Test Report

Product Name ： Bluetooth Helmet

Model No. ： VBTH-100S

FCC ID ： VWU-VBTH-100S

Applicant ： Shanghai Hehui Safety Products Co., LTD

Address ： 8 Fengjin Rd., Fengxian District, Shanghai 201401, China

Date of Receipt ： 2007/09/27

Issued Date ： 2007/01/21

Report No. ： 07AS012-RF-US-P06V01

Test Report Certification

Issued Date : 2007/01/21
Report No. : 07AS012-RF-US-P06V01

QuieTek

Product Name	:	Bluetooth Helmet
Applicant	:	Shanghai Hehui Safety Products Co., LTD
Address	:	8 Fengjin Rd., Fengxian District, Shanghai 201401, China
Manufacturer [1]	:	Shanghai Hehui Safety Products Co., LTD
Manufacturer [2]	:	YiDong Electronic Co., LTD
Model No.	:	VBTH-100S
FCC ID	:	VWU-VBTH-100S
Rated Voltage	:	AC 120 V / 60 Hz
EUT Voltage	:	DC 3.7V
Trade Name	:	N/A
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C: 2007 ANSI C63.4: 2003
Test Result	:	Complied
Performed Location	:	SuZhou EMC laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392

Documented By : 
(Any Liu)

Reviewed By : 
(Dream Cao)

Approved By : 
(Murphy Wang)

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/
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0

1313

LinKou Testing Laboratory :

No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0

0914

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code : 200743-0

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1. General Information

1.1. EUT Description

Product Name	Bluetooth Helmet
Trade Name	N/A
Model No.	VBTH-100S
FCC ID	VWU-VBTH-100S
Working Voltage	DC 3.7V
Frequency Range	2400 - 2483.5MHz
Channel Number	79
Type of Modulation	FHSS
Channel Control	Auto
Antenna type	Multilayer ceramic antenna
Antenna Gain	2dBi

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	--	--

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 on channel (2402MHz, 2441MHz and 2480MHz)

Note: 1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.

2. This device is a composite device in accordance with Part 15 Subpart B regulations. The function for the transmitter was measured and made a test report that the report number is 07AS012-RF-US-P06V01, certified under Declaration of Conformity.

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
N/A	N/A	N/A	N/A	N/A	N/A

1.4. Configuration of Tested System

Connection Diagram


Signal Cable Type		Signal cable Description
N/A	N/A	N/A

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the EUT and connect to the special control software.
3	Set bluetooth modular work at continues transmit mode, and then test it.

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	N/A	N/A
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.209	Yes	No
Peak Power Output	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(b)(1)	Yes	No
Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)	Yes	No
Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.215(c), 15.247(d)	Yes	No
Channel Number	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)(iii)	Yes	No
Channel Separation	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)	Yes	No
Dwell Time	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)(iii)	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

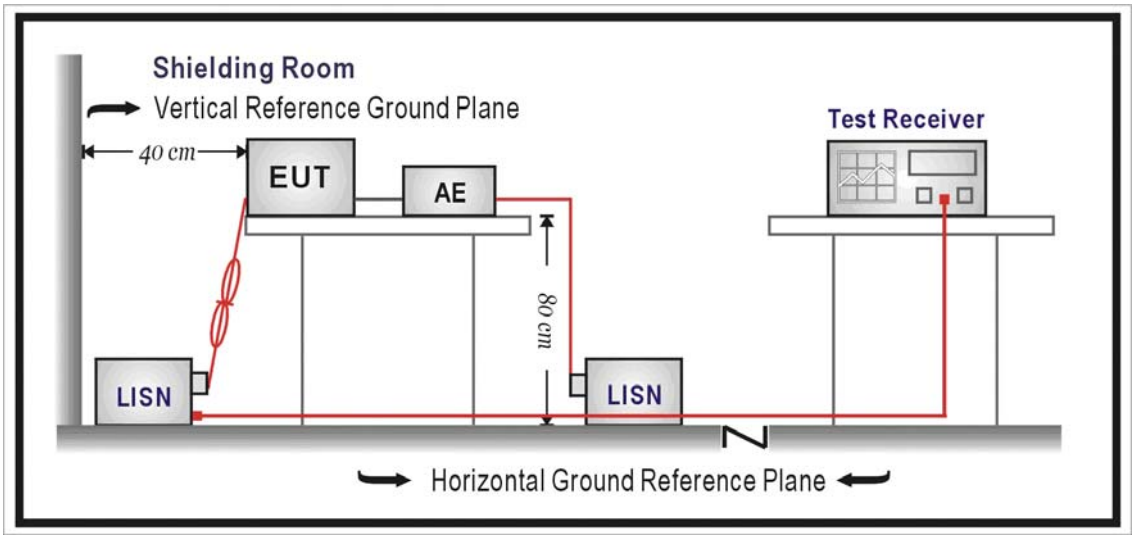
3. Conducted Emission

3.1. Test Equipment

Conducted Emission / SR-1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCI	100176	2007/11/15
Two-Line V-Network	R&S	ENV216	100013	2007/11/15
Two-Line V-Network	R&S	ENV216	100014	2007/11/15
50ohm Coaxial Switch	ANRITSU	MP59B	6200464462	2007/11/25
50ohm Termination	SHX	50ohmI	QT-IM001	2007/03/20
Coaxial Cable	Luthi	RG214	519358	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH004	2007/03/31

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
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

Remarks: In the above table, the tighter limit applies at the band edges.

3.4. Test Procedure

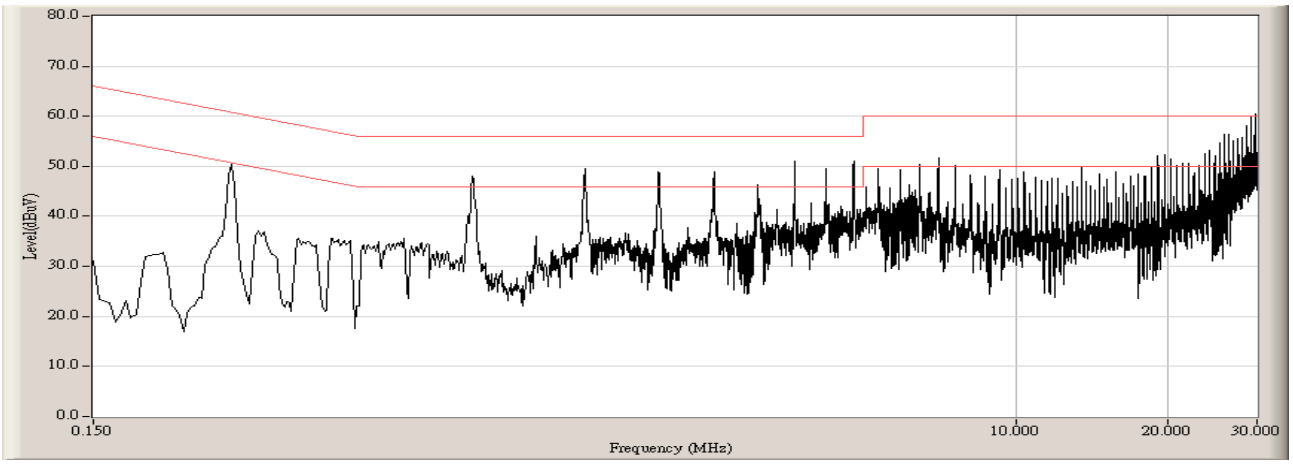
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
(Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

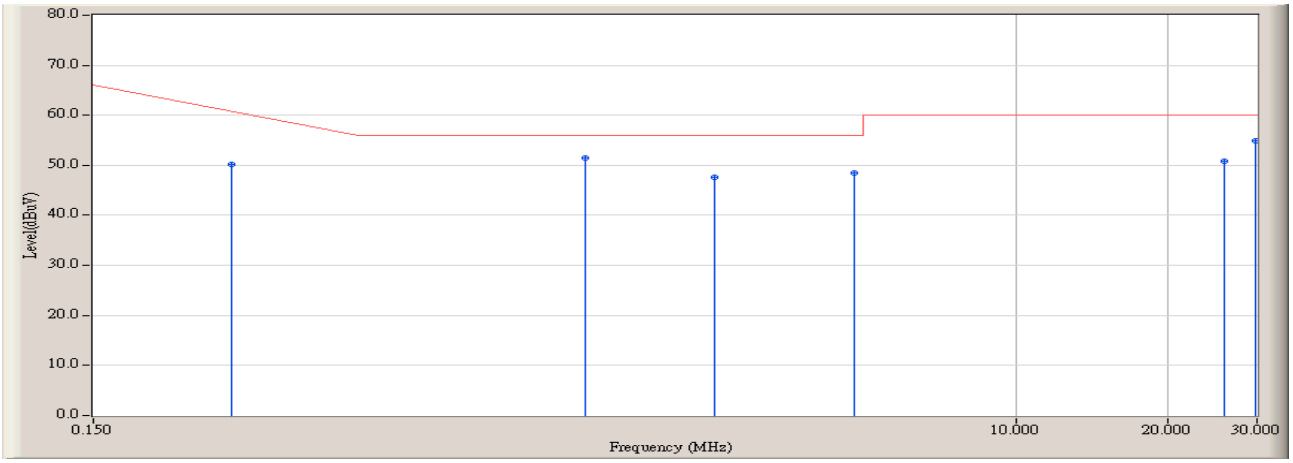
The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	**Time : 2008/01/19 - 09:10**
Limit : FCC_PART15B_B_00M_QP	**Margin : 10**
EUT : Bluetooth Headlet	**Probe : ENV216 - Line1**
Power : AC 120V/60Hz	**Note : Mode 1: Transmit**

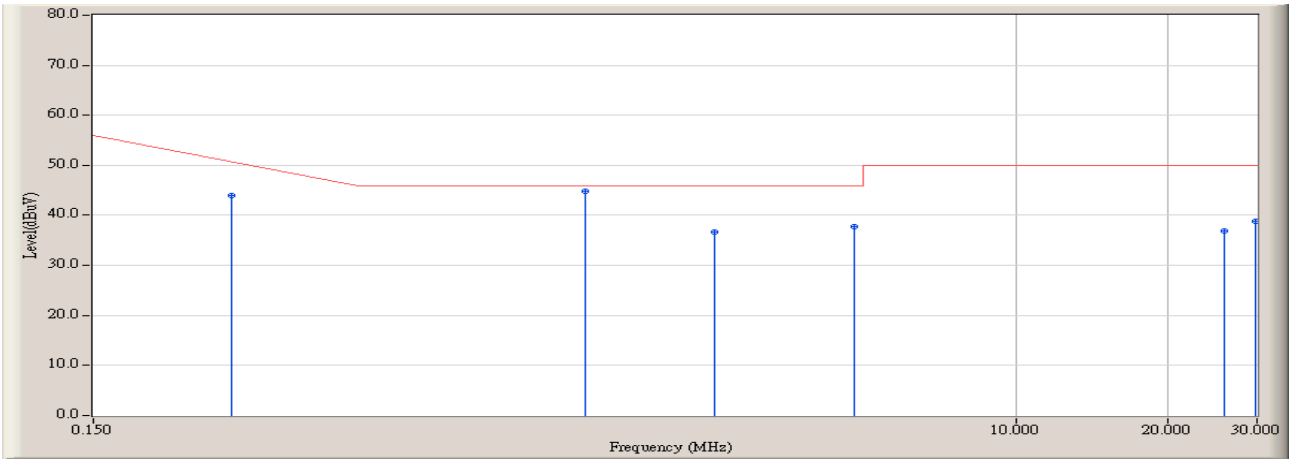


Engineer : Marlin	
Site : SR-1 (Conducted Emission)	**Time : 2008/01/19 - 09:15**
Limit : FCC_PART15B_B_00M_QP	**Margin : 0**
EUT : Bluetooth Headlet	**Probe : ENV216 - Line1**
Power : AC 120V/60Hz	**Note : Mode 1: Transmit**



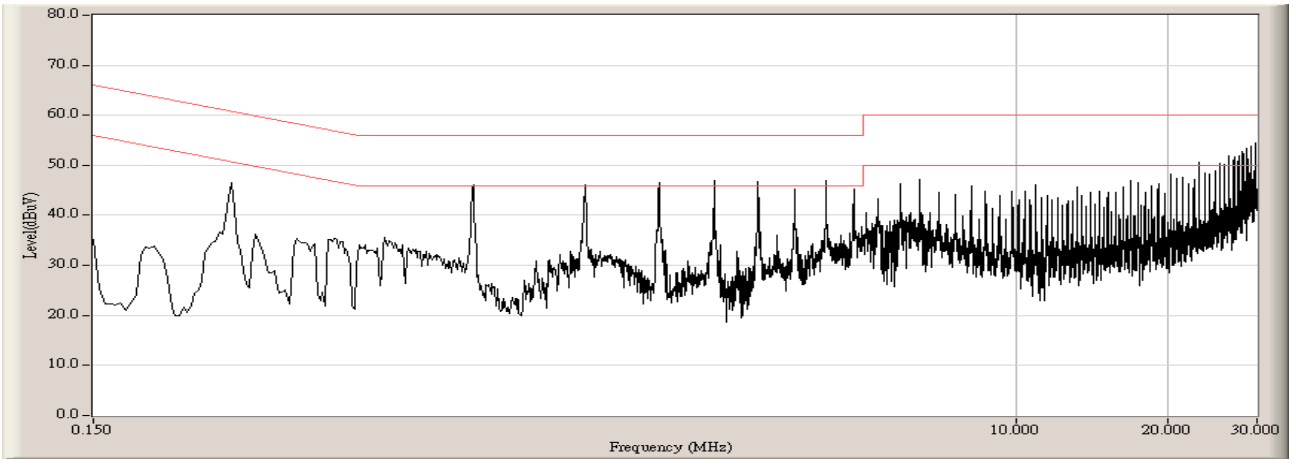
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.282	9.383	40.800	50.183	-12.046	62.229	QUASIPEAK
2	*	1.406	9.706	41.700	51.406	-4.594	56.000	QUASIPEAK
3		2.530	9.830	37.800	47.630	-8.370	56.000	QUASIPEAK
4		4.782	9.790	38.700	48.490	-7.510	56.000	QUASIPEAK
5		25.882	10.270	40.600	50.870	-9.130	60.000	QUASIPEAK
6		29.822	10.321	44.600	54.921	-5.079	60.000	QUASIPEAK

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	**Time : 2008/01/19 - 09:15**
Limit : FCC_PART15B_B_00M_AV	**Margin : 0**
EUT : Bluetooth Headlet	**Probe : ENV216 - Line1**
Power : AC 120V/60Hz	**Note : Mode 1: Transmit**

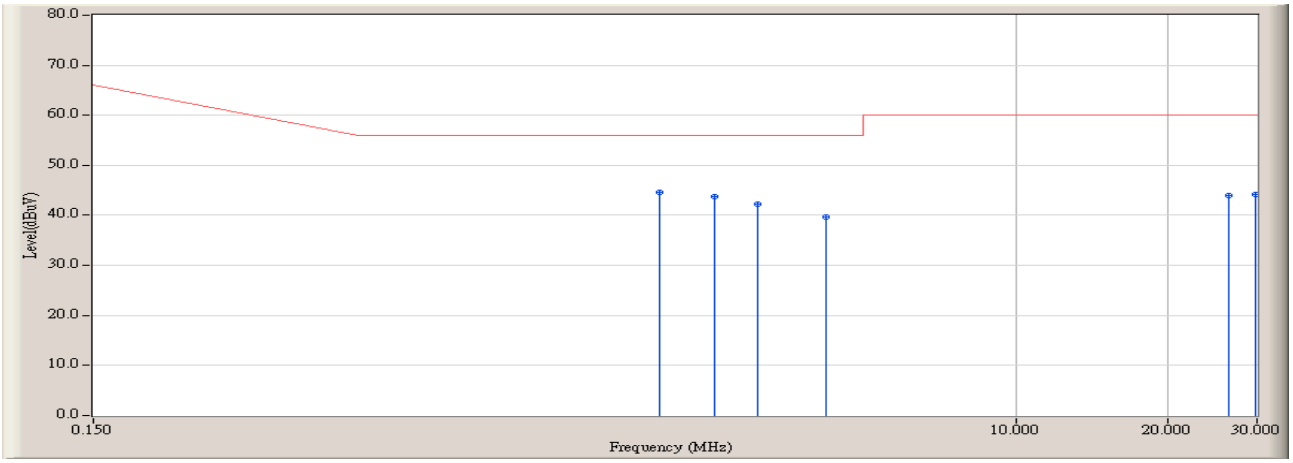


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.282	9.383	34.600	43.983	-8.246	52.229	AVERAGE
2	*	1.406	9.706	35.100	44.806	-1.194	46.000	AVERAGE
3		2.530	9.830	26.900	36.730	-9.270	46.000	AVERAGE
4		4.782	9.790	27.900	37.690	-8.310	46.000	AVERAGE
5		25.882	10.270	26.700	36.970	-13.030	50.000	AVERAGE
6		29.822	10.321	28.600	38.921	-11.079	50.000	AVERAGE

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	**Time : 2008/01/19 - 09:24**
Limit : FCC_PART15B_B_00M_QP	**Margin : 10**
EUT : Bluetooth Headlet	**Probe : ENV216 - Line2**
Power : AC 120V/60Hz	**Note : Mode 1: Transmit**

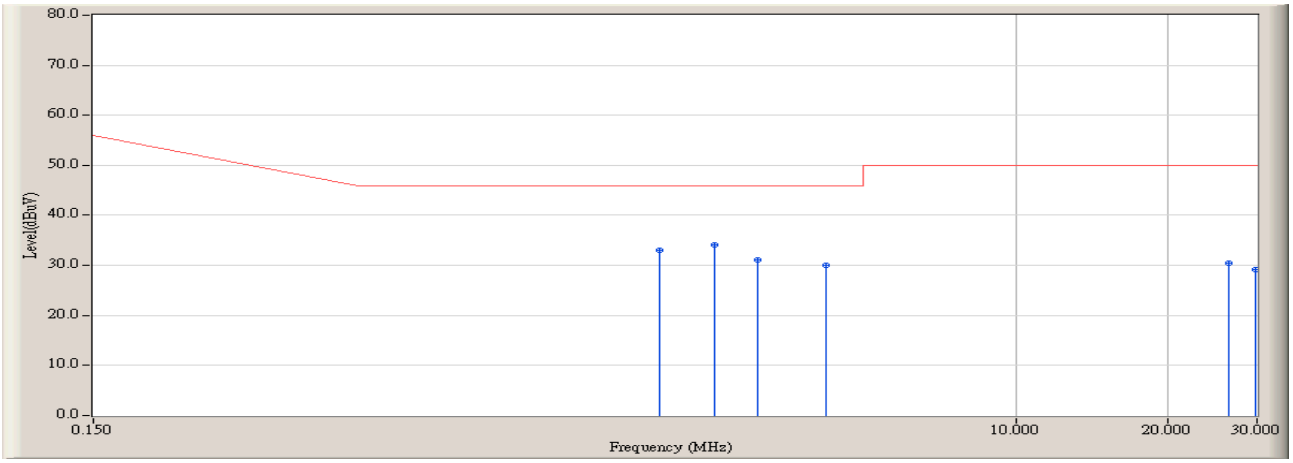


Engineer : Marlin	
Site : SR-1 (Conducted Emission)	**Time : 2008/01/19 - 09:26**
Limit : FCC_PART15B_B_00M_QP	**Margin : 0**
EUT : Bluetooth Headlet	**Probe : ENV216 - Line2**
Power : AC 120V/60Hz	**Note : Mode 1: Transmit**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	1.970	9.790	34.800	44.590	-11.410	56.000	QUASIPEAK
2		2.534	9.778	33.900	43.678	-12.322	56.000	QUASIPEAK
3		3.098	9.760	32.500	42.260	-13.740	56.000	QUASIPEAK
4		4.218	9.740	29.900	39.640	-16.360	56.000	QUASIPEAK
5		26.458	10.429	33.500	43.929	-16.071	60.000	QUASIPEAK
6		29.810	10.510	33.600	44.110	-15.890	60.000	QUASIPEAK

