



Test Report

Product Name : Bluetooth Handsfree Speaker

Model No. : BTHF 341

FCC ID : TQ6BTHF341

Applicant : Shanghai Flaircomm Technologies Inc

Address : No.5,Bibo Road,Keyuan Building,4F,Zhangjiang Hi-Tech
Park. Shanghai,201203 P.R.China

Date of Receipt : 2008/10/27

Issued Date : 2008/11/12

Report No. : 08BS026R-RF-US-P06V01

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

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Park. Shanghai,201203 P.R.China

Manufacturer : Shanghai Flaircomm Technologies Inc

Address : No. 5, Bibo Road, Keyuan Building 4F, Zhangjiang
Hi-Tech Park, Shanghai 201203 P.R. China

Model No. : BTHF 341

FCC ID : TQ6BTHF341

EUT Voltage : DC 3.7V

Trade Name : Flaircomm

Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2007
ANSI C63.4: 2003

Test Result : Complied

Performed Location : SuZhou EMC laboratory
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TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

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Laboratory Information

We , **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited by the following accreditation Bodies in compliance with ISO 17025, EN 45001 and Guide 25:

Taiwan R.O.C.	: BSMI, DGT, CNLA
Germany	: TUV Rheinland
Norway	: Nemko, DNV
USA	: FCC, NVLAP
Japan	: VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://tw.quietek.com/modules/myalbum/>
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1. General Information

1.1. EUT Description

Product Name	Bluetooth Handsfree Speaker
Trade Name	Flaircomm
Model No.	BTHF 341
FCC ID	TQ6BTHF341
Working Voltage	DC 3.7V
Frequency Range	2402 - 2480 MHz
Channel Number	79
Type of Modulation	FHSS
Data Rate	723 kbps
Channel Control	Auto
Antenna Type	Trace Antenna
Antenna Gain	Refer to the "Antenna List"

Component	
Car Charger	Manufacturer: Shanghai Flaircomm Technologies Inc M/N: TTX-GC-196C Input: 12~24VDC Output: 5.0VDC, 500mA Cable Out: Non-Shielded, 1.8m
USB Cable	Manufacturer: MORETHANALL(CHANGZHOU)ELECTRONICS CO.,LTD M/N: YK-C008-USB002

Bluetooth Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz	03	2405 MHz
04	2406 MHz	05	2407 MHz	06	2408 MHz	07	2409 MHz
08	2410 MHz	09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	N/A	N/A

Antenna List

Antenna	Manufacturer	Model No.	Peak Gain
Bluetooth Antenna	Flaircomm Technologies Inc	BTHF341	0.54dBi for 2.4GHz

1.2. Mode of Operation

QuieTek 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: Transmit

1.3. 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 No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.4. Configuration of Tested System

Connection Diagram	
EUT	
Signal Cable Type	Signal cable Description

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above
2	Connect the EUT to PC via a control board and a RS232 cable.
3	Execute the BlueTest program (CSR) on the PC.
4	Setup the test channel and the test mode press ok to start the Continue Transmit.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.209	Yes	No
20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)	Yes	No
Carrier Frequency Separation	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)	Yes	No
Number of Hopping Frequencies	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)(iii)	Yes	No
Time of Occupancy (Dwell Time)	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)(iii)	Yes	No
Peak Output Power	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(b)(1)	Yes	No
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.215(c), 15.247(d)	Yes	No
Spurious RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2007 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2007 15.247(d)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

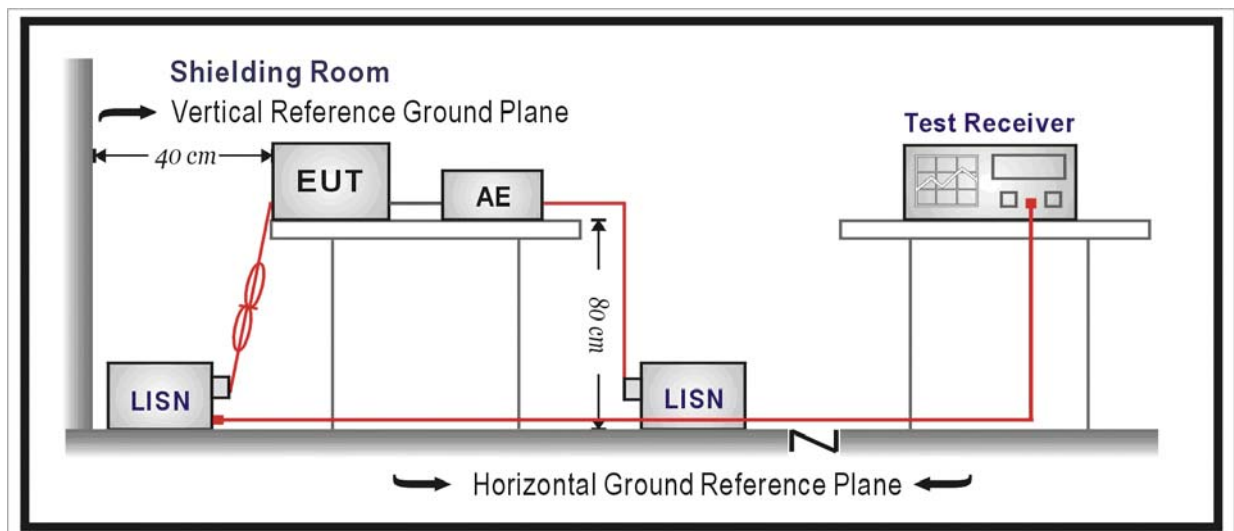
3.1. Test Equipment

Conducted Emission / SR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100726	2008/06/28
Two-Line V-Network	R&S	ENV216	100013	2008/06/28
Two-Line V-Network	R&S	ENV216	100014	2008/06/28
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2007/11/25
50ohm Termination	SHX	TF2	07081401	2008/09/28
Coaxial Cable	Luthi	RG214	519358	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH004	2008/03/31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

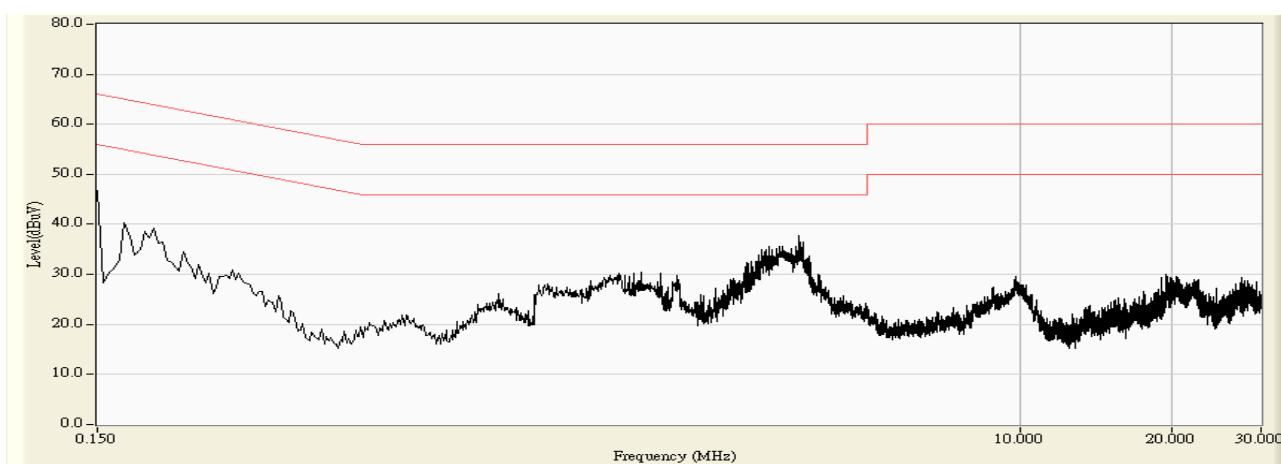
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

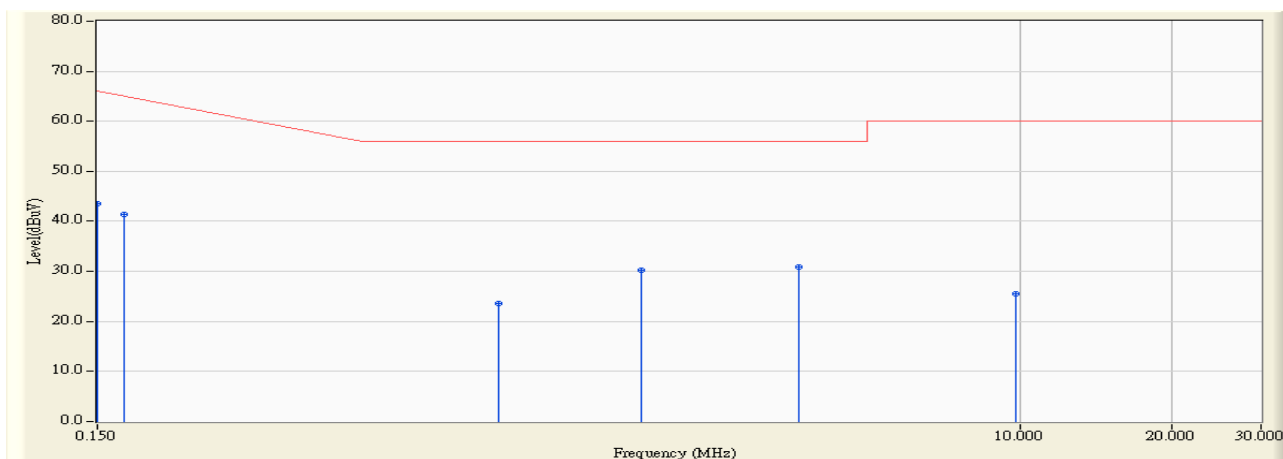
The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

Engineer : Jame	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2008/11/02 - 15:49
Limit : FCC_Part15.207_00M_QP	Margin : 10
EUT : Bluetooth Handsfree Speaker	Probe : ENV216_100014(0.009-30MHz) - Line1
Power : AC 120V/60Hz	Note : USB Connection for Charging

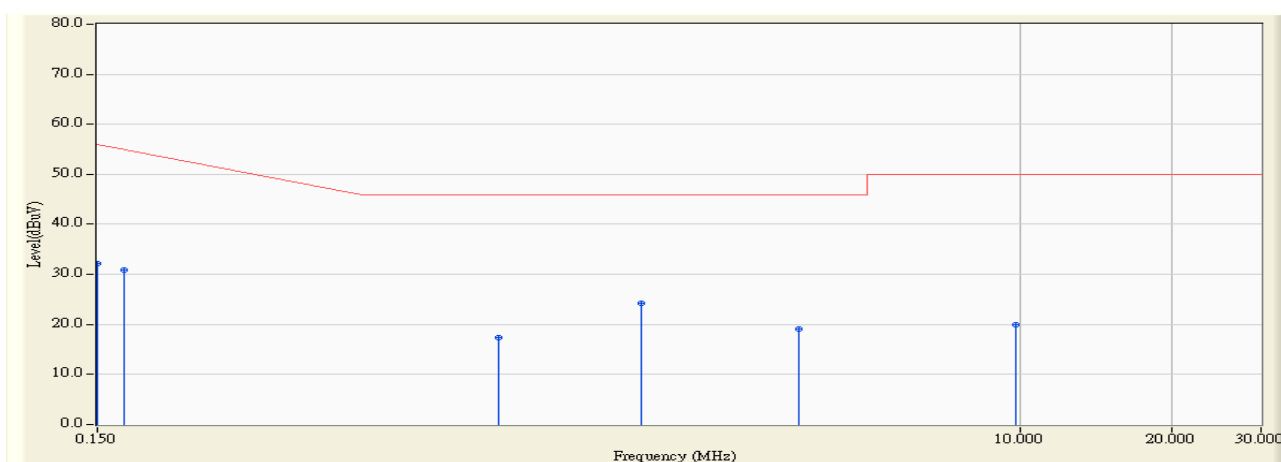


Engineer : Jame	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2008/11/02 - 15:53
Limit : FCC_Part15.207_00M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : ENV216_100014(0.009-30MHz) - Line1
Power : AC 120V/60Hz	Note : USB Connection for Charging



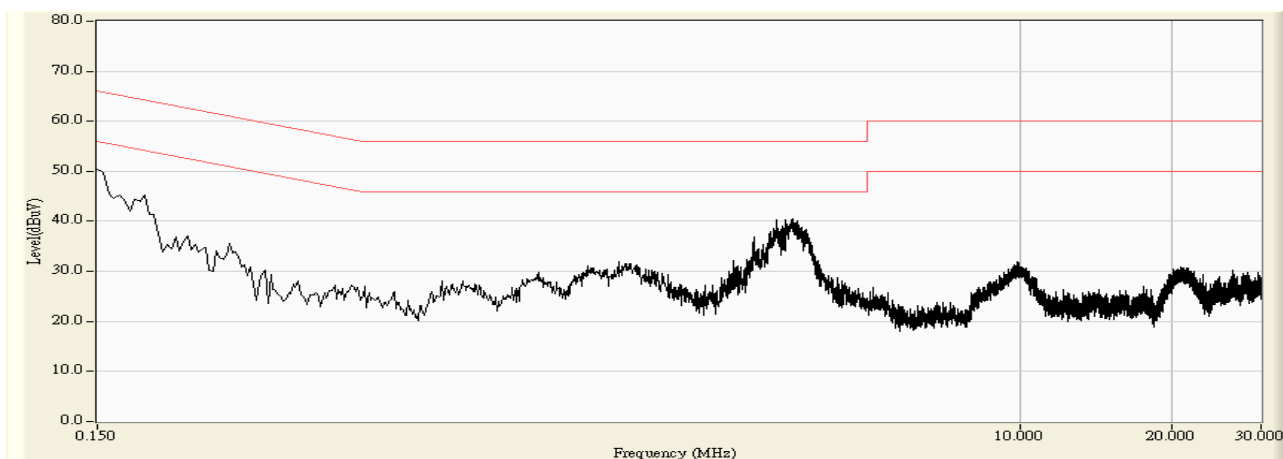
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.150	10.160	33.300	43.460	-22.540	66.000	QUASIPeAK
2		0.170	10.006	31.400	41.406	-24.023	65.429	QUASIPeAK
3		0.934	9.720	13.800	23.520	-32.480	56.000	QUASIPeAK
4		1.782	9.690	20.500	30.190	-25.810	56.000	QUASIPeAK
5		3.662	9.790	21.000	30.790	-25.210	56.000	QUASIPeAK
6		9.802	9.880	15.600	25.480	-34.520	60.000	QUASIPeAK

Engineer : Jame	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2008/11/02 - 15:53
Limit : FCC_Part15.207_00M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : ENV216_100014(0.009-30MHz) - Line1
Power : AC 120V/60Hz	Note : USB Connection for Charging

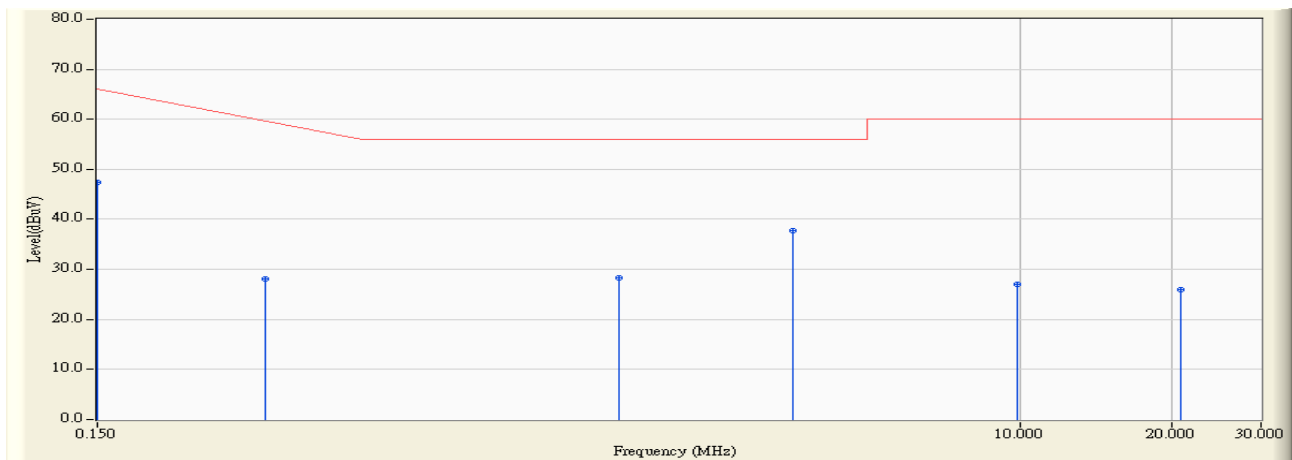


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.150	10.160	22.100	32.260	-23.740	56.000	AVERAGE
2		0.170	10.006	20.800	30.806	-24.623	55.429	AVERAGE
3		0.934	9.720	7.600	17.320	-28.680	46.000	AVERAGE
4	*	1.782	9.690	14.500	24.190	-21.810	46.000	AVERAGE
5		3.662	9.790	9.400	19.190	-26.810	46.000	AVERAGE
6		9.802	9.880	10.000	19.880	-30.120	50.000	AVERAGE

Engineer : Jame	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2008/11/02 - 16:02
Limit : FCC_Part15.207_00M_QP	Margin : 10
EUT : Bluetooth Handsfree Speaker	Probe : ENV216_100014(0.009-30MHz) - Line2
Power : AC 120V/60Hz	Note : USB Connection for Charging

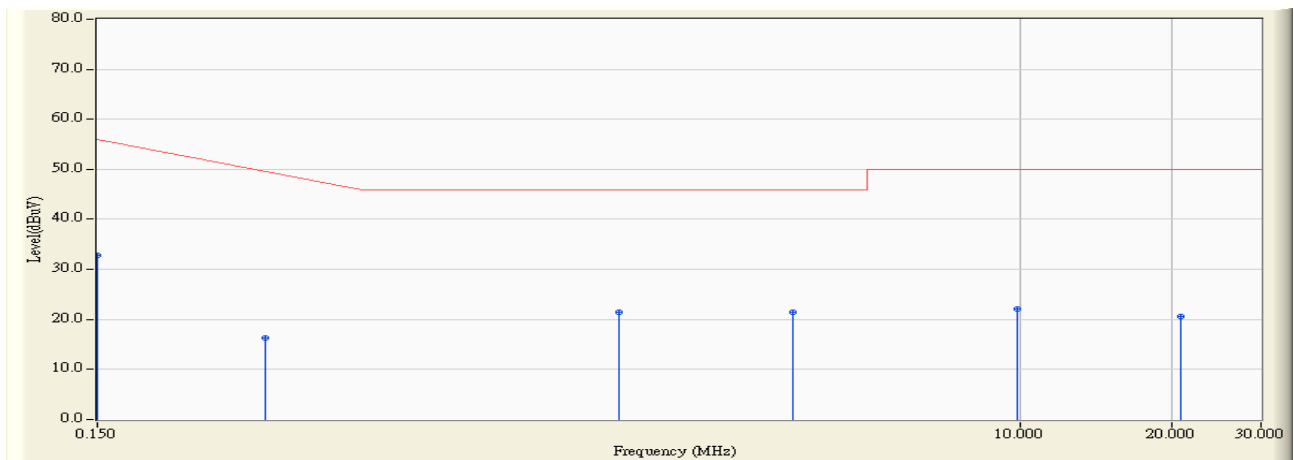


Engineer : Jame	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2008/11/02 - 16:04
Limit : FCC_Part15.207_00M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : ENV216_100014(0.009-30MHz) - Line2
Power : AC 120V/60Hz	Note : USB Connection for Charging



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.150	10.006	37.400	47.406	-18.594	66.000	QUASIPeAK
2		0.322	9.600	18.500	28.100	-32.986	61.086	QUASIPeAK
3		1.614	9.710	18.600	28.310	-27.690	56.000	QUASIPeAK
4	*	3.550	9.700	28.100	37.800	-18.200	56.000	QUASIPeAK
5		9.902	9.860	17.200	27.060	-32.940	60.000	QUASIPeAK
6		20.810	10.241	15.700	25.941	-34.059	60.000	QUASIPeAK

Engineer : Jame	
Site : SR-1 (Conducted Emission and Power Disturbance Test)	Time : 2008/11/02 - 16:04
Limit : FCC_Part15.207_00M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : ENV216_100014(0.009-30MHz) - Line2
Power : AC 120V/60Hz	Note : USB Connection for Charging



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.150	10.006	22.900	32.906	-23.094	56.000	AVERAGE
2		0.322	9.600	6.800	16.400	-34.686	51.086	AVERAGE
3		1.614	9.710	11.700	21.410	-24.590	46.000	AVERAGE
4		3.550	9.700	11.700	21.400	-24.600	46.000	AVERAGE
5		9.902	9.860	12.300	22.160	-27.840	50.000	AVERAGE
6		20.810	10.241	10.300	20.541	-29.459	50.000	AVERAGE

