FCC Part 15C Test Report
FCC ID: 2AEBBQR-A2

Product Name:	**Bluetooth Wireless Speaker**
Trademark:	**N/A**
Model Name :	**QR-A2** **CSR4.0+EDR**
Prepared For : Address :	**Dongguan Qunrui Plastic Products Co., LTD** No.65-B,YuanLinRoad,FengHuangGangIndustrialArea,TangxiaTown,Dongguan City,Guangdong,China
Prepared By : Address :	**Shenzhen BCTC Technology Co., Ltd.** No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	**Feb. 02 - Feb. 10, 2015**
Date of Report :	**Feb. 10, 2015**
Report No.:	**BCTC-150201504**

TEST RESULT CERTIFICATION

Applicant's name ..... Dongguan Qunrui Plastic Products Co., LTD

Address..... No.65-B,YuanLinRoad,FengHuangGangIndustrialArea,TangxiaTown,Dongguan City,Guangdong,China

Manufacture's Name .. Dongguan Qunrui Plastic Products Co., LTD

Address..... No.65-B,YuanLinRoad,FengHuangGangIndustrialArea,TangxiaTown,Dongguan City,Guangdong,China

Product description

Product name ..... Bluetooth Wireless Speaker

Model and/or type reference ..... QR-A2, CSR4.0+EDR

Trade Name N/A

Standards ..... FCC Part15.247

Test procedure ..... ANSI C63.4-2003

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test .....

Date (s) of performance of tests..... Feb. 02 - Feb. 10, 2015

Date of Issue ..... Feb. 10, 2015

Test Result ..... **Pass**

Testing Engineer : Eric Yang

(Eric Yang)

Technical Manager : Sophie Lee

(Sophia Lee)

Authorized Signatory : Casey Wang

SHENZHEN BCTC TECHNOLOGY CO., LTD. APPROVED

(Casey Wang)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)” N/A” denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.
Add. : No.101,Yousong Road,Longhua New District, Shenzhen,China
FCC Registered No.: 187086

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± 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	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>Bluetooth Wireless Speaker</td></tr>
<tr><td>Trade Name</td><td>N/A</td></tr>
<tr><td>Model Name</td><td>QR-A2</td></tr>
<tr><td>Serial Model</td><td>CSR4.0+EDR</td></tr>
<tr><td>Model Difference</td><td>All the same,Only model name is different.</td></tr>
<tr><td>Product Description</td><td>The EUT is a Bluetooth Wireless Speaker
<table>
<tr><td>Operation Frequency:</td><td>2402~2480 MHz</td></tr>
<tr><td>Modulation Type:</td><td>GFSK</td></tr>
<tr><td>Bluetooth</td><td>Bluetooth 4.0</td></tr>
<tr><td>Number Of Channel</td><td>40CH</td></tr>
<tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr>
<tr><td>Output Power(Peak):</td><td>-0.85dbm</td></tr>
<tr><td>Antenna Gain (dBi)</td><td>0dbi</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Channel List</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Battery</td><td>DC3.7V</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Integrated antenna	N/A	0	N/A

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX 2402
Mode 2	TX 2440
Mode 3	TX 2480
Mode 4	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX 2402
Mode 2	TX 2440
Mode 3	TX 2480

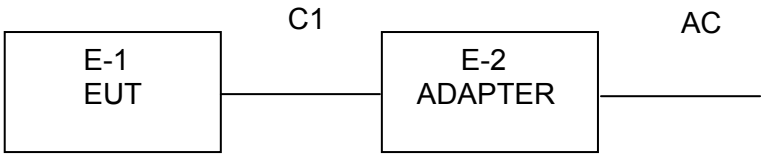
Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

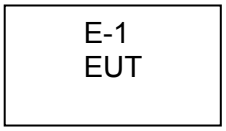
(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Bluetooth Wireless Speaker	N/A	QR-A2	N/A	EUT
E-2	Adapter	N/A	TP-U22	N/A	Support equipment

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.3m	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45109572	2014.08.25	2015.08.24	1 year
2	Test Receiver	R&S	ESPI	101396	2014.08.25	2015.08.24	1 year
3	Bilog Antenna	SCHWARZBECK	VULB9160	VULB9160-3369	2014.08.25	2015.08.24	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.07	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.07	2015.06.06	1 year
6	Horn Antenna	SCHWARZBECK	9120D	9120D-1275	2014.08.25	2015.08.24	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	SCHWARZBECK	BBV9718	9718-270	2014.08.25	2015.08.24	1 year
9	Amplifier	SCHWARZBECK	BBV9743	9743-119	2014.08.25	2015.08.24	1 year
10	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07	1 year
11	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
12	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	1 year
13	RF cables	R&S	N/A	N/A	2014.07.06	2015.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101421	2014.08.25	2015.08.24	1 year
2	LISN	SCHWARZBECK	NSLK8127	812779	2014.08.25	2015.08.24	1 year
3	LISN	EMCO	Feb-16	42990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.07	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.07	2015.06.06	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

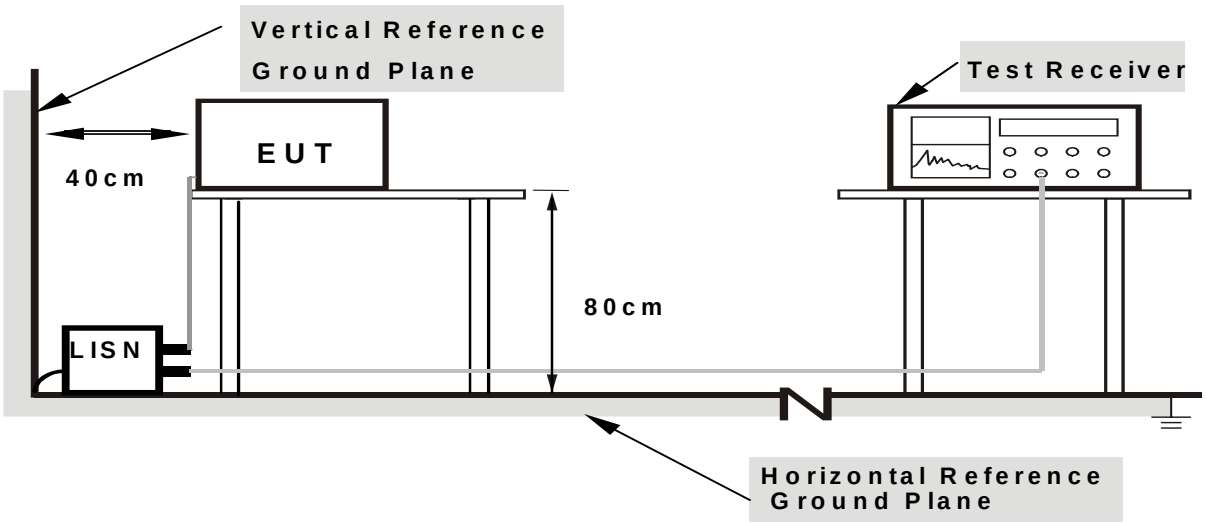
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

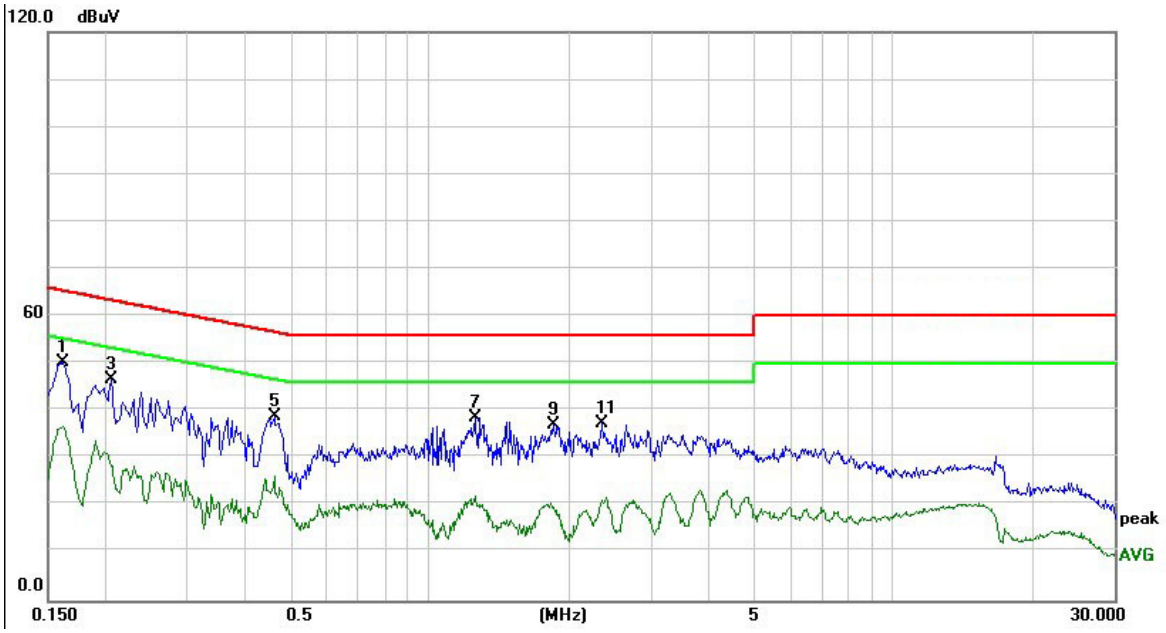
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	Bluetooth Wireless Speaker	Model Name. ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC 120V/60Hz	Test Mode：	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1620	40.14	10.13	50.27	65.36	-15.09	QP
0.1620	26.59	10.13	36.72	55.36	-18.64	AVG
0.2060	36.57	10.12	46.69	63.37	-16.68	QP
0.2060	22.20	10.12	32.32	53.37	-21.05	AVG
0.4620	28.68	10.09	38.77	56.66	-17.89	QP
0.4620	16.17	10.09	26.26	46.66	-20.40	AVG
1.2500	28.54	10.09	38.63	56.00	-17.37	QP
1.2500	11.91	10.09	22.00	46.00	-24.00	AVG
1.8500	26.94	10.09	37.03	56.00	-18.97	QP
1.8500	10.36	10.09	20.45	46.00	-25.55	AVG
2.3580	27.14	10.10	37.24	56.00	-18.76	QP
2.3580	11.59	10.10	21.69	46.00	-24.31	AVG