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	**Time : 2008/01/19 - 09:26**
Limit : FCC_PART15B_B_00M_AV	**Margin : 0**
EUT : Bluetooth Headlet	**Probe : ENV216 - Line2**
Power : AC 120V/60Hz	**Note : Mode 1: Transmit**

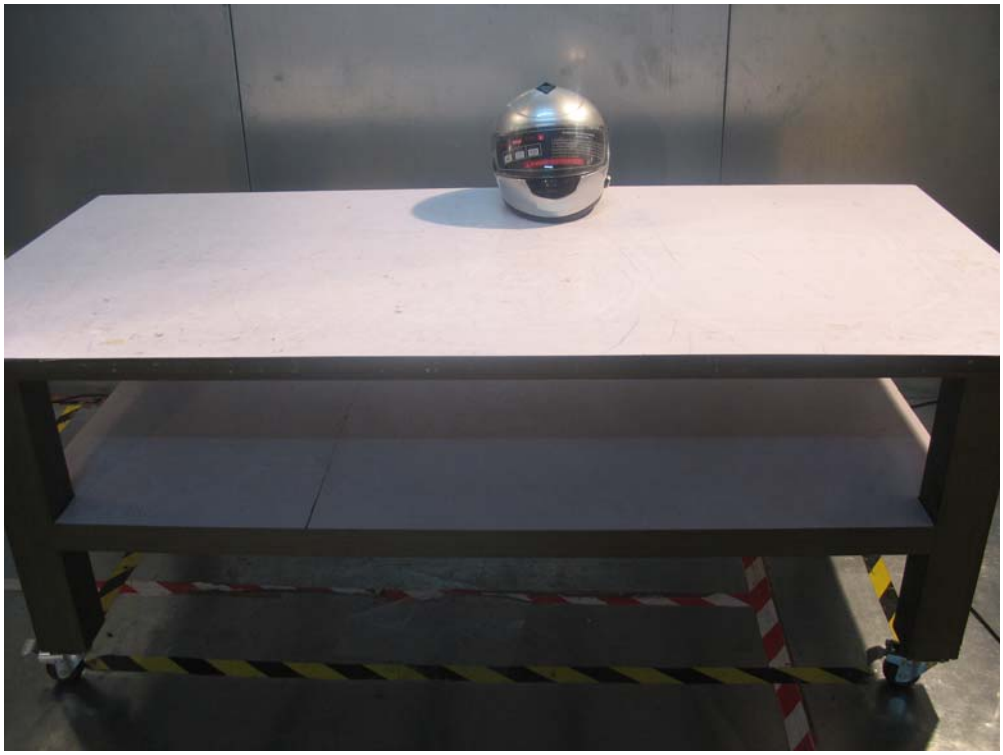


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		1.970	9.790	23.200	32.990	-13.010	46.000	AVERAGE
2	*	2.534	9.778	24.400	34.178	-11.822	46.000	AVERAGE
3		3.098	9.760	21.400	31.160	-14.840	46.000	AVERAGE
4		4.218	9.740	20.300	30.040	-15.960	46.000	AVERAGE
5		26.458	10.429	20.000	30.429	-19.571	50.000	AVERAGE
6		29.810	10.510	18.700	29.210	-20.790	50.000	AVERAGE

3.7. Test Photograph

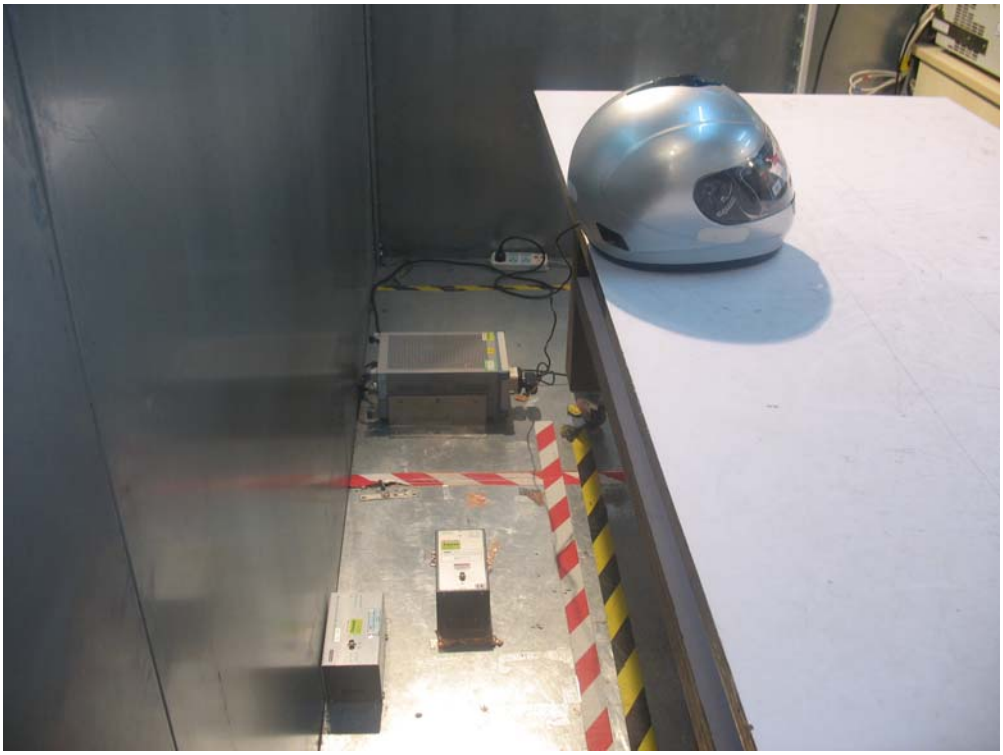
Test Mode: Mode 1: Transmit

Description: Front View of Conducted Emission Test Setup



Test Mode: Mode 1: Transmit

Description: Back View of Conducted Emission Test Setup



4. Radiated Emission

4.1. Test Equipment

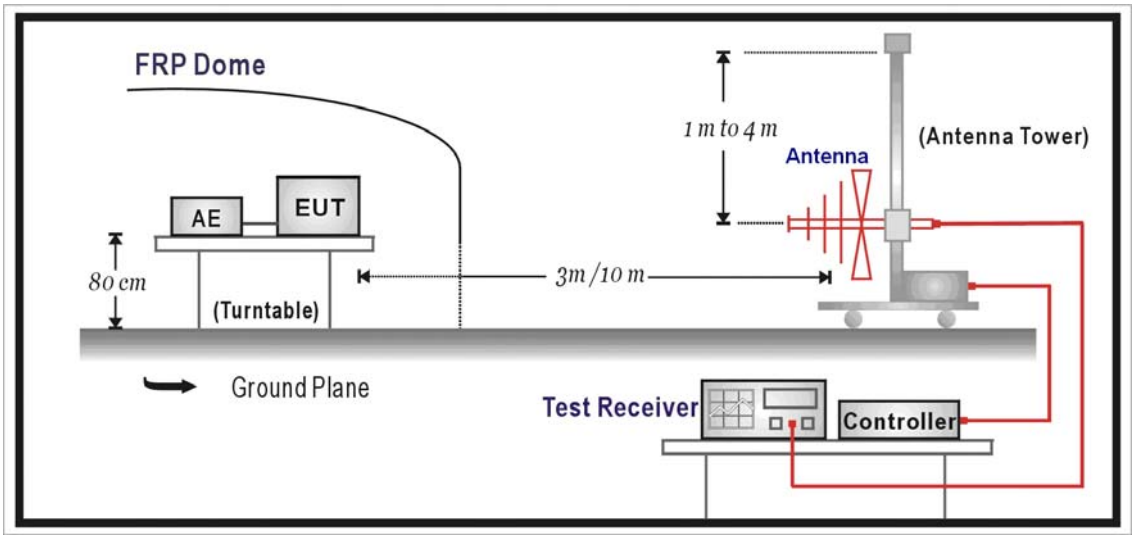
Radiated Emission / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2007/11/20
EMI Test Receiver	R&S	ESCI	100573	2007/05/23
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	2007/11/25
50ohm Coaxial Switch	ANRITSU	MP59B	6200447304	2007/11/25
Coaxial Cable	Huber+Suhner	AC3-C	05	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

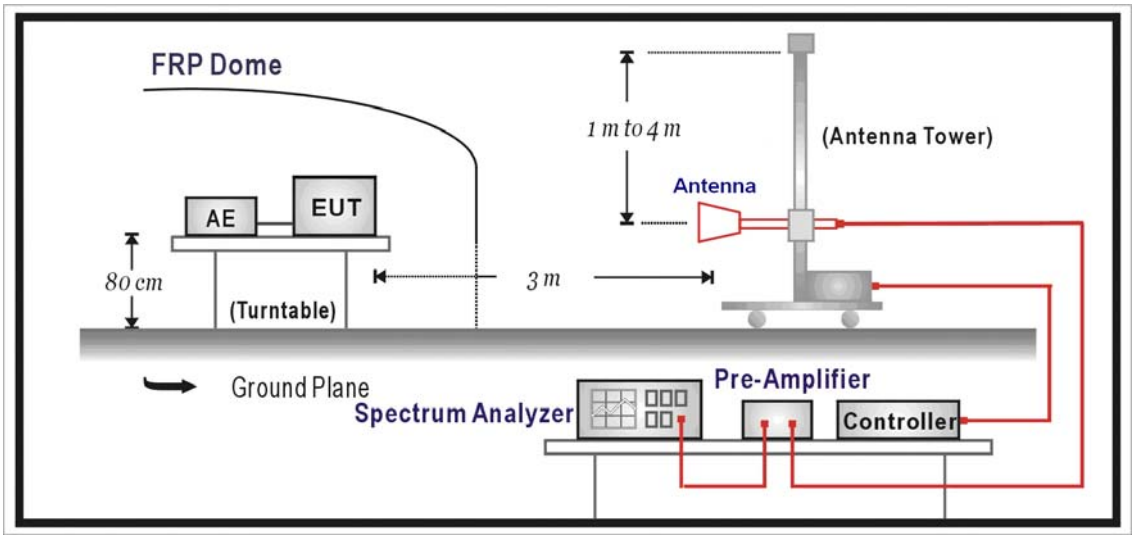
Note: “*” means the test device calibration period for two years.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

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

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
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.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

4.4. Test Procedure

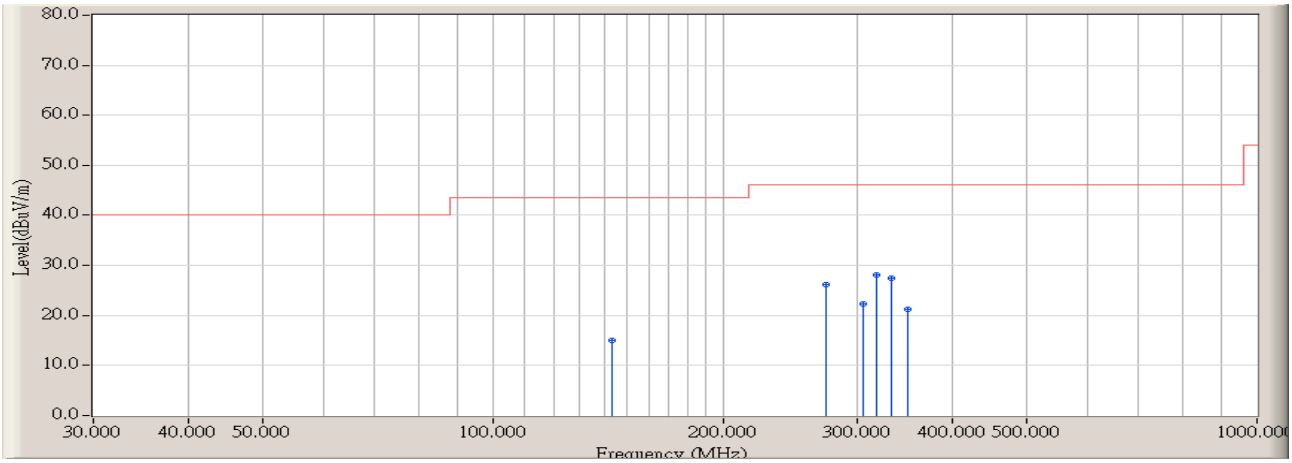
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.
The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.
The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.
The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCI) is 120 kHz and above 1GHz is 1MHz.
The frequency range from 30MHz to 10th harmonic is checked.

4.5. Uncertainty

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

4.6. Test Result

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 17:02**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : CBL6141A_4278(30-2000MHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2402MHz**

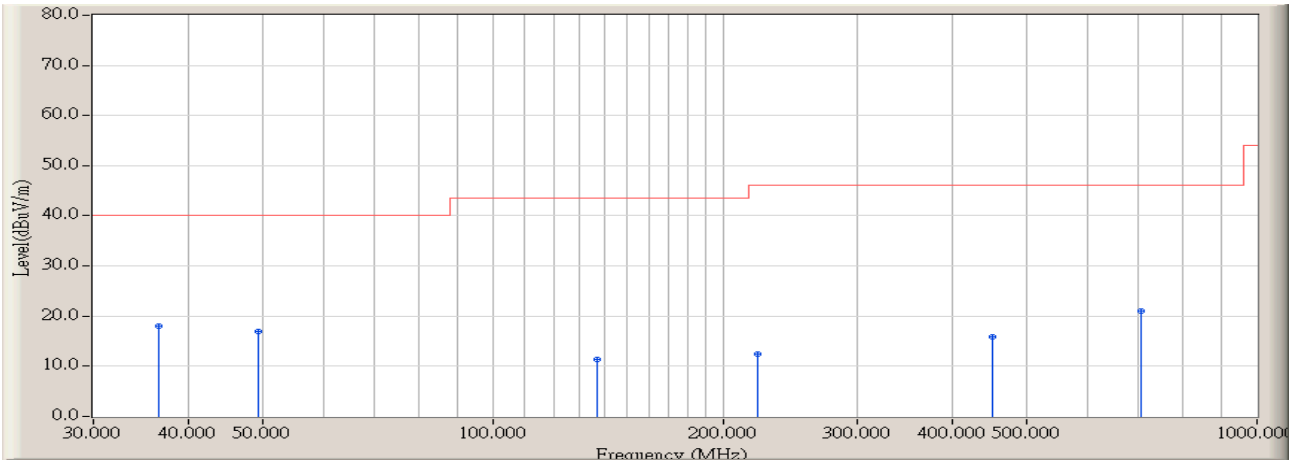


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		143.167	-11.662	26.649	14.987	-28.533	43.520	QUASIPEAK	120.000	24.000
2		272.500	2.520	23.546	26.066	-19.954	46.020	QUASIPEAK	162.000	18.000
3		304.833	-9.671	31.938	22.266	-23.754	46.020	QUASIPEAK	100.000	126.000
4	*	317.767	2.740	25.445	28.185	-17.835	46.020	QUASIPEAK	134.000	33.000
5		332.317	2.677	24.685	27.362	-18.658	46.020	QUASIPEAK	188.000	324.000
6		348.483	-8.360	29.487	21.127	-24.893	46.020	QUASIPEAK	102.000	8.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 17:13**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : CBL6141A_4278(30-2000MHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2402MHz**

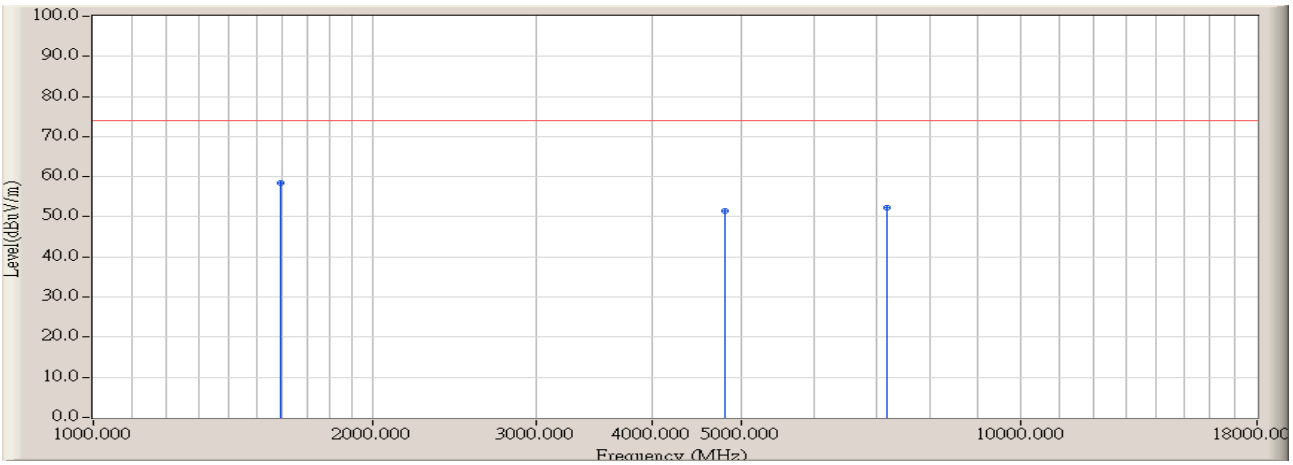


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	36.467	-4.518	22.625	18.107	-21.893	40.000	QUASIPEAK	100.000	16.000
2		49.400	-10.857	27.781	16.924	-23.076	40.000	QUASIPEAK	100.000	167.000
3		136.700	-11.874	23.337	11.463	-32.057	43.520	QUASIPEAK	108.000	108.000
4		222.383	-11.042	23.389	12.347	-33.673	46.020	QUASIPEAK	100.000	22.000
5		450.333	-6.659	22.545	15.886	-30.134	46.020	QUASIPEAK	142.000	10.000
6		704.150	-1.538	22.525	20.987	-25.033	46.020	QUASIPEAK	101.000	28.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:52**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2402MHz**

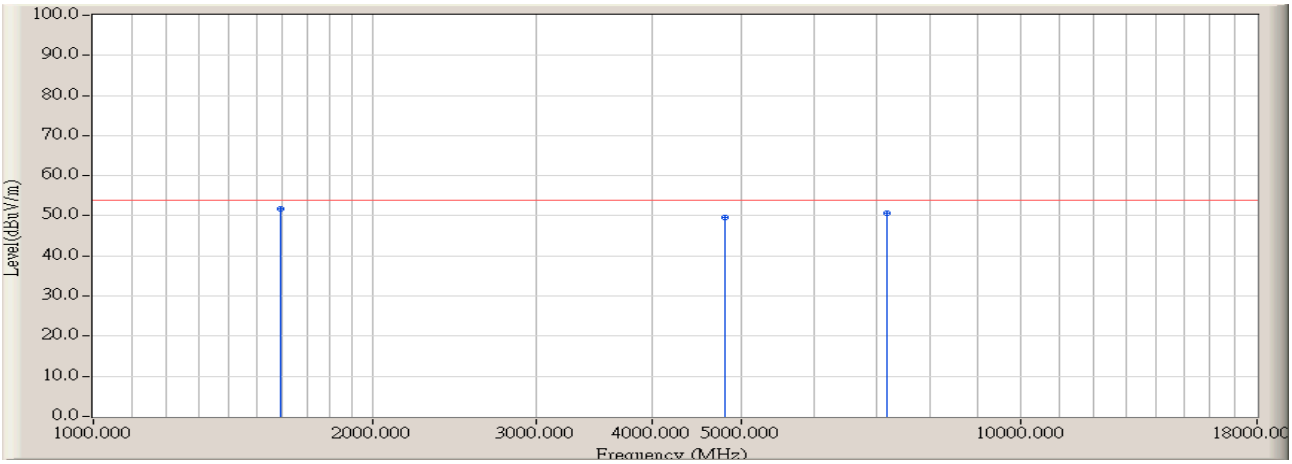


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	1595.000	-7.060	65.528	58.468	-15.502	73.970	PEAK	120.000	22.000
2		4796.600	3.490	48.098	51.588	-22.382	73.970	PEAK	106.000	68.000
3		7176.600	12.693	39.506	52.199	-21.771	73.970	PEAK	148.000	2.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:52**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2402MHz**

