



## SPECIFICATION FOR APPROVAL

**CUSTOMER NAME:** 3-Coil Qi Transmitter 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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APPROVED	SALES BY	QUALITY ASSURE	ENGINEERING

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## 1. Scope

- 1.1 The purpose of the document is to specify the functional requirement of a WPC1.1.2\_Qi Wireless Power Supply's Tx Module. (WPC1.1.2 downward compatible WPC1.0)
- 1.2 The Wireless Power supply's Tx Module shall meet the ROHS requirement.

## 2. Product Characteristic

This product is a WPC Qi-compliant multi-function wireless charging platform: Its transmission efficiency is up to 75% and can provide up to 1A transmission capacity. It enables powering or charging for any WPC Qi certified 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.						
Multiple LED indication scheme available for selection :						
Scheme	LED	Operational States				
		Standby	Power Transfer	Charge Complete	Fault	PMOD or FOD Warning
Generic	D9, Blue	Off	Blink slow	On	Off	Off
	D10, Red	Off	Off	Off	On	Blink fast
Generic + standby	D9, Blue	On	Blink slow	On	Off	Off
	D10, Red	On	Off	Off	On	Blink fast
Generic Opt 1	D9, Blue	Off	Off	On	Off	Off
	D10, Red	Off	On	Off	Blink fast	On
Generic Opt 2	D9, Blue	Off	On	Off	Off	Off
	D10, Red	Off	Off	Off	On	Blink fast
Its dedicated power adapter has ultra-wide input voltage design, can work stably under AC100-240V/ 50-60HZ and can be used for users from all countries and regions.						

## 3. Input Characteristics

### 3.1. Input Voltage & Frequency

Item	Minimum	Normal	Maximum
Input Voltage	12.00Vdc	12.50Vdc	13.00Vdc



### 3.2. Input Current

0.7Amax. @12Vdc Full load

### 3.3. Inrush Current (cold)

1.0Amax. @12Vdc Full load & Ambient temperature 25 °C

### 3.4. Energy Consumption

At 12.0VDC or 13.0VDC, Energy Consumption  $\leq$  0.018A

## 4. Output Characteristics (Rx\_Module)

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

Output	Rated Load		Peak Load	Output Range	R+N	Remark
Power	Min. Load	Max. Load				
5W	0.01A	1A	1.2A	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	Load Condition		Line Regulation	Load Regulation	Remark
Power	Min. Load	Max. Load			
5W	0.01A	1A	$\pm$ 5%	$\pm$ 5%	

## 5. Protection Requirement

### 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%-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.

## 6. Reliability Requirements

### 6.1. Reliability Test

Test Items	Test conditions	Test quantity
Storage at high temperature test	+80°C 16 Hrs	2PCS



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

## 6.2. Burn-in

4hours at 40℃(+/-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 fallen 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

-25℃ to +35℃ 20%RH to 80%RH @Sea level shall below or no more than 10000 feet.

## 7.2 . Storage Temperature and Relative Humidity

-30℃ to +40℃ 10%RH to 80%RH(non-condensing) @Sea level shall below 30000 feet.

# 8. Execution Standards (Compatible with these specifications)

## 8.1. EMC Standards/EMC

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

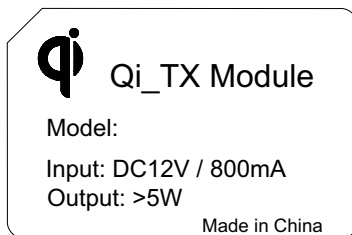
## 8.2. Safety Standards

<b>Certificate</b>	<b>Country</b>	<b>Standard</b>
<b>CCC</b>	<b>China</b>	<b>GB4943</b>
<b>CCC</b>	<b>China</b>	<b>GB8898</b>
<b>CE</b>	<b>Europe</b>	<b>En60950-1</b>

