

FCC Radio Test Report

Product Name:	Bluetooth speaker
Trademark:	N/A
FCC ID:	2AFQBYH-239
Model Name :	YH-239 Speaker
Prepared For :	Shanghai Yuhao Household Appliance Manufacturing Co.,Ltd
Address :	Rm318 Building 1 NO.1481 Gonghexin Rd, Shanghai China.
Prepared By :	DongGuan Precise Testing Service Co., Ltd.
Address :	Building D, Baoding Technology Park, Guangming Road 2, Guangming Community, Dongcheng District, Dongguan, Guangdong, China
Test Date:	Aug. 10 - Aug. 20, 2015
Date of Report :	Aug. 20, 2015
Report No.:	PT1508058014F

TEST RESULT CERTIFICATION

Applicant's name : Shanghai Yuhao Household Appliance Manufacturing Co.,Ltd

Address : Rm318 Building 1 NO.1481 Gonghexin Rd, Shanghai China

Manufacture's Name..... : Shanghai Yuhao Household Appliance Manufacturing Co.,Ltd

Address : Rm318 Building 1 NO.1481 Gonghexin Rd, Shanghai China

Product description

Product name : Bluetooth Speakers

Model and/or type reference : YH-239 Speaker

Serial Model : N/A

Standards : FCC Part15.247

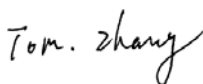
Test procedure ANSI C63.4-2003

This device described above has been tested by PTS, 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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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	

1.1 TEST FACILITY

FCC Registration No.: 371540, IC Registration No.: 12191A-1

Dongguan Precise Testing Service Co., Ltd.

Add.: Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan, Guangdong, China

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Bluetooth Speakers	
Trade Name	N/A	
Model Name	YH-239 Speaker	
Serial Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a Bluetooth Speakers	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	BT(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$ -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): 0.736dBm BT EDR(2Mbps): -0.591dBm BT EDR(3Mbps): -0.569dBm
	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	N/A	
Battery	Capacitance:450mAh Rated Voltage:3.7V	
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	PCB Antenna	NA	1.2	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	Charge

For Conducted Emission	
Final Test Mode	Description
Mode 4	Charge

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	Charge

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The EUT use new battery.
- (3)The data rate was set in 1Mbps for radiated emission due to the highest RF output power.

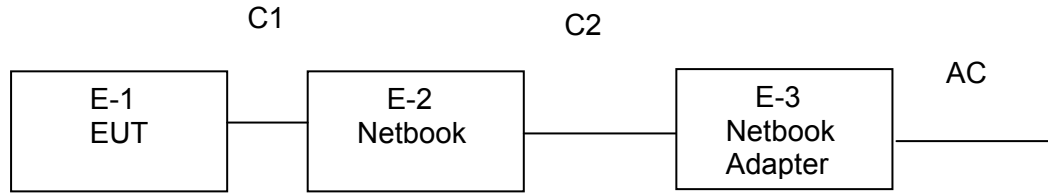
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

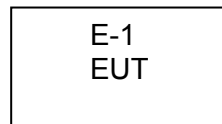
Test software Version	Test program: RF Control Kit v1.0		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters	DEF	DEF	DEF

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 Speakers	N/A	YH-239 Speaker	N/A	EUT
E-2	Netbook	DELL	PP10L	N/A	
E-3	Netbook Adapter	DELL	HA65NS1-00	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO	NO	80cm	
C2	NO	YES	150cm	

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

FOR RADIATED EMISSION TEST (BELOW 1GHZ)

Name of Equipment	Manufacturer	Model	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2015	July 3, 2016
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2015	July 3, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2015	June 5, 2016
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2015	June 5, 2016

FOR RADIATED EMISSION TEST (1GHZ ABOVE)

Name of Equipment	Manufacturer	Model	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2015	July 10, 2016
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 7, 2015	July 6, 2016
RF Cable	SCHWARZBECK	AK9515H	96220	July 8, 2015	July 7, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 6, 2015	June 5, 2016

- Note:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA
 2. N/A = No Calibration Request.

FOR CONDUCTED EMISSION TEST:

Name of Equipment	Manufacturer	Model	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Artificial Mains Network	Narda	L2-16B	000WX31025	July 8, 2015	July 7, 2016
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 8, 2015	July 7, 2016
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2015	July 3, 2016
Shielded Room	CHENGYU	843	PTS-002	June 6, 2015	June 5, 2016

- Note:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA

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

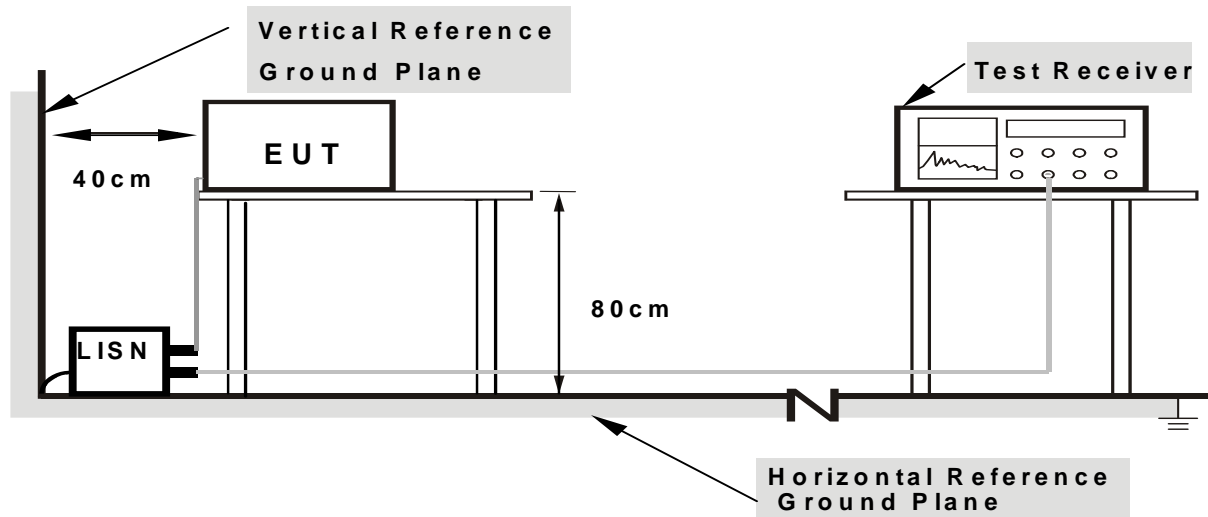
3.1.2 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- 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:**
- Support units were connected to second LISN.
 - Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm 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.

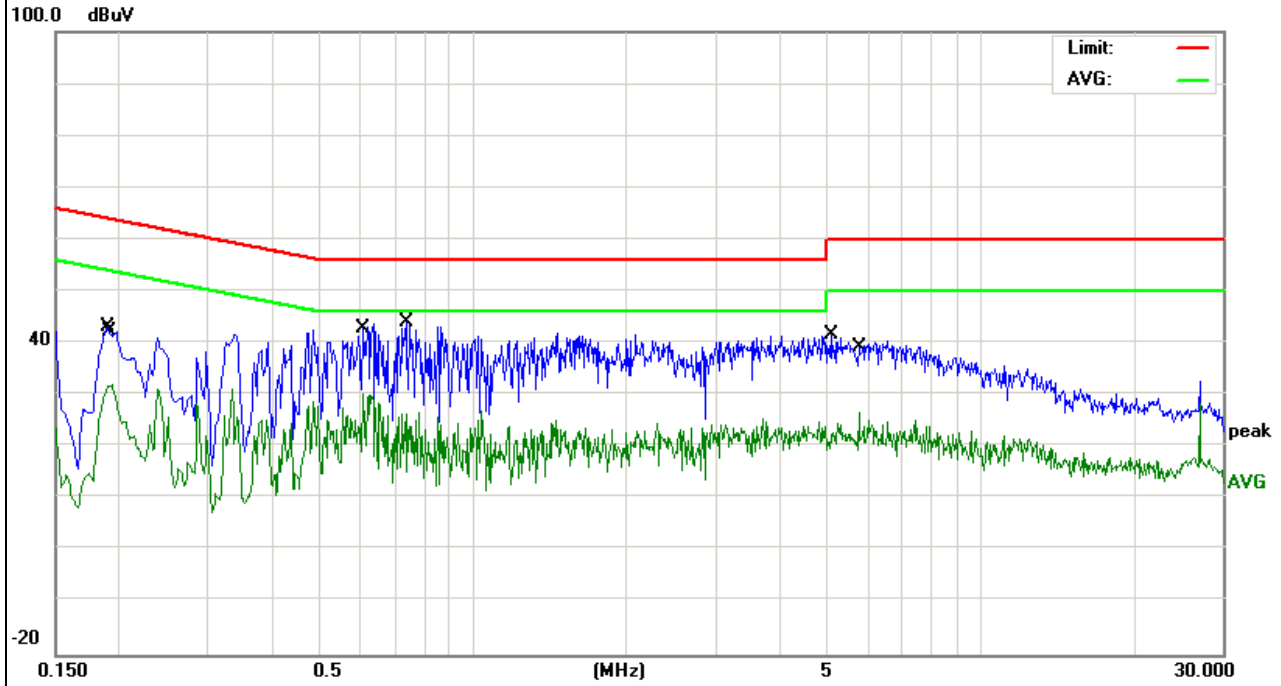
3.1.6 TEST RESULTS

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5.0V from adapter AC 120V/60Hz	Test Mode :	Mode 4

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.19	32.86	10.4	43.26	64.03	-20.77	QP
0.194	21.54	10.41	31.95	53.86	-21.91	AVG
0.6058	19.92	10.4	30.32	46	-15.68	AVG
0.7378	33.61	10.41	44.02	56	-11.98	QP
5.0579	30.91	10.67	41.58	60	-18.42	QP
5.7458	15.89	10.67	26.56	50	-23.44	AVG

Remark:

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

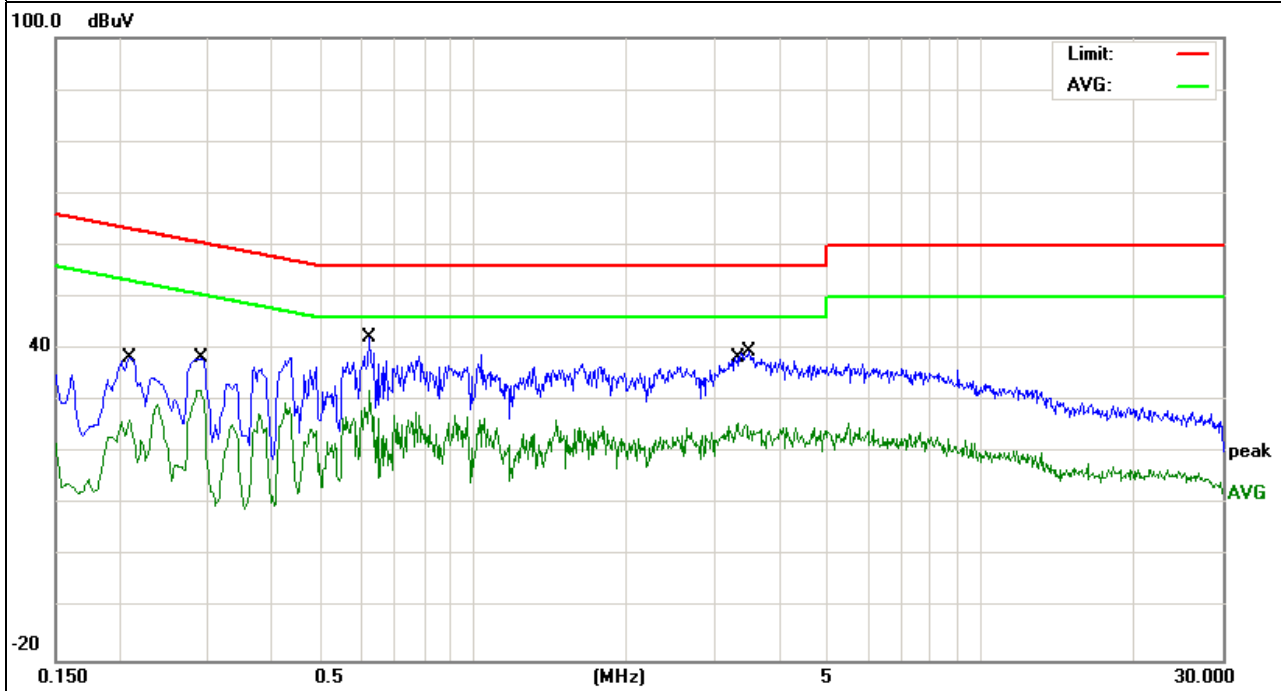


EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5.0V from adapter AC 120V/60Hz	Test Mode :	Mode 4

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.2099	28.01	10.44	38.45	63.21	-24.76	QP
0.2859	21.65	10.43	32.08	50.64	-18.56	AVG
0.626	31.99	10.41	42.4	56	-13.6	QP
0.626	21.76	10.41	32.17	46	-13.83	AVG
3.322	15.15	10.53	25.68	46	-20.32	AVG
3.5019	28.89	10.6	39.49	56	-16.51	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case



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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

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

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:

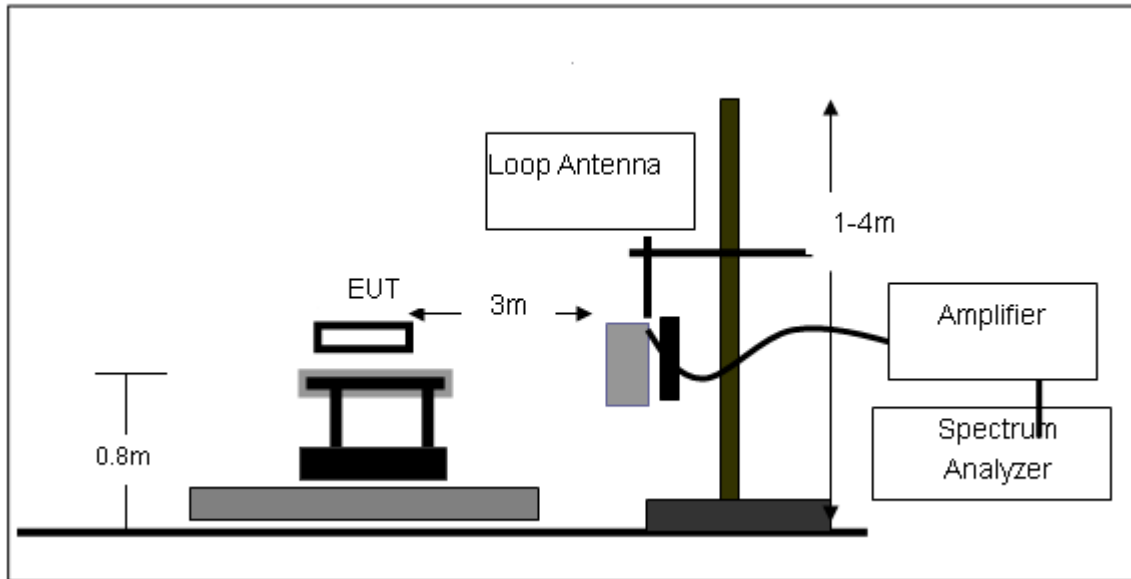
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

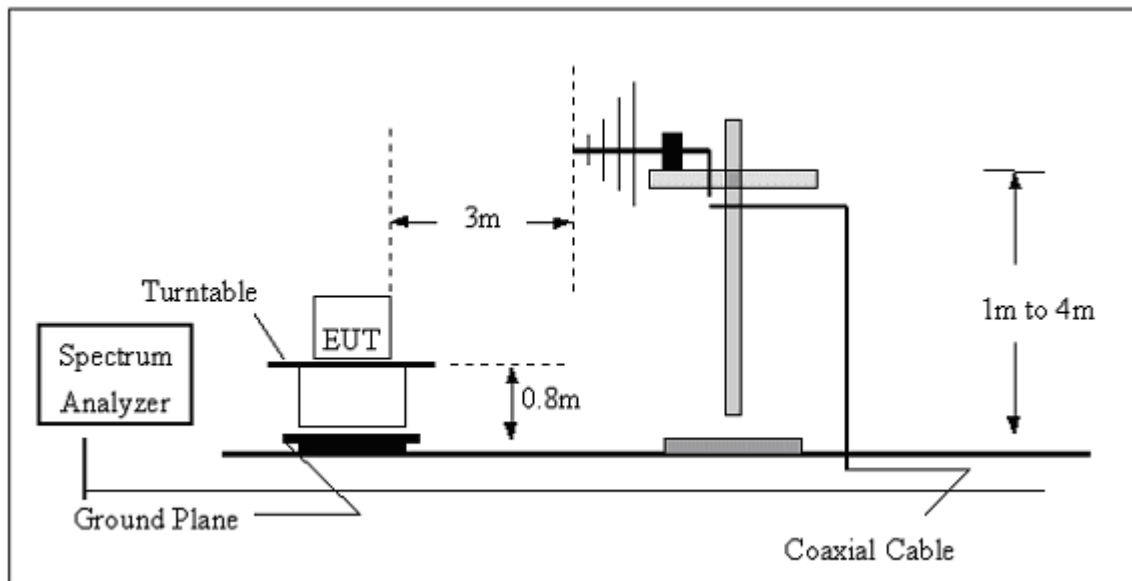
No deviation

3.2.4 TEST SETUP

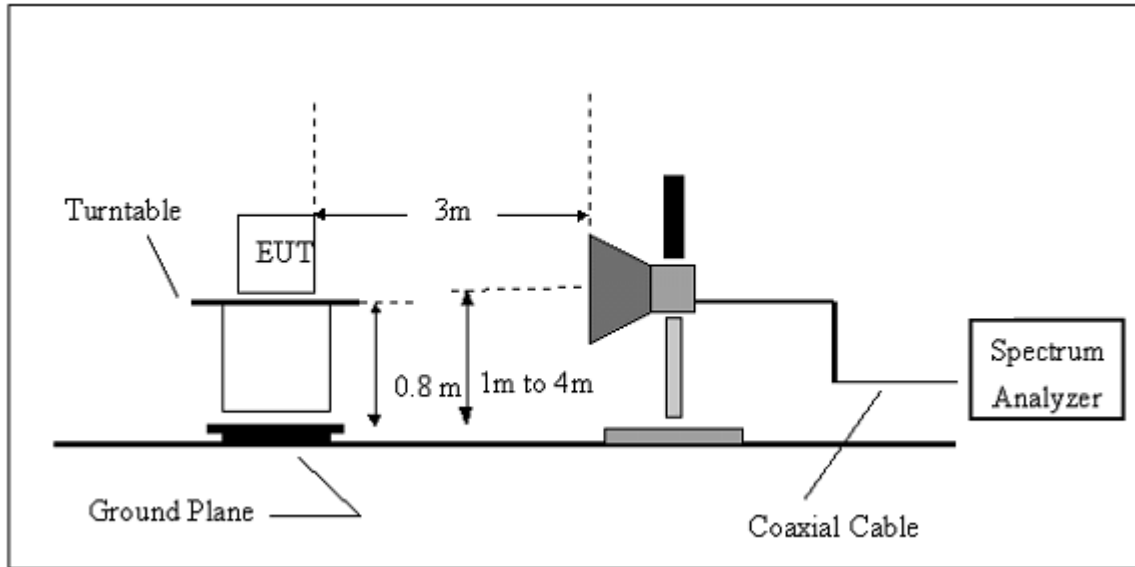
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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 Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Polarization :	---
Test Voltage :	DC 3.7V by battery		
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 = $40 \log(\text{specific distance}/\text{test distance})(\text{dB})$;

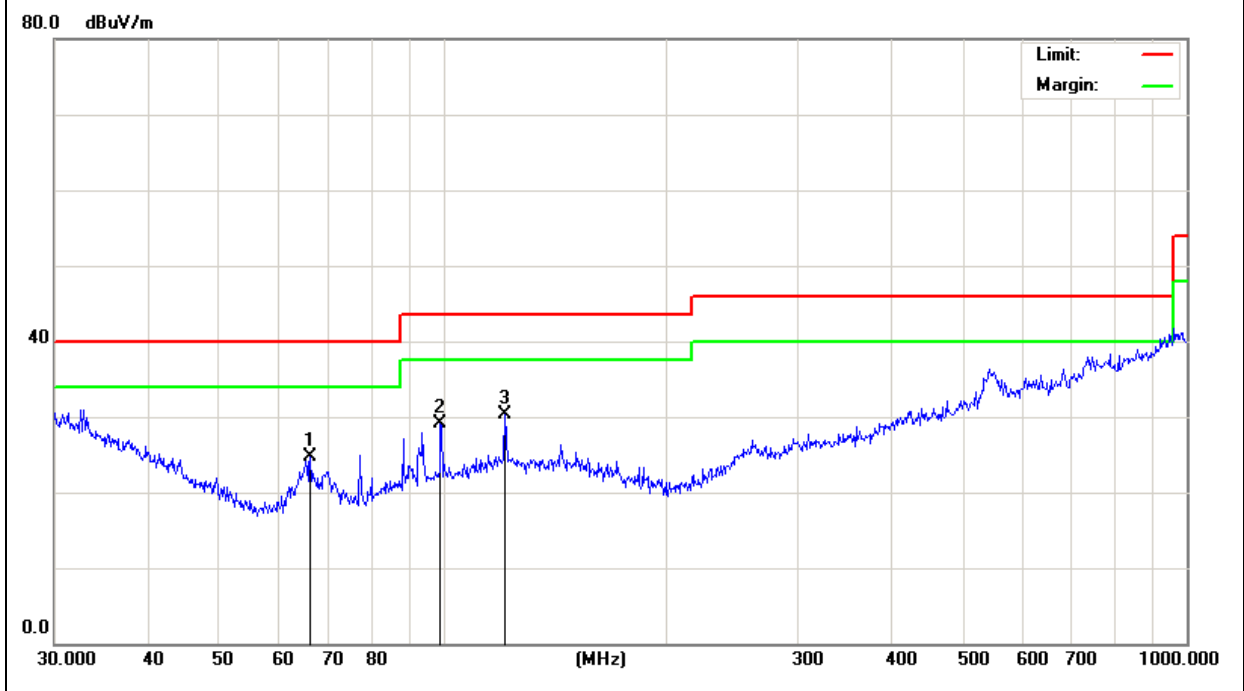
Limit line = specific limits(dBuV) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 3.7V by battery		
Test Mode :	TX		

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
66.266	19.25	5.45	24.7	40	-15.3	QP
99.1795	18.7	10.5	29.2	43.5	-14.3	QP
121.123	18.5	11.8	30.3	43.5	-13.2	QP

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

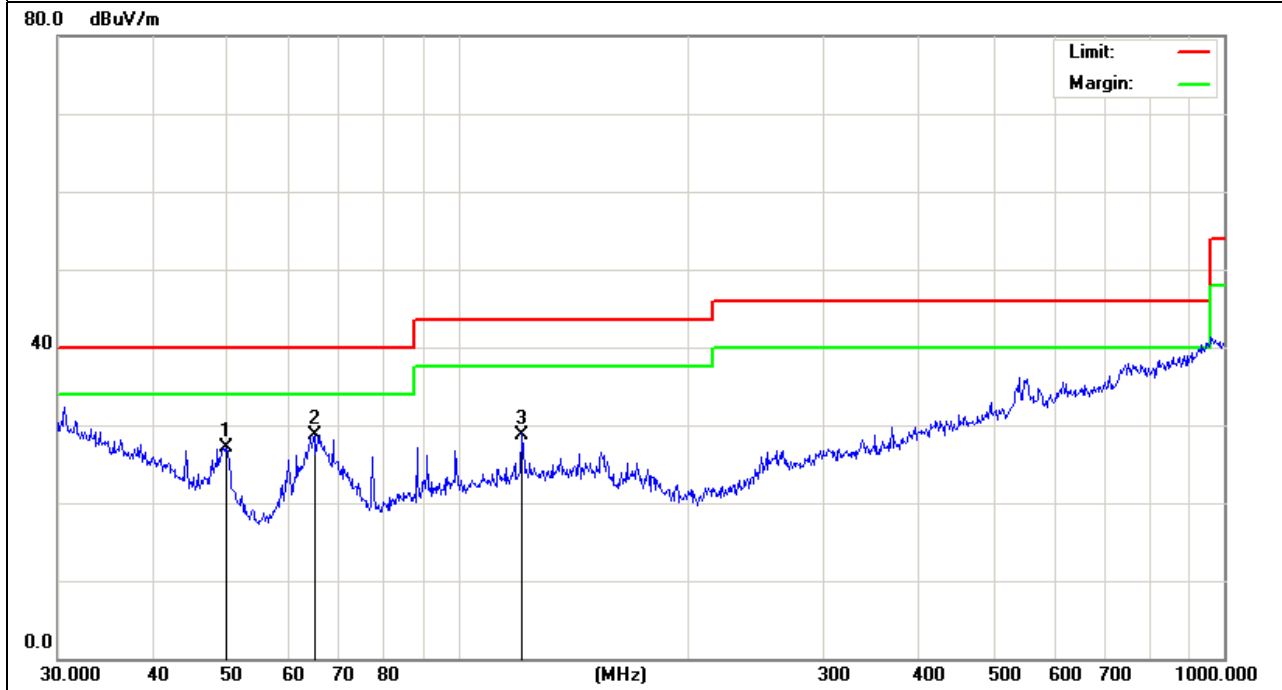


EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 3.7V by battery		
Test Mode :	TX		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
49.7068	18.89	8.31	27.2	40	-12.8	QP
64.8863	23.26	5.35	28.61	40	-11.39	QP
121.123	17	11.8	28.8	43.5	-14.7	QP