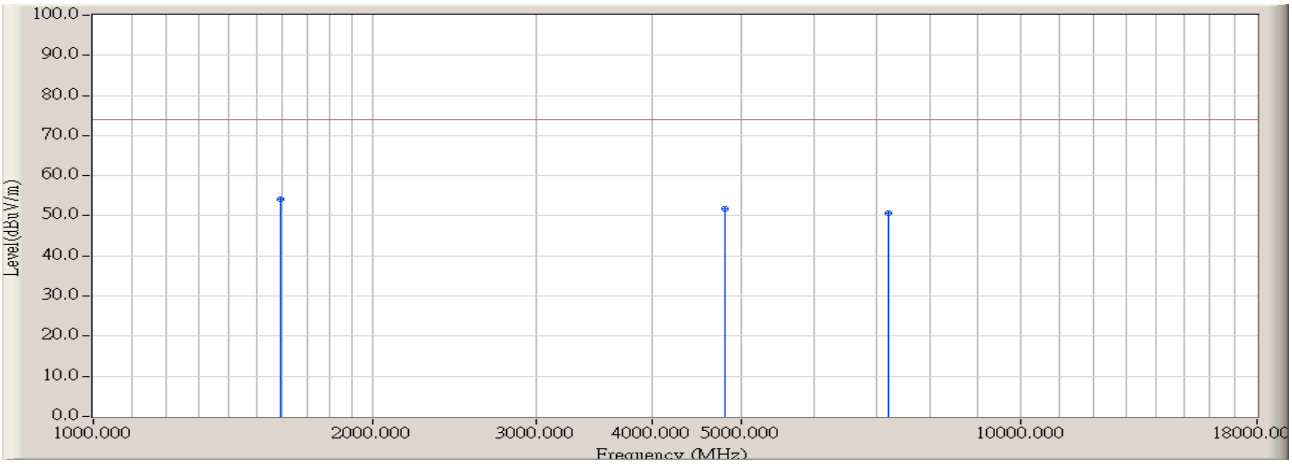


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	1595.000	-7.060	58.790	51.730	-2.240	53.970	AVERAGE	120.000	22.000
2		4796.600	3.490	46.220	49.710	-4.260	53.970	AVERAGE	106.000	68.000
3		7176.600	12.695	38.000	50.694	-3.276	53.970	AVERAGE	148.000	2.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:55**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2402MHz**

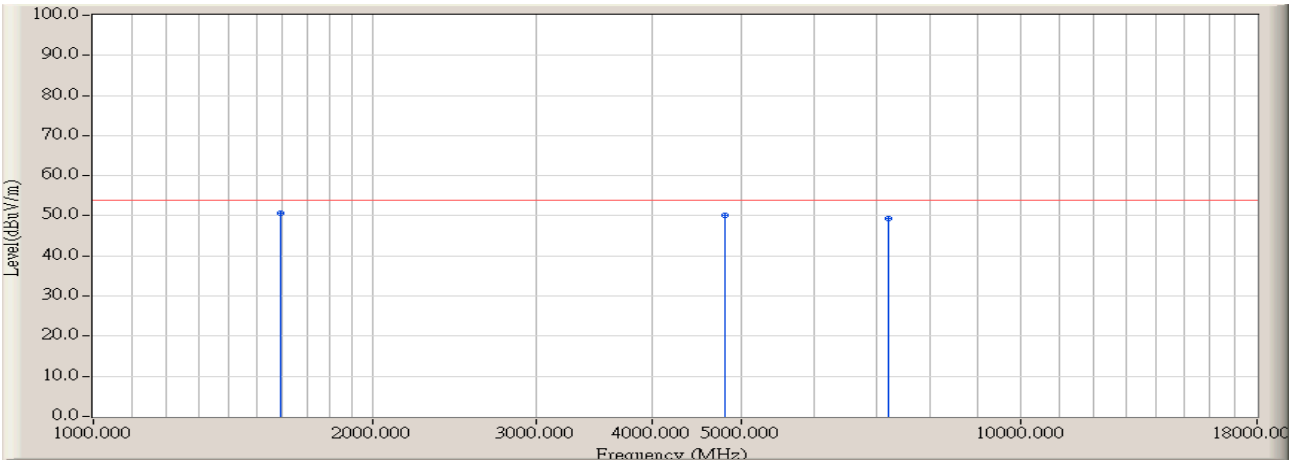


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	1595.000	-7.060	61.306	54.246	-19.724	73.970	PEAK	100.000	24.000
2		4796.600	3.490	48.126	51.616	-22.354	73.970	PEAK	100.000	120.000
3		7205.000	12.290	38.387	50.677	-23.293	73.970	PEAK	102.000	164.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:55**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2402MHz**

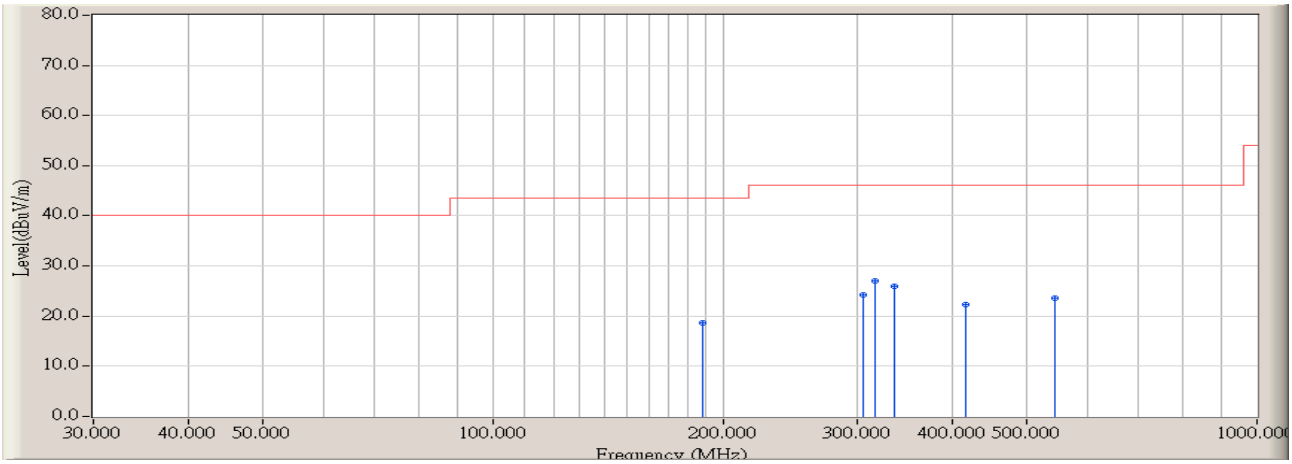


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	1595.000	-7.060	57.690	50.630	-3.340	53.970	AVERAGE	100.000	24.000
2		4796.600	3.490	46.550	50.040	-3.930	53.970	AVERAGE	100.000	120.000
3		7205.000	12.290	37.000	49.290	-4.680	53.970	AVERAGE	102.000	164.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 17:20**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : CBL6141A_4278(30-2000MHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2441MHz**

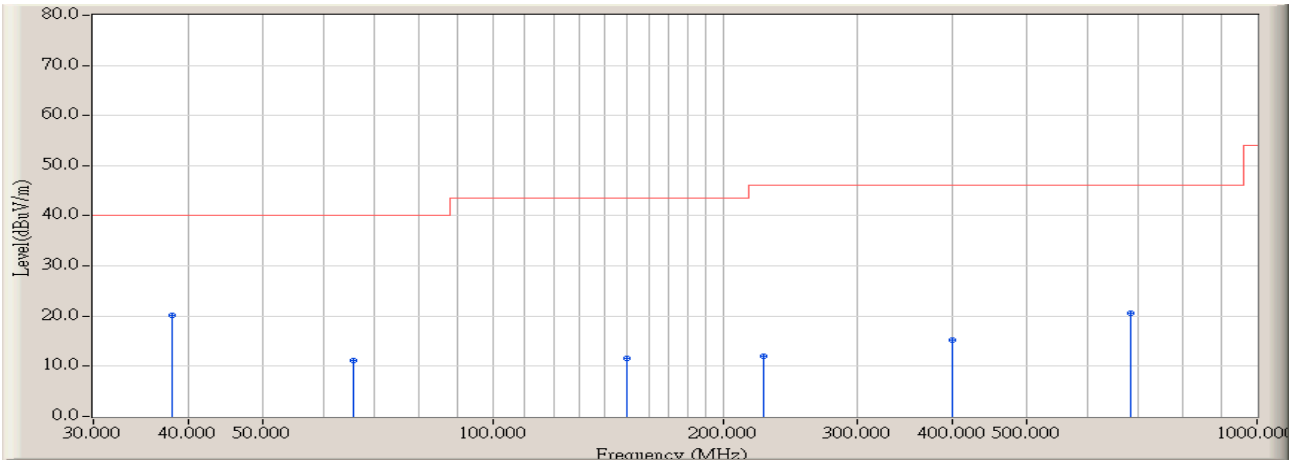


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		188.433	-13.809	32.514	18.705	-24.815	43.520	QUASIPEAK	118.000	22.000
2		304.833	2.586	21.660	24.247	-21.773	46.020	QUASIPEAK	149.000	9.000
3	*	316.150	2.790	24.308	27.098	-18.922	46.020	QUASIPEAK	100.000	133.000
4		335.550	2.750	23.247	25.997	-20.023	46.020	QUASIPEAK	133.000	42.000
5		416.383	-6.694	29.078	22.384	-23.636	46.020	QUASIPEAK	174.000	335.000
6		544.100	-4.906	28.594	23.688	-22.332	46.020	QUASIPEAK	101.000	12.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 17:32**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : CBL6141A_4278(30-2000MHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2441MHz**

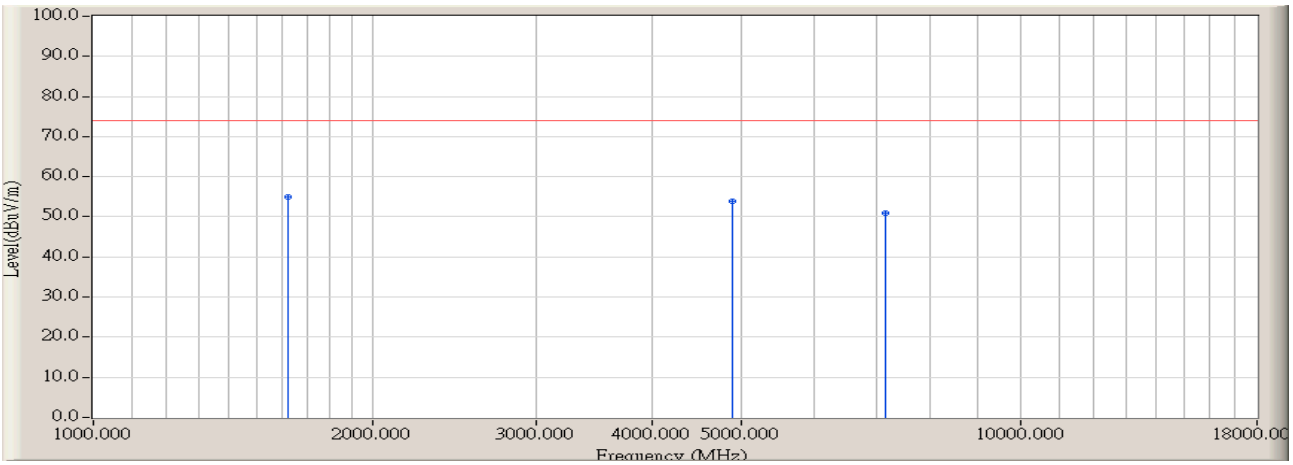


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	38.083	1.693	18.533	20.226	-19.774	40.000	QUASIPEAK	102.000	20.000
2		65.567	-16.689	27.817	11.127	-28.873	40.000	QUASIPEAK	105.000	168.000
3		149.633	-11.820	23.329	11.508	-32.012	43.520	QUASIPEAK	100.000	122.000
4		225.617	-10.927	22.907	11.979	-34.041	46.020	QUASIPEAK	100.000	30.000
5		398.600	-7.181	22.350	15.169	-30.851	46.020	QUASIPEAK	138.000	13.000
6		684.750	3.690	16.895	20.585	-25.435	46.020	QUASIPEAK	100.000	39.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:56**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2441MHz**

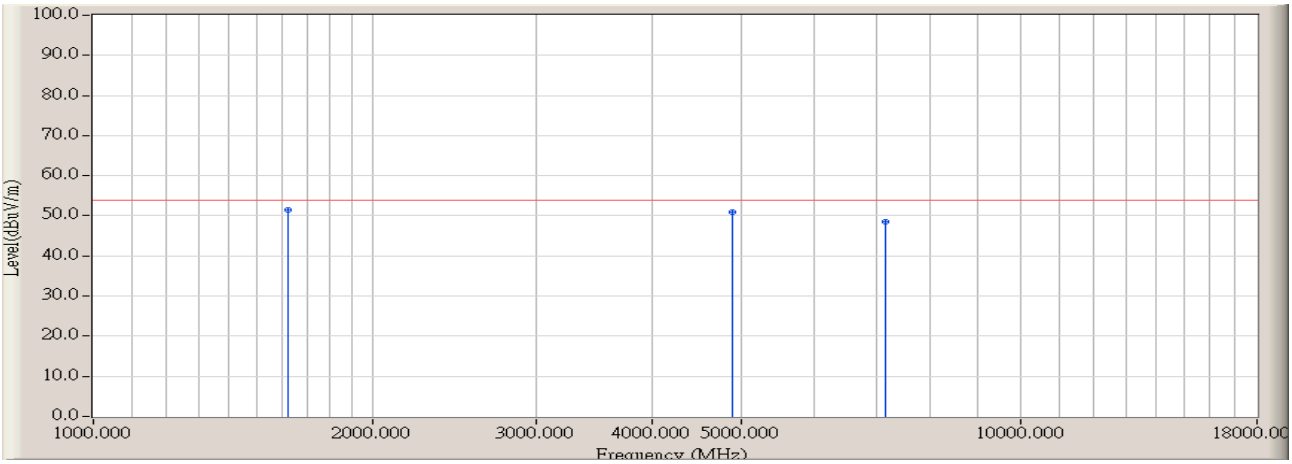


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	1623.300	-7.067	62.123	55.056	-18.914	73.970	PEAK	112.000	24.000
2		4881.600	3.633	50.126	53.759	-20.211	73.970	PEAK	133.000	48.000
3		7148.300	13.013	37.824	50.837	-23.133	73.970	PEAK	162.000	184.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:56**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2441MHz**

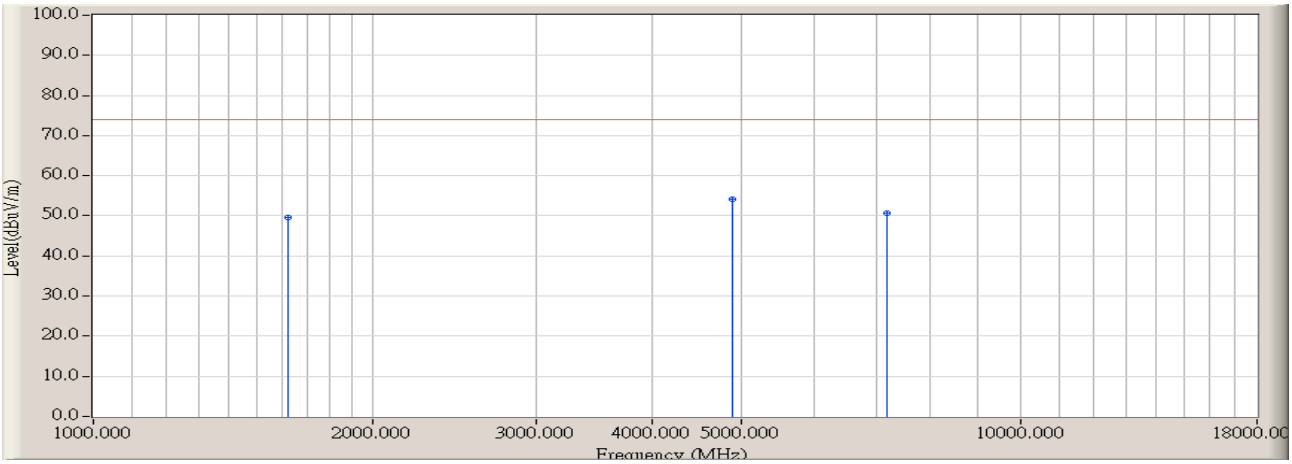


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	1623.300	-7.067	58.420	51.353	-2.617	53.970	AVERAGE	112.000	24.000
2		4881.600	3.633	47.260	50.893	-3.077	53.970	AVERAGE	133.000	48.000
3		7148.300	13.013	35.600	48.613	-5.357	53.970	AVERAGE	162.000	184.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:58**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2441MHz**

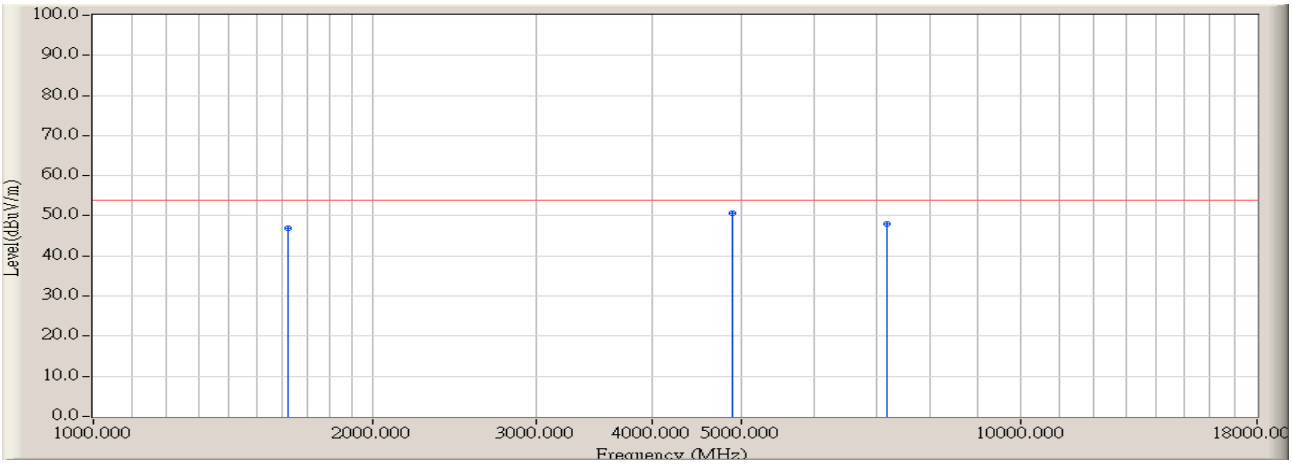


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1623.300	-7.067	56.583	49.516	-24.454	73.970	PEAK	100.000	36.000
2	*	4881.600	3.633	50.554	54.187	-19.783	73.970	PEAK	100.000	182.000
3		7176.600	12.693	38.030	50.723	-23.247	73.970	PEAK	100.000	140.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 13:58**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2441MHz**

