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-150201503**

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 .....

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)(1)	Hopping Channel Separation	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(c)	Radiated Spurious Emission	PASS	
15.247(a)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(iii)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	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

Equipment	Bluetooth Wireless Speaker
Trade Name	N/A
Model Name	QR-A2
Serial Model	CSR4.0+EDR
Model Difference	All the same, Only model name is different.
Product Description	The EUT is a Bluetooth Wireless Speaker Operation Frequency: 2402~2480 MHz Modulation Type: BT(1Mbps): GFSK BT EDR(2Mbps):Π/4-DQPSK BT EDR(3Mbps): 8-DPSK Bit Rate of Transmitter 1Mbps/2Mbps/3Mbps Number Of Channel 79 CH Antenna Designation: Please see Note 3. Output Power(Conducted): BT(1Mbps): 0.782dBm BT EDR(2Mbps): -0.064dBm BT EDR(3Mbps): -0.168dBm 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.
Channel List	Please refer to the Note 2.
Adapter	Model:TP-U22 AC Power Input: 100-240V~, 50/60Hz Output: 5.0V⎓, 1.0A
Battery	DC3.7V
Connecting I/O Port(s)	Please refer to the User's Manual

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)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464

09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3.

Table for Filed Antenna

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

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	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	BT Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	BT Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78

Note:

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

(2)The data rate was set in 1Mbps for radiated emission due to the highest RF output power.

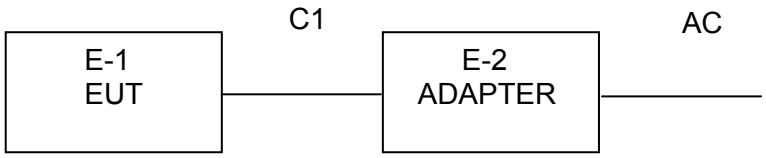
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

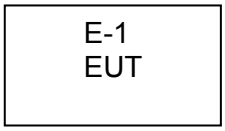
Test software Version	Test program: BC5		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters(1Mbps)	DEF	DEF	DEF
Parameters(2Mbps)	DEF	DEF	DEF
Parameters(3Mbps)	DEF	DEF	DEF

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test



2.5 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.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.6 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

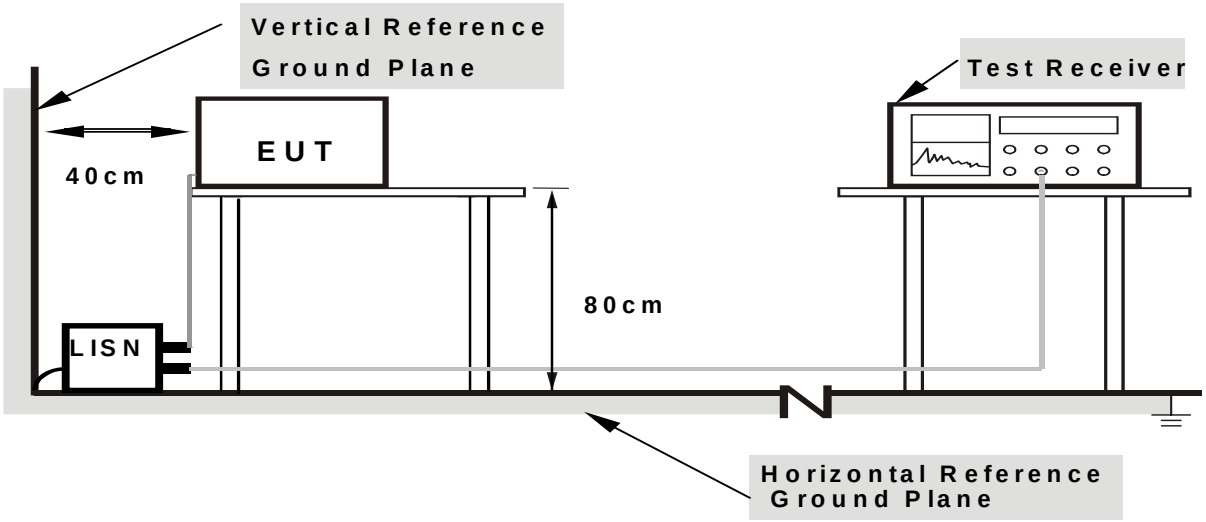
3.1.2 TEST PROCEDURE

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

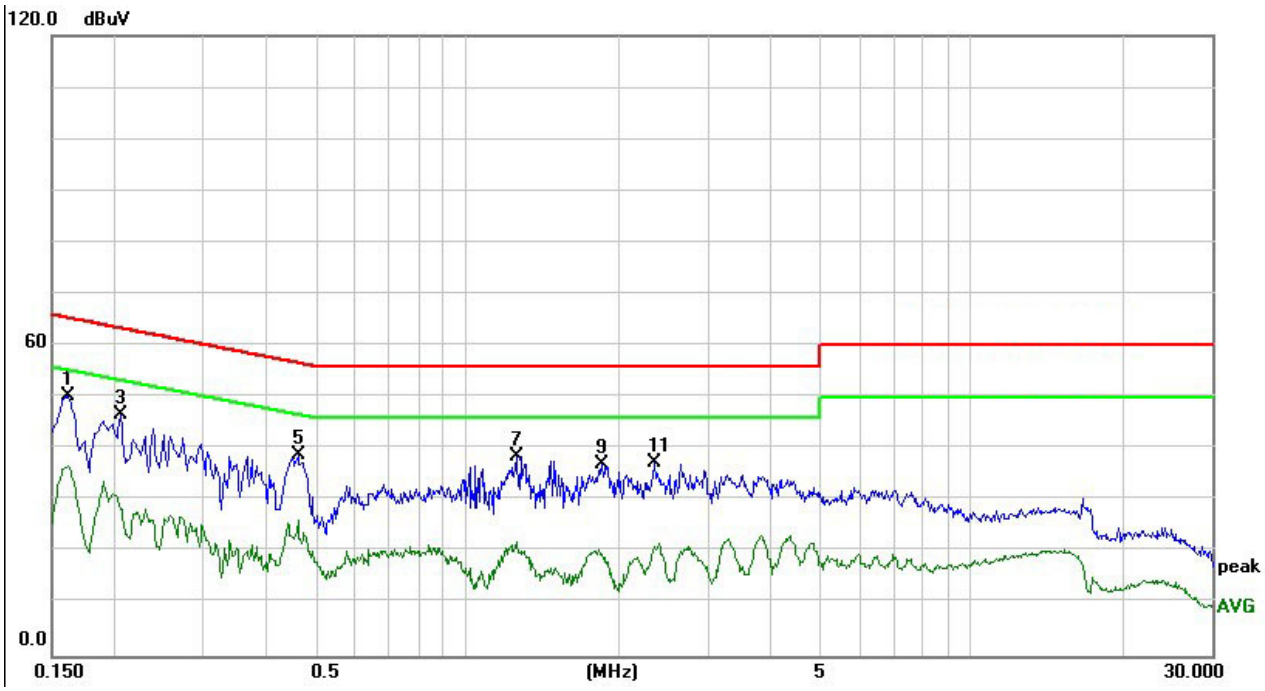
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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

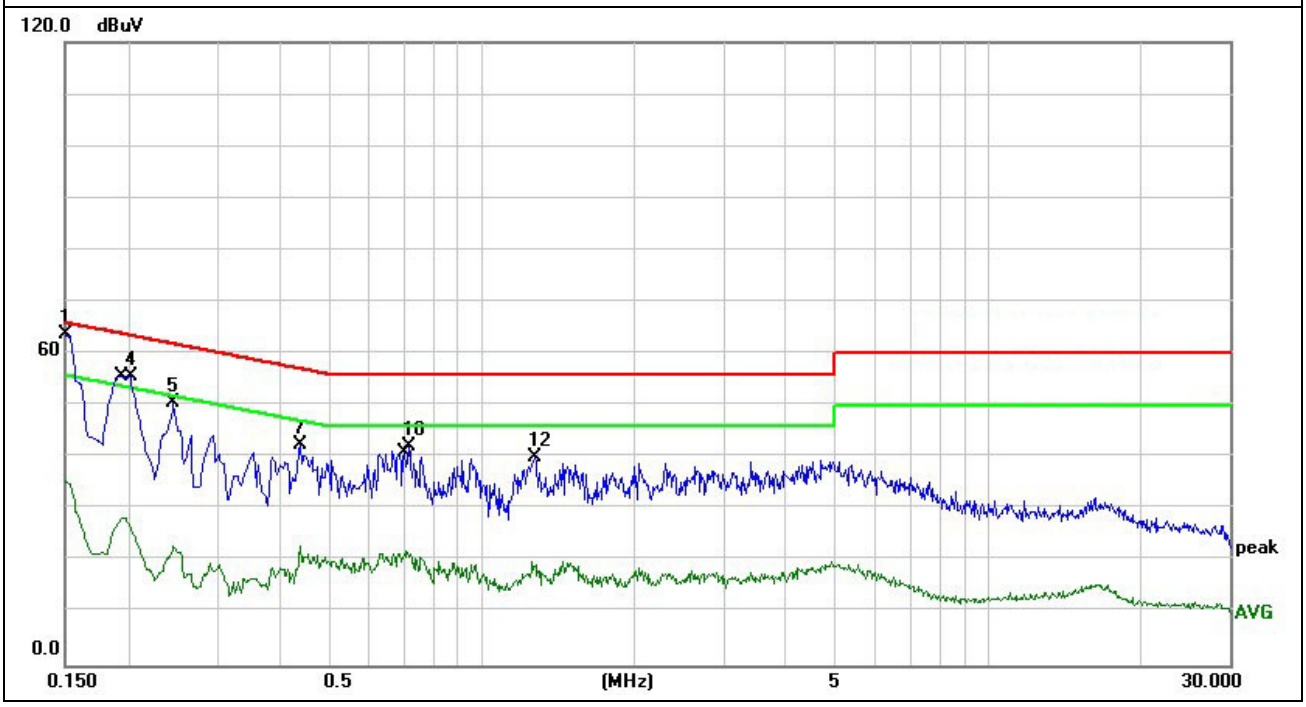
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



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

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:

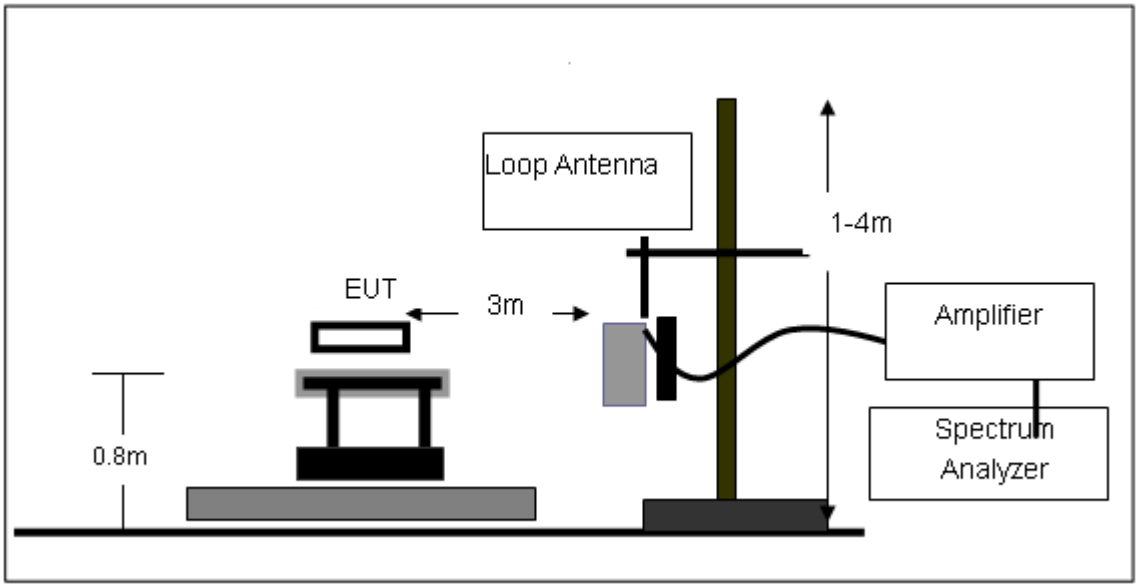
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

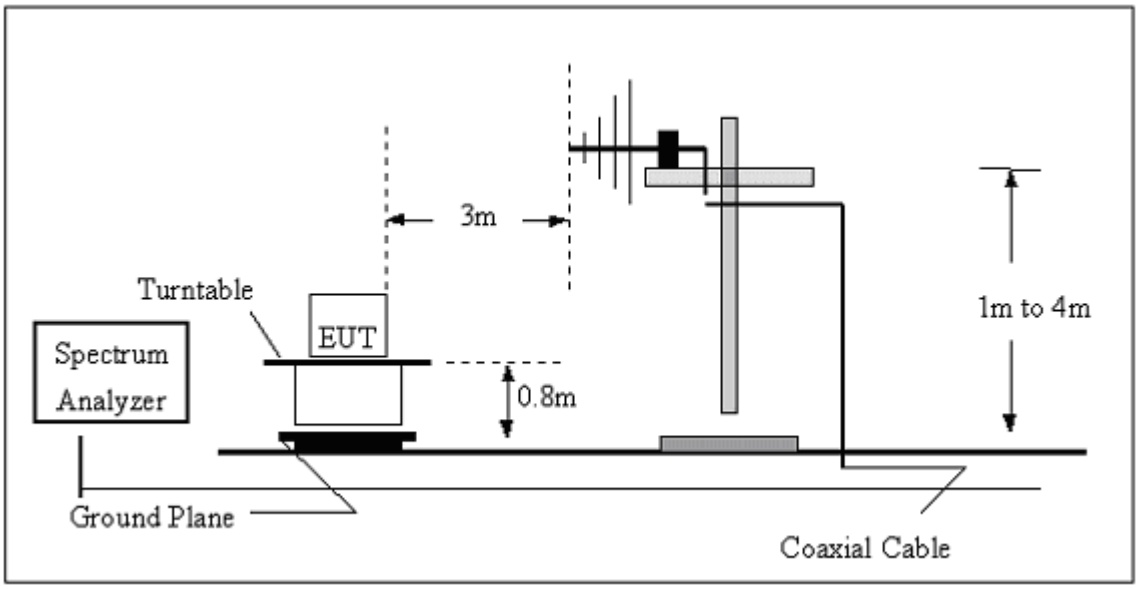
No deviation

3.2.4 TEST SETUP

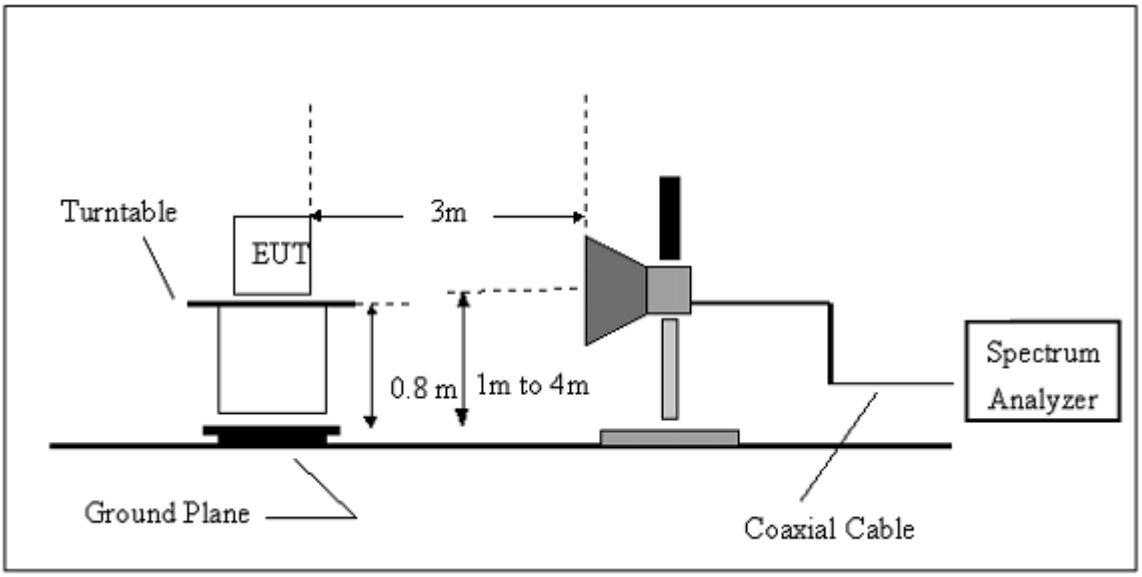
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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 (BELOW 30 MHZ)

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization :	---
Test Voltage ：	DC3.7V		
Test Mode ：	TX		

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

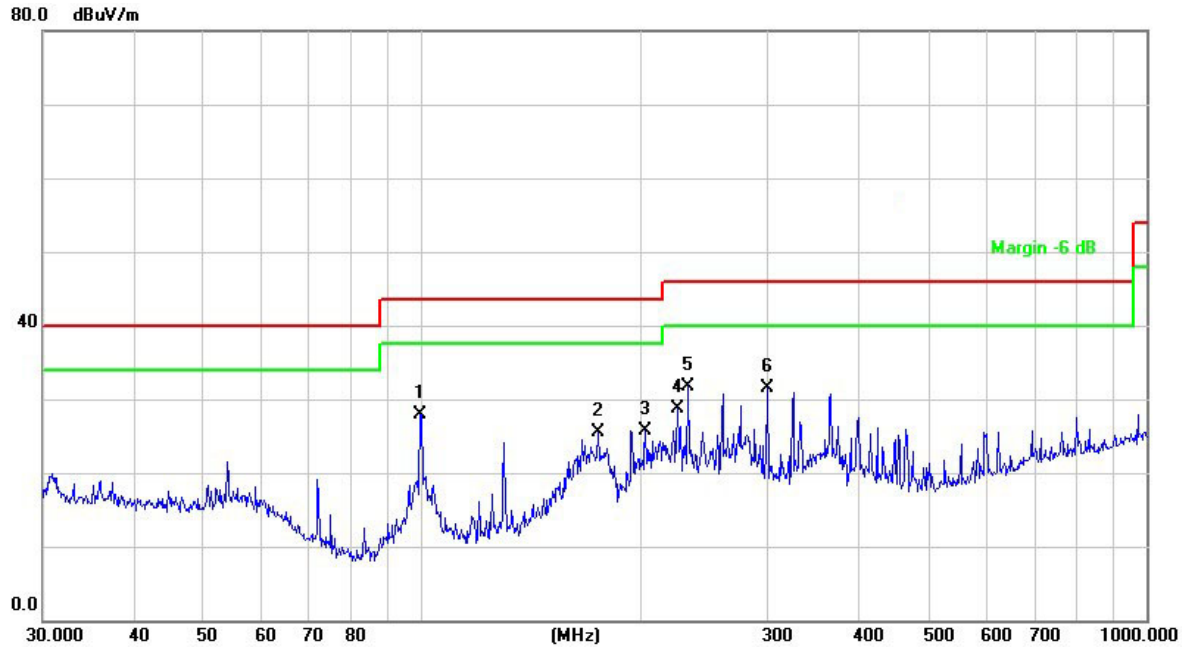
NOTE:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	DC3.7V		
Test Mode ：	TX		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
99.5281	44.43	-16.52	27.91	43.50	-15.59	QP
175.0368	39.41	-13.89	25.52	43.50	-17.98	QP
203.5228	41.71	-16.10	25.61	43.50	-17.89	QP
225.3080	44.08	-15.32	28.76	46.00	-17.24	QP
233.3487	46.55	-14.87	31.68	46.00	-14.32	QP
300.3672	44.15	-12.57	31.58	46.00	-14.42	QP

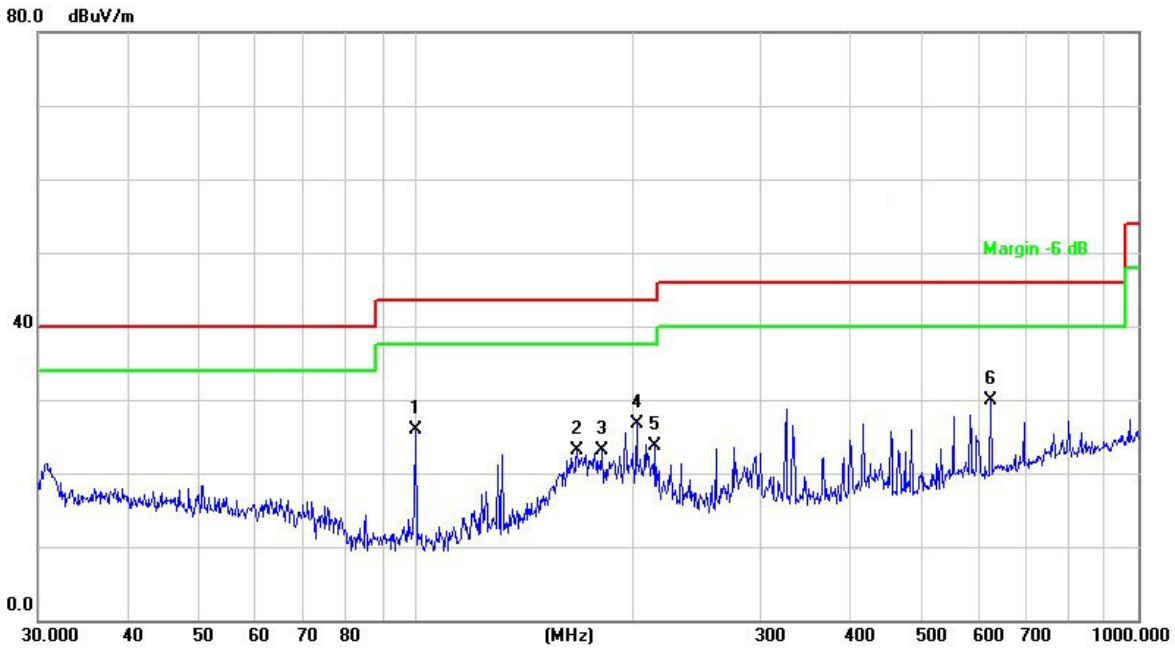
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	DC3.7V		
Test Mode ：	TX		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
99.8777	42.38	-16.49	25.89	43.50	-17.61	QP
167.2368	36.44	-13.29	23.15	43.50	-20.35	QP
180.6488	37.53	-14.42	23.11	43.50	-20.39	QP
202.1005	42.82	-16.14	26.68	43.50	-16.82	QP
214.5143	39.50	-15.78	23.72	43.50	-19.78	QP
625.0780	35.45	-5.52	29.93	46.00	-16.07	QP

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

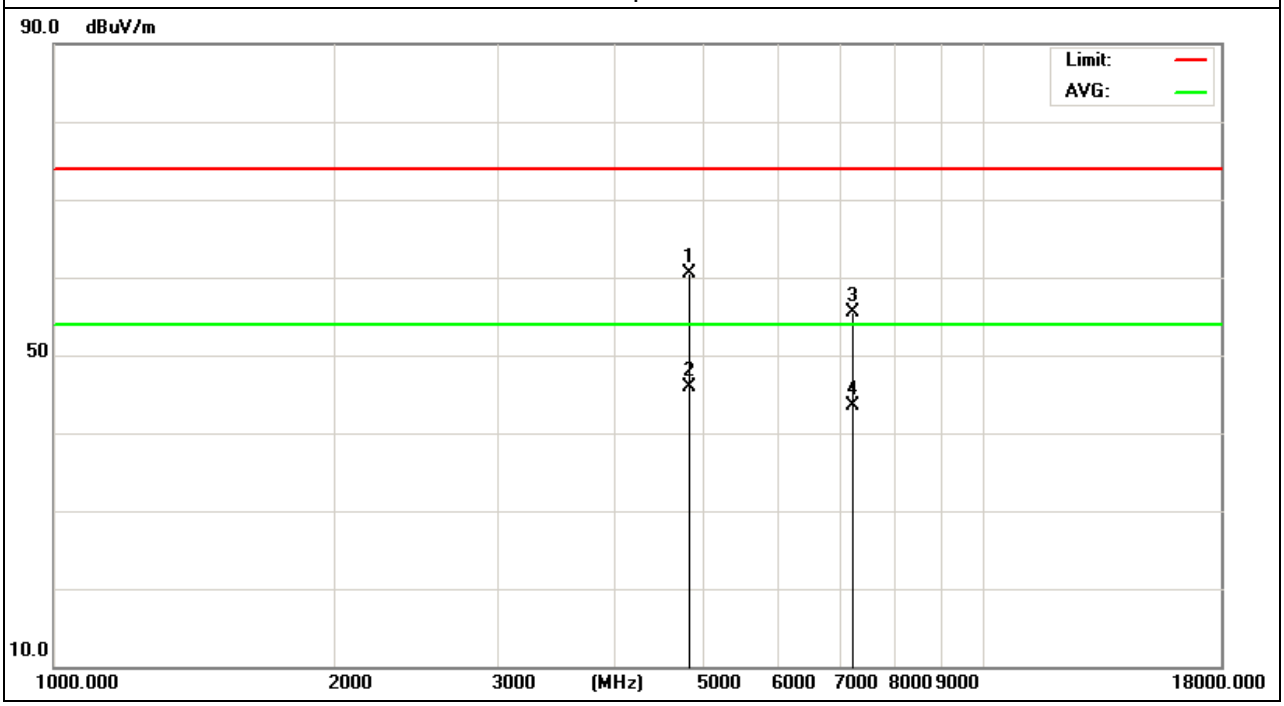


3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2402MHz – CH 00(1Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4804.134	64.11	-3.64	60.47	74	-13.53	peak
4804.134	49.36	-3.64	45.72	54	-8.28	AVG
7206.123	56.44	-0.95	55.49	74	-18.51	peak
7206.123	44.28	-0.95	43.33	54	-10.67	AVG

