

FCC TEST REPORT

FCC ID : WC2DS-955BR
Applicant : Wonders Technology Co., Ltd.
Address : Doss Industrial Zone, Qiping Kengdu Industrial ARE Guihua Village,
Guanlan Town, Baoan District, Shenzhen, China.


Equipment Under Test (EUT) :


Product Name : Wireless Speaker
Model No. : DS-955B, ISP822B

Standards : FCC CFR47 Part 15 Section 15.247:2009

Date of Test : December 29, 2011 ~ January 17, 2012

Date of Issue : January 31, 2012

Test Engineer : Hunk yan / Engineer 

Reviewed By : Philo zhong / Manager 

Test Result	: PASS
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Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

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✧ The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

2 Test Summary

Test Items	Test Requirement	Result
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	15.207(a)	PASS
Radiated Spurious Emissions (9kHz to 25GHz)	15.205(a) 15.209 15.247(d)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Power Spectral Density	15.247(e)	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

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3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION	4
4.1 CLIENT INFORMATION	4
4.2 GENERAL DESCRIPTION OF E.U.T.	4
4.3 DETAILS OF E.U.T.....	4
4.4 DESCRIPTION OF SUPPORT UNITS	4
4.5 STANDARDS APPLICABLE FOR TESTING	4
4.6 TEST FACILITY	5
4.7 TEST LOCATION	5
5 EQUIPMENT USED DURING TEST	6
6 CONDUCTED EMISSION	7
7 RADIATED SPURIOUS EMISSIONS	12
8 BAND EDGE MEASUREMENT	27
9 6 DB BANDWIDTH MEASUREMENT	32
10 MAXIMUM PEAK OUTPUT POWER	35
11 POWER SPECTRAL DENSITY	36
12 ANTENNA REQUIREMENT	39
13 RF EXPOSURE	40
13.1 REQUIMENTS:	40
13.2 MEASUREMENT RESULT:.....	40
14 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	41
14.1 PRODUCT VIEW	41
14.2 EUT – APPEARANCE VIEW	41
14.3 EUT-OPEN VIEW	42
14.4 PCB1 - VIEW	43
14.5 RF MODULE - VIEW	44
14.6 BATTERY - VIEW	45
15 FCC LABEL	46

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4 General Information

4.1 Client Information

Applicant : Wonders Technology Co., Ltd.
Address of Applicant : Doss Industrial Zone, Qiping Kengdu Industrial ARE Guihua Village, Guanlan Town, Baoan District, Shenzhen, China.

Manufacturer : Wonders Technology Co., Ltd.
Address of Manufacturer : Doss Industrial Zone, Qiping Kengdu Industrial ARE Guihua Village, Guanlan Town, Baoan District, Shenzhen, China.

4.2 General Description of E.U.T.

Product Name : Wireless Speaker
Model No. : DS-955B, ISP822B
Difference Description : Both models are exactly same, except for model number.

4.3 Details of E.U.T.

Technical Data : Input: 5.0VDC (Charging mode)
 Internal Li-ion Battery: 3.7VDC
Operation Frequency : 2403MHz ~ 2478MHz
Modulation Technique : DSSS
Channel Number : 26 Channels
Antenna Gain : 0 dBi

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a Wireless Speaker. The standards used were FCC CFR47 Part 15 Section 15.247, Section 15.209, Section 15.207 and Section 15.203.

4.6 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: IC7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, August 3, 2010.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. 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 our files. Registration 880581, May 26, 2011.

4.7 Test Location

All the tests were performed at:

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	Aug. 2, 2011	Aug. 1, 2012	±1dB
Trilog Broadband Antenne	SCHWARZECK MESS-ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug. 2, 2011	Aug. 1, 2012	±1dB
Broad-band Horn Antenna	SCHWARZECK MESS-ELEKTROM / BBHA 9120D(1201)	667	W2008003	1-18GHz	Aug. 2, 2011	Aug. 1, 2012	f < 10 GHz : ±1dB 10GHz < f < 18 GHz : ±1.5dB
Broadband Preamplifier	SCHWARZECK MESS-ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug. 2, 2011	Aug. 1, 2012	±1.2dB
10m Coaxial Cable with N-male Connectors	SCHWARZECK MESS-ELEKTROM / AK 9515 H	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
10m 50 Ohm Coaxial Cable	SCHWARZECK MESS-ELEKTROM / AK 9513	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
Positioning Controller	C&C LAB/ CC-C-IF	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
Color Monitor	SUNSPOT/ SP-14C	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug. 2, 2011	Aug. 1, 2012	±1dB
Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	Aug. 2, 2011	Aug. 1, 2012	±10%
Active Loop Antenna	Beijing Dazhi / ZN30900A	-	-	-	Aug. 2, 2011	Aug. 1, 2012	±1dB
MP3 Player	Ipod Player/A1285	5K85004U3R0	-	-	Aug. 2, 2011	Aug. 1, 2012	±0.5dB

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6 Conducted Emission

Test Requirement:	FCC CFR47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz The tighter limit applies at the band edges.
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

EUT Operation :

Operating Environment:

Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

EUT Operation:

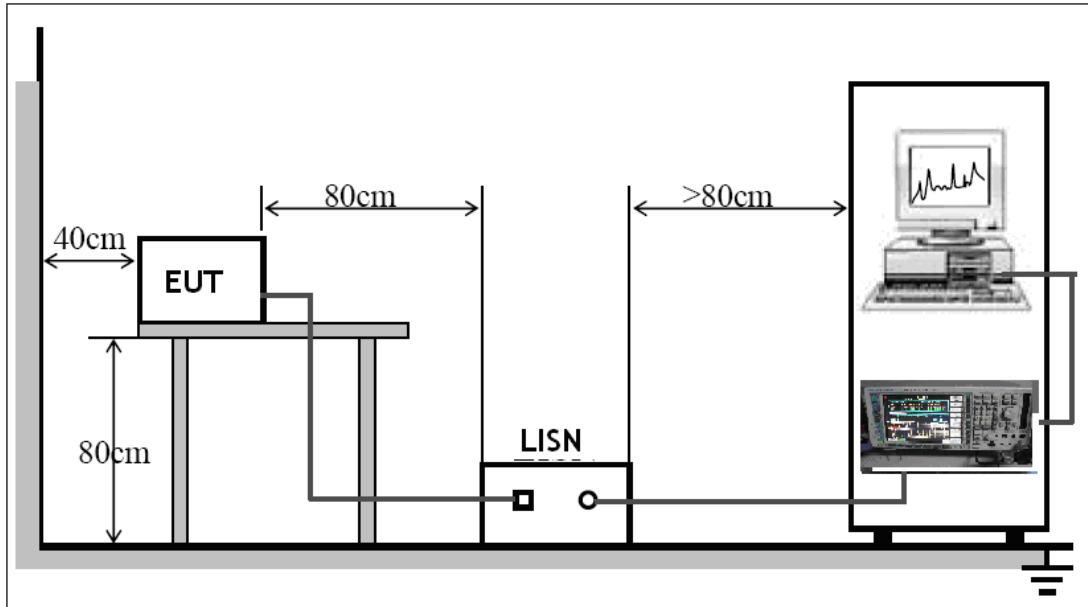
The EUT was tested in charging mode.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC CFR47 Part 15 Section 15.207 limits.

