

TR-XXX-52B

Transceiver Module

Data Sheet

- TR-868-52B
- TR-916-52B

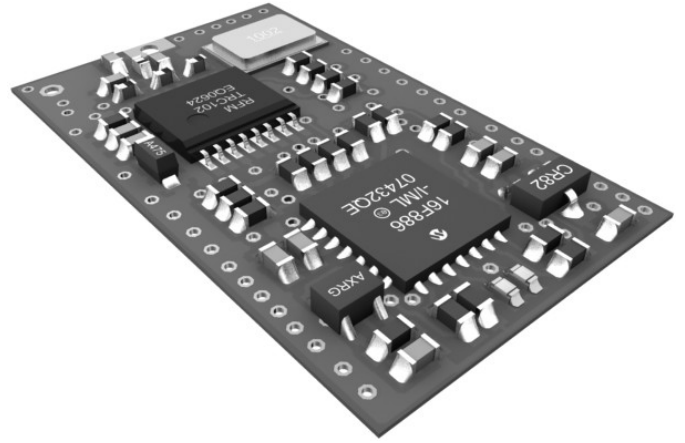
Preliminary



Simple way to smarter wireless solutions

Description

TR-xxx-52B is a family of IQRF transceiver modules operating in the 868 MHz or 916 MHz license free ISM (Industry, Scientific and Medical) frequency band. Its highly integrated ready-to-use design requires no external components. The microcontroller with built-in operating system, excellent development support, integrated LDO regulator and temperature sensor dramatically reduce time of application development. Ultra low power consumption predetermines these modules for use in battery powered applications.



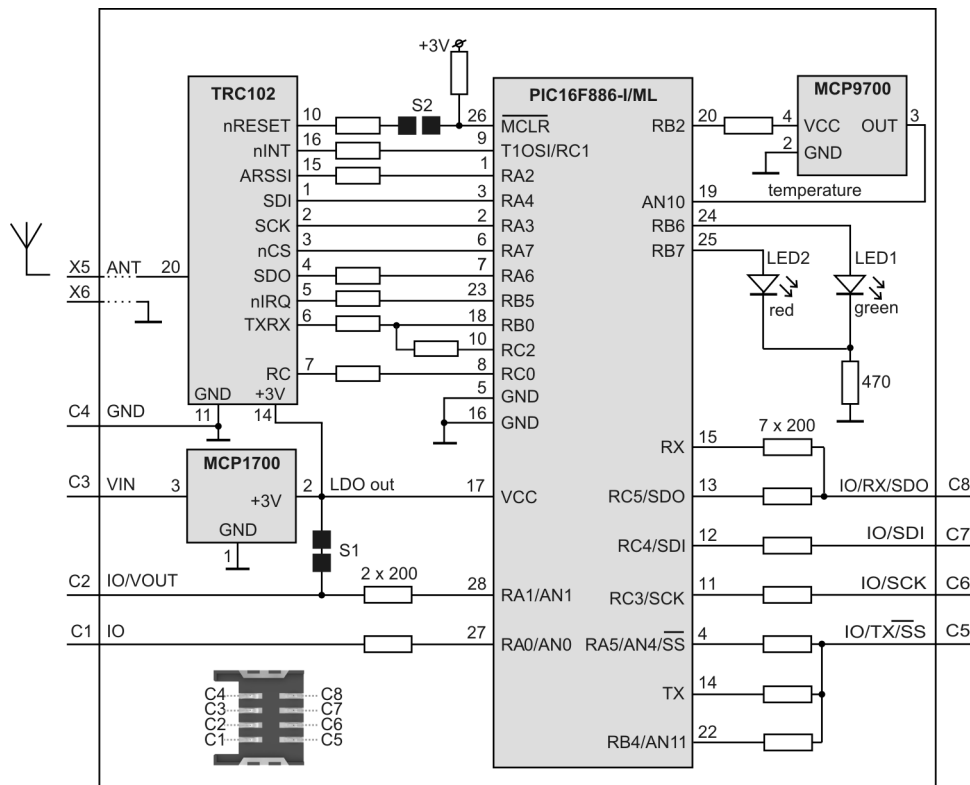
Applications

- Telemetry
- Buildings automation
- Wireless control & regulation
- Access control
- Remote data acquisition
- Communications links
- RF connectivity in many other areas

