

TR-xxx-11A

Transceiver Module

Data Sheet

- TR-868-11A
- TR-916-11A



Simple way to smarter wireless solutions

Description:

TR-xxx-11A 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 high integrated ready-to-use design requires no external components (excluding antenna). The microcontroller with built-in operating system, excellent development support, integrated LDO regulator and temperature sensor dramatically reduce time of application development. Low power consumption of TR-xxx-11A predetermines these modules for use in battery powered applications.



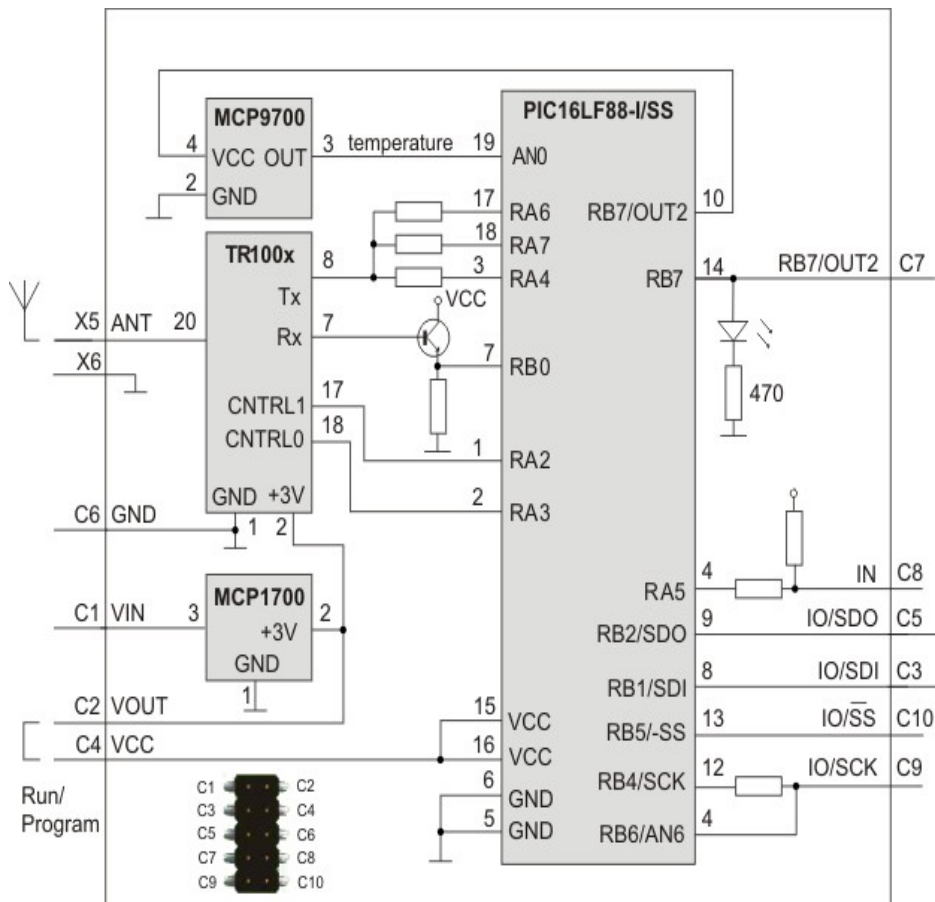
Applications:

- Telemetry
- Home 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 - fast learning curve
- Low cost
- Low power consumption
- SPI Interface supported by OS (in background)
- Battery monitoring
- On-board temperature sensor
- +3 V LDO regulator output

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: 170 µA
 Rx mode: 3.95 mA @ 8 MHz
 Tx mode: 3.0 mA @ 8 MHz, Txpower = 7, transmitting '0'
 12.4 mA @ 8 MHz, Txpower = 7, transmitting '1'
 4.0 mA @ 8 MHz, Txpower = 1, balanced '0' / '1'
 8.0 mA @ 8 MHz, Txpower = 7, balanced '0' / '1'

Additional supply current when LED on: 2 mA

RF sensitivity: -95 dBm
 RF output power: up to 1.5 dBm, programmable in 7 levels of TXpower
 Frequency range: 868.35 MHz (TR-868-11A)
 916.50 MHz (TR-916-11A)
 RF data modulation: ASK (amplitude-shift-keyed)
 RF data transmission bit rate: 20 kbps
 RF data transmission bit rate (true speed) ¹: up to 13 kbps
 LDO output (VOUT): +3 V, 100 mA max.
 Temperature sensor accuracy: ±4 °C max. (not calibrated)
 ±0.1 °C min. (calibrated)
 Size (L x W): 29.5 mm x 20.3 mm

Note 1: True speed of RF data transmission strongly depends on transmitted data structure.

