

FCC REPORT

Applicant: Guangzhou Smamao Electronic Technology Co.,Ltd

Address of Applicant: Room 811, Building 8, No.315, Central City Middle Road,
Yuexiu District, Guangzhou, China

Manufacturer: Guangzhou Smamao Electronic Technology Co.,Ltd

Address of Manufacturer: Room 811, Building 8, No.315, Central City Middle Road,
Yuexiu District, Guangzhou, China

Equipment Under Test (EUT)

Product Name: Fast Wireless Charger

Model No.: Q550, S110, S220, S440, S550, S660, S770, S880, S990,
S100, S200, S300, S400, S500, S600, S700, S800, S900,
SNPA087AB, GEPA090AB

FCC ID: 2AKQO-Q550

Applicable standards: FCC CFR Title 47 Part 15 Subpart C:2016

Date of sample receipt: May 04, 2017

Date of Test: May 05-11, 2017

Date of report issued: May 12, 2017

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

A circular blue stamp for GTS Global United Technology Services Co., Ltd. is visible. The stamp contains the text "GTS", "GLOBAL UNITED TECHNOLOGY SERVICES CO., LTD.", and "1705019". A handwritten signature in black ink is written over the stamp.

Robinson Lo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	May 12, 2017	Original

Prepared By:

Tiger Chen

Date:

May 12, 2017

Project Engineer

Check By:

Andy Wu

Date:

May 12, 2017

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Radiated Emission	15.209	Pass
20dB Bandwidth	15.205	Pass

Pass: The EUT complies with the essential requirements in the standard.

Note: Test according to ANSI C63.10-2013, ANSI C63.4-2014

5 General Information

5.1 General Description of EUT

Product Name:	Fast Wireless Charger
Model No.:	Q550, S110, S220, S440, S550, S660, S770, S880, S990, S100, S200, S300, S400, S500, S600, S700, S800, S900, SNPA087AB, GEPA090AB
Test Model No.:	Q550
<i>Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the model name and appearance color for commercial purpose.</i>	
Operation Frequency:	120kHz ~ 205KHz
Modulation type:	Backscatter modulation
Antenna Type:	Inductive loop coil antenna
Antenna gain:	0dBi (declared by manufacturer)
Power supply:	Charging voltage: DC 5.0V/2A or DC 9V/1.8A

Note:

In section 15.31(m), regards to the operating frequency range less than 1 MHz, only the middle frequency of channel was selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	N/A
The middle channel	154KHz
The Highest channel	N/A

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting and charging mode
<i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval
N/A	Load	N/A	N/A	VOC

5.4 Test Facility

<ul style="list-style-type: none">● FCC —Registration No.: 600491 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.● Industry Canada (IC) —Registration No.: 9079A-2 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016
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5.5 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

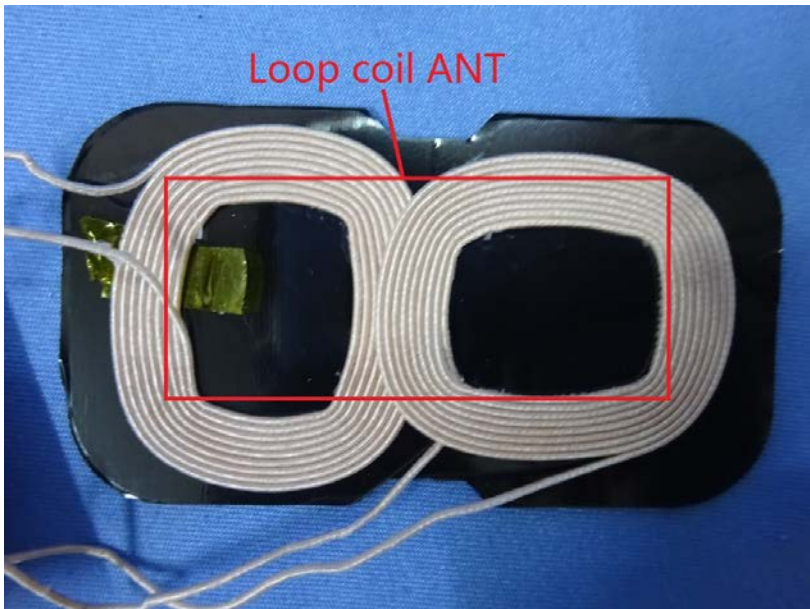
6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 03 2015	July 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June 29 2016	June 28 2017
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 29 2016	June 28 2017
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 29 2016	June 28 2017
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 29 2016	June 28 2017
7	Loop antenna	Laplace instrument	RF300	EMC0701	June 29 2016	June 28 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 29 2016	June 28 2017
10	Coaxial Cable	GTS	N/A	GTS211	June 29 2016	June 28 2017
11	Coaxial cable	GTS	N/A	GTS210	June 29 2016	June 28 2017
12	Coaxial Cable	GTS	N/A	GTS212	June 29 2016	June 28 2017
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 29 2016	June 28 2017
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 29 2016	June 28 2017
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2016	June 28 2017
16	Band filter	Amindeon	82346	GTS219	June 29 2016	June 28 2017
17	Power Meter	Anritsu	ML2495A	GTS540	June 29 2016	June 28 2017
18	Power Sensor	Anritsu	MA2411B	GTS541	June 29 2016	June 28 2017

