TR-11A

Transceiver Module

Data Sheet

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

Simple way to smarter wireless solutions

Description:

TR-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-11A predetermines these modules for use in battery powered applications.

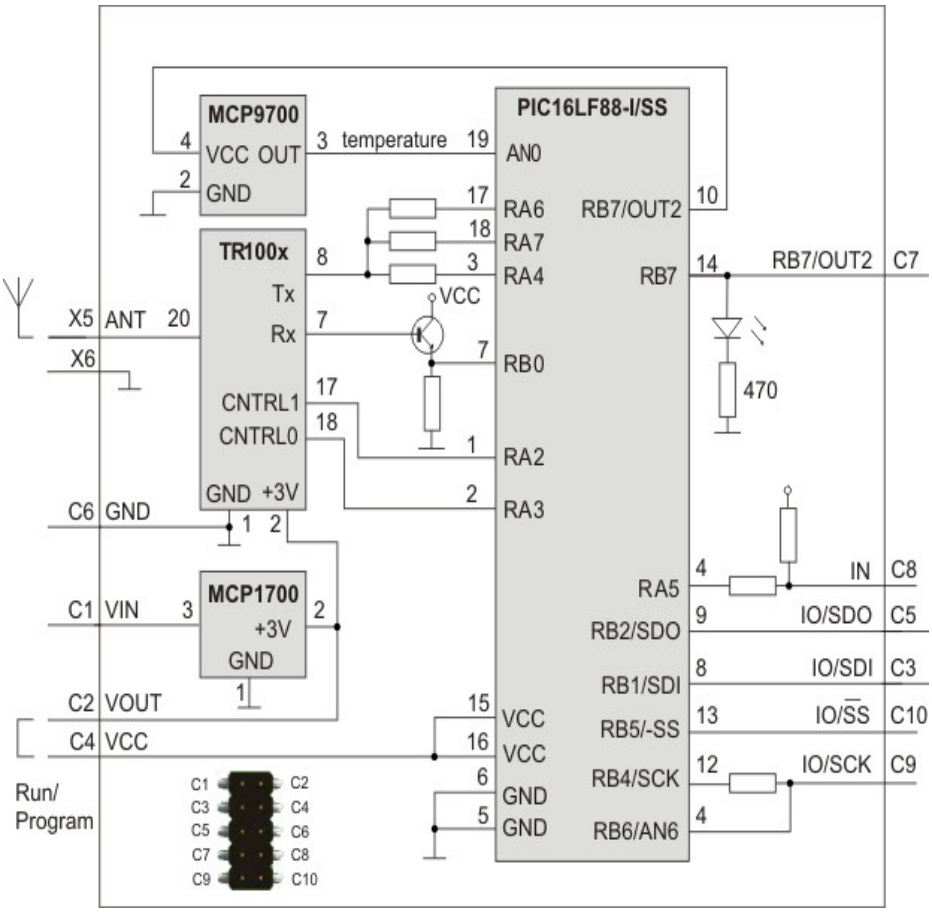
Applications:

- 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-11A-868) 916.50 MHz (TR-11A-916)
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.

The EU users have to ensure observing the CEPT ERC/REC 70-03 Recommendation and subsequent amendments relating to the use of short range devices by software.

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.

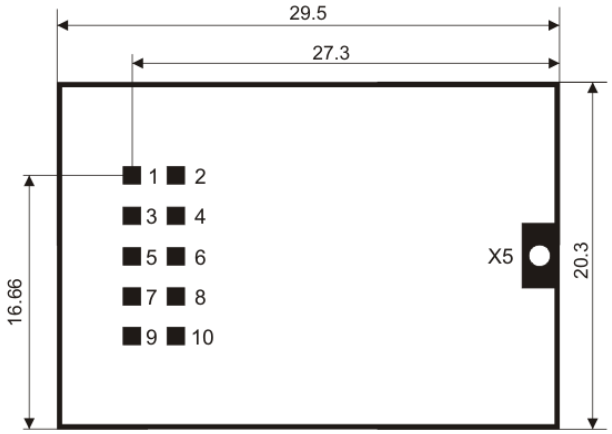
Supply voltage (VCC):	6.5 V
Storage temperature:	-50 °C to +100 °C
Ambient temperature under bias:	-40 °C to +85 °C

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-11A-868	868	EU
TR-11A-916	916	USA

Datasheet revision history:

- 100421 Slightly revised, ordering codes updated
- 080920 Pictures and visual aspects modified, some parameters added
- 070216 First releaase

Sales and Service

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Partners and distribution

Please visit www.iqrf.org/partners

Quality management

ISO 9001 : 2000 certified

Complies with ETSI directives EN 30279 V.1.2.1:99, ETS 30683:97, ETSI EN 301489-1:00, ETSI EN 300220-1:00, ETSI EN 300390-2V.1.1.1:00

Complies with FCC directives FCC CFR, Title 47, Part 15, Section 15.209, FCC CFR, Title 47, Part 15, Section 15.249

Complies with Directive 2002/95/EC (RoHS)

Trademarks

Legal

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

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