuMicro® Ecosystem - Digital Platform

As a microcontroller platform provider, Nuvoton has been devoted to supporting our customers worldwide by our digital platform. Nuvoton's digital platform can meet various needs including but not limited to product selection, product resources, product purchasing, sales/technical support, and knowledge-based learning.

www.nuvoton.com

nuvoton.com is the core of the digital platform where most of your needs could be fulfilled. It provides products selection, products information, development, and mass production. At Nuvoton's website you can find all needed resources, documents, board support packages, and software tools.

- Product Selection
- Product Information
- Resource Download
  - Documents
  - BSP
  - Software Tools

Sample & buy

For customers who need to receive products faster, our eStore can help. Shopping at the official eStore, Nuvoton Direct, is quick and easy.
Besides Nuvoton Direct, other online shopping channels are also available.

- **Nuvoton Direct** - Official eStore
- **Tmall** - Official eStore for China region
- **TechDesign** - Partner Channel
- **Digikey** - Disti. Channel

Knowledge-based learning

Nuvoton team constantly produces contents with great insights. We deliver reference applications and tech articles in different languages, channels, and forms.

- **Facebook** - Nuvoton NuMicro
- **Twitter** - NuvotonMCU
- **LinkedIn** - Nuvoton Technology
- **WeChat** - @nuvoton_mcu
- **YouTube Channel** - Nuvoton NuMicro
- Bilibili Channel
- Tech blog

Online support

Need talking to a real person? Ask questions any time you want and we will do our best to answer. Feel free to reach our online chat on nuvoton.com or Nuvoton Direct. Besides, Nuvoton-owned forums are great for further discussions.

- NuForum https://forum.nuvoton.com
- 21ic Forum http://bbs.21ic.com
- nuvoton-mcu.com
- Tech/Sales Online Chat
  Visit nuvoton.com or Nuvoton Direct

List of Abbreviations, Acronyms & Codes

Abbreviation/ Code of Chip Specification		Description
ACMP		Analog Comparator
EMAC		Ethernet MAC
LP UART		Low-power UART
OPA		OP Amplifier
PDMA		Peripheral Direct Memory Access
QSPI		Quad SPI
RTC		Real-Time Clock
RTC (V_{BAT})		The RTC could be powered via VBAT pin when power off or in in Power-Down mode.
SPI Master		Master mode used only for this SPI.
USB	USB FS	USB Full Speed
	USB HS	USB High Speed
	O	On-The-Go (OTG)
	D	USB Device
	H	USB Host
	H/D	Allows to act as a USB host or device but not OTG
PSIO		Programmable Serial I/O
VAI		Voltage Adjustment Interface
USCI		Universal Serial Control Interface Controller USCI supports UART, SPI and I^2C mode.
XOM		eXecute-Only Memory

Code of Chip Package	Package	Pin	Size (mm)
A	QFN	68	8 x 8
B	MSOP	10	3 x 3
C	WLCSP	-	-
D	TSSOP	14	4.4 x 5.0
E	TSSOP	28	4.4 x 9.7
F	TSSOP	20	4.4 x 6.5
G	QFN	24	3 x 3
H	LQFP	176	24 x 24
I	SOP	8	4 x 5
J	LQFP	144	20 x 20
K	LQFP	128	14 x 14
L	LQFP	48	7 x 7
M	LQFP	44	14 x 14
N	QFN	48	7 x 7
O	SOP	20	300 mil
P	LQFP	32	7 x 7
R	LQFP	64	10 x 10
S	LQFP	64	7 x 7
T	QFN	33	4 x 4
U	SOP	28	300 mil
V	LQFP	100	14 x 14
W	Wafer	-	-
X	QFN	20	3 x 3
Y	QFN	48	5 x 5
Z	QFN	33	5 x 5

NuMicro® Automotive Family

The NuMicro Automotive/CAN microcontroller is a new microcontroller product line which provides high performance with the capability to withstand up to 125 °C ambient temperature, qualified by AEC-Q100 grade 2, with built-in Controller Area Network(CAN) 2.0 B interface that designed for automotive applications.
The NuMicro Automotive/CAN microcontroller is based on the Arm® Cortex®-M0 core with built-in 16 to 68 Kbytes Flash, supports rich communication interfaces (such as LIN, UART, SPI, I2C... etc.), and comes with DAC , ADC, comparator and other rich analog interfaces.

Qualified by AEC-Q100 grade 2
Operating frequency: 48/50 MHz
Operating Voltage: 2.4 to 5.5V
Operating Temperature: -40°C to 125°C

Potential Application: Reverse Parking Assistanc, Automotive lighting, Body control module, Head Up Display, etc.

NuMicro® CAN/Automotive series MCUs are composed of the following product series.
M0A21/M0A23 Series: Up to 125°C, 48 MHz, up to 32KB Flash, CAN/LIN interface, PDMA, DAC, ACMP
NUC131U Series: Qualified by AEC-Q100 grade 2, 50 MHz, up to 68KB Flash, CAN/LIN interface, up to 6 UART

M0A21 Series

NuMicro® M0A23 based on the Arm® Cortex®-M0 core which is designed for automotive applications, provides up to 32 KB Flash, LIN interface and high stability with the capability to withstand up to 125 °C ambient temperature.

Operating Frequency: Up to 48 MHz
Operating Voltage: 2.4V to 5.5V
Operating Temperature: -40°C to 125°C

Potential Applications: automotive, lighting, industrial communication, industrial Automation, power control, etc.

• M0A21 Series

Key Features: Hardware Divider, up to 125°C, LIN interface, PDMA, UART with the One-Wire

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash	ISP ROM (Kbytes)	I/O	Connectivity			ACMP	ADC (12-bit)	DAC (5-bit)	PDMA	PWM (16-bit)	Timer (32-bit)	Package	Mass Production
						CAN	UART/ LIN [1]	USCI								
M0A21OB1AC	16	4	Configurable	2	18	-	2	2	2	17	1	5	6	4	SSOP20	√
M0A21EB1AC	16	4	Configurable	2	26	-	2	2	2	17	1	5	6	4	TSSOP28	√
M0A21OC1AC	32	4	Configurable	2	18	-	2	2	2	17	1	5	6	4	SSOP20	√
M0A21EC1AC	32	4	Configurable	2	26	-	2	2	2	17	1	5	6	4	TSSOP28	√

1. All UARTs support IrDA SIR. UART0/1 support LIN function.

Development Tools: NuMaker -M0A21EC
Mass Production Programmer: NG-M0A23 (M0A23);n; n should be replaced by Package Code

M0A23 Series

NuMicro® M0A23 based on the Arm® Cortex®-M0 core which is designed for automotive applications, provides up to 32 KB Flash, CAN/LIN interface and high stability with the capability to withstand up to 125 °C ambient temperature.

Operating Frequency: Up to 48 MHz
Operating Voltage: 2.4V to 5.5V
Operating Temperature: -40°C to 125°C

Potential Applications: automotive, lighting, industrial communication, industrial Automation, power control, etc.

• M0A23 Series

Key Features: Hardware Divider, up to 125°C, LIN/CAN interface, PDMA, UART with the One-Wire

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash	ISP ROM (Kbytes)	I/O	Connectivity			ACMP	ADC (12-bit)	DAC (5-bit)	PDMA	PWM (16-bit)	Timer (32-bit)	Package	Mass Production
						CAN	UART/LIN [1]	USCI								
M0A23OC1AC	32	4	Configurable	2	18	1	2	2	2	17	1	5	6	4	SSOP20	√
M0A23EC1AC	32	4	Configurable	2	26	1	2	2	2	17	1	5	6	4	TSSOP28	√

1. All UARTs support IrDA SIR. UART0/1 support LIN function.

Development Tools: NK-M0A23EC
Mass Production Programmer: NLG-M0A23n; n should be replaced by Package Code

NUC131U Series

The NuMicro® NUC131SD2AEU is a 32-bit Arm® Cortex®-M0 based microcontroller running up to 50 MHz with built-in Controller Area Network(CAN) 2.0 B interface, up to 68 KB Flash and qualified by AEC-Q100 grade 2

Operating Frequency: Up to 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: automotive, lighting, industrial communication, industrial Automation, Radar, etc.

• NUC131U Series

Key Features: Hardware Divider, LIN/CAN interface, 6 set of UARTs, 24 channels of 100 MHz PWMs

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash	ISP ROM (Kbytes)	I/O	Timer (32-bit)	PWM (16-bit)	Connectivity					ADC (12-bit)	AEC-Q100	Package
								UART	SPI	I²C	LIN	CAN			
NUC131SD2AEU	68	8	Configurable	4	58	4	24	6	1	2	3	1	8	√	LQFP64
NUC131LD2AEU	68	8	Configurable	4	42	4	24	6	1	2	3	1	8	√	LQFP 48

Development Tools: NuMaker -NUC131U
Mass Production Programmer: NG-NUC131U

NuMicro® Family Arm® Cortex®-M23 Microcontrollers

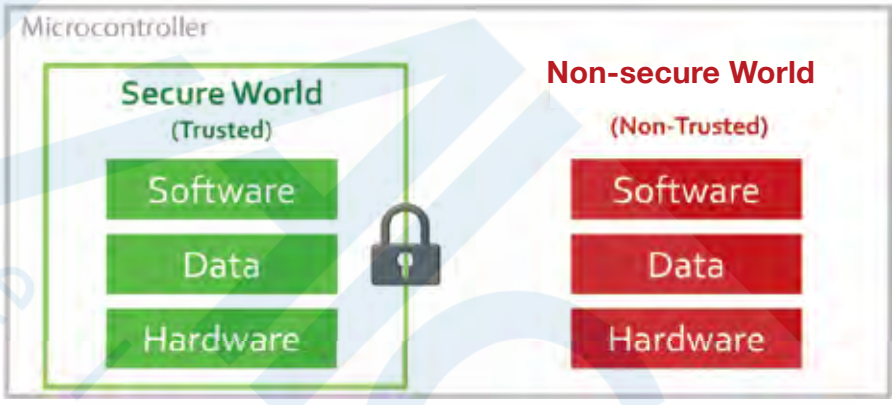
Offers the next industry standard for secure IoT devices

The NuMicro® M23 Family is based on the Arm® Cortex®-M23 core and is empowered by the Arm® TrustZone® for Armv8-M architecture.

With TrustZone® implemented, memory and peripherals could be divided into secure and non-secure worlds to achieve data integrity, firmware update and operation security. In addition, TrustZone® for Armv8-M provides the key benefit of context switching between secure and non-secure worlds by hardware for faster transitions and greater power efficiency.

In additional to the security capability, NuMicro® M23 Series inherits the standard set of Cortex-M0+ as the ultra-low power microprocessor in a tiny footprint.

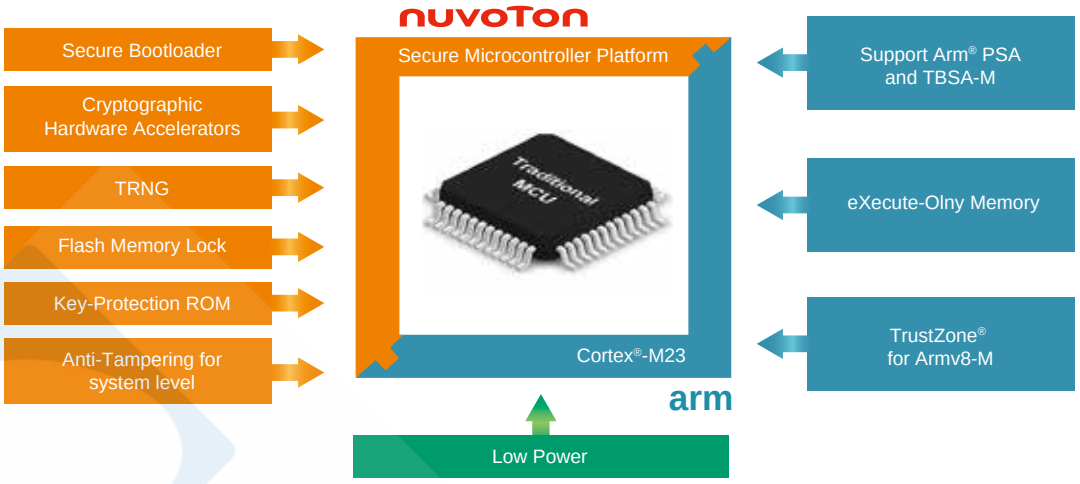
With the two key features of security and ultra-low power, NuMicro® M23 is built for small, energy-sipping IoT and embedded products. With the capability of the small-sized and low-power devices, NuMicro M23 provides security, enhanced efficiency, performance and scalability for deployment even in the most constrained contexts.



M2351 Series

The rise of the internet of things (IoT) era has increased awareness for the integration of physical worlds into digital systems. While the digitization of our everyday lives leads to efficiency improvements and economic benefits, it has also caused pressure on system designers who are now required to come up with innovative IoT products capable of performing secure connection and data exchange with low power consumption. Since security and power consumption are both key requirements for IoT applications, Nuvoton has developed the NuMicro® M2351 Series, which excels in supporting the proliferation of intelligent connected devices. The NuMicro® M2351 microcontroller series is based on the Arm® Cortex®-M23 core with TrustZone® for Armv8-M architecture, which elevates the traditional firmware security to a new level of robust hardware security.

The low power M2351 series microcontroller operates at up to 64 MHz, with up to 512 Kbytes Flash in dual bank mode, supporting secure firmware Over-The-Air (OTA) update and up to 96 Kbytes SRAM. Furthermore, the M2351 series also provides high-performance connectivity peripheral interfaces such as UART, SPI, I²C, GPIOs, USB and ISO 7816-3 for smart card readers. Its secure and efficient power management features strengthen the innovation of IoT security.



*For more information, please visit https://m2351.nuvoton.com

Operating Frequency: 64 MHz
Operating Voltage: 1.7V to 3.6V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C (M2351SFSIAAP: -40°C to 85°C)

Potential Applications: Smart Meters, Gaming Software IP Protection, Smart City, Smart Wearable Devices, Medical Devices, IoT Devices with Secure Connection, Collaborative Secure Software Development Models, etc.
Key Features: TrustZone® for Armv8-M Technology, 8 regions MPU_NS (for non-secure world) and 8 regions MPU_S (for secure world), Hardware Crypto Accelerators, CRC calculation unit, Up to 6 tamper detection pins, Arm® Platform Security Architecture (PSA) and Trusted Base System Architecture-M (TBSA-M) supported, Multiple power modes.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	TRNG	Connectivity											ACMP	ADC (12-bit)	Crypto Engine	DAC (12-bit)	EBI	ECAP	ETM	PWM (16-bit)	QEI	RTC (V_{BAT})	Timer (32-bit)	Tamper	Package	Mass Production
						CAN	I²C	I²S	ISO 7816-3[1]	LIN	LPUART	QSPI	SD Host	SPI / I²S	USB FS	USCI															
M2351ZIAAE	512	96	4	25	√	1	3	1	3	2	6	1	1	3	O*1	2	2	10	√	2	-	-	-	23	1	√	4	-	QFN33[2]	√
M2351CIAAE	512	96	4	41	√	1	3	1	3	2	6	1	1	3	O*1	2	2	12	√	2	√	1	-	24	2	√	4	-	WLCSP49[3]	√
M2351SIAAE	512	96	4	51	√	1	3	1	3	2	6	1	1	4	O*1	2	2	16	√	2	√	1	-	24	2	√	4	1	LQFP64	√
M2351KIAAE	512	96	4	107	√	1	3	1	3	2	6	1	1	4	O*1	2	2	16	√	2	√	2	√	24	2	√	4	6	LQFP128	√
M2351SFSIAAP	512	96	4	45	√	1	3	1	3	2	6	0	1	4	O*1	2	2	16	√	2	√	1	-	24	2	√	4	1	LQFP64	√

1. ISO 7816-3 supports full duplex UART mode.
2. QFN33. (5x5 mm)
3. M2351CIAAE with the package WLCSP49 is available upon request.

Development Tools: NK-BEDM2351/ NK-M2351SF
Mass Production Programmer: NLG-32Z (QFN33)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

M2354 Series

The NuMicro M2354 series is a product portfolio of NuMicro Secure IoT MCU family based on Arm Cortex-M23 TrustZone, covering secure key storage protected by tamper-resistant physical shield, Flash memory protection lock, and secure control unit. It focuses on physical attack protection and certification for Arm PSA Level 2 even for Arm PSA Level 3. The M2354 series is quite competitive for those devices that need more secure, fast computing and low power in the IoT device market.

The major challenge for IoT devices that are connected to cloud or other devices by network communication is Security, so the IoT devices must meet some security requirements to protect firmware, software and secure assets from being stolen or modified by an attacker. “Execution”, “Storage”, and “Connectivity” are the three important targets for secure IoT devices.

The ultra low power M2354 series microcontroller operates at up to 96 MHz frequency, with up to 1 Mbytes embedded Flash memory in dual bank mode, supporting secure firmware Over-The-Air (OTA) update and up to 256 Kbytes embedded SRAM. Following the M2351 series, it also provides high-performance connectivity peripheral interfaces such as UART, SPI, I²C, GPIOs, USB and ISO 7816-3 for smart card reader. On top of all, the countermeasures of mitigation for the side-channel attacks of cryptos and fault injection attacks of voltage and clock tampering elevate an Armv8-M TrustZone application system with physical security enhanced.

Operating Frequency: 96 MHz
Operating Voltage: 1.7V to 3.6V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Key Features: Tamper-resistant key storage in Flash and SRAM, Up to 8 Com. x 40 Seg. LCD controller, TrustZone for Armv8-M Technology, 8 regions MPU_NS (for normal world) and 8 regions MPU_S (for secure world), Hardware Crypto Accelerators, CRC calculation unit, Up to 6 tamper detection pins, Arm Platform Security Architecture (PSA Certified Level 2 /Level 3) supported, Multiple power mode.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency(MHz)	ISP ROM	I/O	Connectivity										Crypto					ACMP	ADC (12-bit)	DAC (12-bit)	Basic PWM (16-bit)	COM/SEG LCD driver	EBI	ECAP	Enhanced PWM (16-bit)	ETM	RTC (V_{BAT})	Tamper	Timer (32-bit)	USB OTG	QEI	Package	Mass Production
						CAN	I²C	I²S	ISO 7816-3[1]	SPI/I²S	LIN	LPUART	Quad SPI	SD Host	USCI	AES, SHA/ HMAC	ECC	RSA	SM2/3/4	TRNG																	
M2354LJFAE	1024	256	96	16	40	1	3	1	3	3	2	6	1	1	2	√	√	√	√	√	2	11	2	12	-	√	1	12	-	√	1	4	FS	2	LQFP48	Q4
M2354SJFAE	1024	256	96	16	50	1	3	1	3	4	2	6	1	1	2	√	√	√	√	√	2	16	2	12	8x13	√	1	12	-	√	1	4	FS	2	LQFP64	Q4
M2354KJFAE	1024	256	96	16	106	1	3	1	3	4	2	6	1	1	2	√	√	√	√	√	2	16	2	12	8x40	√	1	12	√	√	6	4	FS	2	LQFP128	Q4

1. ISO-7816 supports full duplex UART mode
2. Side-Channel Attacks mitigation for hardware AES, RSA, ECC crypto
3. Fault injection mitigation for voltage, clock glitch
4. Crypto supports Chinese SM2/3/4 standards

Development Tools: NK-BEDM2354, NuMaker-IoT-M2354
Mass Production Programmer: NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

M251 Series

The NuMicro® M251 is the low power series based on the Arm® Cortex®-M23 core for Armv8-M architecture, supporting wide operating voltage, built-in 32 to 256 Kbytes Flash, 8 to 32 Kbytes SRAM and 4 Kbytes Flash loader memory for In-System Programming (ISP). The M251 series integrates Programmable Serial I/O (PSIO) that is capable of emulating various serial communication protocols including UART, SPI, I²C, etc. It also features RTC, 840 kSPS ADC, DAC, Analog Comparator, Operational Amplifier, Voltage Adjustable Interface (VAI), ISO 7816-3, and rich peripherals, fast wake-up via communication interfaces, and rich peripherals.

Operating Frequency: 48 MHz
Operating Voltage: 1.8V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: Suitable for battery-powered devices such as Smart Wearable Devices, IoT Node Devices, Portable Medical Devices, Smart Home Appliances, Security Alarm Monitoring, GPS Data Collectors, Wireless Communication (Zigbee, LoRa, etc.) Modules, Electronic Shelf Label (ESL), RFID, Smart Heat/ Water/ Gas Meters, etc.

• M251 Series

Key Features: Up to 8-channel PSIO that is capable of emulating various serial communication protocols. Ultra-low power consumption with 138 µA/MHz (Normal Run Mode), 60 µA/MHz (Idle Mode), 2.5 µA (Power Down, RTC on, RAM retention) and 1.5 µA (Power Down, RTC off, RAM retention)

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	WDT/WWDT	Connectivity							ACMP	ADC (12-bit)	Crypto Engine	DAC (12-bit)	EBI	OPA	PDMA	PWM(16-bit)	RTC	RTC (V_{BAT})	Tamper	Timer (32-bit)	VAI (1.8V~5.5V)	Package	Mass Production
						I²C	ISO 7816-3[1]	PSIO	QSPI	SPI /I²S	UART	USCI															
M251FC2AE	32	8	4	15	√	2	1	-	1	-	2	1	-	7	-	-	-	-	5	9	√	-	-	4	-	TSSOP20	√
M251EC2AE	32	8	4	23	√	2	1	-	1	-	2	1	-	9	-	-	-	-	5	11	√	-	-	4	-	TSSOP28	√
M251ZC2AE	32	8	4	26	√	2	1	-	1	-	2	1	-	10	-	-	-	-	5	12	√	-	-	4	√	QFN33	√
M251LC2AE	32	8	4	41	√	2	1	4	1	1	3	2	2	12	-	-	-	-	5	24	√	-	-	4	√	LQFP48	√
M251SC2AE	32	8	4	54	√	2	1	4	1	1	3	2	2	16	-	-	-	-	5	24	√	-	1	4	√	LQFP64*	√
M251ZD2AE	64	12	4	26	√	2	1	4	1	1	3	2	2	10	-	-	-	-	5	24	√	-	-	4	√	QFN33	√
M251LD2AE	64	12	4	41	√	2	1	4	1	1	3	2	2	12	-	-	-	-	5	24	√	-	-	4	√	LQFP48	√
M251SD2AE	64	12	4	54	√	2	1	4	1	1	3	2	2	16	-	-	-	-	5	24	√	-	1	4	√	LQFP64*	√
M251LE3AE	128	16	4	41	√	2	1	8	1	1	3	3	2	12	-	-	√	-	8	24	√	-	-	4	√	LQFP48	√
M251SE3AE	128	16	4	53	√	2	1	8	1	1	3	3	2	16	-	-	√	-	8	24	√	√	1	4	√	LQFP64*	√
M251KE3AE	128	16	4	85	√	2	1	8	1	1	3	3	2	16	-	-	√	-	8	24	√	√	1	4	√	LQFP128	√
M251LG6AE	256	32	4	41	√	2	1	8	1	1	3	3	2	12	-	1	√	1	8	24	√	-	-	4	√	LQFP48	√
M251SG6AE	256	32	4	53	√	2	1	8	1	1	3	3	2	16	-	1	√	1	8	24	√	√	1	4	√	LQFP64*	√
M251KG6AE	256	32	4	85	√	2	1	8	1	1	3	3	2	16	-	1	√	1	8	24	√	√	1	4	√	LQFP128	√

1. ISO 7816-3 supports full duplex UART mode.

LQFP64*:7x7mm

Development Tools: NK-M251KG/ NK-M251KE/ NK-M251SD/ NK-M251ZC
Mass Production Programmer: NLG-20F/ NLG-28E/ NLG-32Z (QFN33)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

M252 Series

The NuMicro® M252 is the low power series based on the Arm® Cortex®-M23 core for Armv8-M architecture, supporting wide operating voltage, built-in 32 to 256 Kbytes Flash, 8 to 32 Kbytes SRAM and 4 Kbytes Flash loader memory for In-System Programming (ISP). The M252 series integrates Programmable Serial I/O (PSIO) that is capable of emulating various serial communication protocols including UART, SPI, I²C, etc. It also features RTC, 840 kSPS ADC, DAC, Analog Comparator, Operational Amplifier, Voltage Adjustable Interface (VAI), USB 2.0 full speed device (Crystal-less), ISO 7816-3, and rich peripherals, fast wake-up via communication interfaces, and rich peripherals.

Operating Frequency: 48 MHz
Operating Voltage: 1.8V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: Suitable for battery-powered devices such as Smart Wearable Devices, IoT Node Devices, Portable Medical Devices, Smart Home Appliances, Alarm and Security Monitoring, Mobile Payment Smart Card Readers, GPS Data Collectors, Electronic Shelf Label (ESL), RFID, Smart Heat/ Water/ Gas Meters, Keyboards/ Mouse, etc.

• M252 Series

Key Features: USB 2.0 full speed device Crystal-less and up to 8-channel PSIO capable of emulating various serial communication protocols. Ultra-low power Consumption with 138 μA/MHz (Normal Run Mode), 60 μA/MHz (Idle Mode), 2.5μA (Power Down, RTC on, RAM retention) and 1.5μA (Power Down, RTC off, RAM retention)

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	WDT/ WWDT	Connectivity								ADC (12-bit)	ACMP	Crypto Engine	DAC (12-bit)	EBI	OPA	PDMA	PWM (16-bit)	RTC	RTC (V_{BAT})	Tamper	Timer (32-bit)	VAI (1.8V~5.5V)	Package	Mass Production
						I²C	ISO 7816-3[1]	PSIO	QSPI	SPI /I²S	UART	USB FS[2]	USCI															
M252FC2AE	32	8	4	11	√	2	1	-	1	-	2	D*1	1	3	-	-	-	-	-	5	7	√	-	-	4	-	TSSOP20	√
M252EC2AE	32	8	4	19	√	2	1	-	1	-	2	D*1	1	9	-	-	-	-	-	5	11	√	-	-	4	-	TSSOP28	√
M252ZC2AE	32	8	4	22	√	2	1	-	1	-	2	D*1	1	10	-	-	-	-	-	5	12	√	-	-	4	√	QFN33	√
M252LC2AE	32	8	4	37	√	2	1	4	1	1	3	D*1	2	12	2	-	-	-	-	5	24	√	-	-	4	√	LQFP48	√
M252SC2AE	32	8	4	50	√	2	1	4	1	1	3	D*1	2	16	2	-	-	-	-	5	24	√	-	1	4	√	LQFP64*	√
M252ZD2AE	64	12	4	22	√	2	1	4	1	1	3	D*1	2	10	2	-	-	-	-	5	20	√	-	-	4	√	QFN33	√
M252LD2AE	64	12	4	37	√	2	1	4	1	1	3	D*1	2	12	2	-	-	-	-	5	24	√	-	-	4	√	LQFP48	√
M252SD2AE	64	12	4	50	√	2	1	4	1	1	3	D*1	2	16	2	-	-	-	-	5	24	√	-	1	4	√	LQFP64*	√
M252LE3AE	128	16	4	37	√	2	1	8	1	1	3	D*1	3	12	2	-	-	√	-	8	24	√	-	-	4	√	LQFP48	√
M252SE3AE	128	16	4	49	√	2	1	8	1	1	3	D*1	3	16	2	-	-	√	-	8	24	√	√	-	4	√	LQFP64*	√
M252KE3AE	128	16	4	81	√	2	1	8	1	1	3	D*1	3	16	2	-	-	√	-	8	24	√	√	1	4	√	LQFP128	√
M252LG6AE	256	32	4	37	√	2	1	8	1	1	3	D*1	3	12	2	-	1	√	1	8	24	√	-	-	4	√	LQFP48	√
M252SG6AE	256	32	4	49	√	2	1	8	1	1	3	D*1	3	16	2	-	1	√	1	8	24	√	√	1	4	√	LQFP64*	√
M252KG6AE	256	32	4	81	√	2	1	8	1	1	3	D*1	3	16	2	-	1	√	1	8	24	√	√	1	4	√	LQFP128	√

1. ISO 7816-3 supports full duplex UART mode.
2. Supports USB full speed device. (Crystal-less)

LQFP64*:7x7mm

Development Tools: NK-M252KG/ NK-M252KE/ NK-M252SD/ NK-M252ZC
Mass Production Programmer: NLG-20F/ NLG-28E/ NLG-32Z (QFN33)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

M253 Series

The NuMicro M253 series 32-bit microcontroller is based on Arm Cortex-M23 core using Armv8-M architecture. It provides one CAN FD andCrystal-less USB 2.0 FS interface, running up to 48 MHz and features up to 128 Kbytes Flash, 16 Kbytets SRAM.

Operating Frequency: 48 MHz

Operating Voltage: 1.75V to 5.5V

Operating Temperature: -40°C to 105°C

Potential Applications: Suitable for automotive application, Industrial automatic application, and battery management system.

• M253 Series

Key Features: USB 2.0 full speed device interface with up to 17 configurable endpoints, 5 virtual COM ports, and one set of CAN FD interface, supporting up to 64 bytes per message.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	BPWM (16-bit)	WDT/WWDT	Connectivity							ADC(12-Bit)	ACMP	Capacitive Touch	COM/SEG LCD Driver	DAC	OPA	PDMA	RTC	RTC (V_{BAT})	Timer (32-bit)	Package	Mass Production
							I²C	ISO-7816-3	SPI /I²S	UART	USB	CAN FD	USCI												
M253LD3AE	64	16	4	37	6	√	2	-	1	5	√	1	1	12	2	-	-	-	-	5	√	-	4	LQFP48	√
M253ZE3AE	128	16	4	22	6	√	2	-	1	5	√	1	1	10	2	-	-	-	-	5	√	-	4	QFN32	√
M253LE3AE	128	16	4	86	6	√	2	-	1	5	√	1	1	12	2	-	-	-	-	5	√	-	4	LQFP48	√

Development Tools: NK-M253LE
Mass Production Programmer: NLG-48L (LQFP48)

M254/M256/M258 Series

The NuMicro M254/M256/M258 series are a low-power microcontroller platform with COM/SEG LCD driver based on Arm Cortex-M23 core at Armv8-M architecture. M256/M258 series support capacitive touch sensing function. M258 series is with USB 2.0 full speed device. They run up to 48 MHz with 64/128 Kbytes embedded Flash memory and 16 Kbytes embedded SRAM, 4 Kbytes Flash loader memory (LDROM) for In-System Programming (ISP).

Operating Frequency: 48 MHz
Operating Voltage: 1.75V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: Suitable for limited battery-powered device such as Portable Medical Device, Smart Home Appliance, Alarm and Security Monitoring, Thermostat, Temperature Logger Smart Heat/Water/Gas Meters, etc.

• M254 Series

Key Features: A 8x44, 6x46, 4x48 COM/SEG LCD is available on M254 series. The COM/SEG LCD driver is built-in charge-pump, supports 3 ~ 5V LCD panel, with selectable bias voltage (1/2, 1/3, 1/4) and duty (1/4, 1/6, 1/8)

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	BPWM (16-bit)	WDT/WWDT	Connectivity						ADC(12-Bit)	ACMP	Capacitive Touch	COM/SEG LCD Driver	DAC	OPA	PDMA	RTC	RTC (V_{BAT})	Timer (32-bit)	Package	Mass Production
							I^2C	ISO-7816-3	SPI / I^2S	UART	USB	USCI												
M254SD3AE	64	16	4	53	6	√	1	1	1	3+1	-	1	16	2	-	4x32 6x30 8x28	-	-	5	√	√	4	LQFP64	Q2
M254QD3AE	64	16	4	70	6	√	1	1	1	3+1	-	1	16	2	-	4x48 6x46 8x44	-	-	5	√	-	4	LQFP80	Q2
M254KD3AE	64	16	4	86	6	√	1	1	1	3+1	-	1	16	2	-	4x48 6x46 8x44	-	-	5	√	√	4	LQFP128	Q2
M254SE3AE	128	16	4	53	6	√	1	1	1	3+1	-	1	16	2	-	4x32 6x30 8x28	-	-	5	√	√	4	LQFP64	Q2
M254QE3AE	128	16	4	70	6	√	1	1	1	3+1	-	1	16	2	-	4x48 6x46 8x44	-	-	5	√	-	4	LQFP80	Q2
M254KE3AE	128	16	4	86	6	√	1	1	1	3+1	-	1	16	2	-	4x48 6x46 8x44	-	-	5	√	√	4	LQFP128	Q2

Development Tools: NK-M256KE
Mass Production Programmer: NLG-64S (LQFP64)/ NLG-80PX (LQFP80)/NLG-128KX (LQFP128)

• M256 Series

Key Features: Supports 8x44, 6x46, 4x48 COM/SEG LCD driver and capacitive touch sensing function, intergrated up to 14 touch-keys with single-scan or programmable periodic key-scans.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	BPWM (16-bit)	WDT/WWDT	Connectivity						ADC(12-Bit)	ACMP	Capacitive Touch	COM/SEG LCD Driver	DAC	OPA	PDMA	RTC	RTC (V_{BAT})	Timer (32-bit)	Package	Mass Production
							I²C	ISO-7816-3	SPI /I²S	UART	USB	USCI												
M256SD3AE	64	16	4	53	6	√	1	1	1	3+1	-	1	16	2	14+2	4x32 6x30 8x28	-	-	5	√	√	4	LQFP64	Q2
M256QD3AE	64	16	4	70	6	√	1	1	1	3+1	-	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	-	4	LQFP80	Q2
M256KD3AE	64	16	4	86	6	√	1	1	1	3+1	-	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	√	4	LQFP128	Q2
M256SE3AE	128	16	4	53	6	√	1	1	1	3+1	-	1	16	2	14+2	4x32 6x30 8x28	-	-	5	√	√	4	LQFP64	Q2
M256QE3AE	128	16	4	70	6	√	1	1	1	3+1	-	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	-	4	LQFP80	Q2
M256KE3AE	128	16	4	86	6	√	1	1	1	3+1	-	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	√	4	LQFP128	Q2

Development Tools: NK-M256KE
Mass Production Programmer: NLG-64S (LQFP64)/ NLG-80PX (LQFP80)/NLG-128KX (LQFP128)

• M258 Series

Key Features: Supports 8x44, 6x46, 4x48 COM/SEG LCD driver, capacitive touch sensing function, and a crystal-less USB 2.0 full speed device with Battery Charging Detection v1.2 (BC 1.2) profile.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	BPWM (16-bit)	WDT/WWDT	Connectivity						ADC(12-Bit)	ACMP	Capacitive Touch	COM/SEG LCD Driver	DAC	OPA	PDMA	RTC	RTC (V_{BAT})	Timer (32-bit)	Package	Mass Production
							I²C	ISO-7816-3	SPI /I²S	UART	USB	USCI												
M258SD3AE	64	16	4	49	6	√	1	1	1	3+1	√	1	16	2	14+2	4x32 6x30 8x28	-	-	5	√	√	4	LQFP64	Q2
M258QD3AE	64	16	4	65	6	√	1	1	1	3+1	√	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	-	4	LQFP80	Q2
M258KD3AE	64	16	4	82	6	√	1	1	1	3+1	√	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	√	4	LQFP128	Q2
M258SE3AE	128	16	4	49	6	√	1	1	1	3+1	√	1	16	2	14+2	4x32 6x30 8x28	-	-	5	√	√	4	LQFP64	Q2
M258QE3AE	128	16	4	65	6	√	1	1	1	3+1	√	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	-	4	LQFP80	Q2
M258KE3AE	128	16	4	82	6	√	1	1	1	3+1	√	1	16	2	14+2	4x48 6x46 8x44	-	-	5	√	√	4	LQFP128	Q2

Development Tools: NK-M258KE
Mass Production Programmer: NLG-64S (LQFP64)/ NLG-80PX (LQFP80)/NLG-128KX (LQFP128)

M261/M262/M263 Series

The NuMicro® M261/M262/M263 series is the low power microcontroller based on the Arm® Cortex®-M23 core for Armv8-M architecture. It runs at up to 64 MHz with 512 Kbytes Flash in dual bank mode supporting Over-The-Air (OTA) firmware update and 96 Kbytes SRAM. It also supports low supply voltage from 1.8V to 3.6V and operating temperature from -40°C to 105°C.

The NuMicro® M261/M262/M263 series provides multiple power modes for diverse operating scenarios, such as Power-down Mode, Fast Wake-up Power-down Mode, Low Leakage Power-down Mode, Ultra Low Leakage Power-down Mode, Standby Power-down Mode and Deep Power-down mode. The power consumption is 97 µA/MHz (LDO Mode) and 45 µA/MHz (DC-DC Mode) in Normal Run Mode, 2.8 µA in Standby Power-down Mode, and less than 2 µA in Deep Power-down Mode.

The NuMicro® M261/M262/M263 series is equipped with plenty of peripherals, such as Timers, Watchdog Timers, RTC, PDMA, External Bus Interface, Low power UART, Universal Serial Control Interface (USCI), Qual SPI (QSPI), SPI/ I²S, I²C, Smart Card Interface (ISO 7816-3), Secure Digital Host Controllers (SDHC) 2.0, GPIOs, and up to 24 channels of PWM, which makes it highly suitable for connecting comprehensive external modules. It also integrates high performance analog front-end circuit blocks, such as one 16 channels of 12-bit 3.76 MSPS SAR ADC, two 12-bit 1 MSPS voltage type DAC, two rail-to-rail analog comparators (ACMP), temperature sensors, low voltage reset, and Brown-Out Detector to enhance product performance.

The NuMicro® M262 series is based on NuMicro® M261 series. It integrates USB 2.0 full speed OTG transceiver, USB 1.1 Host Controller and USB 2.0 full speed Device Controller with crystal-less function.

The NuMicro® M263 series is based on NuMicro® M262 series. It supports one set of CAN Bus 2.0B controllers. This CAN Bus can be set to be one of six paired I/Os by PinConfigure tool.

Operating Frequency: 64 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 105°C

Potential Applications: Suitable for limited battery-powered devices, such as IoT Node Devices, Portable Medical Devices, Smart Home Appliances, Security Alarm Monitoring, Wireless Sensor Node Devices, Electronic Payment Smart Card Readers, Wireless Communication (Zigbee, LoRa, Thread, etc.) Modules, Smart Door Locks, etc.

