FCC Radio Test Report

FCC ID: OU8-BXH-400

This report concerns (check one) : ☒ **Original Grant** ☐ **Class II Change**

Issued Date : Feb. 26, 2014
Project No. : 1401043
Equipment : Bluetooth Headset
Model Name : BXH-400

Applicant : Antec Inc.
Address : 9F., No. 179, Sec. 2, Tiding Blvd., Neihu District, Taipei City 114, Taiwan

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Jan. 21, 2014
Date of Test: Jan. 21, 2014 ~ Feb. 25, 2014

Testing Engineer : (Josh Lin)

Technical Manager : (Jeff Yang)

Authorized Signatory : (Andy Chiu)

Neutron Engineering Inc.
B1, No. 37, Lane 365, YangGuang St.,
NeiHu District 114, Taipei, Taiwan.
TEL: +886-2-2657-3299
FAX: +886-2-2657-3331

Declaration

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Table of Contents

REPORT ISSUED HISTORY		6
1	CERTIFICATION	7
2 .	SUMMARY OF TEST RESULTS	8
2.1	TEST FACILITY	9
2.2	MEASUREMENT UNCERTAINTY	10
3	GENERAL INFORMATION	11
3.1	GENERAL DESCRIPTION OF EUT	11
3.2	DESCRIPTION OF TEST MODES	13
3.3	TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	14
3.4	BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	15
3.5	DESCRIPTION OF SUPPORT UNITS	16
4	CONDUCTED EMISSION	17
4.1	LIMIT	17
4.2	MEASUREMENT INSTRUMENTS LIST	17
4.3	TEST PROCEDURES	18
4.4	TEST SETUP LAYOUT	18
4.5	DEVIATION FROM TEST STANDARD	18
4.6	EUT OPERATING CONDITIONS	19
4.7	TEST RESULTS	20
5	ANTENNA CONDUCTED SPURIOUS EMISSION	22
5.1	LIMIT	22
5.2	MEASUREMENT INSTRUMENTS LIST	22
5.3	TEST PROCEDURES	22
5.4	TEST SETUP LAYOUT	22
5.5	DEVIATION FROM TEST STANDARD	22
5.6	EUT OPERATING CONDITIONS	22
5.7	TEST RESULTS	23
6	HOPPING CHANNEL SEPARATION	31
6.1	LIMIT	31
6.2	MEASUREMENT INSTRUMENTS LIST	31
6.3	MEASURING INSTRUMENTS SETTING	31
6.4	TEST PROCEDURES	31
6.5	TEST SETUP LAYOUT	31
6.6	DEVIATION FROM TEST STANDARD	31
6.7	EUT OPERATING CONDITIONS	31
6.8	TEST RESULTS	32
7	MAXIMUM PEAK CONDUCTED OUTPUT POWER	40
7.1	LIMIT	40

Table of Contents

7.2	MEASUREMENT INSTRUMENTS LIST	40
7.3	TEST PROCEDURES	40
7.4	TEST SETUP LAYOUT	40
7.5	DEVIATION FROM TEST STANDARD	40
7.6	EUT OPERATING CONDITIONS	40
7.7	TEST RESULTS	41
8	RADIATED SPURIOUS EMISSION (9 KHZ TO 1 GHZ)	45
8.1	LIMIT	45
8.2	MEASUREMENT INSTRUMENTS LIST	46
8.3	MEASURING INSTRUMENTS SETTING	46
8.4	TEST PROCEDURES	47
8.5	DEVIATION FROM TEST STANDARD	47
8.6	TEST SETUP LAYOUT	47
8.7	EUT OPERATING CONDITIONS	48
8.8	TEST RESULTS	49
9	RADIATED SPURIOUS EMISSION (ABOVE 1 GHZ)	51
9.1	LIMIT	51
9.2	MEASUREMENT INSTRUMENTS LIST	52
9.3	MEASURING INSTRUMENTS SETTING	52
9.4	TEST PROCEDURES	53
9.5	DEVIATION FROM TEST STANDARD	53
9.6	TEST SETUP LAYOUT	53
9.7	EUT OPERATING CONDITIONS	54
9.8	TEST RESULTS	55
9.9	TEST RESULTS (RESTRICTED BANDS)	79
10	NUMBER OF HOPPING FREQUENCY	87
10.1	LIMIT	87
10.2	MEASUREMENT INSTRUMENTS LIST	87
10.3	MEASURING INSTRUMENTS SETTING	87
10.4	TEST PROCEDURES	87
10.5	TEST SETUP LAYOUT	87
10.6	DEVIATION FROM TEST STANDARD	87
10.7	EUT OPERATING CONDITIONS	87
10.8	TEST RESULTS	88
11	AVERAGE TIME OF OCCUPANCY	90
11.1	LIMIT	90
11.2	MEASUREMENT INSTRUMENTS LIST	90
11.3	TEST PROCEDURES	90

Table of Contents

11.4	TEST SETUP LAYOUT	90
11.5	DEVIATION FROM TEST STANDARD	90
11.6	EUT OPERATING CONDITIONS	91
11.7	TEST RESULTS	92
12	RF EXPOSURE COMPLIANCE	104
12.1	LIMIT	104
12.2	MEASUREMENT INSTRUMENTS LIST	104
12.3	MPE CALCULATION METHOD	104
12.4	TEST SETUP LAYOUT	105
12.5	DEVIATION FROM TEST STANDARD	105
12.6	EUT OPERATING CONDITIONS	105
12.7	TEST RESULTS	105
13	EUT TEST PHOTO	106

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
NEI-ETSP-1-1401043	Original Issue.	Feb. 26, 2014

1 CERTIFICATION

Equipment	:	Bluetooth Headset
Brand Name	:	ANTEC
Model Name	:	BXH-400
Applicant	:	Antec Inc.
Date of Test	:	Jan. 21, 2014 ~ Feb. 25, 2014
Standard(s)	:	FCC Part 15, Subpart C(15.247): 2012 ANSI C63.4 -2009

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1401043) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Standard Clause	Test Item	Result
15.207	Conducted Emission	**PASS**
15.247 (c)	Antenna conducted Spurious Emission	**PASS**
15.247 (a)(1)	Hopping Channel Separation	**PASS**
15.247 (b)	Maximum Peak Conducted Output Power	**PASS**
15.247 (c)	Radiated Spurious Emission	**PASS**
15.247 (b)(1)	Number of Hopping Frequency	**PASS**
15.247 (a)(1)	Average time of occupancy	**PASS**
15.205	Restricted Bands	**PASS**
15.203	Antenna Requirement	**PASS**
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	**PASS**

NOTE:

1. **N/A**: denotes test is not applicable in this test report.
2. Portable device; SAR report is required.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

C02: (VCCI RN: C-3477; FCC RN: 614388; FCC DN: TW1054)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC/Industry Canada rules and for reference only.

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**%.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

Test Site	Measurement Frequency Range	U，(dB)	NOTE
C02	150 kHz ~ 30 MHz	2.59	

B. Radiated emission test:

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
CB08	Radiated emission at 3m	Horizontal Polarization	30 - 200MHz	3.35 dB	
			200 - 1000MHz	3.11 dB	
			1 - 18GHz	3.97 dB	
			18 - 40GHz	4.01 dB	
		Vertical Polarization	30 - 200MHz	3.22 dB	
			200 - 1000MHz	3.24 dB	
			1 - 18GHz	4.05 dB	
			18 - 40GHz	4.04 dB	

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR}, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR}.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Bluetooth Headset	
Brand Name	ANTEC	
Model Name	BXH-400	
OEM Brand/Model Name	N/A	
Model Difference	The EUT has two colors: black and white. All are identical in construction mechanically and electrically the only difference is the color.	
Product Description	Operation Frequency	2402 MHz ~ 2480 MHz
	Modulation Type	FHSS(GFSK, pi/4 DQPSK, 8DPSK)
	Bit Rate of Transmitter	1/2/3 Mbps
	Number Of Channel	Please refer to the Note 2. (Page 12)
	Antenna Designation	Please refer to the Note 3. (Page 12)
	Antenna Gain(Peak)	
	Maximum Conducted Output Power	Peak Output Power: 1 Mbps: 7.05dBm 3 Mbps: 6.06dBm
Power Source	1. Supplied from micro USB DC Source. 2. Battery supplied.	
Power Rating	1. I/P: DC 5V 2. I/P: DC 3.7V 315mAh	
Connecting I/O Port(s)	Please refer to the User's Manual	
Products Covered	Polymer Li-ion Battery: 502035	

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)
1	福升通訊	N/A	Printed	N/A	2

3.2 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.

Test Items	Mode	Data Rate	Tested Channel/Mode
Conducted Emission	GFSK	1 Mbps	2441 MHz
Antenna conducted Spurious Emission	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Hopping Channel Separation	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Maximum Peak Conducted Output Power	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Radiated Spurious Emission (30 MHz to 1 GHz)	GFSK	1 Mbps	2441 MHz
Radiated Spurious Emission (above 1 GHz)	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Number of Hopping Frequency	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Average time of occupancy	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Restricted Bands	GFSK	1 Mbps	2402 MHz, 2441 MHz, 2480 MHz
	8DPSK	3 Mbps	
Antenna Requirement	GFSK	---	---
RF Exposure Compliance	GFSK	---	---

NOTE: The measurements are performed at the high, middle, low available channels.

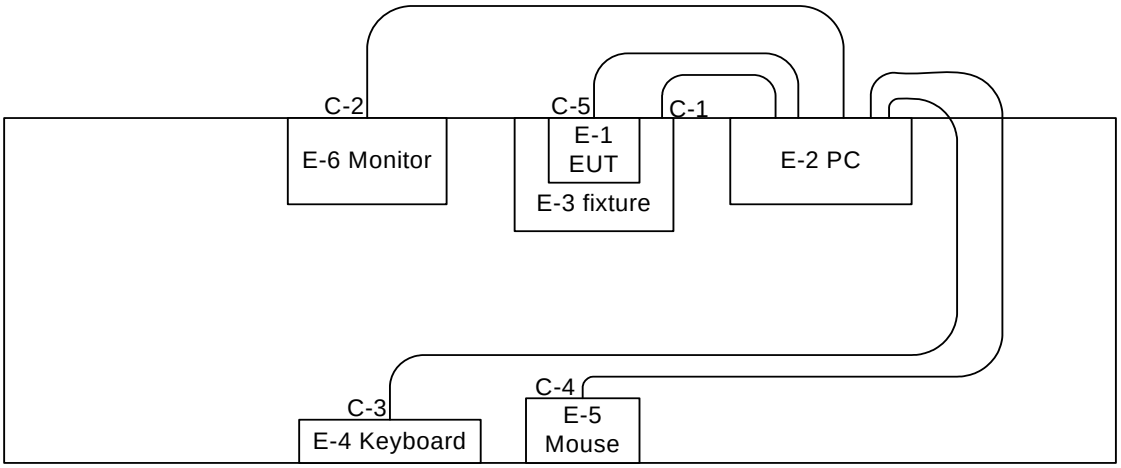
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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.

Data Rate	1 Mbps		
Test software Version	Bluetest 3		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameter	63	63	63

Data Rate	3 Mbps		
Test software Version	Bluetest 3		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameter	120	120	120

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 DATA Cable
C-2 VGA Cable
C-3 USB Cable
C-4 USB Cable
C-5 USB Cable

3.5 DESCRIPTION OF SUPPORT UNITS

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.	FCC ID	Series No.	Note
E-1	Bluetooth Headset	ANTEC	BXH-400	VEG-BXH-400	N/A	EUT
E-2	PC	N/A	N/A	N/A	N/A	
E-3	Fixture	N/A	N/A	N/A	N/A	
E-4	USB K/B	DELL	L50U	DOC	N/A	
E-5	USB Mouse	DELL	MS111-L	DOC	CN-09RRC7-44751-17J-OH1F	
E-6	24” LCD Monitor	DELL	U2410f	DOC	CN-OJ257M-72872-09J-067L	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.5m	
C-2	YES	YES	1.8m	
C-3	YES	NO	1.8m	
C-4	YES	NO	1.8m	
C-5	YES	NO	1m	

NOTE: The support equipment was authorized by Declaration of Conformity (DOC).

4 CONDUCTED EMISSION

4.1 LIMIT

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

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.
3. The test result calculated as following:
   Measurement Value = Reading Level + Correct Factor
   Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
   Margin Level = Measurement Value – Limit Value

4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	Schwarzbeck	NSLK 8127	8127685	Jun. 03, 2014
2	Test Cable	TIMES	CFD300-NL	C01	Jun. 16, 2014
3	EMI Test Receiver	R&S	ESCI	100082	Mar. 21, 2014
4	Measurement Software	EZ	EZ_EMC (Version NB-02A)	N/A	N/A

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

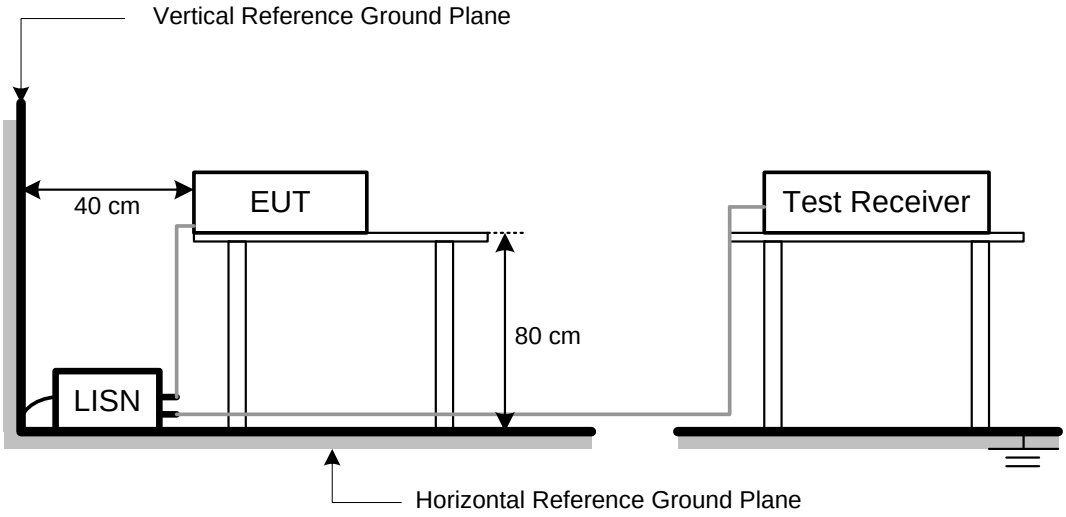
4.3 TEST PROCEDURES

a. The EUT was placed 0.8 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.

NOTE:

a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only Peak or QP Mode was measured, but AVG Mode didn‘t perform.

4.4 TEST SETUP LAYOUT



4.5 DEVIATION FROM TEST STANDARD

No deviation

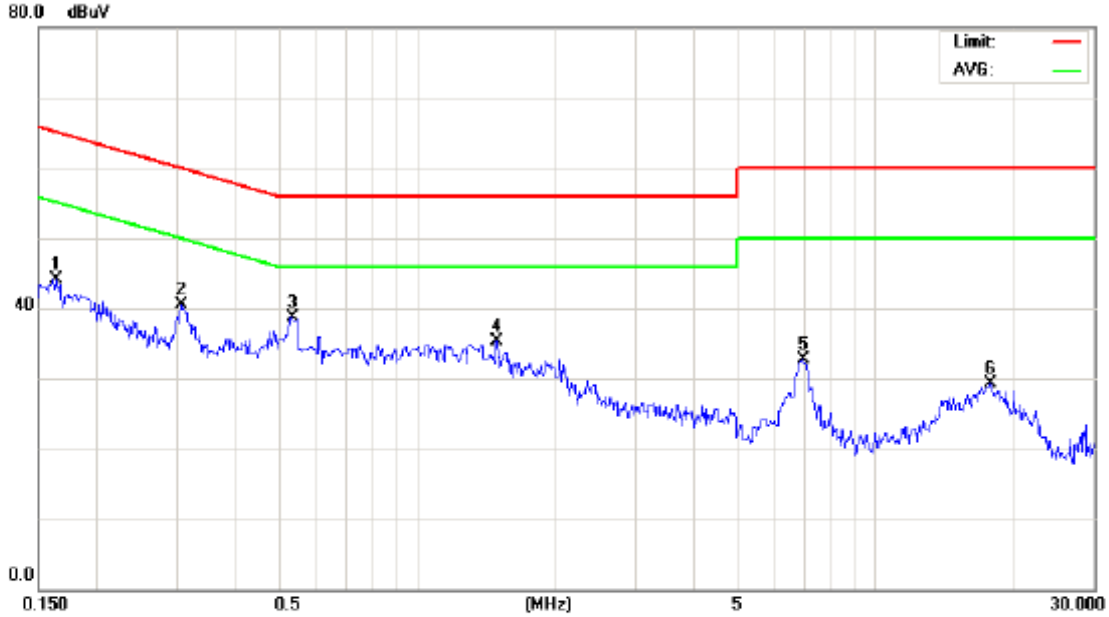
4.6 EUT OPERATING CONDITIONS

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.

4.7 TEST RESULTS

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	55%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

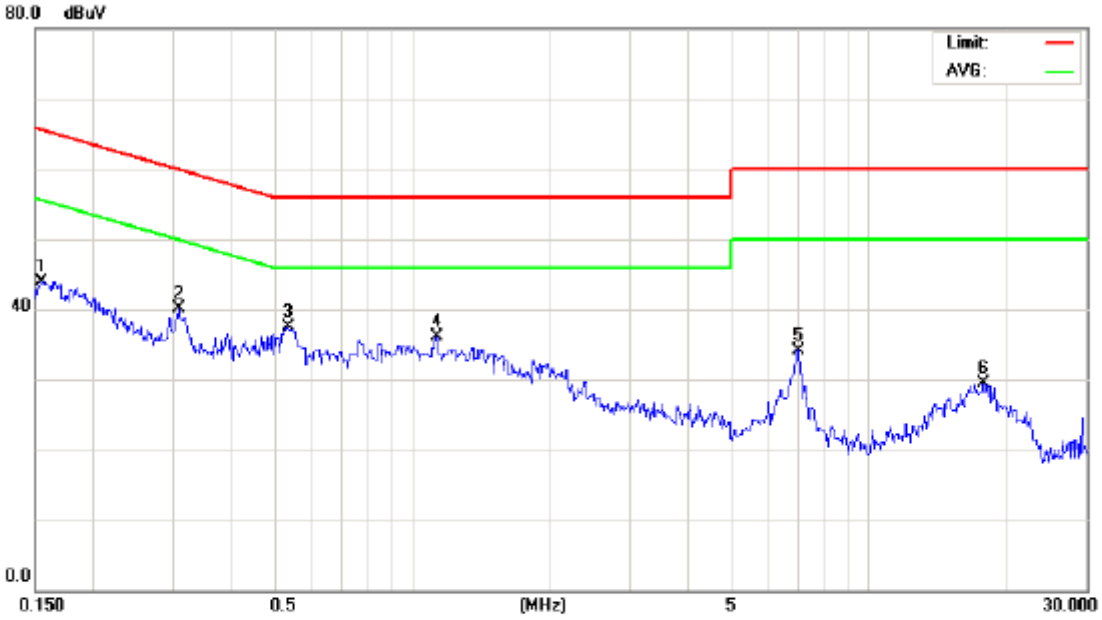
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1632	35.19	8.90	44.09	65.29	-21.20	peak	
2		0.3060	32.77	7.83	40.60	60.08	-19.48	peak	
3	*	0.5360	30.05	8.60	38.65	56.00	-17.35	peak	
4		1.4900	25.80	9.51	35.31	56.00	-20.69	peak	
5		6.9500	23.35	9.45	32.80	60.00	-27.20	peak	
6		17.8000	19.78	9.54	29.32	60.00	-30.68	peak	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	55%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

Phase: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1547	35.09	8.85	43.94	65.74	-21.80	peak	
2		0.3074	32.19	7.83	40.02	60.04	-20.02	peak	
3	*	0.5360	28.81	8.60	37.41	56.00	-18.59	peak	
4		1.1300	26.52	9.64	36.16	56.00	-19.84	peak	
5		7.0000	24.75	9.45	34.20	60.00	-25.80	peak	
6		17.8000	19.86	9.55	29.41	60.00	-30.59	peak	

5 ANTENNA CONDUCTED SPURIOUS EMISSION

5.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Antenna conducted Spurious Emission	30-25000	20 dB less than the peak value of fundamental frequency

5.2 MEASUREMENT INSTRUMENTS LIST

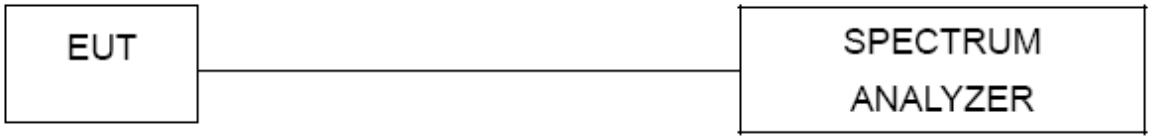
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

5.3 TEST PROCEDURES

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.

5.4 TEST SETUP LAYOUT



5.5 DEVIATION FROM TEST STANDARD

No deviation

5.6 EUT OPERATING CONDITIONS

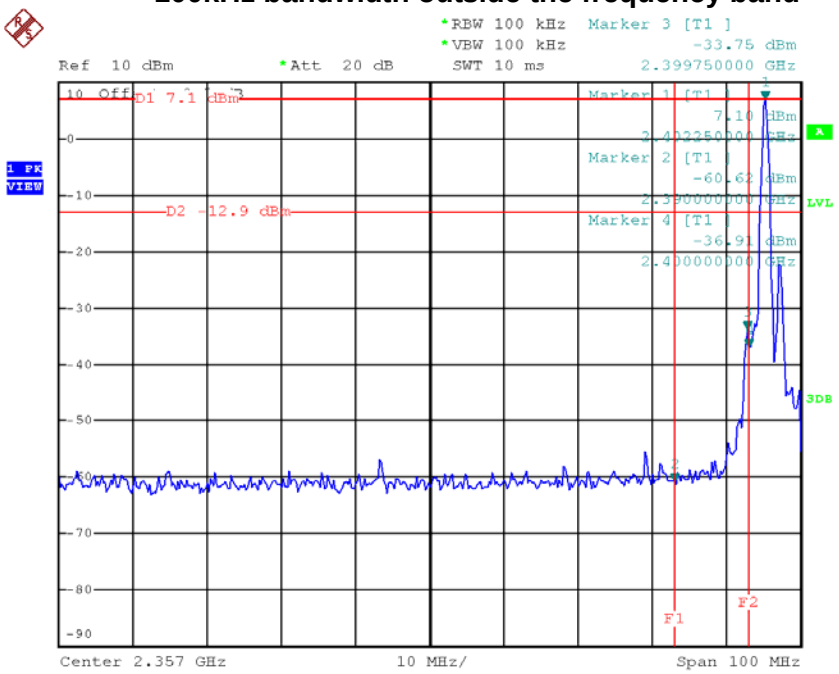
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

5.7 TEST RESULTS

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2399.75	-33.75	2483.50	-54.10
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

Bluetooth/1 Mbps/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



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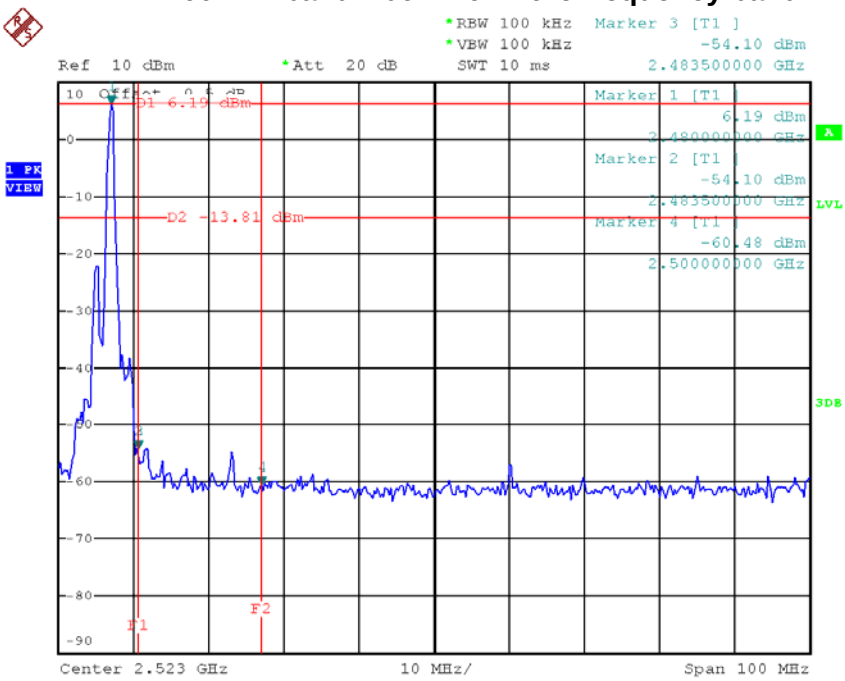
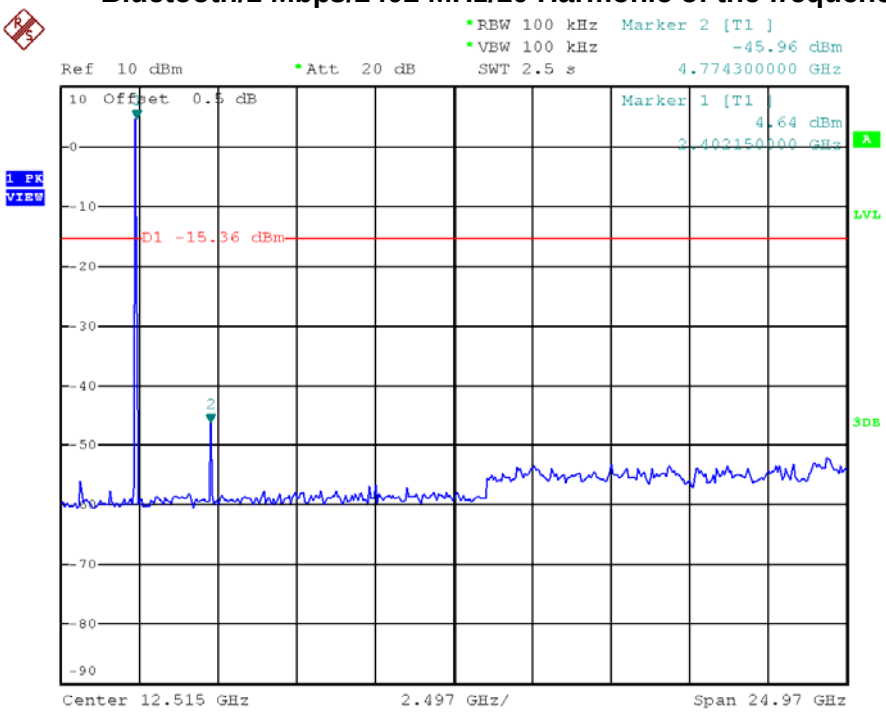
Bluetooth/1 Mbps/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