Remark:

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

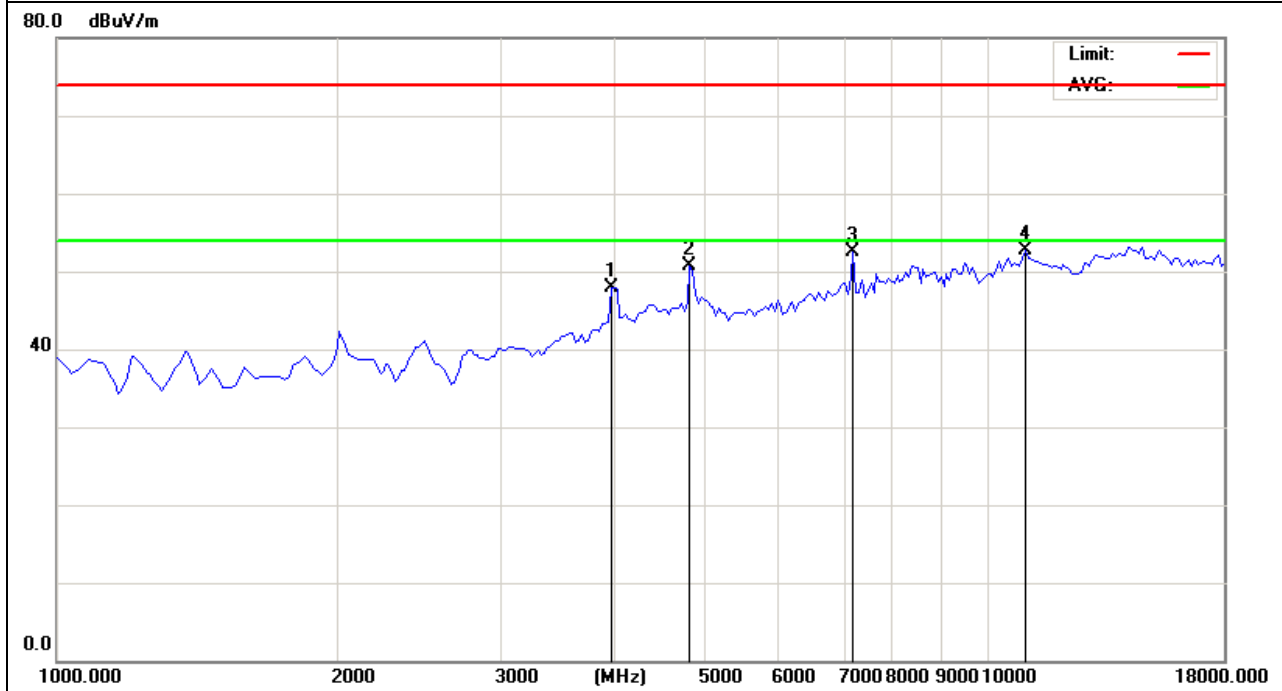


3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
3975	54.39	-6.52	47.87	74	-26.13	peak
4825	54.37	-3.59	50.78	74	-23.22	peak
7205	53.46	-0.96	52.5	74	-21.5	peak
11072.50 0	49.17	3.56	52.73	74	-21.27	peak

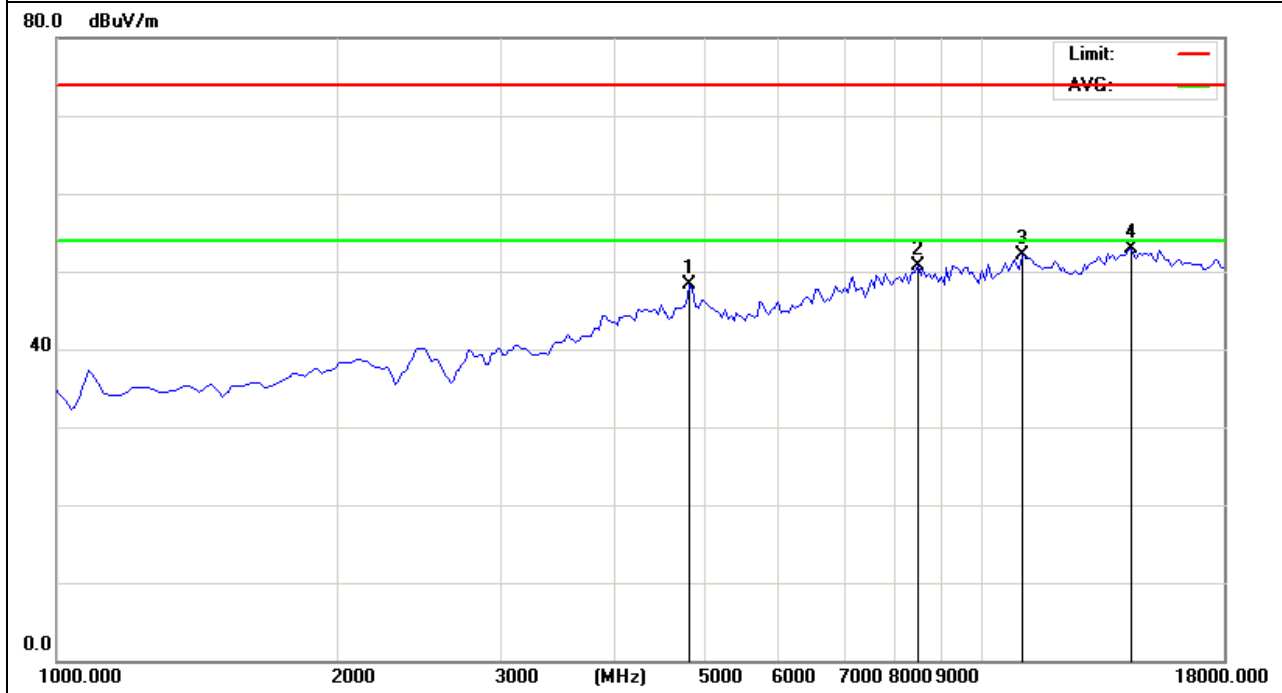
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4825	51.81	-3.59	48.22	74	-25.78	peak
8437.5	49.79	0.84	50.63	74	-23.37	peak
10945.00 0	47.65	4.37	52.02	74	-21.98	peak
14387.50 0	46.06	6.78	52.84	74	-21.16	peak

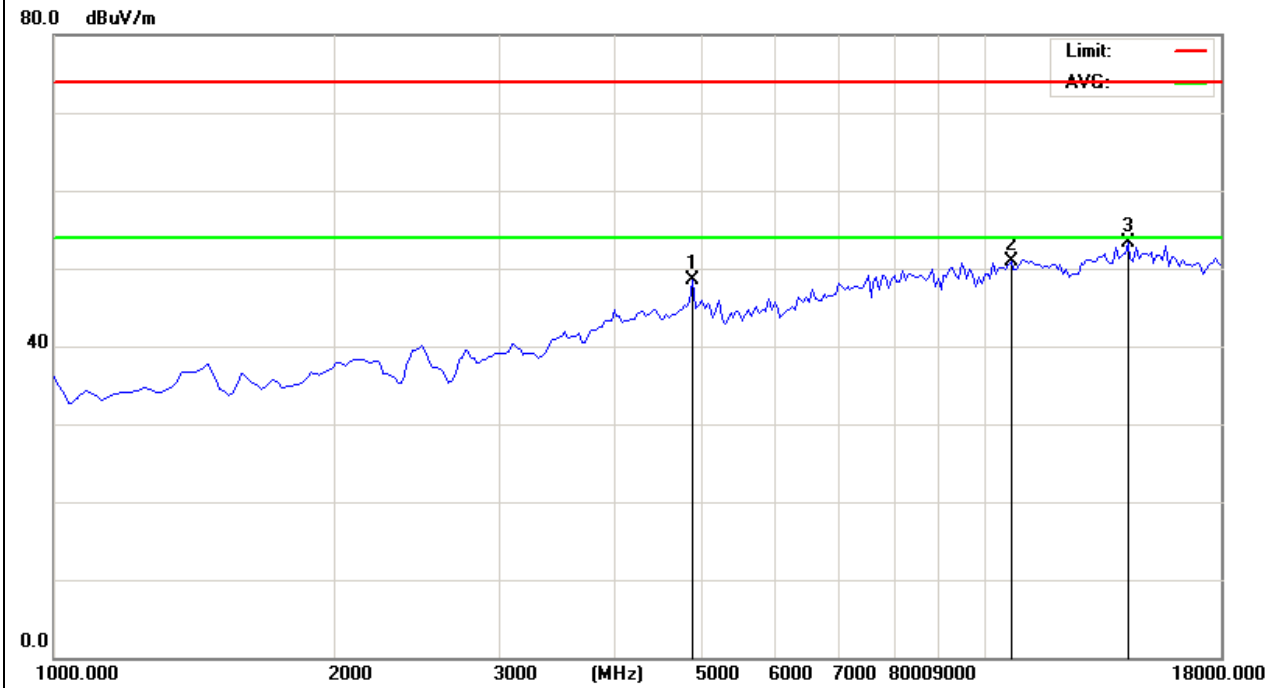
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4867.5	52.14	-3.61	48.53	74	-25.47	peak
10732.50 0	47.67	3.24	50.91	74	-23.09	peak
14302.50 0	46.87	6.34	53.21	74	-20.79	peak

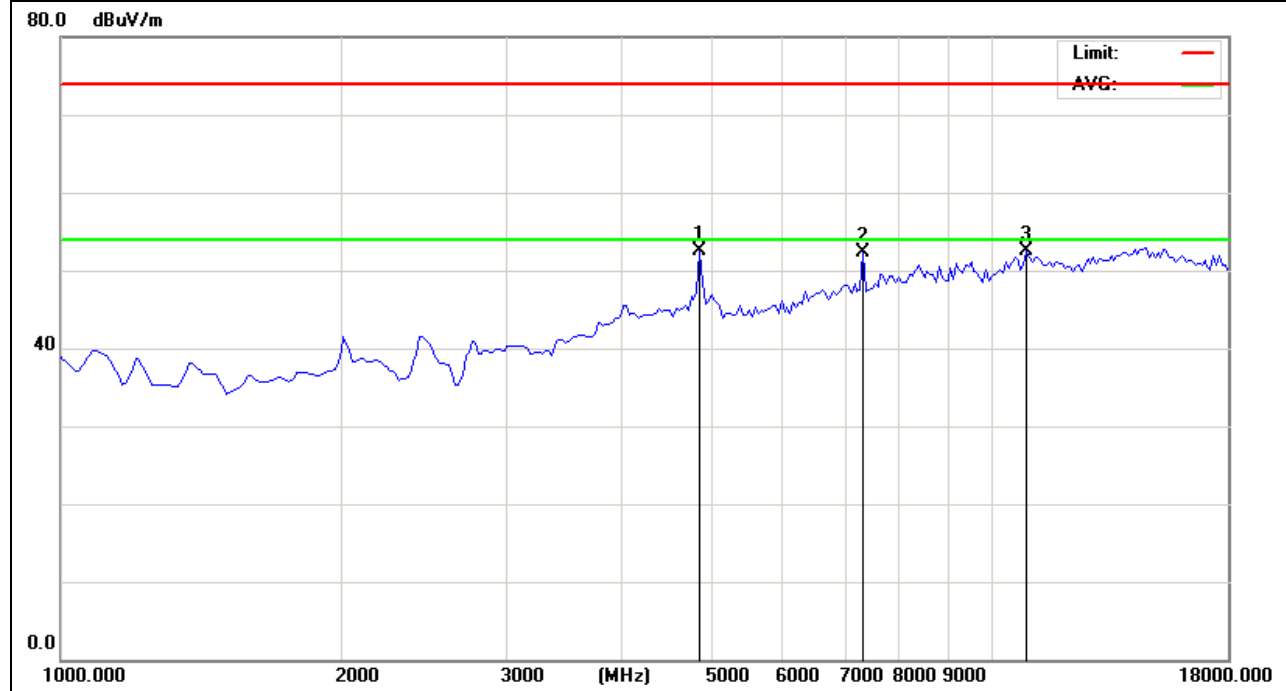
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4867.5	56.19	-3.61	52.58	74	-21.42	peak
7332.5	53.09	-0.82	52.27	74	-21.73	peak
10945.00 0	48.13	4.37	52.5	74	-21.5	peak

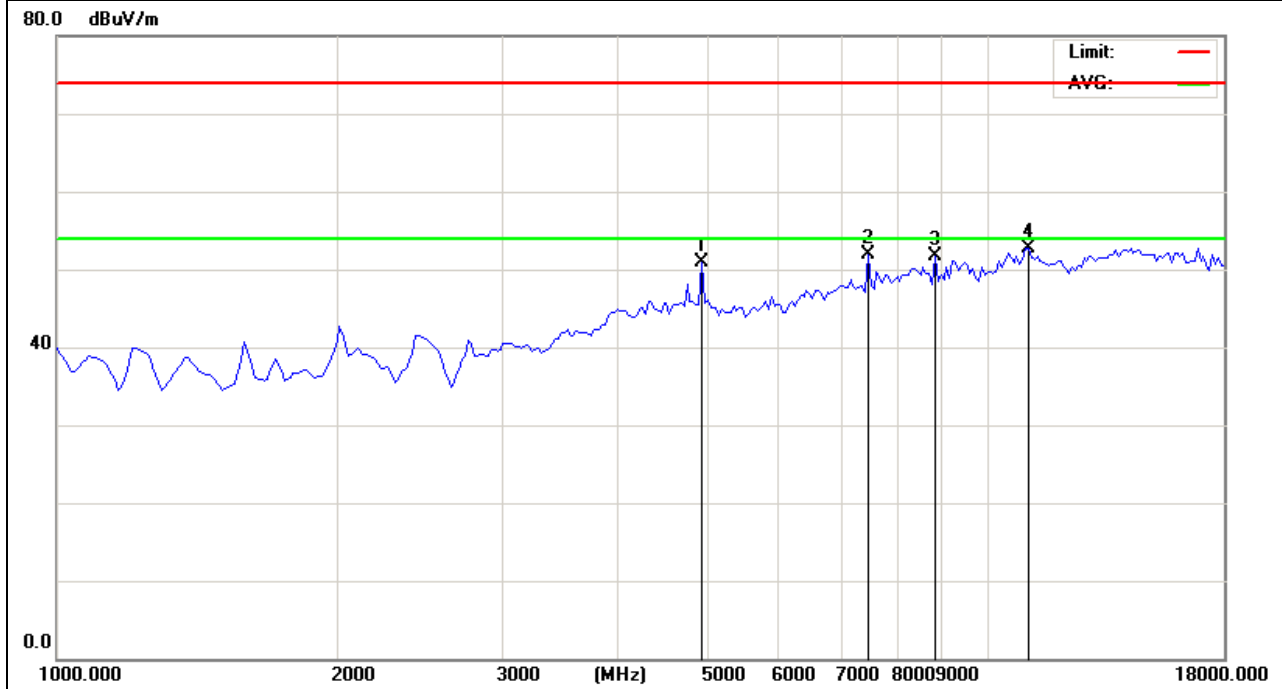
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4952.5	54.37	-3.55	50.82	74	-23.18	peak
7460	52.57	-0.68	51.89	74	-22.11	peak
8820	50.43	1.24	51.67	74	-22.33	peak
11157.50 0	49.66	3.13	52.79	74	-21.21	peak

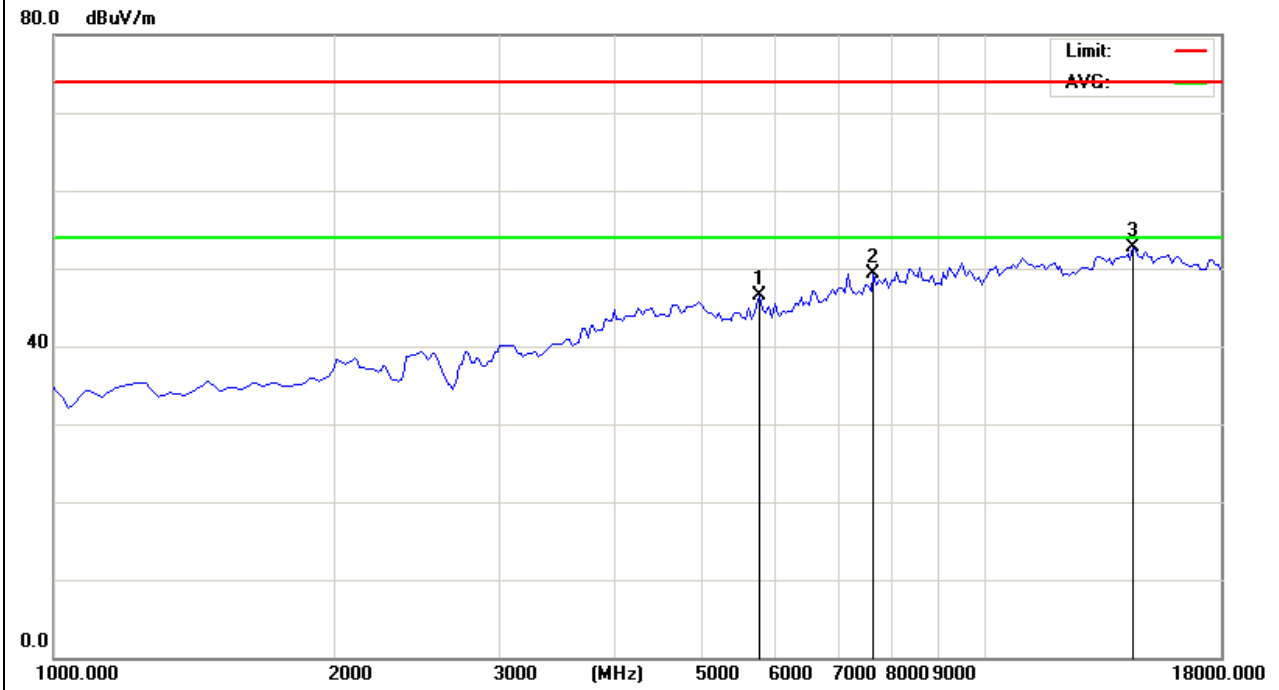
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
5760	50.36	-3.93	46.43	74	-27.57	peak
7672.5	49.36	0.01	49.37	74	-24.63	peak
14515.00 0	46.25	6.4	52.65	74	-21.35	peak

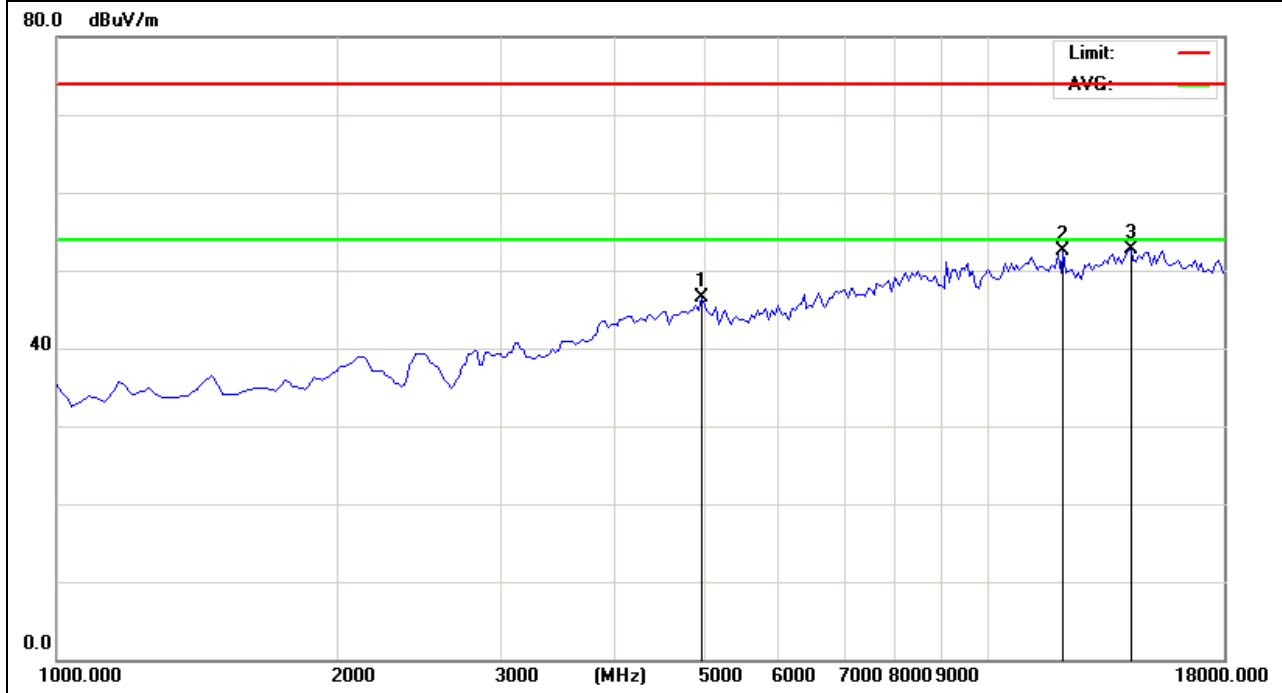
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4952.5	50.07	-3.55	46.52	74	-27.48	peak
12135.00 0	45.99	6.42	52.41	74	-21.59	peak
14345.00 0	46.32	6.46	52.78	74	-21.22	peak

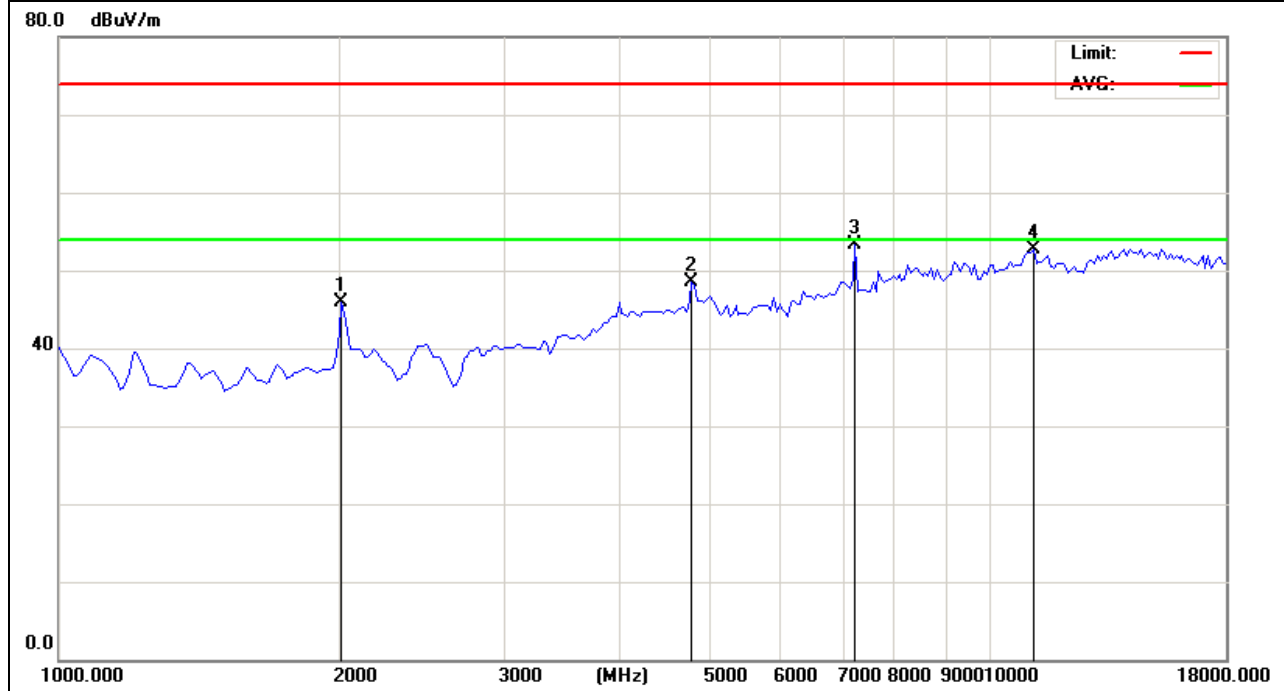
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2020	58.79	-12.92	45.87	74	-28.13	peak
4825	52.14	-3.59	48.55	74	-25.45	peak
7205	54.18	-0.96	53.22	74	-20.78	peak
11242.50 0	50.05	2.67	52.72	74	-21.28	peak