• M261/M262/M263 Series

Key Features: 512 Kbytes Flash in dual bank mode for OTA, USB 2.0 full speed OTG, CAN Bus 2.0B, SDHC 2.0, Secure Boot function, Hardware Crypto Engine, one 16-channel 12-bit 3.76 MSPS SAR ADC, two 12-bit 1 MSPS DAC, two rail-to-rail analog comparators (ACMP), Low power consumption: 97 µA/MHz (LDO mode), 45 µA/MHz (DC-DC mode) in Normal Run Mode, 2.8 µA in Standby Power-down Mode, and less than 2 µA in Deep Power-down Mode.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity											ACMP	ADC (12-bit)	Crypto Engine	DAC (12-bit)	EBI	ECAP	ETM	PWM (16-bit)	QEI	RTC (V_{BAT})	Tamper	Timer (32-bit)	Package	Mass Production
					CAN	I²C	I²S	ISO 7816-3	LIN	LPUART	QSPI	SDHC 2.0	SPI/I²S	USB FS	USCI														
M261ZIAAE	512	96	4	25	-	3	1	3	2	6	1	1	3	-	2	2	9	√	2	-	-	-	23	1	√	-	4	QFN33	√
M261SIAAE	512	96	4	51	-	3	1	3	2	6	1	1	4	-	2	2	16	√	2	√	1	-	24	2	√	1	4	LQFP64*	√
M261KIAAE	512	96	4	107	-	3	1	3	2	6	1	1	4	-	2	2	16	√	2	√	2	√	24	2	√	6	4	LQFP128	√
M262ZIAAE	512	96	4	25	-	3	1	3	2	6	1	1	3	D*1	2	2	9	√	2	-	-	-	23	1	√	-	4	QFN33	√
M262SIAAE	512	96	4	51	-	3	1	3	2	6	1	1	4	D*1	2	2	16	√	2	√	1	-	24	2	√	1	4	LQFP64*	√
M262KIAAE	512	96	4	107	-	3	1	3	2	6	1	1	4	D*1	2	2	16	√	2	√	2	√	24	2	√	6	4	LQFP128	√
M263ZIAAE	512	96	4	25	1	3	1	3	2	6	1	1	3	D*1	2	2	9	√	2	-	-	-	23	1	√	-	4	QFN33	√
M263SIAAE	512	96	4	51	1	3	1	3	2	6	1	1	4	D*1	2	2	16	√	2	√	1	-	24	2	√	1	4	LQFP64*	√
M263KIAAE	512	96	4	107	1	3	1	3	2	6	1	1	4	D*1	2	2	16	√	2	√	2	√	24	2	√	6	4	LQFP128	√

Development Tools: NK-M263KI/ NuMaker-IoT-M263A
Mass Production Programmer: NLG-32Z (QFN33)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

LQFP64*:7x7mm

NuMicro® Family Arm® Cortex®-M0 Microcontrollers

As one of the leading Microcontroller companies in the world, Nuvoton provides the state-of-the–art NuMicro® 32-bit microcontroller family powered by the Arm® Cortex®-M0 core. The Cortex®-M0 microcontroller provide wide operating voltage (1.8V to 3.6V, 2.1V to 5.5V, 2.5V to 5.5V), industrial temperature (-40°C to 105°C), high accuracy oscillator, and high immunity (8 kV ESD, 4 kV EFT).

The Cortex®-M0 microcontroller family includes Industrial control 1.8V M031/M032 series, 5V NUC029 series, NUC121/123/125/126 series with USB 2.0 full speed device, NUC130/131/140/230/240 series with Controller Area Network (CAN) Bus, Mini51 and M051 series for value solutions, and ultra-low power solution Nano100 series (1.8V to 3.6V) targeting battery powered applications. These are ideal solutions for industrial control systems, industrial automation, consumer products, embedded network control, power systems, and motor control.

M030G/M031G Series

The NuMicro® M030G/M031G 32-bit microcontroller series is designed for Optical Transceiver Module applications, both of the M030G and the M031G series have a built-in temperature sensor with ±2°C deviation from -40°C to 105°C. The M031G series is equipped with a Hardware Manchester Codec and 1 set of DAC with "Auto Data Generation" function to generate the smooth sine waveform up to 500kHz for Optical Transceiver Module with the function of pilot tone modulation. The M030G/M031G series runs up to 48/72 MHz and features 32/64 Kbytes Flash, 4/8 Kbytes SRAM, 2.7V ~ 3.6V operating voltage, and -40°C to +105°C operating temperature.
The M030G/M031G series provides plenty of peripherals including 2 sets of I²C supporting 1 MHz Slave Mode, internal voltage reference, up to 16 channels of 1.4 MSPS 12-bit SAR ADC and 4 sets of 12-bit DAC. Both M030G/M031G series provide the QFN 24-pin (3x3 mm) and QFN 33-pin (4x4 mm) small form factor package.

Operating Frequency: 48 MHz/ 72MHz
Operating Voltage: 2.7V to 3.6V
Operating Temperature: -40°C to 105°C

Specific Applications: Optical Transceiver Module

• M030G Series

Key Features: Build-in Temperature Sensor, 1MHz Slave Mode I²C, QFN24/33 Small Form Factor Package

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Connectivity			DAC (12-bit)	ADC (12-bit)	Internal VREF	PDMA	BPWM (16-bit)	Timer (32-bit)	IRC 38.4 kHz 48 MHz	PLL (MHz)	Temp. Sensor	MANCH Codec	CRC	Divider	ICP IAP ISP	Package	Mass Production
							I²C	UART	SPI / I²S															
M030GGC1AE	32	4	48	2	512	19	2	1	1	4	11	√	5	6	2	√	-	√	-	√	√	√	QFN24	√
M030GGD1AE	64	4	48	2	512	19	2	1	1	4	11	√	5	6	2	√	-	√	-	√	√	√	QFN24	√
M030GTC1AE	32	4	48	2	512	28	2	1	1	4	16	√	5	6	2	√	-	√	-	√	√	√	QFN33*	√
M030GTD1AE	64	4	48	2	512	28	2	1	1	4	16	√	5	6	2	√	-	√	-	√	√	√	QFN33*	√

QFN33*: 4x4mm

Development Tools: NK-M030GTD
Mass Production Programmer:NLG-M030GG (QFN24)/ NLG-M030GT (QFN33)

• M031G Series

Key Features: Hardware Manchester Codec, 1 set of DAC with Auto Data Generation Function, Build-in Temperature Sensor, 1MHz Slave Mode I²C, QFN24/33 Small Form Factor Package

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Connectivity			DAC (12-bit)	ADC (12-bit)	Internal VREF	PDMA	BPWM (16-bit)	Timer (32-bit)	IRC 38.4 kHz 48 MHz	PLL (MHz)	Temp. Sensor	MANCH Codec	CRC	Divider	ICP IAP ISP	Package	Mass Production
							I²C	UART	SPI / I²S															
M031GGC2AE	32	8	72	2	512	19	2	1	1	4	11	√	7	6	6	√	144	√	√	√	√	√	QFN24	Q3
M031GGD2AE	64	8	72	2	512	19	2	1	1	4	11	√	7	6	6	√	144	√	√	√	√	√	QFN24	Q3
M031GTC2AE	32	8	72	2	512	28	2	1	1	4	16	√	7	6	6	√	144	√	√	√	√	√	QFN33*	Q3
M031GTD2AE	64	8	72	2	512	28	2	1	1	4	16	√	7	6	6	√	144	√	√	√	√	√	QFN33*	Q3

QFN33*: 4x4mm

Development Tools: NK-M031GTD
Mass Production Programmer:NLG-M031GG (QFN24)/ NLG-M031GT (QFN33)

M031 Series

The NuMicro® M031 series is based on the Arm® Cortex®-M0 core, designed for 1.8V to 3.6V industrial applications. It features high performance and plenty of peripherals, such as 2 MSPS ADC and up to 144 MHz PWM. It also supports IEC-60730 safety specifications. The M031 series supports built-in 16 to 512 Kbytes Flash and 2 to 96 Kbytes SRAM.

Operating Frequency: 48/72 MHz
Operating Voltage: 1.8V to 3.6V (48 MHz)/ 2.0V to 3.6V (72 MHz)
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Control, High-Precision Meters, Wireless Chargers, HMI, IoT Node Devices, Security Systems, Motor Controls, Communication Systems, etc.

• M031 Series

Key Features: Configurable up to 10 UART, 144 MHz PWM, 2 MSPS ADC, 24 MHz SPI, 1-wire UART, OTA, SPROM.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Connectivity					ACMP	ADC (12-bit)	CRC	Divider	EBI	LXT	PDMA	PLL	PWM (16-bit)	RTC	Timer (32-bit)	ICP IAP ISP	IRC 38.4 kHz 48 MHz	Package	Mass Production
							I²C	QSPI	SPI / I²S	UART	USCI															
M031FB0AE	16	2	48	2	512	15	2	-	1	3	-	-	7	√	√	-	-	-	-	6	-	2	√	√	TSSOP20	√
M031EB0AE	16	2	48	2	512	23	2	-	1	3	-	-	9	√	√	-	-	-	-	6	-	2	√	√	TSSOP28	√
M031TB0AE	16	2	48	2	512	27	2	-	1	3	-	-	10	√	√	-	-	-	-	6	-	2	√	√	QFN33*	√
M031FC1AE	32	4	48	2	512	15	2	-	1	3	-	-	7	√	√	-	-	2	-	6	-	4	√	√	TSSOP20	√
M031EC1AE	32	4	48	2	512	23	2	-	1	3	-	-	9	√	√	-	-	2	-	6	-	4	√	√	TSSOP28	√
M031TC1AE	32	4	48	2	512	27	2	-	1	3	-	-	10	√	√	-	√	2	-	6	-	4	√	√	QFN33*	√
M031LC2AE	32	8	48	2	512	42	2	-	1	3	1	2	12	√	√	-	√	5	96	12	-	4	√	√	LQFP48	√
M031SC2AE	32	8	48	2	512	55	2	-	1	3	1	2	16	√	√	-	√	5	96	12	-	4	√	√	LQFP64*	√
M031TD2AE	64	8	48	2	512	27	2	-	1	3	1	2	10	√	√	-	√	5	96	12	-	4	√	√	QFN33*	√
M031LD2AE	64	8	48	2	512	42	2	-	1	3	1	2	12	√	√	-	√	5	96	12	-	4	√	√	LQFP48	√
M031SD2AE	64	8	48	2	512	55	2	-	1	3	1	2	16	√	√	-	√	5	96	12	-	4	√	√	LQFP64*	√
M031LE3AE	128	16	48	4	512	42	2	-	1	3	1	2	12	√	√	√	√	5	96	12	-	4	√	√	LQFP48	√
M031SE3AE	128	16	48	4	512	55	2	-	1	3	1	2	16	√	√	√	√	5	96	12	-	4	√	√	LQFP64*	√
M031LG6AE	256	32	72	4	2048	42	2	1	1	6	2	2	12	√	√	√	√	7	144	24	√	4	√	√	LQFP48	√
M031SG6AE	256	32	72	4	2048	55	2	1	1	6	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP64*	√
M031KG6AE	256	32	72	4	2048	111	2	1	1	6	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP128	√
M031LG8AE	256	64	72	4	2048	42	2	1	1	6	2	2	12	√	√	√	√	7	144	24	√	4	√	√	LQFP48	√
M031SG8AE	256	64	72	4	2048	55	2	1	1	6	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP64*	√
M031KG8AE	256	64	72	4	2048	111	2	1	1	6	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP128	√
M031SIAAE	512	96	72	8	2048	55	2	1	1	8	2	2	16	√	√	√	√	9	144	24	√	4	√	√	LQFP64*	√
M031KIAAE	512	96	72	8	2048	111	2	1	1	8	2	2	16	√	√	√	√	9	144	24	√	4	√	√	LQFP128	√

Development Tools: NK-M031TB/ NK-M031TC/ NK-M031SD/ NK-M031SE/ NK-M031KG/ NK-M031KI
Mass Production Programmer: NLG-20F/ NLG-28E/ NLG-32T (QFN33*)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

QFN33*: 4x4mm
LQFP64*: 7x7mm

M032 Series

The NuMicro® M032 series is based on the Arm® Cortex®-M0 core, designed for 1.8V to 3.6V industrial applications. It features high performance and plenty of peripherals, such as 2 MSPS ADCs and up to 144 MHz PWM. It also supports IEC-60730 safety specifications and USB full speed device mode (Crystal-less). The M032 series supports built-in 16 to 512 Kbytes Flash and 2 to 96 Kbytes SRAM.

Operating Frequency: 48/ 72 MHz
Operating Voltage: 1.8V to 3.6V (48 MHz)/ 2.0V to 3.6V (72 MHz)
Operating Temperature: -40°C to 105°C

Potential Applications: Mouse, Keyboards, Gaming Monitors, HMI, IoT Node Devices, Security Systems, Motor Control, Communication Systems, etc.

• M032 Series

Key Features: Configurable up to 10 UART, 144 MHz PWM, 2 MSPS ADC, 24 MHz SPI, 1-wire UART, OTA, USB full speed (Crystal-less), SPROM.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Connectivity						ACMP	ADC (12-bit)	CRC	Divider	EBI	LXT	PDMA	PLL	PWM (16-bit)	RTC	Timer (32-bit)	ICP IAP ISP	IRC 38.4 kHz 48 MHz	Package	Mass Production
							I²C	QSPI	SPI / I²S	UART	USB FS[1]	USCI															
M032FC1AE	32	4	48	2	512	11	-	-	1	1	D*1	1	-	3	-	-	-	-	-	-	6	-	2	√	√	TSSOP20	√
M032EC1AE	32	4	48	2	512	19	-	-	1	1	D*1	1	-	9	-	-	-	-	-	-	6	-	2	√	√	TSSOP28	√
M032TC1AE	32	4	48	2	512	23	-	-	1	1	D*1	1	-	10	-	-	-	-	-	-	6	-	2	√	√	QFN33*	√
M032LC2AE	32	8	48	2	512	38	-	1	1	1	D*1	2	-	12	-	√	-	-	5	-	12	-	4	√	√	LQFP48	√
M032TD2AE	64	8	48	2	512	23	-	1	1	1	D*1	2	-	10	-	√	-	-	5	-	12	-	4	√	√	QFN33*	√
M032LD2AE	64	8	48	2	512	38	-	1	1	1	D*1	2	-	12	-	√	-	-	5	-	12	-	4	√	√	LQFP48	√
M032LE3AE	128	16	48	4	512	38	2	-	1	3	D*1	1	2	12	√	√	√	√	5	96	12	-	4	√	√	LQFP48	√
M032SE3AE	128	16	48	4	512	51	2	-	1	3	D*1	1	2	16	√	√	√	√	5	96	12	-	4	√	√	LQFP64*	√
M032LG6AE	256	32	72	4	2048	38	2	1	1	6	D*1	2	2	12	√	√	√	√	7	144	24	√	4	√	√	LQFP48	√
M032SG6AE	256	32	72	4	2048	51	2	1	1	6	D*1	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP64*	√
M032KG6AE	256	32	72	4	2048	107	2	1	1	6	D*1	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP128	√
M032LG8AE	256	64	72	4	2048	38	2	1	1	6	D*1	2	2	12	√	√	√	√	7	144	24	√	4	√	√	LQFP48	√
M032SG8AE	256	64	72	4	2048	51	2	1	1	6	D*1	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP64*	√
M032KG8AE	256	64	72	4	2048	107	2	1	1	6	D*1	2	2	16	√	√	√	√	7	144	24	√	4	√	√	LQFP128	√
M032SIAAE	512	96	72	8	2048	51	2	1	1	8	D*1	2	2	16	√	√	√	√	9	144	24	√	4	√	√	LQFP64*	√
M032KIAAE	512	96	72	8	2048	107	2	1	1	8	D*1	2	2	16	√	√	√	√	9	144	24	√	4	√	√	LQFP128	√

1. Supports USB full speed device. (Crystal-less)

QFN33*: 4x4mm
LQFP64*: 7x7mm

Development Tools: NK-M032TC/ NK-M032LD/ NK-M032SE/ NK-M032KG/ NK-M032KI

Mass Production Programmer: NLG-20F/ NLG-28E/NLG-32T (QFN33*)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

M031BT Series

The NuMicro M031BT series embedded with the ARM Cortex-M0 core with built-in Bluetooth Low Energy 5.0 (BLE 5.0), designed for 1.8V~3.6V industrial applications. it equipped with high performance and plenty peripher, such as 2 Msps ADC, up to 96 MHz PWM. Built-in 64/128 Kbytes Flash, 8/16 Kbytes SRAM.

Operating Frequency: 48 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C
Potential Applications: IoT edge device, Personal healthcare device with wireless connectivity, Smart home appliances with remote control, Dual modes gaming keyboard/ mouse, Assess tracking devices, etc.

• M031BT Series

Key Features: Bluetooth Low Energy 5.0, 96 MHz PWM, 2 Msps ADC, 24 MHz SPI, Support 1-wire UART, Security Protection ROM (SPROM).

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Connectivity						ACMP	ADC (12-bit)	CRC	Divider	EBI	LXT	PDMA	PLL (MHz)	PWM (16-bit)	RTC	Timer (32-bit)	ICP IAP ISP	IRC 38.4 kHz 48 MHz	Package	Mass Production
							I²C	SPI / I²S	QSPI	UART	USB	USCI															
M031BTYD2AN	64	8	48	2	512	29	2	-	-	3	-	1	2	16	√	√	-	√	5	96	12	-	4	√	√	QFN48*	√
M031BTYE3AN	128	16	48	4	512	29	2	-	-	3	-	1	2	16	√	√	-	√	5	96	12	-	4	√	√	QFN48*	√

Development Tools: NK-M031BTYE
Mass Production Programmer:NLG-M031BTY

QFN48*: 5x5mm

M032BT Series

The NuMicro® M032BT series embedded with the ARM® Cortex®-M0 core with built-in Bluetooth Low Energy 5.0 (BLE 5.0), designed for 1.8V~3.6V industrial applications. It equipped with high performance and plenty peripher, such as 2M sps ADC, up to 144MHz PWM. Built-in 256/512 Kbytes Flash, 64/96 Kbytes SRAM.

Operating Frequency: 48 MHz
Operating Voltage: 1.8V to 3.6V(48MHz) / 2.0V to 3.6V(72MHz)
Operating Temperature: -40°C to 85°C
Potential Applications: Motor control and access device, IoT edge device, Personal healthcare device with wireless connectivity, Smart home appliances, etc.

• M032BT Series

Key Features: Bluetooth Low Energy 5.0, 144 MHz PWM, 2 Msps ADC, OTA, USB full speed (Crystal-less)

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Connectivity						ACMP	ADC (12-bit)	CRC	Divider	EBI	LXT	PDMA	PLL (MHz)	PWM (16-bit)	RTC	Timer (32-bit)	ICP IAP ISP	IRC 38.4 kHz 48 MHz	Package	Mass Production
							I²C	SPI / I²S	QSPI	UART	USB[1]	USCI															
M032BTAG8AN	256	64	72	4	2048	43	2	-	1	6	√	2	2	16	√	√	-	√	7	96	24	√	4	√	√	QFN68*	Q2
M032BTAIAAN	512	96	72	8	2048	43	2	-	1	8	√	2	2	16	√	√	-	√	9	96	24	√	4	√	√	QFN68*	Q2

1. Supports USB full speed device. (Crystal-less)

Development Tools: NK-M032BTAI
Mass Production Programmer: NLG-M032BTA

QFN68*: 8x8mm

M071 Series

The NuMicro® M071 microcontroller is 32-bit microcontroller based on Arm® Cortex®-M0 and is designed for HA applications with 0.65/0.8mm pin-pitch. The series provides 16 to 256 Kbytes Flash memory, 8 to 20 Kbytes SRAM, rich communication interfaces (such as USB, UART, SPI, I2C... etc.), and comes with ADC, comparator and other rich analog interfaces.

Operating Frequency: Up to 72 MHz
Operating Voltage: 2.5 to 5.5V
Operating Temperature: -40°C to 105°C
Potential Applications: Home appliance, Motor control, White goods, Industrial Control

• M071 Series

Key Features: Hardware Divider, VAI, RTC, EBI, PDMA

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	ISP ROM (KB)	I/O	Timer (32-bit)	PWM (16-bit)	Connectivity						EBI	ADC (12-bit)	Comparator	RTC	VAI	Divider	PDMA	CRC	Package	Mass Production
									USCI	UART	ISO-7816-3	SPI/I²S	I²C	USB										
M071MC2AE	50	36	8	Conf.	4	38	4	12	-	4	-	1	1	-	-	8	-	-	-	-	-	-	LQFP44 (10x10)	√
M071MD2AE	50	68	8	Conf.	4	38	4	12	-	4	-	1	1	-	-	8	-	-	-	-	-	-	LQFP44 (10x10)	√
M071SD3AE	72	64	16	Conf.	8	45	4	6	-	3	-	2	2	v	v	12	-	v	-	-	9	v	LQFP64 (7x7)	√
M071R1D3AE	72	64	16	Conf.	8	45	4	6	-	3	-	2	2	v	v	12	-	v	-	-	9	v	LQFP64 (14x14)	√
M071SE3AE	72	128	16	Conf.	8	45	4	6	-	3	-	2	2	v	v	12	-	v	-	-	9	v	LQFP64 (7x7)	√
M071R1E3AE	72	128	16	Conf.	8	45	4	6	-	3	-	2	2	v	v	12	-	v	-	-	9	v	LQFP64 (14x14)	√
M071QE4AE	72	128	20	Conf.	4	67	4	12	3	3	2	2	2	-	v	17	2	v	v	v	5	v	LQFP80 (14x14)	√
M071QG4AE	72	256	20	Conf.	4	67	4	12	3	3	2	2	2	-	v	17	2	v	v	v	5	v	LQFP80 (14x14)	√
M071VG4AE	72	256	20	Conf.	4	85	4	12	3	3	2	2	2	-	v	20	2	v	v	v	5	v	LQFP100 (14x14)	√

1. Programmable Gain Amplifier.

Development Tools: NuMaker-M071MD/ NuMaker-M071R1E/ NuMaker-M071VG
Mass Production Programmer: NLG-64S (LQFP64);

Mini51 Series

The NuMicro® Mini51 series is based on the Arm® Cortex®-M0 core runs at up to 50 MHz with 4 to 32 Kbytes Flash memory and 2/4 Kbytes SRAM. The Mini51 series is equipped with plenty of ADC and PWM for different industrial applications, supporting Low Voltage Reset , Brown-Out Detector , 96-bit Unique ID, and 128-bit Unique Customer ID.

Potential Applications: Wireless Chargers, Home Appliances, Security/ Alarms, Temperature Sensors, Motors, Industrial Control, etc.

• Mini51 Series

Operating Frequency: 24 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, 2 Kbytes ISP loader

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity			ADC (10-bit)	Comparator	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						I²C	SPI	UART								
MINI51FDE	4	2	Configurable	2	17	1	1	1	4	-	3	2	√	√	TSSOP20	√
MINI51TDE	4	2	Configurable	2	29	1	1	1	8	2	6	2	√	√	QFN33*	√
MINI51ZDE	4	2	Configurable	2	29	1	1	1	8	2	6	2	√	√	QFN33	√
MINI51LDE	4	2	Configurable	2	30	1	1	1	8	2	6	2	√	√	LQFP48	√
MINI52FDE	8	2	Configurable	2	17	1	1	1	4	-	3	2	√	√	TSSOP20	√
MINI52TDE	8	2	Configurable	2	29	1	1	1	8	2	6	2	√	√	QFN33*	√
MINI52ZDE	8	2	Configurable	2	29	1	1	1	8	2	6	2	√	√	QFN33	√
MINI52LDE	8	2	Configurable	2	30	1	1	1	8	2	6	2	√	√	LQFP48	√
MINI54FDE	16	2	Configurable	2	17	1	1	1	4	-	3	2	√	√	TSSOP20	√
MINI54TDE	16	2	Configurable	2	29	1	1	1	8	2	6	2	√	√	QFN33*	√
MINI54ZDE	16	2	Configurable	2	29	1	1	1	8	2	6	2	√	√	QFN33	√
MINI54LDE	16	2	Configurable	2	30	1	1	1	8	2	6	2	√	√	LQFP48	√

Development Tools: NT-Mini51F/ NT-Mini51L
Mass Production Programmer: NLG-Mini51n; n should be replaced by Package Code

QFN33*: 4x4mm

• Mini55 Series

Operating Frequency: 48 MHz
Operating Voltage: 2.1V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Supports Hardware Divider

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (10-bit)	Comparator	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
						I²C	SPI	UART	USCI								
MINI55TDE	17.5	2	Configurable	2	29	1	1	2	-	12	2	6	2	√	√	QFN33*	√
MINI55LDE	17.5	2	Configurable	2	33	1	1	2	-	12	2	6	2	√	√	LQFP48	√

Development Tools: NT-Mini55L
Mass Production Programmer: NLG-Mini55n; n should be replaced by Package Code

QFN33*: 4x4mm

• Mini57 Series

Operating Frequency: 48 MHz
Operating Voltage: 2.1V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: 2 Sample and Hold ADC, Programmable Gain Amplifier

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	ADC (12-bit)	Comparator	PGA[1]	PWM(16-bit)	Timer (32-bit)	USCI	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
MINI57FDE	29.5	4	Configurable	2	18	8	2	√	8	2	2	√	√	TSSOP20	√
MINI57EDE	29.5	4	Configurable	2	22	8	2	√	8	2	2	√	√	TSSOP28	√
MINI57TDE	29.5	4	Configurable	2	22	8	2	√	8	2	2	√	√	QFN33*	√

1. Programmable Gain Amplifier.

QFN33*: 4x4mm

Development Tools: NT-Mini57E
Mass Production Programmer: NLG-Mini57n; n should be replaced by Package Code

• Mini58 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity			ADC (10-bit)	Comparator	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						I²C	SPI	UART								
MINI58FDE	32	4	Configurable	2.5	17	2	1	2	4	-	6	2	√	√	TSSOP20	√
MINI58TDE	32	4	Configurable	2.5	29	2	1	2	8	2	6	2	√	√	QFN33*	√
MINI58ZDE	32	4	Configurable	2.5	29	2	1	2	8	2	6	2	√	√	QFN33	√
MINI58LDE	32	4	Configurable	2.5	30	2	1	2	8	2	6	2	√	√	LQFP48	√

QFN33*: 4x4mm

Development Tools: NT-Mini58L (Mini58L)
Mass Production Programmer: NLG-Mini51n; n should be replaced by Package Code

M051 Series

The NuMicro® M051 series is based on the Arm® Cortex®-M0 core, equipped with plenty of resources and peripherals, such as 8 to 256 Kbytes Flash, 4 to 20 Kbytes SRAM, and 4/ 8 Kbytes Flash loader memory for In-System Programming (ISP), up to 20-channel ADC, and 14-channel PWM. It supports Low Voltage Reset , Brown-Out Detector , 96-bit Unique ID and 128-bit Unique Customer ID.

Potential Applications: Industrial Control, Security/ Alarms, Temperature Sensors, Motors, etc.

• M051 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: 4 Kbytes Data Flash, Hardware Divider, 4x comparators

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity			ADC (12-bit)	Comparator	EBI	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						I²C	SPI	UART									
M052ZDE	8	4	4	4	24	2	1	2	5	3	-	5	4	√	√	QFN33	√
M052LDE	8	4	4	4	40	2	2	2	8	4	√	8	4	√	√	LQFP48	√
M054ZDE	16	4	4	4	24	2	1	2	5	3	-	5	4	√	√	QFN33	√
M054LDE	16	4	4	4	40	2	2	2	8	4	√	8	4	√	√	LQFP48	√
M058ZDE	32	4	4	4	24	2	1	2	5	3	-	5	4	√	√	QFN33	√
M058LDE	32	4	4	4	40	2	2	2	8	4	√	8	4	√	√	LQFP48	√
M0516ZDE	64	4	4	4	24	2	1	2	5	3	-	5	4	√	√	QFN33	√
M0516LDE	64	4	4	4	40	2	2	2	8	4	√	8	4	√	√	LQFP48	√

Development Tools: NT-M051L (M052, M054, M058, M0516)
Mass Production Programmer: NLG-M051n; n should be replaced by Package Code

• M0515 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, 100 MHz PWM

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (12-bit)	Comparator	PWM (16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						I²C	LIN	SPI	UART								
M0515LDE	68	8	Configurable	4	24	1	3	1	4	8	3	12	4	√	√	LQFP48	√

Development Tools: NT-M0515L
Mass Production Programmer: NLG-M0515n; n should be replaced by Package Code

• M0518 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, 24-channel 100 MHz PWM output, 6x UART

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (12-bit)	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						I²C	LIN	SPI	UART							
M0518LC2AE	36	8	Configurable	4	42	2	3	1	6	8	24	4	√	√	LQFP48	√
M0518SC2AE	36	8	Configurable	4	56	2	3	1	6	8	24	4	√	√	LQFP64*	√
M0518LD2AE	68	8	Configurable	4	42	2	3	1	6	8	24	4	√	√	LQFP48	√
M0518SD2AE	68	8	Configurable	4	56	2	3	1	6	8	24	4	√	√	LQFP64*	√

LQFP64*: 7x7mm

Development Tools: NT-M0518S
Mass Production Programmer: NLG-M0518n; n should be replaced by Package Code

• M0519 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Hardware Divider, Dual ADC, 2x OPAs, 3x Comparators

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (12-bit)	Capture	Comparator	OPA	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						I²C	LIN	SPI	UART										
M0519LD3AE	64	16	4	8	38	1	2	1	2	8+8	-	2	2	6	4	√	√	LQFP48	√
M0519SD3AE	64	16	4	8	51	1	2	2	2	8+8	-	2	2	10	4	√	√	LQFP64*	√
M0519LE3AE	128	16	Configurable	8	38	1	2	1	2	8+8	-	2	2	6	4	√	√	LQFP48	√
M0519SE3AE	128	16	Configurable	8	51	1	2	2	2	8+8	-	2	2	10	4	√	√	LQFP64*	√
M0519VE3AE	128	16	Configurable	8	82	1	2	3	2	8+8	6	3	2	14	4	√	√	LQFP100	√

LQFP64*: 7x7mm

Development Tools: NT-M0519V
Mass Production Programmer: NLG-M0519n; n should be replaced by Package Code

• M0564 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, Hardware Divider, Up to 8x UART, 144 MHz PWM output, 800 kSPS ADC

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	SPROM (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity					ACMP	ADC (12-bit)	EBI	PDMA	PWM	RTC (V_{BAT})	Timer (32-bit)	VAI (1.8V-5.5V)	ICP IAP ISP	IRC 10 kHz 22 MHz 48 MHz	Package	Mass Production
							I²C	ISO 7816-3[1]	SPI/I²S	UART	USCI												
M0564LE4AE	128	20	Configurable	2	4	41	2	2	2	3	3	2	10	√	5	12	-	4	√	√	√	LQFP48	√
M0564SE4AE	128	20	Configurable	2	4	53	2	2	2	3	3	2	15	√	5	12	√	4	√	√	√	LQFP64*	√
M0564LG4AE	256	20	Configurable	2	4	41	2	2	2	3	3	2	10	√	5	12	-	4	√	√	√	LQFP48	√
M0564SG4AE	256	20	Configurable	2	4	53	2	2	2	3	3	2	15	√	5	12	√	4	√	√	√	LQFP64*	√
M0564VG4AE	256	20	Configurable	2	4	85	2	2	2	3	3	2	20	√	5	12	√	4	√	√	√	LQFP100	√

1. ISO 7816-3 supports full duplex UART mode.

LQFP64*: 7x7mm

Development Tools: NT-M0564V
Mass Production Programmer: NLG-M0564n; n should be replaced by Package Code

NUC029 Series

The NuMicro® NUC029 series is designed for industrial applications supported by the robust noise immunity EFT features. It is based on the Arm® Cortex®-M0 core with 5V operating voltage. NUC029 series provides 16 to 256 Kbytes Flash, 2 to 20 Kbytes SRAM, and high performance peripherals such as 12-bit ADC, UART, PWM, SPI, I²C, etc. Specific parts support hardware divider, comparator, and USB 2.0 full speed device (Crystal-less).

Operating Frequency: Up to 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 85°C/105°C

Potential Applications: Industrial Control, High-precision Meters, HMI, Motor Control, Communication Systems, etc.

• NUC029 Series

Key Features: 5V industrial control, Robust noise immunity EFT 4.4 kV, strong ESD up to HBM 8 kV.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity								ACMP	ADC (12-bit)	CRC	Divider	EBI	LXT	PDMA	PLL	PWM (16-bit)	RTC	Timer (32-bit)	VAI (1.8V-5.5V)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Operating Temp. (°C)	Mass Production
							I²C	I²S	ISO 7816-3[1]	LIN	SPI	UART	USB[2]	USCI																	
NUC029FAE	16	2	24	Configurable	2	17	1	-	-	-	1	1	-	-	2	4 (10-bit)	-	-	-	√	-	-	3	-	2	-	√	√	TSSOP20	-40 to 105	√
NUC029TAN	32	4	50	4	4	24	2	-	-	-	1	2	-	-	3	5	-	√	-	-	-	√	5	-	4	-	√	√	QFN33*	-40 to 85	√
NUC029ZAN	64	4	50	4	4	24	2	-	-	-	1	2	-	-	3	5	-	√	-	-	-	√	5	-	4	-	√	√	QFN33	-40 to 85	√
NUC029NAN	64	4	50	4	4	40	2	-	-	-	2	2	-	-	4	8	-	√	√	-	-	√	8	-	4	-	√	√	QFN48	-40 to 85	√
NUC029LAN	64	4	50	4	4	40	2	-	-	-	2	2	-	-	4	8	-	√	√	-	-	√	8	-	4	-	√	√	LQFP48	-40 to 85	√
NUC029LDE	68	8	50	Configurable	4	42	2	-	-	3	1	4	-	-	-	8	-	-	-	-	-	√	12	-	4	-	√	√	LQFP48	-40 to 105	√
NUC029SDE	68	8	50	Configurable	4	56	2	-	-	3	1	4	-	-	-	8	-	-	-	-	-	√	12	-	4	-	√	√	LQFP64*	-40 to 105	√
NUC029LEE	128	16	72	Configurable	8	31	2	-	-	2	1	2	1	-	-	10	√	-	-	√	9	√	4	√	4	-	√	√	LQFP48	-40 to 105	√
NUC029SEE	128	16	72	Configurable	8	45	2	-	-	3	2	3	1	-	-	12	√	-	√	√	9	√	6	√	4	-	√	√	LQFP64*	-40 to 105	√
NUC029LGE	256	20	72	Configurable	4	35	2	2	-	-	2	3	1	3	2	9	√	-	√	√	5	√	10	√	4	√	√	√	LQFP48	-40 to 105	√
NUC029SGE	256	20	72	Configurable	4	49	2	2	-	-	2	3	1	3	2	15	√	-	√	√	5	√	12	√	4	√	√	√	LQFP64*	-40 to 105	√
NUC029KGE	256	20	72	Configurable	4	86	2	2	2	-	2	3	1	3	2	20	√	-	√	√	5	√	12	√	4	√	√	√	LQFP128	-40 to 105	√

1. ISO 7816-3 supports full duplex UART mode.
2. Supports USB full speed device. (Crystal-less)

QFN33*: 4x4mm
LQFP64*: 7x7mm

Development Tools: NT-NUC029F/ NT-NUC029L/ NT-NUC029SD/ NT-NUC029SE/ NT-NUC029SG/ NT-NUC029KG
Mass Production Programmer: NLG-NUC029nA/ NLG-NUC029nD/ NLG-NUC029nE/ NLG-NUC029nG ; n should be replaced by Package Code

NUC121 Series

The NuMicro® NUC121 series is based on the Arm® Cortex®-M0 core with 32 to 256 Kbytes Flash, 8 to 20 Kbytes SRAM, and 4 Kbytes Flash loader memory for In-System Programming (ISP). This series is a standard USB series supporting crystal-less (except NUC123). 48 MHz high speed RC oscillator supports crystal-less USB transfer and 24-channel PWM/BPWM supports external components control. In addition, NUC121 series provides plenty of selections with up to 24-channel PWM and 20-channel ADC.

Key Features: Over 4 Kbytes ISP loader, USB 2.0 full speed device crystal-less (except NUC123). NUC125/ NUC126 supports voltage adjustable interface (VAI) with individual I/O (1.8V to 5.5V) connecting to the external components allowing flexbile for product design.
Potential Applications: USB Composite Devices, Gaming Mouse/ Keyboards/ Pads, USB Type-C Earphones, Industrial Automation, IoT devices, etc.

• NUC121 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	SPROM (Bytes)	I/O	Connectivity					ADC (12-bit)	PDMA	PWM (16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
						I²C	SPI/I²S	UART	USCI	USB FS[1]								
NUC121ZC2AE	32	8	4.5	512	22	2	1	1	1	D*1	4	5	17	4	√	√	QFN33	√
NUC121LC2AE	32	8	4.5	512	38	2	1	1	1	D*1	10	5	24	4	√	√	LQFP48	√
NUC121SC2AE	32	8	4.5	512	52	2	1	1	1	D*1	12	5	24	4	√	√	LQFP64*	√

1. Supports USB Full Speed device mode. (Crystal-less)

LQFP64*: 7x7mm

Development Tools: NT-NUC121S
Mass Production Programmer: NLG-NUC121n; n should be replaced by Package Code

• NUC125 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Voltage Adjustable Interface from 1.8V to 5.5V, up to 12-channel ADC

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	SPROM (Bytes)	I/O	Connectivity					ADC (12-bit)	PDMA	PWM (16-bit)	Timer (32-bit)	VAI (1.8V-5.5V)	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
						I²C	SPI/I²S	UART	USCI	USB FS[2]									
NUC125ZC2AE	32	8	4.5	512	22	2	1	1	1	D*1	4	5	17	4	√	√	√	QFN33	√
NUC125LC2AE	32	8	4.5	512	37	2	1	1	1	D*1	9	5	23	4	√	√	√	LQFP48	√
NUC125SC2AE	32	8	4.5	512	51	2	1	1	1	D*1	11	5	23	4	√	√	√	LQFP64*	√

1. Supports USB full speed device mode. (Crystal-less)

LQFP64*: 7x7mm

Development Tools: NT-NUC125S
Mass Production Programmer: NLG-NUC125n; n should be replaced by Package Code

• NUC123 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity						ADC (10-bit)	CRC	PDMA	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
					I²C	I²S	PS2	SPI	UART	USB FS									
NUC123ZC2AE1	36	12	4	20	1	1	-	3	1	D*1	3	√	6	3	4	√	√	QFN33	√
NUC123LC2AE1	36	12	4	36	2	1	1	3	2	D*1	8	√	6	4	4	√	√	LQFP48	√
NUC123SC2AE1	36	12	4	47	2	1	1	3	2	D*1	8	√	6	4	4	√	√	LQFP64*	√
NUC123ZD4AE0	68	20	4	20	1	1	-	3	1	D*1	3	√	6	3	4	√	√	QFN33	√
NUC123LD4AE0	68	20	4	36	2	1	1	3	2	D*1	8	√	6	4	4	√	√	LQFP48	√
NUC123SD4AE0	68	20	4	47	2	1	1	3	2	D*1	8	√	6	4	4	√	√	LQFP64*	√

LQFP64*: 7x7mm

Development Tools: NT-NUC123S
Mass Production Programmer: NLG-NUC123n; n should be replaced by Package Code

• NUC126 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Up to 12-channel 144 MHz PWM, 800 kSPS 20-channel ADC, Hardware Divider.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	SPROM (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity						ACMP	ADC (12-bit)	EBI	PDMA	PWM (16-bit)	RTC (V_{BAT})	Timer (32-bit)	VAI (1.8V-5.5V)	ICP IAP ISP	IRC 10 kHz 22 MHz 48 MHz	Package	Mass Production
						I²C	ISO 7816-3[1]	SPI/I²S	UART	USB FS[2]	USCI												
NUC126NE4AE	128	20	2	4	35	2	2	2	3	D*1	3	2	9	√	5	10	√	4	√	√	√	QFN48	√
NUC126LE4AE	128	20	2	4	35	2	2	2	3	D*1	3	2	9	√	5	10	√	4	√	√	√	LQFP48	√
NUC126SE4AE	128	20	2	4	49	2	2	2	3	D*1	3	2	15	√	5	12	√	4	√	√	√	LQFP64	√
NUC126LG4AE	256	20	2	4	35	2	2	2	3	D*1	3	2	9	√	5	10	√	4	√	√	√	LQFP48	√
NUC126SG4AE	256	20	2	4	49	2	2	2	3	D*1	3	2	9	√	5	12	√	4	√	√	√	LQFP64*	√
NUC126VG4AE	256	20	2	4	81	2	2	2	3	D*1	3	2	20	√	5	12	√	4	√	√	√	LQFP100	√

1. ISO 7816-3 supports full duplex UART mode.
2. Supports USB full speed device. (Crystal-less)

LQFP64*: 7x7mm

Development Tools: NT-NUC126V
Mass Production Programmer: NLG-NUC126n; n should be replaced by Package Code

NUC130 CAN Series

The NuMicro® NUC130/131/140/230/240 series with CAN Bus is based on the Arm® Cortex®-M0 core with 32 to 128 Kbytes Flash memory, 4 to 16 Kbytes SRAM, and 4/ 8 Kbytes Flash loader memory for In-System Programming (ISP). This series is designed for CAN applications. It is equipped with a variety of peripherals for general connectivity functions such as LIN, USB 2.0 full speed device, UART, I²C, and ADC. In addition, the NUC130/131/140/230/240 series features Analog Comparator, Low Voltage Reset, and Brown-Out Detector.

