# Test Report

Product Name ： M-1000 Bluetooth GPS Receiver
Model No. ： M-1000XX
FCC ID. ： RJI M-1000XX

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

Date of Receipt ： 2007/03/09
Issued Date ： 2007/03/29
Report No. ： 073H032-RFUSP06V01

# Test Report Certification

Issued Date : 2007/03/29
Report No. : 073H032-RFUSP06V01

QuieTek

| | | |
|---|---|---|
| Product Name | : | M-1000 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. | : | M-1000XX |
| FCC ID. | : | RJI M-1000XX |
| Rated Voltage | : | AC 120 V / 60 Hz |
| EUT Voltage | : | AC 120 V / 60 Hz |
| 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 : Sheena Huang

( Sheena Huang )

Approved By : Roy Wang

( Roy Wang )

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# 1. General Information

## 1.1. EUT Description

| | |
|---|---|
| Product Name | M-1000 Bluetooth GPS Receiver |
| Trade Name | HOLUX |
| Model No. | M-1000XX |
| Frequency Range | 2402~2480MHz |
| Channel Number | 79 |
| Type of Modulation | FHSS |
| Channel Control | Auto |
| Antenna Type | Micro-strip Antenna |
| Antenna Gain | 2.52dBi |

| Component | |
|---|---|
| Car Charger | Dmatek, YF-051000<br>I/P: 12V-24V<br>O/P: DC 5.4V, 1.0A<br>Cable Out: Non-Shielded, 1.8m |
| Power Adapter | SWITCHING, SYS1196-0605-W2<br>I/P: 100-240V, 0.3A MAX, 20-30VA, 50-60Hz<br>O/P: +5V/1.0A, O/P Power: 5W MAX<br>Cable Out: Non-Shielded, 1.5m |

| 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 M-1000 Bluetooth GPS Receiver included a 2.4GHz receiving function, and 2.4GHz transmitting function.
2. 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.
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 073H032-RFUSP01V02 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 (Adapter)<br>Mode 2: Transmit (Car Charger) |
| Final Test Mode | |
| EMI | Mode 1: Transmit (Adapter)<br>Mode 2: Transmit (Car Charger) |

## 1.4. Tested System Details

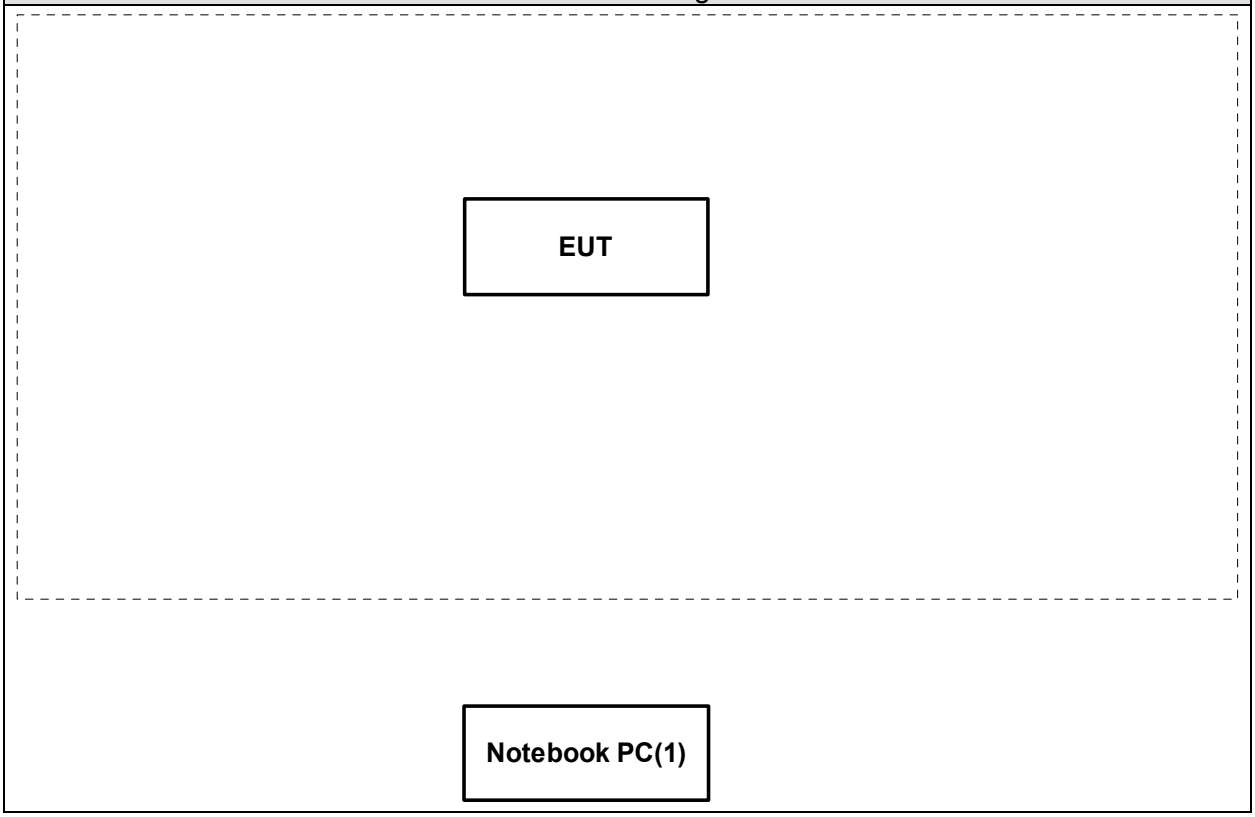
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

| Test Mode | | Mode 1: Receive (Adapter) | | | |
|---|---|---|---|---|---|
| Product | | Manufacturer | Model No. | Serial No. | Power Cord |
| 1 | Notebook PC | DELL | LATITUDE D400 | N/A | Non-Shielded, 1.7m, a ferrite core bonded |

| Test Mode | | Mode 2: Receive (Car Charger) | | | |
|---|---|---|---|---|---|
| Product | | Manufacturer | Model No. | Serial No. | Power Cord |
| 1 | Notebook PC | DELL | LATITUDE D400 | N/A | Non-Shielded, 1.7m, a ferrite core bonded |
| 2 | Battery | SEALED LEAD | N/A | N/A | -- |

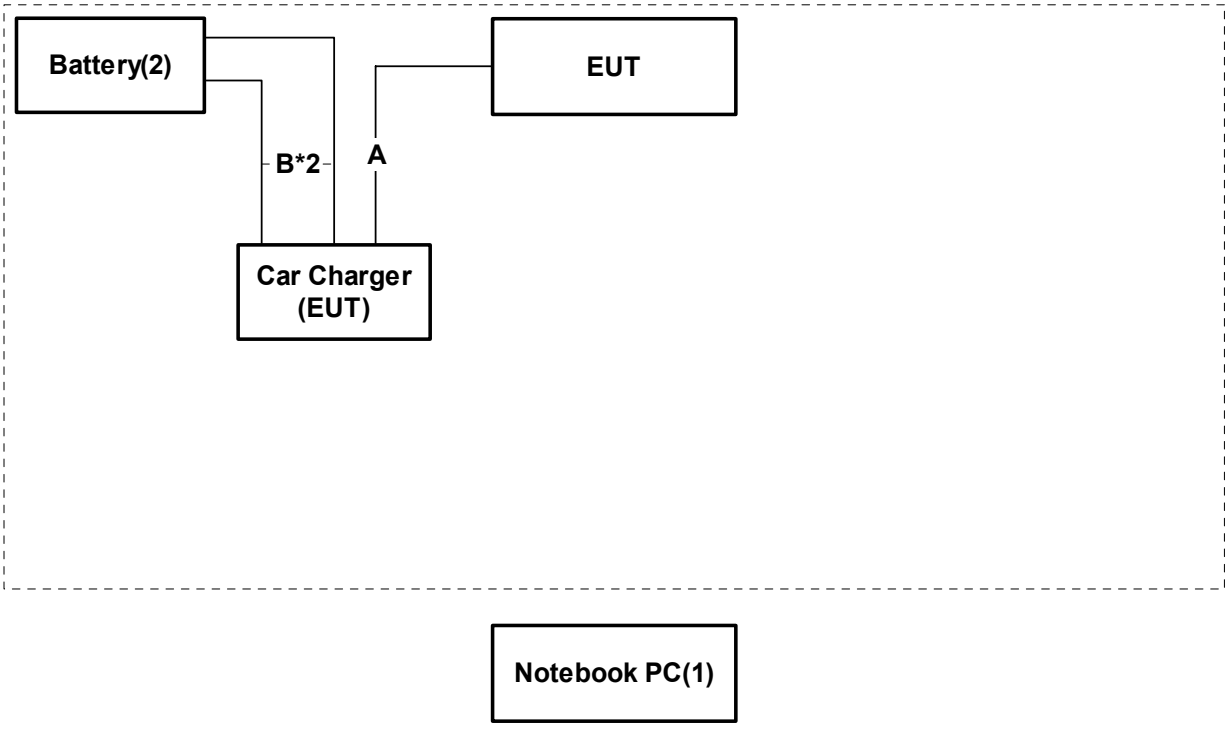
## 1.5. Configuration of tested System

| Test Mode | Mode 1: Receive (Adapter) |
|---|---|
| Connection Diagram | |



| Test Mode | Mode 2: Receive (Car Charger) |
|---|---|

Connection Diagram




| Signal Cable Type | | Signal cable Description |
|---|---|---|
| A | Power Line | Non-Shielded, 1.0m |
| B | Power Line | Non-Shielded, 1.0m, 2Pcs |

## 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 | Verify the model operation. |
| 4 | Repeat the above procedure (3) to (4). |

## 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 | 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 | 25 |
| Humidity (%RH) | | 25 - 75 | 58 |
| 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 | 58 |
| 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 | 59 |
| 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 | 58 |
| 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 | 65 |
| 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

