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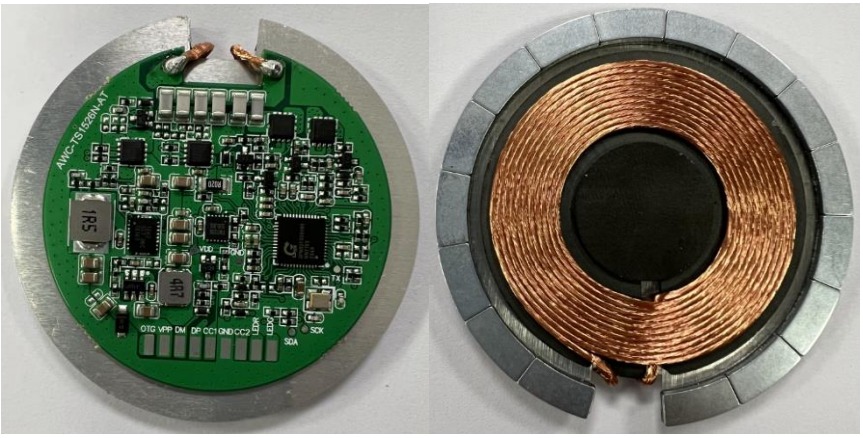
ZXY-TS1526N-AT

Qi2.0 Certified wireless charging module



Revision History

DATE		
2024/Jan	V1.0	Officially release

Trademarks

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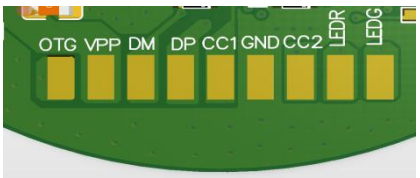
1. Product Introduction

The ZXY-TS1526N-AT is a QI2.0 certified MPP module that supports the MPP2.0 15W and Apple7.5W And BPP 5W protocols, expanding more interfaces to support more applications. Please pay attention that the upper cover of product ID thickness is recommended 1.0mm ± 0.05mm. To achieve better magnetic force and compatibility, it is necessary to ensure that the thickness of upper cover meets the specification requirements, and material of upper cover can't be metal or ferromagnetic.

2. Product Specification

Descriptions	SPEC	
Input Power	PD USB-C mode	9V--2.22A/5V--3A
	QC USB-A mode	9V--2.22A/5V--3A
	DC mode	9V≥2.22A/5V—2.4A
Output Power	MPP-15W/Apple7.5W/BPP-5W (15W Max)	
Standby Power	＜0.75W	
System Efficiency	Max efficiency	＞80%
Coil Type	8.4uH ±5% @360KHz	
Frequency	BPP mode	128KHz
	MPP mode	360KHz
Protection	OVP/UVP/OCP/OTP/FOD	
Input OVP	9V Input	Protection alarm above 10V
	5V Input	Restart above 6.5V
Input UVP	9V Input	Reduce power below 8V, restart below 6.5V
	5V Input	Reduce power below 4.4V, restart below 4.2V
OTP	Trigger:75℃ Recover:55℃	
FOD	Q test (pre-power transfer)/Power Transfer FOD	
Main Chips	Generalplus MCU	GPM32FD0338B
	Authentication chip	FM1230 (Fu dan)
Certification	QI2.0 MPP	
Interface	Power pins: VPP, DM, DP, CC1, GND, CC2	
	LED pins: LEDR, LEDG, GND	

	Debugging and burning solder joints: VDD, SDA, SCK, GND	

3. Environment Characteristics

OperateTemperature and Humidity

Item	Requirements			
	MIN	TYP	MAX	Units
OperateTemperature	-20	-	+40	℃
Operate Humidity	10	-	90	%RH

Storage Temperature and Humidity

Item	Requirements			
	MIN	TYP	MAX	Units
Storage Temperature	-20	-	+70	℃
Storage Humidity	5	-	95	%RH

4. Power Allocation

The module can adjust the maximum output power according to the capability of the PSU as below