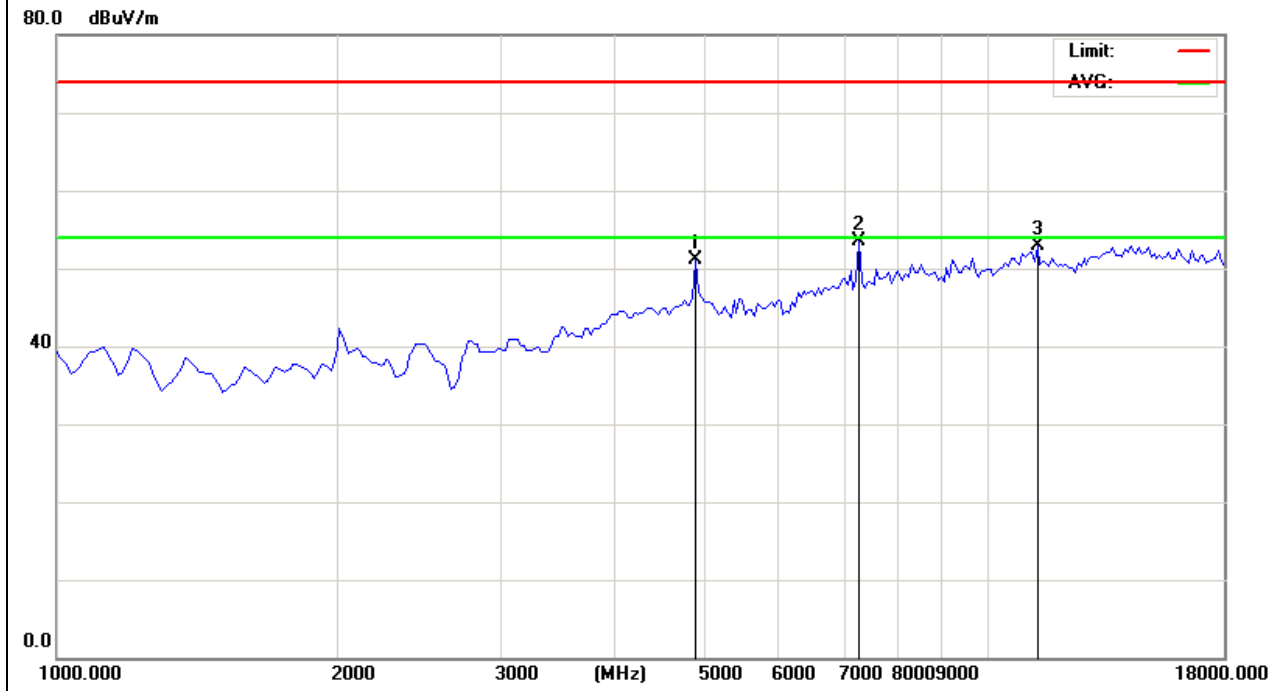
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4867.5	54.72	-3.61	51.11	74	-22.89	peak
7332.5	54.39	-0.82	53.57	74	-20.43	peak
11412.50 0	49.66	3.2	52.86	74	-21.14	peak

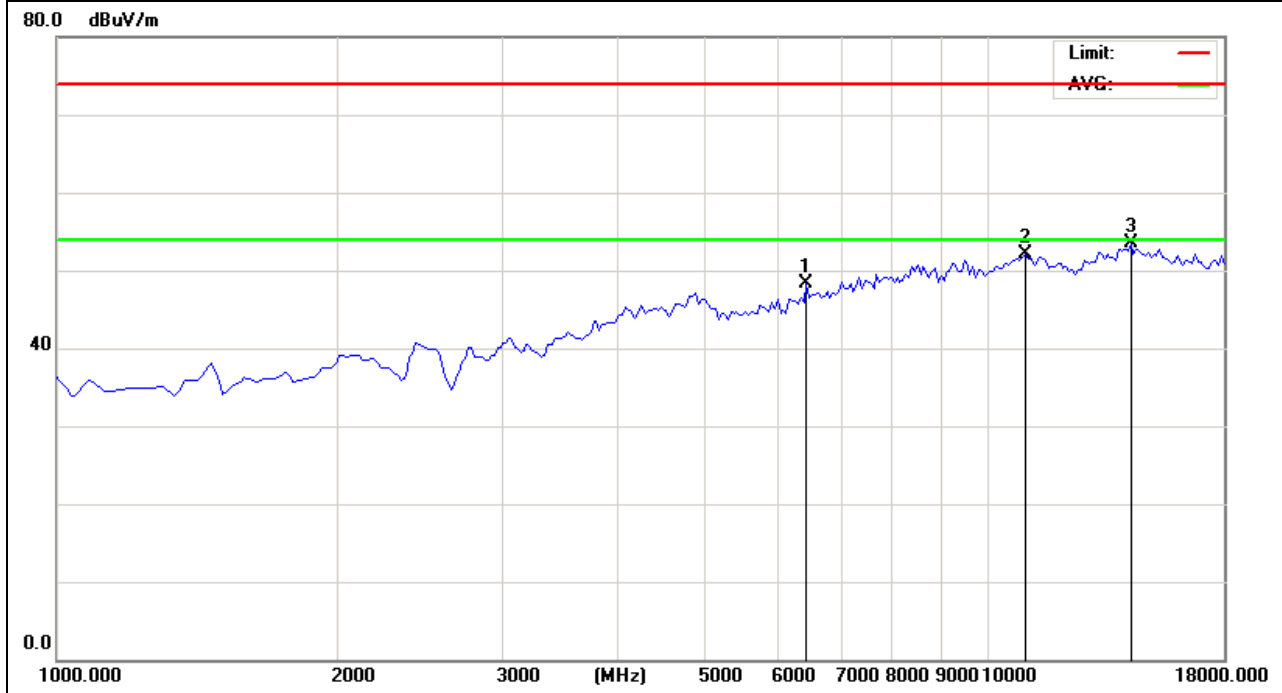
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
6440	50.2	-1.98	48.22	74	-25.78	peak
11030.00 0	48.24	3.82	52.06	74	-21.94	peak
14302.50 0	47.1	6.34	53.44	74	-20.56	peak

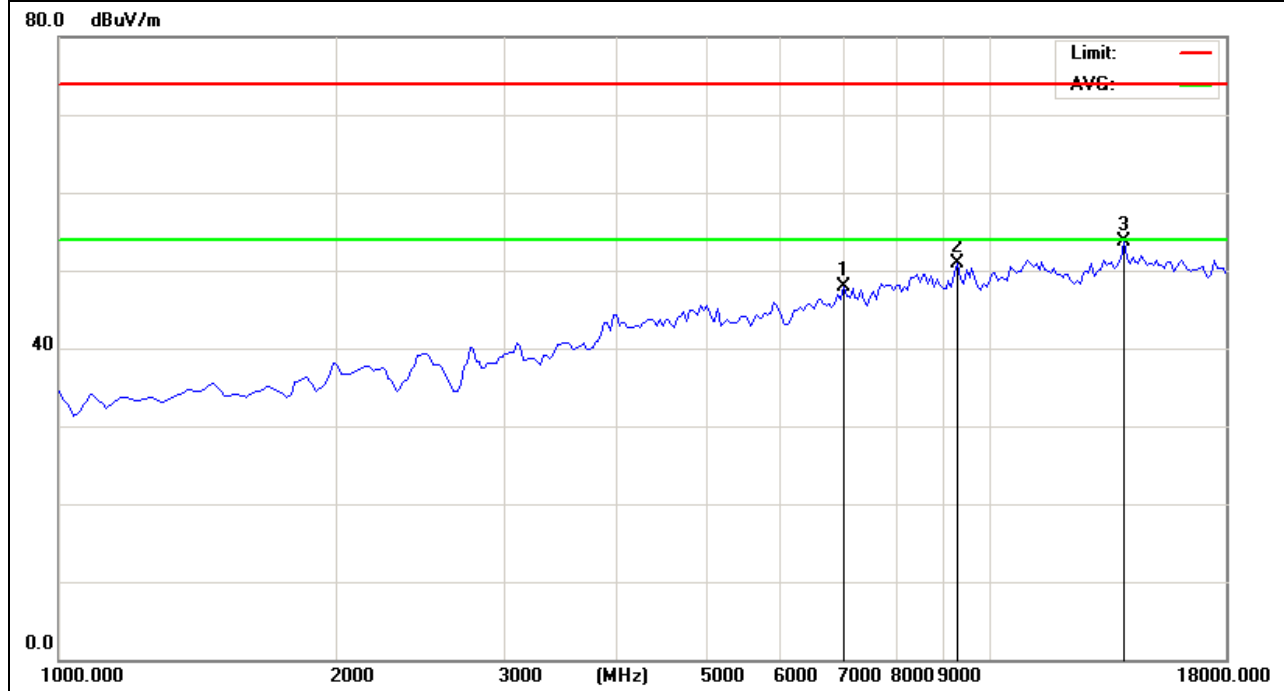
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX 2480MHz – CH 80(2Mbps)	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
7035	47.83	0.03	47.86	74	-26.14	peak
9287.5	48.65	2.27	50.92	74	-23.08	peak
14047.50 0	48.01	5.71	53.72	74	-20.28	peak

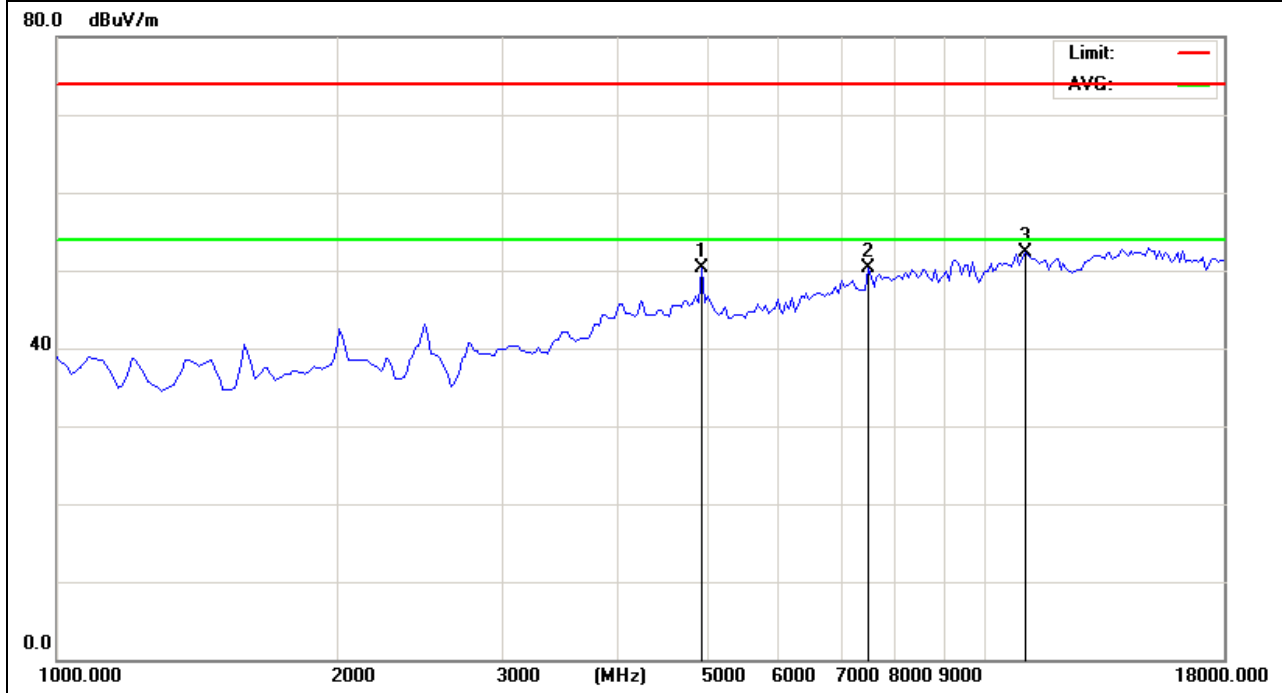
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
4952.5	53.91	-3.55	50.36	74	-23.64	peak
7460	51.03	-0.68	50.35	74	-23.65	peak
11072.50 0	48.82	3.56	52.38	74	-21.62	peak

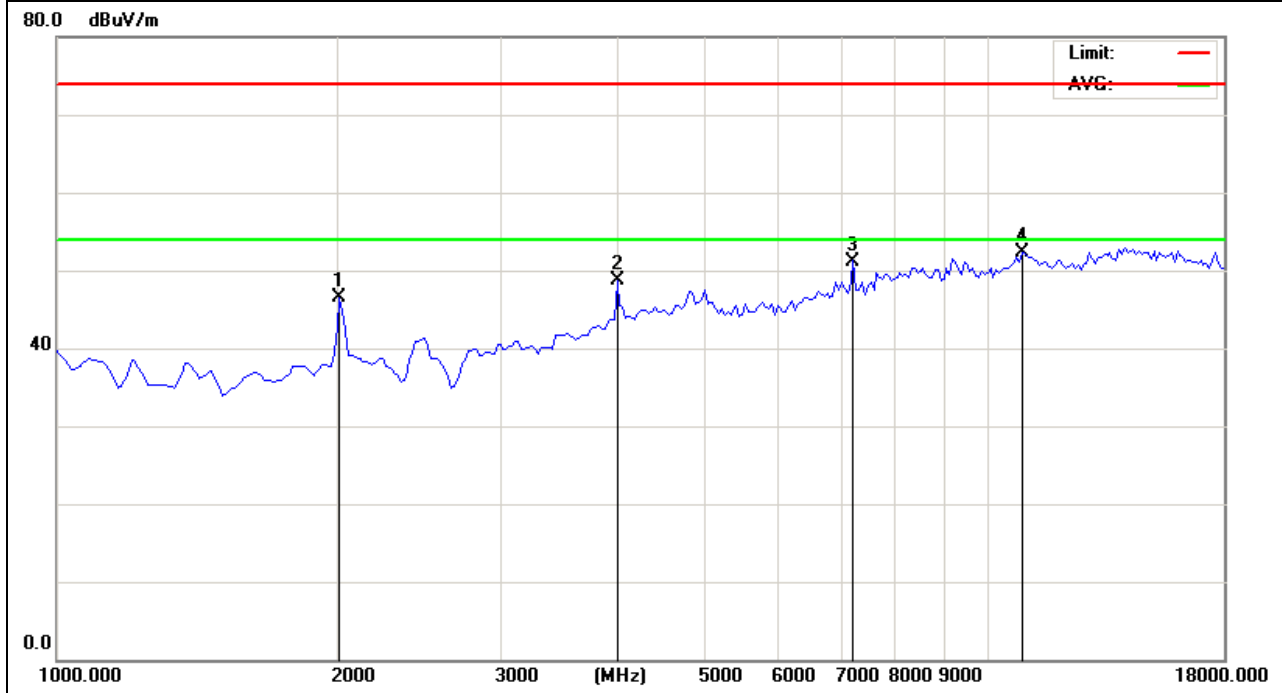
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2020	59.52	-12.92	46.6	74	-27.4	peak
4017.5	55.04	-6.33	48.71	74	-25.29	peak
7205	52.16	-0.96	51.2	74	-22.8	peak
10945.00 0	47.96	4.37	52.33	74	-21.67	peak

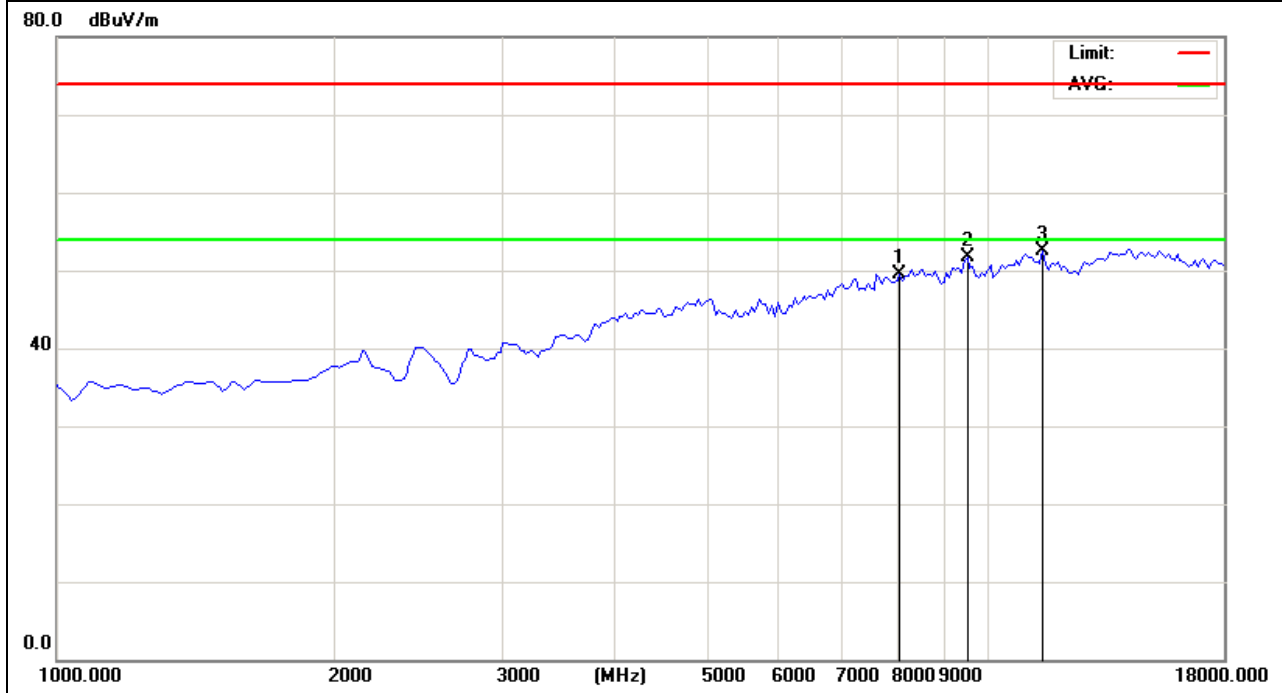
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
8097.5	49.15	0.31	49.46	74	-24.54	peak
9542.5	49.67	1.97	51.64	74	-22.36	peak
11540.00 0	49.6	2.92	52.52	74	-21.48	peak

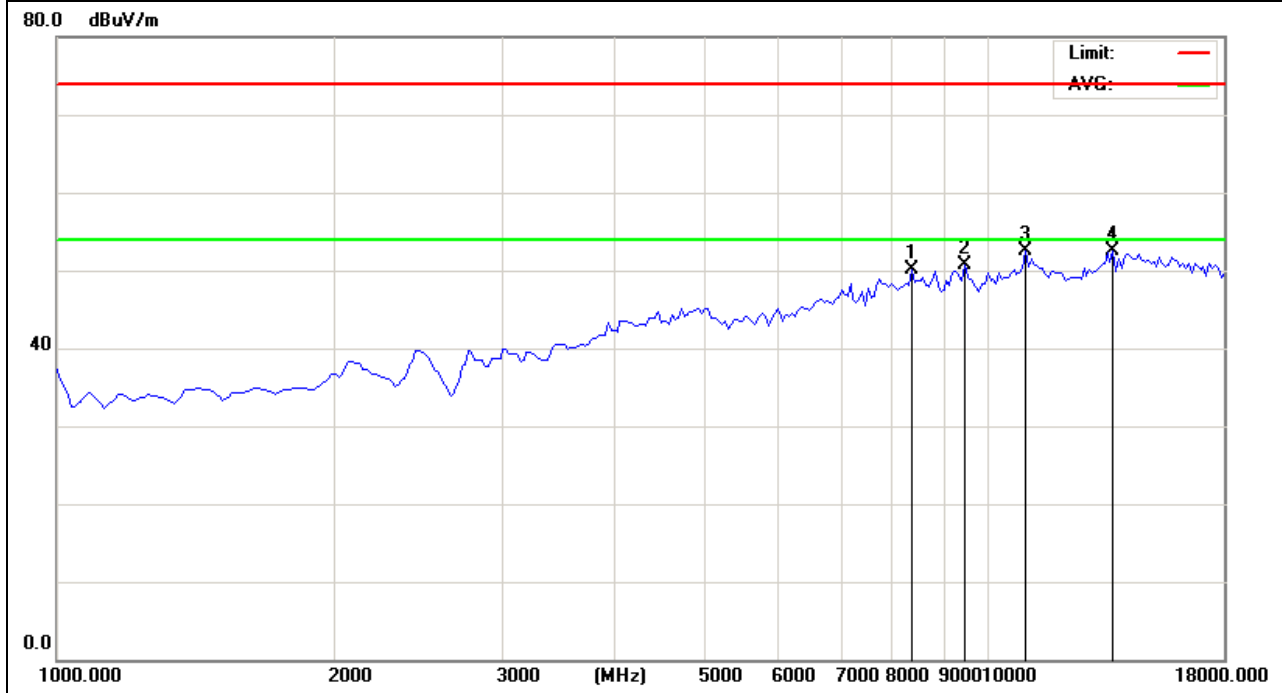
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
8310	48.42	1.65	50.07	74	-23.93	peak
9500	48.18	2.49	50.67	74	-23.33	peak
11030.00 0	48.74	3.82	52.56	74	-21.44	peak
13707.50 0	46.29	6.3	52.59	74	-21.41	peak

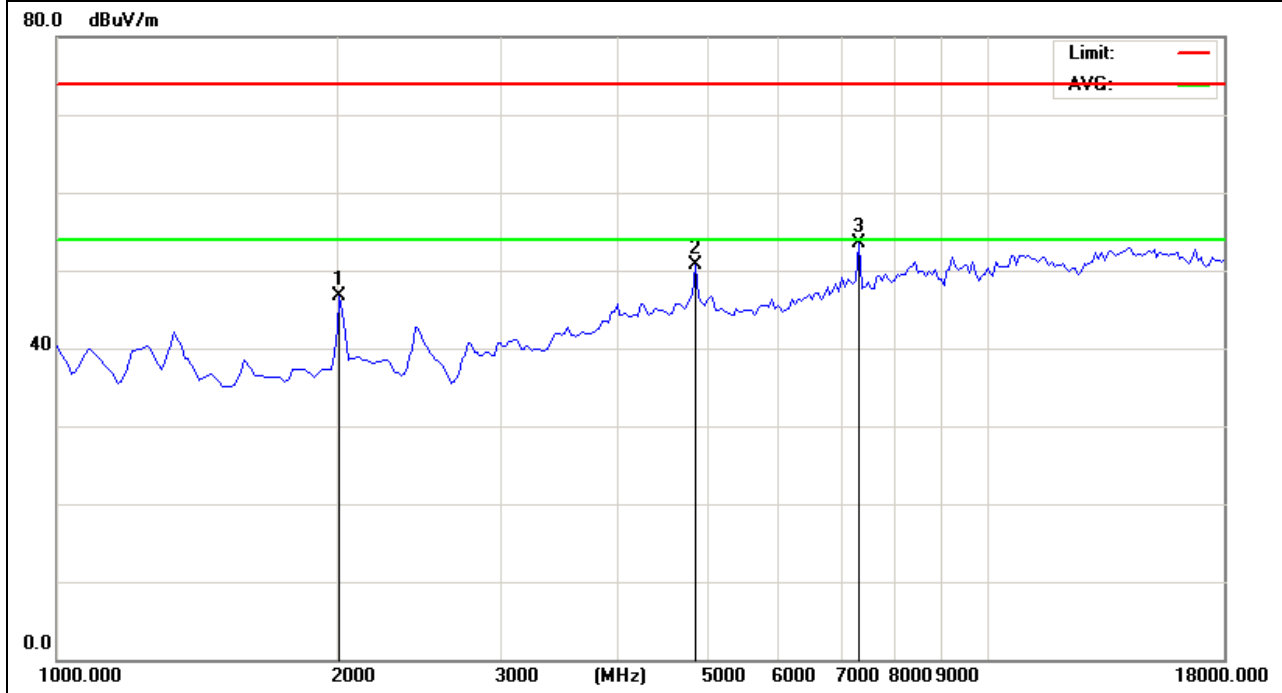
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2020	59.56	-12.92	46.64	74	-27.36	peak
4867.5	54.31	-3.61	50.7	74	-23.3	peak
7332.5	54.36	-0.82	53.54	74	-20.46	peak