NVLAP Lab Code : 200347-0

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

# 2. Conducted Emission

## 2.1. Test Equipment

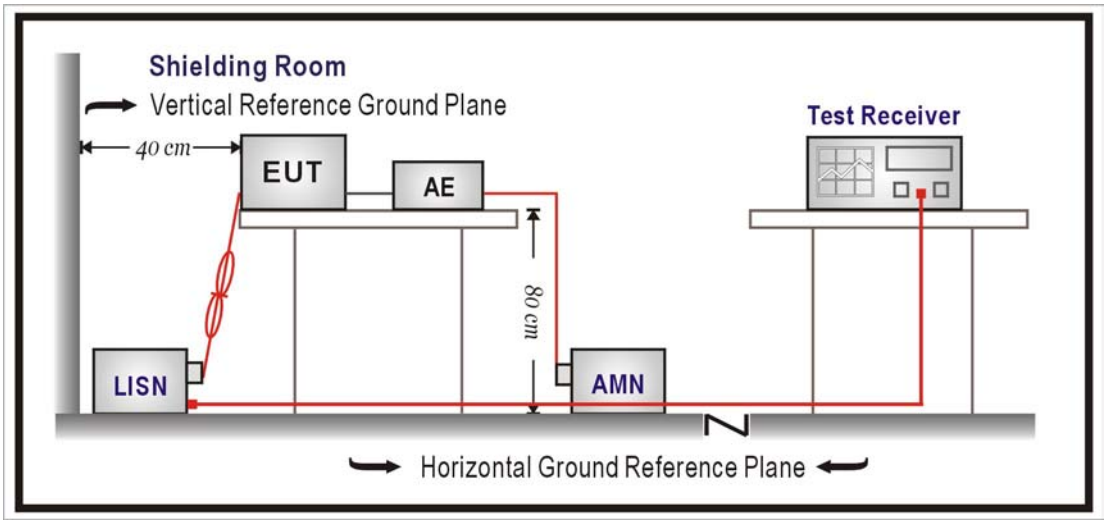
The following test equipment are used during the test:

Conducted Emission / SR2

| Instrument | Manufacturer | Type No. | Serial No | Cal. Date |
|---|---|---|---|---|
| 4-Wire ISN | R & S | ENY 41 | 837032/001 | 2006/04/15 |
| Artificial Mains Network | R & S | ENV4200 | 848411/010 | 2007/03/13 |
| Double 2-Wire ISN | R & S | ENY 22 | 835354/008 | 2006/04/15 |
| LISN | R & S | ESH3-Z5 | 825562/002 | 2006/03/31 |
| Pulse Limiter | R & S | ZSH3Z2 | 357.8810.54 | 2006/07/19 |
| Test Receiver | R & S | ESCS 30 | 100122 | 2007/02/21 |

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

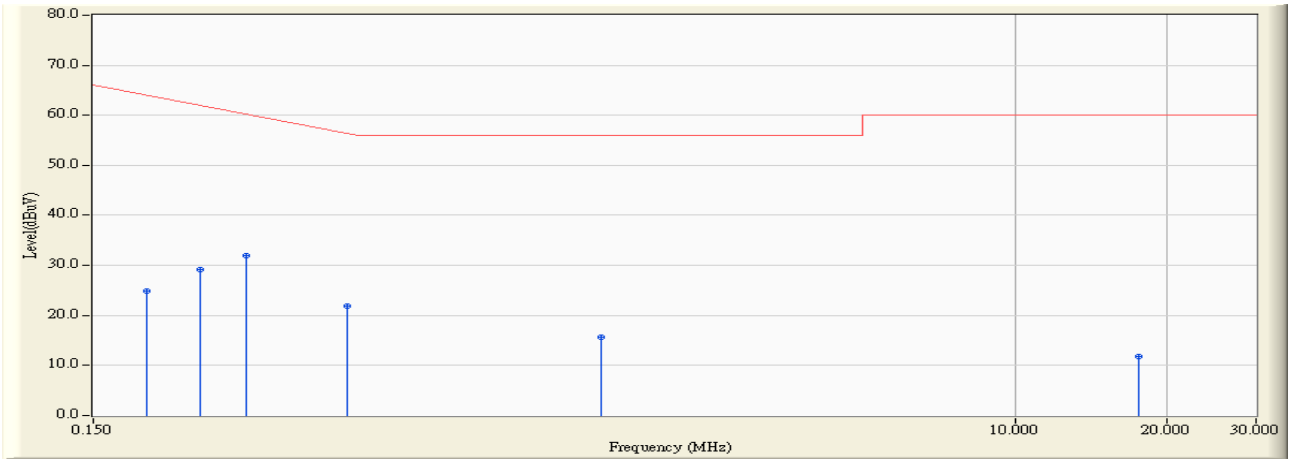
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling 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: 2004

## 2.6. Test Result

| | |
|---|---|
| Site : QuieTek Shielding Room2 | Time : 2007/03/22 - 09:31 |
| Limit : CISPR_B_00M_QP | Margin : 0 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : SR3_LISN(16A) - Line1 |
| Power : AC 120V/60Hz | Note : TX |

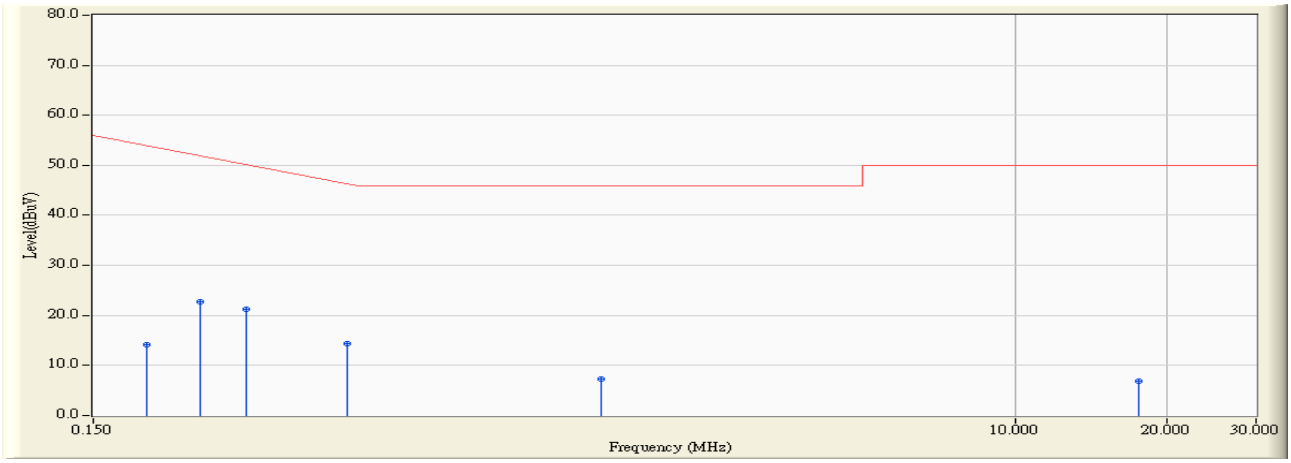



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 0.191 | 0.151 | 24.750 | 24.901 | -39.928 | 64.829 | QUASIPEAK |
| 2 | | 0.244 | 0.160 | 29.040 | 29.200 | -34.114 | 63.314 | QUASIPEAK |
| 3 | * | 0.302 | 0.178 | 31.680 | 31.858 | -29.799 | 61.657 | QUASIPEAK |
| 4 | | 0.478 | 0.207 | 21.630 | 21.837 | -34.792 | 56.629 | QUASIPEAK |
| 5 | | 1.516 | 0.310 | 15.360 | 15.670 | -40.330 | 56.000 | QUASIPEAK |
| 6 | | 17.599 | 0.940 | 10.800 | 11.740 | -48.260 | 60.000 | QUASIPEAK |

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 : QuieTek Shielding Room2 | Time : 2007/03/22 - 09:31 |
| Limit : CISPR_B_00M_AV | Margin : 0 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : SR3_LISN(16A) - Line1 |
| Power : AC 120V/60Hz | Note : TX |

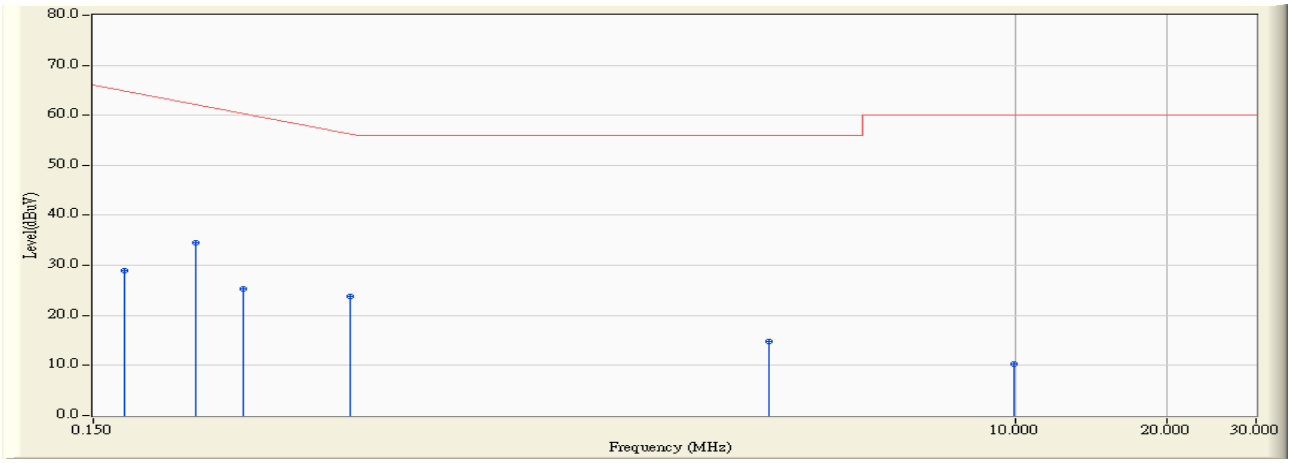



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 0.191 | 0.151 | 14.040 | 14.191 | -40.638 | 54.829 | AVERAGE |
| 2 | | 0.244 | 0.160 | 22.520 | 22.680 | -30.634 | 53.314 | AVERAGE |
| 3 | * | 0.302 | 0.178 | 21.140 | 21.318 | -30.339 | 51.657 | AVERAGE |
| 4 | | 0.478 | 0.207 | 14.150 | 14.357 | -32.272 | 46.629 | AVERAGE |
| 5 | | 1.516 | 0.310 | 7.000 | 7.310 | -38.690 | 46.000 | AVERAGE |
| 6 | | 17.599 | 0.940 | 6.030 | 6.970 | -43.030 | 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 : QuieTek Shielding Room2 | Time : 2007/03/22 - 09:36 |
| Limit : CISPR_B_00M_QP | Margin : 0 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : SR3_LISN(16A) - Line2 |
| Power : AC 120V/60Hz | Note : TX |

