



## Test Report

Product Name : Jawbone

Model No. : JBD

FCC ID. : V3J-JBD

Applicant : Aliph com

Address : 99 Rhode Island Street 3rd Floor, San Francisco, 94103

Date of Receipt : 2010/10/04

Issued Date : 2010/10/07

Report No. : 10A103R-RFUSP43V01

Report Version : V1.0

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

# Test Report Certification

Issued Date : 2010/10/07

Report No. : 10A103R-RFUSP43V01



Product Name : Jawbone  
 Applicant : Aliph com  
 Address : 99 Rhode Island Street 3rd Floor, San Francisco, 94103  
 Manufacturer : Fu Gang (Dong Guan) Electronic Co., LTD.  
 Model No. : JBD  
 FCC ID. : V3J-JBD  
 EUT Voltage : DC 5V  
 Trade Name : JAWBONE  
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2009  
 Test Result : Complied

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

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 ( Demi Chang / Engineering Adm. Specialist )

Reviewed By : Sheena Huang  
 ( Sheena Huang / Engineer )

Approved By : Roy Wang  
 ( Roy Wang / Manager )

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## 1. General Information

### 1.1. EUT Description

Product Name	Jawbone
Trade Name	JAWBONE
Model No.	JBD
Frequency Range	2402~2480MHz
Channel Number	79
Type of Modulation	GFSK (1Mbps), $\pi/4$ -DQPSK (2Mbps), 8-DPSK (3Mbps)
Channel Control	Auto
Antenna Type	Solder on PCB
Antenna Gain	-7.42dBi

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

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

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

**Note:**

1. This device is a Jawbone including a 2.4GHz receiving function, and transmitting function.
2. These test results on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regards to the frequency band operation; the lowest , middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. This device is a composite device in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 10A103R-RFUSP37V02 under Declaration of Conformity.

### 1.3. Test Mode

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-Test Mode	
EMI	Mode 1: Transmit
Final Test Mode	
EMI	Mode 1: Transmit

Emission	Mode 1
Conducted Emission	Yes
Peak Power Output	Yes
Radiated Emission	Yes
RF antenna conducted test	Yes
Band Edge	Yes
Channel of Number	Yes
Channel Separation	Yes
Occupied Bandwidth	Yes
Dwell Time	Yes

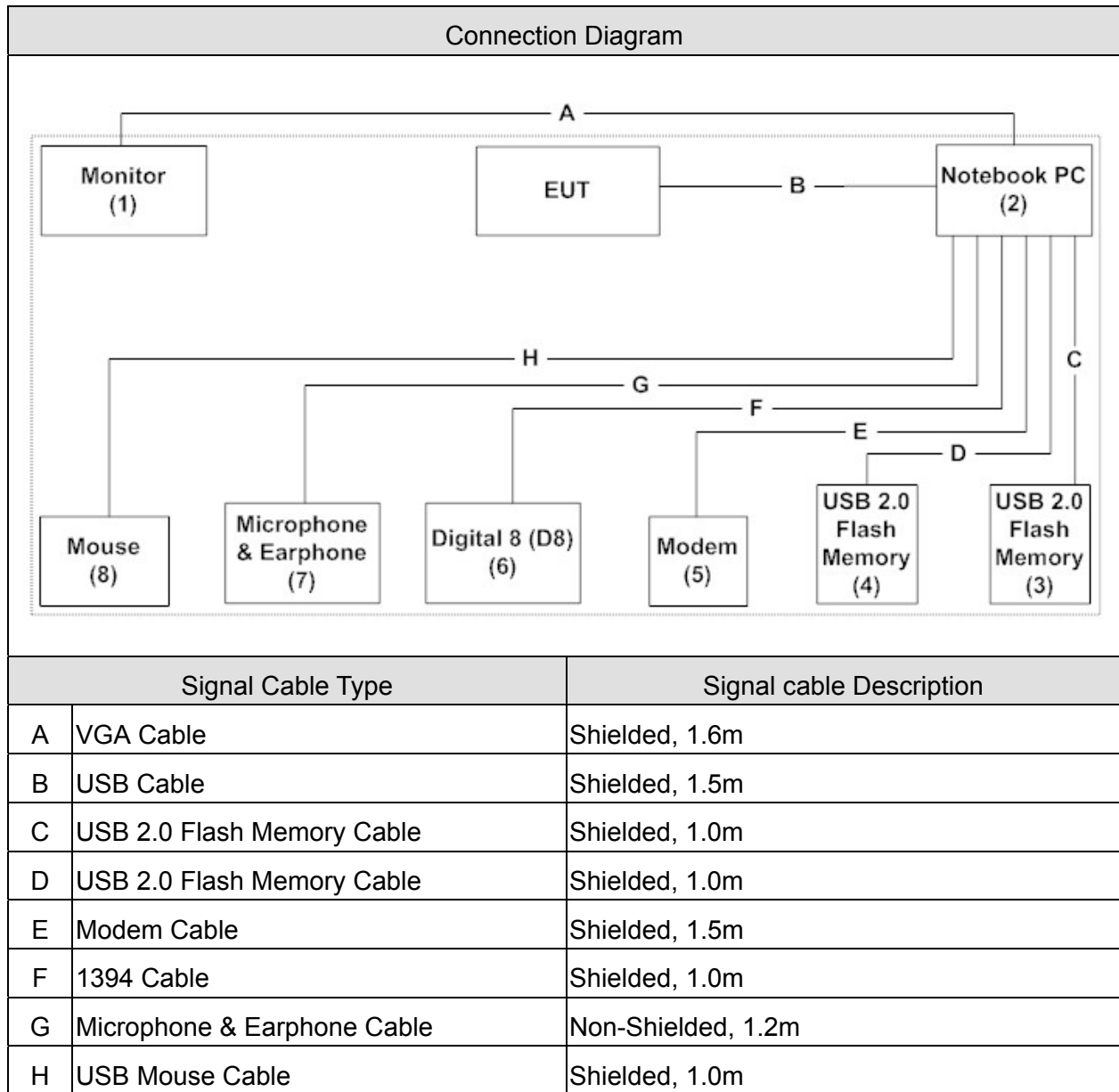
#### 1.4. Tested System Details

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.	FCC ID	Power Cord
1	Monitor	CHI MEI	A170E1-09	3UC120955SA1250	DoC	Non-Shielded, 1.8m
2	Notebook PC	HP Compaq	NX6320FF	CNU7020BXT	DoC	Non-Shielded, 1.8m
3	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--
4	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--
5	Modem	ACEEX	DM-1414	0102027545	DoC	Non-Shielded, 1.6m
6	Digital 8 (D8)	SONY	DCR-TRV110	P35209	DoC	--
7	Microphone & Earphone	Fujiei	SBZ-38	N/A	DoC	--
8	Mouse	Logitech	M-S34	LZE93352932	DZL21 1029	--



### 1.5. Configuration of tested System



### 1.6. EUT Exercise Software

1	Setup the EUT as shown in Section 1.5
2	Execute the BlueSuite V2.0 which is installed on the Notebook
3	Configure the test mode, the test channel.
4	Press "TXDATA1" to start the continuous Transmitter
5	Verify that the EUT works properly.

## 1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (FHSS)	15 - 35	23
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	54
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Of Number (FHSS)	15 - 35	23
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Separation (FHSS)	15 - 35	23
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (FHSS)	15 - 35	24
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Dwell Time (FHSS)	15 - 35	23
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000

## Site Description:

January 24, 2005 File on  
Federal Communications Commission  
Laboratory Division  
7435 Oakland Mills Road  
Columbia, MD 21046  
Registration Number: 365520



Accredited by TAF  
Accreditation Number: 1313  
Effective through: December 27, 2010



Accredited by NVLAP  
NVLAP Lab Code: 200347-0  
Effective through: September 30, 2011



Site Name: Quietek Corporation  
Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,  
Chiung-Lin, Hsin-Chu County,  
Taiwan, R.O.C.  
TEL : 886-3-592-8858 / FAX : 886-3-592-8859  
E-Mail : [service@quietek.com](mailto:service@quietek.com)

## 2. Conducted Emission

### 2.1. Test Equipment

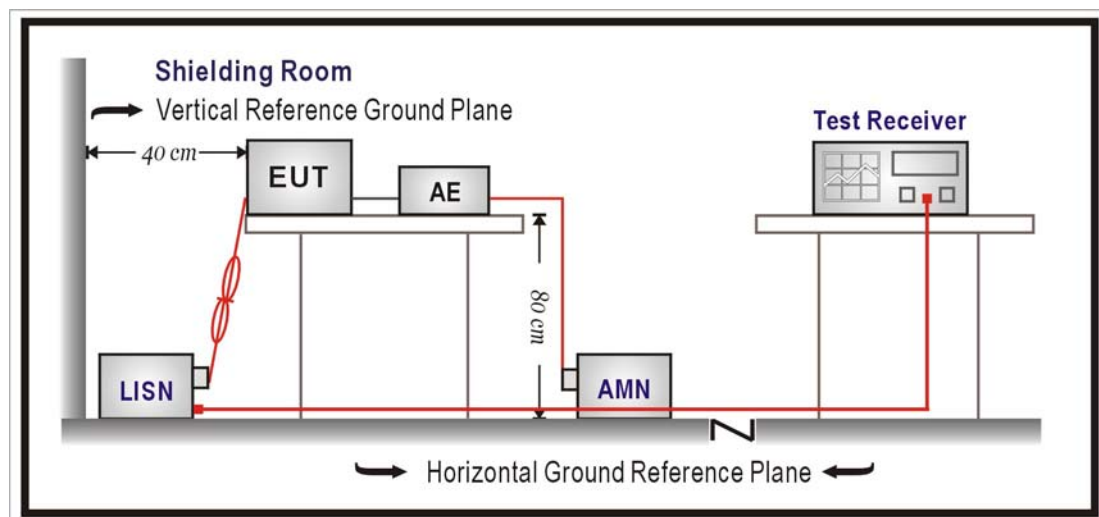
The following test equipments are used during the test:

Conducted Emission / SR3

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
LISN	R&S	ENV216	100096	2011/09/27
LISN	R&S	ESH3-Z5	836679/022	2011/05/30
Test Receiver	R&S	ESCS 30	825442/017	2011/02/04

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 2.2. Test Setup



### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
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.

### 2.4. 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 refer 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 according to ANSI C63.4: 2009 on conducted measurement.

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

### 2.5. Test Specification

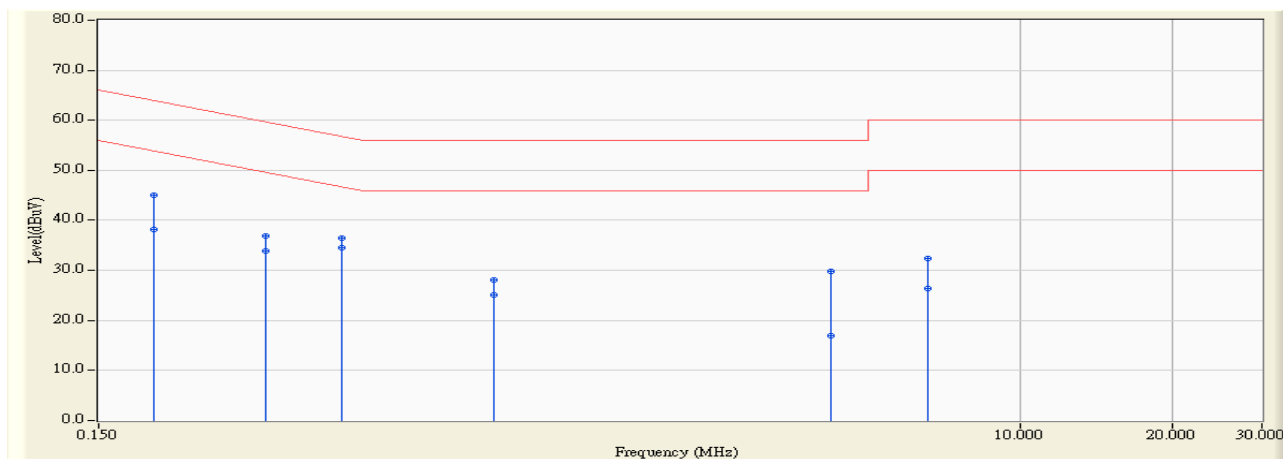
According to FCC Part 15 Subpart C Paragraph 15.207: 2009

### 2.6. Uncertainty

The measurement uncertainty is defined as  $\pm 2.26$  dB.

## 2.7. Test Result

Site : SR3	Time : 2010/10/05 - 11:19
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR3_LISN(16A) - Line1	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit

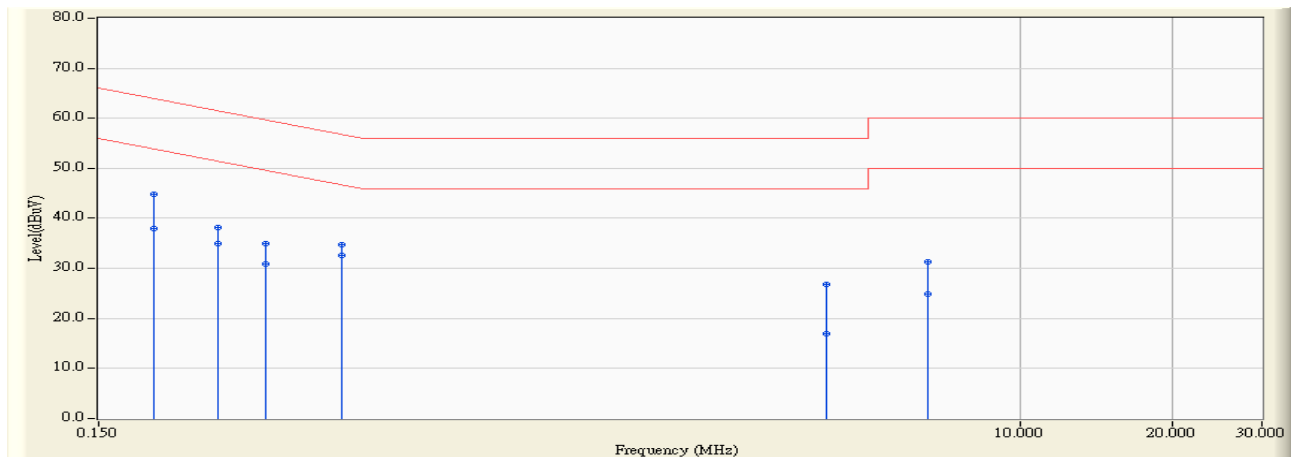


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.193	9.830	35.160	44.989	-18.919	63.908	QUASIPeAK
2		0.193	9.830	28.380	38.209	-15.699	53.908	AVERAGE
3		0.322	9.805	27.100	36.905	-22.753	59.658	QUASIPeAK
4		0.322	9.805	24.130	33.935	-15.723	49.658	AVERAGE
5		0.455	9.771	26.720	36.491	-20.298	56.789	QUASIPeAK
6	*	0.455	9.771	24.800	34.571	-12.218	46.789	AVERAGE
7		0.906	9.758	18.320	28.079	-27.921	56.000	QUASIPeAK
8		0.906	9.758	15.300	25.059	-20.941	46.000	AVERAGE
9		4.205	9.882	19.870	29.752	-26.248	56.000	QUASIPeAK
10		4.205	9.882	7.160	17.042	-28.958	46.000	AVERAGE
11		6.564	9.968	22.500	32.468	-27.532	60.000	QUASIPeAK
12		6.564	9.968	16.340	26.308	-23.692	50.000	AVERAGE

### Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR3	Time : 2010/10/05 - 11:23
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR3_LISN(16A) - Line2	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.193	9.830	35.040	44.869	-19.037	63.906	QUASPEAK
2		0.193	9.830	28.170	37.999	-25.907	63.906	AVERAGE
3		0.259	9.826	28.310	38.136	-23.327	61.463	QUASPEAK
4		0.259	9.826	25.190	35.016	-26.447	61.463	AVERAGE
5		0.322	9.805	25.170	34.975	-24.680	59.655	QUASPEAK
6		0.322	9.805	21.030	30.835	-28.820	59.655	AVERAGE
7		0.455	9.771	25.010	34.781	-22.002	56.783	QUASPEAK
8		0.455	9.771	22.790	32.561	-24.222	56.783	AVERAGE
9		4.138	9.892	16.910	26.802	-29.198	56.000	QUASPEAK
10		4.138	9.892	6.980	16.872	-39.128	56.000	AVERAGE
11		6.564	9.990	21.260	31.251	-28.749	60.000	QUASPEAK
12		6.564	9.990	14.970	24.961	-35.039	60.000	AVERAGE

## Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

### 3. Peak Power Output

#### 3.1. Test Equipment

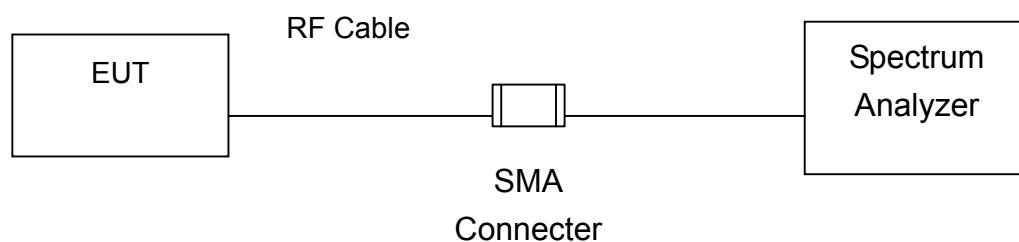
The following test equipment is used during the test:

Peak Power Output / No.7 Shielding Room

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/02/04

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

#### 3.2. Test Setup



#### 3.3. Test procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

#### 3.4. Limits

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.

For frequency hopping systems in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1Watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watt.