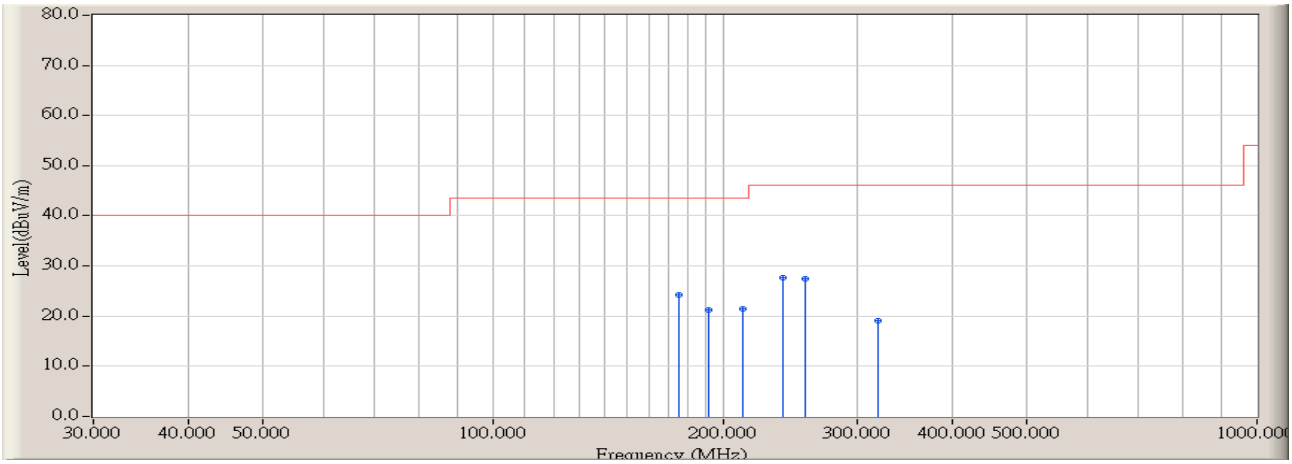


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1623.300	-7.067	53.900	46.833	-7.137	53.970	AVERAGE	100.000	36.000
2	*	4881.600	3.633	46.980	50.613	-3.357	53.970	AVERAGE	100.000	182.000
3		7176.600	12.695	35.400	48.094	-5.876	53.970	AVERAGE	100.000	140.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 17:45**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : CBL6141A_4278(30-2000MHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2480MHz**

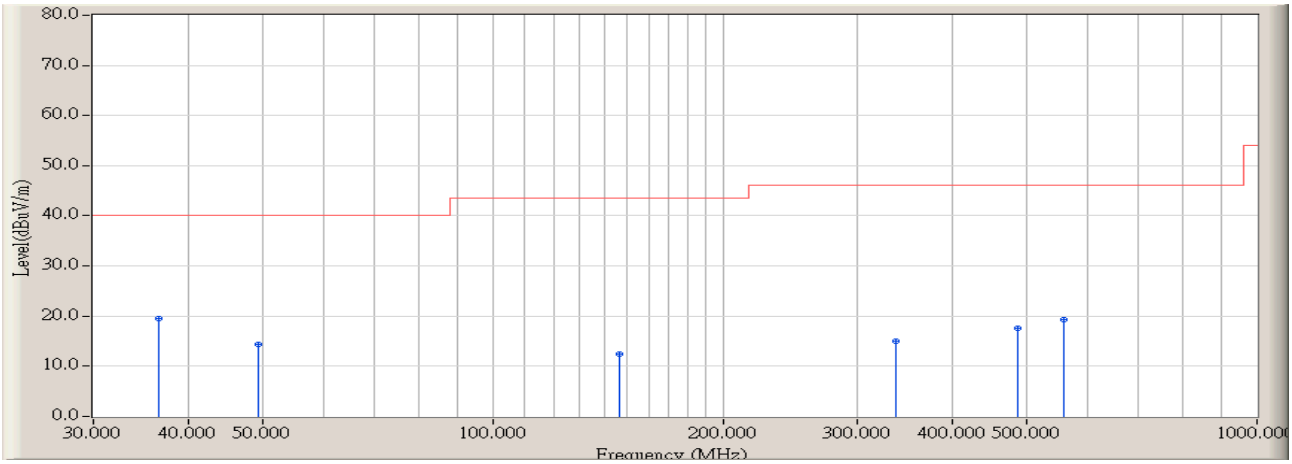


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		175.500	2.150	21.999	24.149	-19.371	43.520	QUASIPEAK	117.000	0.000
2		191.667	-13.654	34.812	21.158	-22.362	43.520	QUASIPEAK	129.000	16.000
3		212.683	2.290	19.184	21.474	-22.046	43.520	QUASIPEAK	110.000	132.000
4	*	240.167	2.460	25.120	27.580	-18.440	46.020	QUASIPEAK	138.000	36.000
5		256.333	2.460	25.060	27.520	-18.500	46.020	QUASIPEAK	156.000	302.000
6		319.383	2.720	16.406	19.126	-26.894	46.020	QUASIPEAK	100.000	14.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 18:04**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : CBL6141A_4278(30-2000MHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2480MHz**

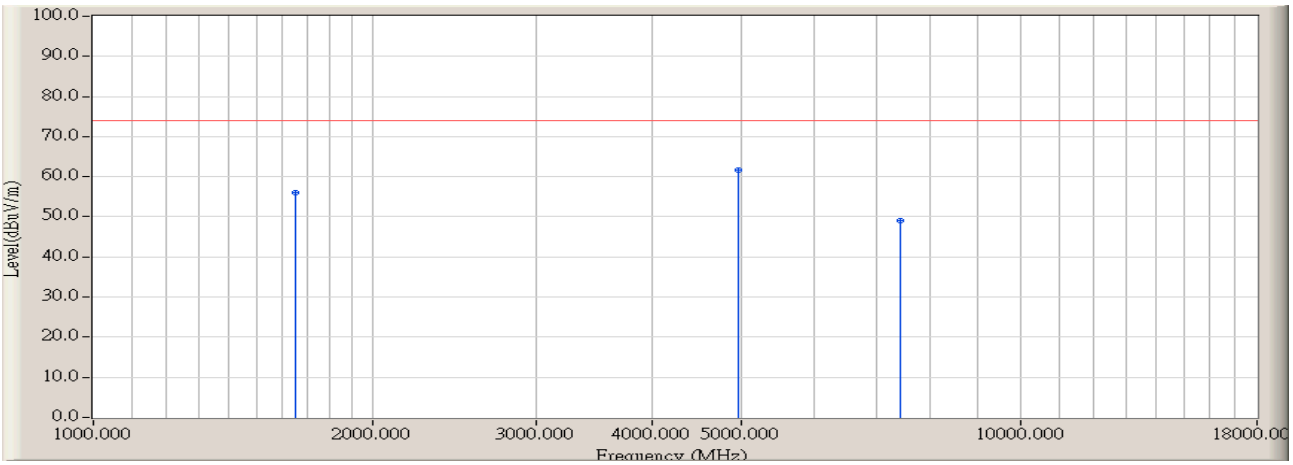


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	36.467	-4.518	24.010	19.492	-20.508	40.000	QUASIPEAK	102.000	22.000
2		49.400	-10.857	25.185	14.328	-25.672	40.000	QUASIPEAK	100.000	182.000
3		146.400	-11.650	24.013	12.363	-31.157	43.520	QUASIPEAK	106.000	86.000
4		337.167	-8.687	23.640	14.953	-31.067	46.020	QUASIPEAK	100.000	20.000
5		485.900	-5.833	23.460	17.627	-28.393	46.020	QUASIPEAK	125.000	16.000
6		558.650	-3.657	23.067	19.410	-26.610	46.020	QUASIPEAK	102.000	30.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 14:00**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2480MHz**

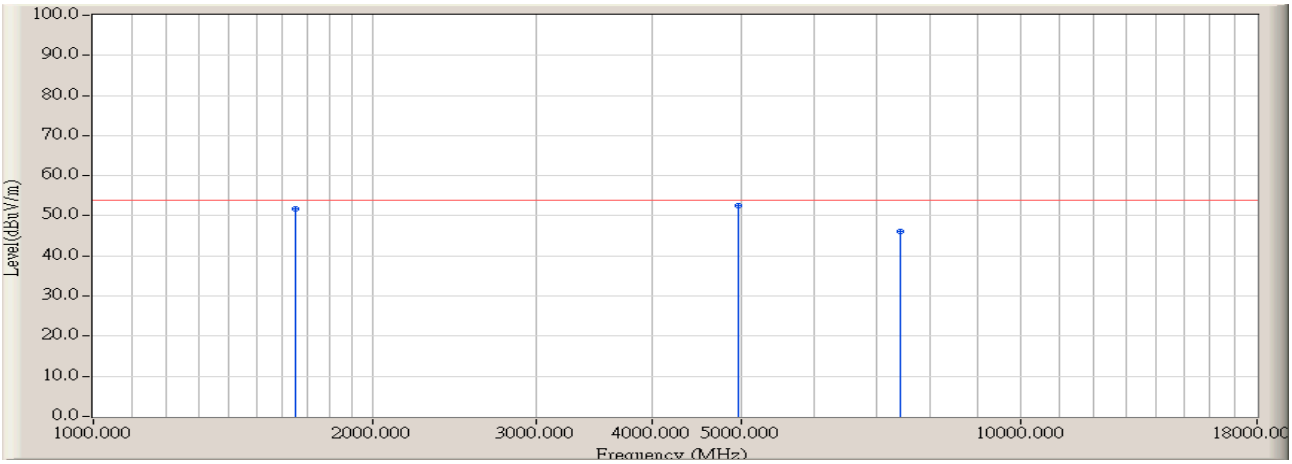


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.600	-7.080	63.000	55.920	-18.050	73.970	PEAK	144.000	20.000
2	*	4966.600	4.073	57.603	61.676	-12.294	73.970	PEAK	124.000	134.000
3		7431.600	11.500	37.691	49.191	-24.779	73.970	PEAK	149.000	342.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 14:00**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - HORIZONTAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2480MHz**

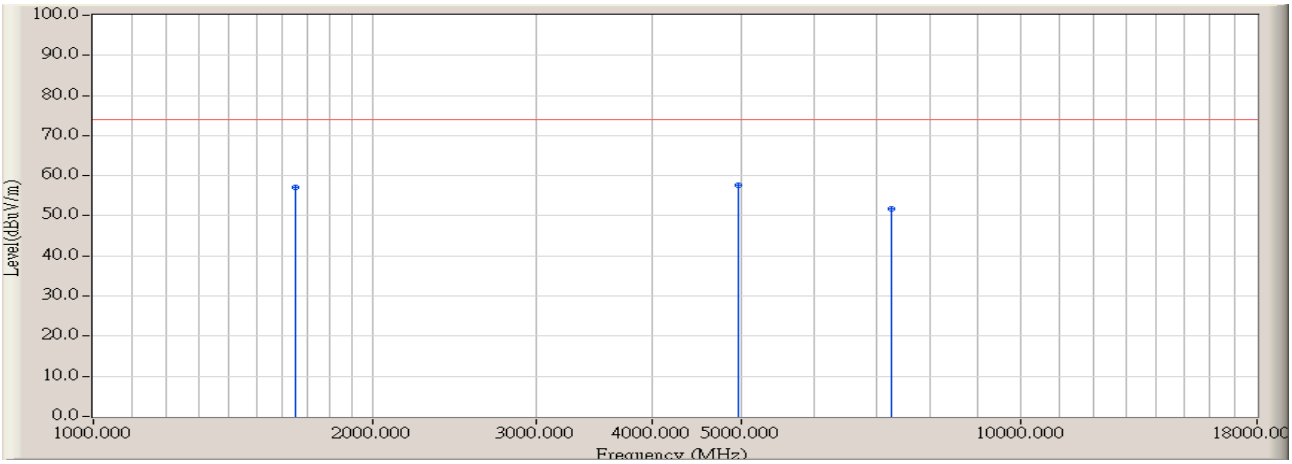


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.600	-7.080	58.770	51.690	-2.280	53.970	AVERAGE	144.000	20.000
2	*	4966.600	4.075	48.570	52.644	-1.326	53.970	AVERAGE	124.000	134.000
3		7431.600	11.500	34.600	46.100	-7.870	53.970	AVERAGE	149.000	342.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 14:01**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on channel 2480MHz**

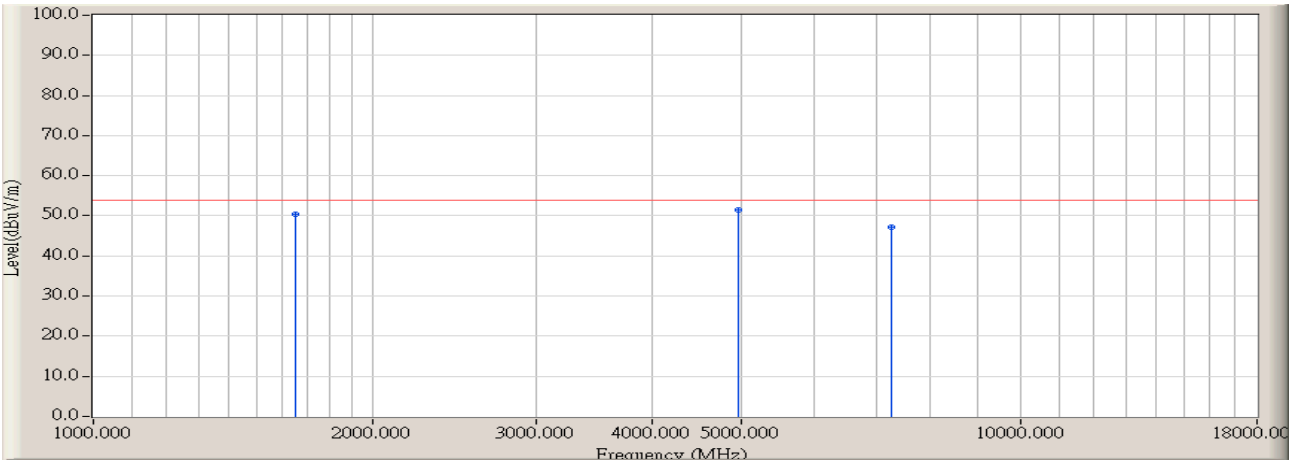


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.600	-7.080	64.153	57.073	-16.897	73.970	PEAK	100.000	30.000
2	*	4966.600	4.073	53.668	57.741	-16.229	73.970	PEAK	102.000	22.000
3		7261.600	12.250	39.483	51.733	-22.237	73.970	PEAK	114.000	356.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2007/12/02 - 14:01**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Bluetooth Helmet (M/N: VBTH-100S)	**Probe : BBHA9120D_499(1-18GHz) - VERTICAL**
Power : DC 3.7V	**Note : Mode 1: Transmit on 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		1651.600	-7.080	57.400	50.320	-3.650	53.970	AVERAGE	100.000	30.000
2	*	4966.600	4.075	47.500	51.574	-2.396	53.970	AVERAGE	102.000	22.000
3		7261.600	12.250	34.900	47.150	-6.820	53.970	AVERAGE	114.000	356.000

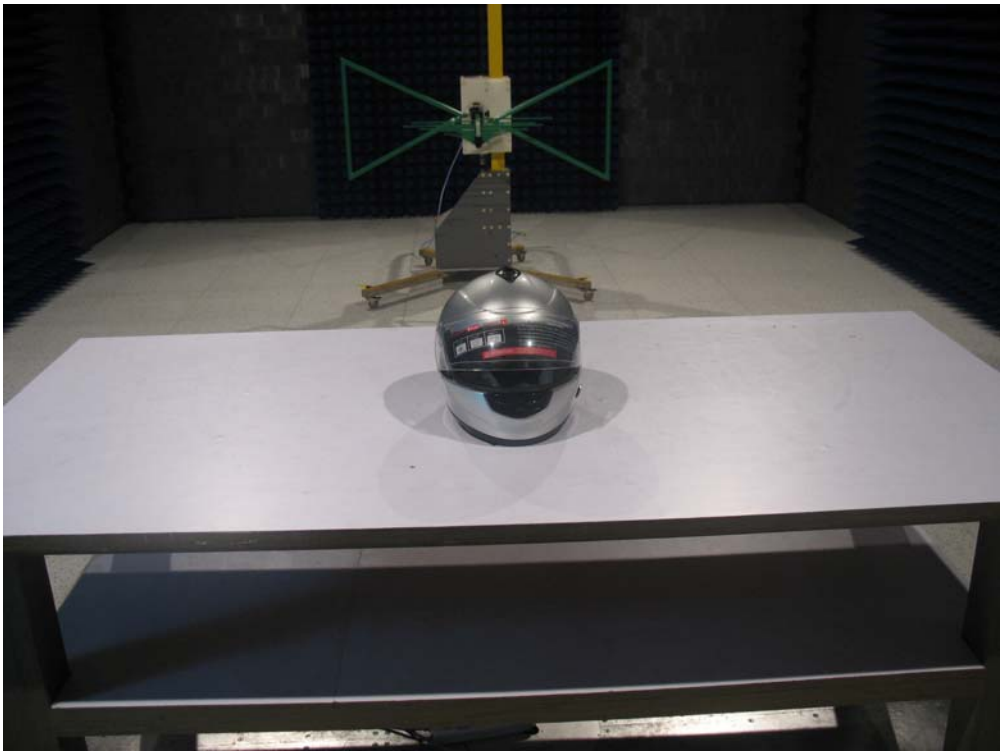
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