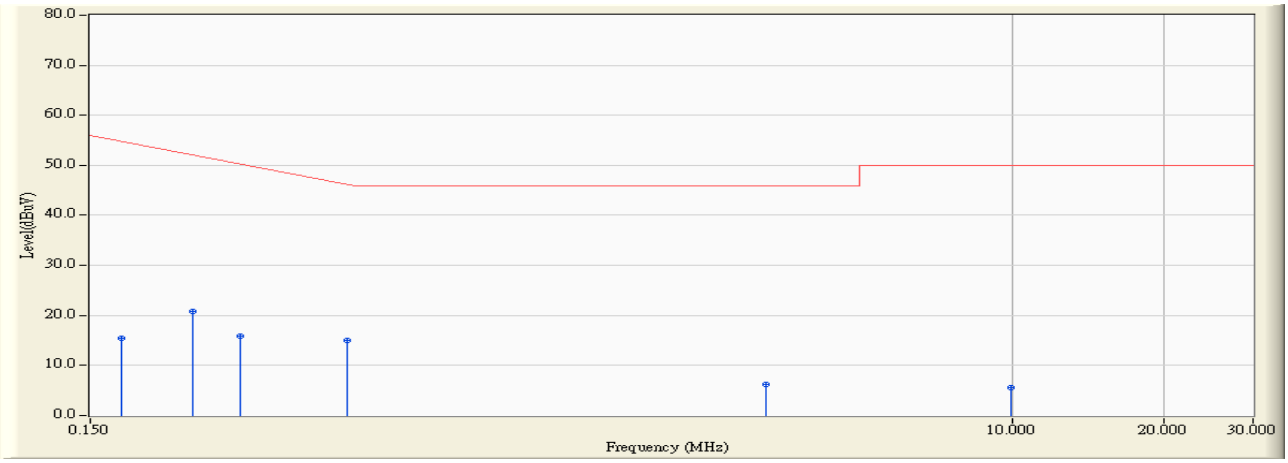



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 0.173 | 0.145 | 28.730 | 28.875 | -36.468 | 65.343 | QUASIPEAK |
| 2 | * | 0.240 | 0.160 | 34.370 | 34.530 | -28.899 | 63.429 | QUASIPEAK |
| 3 | | 0.298 | 0.177 | 25.120 | 25.297 | -36.474 | 61.771 | QUASIPEAK |
| 4 | | 0.482 | 0.208 | 23.590 | 23.798 | -32.716 | 56.514 | QUASIPEAK |
| 5 | | 3.252 | 0.420 | 14.310 | 14.730 | -41.270 | 56.000 | QUASIPEAK |
| 6 | | 9.943 | 0.620 | 9.580 | 10.200 | -49.800 | 60.000 | QUASIPEAK |

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 : QuieTek Shielding Room2 | Time : 2007/03/22 - 09:36 |
| Limit : CISPR_B_00M_AV | Margin : 0 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : SR3_LISN(16A) - Line2 |
| Power : AC 120V/60Hz | Note : TX |




| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV) | Margin (dB) | Limit (dBuV) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 0.173 | 0.145 | 15.320 | 15.465 | -39.878 | 55.343 | AVERAGE |
| 2 | | 0.240 | 0.160 | 20.640 | 20.800 | -32.629 | 53.429 | AVERAGE |
| 3 | | 0.298 | 0.177 | 15.640 | 15.817 | -35.954 | 51.771 | AVERAGE |
| 4 | * | 0.482 | 0.208 | 14.830 | 15.038 | -31.476 | 46.514 | AVERAGE |
| 5 | | 3.252 | 0.420 | 5.850 | 6.270 | -39.730 | 46.000 | AVERAGE |
| 6 | | 9.943 | 0.620 | 4.900 | 5.520 | -44.480 | 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

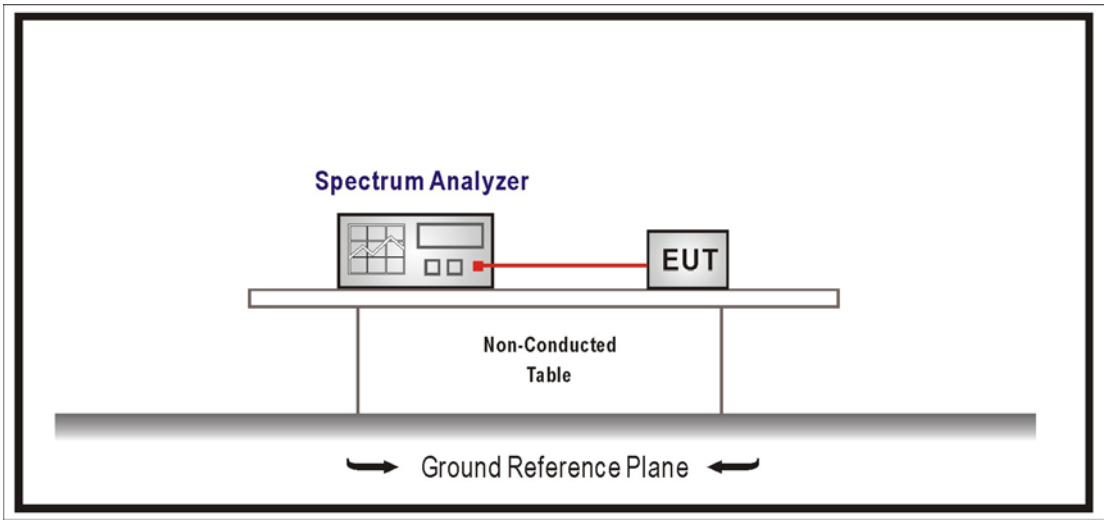
## 3.1. Test Equipment

The following test equipment are used during the test:

| Item | Equipment | Manufacturer | Model No. / Serial No. | Last Cal. |
|---|---|---|---|---|
| 1 | Power Meter | Agilent | E4416A / GB41291630 | May, 2007 |
| 2 | Power Sensor | Agilent | E9323A / US40411166 | Apr., 2006 |
| 3 | No.1 OATS | | | Sep., 2006 |

