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TCT通测检测 TESTING CENTRE TECHNOLOGY

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TCT通测检测 1. Test Certification

Product:	Wireless Charger	
Model No.:	CDRZ34	2
Additional Model No.:	N/A	
Trade Mark:	RANVOO	
Applicant:	SHENZHEN RANVOO DIGITAL TECHNOLOGY CO., LTD.	
Address:	16F, BLOCK C, ZHANTAO TECHNOLOGY BUILDING, MINZHI ROAD, LONGHUA DISTRICT, SHENZHEN, China	3
Manufacturer:	SHENZHEN RANVOO DIGITAL TECHNOLOGY CO., LTD.	
Address:	16F, BLOCK C, ZHANTAO TECHNOLOGY BUILDING, MINZHI ROAD, LONGHUA DISTRICT, SHENZHEN, China	
Date of Test:	Dec. 19, 2017 – Jan. 03, 2018	
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C	S S

Report No.: TCT171220E905

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	Amens Xu	Date:	Jan. 03, 2018	
(C)	Brews Xu	(<u>c</u>	
Reviewed By:	Longhan	Date:	Jan. 08, 2018	
	Joe Zhou		Ś	_
Approved By:	Tomsin	Date:	Jan. 08, 2018	
Ś	Tomsin	(,	C)	Ś
			Page	3 of 27



2. Test Result Summary

Report No.: TCT171220E905

AC Pov		uirement Conductec on	1	§15.20	03		PASS	
			ł					
Sp			(c)	§15.20	§15.207		PASS	
	urious Er	mission		§15.209((a)(f)		PASS	
		meets the requ des not meet th						
		loes not apply t Idgment is deci			rd.			



3. EUT Description

Product:	Wireless Charger
Model No.:	CDRZ34
Additional Model No.:	N/A
Trade Mark:	RANVOO
Operation Frequency:	110-205KHz
Number of Channel:	20 Channels
Modulation Technology:	MSK
Antenna Type:	Inductive loop coil Antenna
Antenna Gain:	0dBi
Power supply:	DC 5V via adapter

Operation Frequency each of channel

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	0.110	6	0.135	11	0.160	16	0.185
2	0.115	7	0.140	12	0.165	17	0.190
3	0.120	8	0.145	13	0.170	18	0.195
4	0.125	9	0.150	14	0.175	19	0.200
5	0.130	10	0.155 🚫	15	0.180	20	0.205









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4. Genera Information

FCT通测检测 TESTING CENTRE TECHNOLOGY

4.1. Test environment and mode

Operating Environment:		
Temperature:	25.0 °C	
Humidity:	56 % RH	
Atmospheric Pressure:	1010 mbar	S
Test Mode:		
Engineering meder	Keen the EUT in early	tiqueus transmitting

Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%) with Fully-charged battery.

The sample was placed (0.1m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	HW-059200CHQ	K68247F5H01734	1	HUAWEI
Mobilephone	honor 9	5JPDU17610004560	1	honor
				[.C

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC Registration No.: 645098
 - Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

• IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%
7	Humidity	±1.0



6. **Test Results and Measurement Data**

6.1. Antenna requirement

Standard requirement:

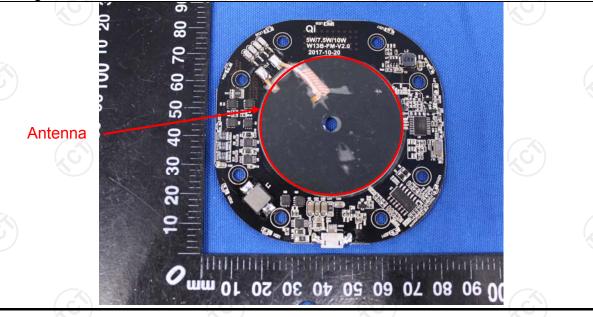
FCC Part15 C Section 15.203

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

E.U.T Antenna:

The antenna is inductive loop coil antenna which permanently attached, and the best case gain of the antenna is 0dBi.



