FCC 47 CFR PART 15 SUBPART C

Product Type	:	Bluetooth Headset
Applicant	:	Sound ID
Address		2637 Marine Way, Suite 200, Mountain View, CA 94043, USA
Trade Name	:	Sound ID
Model Number	:	Sound ID 510
Test Specification	:	FCC 47 CFR PART 15 SUBPART C: Oct., 2009 Canada RSS-210 ISSUE 7: Jun., 2007 Canada RSS-Gen ISSUE 2: Jun., 2007 ANSI C63.4-2003
Issue Date	:	Apr. 28, 2010

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
Taoyuan Country 334, Taiwan R.O.C.
Tel：+886-3-2710188 / Fax：+886-3-2710190

Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Apr. 01, 2010	Initial Issue	
01	Apr. 28, 2010	Revised power table and antenna gain.	Joyce Liao

Verification

Issued Date: 2010/04/28

Product Type	:	Bluetooth Headset
Applicant	:	Sound ID
Address	:	2637 Marine Way, Suite 200, Mountain View, CA 94043, USA
Trade Name	:	Sound ID
Model Number	:	Sound ID 510
FCC ID	:	U3N-XP4
IC ID	:	6975A-XP4
EUT Rated Voltage	:	DC 3.7V
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C: Oct., 2009 Canada RSS-210 ISSUE 7: Jun., 2007 Canada RSS-Gen ISSUE 2: Jun., 2007 ANSI C63.4-2003
Test Result	:	Complied
Performed Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade City, Taoyuan Country 334, Taiwan R.O.C. Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the Electromagnetic Compatibility Directive 2004/108/EC and technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By	:		Reviewed By	:	
(Manager)		(Miller Lee)	(Testing Engineer)		(Gary Wu)

TABLE OF CONTENTS

1 General Information

1.1 Summary of Test Result

Standard		Item	Result	Remark
15.247	RSS-GEN			
15.207	7.2.2	AC Power Conducted Emission	PASS	-----
-----	6	Receiver Radiated Emissions	PASS	-----
Standard		**Item**	**Result**	**Remark**
15.247	**RSS-210**			
15.247(c)	A8.5	Transmitter Radiated Emissions	PASS	-----
15.247(b)(1)	A8.4 (2)	Max. Output Power	PASS	-----
15.247(a)(1)	A8.1 (1)	20dB RF Bandwidth	PASS	-----
15.247(a)(1)(iii)	A8.1 (2)	Carrier Frequency Separation	PASS	-----
15.247(a)(1)(iii)	A8.1 (4)	Number of Hopping	PASS	-----
15.247(a)(1)(iii)	A8.1 (4)	Time of Occupancy (Dwell Time)	PASS	-----
15.247(c)	A8.5	Out of Band Conducted Spurious Emission	PASS	-----
15.247(c)	A8.5	Band Edge Measurement	PASS	-----
15.203	-	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.24 dB.

Radiated Emission

The measurement uncertainty of 30 MHz - 1GHz is evaluated as ± 3.072dB.

2 EUT Description

Product	:	Bluetooth Headset
Trade Name	:	Sound ID
Model Number	:	Sound ID 510
Applicant	:	Sound ID 2637 Marine Way, Suite 200, Mountain View, CA 94043, USA
Manufacturer	:	Fugang Electronic (Dongguan) Co., Ltd. Industry Street, Dong-Keng, Dong-Guan, Guang-Dong, China
FCC ID	:	U3N-XP4
IC ID	:	6975A-XP4
Frequency Range	:	2402 ~ 2480 MHz
Modulation Type	:	GFSK for 1Mbps
		π/4-DQPSK for 2Mbps
		8DPSK for 3Mbps
Antenna Type	:	PCB Antenna
Antenna Gain	:	2.2772 dBi
RF Output Power	:	GFSK for 1Mbps 3.90 dBm
(Conducted)		π/4-DQPSK for 2Mbps 3.32 dBm
		8DPSK for 3Mbps 3.41 dBm
Component		
Power Adapter	:	Shun Shing, SPF2.5-NA
		Input:100-240Vac, 50/60Hz, 0.1A
		Output: 5.0Vdc, 550mA
		Cable out: Shielded, 0.15 m
Battery	:	DC 3.7V, 110mAh

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GFSK Mode
Mode 2: π/4-DQPSK Mode
Mode 3: 8DPSK Mode
Mode 4: Normal Operation Mode
Mode 5: Receiver Mode

Description of Test Modes

Preliminary tests were performed in different modulation to find the worst case. The modulation shown in the table below is the worst-case. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Modulation Type	Channel	Frequency (MHz)	Packet Type	Conducted Power (dBm)	Worst Case
GFSK	Low	2402	DH1	**1.34**	■
	Low	2402	DH3	1.30	□
	Low	2402	DH5	1.22	□
	Middle	2441	DH1	-1.99	□
	Middle	2441	DH3	-1.90	□
	Middle	2441	DH5	-1.87	□
	High	2480	DH1	0.35	□
	High	2480	DH3	0.51	□
	High	2480	DH5	0.41	□
π/4-DQPSK	Low	2402	2DH1	-0.09	□
	Low	2402	2DH3	0.14	□
	Low	2402	2DH5	-0.10	□
	Middle	2441	2DH1	-3.59	□
	Middle	2441	2DH3	-3.82	□
	Middle	2441	2DH5	-3.81	□
	High	2480	2DH1	-1.58	□
	High	2480	2DH3	-1.82	□
	High	2480	2DH5	-1.85	□
8DPSK	Low	2402	3DH1	-0.37	□
	Low	2402	3DH3	0.10	□
	Low	2402	3DH5	-0.49	□
	Middle	2441	3DH1	-3.52	□
	Middle	2441	3DH3	-3.17	□
	Middle	2441	3DH5	-3.23	□
	High	2480	3DH1	-2.25	□
	High	2480	3DH3	-2.54	□
	High	2480	3DH5	-2.00	□

Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model Number	Serial Number	Power Cord
1.	Bluetooth Tester	R & S	CBT	100350	NA

3.2. EUT Exercise Software

1.	Setup the EUT and Bluetooth Tester (CBT) as shown on 3.3.
2.	Turn on the power of all equipment.
3.	Open Bluetooth function.
4.	EUT run test program.

3.3. Configuration of Test System Details

EUT Link to AC Adapter

Signal Cable Type		Signal Cable Description
A	Power Cable	Shielded, 0.15 m

3.4. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	25
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

4 Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

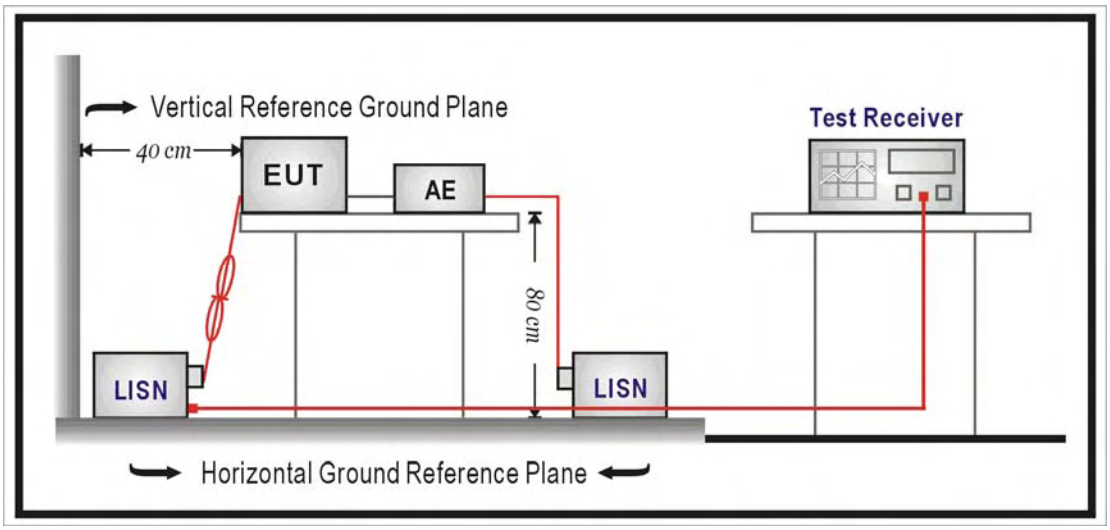
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	07/01/2009	(1)
LISN	EMCO	3816/2 SH	00060110	06/05/2009	(1)
LISN	EMCO	3816/2 SH	00060111	06/29/2009	(1)
Transient Limiter	ELECTRO-METRICS	EM-7600	777	09/22/2009	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

4.3. Test Setup



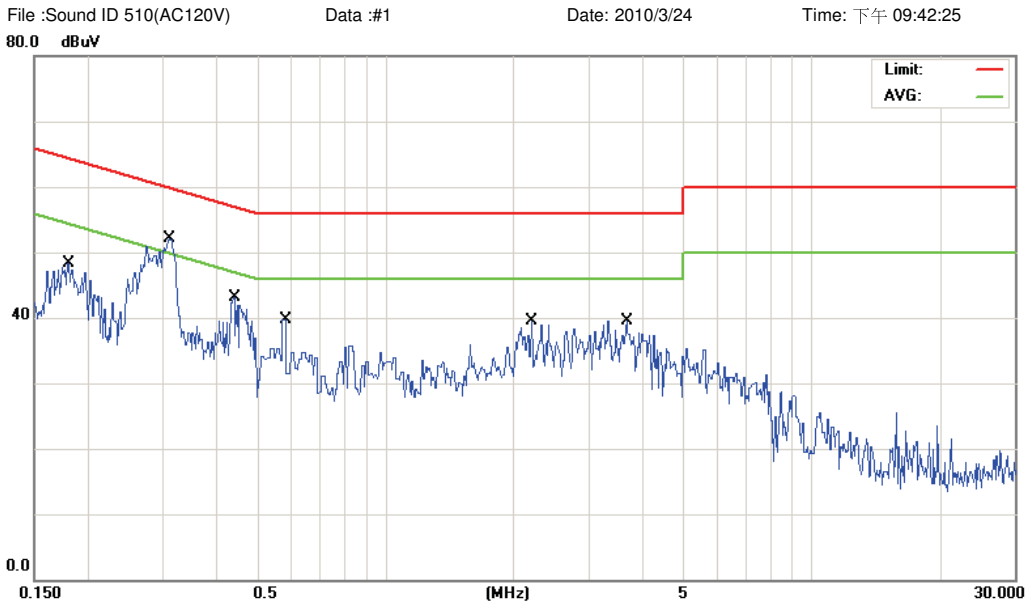
4.4. Test Procedure

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

4.5. Test Result



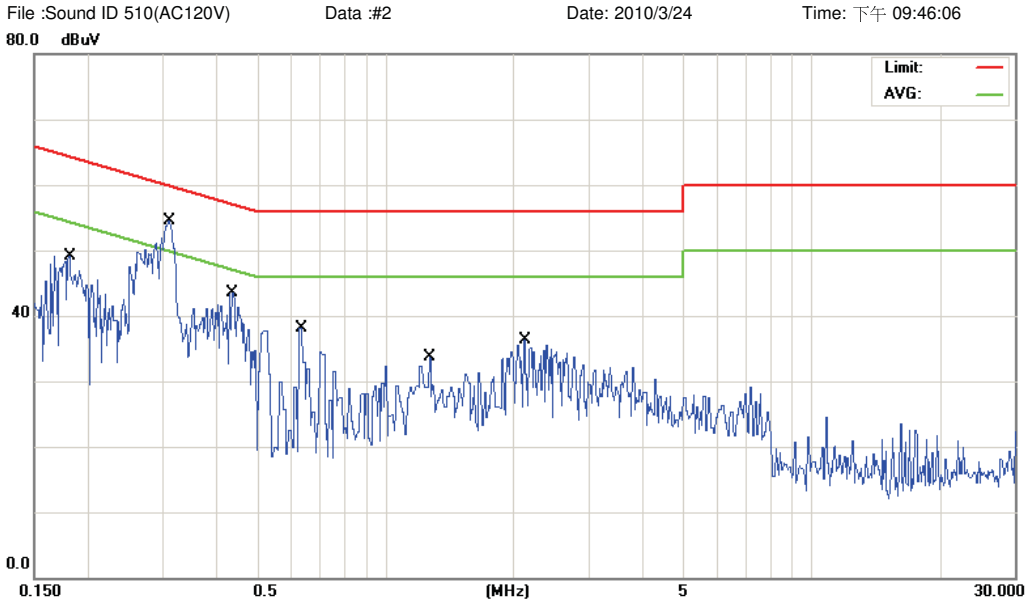
Site : Conducted
Limit: CISPR22 Class B Conduction(QP)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 4
Note:

Phase: *L1*
Power: AC 120V/60Hz

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1801	28.60	10.09	38.69	64.48	-25.79	QP	
2		0.1801	7.20	10.09	17.29	54.48	-37.19	AVG	
3		0.3110	38.90	10.04	48.94	59.94	-11.00	QP	
4	*	0.3110	29.50	10.04	39.54	49.94	-10.40	AVG	
5		0.4398	20.70	9.98	30.68	57.06	-26.38	QP	
6		0.4398	5.60	9.98	15.58	47.06	-31.48	AVG	
7		0.5810	20.20	9.92	30.12	56.00	-25.88	QP	
8		0.5810	6.20	9.92	16.12	46.00	-29.88	AVG	
9		2.2010	19.80	9.74	29.54	56.00	-26.46	QP	
10		2.2010	5.40	9.74	15.14	46.00	-30.86	AVG	
11		3.6770	21.20	9.84	31.04	56.00	-24.96	QP	
12		3.6770	8.30	9.84	18.14	46.00	-27.86	AVG	

*:Maximum data x:Over limit !:over margin ●Reference Only



Site : Conducted
Limit: CISPR22 Class B Conduction(QP)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 4
Note:

Phase: *N*
Power: AC 120V/60Hz

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1808	29.20	10.08	39.28	64.44	-25.16	QP	
2		0.1808	6.60	10.08	16.68	54.44	-37.76	AVG	
3	*	0.3103	40.30	10.04	50.34	59.96	-9.62	QP	
4		0.3103	19.60	10.04	29.64	49.96	-20.32	AVG	
5		0.4377	20.60	9.98	30.58	57.10	-26.52	QP	
6		0.4377	2.40	9.98	12.38	47.10	-34.72	AVG	
7		0.6350	16.50	9.90	26.40	56.00	-29.60	QP	
8		0.6350	2.10	9.90	12.00	46.00	-34.00	AVG	
9		1.2740	16.40	9.63	26.03	56.00	-29.97	QP	
10		1.2740	7.50	9.63	17.13	46.00	-28.87	AVG	
11		2.1110	16.30	9.71	26.01	56.00	-29.99	QP	
12		2.1110	4.30	9.71	14.01	46.00	-31.99	AVG	

*:Maximum data x:Over limit !:over margin ●Reference Only

5 Radiated Interference Measurement

5.1. Limit

Frequency Range (MHz)	Peak (dBuV)
30 to 88	39
88 to 216	43.5
216 to 960	46.4
Above 960	49.5

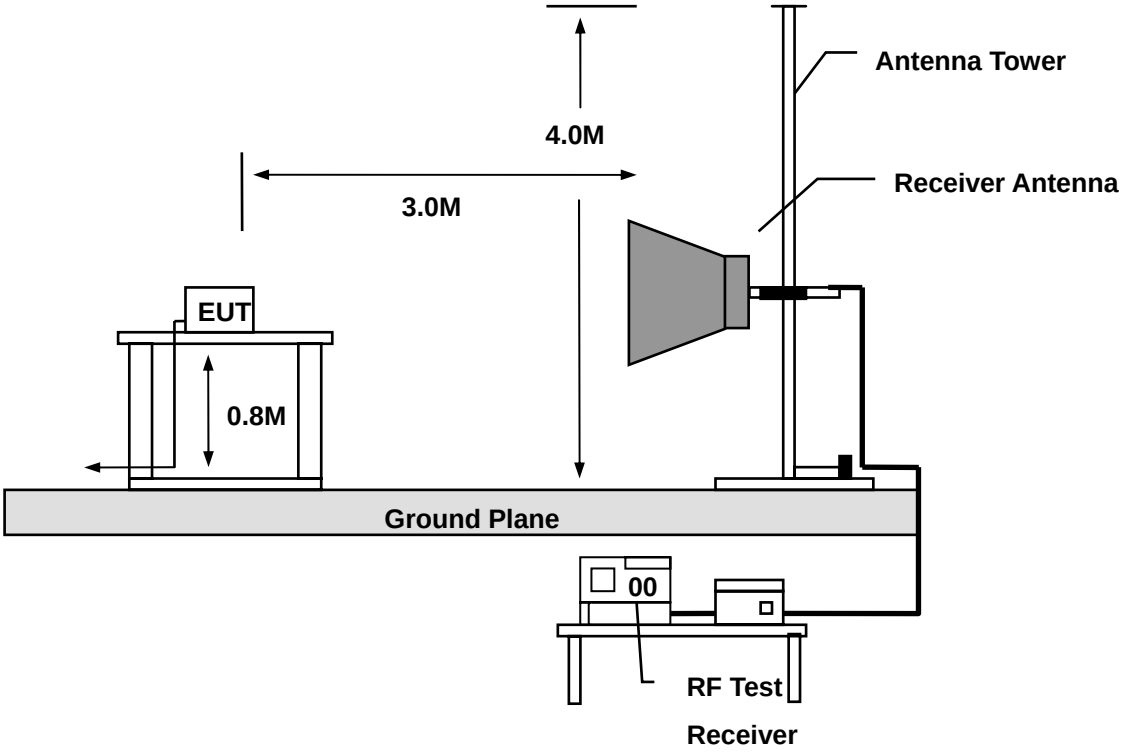
5.2. Test Instruments

3 Meter Chamber					
Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Cal. Date**	**Remark**
RF Pre-selector	Agilent	N9039A	MY46520256	01/27/2009	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/20/2009	(2)
Pre Amplifier	Agilent	8449B	3008A02237	07/01/2009	(1)
Pre Amplifier	Agilent	8447D	2944A10961	06/30/2009	(1)
Bi-log Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	06/23/2009	(2)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	07/01/2009	(2)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/30/2009	(2)
Test Site	ATL	TE01	888001	08/06/2009	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

