



## Test Report

Product Name : 760 GPS Recorder  
Model No. : G-Log 760, G-Log 760B, G-Log 760X  
FCC ID. : OUP981200101

Applicant : TRANSYSTEM INC.  
Address : No.1-2, Li-Hsin Rd.1, Science-Based Industrial Park,  
Hsinchu, Taiwan R.O.C.

Date of Receipt : 2010/04/08  
Issued Date : 2010/04/23  
Report No. : 104193R-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 : 2010/04/23

Report No. : 104193R-RFUSP43V01



Product Name : 760 GPS Recorder  
 Applicant : TRANSYSTEM INC.  
 Address : No.1-2, Li-Hsin Rd.1, Science-Based Industrial Park, Hsinchu,  
 Taiwan R.O.C.  
 Manufacturer : TRANSYSTEM INC.  
 Model No. : G-Log 760, G-Log 760B, G-Log 760X  
 FCC ID. : OUP981200101  
 EUT Voltage : DC 3.7V (Power by Battery)  
 DC 5V (Power by PC/Adapter)  
 Trade Name : TSI  
 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.

Documented By : Demi Chang

( Demi Chang / Engineering Adm. Specialist )

Tested 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	760 GPS Recorder
Trade Name	TSI
Model No.	G-Log 760, G-Log 760B, G-Log 760X
Frequency Range	2402~2480MHz
Channel Number	79
Type of Modulation	FHSS
Channel Control	Auto
Antenna Type	Chip (Soldered on PCB)
Antenna Gain	0dBi

Component	
USB Cable	Shielded, 0.8m
Power Adapter	Sage Power, KSUFB0500050W1US I/P: 100-240V, 50/60Hz, 0.15A O/P: 5V, 0.5A

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 760 GPS Recorder 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 104193R-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-USB Mode 2: Transmit-Charge
Final Test Mode	
EMI	Mode 1: Transmit-USB Mode 2: Transmit-Charge

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



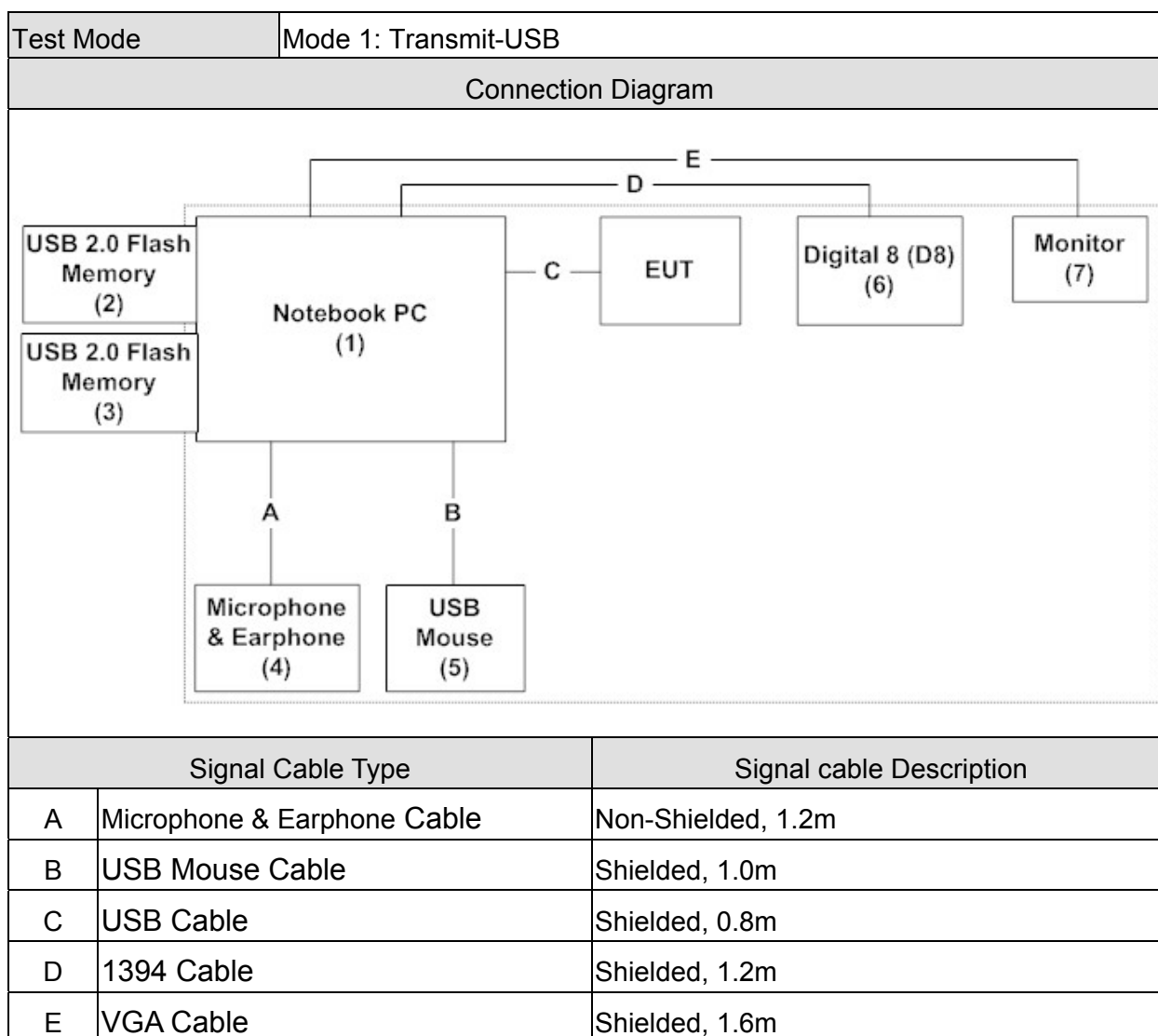
#### 1.4. Tested System Details

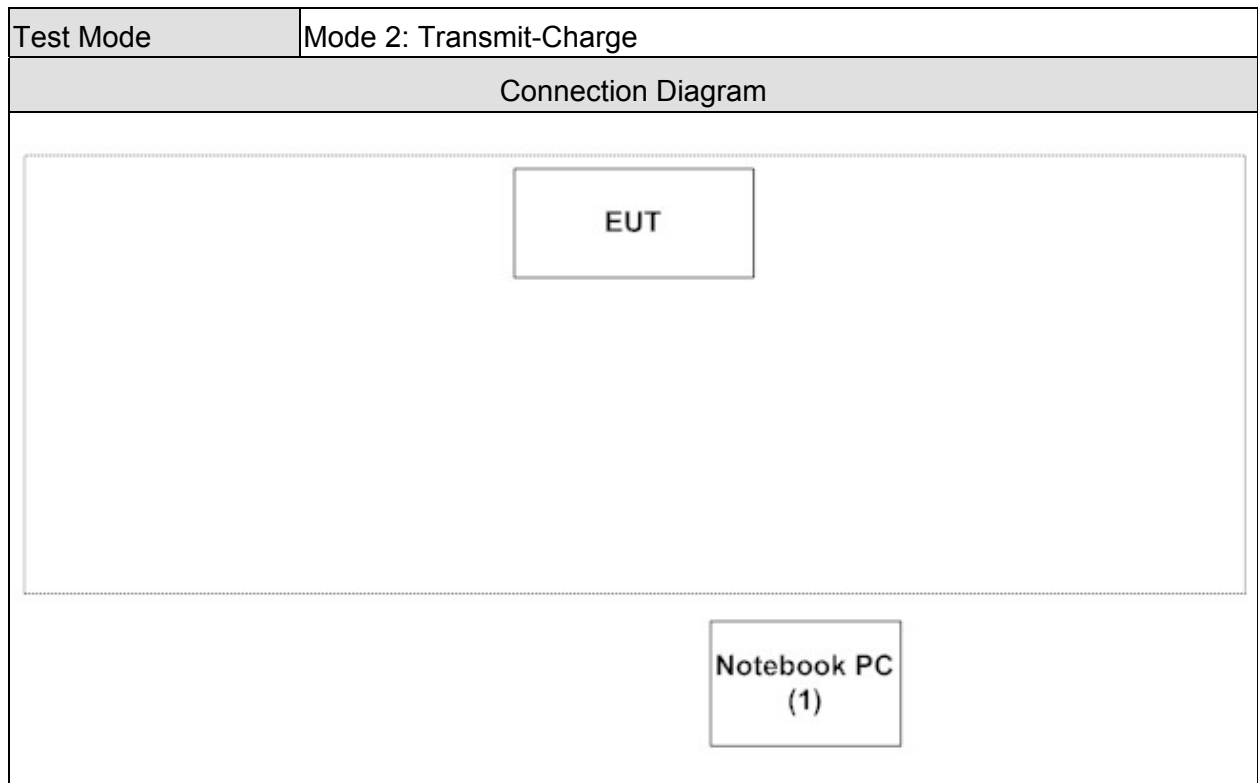
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Test Mode		Mode 1: Transmit-USB				
Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	DELL	Inspiron 1420	66TLZ1S	DoC	Non-Shielded, 1.8m
2	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--
3	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--
4	Microphone & Earphone	Fujiei	SBZ-38	N/A	DoC	--
5	USB Mouse	Logitech	M-UV83	LZE35005997	DoC	--
6	Digital 8 (D8)	SONY	DCR-TRV110	P35209	DoC	--
7	Monitor	ViewSonic	E653	ER01502861	DoC	Non-Shielded, 1.8m

Test Mode		Mode 2: Transmit-Charge				
Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	DELL	Inspiron 1420	66TLZ1S	DoC	Non-Shielded, 1.8m

## 1.5. Configuration of tested System





## 1.6. EUT Exercise Software

1	Setup the EUT and Notebook PC as shown on 1.5.
2	Turn on the power of all equipment.
3	Data will be continue transmitting through EUT.
4	Repeat the above procedure (2) to (3)

## 1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 B 15.207 Conducted Emission	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (FHSS)	15 - 35	26
Humidity (%RH)		25 - 75	51
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.209 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	25
Humidity (%RH)		25 - 75	53
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Separation (FHSS)	15 - 35	22
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (FHSS)	15 - 35	22
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	22
Humidity (%RH)		25 - 75	48
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, 2009



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

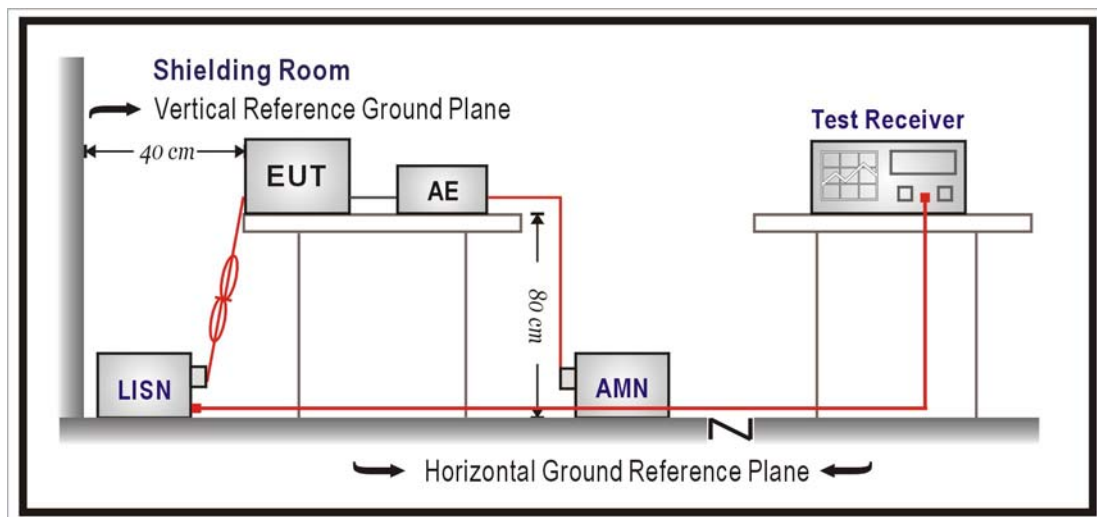
The following test equipment are used during the test:

#### Conducted Emission / SR2

Instrument	Manufacturer	Type No.	Serial No	Last Cal.
4-Wire ISN	R & S	ENY 41	837032/001	2011/04/15
Artificial Mains Network	R & S	ENV4200	848411/010	2011/03/13
Double 2-Wire ISN	R & S	ENY 22	835354/008	2011/04/15
LISN	R & S	ESH3-Z5	825562/002	2011/03/31
Pulse Limiter	R & S	ZSH3Z2	357.8810.54	2010/07/19
Test Receiver	R & S	ESCS 30	100122	2011/02/21

Note: All equipment upon which need to calibrated 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 was setup and tested according to ANSI C63.4, 2003.

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

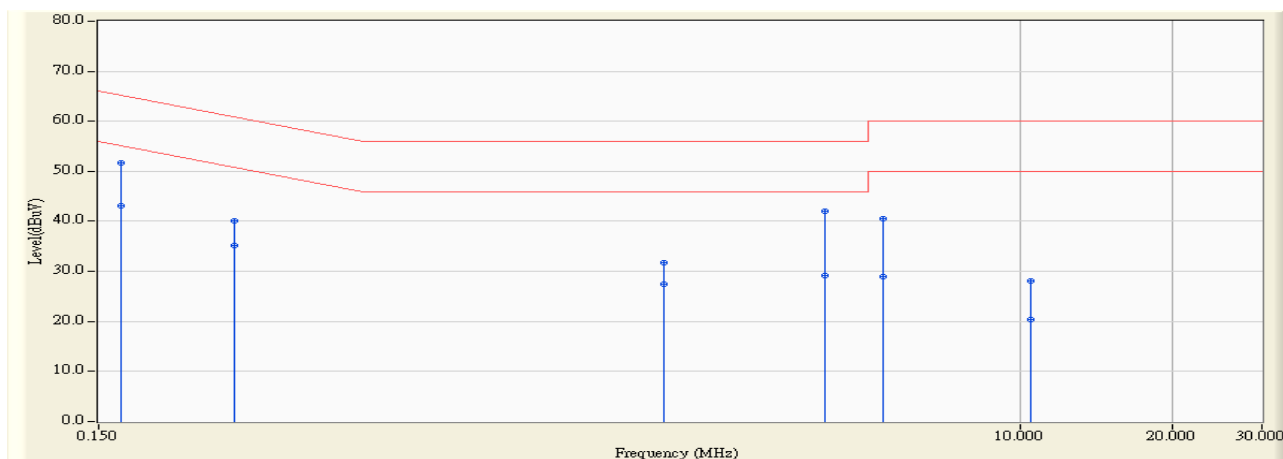
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2009

## 2.6. Test Result

Site : SR2	Time : 2010/04/20 - 21:14
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-LISN(16A) - Line1	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB



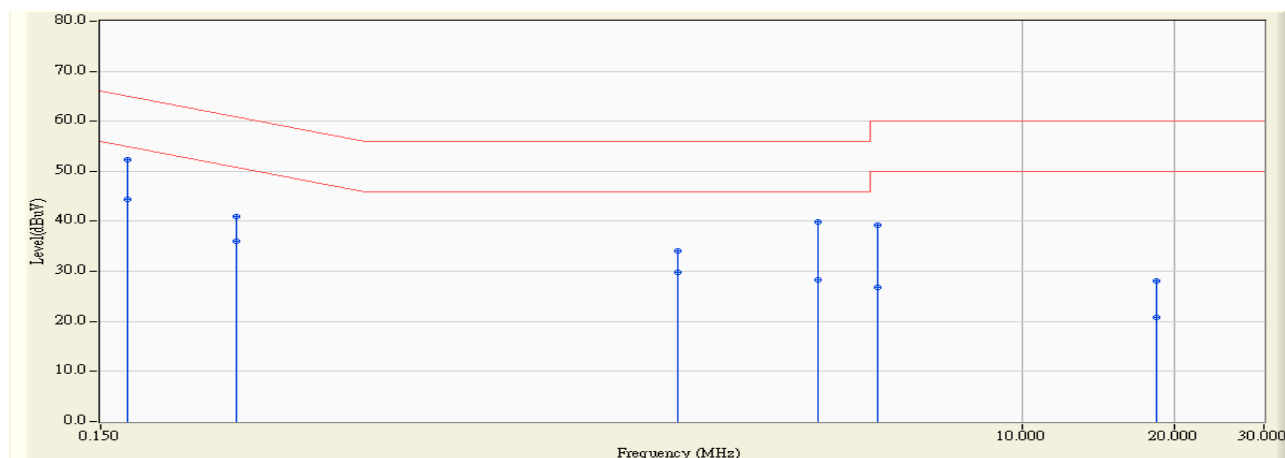
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.783	41.910	51.693	-13.484	65.177	QUASPEAK
2	*	0.166	9.783	33.400	43.183	-11.994	55.177	AVERAGE
3		0.278	9.763	30.450	40.213	-20.659	60.872	QUASPEAK
4		0.278	9.763	25.470	35.233	-15.639	50.872	AVERAGE
5		1.963	9.801	21.940	31.741	-24.259	56.000	QUASPEAK
6		1.963	9.801	17.590	27.391	-18.609	46.000	AVERAGE
7		4.096	9.831	32.200	42.031	-13.969	56.000	QUASPEAK
8		4.096	9.831	19.240	29.071	-16.929	46.000	AVERAGE
9		5.334	9.848	30.730	40.578	-19.422	60.000	QUASPEAK
10		5.334	9.848	19.090	28.938	-21.062	50.000	AVERAGE
11		10.489	10.001	18.030	28.031	-31.969	60.000	QUASPEAK
12		10.489	10.001	10.290	20.291	-29.709	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 : SR2	Time : 2010/04/20 - 21:21
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-LISN(16A) - Line2	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB

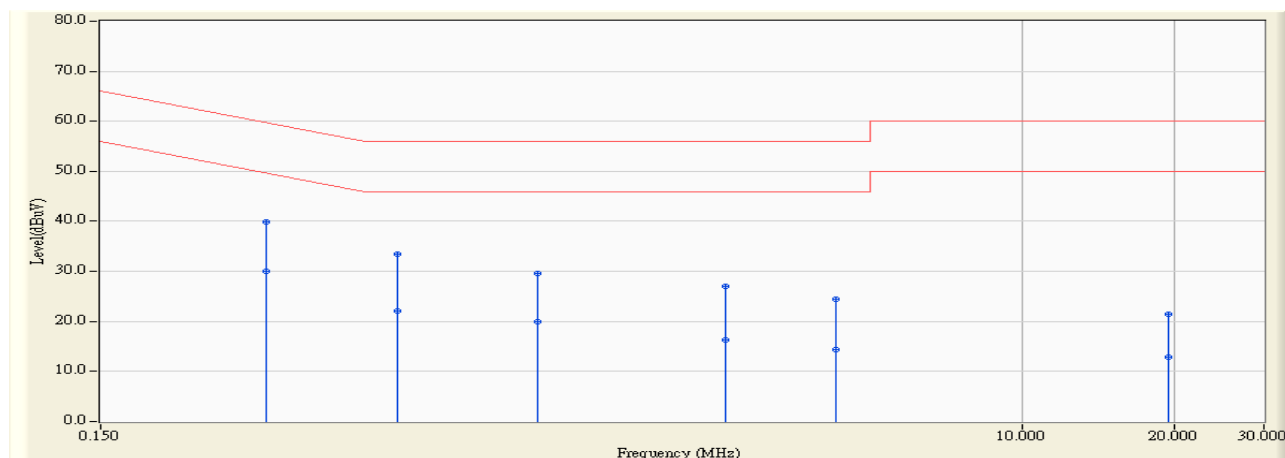


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.170	9.778	42.590	52.368	-12.616	64.983	QUASIPeAK
2	*	0.170	9.778	34.720	44.498	-10.486	54.983	AVERAGE
3		0.279	9.763	31.170	40.933	-19.915	60.848	QUASIPeAK
4		0.279	9.763	26.270	36.033	-14.815	50.848	AVERAGE
5		2.076	9.811	24.360	34.171	-21.829	56.000	QUASIPeAK
6		2.076	9.811	20.020	29.831	-16.169	46.000	AVERAGE
7		3.926	9.829	29.970	39.799	-16.201	56.000	QUASIPeAK
8		3.926	9.829	18.380	28.209	-17.791	46.000	AVERAGE
9		5.158	9.848	29.320	39.169	-20.831	60.000	QUASIPeAK
10		5.158	9.848	16.910	26.759	-23.241	50.000	AVERAGE
11		18.421	10.318	17.680	27.998	-32.002	60.000	QUASIPeAK
12		18.421	10.318	10.560	20.878	-29.122	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 : SR2	Time : 2010/04/20 - 22:13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-LISN(16A) - Line1	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 2: Transmit-Charge

