

Shenzhen Zhiwei Wuxian Technology Co., Ltd.

Shenzhen ForWireless Technology Co., Ltd

Acknowledgment Letter

APPROVAL SHEET

Product Part Number:		Customer Name:	Shenzhen Zhifu New Energy Co., Ltd.
Product Model:	ZF-5W-Tx	Customer Model:	
Product Specifications:	5W wireless charging TX	Customer Material Number:	3.02.06.0035
Version:	V1.0	Sample submission date:	2023.01.12
Sample quantity:	5		

Manufacturer Approval:

Drafted	Review	Approval
Zhong Yuan	Zhang Chengwei	Zhang Liang



Customer acknowledges:

Project	Test Results	Tester	Review	Approved (Official Seal)
Performance				
Structure				

Address: Room 415, Building B, Lingnan Chuanggu, Shiyan Subdistrict, Bao'an District, Shenzhen;
Tel: +86-13670102812 | Fax: +86-755-23003362

Note:Please have the client carefully compare the sample with the test results and, upon confirmation, sign and stamp the document before returning it. If the document is not returned within 7 working days, it shall be deemed as accepted and approved by the client; in the event of any issues arising during subsequent production, our company shall not be held liable!

I. Scope of Application

This specification document provides an overview of the product, along with its product specifications and technical parameters.

II. Overview

This wireless charging transmitter module is a 5W transmitter specifically designed to meet the wireless receiving requirements of the Qi standard; it complies with the WPC 1.2.4 standard and holds CE/FCC product certifications. It utilizes Yingji Core's 5W solution, which offers stable performance and low standby power consumption. The unique PWM modulation mode significantly enhances conversion efficiency, effortlessly delivering the convenience of wireless charging. With high output efficiency and a built-in ratio between transmitter and wireless receiver power levels, the module enables precise control over transmitter energy loss. Featuring a minimal number of components, it delivers excellent cost-performance ratio and requires no debugging – simply plug and play. It effortlessly meets all certification requirements, making it ideal for various wireless charging devices compliant with the Qi standard – such as Bluetooth speakers with wireless charging functionality, desk lamps, or portable power stations.

Module Features:

- 1: Designed in strict compliance with QI standards; compatible with all receivers that meet QI standards;
- 2: The module features overvoltage protection (OVP 13.5V $\pm$ 0.5), undervoltage protection (UVP 4.2V $\pm$ 0.2), overcurrent protection (OCP 5V 2.2A $\pm$ 0.1; 9V/12V 1A $\pm$ 0.1), overtemperature protection (power reduction at 60°C; charging termination at 65°C; resumes operation when temperature drops below 50°C), and Foreign Object Detection (FOD), among other features;
- 3: 9V–13V input; standby power consumption <20 mA; efficiency> 75%; simple peripheral circuit design with high cost-effectiveness.

Product Specifications:

1. Input port: One 2-pin 2.0mm terminal cable (pin 1 connects to the red wire; pin 2 connects to the black wire); cable model: 3239 22AWG, length L = 150 mm. Input voltage/current: 9 V–13 V / 1 A; Output voltage/current: 5 V $\times$ 1 A.
2. Output port: 1 A11 transmission coil, equipped with a 0.5 mm adhesive-backed sponge pad; Dimensions: Diameter 50 mm; Inductance: 6.3 μ H $\pm$ 10%.
3. PCB dimensions: 65 mm $\times$ 55 mm $\times$ 1.0 mm (length $\times$ width $\times$ thickness);
4. Environmental temperature: Storage: -20°C to 60°C; Operating: -10°C to 40°C;
5. Operating frequency: 110 kHz–205 kHz;
6. Charging range: 1–8 mm; Horizontal displacement range: $\pm$ 8 mm (refers to the offset distance between the center positions of the transmitting coil and the mobile phone's receiving coil);
7. NTC thermistor parameters and protection mechanism: For a 100 k Ω NTC thermistor with a B-value of 3950 and a wire length of 40 mm, when the temperature exceeds 60°C, the Tx terminal reduces its power output (the power decreases as the temperature rises), preventing the mobile device from overheating and stopping charging. If the temperature continuously rises above 65°C for more than 1 minute, the Tx terminal stops charging the Rx terminal; once the temperature falls below 50°C, normal operation resumes.

