



## Test Report

Product Name : GR-239 Bluetooth GPS Receiver  
Model No. : GR-239xx, B20  
FCC ID. : RJIGR-239xx

Applicant : Holux Technology, Inc.

Address : 1F, No.30, R&D Rd. II, Hsinchu City 300, Taiwan (R.O.C.)

Date of Receipt : 2006/05/17

Issued Date : 2006/05/30

Report No. : 065H051-RF-US-P05V01

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 : 2006/05/30

Report No. : 065H051-RF-US-P05V01



Product Name : GR-239 Bluetooth GPS Receiver  
Applicant : Holux Technology, Inc.  
Address : 1F, No.30, R&D Rd. II, Hsinchu City 300, Taiwan (R.O.C.)  
Manufacturer : Holux Technology, Inc.  
Model No. : GR-239xx, B20  
FCC ID. : RJIGR-239xx  
Rated Voltage : AC 120 V / 60 Hz  
EUT Voltage : DC 12V  
Trade Name : **HOLUX**  
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247  
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 )

Tested By : Dampier Chang  
( Dampier Chang )

Approved By : Gene Chang  
( Gene Chang )

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## 1. General Information

### 1.1. EUT Description

Product Name	GR-239 Bluetooth GPS Receiver
Trade Name	<b>HOLUX</b>
Model No.	GR-239xx, B20
Frequency Range	2402~2480MHz
Channel Number	79
Type of Modulation	Frequency Hopping Spread Spectrum
Antenna Gain	Auto
Channel Control	Soldered on PCB
Antenna Type	0dBi

Component	
GPS Antenna	Shielded, 5.0m
USB Cable	Shielded, 1.2m

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 hopsets 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 GR-239 Bluetooth GPS Receiver included a 2.4GHz receiving function, and 2.4GHz transmitting function.
2. The different of the each model is shown as below:

Model No	Description
GR-239xx	With USB Port
B20	Without USB Port

The variation of model number is for different externals, X can be A-Z.

3. These tests were conducted 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. 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 065H051-RF-US-P01V01 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 normal operation, which was shown in this test report and defined as:

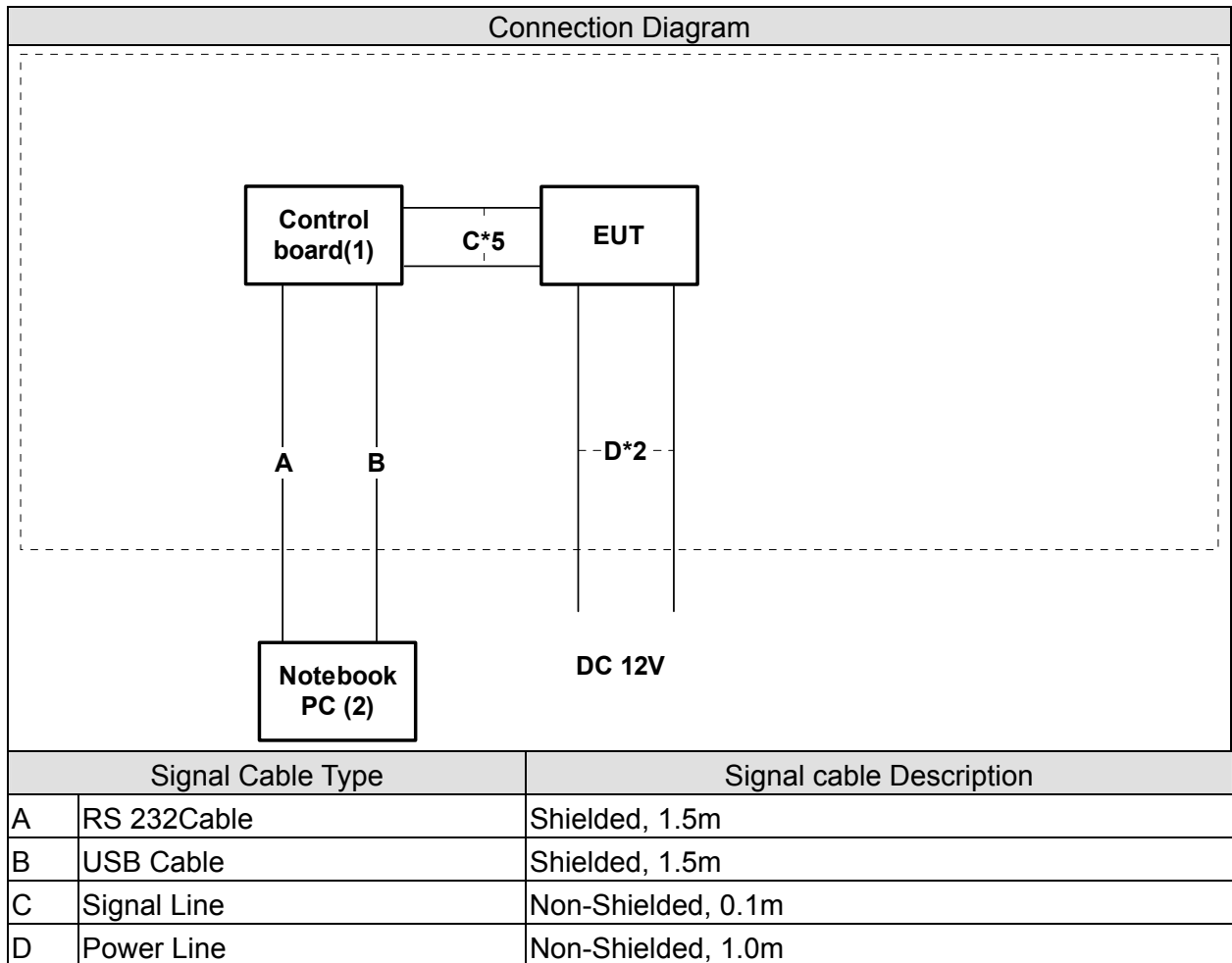
Pre-Test Mode	
EMI	Mode 1: Transmit
Final Test Mode	
EMI	Mode 1: Transmit

### 1.4. Tested System Details

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

Product	Manufacturer	Model No.	Serial No.	Power Cord	
1	Control	Air2U	N/A	N/A	--
2	Notebook PC	DELL	LATITUDE D400	N/A	Non-shielded, 1.7m, one ferrite core bonded

### 1.5. Configuration of tested System





**1.6. EUT Exercise Software**

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	Boot the PC from Hard Disk.
4	Data will be communicated between computer and EUT.
5	All the peripheral will be retrieved during the test.
6	Repeat the above procedure (4) to (5).

**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 Band Edge (FHSS)	15 - 35	20
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	25
Humidity (%RH)		25 - 75	53
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Dwell Time (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	53
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	53
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	53
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	53
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 CNLA  
Accreditation Number: 1313  
Effective through: September 27, 2007



1313  
ILAC MRA

Accredited by NVLAP  
NVLAP Lab Code: 200347-0  
Effective through: September 30, 2006



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. Peak Power Output**

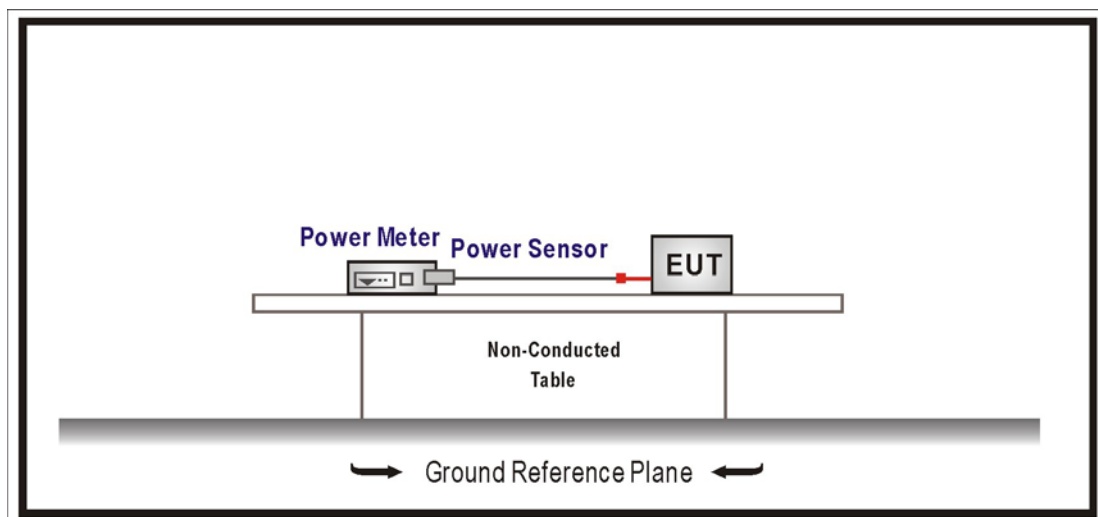
**2.1. Test Equipment**

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Power Meter	Agilent	E4416A / GB41291630	May, 2006
2	Power Sensor	Agilent	E9323A / US40411166	Apr., 2006
3	No.1 OATS			Sep., 2005

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

**2.2. Test Setup**



**2.3. 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.

**2.4. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 2.5. Test Result

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402.00	0.49	1Watt = 30 dBm	Pass
39	2441.00	0.23	1Watt= 30 dBm	Pass
78	2480.00	-0.55	1Watt= 30 dBm	Pass

### 3. Radiated Emission

#### 3.1. Test Equipment

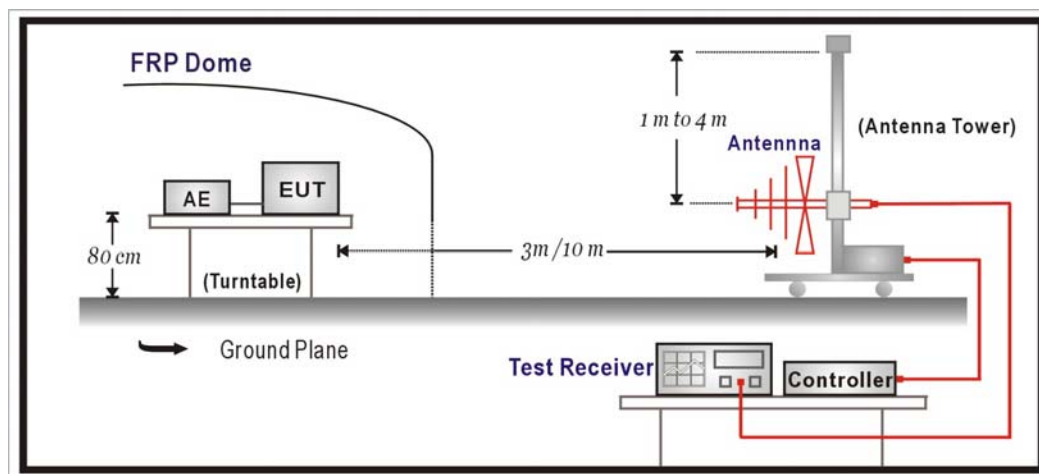
The following test equipment are used during the test:

Item		Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Test Receiver	R & S	ESCS 30 / 825442/014	Jun., 2005
2	X	Spectrum Analyzer	Advantest	R3162 / 91700283	N/A
3	X	Pre-Amplifier	Advantest	BB525C / N/A	N/A
4	X	Bilog Antenna	Schaffner	CBL6112B / 2673	Sep., 2005
5	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2005
6	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2006
7	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Jul., 2005
8		No.3 OATS			Sep., 2005

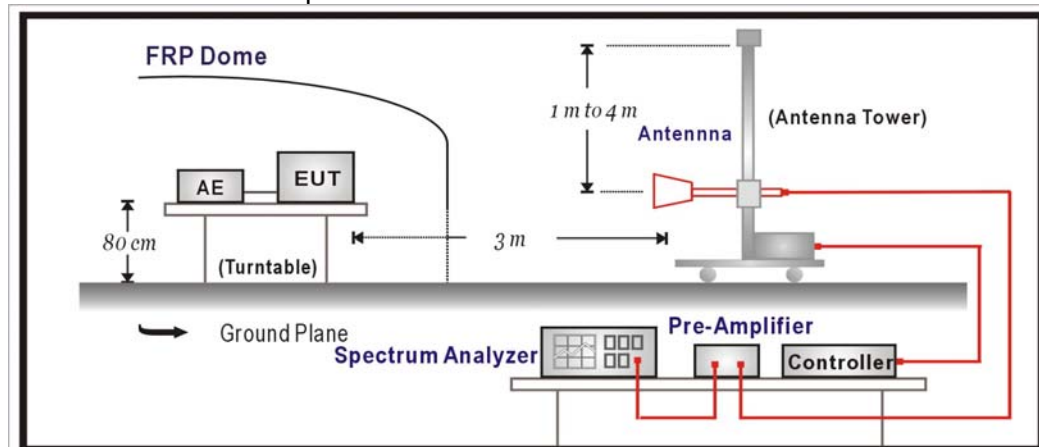
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

#### 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.

<b>FCC Part 15 Subpart C Paragraph 15.209 Limits</b>		
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 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.