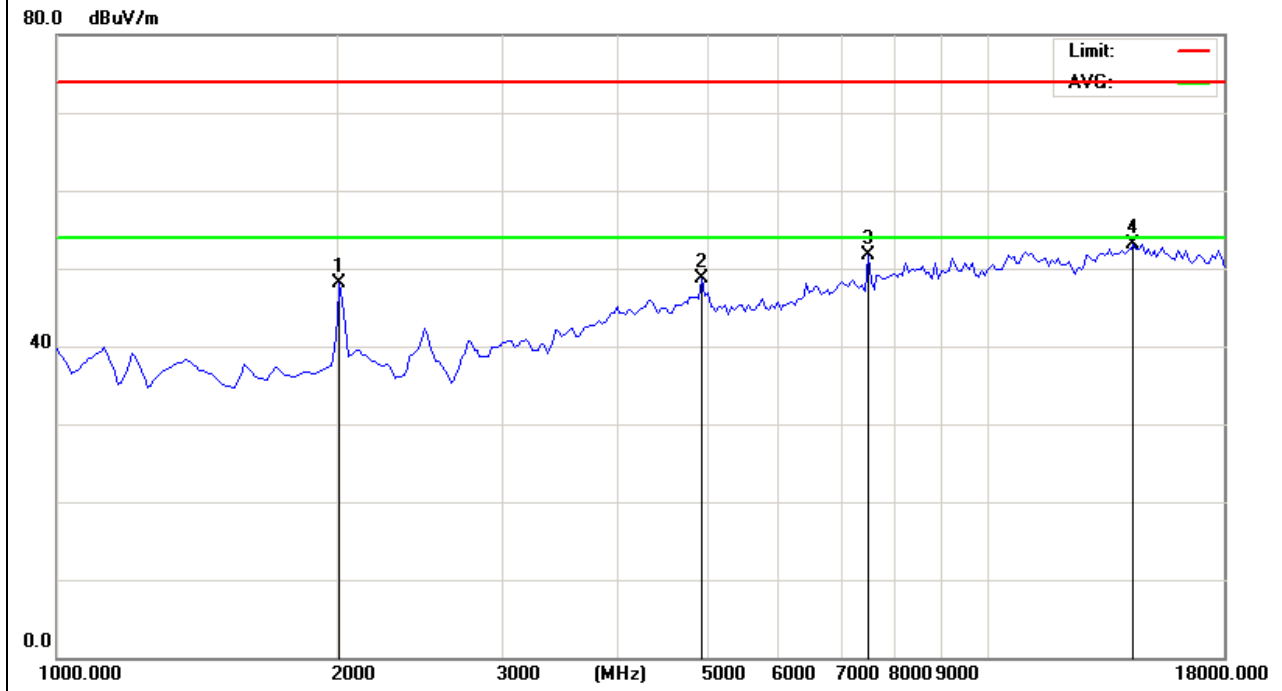
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2020	61.11	-12.92	48.19	74	-25.81	peak
4952.5	52.32	-3.55	48.77	74	-25.23	peak
7460	52.46	-0.68	51.78	74	-22.22	peak
14430.00 0	46.14	6.99	53.13	74	-20.87	peak

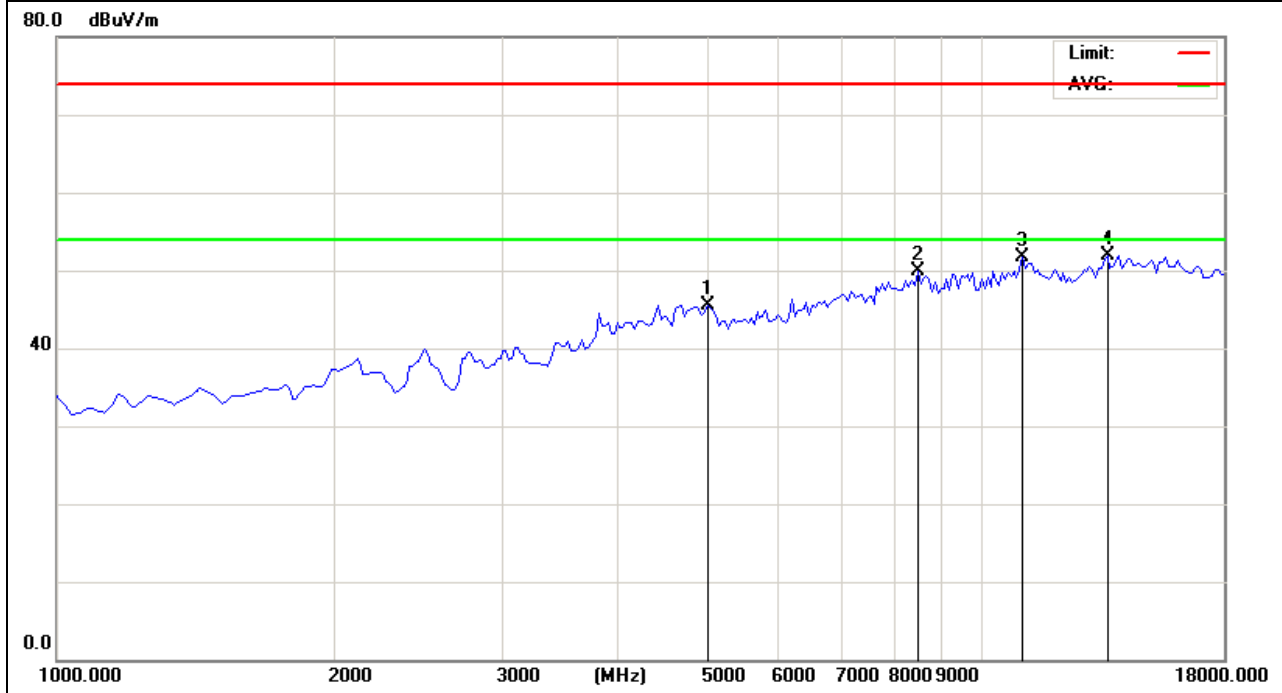
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 No emission above 18GHz



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
5037.5	49.36	-3.83	45.53	74	-28.47	peak
8437.5	49.03	0.84	49.87	74	-24.13	peak
10945.00 0	47.26	4.37	51.63	74	-22.37	peak
13537.50 0	45.34	6.57	51.91	74	-22.09	peak

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

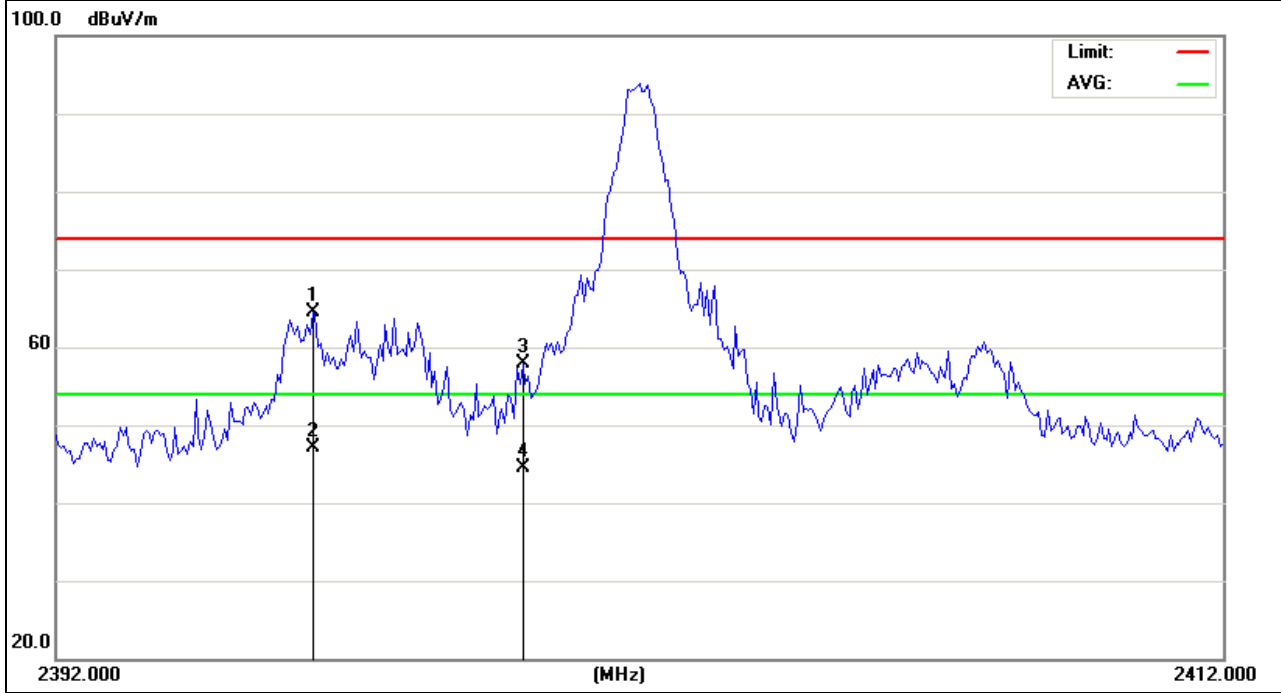


3.2.9 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2396.4	77.51	-13.02	64.49	74	-9.51	peak
2396.4	60.21	-13.02	47.19	54	-6.81	AVG
2400	70.87	-12.99	57.88	74	-16.12	peak
2400	57.58	-12.99	44.59	54	-9.41	AVG

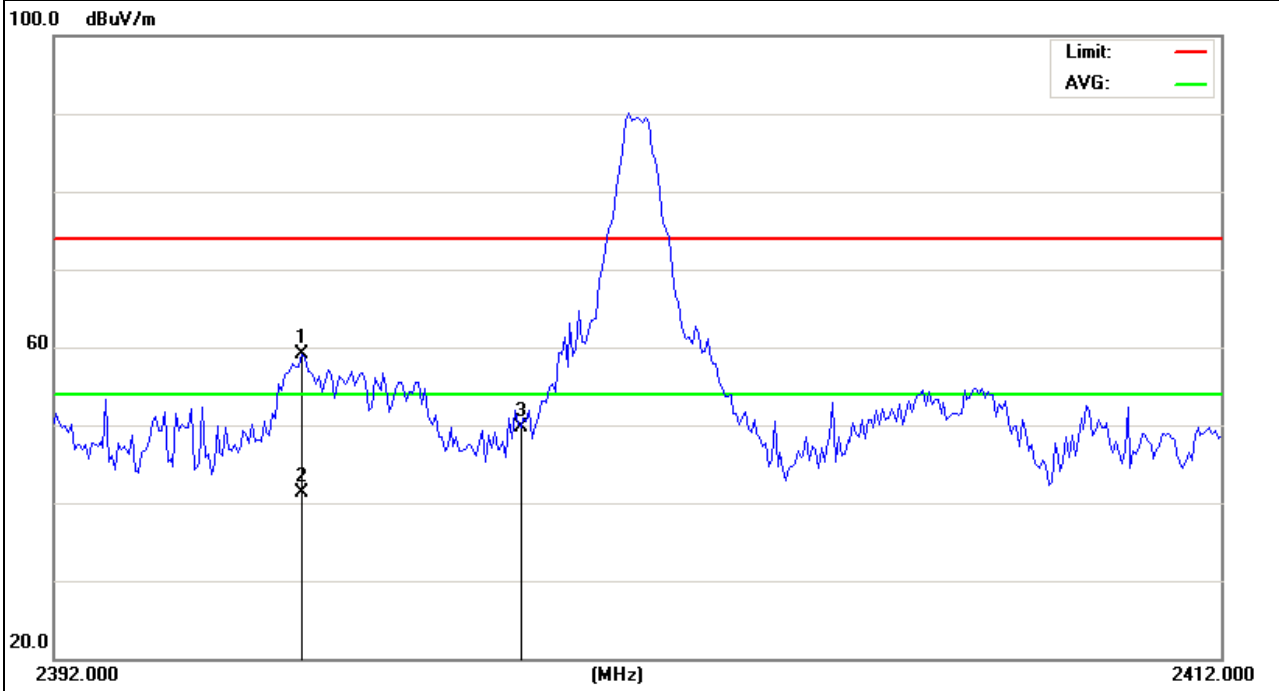
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2396.25	72.04	-13.02	59.02	74	-14.98	peak
2396.25	54.29	-13.02	41.27	54	-12.73	AVG
2400	62.62	-12.99	49.63	74	-24.37	peak

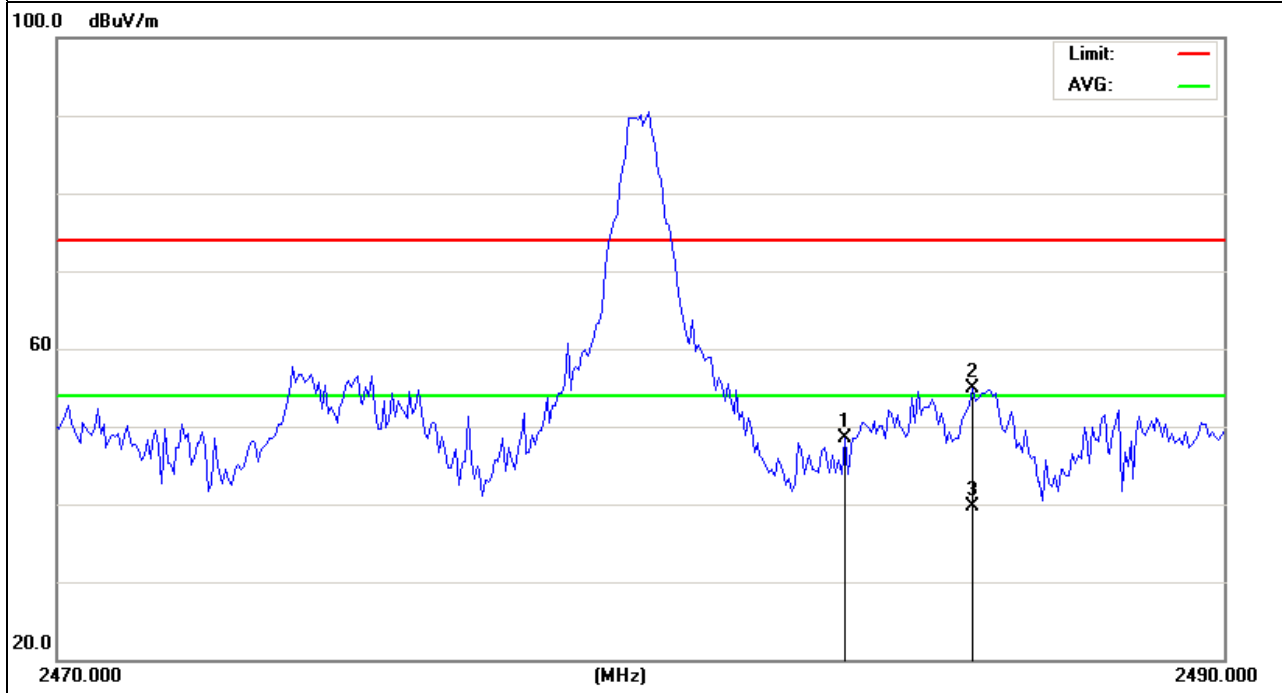
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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	61.28	-12.78	48.5	74	-25.5	peak
2485.7	67.61	-12.78	54.83	74	-19.17	peak
2485.7	52.51	-12.78	39.73	54	-14.27	AVG

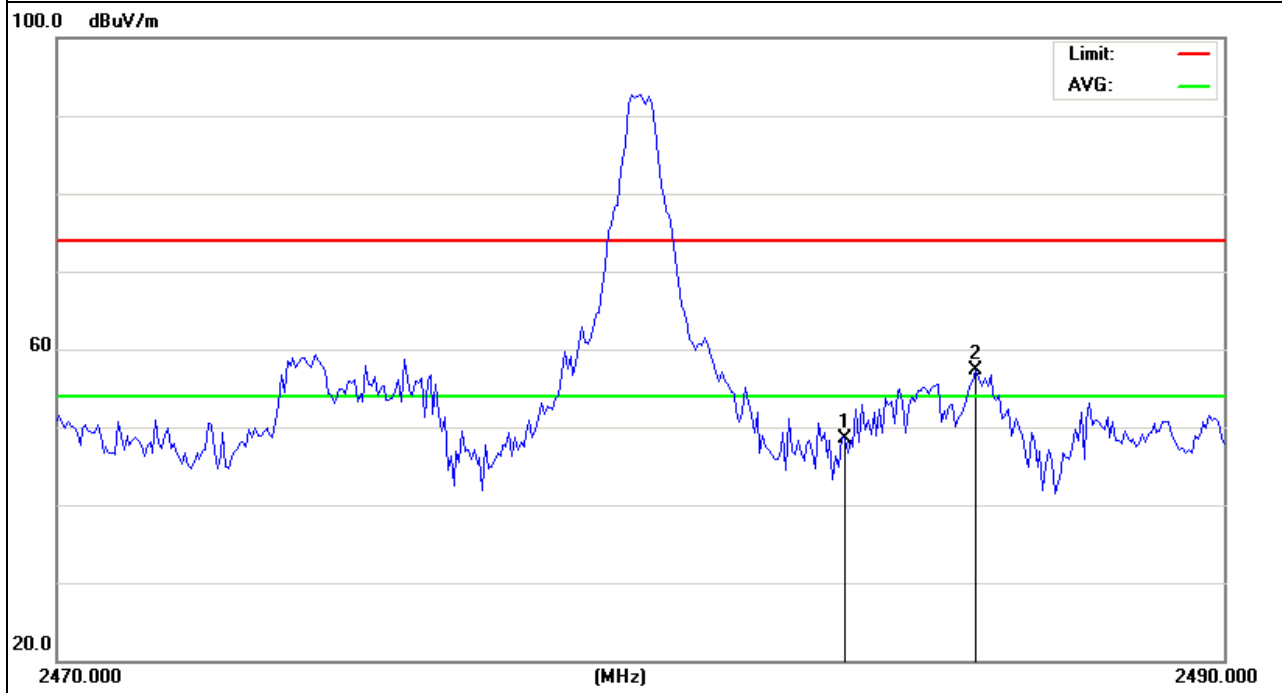
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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	61.31	-12.78	48.53	74	-25.47	peak
2485.75	70.02	-12.78	57.24	74	-16.76	peak

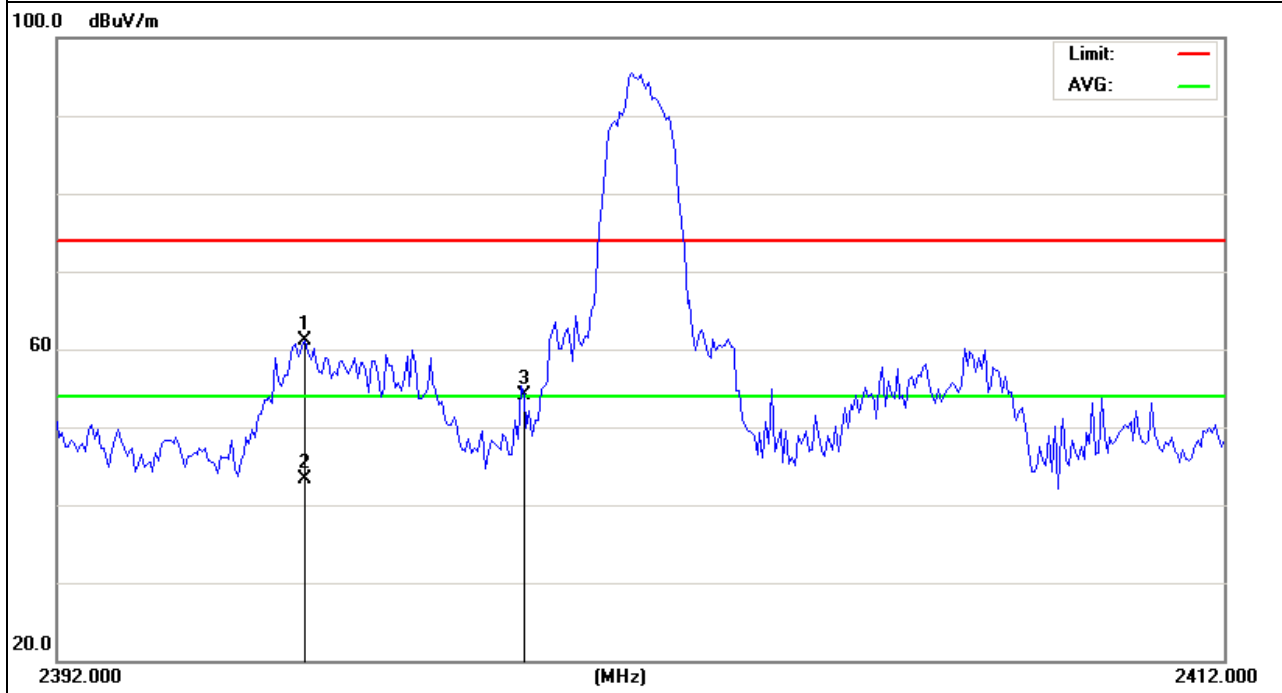
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2396.25	74.03	-13.02	61.01	74	-12.99	peak
2396.25	56.38	-13.02	43.36	54	-10.64	AVG
2400	67.08	-12.99	54.09	74	-19.91	peak

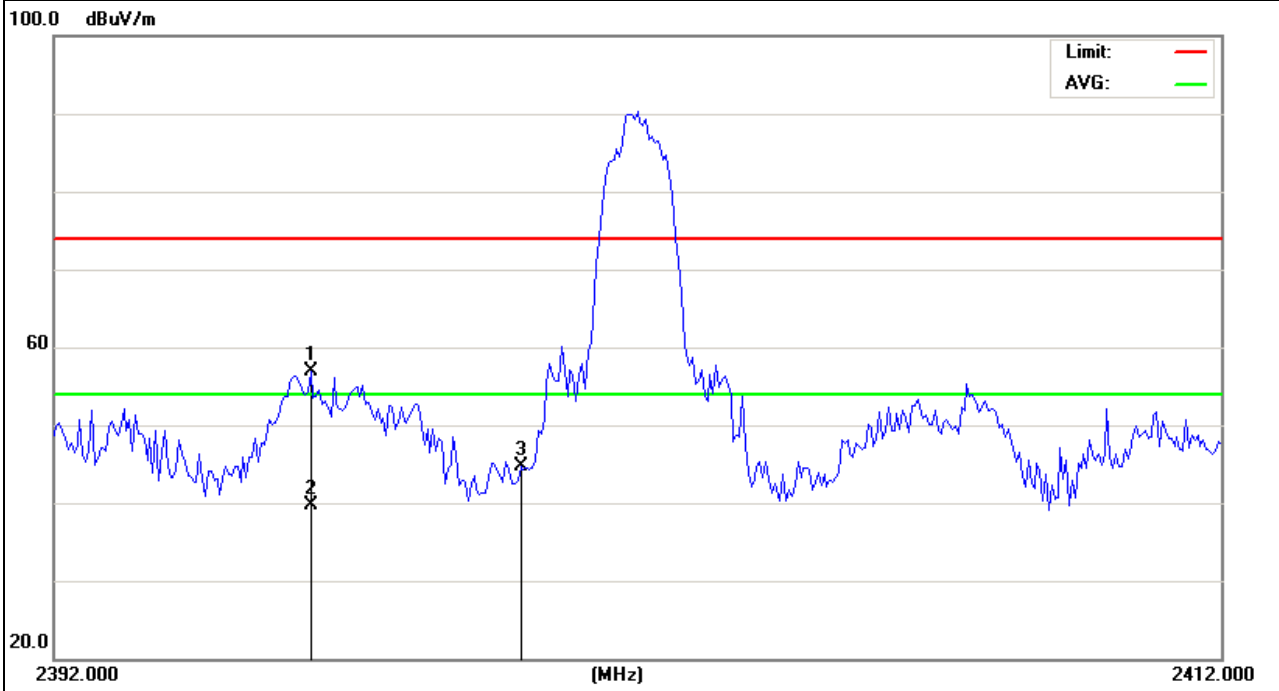
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2396.4	69.97	-13.02	56.95	74	-17.05	peak
2396.4	52.68	-13.02	39.66	54	-14.34	AVG
2400	57.75	-12.99	44.76	74	-29.24	peak

