TM-915 User's Manual

Version 2.0

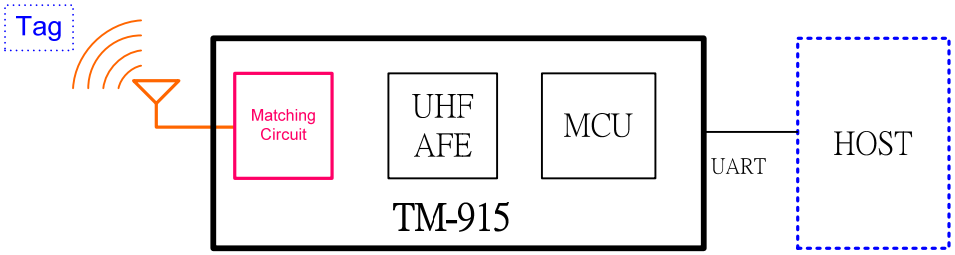
2015/05/13

1 Product Overview

1.1 General Description

TM-915 is designed as handheld reader module for UHF RFID, usually applied to Smart phone, Tablet PC or other handheld device. Our advance technology delivers small, reliable, easy to design and cost-effective EPC C1G2 UHF reader module solution. TM-915 also compatible with ISO-18000-6C. Its simplified Uart interface, low power consumption and high performance, make it easily to integrate any device with UHF technology.