#### 3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2009



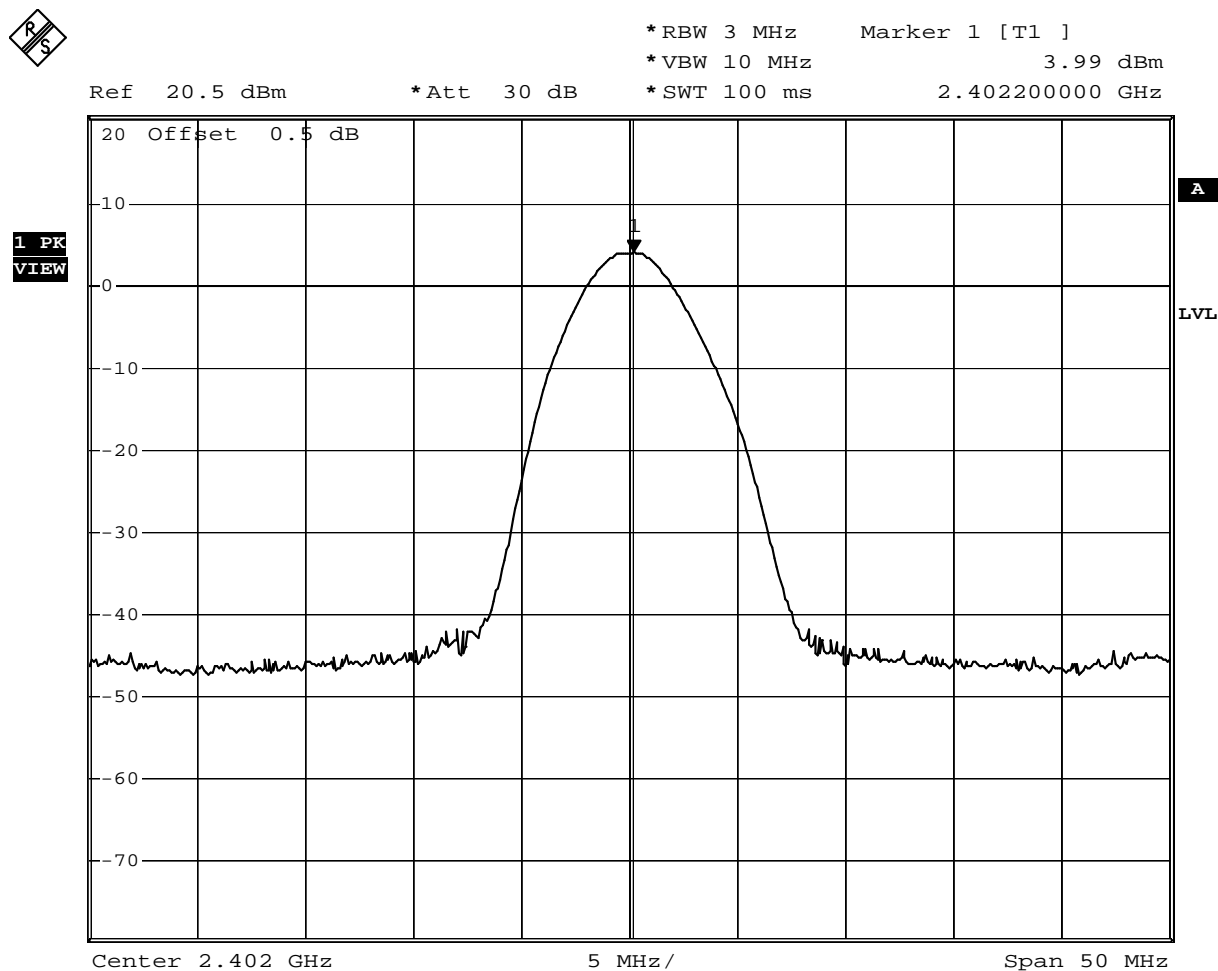
## 3.6. Test Result

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	3.99	1Watt= 30 dBm	Pass

### Channel 00



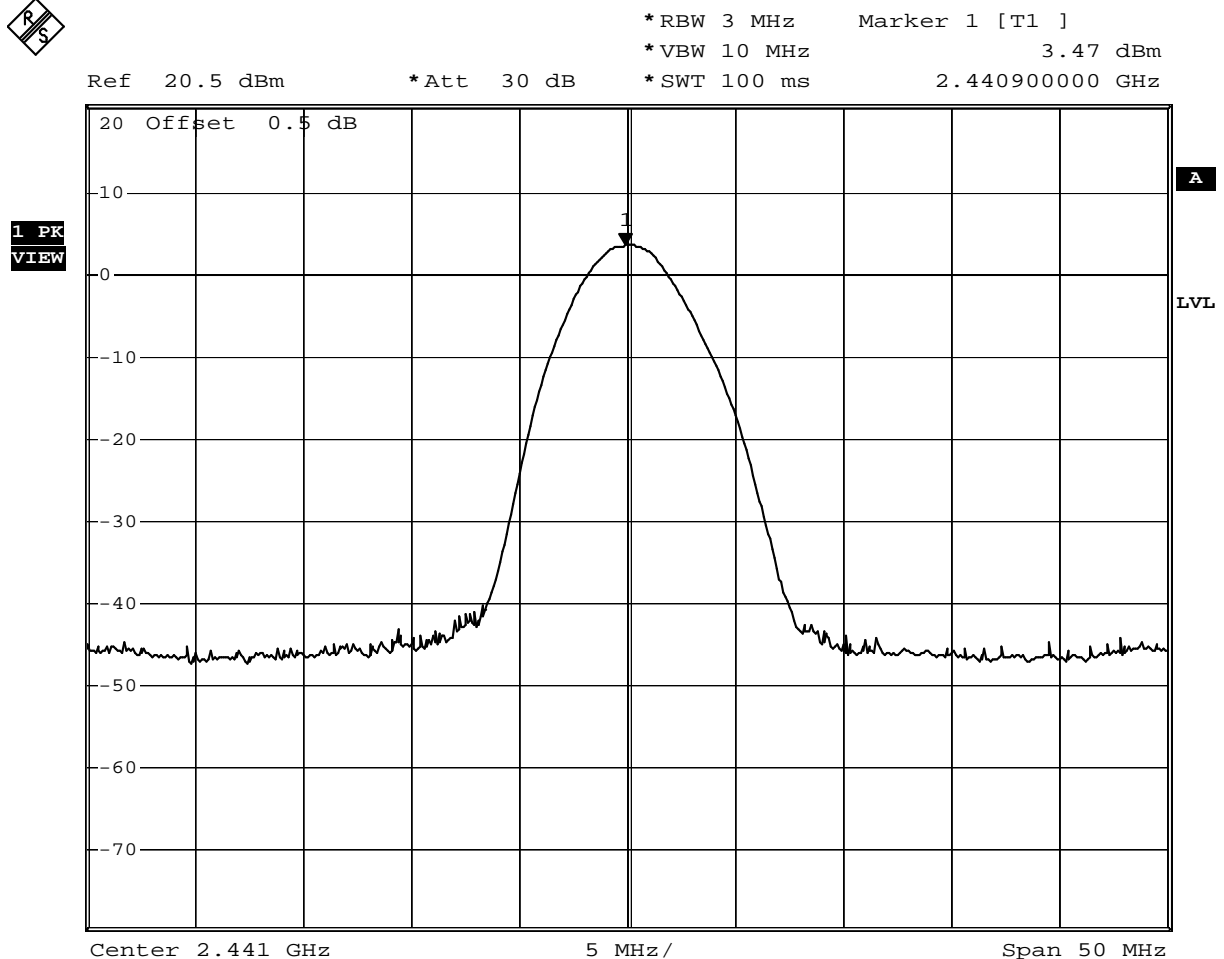
Date: 7.OCT.2010 12:21:06

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	3.47	1Watt= 30 dBm	Pass

### Channel 39



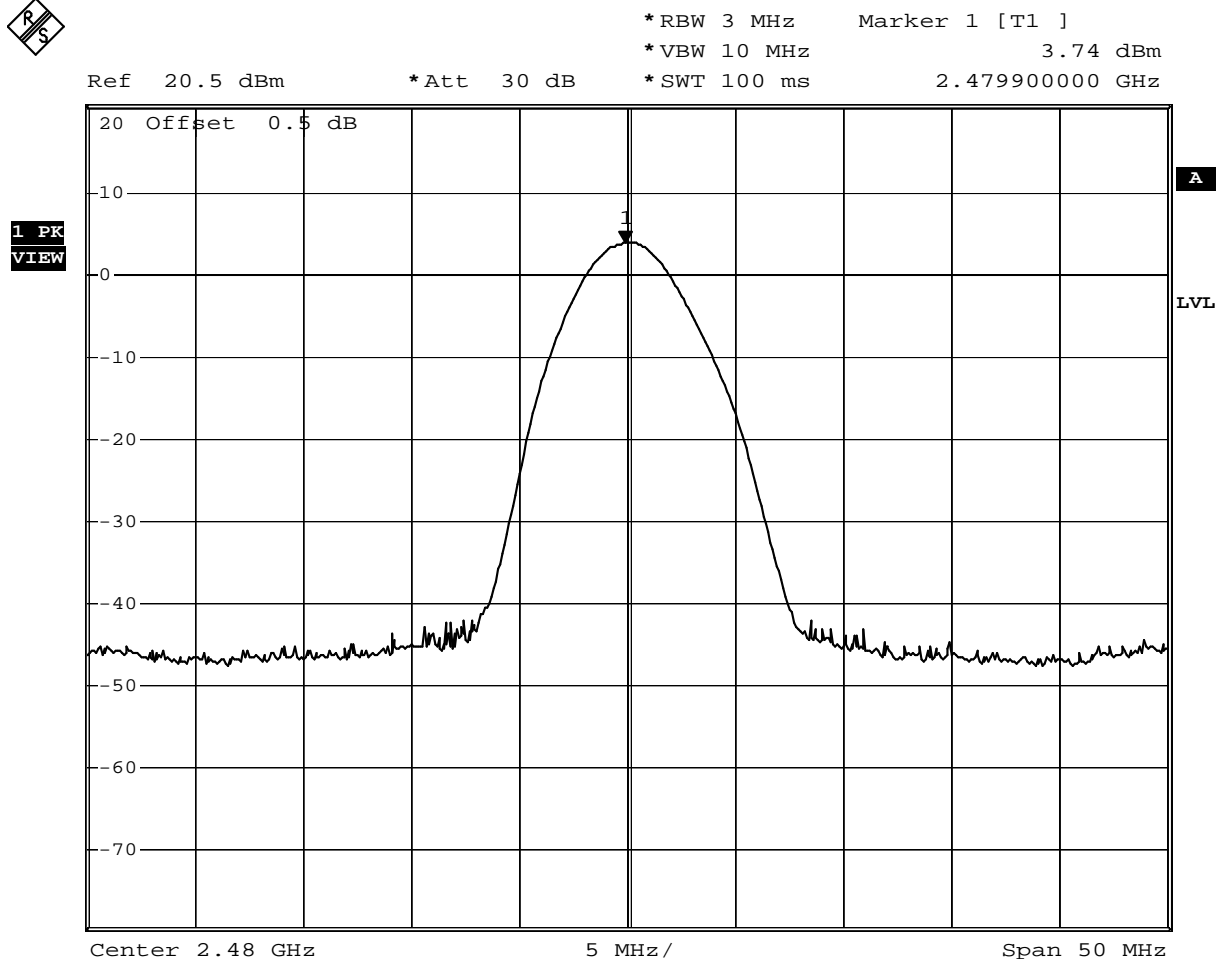
Date: 7.OCT.2010 12:20:25

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	3.74	1Watt= 30 dBm	Pass

### Channel 78



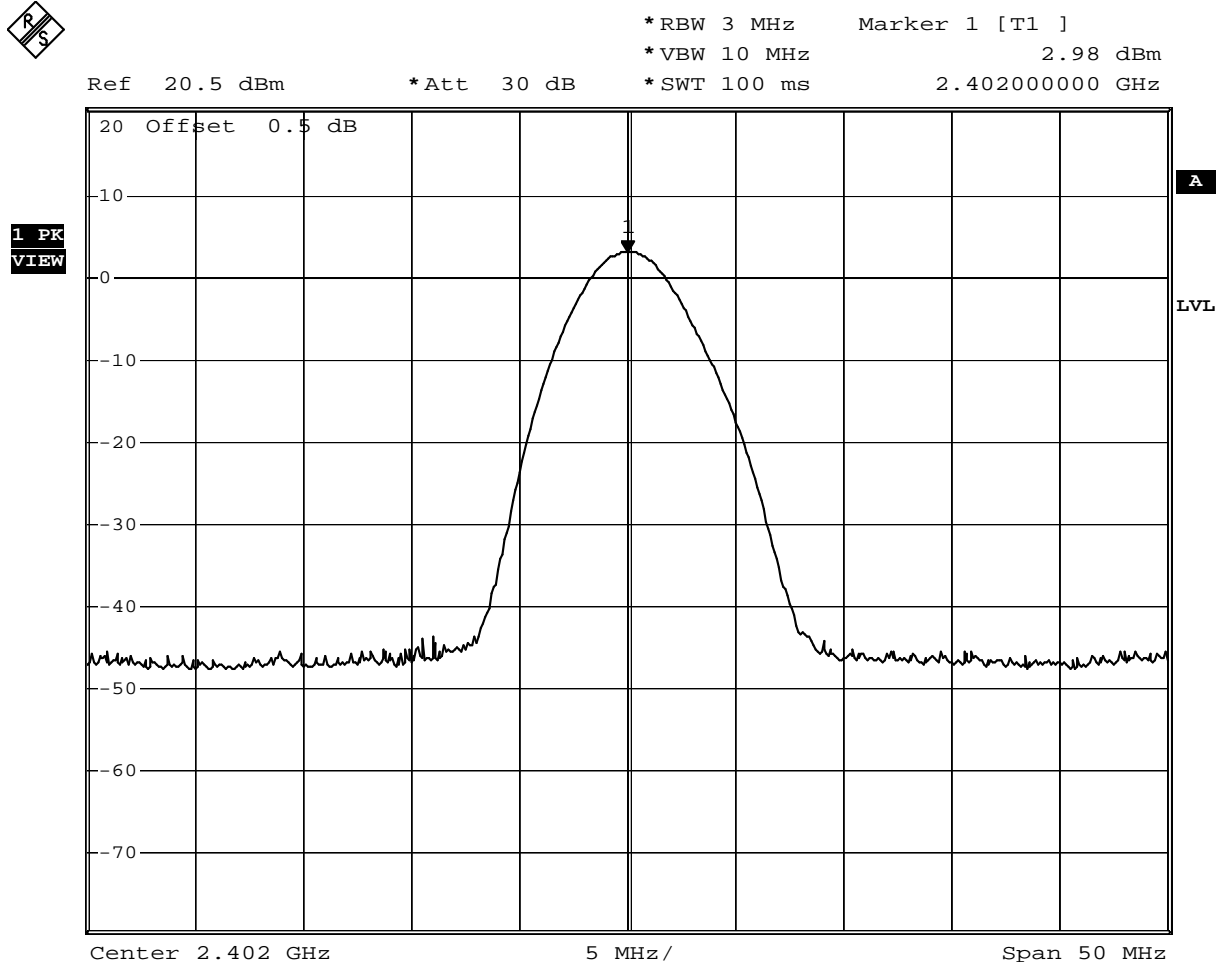
Date: 7.OCT.2010 12:21:41

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## $\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	2.98	1Watt= 30 dBm	Pass

### Channel 00



Date: 7.OCT.2010 12:32:49

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

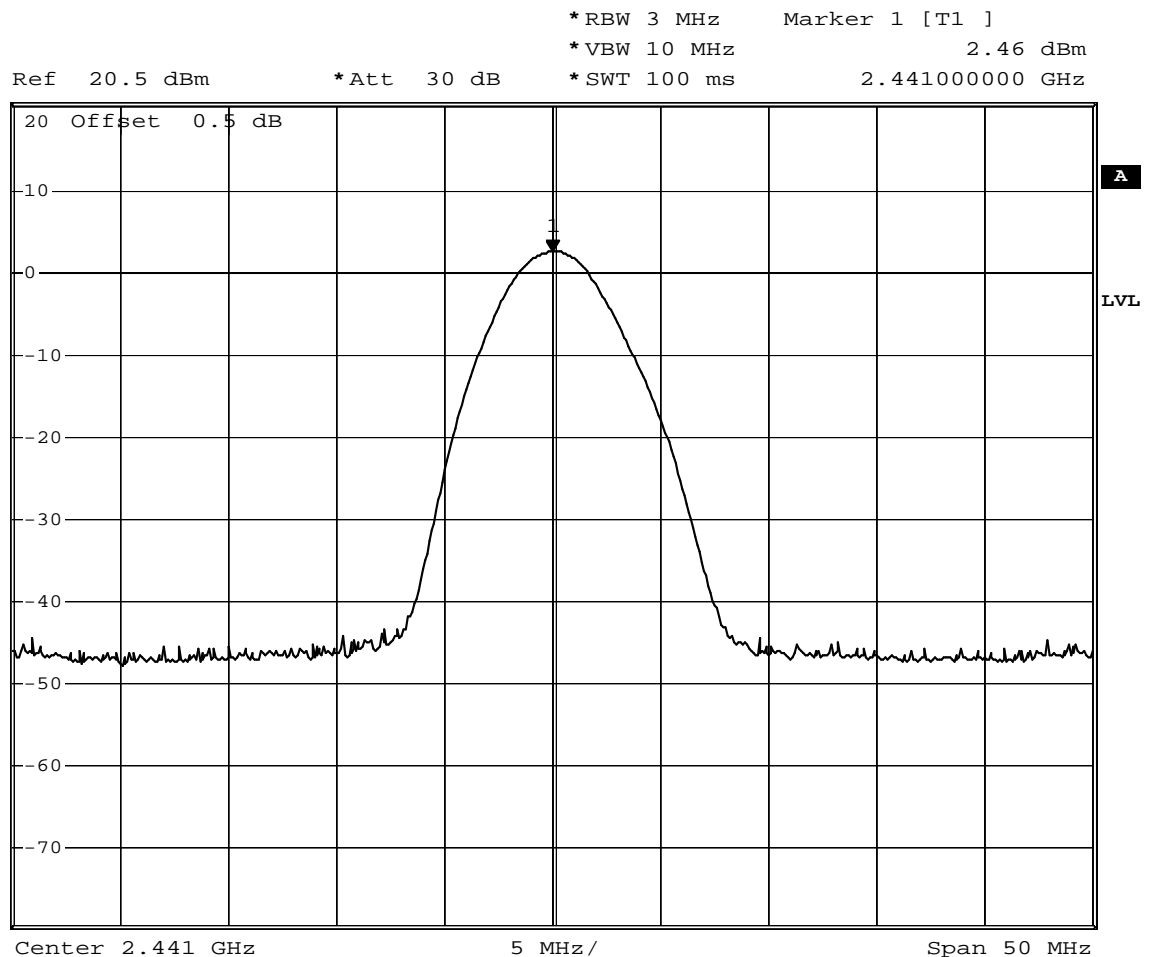
## $\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	2.46	1Watt= 30 dBm	Pass

### Channel 39



1 PK  
VIEW



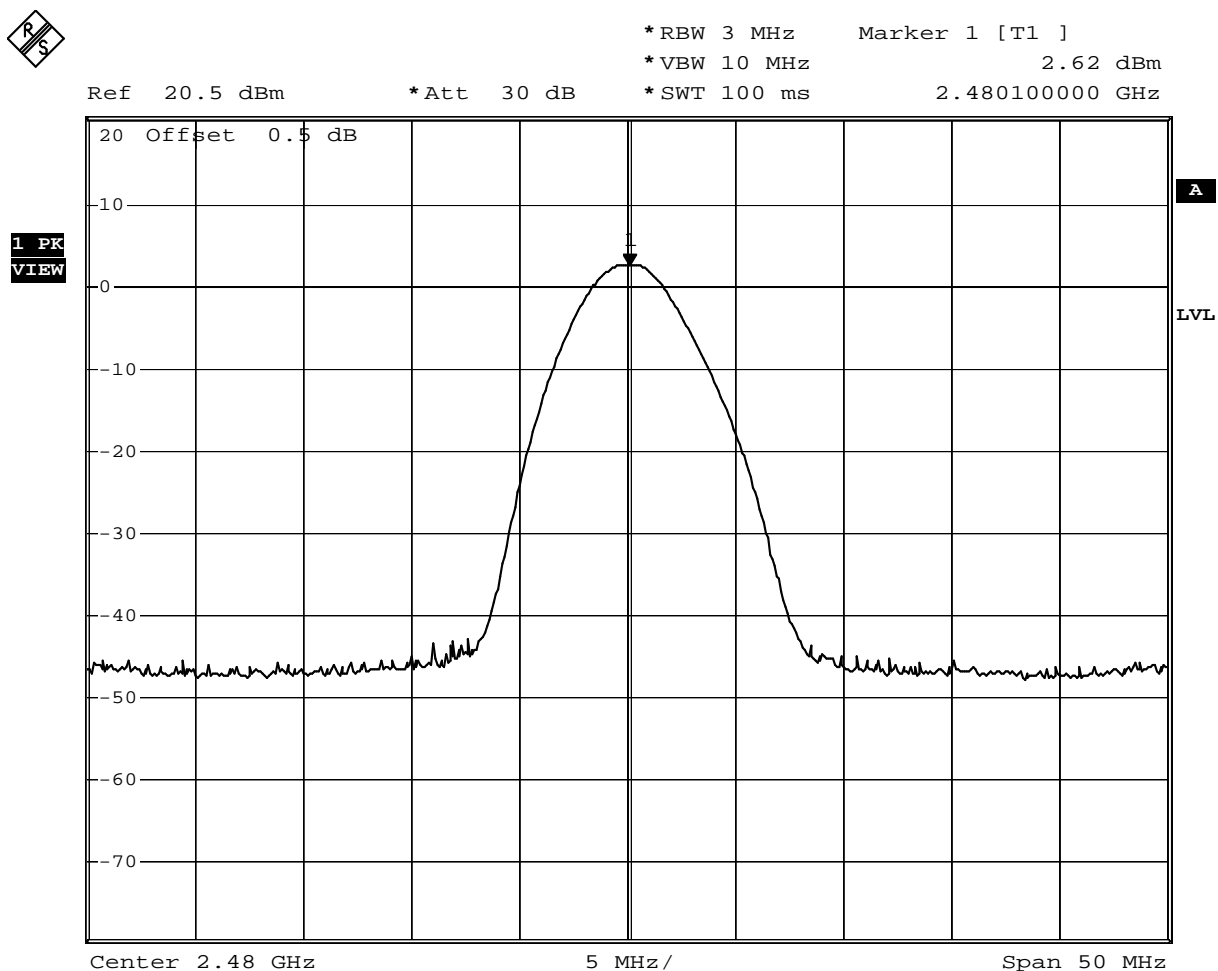
Date: 7.OCT.2010 12:33:40

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## $\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	2.62	1Watt= 30 dBm	Pass

### Channel 78



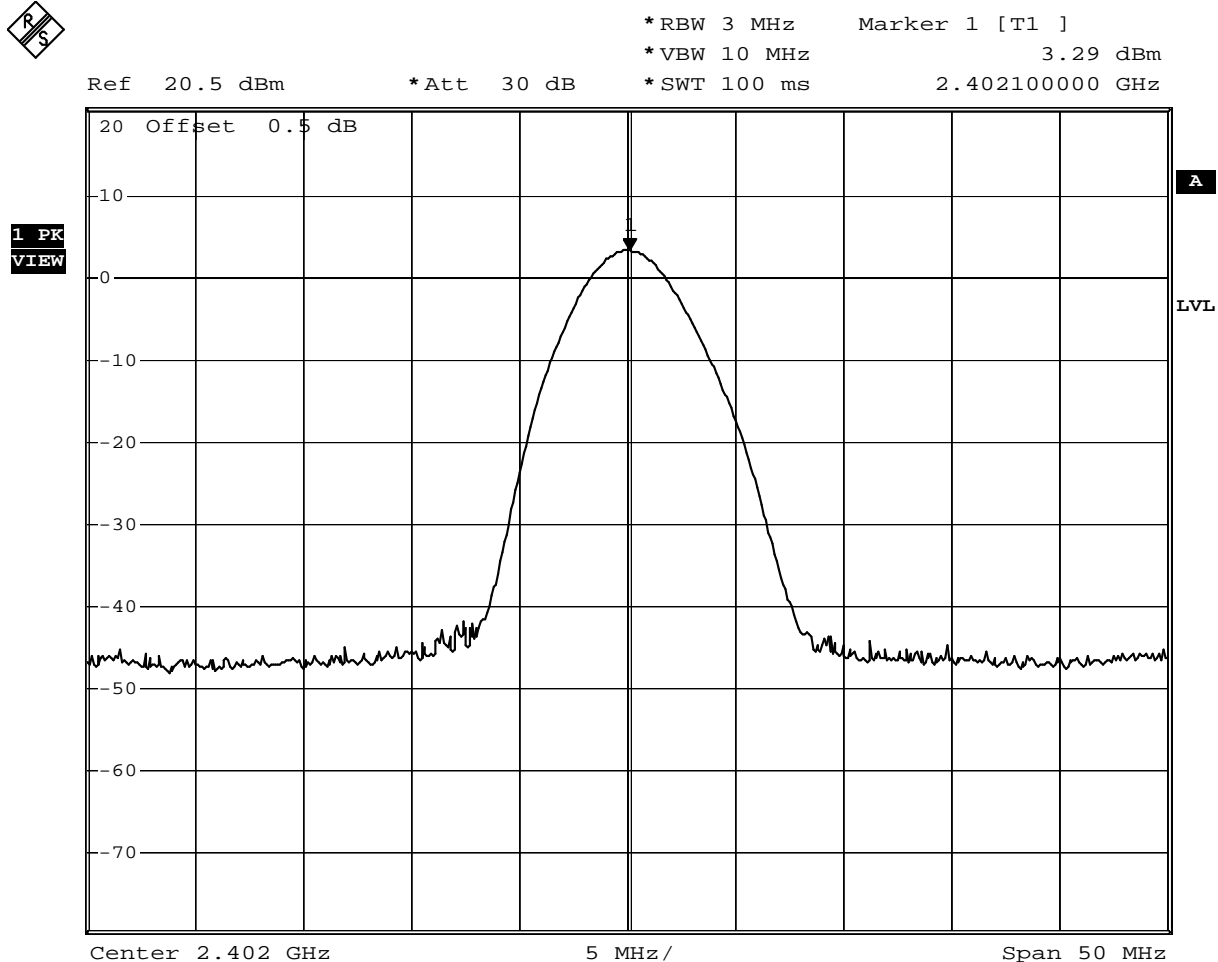
Date: 7.OCT.2010 12:34:18

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## 8-DPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	3.29	1Watt= 30 dBm	Pass

### Channel 00



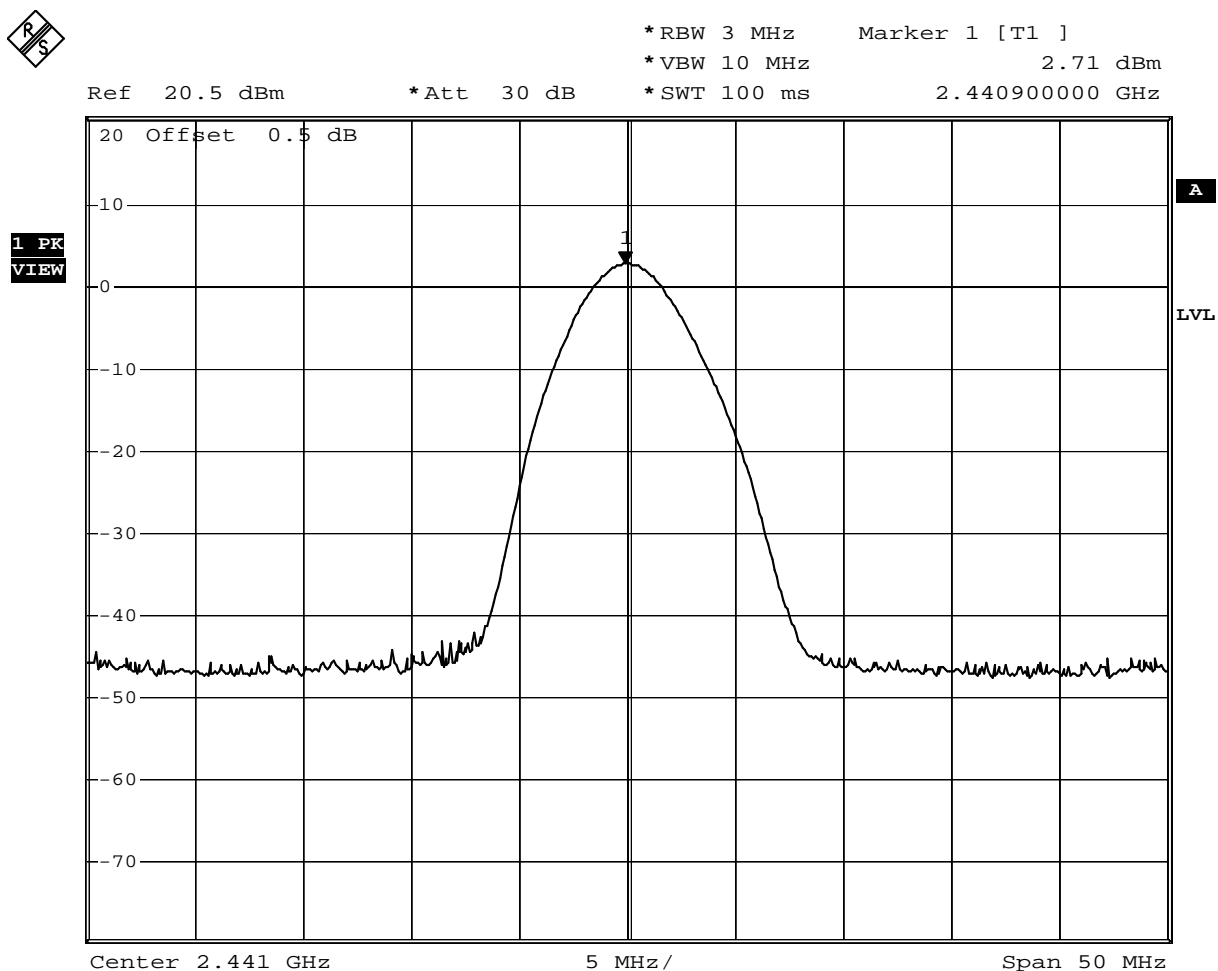
Date: 7.OCT.2010 12:36:14

Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## 8-DPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	2.71	1Watt= 30 dBm	Pass

