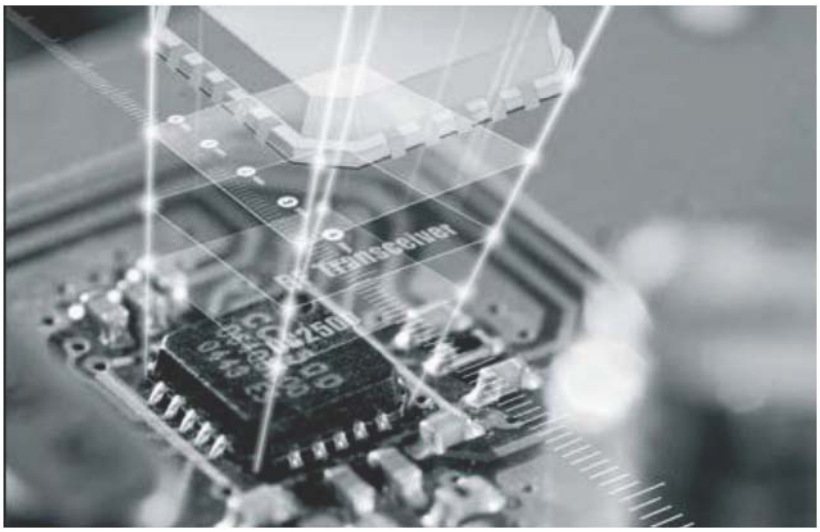
SPECIFICATION

Single Chip High Performance low Power RF Transceiver



Model : TAINET Transceiver Module
Part No : TCRF-PTI4
Version : V1.0
Date : 2018.2.5

Function Description

The TCRF-PT14 is a fully integrated single-chip radio transceiver design for high performance at very low power and low voltage operation in cost effective wireless system.

The circuit is mainly intended for the ISM and SRD frequency band at 432-436MHz

Applications

- *Low power, high performance, wireless systems with up to 1250 Kbit/s data rate*
- *Operating at* 432-436MHz
- *Wireless alarm and security systems*
- *Industrial monitoring and control*
- *Wireless sensor networks*
- *AMR – utomatic Meter Reading*
- *Home and building automation*
- *Wireless MBUS, all modes*
- Wireless healthcare application

Selection Guide

Denomination	:	TAINET Transceiver Module
Part No.	:	TCRF-PTI4

Note: ***Antenna Design is should be considered and based on the mechanism design.***

We can be your consultant and we also provide customize antenna solution.

Absolute Maximum Ratings

Under no circumstances must the absolute maximum ratings given in Table 1 be violated. Stress exceeding one or more of the limiting values may cause permanent damage to the device.

Caution! *ESD sensitive device. Precaution should be used when handling the device in order to prevent permanent damage.*

Parameter	Min	Max	Units	Condition
Supply voltage	–0.3	3.9	V	All supply pins must have the same voltage
Voltage on any digital pin	–0.3	VDD + 0.3, max 3.9	V	
Voltage on the pins	–0.3	2.0	V	
Input RF level		+10	dBm	
Storage temperature range	–40	125	°C	

Operating Conditions

Parameter	Min	Max	Units	Condition
Operating temperature	–40	85	°C	
Operating supply voltage	2.0	3.6	V	All supply pins must have the same voltage

General Characteristics

Parameter	Min	Typ	Max	Units	Condition/Note
Frequency Bands	432		436	MHz	
Frequency Resolution		15		MHz	In 432-436 MHz Band
Data Rate	0		1250	Kbps	Packet Mode
	0		625	Kbps	Transparent Mode

■ Electrical Specifications

● Current Consumption

T_A= 25°C, VDD = 3.0 V if nothing else stated.

Parameter	Min	Typ	Max	Units	Condition
Power Down with Retention		0.3	1	uA	
		0.5		uA	Low-Power RC oscillator running
XOFF Mode		180		uA	Crystal Oscillator/TCXO disable
Idle Mode		1.5		mA	Clock running. System waiting with no radio activity

Transition mode for 434 MHz Bands

T_A= 25°C, VDD = 3.0 V if nothing else stated.