1.2 Application Diagram:



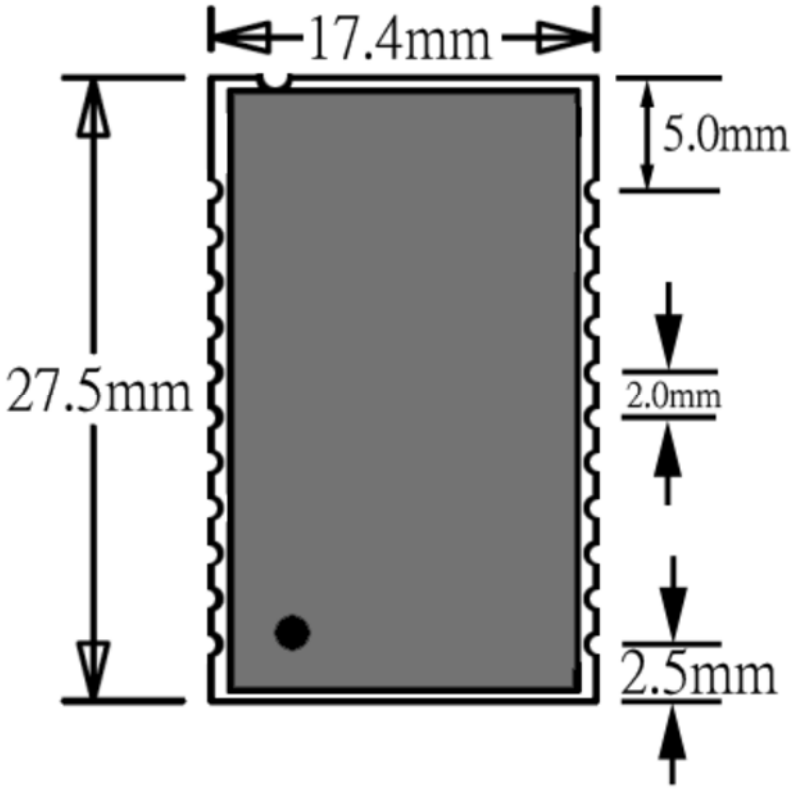
1.3 Features

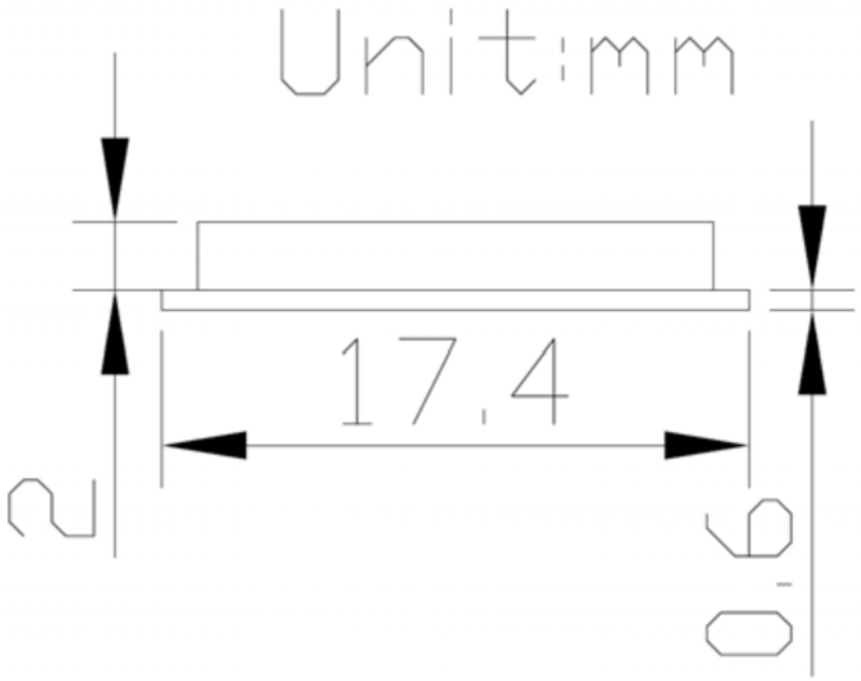
- UHF EPC G2 reader mode
- Compatible with ISO-18000-6C
- Ultra low cost
- Support UART Interface
- Ultra low power consumption
- External antenna option with 50 Ohms output
- Enhanced Noise Filtering for better RF performance

