



FCC TEST REPORT

**Test report
On Behalf of
Qingdao Zhonghaihuizhi Power Technology Co., Ltd.
For**

**Wireless Charging Smart Bluetooth Speaker
Model No.:
WSS-503GB-E, WSS-503BB-E, WSS-503GB-A, WSS-503BB-A,
WSS-503GB-B, WSS-503BB-B, WSS-503GB-Au, WSS-503BB-Au**

FCC ID: 2AISC-WSS503GBE

Prepared for : Qingdao Zhonghaihuizhi Power Technology Co., Ltd.
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Shandong, China

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Date of Test: Jun. 01, 2016 ~ Jun. 10, 2016
Date of Report: Jun. 10, 2016
Report Number: HUAK160601009-E



TEST RESULT CERTIFICATION

Applicant's name Qingdao Zhonghaihuizhi Power Technology Co., Ltd.
Address..... B2,5th floor section B, No.1, Keyuanwei 1st Road, Laoshan, Qingdao,
Shandong, China
Manufacture's Name.. Qingdao Zhonghaihuizhi Power Technology Co., Ltd.
Address..... B2,5th floor section B, No.1, Keyuanwei 1st Road, Laoshan, Qingdao,
Shandong, China

Product description

Trade Mark: N/A
Product name Wireless Charging Smart Bluetooth Speaker
Model and/or type WSS-503GB-E, WSS-503BB-E, WSS-503GB-A, WSS-503BB-A, WSS-503GB-B,
reference WSS-503BB-B, WSS-503GB-Au, WSS-503BB-Au

Standards FCC Rules and Regulations Part 15 Subpart C Section 15.225
ANSI C63.10: 2013

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Date of Test

Date (s) of performance of tests..... Jun. 01, 2016 ~ Jun. 10, 2016

Date of Issue Jun. 10, 2016

Test Result..... Pass

Testing Engineer :

(Eric Xie)

Technical Manager :

(Dora Qin)

Authorized Signatory :

(Kait Chen)



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1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	COMPLIANT
RADIATED EMISSION TEST	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
FREQUENCY STABILITY TOLERANCE	COMPLIANT

1.2 TEST FACILITY

Test Firm : Shenzhen WST Testing Technology Co., Ltd.
Certificated by FCC, Registration No.: 939433
Address : 1F, No.9 Building, TKG Science & Technology Park, Yangtian Rd.,
NO.72 Bao'an Dist., Shenzhen, Guangdong, China. 518101

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty	
Conducted Emission Expanded Uncertainty	= 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.06dB, k=2



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Charging Smart Bluetooth Speaker
Model Name	WSS-503GB-E
Serial Model:	WSS-503BB-E,WSS-503GB-A,WSS-503BB-A,WSS-503GB-B,WSS-503BB-B,WSS-503GB-Au,WSS-503BB-Au
Model Difference	All the model are the same circuit and RF module,except the appearance colour, this report only test mode name: WSS-503GB-E.
FCC ID	2AISC-WSS503GBE
Antenna Type	PCB Antenna
Antenna Gain	0dBi
Operation frequency	13.56MHz
Number of Channels	1CH
Modulation Type	ASK
Power Source	AC 120V/60Hz
Power Rating	/
Adapter Model	/



2.1.1 Carrier Frequency of Channels

Channel	Frequency (MHz)
01	13.56MHz

Operation of EUT during testing

Operating Mode

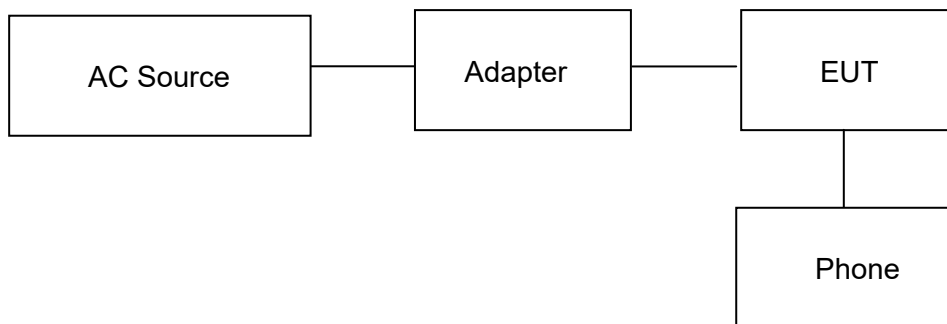
The mode is used: **Transmitting mode**

Channel: 13.56MHz

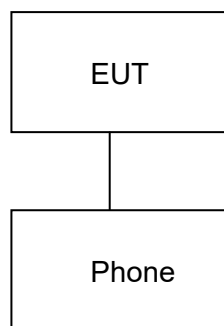
2.2 DESCRIPTION OF TEST SETUP

Operation of EUT during testing

Mode 1:



Mode 2:



Setup: Transmitting mode



2.3 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2016	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2016	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2016	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2016	1 Year
6.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 19, 2016	1 Year
7.	Pre-amplifier	Compliance Direction	PAP-0203	22008	May 19, 2016	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2016	1 Year
10.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2016	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2016	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2016	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2016	1 Year
15.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2016	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2016	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
18.	Programmable AC Power source	SOPH POWER	PAG-1050	630250	May 19, 2016	1 Year
19.	Harmonic and Flicker Analyzer	LAPLACE	AC2000A	272629	May 19, 2016	1 Year
20.	Harmonic and Flicker Test Software AC 2000A	LAPLACE	N/A	N/A	N/A	N/A
21.	ESD Simulators	KIKUSUI	KES4021	LJ003477	May 19, 2016	1 Year
22.	EFT Generator	EMPEK	EFT-4040B	0430928N	May 19, 2016	1 Year
23.	Shielding Room	ChangZhou ZhongYu	JB88	SEL0166	May 19, 2016	1 Year
24.	Signal Generator 9KHz~2.2GHz	R&S	SML02	SEL0143	May 19, 2016	1 Year
25.	Signal Generator 9KHz~1.1GHz	R&S	SML01	SEL0135	May 19, 2016	1 Year
26.	Power Meter	R&S	NRVS	SEL0144	May 19, 2016	1 Year
27.	RF Level Meter		URV35	SEL0137	May 19, 2016	1 Year
28.	Audio Analyzer	R&S	UPL	SEL0136	May 19, 2016	1 Year
29.	RF-Amplifier 150KHz~150MHz	BONN Elektronik	BSA1515-25	SEL0157	May 19, 2016	1 Year



30.	Stripline Test Cell	Erika Fiedler	VDE0872	SEL0167	May 19, 2016	N/A
31.	TV Test Transmitter	R&S	SFM	SEL0159	May 19, 2016	1 Year
32.	TV Generator PAL	R&S	SGPF	SEL0138	May 19, 2016	1 Year
33.	TV Generator Ntsc	R&S	SGMF	SEL0140	May 19, 2016	1 Year
34.	TV Generator Secam	R&S	SGSF	SEL0139	May 19, 2016	1 Year
35.	TV Test Transmitter 0.3MHz~3300MHz	R&S	SFQ	SEL0142	May 19, 2016	1 Year
36.	MPEG2 Measurement Generator	R&S	DVG	SEL0141	May 19, 2016	1 Year
37.	Spectrum Analyzer	R&S	FSP	SEL0177	May 19, 2016	1 Year
38.	Matching	R&S	RAM	SEL0146	N/A	N/A
39.	Matching	R&S	RAM	SEL0148	N/A	N/A
40.	Absorbing Clamp	R&S	MDS21	SEL0158	May 19, 2016	1 Year
41.	Coupling Set	Erika Fiedler	Rco, Rci, MC, AC, LC	SEL0149	May 19, 2016	N/A
42.	Filters	Erika Fiedler	Sr, LBS	SEL0150	N/A	N/A
43.	Matching Network	Erika Fiedler	MN, T1	SEL0151	N/A	N/A
44.	Fully Anechoic Room	ChangZhou ZhongYu	854	SEL0169	May 19, 2016	1 Year
45.	Signal Generator	R&S	SML03	SEL0068	May 19, 2016	1 Year
46.	RF-Amplifier 30M~1GHz	Amplifier Reasearch	250W1000A	SEL0066	Oct. 24, 2015	1 Year
47.	RF-Amplifier 0.8~3.0GHz	Amplifier Reasearch	60S1G3	SEL0065	Oct. 24, 2015	1 Year
48.	Power Meter	R&S	NRVD	SEL0069	April 26, 2016	1 Year
49.	Power Sensor	R&S	URV5-Z2	SEL0071	April 26, 2016	1 Year
50.	Power Sensor	R&S	URV5-Z2	SEL0072	April 26, 2016	1 Year
51.	Software EMC32	R&S	EMC32-S	SEL0082	April 26, 2016	1 Year
52.	Log-periodic Antenna	Amplifier Reasearch	AT1080	SEL0073	April 26, 2016	1 Year
53.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	April 26, 2016	1 Year
54.	Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	April 26, 2016	1 Year
55.	High Gain Horn Antenna(0.8-5G Hz)	Amplifier Reasearch	AT4002A	SEL0075	April 26, 2016	1 Year