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6.2. Conducted Emission

6.2.1. Test Specification

Receiver setup: RBW=9 kHz, VBW=30 kHz, Sweep time=auto Limits: Frequency range Limit (dBuV) 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane EU.T Adapter Filter Ac powe Remark EU.T Adapter LISN Line Impedence Stabilization Network Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a lime 1. The E.U.T is connected to an adapter through a lime	Test Requirement:	FCC Part15 C Section	15.207					
Receiver setup: RBW=9 kHz, VBW=30 kHz, Sweep time=auto Limits: Frequency range Limit (dBuV) (MHz) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Formark EUT Equipment Under Test USN Line Impedence Stabilization Network Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). Th provides a 500hm/50uH coupling impedance for the measuring equipment. Test Procedure: 2. The peripheral devices are also connected to the mai power through a LISN that provides a 500hm/50uH coupling impedance for the measuring equipment. B. Both sides of A.C. line are checked for maximul conducted interference. In order to find the maximul emission, the relative positions of equipment and allo the interface cables must be changed according the ANSI C63.10: 2013 on conducted measurement.	Test Method:	ANSI C63.10:2013						
Limits: Frequency range (MHz) Limit (dBuV) Quasi-peak Average 0.15-0.5 66 to 56* 0.5-5 56 30 60 5-30 60 60 50 Reference Plane Filter Ac powe Filter Acc powe Filter Filter Accessed Accessed Filter Filter Accessed Filter Filter Accessed Filter Filter Accessed Filter Filter Filter Filter Filter Fest Mode: Charging + Transmitting Mode <td>Frequency Range:</td> <td>150 kHz to 30 MHz</td> <td></td> <td>$\left(\mathcal{C}^{\prime}\right)$</td>	Frequency Range:	150 kHz to 30 MHz		$\left(\mathcal{C}^{\prime}\right)$				
Limits: Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: test Setup: Reference Plane Reference Plane Image: test test test test test test test te	Receiver setup:	RBW=9 kHz, VBW=30	RBW=9 kHz, VBW=30 kHz, Sweep time=auto					
Imits: Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Imitation B0cm Filter Rest Setup: Reference Plane EU.T Adapter Imitation B0cm Filter Ac powe Rest Setup: Remark EU.T Editation Network Rest Setup: Remark EU.T Editation Network Rest Bode: Charging + Transmitting Mode Notes Notes Test Mode: Charging + Transmitting Mode Notes Notes Solution network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. Test Procedure: Solution of the test setup an power through a LISN that provides a 500hm/50uc coupling impedance with 500hm termination. (Pleas refer to the block diagram of the test setup an photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to the interface ca		Frequency range	Erequency range Limit (dBuV)					
Limits: 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2" Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a lini impedance stabilization network (L.I.S.N.). Th provides a 500hm/50uH coupling impedance for th measuring equipment. 2. The peripheral devices are also connected to the mai power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Pleas refer to the block diagram of the test setup an photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.			Quasi-peak	Áverage				
5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2" Colsp	Limits:	0.15-0.5						
Test Setup: Reference Plane Image: Test Setup: Image: Test table/Insulation plane Remark: EUT Equipment Under Test LISN Line Impedence Stabilization Network Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a lini impedance stabilization network (L.I.S.N.). Th provides a 50ohm/50uH coupling impedance for th measuring equipment. 2. The peripheral devices are also connected to the mai power through a LISN that provides a 50ohm/50u coupling impedance with 50ohm termination. (Pleas refer to the block diagram of the test setup an photographs). 3. Both sides of A.C. line are checked for maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		0.5-5	56	46				
Test Setup: Image: Constraint of the set to the set the set to t		5-30	60	50				
Test Setup: Image: Filter and provide a setup of the setup of t		Refere	nce Plane					
 The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 	Test Setup:	Test table/Insulation plan Remarkc E.U.T: Equipment Under Test LISN: Line Impedence Stabilization	ne EMI Receiver					
 impedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 								
	Test Mode:	Charging + Transmittin	ig Mode					
		 The E.U.T is connerimpedance stabilizy provides a 500hm/8 measuring equipment The peripheral device power through a LI coupling impedance refer to the block photographs). Both sides of A.C. conducted interferer emission, the relative the interface cables 	cted to an adapte ation network 50uH coupling im nt. ces are also conne SN that provides with 50ohm term diagram of the line are checkence. In order to fir e positions of equ s must be chang	(L.I.S.N.). This pedance for the ected to the main a 500hm/50uh hination. (Please test setup and d for maximun d the maximun ipment and all o ed according to				