Key features

- Complete solution with operating system, easy to use
- Extended RF power, FSK modulation, multiple channel
- MCU with extended Flash memory
- Ultra low power consumption, low cost
- SPI interface supported by OS (on background)
- On-board temperature sensor and battery monitoring
- +3 V LDO regulator output
- Dual LED
- 5/6 I/Os, 3 analog inputs (A/D)
- SIM card format
- Coaxial antenna connector (optional)

Simplified schematics



Electrical specifications

(typical values unless otherwise stated)

Supply voltage (VCC)	3.0 V to 5.3 V
Operating temperature	0 °C to +70 °C -40 °C to +85 °C (Industrial) available on request
Supply current	
Sleep mode	2.5 µA
Run mode ¹	1 mA @ 8 MHz 170 µA @ 125 kHz 17 µA @ 31 kHz
Rx mode	13 mA @ 8 MHz
Tx mode	23 mA max.
Additional supply current when LED(s) on	2 mA
RF sensitivity ²	up to -110 dBm
RF output power	up to 5 dBm, programmable
Frequency range	868.35 MHz (TR-868-52B) 916.50 MHz (TR-916-52B)
RF data modulation	FSK (frequency-shift-keyed)
RF data transmission bit rate	up to 115 kb/s
LDO output (VOUT)	+3 V, 100 mA max.
A/D converter	10 b, 3 inputs (multiplexed S&H, successive approximation)
Input A/D impedance	10 kΩ max.
Temperature sensor accuracy	±2 °C typ., ±4 °C max. (not calibrated) ±0.1 °C min. (calibrated)
Size (L x W x H)	25.0 mm x 14.9 mm x 3.0 mm

Note 1: TRC102 in standby mode, BOR disabled, WDT disabled.

Note 2: RF sensitivity depends on bit rate.

Absolute maximum ratings

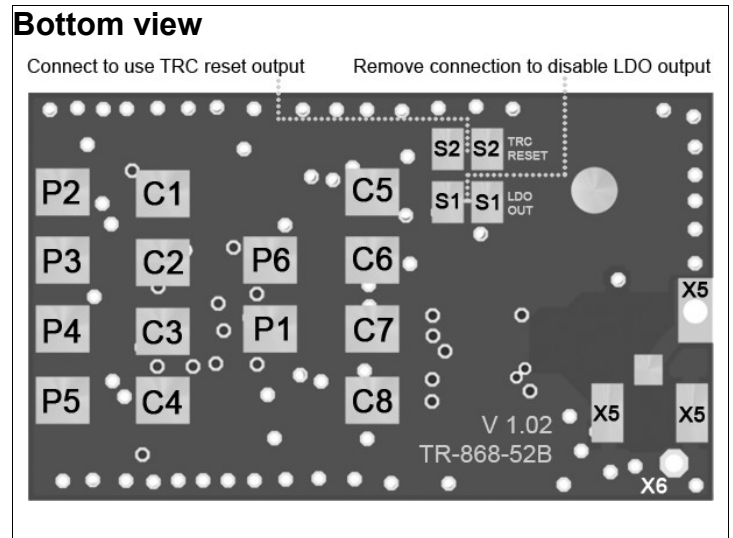
Stresses above those values may cause permanent damage to the device. Exposure to maximum rating conditions for extended periods may affect device reliability.

Supply voltage (VCC)	5.5 V
Storage temperature	-50 °C to +100 °C
Ambient temperature under bias	-40 °C to +85 °C

For more information refer to datasheets of ICs used:

IC	type	manufacturer
MCU	PIC16F886-I/ML	Microchip
RF	TRC102	RF Monolithics (RFM)
LDO voltage regulator	MCP1700	Microchip
Temperature sensor	MCP9700	Microchip