4.7. Test Photograph

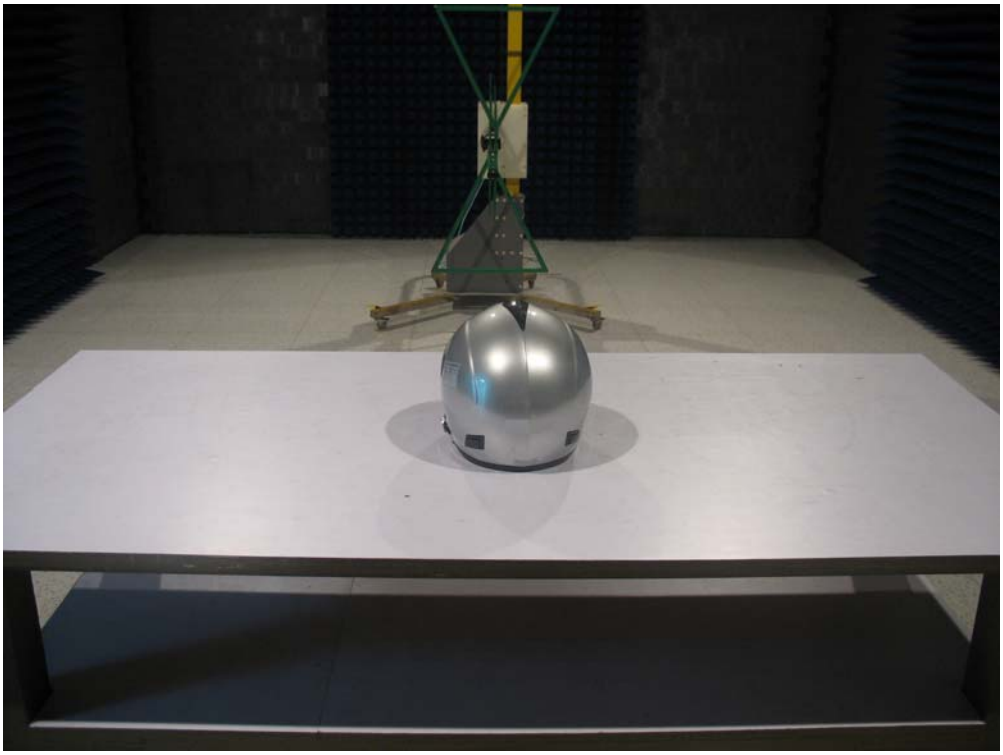
Test Mode: Mode 1: Transmit

Description: Front View of Radiated Test for Under 1GHz



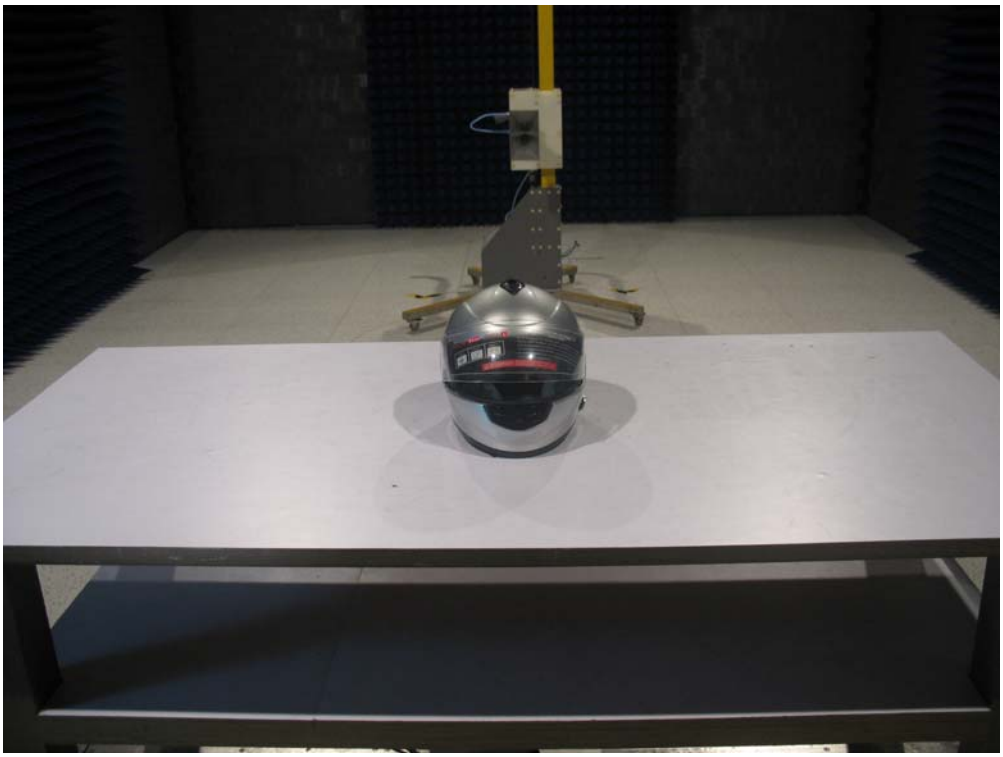
Test Mode: Mode 1: Transmit

Description: Back View of Radiated Test for Under 1GHz



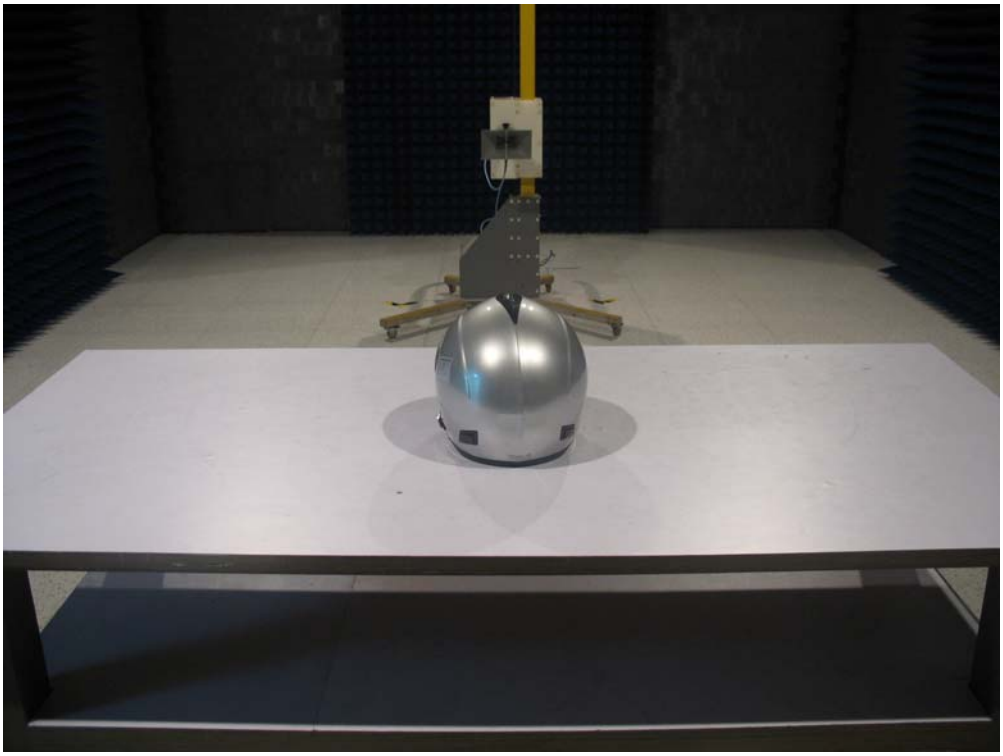
Test Mode: Mode 1: Transmit

Description: Front View of Radiated Test for Above 1GHz



Test Mode: Mode 1: Transmit

Description: Back View of Radiated Test for Above 1GHz



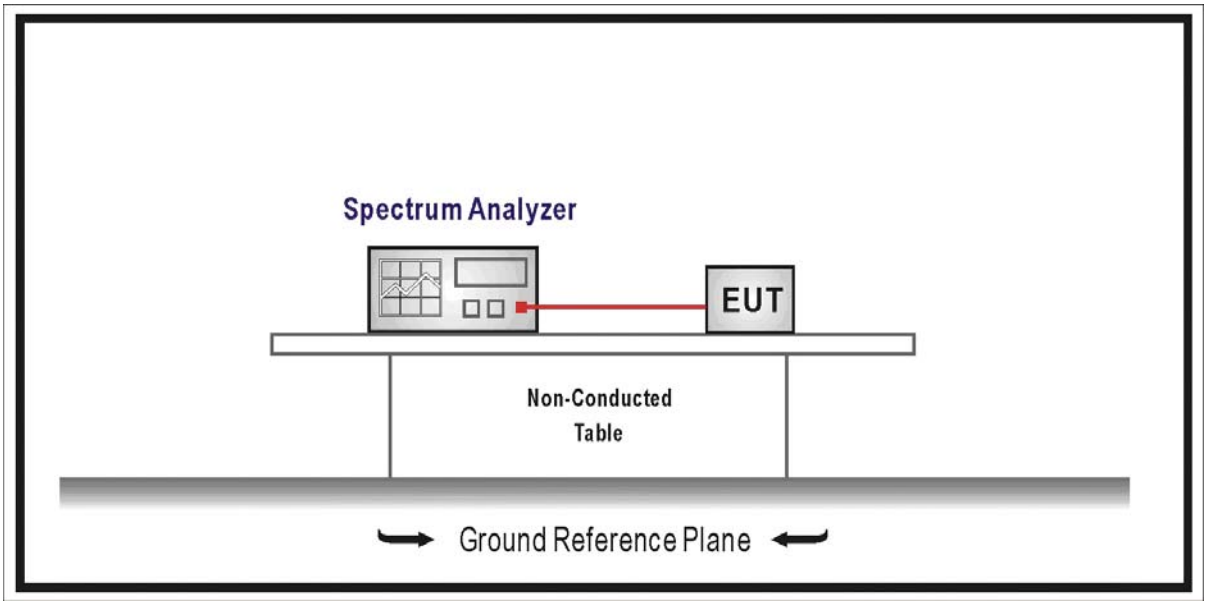
5. Peak Power Output

5.1. Test Equipment

Peak Power Output / AC-4

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2007/11/30

5.2. Test Setup



5.3. Limit

The maximum peak power shall be less 1Watt (30dBm).
The conducted output power limit is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of standard FCC part 15.247, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, by the amount in dB that the directional gain of the antenna exceeds dBi.

5.4. Test Procedure

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
c) Add a correction factor to the display, and then test.

5.5. Uncertainty

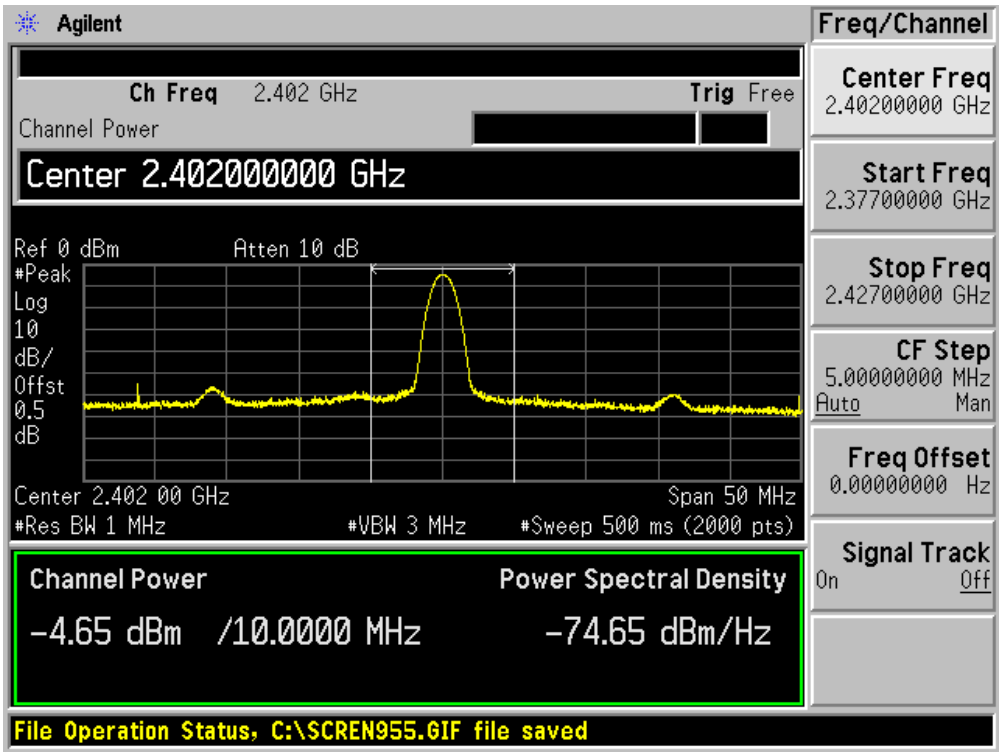
The measurement uncertainty is defined as ± 1.27 dB

5.6. Test Result

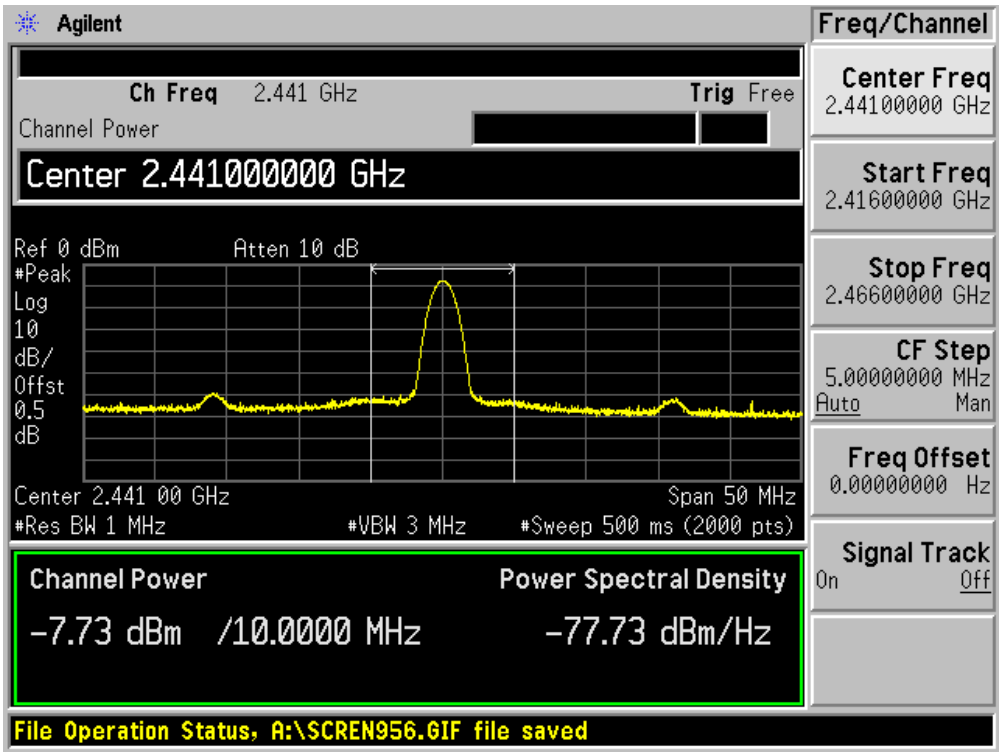
Product	:	Bluetooth Helmet
Test Item	:	Peak Power Output
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit (dBm)	Result
00	2402.00	-4.65	1 Watt= 30 dBm	Pass
39	2441.00	-7.73	1 Watt= 30 dBm	Pass
78	2480.00	-9.78	1 Watt= 30 dBm	Pass

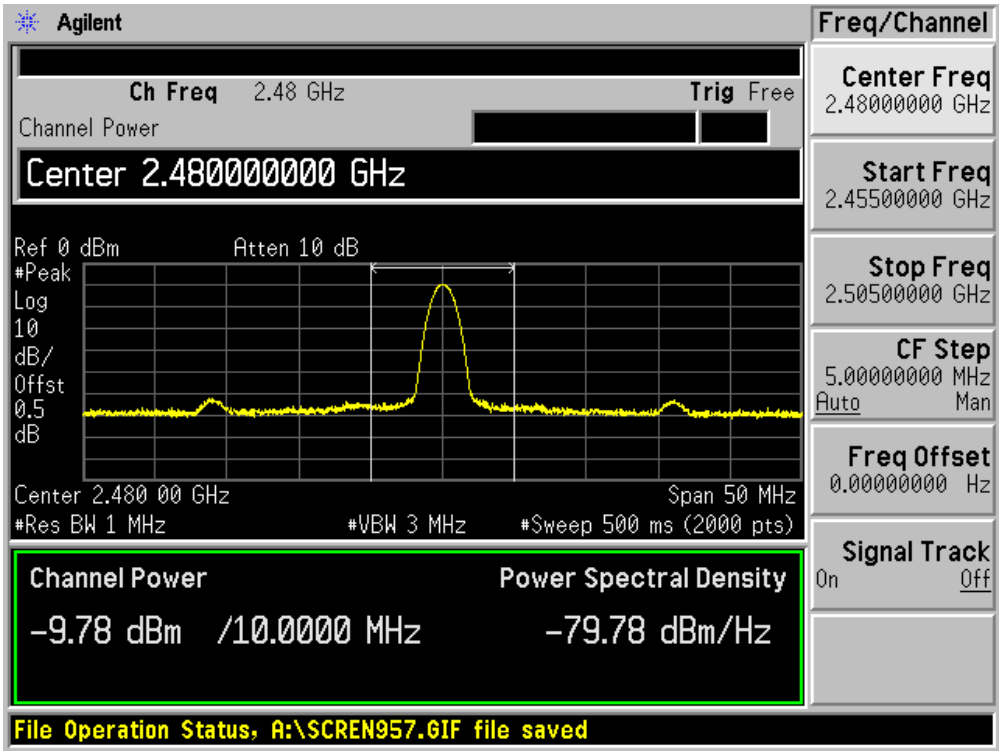
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



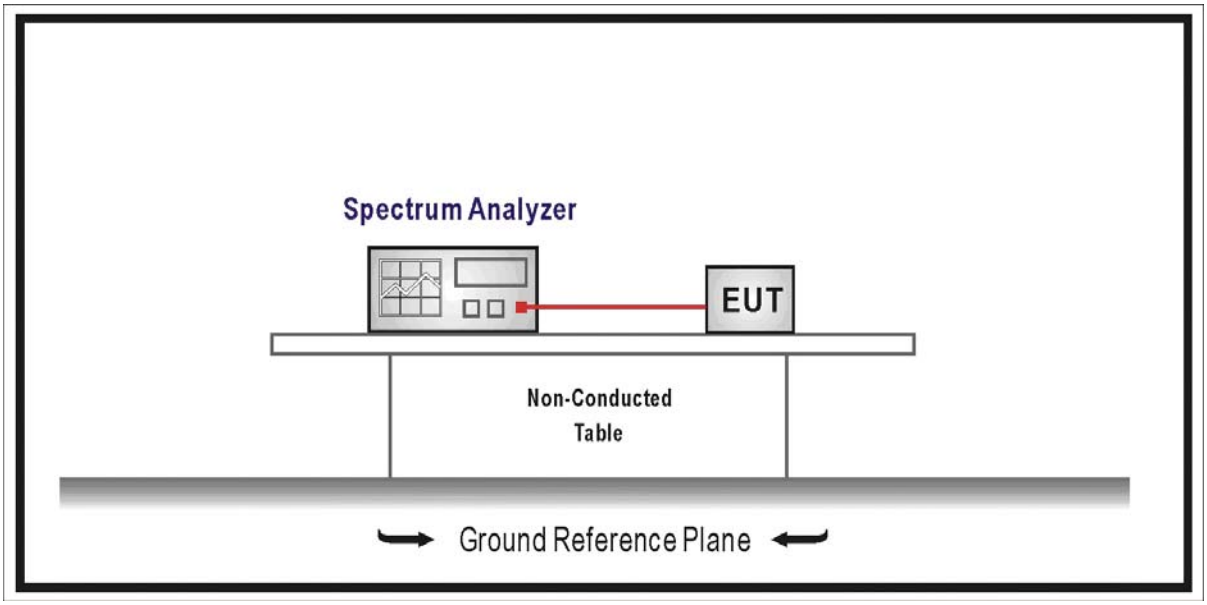
6. Occupied Bandwidth

6.1. Test Equipment

Occupied Bandwidth / AC-4

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2007/11/30

6.2. Test Setup



6.3. Limit

N/A

6.4. Test Procedure

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
c) Add a correction factor to the display, and then test.

6.5. Uncertainty

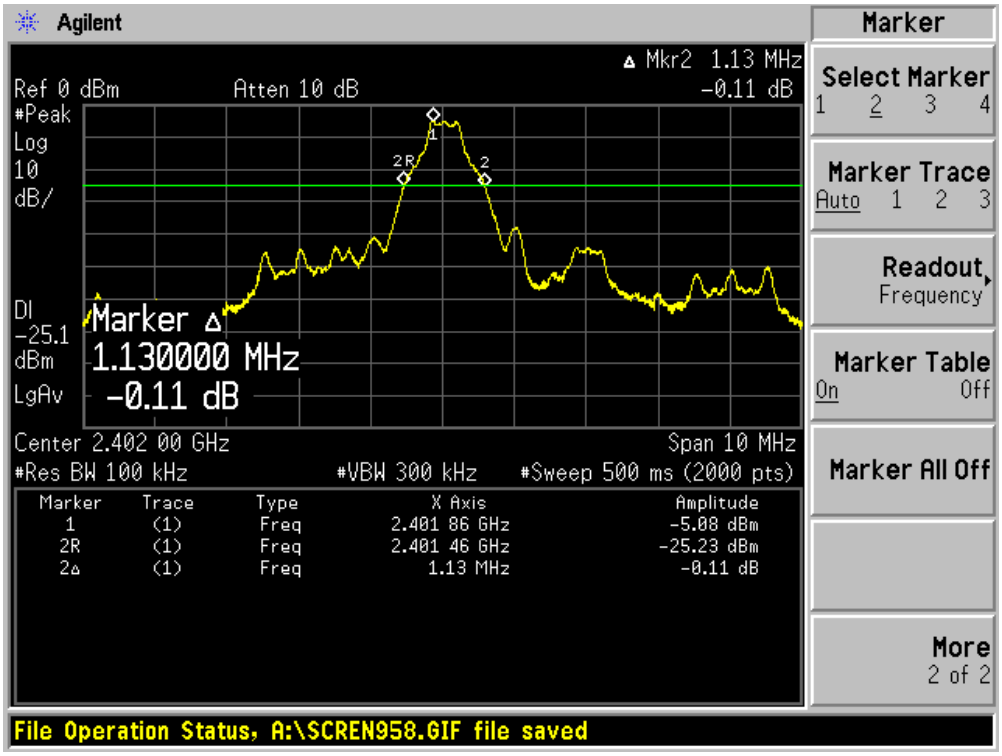
The measurement uncertainty is defined as ± 100 Hz

