

### Scope

- This document is consistent with WPC and PMA standard receiver modules described.
- The Wireless Power supply's Rx Module shall meet the ROHS requirement.

### Applications

- Smartphone, Notebooks, Tablets
- Wearable devices
- Game accessories
- Power bank, Charging case
- Computer peripheral devices
- Medical Care

### Product Characteristic

The QPR-0303 device is a fully contained wireless power receiver capable of operating in both WPC and PMA protocols which allows a wireless power system to work with both WPC and PMA inductive charging standards. The QPR-0303 device provides a single device power conversion (rectification and regulation) as well as the digital control and communication for both standards. It also has autonomous detection of protocol and requires no additional active devices. The QPR-0303 device complies with the WPC1.2.2 Qi and PMA communication protocol. Together with the WPC or a PMA primary-side controller, the Ti BQ51222 device enables a complete wireless power transfer system for a wireless power supply solution. The receiver allows for synchronous rectification, regulation and control and communication to all exist in a market-leading form factor, efficiency, and solution size.

### Input Characteristics

- Input Voltage & Frequency

Item	Minimum	Normal	Maximum
Input Frequency	110kHz	145kHz	205kHz
Input Voltage	6.5VAC	7.5VAC	15.5VAC

- Energy Consumption  
At 7.5VAC or 15.5VAC, Energy Consumption  $\leq 0.01A$ .

### Output Characteristics (Rx Module)

- Static Output Characteristics (Vo & R+N)

Output Voltage	Rated Load		Peak	Output Range	R + N
	Min. Load	Max. Load			
5V DC	0.05A	1A	1.2A	5V $\pm$ 5.0%	$\leq 250m$ Vp-p

**Note:**

Ripple & Noise: Measurement is done by 20MHz bandwidth oscilloscope and the output end paralleled a 0.1uF ceramic capacitor and a 10uF electrolysis capacitor.

- Line & Load Regulation

Output Voltage	Load Condition		Line Regulation	Load Regulation
	Min. Load	Max. Load		
5V DC	0.05A	1A	$\pm 5.0\%$	$\pm 5.0\%$

### Protection Requirement

- Short Circuit Protection

The input power shall decrease when the output is short to GND, the power supply shall not damage, and shall be self-recovery when the fault condition is removed.

- Over Current Protection

OCP Point Limited: 120%~130% auto restart.

The output shall hiccup when the over current applied to the output, and shall be self-recovery when the fault condition is removed.

### Reliability Requirements

- Reliability Test

Test Items	Test Conditions
Storage at high temperature test	+60°C, 16hours
Storage at low temperature test	-20°C, 16hours
Operating at high temperature test	+40°C, 8hours
Operating at low temperature test	-20°C, 8hours
High/Low temperature cycle test	+45°C (2Hrs) → -20°C (2Hrs) → +45°C (2Hrs) → -20°C (2Hrs) continually work 24hours

- Burn-in : 2hours under 35°C (±5°C), nominal input voltage, nominal load.

### Environment Requirement

- Operating Temperature and Relative Humidity

0°C to +40°C, 20%RH to 80%RH @ altitude should be below 10000 feet.

- Storage Temperature and Relative Humidity

-20°C to +60°C, 10%RH to 90%RH (non-condensing) @ altitude should be below 30000 feet.

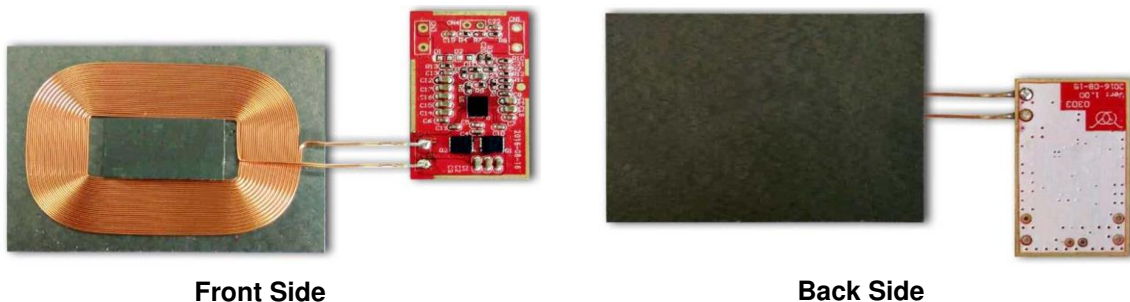
### Execution Standards (Compatible with these specifications)

