

Scope

- The purpose of the document is to specify the functional requirement of a Qi Wireless Power Rx Module. (WPC1.2.2 devices are compatible with WPC1.1.2 and early versions)
- The Wireless Power supply's Rx Module must meet the ROHS requirement.

Applications

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

Product Characteristic

QPR-882Q is a WPC1.2 Qi compliant wireless power receiver module. It complies with all Qi wireless charging platform. Its conversion efficiency is up to 78%, can provide up to DC5V/1A transmission capacity. This module enables powering or charging for any DC5V electronic products. It adopts intelligent identification system while its transmitter and receiver unit adopts UART (Universal asynchronous receiver/ transmitter) encrypted transmission control signal which is stipulated by WPC. The console will process the corresponding power adjustment based on the encoding of the receiving unit. This module has fulfilled the WPC Qi requirement and is certified by Qi V1.2.

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 will decrease when the output shorts to GND, no damage to power supply, and resume to work 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) environment, 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.

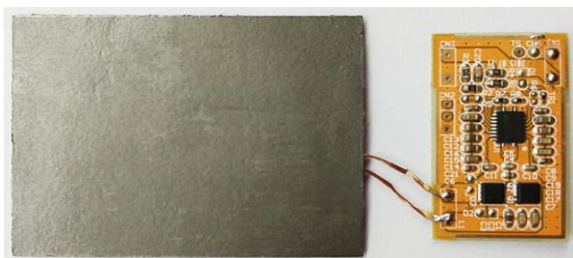
Execution Standards (Compatible with these specifications)

- EMC Standards

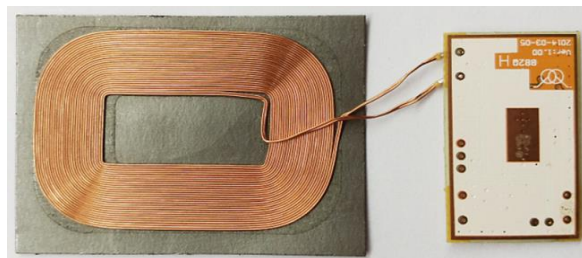
GB9254	GB17625.1	GB13837	FCC-Part15
EN55022	EN55024	CISPR22	EN61000-4-4
EN61000-3-2	EN61000-3-3	EN61000-4-2	EN61000-4-3
EN61000-4-5	EN61000-4-6	EN61000-4-8	EN61000-4-11

- WPC V1.2 Qi Certification

Photo of Product



Front Side



Back Side

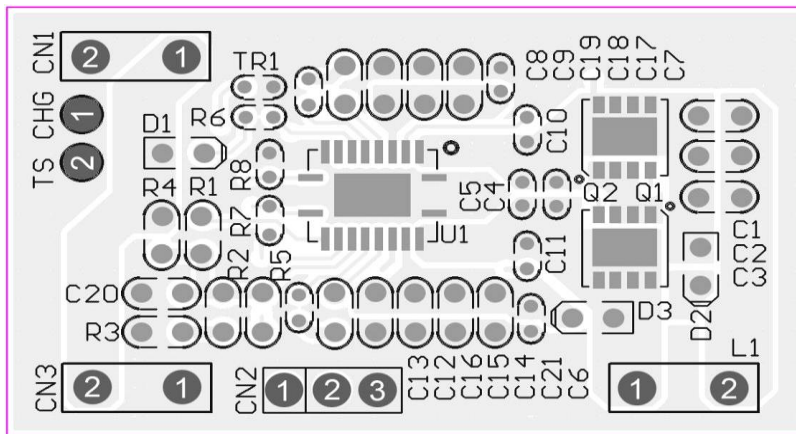
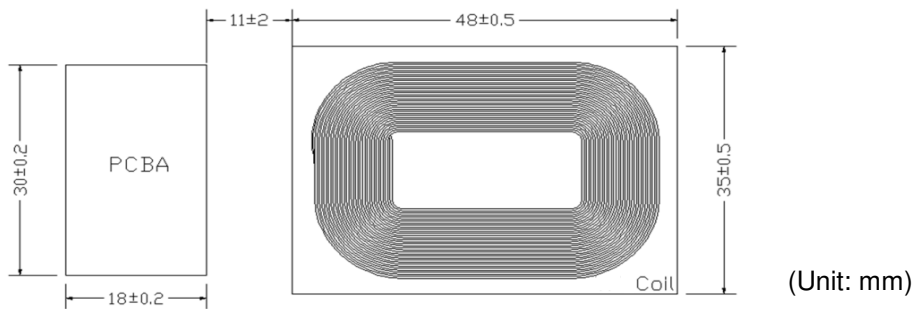
Module