III. Performance Parameter Testing (Ambient Temperature: 26°C):

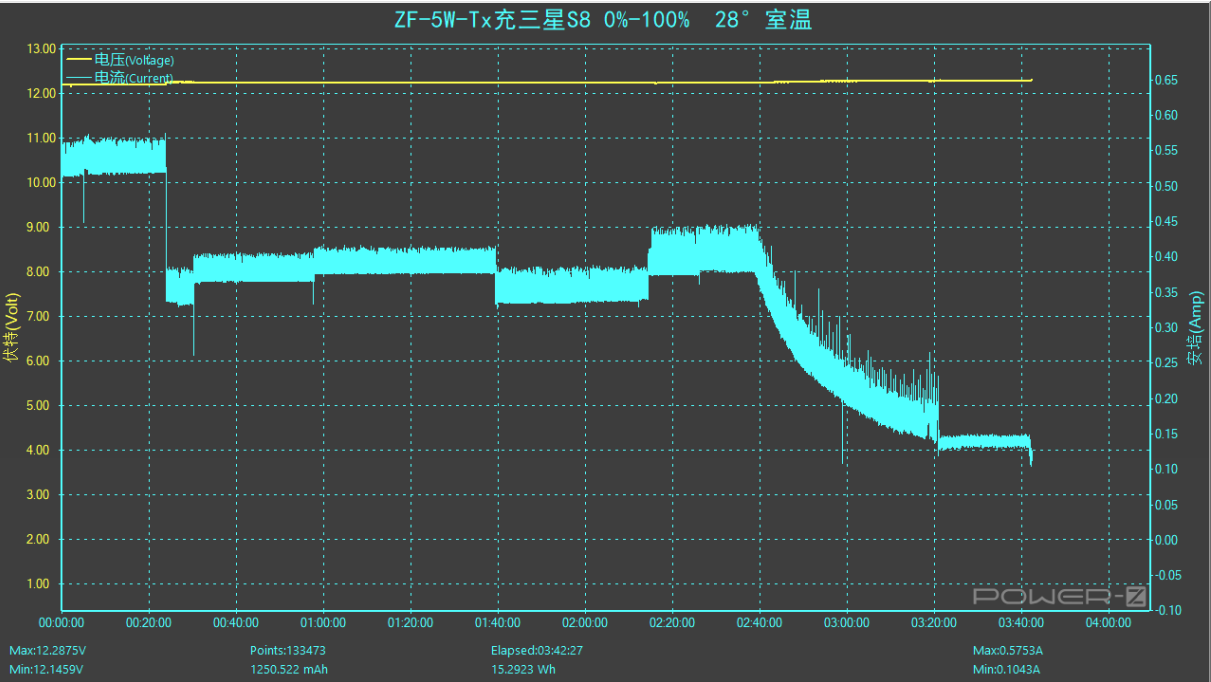
Electrical Testing Items

NO	Test Item	Test Standards	Test Description	Results
1	Standby mode and power consumption	<20mA	Power supply voltage:9–13 V; Standby current:15 mA;	OK
2	Compatibility Matching Test	Reception Compatibility	Test whether the TI/NewJie/Kuper 5W receiver attachment, universal 10W/15W connection fixtures, and devices such as iPhone X, iPhone 12, and Samsung S8 are compatible: Yes (☒) , No ()	OK
		Adapter	QC2.0/3.0 adapters, PD adapters – subjected to multiple ON/OFF switching cycles for DC power supply; does charging function normally? Yes (☒) , No ()	OK
3	Load Efficiency Test (Stabilized DC Power Supply + Electronic Load)	> 72 %	TX: 12 V; RX: 5 W fixture. Vout:5 V; Iout:1 A; Vin:12 V; Iin:0.554 A; Efficiency:75.2%	OK
4	FOD Foreign Body Detection	TX output disconnected	Place a 1-yuan coin at the center of the coil to test the static FOD; Samsung and Apple smartphones will not charge. Yes (☒) , No ()	OK
			Place a 1-yuan coin inside the coil to test for static FOD; if the Samsung or Apple smartphone does not charge – Answer: (☒) , Otherwise ():	OK
5	NTC Temperature Protection	65°C reporting range ($\pm$ 10%)	Set the hot air gun to 100°C to heat the NTC resistor on the PCBA for 1 minute;disconnect the TX output;set the cutoff temperature to 70 °C; resume operation once the temperature falls below 50°C;	OK
6	Light indicator	As required	Power-on standby:Low level; Operating:High level; Abnormal:Output 50% Flash PWM wave	OK
7	Fast Charging Compatibility Test	Adapter	For different adapters – does Samsung or Apple smartphone support fast charging? Does the adapter support fast charging output? Yes (☒) , No ()	OK