PSU Type	Output power
PD >=20W（9V/2.22A）	MPP15W / APPLE7.5W / BPP5W
PD 18W (9V/2A)	MPP15W / APPLE7.5W / BPP5W
PD 15W（5V/3A）	BPP5W
QC 18W（9V/2A）	MPP15W / APPLE7.5W / BPP5W
AFC 15W（9V/1.67A）	MPP10W / APPLE7.5W / BPP5W
DC >=20W（9V/2.22A）	MPP15W / APPLE7.5W / BPP5W
DC >=12W（5V/2.4A）	BPP5W
BC1.2 12W	BPP5W

5. Pads Definition

Instructions for using pins and soldering wires. When selecting external welding wires, it is necessary to make sure the connection is correct. To ensure that the wires do not short circuit the casing and that the current carrying capacity of the cable can meet the requirements. Suggest using shielded cables to achieve better EMI performance; The reference connection is shown below;

PIN	USB-C cable mode	USB-C Receptacle mode	DC 9V mode
OTG	NC	NC	NC
VPP	VBUS	VBUS	VBUS
DM	USB D-	USB D-	NC
DP	USB D+	USB D+	NC
CC1	USB CC1	USB CC1	NC
GND	GND	GND	GND
CC2	NC	USB CC2	NC
LEDR	NC	NC	NC
LEDG	NC	NC	NC

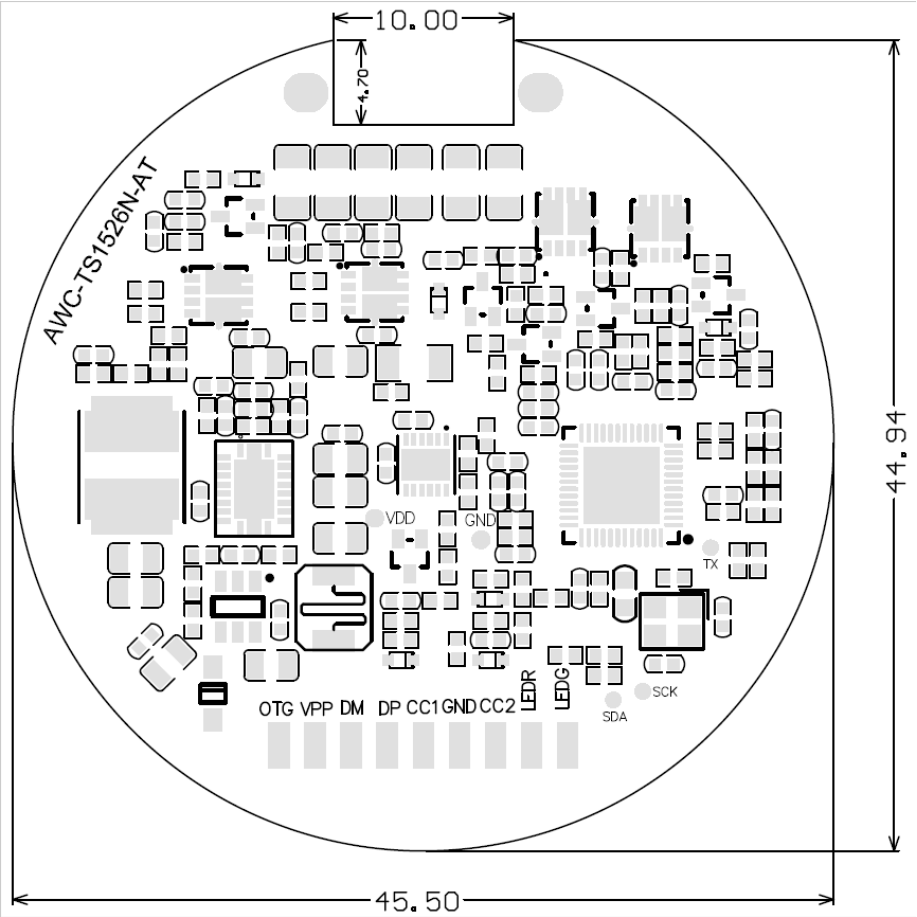
6. LED Definition

Users can connect the positive pole of the red LED indicator light to the LEDR PAD, the positive pole of the green LED indicator light to the LEDG PAD, and the negative pole of the red and green lights to the GND PAD; The red/green LED indicator lights display the following status:

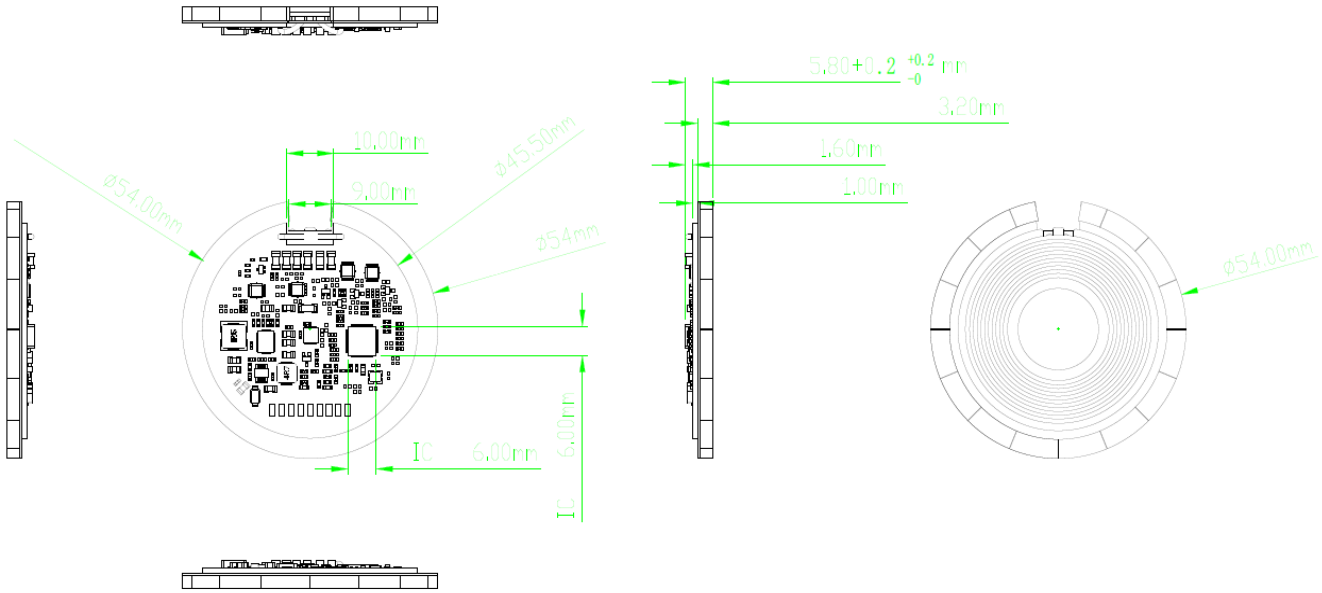
State	Green light	Red light
power on	Always on for 3 seconds and off	not have
Standby	not have	not have
charge	not have	always bright
Fully charged	always bright	not have
FOD	Alternating flicker	Alternating flicker
abnormal	Alternating flicker	Alternating flicker

7. Dimension diagram

PCB size diagram；



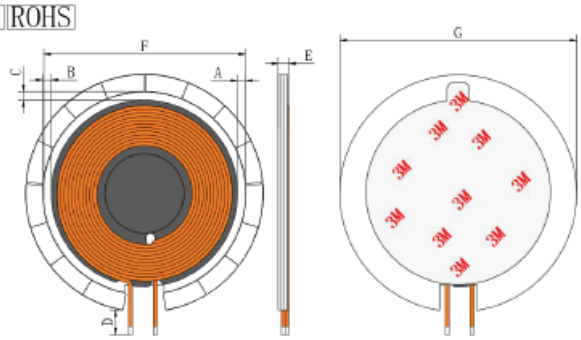
PCBA 2D Dimensional Drawing:



Complete set size of coil/magnet/heat sink:

一、尺寸 DIMENSION:(mm)

HF ROHS



A/B/C	1.8Ref
D	4.8Ref
E	3.2Max
F	46±0.5
G	54±0.5

二、原理图 SCHEMATIC DIAGRAM:

三、绕线参数 Winding Specification:

序号 NO.	端子 TERMINAL		线径 WIRE	圈数 Turns	绕线方向 Winding Direction
1	S	F	Litz0.08*65p	11Ts	CW

四、电气特性 ELECTRICAL CHARACTERISTICS:

温度 TEMPERATURE:25±10°C, 湿度 RELATIVE HUMIDITY:65±20%

序号 NO.	项目 ITEM	端子 TERMINAL	标准 SPECIFICATION	测试条件 TEST FREQUENCY	测试仪器 TEST EQUIPMENTS
1	IND.	S-F	7.8uH ±10%	360KHz/1.0V	TH2829LX
2	DCR	S-F	≤70mΩ	@25℃	TH2829LX
3	ACR	S-F	150mΩ Max	360KHz/1.0V	TH2829LX

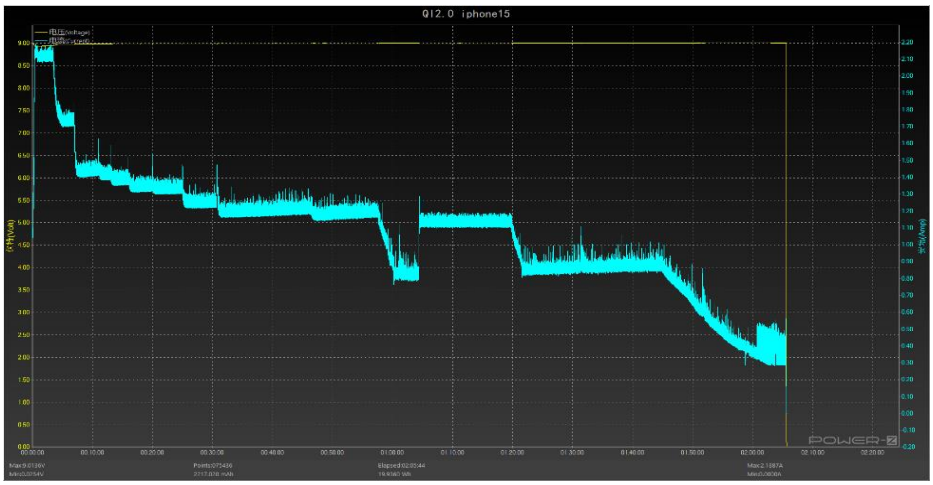
8. Functional Testing with iPhone 13/14/15 serires

Testing module：ZXY-TS1526N-AT

Testing equipment：Apple original PD 20W adapter A2244 (output 9V/2.22A) Power-Z (V1.2.5), TYPE_ C3.1 charging cable, infrared temperature measuring instrument (AS852B)

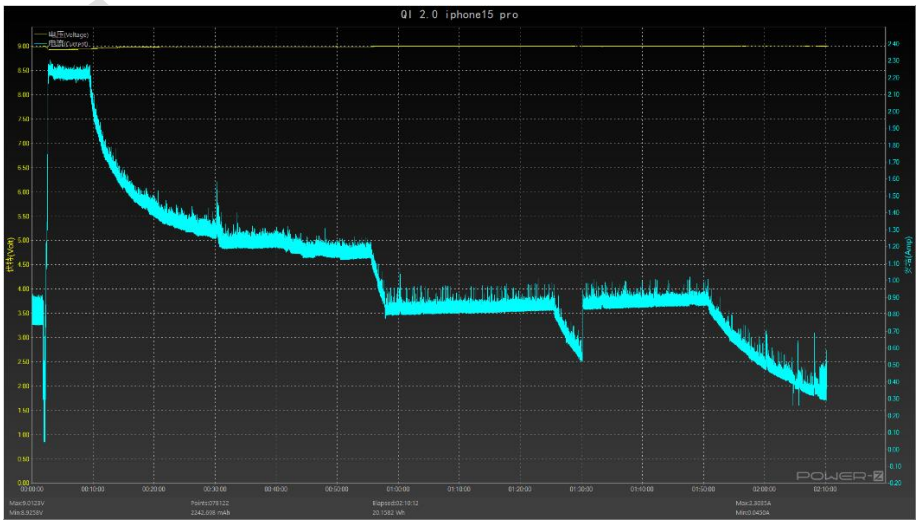
The ambient temperature is 24.5-26.5 ℃.