4. Radiated Emission

4.1. Test Equipment

☒ Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2008/06/11
EMI Test Receiver	R&S	ESCI	100573	2008/05/10
Preamplifier	Quietek	AP-025C	QT-AP003	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112B	2932	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2008/06/28
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2008/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375 /2510-60/11SS	SN9	2008/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2008/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2008/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200447304	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	04	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2008/03/31

☐ Radiated Emission / AC-3

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2008/04/24
EMI Test Receiver	R&S	ESCI	100176	2007/11/15
Preamplifier	Quietek	AP-025C	QT-AP004	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112D	22254	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2008/06/28
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2008/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375 /2510-60/11SS	SN9	2008/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2008/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2008/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	05	2007/11/25

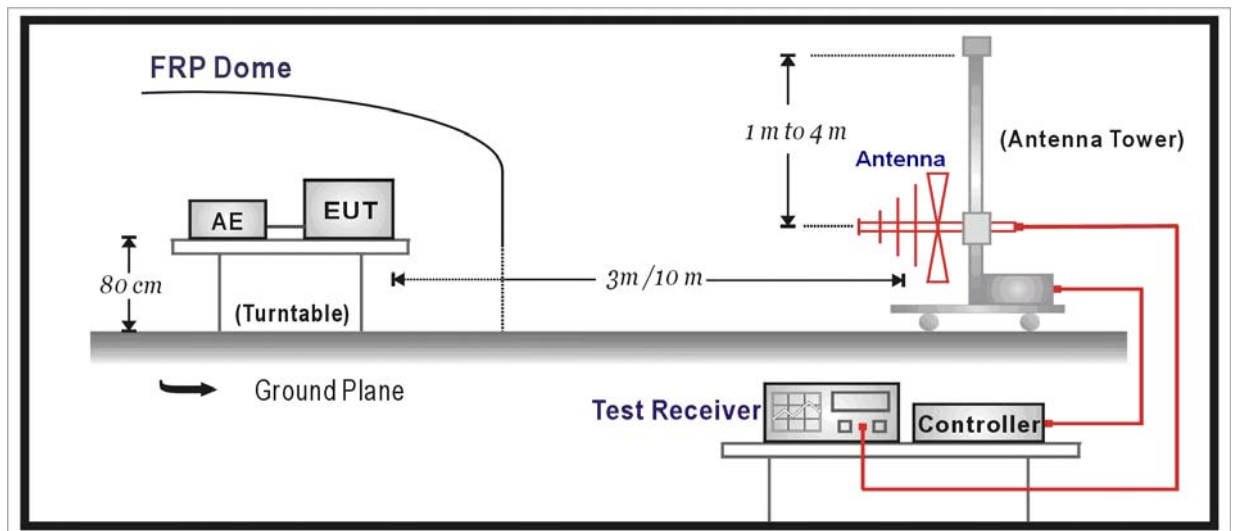
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2008/03/31
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Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

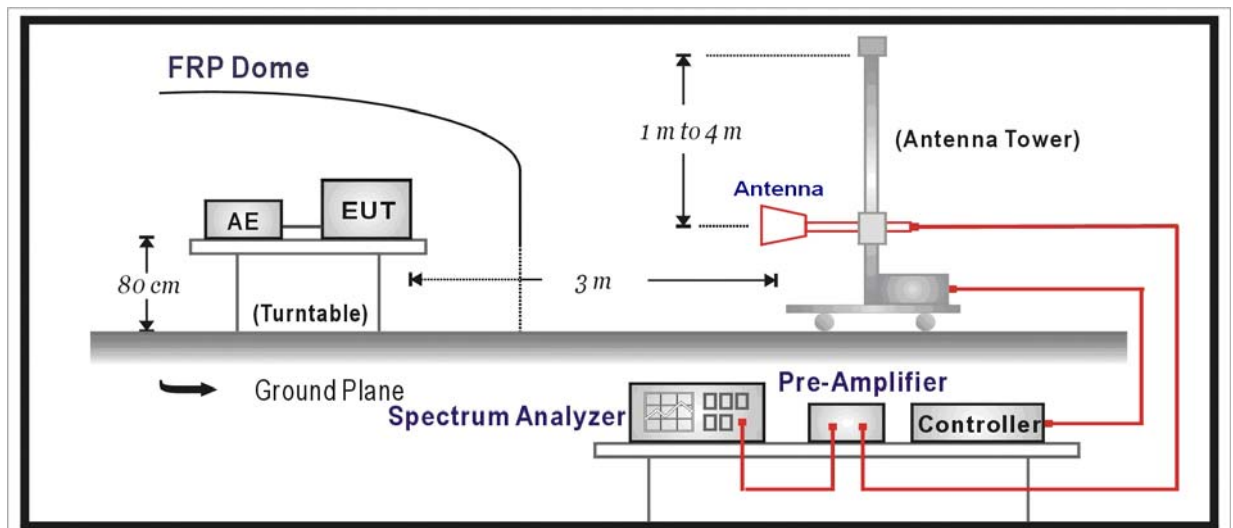
Note 2: The test instruments marked with "X" are used to measure the final test results.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

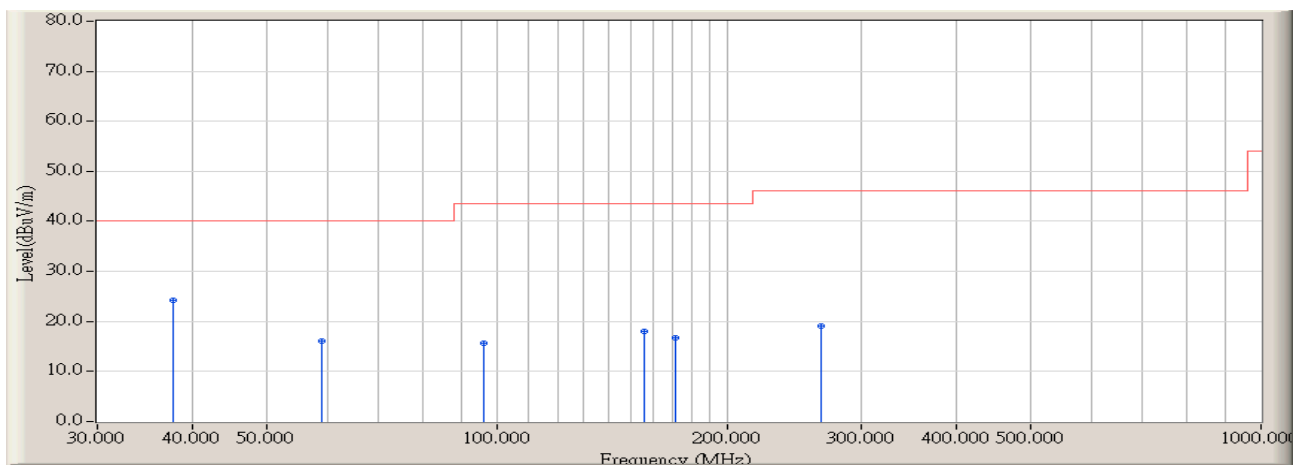
Note: When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the "cone of radiation" of EUT. This horn 3dB beamwidth is 60 degrees for H-plane and 90 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
below 1G is defined as ± 3.8 dB

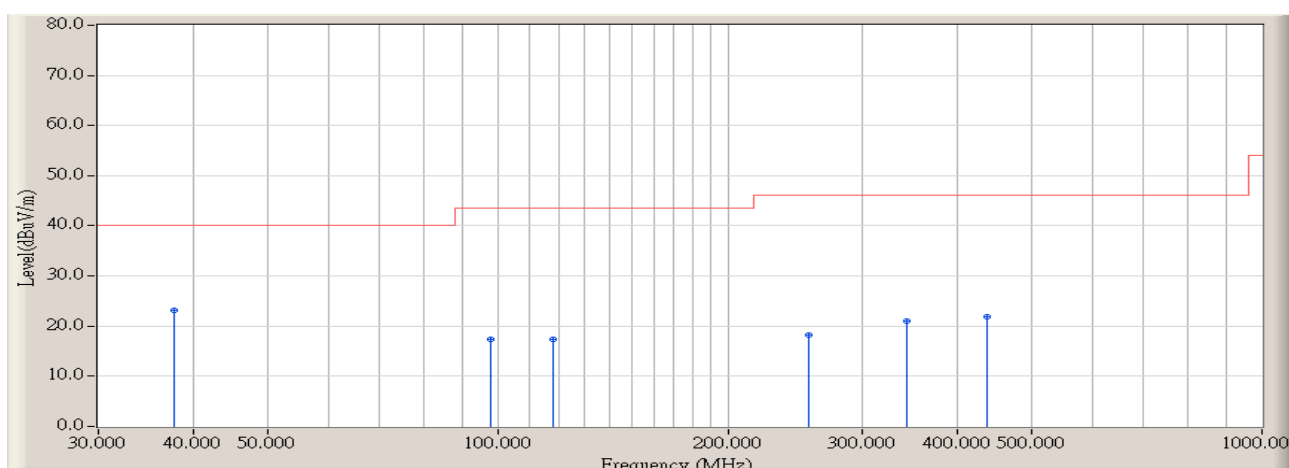
4.6. Test Result

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:30
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : CBL6141A_4278(30-2000MHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2402MHz



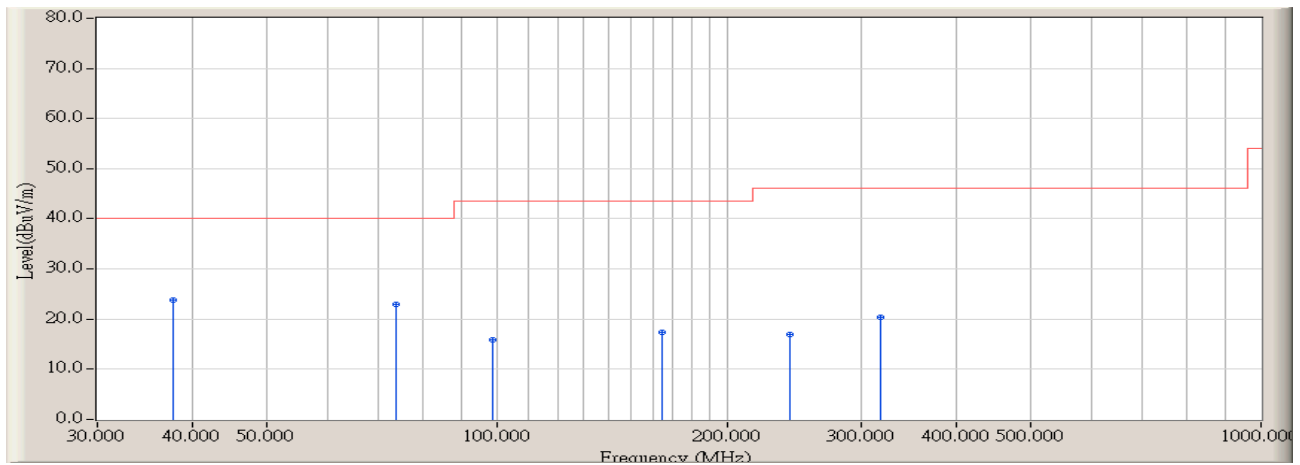
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	37.760	-2.312	26.580	24.268	-15.732	40.000	QUASIPeAK	105.100	20.500
2		59.100	-12.373	28.487	16.114	-23.886	40.000	QUASIPeAK	110.000	125.000
3		95.960	-12.020	27.643	15.623	-27.897	43.520	QUASIPeAK	100.000	234.900
4		156.100	-9.581	27.524	17.943	-25.577	43.520	QUASIPeAK	100.000	25.900
5		171.620	-10.840	27.545	16.705	-26.815	43.520	QUASIPeAK	102.000	189.900
6		265.710	-8.544	27.675	19.131	-26.889	46.020	QUASIPeAK	135.800	312.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:31
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : CBL6141A_4278(30-2000MHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2402MHz



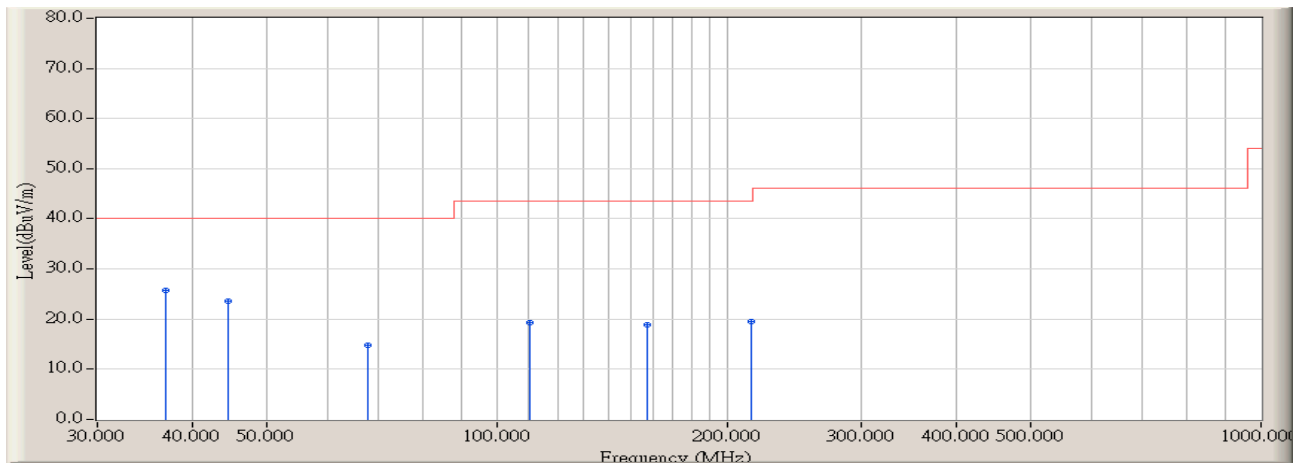
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	37.760	-2.312	25.500	23.188	-16.812	40.000	QUASIPeAK	100.000	122.000
2		97.900	-11.793	29.216	17.423	-26.097	43.520	QUASIPeAK	112.900	12.700
3		118.270	-10.172	27.541	17.369	-26.151	43.520	QUASIPeAK	111.000	152.900
4		255.040	-8.638	26.836	18.198	-27.822	46.020	QUASIPeAK	100.000	278.900
5		342.340	-6.284	27.246	20.962	-25.058	46.020	QUASIPeAK	100.000	240.000
6		436.430	-4.620	26.460	21.840	-24.180	46.020	QUASIPeAK	100.000	162.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:31
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : CBL6141A_4278(30-2000MHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2441MHz



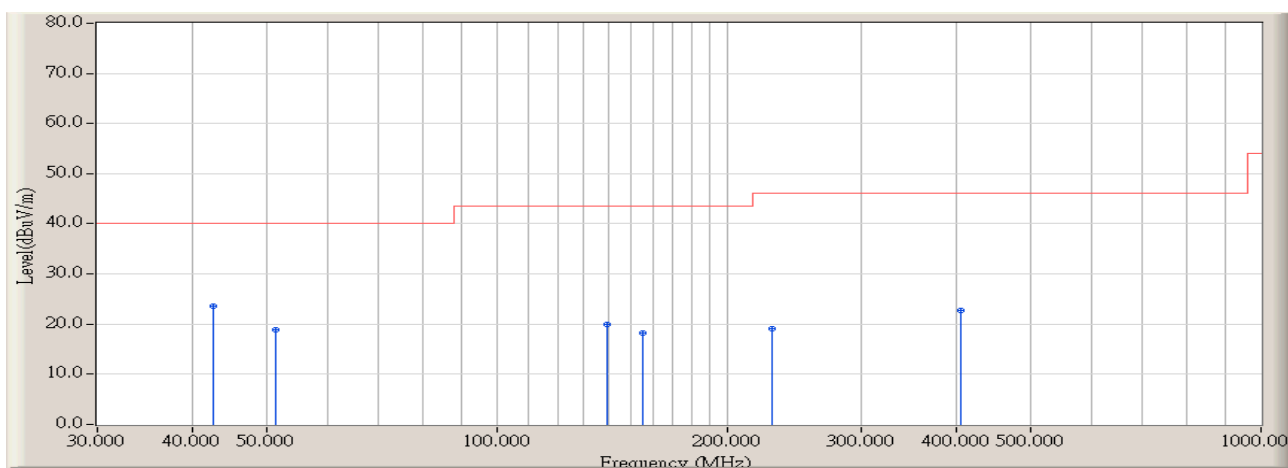
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	37.760	-2.312	26.051	23.739	-16.261	40.000	QUASIPeAK	109.100	252.000
2		73.650	-14.364	37.307	22.943	-17.057	40.000	QUASIPeAK	100.000	23.400
3		98.870	-11.659	27.428	15.769	-27.751	43.520	QUASIPeAK	102.000	156.200
4		164.830	-10.245	27.639	17.394	-26.126	43.520	QUASIPeAK	100.000	235.000
5		241.460	-9.256	26.164	16.908	-29.112	46.020	QUASIPeAK	115.000	219.900
6		317.120	-7.010	27.299	20.289	-25.731	46.020	QUASIPeAK	109.200	231.600

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:32
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : CBL6141A_4278(30-2000MHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2441MHz



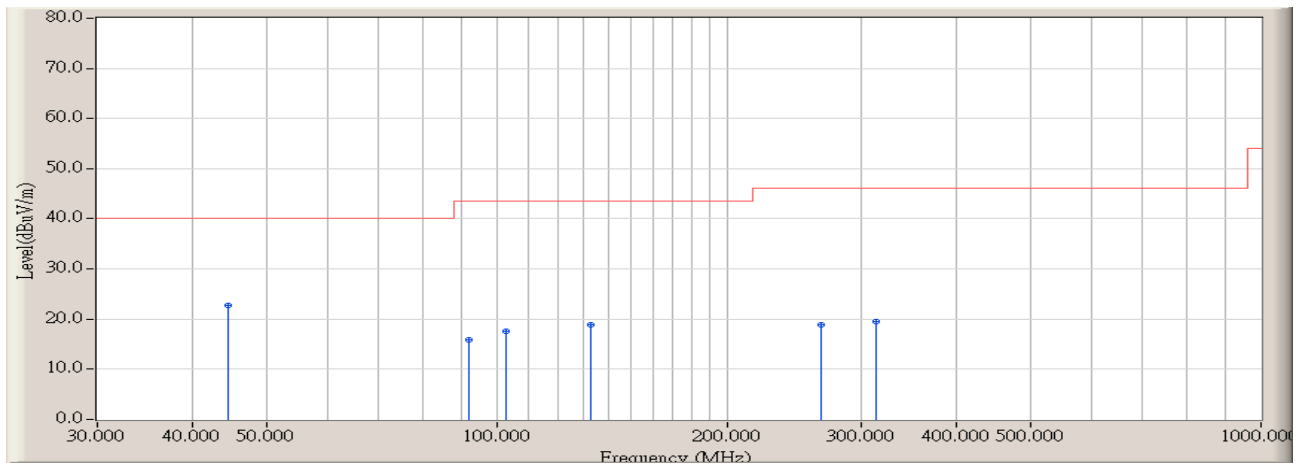
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	36.790	-1.849	27.502	25.653	-14.347	40.000	QUASIPeAK	100.100	126.000
2		44.550	-5.645	29.133	23.488	-16.512	40.000	QUASIPeAK	120.100	221.000
3		67.830	-14.312	29.006	14.694	-25.306	40.000	QUASIPeAK	100.000	25.000
4		110.510	-10.578	29.897	19.319	-24.201	43.520	QUASIPeAK	100.000	264.000
5		157.070	-9.675	28.453	18.778	-24.742	43.520	QUASIPeAK	122.000	158.000
6		215.270	-9.607	29.212	19.605	-23.915	43.520	QUASIPeAK	110.000	233.800

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:32
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : CBL6141A_4278(30-2000MHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2480MHz



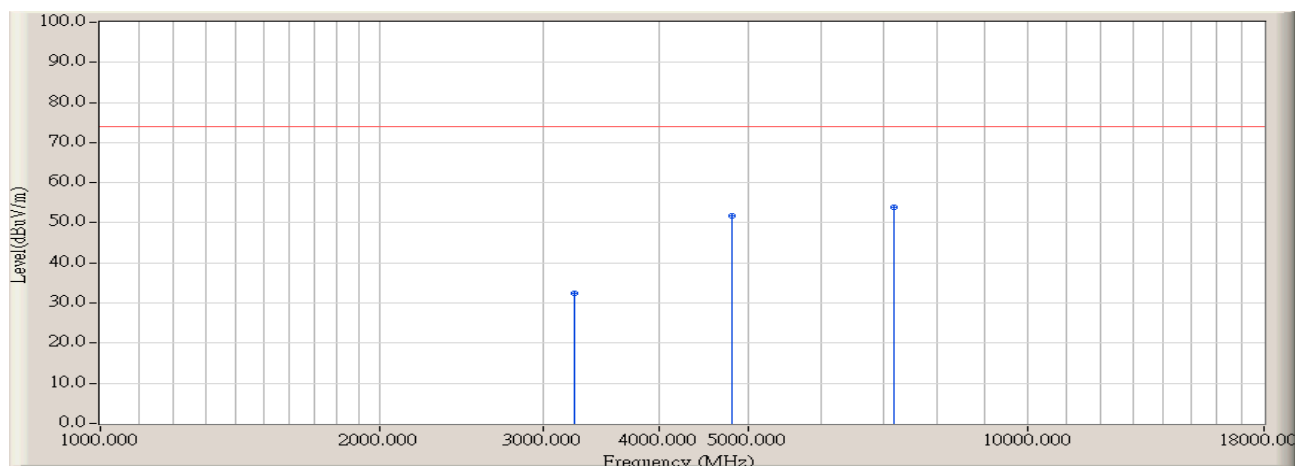
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	42.610	-4.701	28.326	23.625	-16.375	40.000	QUASIPeAK	120.600	85.000
2		51.340	-8.886	27.661	18.775	-21.225	40.000	QUASIPeAK	113.600	165.800
3		139.610	-9.348	29.248	19.900	-23.620	43.520	QUASIPeAK	102.500	244.600
4		155.130	-9.557	27.708	18.151	-25.369	43.520	QUASIPeAK	100.000	115.900
5		228.850	-9.159	28.246	19.087	-26.933	46.020	QUASIPeAK	104.600	79.500
6		404.420	-4.755	27.578	22.823	-23.197	46.020	QUASIPeAK	100.000	166.800