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

## 3.2. Test Setup




## 3.3. 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.

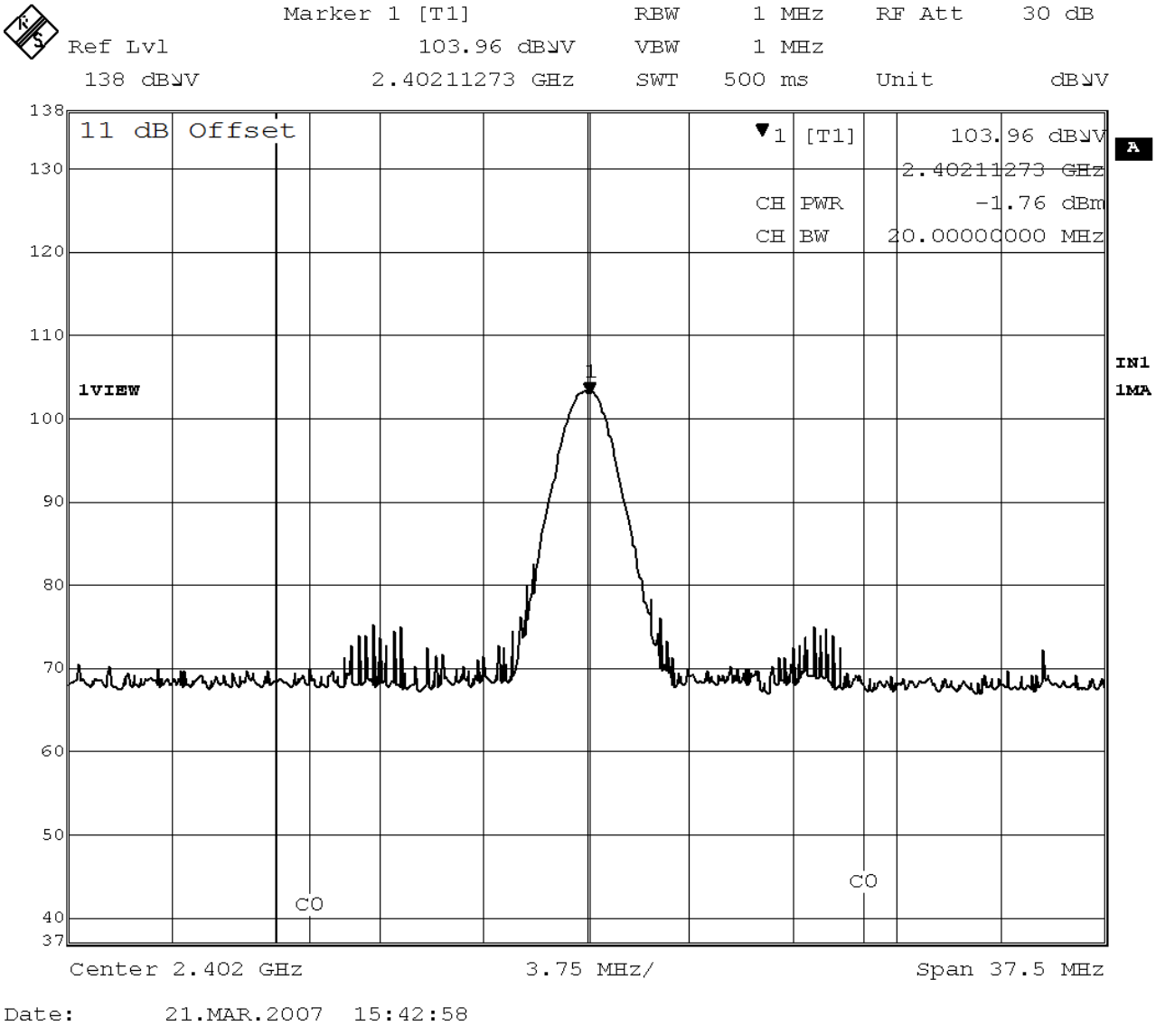
## 3.4. Test Specification

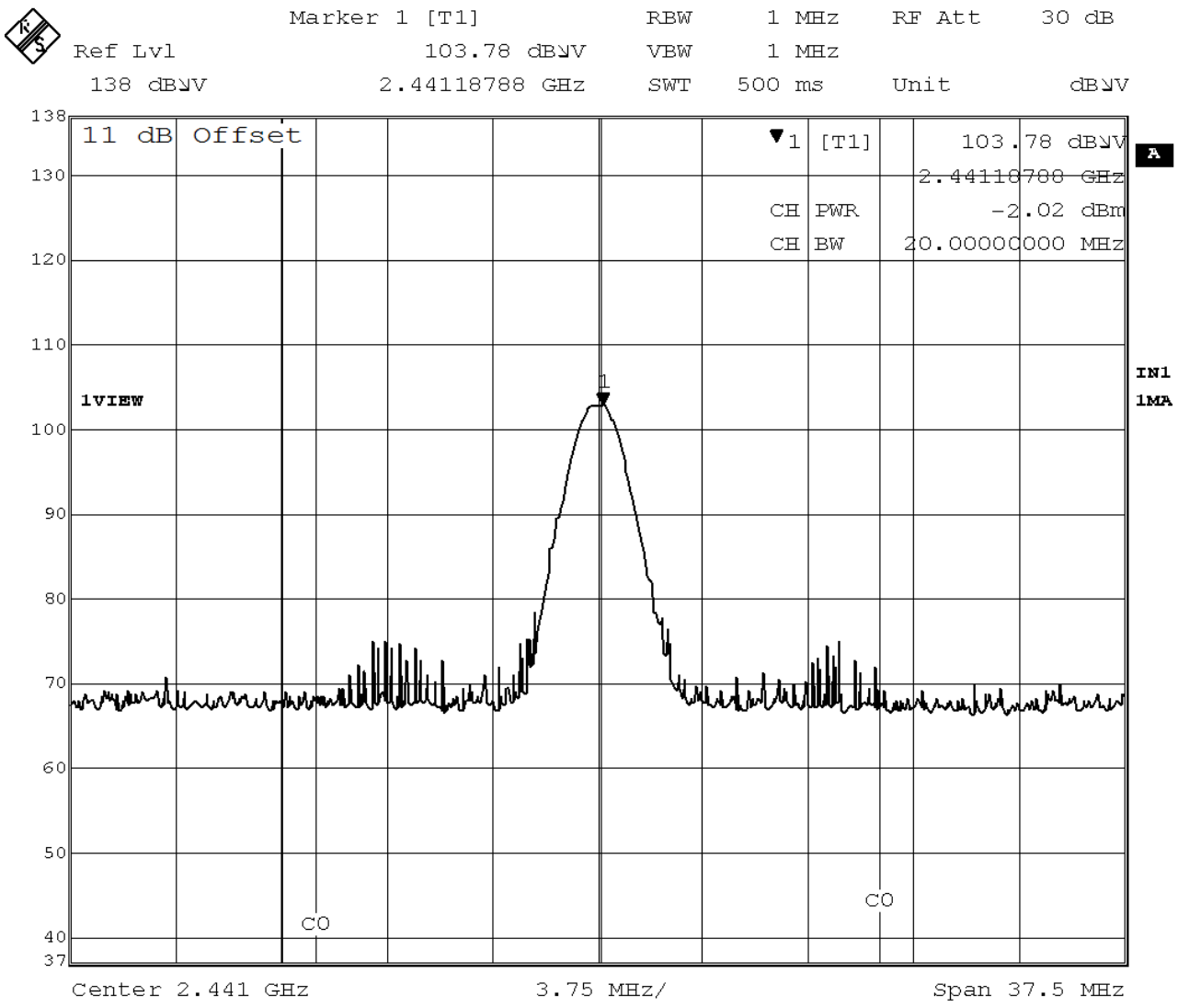
According to FCC Part 15 Subpart C Paragraph 15.247: 2004

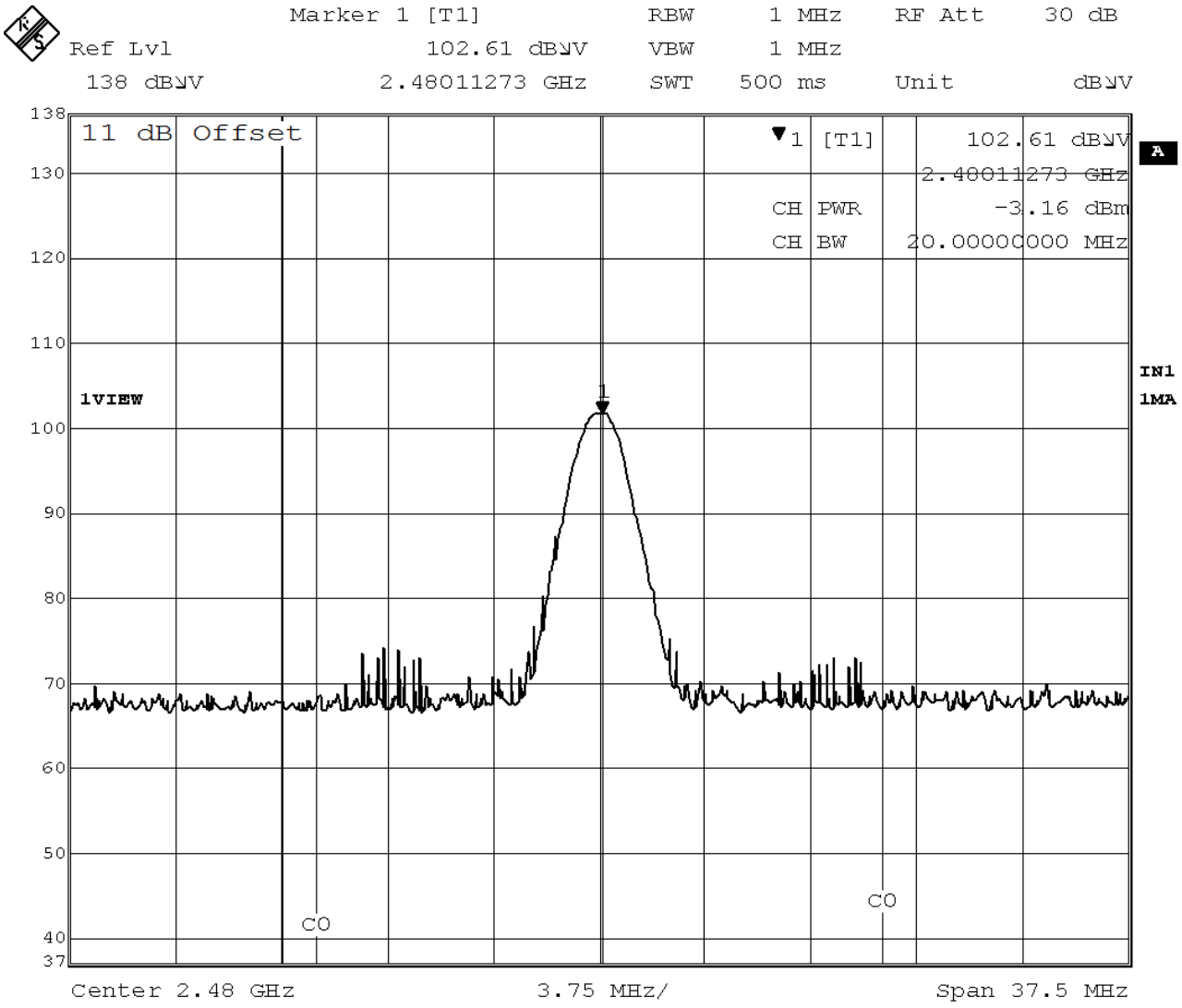
## 3.5. Test Result

| | | | |
|---|---|---|---|
| Product | M-1000 Bluetooth GPS Receiver | | |
| Test Item | Peak Power Output | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 00 | 2402.00 | -1.76 | 1Watt = 30 dBm | Pass |
| 39 | 2441.00 | -2.02 | 1Watt= 30 dBm | Pass |
| 78 | 2480.00 | -3.16 | 1Watt= 30 dBm | Pass |




Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl 103.78 dBµV
VBW 1 MHz
138 dBµV 2.44118788 GHz
SWT 500 ms
Unit dBµV
11 dB Offset
1 [T1] 103.78 dBµV
2.44118788 GHz
CH PWR -2.02 dBm
CH BW 20.00000000 MHz
1VIEW
IN1
1MA
138
130
120
110
100
90
80
70
60
50
40
37
C0
C0
Center 2.441 GHz
3.75 MHz/
Span 37.5 MHz
Date: 21.MAR.2007 15:44:57


Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
102.61 dBµV
VBW 1 MHz
138 dBµV
2.48011273 GHz
SWT 500 ms
Unit dBµV
11 dB Offset
1 [T1]
102.61 dBµV
2.48011273 GHz
CH PWR -3.16 dBm
CH BW 20.00000000 MHz
A
IN1
1MA
1VIEW
138
130
120
110
100
90
80
70
60
50
40
37
C0
C0
Center 2.48 GHz
3.75 MHz/
Span 37.5 MHz
Date: 21.MAR.2007 15:47:05

# 4. Radiated Emission

## 4.1. Test Equipment

The following test equipment are used during the test:

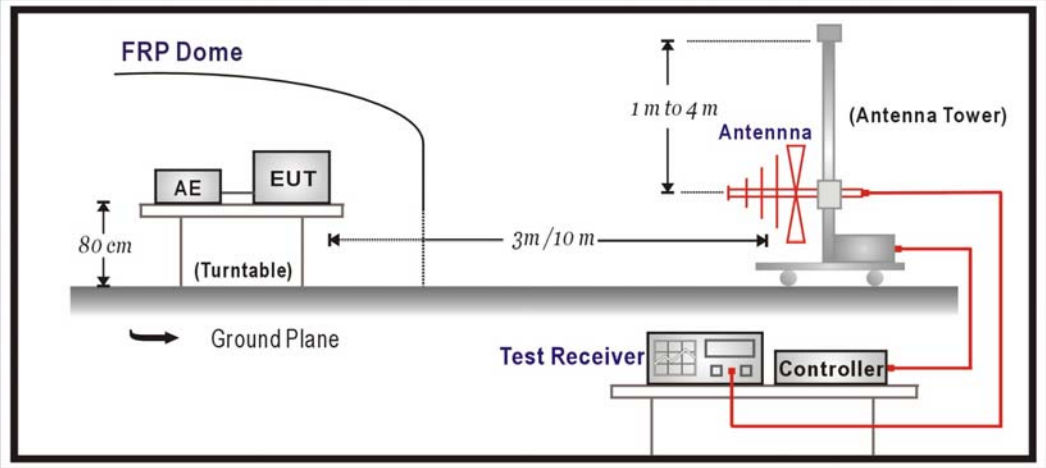
Radiated Emission / Site1

| Instrument | Manufacturer | Type No. | Serial No | Cal. Date |
|---|---|---|---|---|
| Bilog Antenna | Schaffner Chase | CBL6112B | 2895 | 2006/09/03 |
| Horn Antenna | Electro Metrics | EM-6961 | 103325 | 2007/03/15 |
| Pre-Amplifier | HP | 8449B | 3008A01123 | 2006/11/15 |
| Pre-Amplifier | Quietek | AP-025C | N/A | N/A |
| Spectrum Analyzer | R & S | FSP40 | 100005 | 2006/08/25 |
| Spectrum Analyzer | Advantest | R3162 | 120300649 | 2006/11/24 |
| Test Receiver | R & S | ESCS 30 | 825442/017 | 2007/02/13 |