NUC130 CAN Series	USB FS	LIN	CAN
NUC131		√	√
NUC130		√	√
NUC140	√	√	√
NUC230		√	√
NUC240	√	√	√

Key Features: LIN, up to 2-channel CAN Bus, 4 Kbytes Data Flash, 4/ 8 Kbytes ISP loader.
Potential Applications: Automotive, Security/ Alarms, Temperature Sensors, Communication Systems, etc.

• NUC131 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity					ADC (12-bit)	PWM (16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						CAN	I²C	LIN	SPI	UART							
NUC131LC2AE	36	8	Configurable	4	42	1	2	3	1	6	8	24	4	√	√	LQFP48	√
NUC131SC2AE	36	8	Configurable	4	56	1	2	3	1	6	8	24	4	√	√	LQFP64*	√
NUC131LD2AE	68	8	Configurable	4	42	1	2	3	1	6	8	24	4	√	√	LQFP48	√
NUC131SD2AE	68	8	Configurable	4	56	1	2	3	1	6	8	24	4	√	√	LQFP64*	√

LQFP64*: 7x7mm

Development Tools: NT-NUC131S
Mass Production Programmer: NLG-NUC131n; n should be replaced by Package Code

• NUC130 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 85°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity								ADC (12-bit)	Comparator	EBI	PDMA	PWM (16-bit)	RTC	Timer (32-bit)	ICP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						CAN	I²S	I²C	ISO 7816-3	LIN	SPI	UART	USB FS											
NUC130LC1CN	32	4	4	4	35	1	1	2	-	2	1	3	-	8	1	-	9	4	√	4	√	√	LQFP48	√
NUC130RC1CN	32	4	4	4	49	1	1	2	-	2	2	3	-	8	2	√	9	6	√	4	√	√	LQFP64	√
NUC130LD2CN	64	8	4	4	35	1	1	2	-	2	1	3	-	8	1	-	9	4	√	4	√	√	LQFP48	√
NUC130RD2CN	64	8	4	4	49	1	1	2	-	2	2	3	-	8	2	√	9	6	√	4	√	√	LQFP64	√
NUC130LE3CN	128	16	Configurable	4	35	1	1	2	-	2	1	3	-	8	1	-	9	4	√	4	√	√	LQFP48	√
NUC130RE3CN	128	16	Configurable	4	49	1	1	2	-	2	2	3	-	8	2	√	9	6	√	4	√	√	LQFP64	√
NUC130VE3CN	128	16	Configurable	4	80	1	1	2	-	2	4	3	-	8	2	√	9	8	√	4	√	√	LQFP100	√

Development Tools: NT-NUC140V
Mass Production Programmer: NLG-NUC100n; n should be replaced by Package Code

• NUC1311 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (12-bit)	PWM(16-bit)	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						CAN	I²C	SPI	UART							
NUC1311LC2AE	34	8	Configurable	4	42	1	1	1	4	8	12	4	√	√	LQFP48	√
NUC1311LD2AE	68	8	Configurable	4	42	1	1	1	4	8	12	4	√	√	LQFP48	√

Development Tools: NT-NUC1311L
Mass Production Programmer: NLG-NUC1311L

• NUC140 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 85°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM	I/O	Connectivity								ADC (12-bit)	Comparator	EBI	PDMA	PWM (16-bit)	RTC	Timer (32-bit)	ICP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						CAN	I²C	I²S	ISO 7816-3	LIN	SPI	UART	USB FS											
NUC140LC1CN	32	4	4	4	31	1	2	1	-	2	1	2	D*1	8	1	-	9	4	√	4	√	√	LQFP48	√
NUC140RC1CN	32	4	4	4	45	1	2	1	-	2	2	3	D*1	8	2	√	9	4	√	4	√	√	LQFP64	√
NUC140LD2CN	64	8	4	4	31	1	2	1	-	2	1	2	D*1	8	1	-	9	4	√	4	√	√	LQFP48	√
NUC140RD2CN	64	8	4	4	45	1	2	1	-	2	2	3	D*1	8	2	√	9	4	√	4	√	√	LQFP64	√
NUC140LE3CN	128	16	Configurable	4	31	1	2	1	-	2	1	2	D*1	8	1	-	9	4	√	4	√	√	LQFP48	√
NUC140RE3CN	128	16	Configurable	4	45	1	2	1	-	2	2	3	D*1	8	2	√	9	4	√	4	√	√	LQFP64	√
NUC140VE3CN	128	16	Configurable	4	76	1	2	1	-	2	4	3	D*1	8	2	√	9	8	√	4	√	√	LQFP100	√

Development Tools: NT-NUC140V
Mass Production Programmer: NLG-NUC100n; n should be replaced by Package Code

• NUC230 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity								ADC (12-bit)	Comparator	CRC	PDMA	PWM (16-bit)	RTC (V_{BAT})	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						CAN	I²C	I²S	ISO 7816-3[1]	LIN	SPI	UART	USB FS											
NUC230LC2AE	32	8	4	8	35	2	2	1	2	3	1	3	-	7	1	√	9	4	√	4	√	√	LQFP48	√
NUC230SC2AE	32	8	4	8	49	2	2	1	2	3	2	3	-	7	2	√	9	6	√	4	√	√	LQFP64*	√
NUC230LD2AE	64	8	4	8	35	2	2	1	2	3	1	3	-	7	1	√	9	4	√	4	√	√	LQFP48	√
NUC230SD2AE	64	8	4	8	49	2	2	1	2	3	2	3	-	7	2	√	9	6	√	4	√	√	LQFP64*	√
NUC230LE3AE	128	16	Configurable	8	35	2	2	1	2	3	1	3	-	7	1	√	9	4	√	4	√	√	LQFP48	√
NUC230SE3AE	128	16	Configurable	8	49	2	2	1	2	3	2	3	-	7	2	√	9	6	√	4	√	√	LQFP64*	√
NUC230VE3AE	128	16	Configurable	8	83	2	2	1	3	3	4	3	-	8	2	√	9	8	√	4	√	√	LQFP100	√

1. ISO 7816-3 supports full duplex UART mode.

LQFP64*: 7x7mm

Development Tools: NT-NUC240V
Mass Production Programmer: NLG-NUC200n; n should be replaced by Package Code

• NUC240 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity								ADC (12-bit)	Comparator	CRC	PDMA	PWM (16-bit)	RTC (V_{BAT})	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						CAN	I²C	I²S	ISO 7816-3[1]	LIN	SPI	UART	USB FS											
NUC240LC2AE	32	8	4	8	31	2	2	1	1	2	1	3	D*1	7	1	√	9	4	√	4	√	√	LQFP48	√
NUC240SC2AE	32	8	4	8	45	2	2	1	2	3	2	3	D*1	7	2	√	9	4	√	4	√	√	LQFP64*	√
NUC240LD2AE	64	8	4	8	31	2	2	1	1	2	1	3	D*1	7	1	√	9	4	√	4	√	√	LQFP48	√
NUC240SD2AE	64	8	4	8	45	2	2	1	2	3	2	3	D*1	7	2	√	9	4	√	4	√	√	LQFP64*	√
NUC240LE3AE	128	16	Configurable	8	31	2	2	1	1	2	1	3	D*1	7	1	√	9	4	√	4	√	√	LQFP48	√
NUC240SE3AE	128	16	Configurable	8	45	2	2	1	2	3	2	3	D*1	7	2	√	9	4	√	4	√	√	LQFP64*	√
NUC240VE3AE	128	16	Configurable	8	79	2	2	1	3	3	4	3	D*1	8	2	√	9	8	√	4	√	√	LQFP100	√

1. ISO 7816-3 supports full duplex UART mode

LQFP64*: 7x7mm

Development Tools: NT-NUC240V
Mass Production Programmer: NLG-NUC200n; n should be replaced by Package Code

Nano100 Series

The NuMicro® Nano100 series supports Ultra-Low power consumption. It is based on the Arm® Cortex®-M0 core with 16 to 128 Kbytes Flash, 4 to 16 Kbytes SRAM, and 4 Kbytes Flash loader memory for In-System Programming (ISP). The Nano series integrates COM/ SEG LCD controller, RTC, ADC, DAC, USB 2.0 full speed device, ISO 7816-3, and rich peripherals, supporting fast wake-up via different interfaces.

Key Features: Ultra-low power and short wake-up time.
Potential Applications: Suitable for battery-powered devices such as Smart Wearable Devices, IoT Devices, Portable Medical Devices, Smart Home Appliances, Security Alarms Monitoring, Mobile Payment Smart Card Readers, GPS Data Collector, Wireless Communication (Zigbee, LoRa, etc.), Node Device, Electronic Shelf Label (ESL), RFID, Smart Heat/ Water/ Gas Meters, etc.

• Nano100 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Ultra-low power: 200 µA/MHz (Normal Run Mode), 75 µA/MHz (Idle Mode), 2.5 µA (Power-down Mode, RTC On, RAM retention), 1 µA (Power-down Mode, RAM retention), less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity						PWM (16-bit)	ADC (12-bit)	DAC (12-bit)	EBI	PDMA	RTC	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz	Package	Mass Production
						I²C	I²S	ISO 7816-3[1]	SPI	UART	USB FS											
NANO100NC2BN	32	8	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	QFN48	√
NANO100LC2BN	32	8	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	LQFP48	√
NANO100SC2BN	32	8	Configurable	4	52	2	1	3	3	2	-	8	7	2	-	8	√	4	√	√	LQFP64*	√
NANO100ND2BN	64	8	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	QFN48	√
NANO100ND3BN	64	16	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	QFN48	√
NANO100LD2BN	64	8	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	LQFP48	√
NANO100LD3BN	64	16	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	LQFP48	√
NANO100SD2BN	64	8	Configurable	4	52	2	1	3	3	2	-	8	7	2	-	8	√	4	√	√	LQFP64*	√
NANO100SD3BN	64	16	Configurable	4	52	2	1	3	3	2	-	8	7	2	-	8	√	4	√	√	LQFP64*	√
NANO100KD3BN	64	16	Configurable	4	86	2	1	3	3	2	-	8	12	2	√	8	√	4	√	√	LQFP128	√
NANO100NE3BN	128	16	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	QFN48	√
NANO100LE3BN	128	16	Configurable	4	38	2	1	2	3	2	-	6	7	2	-	8	√	4	√	√	LQFP48	√
NANO100SE3BN	128	16	Configurable	4	52	2	1	3	3	2	-	8	7	2	-	8	√	4	√	√	LQFP64*	√
NANO100KE3BN	128	16	Configurable	4	86	2	1	3	3	2	-	8	12	2	√	8	√	4	√	√	LQFP128	√

1. ISO 7816-3 supports duplex UART mode

LQFP64*:7X7mm

Development Tools: NT-Nano100K / NT-Nano120K / NT-Nano130K
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

• Nano102 Series

Operating Frequency: 32 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Ultra-low power: 150 µA/MHz (Normal Run Mode), 65 µA/MHz (Idle Mode), 1.5 µA (Power-down Mode, RTC On, RAM retention), 0.65 µA
(Power-down Mode, RAM retention), less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (12-bit)	Comparator	PDMA	PWM(16-bit)	RTC	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz 16 MHz	Package	Mass Production
						I²C	ISO 7816-3[1]	SPI	UART										
NANO102ZB1AN	16	4	Configurable	4	27	2	1	2	2	2	2	4	4	√	4	√	√	QFN33	√
NANO102LB1AN	16	4	Configurable	4	40	2	2	2	2	7	2	4	4	√	4	√	√	LQFP48	√
NANO102ZC2AN	32	8	Configurable	4	27	2	1	2	2	2	2	4	4	√	4	√	√	QFN33	√
NANO102LC2AN	32	8	Configurable	4	40	2	2	2	2	7	2	4	4	√	4	√	√	LQFP48	√
NANO102SC2AN	32	8	Configurable	4	58	2	2	2	2	7	2	4	4	√	4	√	√	LQFP64*	√

1. ISO 7816-3 supports full duplex UART mode.

LQFP64*: 7x7mm

Development Tools: NT-Nano102S/ NT-Nano112V
Mass Production Programmer: NLG-Nano102Z (QFN33)/ NLG-Nano112L (LQFP48)/ NLG-Nano112S (LQFP64)

• Nano103 Series

Operating Frequency: 36 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 105°C

Key Features: Ultra-low power: 180 µA/MHz (Normal Run Mode), 75 µA/MHz (Idle Mode), 2 µA (Power-down Mode, RTC On, RAM retention).

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity					ACMP	ADC (12-bit)	PWM	RTC (V_{BAT})	Timer (32-bit)	IRC 10 KHz 4 MHz 12/16MHz 36 MHz	PDMA	ICP IAP ISP	Package	Mass Production
						I²C	I²S	ISO 7816-3[1]	SPI	UART										
NANO103ZD3AE	64	16	Configurable	4	26	2	-	2	4	2	1	6	2	√	4	√	4	√	QFN33	√
NANO103LD3AE	64	16	Configurable	4	39	2	-	2	4	2	1	8	6	√	4	√	4	√	LQFP48	√
NANO103SD3AE	64	16	Configurable	4	53	2	-	2	4	2	1	8	6	√	4	√	4	√	LQFP64*	√

1. ISO 7816-3 supports full duplex UART mode.

LQFP64*: 7x7mm

Development Tools: NT-Nano103S
Mass Production Programmer: NLG-Nano103n; n should be replaced by Package Code

• Nano110 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Integrates 4x40 and 6x38 COM/ SEG LCD controller, Ultra-low power: 200 µA/MHz (Normal Run Mode), 75 µA/MHz (Idle Mode), 2.5 µA (Power-down Mode, RTC On, RAM retention), 1 µA (Power-down Mode, RAM retention), less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity						ADC (12-bit)	DAC (12-bit)	EBI	PDMA	PWM(16-bit)	RTC	Timer (32-bit)	LCD	ICP IAP ISP	IRC 10 kHz 12 MHz	Package	Mass Production
						I²C	I²S	ISO 7816-3[1]	SPI	UART	USB FS												
NANO110SC2BN	32	8	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64*	√
NANO110RC2BN	32	8	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64	√
NANO110KC2BN	32	8	Configurable	4	86	2	1	3	3	2	-	12	2	√	8	8	√	4	4x40, 6x38	√	√	LQFP128	√
NANO110SD2BN	64	8	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64*	√
NANO110SD3BN	64	16	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64*	√
NANO110RD2BN	64	8	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64	√
NANO110RD3BN	64	16	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64	√
NANO110KD2BN	64	8	Configurable	4	86	2	1	3	3	2	-	12	2	√	8	8	√	4	4x40, 6x38	√	√	LQFP128	√
NANO110KD3BN	64	16	Configurable	4	86	2	1	3	3	2	-	12	2	√	8	8	√	4	4x40, 6x38	√	√	LQFP128	√
NANO110SE3BN	128	16	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64*	√
NANO110RE3BN	128	16	Configurable	4	51	2	1	3	3	2	-	7	2	-	8	7	√	4	4x31, 6x29	√	√	LQFP64	√
NANO110KE3BN	128	16	Configurable	4	86	2	1	3	3	2	-	12	2	√	8	8	√	4	4x40, 6x38	√	√	LQFP128	√

1. ISO 7816-3 supports half duplex UART mode.

LQFP64*:7X7mm

Development Tools:NT-Nano130K
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

• Nano112 Series

Operating Frequency: 32 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Integrates 4x36 and 6x34 COM/ SEG LCD controller, Ultra-low power: 150 µA/MHz (Normal Run Mode), 65 µA/MHz (Idle Mode), 1.5 µA (Power-down Mode, RTC On, RAM retention), 0.65 µA (Power-down Mode, RAM retention), less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity				ADC (12-bit)	Comparator	PDMA	PWM (16-bit)	RTC	Timer (32-bit)	LCD	ICP IAP ISP	IRC 10 kHz 12 MHz 16 MHz	Package	Mass Production
						I²C	ISO 7816-3[1]	SPI	UART											
NANO112LB1AN	16	4	Configurable	4	40	2	2	2	2	7	2	4	4	√	4	4x20, 6x18	√	√	LQFP48	√
NANO112SB1AN	16	4	Configurable	4	58	2	2	2	2	7	2	4	4	√	4	4x32, 6x30	√	√	LQFP64*	√
NANO112RB1AN	16	4	Configurable	4	58	2	2	2	2	7	2	4	4	√	4	4x32, 6x30	√	√	LQFP64	√
NANO112LC2AN	32	8	Configurable	4	40	2	2	2	2	7	2	4	4	√	4	4x20, 6x18	√	√	LQFP48	√
NANO112SC2AN	32	8	Configurable	4	58	2	2	2	2	7	2	4	4	√	4	4x32, 6x30	√	√	LQFP64*	√
NANO112RC2AN	32	8	Configurable	4	58	2	2	2	2	7	2	4	4	√	4	4x32, 6x30	√	√	LQFP64	√
NANO112VC2AN	32	8	Configurable	4	80	2	2	2	2	8	2	4	4	√	4	4x36, 6x34	√	√	LQFP100	√

1. ISO 7816-3 supports full duplex UART mode.

LQFP64*:7X7mm

Development Tools: NT-Nano112V
Mass Production Programmer: NLG-Nano112n; n should be replaced by Package Code

• Nano120 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Integrates USB 2.0 full speed device, Ultra-low power: 200 μA/MHz (Normal Run Mode), 75 μA/MHz (Idle Mode), 2.5 μA (Power-down Mode, RTC On, RAM retention), 1 μA (Power-down Mode, RAM retention), less than 3.5 μs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity						ADC (12-bit)	DAC (12-bit)	EBI	PDMA	PWM (16-bit)	RTC	Timer (32-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz	Package	Mass Production
						I²C	I²S	ISO 7816-3[1]	SPI	UART	USB FS											
NANO120LC2BN	32	8	Configurable	4	34	2	1	2	3	2	D*1	7	2	-	8	4	√	4	√	√	LQFP48	√
NANO120SC2BN	32	8	Configurable	4	48	2	1	3	3	2	D*1	7	2	-	8	8	√	4	√	√	LQFP64*	√
NANO120LD2BN	64	8	Configurable	4	34	2	1	2	3	2	D*1	7	2	-	8	4	√	4	√	√	LQFP48	√
NANO120LD3BN	64	16	Configurable	4	34	2	1	2	3	2	D*1	7	2	-	8	4	√	4	√	√	LQFP48	√
NANO120SD2BN	64	8	Configurable	4	48	2	1	3	3	2	D*1	7	2	-	8	8	√	4	√	√	LQFP64*	√
NANO120SD3BN	64	16	Configurable	4	48	2	1	3	3	2	D*1	7	2	-	8	8	√	4	√	√	LQFP64*	√
NANO120KD3BN	64	16	Configurable	4	86	2	1	3	3	2	D*1	8	2	√	8	8	√	4	√	√	LQFP128	√
NANO120LE3BN	128	16	Configurable	4	34	2	1	2	3	2	D*1	7	2	-	8	4	√	4	√	√	LQFP48	√
NANO120SE3BN	128	16	Configurable	4	48	2	1	3	3	2	D*1	7	2	-	8	8	√	4	√	√	LQFP64*	√
NANO120KE3BN	128	16	Configurable	4	86	2	3	3	2	1	D*1	8	2	√	8	8	√	4	√	√	LQFP128	√

1. ISO 7816-3 supports half duplex UART mode.

LQFP64*:7X7mm

Development Tools: NT-Nano120K/ NT-Nano130K
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

• Nano130 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to +85°C

Key Features: Integrates 4x40 and 6x38 COM/ SEG LCD controller and USB 2.0 full speed device, Ultra-low power: 200 μA/MHz (Normal Run Mode), 75 μA/MHz (Idle Mode), 2.5 μA (Power-down Mode, RTC On, RAM retention), 1 μA (Power-down Mode, RAM retention), less than 3.5 μs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity						PWM (16-bit)	ADC (12-bit)	DAC (12-bit)	EBI	PDMA	RTC	Timer (32-bit)	LCD	ICP IAP ISP	IRC 10 kHz 12 MHz	Package
						I²C	I²S	ISO 7816-3[1]	SPI	UART	USB FS											
NANO130SC2BN	32	8	Configurable	4	47	2	1	3	3	2	D*1	7	7	2	-	8	√	4	4x31, 6x29	√	√	LQFP64*
NANO130KC2BN	32	8	Configurable	4	86	2	1	3	3	2	D*1	8	8	2	√	8	√	4	4x40, 6x38	√	√	LQFP128
NANO130SD2BN	64	8	Configurable	4	47	2	1	3	3	2	D*1	7	7	2	-	8	√	4	4x31, 6x29	√	√	LQFP64*
NANO130SD3BN	64	16	Configurable	4	47	2	1	3	3	2	D*1	7	7	2	-	8	√	4	4x31, 6x29	√	√	LQFP64*
NANO130KD2BN	64	8	Configurable	4	86	2	1	3	3	2	D*1	8	8	2	√	8	√	4	4x40, 6x38	√	√	LQFP128
NANO130KD3BN	64	16	Configurable	4	86	2	1	3	3	2	D*1	8	8	2	√	8	√	4	4x40, 6x38	√	√	LQFP128
NANO130SE3BN	128	16	Configurable	4	47	2	1	3	3	2	D*1	7	7	2	-	8	√	4	4x31, 6x29	√	√	LQFP64*
NANO130KE3BN	128	16	Configurable	4	86	2	1	3	3	2	D*1	8	8	2	√	8	√	4	4x40, 6x38	√	√	LQFP128

1. ISO 7816-3 supports half duplex UART mode.

LQFP64*:7X7mm

Development Tools: NT-Nano130K
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

NuMicro® Family Arm® Cortex®-M4 Microcontrollers

The NuMicro Family Cortex®-M4 based microcontrollers provide high performance system design with 90 to 240 DMIPS, operating at up to 192 MHz. When the execution is from the Flash, the power consumption can be down to 130 µA/MHz with dynamic power scaling function supported by the M480 series. EBI supports Intel 8080 panel. With emWin graphics library, designers can easily create outstanding graphical user interfaces.

The NuMicro Family Cortex®-M4 based microcontrollers are composed of the following product series.

M480 Series: 192 MHz CPU, up to 512 Kbytes of dual bank Flash, up to 160 Kbytes of SRAM, SPI Master interface with eXecute-In-Place (XIP), and 16-bit I80 QVGA LCD

M481 – 192 MHz PWM, dual SDHC, dual 5 MSPS ADC, and dual 1 MSPS DAC.
M482 – USB 2.0 full speed device/ host/ OTG with integrated OTG PHY and 1 Kbytes data buffer; dual 5 MSPS ADC.
M483 – Dual/ Triple CAN Bus 2.0B and dual USB supporting high speed (HS) OTG and full speed (FS) OTG.
M484 – USB 2.0 high speed device/ host/ OTG with integrated OTG PHY and 4 Kbytes data buffer; USB 2.0 full speed device/ host/ OTG with integrated OTG PHY and 1 Kbytes data buffer.
M485 – Hardware cryptography engine including ECC-256/ AES-256/ SHA-512, random number generator, and dual USB 2.0 device/ host/ OTG.
M487 – 10/100 Mbps Ethernet MAC with RMII/ MDC/ MDIO interface, hardware cryptography engine, dual CAN Bus 2.0B, and dual USB 2.0 device/ host/ OTG.

M471 Series: 72/120 MHz CPU, up to 512 Kbytes of Flash memory, up to 64 Kbytes of SRAM memory, an independent 32 Kbytes of data Flash, wide package pin pitch

M471 V/K – 2 MSPS, 12-bit, up to 24 channels SAR ADC, hardware Customize IR receiver interface.
M471 M/R1/S – 1 MSPS, 12-bit, up to 16 channels SAR ADC, USB 2.0 full speed device / host with integrated PHY.

M451 Series: 72 MHz CPU, up to 256 Kbytes of Flash memory, up to 32 Kbytes of SRAM memory, and Quad-SPI interface

M451 – 144 MHz PWM, 1 MSPS ADC, and 1 MSPS DAC.
M452 – USB 2.0 Full Speed device/ host/ OTG with integrated OTG PHY.
M453 – USB 2.0 Full Speed device/ host/ OTG with integrated OTG PHY and CAN Bus 2.0B.

M451 Series

The high immunity NuMicro® M451 series based on the Arm® Cortex®-M4F core supports DSP instruction and integrated floating-point unit (FPU).The dynamic power consumption can be down to 430 µA/MHz and the standby current can be down to 1.6 µA.

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Automation, Home Automation, Motor Control, Communication Systems, USB Accessories, etc.

M451 Series	USB FS	CAN
M451		
M452	√	
M453	√	√

Key Features: Configurable Data flash, Voltage Adjustable Interface, 16+16 bytes UART FIFO for TX/ RX, 1 MSPS ADC, USB full speed device/ host/ OTG with on-chip PHY, Intel 8080 on EBI, ICP/ ISP.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	PDMA	I/O	Connectivity						ACMP	ADC (12-bit)	DAC (12-bit)	EBI	PWM[3] (16-bit)	QSPI	RTC (V_{BAT})	Timer (32-bit)	VAI	Package	Mass Production
						CAN	I²C	ISO 7816-3[1]	SPI/FS	UART[2]	USB FS											
M451LC3AE	40	16	4	8	39	-	2	1	1	4	-	2	10	1	√	12	1	√	4	√	LQFP48	√
M451MLC3AE	40	16	4	8	42	-	2	1	1	4	-	2	11	1	√	12	1	-	4	-	LQFP48	√
M451RC3AE	40	16	4	8	53	-	2	1	1	4	-	2	16	1	√	12	1	√	4	√	LQFP64	√
M451MSC3AE	40	16	4	8	55	-	2	1	1	4	-	2	13	1	√	12	1	-	4	-	LQFP64[5]	√
M451LD3AE	72	16	4	8	39	-	2	1	1	4	-	2	10	1	√	12	1	√	4	√	LQFP48	√
M451MLD3AE	72	16	4	8	42	-	2	1	1	4	-	2	11	1	√	12	1	-	4	-	LQFP48	√
M451RD3AE	72	16	4	8	53	-	2	1	1	4	-	2	16	1	√	12	1	√	4	√	LQFP64	√
M451MSD3AE	72	16	4	8	55	-	2	1	1	4	-	2	13	1	√	12	1	-	4	-	LQFP64[5]	√
M451LE6AE	128	32	4	12	39	-	2	1	2	3	-	2	8	1	√	12	1	√	4	√	LQFP48	√
M451MLE6AE	128	32	4	12	42	-	2	1	2	4	-	2	9	1	√	12	1	-	4	-	LQFP48	√
M451RE6AE	128	32	4	12	53	-	2	1	2	4	-	2	12	1	√	12	1	√	4	√	LQFP64	√
M451VE6AE	128	32	4	12	85	-	2	1	2	4	-	2	16	1	√	12	1	√	4	√	LQFP100	√
M451LG6AE	256	32	4	12	39	-	2	1	2	3	-	2	8	1	√	12	1	√	4	√	LQFP48	√
M451MLG6AE	256	32	4	12	42	-	2	1	2	3	-	2	9	1	√	12	1	-	4	-	LQFP48	√
M451RG6AE	256	32	4	12	53	-	2	1	2	4	-	2	12	1	√	12	1	√	4	√	LQFP64	√
M451VG6AE	256	32	4	12	85	-	2	1	2	4	-	2	16	1	√	12	1	√	4	√	LQFP100	√
M452LC3AE	40	16	4	8	35	-	2	1	1	4	D*1	2	10	1	√	10	1	√	4	√	LQFP48	√
M452LD3AE	72	16	4	8	35	-	2	1	1	4	D*1	2	10	1	√	10	1	√	4	√	LQFP48	√
M452RD3AE	72	16	4	8	49	-	2	1	1	4	D*1	2	16	1	√	12	1	√	4	√	LQFP64	√
M452LE6AE	128	32	4	12	34	-	2	1	1	3	O*1	2	8	1	√	10	1	√	4	√	LQFP48	√
M4521LE6AE	128	32	4	8	35	-	2	1	1	3*	H/ D*1[4]	-	10	-	√	10	1	√	4	√	LQFP48	√
M4521SE6AE	128	32	4	8	49	-	2	1	1	4*	H/ D*1[4]	-	16	-	√	12	1	√	4	√	LQFP64[5]	√
M452RE6AE	128	32	4	12	48	-	2	1	2	4	O*1	2	12	1	√	12	1	√	4	√	LQFP64	√
M452VE6AE	128	32	4	12	80	-	2	1	2	4	O*1	2	16	1	√	12	1	√	4	√	LQFP100	√
M452LG6AE	256	32	4	12	34	-	2	1	1	3	O*1	2	8	1	√	10	1	√	4	√	LQFP48	√
M452RG6AE	256	32	4	12	48	-	2	1	2	4	O*1	2	12	1	√	12	1	√	4	√	LQFP64	√
M452VG6AE	256	32	4	12	80	-	2	1	2	4	O*1	2	16	1	√	12	1	√	4	√	LQFP100	√
M453LC3AE	40	16	4	8	35	1	2	1	1	4	D*1	2	10	1	√	10	1	√	4	√	LQFP48	√
M453LD3AE	72	16	4	8	35	1	2	1	1	4	D*1	2	10	1	√	10	1	√	4	√	LQFP48	√
M453RD3AE	72	16	4	8	49	1	2	1	1	4	D*1	2	16	1	√	12	1	√	4	√	LQFP64	√
M453VD3AE	72	16	4	8	72	1	2	1	1	4	D*1	2	16	1	√	12	1	√	4	√	LQFP100	√
M453LE6AE	128	32	4	12	34	1	2	1	2	3	O*1	2	8	1	√	10	1	√	4	√	LQFP48	√
M453RE6AE	128	32	4	12	48	1	2	1	2	4	O*1	2	12	1	√	12	1	√	4	√	LQFP64	√
M453VE6AE	128	32	4	12	80	1	2	1	2	4	O*1	2	16	1	√	12	1	√	4	√	LQFP100	√
M453LG6AE	256	32	4	12	34	1	2	1	2	3	O*1	2	8	1	√	10	1	√	4	√	LQFP48	√
M453RG6AE	256	32	4	12	48	1	2	1	2	4	O*1	2	12	1	√	12	1	√	4	√	LQFP64	√
M453VG6AE	256	32	4	12	80	1	2	1	2	4	O*1	2	16	1	√	12	1	√	4	√	LQFP100	√

1. ISO 7816-3 supports full duplex UART mode with 4+4 bytes FIFO for TX/RX.
2. All UARTs support IrDA SIR. UART0/1 support LIN function. *M4521xE6AE doesn't support LIN function.
3. 12-channel PWM from 12x 16-bit timers. (144 MHz)
4. Supports USB full speed device mode. (Crystal-less)
5. LQFP64, 7 mm x 7 mm

Development Tools: NT-M451V (M451, M452, M453, M451M), NT-M4521S (M4521)
Mass Production Programmer: NG-M451n (M451n)/ NG-M451Mn (M451Mn); n should be replaced by Package Code/ NG-M453L (M452L, M453L, M4TKL)/ NG-M453R (M452R, M453R, M4TKR)/ NG-M453V (M453V, M4TKV)

M471 Series

The high immunity NuMicro M471 series Arm Cortex-M4F microcontroller supports DSP instruction and integrated floating-point unit (FPU). The dynamic power consumption can be down to 370 µA/MHz.

Operating Frequency: 72 MHz/ 120 MHz
Operating Voltage: 2.5V to 5.5V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Potential Applications: Home Applicance, Industrial Automation, Home Automation, Motor Control, Communication Systems, etc.
Key Features: Configurable data flash, Voltage Adjustable Interface, 16+16 bytes UART FIFO for TX/RX, 1 MSPS ADC, USB full speed device/host with on-chip PHY, Intel 8080 on EBI, ICP/ISP

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	CRC	I/O	Connectivity				ACMP	ADC (12-bit)	DAC (12-bit)	EBI (i80)	ISP ROM (Kbytes)	PWM3 (16-bit)	Quad SPI	RTC	RTC(V_{BAT})	USB FS	VAI	Timer (32-bit)	Package	Mass Production
						I²C	ISO 7816-3[1]	SPI/I²S	UART[2]														
M471MD6AE	64	32	Configurable	v	35	2	1	1	3	-	10	-	v	4	10	1	-	√	-	-	4	LQFP44*	Q1
M471SD6AE	64	32	Configurable	v	49	2	1	1	4	-	16	-	v	4	12	1	-	√	Host/ Device[4]	√	4	LQFP64	Q1
M471SE6AE	128	32	Configurable	v	49	2	1	1	4	-	16	-	v	4	12	1	-	√	Host/ Device[4]	√	4	LQFP64	Q1
M471R1D6AE	64	32	Configurable	v	49	2	1	1	4	-	16	-	v	4	12	1	-	√	Host/ Device[4]	√	4	LQFP64*	Q1
M471R1E6AE	128	32	Configurable	v	49	2	1	1	4	-	16	-	v	4	12	1	-	√	Host/ Device[4]	√	4	LQFP64*	Q1
M471VG7AE	256	48	32	v	91	2	-	2	6	2	23	1	-	4	24	-	√	-	-	-	4	LQFP100*	Q1
M471VI8AE	512	64	32	v	91	2	-	2	6	2	23	1	-	4	24	-	√	-	-	-	4	LQFP100*	Q1
M471KI8AE	512	64	32	v	119	2	-	2	6	2	24	1	-	4	24	-	√	-	-	-	4	LQFP128	Q1

1. ISO-7816 supports full duplex UART mode with 4+4 bytes FIFO for TX/RX.
2. All UARTs support IrDA SIR. UART0/1 support LIN function. *M471xE6AE doesn't support LIN function.
3. 12-ch PWM from 6x 16-bit timers. (144 MHz)
4. USB supports crystal-less feature in full speed device mode.

LQFP44*:10x10mm
LQFP64*:14x14mm
LQFP100*:14x14mm

Development Tools: NK-M471R1 (M471Mx/R1x/Sx), NK-M471KI (M471Vx/Kx)
Mass Production Programmer: NG-M471n (M471n); n should be replaced by Package Code

M480 Series

The high performance, low power consumption, secure boot and hardware cryptography NuMicro® M480 series based on the Arm® Cortex®-M4F core supports DSP instruction and integrated floating-point unit (FPU).The dynamic power consumption can be down to 175 or 130 μA/MHz and the standby current can be down to 1 μA. M480 series supports Secure Boot functionality, which provides a constant digital signature of system software for identification during boot up. Secure Boot protects the integrity of Flash content from attack.

Operating Frequency: 192 MHz
Operating Voltage: 1.8V to 3.6V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Automation, Home Automation, Motor Control, Sensor Hubs, IoT/ IIoT Gateway, Security Systems, Ethernet Converters, Gaming Accessories, etc.

M480 Series	USB FS	USB HS	CAN	Crypto Engine	Ethernet
M481					
M482	√				
M483	√	√	√		
M484	√	√			
M485	√	√		√	
M487	√	√	√	√	√

Key Features: Configurable Data Flash, Voltage Adjustable Interface, 16+16 bytes UART FIFO for TX/ RX, Dual 5 MSPS ADC, USB high speed device/ host/ OTG with on-chip PHY, Hardware Elliptic Curve Cryptography, 10/100 Mbps Ethernet, Intel 8080 on EBI, ICP/ISP/IAP.

Part No.	Flash(Kbytes)	SRAM(Kbytes)	ISP ROM(Kbytes)	SPROM(Kbytes)	XOM	PDMA	I/O	Timer (32-bit)	Connectivity										ACMP	ADC (12-bit)	Camera	Crypto Engine	DAC (12-bit)	eCAP	EBI	EMAC	OP Amp.	PWM[4](16-bit)	QEI	QSPI	RTC	RTC (V_{BAT})	SPI Master[5]	TRNG	VAI	Package	Mass Production
									CAN	I²C	I²S	ISO 7816-3[1]	LPUART[2]	SD Host	SPI/I²S	USCI[3]	USB FS	USB HS																				
M481ZE8AE	128	64	4	-	√	16	26	4	-	3	1	1	8	1	2	-	-	-	2	10	-	AES	1	-	-	-	-	24	1	2	-	√	-	√	√	QFN33	√
M481LE8AE	128	64	4	-	√	16	41	4	-	3	1	1	8	1	2	-	-	-	2	12	-	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP48	√
M481SE8AE	128	64	4	-	√	16	52	4	-	3	1	1	8	1	3	-	-	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M481ZGCAE	256	128	4	-	√	16	26	4	-	3	1	1	8	1	2	-	-	-	2	10	-	AES	1	-	-	-	-	24	1	2	-	√	-	√	√	QFN33	√
M481LGCAE	256	128	4	-	√	16	41	4	-	3	1	1	8	1	2	-	-	-	2	12	-	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP48	√
M481SGCAE	256	128	4	-	√	16	52	4	-	3	1	1	8	1	3	-	-	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M481SGCAE2A	256	128	4	-	√	16	52	4	-	3	1	1	8	1	3	-	-	-	2	8+8	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M481ZIDAE	512	160	4	4	-	16	26	4	-	3	1	3	6	1	3	2	-	-	2	10	-	-	2	-	-	-	1	24	1	1	√	-	1	-	√	QFN33	√
M481LIDAE	512	160	4	4	-	16	41	4	-	3	1	3	6	2	3	2	-	-	2	12	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP48	√
M481SIDAE	512	160	4	4	-	16	52	4	-	3	1	3	6	2	4	2	-	-	2	16	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP64	√
M482ZE8AE	128	64	4	-	√	16	26	4	-	3	1	1	8	1	2	-	O*1[6]	-	2	10	-	AES	1	-	-	-	-	24	1	2	-	√	-	√	√	QFN33	√
M482LE8AE	128	64	4	-	√	16	41	4	-	3	1	1	8	1	2	-	O*1[6]	-	2	12	-	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP48	√
M482SE8AE	128	64	4	-	√	16	52	4	-	3	1	1	8	1	3	-	O*1[6]	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M482ZGCAE	256	128	4	-	√	16	26	4	-	3	1	1	8	1	2	-	O*1[6]	-	2	10	-	AES	1	-	-	-	-	24	1	2	-	√	-	√	√	QFN33	√
M482LGCAE	256	128	4	-	√	16	41	4	-	3	1	1	8	1	2	-	O*1[6]	-	2	12	-	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP48	√
M482SGCAE	256	128	4	-	√	16	52	4	-	3	1	1	8	1	3	-	O*1[6]	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M482KGCAE	256	128	4	-	√	16	100	4	-	3	1	1	8	1	3	-	O*1[6]	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP128	√
M482ZIDAE	512	160	4	4	-	16	26	4	-	3	1	3	6	1	3	2	O*1	-	2	10	-	-	2	-	-	-	1	24	1	1	√	-	1	-	√	QFN33	√
M482LIDAE	512	160	4	4	-	16	41	4	-	3	1	3	6	2	3	2	O*1	-	2	12	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP48	√
M482SIDAE	512	160	4	4	-	16	52	4	-	3	1	3	6	2	4	2	O*1	-	2	16	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP64	√
M482KIDAE	512	160	4	4	-	16	100	4	-	3	1	3	6	2	4	2	O*1	-	2	16	-	-	2	2	√	-	3	24	2	1	√	-	1	-	√	LQFP128	√
M483SE8AE	128	64	4	-	√	16	52	4	2	3	1	1	8	1	3	-	O*1[6]	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M483SGCAE	256	128	4	-	√	16	52	4	2	3	1	1	8	1	3	-	O*1[6]	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M483SGCAE2A	256	128	4	-	√	16	52	4	2	3	1	1	8	1	3	-	O*1[6]	-	2	8+8	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP64	√
M483KGCAE	256	128	4	-	√	16	100	4	3	3	1	1	8	1	3	-	O*1[6]	-	2	16	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP128	√
M483KGCAE2A	256	128	4	-	√	16	100	4	3	3	1	1	8	1	3	-	O*1[6]	-	2	16+8	√	AES	1	2	√	-	-	24	2	2	-	√	-	√	√	LQFP128	√
M483SIDAE	512	160	4	4	-	16	44	4	2	3	1	3	6	2	4	2	-	O*1	2	16	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP64	√
M483KIDAE	512	160	4	4	-	16	100	4	2	3	1	3	6	2	4	2	O*1	O*1	2	16	-	-	2	2	√	-	3	24	2	1	√	-	1	-	√	LQFP128	√
M484SIDAE	512	160	4	4	-	16	44	4	-	3	1	3	6	2	4	2	-	O*1	2	16	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP64	√
M484SIDAE2U	512	160	4	4	-	16	44	4	-	3	1	3	6	2	4	2	O*1	O*1	2	16	-	-	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP64	√
M484KIDAE	512	160	4	4	-	16	100	4	-	3	1	3	6	2	4	2	O*1	O*1	2	16	-	-	2	2	√	-	3	24	2	1	√	-	1	-	√	LQFP128	√
M485LIDAE	512	160	4	4	-	16	41	4	-	3	1	3	6	2	3	2	O*1	-	2	12	-	√	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP48	√
M485SIDAE	512	160	4	4	-	16	44	4	-	3	1	3	6	2	4	2	-	O*1	2	16	-	√	2	1	√	-	2	24	2	1	√	-	1	-	√	LQFP64	√
M485KIDAE	512	160	4	4	-	16	100	4	-	3	1	3	6	2	4	2	O*1	O*1	2	16	-	√	2	2	√	-	3	24	2	1	√	-	1	-	√	LQFP128	√
M487SIDAE	512	160	4	4	-	16	44	4	2	3	1	3	6	2	4	2	-	O*1	2	16	-	√	2	1	√	√	2	24	2	1	√	-	1	-	√	LQFP64	√
M487KIDAE	512	160	4	4	-	16	100	4	2	3	1	3	6	2	4	2	O*1	O*1	2	16	-	√	2	2	√	√	3	24	2	1	√	-	1	-	√	LQFP128	√
M487JIDAE	512	160	4	4	-	16	114	4	2	3	1	3	6	2	4	2	O*1	O*1	2	16	-	√	2	2	√	√	3	24	2	1	√	-	1	-	√	LQFP144	√

1. ISO 7816-3 supports full duplex UART mode.
2. All UARTs support IrDA SIR. UART0/1 support LIN function.
3. USCI supports configurable UART, SPI and I²C mode. UART mode supports 1+2 bytes FIFO for TX/ RX.
4. 12-channel Enhanced PWM from 12x 16-bit timers + 12-channel Basic PWM from 2x 16-bit timers. (192 MHz)
5. SPI Master is designed for accessing SPI Flash and supports eXecute-In-Place (XIP) with 32 Kbytes cache.
6. Supports USB full speed device (Crystal-less).