6.6. Test Result

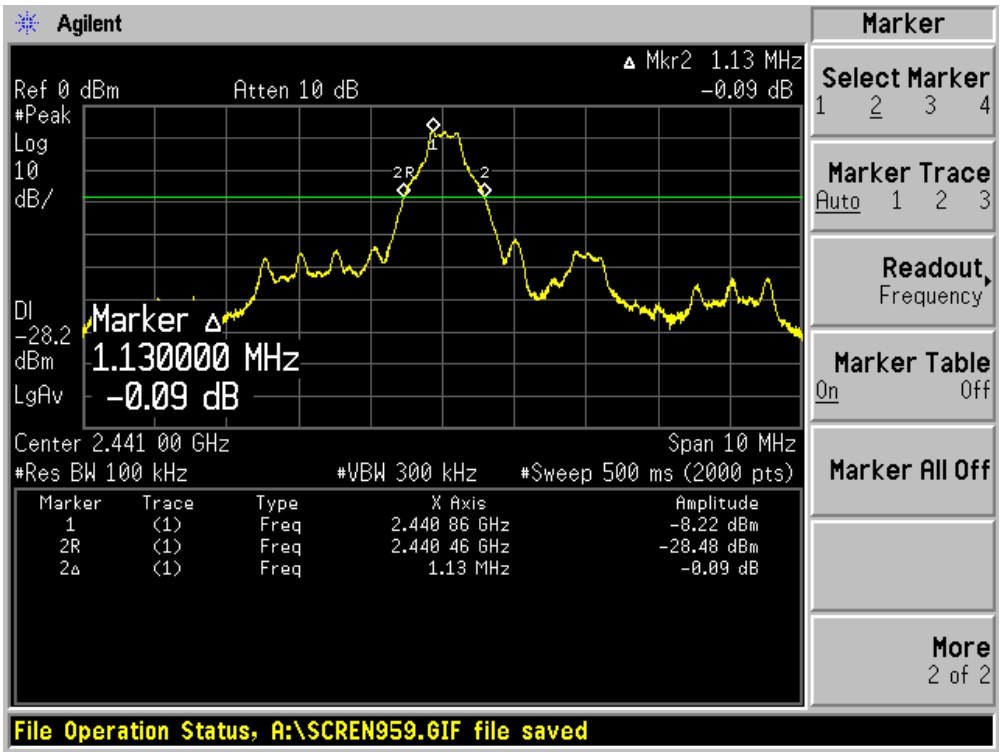
Product	:	Bluetooth Helmet
Test Item	:	Occupied Bandwidth
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1130	N/A	Pass
39	2441	1130	N/A	Pass
78	2480	1130	N/A	Pass

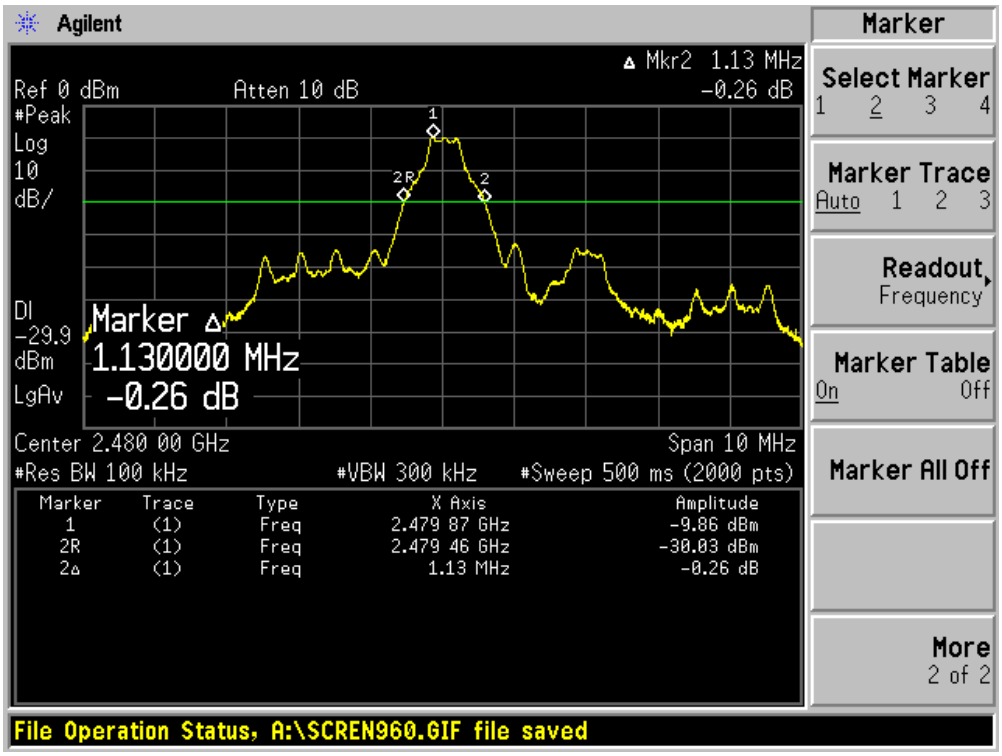
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



7. Band Edge

7.1. Test Equipment

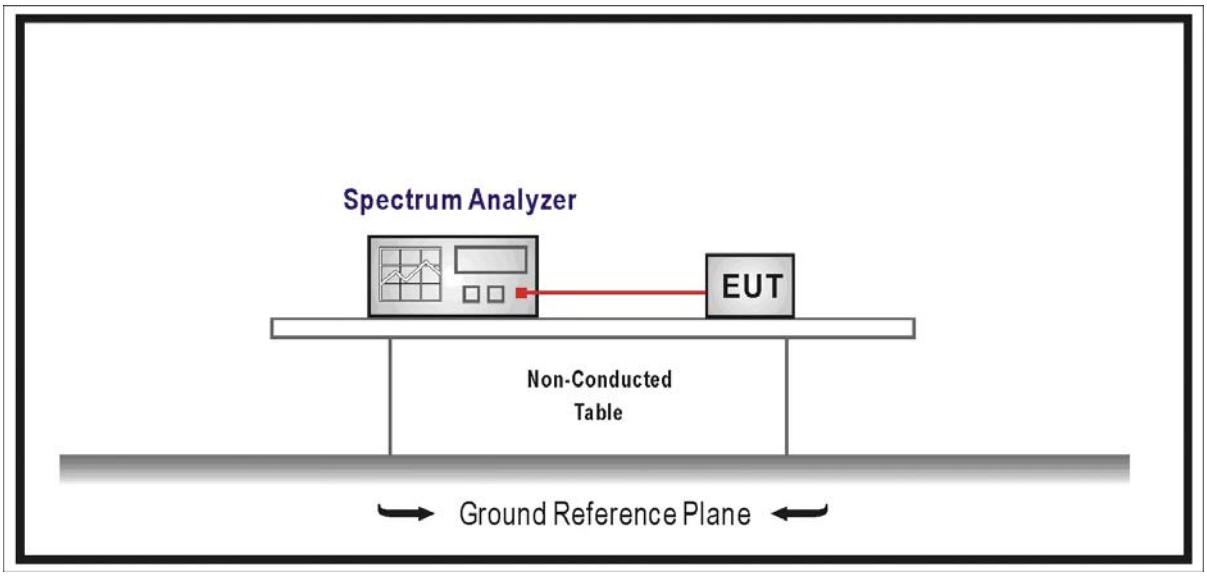
Band Edge / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2007/11/20
EMI Test Receiver	R&S	ESCI	100573	2007/05/23
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	2007/11/25
50ohm Coaxial Switch	ANRITSU	MP59B	6200447304	2007/11/25

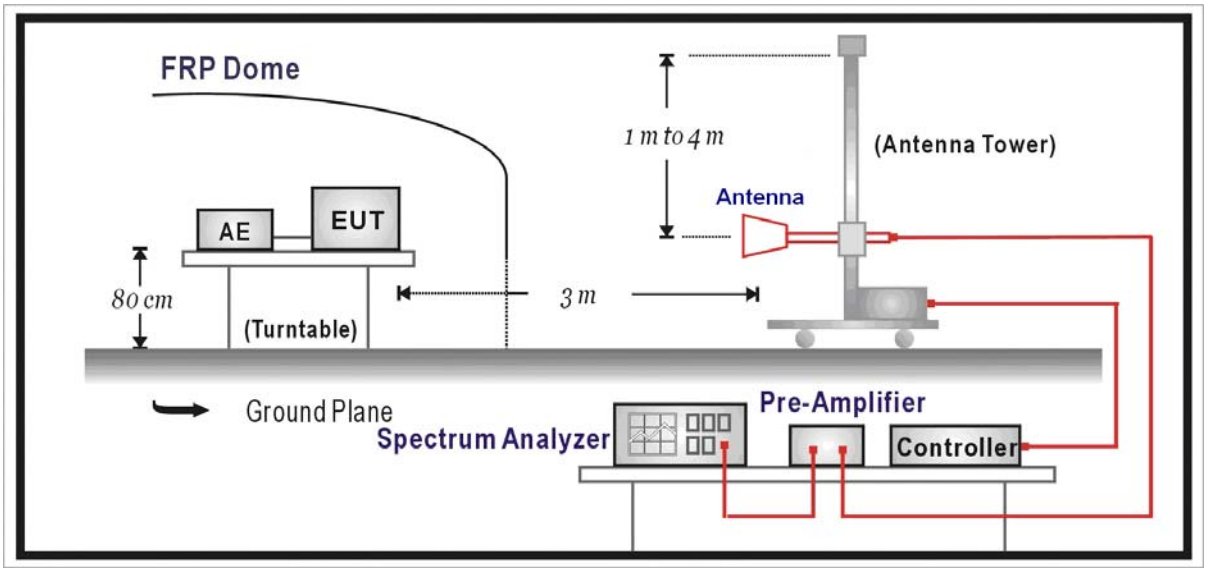
Note: “*” means the test device calibration period for two years.

7.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement



7.3. Limit

For 15.215(C) requirement:

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.

For 15.247(d) requirement:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

7.4. Test Procedure

For RF Conducted Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.

c) Add a correction factor to the display, and then test.

For RF Radiated Measurement:

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCI) is 120 kHz and above 1GHz is 1MHz.

7.5. Uncertainty

For RF Conducted Measurement:

The measurement uncertainty is defined as ± 1.27 dB

For RF Radiated Measurement:

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

under 1G is defined as ± 3.8 dB

7.6. Test Result

Product	:	Bluetooth Helmet
Test Item	:	Band Edge
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit

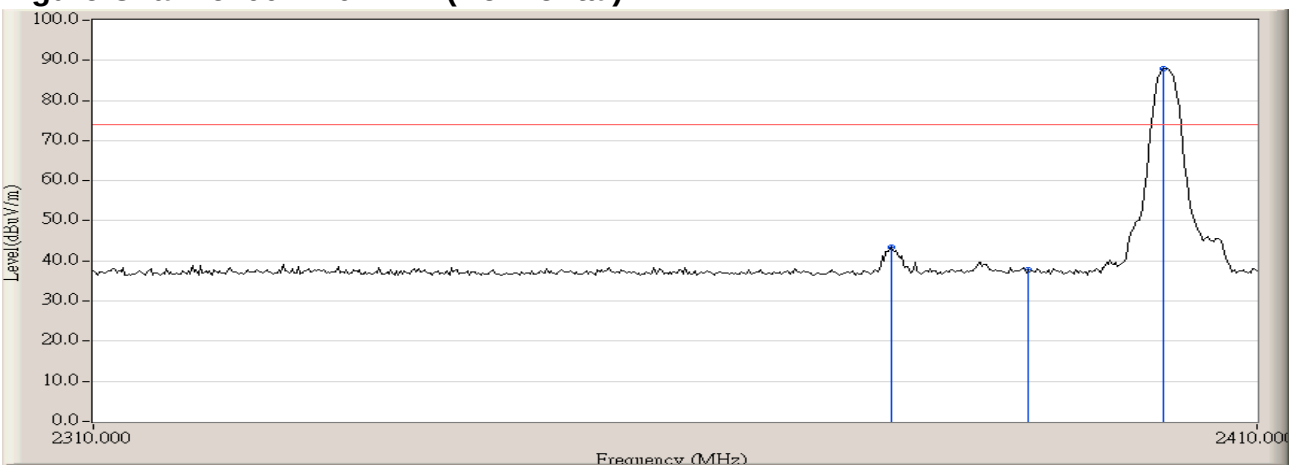
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
00	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2390.000	40.914	37.712	74.00	N/A	Pass
00 (Average)	2390.000	N/A	N/A	N/A	54.00	Pass

Figure Channel 00: 2402MHz (Horizontal)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	Bluetooth Helmet
Test Item	:	Band Edge
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit

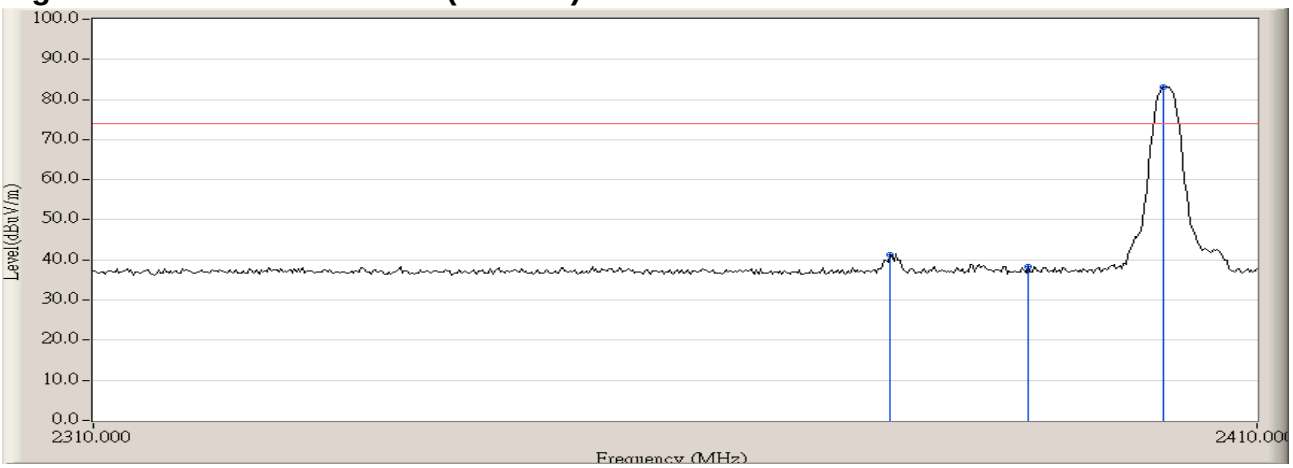
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
00	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2390.000	41.666	38.464	74.00	N/A	Pass
00 (Average)	2390.000	N/A	N/A	N/A	54.00	Pass

Figure Channel 00: 2402MHz (Vertical)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	Bluetooth Helmet
Test Item	:	Band Edge
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit

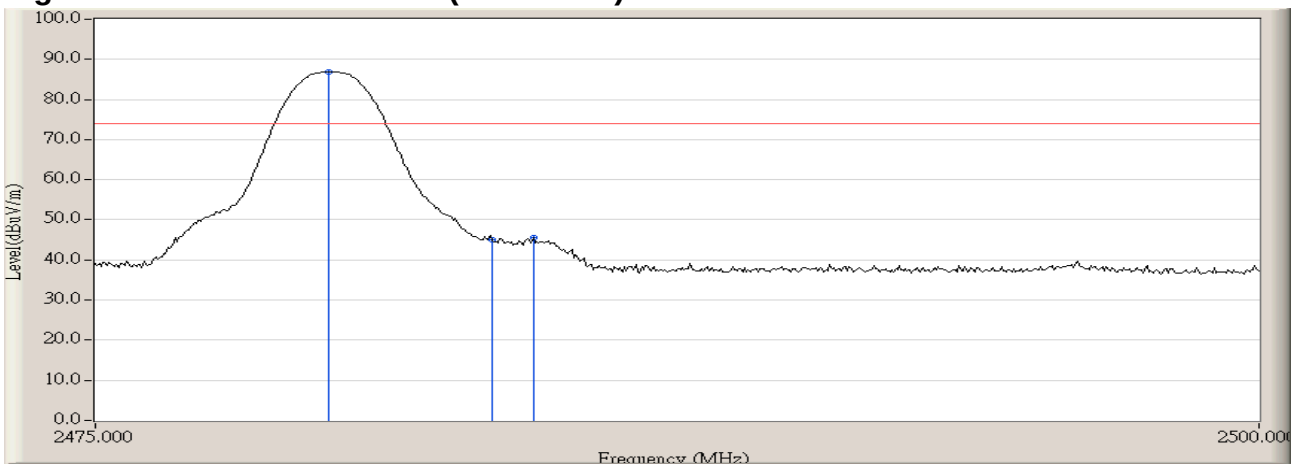
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2483.500	48.344	45.167	74.00	N/A	Pass
78(Average)	2483.500	N/A	N/A	N/A	54.00	Pass

Figure Channel 78: 2480MHz (Horizontal)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	Bluetooth Helmet
Test Item	:	Band Edge
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit

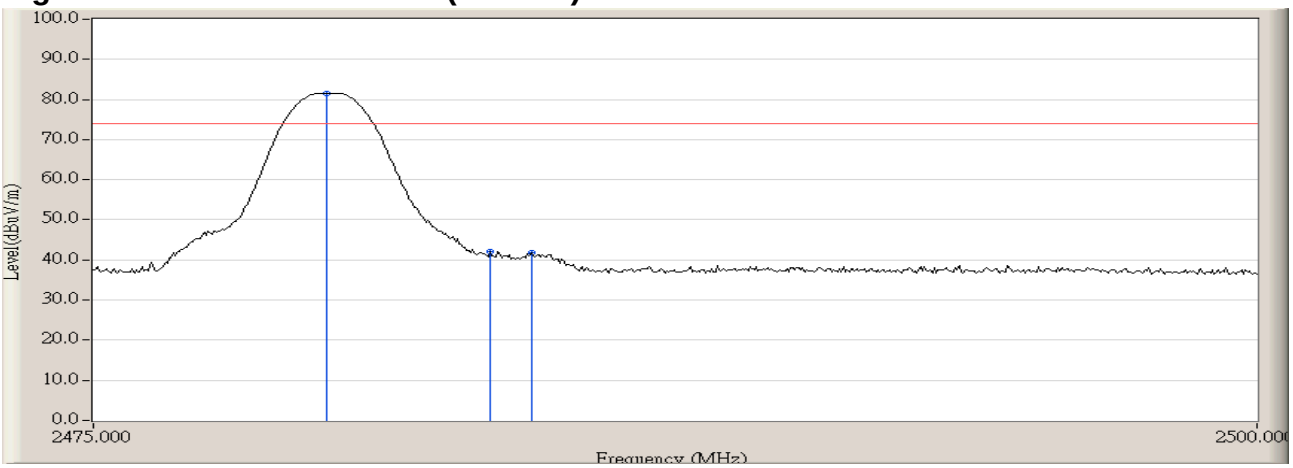
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2483.500	45.211	42.034	74.00	N/A	Pass
78(Average)	2483.500	N/A	N/A	N/A	54.00	Pass

Figure Channel 78: 2480MHz (Vertical)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

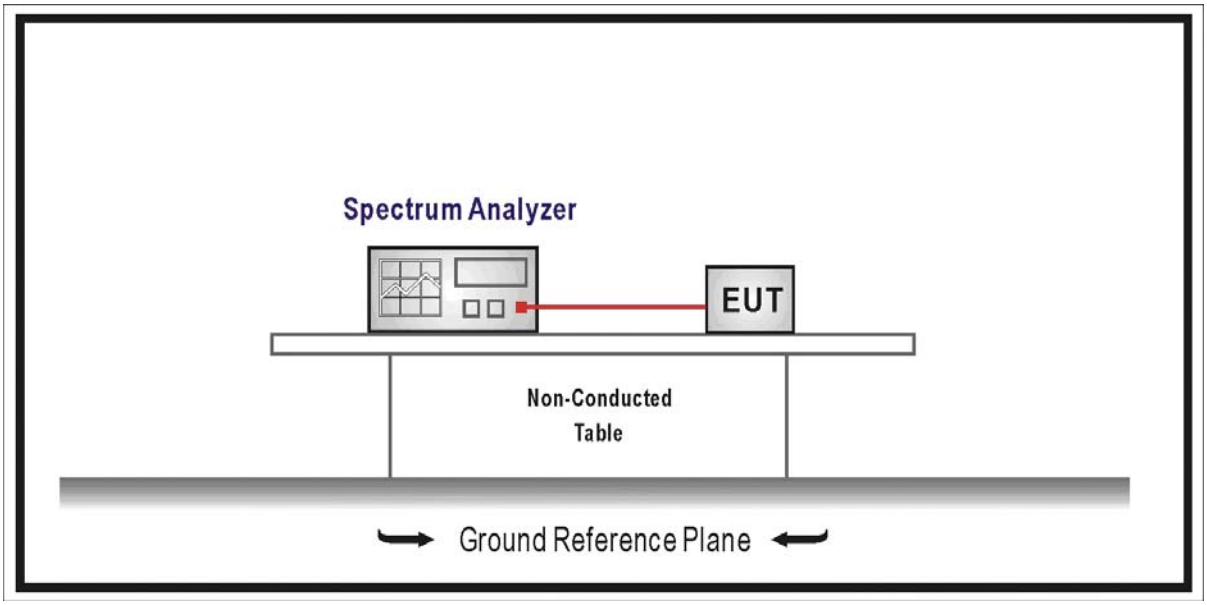
8. Channel Number

8.1. Test Equipment

Channel Number / AC-4

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2007/11/30

8.2. Test Setup



8.3. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 15 hopping frequencies.