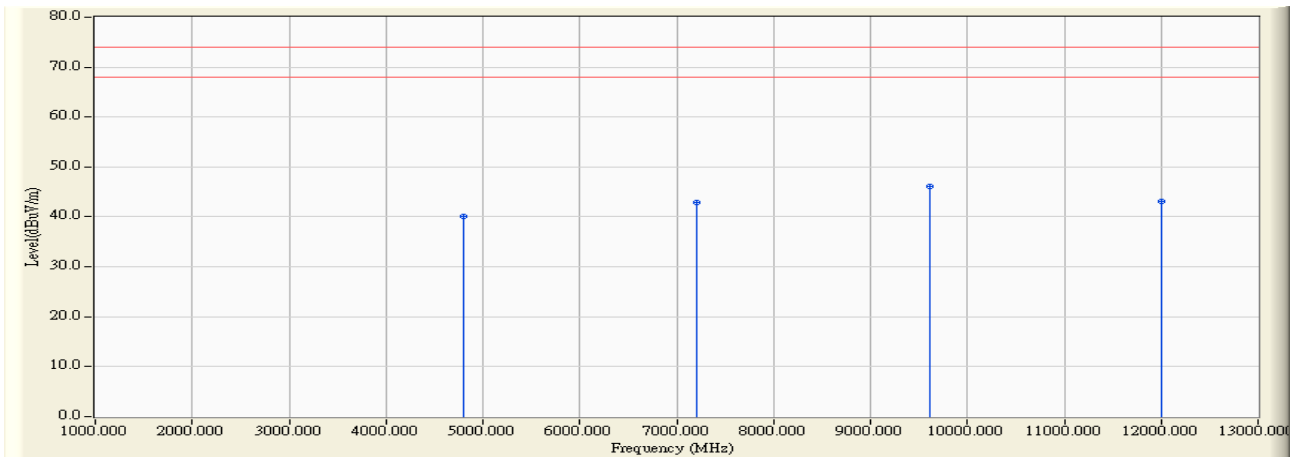
**3.5. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

### 3.6. Test Result

Harmonic & Spurious:

Site : OATS 3	Time : 2006/05/17 - 10:48
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : RF_1G-18G(2005-3) - HORIZONTAL
Power : DC 12V	Note : TX CH00 2402MHz



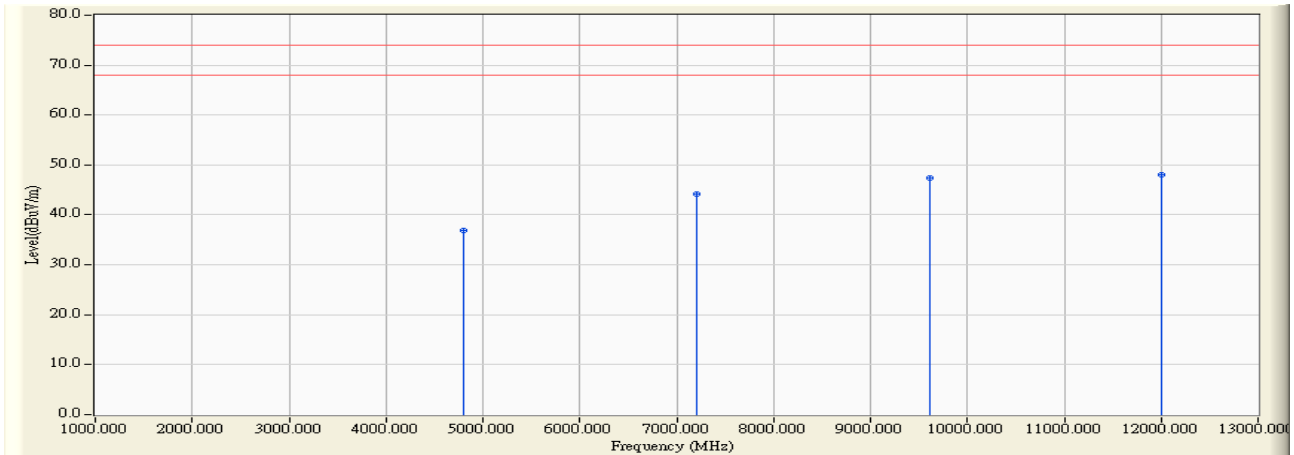
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	4804.340	2.687	37.510	40.197	-33.803	74.000	PEAK	0.000	0.000
2	7206.040	7.760	35.160	42.920	-31.080	74.000	PEAK	0.000	0.000
3	* 9607.940	11.497	34.680	46.177	-27.823	74.000	PEAK	0.000	0.000
4	12010.060	9.063	34.000	43.063	-30.937	74.000	PEAK	0.000	0.000

Note:

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



Site : OATS 3	Time : 2006/05/17 - 10:55
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : RF_1G-18G(2005-3) - VERTICAL
Power : DC 12V	Note : TX CH00 2402MHz

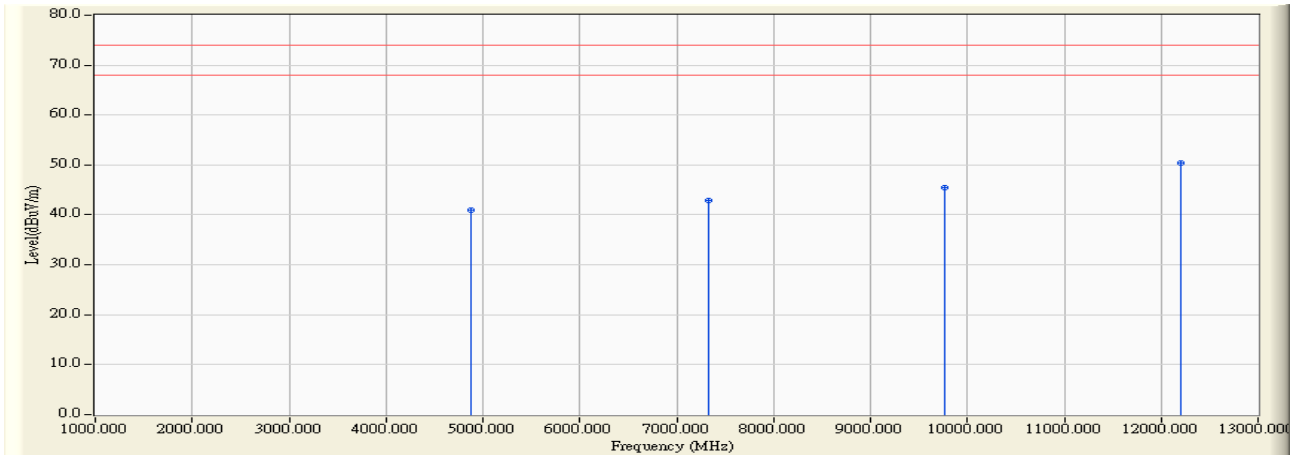


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	4803.960	0.901	36.070	36.971	-37.029	74.000	PEAK	0.000	0.000
2	7206.000	7.694	36.580	44.274	-29.726	74.000	PEAK	0.000	0.000
3	9608.040	13.498	33.890	47.388	-26.612	74.000	PEAK	0.000	0.000
4	* 12010.060	14.792	33.230	48.022	-25.978	74.000	PEAK	0.000	0.000

**Note:**

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

Site : OATS 3	Time : 2006/05/17 - 11:04
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : RF_1G-18G(2005-3) - HORIZONTAL
Power : DC 12V	Note : TX CH39 2441MHz

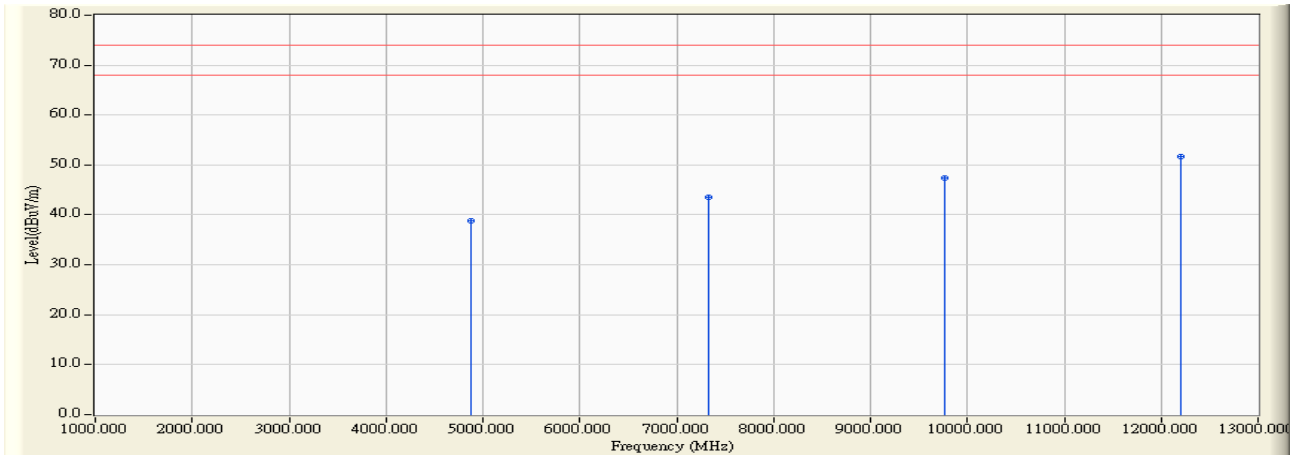


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	4882.120	3.042	37.900	40.942	-33.058	74.000	PEAK	0.000	0.000
2	7323.020	8.653	34.190	42.843	-31.157	74.000	PEAK	0.000	0.000
3	9763.940	11.619	33.810	45.429	-28.571	74.000	PEAK	0.000	0.000
4	* 12205.000	16.722	33.650	50.372	-23.628	74.000	PEAK	0.000	0.000

**Note:**

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

Site : OATS 3	Time : 2006/05/17 - 11:09
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : RF_1G-18G(2005-3) - VERTICAL
Power : DC 12V	Note : TX CH39 2441MHz