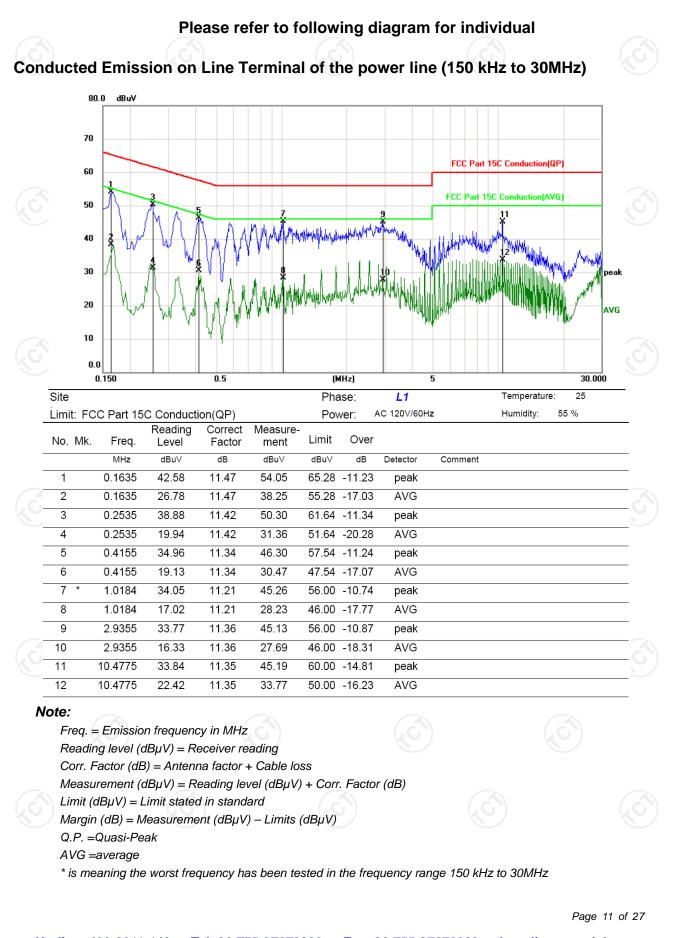
6.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)							
Equipment	Manufacturer	Model	Serial Number	Calibration Due			
Test Receiver	R&S	ESPI	101401	Jun. 12, 2018			
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 27, 2018			
Coax cable (9KHz-30MHz)	тст	CE-05	N/A	Sep. 27, 2018			
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A			

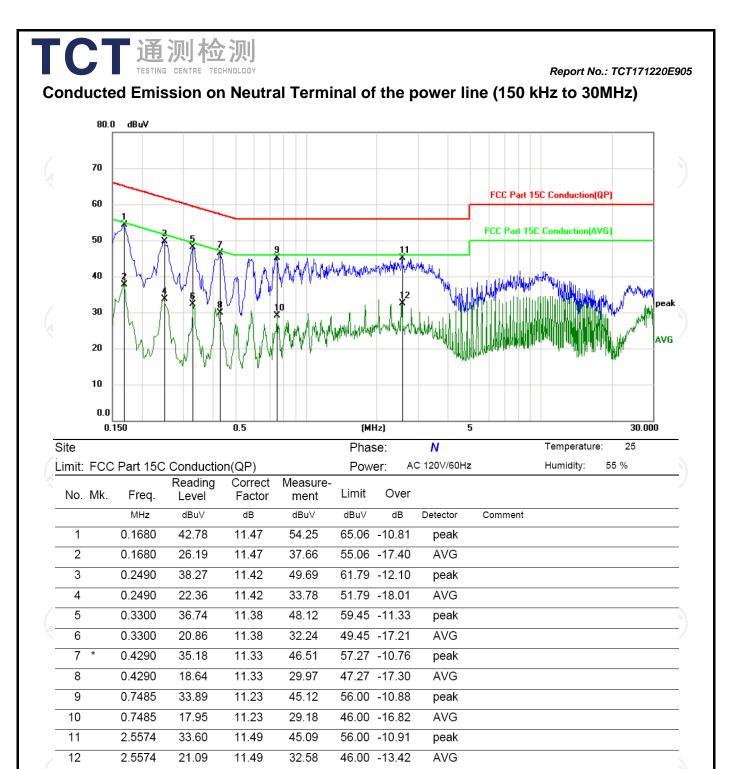
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

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6.2.3. Test data



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Note1:

Freq. = Emission frequency in MHz Reading level $(dB\mu V)$ = Receiver reading Corr. Factor (dB) = Antenna factor + Cable loss Measurement $(dB\mu V)$ = Reading level $(dB\mu V)$ + Corr. Factor (dB)Limit $(dB\mu V)$ = Limit stated in standard Margin (dB) = Measurement $(dB\mu V)$ - Limits $(dB\mu V)$ Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