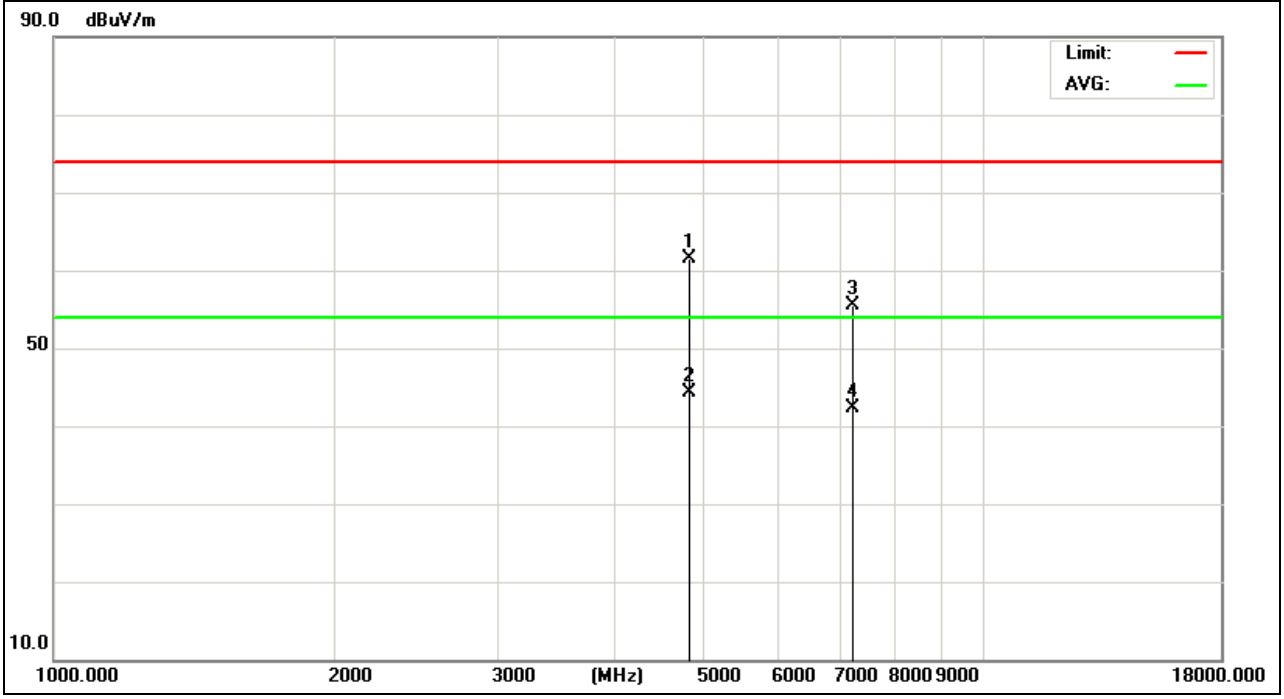
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2402MHz – CH 00(1Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4804.137	64.12	-3.64	60.48	74	-13.52	peak
4804.137	47.03	-3.64	43.39	54	-10.61	AVG
7206.118	55.4	-0.95	54.45	74	-19.55	peak
7206.118	42.29	-0.95	41.34	54	-12.66	AVG

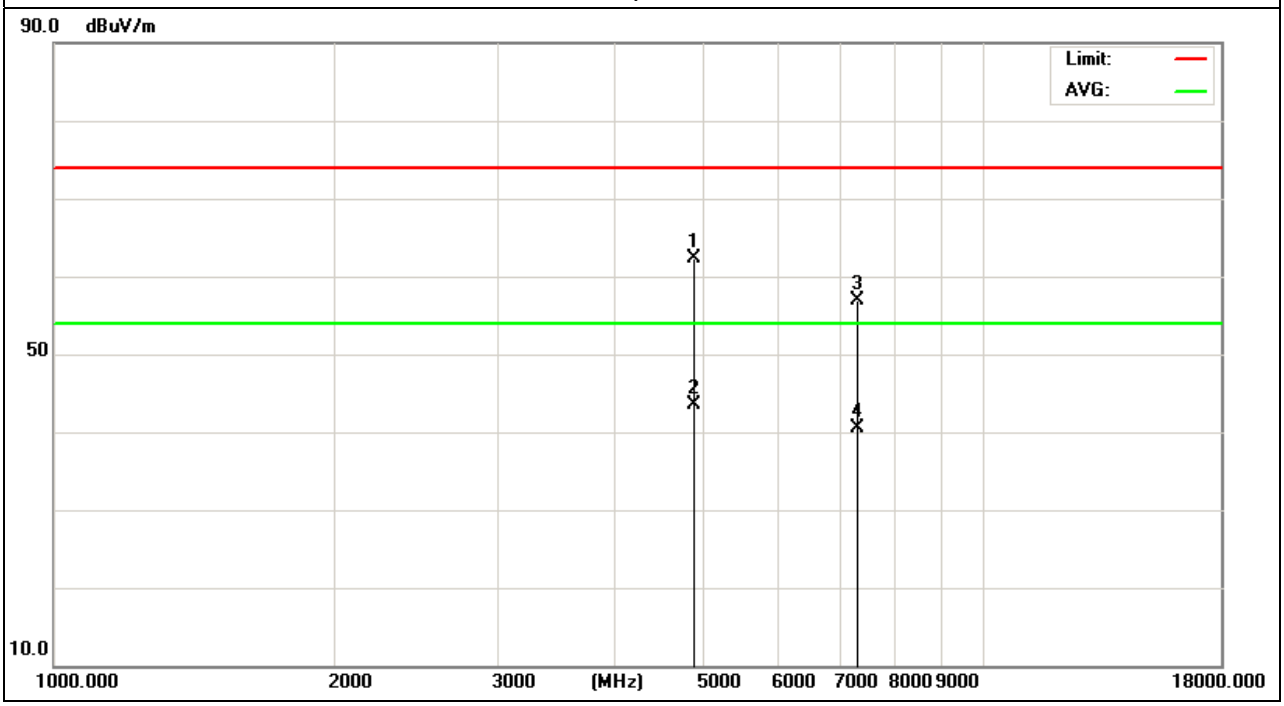
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2441MHz – CH 39(1Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.232	66.31	-3.68	62.63	74	-11.37	peak
4882232	47.45	-3.68	43.77	54	-10.23	AVG
7323.218	57.75	-0.82	56.93	74	-17.07	peak
7323.218	41.38	-0.82	40.56	54	-13.44	AVG

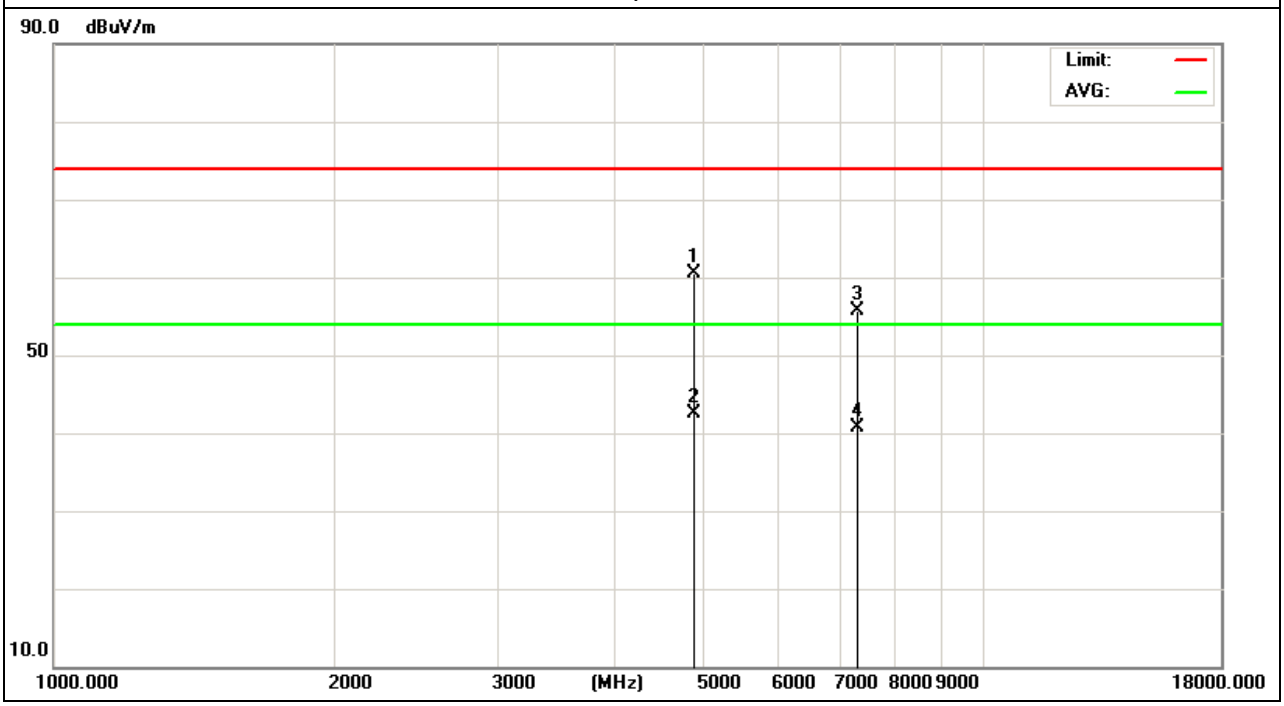
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2441MHz – CH 39(1Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.176	64.34	-3.68	60.66	74	-13.34	peak
4882.176	46.25	-3.68	42.57	54	-11.43	AVG
7323.148	56.65	-0.82	55.83	74	-18.17	peak
7323.148	41.61	-0.82	40.79	54	-13.21	AVG

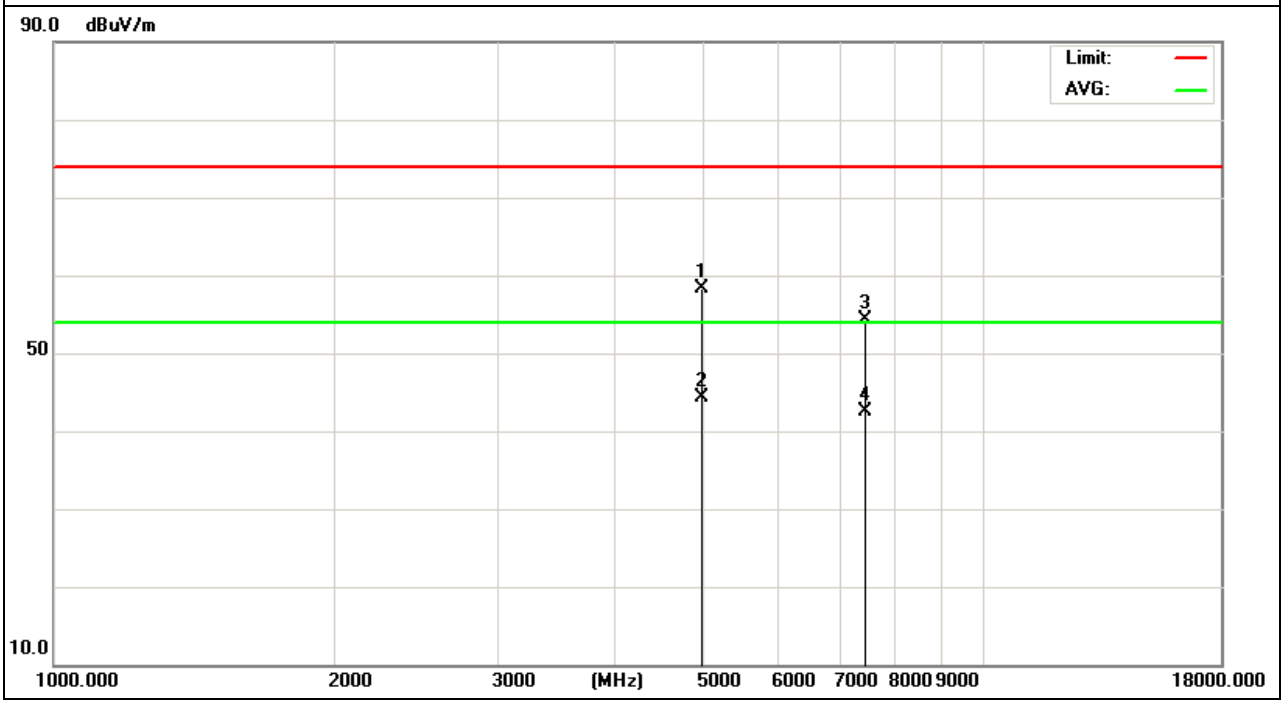
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2480MHz – CH 78(1Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4960.165	62.94	-3.59	59.35	74	-14.65	peak
4960.165	48.87	-3.59	45.28	54	-8.72	AVG
7440.139	56.05	-0.68	55.37	74	-18.63	peak
7440.139	44.14	-0.68	43.46	54	-10.54	AVG

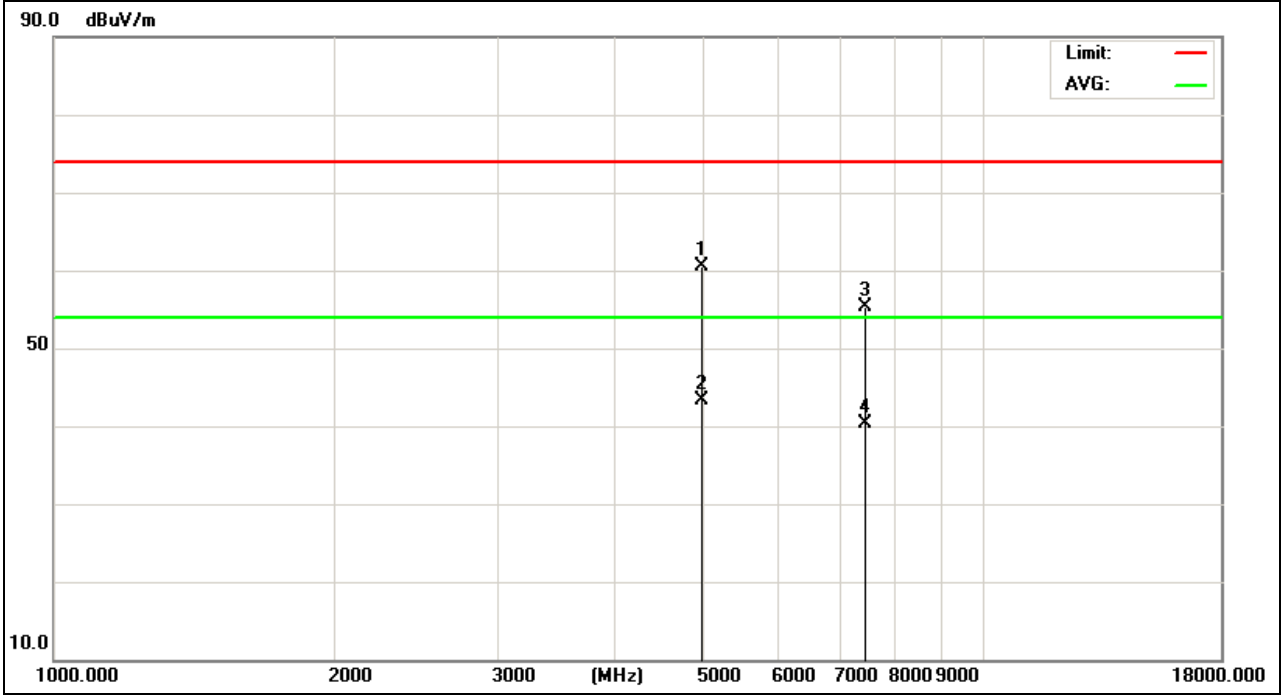
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2480MHz – CH 78(1Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4960.144	64.18	-3.59	60.59	74	-13.41	peak
4960.144	46.99	-3.59	43.4	54	-10.6	AVG
7440.112	55.98	-0.68	55.3	74	-18.7	peak
7440.112	41.11	-0.68	40.43	54	-13.57	AVG

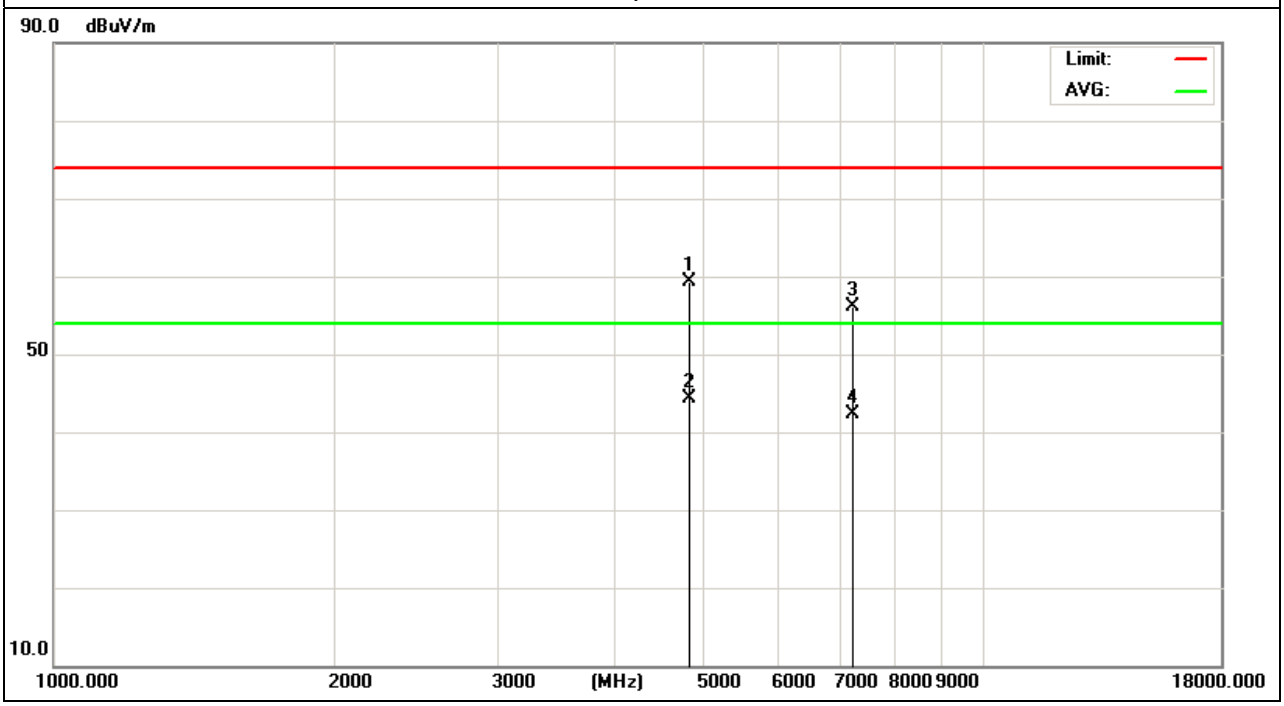
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2402MHz – CH 00(2Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4804.178	62.79	-3.64	59.15	74	14.85	peak
4804.178	48.02	-3.64	44.38	54	9.62	AVG
7206.162	57.04	-0.95	56.09	74	17.91	peak
7206.162	43.25	-0.95	42.3	54	11.7	AVG

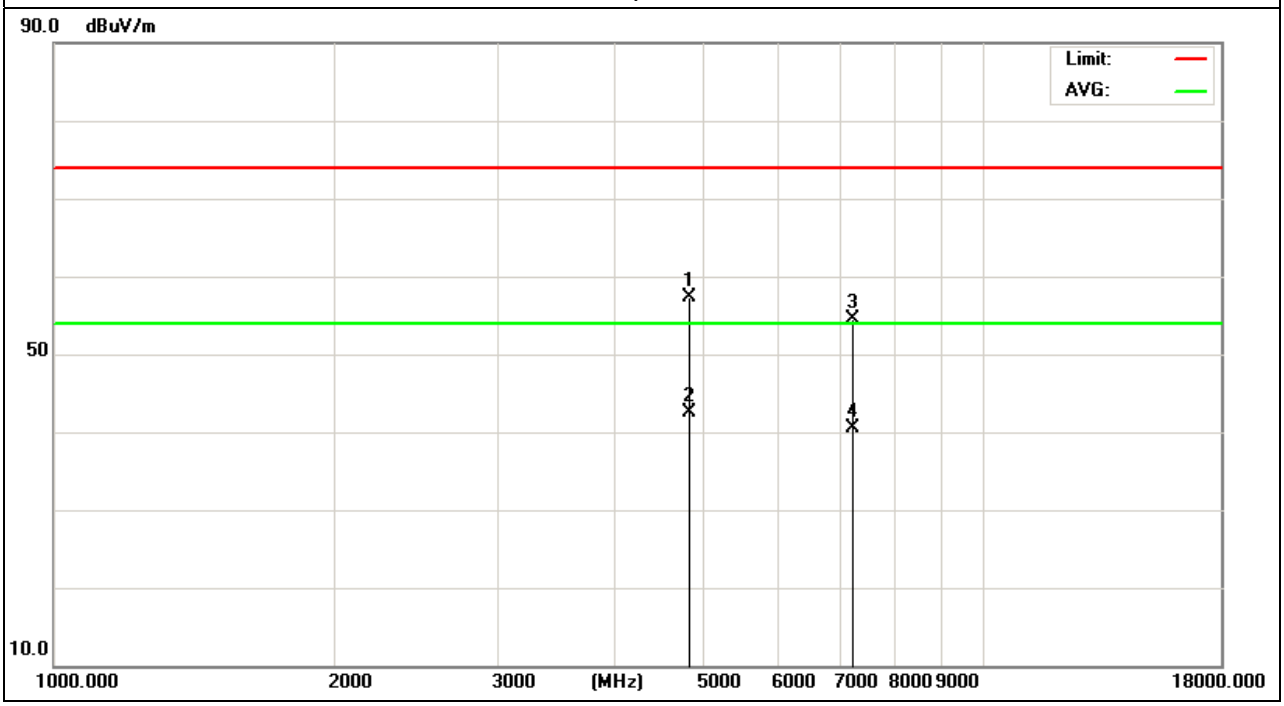
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2402MHz – CH 00(2Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4804.135	61.42	-3.64	57.78	74	-16.22	peak
4804.135	46.53	-3.64	42.89	54	-11.11	AVG
7206.147	55.91	-0.95	54.96	74	-19.04	peak
7206.147	42.02	-0.95	41.07	54	-12.93	AVG

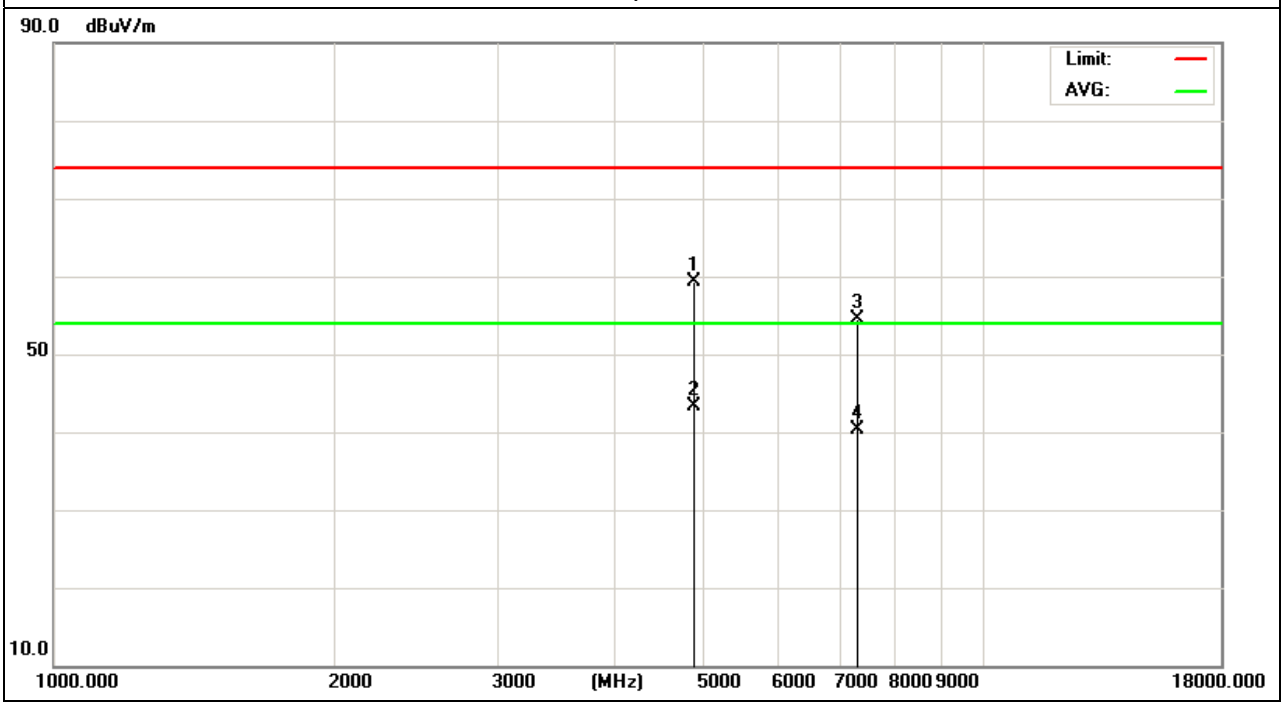
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2441MHz – CH 39(2Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.136	62.79	-3.68	59.11	74	-14.89	peak
4882.136	47.12	-3.68	43.44	54	-10.56	AVG
7323.153	55.17	-0.82	54.35	74	-19.65	peak
7323.153	41.28	-0.82	40.46	54	-13.54	AVG

