



Test Report

Product Name : Hypo-Vigilance / Fatigue Detector /
VigilanceSense / BodySensing
Model No. : DFD-100
FCC ID. : RJI-DF100

Applicant : Holux Technology, Inc.

Address : No.1-1, Innovation Road I , Science-Based Industrial Park, Hsinchu
300, Taiwan, R.O.C.

Date of Receipt : 2011/08/09
Issued Date : 2011/09/13
Report No. : 118224R-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 : 2011/09/13

Report No. : 118224R-RFUSP43V01



Product Name : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing

Applicant : Holux Technology, Inc.

Address : 1No.1-1, Innovation Road I , Science-Based Industrial Park, Hsinchu 300,Taiwan, R.O.C.

Manufacturer : Holux Technology, Inc.

Model No. : DFD-100

FCC ID. : RJI-DF100

EUT Voltage : DC 3.7V (Power by Battery)

Trade Name : Holux

Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2010

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.

Documented By : Sandy Chuang
 (Sandy Chuang / Adm. Specialist)

Reviewed By : Ben Huang
 (Ben Huang / Engineer)

Approved By : Roy Wang
 (Roy Wang / Manager)

TABLE OF CONTENTS

Description	Page
1. General Information.....	5
1.1. EUT Description	5
1.2. Operational Description	8
1.3. Test Mode	9
1.4. Tested System Details	10
1.5. Configuration of tested System	10
1.6. EUT Exercise Software	10
1.7. Test Facility.....	11
2. Peak Power Output	13
2.1. Test Equipment.....	13
2.2. Test Setup	13
2.3. Test procedures	13
2.4. Limits	13
2.5. Test Specification.....	13
2.6. Test Result.....	14
3. Radiated Emission	23
3.1. Test Equipment.....	23
3.2. Test Setup	23
3.3. Limits	24
3.4. Test Procedure	24
3.5. Test Specification.....	24
3.6. Test Result.....	25
3.7. Test Photo	33
4. RF antenna conducted test	35
4.1. Test Equipment.....	35
4.2. Test Setup	35
4.3. Limits	36
4.4. Test Procedure	36
4.5. Test Specification.....	36
4.6. Test Result.....	37
5. Band Edge.....	43
5.1. Test Equipment.....	43
5.2. Test Setup	43
5.3. Limits	44
5.4. Test Procedure	44
5.5. Test Specification.....	44
5.6. Test Result.....	45
6. Number of hopping frequency	53
6.1. Test Equipment.....	53
6.2. Test Setup	53
6.3. Limits	54

6.4.	Test Procedures	54
6.5.	Test Specification.....	54
6.6.	Test Result.....	55
7.	Carrier Frequency Separation	59
7.1.	Test Equipment.....	59
7.2.	Test Setup	59
7.3.	Limits	59
7.4.	Test Procedures	59
7.5.	Test Specification.....	59
7.6.	Test Result.....	60
8.	Occupied Bandwidth	69
8.1.	Test Equipment.....	69
8.2.	Test Setup	69
8.3.	Limits	70
8.4.	Test Procedures	70
8.5.	Test Specification.....	70
8.6.	Test Result.....	71
9.	Dwell Time.....	80
9.1.	Test Equipment.....	80
9.2.	Test Setup	80
9.3.	Limits	81
9.4.	Test Procedures	81
9.5.	Test Specification.....	81
9.6.	Test Result.....	82
Attachement.....		85
	EUT Photograph.....	85

1. General Information

1.1. EUT Description

Product Name	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing
Trade Name	Holux
Model No.	DFD-100
Frequency Range	2402~2480MHz
Channel Number	79
Type of Modulation	GFSK (1Mbps), $\pi/4$ -DQPSK (2Mbps), 8-DPSK (3Mbps)
Channel Control	Auto
Antenna Type	Soldered on PCB
Antenna Gain	2 dBi

Component	
USB Cable	Shielded, 0.5m
Car Charge	EMDICAR, IC-USB-D I/P: DC 12V~24V O/P: DC 5V, 1A
Power Adapter	Sage Power, KSAS0080500100VUU I/P: 100~240V~50/60Hz, 0.18A O/P: 5.0V \equiv 1.0A

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 Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing including a 2.4GHz receiving function, and transmitting function.
2. This device has three modulation types (GFSK, $\pi/4$ -DQPSK, 8DPSK). We measured and found the worst case of these three modulation types. Only the worst case measured all test items.
3. 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.
4. 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.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
6. 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 118224R-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 (GFSK) Mode 2: Transmit ($\pi/4$ -DQPSK) Mode 3: Transmit (8PSK)
Final Test Mode	
EMI	Mode 1: Transmit (GFSK) Mode 2: Transmit ($\pi/4$ -DQPSK) Mode 3: Transmit (8PSK)

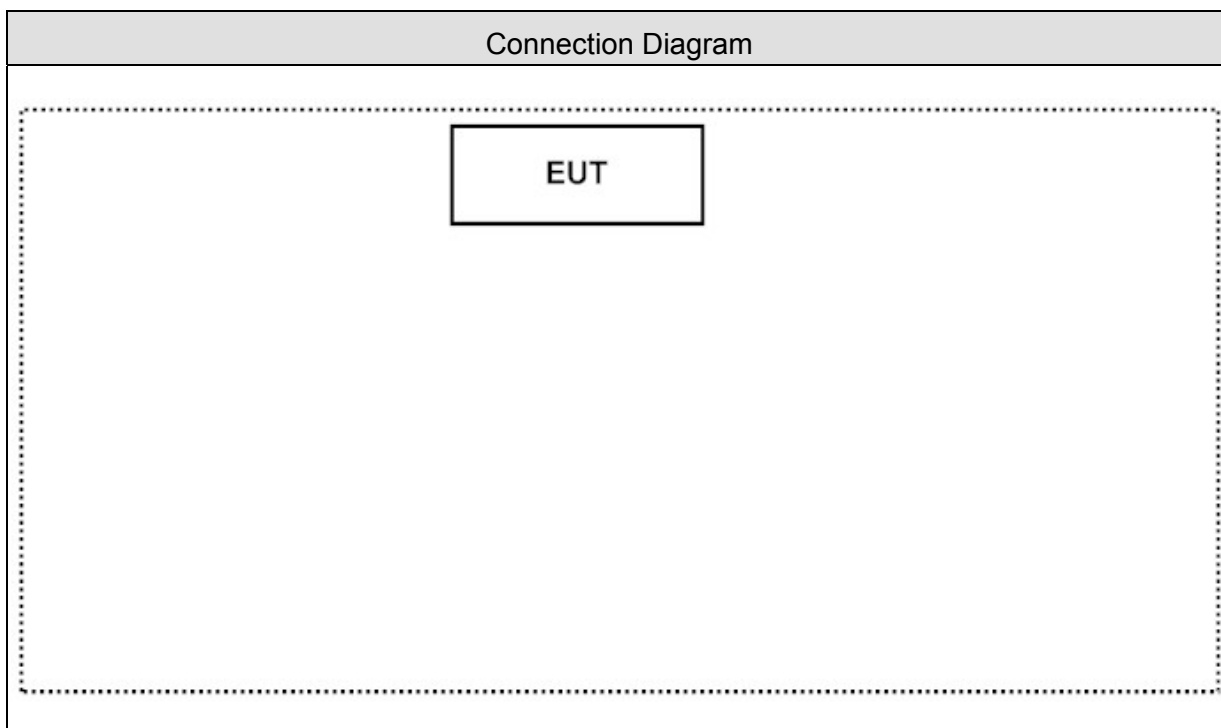
Emission	Mode 1	Mode 2	Mode 3
Conducted Emission	No	No	No
Peak Power Output	Yes	Yes	Yes
Radiated Emission	Yes	No	No
RF antenna conducted test	Yes	No	No
Band Edge	Yes	No	No
Channel of Number	Yes	No	No
Channel Separation	Yes	Yes	Yes
Occupied Bandwidth	Yes	Yes	Yes
Dwell Time	Yes	No	No

1.4. Tested System Details

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

N/A

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: September 27, 2010 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, 2013



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



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TEL : 886-3-5928858 / FAX : 886-3-5928859
E-Mail : service@quietek.com

2. Peak Power Output

2.1. Test Equipment

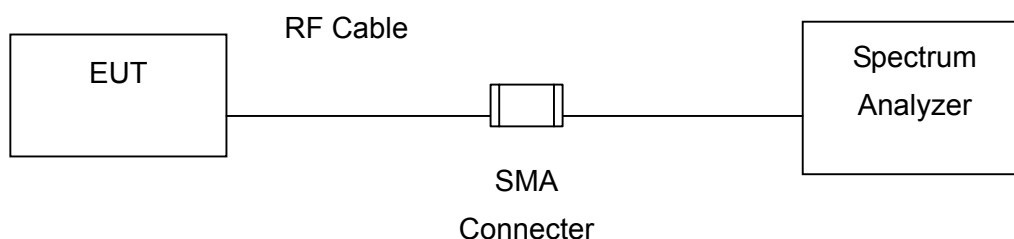
The following test equipment is used during the test:

Peak Power Output / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2012/01/16

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

2.2. Test Setup



2.3. 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

2.4. 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.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

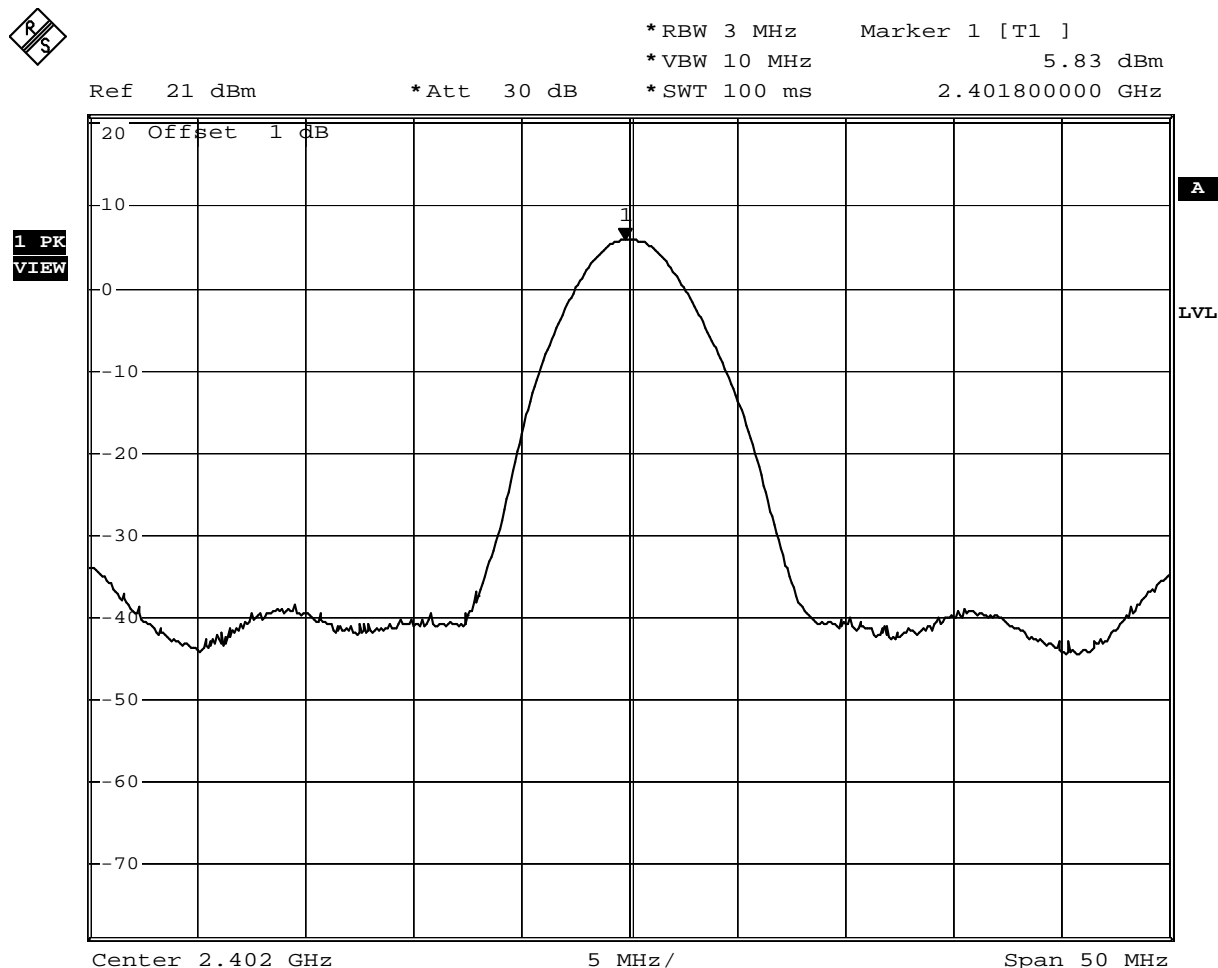
2.6. Test Result

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	5.83	1Watt= 30 dBm	Pass

Channel 00



Comment: A:\2
 Date: 1.SEP.2011 11:10:12

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

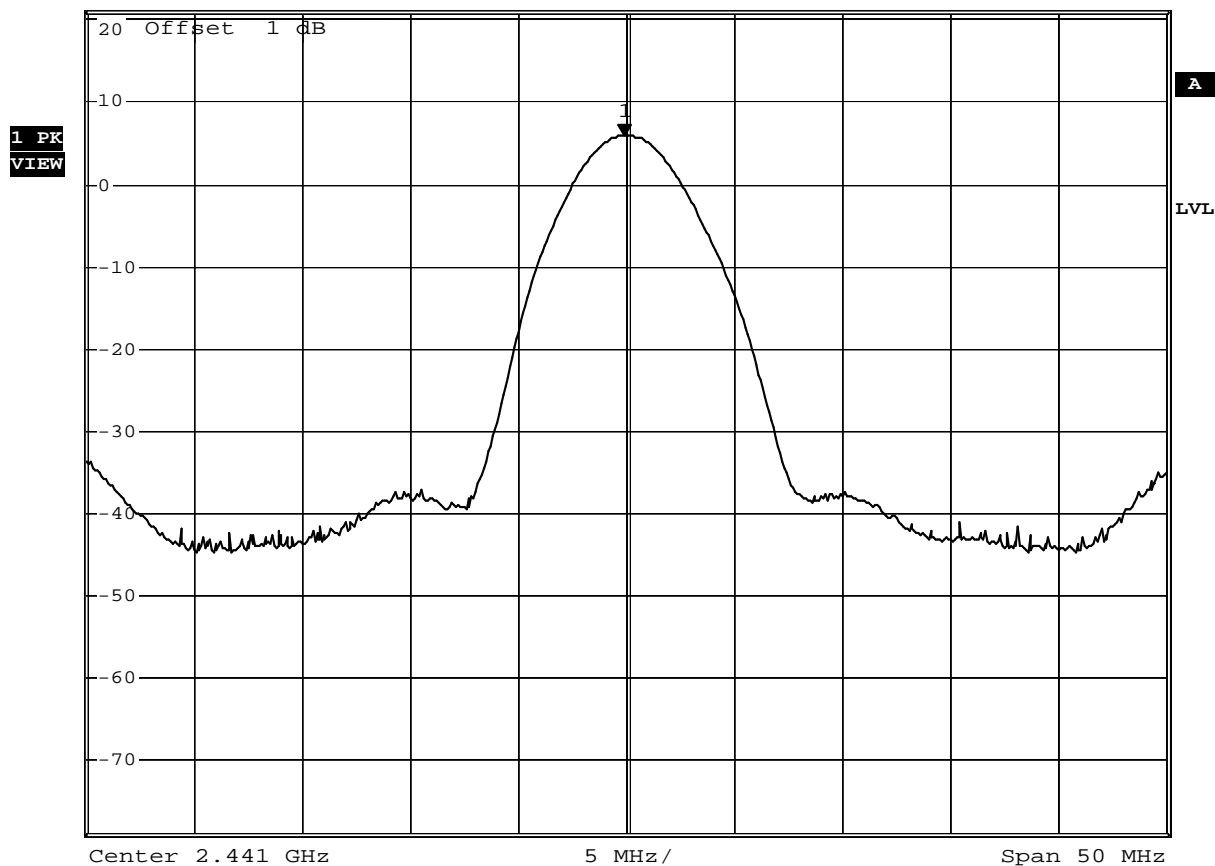
GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	5.86	1Watt= 30 dBm	Pass

Channel 39



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 5.86 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.440900000 GHz



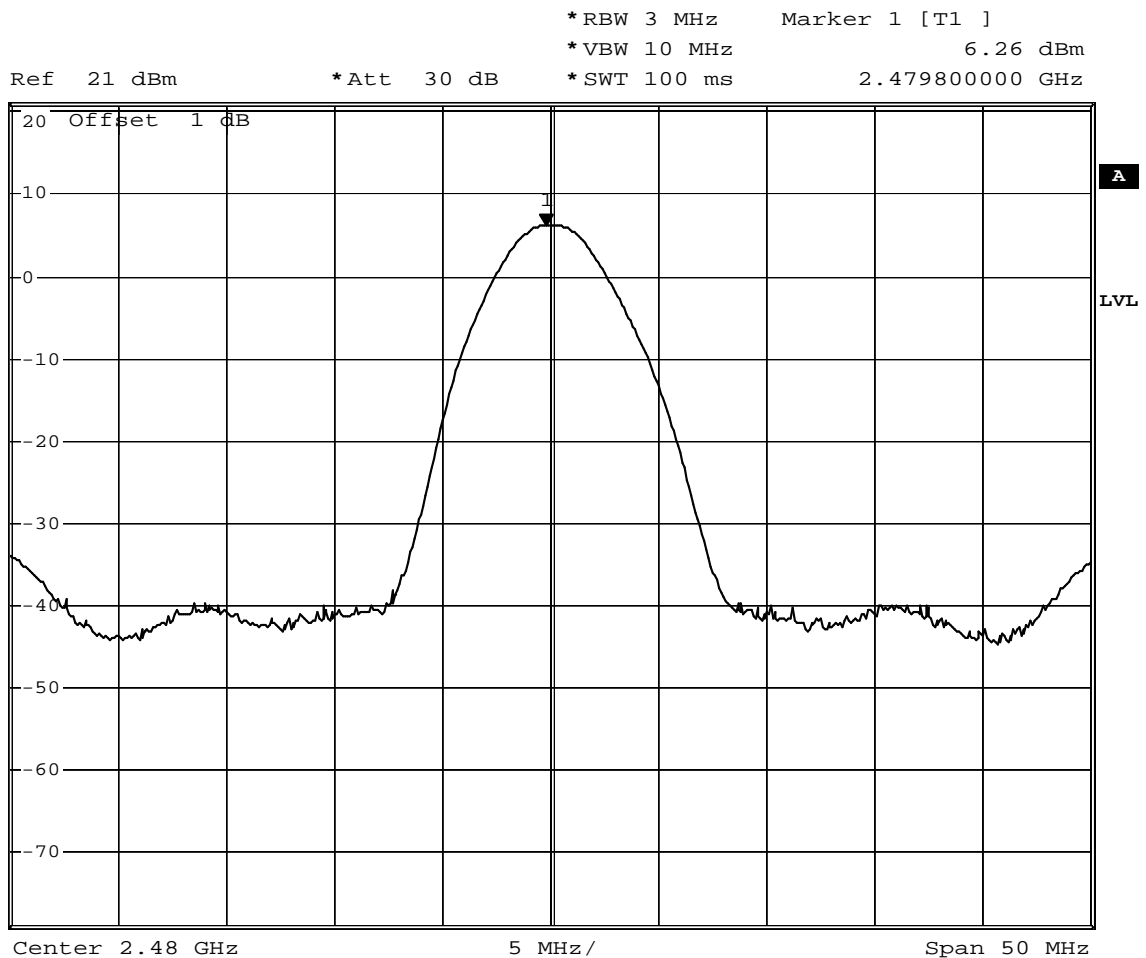
Comment: A:\2
 Date: 1.SEP.2011 11:12:33

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	6.26	1Watt= 30 dBm	Pass

Channel 78



Comment: A:\2
 Date: 1.SEP.2011 11:13:00

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

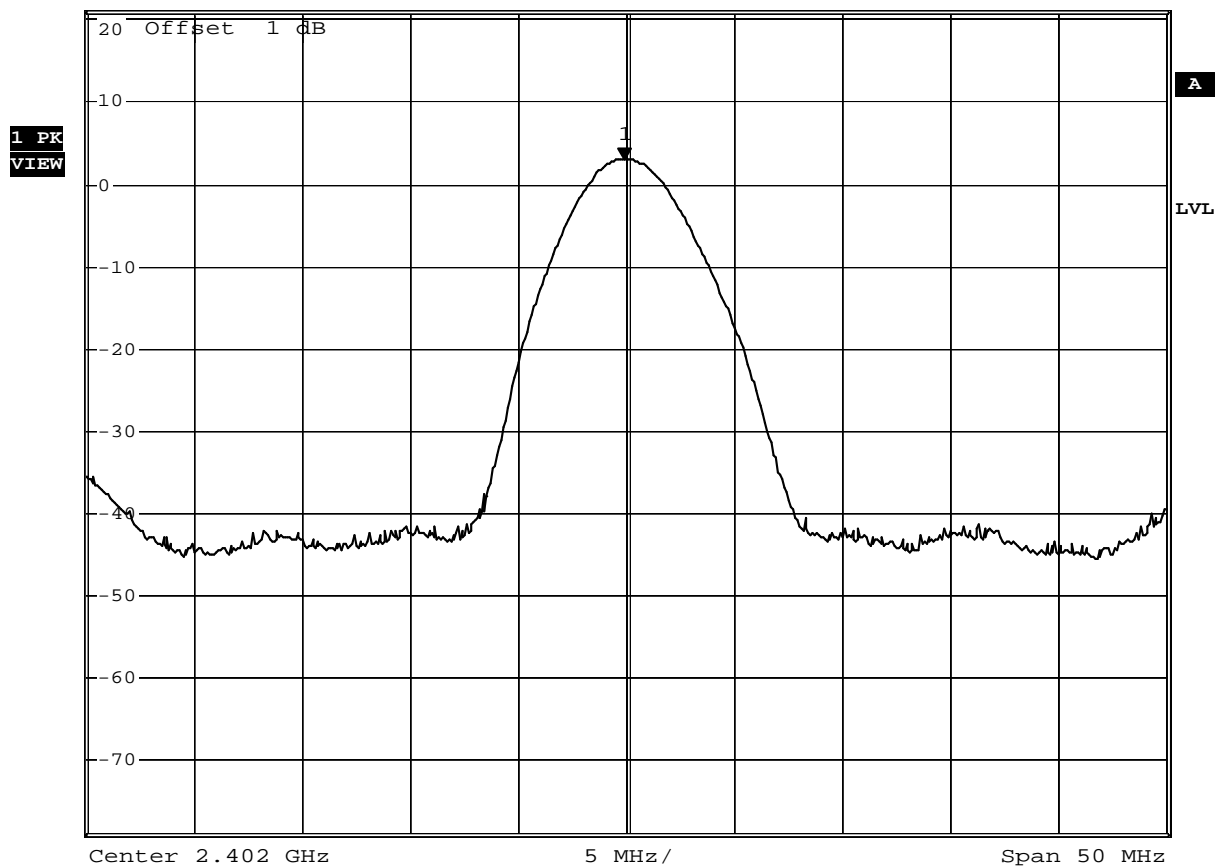
$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	3.12	1Watt= 30 dBm	Pass

Channel 00



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 3.12 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.401900000 GHz



Comment: A:\2
 Date: 6.SEP.2011 16:01:01

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

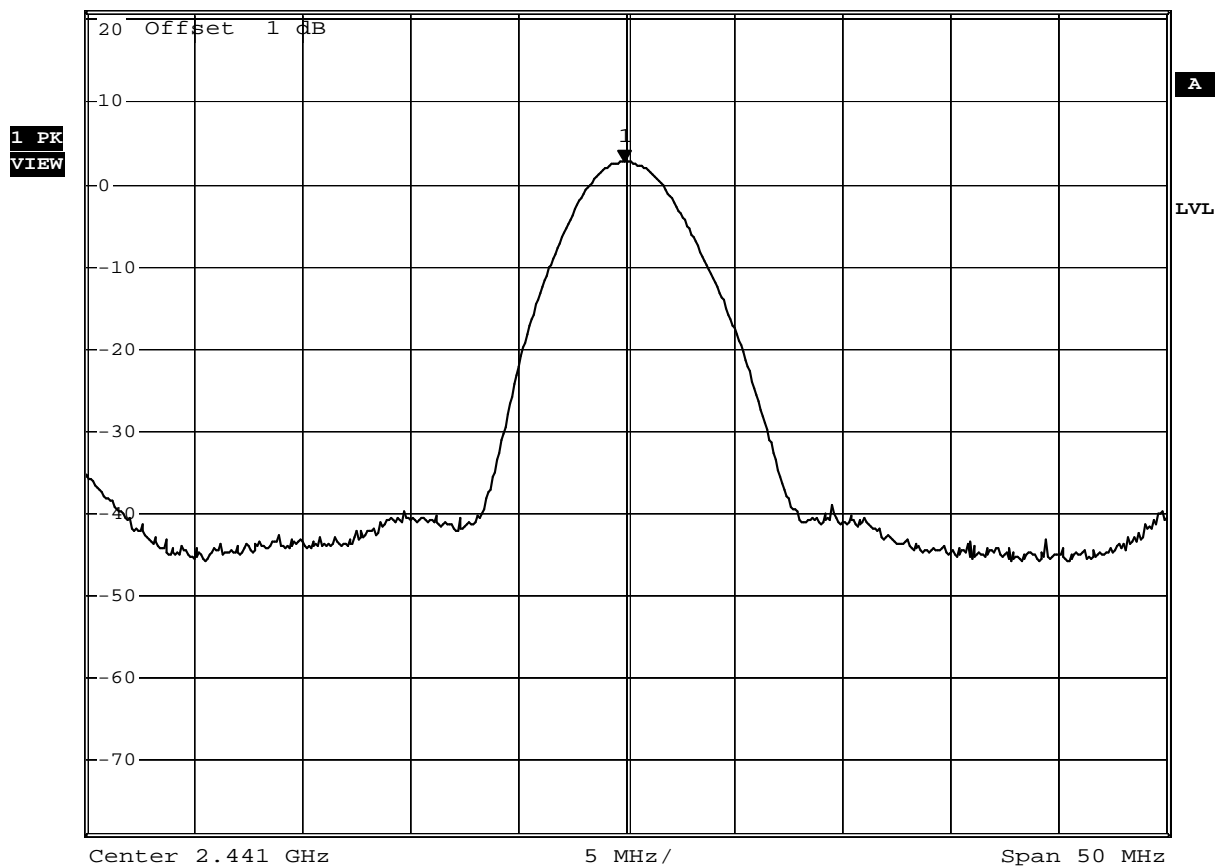
$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	2.75	1Watt= 30 dBm	Pass