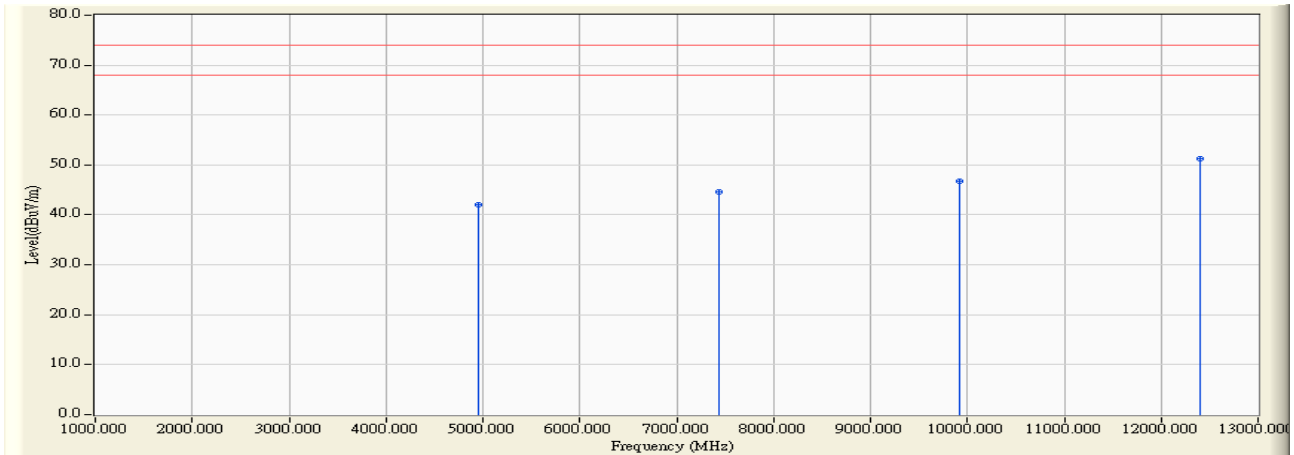


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	4881.940	1.401	37.400	38.801	-35.199	74.000	PEAK	0.000	0.000
2	7323.020	8.653	34.930	43.583	-30.417	74.000	PEAK	0.000	0.000
3	9764.020	13.620	33.790	47.409	-26.591	74.000	PEAK	0.000	0.000
4	* 12204.900	17.917	33.680	51.597	-22.403	74.000	PEAK	0.000	0.000

**Note:**

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

Site : OATS 3	Time : 2006/05/17 - 11:19
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : RF_1G-18G(2005-3) - HORIZONTAL
Power : DC 12V	Note : TX CH78 2480MHz

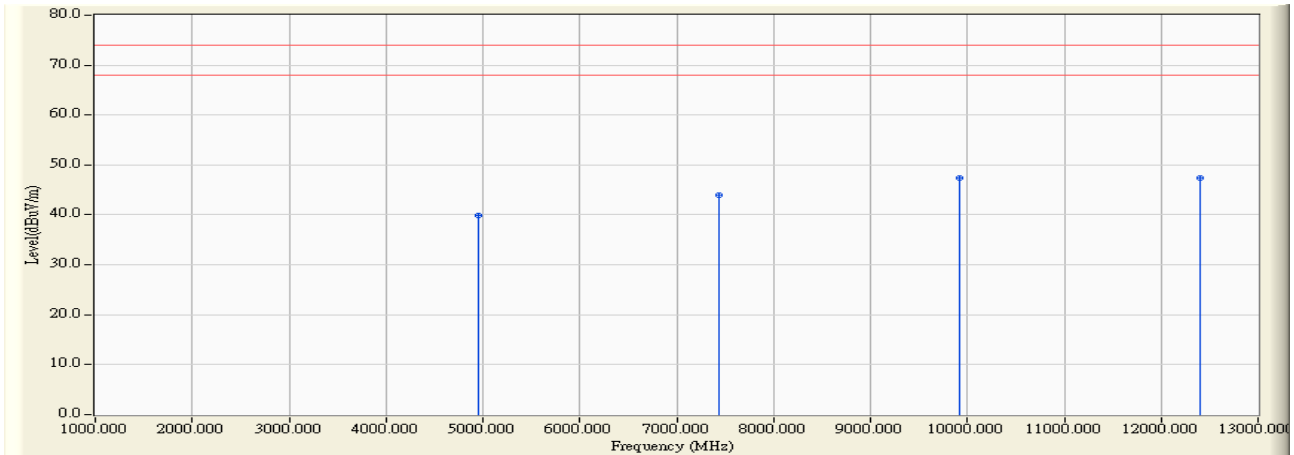


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	4960.110	3.387	38.660	42.047	-31.953	74.000	PEAK	0.000	0.000
2	7439.970	9.209	35.400	44.609	-29.391	74.000	PEAK	0.000	0.000
3	9920.040	12.665	34.000	46.665	-27.335	74.000	PEAK	0.000	0.000
4	* 12400.040	18.629	32.700	51.329	-22.671	74.000	PEAK	0.000	0.000

**Note:**

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

Site : OATS 3	Time : 2006/05/17 - 11:23
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : RF_1G-18G(2005-3) - VERTICAL
Power : DC 12V	Note : TX CH78 2480MHz



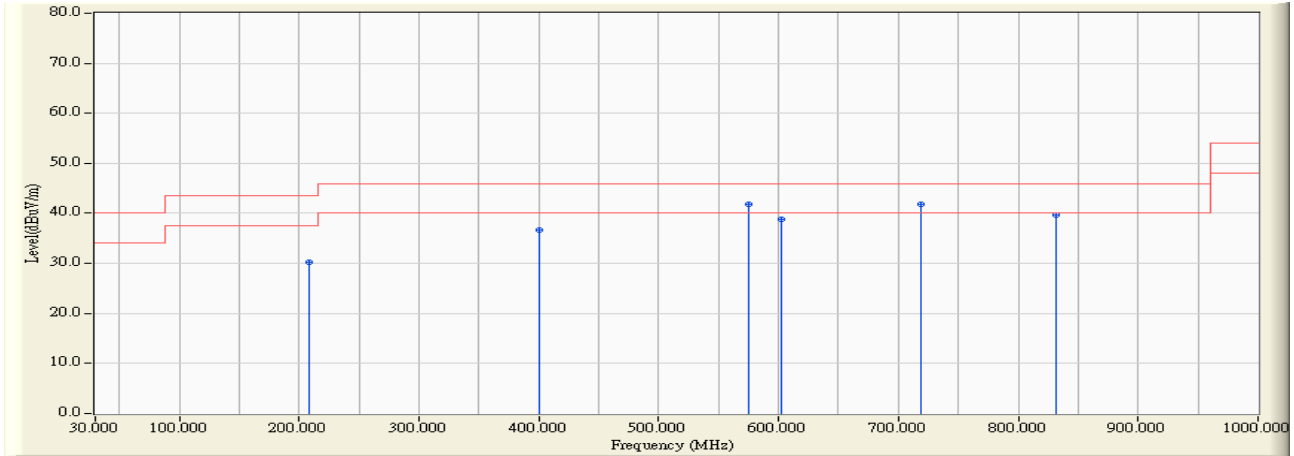
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	4960.230	1.907	37.920	39.827	-34.173	74.000	PEAK	0.000	0.000
2	7440.010	9.209	34.750	43.959	-30.041	74.000	PEAK	0.000	0.000
3	9919.980	13.464	33.920	47.385	-26.615	74.000	PEAK	0.000	0.000
4	* 12400.000	13.936	33.510	47.446	-26.554	74.000	PEAK	0.000	0.000

**Note:**

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

30 MHz – 1 GHz Spurious:

Site : OATS 3	Time : 2006/05/17 - 17:50
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : ITE_30-1G(2005) - HORIZONTAL
Power : DC 12V	Note : TX CH0 2402MHz

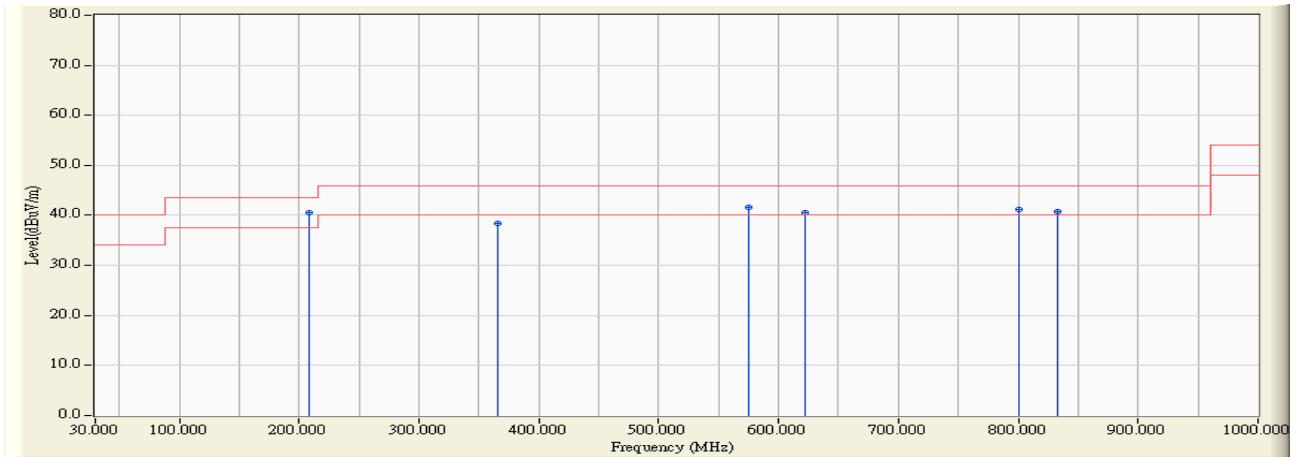


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	208.480	-10.602	40.820	30.218	-13.282	43.500	PEAK	0.000	0.000
2	400.540	-2.667	39.416	36.749	-9.251	46.000	PEAK	0.000	0.000
3	* 575.140	4.150	37.702	41.852	-4.148	46.000	PEAK	0.000	0.000
4	602.300	5.419	33.372	38.791	-7.209	46.000	PEAK	0.000	0.000
5	718.700	4.556	37.228	41.784	-4.216	46.000	PEAK	0.000	0.000
6	831.220	6.601	33.120	39.721	-6.279	46.000	PEAK	0.000	0.000

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 : OATS 3	Time : 2006/05/17 - 17:51
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : ITE_30-1G(2005) - VERTICAL
Power : DC 12V	Note : TX CH0 2402MHz

