



## **SPECIFICATION FOR APPROVAL**

**CUSTOMER NAME:** Qi Receiver Module

**CUSTOMER ITEM :** \_\_\_\_\_

**PRODUCT MODEL :** \_\_\_\_\_

**APP Date :** \_\_\_\_\_

|                           |
|---------------------------|
| <b>APPROVAL SIGNATURE</b> |
|                           |

Please return to us one copy of "SPECIFICATION FOR APPROVAL" with you approved signature.

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|----------|----------|----------------|-------------|
|          |          |                |             |

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## 1. Scope

- 1.1. The purpose of the document is to specify the functional requirement of a Qi Wireless Power Supply's Rx Module.
- 1.2. The Wireless Power supply's Rx Module shall meet the ROHS requirement.

## 2. Product Characteristic

This product is a WPC Qi V1.1.2 compliant wireless power receiver module. It complies with all Qi wireless charging platform. It 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 V1.1.2.

## 3. Input Characteristics

### 3.1. Input Voltage & Frequency

| Item            | Minimum | Normal | Maximum |
|-----------------|---------|--------|---------|
| Input Frequency | 110KHz  | 145KHz | 205KHz  |
| Input Voltage   | 6.5VAC  | 7.5VAC | 15.5VAC |

### 3.2. Energy Consumption

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

## 4. Output Characteristics

### 4.1. Static Output Characteristics <Vo & R+N>

| Output<br>Voltage | Rated Load |           | Peak Load | Output Range | R+N       | Remark |
|-------------------|------------|-----------|-----------|--------------|-----------|--------|
|                   | Min. Load  | Max. Load |           |              |           |        |
| 5Vdc              | 0.05A      | 1A        | 1.20A     | 5V $\pm$ 5%  | <250mVp-p |        |

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

### 4.2. Line & Load Regulation

| Output<br>Voltage | Load Condition |           | Line Regulation | Load Regulation | Remark |
|-------------------|----------------|-----------|-----------------|-----------------|--------|
|                   | Min. Load      | Max. Load |                 |                 |        |
| 5VDC              | 0.05A          | 1A        | $\pm$ 5%        | $\pm$ 5%        |        |

## 5. Protection Requirements

### 5.1. 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.

### 5.2. Over Current Protection

OCP Point Limited:120%-300% 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.

## 6. Reliability Requirements

### 6.1. Reliability Test

| Test Items                         | Test conditions   | Test quantity |
|------------------------------------|---|---------------|
| Storage at high temperature test   | +80℃ 16Hrs  | 2PCS          |
| Storage at low temperature test    | -20℃ 16Hrs  | 2PCS          |
| Operating at high temperature test | +45℃ 8Hrs   | 2PCS          |
| Operating at low temperature test  | -20℃ 8Hrs   | 2PCS          |
| Low Temperature turn on test       | EUT should start-up normally after storage at 0℃ of 2 hours under minimum input voltage and maximum load. | 2PCS          |
| High/low Temperature circle test   | 45℃(2Hrs)→-40℃(2Hrs)→45℃(2Hrs) →-40℃(2Hrs)<br>Continually work 18 Hours                                   | 2PCS          |
| Constant Temperature turn on test  | +25℃ 90%RH,continually operating 48 hours   | 2PCS          |

### 6.2. Burn-in

4hours at 35℃(+/-5℃), Nominal input voltage, Nominal load.

### 6.3. Vibration

10 to 300Hz sweep at a constant acceleration of 1.0G (Breadth:3.5mm) for 1Hour for each of the perpendicular axes X,Y,Z

### 6.4. Drop test

Height:1m;the product (individual packaging) should be fell off on the hardwood with the thickness of 20mm,and the hardwood should be put on the cement or on the ground without flexibility. Apply two times on all surface.

## 7. Environment Requirement

### 7.1. Operating Temperature and Relative Humidity

0℃-40℃ 20%RH to 80%RH @Sea level shall below or no more than 10000 feet.

## 7.2. Storage Temperature and Relative Humidity

-30℃ to +70℃ 10%RH to 90%RH(non-condensing) @Sea level shall below 30000 feet.

## 8. Execution Standards (Compatible with these specifications)

### 8.1. EMC Standards

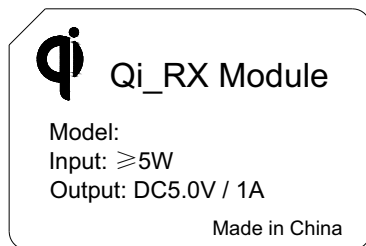
|             |             |             |              |
|-------------|-------------|-------------|--------------|
| GB9254      | GB17625.1   | GB13837     | FCC-Part15   |
| EN55022     | EN55024     | CISPR22     | EN61000-4-4  |
| EN61000-3-2 | EN61000-3-3 | EN61000-4-2 | EN61000-4-3  |
| EN61000-4-5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