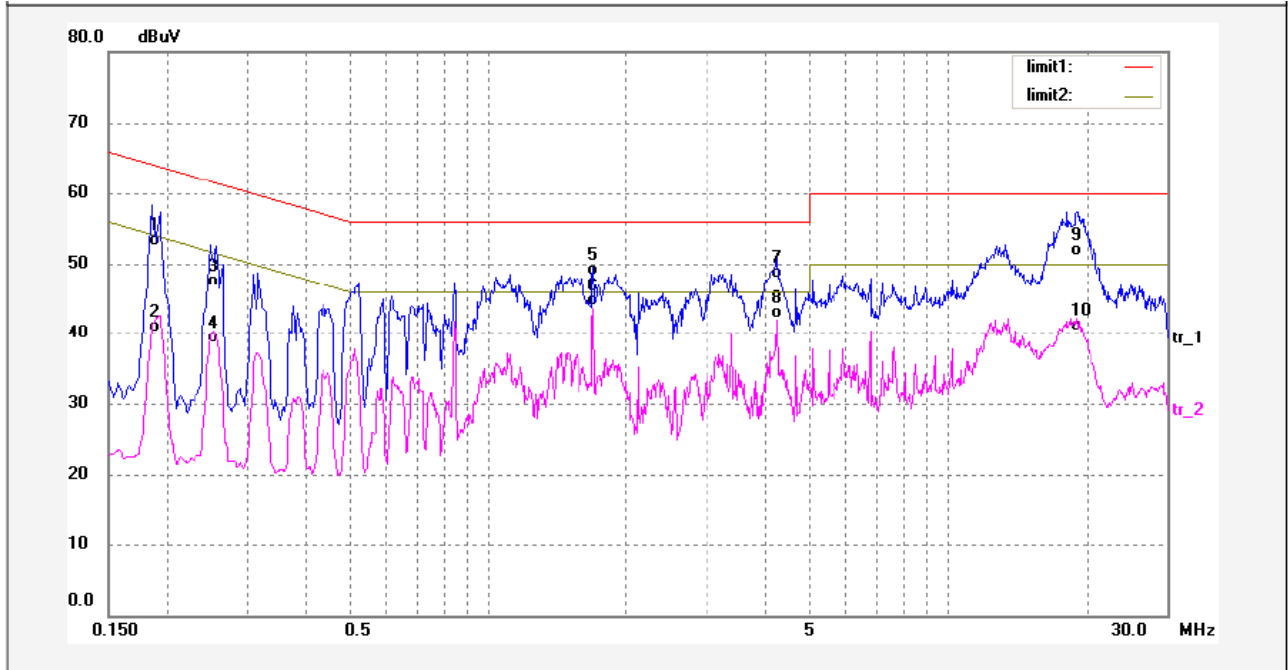


The EUT was placed on the test table in shielding room

Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

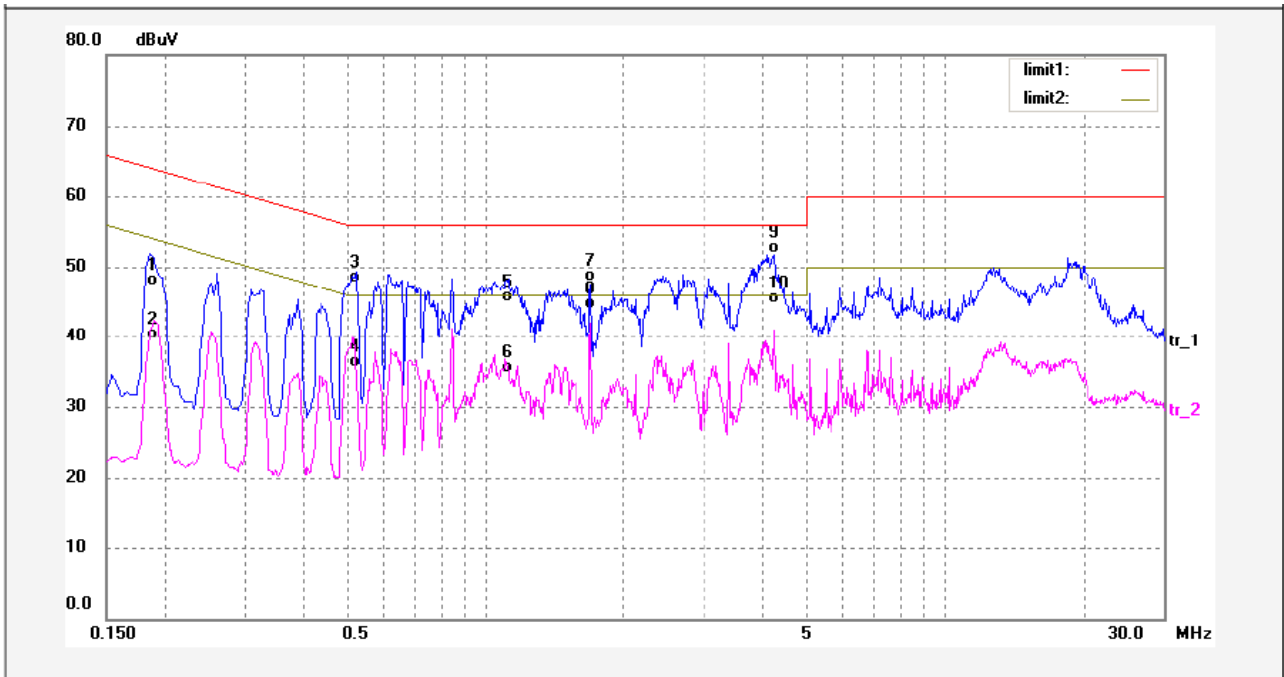
Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1860	41.86	10.66	52.52	64.21	-11.69	QP	
2	0.1860	29.43	10.66	40.09	54.21	-14.12	AVG	
3	0.2500	36.04	10.64	46.68	61.75	-15.07	QP	
4	0.2500	27.79	10.64	38.43	51.75	-13.32	AVG	
5	1.7020	36.07	12.21	48.28	56.00	-7.72	QP	
6	1.7020	31.62	12.21	43.83	46.00	-2.17	AVG	
7	4.2540	35.30	12.54	47.84	56.00	-8.16	QP	
8	4.2540	29.55	12.54	42.09	46.00	-3.91	AVG	
9	19.1299	38.88	12.27	51.15	60.00	-8.85	QP	
10	19.1299	28.09	12.27	40.36	50.00	-9.64	AVG	

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Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1860	36.58	10.66	47.24	64.21	-16.97	QP	
2	0.1860	28.89	10.66	39.55	54.21	-14.66	AVG	
3	0.5260	36.11	11.66	47.77	56.00	-8.23	QP	
4	0.5260	23.93	11.66	35.59	46.00	-10.41	AVG	
5	1.1260	32.76	12.19	44.95	56.00	-11.05	QP	
6	1.1260	22.51	12.19	34.70	46.00	-11.30	AVG	
7	1.7020	35.68	12.21	47.89	56.00	-8.11	QP	
8	1.7020	31.61	12.21	43.82	46.00	-2.18	AVG	
9	4.2540	39.40	12.54	51.94	56.00	-4.06	QP	
10	4.2540	32.22	12.54	44.76	46.00	-1.24	AVG	

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Photograph – Conducted Emission Test Setup



7 Radiated Spurious Emissions

Test Requirement:	FCC CFR47 Part 15 Section 15.209 & 15.247
Test Method:	Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005
Test Result:	PASS
Frequency Range:	9kHz to 25GHz
Measurement Distance:	3m
15.209 Limit:	40.0 dBuV/m between 30MHz & 88MHz 43.5 dBuV/m between 88MHz & 216MHz 46.0 dBuV/m between 216MHz & 960MHz 54.0 dBuV/m above 960MHz
15.247 (d) Limit:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.
Test mode:	The EUT was tested in continuously Transmit mode.

EUT Operation :

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

Atmospheric Pressure: 1012 mbar

Measurement Uncertainty

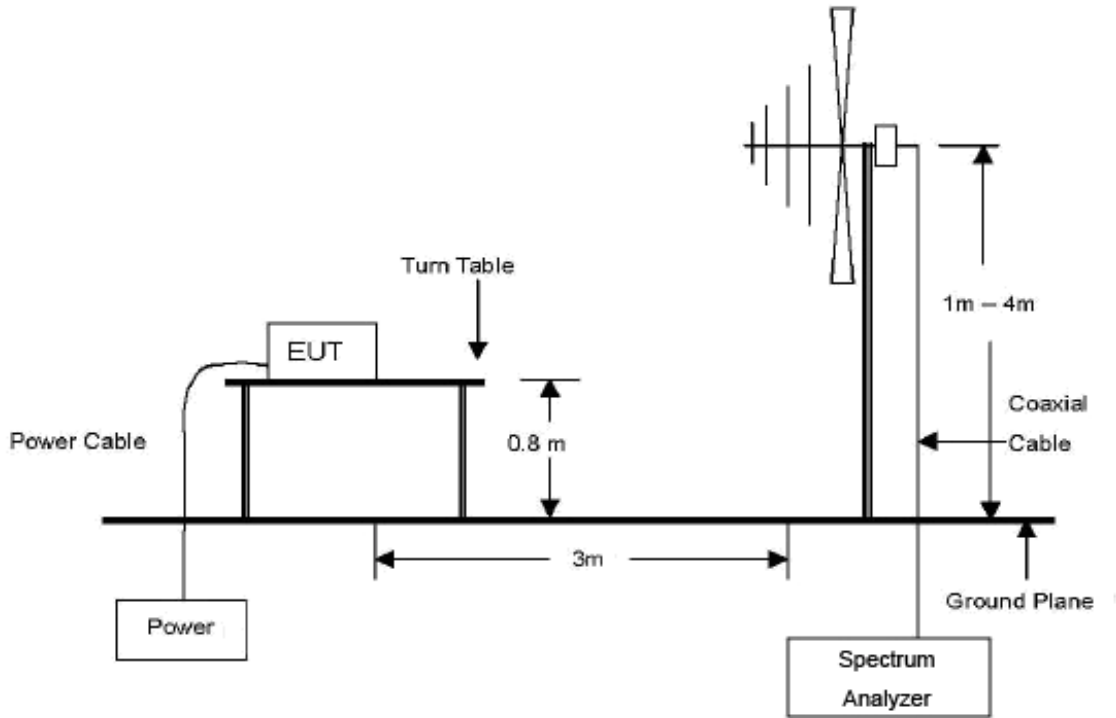
All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC Lab is ± 5.03 dB.

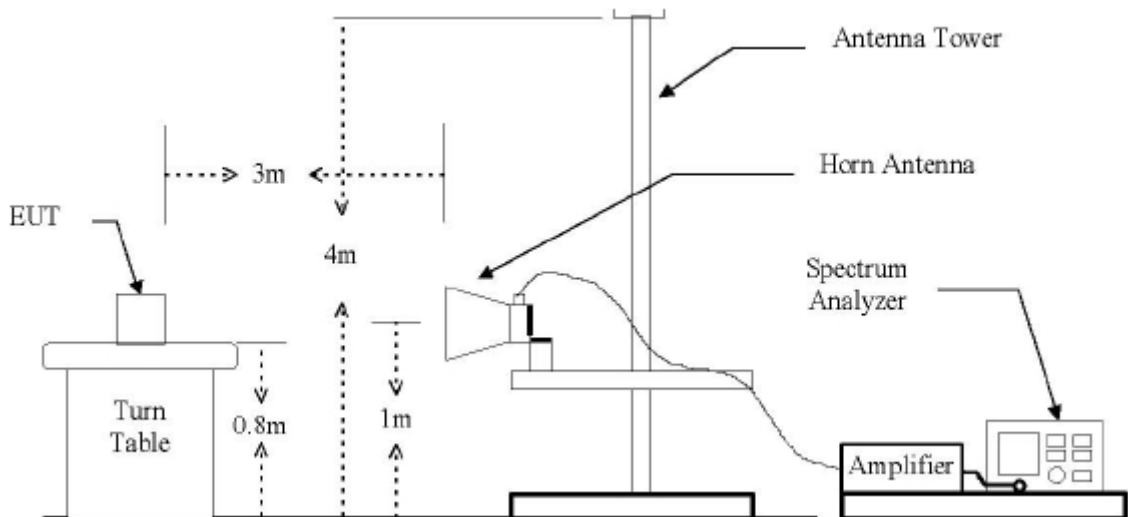
Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003.

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 25 GHz Emissions.



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Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 9kHz to 25000MHz.

9kHz ~ 30MHz

Start Frequency	9kHz
Stop Frequency	30MHz
Sweep Speed.....	Auto
IF Bandwidth.....	10kHz
Video Bandwidth.....	10kHz
Resolution Bandwidth.....	10kHz

30MHz ~ 1GHz

Start Frequency	30 MHz
Stop Frequency	1000MHz
Sweep Speed.....	Auto
IF Bandwidth.....	120 KHz
Video Bandwidth.....	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

Above 1GHz

Start Frequency	1000 MHz
Stop Frequency	25000MHz
Sweep Speed.....	Auto
IF Bandwidth.....	120 KHz
Video Bandwidth.....	3MHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. The battery is fully charged. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum 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.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

Summary of Test Results

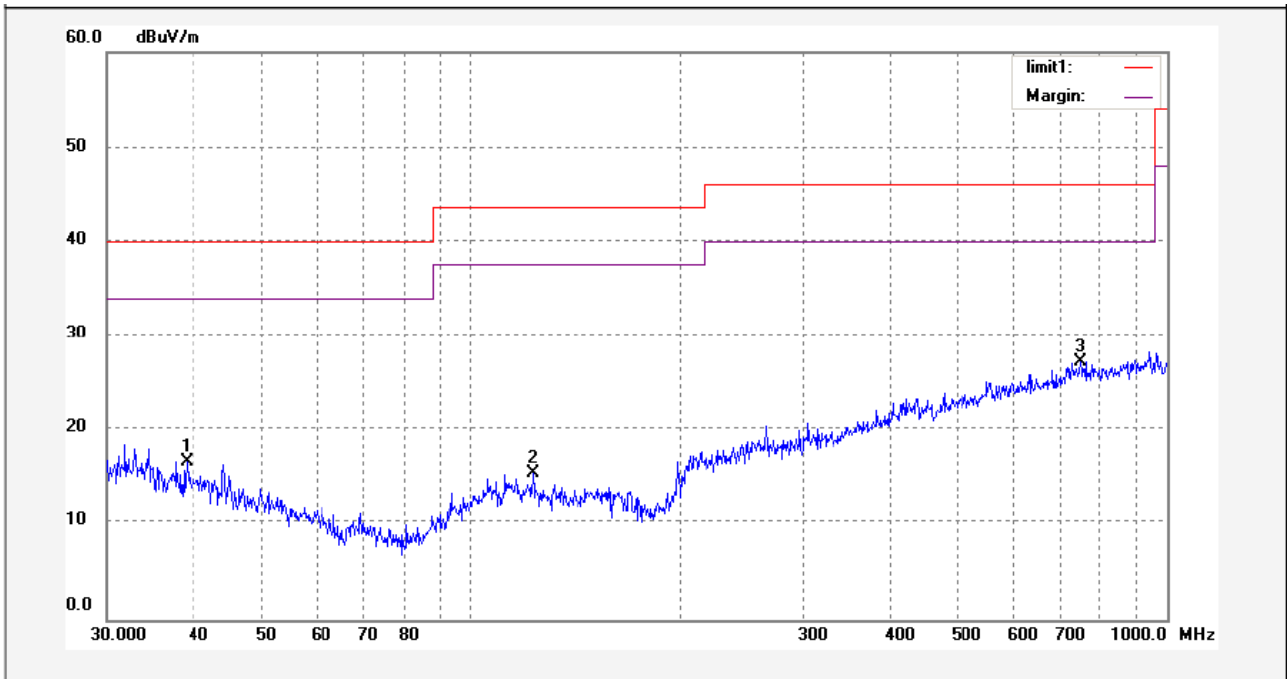
According to the data in this section, the EUT complied with the FCC CFR47 Part 15 Section 15.209 & 15.247 standards.