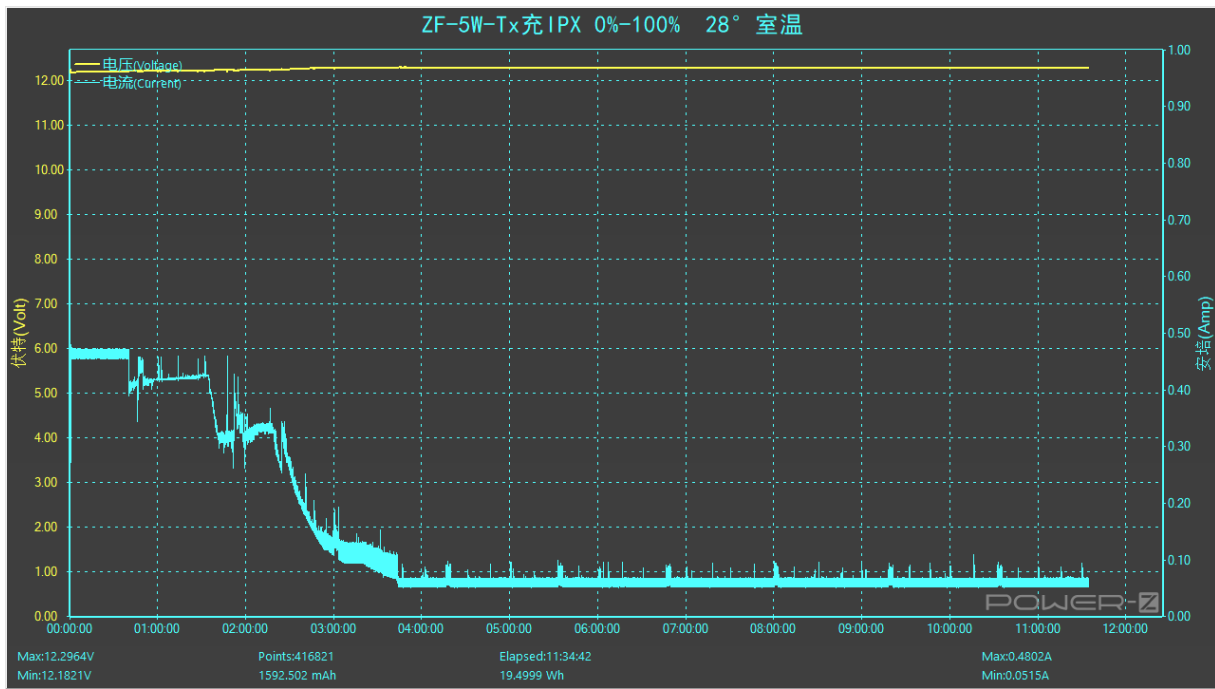
8	Under-voltage and over-voltage protection	Low voltage	When a low-voltage alarm is triggered, the power supply voltage is <u>4.2</u> V.	OK
		Overvoltage	When overvoltage alarm occurs, the power supply voltage is <u>13</u> V.	OK
9	Mobile phone charging stability	Continuous charging	Use your smartphone to perform tasks (e.g., recording video, using navigation, etc.) while charging; check for any charging interruptions. Apple (√) Samsung (√)	OK
10	Noise Test	Mild	Does any noise or abnormal sound occur during the charging process? <u>Slight noise under low electronic load</u>	OK
11	Full-load aging and temperature	≤80℃	After aging for 60 minutes under the maximum stable load current, the peak temperature at the <u>main control IC</u> is <u>75</u> °C.	OK
12	Load lifting and switching test	Normal	When the electronic load is adjusted or switched, is the wireless charging functioning normally? () / (×)	OK
13	Output Overcurrent Protection	Protection	Is the electronic load output setting configured with shutdown protection? Yes (√) No ()	OK
14	Mobile phone charging time	Within 300 minutes	At a temperature of 28°C, the charging time from 0% to 100% for a Samsung smartphone is: Samsung S8 - <u>3 hours 40 minutes</u>	OK
			At a temperature of 28°C, the charging time from 0% to 100% for an iPhone is: iPhone X <u>3 hours 48 minutes</u>	OK
			At a temperature of 28°C, the charging time for an iPhone from 0% to 100% is: Apple iPhone 12 - <u>3 hours 32 minutes</u>	OK
15	Mobile phone charging curve	Full	Mobile phone test images are shown in Figures 1, 2, and 3.	OK