5.3. Setup



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)

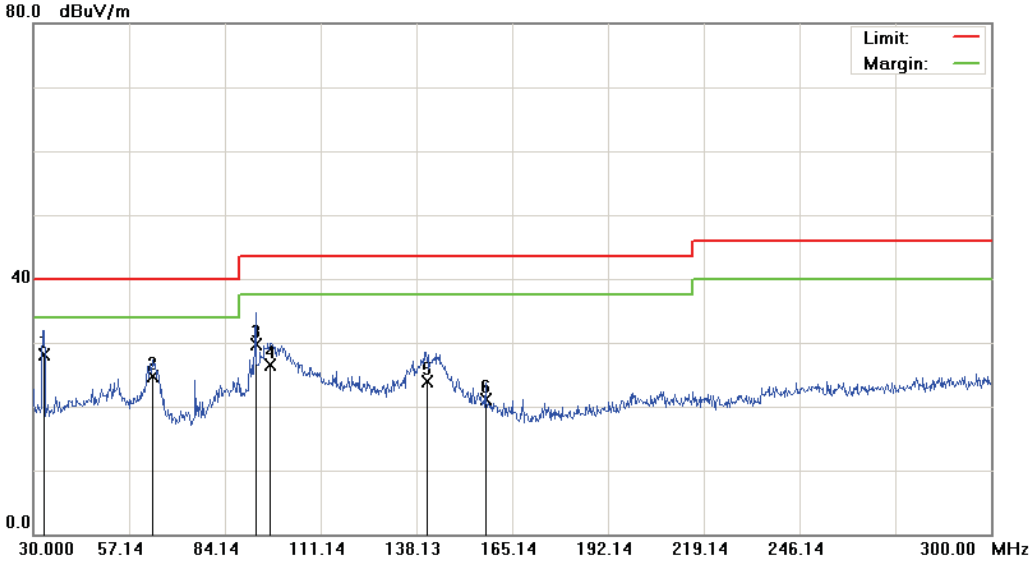
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

5.5. Test Result

File :XP4(Normal Link) Data :#1 Date: 2010-3-19 Time: 下午 10:27:06



Site: : 966 Chamber
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 4
Note:

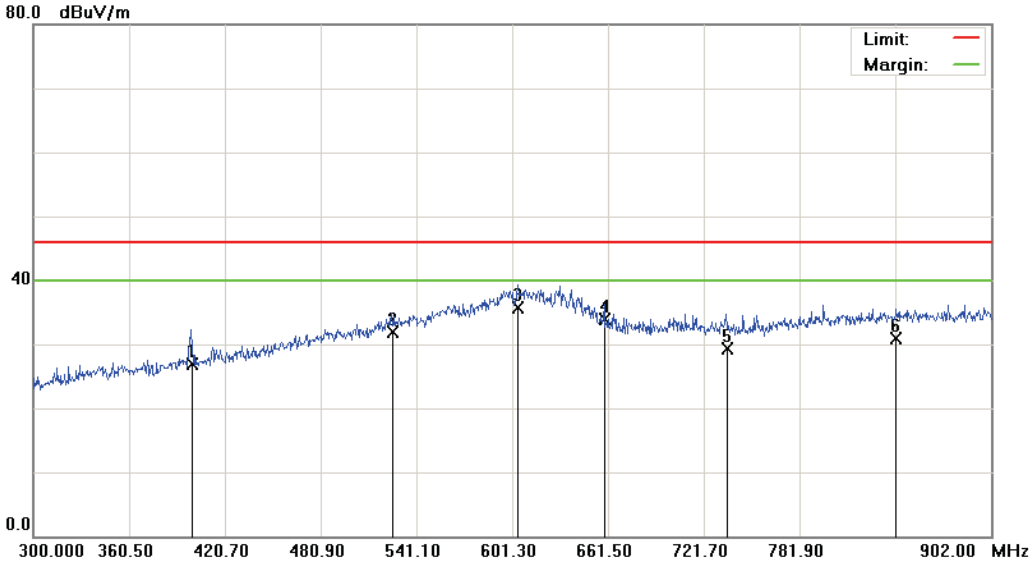
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 120 KHz VBW: 300 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	32.8350	41.35	-13.25	28.10	40.00	-11.90	QP			
2		63.7500	38.67	-13.89	24.78	40.00	-15.22	QP			
3		92.7750	42.34	-12.55	29.79	43.50	-13.71	QP			
4		96.6900	38.46	-11.94	26.52	43.50	-16.98	QP			
5		140.8350	40.25	-16.32	23.93	43.50	-19.57	QP			
6		157.4400	36.78	-15.70	21.08	43.50	-22.42	QP			

*:Maximum data x:Over limit !:over margin

File :XP4(Normal Link) Data :#2 Date: 2010-3-19 Time: 下午 10:29:59



Site: : 966 Chamber
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 4
Note:

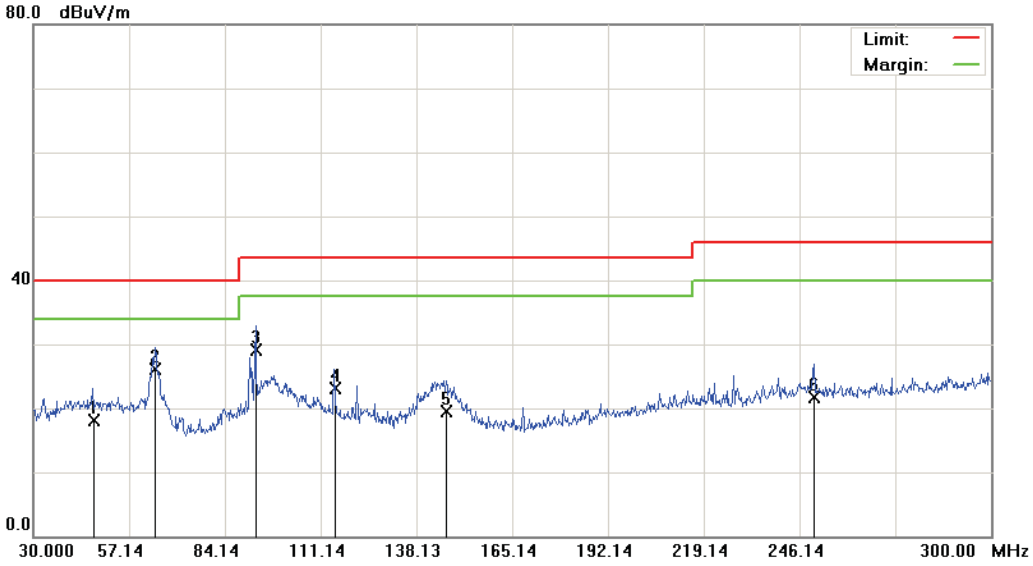
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 120 KHz VBW: 300 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		399.6310	35.29	-8.34	26.95	46.00	-19.05	QP			
2		525.4490	38.46	-6.49	31.97	46.00	-14.03	QP			
3	*	604.6120	40.29	-4.60	35.69	46.00	-10.31	QP			
4		659.0930	38.16	-4.34	33.82	46.00	-12.18	QP			
5		735.5470	32.67	-3.30	29.37	46.00	-16.63	QP			
6		842.4020	32.19	-1.33	30.86	46.00	-15.14	QP			

*:Maximum data x:Over limit !:over margin

File :XP4(Normal Link) Data :#3 Date: 2010-3-19 Time: 下午 10:32:54



Site: : 966 Chamber
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 4
Note:

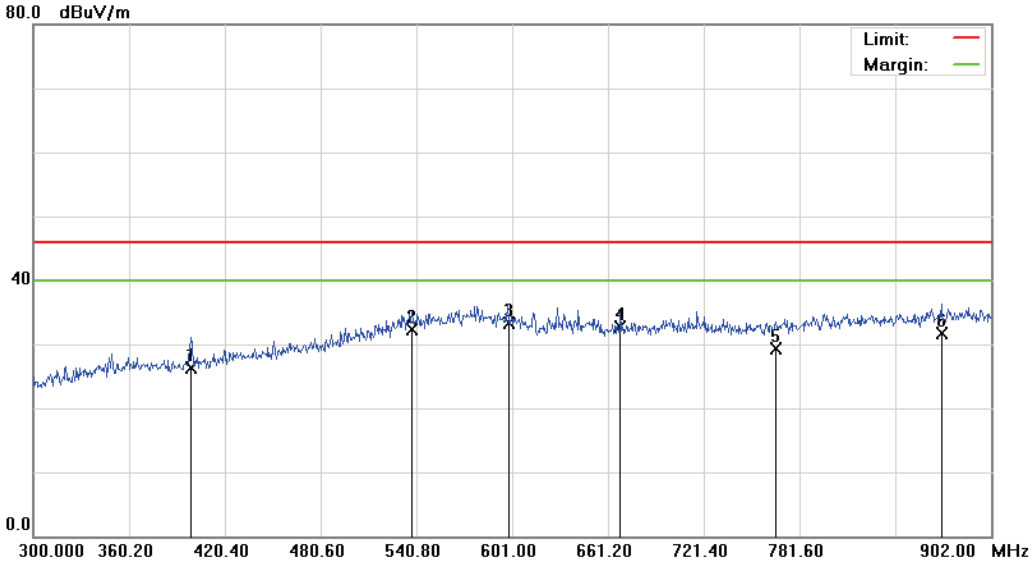
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 120 KHz VBW: 300 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		46.8750	30.15	-11.95	18.20	40.00	-21.80	QP			
2	*	64.2900	40.16	-14.09	26.07	40.00	-13.93	QP			
3		92.6400	41.67	-12.57	29.10	43.50	-14.40	QP			
4		114.9150	36.49	-13.33	23.16	43.50	-20.34	QP			
5		146.3700	35.74	-16.14	19.60	43.50	-23.90	QP			
6		250.0500	32.46	-10.82	21.64	46.00	-24.36	QP			

*:Maximum data x:Over limit !:over margin

File :XP4(Normal Link) Data :#4 Date: 2010-3-19 Time: 下午 10:35:48



Site: : 966 Chamber
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 4
Note:

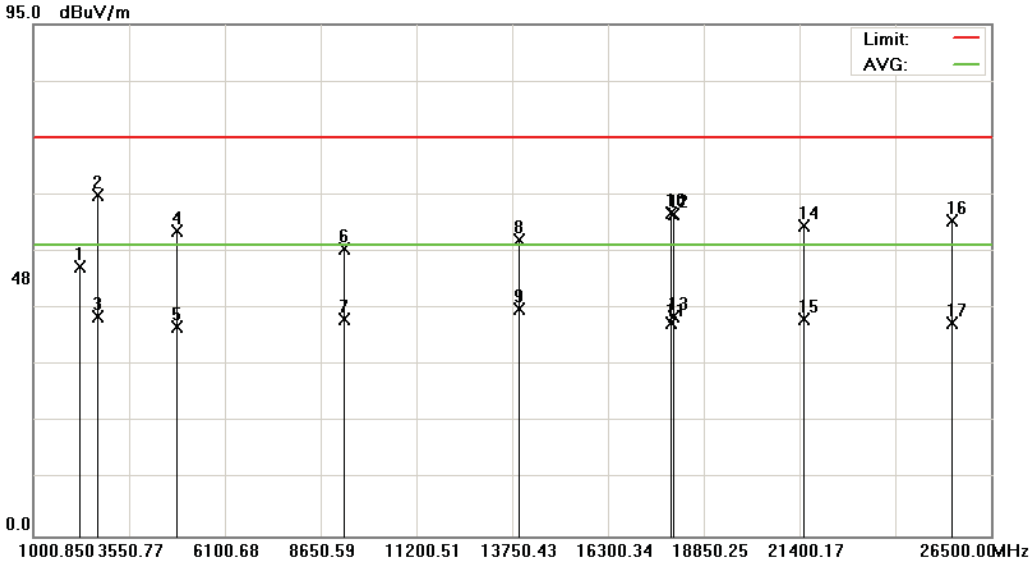
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 120 KHz VBW: 300 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		399.3300	34.57	-8.35	26.22	46.00	-19.78	QP			
2		537.7900	38.49	-6.21	32.28	46.00	-13.72	QP			
3	*	598.2910	38.26	-4.89	33.37	46.00	-12.63	QP			
4		669.0260	36.97	-4.31	32.66	46.00	-13.34	QP			
5		766.5500	32.16	-2.77	29.39	46.00	-16.61	QP			
6		870.6960	32.48	-0.87	31.61	46.00	-14.39	QP			

*:Maximum data x:Over limit !:over margin

File :XP4(2402MHZ) Data :#17 Date: 2010-3-20 Time: 上午 01:20:53



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2402MHz

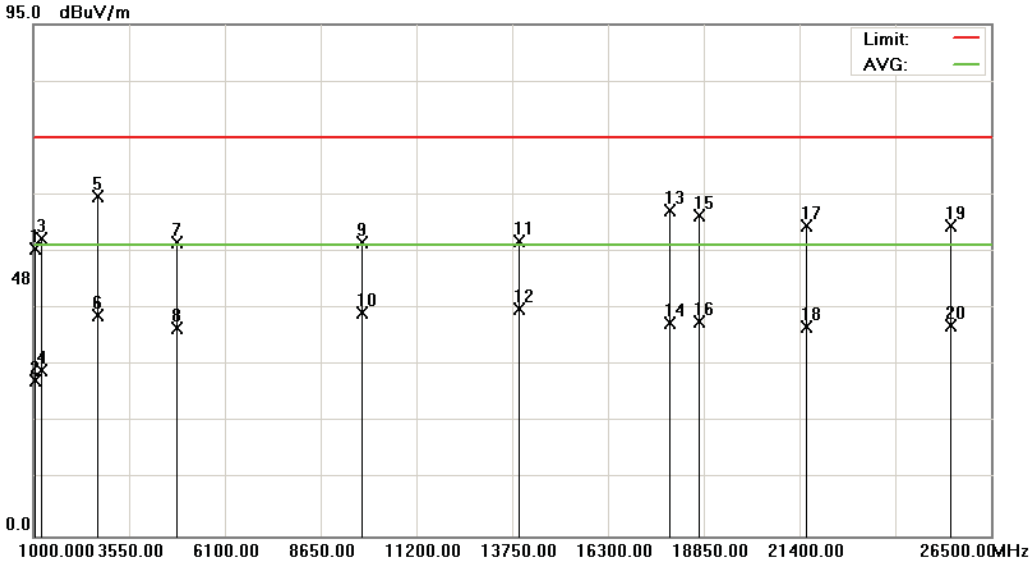
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2214.650	49.68	0.37	50.05	74.00	-23.95	peak			
2	*	2700.000	40.75	22.58	63.33	74.00	-10.67	peak			
3		2700.000	18.24	22.58	40.82	54.00	-13.18	AVG			
4		4802.400	49.25	7.30	56.55	74.00	-17.45	peak			
5		4802.400	31.62	7.30	38.92	54.00	-15.08	AVG			
6		9280.950	36.67	16.70	53.37	74.00	-20.63	peak			
7		9280.950	23.47	16.70	40.17	54.00	-13.83	AVG			
8		13912.000	26.80	28.07	54.87	74.00	-19.13	peak			
9		13912.000	14.13	28.07	42.20	54.00	-11.80	AVG			
10		17972.000	25.49	34.59	60.08	74.00	-13.92	peak			
11		17972.000	5.04	34.59	39.63	54.00	-14.37	AVG			
12		18042.500	36.55	23.27	59.82	74.00	-14.18	peak			
13		18042.500	17.38	23.27	40.65	54.00	-13.35	AVG			
14		21502.000	36.28	21.36	57.64	74.00	-16.36	peak			
15		21502.000	18.79	21.36	40.15	54.00	-13.85	AVG			
16		25437.500	39.56	19.02	58.58	74.00	-15.42	peak			
17		25437.500	20.56	19.02	39.58	54.00	-14.42	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(2402MHZ) Data :#19 Date: 2010-3-20 Time: 上午 01:22:10



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2402MHz

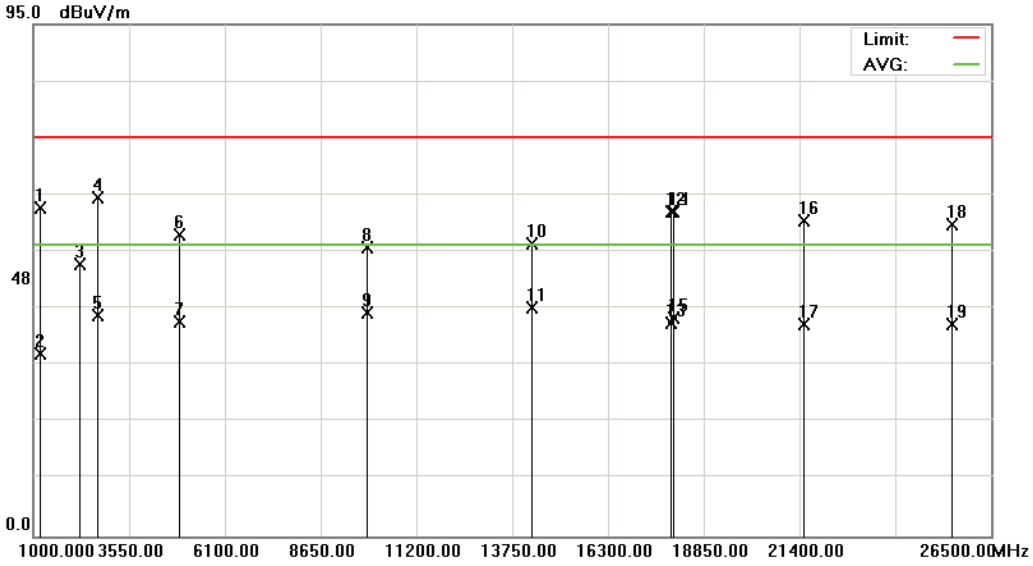
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1032.300	59.56	-6.20	53.36	74.00	-20.64	peak			
2		1032.300	35.07	-6.20	28.87	54.00	-25.13	AVG			
3		1198.900	60.17	-4.91	55.26	74.00	-18.74	peak			
4		1198.900	35.70	-4.91	30.79	54.00	-23.21	AVG			
5	*	2700.000	40.38	22.58	62.96	74.00	-11.04	peak			
6		2700.000	18.31	22.58	40.89	54.00	-13.11	AVG			
7		4802.400	47.27	7.30	54.57	74.00	-19.43	peak			
8		4802.400	31.25	7.30	38.55	54.00	-15.45	AVG			
9		9726.250	36.90	17.60	54.50	74.00	-19.50	peak			
10		9726.250	23.74	17.60	41.34	54.00	-12.66	AVG			
11		13904.000	26.69	28.07	54.76	74.00	-19.24	peak			
12		13904.000	14.00	28.07	42.07	54.00	-11.93	AVG			
13		17940.000	26.24	34.25	60.49	74.00	-13.51	peak			
14		17940.000	5.35	34.25	39.60	54.00	-14.40	AVG			
15		18714.000	36.26	23.12	59.38	74.00	-14.62	peak			
16		18714.000	16.76	23.12	39.88	54.00	-14.12	AVG			
17		21565.750	36.39	21.31	57.70	74.00	-16.30	peak			
18		21565.750	17.48	21.31	38.79	54.00	-15.21	AVG			
19		25424.750	38.47	19.03	57.50	74.00	-16.50	peak			
20		25424.750	19.93	19.03	38.96	54.00	-15.04	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(2441MHZ) Data :#17 Date: 2010-3-20 Time: 上午 01:17:57