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 29 2016	June. 28 2017
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June. 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June. 28 2017
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 29 2016	June. 28 2017

7 Test results and Measurement Data

7.1 Antenna requirement:

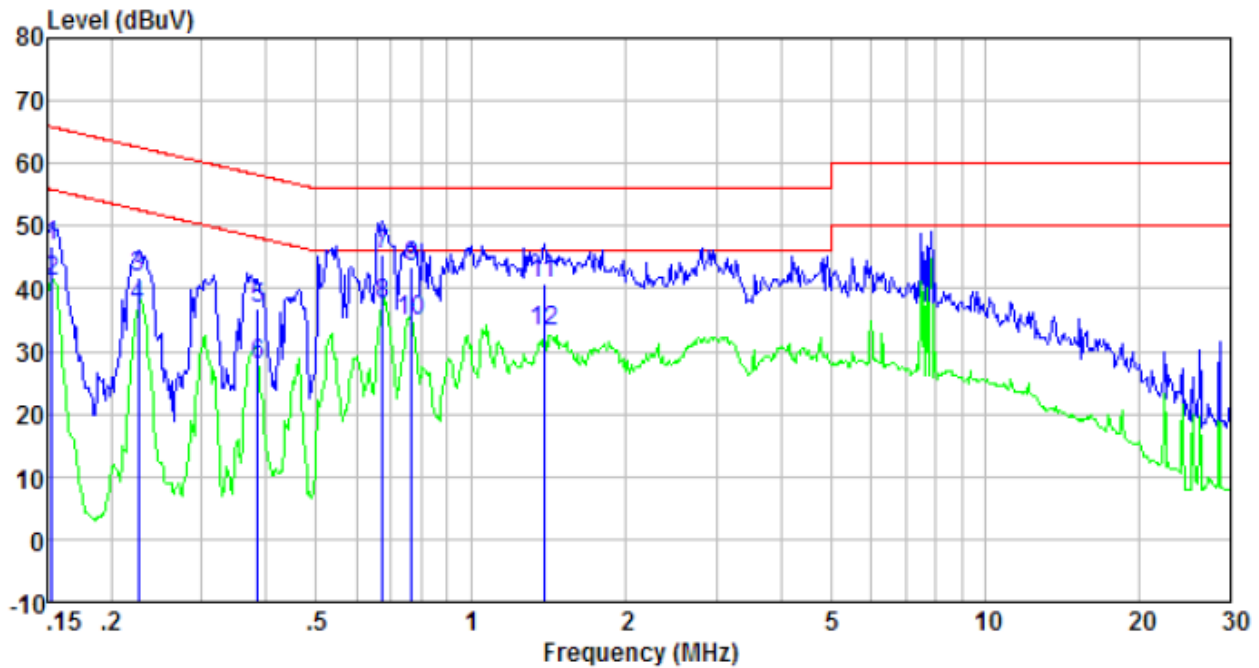
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling 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.	
EUT Antenna: <p><i>The antenna is integral antenna, the best case gain of the antenna is 0dBi</i></p> 	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207																
Test Method:	ANSI C63.4:2014																
Test Frequency Range:	150KHz to 30MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto																
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> <p>* Decreases with the logarithm of the frequency.</p>			Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															
Test setup:	<div><p style="text-align: center;">Reference Plane</p><p style="text-align: center;">Test table/Insulation plane</p><p><i>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i></p></div>																
Test procedure:	<div><div>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. 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).</div><div>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 C63.4: 2014 on conducted measurement.</div></div>																
Test Instruments:	Refer to section 6.0 for details																
Test mode:	Refer to section 5.2 for details																
Test results:	Pass																