It takes about 2 hours and 4 minutes to fully charge iPhone 15 (system: iOS 17.1)



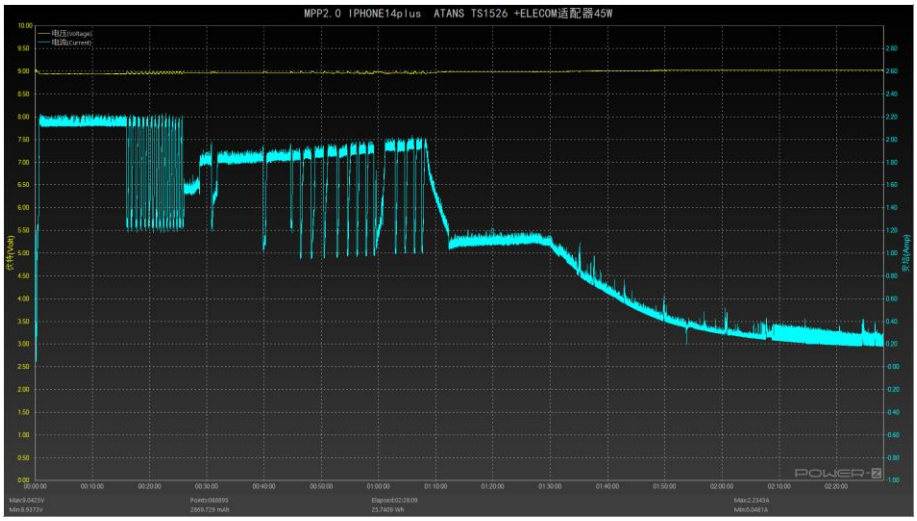
iPhone 15 (system: iOS 17.1)

It takes about 2 hours and 10 minutes to fully charge iPhone 15 Pro (system: iOS 17.1.1)



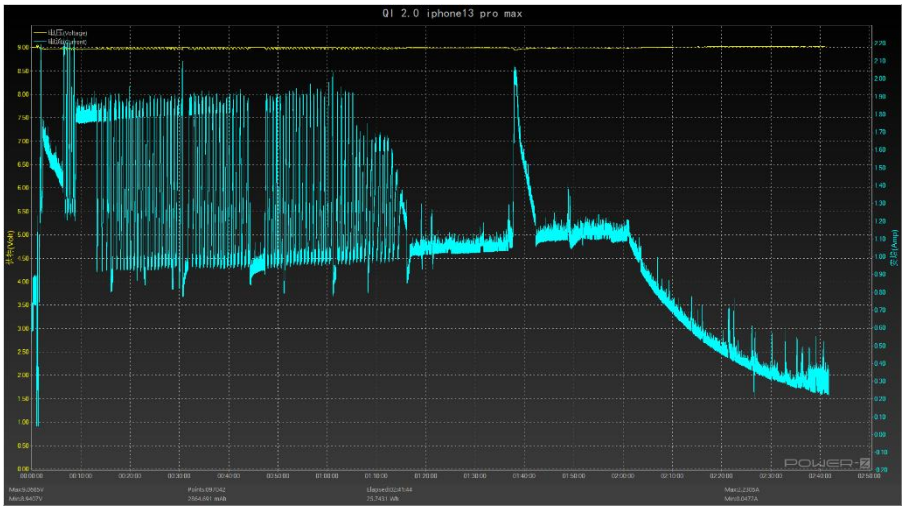
iPhone 15 Pro (system: iOS 17.1.1)