Development Tools: NK-BEDM487, NK-BEDM487D, NK-BEDM487E, NK-M483KG
Mass Production Programmer: NLG-32Z (QFN33)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)/ NLG-144J (LQFP144)

NUC505 Series

The NuMicro® NUC505 series based on the Arm® Cortex®-M4F core supports DSP instructions and integrated floating-point unit (FPU). The dynamic power consumption can be down to 479 μA/MHz and the standby current can be down to 7 μA. NUC505 series supports internal Audio PLL and internal stereo 24-bit Sigma-Delta audio CODEC with Mic/ Line input and headphone output.

Operating Frequency: 100 MHz
Operating Voltage: 3.3V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 85°C

Potential Applications: Thermal Printers, GPS Trackers, Wireless Microphones, Security/ Alarms, etc.
Key Features: 128-bit Key for Code Protection, 64+64 bytes UART FIFO for TX/ RX, Dual USB, Audio PLL, 24-bit audio CODEC.

Part No.	Serial Flash (Kbytes)	SRAM (Kbytes)	I/O	Connectivity									ADC (12-bit)	Auio CODEC (24-bit)	DAC (12-bit)	Digital Mic	PWM[2](16-bit)	QSPI	RTC (V_{BAT})	SPI Master[3]	Timer (32-bit)	Package
				CAN	I²C	I²S	ISO 7816-3	SD Host	SPI	UART[1]	USB FS	USB HS										
NUC505DLA	512	128	18	-	2	1	-	-	1	2	-	D*1	5-ch	√	-	√	-	-	-	1	4	LQFP48
NUC505YLA	512	128	18	-	2	1	-	-	1	2	-	D*1	5-ch	√	-	√	-	-	-	1	4	QFN48
NUC505YLA2Y	512	128	25	-	3	1	-	√	2	3	H*1	D*1	5-ch	-	-	√	4	-	√[5]	1	4	QFN48
NUC505DSA	512	128	34	-	2	1	-	√	2	3	H*1	D*1	5-ch	√	-	√	4	-	-	1	4	LQFP64
NUC505DL13Y	2048	128	25	-	2	1	-	√	2	3	H*1	D*1	5-ch	-	-	√	4	-	√[5]	1	4	LQFP48
NUC505DS13Y	2048	128	35	-	2	1	-	√	2	3	H*1	D*1	8-ch	√[4]	-	√	4	-	√[5]	1	4	LQFP64
NUC505YO13Y	2048	128	52	-	2	1	-	√	2	3	H*1	D*1	8-ch	√	-	√	4	-	√	1	4	QFN88

1. All UARTs support IrDA SIR. UART0 only supports 16+16 bytes FIFO for TX/ RX. UART1/2 support LIN function.
2. 4-channel PWM from single 2x 16-bit timers.
3. SPI Master is designed for accessing SPI Flash and supports XIP(eXecute-In-Place).
4. Only headphone output is supported.
5. 32 kHz crystal pin out is not supported.

Development Tools: NT-NUC505Y
Mass Production Programmer: NG-NUC505LA (NUC505DLA)/ NG-NUC505L (NUC505DL13Y)/ NG-NUC505NA (NUC505YLA)/ NG-NUC505N (NUC505YLA2Y)/ NG-NUC505SA (NUC505DSA)/ NG-NUC505S (NUC505DS13Y)/ NG-NUC505O (NUC505YO13Y)

NuMicro® Family Arm9 MPUs

NUC970/980 Series

Nuvoton's Arm9 Industrial network series offers LQFP packages stacked with 64 to 128 Mbytes DDR memory to reduce PCB size and EMI issues. Rich peripherals include 11 sets of UART, dual Ethernet, SDIO/ eMMC interface, NAND Flash interface, LCD controller, CAN Bus 2.0B interface, and USB 2.0 high speed host/ device controller, allowing flexibility for product design. The Arm9 Industrial network series also integrates the crypto engine which provides hardware acceleration for AES, ECC, RSA, and SHA functions.

Operating Frequency: 300 MHz (ARM926EJ-S)
Operating Voltage: 3.0V to 3.6V, GPIOs support 5V tolerance
Operating Temperature: -40°C to 85°C

Boot Source: SPI NOR, SPI NAND, NAND, SD, eMMC
Potential Applications: Industrial Control, HMI, Industrial IoT Gateway, Network Printer, Smart Meter, and Smart Home Gateway applications.

Series	EBI	LCD	Crypto Engine	Linux
NUC980DF	√	-	AES/ECC/RSA/SHA	√
NUC980DK	√	-	AES/ECC/RSA/SHA	√
NUC980DR	-	-	AES/ECC/RSA/SHA	√
NUC972DF	√	√	AES/ECC/SHA/DES/3DES	√
NUC976DK	-	√	AES/ECC/SHA/DES/3DES	√
NUC977DK	-	√	AES/ECC/SHA/DES/3DES	√

Key Features: MCP industrial DDR in LQFP package, Dual USB high speed host, Dual 10/100M Ethernet MAC.

Part No.	Stack DDR Size(MB)	Crypto Engine	Q SPI Flash Boot	SPI NAND Boot	NAND Flash Boot	SD Memory Boot	eMMC I/F	SD/ SDIO	Ethernet	USB FS	USB HS	EBI	PWM	CMOS Interface	UART	CAN	I²C	SPI	ISO 7816-3	I²S	GPIO(Max)	Package	Mass Production
NUC980DF71YC	128	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	4	4	3	2	1	104	LQFP216	√
NUC980DF71Y	128	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	-	4	3	2	1	104	LQFP216	√
NUC980DF61YC	128	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	4	4	3	2	1	104	LQFP216	√
NUC980DK71YC	128	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	4	4	3	2	1	92	LQFP128	√
NUC980DK71Y	128	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	-	4	3	2	1	92	LQFP128	√
NUC980DK61YC	64	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	4	4	3	2	1	92	LQFP128	√
NUC980DK61Y	64	√	√	√	√	√	√	2	2	HL*6	H*1+H/D*1	√	8	2	10	-	4	3	2	1	92	LQFP128	√
NUC980DR61YC	64	√	-	-	-	-	√	1	1	HL*6	H/D*1	-	5	1	8	2	2	2	2	1	40	LQFP64-EP	√
NUC980DR61Y	64	√	-	-	-	-	√	1	1	HL*6	H/D*1	-	5	1	8	-	2	2	2	1	40	LQFP64-EP	√
NUC972DF71YC	128	√	√	-	√	-	√	2	2	-	H*1+H/D*1	√	4	1	11	2	2	2	2	1	146	LQFP216	√
NUC972DF61YC	64	√	√	-	√	-	√	2	2	-	H*1+H/D*1	√	4	1	11	2	2	2	2	1	146	LQFP216	√
NUC972DF61Y	64	√	√	-	√	-	√	2	2	-	H*1+H/D*1	√	4	1	11	-	2	2	2	1	146	LQFP216	√
NUC976DK61YC	64	√	√	-	-	-	√	2	1	-	H*1+H/D*1	-	4	1	6	1	2	2	2	1	80	LQFP128	√
NUC976DK61Y	64	√	√	-	-	-	√	2	1	-	H*1+H/D*1	-	4	1	6	-	2	2	2	1	80	LQFP128	√
NUC977DK61YC	64	√	√	-	√	-	√	2	1	-	H*1+H/D*1	-	4	1	8	1	2	2	2	1	87	LQFP128	√
NUC977DK61Y	64	√	√	-	√	-	√	2	1	-	H*1+H/D*1	-	4	1	8	-	2	2	2	1	87	LQFP128	√

Development Tools: ND-NUC972 (NUC970), NK-NUC980 (NUC980)

N9H Series

The HMI emWin N9H series is based on the ARM926EJ-S core. CPU operates at up to 300 MHz respectively. Multi Chip Package (MCP) with SDRAM, size ranging from 2 to 128 Mbytes. The MCP could significantly reduces PCB size and electromagnetic interference (EMI) to minimize system design efforts and shorten the product design cycle time.

The N9H series Board Support Package (BSP) comes with licensed industrial leading emWin embedded graphical user interface (GUI) library, containing emWin library, samples, tools, and documents. Nuvoton licenses it from SEGGER to allow developers to create smooth, professional, high quality graphical user interface (GUI).

Operating Frequency: 200/264/300 MHz (ARM926EJ-S)
Operating Voltage: 3.0V to 3.6V
Operating Temperature: -40°C to 85°C (N9H30)/ -20°C to 85°C (N9H20/ N9H26)

Boot Source: SPI NOR, NAND, SD, eMMC
Potential Applications: HMI of home appliances and industrial control applications.

Series	Operating Frequency	LCD	Video CODEC	Audio DAC	Ethernet/ CAN	Operating Temp	Linux
N9H20	200	16 / 24bit	JPEG	√	-	-20°C to 85°C	√
N9H26	264	24bit	JPEG /H.264	√	-	-20°C to 85°C	√
N9H30	300	16 / 24bit	JPEG	-	√	-40°C to 85°C	√

Key Features: MCP Memory up to 128 Mbytes, LCD up to 1024x768 24-bit, SEGGER emWin library supported.

Part No.	Stack DDR Size(MB)	SPI NOR Boot	NAND Flash Boot	SD Card Boot	eMMC I/F	SD / SDIO	Ethernet	USB FS	USB HS	2D Graphics	Parallel RGB LCD Color(bit)	Touch Screen Controller	Real-Time Clock(RTC)	Timer (32-bit)	Watchdog Timer	Window Watchdog Timer	ADC (10-bit)	ADC (12-bit)	PWM	EBI	UART	CAN	I²C	SPI	I²S	GPIO(Max)	Package	Mass Production
N9H20R11N	2	√	-	√	√	1	-	H*1	D*1	√	16	-	-	2	√	-	-	-	4	-	2	-	1	1	-	44	TQFP64-EP	√
N9H20K11N	2	√	√	√	√	3	-	H*1	D*1	√	24	√	√	2	√	-	3	-	4	-	2	-	1	2	1	70	LQFP128	√
N9H20K31N	8	√	√	√	√	3	-	H*1	D*1	√	24	√	√	2	√	-	3	-	4	-	2	-	1	2	1	70	LQFP128	√
N9H20K51N	32	√	√	√	√	3	-	H*1	D*1	√	24	√	√	2	√	-	3	-	4	-	2	-	1	2	1	70	LQFP128	√
N9H26K61N	64	√	√	√	√	3	-	-	H*1+D*1	√	24	√	√	4	√	-	7	-	4	-	2	-	1	2	1	80	LQFP128	√
N9H30K61I	64	√	√	-	√	2	-	-	H*1+H/D*1	√	16	√	√	5	√	√	-	5	4	-	9	-	2	2	1	86	LQFP128	√
N9H30F61IEC	64	√	√	-	√	2	2	-	H*1+H/D*1	√	24	√	√	5	√	√	-	8	4	√	11	2	2	2	1	146	LQFP216	√
N9H30F71IEC	128	√	√	-	√	2	2	-	H*1+H/D*1	√	24	√	√	5	√	√	-	8	4	√	11	2	2	2	1	146	LQFP216	√

Development Tools: NK-N9H20 (N9H20)/ NK-N9H26 (N9H26)/ NK-N9H30 (N9H30)

N329 Series

Designed for cost-effective solutions targeting consumer electronics, the ARM926EJ-S based SoC is embedded with various hardware accelerators and useful peripherals. All part numbers come up with a unique Multi-Chip Package (MCP) in the LQFP footprint, which is ideal in terms of several key design factors: high performance, small dimension, much less EMI, high production yield, and lower BOM cost.

Operating Frequency: 200/ 240 MHz (ARM926EJ-S)
Operating Voltage: 3.0V to 3.6V
Operating Temperature: -20°C to 85°C

Boot Source: SPI NOR, NAND, SD, eMMC

Series	Operation Frequency	Video CODEC	Linux
N3290xR	200	JPEG	√
N3290xU	200	JPEG	√
N3290xK	200	JPEG	√
N3292xU	240	H.264/ JPEG	√

Key Features: H.264/ JPEG CODEC, LQFP MCP Memory up to 64 Mbytes, LCD Display, Built-in Audio CODEC.

Part No.	Stacked DDR Size(MB)	SPI NOR Boot	NAND Flash Boot	SD/ SDIO	USB FS	USB HS	Video CODEC	2D Graphics	Parallel RGB LCD Color(bit)	Max. Resolution[3]	SAR ADC	ADC for MIC Input	Touch Panel (Wire)	Stereo DAC (16-bit)	JTAG	EMAC	CMOS Sensor	UART	I²C	SPI	RTC	PWM	I²S	GPIO(Max)	Package	Mass Production
N32901R1DN	2	√	-	2	H*1	D*1	JPEG	-	-	-	1	√	-	2	-	-	1	2	-	1	-	2	√	34	LQFP64	√
N32903R5DN	8	√	-	2	H*1	D*1	JPEG	-	-	-	1	√	-	2	-	-	1	2	-	1	-	2	√	34	TQFP64-EP	√
N32905R3DN	32	√	-	2	H*1	D*1	JPEG	-	-	-	1	√	-	2	-	-	1	2	-	1	-	2	√	34	TQFP64-EP	√
N32901U1DN	2	√	√	3	H*1	D*1	JPEG	√	18	QVGA	2	√	4	2	√	-	1	2	1	1	√	4	√	64	LQFP128	√
N32903U5DN	8	√	√	3	H*1	D*1	JPEG	√	18	VGA	2	√	4	2	√	-	1	2	1	1	√	4	√	64	LQFP128	√
N32905U3DN	32	√	√	3	H*1	D*1	JPEG	√	18	VGA	2	√	4	2	√	-	1	2	1	1	√	4	√	64	LQFP128	√
N32901K3DN	2	√	√	3	H*1	D*1	JPEG	√	24	VGA	3	-	4	2	√	-	1	2	1	2	√	4	√	70	LQFP128	√
N32903K5DN	8	√	√	3	H*1	D*1	JPEG	√	24	VGA	3	-	4	2	√	-	1	2	1	2	√	4	√	70	LQFP128	√
N32905K5DN	32	√	√	3	H*1	D*1	JPEG	√	24	VGA	3	-	4	2	√	-	1	2	1	2	√	4	√	70	LQFP128	√
N32926U4DN	64	√	√	3	H*2	H*1+D*1	JPEG/H.264	√	24	XGA	7	√	4/5	2	√	1	2	2	1	1	√	4	√	80	LQFP128	√

Development Tools: ND-N32905 (N32901, N32903, N32905)/ ND-N32926 (N32926)

NuMicro® Family 8051 Microcontrollers

As a leading supplier of 8051 microcontrollers, Nuvoton offers a variety of products with a great price-performance ratio which is critical to the success of consumers and industrial products. The 8-bit microcontrollers are equipped with rich peripherals to meet various system requirements and are supported by the toolchain from world-leading tool makers for rapid product development.

ML51 low power series provides up to 64 Kbytes and 4 Kbytes SRAM. The operating current is 80 μA/MHz and the power-down current can be as low as 0.8 μA.

ML51 - Basic low power line
ML54 - Low power with an LCD driver line
ML56 - Low power with LCD driver and Touch key line

MS51 series is suitable for cost-conscious applications by being based on the 1T 8051 core and rich peripherals in various compact packages. GPIO is equipped with 20 mA high sink current. This series provides high immunity 8 kV ESD.

MS51 Industrial Control Series (1T)

Nuvoton's compact 8-bit microcontroller MS51 series is suitable for cost-conscious applications by being based on the 1T 8051 core and rich peripherals in various compact packages.

Operating Frequency: 24 MHz
Operating Voltage: 2.4V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Control, Battery Packs, Home Appliances, LED Control, Consumer Devices, etc.

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Connectivity				ADC (12-bit)	PWM (16-bit)	Timer (16-bit)	LCD Driver	Package	Mass Production
						I²C	ISO 7816-3	SPI	UART						
MS51BA9AE	8	256+1K	Configurable	4	8	1	0	0	2	5	5	4	-	MSOP10	√
MS51DA9AE	8	256+1K	Configurable	4	12	1	0	1	2	7	5	4	-	TSSOP14	√
MS51FB9AE	16	256+1K	Configurable	4	18	1	0	1	2	8	6	4	-	TSSOP20	√
MS51XB9AE	16	256+1K	Configurable	4	18	1	0	1	2	8	6	4	-	QFN20[1]	√
MS51XB9BE	16	256+1K	Configurable	4	18	1	2	1	2	8	6	4	-	QFN20[2]	√
MS51FC0AE	32	256+2K	Configurable	4	18	1	3	1	2	10	10	4	-	TSSOP20	√
MS51XC0BE	32	256+2K	Configurable	4	18	1	3	1	2	10	10	4	-	QFN20	√
MS51EC0AE	32	256+2K	Configurable	4	26	1	3	1	2	15	12	4	-	TSSOP28	√
MS51TC0AE	32	256+2K	Configurable	4	30	1	3	1	2	15	12	4	-	QFN33	√
MS51PC0AE	32	256+2K	Configurable	4	30	1	3	1	2	15	12	4	-	LQFP32	√

1.QFN20: 0.4mm Pitch width.
2.QFN20: 0.5mm Pitch width.

Development Tools: NT-MS51, Nu-Link

ML51 / ML54 / ML56 Low-power Series

NuMicro® ML51 series based on the 1T 8051 core is suitable for low power and high performance applications. The internal voltage reference and analog comparator can support portable devices, where power consumption is critical.

Key Features: The operating current can support 80 µA/MHz, 15 µA power consumption for low power run mode, 13 µA for low power idle mode, 0.8 µA (at 3.3V) for Power-down mode, 10 µs fast wake-up time, high immunity (8 kV ESD, 4 kV EFT), 20 mA large sink current, making this series also ideal for industrial applications.

Potential Applications: Industrial Control, Home Appliances, Thermostats, Smart Door Locks, HMI, Battery Packs, Medical Devices, etc.

• ML51 Low Power Series

Operating Frequency: 24 MHz

Operating Voltage: 1.8V to 5.5V (16~32KB)/ 1.8V to 3.6 V(64KB)

Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	ISP ROM (Kbytes)	PDMA	I/O	Connectivity				ACMP	ADC (12-bit)	Internal Voltage Reference	PWM (16-bit)	Timer (16-bit)	ICP IAP ISP	LCD Driver	Package	Mass Production
						I²C	ISO 7816-3	SPI	UART									
ML51BB9AE	16	256+1K	4	-	7	2	-	-	2	-	2	-	6	4	√	-	MSOP10	√
ML51DB9AE	16	256+1K	4	-	11	2	1	1	2	-	3	-	6	4	√	-	TSSOP14	√
ML51FB9AE	16	256+1K	4	-	16	2	1	1	2	-	6	-	6	4	√	-	TSSOP20	√
ML51OB9AE	16	256+1K	4	-	17	2	1	1	2	-	6	-	6	4	√	-	SOP20	√
ML51XB9AE	16	256+1K	4	-	17	2	1	1	2	-	6	-	6	4	√	-	QFN20	√
ML51EB9AE	16	256+1K	4	-	24	2	1	1	2	-	8	-	6	4	√	-	TSSOP28	√
ML51UB9AE	16	256+1K	4	-	24	2	1	1	2	-	8	-	6	4	√	-	SOP28	√
ML51PB9AE	16	256+1K	4	2	28	2	1	2	2	2	8	√	6	4	√	-	LQFP32	√
ML51TB9AE	16	256+1K	4	2	28	2	1	2	2	2	8	√	6	4	√	-	QFN33	√
ML51EC0AE	32	256+2K	4	2	24	2	1	2	2	2	8	√	6	4	√	-	TSSOP28	√
ML51UC0AE	32	256+2K	4	2	24	2	1	2	2	2	8	√	6	4	√	-	SOP28	√
ML51PC0AE	32	256+2K	4	2	28	2	1	2	2	2	8	√	6	4	√	-	LQFP32	√
ML51TC0AE	32	256+2K	4	2	28	2	1	2	2	2	8	√	6	4	√	-	QFN33	√
ML51TD1AE	64	256+4K	4	4	28	2	2	2	2	2	9	√	12	4	√	-	QFN33	√
ML51LD1AE	64	256+4K	4	4	43	2	2	2	2	2	10	√	12	4	√	-	LQFP48	√
ML51SD1AE	64	256+4K	4	4	56	2	2	2	2	2	14	√	12	4	√	-	LQFP64	√

Development Tools: NT-ML51P, NK-ML51P, Nu-Link, Nu-Link 2

• ML54 Low Power LCD Series

Operating Frequency: 24 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	PDMA	I/O	Connectivity				ACMP	ADC (12-bit)	Internal Voltage Reference	PWM (16-bit)	Timer (16-bit)	ICP IAP ISP	LCD Driver	Package	Mass Production
						I²C	ISO 7816-3	SPI	UART									
ML54MD1AE	64	256+4K	4	4	38	2	2	2	2	2	10	√	12	4	√	8 X 17 6 X 19 4 X 21	LQFP44	√
ML54LD1AE	64	256+4K	4	4	42	2	2	2	2	2	10	√	12	4	√	8 X 18 6 X 20 4 X 22	LQFP48	√
ML54SD1AE	64	256+4K	4	4	55	2	2	2	2	2	14	√	12	4	√	8 X 28 6 X 30 4 X 32	LQFP64	√

Development Tools: NK-ML54SD

• ML56 Low Power Touch Key Series

Operating Frequency: 24 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	PDMA	I/O	Connectivity				ACMP	ADC (12-bit)	Internal Voltage Reference	PWM (16-bit)	Timer (16-bit)	TouchKey	ICP IAP ISP	LCD Driver	Package	Mass Production
						I²C	ISO 7816-3	SPI	UART										
ML56MD1AE	64	256+4K	4	4	38	2	2	2	2	2	14	√	12	4	6	√	8 X 17 6 X 19 4 X 21	LQFP44	√
ML56LD1AE	64	256+4K	4	4	42	2	2	2	2	2	14	√	12	4	9	√	8 X 18 6 X 20 4 X 22	LQFP48	√
ML56SD1AE	64	256+4K	4	4	55	2	2	2	2	2	14	√	12	4	14	√	8 X 28 6 X 30 4 X 32	LQFP64	√

Development Tools: NK-ML56SD

N76E Series (1T)

Operating Frequency: 16 MHz
Operating Voltage:2.4V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Control, Thermostat, HMI, LED Control, Consumer, etc.

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Connectivity			ADC (12-bit)	PWM (16-bit)	Timer (16-bit)	Package	Mass Production
						I²C	SPI	UART					
N76E003AT20	18	256+768	Configurable	√	18	1	1	2	8	6	4	TSSOP20	√
N76E003AQ20	18	256+768	Configurable	√	18	1	1	2	8	6	4	QFN20*	√
N76E003BQ20	18	256+768	Configurable	√	18	1	1	2	8	6	4	QFN20**	√

*QFN20: 0.4mm Pitch width.
**QFN20: 0.5mm Pitch width.

Development Tools: NT-N76E003, Nu-Link

Operating Frequency: 25 MHz
Operating Voltage: 2.4V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Connectivity			ADC (10-bit)	PWM (12-bit)	Timer (16-bit)	Package	Mass Production
						I²C	SPI	UART					
N76E885AT20	18	512	Configurable	√	26	1	1	2	10	8	4	TSSOP20	√
N76E885AT28	18	512	Configurable	√	26	1	1	2	10	8	4	TSSOP28	√

Development Tools: NT-NT-N76E885, Nu-Link, Nu-Link2

Operating Frequency: 16 MHz
Operating Voltage: 2.4V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Connectivity			ADC (10-bit)	PWM (16-bit)	Timer (16-bit)	LCD Driver	Package	Mass Production
						I²C	SPI	UART						
N76E616AL48	18	512	Configurable	√	46	1	-	2	8	4	7	4 X 32 6 X 30	LQFP48	√
N76E616AF44	18	512	Configurable	√	46	1	-	2	8	4	7	4 X 32 6 X 30	PQFP44	√
N76E616AM44	18	512	Configurable	√	46	1	-	2	8	4	7	4 X 32 6 X 30	LQFP44	√

Development Tools: NT-N76E616 Nu-Link, Nu-Link2

N79E Series (4T)

Operating Frequency: 24 MHz
Operating Voltage: 2.4V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Connectivity			ADC (10-bit)	PWM (16-bit)	Timer (16-bit)	Package	Mass Production
						I²C	SPI	UART					
N79E715AS28	16	512	Configurable	2	25	1	1	1	8	4	3	SOP28	√
N79E715AS20	16	512	Configurable	2	25	1	1	1	8	4	3	SOP20	√
N79E715AS16	16	512	Configurable	2	25	1	1	1	8	4	3	SOP16	√
N79E715AT28	16	512	Configurable	2	25	1	1	1	8	4	3	TSSOP28	√
N79E715AT20	16	512	Configurable	2	25	1	1	1	8	4	3	TSSOP20	√

Development Tools: NT-N79E715, ISP-ICP Programmer (NWR-005)

Standard 8051

The Nuvoton standard 8051 series is based on 6/12 cycle core structure, providing 22.1184 MHz internal oscillator (1% accuracy at 25°C, 5V), Data Flash configurable and high immunity (8 kV ESD, 4 kV EFT).

Operating Frequency: 40 MHz
Operating Voltage: 2.5V to 5.5V
Operating temperature: -40°C to 105°C

Potential Applications: Industrial Control, Power Management, etc.
Key Features: 16 to 64 Kbytes Flash, with sufficient IO, pin supports from 40 to 48. Standard line also includes energy management circuit such as LDO, POR, and BOD.

• N78E Series

Operating Frequency: 40 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Connectivity			ADC (10-bit)	Comp	ISP	INT	PWM (8-bit)	Timer (16-bit)	Special Function	Package	Mass Production
						I²C	SPI	UART									
N78E055A	16	256+1K	4	2.5	40	-	1	1	-	-	√	4	5	3	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PLCC44/PQFP44/LQFP48/ DIP40	√
N78E059A	32	256+1K	4	2.5	40	-	1	1	-	-	√	4	5	3	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PLCC44/PQFP44/LQFP48/ DIP40	√
N78E517A	64	256+1K	Configurable	2.5	40	-	1	1	-	-	√	4	5	3	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PDIP40/PLCC44/PQFP44/ LQFP48 /TQFP44	√
N78E366A	64	256+1K	-	2.5	40	-	1	1	-	-	√	4	5	3	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PLCC44/PQFP44/LQFP48/ DIP40	√

Development Tools: ISP-ICP Programmer (NWR-005)

• W78 Series

Operating Frequency: 40 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	ISP ROM (Kbytes)	I/O	Connectivity			ADC (10-bit)	Comp	ISP	INT	PWM (8-bit)	Timer (16-bit)	Special Function	Package	Mass Production
					I²C	SPI	UART									
W78E052D	8	256	2	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48//TQFP44	√
W78E054D	16	256	2	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48//TQFP44	√
W78E058D	32	512	4	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48	√
W78E516D	64	512	4	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48	√

Development Tools: ISP-ICP Programmer (NWR-005)

nuvoTon

Smart Home

Smart Toy

PowerSpeech® Series
NuSpeech Series
BandDirector® Series
ViewTalk® Series
NuVoice™ Series
Peripheral Series

NSP & NSC

NSP Series
NSC Series

Arm® Cortex®-M Audio SoCs

AUI Enabled Series-M0
AUI-Enabled Series-M4

Audio Converters

Mono Codec Series
Stereo Codec Series
Ultra Low Power (ULP) Codec Series
Stereo ADC Series
Ultra Low Power (ULP) ADC Series
Stereo DAC Series
Precision ADC Series

Audio Amplifiers

2Vrms Line Driver and Class-AB Series
Class D Series
Smart Amplifier

Audio Enhancement

ChipCorder® Family

Digital ChipCorder® Series
MLS ChipCorder® Series

Smart Toy & NSP/NSC Development Tools

Audio Development Tools

Contact us: Audio@nuvoton.com

Smart Toy

PowerSpeech® Series

• W584A 4-bit µC Base, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584A011	300	9	7	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A016	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A021	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A031	1020	34	25	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A041	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A052	1580	53	40	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A062	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A017	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A022	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A032	1020	34	25	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A042	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A051	1580	53	40	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A061	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A071	2220	75	56	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A081	2540	86	64	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A025	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A035	1020	35	26	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A045	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W584A 4-bit µC Base, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584A065	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A075	2220	75	56	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A085	2540	86	64	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A100	3180	108	81	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A120	3820	129	97	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A151	4460	151	113	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A171	5100	173	130	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A191	5740	195	146	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A300	9100	310	232	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A340	10220	348	261	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584AP017 (OTP)	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	-
W584AP045 (OTP)	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	-
W584AP065 (OTP)	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	-

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• W584B 4-bit µC Base, 1-ch Voice Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584B010	300	9	7	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B015	460	15	11	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B020	620	20	15	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B030	1020	34	25	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B040	1260	42	32	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B052	1580	53	40	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B062	1900	64	48	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B016	460	15	11	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B021	620	20	15	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B031	1020	34	25	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B041	1260	42	32	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B070	2220	75	56	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B080	2540	86	64	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B100	3180	108	81	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B120	3820	129	97	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B150	4460	151	113	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B170	5100	173	130	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B190	5740	195	146	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W588L 8-bit µC Base, 2 Batteries, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 5-bit MDM		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
W588L020	94	23	18	1.8~3.6	1	4, 6	Ring	12-bit	-	96	8 I/O
W588L030	126	32	24	1.8~3.6	1	4, 6	Ring	12-bit	-	96	8 I/O
W588L035	170	44	33	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L040	192	50	37	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L050	224	58	43	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L060	254	66	49	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L070	330	86	65	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L080	382	100	75	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L100	448	118	88	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O

• W588C 8-bit µC Base, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
W588C003	20	5	4	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C006	30	8	6	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C009	50	14	11	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C012	62	18	14	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C015	78	23	17	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C020	98	29	22	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
W588C025	114	35	26	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
W588C030	126	38	29	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O

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• W588C 8-bit µC Base, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
***W588C036**	170	52	39	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C041**	192	59	44	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C046**	205	63	48	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C051**	224	69	52	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C056**	240	74	56	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C061**	254	79	59	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C071**	330	103	77	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C081**	382	119	90	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C101**	448	140	105	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C121**	510	160	120	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
W588C150	640	201	151	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C170	768	242	181	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C210	896	282	212	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C260	1022	322	242	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C300	1180	372	279	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O

*DAC w/o Noise Shaping

• W588D 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Sub-Clock 32KHz	Audio		RAM (Bytes)	GPIO	SIM SPI
		(6 KHz)	(8 KHz)						PWM	DAC			
W588D003	20	5	4	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	192	16 I/O	√
W588D006	30	8	6	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	192	16 I/O	√
W588D009	50	14	11	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D012	62	18	14	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D015	78	23	17	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D020	98	29	22	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D025	114	35	26	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D030	126	38	29	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D035	170	52	39	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D040	192	59	44	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D045	205	63	48	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D050	224	69	52	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D055	240	74	56	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D060	254	79	59	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588DF060 (MTP)	254	79	59	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D070	330	103	77	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D080	382	119	90	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D100	448	140	105	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D120	510	160	120	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D150	640	201	151	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D170	768	242	181	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D210	896	282	212	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D260	1022	322	242	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D300	1180	372	279	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√
W588D350	1348	425	319	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√
W588D400	1534	484	363	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√

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• N584L 4-bit µC Base, 1~2 Battery, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	Booster Output (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO
		(6 KHz)	(8 KHz)						PWM	DAC		
N584L020	620	20	15	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L030	1020	34	25	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L040	1260	42	32	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L080	2540	86	64	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L120	3820	129	97	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L031	1020	34	25	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L041	1260	42	32	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L061	1900	64	48	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L081	2540	86	64	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L121	3820	129	97	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O

• N588L 1.0~3.6V, 8-bit µC Base, 2-ch Voice Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (6 MHz)	CH	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)					PWM	DAC					
N588L040	126	40	30	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L080	254	80	60	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L120	416	132	99	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L160	528	167	125	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L200	638	202	152	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L240	768	243	182	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L280	896	284	213	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L330	1022	324	243	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP080 (OTP)	254	80	60	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP200 (OTP)	638	202	152	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP330 (OTP)	1022	324	243	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

* N588LP (OTP) 1.0~3.6V, 8-bit µC base, 2-ch Voice Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (6 MHz)	CH	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)					PWM	DAC					
N588LP042	126	40	30	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP082	254	80	60	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP122	416	132	99	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP162	528	167	125	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP202	638	202	152	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP242	768	243	182	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP282	896	284	213	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP332	1022	324	243	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

* Under Development

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• N584H High Sound Quality 1-ch Voice

Part No.	ROM (Kbits)	Duration (Sec.) @ 4-bit NM4		V_{DD} (4 MHz)	CH	Fsys (MHz)	OSC	Audio		Cap Sensor	RAM (N)	LVD	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC					
N584H009	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H019	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H029	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H039	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H010	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H020	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H030	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H040	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H060	1740	68	51	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H070	1900	74	56	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H120	3340	131	98	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H160	4070	159	119	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit		8-pin	224	√	16 I/O	8-pin
N584H170	4460	175	131	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H210	5740	225	169	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H260	7020	275	206	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H300	7980	312	234	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP030 (OTP)	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP070 (OTP)	1900	74	56	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP160 (OTP)	4070	159	119	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP300 (OTP)	7980	312	234	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin

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* N584HP (OTP), High Sound Quality 1-ch Voice

Part No.	ROM (Kbits)	Duration (Sec.) @ 4-bit NM4		V_{DD} (4 MHz)	CH	Fsys (MHz)	OSC	Audio		Cap Sensor	RAM (N)	LVD	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC					
N584HP012	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP022	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP032	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP042	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP062	1740	68	51	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP072	1900	74	56	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584HP122	3340	131	98	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP162	4070	159	119	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP172	4460	175	131	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP212	5740	225	169	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP262	7020	275	206	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584HP302	7980	312	234	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin

* Under Development

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• N588J 8-bit µC Base, 1-ch Voice Synthesizer w/ PWM Direct Driver

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (6MHz)	CH	Fsys (MHz)	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)				PWM	DAC				
N588J010	30	10	7	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J040	126	40	30	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J060	206	65	49	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J080	254	80	60	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J120	414	131	98	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J170	510	162	121	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J200	704	223	167	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J250	830	263	197	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J340	1020	324	243	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J480	1534	486	364	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J650	2044	648	486	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair

• N588JP (OTP), 8-bit µC Base, 1-ch Voice Synthesizer w/ PWM Direct Driver

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (6MHz)	CH	Fsys (MHz)	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)				PWM	DAC				
N588JP062 (OTP)	206	65	49	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP082 (OTP)	254	80	60	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP122 (OTP)	414	131	98	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP172 (OTP)	510	162	121	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP202 (OTP)	704	223	167	2.0~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP252 (OTP)	830	263	197	2.0~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP342 (OTP)	1020	324	243	2.0~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair

• N588H 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)					PWM	DAC				
N588H061	206	65	49	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H081	254	80	60	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H120	414	131	98	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H170	510	162	121	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H200	704	223	167	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H250	830	263	197	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H340	1022	324	243	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H480	1534	486	364	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H650	2044	648	486	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair

• N588HP (OTP), 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)					PWM	DAC				
N588HP062 (OTP)	206	65	49	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP082 (OTP)	254	80	60	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP122 (OTP)	414	131	98	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP172 (OTP)	510	162	121	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP202 (OTP)	704	223	167	2.0~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP252 (OTP)	830	263	197	2.0~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP342 (OTP)	1022	324	243	2.0~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair

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NuSpeech Series

• N589A, 8-bit µC Base, 2-ch Voice, w/ SPIO, SPIM, ADC, IR Wake-up

Part No.	Duration (Sec) 8KHz	V_{DD} (V)	LVR (V)	Speech/ MIDI CH	ADC	Audio PWM	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR wake up	LRC
N589A150	128	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589A200	189	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589A280	250	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589A400	371	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589A600	614	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589A900	857	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
***N589A1K4**	1342	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes

• N589B, 8-bit µC Base, 2-ch Voice, w/ SPIO, SPIM, ADC, IR Wake-up

Part No.	Duration (Sec) 8 KHz	V_{DD} (V)	LVR (V)	Voice CH	ADC	Audio PWM	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR wake up	LRC
N589B120	125	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B170	155	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B200	216	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B250	276	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B340	337	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B480	458	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589B650	701	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589B960	944	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
***N589B1K5**	1429	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes

• N589C, 8-bit µC Base, 2-ch Voice, with SPIO, IR Wake-up

Part No.	Duration (Sec) 8KHz	V_{DD} (V)	LVR (V)	Voice CH	ADC	Audio PWM	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR wake up	LRC
N589C080	94	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	6 pin	Yes	Yes	Yes
N589C120	125	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	6 pin	Yes	Yes	Yes
N589C170	155	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	6 pin	Yes	Yes	Yes
N589C200	216	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	6 pin	Yes	Yes	Yes
N589C250	276	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	6 pin	Yes	Yes	Yes
N589C340	337	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	6 pin	Yes	Yes	Yes
N589C480	458	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589C650	701	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589C960	944	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
***N589C1K5**	1429	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes

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• N589D, 8-bit µC Base, 1-ch Voice, with SPIO, IR Wake-up

Part No.	Duration (Sec)	V_{DD} (V)	LVR (V)	Speech CH	ADC	Audio	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR wake up	LRC
	8 KHz					PWM								
N589D081	94	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D121	125	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D171	155	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D201	216	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D251	276	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D341	337	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D481	458	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D650	701	2.0~5.5	1.9	1	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
N589D960	944	2.0~5.5	1.9	1	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes
***N589D1K5**	1429	2.0~5.5	1.9	1	NO	13-bit	512	32 I/O	SPIO, UART, LED String	6 pin	12 pin	Yes	Yes	Yes

* Under Development

• N589E, 8-bit µC Base, 1-ch Voice Synthesizer

Part No.	Flash (Kbytes)	Duration (Sec.)@ 4-bit NM4		V_{DD} (V)	Voice CH	Audio	RAM (Bytes)	GPIO	PWM Output	Cap Touch	LVD	IR Carrier	LVR
		(6 KHz)	(8 KHz)			PWM							
N589E040	128	40	30	2.0~5.5	1	12-bit	384	8 I/O	3 pin	4 pin	Yes	Yes	Yes
N589E060	192	60	45	2.0~5.5	1	12-bit	384	8 I/O	3 pin	4 pin	Yes	Yes	Yes
N589E080	256	80	60	2.0~5.5	1	12-bit	384	8 I/O	3 pin	4 pin	Yes	Yes	Yes

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BandDirector® Series

• W567C 8-bit µC Base, 16-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		Fsys (MHz)	OSC	Sub-Clock 32 KHz	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI	PAN Stereo
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
W567C070	336	99	74	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C080	416	124	93	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C100	464	139	104	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C120	508	152	114	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C151	640	193	145	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C171	768	233	174	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C210	896	272	204	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C260	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C300	1232	376	282	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C340	1376	421	316	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C380	1532	469	352	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C126	508	152	114	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C266	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C306	1232	376	282	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C346	1376	421	316	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C386	1532	469	352	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567CP260 (OTP)	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-

• N567G 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC				
N567G030	126	34	26	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567G041	158	44	33	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567G080	286	84	63	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	√
N567G121	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G161	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G201	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G240	768	233	174	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567G280	896	272	204	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567G330	1022	311	233	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√

• N567K 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC					
N567K030	126	34	26	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	24 I/O	-	√
N567K041	158	44	33	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	24 I/O	-	√
N567K080	286	84	63	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	√
N567K081	254	80	60	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	√	24 I/O	-	√
N567K121	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K161	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K201	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K240	768	233	174	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√
N567K280	896	272	204	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√
N567K330	1022	311	233	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√

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• N567H 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC				
N567H030	126	34	26	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567H041	158	44	33	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567H080	286	84	63	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	√
N567H121	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H161	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H201	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H240	768	233	174	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567H280	896	272	204	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567H330	1022	311	233	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567HP330 (OTP)	1022	311	233	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√

• N567D 8-bit µC Base, 14-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		Fsys (MHz)	OSC	Sub-Clock 32 KHz	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC				
N567D070	224	71	53	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D100	336	106	80	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D120	416	132	99	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D140	464	147	110	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D160	508	161	121	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D200	640	203	152	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D240	768	243	183	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D280	896	284	213	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D320	1020	323	242	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D380	1232	390	293	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D420	1376	436	327	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D470	1532	485	364	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567DP320 (OTP)	1020	323	242	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√

• N567L 1.0~3.6V, 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		V_{DD} (6 MHz)	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
N567L080	254	80	60	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L120	416	132	99	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L160	528	167	125	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L200	638	202	152	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L240	768	243	182	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L280	896	284	213	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L330	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP330 (OTP)	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

• N567LP (OTP), 1.0~3.6V, 8-bit µC base, 8-ch Voice/Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		VDD (6 MHz)	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
N567LP122	416	132	99	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP162	528	167	125	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP202	638	202	152	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP242	768	243	182	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP282	896	284	213	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP332	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

• N566G 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC					
N566G120	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G160	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G200	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G240	768	233	174	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G280	896	272	204	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G320	1022	311	233	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√

• N566GP (OTP), 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC					
N566GP120 (OTP)	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP160 (OTP)	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP200 (OTP)	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP240 (OTP)	768	233	174	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP280 (OTP)	896	272	204	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP320 (OTP)	1022	311	233	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-

• N566K 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566K080	254	74	55	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566K120	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K160	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K200	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K240	768	233	174	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K280	896	272	204	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K320	1022	311	233	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√

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• N566KP (OTP), 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566KP120 (OTP)	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP160 (OTP)	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP200 (OTP)	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP240 (OTP)	768	233	174	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP280 (OTP)	896	272	204	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP320 (OTP)	1022	311	233	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-

• N566H 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566H080	254	74	55	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566H120	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H160	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H200	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H240	768	233	174	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H280	896	272	204	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H320	1022	311	233	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566HP080 (OTP)	254	74	55	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√

• N566HP (OTP), 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566HP120 (OTP)	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP160 (OTP)	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP200 (OTP)	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP240 (OTP)	768	233	174	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP280 (OTP)	896	272	204	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP321 (OTP)	1022	311	233	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-

ViewTalk® Series

• N537A090 8-bit µC Base, 2-ch Voice + Dual Tone Melody Synthesizer w/ B/W 1K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N537A090	283	1K	90	128	12 I/O	9-bit	-	64x16	1/4, 1/5	1/8, 1/16

• N531A170 8-bit µC Base, 2-ch Voice + Dual Tone Melody Synthesizer w/ B/W 1K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N531A170	509	1K	170	128x2	16 I/O	12-bit	-	64x16	1/4, 1/5	1/8, 1/16

• N538T 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ B/W 2K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N538T080	249	1K	60	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32
N538T170	505	1K	120	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32
N538T260	761	1K	180	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32
N538T340	1017	1K	250	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32

• N538A 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ B/W 1K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N538A170	505	1K	120	128x2	24 I/O	9-bit	10-bit	64x16	1/4, 1/5	1/6
N538A260	761	1K	180	128x2	24 I/O	9-bit	10-bit	64x16	1/4, 1/5	1/6
N538A340	1017	1K	250	128x2	24 I/O	9-bit	10-bit	64x16	1/4, 1/5	1/6

• W539A 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ B/W 1K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
W539A804	505	1K	120	128x2	24 I/O	12-bit	13-bit	64x16	1/4, 1/5	1/8, 1/16
W539A806	761	1K	180	128x2	24 I/O	12-bit	13-bit	64x16	1/4, 1/5	1/8, 1/16
W539A808	1017	1K	250	128x2	24 I/O	12-bit	13-bit	64x16	1/4, 1/5	1/8, 1/16

• N539T 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ 4-Gray Level, 2K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	H/W PWM	SIM	Bias	Duty
						PWM	DAC					
N539T171	509	1K	120	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539T261	765	1K	180	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539T341	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539TP340 (OTP)	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	-	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32

* N539TP (OTP), 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ 4-Gray Level, 2K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	H/W PWM	SIM	Bias	Duty
						PWM	DAC					
N539TP171	509	1K	120	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539TP261	765	1K	180	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539TP341	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32

* Under Development

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NuVoice™ Series

• N569S, 32-bit Cortex-M0 with Embedded Flash, Long Duration Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM Output	Audio Mic.	Audio Speaker	LDO	ADC	Other	Package
N569S502	Cortex®-M0 49 MHz	64KB	4Mbit	2.4~5.5	500	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S1K0	Cortex®-M0 49 MHz	64KB	8Mbit	2.4~5.5	1,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S2K0	Cortex®-M0 49 MHz	64KB	16Mbit	2.4~5.5	2,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S4K0	Cortex®-M0 49 MHz	64KB	32Mbit	2.4~5.5	4,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S8K0	Cortex®-M0 49 MHz	64KB	64Mbit	2.4~5.5	8,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569SAK2	Cortex®-M0 49 MHz	64KB	128Mbit	2.4~5.5	16,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48

• N570F, N570C, 32-bit Cortex-M0 with Embedded Flash and 10-bit ADC

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM Output	Audio Mic.	Audio Speaker	LDO	ADC	Other	Package
N570F064	Cortex®-M0 49 MHz	64KB	-	1.8~5.5	-	6 KB	22	SPI x 2, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570C064	Cortex®-M0 49 MHz	64KB	-	1.8~5.5	-	6 KB	22	SPI x 2, UART	8	√	DPWM DAC	√	10-bit 4-ch	Voice Recognition	LQFP48

• N570S, N570SC, 32-bit Cortex-M0 with Embedded Flash and 10-bit ADC, Long Duration Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM Output	Audio Mic.	Audio Speaker	LDO	ADC	Voice Recognition	Package
N570S08A	Cortex®-M0 49 MHz	64 KB	8Mbit	2.4~5.5	1,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S16A	Cortex®-M0 49 MHz	64 KB	16Mbit	2.4~5.5	2,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S32A	Cortex®-M0 49 MHz	64 KB	32Mbit	2.4~5.5	4,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S64A	Cortex®-M0 49 MHz	64 KB	64Mbit	2.4~5.5	8,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S130	Cortex®-M0 49 MHz	64 KB	128Mbit	2.4~5.5	16,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570SC08	Cortex®-M0 49 MHz	64 KB	8Mbit	2.4~5.5	1,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48
N570SC16	Cortex®-M0 49 MHz	64 KB	16Mbit	2.4~5.5	2,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48
N570SC32	Cortex®-M0 49 MHz	64 KB	32Mbit	2.4~5.5	4,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48
N570SC64	Cortex®-M0 49 MHz	64 KB	64Mbit	2.4~5.5	8,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48

• N570H, 32-bit Cortex-M0 with Embedded Flash, 10-bit ADC, Touch Wake-up

Part No.	CPU	APROM Flash	VDD(V)	SRAM	GPIO	I/O Interface	PWM Output	Audio Mic.	Audio Speaker	ADC	Touch Wakeup	Voice Recognition
N570H064	Cortex®-M0 49 MHz	64 KB	1.8~5.5	6 KB	28	SPI x 2, UART	8	√	DPWM	10-bit 5-ch	√	-
N570HC64	Cortex®-M0 49 MHz	64 KB	1.8~5.5	6 KB	28	SPI x 2, UART	8	√	DPWM	10-bit 5-ch	√	√

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• N569J, 32-bit Cortex-M0 with Embedded Flash, Touch Wake-up, Long Duration Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Touch Wakeup	Package
										Mic.	Speaker			
N569J502L	Cortex®-M0 49 MHz	64 KB	4Mbit	1.8~5.5	500	6 KB	24	SPI, UART	8	-	DPWM	-	√	LQFP48
N569J1K0L	Cortex®-M0 49 MHz	64 KB	8Mbit	1.8~5.5	1,000	6 KB	24	SPI, UART	8	-	DPWM	-	√	LQFP48
N569J2K0L	Cortex®-M0 49 MHz	64 KB	16Mbit	1.8~5.5	2,000	6 KB	24	SPI, UART	8	-	DPWM	-	√	LQFP48
N569J4K0L	Cortex®-M0 49 MHz	64 KB	32Mbit	1.8~5.5	4,000	6 KB	24	SPI, UART	8	-	DPWM	-	√	LQFP48

• N570J, 32-bit Cortex-M0 with Embedded Flash, 10-bit ADC, Touch Wake-up, Long Duration Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Touch Wakeup	Package
										Mic.	Speaker			
N570J08AL	Cortex®-M0 49 MHz	64 KB	8Mbit	2.4~5.5	1,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J08DL	Cortex®-M0 49 MHz	64 KB	8Mbit	1.8~5.5	1,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J16AL	Cortex®-M0 49 MHz	64 KB	16Mbit	2.4~5.5	2,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J16DL	Cortex®-M0 49 MHz	64 KB	16Mbit	1.8~5.5	2,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J32AL	Cortex®-M0 49 MHz	64 KB	32Mbit	2.4~5.5	4,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J32DL	Cortex®-M0 49 MHz	64 KB	32Mbit	1.8~5.5	4,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J01GR	Cortex®-M0 49 MHz	64 KB	1Gbit	2.4~5.5	128,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP64

• N571P, 32-bit Cortex M0 with Embedded OTP and 10-bit ADC Solution

Part No.	CPU	APROM OTP	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
										Mic.	Speaker				
N571P032	Cortex®-M0 23 MHz	32 KB	-	2.4~5.5	-	4 KB	24	SPI	4	√	Class-AB (400mW)	√	10-bit 3-ch	-	LQFP48

• N572, 32-bit Cortex M0 with Embedded OTP/Flash and 12-bit ADC Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
										Mic.	Speaker				
N572F072	Cortex®-M0 48 MHz	72 KB	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572C072	Cortex®-M0 48 MHz	72 KB	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	Voice Recognition	LQFP64
N572F065	Cortex®-M0 48 MHz	64 KB	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (250mW)	√	12-bit 8-ch	USB 2.0 FS Device	LQFP64
N572S16A	Cortex®-M0 48 MHz	64 KB	16Mbit	2.4~5.5	2,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S32A	Cortex®-M0 48 MHz	64 KB	32Mbit	2.4~5.5	4,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S64A	Cortex®-M0 48 MHz	64 KB	64Mbit	2.4~5.5	8,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572U130	Cortex®-M0 48 MHz	64 KB	128Mbit	2.4~5.5	16,000	8 KB	22	SPI	4	√	Class-AB (250mW)	√	12-bit 8-ch	USB 2.0 FS Device	LQFP64

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• N573, 32-bit Cortex-M0 with Embedded Flash and 16-bit ADC Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec)	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
					8KHz					Mic.	Speaker				
N573F128	Cortex®-M0 48 MHz	128 KB	-	1.8~5.5	-	12 KB	32	UART, I²C, I²S, SPI	4	√	DPWM (1W)	√	16-bit sigma delta, 12-bit 10-ch SAR ADC	16-ch Touch Key, PDMA, CRC	LQFP64

• N574, 32-bit Cortex-M0 with Embedded Flash, 10-bit ADC, Voice Wake-up

Part No.	CPU	APROM Flash	V_{DD} (V)	Duration (Sec.)		SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Cap Touch	AED	Voice Recognition
				8KHz	12KHz					Mic.	Speaker				
N574F256	Cortex®-M0 40 MHz	256 KB	1.8~5.5	220	146	8 KB	40	SPI, UART, LED String	12	√	DPWM	10-bit 5-ch	12	√	-
N574C256	Cortex®-M0 40 MHz	256 KB	1.8~5.5	220	146	8 KB	40	SPI, UART, LED String	12	√	DPWM	10-bit 5-ch	12	√	√
N574F512	Cortex®-M0 40 MHz	512 KB	1.8~5.5	462	308	8 KB	40	SPI, UART, LED String	12	√	DPWM	10-bit 5-ch	12	√	-
N574C512	Cortex®-M0 40 MHz	512 KB	1.8~5.5	462	308	8 KB	40	SPI, UART, LED String	12	√	DPWM	10-bit 5-ch	12	√	√
N574F1K0	Cortex®-M0 40 MHz	1024 KB	1.8~5.5	948	632	8 KB	40	SPI, UART, LED String	12	√	DPWM	10-bit 5-ch	16	√	-
N574C1K0	Cortex®-M0 40 MHz	1024 KB	1.8~5.5	948	632	8 KB	40	SPI, UART, LED String	12	√	DPWM	10-bit 5-ch	16	√	√

• N575, 32-bit Cortex-M0 with Embedded Flash and 16-bit ADC Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec)	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
					8KHz					Mic.	Speaker				
N575F145	Cortex®-M0 48 MHz	145 KB	-	2.4~5.5	-	12 KB	24	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC	LQFP48
N575C145	Cortex®-M0 48 MHz	145 KB	-	2.4~5.5	-	12 KB	24	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC, Voice Recognition	LQFP48
N575S64A	Cortex®-M0 48 MHz	145 KB	64 Mbit	2.4~5.5	8,000	12 KB	20	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC	LQFP64

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Peripheral Series

■ Nu-Touch

• N55T Capacitor Sensor Controller

Part No.	Input	Wake Up	V_{DD}(V)	Interface
N55T10	10	√	2.4~5.5	I²C
N55T16	16	√	2.1~5.5	I²C, SPI

■ ADC

• N55AD SAR ADC

Part No.	Channel	Resolution	V_{DD}(V)	Conversion Rate
N55AD808	8	8-bit	2.7~5.5	50 KHz

■ I/O Expander

• W55P241 I/O Expander w/ 24 I/O Pins and SPI Interface

Part No.	Interface	GPIO	Wake Up	H/W PWM	Internal OSC
W55P241	SPI	24 I/O	√	8-pin	8 MHz

• N55P242 I/O Expander w/ 24 I/O Pins and SPI Interface

Part No.	Interface	GPIO	Wake Up	H/W PWM	Constant Current	Internal OSC
N55P242	SPI	24 I/O	√	24-pin	24-pin	8 MHz

■ MFID Family

• W55MID 13.56MHz MFID w/ Single-Tag/Multi-Tag and Reader

Part No.	Category	Frequency (MHz)	ID type	ID No.	Anti-collision	TX power	µC Interface
W55MID15	Single-tag	13.56	Bonding-ID	243	-	-	-
W55MID35	Multi-tag	13.56	Bonding-ID	243	4~6 tags	-	-
W55MID20	Single-tag	13.56	Programmable	> 1K	-	-	-
W55MID50	Reader	13.56	-	-	-	4-level	Serial/Parallel

• N55MID, 13.56MHz MFID w/ Single-Tag/Multi-Tag and Reader

Part No.	Category	Frequency (MHz)	ID type	ID No.	Anti-collision	TX power	µC Interface
N55MID16	Single-tag	13.56	Bonding-ID	729	-	-	-
N55MID36	Multi-tag	13.56	Bonding-ID	729	4~6 tags	-	-
N55MID51	Reader	13.56	-	-	-	4-level	Serial/Parallel

■ Serial ROM Family

• N551C Serial Mask ROM

Part No.	ROM (bits)	Access Time	V_{DD}(V)	Interface
N551C161	16M	1us	2.4~5.5	SPI
N551C321	32M	1us	2.4~5.5	SPI

■ PWM Power Amplifier

N55PA, PWM Power Amplifier

Part No.	ROM (bits)	Access Time	V_{DD}(V)	Interface	Interface	Interface	Interface
N55PA01	2.0~5.5V	Yes	Ext. R	Yes	1W (@ 5.5V)	1% (0.8W, 4.5V)	SOP8
***N55PA03**	2.0~5.5V	Yes	Ext. R	Yes	3W (@ 5.5V)	1% (2.4W, 4.5V)	SOP8

* Under Development

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NSP Series

NSP Series

• NSPxx, Embedded Flash, 1-ch Voice for Voice Prompt Application

Part No.	Package	Duration(Sec)		V_{DD} (V)	LVR (V)	Speech CH	Audio	WDT
		8KHz	12KHz				PWM	
NSP081A	SOP8	94	63	2.0~5.5	1.9	1	13-bit	Yes
NSP171A	SOP8	155	103	2.0~5.5	1.9	1	13-bit	Yes
NSP340A	SOP8	337	225	2.0~5.5	1.9	1	13-bit	Yes
NSP341A	SOP8	337	225	2.0~5.5	1.9	1	13-bit	Yes
NSP481A	SOP8	458	305	2.0~5.5	1.9	1	13-bit	Yes
NSP080B	SOP14	94	63	2.0~5.5	1.9	1	13-bit	Yes
NSP170B	SOP14	155	103	2.0~5.5	1.9	1	13-bit	Yes
NSP340B	SOP14	337	225	2.0~5.5	1.9	1	13-bit	Yes
NSP480B	SOP14	458	305	2.0~5.5	1.9	1	13-bit	Yes
NSP650B	SOP14	701	467	2.0~5.5	1.9	1	13-bit	Yes
NSP960B	SOP14	944	629	2.0~5.5	1.9	1	13-bit	Yes

• NSPxx, Embedded OTP, 1-ch Voice for Voice Prompt Application

Part No.	Package	Duration(Sec)		V_{DD} (V)	LVR (V)	Speech CH	Audio	WDT
		8KHz	12KHz				PWM	
NSP075A	SOP8	81	49	2.0~5.5	2.0	1	12-bit	Yes
NSP165A	SOP8	162	97	2.0~5.5	2.0	1	12-bit	Yes
NSP335A	SOP8	324	194	2.0~5.5	2.0	1	12-bit	Yes
NSP075B	SOP14	81	49	2.0~5.5	2.0	1	12-bit	Yes
NSP165B	SOP14	162	97	2.0~5.5	2.0	1	12-bit	Yes
NSP335B	SOP14	324	194	2.0~5.5	2.0	1	12-bit	Yes

NSC Series

• NSC, 8-bit µC Controller, 1-ch Voice, with SPI, Cap Touch

Part No.	Package	Duration (Sec)	Flash (KByte)	V_{DD} (V)	LVR (V)	Speech CH	Audio	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	BOD	IR wake up	Touch wake up	Fly-Key
		8KHz					PWM									
NSC128DF	TSSOP20	94	128	2.0~5.5	1.9	1	13-bit	384	12 I/O	SPI	3 pin	4 pin	√	√	√	√
NSC192DF	TSSOP20	155	192	2.0~5.5	1.9	1	13-bit	384	12 I/O	SPI	3 pin	4 pin	√	√	√	√
NSC384DF	TSSOP20	337	384	2.0~5.5	1.9	1	13-bit	384	12 I/O	SPI	3 pin	4 pin	√	√	√	√
NSC512DF	TSSOP20	458	512	2.0~5.5	1.9	1	13-bit	384	12 I/O	SPI	3 pin	4 pin	√	√	√	√
NSC768DF	TSSOP20	701	768	2.0~5.5	1.9	1	13-bit	512	12 I/O	SPI, UART, LED String	6 pin	10 pin	√	√	√	√
NSC1K0DF	TSSOP20	944	1024	2.0~5.5	1.9	1	13-bit	512	12 I/O	SPI, UART, LED String	6 pin	10 pin	√	√	√	√

ARM® Cortex®-M Audio SoCs

• AUI Enabled Series-M0

Part No.	CPU	APROM	SRAM	I/O	Timer	SPI	PWM	ADC	RTC	Audio		Developemnt Tools	Other	Package
										MIC.	Speaker			
ISD91032	Cortex®-M0 49 MHz	64 KB	6 KB	22	3	1	8	10-bit SAR ADC	√	1	Class-D (0.45W)	ISD-DMK_91032C	13-bit DAC, UART	LQFP48
ISD91032C	Cortex®-M0 49 MHz	64 KB	6 KB	22	3	1	8	10-bit SAR ADC	√	1	Class-D (0.45W)	ISD-DMK_91032C	VR, 13-bit DAC, UART	LQFP48
ISD9130	Cortex®-M0 49 MHz	68 KB	12 KB	24	2	1	2	Sigma-Delta >92 dB	√	1	Class-D (1W)	ISD-DMK_9160	8-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP48 QFN32
ISD9160	Cortex®-M0 49 MHz	145 KB	12 KB	24	2	1	2	Sigma-Delta >92 dB	√	1	Class-D (1W)	ISD-DMK_9160	8-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP48 QFN32
ISD9160C	Cortex®-M0 49 MHz	145 KB	12 KB	24	2	1	2	Sigma-Delta >92 dB	√	1	Class-D (1W)	ISD-DMK_9160	VR, 8-ch Touch Key,Temperature Alarm,UART, I²C, I²S, PDMA, CRC	LQFP48 QFN32
ISD91230	Cortex®-M0 49 MHz	64 KB	12 KB	32	2	2 (Quad /Dual)	4	Sigma-Delta >90 dB	√	1	Class-D (0.45W)	ISD-DMK_91260	16-ch Touch Key,Temperature Alarm,2*UART, I²C, I²S, PDMA, CRC	LQFP64 QFN32
ISD91230B	Cortex®-M0 49 MHz	64 KB	12 KB	32	2	2 (Quad/ Dual)	4	Bridge Sense ADC, 24-bit	√	-	Class-D (0.45W)	ISD-DMK_91260B	16-ch Touch Key, Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91260	Cortex®-M0 49 MHz	128 KB	12 KB	32	2	2 (Quad /Dual)	4	Sigma-Delta >90 dB	√	1	Class-D (0.45W)	ISD-DMK_91260	16-ch Touch Key,Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64 QFN32
ISD91260B	Cortex®-M0 49 MHz	128 KB	12 KB	32	2	2 (Quad/ Dual)	4	Bridge Sense ADC, 24-bit	√	-	Class-D (0.45W)	ISD-DMK_91260B	16-ch Touch Key, Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91260C	Cortex®-M0 49 MHz	128 KB	12 KB	32	2	2 (Quad/ Dual)	4	Sigma-Delta >90 dB	√	1	Class-D (0.45W)	ISD-DMK_91260	VR, 16-ch Touch Key, Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64 QFN32
ISD91331	Cortex®-M0 98 MHz	68 KB	16 KB	32	2	1 (Quad)	6	Sigma-Delta >90 dB	√	1	Class-D (1W)	ISD-DMK_91300	16-ch Touch Key,Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91361	Cortex®-M0 98 MHz	145 KB	16 KB	32	2	1 (Quad)	6	Sigma-Delta >90 dB	√	1	Class-D (1W)	ISD-DMK_91300	16-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91361C	Cortex®-M0 98 MHz	145 KB Flash	16 KB	32	2	1 (Quad)	6	Sigma-Delta >90 dB	√	1	Class-D (1W)	ISD-DMK_91300	VR, 16-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP64

• AUI Enabled Series-M4

Part No.	CPU	APROM	SRAM	I/O	Timer	SPI	PWM	ADC	RTC	Audio		Developemnt Tools	Other	Package	Status*
										MIC.	Speaker				
ISD94124A	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	USB 2.0 FS VAD	LQFP64, QFN48	P
ISD94124B	Cortex®-M4 200 MHz, Basic fetaure	512 KB	192 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	-	-	ISD-DMK_94100_AM ISD-DMK_94100_DM	USB 2.0 FS	LQFP64 QFN48	P
ISD94124C	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	VR, USB 2.0 FS VAD	LQFP64 QFN48	P
ISD94124D	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	BF+NR, USB 2.0 FS VAD	LQFP64	P
ISD94124P	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	BF+NR+VR, USB 2.0 FS VAD	LQFP64	P
ISD94124S	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	AEC+NR, USB 2.0 FS VAD	LQFP64 QFN48	P
ISD94123B	Cortex®-M4 200 MHz	512 KB Flash	128 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	-	-	ISD-DMK_94100_AM ISD-DMK_94100_DM	USB 2.0 FS	LQFP64 QFN48	P
ISD94123S	Cortex®-M4 200 MHz	512 KB	128 KB	41	4	3 (1 x Quad/ Dual)	5	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	AEC+NR, USB 2.0 FS VAD	QFN48	P
ISD94113A	Cortex®-M4 200 MHz	256 KB	128 KB	57	4	3 (1 x Quad/ Dual,)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	USB 2.0 FS VAD	LQFP64 QFN48	P
ISD94113B	Cortex®-M4 200 MHz	256 KB	128 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	-	-	ISD-DMK_94100_AM ISD-DMK_94100_DM	USB 2.0 FS	LQFP64 QFN48	P
ISD94113C	Cortex®-M4 200 MHz	256 KB	128 KB	57	4	2 (Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	VR, USB 2.0 FS VAD	LQFP64 QFN48	P
ISD94113S	Cortex®-M4 200 MHz	256 KB	128 KB	57	4	3 (1 x Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100_AM ISD-DMK_94100_DM	AEC+NR, USB 2.0 FS VAD	LQFP64 QFN48	P

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Audio Converters

• Mono Codec Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8810	Mono Codec with 2-wire interface	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU8810-DEMO	2-Wire	2.50~5.50 2.50~3.60 1.71~3.60 1.71~3.60	QFN20 (4x4)
NAU88C10	Mono Codec with 2-wire interface	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU88C10-DEMO	2-Wire	2.50~5.50 2.50~3.60 1.71~3.60 1.71 ~ 3.60	QFN20 (4x4)
NAU88U10	AEC-Q100 Automotive Grade Mono Codec with 2-wire interface.	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU88C10-DEMO	2-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN20 (4x4)
NAU8812	Mono Codec with speaker driver	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU8812-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN32 (5x5) SSOP-28
NAU8814	Mono Audio Codec with Equalizer, speaker driver	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU8814-DEMO	2-Wire 3-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN24 (4x4)
NAU88C14	Mono Audio Codec with Equalizer, speaker driver	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU88C14-DEMO	2-Wire 3-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN24 (4x4)

• Stereo Codec Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ Analog/Digital/ Digital I/O (V)	Package (mm)	Status*
		ADC	DAC	ADC	DAC	ADC	DAC							
NAU8822A	Stereo Codec with Speaker Drive	2	2	90	94	-80	-84	8~48	I²S PCM (Timeslot)	NAU8822A-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5)	P
NAU88U22A	AEC-Q100 Automotive Grade Stereo Codec with Speaker Drive	2	2	90	94	-80	-84	8~48	I²S PCM (Timeslot)	NAU8822A-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5)	P
NAU88C22	Stereo Codec with Speaker Drive	2	2	89	89	-78	-84	8~192	I²S PCM (Timeslot)	NAU88C22-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5) QFN32 (4x4)	P
NAU8820	Stereo Codec	2	2	90	94	-80	-84	8~48	I²S PCM (Timeslot)	NAU8820-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5)	P

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• Ultra Low Power (ULP) Codec Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ MICBIAS/ Analog/Digital/ Digital I/O (V)	Package (mm)	Status*
		ADC	DAC	ADC	DAC	ADC	DAC							
NAU88L21	ULP Stereo CODEC with Class-G Headphone Driver	2	2	103	105	-91	-80	8~192	I²S (TDM) PCM (Timeslot)	NAU88L21-DEMO	I²C	NA 3.0 ~ 3.6 1.62 ~ 1.98 N/A 1.62 to 3.6	QFN32 (5x5)	P
***NAU88L11**	ULP Mono CODEC with Class-G Headphone Driver	1	1	102	105	-90	-85	8~96	I²S (TDM) PCM (Timeslot)	*NAU88L11-DEMO	I²C	NA 3.0 ~ 3.6 1.62 ~ 1.98 N/A 1.62 to 3.6	QFN20 (4x4)	Q4'20
NAU88L24	ULP Stereo CODEC With Advanced Headset Detection and Stereo Class D Amp	2	2	100	103	-85	-77	8~96	I²S (TDM) PCM (Timeslot)	NAU88L24I-DEMO	I²C	2.5 ~ 5.0 2.5 ~ 5.0 1.6 ~ 2.0 1.1 ~ 1.98 1.6 ~ 3.6	QFN48 (6x6)	P
NAU88L25B	Ultra-Low Power Audio CODEC With Advanced Headset Features and 124dB Class G Headphone Drive	1	2	101	124	-91	-89	8~192	I²S / PCM	NAU88L25-DEMO	I²C	NA 2.6 ~ 5.0 1.6 ~ 2.0 1.1 ~ 1.98 1.6 ~ 3.6	QFN32 (5x5)	P

• Stereo ADC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8501	Stereo ADC with Input Mixer and Line Output	2	-	90	-	-80	-	8~48	I²S (TDM) PCM (Timeslot)	NAU8501-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5)
NAU8502	Stereo ADC with Integrated LDO	2	-	90	-	-80	-	8~48	I²S (TDM) PCM (Timeslot)	NAU8502-Card	2-Wire 3-Wire 4-Wire	2.70 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN32 (5x5)

• Ultra Low Power (ULP) ADC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	MICBIAS/ Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU85L20B	ULP Stereo Audio ADC with integrated FLL and Microphone Preamplifier	2	-	101	-	-91	-	8~96	I²S (TDM)	NAU85L20-DEMO	I²S	1.80 ~ 5.50 1.62 ~ 1.98 1.20 ~ 1.98 1.62 ~ 3.60	QFN28 (4x4)
NAU85L40B	ULP Quad Audio ADC with integrated FLL and Microphone Preamplifier	4	-	101	-	-91	-	8~96	I²S (TDM)	NAU85L40-DEMO	I²S	2.50 ~ 5.50 1.62 ~ 1.98 1.20 ~ 1.98 1.62 ~ 3.60	QFN28 (4x4)

• Stereo DAC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8401	Stereo DAC with Speaker Drive and Line Input	-	2	-	94	-	-84	8~48	I²S PCM (Timeslot)	NAU8401-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5)
NAU8402	Stereo DAC with 2Vrms Output	-	2	-	98	-	-82	8~96	I²S	NAU8402-Card	-	NA 3.0 ~ 3.6 1.7 ~ 3.6 1.7 ~ 3.6	TSSOP 16

• Precision ADC Series

Part No.	Description	Resolution Bits	Sample Rates (max)	Architectur	Gain	# of Input Channels	Development Tools	ENOB (Gain=1,10SPS)	Package	Satus*
NAU7802	Dual Channel 24-bit ADC	24	10, 20, 40,80 & 320Hz	Sigma-Delta	1x, 2x, 4x,8x, 16x,32x, 64x,128x	2	N/A	23	SOP-16, PDIP-16	P

*Status: P=Mass Production

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Audio Amplifiers

• 2Vrms Line Driver and Class-AB Series

Part No.	Description	SNR (dB)	Output Power		Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Temp (°C)	Development Tools	Package
			Power (W)	THD+N (%)						
NAU8220	2Vrms Line Driver	108	-	0.003	-	-	3.0~3.6	-40~85	NAU8220WG-EVB	SOP14 TSSOP14
ISD8101	1.5W Class-AB Audio Amplifier with Chip Enable, Differential/ Single ended inputs, Low pop and Click	100	0.825 (5.0V)	<1	20	<1	2.4~6.8	-40~85	ISD-DEMO8101	8-pin SOP 8-pin PDIP
			1.1 (5.0V)	<10						
			1.5 (6.8V)	<10						
ISD8102	2W Class-AB Audio Amplifier with Head Phone Sense Input	100	2W into 4Ω at 5V	<10	20	<1	2.0~6.8	-40~85	ISD-DEMO8102	8-pin SOP (Thermal ex-pad)
ISD8104	2W Class-AB Audio Amplifier, Differential/Single ended inputs	100	2W into 4Ω at 5V	<10	20	<1	2.0~6.8	-40~85	ISD-DEMO8104	8-pin SOP (Thermal ex-pad)P

• Class D Series

Part No.	Description	Output Power		Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Temp (°C)	Development Tools	Package	Status*
		Power (W)	THD+N (%)							
NAU82011	3.1W Mono Class-D Audio Amplifier, variable gain with Differential / Single ended inputs	3.1W into 4Ω at 5V	<10	Variable	<1	2.5~5.5	-40~85	NAU82011VG-EVB	QFN16 WCSP-9	P
NAU8223	3.1W Stereo Filer-Free Class-D Audio Amplifier, 5 gain steps with Differential / Single ended inputs	3.1W into 4Ω at 5V	<10	0, 6, 12, 18, 24	<1	2.5~5.5	-40~85	NAU8223-EVB	QFN20	P
NAU8224	3.1W Stereo Filer-Free Class-D Audio Amplifier, 2 wire interface gain control with Differential / Single ended inputs	3.1W into 4Ω at 5V	<10	24 to -62	<1	2.5~5.5	-40~85	NAU8224-EVB	QFN20	P
NAU8315	I2S, 3.2W Mono Filer-Free Class-D Audio Amplifier, with I2S input	3.2W into 4Ω at 5V, WLCPS-12	<10	3, 6, 9, 12	typ. 0.3	SPK_VDD: 2.5 - 5.25 IO_Vdd: 1.8 - 5.25	-40~85	NAU8325-DEMO	QFN20 WLCSP-9 WLCSP-12	P
NAU8325	I2S, 3.1W Stereo Filer-Free Class-D Audio Amplifier, 2 wire interface	3.0W into 4Ω at 5V	<10	24 to -62	<2	SPK_VDD: 2.5 - 5.5 A_Vdd: 1.62 - 1.98 IO_Vdd: 1.62 - 3.6	-40~85	NAU8325-DEMO	QFN20	P
NAU83P20	Class D power stage 2x20W into 8Ohms (1% THD)	10Wx4 20Wx2	<0.18	3BTL / 3SE	<1	7.0 to 24.0	-40~85	NAU83P20-DEMO	QFN48	P

• Smart Amplifier

Part No.	Description	Output Power	Operating Voltage (V)	Speaker Protection	Speaker Channel	Audio Interface	Package	Status
NAU8331VG	8W Mono Boosted Class D Amplifier	8W @ 4Ω 6W @ 8Ω	2.9~5.5	External DSP	Mono	I2S, PCM, TDM	WLCSP 35 Balls with 0.5mm Pitch	P
NAU83G10VG	12W Mono Boosted Class D with Klippel Controlled Sound DSP	8W @ 4Ω 6.5W @ 8Ω	2.9~5.5	Integrated DSP	Mono	I2S, PCM, TDM	WLCSP 50 Balls swith 0.5mm Pitch	P
NAU83G20VG	20W Mono Boosted Class D with Klippel Controlled Sound DSP	20W @ 4Ω 11W @ 8Ω	Up to 14	Integrated DSP	Mono	I2S, PCM, TDM	WLCSP 50 Balls with 0.5mm Pitch	P

* Under Development

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Audio Enhancement

Part No.	Description	HW Configuration					Algorithms									
		I²S Stereo Inputs	ADC Stereo Inputs	I²S Output 2 x Stereo	DAC Single Output	Power Output	Bass	Pro. Eq.	3D	Treble	Volume	Level	Dialog	DRC	V3D	Package
NPCP215F	MaxxAudio	4	0	3	0	20W (8R)	Y	Y	Y	Y	Y	Y	Y	-	-	QFN48
NPCA112D	MaxxAudio	4	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN32
NPCA110P	MaxxAudio	2	3	3	4	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN40
NPCA110T	MaxxAudio	3	0	3	3	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN32
NPCA110D	MaxxAudio	3	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN32
NPCA110B	MaxxAudio	1	2	1	2	-	Y	Y	-	-	Y	-	-	-	-	QFN32
NPCA120D	DPS	2	0	2	0	-	Y	Y	Y	Y	Y	Y	Y	Y	-	LQFP64
NPCA121D	DPS	3	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	LQFP64