### Channel 39



Date: 7.OCT.2010 12:35:42

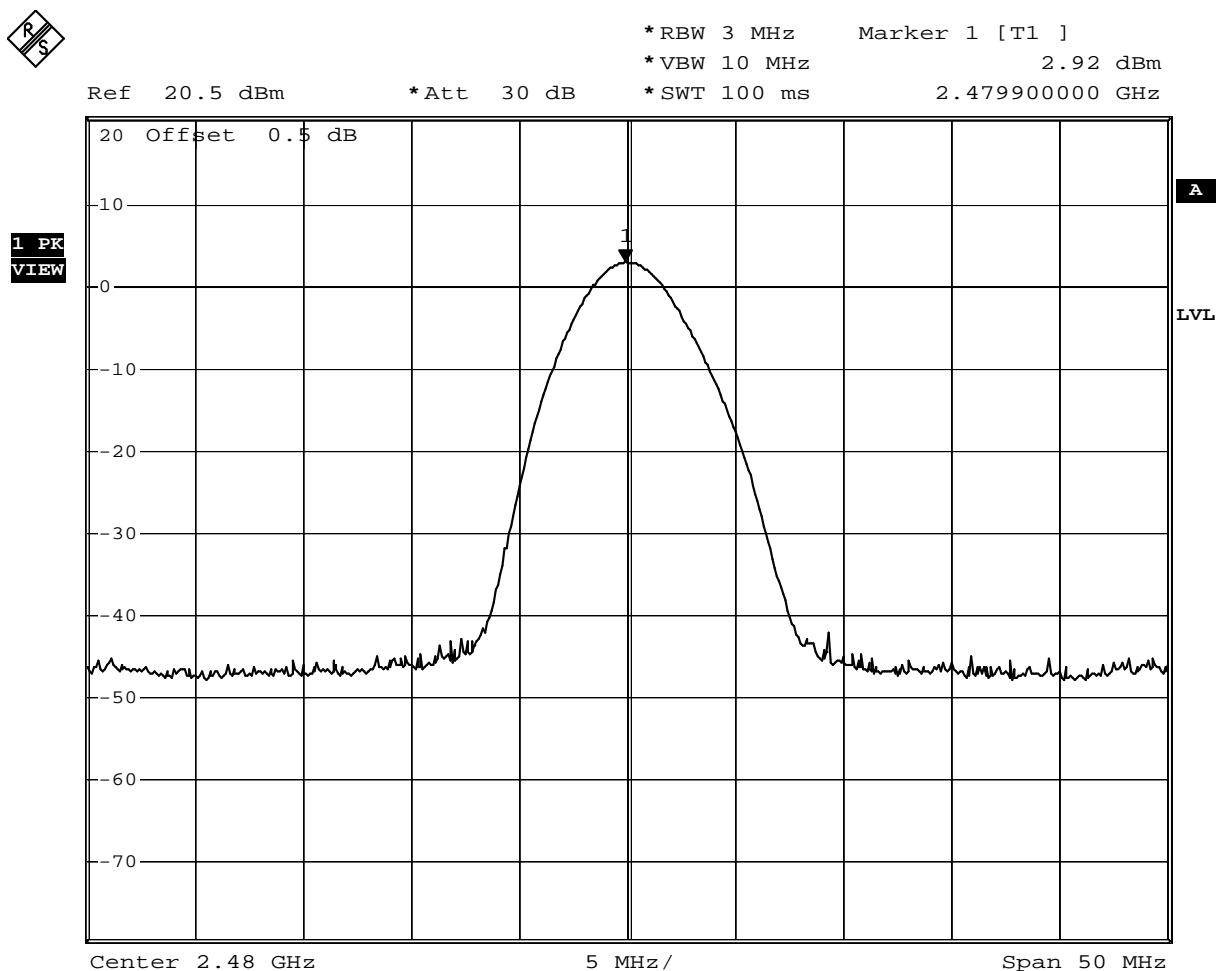


Product	Jawbone		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## 8-DPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	2.92	1Watt= 30 dBm	Pass

### Channel 78



Date: 7.OCT.2010 12:35:01

## 4. Radiated Emission

### 4.1. Test Equipment

The following test equipments are used during the test:

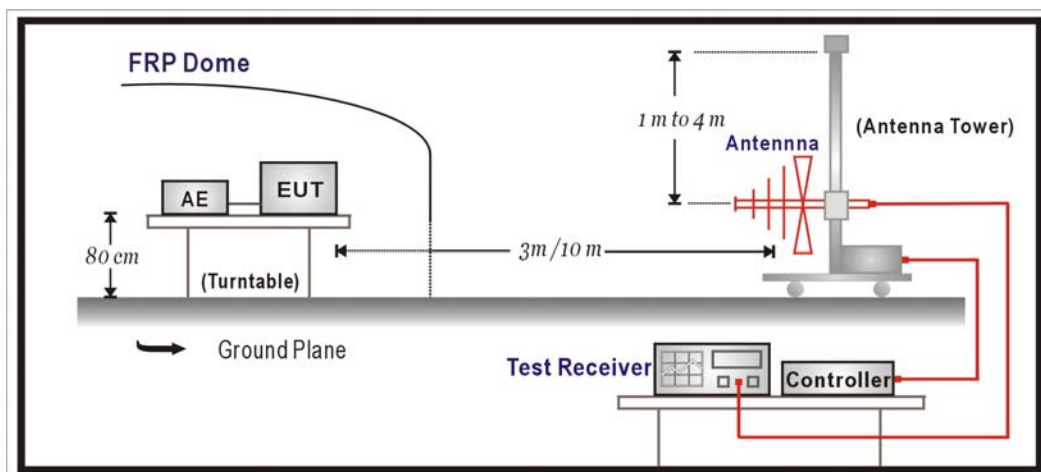
Spurious Emissions / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Horn Antenna	Schwarzback	BBHA 9120D	743	2011/03/15
Bilog Antenna	SCHAFFNER	CBL6112B	2895	2010/08/15
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2010/12/04
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2011/03/26
Spectrum Analyzer	Agilent	E4440A	MY46187335	2011/01/15
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2011/04/07

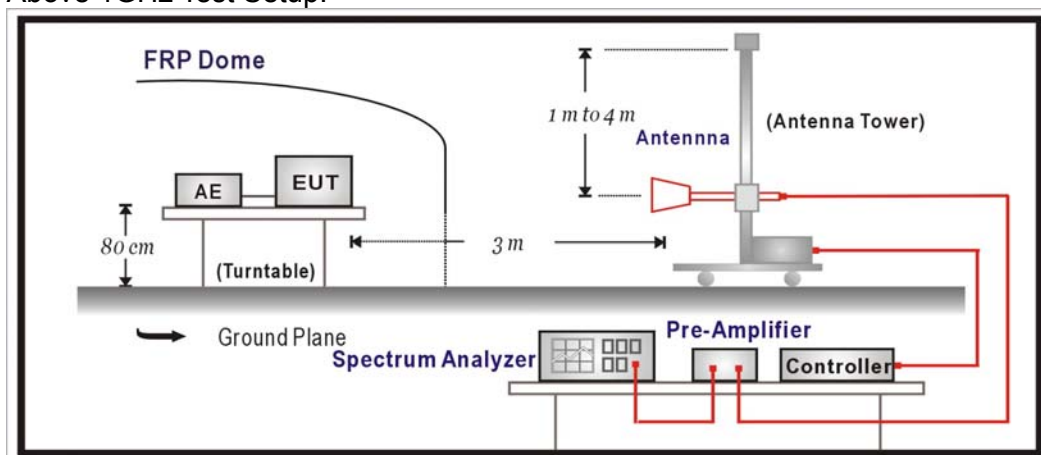
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



### 4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m	dBuV/m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

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

### 4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

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. 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 according to ANSI C63.4:2009 on radiated measurement.

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit. The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

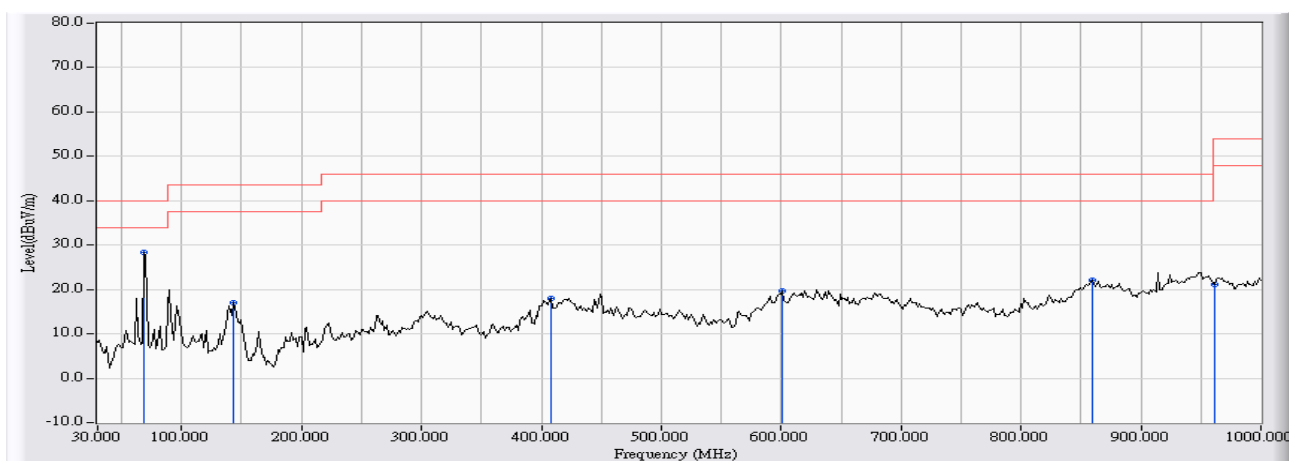
### 4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 4.6. Test Result

### 30MHz-1GHz Spurious

Site : CB1	Time : 2010/10/04 - 11:50
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_30-1G(2009) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit

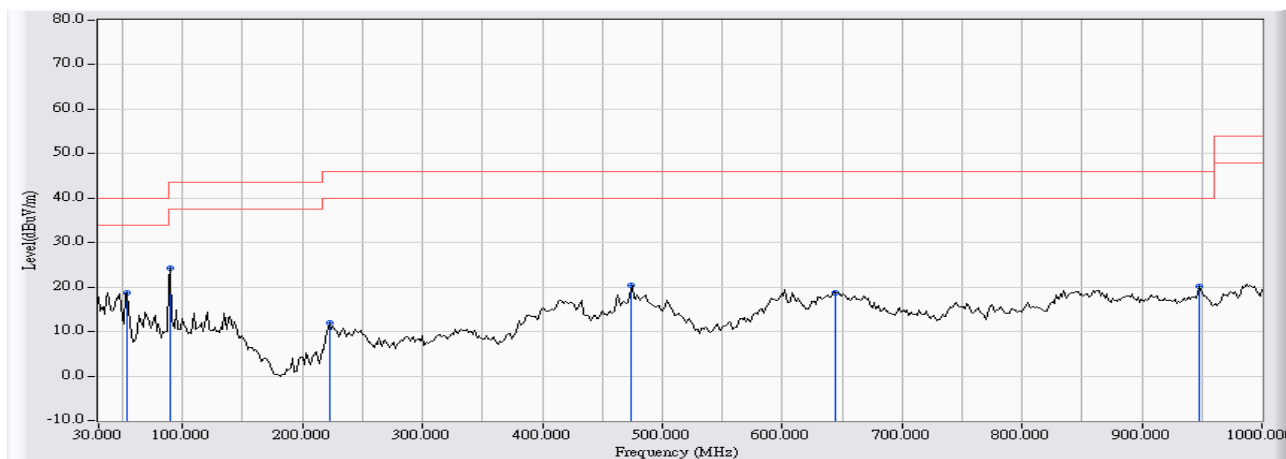


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	68.800	-15.340	43.633	28.292	-11.708	40.000	QUASIPeAK
2		143.167	-17.636	34.550	16.914	-26.586	43.500	QUASIPeAK
3		408.300	-6.409	24.311	17.902	-28.098	46.000	QUASIPeAK
4		600.683	-2.795	22.469	19.674	-26.326	46.000	QUASIPeAK
5		859.350	0.265	21.884	22.150	-23.850	46.000	QUASIPeAK
6		961.200	1.096	20.021	21.117	-32.883	54.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : CB1	Time : 2010/10/04 - 11:54
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_30-1G(2009) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit



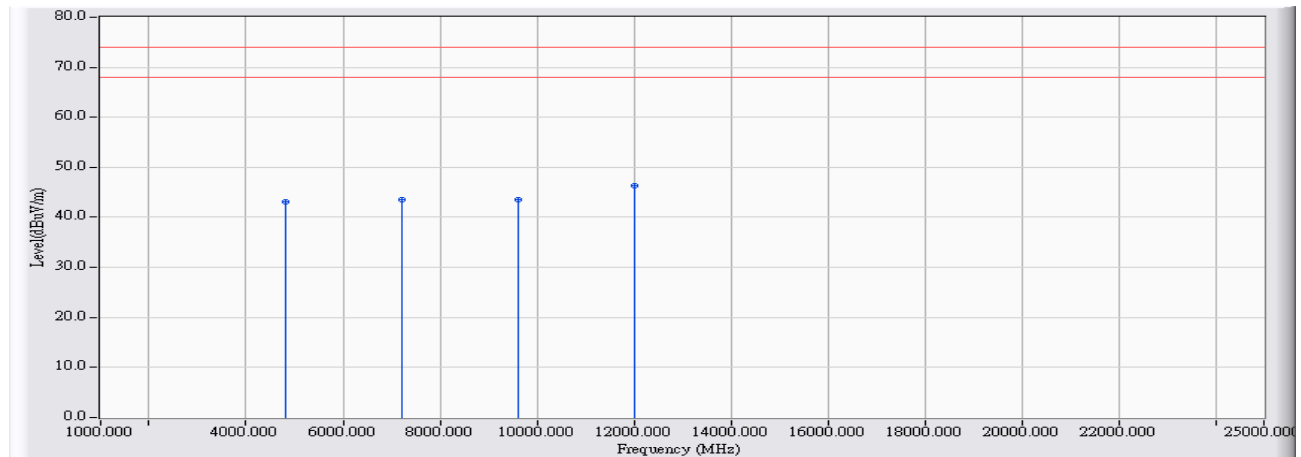
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		54.250	-16.074	34.841	18.767	-21.233	40.000	QUASIPeAK
2	*	89.817	-13.427	37.627	24.200	-19.300	43.500	QUASIPeAK
3		222.383	-13.898	25.768	11.870	-34.130	46.000	QUASIPeAK
4		474.583	-3.745	24.040	20.294	-25.706	46.000	QUASIPeAK
5		644.333	-3.046	21.799	18.753	-27.247	46.000	QUASIPeAK
6		948.267	-2.678	22.765	20.087	-25.913	46.000	QUASIPeAK

## Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

# Harmonic & Spurious:

Site : CB1	Time : 2010/10/03 - 15:04
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2402

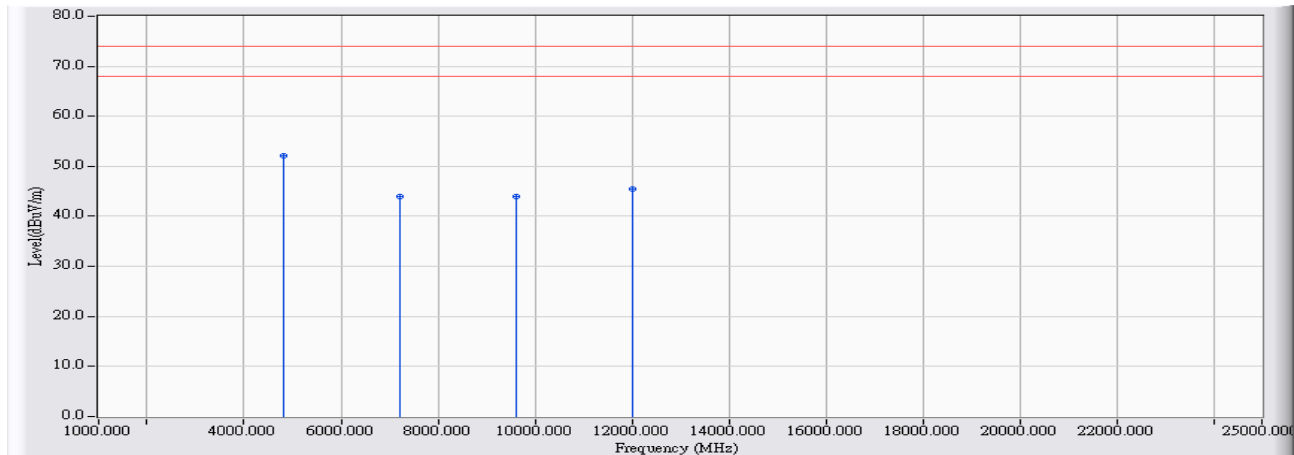


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-0.763	43.837	43.074	-30.926	74.000	PEAK
2		7206.000	6.100	37.507	43.607	-30.393	74.000	PEAK
3		9608.000	7.508	36.035	43.543	-30.457	74.000	PEAK
4	*	12010.020	10.870	35.504	46.375	-27.625	74.000	PEAK

## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	Time : 2010/10/03 - 15:09
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2402

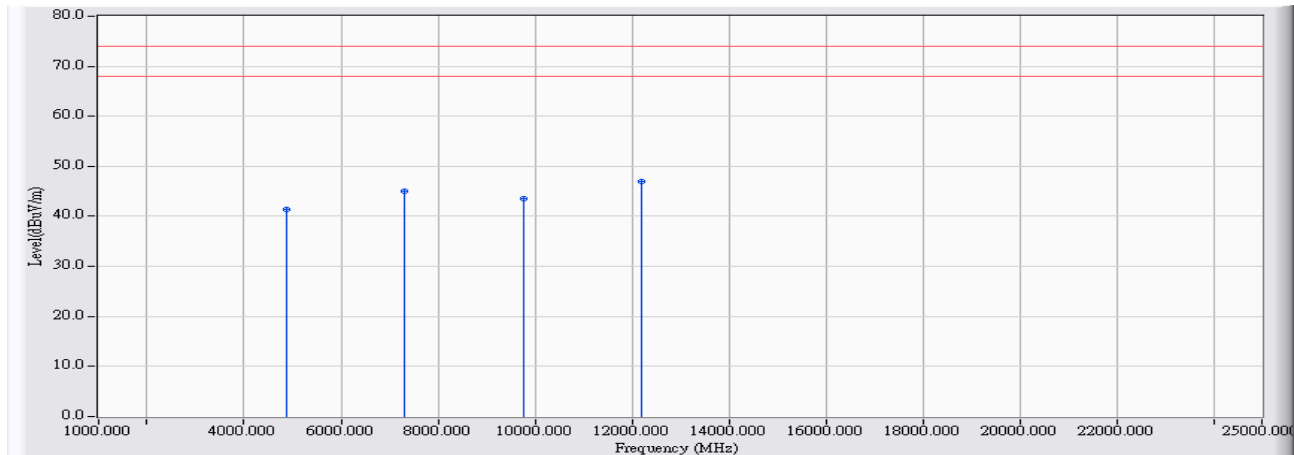


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4804.010	-0.886	52.937	52.052	-21.948	74.000	PEAK
2		7206.000	6.307	37.624	43.930	-30.070	74.000	PEAK
3		9608.000	7.744	36.282	44.027	-29.973	74.000	PEAK
4		12010.020	9.759	35.777	45.536	-28.464	74.000	PEAK

## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	Time : 2010/10/03 - 15:18
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2441



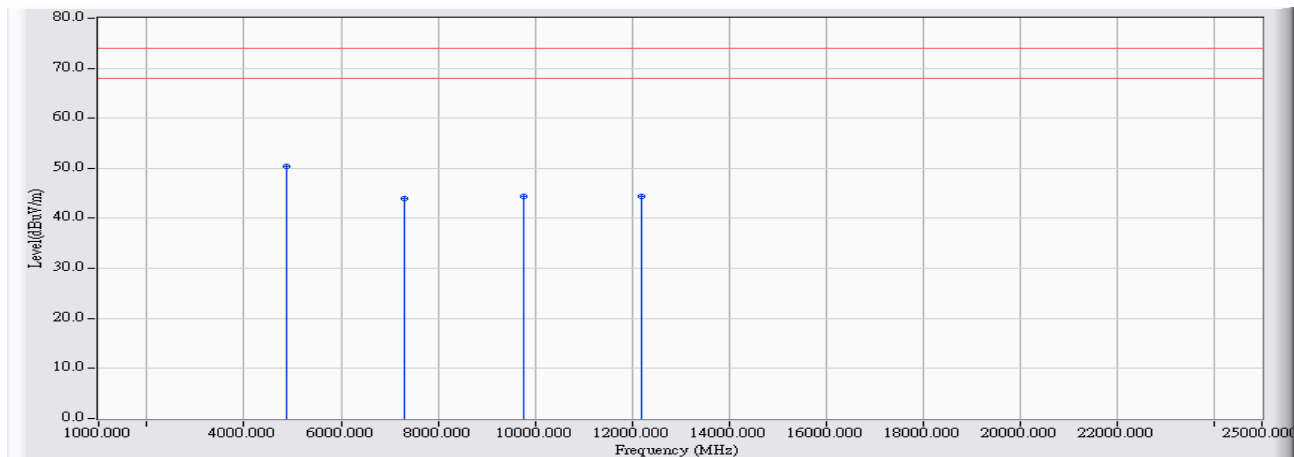
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4882.000	-0.969	42.408	41.439	-32.561	74.000	PEAK
2		7323.000	7.212	37.737	44.949	-29.051	74.000	PEAK
3		9764.000	7.876	35.721	43.597	-30.403	74.000	PEAK
4	*	12205.000	10.336	36.533	46.869	-27.131	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.