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2441MHz

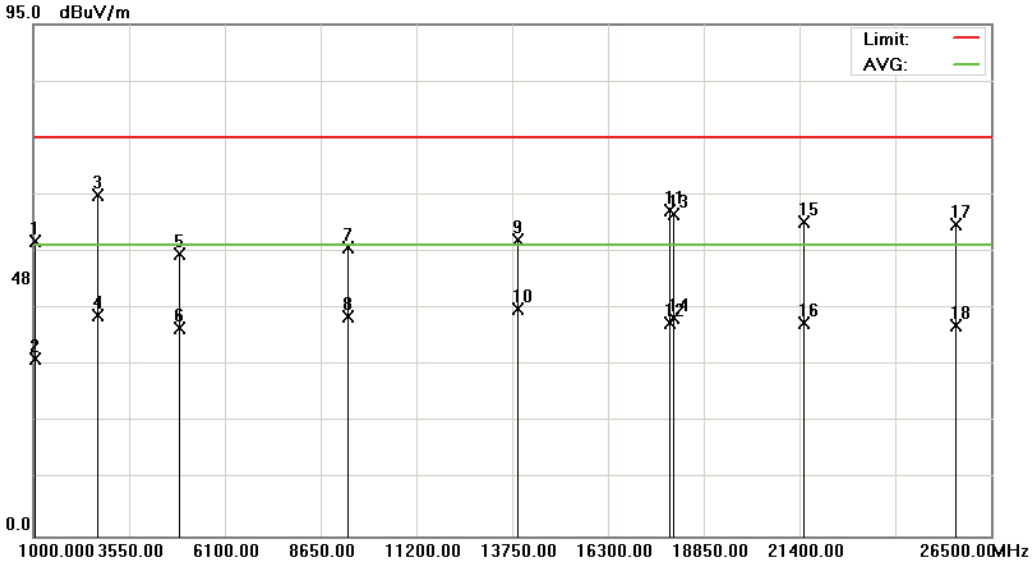
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1178.500	66.03	-5.21	60.82	74.00	-13.18	peak			
2		1178.500	39.15	-5.21	33.94	54.00	-20.06	AVG			
3		2213.800	50.08	0.38	50.46	74.00	-23.54	peak			
4	*	2700.000	40.29	22.58	62.87	74.00	-11.13	peak			
5		2700.000	18.28	22.58	40.86	54.00	-13.14	AVG			
6		4882.700	48.17	7.74	55.91	74.00	-18.09	peak			
7		4882.700	32.11	7.74	39.85	54.00	-14.15	AVG			
8		9857.650	35.66	17.88	53.54	74.00	-20.46	peak			
9		9857.650	23.68	17.88	41.56	54.00	-12.44	AVG			
10		14252.000	26.12	28.22	54.34	74.00	-19.66	peak			
11		14252.000	14.11	28.22	42.33	54.00	-11.67	AVG			
12		17968.000	25.77	34.52	60.29	74.00	-13.71	peak			
13		17968.000	5.03	34.52	39.55	54.00	-14.45	AVG			
14		18038.250	37.00	23.28	60.28	74.00	-13.72	peak			
15		18038.250	17.33	23.28	40.61	54.00	-13.39	AVG			
16		21506.250	37.26	21.35	58.61	74.00	-15.39	peak			
17		21506.250	17.99	21.35	39.34	54.00	-14.66	AVG			
18		25433.250	38.84	19.02	57.86	74.00	-16.14	peak			
19		25433.250	20.22	19.02	39.24	54.00	-14.76	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(2441MHZ) Data :#18 Date: 2010-3-20 Time: 上午 01:19:14



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2441MHz

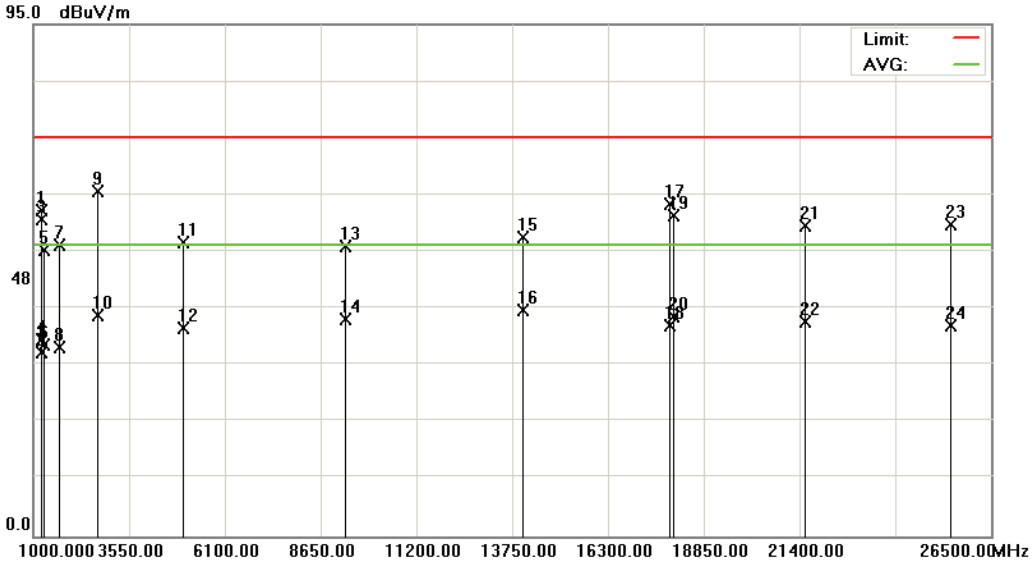
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1033.150	61.01	-6.20	54.81	74.00	-19.19	peak			
2		1033.150	39.07	-6.20	32.87	54.00	-21.13	AVG			
3	*	2700.000	40.62	22.58	63.20	74.00	-10.80	peak			
4		2700.000	18.34	22.58	40.92	54.00	-13.08	AVG			
5		4882.700	44.71	7.74	52.45	74.00	-21.55	peak			
6		4882.700	30.86	7.74	38.60	54.00	-15.40	AVG			
7		9379.500	36.62	17.03	53.65	74.00	-20.35	peak			
8		9379.500	23.74	17.03	40.77	54.00	-13.23	AVG			
9		13896.000	26.88	28.04	54.92	74.00	-19.08	peak			
10		13896.000	14.14	28.04	42.18	54.00	-11.82	AVG			
11		17912.000	25.92	34.43	60.35	74.00	-13.65	peak			
12		17912.000	5.13	34.43	39.56	54.00	-14.44	AVG			
13		18051.000	36.55	23.27	59.82	74.00	-14.18	peak			
14		18051.000	17.33	23.27	40.60	54.00	-13.40	AVG			
15		21519.000	36.87	21.34	58.21	74.00	-15.79	peak			
16		21519.000	18.18	21.34	39.52	54.00	-14.48	AVG			
17		25539.500	38.92	18.95	57.87	74.00	-16.13	peak			
18		25539.500	20.02	18.95	38.97	54.00	-15.03	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(2480MHZ) Data :#18 Date: 2010-3-20 Time: 上午 01:15:16



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2480MHz

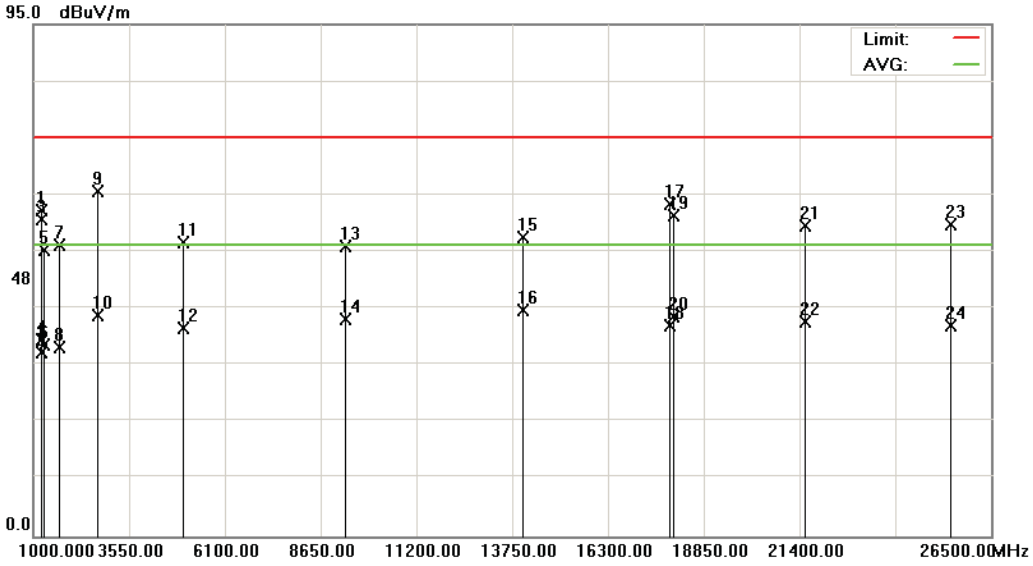
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1179.350	65.58	-5.21	60.37	74.00	-13.63	peak			
2		1179.350	39.40	-5.21	34.19	54.00	-19.81	AVG			
3		1198.900	63.61	-4.91	58.70	74.00	-15.30	peak			
4		1198.900	41.27	-4.91	36.36	54.00	-17.64	AVG			
5		1265.200	57.18	-4.05	53.13	74.00	-20.87	peak			
6		1265.200	39.54	-4.05	35.49	54.00	-18.51	AVG			
7		1665.550	57.90	-3.85	54.05	74.00	-19.95	peak			
8		1665.550	38.95	-3.85	35.10	54.00	-18.90	AVG			
9	*	2700.000	41.46	22.58	64.04	74.00	-9.96	peak			
10		2700.000	18.33	22.58	40.91	54.00	-13.09	AVG			
11		4959.350	46.71	7.80	54.51	74.00	-19.49	peak			
12		4959.350	30.78	7.80	38.58	54.00	-15.42	AVG			
13		9310.150	36.85	16.89	53.74	74.00	-20.26	peak			
14		9310.150	23.27	16.89	40.16	54.00	-13.84	AVG			
15		14024.000	27.32	28.21	55.53	74.00	-18.47	peak			
16		14024.000	13.67	28.21	41.88	54.00	-12.12	AVG			
17		17940.000	27.31	34.25	61.56	74.00	-12.44	peak			
18		17940.000	4.83	34.25	39.08	54.00	-14.92	AVG			
19		18017.000	36.21	23.29	59.50	74.00	-14.50	peak			
20		18017.000	17.33	23.29	40.62	54.00	-13.38	AVG			
21		21531.750	36.25	21.34	57.59	74.00	-16.41	peak			
22		21531.750	18.41	21.34	39.75	54.00	-14.25	AVG			
23		25429.000	38.88	19.03	57.91	74.00	-16.09	peak			
24		25429.000	20.00	19.03	39.03	54.00	-14.97	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(2480MHZ) Data :#18 Date: 2010-3-20 Time: 上午 01:15:16



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2480MHz

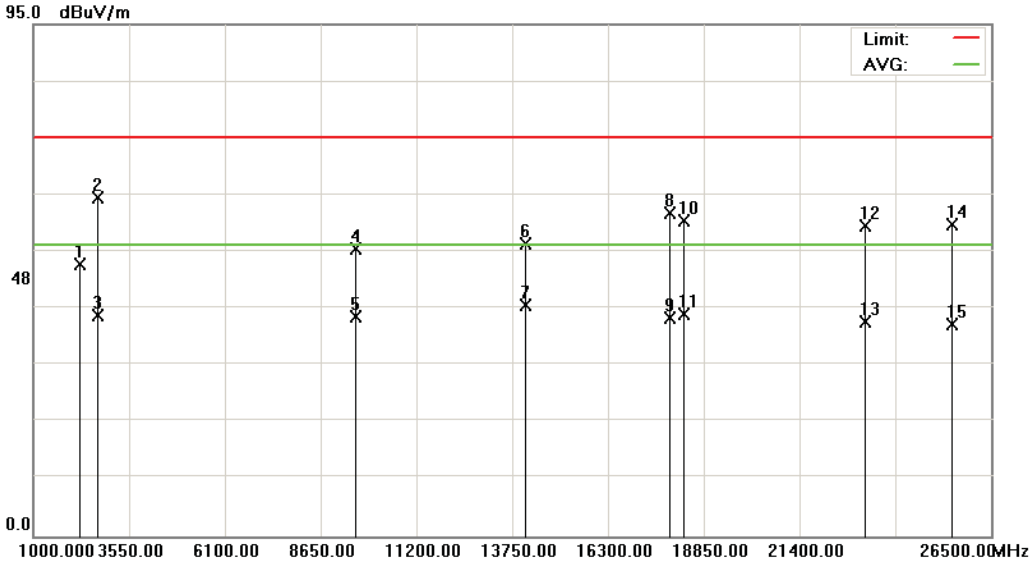
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1179.350	65.58	-5.21	60.37	74.00	-13.63	peak			
2		1179.350	39.40	-5.21	34.19	54.00	-19.81	AVG			
3		1198.900	63.61	-4.91	58.70	74.00	-15.30	peak			
4		1198.900	41.27	-4.91	36.36	54.00	-17.64	AVG			
5		1265.200	57.18	-4.05	53.13	74.00	-20.87	peak			
6		1265.200	39.54	-4.05	35.49	54.00	-18.51	AVG			
7		1665.550	57.90	-3.85	54.05	74.00	-19.95	peak			
8		1665.550	38.95	-3.85	35.10	54.00	-18.90	AVG			
9	*	2700.000	41.46	22.58	64.04	74.00	-9.96	peak			
10		2700.000	18.33	22.58	40.91	54.00	-13.09	AVG			
11		4959.350	46.71	7.80	54.51	74.00	-19.49	peak			
12		4959.350	30.78	7.80	38.58	54.00	-15.42	AVG			
13		9310.150	36.85	16.89	53.74	74.00	-20.26	peak			
14		9310.150	23.27	16.89	40.16	54.00	-13.84	AVG			
15		14024.000	27.32	28.21	55.53	74.00	-18.47	peak			
16		14024.000	13.67	28.21	41.88	54.00	-12.12	AVG			
17		17940.000	27.31	34.25	61.56	74.00	-12.44	peak			
18		17940.000	4.83	34.25	39.08	54.00	-14.92	AVG			
19		18017.000	36.21	23.29	59.50	74.00	-14.50	peak			
20		18017.000	17.33	23.29	40.62	54.00	-13.38	AVG			
21		21531.750	36.25	21.34	57.59	74.00	-16.41	peak			
22		21531.750	18.41	21.34	39.75	54.00	-14.25	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(Rx) Data :#17 Date: 2010-3-20 Time: 上午 01:53:52



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 5
Note:

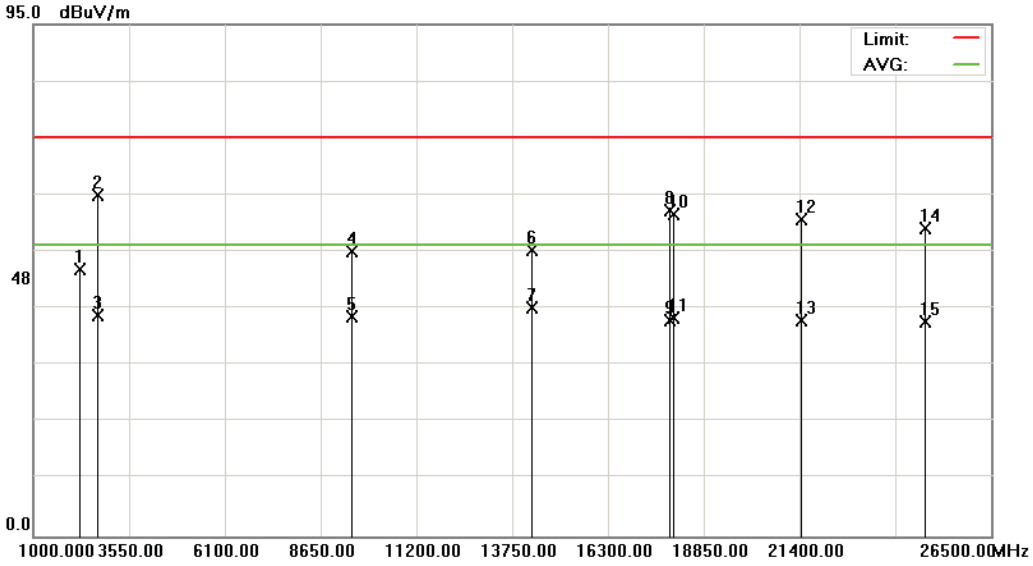
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2213.800	50.08	0.38	50.46	74.00	-23.54	peak			
2	*	2700.000	40.29	22.58	62.87	74.00	-11.13	peak			
3		2700.000	18.28	22.58	40.86	54.00	-13.14	AVG			
4		9543.750	36.15	17.10	53.25	74.00	-20.75	peak			
5		9543.750	23.58	17.10	40.68	54.00	-13.32	AVG			
6		14084.000	25.90	28.37	54.27	74.00	-19.73	peak			
7		14084.000	14.39	28.37	42.76	54.00	-11.24	AVG			
8		17908.000	25.49	34.45	59.94	74.00	-14.06	peak			
9		17908.000	6.02	34.45	40.47	54.00	-13.53	AVG			
10		18306.000	35.35	23.19	58.54	74.00	-15.46	peak			
11		18306.000	18.03	23.19	41.22	54.00	-12.78	AVG			
12		23129.750	36.66	20.83	57.49	74.00	-16.51	peak			
13		23129.750	19.06	20.83	39.89	54.00	-14.11	AVG			
14		25433.250	38.84	19.02	57.86	74.00	-16.14	peak			
15		25433.250	20.22	19.02	39.24	54.00	-14.76	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(Rx) Data :#18 Date: 2010-3-20 Time: 上午 01:54:49