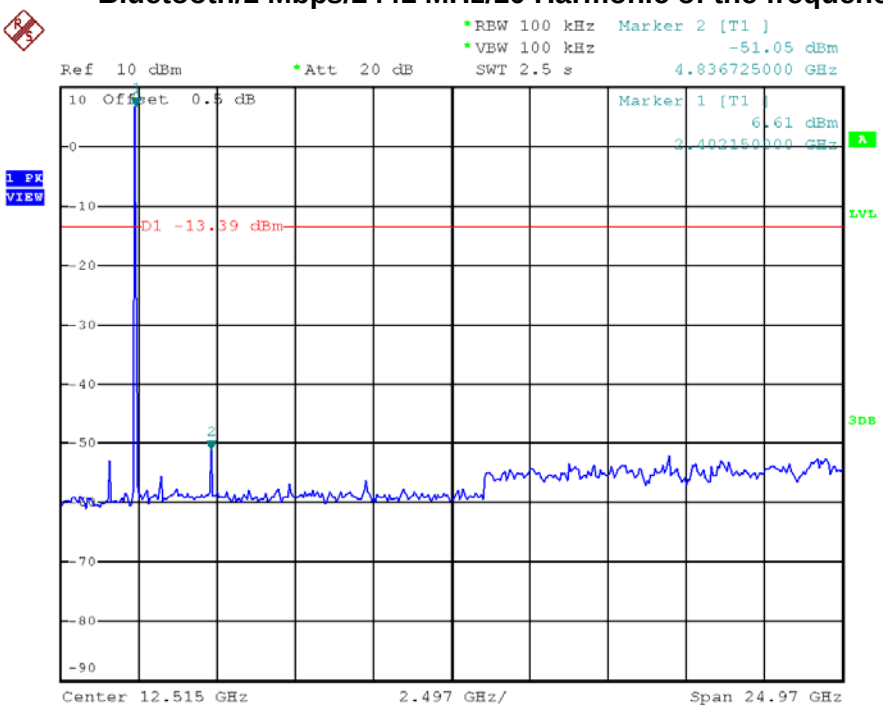
Date: 10.FEB.2014 11:51:14

Bluetooth/1 Mbps/2402 MHz/10 Harmonic of the frequency



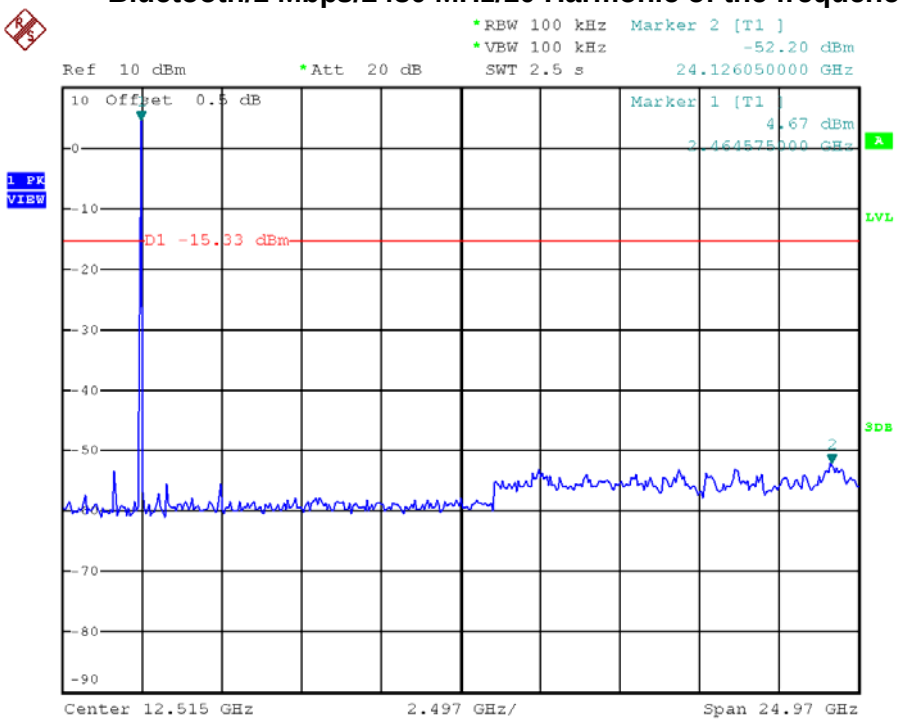
Date: 10.FEB.2014 11:44:28

Bluetooth/1 Mbps/2441 MHz/10 Harmonic of the frequency



Date: 10.FEB.2014 11:48:33

Bluetooth/1 Mbps/2480 MHz/10 Harmonic of the frequency

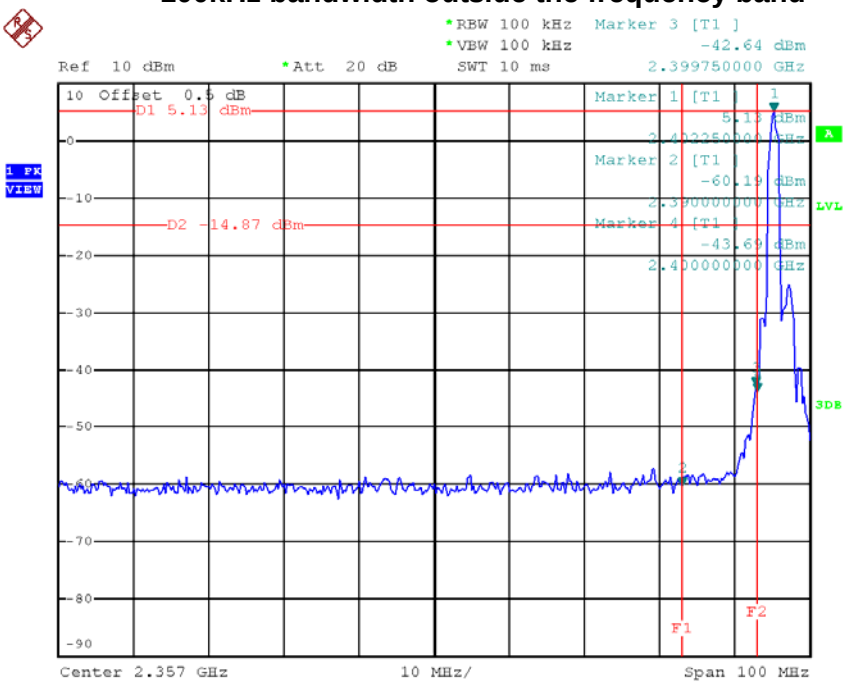


Date: 10.FEB.2014 11:50:42

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps		

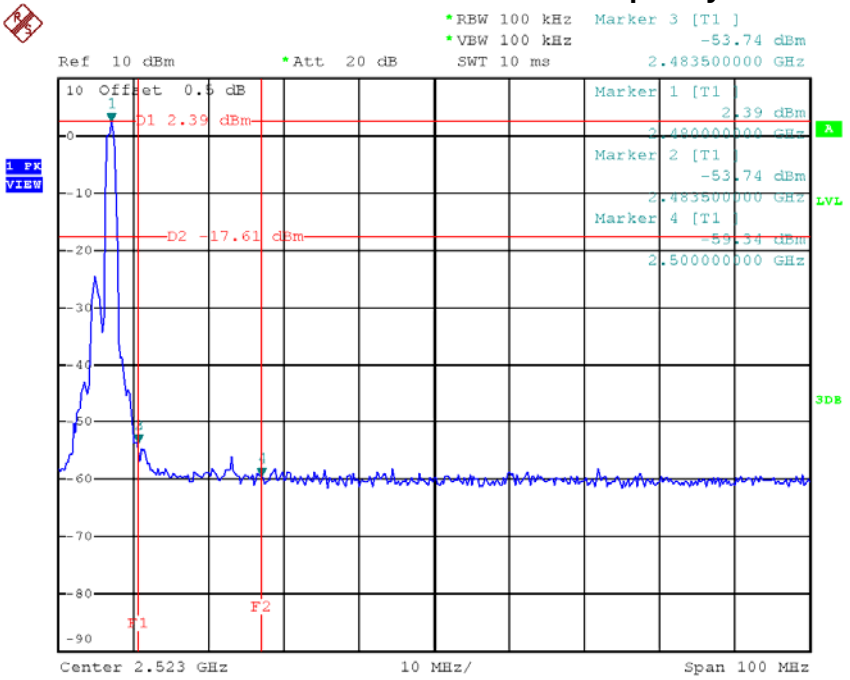
Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2399.75	-42.64	2483.50	-53.74
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

Bluetooth/3 Mbps/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



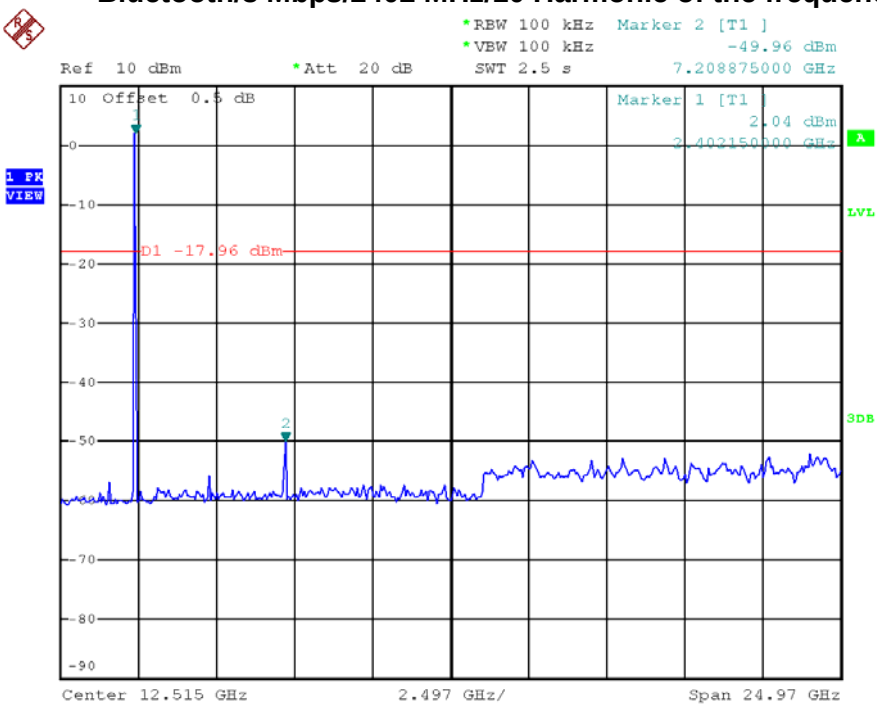
Date: 10.FEB.2014 12:01:33

Bluetooth/3 Mbps/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



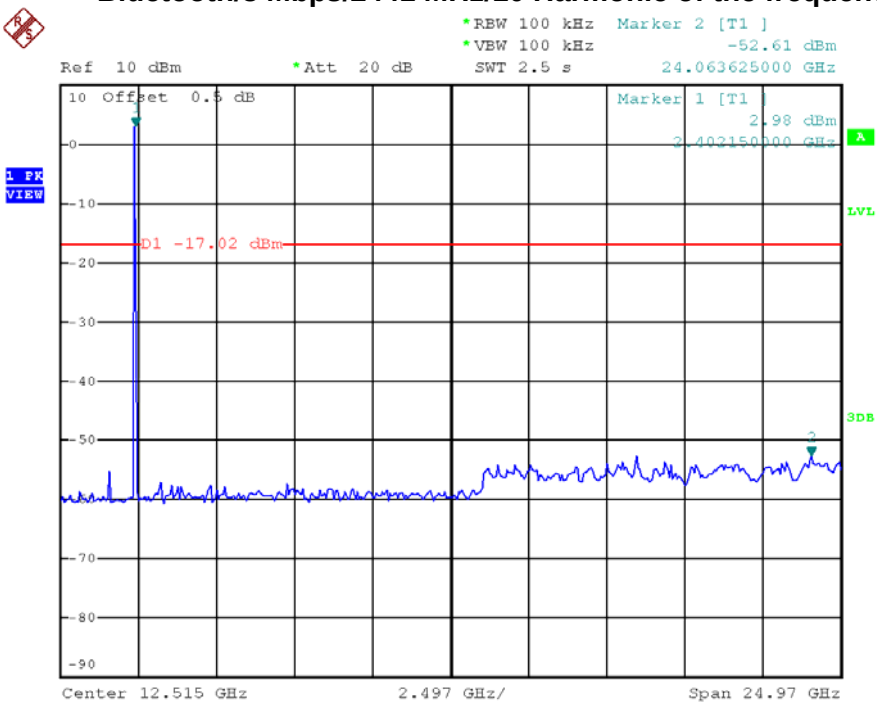
Date: 10.FEB.2014 12:07:55

Bluetooth/3 Mbps/2402 MHz/10 Harmonic of the frequency



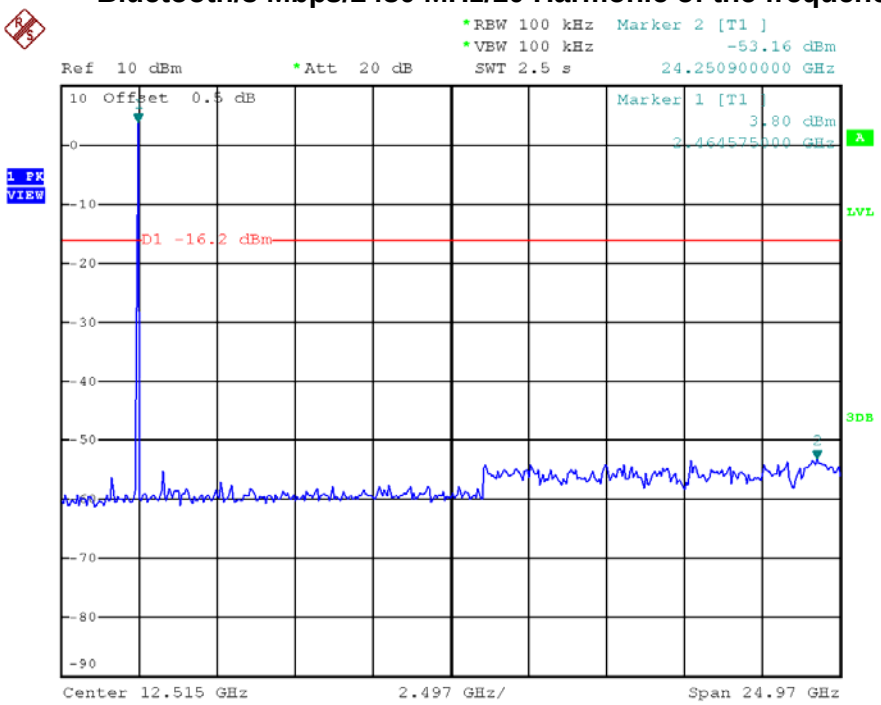
Date: 10.FEB.2014 12:01:01

Bluetooth/3 Mbps/2441 MHz/10 Harmonic of the frequency



Date: 10.FEB.2014 12:04:07

Bluetooth/3 Mbps/2480 MHz/10 Harmonic of the frequency



Date: 10.FEB.2014 12:07:15

6 HOPPING CHANNEL SEPARATION

6.1 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.

6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

6.3 MEASURING INSTRUMENTS SETTING

EMI Test Receiver	Parameter Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.4 TEST PROCEDURES

a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
c. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

6.5 TEST SETUP LAYOUT

6.6 DEVIATION FROM TEST STANDARD

No deviation

6.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

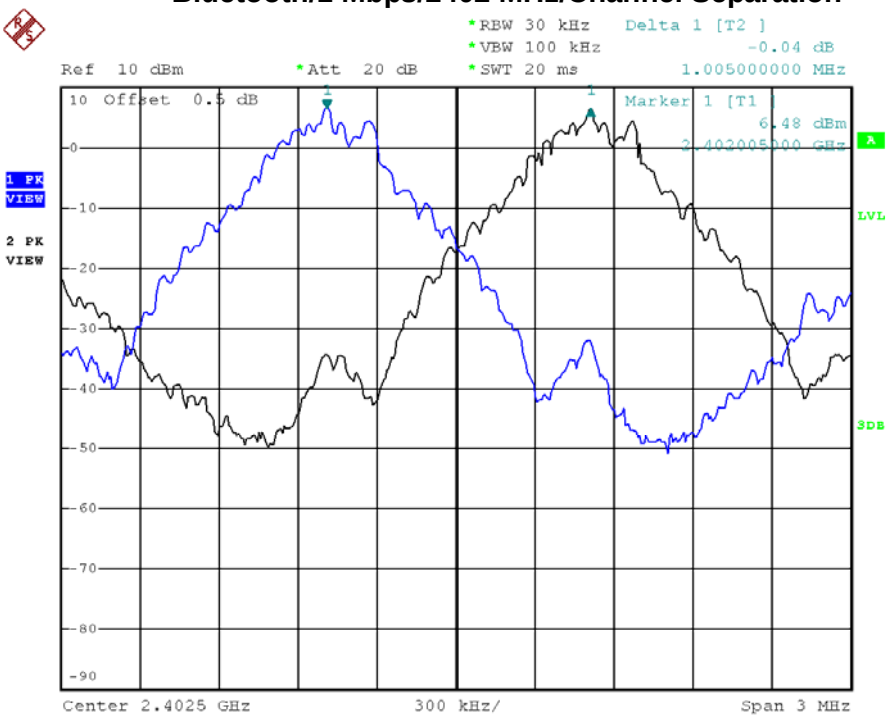
6.8 TEST RESULTS

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz, 2441 MHz, 2480 MHz		

Frequency	Channel Separation (MHz)	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Two-thirds of the 20 dB Bandwidth	Result
2402 MHz	1.01	0.923	0.855	0.62	PASS
2441 MHz	1.01	0.863	0.850	0.58	PASS
2480 MHz	1.01	0.928	0.855	0.62	PASS

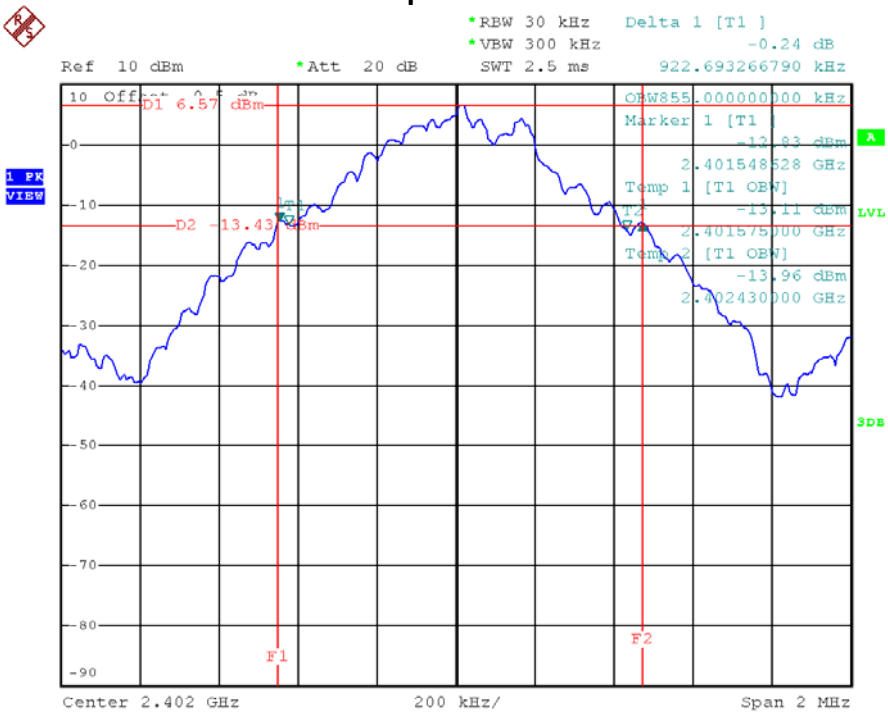
NOTE: Ch. Separation Limits: >25 KHz or >2/3 of 20dB bandwidth

Bluetooth/1 Mbps/2402 MHz/Channel Separation



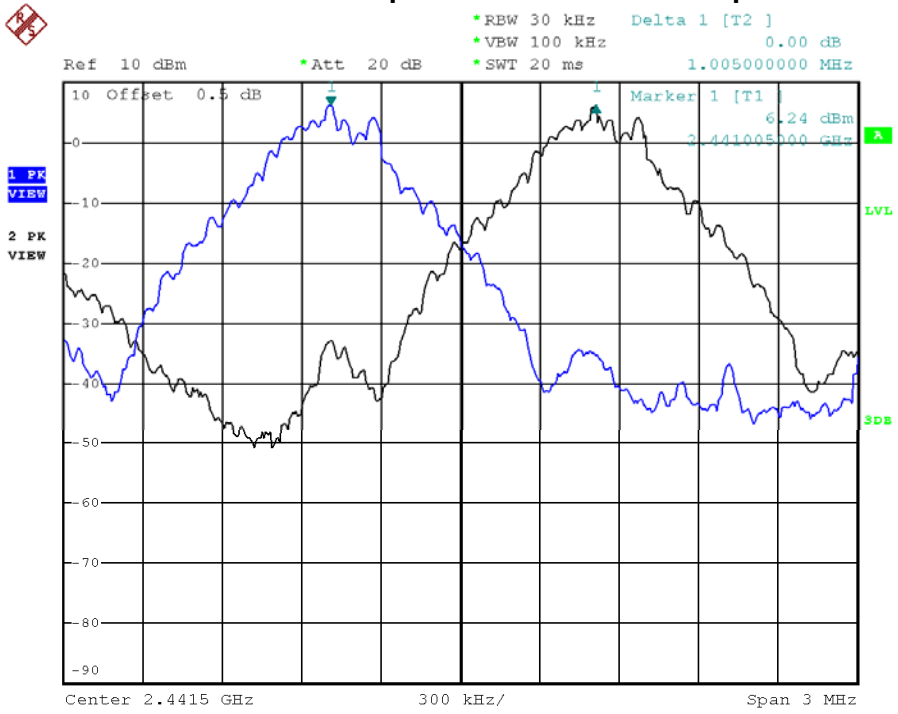
Date: 10.FEB.2014 11:47:45

Bluetooth/1 Mbps/2402 MHz/20dB Bandwidth



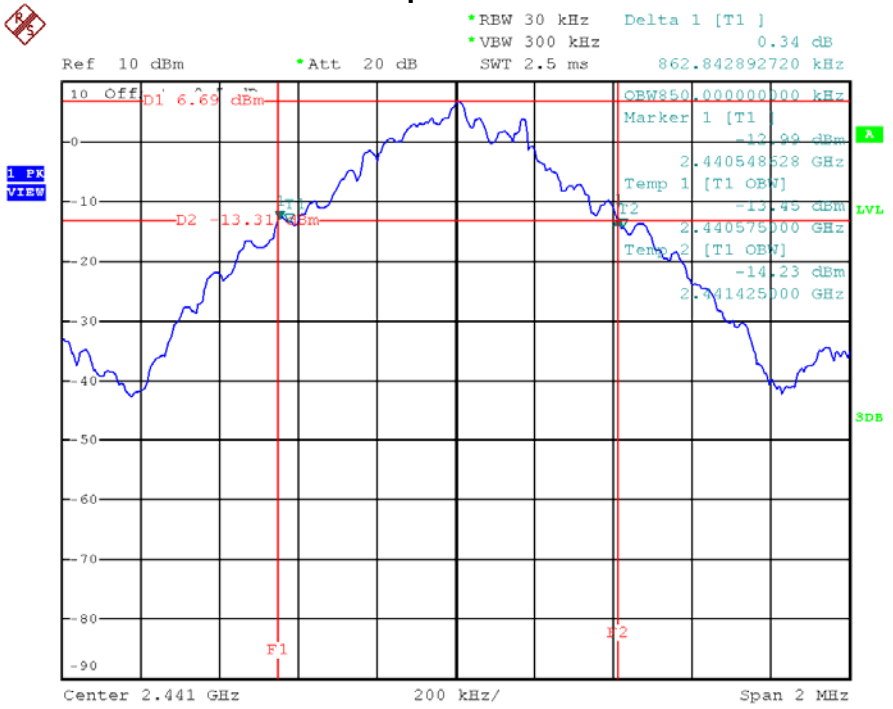
Date: 10.FEB.2014 11:47:06

Bluetooth/1 Mbps/2441 MHz/Channel Separation



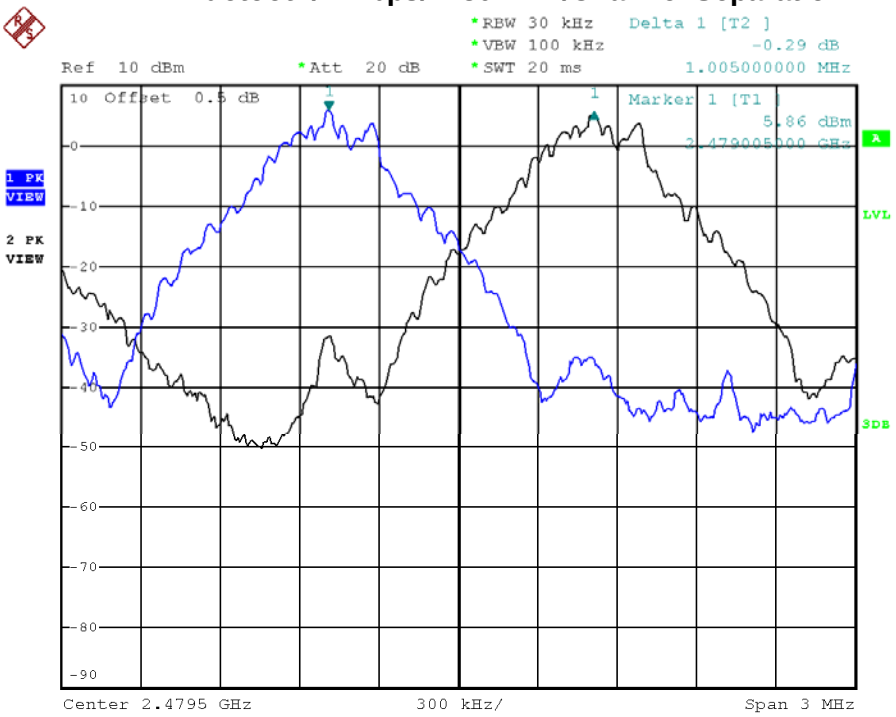
Date: 10.FEB.2014 11:50:01

Bluetooth/1 Mbps/2441 MHz/20dB Bandwidth



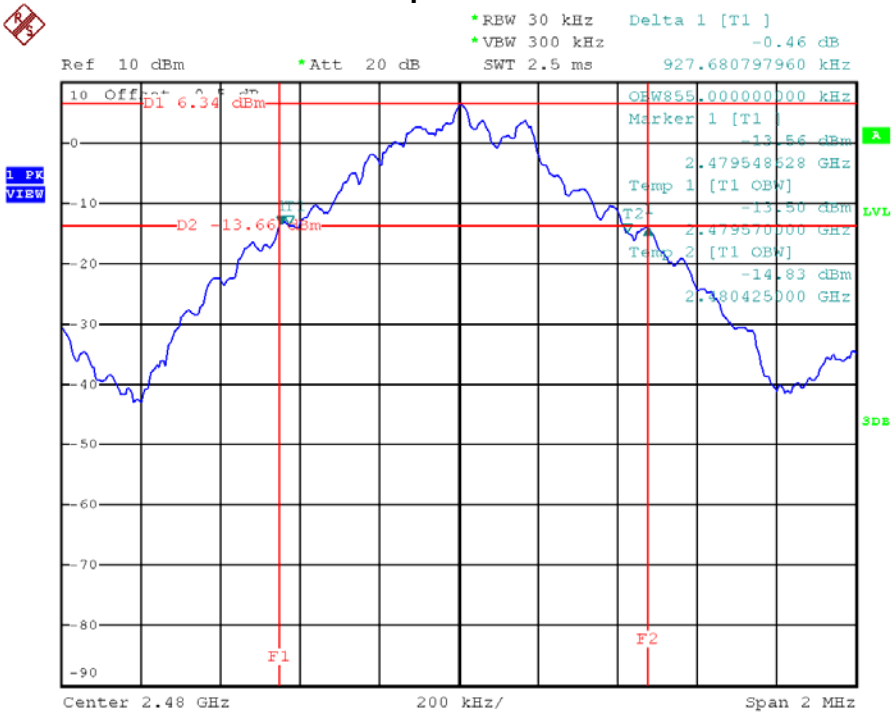
Date: 10.FEB.2014 11:48:55

Bluetooth/1 Mbps/2480 MHz/Channel Separation



Date: 10.FEB.2014 11:52:16

Bluetooth/1 Mbps/2480 MHz/20dB Bandwidth



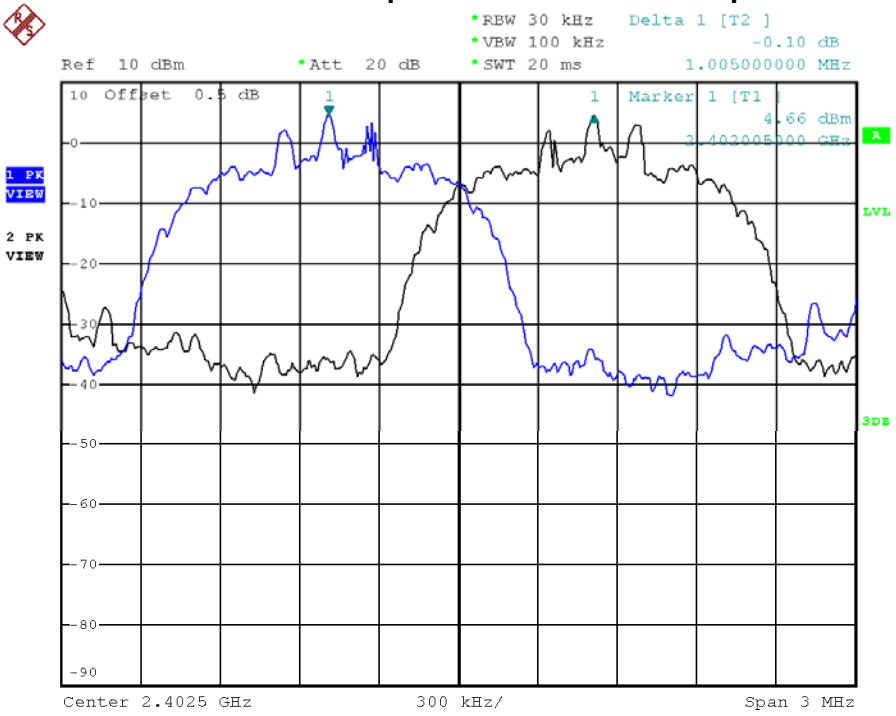
Date: 10.FEB.2014 11:51:03

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz, 2441 MHz, 2480 MHz		

Frequency	Channel Separation (MHz)	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Two-thirds of the 20 dB Bandwidth	Result
2402 MHz	1.01	1.277	1.180	0.85	PASS
2441 MHz	1.01	1.257	1.175	0.84	PASS
2480 MHz	1.01	1.247	1.165	0.83	PASS