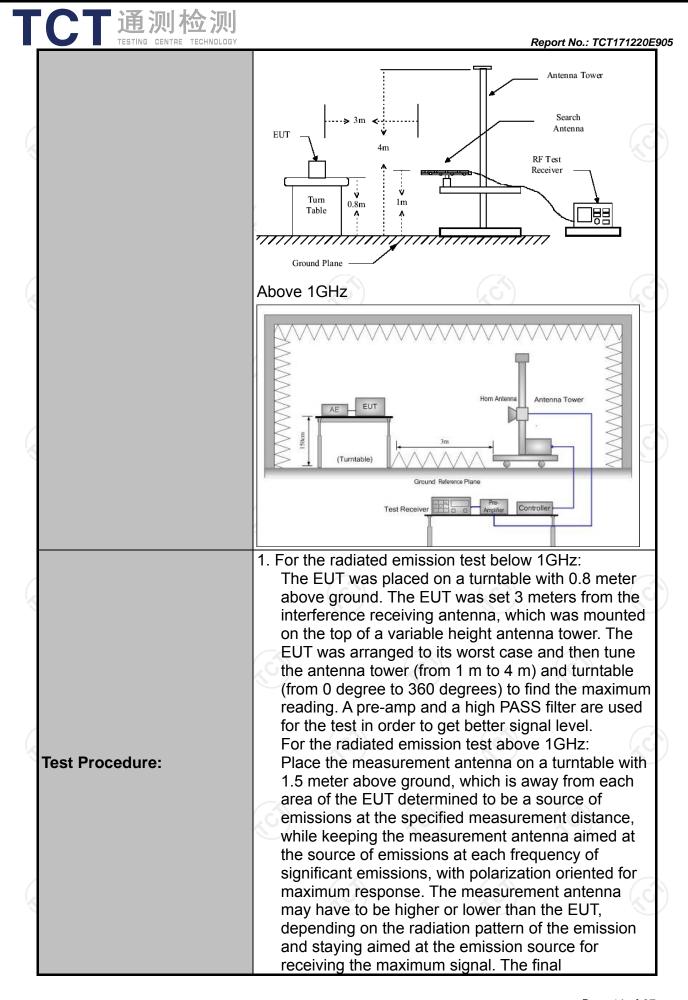
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6.3. Radiated Spurious Emission Measurement