Apple and Samsung smartphones – EB System ambient temperature (28°C) charging test curve				
Charging Process Monitoring	Send via mobile phone Thermal condition	Presence/absence Abnormal noise	Presence of intermittent charging (number of intermittent charging cycles during the 0–100% charging range ≤ 2)	Note
	<40℃	None	None	The following mobile phone charging curve is for reference only (mobile phone wireless charging is significantly affected by factors such as ambient temperature and placement location; this curve should not be used as a definitive criterion).

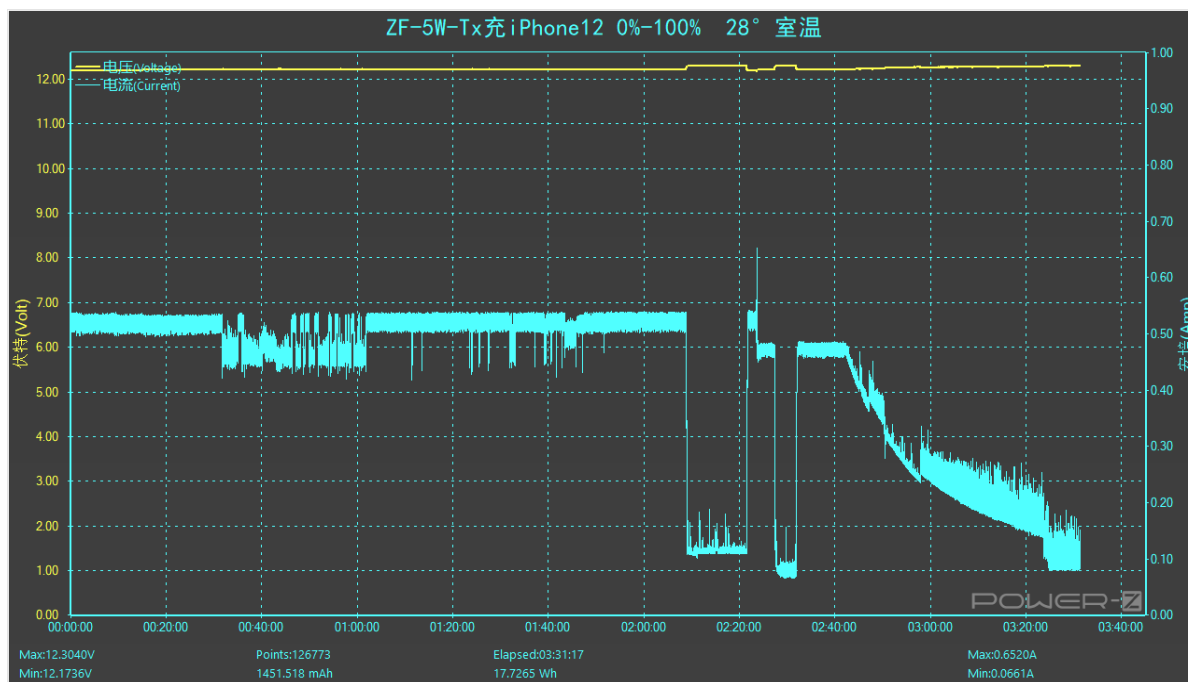
1. Samsung S8 Smartphone Charging Curve Graph