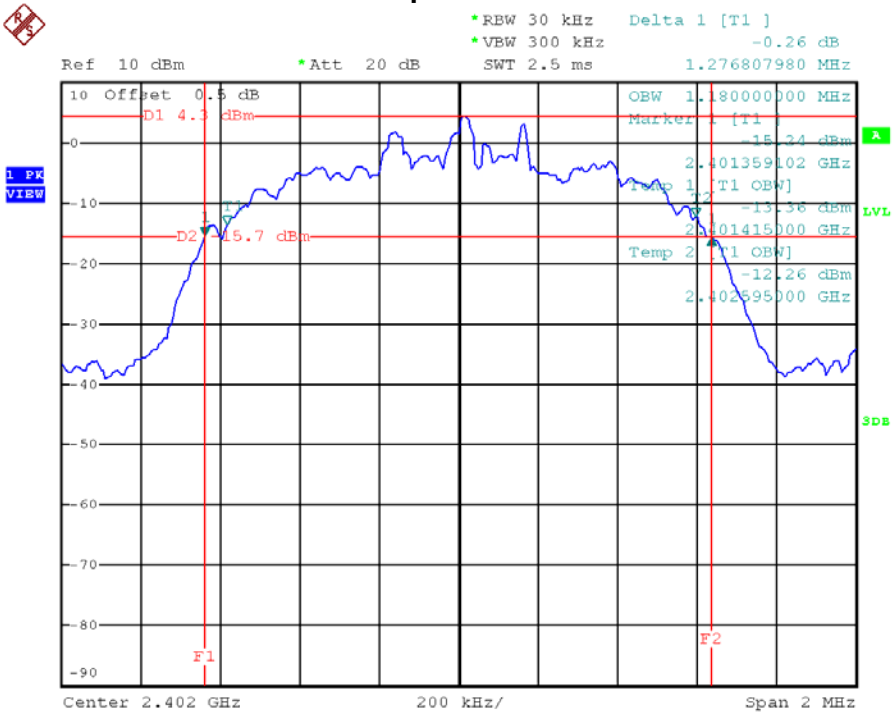
NOTE: Ch. Separation Limits: >25 KHz or >2/3 of 20dB bandwidth

Bluetooth/3 Mbps/2402 MHz/Channel Separation



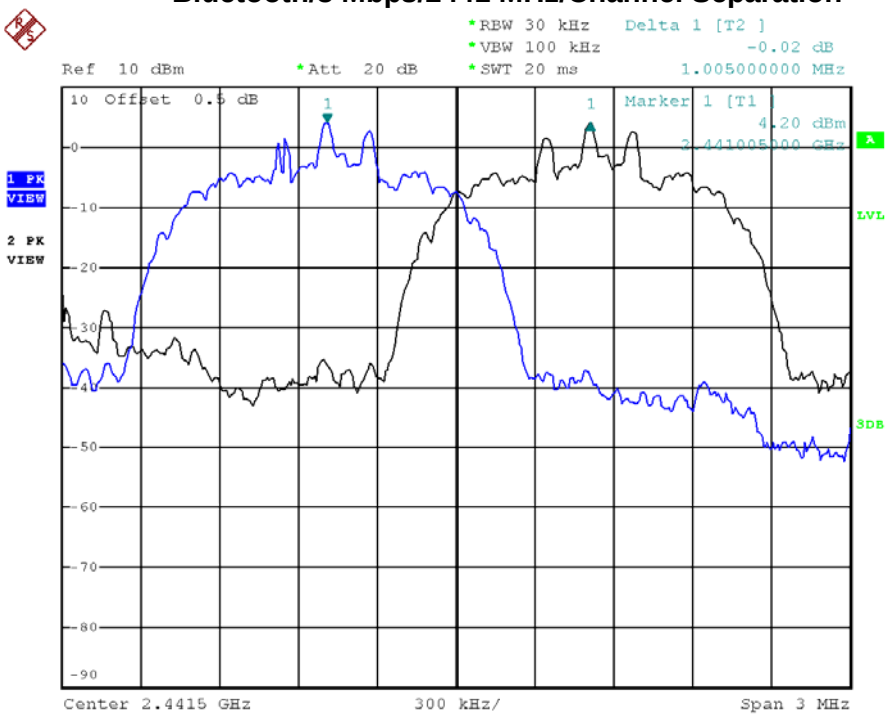
Date: 10.FEB.2014 12:02:38

Bluetooth/3 Mbps/2402 MHz/20dB Bandwidth



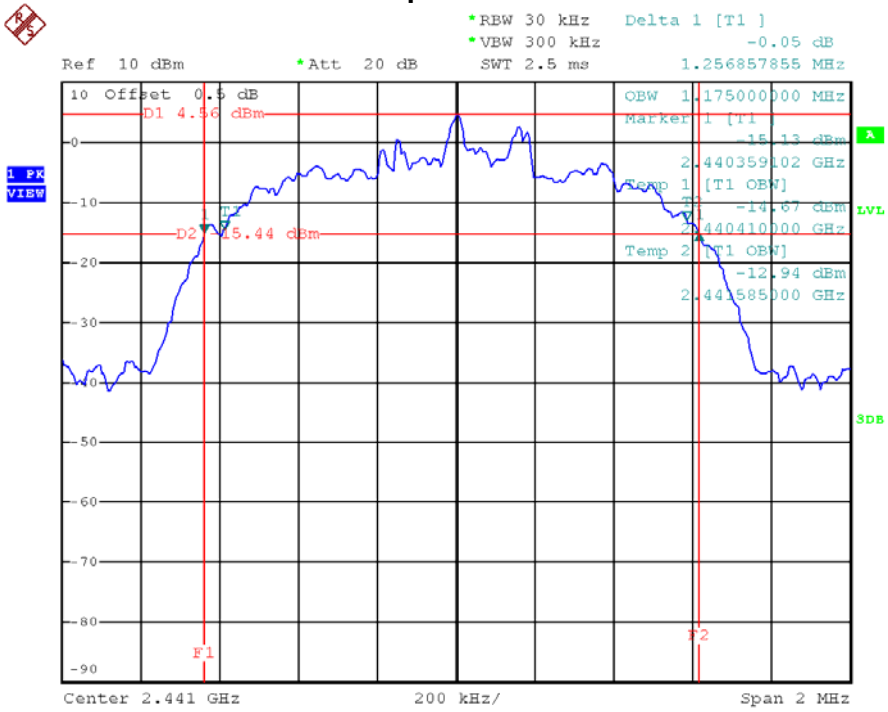
Date: 10.FEB.2014 12:01:20

Bluetooth/3 Mbps/2441 MHz/Channel Separation



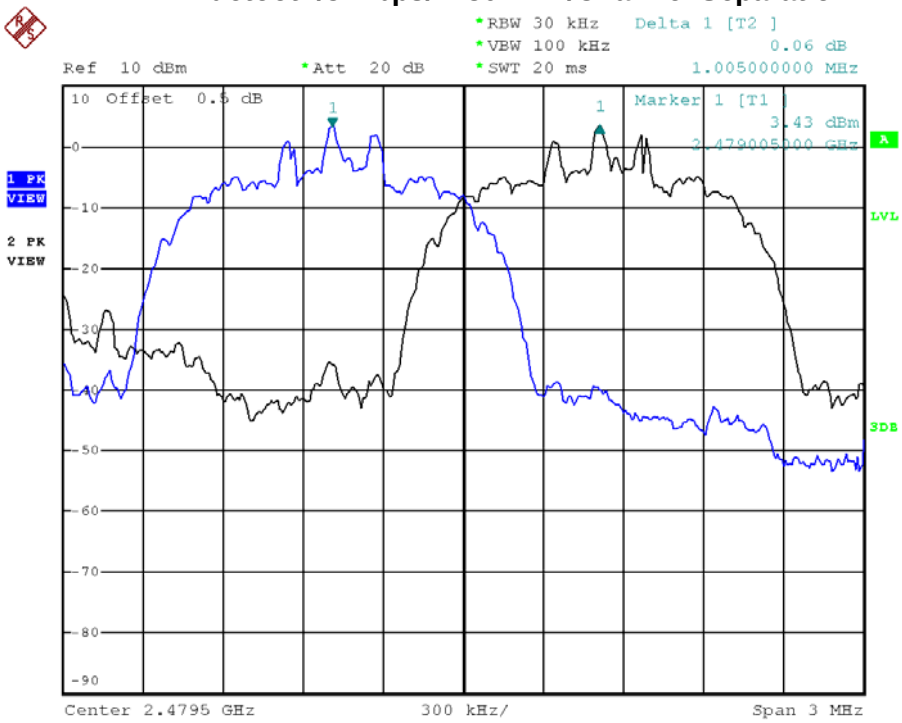
Date: 10.FEB.2014 12:05:43

Bluetooth/3 Mbps/2441 MHz/20dB Bandwidth



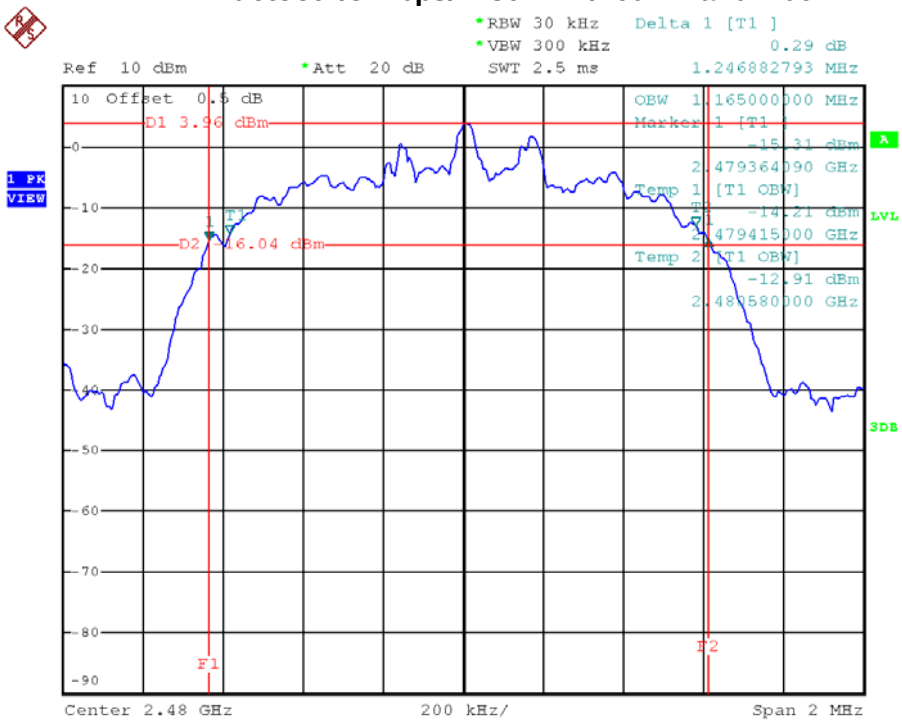
Date: 10.FEB.2014 12:04:25

Bluetooth/3 Mbps/2480 MHz/Channel Separation



Date: 10.FEB.2014 12:09:08

Bluetooth/3 Mbps/2480 MHz/20dB Bandwidth



Date: 10.FEB.2014 12:07:35

7 MAXIMUM PEAK CONDUCTED OUTPUT POWER

7.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Maximum Peak Conducted Output Power	2400-2483.5	1 watt or 30 dBm

7.2 MEASUREMENT INSTRUMENTS LIST

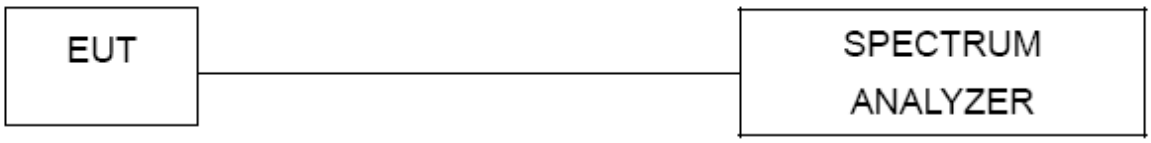
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

7.3 TEST PROCEDURES

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= 3 MHz, VBW= 3 MHz, Sweep time = Auto.

7.4 TEST SETUP LAYOUT



7.5 DEVIATION FROM TEST STANDARD

No deviation

7.6 EUT OPERATING CONDITIONS

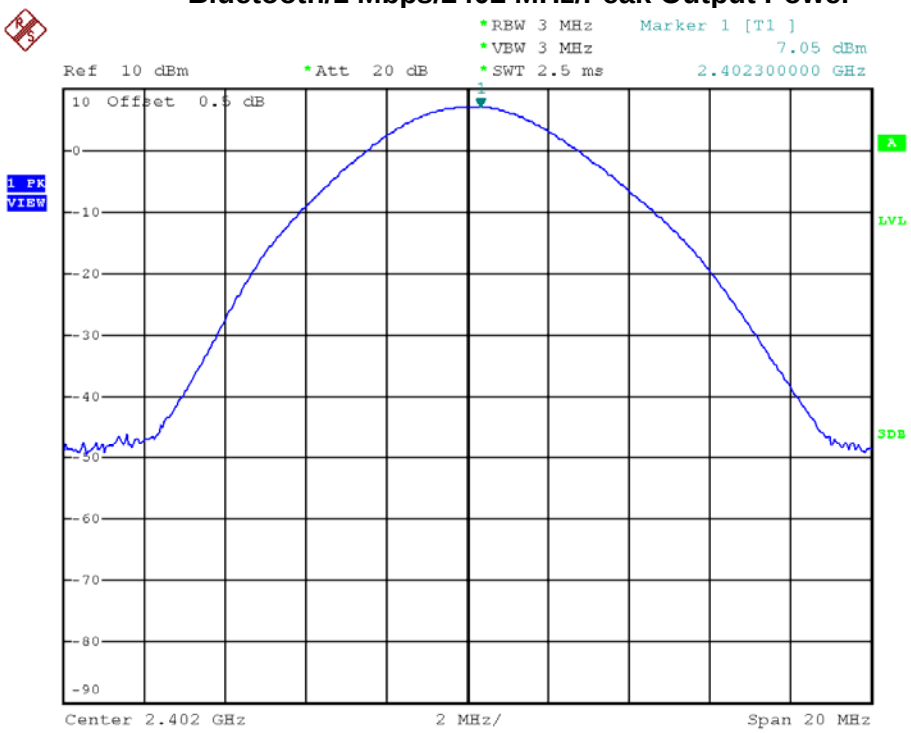
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.7 TEST RESULTS

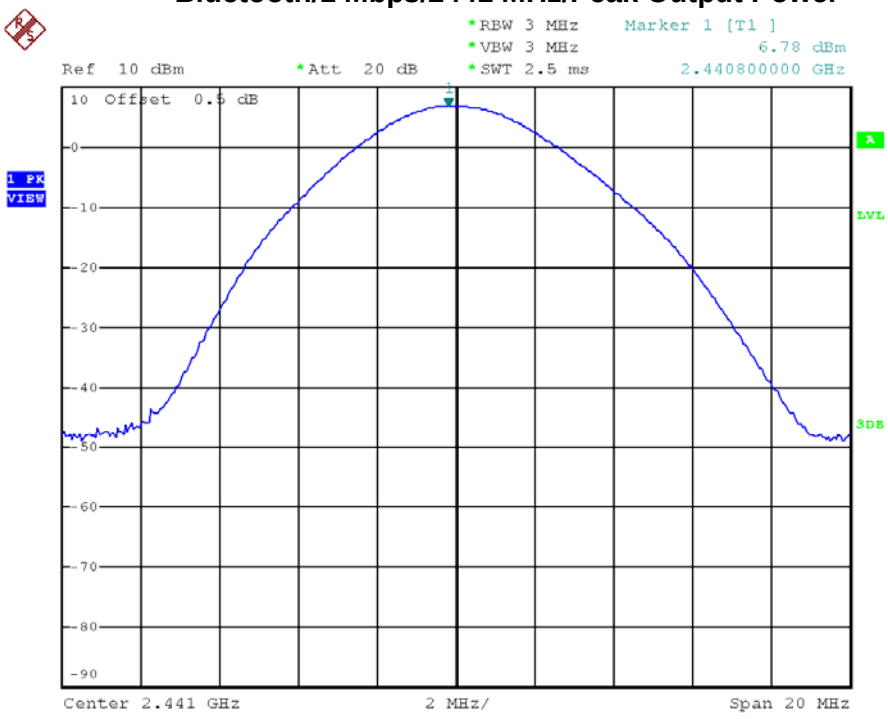
E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz, 2441 MHz, 2480 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2402 MHz	7.05	30	PASS
2441 MHz	6.78	30	PASS
2480 MHz	6.43	30	PASS

Bluetooth/1 Mbps/2402 MHz/Peak Output Power

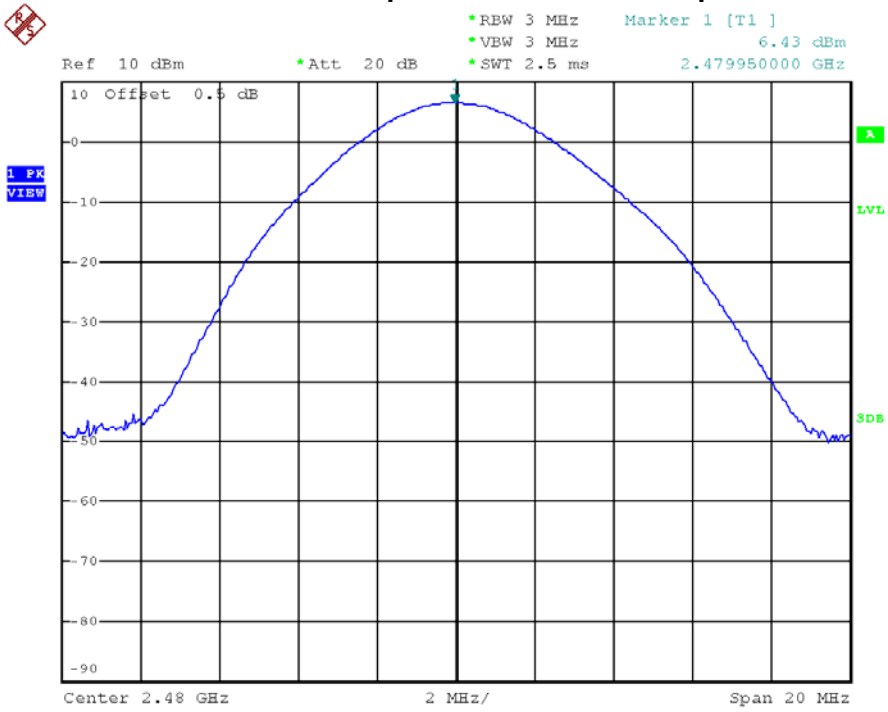


Bluetooth/1 Mbps/2441 MHz/Peak Output Power



Date: 10.FEB.2014 11:49:31

Bluetooth/1 Mbps/2480 MHz/Peak Output Power

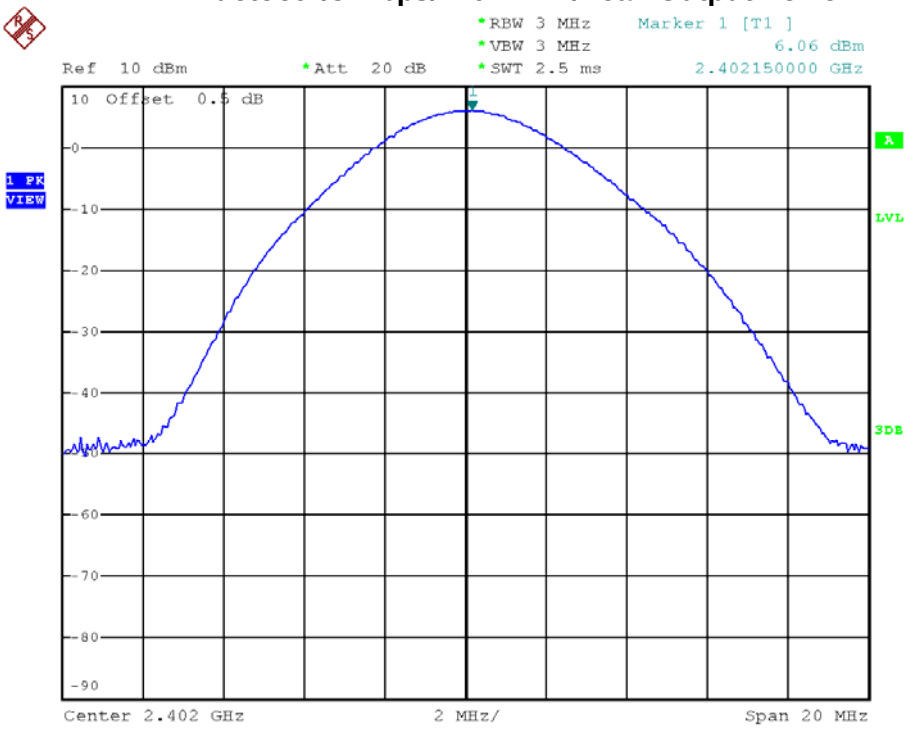


Date: 10.FEB.2014 11:51:51

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz, 2441 MHz, 2480 MHz		

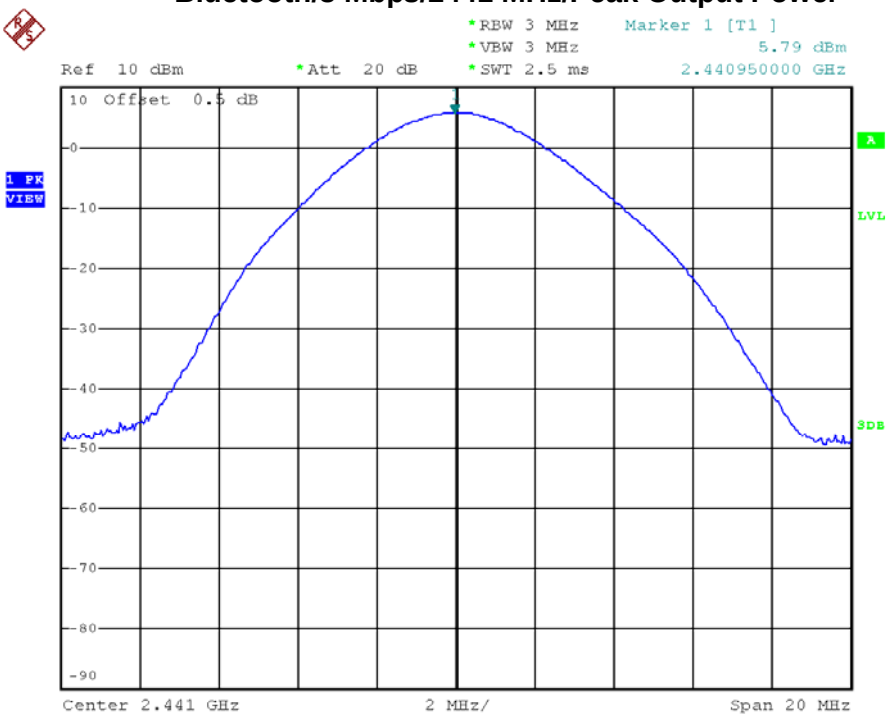
Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2402 MHz	6.06	30	PASS
2441 MHz	5.79	30	PASS
2480 MHz	5.26	30	PASS

Bluetooth/3 Mbps/2402 MHz/Peak Output Power



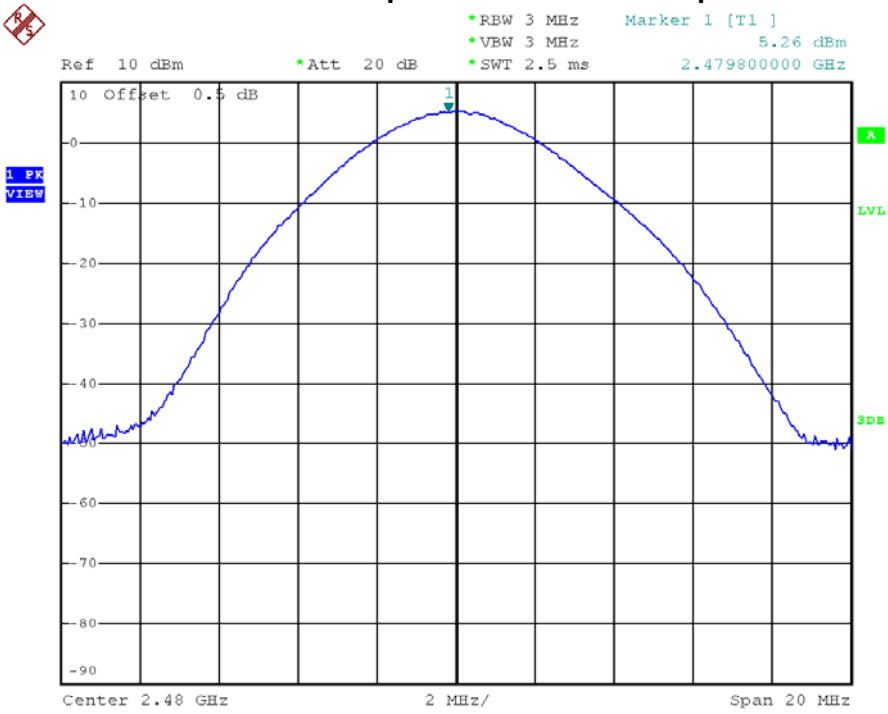
Date: 10.FEB.2014 12:02:10

Bluetooth/3 Mbps/2441 MHz/Peak Output Power



Date: 10.FEB.2014 12:05:16

Bluetooth/3 Mbps/2480 MHz/Peak Output Power



Date: 10.FEB.2014 12:08:32

8 RADIATED SPURIOUS EMISSION (9 KHZ TO 1 GHZ)

8.1 LIMIT

20 dB 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.

Frequency Range: 9 kHz to 1 GHz		
FREQUENCY (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

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

(1) The limit for radiated test was performed according to FCC PART 15B.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 15, 2014
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2014
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 13, 2014
5	Microflex Cable	EMC	S104-SMA	8m	May. 13, 2014
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2014
7	Test Cable	LMR	LMR-400	12m	May. 14, 2014
8	Test Cable	LMR	LMR-400	3m	May. 14, 2014
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2014
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 11, 2014
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 17, 2015
12	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 24, 2013

Remark: “N/A” denotes no model name, no serial No. or no calibration specified.

8.3 MEASURING INSTRUMENTS SETTING

EMI Test 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

8.4 TEST PROCEDURES

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz. For frequencies above 1 GHz, 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 3m Semi-anechoic chamber. 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.
g. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

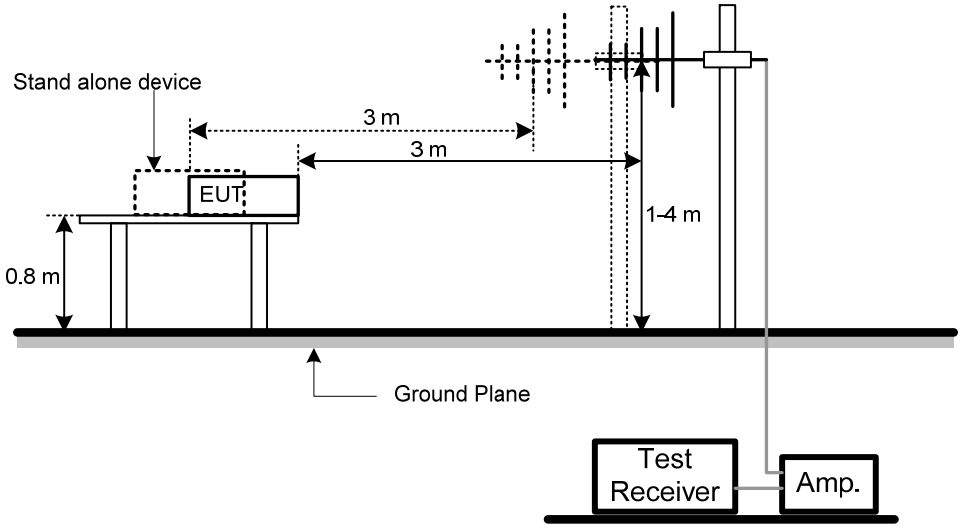
NOTE:

a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz; SPA setting in RBW=100 kHz, VBW =100 kHz, Swp. Time = 0.3 sec./ MHz.
b. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform.