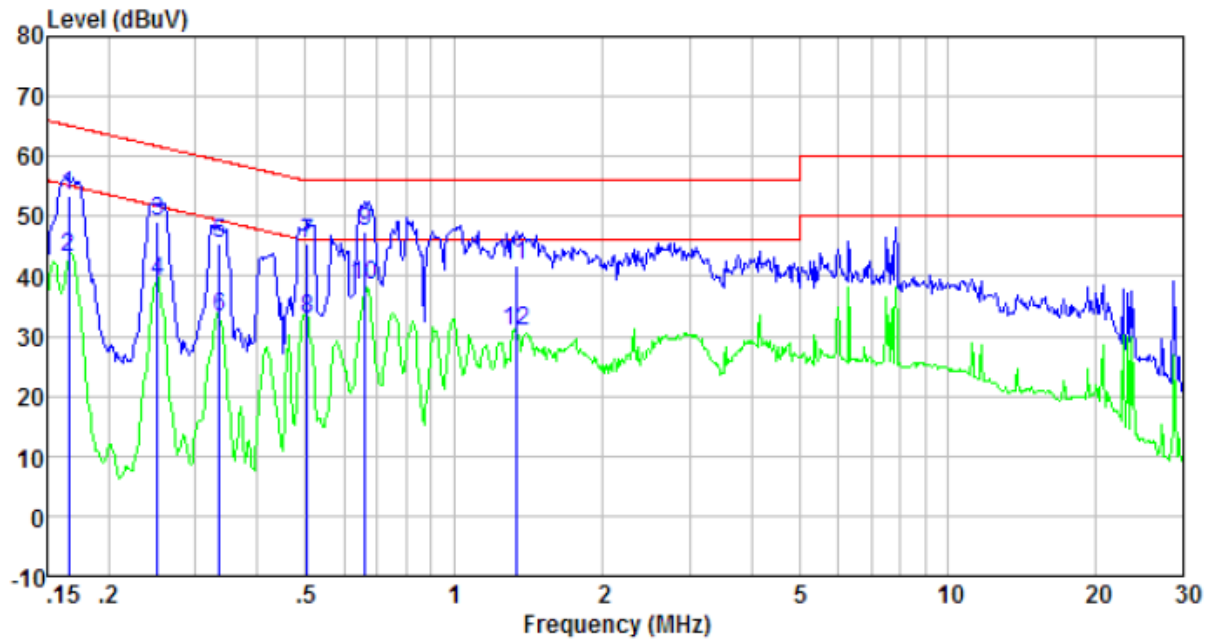
Measurement data:

Line:



Freq MHz	Reading level dBuV	LIISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.153	46.28	0.42	0.12	46.82	65.82	-19.00	QP
0.153	40.71	0.42	0.12	41.25	55.82	-14.57	Average
0.226	41.10	0.43	0.12	41.65	62.61	-20.96	QP
0.226	36.71	0.43	0.12	37.26	52.61	-15.35	Average
0.385	36.18	0.42	0.10	36.70	58.17	-21.47	QP
0.385	27.26	0.42	0.10	27.78	48.17	-20.39	Average
0.672	45.16	0.29	0.13	45.58	56.00	-10.42	QP
0.672	36.94	0.29	0.13	37.36	46.00	-8.64	Average
0.767	43.14	0.27	0.13	43.54	56.00	-12.46	QP
0.767	34.49	0.27	0.13	34.89	46.00	-11.11	Average
1.388	40.29	0.23	0.13	40.65	56.00	-15.35	QP
1.388	32.68	0.23	0.13	33.04	46.00	-12.96	Average

Neutral:



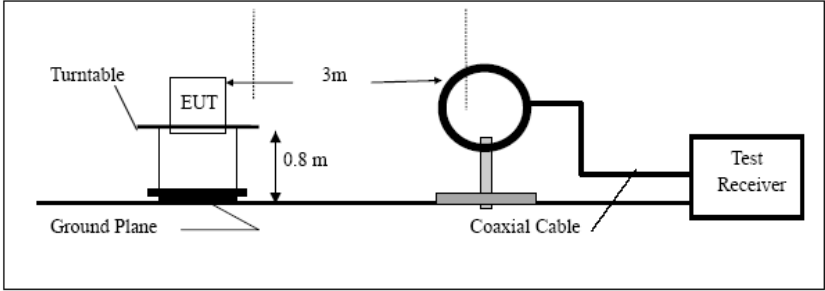
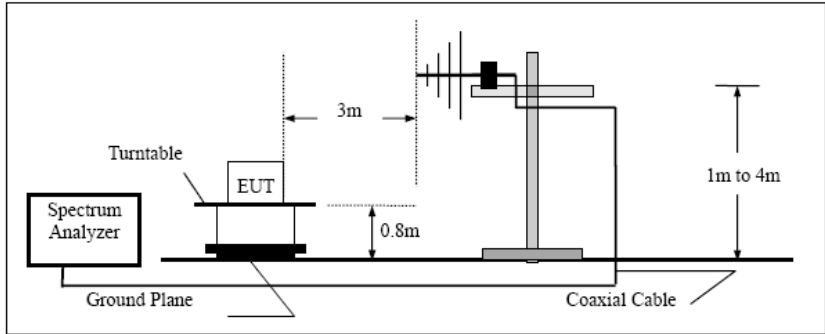
Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.166	52.84	0.41	0.12	53.37	65.16	-11.79	QP
0.166	42.64	0.41	0.12	43.17	55.16	-11.99	Average
0.251	48.68	0.42	0.11	49.21	61.73	-12.52	QP
0.251	38.55	0.42	0.11	39.08	51.73	-12.65	Average
0.336	44.79	0.41	0.10	45.30	59.31	-14.01	QP
0.336	32.54	0.41	0.10	33.05	49.31	-16.26	Average
0.505	45.09	0.35	0.11	45.55	56.00	-10.45	QP
0.505	32.53	0.35	0.11	32.99	46.00	-13.01	Average
0.661	47.00	0.25	0.13	47.38	56.00	-8.62	QP
0.661	37.99	0.25	0.13	38.37	46.00	-7.63	Average
1.338	41.55	0.21	0.13	41.89	56.00	-14.11	QP
1.338	30.46	0.21	0.13	30.80	46.00	-15.20	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.4:2014				
Test Frequency Range:	9kHz to 1GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz - 30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
	Remark: For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission test in these three bands are based on measurements employing an average detector.				
Limit: (Spurious Emissions)	Limits for frequency below 30MHz				
	Frequency	Limit (uV/m)	Measurement Distance(m)	Remark	
	0.009-0.490	2400/F(kHz)	300	Quasi-peak Value	
	0.490-1.705	24000/F(kHz)	30	Quasi-peak Value	
	1.705-30	30	30	Quasi-peak Value	
	Limits for frequency Above 30MHz				
	Frequency	Limit (dBuV/m @3m)		Remark	
	30MHz-88MHz	40.00		Quasi-peak Value	
	88MHz-216MHz	43.50		Quasi-peak Value	
	216MHz-960MHz	46.00		Quasi-peak Value	
960MHz-1GHz	54.00		Quasi-peak Value		
Above 1GHz	54.00		Average Value		
	74.00		Peak Value		
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.					
Test Procedure:	<div>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</div> <div>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</div> <div>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</div> <div>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</div> <div>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</div> <div>6. If the emission level of the EUT in peak mode was 10dB lower than the</div>				