Channel 39



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 2.75 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.440900000 GHz



Comment: A:\2
 Date: 6.SEP.2011 16:01:52

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

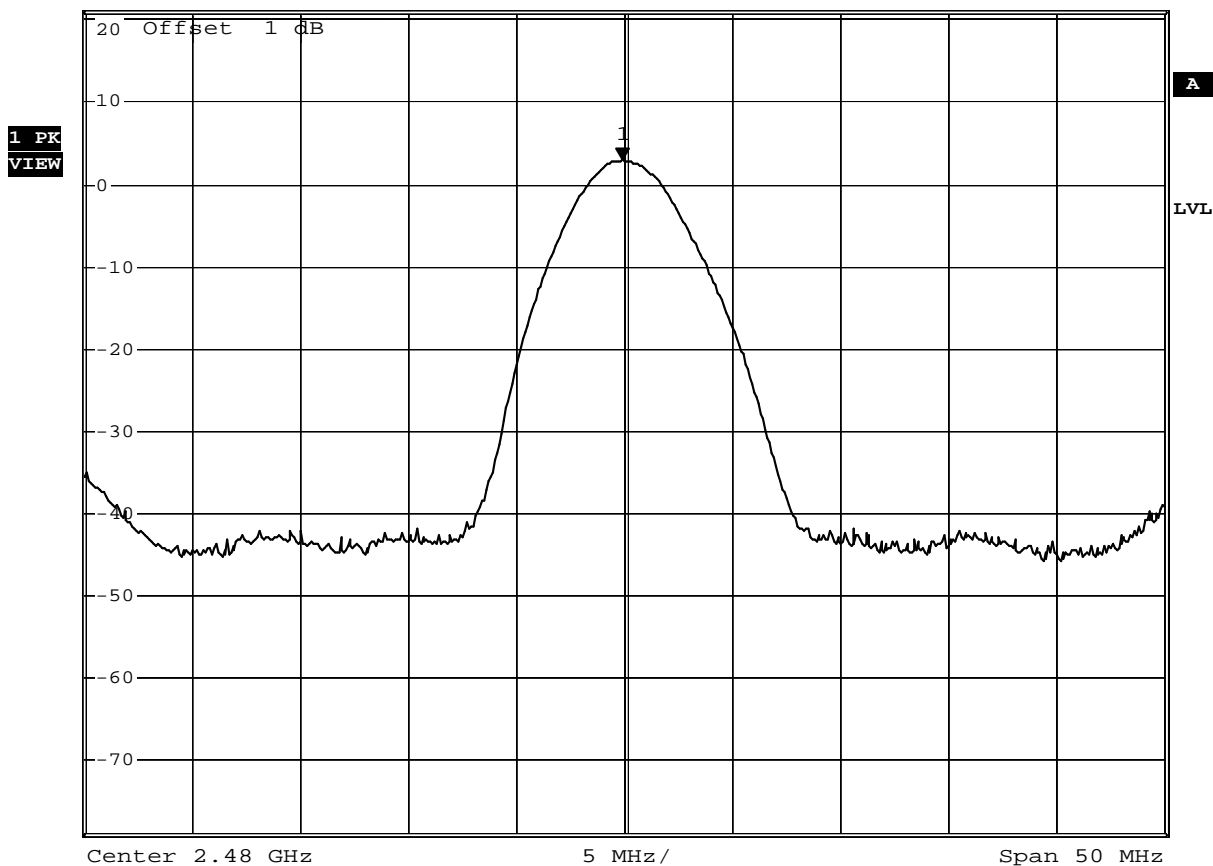
$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	2.99	1Watt= 30 dBm	Pass

Channel 78



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 2.99 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.479900000 GHz



Comment: A:\2
 Date: 6.SEP.2011 16:02:21

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/09/06	Test Site	SR7

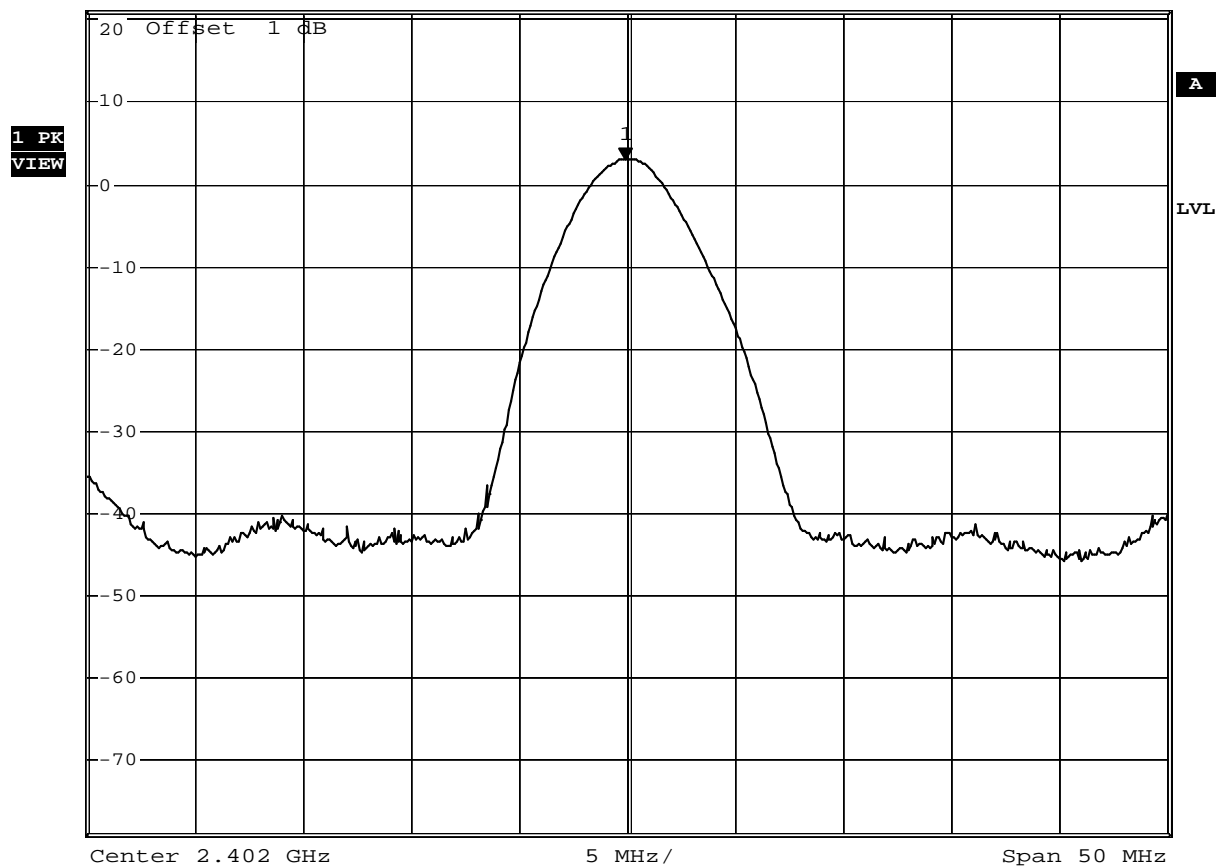
8PSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	3.12	1Watt= 30 dBm	Pass

Channel 00



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 3.12 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.401900000 GHz



Comment: A:\2
 Date: 6.SEP.2011 16:04:07

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/09/06	Test Site	SR7

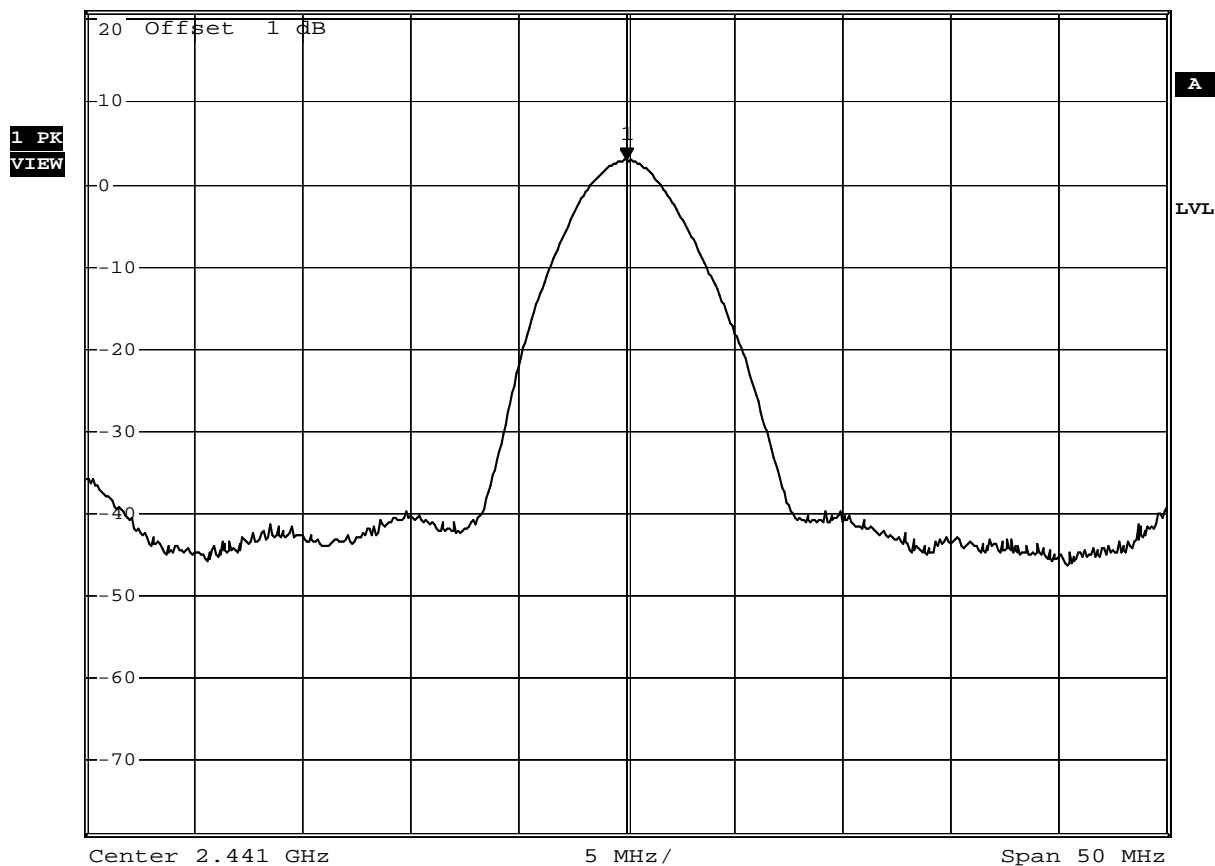
8PSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	2.96	1Watt= 30 dBm	Pass

Channel 39



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 2.96 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.441000000 GHz



Comment: A:\2
 Date: 6.SEP.2011 16:03:44

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Peak Power Output		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/09/06	Test Site	SR7

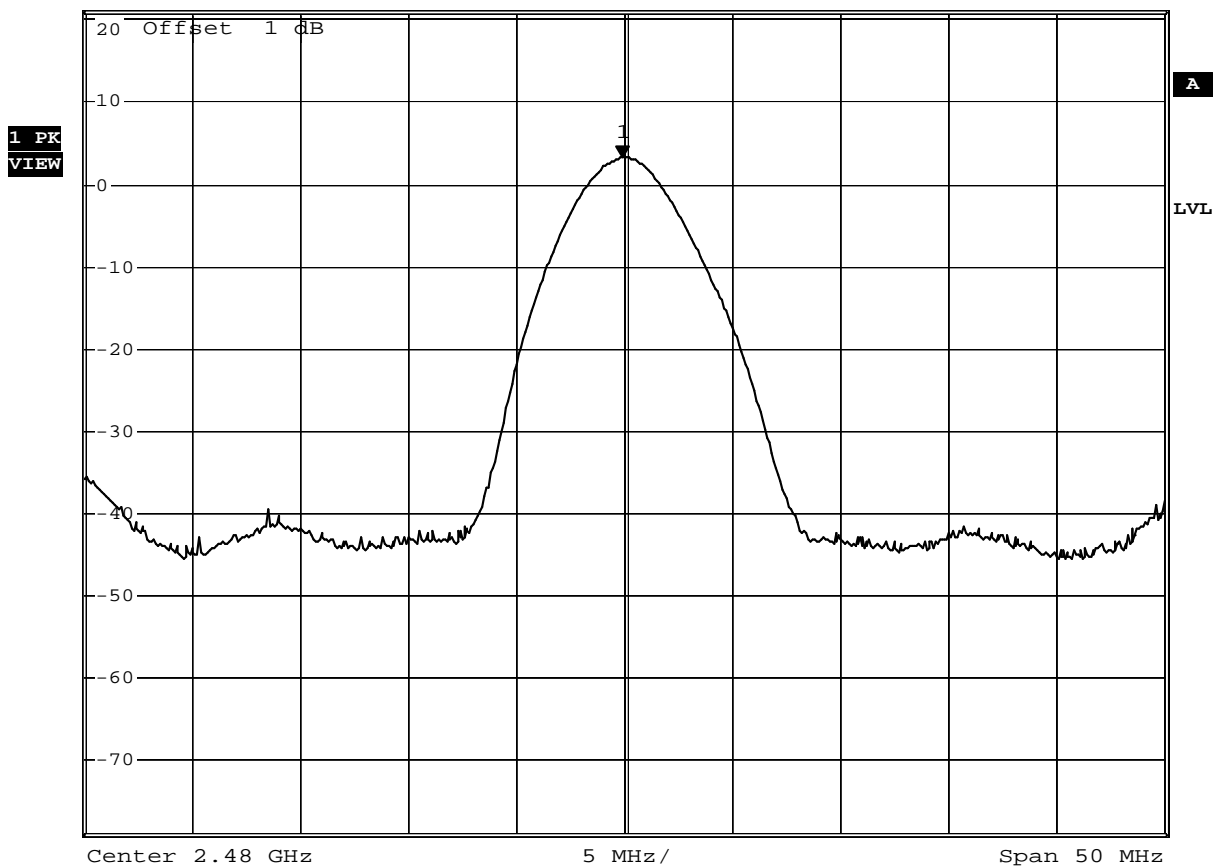
8PSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	3.24	1Watt= 30 dBm	Pass

Channel 78



*RBW 3 MHz Marker 1 [T1]
 *VBW 10 MHz 3.24 dBm
 Ref 21 dBm *Att 30 dB *SWT 100 ms 2.479900000 GHz



Comment: A:\2
 Date: 6.SEP.2011 16:03:12

3. Radiated Emission

3.1. Test Equipment

The following test equipments are used during the test:

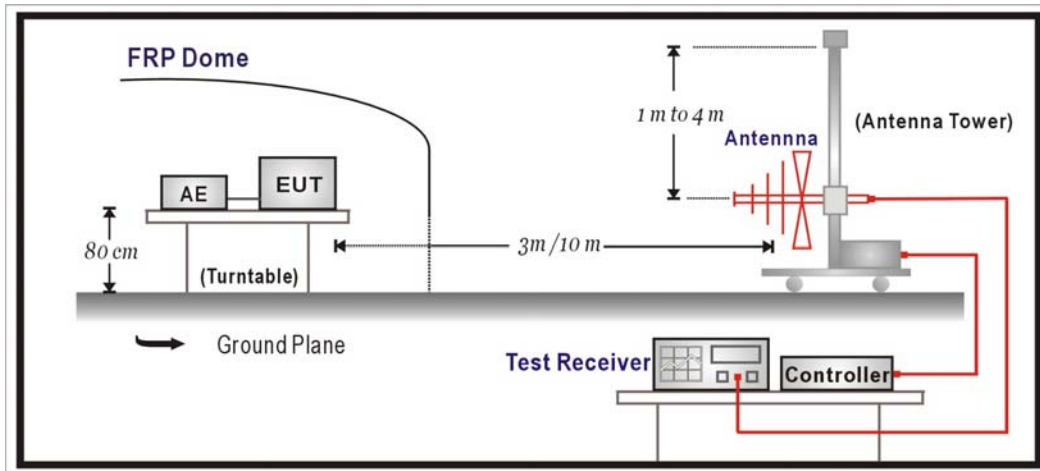
Radiated Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	SCHAFFNER	CBL6112B	2895	2012/08/14
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120D	743	2012/02/24
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2011/12/16
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2012/03/10
PSA Series Spectrum analyzer	Agilent	E4440A	MY46187335	2012/01/06
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2012/03/21

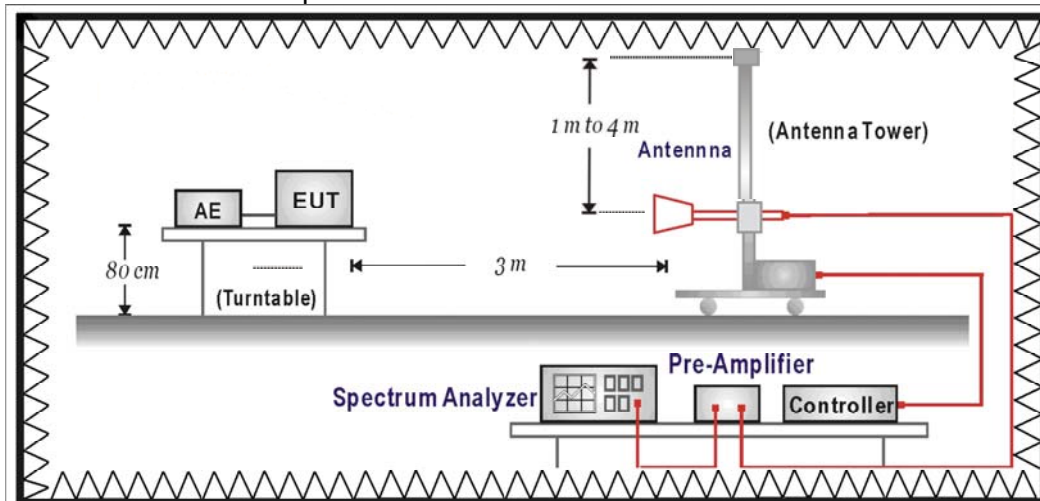
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



3.3. 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.

3.4. 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.

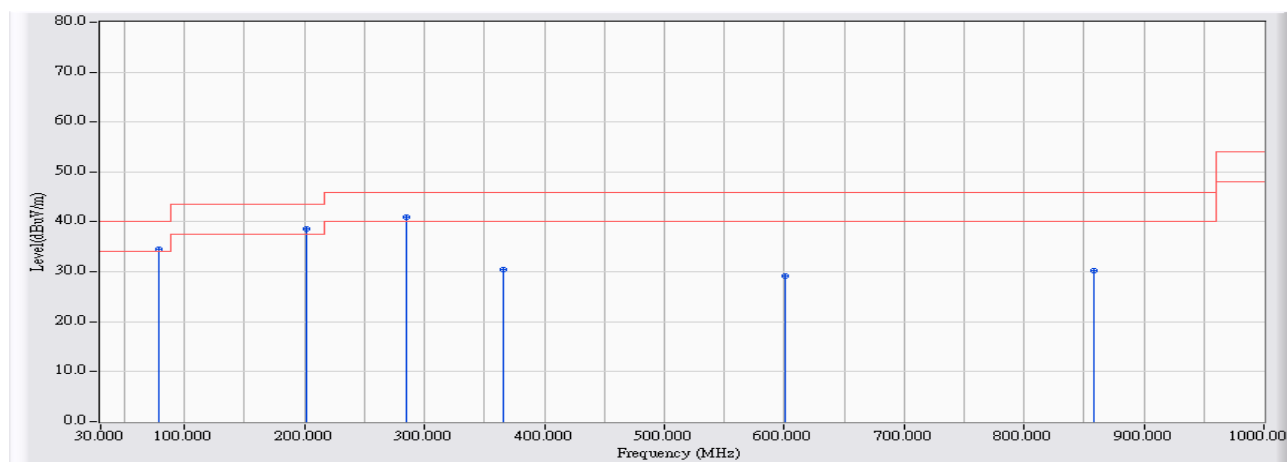
3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

3.6. Test Result

30MHz-1GHz Spurious

Site : CB1	Time : 2011/08/16 - 20:47
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_EFS_30-1G(2010-12) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2441MHz

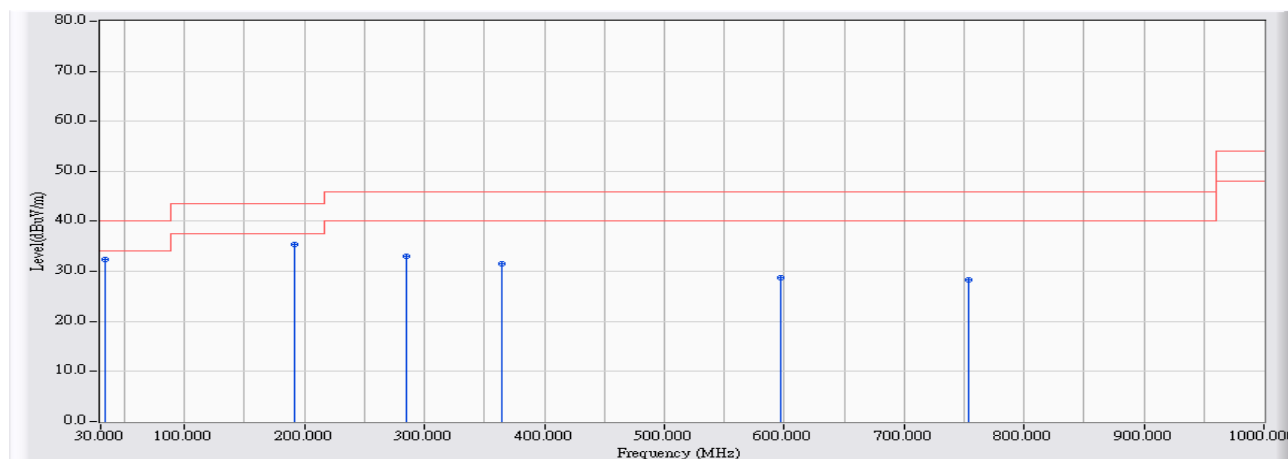


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	78.500	-17.545	52.126	34.581	-5.419	40.000	QUASPEAK
2	* 201.367	-15.016	53.667	38.652	-4.848	43.500	QUASPEAK
3	285.433	-10.904	51.824	40.920	-5.080	46.000	QUASPEAK
4	366.267	-8.810	39.237	30.427	-15.573	46.000	QUASPEAK
5	600.683	-5.025	34.094	29.068	-16.932	46.000	QUASPEAK
6	857.733	-3.091	33.376	30.285	-15.715	46.000	QUASPEAK

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 : 2011/08/16 - 20:47
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_EFS_30-1G(2010-12) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2441MHz



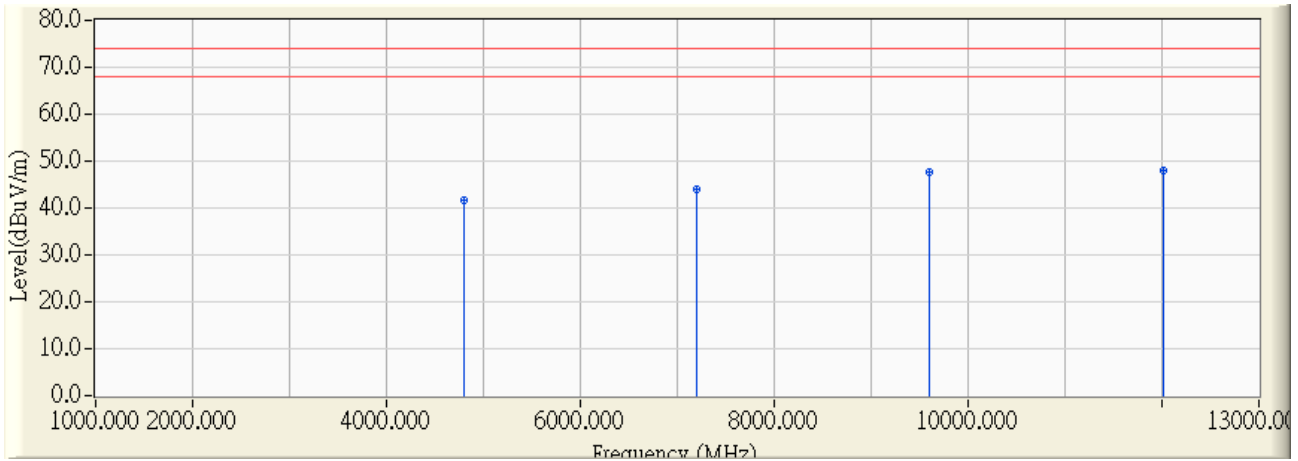
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	33.233	-10.905	43.271	32.366	-7.634	40.000	QUASPEAK
2		191.667	-15.115	50.487	35.372	-8.128	43.500	QUASPEAK
3		285.433	-10.904	44.032	33.128	-12.872	46.000	QUASPEAK
4		364.650	-8.855	40.383	31.527	-14.473	46.000	QUASPEAK
5		597.450	-5.051	33.736	28.686	-17.314	46.000	QUASPEAK
6		754.267	-3.889	32.247	28.358	-17.642	46.000	QUASPEAK