Site : CB1	Time : 2010/10/03 - 15:24
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2441

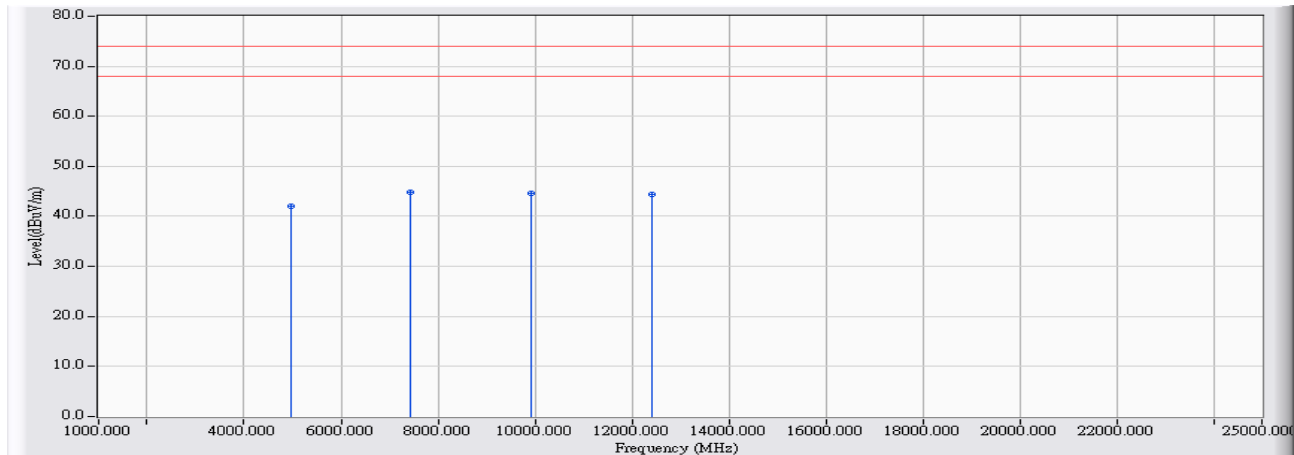


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4882.000	-1.001	51.318	50.317	-23.683	74.000	PEAK
2		7323.000	6.945	37.068	44.013	-29.987	74.000	PEAK
3		9764.000	8.025	36.399	44.423	-29.577	74.000	PEAK
4		12205.000	9.249	35.249	44.498	-29.502	74.000	PEAK

**Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	Time : 2010/10/03 - 15:36
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2480

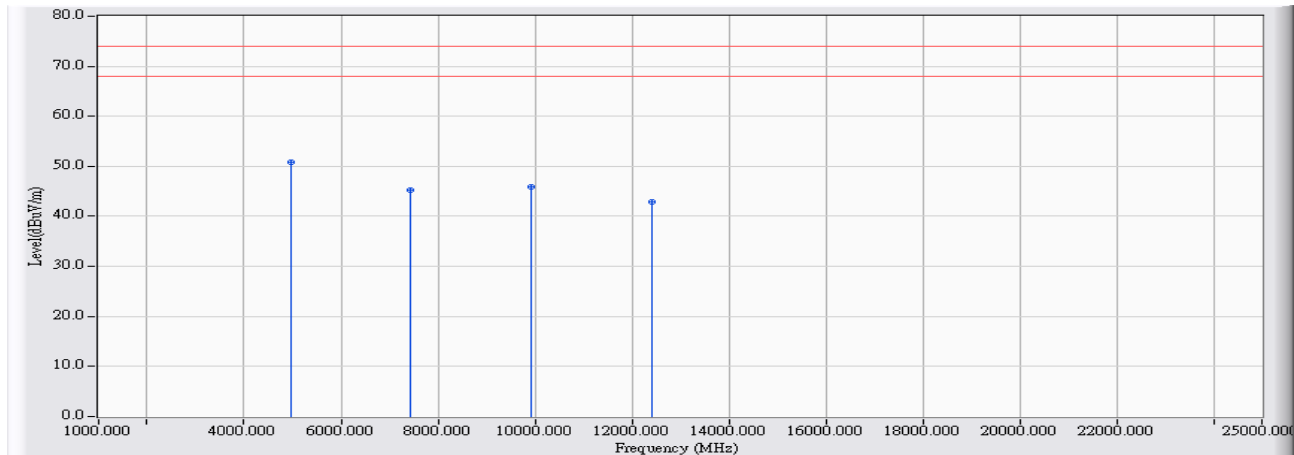


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	-0.478	42.598	42.120	-31.880	74.000	PEAK
2	*	7440.000	8.425	36.372	44.796	-29.204	74.000	PEAK
3		9920.000	8.108	36.568	44.676	-29.324	74.000	PEAK
4		12400.000	8.906	35.422	44.327	-29.673	74.000	PEAK

## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB1	Time : 2010/10/03 - 15:43
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2480



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-0.431	51.346	50.916	-23.084	74.000	PEAK
2		7440.000	7.684	37.538	45.222	-28.778	74.000	PEAK
3		9920.000	8.172	37.681	45.852	-28.148	74.000	PEAK
4		12400.000	7.839	35.118	42.957	-31.043	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

## 5. RF antenna conducted test

### 5.1. Test Equipment

The following test equipment is used during the test:

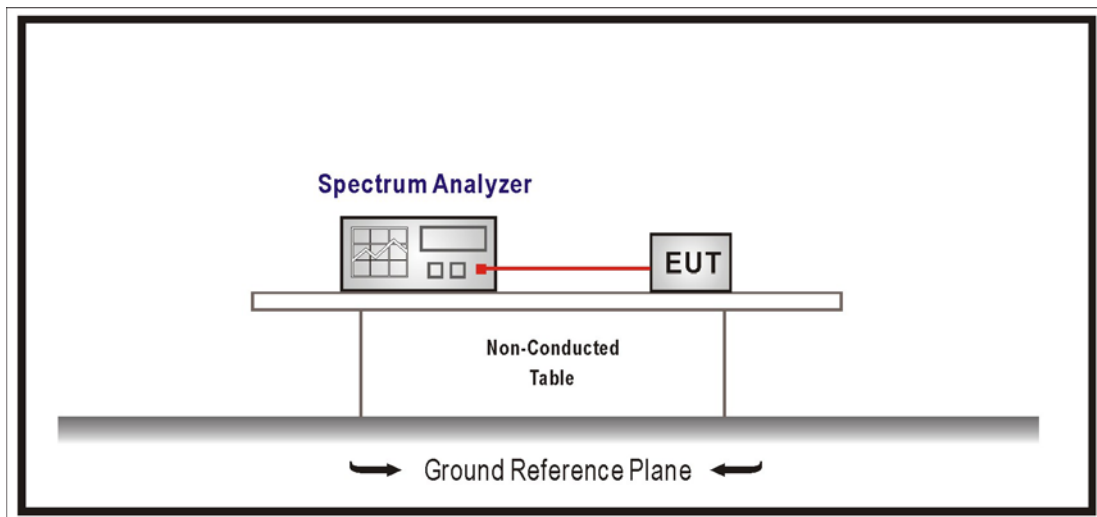
RF antenna conducted test / No.7 Shielding Room

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/02/04

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 5.2. Test Setup

RF Conducted Measurement:



### **5.3. Limits**

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 an RF conducted or 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)).

### **5.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

### **5.5. Test Specification**

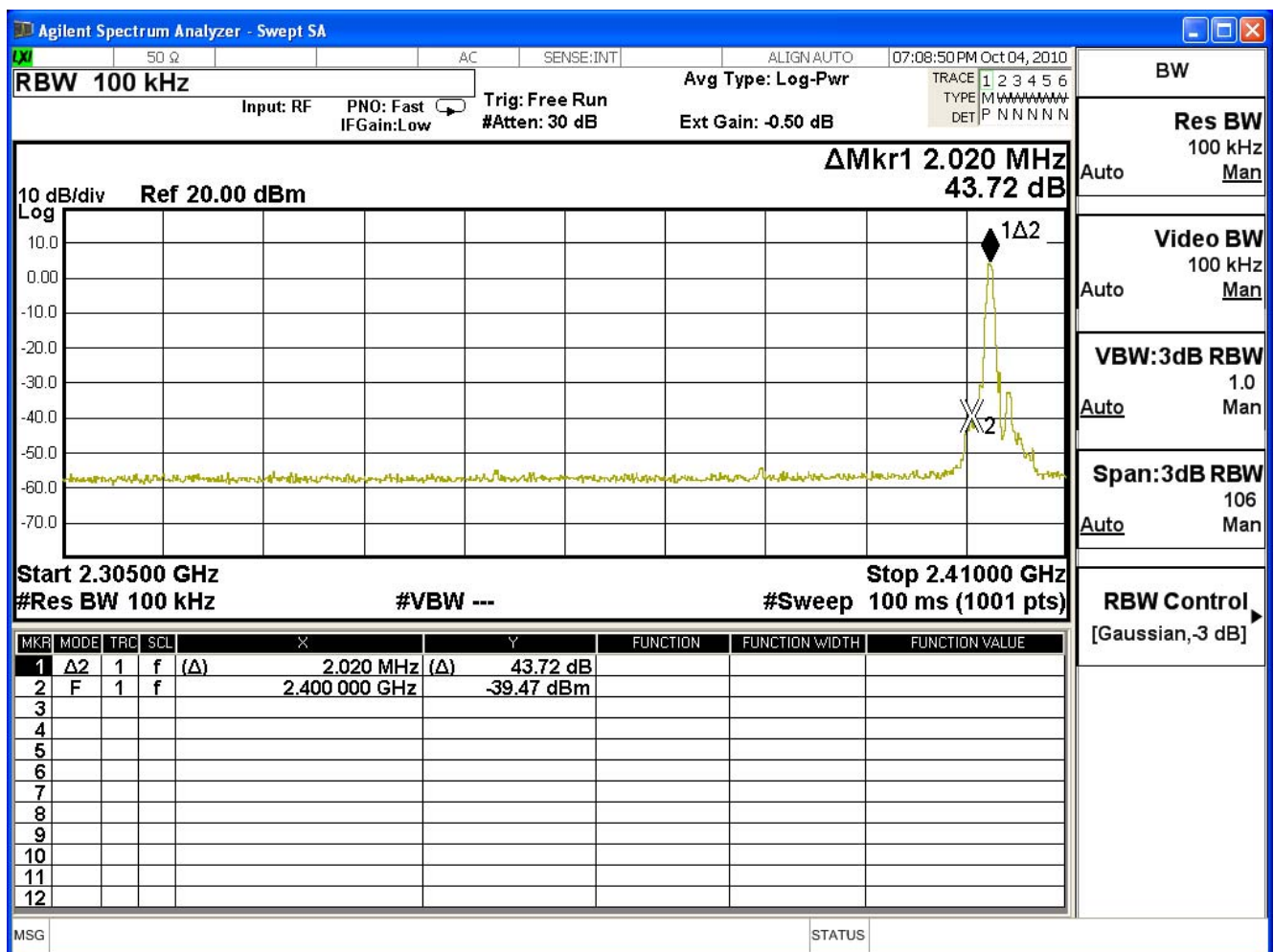
According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 5.6. Test Result

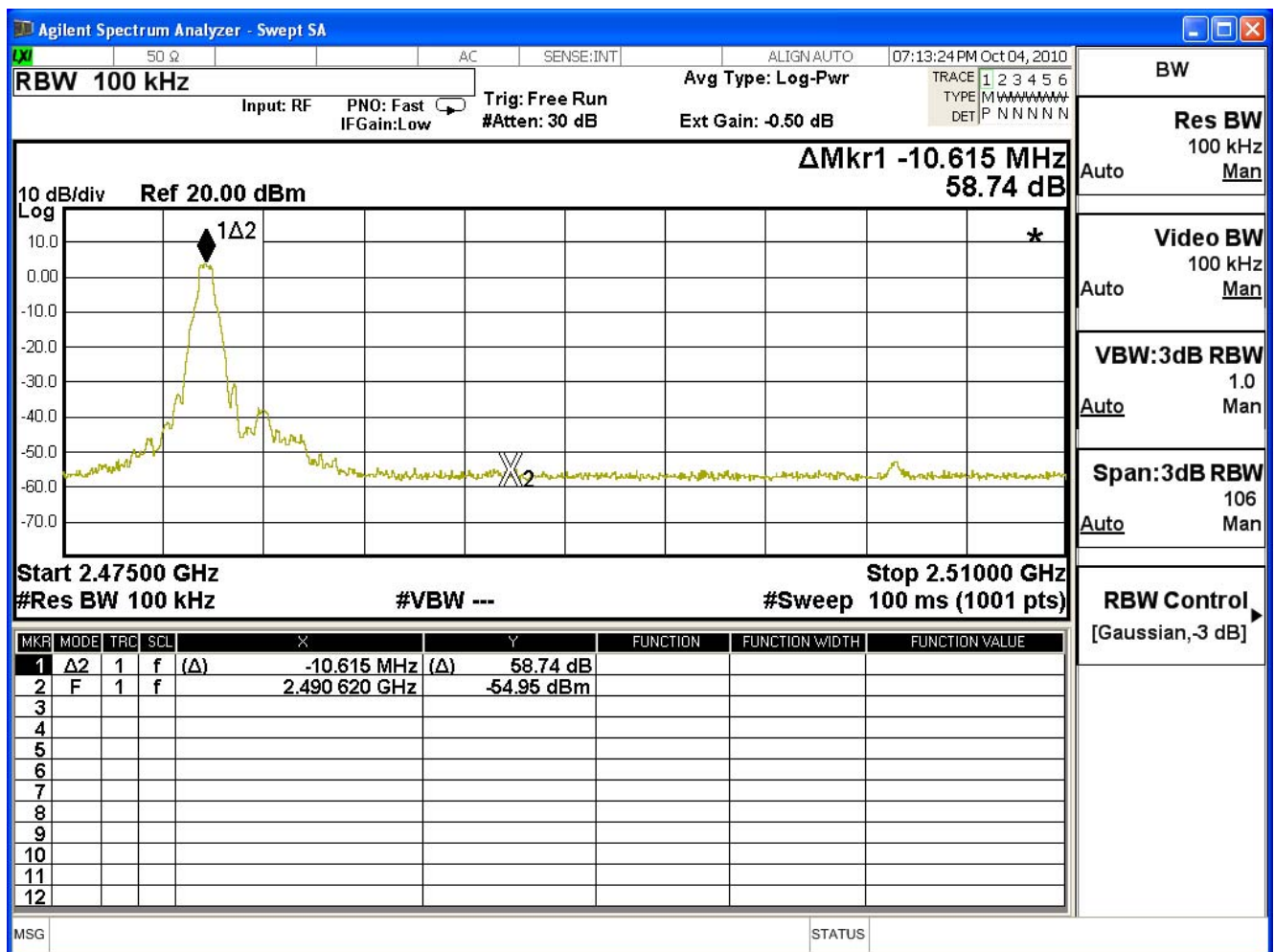
Product	Jawbone		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dBc)	Result
00	2402	43.72	$\geq 20$	Pass
78	2480	58.74	$\geq 20$	Pass

## Channel 00

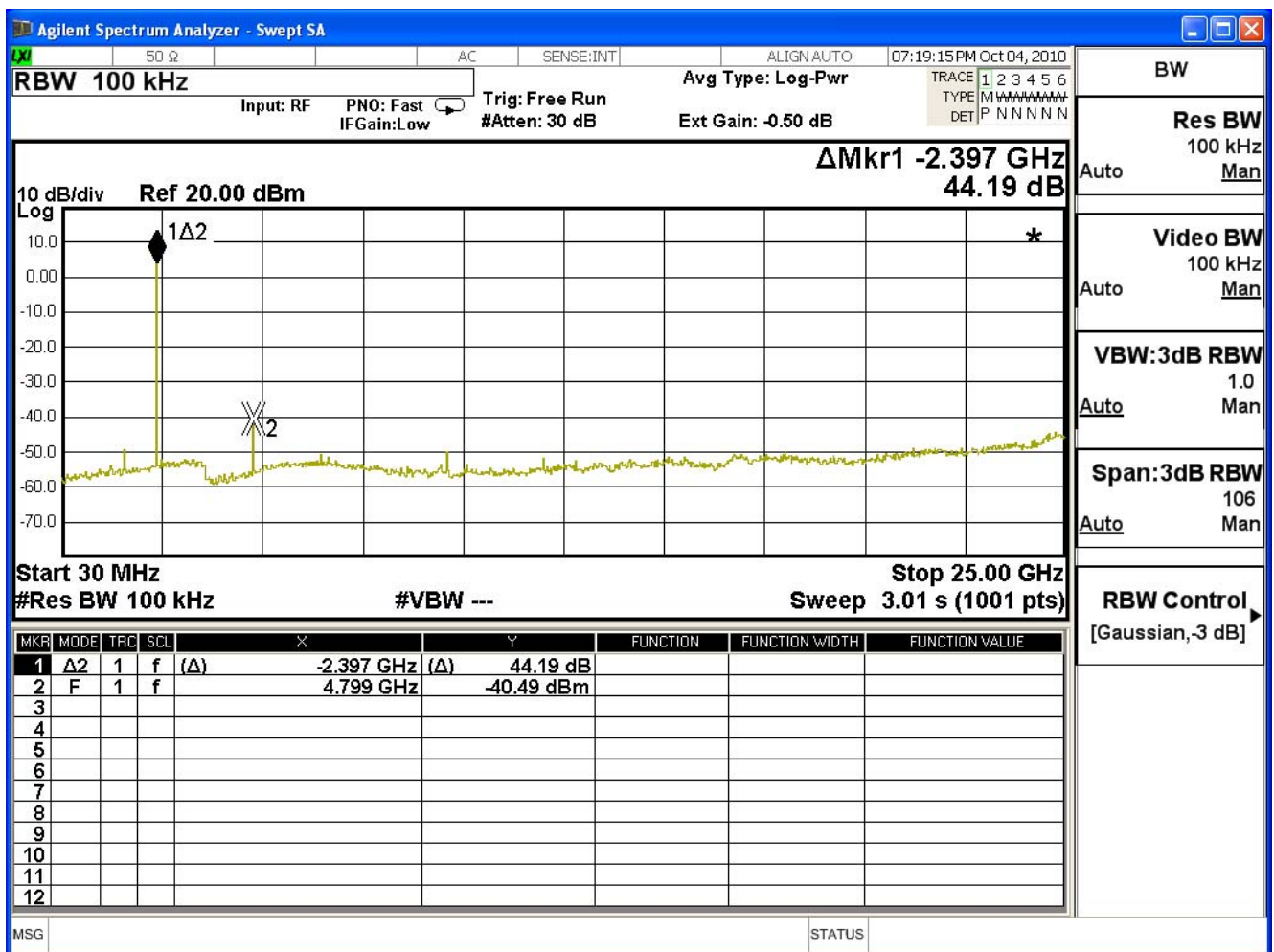


## Channel 78

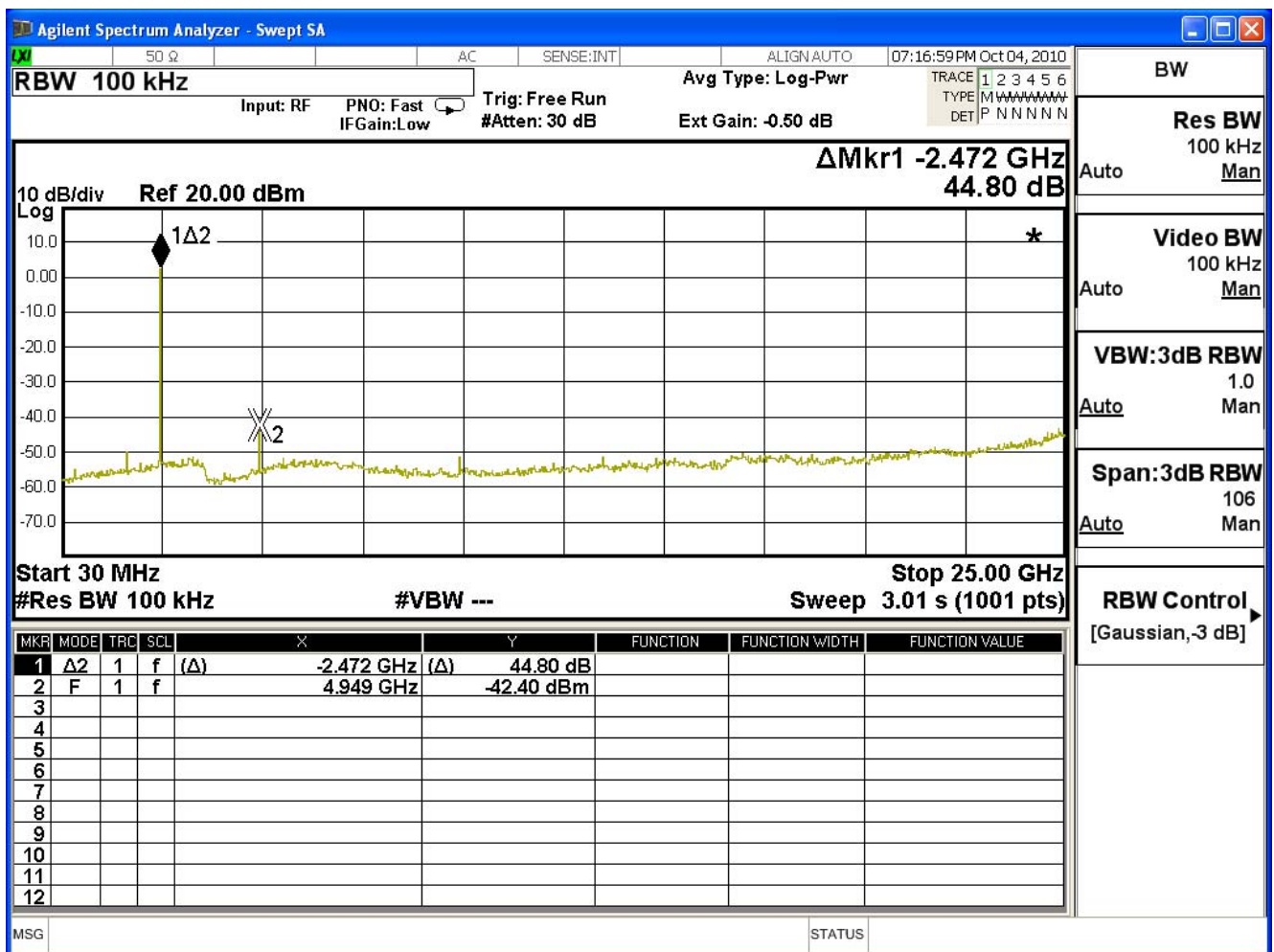




## Channel 00 (30MHz-25GHz)



## Channel 78 (30MHz~25GHz)



## 6. Band Edge

### 6.1. Test Equipment

The following test equipments are used during the test:

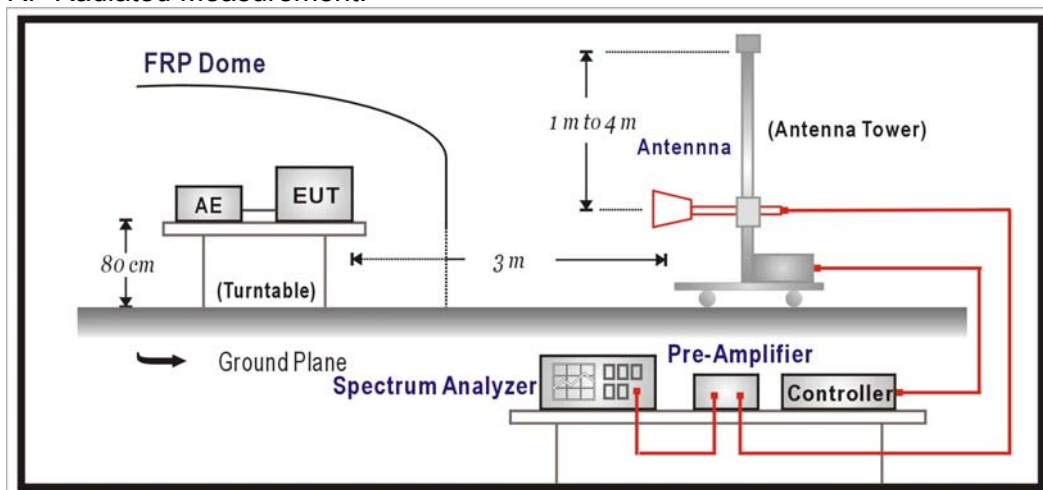
Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Horn Antenna	Schwarzback	BBHA 9120D	743	2011/03/15
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2010/12/04
Spectrum Analyzer	Agilent	E4440A	MY46187335	2011/01/15
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2011/04/07

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 6.2. Test Setup

RF Radiated Measurement:



### **6.3. Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

### **6.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

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. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

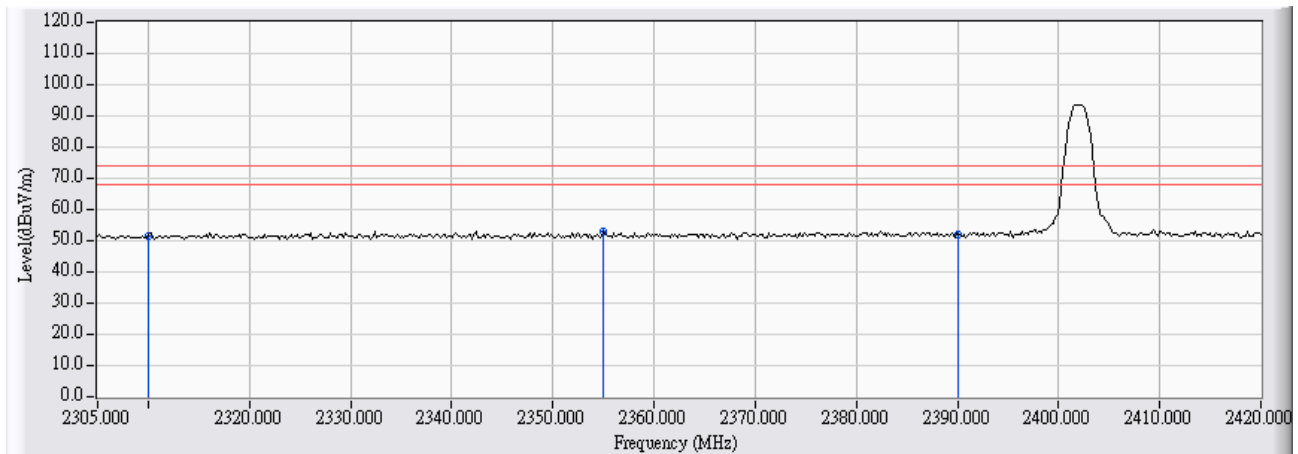
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2009 on radiated measurement.

### **6.5. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 6.6. Test Result

Site : CB1	Time : 2010/10/06 - 14:29
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2402

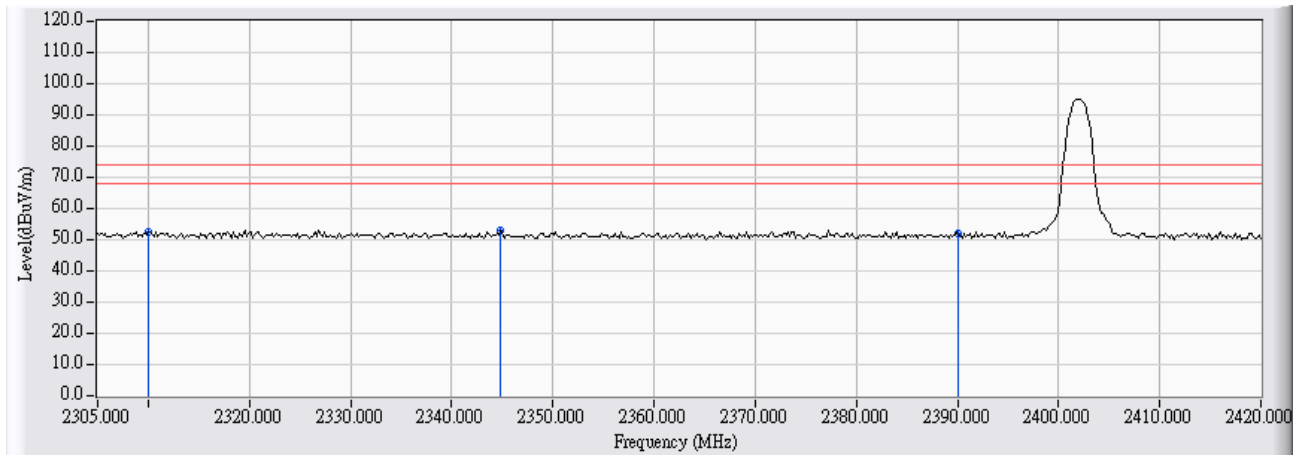


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	27.154	24.430	51.584	-22.416	74.000	PEAK
2	*	2355.025	27.374	25.511	52.884	-21.116	74.000	PEAK
3		2390.000	27.549	24.639	52.188	-21.812	74.000	PEAK

### Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. 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.

Site : CB1	Time : 2010/10/06 - 14:35
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2402

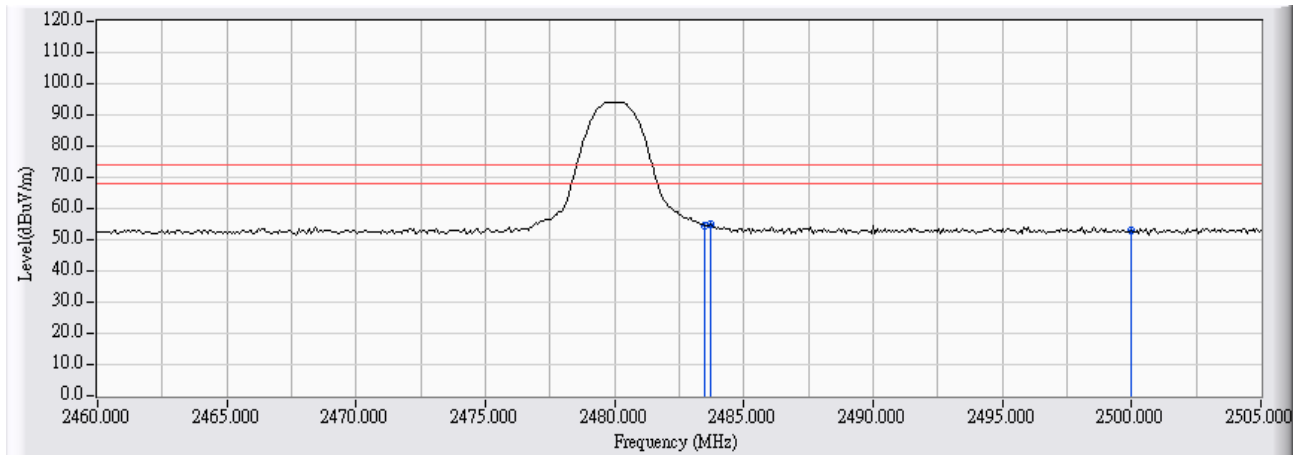


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	27.780	24.633	52.413	-21.587	74.000	PEAK
2	*	2344.867	27.606	25.173	52.779	-21.221	74.000	PEAK
3		2390.000	27.371	24.736	52.106	-21.894	74.000	PEAK

**Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. 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.

Site : CB1	Time : 2010/10/06 - 14:44
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2480

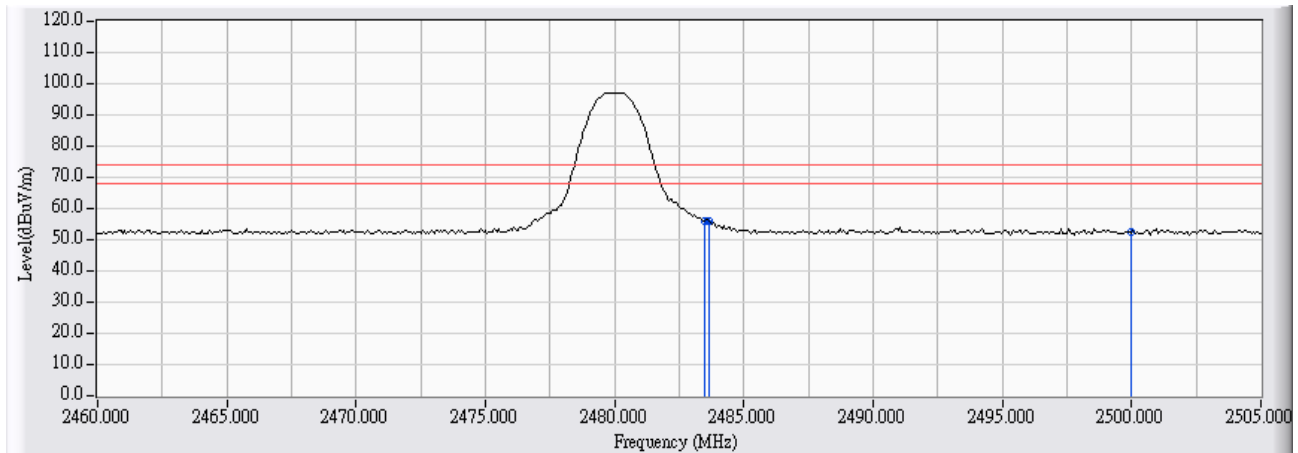


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2483.500	28.018	26.655	54.673	-19.327	74.000	PEAK
2	*	2483.700	28.020	26.917	54.936	-19.064	74.000	PEAK
3		2500.000	28.097	24.675	52.772	-21.228	74.000	PEAK

**Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. 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.

Site : CB1	Time : 2010/10/06 - 14:52
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2480



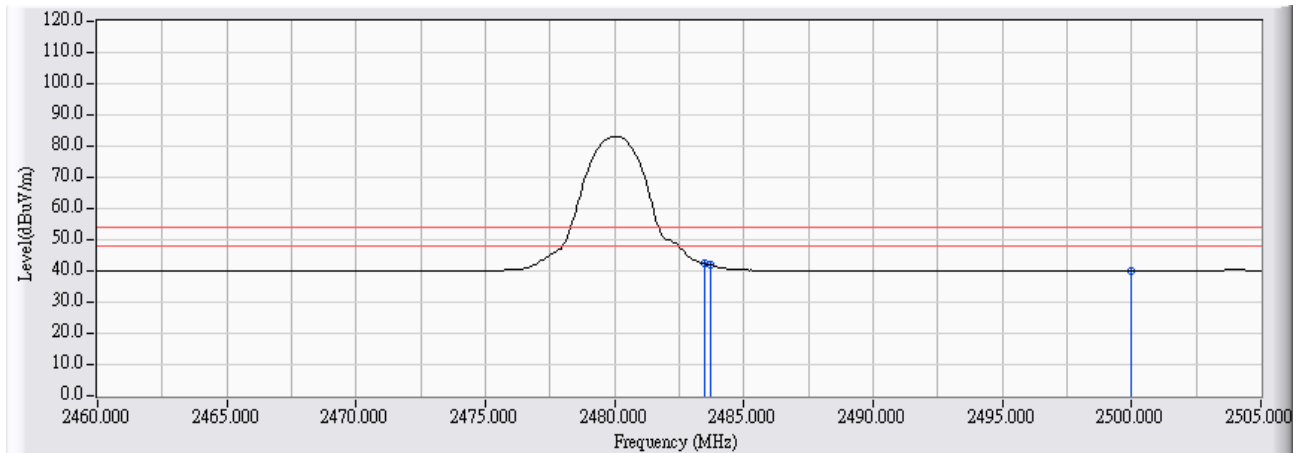
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	26.896	29.252	56.149	-17.851	74.000	PEAK
2		2483.625	26.895	28.922	55.818	-18.182	74.000	PEAK
3		2500.000	26.834	25.555	52.389	-21.611	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. 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.



Site : CB1	Time : 2010/10/06 - 14:45
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2480

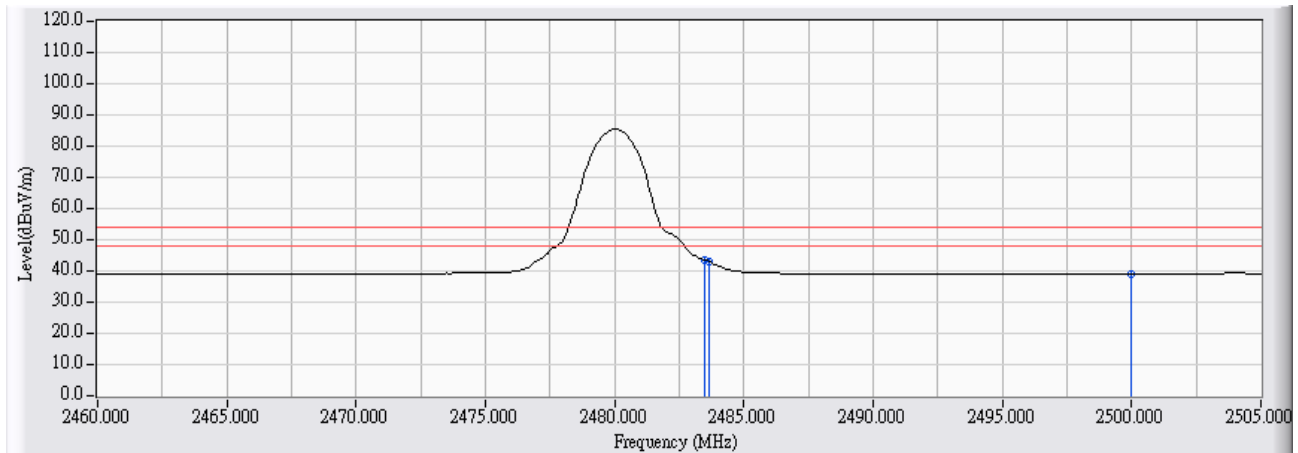


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	28.018	14.293	42.311	-11.689	54.000	AVERAGE
2		2483.700	28.020	13.916	41.935	-12.065	54.000	AVERAGE
3		2500.000	28.097	12.042	40.139	-13.861	54.000	AVERAGE

**Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. 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.

Site : CB1	Time : 2010/10/06 - 14:54
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : Jawbone	Note : Mode 1: Transmit-2480



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	26.896	16.512	43.409	-10.591	54.000	AVERAGE
2		2483.625	26.895	16.095	42.991	-11.009	54.000	AVERAGE
3		2500.000	26.834	12.042	38.876	-15.124	54.000	AVERAGE

**Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. 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.

## 7. Number of hopping frequency

### 7.1. Test Equipment

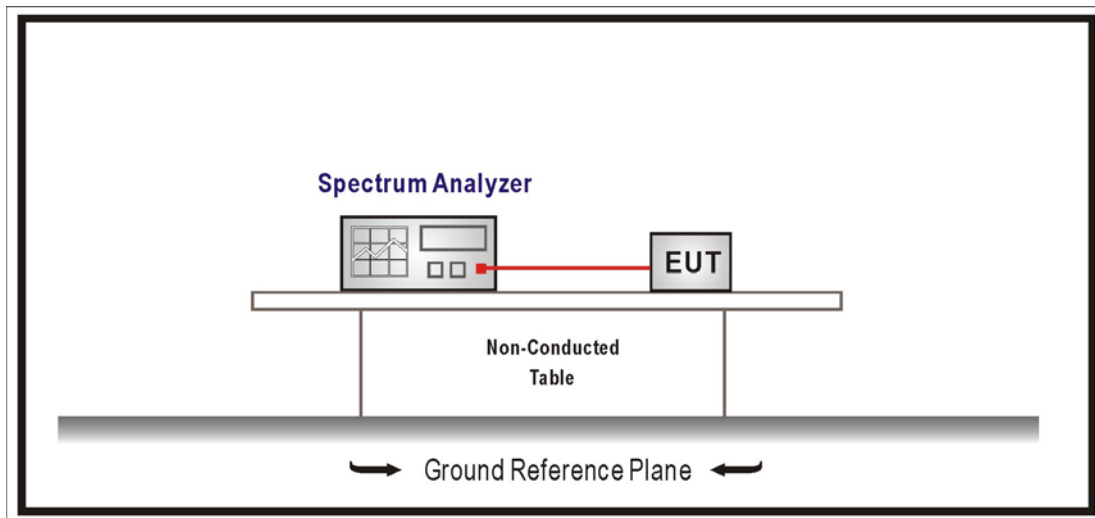
The following test equipment is used during the test:

Number of hopping frequency / No.7 Shielding Room

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/02/04

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 7.2. Test Setup



### 7.3. Limits

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.

For frequency hopping systems operating in the 2400-2483.5 MHz bands, which use fewer than 75 hopping frequencies, may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

### 7.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = the frequency band of operation

$RBW \geq 1\%$  of the span ,  $VBW \geq RBW$

Sweep = auto, Detector function = peak, Trace = max hold

### 7.5. Test Specification

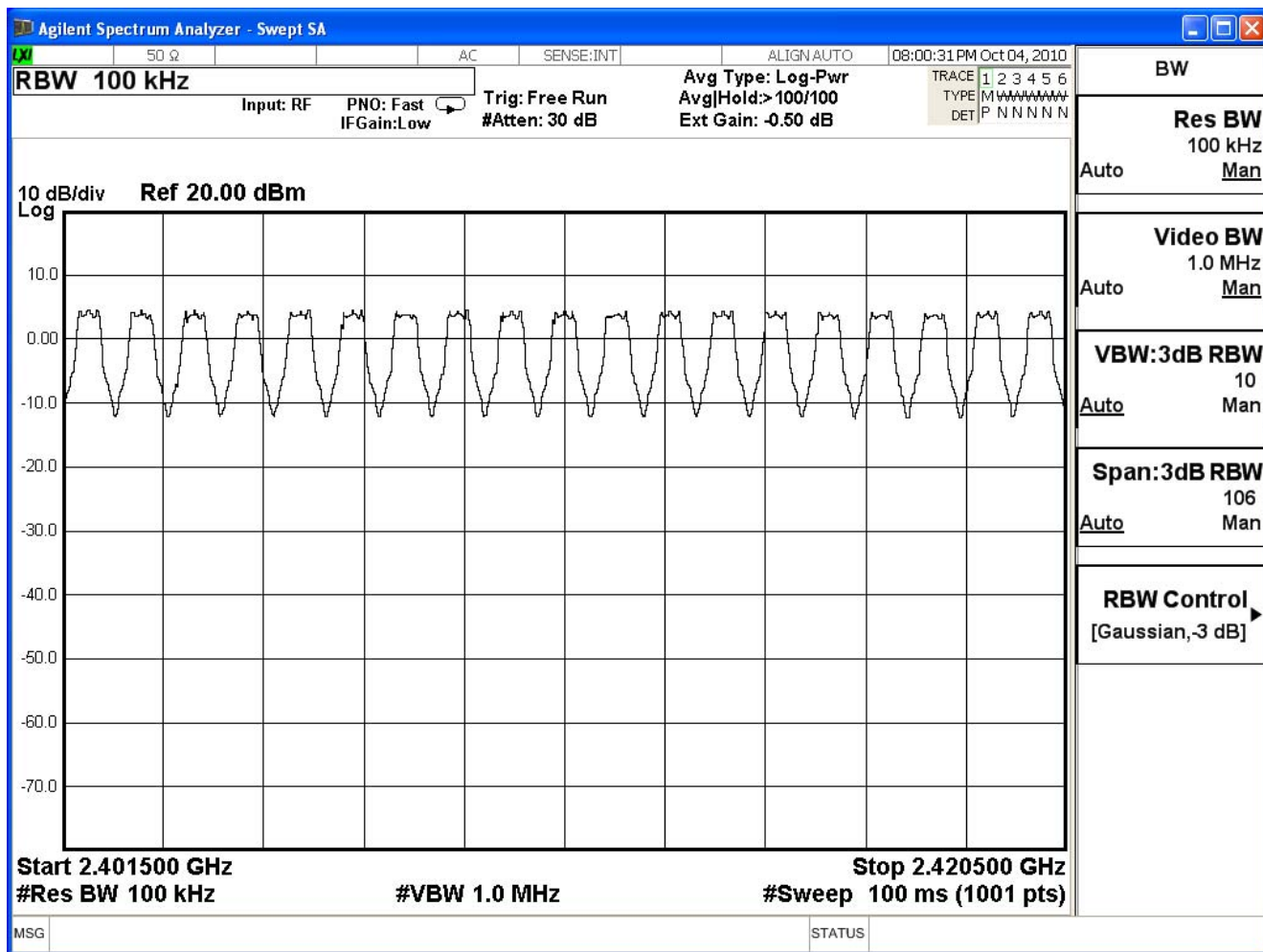
According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 7.6. Test Result

