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LT103OEM_xBT Radar Board

Rev.1.1

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Version for public release; specifications are subject to change without notice to improve reliability, function, or design or otherwise.

LT103OEM_xBT Radar Board

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1 Summary

- The LT103OEM is a complete micro-UWB radar module designed for SMD mounting.
- The LT103OEM_xBT is a convenient PCBA with an LT103OEM already mounted and providing greater processing capability, Wi-Fi and BT communication and a series of solid-state relays and mechanical inputs like trimmer and push-button.

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2 Reference Documents

1. LT103OEM Datasheet
2. LT102 and LT103OEM COM Protocol

3 Document Scope

This document is relevant to the designers involved in the development of radar algorithms over the LT103OEM or by implementing a new product line with a ready to use radar board.

4 Description

The LT103OEM_xBT is a board holding an LT103OEM with advanced features and specific components like ESP32 MCU, Wi-Fi and BT communication and a series of solid-state relays and mechanical inputs like trimmer and push-button. To build custom applications, a source code for radar interface and data-grabbing is available.

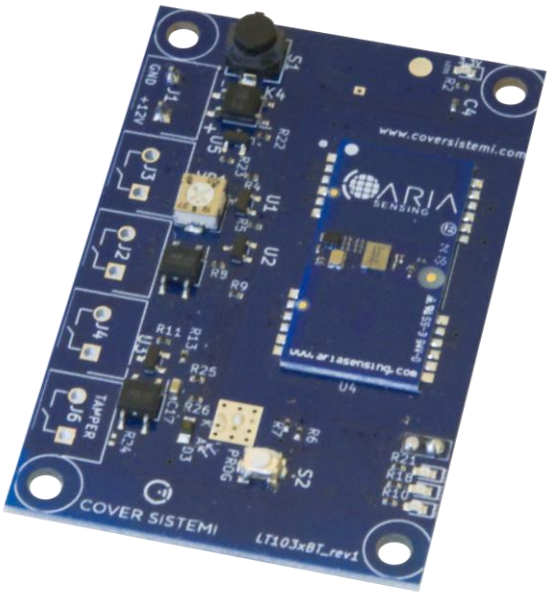

Fig. 1: LT103OEM_xBT; Top view

5 Electrical and mechanical specifications

	Min	Typ	Max
Operating frequency	7.3GHz	7.9GHz	8.5GHz
Temperature range	-40°C		+85°C
Supply voltage		12/24Vdc	

Power max.		0.9W	
Output signals	4 normally open contact (1 power relè, 2 NO contacts, 1 antitamper) and 4 user interface Leds (1 green for 3v3 power supply, 1 green, 1 red and 1 yellow for general purpose)		
Communication interfaces	UART and JTAG connections, 1 program button, 1 trimmer to adjust the radar range or the sensitivity, BT 4.2, Wi-Fi 802.11bgn		
Input signals	current value proportional to ambient light from a photodiode (D3), antitamper alarm trimmer for sensitivity/range, program button		
Dimensions	45mm x 68 mm		

Table 1 LT103OEM_xBT electrical and mechanical specifications

6 Block Diagram

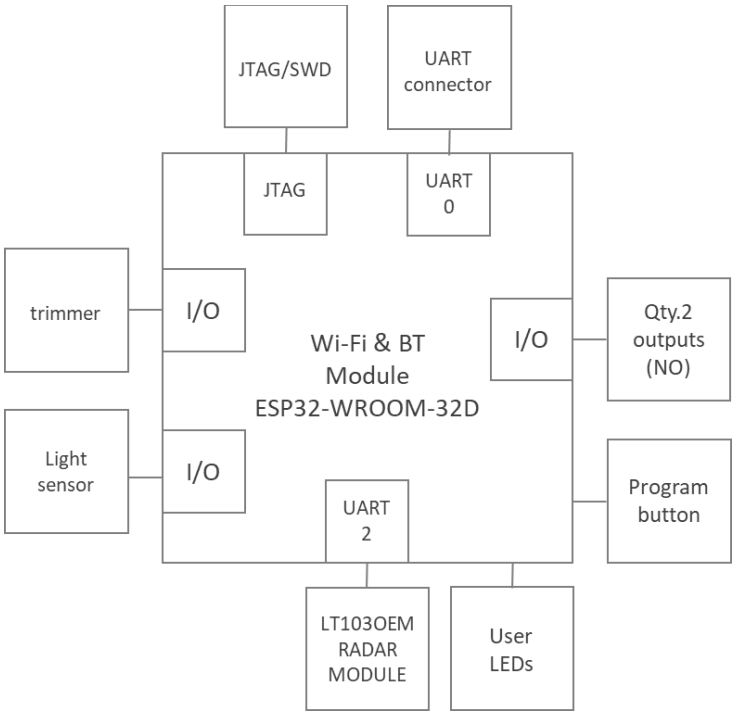

Fig. 2: Block diagram

6.1 Power supply

The system is powered through J1 by a 12 or a 24 Vdc. When the system is powered correctly, the green LED1 is turned on.