- EMC Standards

GB9254	GB17625.1	GB13837	FCC-Part15
EN55022	EN55024	CISPR22	EN61000-4-4
EN61000-3-2	EN61000-3-3	EN61000-4-2	EN61000-4-3
EN61000-4-5	EN61000-4-6	EN61000-4-8	EN61000-4-11

- WPC V1.2.2 Qi Standards

### Photo of Product



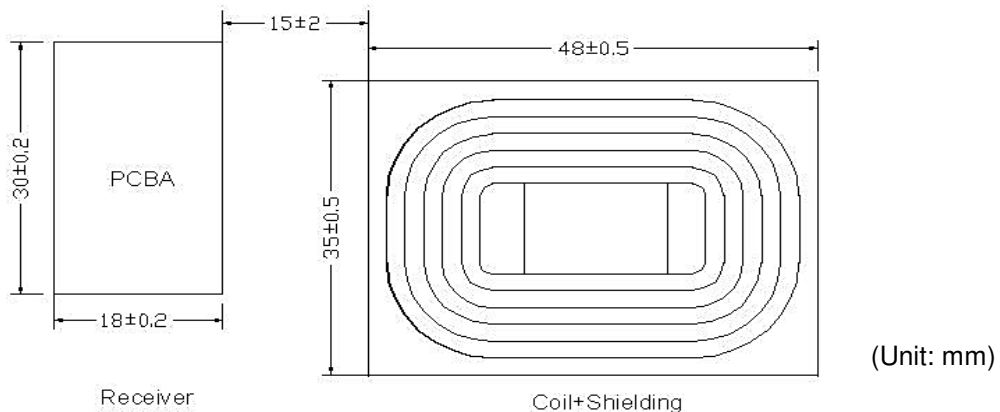
### Module

- Product Design Proposal

According to the standardization of Qi, there are three principles that need to be careful:

- (1) The distance between Tx Coil with PCB and other metal components is Min: 5.0mm
- (2) The distance between the surface of Tx Coil and the surface of product (Working Face) is  $2.0_{-0.25}^{+0.5}$  mm, which means the thickness of the working face plastic is not more than 2.5mm.
- (3) The surface distance between Tx Coil and Rx Coil is 3.5~4.5mm.

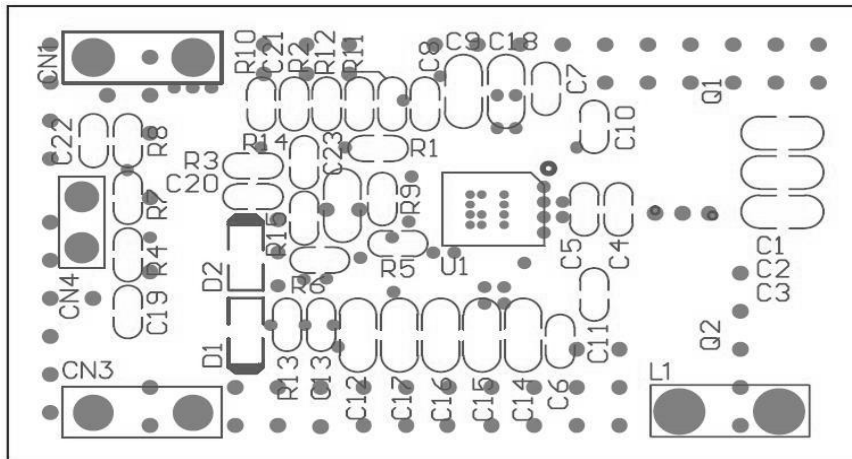
- PCBA Port Functional Illustration



PCBA : 30 \* 18 \* 1.6 mm (Max.)