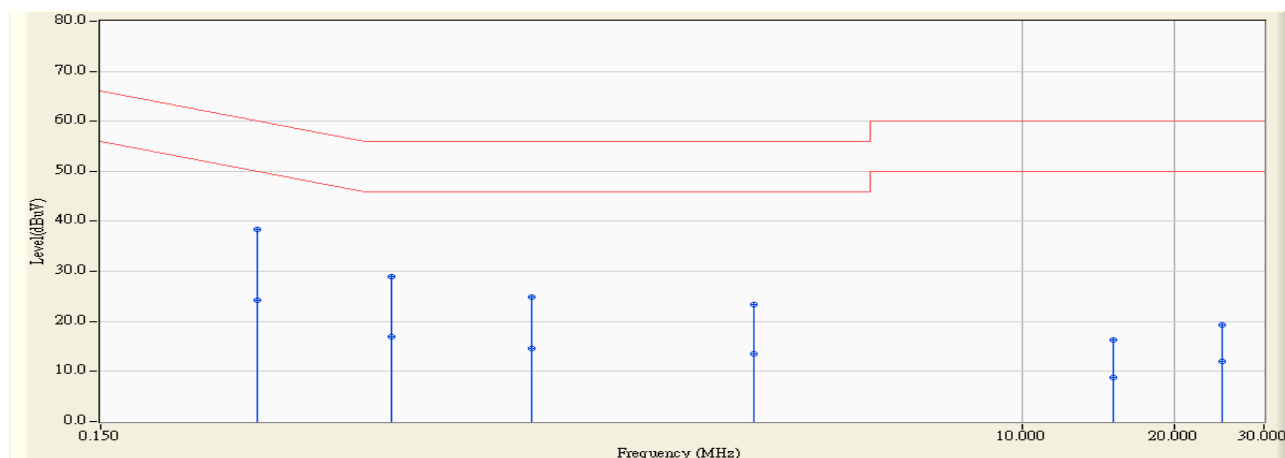


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.318	9.785	30.200	39.985	-19.773	59.759	QUASIPeAK
2		0.318	9.785	20.320	30.105	-29.653	59.759	AVERAGE
3		0.580	9.830	23.560	33.390	-22.610	56.000	QUASIPeAK
4		0.580	9.830	12.240	22.070	-33.930	56.000	AVERAGE
5		1.095	9.620	19.950	29.570	-26.430	56.000	QUASIPeAK
6		1.095	9.620	10.320	19.940	-36.060	56.000	AVERAGE
7		2.578	9.816	17.200	27.016	-28.984	56.000	QUASIPeAK
8		2.578	9.816	6.430	16.246	-39.754	56.000	AVERAGE
9		4.267	9.832	14.520	24.352	-31.648	56.000	QUASIPeAK
10		4.267	9.832	4.530	14.362	-41.638	56.000	AVERAGE
11		19.455	10.191	11.240	21.431	-38.569	60.000	QUASIPeAK
12		19.455	10.191	2.670	12.861	-47.139	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.

Site : SR2	Time : 2010/04/20 - 22:17
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-LISN(16A) - Line2	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 2: Transmit-Charge



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.306	9.779	28.700	38.479	-21.593	60.072	QUASIPeAK
2		0.306	9.779	14.360	24.139	-25.933	50.072	AVERAGE
3		0.563	9.831	19.210	29.040	-26.960	56.000	QUASIPeAK
4		0.563	9.831	7.140	16.970	-29.030	46.000	AVERAGE
5		1.071	9.615	15.350	24.965	-31.035	56.000	QUASIPeAK
6		1.071	9.615	4.870	14.485	-31.515	46.000	AVERAGE
7		2.940	9.819	13.510	23.329	-32.671	56.000	QUASIPeAK
8		2.940	9.819	3.620	13.439	-32.561	46.000	AVERAGE
9		15.087	10.271	6.050	16.321	-43.679	60.000	QUASIPeAK
10		15.087	10.271	-1.430	8.841	-41.159	50.000	AVERAGE
11		24.840	10.466	8.930	19.396	-40.604	60.000	QUASIPeAK
12		24.840	10.466	1.630	12.096	-37.904	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.

### 3. Peak Power Output

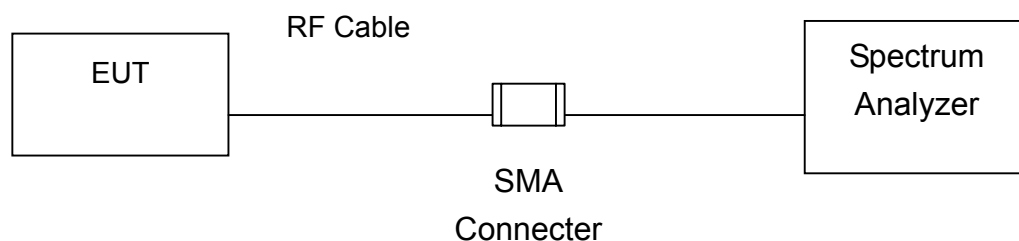
#### 3.1. Test Equipment

The following test equipments are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R&S	FSP/ 100005	Oct., 2010
2	No.1 OATS			Sep., 2010

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, 2003 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

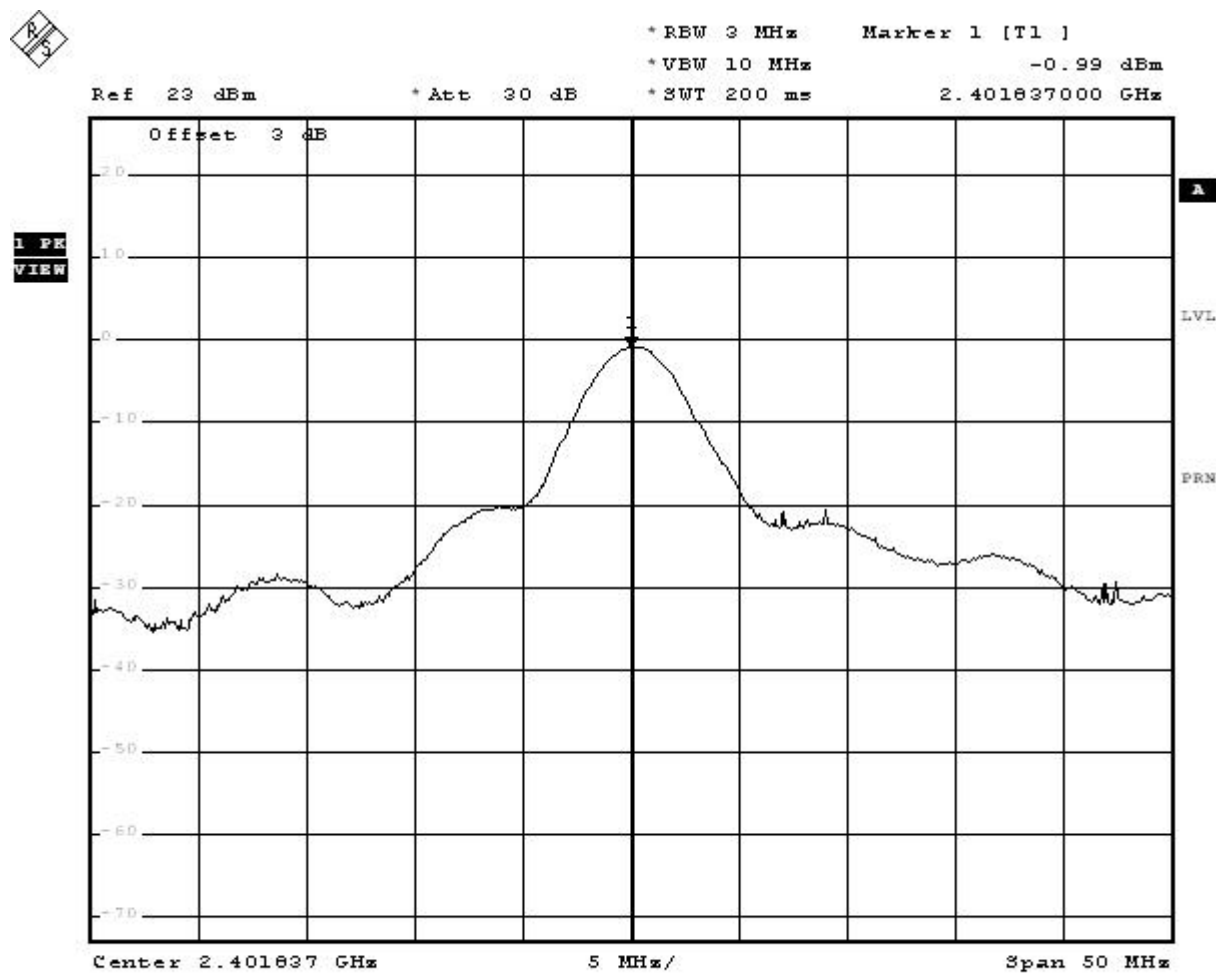
### 3.6. Test Result

Product	760 GPS Recorder		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit-USB		
Date of Test	2010/04/09	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	-0.99	1Watt= 30 dBm	Pass

#### Channel 00



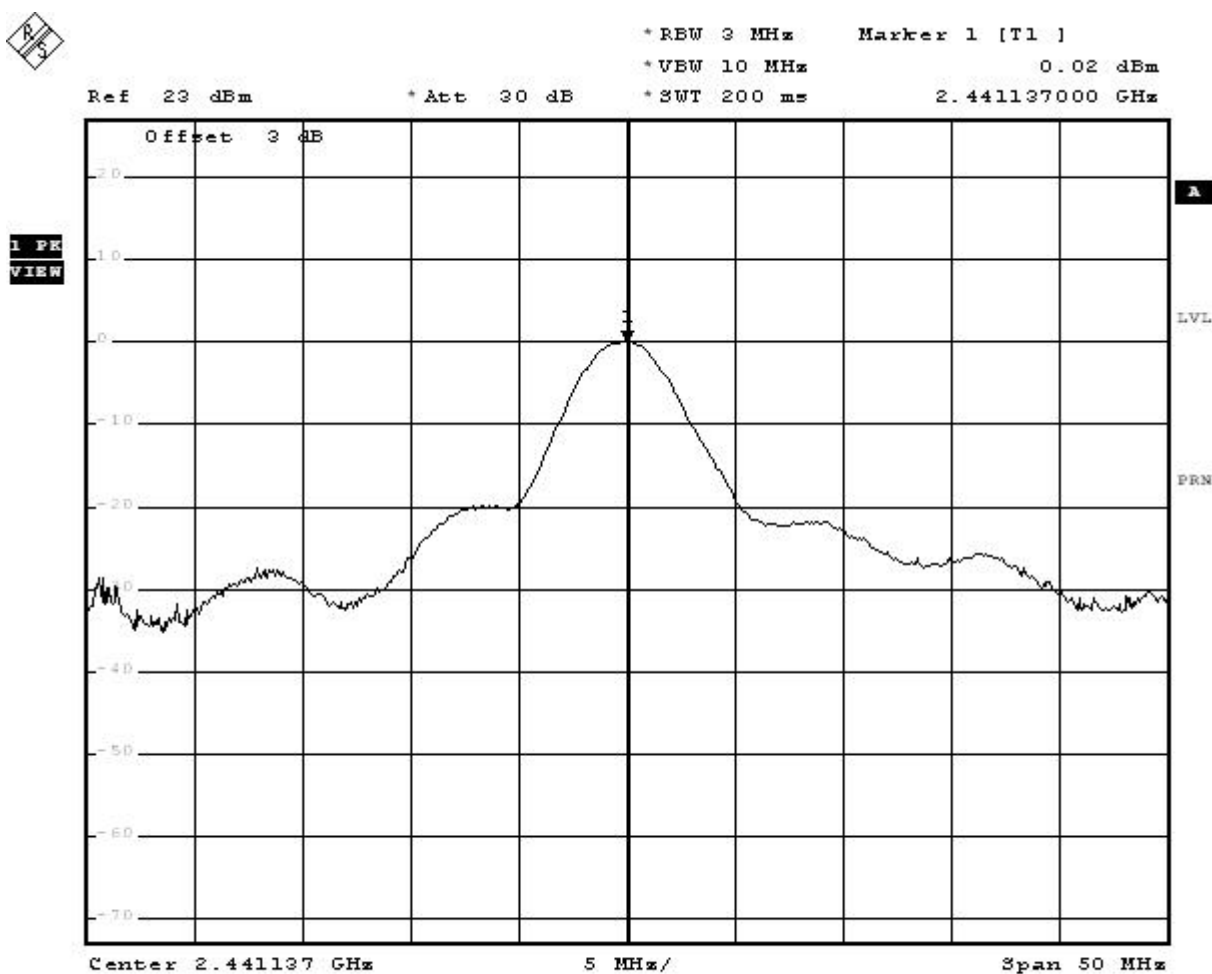
Date: 9.APR.2010 13:31:18

Product	760 GPS Recorder		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	0.02	1Watt= 30 dBm	Pass

## Channel 39



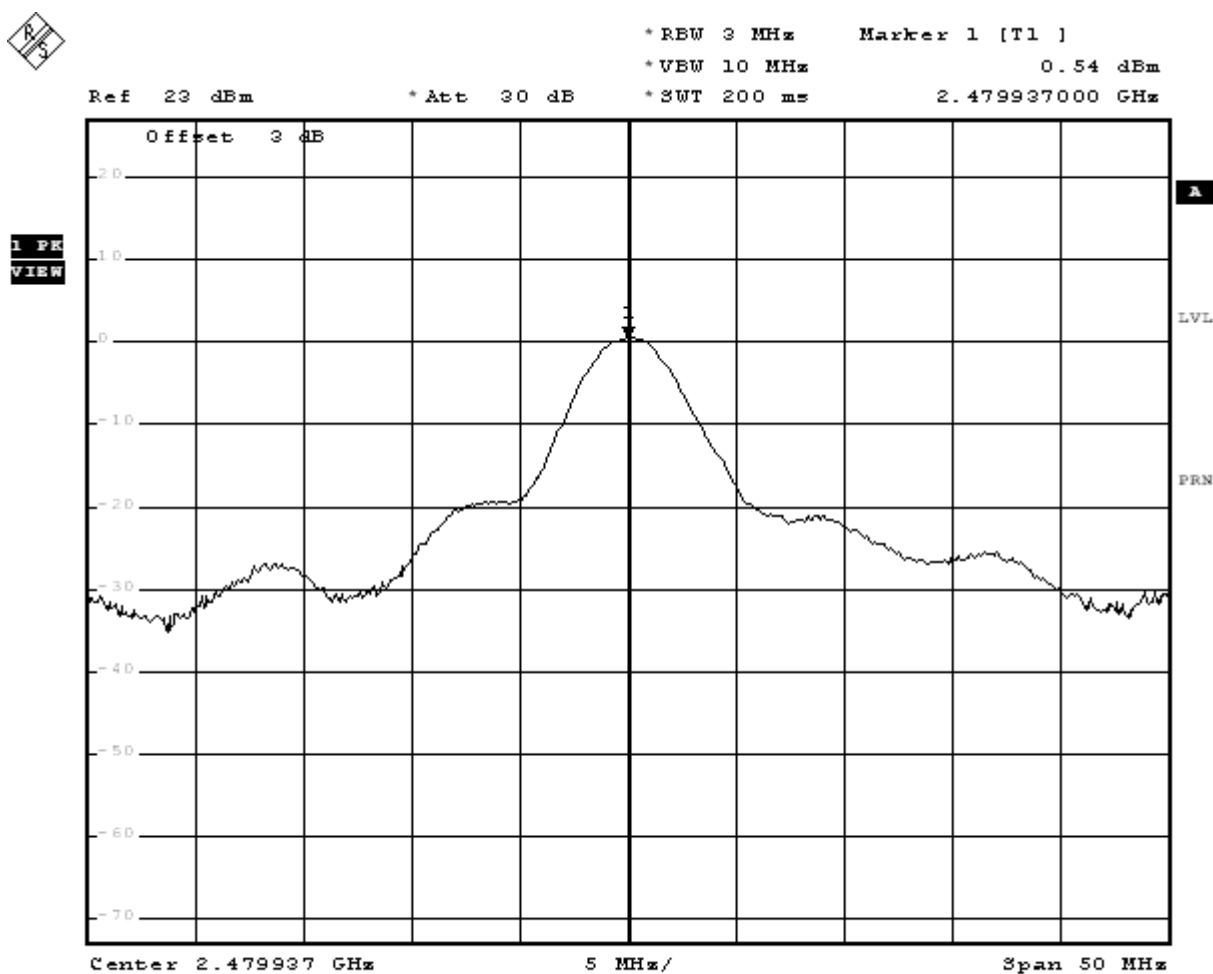
Date: 9.APR.2010 13:34:39

Product	760 GPS Recorder		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	0.29	1Watt= 30 dBm	Pass

## Channel 78



Date: 9.APR.2010 13:35:17

## 4. Radiated Emission

### 4.1. Test Equipment

The following test equipment are used during the test:

#### Radiated Emission / CB1

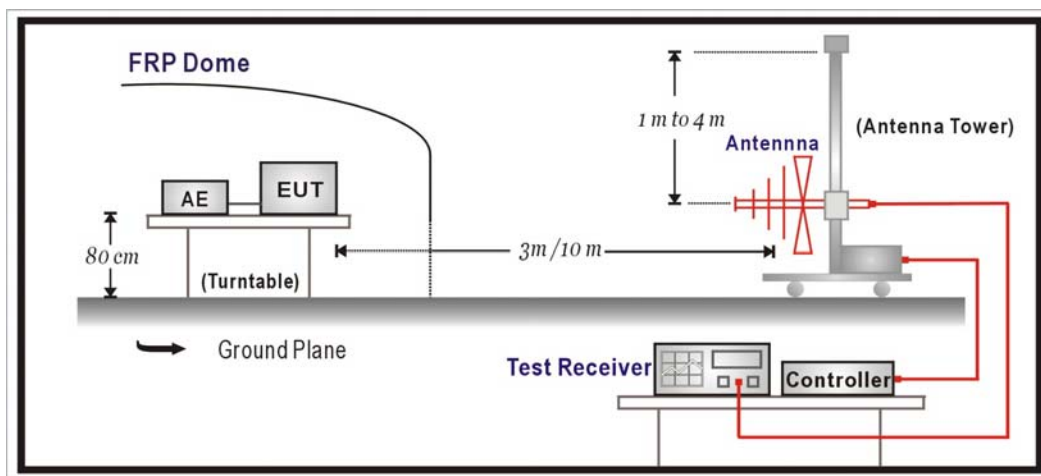
Instrument	Manufacturer	Type No.	Serial No	Last Cal.
Horn Antenna	Schwarzback	9120D743	D69250	2011/03/16
Pre-Amplifier	HP	8449B	3008A01123	2010/11/15
Spectrum Analyzer	R & S	FSP40	100005	2010/08/25

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

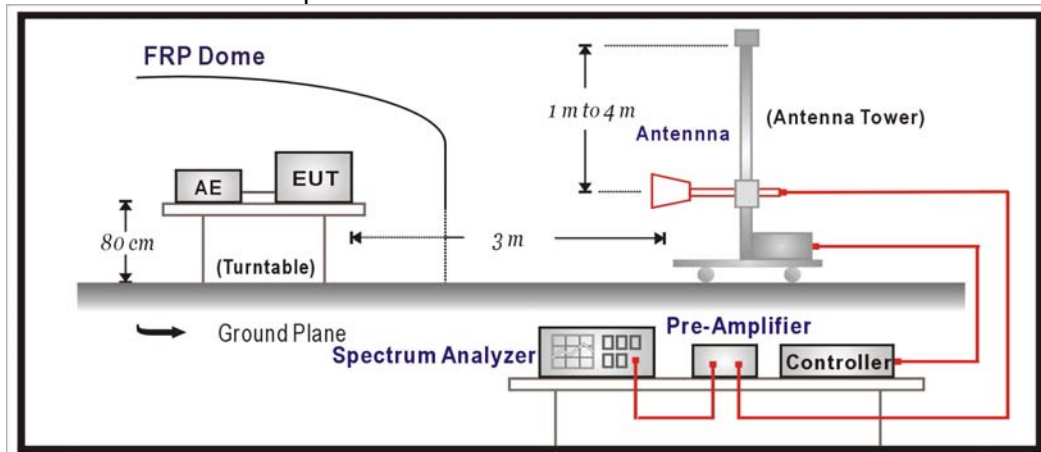
2. "N/A" Ca1.Date is used to Pre-test, not final test.