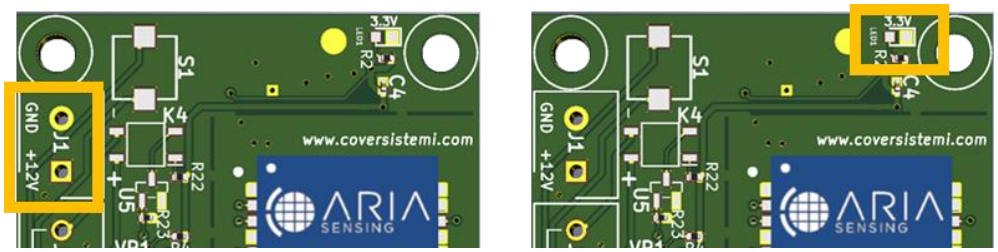

Fig. 3: Power supply connector and 3.3V LED

6.2 LT103OEM Radar Module

An ESP32-WROOM-32D chipset communicates by means a suitable UART interface with the LT103OEM Radar Module. It is possible to use the SYSRST to reset the radar from the microcontroller.

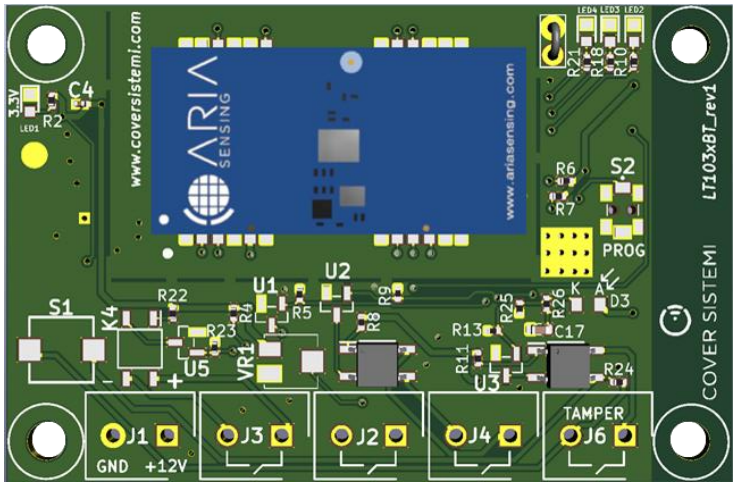

Fig. 4: LT103OEM Radar Module

6.3 ESP32-WROOM-32D module

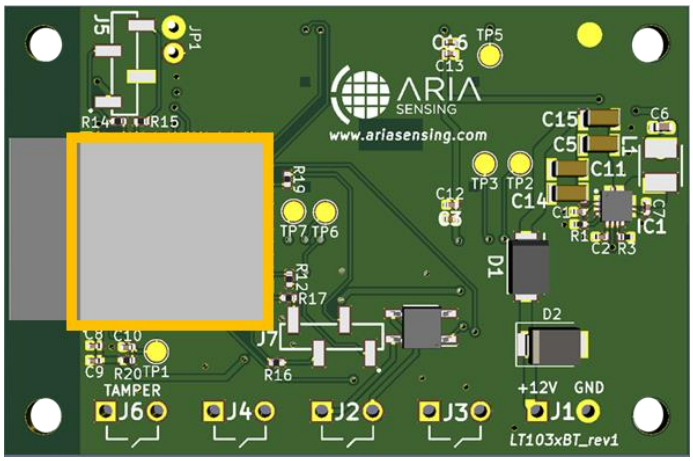

Fig. 5: ESP32-WROOM-32D module

The ESP32-WROOM-32D is used as UART interface with the LT103OEM. The module offers the interconnection through the UART connector and the JTAG connector. The output relays are

controlled with the ESP GPIOs. There is also the possibility to reset and program the ESP through the button S2. To provide additional user interfaces there are 3 programmable LED diodes. The board offers the possibility to mount a photodiode (D3) as ambient light sensor. Small setting adjustment available by a specific trimmer (VR1).