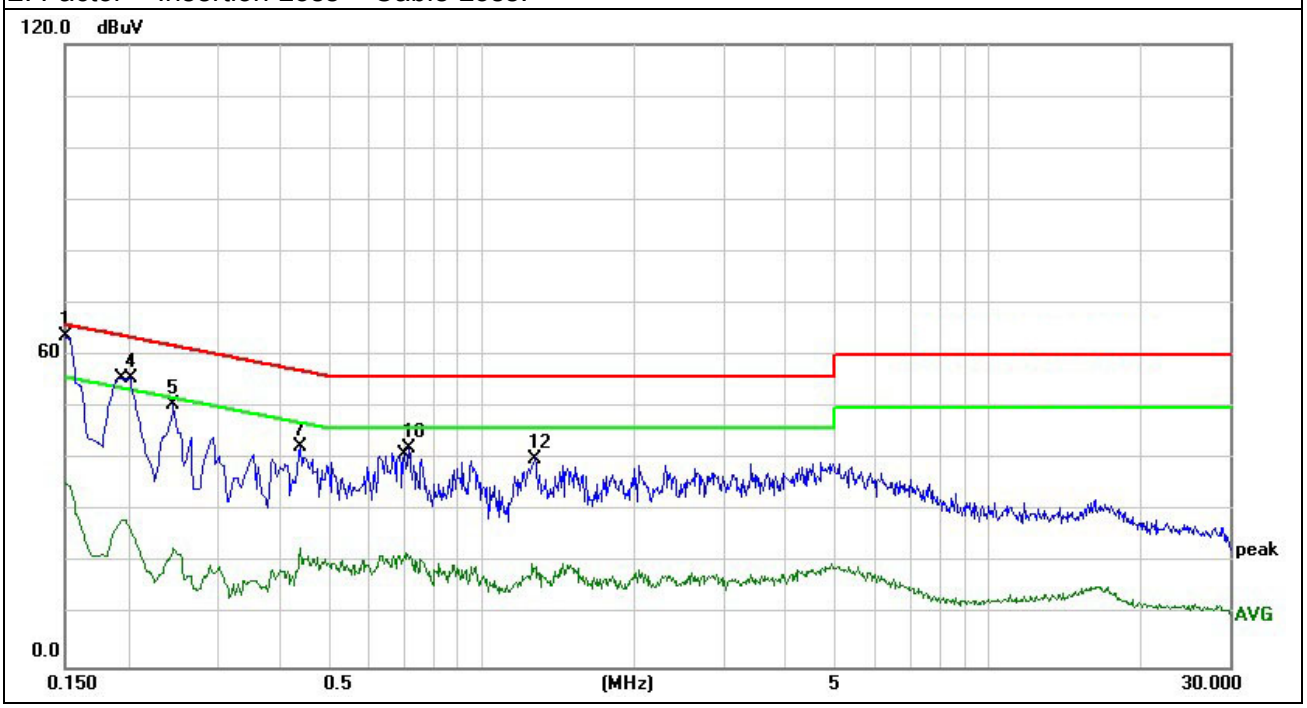
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Bluetooth Wireless Speaker	Model Name. ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	AC 120V/60Hz	Test Mode：	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1500	53.52	10.13	63.65	66.00	-2.35	QP
0.1500	25.37	10.13	35.50	56.00	-20.50	AVG
0.1940	18.28	10.12	28.40	53.86	-25.46	QP
0.1940	45.53	10.12	55.65	63.86	-8.21	AVG
0.2460	40.44	10.12	50.56	61.89	-11.33	QP
0.2460	12.95	10.12	23.07	51.89	-28.82	AVG
0.4380	32.25	10.09	42.34	57.10	-14.76	QP
0.4380	12.87	10.09	22.96	47.10	-24.14	AVG
0.7060	12.11	10.07	22.18	46.00	-23.82	QP
0.7060	32.09	10.07	42.16	56.00	-13.84	AVG
1.2580	9.88	10.09	19.97	46.00	-26.03	QP
1.2580	29.85	10.09	39.94	56.00	-16.06	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	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

Above 1GHz

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average

Below 1GHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

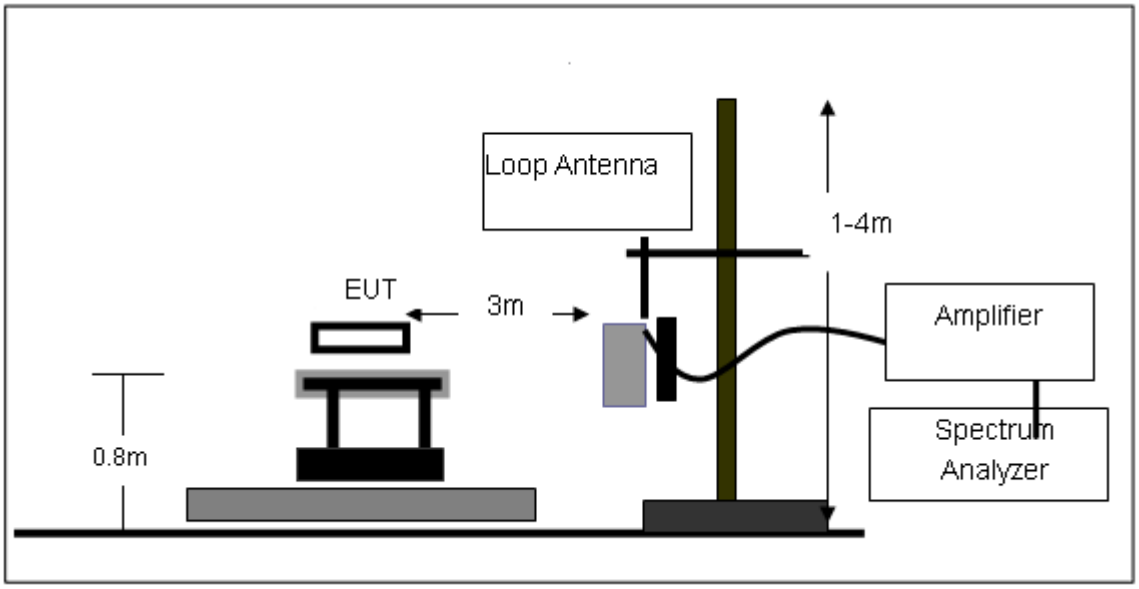
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

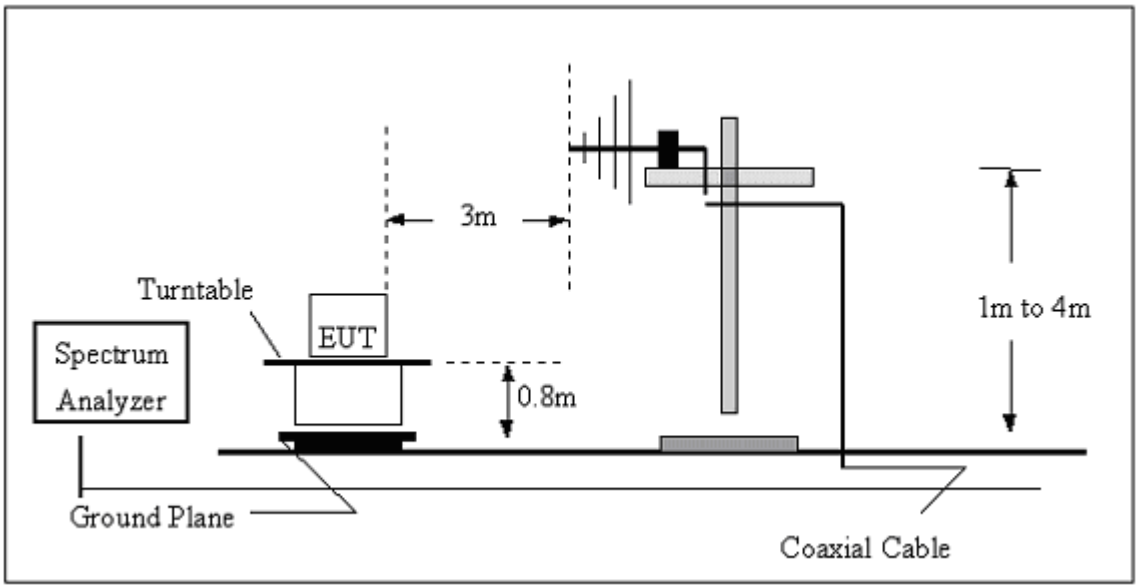
No deviation

3.2.4 TEST SETUP

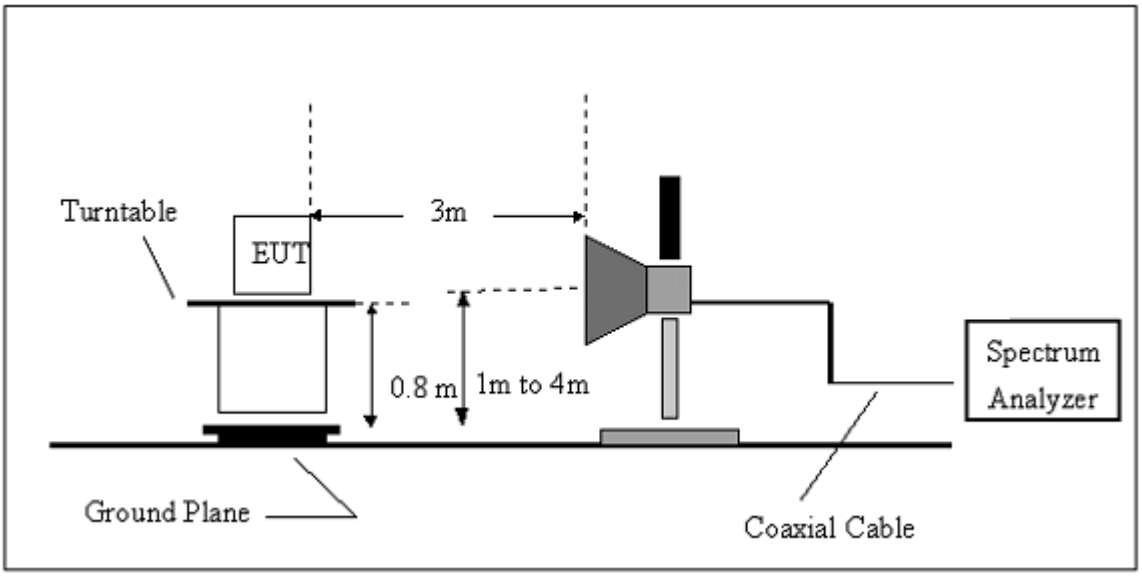
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT：	Bluetooth Wireless Speaker	Model Name. ：	QR-A2
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