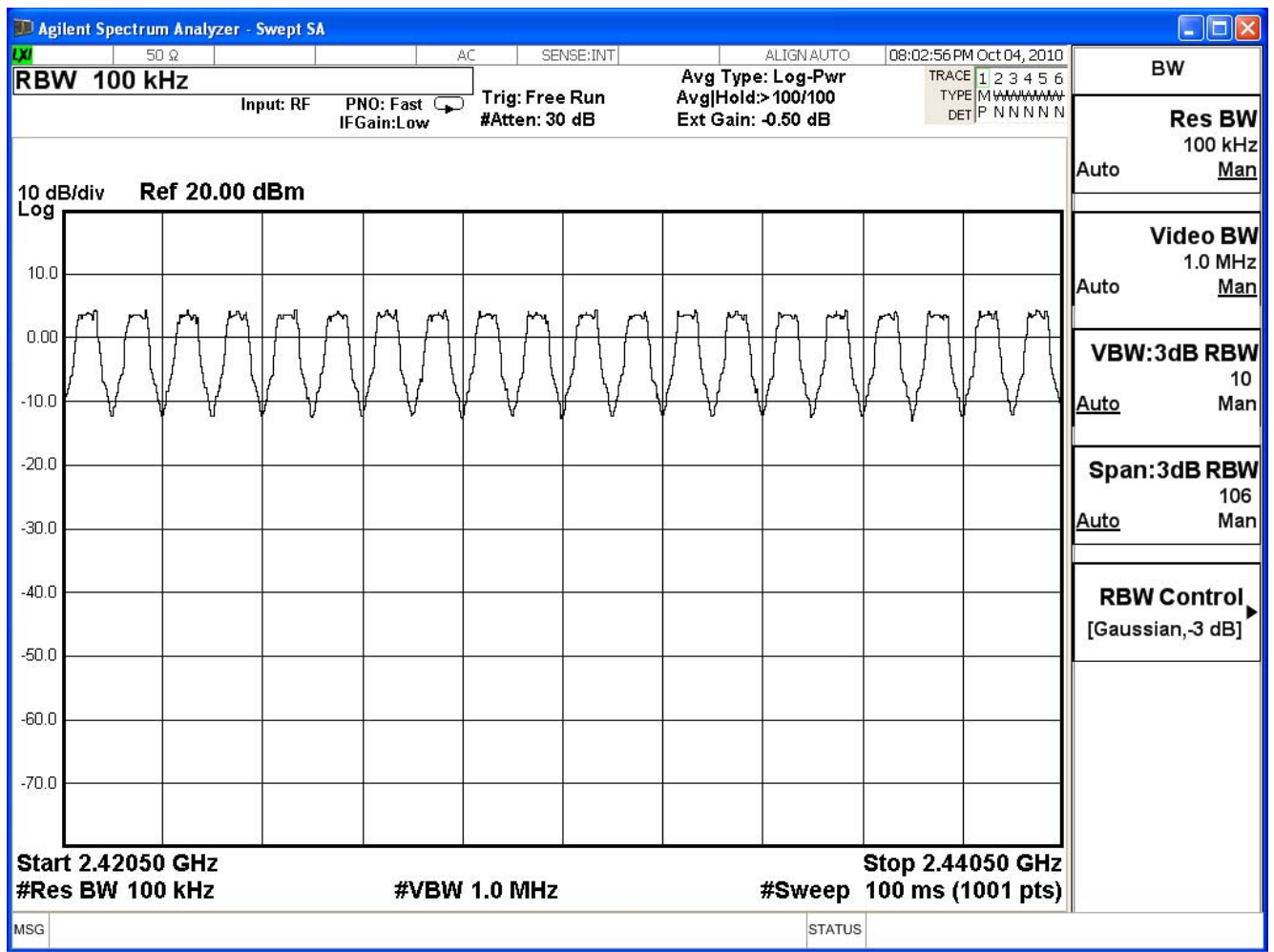
Product	Jawbone		
Test Item	Number of hopping frequency		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

Frequency Range (MHz)	Measure Level (Channels)	Limit (Channels)	Result
2402 ~ 2480	79	>75	Pass

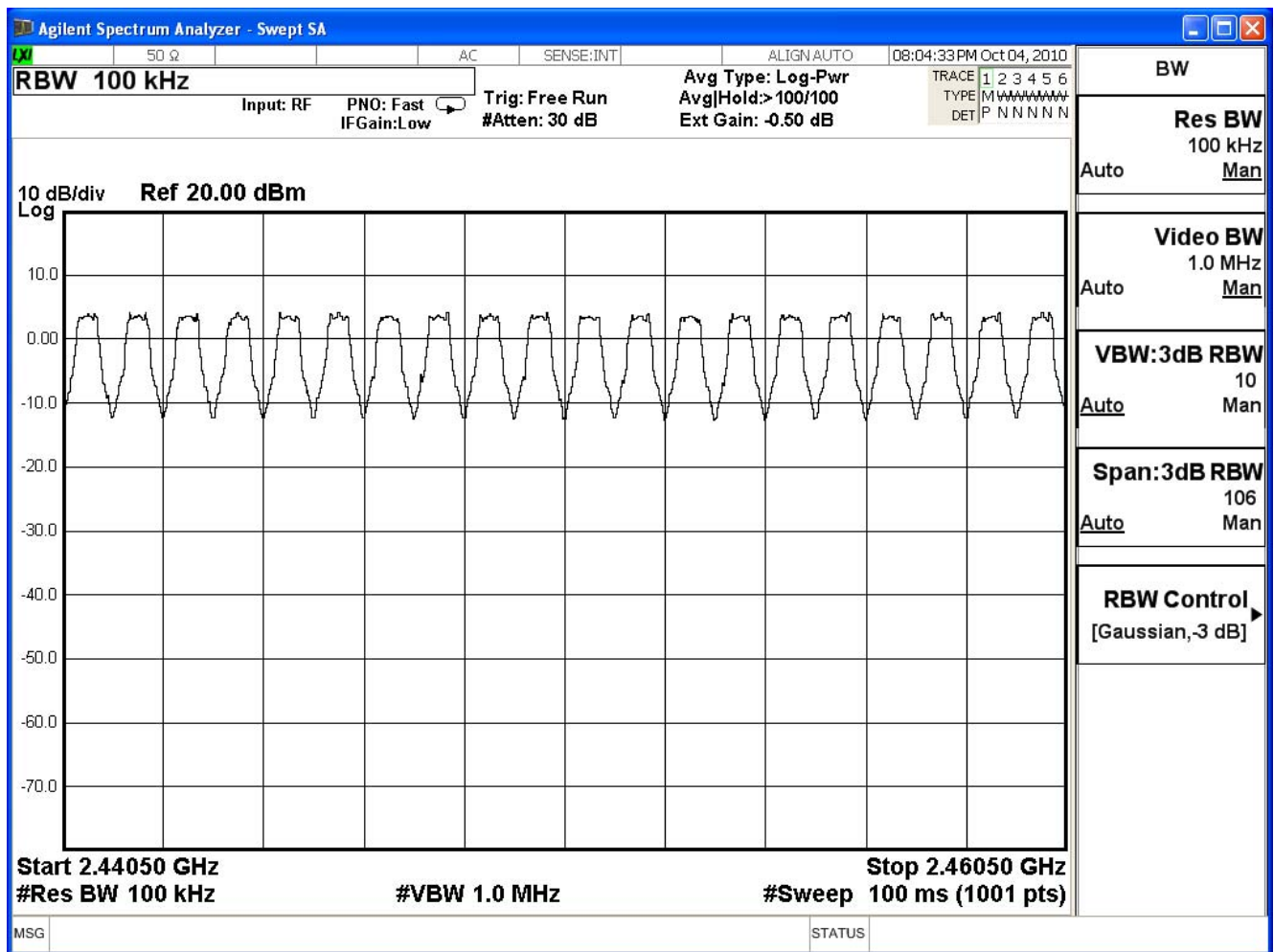
**2401.5-2420.5MHz**



**2420.5-2440.5MHz**

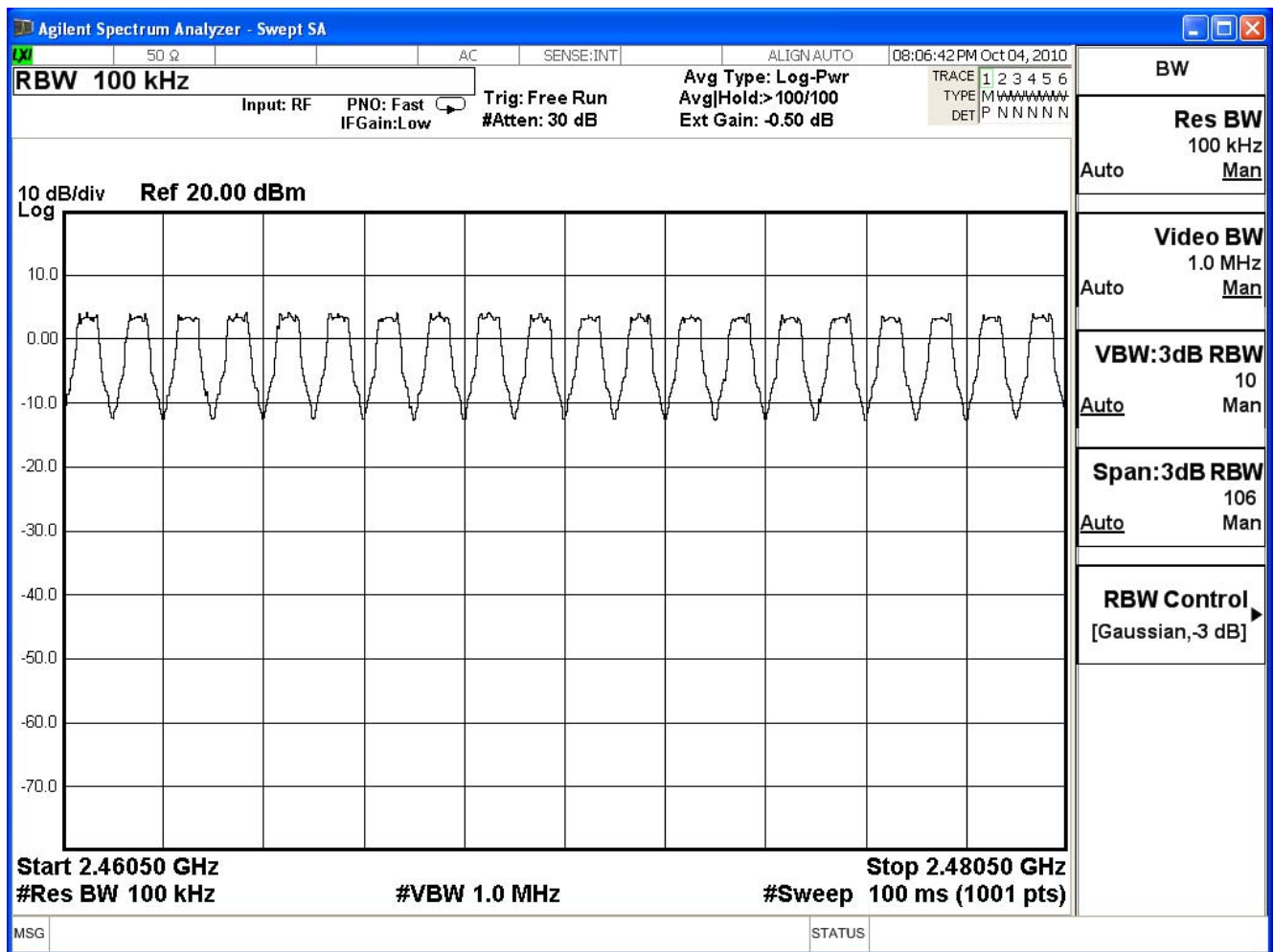


**2440.5-2460.5MHz**





**2460.5-2480.5MHz**



## 8. Carrier Frequency Separation

### 8.1. Test Equipment

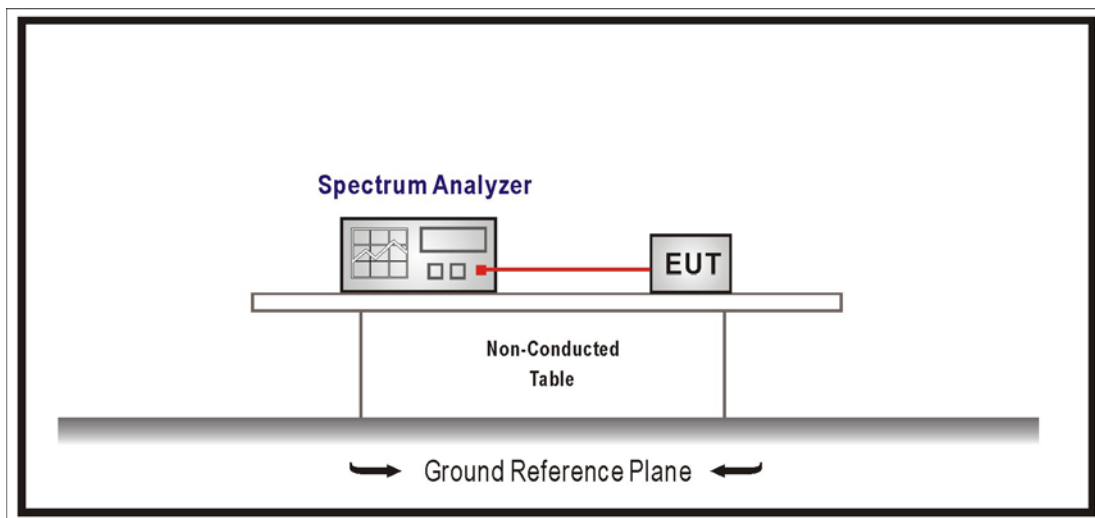
The following test equipment is used during the test:

Carrier Frequency Separation / No.7 Shielding Room

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/02/04

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 8.2. Test Setup



### 8.3. Limits

For frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

### 8.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

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

Resolution Bandwidth (RBW)  $\geq$  1% of the span, VBW  $\geq$  RBW

Sweep = auto, Detector function = peak, Trace = max hold

### 8.5. Test Specification

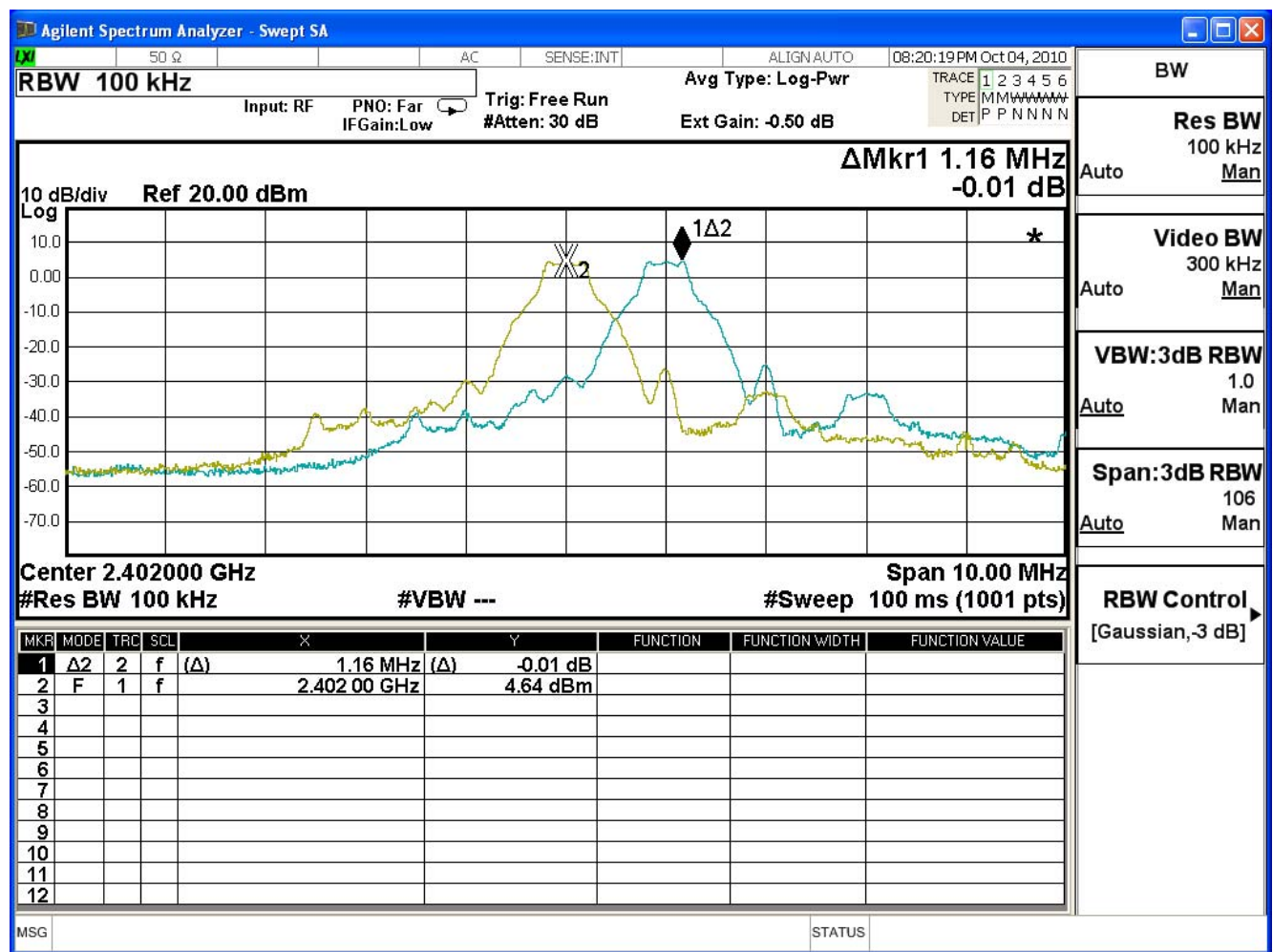
According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 8.6. Test Result

Product	Jawbone		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402	1160	>740	Pass

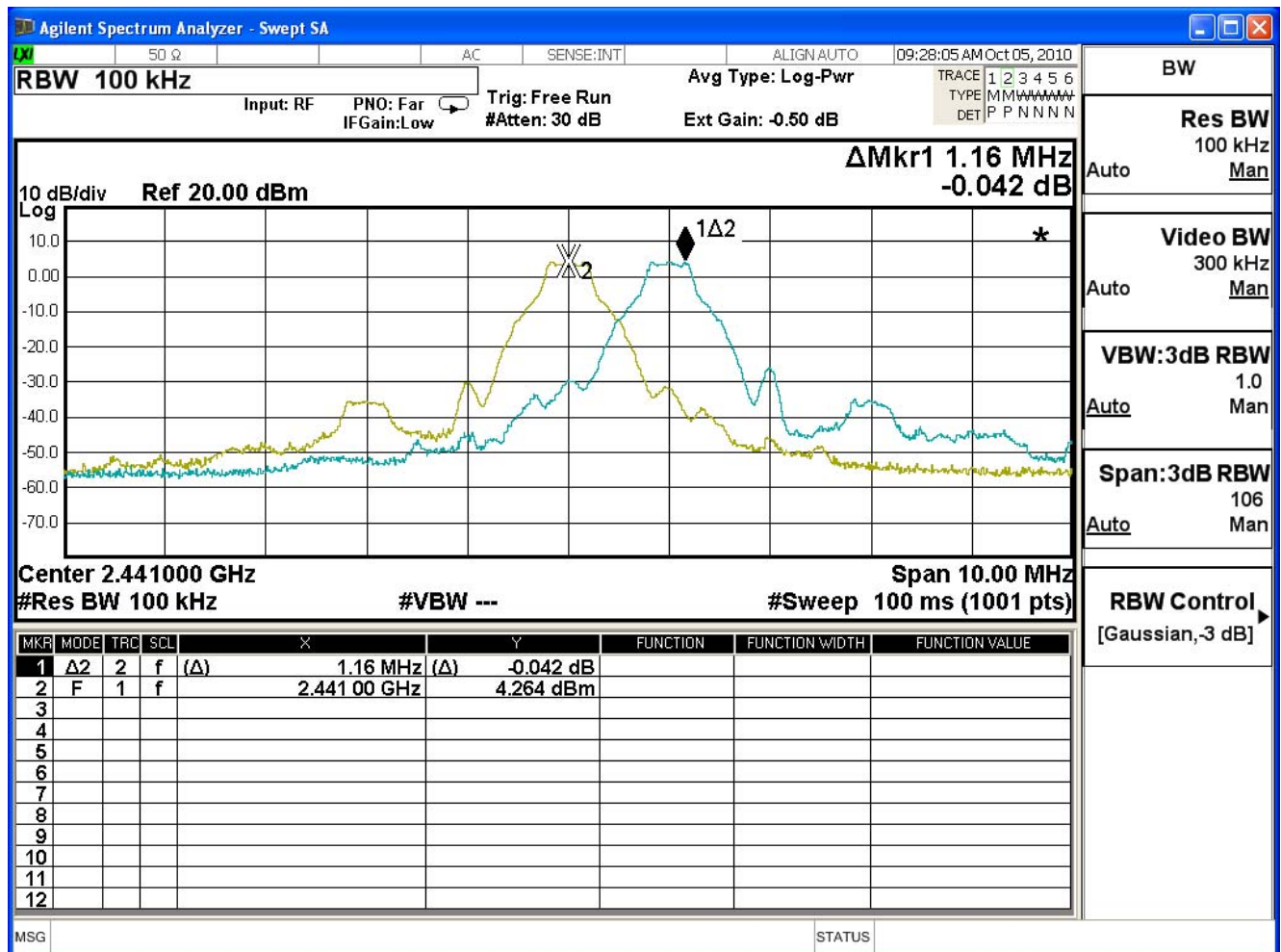
### Channel 00



Product	Jawbone		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
39	2441	1160	>746.6	Pass

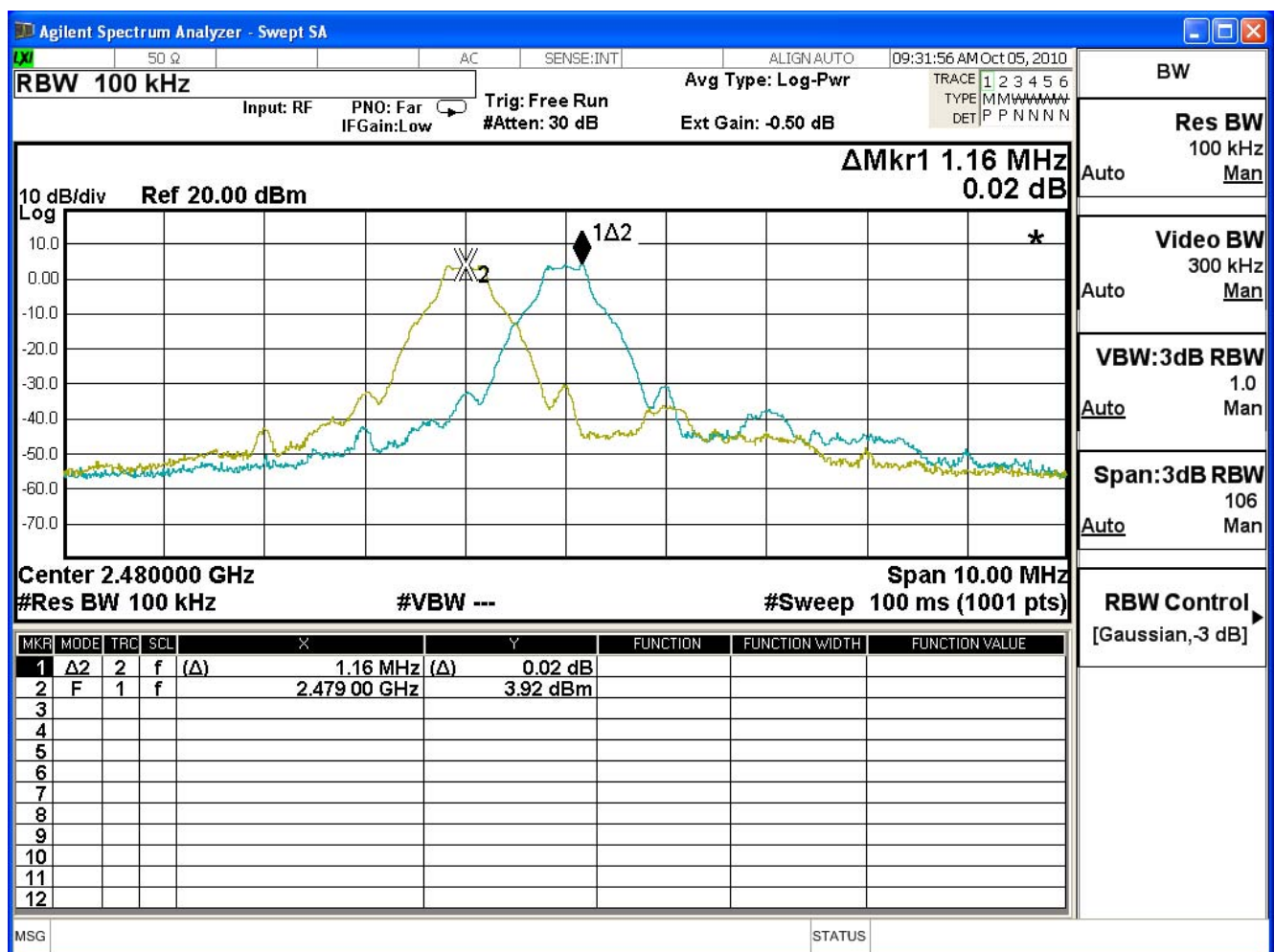
## Channel 39



Product	Jawbone		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
78	2480	1160	>746.6	Pass

## Channel 78



## 9. Occupied Bandwidth

### 9.1. Test Equipment

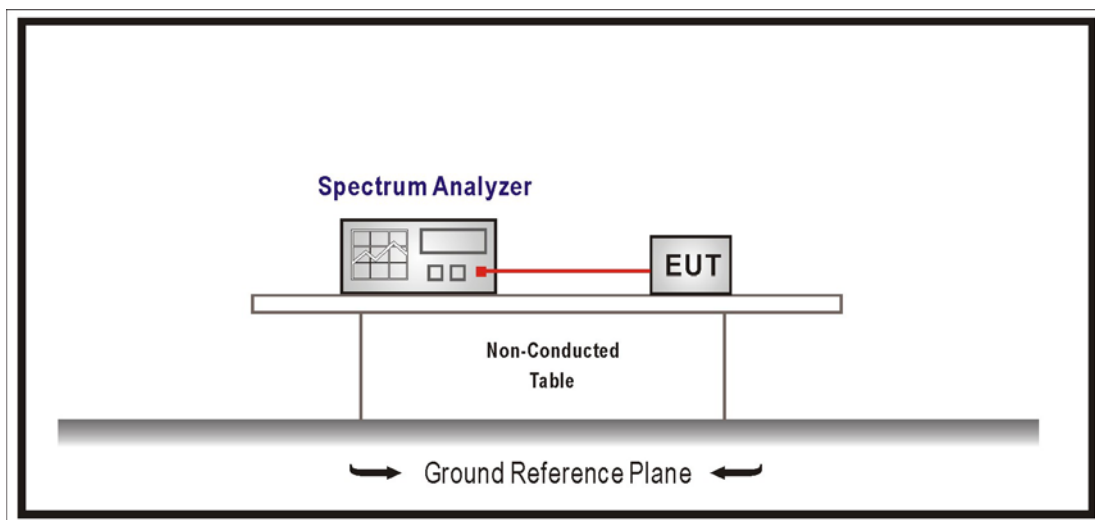
The following test equipment is used during the test:

Occupied Bandwidth / No.7 Shielding Room

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/02/04

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 9.2. Test Setup



### **9.3. Limits**

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.