Parameter	Min	Typ	Max	Units	Condition
TX Current Consumption +14 dBm		46		mA	
TX Current Consumption +10dBm		35		mA	

● RF Receive Section

General Receive Parameter(High Performance mode)

T_A = 25°C, VDD = 3.0 V if nothing else stated.

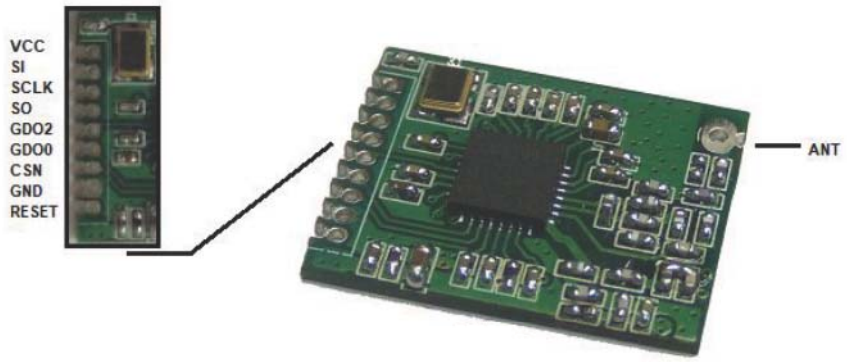
Parameter	Min	Typ	Max	Units	Condition/Note
Saturation		10		dBm	
IIP3		-14		dBm	At maximum gain
Optimum Source Impedance 868/915/920 MHz bands 434 MHz bands 169 MHz bands		 60+j60 / 30+j30 100+j60 / 50+j30 140+j40 / 70+j20		 ohm ohm 0hm	 (Differential / Single Ended RX configuration)

RX Performance in 434MHz

T_A = 25°C, VDD = 3.0 V if nothing else stated.