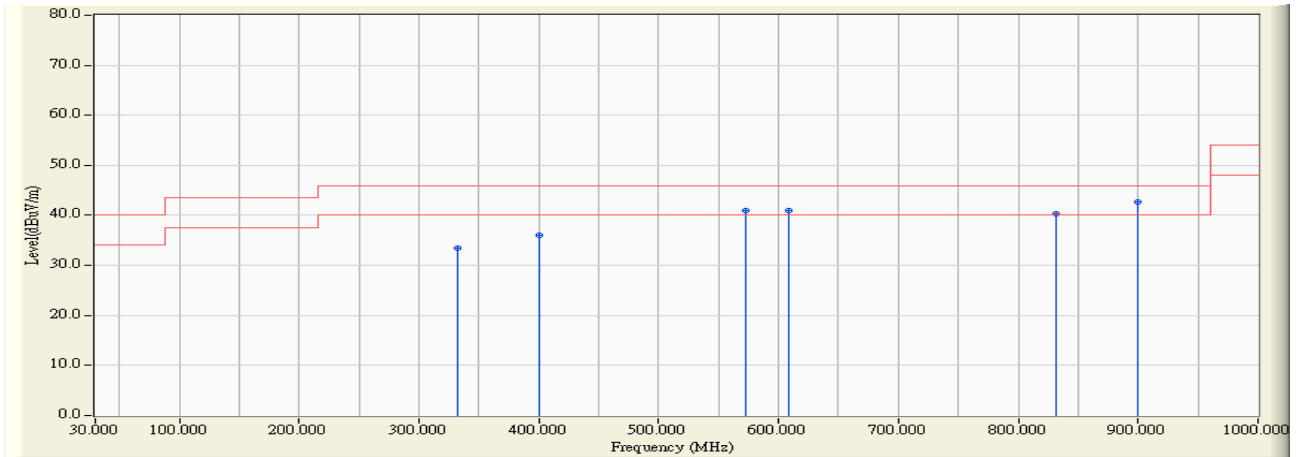


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	208.480	-2.292	42.803	40.511	-2.989	43.500	PEAK	0.000	0.000
2		365.620	-0.305	38.600	38.295	-7.705	46.000	PEAK	0.000	0.000
3		575.140	5.670	35.908	41.578	-4.422	46.000	PEAK	0.000	0.000
4		621.700	4.783	35.660	40.443	-5.557	46.000	PEAK	0.000	0.000
5		800.180	6.813	34.472	41.285	-4.715	46.000	PEAK	0.000	0.000
6		833.160	6.220	34.546	40.766	-5.234	46.000	PEAK	0.000	0.000

**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 : OATS 3	Time : 2006/05/17 - 17:52
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : ITE_30-1G(2005) - HORIZONTAL
Power : DC 12V	Note : TX CH39 2441MHz



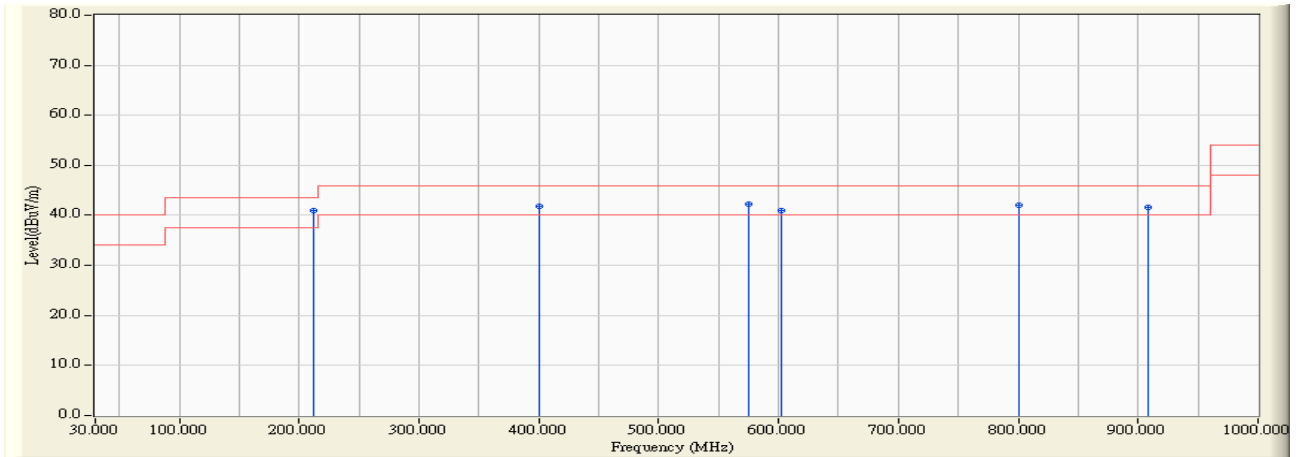
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	332.640	-4.657	38.057	33.400	-12.600	46.000	PEAK	0.000	0.000
2	400.540	-2.667	38.726	36.059	-9.941	46.000	PEAK	0.000	0.000
3	573.200	3.926	37.061	40.987	-5.013	46.000	PEAK	0.000	0.000
4	608.120	6.965	33.985	40.950	-5.050	46.000	PEAK	0.000	0.000
5	831.220	6.601	33.659	40.260	-5.740	46.000	PEAK	0.000	0.000
6	* 899.120	4.871	37.794	42.665	-3.335	46.000	PEAK	0.000	0.000

**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 : OATS 3	Time : 2006/05/17 - 17:52
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : ITE_30-1G(2005) - VERTICAL
Power : DC 12V	Note : TX CH39 2441MHz

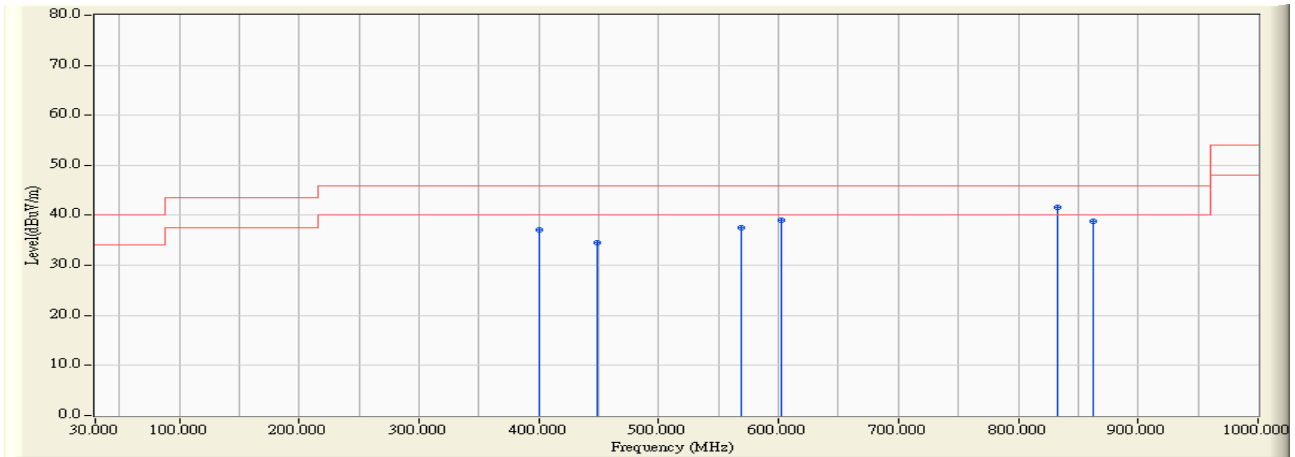


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	212.360	-2.048	42.974	40.926	-2.574	43.500	PEAK	0.000	0.000
2		400.540	3.503	38.260	41.763	-4.237	46.000	PEAK	0.000	0.000
3		575.140	5.670	36.539	42.209	-3.791	46.000	PEAK	0.000	0.000
4		602.300	4.359	36.551	40.910	-5.090	46.000	PEAK	0.000	0.000
5		800.180	6.813	35.178	41.991	-4.009	46.000	PEAK	0.000	0.000
6		908.820	3.287	38.284	41.571	-4.429	46.000	PEAK	0.000	0.000

**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 : OATS 3	Time : 2006/05/17 - 17:55
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : ITE_30-1G(2005) - HORIZONTAL
Power : DC 12V	Note : TX CH78 2480MHz

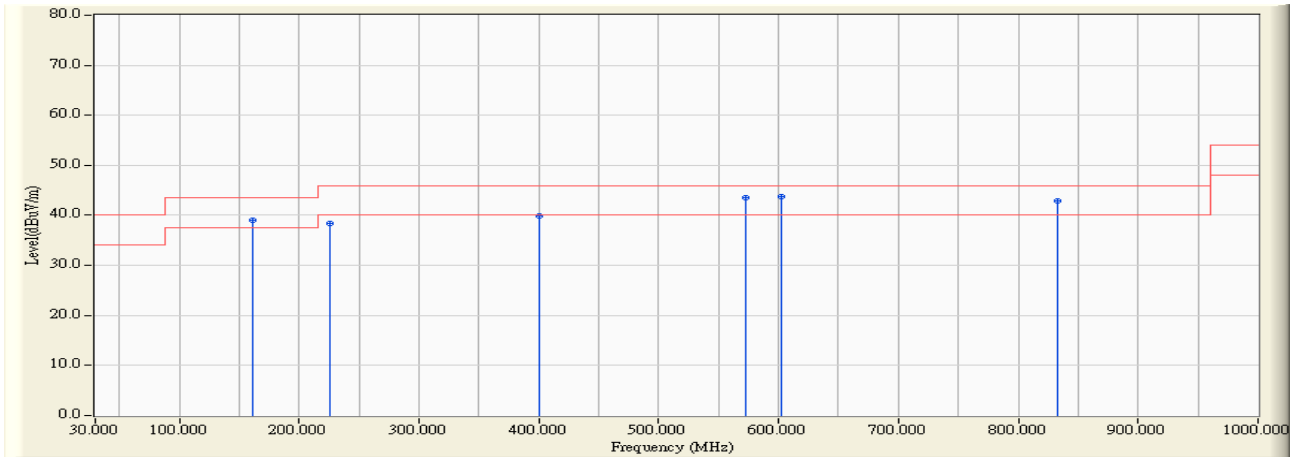


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	400.540	-2.667	39.689	37.022	-8.978	46.000	PEAK	0.000	0.000
2	449.040	0.461	34.119	34.580	-11.420	46.000	PEAK	0.000	0.000
3	569.320	3.969	33.521	37.490	-8.510	46.000	PEAK	0.000	0.000
4	602.300	5.419	33.667	39.086	-6.914	46.000	PEAK	0.000	0.000
5	* 833.160	6.320	35.299	41.619	-4.381	46.000	PEAK	0.000	0.000
6	862.260	7.934	30.891	38.825	-7.175	46.000	PEAK	0.000	0.000

**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 : OATS 3	Time : 2006/05/17 - 17:56
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : GR-239 Bluetooth GPS Receiver	Probe : ITE_30-1G(2005) - VERTICAL
Power : DC 12V	Note : TX CH78 2480MHz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	161.920	-2.958	41.956	38.998	-4.502	43.500	PEAK	0.000	0.000
2	225.940	-0.888	39.246	38.358	-7.642	46.000	PEAK	0.000	0.000
3	400.540	3.503	36.443	39.946	-6.054	46.000	PEAK	0.000	0.000
4	573.200	5.396	38.142	43.538	-2.462	46.000	PEAK	0.000	0.000
5	* 602.300	4.359	39.498	43.857	-2.143	46.000	PEAK	0.000	0.000
6	833.160	6.220	36.569	42.789	-3.211	46.000	PEAK	0.000	0.000