Test mode: continuously receive mode

Remark: the EUT was pre-tested at the high, middle and low channel, and the worse case was the low Channel, so the data show was the low channel's only. Because the emissions below 30MHz are more than 20dB below the limit, the data is not show in the report.

Test Frequency : 30MHz ~ 1000MHz

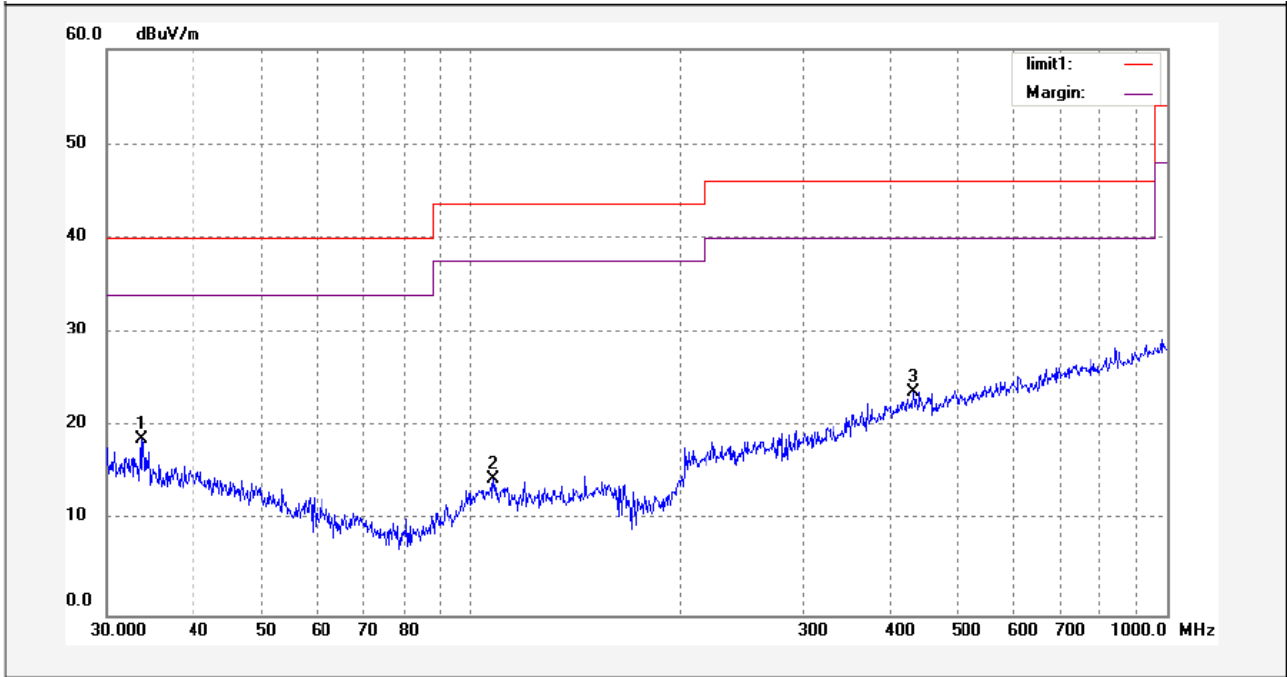
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	39.0449	0.58	16.18	16.76	40.00	-23.24	peak	
2	122.7493	2.81	12.73	15.54	43.50	-27.96	peak	
3	749.6761	1.90	25.36	27.26	46.00	-18.74	peak	

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Antenna polarization: Horizontal

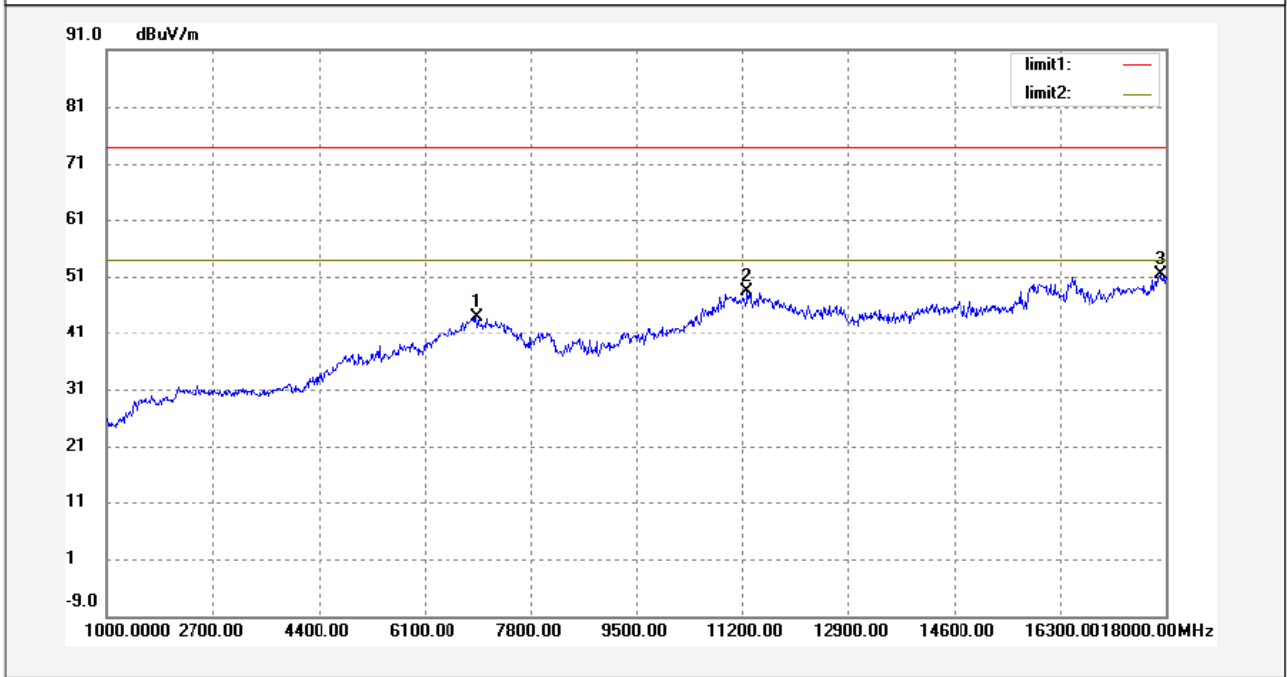


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.5700	1.89	16.76	18.65	40.00	-21.35	peak	
2	107.7853	1.12	13.35	14.47	43.50	-29.03	peak	
3	431.8197	1.99	21.63	23.62	46.00	-22.38	peak	

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Test Frequency: Above 1GHz radiation test data:

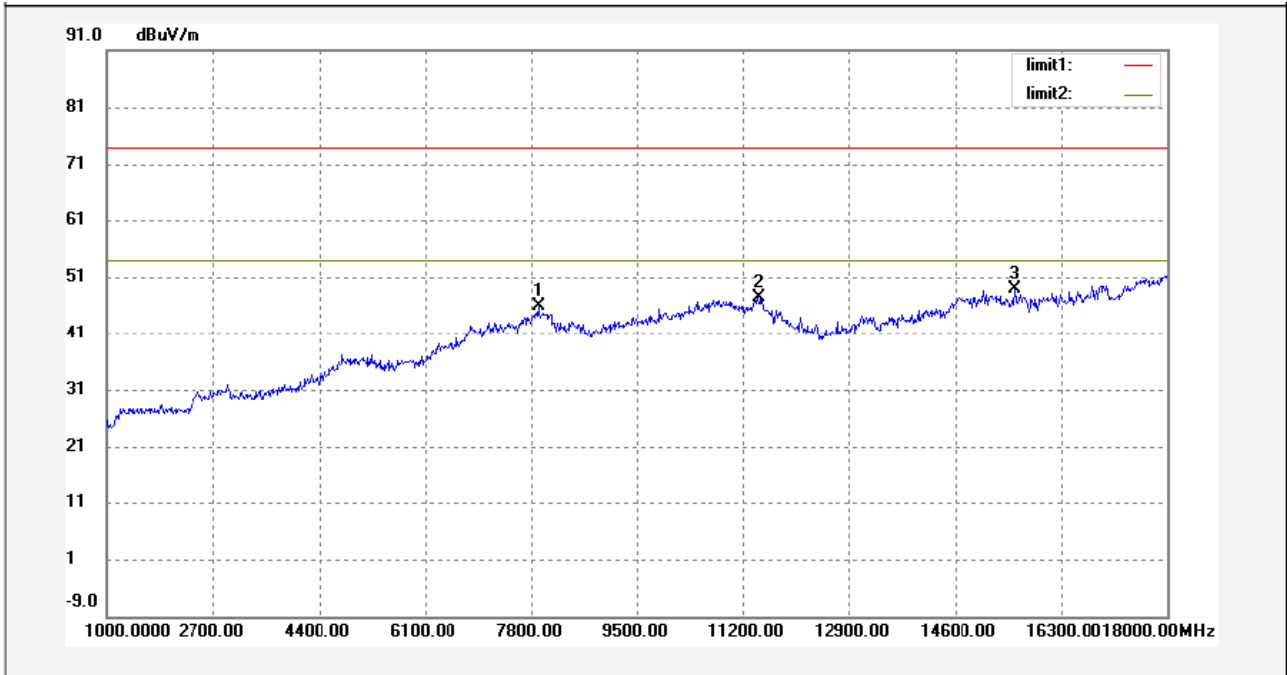
Remark: No any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	6927.856	39.45	4.55	44.00	74.00	-30.00	peak	
2	11288.577	37.68	10.61	48.29	74.00	-25.71	peak	
3	17914.830	-16.26	67.68	51.42	74.00	-22.58	peak	

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Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	7915.832	40.33	5.43	45.76	74.00	-28.24	peak	
2	11441.884	36.33	10.94	47.27	74.00	-26.73	peak	
3	15564.128	-7.95	56.94	48.99	74.00	-25.01	peak	