8.5 DEVIATION FROM TEST STANDARD

No deviation

8.6 TEST SETUP LAYOUT



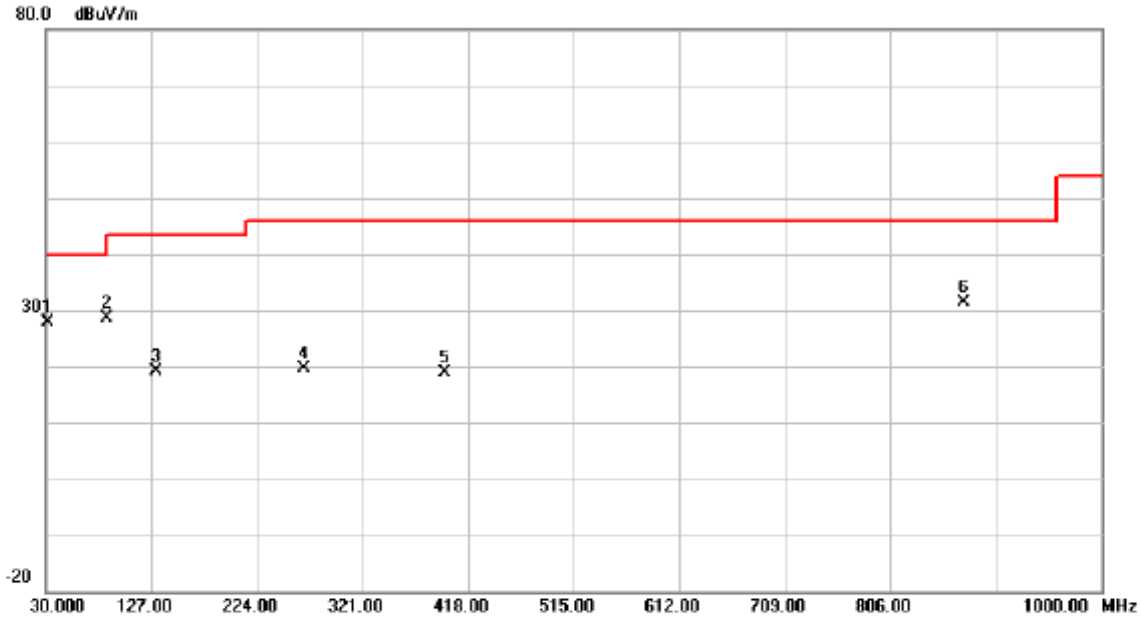
8.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.8 TEST RESULTS

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

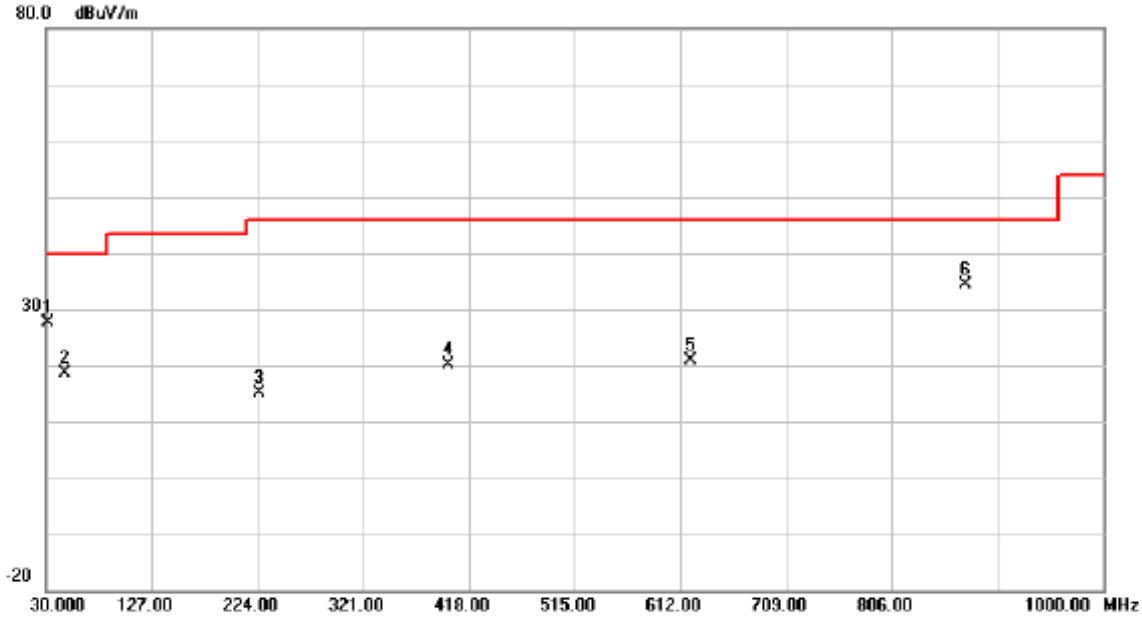
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.4250	42.76	-14.93	27.83	40.00	-12.17	peak	
2	*	85.7750	48.34	-19.62	28.72	40.00	-11.28	peak	
3		131.8500	34.74	-15.66	19.08	43.50	-24.42	peak	
4		267.6500	34.09	-14.49	19.60	46.00	-26.40	peak	
5		396.1750	30.11	-11.33	18.78	46.00	-27.22	peak	
6		873.9000	35.35	-3.87	31.48	46.00	-14.52	peak	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.4250	42.67	-14.93	27.74	40.00	-12.26	peak	
2		46.9750	32.41	-13.84	18.57	40.00	-21.43	peak	
3		226.4250	31.74	-16.50	15.24	46.00	-30.76	peak	
4		398.6000	31.39	-11.23	20.16	46.00	-25.84	peak	
5		621.7000	27.67	-6.82	20.85	46.00	-25.15	peak	
6	*	873.9000	38.26	-3.87	34.39	46.00	-11.61	peak	

9 RADIATED SPURIOUS EMISSION (ABOVE 1 GHZ)

9.1 LIMIT

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.

Frequency Range: 9 kHz to 1 GHz		
FREQUENCY (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

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

(1) The limit for radiated test was performed according to FCC PART 15B.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 15, 2014
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2014
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 13, 2014
5	Microflex Cable	EMC	S104-SMA	8m	May. 13, 2014
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2014
7	Test Cable	LMR	LMR-400	12m	May. 14, 2014
8	Test Cable	LMR	LMR-400	3m	May. 14, 2014
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2014
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 11, 2014
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 17, 2015
12	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 24, 2013

Remark: “N/A” denotes no model name, no serial No. or no calibration specified.

9.3 MEASURING INSTRUMENTS SETTING

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

9.4 TEST PROCEDURES

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz. For frequencies above 1 GHz, 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 3m Semi-anechoic chamber. 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.
g. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

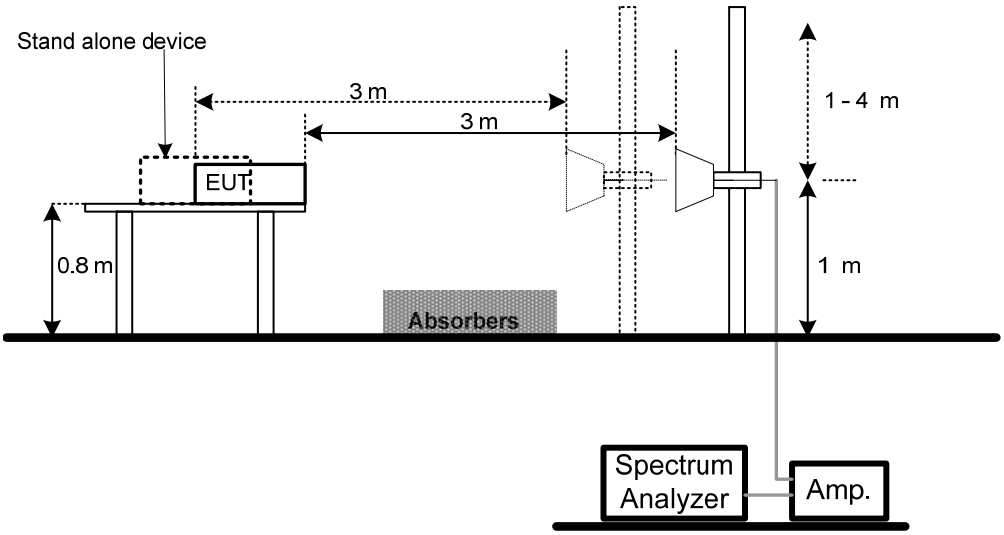
NOTE:

a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

9.5 DEVIATION FROM TEST STANDARD

No deviation

9.6 TEST SETUP LAYOUT



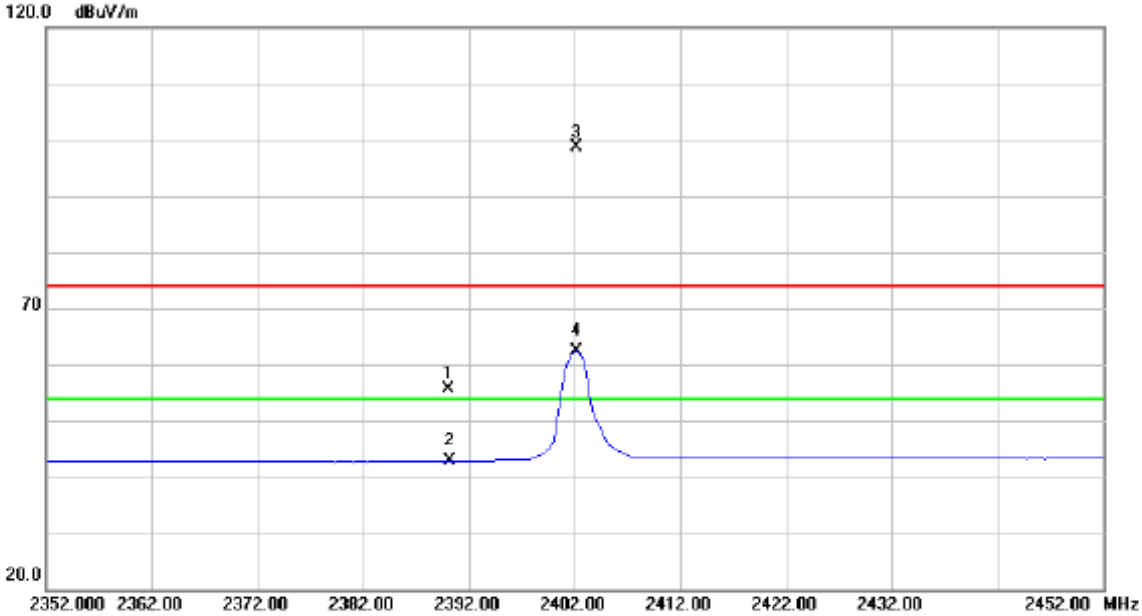
9.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

9.8 TEST RESULTS

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		

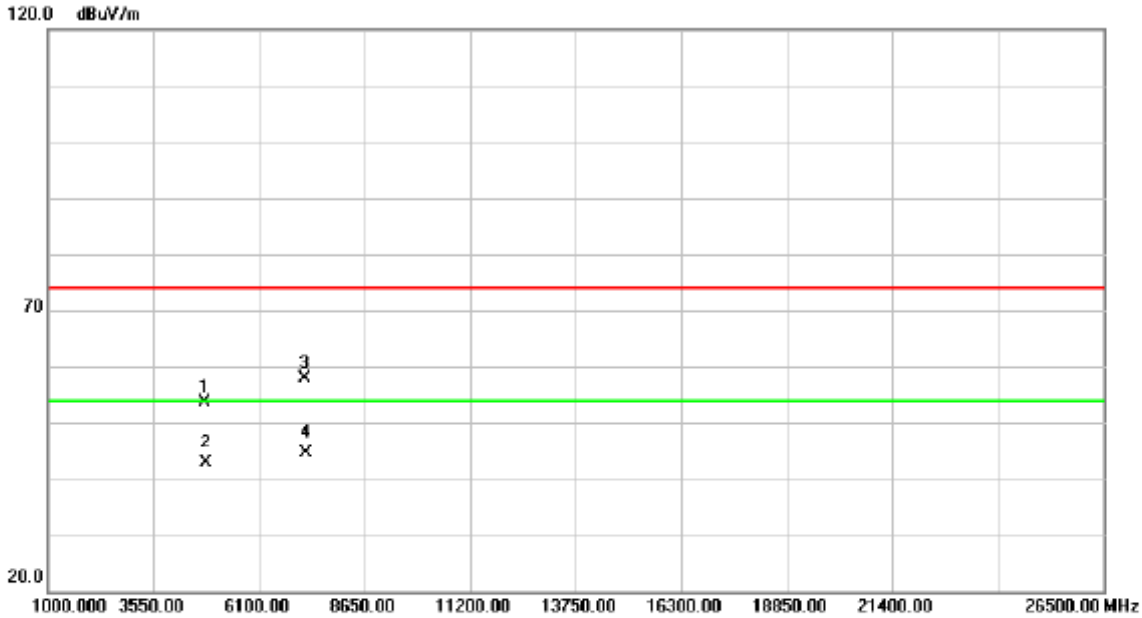
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.85	31.81	55.66	74.00	-18.34	peak	
2		2390.000	11.06	31.81	42.87	54.00	-11.13	AVG	
3	*	2402.250	66.79	31.86	98.65	74.00	24.65	peak	
4	X	2402.250	30.50	31.86	62.36	54.00	8.36	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		

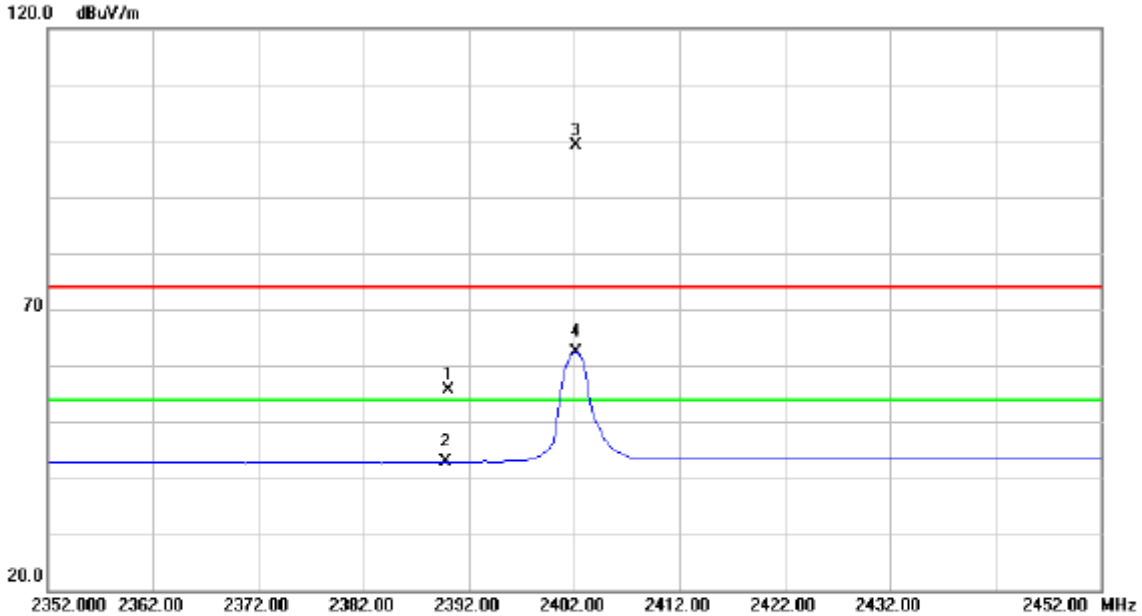
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4803.970	47.33	6.19	53.52	74.00	-20.48	peak	
2		4803.970	36.60	6.19	42.79	54.00	-11.21	AVG	
3		7205.975	45.58	12.37	57.95	74.00	-16.05	peak	
4	*	7205.975	32.35	12.37	44.72	54.00	-9.28	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		

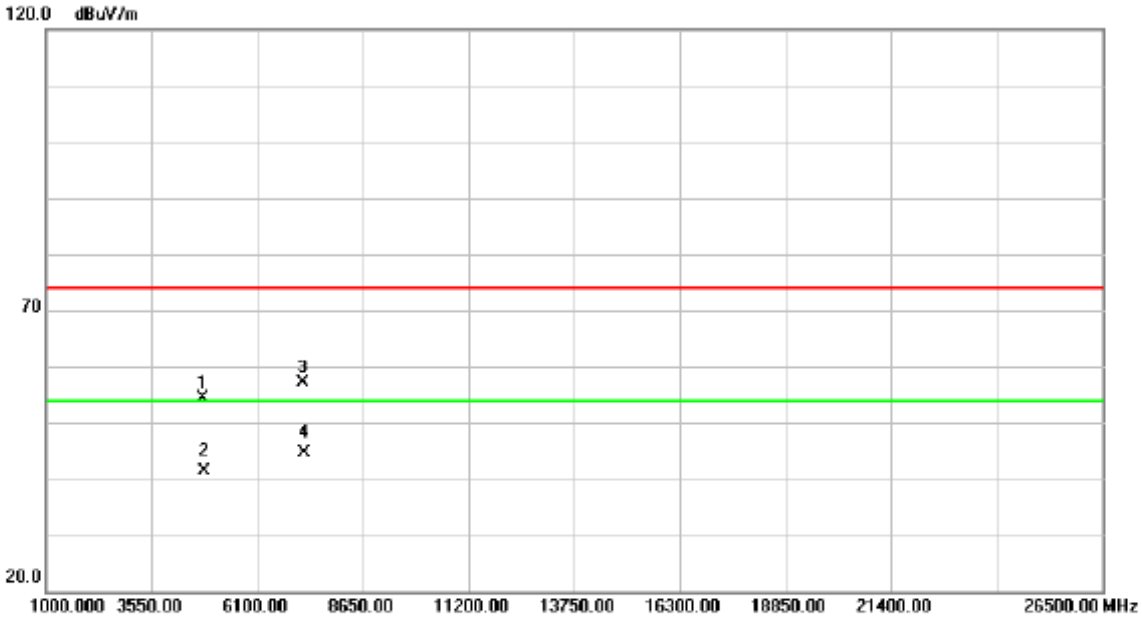
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.86	31.81	55.67	74.00	-18.33	peak	
2		2390.000	11.06	31.81	42.87	54.00	-11.13	AVG	
3	*	2402.250	67.17	31.86	99.03	74.00	25.03	peak	
4	X	2402.250	30.61	31.86	62.47	54.00	8.47	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		

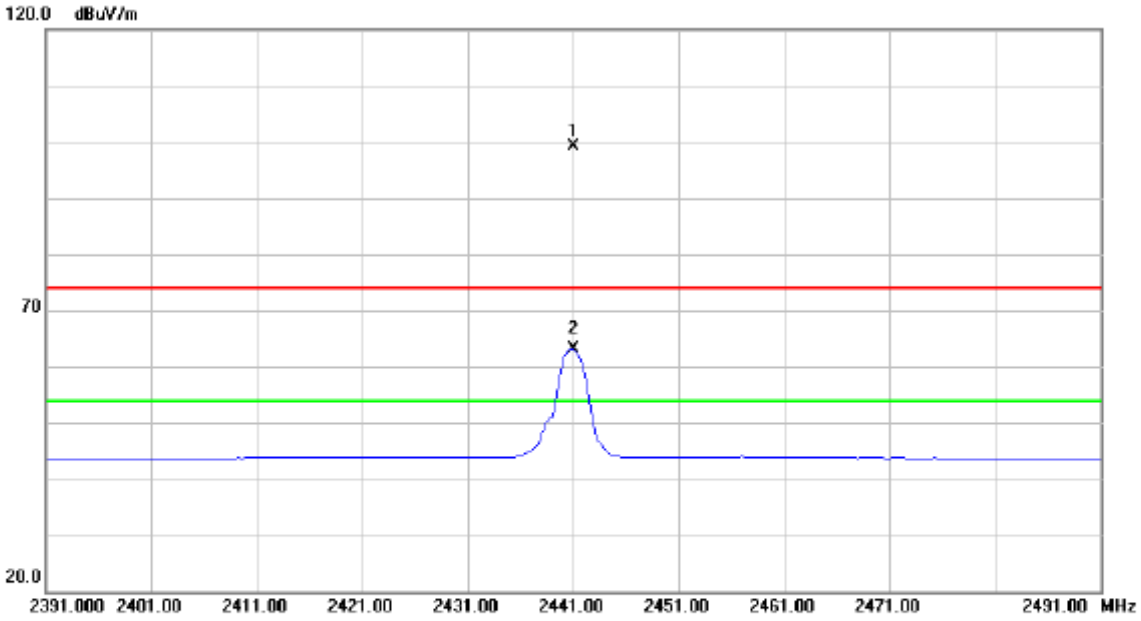
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.055	48.17	6.19	54.36	74.00	-19.64	peak	
2		4804.055	35.21	6.19	41.40	54.00	-12.60	AVG	
3		7206.135	44.75	12.37	57.12	74.00	-16.88	peak	
4	*	7206.135	32.34	12.37	44.71	54.00	-9.29	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

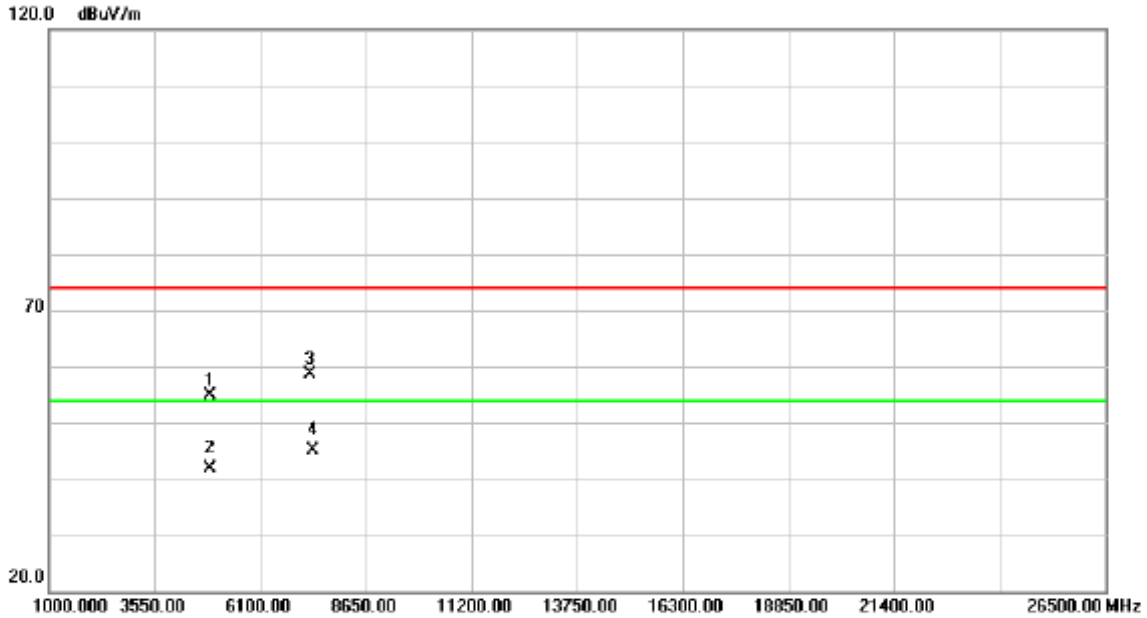
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2441.000	67.22	32.02	99.24	74.00	25.24	peak	
2	X	2441.000	31.11	32.02	63.13	54.00	9.13	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

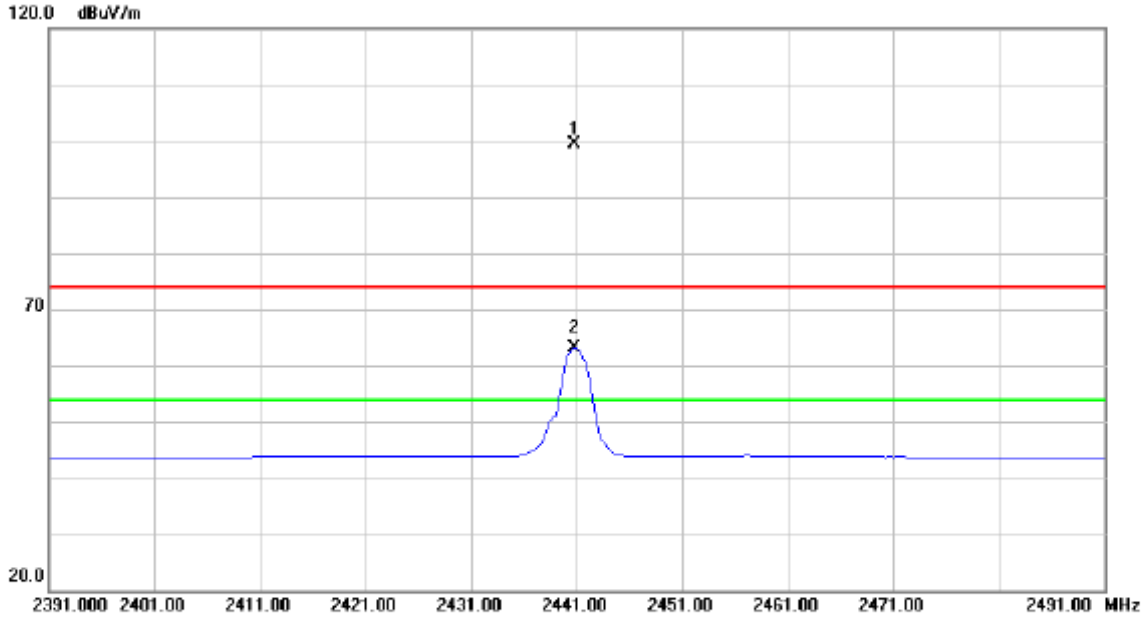
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.055	48.51	6.29	54.80	74.00	-19.20	peak	
2		4882.055	35.55	6.29	41.84	54.00	-12.16	AVG	
3		7323.340	45.78	12.82	58.60	74.00	-15.40	peak	
4	*	7323.340	32.28	12.82	45.10	54.00	-8.90	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

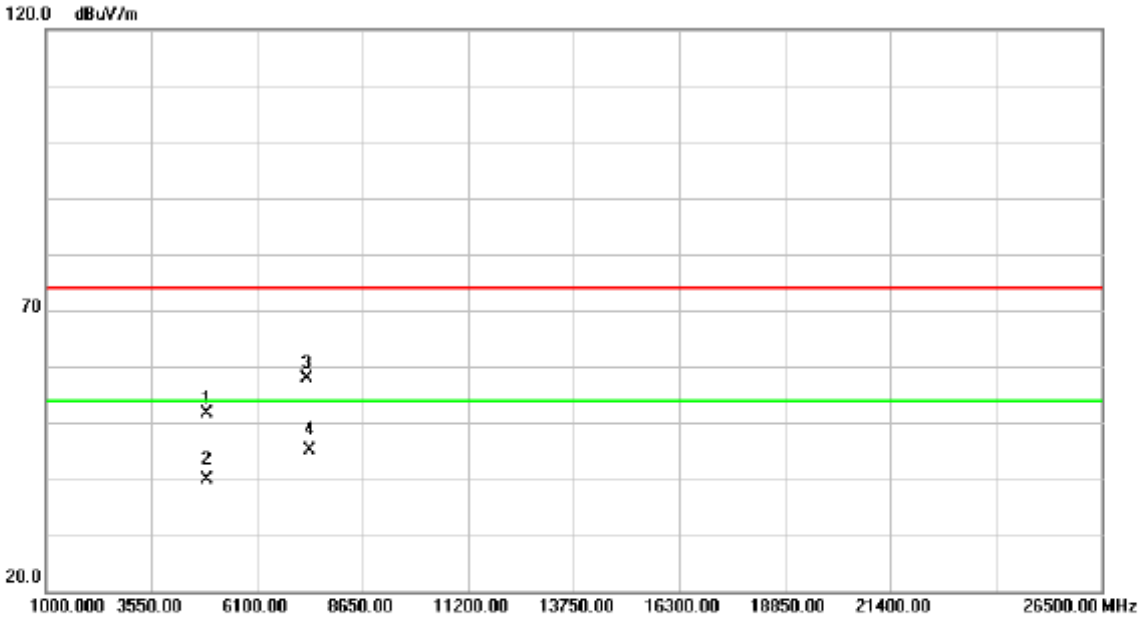
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2440.750	67.37	32.02	99.39	74.00	25.39	peak	
2	X	2440.750	31.13	32.02	63.15	54.00	9.15	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

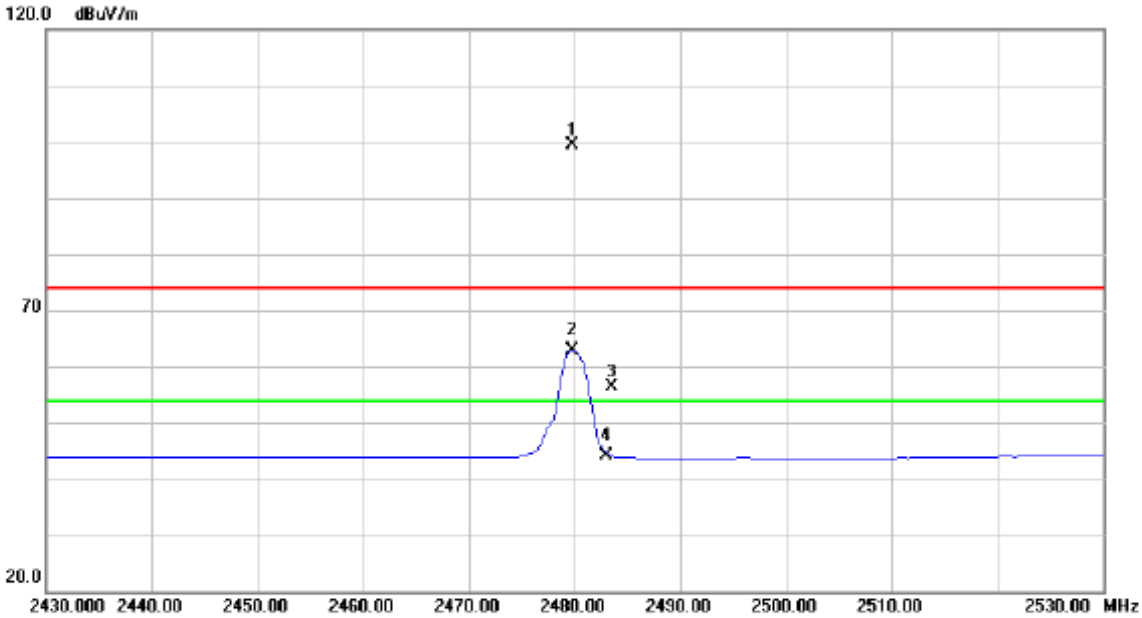
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.015	45.44	6.29	51.73	74.00	-22.27	peak	
2		4882.015	33.66	6.29	39.95	54.00	-14.05	AVG	
3		7323.085	45.03	12.82	57.85	74.00	-16.15	peak	
4	*	7323.085	32.33	12.82	45.15	54.00	-8.85	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		