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 : 2011/08/15 - 15:07
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2402MHz

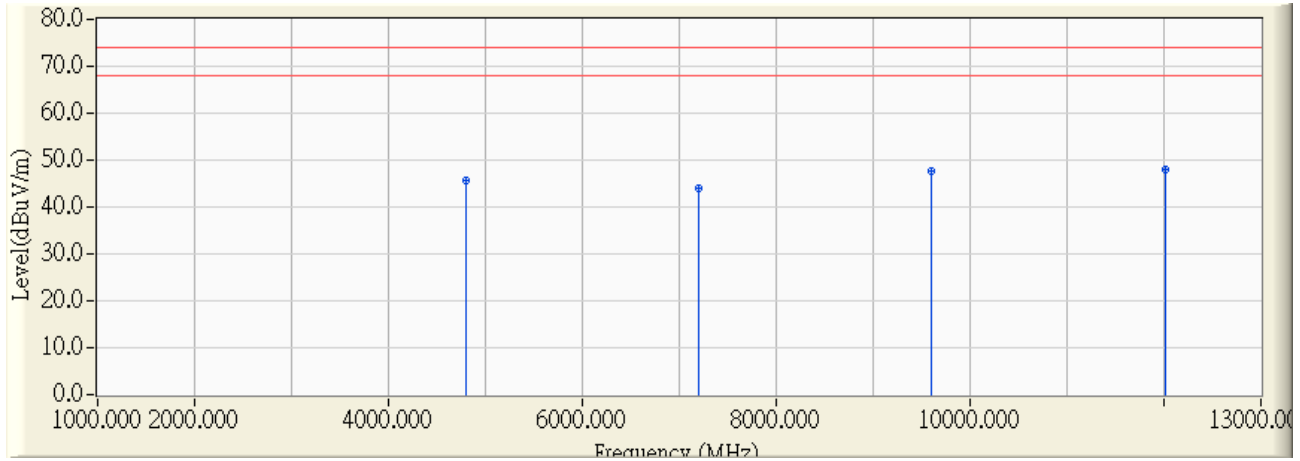


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	4804.100	-1.546	43.060	41.515	-32.485	74.000	54.000	PEAK
2	7205.200	4.701	39.270	43.971	-30.029	74.000	54.000	PEAK
3	9607.300	7.942	39.810	47.752	-26.248	74.000	54.000	PEAK
4	* 12012.300	10.221	37.770	47.991	-26.009	74.000	54.000	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 : 2011/08/15 - 15:02
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2402MHz

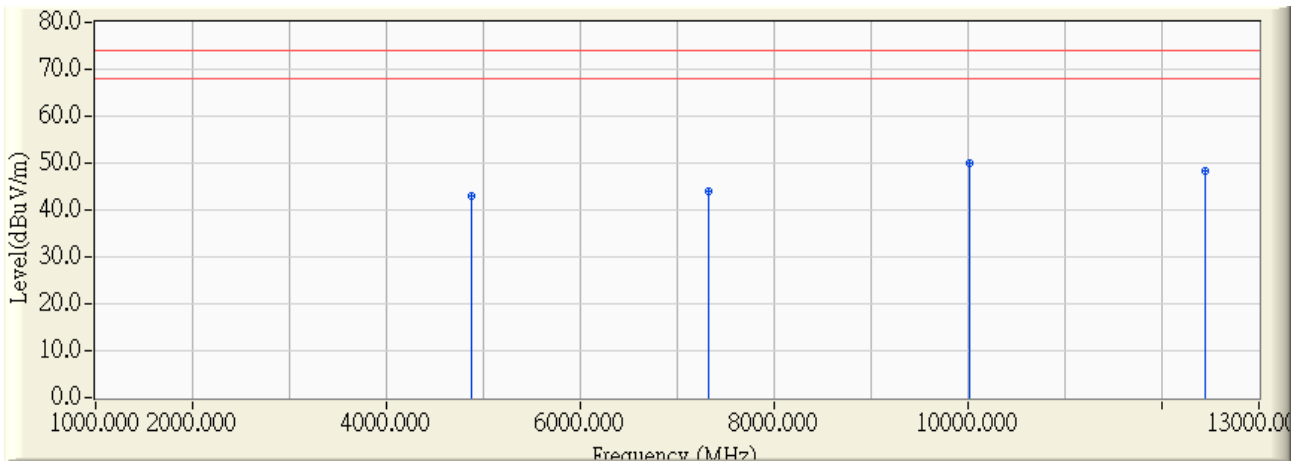


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	4803.900	-1.546	47.110	45.564	-28.436	74.000	54.000	PEAK
2	7204.900	4.701	39.190	43.891	-30.109	74.000	54.000	PEAK
3	9607.300	7.942	39.800	47.742	-26.258	74.000	54.000	PEAK
4	* 12009.100	10.220	37.800	48.021	-25.979	74.000	54.000	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 : 2011/08/15 - 15:23
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2441MHz

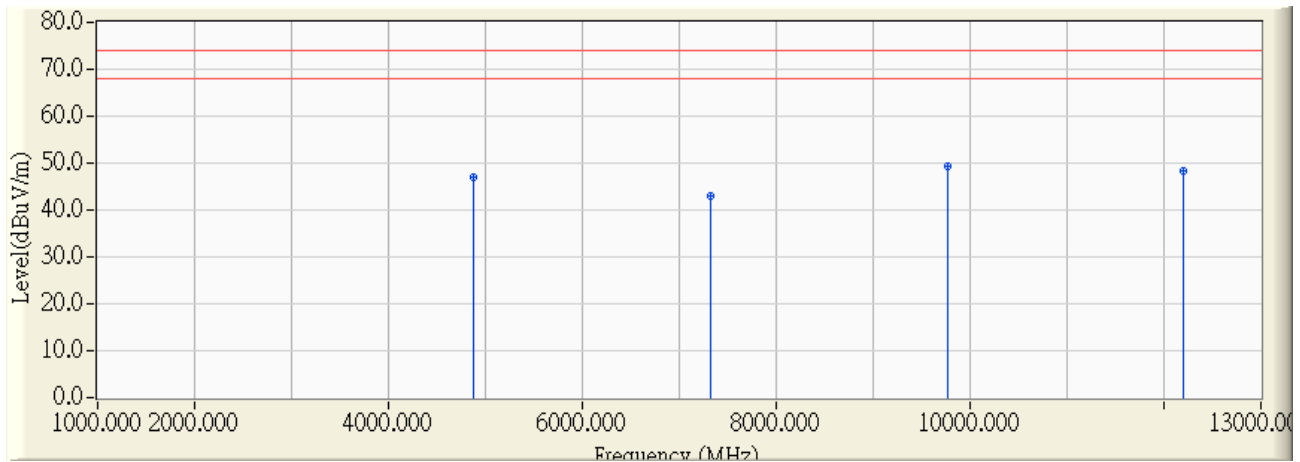


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	4882.100	-1.377	44.490	43.113	-30.887	74.000	54.000	PEAK
2	7320.600	4.913	39.110	44.023	-29.977	74.000	54.000	PEAK
3	* 10008.500	10.452	39.560	50.013	-23.987	74.000	54.000	PEAK
4	12452.300	10.265	38.040	48.304	-25.696	74.000	54.000	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 : 2011/08/15 - 15:15
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2441MHz

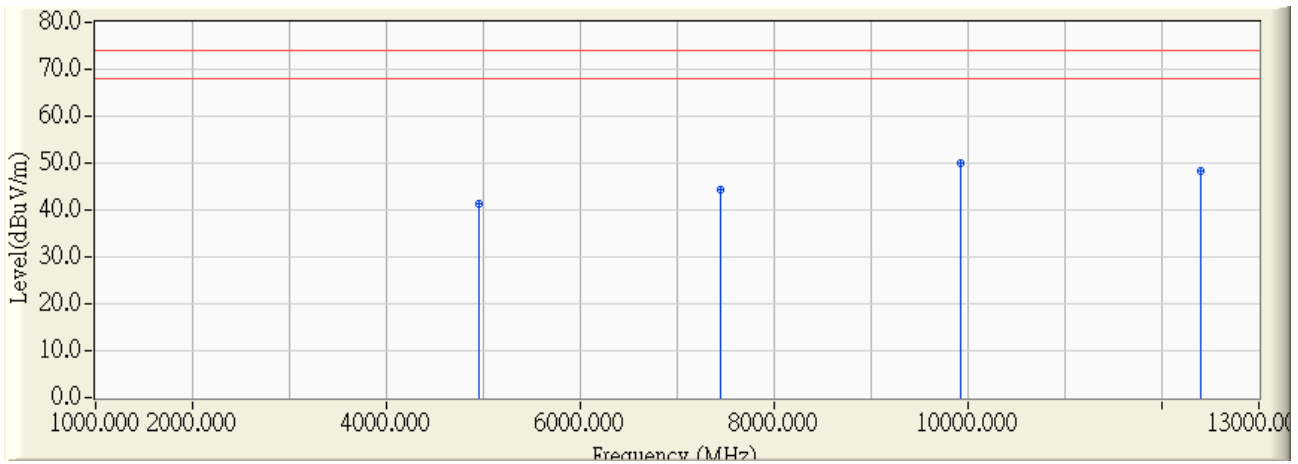


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	4882.000	-1.377	48.270	46.893	-27.107	74.000	54.000	PEAK
2	7323.000	4.917	38.240	43.157	-30.843	74.000	54.000	PEAK
3	* 9764.300	8.955	40.280	49.235	-24.765	74.000	54.000	PEAK
4	12204.700	10.240	37.980	48.220	-25.780	74.000	54.000	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 : 2011/08/15 - 15:32
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2480MHz

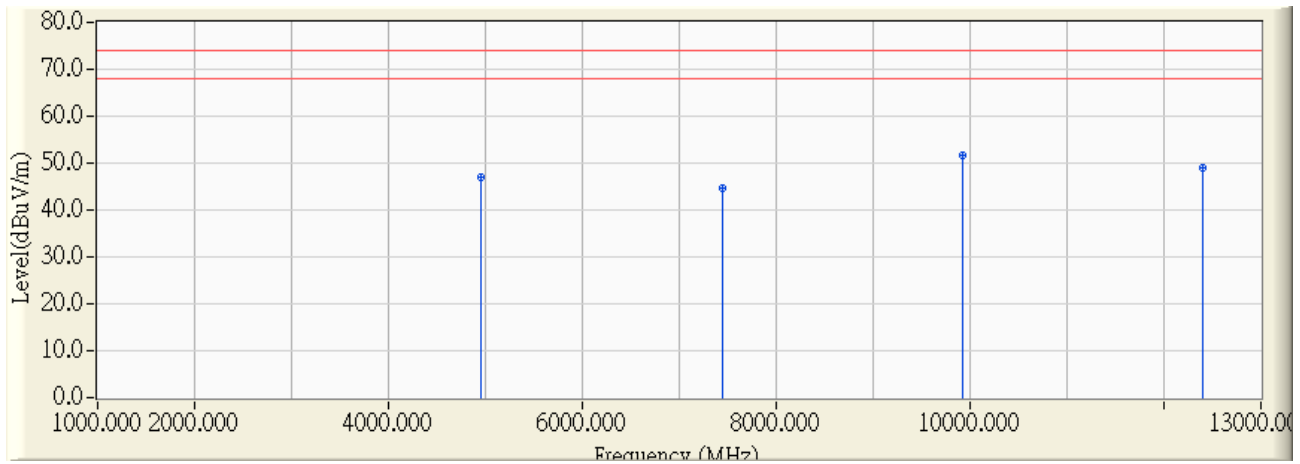


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	4960.100	-1.209	42.450	41.241	-32.759	74.000	54.000	PEAK
2	7440.600	5.133	39.230	44.363	-29.637	74.000	54.000	PEAK
3	* 9920.100	9.960	40.150	50.110	-23.890	74.000	54.000	PEAK
4	12402.400	10.260	38.110	48.369	-25.631	74.000	54.000	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 : 2011/08/15 - 15:28
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2480MHz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	4960.000	-1.209	48.180	46.971	-27.029	74.000	54.000	PEAK
2	7439.800	5.132	39.470	44.601	-29.399	74.000	54.000	PEAK
3	* 9920.100	9.960	41.620	51.580	-22.420	74.000	54.000	PEAK
4	12395.900	10.259	38.740	48.999	-25.001	74.000	54.000	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.

4. RF antenna conducted test

4.1. Test Equipment

The following test equipment is used during the test:

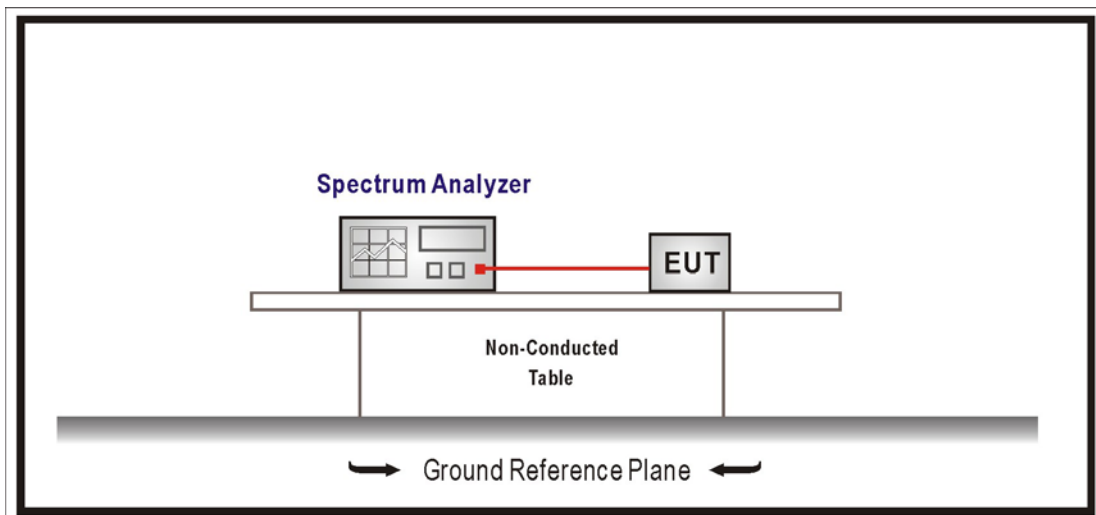
RF antenna conducted test / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2012/01/16

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

4.2. Test Setup

RF Conducted Measurement:



4.3. 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)).

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

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

4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

4.6. Test Result

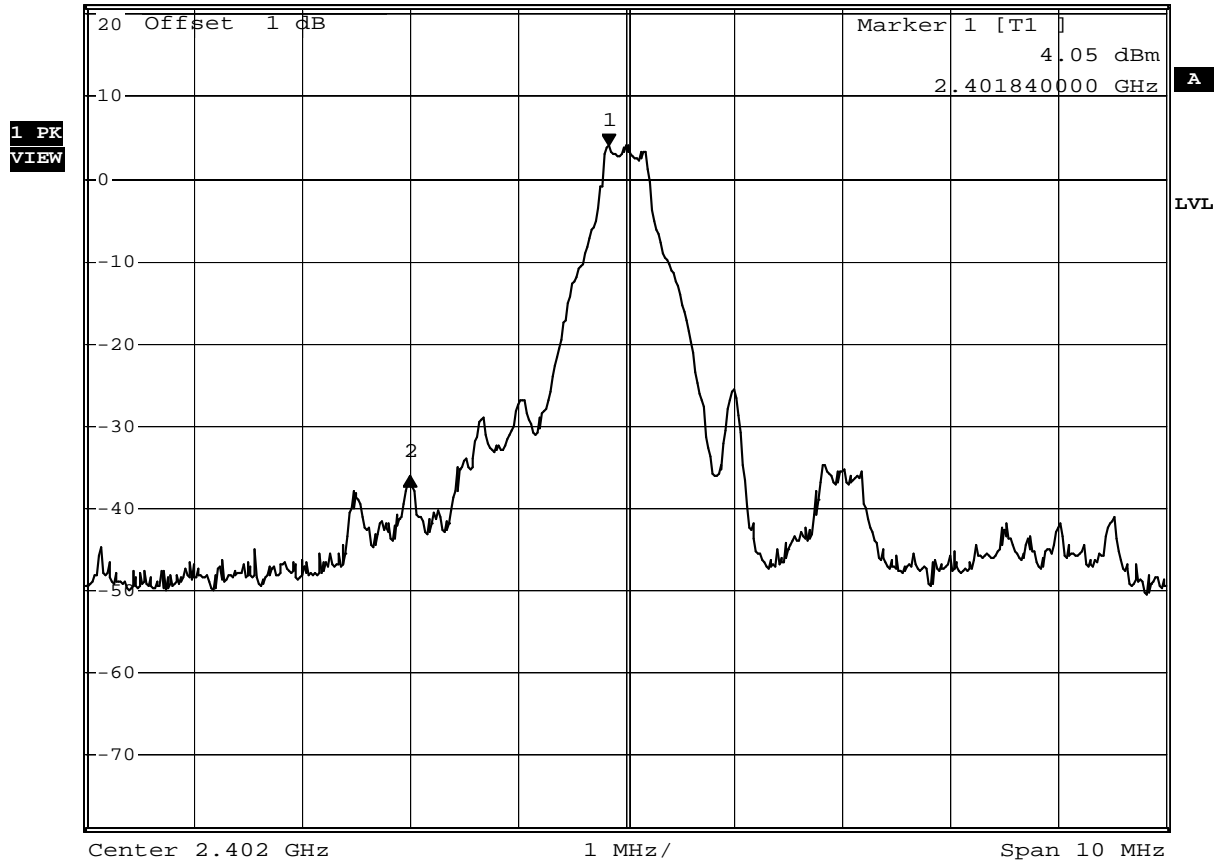
Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2011/08/13	Test Site	SR7

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dBC)	Result
00	2402	40.06	≥ 20	Pass
78	2480	49.40	≥ 20	Pass

Channel 00



*RBW 100 kHz Delta 2 [T1]
 *VBW 100 kHz -40.06 dB
 Ref 21 dBm *Att 30 dB *SWT 100 ms -1.840000000 MHz



Date: 13.AUG.2011 11:50:59

Channel 78

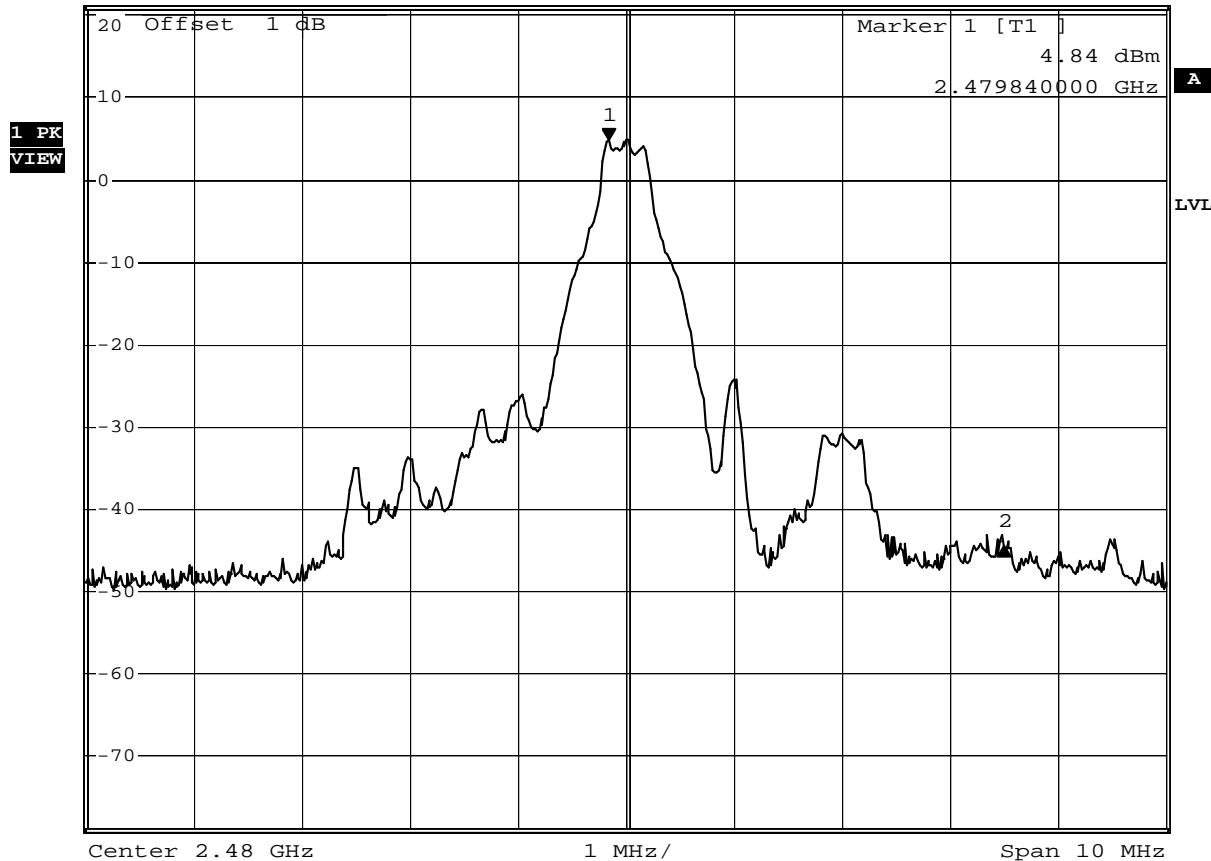


*RBW 100 kHz Delta 2 [T1]
*VBW 100 kHz -49.40 dB
*SWT 100 ms 3.66000000 MHz

Ref 21 dBm

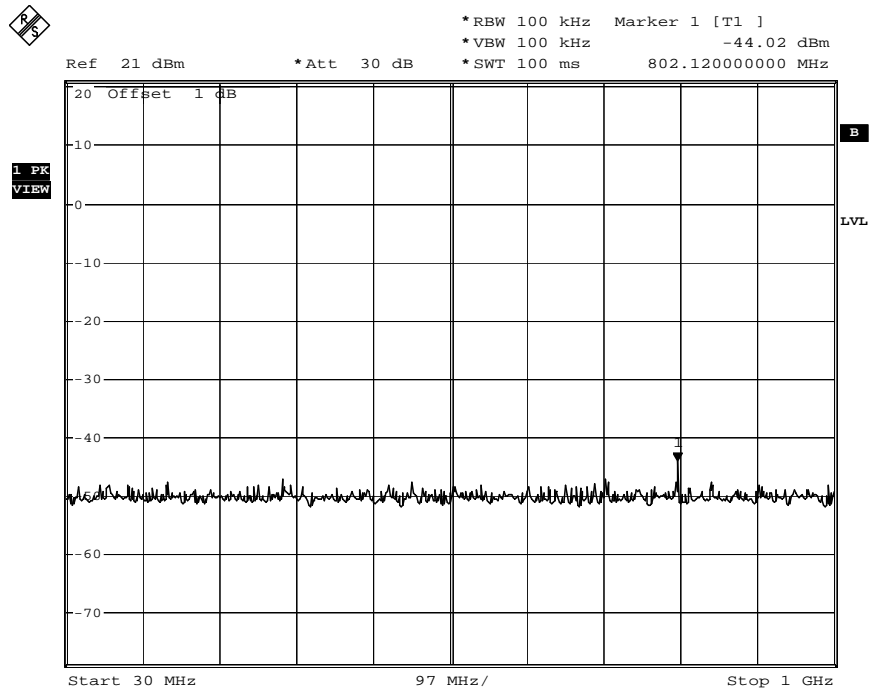
*Att 30 dB

3.66000000 MHz



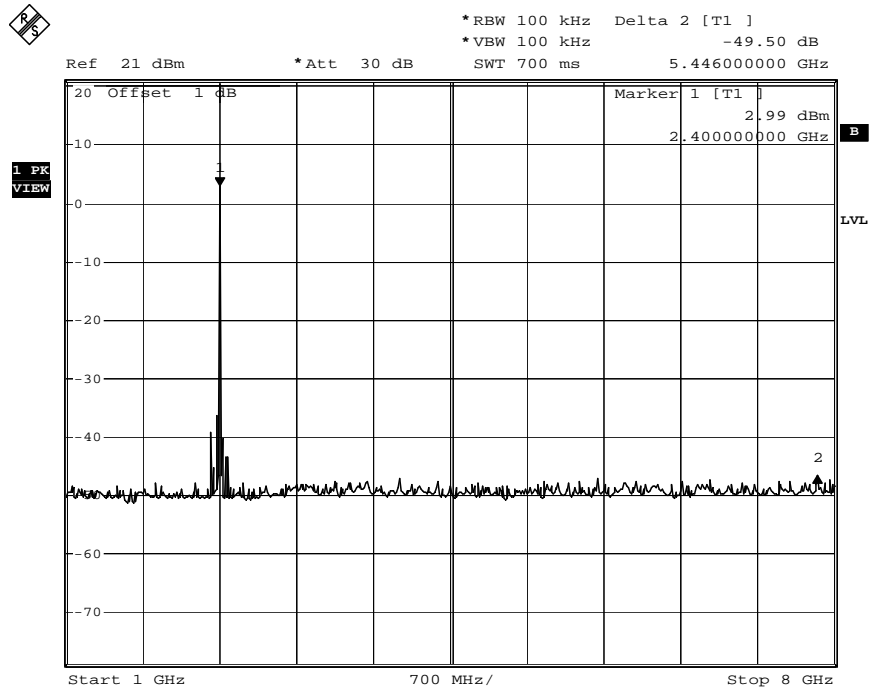
Date: 13.AUG.2011 11:50:26

Channel 00 (30MHz-1GHz)