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 5
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2215.500	49.18	0.37	49.55	74.00	-24.45	peak			
2	*	2700.000	40.62	22.58	63.20	74.00	-10.80	peak			
3		2700.000	18.34	22.58	40.92	54.00	-13.08	AVG			
4		9474.400	35.92	16.90	52.82	74.00	-21.18	peak			
5		9474.400	23.75	16.90	40.65	54.00	-13.35	AVG			
6		14244.000	24.86	28.24	53.10	74.00	-20.90	peak			
7		14244.000	14.21	28.24	42.45	54.00	-11.55	AVG			
8		17912.000	25.92	34.43	60.35	74.00	-13.65	peak			
9		17912.000	5.55	34.43	39.98	54.00	-14.02	AVG			
10		18051.000	36.55	23.27	59.82	74.00	-14.18	peak			
11		18051.000	17.33	23.27	40.60	54.00	-13.40	AVG			
12		21442.500	37.41	21.39	58.80	74.00	-15.20	peak			
13		21442.500	18.53	21.39	39.92	54.00	-14.08	AVG			
14		24719.250	37.51	19.57	57.08	74.00	-16.92	peak			
15		24719.250	20.27	19.57	39.84	54.00	-14.16	AVG			

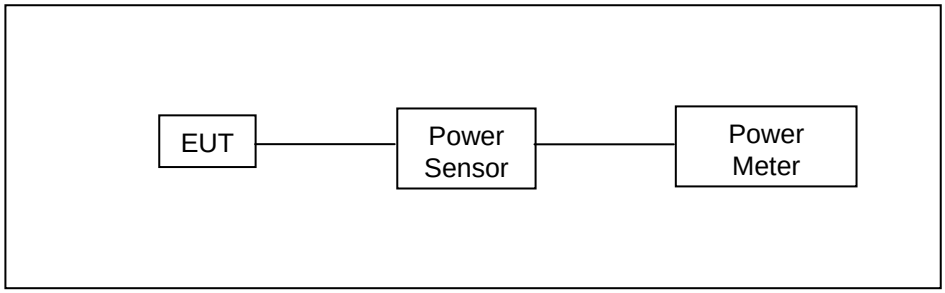
*:Maximum data x:Over limit !:over margin

6 Maximum Conducted Output Power Measurement

6.1. Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels < 1 watt.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Single Channel PK Power Sensor	Agilent	N1911A	MY15101619	07/14/2009	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	07/25/2009	(1)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Product	Bluetooth Headset					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 1: GFSK Link Mode					
Date of Test	04/27/2010			Test Site	TE06	
Frequency (MHz)	Packet Type	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
2402	DH1	2.83	0.002	3.28	0.002	< 1
	DH3	2.82	0.002	3.26	0.002	< 1
	DH5	2.82	0.002	3.23	0.002	< 1
2441	DH1	3.48	0.002	3.89	0.002	< 1
	DH3	3.48	0.002	3.85	0.002	< 1
	DH5	3.47	0.002	3.90	0.002	< 1
2480	DH1	3.46	0.002	3.86	0.002	< 1
	DH3	3.46	0.002	3.82	0.002	< 1
	DH5	3.45	0.002	3.85	0.002	< 1

Product	Bluetooth Headset					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 2: π/4-DQPSK Mode					
Date of Test	04/27/2010			Test Site	TE06	
Frequency (MHz)	Packet Type	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
2402	DH1	0.98	0.001	2.56	0.002	< 1
	DH3	0.97	0.001	2.75	0.002	< 1
	DH5	0.96	0.001	2.67	0.002	< 1
2441	DH1	1.57	0.001	3.18	0.002	< 1
	DH3	1.55	0.001	3.32	0.002	< 1
	DH5	1.56	0.001	3.29	0.002	< 1
2480	DH1	1.32	0.001	2.96	0.002	< 1
	DH3	1.31	0.001	3.12	0.002	< 1
	DH5	1.71	0.001	3.12	0.002	< 1

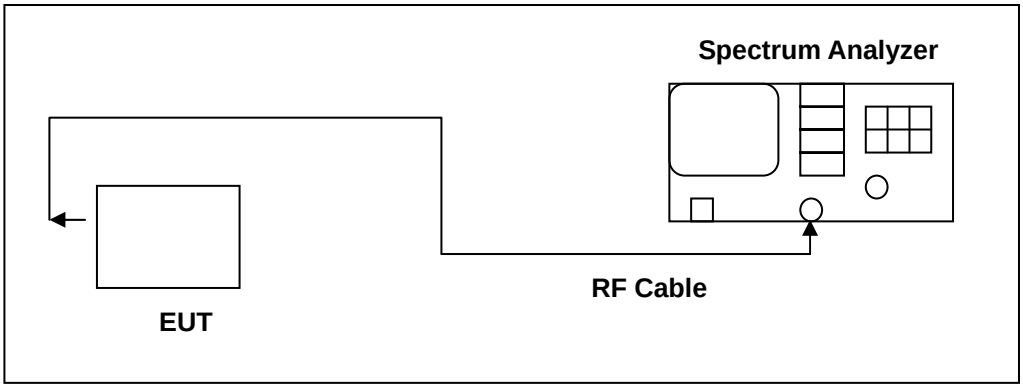
Product	Bluetooth Headset					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: 8DPSK Mode					
Date of Test	04/27/2010			Test Site	TE06	
Frequency (MHz)	Packet Type	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
2402	DH1	0.97	0.001	2.68	0.002	< 1
	DH3	0.79	0.001	2.81	0.002	< 1
	DH5	0.56	0.001	2.79	0.002	< 1
2441	DH1	1.57	0.001	3.32	0.002	< 1
	DH3	1.34	0.001	3.41	0.002	< 1
	DH5	1.12	0.001	3.38	0.002	< 1
2480	DH1	1.32	0.001	3.19	0.002	< 1
	DH3	1.10	0.001	3.20	0.002	< 1
	DH5	0.85	0.001	3.24	0.002	< 1

7 Minimum 20dB RF Bandwidth Measurement

7.1. Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hop-ping channel is < 1 MHz.

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

7.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW ≥ 1% of the 20dB span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

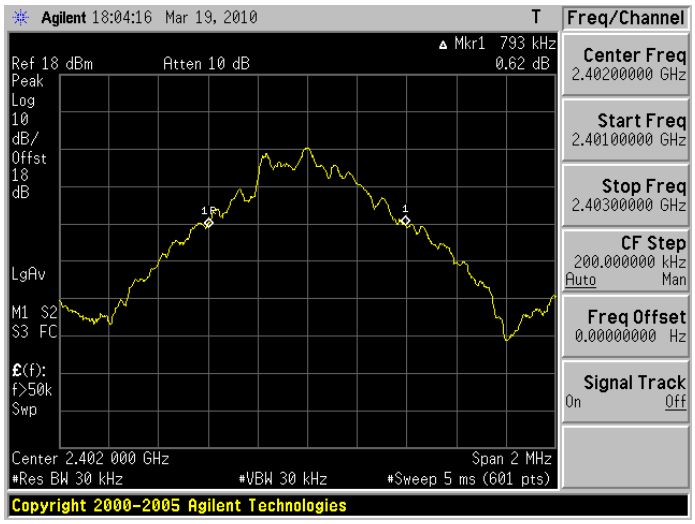
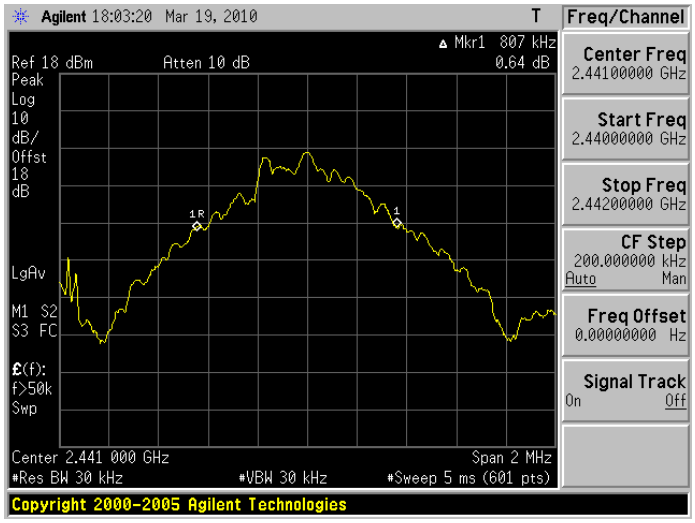
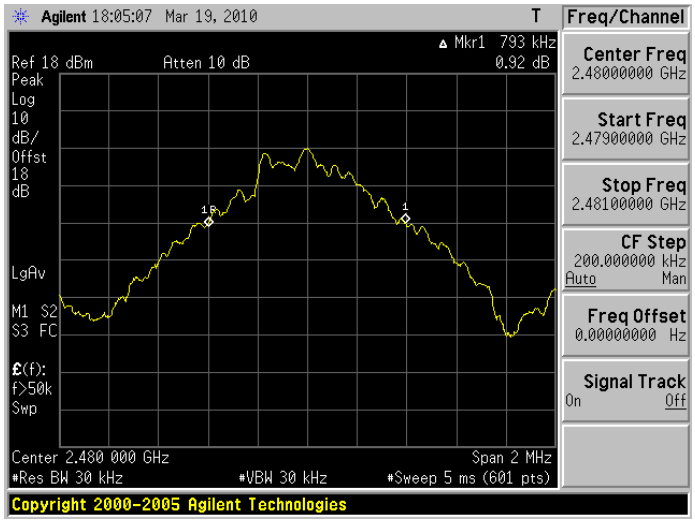
The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

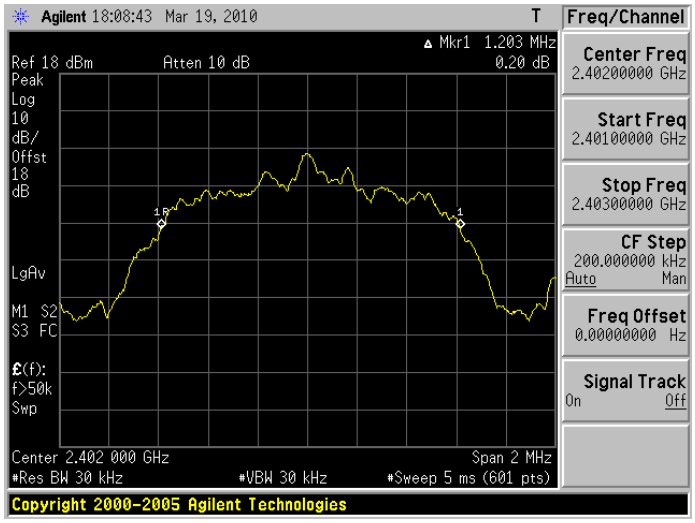
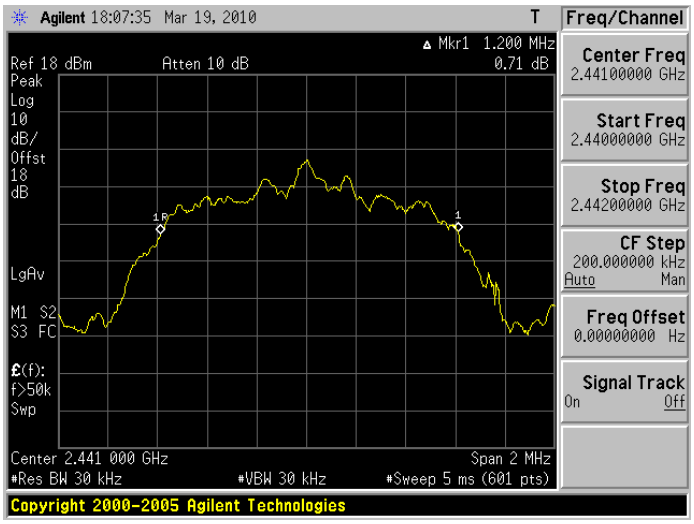
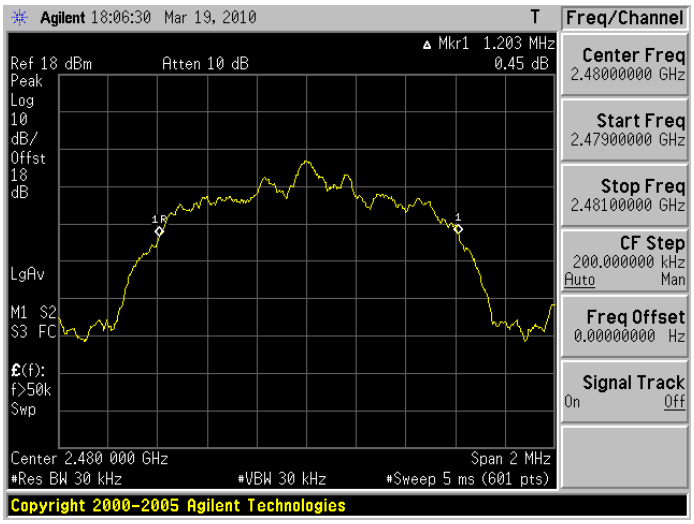
7.5. Test Result

Product	Bluetooth Headset		
Test Item	Minimum 20dB RF Bandwidth		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	03/19/2010	Test Site	TE06
Frequency (MHz)	Measurement (MHz)		Limit (MHz)
2402	0.793		< 1
2441	0.807		< 1
2480	0.793		< 1

Product	Bluetooth Headset		
Test Item	Minimum 20dB RF Bandwidth		
Test Mode	Mode 3: 8DPSK Mode		
Date of Test	03/19/2010	Test Site	TE06
Frequency (MHz)	20dB Bandwidth (MHz)	2/3 20dB Bandwidth (MHz)	Limit (MHz)
2402	1.203	0.802	< 1
2441	1.200	0.800	< 1
2480	1.203	0.802	< 1

7.6. Test Graphs

Mode 1: GFSK Link Mode	
2402	
2441	
2480	

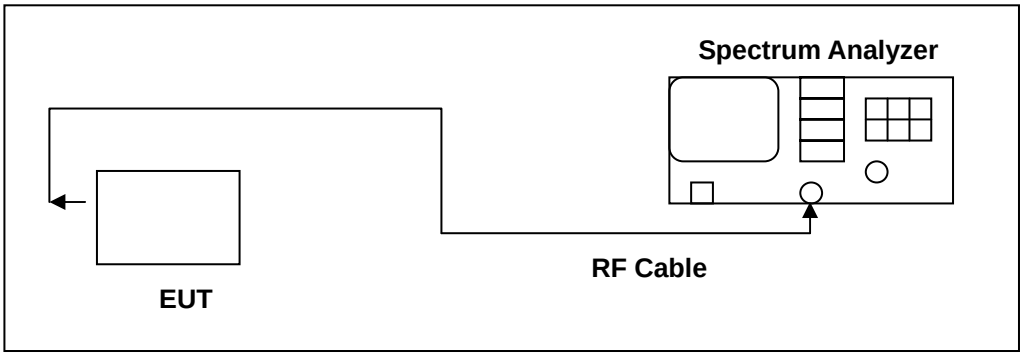
Mode3: 8DPSK Link Mode	
2402	
2441	
2480	

8 Carrier Frequency Separation Measurement

8.1. Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band shall use at least 75 hopping frequencies. The Carrier Frequency Separation is 1 MHz.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

8.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth transmitter of the V6 had its hopping function enabled. The following spectrum analyzer settings were used:

1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
3. Video (or Average) Bandwidth (VBW) ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

