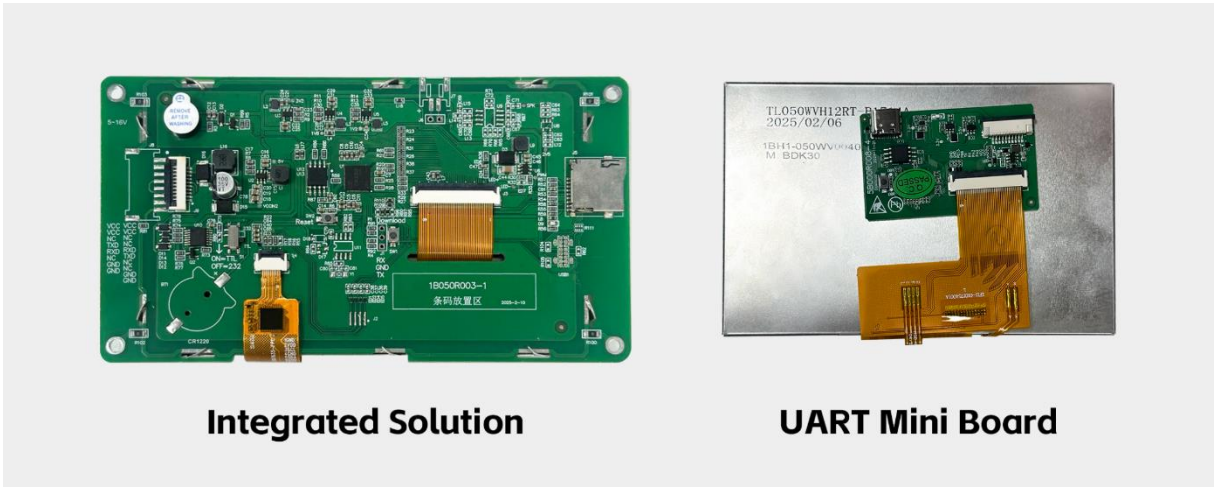
Top Display Optoelectronics

TDO's Compact UART Mini Board Solution: A High-Performance, Low-Cost & Small Form Factor Embedded Platform

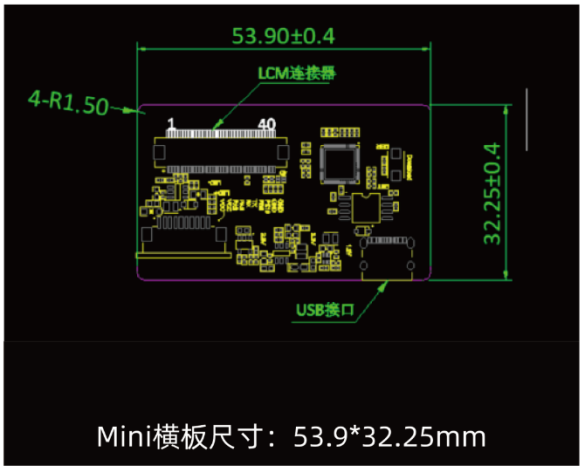
In sectors such as industrial control, smart home, and medical devices, UART touch display are valued for their stability, reliability, and ease of development. They are often regarded as the core of human-machine interfaces. However, traditional solutions tend to be bulky, complex to develop, and involve redundant hardware. To overcome these challenges, Top Display Optoelectronics (TDO) has launched a compact UART small board solution, offering an innovative approach for embedded development.

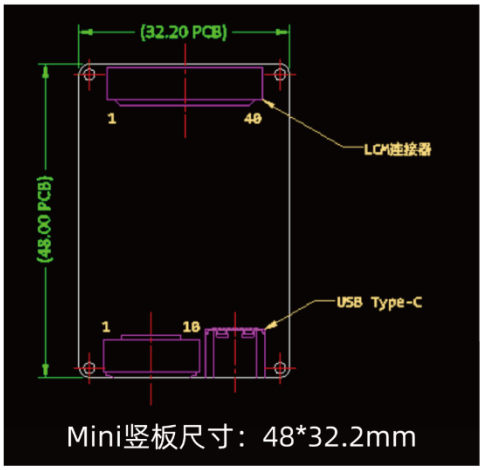
Four Key Benefits of the New UART Mini Board Solution

Flexible Structure with UART Functionality



Compared to traditional integrated PCBA boards, this small board UART solution offers significant structural advantages. Its overall thickness is just 3mm (maximum 3.16mm), and the PCBA size is substantially reduced, enabling increased flexibility for compact device designs.