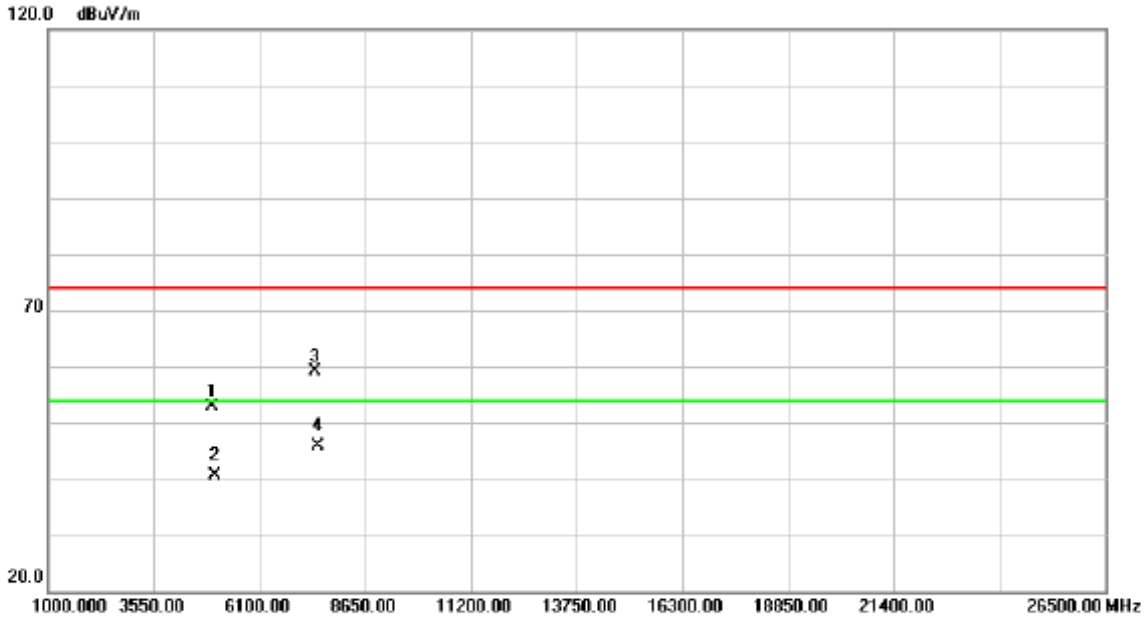
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2479.750	67.09	32.18	99.27	74.00	25.27	peak	
2	X	2479.750	30.81	32.18	62.99	54.00	8.99	AVG	
3		2483.500	24.13	32.19	56.32	74.00	-17.68	peak	
4		2483.500	11.96	32.19	44.15	54.00	-9.85	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		

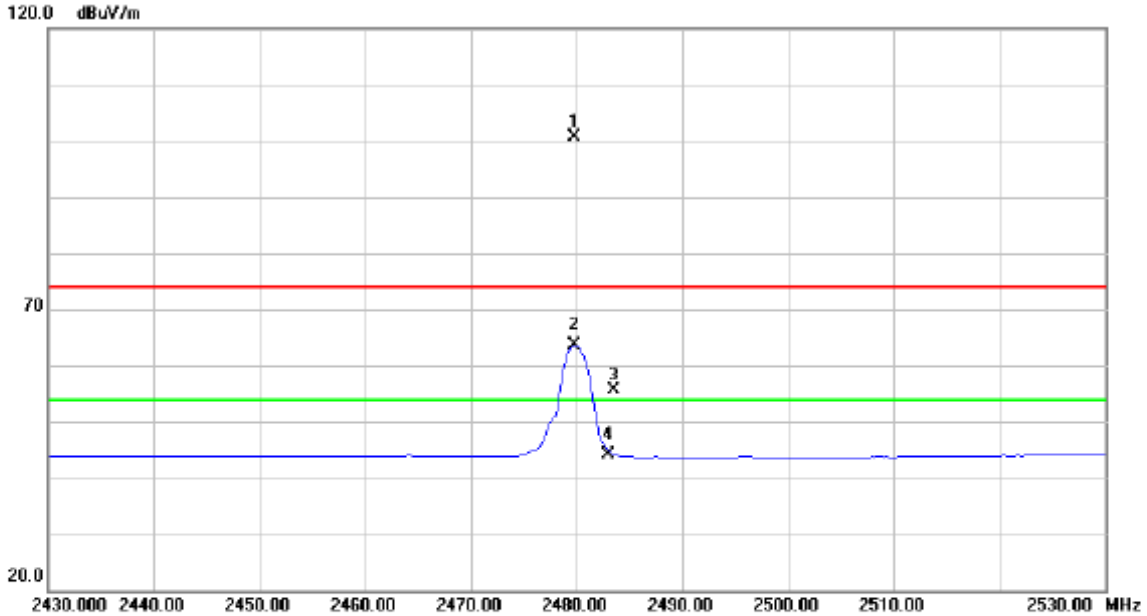
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.015	46.47	6.39	52.86	74.00	-21.14	peak	
2		4960.015	34.20	6.39	40.59	54.00	-13.41	AVG	
3		7440.005	45.96	13.25	59.21	74.00	-14.79	peak	
4	*	7440.005	32.70	13.25	45.95	54.00	-8.05	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		

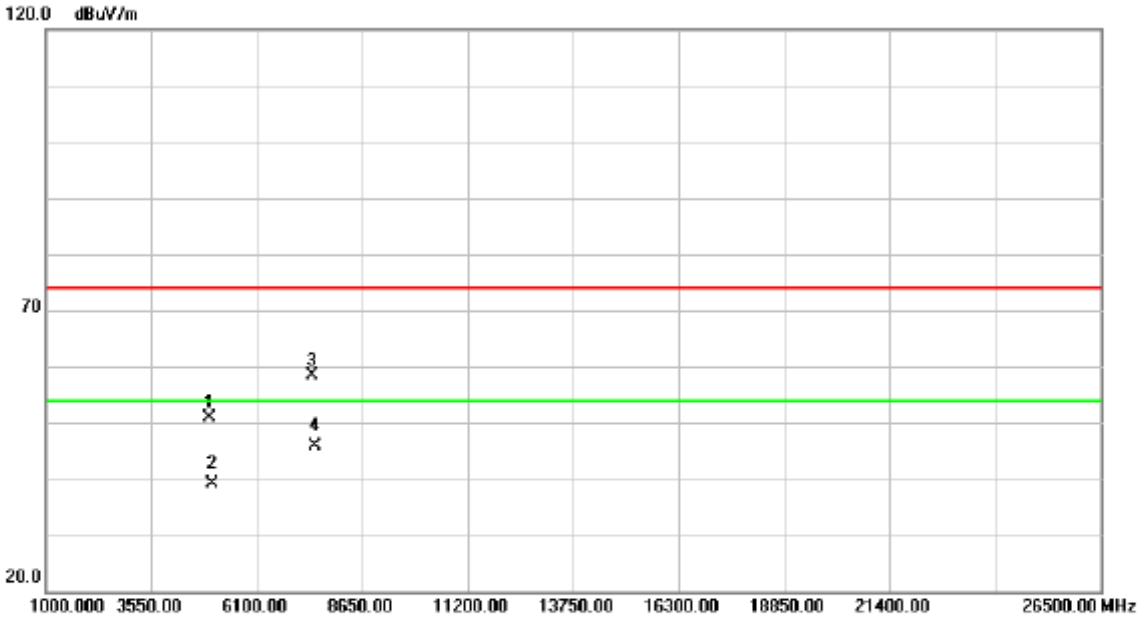
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2479.750	68.50	32.18	100.68	74.00	26.68	peak	
2	X	2479.750	31.43	32.18	63.61	54.00	9.61	AVG	
3		2483.500	23.54	32.19	55.73	74.00	-18.27	peak	
4		2483.500	12.05	32.19	44.24	54.00	-9.76	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		

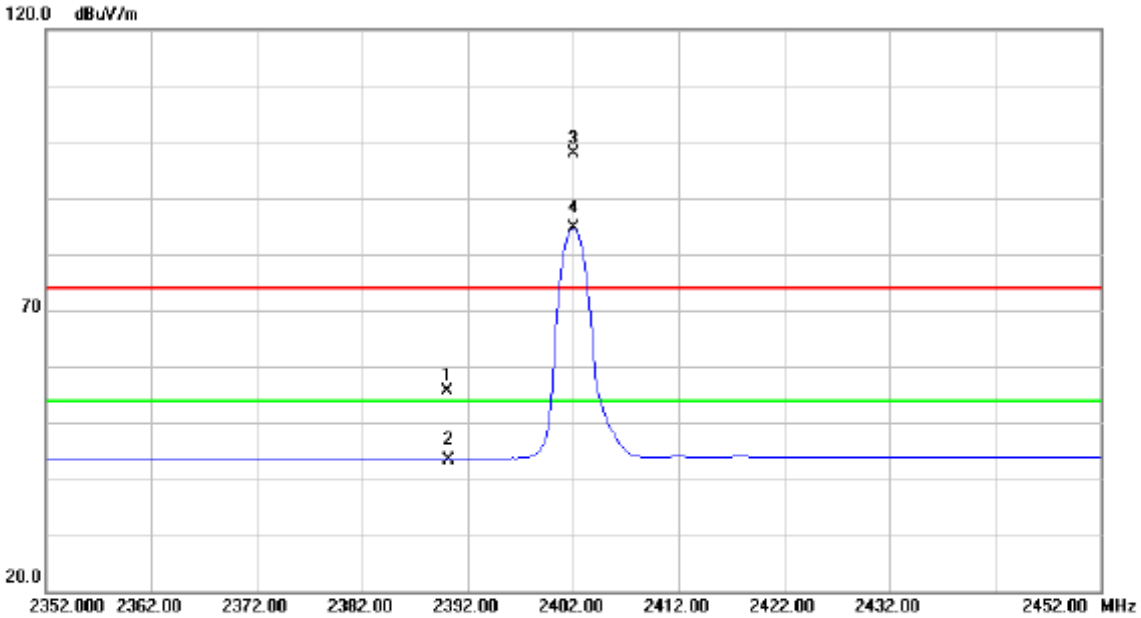
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4959.990	44.43	6.39	50.82	74.00	-23.18	peak	
2		4959.990	32.76	6.39	39.15	54.00	-14.85	AVG	
3		7440.090	45.14	13.25	58.39	74.00	-15.61	peak	
4	*	7440.090	32.75	13.25	46.00	54.00	-8.00	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		

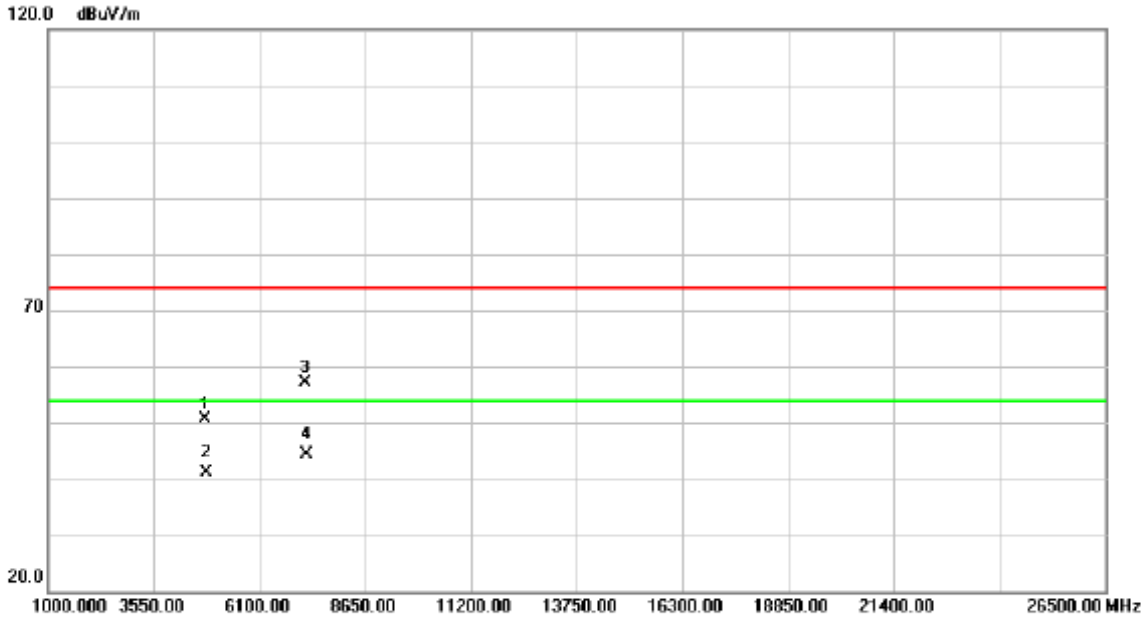
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.74	31.81	55.55	74.00	-18.45	peak	
2		2390.000	11.68	31.81	43.49	54.00	-10.51	AVG	
3	X	2402.000	66.04	31.86	97.90	74.00	23.90	peak	
4	*	2402.000	52.88	31.86	84.74	54.00	30.74	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		

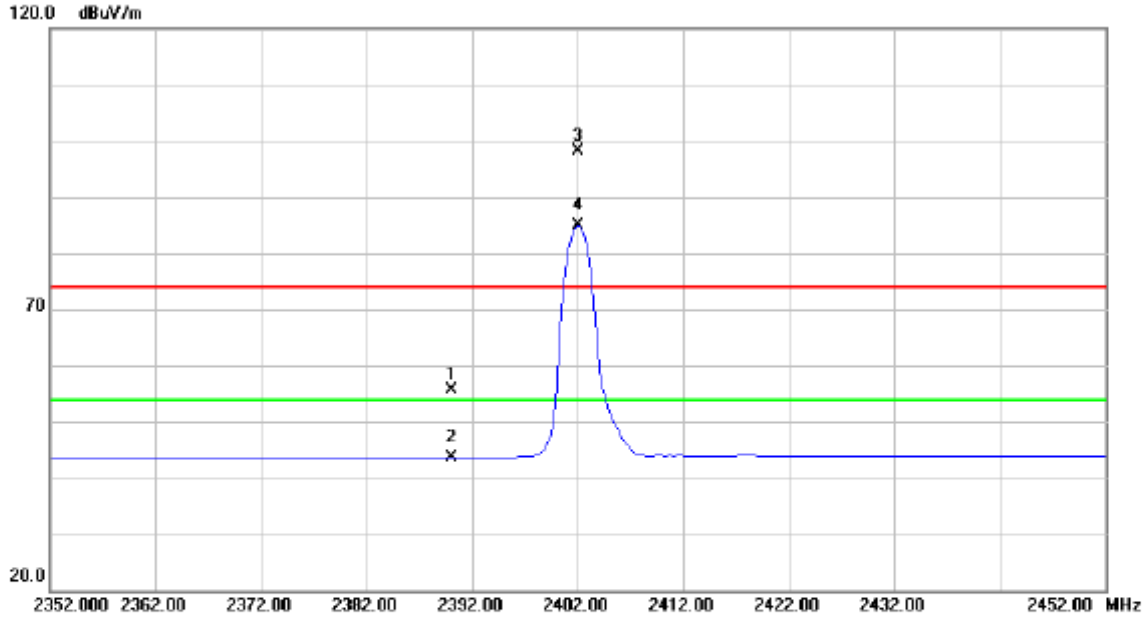
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.175	44.53	6.19	50.72	74.00	-23.28	peak	
2		4804.175	34.90	6.19	41.09	54.00	-12.91	AVG	
3		7205.685	44.83	12.37	57.20	74.00	-16.80	peak	
4	*	7205.685	32.10	12.37	44.47	54.00	-9.53	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		

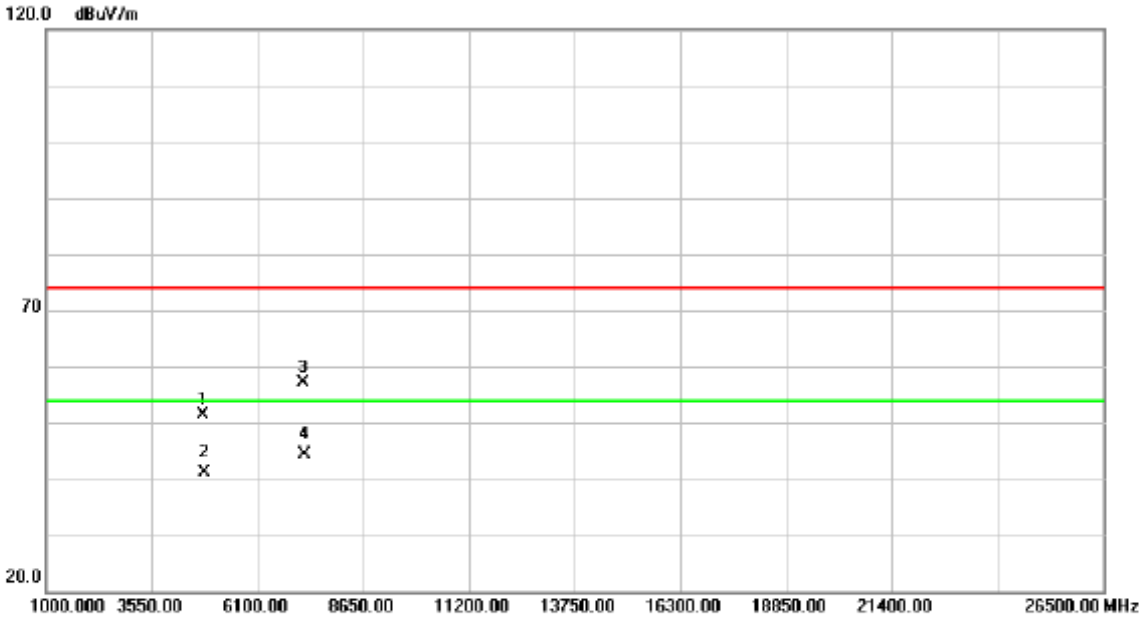
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.85	31.81	55.66	74.00	-18.34	peak	
2		2390.000	11.74	31.81	43.55	54.00	-10.45	AVG	
3	X	2402.000	66.31	31.86	98.17	74.00	24.17	peak	
4	*	2402.000	53.14	31.86	85.00	54.00	31.00	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		

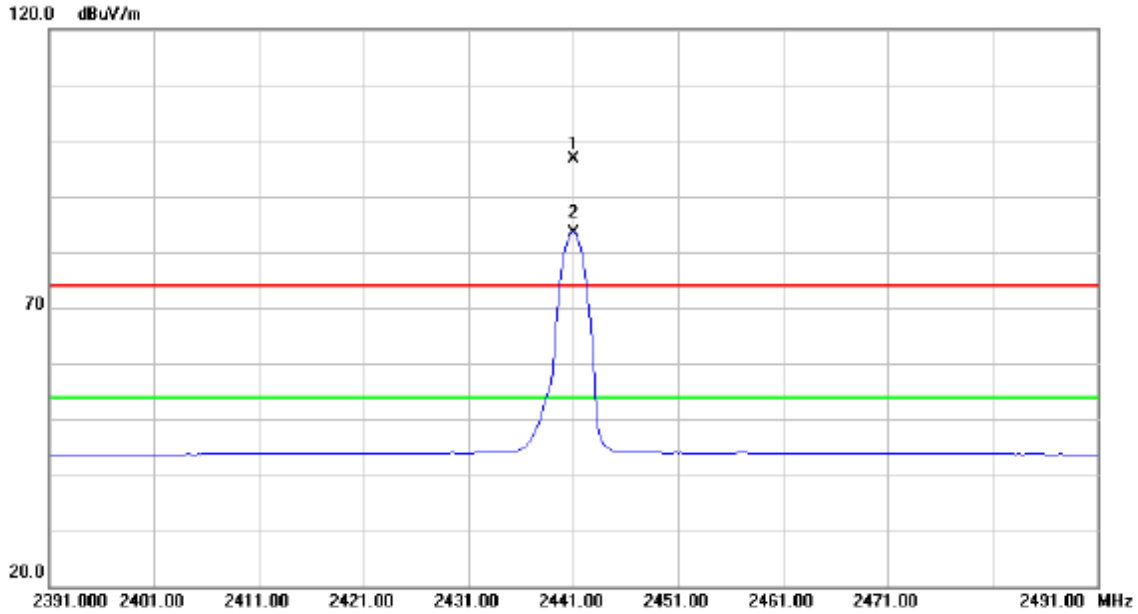
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.075	45.10	6.19	51.29	74.00	-22.71	peak	
2		4804.075	34.96	6.19	41.15	54.00	-12.85	AVG	
3		7205.935	44.75	12.37	57.12	74.00	-16.88	peak	
4	*	7205.935	32.10	12.37	44.47	54.00	-9.53	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2441 MHz		

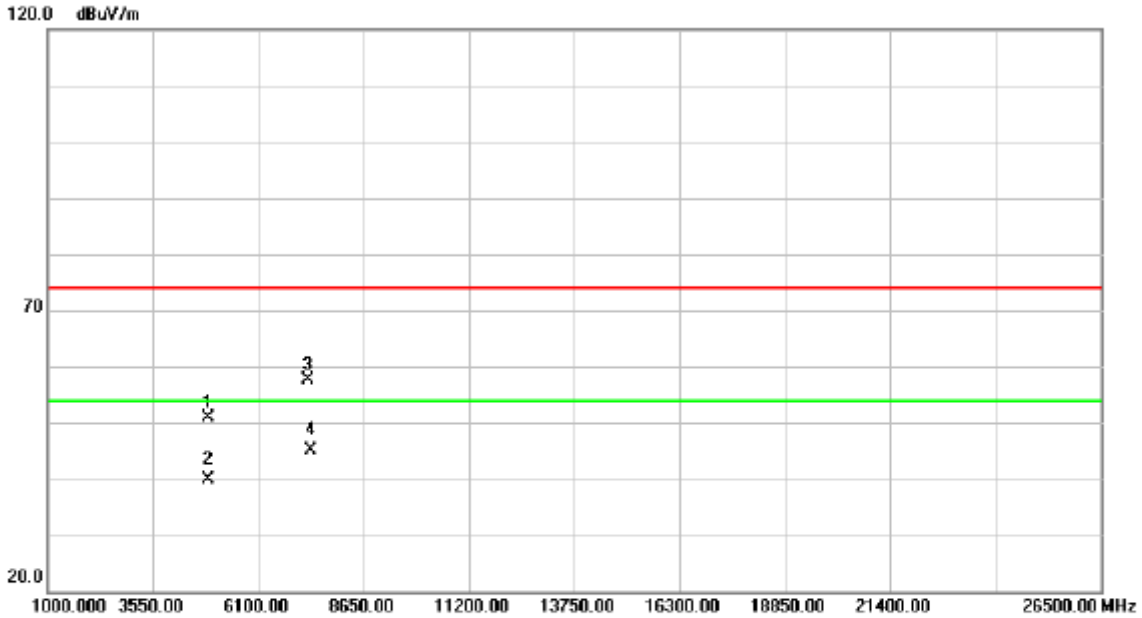
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.000	64.55	32.02	96.57	74.00	22.57	peak	
2	*	2441.000	51.48	32.02	83.50	54.00	29.50	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2441 MHz		

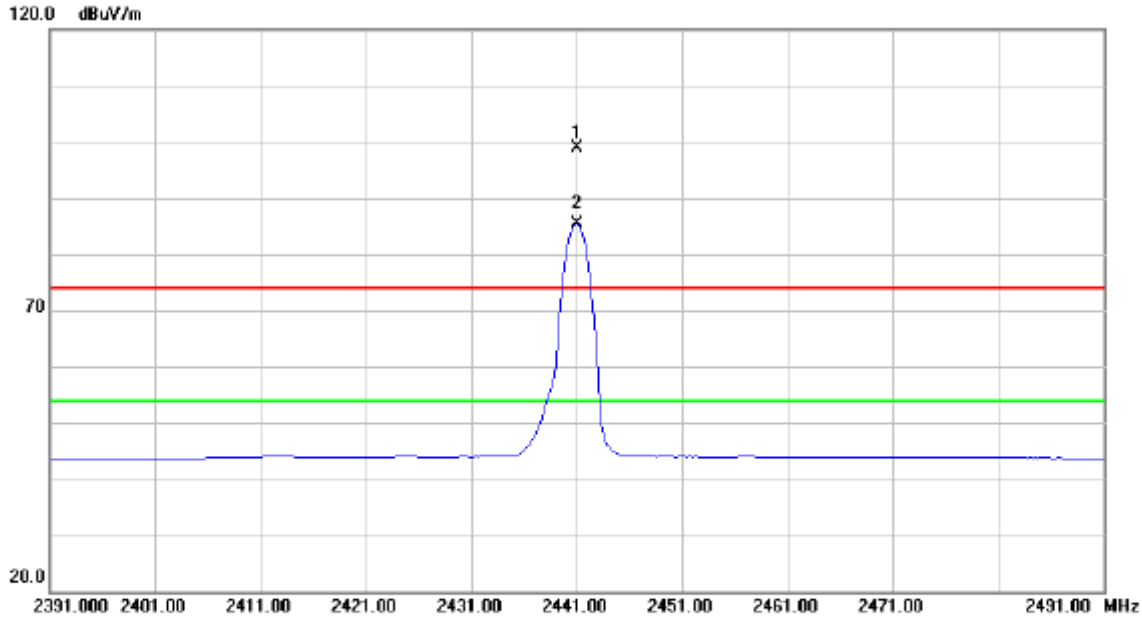
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.930	44.66	6.29	50.95	74.00	-23.05	peak	
2		4881.930	33.50	6.29	39.79	54.00	-14.21	AVG	
3		7323.160	44.71	12.82	57.53	74.00	-16.47	peak	
4	*	7323.160	32.23	12.82	45.05	54.00	-8.95	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2441 MHz		

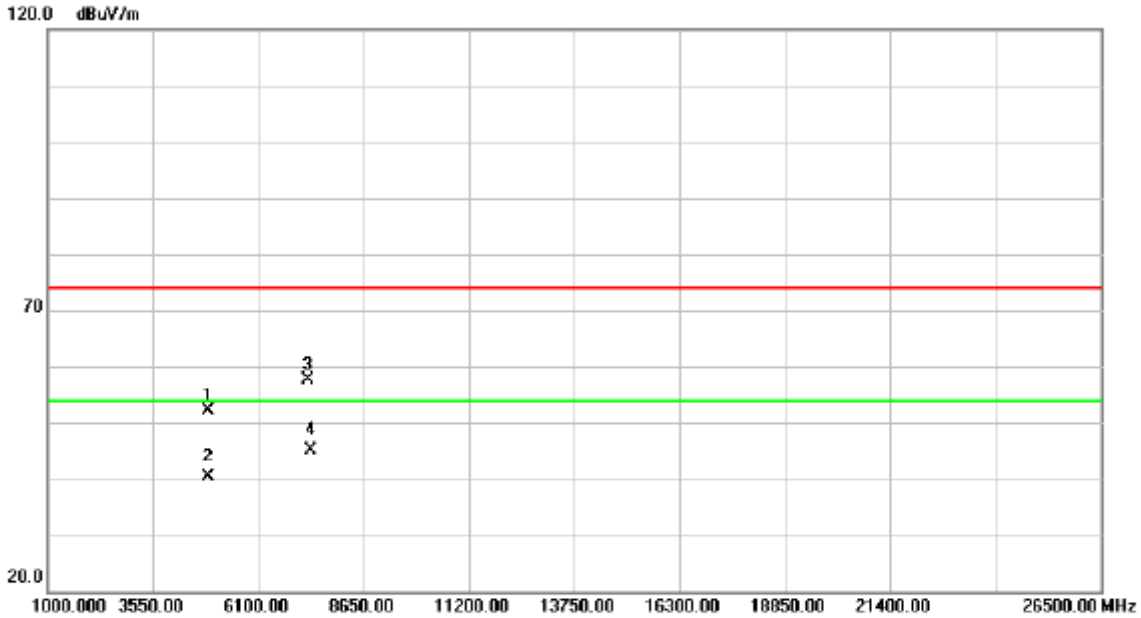
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.000	66.83	32.02	98.85	74.00	24.85	peak	
2	*	2441.000	53.31	32.02	85.33	54.00	31.33	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2441 MHz		