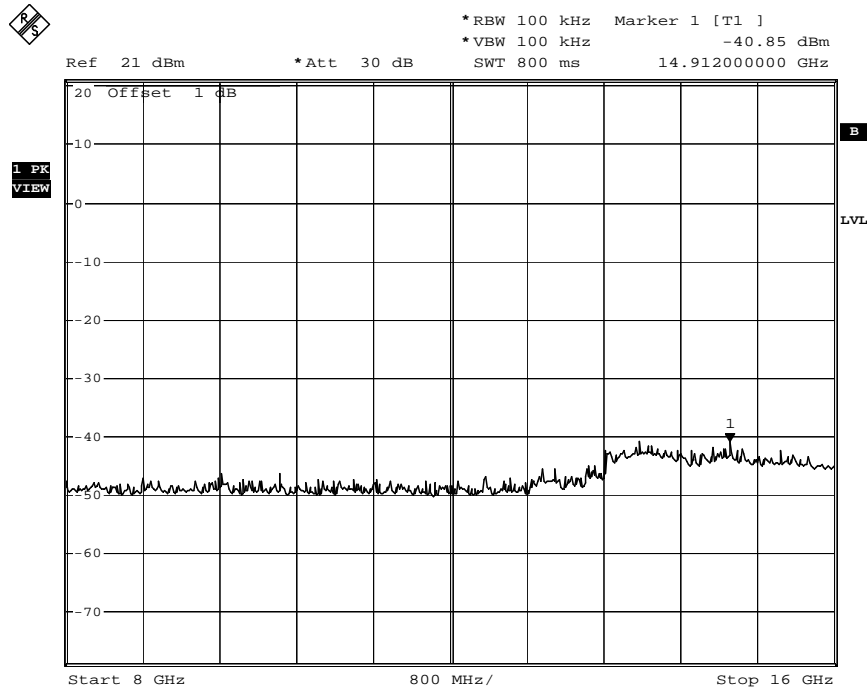
Date: 13.AUG.2011 11:14:55

Channel 00 (1GHz-8GHz)



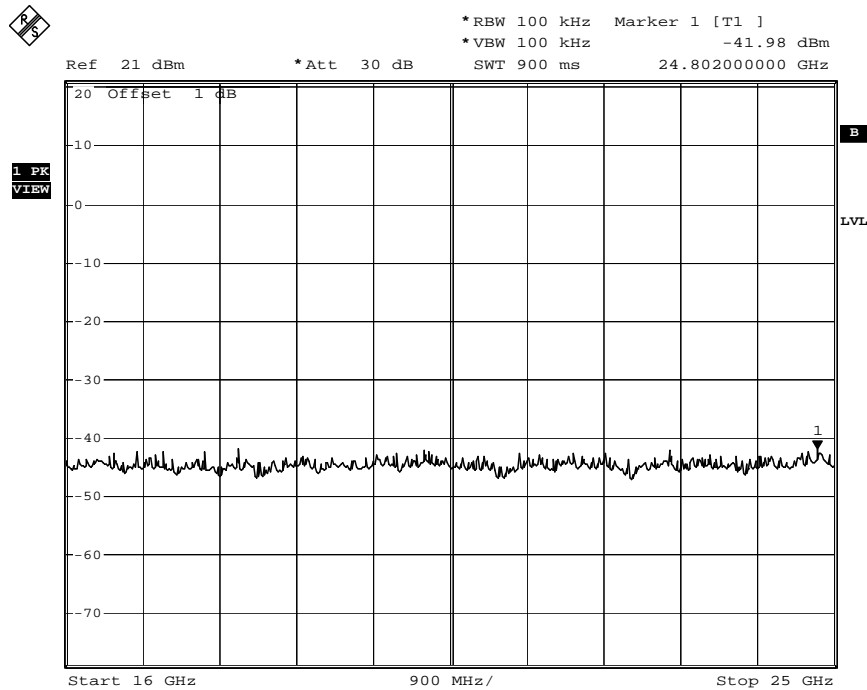
Date: 13.AUG.2011 11:17:09

Channel 00 (8GHz-16GHz)



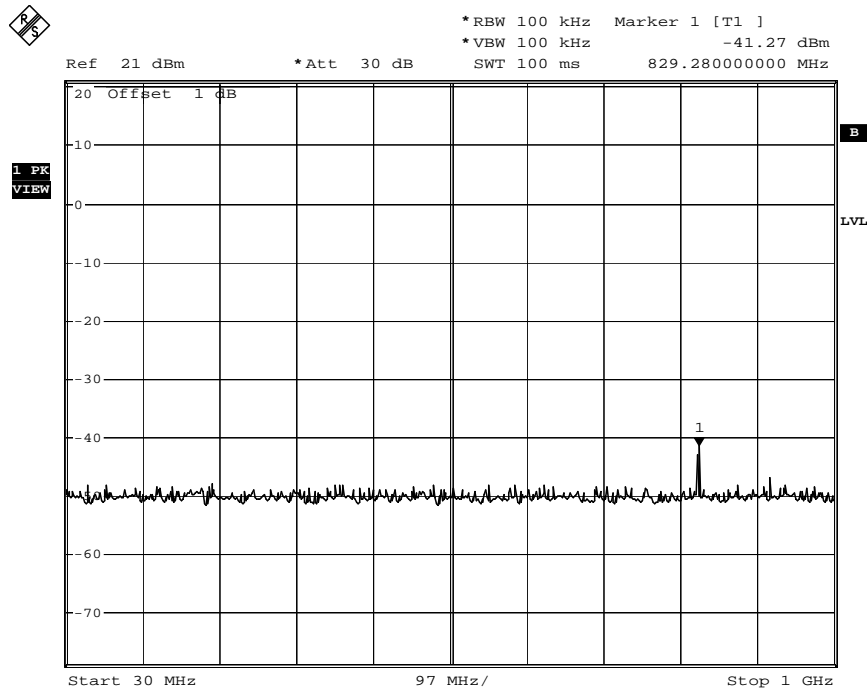
Date: 13.AUG.2011 11:17:36

Channel 00 (16GHz-25GHz)



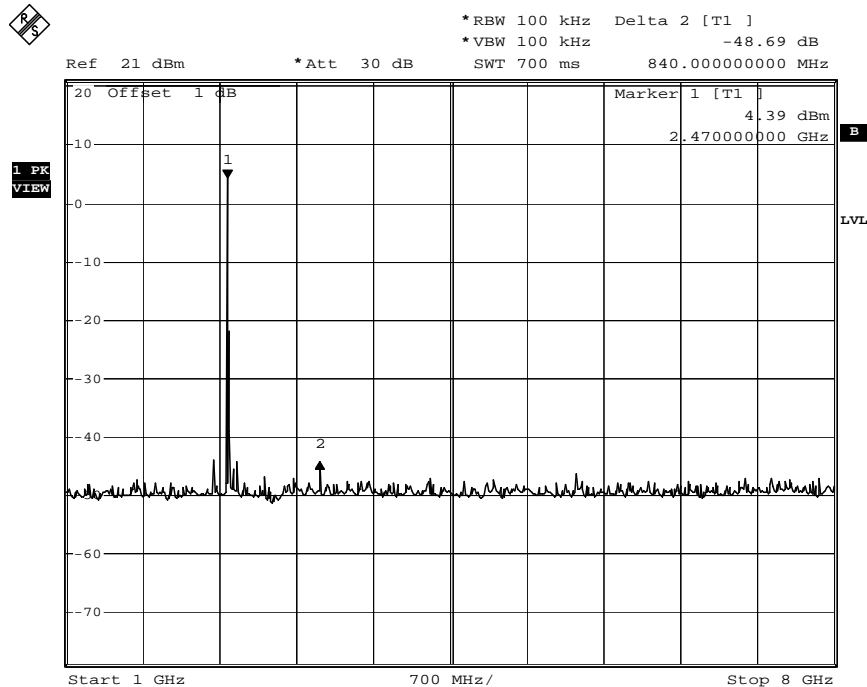
Date: 13.AUG.2011 11:17:59

Channel 78 (30MHz-1GHz)



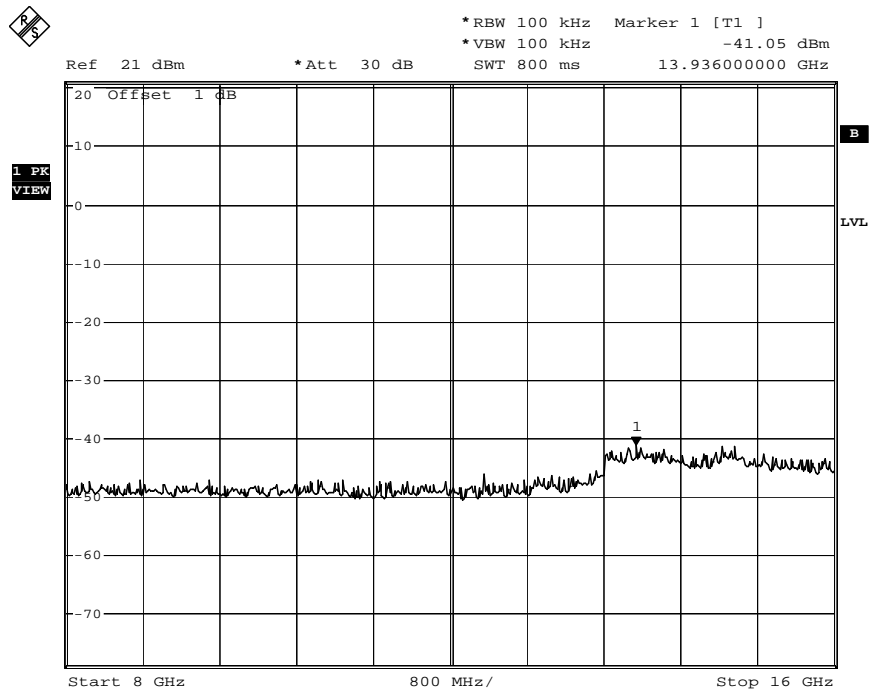
Date: 13.AUG.2011 11:19:06

Channel 78 (1GHz-8GHz)



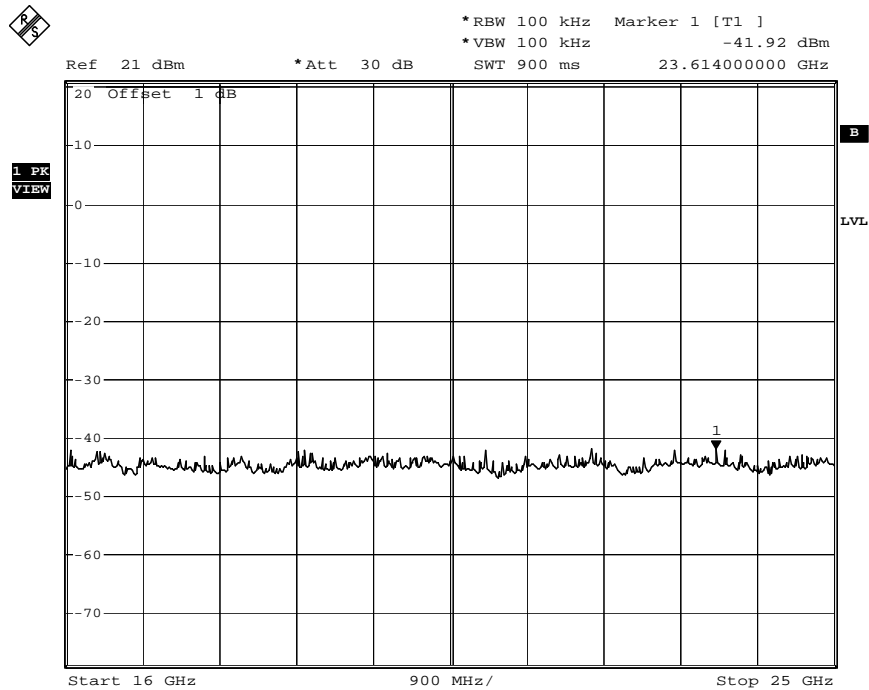
Date: 13.AUG.2011 11:19:46

Channel 78 (8GHz-16GHz)



Date: 13.AUG.2011 11:20:16

Channel 78 (16GHz-25GHz)



Date: 13.AUG.2011 11:20:54

5. Band Edge

5.1. Test Equipment

The following test equipments are used during the test:

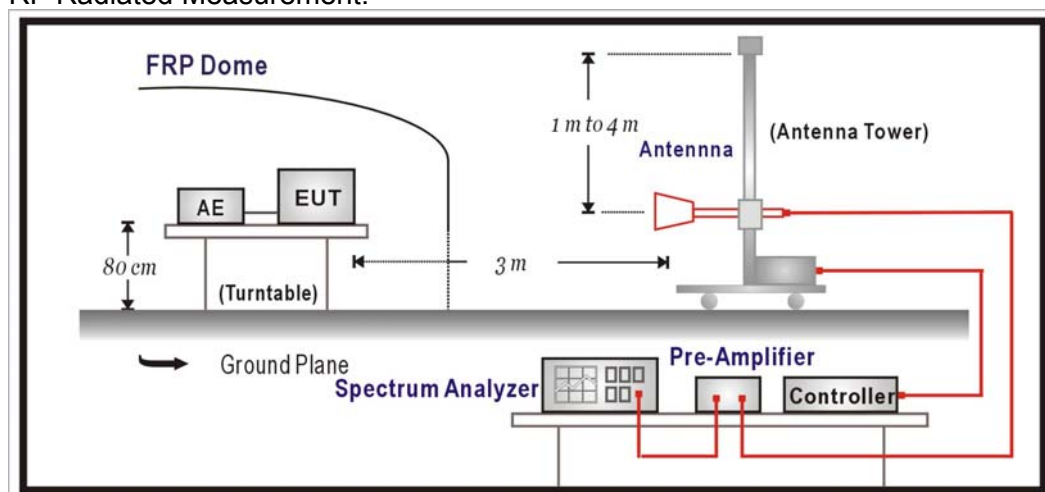
Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120D	743	2012/02/24
PSA Series Spectrum analyzer	Agilent	E4440A	MY46187335	2012/01/06
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2012/03/21

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

5.2. Test Setup

RF Radiated Measurement:



5.3. 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.

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

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.

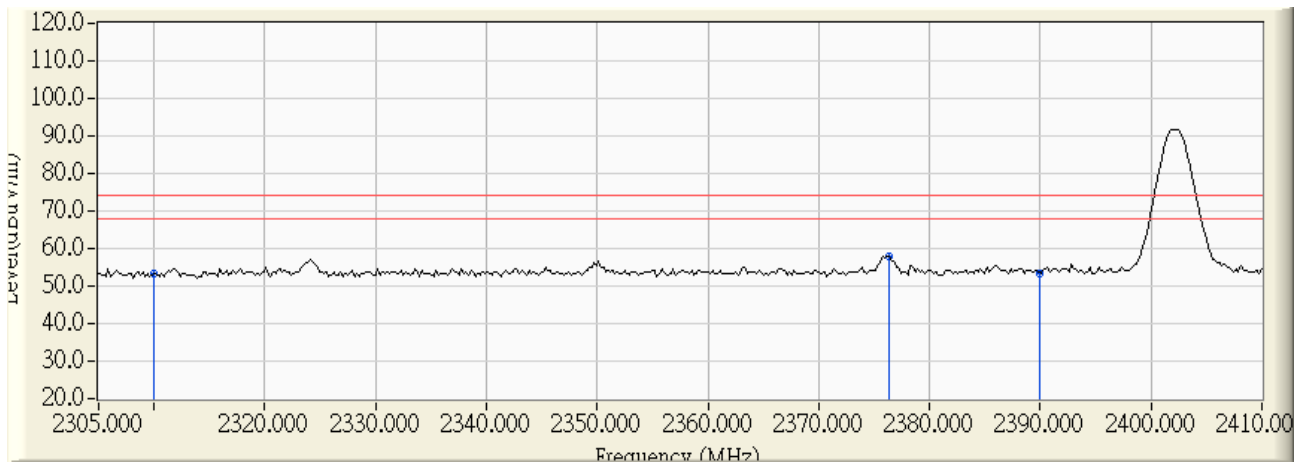
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2009 on radiated measurement.

5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

5.6. Test Result

Site : CB1	Time : 2011/08/15 - 16:40
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2402MHz

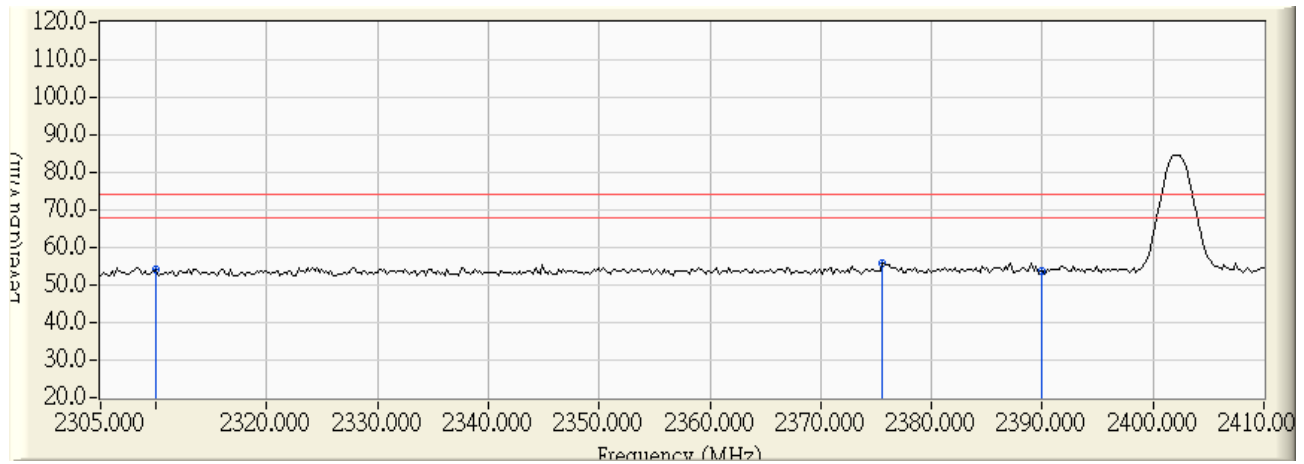


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.125	24.115	53.240	-20.760	74.000	PEAK
2	* 2376.400	29.802	28.312	58.113	-15.887	74.000	PEAK
3	2390.000	29.940	23.509	53.449	-20.551	74.000	PEAK

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 : 2011/08/15 - 16:36
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2402MHz

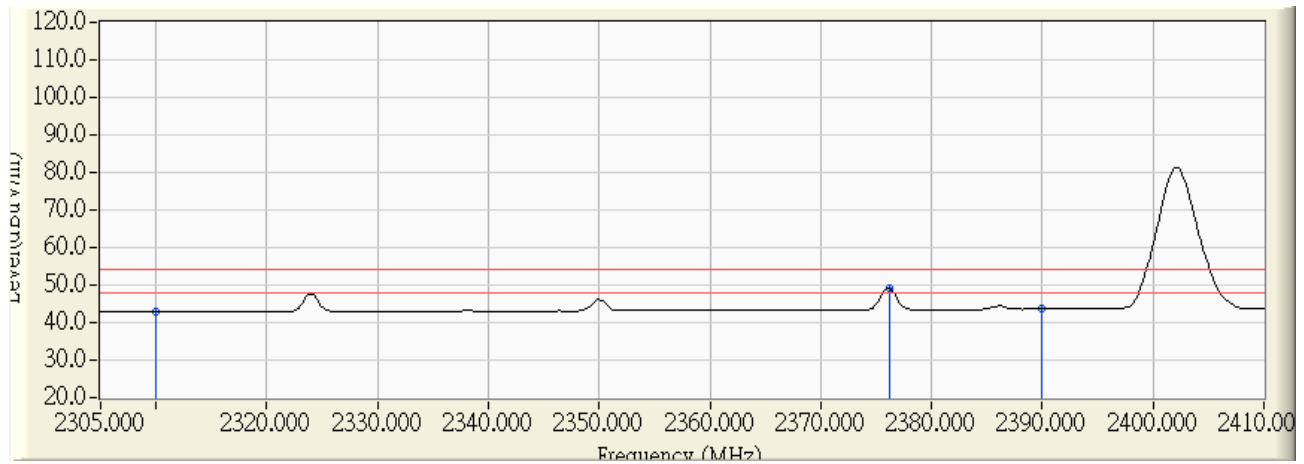


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.125	25.003	54.128	-19.872	74.000	PEAK
2	* 2375.560	29.793	25.874	55.667	-18.333	74.000	PEAK
3	2390.000	29.940	23.648	53.588	-20.412	74.000	PEAK

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 : 2011/08/15 - 16:41
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2402MHz

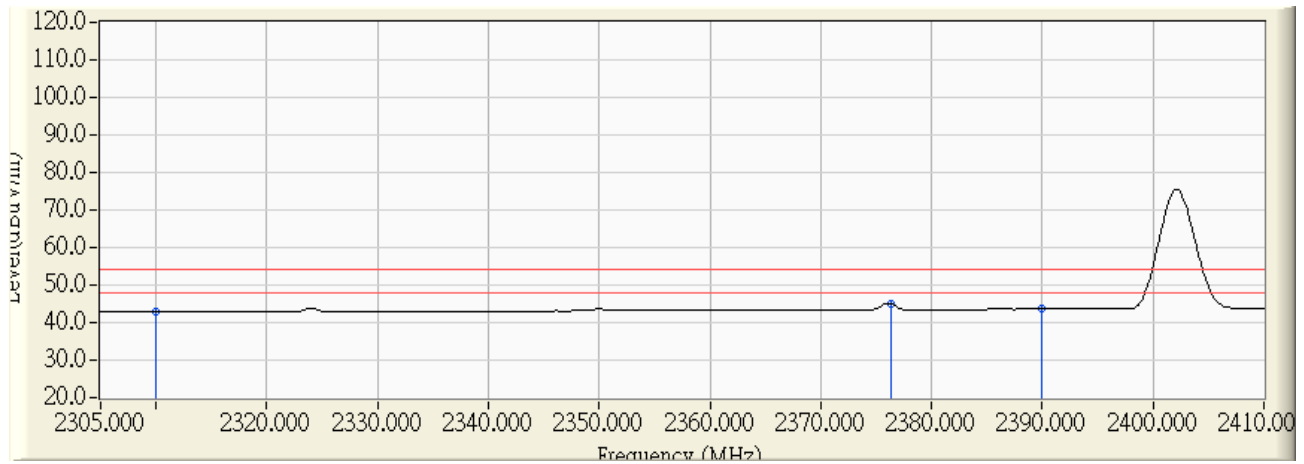


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.125	13.677	42.802	-11.198	54.000	AVERAGE
2	* 2376.190	29.799	19.415	49.214	-4.786	54.000	AVERAGE
3	2390.000	29.940	13.639	43.579	-10.421	54.000	AVERAGE

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 : 2011/08/15 - 16:37
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2402MHz

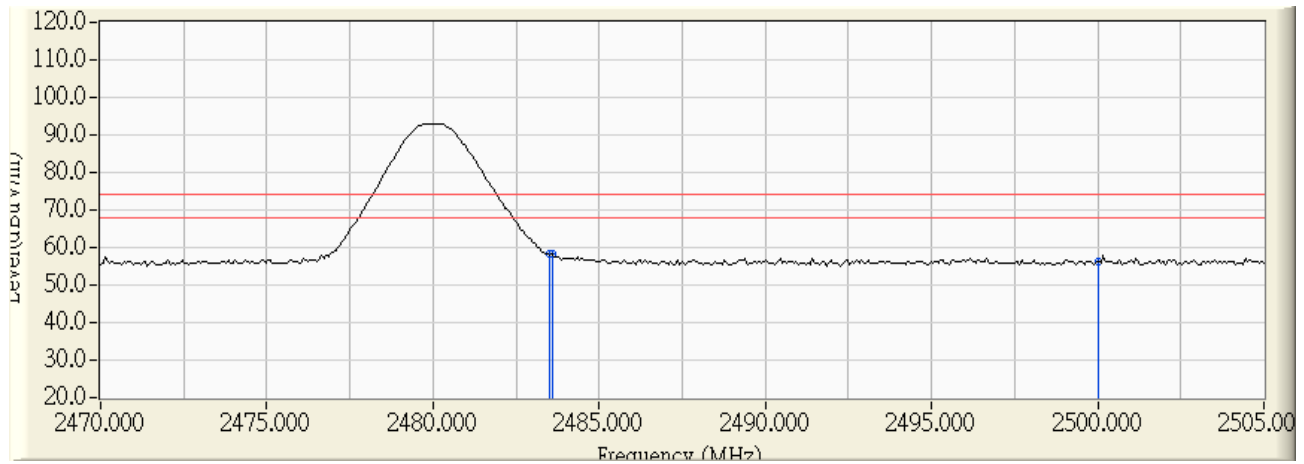


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.125	13.689	42.814	-11.186	54.000	AVERAGE
2	* 2376.400	29.802	15.003	44.804	-9.196	54.000	AVERAGE
3	2390.000	29.940	13.622	43.562	-10.438	54.000	AVERAGE

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 : 2011/08/15 - 16:49
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2480MHz