	<p>limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.</p>
Test setup:	<p>Below 30MHz</p>  <p>30MHz ~ 1000MHz</p> 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

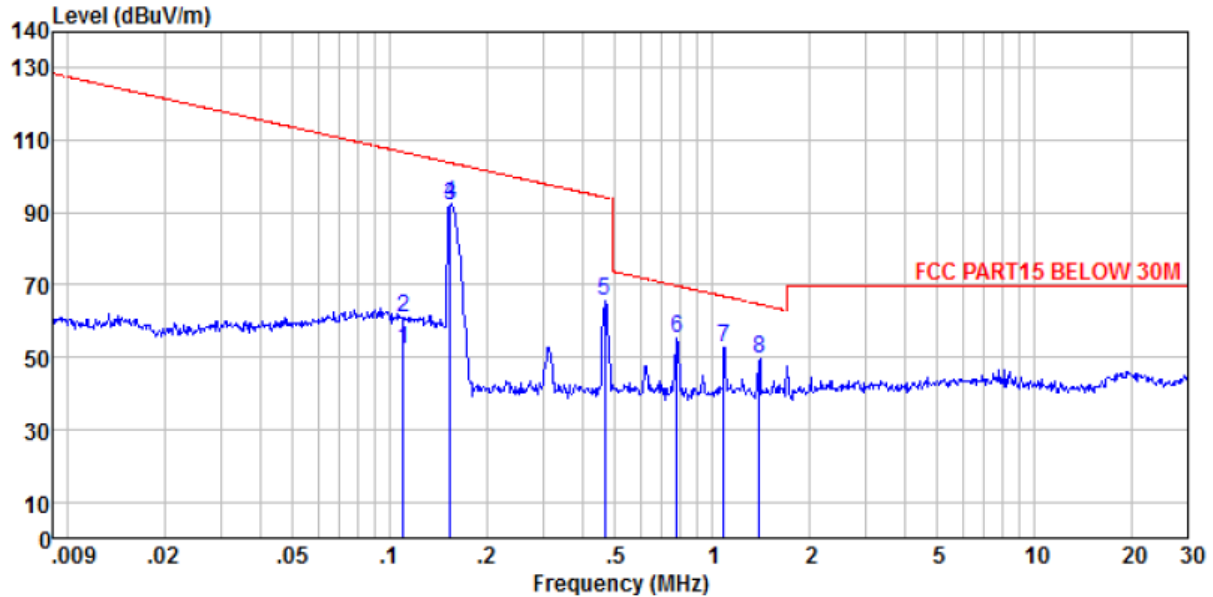
Measurement data:

Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

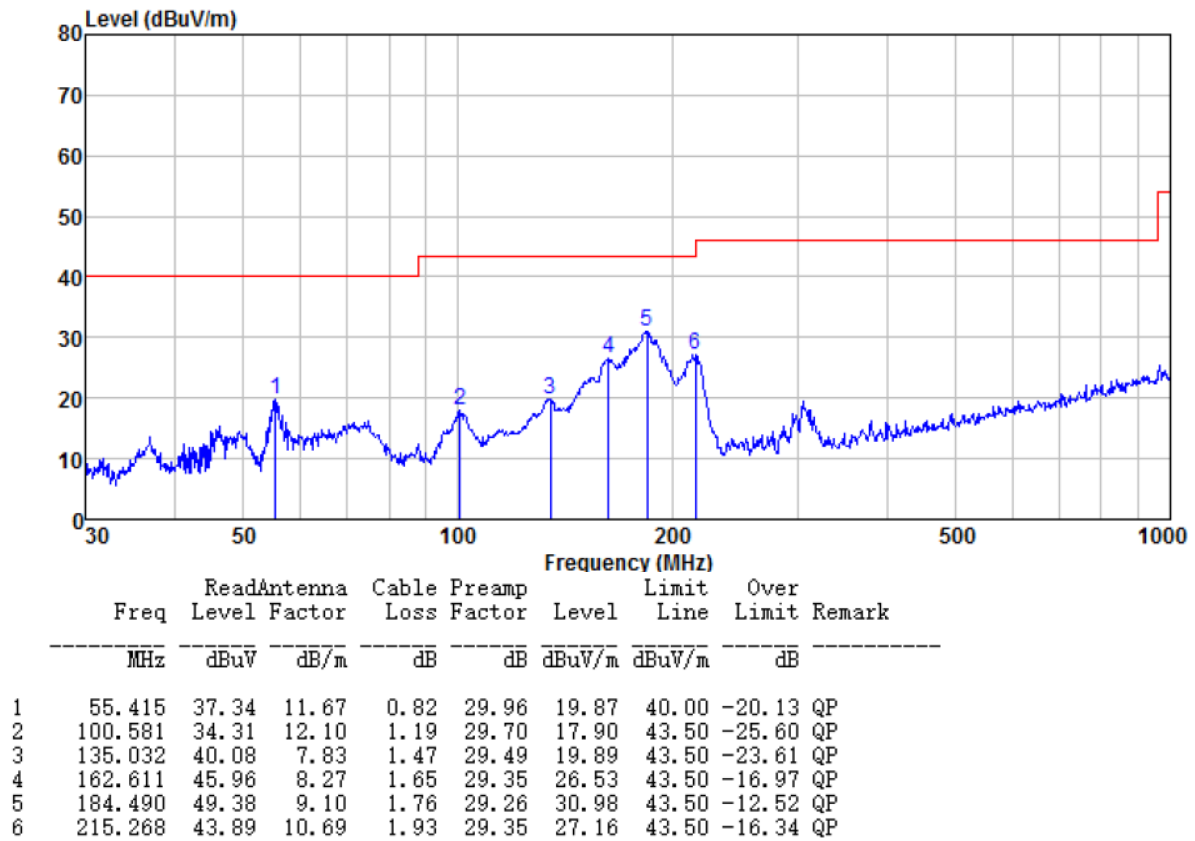
Below 30MHz



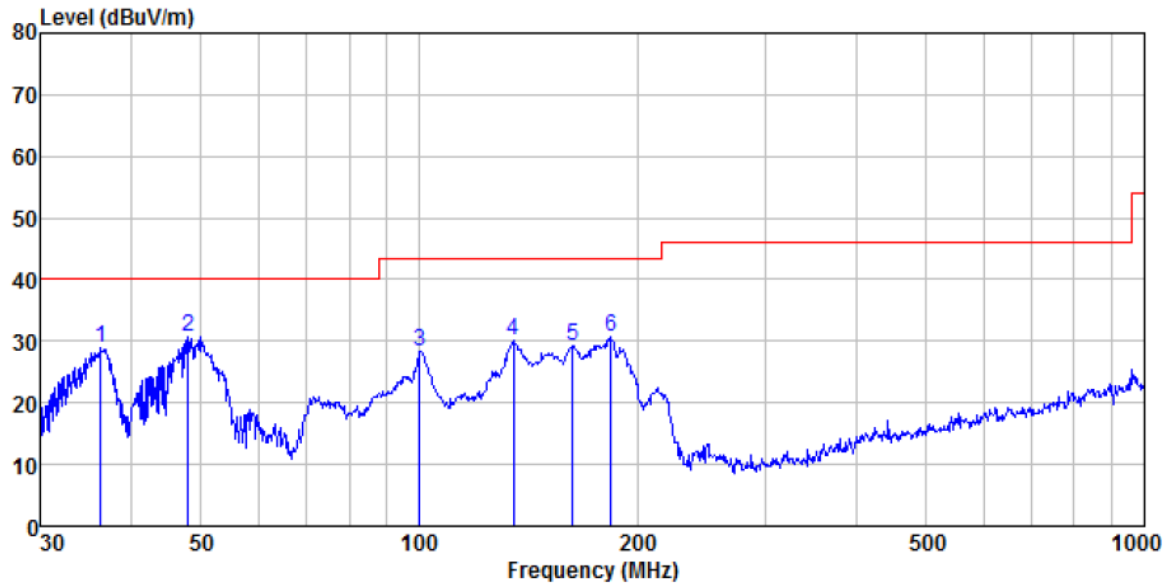
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
0.110	28.06	24.12	0.17	0.00	52.35	106.78	-54.43	Average
0.110	36.77	24.12	0.17	0.00	61.06	106.78	-45.72	Peak
0.154	68.68	22.84	0.20	0.00	91.72	103.85	-12.13	Average
0.154	69.20	22.84	0.20	0.00	92.24	103.85	-11.61	Peak
0.466	44.42	20.79	0.27	0.00	65.48	94.23	-28.75	Peak
0.779	34.51	20.66	0.31	0.00	55.48	69.77	-14.29	Peak
1.088	31.47	20.96	0.33	0.00	52.76	66.87	-14.11	Peak
1.403	28.59	20.86	0.35	0.00	49.80	64.66	-14.86	Peak