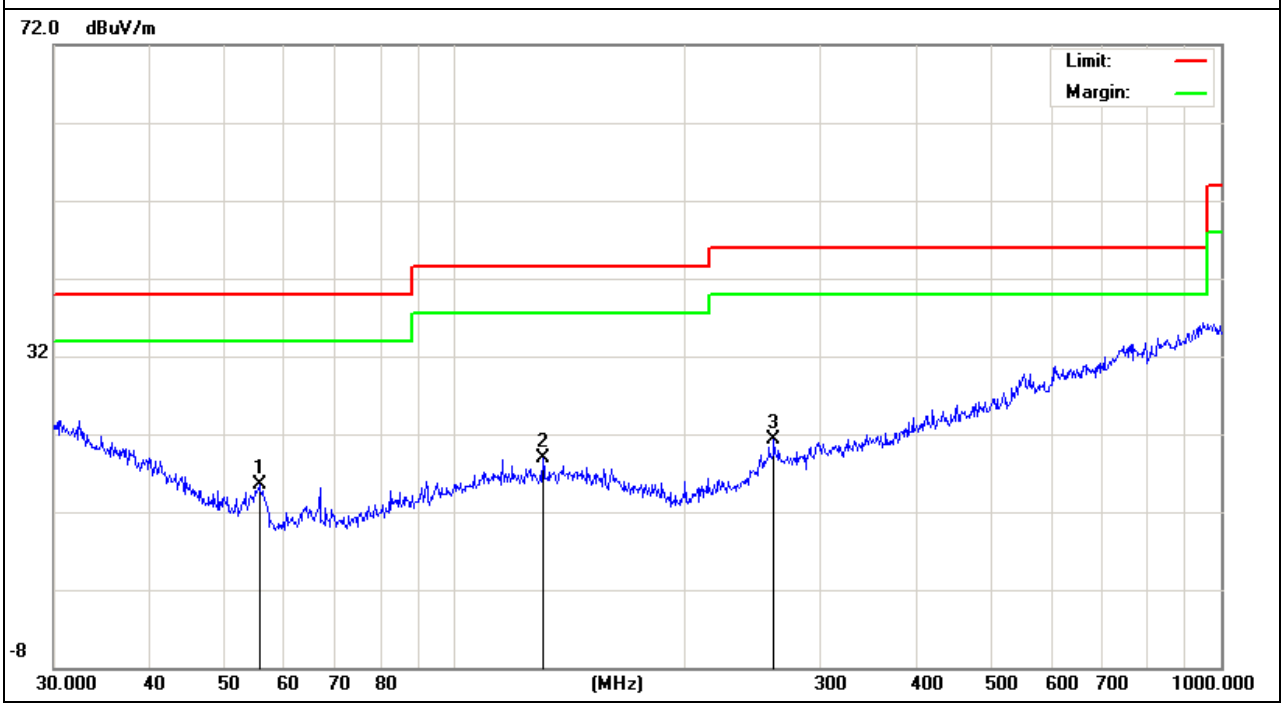
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	Mode 2	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
55.6094	9.32	6.1	15.42	40	-24.58	QP
130.3788	6.74	12.2	18.94	43.5	-24.56	QP
261.0582	6.45	14.85	21.3	46	-24.7	QP

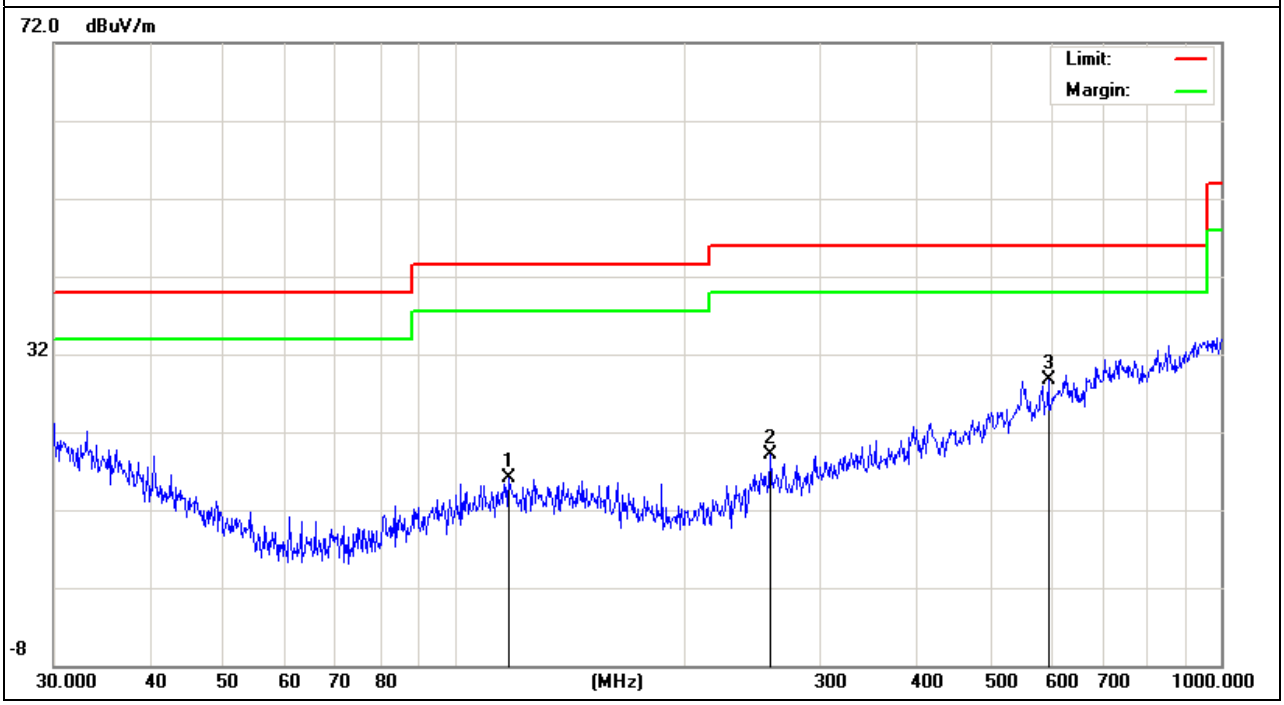
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	Mode 2	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
117.7724	4.01	12.04	16.05	43.5	-27.45	QP
258.3263	4.48	14.71	19.19	46	-26.81	QP
595.1327	6.07	22.6	28.67	46	-17.33	QP

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

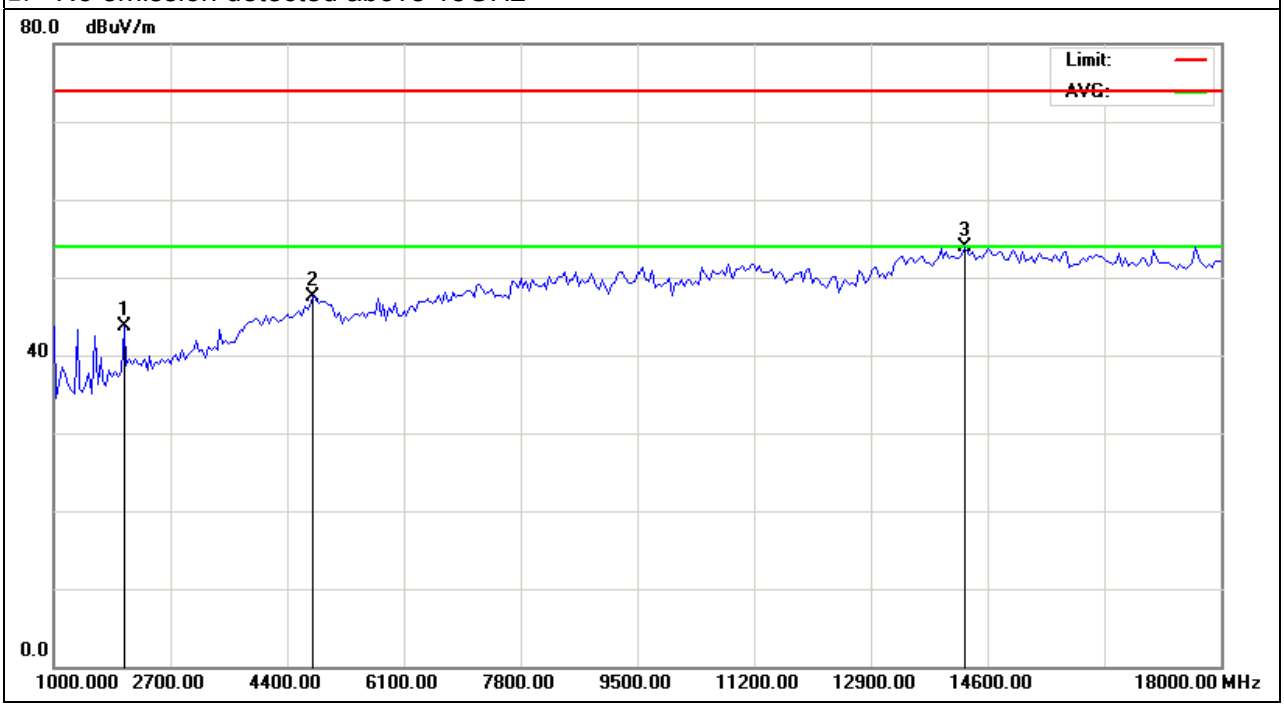


3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2020	56.6	-12.92	43.68	74	-30.32	peak
4782.5	51.5	-3.91	47.59	74	-26.41	peak
14260.00 0	47.36	6.5	53.86	74	-20.14	peak