### 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, 2003 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 C63.4:2003 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.

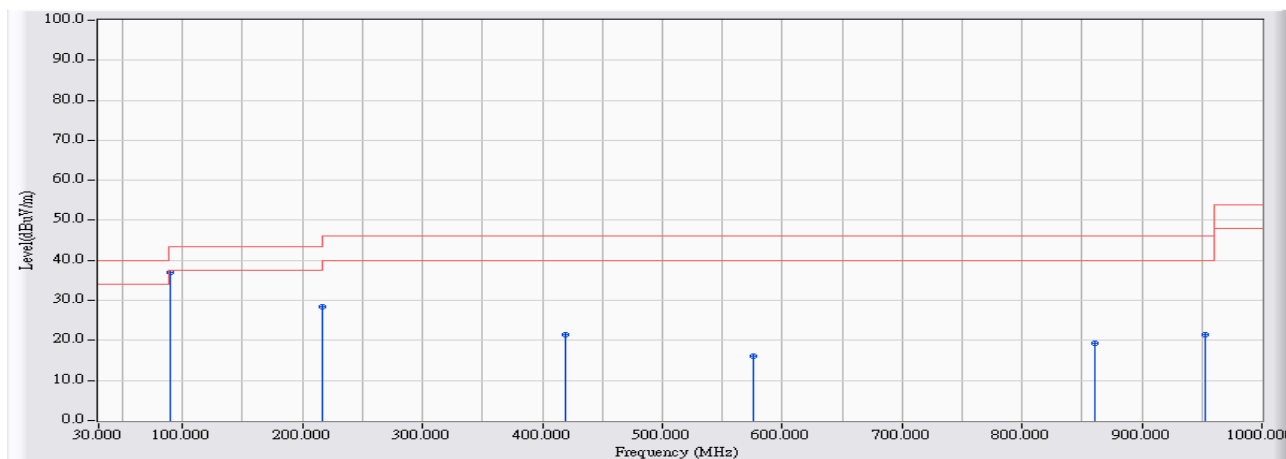
### 4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.209: 2009

#### 4.6. Test Result

##### 30MHz-1GHz Spurious

Site : CB1	Time : 2010/04/19 - 19:41
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_30-1G(2009) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : Mode 1: Transmit-USB-2441

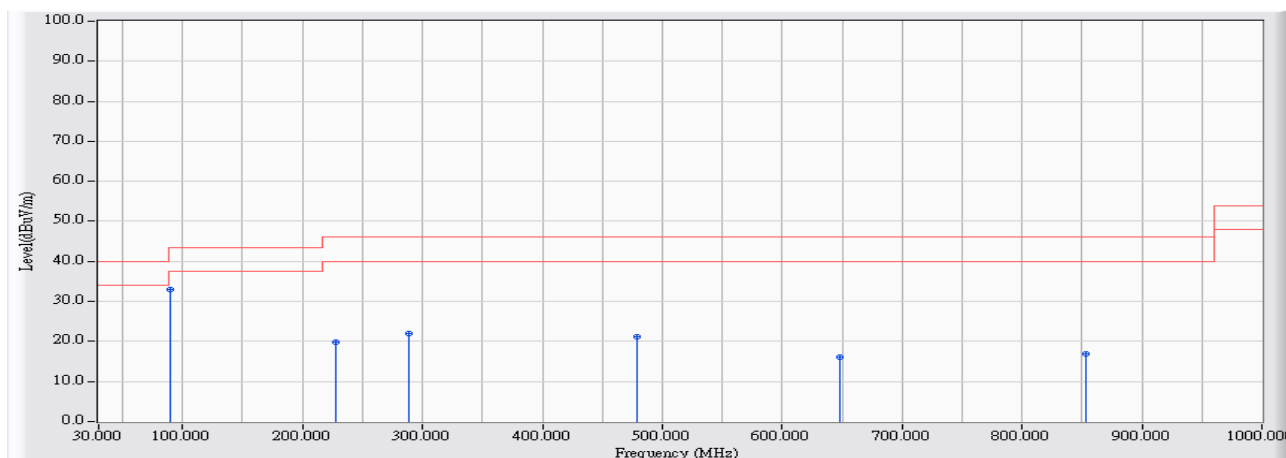


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	89.817	-46.833	83.872	37.039	-6.461	43.500	QUASIPeak
2		215.917	-45.604	74.139	28.535	-14.965	43.500	QUASIPeak
3		419.617	-35.608	57.134	21.526	-24.474	46.000	QUASIPeak
4		576.433	-37.649	53.816	16.167	-29.833	46.000	QUASIPeak
5		860.967	-31.130	50.430	19.300	-26.700	46.000	QUASIPeak
6		953.117	-29.199	50.649	21.450	-24.550	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.

Site : CB1	Time : 2010/04/19 - 19:48
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB1_FCC_30-1G(2009) - VERTICAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : Mode 1: Transmit-USB-2441



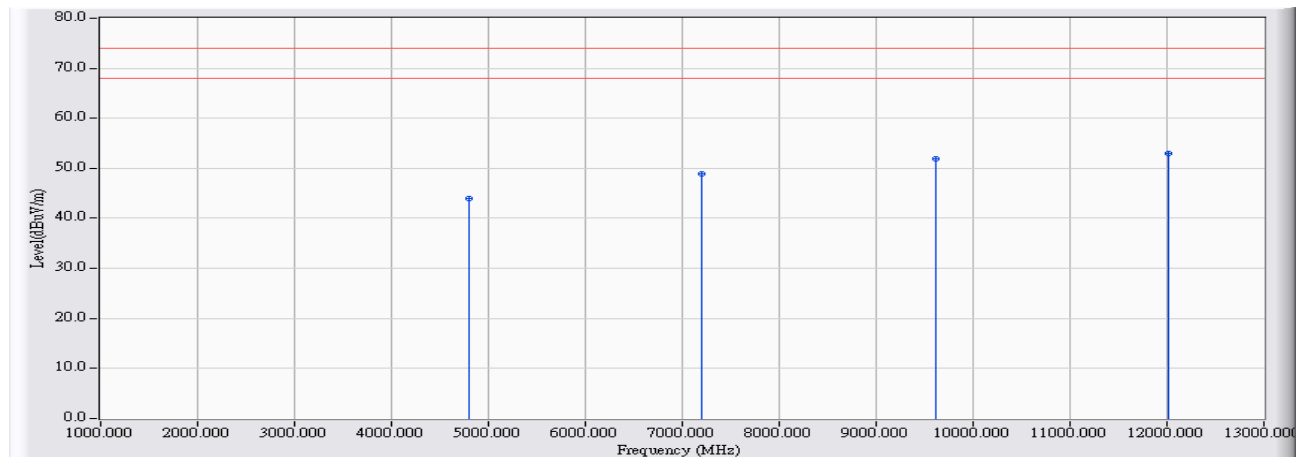
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	89.817	-44.829	77.832	33.003	-10.497	43.500	QUASIPeAK
2		227.233	-43.779	63.627	19.848	-26.152	46.000	QUASIPeAK
3		288.667	-44.400	66.280	21.880	-24.120	46.000	QUASIPeAK
4		479.433	-35.835	57.088	21.253	-24.747	46.000	QUASIPeAK
5		647.567	-33.809	49.996	16.187	-29.813	46.000	QUASIPeAK
6		852.883	-33.991	50.973	16.981	-29.019	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.

**Above 1GHz Spurious:**

Site : CB1	Time : 2010/04/09 - 17:08
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2402

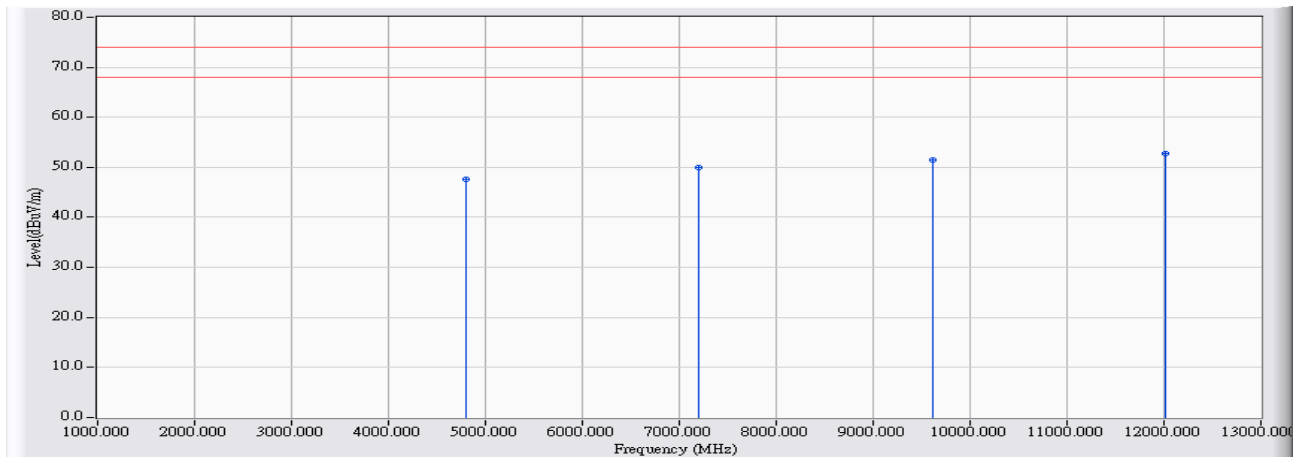


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.200	3.344	40.517	43.861	-30.139	74.000	PEAK
2		7205.640	9.743	39.066	48.809	-25.191	74.000	PEAK
3		9607.800	13.651	38.239	51.891	-22.109	74.000	PEAK
4	*	12010.600	18.804	34.191	52.995	-21.005	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 : 2010/04/09 - 17:15
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - VERTICAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2402

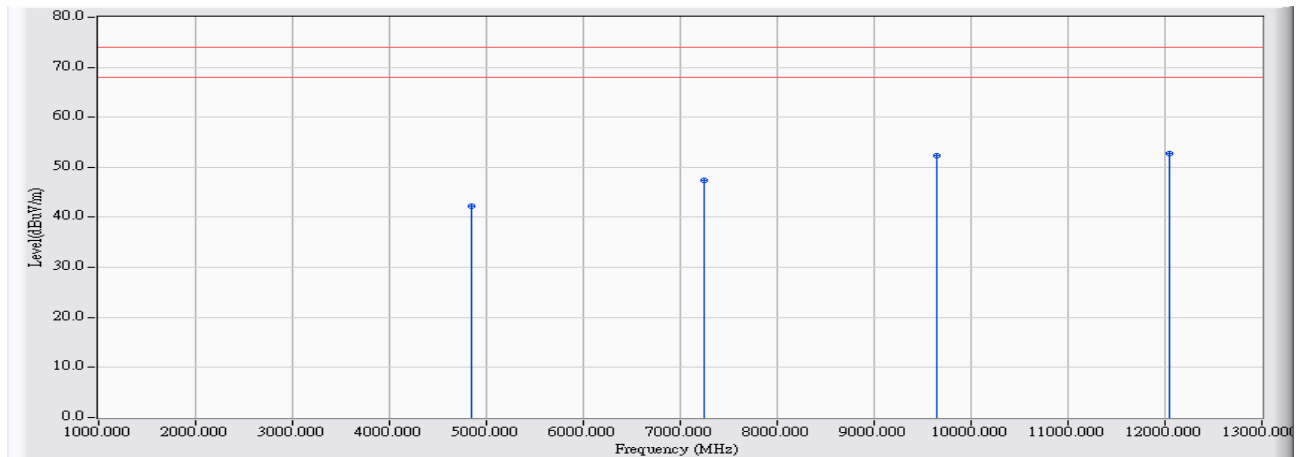


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.100	5.532	42.082	47.614	-26.386	74.000	PEAK
2		7205.600	9.399	40.636	50.035	-23.965	74.000	PEAK
3		9607.880	13.714	37.777	51.492	-22.508	74.000	PEAK
4	*	12010.510	17.435	35.367	52.801	-21.199	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 : 2010/04/09 - 17:24
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2441

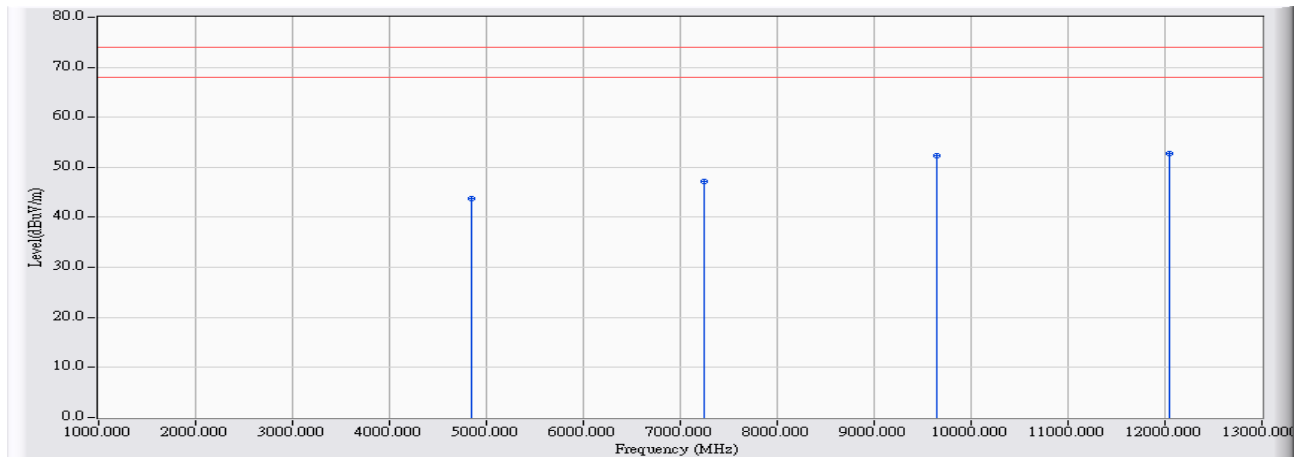


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4843.520	3.449	38.725	42.174	-31.826	74.000	PEAK
2		7245.160	9.925	37.578	47.503	-26.497	74.000	PEAK
3		9647.840	13.812	38.510	52.322	-21.678	74.000	PEAK
4	*	12049.480	18.660	34.172	52.833	-21.167	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 : 2010/04/09 - 17:32
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - VERTICAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2441

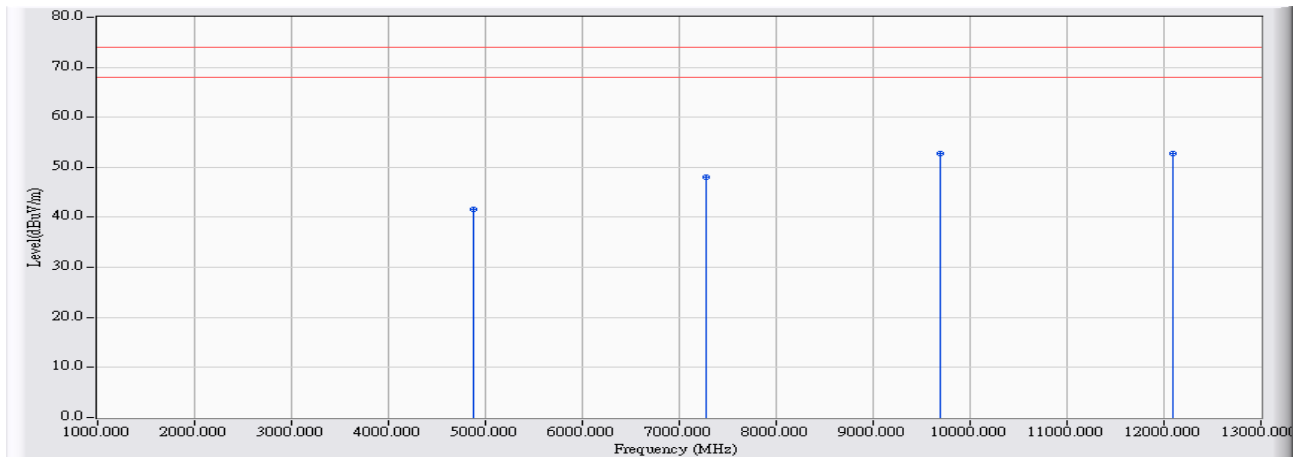


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4842.480	5.557	38.206	43.762	-30.238	74.000	PEAK
2		7244.640	9.475	37.702	47.177	-26.823	74.000	PEAK
3		9647.440	13.916	38.321	52.237	-21.763	74.000	PEAK
4	*	12049.080	17.375	35.427	52.801	-21.199	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 : 2010/04/09 - 17:40
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2480



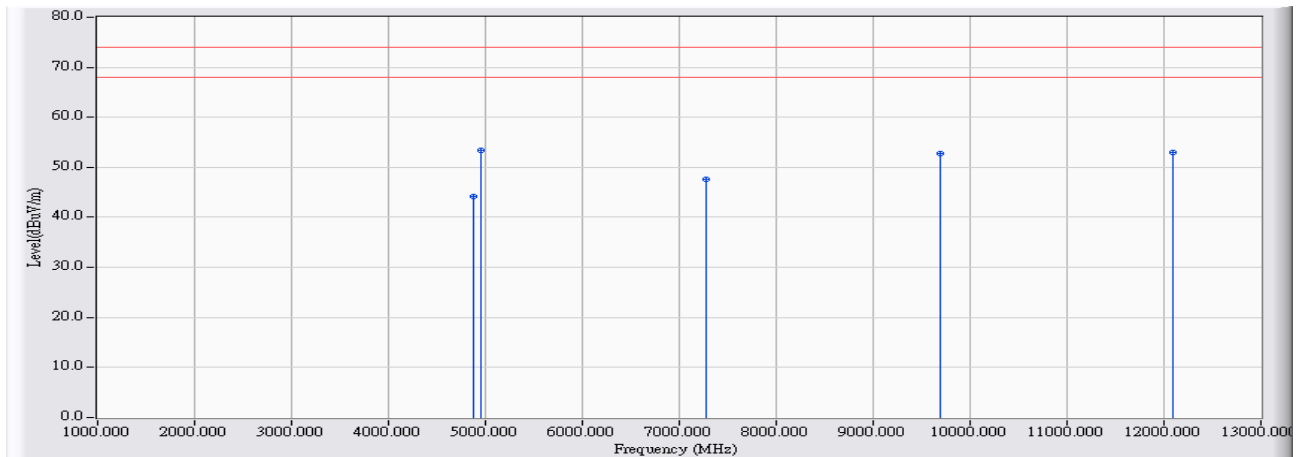
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4882.120	3.553	38.088	41.641	-32.359	74.000	PEAK
2		7284.120	10.104	37.970	48.074	-25.926	74.000	PEAK
3	*	9685.000	13.959	38.903	52.862	-21.138	74.000	PEAK
4		12087.920	18.511	34.286	52.796	-21.204	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 : 2010/04/09 - 17:49
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - VERTICAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2480