6.3.1. Test Specification

TCT通测检测 TESTING CENTRE TECHNOLOGY

FCC Part15	C Section	15.209			No.	
ANSI C63.10: 2013						
9 kHz to 25 GHz						
3 m						
Horizontal &	Vertical					
Refer to item 4.1						
Frequency 9kHz- 150kHz			VBW 1kHz	Quas	Remark si-peak Value si-peak Value	
30MHz	(\mathbf{c}		L.C		
30MHz-1GHz					si-peak Value eak Value	
Above 1GHz	Peak	1MHz	10Hz		erage Value	
Frequency		Field Strength (microvolts/meter)		Measurement Distance (meters)		
0.009-0.490		2400/F(KHz)		300		
		24000/F(KHz)		30		
				30		
				3		
				3		
					3	
		(G)				
Frequency		eld Strength rovolts/meter) Distan		се	Detector	
Above 1GHz						
		5000 3		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Peak	
		s below 30)MHz		Computer	
EUT Turn table						
			<u> </u>	F	Receiver	
30MHz to 10	G	round Plane		F	Receiver	
30MHz to 10	G	round Plane		F	Receiver	
	ANSI C63.10 9 kHz to 25 0 3 m Horizontal & Refer to item Frequency 9kHz-150kHz 150kHz- 30MHz 30MHz-1GHz Above 1GHz Frequen 0.009-0.4 0.490-1.7 1.705-3 30-88 88-216 216-96 Above 9 Frequency Above 1GHz	ANSI C63.10: 2013 9 kHz to 25 GHz 3 m Horizontal & Vertical Refer to item 4.1 Frequency Detector 9kHz-150kHz Quasi-peak 30MHz-130kHz Quasi-peak 30MHz-1GHz Quasi-peak Above 1GHz Peak Peak Peak 30MHz-1GHz Quasi-peak Above 1GHz Peak 1.705-30 30-88 88-216 216-960 Above 960 Frequency Frequency Fiel (microson) Above 1GHz	9 kHz to 25 GHz 3 m Horizontal & Vertical Refer to item 4.1 Frequency Detector RBW 9kHz-150kHz Quasi-peak 200Hz 150kHz- 20uasi-peak 9kHz 30MHz 30MHz-1GHz Quasi-peak 100KHz Above 1GHz Peak 1MHz Peak 1MHz Peak 1MHz Frequency Field Stre (microvolts 0.009-0.490 2400/F(t) 0.490-1.705 24000/F(t) 1.705-30 30 30-88 100 88-216 150 216-960 200 Above 960 500 Frequency Field Strength (microvolts/meter) Above 1GHz 500 500 Frequency Above 1GHz 500 S00 Frequency Field Strength (microvolts/meter) Above 1GHz 500 S000 Frequency Field Strength (microvolts/meter) Above 1GHz 500 S000	ANSI C63.10: 2013 9 kHz to 25 GHz 3 m Horizontal & Vertical Refer to item 4.1 Frequency Detector RBW VBW 9kHz-150kHz Quasi-peak 200Hz 1kHz 30MHz 300Hz-1GHz Quasi-peak 100KHz 300Hz-1GHz Quasi-peak 100KHz 300Hz 300Hz 100KHz 300Hz 300Hz 100KHz 300Hz 300Hz 100KHz Quasi-peak 100KHz 300KHz 300Hz 300Hz 100KHz 300KHz 300KHz 300Hz 100KHz 300KHz 300KHz 100KHz 300KHz 100KHz 300KHz 100 100 1705-30 30 30-30 30 30-30 30-30 30 30	ANSI C63.10: 2013 9 kHz to 25 GHz 3 m Horizontal & Vertical Refer to item 4.1 Frequency Detector RBW VBW 9kHz-150kHz Quasi-peak 200Hz 1kHz Quasi-peak 200Hz 1kHz Quasi-peak 30KHz Quasi-peak 100KHz Quasi-peak 100KHz	



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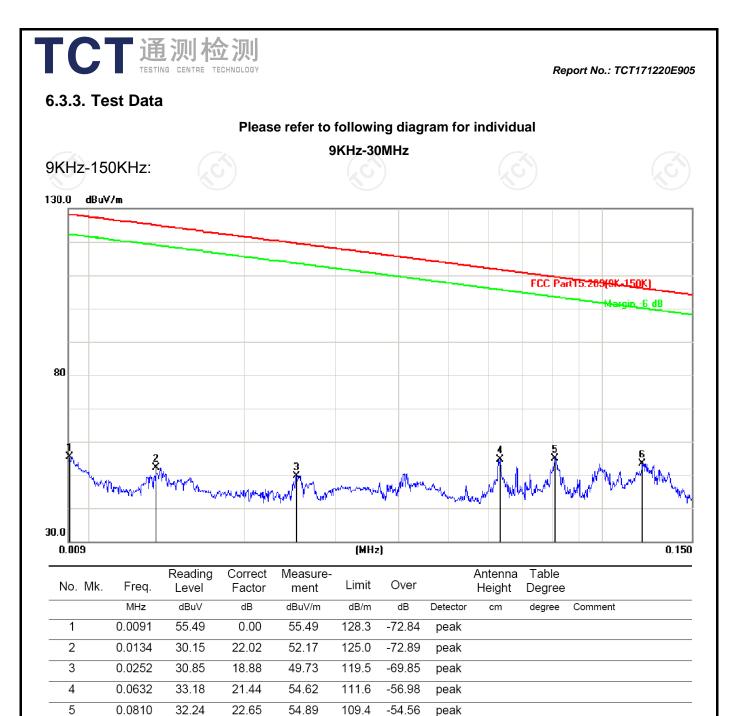
CT 通测检测	
	 Report No.: TCT171220E measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. Use the following spectrum analyzer settings: Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold; Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement. For average measurement. VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test mode:	Refer to section 4.1 for details
Test results:	PASS