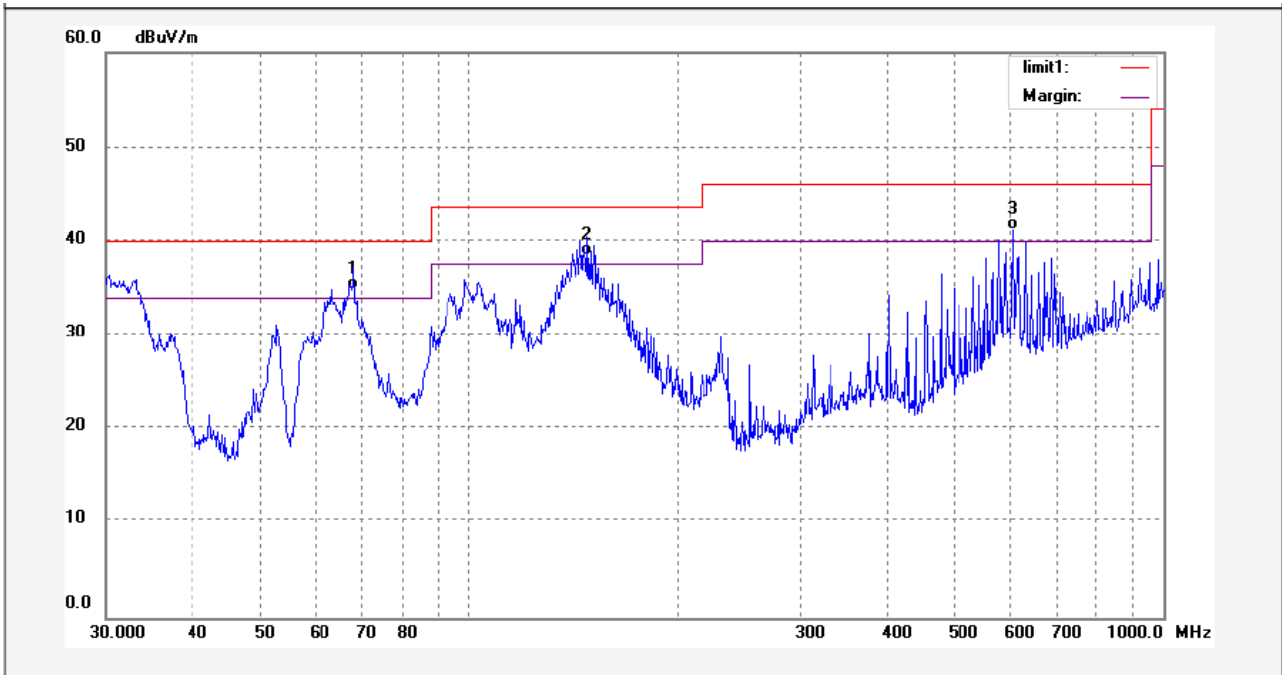
The results shown in this test report refer only to the sample(s) tested , This Test report cannot be reproduced, except in full, without prior written permission of the Company.

Test mode: continuously transmit mode

Test Frequency : 30MHz ~ 1000MHz

Remark: the EUT was pretested at the high, middle and low channel, and the worse case was the low Channel, so the data show was the low channel only. Because the emissions below 30MHz are more than 20dB below the limit, the data is not show in the report.

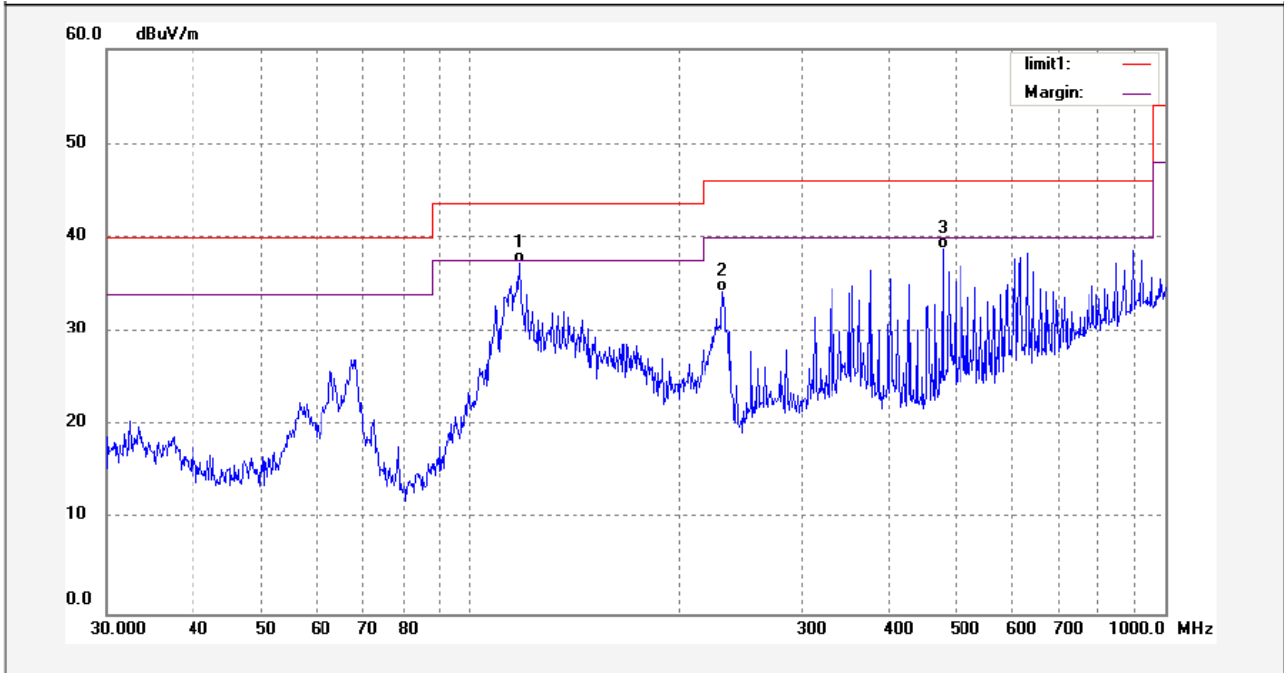
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	68.2636	24.62	10.31	34.93	40.00	-5.07	QP	
2	148.3951	27.38	11.15	38.53	43.50	-4.97	QP	
3	607.1806	15.29	25.95	41.24	46.00	-4.76	QP	

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Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	117.6815	25.03	12.24	37.27	43.50	-6.23	QP	
2	231.0399	18.20	16.12	34.32	46.00	-11.68	QP	
3	478.1394	16.28	22.52	38.80	46.00	-7.20	QP	

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Test Frequency: 1GHz ~ 25GHz

And the below is the Fundamental and Harmonic

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
Low frequency							
2403	AV	Vertical	77.57		(Fund.)	1.2	150
4806	AV	Vertical	33.59	54.00	-20.41	1.2	0
7209	AV	Vertical	35.21	54.00	-18.79	1.5	120
9612	AV	Vertical	34.36	54.00	-19.64	1.8	60
12015	AV	Vertical	37.17	54.00	-16.83	1.6	90
14418	AV	Vertical	36.76	54.00	-17.24	1.4	120
16821	AV	Vertical	29.15	54.00	-24.85	1.7	100
19224	AV	Vertical	30.30	54.00	-23.70	1.5	180
21627	AV	Vertical	28.30	54.00	-25.70	1.6	120
24030	AV	Vertical	29.67	54.00	-24.33	1.2	135
2403	AV	Horizontal	85.31		(Fund.)	1.2	120
4806	AV	Horizontal	38.19	54.00	-15.81	1.2	150
7209	AV	Horizontal	40.31	54.00	-13.69	1.5	120
9612	AV	Horizontal	37.56	54.00	-16.44	1.2	180
12015	AV	Horizontal	33.33	54.00	-20.67	1.5	135
14418	AV	Horizontal	34.49	54.00	-19.51	1.2	120
16821	AV	Horizontal	32.41	54.00	-21.59	1.5	180
19224	AV	Horizontal	30.16	54.00	-23.84	1.8	60
21627	AV	Horizontal	29.76	54.00	-24.24	1.2	90
24030	AV	Horizontal	27.70	54.00	-26.30	1.5	90
2403	PK	Vertical	95.63		(Fund.)	1.5	180
4806	PK	Vertical	54.79	74.00	-19.21	1.8	30
7209	PK	Vertical	52.68	74.00	-21.32	1.6	110
9612	PK	Vertical	56.26	74.00	-17.74	1.4	100
12015	PK	Vertical	57.20	74.00	-16.80	1.2	90
14418	PK	Vertical	52.29	74.00	-21.71	1.2	60
16821	PK	Vertical	50.28	74.00	-23.72	1.4	90
19224	PK	Vertical	51.57	74.00	-22.43	1.2	120
21627	PK	Vertical	49.38	74.00	-24.62	1.7	120
24030	PK	Vertical	47.87	74.00	-26.13	1.4	135

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2403	PK	Horizontal	104.21		(Fund.)	1.8	180
4806	PK	Horizontal	60.37	74.00	-13.63	1.8	60
7209	PK	Horizontal	54.70	74.00	-19.30	1.8	120
9612	PK	Horizontal	58.47	74.00	-15.53	1.2	180
12015	PK	Horizontal	57.42	74.00	-16.58	1.2	90
14418	PK	Horizontal	52.19	74.00	-21.81	1.5	90
16821	PK	Horizontal	50.02	74.00	-23.98	1.8	150
19224	PK	Horizontal	50.25	74.00	-23.75	1.5	150
21627	PK	Horizontal	48.16	74.00	-25.84	1.2	120
24030	PK	Horizontal	46.91	74.00	-27.09	1.2	180
Middle frequency							
2439	AV	Vertical	78.59		(Fund.)	1.0	210
4878	AV	Vertical	34.69	54.00	-19.31	1.1	50
7317	AV	Vertical	38.07	54.00	-15.93	1.5	130
9756	AV	Vertical	34.57	54.00	-19.43	1.2	70
12195	AV	Vertical	34.16	54.00	-19.84	1.5	200
14634	AV	Vertical	33.42	54.00	-20.58	1.3	280
17073	AV	Vertical	31.50	54.00	-22.50	1.2	180
19512	AV	Vertical	30.36	54.00	-23.64	1.1	150
21951	AV	Vertical	34.07	54.00	-19.93	1.3	260
24390	AV	Vertical	29.99	54.00	-24.01	1.1	140
2439	AV	Horizontal	86.71		(Fund.)	1.7	70
4878	AV	Horizontal	39.07	54.00	-14.93	1.8	40
7317	AV	Horizontal	36.69	54.00	-17.31	1.9	100
9756	AV	Horizontal	35.41	54.00	-18.59	1.5	160
12195	AV	Horizontal	33.16	54.00	-20.84	1.9	190
14634	AV	Horizontal	30.00	54.00	-24.00	2.3	310
17073	AV	Horizontal	29.49	54.00	-24.51	2.0	200
19512	AV	Horizontal	32.18	54.00	-21.82	1.9	100
21951	AV	Horizontal	28.10	54.00	-25.90	1.5	160
24390	AV	Horizontal	28.84	54.00	-25.16	1.7	140
2439	PK	Vertical	96.33		(Fund.)	1.5	130
4878	PK	Vertical	59.10	74.00	-14.90	1.2	70
7317	PK	Vertical	60.36	74.00	-13.64	1.3	260
9756	PK	Vertical	55.47	74.00	-18.53	1.5	200