**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

**4. Band Edge**

**4.1. Test Equipment**

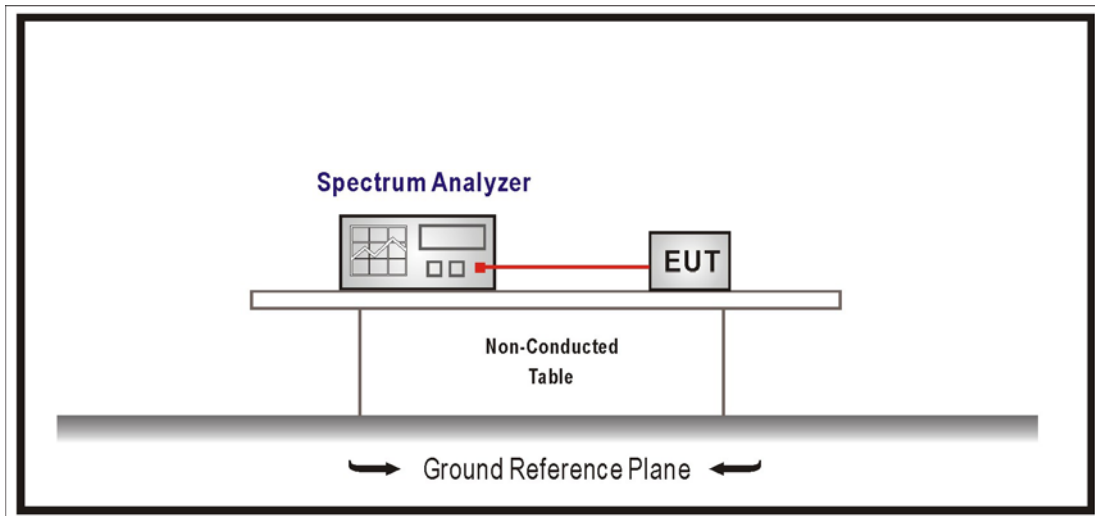
The following test equipment are used during the test:

RF Conducted Measurement:					
Item	Equipment		Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer		R & S	FSP / 100561	Mar., 2006
2	No.1 OATS				Sep., 2005
RF Radiated Measurement:					
Item		Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2005
2	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2006
3		Loop Antenna	R & S	HFH2-Z2 / 833799/004	Sep., 2005
4		BiconiLog Antenna	Schwarzbeck	VULB 9166 / 1061	Sep., 2005
5		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2005
6	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Sep., 2005
7	No.1 OATS				Sep., 2005

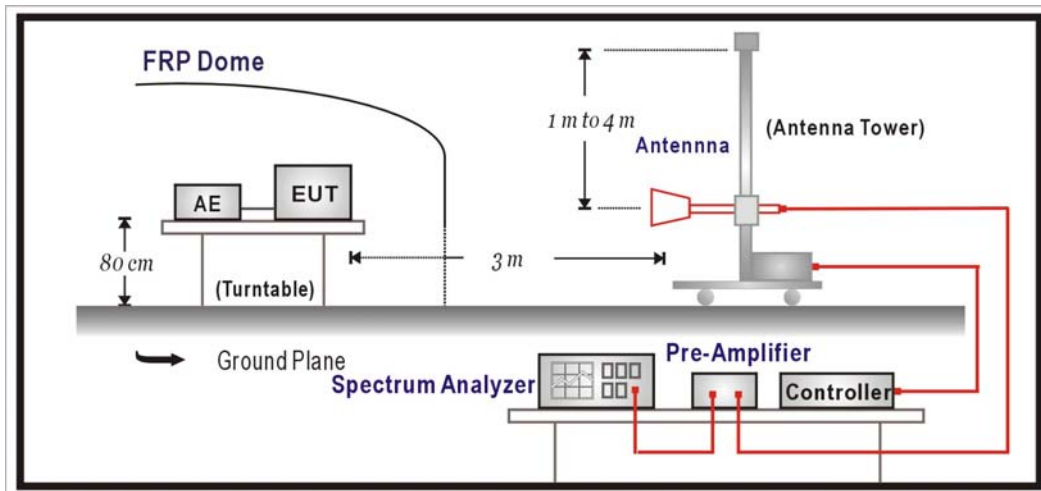
- Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
 2. Mark "X" test instruments are used to measure the final test results.

## 4.2. Test Setup

RF Conducted Measurement:



RF Radiated 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 either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. 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.

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

### 4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

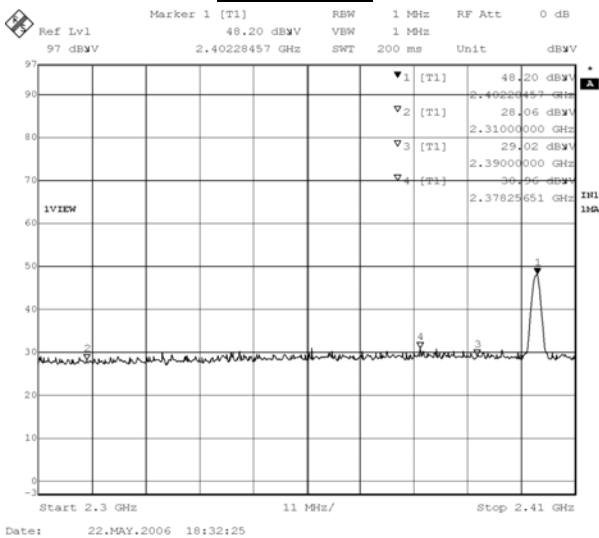
4.6. Test Result

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Band Edge		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

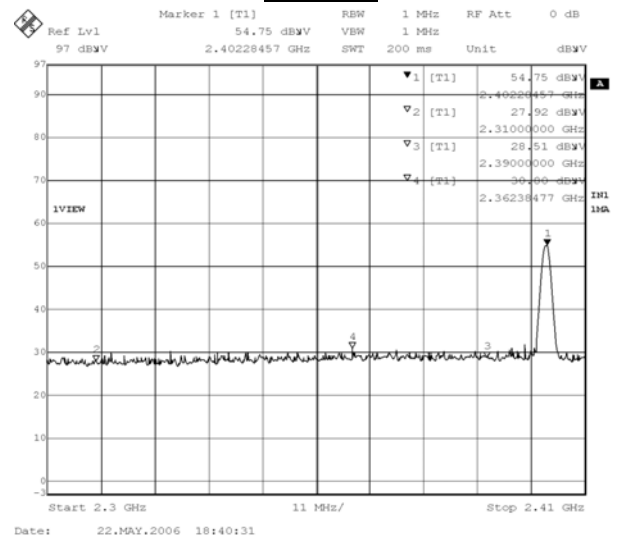
RF Radiated Measurement: (Peak Detector)

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	PreAMP (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Result
00(Horizontal)	2378.250	30.960	28.351	00.00	59.311	74.000	Pass
00(Vertical)	2362.380	30.300	26.697	00.00	56.997	74.000	Pass

Horizontal



Vertical



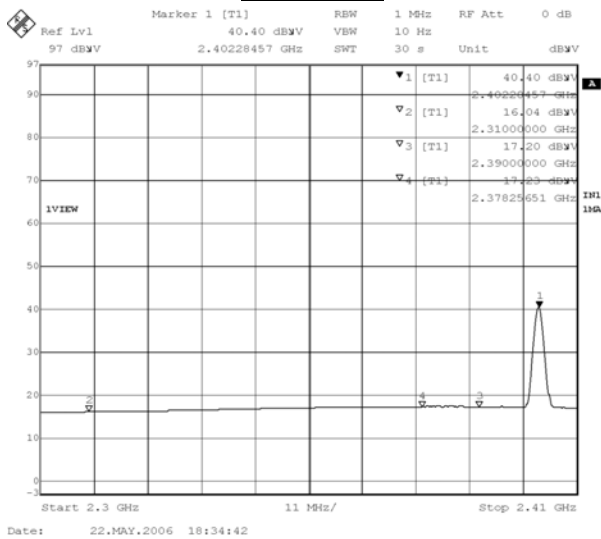
Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Band Edge		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

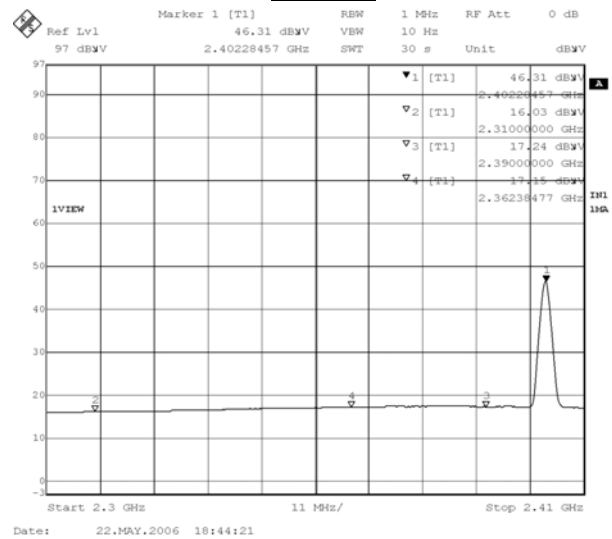
**RF Radiated Measurement: (Average Detector)**

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	PreAMP (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Result
00(Horizontal)	2378.250	17.230	28.351	00.00	45.581	54.00	Pass
00(Vertical)	2362.380	17.150	26.697	00.00	43.847	54.000	Pass

**Horizontal**



**Vertical**



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

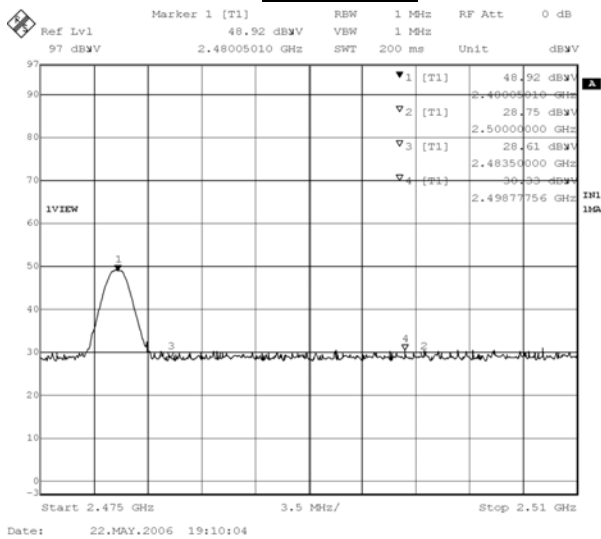


Product	GR-239 Bluetooth GPS Receiver		
Test Item	Band Edge		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

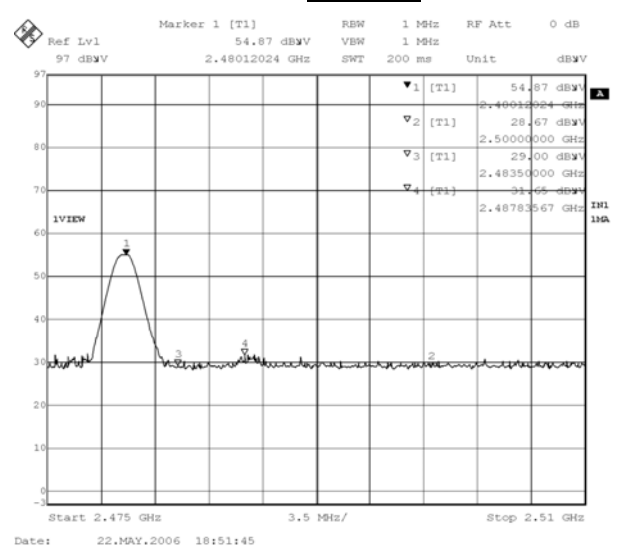
### RF Radiated Measurement: (Peak Detector)

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	PreAMP (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Result
78(Horizontal)	2498.770	30.330	28.761	00.00	59.090	74.000	Pass
78(Vertical)	2787.830	31.650	27.126	00.00	58.776	74.000	Pass