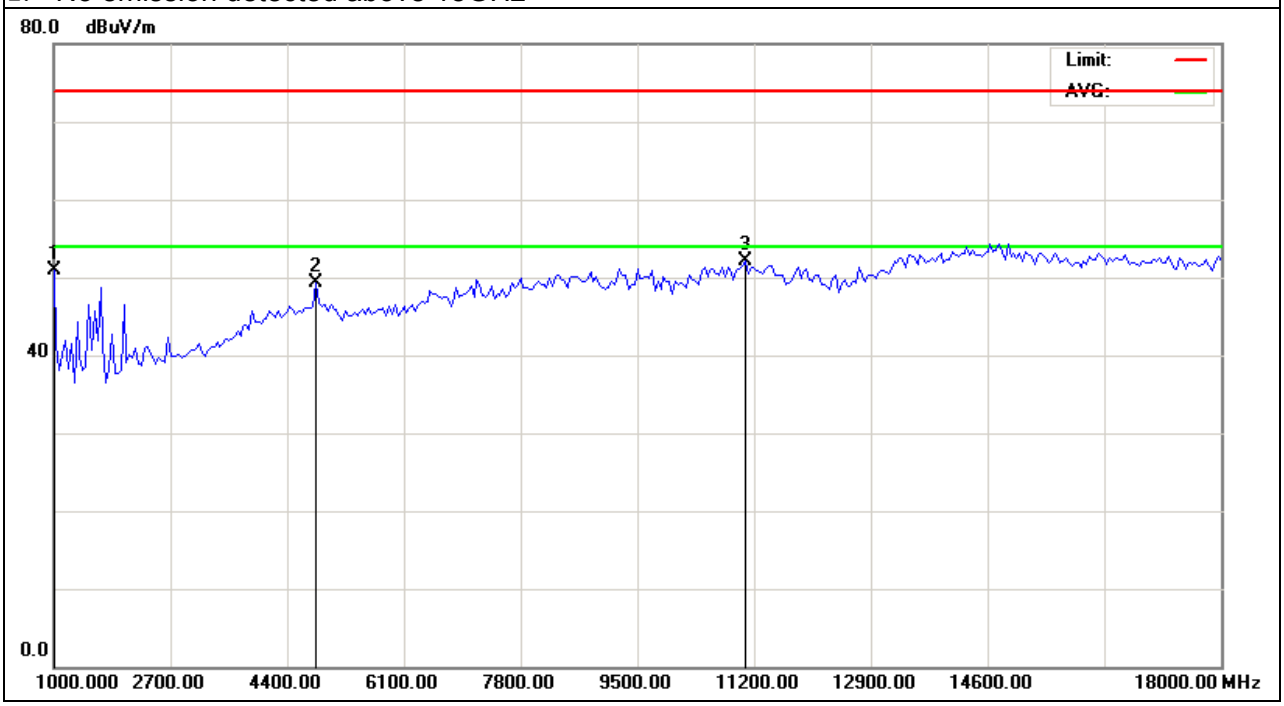
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. No emission detected above 18GHz



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
1000.000 0	70.93	-20.02	50.91	74	-23.09	peak
4825	52.96	-3.59	49.37	74	-24.63	peak
11072.50 0	48.46	3.56	52.02	74	-21.98	peak

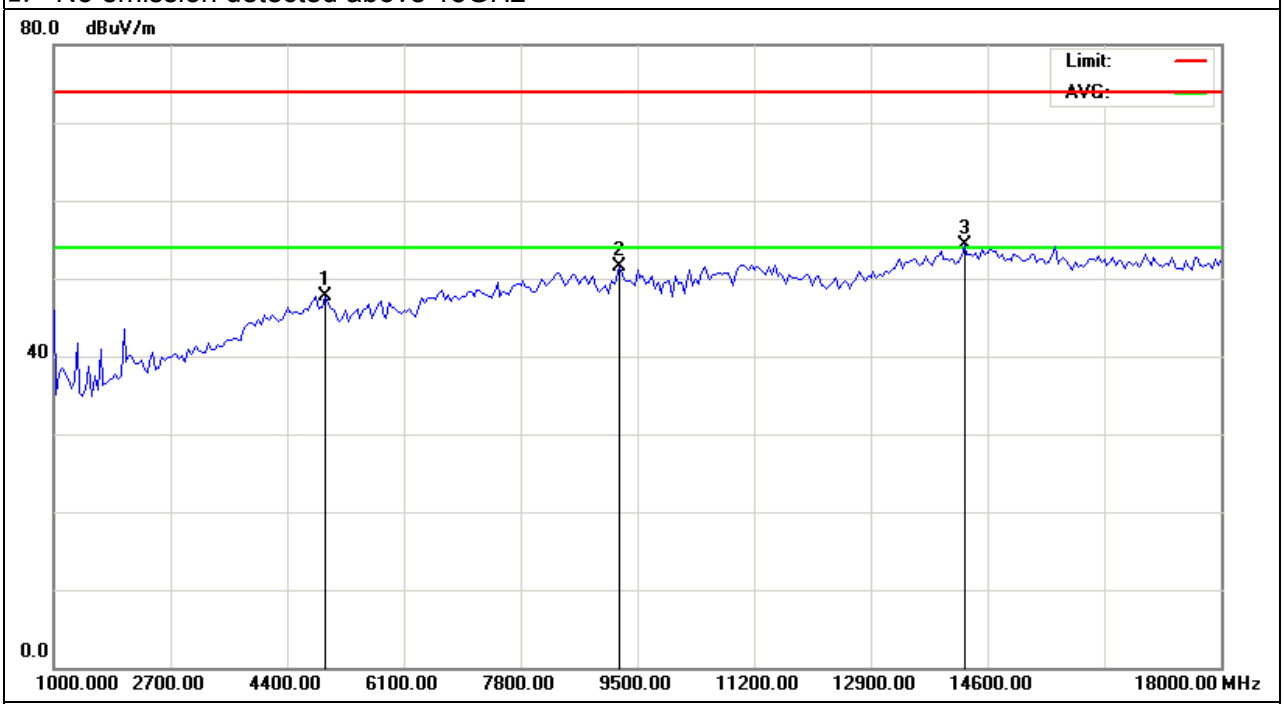
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. No emission detected above 18GHz



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH19	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4952.5	51.19	-3.55	47.64	74	-26.36	peak
9245	49.24	2.29	51.53	74	-22.47	peak
14260.00 0	47.72	6.5	54.22	74	-19.78	peak
14260.00 0	32.94	6.5	39.44	54	-14.56	peak

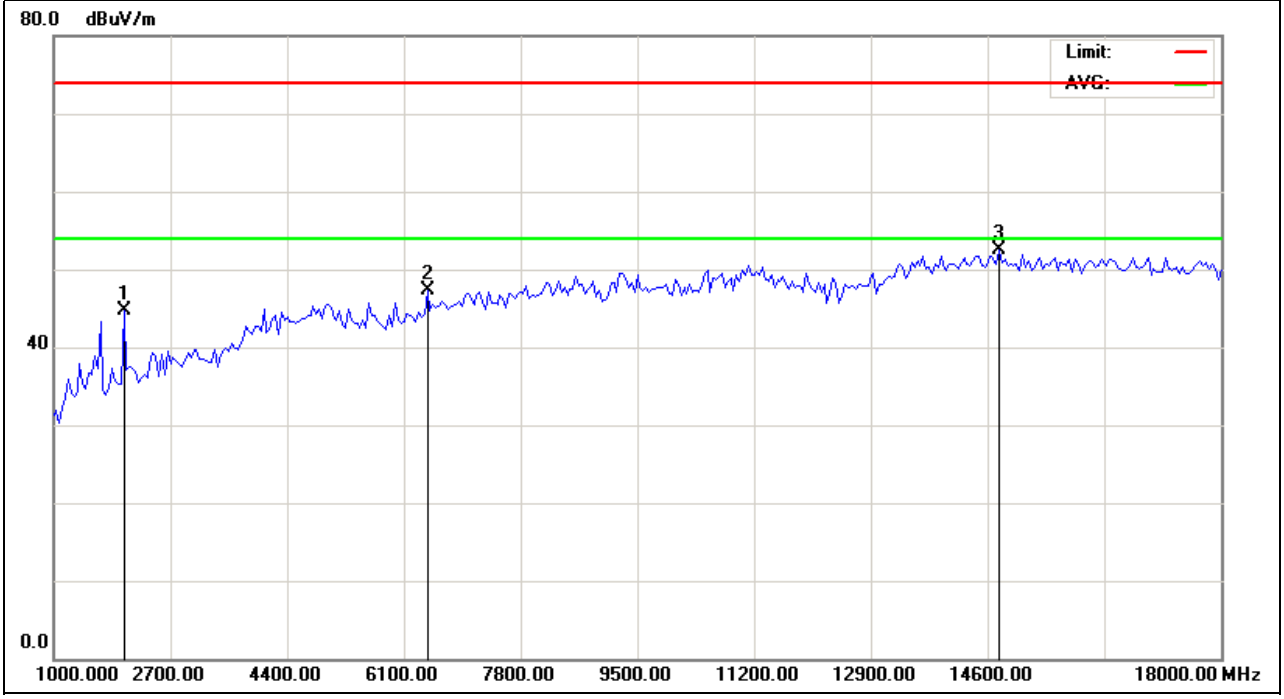
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. No emission detected above 18GHz



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH19	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2020	57.63	-12.92	44.71	74	-29.29	peak
6440	49.2	-1.98	47.22	74	-26.78	peak
14770.00 0	46.32	6.12	52.44	74	-21.56	peak