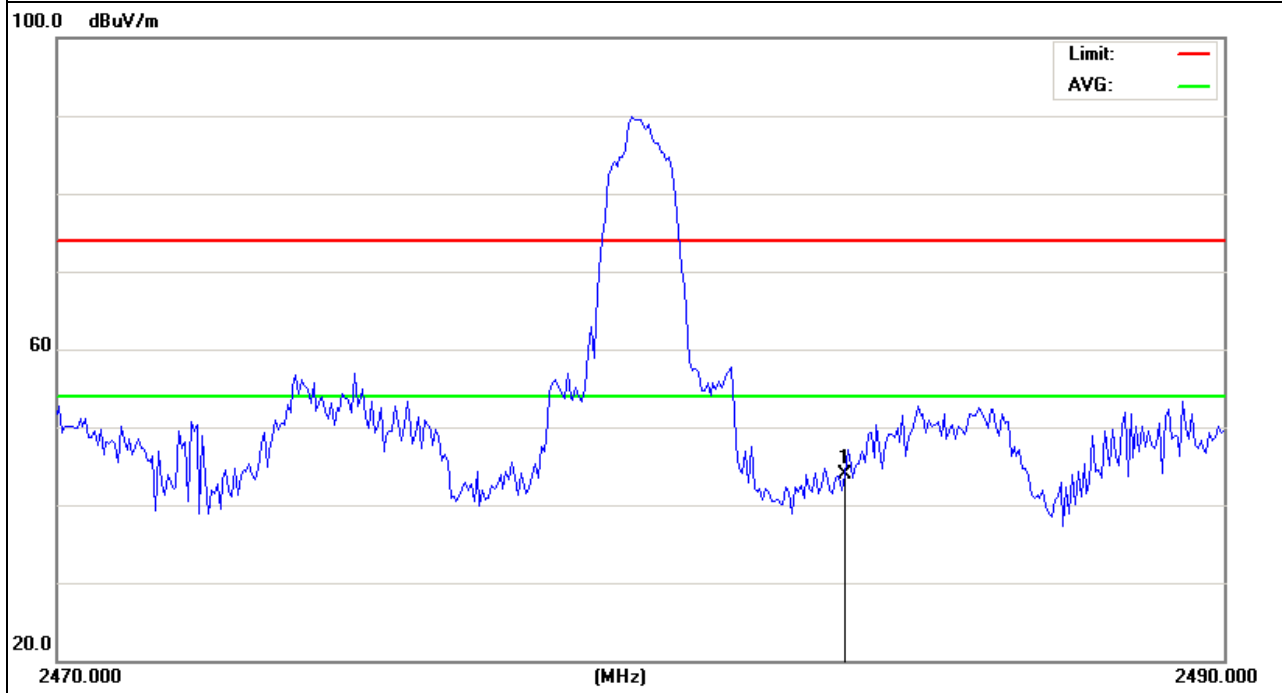
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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	56.73	-12.78	43.95	74	-30.05	peak

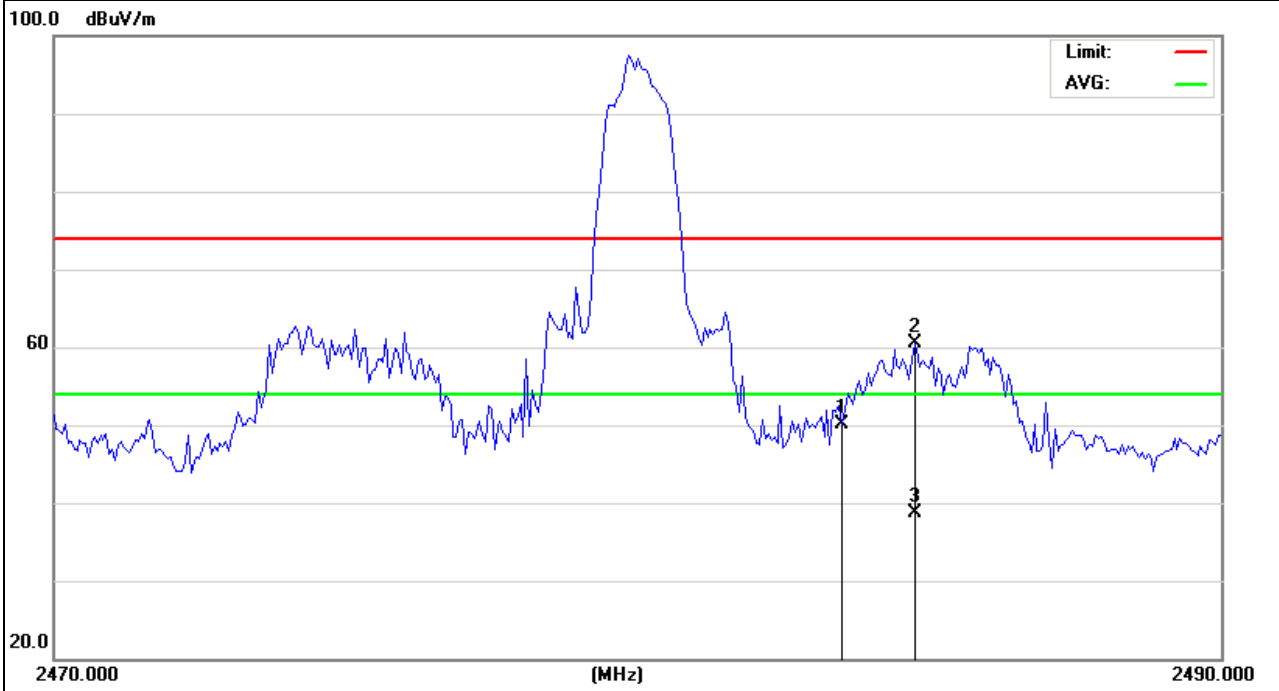
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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	62.93	-12.78	50.15	74	-23.85	peak
2484.75	73.32	-12.78	60.54	74	-13.46	peak
2484.75	51.44	-12.78	38.66	54	-15.34	AVG

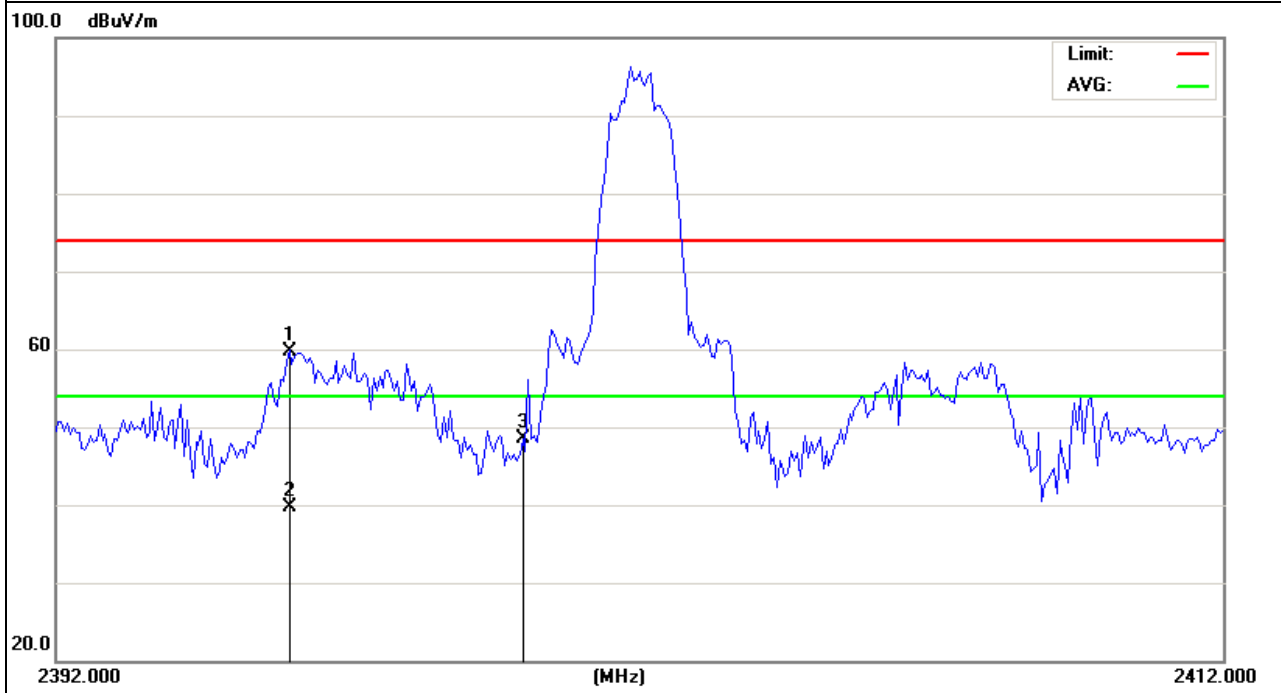
Remark:
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2396	72.82	-13.02	59.8	74	-14.2	peak
2396	52.69	-13.02	39.67	54	-14.33	AVG
2400	61.56	-12.99	48.57	74	-25.43	peak

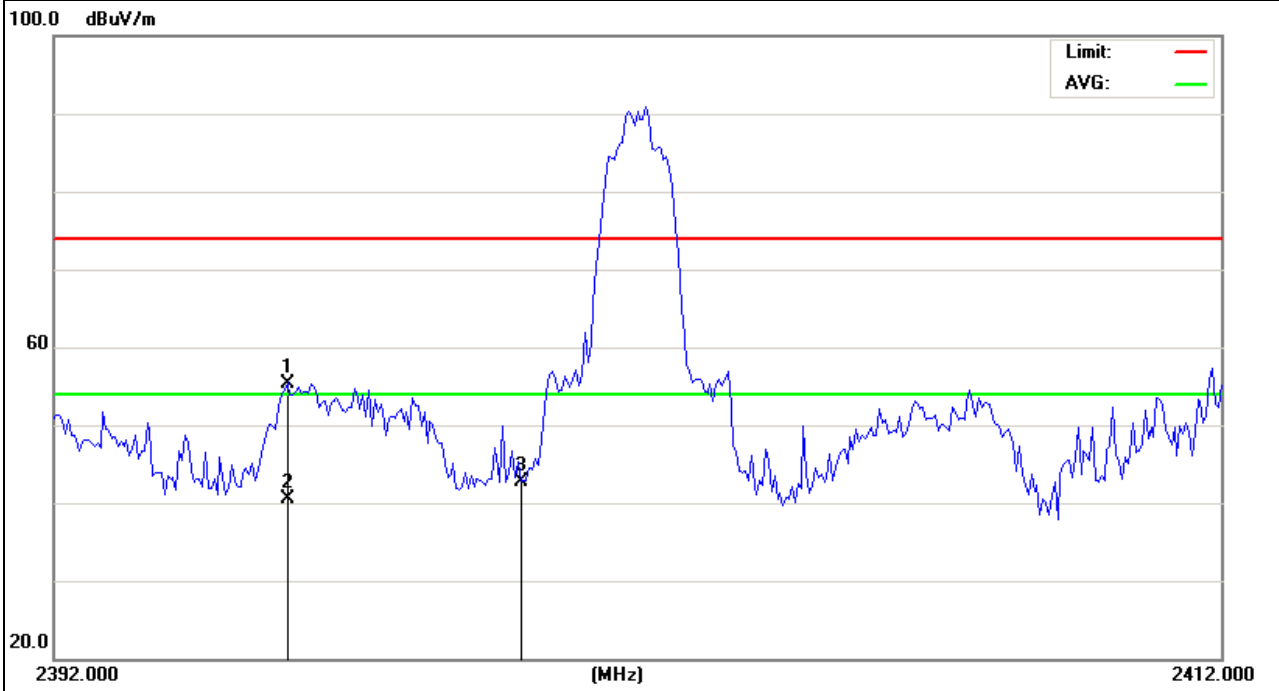
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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
2396	68.42	-13.02	55.4	74	-18.6	peak
2396	53.45	-13.02	40.43	54	-13.57	AVG
2400	55.63	-12.99	42.64	74	-31.36	peak

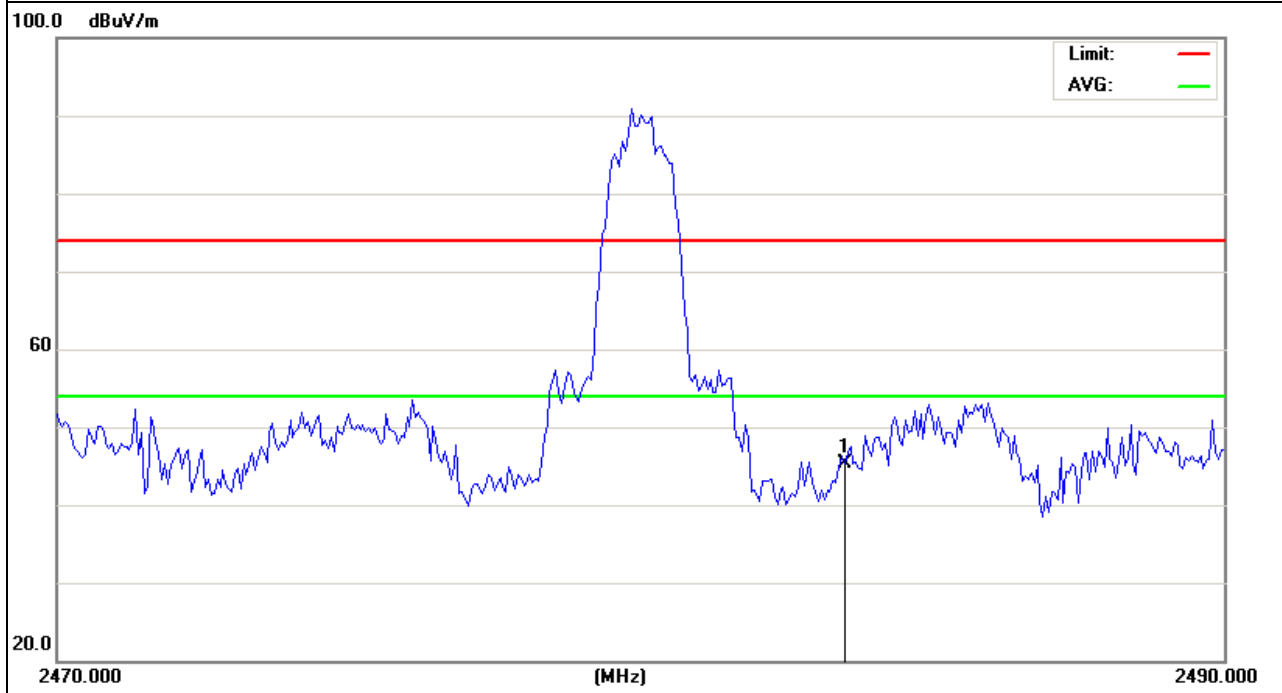
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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	57.98	-12.78	45.2	74	-28.8	peak

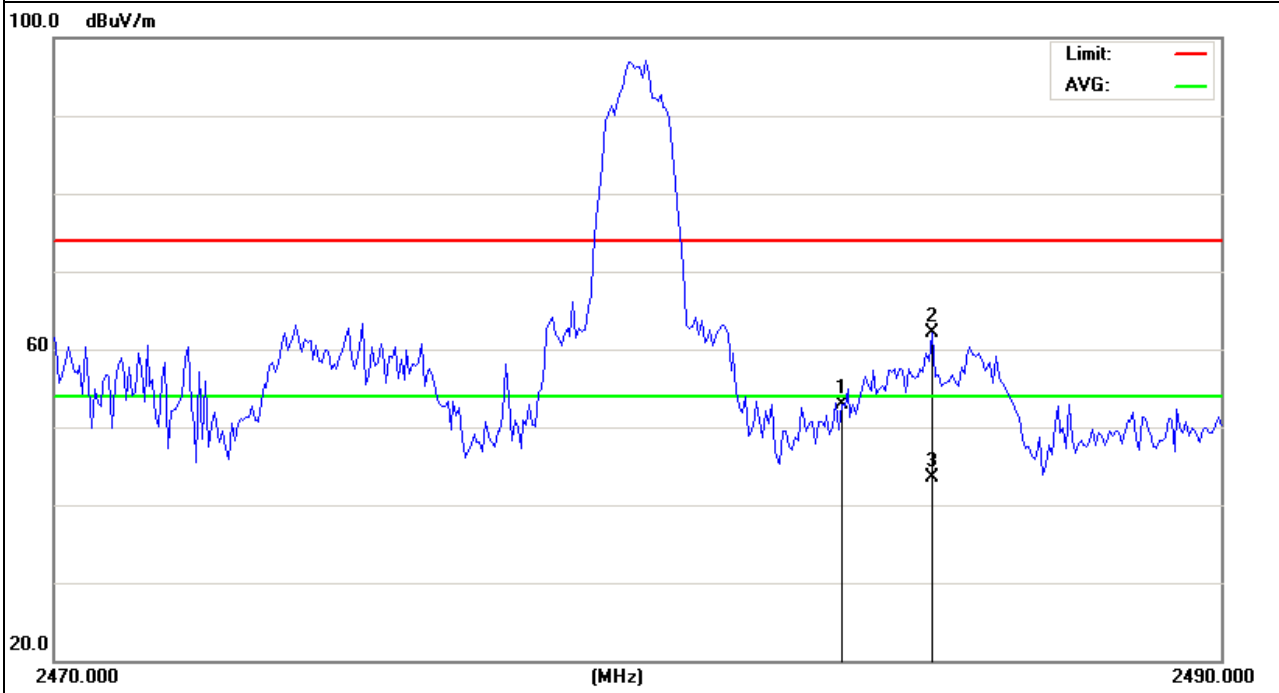
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
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	65.66	-12.78	52.88	74	-21.12	peak
2485.05	74.89	-12.78	62.11	74	-11.89	peak
2485.05	56.37	-12.78	43.59	54	-10.41	AVG

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



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



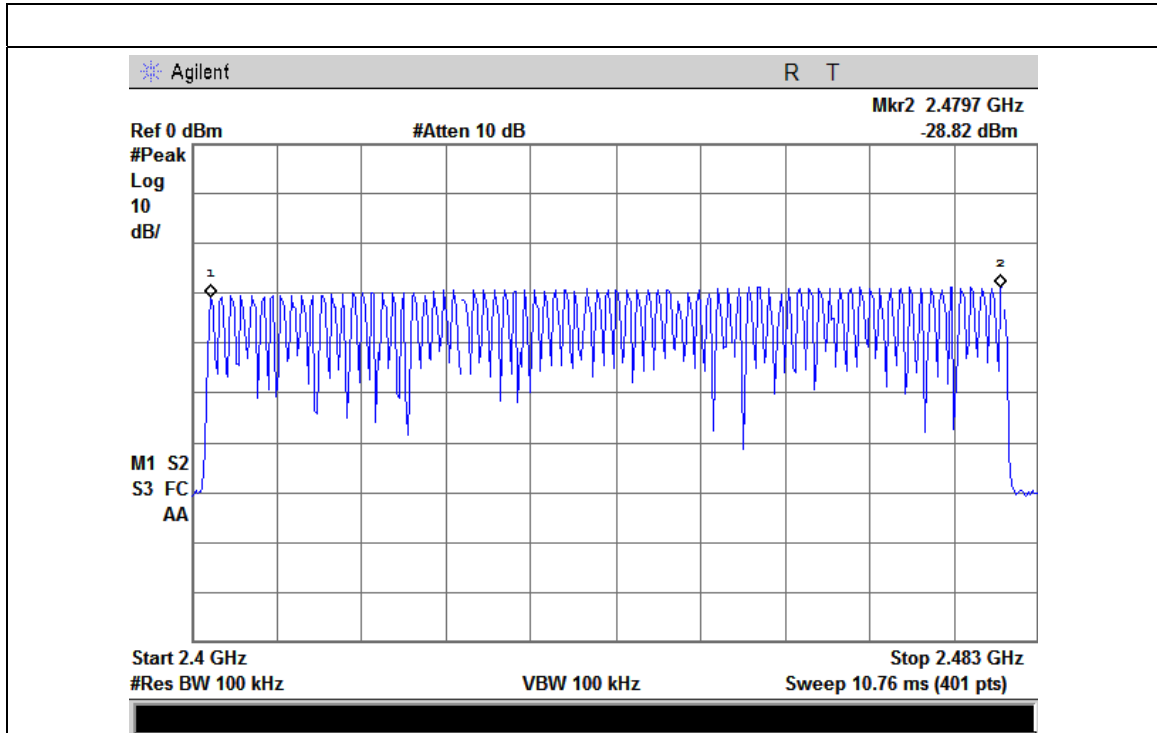
4.1.4 EUT OPERATION CONDITIONS

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 Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	Hopping Mode		

Number of Hopping Channel	79
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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

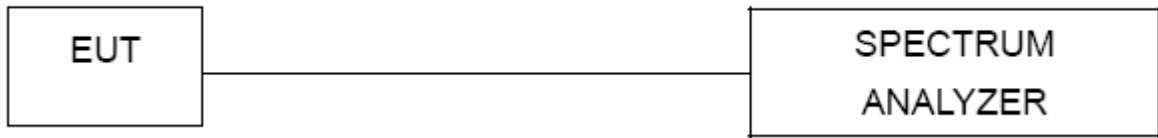
5.1.1 TEST PROCEDURE

- 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



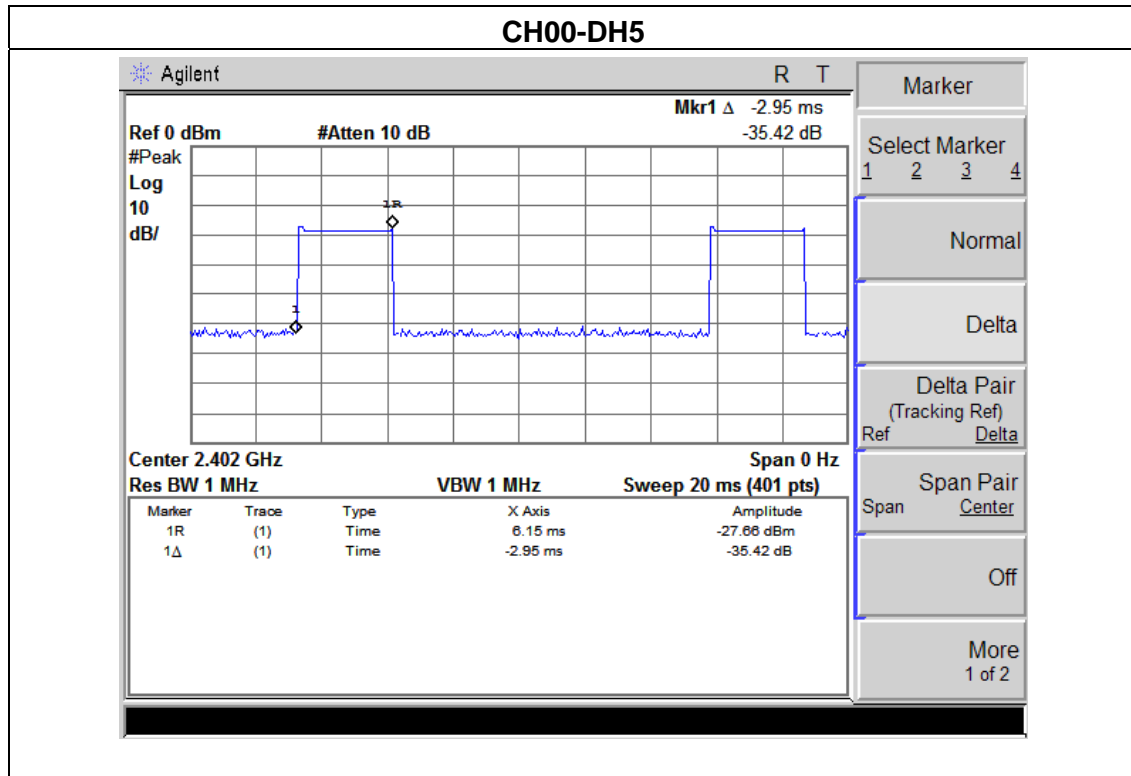
5.1.4 EUT OPERATION CONDITIONS

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.