### Horizontal



### Vertical



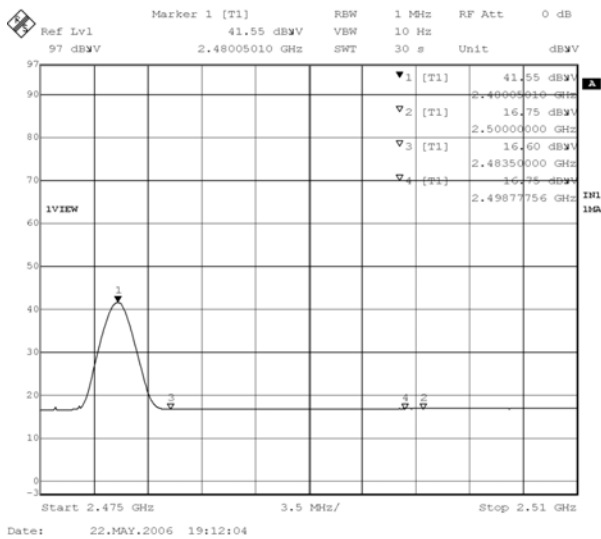
Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Band Edge		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

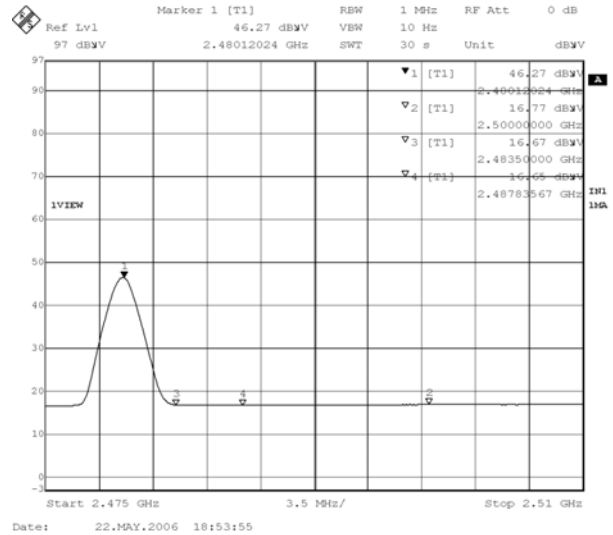
**RF Radiated Measurement: (Average Detector)**

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	PreAMP (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Result
78(Horizontal)	2498.770	16.740	28.761	00.00	45.500	54.000	Pass
78(Vertical)	2487.730	16.620	27.126	00.00	43746.	54.000	Pass

**Horizontal**



**Vertical**



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

**5. Channel of Number**

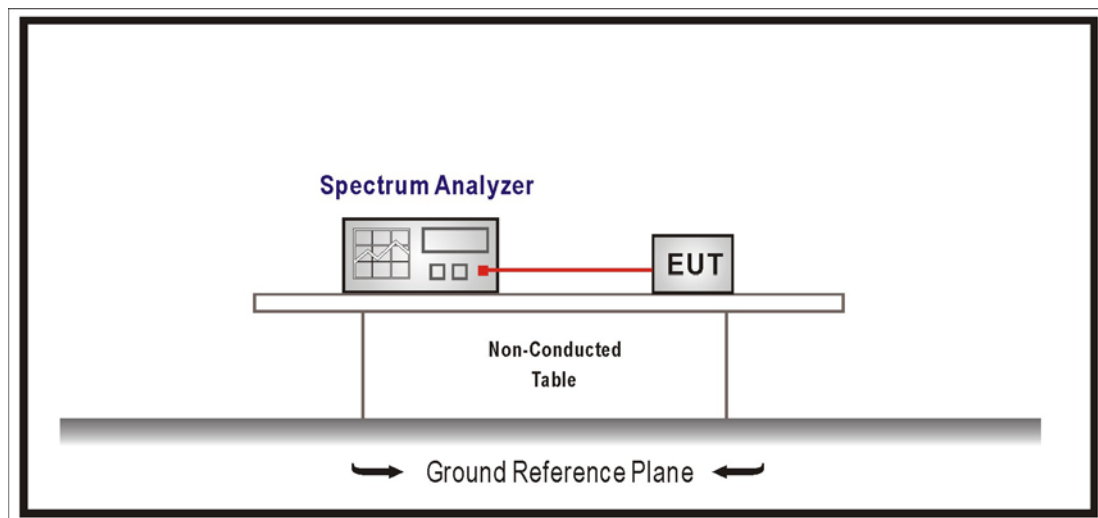
**5.1. Test Equipment**

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	Mar., 2006
2	No.1 OATS			Sep., 2005

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

**5.2. Test Setup**



**5.3. 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.

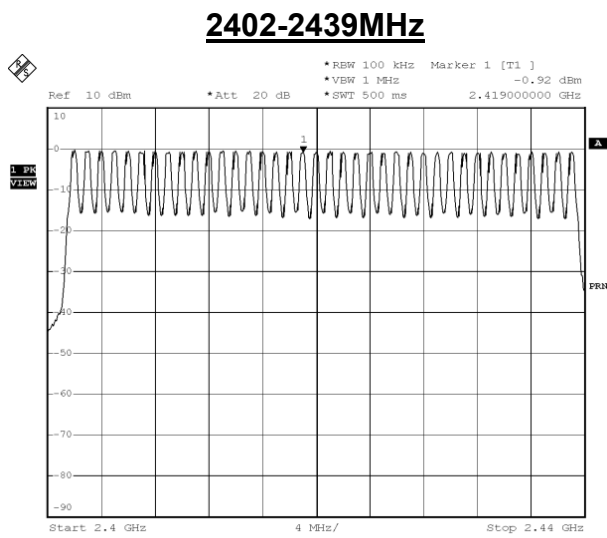
**5.4. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

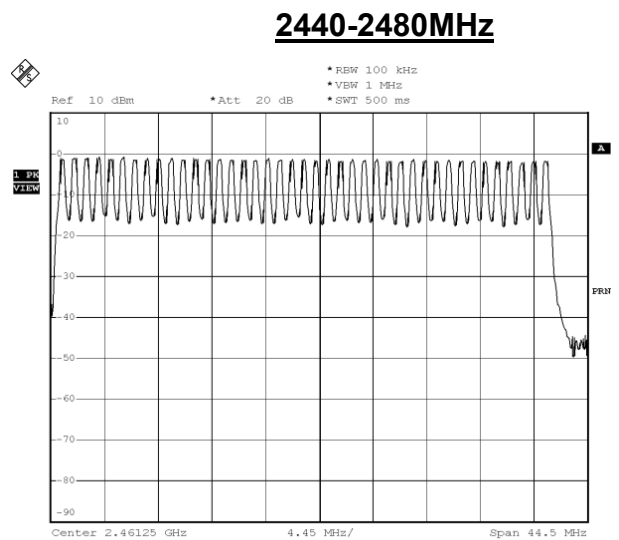
## 5.5. Test Result

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Channel of Number		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

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



Date: 22.MAY.2006 12:13:04



Date: 22.MAY.2006 12:19:03

**6. Channel Separation**

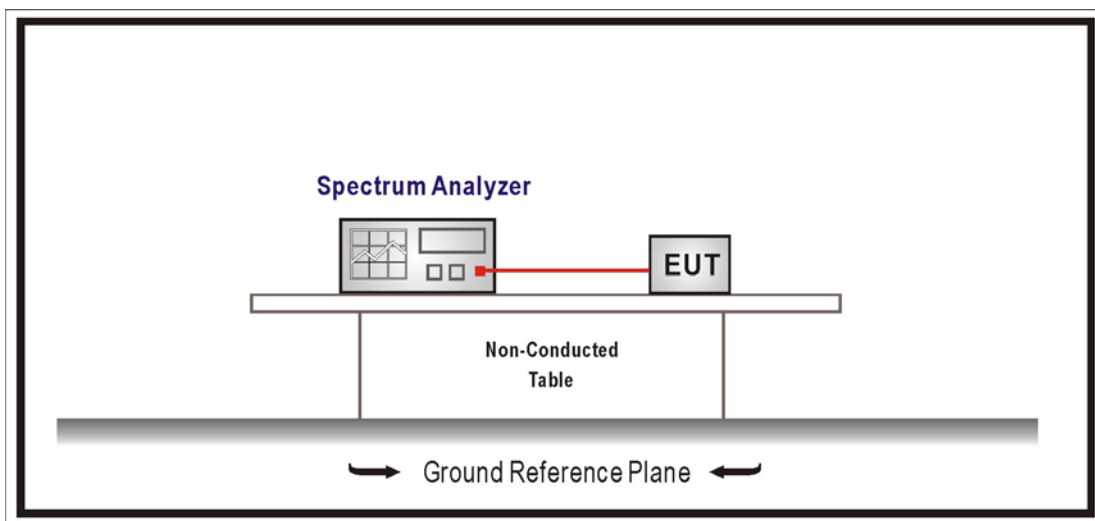
**6.1. Test Equipment**

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	Mar., 2006
2	No.1 OATS			Sep., 2005

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 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.

**6.4. Test Specification**

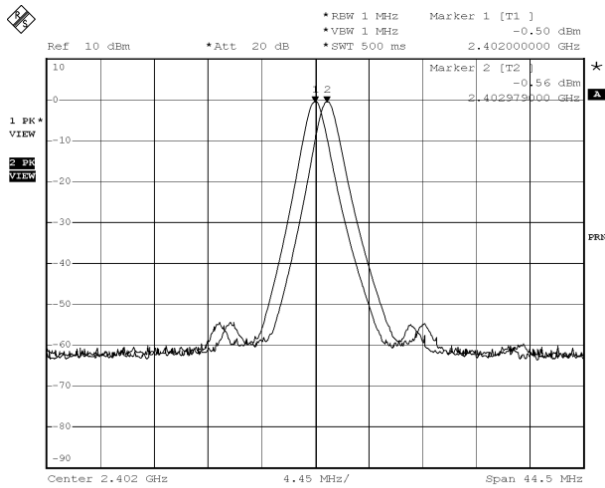
According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 6.5. Test Result

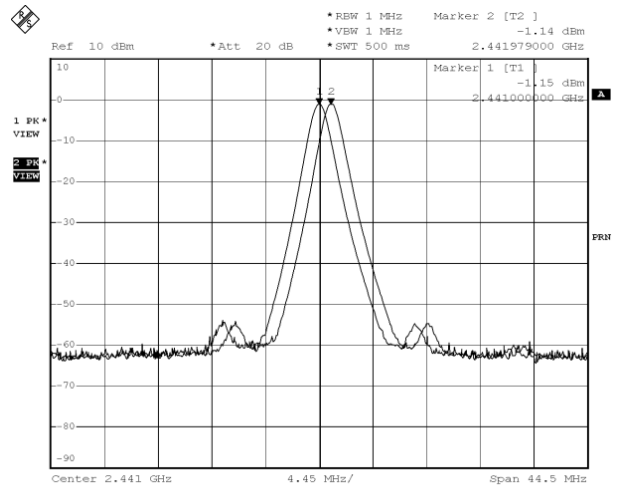
Product	GR-239 Bluetooth GPS Receiver		
Test Item	Channel Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402.00	979	1000	Pass
39	2441.00	979	1000	Pass
78	2480.00	979	1000	Pass

