

# **TEST REPORT**

FCC ID: 2ADDWTB-WDC01 Product: WIRELESS CHARGER Model No.: TB-WDC01 Additional Model No.: N/A Trade Mark: TOPBAND Report No.: TCT180111E036 Issued Date: Jan. 03, 2018

Issued for:

Shenzhen Topband Co.,Ltd Topband Industrial Park,Liyuan Industrial Zone,Shiyan Town,Bao'An District, Shenzhen 518108, China

Issued By:

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TCT 通测检测 TESTING CENTRE TECHNOLOGY

#### TCT通测检测 TESTING CENTRE TECHNOLOGY 1. Test Certification

Product:	WIRELESS CHARGER
Model No.:	TB-WDC01
Additional Model No.:	N/A
Trade Mark:	TOPBAND
Applicant:	Shenzhen Topband Co.,Ltd
Address:	Topband Industrial Park,Liyuan Industrial Zone,Shiyan Town,Bao'An District, Shenzhen 518108, China
Manufacturer:	Shenzhen Topband Co.,Ltd
Address:	Topband Industrial Park,Liyuan Industrial Zone,Shiyan Town,Bao'An District, Shenzhen 518108, China
Date of Test:	Dec. 21 – Jan. 03, 2018
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C

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:	Beng zhao	Date:	Jan. 03, 2018
Reviewed By:	Beryl Zhao	Date:	Jan. 03, 2018
Approved By:	Loe Zhou	Date:	Jan. 03, 2018
	Tomsin	_	

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# 2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a)(f)	PASS
Occupied Bandwidth	§15.215 (c)	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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# 3. EUT Description

Product:	WIRELESS CHARGER
Model No.:	TB-WDC01
Additional Model No.:	N/A
Trade Mark:	TOPBAND
Number of Channel	19 channels
<b>Operation Frequency:</b>	110-200KHz
Modulation Technology:	PFM
Antenna Type:	Coil Antenna
Antenna Gain:	10dBi

#### **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	

# 4. Genera Information

TCT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
Test Mode:	
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.	Certification
Adapter	HW-059200CHQ	K68247F5H01734	VOC
Mobilephone	honor 9	5JPDU17610004560	DOC
Notebook	ZQT	N/A	DOC

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

TCT 通测检测 TESTING CENTRE TECHNOLOGY

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%



# 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 coil antenna which permanently attached, and the best case gain of the antenna is 10dBi.





## 6.2. Conducted Emission

#### 6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section	15.207		
Test Method:	ANSI C63.10:2013			
Frequency Range:	150 kHz to 30 MHz			
Receiver setup:	RBW=9 kHz, VBW=30	kHz, Sweep time	=auto	
Limits:	Frequency range (MHz)         Limit (dBuV)           0.15-0.5         66 to 56*         56 to 46*           0.5-5         56         46           5-30         60         50			
Test Setup:	Reference Plane			
Test Mode:	Charging + Transmitting Mode			
Test Procedure:	<ol> <li>The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>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.</li> </ol>			
Test Result:	PASS			

#### 6.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)						
Equipment	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).

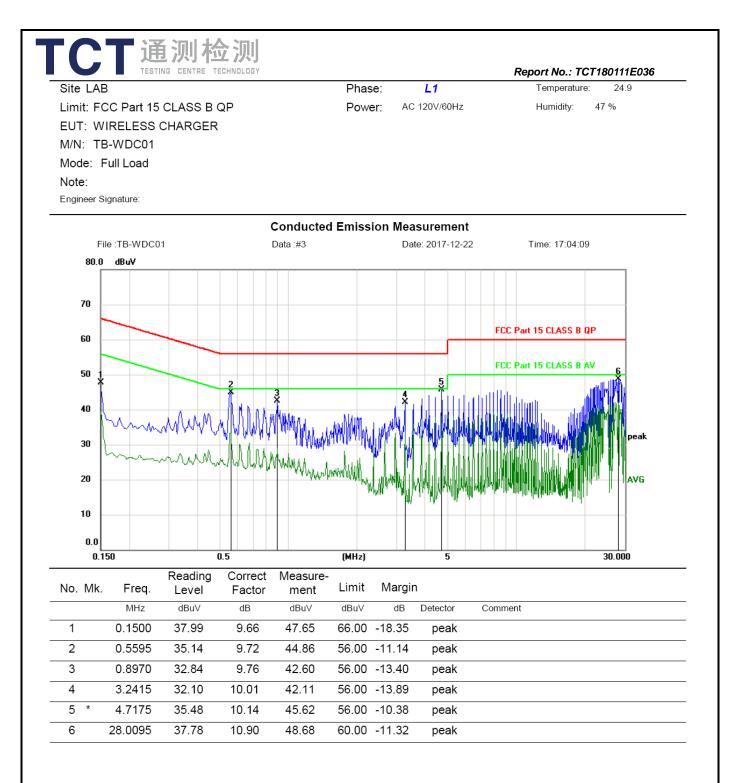
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#### Please refer to following diagram for individual