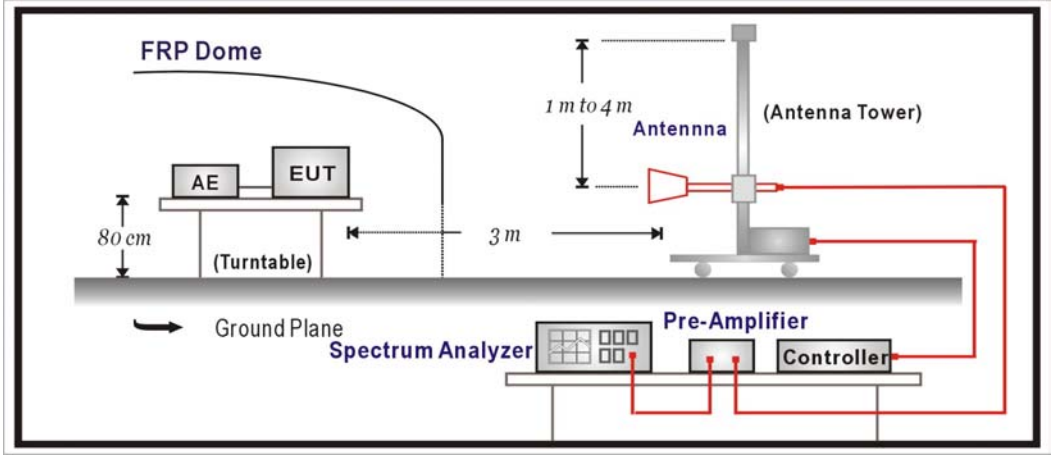
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark “X” test instruments are used to measure the final test results.

## 4.2. Test Setup

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 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.

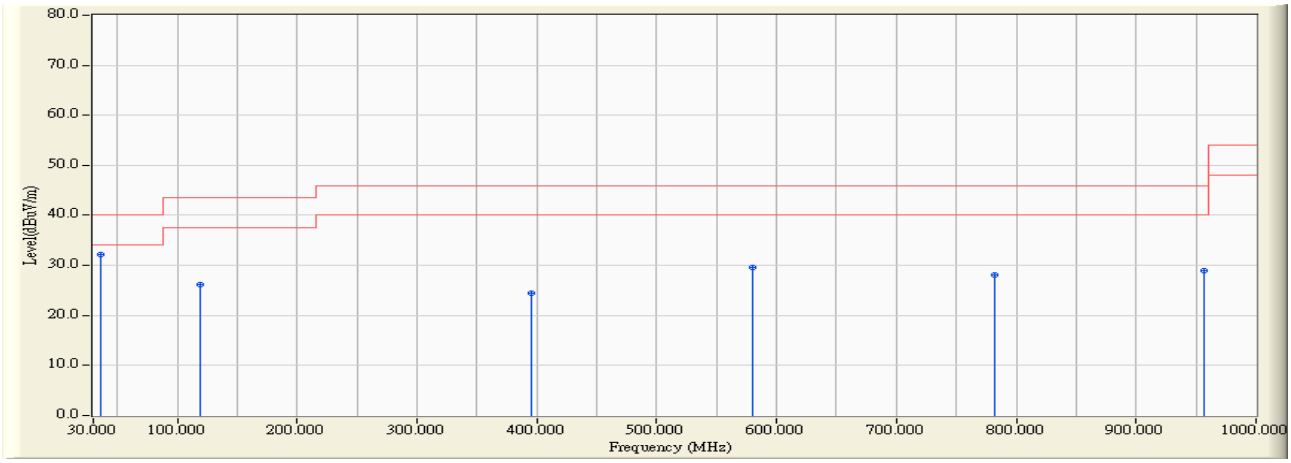
## 4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 4.6. Test Result

### 30MHz-1GHz Spurious:

| | |
|---|---|
| Site : Site 1 | Time : 2007/03/22 - 23:02 |
| Limit : FCC_CLASS_B_03M_QP | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_30-1G(200605) - HORIZONTAL |
| Power : AC120V/60Hz | Note:TX-MODE1 |

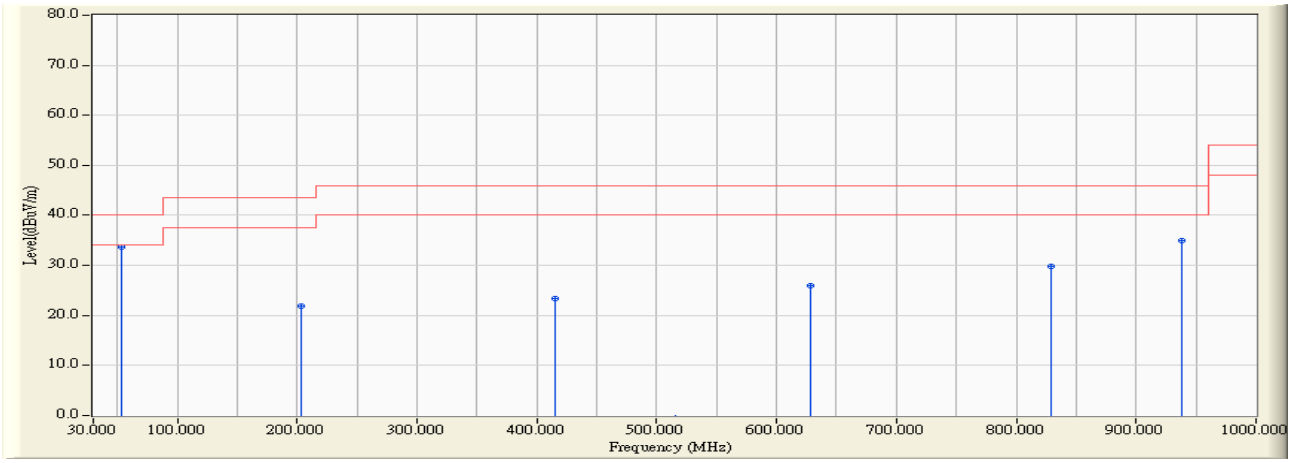



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 35.832 | -4.761 | 36.931 | 32.170 | -7.830 | 40.000 | Quasi-Peak |
| 2 | | 119.419 | -11.064 | 37.308 | 26.244 | -17.256 | 43.500 | Quasi-Peak |
| 3 | | 395.451 | 1.023 | 23.466 | 24.489 | -21.511 | 46.000 | Quasi-Peak |
| 4 | | 580.120 | 5.369 | 24.221 | 29.590 | -16.410 | 46.000 | Quasi-Peak |
| 5 | | 782.285 | 4.118 | 23.936 | 28.054 | -17.946 | 46.000 | Quasi-Peak |
| 6 | | 957.234 | 3.719 | 25.244 | 28.963 | -17.037 | 46.000 | Quasi-Peak |

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 : Site 1 | Time : 2007/03/22 - 23:09 |
| Limit : FCC_CLASS_B_03M_QP | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_30-1G(200605) - VERTICAL |
| Power : AC120V/60Hz | Note:TX-MODE1 |

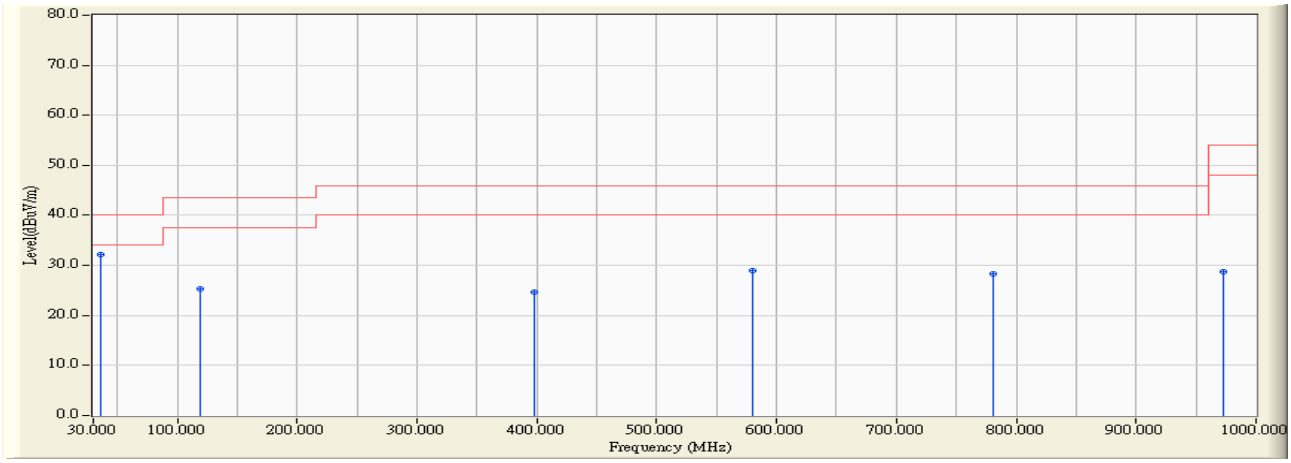



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 53.327 | -7.186 | 40.931 | 33.745 | -6.255 | 40.000 | Quasi-Peak |
| 2 | | 203.006 | -3.127 | 24.904 | 21.777 | -21.723 | 43.500 | Quasi-Peak |
| 3 | | 414.890 | -0.338 | 23.679 | 23.341 | -22.659 | 46.000 | Quasi-Peak |
| 4 | | 515.000 | -2.520 | 0.000 | -2.520 | -48.520 | 46.000 | Quasi-Peak |
| 5 | | 628.717 | 1.939 | 23.934 | 25.873 | -20.127 | 46.000 | Quasi-Peak |
| 6 | | 828.938 | 5.191 | 24.544 | 29.735 | -16.265 | 46.000 | Quasi-Peak |
| 7 | | 937.796 | 9.020 | 26.030 | 35.050 | -10.950 | 46.000 | Quasi-Peak |

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 : Site 1 | Time : 2007/03/22 - 23:23 |
| Limit : FCC_CLASS_B_03M_QP | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_30-1G(200605) - HORIZONTAL |
| Power : AC120V/60Hz | Note:TX-MODE2 |