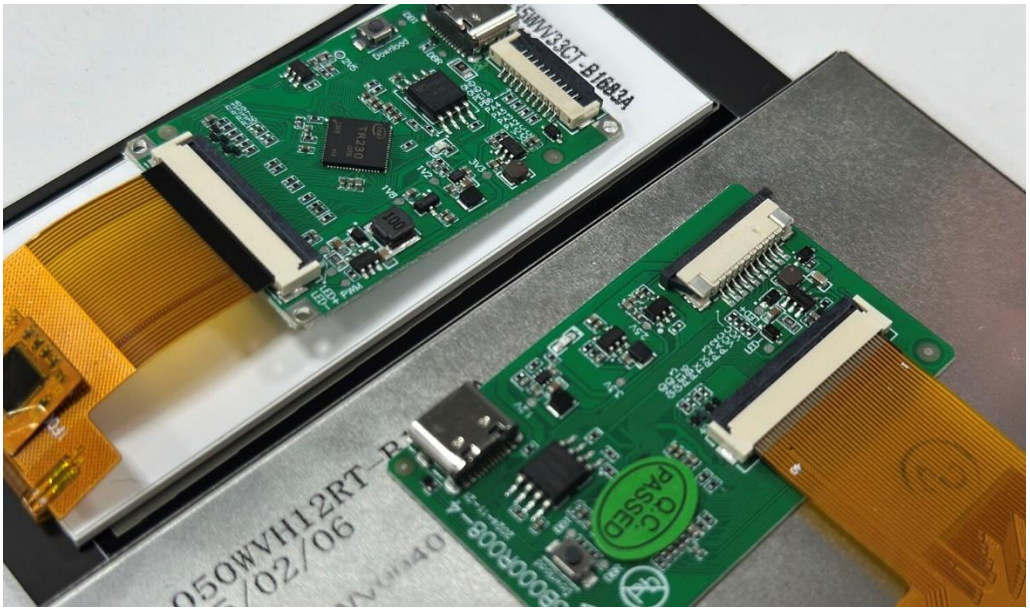


Furthermore, the mounting options are diverse—users can choose adhesive tape, FFC connections, or screw mounting to suit different structural requirements. Communication between the small board and the UART touchscreen is via TTL.

No.	Pin Name	Reset state	Function	Note
1	VCC	-	POWER-IPUT, 5~15V	All multiplexed functions can be forced to be converted to GPIO functions when not in use
2	VCC	-	POWER-IPUT, 5~15V	
3	PA2	Z	Default I2C1-SCL function (2~5KΩ pull-up resistor required)	
4	PA3	Z	Default I2C1-SDA function (2~5KΩ pull-up resistor required)	
5	PA5	Z	Default UART2-RX function, connect to user's TX	
6	PA4	Z	Default UART2-TX function, connected to user's RX	
7	PB6	Z	Default AUDIO-PA-EN (high with no audio output, low with audio output)	
8	PE13	Z	Default SPK to audio amplifier	
9	GND	-	POWER-GND	
10	GND	-	POWER-GND	

Pin Definition

Stable, Reliable Performance with Strong Anti-Interference Capabilities



With an integrated chip design and comprehensive protection circuitry, the solution effectively resists electromagnetic interference, ensuring robust anti-interference performance.

Compared with FPC-based products, it avoids issues like poor contact or easy damage associated with flexible cables, resulting in greater stability. This makes it well-suited for harsh industrial environments or situations with high-frequency vibrations, ensuring long-term reliable operation.

Powerful Chipset for Seamless, High-Quality UI Experience

The onboard chipset delivers exceptional performance, featuring an embedded co-processor that supports 2D acceleration and hardware decoding of images. This allows quick processing of graphics and images, resulting in smooth, natural interface display even with complex animations.

Options for dual-chip configurations are available for more demanding performance needs.

Chip	OS	Max. Resolution	Application
TR230M	RTOS	800*480	lightweight application
TR240	RTOS	1024*768	Complex UI

Easy Development with Self-Developed UI Software—Giraffe IDE

The solution integrates with Giraffe IDE, a proprietary UI development environment supporting C language compilation—aligned with embedded engineers' workflows and compatible with C standard libraries, allowing customized code addition for flexibility.

It provides a rich library of UI controls—including buttons, sliders, text boxes, and over 28 widget types. The continuously updated GUI sample library offers plentiful inspiration and resources to accelerate development.

Additionally, it supports a low-code development approach—developers can use drag-and-drop and simple configuration to quickly create sophisticated UI effects similar to Android, without extensive coding effort.

Top Display Optoelectronics' (TDO) UART small board solution addresses core embedded needs by integrating lightweight chips and RTOS to ensure smooth UART communication and basic UI interactions. It reduces hardware costs and enhances development efficiency, making it ideal for industrial control, smart home, and other lightweight interactive applications.

NO.	Type	Size	Resolution	In-built	Chip
1	Mini Board for Portrait Display	2.1"	480*480	TY021WVL02NH	TR230M
2		2.1"	480*480	TY021WVL02CH	TR230M
3		2.86"	320*820	TY029FWL02NH	TR230M
4		2.86"	320*820	TY029FWL02CH	TR230M
5		3.4"(Square)	480*480	TY034WVL02NH	TR230M
6		3.4"(Square)	480*480	TY034WVL02CH	TR230M
7		3.5"	340*800	TY035WVL02NH	TR230M
8		3.5"	340*800	TY035WVL02CH	TR230M
9		3.99"	400*960	TY040FWL02NH	TR230M
10		3.99"	400*960	TY040FWL02CH	TR230M
11		4.0"(Square)	480*480	TY040WVL02NH	TR230M
12		4.0"(Square)	480*480	TY040HDL02NH	TR230M
13		4.0"(Square)	720*720	TY040HDL02CH	TR230M
14		5.0"	480*854	TY050FWL01NH	TR230M
15		3.5"	320*480	TY035HVL02NH	TR230M
16		3.5"	320*480	TY035HVL02CH	TR230M
17	Mini Board for Landscape Display	4.3"	480*272	TY043WQL02NH	TR230M
18		4.3"	480*272	TY043WQL02RH	TR230M
19		4.3"	800*480	TY043WVL02NH	TR230M
20		4.3"	800*480	TY043WVL02RH	TR230M
21		5.0"	800*480	TY050WVL02NH	TR230M
22		5.0"	800*480	TY050WVL02RH	TR230M