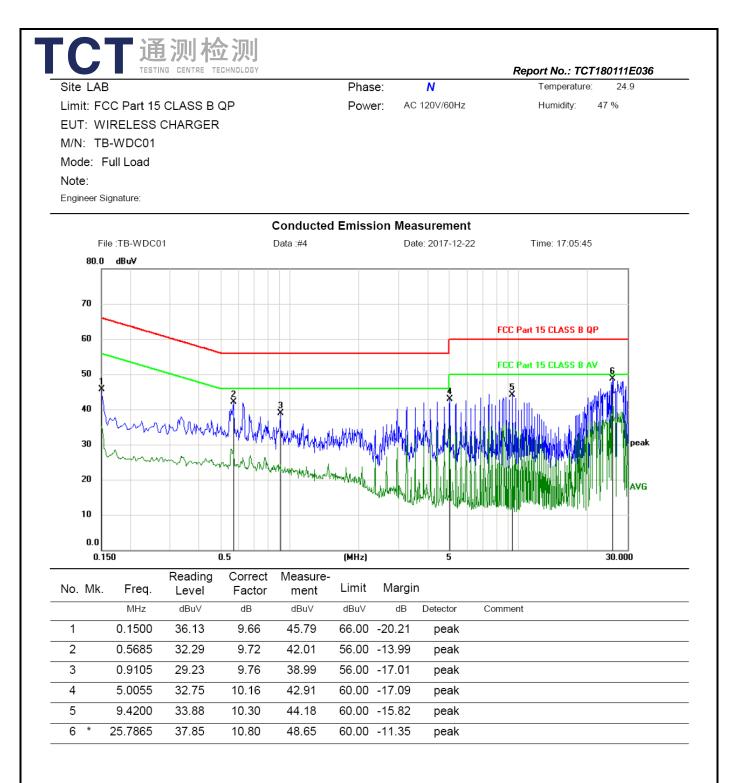
Test M	Test Mode : Full Load				
Test R	Results : PASS				
Note:	The test results are listed in next pages.				
Test Results : PASS         Note:       The test results are listed in next pages.         This mode is worst case mode, so this report only reflected the worst mode.         If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.         If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.					

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\*:Maximum data x:Over limit !:over margin Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

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\*:Maximum data x:Over limit !:over margin Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

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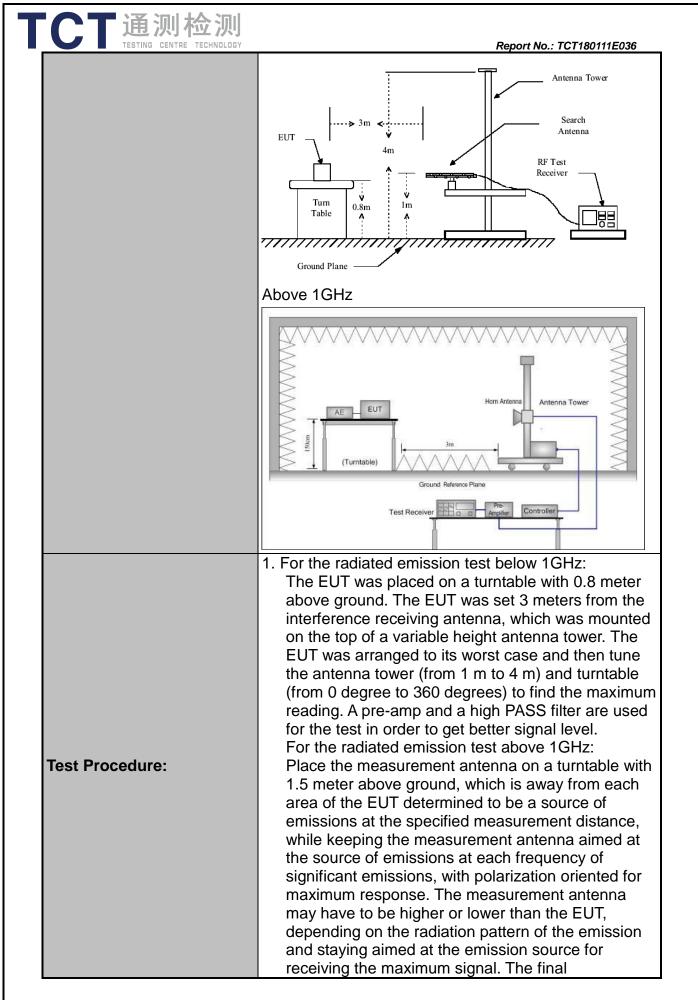
# 6.3. Radiated Spurious Emission Measurement