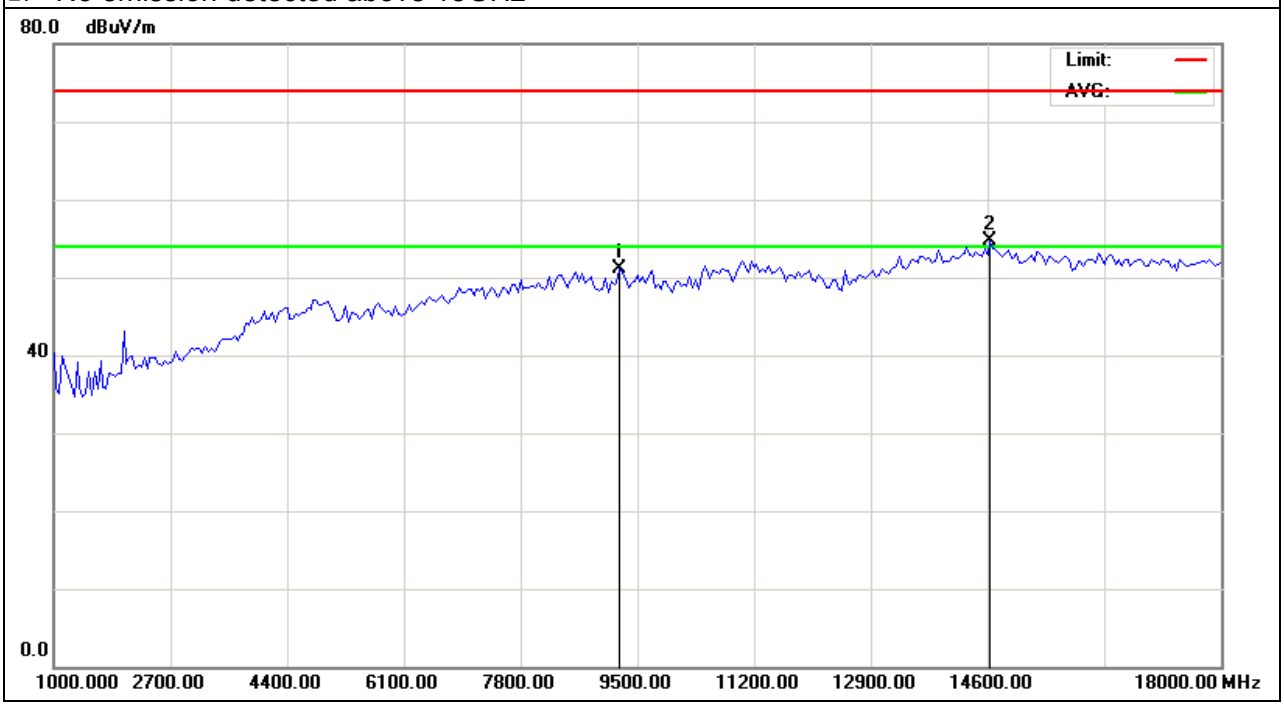
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. No emission detected above 18GHz



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
9245	48.73	2.29	51.02	74	-22.98	peak
14642.50 0	47.39	7.28	54.67	74	-19.33	peak
14642.50 0	30.88	7.28	38.16	54	-15.84	AV

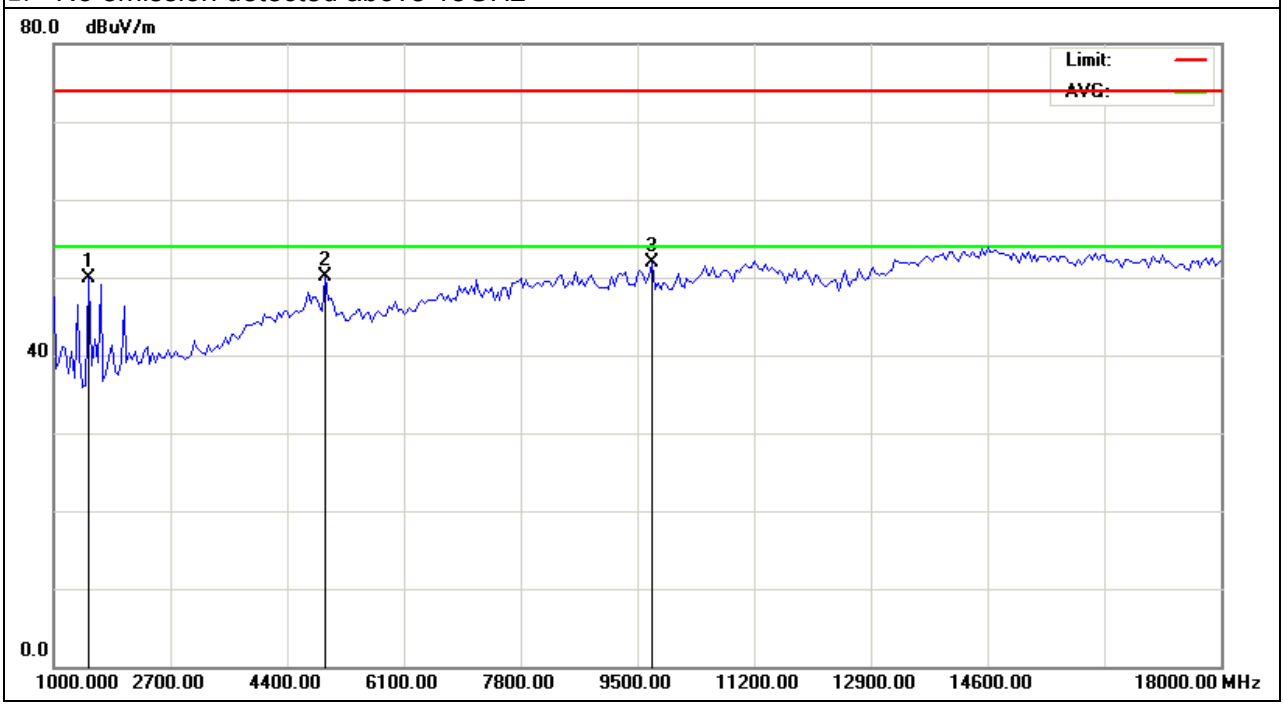
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. No emission detected above 18GHz



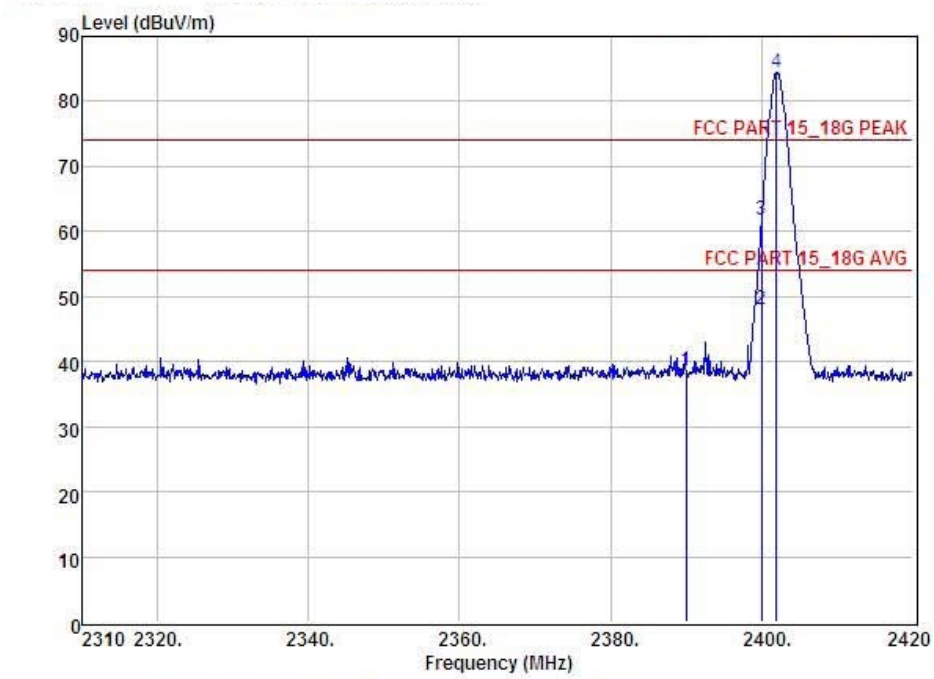
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
1510	66.93	-17.1	49.83	74	-24.17	peak
4952.5	53.6	-3.55	50.05	74	-23.95	peak
9712.5	50.62	1.37	51.99	74	-22.01	peak

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. No emission detected above 18GHz



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00	Polarization :	Horizontal

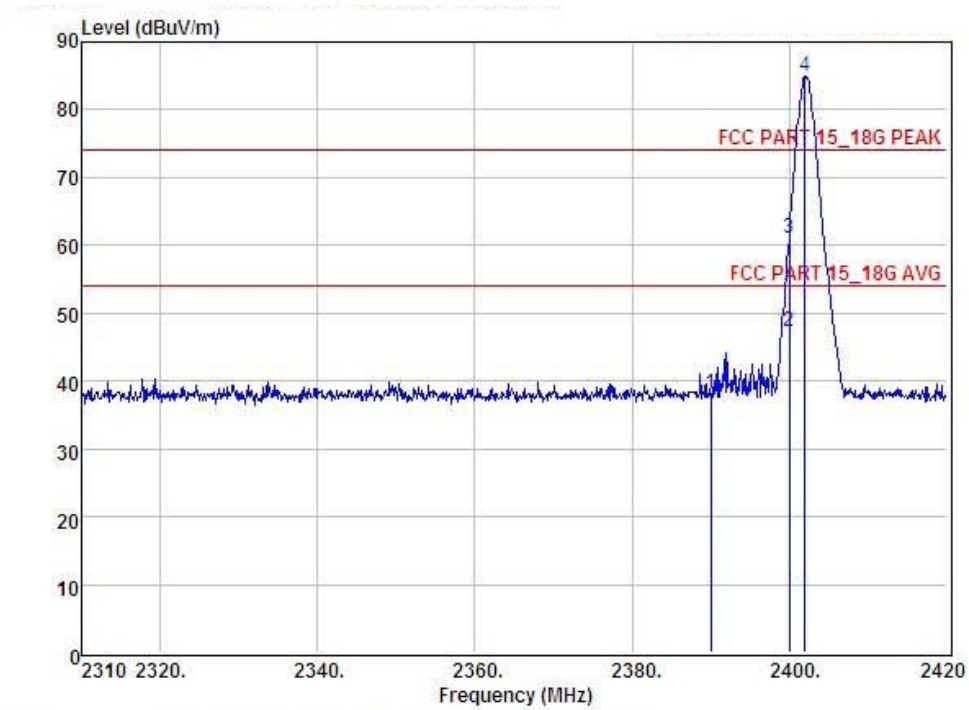


Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2390.00	41.98	27.62	34.97	3.92	38.55	74.00	-35.45	Peak
2	2400.00	51.45	27.62	34.97	3.94	48.04	54.00	-5.96	Average
3	2400.00	65.12	27.62	34.97	3.94	61.71	74.00	-12.29	Peak
4	2402.00	67.77	27.62	34.97	3.94	64.36	74.00	10.36	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00	Polarization :	Vertical