3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

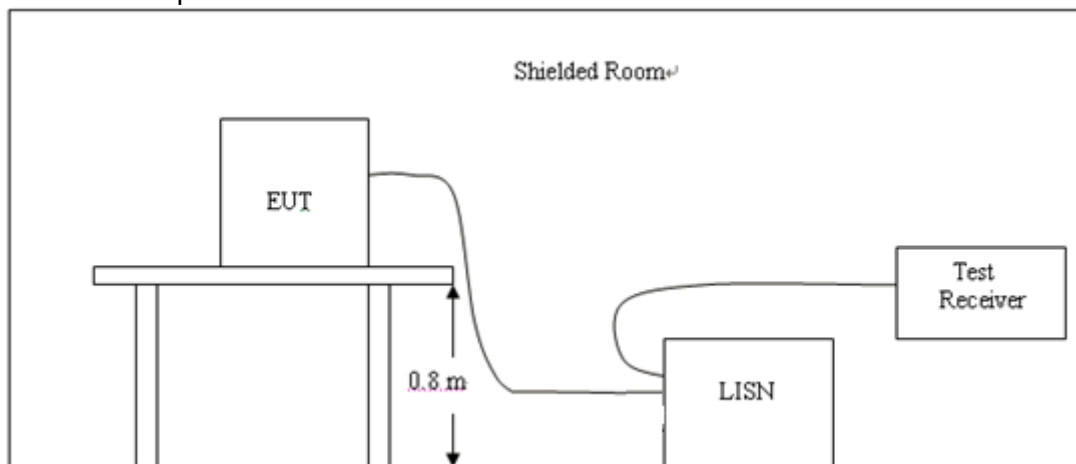
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup

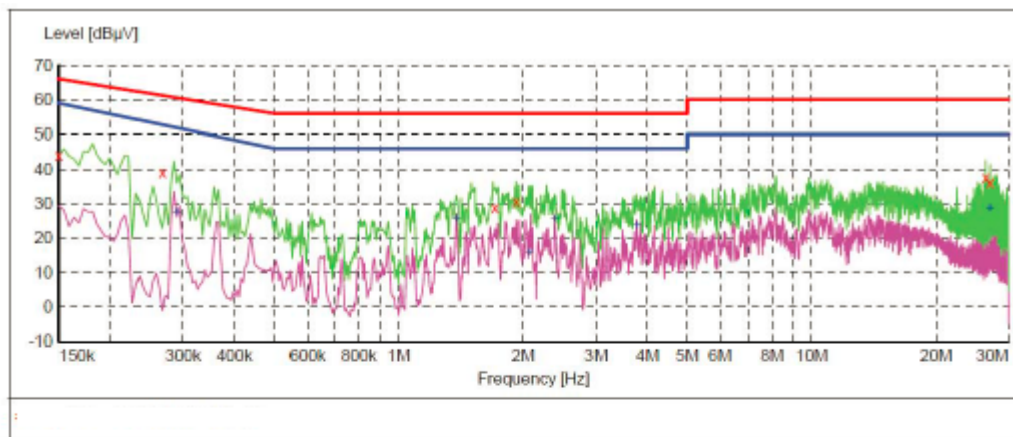


3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

3.4 Test Result

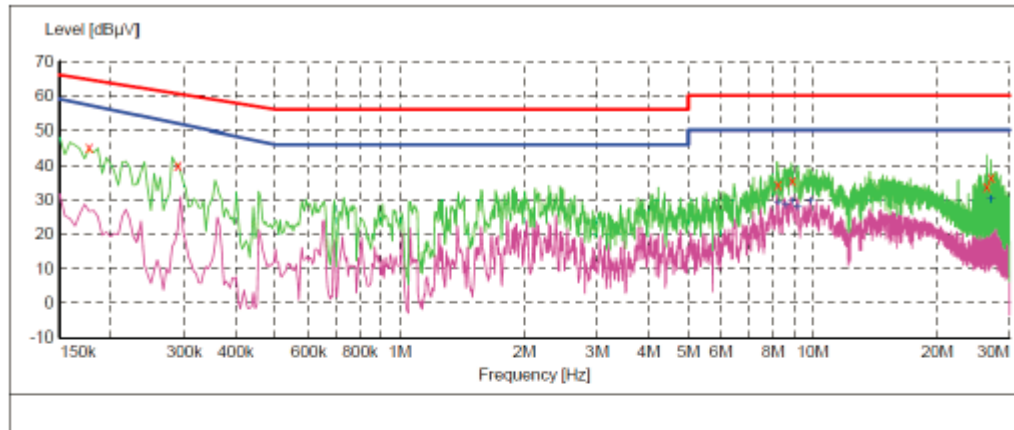
PASS

**MEASUREMENT RESULT:**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150001	44.10	10.2	66	21.9	QP	L1	GND
0.267001	39.00	10.2	61	22.2	QP	L1	GND
1.707001	28.80	10.3	56	27.2	QP	L1	GND
1.923001	30.60	10.3	56	25.4	QP	L1	GND
26.412001	37.70	11.2	60	22.3	QP	L1	GND
27.073501	36.20	11.2	60	23.8	QP	L1	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.289501	27.40	10.2	52	24.5	AV	L1	GND
1.374001	25.70	10.3	46	20.3	AV	L1	GND
2.071501	15.70	10.4	46	30.3	AV	L1	GND
2.386501	25.60	10.4	46	20.4	AV	L1	GND
3.763501	23.50	10.4	46	22.5	AV	L1	GND
27.015001	28.60	11.2	50	21.4	AV	L1	GND

**MEASUREMENT RESULT:**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.177001	45.00	10.2	65	19.6	QP	N	GND
0.289501	39.90	10.2	61	20.6	QP	N	GND
8.227501	34.40	10.5	60	25.6	QP	N	GND
8.902501	35.40	10.6	60	24.6	QP	N	GND
26.416501	33.70	11.2	60	26.3	QP	N	GND
27.073501	36.50	11.2	60	23.5	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
8.196001	29.00	10.5	50	21.0	AV	N	GND
8.560501	28.40	10.6	50	21.6	AV	N	GND
8.884501	29.30	10.6	50	20.7	AV	N	GND
9.172501	27.50	10.6	50	22.5	AV	N	GND
9.861001	29.50	10.6	50	20.5	AV	N	GND
27.015001	30.10	11.2	50	19.9	AV	N	GND



4 RADIATED EMISSION TEST

4.1 Radiation Limit

Field Strength of Fundamental Emissions Measurement

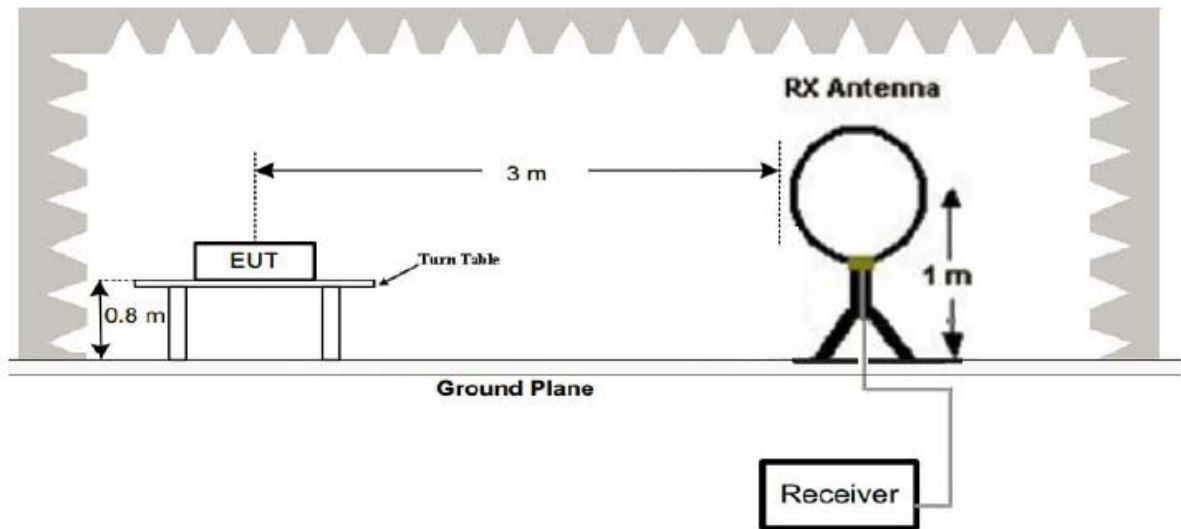
Rules and specifications	CFR 47 Part 15 section 15.225(a)-(d)			
Description	Compliance with the spectrum mask is tested using a spectrum analyzer with RBW set to a 9kHz for the band 13.553~13.567MHz			
Freq. of Emission (MHz)	Field Strength (μV/m) at 30m	Field Strength (dBμV/m) at 30m	Field Strength (dBμV/m) at 10m	Field Strength (dBμV/m) at 3m
1.705~13.110	30	29.5	48.58	69.5
13.110~13.410	106	40.5	59.58	80.5
13.410~13.553	334	50.5	69.58	90.5
13.553~13.567	15848	84.0	103.08	124.0
13.567~13.710	334	50.5	69.58	90.5
13.710~14.010	106	40.5	59.58	80.5
14.010~30.000	30	29.5	48.58	69.5

The field strength of any emissions which appear outside of 13.553-13.567MHz band shall not exceed the General radiated emissions limits