#### 6.3.1. Test Specification

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Test Requirement:	FCC Part15	C Sectio	on 15.209				
Test Method:	ANSI C63.10	): 2013					
Frequency Range:	9 kHz to 25 GHz						
Measurement Distance:	3 m						
Antenna Polarization:	Horizontal & Vertical						
Operation mode:	Refer to item	4.1					
	Frequency	r RBW	VBW		Remark		
Receiver Setup:	9kHz- 150kHz 150kHz- 30MHz	Quasi-pe Quasi-pe		1kHz 30kHz		si-peak Value si-peak Value	
	30MHz-1GHz	Quasi-pe	ak 100KHz	300KHz		si-peak Value	
	Above 1GHz	Peak	1MHz	3MHz		eak Value	
		Peak	1MHz	10Hz	Ave	erage Value	
	Frequen 0.009-0.4	-	Field Stre (microvolts) 2400/F(F	/meter)		easurement ance (meters)	
	0.490-1.7		2400/F(r 24000/F(	,	300 30		
	1.705-30		30	1112)	30		
	30-88		100		3		
	88-216		150		3		
Limit:	216-96		200		3		
	Above 960 500 3					3	
	Frequency		Field Strength (microvolts/meter)		ment ce rs)	Detector	
	Above 1GHz		500	3		Average	
			5000	3		Peak	
	For radiated	emissio	ns below 30	)MHz			
	Computer						
Test setup:	EUT Turn table					Receiver	
		[	Ground Plane		L	]	
	30MHz to 10	Hz					

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	<ul> <li>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.</li> <li>Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</li> <li>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.</li> <li>Use the following spectrum analyzer settings: <ul> <li>(1) Span shall wide enough to fully capture the emission being measured;</li> <li>(2) Set RBW=100 kHz for f &lt; 1 GHz; VBW RBW; Sweep = auto; Detector function = peak; Trace = max hold;</li> <li>(3) Set RBW = 1 MHz, VBW= 3MHz for f □ 1 GHz for peak measurement. For average measurement.</li> <li>For average measurement: VBW = 10 Hz, 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</li> </ul> </li> </ul>
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).

#### 6.3.3. Test Data

Please refer to following diagram for individual

Frequency Range	: 9KHz~30MHz
Test Mode	: TX 155.0KHz For Full Load
Test Results	: PASS

Note: 1. The test results are listed in next pages.

2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Freq.	Readi ng	Antenna Factor	Cab le loss	Amp Factor	Result	Limit	Margin	Detect	State
(MHz)	(dBu V/m)	dB/m	dB	dB	(dBuV/ m)	(dBuV/ m) at 3 m	(dB)	or	P/F
0.11	48.66	48.34	0.16	29.87	67.29	126.77	-59.48	PK	PASS
0.11	47.73	48.34	0.16	29.87	66.36	106.77	-40.41	AV	PASS
0.155	94.01	48.34	0.16	29.87	112.64	122.95	-10.31	PK	PASS
0.155	67.88	48.34	0.16	29.87	86.51	102.95	-16.44	AV	PASS
0.21	48.56	48.38	0.17	29.89	67.22	120.76	-53.54	PK	PASS
0.21	49.47	48.38	0.17	29.89	68.13	100.76	-32.63	AV	PASS
0.35	47.61	48.44	0.19	29.89	66.35	117.78	-51.43	PK	PASS
0.35	47.88	48.44	0.19	29.89	66.62	97.78	-31.16	AV	PASS
0.44	49.06	48.47	0.19	29.89	67.83	115.35	-47.52	PK	PASS
0.44	47.38	48.47	0.19	29.89	66.15	95.35	-29.20	AV	PASS
1.929	16.11	49.12	0.20	29.94	35.49	60.00	-24.51	QP	PASS
1.929	21.70	49.12	0.20	29.94	41.08	60.00	-18.92	QP	PASS