8.5. Test Result

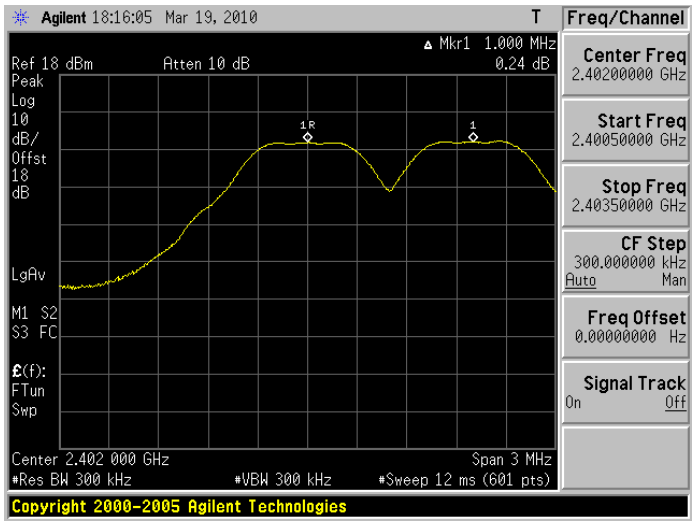
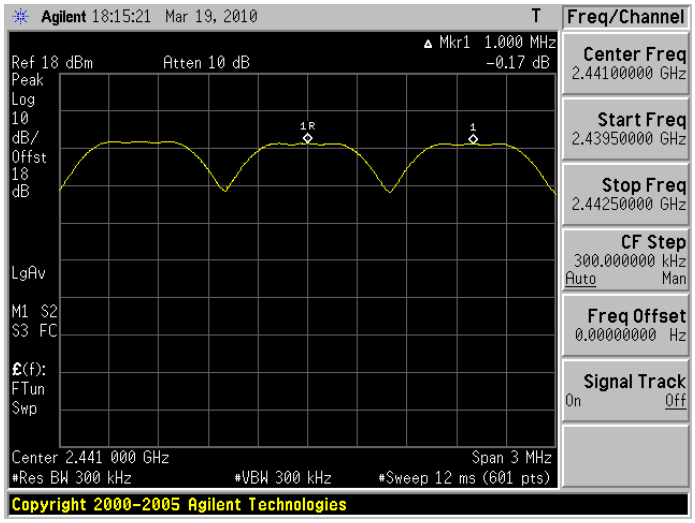
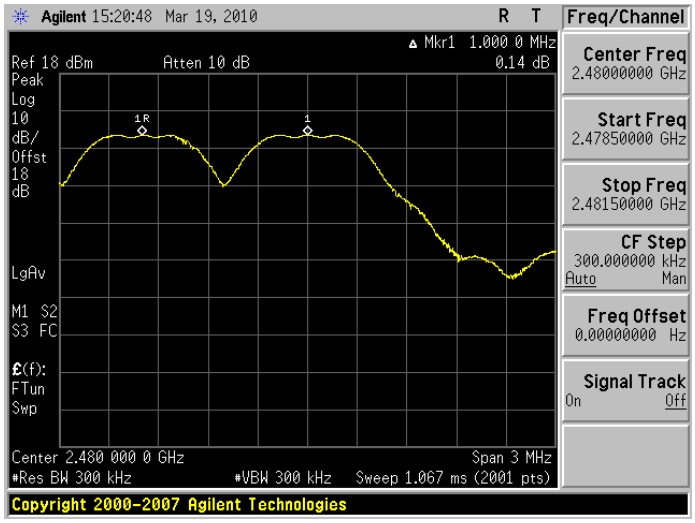
Product	Bluetooth Headset		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	03/19/2010	Test Site	TE06

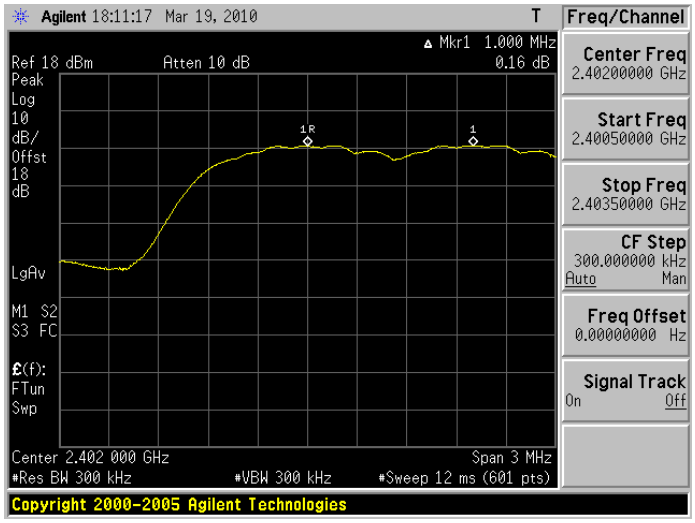
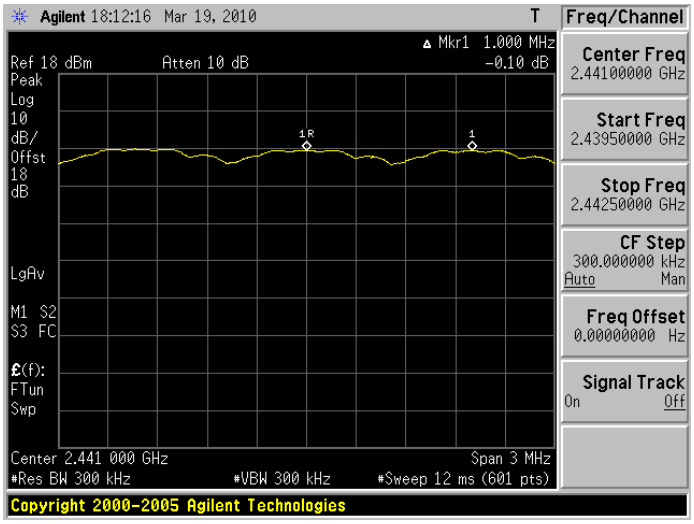
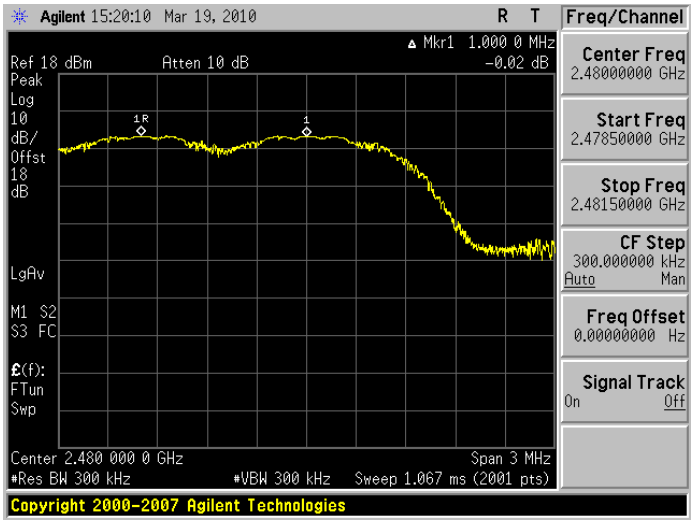
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2402	1	1
2441	1	1
2480	1	1

Product	Bluetooth Headset		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: 8DPSK Mode		
Date of Test	03/19/2010	Test Site	TE06

Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2402	1	1
2441	1	1
2480	1	1

8.6. Test Graphs

Mode 1: GFSK Link Mode	
2402	
2441	
2480	

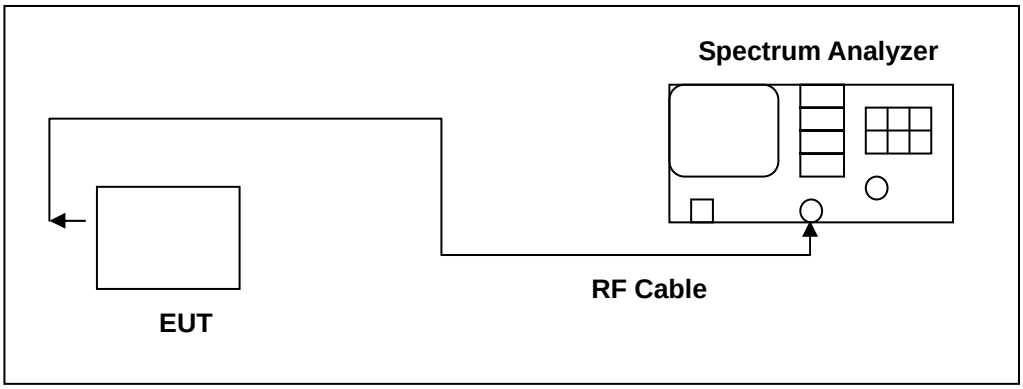
Mode3: 8DPSK Link Mode	
2402	
2441	
2480	

9 Number of Hopping Measurement

9.1. Limit

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

9.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = the frequency band of operation
2. RBW ≥ 1% of the span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

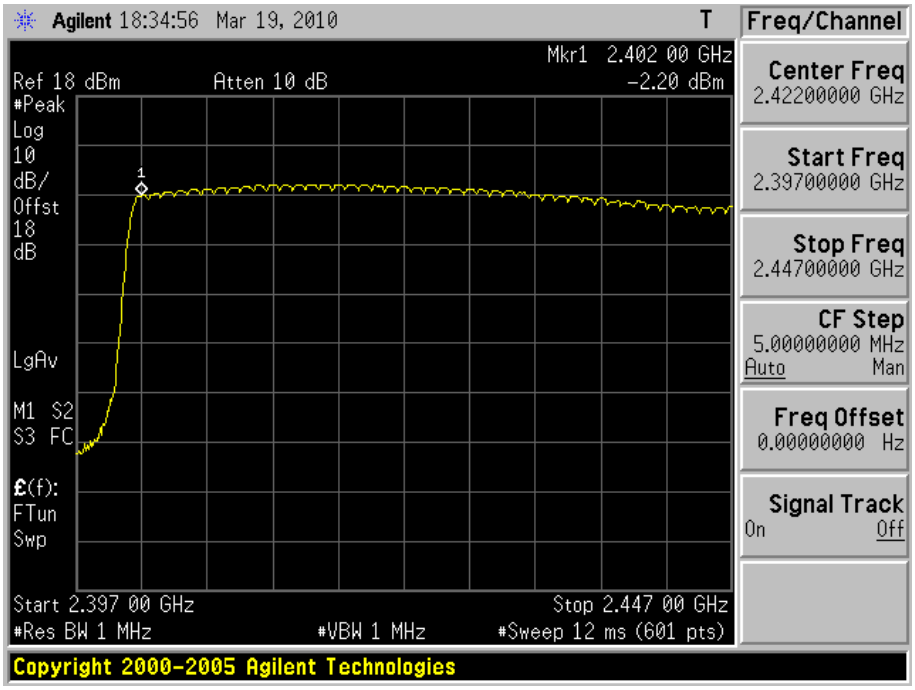
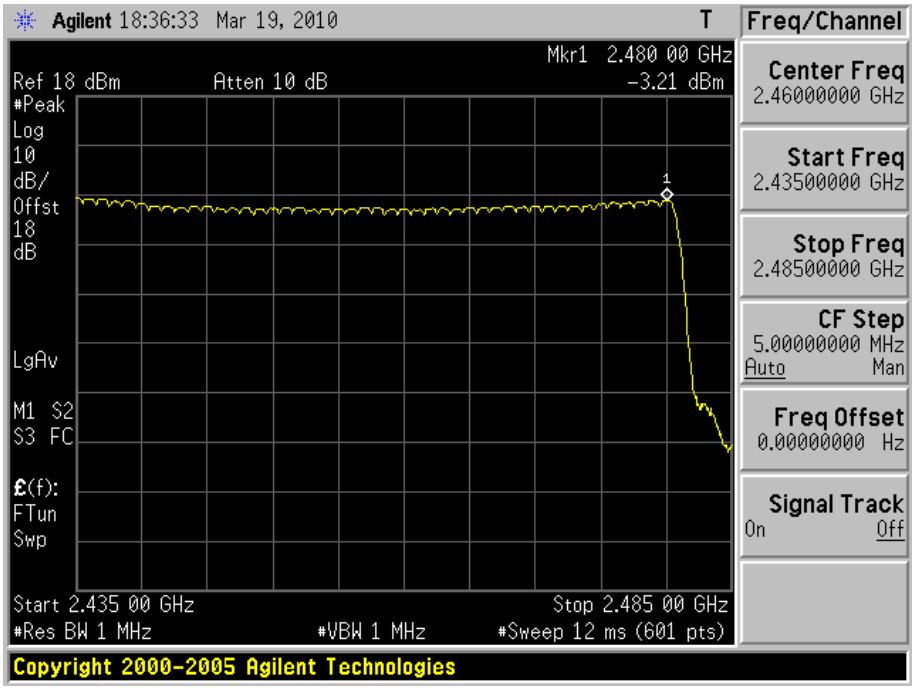
The trace was allowed to stabilize.

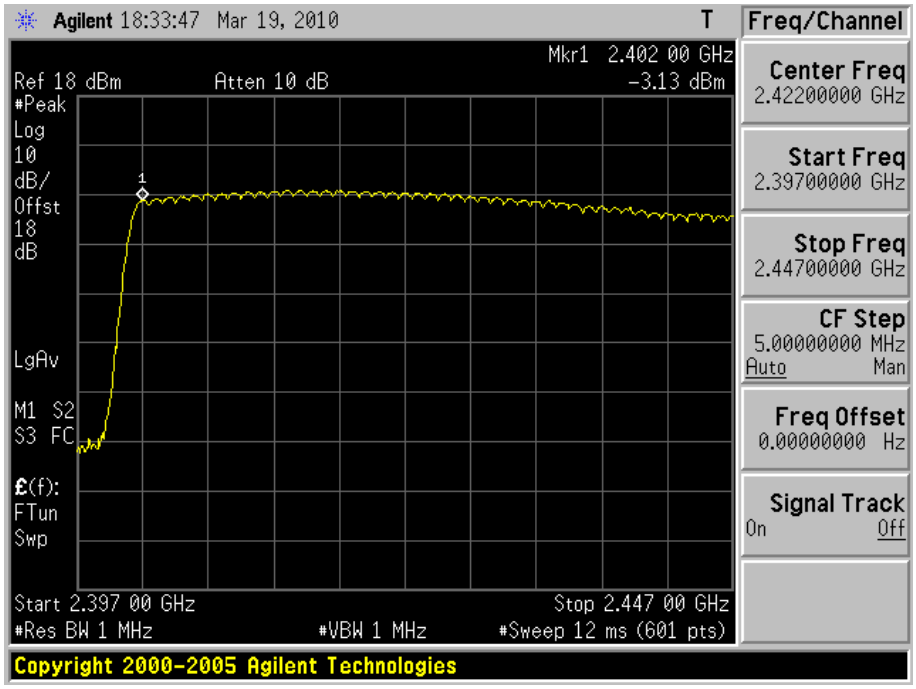
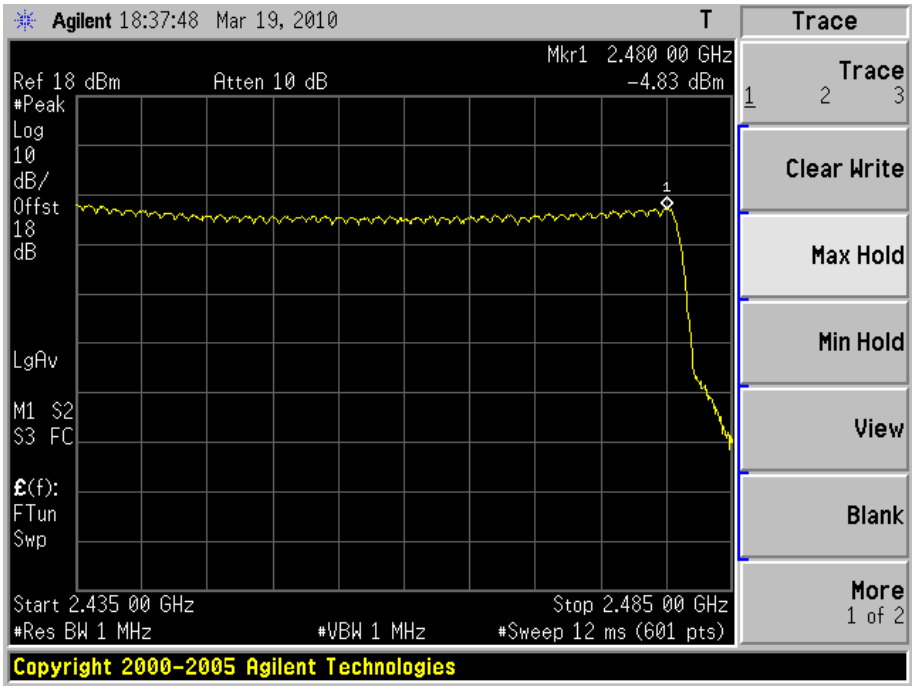
9.5. Test Result

Product	Bluetooth Headset		
Test Item	Number of Hopping		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	03/19/2010	Test Site	TE06
Frequency Range (MHz)	Measurement (ch)	Limit (ch)	
2402 – 2480	79	> 15	

Product	Bluetooth Headset		
Test Item	Number of Hopping		
Test Mode	Mode 3: 8DPSK Mode		
Date of Test	03/19/2010	Test Site	TE06
Frequency Range (MHz)	Measurement (ch)	Limit (ch)	
2402 - 2480	79	> 15	

9.6. Test Graphs

Mode 1: GFSK Link Mode	
CH0~CH39	
CH40~CH78	

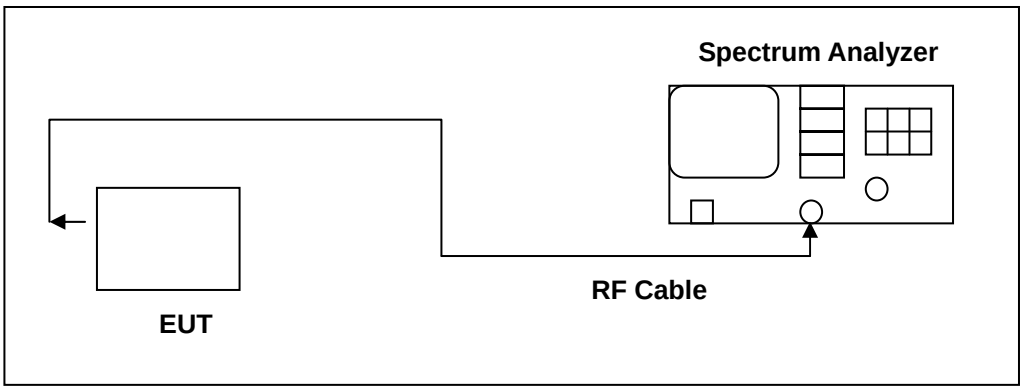
Mode 3: 8DPSK Link Mode	
CH0~CH39	
CH40~CH78	

10 Time of Occupancy (Dwell Time) Measurement

10.1. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

10.2. Test Setup



10.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

10.4. Test Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW ≥ RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