30MHz ~ 1GHz

Horizontal

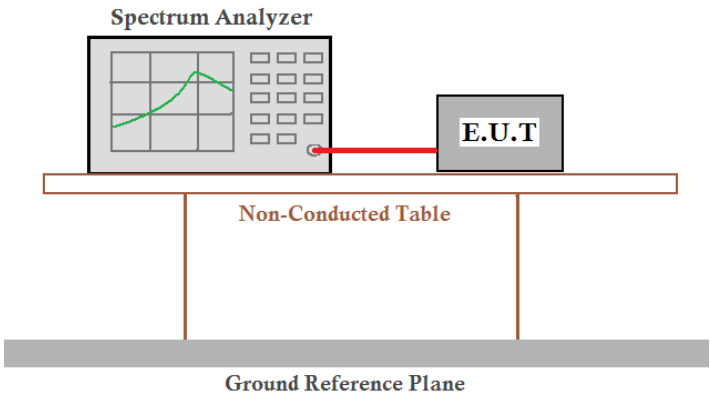


Vertical

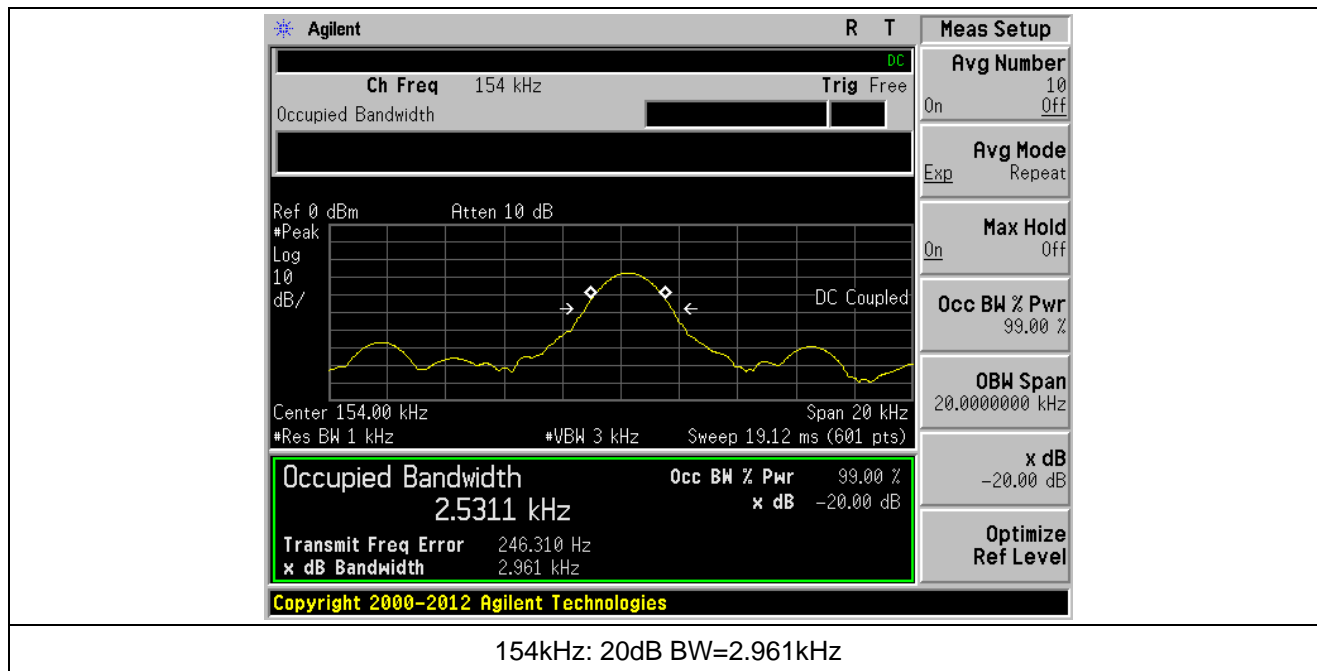


	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	36.381	47.18	11.20	0.62	30.06	28.94	40.00	-11.06 QP
2	47.994	47.63	12.23	0.75	30.01	30.60	40.00	-9.40 QP
3	100.229	44.74	12.10	1.19	29.70	28.33	43.50	-15.17 QP
4	135.032	50.21	7.83	1.47	29.49	30.02	43.50	-13.48 QP
5	162.611	48.72	8.27	1.65	29.35	29.29	43.50	-14.21 QP
6	183.844	49.14	9.10	1.76	29.26	30.74	43.50	-12.76 QP