Pin	Name	Description
C1	IO/AN RA0	General I/O pin
	AN0	Analog A/D input
C2	IO/AN/VOUT RA1	General I/O pin (S1 disconnected)
	AN1	Analog A/D input (S1 disconnected)
	VOUT	On-board +3 V LDO output (S1 connected)
C3	VIN	Power supply voltage
C4	GND	Ground
C5	IO/AN/TX/-SS RA5	General I/O pin
	AN4, AN11	Analog A/D input
	TX	UART Tx
	-SS	SPI Slave select input (SPI enabled)
	RB4	General I/O pin, Interrupt on change
C6	IO/SCK RC3	General I/O pin
	SCK	SPI clock input (SPI enabled)
C7	IO/SDI RC4	General I/O pin
	SDI	SPI data in (SPI enabled)
C8	IO/RX/SDO RC5	General I/O pin
	RX	UART Rx
	SDO	SPI data out (SPI enabled)
X5	ANT	Antenna input
X6	GND	Ground (for dipole antenna)
P1–P6		For factory programming only
S1		LDO output enable. Disconnect to disable (default enabled).
S2		TRC reset output enable. Connect to reset the MCU from the TRC (default disabled).

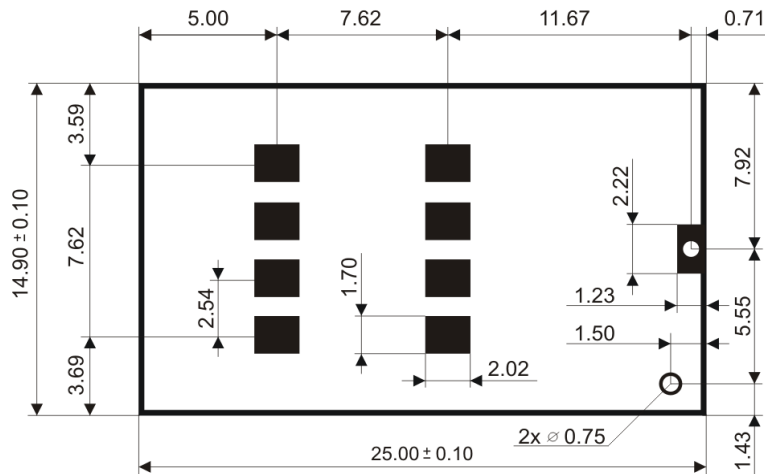


Application

See IQRF OS User's manual, Application examples, www.iqrf.org and www.iq-esupport.com.

Dimensions

TR-xxx-52B, TR-xxx-52BK, TR-xxx-52BC

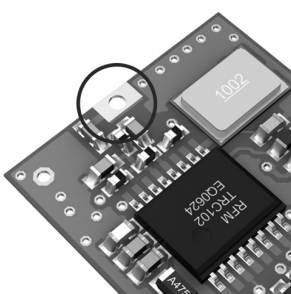


Units: mm

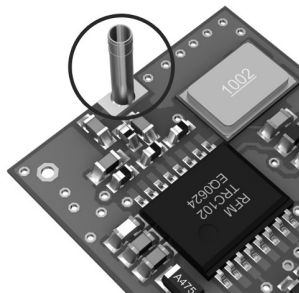
Recommended SIM connector: KON-SIM-01

Ordering codes

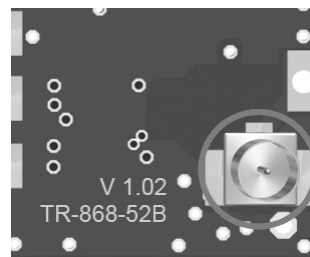
Type	frequency [MHz]	locality	antenna connector
TR-868-52B	868	EU	–
TR-868-52BK	868	EU	for AN-868-03 (¼ whip)
TR-868-52BC	868	EU	KON-U.FL-R-SMT (coax)
TR-916-52B	916	USA	–
TR-916-52BK	916	USA	for AN-916-03 (¼ whip)
TR-916-52BC	916	USA	KON-U.FL-R-SMT (coax)



TR-xxx-52B



TR-xxx-52BK



TR-xxx-52BC

Sales and Service

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Partners and distribution

Please visit www.iqrf.org/partners

Quality management

ISO 9001 : 2000 certified

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On-line support: <http://iq-esupport.com>



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