It takes about 2 hours and 25 minutes to fully charge;



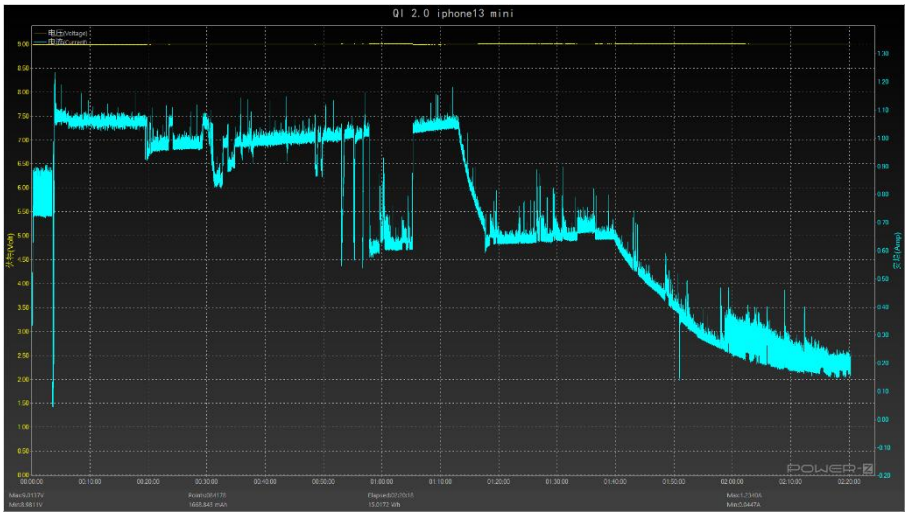
iPhone 14 Plus (system: iOS 17.2)

It takes about 2 hours and 37 minutes to fully charge iPhone 13 Pro Max (system: iOS 17.2)



iPhone 13 Pro Max (system: iOS 17.2)

It takes about 2 hours and 19 minutes to fully charge iPhone 13 mini (system: iOS 16.2)



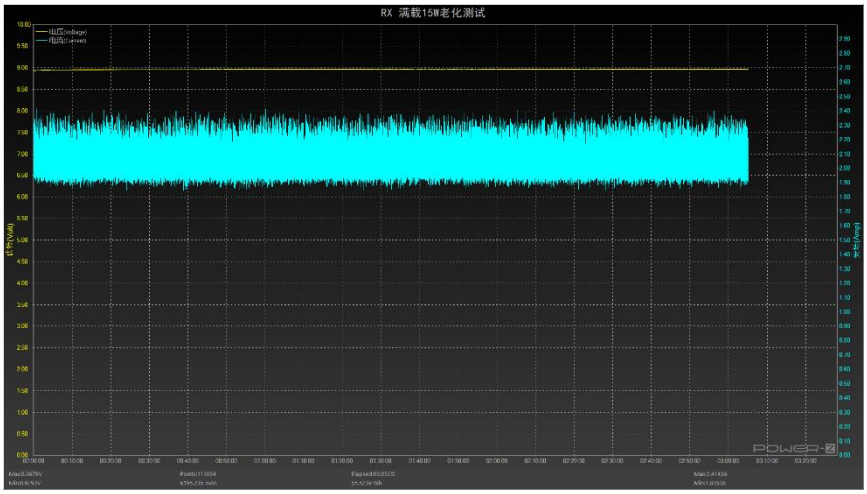
iPhone 13 mini (system: iOS 16.2)

Mobile phone Temperature Test

	Charging 30 minutes	Charging 60 minutes	Charging 90 minutes	Charging 120 minutes
NPO cap	42.6℃	43.3℃	39.7℃	37.3℃
MOS VS3622DE	37.6℃	39.6℃	36.8℃	35.5℃
GPM32FD0338B	43.8℃	45.2℃	42.4℃	38.6℃
SCT12A2 (DC-DC)	44.9℃	46.3℃	43.2℃	39.6℃
Inductance	41.8℃	43.1℃	40.1℃	38.7℃
PCBA	39.4℃	40.6℃	38.1℃	36.2℃
Coil	42.7℃	43.8℃	38.3℃	36.5℃
Electricity ratio	34%	58%	78%	100%

RX full load 15W for 3 hours testing (ambient temperature is 24.5-26.5 ℃.)