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ChipCorder® Family

• Digital ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Package	Development Tools	Temp (°C)	Status*
ISD15102	Multi-message record/playback, Flash memory, I²S digital audio and SPI interfaces	2 min	Up to 48	2.7~3.6	LQFP48	ISD-DMK_15100	Industrial -40~85°C	P
ISD15104		4 min						
ISD15108		8 min						
ISD15C00	Multi-message record/playback with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~3.6	LQFP48	ISD-DMK_15C00	AEC-Q100	P
ISD15D00	Multi-message playback-only with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~5.5	QFN32	ISD-DMK_15D00	AEC-Q100	P
ISD3900	Multi-message record/playback with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~3.6	LQFP48	ISD-DMK_3900	Industrial -40~85°C	P
ISD3800	Multi-message playback-only with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~5.5	LQFP48 QFN32	ISD-DMK_3800	Industrial -40~85°C	P
ISD2130	Multi-message playback-only with embedded Flash memory	30 sec	Up to 32	2.7~3.6	QFN20 SOP14	ISD-DMK_2100	Industrial -40~85°C	P
ISD2115A		15 sec				ISD-DMK_2100		P
ISD2360	Multi-message, 3-channel audio, playback-only with embedded Flash memory	64 sec	Up to 32	2.4~5.5	QFN32 SOP16	ISD-DMK_2360	Industrial -40~85°C	P
***ISD2361**	Multi-message, 3-channel audio, playback-only with embedded Flash and SPI Interface	64 sec + Ext. Flash up to 1024 min	Up to 32	2.4~5.5	QFN32	*ISD-DMK_2361	Industrial -40~85°C	Q4' 20

* Under Development

• MLS ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Package	Development Tools	Temp (˚C)
ISD14B20	Multi-message record/playback with internal Flash memory	10~128 sec	4~12	2.4~5.5	DIE	ISD-COB18B20	0~50°C
ISD14B40						ISD-COB18B24	
ISD14B80						ISD-COB18B80	
ISD1916	Multi-message record/playback with internal Flash memory	10~128 sec	4~12	2.4~5.5	SOIC 28	ISD-DEMO1964	Industrial -40~85°C
ISD1932							
ISD1964							

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Package	Development Tools	Temp (˚C)
ISD1610B	Single-message record/playback with internal Flash memory	6~40 sec	4~12	2.4~5.5	SOIC 16 DIE	I16-COB20	Commercial Industrial
ISD1616B							
ISD1620B							
ISD1730	Multi-message record/playback, internal Flash memory and SPI interface	20~480 sec	4~12	2.4~5.5	SOIC 28 PDIP 28 DIE	ISD-COB1730	Commercial Industrial
ISD1760						ISD-COB17160	
ISD17120						ISD-COB17150	
ISD17240						ISD-COB17240	
ISD1806	Single-message record/playback with internal Flash	6~16 sec	4~8	2.7~4.5	DIE	ISD-COB1810	0~50ºC
ISD1810							
ISD18A04	Single-message record/playback with internal Flash memory	4~8 sec	4~8	2.4~5.5	DIE	ISD-COB18A04	0~50ºC
ISD18B12	Single-message record/playback with internal Flash memory	6~24 sec	4~8	2.4~5.5	DIE	ISD-COB18B24	0~50ºC
ISD18B24							
ISD18C10	Single-message record/playback with internal Flash memory	8-16 sec	4~8	2.7~4.5	DIE	ISD-COB18C10	0~50ºC
ISD4002	Multi-message record/playback, internal Flash memory and SPI interface	2~16 min	4,5.3,6.4,8	2.7~3.3	PDIP 28 SOIC 28 DIE	ISD-IPROG-1	Commercial Industrial
ISD4003							
ISD4004							
ISD5102	Multi-message record/playback, internal Flash memory and I²C interface	2~16 min	4,5.3,6.4,8	2.7~3.3	PDIP 28 SOIC 28 DIE	ISD-IPROG-1	Commercial Industrial
ISD5104							
ISD5108							
ISD5116							

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Development Tools for PowerSpeech® Family

Ordering No.	Board Name	Content	Description	Picture
Development Kit				
ICE-W588D-FS	WHS-588D-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-588D-ICE System V3.3 • WHS-KEY + Cable • USB Cable	• W588C/D In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-W584A-FS	WHS-584A-ICE	• WHS-584A-ICE-IL System V1.1 • WHS-584A-ICE System V1.2 • WHS-KEY + Cable • Power Adaptor • USB Cable	• W584A In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N588H	NHS-588H-ICE	• WHS-MINI-USB-ICE System V1.1 • NHS-588H-ICE System V1.1 2 layer boards	• N588H/J In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N584H	NHS-584H-ICE	• N584H ICE System	• N584H In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
Evaluation Board				
NV-W588D	WHS-588C/D-16M	• W588C/D series EVB	• W588C/D Series Evaluation Board (EVB) with 16Mbit Flash	
NV-W588DF20B	WHS-W588DF20-H1	• W588DF060(W588DF20) EVB	• W588DF060(W588DF20) Evaluation Board (EVB) with 2Mbit Embedded Flash	
NV-N588H	NHS-588H-16M	• N588H/J Series EVB	• N588H/J Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N588H-L	NHS-588H-08ML	• N588H/J Series EVB for Low Voltage	• N588H/J EVB Series Evaluation Board (EVB) with 8Mbit Low Voltage Flash	
NV-N5132	NV-513X-16M	• N5132	• N513X EVB with 16M-bit Parallel Flash	
NV-N5132-FS	NV-5132-FS	• N5132 + USB	• N5132 TOOL SET	
NV-N5160	NHS-W588X006 (NV-N5160)	• N5160 EVB	• N5160 Evaluation Board (EVB) with 32M-bit SPI Flash	

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-N5160S16	NHS-N5160S16	• N5160S16 EVB	• N5160S16 Evaluation Board (EVB)	
NV-N5160S32	NHS-N5160S32	• N5160S32 EVB	• N5160S32 Evaluation Board (EVB)	
NV-N589EVB	NHS-589EVB	• N589 EVB	• N589A/B/C/D ICE and Evaluation Board (EVB)	
NV-N589D-TB	N589D-TBoard	• N589D-TBoard	• N589D series Tiny Demo Board to cover N589D080, 120, 170, 200, 250, 340	
N589D171-EVB	N589D171-EVB	• N589D171 EVB	• N589D171 Evaluation Board to cover N589D081, N589D121 and N589D171	
N589D171-TB	N589D171TBoard	• N589D171 (COB) Tiny Board	• N589D171 (COB) tiny demo board to cover N589D081, N589D121, N589D171	
N589D171-STB	N589D171_TOP_ Board	• N589D171 Top Board	• N589D171 standard top board w/ passive parts	
N589-1-WTR	N589 1-1 Writer	• N589 1-1 Writer	• N589 USB dongle, supports 1 to 1 writer and ICE debug	
N589-8-WTR-M (NW-N589-MAIN)	N589 1-8 Writer	• N589 Gang Writer Main Board	• N589 1 to 8 gang writer (mother board)	
N589-8-WTR-F	N589 GANG WRITER 20180724	• N589 1-8 Gang Writer Main Board, SOP14 Adaptor Board x 8, SOP14 Socket x 8	• N589 Gang Writer full set, Main Board x 1, Socket Adaptor SOP14 x 8	
N589A-TB	N589A Tboard	• N589A Tiny Board to cover N589A, N589B, N589C and N589D200/250/340	• N589A tiny demo board with passive parts. It covers N589A/B/C and N589D200/250/340	
N589A-STB	N589A_TOP_ BOARD	• N589A Dev Platform Standard Top Board	• N589A Dev Platform Standard Top Board with passive parts. It covers N589A/B/C and N589D200/250/340	

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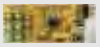
Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
N589A900-TB	N589A900-Tboard	• N589A900 Tiny Board	• N589A900 (COB) Tiny Board Cover: N589A400/600/900, N589B480/650/960, N589C480/650/960, N589D650/960	
N589A900-EVB	N589A900-EVB	• N589A900 EVB	• N589A900 (LQFP48) Evaluation Board (EVB) Cover: N589A400/600/900, N589B480/650/960, N589C480/650/960, N589D650/960	
N589D-TB2	N589D Tboard	• N589D Tiny Board with dual ICP pin hole	• N589D series tiny demo board with passive parts to cover N589D080/120/170/200/250/340	
N589D481-EVB	N589D481-EVB	• N589D481-EVB	• N589D481 Evaluation Board to cover N589D201, D251, D341 and D481	
N589D481-TB	N589D481-TB	• N589D481 Tiny Board	• N589D481 Tiny Board for N589D201/D251/D341/D481	
NSP-1-WTR	NSP 1-1 Writer	• NSP-Flash 1 to 1 Writer	• NSP-Flash 1 to 1 Writer to cover NSP080A/081A/170A/171A/340A/341A/481A, and NSP080B/170B/340B/480B/650B/960B	
NSP-8-WTR-F	NSP GANG WRITER 20180724	• NSP 1-8 Gang Writer Main Board, SOP14 Adaptor Board x 8, SOP14 Socket	• NSP Gang Writer full set, Main Board x 1, Socket Adaptor SOP14 x 8	
NSP-8-WTR-F8	NSP GANG WRITER 20180724	• NSP SOP8 Gang Writer full set with Main Board x 1 and Socket Adaptor SOP8 x 8	• NSP series 1 to 8 Gang Writer full set for SOP8 package. It is suitable for the item of NSP080A/081A, NSP170A/171A, NSP340A	
NSP-8-WTR-M	NSP GANG WRITER 20180724	• NSP 1-8 Gang Writer Main Board	• NSP Gang Writer Main Board only	
NSP-OTP-EVB	NSP-OTP-EVB	• NSP-OTP series EVB	• NSP-OTP Series Evaluation Board (EVB) Cover: NSP075A/165A/335A, NSP075B/165B/335B	
NSP-SOP8	NSP-SOP8	• NSP-Flash SOP8 Adaptor	• NSP-Flash SOP8 adaptor on NSP 1-8 Gang Writer Cover: NSP080A/081A/170A/171A/340A/341A/481A	
NSP-SOP14	Adaptor of NSP SOP14	• NSP SOP14 Adaptor Board	• SOP14 Socket Adaptor PCB	
NSP-SOP14-2	NSP-SOP14-2	• NSP-Flash SOP14 Adaptor	• NSP-Flash SOP14 adaptor on NSP 1-8 Gang Writer Cover: NSP480B/650B/960B	

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NSP165A-TB2	NSP165A-TB2	• NSP165A Tiny Board	• NSP165A OTP Tiny Board for NSP165A chip.	
NSP171A-TB1	NSP171A-TB1	• NSP171A (SOP8) Tiny Board	• NSP171A (SOP8) tiny demo board to cover NSP081A, NSP171A	
NSP340A-TB1	NSP340A-TB1	• NSP340A (SOP8) Tiny Board	• NSP340A (SOP8) tiny demo board to cover NSP080A, NSP170A, NSP340A	
NSP340B-TB1	NSP340B-TB1	• NSP340B (SOP14) Tiny Board	• NSP340B (SOP14) tiny demo board to cover NSP080B, NSP170B, NSP340B	
NSP340A-TB2	NSP340A TB2	• NSP340A (SOP8) Tiny Board with I8101 PA	• NSP340A Tinny Board w/PA and passive parts	
NSP340B-TB2	NSP340B-TB2	• NSP340B Tiny Demo Board with I8101 PA	• NSP340B Tiny Demo Board with I8101 PA for NSP080B/170B/340B	
NSP960B-TB1	NSP960B-TB1	• NSP960B Tiny Board	• NSP960B (SOP14) Tiny Board Cover: NSP480B/650B/960B	
NV-N584H	NHS-584H-16M	• N584H Series EVB	• N584H Series Evaluation Board (EVB) with 16Mbit Flash	
NV-W584A-H	WHS-584AH-16M	• W584A/B/C Series EVB	• W584A/B/C Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N584L-3V	NHS-584L-16M-3V	• N584L Series EVB with Vp=3V	• N584L Series Evaluation Board (EVB) with 16Mbit Flash for Vp=3V	
NV-N584L-4V	NHS-584L-16M-4V	• N584L Series EVB with Vp=4V	• N584L Series Evaluation Board (EVB) with 16Mbit Flash for Vp=4V	
NV-N588L	NHS-N588L-16M	• N588L Series EVB	• N588L Series Evaluation Board (EVB) with 16Mbit Flash	

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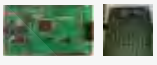
Development Tools for BandDirector® Family

Ordering No.	Board Name	Content	Description	Picture
Development Kit				
ICE-W567C	WHS-BD567C	• WHS-MINI-USB-ICE System V1.1 • WHS-567C-IC System V1.3 • USB Cable • Power Adaptor	• W567C/J In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N566H	NHS-566H001-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-566H001-ICE System V1.1	• N566H001 In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N567H	WHS-N567H-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-N567H-ICE System V3.0	• N567G/H/K In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
Evaluation Board				
NV-W567C	WHS-567C-16M	• W567C/J series EVB	• W567C/J Series Evaluation Board (EVB) with 16Mbit Flash	
N566H-EVB	NHS-566H001-16M	• N566H001 EVB	• N566H001 Evaluation Board (EVB) with 16M-bit Parallel Flash	
NV-N567H	WHS-N567-H1	• N567G/H/K series EVB	• N567G/H/K Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N567L	NHS-N567L-16M	• N567L Series EVB	• N567L Series Evaluation Board (EVB) with 16Mbit Flash	

Development Tools for ViewTalk® Family

Ordering No.	Board Name	Content	Description	Picture
Development Kit				
ICE-N539T-FS	NHS-539-ICE	• WHS-MINI-USB-ICE System V1.1 • NHS-539-ICE System V1.2 • USB Cable • WHS-KEY + Cable	• N539 In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
Evaluation Board				
NV-N531-16M	NHS-531-16M	• N531 Series EVB	• N531 Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N539T001	NHS-539001-16M	• N539T001 Series EVB	• N539T001 Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N539T000	NHS-539-16M	• N539T000 Series EVB	• N539T000 Series Evaluation Board (EVB) with 16Mbit Flash	

Development Tools for OTP Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-W584AP20	NHS-584AP20	• W584AP065(W584AP20) OTP EVB	• W584AP065(W584AP20) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-W584AP05	NHS-584AP05	• W584AP017(W584AP05) OTP EVB	• W584AP017(W584AP05) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N584HP300	NHS-584HP300	• N584HP300 OTP EVB	• N584HP300 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-W567CP80	NHS-W567CP80	• W567CP260(W567CP80) OTP EVB	• W567CP260(W567CP80) One-Time Programmable (OTP) Evaluation Board (EVB)	
N566HP080EVB	NHS-566HP080	• N566HP080 EVB	• N566HP080 OTP EV Board w/ Components	
NV-N566HP320	NHS-N566HP320	• N566HP EVB	• N566HP320 COB with passive parts	

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Development Tools for OTP Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
N566HP321EVB	N566HP321-EVB	• N566HP321 EVB	• N566HP321 COB with passive part	
NV-N567HP80	NHS-567HP80	• N567HP330(N567HP80) OTP EVB	• N567HP330(N567HP80) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N567LP330	NHS-567LP330	• N567LP330 OTP EVB	• N567LP330 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	
N588HP082-TB	N588HP082-TB	• N588HP082 Tiny Board	• N588HP082 Tiny Board to cover N588HP062/082, N588JP062/082	
N588HP172-TB	N588HP172-TB	• N588HP172 OTP Tiny Board	• N588HP172 OTP tiny demo board to cover N588JP122/172 and N588HP122/172	
N588HP342-TB	N588HP342-TB	• N588HP342 Tiny Board	• N588HP342 Tiny Board to cover N588HP202/252/342 and N588JP202/252/342	
NV-N588LP330	NHS-588LP330	• N588LP330 OTP EVB	• N588LP330 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588HP650	NHS-N588HP650	• N588HP650 OTP EVB	• N588HP650 COB with passive parts	
NV-N588HP340	NHS-588HP340	• N588HP340 OTP EVB	• N588HP340 One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588HP170	NHS-588HP170	• N588HP170 OTP EVB	• N588HP170 One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588HP080	NHS-588HP080	• N588HP080 OTP EVB	• N588HP080 One-Time Programmable (OTP) Evaluation Board (EVB)	
Writer				
NW-OTP	Nuvoton OTP Writer	• Nu-Speech / Nu-Voice OTP chip Writer	• Nu-Speech / Nu-Voice OTP chip Writer	
NW-OTP-Gang	Nuvoton OTP Gang Writer	• Nu-Speech / Nu-Voice OTP chip Gang Writer	• Nu-Speech / Nu-Voice OTP chip Gang Writer - support to write 4 chips one time	
NW-OTP-SP	NW-OTP-SP	• New OTP writer with adaptor	• New OTP writer dongle for N566GP/KP-120/160/200/240/280/320, N566HP-120/160/200/240/280/321, N588HP/JP-062/082/122/172/202/252/342, and NSP075/165/335	
NW-570S64A-F	Flash Gang Writer	• Nu-Voice N569S, N57xS chip Gang Writer	• Nu-Voice N569S, N57xS chip Gang Writer - support to write 8 chips one time	

Development Tools for NuVoice™

Ordering No.	Board name	Content	Description	Picture
Evaluation Board				
NU-NUVOICE	NU-LINK	• Nu-Link Debug Adapter • USB Cable	• Nu-Link Debug Adapter for Nu-Voice Series, supports online/offline In-Circuit Programming (ICP), development, and debug.	
NV-N569S2K0	NHS-N569S2K0	• NHS-N569S2K0 EVB	• N569S (w/ 16Mbit Flash) Evaluation Board (EVB) with I/O Interface	
NV-N569S8K0	NHS-N569S8K0	• NHS-N569S8K0 EVB	• N569S (w/ 64Mbit Flash) Evaluation Board (EVB) with I/O Interface	
NV-N570C064	NHS-570C064-EVB	• NHS-570C064 EVB	• N570C064 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
N570HC64-EVB	NHS-570H064-EVB	• NHS-570H064 EVB	• N570H064 and N570HC64 Evaluation Board (EVB) with push button for demo	
N570J32A-EVB	NHS-N570J32A	• N570J32A-EVB	• N570J32AL Evaluation Board to cover N570J08AL, N570J16AL and N570J32AL	
NV-N570S16A	NHS-N570S16A	• NHS-N570S16A EVB	• N570S16A (w/ 16Mbit Flash) Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N570S64A	NHS-N570S64A	• NHS-N570S64A EVB	• N570S64A (w/ 64Mbit Flash) Evaluation Board (EVB) with I/O Interface & Microphone	
NV-N570SC64	NHS-570SC64	• NHS-570SC64 EVB	• N570S64A (w/ 64Mbit Flash) Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N572F065	NHS-572F065-EVB	• NHS-572F065 EVB	• N572F065 Evaluation Board (EVB) with I/O Interface	
NV-N572F072	NHS-572F072-EVB	• NHS-572F072 EVB	• N572F072 Evaluation Board (EVB) with I/O Interface & Microphonefor Voice Recognition Application	
NV-N572C072	NHS-572C072-EVB	• NHS-572C072 EVB	• N572C072 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N571P032	NHS-571P032-EVB	• NHS-571P032 EVB	• N571P032 One-Time Programmable (OTP) Evaluation Board (EVB) with I/O Interface & Microphone for program verifcation	
ICE-N571P032	NHS-571E000-EVB	• N571P032 ICE Chip EVB	• N571P032 In-Circuit Emulation (ICE) Chip with I/O interface & Microphone, Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	

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Development Tools for NuVoice™

Ordering No.	Board name	Content	Description	Picture
Evaluation Board				
NV-N575C145	NHS-575C145	• NHS-575C145 EVB	• NHS-575C145 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N575F145	NHS-575F145	• NHS-575F145 EVB	• NHS-575F145 Evaluation Board (EVB) with I/O Interface & Microphone	
NK-N575CF145	AU9110-DemoKit	• I/O Expansion Daughter Board for N575 EVB	• NHS-575C/F145-Daughter Board expands N575 EVB with additional Push Button & Reserved SD Card Socket.	
NT-N575C145	NHS-575C145	• NHS-575C145-EVB + Daughter Board	• NHS-575C145 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application with Daughter Board	
NT-N575F145	NHS-575F145	• NHS-575F145-EVB + Daughter Board	• NHS-575F145 Evaluation Board (EVB) with I/O Interface & Microphone with Daughter Board	

Development Tools for Nu-Touch

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
ICE-N55T10	NHS-55T10 (TOUCH SYSTEM)	• N55T10 Evaluation Kit	• N55T10 Evaluation kits, it include NHS-55T-1, NHS-55T-2, NHS- 55T10-COB, WHS-588L-8M	
NV-N55T10	NHS-55T10-COB EVB	• N55T10 EVB	• N55T10 Evaluation Board (EVB)	
N55T16-EVB	N55T16 EV Board	• N55T16 EV Board	• N55T16 Evaluation Board	

IO Expander Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-N55P242	NHS-55P242	• N55P242 EVB	• N55P242 Evaluation Board (EVB)	
Demo Board				
NV-N55P242-R	N55P242_RING_TYPE_ DEMO_BOARD_V1.0	• N55P242 Demo Board (Circle)	• N55P242 Circle Demo Board	
NV-N55P242-S	N55P242_SINGLE_STRIP_ DEMO_BOARD_V1.0	• N55P242 Demo Board (Rectangle)	• N55P242 Rectangle Demo Board	

Development Tools for MFID Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-MFID50	WHS-55MID50-002	• W55MID50 EVB	• W55MID50 MFID Evaluation Board (EVB) with PCB Antenna (42mm*34.5mm)	
NV-W55MID15	WHS-55MID15	• W55MID15 MFID Tag EVB	• W55MID15 w/ ANT (20mm*20mm)	
NV-W55MID35	WHS-55MID35	• W55MID35 MFID Tag EVB	• W55MID35 w/ ANT (15mm*15mm)	
N55MID16-TB1	N55MID16 Tiny Board	• N55MID16 Tiny Board	• N55MID16 single tag COB w/ antenna 2CM x 2CM	
N55MID36-TB1	N55MID36 Tiny Board	• N55MID36 Tiny Board	• N55MID36 multi-tag CON demo board w/ antenna 1.5CM x 1.5CM	
N55MID51-EVB	N55MID51 EV Board	• N55MID51 EV Board	• N55MID51 Reader Evaluation Board w/ antenna 4CM x 3.5CM	

Development Tools for Other

Ordering No.	Board Name	Content	Description	Picture
Accessary				
NK-Keymatrix	WHS-KEY MATRIX	• External Key-Matrick Board	• External Key-Matrick Board	
NW-USB	WHS-USB-Writer	• USB Writer	• EVB USB Writer to cover PowerSpeech/ViewTalk/ BandDirectorEVB, and NSP-OTP-EVB	

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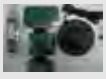
Development Tools for AUI Enabler Series

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Development Kit					
NM-I94100_AM	**ISD-DMK_94100_AM**	ISD941xx series	• NL-ISD94124A • NP-I94124_AM • Speaker	• Evaluation, debugging and demo kit for ISD941xx • Connect with Analog microphone adaptor	
NM-I94100_DM	**ISD-DMK_94100_DM**	ISD941xx series	• NL-ISD94124A • NP-I94124_DM • Speaker	• Evaluation, debugging and demo kit for ISD941xx • Connect with Digital microphone adaptor	
NV-ISD94100	**DEMO-I94100-NAU88C22**	ISD941xx series	• DEMO-I94100-NAU88C22	• ISD94100* demo board with Audio CODEC (NAU88C22) on board • Connect to PC via ISD-NU-LINK for programming and debugging *P/N ISD94100 is for demo board use only	
NL-ISD94124A	**EVB-I94124**	ISD94124	• EVB-I94124	• ISD94124PDI Eval board with Nu-Link ICE Bridge on board for drag and drop programming	
NP-I94124_AM	**EVB-I94124-NAU85L40**	ISD94124	• EVB-I94124-NAU85L40	• Analog Microphone adaptor for NL-ISD94124A	
NP-I94124_DM	**EVB-I94124-Audio**	ISD94124	• EVB-I94124-Audio	• Digital Microphone adaptor for NL-ISD94124A	
NM-ISD91260	**ISD-DMK_91260**	ISD91260CRI	• ISD-DEMO91260 • ISD-NU-LINK • Speaker	• Evaluation and demo kit for ISD91260CRI	
NM-ISD91260B	**ISD-DMK_91260B**	ISD91260BRI	• ISD-DEMO91260B • ISD-NU-LINK • Speaker	• Evaluation and demo kit for ISD91260BRI	
NM-ISD91032C	**ISD-DMK_91032C**	ISD91032CFI	• ISD-DEMO91032C • ISD-NU-LINK • Speaker	• Evaluation and demo kit for ISD91032CFI	
NM-ISD9160	**ISD-DMK_9160**	ISD9160	• ISD-DEMO9160 • ISD-NU-LINK • ISD-9160-Touch • ISD-9160-KB • Speaker	• Evaluation, debugging and demo kit for ISD9160 • Keil RV/MDK available on Keil website • Supports ICP (In-Circuit Programming)	
NM-ISD91300	**ISD-DMK_91300**	ISD913xx	• ISD-DEMO91300 • ISD-91300-Touch • Speaker	• Evaluation, debugging and demo kit for ISD91300 • Keil RV/MDK available on Keil website • Supports ICP (In-Circuit Programming)	
Programmer/Writer					
NW-ISD9160	**ISD-ES9160__Prog_F**	ISD9160 Series LQFP pakcage	• ISD-ES9160__Prog_F	• ISD9160 LQFP single socket programmer • Connect to PC via ISD NU-LINK for programming and evaluation	
NG-ISD9160	**ISD-9160_GANG_Prog_F**	ISD9160	• ISD-9160_GANG_Prog_F	• ISD9160 LQFP standalone gang programmer	
NW-ISD91300	**ISD-ES91300_PROG_F**	ISD913xx	• ISD-ES91300_PROG_F	• ISD913xx LQFP single socket programmer for programming and evaluation	
NG-ISD91300	**ISD-91300_GANG_Prog_F**	ISD913xx	• ISD-91300_GANG_Prog_F	• ISD913xx LQFP standalone gang programmer	

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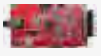
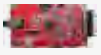
Development Tools for Audio Converters

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation Board					
NV-NAU88C10	NAU88C10-DEMO	NAU88C10	• NAU88C10-DEMO	• Compact Audio Base Board + NAU88C10YG daughter card	
NV-NAU8810	NAU8810-DEMO	NAU8810	• NAU8810-DEMO	• Compact Audio Base Board + NAU8810YG daughter card	
NV-NAU8812	NAU8812-DEMO	NAU8812	• NAU8812-DEMO	• Compact Audio Base Board + NAU8812RG daughter card	
NV-NAU88C14	NAU88C14-DEMO	NAU88C14	• NAU88C14-DEMO	• Compact Audio Base Board + NAU88C14YG daughter card	
NV-NAU8814	NAU8814-DEMO	NAU8814	• NAU8814-DEMO	• Compact Audio Base Board + NAU8814YG daughter card	

Development Tools for Audio CODECs

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation Board					
NL-NAU88L25	NAU88L25-DEMO	NAU88L25	• NAU88L25-DEMO	• Demo board for NAU88L25YGB	
NU-NAUSB2I2C	USB-To-I2C/I2S	Audio Amplifier Audio converter (CODEC/ADC/DAC) Audio Enhancement	• USB-To-I2C/I2S	• USB-To-I2C/I2S control board for Audio Converter/Audio Amplifier/Audio Enhancement product lines.	
NL-NAU88L24I	NAU88L24I-DEMO	NAU88L24	• NAU88L24I-DEMO	• Demo board for NAU88L24IG	
NL-NAU88L21	NAU88L21-DEMO	NAU88L21	• NAU88L21-DEMO	• Demo board for NAU88L21YG	
NV-NAU8822A	NAU8822A-DEMO	NAU8822A NAU88U22A	• NAU8822A-DEMO	• Compact Audio Base Board + NAU8822AYG daughter card	
NV-NAU88C22	NAU88C22-DEMO	NAU88C22	• NAU88C22-DEMO	• Compact Audio Base Board + NAU88C22YG daughter card	
NV-NAU8820	NAU8820-DEMO	NAU8820	• NAU8820-DEMO	• Compact Audio Base Board + NAU8820YG daughter card	
NV-NAU8401	NAU8401-DEMO	NAU8401	• NAU8401-DEMO	• Compact Audio Base Board + NAU8401YG daughter card	
NV-NAU8501	NAU8501-DEMO	NAU8501	• NAU8501-DEMO	• Compact Audio Base Board + NAU8501YG daughter card	
NL-NAU85L40	NAU85L40-DEMO	NAU85L40	• NAU85L40-DEMO	• Demo board for NAU85L40YGB	
NL-NAU85L20	NAU85L20-DEMO	NAU85L20	• NAU85L20-DEMO	• Demo board for NAU85L20YGB	
NT-NAU8402	NAU8402-Card	NAU8402	• NAU8402-Card	• NAU8402WG Daughter Board	
NT-NAU8502	NAU8502-Card	NAU8502	• NAU8502-Card	• NAU8502YG Daughter Board	

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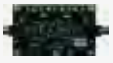
Development Tools for Audio Amplifiers

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Power Amplifier					
NE-NAU82011V	NAU82011V-EVB	NAU82011	• NAU82011V-EVB	• Evaluation Board for NAU82011VG	
NT-ISD8101	ISD-DEMO8101	ISD8101	• ISDI8101-DEMO	• Demo Board for I8101SYI	
NT-ISD8102	ISD-DEMO8102	ISD8102	• ISD8102-DEMO	• Demo Board for I8102SYI	
NT-ISD8104	ISD-DEMO8104	ISD8104	• ISD8104-DEMO	• Demo Board for I8104SYI	
NL-NAU8315	NAU8315-DEMO	NAU8315	• NAU8315-DEMO	• Demo Board for NAU8315YG	
NL-NAU8315B	NAU8315B-DEMO	NAU8315	• NAU8315-DEMO	• Demo Board for NAU8315B31VG WLCSP-12	
NL-NAU8325	NAU8325-DEMO	NAU8325	• NAU8325-DEMO	• Demo Board for NAU8325YG	
NE-NAU8223	NAU8223-EVB	NAU8223	• NAU8223-EVB	• Evaluation Board for NAU8223YG	
NE-NAU8224	NAU8224-EVB	NAU8224	• NAU8224-EVB	• Evaluation Board for NAU8224YG	
NU-NAU8224	NAU-ES_MINI_USB	NAU8224	• NAU-ES_MINI_USB	• USB to I²C bus dongle for NAU8224-EVB	

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Power Amplifier					
NE-NAU8220	NAU8220WG-EVB	NAU8220	• NAU8220WG-EVB	• Evaluation Board for NAU8220WG	
NV-NAU83G10S	NAD-NAU83G10	NAU83G10	• NAD-NAU83G10	• Stereo NAU83G10 EVAL Board	
NV-NAU83G20S	NAD-NAU83G20	NAU83G20	• NAD-NAU83G20	• Stereo NAU83G20 EVAL Board	
NM-N83G10MA	NAD-NAU83G10_BRS-161200	NAU83G10	• NAD-NAU83G10_BRS-161200	• Mono NAU83G10 with Bujeon BRS-161200	
NM-N83G10MB	NAD-NAU83G10_BRS-181300	NAU83G10	• NAD-NAU83G10_BRS-181300	• Mono NAU83G10 with Bujeon BRS-181300	
NM-N83G10SA	NAD-NAU83G10_2*BRS-161200	NAU83G10	• NAD-83G10_2*BRS-161200	• Stereo NAU83G10 with 2x Bujeon BRS-161200	
NM-N83G10SB	NAD-NAU83G10_2*BRS-181300	NAU83G10	• NAD-83G10_2*BRS-181300	• Stereo NAU83G10 with 2x Bujeon BRS-181300	
NM-N83G20MA	NAD-NAU83G20_BUF-4203	NAU83G20	• NAD-NAU83G20_BUF-4203	• Mono NAU83G20 with Bujeon BUF-4203	
NM-N83G20SA	NAD-NAU83G20_2*BUF-4203	NAU83G20	• NAD-NAU83G20_2*BUF-4203	• Stereo NAU83G20 with 2x Bujeon BUF-4203	

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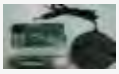
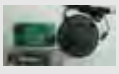
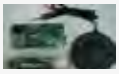
Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Development Kit					
NM-ISD15100	ISD-DMK_15100	ISD15102/04/08	• ISD-DEMO15100 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD15102/4/8	
NM-ISD15C00	ISD-DMK_15C00	ISD15C00	• ISD-DEMO15C00 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD15C00	
NM-ISD15D00	ISD-DMK_15D00	ISD15D00	• ISD-DEMO15D00 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD15D00	
NM-ISD2100Q	ISD-DMK_2100	ISD2100YYI	• ISD-DEMO2100_Q • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2100Y	
NM-ISD2360Q	ISD-DMK_2360_Q	ISD2360YYI	• ISD-DEMO2360_Q • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2360Y	
NM-ISD2360S	ISD-DMK_2360_S	ISD2360SYI	• ISD-DEMO2360_S • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2360S	
NM-ISD3800	ISD-DMK_3800	ISD3800	• ISD-DEMO3800 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD3800	
NM-ISD3900	ISD-DMK_3900	ISD3900	• ISD-DEMO3900 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD3900	

Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NT-ISD1964	ISD-DEMO1964	ISD1916/32/64 Class-D output	• ISD-DEMO1964	• ISD1900 demo board with I1964SYI on board	
NT-ISD1964A	ISD-DEMO1964_AUX	ISD1916/32/64 AUX output	• ISD-DEMO1964_AUX	• ISD1900 AUX output demo board with ISD1964SYI01 on board	
NC-ISD18B24	ISD-COB18B24	ISD18B12/24	• ISD-COB18B24	• ISD18B24/12 demo board	
NC-ISD18C10	ISD-COB18C10	ISD18C10	• ISD-COB18C10	• ISD18C10/18C06 demo board (SPK/MIC sharing)	
NC-ISD1810	ISD-COB1810	ISD1806/10	• ISD-COB1810	• ISD1810/1806 demo board	

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Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NC-ISD17240	ISD-COB17240	ISD17240/210/180	• ISD-COB17240	• ISD17240/210/180 demo board	
NC-ISD17150	ISD-COB17150	ISD17150	• ISD-COB17150	• ISD17150/120/090 demo board	
NC-ISD1760	ISD-COB1760	ISD1760	• ISD-COB1760	• ISD1760/50/40 demo board	
NC-ISD1730	ISD-COB1730	ISD1730	• ISD-COB1730	• ISD1730 demo board	
NC-ISD1620B	I16-COB20	ISD1600 Series	• I16-COB20	• ISD1610/16/20 demo board	
Programmer/Writer					
NW-ISD15100	ISD-ES15100_Mini_PROG_F	ISD15102/04/08	• ISD-ES15100_Mini_PROG	• ISD15102/04/08 LQFP single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISD2100Q	ISD-ES2100_Mini_PROG_Q	ISD2100 Series QFN package	• ISD-ES2100_Mini_PROG_Q	• ISD2100 QFN single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISD2100S	ISD-ES2100_Mini_PROG_S	ISD2100 Series SOP package	• ISD-ES2100_Mini_PROG_S	• ISD2100 SOP single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NG-ISD2100Q	ISD-2100_GANG_Prog_Q	ISD2100 Series QFN package	• ISD-2100_GANG_Prog_Q	• ISD2100 QFN standalone gang programmer	

Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NG-ISD2100S	ISD-2100_GANG_Prog_S	ISD2100 Series package SOP	• ISD-2100_ GANG Prog_S	• ISD2100 SOP standalone gang programme	
NW-ISD2360Q	ISD-ES2360_MINI_PROG_Q	ISD2360	• ISD-ES2360_ MINI_PROG_Q	• ISD2360 QFN single socket programmer, used with ISD-ES_Mini_USB • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISD2360S	ISD-ES2360_MINI_PROG_S	ISD2360	• ISD-ES2360_ MINI_PROG_S	• ISD2360 SOP single socket programme • Connect to PC via ISD-ES_Mini_USB for programming and evaluatio	
NG-ISD2360S	ISD-2360_GANG_PROG_S	ISD2360 packageP SO	• ISD-2360_ GANG PROG_S	• ISD2360 SOP rstandalone gang programme	
NG-ISD2360Q	ISD-2360_GANG_PROG_Q	ISD2360 QFN package	• ISD-2360_ GANG PROG_Q	• ISD2360 QFN standalone gang programmer	
***NM-ISD2361Q**	ISD-DMK_2361_Q	ISD2361YYI	• ISD-DEMO2361_Q • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2361Y • Available in Q4'20	
***NM-ISD2361S**	ISD-DMK_2361_S	ISD2361SYI	• ISD-DEMO2361_S • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2361S • Available in Q4'20	

* Under Development

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Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NW-ISDPROG	ISD-PROG	ISD2100 Series ISD15100 Series ISD15D00 Series Winbond SPI Flash	• ISD-PROG	• Stand alone Programmer for Digital ChipCorder	
NW-ISDIPROG1	ISD-IPROG-1	ISD4000/5000/1700	• ISD-PROG-1	• Single chip programming board support ISD4000/5000/1700 Series	
NW-P1700	P1700	ISD1700	• P1700	• Programmer adapter of ISD-IPROG-1 for ISD1700 Series	
NE-ISD1700	ISD-ES17XX_USB_PB	ISD1700 Serie	• ISD-ES17XX_ USB_PB	• Eval board for 1700 Series	
NE-ISD1900	ISD-ES1900_USB_PROG	ISD1900 Serie	• ISD-ES1900_ USB_PROG	• USB evaluation board for ISD1900 Series	
NE-ISD1600	ISD-ES1600_USB_PROG	ISD1600 Serie	• ISD-ES1600_ USB_PROG	• USB evaluation board for ISD1600 Series	
Software					
	VPE	ISD2130/15 ISD2360 ISD15C00/3900 ISD15C00/3900/15102/4/8 ISD15D00/3800	• Development software	• Download link: http://www.nuvoton.com/hq/products/isd-voice-ics/isd-chipcorder-family/Software/?__locale=en&resourcePage=Y	
	SDK for Audio SoC	ISD91xxx	• Development software	• http://www.nuvoton.com/hq/products/application-specific-socs/arm-based-audio/Software/?__locale=en&resourcePage=Y&category=%2f_categories%2fsupport%2ftool-and-software%2fsoftware%2f&pageIndex=1	

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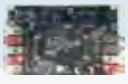
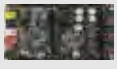
Development Tools for Audio Enhancement Series

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NE-NPCA120	EVB-NPCA120_V1.0	NPCA120DD	• NPCA120DD evaluation board	• NPCA120 Audio enhancement, Bongiovi DPS, Standard level evaluation board	
NE-NPCA121	EVB-NPCA121_V1.0	NPCA121DD	• NPCA121DD evaluation board	• NPCA121 Audio enhancement, Bongiovi DPS, Premium level evaluation board	
NE-NPCA110XB	NPCA110x evaluation board	NPCA110x device	• NPCA110x evaluation board	• NPCA110x 1 watt base board	
NT-NPCA110PP	NPCA110P/M Piggy board	NPCA110P	• NPCA110P/M evaluation board	• NPCA110P Piggy board	
NU-NPUSB2I2C	USB-To-I²C/I²S	NPCA110x & NPCP215x	• USB-To-I²C/I²S	• USB2I2C board for NPCA110x & NPCP215x	
NE-NPCP215F	NPCP215x evaluation board	NPCP215F	• NPCP215x evaluation board	• NPCP215F evaluation board	

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nuvoTon

Cloud Security

EC

EC for Portable Applications

Security

Trusted Platform Module (TPM)

Hardware Monitors

Desktop / Server Series
NB and Networking / Storage Series

Interface Logic

Switches and Multiplexers
Interface Logic Series

I/O

General Purpose I/O Series
Super I/O Series
eSIO Series

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EC

EC for Portable Applications

Nuvoton's highly-integrated embedded controller (EC) device has an embedded 32-bit, high-performance RISC core and integrated advanced functions. It is targeted for a wide range of portable applications and provides best-in-class, complete EC functionality. The EC uses either the Low Pin Count (LPC), the Enhanced Serial Peripheral Interface (eSPI), or I²C Host interface and is designed to best meet the requirements of mobile systems.