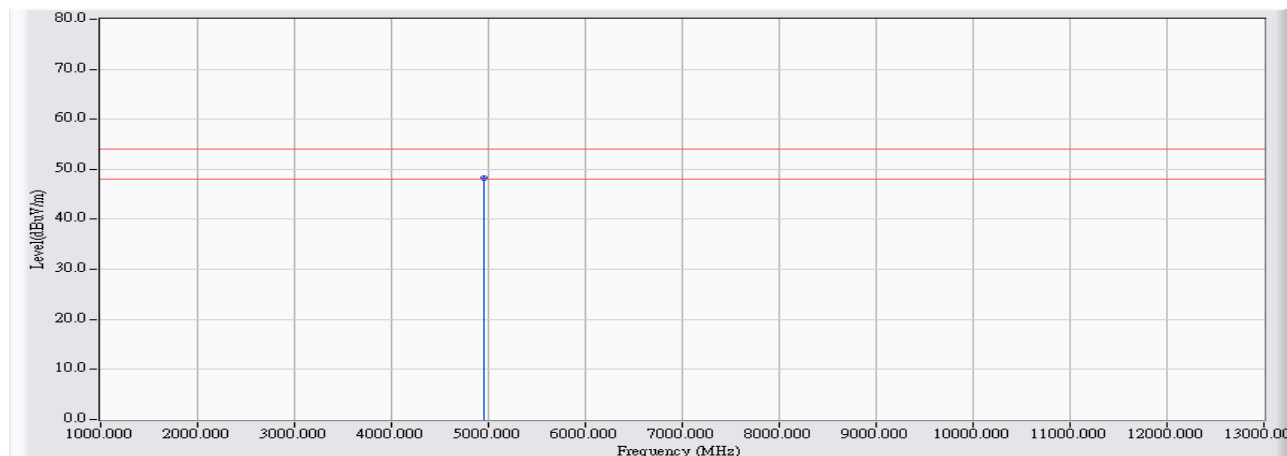


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4882.320	5.581	38.662	44.243	-29.757	74.000	PEAK
2	*	4960.000	5.629	47.869	53.498	-20.502	74.000	PEAK
3		7284.520	9.553	37.958	47.511	-26.489	74.000	PEAK
4		9685.160	14.106	38.751	52.857	-21.143	74.000	PEAK
5		12088.840	17.304	35.578	52.881	-21.119	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 : 2010/04/09 - 18:19
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G(2009-06) - VERTICAL	Power : AC 120V/60Hz
EUT : 760 GPS Recorder	Note : Mode 1: Transmit-USB-2480



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.100	5.629	42.620	48.249	-5.751	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.
7. The Emission above 13GHz were not included is because their levels are too low.

## 5. RF antenna conducted test

### 5.1. Test Equipment

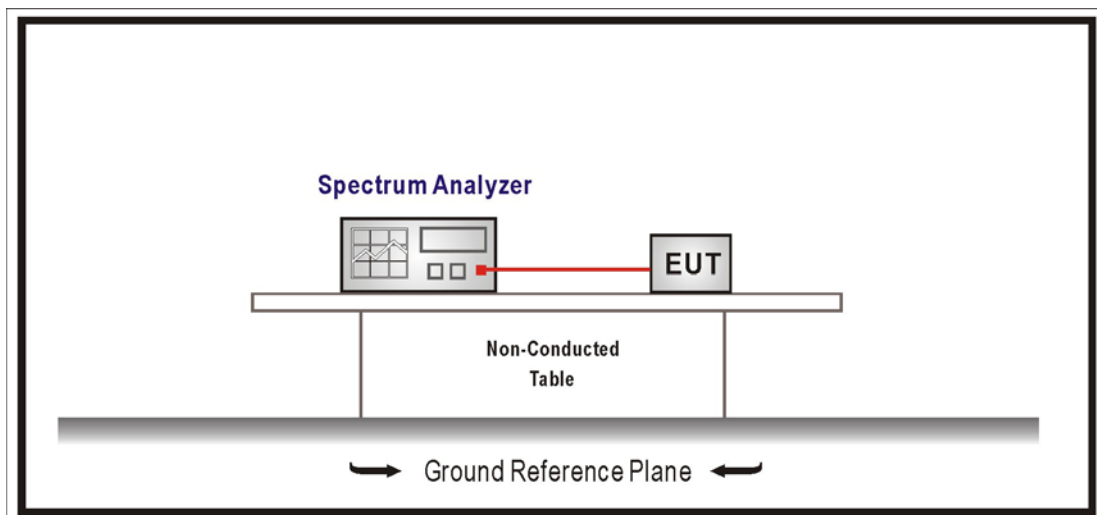
The following test equipments are used during the test:

RF Conducted Measurement:				
Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP40 / 100005	2010/08/25
2	No.1 OATS			Sep., 2010

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

### 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, 2003 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.

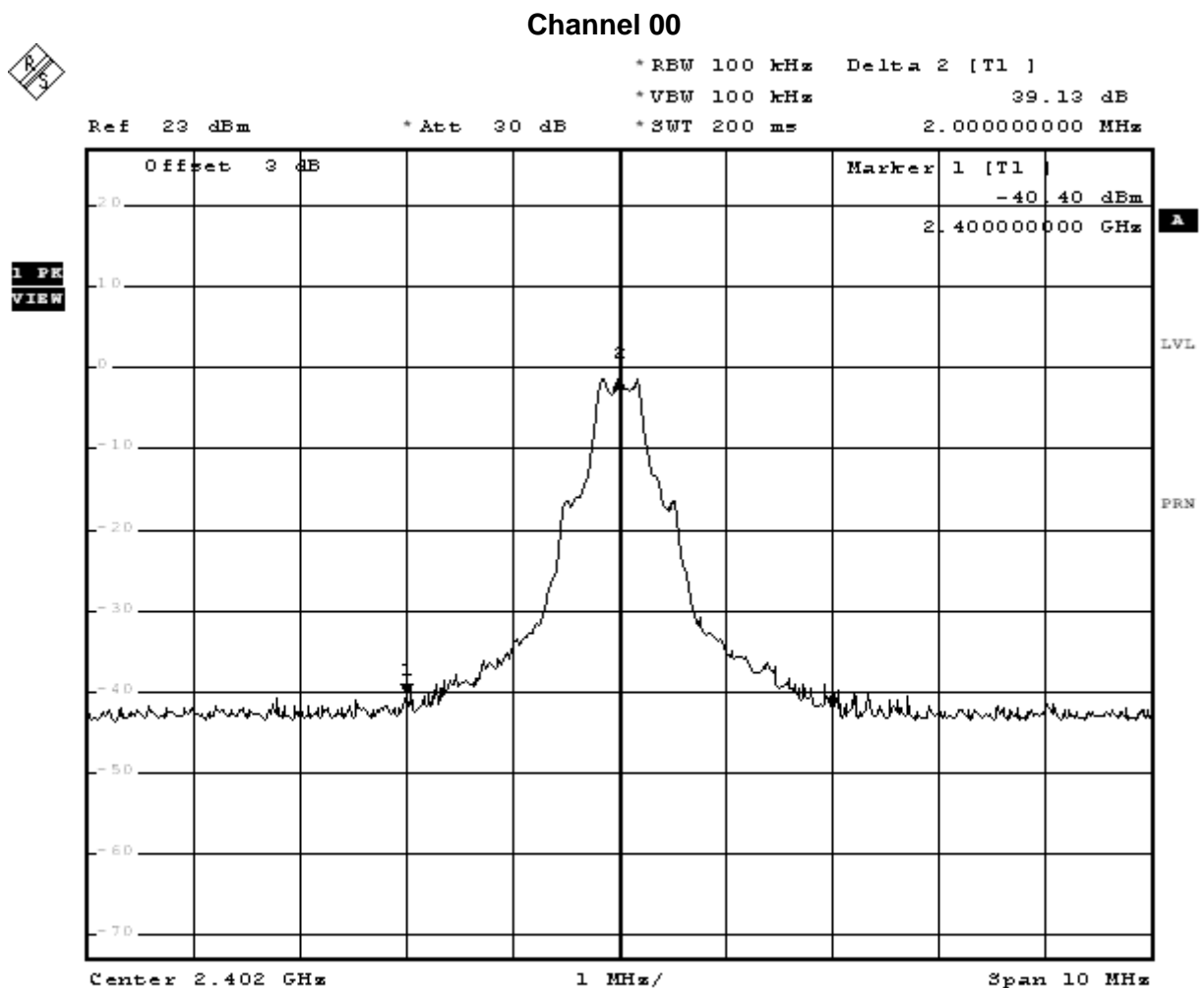
### **5.5. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 5.6. Test Result

Product	760 GPS Recorder		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dBc)	Result
00	2402	39.13	$\geq 20$	Pass
78	2480	44.27	$\geq 20$	Pass



Date: 9.APR.2010 16:11:17

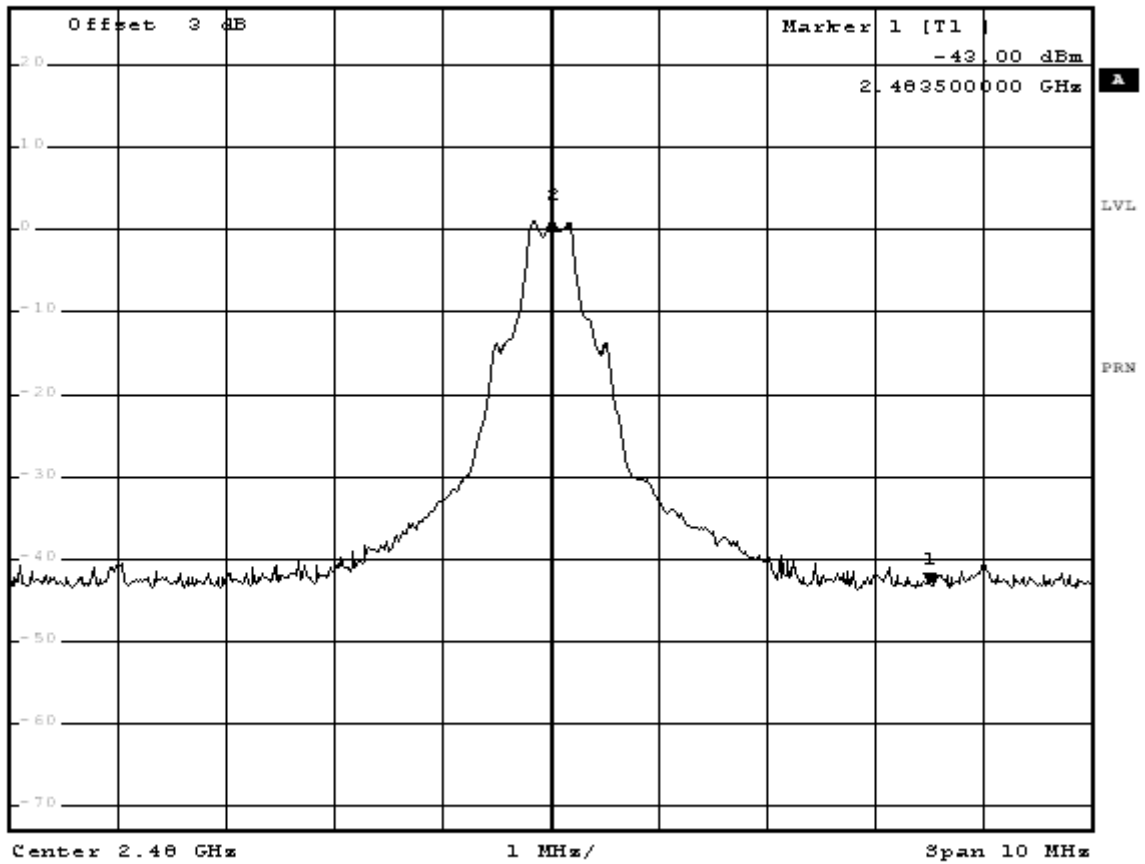
## Channel 78



\*RBW 100 kHz Delta 2 [T1 ]  
 \*VBW 100 kHz 44.27 dB  
 \*SWT 200 ms -3.480000000 MHz

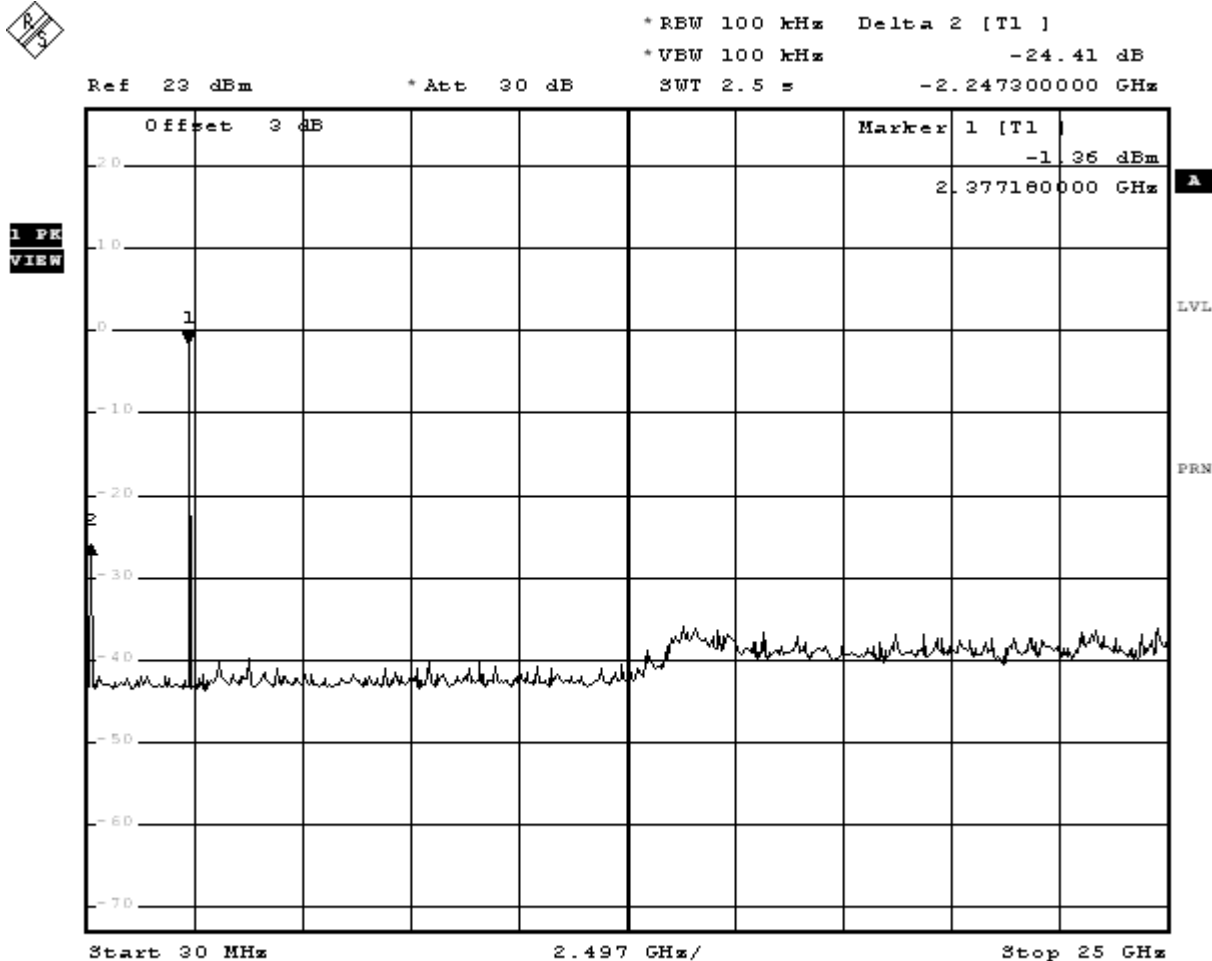
Ref 23 dBm \*Att 30 dB

1 PK  
VIEW



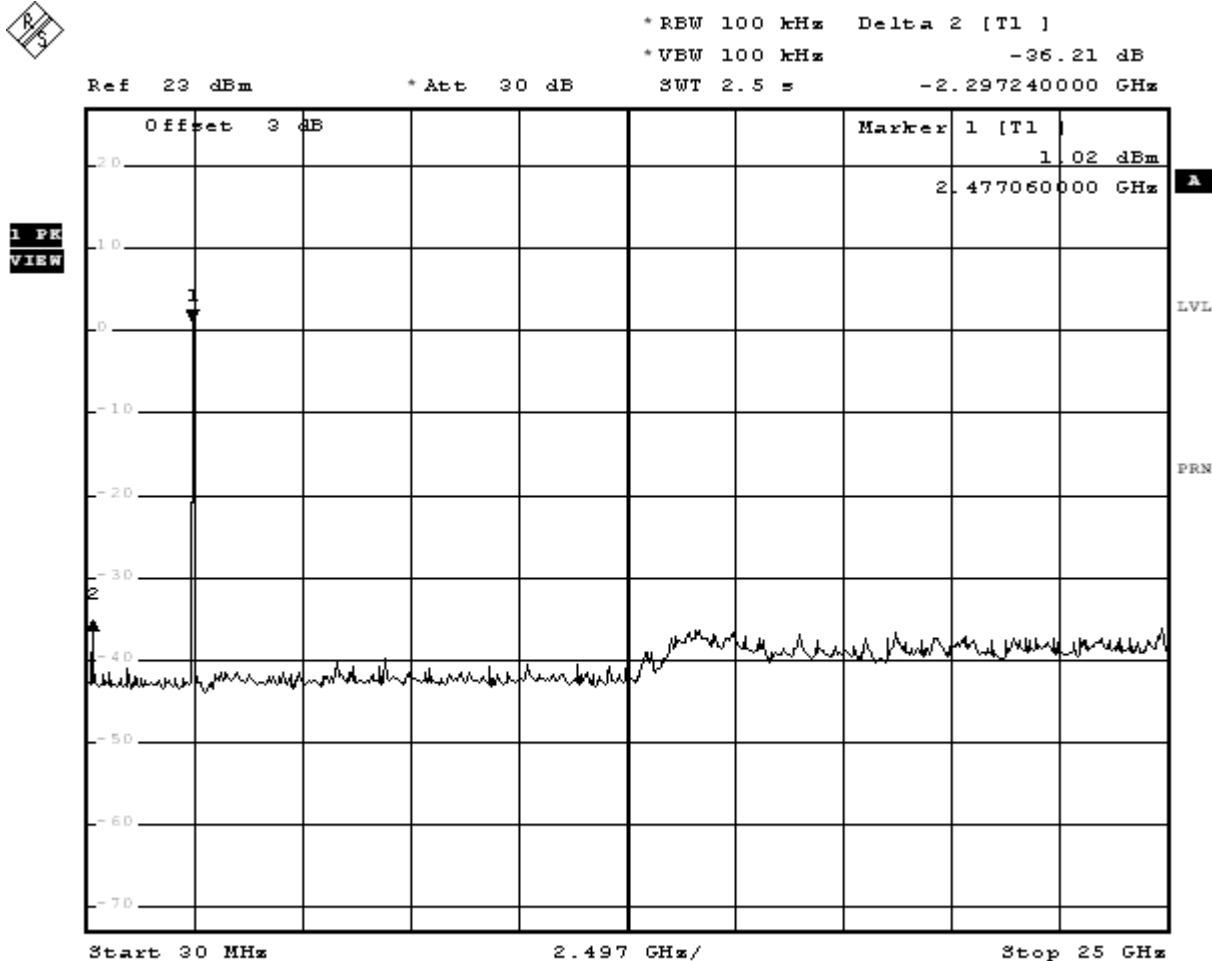
Date: 9.APR.2010 16:10:02

Channel 00 (30-25000)