7.4 20dB Occupy Bandwidth

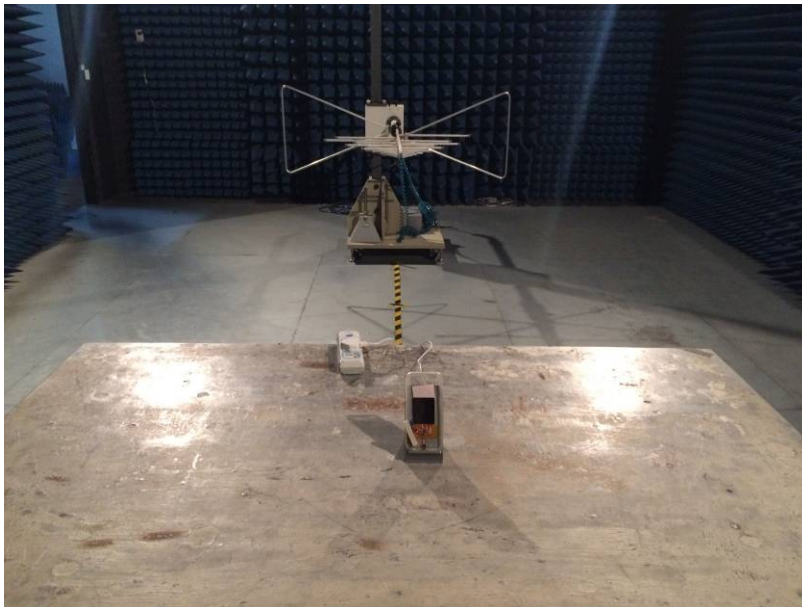
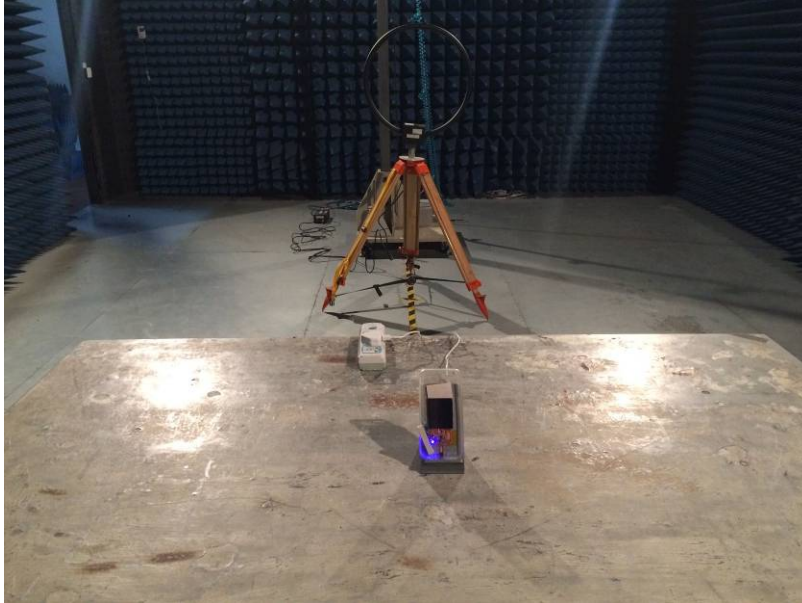
Test Requirement:	FCC Part15 C Section 15.215
Test Method:	ANSI C63.4:2014
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data