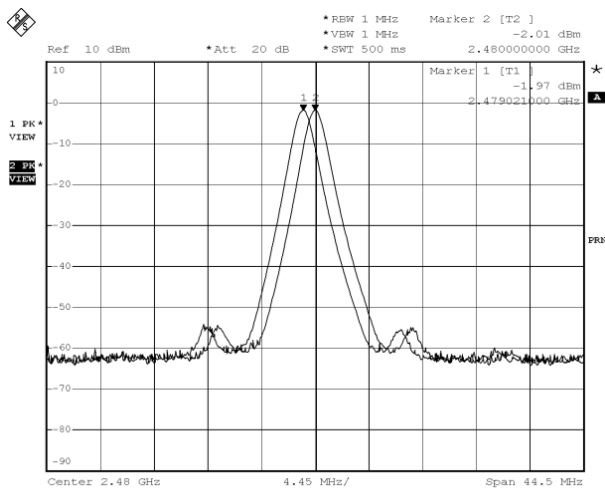
### Channel 00



### Channel 39



### Channel 78



**7. Occupied Bandwidth**

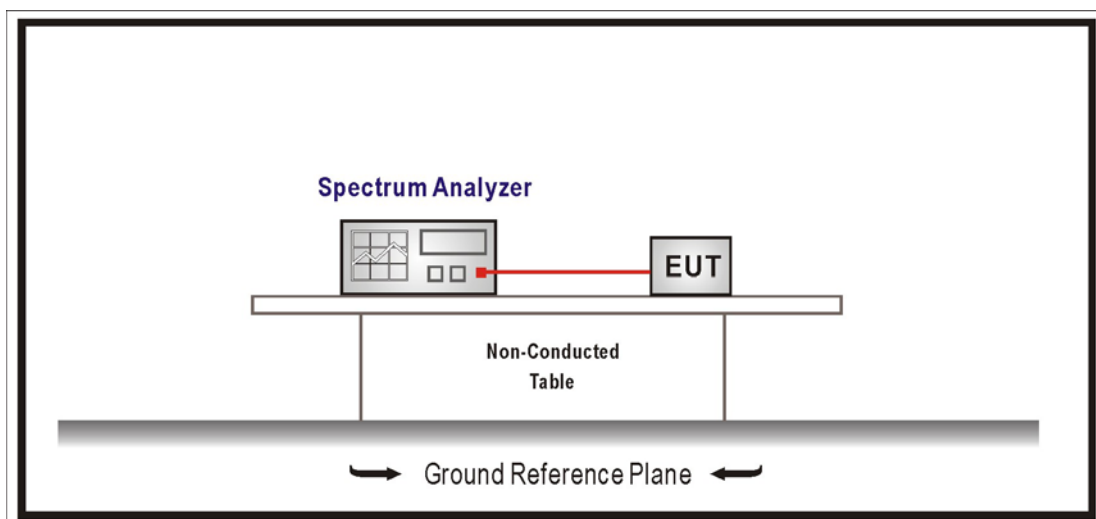
**7.1. Test Equipment**

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	Mar., 2006
2	No.1 OATS			Sep., 2005

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 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.

**7.4. Test Specification**

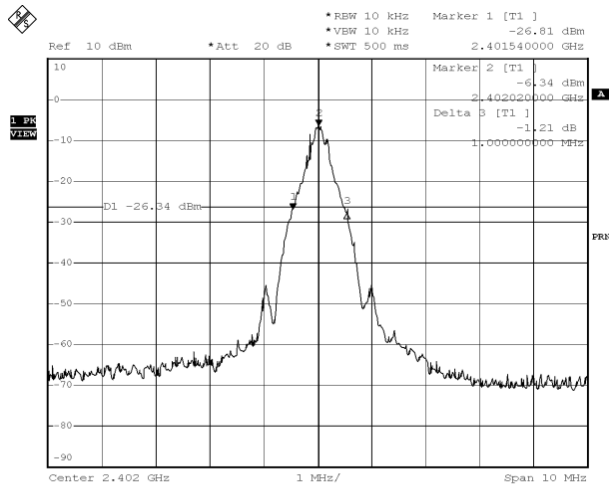
According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 7.5. Test Result

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

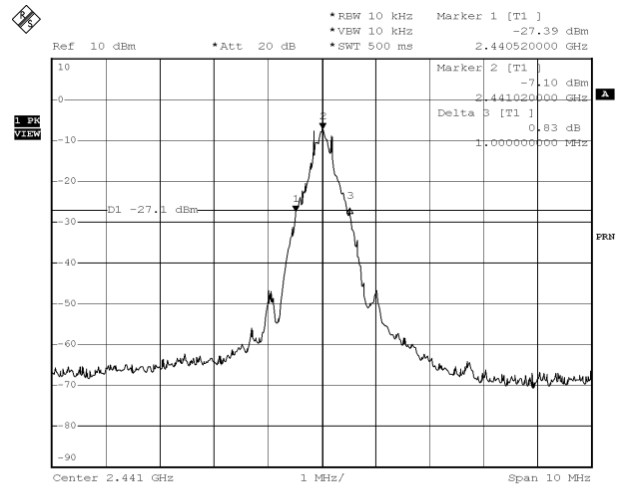
Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402.00	1	<1	Pass
39	2441.00	1	<1	Pass
78	2480.00	1	<1	Pass

**Channel 00**



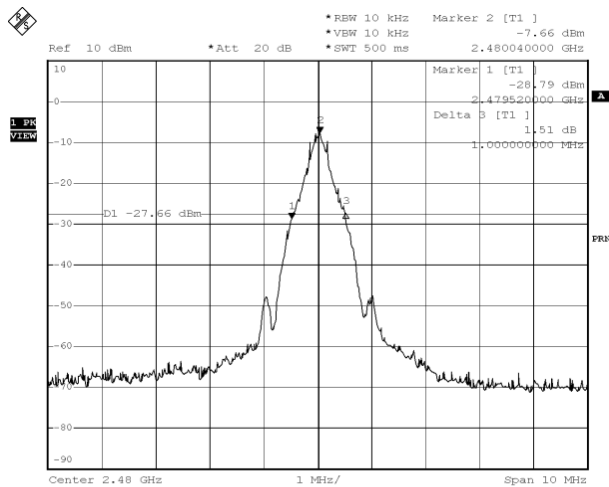
Date: 22.MAY.2006 11:24:54

**Channel 39**



Date: 22.MAY.2006 12:35:58

**Channel 78**



Date: 22.MAY.2006 11:33:21



**8. Dwell Time**

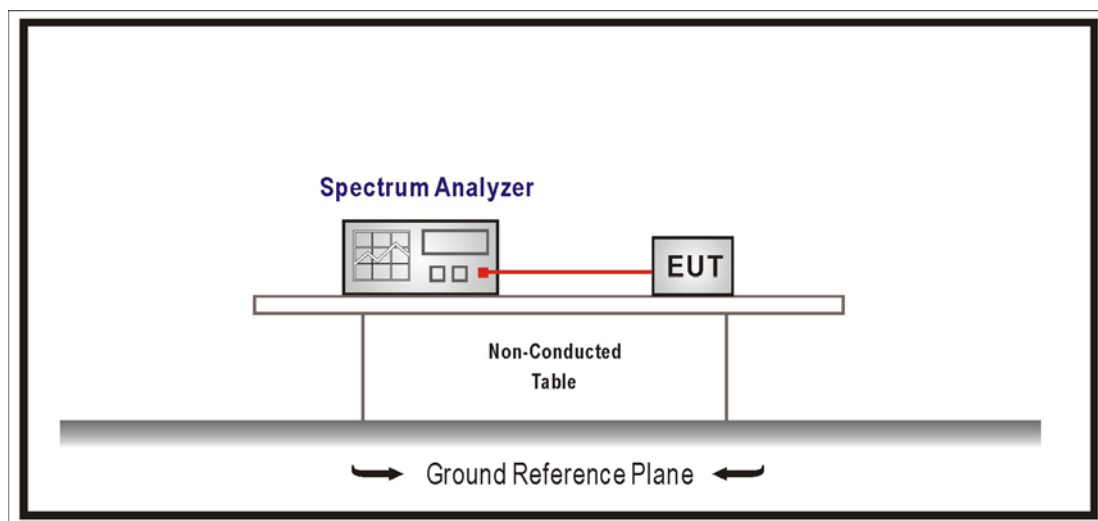
**8.1. Test Equipment**

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	Mar., 2006
2	No.1 OATS			Sep., 2005

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. 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.

**8.4. Test Specification**

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 8.5. Test Result

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

### Occupancy Time of Frequency Hopping System-DH 1

Test Time Period:  $0.4 \times 79 = 31.6 \text{sec}$  , Hopping Times Within 1sec:  $39/50 \text{msec} = 0.78 = 780 / \text{sec}$

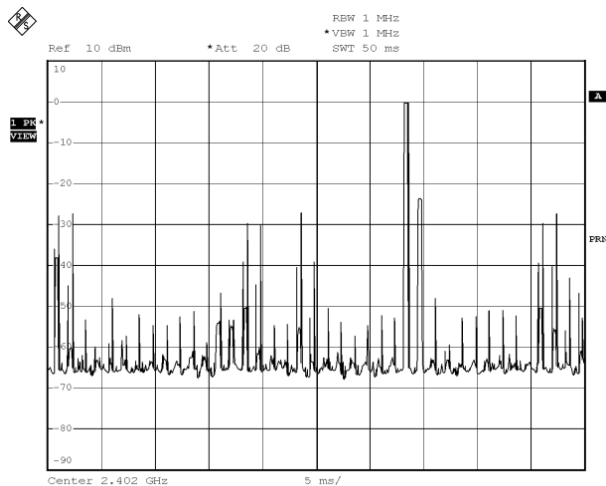
A) 2402MHz The Maximum Occupancy Time Within 31.6sec:  $1220 \mu\text{s} \times (780/79) \times 31.6 = 380.64 \text{msec}$  ◦

B) 2441MHz The Maximum Occupancy Time Within 31.6sec:  $1240 \mu\text{s} \times (780/79) \times 31.6 = 386.88 \text{msec}$  ◦

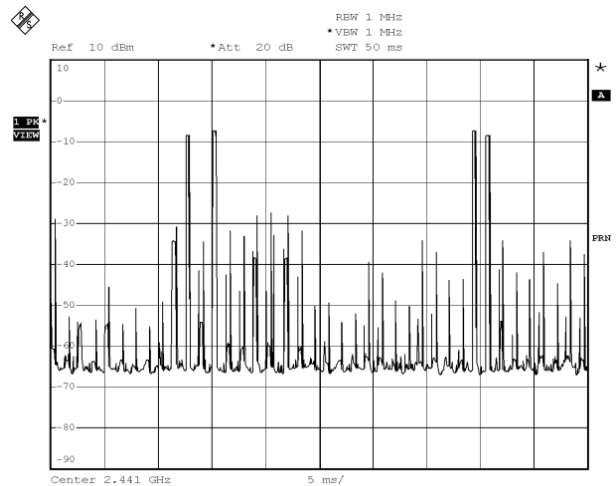
C) 2480MHz The Maximum Occupancy Time Within 31.6sec:  $1240 \mu\text{s} \times (780/79) \times 31.6 = 386.88 \text{msec}$  ◦