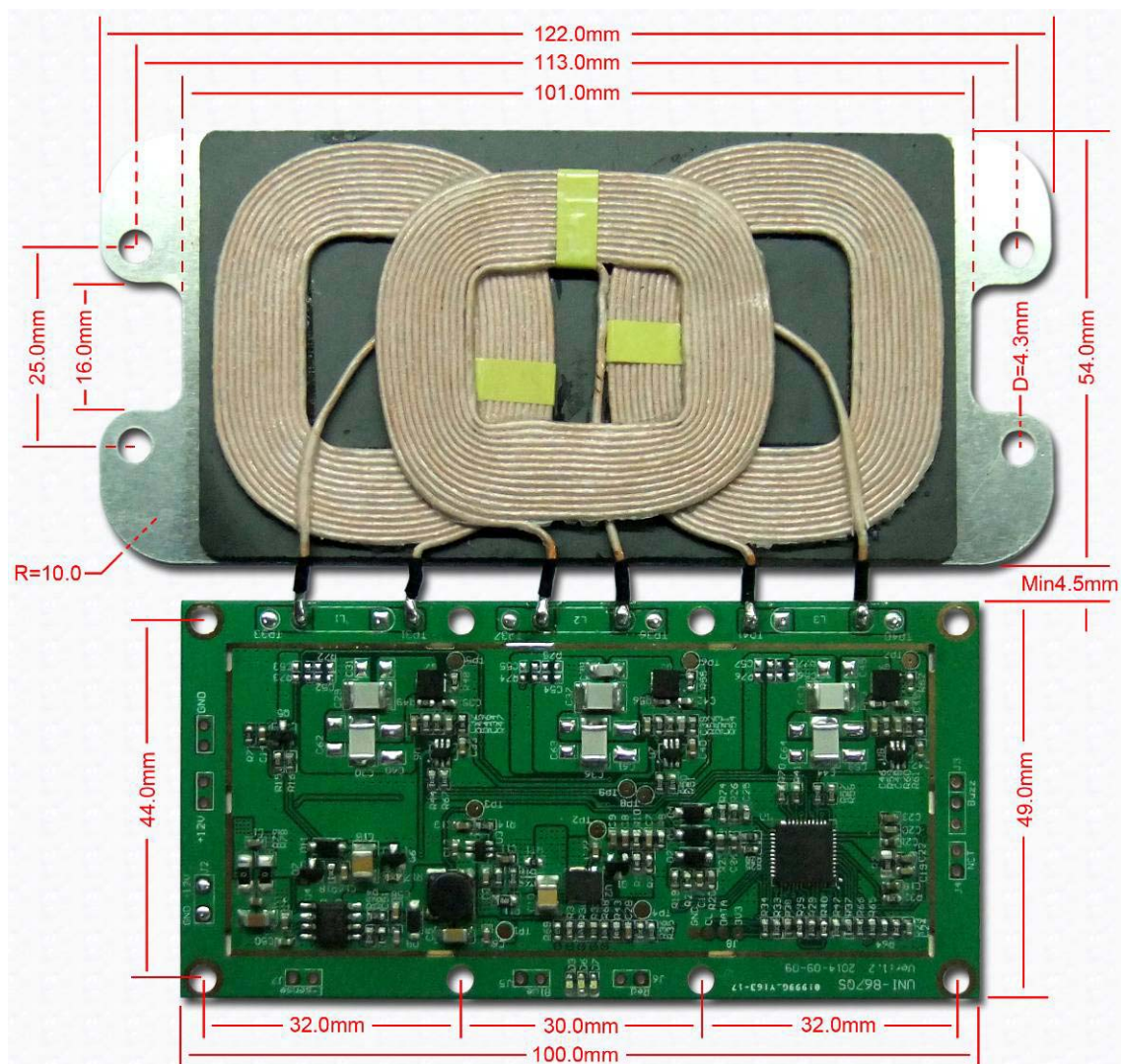
CB	CB	IEC60950
KC	Korea	Kc60950
UL/CUL	USA	UL60950-1
C-TICK	Australia	
GS/TUV	German	