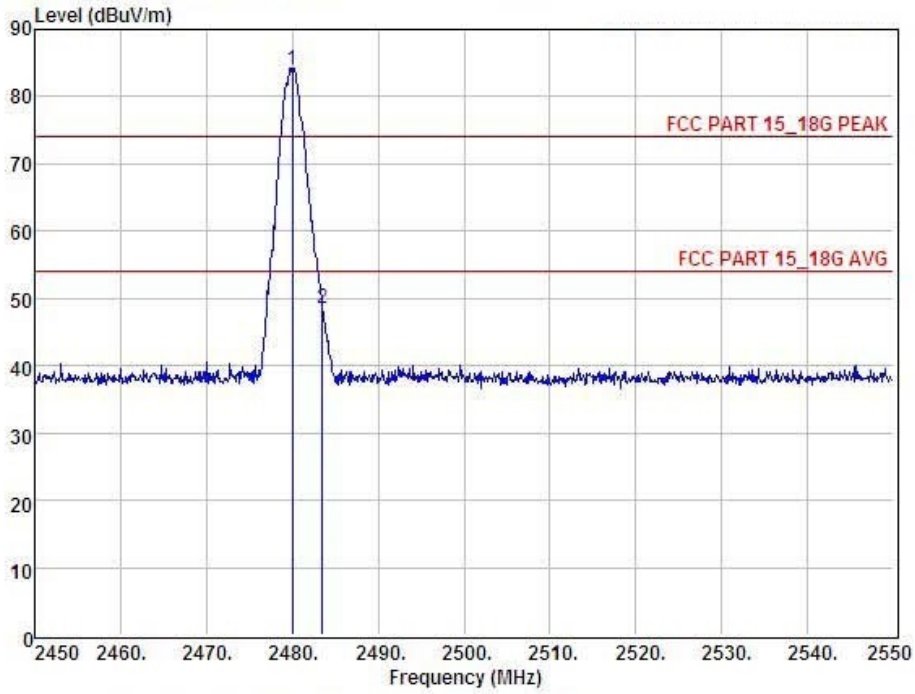


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2390.00	41.51	27.62	34.97	3.92	38.08	74.00	-35.92	Peak
2	2400.00	50.73	27.62	34.97	3.94	47.32	54.00	-6.68	Average
3	2400.00	64.44	27.62	34.97	3.94	61.03	74.00	-12.97	Peak
4	2402.00	88.23	27.62	34.97	3.94	84.82	74.00	10.82	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39	Polarization :	Horizontal

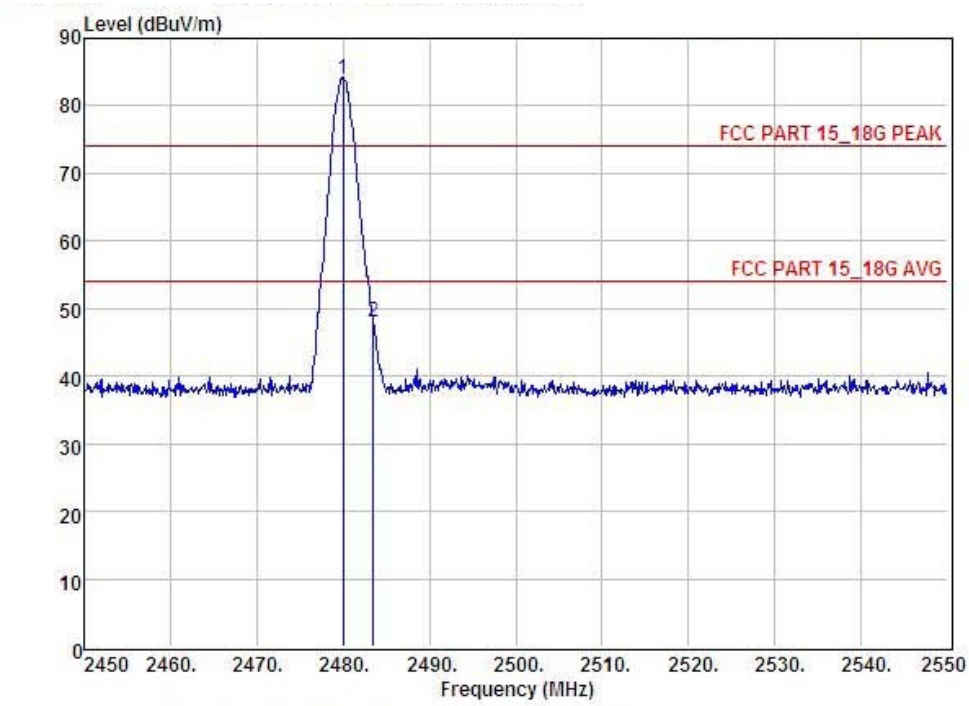


Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2480.00	87.33	27.59	34.97	4.00	83.95			Peak
2	2483.50	51.97	27.59	34.97	4.00	48.59	74.00	-25.41	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39	Polarization :	Vertical



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	2480.00	87.28	27.59	34.97	4.00	83.90	74.00	9.90	Peak
2	2483.50	51.50	27.59	34.97	4.00	48.12	74.00	-25.88	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

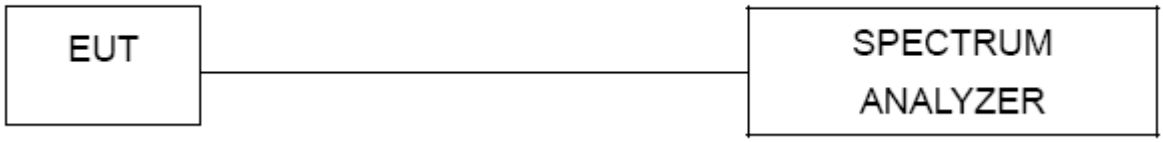
4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ⩾ 3 kHz.
4. Set the VBW ⩾ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

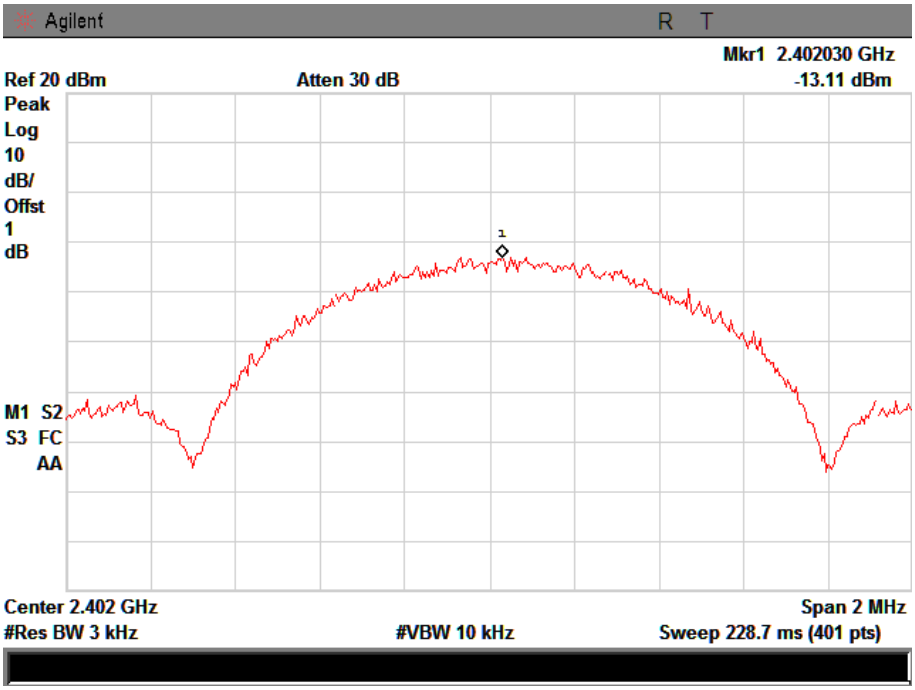
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

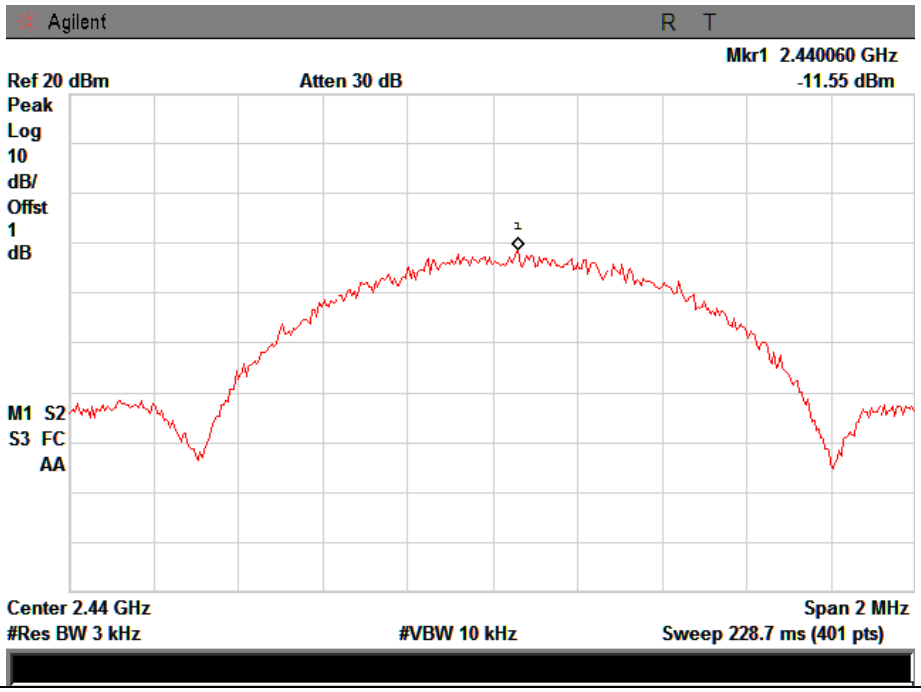
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX Mode /CH00, CH19, CH39		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2402 MHz	-13.11	8	**PASS**
2440 MHz	-11.55	8	**PASS**
2480 MHz	-12.11	8	**PASS**