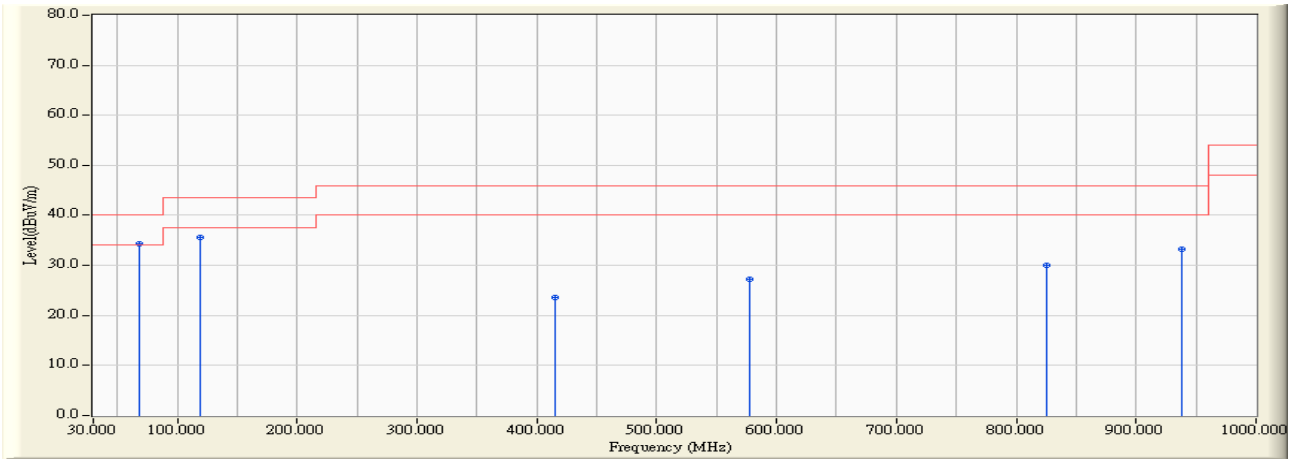



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 35.832 | -4.761 | 37.021 | 32.260 | -7.740 | 40.000 | Quasi-Peak |
| 2 | | 119.419 | -11.064 | 36.372 | 25.308 | -18.192 | 43.500 | Quasi-Peak |
| 3 | | 397.395 | 1.158 | 23.553 | 24.711 | -21.289 | 46.000 | Quasi-Peak |
| 4 | | 580.120 | 5.369 | 23.641 | 29.010 | -16.990 | 46.000 | Quasi-Peak |
| 5 | | 780.341 | 4.104 | 24.228 | 28.332 | -17.668 | 46.000 | Quasi-Peak |
| 6 | | 972.786 | 4.555 | 24.090 | 28.645 | -25.355 | 54.000 | Quasi-Peak |

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 : Site 1 | Time : 2007/03/22 - 23:29 |
| Limit : FCC_CLASS_B_03M_QP | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_30-1G(200605) - VERTICAL |
| Power : AC120V/60Hz | Note:TX-MODE2 |



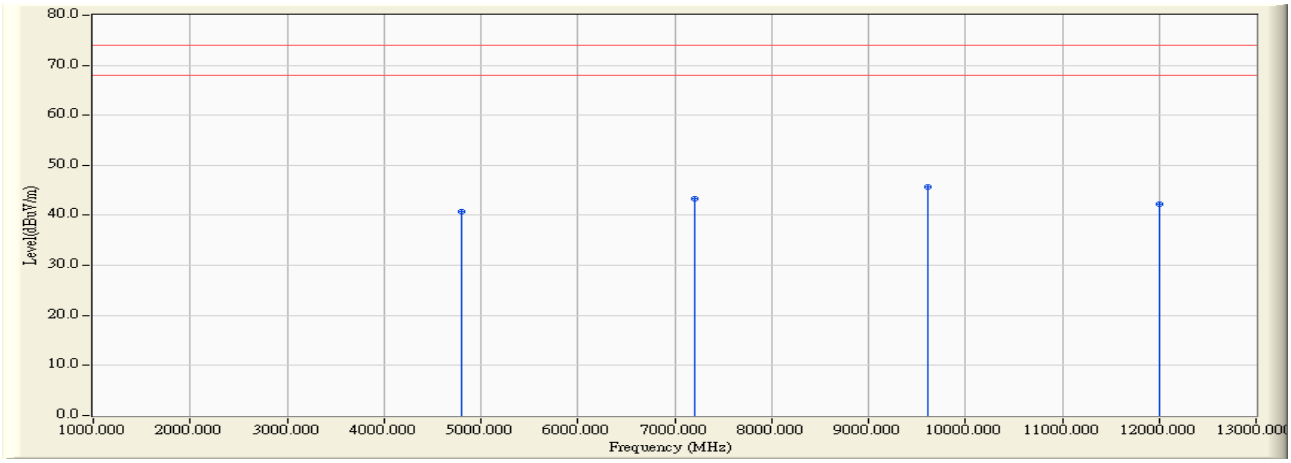

| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 68.878 | -7.810 | 42.217 | 34.407 | -5.593 | 40.000 | Quasi-Peak |
| 2 | | 119.419 | -3.996 | 39.616 | 35.620 | -7.880 | 43.500 | Quasi-Peak |
| 3 | | 414.890 | -0.338 | 23.931 | 23.593 | -22.407 | 46.000 | Quasi-Peak |
| 4 | | 578.176 | 4.216 | 23.067 | 27.283 | -18.717 | 46.000 | Quasi-Peak |
| 5 | | 825.050 | 5.259 | 24.790 | 30.049 | -15.951 | 46.000 | Quasi-Peak |
| 6 | | 937.796 | 9.020 | 24.231 | 33.251 | -12.749 | 46.000 | Quasi-Peak |

Note:

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

**Harmonic & Spurious:**

| | |
|---|---|
| Site : Site 1 | Time : 2007/03/20 - 17:59 |
| Limit : FCC_SpartC_15.247_H_03M_PK | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_1G-18G(2005-3) - HORIZONTAL |
| Power :AC120V/60Hz | Note:CH00-TX |

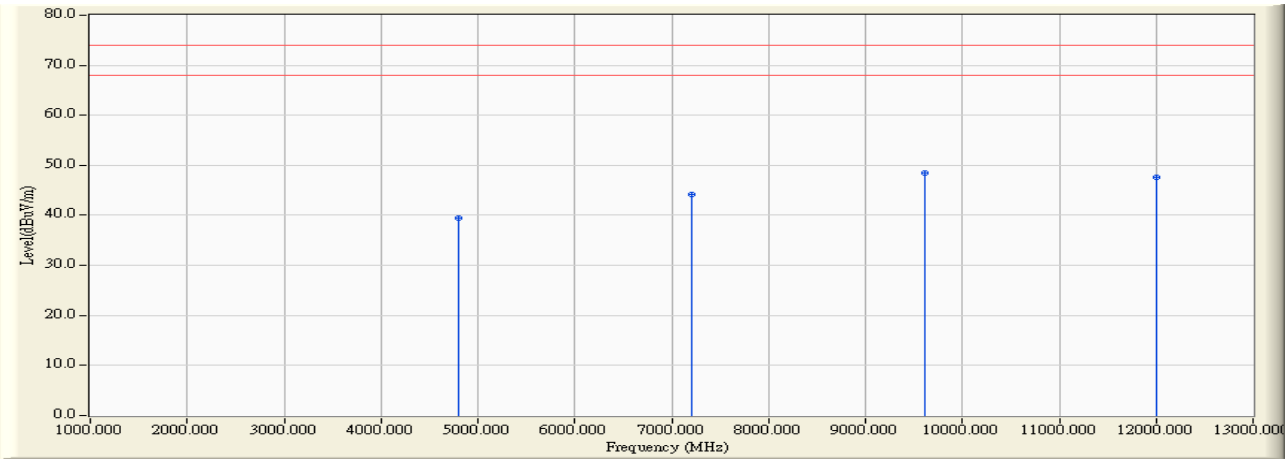



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 4804.330 | 3.596 | 37.100 | 40.696 | -33.304 | 74.000 | 74.000 | PEAK |
| 2 | | 7205.880 | 8.691 | 34.590 | 43.281 | -30.719 | 74.000 | 74.000 | PEAK |
| 3 | * | 9608.180 | 12.690 | 32.940 | 45.630 | -28.370 | 74.000 | 74.000 | PEAK |
| 4 | | 12010.030 | 11.028 | 31.290 | 42.317 | -31.683 | 74.000 | 74.000 | PEAK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. 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 : Site 1 | Time : 2007/03/20 - 18:07 |
| Limit : FCC_SpartC_15.247_H_03M_PK | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_1G-18G(2005-3) - VERTICAL |
| Power :AC120V/60Hz | Note:CH00-TX |

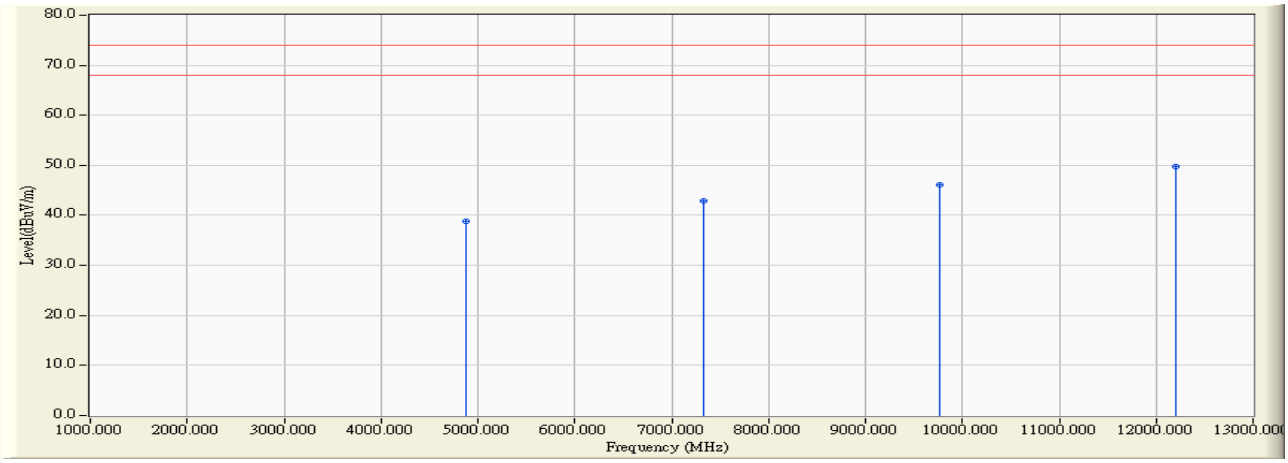



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 4804.410 | 1.814 | 37.580 | 39.395 | -34.605 | 74.000 | 54.00 | PEAK |
| 2 | | 7206.110 | 8.635 | 35.480 | 44.115 | -29.885 | 74.000 | 54.00 | PEAK |
| 3 | * | 9607.880 | 14.677 | 33.750 | 48.427 | -25.573 | 74.000 | 54.00 | PEAK |
| 4 | | 12010.110 | 16.608 | 30.900 | 47.508 | -26.492 | 74.000 | 54.00 | PEAK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. 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 : Site 1 | Time : 2007/03/20 - 21:45 |
| Limit : FCC_SpartC_15.247_H_03M_PK | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_1G-18G(2005-3) - HORIZONTAL |
| Power :AC120V/60Hz | Note:CH39-TX |