8.4. Test Procedure

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
c) Add a correction factor to the display, and then test.

8.5. Uncertainty

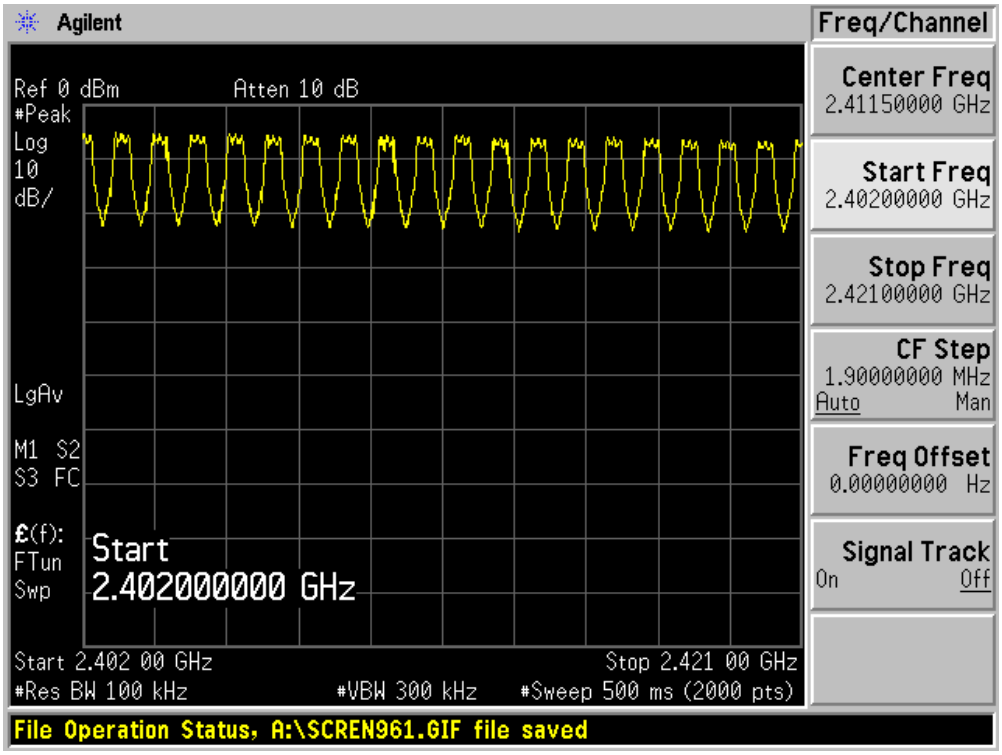
The measurement uncertainty is defined as ± 200 kHz

8.6. Test Result

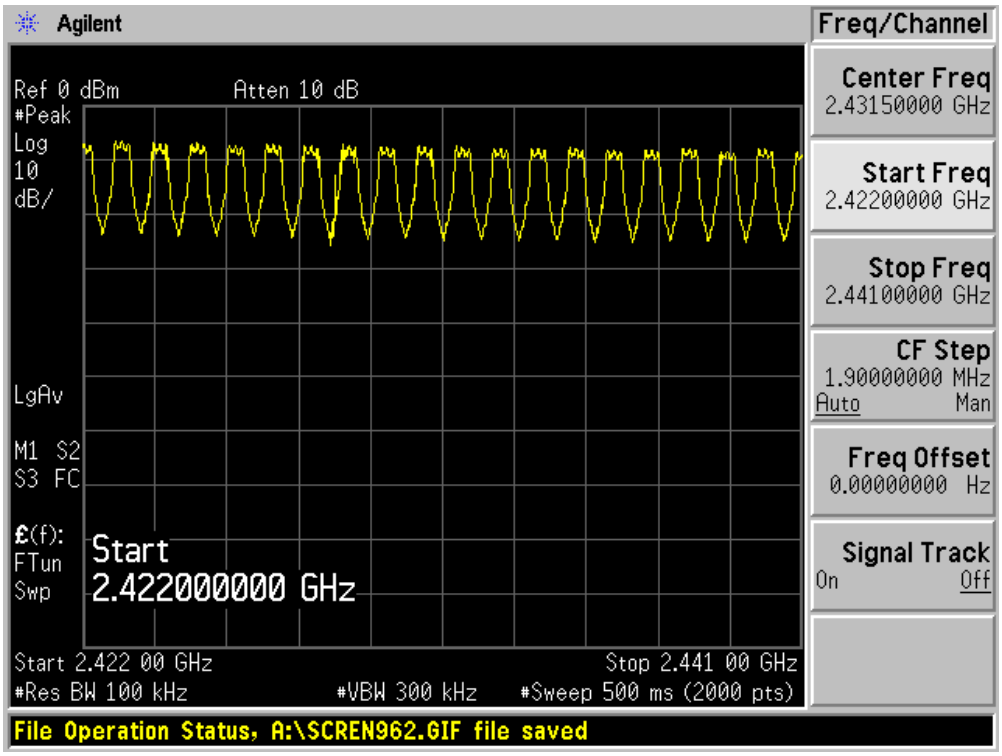
Product	:	Bluetooth Helmet
Test Item	:	Channel Number
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>15	Pass

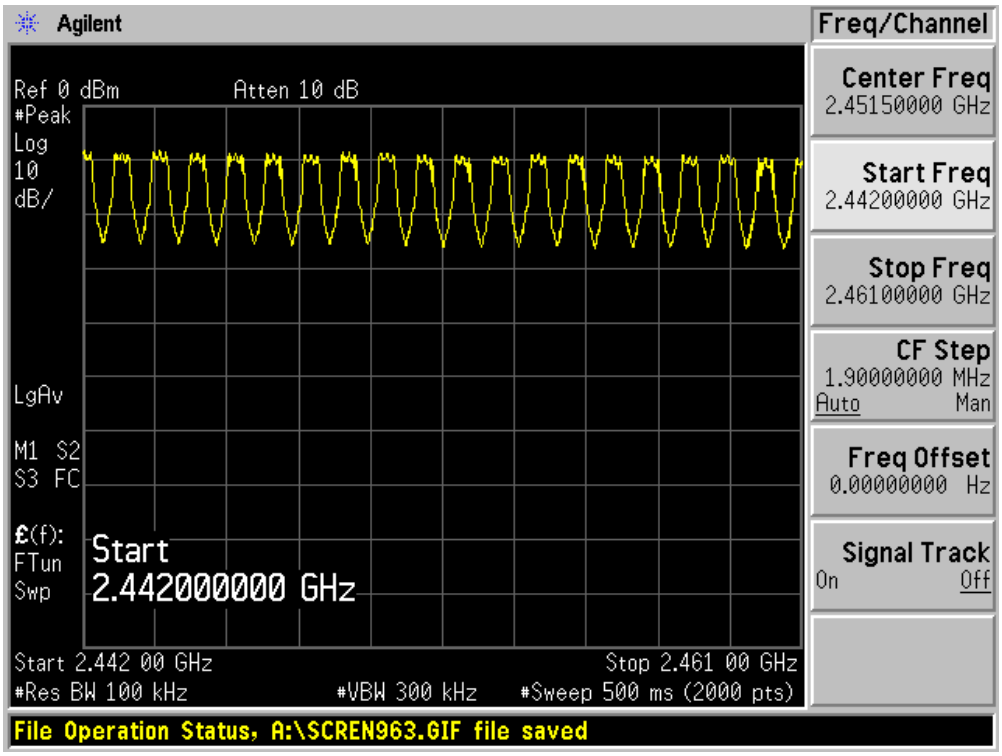
Frequency Range (2402~2421MHz)



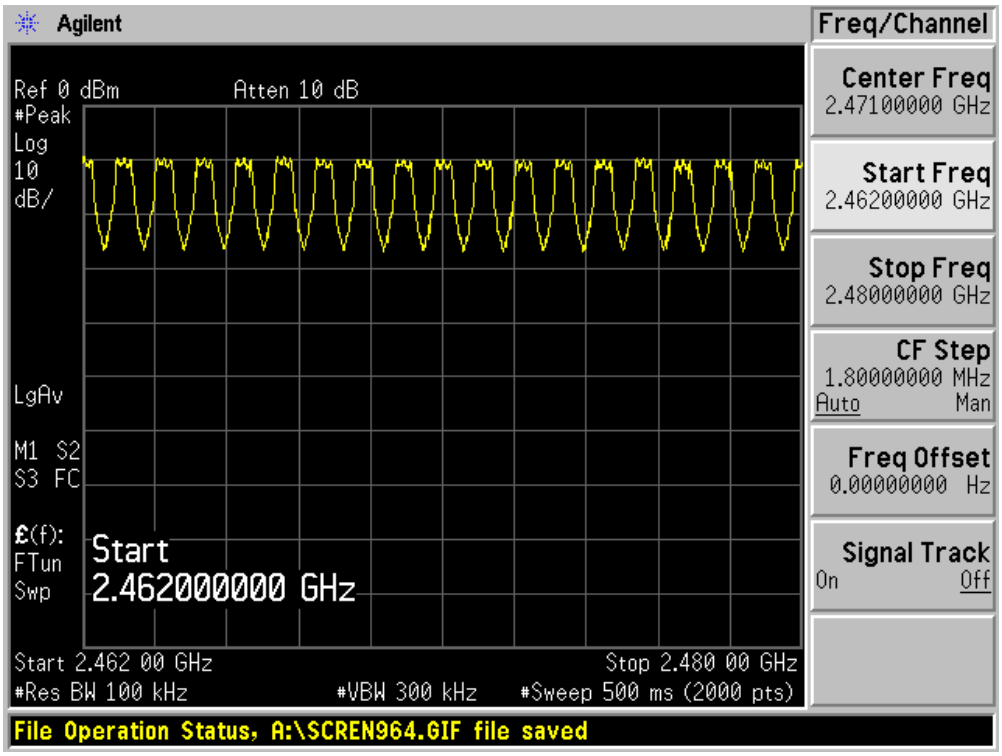
Frequency Range (2422~2441MHz)



Frequency Range (2442~2461MHz)



Frequency Range (2462~2480MHz)



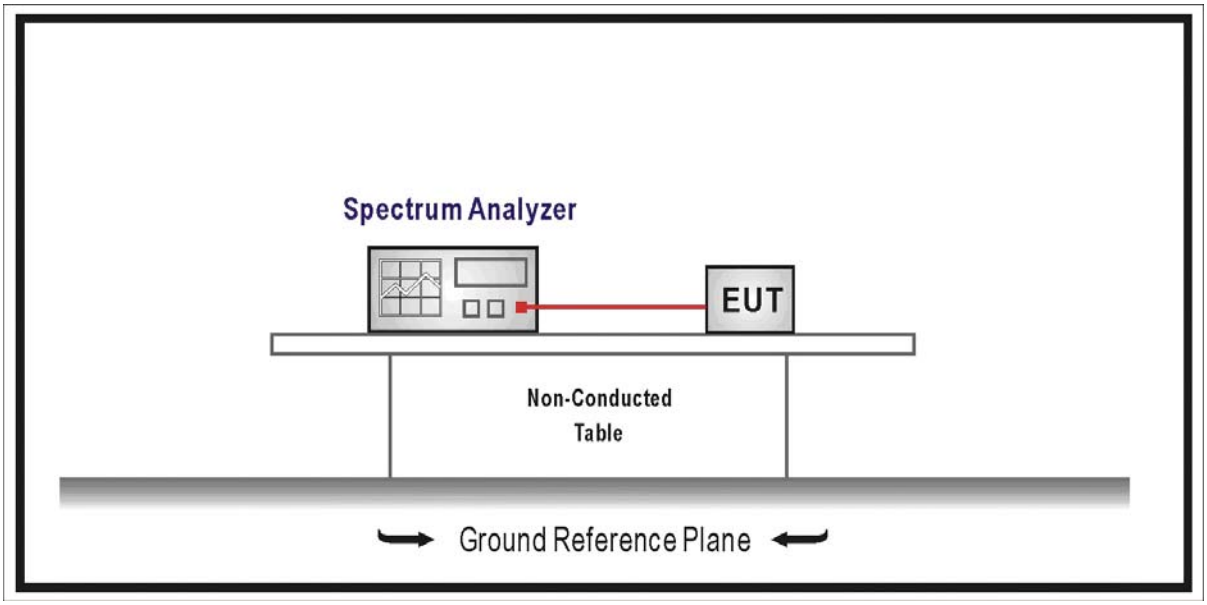
9. Channel Separation

9.1. Test Equipment

Channel Separation / AC-4

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2007/11/30

9.2. Test Setup



9.3. 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 125 mW.

9.4. Test Procedure

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
c) Add a correction factor to the display, and then test.

9.5. Uncertainty

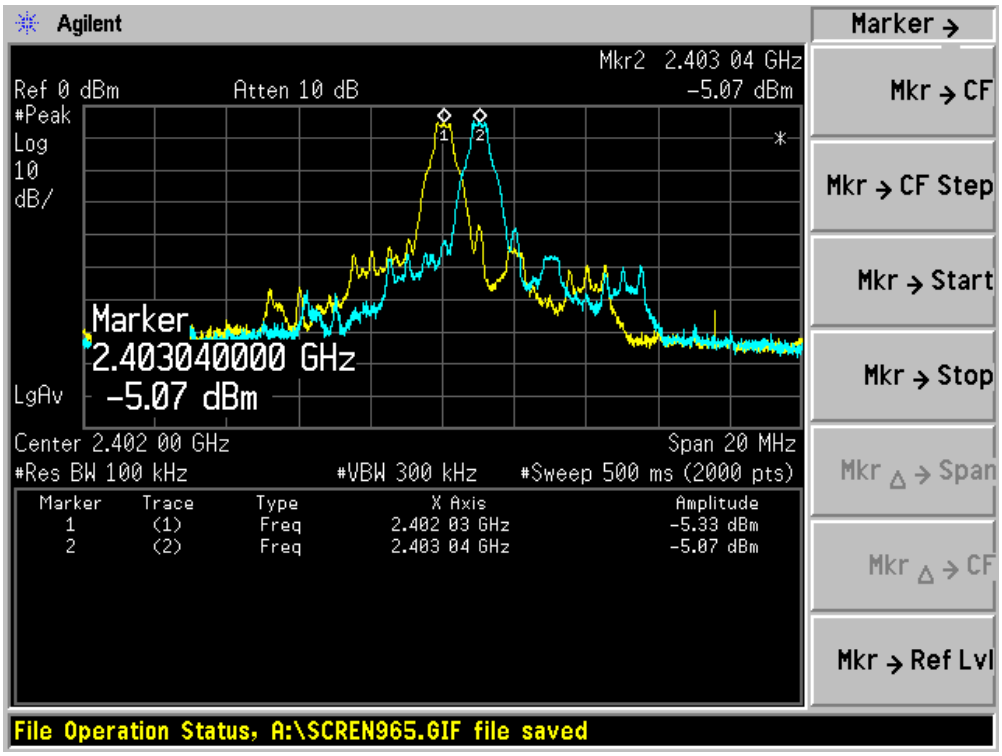
The measurement uncertainty is defined as ± 150 kHz

9.6. Test Result

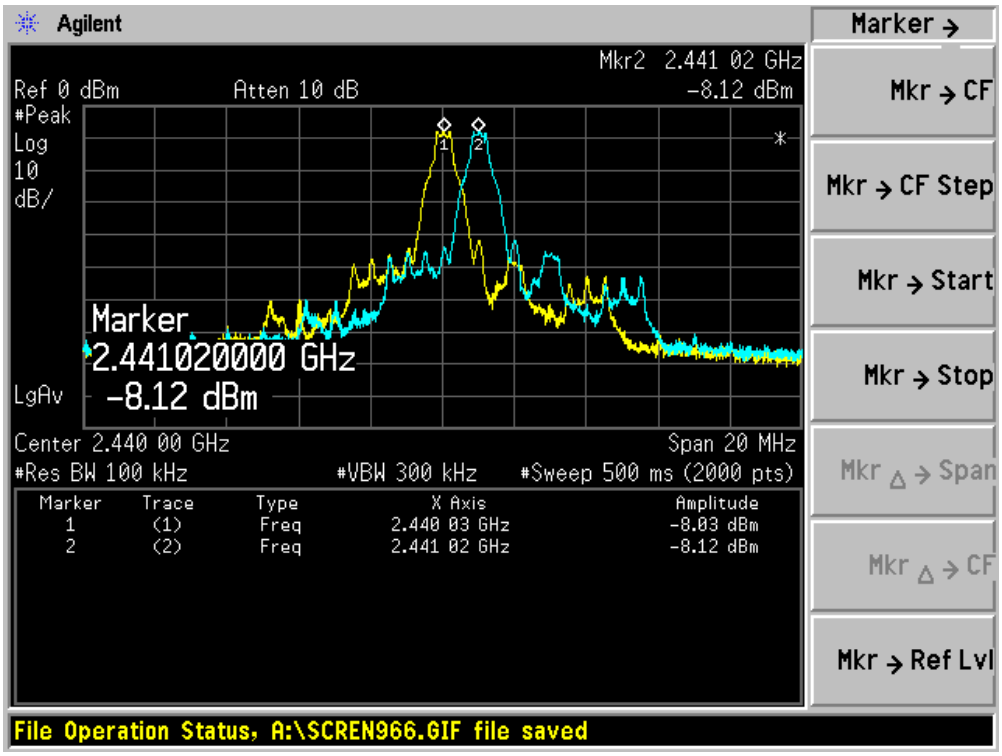
Product	:	Bluetooth Helmet
Test Item	:	Channel Separation
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Frequency (MHz)	Measurement Level (MHz)	Required Limit	Result
2402	1.01	>25 kHz or 2/3 * 20 dB BW	Pass
2441	0.99	>25 kHz or 2/3 * 20 dB BW	Pass
2480	1.02	>25 kHz or 2/3 * 20 dB BW	Pass