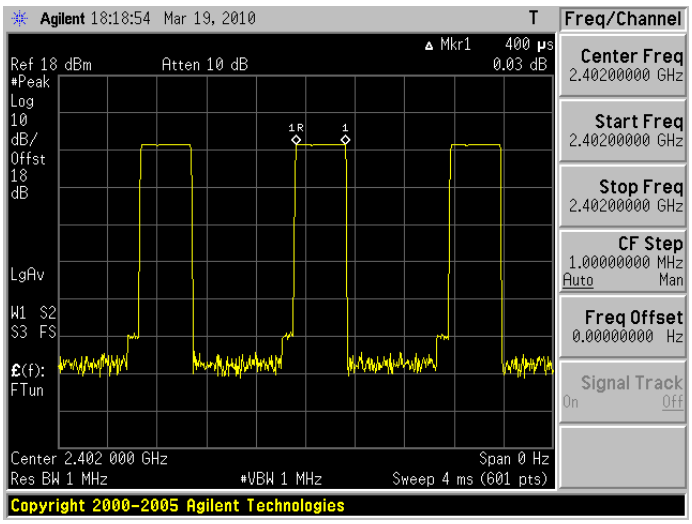
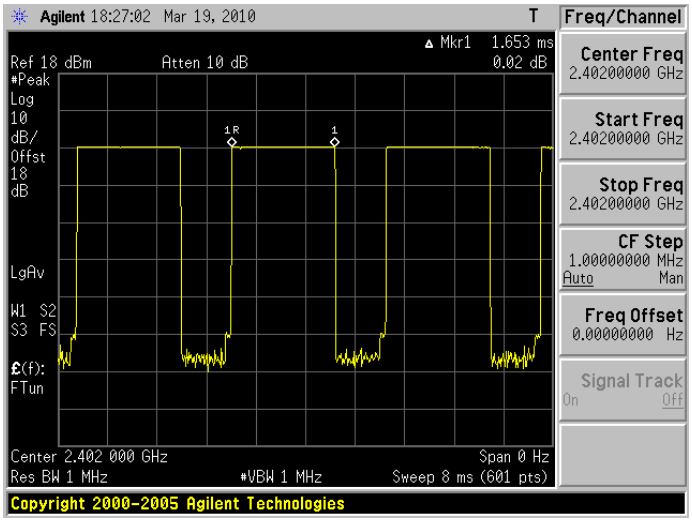
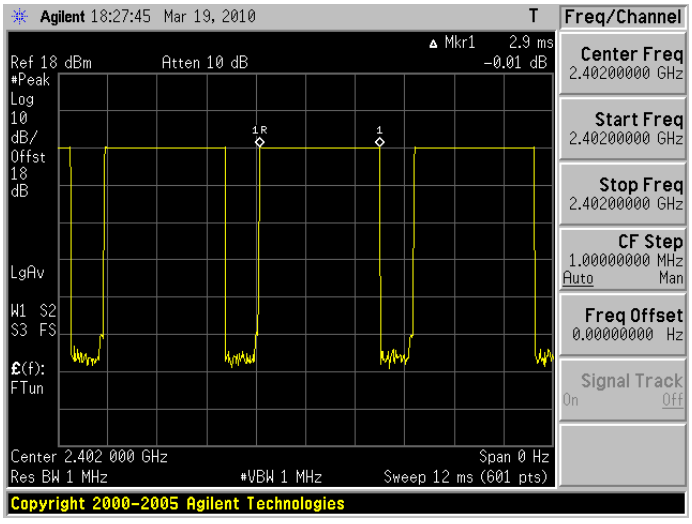
The marker-delta function was used to determine the dwell time.

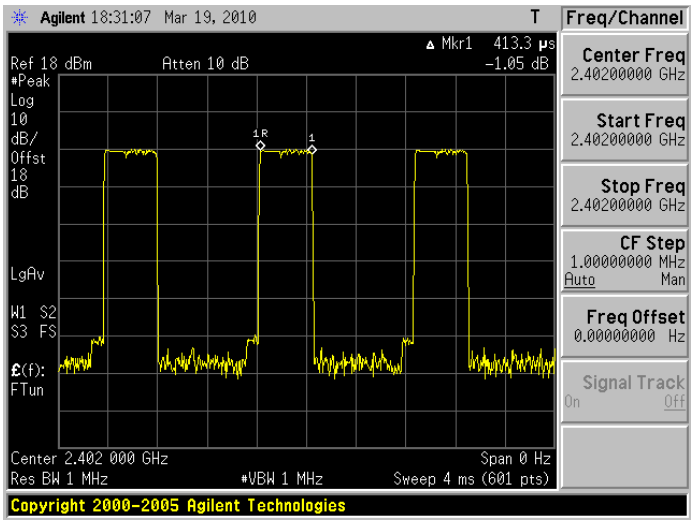
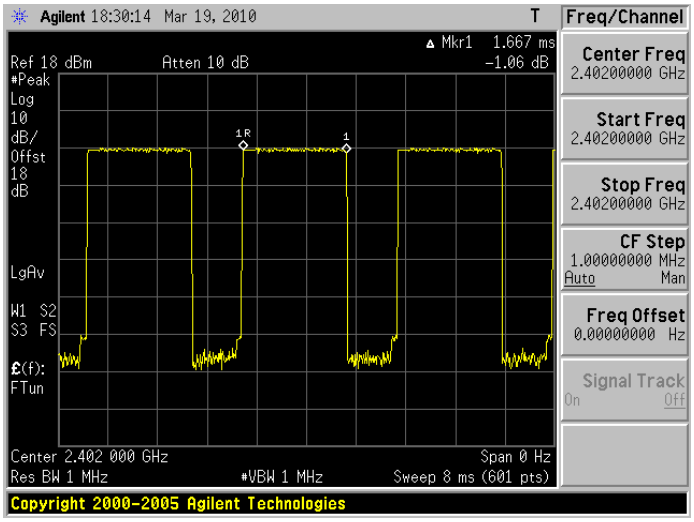
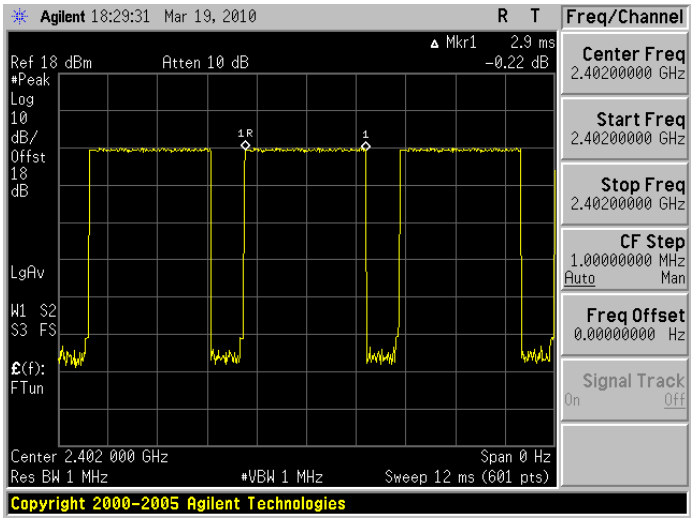
10.5. Test Result

Product	Bluetooth Headset		
Test Item	Time of Occupancy (Dwell Time)		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	03/19/2010	Test Site	TE06
DH1			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	800/79CH = 10.13(times/sec)		
Each Channel Dwell Times (1)	0.400 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 10.13 = 320.108(times)		
Dwell Times on Cycle (1) * (2)	128.0432 ms (sec)		
LIMIT(msec)	< = 400		
DH3			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	400/79CH = 5.1(times/sec)		
Each Channel Dwell Times (1)	1.653 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 5.1 = 161.16(times)		
Dwell Times on Cycle (1) * (2)	266.39748 ms (sec)		
LIMIT(msec)	< = 400		
DH5			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	266.7/79CH = 3.37(times/sec)		
Each Channel Dwell Times (1)	2.900 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 3.37 = 106.492(times)		
Dwell Times on Cycle (1) * (2)	308.8268 ms (sec)		
LIMIT(msec)	< = 400		

Product	Bluetooth Headset		
Test Item	Time of Occupancy (Dwell Time)		
Test Mode	Mode 3: 8DPSK Mode		
Date of Test	03/19/2010	Test Site	TE06
DH1			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	800/79CH = 10.13(times/sec)		
Each Channel Dwell Times (1)	0.4133 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 10.13 = 320.108(times)		
Dwell Times on Cycle (1) * (2)	132.3006 ms (sec)		
LIMIT(msec)	< = 400		
DH3			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	400/79CH = 5.1(times/sec)		
Each Channel Dwell Times (1)	1.667 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 5.1 = 161.16(times)		
Dwell Times on Cycle (1) * (2)	268.6537 ms (sec)		
LIMIT(msec)	< = 400		
DH5			
Cycle Calculate	79CH * 0.4 = 31.6 (sec)		
The EUT Hopping Number per Sec	1600 times/sec		
Each Channel Dwell Times per Sec	266.7/79CH = 3.37(times/sec)		
Each Channel Dwell Times (1)	2.900 ms (sec)		
Each Channel Dwell Times on Cycle(2)	31.6 * 3.37 = 106.492(times)		
Dwell Times on Cycle (1) * (2)	308.8268 ms (sec)		
LIMIT(msec)	< = 400		

10.6. Test Graphs

Mode 1: GFSK Link Mode	
DH1	
DH3	
DH5	

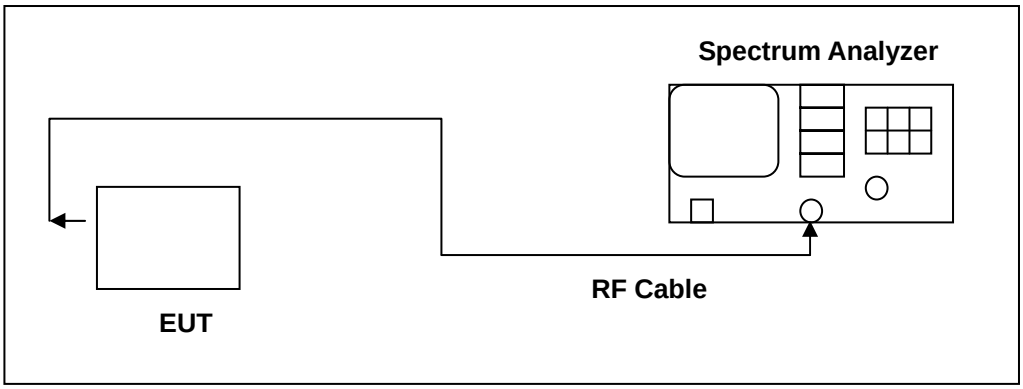
Mode3: 8DPSK Link Mode	
3DH1	
3DH3	
3DH5	

11 Out of Band Conducted Emissions Measurement

11.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

11.2. Test Setup



11.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

11.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 39, 78)

11.5. Test Result

Product	Bluetooth Headset		
Test Item	Out of Band Conducted		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	03/20/2010	Test Site	TE06

Frequency (MHz)	Fundamental (dBμV)	Limit (dBμV)	Measurement (dBμV)
2402	104.69	84.69	78.41
2441	102.73	82.73	78.30
2480	102.33	82.33	78.47

Product	Bluetooth Headset		
Test Item	Out of Band Conducted		
Test Mode	Mode 3: 8DPSK Mode		
Date of Test	03/20/2010	Test Site	TE06

Frequency (MHz)	Fundamental (dBμV)	Limit (dBμV)	Measurement (dBμV)
2402	105.39	85.39	78.48
2441	104.61	84.61	77.73
2480	100.99	80.99	77.93

11.6. Test Graphs

Site: : RF Conducted
Limit:
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2402MHz

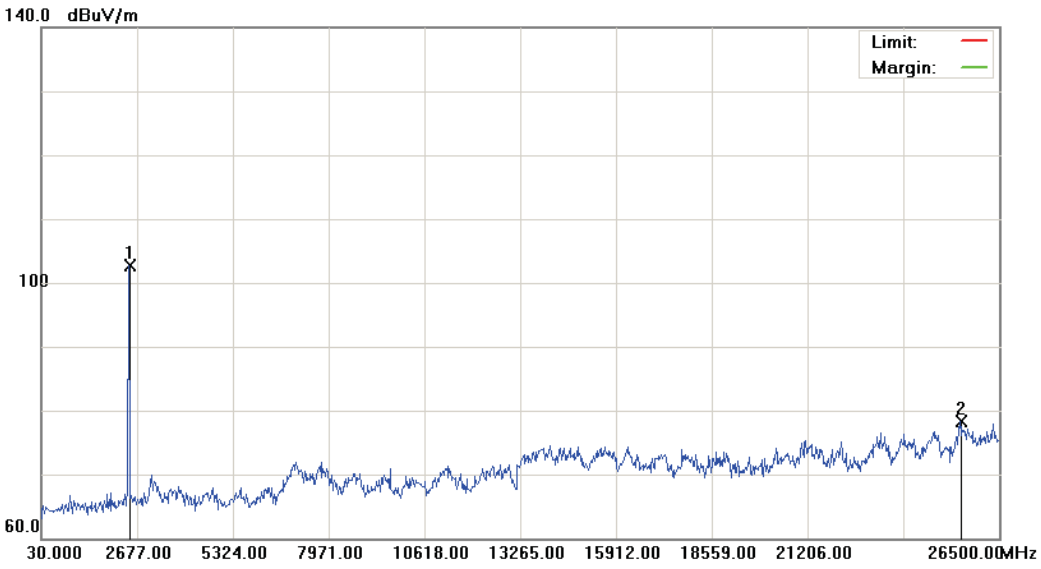
Polarization:
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 100 KHz VBW: 100 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2402.000	104.69	0.00	104.69			peak			TX
2		24819.155	78.41	0.00	78.41			peak			

*:Maximum data x:Over limit !:over margin

File :XP4(20db) Data :#2 Date: 2010/3/20 Time: 下午 04:01:52



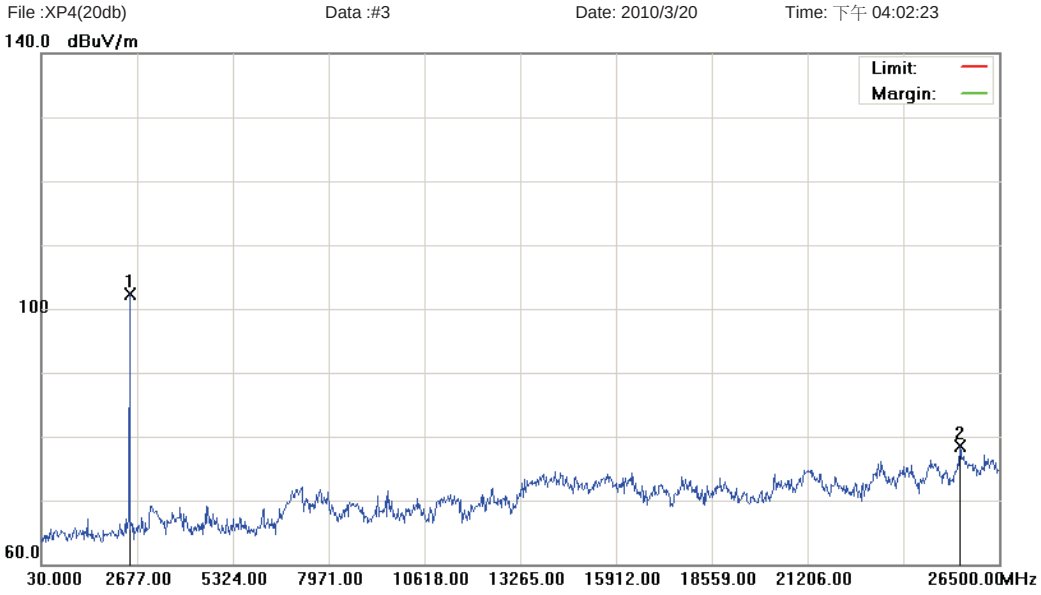
Site: : RF Conducted
Limit:
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2441MHz

Polarization:
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 100 KHz VBW: 100 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2441.000	102.73	0.00	102.73			peak			TX
2		25427.965	78.30	0.00	78.30			peak			

*:Maximum data x:Over limit !:over margin



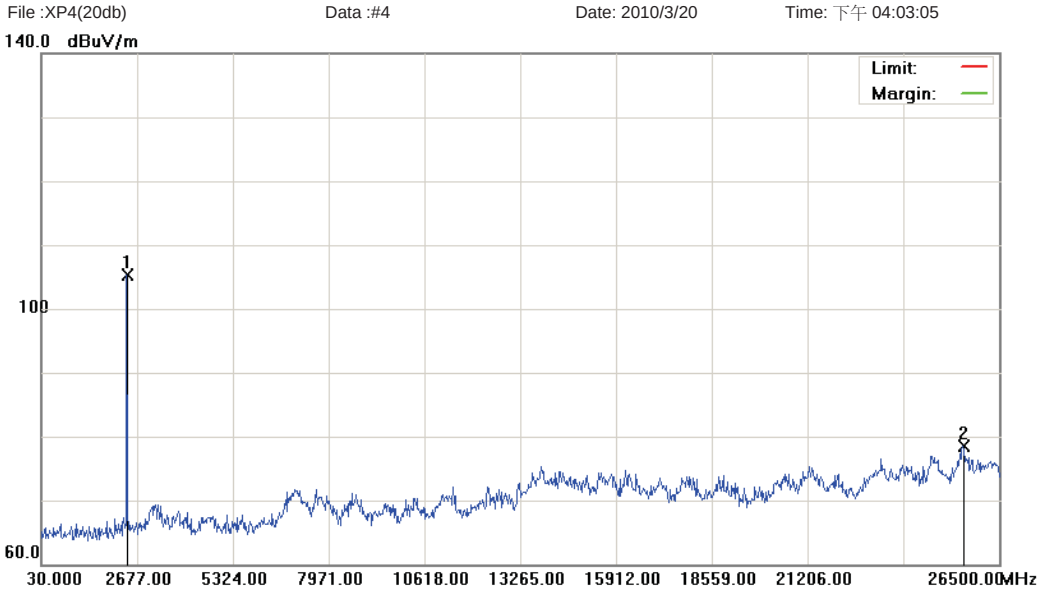
Site: : RF Conducted
Limit:
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2480MHz