Date: 9.APR.2010 16:19:51

Channel 78 (30-25000)



Date: 9.APR.2010 16:21:10



## 6. Band Edge

### 6.1. Test Equipment

The following test equipments are used during the test:

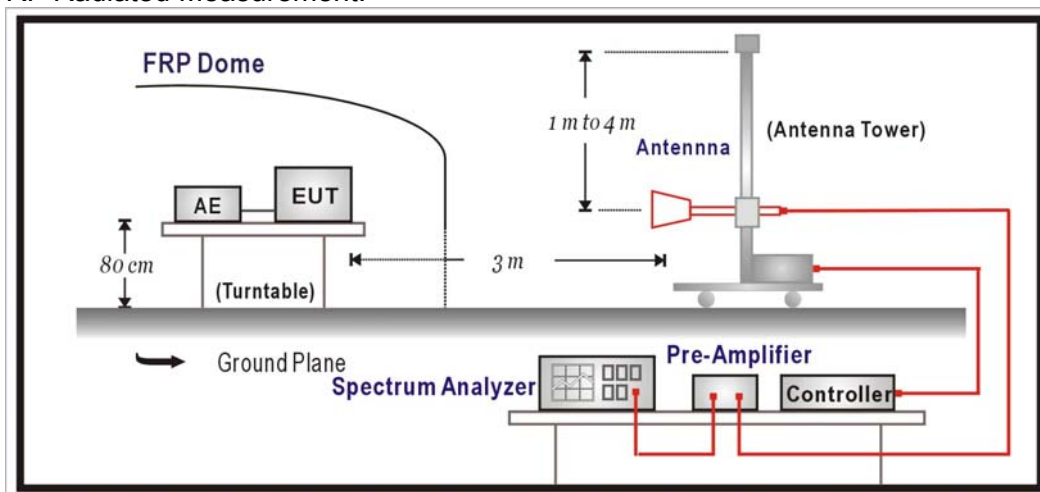
RF Radiated Measurement:					
Item	Equipment		Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2010
2	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2011
3		Loop Antenna	R & S	HFH2-Z2 / 833799/004	Sep., 2010
4		BiconiLog Antenna	Schwarzbeck	VULB 9166 / 1061	Sep., 2010
5		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2010
6	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Sep., 2010
7	No.1 OATS				Sep., 2010

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

2. Mark "X" test instruments are used to measure the final test results.

### 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, 2003 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.

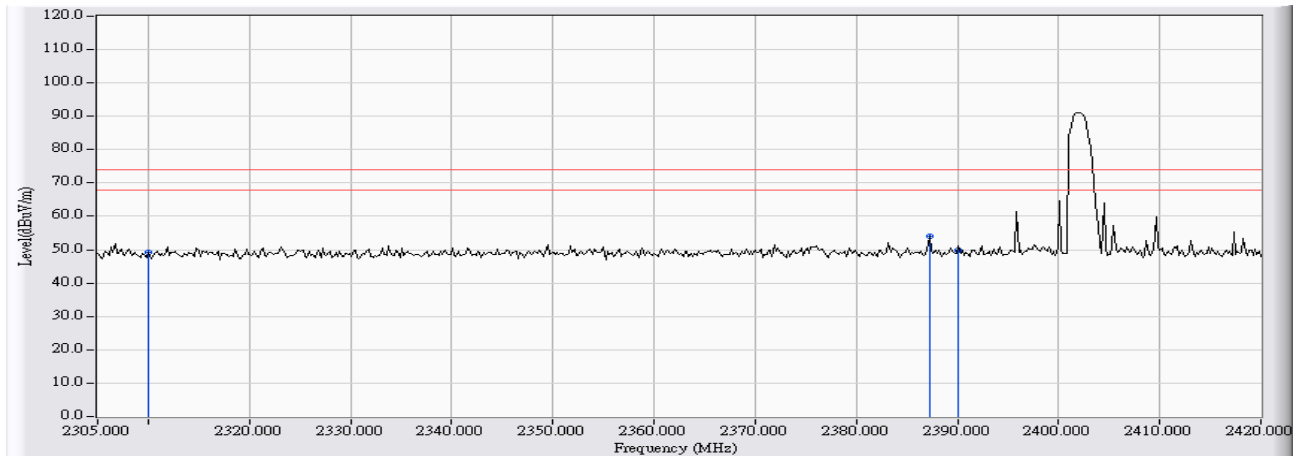
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

### **6.5. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 6.6. Test Result

Site : Site1	Time : 2010/04/19 - 20:20
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2404

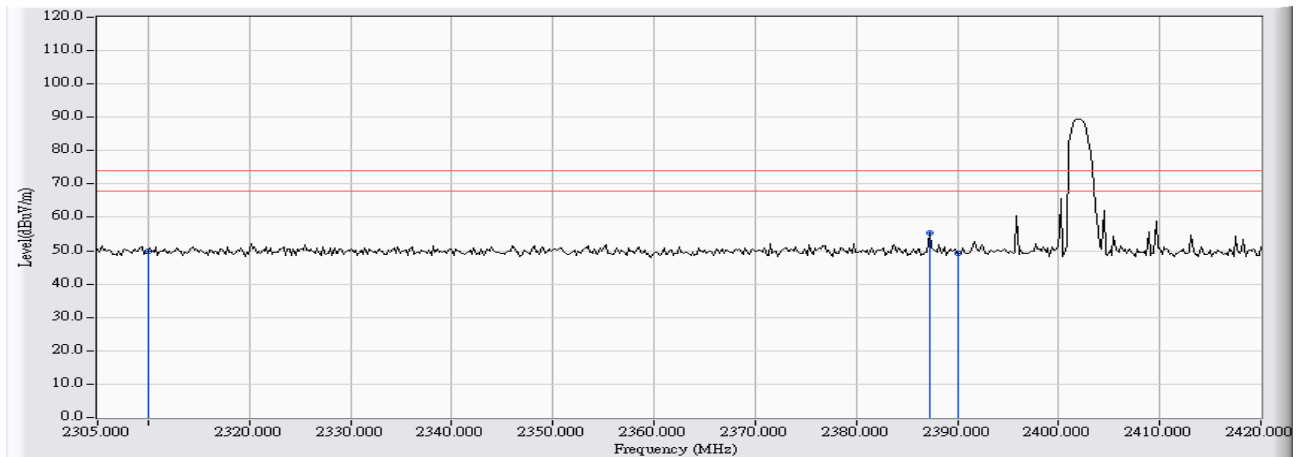


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	27.154	22.142	49.296	-24.704	74.000	PEAK
2	*	2387.225	27.535	26.507	54.042	-19.958	74.000	PEAK
3		2390.000	27.549	22.457	50.006	-23.994	74.000	PEAK

### 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 : Site1	Time : 2010/04/19 - 20:25
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2404

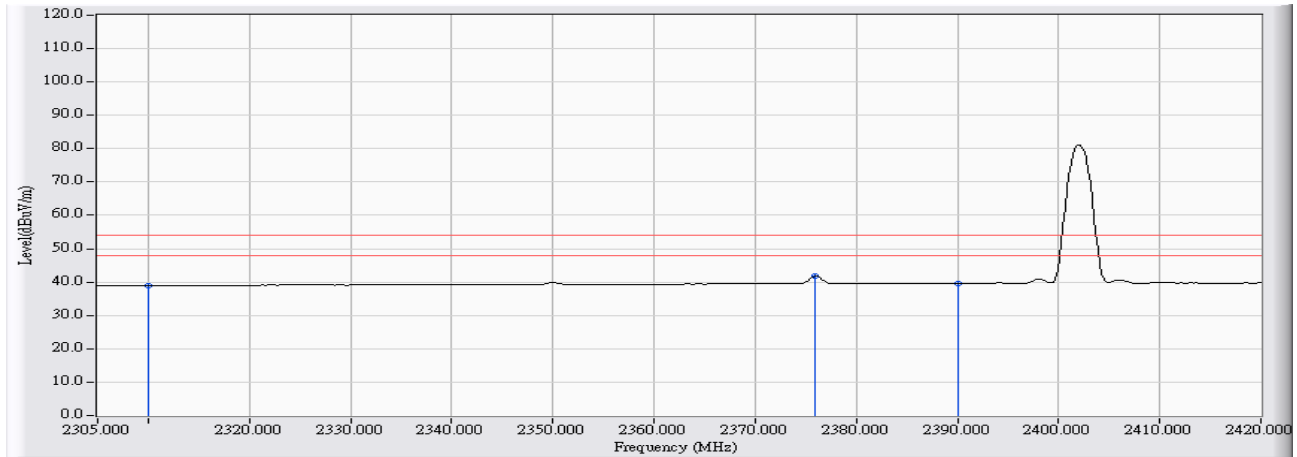


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	27.780	21.946	49.726	-24.274	74.000	PEAK
2	*	2387.225	27.385	27.914	55.299	-18.701	74.000	PEAK
3		2390.000	27.371	21.921	49.291	-24.709	74.000	PEAK

**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 : Site1	Time : 2010/04/19 - 20:21
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2404

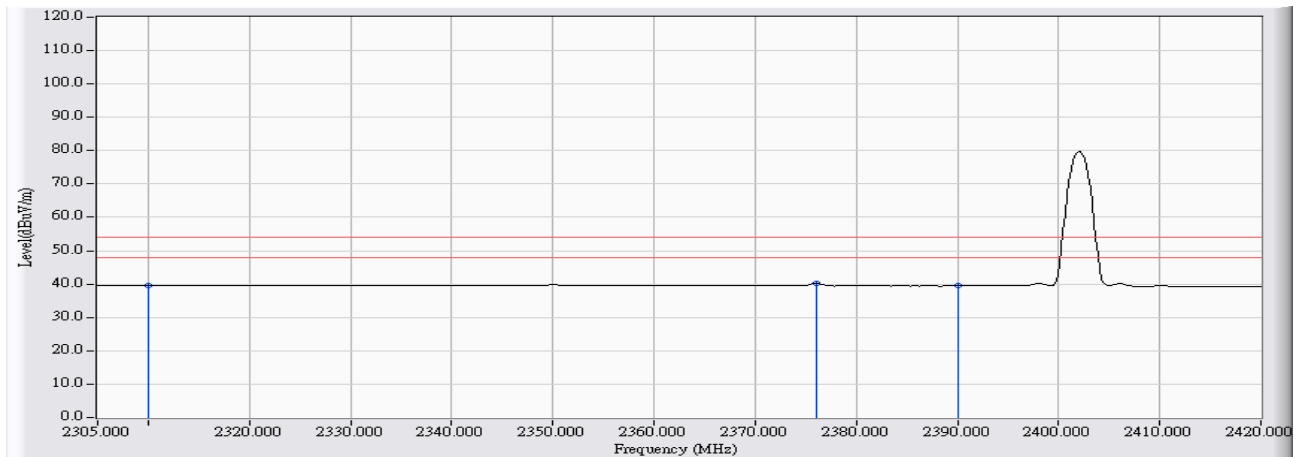


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	27.154	11.863	39.017	-14.983	54.000	AVERAGE
2	*	2375.917	27.480	14.272	41.752	-12.248	54.000	AVERAGE
3		2390.000	27.549	12.075	39.624	-14.376	54.000	AVERAGE

**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 : Site1	Time : 2010/04/19 - 20:25
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2404

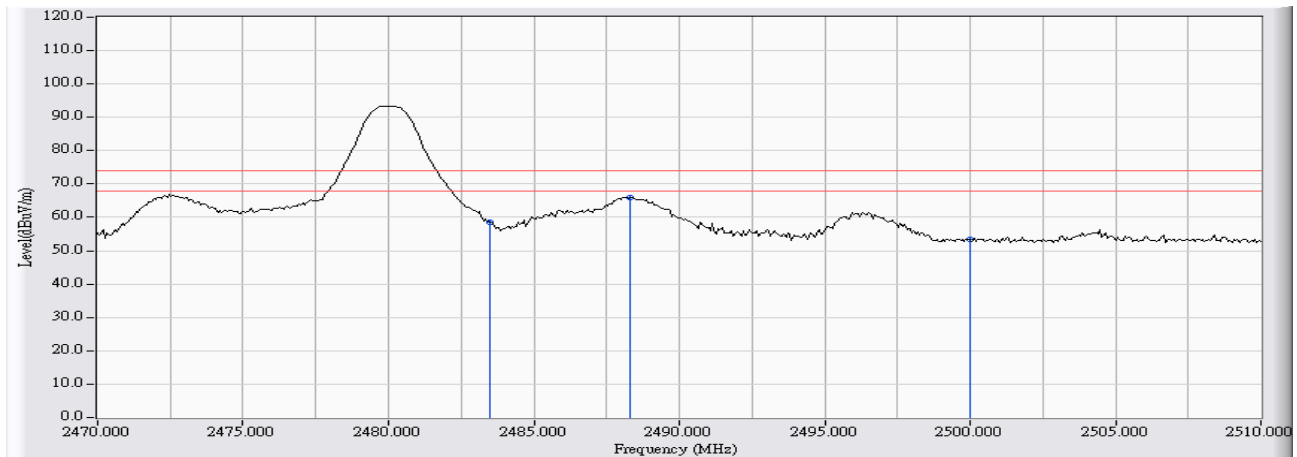


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	27.780	11.842	39.622	-14.378	54.000	AVERAGE
2	*	2376.108	27.442	12.797	40.240	-13.760	54.000	AVERAGE
3		2390.000	27.371	12.070	39.440	-14.560	54.000	AVERAGE

**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 : Site1	Time : 2010/04/19 - 20:38
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2480

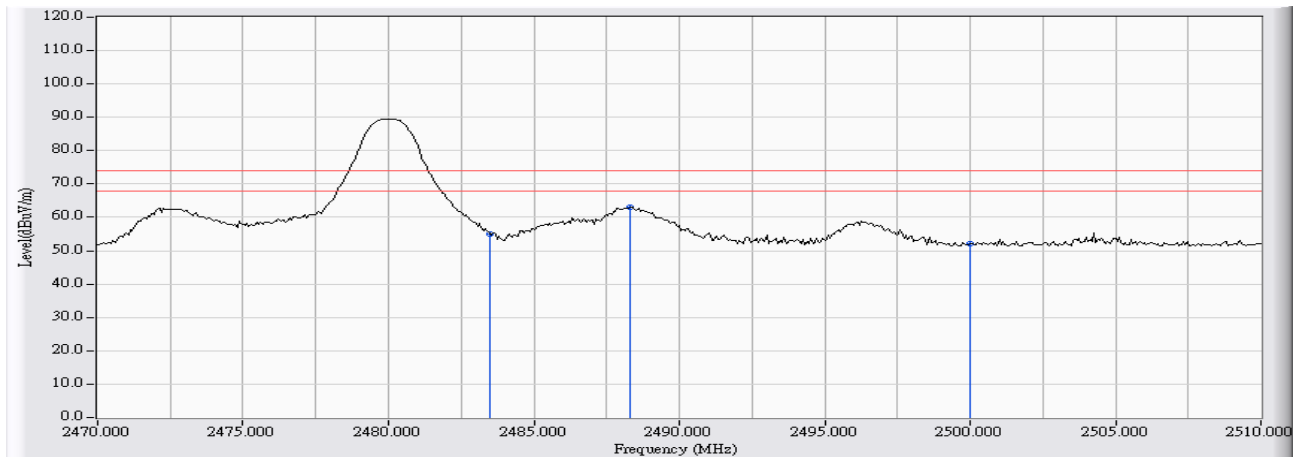


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2483.500	28.018	30.548	58.566	-15.434	74.000	PEAK
2	*	2488.333	28.042	38.014	66.056	-7.944	74.000	PEAK
3		2500.000	28.097	25.259	53.356	-20.644	74.000	PEAK

**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 : Site1	Time : 2010/04/19 - 20:44
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2480



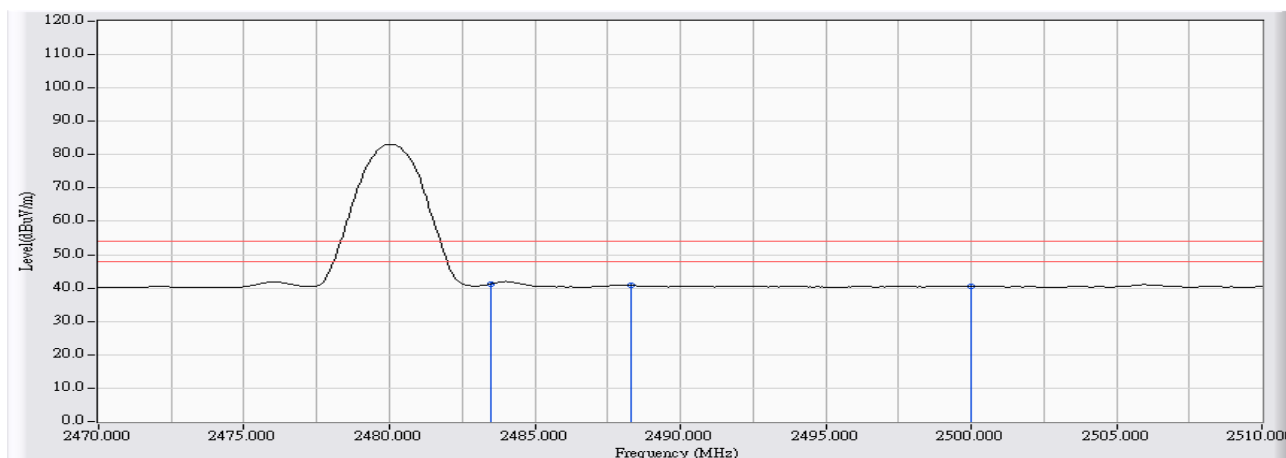
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2483.500	26.896	28.176	55.073	-18.927	74.000	PEAK
2	*	2488.333	26.868	36.134	63.002	-10.998	74.000	PEAK
3		2500.000	26.834	25.228	52.062	-21.938	74.000	PEAK

**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 : Site1	Time : 2010/04/19 - 20:39
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-2480

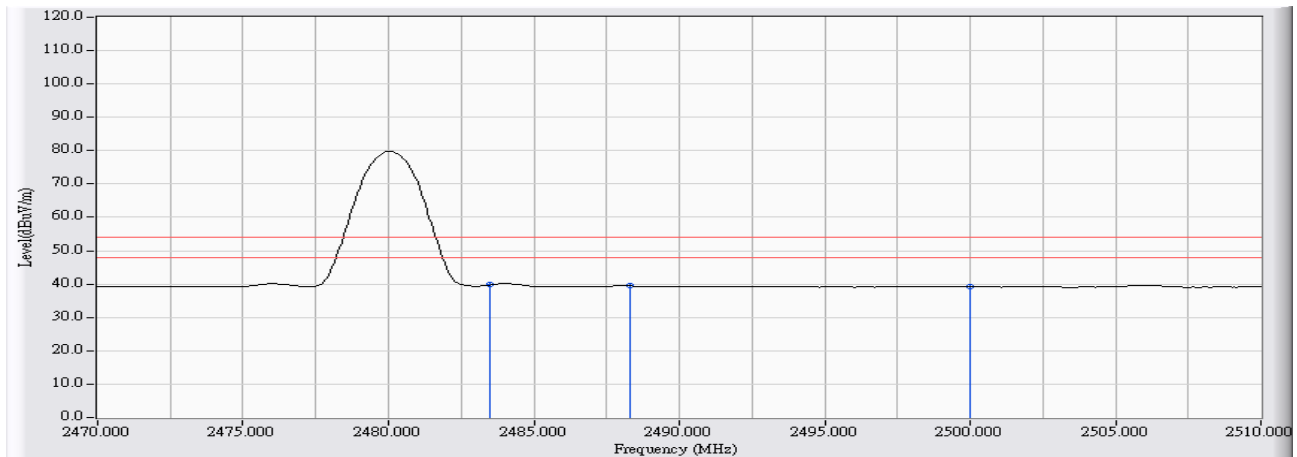


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	28.018	13.287	41.305	-12.695	54.000	AVERAGE
2		2488.333	28.042	12.749	40.791	-13.209	54.000	AVERAGE
3		2500.000	28.097	12.286	40.383	-13.617	54.000	AVERAGE