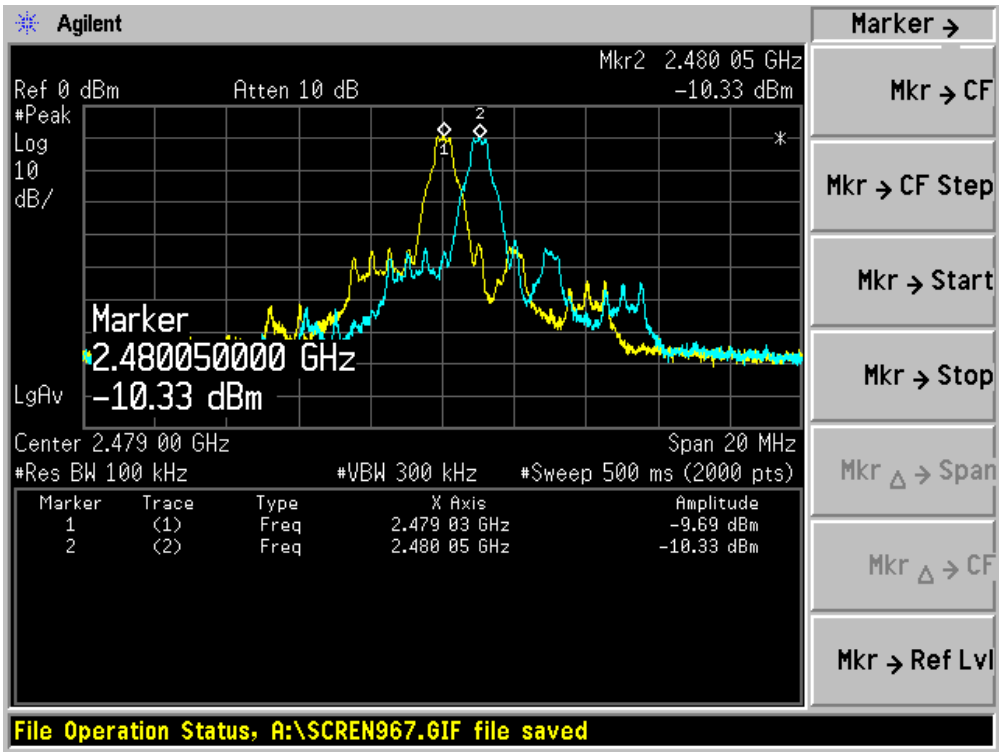
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



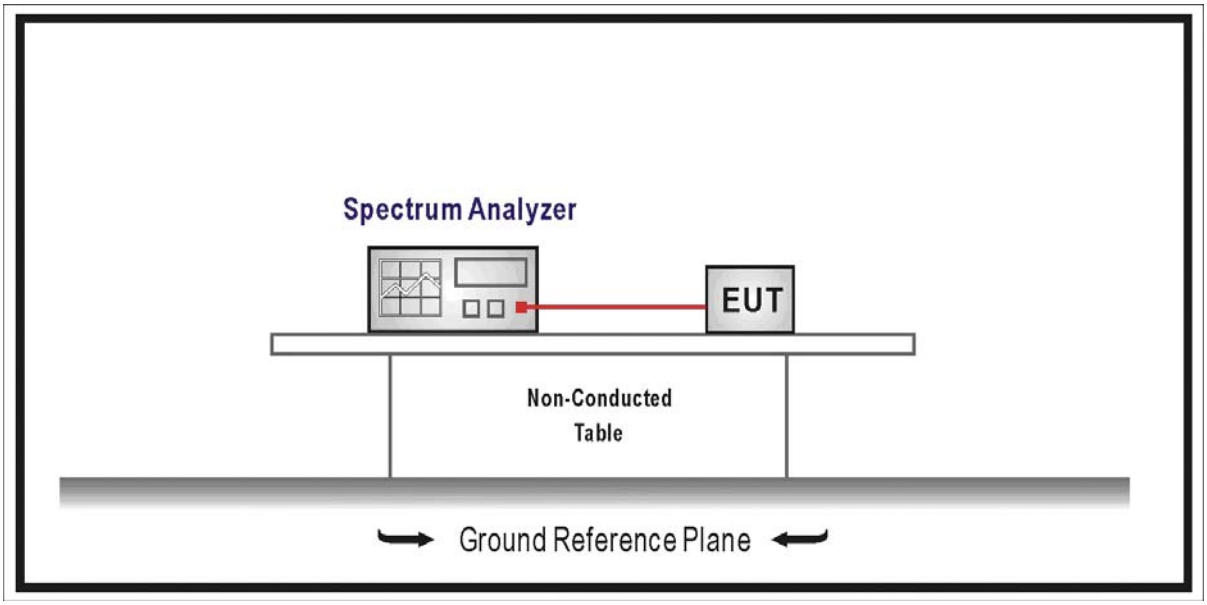
10. Dwell Time

10.1. Test Equipment

Dwell Time / AC-4

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2007/11/30

10.2. Test Setup



10.3. Limit

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

10.4. Test Procedure

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
c) Add a correction factor to the display, and then test.

10.5. Uncertainty

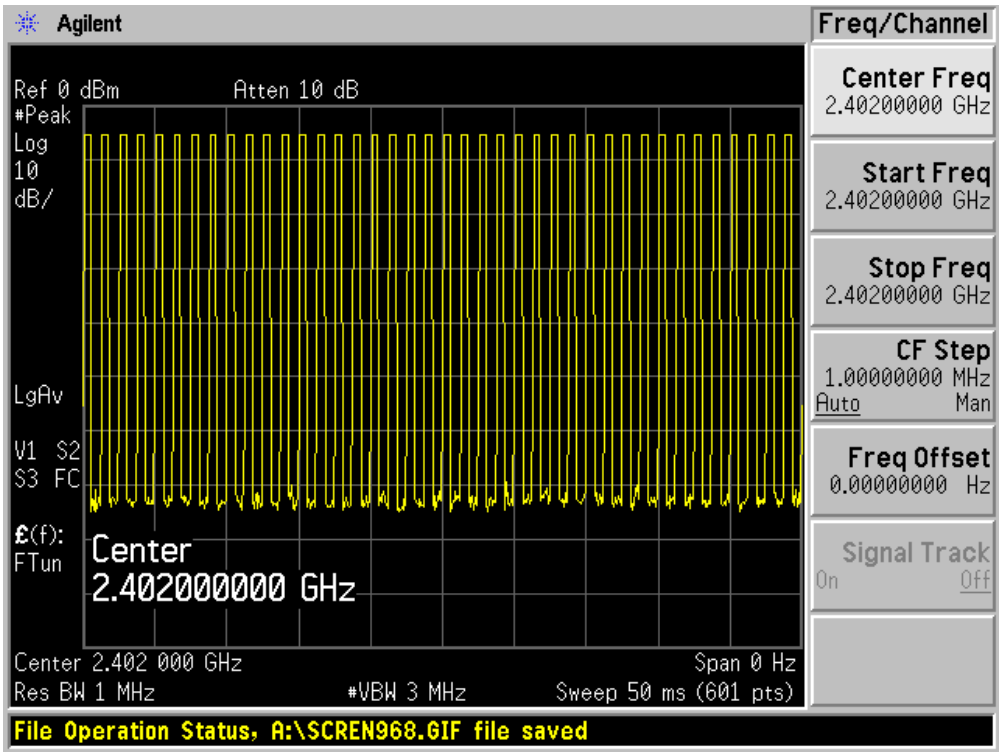
The measurement uncertainty is defined as ± 25 ms

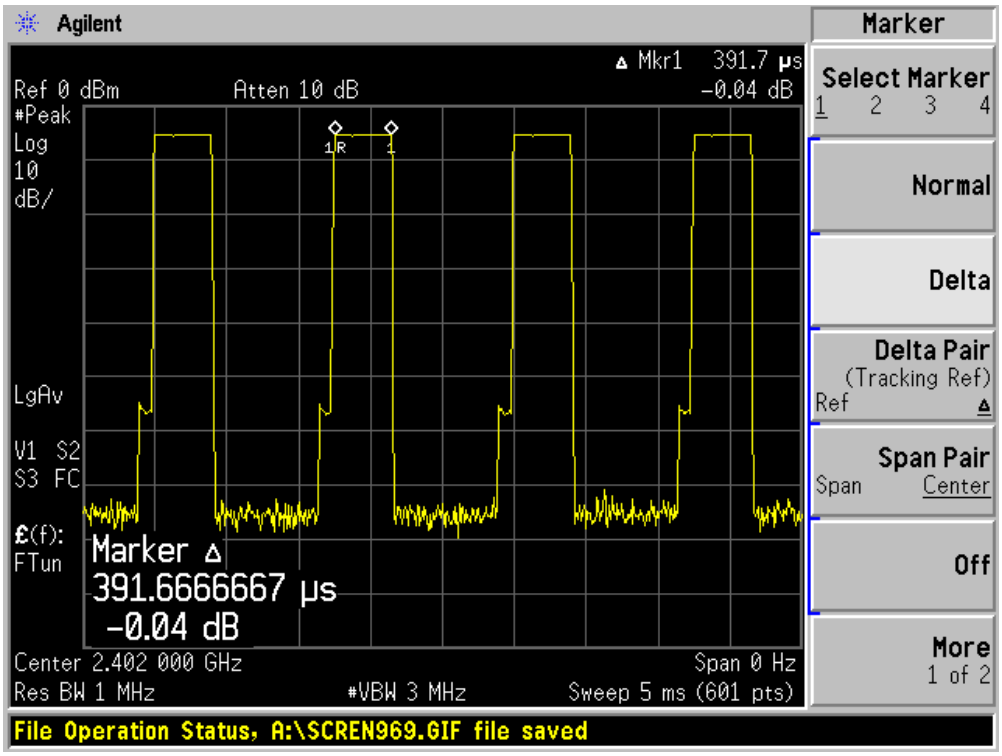
10.6. Test Result

Product	:	Bluetooth Helmet
Test Item	:	Dwell Time
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

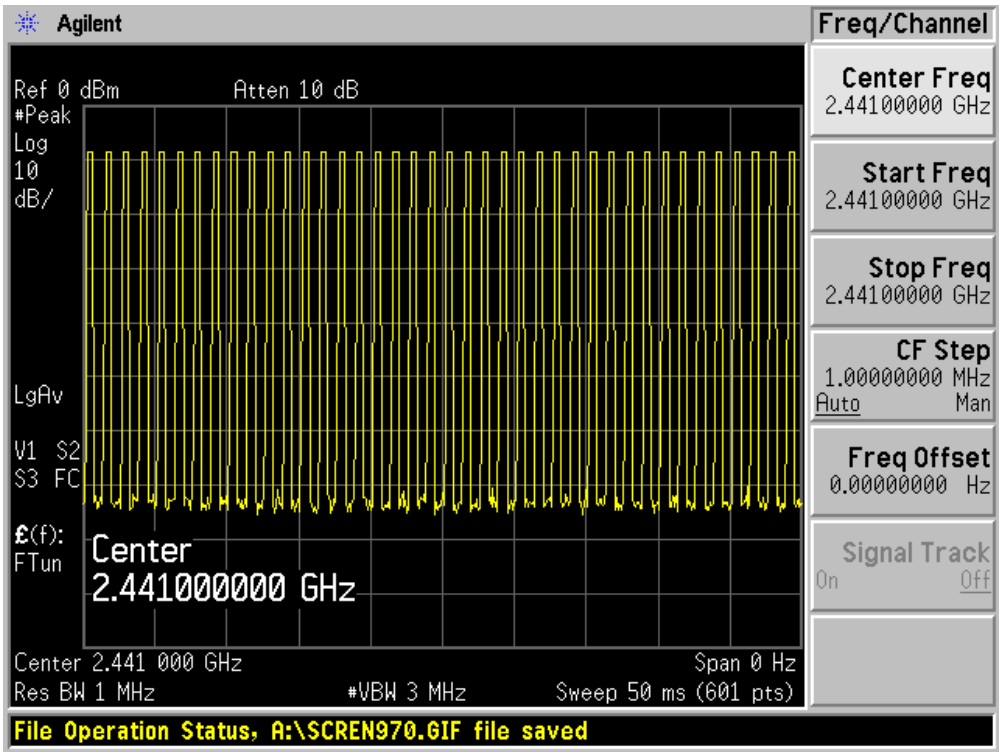
Frequency (MHz)	Measurement Level (ms)	Required Limit (sec.)	Result
2402	125.344	< 0.4	Pass
2441	125.344	< 0.4	Pass
2480	125.344	< 0.4	Pass

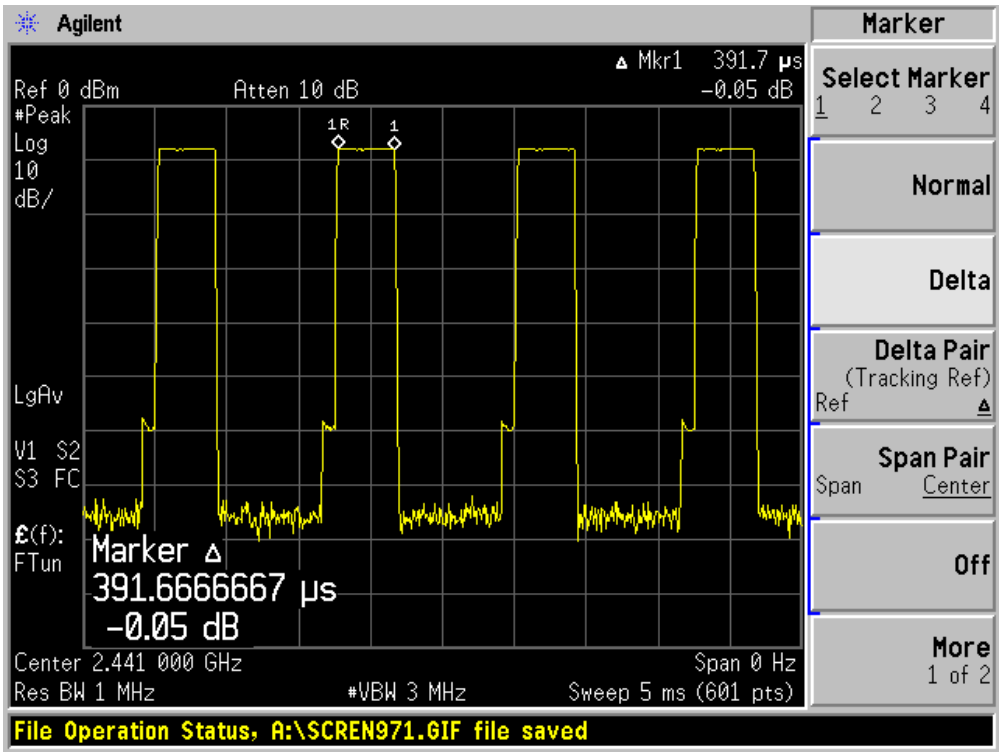
Channel 00 (2402MHz)



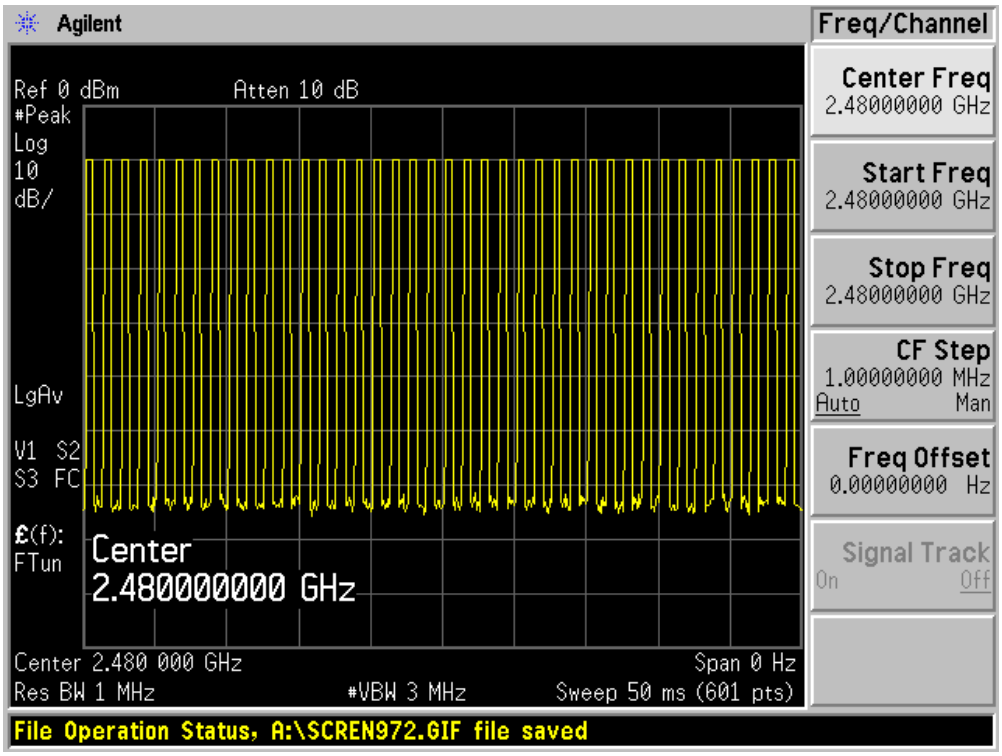


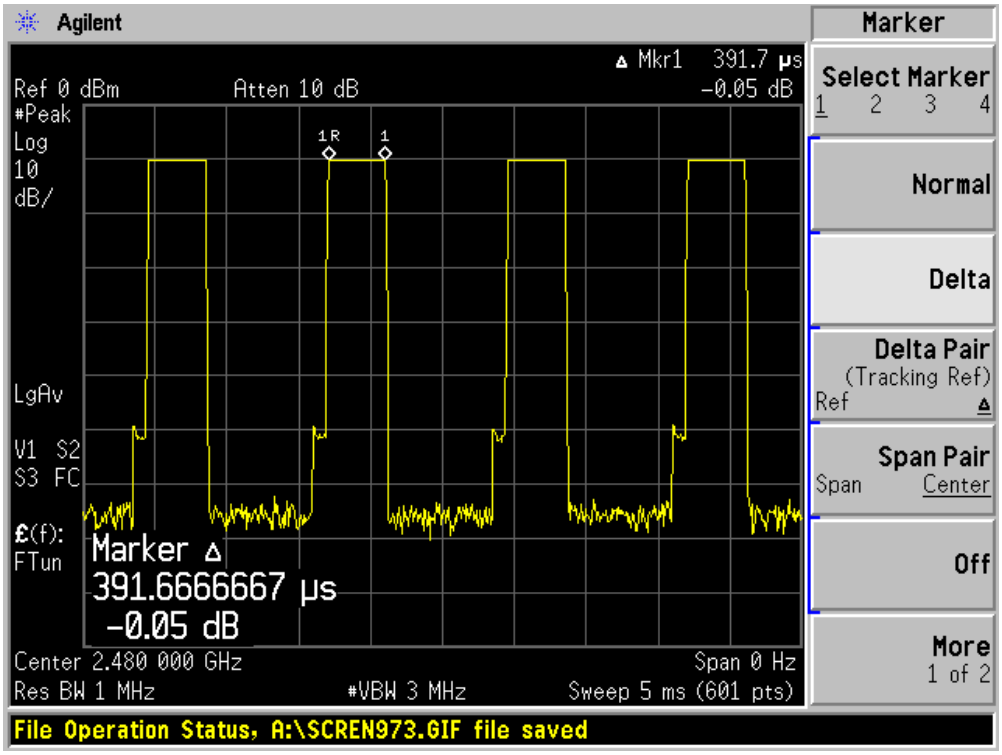
Channel 39 (2441MHz)





Channel 78 (2480MHz)





Occupancy Time of Frequency Hopping System

Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 40/50msec=800 hops/sec.

A) 2402MHz The Maximum Occupancy Time Within 31.6sec: 0.3917msec*(800/79)*31.6= 125.344msec

B) 2441MHz The Maximum Occupancy Time Within 31.6sec: 0.3917msec*(800/79)*31.6= 125.344msec

C) 2480MHz The Maximum Occupancy Time Within 31.6sec: 0.3917msec*(800/79)*31.6= 125.344msec

Test Result: The Average Occupancy Time of Each Highest，Middle and Lowest Channel Is Less Than 0.4sec，And Corresponds to The Standard

PS: (1) From Bluetooth Specification， It Hops 1640 Times in 1sec。The Average Occupancy Time of Each 79 Channels is 1640/79 Times，Therefore，We Calculate The Maximum Occupancy Time (worse cars)As Below:

A) 2402Mhz The Occupancy Time of Each Pulse is 0.4msec，The Maximum Occupancy Time within 31.6sec is 0.4msec*1640/79*31.6=289.056msec

B) 2441MHz The Occupancy Time of Each Pulse is 0.4msec，The Maximum Occupancy Time within 31.6sec is 0.4msec*1640/79*31.6=289.056msec

C) 2480MHz The Occupancy Time of Each Pulse is 0.4msec，The Maximum Occupancy Time within 31.6sec is 0.4msec*1640/79*31.6=289.056msec

Test Result: The Maximum Occupancy Time of Each Highest，Middle and Lowest Channel Is Less Than 0.4sec，And Corresponds to The Standard