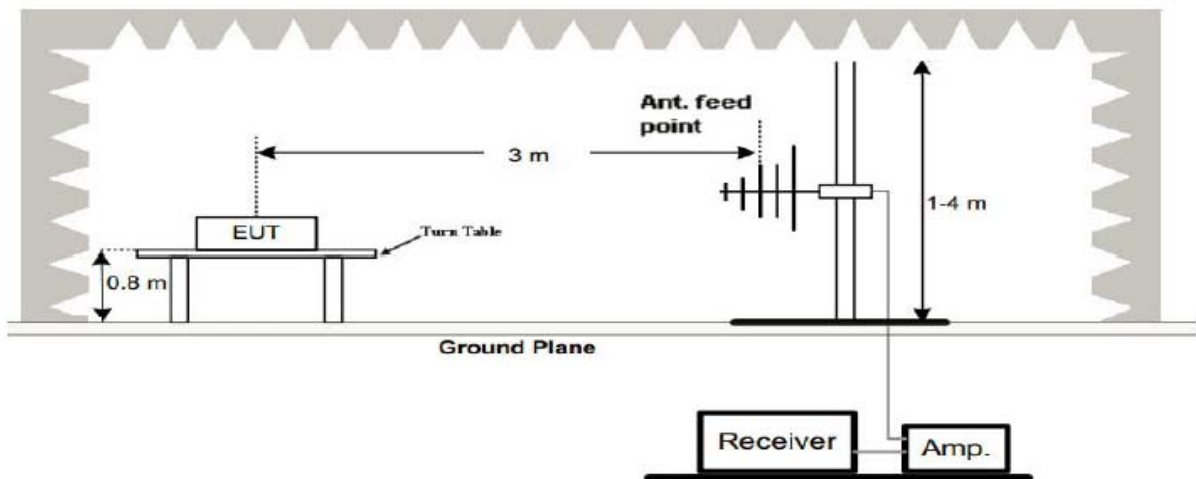
Frequencies (MHz)	Field Strength (μV/m)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.2 Test Setup

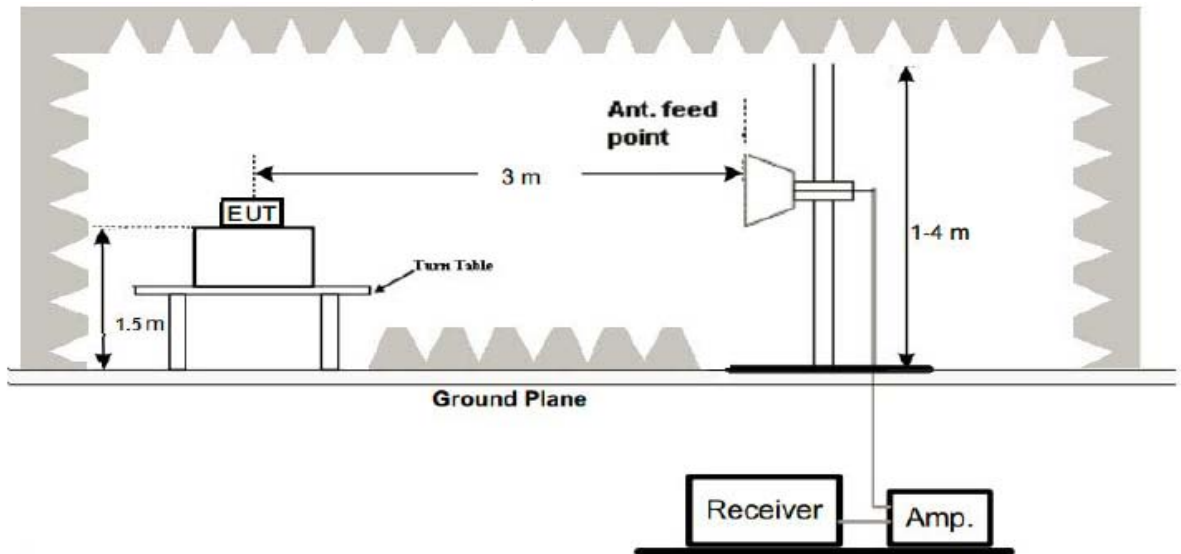
(1) Radiated Emission Test-Up Frequency Below 30MHz