## 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 : Site1	Time : 2010/04/19 - 20:45
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : Site1_FCC_EFS_1-18G(2009-11) - VERTICAL	Power : AC 120V/60Hz
EUT : 765 GPS Recorder	Note : TX-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	12.850	39.747	-14.253	54.000	AVERAGE
2		2488.333	26.868	12.587	39.455	-14.545	54.000	AVERAGE
3		2500.000	26.834	12.283	39.117	-14.883	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

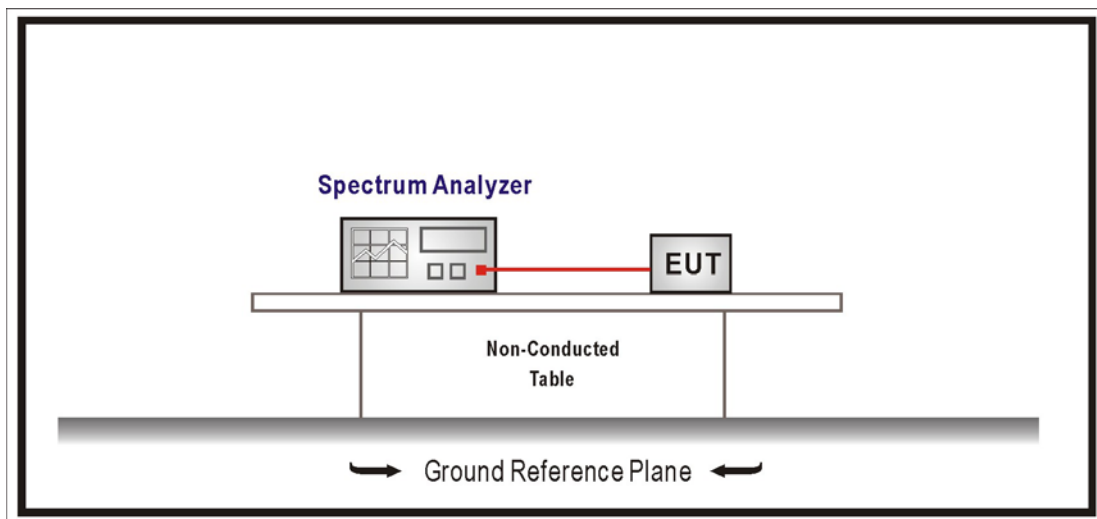
### 7.1. Test Equipment

The following test equipments are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Jan., 2011
2	No.1 OATS			Sep., 2010

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, 2003 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

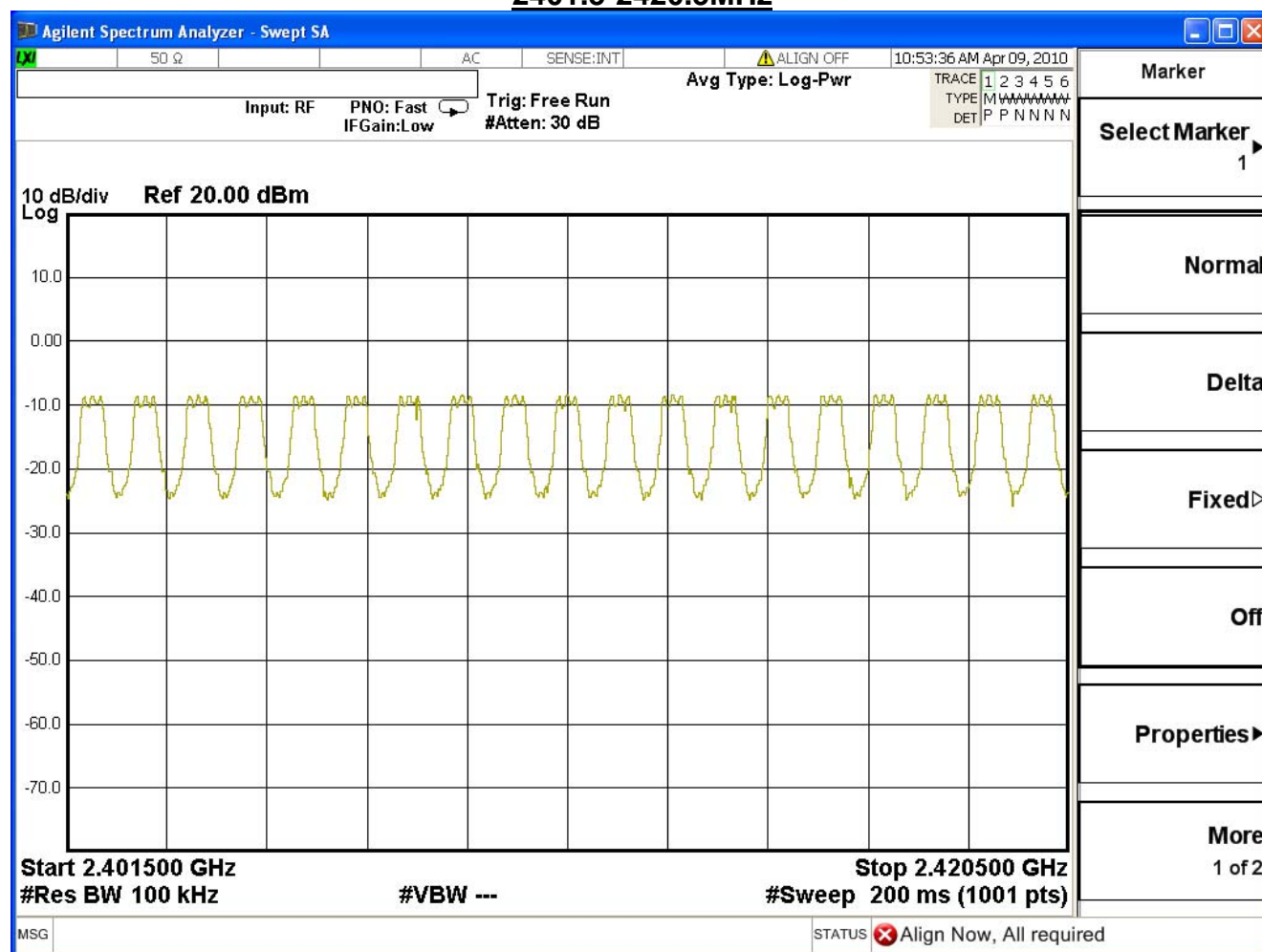
According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 7.6. Test Result

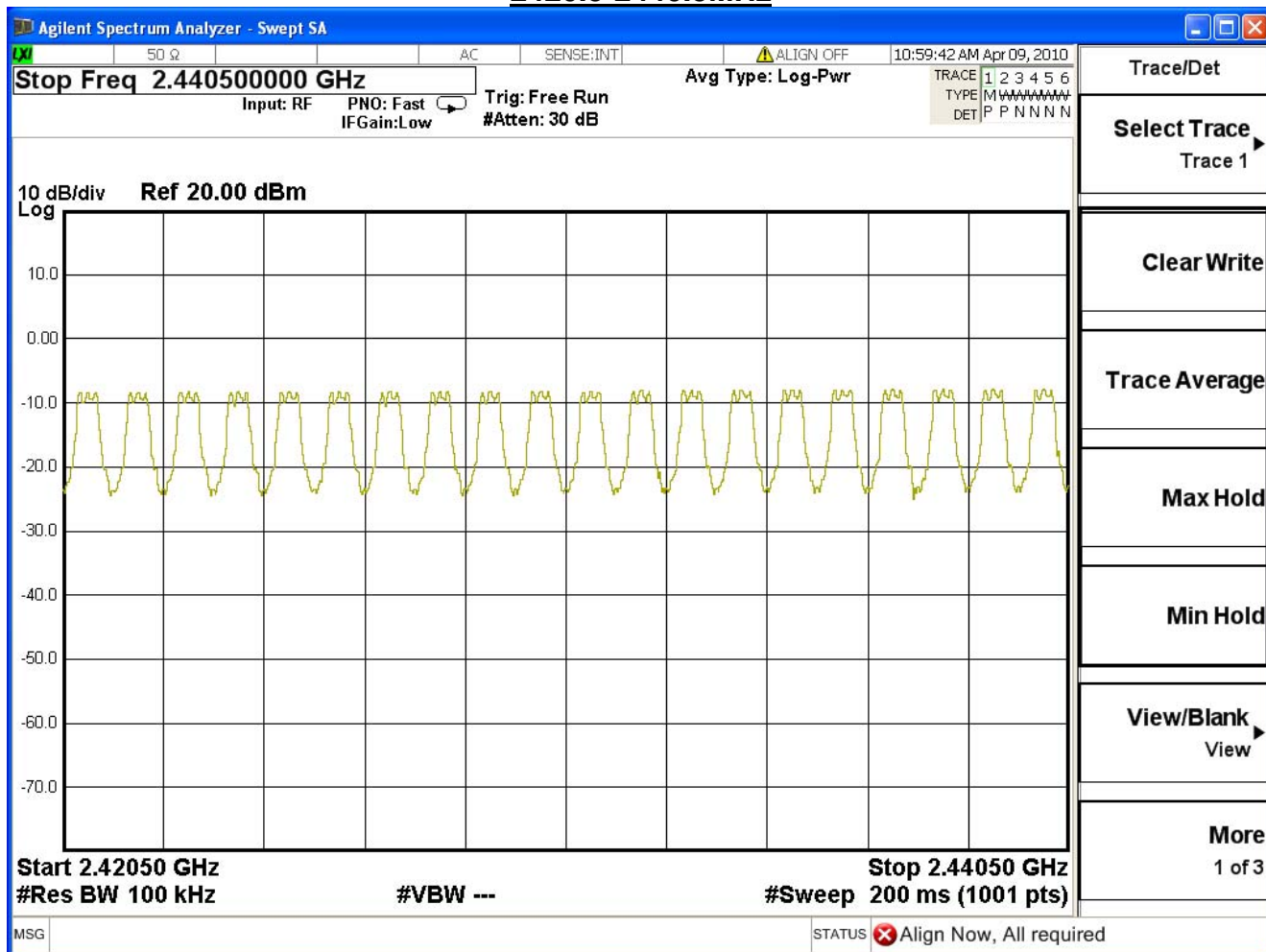
Product	760 GPS Recorder		
Test Item	Number of hopping frequency		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

Frequency Range (MHz)	Measure Level (Hopping Channel)	Limit (Hopping Channel)	Result
2400 ~ 2483.5	79	>75	Pass

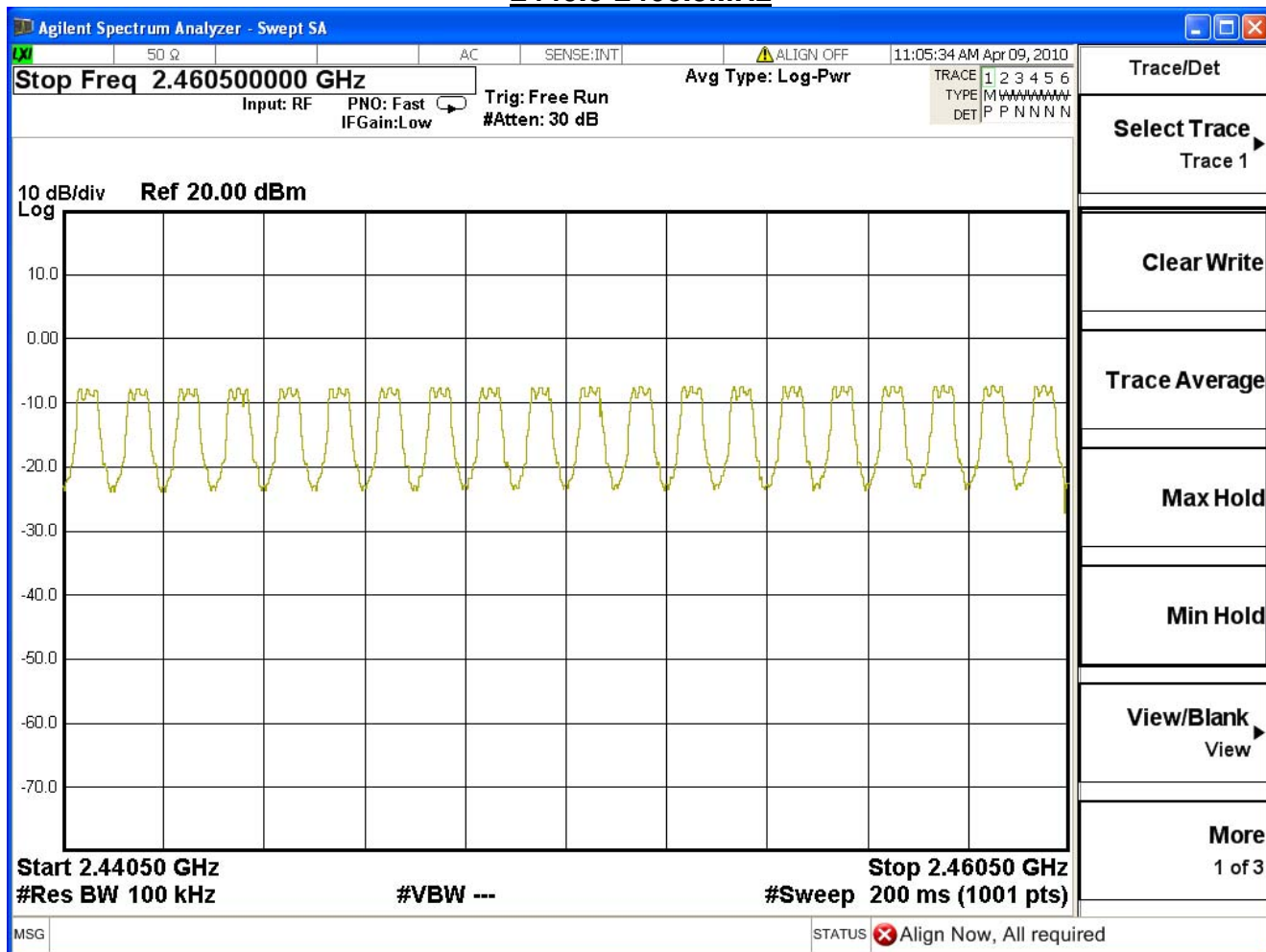
### 2401.5-2420.5MHz



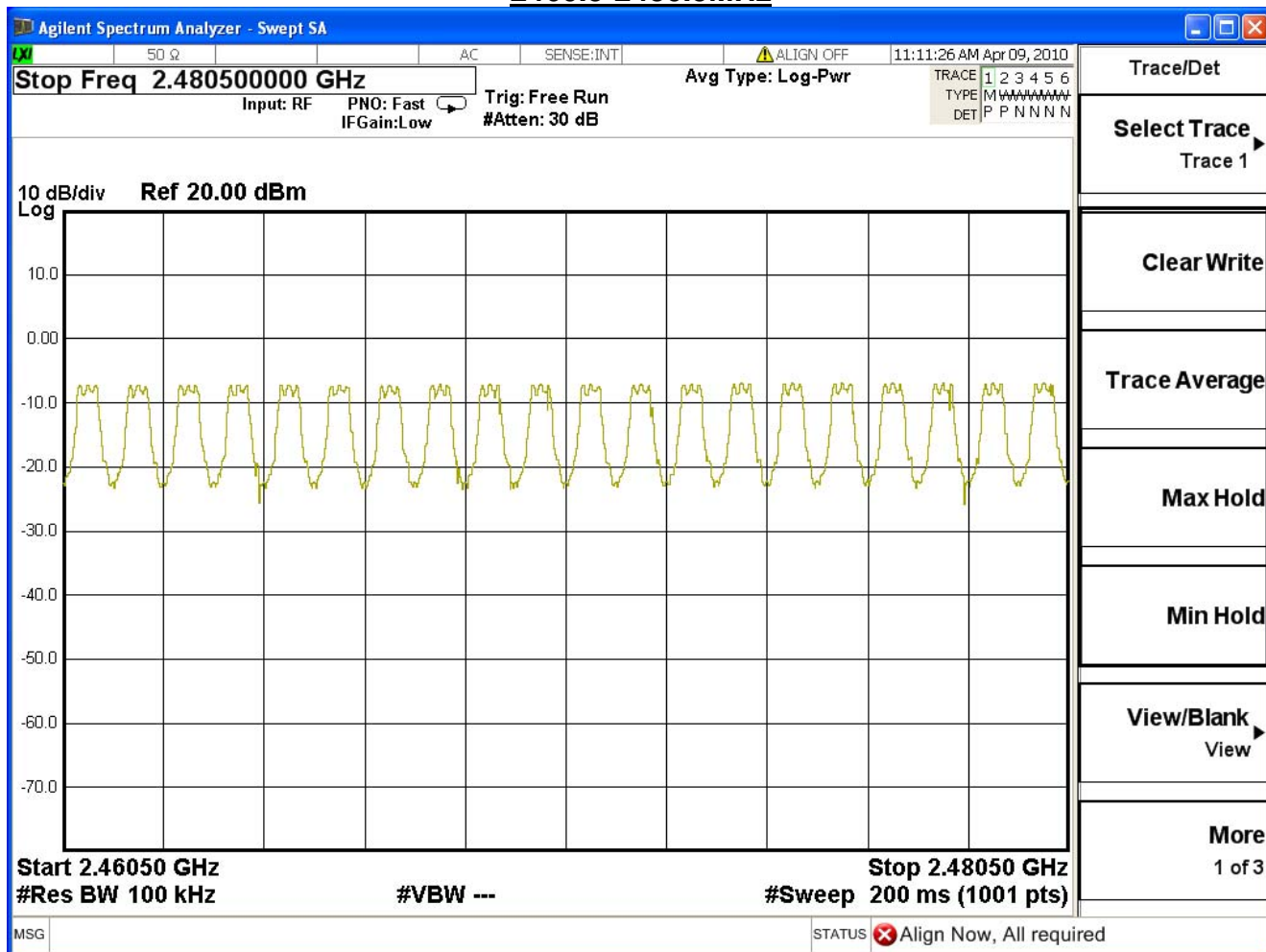
2420.5-2440.5MHz



2440.5-2460.5MHz



2460.5-2480.5MHz





## 8. Carrier Frequency Separation

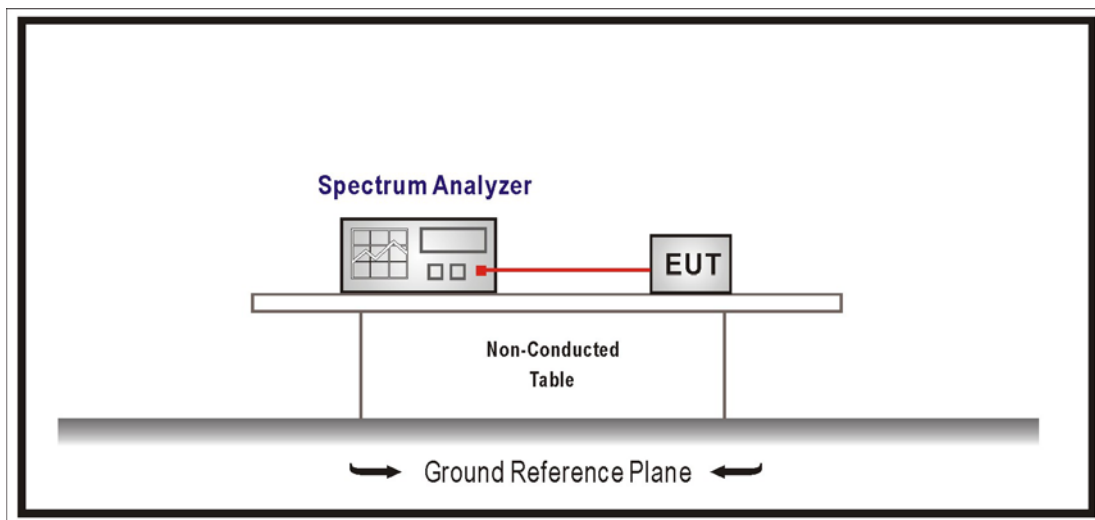
### 8.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Jan., 2011
2	No.1 OATS			Sep., 2010