Part No.	Core Type	Core Max Freq.	Internal Flash Memory	SRAM	SPI Flash I/F	eSPI	LPC	SMBus /I²C	Core UART	Peripheral SPI Ctrl	PECI	ADC	DAC	Host I/F Ch.	8042 KBC	Host Mailbox	PWM Ch./ with HB	Fan TACHs	KBD Scan	PS/2	JTAG	Package
NPCE6mnx	CR16CPlus	50 MHz	Up to 512 KB	32 KB	Up to 64 MB	√	√	5 Controllers/ 7 Ports	1	Master	3.1	Up to 10-bit / Up to 10 inputs	-	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 VFBGA128
NPCX796FA	Arm® Cortex®-M4	100 MHz	1 MB	256 KB	N/A	√	√	8 Controllers/ 10 Ports	1	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	-	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144
NPCX796FB	Arm® Cortex®-M4	100 MHz	1 MB	256 KB	N/A	√	√	8 Controllers/ 10 Ports	2	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	-	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144
NPCX796FC	Arm® Cortex®-M4	100 MHz	512 KB	256 KB	N/A	√	√	8 Controllers/ 10 Ports	2	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	-	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144
NPCX797FC	Arm® Cortex®-M4	100 MHz	512 MB	384 KB	N/A	√	√	8 Controllers/ 10 Ports	2	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	-	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144

Hardware Monitors

Desktop / Server Series

Nuvoton's Desktop & Server Hardware Monitoring IC Series is one of Nuvoton's most popular computer product categories. Hardware Monitoring ICs are widely adopted in desktop and server motherboards and in Industrial PC applications. Hardware Monitoring ICs monitor important hardware parameters including voltage, temperature, and fan speed and are able to issue alarms or warning signals to prevent system damage when abnormal events are detected.

Part No.	System Interface	On-chip Thermal Sensor	Remote Thermal Sensor Inputs	Voltage Monitor Inputs	Fan Tachometer Inputs	Fan Speed Control Outputs	Operation Voltage	PECI I/F	Package
NCT7802Y	SMBus/I²C	Y	3(max)	5(max)	3	3	3.3V	3.1	QFN20
NCT7906D	SMBus/I²C	Y	4(max)	16(max)	8	4	3.3V	3.1	TQFP64
NCT7904D	SMBus/I²C	Y	4(max)	17(max)	12(max)	4	3.3V	3.1	LQFP48
W83795ADG	SMBus/I²C	N	6	18(max)	14(max)	2	3.3V	2.0	LQFP48
W83795G	SMBus/I²C	N	6	21(max)	14(max)	8(max)	3.3V	2.0	LQFP64
NCT7201Y/W	SMBus/I2C	N	N	8 (max)	N	N	3.3V	N	QFN16/TSSOP16
NCT7202Y/W	SMBus/I2C	N	N	12 (max)	N	N	3.3V	N	QFN20/TSSOP20
NCT7362Y	SMBus/I2C	N	N	N	16	16	2.7V-5.5V	N	QFN24

NB and Networking / Storage Series

Nuvoton's Notebook and Networking/Storage Hardware Monitoring IC series is widely adopted in the industry and monitor important hardware parameters including voltage, temperature, and fan speed. These devices prevent system damage by issuing alarms or warning signals when abnormal events are detected.

Part No.	System Interface	On-chip Thermal Sensor	Remote Thermal Sensor Inputs	Voltage Monitor Inputs	Fan Tachometer Inputs	Fan Speed Control Outputs	Operation Voltage	PECI I/F	Package
NCT7511Y	SMBus/I²C	Y	2 (max)	N	1	1	3.3V	N	QFN16
NCT7717U	SMBus/I²C	Y	N	N	N	N	3.3V	N	SOT23-5
NCT7718W	SMBus/I²C	Y	1	N	N	N	3.3V	N	MSOP8
NCT7719W	SMBus/I²C	Y	2	N	N	N	3.3V	N	MSOP10
W83773G	SMBus/I²C	Y	2	N	N	N	3.3V	N	MSOP8
NCT7601Y/W	SMBus/I²C	N	8 (max)	N	N	N	3.3V	N	QFN16/TSSOP16
NCT7602Y/W	SMBus/I²C	N	12 (max)	N	N	N	3.3V	N	QFN20/TSSOP20
NCT7716Y/U	SMBus/I²C	Y	N	N	N	N	3.3V	N	DFN6/SOT23-6
NCT7728W/S	SMBus/I²C	Y	N	N	N	N	3.3V	N	MSOP8/SOP8

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I/O

General Purpose I/O Series

Nuvoton's General Purpose I/O Expansion IC series allows the easy addition of multiple GPIO capabilities over a standard SMBus interface. These devices include strappable address setting, Input interrupts, and LED and BEEP functions.

Part No.	Supply Voltage	GPIO	Interface	Package
NCT5655W/Y	2.3V ~ 5.5V	16	SMBus	TSSOP24/QFN24
NCT5635W/Y	2.3V ~ 5.5V	16	SMBus	TSSOP24/QFN24
NCT5605Y	3.3V	14	SMBus	QFN20
W83L604G	3.3V	14	SMBus	SSOP20
W83L603G	3.3V	8	SMBus	SOP14
W83601G	5V	15	SMBus	SSOP20

Super I/O Series

Nuvoton's Super I/O series are widely adopted in the motherboard, industrial PC, AIO and workstation applications and support both traditional legacy functions (serial port, parallel port, KBC, and General Purpose I/O) as well as advanced hardware monitoring functions and control features.

Part No.	Interface	KBC	UART	Parallel Port	Hardware Monitor	ACPI	SMBus Master	PECI I/F	SB-TSI I/F	EuP Power Saving	Port 80	Package
NCT5104D	LPC	N	4	N	N	N	N	N	N	N	N	LQFP48
NCT5124D	LPC / eSPI	N	4	N	N	N	N	N	N	N	N	LQFP48
NCT5567D-B	LPC	Y	1	N	Y	Y	Y	3.1	Y	Y	N	LQFP64
NCT5581D	LPC	Y	1	N	Y	Y	Y	3.1	Y	Y	Y	LQFP64
NCT5585D	LPC / eSPI	Y	1	N	Y	Y	Y	3.1	Y	Y	Y	LQFP64
NCT6793D	LPC	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6796D	LPC	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6796D-E	LPC / eSPI	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6106D	LPC	Y	6	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6126D	LPC / eSPI	Y	6	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128

eSIO Series

Nuvoton's family of eSIO devices combines built-in microcontroller and traditional legacy SIO functions in a single device. These devices can perform traditional Super I/O functions and the programmable core allows a rich set of customized features including advanced fan control and flexible power sequence control. The eSIO series is widely adopted in gaming PCs, AIOs, workstations, datacenter and entry-level server applications.

Part No.	Interface	KBC	UART	Parallel Port	Hardware Monitor	ACPI	SMBus Master	SPI I/F	PECI I/F	SB-TSI I/F	EuP Power Saving	Port 80	Built-in uC	Package
NCT6683D-T	LPC	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128
NCT6685D	LPC	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128
NCT6686D	LPC / eSPI	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128

Security

Trusted Platform Module (TPM)

Nuvoton's Trusted Platform Module (TPM) (NPCT75x) is a seventh-generation Nuvoton SafeKeeper™ device that implements the Trusted Platform Module (TPM) 2.0 specifications for PC-Client TPM.

Part No.	Description	TPM Main Specification Version Compliance	TCG PC Client Specific TIS Version	Compliances	Interface	Operation Temperature (°C)	Package Options
NPCT75x	SafeKeeper™ Trusted Platform Module (TPM)	Version 2.0 revision 01.16	PTP v1.03 Rev 22	CC EAL4+ and FIPS 140-2 Level 2	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16
		Version 2.0 revision 01.38	PTP v1.04 Rev 0.37	CC EAL4+ and FIPS 140-2 Level 2 with Physical security level 3	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16

Interface Logic

Voltage Level Shifter

Nuvoton level shifter series provides the ability to interface a variety of devices with different operating voltages. High ESD protection and speeds are supported. These devices are suitable for all Desktop, Workstation, Industrial PC, Server and Cloud computing applications.

Part No.	Operation Voltage	Interface	Inputs	Outputs	Operation Temperature (°C)	Package
NCT5927W	0.8V-5.5V/ 2.2V-5.5V	SMBus/I²C	1	1	-40~85	MSOP 8
NCT5914W	0.5V-6.0V	GTL to LVTTL	4	4	-40~85	TSSOP14

Switches and Multiplexers

Nuvoton Switches and multiplexers allow the connection of devices that operate at different voltage levels but share the same bus, and isolate devices when not in use to reduce overall system capacitive loading. They are widely used in Workstation, Industrial PC, Server and Cloud computing applications.

Part No.	Frequency	Operation Voltage	Interface	Inputs	Outputs	Operation Temperature (°C)	Package
NCT5945W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	4	-40~85	TSSOP20/QFN20
NCT5946W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	4	-40~85	TSSOP16/QFN16
NCT5948W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	8	-40~85	TSSOP24/QFN24
NCT1901D	380Mbit	0.8-3.6V	NC-SI	2	3	-40~85	LQFP64

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Power Management

TCPC (Type C Port Controller)

TCPC (Type C Port Controller) Series

Power Switch

Power Switch Series

Voltage Regulators

DDR Bus Termination Series
Fan Driver IC Series
Linear Regulator Series

TCPC (Type C Port Controller)

TCPC (Type C Port Controller) Series

Part No.	Description	Main Specification Version Compliance	Interface	Power Role	VCONN Switch	Type-C Ports	No. of GPIOs		Package
							Multiplexed	Dedicated	
NCT3807A0YX	Type-C Port Controller with integrated VCONN switch and GPIO expander	Type-C Cable and Connector, Revision 2.0 Power Delivery (PD), Revision 3.0, v2.0 Type-C Port Controller Interface (TCPCI), Revision 2.0, v1.1	I2C, up to 1MHz	Sink, Source and Dual Power Role	Integrated, up to 1.5W with automatic turn-off protection	1	7	9	QFN32, 5x5
NCT3808A0YX	Type-C Port Controller with integrated VCONN	Type-C Cable and Connector, Revision 2.0 Power Delivery (PD), Revision 3.0, v2.0 Type-C Port Controller Interface (TCPCI) Revision 2.0, v1.1	I2C, up to 1MHz	Sink, Source and Dual Power Role	Integrated, up to 1.5W with automatic turn-off protection	2	10	-	QFN32, 5x5

Power Switch

Power Switch Series

Nuvoton's Power Switch Series are solutions of high integration and cost-effectiveness. Our products offer PCB space saving and are ideal for high side over current protection and system power saving applications. Our series feature low RDS (ON), low input voltage and abundant protections such as over current protection, short circuit, over temperature and reverse voltage/current protections.

Part No.	Input Voltage (VIN)	Features	Rdson (typ.)	Output Current (typ.)	Flag indicator	OCP Adjustable	Output Discharge	Package
NCT3521U	2.7V ~ 5.5V	Enable; Adj. Soft-start & Shutdown Output Discharge, UVLO, OCP, RCP, RVP, OTP	80 m-ohm	2.0A	Y	N	Y	SOT23-5 SOT23-6
NCT3521U-2	2.7V ~ 5.5V	Enable; Adj. Soft-start & Shutdown Output Discharge, UVLO, OCP, RCP, RVP, OTP	80 m-ohm	2.0A	Y	N	Y	SOT23-5 SOT23-6
NCT3527U	3.0V ~ 5.5V	Enable; OCP adjustable, UVLO, OCP, RCP, RVP, OTP; Output Latched off when Flag# Alerted	70 m-ohm	2.5A	Y	Y	Y	TSOT23-6
NCT3527U-A	3.0V ~ 5.5V	Enable; OCP adjustable, UVLO, OCP, RCP, RVP, OTP; Output cycle by cycle re-try when Flag# Alerted	70 m-ohm	2.5A	Y	Y	Y	TSOT23-6
NCT3530Y	4.5V ~ 5.5V	Enable; OCP, UVLO, OCP, RCP, RVP, OTP; HDMI/DVI DDC I²C, HPD Level Shifters	0.6 ohm	0.25A	Y	N	Y	DFN10
NCT3532Y	3.0V ~ 5.5V	Enable; OCP, UVLO, OCP, RCP, RVP, OTP; Dual Mode Display Port (DP++) Auxiliary Channels Splitter with HDMI DDC I²C, HPD Voltage Level Translators	0.2 ohm	0.5A	N	N	N	QFN16

Voltage Regulators

DDR Bus Termination Series

Nuvoton's family of DDR bus termination regulators series provides bi-directional (sinking/ sourcing) current outputs for high speed bus termination applications. These devices provide stable termination power (VTT) and fast transient response for DDR, DDR2, DDR3x, and DDR4 VTT bus termination applications, and are intended for high-performance, low cost DDR designs.

Part No.	Input Voltage (VIN)	Features	Control Voltage	Memory Supported	VTT Output offset (max)	Sink/Source Current (max)	Package
NCT3103S	1.0V ~ 5.5V	Sleep S3 & DDR VTT Enable Control Signals, OCP & OTP	3.0V ~ 5.5V	DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	SOP8 with Exposed Pad
NCT3105Y	1.0V ~ 3.6V	EN with Suspend to RAM (STR) Functionality, Power Good, OCP & OTP	2.3V ~ 5.5V	DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	DFN10
NCT3101S	1.0V ~ 5.5V	OCP & OTP	3.0V ~ 5.5V	DDRI, DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	SOP8 with Exposed Pad

Fan Driver IC Series

Nuvoton's Fan Driver devices are highly integrated and cost-effective solutions providing small PCB footprint and reduced BOM cost. These devices can be coupled with Nuvoton's Super IO Series to drive low cost DC or PWM fans and feature over-current protection, short circuit protection and thermal shutdown for enhanced design safety.

Part No.	Input Voltage (VIN)	Output Voltage	Features	V_{SET} / DCIN	Current Limit Trigger	Output Current (typ.)	Package
NCT3941S	8.0V ~ 17.6V	Follow V_{SET} *4.0 times	OCP, SCP & OTP EN: NCT3941S FON#: NCT3941S-A	1.0 ~ VIN	1.6A (typ.)	0.5A	SOP8 with Exposed Pad
NCT3941S-A	8.0V ~ 17.6V	Follow V_{SET} *4.0 times	OCP, SCP & OTP EN: NCT3941S FON#: NCT3941S-A	1.0 ~ VIN	1.6A (typ.)	0.5A	SOP8 with Exposed Pad
NCT3947S-A	10.8V ~ 13.2V	DC Mode: 3.8 * DCIN; PWM Mode: follows VIN	Auto Fan Type Detection (DC/PWM Fan), Manual Mode, Fault#, OCP, SCP & OTP	0 ~ 3.6V	3.0A ~ 4.0A	2.0A	SOP8 with Exposed Pad

Linear Regulator Series

Nuvoton's Linear Regulator Series provides high performance, low input voltage and low dropout voltage features. Our products provide on/off control (enable pin) for power saving and feature over-current protection, short circuit protection and thermal shutdown for enhanced design safety.

Part No.	Input Voltage (VIN)	Features	Control Voltage	Dropout (typ.)	Output Current (typ.)	Package
NCT3720S	1V ~ 5.5V	EN, PG, UVLO, OCP, SCP & OTP	3V ~ 5.5V	150mV	2A	SOP8 with Exposed Pad
NCT3730S	1V ~ 5.5V	EN, PG, UVLO, OCP, SCP & OTP	3V ~ 5.5V	210mV	3A	SOP8 with Exposed Pad

Foundry Service

Nuvoton Foundry FAB

Technologies and Applications

Focus on Technology
Available Technologies
Applications
Advanced 0.35um BCD Process:
Increase Product Value

Foundry Service

Multi-Layer Mask (MLM)
Multi-Project Wafer (MPW) Services
Customized Technology
Excellent Cycle Time
Embedded Non-Volatile Memory IP
Complete Design Kits
Product Service Team

Nuvoton Foundry FAB

Nuvoton Foundry Service (previous Winbond FAB2: 6 inch fab) has a capacity of 45,000 wafers per month. As a semiconductor manufacturing foundry, our mission is to deliver excellent foundry capabilities as a manufacturing partner to fabless or fab-lite semiconductor companies.

Nuvoton Foundry FAB offers a variety of technologies including Generic Logic, Mixed Signal (Mixed Mode), High Voltage, HVIC, Ultra High Voltage, Power Management, Mask ROM (Flat Cell), embedded Logic Non-Volatile Memory, and customized processes (e.g. GaN HEMT, MOSFET, Biochip, TVS, Sensor, etc.) based on 0.35um to 1.0um technologies.

In addition to its mature, stable, and customized processes, Nuvoton also provides long-term stable production capacity, high quality, and accurate delivery schedules.

In addition, Nuvoton's foundry has a process development team with more than 20 years of experience in Devices, Integration, Modules, ESD, and SPICE Modeling to meet your customized process needs.

Nuvoton's foundry also has a product service team to provide customers with complete IDM class service. We have an internationally certified laboratory (with ESD, EMMI, OBIRCH, FIB, SEM, and TEM electrical / physical analysis equipment) to ensure product reliability and certification requirements.

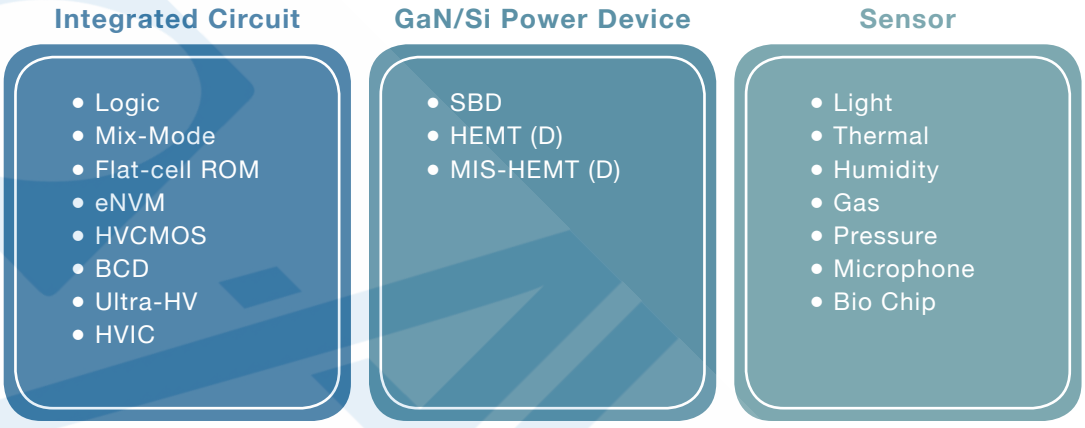
Nuvoton has a wealth of resources and support services, and operates with a More-Than-Foundry thinking process. Nuvoton Foundry Service can meet market capacity demand and enable customers to achieve business goals. Nuvoton Foundry Service is your best foundry choice.

Process Technology: 0.35um ~ 1.0um
Wafer Size: 6"
Capacity: 45,000 pcs/month

Technologies and Applications

Focus on Technology

Nuvoton Foundry's process technology currently offers 0.35um processes, including Integrated-circuit (logic, Mix-mode, Flat-cell ROM, eNVM, HVCMOS, BCD, Ultra-HV, Gate-driver HVIC), GaN on Si Power Device (SBD, Depletion HEMT, Depletion MIS-HEMT), Sensor (Light, Thermal, Humidity, Gas, Pressure, Micropnone, Bio chip) more and more process and customized.



Available Technologies

Process	Technology	Process Feature
Power (HV / BCD / HVIC)	0.35um	5/12~40V BCD G2(NEW)
		5/12~40V BCD (YMC_OTP)
		5/60~80V BCD
		5/20/150V HVIC
		5/25/600V HVIC
	0.5um	7/9/30/40/150~700V UHV G2 (NEW)
		5/20/120/250/600V HVIC G2 (NEW)
		5/7/9/25V HVCMOS (NEW)
	0.6um	5/12/16/20V BCD
		5/25/40V BCD
		5/25/40/120/500V UHV
	0.8um	5/40V HVCMOS (N-sub)
	1.0um	5940V HVCOMS (P-epi)
Logic / Mixed Mode	0.35um	1.5/3.3/5V Logic (NEW) 3.3/5V Logic 5V Logic (NEW)
	0.45um	3.3V Logic 5V Logic
	0.5um	1.5V Logic 3.3V Logic 5V Logic
Logic / Mixed Mode + eNVM	0.35um	3.3/5V Logic (YMC eNVM)
Mask ROM / Flat Cell	0.32um	1.5/3.3/5V embedded 0.32 flat cell
	0.37um	5v embedded 0.37 flat cell

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Applications

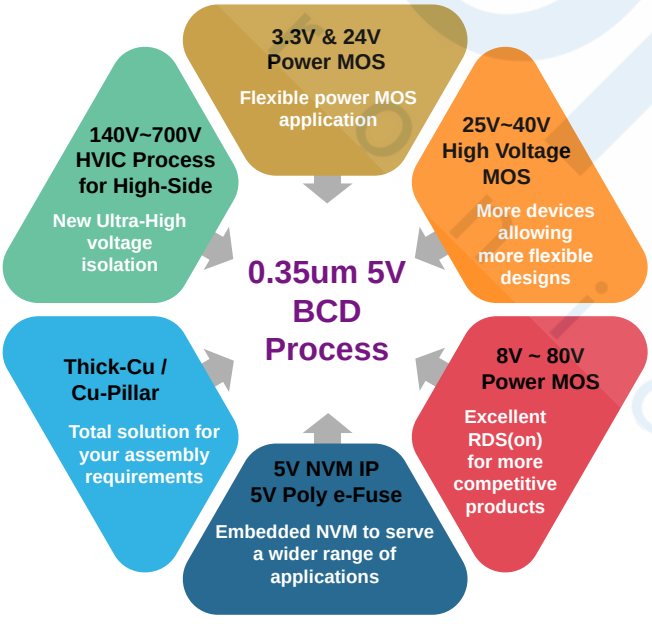
Nuvoton Foundry's process technologies are highly focused on High-Voltage, power management, LED Driver, and logic related fields. Current customers have successfully used our processes to create MCUs, Speech ICs, DC / DC converters, AC / DC SMPS, LDOs, USB Switches, Chargers, LCD drivers, Fan Drivers, Hall Sensors and LED B/L driver products in volumes exceeding several million wafers.

In addition to general IC processes, Nuvoton also provides customized process services to support HV MOSFETs, TVS, Light Sensor, Pressure Sensors, BioChip, GaN HEMT etc. Applications include industrial control, high power conversion systems, mobile devices, sensors, system electrostatic protection, medical care, and more. Nuvoton also has a strong R&D team that can create a variety of customized processes for customer requirements.

- DC/DC Converter & Controller
- AC/DC SMPS (PFC and PWM)
- LDO, USB Switch
- LED Lighting, LED Display
- HVIC, MOSFET, SBD
- Biochip, MCU, Speech
- Motor Driver, Fan Driver,
- Audio Amp, Sensor, TVS
- Car Charger
- Pressure sensor, MEMS Microphone
- Thermal Sensor, Light sensor
- Gas sensor, Humidity Sensor

Advanced 0.35um BCD Process: Increase Product Value

Nuvoton Foundry Services offers a wide range of customizable processes and design tools in order to manufacture optimized semiconductors. Nuvoton's 0.35um BCD process provides multiple device structures integrated into one process using a modular process approach. This approach allows the customer to create products with complex circuits for applications such as AC/DC, DC/DC, Charger, LED products etc. Nuvoton's highly integrated 0.35um BCD process saves development cost and increases competitive advantage.



Foundry Service

Multi-Layer Mask (MLM), and Multi-Project Wafer (MPW) Services

Multi-Layer Mask (MLM) services are available for engineering lots on all processes. The MLM service configures images with multiple design layers using similar mask specifications on a single reticle. This service not only saves development cost, but provides tape-out flexibility allowing customers to tape-out products at any time without being dependent on pre-set prototyping schedules. MPW Service offers platforms that use multi-project wafers for prototyping which enables multiple customers to share mask tooling costs.

Customized Technology and Excellent Cycle Time

Nuvoton's modular platform provides customers customized processes and quick Cycle Time of 0.8 Days/Layer for fast prototyping to help customers' Time to Market in a fast changing world.

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Embedded Non-Volatile Memory IP

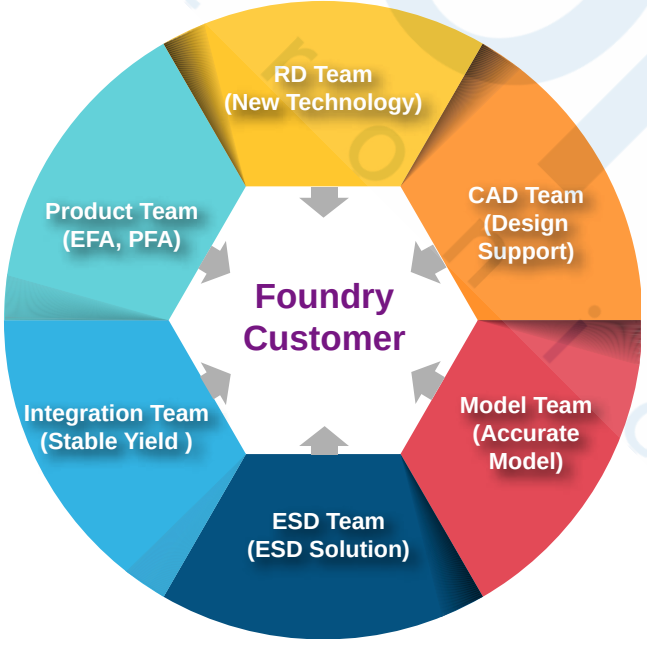
Nuvoton recognizes that memory requirements vary by application. Specifically in a 0.35um process Nuvoton offers three versions of matching logic processes with embedded non-volatile memory (NVM). They are (1) Yield Microelectronics Corporation's (YMC) 3.3V MTP (Multi-Time-Programing) NVM IP; (2) YMC's 5V MTP (Multi-Time-Programing) NVM IP; (3) Nuvoton's proprietary 5V Poly e-Fuse Trimming IP.

Application	Target Product	Function	0.35um Process	NVM IP
Trimming	LCD Driver, LED Driver, Touch Panel, Power IC, STB Control	Fuse Like	5V/40V/UHV or BCD	YMC 5V MTP NTC Poly e-fuse
Parameter Setting	LCD, LED, Battery Pack Protection	Status Parameter	5V/40V HV or BCD	YMC 5V MTP
Encryption	LCD, STB, Smart Card	Security confirm code	5V/40V HV or BCD	YMC 5V MTP
Function Selection	SoC product Function selecter	SoC Function Control	3.3V/5V Logic	YMC 3.3V MTP
Identification Setting	Product ID, TagIC <13.5 MHz	ID Code	3.3V/5V Logic	YMC 3.3V MTP
Code Storage	4/8-bits MCU	Program, Data Storage	3.3V/5V Logic	YMC 3.3V MTP

Complete Design Kits and Product Service Team

We provide the most accurate and complete Design Kits to customers for product design, while providing a full range of customer support services to help customers get to market quickly.

Process	Vender	Tools / Version	
Design Rule & Sample Layout	-	Layout Design Rule	Device sample layout
	-	ESD/Latch-Up Layout Design Rule	ESD sample layout
Schematic Entry	-	Schematic Symbol	
SPICE Model	-	HSPICE	BSIM3V3 (L49) (+ macro)
	-	Spectre SPICE	BSIM3V3 (L49) (+ macro)
DRC	Mentor Graphics	Calibre	
LVS	Mentor Graphics	Calibre	
LPE	Mentor Graphics	Calibre	
IP	Cell Library	Standard Cell Library / IO Cell Library	
	NVM IP	Yield Microelectronics Corp. (YMC) (Third Party) Provides MTP, Flash, EEPROM (Logic Base without extra Mask)	
	SRAM	3.3V SRAM Compiler	
PDK	Cadence	Cadence Virtuoso P-Cells	
	Synopsys	Laker Custom Layout System (with Magic-Cell)	



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IoT with Security

Microcontrollers

32bit Inverter Control MCUs

8bit MCUs

Communication & Interface LSIs

High Speed Interface LSIs

NFC Tag LSIs

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Microcontrollers

32bit Inverter Control MCUs

• Arm® Cortex®-M7 MCUs KM1M7 Series

Product Overview

KM1M7 Series MCU is a 32-bit MCU with Arm Cortex M7, which have a good balance between high speed processing ability and low power consumption.
High speed/high-precision analog functions and assist functions are embedded, which can satisfy the request of motor control and power control.
Accessing EEPROM becomes more efficient by using RWW(Read While Write) flash.
They can contribute to the power management system which needs high-efficiency, super low-power consumption and miniaturization.

Features

· Arm Cortex M7 with high-speed calculation ability and high speed processing
· High-performance and high resolution PWM and noise protection are embedded, which can satisfy the request of power control
· Functional safety and security features are embedded to realize the safety/security of product

Added Value

· Possible to improve the efficiency because of the high speed and optimal feedback process
· Redevelopment can be avoided with noise auto avoidance function
· Easy to satisfy the request of the system functional safety

Parts	Applications	OROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	16-bit Timer (channel)	PWM (channel)	3-Phase PWM Output Function [use 3 PWMs] (Set)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [LIN] (channel)	Serial I/F [CAN] (channel)	Serial I/F [Remarks]	DMA (channel)	ADC [12bit] (channel)	Op amp	Comparator	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	External Interrupt (channel)	High Speed On Chip Oscillator Frequency (MHz)	Power On Reset	Low Voltage Detection	Watch Dog Timer (channel)	Other Special Function	Package
KM1M7AF02N	Invertor & Converter control	512	FLASH	128	100	160	20	10	3	7	6	2	1		Sync/I2C x1,Sync/ UART/ LIN x1,Sync/ UART x2,Sync/ SPI/ UART x2, Sync/ SPI/ UART/ I2C x1	16	23	5	10	6.25 / 3.5 to 5.5	5.5	3.5	82	18	10	Yes	Yes	1	Double-precision f loating-point arithmetic, ROM/RAM-ECC, Clock monitor, High resolution PWM	HQFP100-P-1414
KM1M7AF52N	Invertor & Converter control	512	FLASH	128	100	160	20	10	3	7	6	2	1	2	Sync/I2C x1,Sync/ UART/ LIN x1,Sync/ UART x2,Sync/ SPI/ UART x2, Sync/ SPI/ UART/ I2C x1	16	23	5	10	6.25 / 3.5 to 5.5	5.5	3.5	82	18	10	Yes	Yes	1	Double-precision floating-point arithmetic, ROM/RAM-ECC,Clock monitor, High esolution PWM	HQFP100-P-1414

• KM103H Series

Product Overview

KM103H Series MCU embedded 32-bit flash MCU with original 32-bit CPU , have high speed processing ability and low power consumption.

They can contribute to create a high efficiency and high performance power management system , because of their high performance PWM circuit, high speed A/D converter, inverter/converter dedicated Arithmetic logic unit(3phase-3phase conversion, Trigonometric function, square root, n-order multiply–accumulate operation, flash dedicated cache) .

Features

· 32-bit CPU original core with high-speed calculation ability and high processing speed
· High-speed/High-precision analog circuit
· Abundant lineup from 48-pin to 144-pin can satisfy various systems' requirement

Added Value

· Rationalization of the system is possible, because it is possible to use one MCU to control multiple motors and power
· Miniaturization of the board is possible, because high-precision analog circuit is built-in and external components can be reduced
· System development man-hour reduction is possible, because of various support tools such as motor automatic adjustment

Parts	Product Lifecycle Stage	Applications	ROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	8-bit Timer (channel)	16-bit Timer (channel)	PWM (channel)	3-Phase PWM Output Function (Set)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [LIN] (channel)	Serial I/F [CAN] (channel)	Serial I/F [Remarks]	DMA (channel)	ADC [12bit] (channel)	ADC [Remarks]	Op Amp	Comparator	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	Interrupt Sources (channel)	External Interrupt (channel)	Power On Reset	Low Voltage Detection	Watch Dog Timer (channel)	Package
KM103HFB5K	ES Available	Invertor & Converter control	264	FLASH	20	80	80	12	6	6	2	4	4	1	1		Sync./ UART x2, Sync./ UART /I2C x1, Sync./ UART/ LIN x1	2	16	12bit x 3units	2	4	12.5 / 2.9 to 5.5	5.5	2.9	54	104	10	Yes	Yes	2	LQFP080-P-1414, TQFP080-P-1212
KM103HFD8N	ES Available	Invertor & Converter control	512	FLASH	64	144	120	20	4	10	3	7	7	1	1		Sync./ UART x5, Sync./ UART /I2C x1, Sync./ UART /LIN x1	3	28	12bit x 3units	3	6	8.33 / 2.9 to 5.5	5.5	2.9	124	163	16	Yes	Yes	2	LQFP144-P-2020

• KM103S Series

Product Overview

KM103S Series MCU embedded 32-bit flash MCU with original 32-bit CPU , have a good balance between high speed processing ability and low power consumption.
They can contribute to creation of a high performance and high-efficiency inverter system, and help the system easily to realize the safety standards(IEC60730) because of complementary 3-phase PWM circuit, high speed A/D converter, expansion calculation(high speed multiplication and division, dedicated calculation for inverter control).

Features

· 32-bit CPU original core with high-speed calculation ability and high processing speed
· High-speed/High-precision analog circuit
· Abundant lineup from 48-pin to 144-pin can satisfy various systems' requirement

Added Value

· Rationalization of the system is possible, because it is possible to use one MCU to control multiple motors and power
· Miniaturization of the board is possible, because high-precision analog circuit is built-in and external components can be reduced
· System development man-hour reduction is possible, because of various support tools such as motor automatic adjustment

Parts	Applications	ROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	8-bit Timer (channel)	16-bit Timer (channel)	PWM (channel)	3-Phase PWM Output Function (set)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [Remarks]	ADC [10bit] (channel)	ADC [12bit] (channel)	ADC [Remarks]	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	Interrupt Sources (channel)	External Interrupt (channel)	High Speed On Chip Oscillator Frequency (MHz)	Power On Reset	Watch Dog Timer (channel)	Package
KM103SFE4K	Invertor motor control	256	FLASH	8	80	60	12	6	4	2	3	3		Sync./UART x3	16		10bit x 3units	16.7 / 3.6 to 5.5	5.5	3.6	61	56	9		Yes	1	LQFP080-P-1414
KM103SFJ9D	Invertor motor control	64	FLASH	4	44	60	8	3	2	1	2	2		Sync./UART x2	8	8	10bit x 1unit,12bit x 1unit	16.7 / 3.7 to 5.5	5.5	3.7	30	38	8	10	Yes	1	QFP044-P-1010
KM103SFK0K	Invertor motor control	256	FLASH	8	100	60	12	7	7	2	4	3	1	Sync./UART x3,Sync./I2C x1	20		10bit x 3units	16.7 / 3.7 to 5.5	5.5	3.7	84	70	16	10	Yes	1	QFP100-P-1818
KM103SFK1K	Invertor motor control	256	FLASH	8	80	60	12	7	5	2	4	3	1	Sync./UART x3,Sync./I2C x1	20		10bit x 3units	16.7 / 3.7 to 5.5	5.5	3.7	64	66	12	10	Yes	1	LQFP080-P-1414, TQFP080-P-1212

8bit MCUs

• Ultra Low Power KM101L Series

Product Overview

KM101LSeries MCU is a 8-bit flash MCU with original 32-bit CPU , which have a good balance between high speed processing ability and low power consumption.

ReRAM is embedded in the MCU. It is possible to rewrite in high speed and low-power, and large-capacity data area is also realized. They can contribute to create the sensor system which needs high-speed, super low-power consumption and miniaturization.

Features

· 8-bit CPU original core with low-power consumption
· ReRAM which can be rewritten by high-speed and low-power consumption
· Archive a good balance between high-performance and low-power consumption by low-power design

Added Value

· System battery can be a longer life because of the super low-power consumption
· EEPROM size reduction is possible, because ReRAM can be rewritten by byte
· Production cycle time reduction is possible because of high-speed rewritten

Parts	ROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	8-bit Timer (channel)	16-bit Timer (channel)	PWM (channel)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [Remarks]	DMA (channel)	ADC [12bit] (channel)	ADC [Remarks]	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	Interrupt Sources (channel)	External Interrupt (channel)	LCD [SEG] (channel)	LCD [COM] (channel)	RTC	High Speed On Chip Oscillator Frequency (MHz)	Low Speed On Chip Oscillator Frequency (kHz)	Power On Reset	Low Voltage Detection	Watch Dog Timer (channel)	Package
KM101LR03D	64	ReRAM	4	48	10	6	3	6	4	2	2	Sync./ UART x2, Sync. /I2C x2	1	4	12bit x 1unit	100 / 1.8 to 3.6	3.6	1.1	38	39	8	21	4	Yes	10,8	40	Yes	Yes	1	TQFP048 -P-0707
KM101LR04D	64	ReRAM	4	64	10	6	3	6	4	2	2	Sync./ UART x2, Sync. /I2C x2	1	6	12bit x 1unit	100 / 1.8 to 3.6	3.6	1.1	53	39	8	31	4	Yes	10,8	40	Yes	Yes	1	TQFP064 -P-1010
KM101LR05D	64	ReRAM	4	80	10	6	3	6	4	2	2	Sync./ UART x2, Sync ./I2C x2	1	8	12bit x 1unit	100 / 1.8 to 3.6	3.6	1.1	69	39	8	43 (39)	4(8)	Yes	10,8	40	Yes	Yes	1	TQFP080 -P-1212
KM101LFM3D	64	FLASH	2	32	16	2		1				SMBus x1			ΔΣADC x 1unit	62.5 / 3.9 to 20	20	3.9	10	7	1			No	16	262	Yes	Yes	1	HQFN032 -A2-0404

• Low Power KM101E Series

Product Overview

KM101E Series MCU is 8-bit general use flash MCU with original 8-bit CPU.
They can contribute to create various systems because of its simple and compact, various peripheral functions such as LCD driver, wide range of pin count and memory lineup.