2. iPhone X charging curve graph

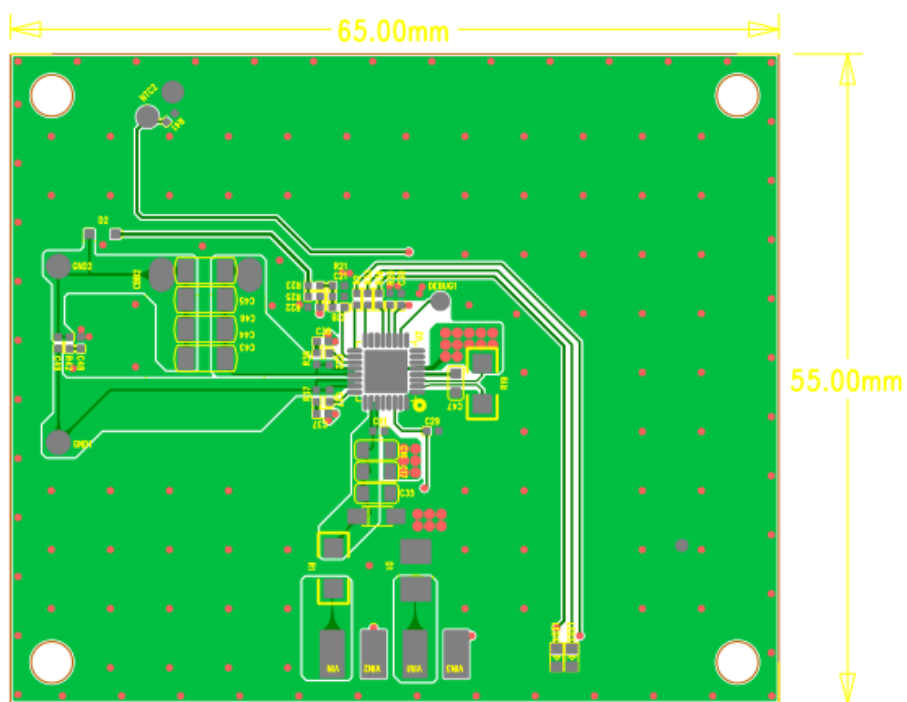


2. iPhone 12 charging curve graph

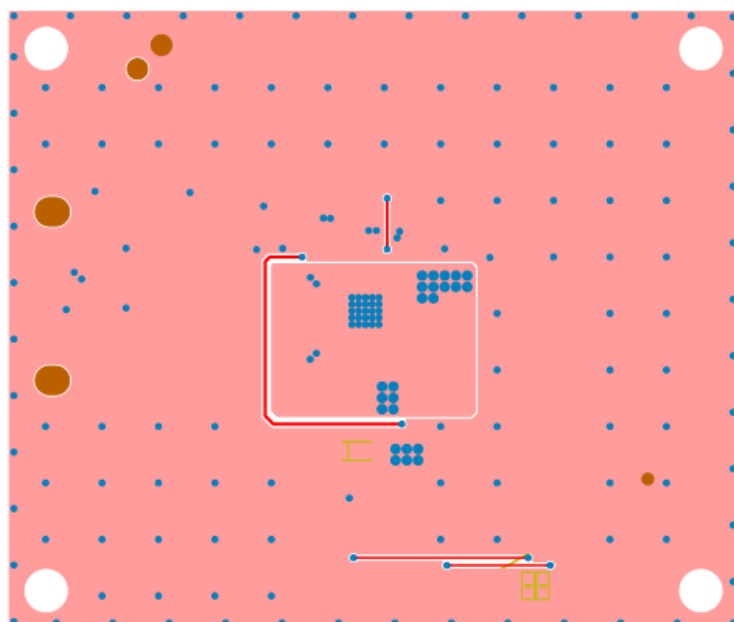