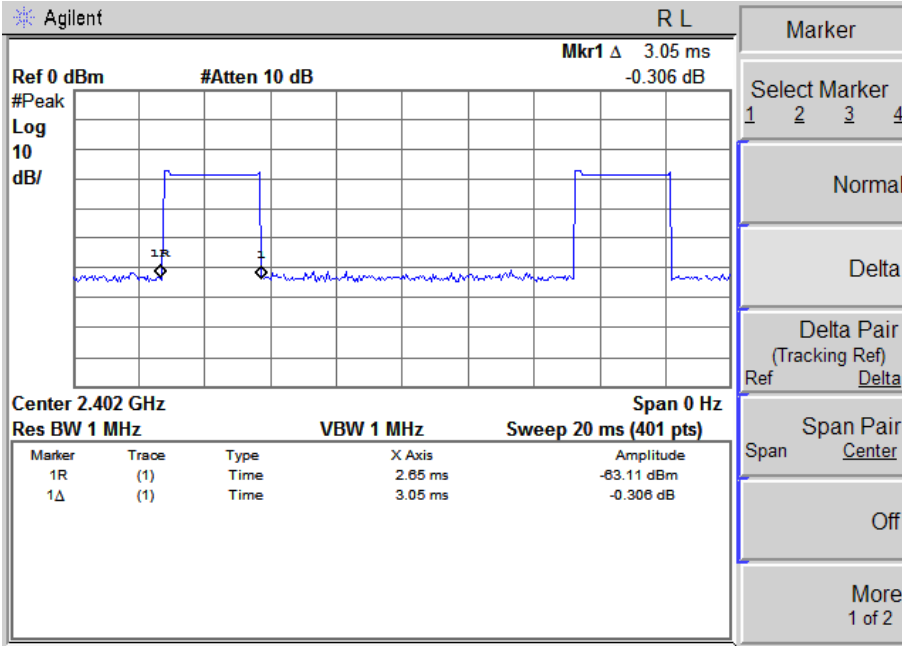
5.1.5 TEST RESULTS

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00-DH5 (1M/2M/3Mbps Mode)		

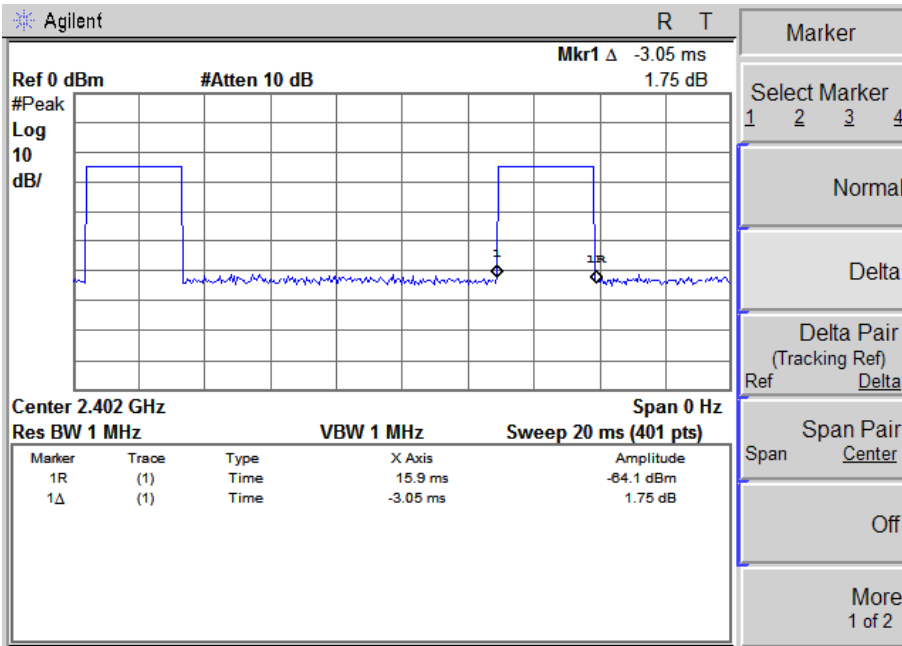
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH5	2402 MHz	2.95	0.31	0.4
2DH5	2402 MHz	3.05	0.33	0.4
3DH5	2402 MHz	3.05	0.33	0.4



CH00-2DH5



CH00-3DH5



NOTE :The dwell time is showed the maximum data of all data(DH1,2DH1,3DH1, DH3,2DH3,3DH3, DH5,2DH5,3DH5), (DH5,2DH5,3DH5) of mode have the maximum dwell time.

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

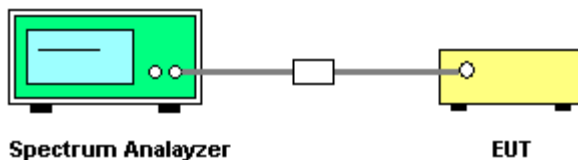
6.1.1 TEST PROCEDURE

- 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

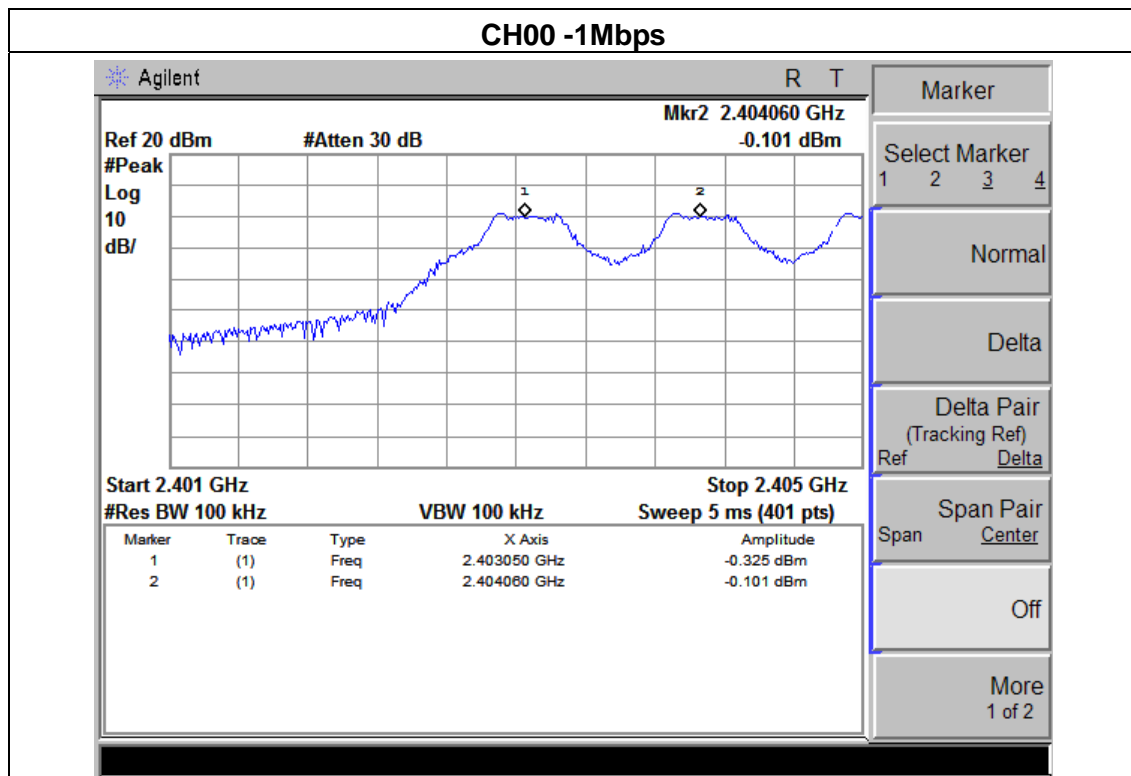
The EUT was programmed to be in continuously transmitting mode.

6.1.5 TEST RESULTS

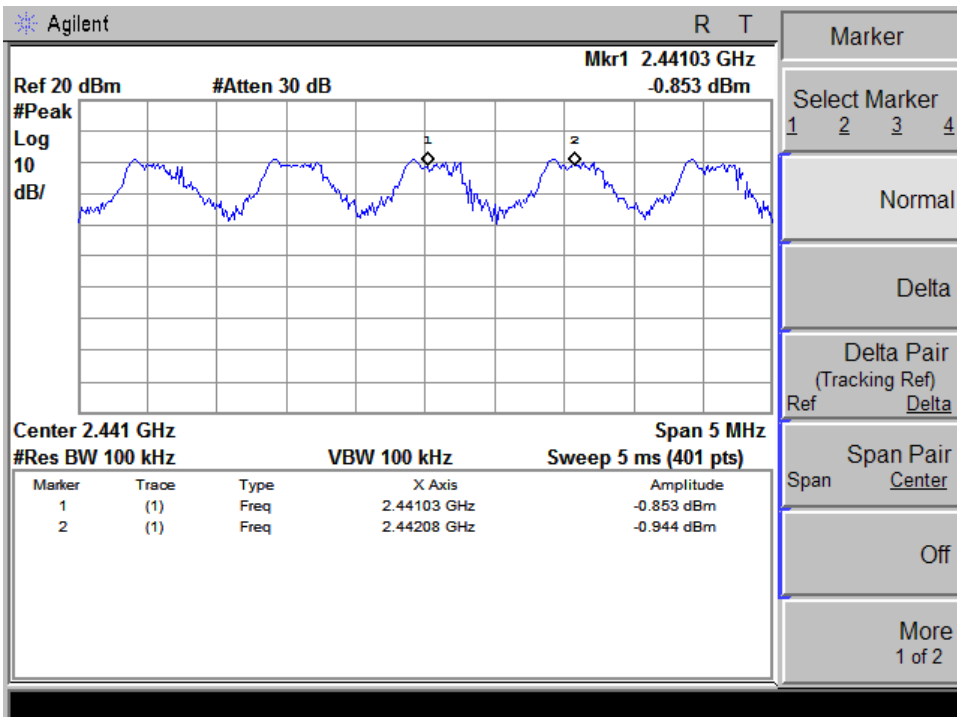
EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (1Mbps Mode)		

Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.010	Complies
2441 MHz	1.050	Complies
2480 MHz	1.030	Complies

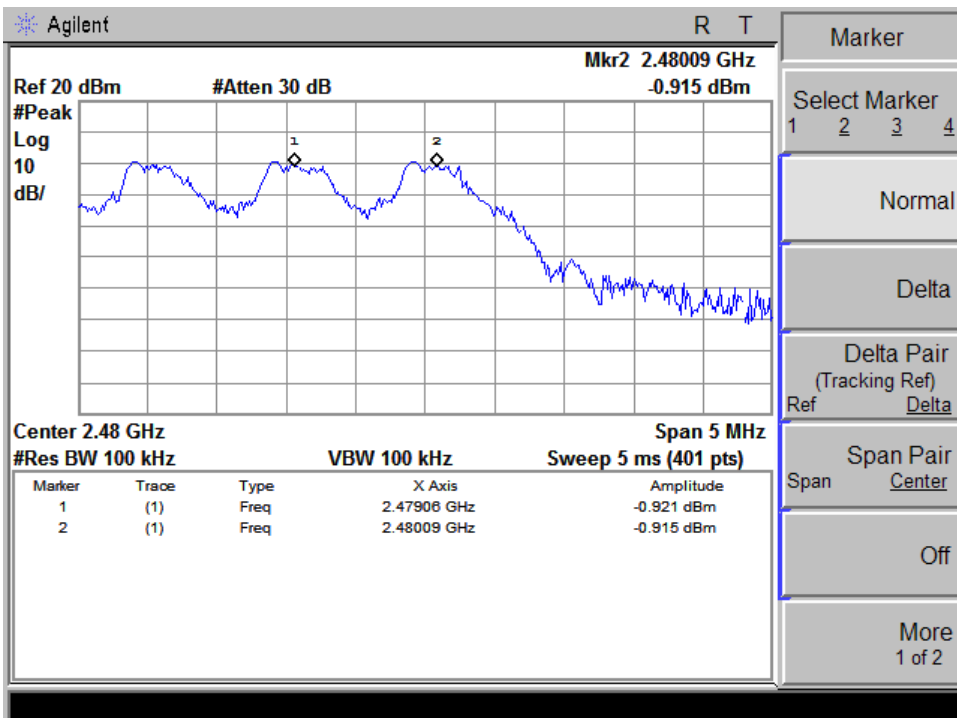
Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth



CH39 -1Mbps



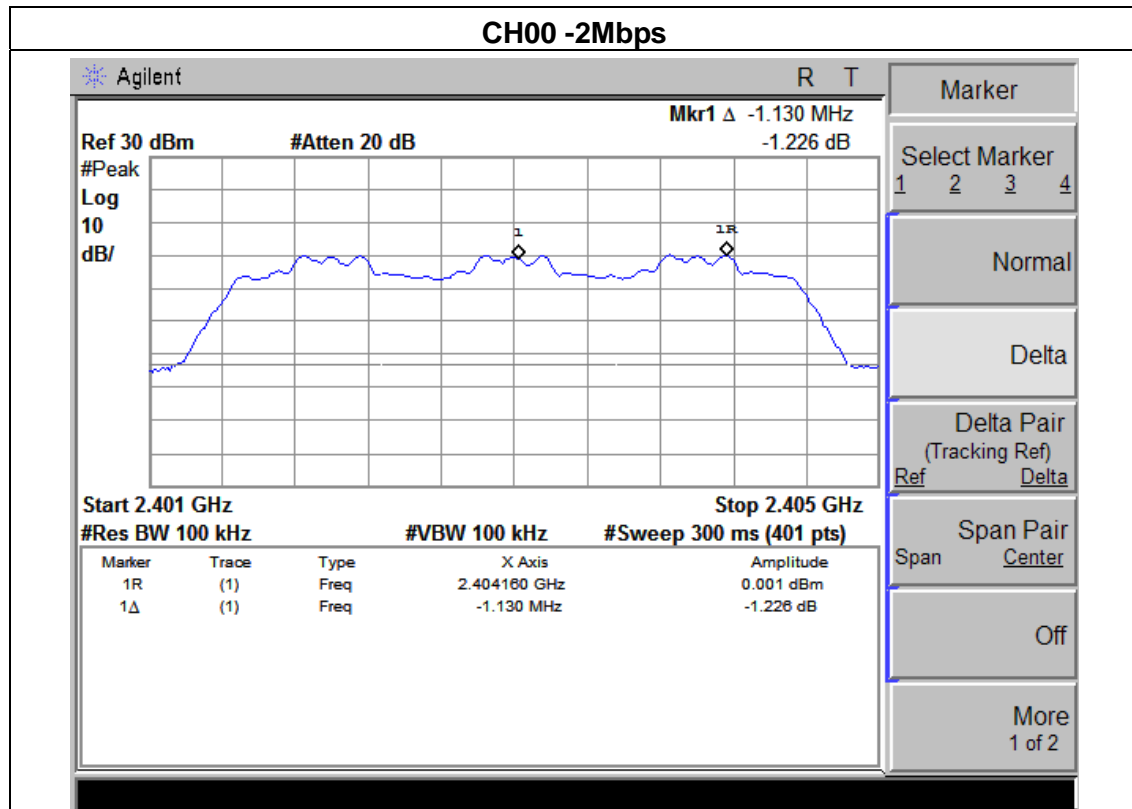
CH78 -1Mbps



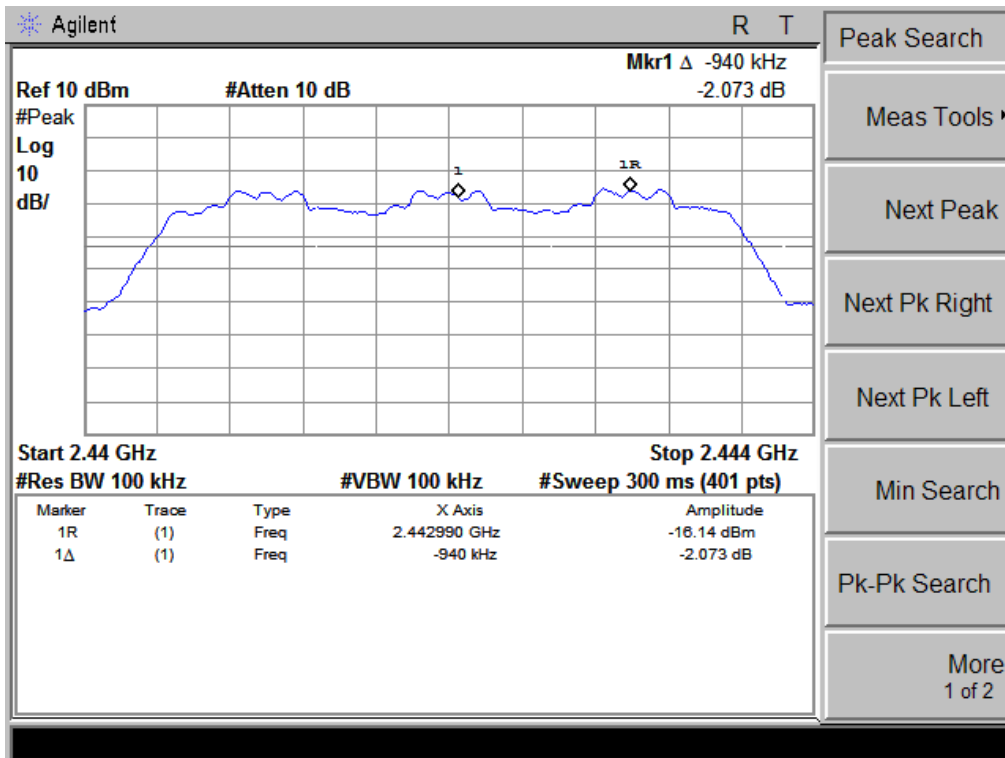
EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (2Mbps Mode)		

Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.130	Complies
2441 MHz	0.940	Complies
2480 MHz	0.970	Complies

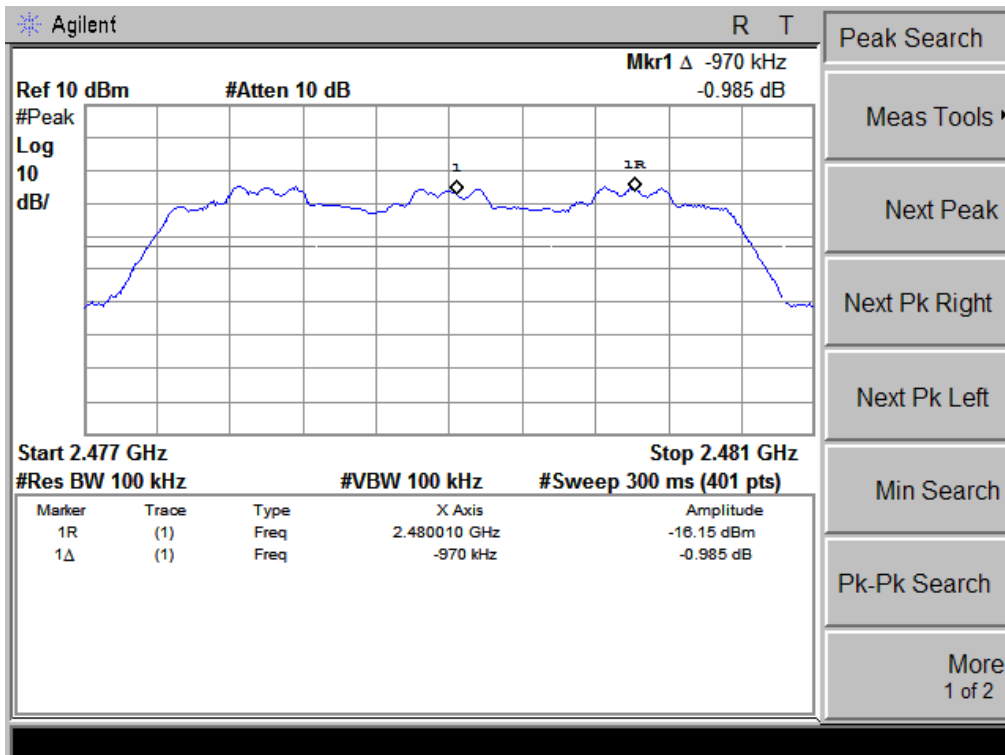
Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth



CH39 -2Mbps



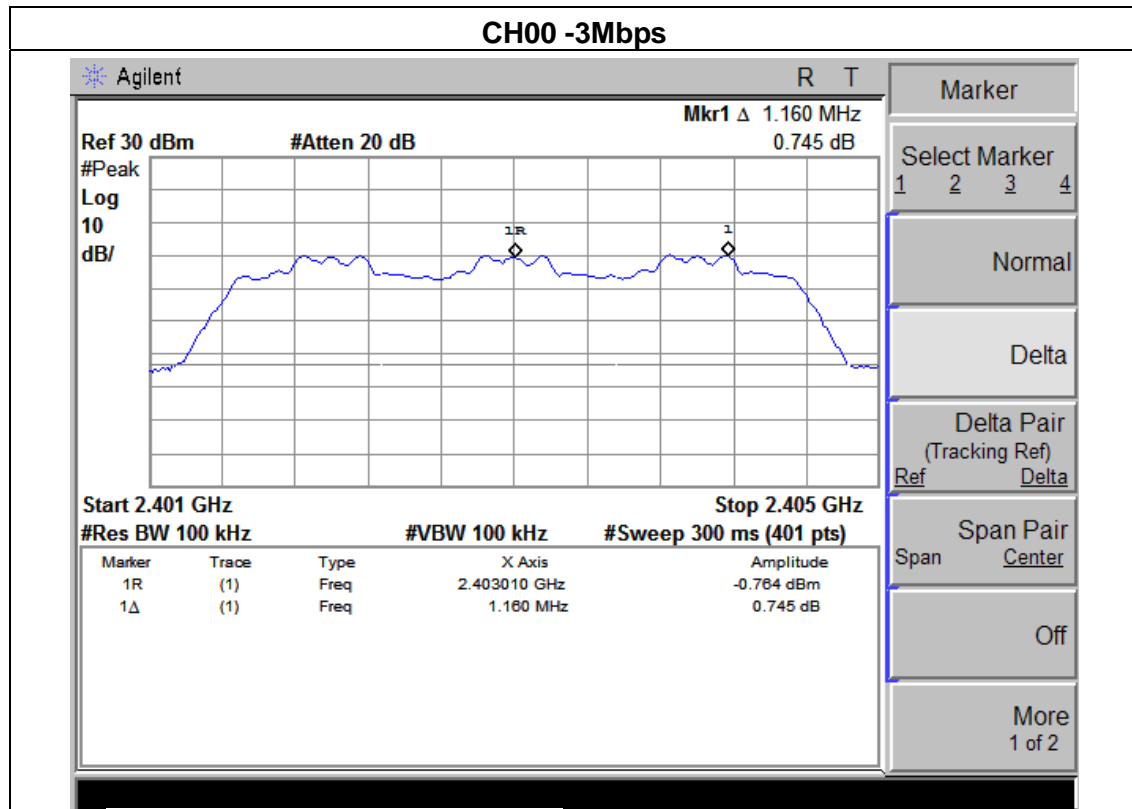
CH78 -2Mbps



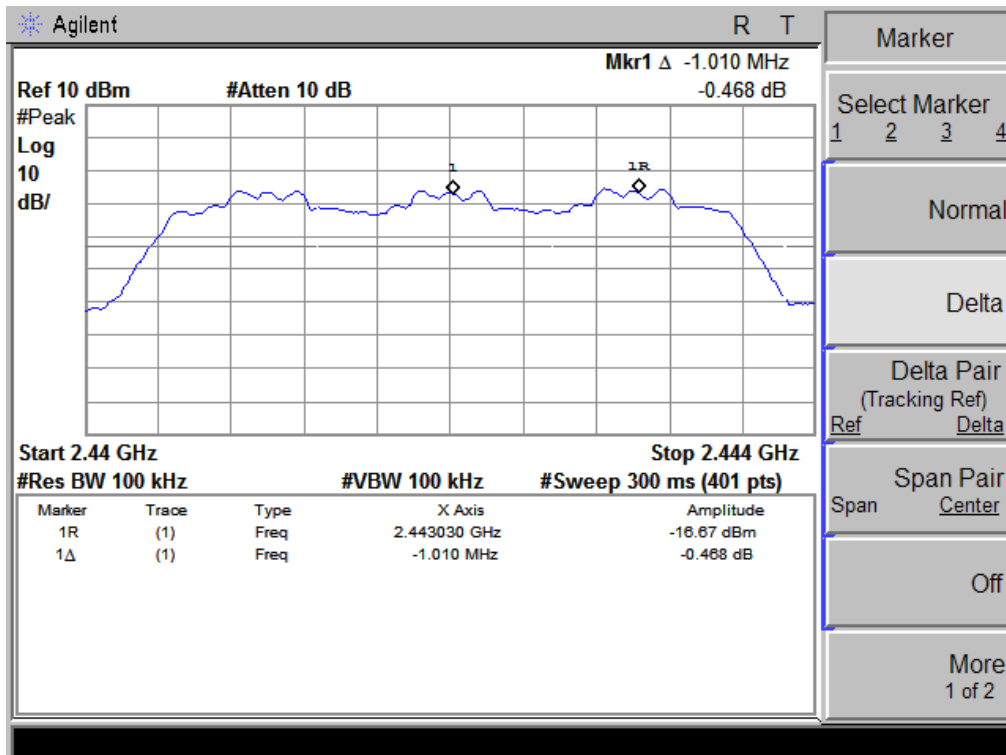
EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (3Mbps Mode)		