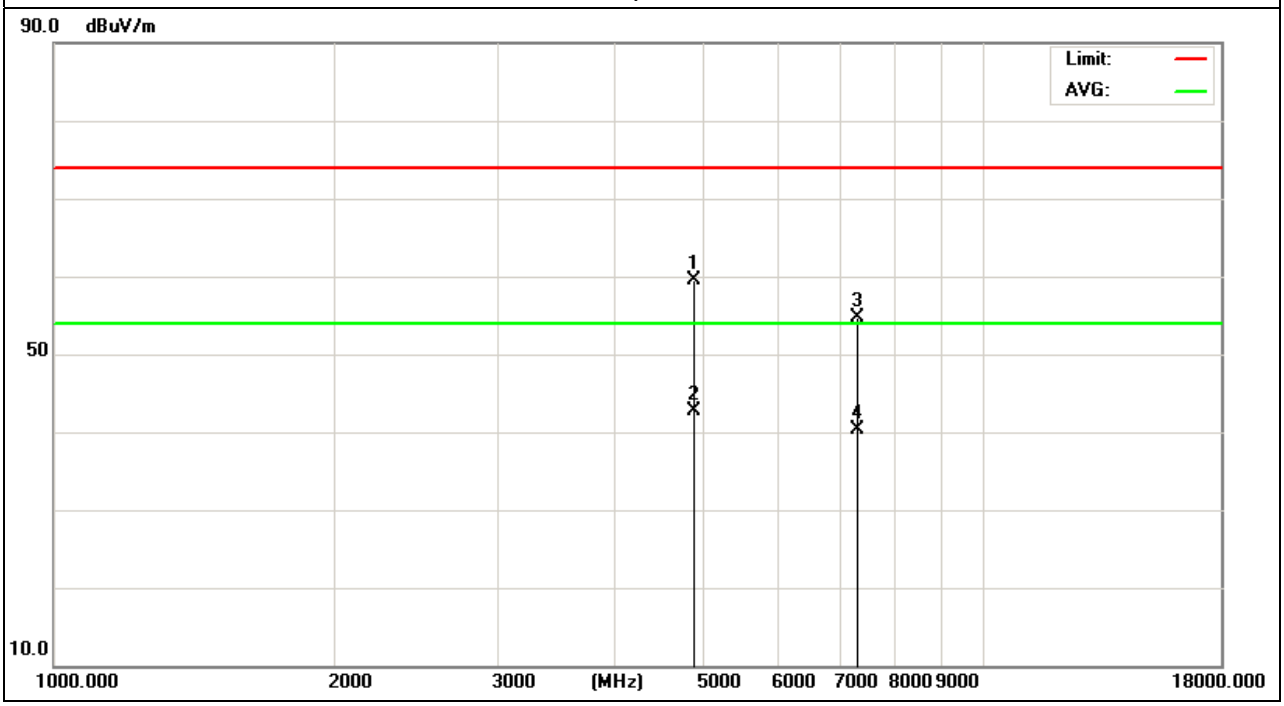
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2441MHz – CH 39(2Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.137	63.26	-3.68	59.58	74	-14.42	peak
4882.137	46.43	-3.68	42.75	54	-11.25	AVG
7323.178	55.63	-0.82	54.81	74	-19.19	peak
7323.178	41.22	-0.82	40.4	54	-13.6	AVG

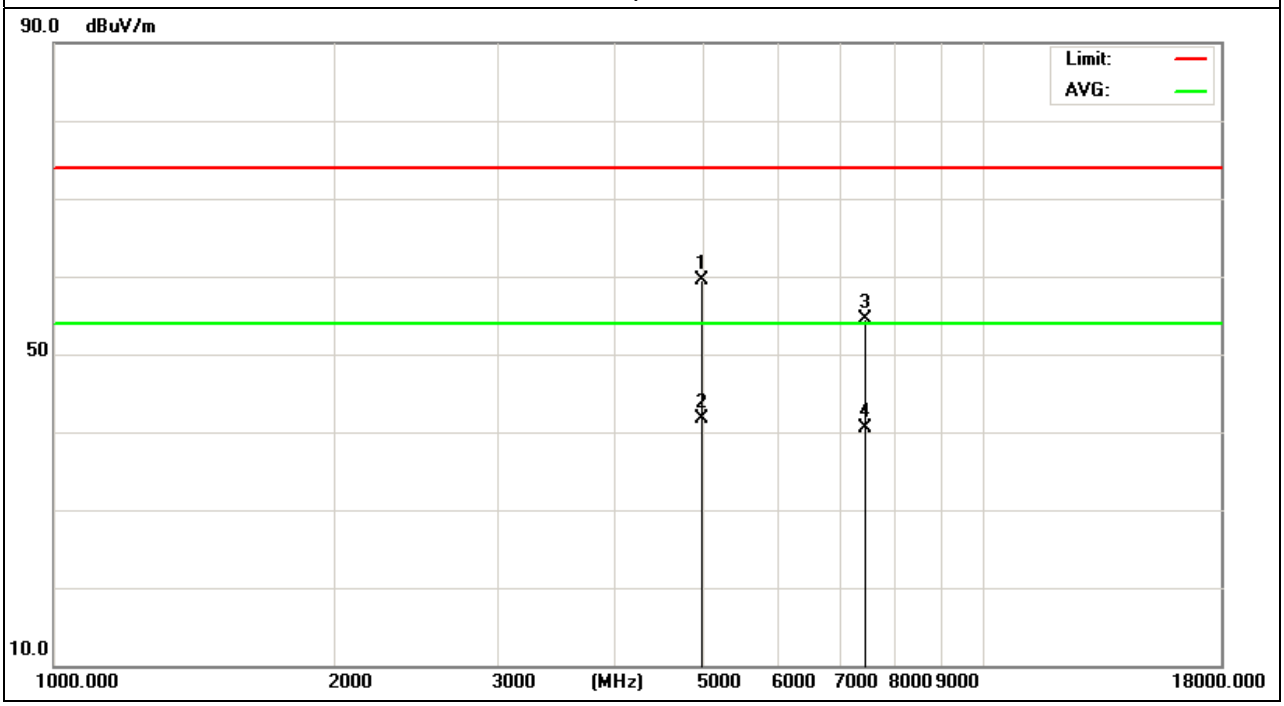
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2480MHz – CH 78(2Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4960.121	63.26	-3.59	59.67	74	-14.33	peak
4960.121	45.34	-3.59	41.75	54	-12.25	AVG
7440.199	55.22	-0.68	54.54	74	-19.46	peak
7440.199	41.36	-0.68	40.68	54	-13.32	AVG

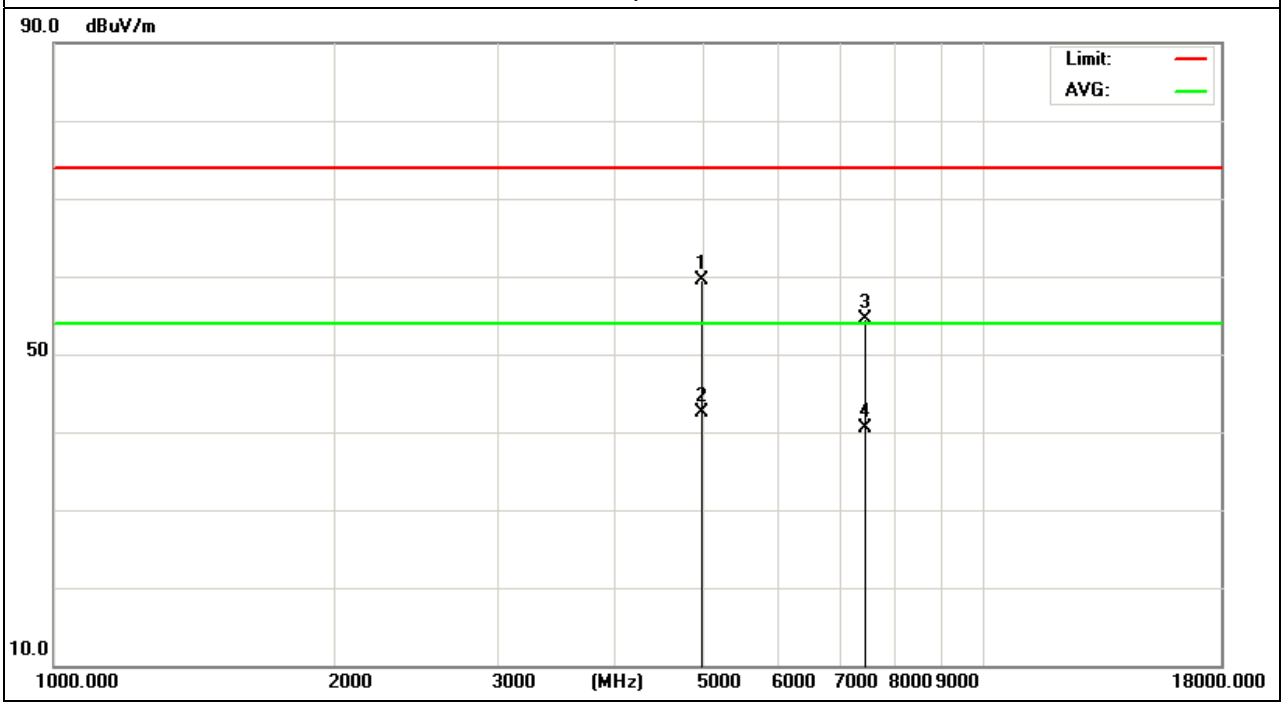
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2480MHz – CH 78(2Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4960.124	63.31	-3.59	59.72	74	-14.28	peak
4960.124	46.42	-3.59	42.83	54	-11.17	AVG
7440.228	55.65	-0.68	54.97	74	-19.03	peak
7440.228	41.57	-0.68	40.89	54	-13.11	AVG

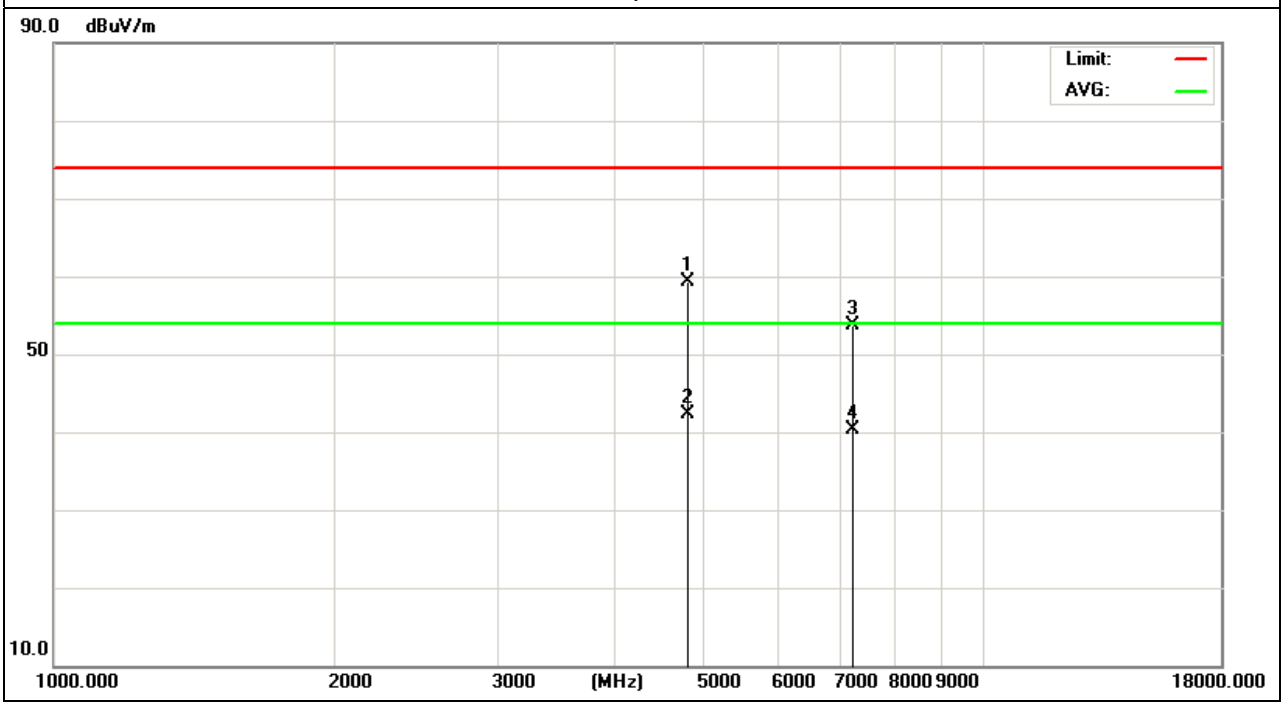
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2402MHz – CH00 (3Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4804.109	62.72	-3.64	59.08	74	-14.92	peak
4804.109	45.08	-3.64	41.44	54	-12.56	AVG
7206.118	54.37	-0.95	53.42	74	-20.58	peak
7206.118	41.12	-0.95	40.17	54	-13.83	AVG

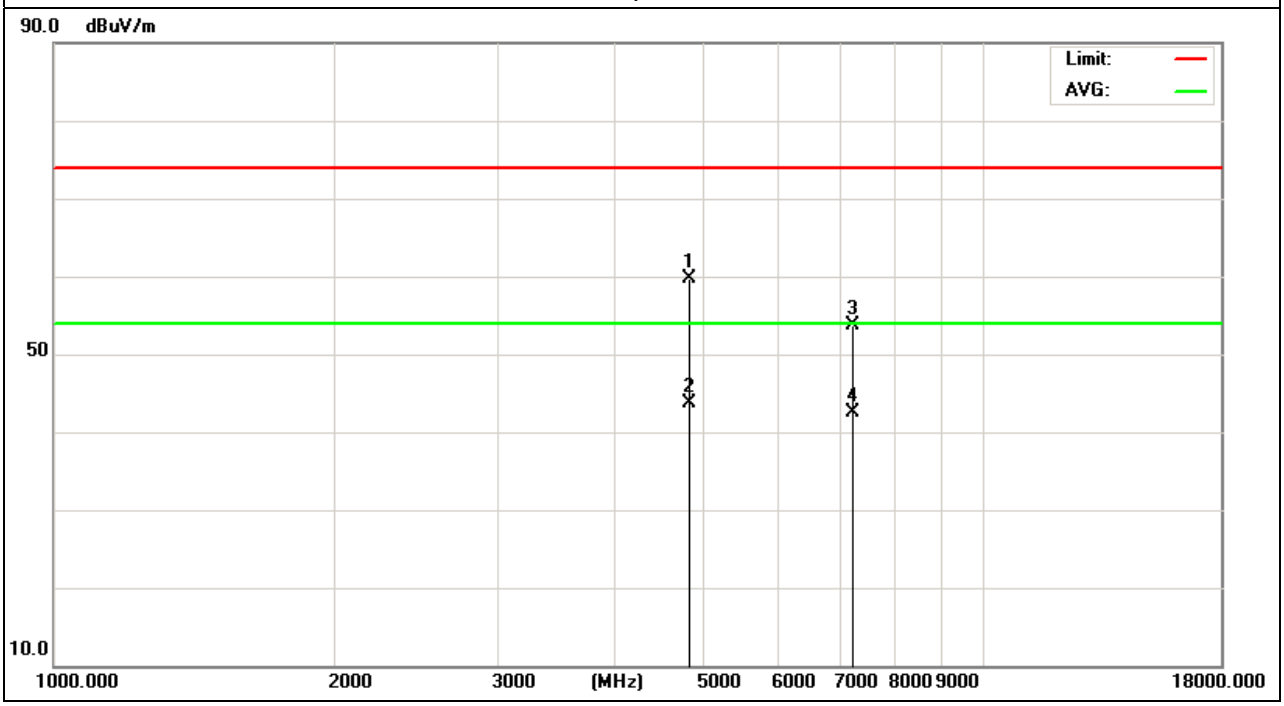
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2402MHz – CH00 (3Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4804.105	63.43	-3.64	59.79	74	-14.21	peak
4804.105	47.29	-3.64	43.65	54	-10.35	AVG
7206.101	54.66	-0.95	53.71	74	-20.29	peak
7206.101	43.45	-0.95	42.5	54	-11.5	AVG

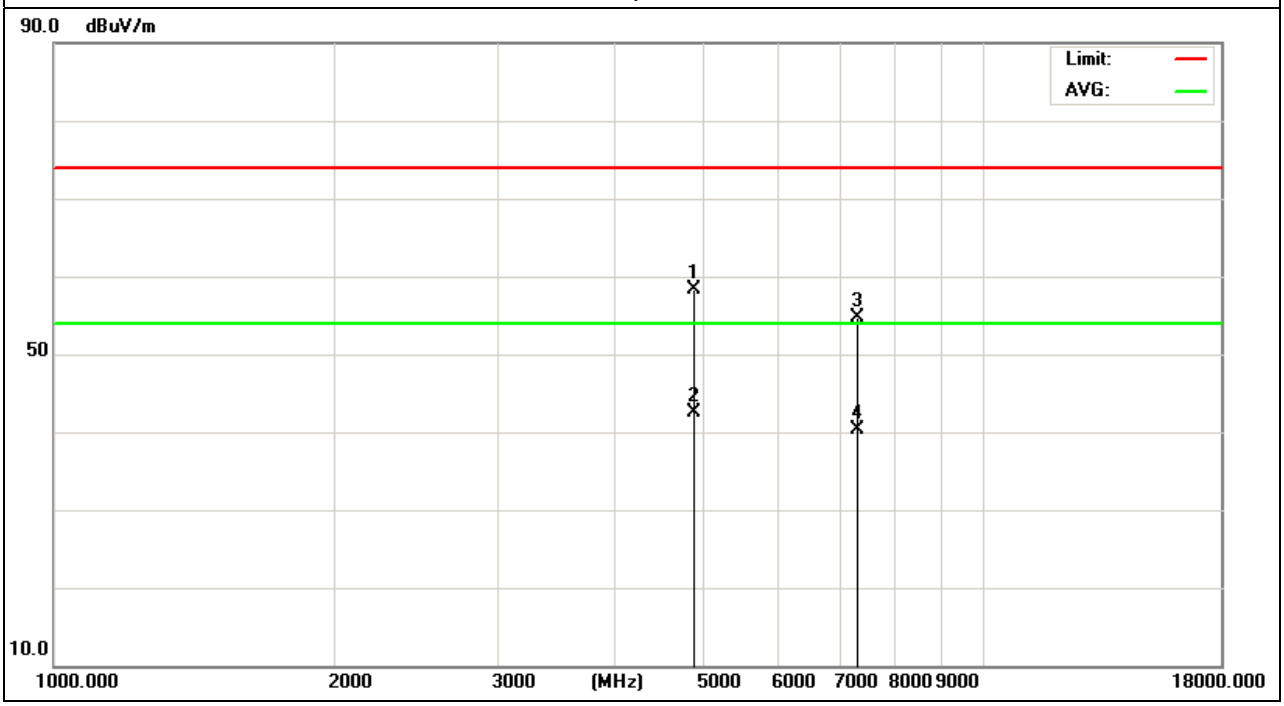
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2441MHz – CH39(3Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.126	62.27	-3.68	58.59	74	-15.41	peak
4882.126	46.29	-3.68	42.61	54	-11.39	AVG
7323.157	55.64	-0.82	54.82	74	-19.18	peak
7323.157	41.37	-0.82	40.55	54	-13.45	AVG

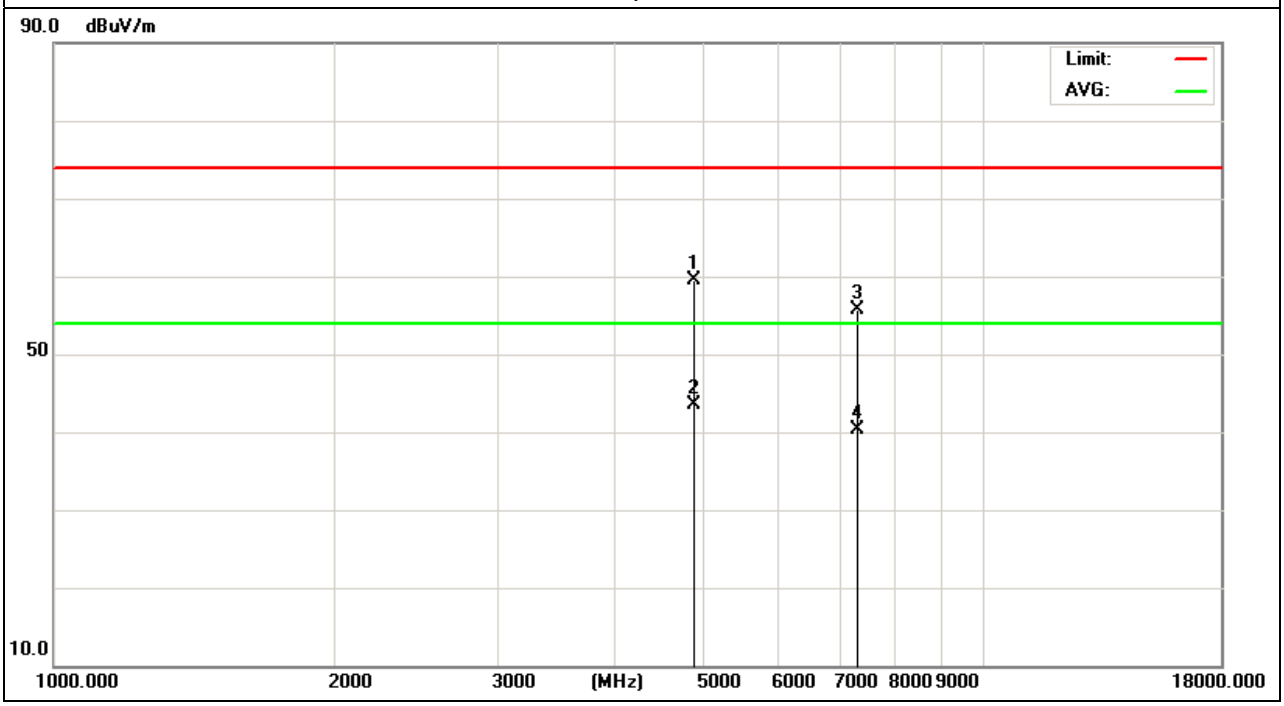
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2441MHz – CH39 (3Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.176	63.18	-3.68	59.5	74	-14.5	peak
4882.176	47.18	-3.68	43.5	54	-10.5	AVG
7323.152	56.61	-0.82	55.79	74	-18.21	peak
7323.152	41.15	-0.82	40.33	54	-13.67	AVG

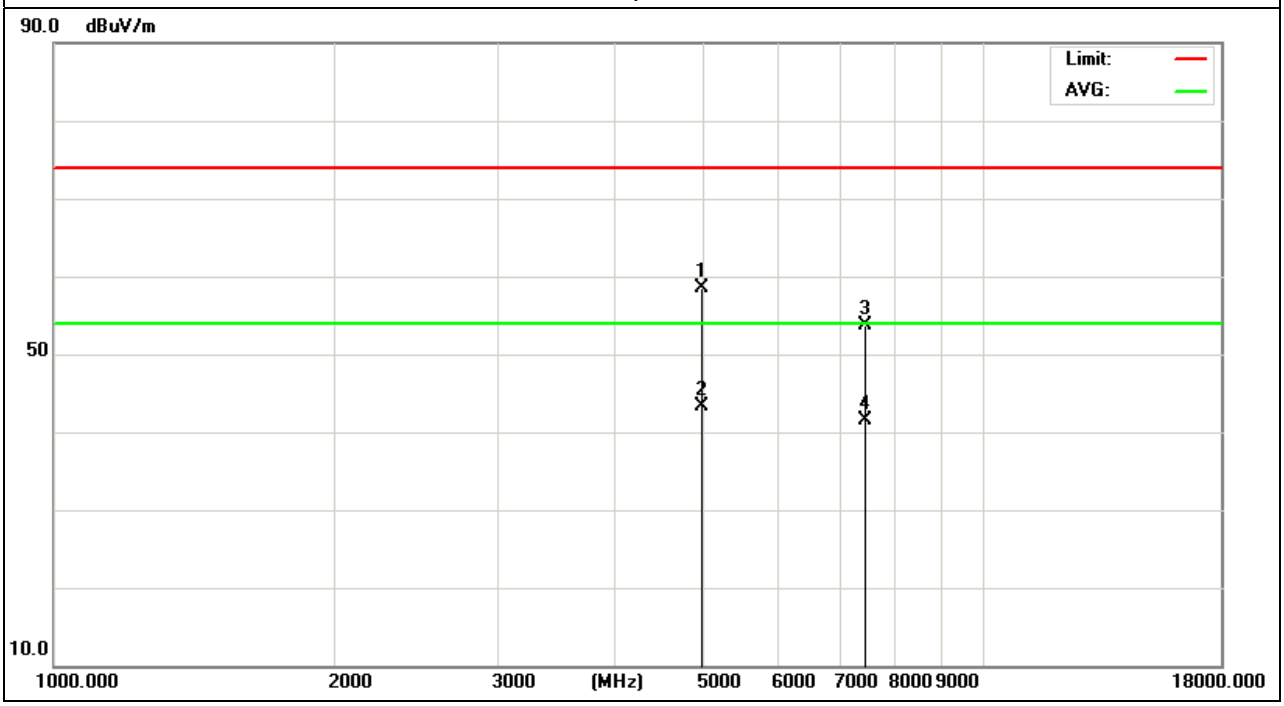
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2480MHz – CH78 (3Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4960.156	62.29	-3.59	58.7	74	-15.3	peak
4960.156	47.18	-3.59	43.59	54	-10.41	AVG
7440.149	54.66	-0.68	53.98	74	-20.02	peak
7440.149	42.44	-0.68	41.76	54	-12.24	AVG