- Product Design Proposal

According to the standardization of Qi, Please note below 3 points :

- (1) The distance between Tx Coil with PCB and other metal components is Min: 4.5mm.
- (2) The distance between the surface of Rx Coil and the surface of product (Working Face) is 1.0~2.0mm, which means the thickness of the working face plastic is less than 1.8mm.
- (3) The surface distance between Tx Coil and Rx Coil is 3.5~5.0mm.

- PCBA Port Functional Illustration



- Pin Description

Port	CN1		CN2		
	Pin 1	Pin 2	Pin 1	Pin 2	Pin 3
Function	DC5V	GND	EN1	EN2	GND
Port	CN3		CN4		L1
	Pin 1	Pin 2	Pin 1	Pin 2	
Function	GND	DC5V	CHG	TS	Receiver Coil

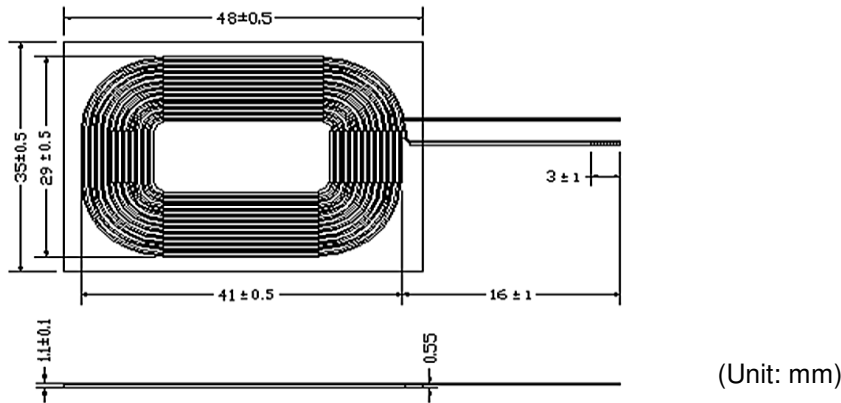
(1) CN1-Pin1: DC5V Output.

(2) CN2-Pin1 / CN2-Pin2:

- EN1/EN2: Inputs that allow user to enable/disable wireless and wired charging <EN1 EN2> :
- <00> wireless charging is enabled unless AD voltage > 3.6 V.
 - <01> Dynamic communication current limit disabled.
 - <10> AD-EN pulled low, wireless charging disabled.
 - <11> wired and wireless charging disabled.

- (3) CN3-Pin2: DC5V Output.
- (4) CN4-Pin1: CHG - Open-drain output – active when output current is being delivered to the load (i.e. when the output of the supply is enabled).
- (5) CN4-Pin2: TS – NTC Temperature Sensor.

● Rx Coil Spec



Electrical specification @25°C

Parameters	Unit	Limit
Inductance, LS @100kHz, 1.0V, 0.280mm*2 → 14Turns	uH	11 ± 10%
Q	---	20 ± 5%
DCR	mΩ	170 ± 10%

The Notices During Installation

- During the installation, please put the Rx coil and PCBA with the mechanical heat radiation point of the product, and thermal grease shall be applied.
- The vertical distance between the working face of Tx coil and working face of Rx Coil has to be kept between 3.0-5.0mm
- The horizontal offset between the working face of Tx coil and working face of Rx coil has to be kept within 5mm.

Note:

For details, please refer 《System Description Wireless Power Transfer》 published by WPC.

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