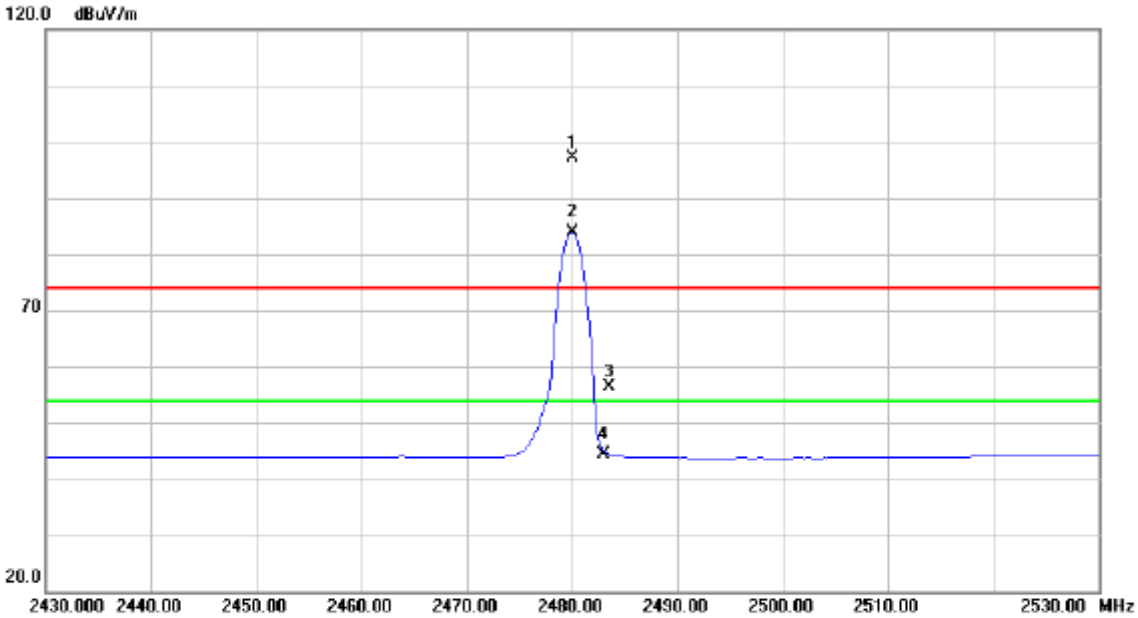
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.020	45.93	6.29	52.22	74.00	-21.78	peak	
2		4882.020	34.15	6.29	40.44	54.00	-13.56	AVG	
3		7323.215	44.85	12.82	57.67	74.00	-16.33	peak	
4	*	7323.215	32.19	12.82	45.01	54.00	-8.99	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		

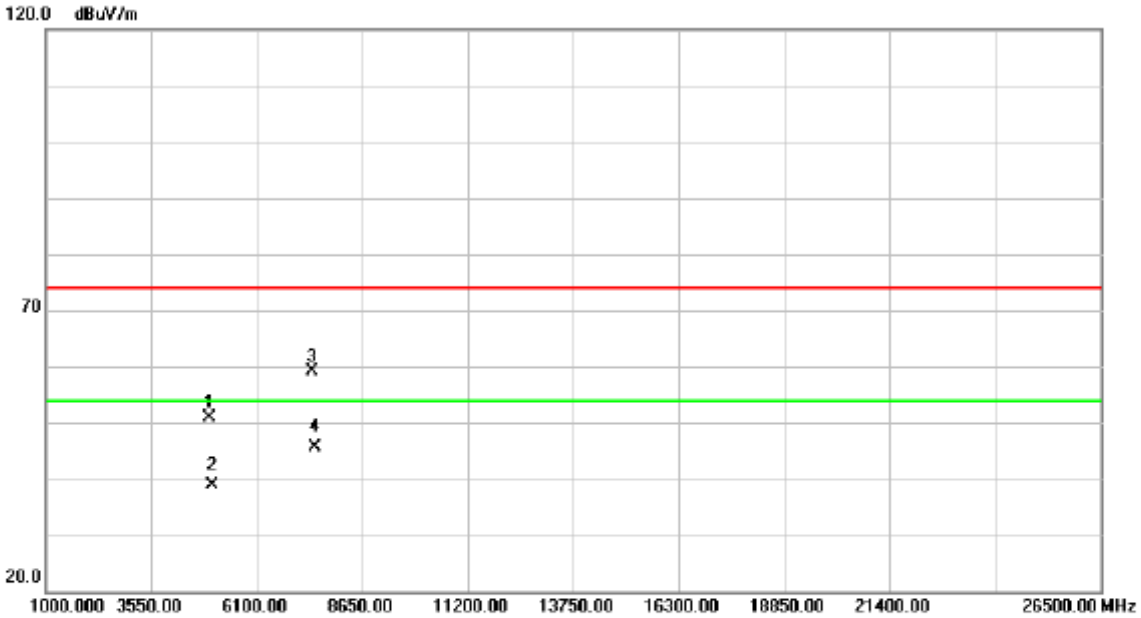
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2480.000	64.96	32.18	97.14	74.00	23.14	peak	
2	*	2480.000	51.61	32.18	83.79	54.00	29.79	AVG	
3		2483.500	24.30	32.19	56.49	74.00	-17.51	peak	
4		2483.500	12.14	32.19	44.33	54.00	-9.67	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		

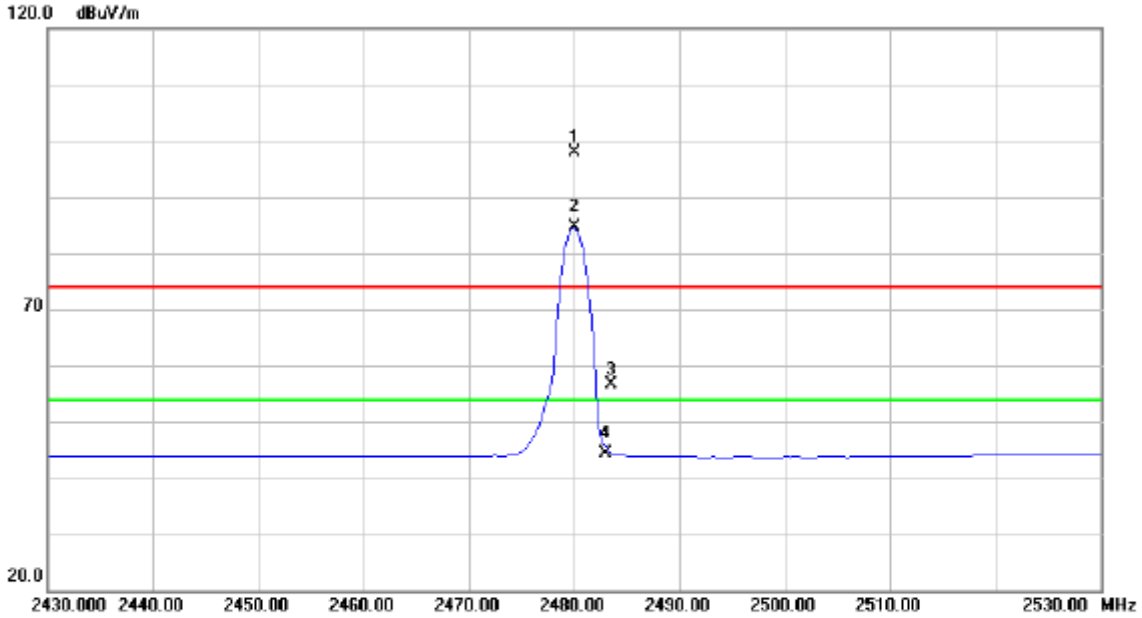
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4959.965	44.58	6.39	50.97	74.00	-23.03	peak	
2		4959.965	32.56	6.39	38.95	54.00	-15.05	AVG	
3		7439.850	45.83	13.25	59.08	74.00	-14.92	peak	
4	*	7439.850	32.27	13.25	45.52	54.00	-8.48	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		

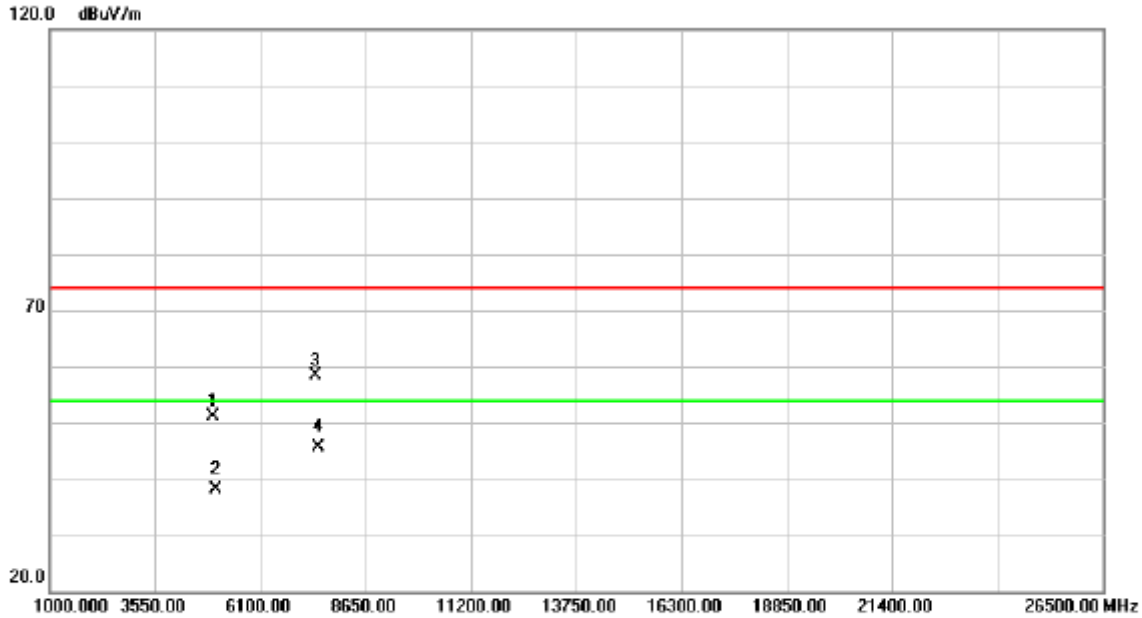
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2480.000	65.77	32.18	97.95	74.00	23.95	peak	
2	*	2480.000	52.35	32.18	84.53	54.00	30.53	AVG	
3		2483.500	24.52	32.19	56.71	74.00	-17.29	peak	
4		2483.500	12.31	32.19	44.50	54.00	-9.50	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		

Polarization: Horizontal

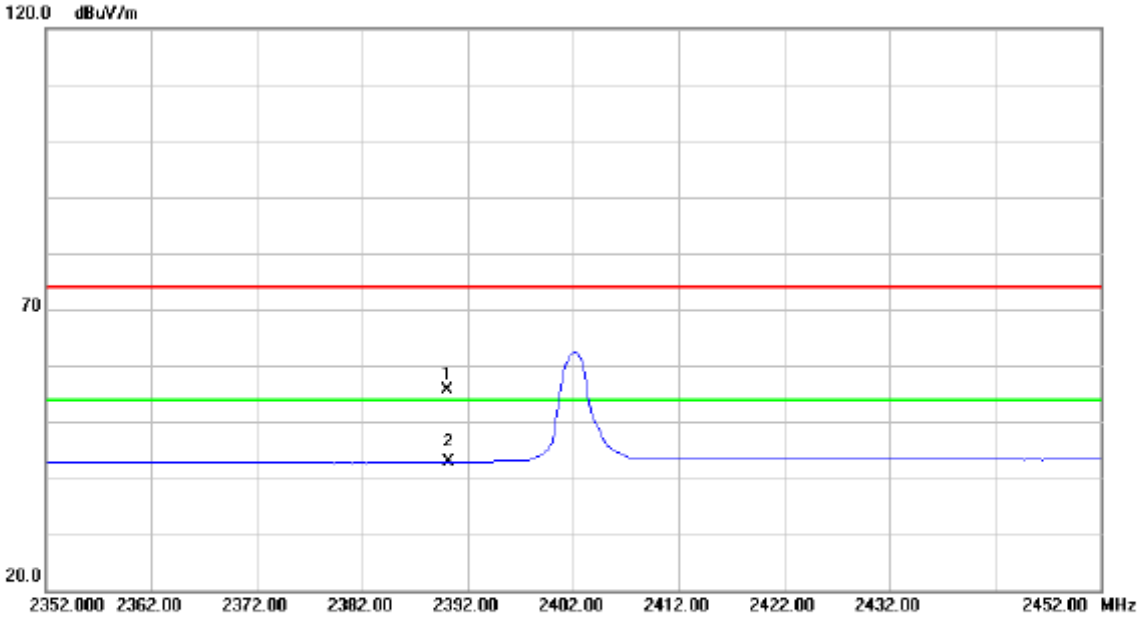


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.065	44.68	6.39	51.07	74.00	-22.93	peak	
2		4960.065	31.69	6.39	38.08	54.00	-15.92	AVG	
3		7439.890	45.04	13.25	58.29	74.00	-15.71	peak	
4	*	7439.890	32.28	13.25	45.53	54.00	-8.47	AVG	

9.9 TEST RESULTS (RESTRICTED BANDS)

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

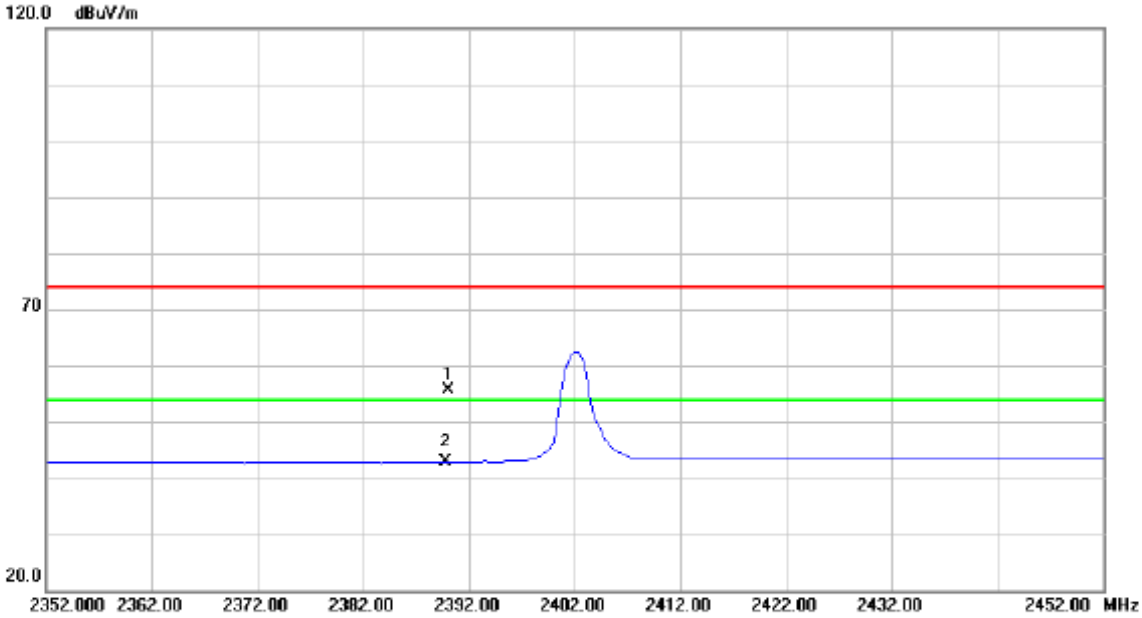
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.85	31.81	55.66	74.00	-18.34	peak	
2	*	2390.000	11.06	31.81	42.87	54.00	-11.13	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

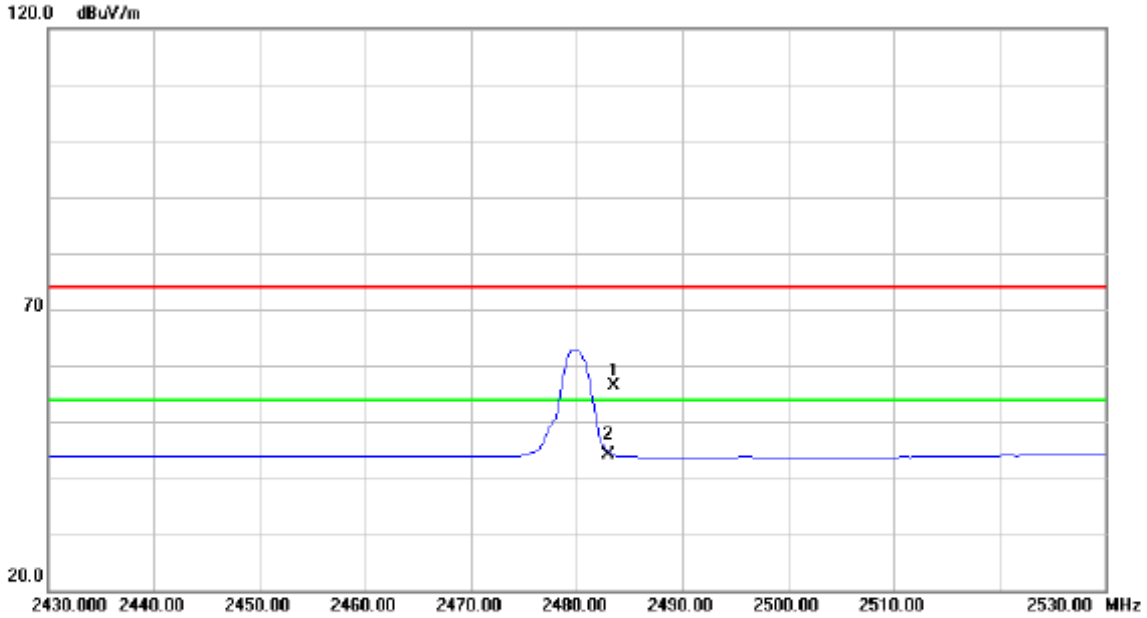
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.86	31.81	55.67	74.00	-18.33	peak	
2	*	2390.000	11.06	31.81	42.87	54.00	-11.13	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

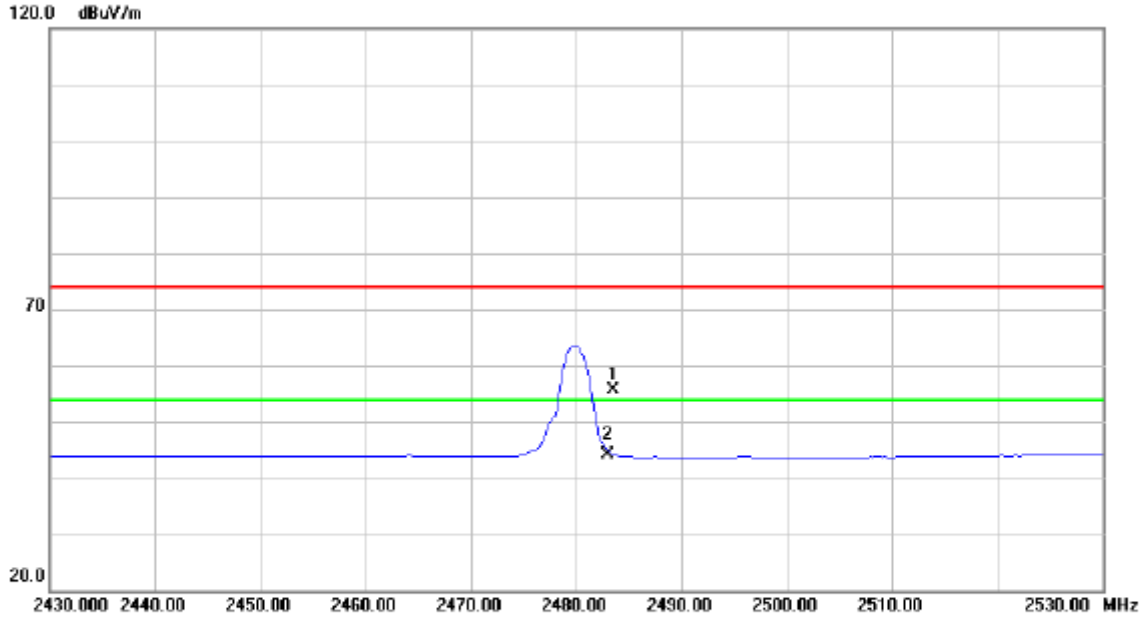
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.13	32.19	56.32	74.00	-17.68	peak	
2	*	2483.500	11.96	32.19	44.15	54.00	-9.85	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

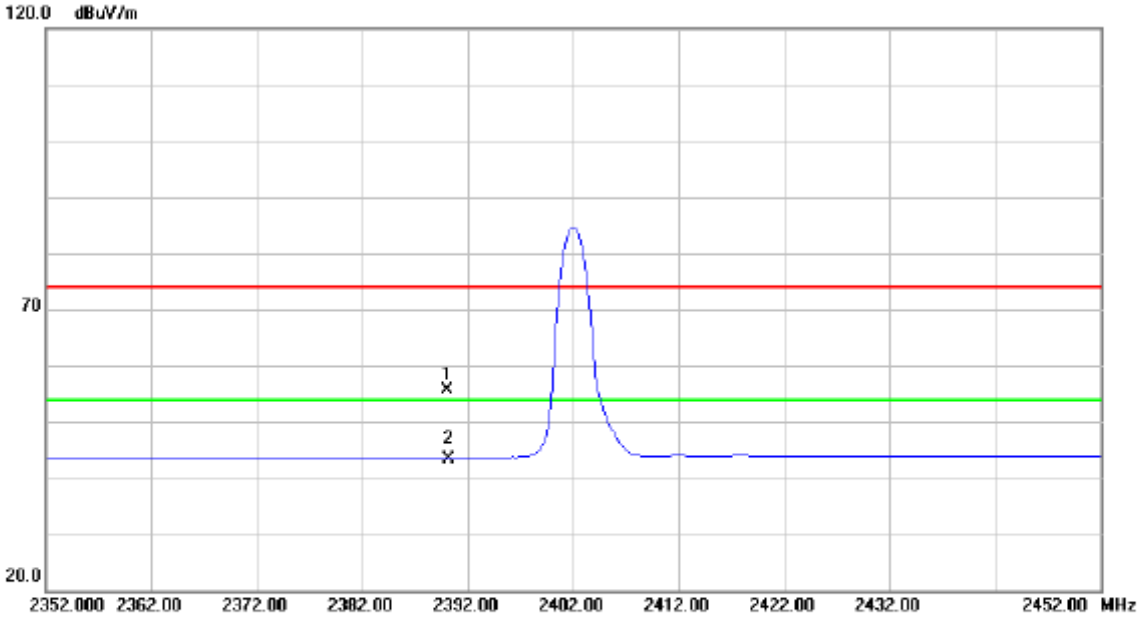
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	23.54	32.19	55.73	74.00	-18.27	peak	
2	*	2483.500	12.05	32.19	44.24	54.00	-9.76	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

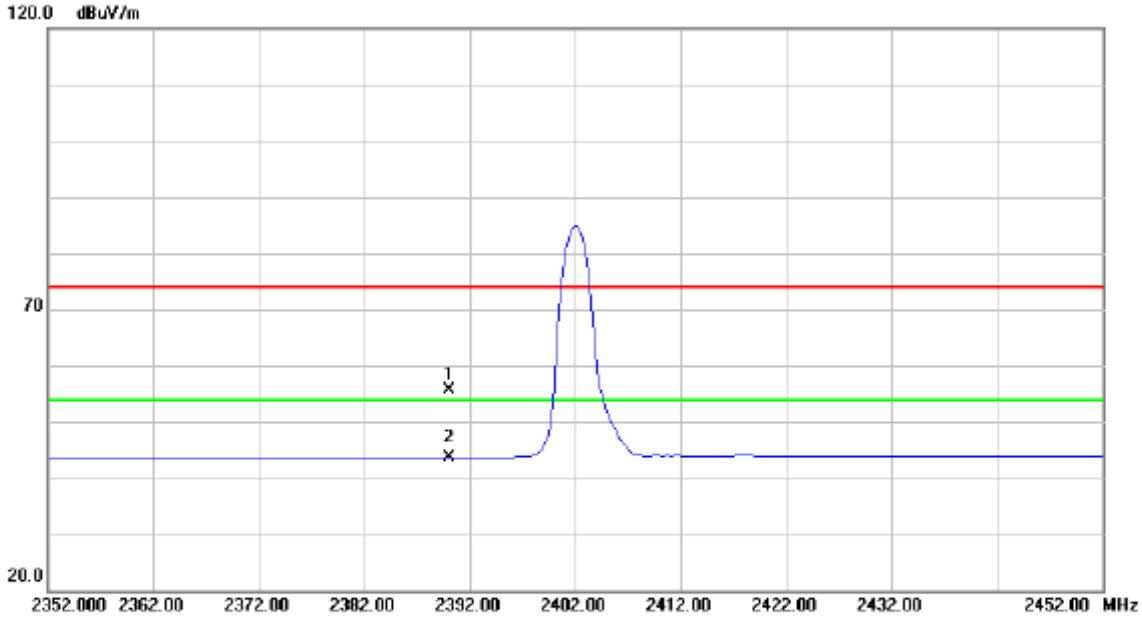
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.74	31.81	55.55	74.00	-18.45	peak	
2	*	2390.000	11.68	31.81	43.49	54.00	-10.51	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

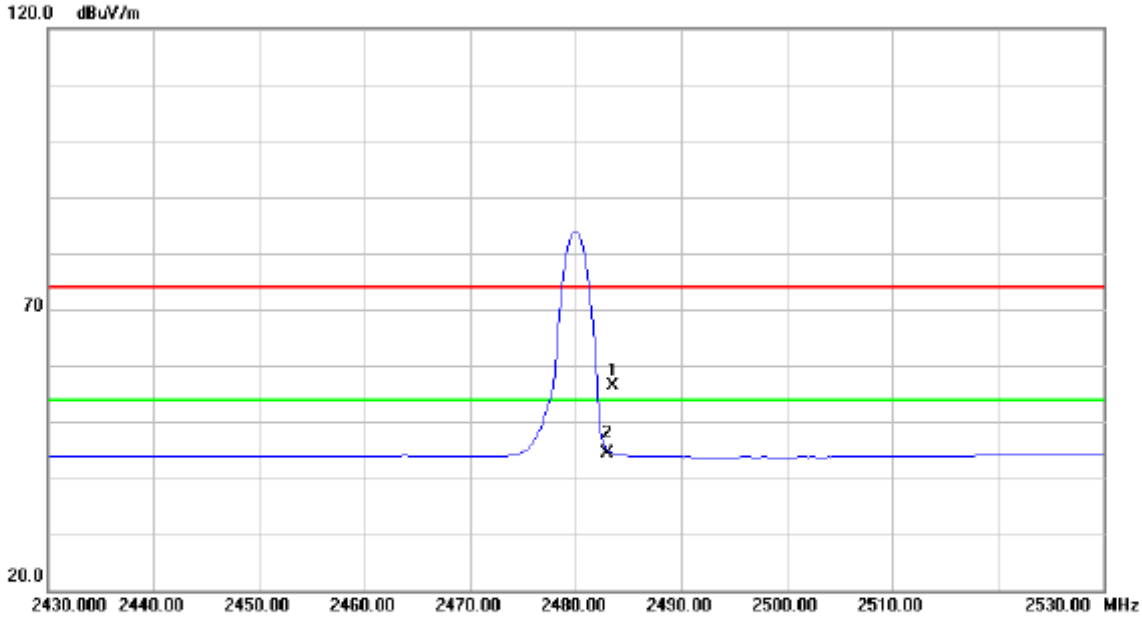
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.85	31.81	55.66	74.00	-18.34	peak	
2	*	2390.000	11.74	31.81	43.55	54.00	-10.45	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

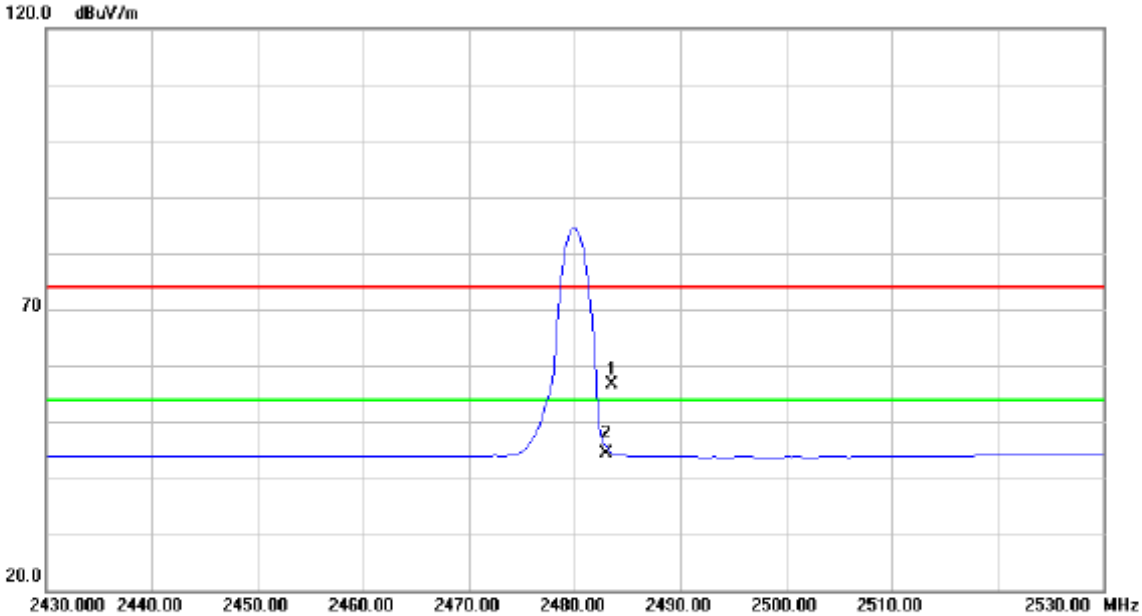
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.30	32.19	56.49	74.00	-17.51	peak	
2	*	2483.500	12.14	32.19	44.33	54.00	-9.67	AVG	

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	25°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.52	32.19	56.71	74.00	-17.29	peak	
2	*	2483.500	12.31	32.19	44.50	54.00	-9.50	AVG	

10 NUMBER OF HOPPING FREQUENCY

10.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Number of Hopping Channel	2400-2483.5	shall use at least 15 channels

10.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

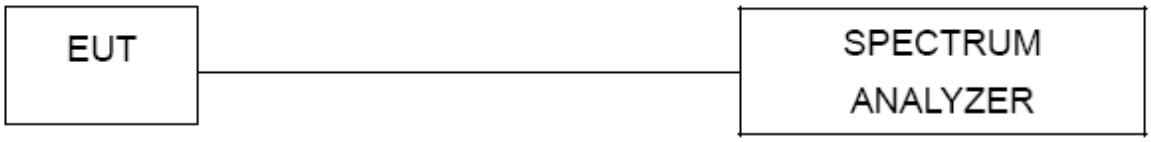
10.3 MEASURING INSTRUMENTS SETTING

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

10.4 TEST PROCEDURES

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= 100 kHz, VBW=100 kHz, Sweep time = Auto.