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:32
Limit : FCC_SpartC_15.209_03M_QP	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : CBL6141A_4278(30-2000MHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2480MHz



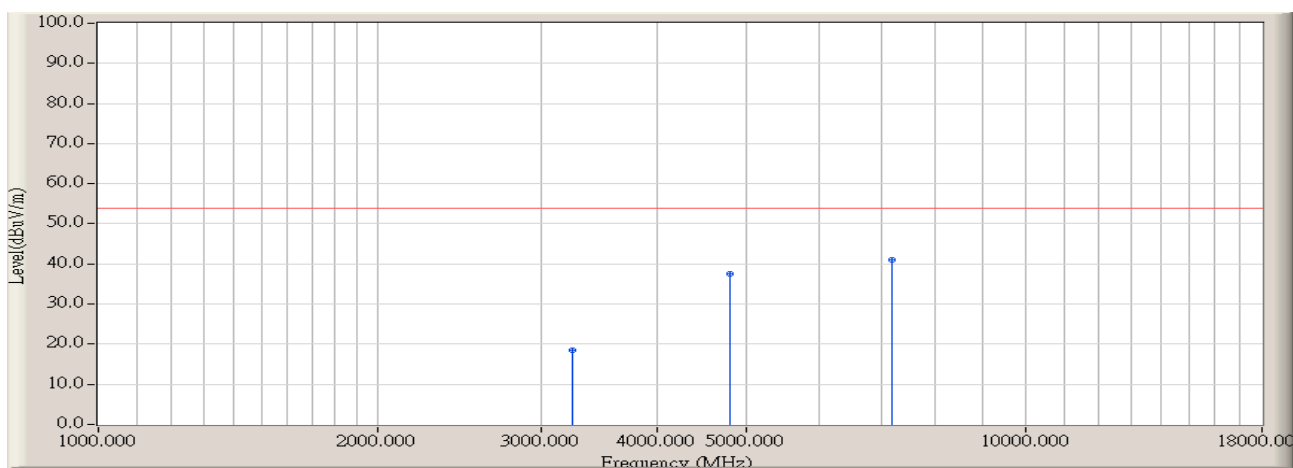
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	44.550	-5.645	28.287	22.642	-17.358	40.000	QUASIPeAK	100.000	93.500
2		92.080	-12.398	28.296	15.898	-27.622	43.520	QUASIPeAK	205.600	311.500
3		102.750	-11.204	28.712	17.508	-26.012	43.520	QUASIPeAK	112.600	49.800
4		132.820	-9.428	28.309	18.881	-24.639	43.520	QUASIPeAK	123.600	185.500
5		265.710	-8.544	27.435	18.891	-27.129	46.020	QUASIPeAK	100.000	108.500
6		313.240	-7.031	26.541	19.510	-26.510	46.020	QUASIPeAK	100.000	147.500

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:56
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2402 MHz



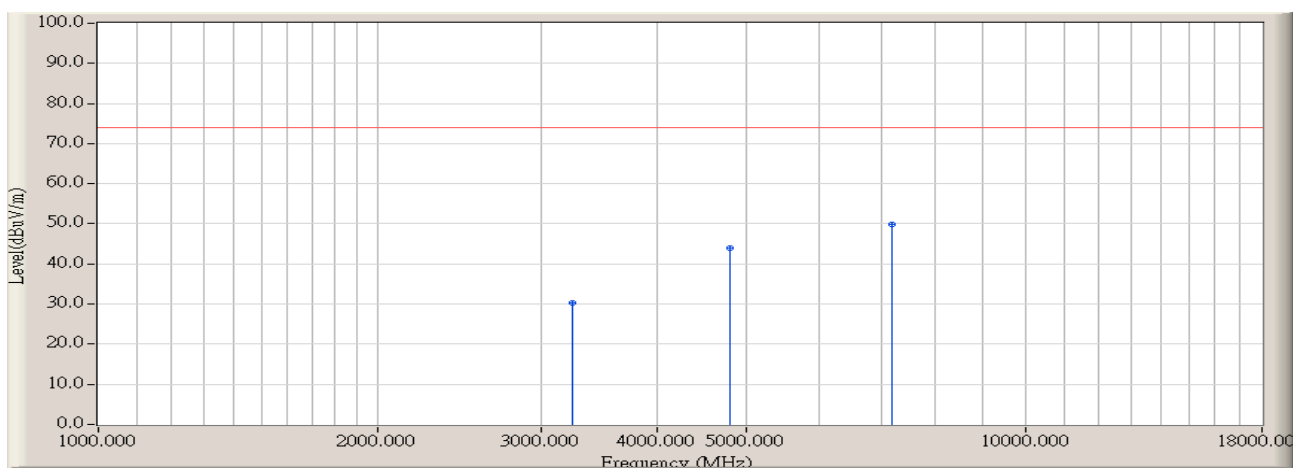
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3250.000	-1.797	34.300	32.503	-41.467	73.970	PEAK	102.500	184.000
2		4800.000	3.508	48.250	51.758	-22.212	73.970	PEAK	100.000	146.000
3	*	7180.000	12.637	41.320	53.956	-20.014	73.970	PEAK	103.600	193.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:56
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2402 MHz



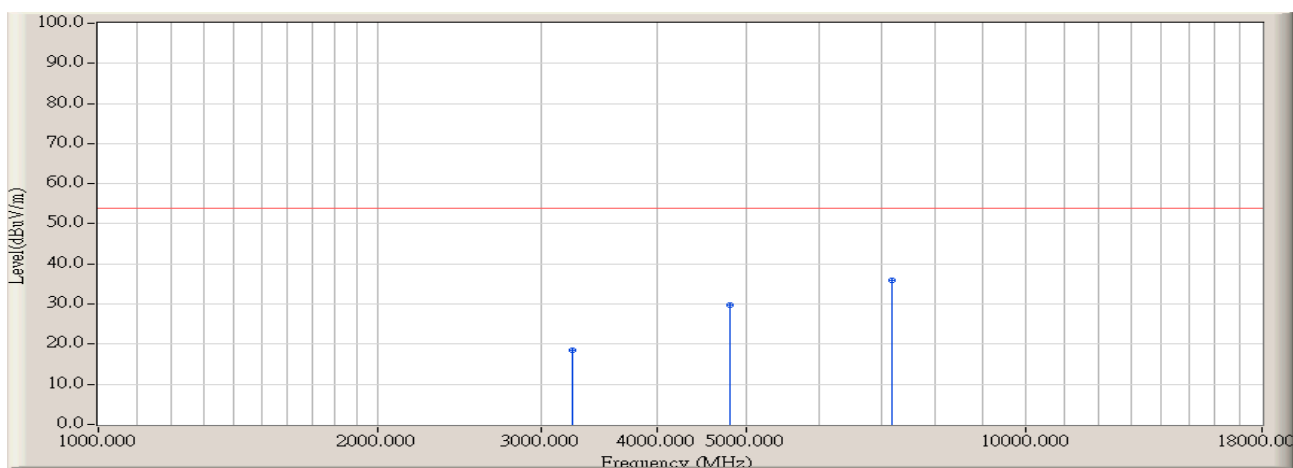
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3250.000	-1.797	20.210	18.413	-35.557	53.970	AVERAGE	102.500	184.000
2		4800.000	3.508	34.140	37.648	-16.322	53.970	AVERAGE	100.000	146.000
3	*	7180.000	12.637	28.260	40.896	-13.074	53.970	AVERAGE	103.600	193.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:59
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2402 MHz



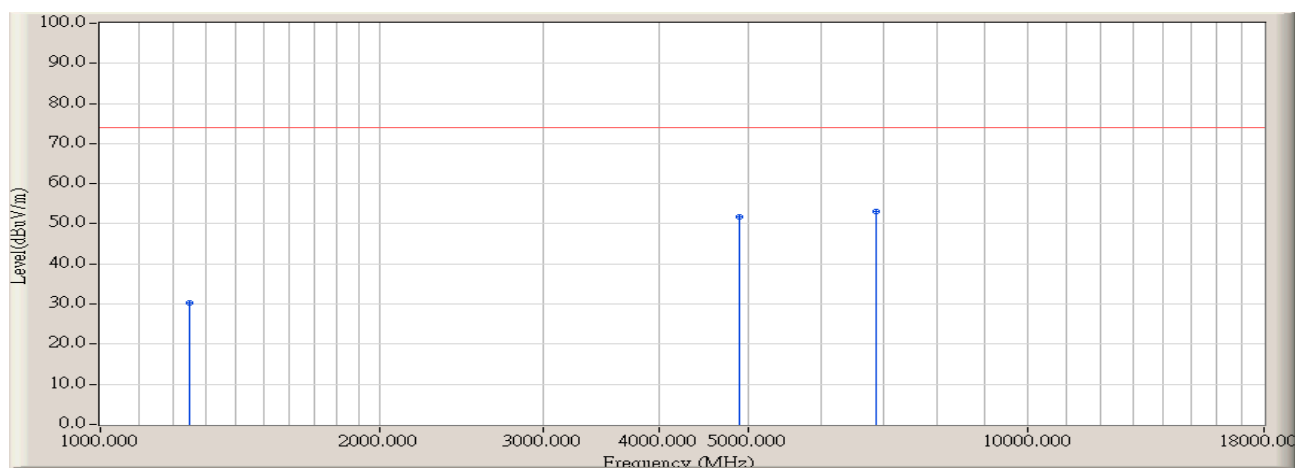
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3250.000	-1.797	32.140	30.343	-43.627	73.970	PEAK	104.000	62.000
2		4800.000	3.508	40.360	43.868	-30.102	73.970	PEAK	100.000	184.000
3	*	7180.000	12.637	37.320	49.956	-24.014	73.970	PEAK	120.000	147.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 13:59
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2402 MHz



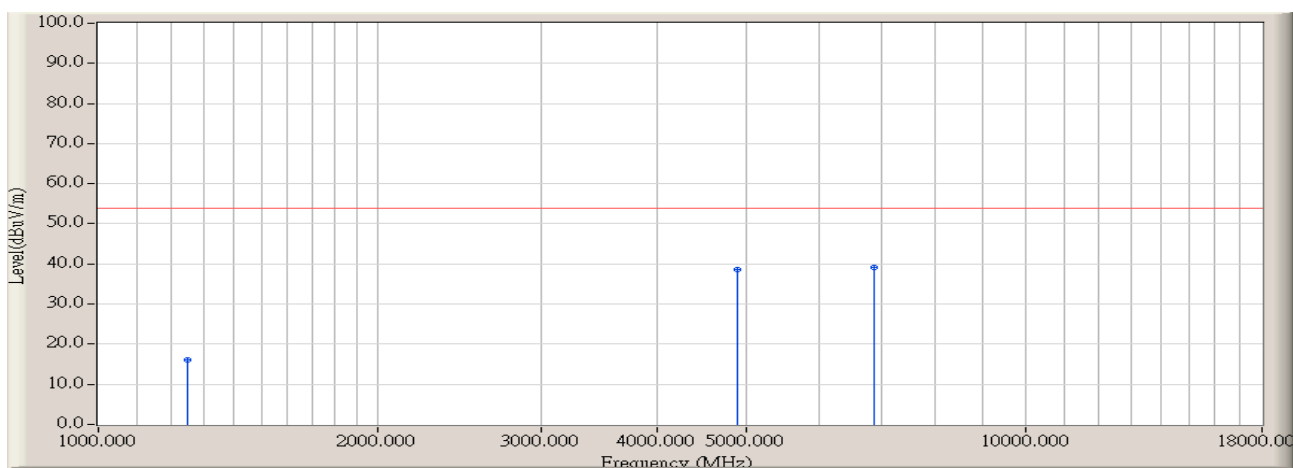
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3250.000	-1.797	20.360	18.563	-35.407	53.970	AVERAGE	104.000	62.000
2		4800.000	3.508	26.380	29.888	-24.082	53.970	AVERAGE	100.000	184.000
3	*	7180.000	12.637	23.250	35.886	-18.084	53.970	AVERAGE	120.000	147.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:03
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2441 MHz



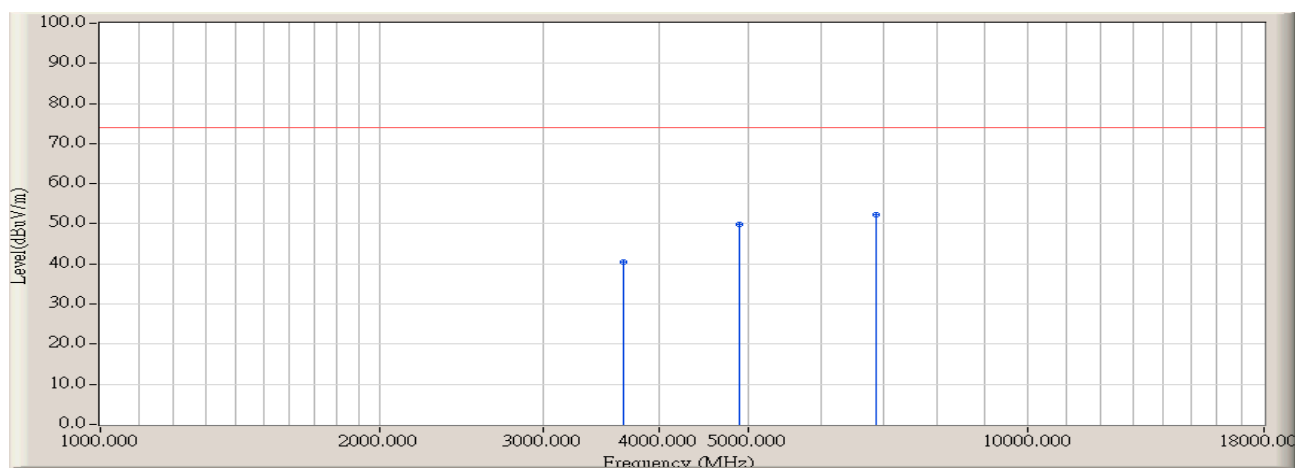
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1250.000	-8.047	38.350	30.303	-43.667	73.970	PEAK	100.000	26.400
2		4890.000	3.624	48.025	51.649	-22.321	73.970	PEAK	102.600	193.000
3	*	6880.000	10.797	42.274	53.072	-20.898	73.970	PEAK	118.000	96.300

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:03
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2441 MHz



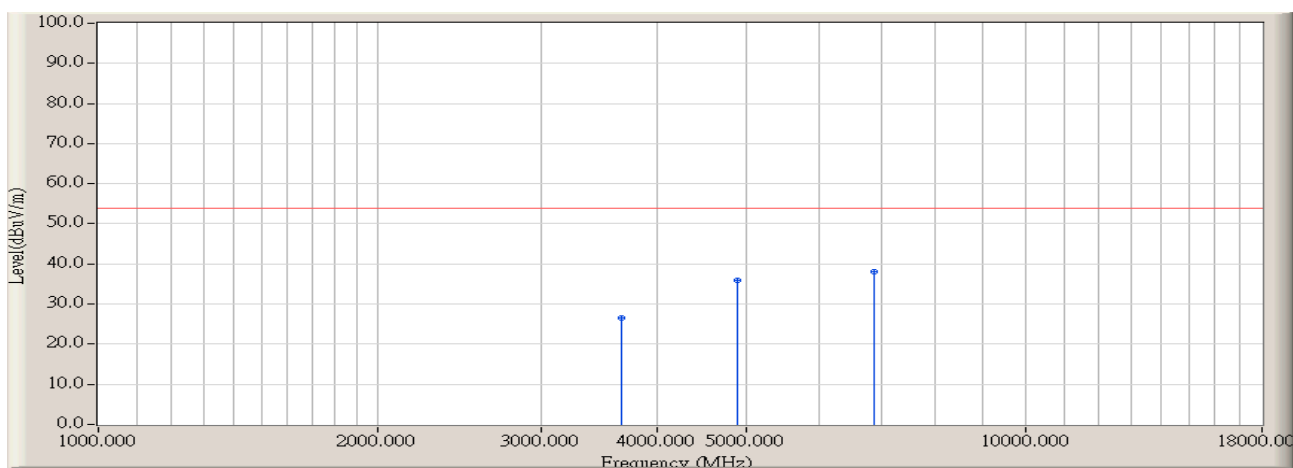
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1250.000	-8.047	24.203	16.156	-37.814	53.970	AVERAGE	104.000	62.000
2		4890.000	3.624	35.012	38.636	-15.334	53.970	AVERAGE	100.000	184.000
3	*	6880.000	10.797	28.362	39.160	-14.810	53.970	AVERAGE	120.000	147.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:05
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2441 MHz



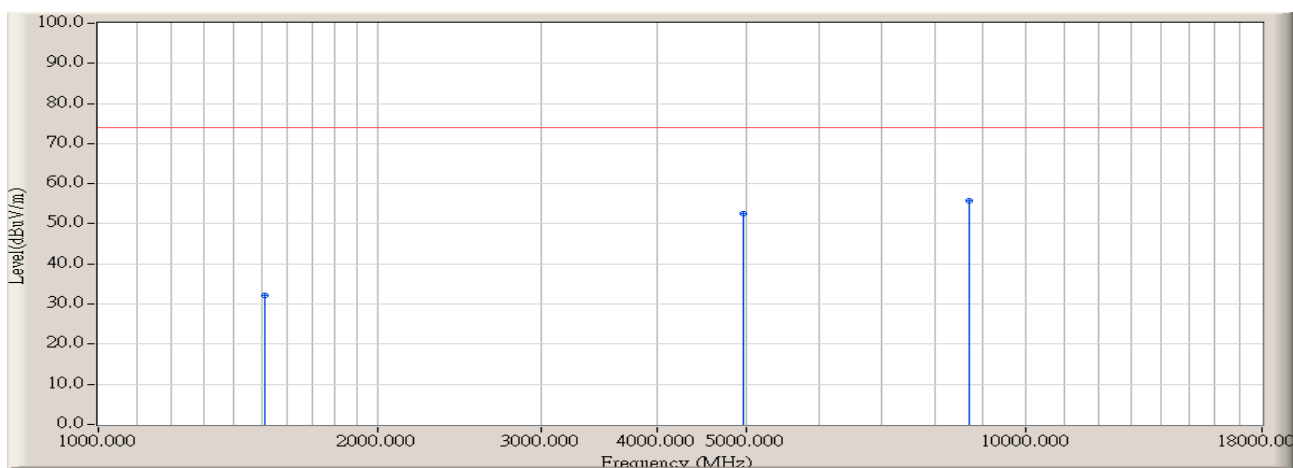
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3667.000	-0.615	41.021	40.406	-33.564	73.970	PEAK	100.000	198.000
2		4890.000	3.624	46.324	49.948	-24.022	73.970	PEAK	102.000	117.000
3	*	6880.000	10.797	41.365	52.163	-21.807	73.970	PEAK	100.000	126.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:05
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2441 MHz



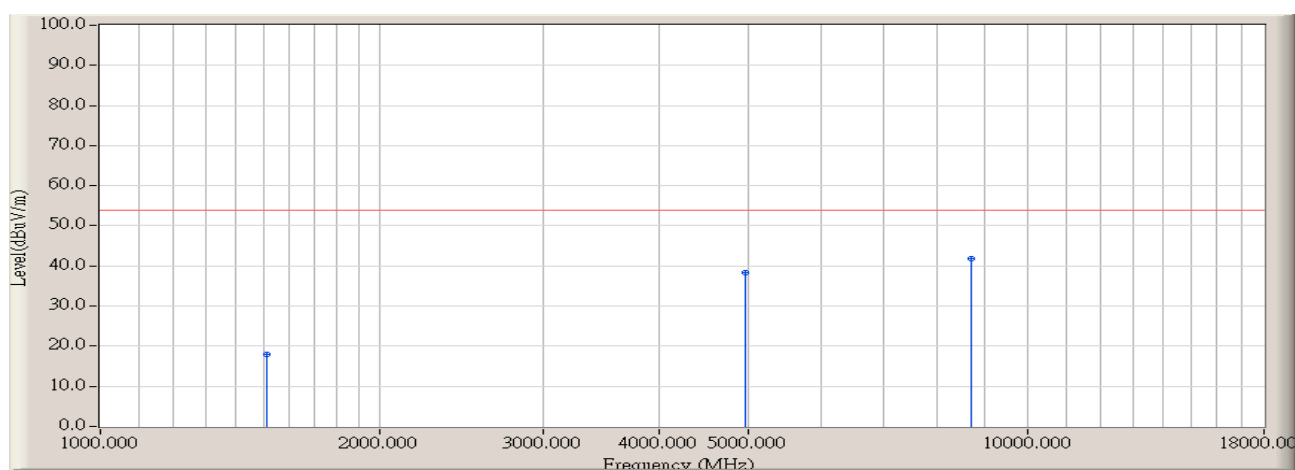
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3667.000	-0.615	27.210	26.595	-27.375	53.970	AVERAGE	100.000	198.000
2		4890.000	3.624	32.201	35.825	-18.145	53.970	AVERAGE	102.000	117.000
3	*	6880.000	10.797	27.214	38.012	-15.958	53.970	AVERAGE	100.000	126.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:07
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2480 MHz