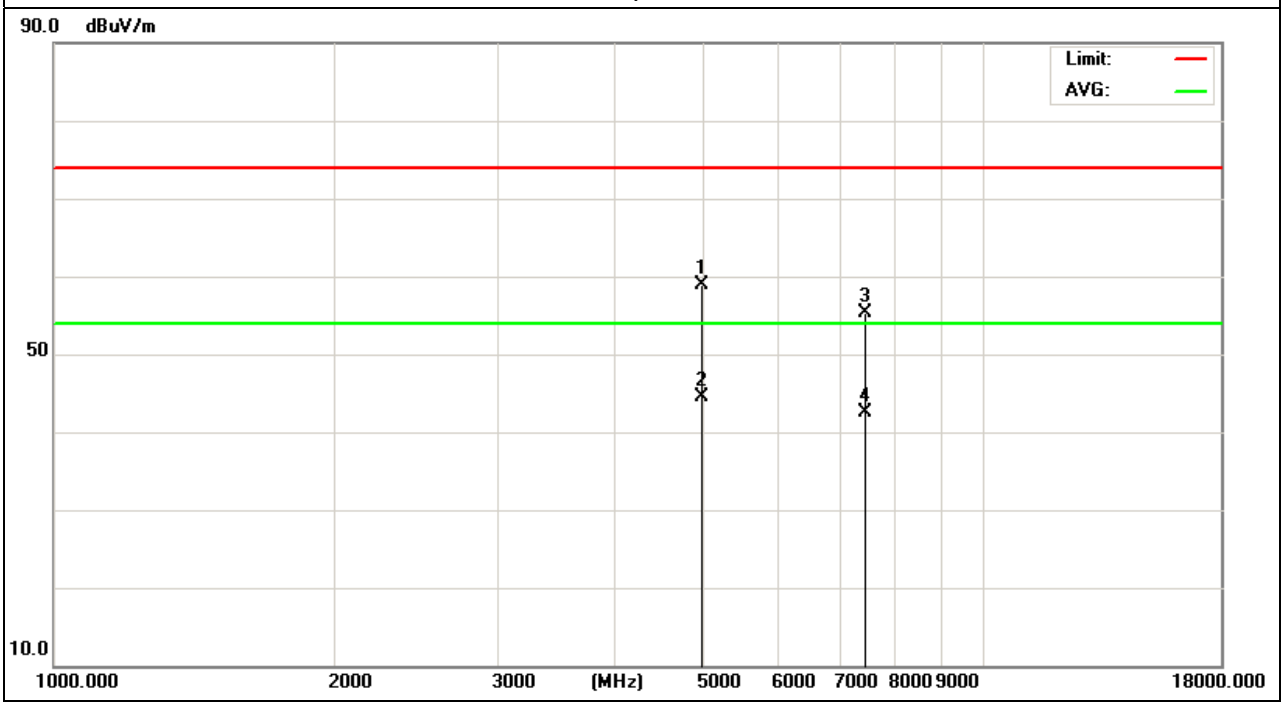
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX 2480MHz – CH78 (3Mbps)	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4960.153	62.35	-3.59	58.76	74	-15.24	peak
4960.153	47.74	-3.59	44.15	54	-9.85	AVG
7440.195	55.75	-0.68	55.07	74	-18.93	peak
7440.195	42.96	-0.68	42.28	54	-11.72	AVG

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

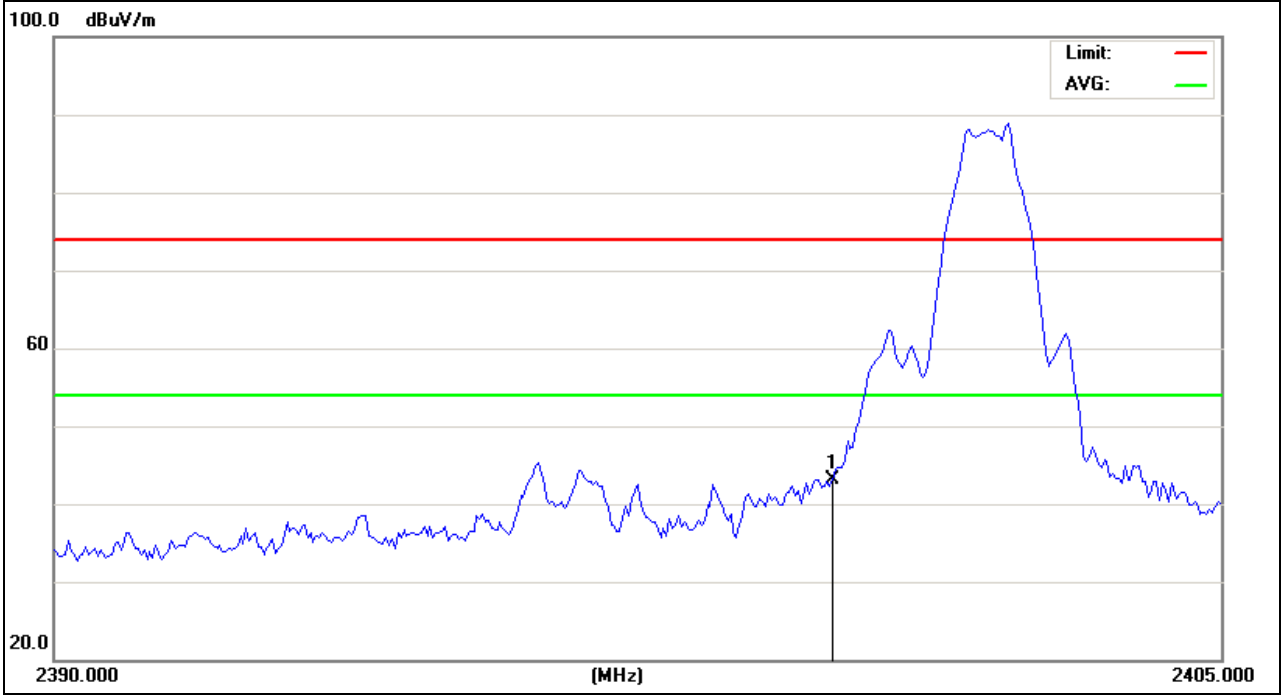


3.2.9 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2402MHz-1Mbps	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	83.5	-40.5	43	74	-31	peak

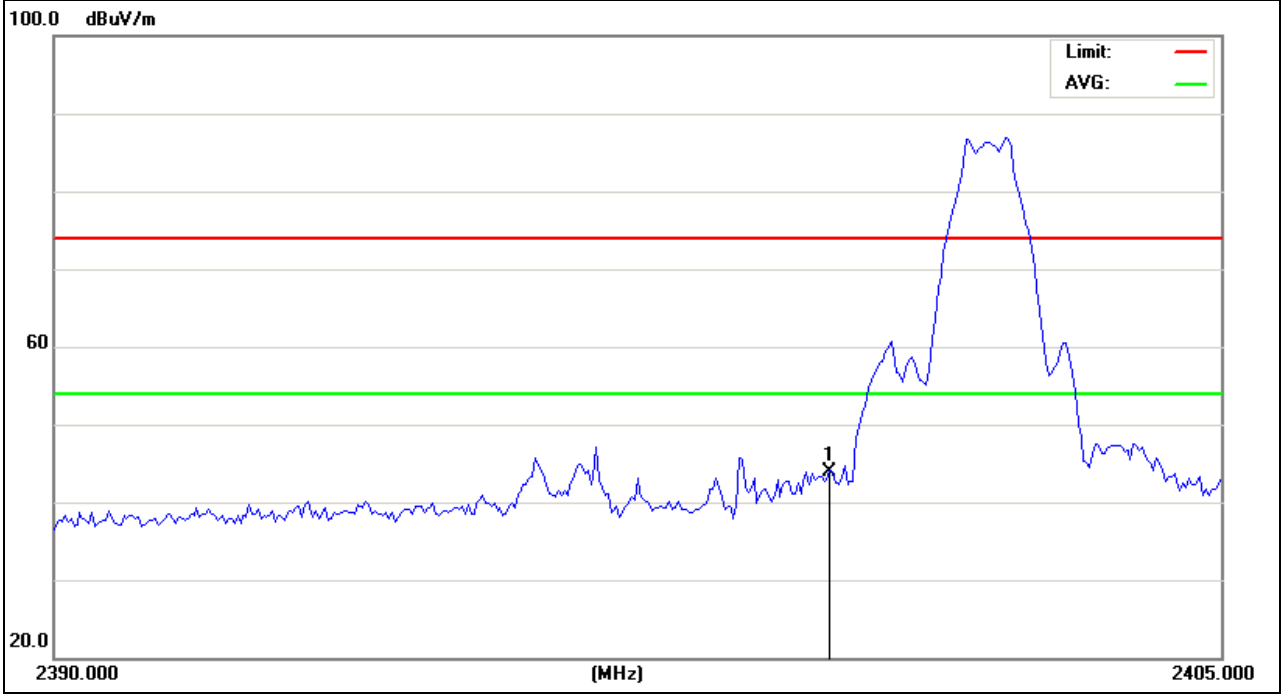
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2402MHz-1Mbps	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	83.2	-40.5	42.7	74	-31.3	peak

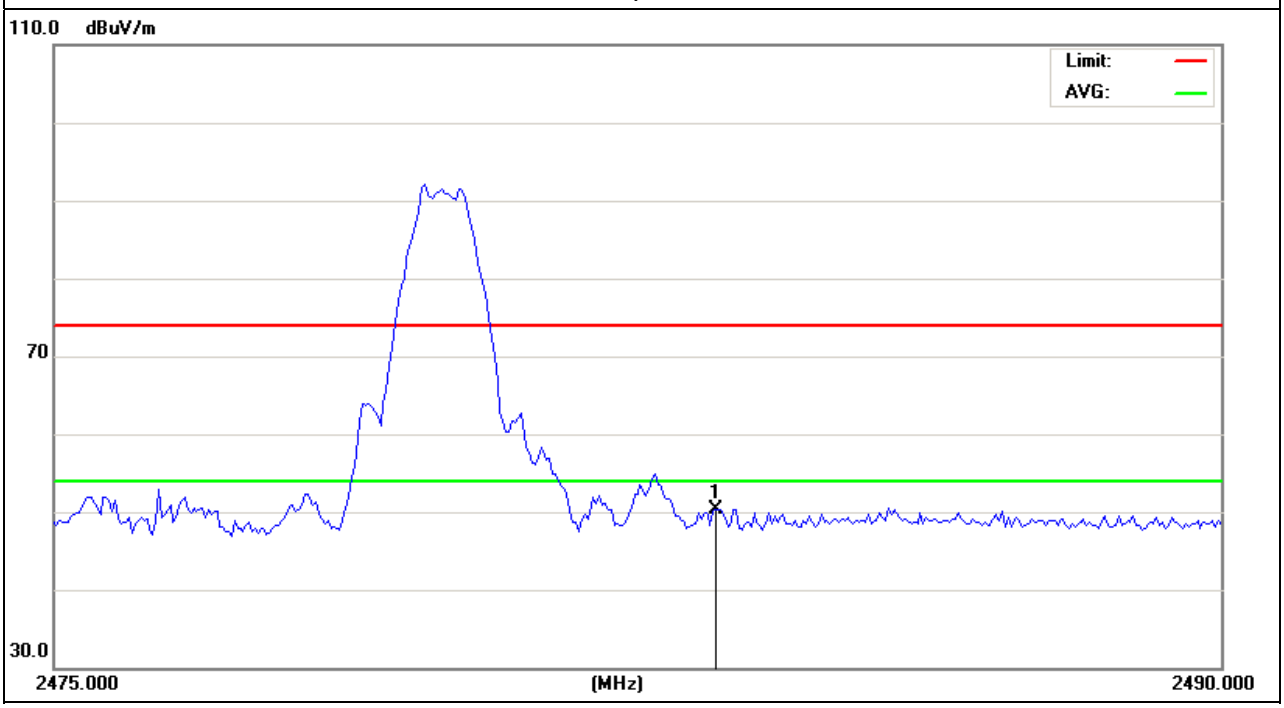
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2480MHz-1Mbps	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	90.25	-40.43	49.82	74	-24.18	peak

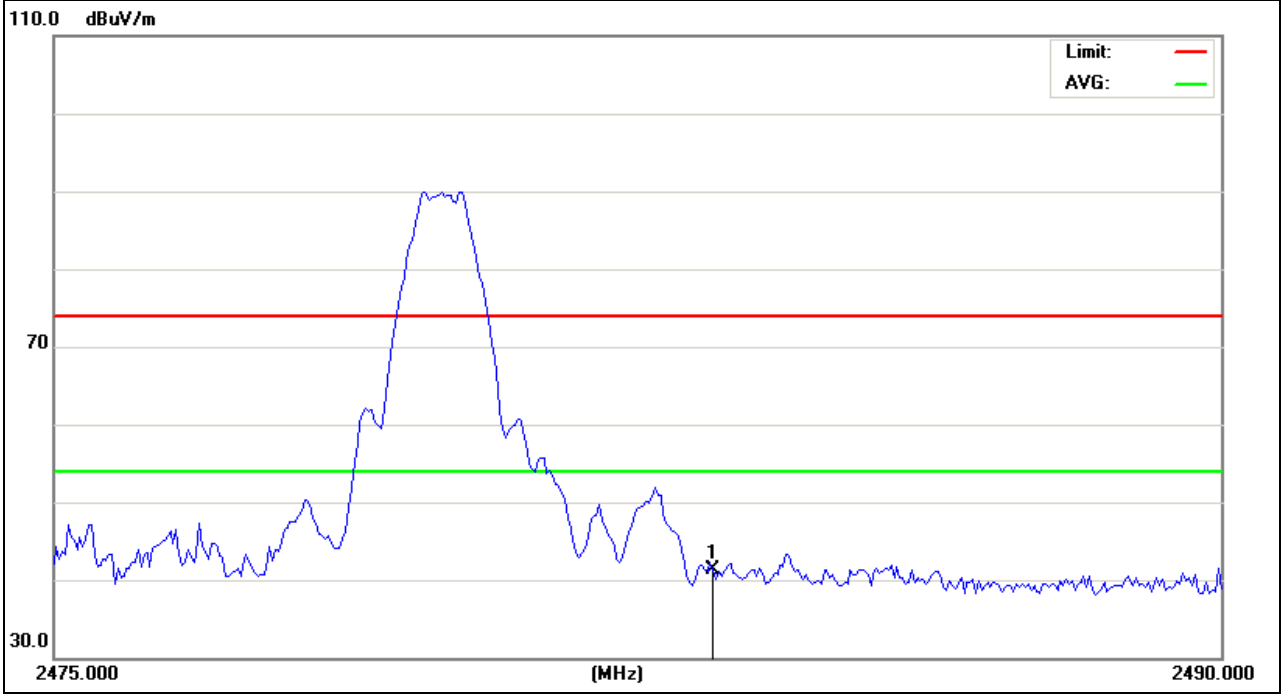
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2480MHz-1Mbps	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	81.23	-40.43	40.8	74	-33.2	peak

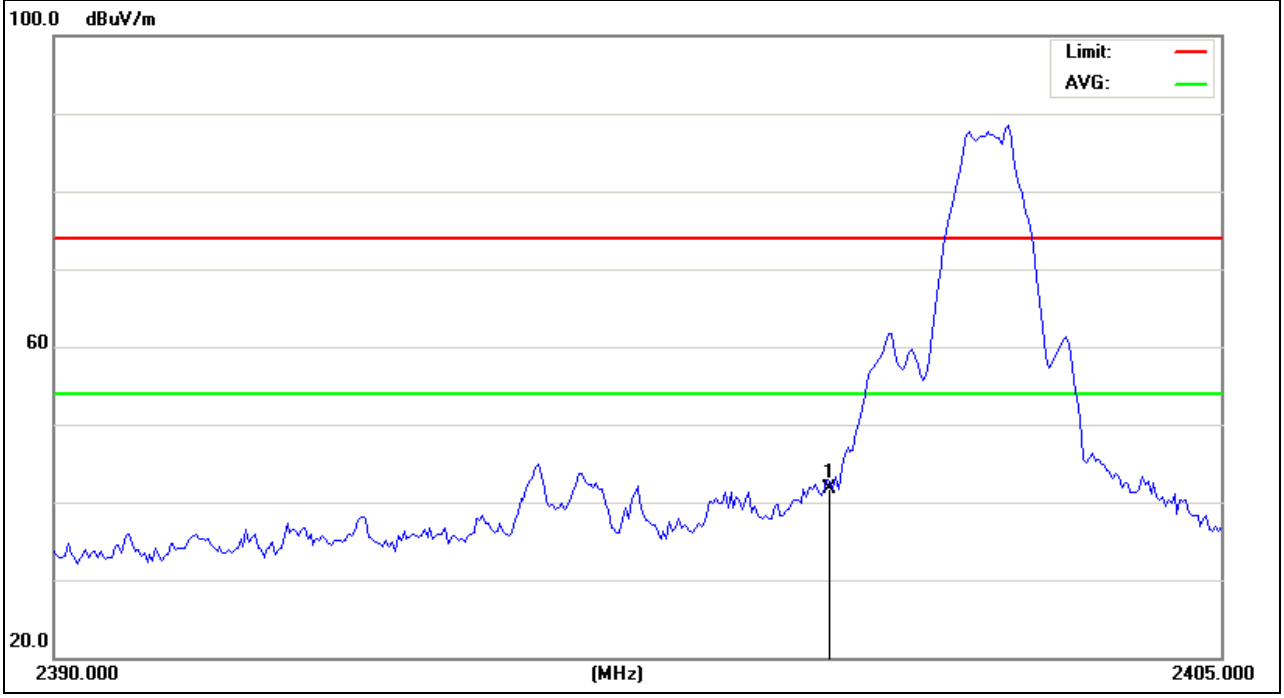
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2402MHz-2Mbps	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	82.8	-40.5	42.3	74	-31.7	peak

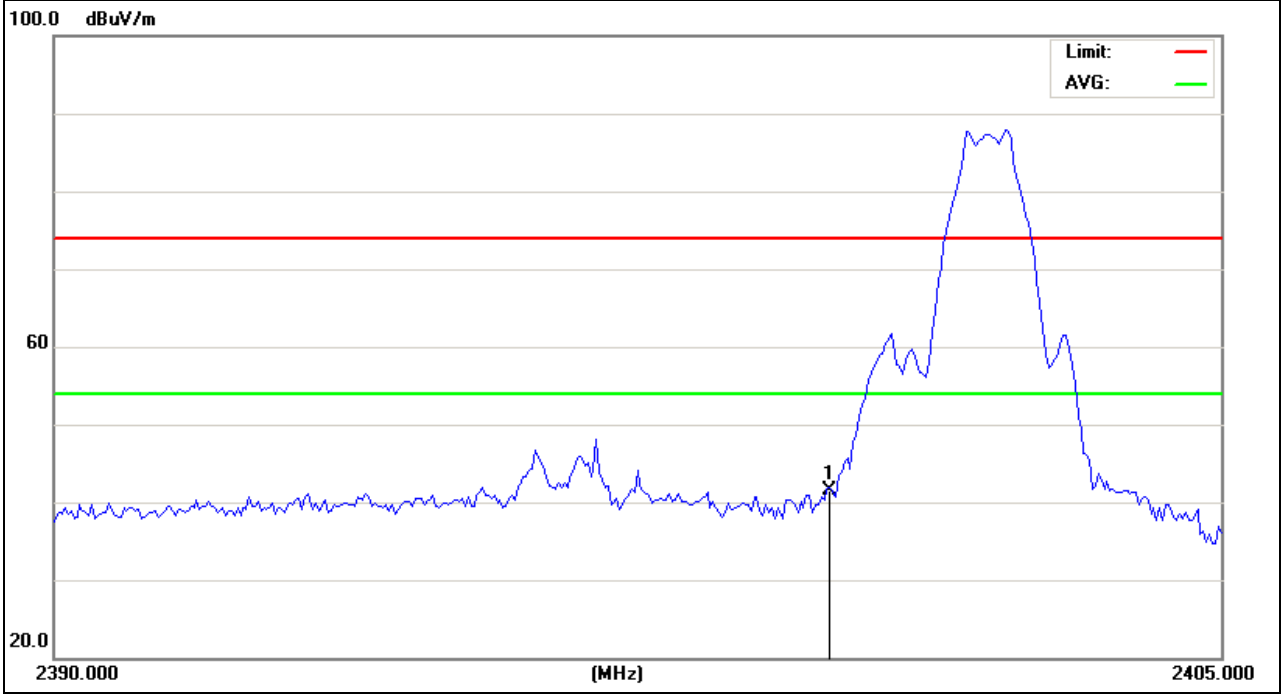
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2402MHz-2Mbps	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	81.5	-40.5	41	74	-33	peak

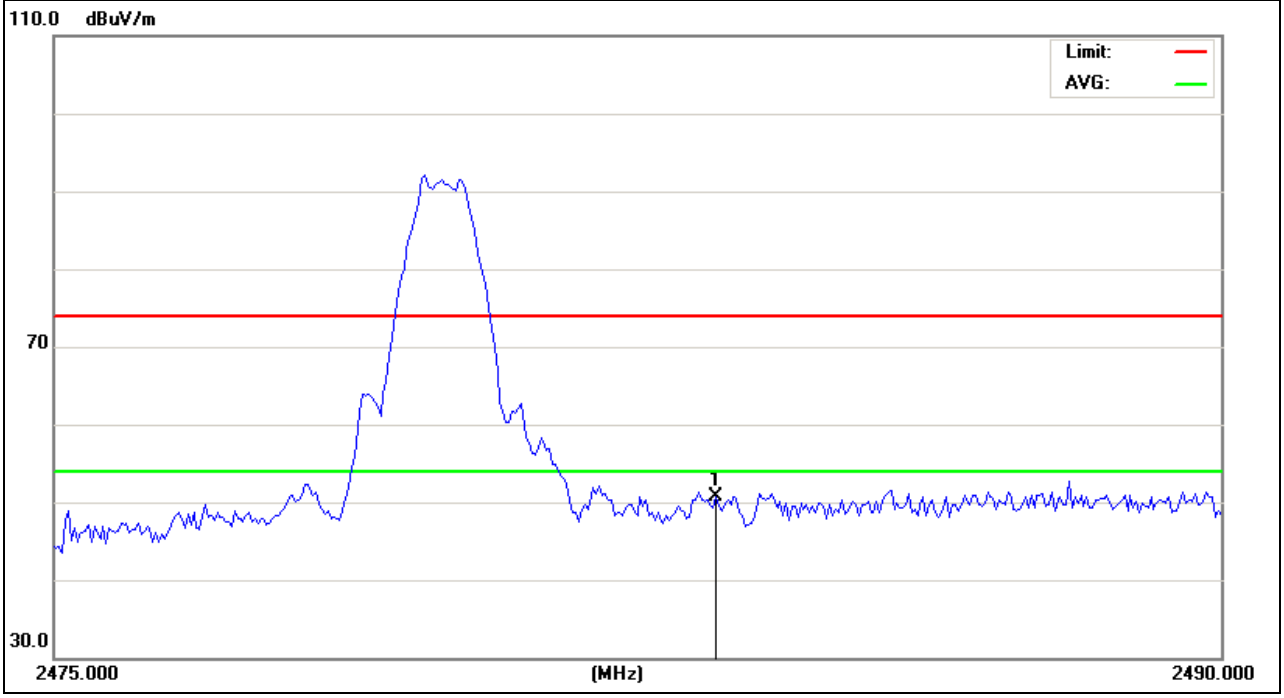
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2480MHz-2Mbps	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	89.14	-40.43	48.71	74	-25.29	peak

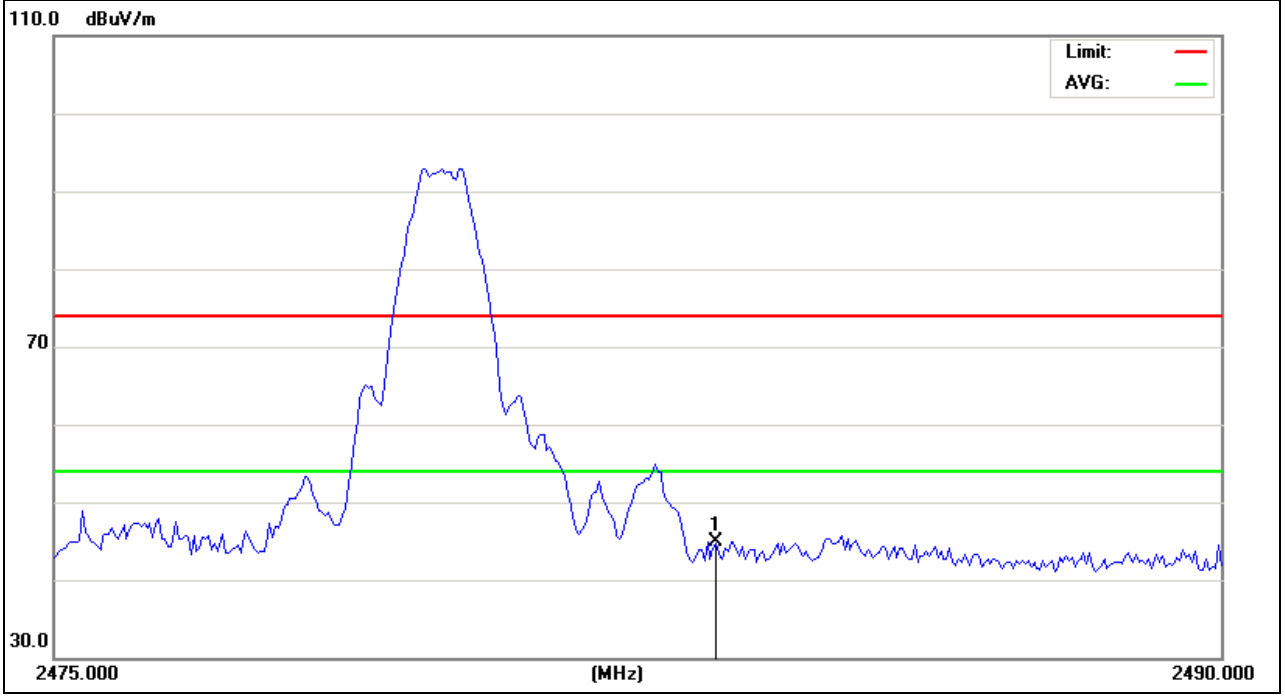
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2480MHz-2Mbps	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	86.24	-40.43	45.81	74	-28.19	peak