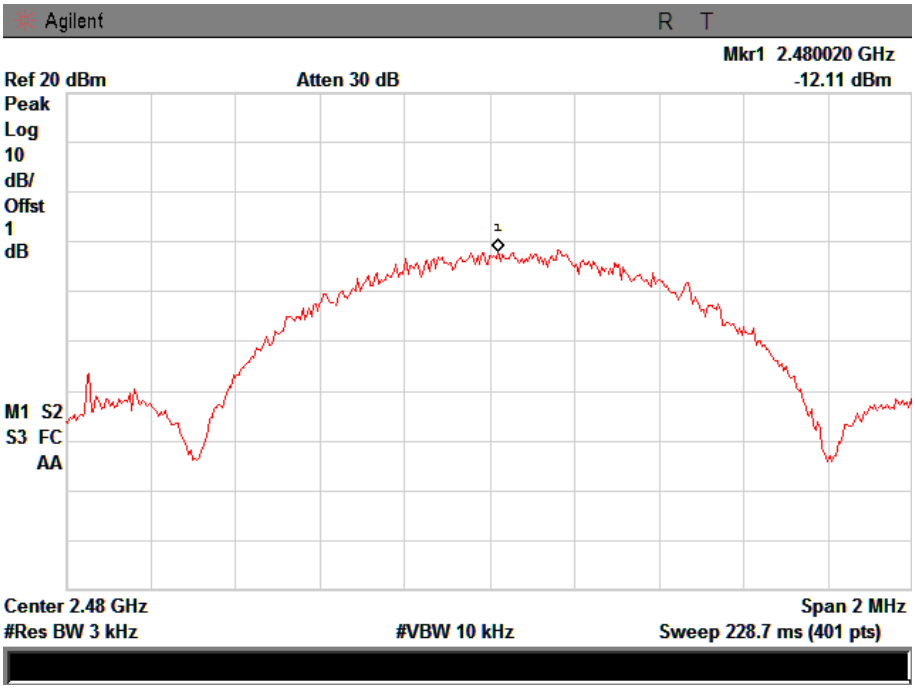
TX CH00



TX CH19



TX CH39



5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

5.1.4 EUT OPERATION CONDITIONS

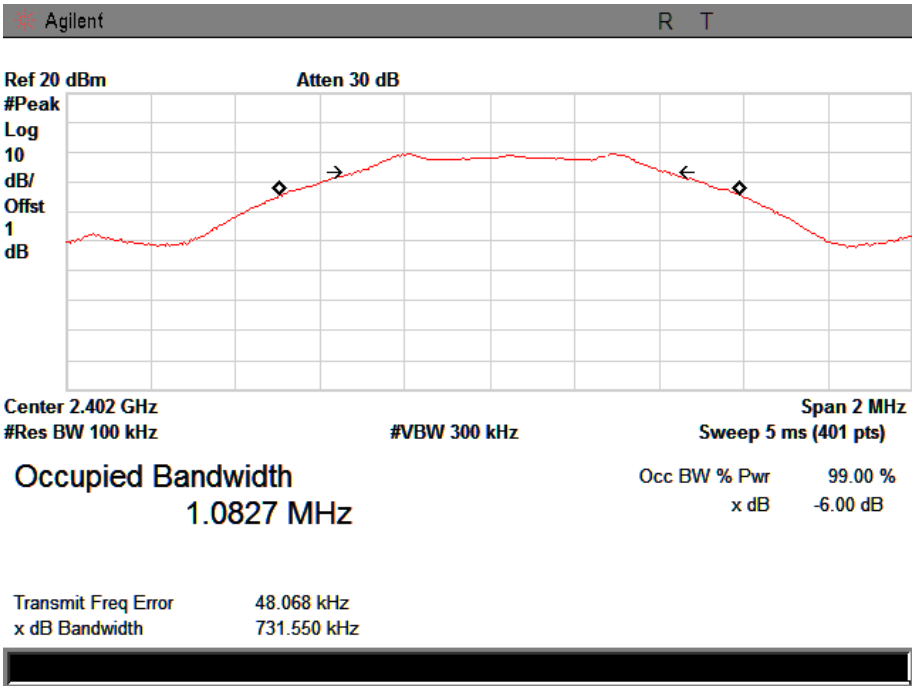
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

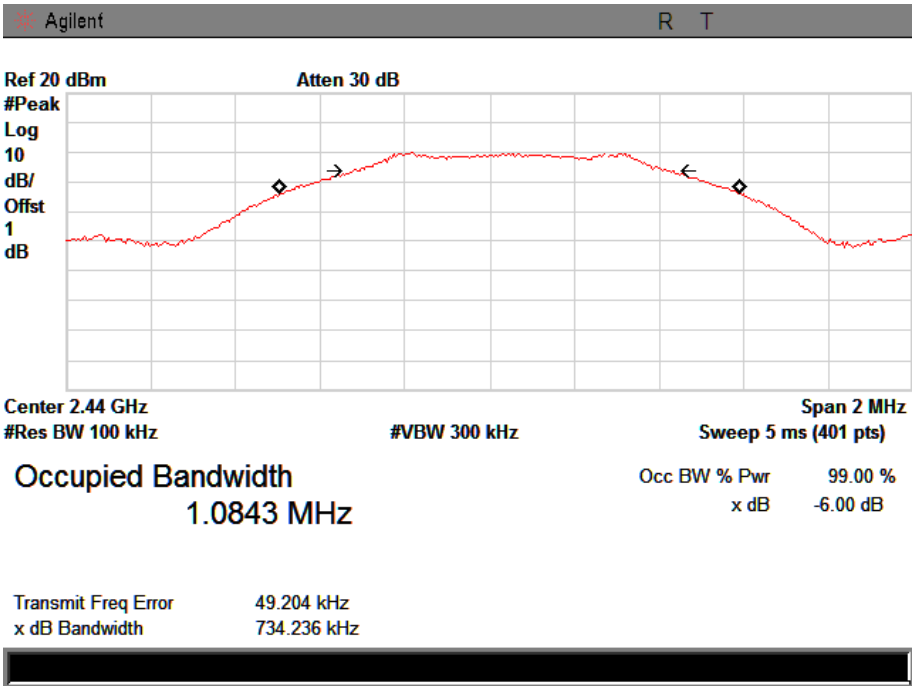
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX Mode/CH00, CH19, CH39		

Frequency	6dB Bandwidth (kHz)	99% Bandwidth (MHz)	Channel Separation (MHz)	Result
2402 MHz	731.55	1.0827	>=500KHz	PASS
2440 MHz	734.24	1.0843	>=500KHz	PASS
2480 MHz	710.50	1.0814	>=500KHz	PASS

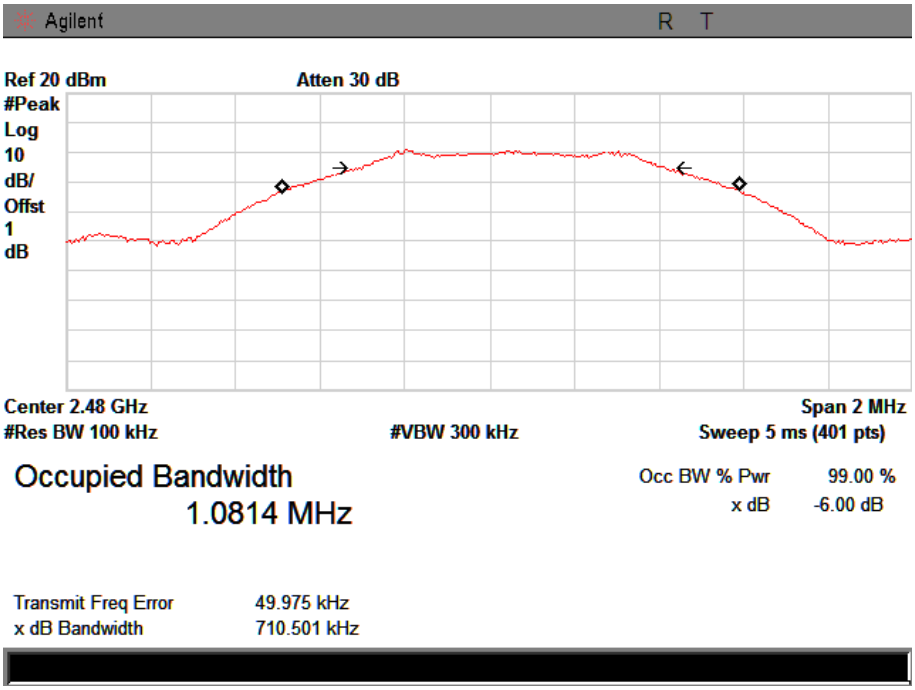
TX CH 00



TX CH 19



TX CH 39



6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

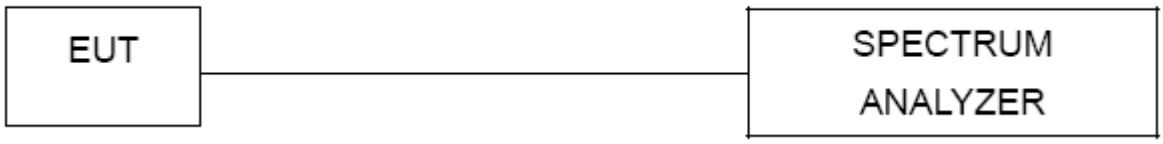
6.1.1 TEST PROCEDURE

a. The EUT was directly connected to spectrum analyzer

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

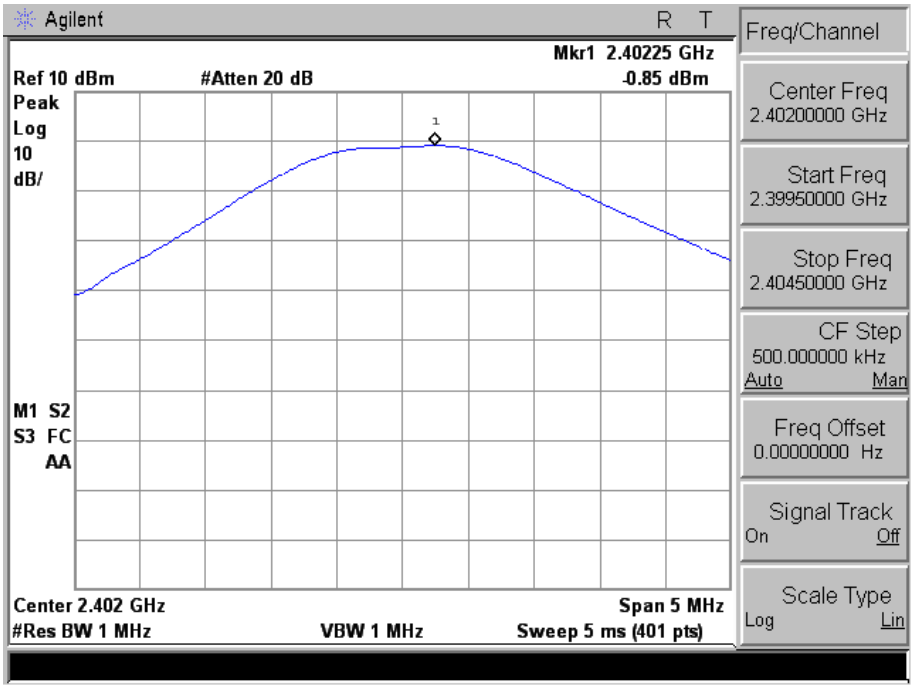
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