Freque Range	•	30MHz~1000MHz		
Test M	lode	Full Load		
Test R	esults	PASS		
Note:	1. The te	esults are listed in next pages.		
2. This mode is worst case mode, so this report only reflected the worst mode.				
	3 If the I	s for the measurement with the average detector are met when using		

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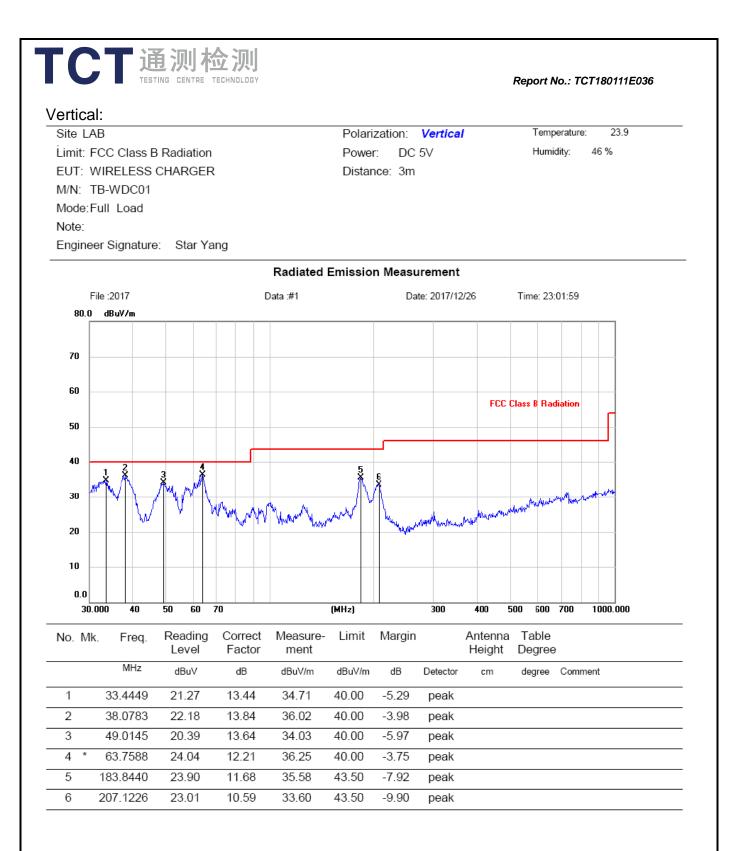
> 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Freque Range	ncy	:	Above 1GHz			
EUT		:	/	Test Date	:	/
M/N		:	/	Temperatur e	:	/
Test Er	ngineer	:	/	Humidity	:	/
Test Mo	ode	:	/			
Test Re	esults	:	N/A			
Note:	the measure	ure	est frequency of the internal source ement shall only be made up to 1 C ion test not applicable.			

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		TING CENTRE	TECHNOLOGY						Report N	No.: TCT180111E0:
nizo	ntal:				30MHz∙	-1GHz				
					<b>D</b> • •				<b>-</b>	
ite L/		Dedictio					Horizon	ntal		erature: 23.9
Limit: FCC Class B Radiation EUT: WIRELESS CHARGER					Power	r: DC nce: 3m	SV		Humid	dity: 46 %
	TB-WDC01	CHARGER			Distan	ice. 311)				
	Full Load									
lote:										
ngine	er Signature	e: Star Ya	ing							
				Radiated	Emissio	n Measu	irement			
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80.0 T	dBu¥/m									
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10										
0.0										
L	.000 40	50 60	70		(MHz)		300	400 5	500 600	700 1000.000
o. M	k. Freq.	Reading	Correct	Measure-	Limit	Margin		Antenna	Table	
	-	Level	Factor	ment		-		Height	Degree	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	48.3318	14.39	13.67	28.06	40.00	-11.94	peak			
2	63.0916	18.64	12.19	30.83	40.00	-9.17	peak			
3	101.2885	21.96	10.73	32.69	43.50	-10.81	peak			
4	183.2005	24.57	11.76	36.33	43.50	-7.17	peak			
5 *	206.3976	26.21	10.56	36.77	43.50	-6.73	peak			
6	301.4224	19.32	13.51	32.83	46.00	-13.17	peak			

Note:1. \*:Maximum data; x:Over limit; !:over margin. 2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