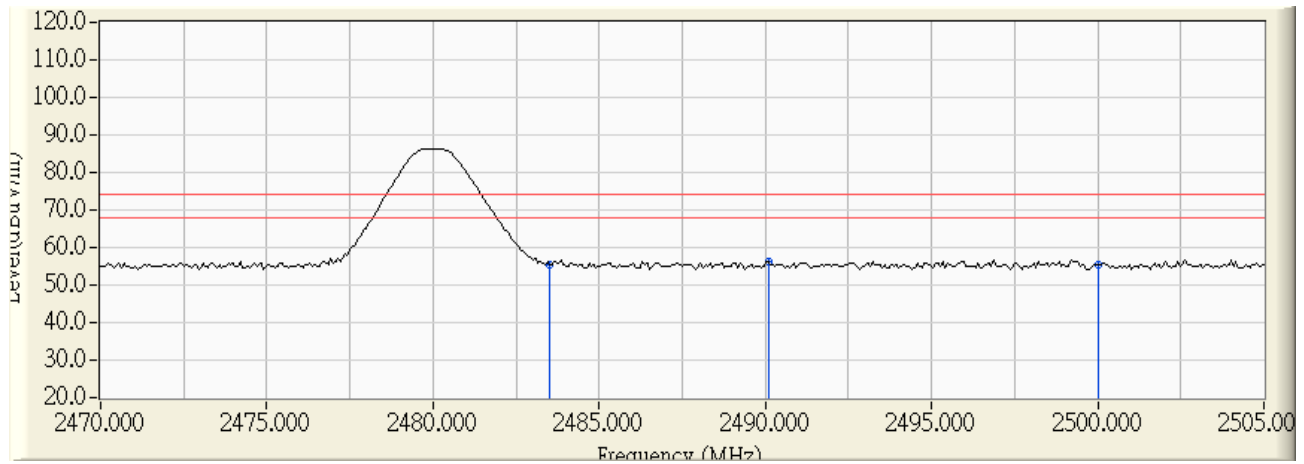


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2483.500	30.892	27.237	58.129	-15.871	74.000	PEAK
2	* 2483.580	30.893	27.259	58.152	-15.848	74.000	PEAK
3	2500.000	31.020	25.262	56.282	-17.718	74.000	PEAK

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 : 2011/08/15 - 16:45
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2480MHz

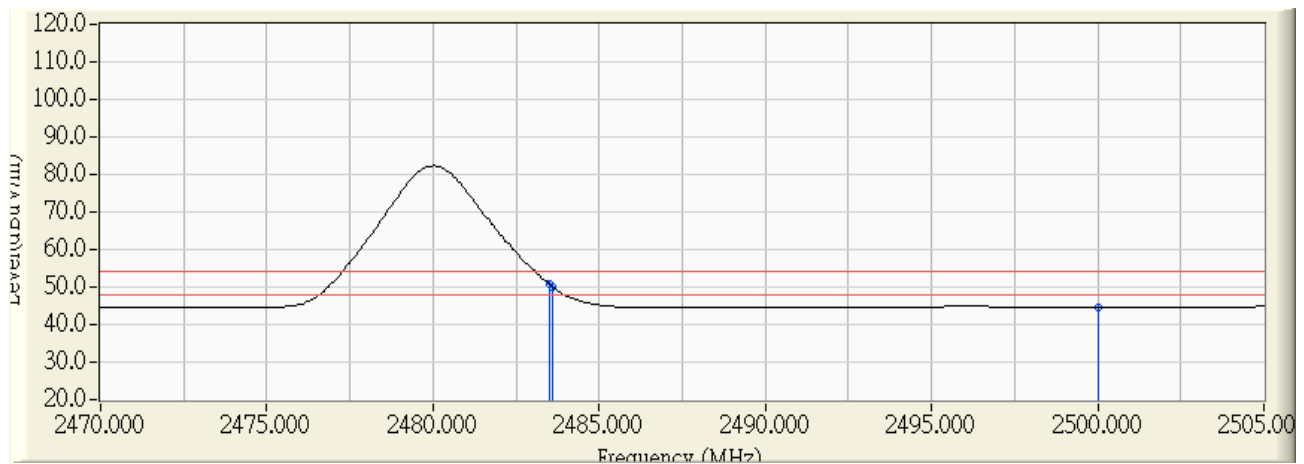


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2483.500	30.892	24.582	55.474	-18.526	74.000	PEAK
2	* 2490.090	30.959	25.476	56.435	-17.565	74.000	PEAK
3	2500.000	31.020	24.445	55.465	-18.535	74.000	PEAK

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 : 2011/08/15 - 16:49
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - HORIZONTAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2480MHz

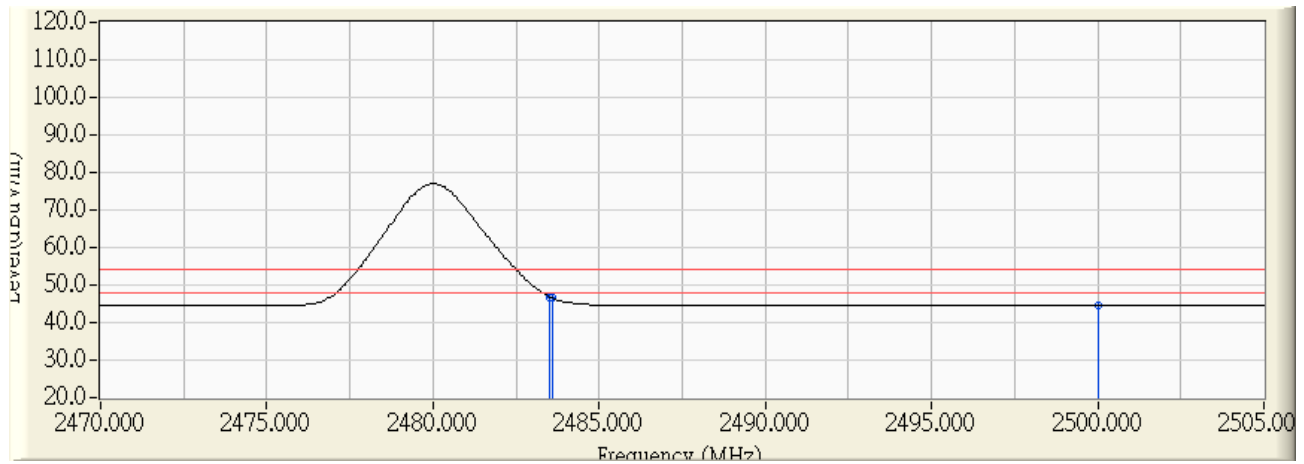


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	30.892	19.849	50.741	-3.259	54.000	AVERAGE
2		2483.580	30.893	19.175	50.068	-3.932	54.000	AVERAGE
3		2500.000	31.020	13.589	44.609	-9.391	54.000	AVERAGE

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 : 2011/08/15 - 16:45
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2011-05) - VERTICAL	Power : DC 3.7V (Power by Battery)
EUT : Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing	Note : TX-2480MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	30.892	15.904	46.796	-7.204	54.000	AVERAGE
2		2483.580	30.893	15.614	46.507	-7.493	54.000	AVERAGE
3		2500.000	31.020	13.594	44.614	-9.386	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.

6. Number of hopping frequency

6.1. Test Equipment

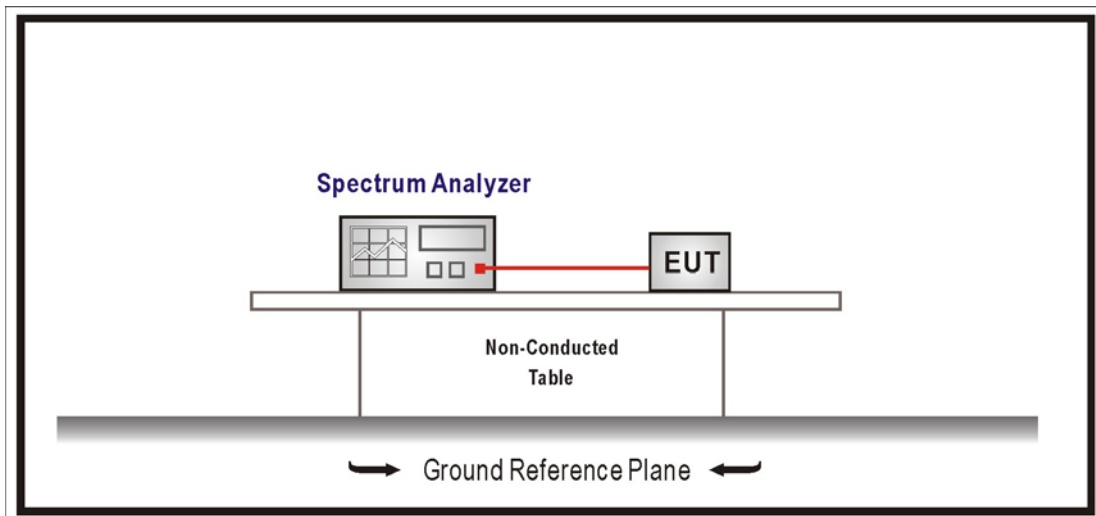
The following test equipment is used during the test:

Number of hopping frequency / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2012/01/16

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

6.2. Test Setup



6.3. 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.

6.4. 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

6.5. Test Specification

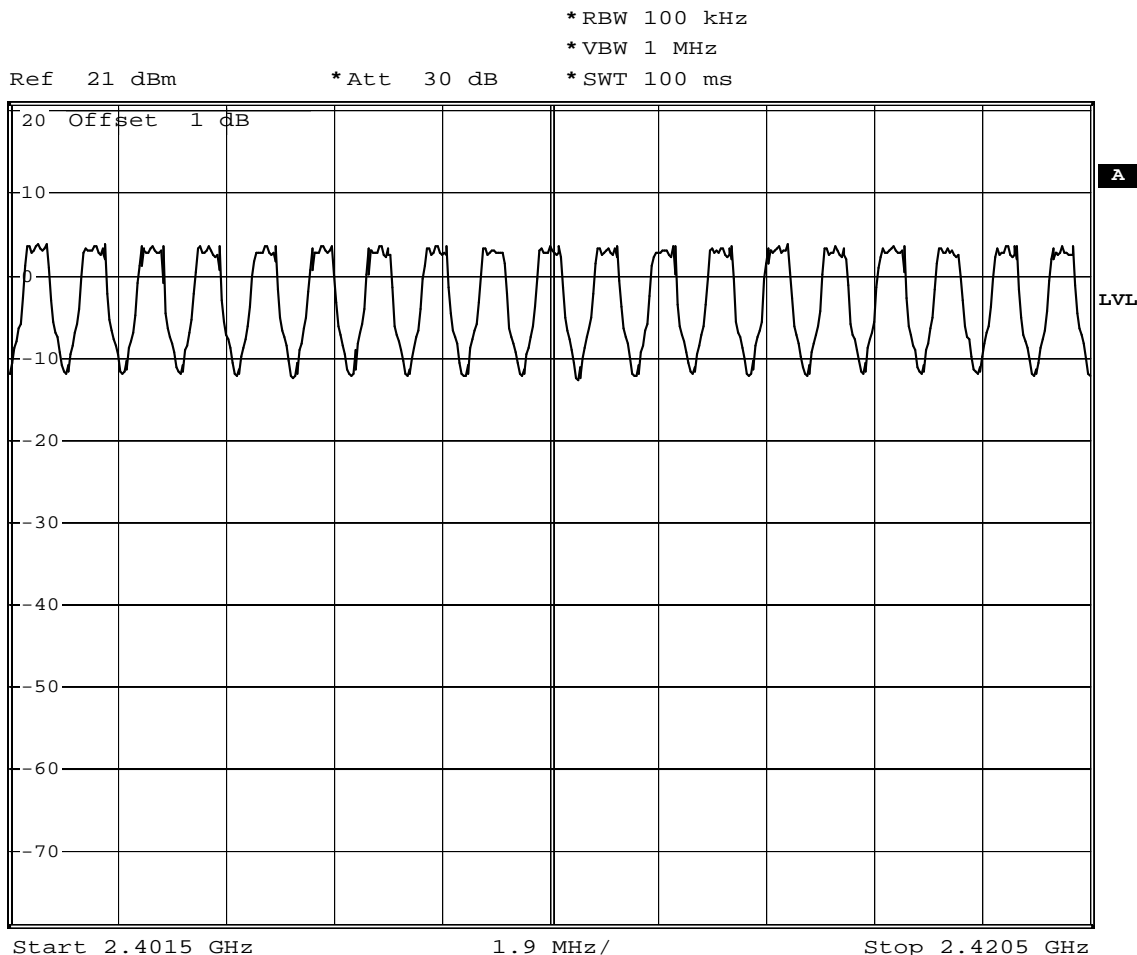
According to FCC Part 15 Subpart C Paragraph 15.247: 2010

6.6. Test Result

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Number of hopping frequency		
Test Mode	Mode 1: Transmit		
Date of Test	2011/08/12	Test Site	SR7

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

2401.5-2420.5MHz



Date: 12.AUG.2011 18:01:20

2420.5-2440.5MHz

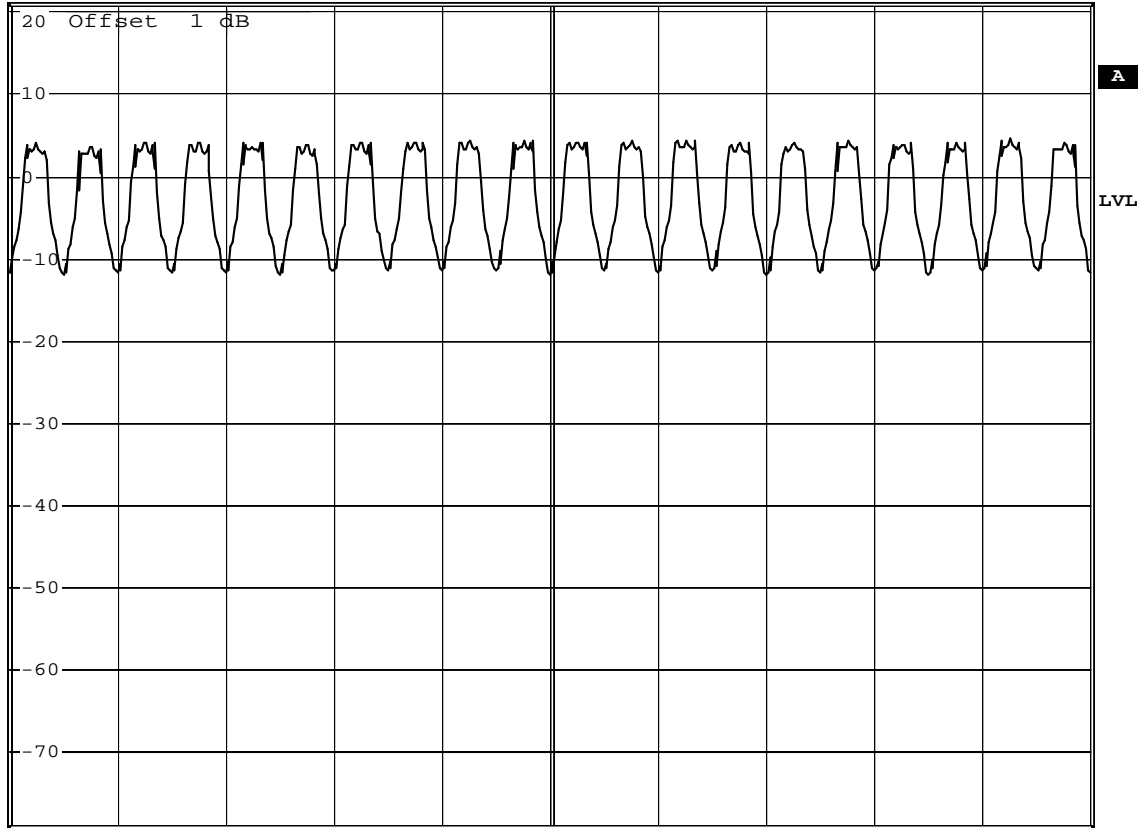


*RBW 100 kHz
*VBW 1 MHz
*SWT 100 ms

Ref 21 dBm

*Att 30 dB

1 PK
VIEW



Date: 12.AUG.2011 18:04:11

2440.5-2460.5MHz

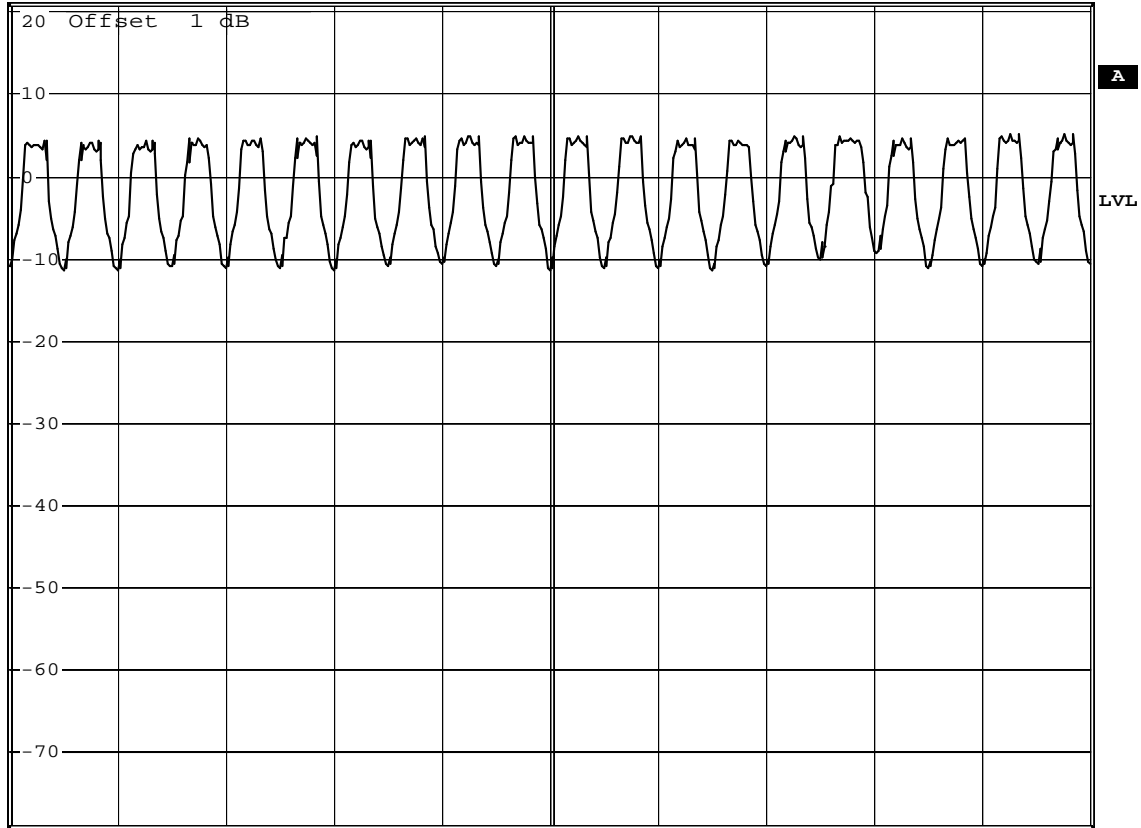


*RBW 100 kHz
*VBW 1 MHz
*SWT 100 ms

Ref 21 dBm

*Att 30 dB

1 PK
VIEW



Start 2.4405 GHz

2 MHz/

Stop 2.4605 GHz

Date: 12.AUG.2011 18:06:20

2460.5-2480.5MHz

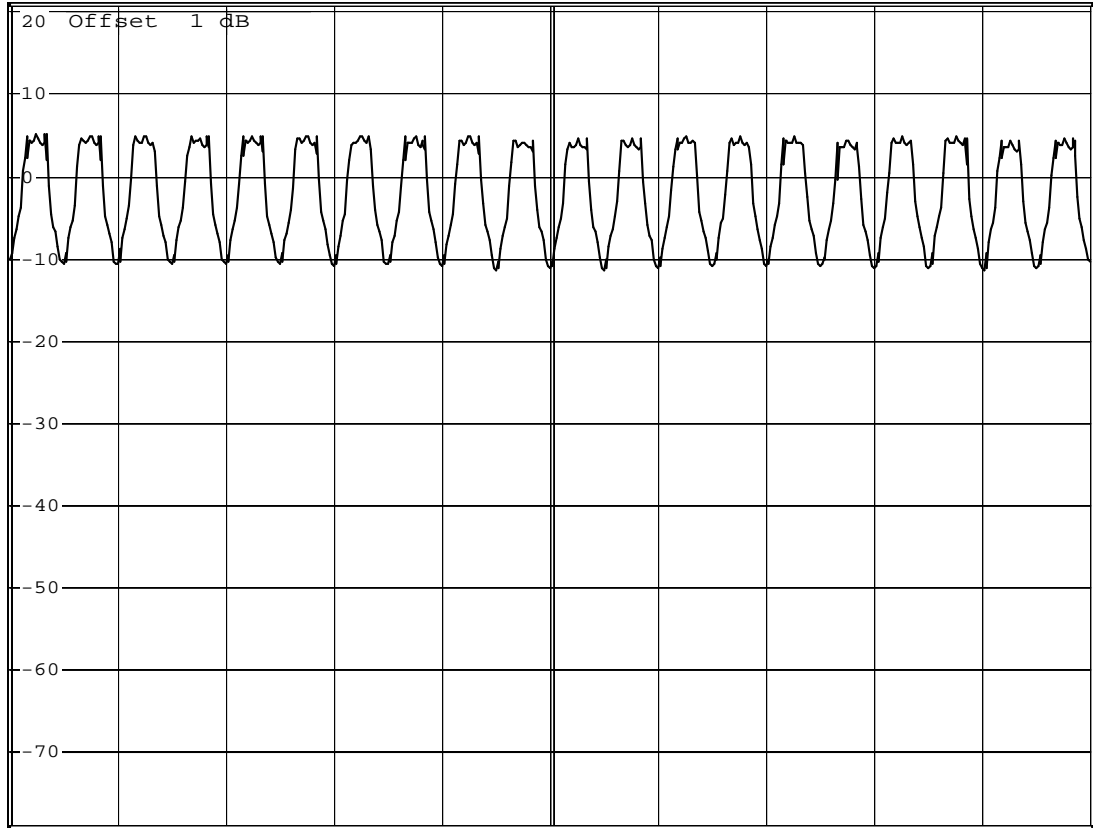


*RBW 100 kHz
*VBW 1 MHz
*SWT 100 ms

Ref 21 dBm

*Att 30 dB

1 PK
VIEW



Date: 12.AUG.2011 18:08:27

7. Carrier Frequency Separation

7.1. Test Equipment

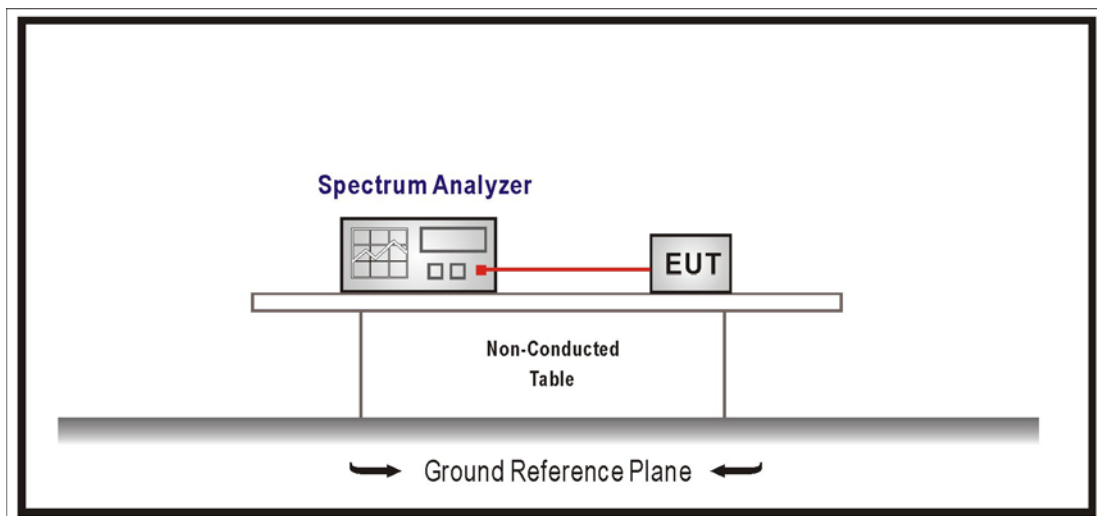
The following test equipment is used during the test:

Carrier Frequency Separation / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2012/01/16

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 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.