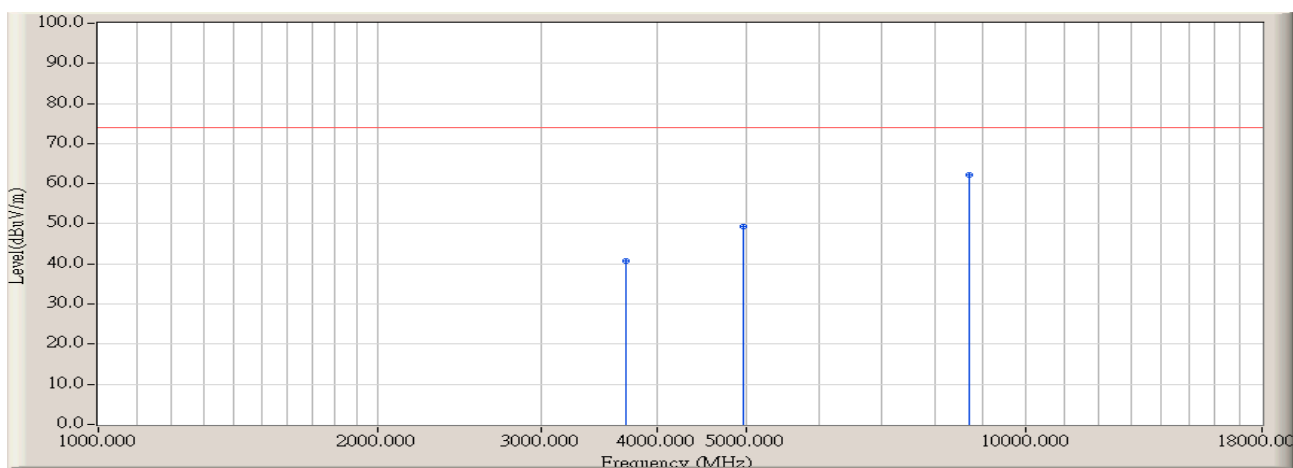
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1510.000	-7.280	39.320	32.040	-41.930	73.970	PEAK	105.400	85.000
2		4960.000	4.110	48.321	52.431	-21.539	73.970	PEAK	110.400	208.000
3	*	8690.000	14.144	41.741	55.885	-18.085	73.970	PEAK	105.100	174.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:07
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2480 MHz



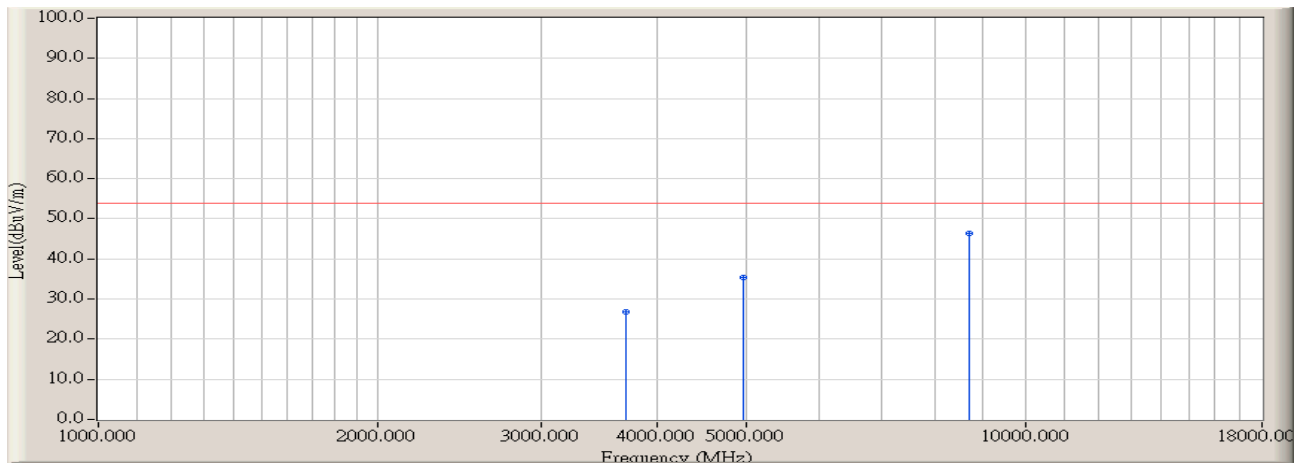
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1510.000	-7.280	25.180	17.900	-36.070	53.970	AVERAGE	105.400	85.000
2		4960.000	4.110	34.250	38.360	-15.610	53.970	AVERAGE	110.400	208.000
3	*	8690.000	14.144	27.640	41.784	-12.186	53.970	AVERAGE	105.100	174.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:10
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2480 MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3710.000	-0.344	41.146	40.802	-33.168	73.970	PEAK	105.400	85.000
2		4960.000	4.110	45.329	49.439	-24.531	73.970	PEAK	110.400	208.000
3	*	8690.000	14.144	48.102	62.246	-11.724	73.970	PEAK	105.100	174.000

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 14:10
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1: Transmit at channel 2480 MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		3710.000	-0.344	27.210	26.866	-27.104	53.970	AVERAGE	105.400	85.000
2		4960.000	4.110	31.245	35.355	-18.615	53.970	AVERAGE	110.400	208.000
3	*	8690.000	14.144	32.246	46.390	-7.580	53.970	AVERAGE	105.100	174.000

5. 20dB Bandwidth

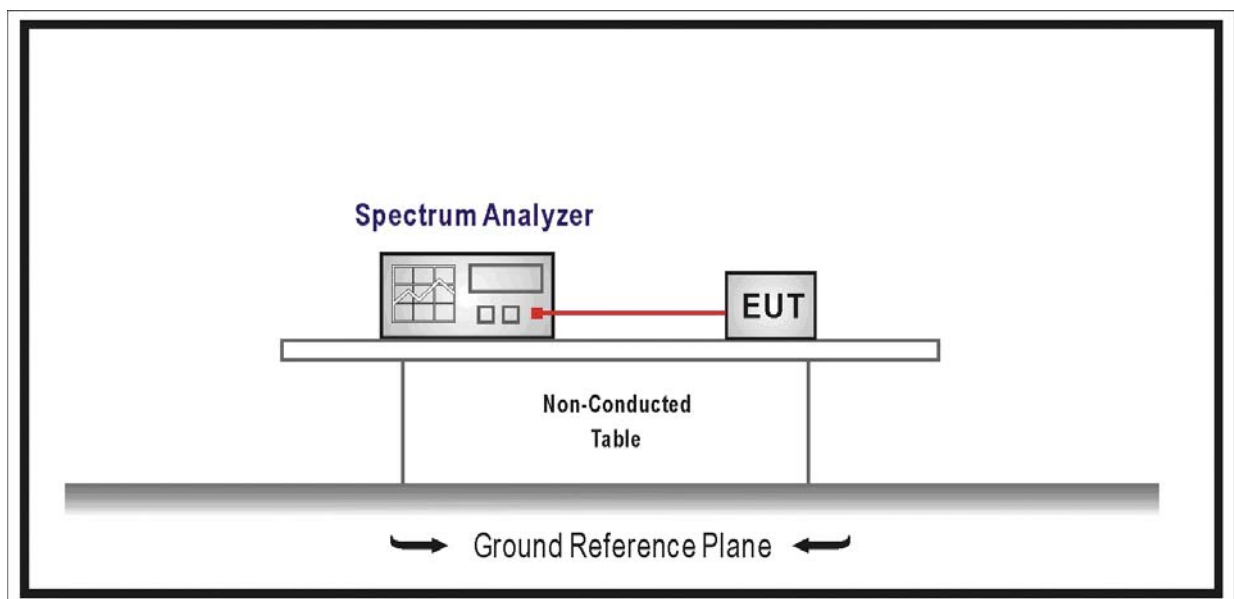
5.1. Test Equipment

20dB Bandwidth / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

- For frequency hopping systems operating in 2400-2483.5 MHz band, no limitation.
- For frequency hopping systems operating in 902-928 MHz band, the maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- For frequency hopping systems operating in 5725-5850 MHz band, the maximum 20 dB bandwidth of the hopping channel is 1 MHz.

5.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20dB bandwidth

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize.

Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

5.5. Uncertainty

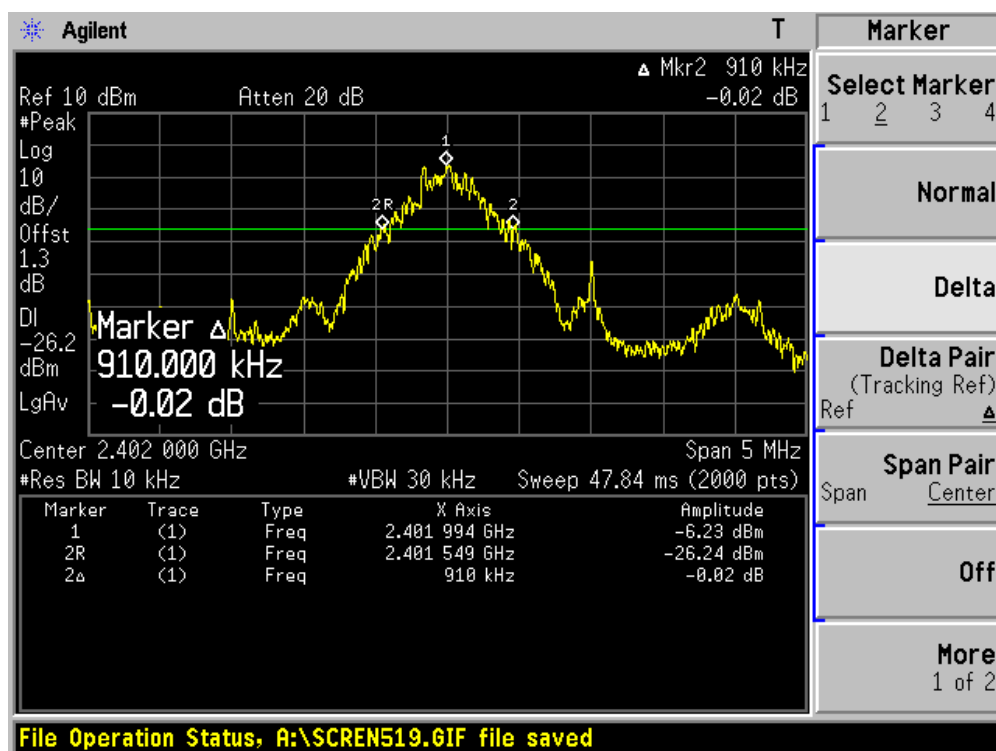
The measurement uncertainty is defined as ± 1 kHz

5.6. Test Result

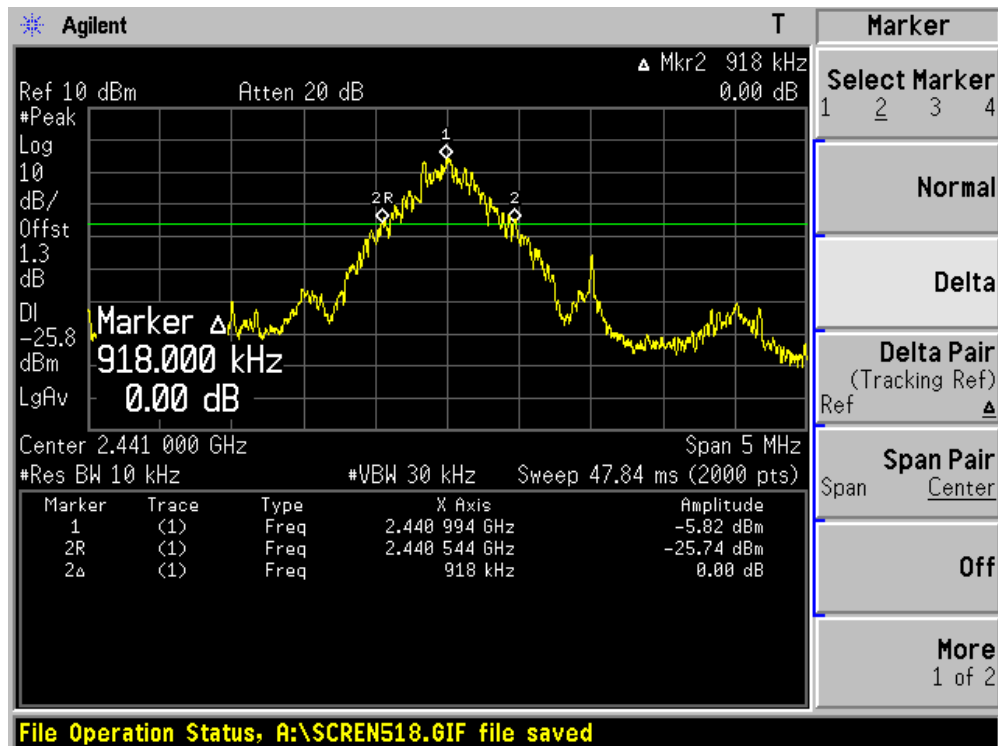
Product	:	Bluetooth Handsfree Speaker
Test Item	:	20dB Bandwidth
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
00	2402	910	N/A	Pass
39	2441	918	N/A	Pass
78	2480	930	N/A	Pass

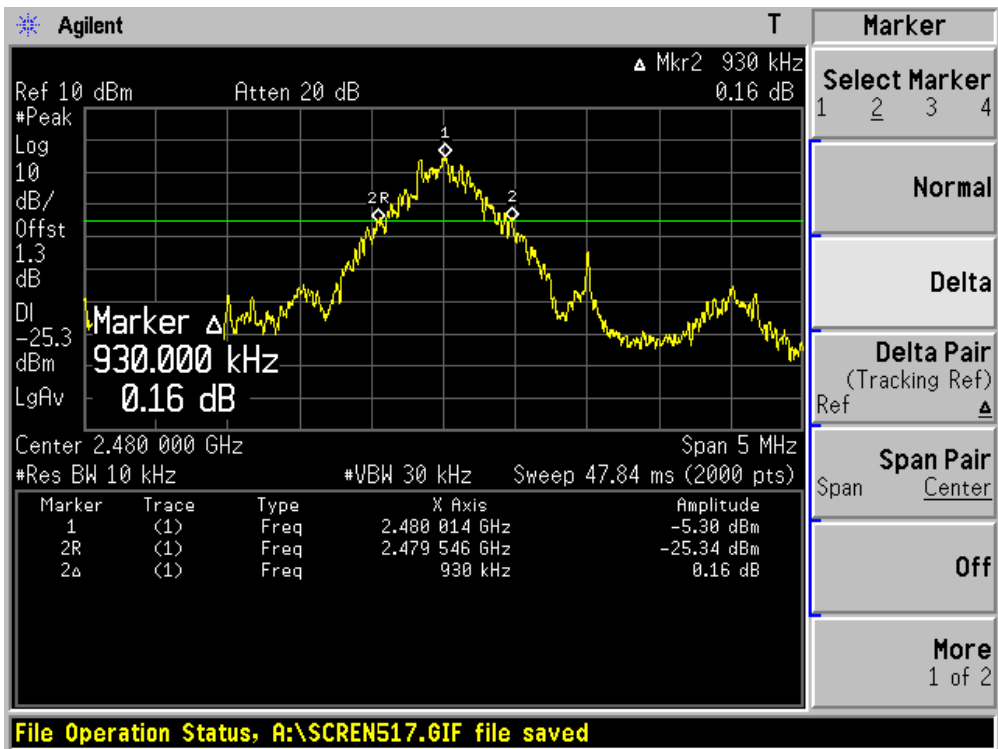
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



6. Carrier Frequency Separation

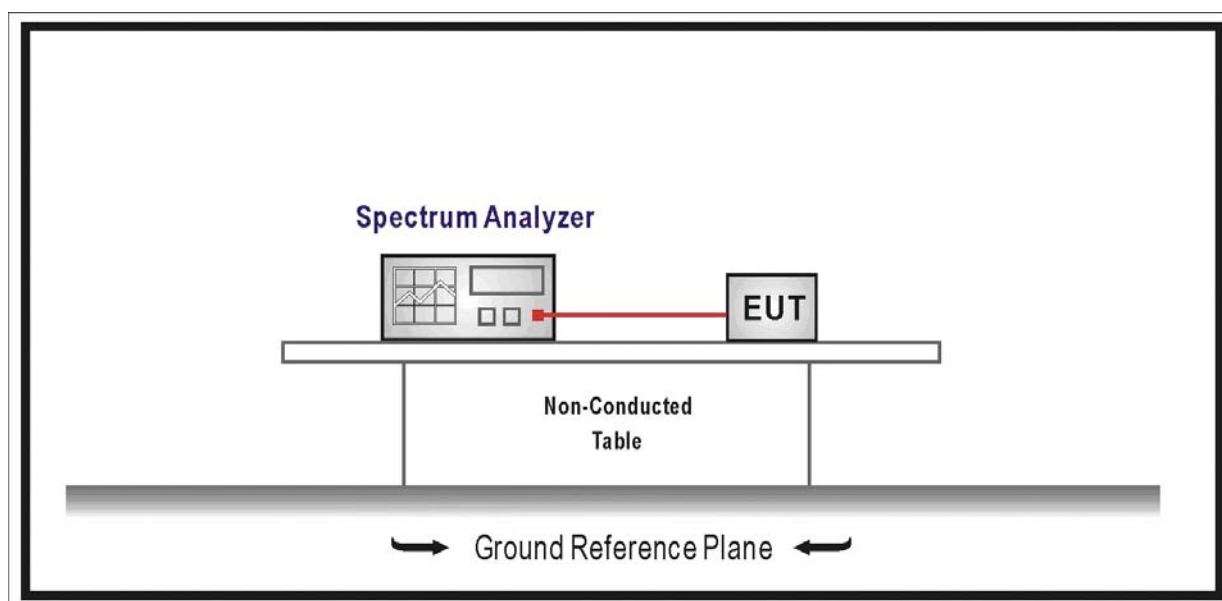
6.1. Test Equipment

Carrier Frequency Separation / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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, provided the systems operate with an output power no greater than 125mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo-randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each

transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

6.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq$ 1% of the span

Video (or Average) Bandwidth VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

6.5. Uncertainty

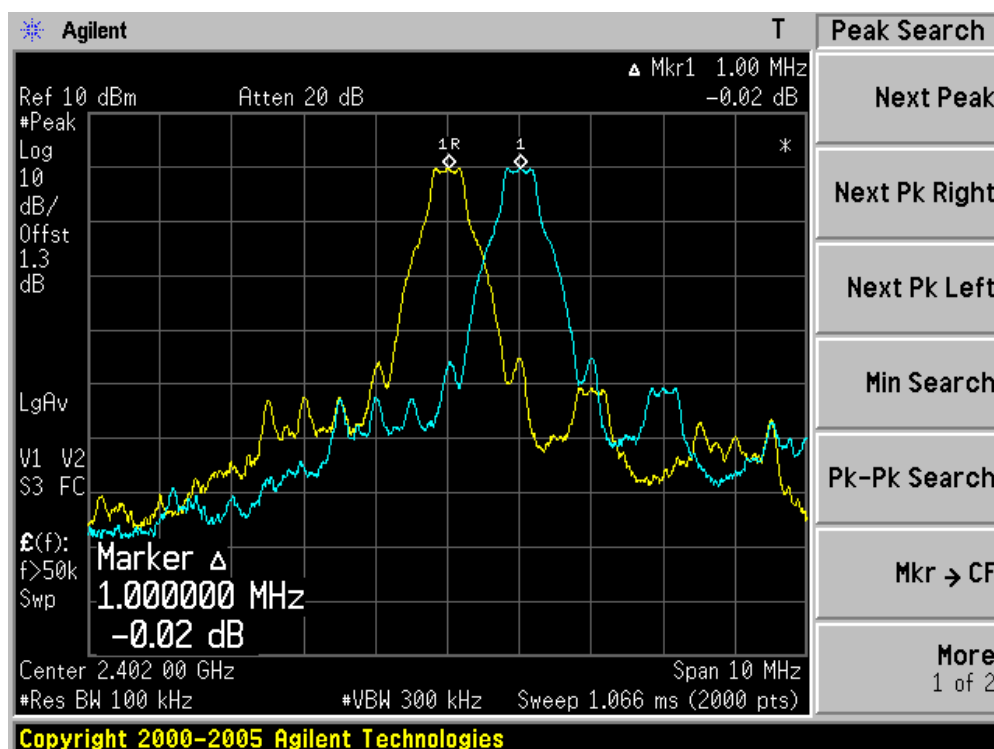
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