Polarization:
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 100 KHz VBW: 100 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2480.000	102.33	0.00	102.33			peak			TX
2		25414.730	78.47	0.00	78.47			peak			

*:Maximum data x:Over limit !:over margin



Site: : RF Conducted
Limit:
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 3
Note: 2402MHz

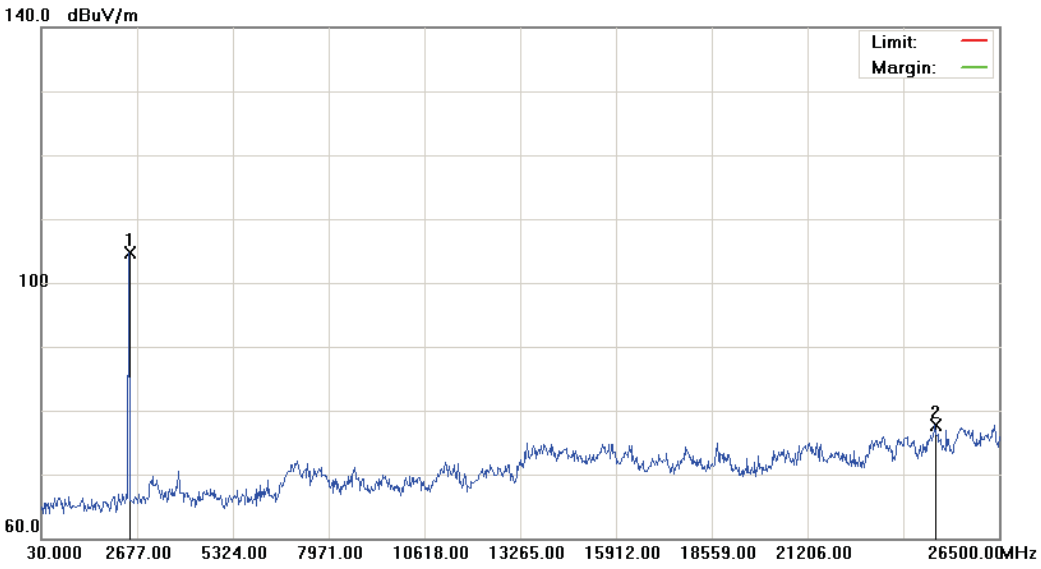
Polarization:
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 100 KHz VBW: 100 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2402.000	105.39	0.00	105.39			peak			TX
2		25507.375	78.48	0.00	78.48			peak			

*:Maximum data x:Over limit !:over margin

File :XP4(20db) Data :#5 Date: 2010/3/20 Time: 下午 04:03:38



Site: : RF Conducted
Limit:
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 3
Note: 2441MHz

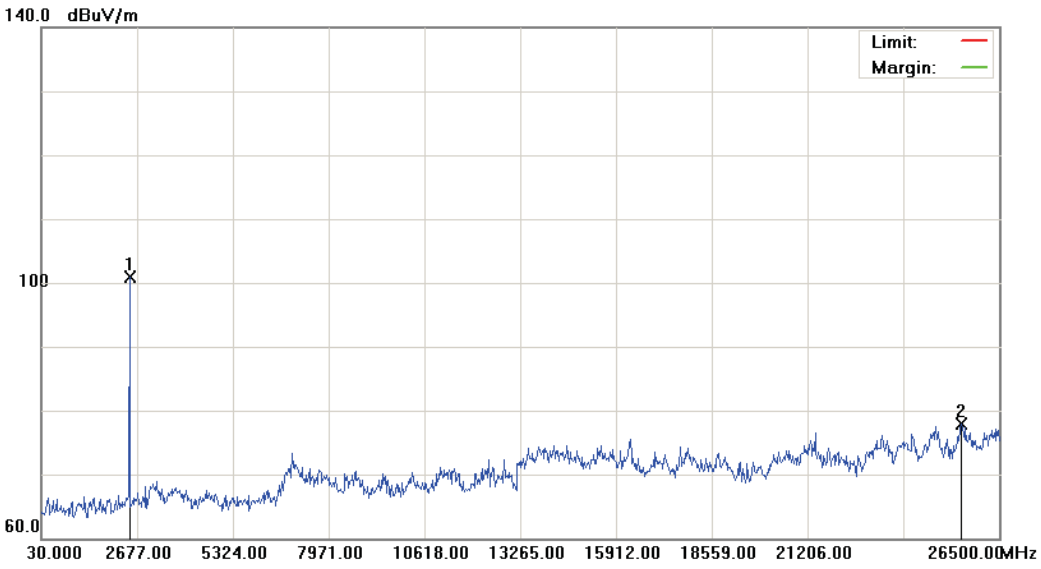
Polarization:
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 100 KHz VBW: 100 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2441.000	104.61	0.00	104.61			peak			TX
2		24739.745	77.73	0.00	77.73			peak			

*:Maximum data x:Over limit !:over margin

File :XP4(20db) Data :#6 Date: 2010/3/20 Time: 下午 04:04:10



Site: : RF Conducted
Limit:
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 3
Note: 2480MHz

Polarization:
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 100 KHz VBW: 100 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2480.000	100.99	0.00	100.99			peak			TX
2		25454.435	77.93	0.00	77.93			peak			

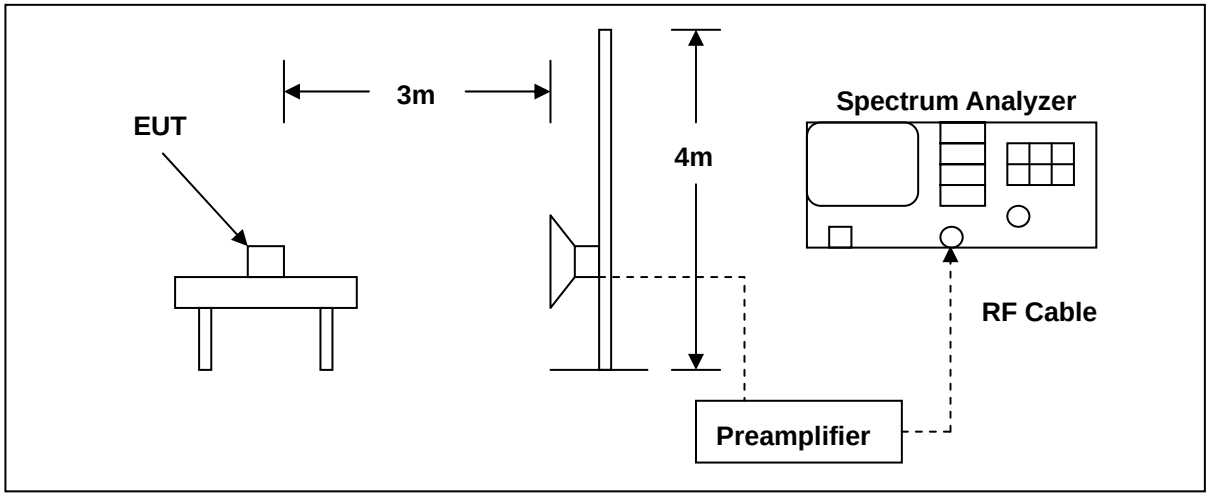
*:Maximum data x:Over limit !:over margin

12 Band Edges Measurement

12.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

12.2. Test Setup



12.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	06/23/2009	(2)
Pre Amplifier	Agilent	8449B	3008A02237	07/01/2009	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	9120D	9120D-550	07/01/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

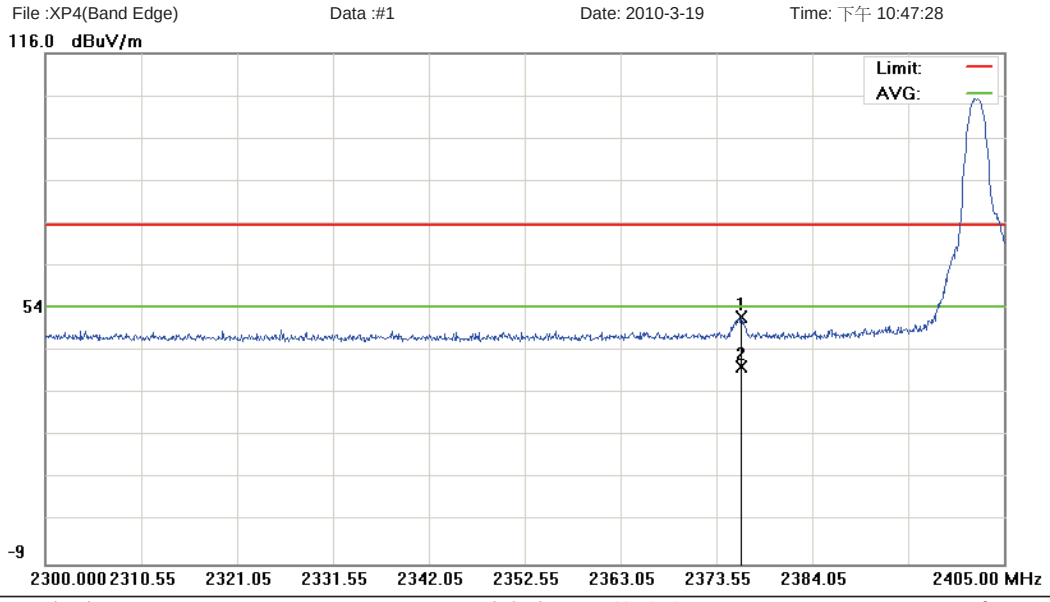
12.4. Test Procedure

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest ch annel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

12.5. Test Graphs

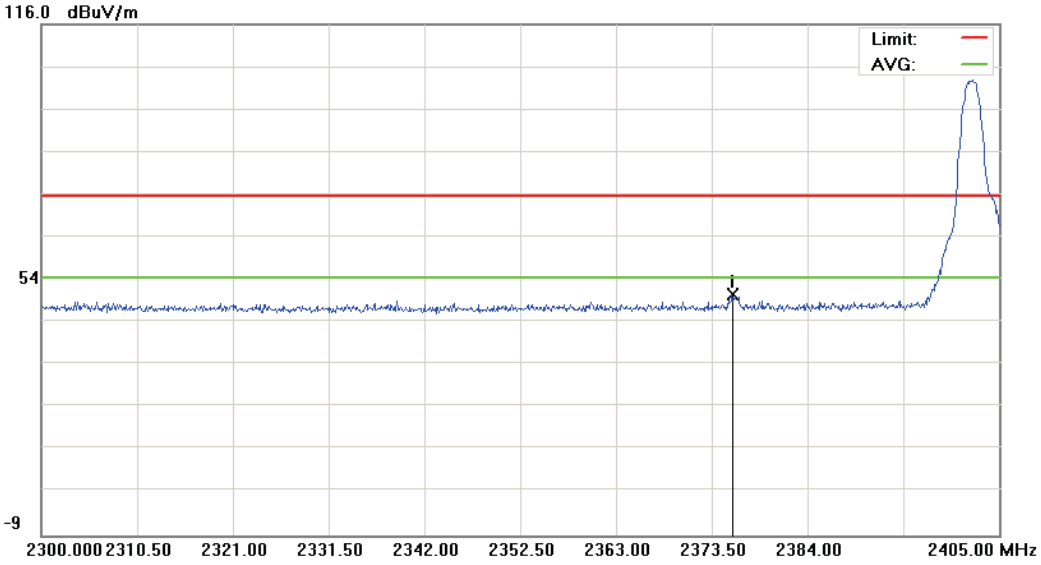


Site: : 966 Chamber	Polarization: *Vertical*	Temperature: 22 ℃
Limit: FCC part 15 (PK)	Power:	Humidity: 60 %
EUT: Bluetooth Headset	Distance: 3m	RBW: 1000 KHz VBW: 1000 KHz
M/N: Sound ID 510		
Mode: 1		
Note: 2402MHZ		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2376.230	51.45	0.17	51.62	74.00	-22.38	peak			
2	*	2376.230	39.13	0.17	39.30	54.00	-14.70	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge) Data :#5 Date: 2010-3-19 Time: 下午 10:50:18

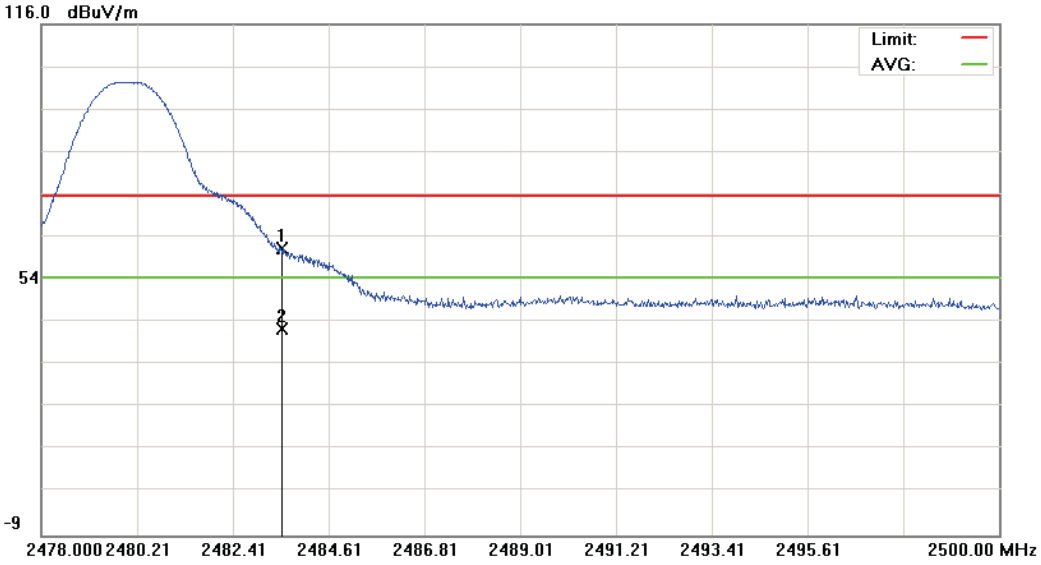


Site: : 966 Chamber	Polarization: *Horizontal*	Temperature: 22 ℃
Limit: FCC part 15 (PK)	Power:	Humidity: 60 %
EUT: Bluetooth Headset	Distance: 3m	RBW: 1000 KHz VBW: 1000 KHz
M/N: Sound ID 510		
Mode: 1		
Note: 2402MHZ		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2375.758	49.64	0.17	49.81	74.00	-24.19	peak			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge) Data :#3 Date: 2010-3-19 Time: 下午 10:52:37



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2480MHZ

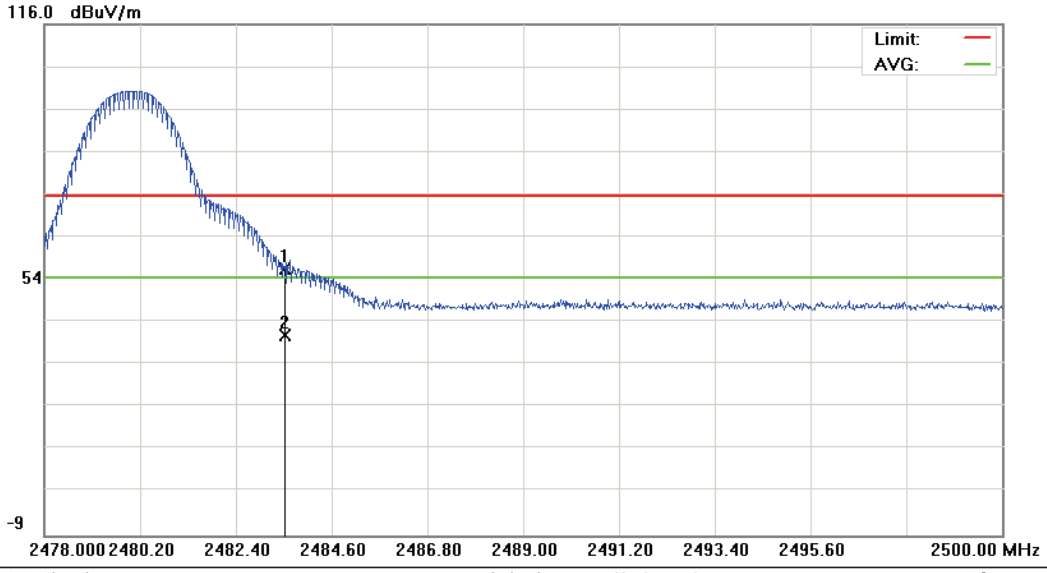
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.510	60.80	0.25	61.05	74.00	-12.95	peak			
2	*	2483.510	41.07	0.25	41.32	54.00	-12.68	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge) Data :#7 Date: 2010-3-19 Time: 下午 10:55:29



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 1
Note: 2480MHZ

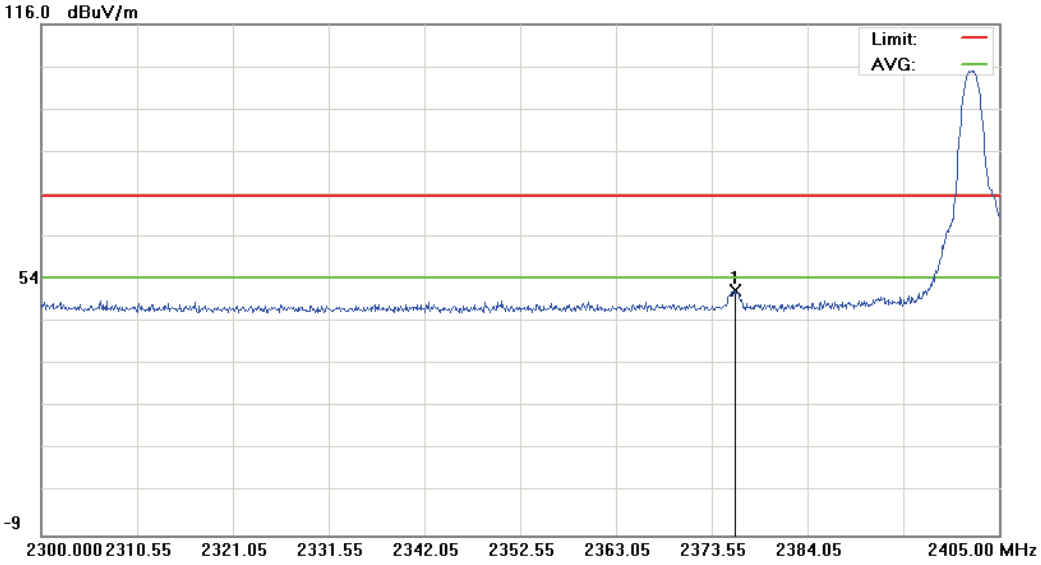
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.510	55.98	0.25	56.23	74.00	-17.77	peak			
2	*	2483.510	39.59	0.25	39.84	54.00	-14.16	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge+EDR) Data :#1 Date: 2010-3-20 Time: 上午 12:32:11