10.5 TEST SETUP LAYOUT



10.6 DEVIATION FROM TEST STANDARD

No deviation

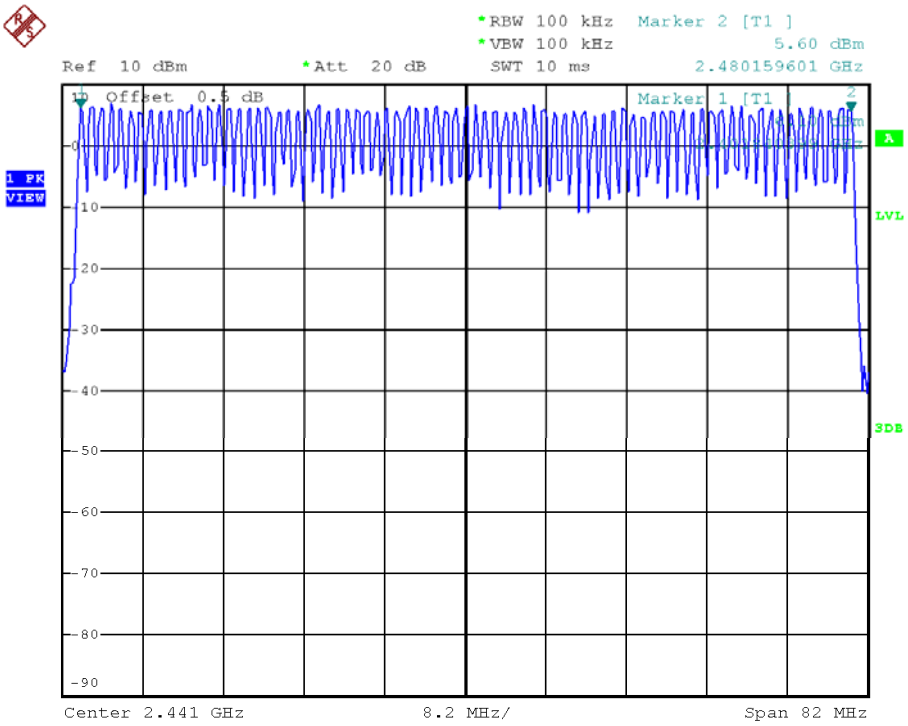
10.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

10.8TEST RESULTS

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps		

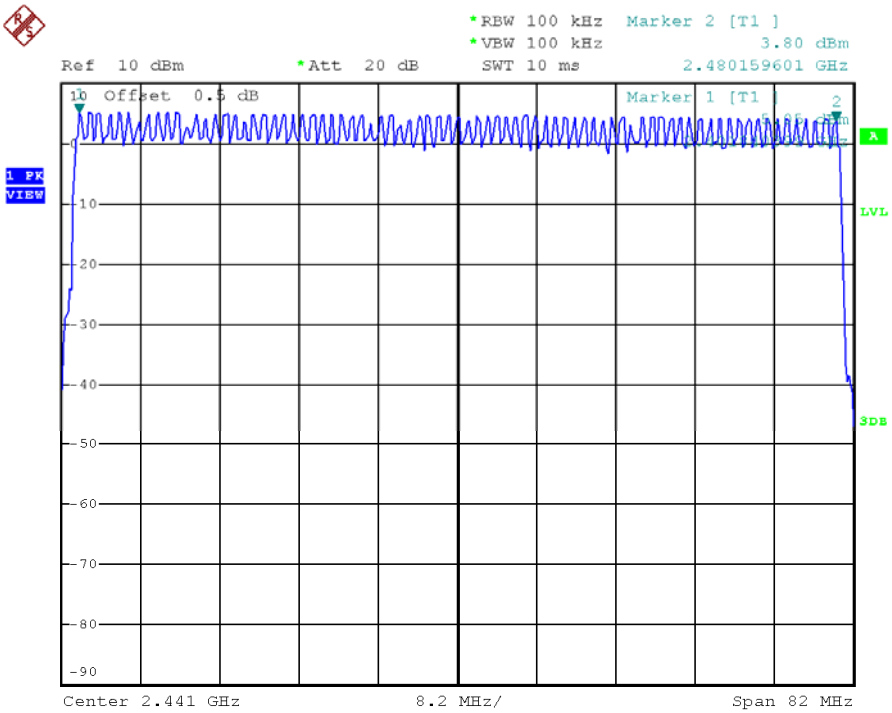
Number of Hopping Channel	Limit	Result
79	75	Pass



Date: 10.FEB.2014 11:58:56

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps		

Number of Hopping Channel	Limit	Result
79	75	Pass



Date: 10.FEB.2014 12:20:43

11 AVERAGE TIME OF OCCUPANCY

11.1LIMIT

Test Item	Frequency Range (MHz)	Limit
Average time of occupancy	2400-2483.5	shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

11.2MEASUREMENT INSTRUMENTS LIST

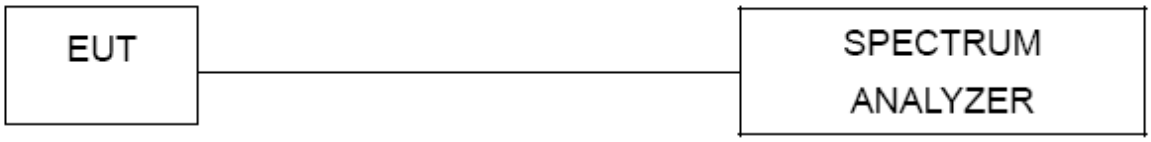
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

11.3TEST PROCEDURES

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 100 kHz and VBW to 100 kHz.
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. DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds.
j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds.
k. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

11.4TEST SETUP LAYOUT



11.5DEVIATION FROM TEST STANDARD

No deviation

11.6 EUT OPERATING CONDITIONS

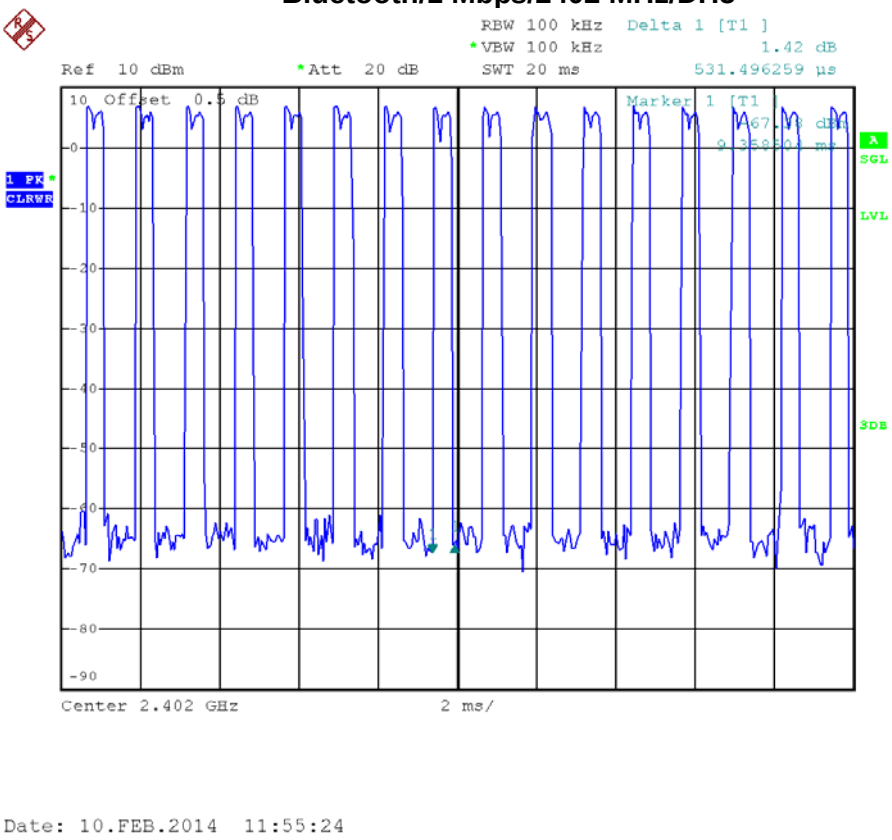
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

11.7TEST RESULTS

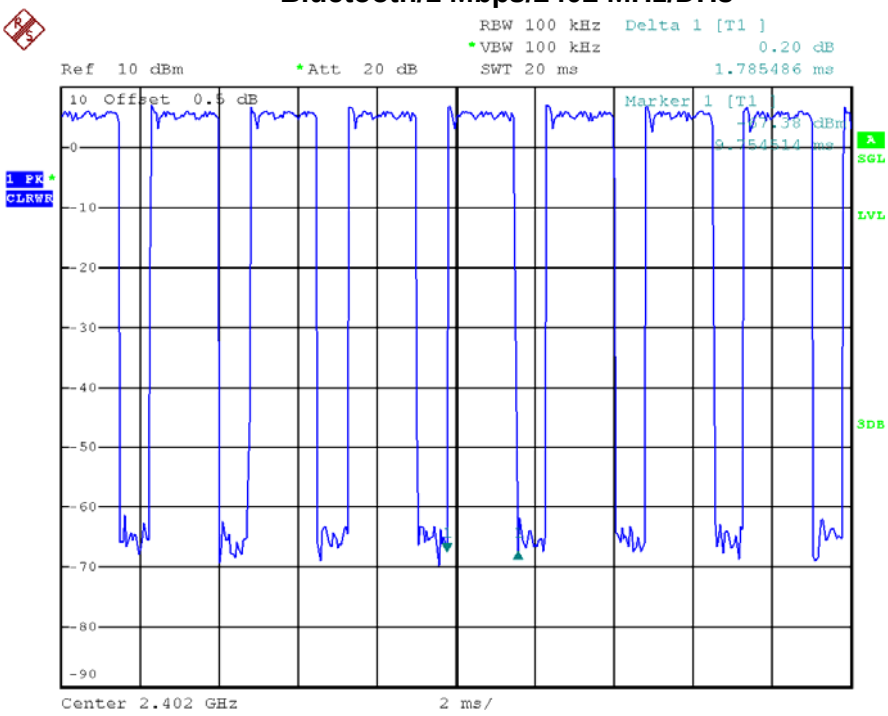
E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2402 MHz		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Result
DH5	2402 MHz	3.0644	0.3269	0.4	PASS
DH3	2402 MHz	1.7855	0.2857	0.4	PASS
DH1	2402 MHz	0.5315	0.1701	0.4	PASS

Bluetooth/1 Mbps/2402 MHz/DH5

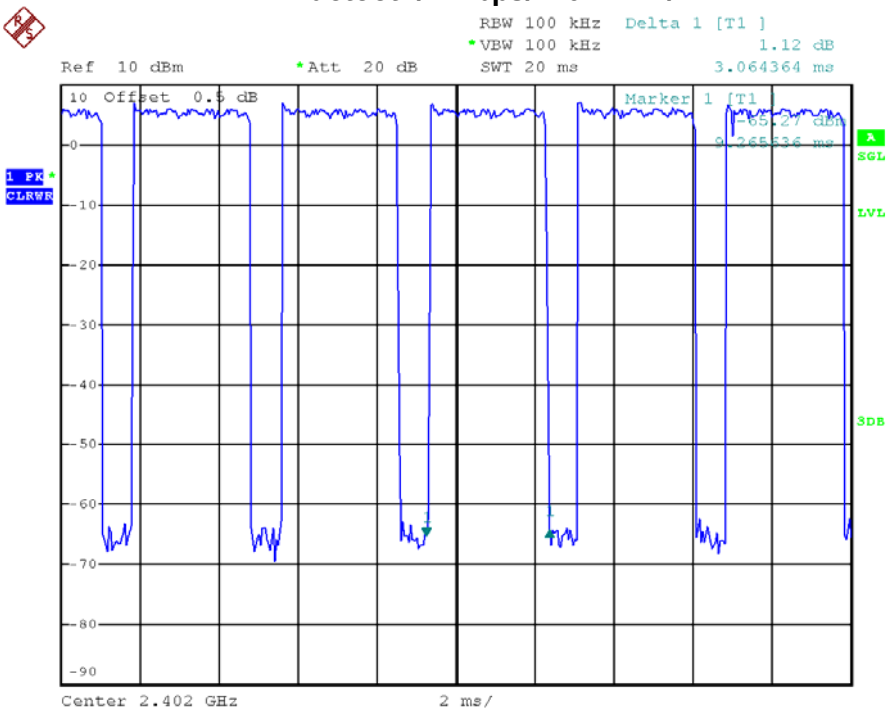


Bluetooth/1 Mbps/2402 MHz/DH3



Date: 10.FEB.2014 11:55:53

Bluetooth/1 Mbps/2402 MHz/DH1

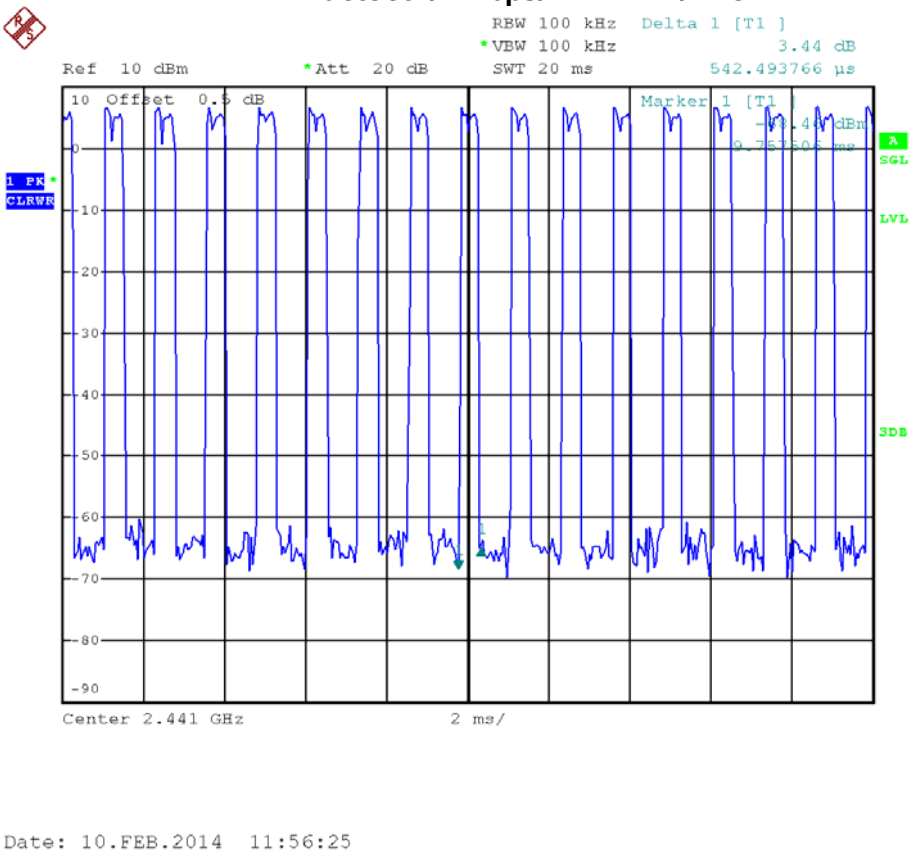


Date: 10.FEB.2014 11:46:05

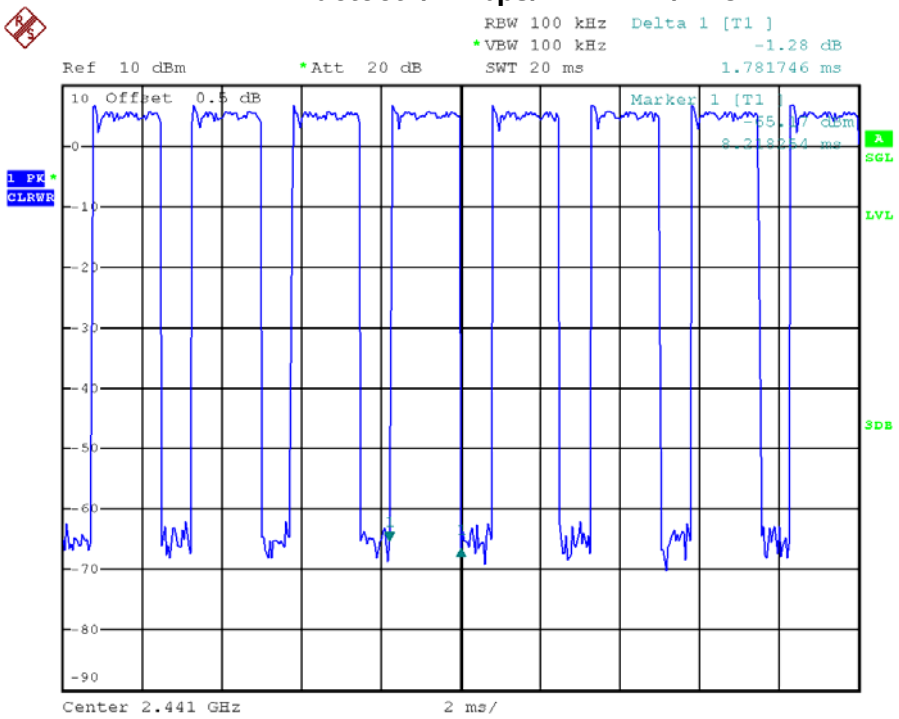
E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2441 MHz		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Result
DH5	2441 MHz	3.0119	0.3213	0.4	PASS
DH3	2441 MHz	1.7817	0.2851	0.4	PASS
DH1	2441 MHz	0.5425	0.1736	0.4	PASS

Bluetooth/1 Mbps/2441 MHz/DH5

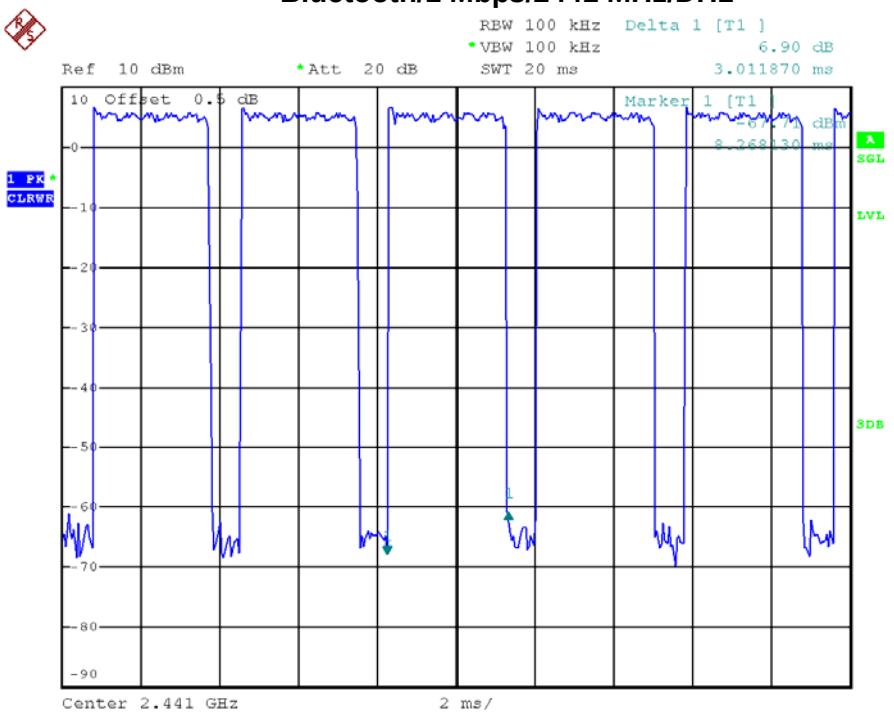


Bluetooth/1 Mbps/2441 MHz/DH3



Date: 10.FEB.2014 11:56:49

Bluetooth/1 Mbps/2441 MHz/DH1

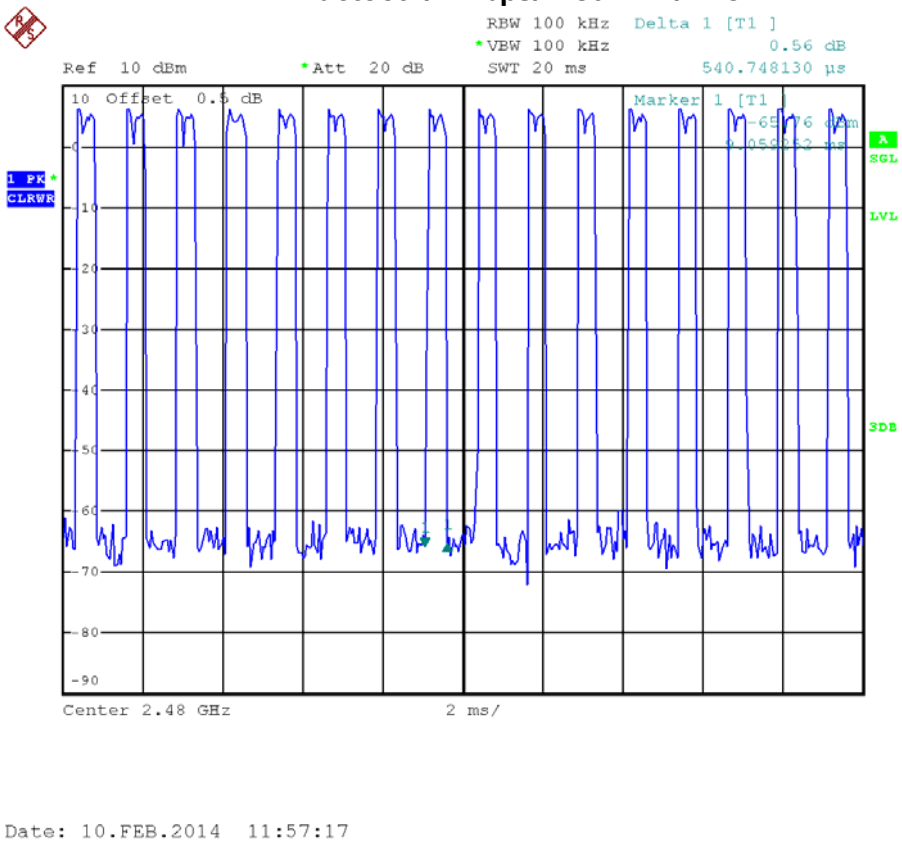


Date: 10.FEB.2014 11:49:21

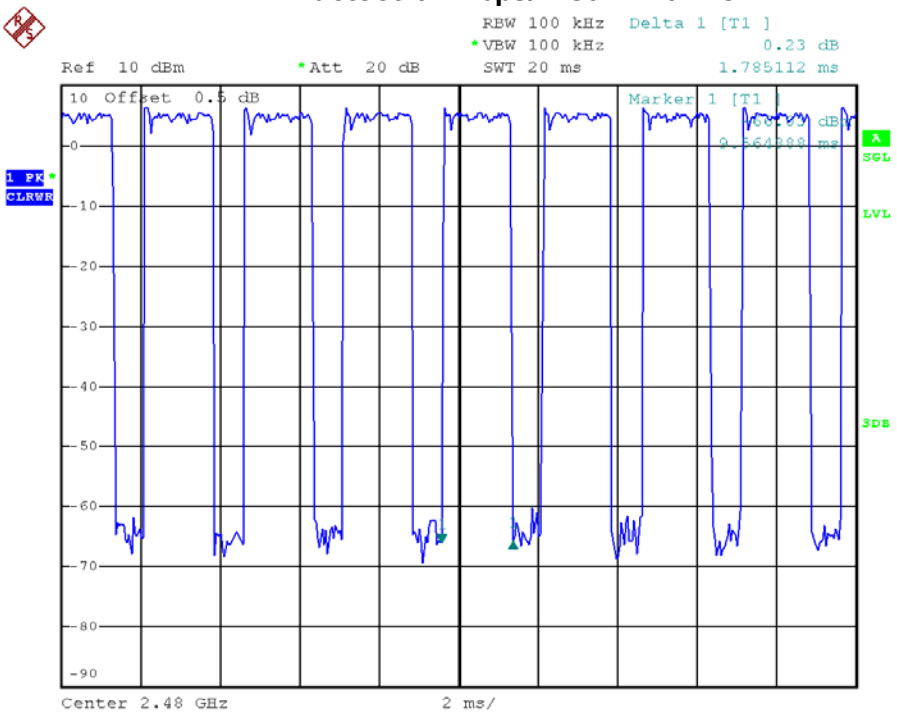
E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/1 Mbps/2480 MHz		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Result
DH5	2480 MHz	3.0455	0.3249	0.4	PASS
DH3	2480 MHz	1.7851	0.2856	0.4	PASS
DH1	2480 MHz	0.5407	0.1730	0.4	PASS