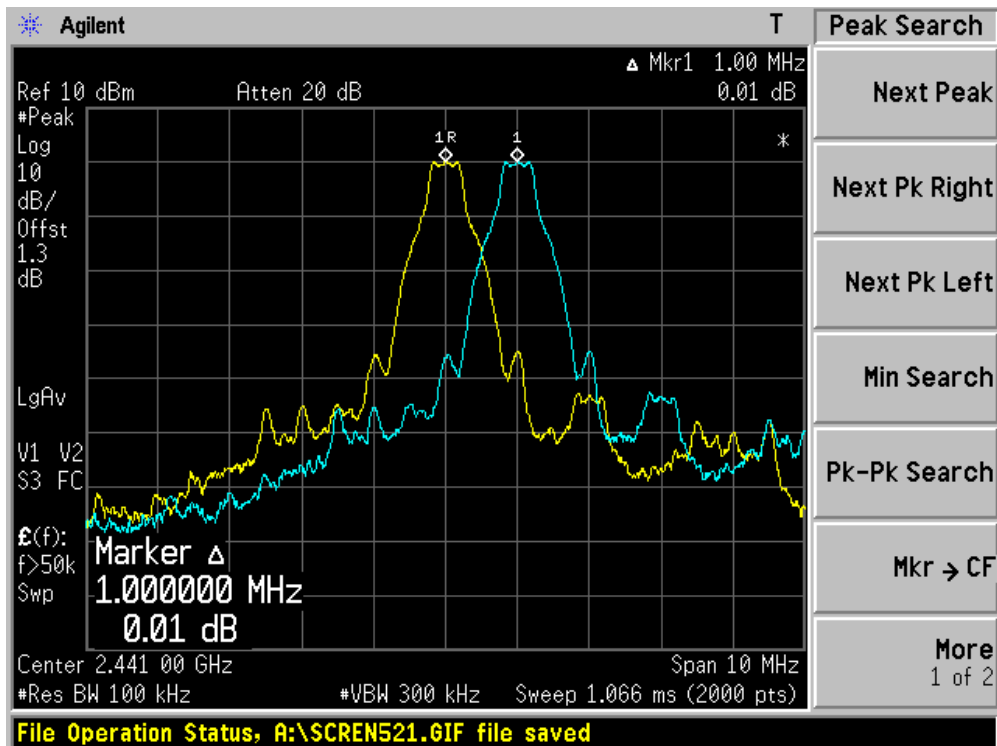
Product	:	Bluetooth Handsfree Speaker
Test Item	:	Carrier Frequency Separation
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

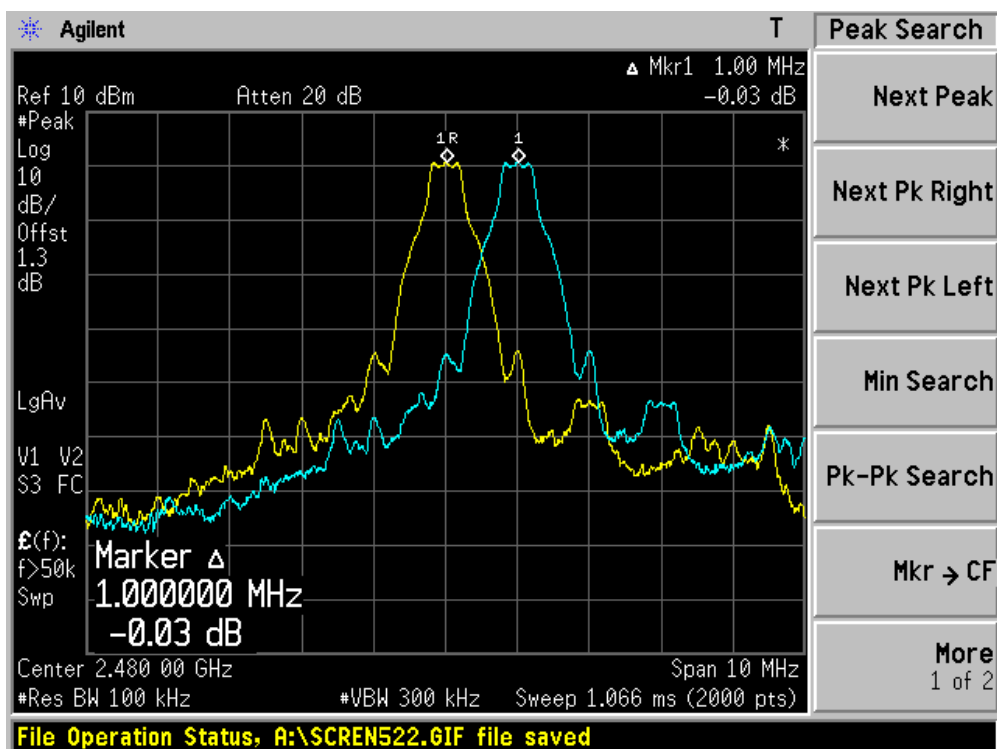
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



7. Number of Hopping Frequencies

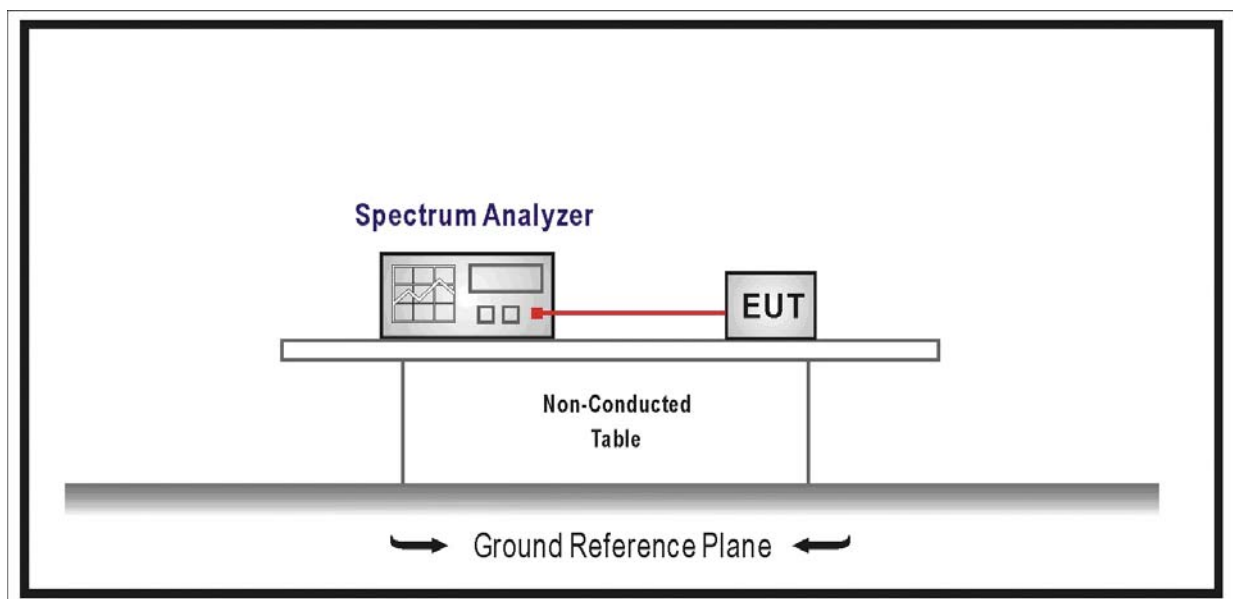
7.1. Test Equipment

Number of Hopping Frequencies / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies.
- For frequency hopping systems operating in 902-928 MHz band shall use at least 50 hopping frequencies.
- For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.

7.5. Uncertainty

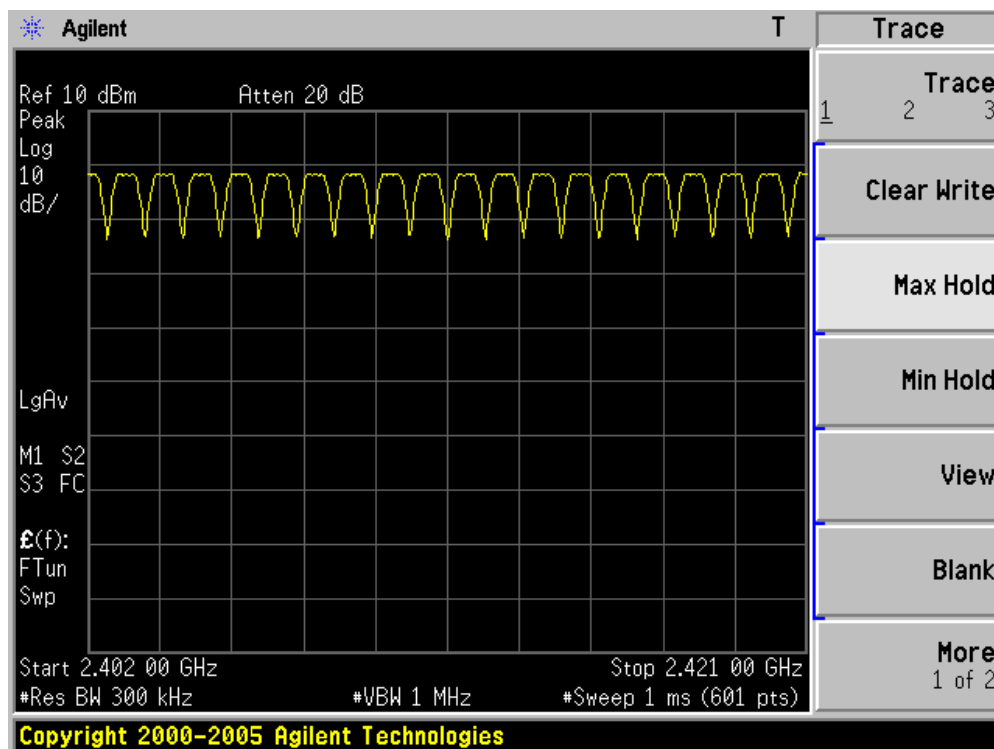
The measurement uncertainty is defined as ± 1 kHz

7.6. Test Result

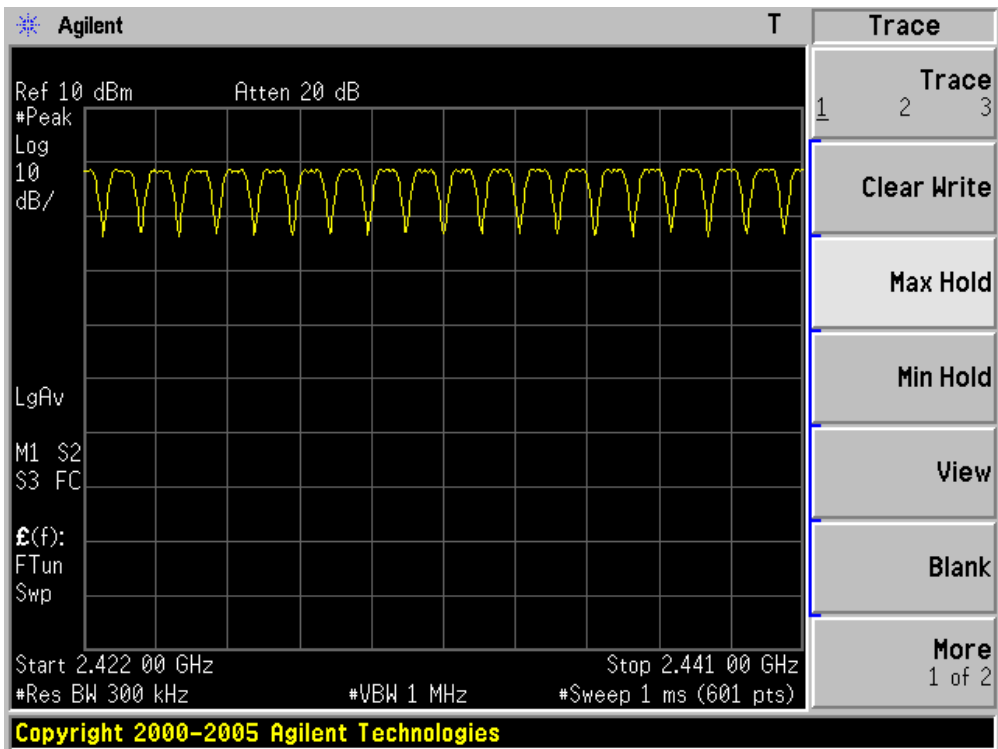
Product	:	Bluetooth Handsfree Speaker
Test Item	:	Number of Hopping Frequencies
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

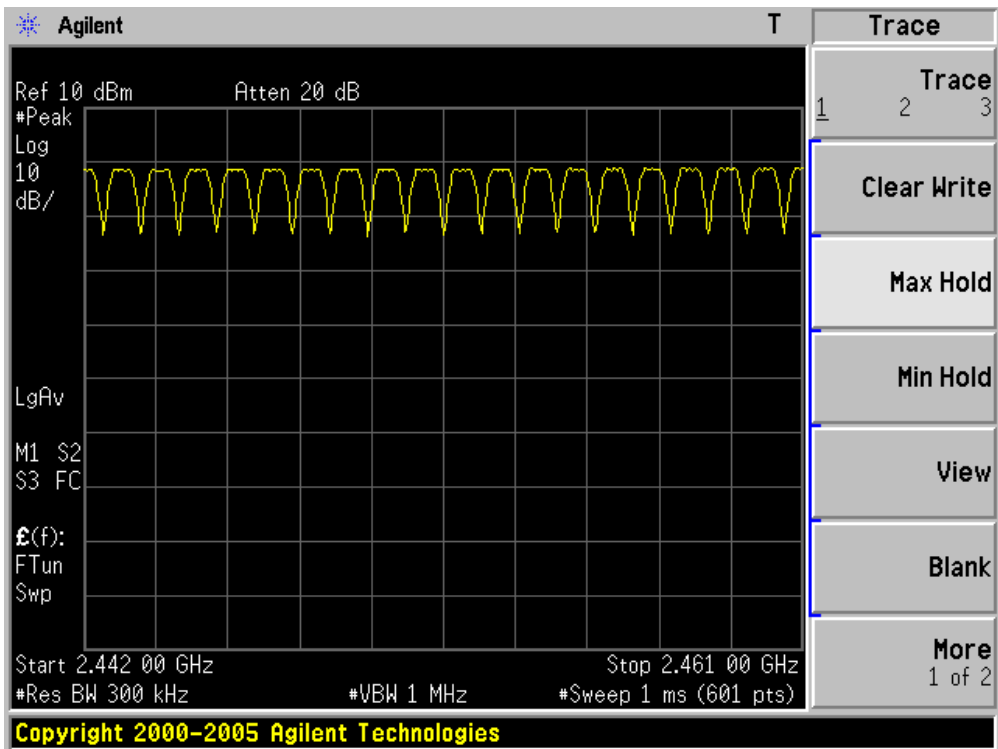
2402 - 2421 MHz



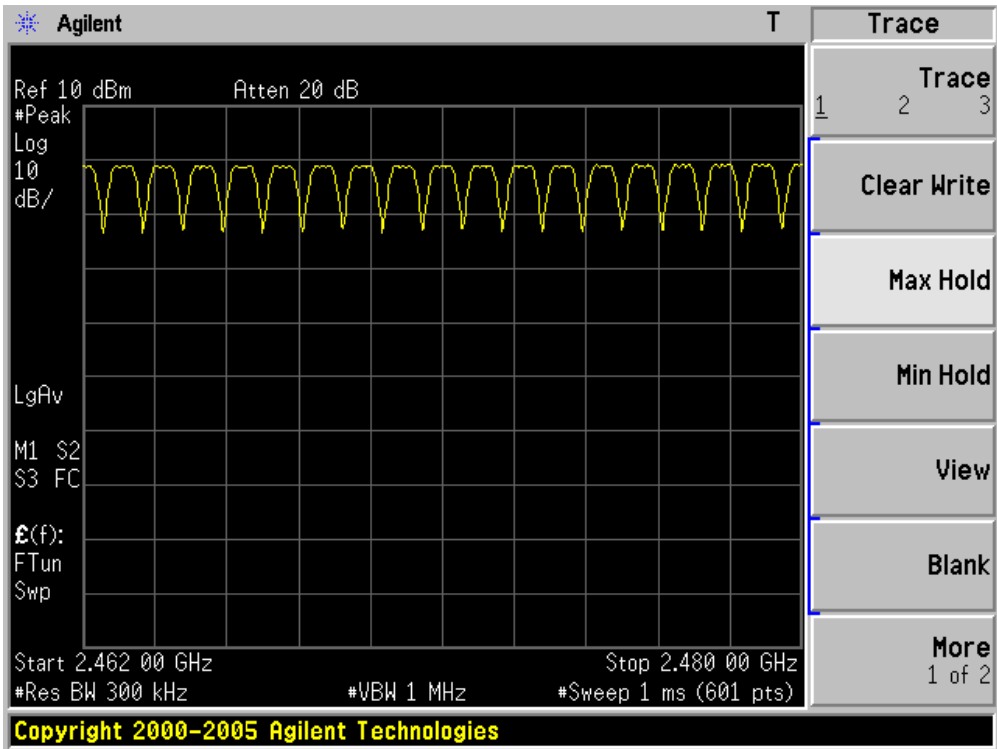
2422 - 2441 MHz



2442 - 2461 MHz



2462 - 2480 MHz



8. Time of Occupancy (Dwell Time)

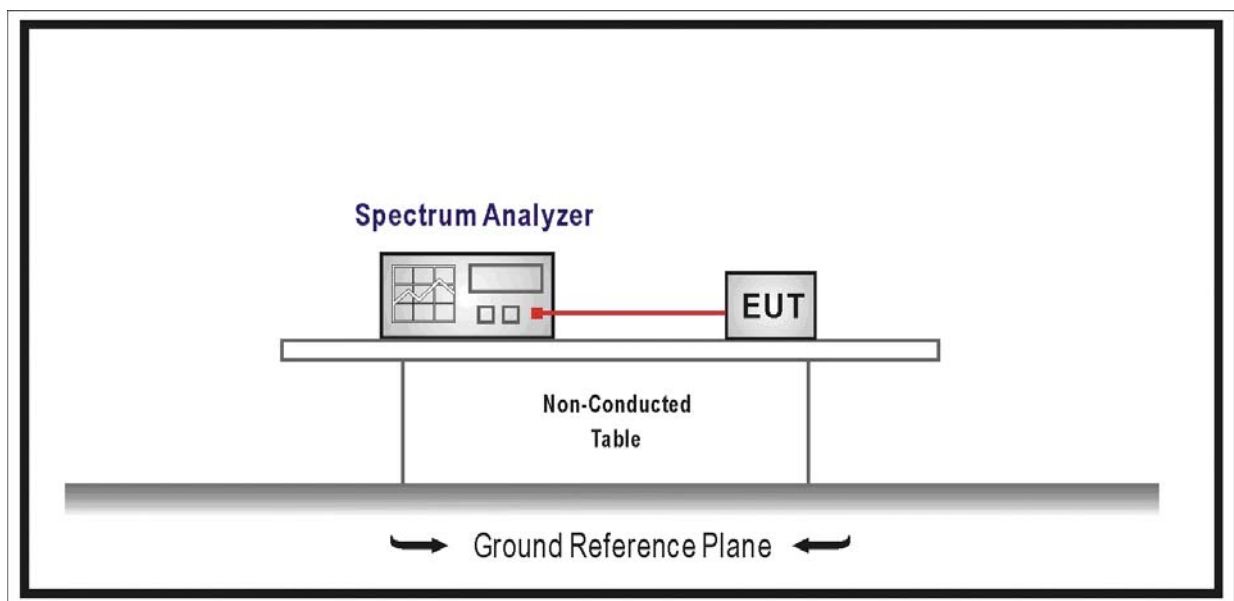
8.1. Test Equipment

Time of Occupancy (Dwell Time) / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.
- Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1MHz