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12195	PK	Vertical	52.32	74.00	-21.68	1.3	280
14634	PK	Vertical	53.31	74.00	-20.69	1.2	180
17073	PK	Vertical	50.12	74.00	-23.88	1.3	260
19512	PK	Vertical	51.07	74.00	-22.93	1.1	140
21951	PK	Vertical	48.09	74.00	-25.91	1.5	200
24390	PK	Vertical	49.01	74.00	-24.99	1.3	280
2439	PK	Horizontal	106.16		(Fund.)	1.7	70
4878	PK	Horizontal	61.30	74.00	-12.70	1.8	40
7317	PK	Horizontal	58.18	74.00	-15.82	1.9	100
9756	PK	Horizontal	59.42	74.00	-14.58	1.8	60
12195	PK	Horizontal	56.29	74.00	-17.71	1.9	190
14634	PK	Horizontal	53.16	74.00	-20.84	2.3	310
17073	PK	Horizontal	50.12	74.00	-23.88	2.0	200
19512	PK	Horizontal	48.19	74.00	-25.81	1.7	70
21951	PK	Horizontal	49.59	74.00	-24.41	1.5	160
24390	PK	Horizontal	48.10	74.00	-25.90	1.7	140
High frequency							
2478	AV	Vertical	82.86		(Fund.)	1.0	0
4956	AV	Vertical	37.07	54.00	-16.93	1.3	280
7434	AV	Vertical	34.29	54.00	-19.71	1.2	180
9912	AV	Vertical	34.98	54.00	-19.02	1.1	150
12390	AV	Vertical	36.10	54.00	-17.90	1.2	70
14868	AV	Vertical	33.48	54.00	-20.52	1.3	260
17346	AV	Vertical	29.99	54.00	-24.01	1.1	140
19824	AV	Vertical	29.10	54.00	-24.90	1.5	200
22302	AV	Vertical	30.06	54.00	-23.94	1.3	280
24780	AV	Vertical	28.49	54.00	-25.51	1.2	180
2478	AV	Horizontal	88.90		(Fund.)	1.9	190
4956	AV	Horizontal	39.02	54.00	-14.98	2.3	310
7434	AV	Horizontal	38.13	54.00	-15.87	1.7	70
9912	AV	Horizontal	35.10	54.00	-18.90	1.8	40
12390	AV	Horizontal	33.27	54.00	-20.73	2.0	200
14868	AV	Horizontal	34.40	54.00	-19.60	1.5	160
17346	AV	Horizontal	31.27	54.00	-22.73	1.8	40
19824	AV	Horizontal	28.12	54.00	-25.88	1.8	100

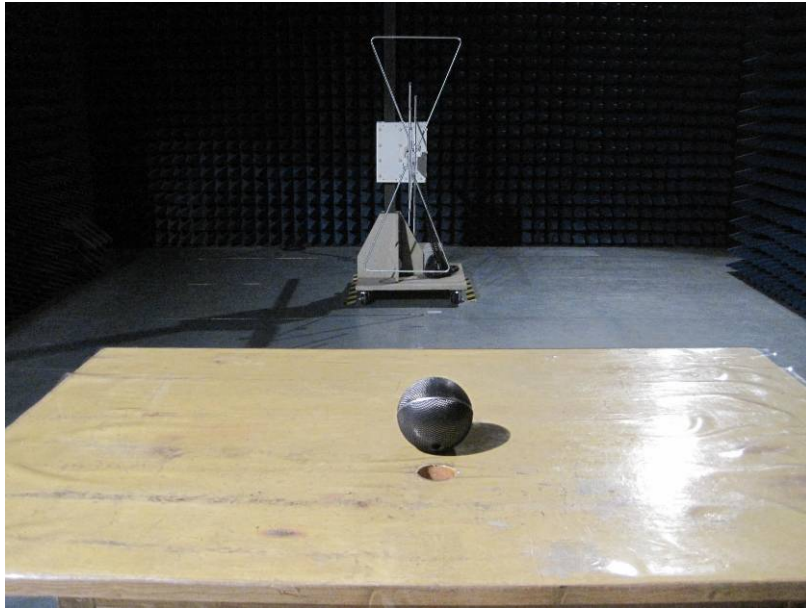
The results shown in this test report refer only to the sample(s) tested , This Test report cannot be reproduced, except in full, without prior written permission of the Company.

22302	AV	Horizontal	28.90	54.00	-25.10	2.1	110
24780	AV	Horizontal	28.12	54.00	-25.88	1.8	60
2478	PK	Vertical	95.64		(Fund.)	1.0	0
4956	PK	Vertical	58.48	74.00	-15.52	1.2	60
7434	PK	Vertical	58.93	74.00	-15.07	1.3	260
9912	PK	Vertical	55.71	74.00	-18.29	1.1	140
12390	PK	Vertical	54.17	74.00	-19.83	1.5	200
14868	PK	Vertical	56.09	74.00	-17.91	1.2	60
17346	PK	Vertical	50.33	74.00	-23.67	1.3	280
19824	PK	Vertical	51.02	74.00	-22.98	1.2	180
22302	PK	Vertical	48.23	74.00	-25.77	1.1	150
24780	PK	Vertical	49.01	74.00	-24.99	1.4	90
2478	PK	Horizontal	107.03		(Fund.)	2.1	110
4956	PK	Horizontal	61.22	74.00	-12.78	1.8	60
7434	PK	Horizontal	58.40	74.00	-15.60	1.9	190
9912	PK	Horizontal	57.27	74.00	-16.73	2.0	200
12390	PK	Horizontal	55.16	74.00	-18.84	1.7	70
14868	PK	Horizontal	51.88	74.00	-22.12	1.8	40
17346	PK	Horizontal	49.19	74.00	-24.81	1.8	60
19824	PK	Horizontal	50.04	74.00	-23.96	1.9	190
22302	PK	Horizontal	48.72	74.00	-25.28	1.8	40
24780	PK	Horizontal	47.90	74.00	-26.10	1.9	100

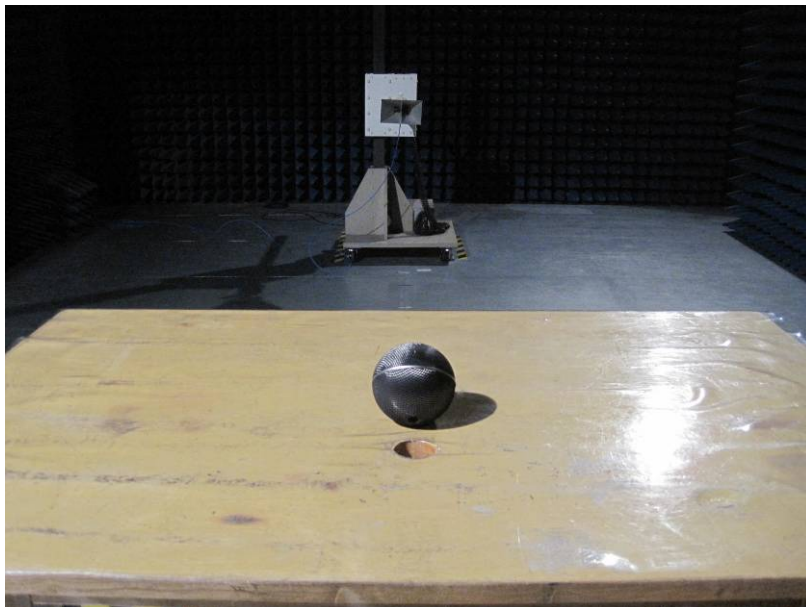
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Photograph – Radiation Spurious Emission Test Setup

Below 1GHz



Above 1GHz



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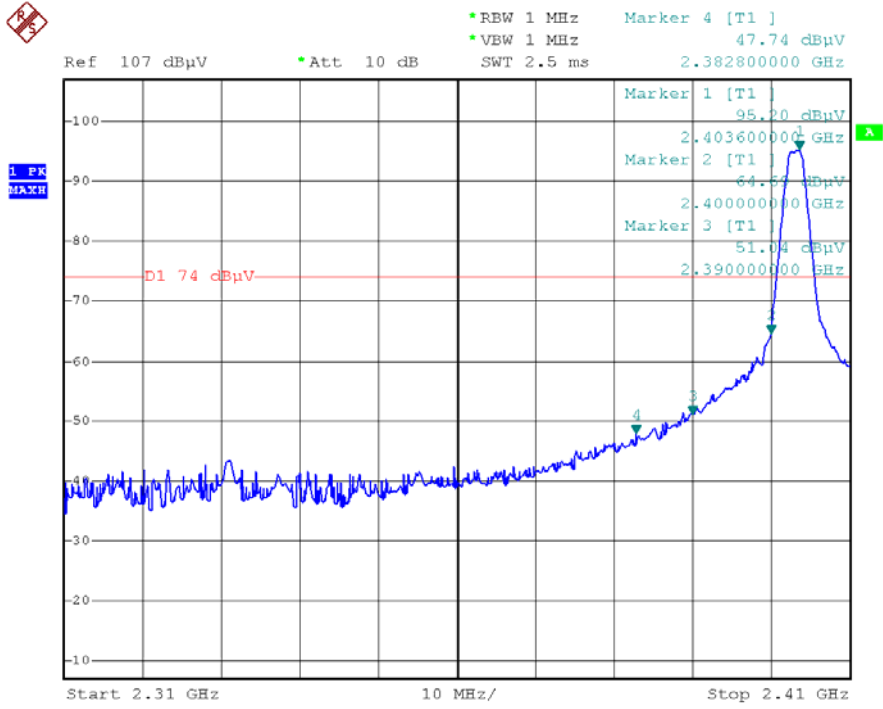
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Reference No.: WT11127438-D-E-F