IV. PCB Layout Diagram

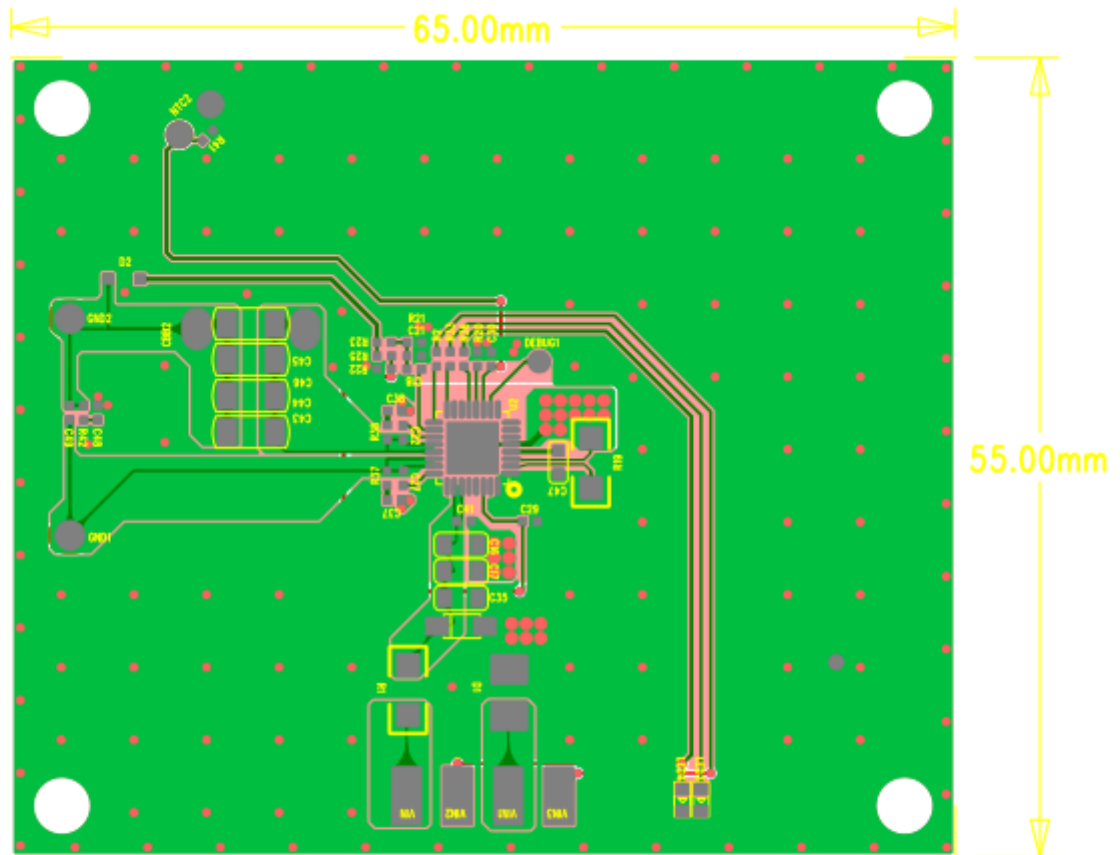
Top Floor



Bottom Layer



Schematic Diagram



工艺要求:

FR4

板厚1.0MM

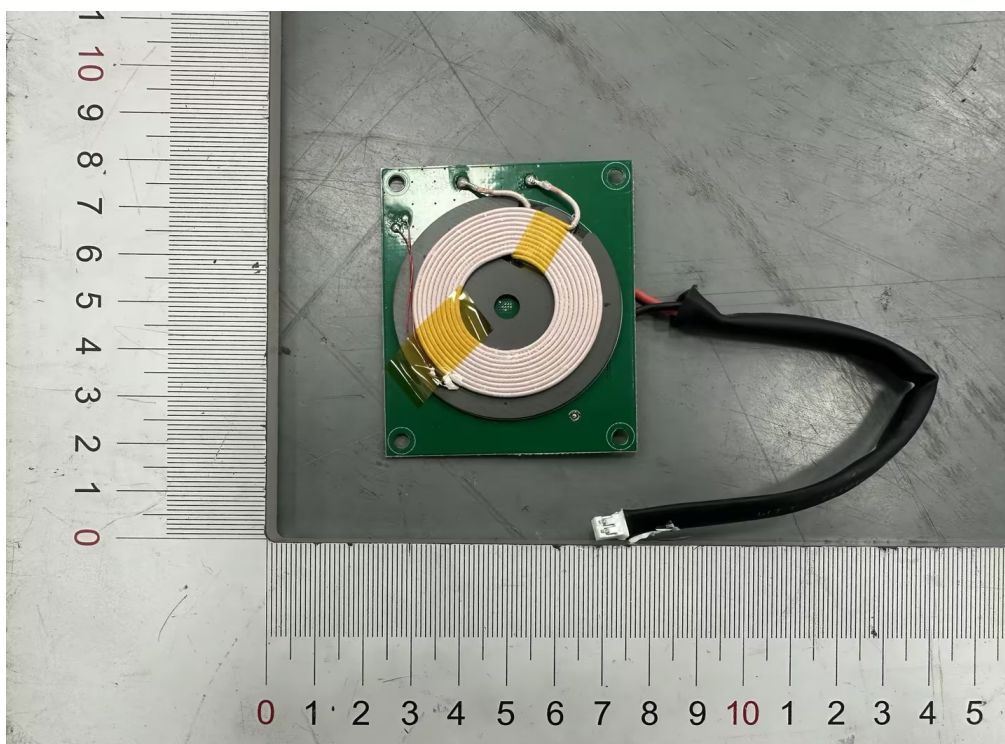
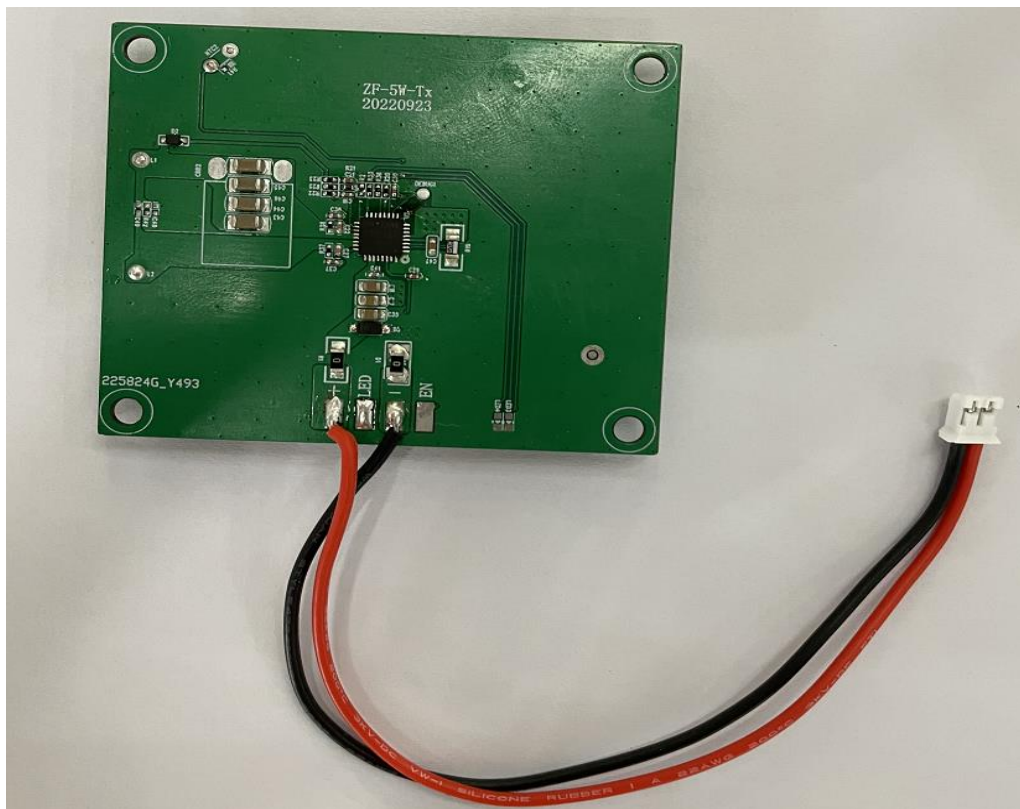
铜厚1盎司

绿油白字

过孔盖油

无铅喷锡

V. PCBA Physical Diagram



Turns : 10Ts