VBW $\geq$ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

8.5. Uncertainty

The measurement uncertainty is defined as ± 0.1 us

8.6. Test Result

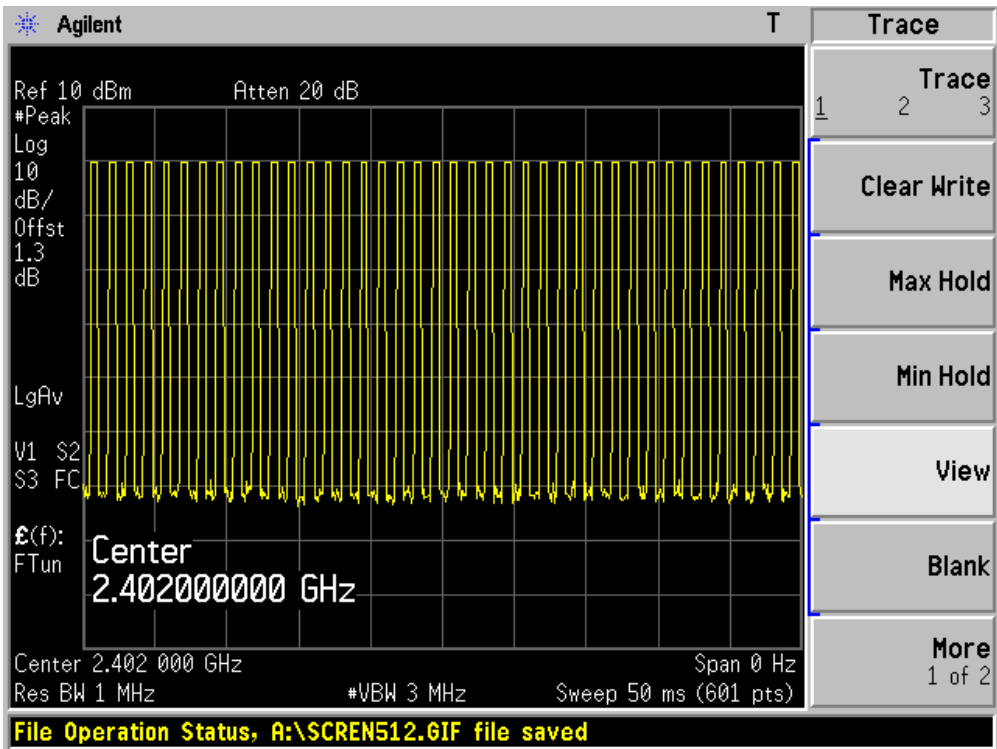
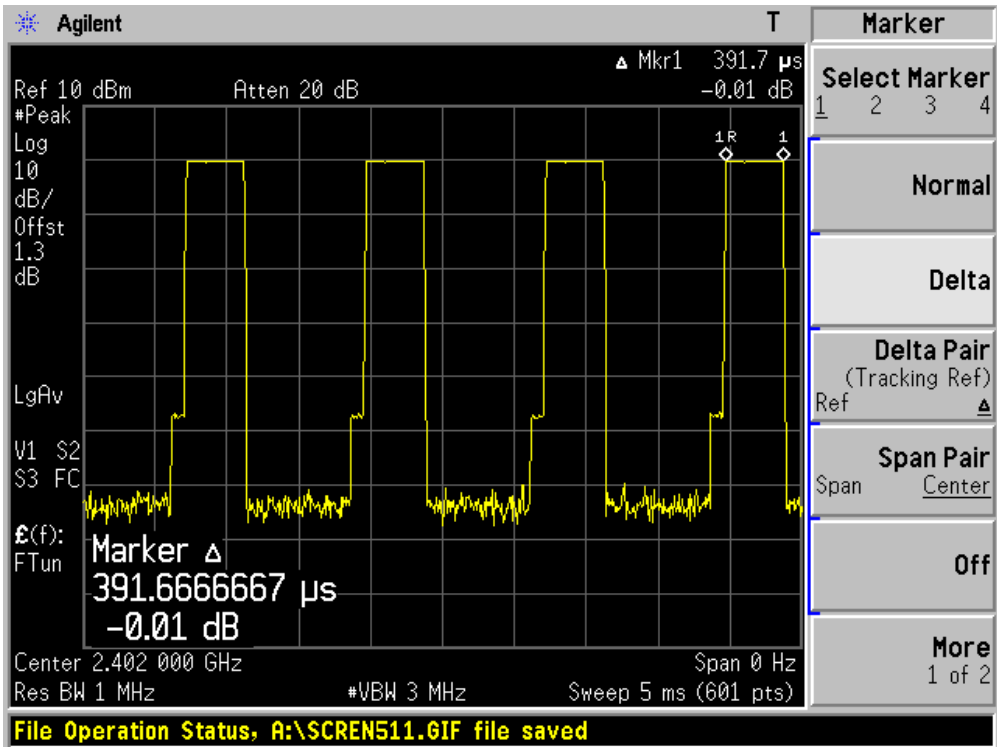
Product	:	Bluetooth Handsfree Speaker
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
00	2402	125.344	< 400	Pass
39	2441	122.656	< 400	Pass
78	2480	122.656	< 400	Pass

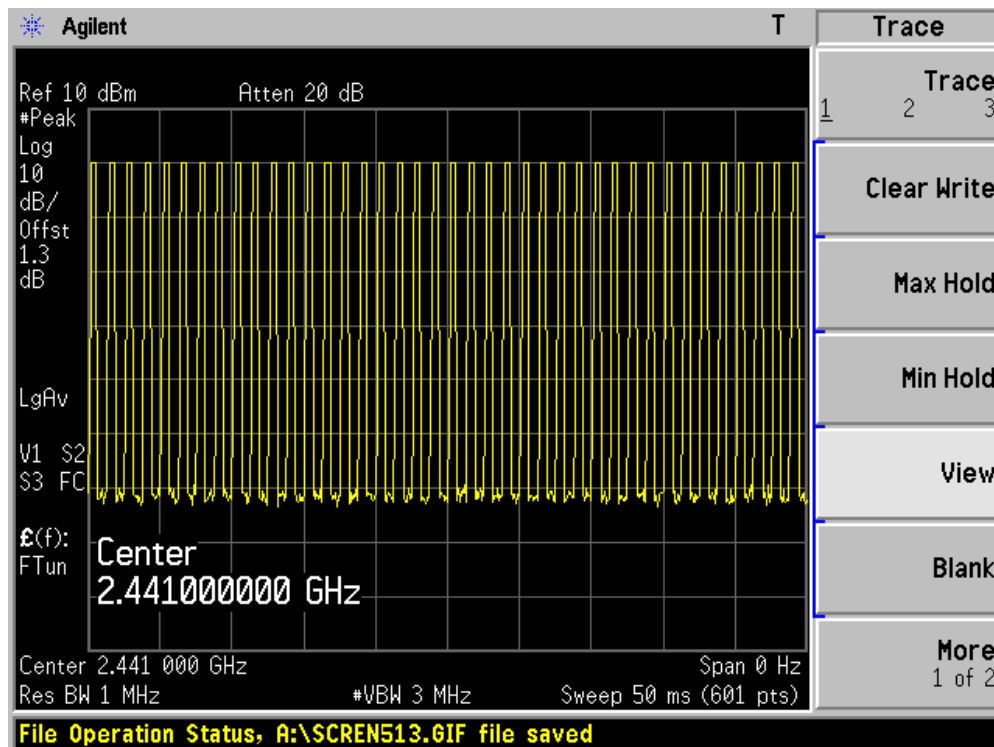
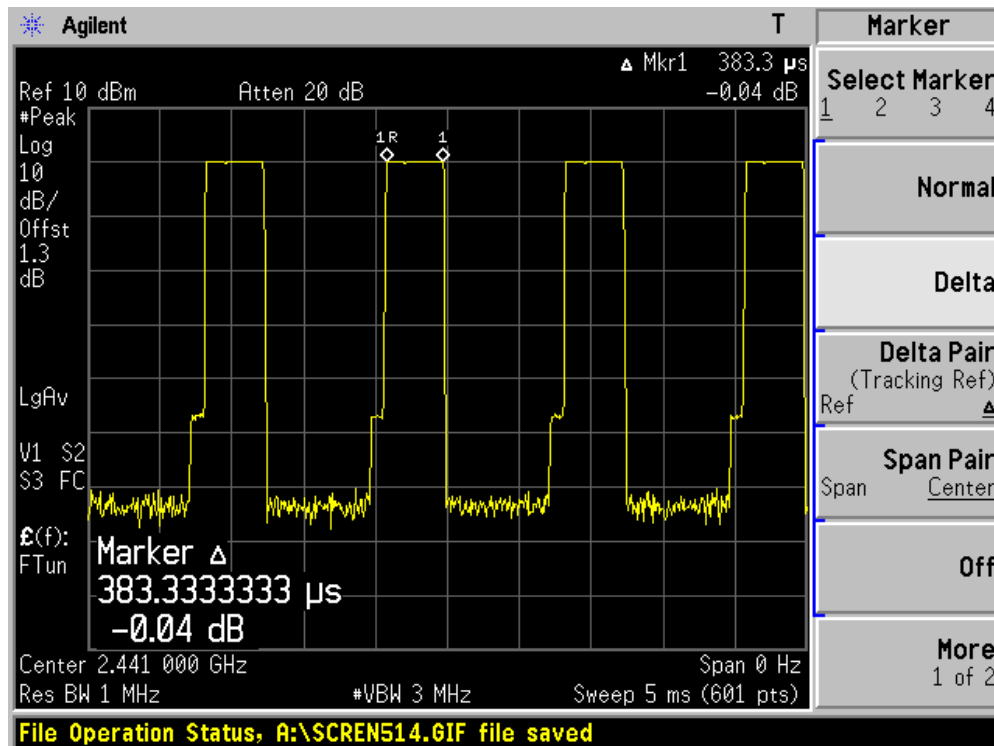
Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $40/50\text{msec} = 800\text{ hops/sec}$.

- 2402MHz, The Maximum Occupancy Time Within 31.6sec: $(391.7 \mu\text{s} \times 800) / 79 \times 31.6 = 125.344\text{msec}$
- 2441MHz, The Maximum Occupancy Time Within 31.6sec: $(383.3 \mu\text{s} \times 800) / 79 \times 31.6 = 122.656\text{msec}$
- 2480MHz, The Maximum Occupancy Time Within 31.6sec: $(391.7 \mu\text{s} \times 800) / 79 \times 31.6 = 125.344\text{msec}$

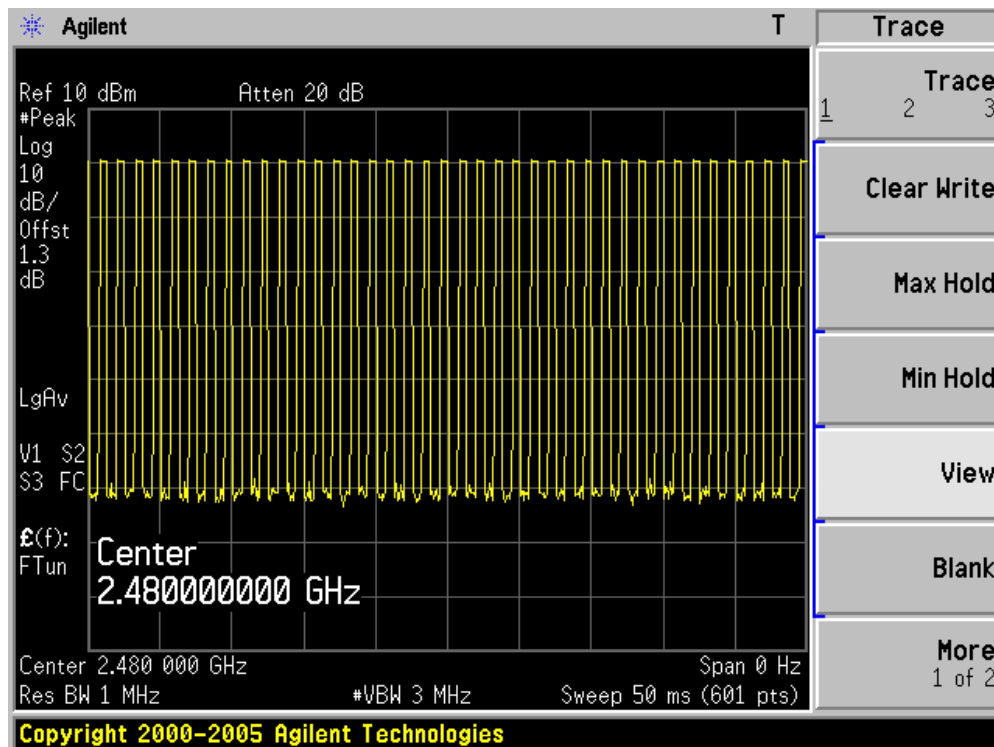
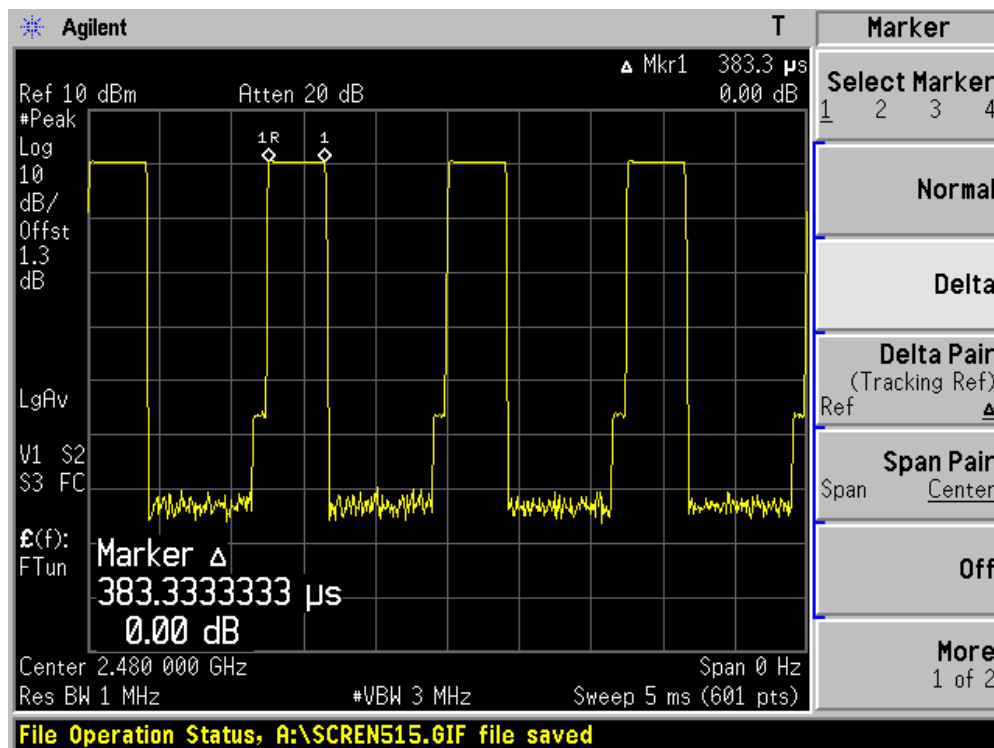
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



9. Peak Output Power

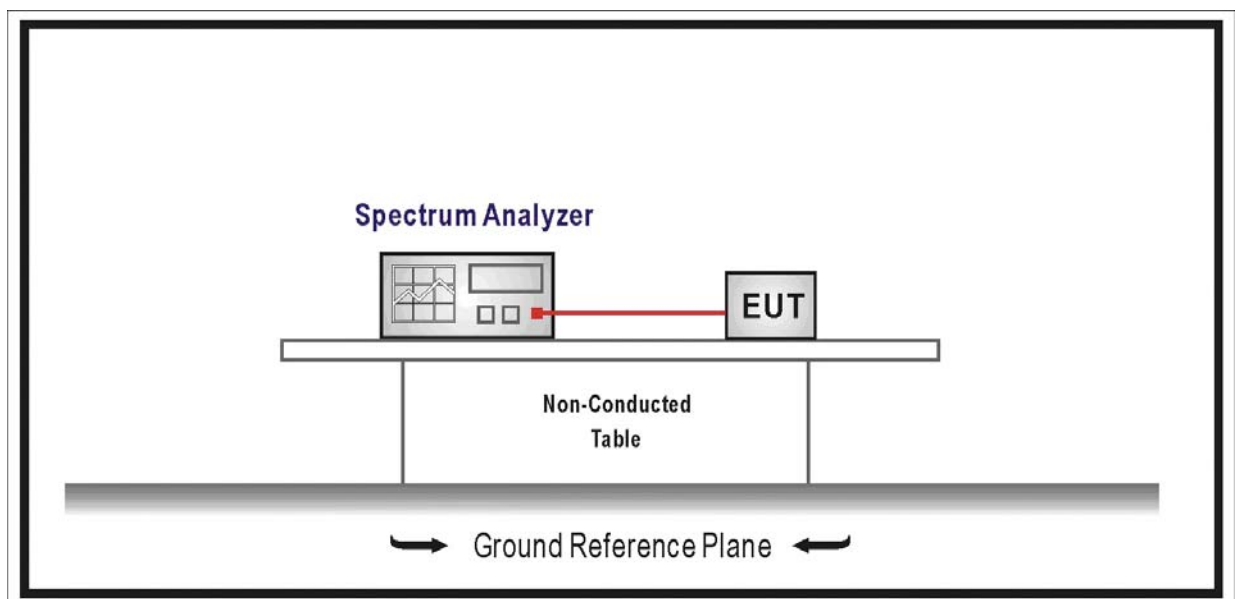
9.1. Test Equipment

Peak Output Power / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
- For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

Use the following spectrum analyzer settings:

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

RBW > the 20 dB bandwidth of the emission being measured.

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (don't forget added the external attenuation and cable loss).

9.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

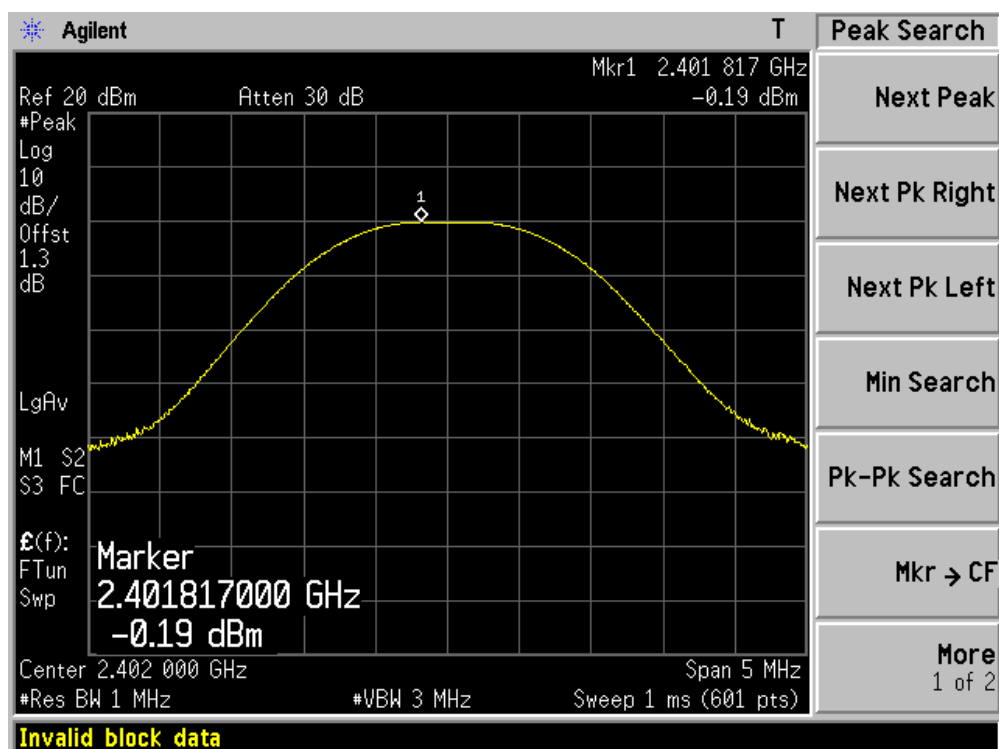
9.6. Test Result

Product	:	Bluetooth Handsfree Speaker
Test Item	:	Peak Output Power
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

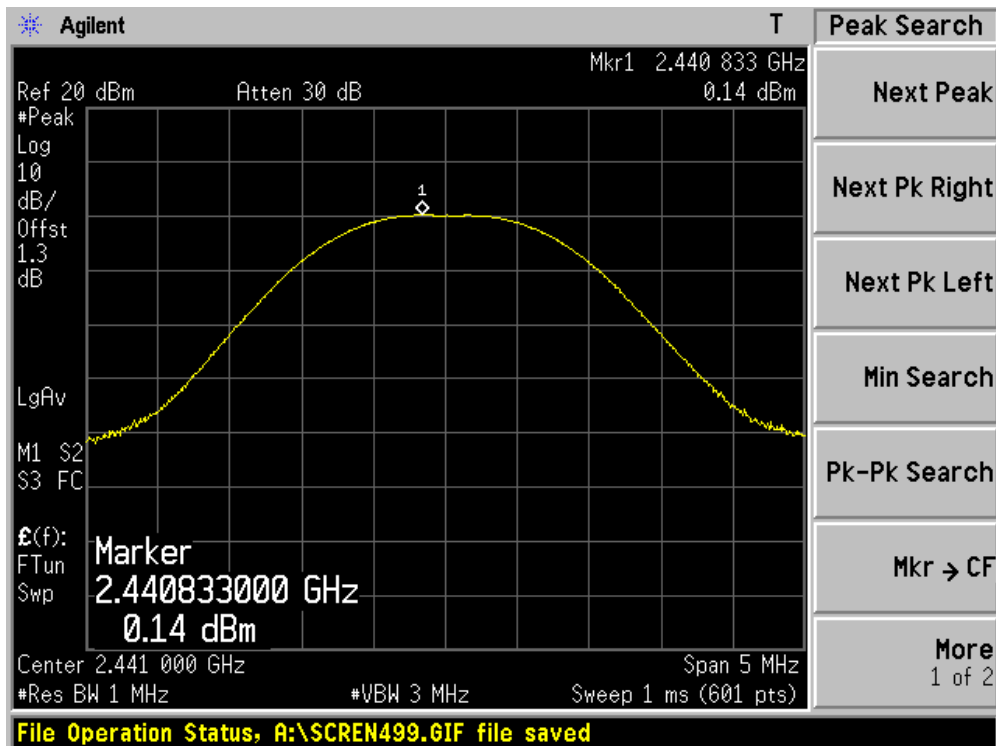
Channel No.	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Result
00	2402	-0.19	30	Pass
39	2441	0.14	30	Pass
78	2480	0.63	30	Pass

Note: The antenna gain of transmitter is less than 6dBi and other than fixed point-to-point operation, therefore the limit is 30dBm.