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 = 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

7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

7.6. Test Result

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

GFSK

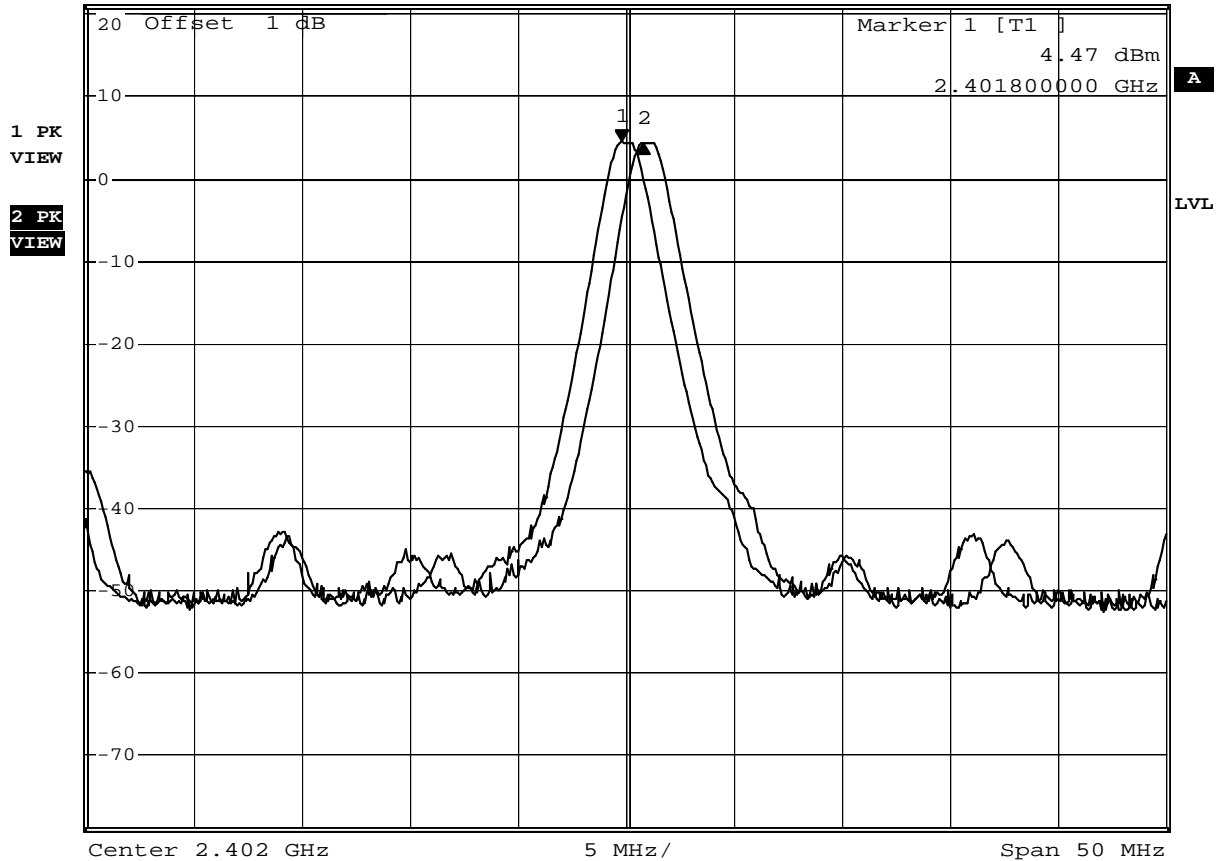
Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.00	>0.77	Pass

Channel 00



*RBW 1 MHz Delta 2 [T2]
 *VBW 1 MHz -0.02 dB
 *SWT 100 ms 1.000000000 MHz

Ref 21 dBm *Att 30 dB



Comment : A:\2

Date: 1.SEP.2011 12:01:18

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

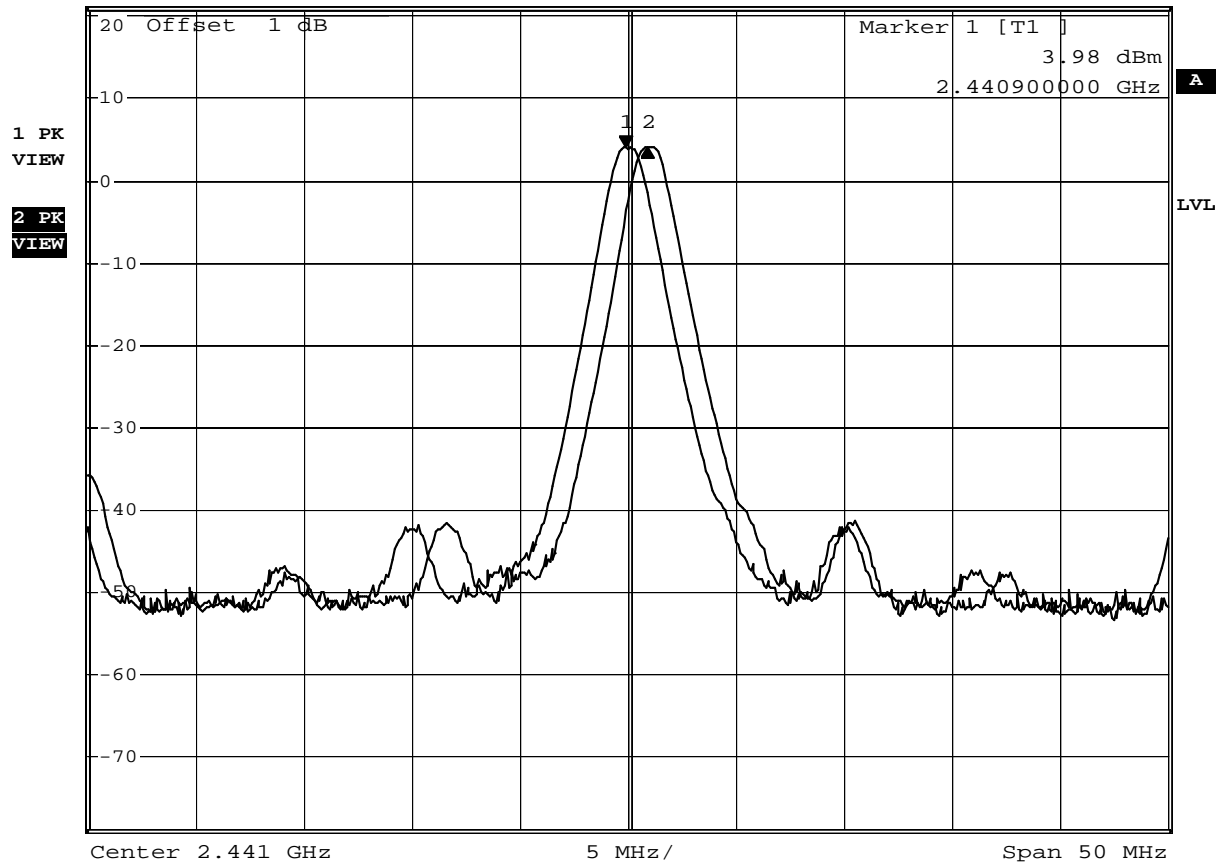
GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.00	>0.77	Pass

Channel 39



*RBW 1 MHz Delta 2 [T2]
 *VBW 1 MHz 0.02 dB
 *SWT 100 ms 1.000000000 MHz
 Ref 21 dBm *Att 30 dB



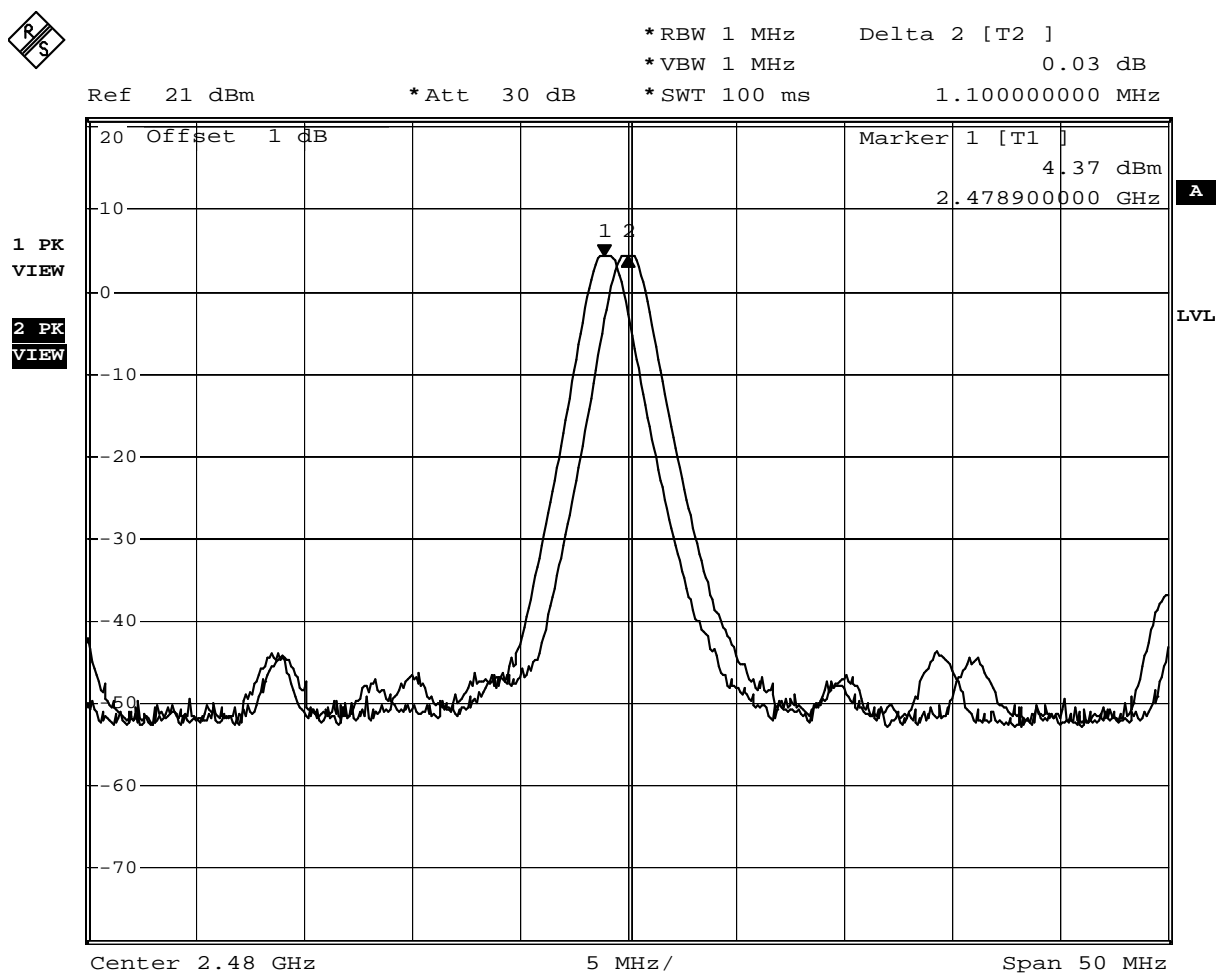
Comment: A:\2
 Date: 1.SEP.2011 13:13:18

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.10	>0.74	Pass

Channel 78



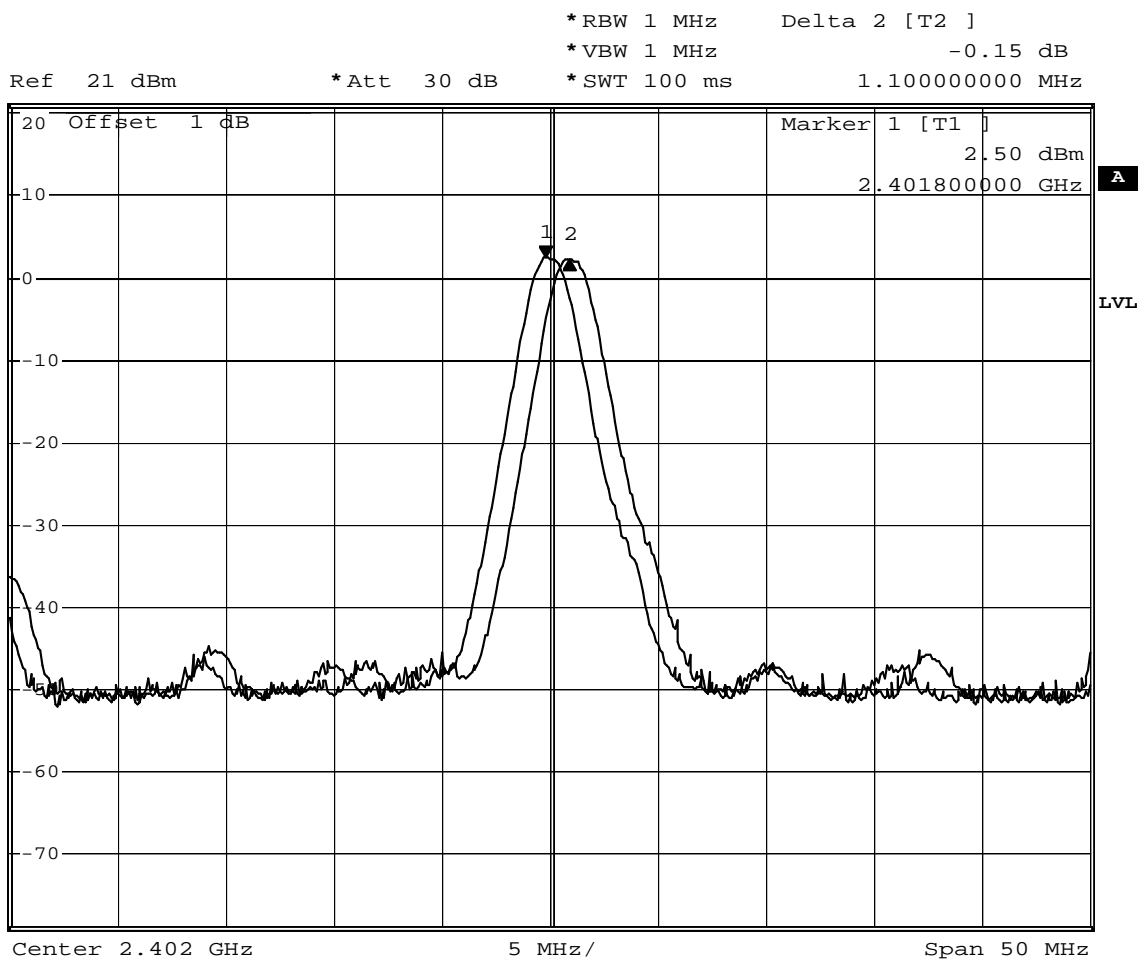
Comment: A:\2
 Date: 1.SEP.2011 13:16:31

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.10	>0.93	Pass

Channel 00



Comment: A:\2
 Date: 6.SEP.2011 16:16:01

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

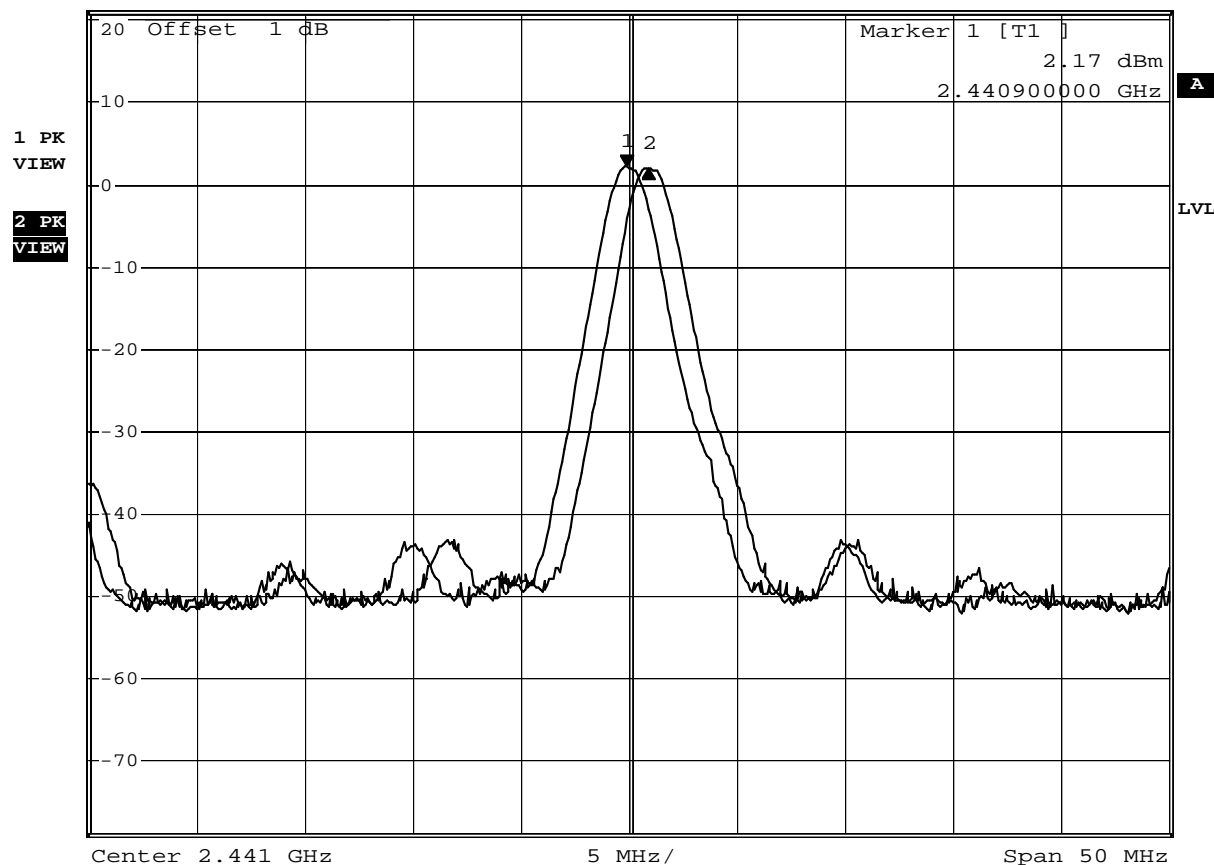
$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.00	>0.94	Pass

Channel 39



*RBW 1 MHz Delta 2 [T2]
 *VBW 1 MHz -0.10 dB
 *SWT 100 ms 1.000000000 MHz
 Ref 21 dBm *Att 30 dB



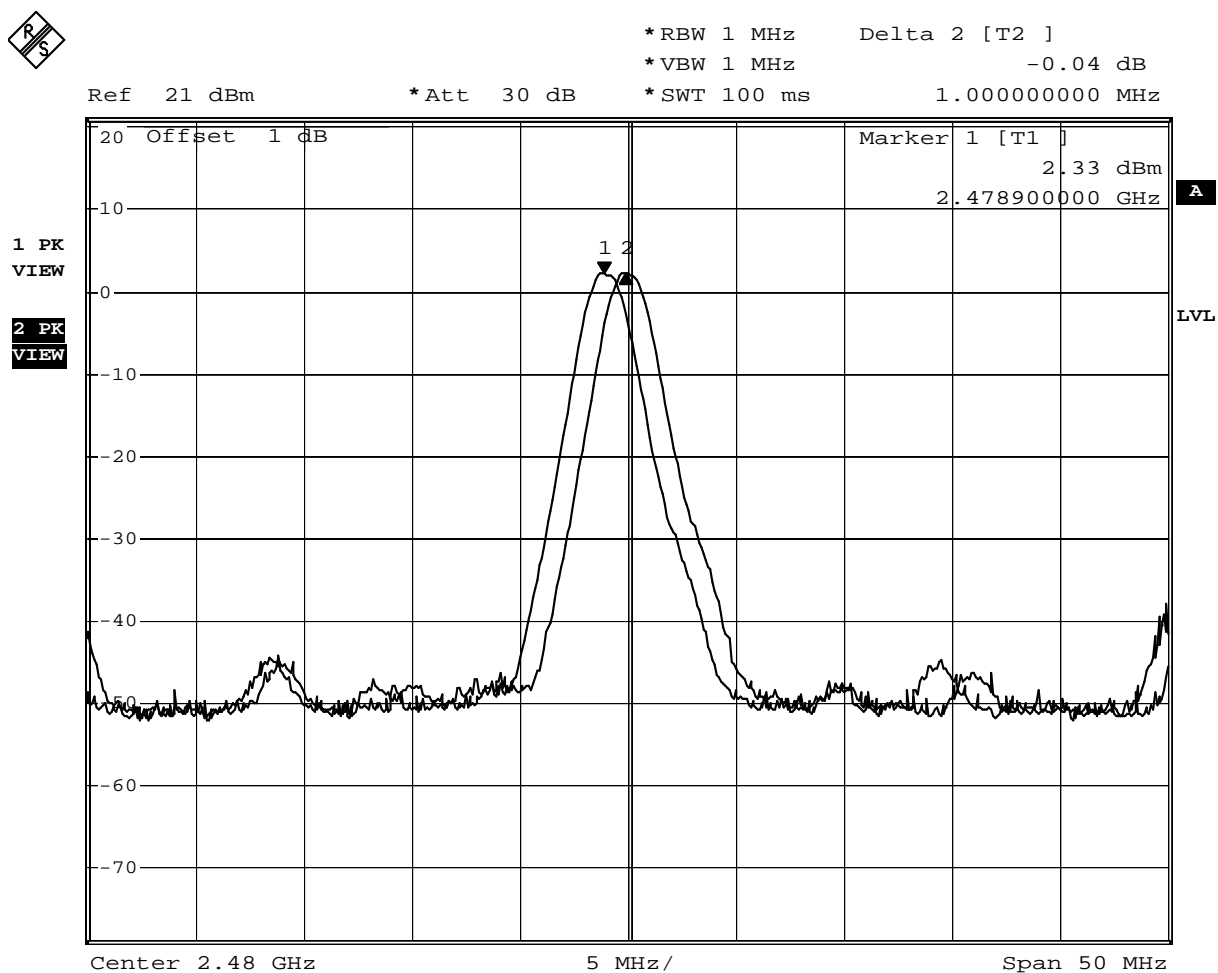
Comment: A:\2
 Date: 6.SEP.2011 16:17:40

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.00	>0.94	Pass

Channel 78



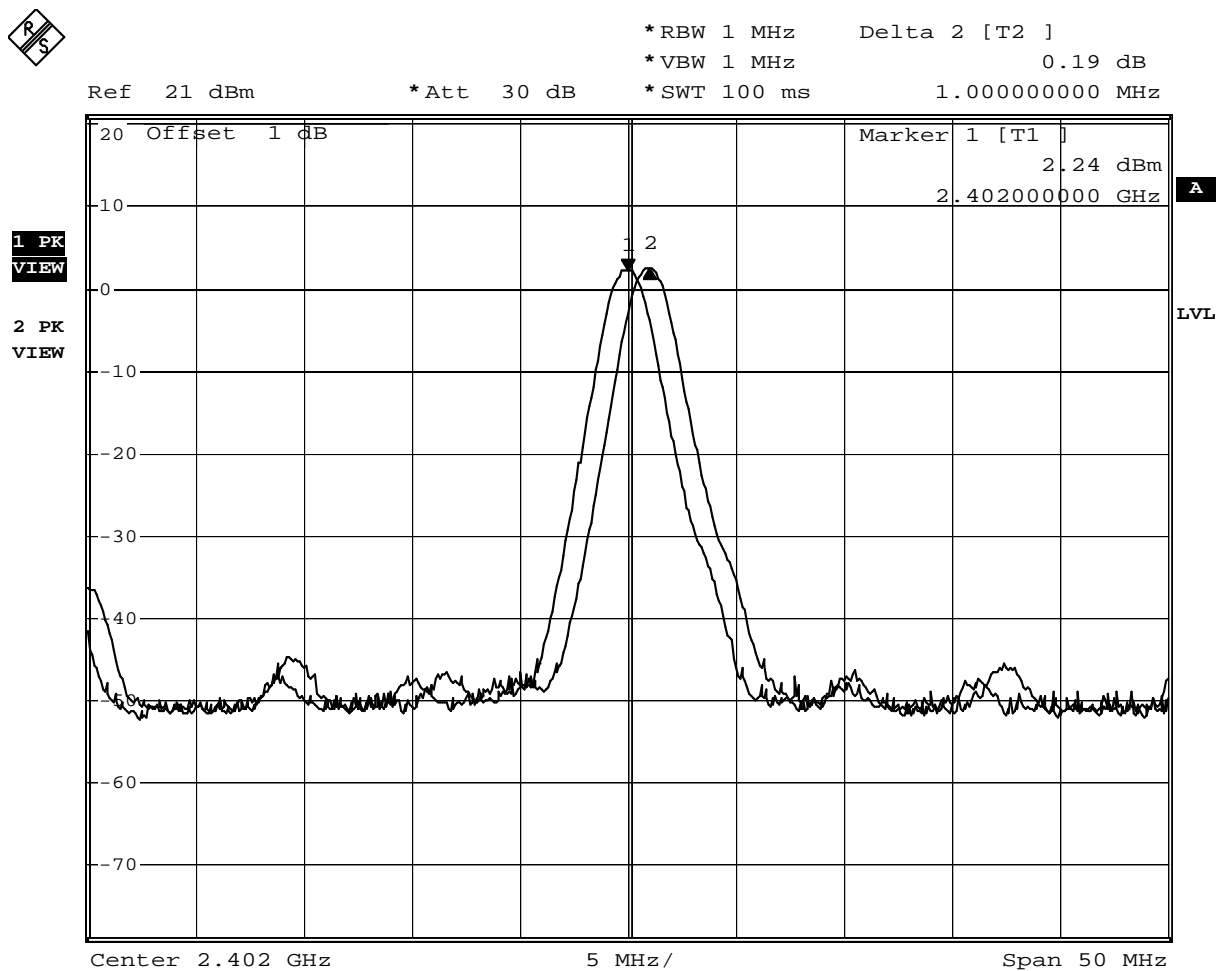
Comment: A:\2
 Date: 6.SEP.2011 16:18:29