Note 2: When the operating temperature is limited to 60°C, the time required to switch from transmit to receive is dramatically less for short transmissions.

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.

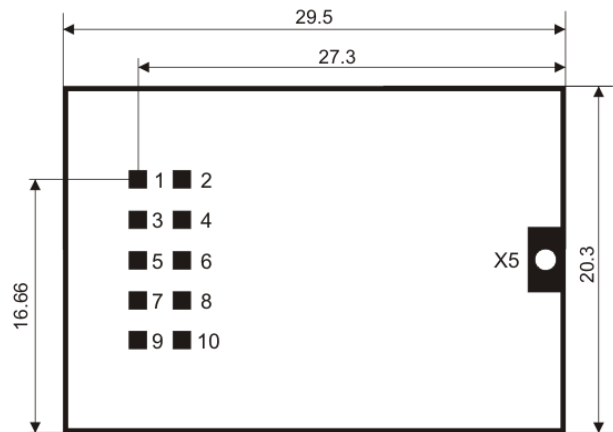
Supply voltage (VCC): 6.5 V
 Storage temperature: -50 °C to +100 °C
 Ambient temperature under bias: -40 °C to +85 °C

For more information see datasheets of ICs used:

IC	type	manufacturer
MCU	PIC16LF88-I/SS	Microchip
RF	TR1001 (868 MHz) / TR1000 (916 MHz)	RF Monolithics (RFM)
LDO voltage regulator	MCP1700	Microchip
Temperature sensor	MCP9700	Microchip

Pin	Name	Description
C1	VIN	Power supply voltage
C2	VOUT	Output from on-board LDO regulator (+3 V).
C3	IO/SDI	
	RB1	General I/O pin
	SDI	SPI data in (SPI enabled)
C4	VCC	Supply voltage of microcontroller. Connect to VOUT.
C5	IO/SDO	
	RB2	General I/O pin
	SDO	SPI data out (SPI enabled)
C6	GND	Ground
C7	RB7/OUT2	
	RB7	General I/O pin. Interrupt-on-change pin.
	OUT2	Output pin, connected to LED
C8	IN	
	RA5	General digital input pin (with pull-up)
C9	IO/SCK	
	RB4	General I/O pin. Interrupt-on-change pin.
	SCK	SPI clock input (SPI enabled)
	IO/AN5	Internally connected to RB4
	RB6	General I/O pin. Interrupt-on-change pin.
	AN5	Analog input channel 5
C10	IO/-SS	
	RB5	General I/O pin. Interrupt-on-change pin.
	-SS	SPI Slave select input (SPI enabled)
X5	ANT	Antenna input
X6	GND	Ground (for dipole antenna)

Bottom view:



Dimensions in mm.

Application:

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

Ordering codes:

Type	frequency [MHz]	locality
TR-868-11A	868	EU
TR-916-11A	916	USA

Datasheet revision history:

- 070216 First release
- 080920 Pictures and visual aspects modified, some parameters added

Sales and Service

Corporate office:

MICRORISC s.r.o., Delnicka 222, 506 01 Jicin, Czech Republic, EU
Tel: +420 493 538 125, Fax: +420 493 538 126, www.microrisc.com

Partners and distribution:

Please visit www.iqrf.org/partners

Quality management:

ISO 9001 : 2000 certified

Trademarks:

*The IQRF name and logo are registered trademarks of MICRORISC s.r.o.
PIC, SPI, Microchip, RFM and all other trademarks mentioned herein are property of their respective owners.*

Legal:

All information contained in this publication is intended through suggestion only and may be superseded by updates without prior notice. No representation or warranty is given and no liability is assumed by MICRORISC s.r.o. with respect to the accuracy or use of such information.

Without written permission it is not allowed to copy or reproduce this information, even partially.

No licenses are conveyed, implicitly or otherwise, under any intellectual property rights.

The IQRF products utilize several patents (CZ, EU, US)

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



Simple way to smarter wireless solutions