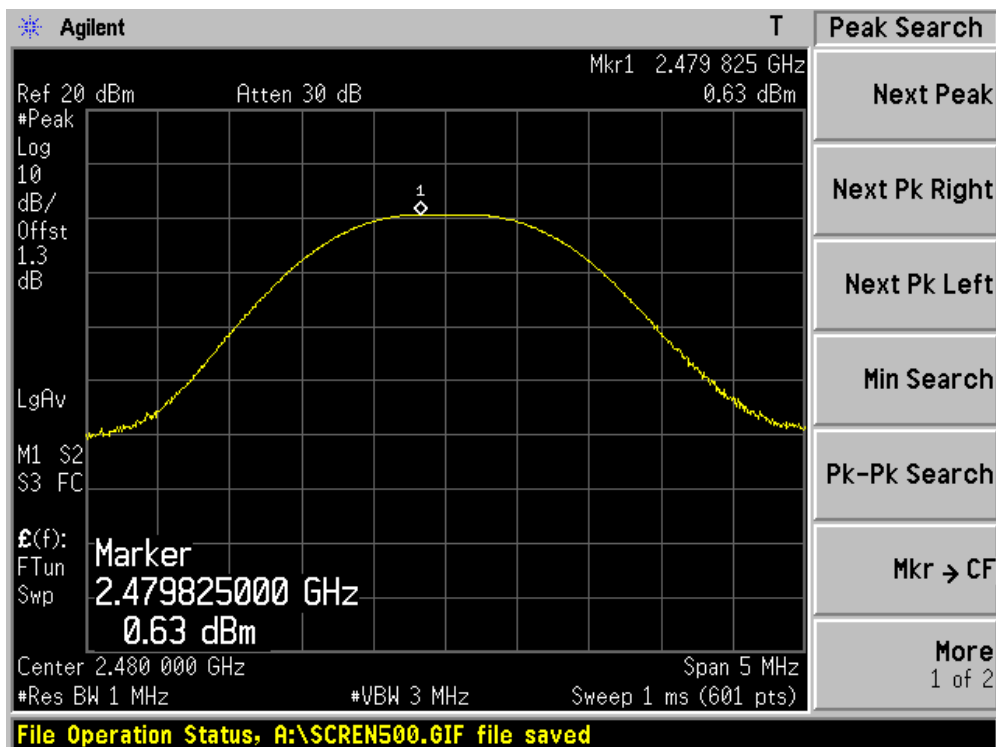
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



10. Band-edge Compliance of RF Conducted Emissions

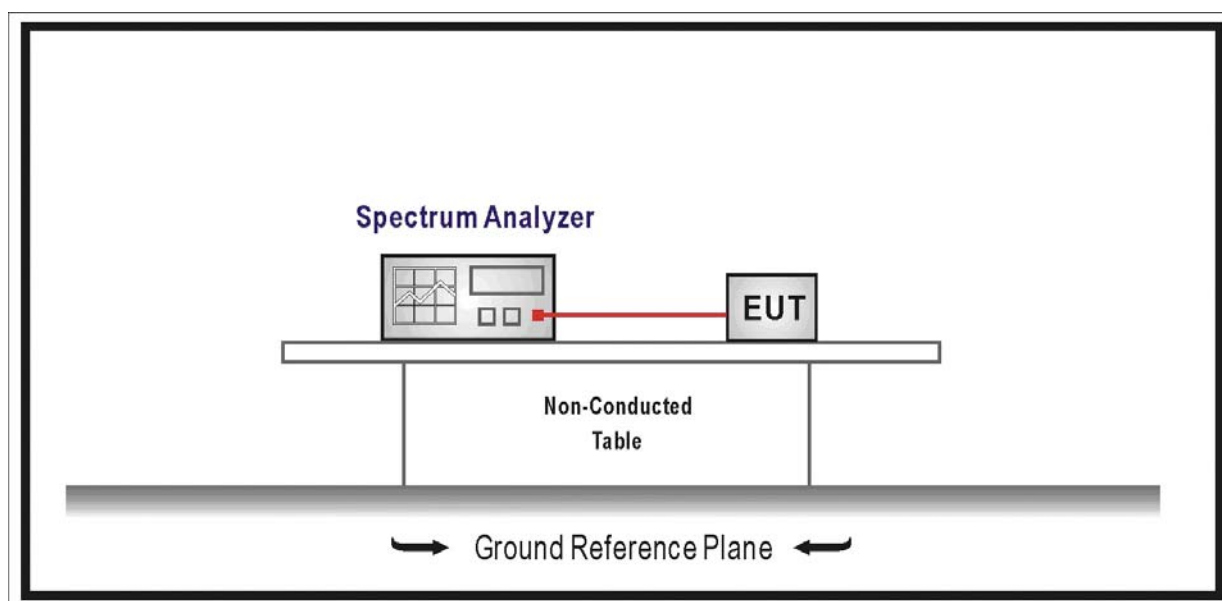
10.1. Test Equipment

Band-edge Compliance of RF Conducted Emissions / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

- Intentional radiators operating under the alternative provisions to the general emission limits as contained in 15.217 through 15.257 and in Subpart E of FCC part 15, must be designed to ensure that 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
- 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

10.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation.

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge.

Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

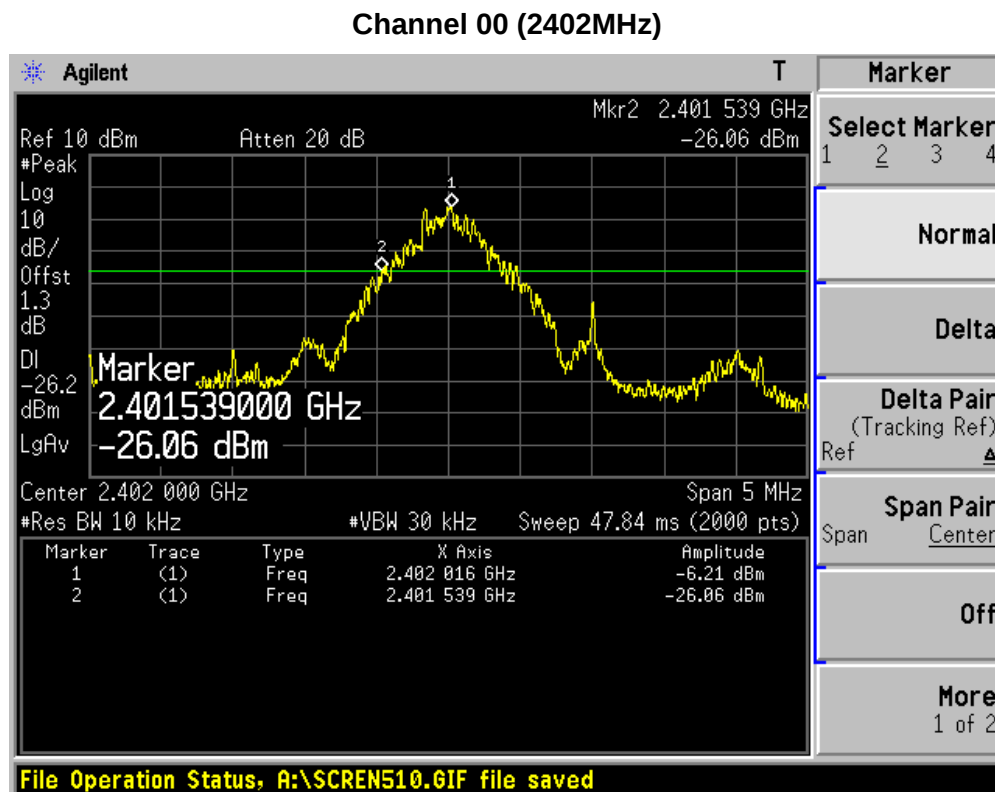
Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

10.5. Uncertainty

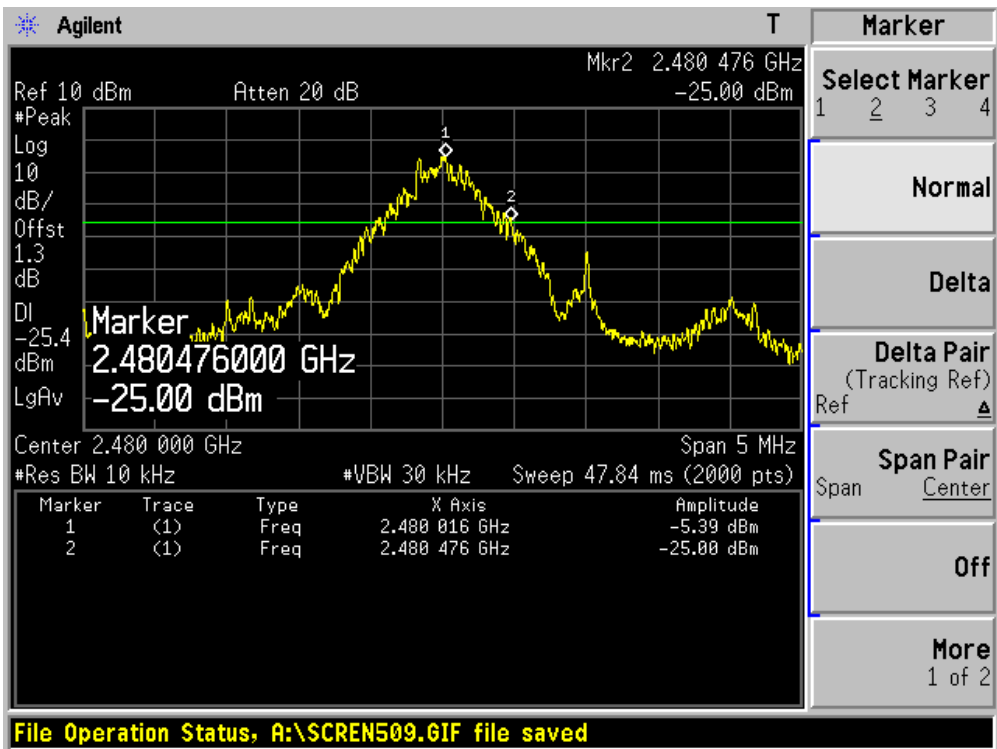
The measurement uncertainty is defined as ± 1.0 dB

10.6. Test Result

Product	:	Bluetooth Handsfree Speaker
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit



Channel 78 (2480MHz)



11. Spurious RF Conducted Emissions

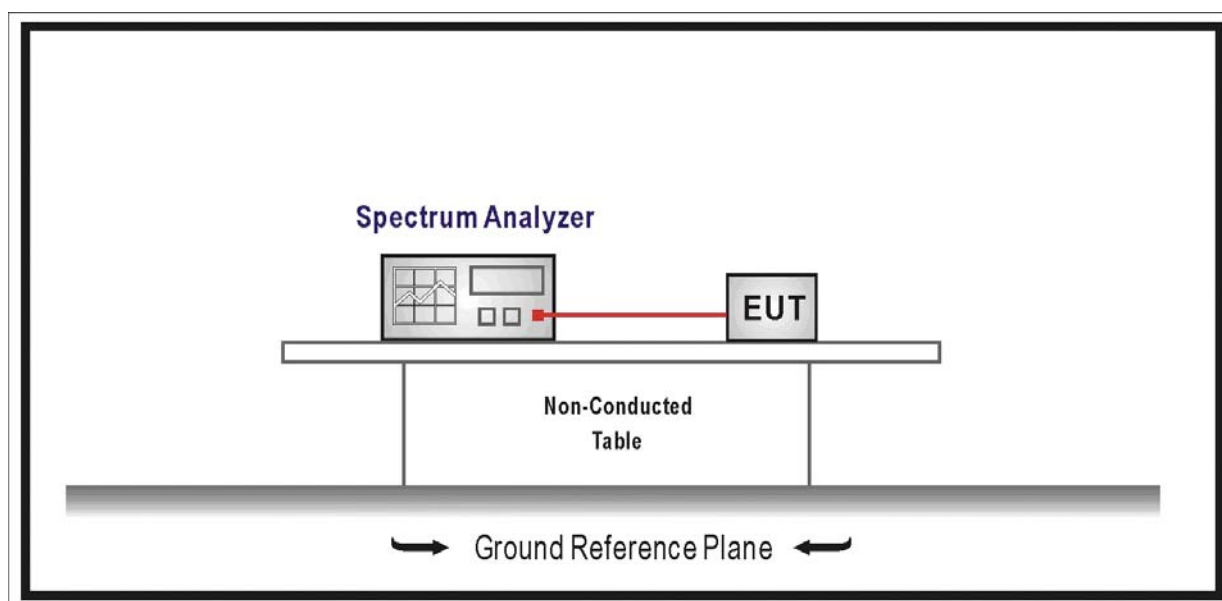
11.1. Test Equipment

Spurious RF Conducted Emissions / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

11.2. Test Setup



11.3. 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this

paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

11.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

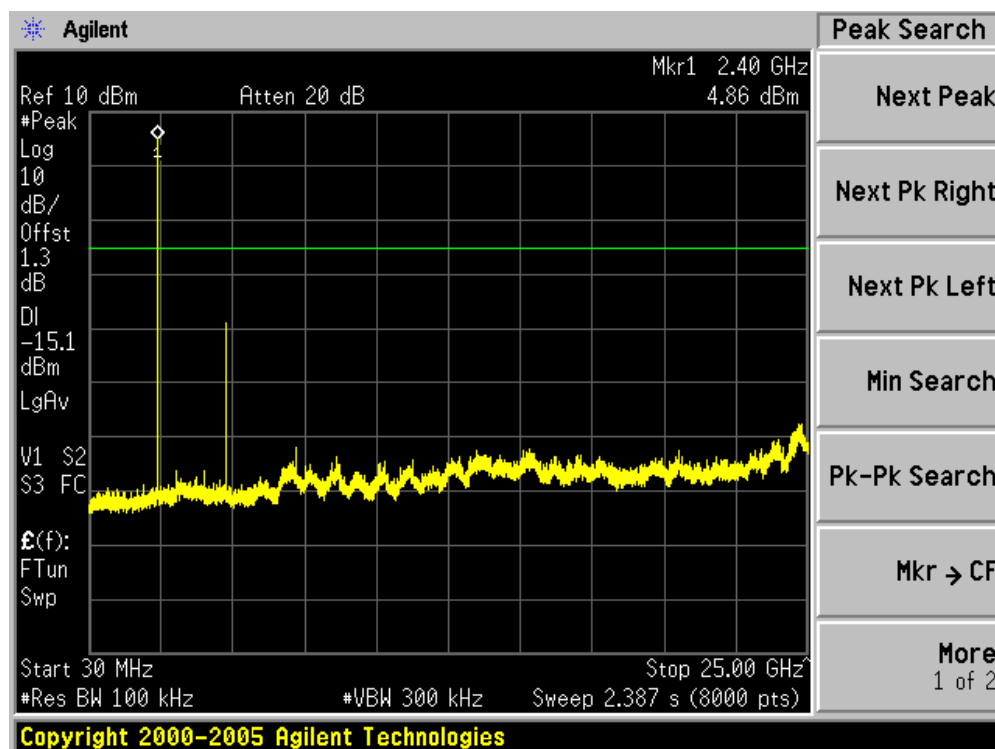
11.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

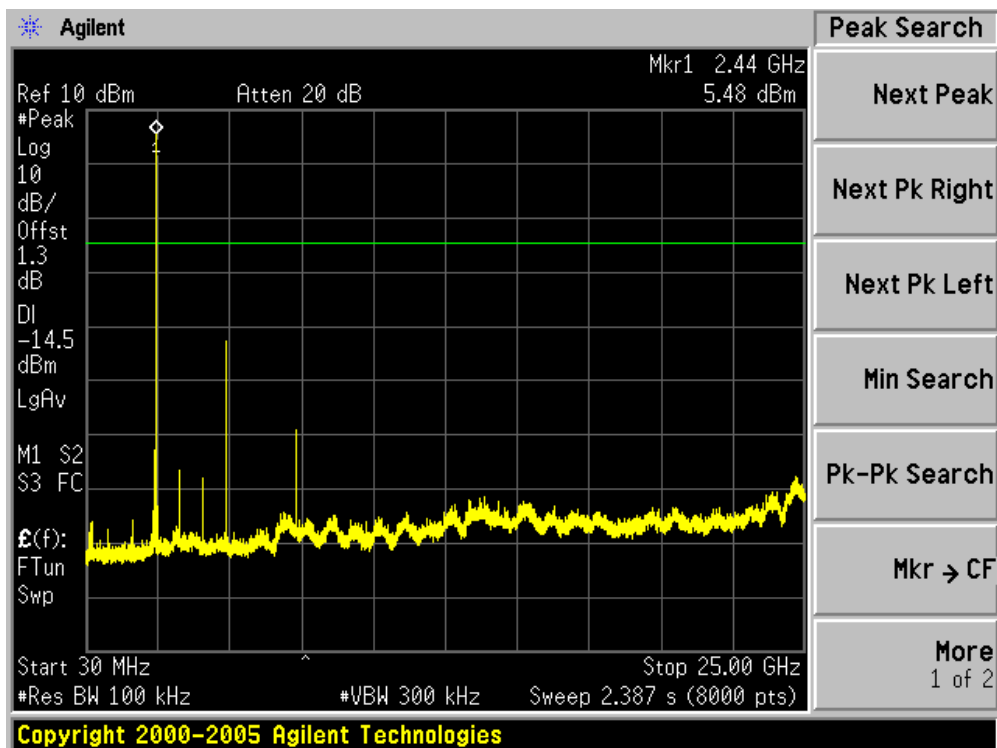
11.6. Test Result

Product	:	Bluetooth Handsfree Speaker
Test Item	:	Spurious RF Conducted Emissions
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

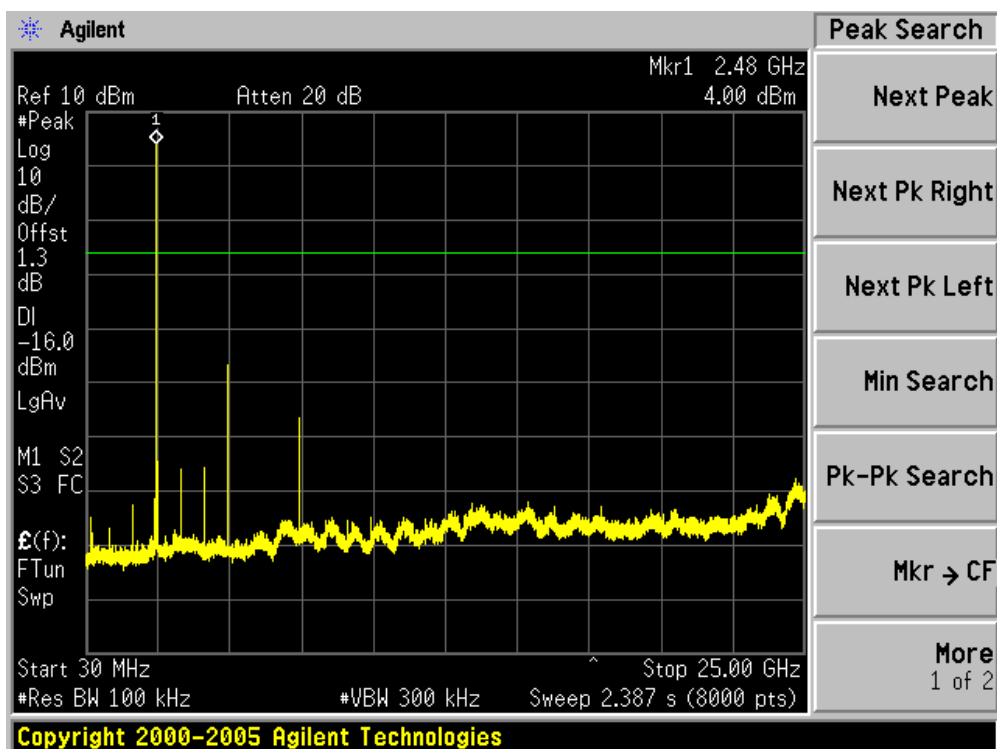
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



12. Radiated Emission Band Edge

12.1. Test Equipment

☒ Radiated Emission Band Edge / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2008/06/11
EMI Test Receiver	R&S	ESCI	100573	2008/05/10
Preamplifier	Quietek	AP-025C	QT-AP003	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112B	2932	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2008/06/28
50ohm Coaxial Switch	Anritsu	MP59B	6200447304	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	04	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2008/03/31

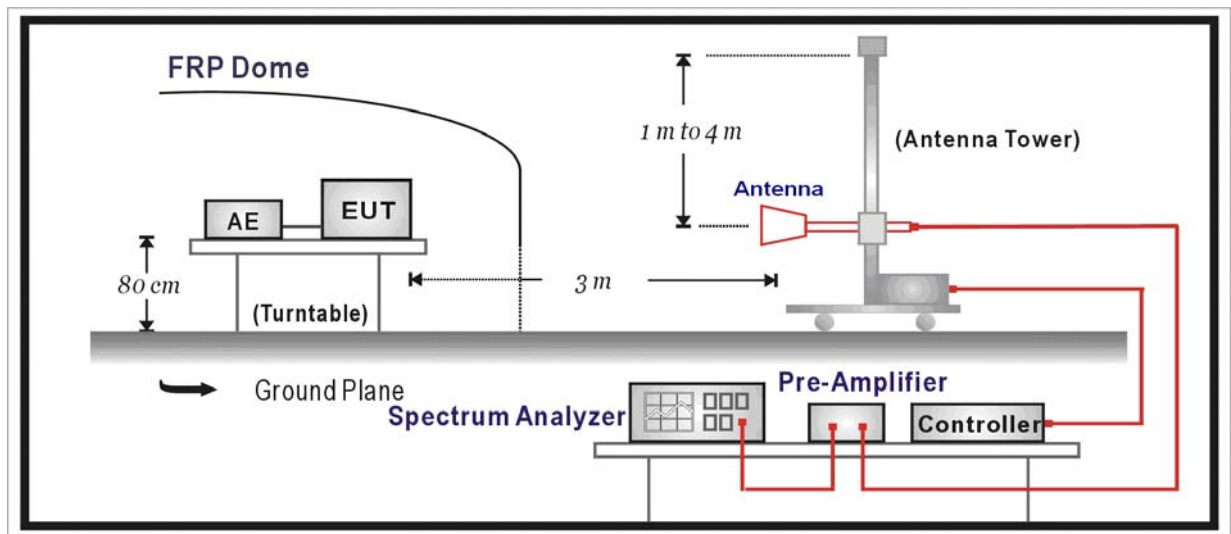
☐ Radiated Emission Band Edge / AC-3

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2008/04/24
EMI Test Receiver	R&S	ESCI	100176	2007/11/15
Preamplifier	Quietek	AP-025C	QT-AP004	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112D	22254	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2008/06/28
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	05	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2008/03/31

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Note 2: The test instruments marked with "X" are used to measure the final test results.