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/05/02	Test Site	SR7

8PSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.00	>0.93	Pass

Channel 00



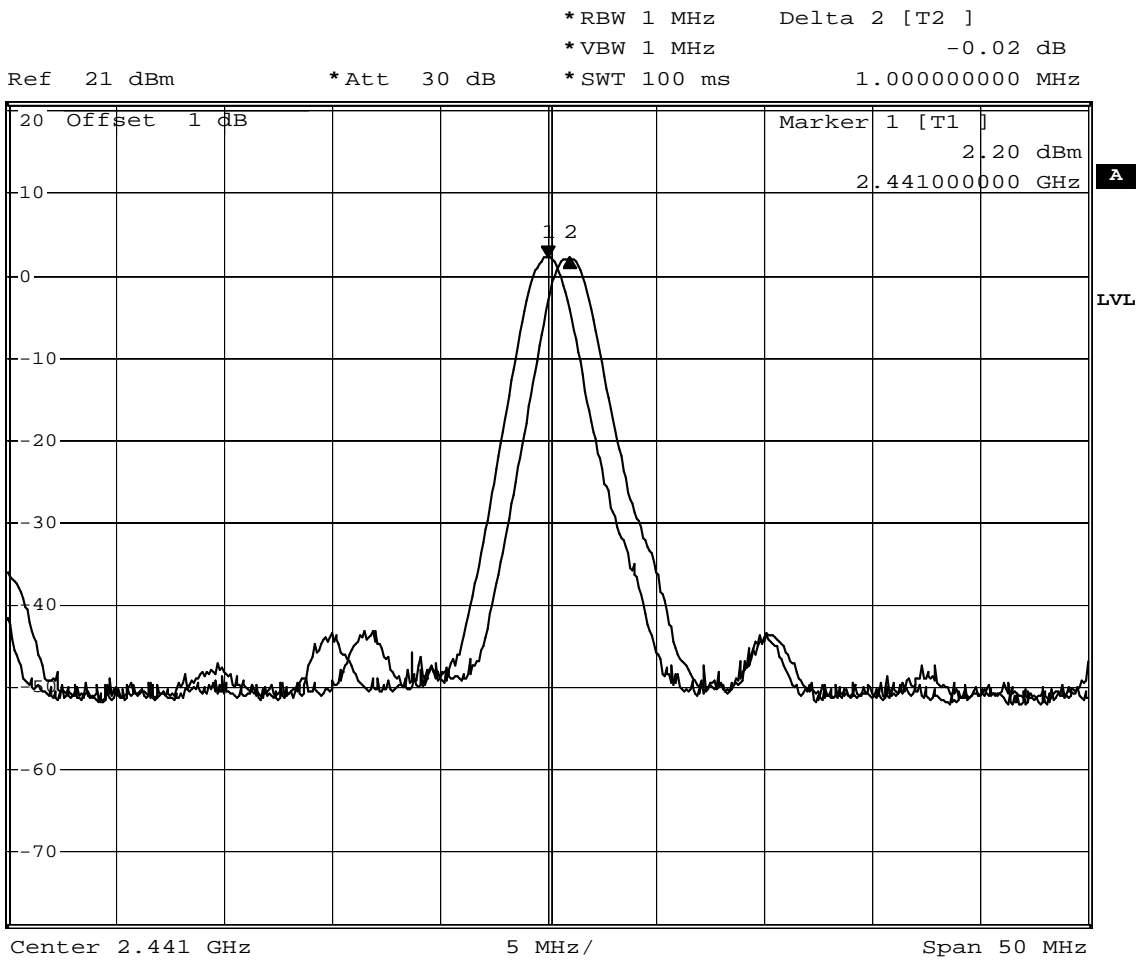
Comment: A:\2
 Date: 6.SEP.2011 16:22:00

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/05/02	Test Site	SR7

8PSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.00	>0.92	Pass

Channel 39



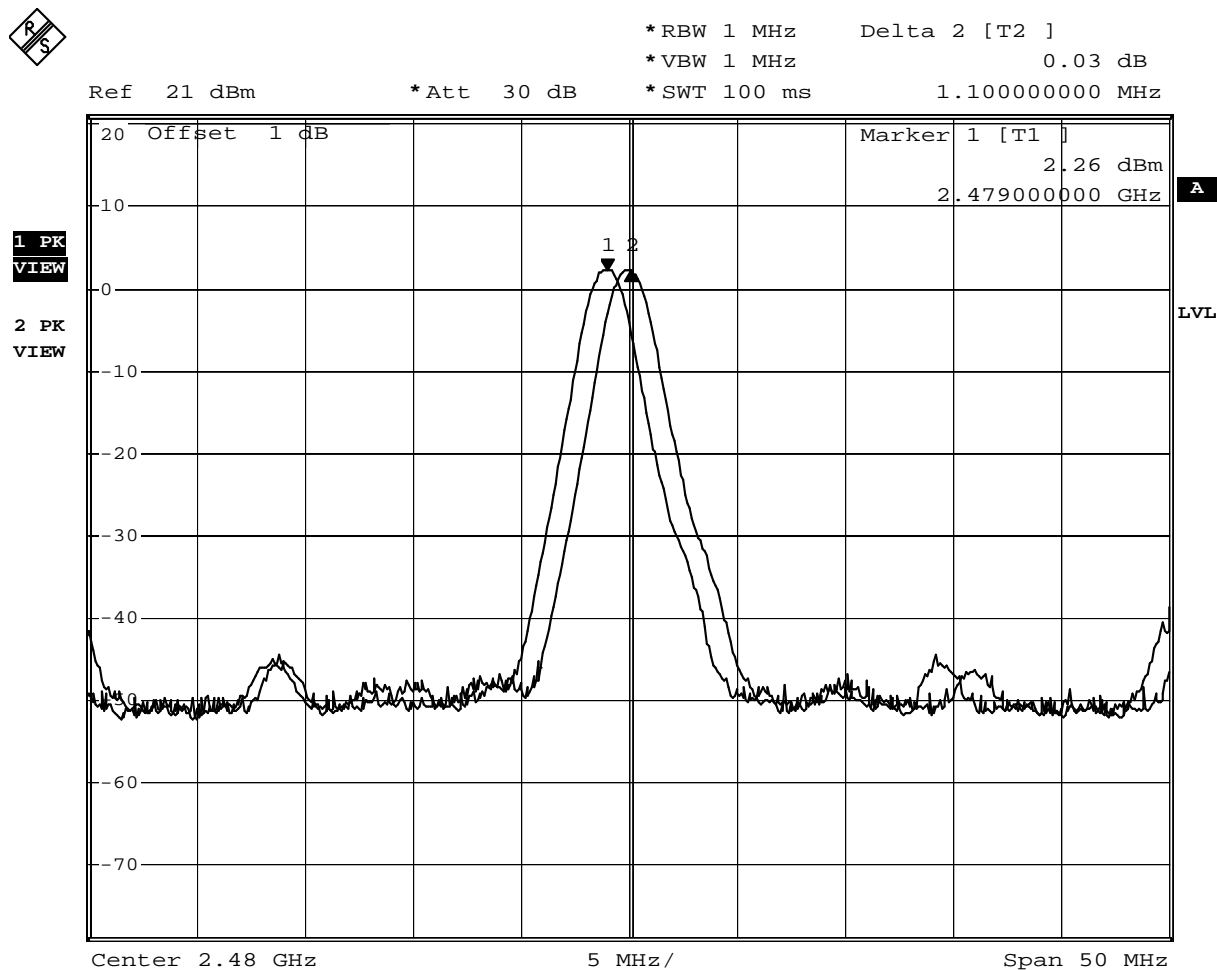
Comment: A:\2
 Date: 6.SEP.2011 16:20:56

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/05/02	Test Site	SR7

8PSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.10	>0.93	Pass

Channel 78



Comment: A:\2
 Date: 6.SEP.2011 16:20:08

8. Occupied Bandwidth

8.1. Test Equipment

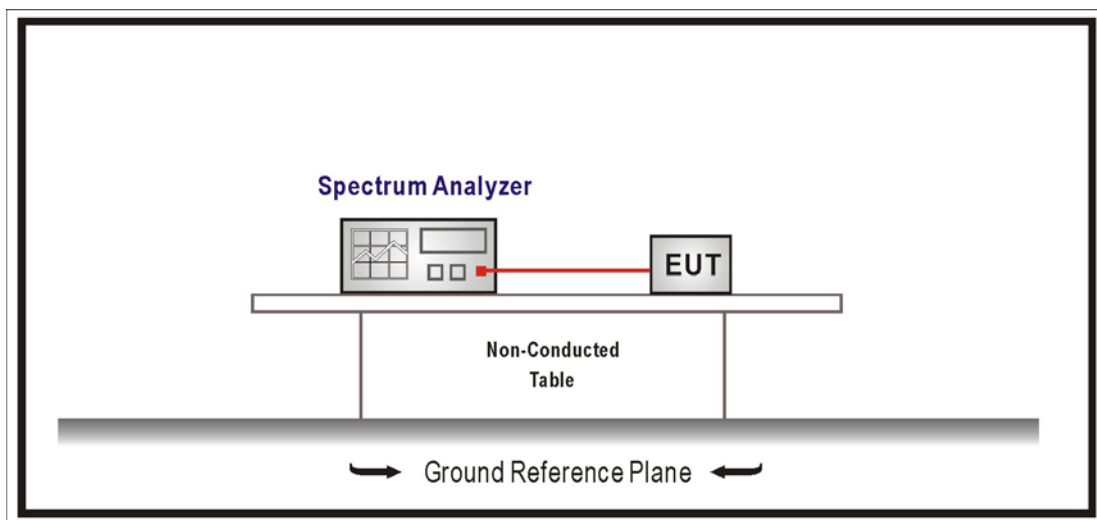
The following test equipment is used during the test:

Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2012/01/16

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 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.

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

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.

8.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

8.6. Test Result

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.16	--	Pass

Channel 00



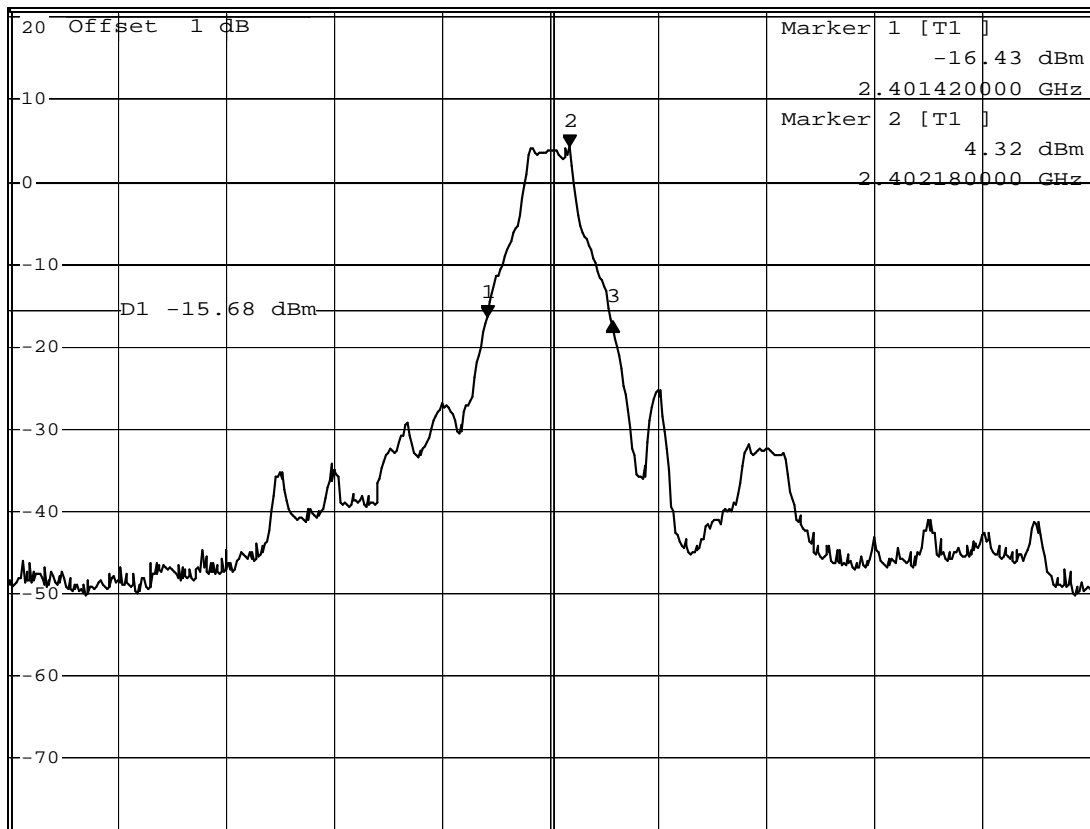
*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz -0.38 dB
 *SWT 100 ms 1.16000000 MHz

Ref 21 dBm

*Att 30 dB

1.16000000 MHz

1 PK VIEW



Center 2.402 GHz

1 MHz/

Span 10 MHz

Comment : A:\2

Date : 1.SEP.2011 11:25:36

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

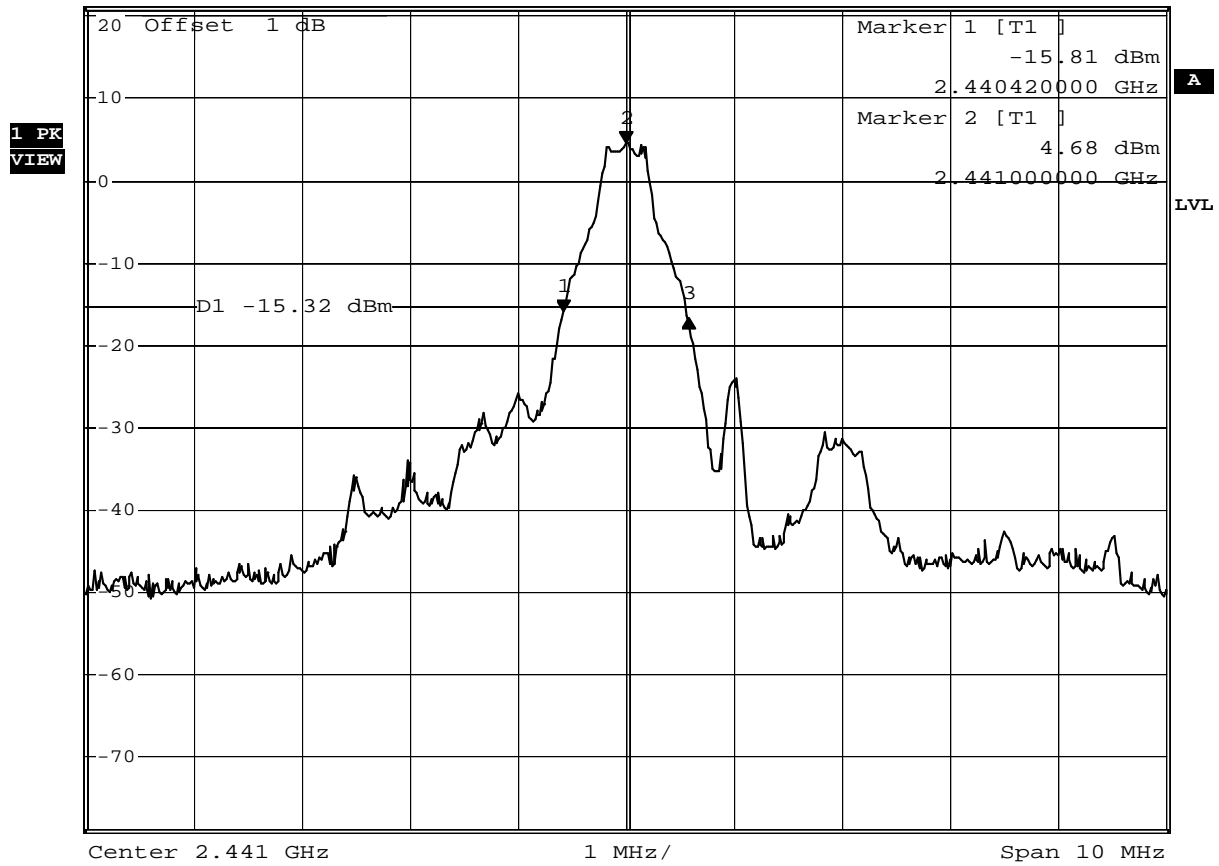
GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.16	--	Pass

Channel 39



*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz -0.81 dB
 Ref 21 dBm *Att 30 dB *SWT 100 ms 1.160000000 MHz



Comment: A:\2

Date: 1.SEP.2011 11:27:30

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (GFSK)		
Date of Test	2011/09/06	Test Site	SR7

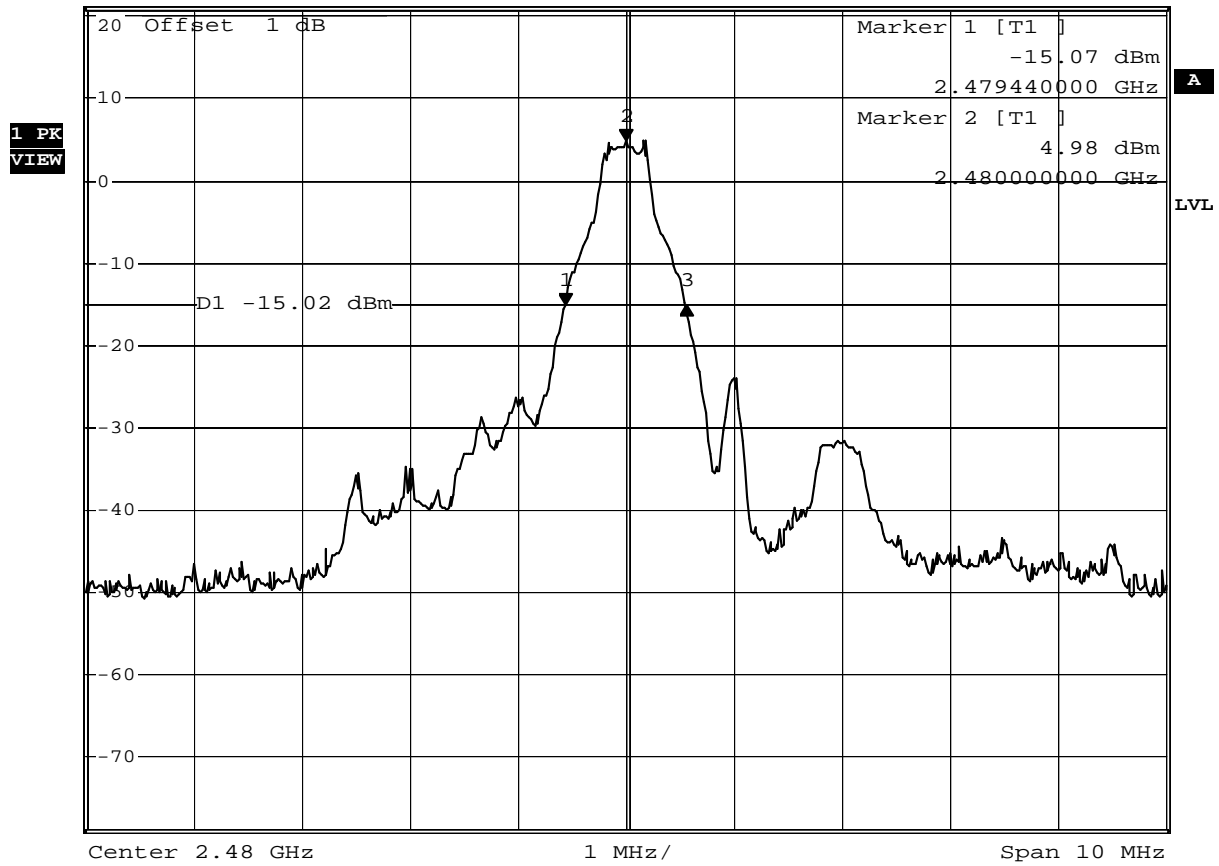
GFSK

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

Channel 78



*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz -0.13 dB
 Ref 21 dBm *Att 30 dB *SWT 100 ms 1.120000000 MHz



Comment: A:\2

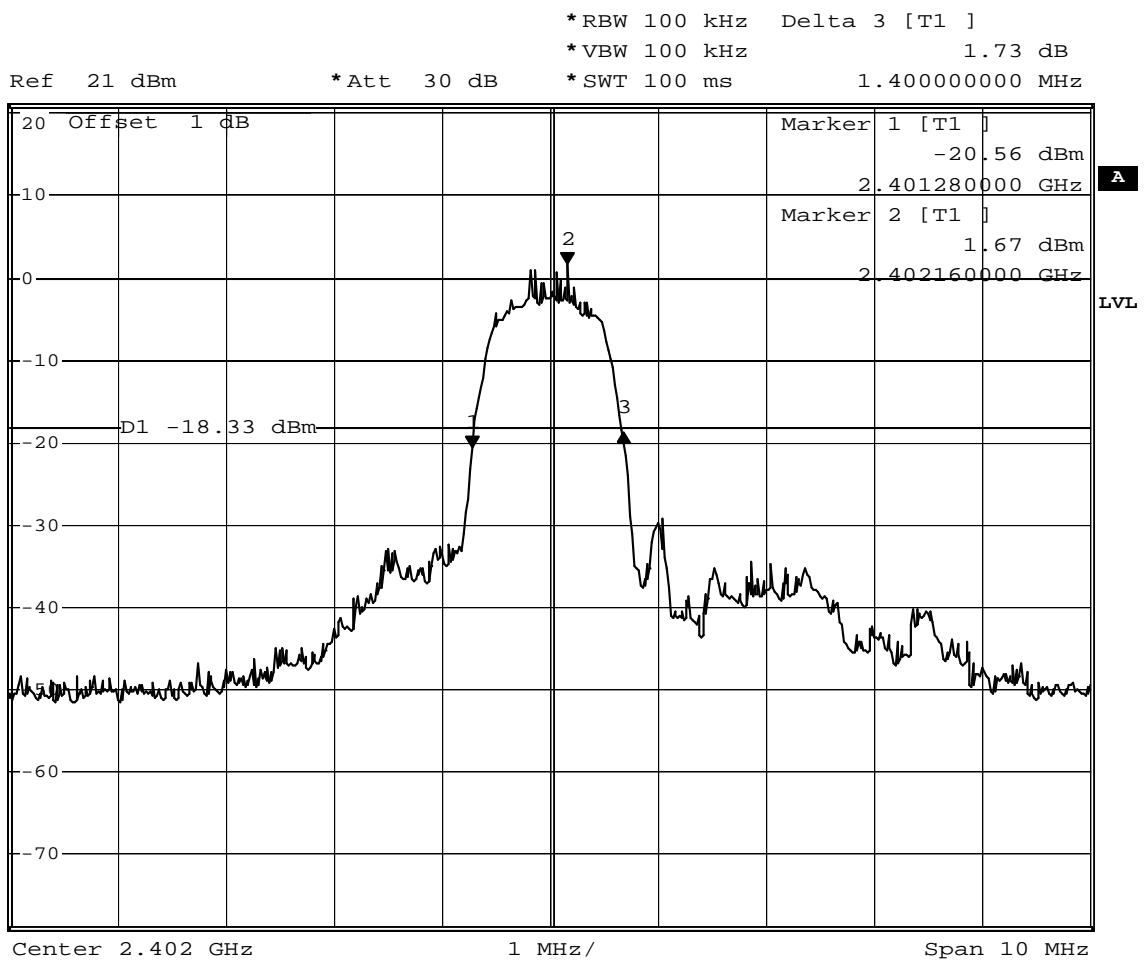
Date: 1.SEP.2011 11:28:40

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

$\pi/4$ -DQPSK

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

Channel 00



Comment: A:\2
 Date: 6.SEP.2011 16:12:48

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.42	--	Pass

Channel 39

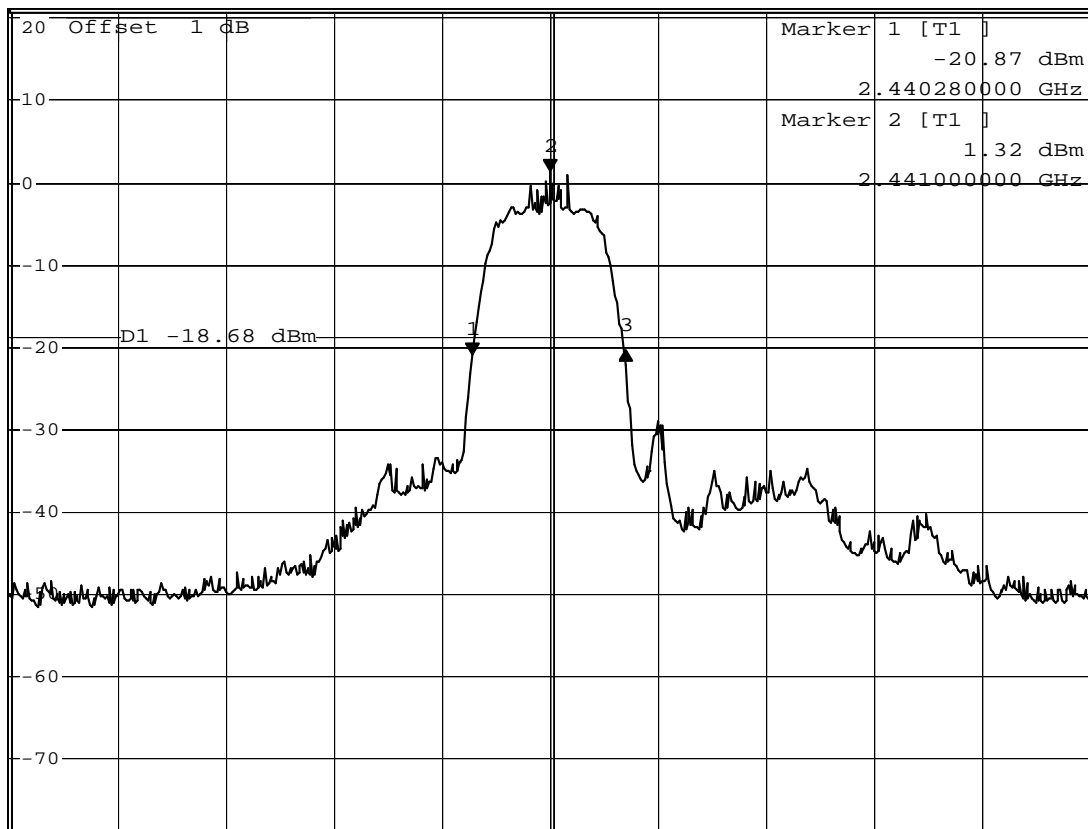


*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz 0.40 dB
 *SWT 100 ms 1.420000000 MHz