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, 2003 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

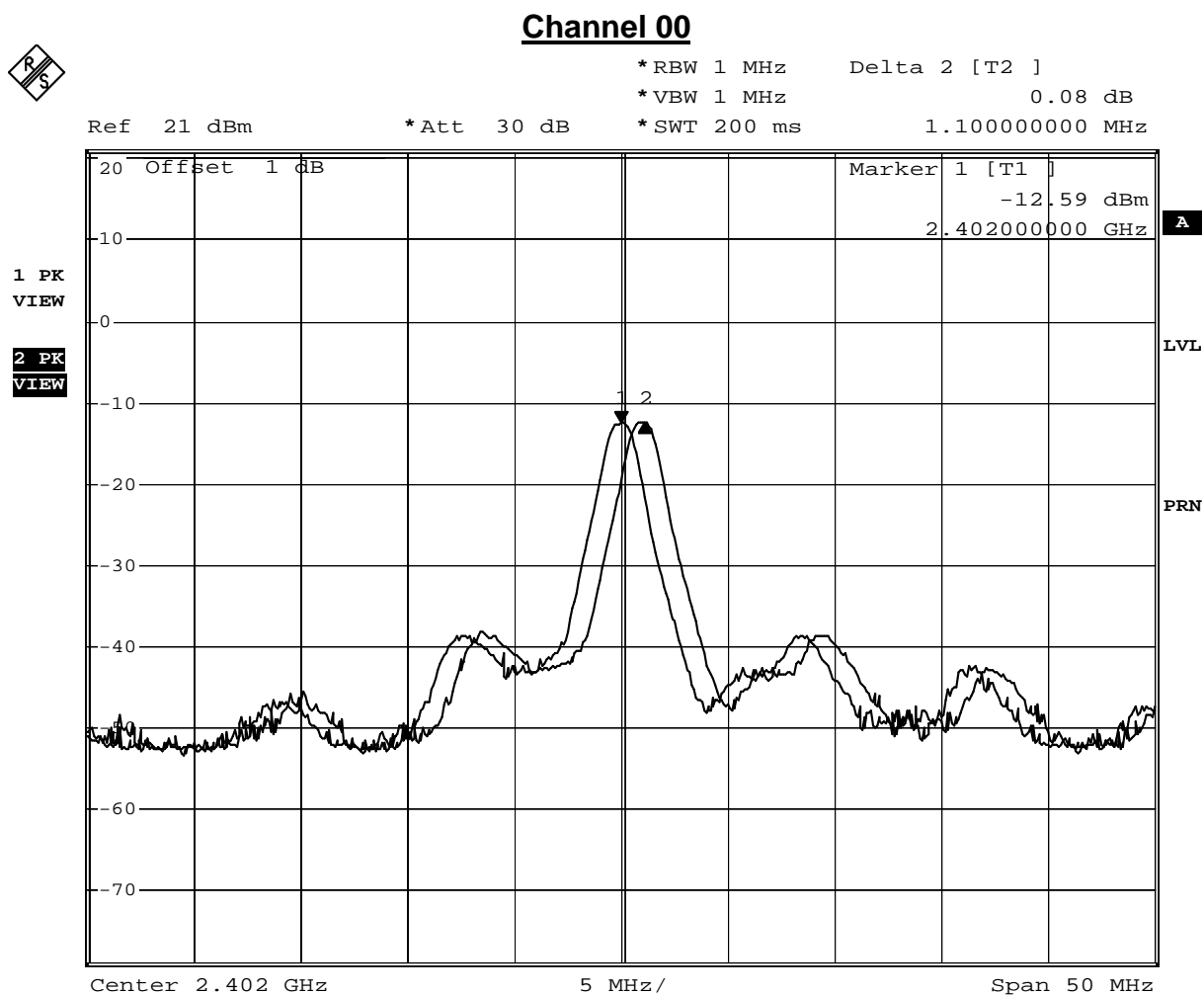
### 8.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 8.6. Test Result

Product	760 GPS Recorder		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402	1.1	>0.77	Pass



Date: 21.APR.2010 09:45:30

Product	760 GPS Recorder		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
39	2441	1.1	>0.77	Pass

## Channel 39



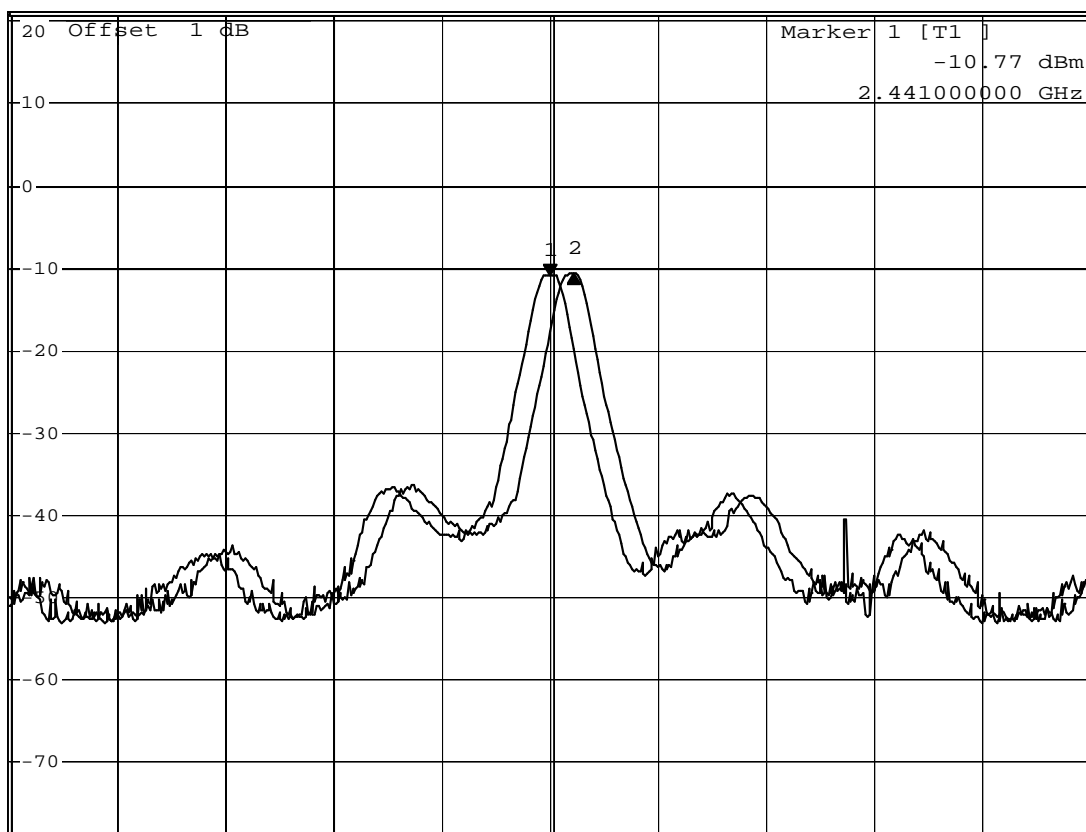
\*RBW 1 MHz      Delta 2 [T2 ]  
 \*VBW 1 MHz      0.08 dB  
 \*SWT 200 ms      1.100000000 MHz

Ref 21 dBm

\*Att 30 dB

1 PK  
VIEW

2 PK  
VIEW



Center 2.441 GHz

5 MHz/

Span 50 MHz

Date: 21.APR.2010 09:47:53

Product	760 GPS Recorder		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
78	2480	1.1	>0.77	Pass

## Channel 78



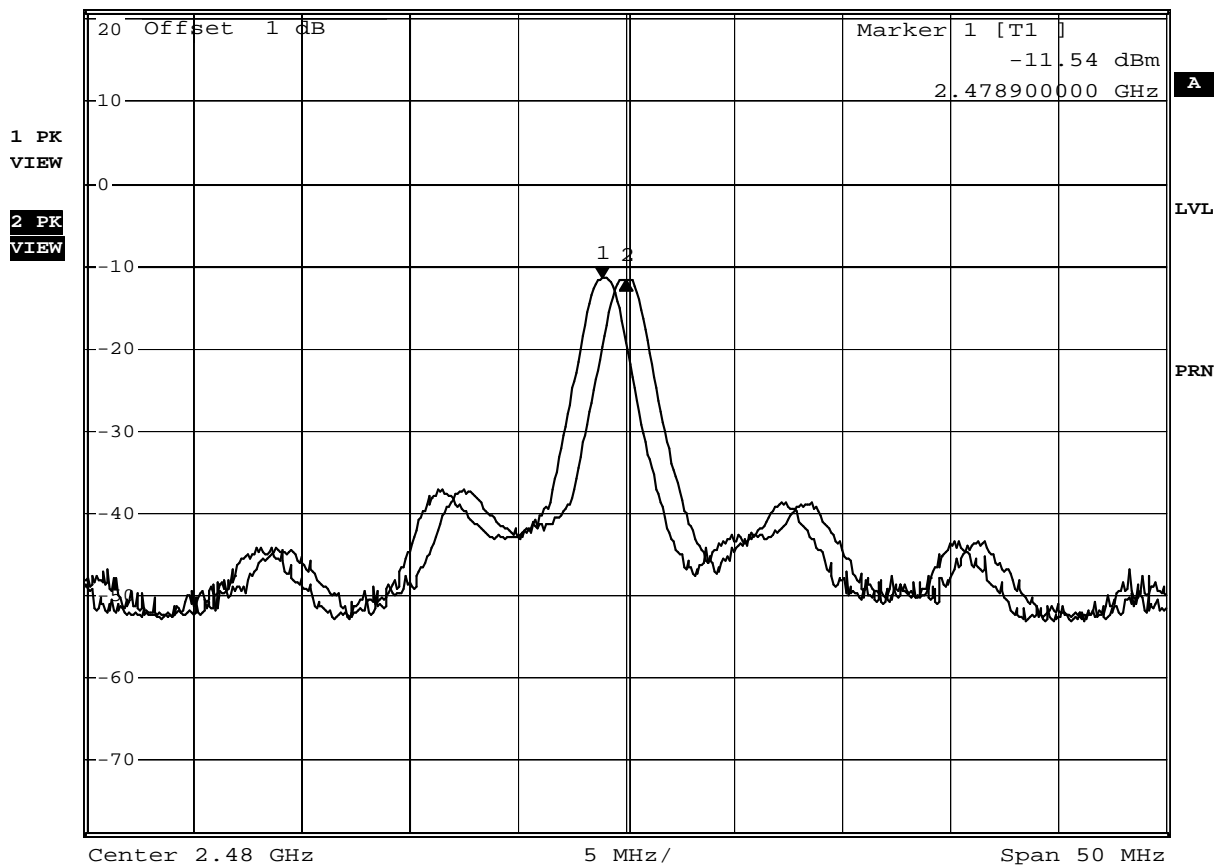
\*RBW 1 MHz      Delta 2 [T2 ]  
 \*VBW 1 MHz      -0.01 dB  
 \*SWT 200 ms      1.100000000 MHz

Ref 21 dBm

\*Att 30 dB

\*SWT 200 ms

1.100000000 MHz



Date: 21.APR.2010 09:50:00

## 9. Occupied Bandwidth

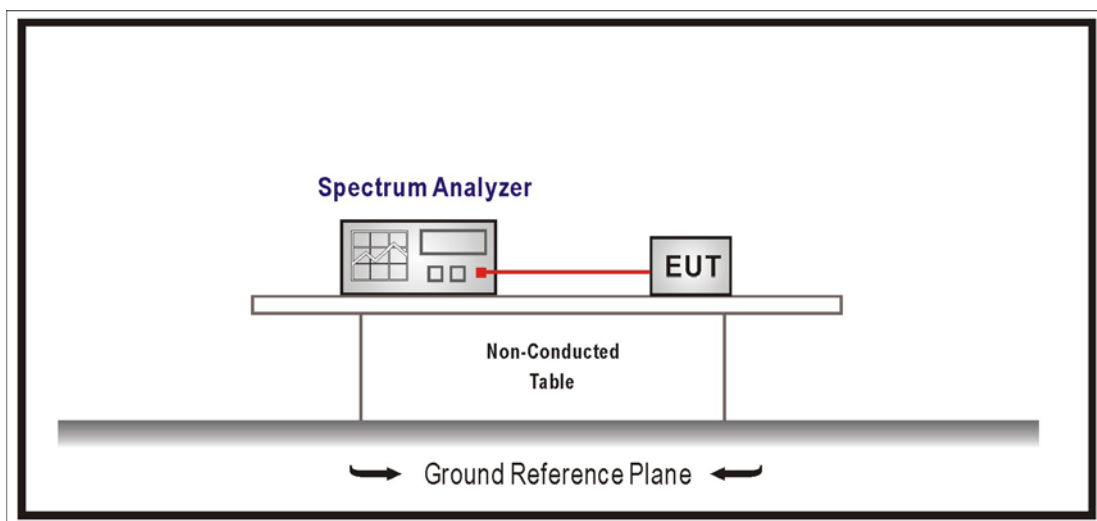
### 9.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP40 / 100005	2010/08/25
2	No.1 OATS			Sep., 2010

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, 2003 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**

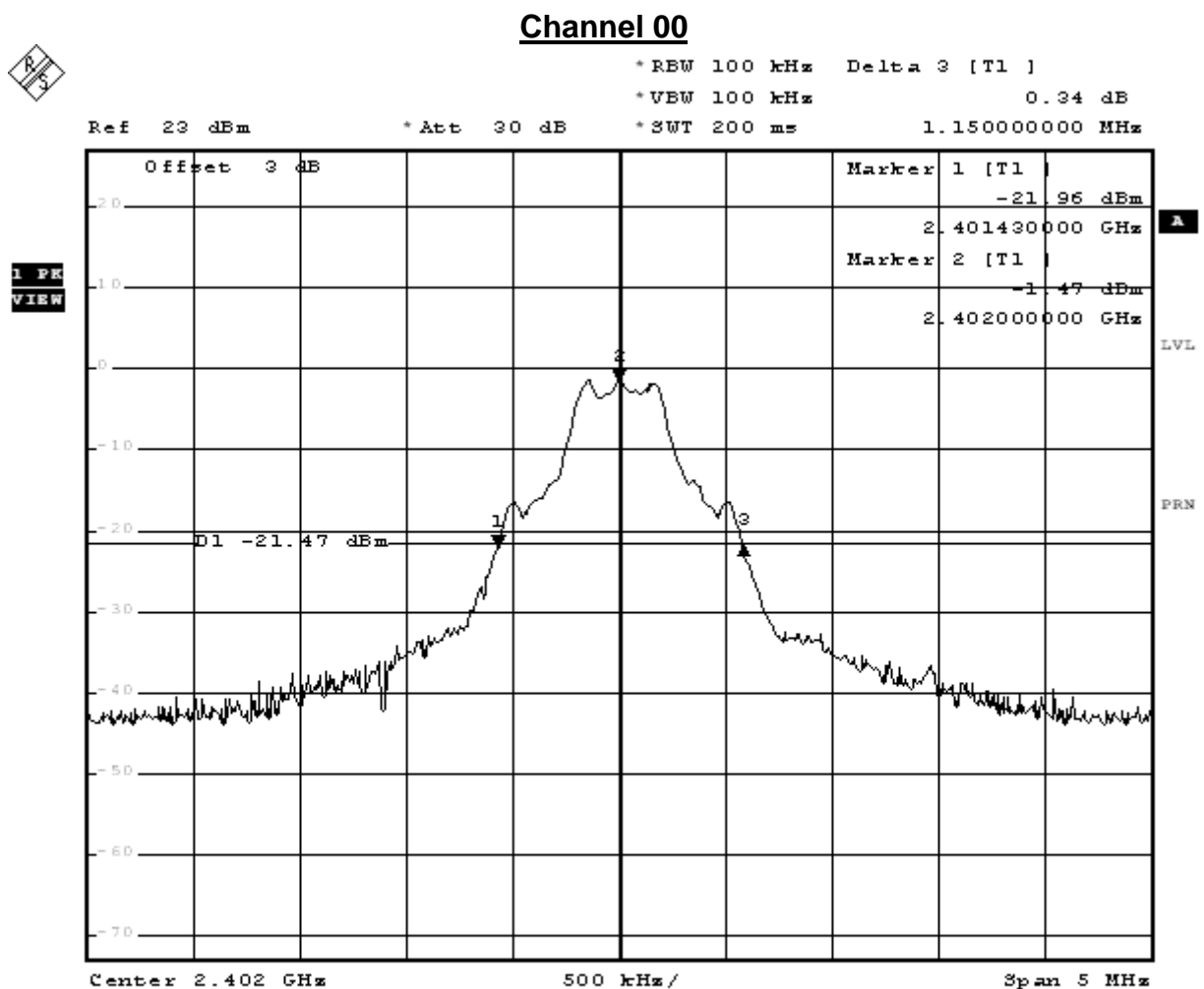
According to FCC Part 15 Subpart C Paragraph 15.247: 2009

## 9.6. Test Result

Product	760 GPS Recorder		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402.00	1.15	--	Pass