Frequency	Ch. Separation (MHz)	Result
2402 MHz	0.745	Complies
2441 MHz	1.010	Complies
2480 MHz	1.000	Complies

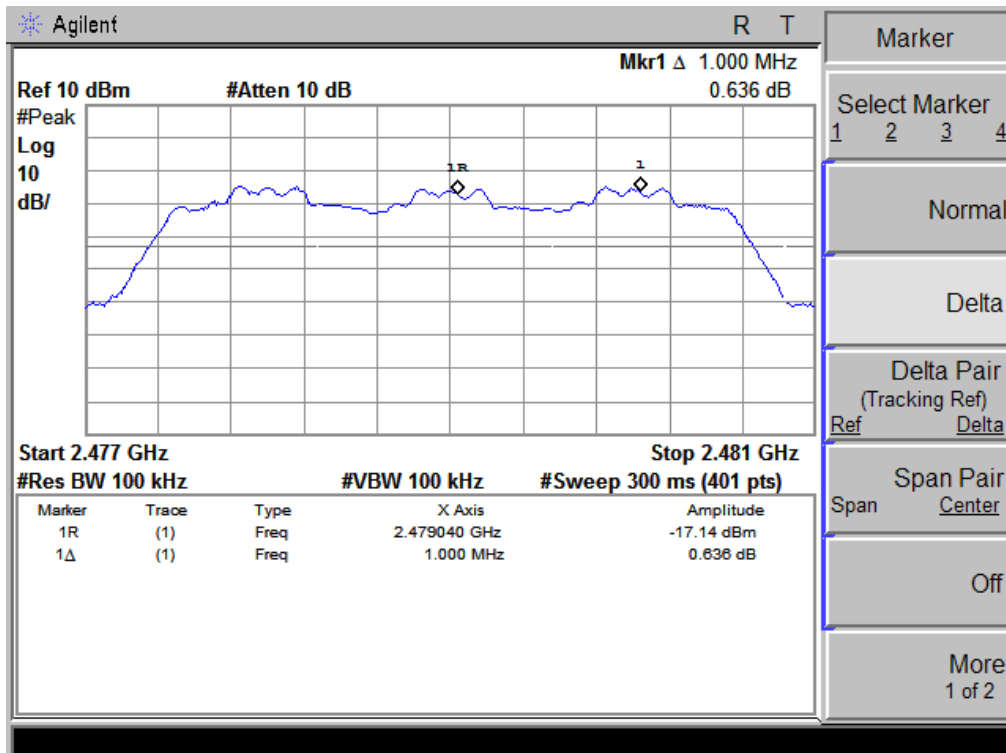
Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth



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

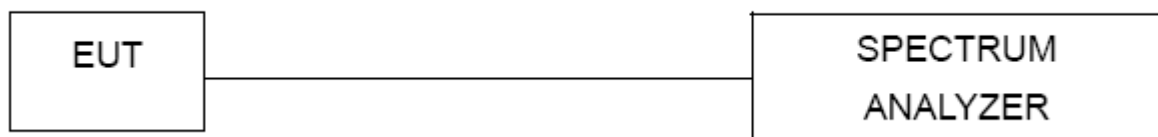
7.1.1 TEST PROCEDURE

- 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



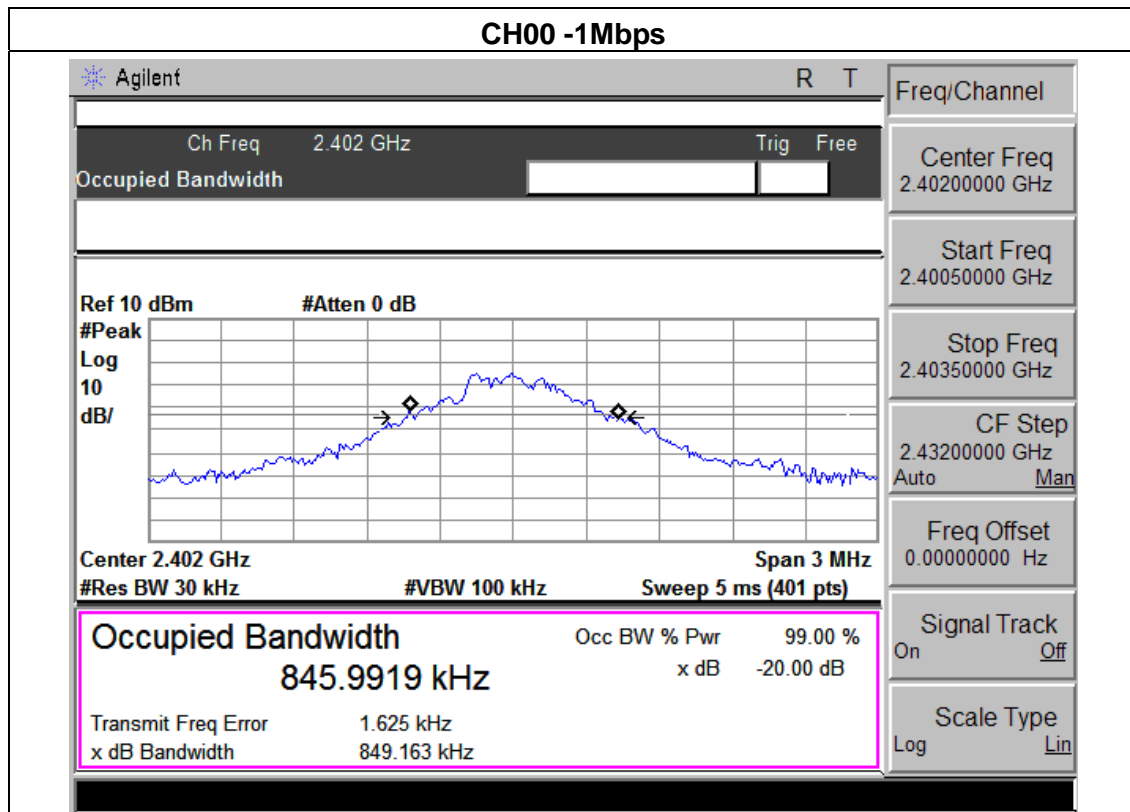
7.1.4 EUT OPERATION CONDITIONS

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.

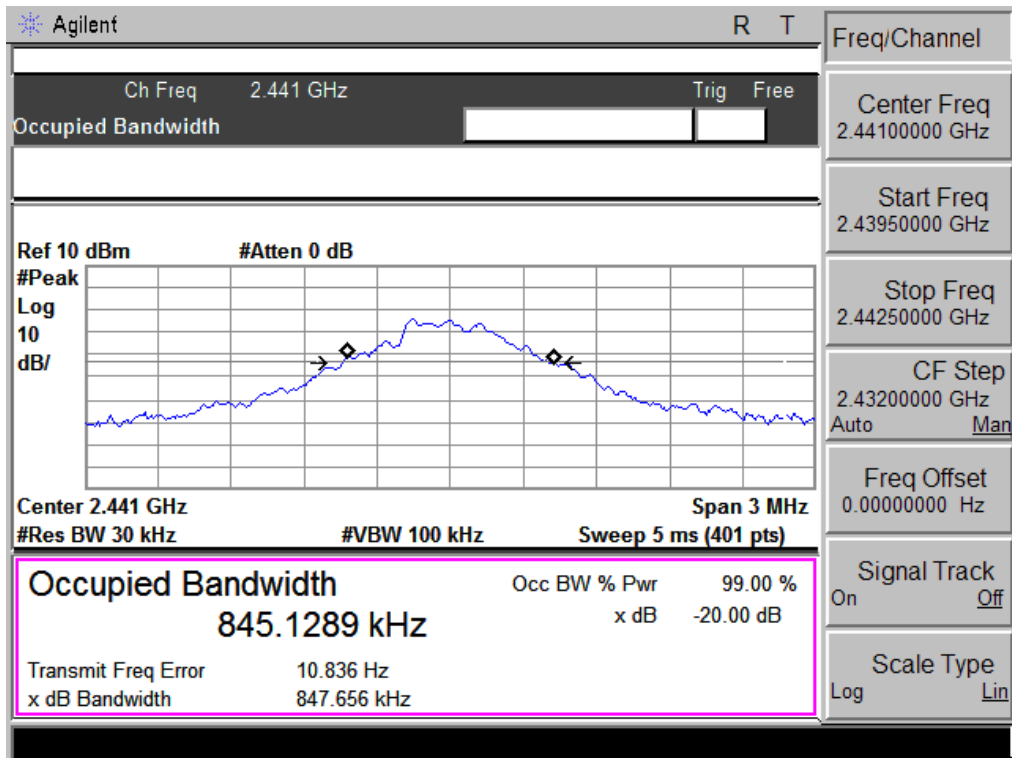
7.1.5 TEST RESULTS

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(1Mbps)		

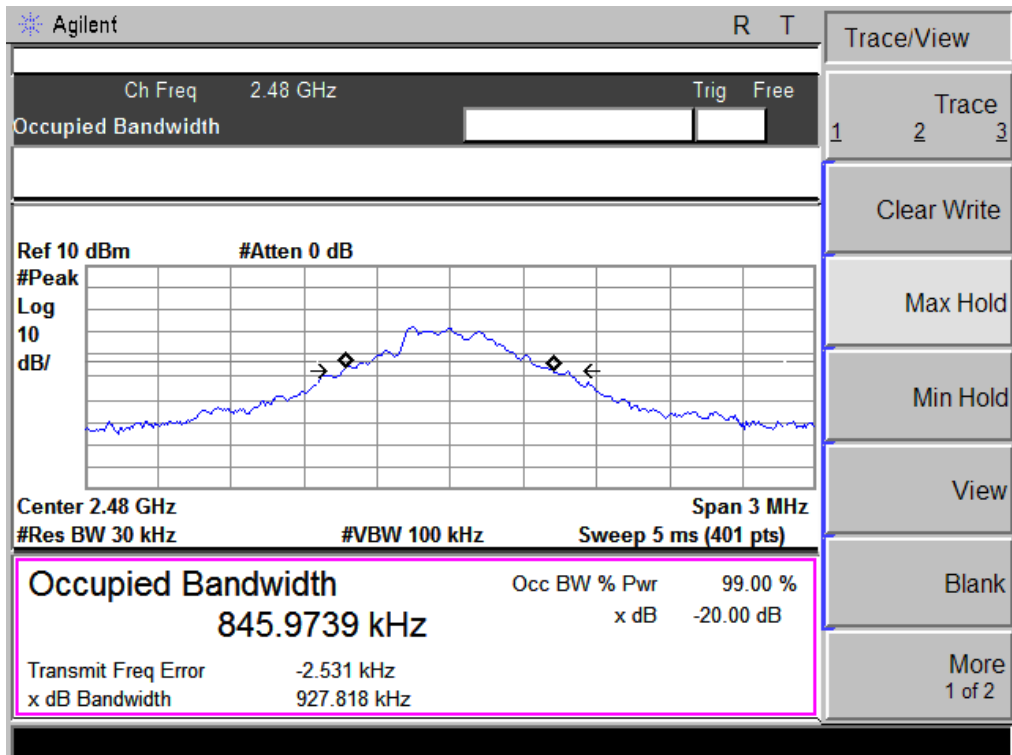
Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	849.163	PASS
2441 MHz	847.656	PASS
2480 MHz	927.818	PASS



CH39 -1Mbps

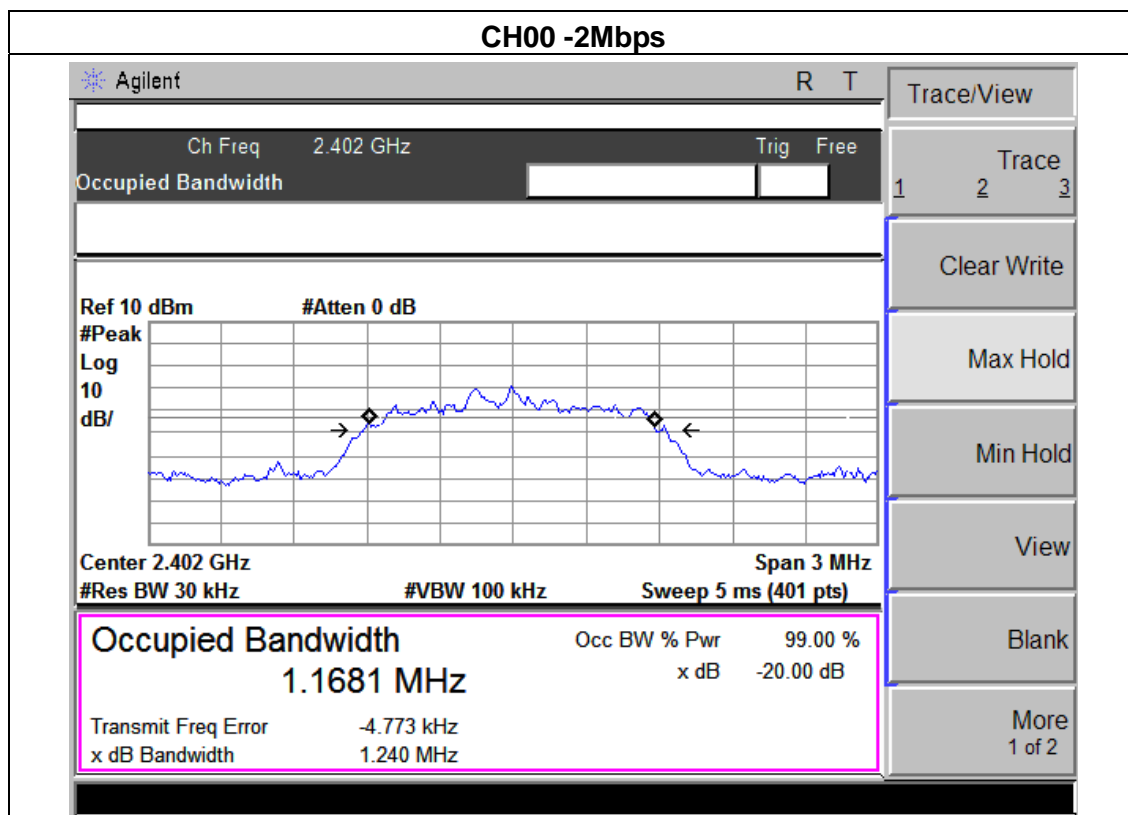


CH78 -1Mbps

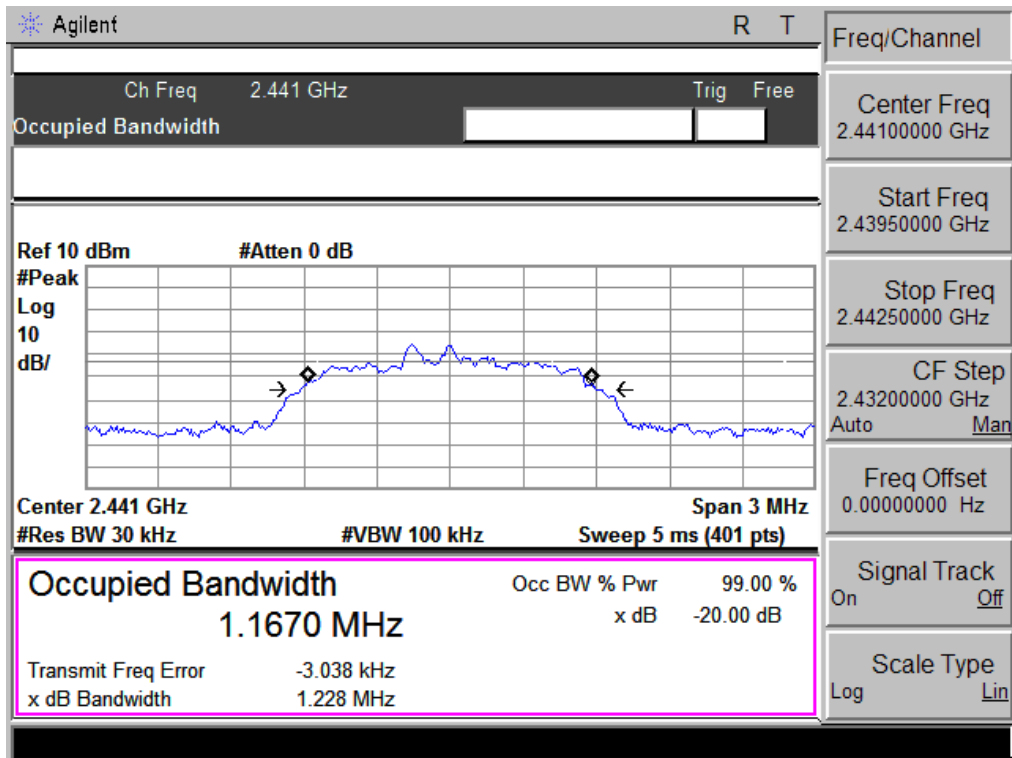


EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(2Mbps)		

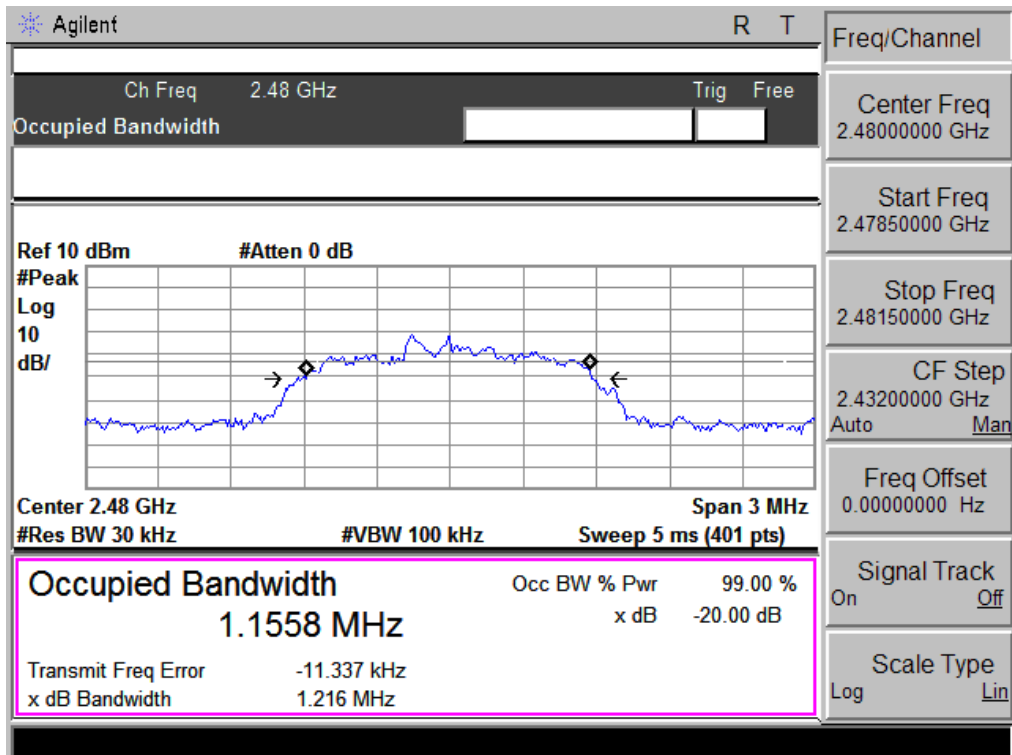
Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.240	PASS
2441 MHz	1.228	PASS
2480 MHz	1.216	PASS



CH39 -2Mbps

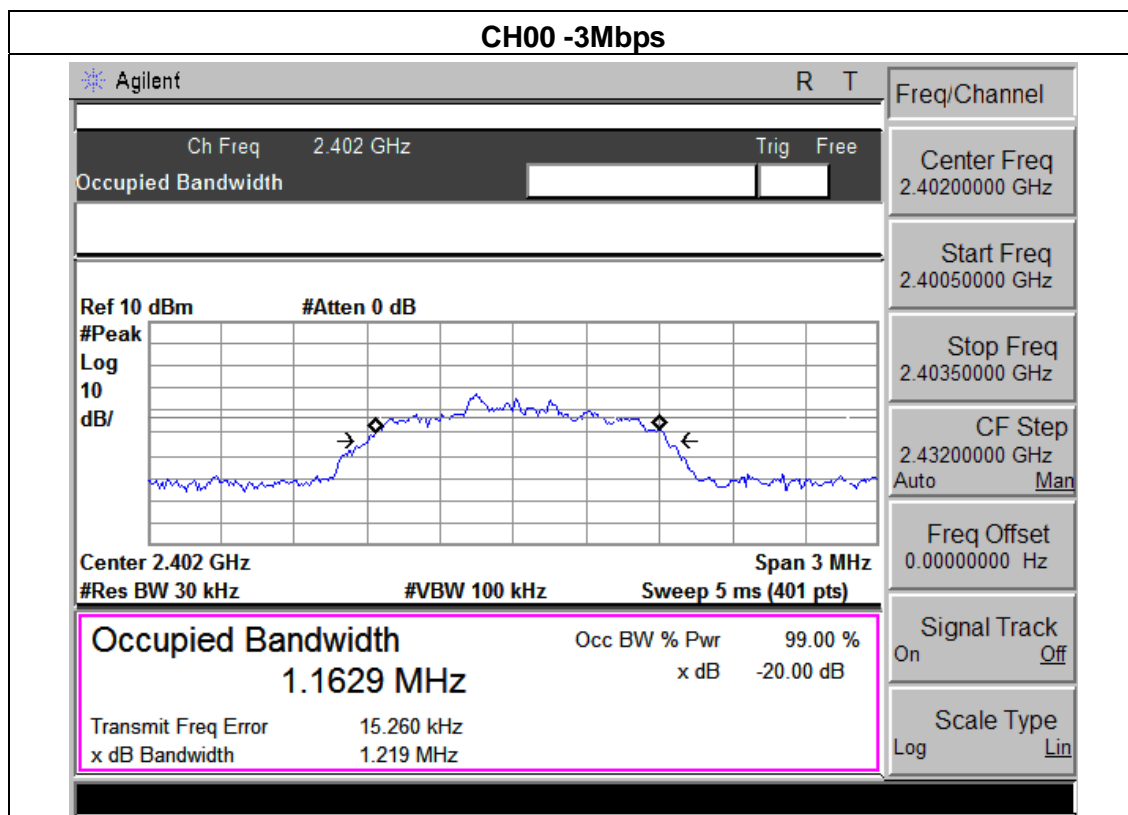


CH78 -2Mbps



EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(3Mbps)		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.219	PASS
2441 MHz	1.228	PASS
2480 MHz	1.216	PASS



CH39 -3Mbps

Agilent		R	T	Freq/Channel	
Ch Freq 2.441 GHz		Trig Free		Center Freq 2.44100000 GHz	
Occupied Bandwidth				Start Freq 2.43950000 GHz	
Ref 10 dBm #Atten 0 dB				Stop Freq 2.44250000 GHz	
				CF Step 2.43200000 GHz Auto Man	
Center 2.441 GHz		Span 3 MHz		Freq Offset 0.00000000 Hz	
#Res BW 30 kHz		#VBW 100 kHz		Sweep 5 ms (401 pts)	
Occupied Bandwidth 1.1631 MHz		Occ BW % Pwr 99.00 %		Signal Track On Off	
x dB Bandwidth 1.228 MHz		x dB -20.00 dB		Scale Type Log Lin	
Transmit Freq Error 7.149 kHz					