Test Equipment	Apple original PD 20W adapter A2244 (output 9V/2.22A), TYPE_ C3.1 charging cable, Digital temperature instrument DT1312, MPP specific RX fixture;					
Test Setup	Input	PD 9V				
	Output	MPP dedicated RX fixture load, Full load 15W test				
Test Method	Use MPP2.0 dedicated RX to conduct a full load aging test of 15W for 3 hours, and record the highest temperature of important parts					
Testing 3H	Output	9.07V	1.65A	14.97W		
Device	Charging 30minutes	Charging 60minutes	Charging 90 minutes	Charging 120 minutes	Charging 150 minutes	Charging 180 minutes
NPO CAP	54.8℃	56.3℃	54.9℃	54.2℃	53.8℃	53.9℃
MOS VS3622DE	65.1℃	64.6℃	64.7℃	63.8℃	63.5℃	63.1℃
MCU	58.5℃	60.1℃	57.4℃	56.9℃	57.2℃	56.8℃
DC-DC SCT12A2	68.4℃	67.7℃	67.8℃	67.3℃	67.4℃	66.2℃
Inductance	64.6℃	65.2℃	63.5℃	60.2℃	62.2℃	62.4℃
PCBA	41.8℃	46.9℃	45.6℃	45.3℃	46.1℃	42.6℃



PS1: the module can work normally at low temperature (-20 degree C) and high temperature (40 degree C)

PS2: With 9V/1.65A output, after continuous 156 hours of static burn-in testing, the module is working well.

9. Efficiency Testing via different distance

Test Equipment	Apple original PD 20W adapter A2244 (output 9V/2.22A)，ZUK QC adapter A5325(output 5.3/2.5A) Power-Z (V1.2.5), TYPE_ C3.1 charging cable，Digital temperature instrument DT1312, MPP specific RX fixture；	
Test Setup	Input	PD 9V/DC5V
	Output	MPP dedicated RX fixture load, Full load 15W test
Test Method	1、 Input test point is the TX input connector port/ adapter output end, output test point is the RX fixture's output joint. record the input and output volt, current, and calculate efficiency of every step. 2、 Record the highest temperature point on the TX module 3、 Efficiency data for testing the distance between TX surface and RX surface from 1.0 mm to 2.46mm. Specification requirement thickness: 1.0mm	

Distance	Vin(V)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Eff(%)	Test 15 minutes	Test 30 minutes
1.0mm	8.96V	2.02A	18.10W	9.11V	1.65A	15.03W	83%	69.2℃	68.6℃
2.0mm	8.94V	2.09A	18.68W	8.56V	1.61A	13.78W	74%	77.6℃	81.6℃
2.46mm	8.93V	2.10A	18.75W	8.31V	1.56A	12.96W	69%	80.2℃	85.4℃
1.0mm	5.22V	1.29A	6.73W	5.06V	1.0A	5.06W	75%	38.3℃	38.8℃
2.0mm	5.23V	1.31A	6.85W	5.02V	1.0A	5.03W	73%	40.9℃	41.7℃
2.46mm	5.23V	1.38A	7.22W	5.08V	1.0A	5.08W	70%	41.8℃	42.3℃