(2) Radiated Emission Test-Up Frequency 30MHz~1GHz



(3) Radiated Emission Test-Up Frequency Above 1GHz





4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

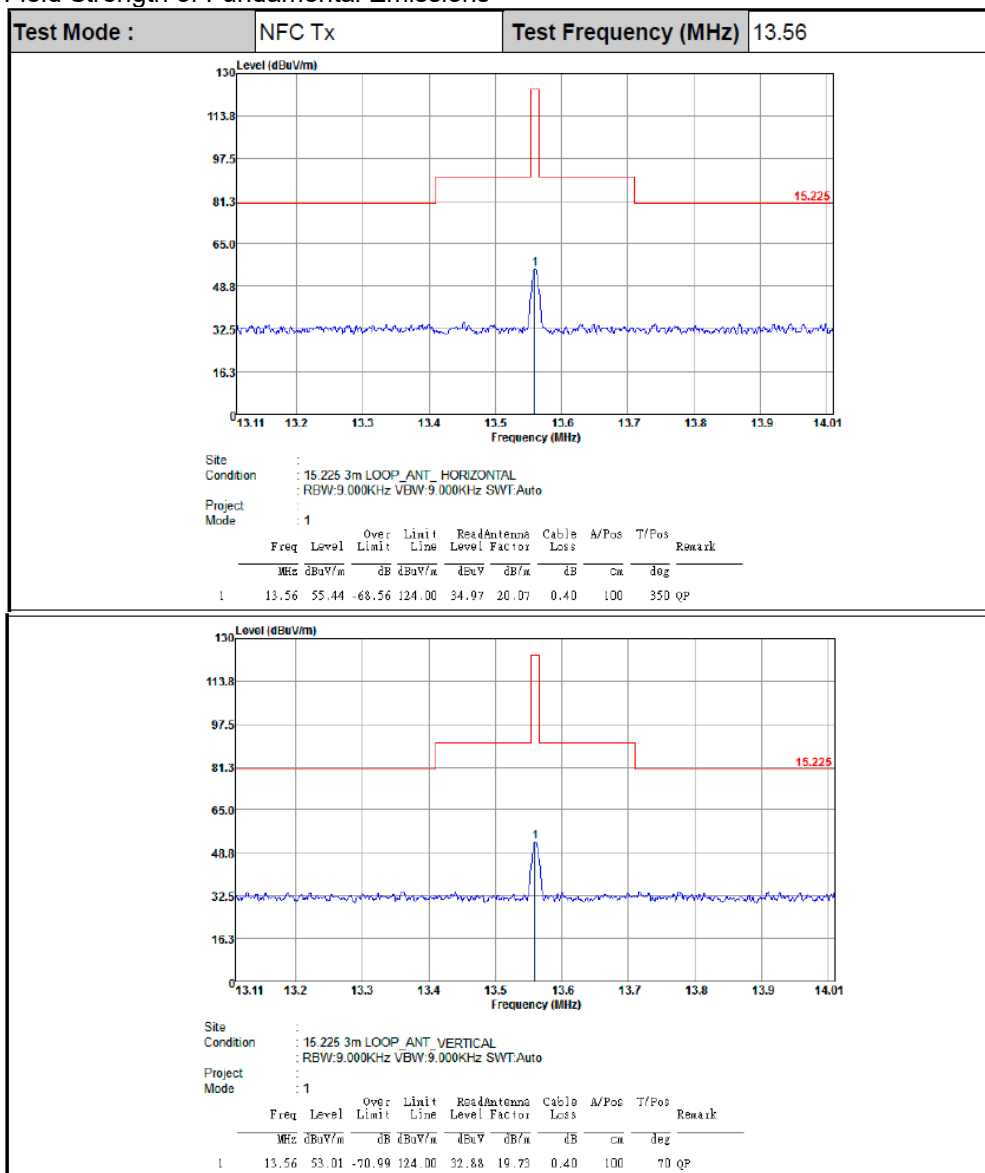
Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

PASS

Field Strength of Fundamental Emissions





The field strength of any emissions which appear outside of 13.553-13.567MHz
9KHz-30MHz Test Results:

Test Mode :		NFC Tx			Polarization :		Horizontal		
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.05414	35.19	-77.74	112.93	14.89	20.01	0.29	-	-	Average
0.08481	22.39	-86.65	109.04	2.14	19.96	0.29	-	-	Average
0.10828	26.86	-80.05	106.91	6.61	19.96	0.29	-	-	QP
0.13832	20.35	-84.44	104.79	0.12	19.94	0.29	-	-	Average
0.4492	39.17	-55.39	94.56	19	19.88	0.29	-	-	Average
0.50502	39.56	-33.98	73.54	19.39	19.88	0.29	-	-	QP
11.328	35.55	-34.45	70	15.1	20.06	0.39	-	-	QP
13.56	55.59	-14.41	70	35.12	20.07	0.4	-	-	QP
20.068	37.43	-32.57	70	16.56	20.44	0.43	100	245	QP
27.225	35.8	-34.2	70	14.64	20.68	0.48	-	-	QP