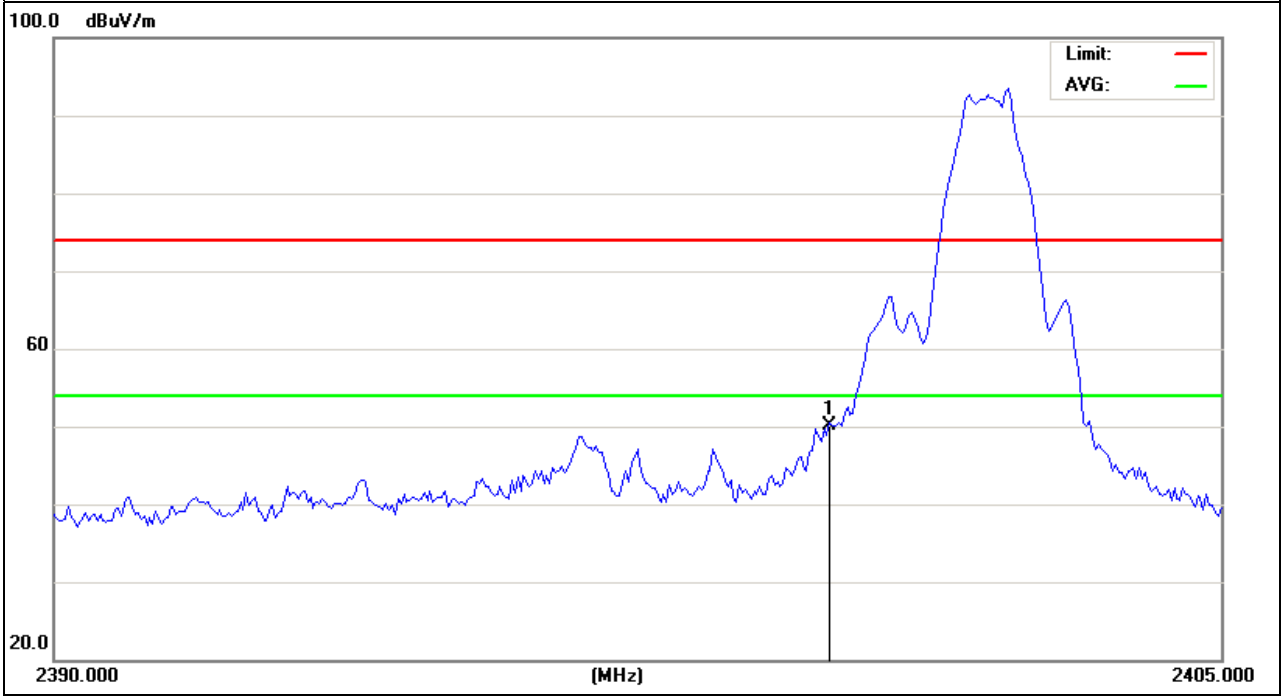
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2402MHz-3Mbps	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	90.8	-40.5	50.3	74	-23.7	peak

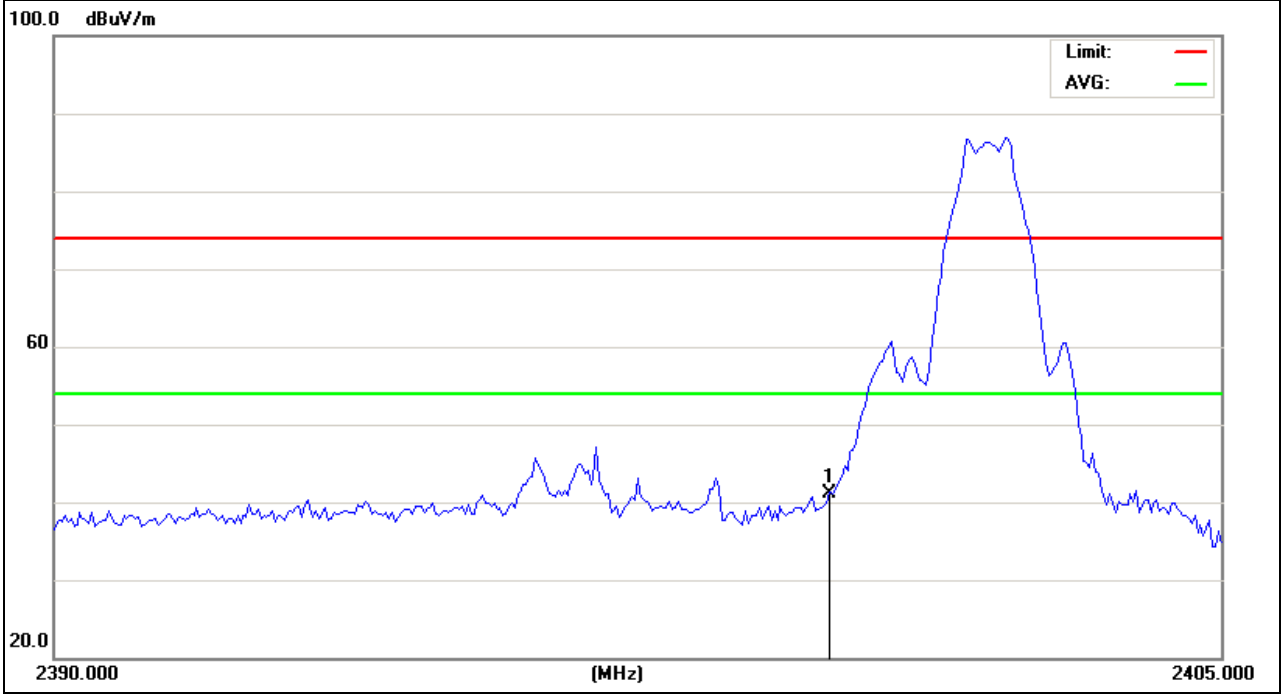
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2402MHz-3Mbps	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	80.6	-40.5	40.1	74	-33.9	peak

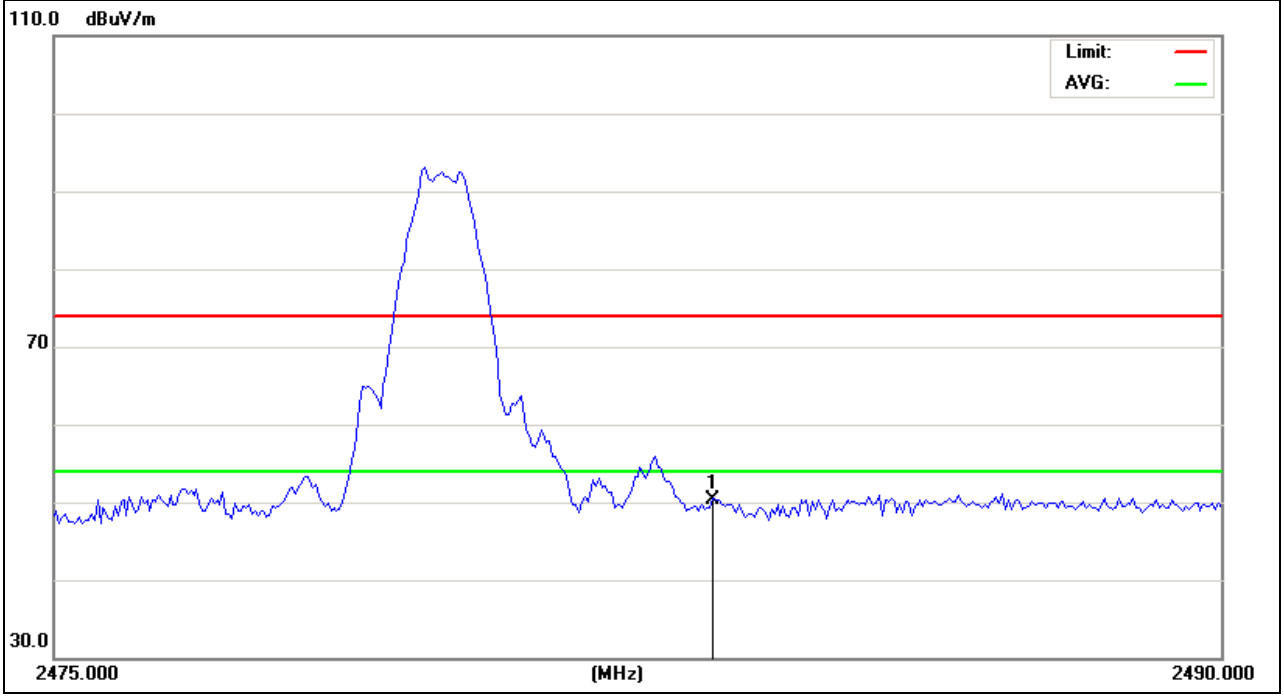
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2480MHz-3Mbps	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	90.23	-40.43	49.8	74	-24.2	peak

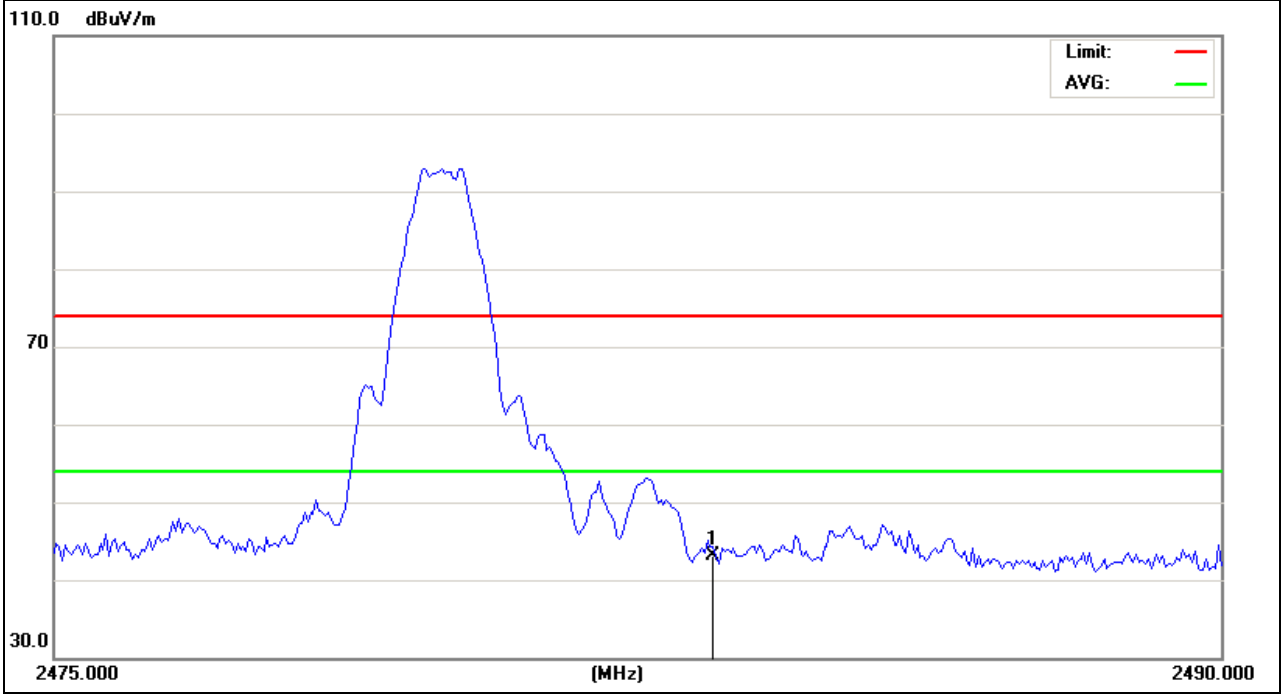
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	TX /2480MHz-3Mbps	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	83.13	-40.43	42.7	74	-31.3	peak

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



NOTE: Hopping enabled and disabled have evaluated,and the worrest data (disabled)was reported

4. NUMBER OF HOPPING CHANNEL

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

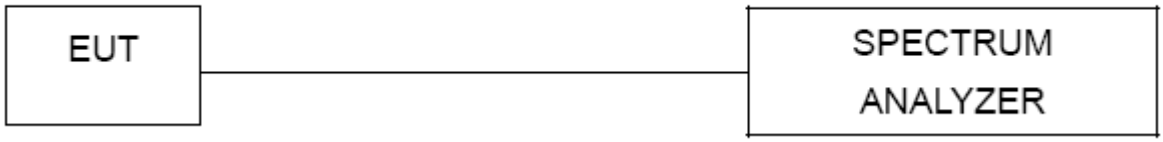
4.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



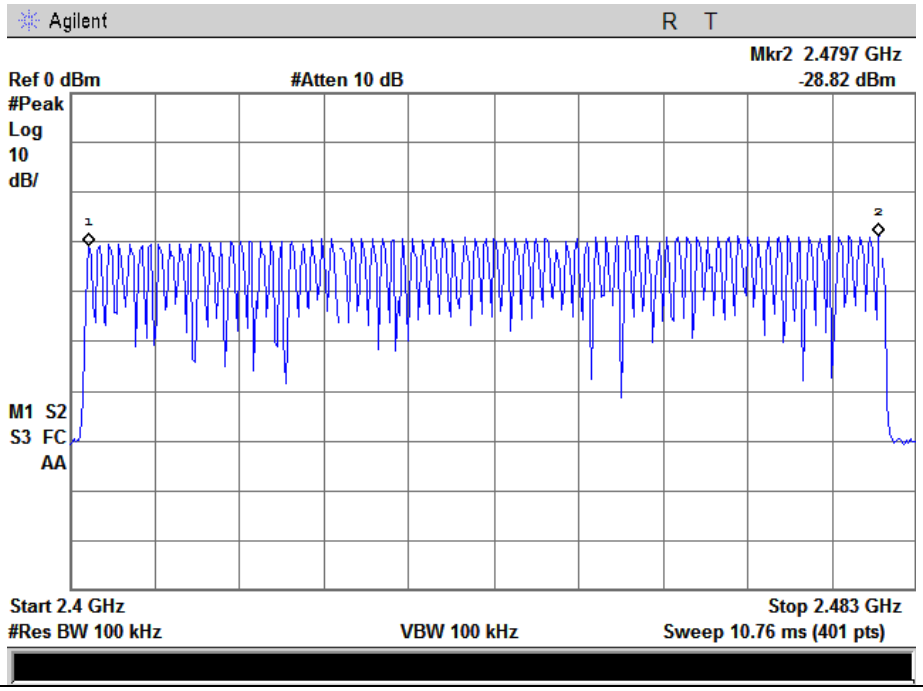
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 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：	26 ℃	Relative Humidity：	54%
Pressure：	1015 hPa	Test Voltage ：	DC3.7V
Test Mode ：	Hopping Mode		

Number of Hopping Channel	79



5. AVERAGE TIME OF OCCUPANCY

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
i. A Period Time = (channel number)*0.4
DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

5.1.4 EUT OPERATION CONDITIONS

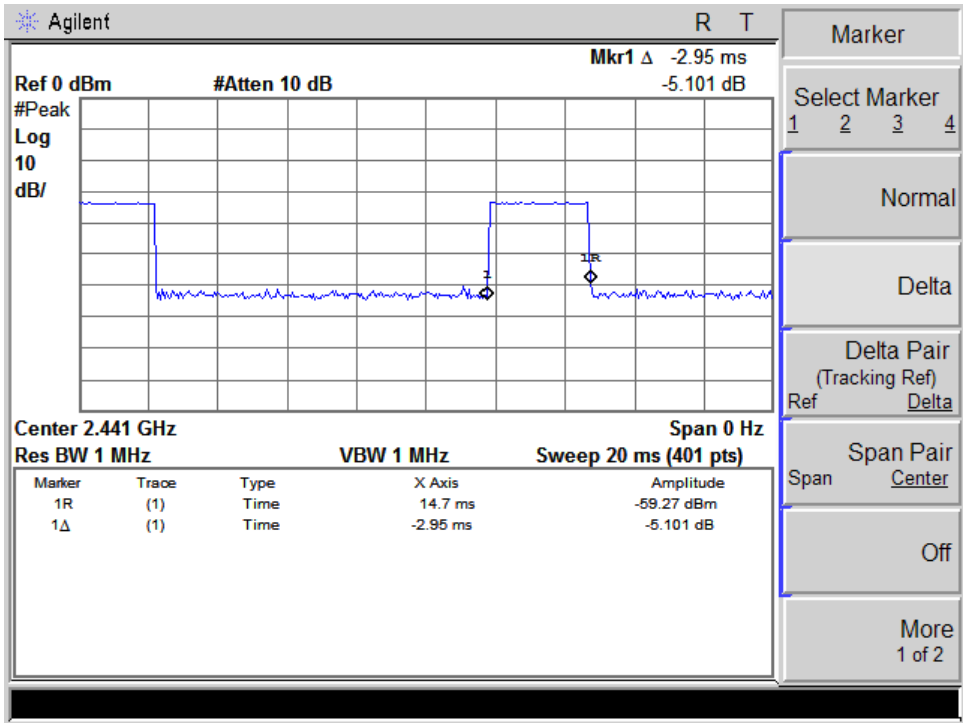
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

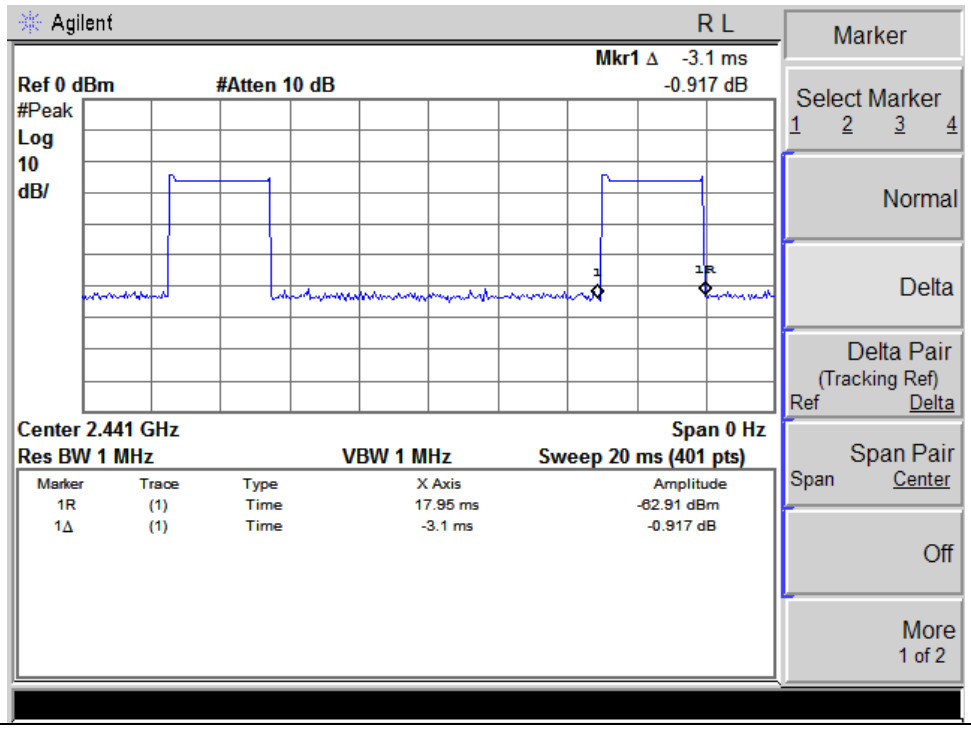
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39-DH5 ,2DH5,3DH5		

Data Packet	Frequency	Pulse Duration(ms)	Dwell Time(s)	Limits(s)
DH5	2441MHz	2.95	0.31	0.4
2DH5	2441MHz	3.10	0.33	0.4
3DH5	2441MHz	3.15	0.34	0.4

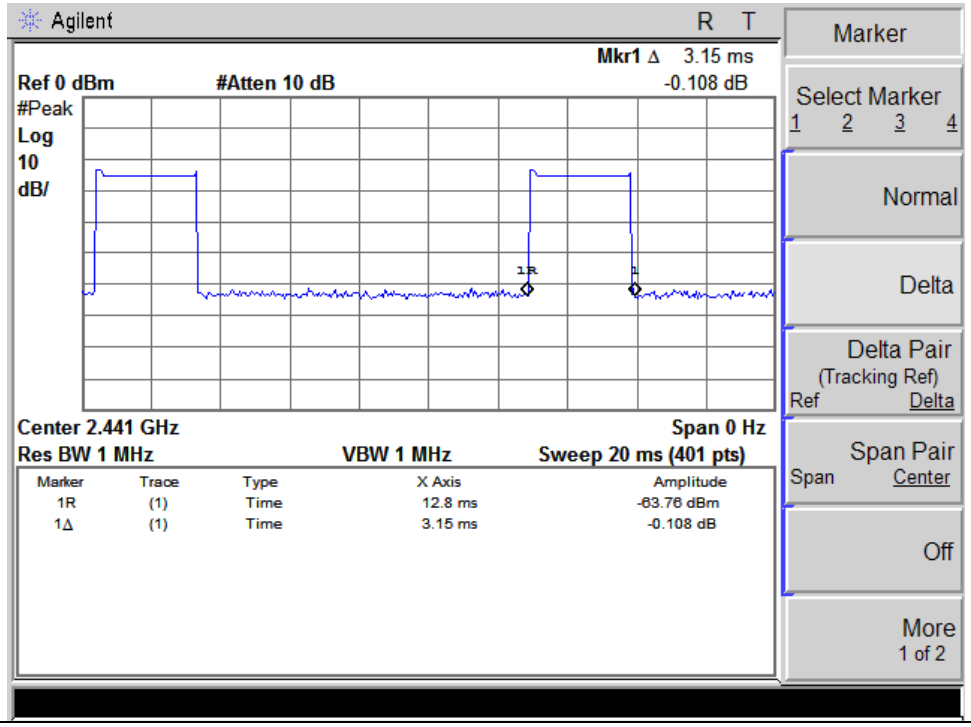
CH39-DH5



CH39-2DH5



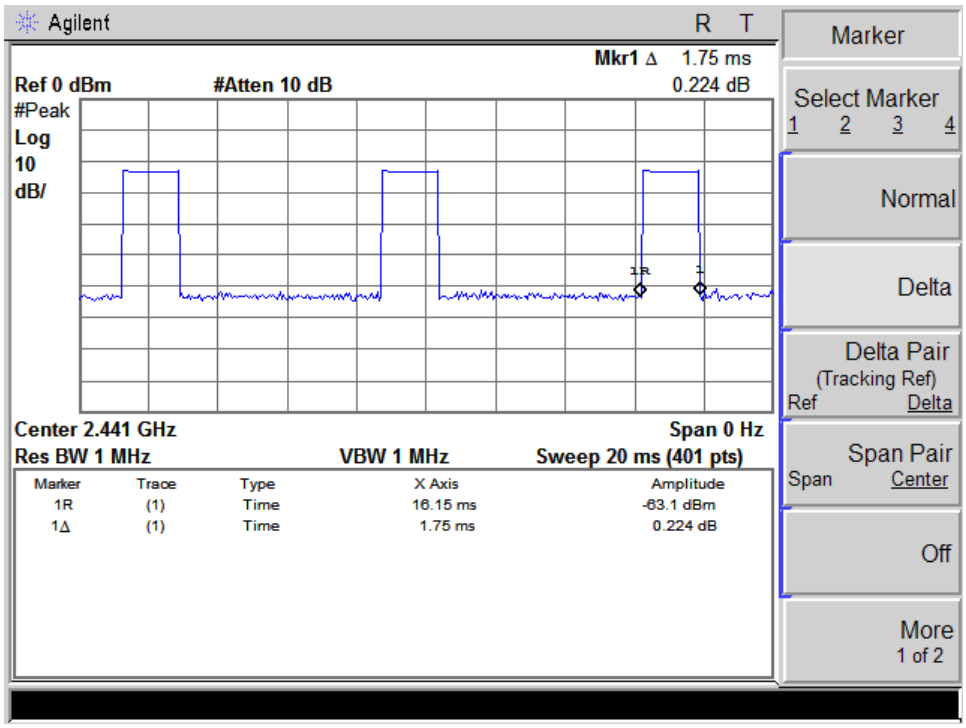
CH39-3DH5



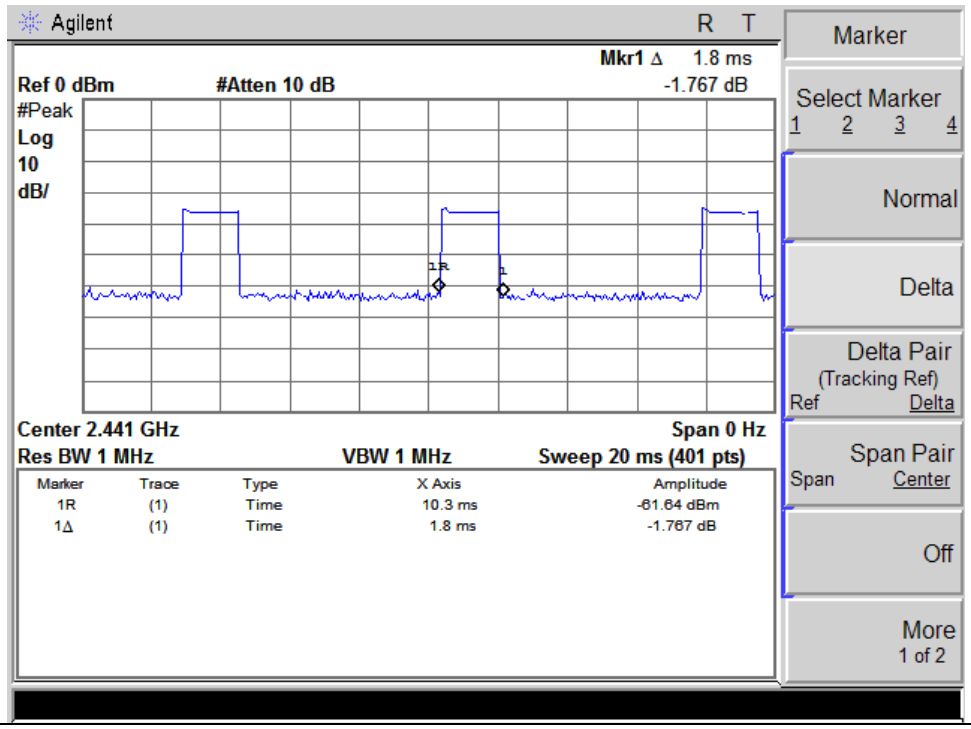
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39-DH3,2DH3,3DH3		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH3	2441 MHz	1.75	0.28	0.4
2DH3	2441 MHz	1.80	0.29	0.4
3DH3	2441 MHz	1.80	0.29	0.4