For frequency hopping systems operating in the 5725-5850 MHz bands. The maximum 20 dB bandwidth of the hopping channel is 1 MHz.

For 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.

### **9.4. Test Procedures**

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Use the following spectrum analyzer settings:

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

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

Sweep = auto, Detector function = peak, Trace = max hold

The EUT should be transmitting at its maximum data rate.

### **9.5. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

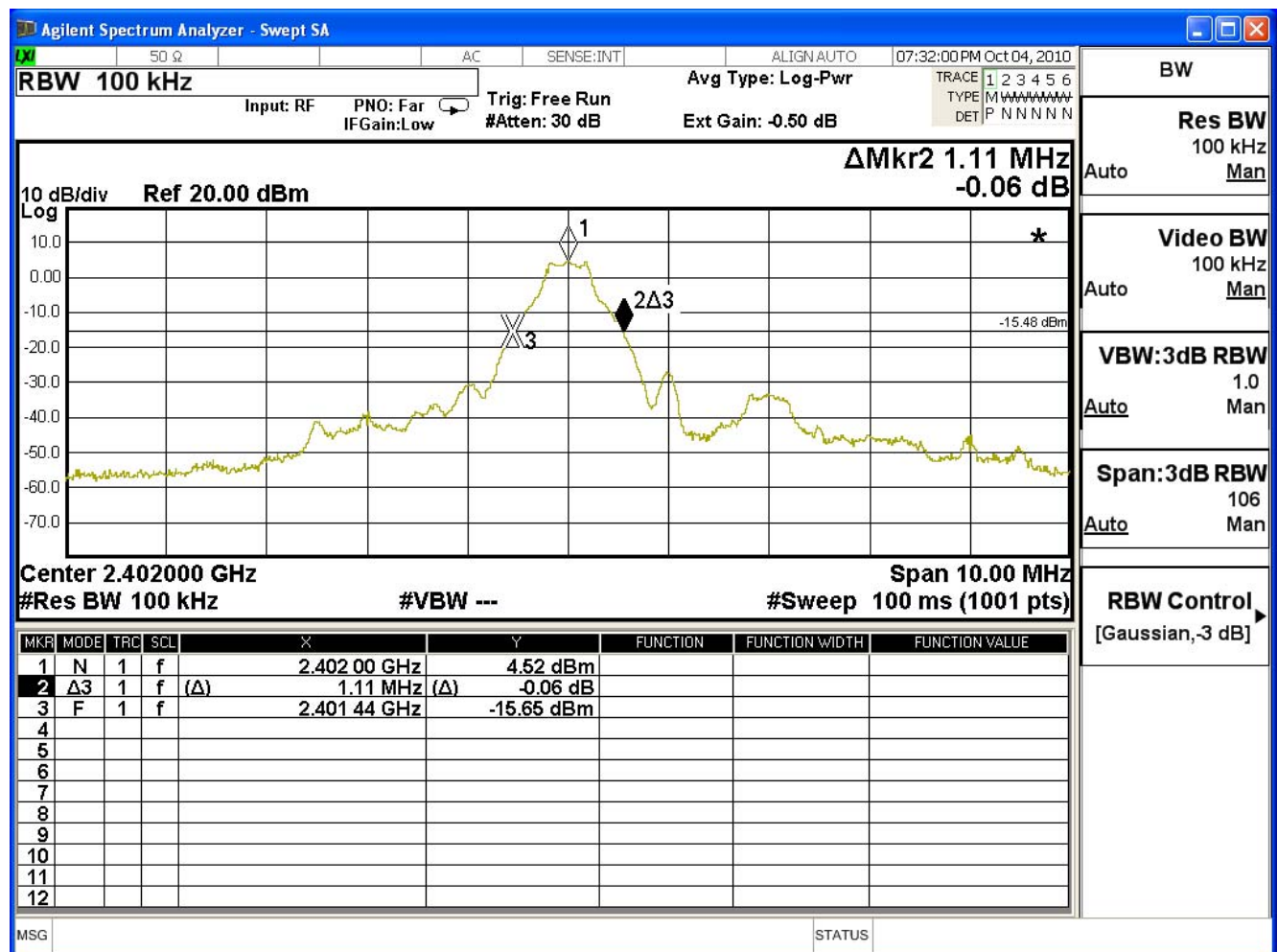
## 9.6. Test Result

Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.11	--	Pass

### Channel 00



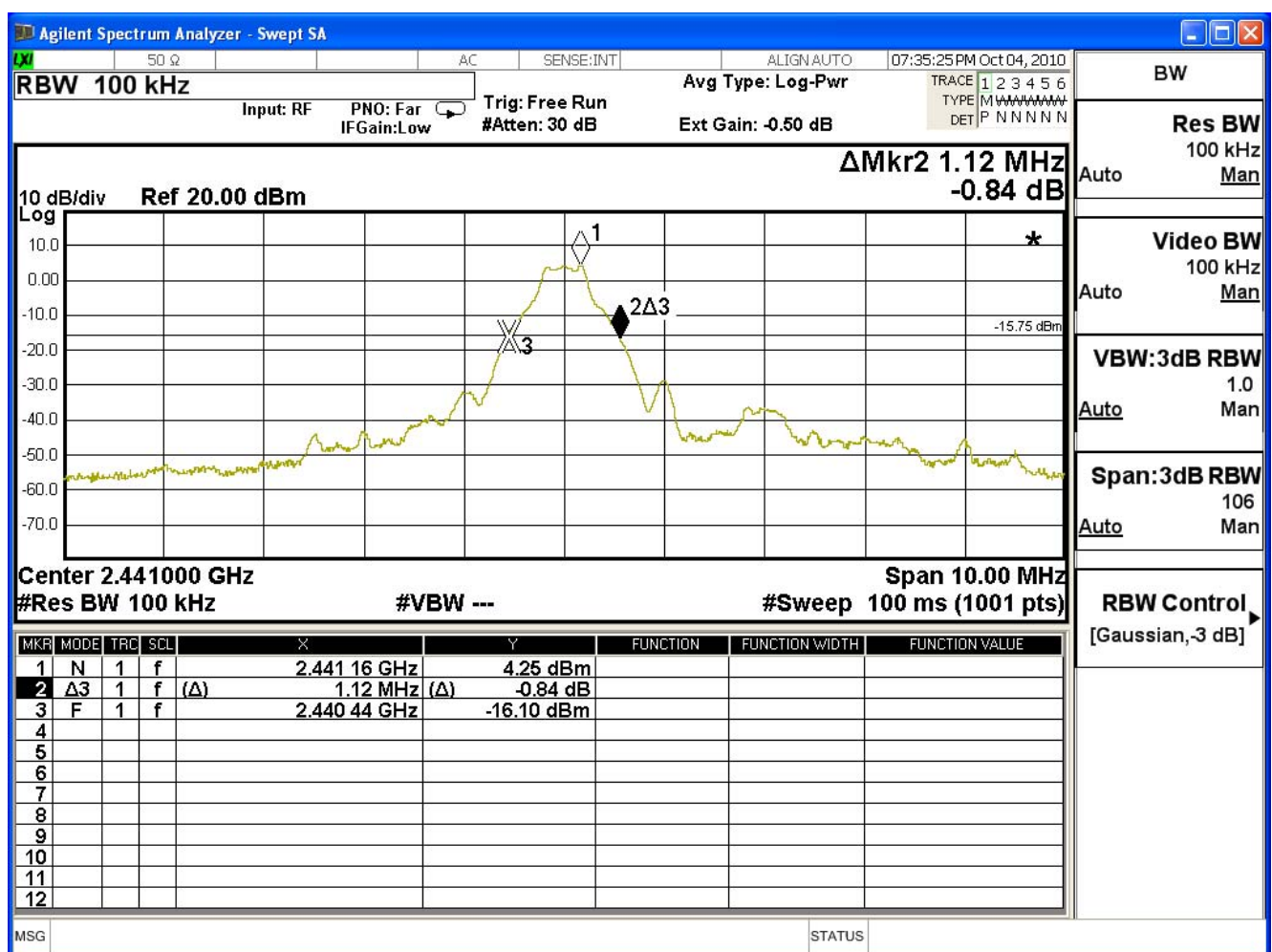


Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

**GFSK**

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.12	--	Pass

## Channel 39



**GFSK**

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.12	--	Pass

Agilent Spectrum Analyzer - Swept SA

50  $\Omega$  AC SENSE:INT ALIGN AUTO 07:37:22 PM Oct 04, 2010

**RBW 100 kHz** Avg Type: Log-Pwr

Input: RF PNO: Far IF Gain: Low Trig: Free Run #Atten: 30 dB Ext Gain: -0.50 dB

TRACE 1 2 3 4 5 6  
TYPE M W W W W W W W  
DET P N N N N N N

**$\Delta$ Mkr2 1.12 MHz -0.68 dB**

10 dB/div Ref 20.00 dBm

Center 2.480000 GHz Span 10.00 MHz

#Res BW 100 kHz #VBW --- #Sweep 100 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 16 GHz	3.980 dBm			
2	$\Delta$ 3	1	f	( $\Delta$ ) 1.12 MHz	( $\Delta$ ) -0.68 dB			
3	F	1	f	2.479 44 GHz	-16.25 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								

MSG STATUS

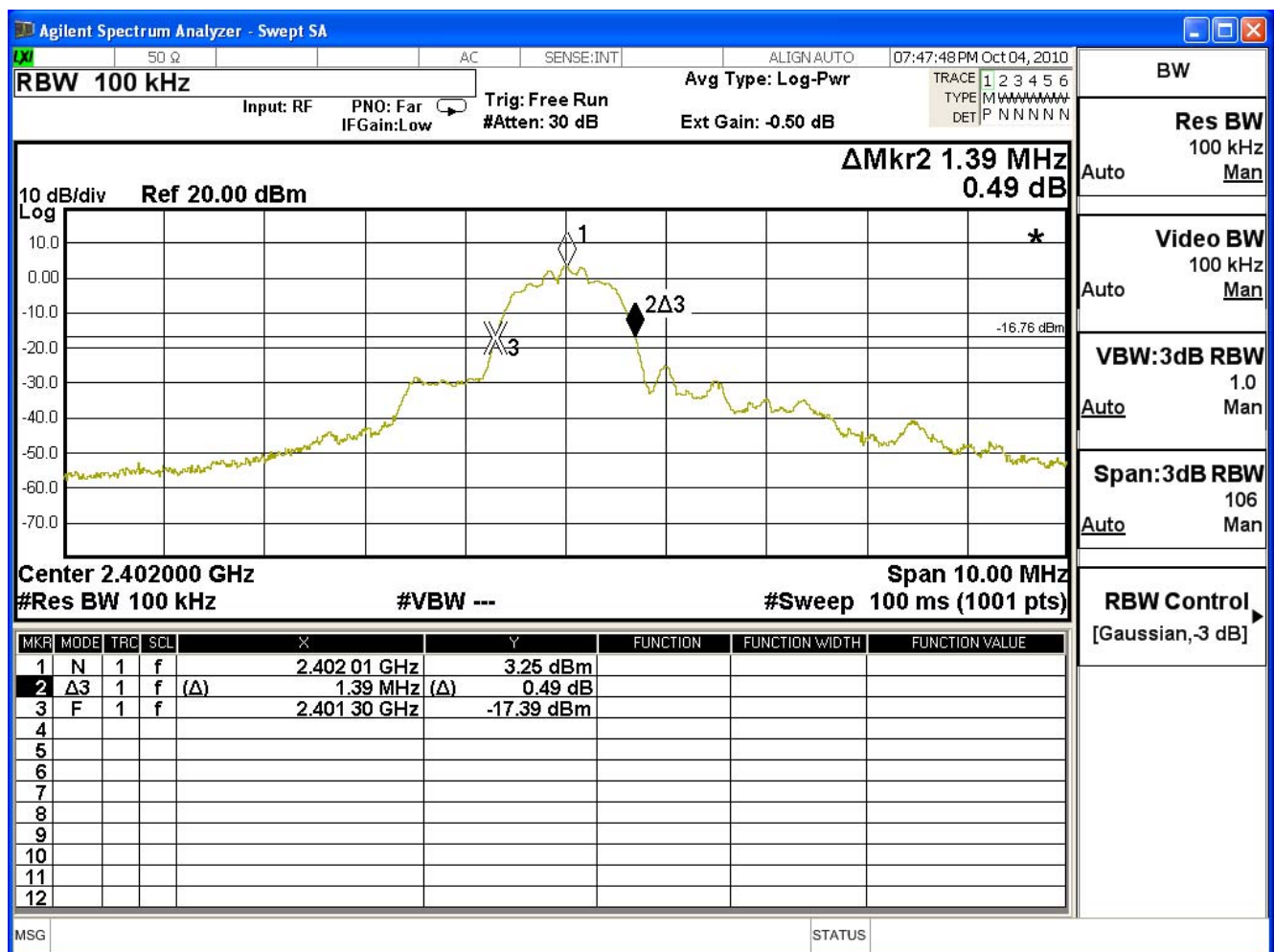
**BW**  
Auto  
Res BW 100 kHz Man  
Video BW 100 kHz Man  
VBW:3dB RBW 1.0 Man  
Span:3dB RBW 106 Man  
RBW Control [Gaussian, -3 dB]

Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## $\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.39	--	Pass

## Channel 00

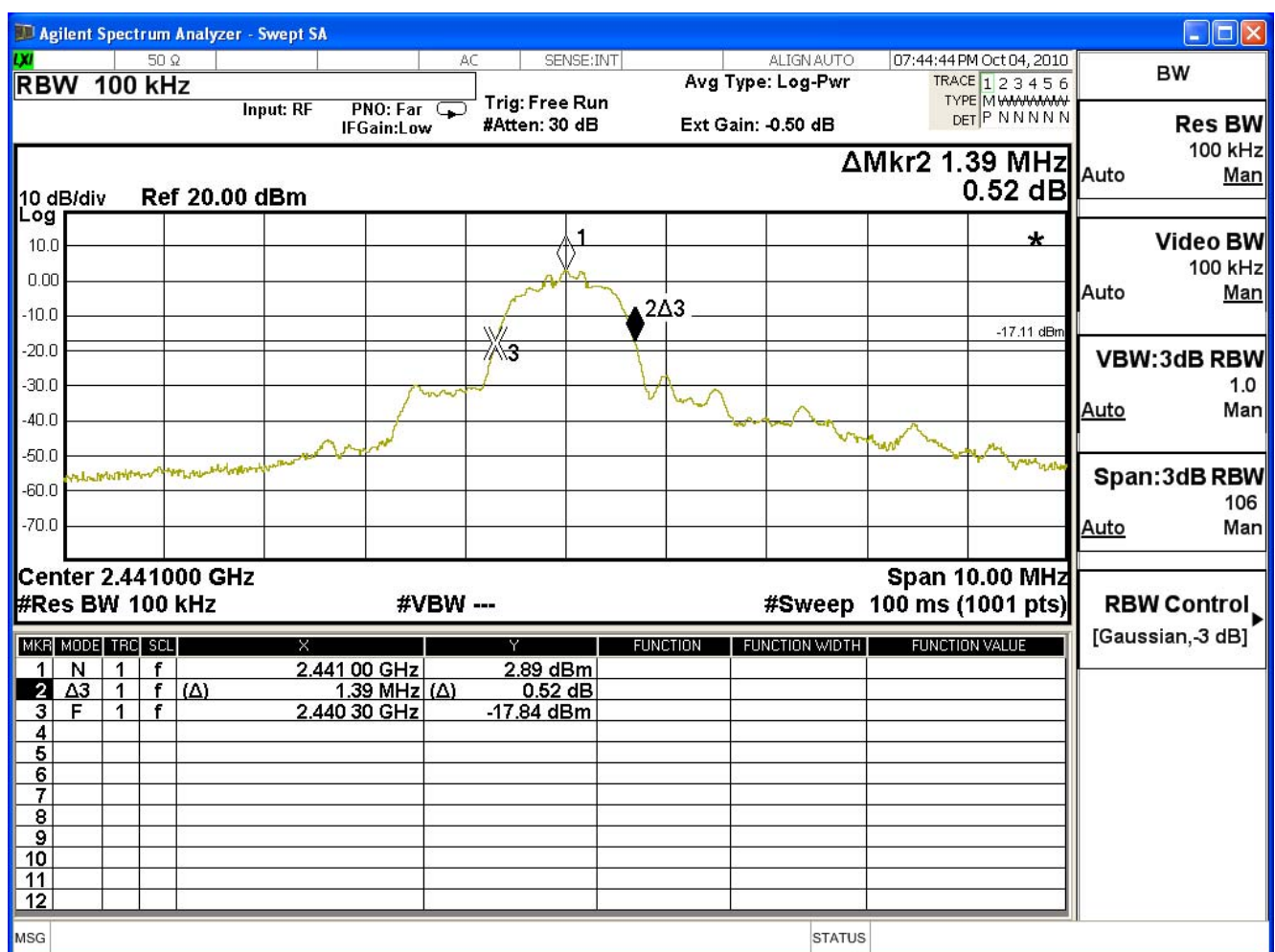


Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## $\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.39	--	Pass

## Channel 39

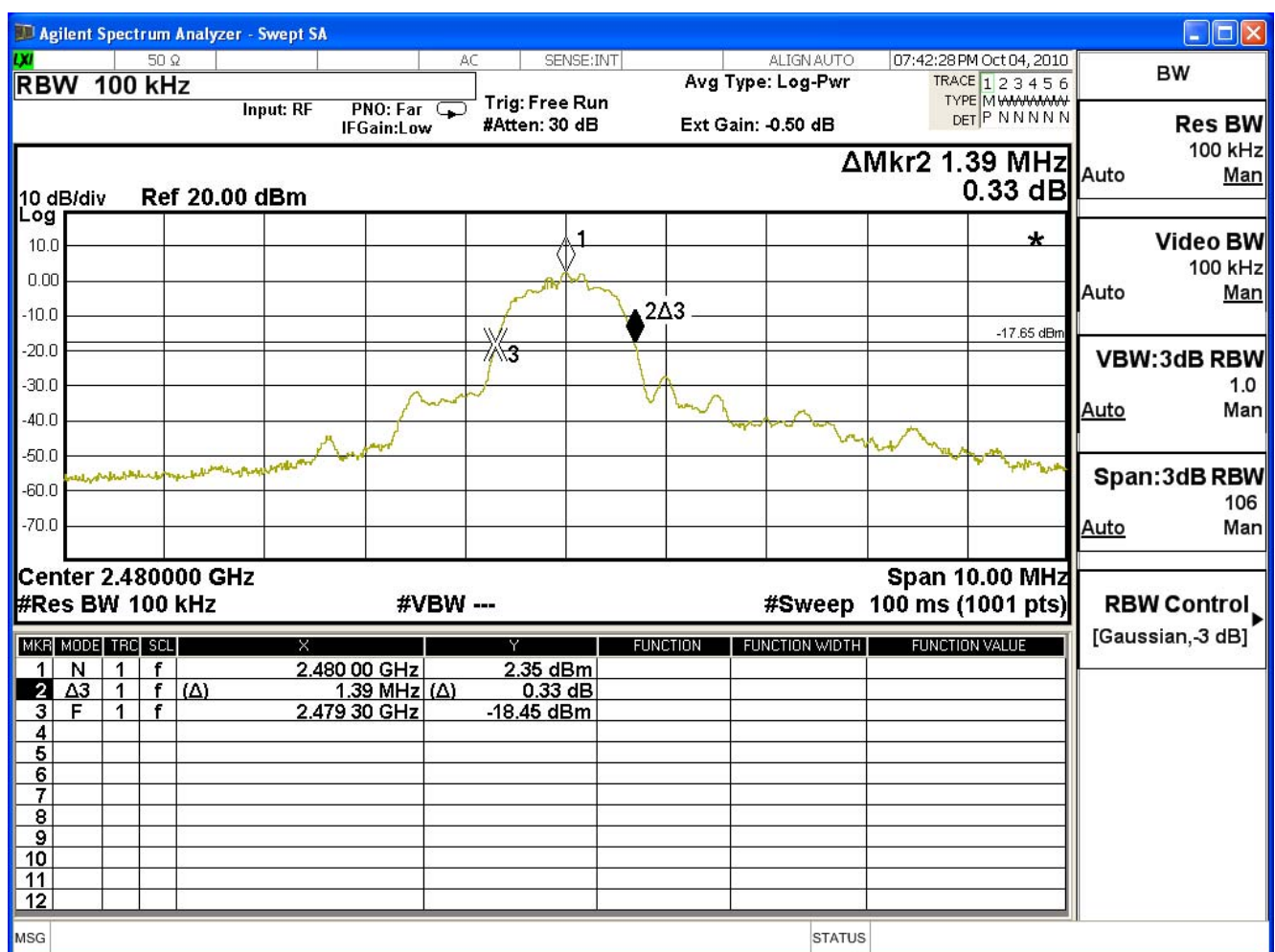


Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## $\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.39	--	Pass