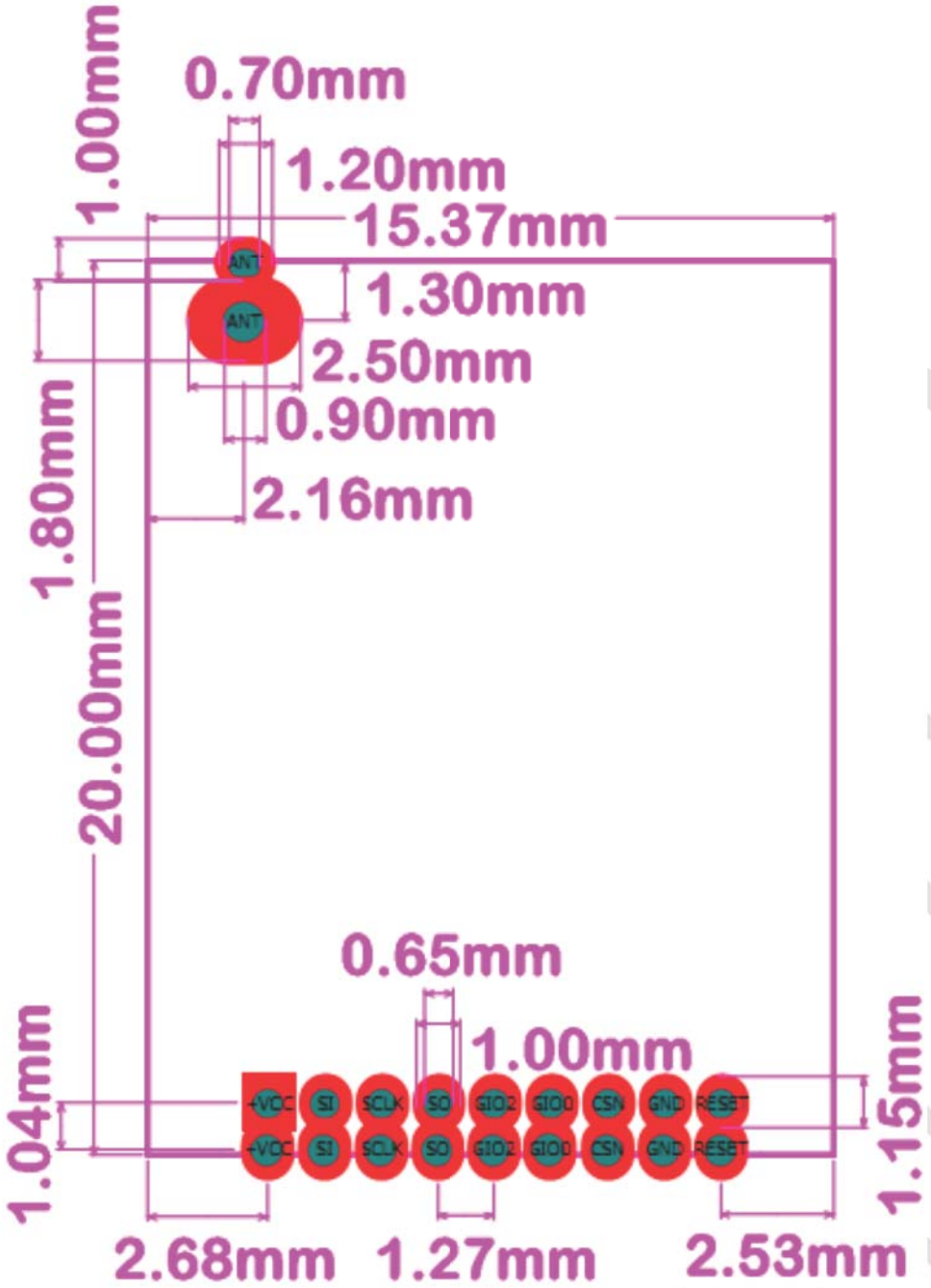
Parameter	Min	Typ	Max	Units	Condition/Note
Receiver sensitivity		-122		dBm	1.2 kbps 2-FSK, DEV=4 kHz CHF=11 kHz
		-110		dBm	38.4 kbps 2-GFSK, DEV=20 kHz CHF=104 kHz
Blocking and Selectivity 1.2 kbps 2-FSK, 12.5 kHz channel separation, 4 kHz deviation, 11 kHz channel filter		60		dB	+/- 12.5KHz (adjacent channel)
		61		dB	+/- 25KHz(alternate channel)
		82		dB	+/- 2MHz
		85		dB	+/- 10MHz
Blocking and Selectivity 38.4 kbps 2-GFSK, 100 kHz channel separation, 20 kHz deviation, 104 kHz channel filter		49		dB	+/- 100KHz (adjacent channel)
		48		dB	+/- 200KHz(alternate channel)
		66		dB	+/- 2MHz
		74		dB	+/- 10MHz