6.4 General I/O

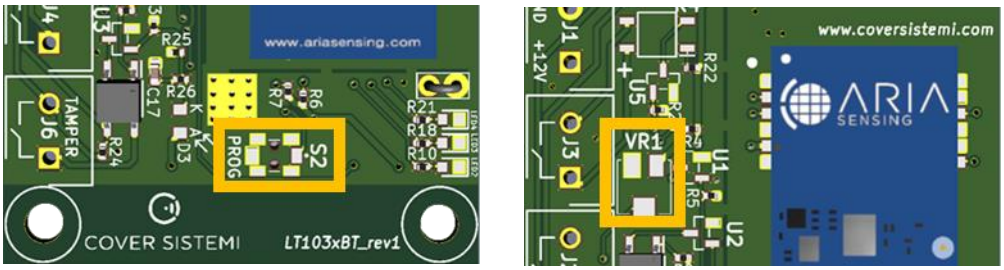

Fig. 6: Program button (left) and trimmer (right)

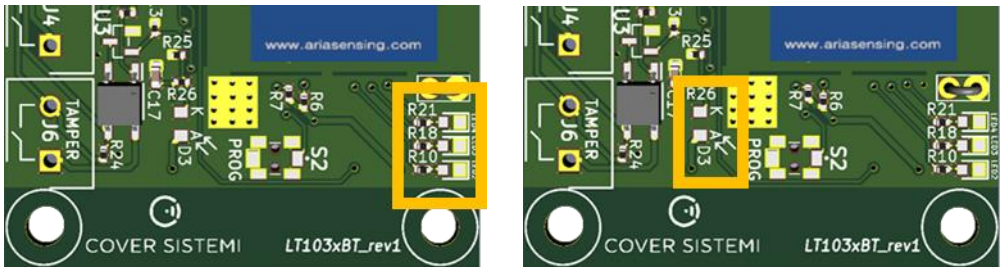

Fig. 7: Programmable LED (left) and light sensor (right)

The photodiode generates a linear output current with incident light.

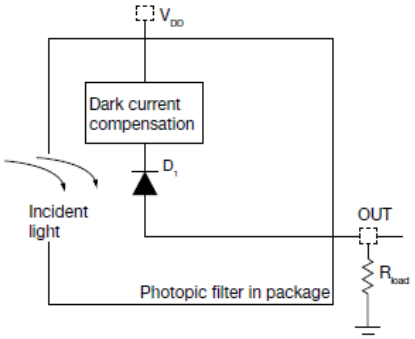

Fig. 8: photodiode schematic

6.5 Output Relays

The GPIOs signals are used to control the output relays. The output signals are provided through the NO (Normally Open) contacts. There is an antitamper control switch (S1) on the J6 connector. The J3 connector provides the power contact using the power relay CPC1014N.

	Blocking Voltage	Load Current	Alarm/Power
CPC1017N	60 V_p	100 mA_{rms}/mA_{DC}	Signal
CPC1014N	60 V_p	400 mA_{rms}/mA_{DC}	Power

Table 2 Output relays

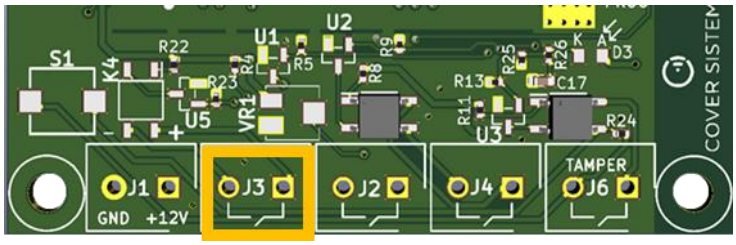

Fig. 9: Contact (power)

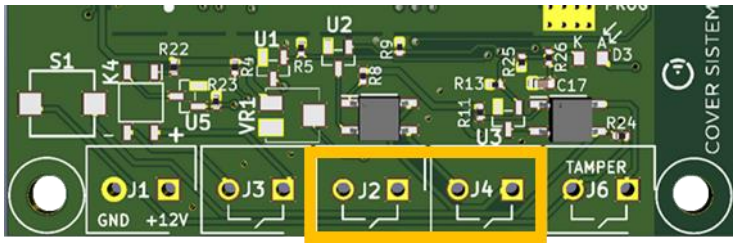

Fig. 10: Contacts (signal)

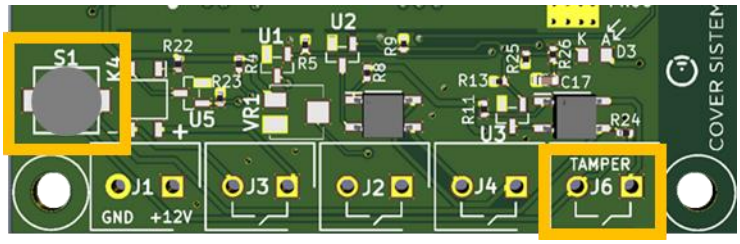

Fig. 11: Anti-tamper contact (J6) and anti-tamper button (S1)