8 Band Edge Measurement

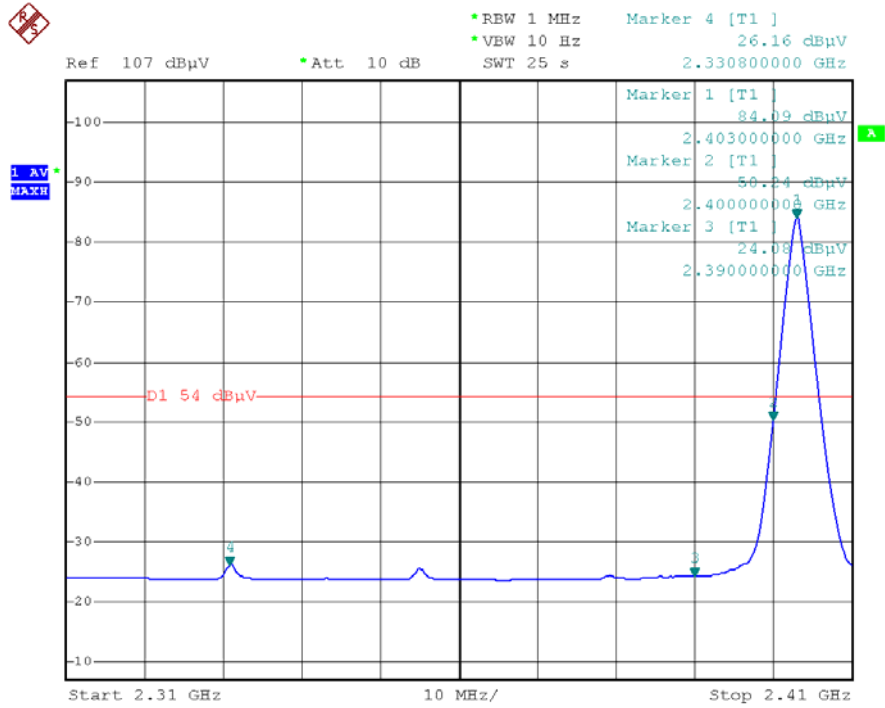
Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005
Measurement Distance:	3m
Limit:	According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see §15.205(c)).
Detector:	<p>For Peak value:</p> <p>RBW = 1 MHz for $f \geq 1$ GHz</p> <p>VBW \geq RBW; Sweep = auto</p> <p>Detector function = peak</p> <p>Trace = max hold</p> <p>For AVG value:</p> <p>RBW = 1 MHz for $f \geq 1$ GHz</p> <p>VBW = 10Hz; Sweep = auto</p> <p>Detector function = AVG</p> <p>Trace = max hold</p>

Test Result:
Low Channel – Peak



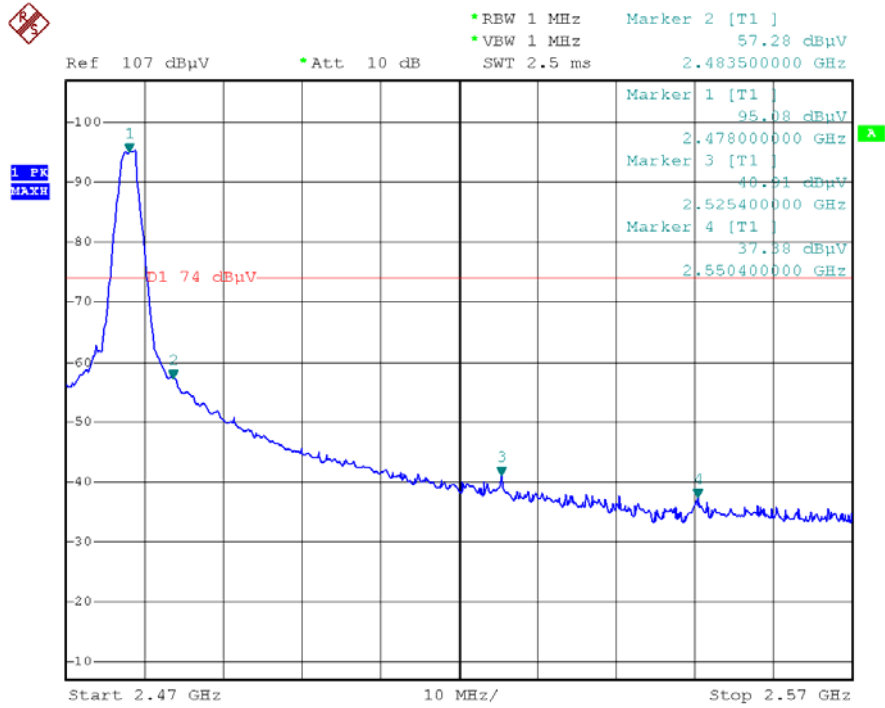
The results shown in this test report refer only to the sample(s) tested , This Test report cannot be reproduced, except in full, without prior written permission of the Company.

Low Channel – AV



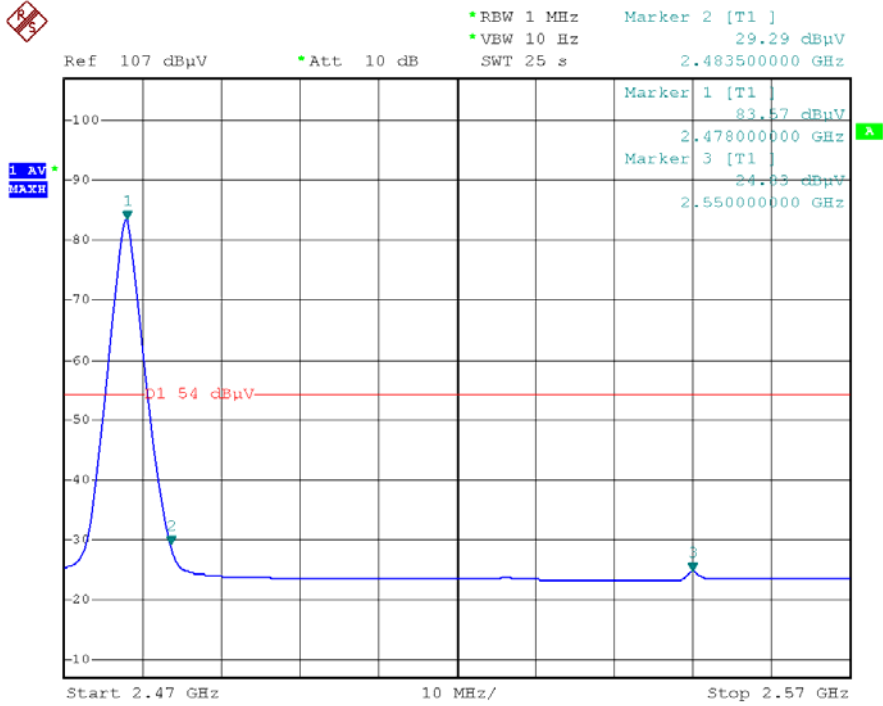
The results shown in this test report refer only to the sample(s) tested , This Test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel – Peak



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High Channel – AV



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9 6 dB Bandwidth Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005
Limit:	Regulation 15.247 (a)(2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Mode:	Test in fixing operating frequency at low, Middle, high channel.

Test Procedure:

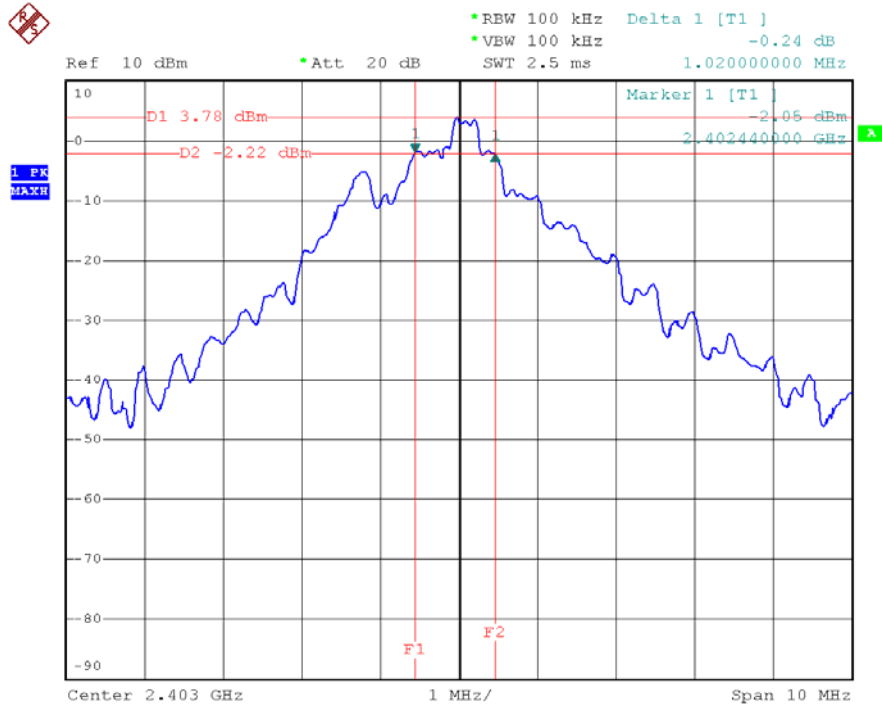
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = 10MHz, RBW = 100kHz, VBW = 100kHz

Test Result:

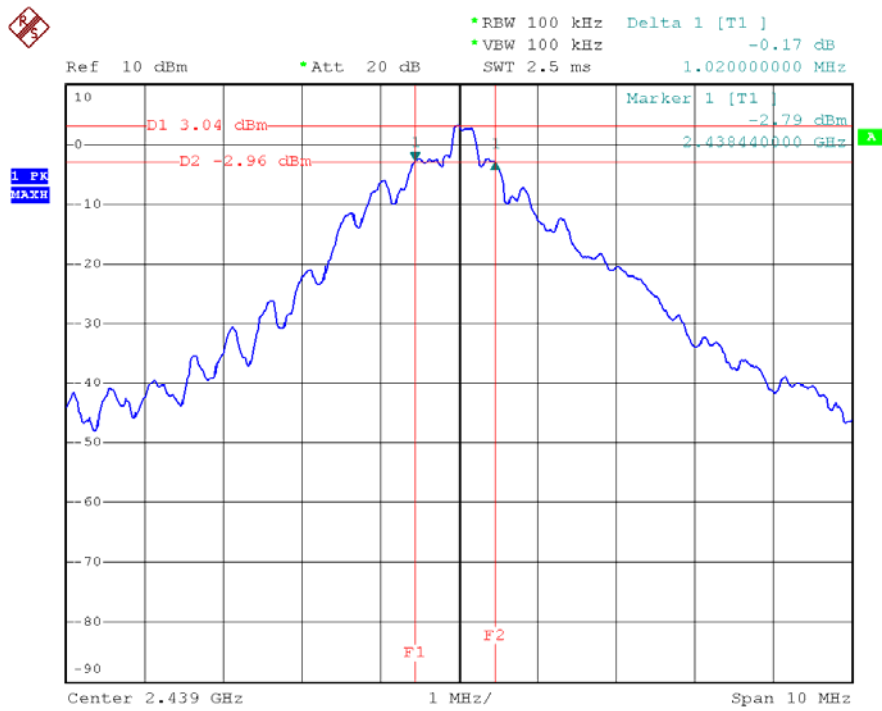
Test Channel	Bandwidth	Result
Low	1.02MHz	PASS
Middle	1.02MHz	PASS
High	0.98MHz	PASS

Test result plot as follows:

Low Channel

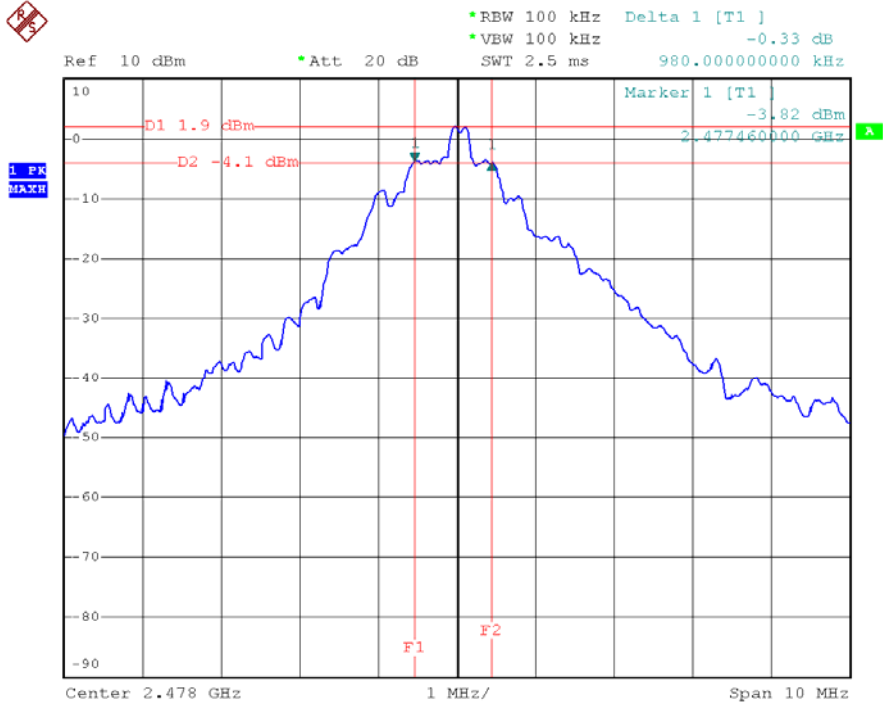


Middle Channel



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High Channel



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10 Maximum Peak Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005
Test Limit:	Regulation 15.247 (b)(3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test mode:	Test in fixing operating frequency at low, Middle, high channel.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3 MHz, VBW = 10 MHz, Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

Test Result:

Test Channel	Output Power (dBm)	Limit (dBm)
Low	2.40	30
Middle	3.43	30
High	4.35	30

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11 Power Spectral Density

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005
Test Limit:	Regulation 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Mode:	Test in fixing operating frequency at low, Middle, high channel.

Test Procedure:

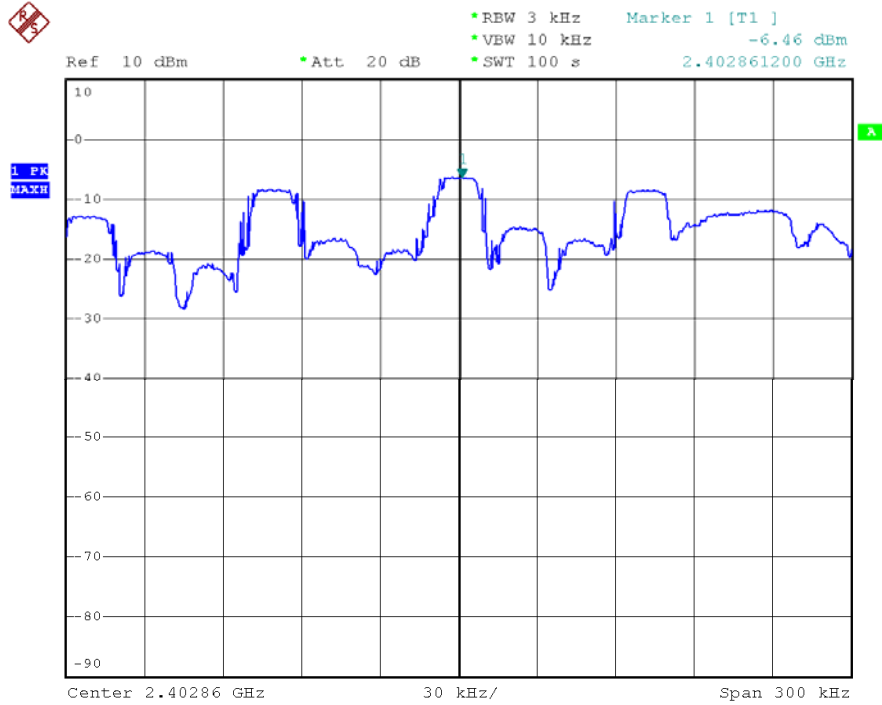
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 300kHz. Sweep = 100s; Detector Function = Peak. Trace = Max hold.

Test Result:

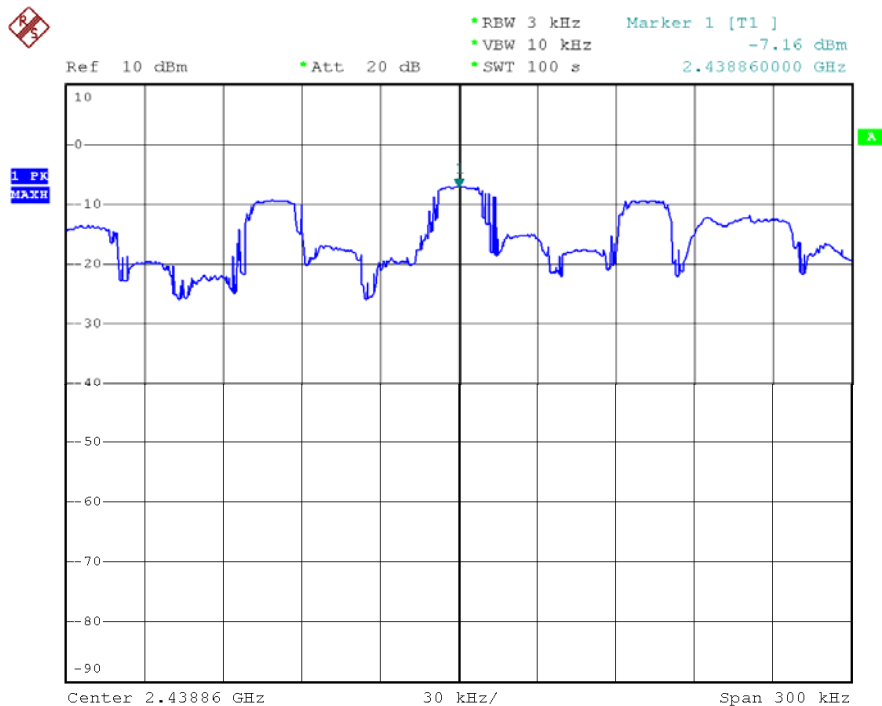
Test result: PASS

Test result plot as follows:

Low Channel

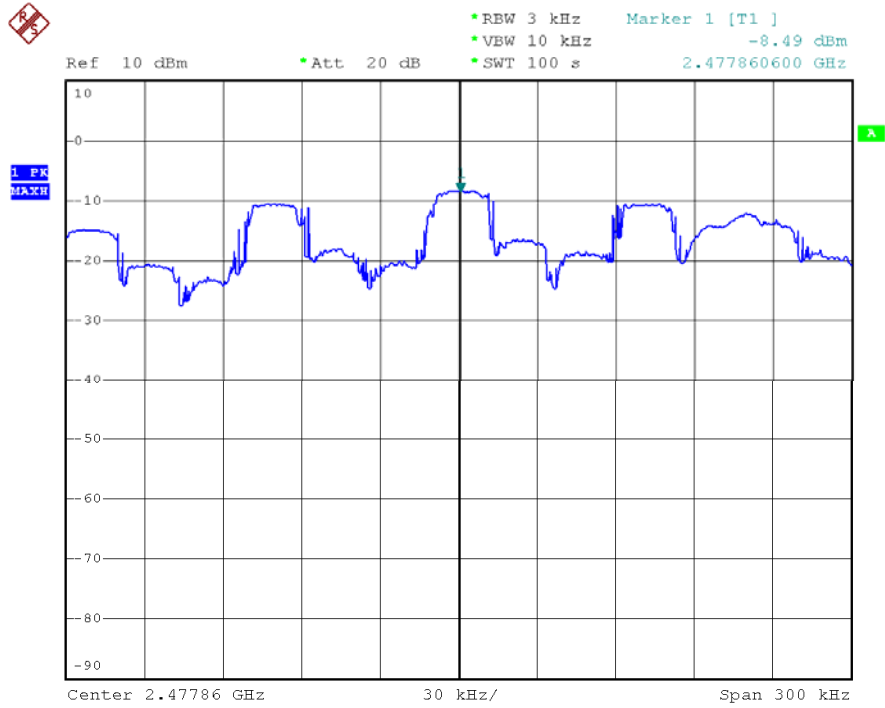


Middle Channel



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High Channel



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12 Antenna Requirement

According to the FCC Part 15 Paragraph 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a permanent antenna, fulfill the requirement of this section.

13 RF Exposure

13.1 Requirments:

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a portable device.

13.2 Measurement Result:

Antenna Gain (dBi)	Antenna Gain (numeric)	Conducted Power (dBm)	Conducted Power (mW)	Radiated Power (e.i.r.p) (mW)
0	1	2.40	1.738	1.738
0	1	3.43	2.202	2.202
0	1	4.35	2.723	2.723

The EUT works on the 2.4G ISM band, and the max output power (conducted) of which is 2.723 mW lower than low threshold 60/f (GHz) mW (24.21mW), d < 2.5cm in general population category.

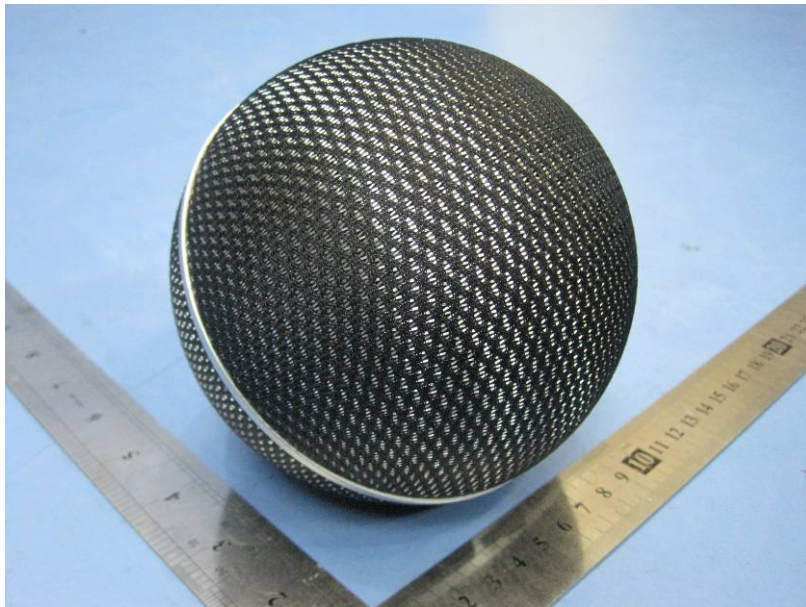
The SAR evaluation is not required.