■ TC1200-PTIx-N RF Module Pin Configuration

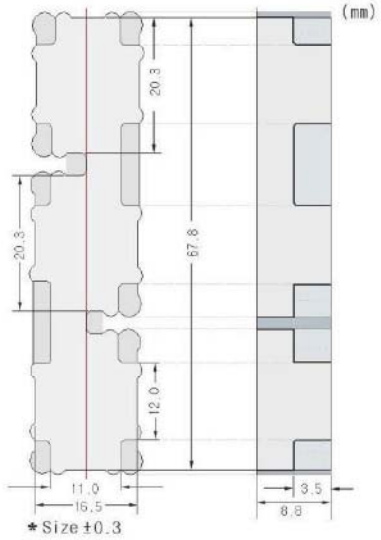


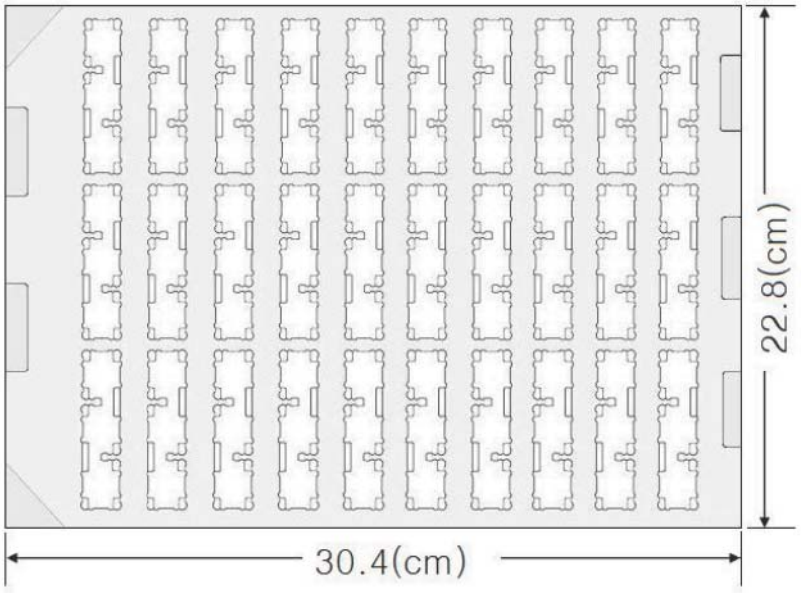
Pin #	Pin name	Pin type	Description
1	VCC	Power (Digital)	Power supply 3.3V
2	SI	Digital Input	Serial configuration interface, data input
3	SCLK	Digital Input	Serial configuration interface, clock input
4	SO	Digital Output	Serial configuration interface, data output. Optional general output pin when CSN is high
5	GDO2	Digital Output	Digital output pin for general use: • Test signals • FIFO status signals • Clear Channel Indicator • Clock output, down-divided from XOSC • Serial output RX data
6	GDO0	Digital I/O	Digital output pin for general use: • Test signals • FIFO status signals • Clear Channel Indicator • Clock output, down-divided from XOSC • Serial output RX data • Serial input TX data Also used as analog test I/O for prototype/production testing
7	CSN	Digital Input	Serial configuration interface, chip select
8	GND	Ground	Ground
9	RESET	Digital Input	Asynchronous, active-low digital reset
10	ANT	RF signal	50 ohm impedance / RX configuration

■ Recommended PCB layout for Module

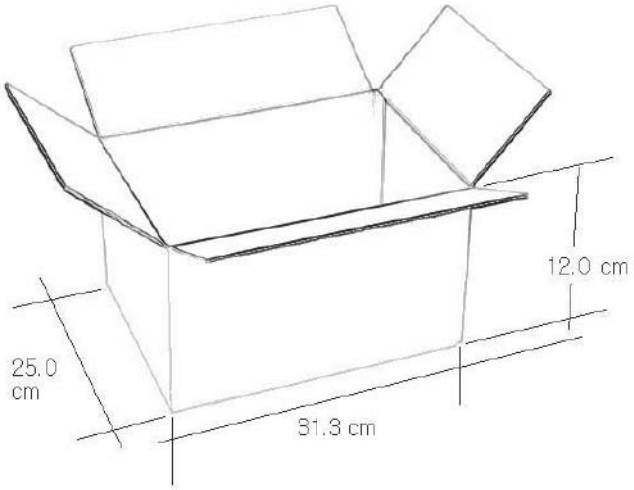


■ Skin packing Information





■ Skin packing box Information



Device	Type	SPQ	Length(cm)	Width(cm)	Height(cm)
TCRF-PT14	Module	600	31.3	25.0	12.0

Document History

Revision	Date	Description/Changes
1.1	2013/11/11	First Release
1.2	2013/12/11	Change skin package box information

This user manual pertains to TAINET Transceiver Module. The Main board can be assembled in the Electronic Water Meter, listed as below;

Model	Model Description
RFD	RF USB Dongle
RFI	RF Transceiver Interface
RFR	RF Network Repeater

FCC Statement:

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/ TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF exposure warning

The equipment complies with FCC RF exposure limits set forth for an uncontrolled environment. The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

End Product Labeling :

The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2AOQRTCRF-PTI4 ".

Information for the OEMs and Integrators

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

1) This device is intended for OEM integrators only.
2) Please see the full Grant of Equipment document for other restrictions.