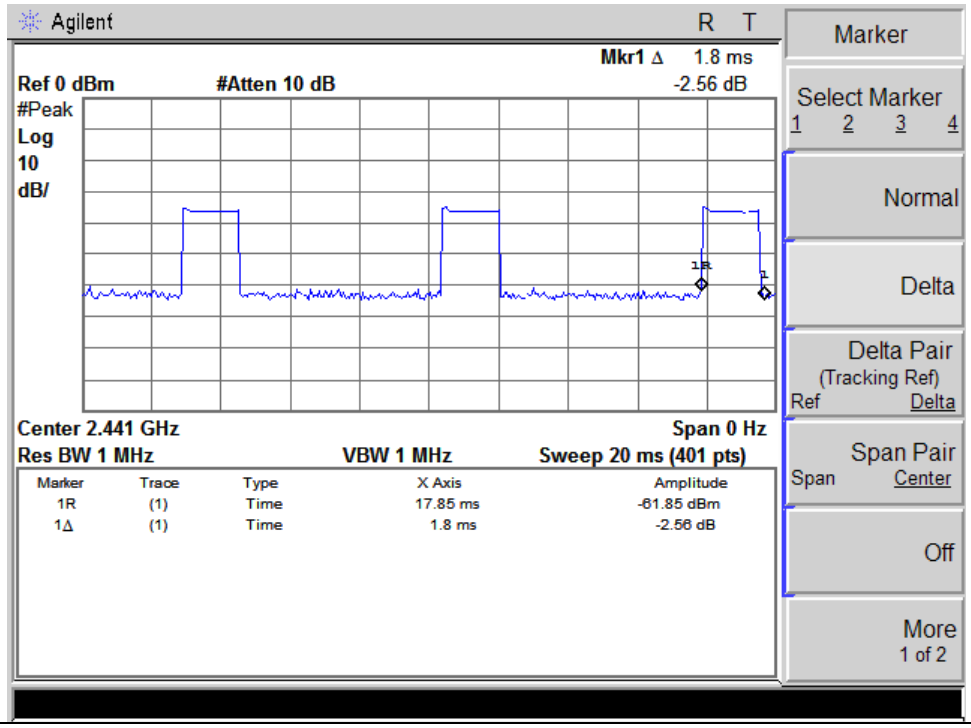
CH39-DH3



CH39-2DH3



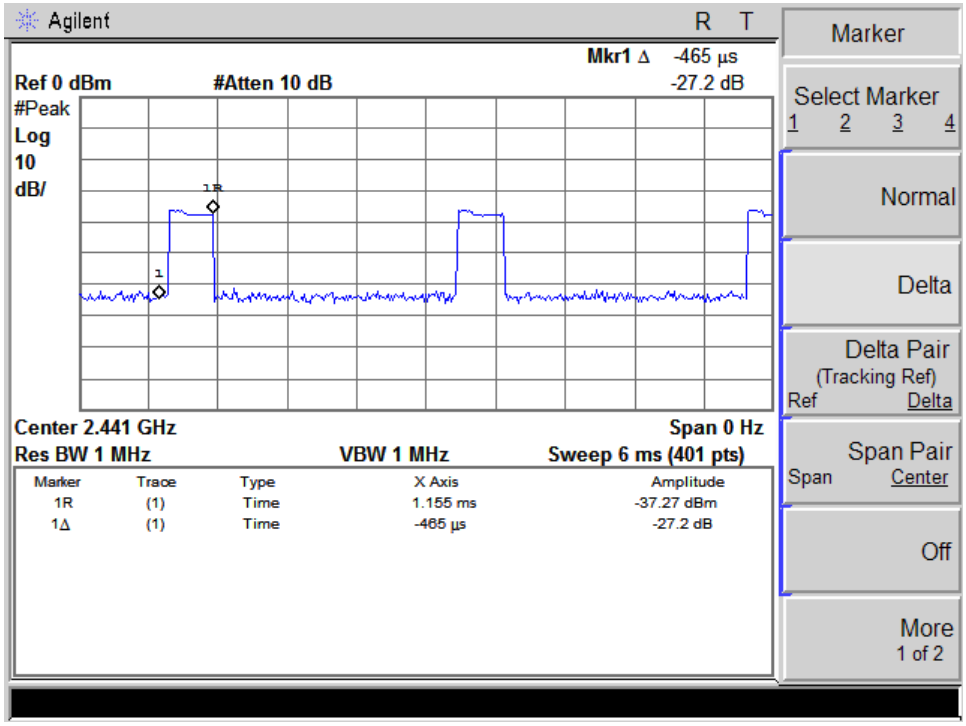
CH39-3DH3



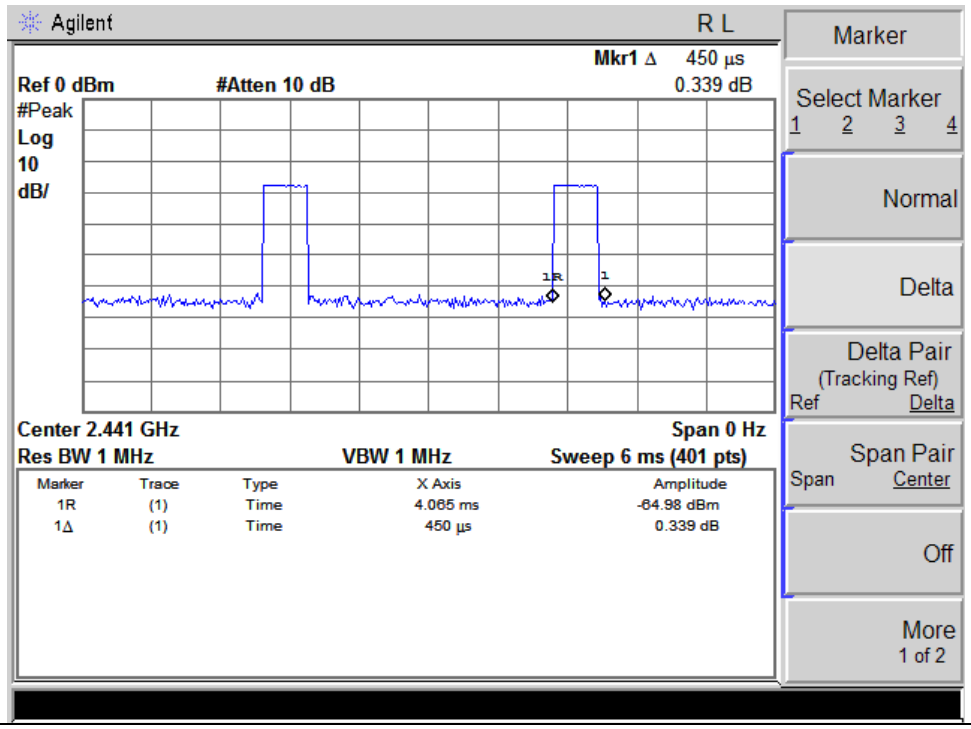
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH39-DH1,2DH1,3DH1		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH1	2441 MHz	0.46	0.15	0.4
2DH1	2441 MHz	0.45	0.14	0.4
3DH1	2441 MHz	0.45	0.14	0.4

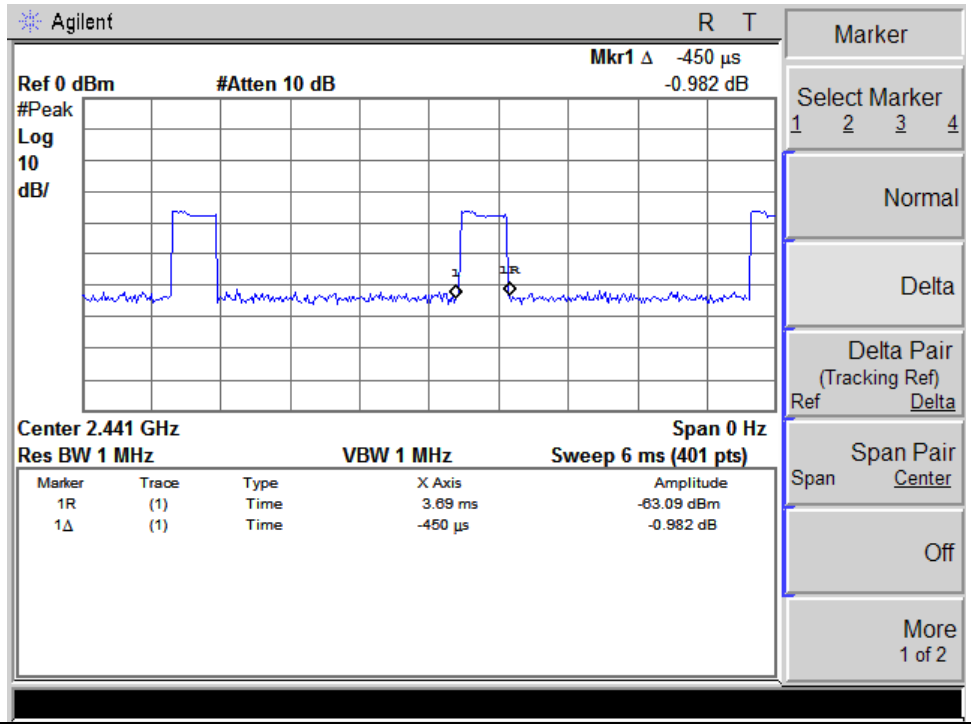
CH39-DH1



CH39-2DH1



CH39-3DH1



6. HOPPING CHANNEL SEPARATION MEASUREMENT

6.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100 kHz (Channel Separation)
VB	300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.1.1 TEST PROCEDURE

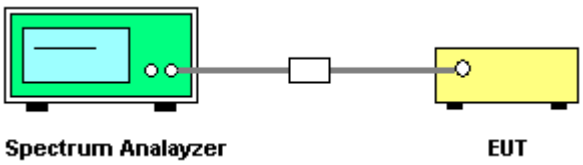
a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

b. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

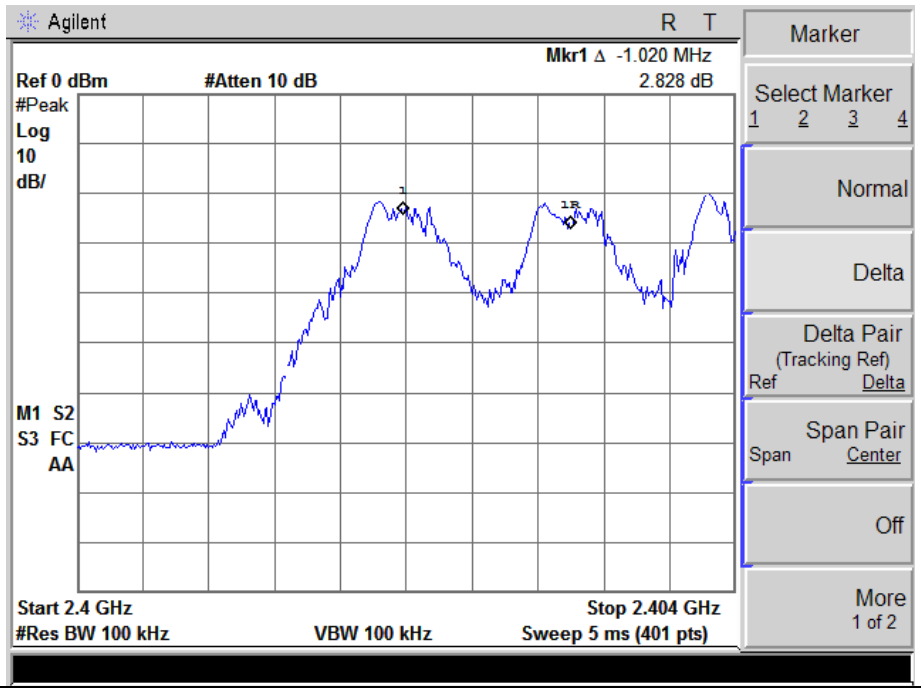
6.1.5 TEST RESULTS

EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00 / CH39 /CH78 (1Mbps Mode)		

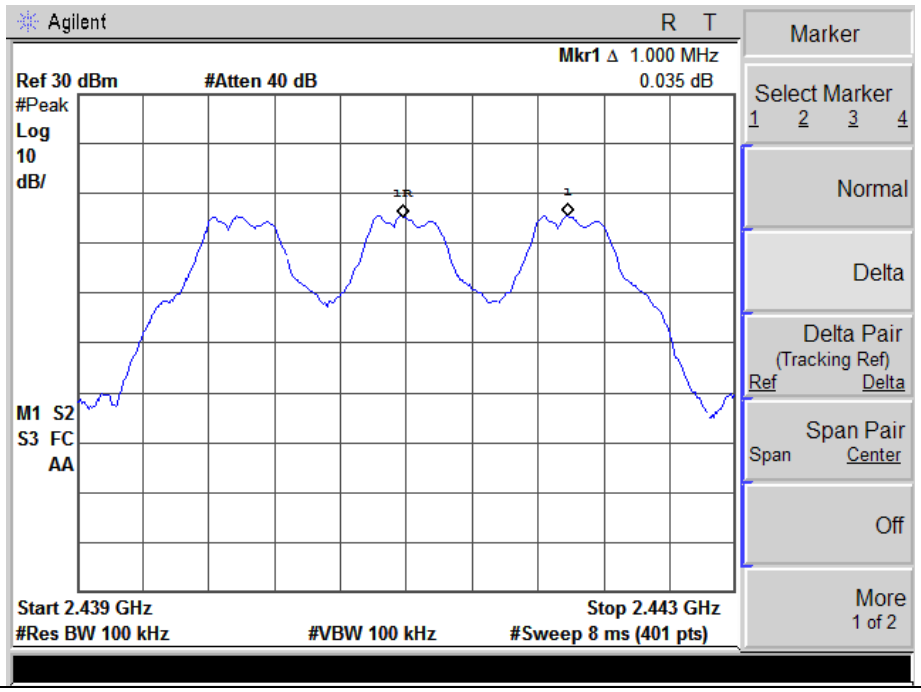
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.020	**Complies**
2441 MHz	1.000	**Complies**
2480 MHz	1.010	**Complies**

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth

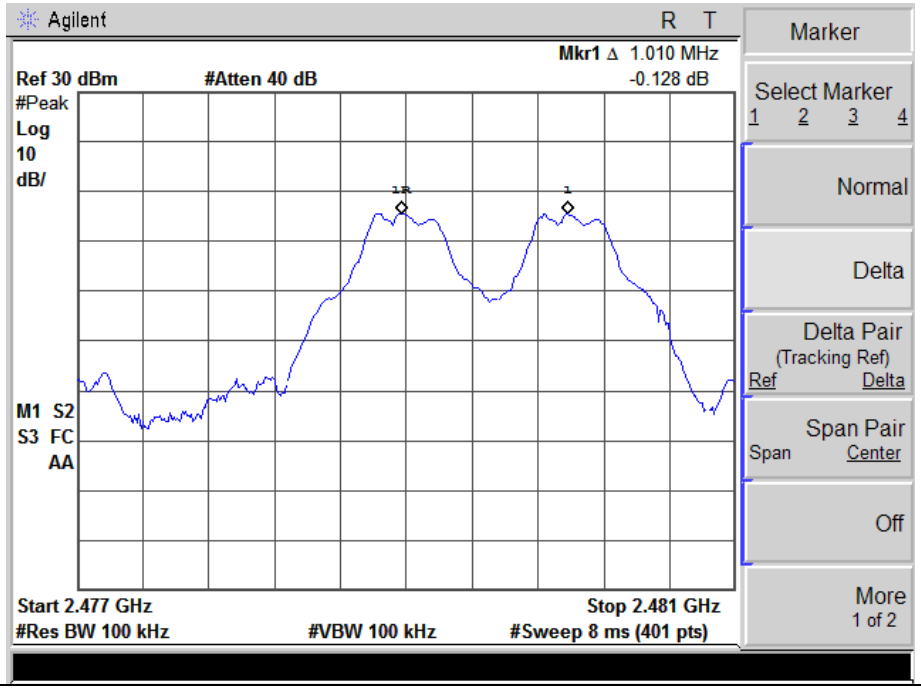
CH00 -1Mbps



CH39 -1Mbps



CH78 -1Mbps

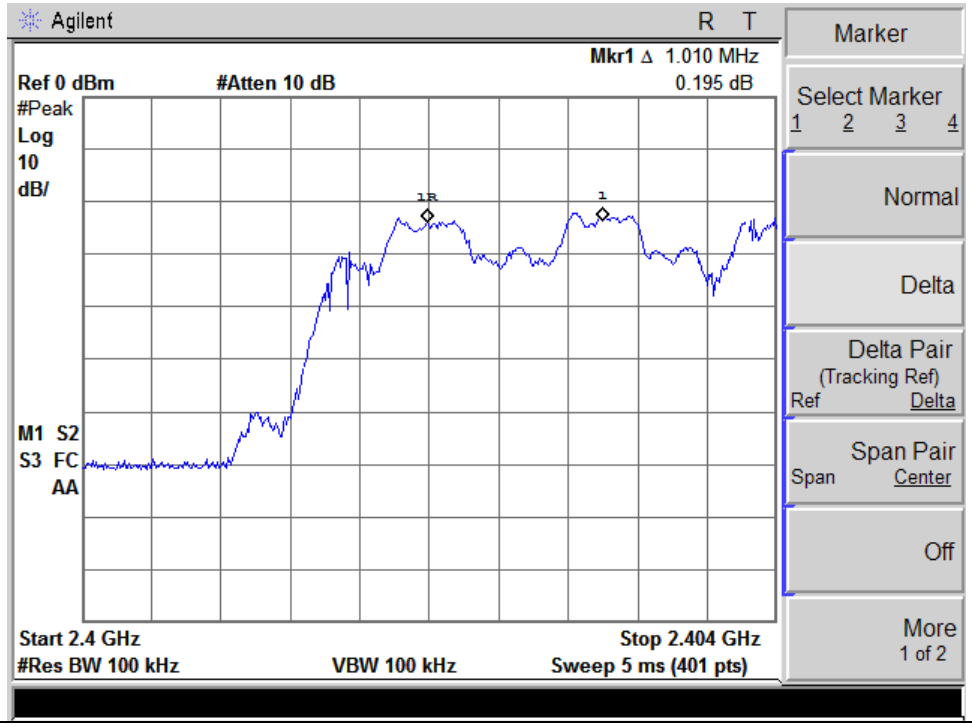


EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00 / CH39 /CH78 (2Mbps Mode)		

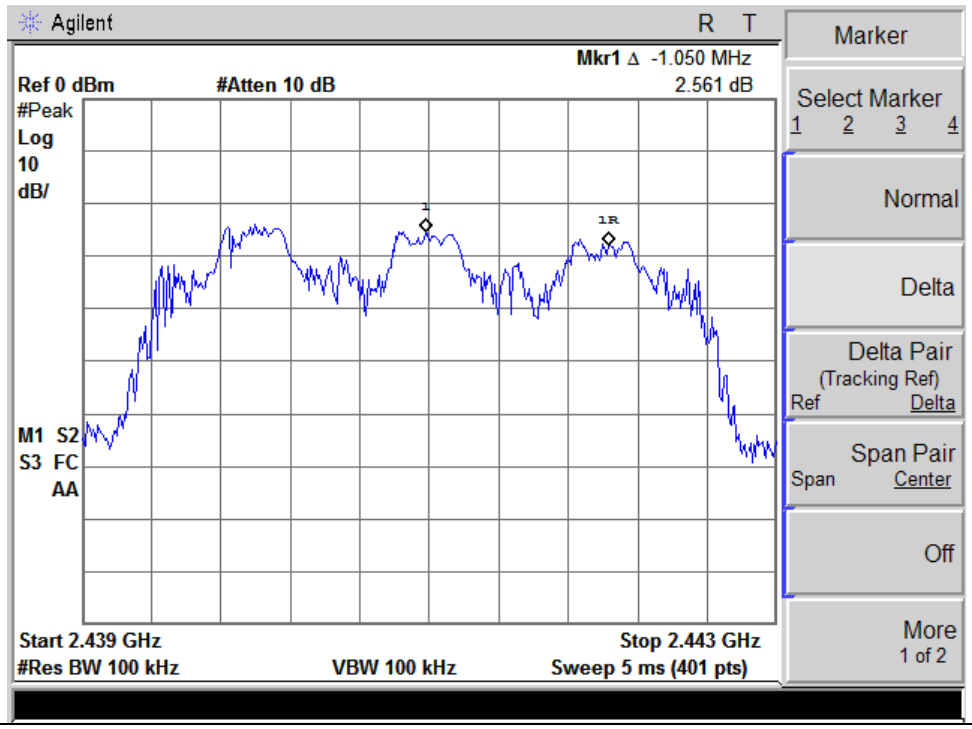
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.010	**Complies**
2441 MHz	1.050	**Complies**
2480 MHz	1.010	**Complies**

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth

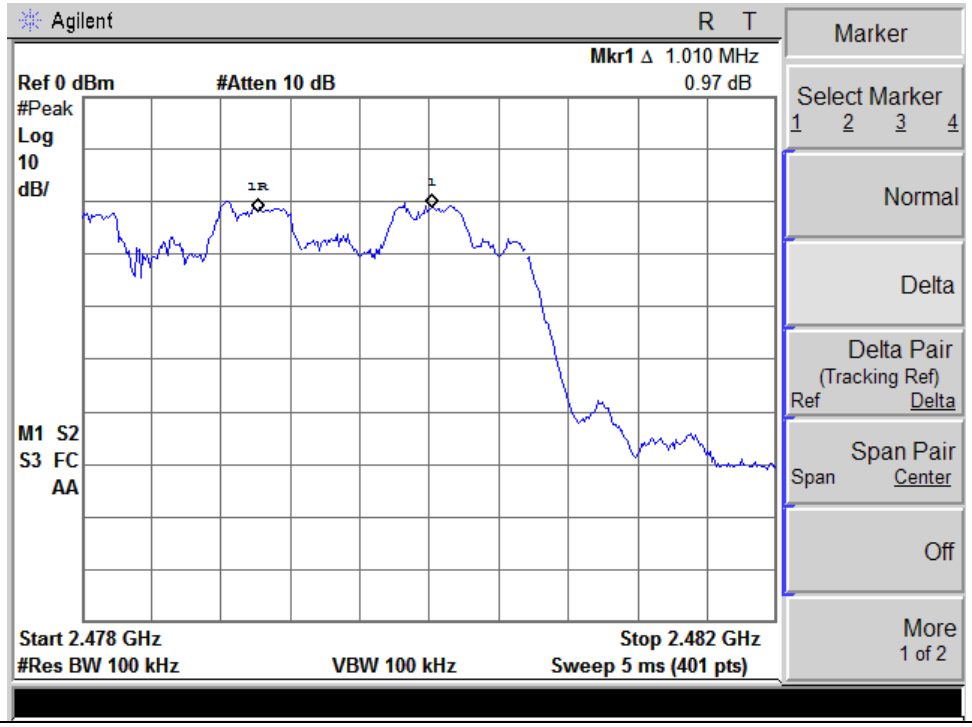
CH00 -2Mbps



CH39 -2Mbps



CH78 -2Mbps

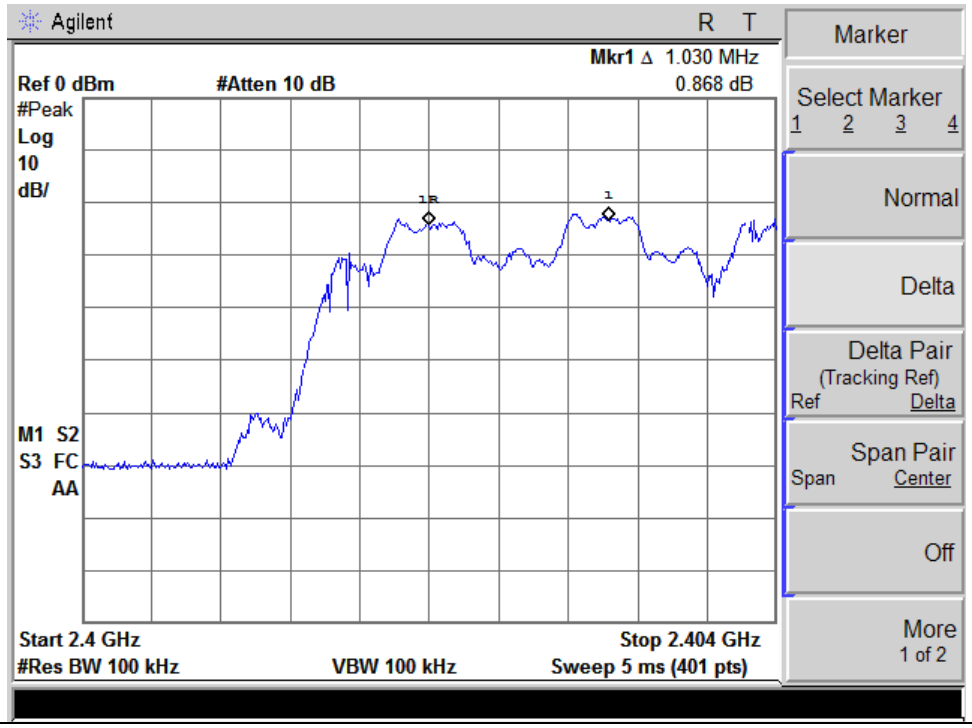


EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00 / CH39 /CH78 (3Mbps Mode)		