Features

· 8-bit CPU original core with high efficiency command set and small ROM size
· Various peripheral functions embedded, which is easy to use and have abundant track record
· Abundant lineup with up to 512KB(ROM) and 128-pin counts

Added Value

· ROM can be the same size as which developed by assemble language to reduce the set cost
· System rationalization is possible because of the function of LCD driver control and fault detection control
· They can be used in various product such and home appliances or battery product because of the wide voltage range

Parts	Applications	ROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	8-bit Timer (channel)	16-bit Timer (channel)	PWM (channel)	3-Phase PWM Output Function (set)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [LIN] (channel)	Serial I/F [CAN] (channel)	Serial I/F [Remarks] (channel)	DMA (channel)	ADC [10bit] (channel)	ADC [Remarks]	DAC [8bit] (channel)	Op Amp	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	Interrupt Sources (channel)	External Interrupt (channel)	LCD [SEG] (channel)	LCD [COM] (channel)	External Bus Expansion	High Speed On Chip Oscillator Frequency (MHz)	Low Speed On Chip Oscillator Frequency (kHz)	Power On Reset	Low Voltage Detection	Watch Dog Timer (channel)	Package
KM101EF56K	LCD Driver Built-in Type	256	FLASH	10	100	20	7	3	5	1	5	4	1			Sync./ UART x4,Sync./ I2C x1	1	24	10bit x 1 unit	4		50 / 2.7 to 5.5	5.5	1.8	90	36	5	55	4		20,16	30	Yes	Yes	2	QFP100-P-1818
KM101EF59R	Voice Control	928	FLASH	8	100	20	7	3	6		5	4	2			Sync./ UART x4,Sync./ I2C x1,I2C x1	2	12	10bit x 1unit	4		50 / 2.2 to 5.5	5.5	2.2	85	36	5	55	4	Yes			Yes		1	QFP100-P-1818
KM101EF76K	LCD Driver Built-in Type	256	FLASH	10	128	20	7	3	5	1	5	4	1			Sync./ UART x4,Sync./ I2C x1	1	24	10bit x 1unit	4		50 / 2.7 to 5.5	5.5	1.8	104	36	5	55	4		20,16	30	Yes	Yes	2	LQFP128-P-1818
KM101EF77G	Audio Amplifier Built-in Type	128	FLASH	2	48	10	5	2	4		3	2	1			Sync./ UART x2,Sync./ I2C x1		9	10bit x 1unit		2	62.5 / 2.7 to 3.6	3.6	1.8	35	24	5				16	5	Yes		2	HQFP048-P-0707
KM101EF93G	ADC Built-in Type	128	FLASH	6	80	20	6	2	4		4	3	1			Sync./ UART x3,Sync./ I2C x1		12	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	72	25	5				16		Yes		1	LQFP080-P-1414
KM101EFA0A	ADC Built-in Type	32	FLASH	1	32	20	5	2	3	1	3	2	1			Sync./ UART x2,Sync./ I2C x1		8	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	24	21	5				16		Yes		1	SSOP032-P-0300
KM101EFA1A	ADC Built-in Type	32	FLASH	1	44	20	5	2	3	1	3	2	1			Sync./ UART x2,Sync./ I2C x1		12	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	36	27	5				16		Yes		1	QFP044-P-1010
KM101EFA2G	ADC Built-in Type	128	FLASH	6	64	20	6	3	4	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		12	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	55	32	5				16		Yes		1	LQFP064-P-1414, TQFP064-P-1010

Parts	Applications	ROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	8-bit Timer (channel)	16-bit Timer (channel)	PWM (channel)	3-Phase PWM Output Function (set)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [LIN] (channel)	Serial I/F [CAN] (channel)	Serial I/F [Remarks] (channel)	DMA (channel)	ADC [10bit] (channel)	ADC [Remarks]	DAC [8bit] (channel)	Op Amp	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	Interrupt Sources (channel)	External Interrupt (channel)	LCD [SEG] (channel)	LCD [COM] (channel)	External Bus Expansion	High Speed On Chip Oscillator Frequency (MHz)	Low Speed On Chip Oscillator Frequency (kHz)	Power On Reset	Low Voltage Detection	Watch Dog Timer (channel)	Package
KM101EFA8D	Touch Key Control	64	FLASH	4	80	20	6	3	4	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		16	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	70	36	5				16		Yes		1	LQFP080-P-1414, TQFP080-P-1212
KM101EFC3D	Auto -motive Network	76	FLASH	6	64	20	7	3	5	1	4	3	1	1		Sync./ UART x3,Sync./ I2C x1	1	12	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	54	33	5	32	4		20,16	30	Yes	Yes	2	LQFP064-P-1414, TQFP064-P-1010
KM101EFG0D	ADC Built-in Type	64	FLASH	4	56	20	6	3	4	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		12	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	48	26	4				16		Yes		1	TQFP056-P-1010
KM101EFG0G	ADC Built-in Type	128	FLASH	6	56	20	6	3	4	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		12	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	48	26	4				16		Yes		1	TQFP056-P-1010
KM101EF50D	LCD Driver Built-in Type	64	FLASH	4	64	20	7	2	5	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		12	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	55	30	5	24	8		20,16		Yes	Yes	1	LQFP064-P-1414
KM101EF51A	ADC Built-in Type	32	FLASH	1	44,48	20	5	2	3	1	3	2	1			Sync./ UART x2,Sync./ I2C x1		12	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	36	25	5				20,16	30	Yes	Yes	2	QFP044-P-1010, TQFP048-P-0707
KM101EF52A	ADC Built-in Type	32	FLASH	1	32	20	5	2	3	1	3	2	1			Sync./ UART x2,Sync./ I2C x1		8	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	24	22	5				20,16	30	Yes	Yes	2	TQFP032-P-0707
KM101EF57G	LCD Driver Built-in Type	128	FLASH	6	80	20	7	3	5	1	4	3	1			Sync./ UART x3,Sync./ I2C x1	1	16	10bit x 1unit	2		50 / 2.7 to 5.5	5.5	1.8	70	34	5	41	4		20,16	30	Yes	Yes	2	LQFP080-P-1414, TQFP080-P-1212
KM101EF79G	ADC Built-in Type	128	FLASH	2	48	8	5	1	3		1	1				Sync./ UART x1		6	10bit x 1unit	2		125 / 2.0 to 3.6	3.6	1.8	26	17	5				16	5	Yes	Yes	2	HQFP048-P-0707
KM101EF94F	LCD Driver Built-in Type	96	FLASH	6	100	20	7	3	5	1	6	5	1			Sync./ UART x5,Sync./ I2C x1	1	19	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	86	35	5	55	8		16	32.5	Yes	Yes	2	LQFP100-P-1414
KM101EFA2D	ADC Built-in Type	64	FLASH	4	64	20	6	3	4	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		12	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	55	32	5				16		Yes		1	LQFP064-P-1414, TQFP064-P-1010
KM101EFA3D	ADC uilt-in Type	64	FLASH	4	80	20	6	3	4	1	4	3	1			Sync./ UART x3,Sync./ I2C x1		16	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	70	28	5				16		Yes		1	LQFP080-P-1414, TQFP080-P-1212

Parts	Applications	ROM Size (KB)	ROM Type	RAM Size (KB)	Pin Count	Max Operating Frequency (MHz)	8-bit Timer (channel)	16-bit Timer (channel)	PWM (channel)	3-Phase PWM Output Function (set)	Serial I/F [Clock Synchronous] (channel)	Serial I/F [UART] (channel)	Serial I/F [I2C] (channel)	Serial I/F [LIN] (channel)	Serial I/F [CAN] (channel)	Serial I/F [Remarks] (channel)	DMA (channel)	ADC [10bit] (channel)	ADC [Remarks]	DAC [8bit] (channel)	Op Amp	Min Instruction Exec. Time / Voltage (ns/V)	Max Operating Voltage (V)	Min Operating Voltage (V)	Number of I/O Ports (channel)	Interrupt Sources (channel)	External Interrupt (channel)	LCD [SEG] (channel)	LCD [COM] (channel)	External Bus Expansion	High Speed On Chip Oscillator Frequency (MHz)	Low Speed On Chip Oscillator Frequency (kHz)	Power On Reset	Low Voltage Detection	Watch Dog Timer (channel)	Package
KM101EFA3G	ADC Built-in Type	128	FLASH	6	80	20	6	3	4	1	4	3	1			Sync./ UART x3, Sync./ I2C x1		16	10bit x 1unit			50 / 4.0 to 5.5	5.5	4	70	28	5				16		Yes		1	LQFP080-P-1414, TQFP080-P-1212(ES Available)
KM101EFC3G	Automotive Network	128	FLASH	10	64	20	7	3	5	1	4	3	1	1		Sync./ UART x3, Sync./ I2C x1	1	12	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	54	33	5	32	4		20,16	30	Yes	Yes	2	LQFP064-P-1414, TQFP064-P-1010
KM101EFD3G	Automotive Network	128	FLASH	10	64	20	7	3	5	1	4	3	1	1	1	Sync./ UART x3, Sync./ I2C x1	1	12	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	54	33	5	32	4		20,16	30	Yes	Yes	2	LQFP064-P-1414, TQFP064-P-1010
KM101EFG1H	ADC Built-in Type	164	FLASH	8	80	20	7	2	5		4	3	2			Sync./ UART x3,Sync. /I2C x1,I2C x1	1	12	10bit x 1unit			50 / 2.7 to 5.5	5.5	1.8	70	29	6						Yes	Yes	1	LQFP080-P-1414

Communication & Interface LSIs

High Speed Interface LSIs

• KM864 Series

Product Overview

Nuvoton is a leading supplier of HDMI (High Definition Multimedia Interface) ICs used in various applications of AV receiver, sound bar, switcher, game, VR, signage and measuring equipment of HDMI.
KM86473D is a bridge IC that convert HDMI2.0 and Display Port to MIPI, used in head mount display of VR. KM864788 is a matrix switch IC that supports HDMI2.0 with 4 input and 2 output, used in AV receiver, sound bar, switcher etc. KM864807 is a matrix switch IC that supports HDMI2.1 with 4 input and 2 output.

Features

· KM86473D : Selectable input of HDMI2.0 and Display Port 1.4. MIPI DSI 2.5Gbps x 16 lanes output. Support HDCP1.4/2.3, Audio output of I2S/TDM/SPDIF, DSC encode, OSD, Up scaler and I2C slave control.
· KM864788 : 4 HDMI2.0 input and 2 HDMI2.0 output. Resolution of up to 4k/60Hz. Support HDCP1.4/2.3, Audio output of I2S/SPDIF, OSD, Up and Down scaler, ARC, and I2C slave control.
· KM864807 : 4 HDMI2.1 input and 2 HDMI2.1 output. Resolution of up to 8k/60Hz and 4k/120Hz. Support HDCP1.4/2.3, Audio output of I2S/TDM/SPDIF, OSD, Up and Down scaler, eARC input, and I2C slave control.

Parts	Input interface	Output interface	HDCP	Power supply	Power consumption	Package	Other functions
KM86473D	Selectable of HDMI2.0 and Display Port 1.4	MIPI DSI 2.5Gbps x 16 lanes	HDCP 1.4 and 2.3	0.9V, 1.8V, 3.3V	0.9W	8x8mm BGA 160pin 0.5mm pitch	Audio output of I2S/TDM/SPDIF, DSC encode, OSD, Up scaler and I2C slave control.
KM864788	4 input of HDMI2.0	2 output of HDMI2.0	HDCP 1.4 and 2.3	1.1V, 3.3V	3.5W	20x20mm QFP 144pin 0.5mm pitch	Audio output of I2S/SPDIF, OSD, Up and Down scaler, ARC, and I2C slave control.
KM864807	4 input of HDMI2.1	2 output of HDMI2.1	HDCP 1.4 and 2.3	0.9V, 1.8V, 3.3V	3.8W	16x16mm BGA 378pin 0.65mm pitch	Audio output of I2S/TDM/SPDIF, OSD, Up and Down scaler, eARC input, DSC pass through, Dynamic HDR, HDR10+, VRR, ALLM, and I2C slave control.

NFC Tag LSIs

• KM63Y Series

Product Overview

We are one of the leading NFC Tag LSIs (also known as NFC Tag ICs) maker in the world. Our NFC Tag LSI is a contactless IC tag supporting Near Field Communication (NFC) technology, where NFC devices like smartphones can communicate with the tag to read/write data .

Embedding this NFC LSI in various equipment enables radio communication between the equipment and NFC devices.

In addition, with built-in memory for data retention, this NFC interface LSI can be used as an individual wireless IC tag.

NFC tag IC works with the power supplied wirelessly from NFC devices, and enables radio communication to NFC devices even while equipment with this LSI are turned off.

Using this LSI as an individual contactless IC tag enables the system to be configured without power supply.

Features

· No communication delay regardless of model of smartphone / tablet
· Able to communicate with off-powered devices
· Protect important data from skimming
· High speed communication with microcomputer of devices by NFC touch

Parts	Host Interface	Operating Voltage (V)	Built-in FeRAM (Nonvolatile Memory)	RF interface (Auto selection)	NDEF Communication (NFC Forum Tag)	RF communication stop function when the power OFF	Encryption	User memory (FeRAM)	Power current	Package Type
KM63Y1212	N/A		Rewriting : 100 million times , Data retention period : 10 years	ISO/IEC14443 Type B JISX6319-4 (FeliCa) *1	Type4B Tag(NFC-B) Type3 Tag(NFC-F)	N/A	AES128	432Bytes (FeRAM)	-	HSON008-A-0202
KM63Y1213	I2C (to 100Kbps)	1.7 to 3.6	Rewriting : 100 million times , Data retention period : 10 years	ISO/IEC14443 Type B JISX6319-4 (FeliCa) *1	Type4B Tag(NFC-B) Type3 Tag(NFC-F)	N/A	AES128	432Bytes (FeRAM)	to 500uA	HSON008-A-0202
KM63Y1221	I2C (to 400Kbps)	1.7 to 3.6	Rewriting : 100 million times , Data retention period : 10 years	ISO/IEC14443 Type A ISO/IEC14443 Type B JISX6319-4 (FeliCa) *1	Type4A,/4B (NFC-A,B) Type3 Tag(NFC-F)	Available	N/A (Password)	960Byte (FeRAM)	to 500uA	HSON008-A-0202

*1 : FeliCa is a trademark of Sony Corporation. FeliCa is the contactless IC card technology developed by Sony Corporation

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Visual Sensing

Image Sensors

2D View Sensors

3D TOF Sensors

DSP / ISPs

Human Machine Interface Display LSIs

Camera ISPs

Contact us: Audio@nuvoton.com

Image Sensors

2D View Sensors

• KM344 Series

Product Overview

Our CMOS Image sensors using "SmartFSI®" technology achieve high sensitivity, low noise and high color reproducibility which enables backlight scenes to be captured, reducing blur and providing near infrared photo shooting capability.
Our Image sensors therefore meet the diversified needs of many applications.

Features

· High sensitivity & low noise Clear images under low illuminance
· High color reproducibility Uniformed Images
· Supports WDR-mode Bright images in backlight conditions
· High frame-rate Capture the moment
· High sensitivity for NIR Detecting invisible objects

Parts	Series	Applications	Number of pixels	Optical size	Filter	Output frame rate	Package	Halogen Free
KM34427AL	CMOS	Security and Industrial, Medical Camera Use	2.4M	1/3 type	B/W	1080p/120fps	WQFN046-C-0809C	Yes
KM34440PL	CMOS	Broadcast Cameras	20M(6k)	Super35mm	RGB	Super35mm/14bit_60fps	LGA416-C-331432-IA	Yes
KM34420PLJ	CMOS	Security and Industrial, Medical Camera Use	2.4M	1/3 type	RGB	1080p/120fps	WQFN046-C-0809C	Yes
KM34450PLJ	CMOS	Broadcast,Drone and Industrial Cameras	48M(8k)	Full-frame	RGB	8k4k/12bit_60fps	LGA632-C-379505-IA	Yes
KM34430P1T	CMOS	Automotive and Security Camera Use	2.4M	1/3 type	RGB	1080p/240fps	FBGA077-P-0910	Yes

3D TOF Sensors

• KM349 Series

Product Overview

We provide ToF sensing technical information. It must be useful for your selection of 3D sensing methodology for your design application.

Features

·High-density spatial sensing with High frame rate: 3D coordinates of 640 x480 points with 30 frames per second
·Wide sensing range: Up to 10m depth range with 88 x 66 degree field of view
·High robustness: Sunlight tolerance up up to 150klux and Operating temperature from -40°C to 105°C

Parts	Number of pixels	Optical size	Filter	Output frame rate	Depth range (m)/FoV (deg)	Package
KM34906BRA	640x480	1/4	No	30fps	Type-1)0.2m-3.0m/110x85deg or 88x66deg Type-2)1.0m-6.0m/88x66deg Type-3)1.6m-10m/88x66deg	CHIP/WAFER
KM34906B1S	640x480	1/4	No	30fps	Type-1)0.2m-3.0m/110x85deg or 88x66deg Type-2)1.0m-6.0m/88x66deg Type-3)1.6m-10m/88x66deg	FBGA057-P-0808
KM34906BL	640x480	1/4	No	30fps	Type-1)0.2m-3.0m/110x85deg or 88x66deg Type-2)1.0m-6.0m/88x66deg Type-3)1.6m-10m/88x66deg	WQFN038-C-0708
KM34906BLJ5Z	640x480	1/4	No	30fps	Type-1)0.2m-3.0m/110x85deg or 88x66deg Type-2)1.0m-6.0m/88x66deg Type-3)1.6m-10m/88x66deg	WQFN038-C-0708

DSP / ISPs

Human Machine Interface Display LSIs

• Gerda™ Series

Product Overview

An in-vehicle information display having high-class sense harmonized with the interior and functional extensibility can be achieved by various graphic functions and video input interface.
*Gerda® is our trademark

Features

· The high-quality 2D/3D graphics can be displayed on information devices.
· Supporting composite analog input and the latest digital video input can expand the system and product lineup.
· The embedded CPU can execute the HMI scenario and extend applications(e.g. for connected car).

Parts	CPU	Graphics	Display size	Video input	Video output channel	AV decoder	Radio	Memory	Package
KM103SZ73UB	AM32 (original CPU) Single	2D	WVGA	Analog, Digital	1ch	-	-	Embedded	QFP 14mm^2
KM2KDEM11UB	AM32 (original CPU) Dual	2D	WXGA	Analog, Digital	1ch	-	-	Embedded	QFP 20mm^2
KM2KSC15 series	ARM Cortex®-A9 Dual	2D, 3D	FullHD + WVGA	Analog, Digital	2ch	HW decoder	-	External (2x16bit DDR3)	BGA 21mm^2
KM2KSR000BUB	AM32 (original CPU) Dual	2D	WVGA	Analog, Digital	1ch	-	AM/FM Tuner	External (16/32bit SDRAM)	BGA 21mm^2

Camera ISPs

• KM1M Series

Product Overview

We are a leader in image processor (ISP) technology.
Our Camera DSP has a built-in high-quality ISP, Dewarp engine, and AI processor, and can achieve high visibility and sensing performance with a small camera.
Our ISP has a unique NR / Tone-Curve Control function and supports a 2M pixel image sensor with high dynamic range.
The KM5460 series does not require external memory and realizes AI functions to reduce the number of system components.
By utilizing our SDK and AI-tool, it is possible to bring it to market quickly.
The KM1M001A series is an LSI that cuts out the ISP function of the KM5460 and has a function to correct LED flicker.

Features

· Outputs high dynamic range (HDR) 2M pixel image
· Common: Full-HD / 60fps, on-chip combining of 3 exposures drives dynamic range up to 120dB, 2D-NR, On Screen Display
· KM5460: AI-Processor installed, RGB-iR support, 3D-NR, Fisheye compatible distortion correction, on-chip combining of up to four exposures
· KM1M001A: 120dB HDR and LED flicker mitigation (LFM) can be realized by using with NTCJ image sensor (KM34430).

Parts	Sensor Interface	Image output	ISP function	Dewarp Engine	Overlay Graphics	Processor	Built-in Memory	System Feature	Electrical Specifications	Package
KM1M001A00UB	MIPI-CSI2 4Lane 1.5Gbps/ Lane	MIPI-CSI2 4Lane 1.2Gbps/ Lane	2.4MP60 resolution High Dynamic Range (HDR) processing 2D Noise Reduction Dynamic defect lens shading correction Dynamic tone curve control Zone-based statistics for AE and AWB	-	Alpha-Blending of up to 6 layer H/ V-Line&Curves	Application CPU - 32bit, 54MHz	-	I2C (x3) SPI (x2) GPIO/ JTAG	Core 1.1V MIPI 1.1V & 1.8V IO 1.8V PLL 2.8V	99pin MGBA 7x7mm

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Analog ICs

Battery Monitoring ICs

• KA49 Series

Product Overview

Lithium-ion batteries has high energy density and low memory effect and will be used in storage likes battery-powered equipment and solar power as well as automotive .

To safely and efficiently use a battery , the management of the series connected cells is important. This IC has high precision AD converter for 16-series cells to measure battery voltage and charge/discharge current and equalizes the cell voltage. It has the protection function for battery voltage and over- current detection for safety.

The micro computer with communication function for battery management , analog IC and power devices are prepared.

Features

· Monitoring up to 16-series lithium -ion cells

· High performance by SOI (Silicon on Insulator) process

1. High accuracy from low to high temperatures
2. Stabilize a circuit by reducing noise
3. Latch-up free

· Controlling cell by integrated circuit reduces the number of parts, circuit board area and costs

Parts	Description	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Operating Temperature [Min] (°C)	Operating Temperature [Max] (°C)	Max Series Cells	Cell Voltage Measurement Accuracy (mV)	Monitoring Function	Daisy Chain Connection	High-Side NchFET	Protective Function	Package
KA49503A	BM-IC for Industrial	12.5	85	-40	105	16	±10	Voltage/ Current/ Temperature	N/A	Available	Over and Under Voltage/ Over Current in Charge/ Over Current in Discharge/ Short Circuit in Discharge	LQFP080-P-1414FZ
KA49511A-VT	BM-IC for Industrial	12.5	45	-40	105	10	±10	Voltage	N/A	Available	Over Voltage	TQFP056-P-1010
KA49511A-VB	BM-IC for Industrial	12.5	45	-40	105	10	±10	Voltage	N/A	Available	Over Voltage	TQFP056-P-1010
KA49517A	BM-IC for Industrial	12.5	85	-40	105	17	±10	Voltage/ Current/ Temperature	N/A	Available	Over and Under Voltage/ Over Current in Charge/ Over Current in Discharge/ Short Circuit in Discharge. Diagnostic function check	HQFP064-P-1010DZ
KA49522A	BM-IC for Industrial	12.5	110	-40	85	22	±10	Voltage/ Current/ Temperature	N/A	Available	Over and Under Voltage/ Over Current in Charge/ Over Current in Discharge/ Short Circuit in Discharge. Diagnostic function check	HQFP064-P-1010DZ

Motor Driver ICs

• 1-Phase Brushless DC KA44 Series

Product Overview

This product is Driver IC for 1-phase brushless motor which used for industrial products like base stations or sever, OA equipment, beauty home appliances and white goods.
On motor module design, by induced power, current phase is slipped out and it makes inefficient.
This driver has real time auto phase correction and detected motor current and keeps good rotation efficiency for reducing power consumption.

Features

· Real time auto phase correction
· Build in soft switching function and protection make reducing external parts

Parts	Control Circuit	Interface	Protection Circuit	Operating Voltage [VCC] (V)	Rated Voltage (V)	Rated Current (A)	RDS(on) (Ω)	Operating Temperature [Min] (°C)	Operating Temperature [Max] (°C)	Package
KA44168A	PWM (Voltage Drive)		Low Voltage, Heat, Locking, Overcurrent	12V/24V System	35	1	1.6	-40	90	MSOP008-P-0150XZL
KA44169A	PWM (Voltage Drive)	PWM	Low Voltage, Heat, Locking, Overcurrent	12V/24V System	36	1.4 (1sec)	1.6	-40	90	MSOP014-P-0225XZL
KA44169AB	PWM (Voltage Drive)	DC	Low Voltage, Heat, Locking, Overcurrent	12V/24V System	36	1.4 (1sec)	1.6	-40	105	MSOP014-P-0225XZL
KA44170A	PWM (Voltage Drive)	PWM	Low Voltage, Heat, Locking, Overcurrent	12V/24V System	36	1.6 (1sec)	1.25	-40	105	MSOP014-P-0225XZL
KA44171A	PWM (Voltage Drive)	PWM/DC	Low Voltage, Heat, Locking, Overcurrent	12V/24V /48V System	39	Pre-Dr	Pre-Dr	-40	95	HQFN020-A-0303XZL

• 3-Phase Brushless DC KA44 Series

Product Overview

Our 3-phase Brushless DC motor driver ICs provide sine-wave PWM drive with one Hall sensor to reduce the component count, size, and noise of a motor module, which are best suited for a cooling fan and can also be applied to air conditioner, electric fan and other home appliances.

Features

With the rotor position detector and sine-wave PWM drive with one Hall sensor, and the Real-time-Auto-Phase-Correction,
· Allow the reduce of components of motor products, so it comes reduction of BOM cost.
· Feature with Real-time-Auto-Phase-Correction and hence development time can be reduced by cutting down manual adjustment or fine tuning process.
· Achieve low noise operation by adopting full sine wave output driving current.
· Maximize efficiency, torque and speed.
· Built-in standby function for power-saving purpose.

Parts	Control Circuit	Interface	Protection Circuit	Operating Voltage [VCC] (V)	Rated Voltage (V)	Rated Current (A)	RDS(on) (Ω)	Operating Temperature [Min] (°C)	Operating Temperature [Max] (°C)	Package
KA44143A	PWM (Voltage Drive)	DC/ PWM	Low Voltage, Heat, Overvoltage, Locking, Overcurrent	12V/24V System	28	2.2	1	-40	95	HQFN024-A-0404AZ

DC-DC Regulator ICs

• KA83 Series

Product Overview

· KA83111UA is a synchronous DC-DC Step down Regulator (1-ch) with integrated power MOSFETs and employs the hysteretic control system.
By this system, when load current changes suddenly, it responds at high speed and minimizes the changes of output voltage.
The wide input voltage range (VIN:4.5V~80V), and low current consumption mode make it ideal for use in battery-powered applications .

Features

· High-Speed Response DC-DC Step Down Regulator Circuit that employs Hysteretic Control System
· Integrated Low Ron Power MOSFETs (400/300mΩ) for High Efficiency at 1.0A
· Skip (discontinuous) mode for Light Load Efficiency
· Adjustable Switching Frequency by external resisto: 250kHz ~ 1.0MHz
· Adjustable Soft Start
· Low Current Consumption: Skip mode 190uA
· Power Good Indication for Output Over and Under Voltage
· FLAG Indication for over current condition
· Built-in : Under Voltage Lockout (UVLO), Thermal Shut Down (TSD), VOUT Over Voltage Protection (XOVP),VFB Under & Over Voltage Detection (PGOOD), Over Current Protection (OCP), Short Circuit Protection (SCP)
· Package : HSOP20 (Size : 4.4 mm x 6.5 mm x 1.1 mm, 0.65 mm pitch)

Parts	Channel number	MOSFET	Rectification system	Operating Voltage (V)	Operating Voltage (V)	Rated voltage (V)	Output Voltage (V)	Max. Output Current (A)	SW Frequency (MHz)	Control System	Control Mode	5V Regulator	Protection Circuit	Operating Temperature (°C)	Package Type	Evaluation Board
KA83111UA	1	H/L-side Built in	Synchronous	4.5~80	-	90	2.5~18	1	0.25~1	Hysteretic	Skip mode or FCCM	Built in	UVLO, TSD, XOVP, PGOOD, OCP, SCP	-40~125	HSOP20	Available

LED Driver ICs for Illumination

• KA32 Series

Product Overview

Our Illumination LED Driver Series covers from indicators to Matrix Display.
Functions for LED drive are highly integrated and with its high expressive faculty,
you can make your devices more stylish and elegant.
Our LED Driver ICs for Illumination are used for various applications including mobile, wearable, AV equipment, home appliances and others.

Features

· Integrated LED drive function matrix/back light
· Smooth gradation of brightness and over 67 millions RGB colors
· Built-in scroll/music synchronization functions
· Stand alone operation separated from host MCU. Low power consumption

Parts	Series	Number of Matrix LEDs	Number of PWM step	Number of Current step	Host I/F	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Package
KA32180A	LED Matrix Driver	4 x 4	256	16	I2C	3.1	5.5	QFN016-P-0304C
KA32182A	LED Matrix Driver	6 x 6	256	16	I2C	3.1	5.5	QFN020-P-0304C
KA32183A	LED Matrix Driver	9 x 9	256	16	I2C	3.1	5.5	SSOP024-P-0300F

RF-ICs

• KA29 Series

Product Overview

· KA29222K/KA29223K is LNA (Low Noise Amplifier)-IC integrated SW for 5GHz/2.4GHz Band applications,
TX mode, RX mode / High Gain, RX mode / Low Gain are controlled by integrated CMOS logic circuit.
KA29242K is a SW(SP3T)-IC for Wireless LAN, Bluetooth and General Purpose Middle-Power Wireless Applications.
Available for Low voltage control switching, available for Shutdown mode for blocking disturbing wave from other High-Power Wireless Applications.
ALL of them are achieving miniaturization by using small size Chip Size Package with solder bump.

Features

· Low voltage operation
· Low current consumption
· High gain (for LNA)
· Low noise figure (for LNA)
· Low insertion loss

Parts	Application	Frequency [GHz]	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Gani1 (High Gain Mode) [dB]	Gani2 (Low Gain Mode) [dB]	IIP3 (Gain1) [dBm]	NF (High Gain Mode) [dB]	Insertion Loss (SW) [dB]	ICC(Typ) [mA]	Package
KA29222K-PR	LNA+SW(SPDT)-IC for WLAN	WLAN5GHz Band	3	3.6	11	-8.5	8	2.5	0.7	12	Chip Size Package with solder bump (11Pin, Size : 0.711 x 0.923 mm2 x 0.3 t mm)
KA29223K-PR	LNA+SW(SP3T)-IC for WLAN	WLAN2.4GHz Band	3	3.6	12.5	-8	4	1.7	0.6	11.5	Chip Size Package with solder bump (11Pin, Size : 0.711 x 0.923 mm2 x 0.3 t mm)
KA29242K-PR	SW(SP3T)-IC for WLAN etc.	WLAN2.4GHz Band	2.7	5	-	-	-	-	0.5	0.012	Chip Size Package with solder bump (10Pin, Size : 0.807 x 0.601 mm2 x 0.3 t mm)

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Component

MOSFETs(CSP)

Lithium-ion Battery Protection

General Switching

Laser Diodes

Blue-Violet

Red and/or Infrared

MOSFETs(CSP)

Lithium-ion Battery Protection

• KFC4 Series

Product Overview

With industry leading technologies on ultra-small package and low impedance contributing to battery long life and high density PCB mount for 1 and 2 cell rechargeable Li-battery applications.

Features

· Advantage of low resistance and high thermal performance contributes to achieving longer battery run time or fast charge.
· Ultra small package contribute to save board space.
· The high reliability performance ensure safety of lithium battery.

Parts	Series	Spice	Type	VSS / VDS (V)	VGS (V)	IS /ID (A)	ISp / IDp (A)	PD (W)	Package	Package Length (mm)	Package Width (mm)	Package Thickness (mm)	RSS(on)@VGS=4.5V [Min] (mΩ)	RSS(on)@VGS=4.5V [Typ] (mΩ)	RSS(on)@VGS=4.5V [Max] (mΩ)	RSS(on)@VGS=3.8V [Min] (mΩ)	RSS(on)@VGS=3.8V [Typ] (mΩ)	RSS(on)@VGS=3.8V [Max] (mΩ)	RSS(on)@VGS=3.1V [Min] (mΩ)	RSS(on)@VGS=3.1V [Typ] (mΩ)	RSS(on)@VGS=3.1V [Max] (mΩ)	RSS(on)@VGS=2.5V [Min] (mΩ)	RSS(on)@VGS=2.5V [Typ] (mΩ)	RSS(on)@VGS=2.5V [Max] (mΩ)	ISSS / IDSS [Max] (μA)	IGSS@VGS=8V [Max] (μA)	IGSS@VGS=5V [Max] (μA)
KFC4B21080L	CSP	Available	Nchx2	12	±12	2.9	29	0.35	ULGA004-W-1212	1.11	1.11	0.1	18	27	37	21	30	41.5	23	39	64	30	60	100	1	±10	±1
KFC4B21320L	CSP	Available	Nchx2	12	±8	2.5	25	0.34	XLGA004-W-0808-RA	0.8	0.8	0.1	27	36	48	29	39	53	32	45	75	35	58	115	1	±10	±1
KFC4B22690L	CSP	Available	Nchx2	20	±12	3.4	34	0.42	MLGA004-W-1111-RA	1.1	1.1	0.1	23	28	32	24	30.5	36	25	33	40	26	36	50	1	±1	
KFC4B22670L	CSP	Available	Nchx2	20	±12	2.9	29	0.42	MLGA004-W-1111-RA	1.1	1.1	0.1	29	35	45	31	37.5	49	33	42	57	34	64	100	1	±1	
KFC4B21210L	CSP	N/A	Nchx2	12	±8	4.7	47	0.37	ULGA004-W-1313-RA	1.29	1.29	0.1	8	12	14.5	9	13	16.5	9.5	14	21.5	10	17	31.5	1	±10	±1
KFC4A21300L	CSP	Available	Nchx2	12	±8	1.5	15	0.32	ABGA004-W-0606ARA	0.6	0.6	0.2	55	70	95	60	80	110	65	90	150	70	115	225	1	±10	±1
KFC4B21300L	CSP	Available	Nchx2	12	±8	1.5	15	0.32	ALGA004-W-0606-RA	0.6	0.6	0.1	55	70	95	60	80	110	65	90	150	70	115	225	1	±10	±1
KFC4B21330L	CSP	N/A	Nchx2	12	±8	1.5	15	0.34	XLGA004-W-0808-RA	0.8	0.8	0.1	70	95	125	75	100	135	80	115	190	85	145	285	1	±10	±1

Parts	Vth [Min] (V)	Vth [Typ] (V)	Vth [Max] (V)	Ciss [Typ] (pF)	Coss [Typ] (pF)	Crss [Typ] (pF)	td(on) [Typ] (μs)	tr [Typ] (μs)	td(off) [Typ] (μs)	tf [Typ] (μs)	Qg [Typ] (nC)	Qgs [Typ] (nC)	Qgd [Typ] (nC)	VF(s-s) / VSD [Typ] (V)	VF(s-s) / VSD [Max] (V)	Tch (°C)	Tstg (°C)	Rth (°C/W)	Halogen Free
KFC4B21080L	0.4	0.85	1.4	850	205	203	0.6	1.7	2.6	3.1	7.1	1.5	2.7	0.8	1.2	150	-55 to +150	352	Yes
KFC4B21320L	0.35	0.9	1.4	205	50	40	0.1	0.15	0.5	0.3	3.5	0.8	1	0.6	1.2	150	-55 to +150	368	Yes
KFC4B22690L	0.35	0.9	1.4	426	84	71	0.11	0.28	0.66	0.46	4.5	1.1	1.2	0.8	1.2	150	-55 to +150	292	Yes
KFC4B22670L	0.35	0.9	1.4	440	82	68	0.12	0.26	0.54	0.39	4.5	1.1	1.2	0.8	1.2	150	-55 to +150	292	Yes
KFC4B21210L	0.35	0.9	1.4	1140	180	140	0.33	0.56	1.57	0.86	9.4	2.6	1.9	0.7	1	150	-55 to +150	338	Yes
KFC4A21300L	0.35	0.9	1.4	115	25	18	0.1	0.2	0.27	0.22	1.7	0.5	0.45	0.6	1.2	150	-55 to +150	390	Yes
KFC4B21300L	0.35	0.9	1.4	115	25	18	0.1	0.2	0.27	0.22	1.7	0.5	0.45	0.6	1.2	150	-55 to +150	390	Yes
KFC4B21330L	0.35	0.9	1.4	225	45	35	0.1	0.15	0.4	0.3	1.7	0.5	0.45	0.6	1.2	150	-55 to +150	368	Yes

General Switching

• KFJ4 Series

Product Overview

With advantages of ultra-small package, low inductance and low failure rate, suitable for the circuit/applications require low speed switching but high density mounting, high reliability.

Features

· Ultra small package, contribute to save board space.
· Ultra thin package, suitable for low profile required application.
· The high reliability performance help to reduce circuit failure rate.

Parts	series	Spice	Type	VDS (V)	VGS (V)	ID (A)	IDp (A)	PD (W)	Package	Package Length (mm)	Package Width (mm)	Package Thickness (mm)	RDS(on)@VGS=4.5V [Typ] (mΩ)	RDS(on)@VGS=4.5V [Max] (mΩ)	RDS(on)@VGS=2.5V [Typ] (mΩ)	RDS(on)@VGS=2.5V [Max] (mΩ)	RDS(on)@VGS=1.8V [Typ] (mΩ)	RDS(on)@VGS=1.8V [Max] (mΩ)	RDS(on)@VGS=1.5V [Typ] (mΩ)	RDS(on)@VGS=1.5V [Max] (mΩ)
KFJ4B01100L	CSP	Available	Pch	-12	±8	-3.3	-26	0.82	XLGA004-W-0808-RA01	0.8	0.8	0.1	57	74	68	90	82	139	97	290
KFJ4B01110L	CSP	Available	Pch	-12	±8	-2.2	-17	0.76	ALGA004-W-0606-RA01	0.6	0.6	0.1	118	153	141	183	169	287	199	597
KFJ4B01120L	CSP	Available	Pch	-12	±8	-4.2	-33	0.94	ULGA004-W-1010-RA01	1	1	0.1	34	51	40	61	48	85	57	170

Parts	IDSS [Max] (μA)	IGSS@VGS=8V [Max] (μA)	Vth [Min] (V)	Vth [Max] (V)	Ciss [Typ] (pF)	Coss [Typ] (pF)	Crss [Typ] (pF)	td(on) [Typ] (ns)	tr [Typ] (ns)	td(off) [Typ] (ns)	tf [Typ] (ns)	Qg [Typ] (nC)	Qgs [Typ] (nC)	Qgd [Typ] (nC)	Tch (°C)	Tstg (°C)	Halogen Free
KFJ4B01100L	-10	±10	-0.3	-1	459	85	75	8	11	59	10	7	0.75	0.95	150	-55 to +150	Yes
KFJ4B01110L	-10	±10	-0.3	-1	226	62	51	3.8	2.5	30	5.4	3.3	0.55	0.65	150	-55 to +150	Yes
KFJ4B01120L	-1	±10	-0.3	-1	814	201	187	6	4	63	46	10.7	1.4	2.1	150	-55 to +150	Yes

Laser Diodes

Blue-Violet

• KLC4 Series

Product Overview

NTCJ have both laser technology for IR (GaAs base) and Blue (GaN base) lasers.
Unique compound semiconductor process technology and low optical loss structure can be realized high output power and high reliability lasers which are suitable for industrial use.

Features

· KLC4xx (Typ. 402nm) : High Power multi mode laser with conventional TO-CAN package.

Parts	Wavelength [Typ] (nm)	Optical power output [Typ] (mW)	Operating temperature (°C)	Package
KLC431FS01WW	402	1000(CW) ※Maximum Ratings	0 ~ 50	Φ5.6CAN
KLC431FS03WW	402	1000(CW) ※Maximum Ratings	0 ~ 50	Φ5.6CAN
KLC432FL01WW	402	3300(CW) ※Maximum Ratings	0 ~ 50	Φ9.0CAN

Red and/or Infrared

• KLCT,KLCQ,KLC7 Series

Product Overview

NTCJ have both laser technology for IR (GaAs base) and Blue (GaN base) lasers.
Unique compound semiconductor process technology and low optical loss structure can be realized high output power and high reliability lasers which are suitable for industrial use.

Features

· KLCT,KLCQ,KLC7 (Typ. 661/783nm) : High Power single mode laser with conventional TO-CAN package and low profile flat package.

Parts	Wavelength [Typ] (nm)	Optical power output [Typ] (mW)	Operating temperature (°C)	Package
KLC728MS01WW	783	200(CW), 380(pulse) ※Maximum Ratings	-10 ~ 85	Φ5.6CAN
KLC728PS01WW	783	200(CW), 380(pulse) ※Maximum Ratings	-10 ~ 85	Φ5.6CAN
KLCQ28MS01WW	661	100(CW), 350(pulse) ※Maximum Ratings	-10 ~ 85	Φ5.6CAN
KLCQ28PS01WW	661	100(CW), 350(pulse) ※Maximum Ratings	-10 ~ 85	Φ5.6CAN
KLCT28PF01WW	661 783	100(CW), 300(pulse) 200(CW), 380(pulse) ※Maximum Ratings	-10 ~ 85	Flat Package
KLCT28PS01WW	661 783	100(CW), 350(pulse) 200(CW), 380(pulse) ※Maximum Ratings	-10 ~ 85	Φ5.6CAN

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