## 8.3. WPC1.1.2\_Qi Standards

## 9. Label drawing

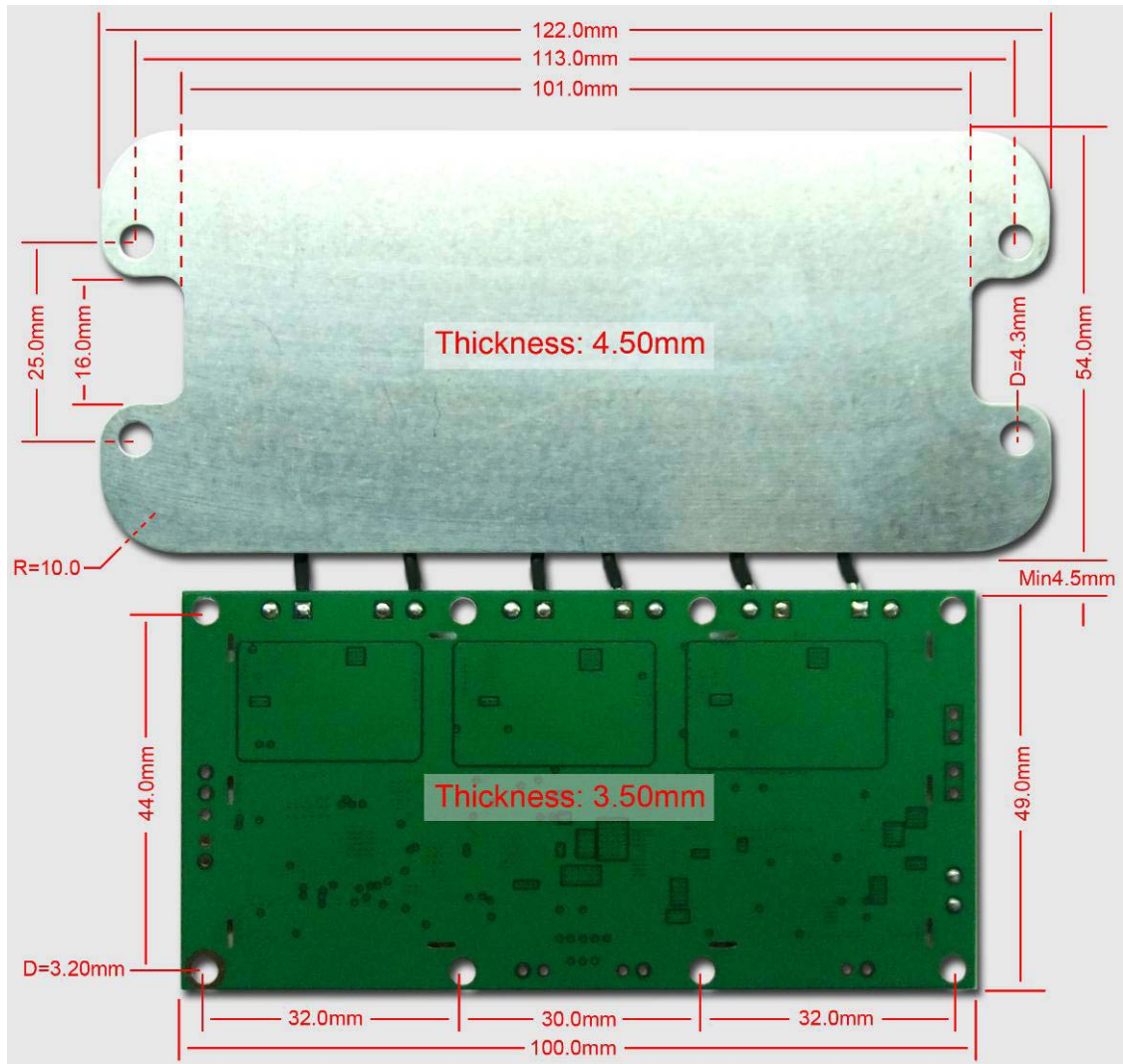


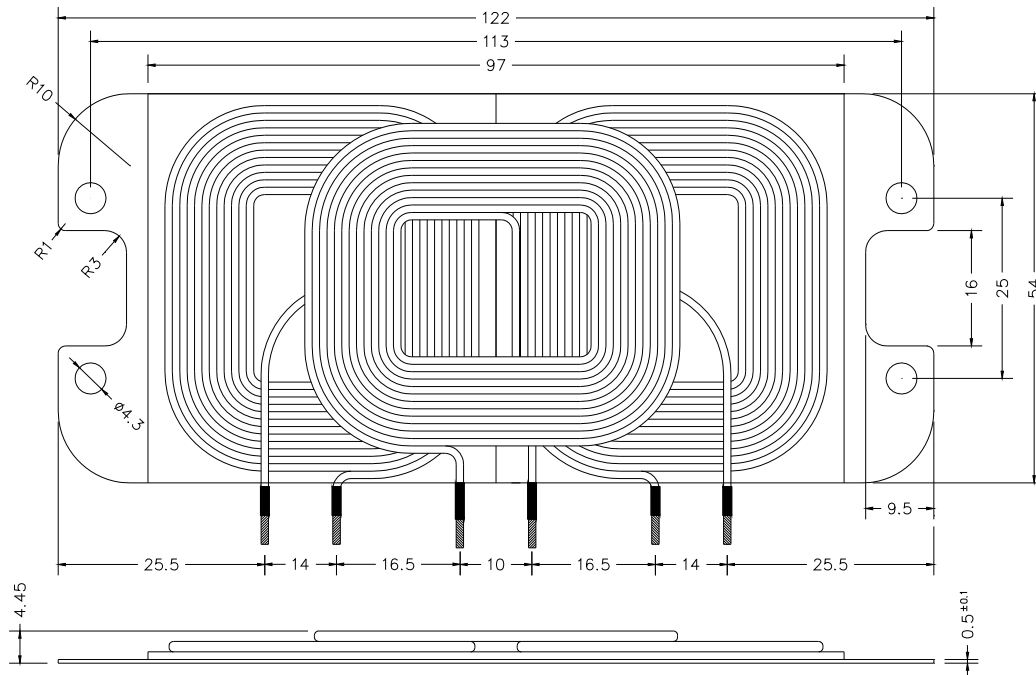
## 10. Photo of Product



Module Front Side



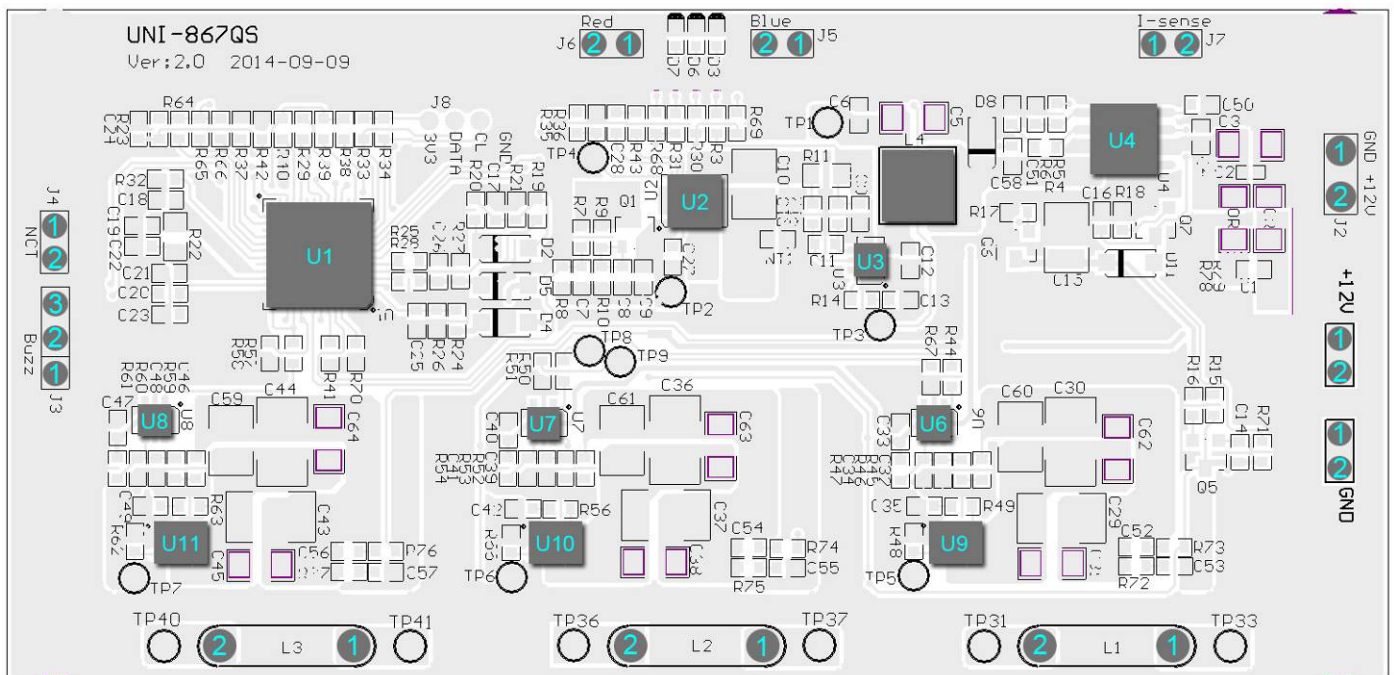




Coil

- Description:
1. According to Qi installation rule, the distance between Tx Coil with PCBA or other metal components is Min: 4.50mm;
  2. The distance between the surface of Tx 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 2.5 – 4.5mm.

## 11.2. PCBA Port Functional Illustration



Port	J2		J3		J4		J5		J6		+12V
	J2-1	J2-2	J3-3	J3-2	J4-1	J4-2	J5-1	J5-2	J6-1	J6-2	
Function	GND	+12V	GND	BUZZ	NTC	GND	Blue LED+	GND	GND	Red LED+	DC12V +





PARAMETERS	UNIT	LIMIT		
		L1	L2	L3
Inductance,LS@100KHz,1.0V , 纱包线 Φ0.08mm*100 ~12Turns	uH	12.5±10%	11.5±10%	12.5±10%
Q	- - -	75±10%	85±10%	75±10%
DCR	mΩ	55±10%	55±10%	55±10%

PART NO	
DESCRIPTION	
Dimensions	mm
Modified version	A2
Modified by	David
Modified Date	Mav - 17 - 2013

