

REAL TIME CLOCK MODULE (SPI-Bus)

Time stamp function and Low current consumption



Product Number (2,000 pcs / Reel)
RX4111CE A : X1B000431000115
RX4111CE B : X1B000431000215

RX4111CE

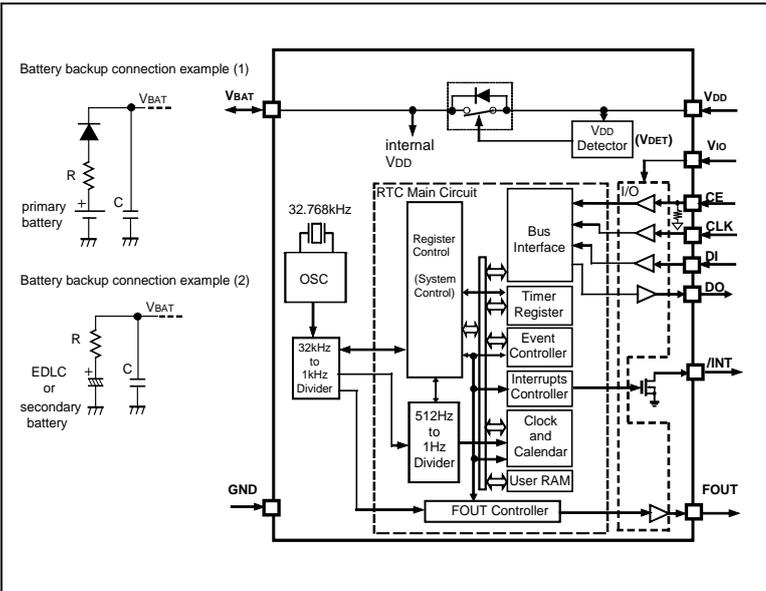
- Built in frequency adjusted 32.768 kHz crystal unit
- Interface Type : SPI -Bus 4 wire
- Low backup current : 100 nA Typ. / 3 V
- Auto power switching function : Automatically switches to backup power supply by monitoring the V_{DD} voltage.
- Time stamp function : 8 times stamped from year to 1/256 seconds
- Interrupt output : Wake up every minute or every second
- Alarm interruption : Day, date, hour, minute, second
- Auto repeat wakeup timer interruption
- Self-monitoring interruption : Crystal oscillation stop, V_{BAT} low, V_{DD} low



RX4111CE
 (3.2 x 2.5 mm, t = 1.0 mm Max.)

Block diagram

Overview

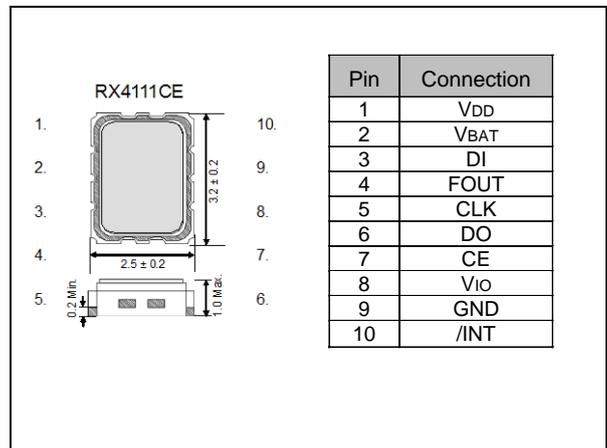


- Interface type
SPI-Bus interface (4 wire, 1 MHz)
- Auto power switch function
The V_{DD} voltage is monitored and it switches to the backup power supply by the automatic operation
Backup power supply switching voltage 1.2V Min.
- Clock output function
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
When the clock output is not used, the FOUT pin can be used as a timer output pin (CMOS)
- Wakeup timer function
Selectable from 244 μs to 32 years (24 bit x 1 ch.)
Timer source clock selectable from 1/60 Hz, 1 Hz, 64 Hz, 4096 Hz
Auto release after interrupt output from /INT pin at timer completes
This operation is auto repeat with a selected cycle, it can be used like a watchdog timer
- Time stamp function
8 times stamped from year to 1/256 seconds
The time stamp trigger inputs from self-monitoring and SPI command
- Alarm function
It is possible program from year to second
- Self-monitoring interruption
Crystal oscillation stop, V_{BAT} low, V_{DD} low

Pin Functin

Terminal connection / External dimensions (Unit: mm)

Signal Name	I / O	Function
CE	Input	Chip enables input pin
CLK	Input	Serial clock input pin
DI	Input	Serial data input pin
DO	Output	Serial data output pin
FOUT	Output	Frequency output (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz)
/INT	Output	Interrupts output by Alarm and Timer events (N-ch. open drain)
V _{DD}	-	Power supply pin Possible to supply different voltage from V _{IO}
V _{IO}	-	Interface power supply pin Input to supply the voltage same as a host
V _{BAT}	-	Power supply pin for backup battery Connect an EDLC, a secondary battery, a primary battery In the backup voltage range, supplied to IC, from this pin
GND	-	Ground pin



Specifications (characteristics)

* Refer to application manual for details

Recommended Operating Conditions

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating supply voltage	V _{DD}	-	1.6	3.0	5.5	V
Clock supply voltage	V _{CLK}	-	1.1	3.0	5.5	V
Operating temperature	T _a	-	-40	+25	+85	°C
V _{DD} detect voltage	-V _{DET1}	V _{DD} , Fall	1.20	1.40	1.60	V

Frequency characteristics

Item	Grade	Symbol	Conditions	Min.	Typ.	Max.	Unit
Frequency tolerance	A	Δf / f	T _a = +25 °C V _{DD} = 3.0 V	-11.5	-	+11.5	x 10 ⁻⁶
	B			-23	-	+23	
Oscillation start-up time		t _{STA}	V _{DD} = 2.75 V to 5.5 V	-	0.3	1.0	s

Current consumption characteristics T_a = -40 °C to +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption	I _{BAT}	Input pins = "L", FOUT = OFF, /INT = OFF, V _{BAT} = 3.0 V, V _{DD} = V _{IO} = 0.0 V, CHGEN = 0b, INIEN = 0b, SWSEL0 = 1, SWSEL1 = 0	-	100	450	nA
	I _{32k}	Input pins = "L", FOUT = 32.768 kHz, /INT = OFF, V _{DD} = V _{IO} = 3.0 V, FOUT pin CL = 15 pF, CHGEN = 0b, INIEN = 1b	-	2.0	3.0	μA

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