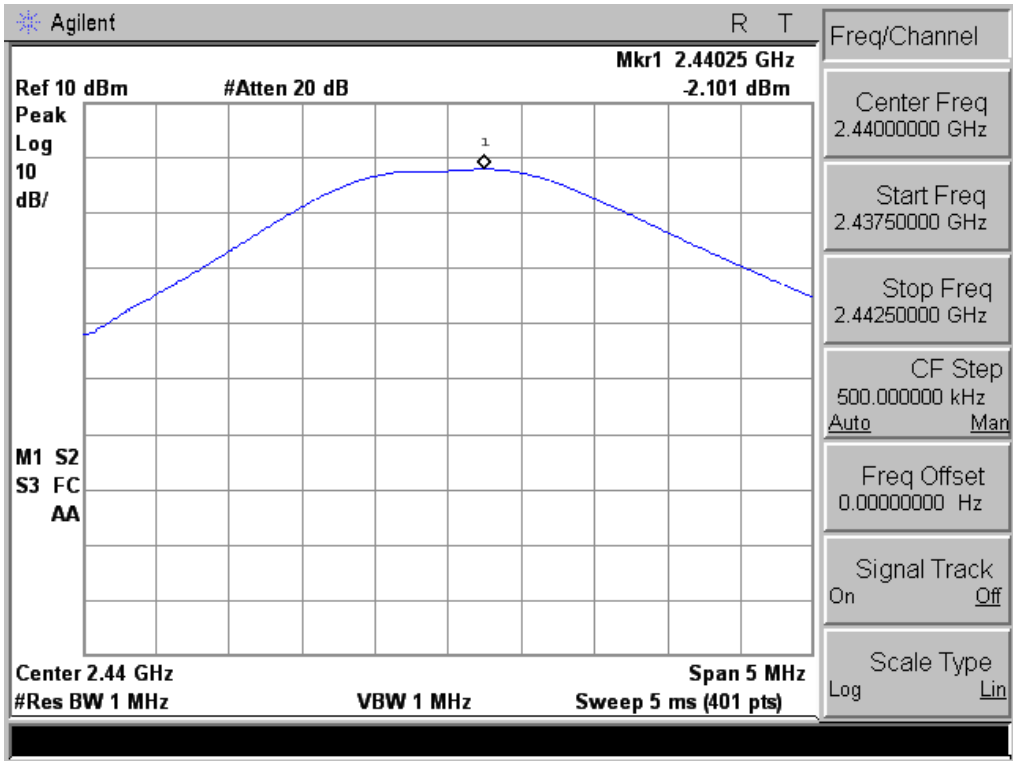
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX Mode /CH00, CH19, CH39		

Test Channe	Frequency	Maximum Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH00	2402	-0.85	30
CH19	2440	-2.10	30
CH39	2480	-1.61	30

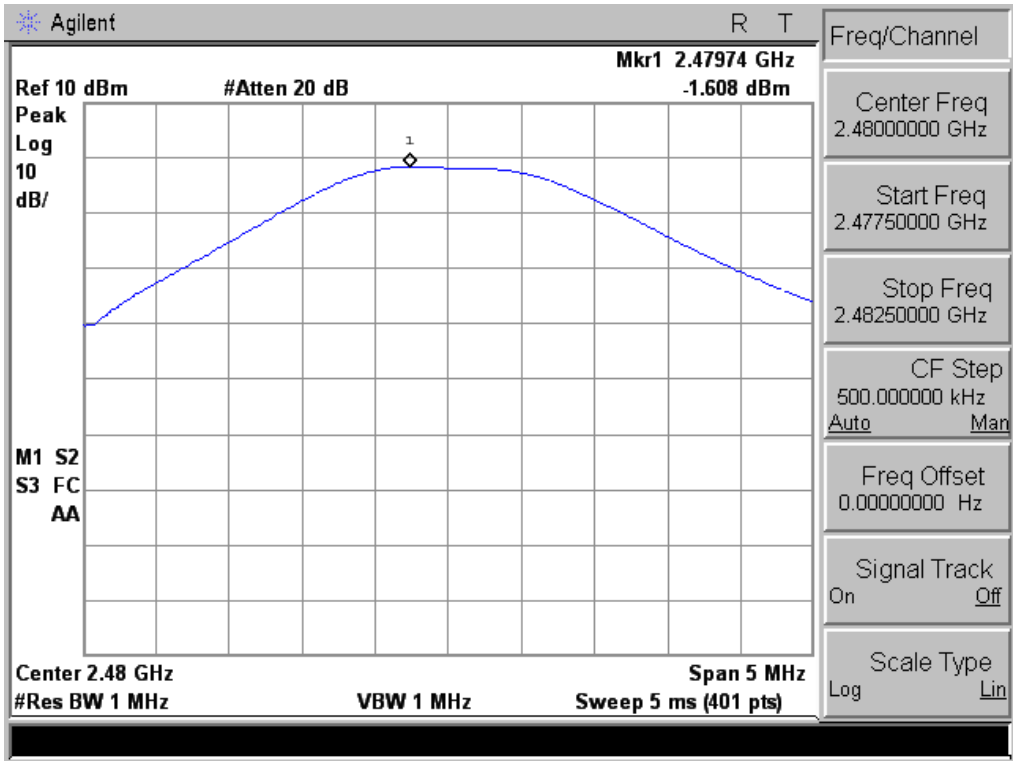
TX CH 00



TX CH 19


Agilent
R T
Mkr1 2.44025 GHz
Ref 10 dBm
#Atten 20 dB
-2.101 dBm
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center 2.44 GHz
Span 5 MHz
#Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
Freq/Channel
Center Freq
2.44000000 GHz
Start Freq
2.43750000 GHz
Stop Freq
2.44250000 GHz
CF Step
500.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

TX 39


Agilent
R T
Mkr1 2.47974 GHz
Ref 10 dBm
#Atten 20 dB
-1.608 dBm
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center 2.48 GHz
Span 5 MHz
#Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
Freq/Channel
Center Freq
2.48000000 GHz
Start Freq
2.47750000 GHz
Stop Freq
2.48250000 GHz
CF Step
500.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

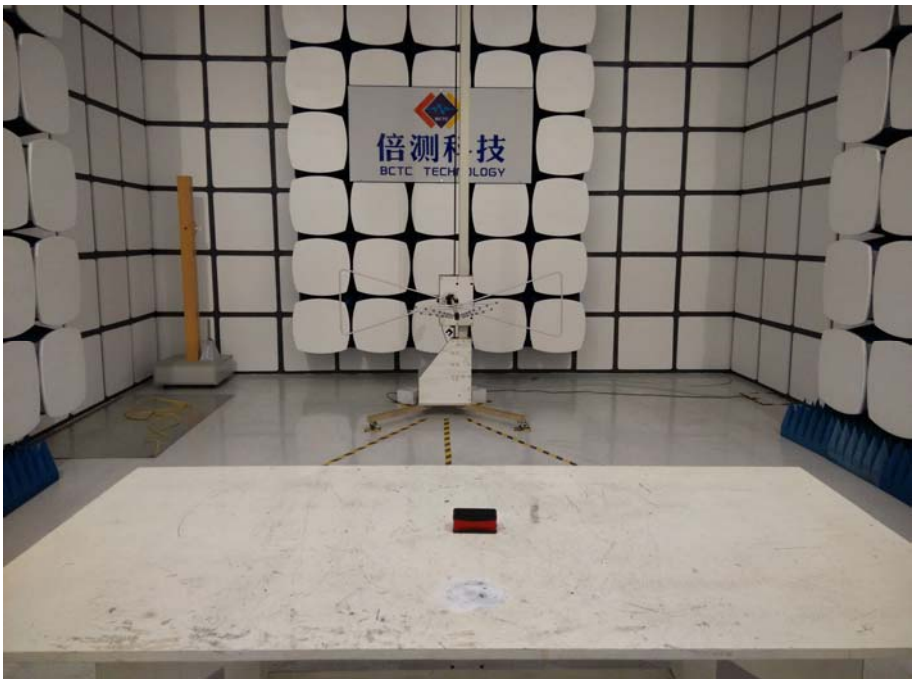
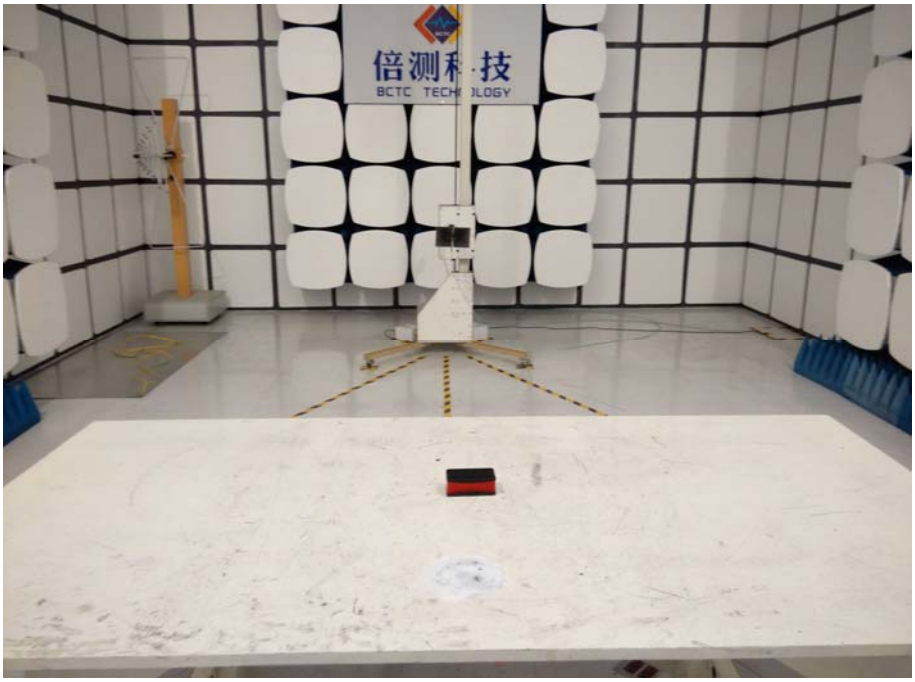
7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

7.2 EUT ANTENNA

The EUT antenna is Integrated antenna. It comply with the standard requirement.

8. EUT TEST PHOTO

Radiated Measurement Photos