Coil + Shielding : 48 \* 35 \* 1.5 mm (Max.)

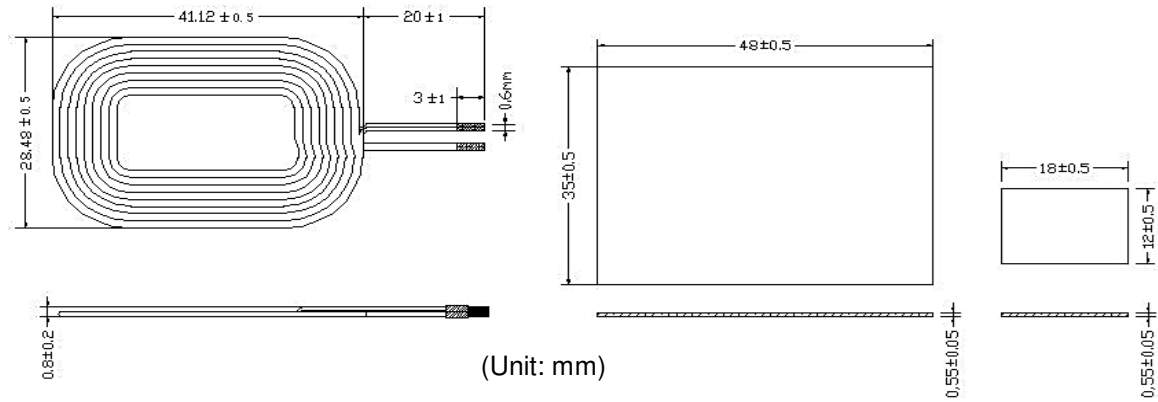
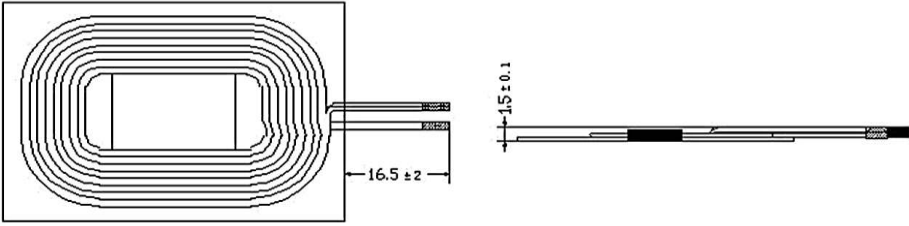
Amount of space between the PCBA to Coil+Shielding as follows: 15 ± 2 mm



- Pin Description

Port	CN1		CN3	
	Right Pin	Left Pin	Left Pin	Right Pin
Function	OUT+	GND	OUT+	GND
Port	L1		CN4	
	Left Pin	Right Pin	Up Pin	Down Pin
Function	Receiver Coil		NTC	

- Rx Coil Spec

Dimensions shown in the drawing:  
 Top view: 16.5 ± 2  
 Side view: 1.15 ± 0.1

**Electrical specification @25°C**

Parameters	Unit	Limit
Inductance, LS @100kHz, 1.0V, 0.30mm*2 → 13Turns	uH	9.75 ± 5%
Q @100kHz, 1.0V	---	25 ± 5%
DCR	mΩ	160 ± 10%

### Others

- Weight : 6 ± 1 g
- Major Test Equipment
  - (1) DC Supply
  - (2) Qi Tx\_Module
  - (3) Electronic Load
  - (4) DPO3014 Digital Phosphor Oscilloscope
  - (5) Logical Analyzer
  - (6) AVID Technologies Qi Sniffer