12.2. Test Setup



12.3. Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) of FCC part 15.

12.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205 of FCC part 15. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being

corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b) of FCC part 15.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209 of FCC Part 15. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit of FCC part 15.

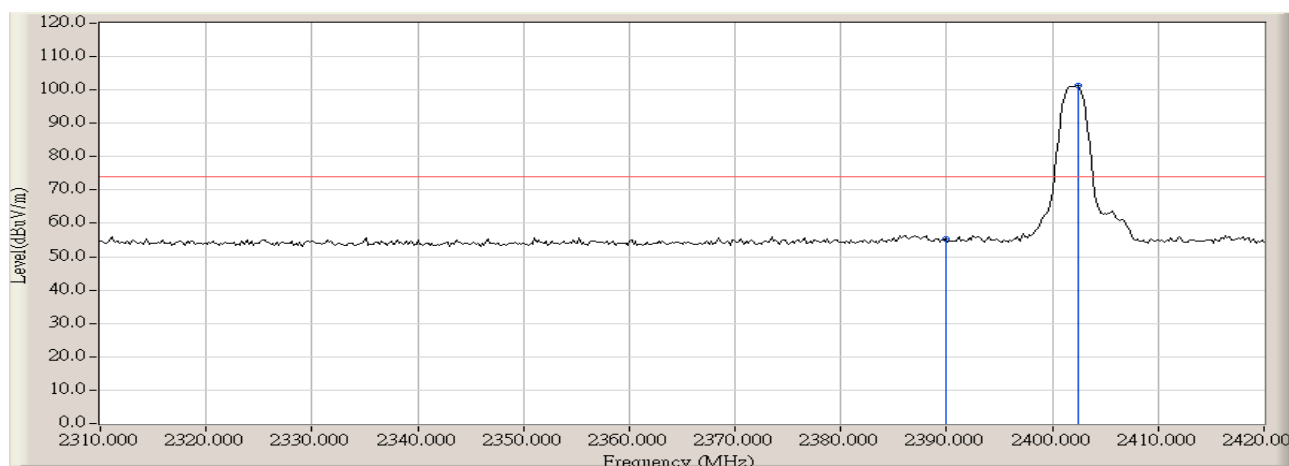
If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method may be employed.

12.5. Uncertainty

The measurement uncertainty above 1G is defined as $\pm 3.9 \text{ dB}$
below 1G is defined as $\pm 3.8 \text{ dB}$

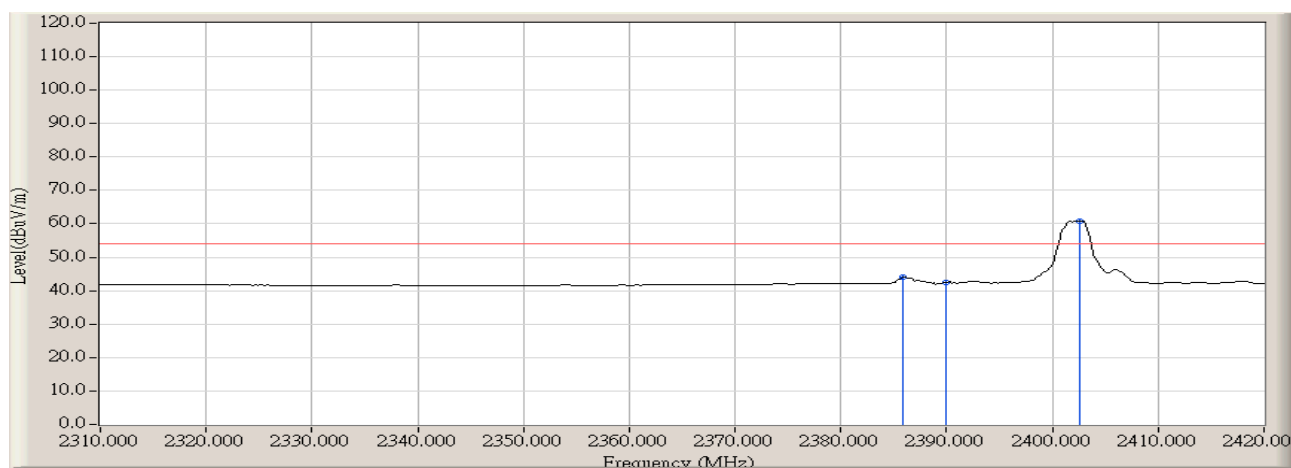
12.6. Test Result

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 11:59
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2402 MHz



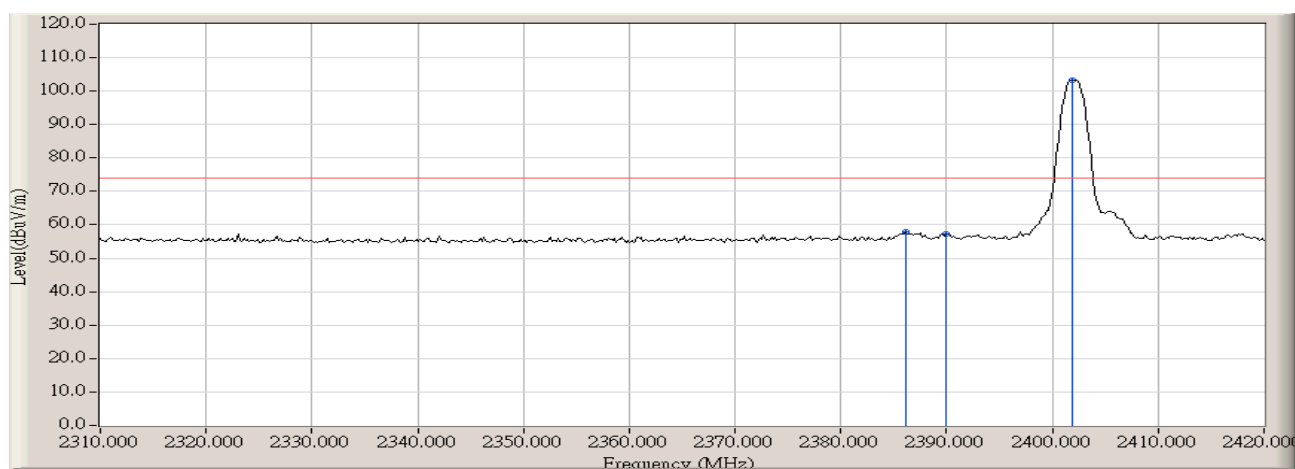
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	-3.202	58.420	55.218	-18.752	73.970	PEAK
2	*	2402.400	-3.200	104.446	101.246	N/A	N/A	PEAK

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 11:59
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2402 MHz



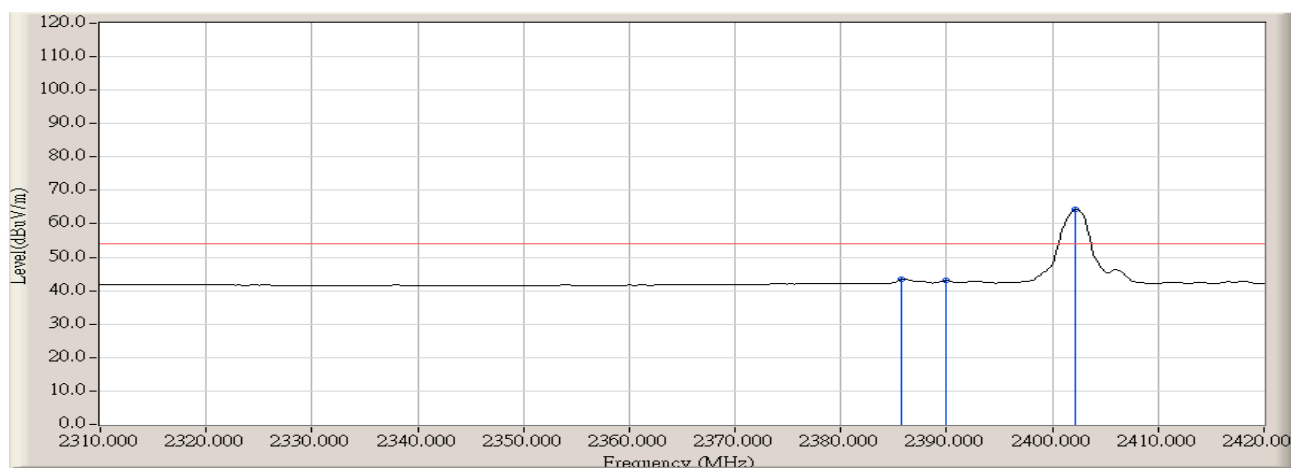
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2385.900	-3.215	47.224	44.010	-9.960	53.970	AVERAGE
2		2390.000	-3.202	45.720	42.518	-11.452	53.970	AVERAGE
3	*	2402.583	-3.200	64.081	60.881	N/A	N/A	AVERAGE

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 11:56
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2402 MHz



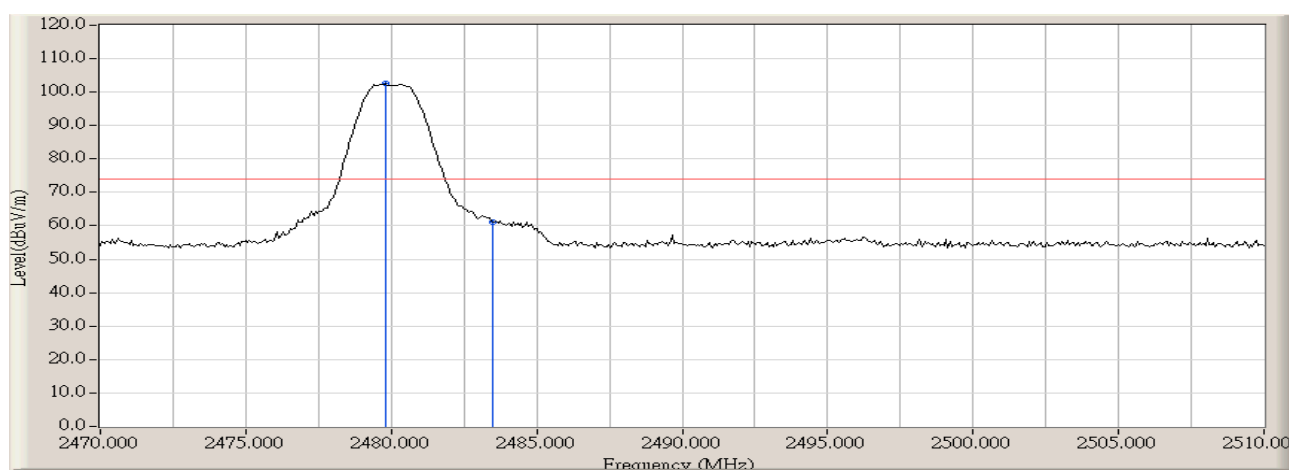
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2386.083	-3.213	61.209	57.996	-15.974	73.970	PEAK
2		2390.000	-3.202	60.603	57.401	-16.569	73.970	PEAK
3	*	2401.850	-3.200	106.454	103.255	N/A	N/A	PEAK

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 11:57
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2402 MHz



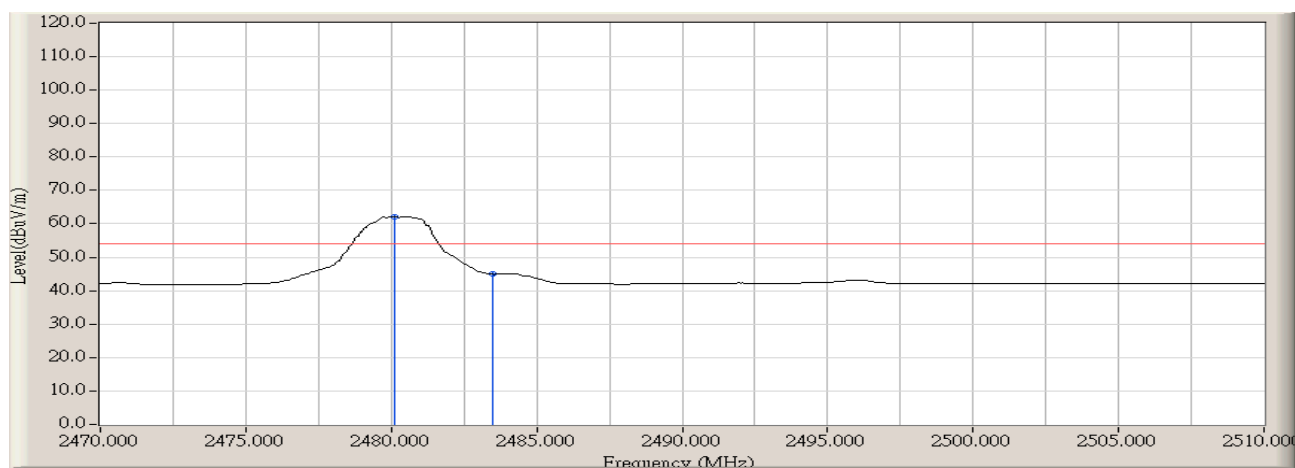
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2385.717	-3.214	46.568	43.354	-10.616	53.970	AVERAGE
2		2390.000	-3.202	46.202	43.000	-10.970	53.970	AVERAGE
3	*	2402.217	-3.199	67.397	64.197	N/A	N/A	AVERAGE

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 12:04
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2480 MHz



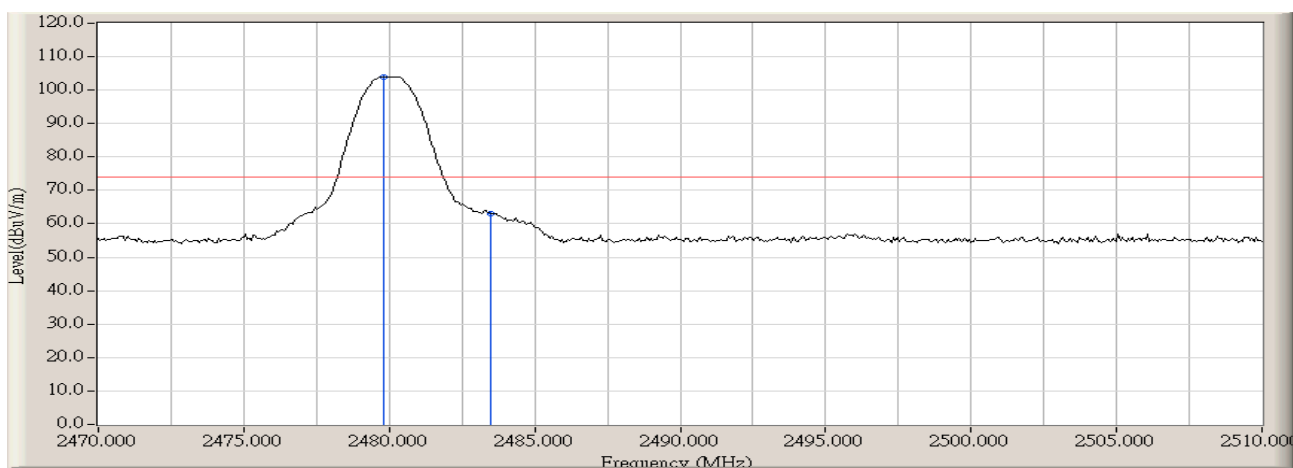
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.800	-3.187	105.745	102.557	N/A	N/A	PEAK
2		2483.500	-3.177	64.362	61.185	-12.785	73.970	PEAK

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 12:04
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2480 MHz



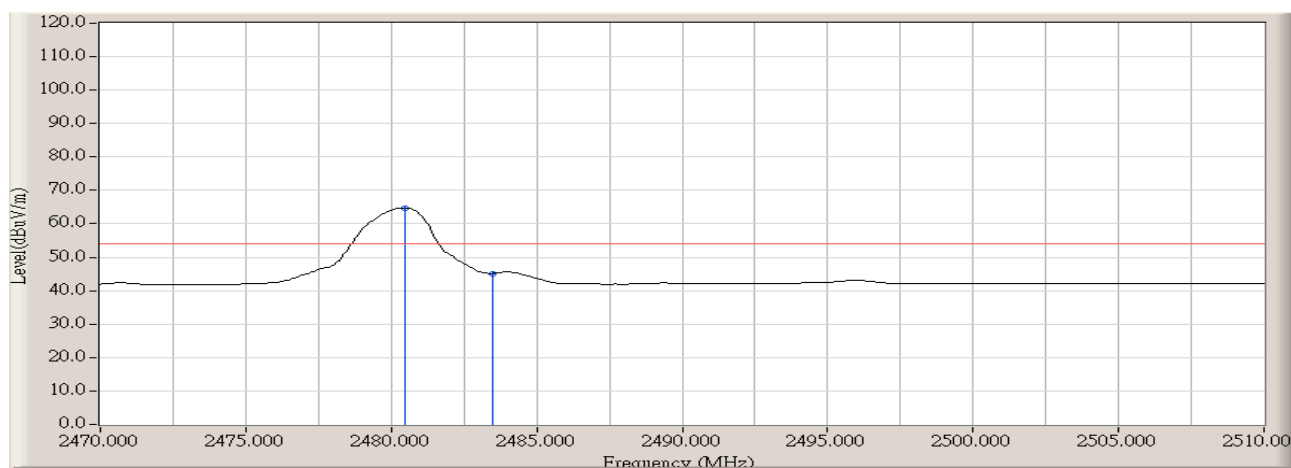
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.133	-3.187	65.399	62.212	N/A	N/A	AVERAGE
2		2483.500	-3.177	48.078	44.901	-9.069	53.970	AVERAGE

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 12:03
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2480 MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.800	-3.187	107.257	104.069	N/A	N/A	PEAK
2		2483.500	-3.177	66.303	63.126	-10.844	73.970	PEAK

Engineer : Jame	
Site : AC-2 (3m Semi-Anechoic Chamber)	Time : 2008/11/02 - 12:03
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Bluetooth Handsfree Speaker	Probe : BBHA9120D_496(1-18GHz) - VERTICAL
Power : DC 12V	Note : Mode 1:Transmit at channel 2480 MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.467	-3.186	67.942	64.756	N/A	N/A	AVERAGE
2		2483.500	-3.177	48.355	45.178	-8.792	53.970	AVERAGE