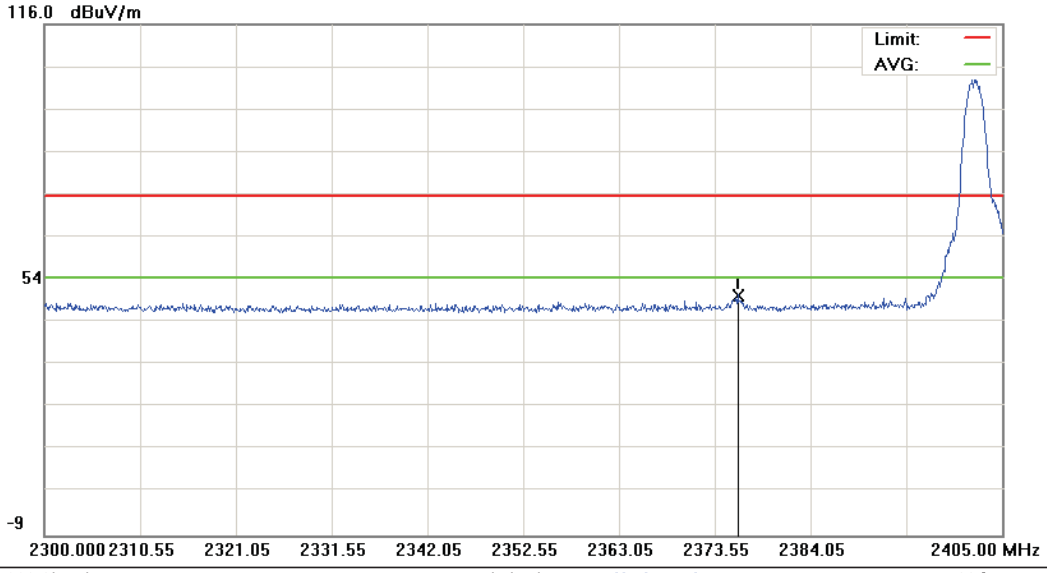


Site: : 966 Chamber	Polarization: *Vertical*	Temperature: 22 ℃
Limit: FCC part 15 (PK)	Power:	Humidity: 60 %
EUT: Bluetooth Headset	Distance: 3m	RBW: 1000 KHz VBW: 1000 KHz
M/N: Sound ID 510		
Mode: 3		
Note: 2402MHZ		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2376.020	50.78	0.17	50.95	74.00	-23.05	peak			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge+EDR) Data :#5 Date: 2010-3-20 Time: 上午 12:33:52

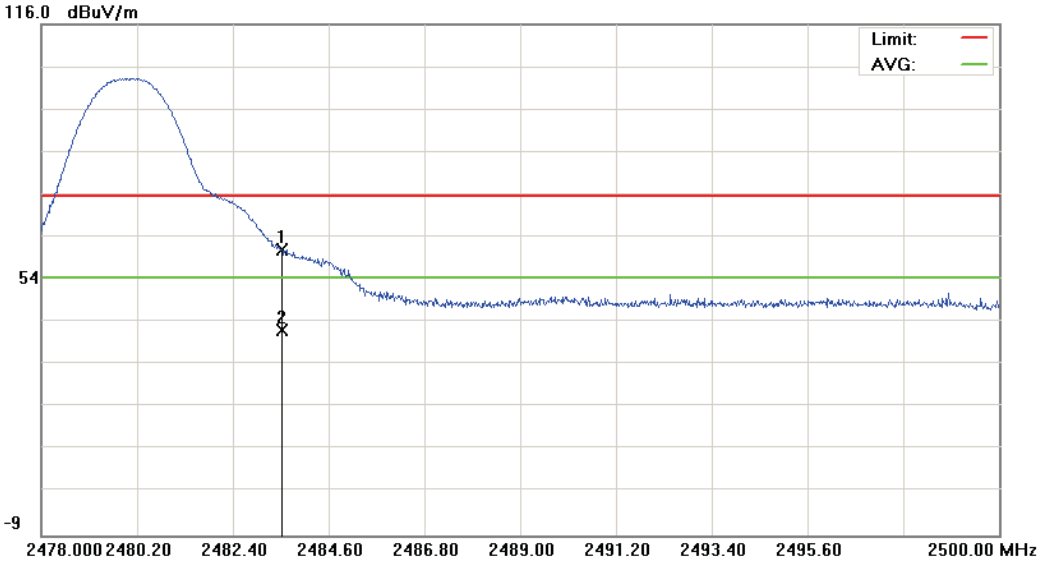


Site: : 966 Chamber	Polarization: *Horizontal*	Temperature: 22 ℃
Limit: FCC part 15 (PK)	Power:	Humidity: 60 %
EUT: Bluetooth Headset	Distance: 3m	RBW: 1000 KHz VBW: 1000 KHz
M/N: Sound ID 510		
Mode: 3		
Note: 2402MHZ		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2376.020	49.58	0.17	49.75	74.00	-24.25	peak			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge+EDR) Data :#3 Date: 2010-3-20 Time: 上午 12:36:23



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 3
Note: 2480MHZ

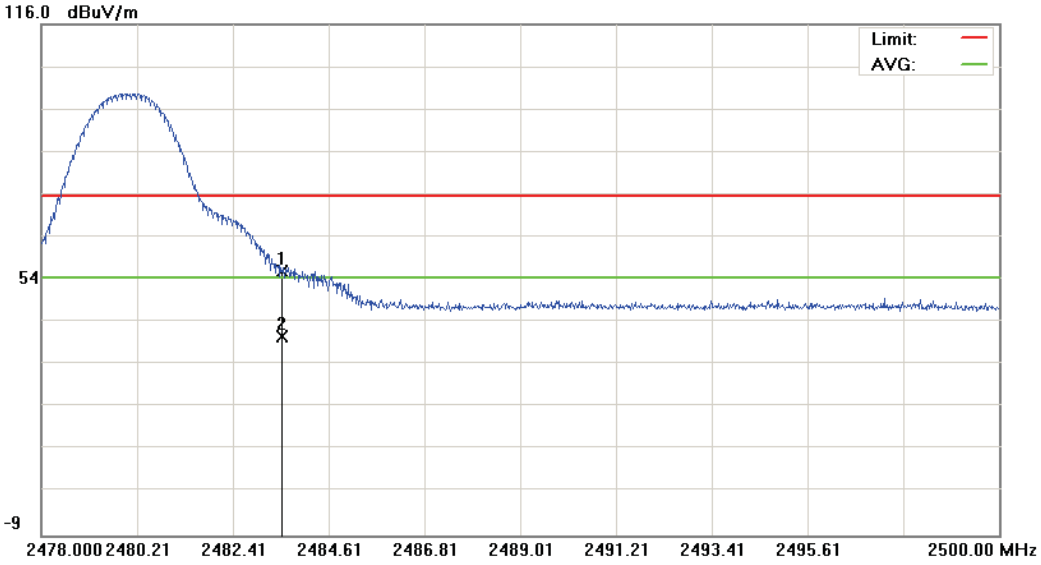
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.510	60.45	0.25	60.70	74.00	-13.30	peak			
2	*	2483.510	40.79	0.25	41.04	54.00	-12.96	AVG			

*:Maximum data x:Over limit !:over margin

File :XP4(Band Edge+EDR) Data :#7 Date: 2010-3-20 Time: 上午 12:39:15



Site: : 966 Chamber
Limit: FCC part 15 (PK)
EUT: Bluetooth Headset
M/N: Sound ID 510
Mode: 3
Note: 2480MHZ

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %
RBW: 1000 KHz VBW: 1000 KHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.510	55.43	0.25	55.68	74.00	-18.32	peak			
2	*	2483.510	39.34	0.25	39.59	54.00	-14.41	AVG			

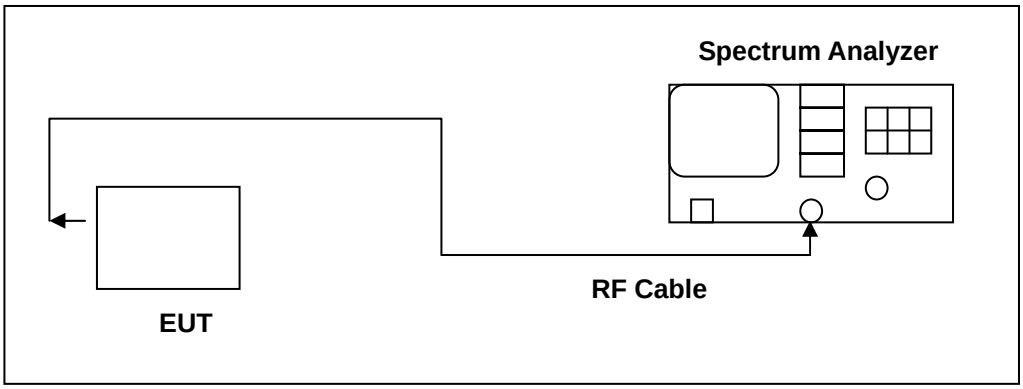
*:Maximum data x:Over limit !:over margin

13 99 % Occupied Bandwidth Measurement

13.1. Limit

N/A

13.2. Test Setup



13.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/14/2009	(2)
Test Site	ATL	TE06	TE06	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

13.4. Test Procedure

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

13.5. Test Result

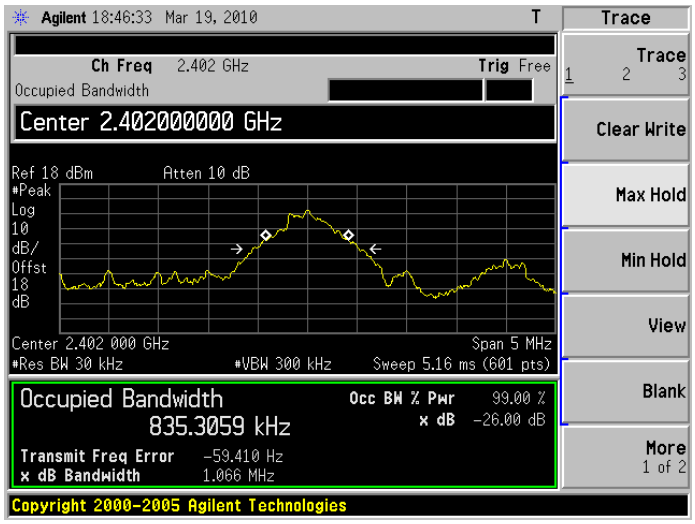
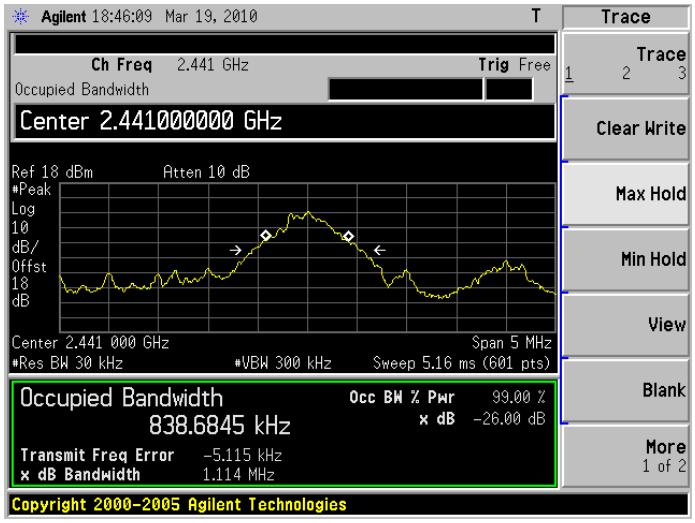
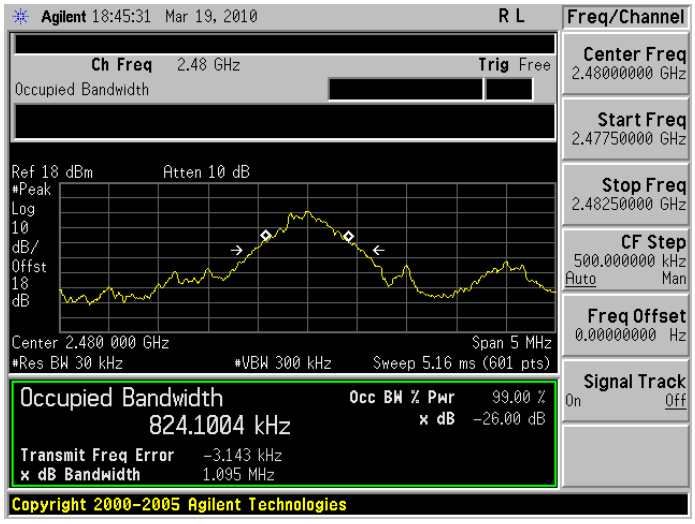
Product	Smartphone		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 1: GFSK Link Mode		
Date of Test	03/19/2010	Test Site	TE06

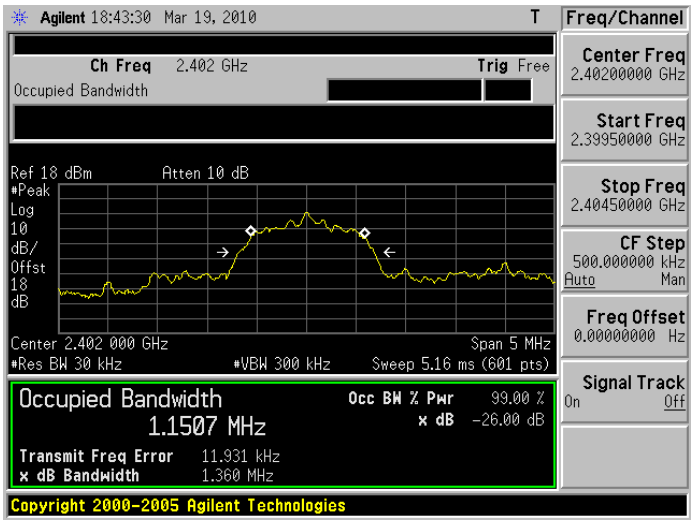
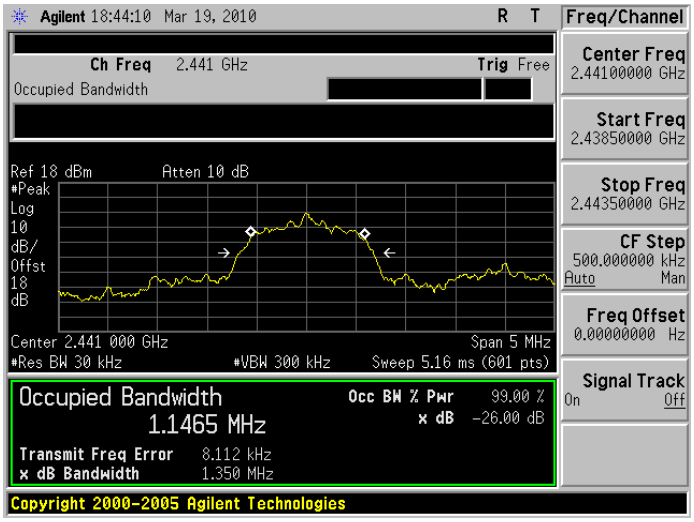
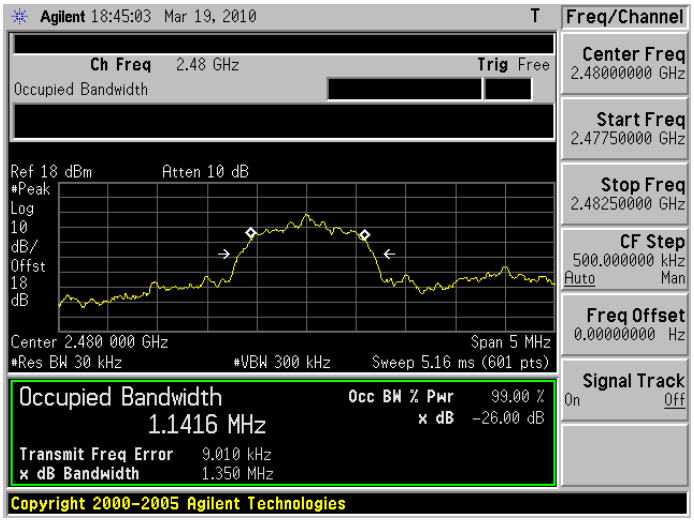
Frequency (MHz)	Measurement (kHz)	Limit (MHz)
2402	835.3059	-----
2441	838.6845	-----
2480	824.1004	-----

Product	Smartphone		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: 8DPSK Mode		
Date of Test	03/19/2010	Test Site	TE06

Frequency (MHz)	Measurement (MHz)	Limit (MHz)
2402	1.1507	-----
2441	1.1465	-----
2480	1.1416	-----

13.6. Test Graphs

Mode 1: GFSK Link Mode	
2402	
2441	
2480	

Mode3: 8DPSK Link Mode	
2402	
2441	
2480	

14 Antenna Measurement

14.1. Limit

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.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

14.2. Antenna Connector Construction

The antenna used in this product is **PCB antenna**. And the maximum Gain of this antenna is only **2.2772 dBi**.