### 8.2. Safety Standards

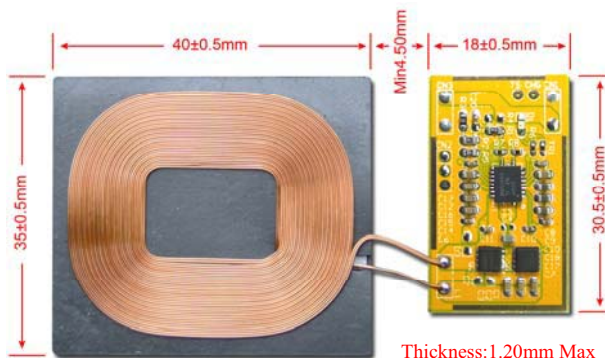
| Certificate | Country   | Standard  |
|-------------|-----------|-----------|
| CCC         | China     | GB4943    |
| CCC         | China     | GB8898    |
| CE          | Europe    | En60950-1 |
| CB          | CB        | IEC60950  |
| KC          | Korea     | Kc60950   |
| UL/CUL      | USA       | UL60950-1 |
| C-TICK      | Australia |           |
| GS/TUV      | German    |           |

### 8.3. WPC\_Qi V1.1.2 Certification

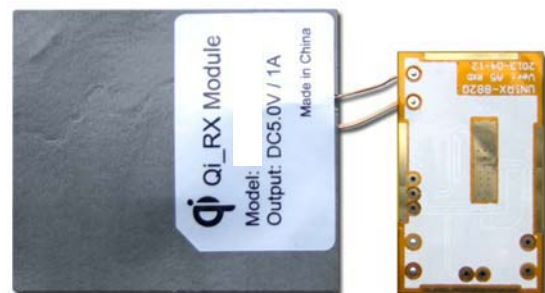
## 9. Label drawing



## 10. Photo of Product



Module Front Side

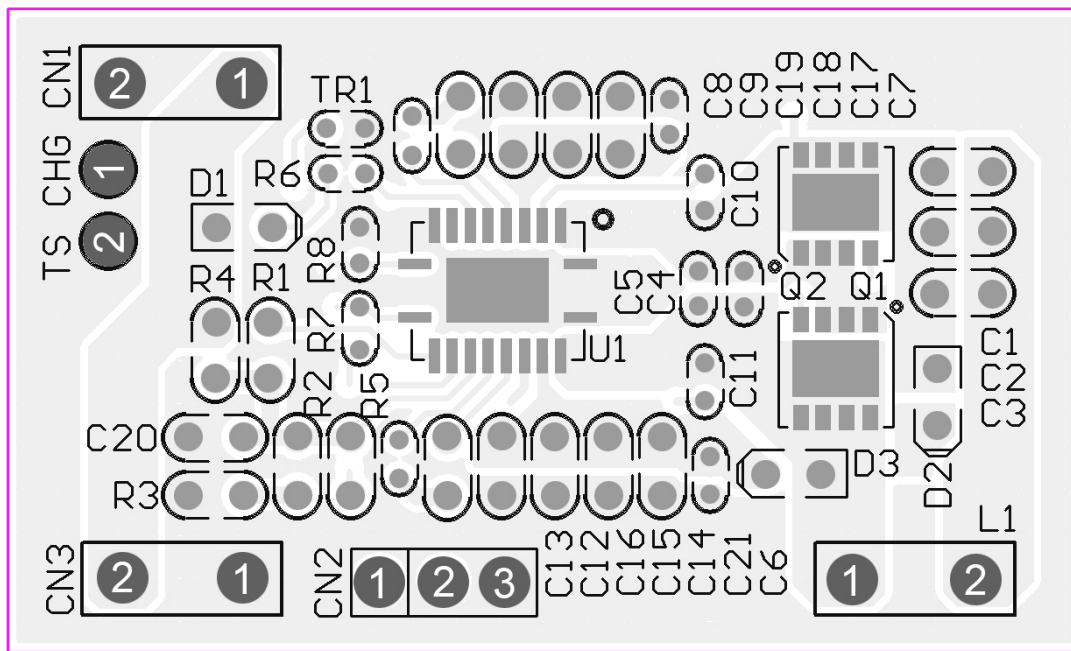


Module Back Side

- Description:
1. The minimum distance between PCBA and other metal components is 4.50mm;
  2. The distance of 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 not more than 1.8mm;
  3. The surface distance between Tx Coil and Rx Coil is 3.0 – 5.0mm;