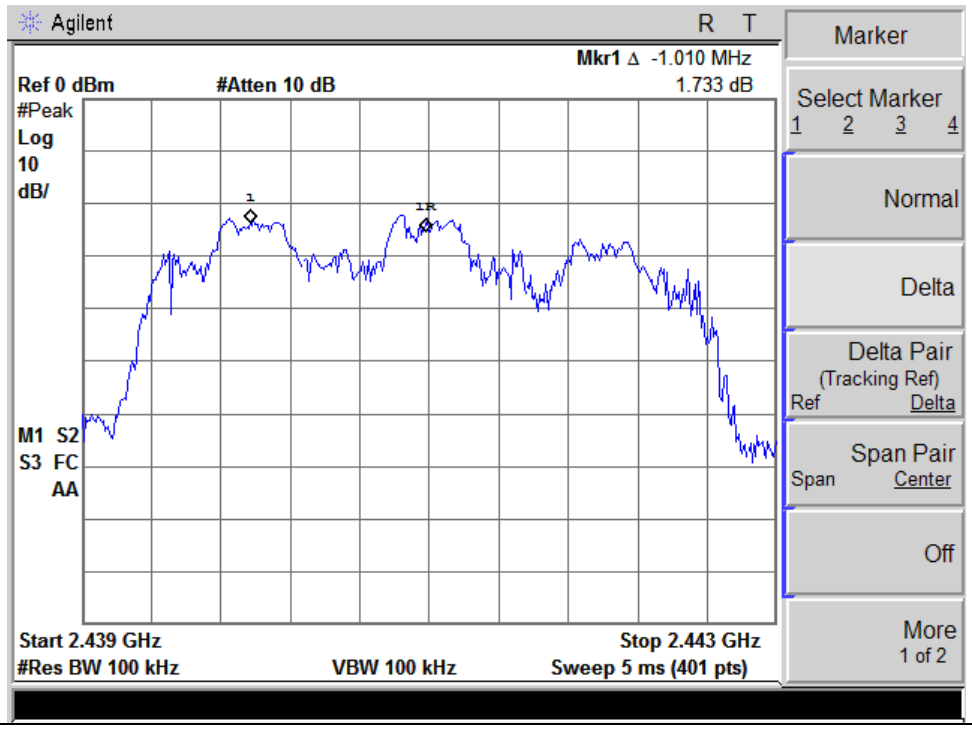
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.030	**Complies**
2441 MHz	1.010	**Complies**
2480 MHz	1.000	**Complies**

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth

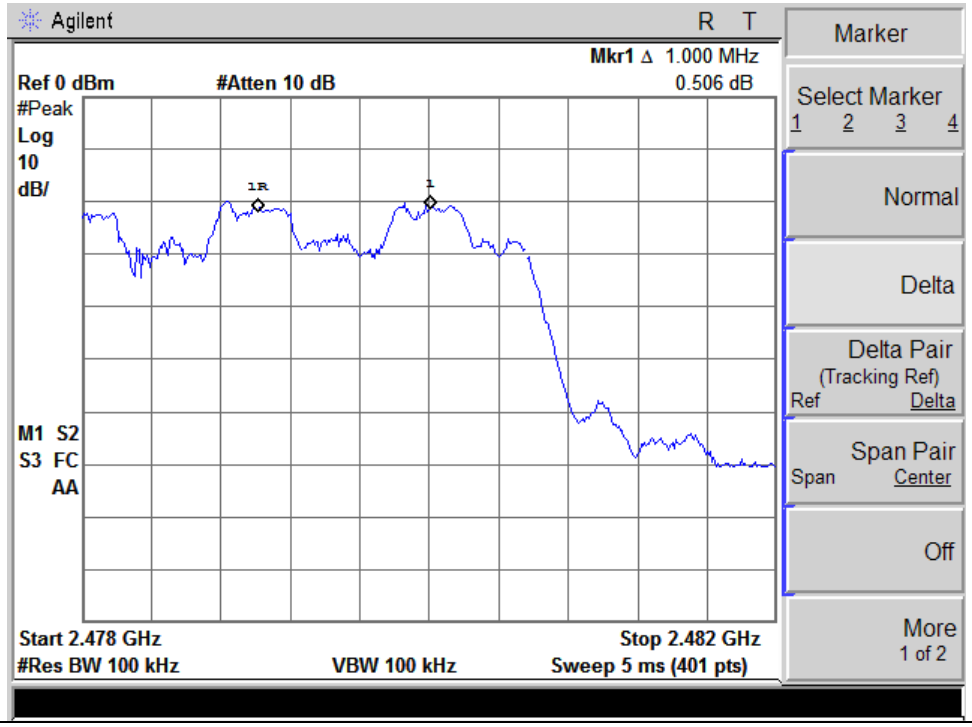
CH00 -3Mbps



CH39 -3Mbps



CH78 -3Mbps



7. BANDWIDTH TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

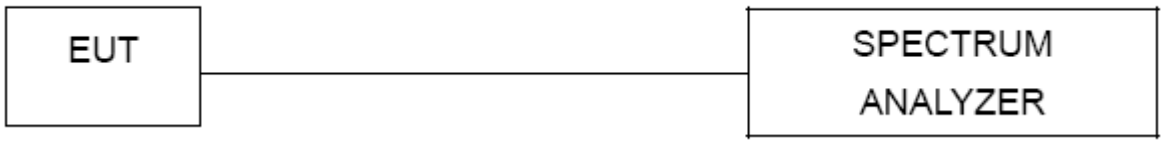
7.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

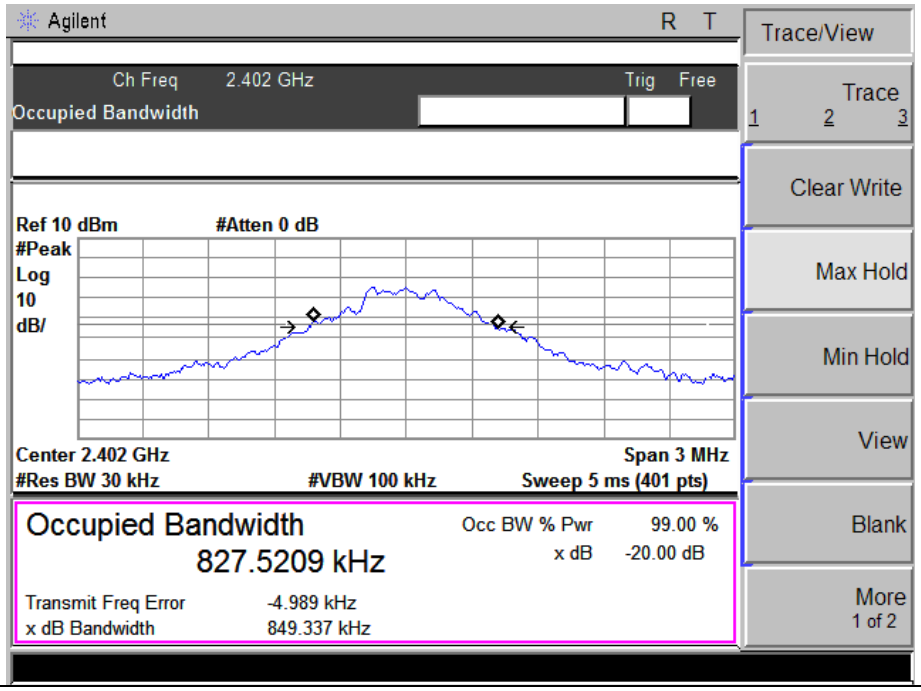
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

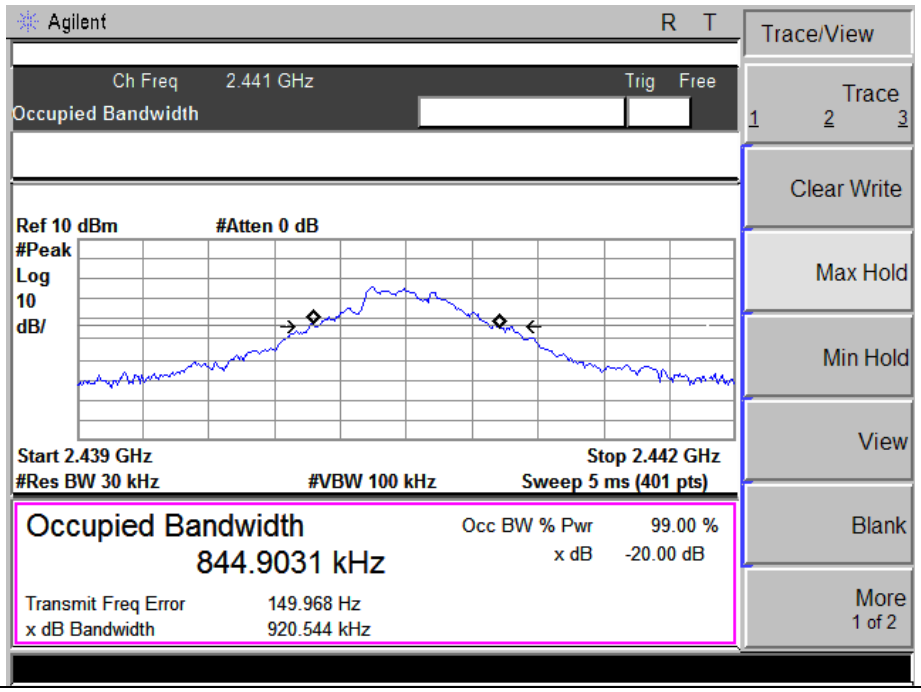
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00 / CH39 /C78**(1Mbps)**		

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	849.34	**PASS**
2441 MHz	920.54	**PASS**
2480 MHz	850.35	**PASS**

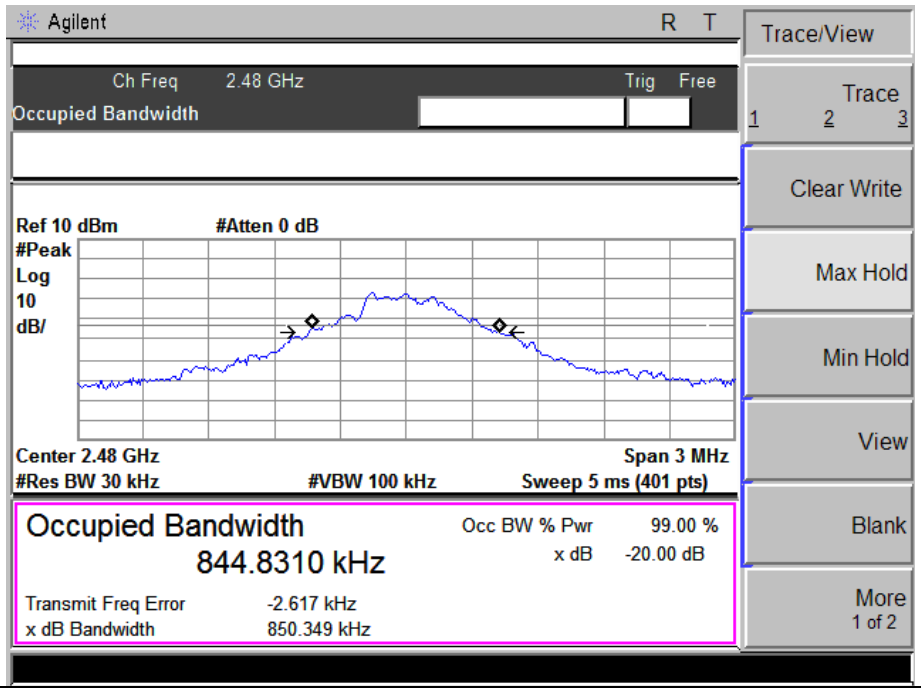
CH00 -1Mbps



CH39 -1Mbps



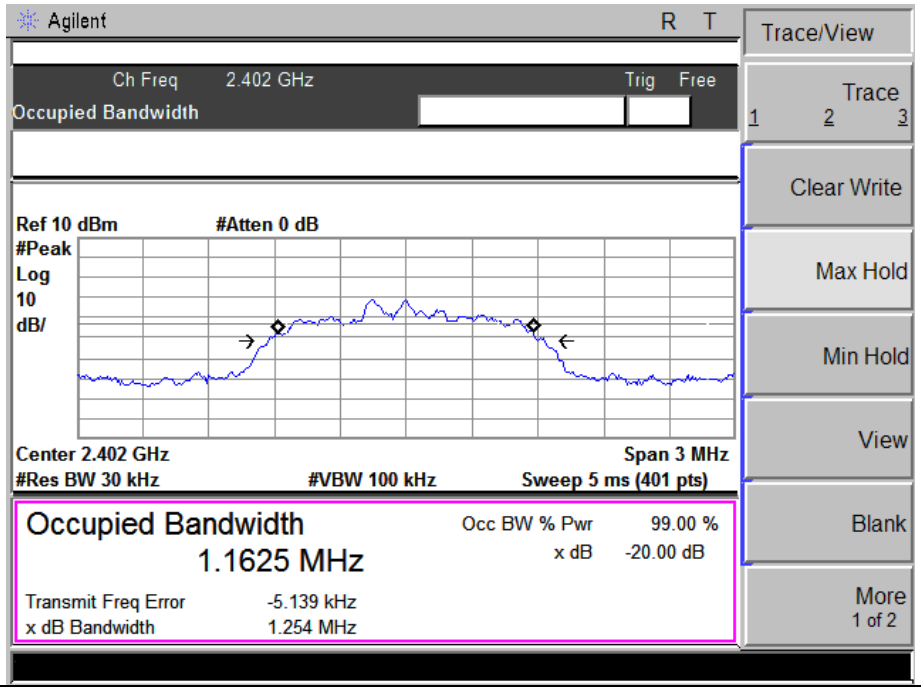
CH78 -1Mbps



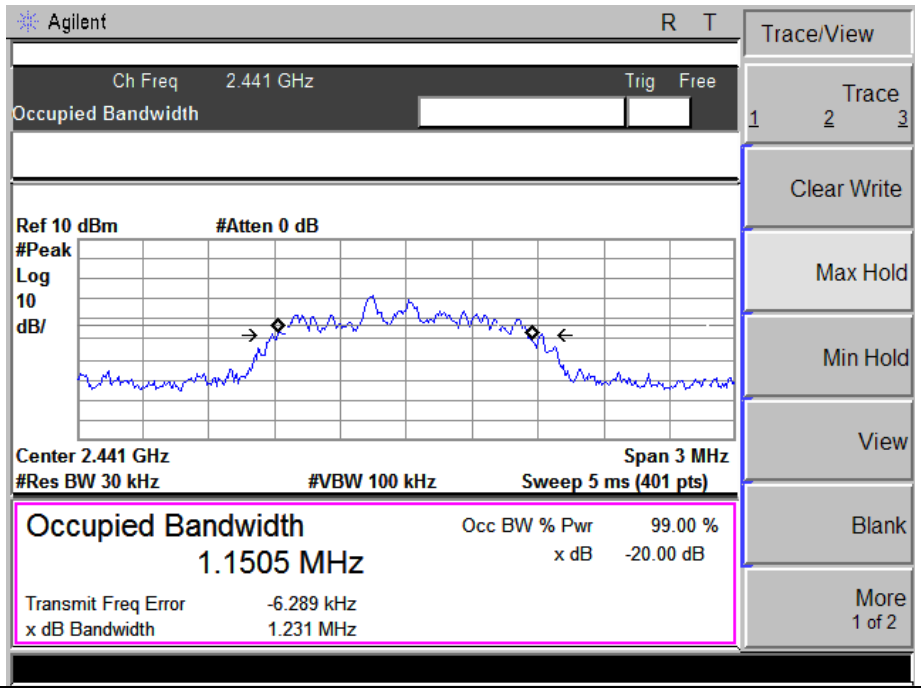
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00 / CH39 /C78**(2Mbps)**		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.25	**PASS**
2441 MHz	1.23	**PASS**
2480 MHz	1.24	**PASS**

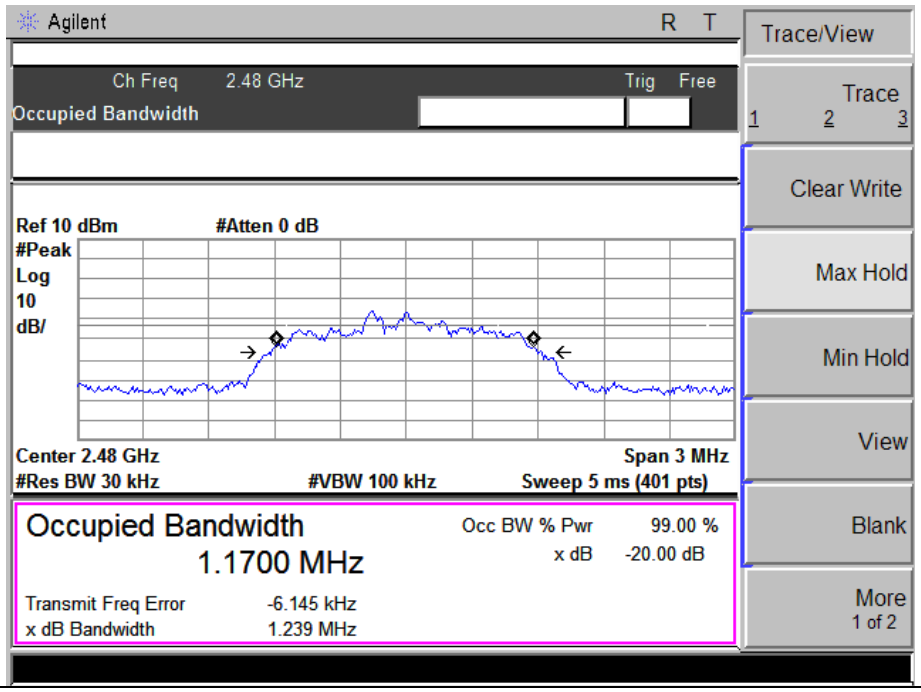
CH00 -2Mbps



CH39 -2Mbps



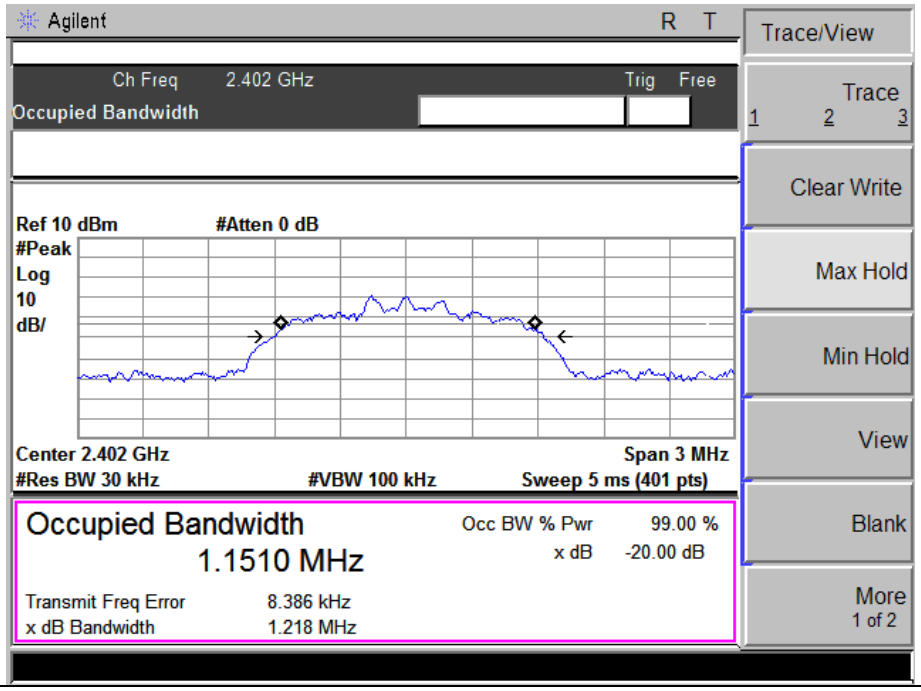
CH78 -2Mbps



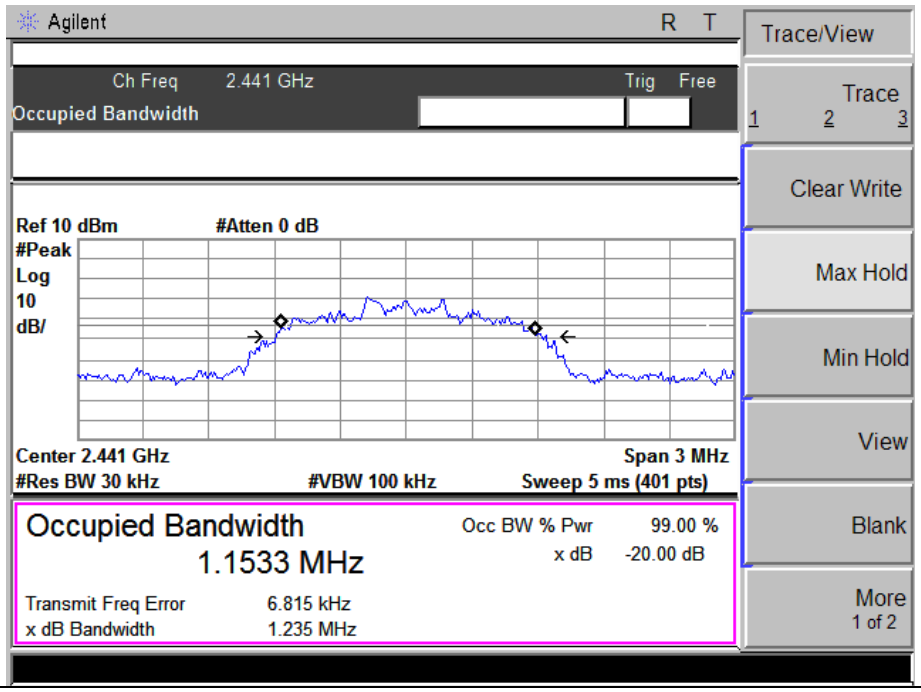
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00 / CH39 /C78**(3Mbps)**		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.22	**PASS**
2441 MHz	1.24	**PASS**
2480 MHz	1.18	**PASS**

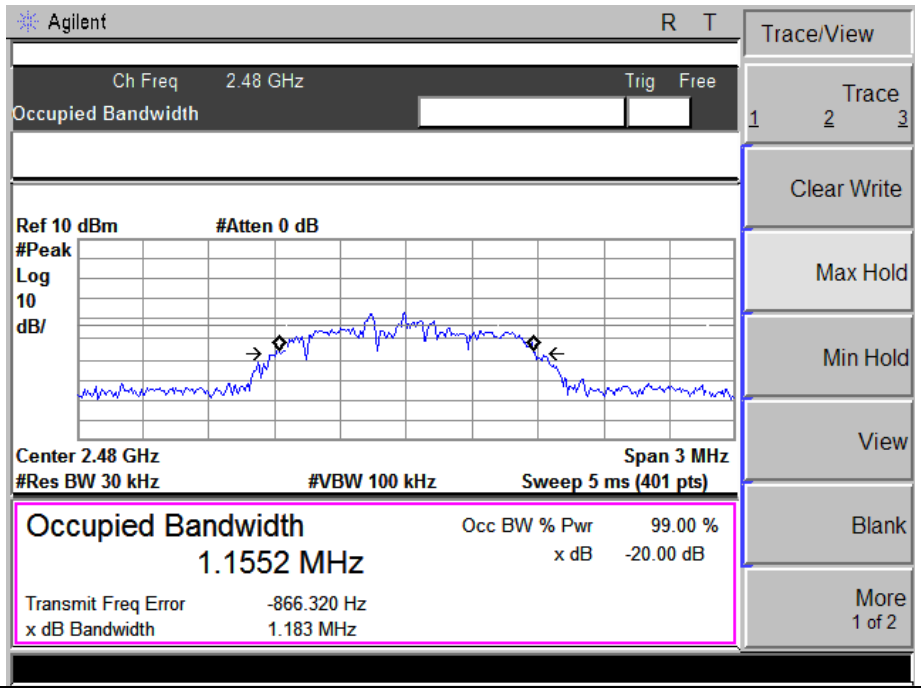
CH00 -3Mbps



CH39 -3Mbps



CH78 -3Mbps



8. PEAK OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(i)	Peak Output Power	0.125 w or 20.96dBm	2400-2483.5	PASS

8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b. Spectrum Setting : RBW > the 20 dB bandwidth of the emission being measured