## 12. Exterior Features

### 12.1.Size

L \* W \* H

PCBA : 100 \* 49 \* 3.5 mm

Coil + Shielding : 122 \* 54 \* 4.5mm

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

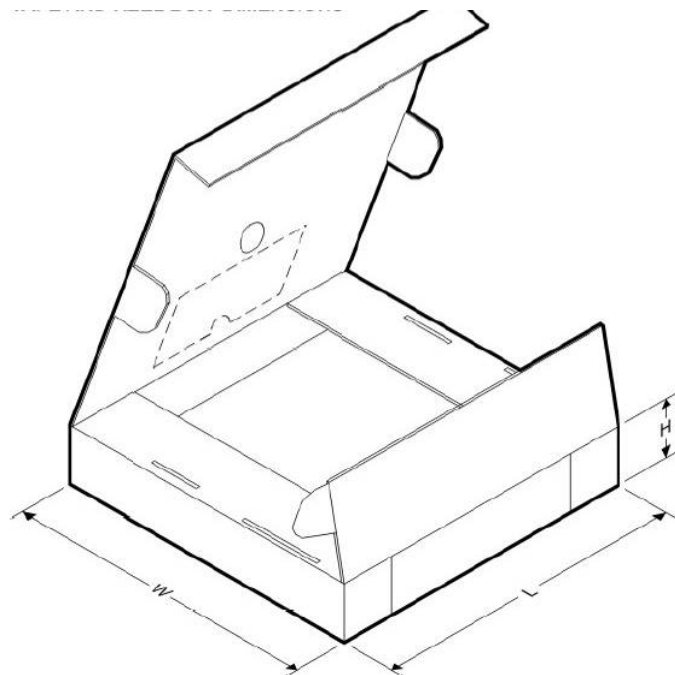
Total : 122\* 108 \* 4.5mm

122 \* 108 \* 4.5 mm (108mm length is the total length including the 5.0mm gap between the PCBA with transmitter coil)

### 12.2. Weight

70 $\pm$ 5 Gs

## 13. Package Drawing



\*All dimensions are nominal

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

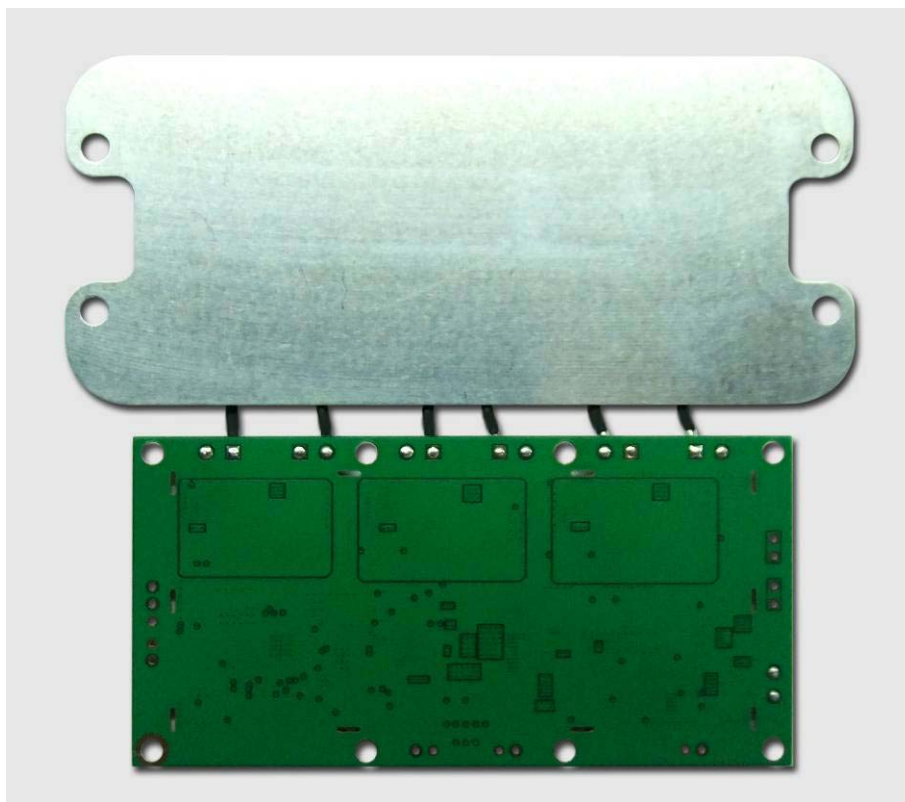
## 14.Inspection Standards

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

## 15. Major Test Equipment

- 15.1. DC Supply
- 15.2. Rx\_Module
- 15.3. ELECTRONIC LOAD
- 15.4. DPO3014 Digital Phosphor OSCILLOSCOPE
- 15.5. Logical Analyzer
- 15.6. Q110 Qi BST (Base Station Tester)

## 16. The notices during installation



Add a cooling plate

16.1.1 The cooling plate performs the best cooling effect if it is being exposed outside the plastic cover of the product.

16.1.2 The distance between the highest PCBA component and the product itself is  $\geq 2.0\text{mm}$

## 17. Statement

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

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