**Channel 78**

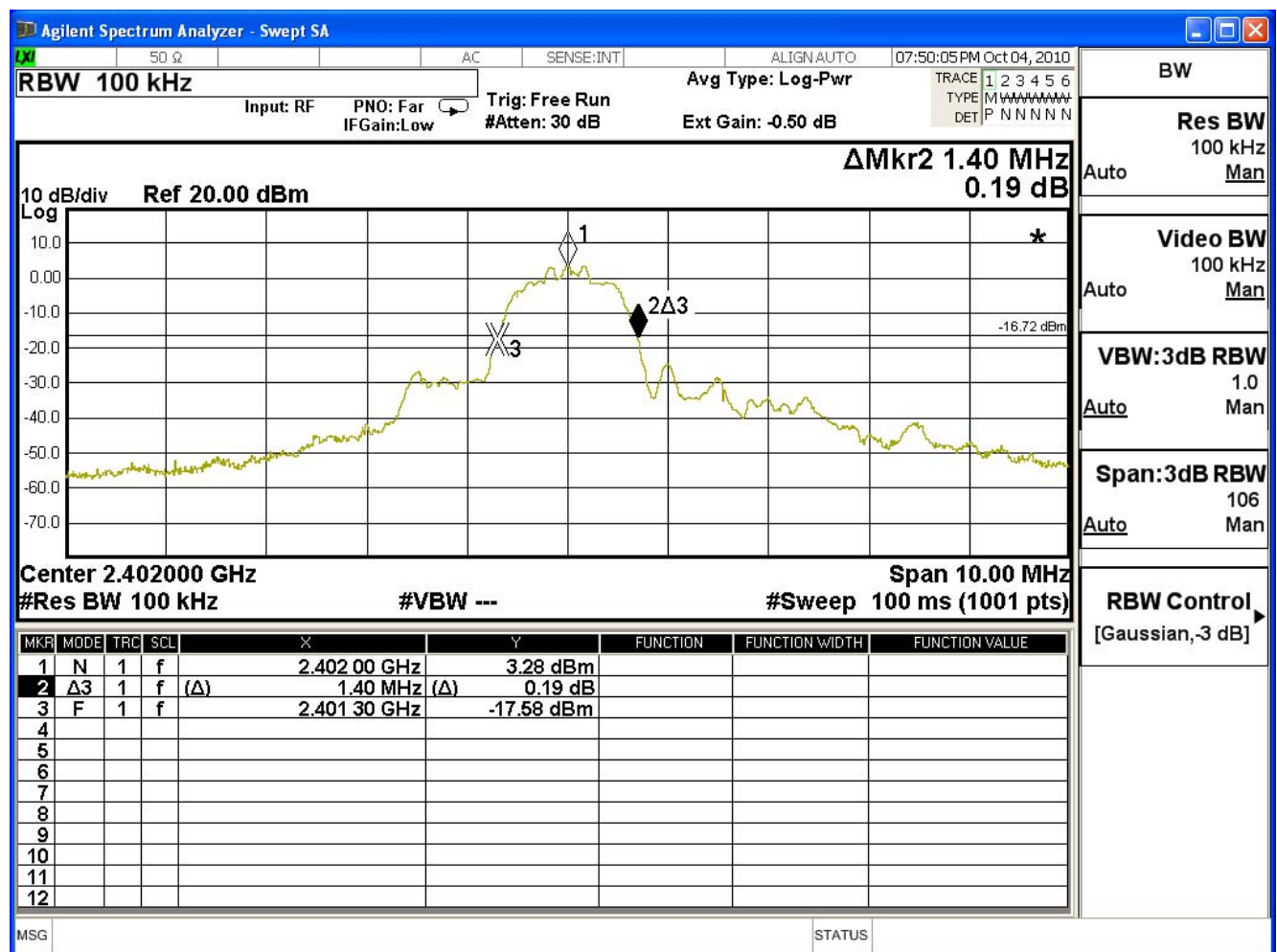


Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## 8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.40	--	Pass

### Channel 00



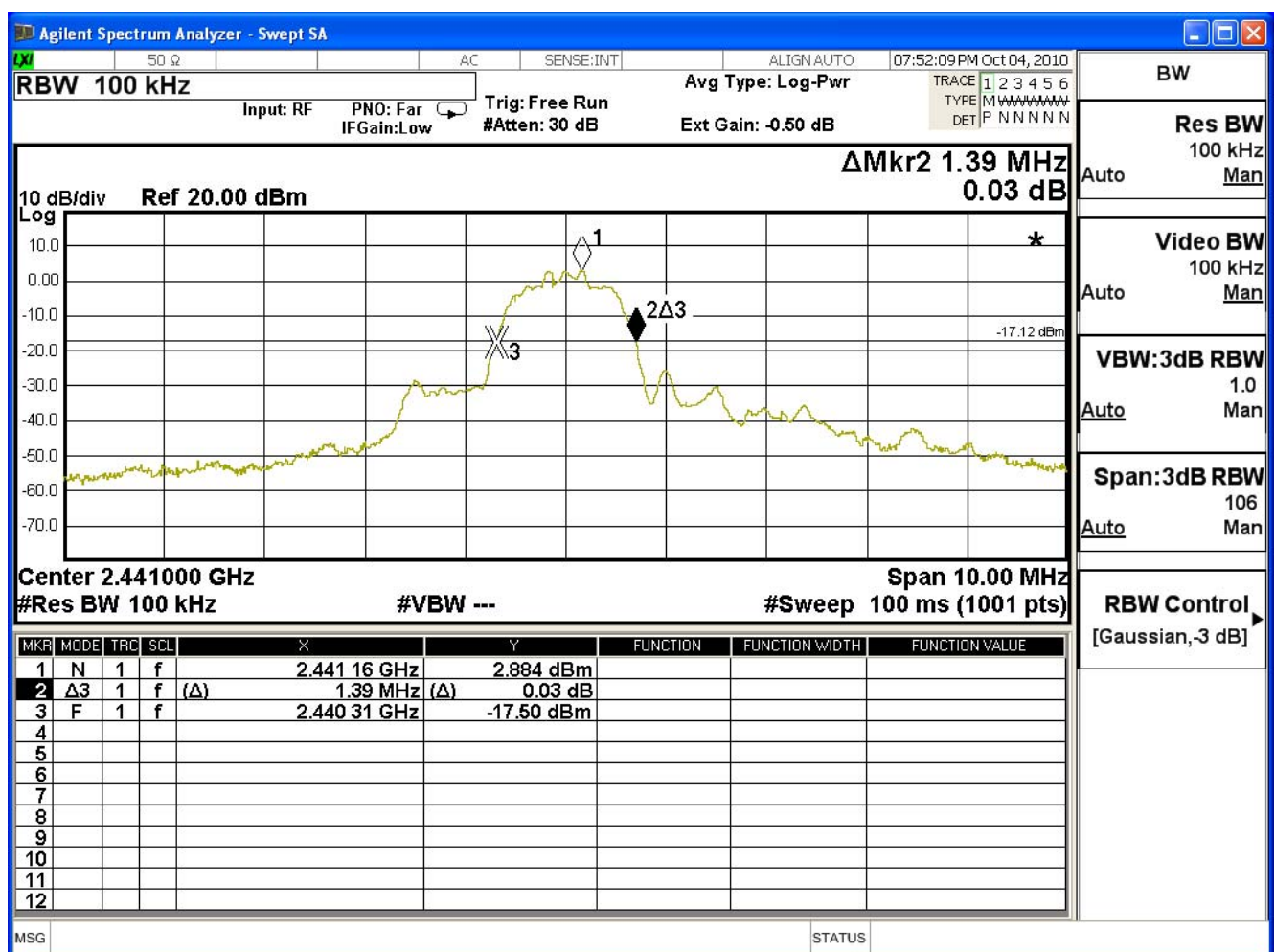


Product	Jawbone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

## 8-DPSK

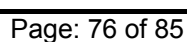
Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.39	--	Pass

## Channel 39



## 8-DPSK

## Channel 78





## 10. Dwell Time

### 10.1. Test Equipment

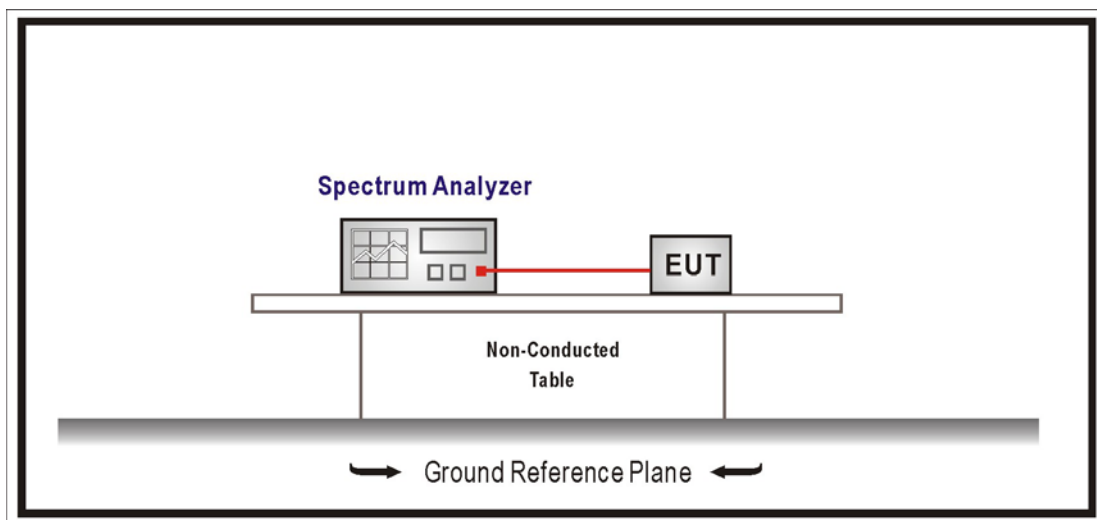
The following test equipment is used during the test:

Dwell Time / No.7 Shielding Room

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2011/02/04

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

### 10.2. Test Setup



### 10.3. Limits

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. For frequency hopping systems operating in the 2400-2483.5 MHz bands. 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. For frequency hopping systems operating in the 5725-5850 MHz bands. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

### 10.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = zero span, centered on a hopping channel

RBW = 1 MHz, VBW  $\geq$  RBW

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

Detector function = peak, Trace = max hold

### 10.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 10.6. Test Result

Product	Jawbone		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2010/10/04	Test Site	No.7 Shielding Room

Occupancy Time of Frequency Hopping System

A) 2402MHz Test Time Period:  $0.4 \times 79 = 31.6\text{sec}$  · Hopping Times Within 1sec:  $5.3/20\text{msec} = 265/\text{sec}$

The Maximum Occupancy Time Within 3.06sec:  $0.00306 \times (265/79) \times 31.6 = 0.324\text{sec}$  ·

B) 2441MHz Test Time Period:  $0.4 \times 79 = 31.6\text{sec}$  · Hopping Times Within 1sec:  $5.3/20\text{msec} = 265/\text{sec}$

The Maximum Occupancy Time Within 3.06sec:  $0.00306 \times (265/79) \times 31.6 = 0.324\text{sec}$  ·

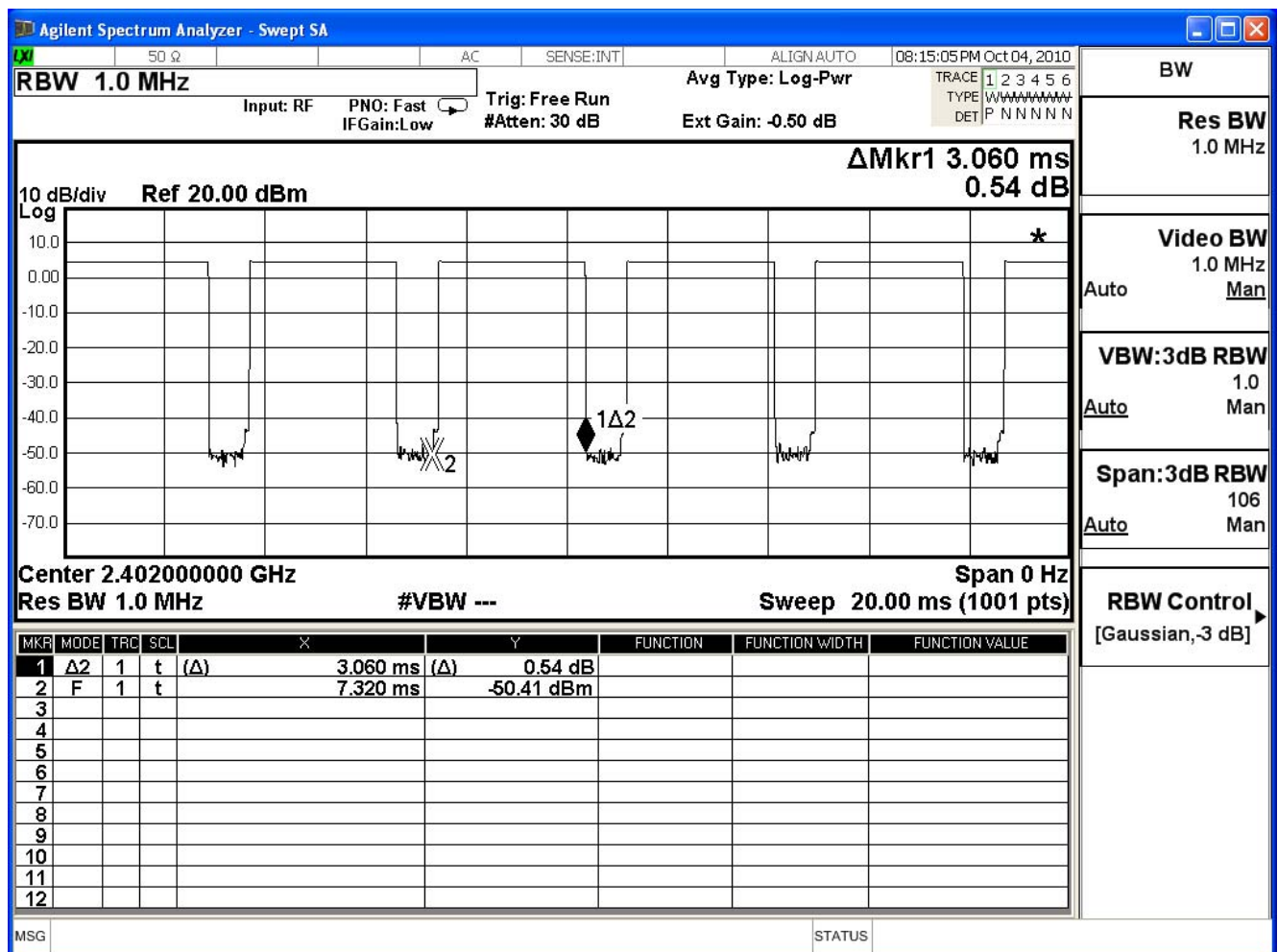
C) 2480MHz Test Time Period:  $0.4 \times 79 = 31.6\text{sec}$  · Hopping Times Within 1sec:  $5.3/20\text{msec} = 265/\text{sec}$

The Maximum Occupancy Time Within 3.06sec:  $0.00306 \times (265/79) \times 31.6 = 0.324\text{sec}$  ·

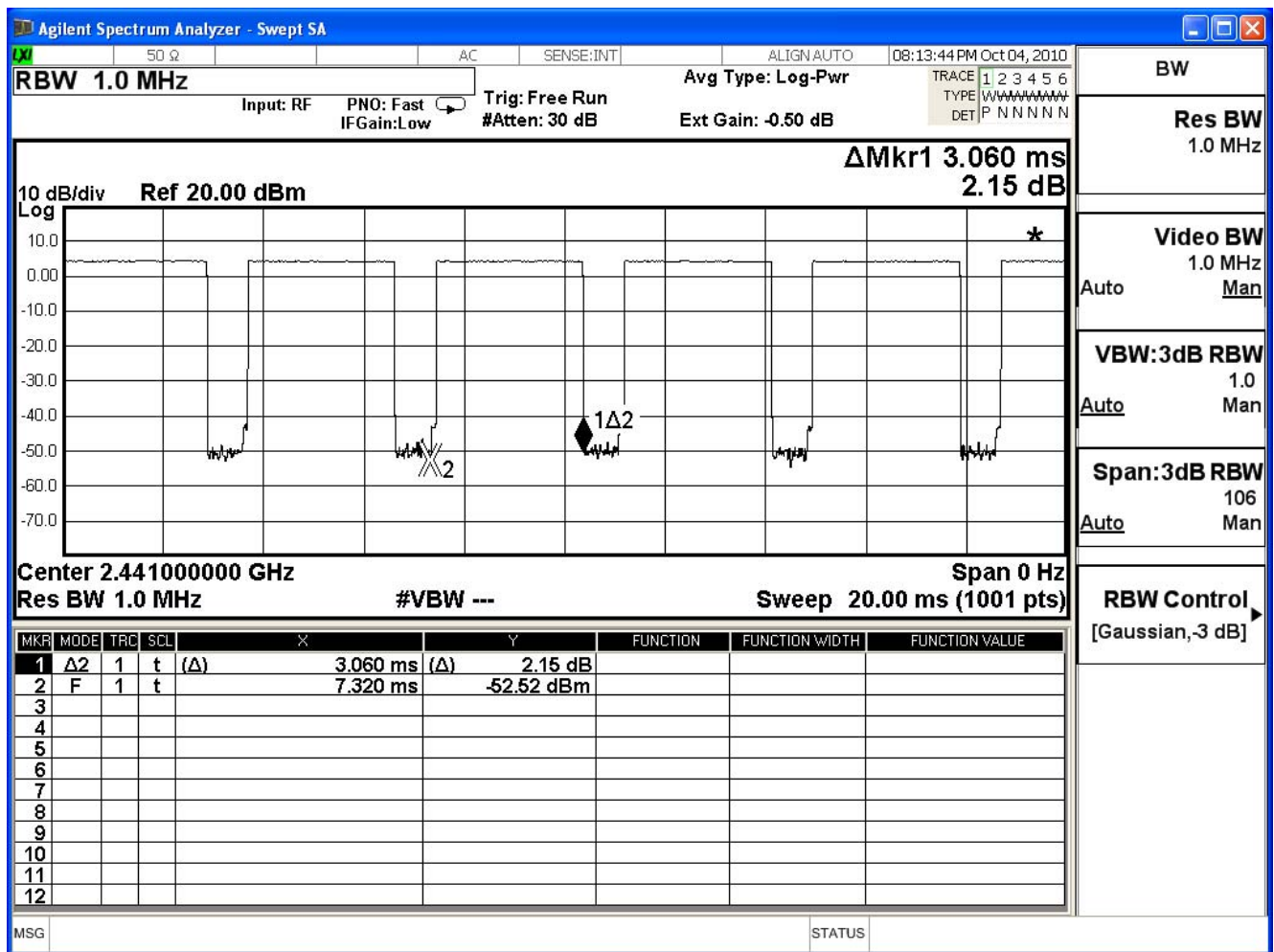
Test Result: The Average Occupancy Time of Each Highest · Middle and Lowest Channel Is Less Than

0.4sec · And Corresponds to The Standard ·

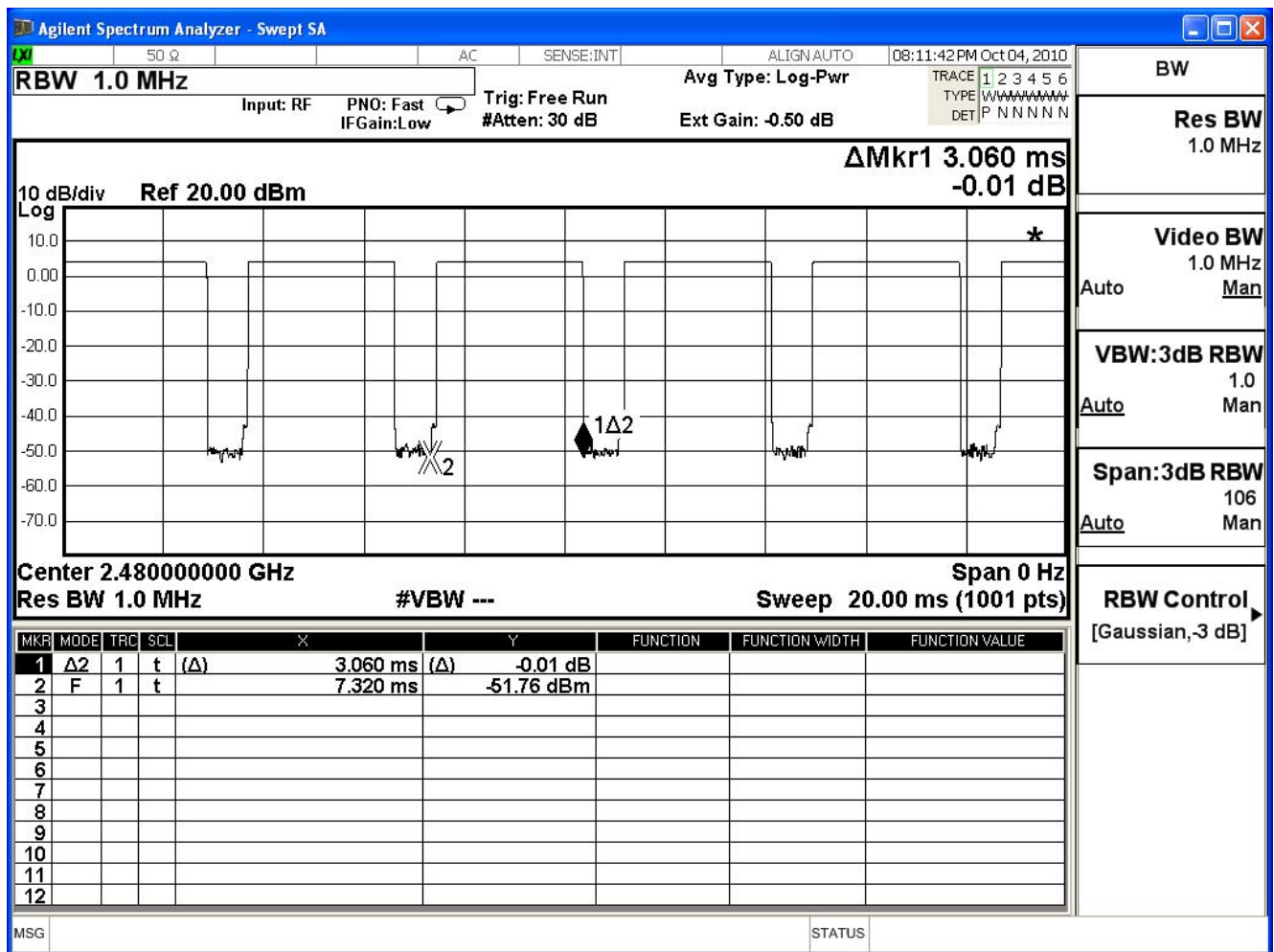
### Hop rate-2402MHz



# Hop rate-2441MHz



# Hop rate-2480MHz



Note: Dwell time = time slot length \* hop rate / number of hopping channels \* period