Test Mode :		NFC Tx			Polarization :		Vertical		
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.05419	31.39	-81.54	112.93	11.07	20.03	0.29	-	-	Average
0.08652	22.35	-86.51	108.86	2.07	19.99	0.29	-	-	Average
0.10838	24.12	-82.79	106.91	3.84	19.99	0.29	-	-	QP
0.1422	21.12	-83.43	104.55	0.88	19.95	0.29	-	-	Average
0.2605	40.23	-59.06	99.29	20.02	19.92	0.29	-	-	Average
0.51253	38.28	-35.13	73.41	18.07	19.9	0.31	-	-	QP
9.288	35.35	-34.65	70	15.16	19.81	0.38	-	-	QP
13.56	53.82	-16.18	70	33.69	19.73	0.4	-	-	QP
21.274	37.95	-32.05	70	17.5	20.02	0.43	100	147	QP
26.56	35.76	-34.24	70	15.19	20.09	0.48	-	-	QP



30MHz-1GHz Test Results:

Test Mode :		NFC Tx			Polarization :		Horizontal		
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
49.44	12.63	-27.37	40	33.31	8.75	1.77	-	-	Peak
160.95	12.36	-31.14	43.5	30.58	10.36	2.61	-	-	Peak
237.9	14.98	-31.02	46	31.96	11.06	2.96	-	-	Peak
493.2	21.45	-24.55	46	30.41	17.94	3.77	-	-	Peak
629.7	24.11	-21.89	46	30.05	20.38	4.22	-	-	Peak
838.3	27.94	-18.06	46	30.5	23.12	4.7	132	214	Peak

Test Mode :		NFC Tx			Polarization :		Vertical		
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
102.9	12.4	-31.1	43.5	30.69	10.46	2.38	-	-	Peak
172.29	11.83	-31.67	43.5	30.82	9.46	2.61	-	-	Peak
253.29	16.24	-29.76	46	31.4	12.88	2.96	-	-	Peak
437.2	19.91	-26.09	46	30.02	16.97	3.63	-	-	Peak
620.6	23.45	-22.55	46	29.57	20.22	4.22	-	-	Peak
881.7	27.75	-18.25	46	30.53	22.9	4.66	125	147	Peak



6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Setup

Same as Radiated Emission Measurement

6.2 Test Procedure

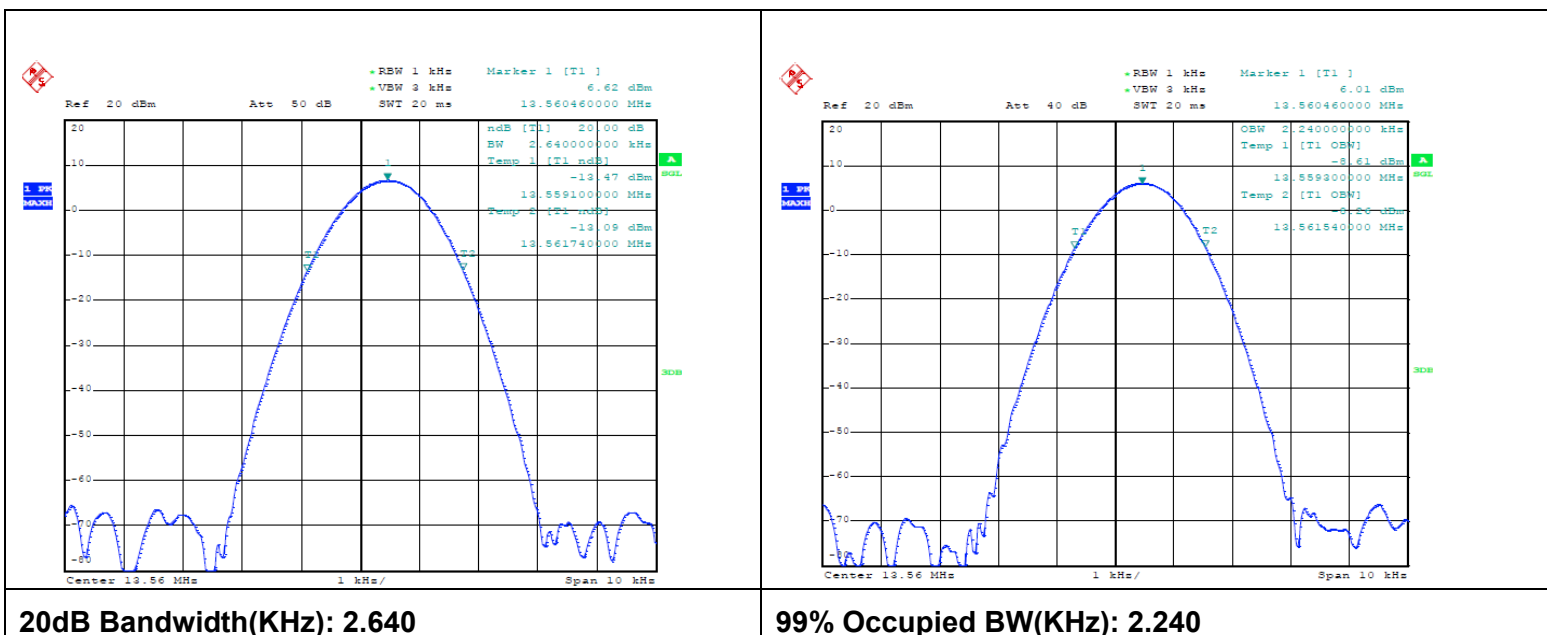
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.225: RBW= 1KHz. VBW= 3 KHz, Span=10KHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