Bluetooth/1 Mbps/2480 MHz/DH5

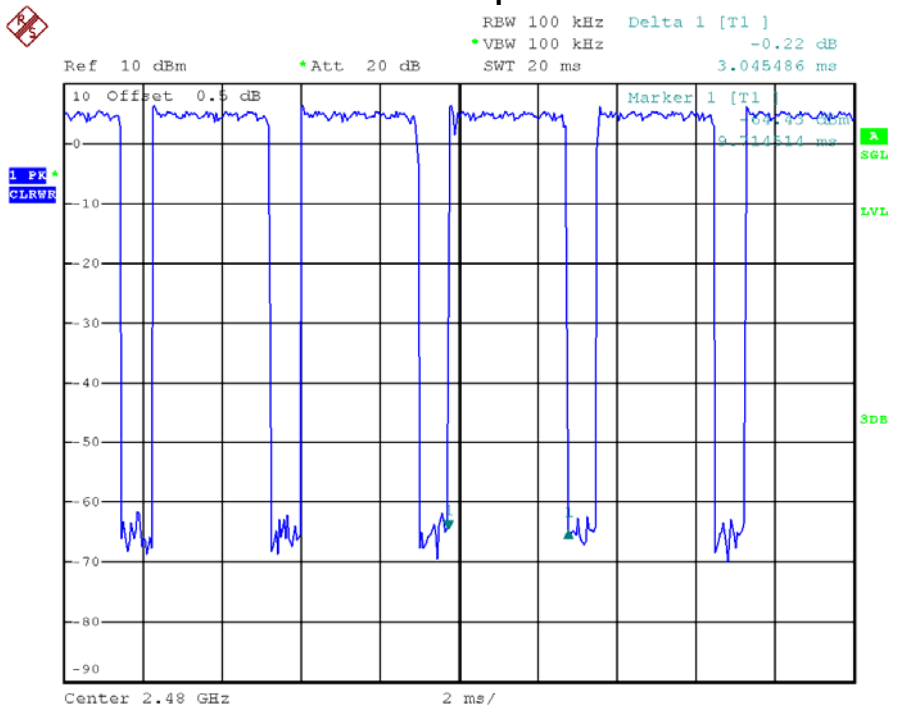


Bluetooth/1 Mbps/2480 MHz/DH3



Date: 10.FEB.2014 11:57:42

Bluetooth/1 Mbps/2480 MHz/DH1

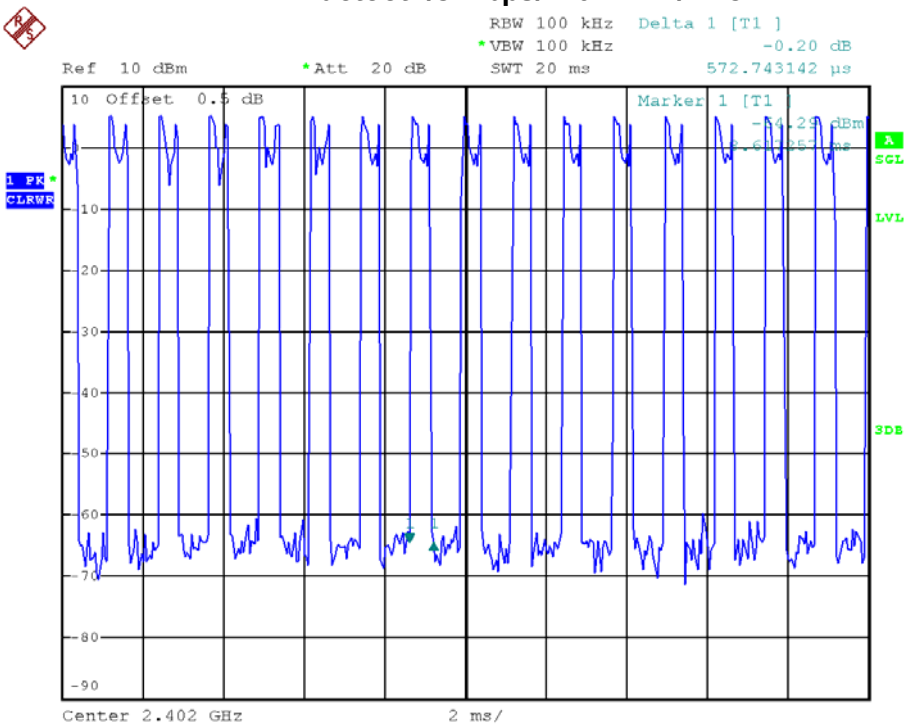


Date: 10.FEB.2014 11:51:41

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2402 MHz		

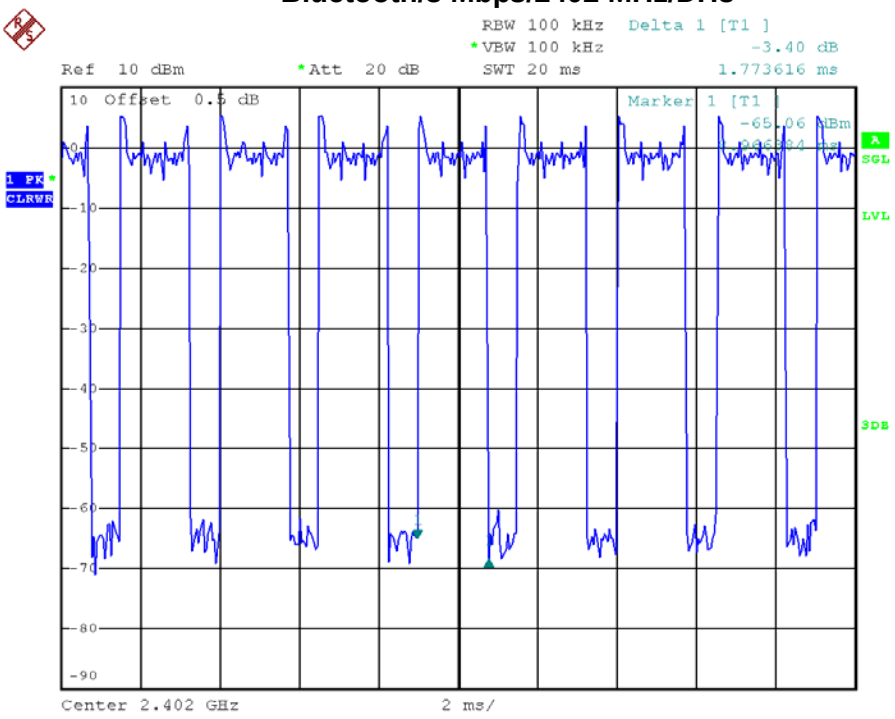
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Result
DH5	2402 MHz	3.0882	0.3294	0.4	PASS
DH3	2402 MHz	1.7736	0.2838	0.4	PASS
DH1	2402 MHz	0.5727	0.1833	0.4	PASS

Bluetooth/3 Mbps/2402 MHz/DH5



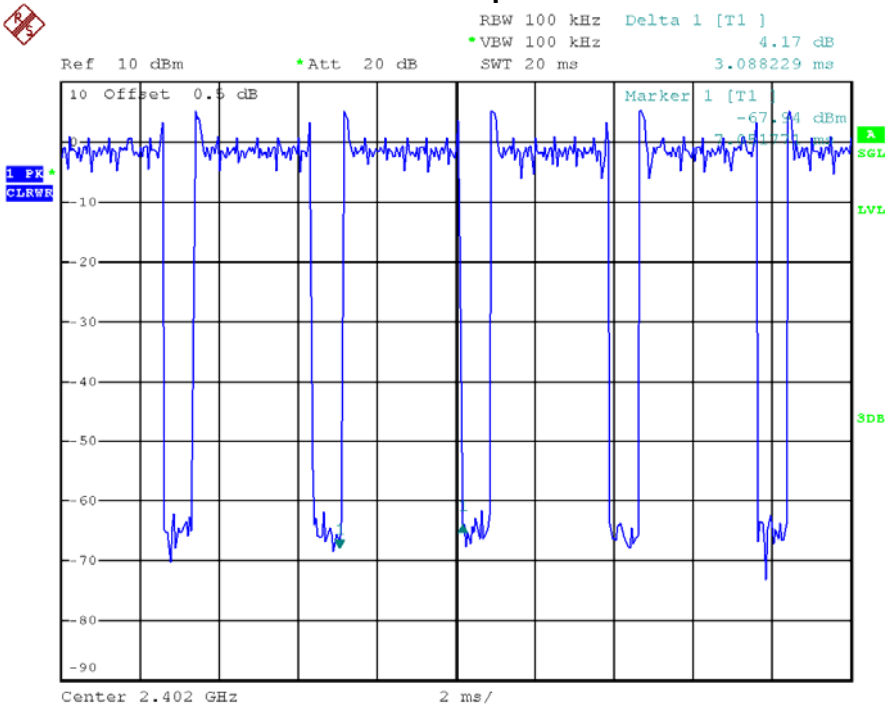
Date: 10.FEB.2014 12:11:27

Bluetooth/3 Mbps/2402 MHz/DH3



Date: 10.FEB.2014 12:11:56

Bluetooth/3 Mbps/2402 MHz/DH1

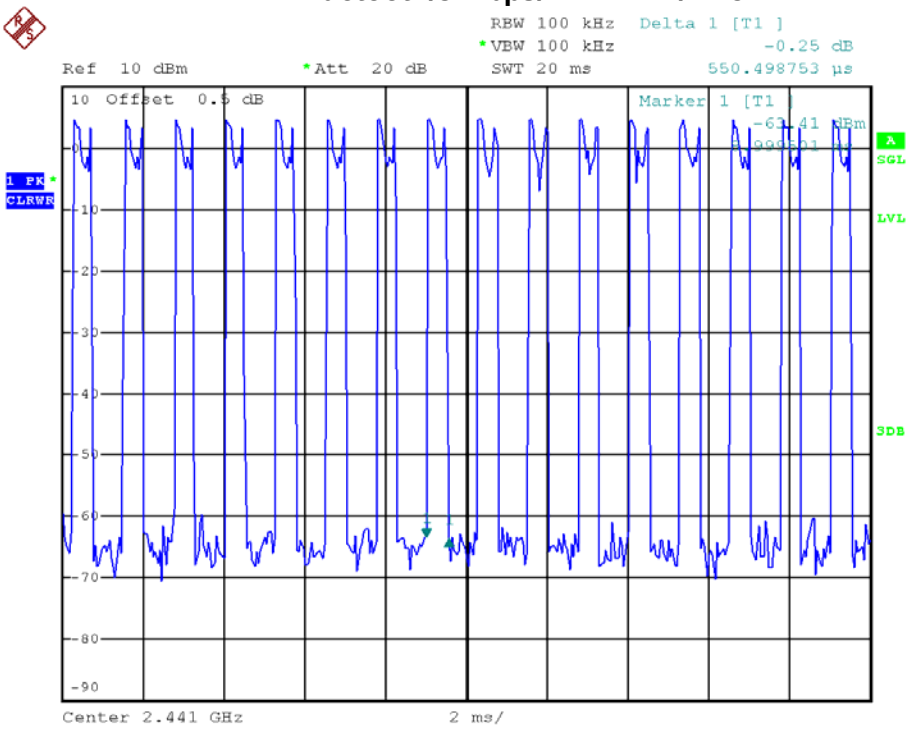


Date: 10.FEB.2014 12:02:00

E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2441 MHz		

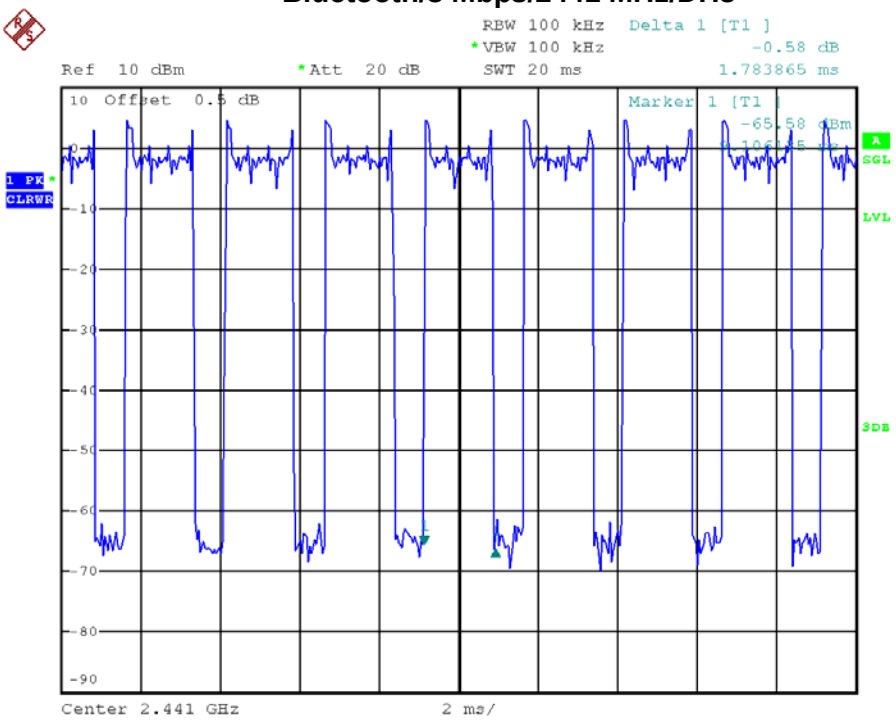
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Result
DH5	2441 MHz	3.0579	0.3262	0.4	PASS
DH3	2441 MHz	1.7839	0.2854	0.4	PASS
DH1	2441 MHz	0.5505	0.1762	0.4	PASS

Bluetooth/3 Mbps/2441 MHz/DH5



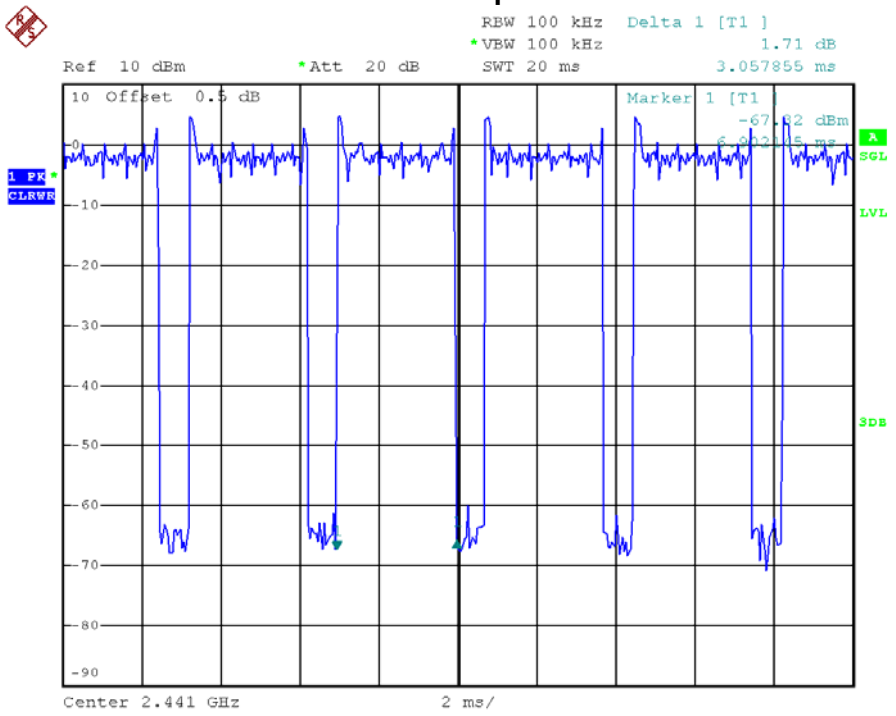
Date: 10.FEB.2014 12:12:22

Bluetooth/3 Mbps/2441 MHz/DH3



Date: 10.FEB.2014 12:12:45

Bluetooth/3 Mbps/2441 MHz/DH1

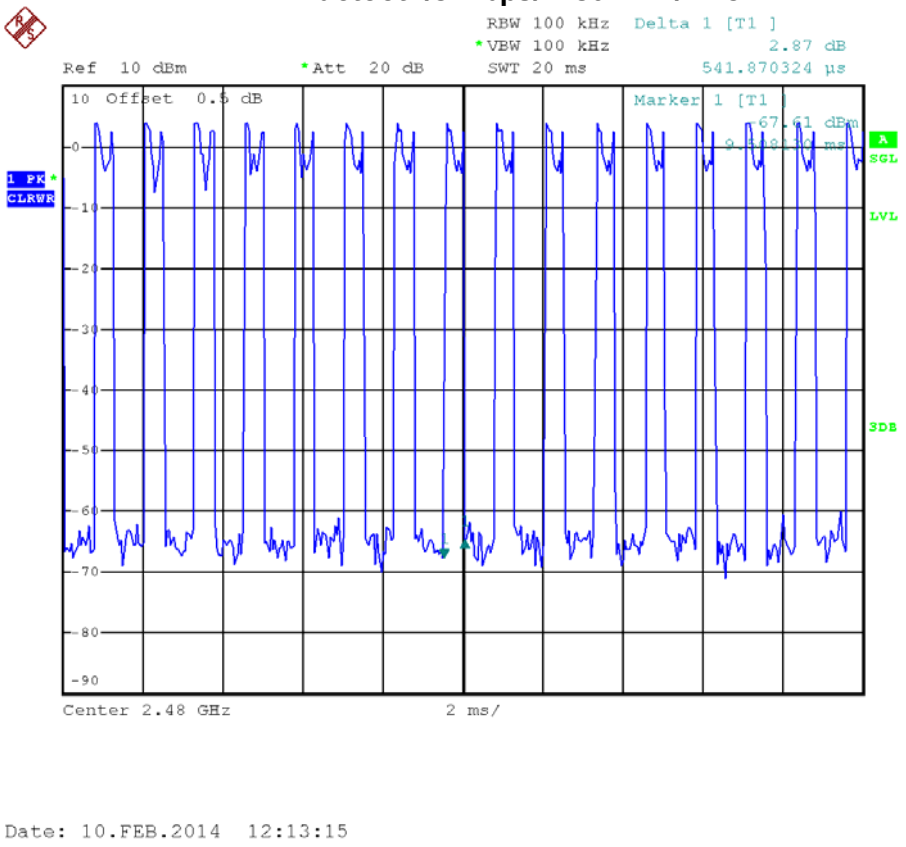


Date: 10.FEB.2014 12:04:59

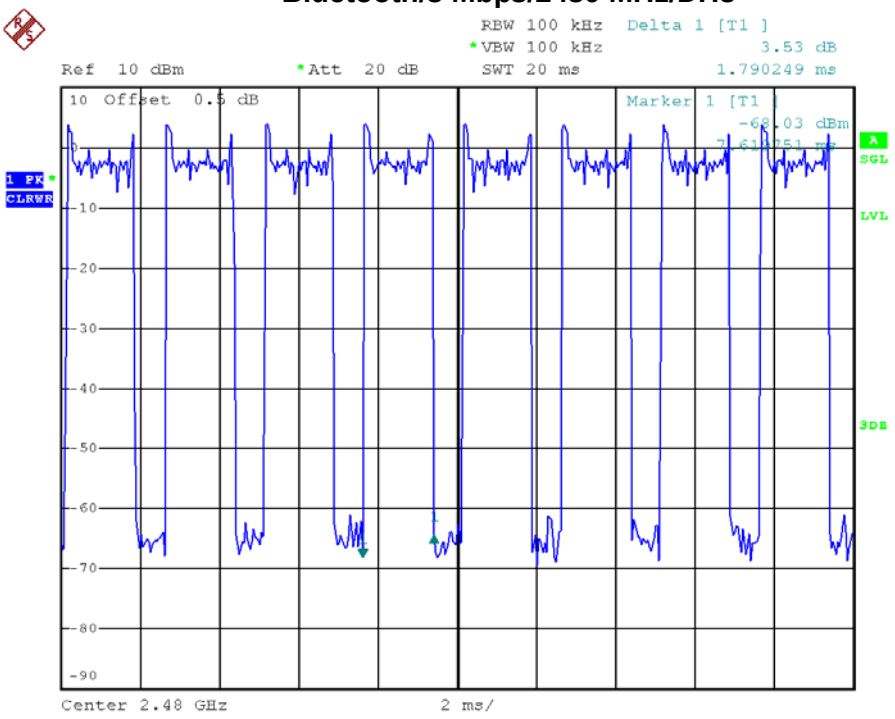
E.U.T	Bluetooth Headset	Model Name	BXH-400
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 3.7V		
Test Mode	Bluetooth/3 Mbps/2480 MHz		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Result
DH5	2480 MHz	3.0886	0.3295	0.4	PASS
DH3	2480 MHz	1.7902	0.2864	0.4	PASS
DH1	2480 MHz	0.5419	0.1734	0.4	PASS

Bluetooth/3 Mbps/2480 MHz/DH5

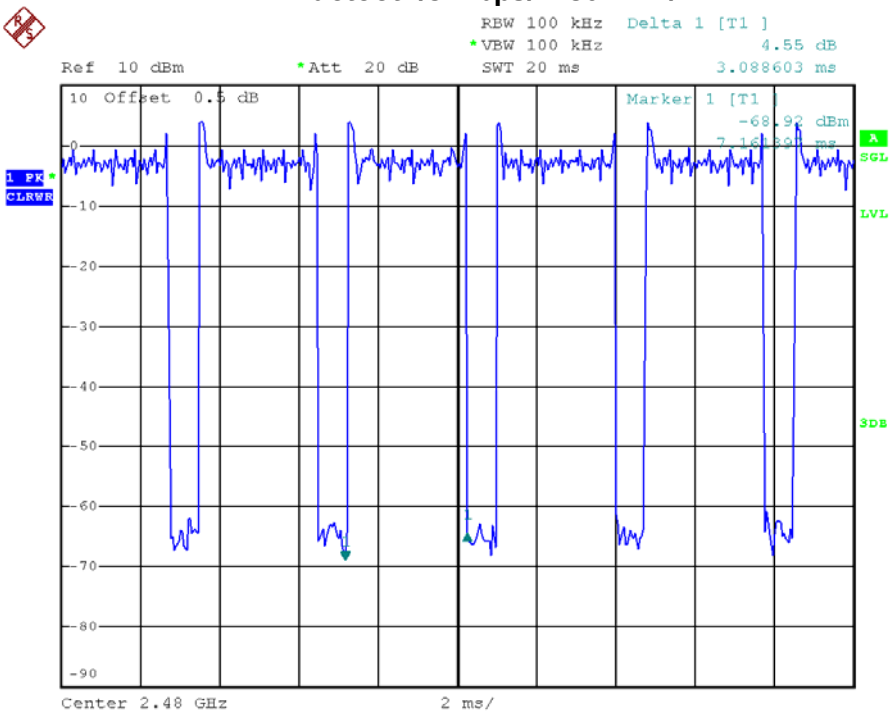


Bluetooth/3 Mbps/2480 MHz/DH3



Date: 10.FEB.2014 12:13:38

Bluetooth/3 Mbps/2480 MHz/DH1



Date: 10.FEB.2014 12:08:22

12 RF EXPOSURE COMPLIANCE

12.1 LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

NOTE: f = frequency in MHz ; *Plane-wave equivalent power density.

12.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Aug. 15, 2014
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Aug. 15, 2014

NOTE: **"N/A" denotes no model name, no serial No. or no calibration specified.**

12.3 MPE CALCULATION METHOD

E (V/m) $= \frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) $= \frac{E^2}{377}$

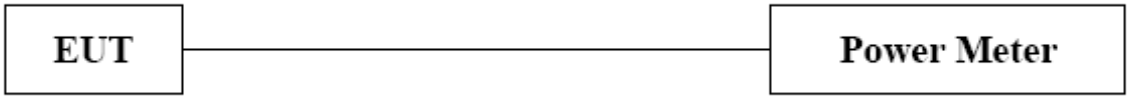
E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

12.4TEST SETUP LAYOUT



12.5DEVIATION FROM TEST STANDARD

No deviation

12.6EUT OPERATING CONDITIONS

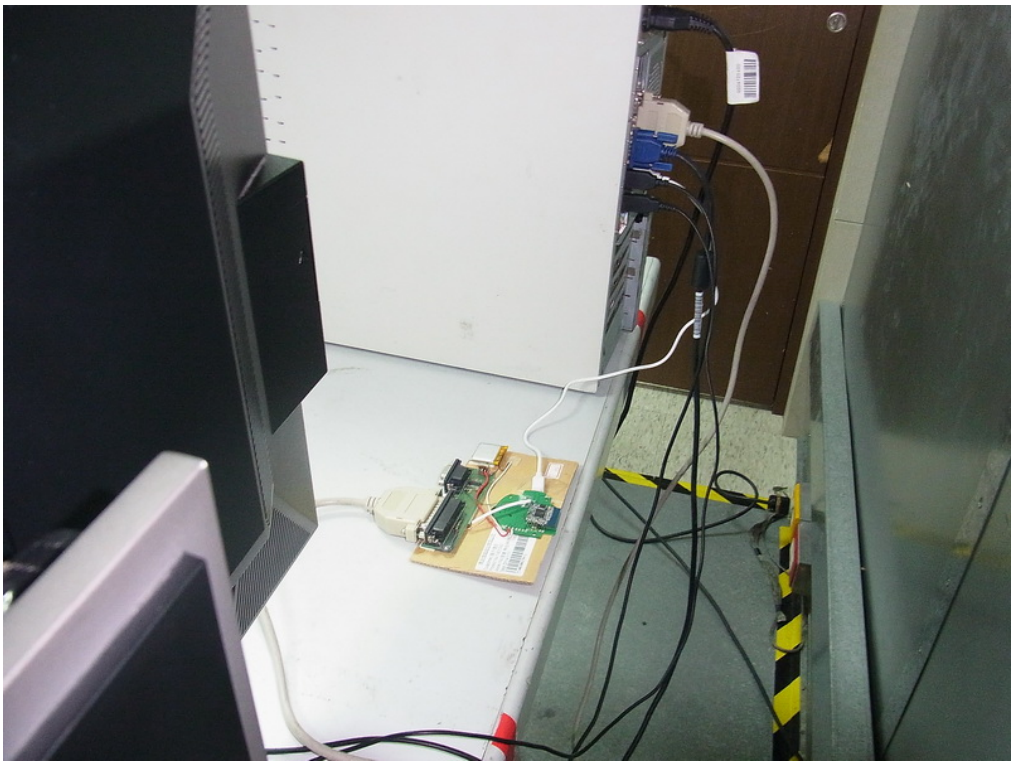
The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

12.7TEST RESULTS

The power is so low so there is no need for RF calculations.

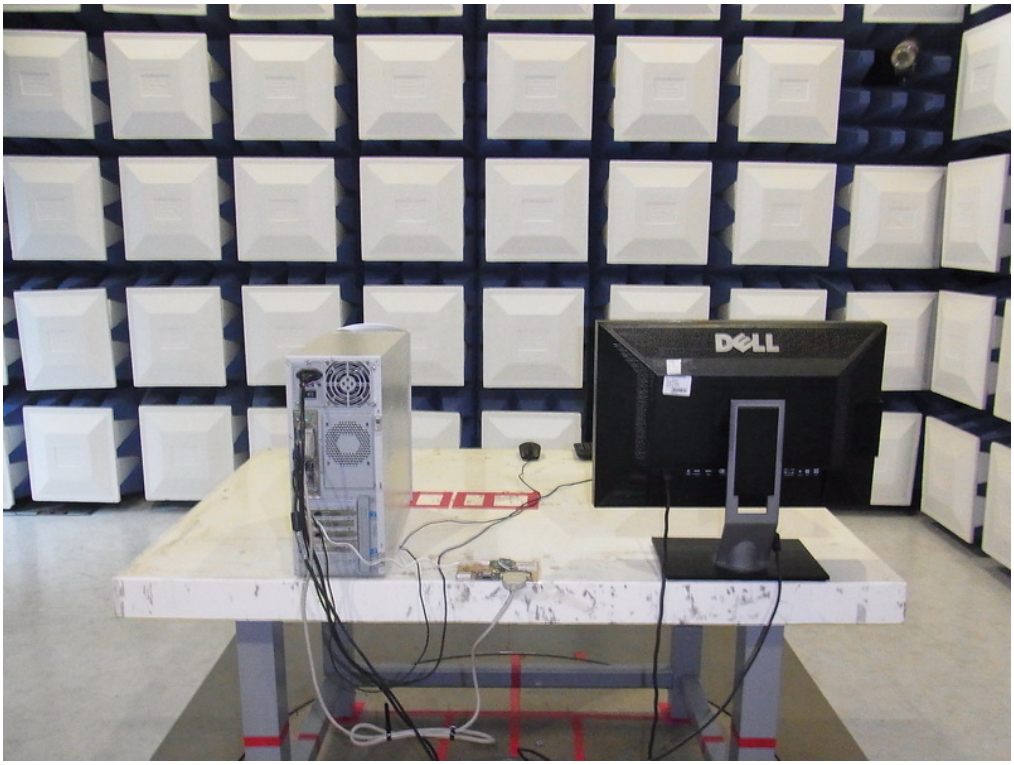
13 EUT TEST PHOTO

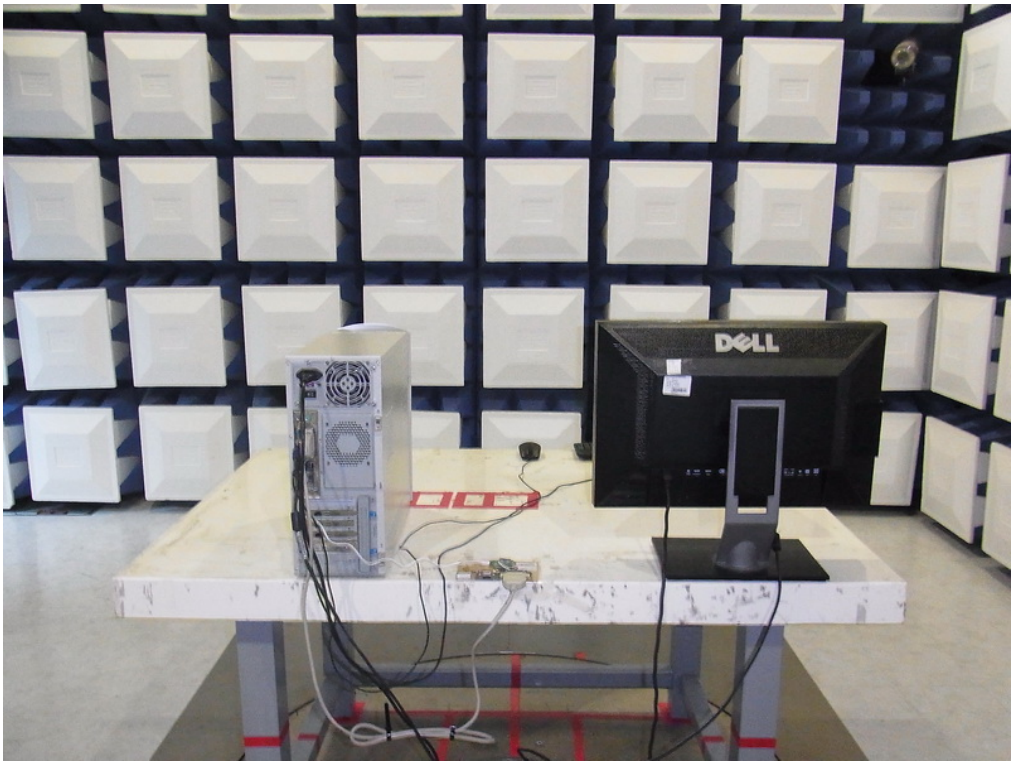
Conducted emission test photos



Radiated spurious emission test photos

Below 1 GHz



Radiated spurious emission test photos

Above 1 GHz