Ref 21 dBm

*Att 30 dB

1 PK
VIEW



Center 2.441 GHz

1 MHz/

Span 10 MHz

Comment: A:\2

Date: 6.SEP.2011 16:11:25

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit ($\pi/4$ -DQPSK)		
Date of Test	2011/09/06	Test Site	SR7

$\pi/4$ -DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.42	--	Pass

Channel 78

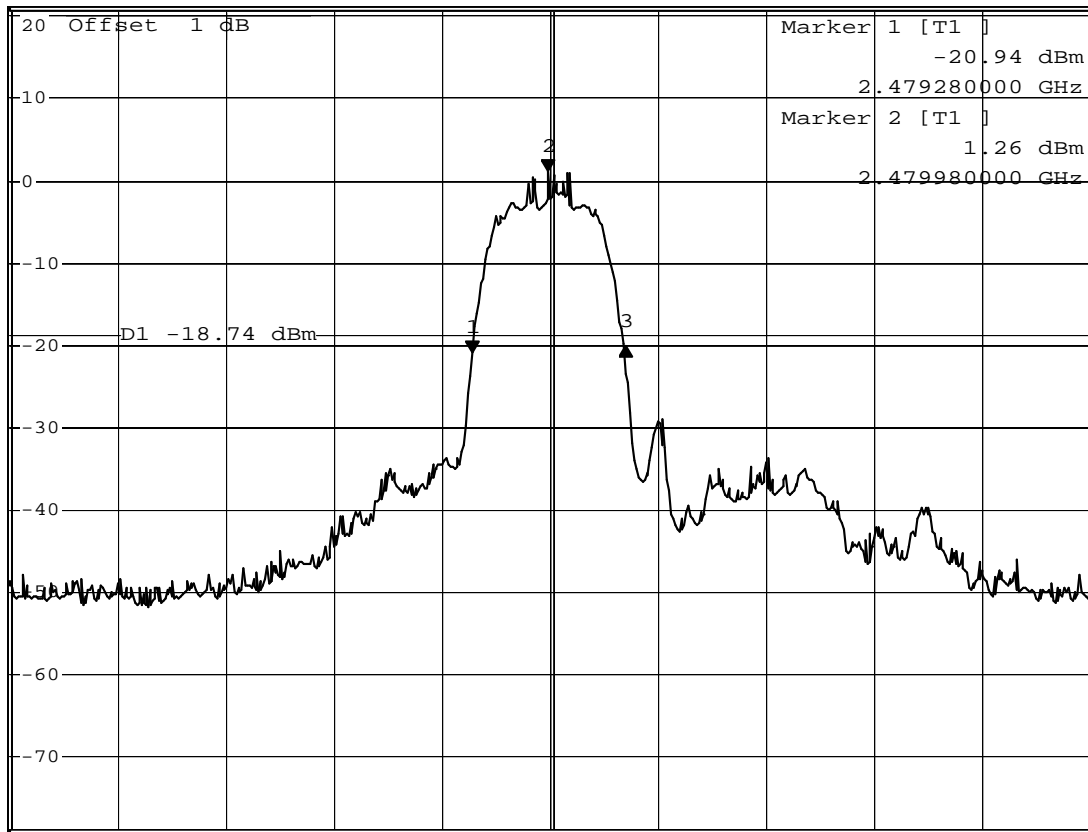


*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz 0.73 dB
 *SWT 100 ms 1.420000000 MHz

Ref 21 dBm

*Att 30 dB

1 PK
VIEW



Comment: A:\2

Date: 6.SEP.2011 16:10:33

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/09/06	Test Site	SR7

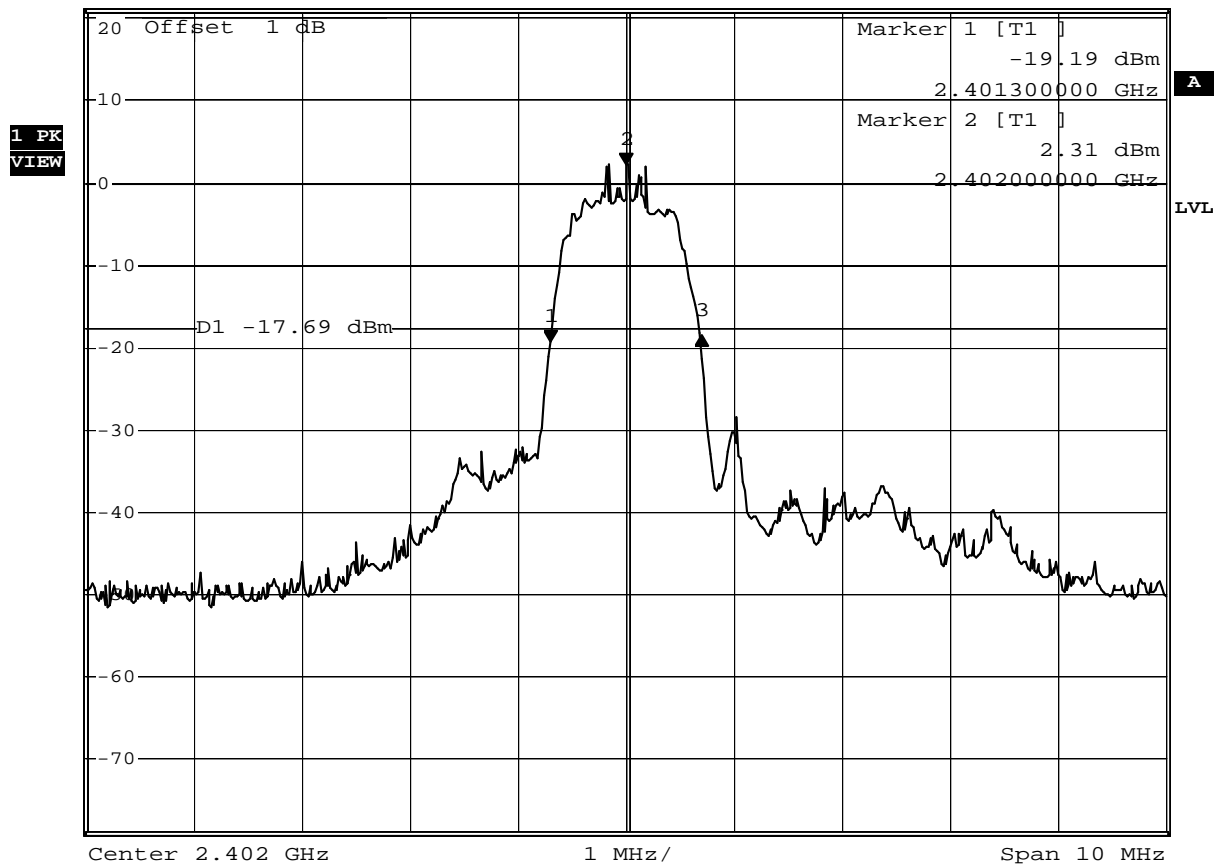
8PSK

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

Channel 00



*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz 0.80 dB
 Ref 21 dBm *Att 30 dB *SWT 100 ms 1.40000000 MHz



Comment: A:\2
 Date: 6.SEP.2011 16:07:39

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/09/06	Test Site	SR7

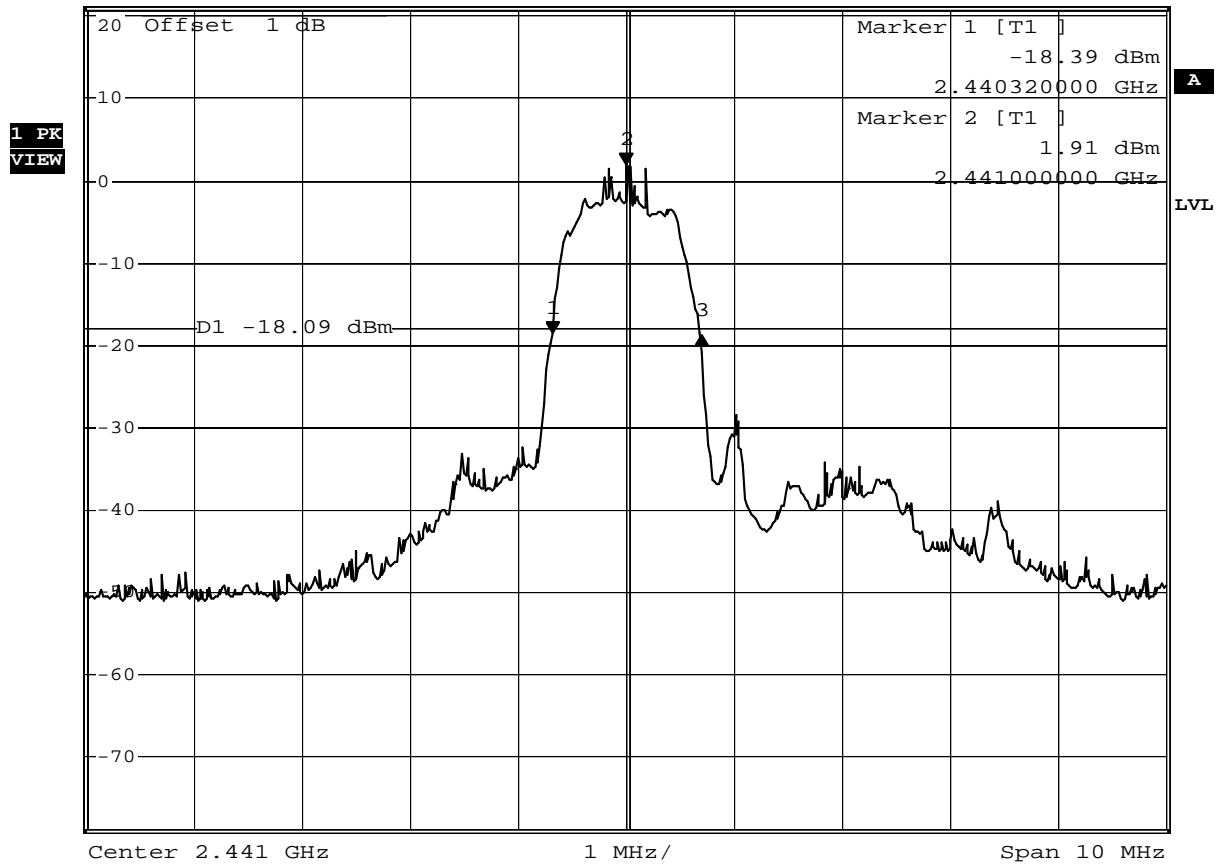
8PSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.38	--	Pass

Channel 39



*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz -0.25 dB
 Ref 21 dBm *Att 30 dB *SWT 100 ms 1.380000000 MHz



Comment: A:\2

Date: 6.SEP.2011 16:08:42

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (8PSK)		
Date of Test	2011/09/06	Test Site	SR7

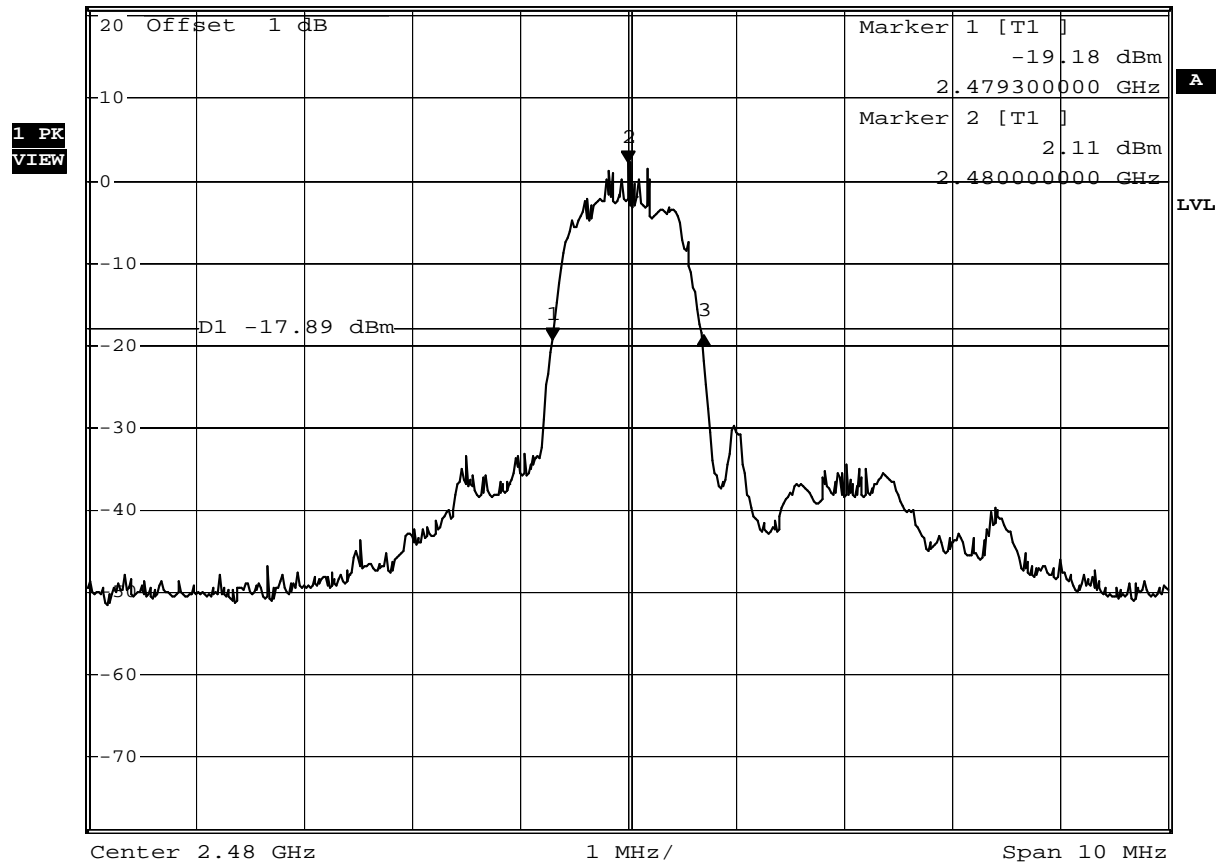
8PSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.40	--	Pass

Channel 78



*RBW 100 kHz Delta 3 [T1]
 *VBW 100 kHz 0.40 dB
 Ref 21 dBm *Att 30 dB *SWT 100 ms 1.400000000 MHz



Comment: A:\2

Date: 6.SEP.2011 16:09:42

9. Dwell Time

9.1. Test Equipment

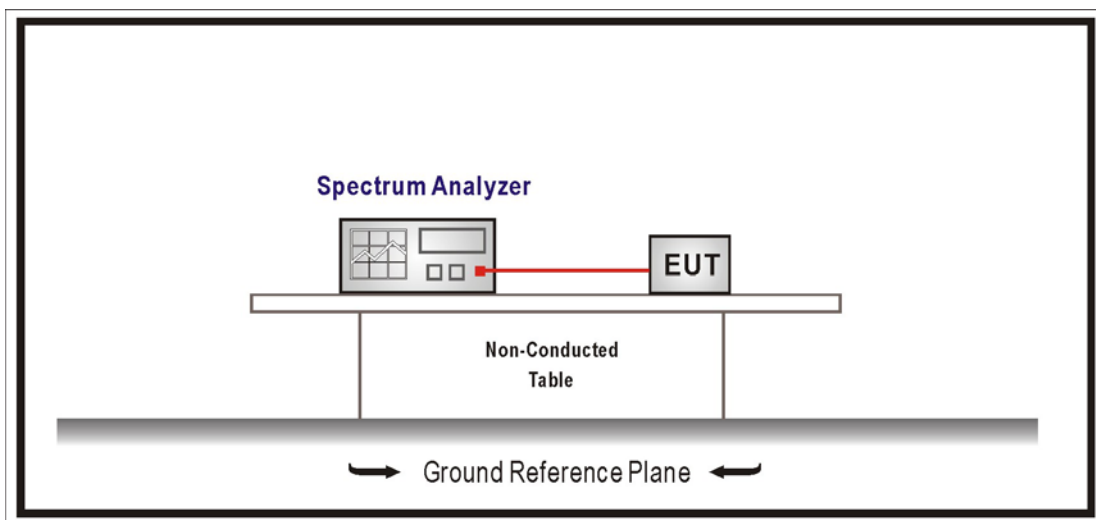
The following test equipment is used during the test:

Dwell Time / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2012/01/16

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. 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.

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

Span = zero span, centered on a hopping channel

RBW = 1 MHz, VBW ≥ RBW

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

Detector function = peak, Trace = max hold

9.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2010

9.6. Test Result

Product	Hypo-Vigilance / Fatigue Detector / VigilanceSense / BodySensing		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2011/09/01	Test Site	SR7

Occupancy Time of Frequency Hopping System

A) 2402MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $5/20\text{msec} = 250 / \text{sec}$

The Maximum Occupancy Time Within 3.16sec: $0.00312 \times (250/79) \times 31.6 = 0.312\text{sec}$ ◦

B) 2441MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $5/20\text{msec} = 250 / \text{sec}$

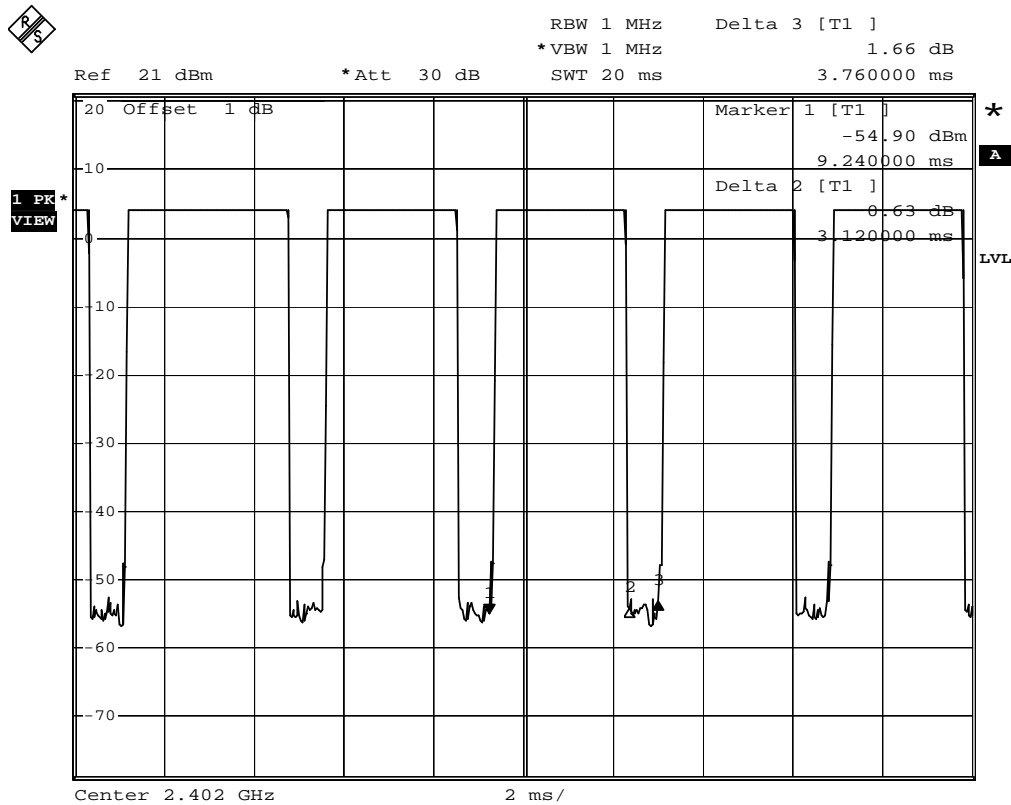
The Maximum Occupancy Time Within 3.16sec: $0.00312 \times (250/79) \times 31.6 = 0.312\text{sec}$ ◦

C) 2480MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $5/20\text{msec} = 250 / \text{sec}$

The Maximum Occupancy Time Within 3.16sec: $0.00312 \times (250/79) \times 31.6 = 0.312\text{sec}$ ◦

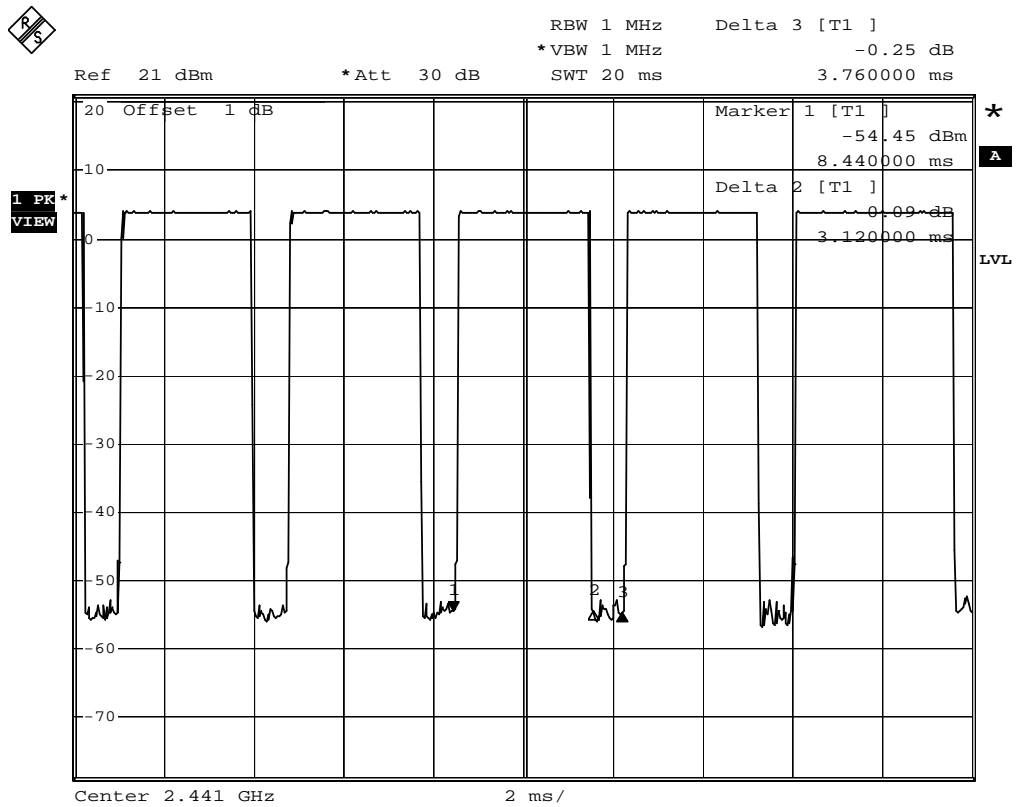
Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard ◦

Hop rate-2402MHz



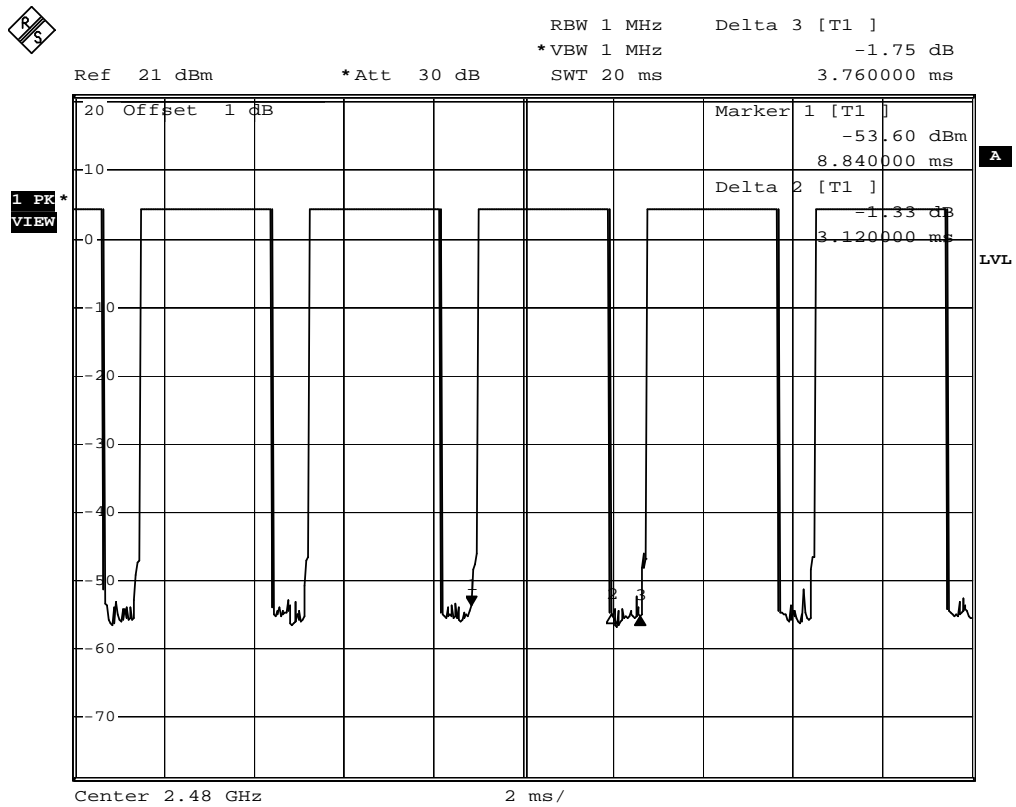
Comment: A:\2
 Date: 1.SEP.2011 13:30:09

Hop rate-2441MHz



Comment: A:\2
 Date: 1.SEP.2011 13:29:24

Hop rate-2480MHz



Comment: A:\2
 Date: 1.SEP.2011 13:27:53

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