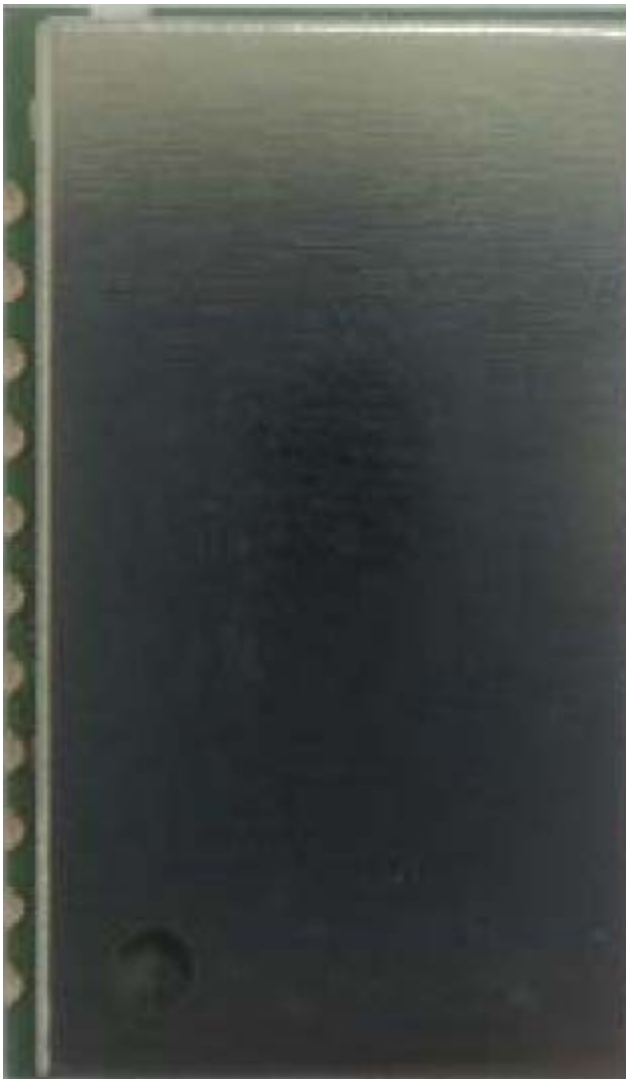
- Easy Connection to Flex antenna

2 Mechanical Characteristics

2.1 Dimensions:



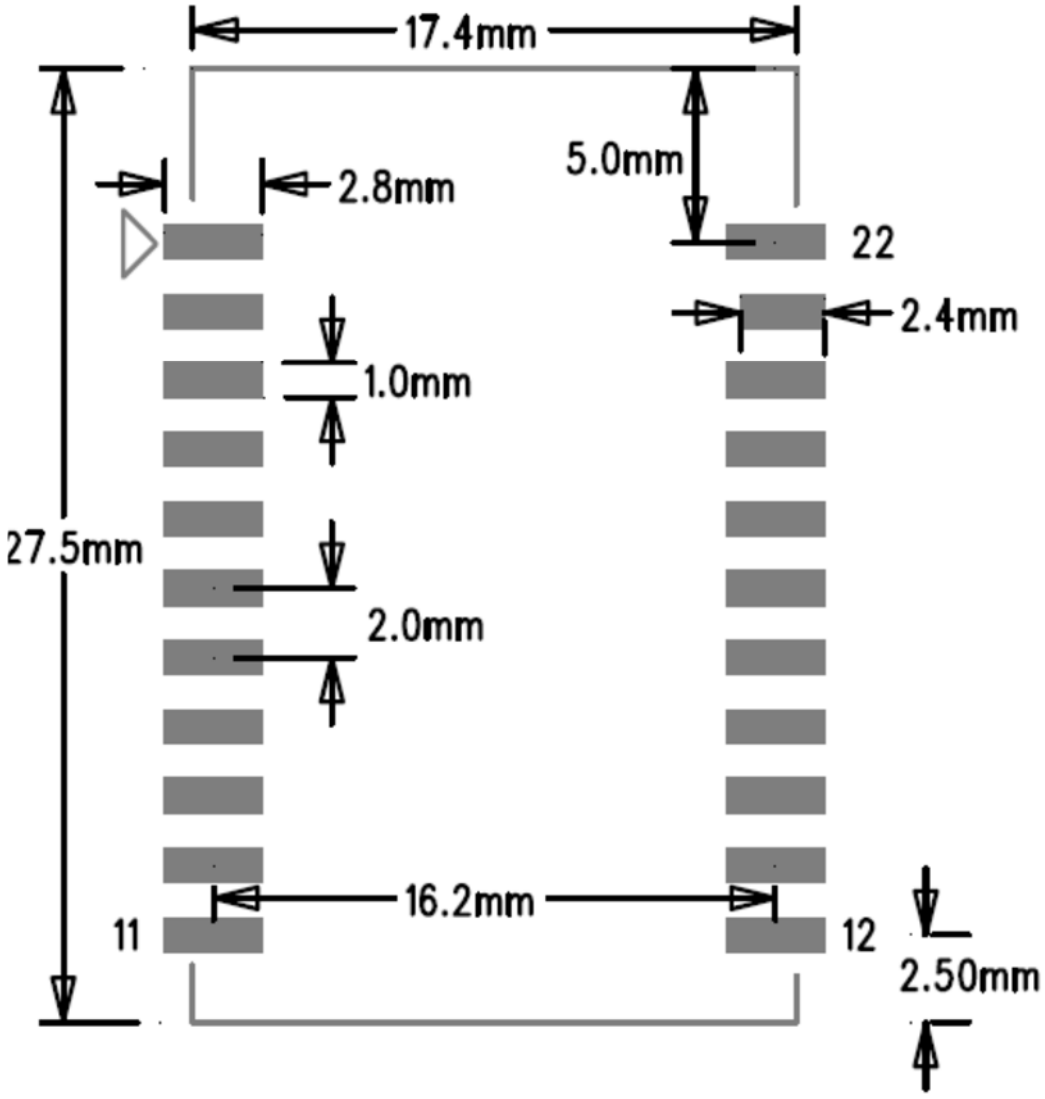

Unit:mm
17.4



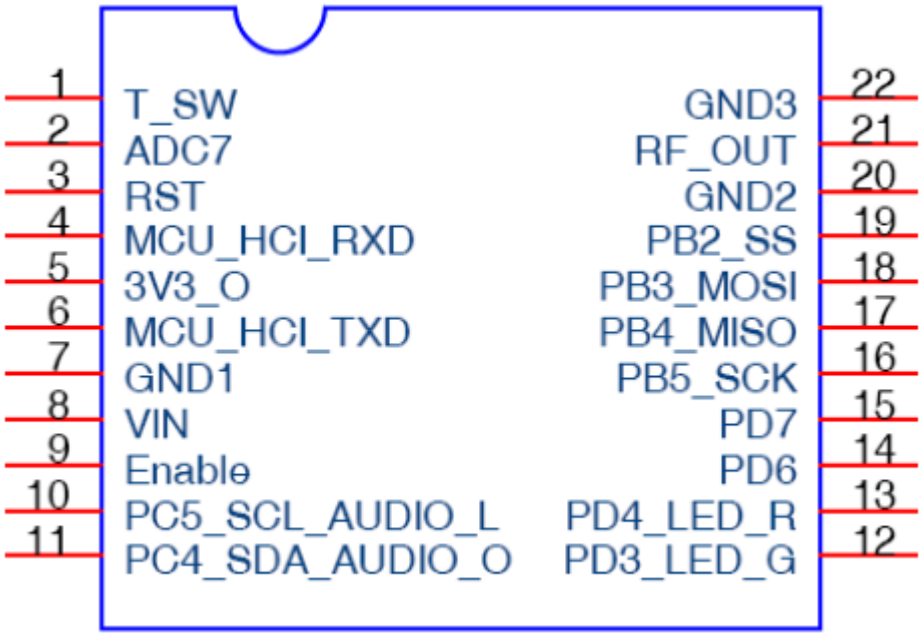
Module Top View

Module Bottom View

2.2 Recommended PCB Footprint



2.3 PIN DESCRIPTION



Pin NO.	Pin name	Direction	Description
1	T_SW	NC	Not connect
2	ADC7	NC	Not connect
3	RST	I	Not connect; L Reset
4	MCU_HCI_RXD	I	UART RX PIN
5	3V3_O	NC	Not connect
6	MCU_HCI_TXD	O	UART TX PIN
7	GND1	P	Ground
8	VIN	P	Power in
9	Enable	I	Module enable; H enable
10	PC5_SCL_AUDIO_L	NC	Not connect
11	PC5_SCL_AUDIO_O	NC	Not connect
12	PD3_LED_G	O	Signal L if Tag Read success
13	PD3_LED_R	O	Signal L if Command receive success
14	PD6	NC	Not connect
15	PD7	NC	Not connect
16	PB5_SCK	NC	Not connect
17	PB4_MISO	NC	Not connect
18	PB3_MOSI	NC	Not connect
19	PB2_SS	NC	Not connect
20	GND2	P	Ground
21	RF_OUT	O	RF output
22	GND3	P	Ground

3 Electrical Characteristics

Operating Temperature Range: 0°C to +50°C

Storage Temperature : -40°C to +85°C

Input Voltage Range: DC 3.6-5.5V (v6.0 only 5V)

TM915 V2.0 (VIN =5V, VSS= 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Average operating current	I_{OC}	-	80	-	mA
Standby current	I_{SB}	-	-	10	mA
Peak current	I_{peak}	100	-	-	mA
Disable current	I_{dis}	-	0.7	1.5	uA

TM915 V3.0 (VIN =5V, VSS= 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Average operating current	I_{OC}	-	280	-	mA
Standby current	I_{SB}	-	30	-	mA
Peak current	I_{peak}	-	300		mA
Disable current	I_{dis}		0.7		uA

TM915 V5.0 (VIN =5V, VSS= 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Average operating current	I_{OC}	-	280	-	mA
Standby current	I_{SB}	-	30	-	mA
Peak current	I_{peak}	-	300		mA
Disable current	I_{dis}		0.7		uA

TM915 V6.0 (VIN =5V, VSS= 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Average operating current	I_{OC}	-	320	-	mA