Note:1. \*:Maximum data; x:Over limit; I:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Note:

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

### 6.3.4. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
Test Procedure:	<ol> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW ≥ 1% of the 20 dB bandwidth; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>Measure and record the results in the test report.</li> </ol>
Test setup:	Spectrum Analyzer
Test Mode:	Refer to section 4.1 for details
Test results:	PASS

#### 6.3.5. Test Instruments

RF Test Room							
Equipment Manufacturer Model Serial Number Calibration Due							
Spectrum Analyzer	R&S	FSU	200054	Aug. 11, 2018			

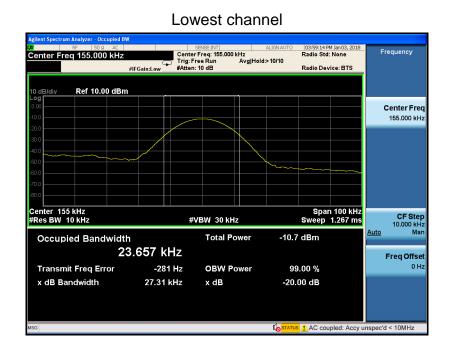
**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



## 6.3.6. Test data

Frequency(MHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion	
155.0	23.66		PASS	

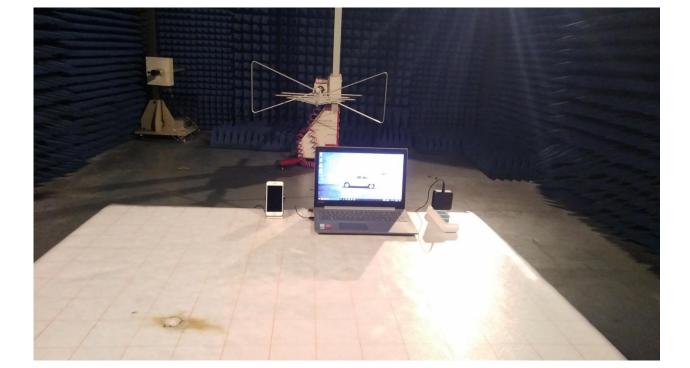
Test plots as follows:



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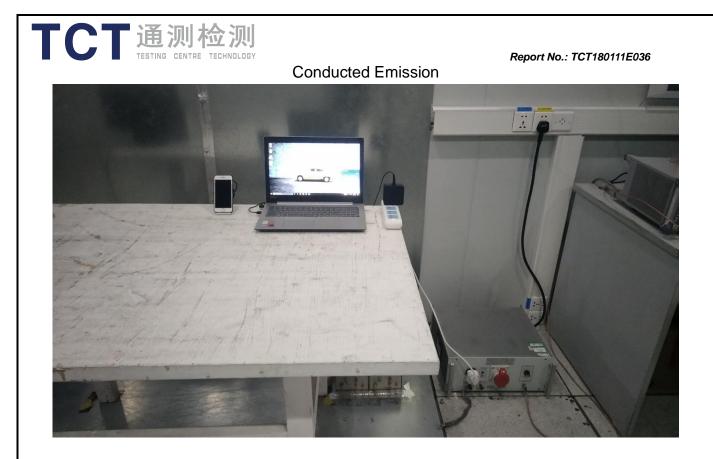
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# Appendix A: Photographs of Test Setup Product: WIRELESS CHARGER

Model: TB-WDC01 Radiated Emission



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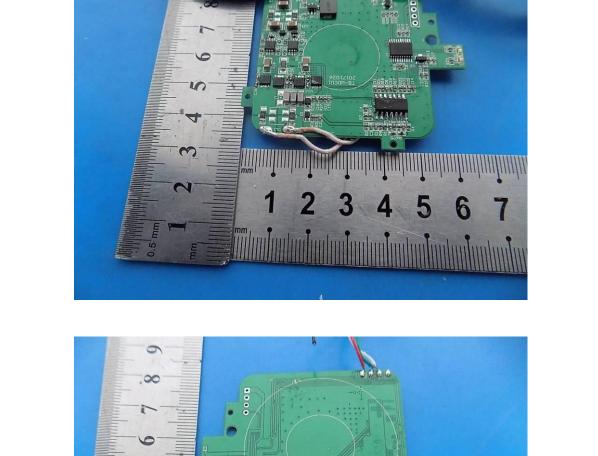
1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 1 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6

### Product: WIRELESS CHARGER Model: TB-WDC01 Internal Photos





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