8 Test Setup Photo

Radiated Emission

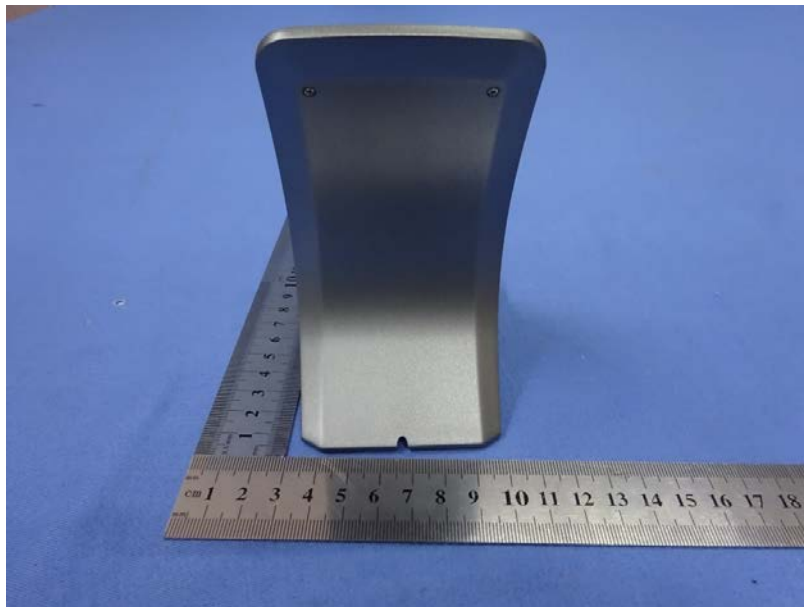


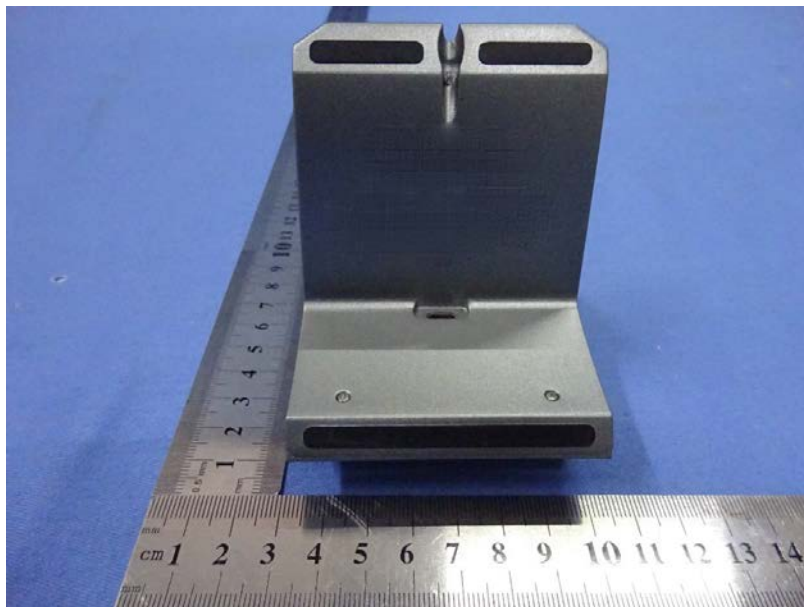
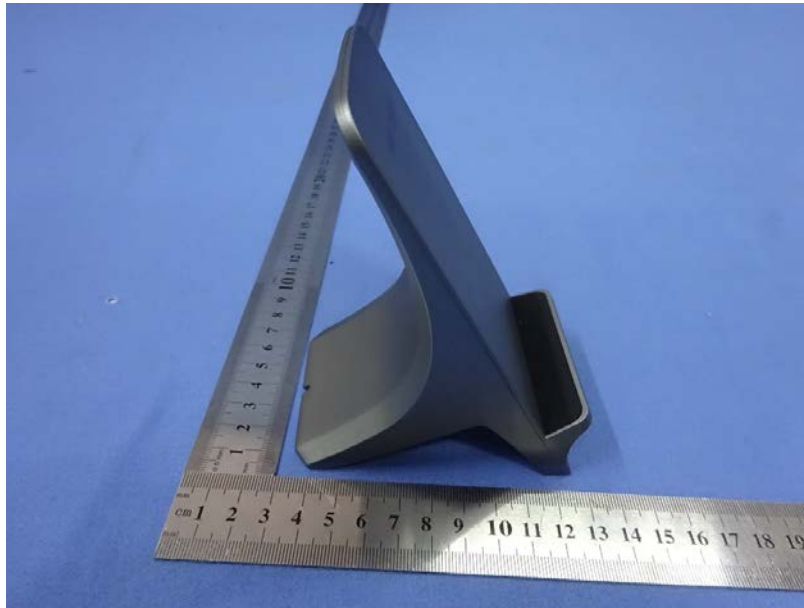
Conducted Emission



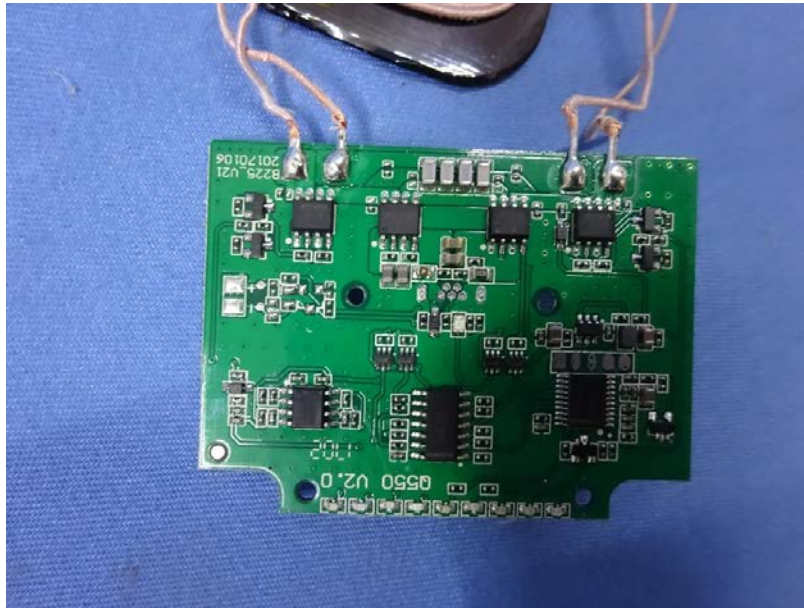
9 EUT Constructional Details











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