## 11. Module

### 11.1. PCBA Port Functional Illustration



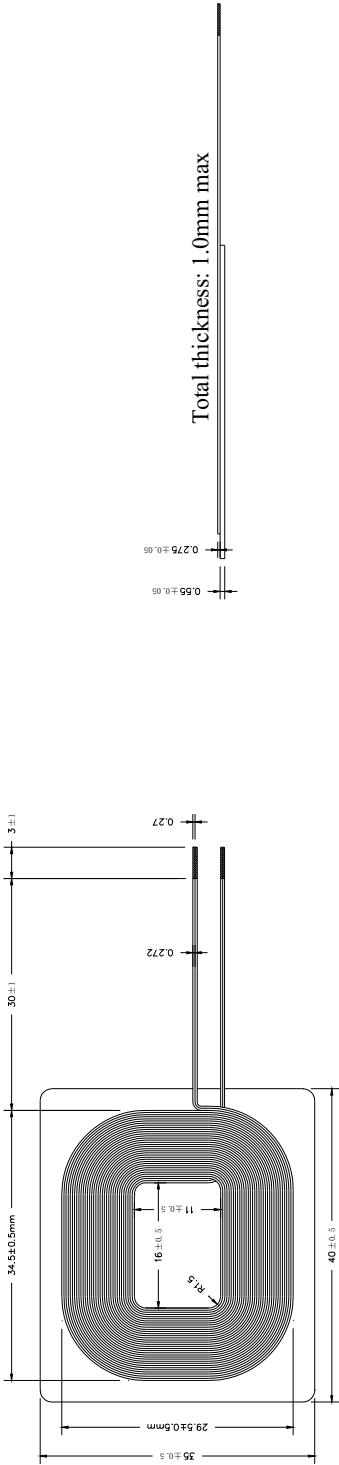
| Port     | CN1  |      | CN2  |      |      | CN3  |      | CN4  |      | L1            |
|----------|------|------|------|------|------|------|------|------|------|---------------|
|          | Pin1 | Pin2 | Pin1 | Pin2 | Pin3 | Pin1 | Pin2 | Pin1 | Pin2 |               |
| Function | DC5V | GND  | EN1  | EN2  | GND  | GND  | DC5V | CHG  | TS   | Receiver Coil |

### 11.2. Pin Description:

- 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 .

Detailed application at the pin, consult ACRON's Engineer, Please

11.3. Rx\_Coil Spec



ELECTRICAL SPEDIFICATION@25 °C

| PARAMETERS  | UNIT  | LIMIT    |
|---|-------|----------|
| Inductance,LS@100KHz,1.0V ,<br>AWG29(0.270mm*2)~17Turns | uH    | 10.5±0.5 |
| Q   | - - - | 24 ± 5   |
| DCR   | m Ω   | 260 ± 5  |

|                  |    |
|------------------|----|
| PART NO          |    |
| DESCRIPTION      |    |
| Dimensions       | mm |
| Modified version | A0 |

## 12. Exterior Features

### 12.1. Size

L \* W \* H

PCBA : 30.5 \* 18 \* 1.2 mm ( Max )

Coil + Shielding : 40 \* 35 \* 1.0mm (Max)

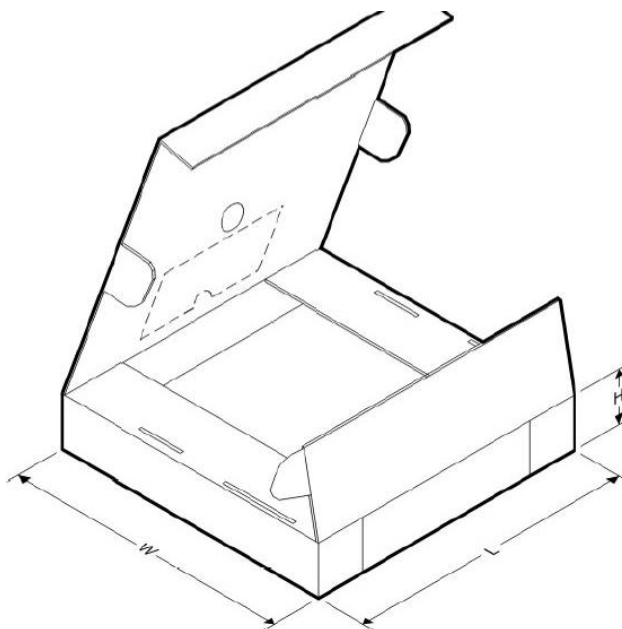
Distance between PCBA and Coil + Shielding  $\geq$  4.5mm

Total : 63 \* 35 \* 1.2mm ( Max )

### 12.2. Weight

$\geq$ 5.0g

## 13. Package Drawing



\*All dimensions are nominal

| Package Type | Package Drawing | SPQ | L(mm) | W(mm) | H(mm) |
|--------------|-----------------|-----|-------|-------|-------|
| Module       | MOD             | 20  |       |       |       |

## 14. Inspection Standards

| NO. | Test project   | Test standard | Sample Level | Test standard   |
|-----|----------------|---------------|--------------|-----------------|
| 1   | Performance    |               |              | Serious defect: |
| 2   | Size           |               |              | Main defect:    |
| 3   | Shell, Package |               |              | Petit defect:   |





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## 15. Major Test Equipment

- 15.1. DC Supply
- 15.2. Qi Tx\_Module
- 15.3. ELECTRONIC LOAD
- 15.4. DPO 3014 Phosphor OSCILLOSCOPE
- 15.5. Logical Analyzer
- 15.6. AVID Technologies QI Sniffer

## 16. The notices during installation

16.1. 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.

16.2. 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;

16.3. The horizontal offset between the working face of Tx coil and working face of Rx coil has to be kept within 5mm. (For details, please refer 《System Description Wireless Power Transfer》 published by WPC)

## 17. Statement

**All rights reserved by ACRON PRECISION IND. CO., LTD. for all of this specification for approval.**

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