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

VBW ≥ RBW

Sweep = auto

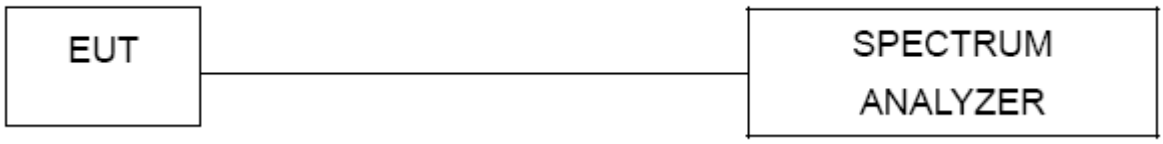
Detector function = peak

Trace = max hold

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

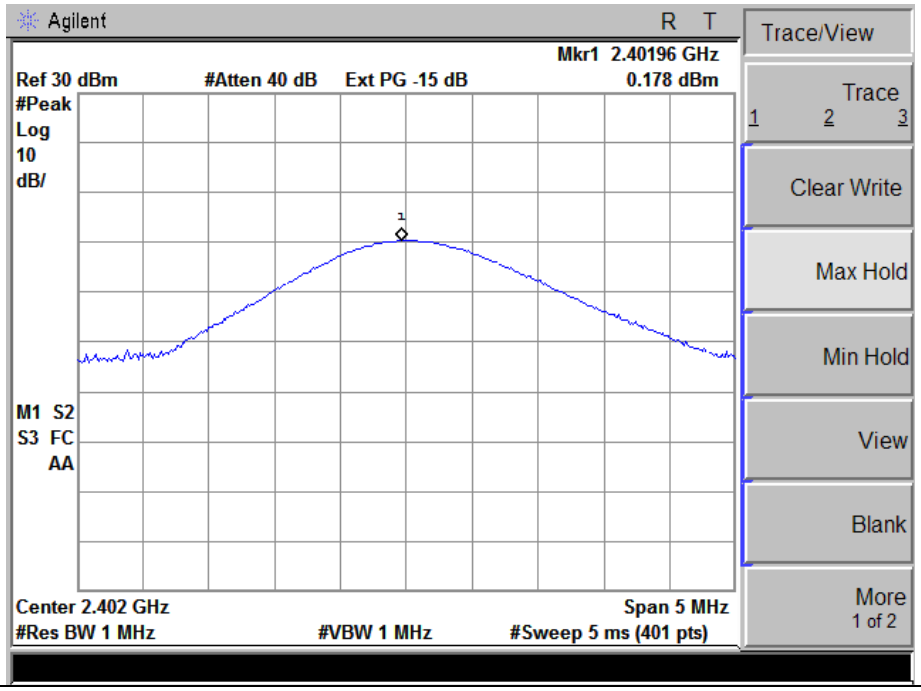
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 TEST RESULTS

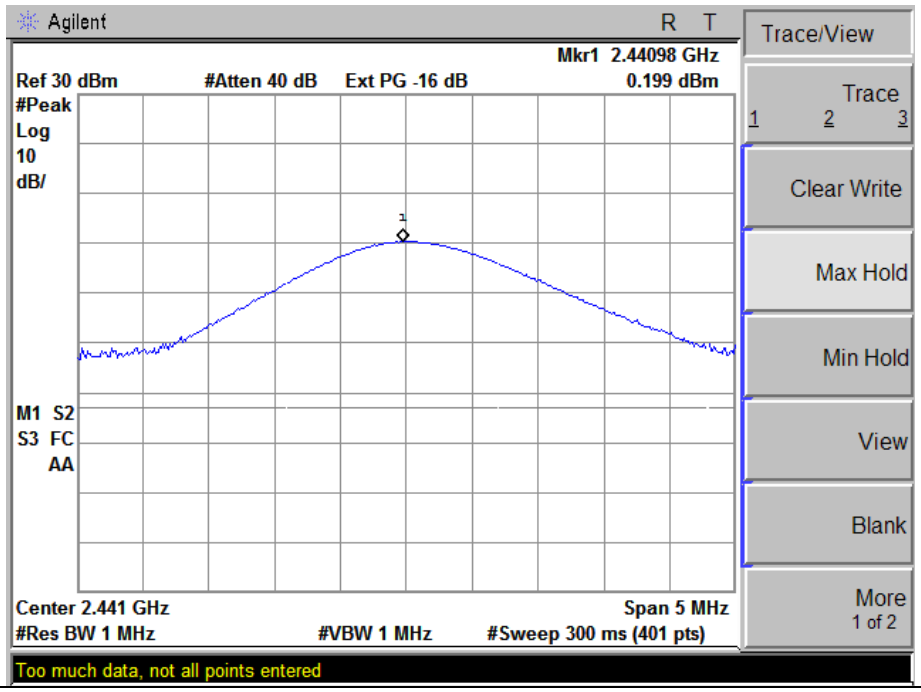
EUT：	Bluetooth Wireless Speaker	Model Name ：	QR-A2
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC3.7V
Test Mode ：	CH00/ CH39 /CH78 (1M/2M/3Mbps Mode)		

1Mbps			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	0.178	30
CH39	2441	0.199	30
CH78	2480	0.782	30
2Mbps			
CH00	2402	-0.064	20.96
CH39	2441	-0.810	20.96
CH78	2480	-0.736	20.96
3Mbps			
CH00	2402	-0.929	20.96
CH39	2441	-0.168	20.96
CH78	2480	-0.370	20.96

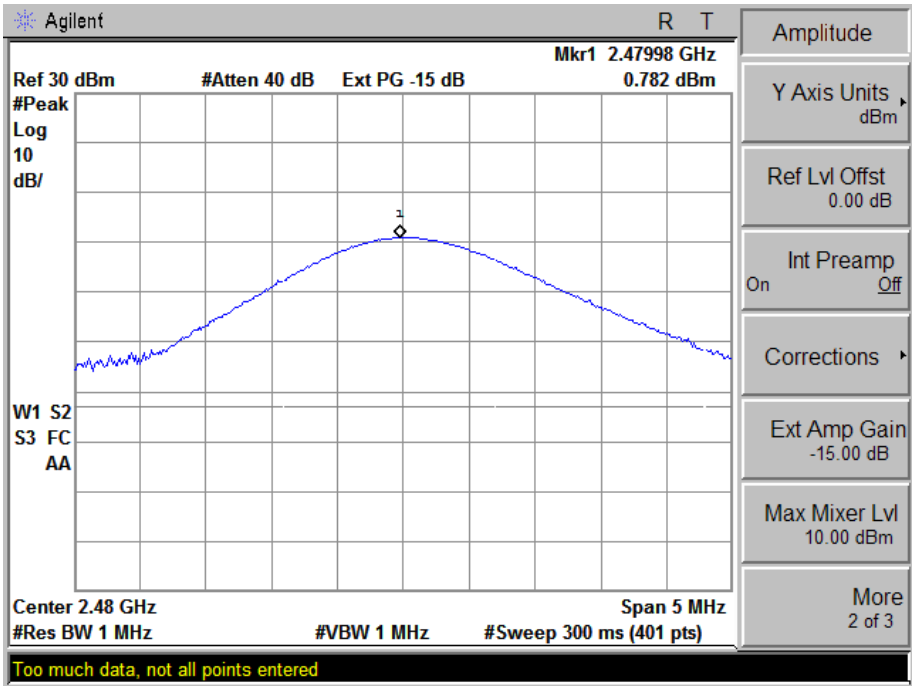
CH00 -1Mbps



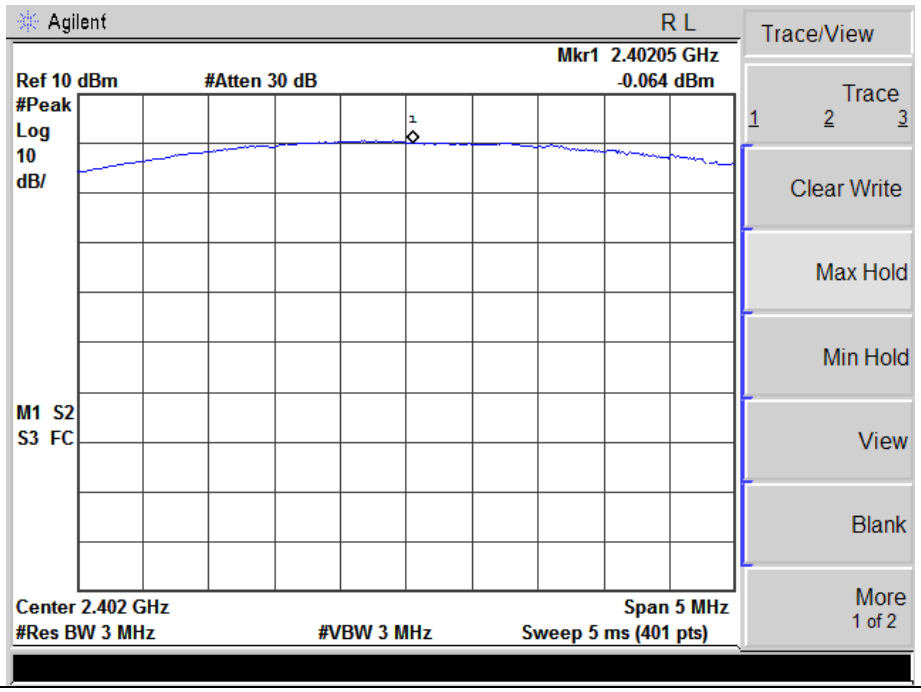
CH39 -1Mbps



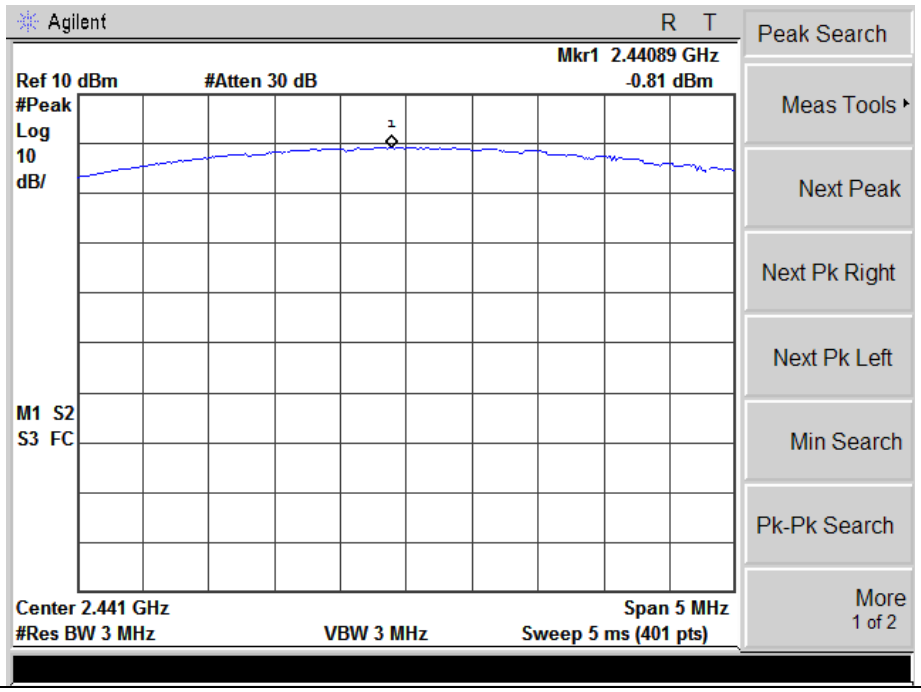
CH78 -1Mbps



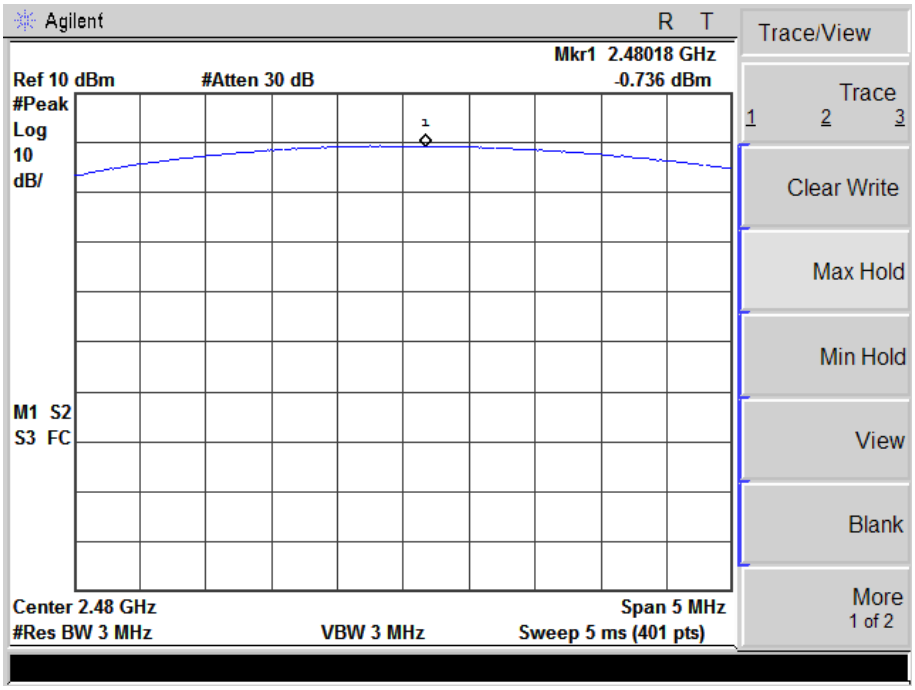
CH00 -2Mbps


Agilent
R L
Trace/View
Mkr1 2.40205 GHz
Ref 10 dBm
#Atten 30 dB
-0.064 dBm
#Peak
Log
10
dB/
Trace
1
2
3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
M1 S2
S3 FC
Center 2.402 GHz
Span 5 MHz
#Res BW 3 MHz
#VBW 3 MHz
Sweep 5 ms (401 pts)

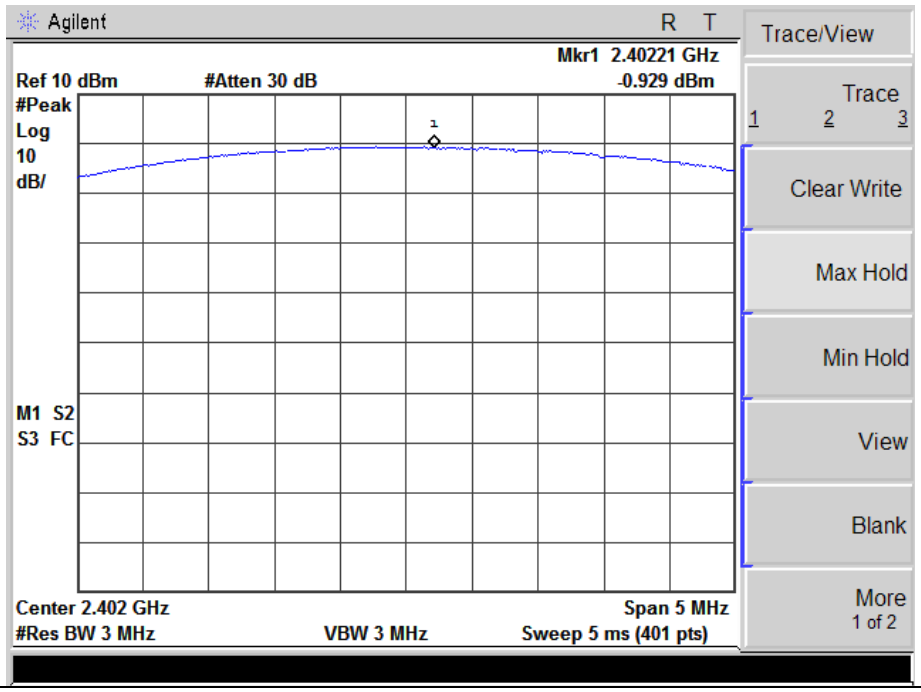
CH39 -2Mbps



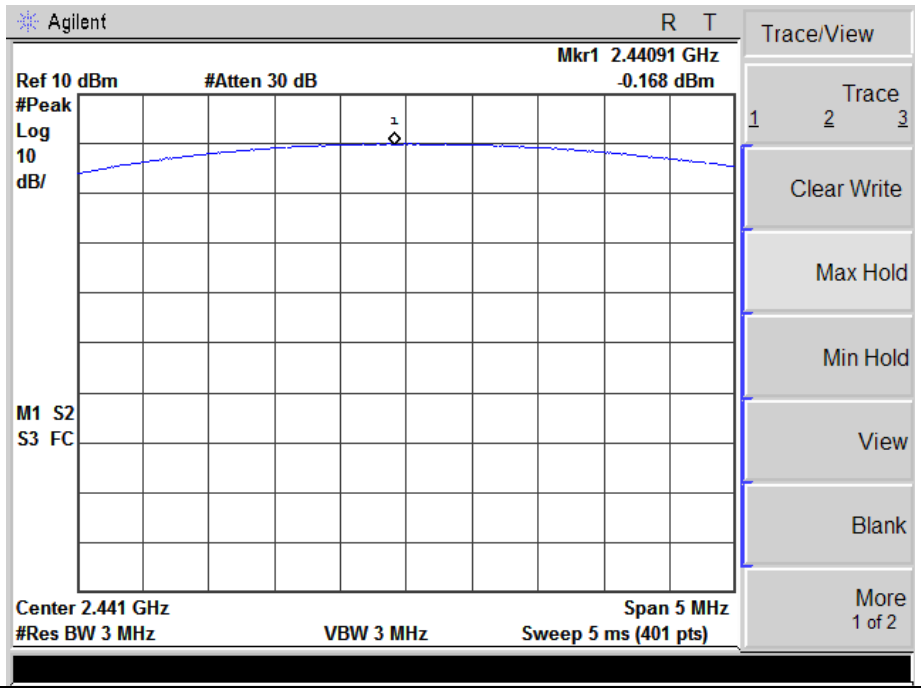
CH78 -2Mbps



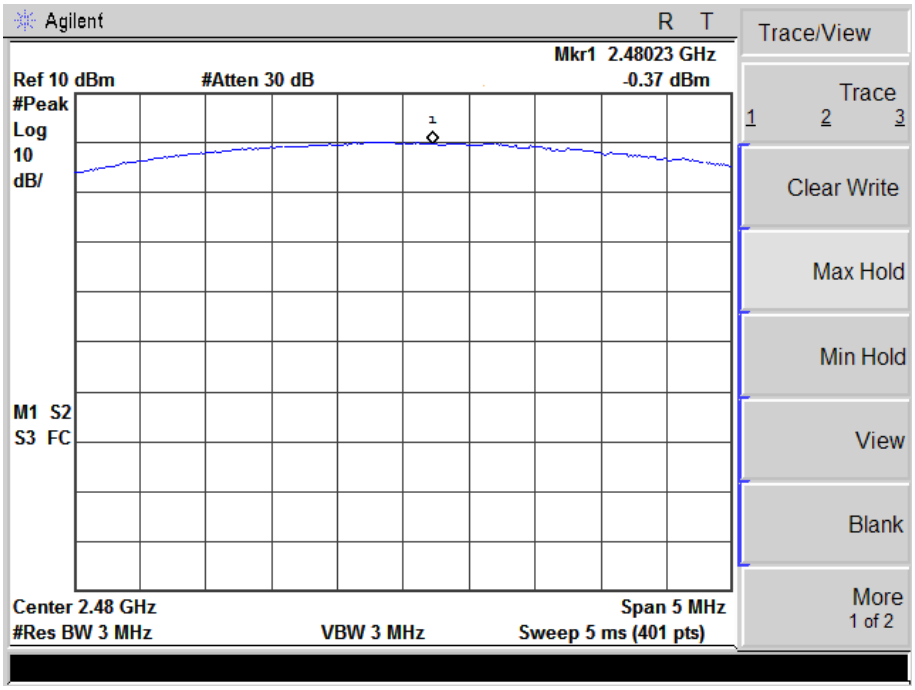
CH00 -3Mbps


Agilent
R T
Mkr1 2.40221 GHz
Ref 10 dBm
#Atten 30 dB
-0.929 dBm
#Peak
Log
10
dB/
M1 S2
S3 FC
Center 2.402 GHz
#Res BW 3 MHz
VBW 3 MHz
Span 5 MHz
Sweep 5 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

CH39 -3Mbps

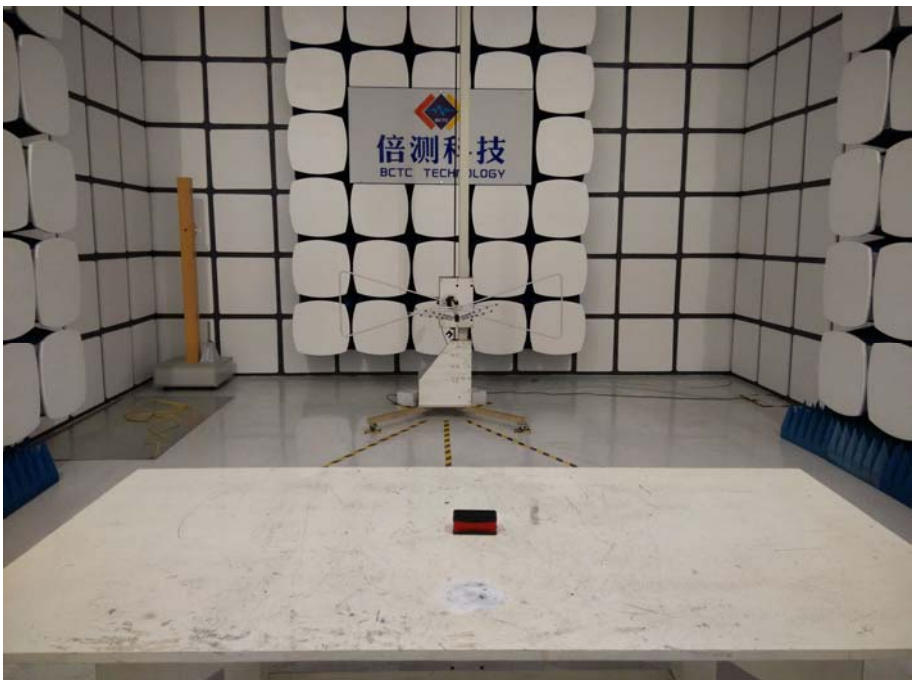


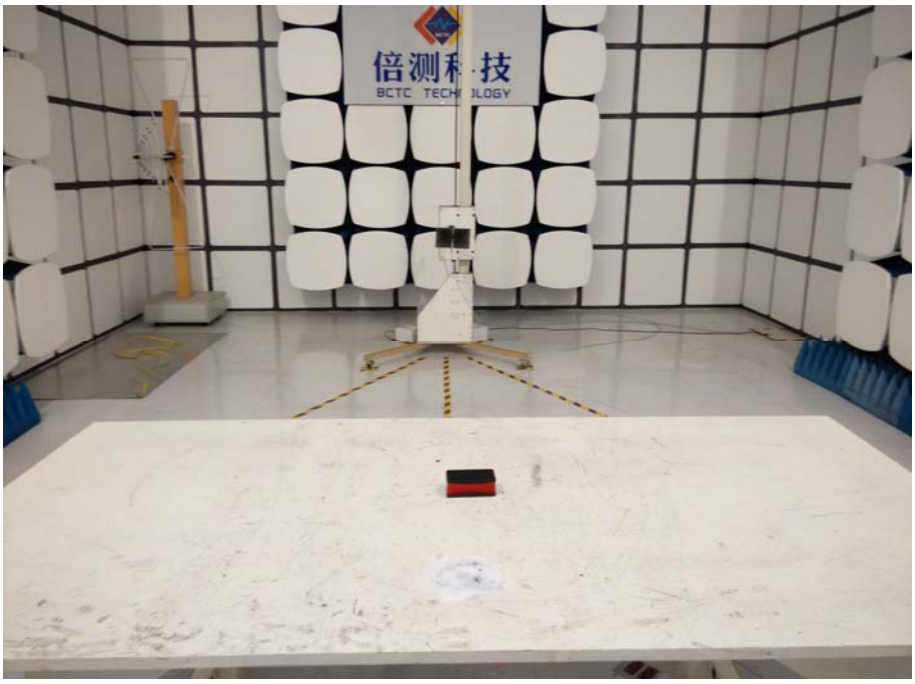
CH78 -3Mbps



9. EUT TEST PHOTO

Radiated Measurement Photos





Radiated Measurement Photos