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

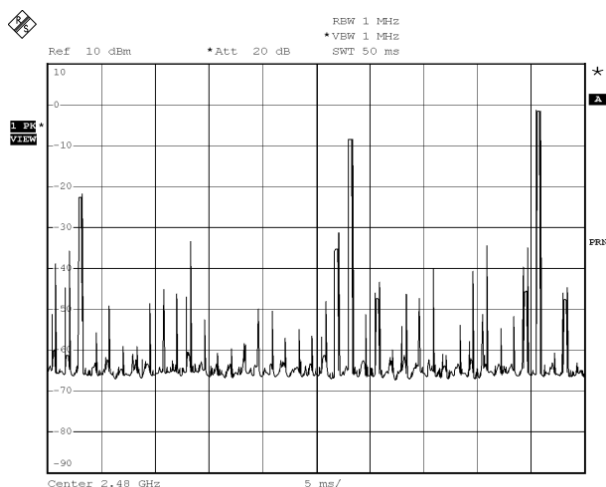
### Hop rate-2402MHz



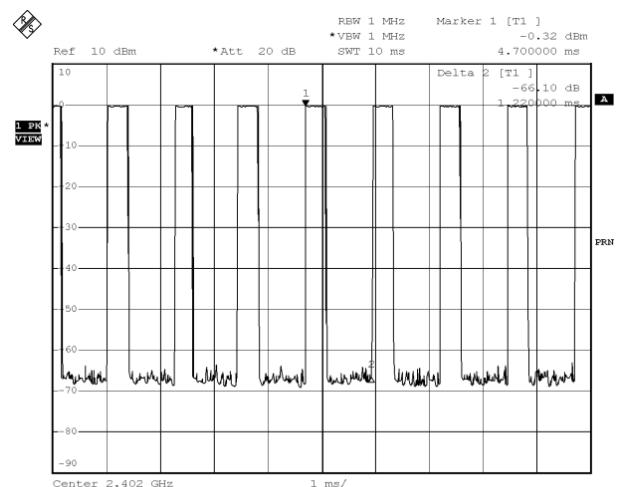
### Hop rate-2441MHz



### Hop rate-2480MHz



### Time slot length



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

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

### Occupancy Time of Frequency Hopping System-DH 3

Test Time Period:  $0.4 \times 79 = 31.6 \text{sec}$  , Hopping Times Within 1sec:  $20/50 \text{msec} = 400 / \text{sec}$

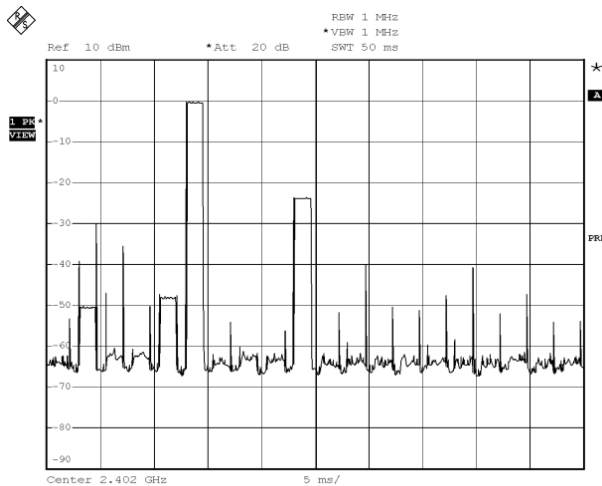
A) 2402MHz The Maximum Occupancy Time Within 31.6sec:  $2480 \mu\text{s} \times (400/79) \times 31.6 = 396.8 \text{msec}$  ◦

B) 2441MHz The Maximum Occupancy Time Within 31.6sec:  $2480 \mu\text{s} \times (400/79) \times 31.6 = 396.8 \text{msec}$  ◦

C) 2480MHz The Maximum Occupancy Time Within 31.6sec:  $2480 \mu\text{s} \times (400/79) \times 31.6 = 396.8 \text{msec}$  ◦

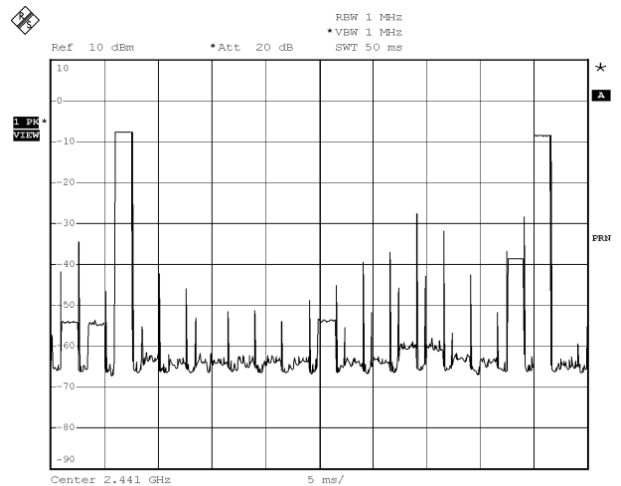
Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard ◦

### Hop rate-2402MHz



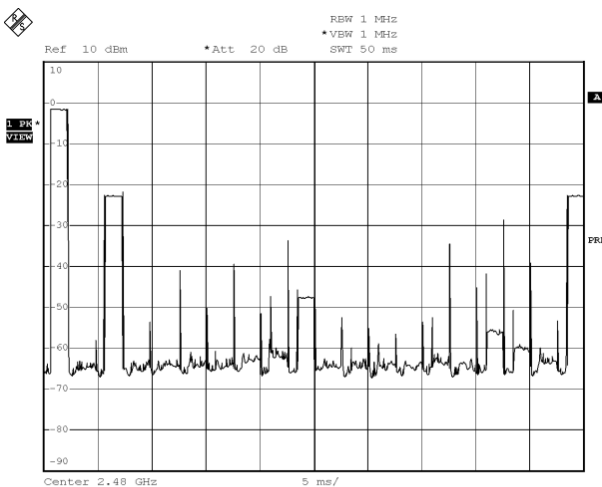
Date: 22.MAY.2006 13:12:33

### Hop rate-2441MHz



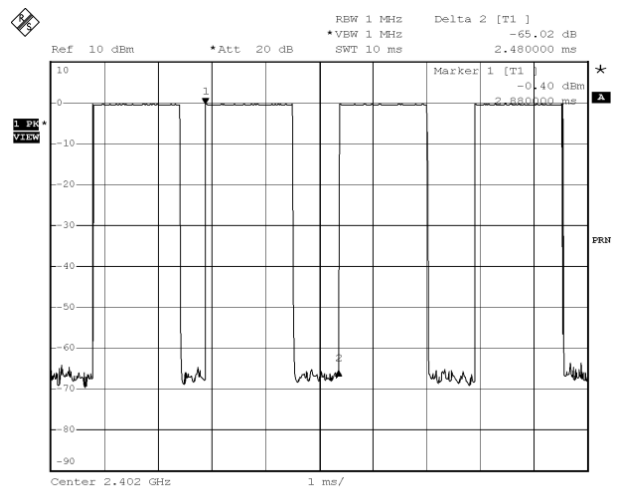
Date: 22.MAY.2006 13:09:15

### Hop rate-2480MHz



Date: 22.MAY.2006 13:07:41

### Time slot length



Date: 22.MAY.2006 13:11:44

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

Product	GR-239 Bluetooth GPS Receiver		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2006/05/22	Test Site	No.1 OATS

**Occupancy Time of Frequency Hopping System-DH 5**

Test Time Period:  $0.4 \times 79 = 31.6 \text{sec}$  , Hopping Times Within 1sec:  $13/50 \text{msec} = 260 / \text{sec}$

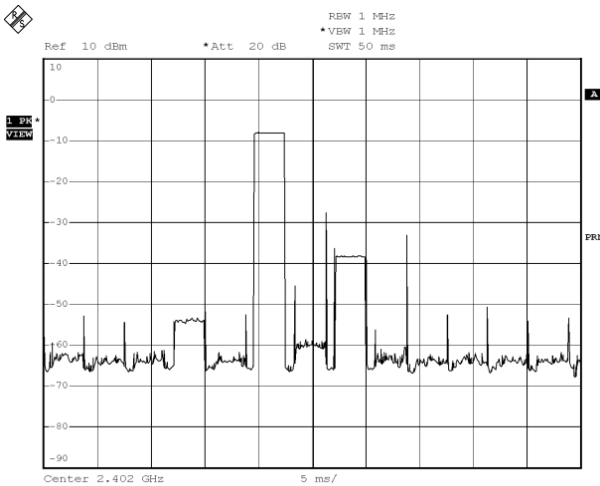
A) 2402MHz The Maximum Occupancy Time Within 31.6sec:  $3720 \mu\text{s} \times (260/79) \times 31.6 = 386.88 \text{msec}$  ◦

B) 2441MHz The Maximum Occupancy Time Within 31.6sec:  $3720 \mu\text{s} \times (260/79) \times 31.6 = 386.88 \text{msec}$  ◦

C) 2480MHz The Maximum Occupancy Time Within 31.6sec:  $3720 \mu\text{s} \times (260/79) \times 31.6 = 386.88 \text{msec}$  ◦

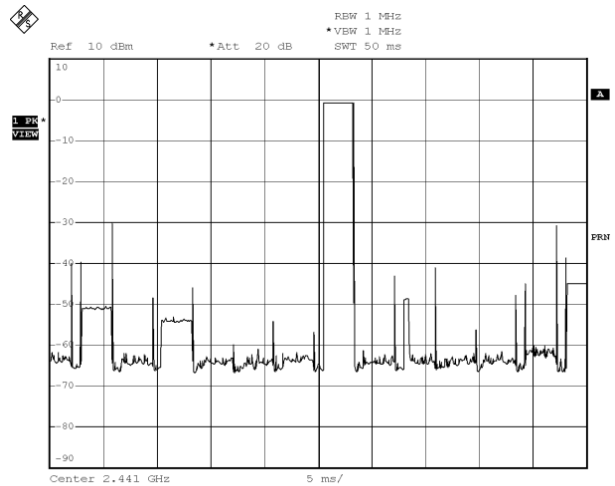
Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard ◦

**Hop rate-2402MHz**



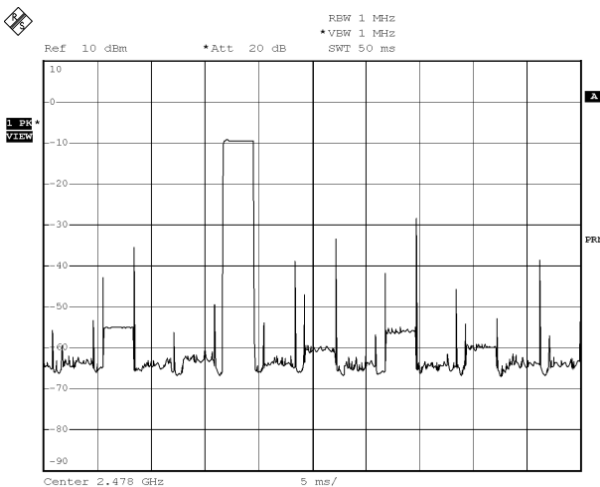
Date: 22.MAY.2006 13:13:33

**Hop rate-2441MHz**



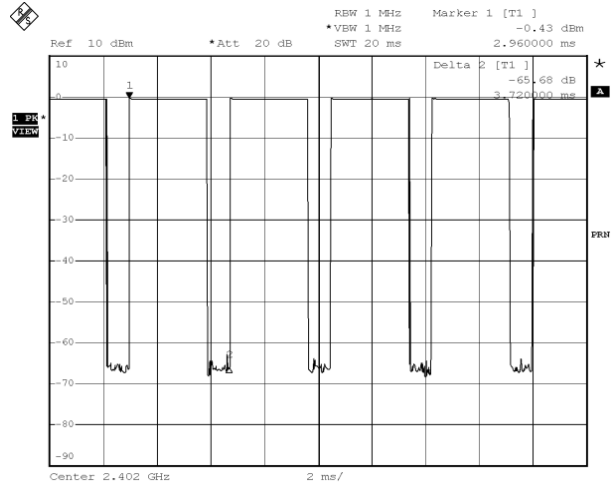
Date: 22.MAY.2006 13:15:35

**Hop rate-2480MHz**



Date: 22.MAY.2006 13:17:23

**Time slot length**



Date: 22.MAY.2006 13:14:05

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