14 Photographs - Constructional Details

14.1 Product View



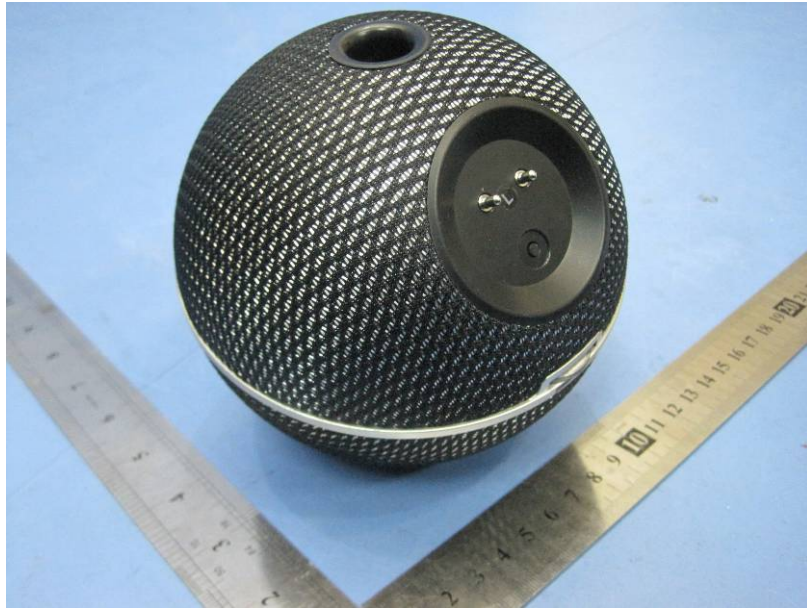
14.2 EUT – Appearance View



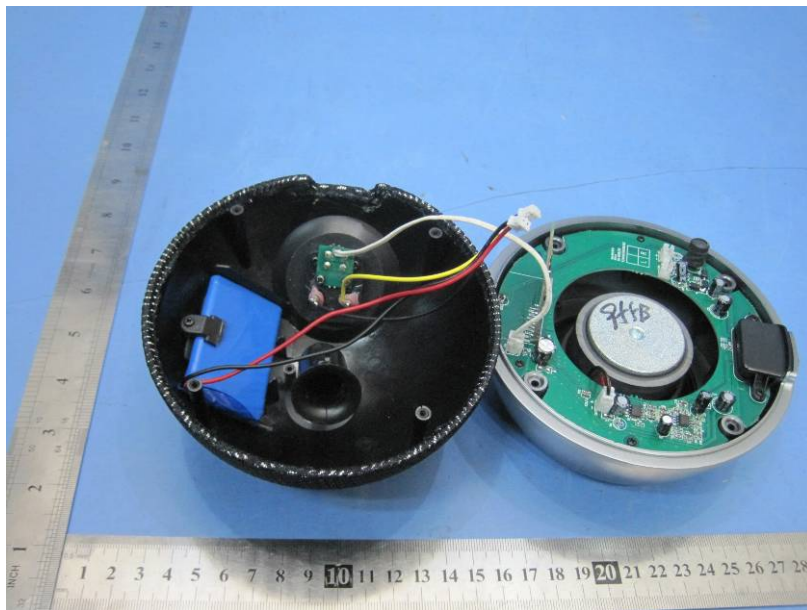
The results shown in this test report refer only to the sample(s) tested , This Test report cannot be reproduced, except in full, without prior written permission of the Company.

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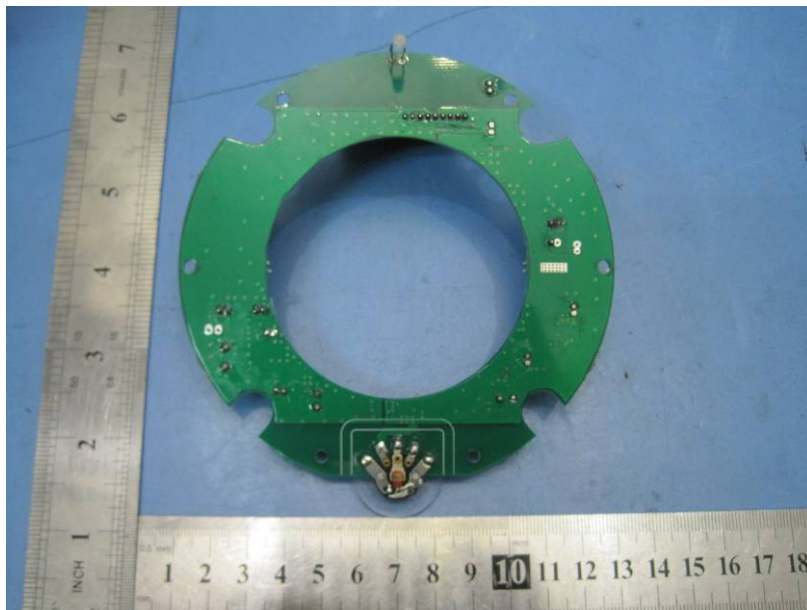
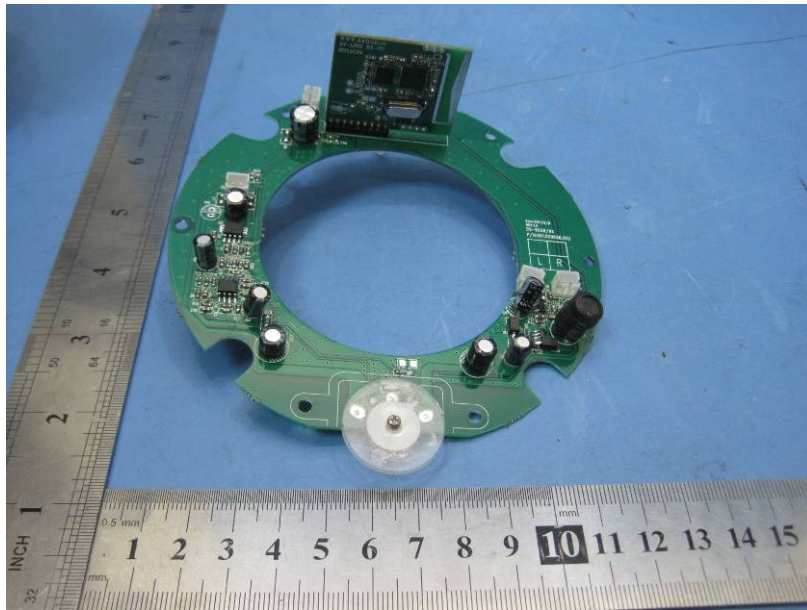
Reference No.: WT11127438-D-E-F



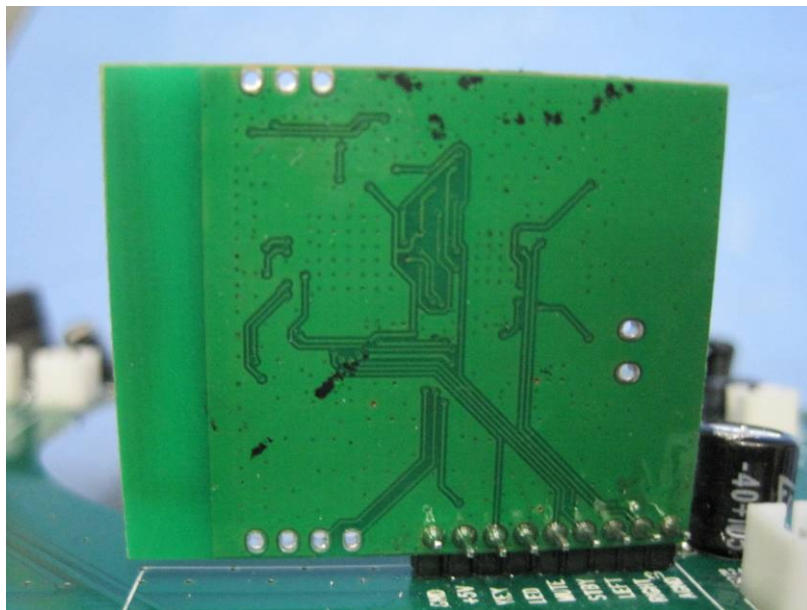
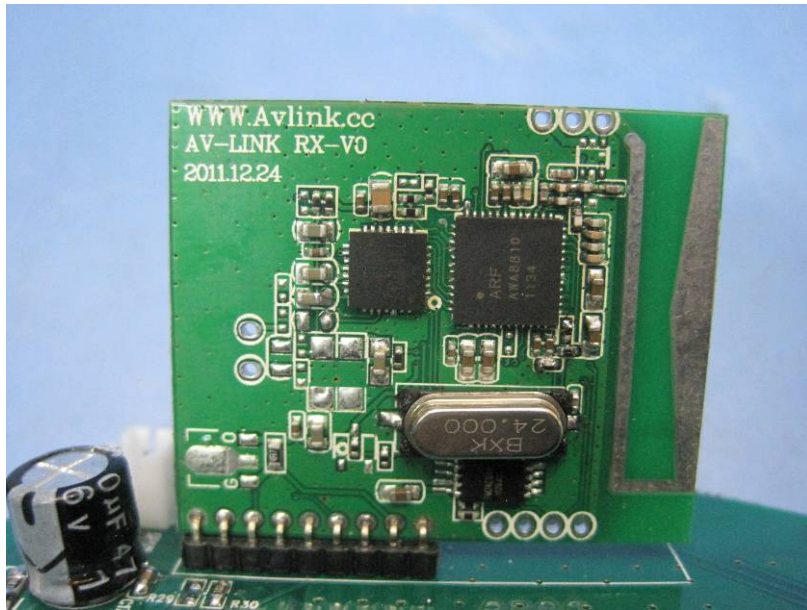
14.3 EUT-Open View



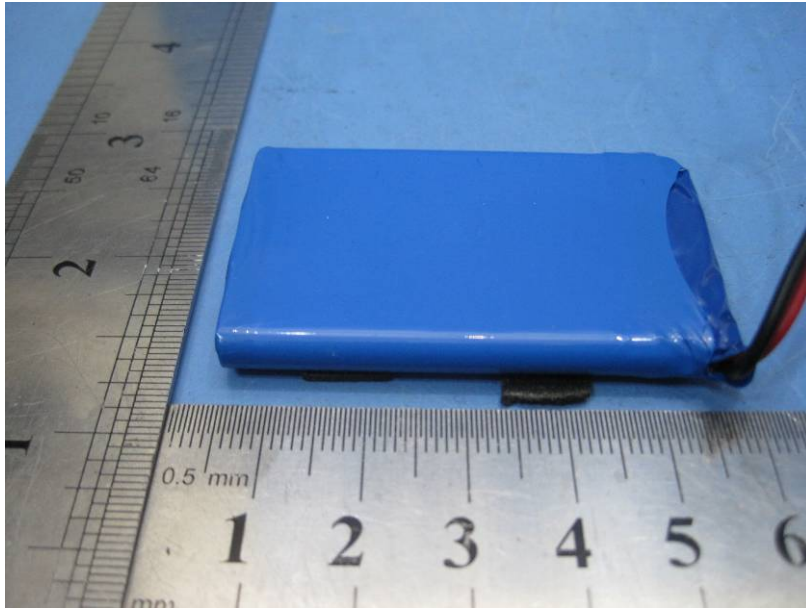
14.4 PCB1 - View



14.5 RF Module - View



14.6 Battery - View



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Reference No.: WT11127438-D-E-F

15 FCC Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1)this device may not cause harmful interference,and (2) this device must accept any interference received, including interference that may cause undesired operation

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT
EUT Side View/proposed FCC Mark Location