CH78 -3Mbps

Agilent		R	T	Trace/View	
Ch Freq 2.48 GHz		Trig Free		1 2 3	
Occupied Bandwidth				Clear Write	
Ref 10 dBm #Atten 0 dB				Max Hold	
				Min Hold	
Center 2.48 GHz		Span 3 MHz		View	
#Res BW 30 kHz		#VBW 100 kHz		Blank	
Sweep 5 ms (401 pts)				More 1 of 2	
Occupied Bandwidth 1.1468 MHz		Occ BW % Pwr 99.00 %			
x dB Bandwidth 1.216 MHz		x dB -20.00 dB			
Transmit Freq Error 9.191 kHz					

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

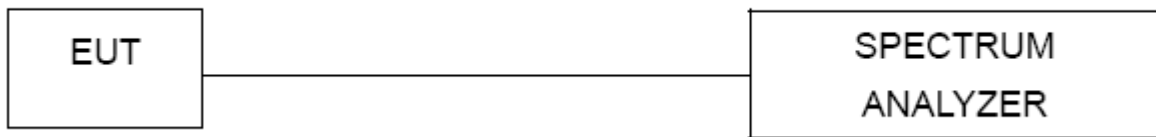
8.1.1 TEST PROCEDURE

- 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= 1MHz, VBW= 1MHz, Sweep time = Auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



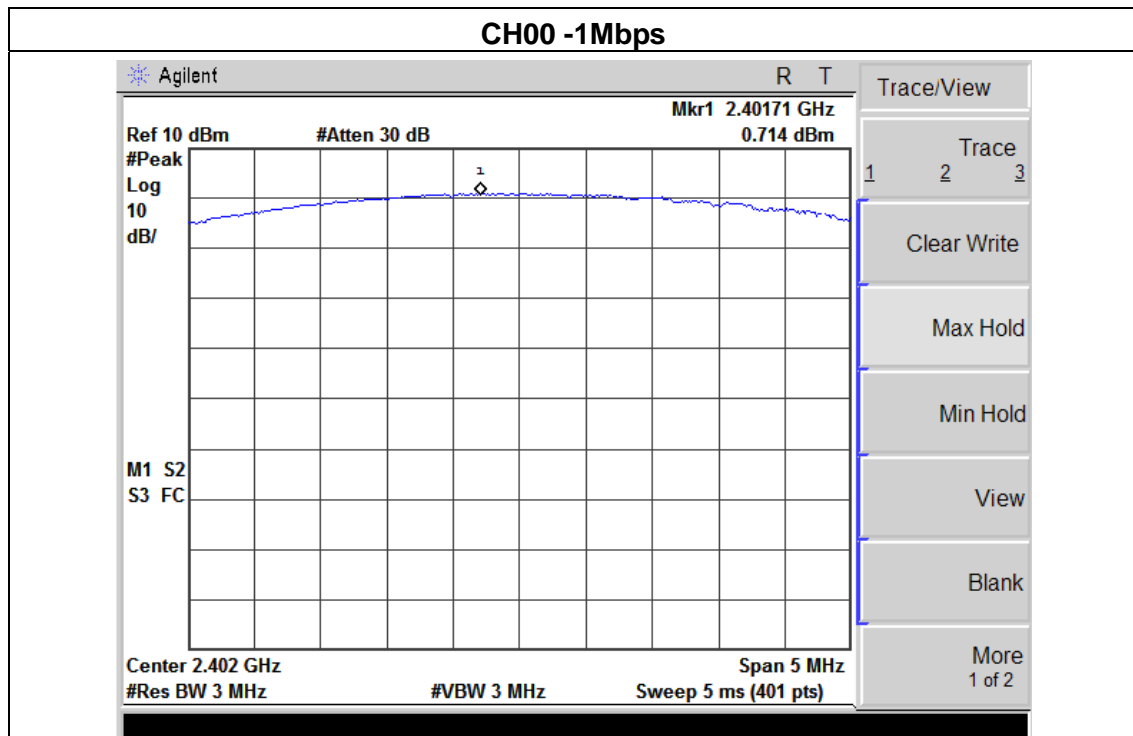
8.1.4 EUT OPERATION CONDITIONS

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.

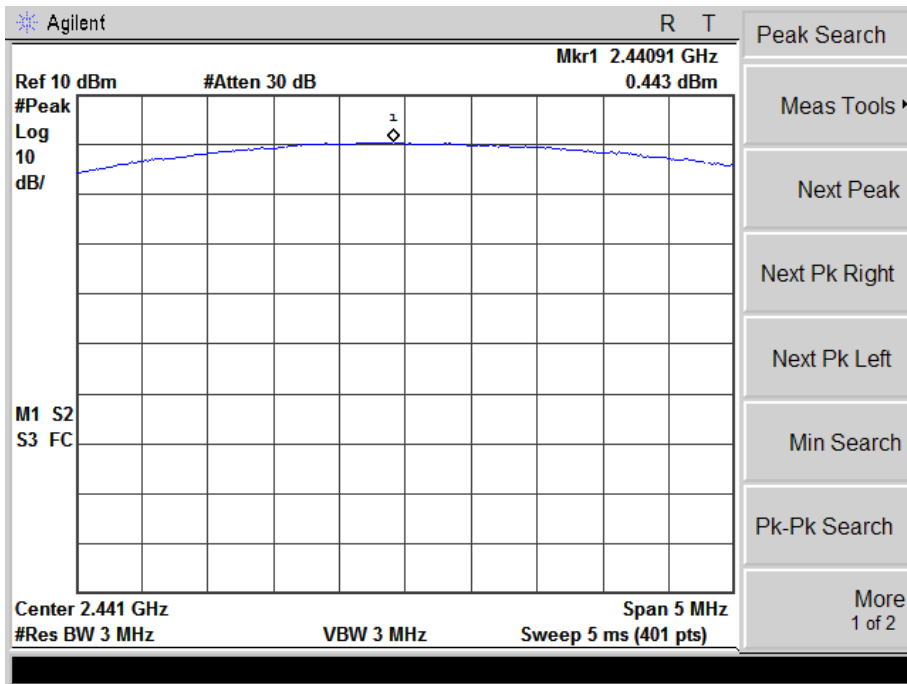
8.1.5 TEST RESULTS

EUT :	Bluetooth Speakers	Model Name :	YH-239 Speaker
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 (1M/2M/3Mbps Mode)		

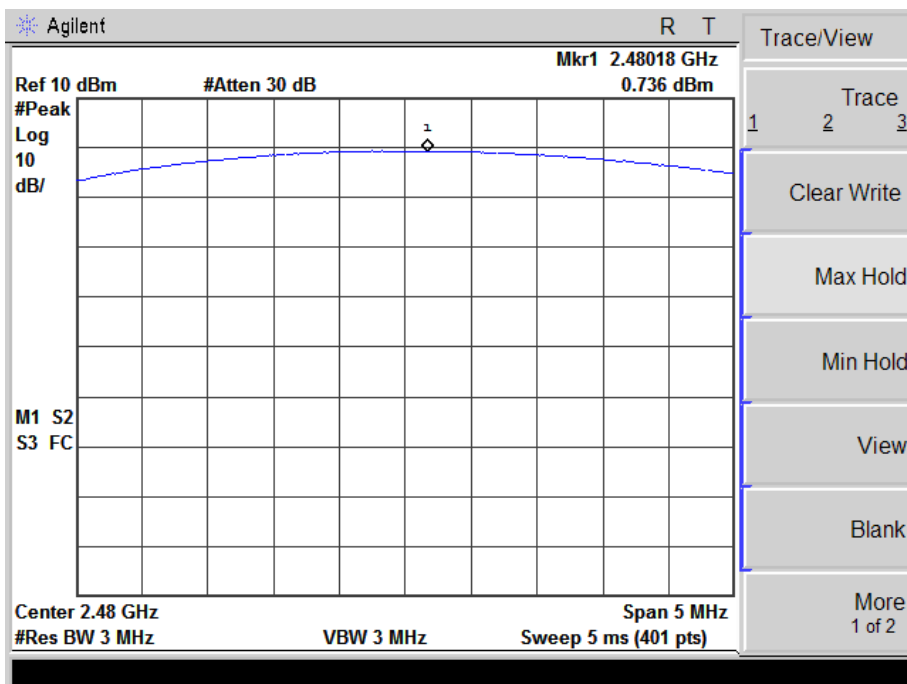
1Mbps				
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH00	2402	0.714	20.96	0.125
CH39	2441	0.443	20.96	0.125
CH78	2480	0.736	20.96	0.125
2Mbps				
CH00	2402	-0.655	20.96	0.125
CH39	2441	-0.594	20.96	0.125
CH78	2480	-0.591	20.96	0.125
3Mbps				
CH00	2402	-0.584	20.96	0.125
CH39	2441	-0.872	20.96	0.125
CH78	2480	-0.569	20.96	0.125

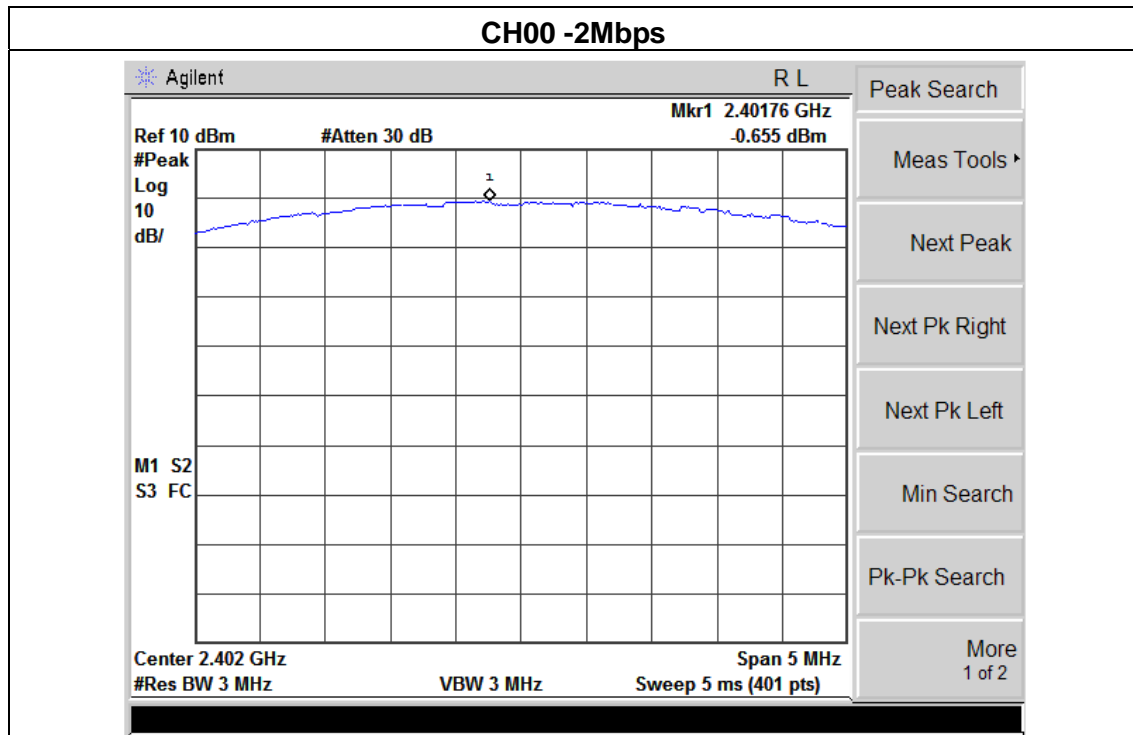


CH39 -1Mbps

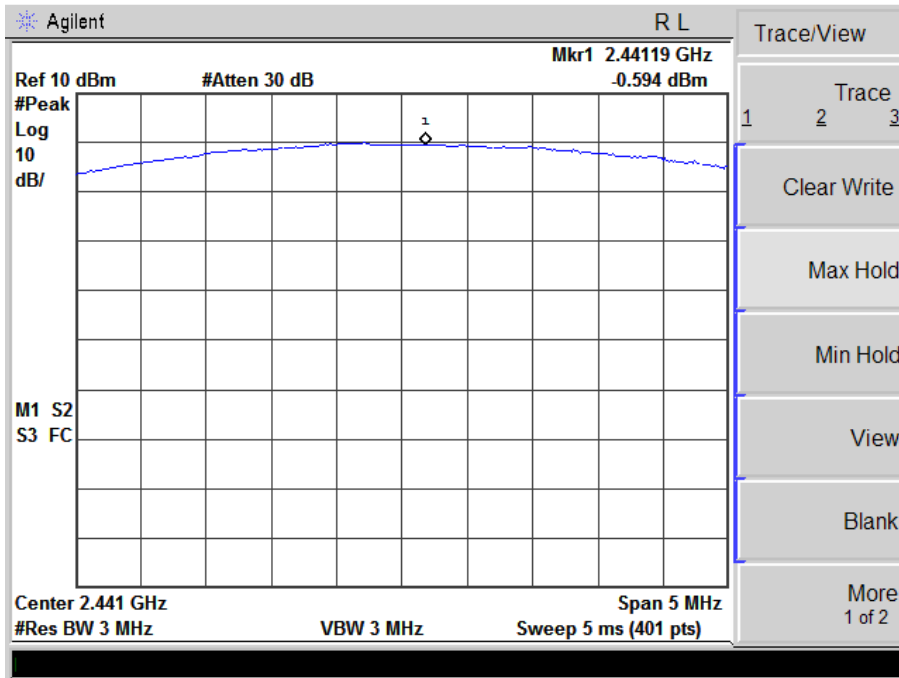


CH78 -1Mbps

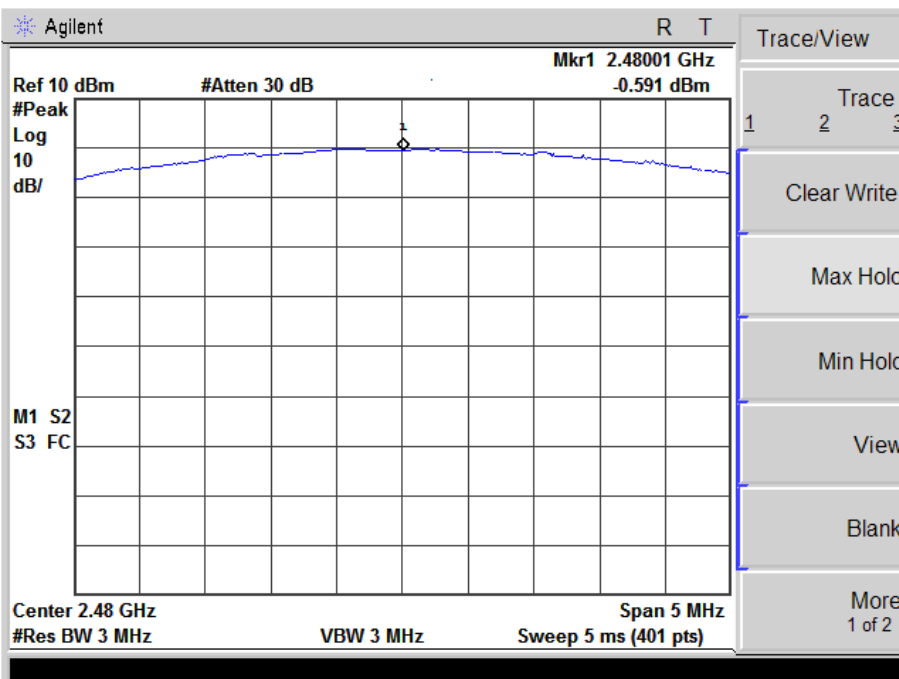


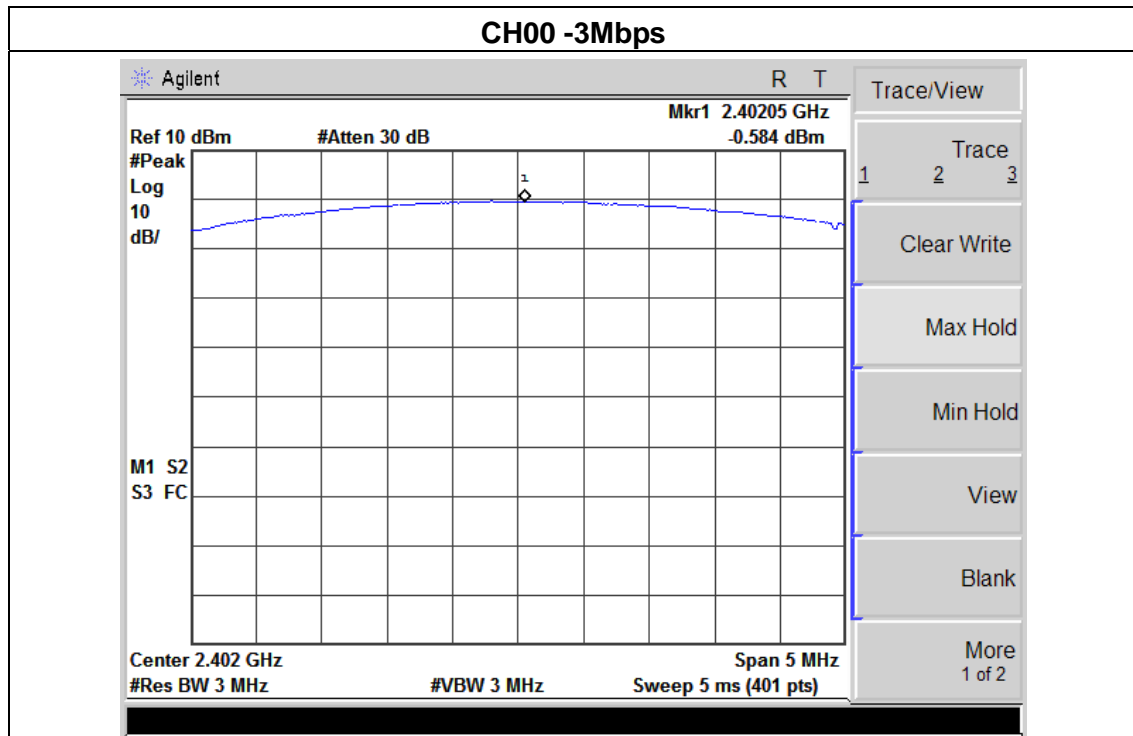


CH39 -2Mbps

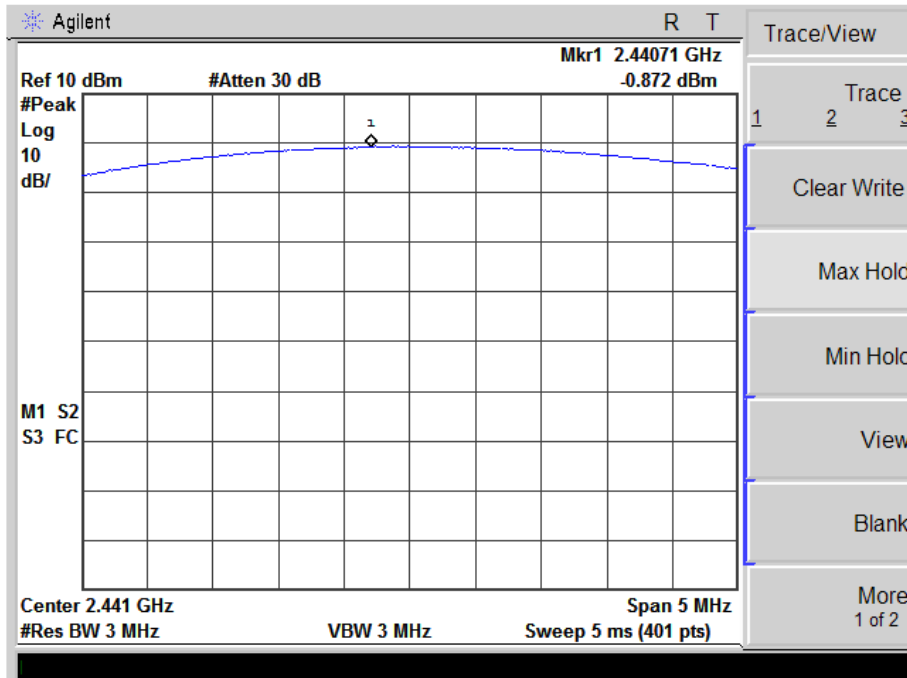


CH78 -2Mbps

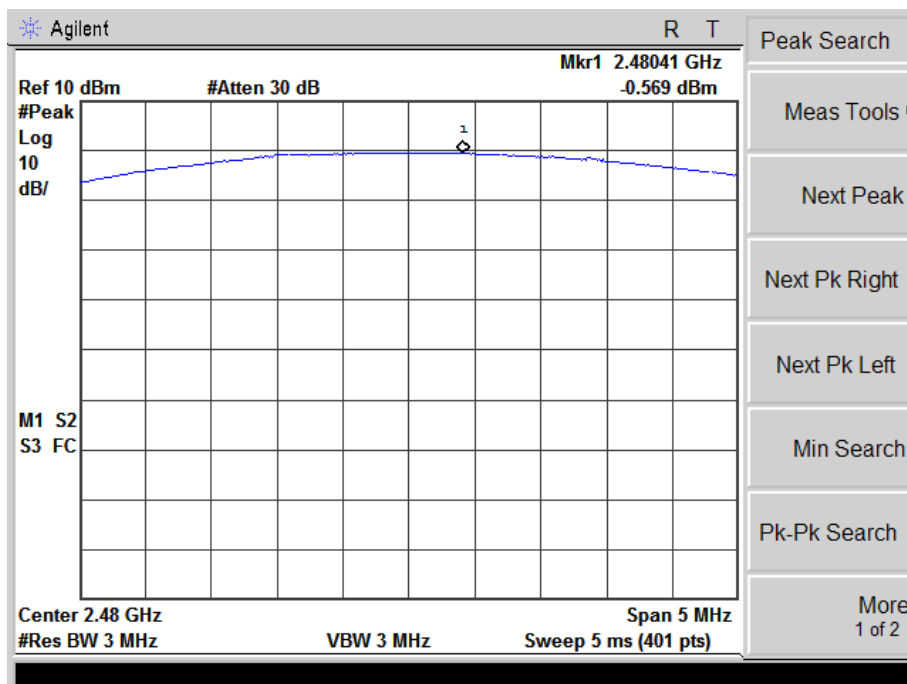




CH39 -3Mbps



CH78 -3Mbps



9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

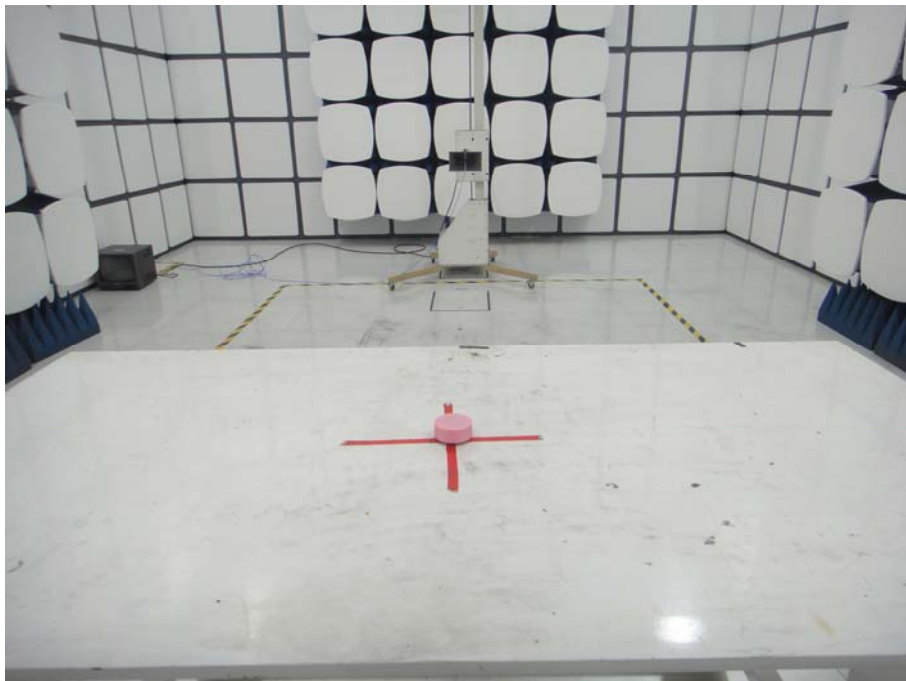
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

9.2 EUT ANTENNA

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

10. EUT TEST PHOTO

Radiated Measurement Photos



CONDUCTED EMISSION Photos