6.3.2. Test Instruments

Radiated Emission Test Site (966)						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due		
Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Sep. 27, 2018		
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ	200061	Sep. 27, 2018		
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018		
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018		
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018		
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018		
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018		
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018		
Antenna Mast	Keleto	CC-A-4M	N/A	N/A		
Coax cable (9KHz-1GHz)	тст	RE-low-01	N/A	Sep. 27, 2018		
Coax cable (9KHz-40GHz)	тст	RE-high-02	N/A	Sep. 27, 2018		
Coax cable (9KHz-1GHz)	тст	RE-low-03	N/A	Sep. 27, 2018		
Coax cable (9KHz-40GHz)	тст	RE-high-04	N/A	Sep. 27, 2018		
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A		

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



0.1200

28.53

24.90

53.43

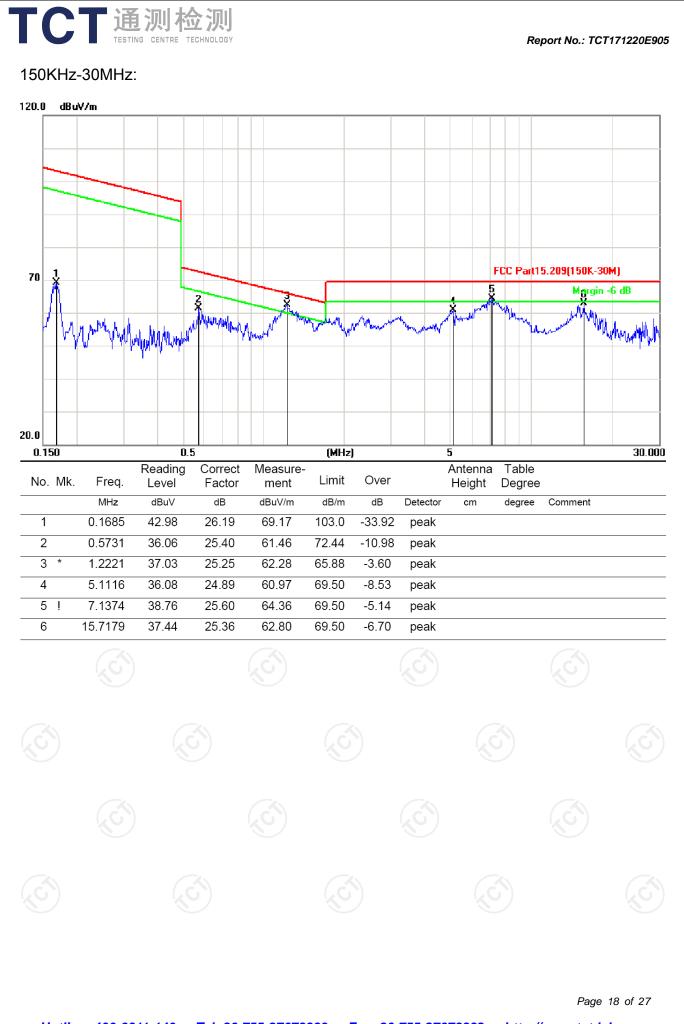
106.0

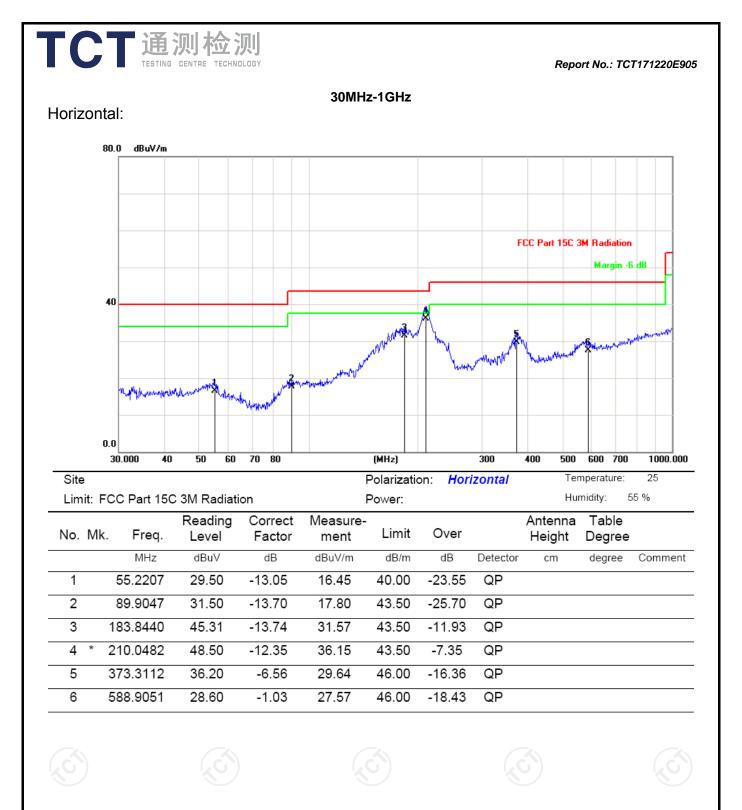
-52.61

peak

6 *

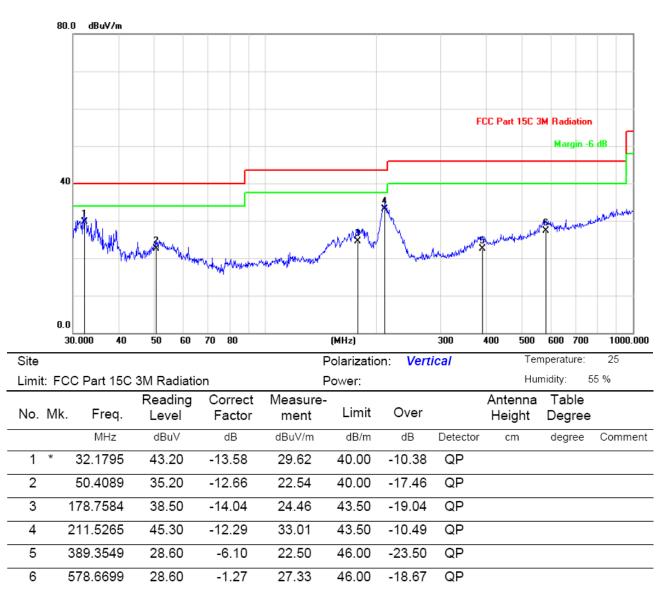
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Vertical:

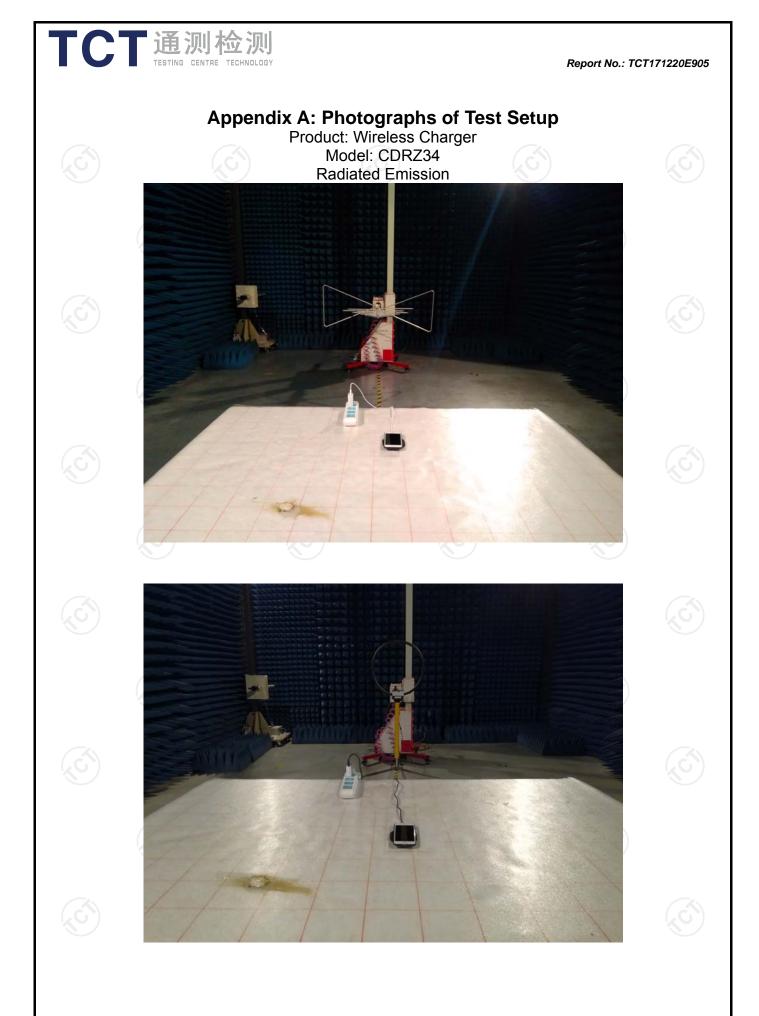


Note:

Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

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