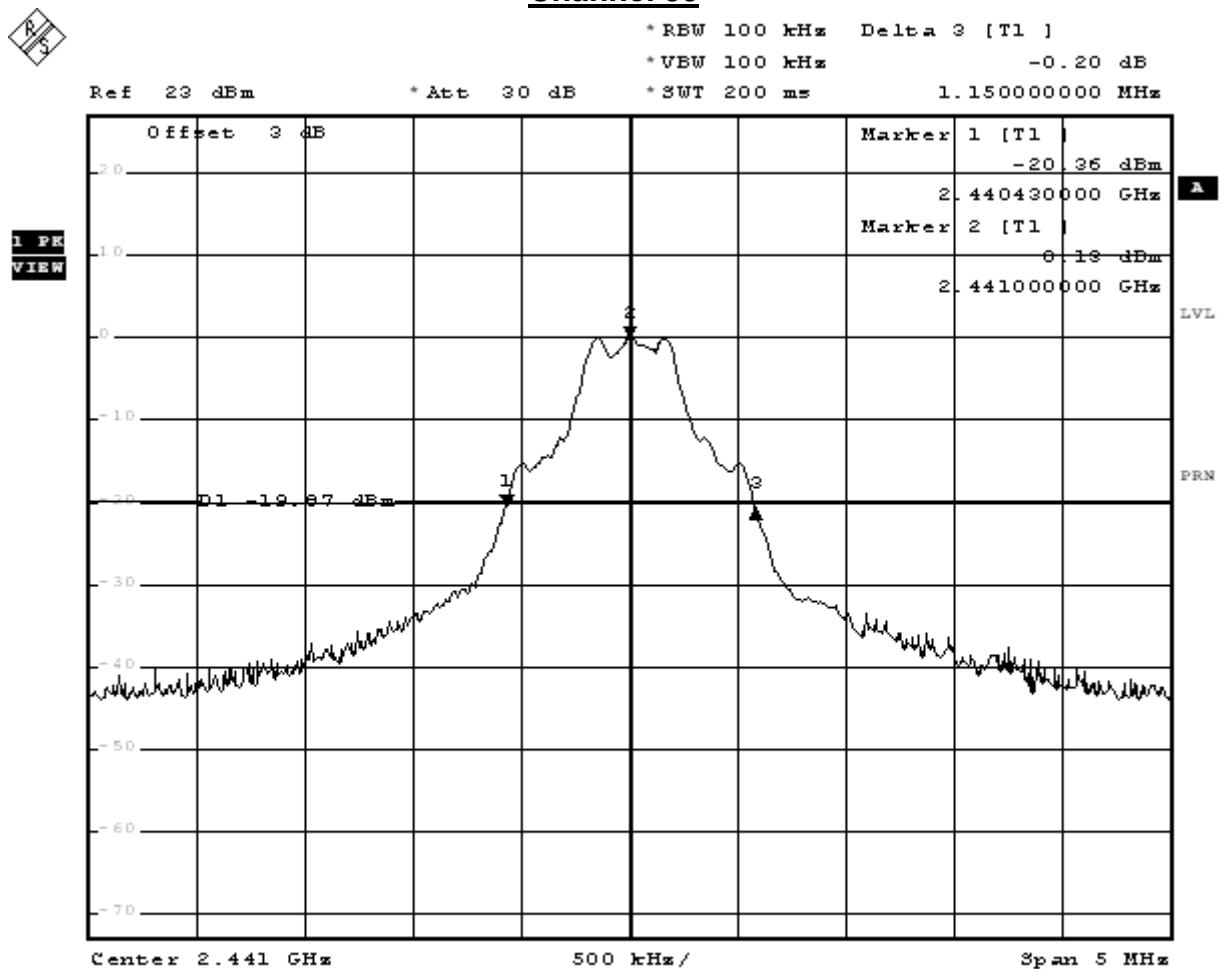
Date: 9.APR.2010 13:50:44

Product	760 GPS Recorder		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441.00	1.15	--	Pass

## Channel 39



Date: 9.APR.2010 13:53:36

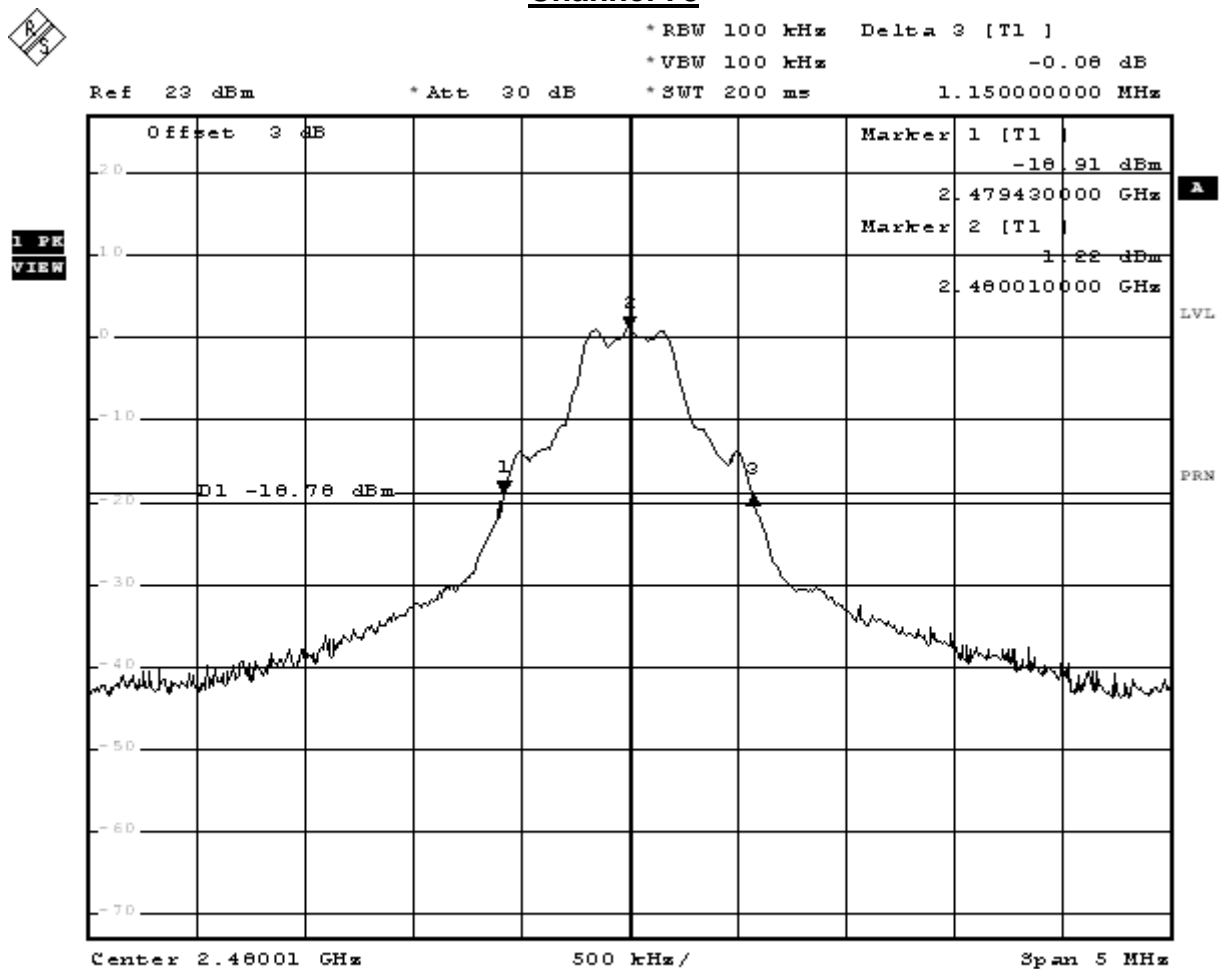


Product	760 GPS Recorder		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480.00	1.15	--	Pass

## Channel 78



Date: 9.APR.2010 13:56:20

## 10. Dwell Time

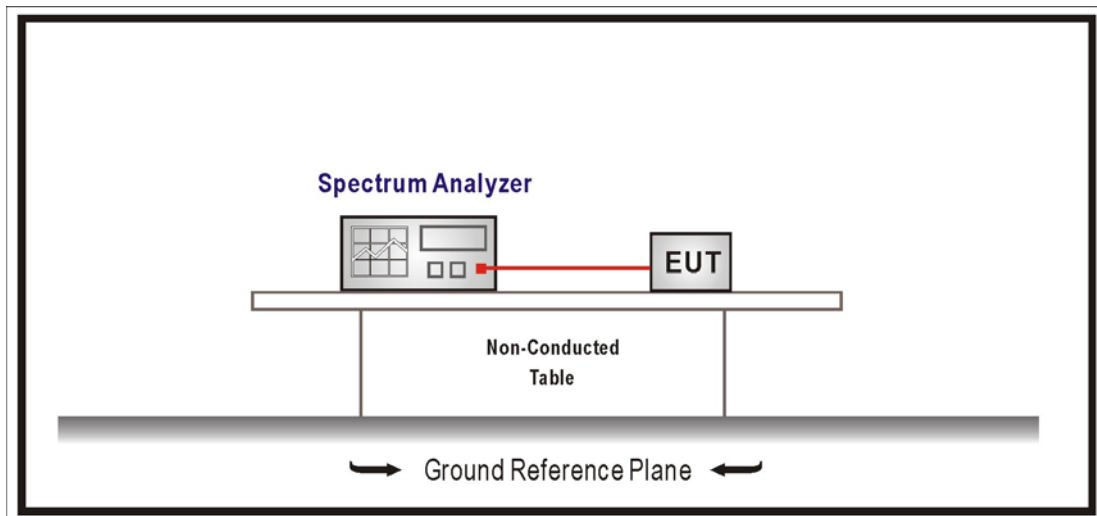
### 10.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Jan., 2011
2	No.1 OATS			Sep., 2010

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, 2003 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	760 GPS Recorder		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2010/04/09	Test Site	No.1 OATS

Occupancy Time of Frequency Hopping System-DH 5

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 0.00312sec:  $0.00312 \times (250/79) \times 31.6 = 0.312\text{sec}$  .

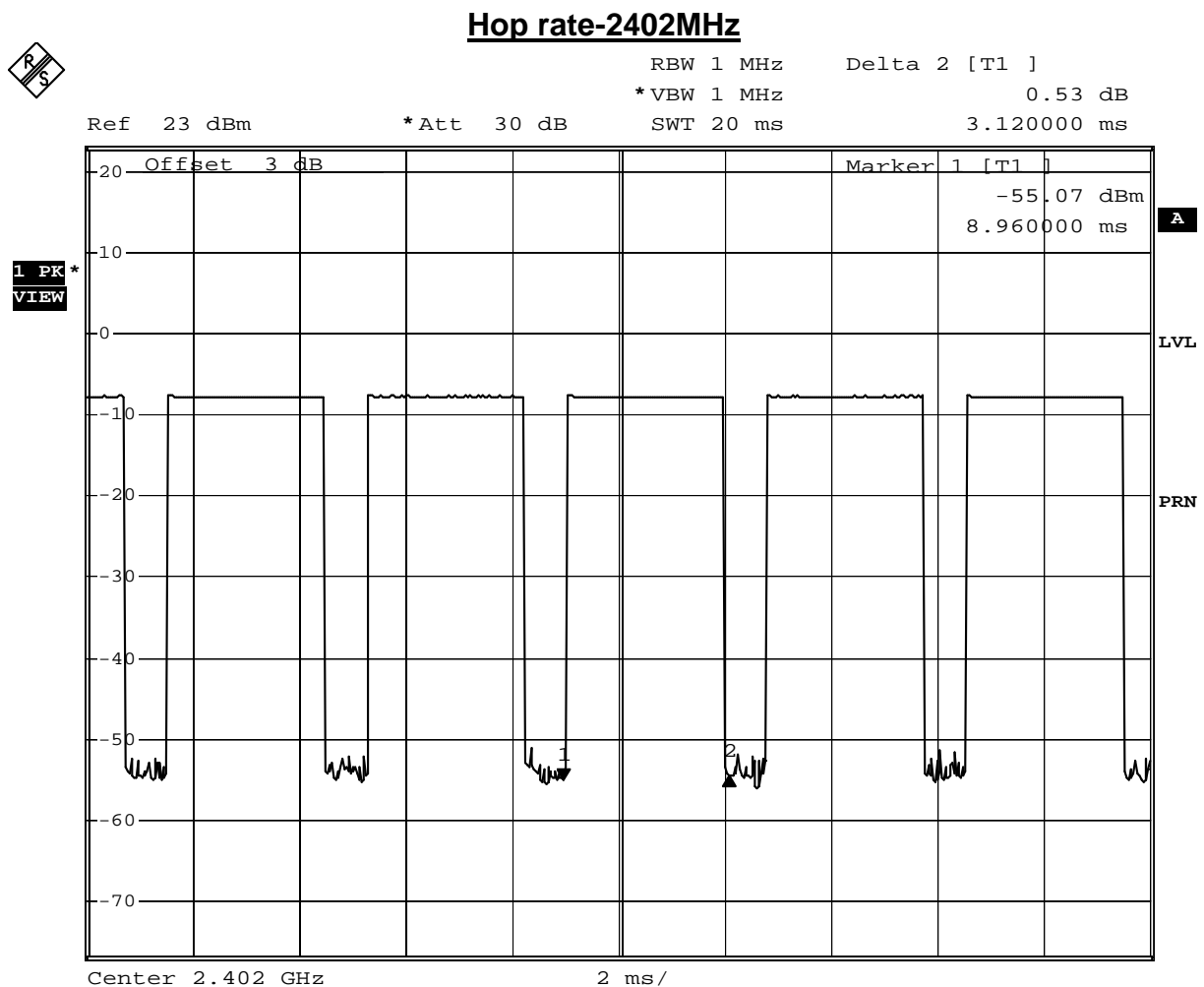
B) 2441MHz Test Time Period:  $0.4 \times 79 = 31.6\text{sec}$  , Hopping Times Within 1sec:  $5/20\text{msec} = 250 / \text{sec}$

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

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 0.00308sec:  $0.00308 \times (250/79) \times 31.6 = 0.308\text{sec}$  .

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

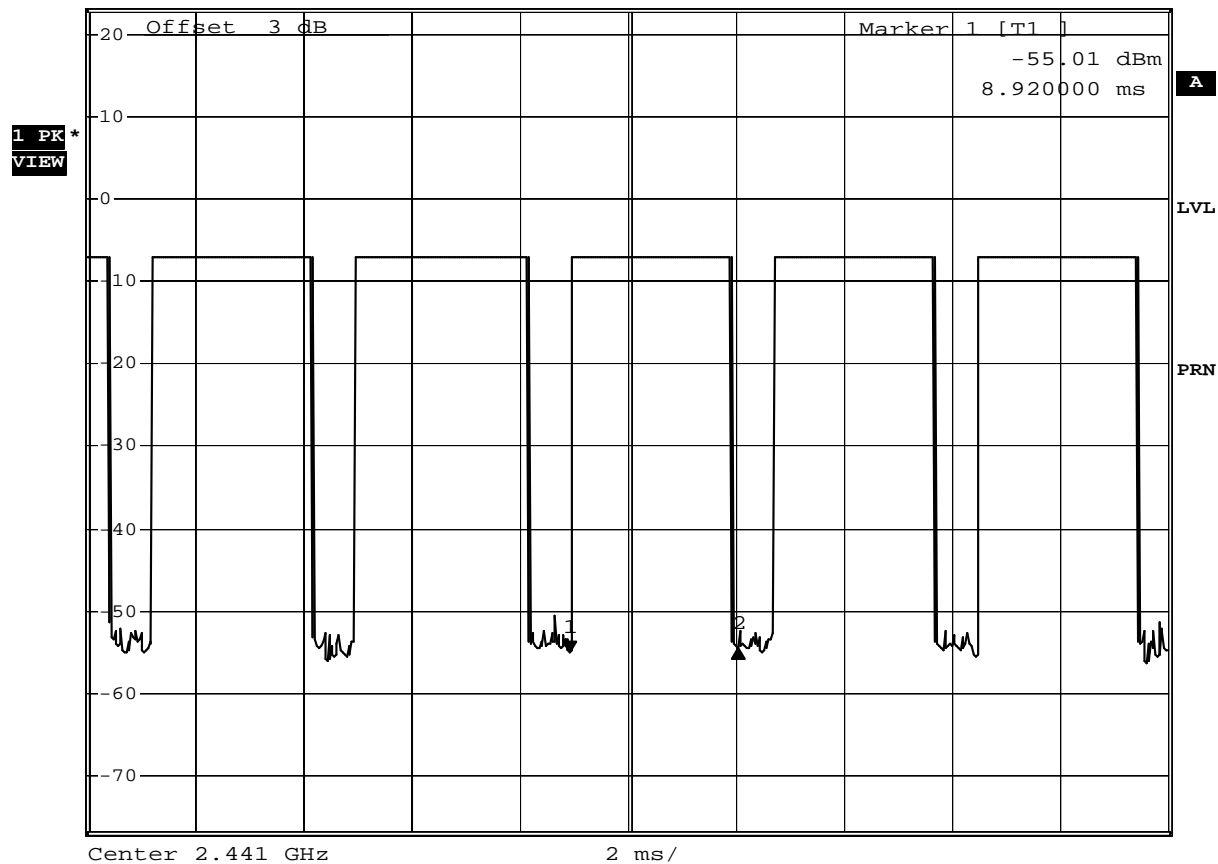


Date: 8.APR.2010 17:50:06

# Hop rate-2441MHz



Ref 23 dBm      \*Att 30 dB      RBW 1 MHz      Delta 2 [T1 ]  
 \*VBW 1 MHz      0.56 dB  
 SWT 20 ms      3.120000 ms

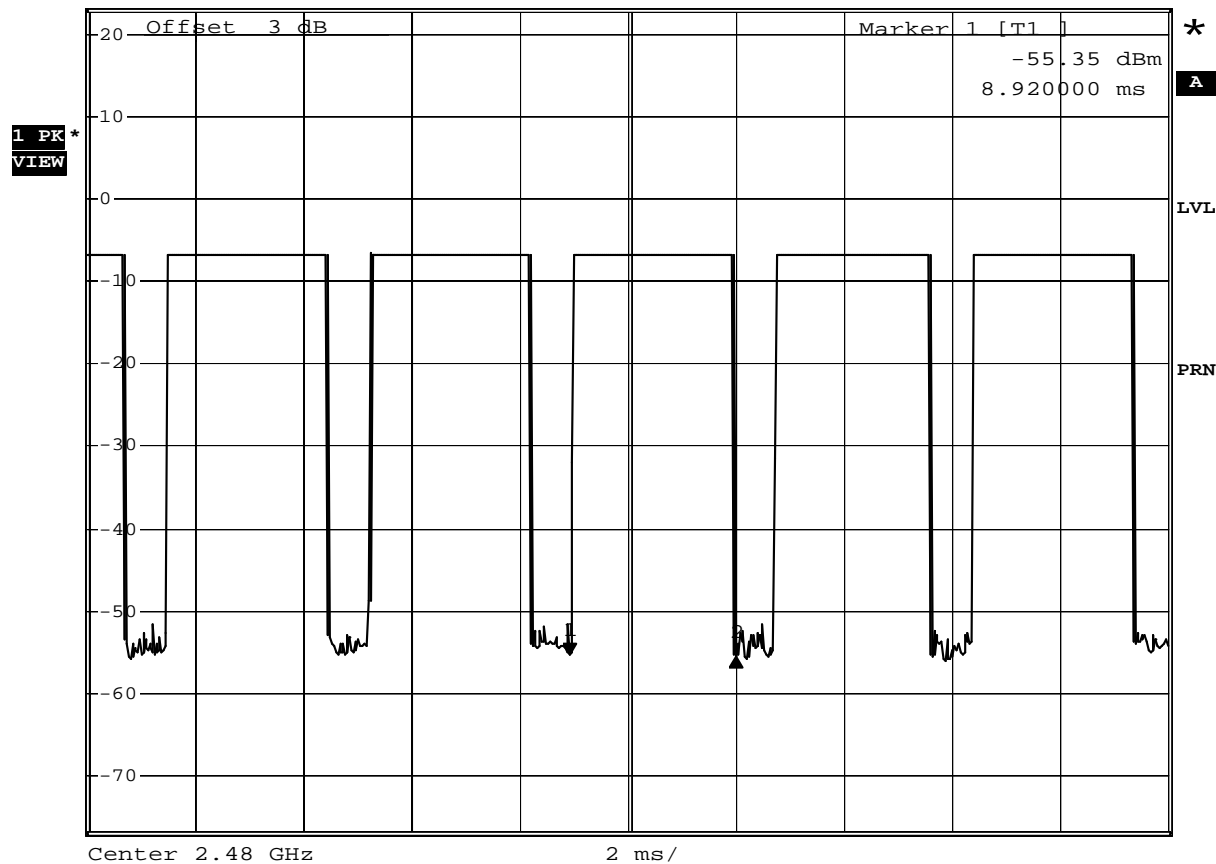


Date: 8.APR.2010 17:52:33

# Hop rate-2480MHz



Ref 23 dBm      \*Att 30 dB      RBW 1 MHz      Delta 2 [T1 ]  
 \*VBW 1 MHz      -0.22 dB  
 SWT 20 ms      3.080000 ms



Date: 8.APR.2010 17:54:15

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