10. Noise Testing

Test Equipment	Apple original PD 20W adapter A2244 (output 9V/2.22A)， Power-Z (V1.2.5), TYPE_ C3.1 charging cable， All kinds of phones, RX fixtures				
Test Setup	Input	DC 5V PD 9V			
	Output	No-load, slight load, full load			
Test Method	Noise test should be taken in a closed and quiet room, let the TX charge all kind of RX, record the distance where cannot hear any noise.				
Test standard	Canhearnoiseat15cm				
RX Model	Battery Level (%)	Input	Output	Descriptions	Remarks
No-load	＜50%	DC5V	No-load	Can hear noise at no distance	NO
		PD9V	No-load	Can hear noise at no distance	NO
iPhone15	＜50%	DC5V	Full load	Can't hear noise at no distance	NO
		PD9V	Full load	Can't hear noise at no distance	NO
iPhone15 Pro	＜50%	DC5V	Full load	Can't hear noise at no distance	NO
		PD9V	Full load	Can't hear noise at no distance	NO

iPhone13 pro max	＜50%	DC5V	Full load	Can’t hear noise at no distance	NO
		PD9V	Full load	Can’t hear noise at no distance	NO
iPhone12 Pro	＜50%	DC5V	Full load	Can’t hear noise at no distance	NO
		PD9V	Full load	Can’t hear noise at no distance	NO
iPhone13 mini	＜50%	DC5V	Full load	Can’t hear noise at no distance	NO
		PD9V	Full load	Can’t hear noise at no distance	NO

12. Qi Certificate for QI-ID 20231

Qi Certificate for QI-ID 20231

The product AWC-TS1526N-AT by ATANS with manufacturing part number AWC-TS1526N-AT is licensed to use the Qi logo on the product, on the product's packaging, and in the product's user manual.

The product passed the tests defined in the Qi wireless power specification and works correctly when used in combination with other products that are licensed to use the Qi logo.

17 January 2024
Paul Struhsaker
Executive Director
Wireless Power Consortium

https://wirelesspowerconsortium.atlassian.net/servicedesk/customer/kb/view/65044482

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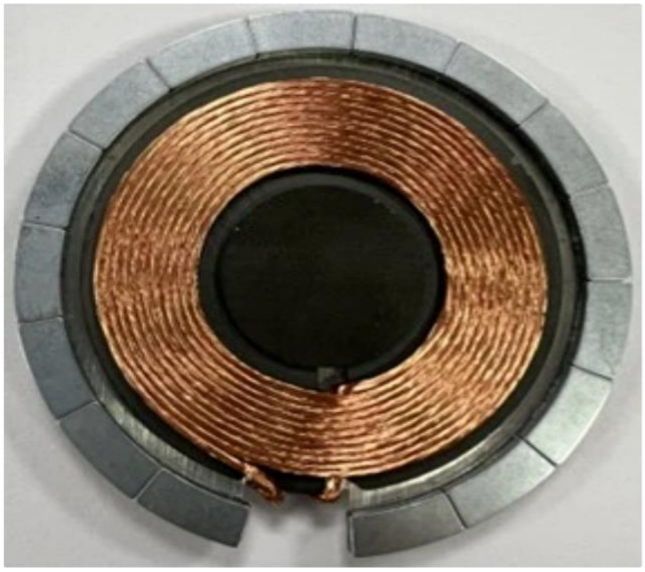
This certificate of Certification can be withdrawn by the Wireless Power Consortium. For actual status consult the website.

[QI-20231] ATANS - AWC-TS1526N-AT



QI-ID

QI-20231

LICENSED

YES

SPECIFICATION VERSION

2.0.0

BRAND

ATANS

PRODUCT NAME

AWC-TS1526N-AT

MANUFACTURER PART NUMBER

AWC-TS1526N-AT

Additional Details:

POWER PROFILE	Magnetic Power Profile (MPP)
POTENTIAL LOAD POWER	15.0
PRODUCT CONTAINS SUBSYSTEM	No
EVALUATION MODULE	No
AUTOMOTIVE CHARGER FOR INLINE ASSEMBLY	No
SUBSYSTEM FOR INTEGRATION IN OTHER PRODUCTS	Yes
COMPLIANT AUTOMOTIVE GUIDELINES	No

13. Procurement information

Procurement module part number	Resonant capacitor
ZXYTS1526N-AT	NPO capacitor version