6.4 Test Result

PASS



Frequency range(MHz)	Test result
FL>13.553	13.55910
FH<13.567	13.56174

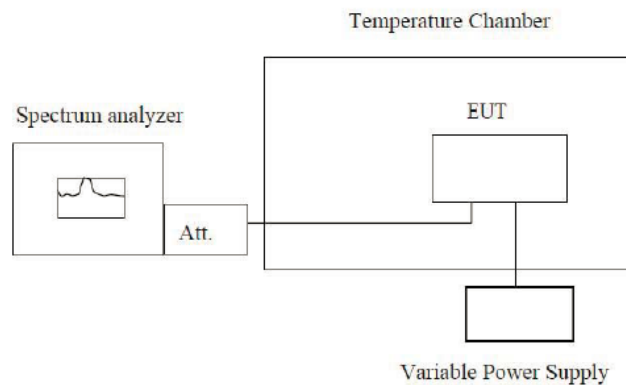


7 FREQUENCY STABILITY

7.1 Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

7.2 Test Setup



Note : Measurement setup for testing on Antenna connector

7.2 Test Procedure

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators..
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10 increased per stage until the highest temperature of +50°C reached.
7. Reduce the input voltage to specified extreme voltage variation (+/- 15%) or endpoint, record the maximum frequency change.

7.3 Test Result

PASS



Voltage vs. Frequency Stability		Temperature vs. Frequency Stability	
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (°C)	Measurement Frequency (MHz)
120	13.560420	-20	13.560550
102	13.560420	-10	13.560550
138	13.560420	0	13.560540
		10	13.560500
		20	13.560480
		30	13.560460
		40	13.560420
		50	13.560400
Max.Deviation (MHz)	0.000420	Max.Deviation (MHz)	0.000550
Max.Deviation (ppm)	30.9735	Max.Deviation (ppm)	40.5605
Limit	FS < ± 100 ppm	Limit	FS < ± 100 ppm
Test Result	PASS	Test Result	PASS

8 ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.225, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

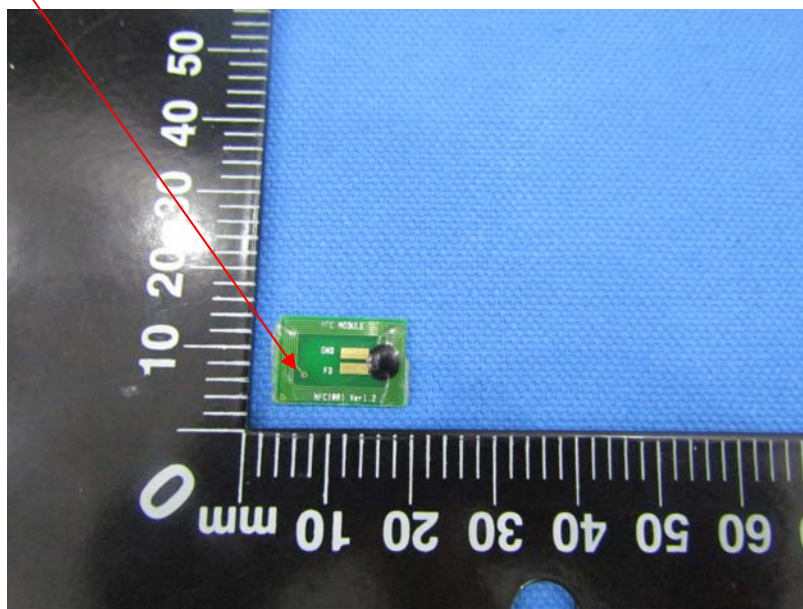
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 0dBi.

ANTENNA



9 PHOTOGRAPH OF TEST

9.1 Radiated Emission





9.2 Conducted Emission