Standby current	I_{SB}	-	30	-	mA
Peak current	I_{peak}	-	350		mA
Disable current	I_{dis}		0.7		uA

4 System Characteristics

RFID protocol: ISO-18000-6C/ EPC class1 gen2

Operation range: around 100-200mm (30 x 30mm antenna)

Interface:

- UART TTL
- Baud Rate: 38400 (default)
- Data Bits: 8 bit
- Stop Bits: 1 bit
- Parity Bit: none

5 RF Characteristics

RF Output Frequency for reader: 860 - 960 MHz

RF Output Power:

V1.0 : 12dBm

V2.0 : 18dBm

V3.0 : 25dBm

V5.0 : 27dBm

V6.0 : 29dBm

Modulation: ASK

Modulation depth: 90% normally

Data Coding: PIE

Demodulation: ASK

Download data rate: 40K - bps

Data encoding: FM0

6 EMI/EMC/Environmental regulations

Meet NCC regulations:

Meet RoHs regulations

7 SALES AND SERVICE INFORMATION

To obtain information about Jogtek Corp. products and technical support, reference the following information. www.jogtek.com

Jogtek corp: 2F., No.300, YangGuang Street, NeiHu District, Taipei City 114, Taiwan
Tel : +886-2-8797-1112 EXT:500 Fax : +886-2-2659-6884 john@jogtek.com

Federal Communication 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 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.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the following: "Contains FCC ID: VZP-TM915" ".

End Product Manual Information

The user manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the

antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter." 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.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or colocation with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization. This device is intended only for OEM integrators under the following conditions: The antenna must be installed such that 20 cm is maintained between the antenna and users. As long as a condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).