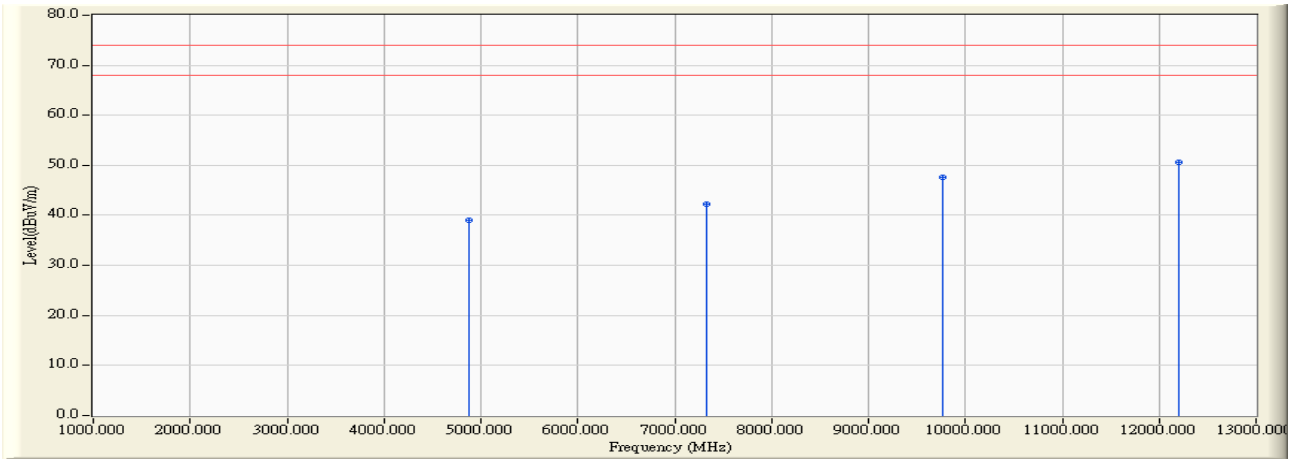



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 4881.930 | 4.141 | 34.580 | 38.722 | -35.278 | 74.000 | 54.00 | PEAK |
| 2 | | 4884.930 | 4.163 | 34.580 | 38.743 | -35.257 | 74.000 | 54.00 | PEAK |
| 3 | | 7323.000 | 8.859 | 34.130 | 42.989 | -31.011 | 74.000 | 54.00 | PEAK |
| 4 | | 9764.010 | 13.218 | 32.920 | 46.138 | -27.862 | 74.000 | 54.00 | PEAK |
| 5 | * | 12205.010 | 18.109 | 31.670 | 49.779 | -24.221 | 74.000 | 54.00 | PEAK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. 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 : Site 1 | Time : 2007/03/20 - 21:55 |
| Limit : FCC_SpartC_15.247_H_03M_PK | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_1G-18G(2005-3) - VERTICAL |
| Power :AC120V/60Hz | Note:CH39-TX |

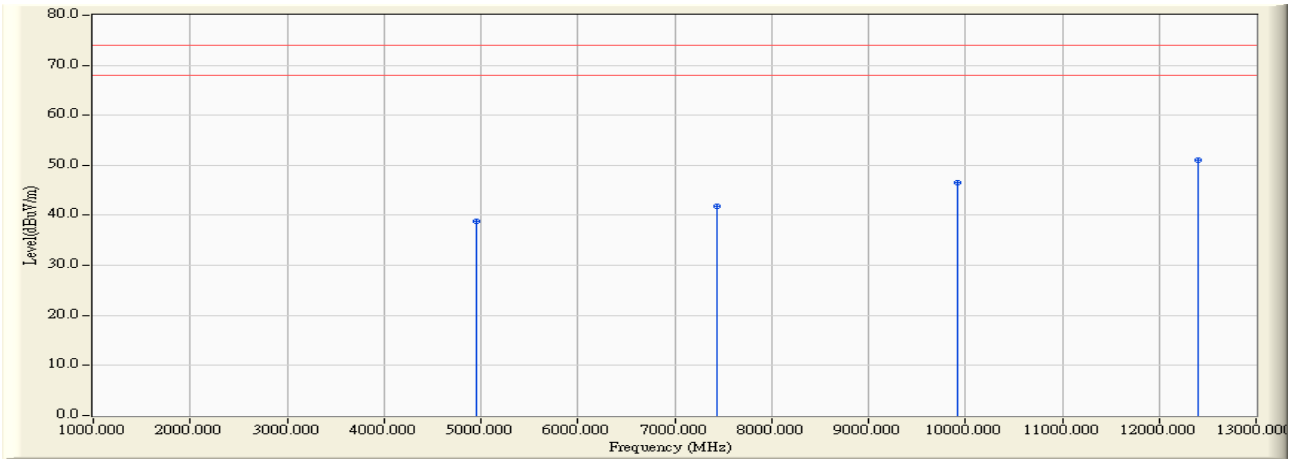



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 4881.780 | 2.500 | 36.510 | 39.011 | -34.989 | 74.000 | 54.00 | PEAK |
| 2 | | 7323.030 | 8.859 | 33.480 | 42.339 | -31.661 | 74.000 | 54.00 | PEAK |
| 3 | | 9764.230 | 15.219 | 32.420 | 47.639 | -26.361 | 74.000 | 54.00 | PEAK |
| 4 | * | 12205.050 | 19.567 | 31.150 | 50.717 | -23.283 | 74.000 | 54.00 | PEAK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. 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 : Site 1 | Time : 2007/03/20 - 22:27 |
| Limit : FCC_SpartC_15.247_H_03M_PK | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_1G-18G(2005-3) - HORIZONTAL |
| Power :AC120V/60Hz | Note:CH78-TX |

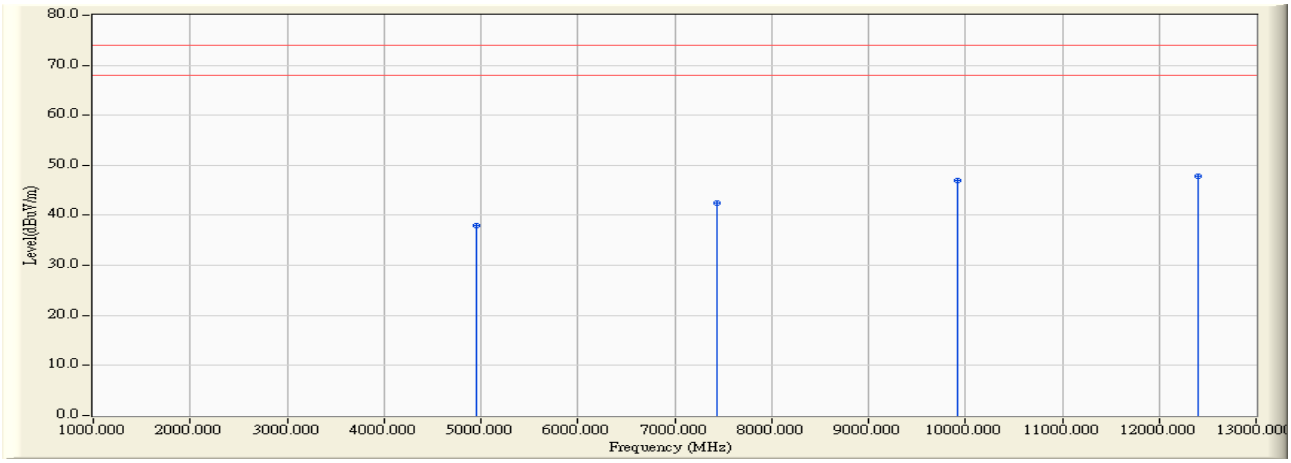



| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 4960.030 | 4.399 | 34.320 | 38.720 | -35.280 | 74.000 | 54.00 | PEAK |
| 2 | | 7440.050 | 9.017 | 32.910 | 41.927 | -32.073 | 74.000 | 54.00 | PEAK |
| 3 | | 9920.050 | 14.540 | 31.970 | 46.510 | -27.490 | 74.000 | 54.00 | PEAK |
| 4 | * | 12400.030 | 20.665 | 30.360 | 51.025 | -22.975 | 74.000 | 54.00 | PEAK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. 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 : Site 1 | Time : 2007/03/20 - 22:29 |
| Limit : FCC_SpartC_15.247_H_03M_PK | Margin : 6 |
| EUT : M-1000 Bluetooth GPS Receiver | Probe : FCC_RF_1G-18G(2005-3) - VERTICAL |
| Power :AC120V/60Hz | Note:CH78-TX |




| | | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Measure Level (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 4960.010 | 2.917 | 34.940 | 37.858 | -36.142 | 74.000 | 54.00 | PEAK |
| 2 | | 7439.940 | 9.017 | 33.450 | 42.466 | -31.534 | 74.000 | 54.00 | PEAK |
| 3 | | 9920.010 | 15.340 | 31.660 | 47.000 | -27.000 | 74.000 | 54.00 | PEAK |
| 4 | * | 12400.050 | 16.165 | 31.760 | 47.925 | -26.075 | 74.000 | 54.00 | PEAK |

Note:

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

## 5.1. Test Equipment

The following test equipment are used during the test:

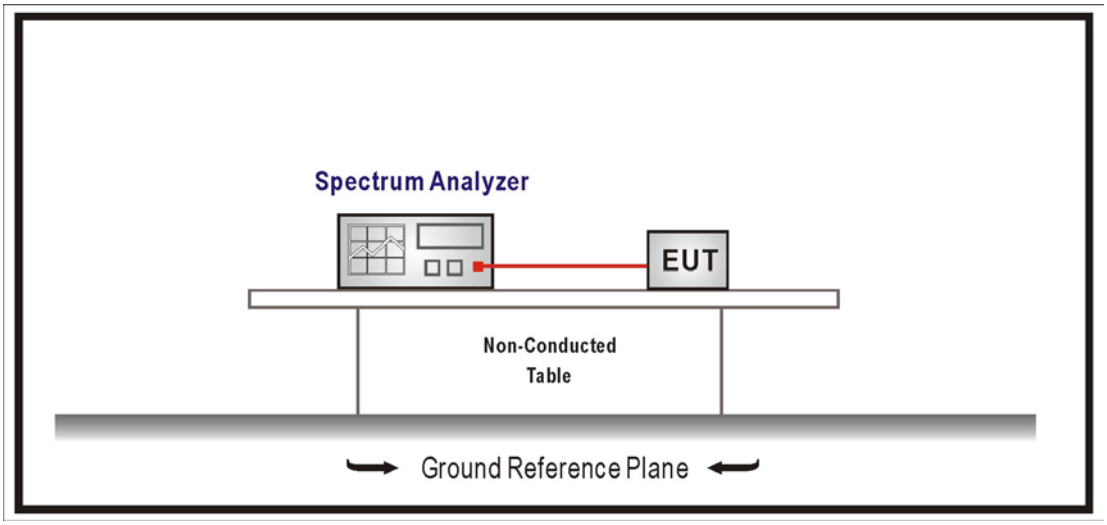
| RF Conducted Measurement: | | | | | |
|---|---|---|---|---|---|
| Item | Equipment | | Manufacturer | Model No. / Serial No. | Last Cal. |
| 1 | Spectrum Analyzer | | R & S | FSP / 100561 | Mar., 2007 |
| 2 | No.1 OATS | | | | Sep., 2006 |
| RF Radiated Measurement: | | | | | |
| Item | Equipment | | Manufacturer | Model No. / Serial No. | Last Cal. |
| 1 | X | Spectrum Analyzer | R & S | FSP40 / 100005 | Aug., 2006 |
| 2 | X | Pre-Amplifier | HP | 8449B / 3008A01123 | Feb., 2007 |
| 3 | | Loop Antenna | R & S | HFH2-Z2 / 833799/004 | Sep., 2006 |
| 4 | | BiconiLog Antenna | Schwarzbeck | VULB 9166 / 1061 | Sep., 2006 |
| 5 | | Bilog Antenna | Chase | CBL6112B / 2455 | Sep., 2006 |
| 6 | X | Horn Antenna | Schwarzbeck | BBHA 9120D / BBHA9120D312 | Sep., 2006 |
| 7 | No.1 OATS | | | | Sep., 2006 |

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

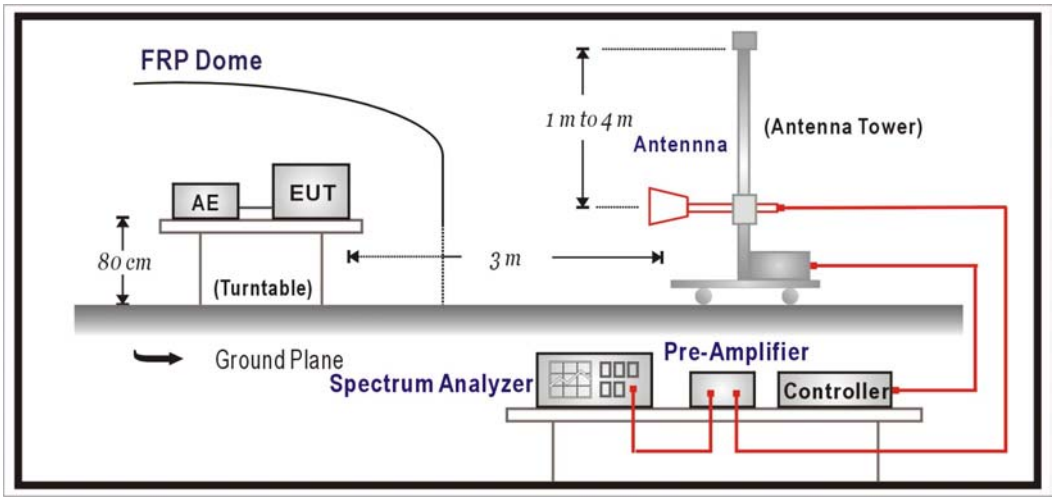
2. Mark “X” test instruments are used to measure the final test results.

## 5.2. Test Setup

RF Conducted Measurement:




RF Radiated 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 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)).

## 5.4. 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.

## 5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

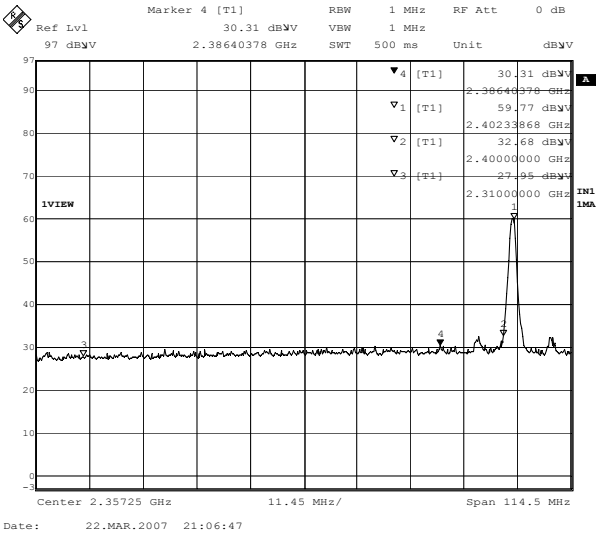
## 5.6. Test Result

| Product | M-1000 Bluetooth GPS Receiver | | |
|---|---|---|---|
| Test Item | Band Edge | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/22 | Test Site | No.1 OATS |

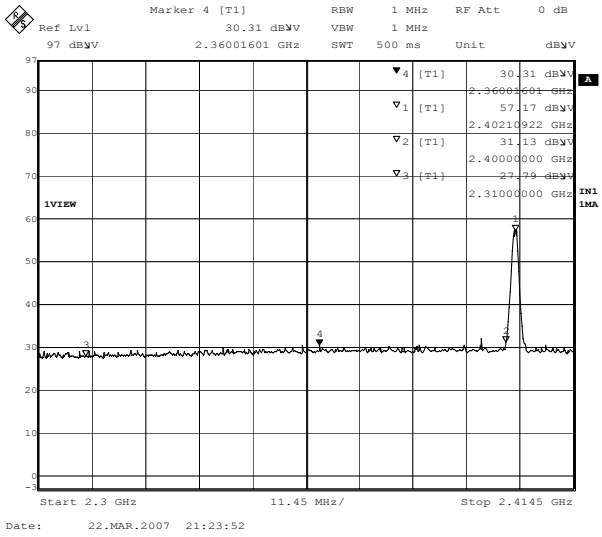
**RF Radiated Measurement: (Peak Detector)**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | PreAMP (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Result |
|---|---|---|---|---|---|---|---|
| 00(Horizontal) | 2386.400 | 30.310 | 28.969 | 0.00 | 59.279 | 74.000 | Pass |
| 00(Vertical) | 2360.010 | 30.310 | 27.270 | 0.00 | 57.580 | 74.000 | Pass |

**Horizontal**




**Vertical**



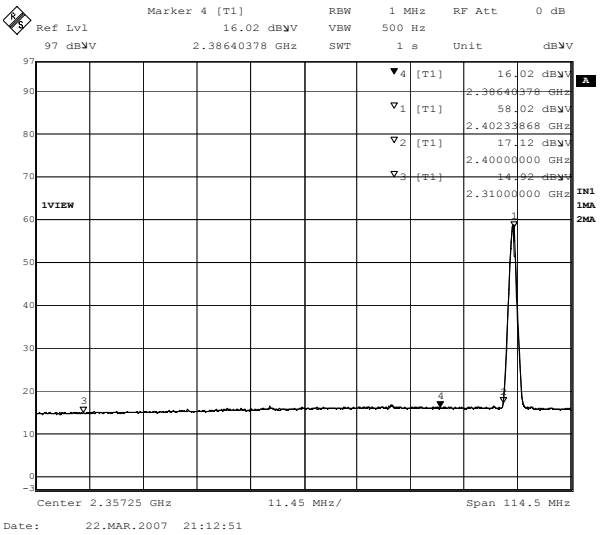

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

| | | | |
|---|---|---|---|
| Product | M-1000 Bluetooth GPS Receiver | | |
| Test Item | Band Edge | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/22 | Test Site | No.1 OATS |

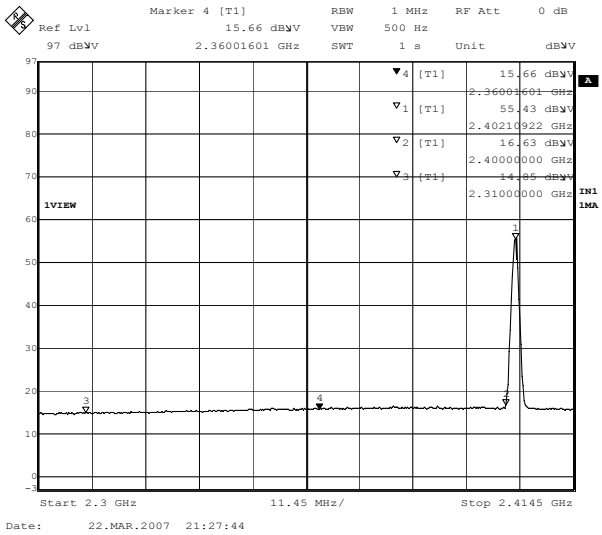
**RF Radiated Measurement: (Average Detector)**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | PreAMP (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Result |
|---|---|---|---|---|---|---|---|
| 00(Horizontal) | 2386.400 | 16.020 | 28.969 | 0.00 | 44.989 | 54.00 | Pass |
| 00(Vertical) | 2360.010 | 15.660 | 27.270 | 0.00 | 42.930 | 54.00 | Pass |

**Horizontal**




**Vertical**



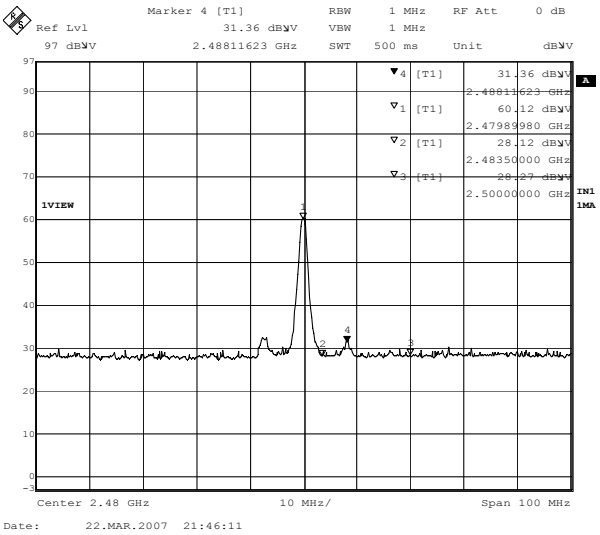

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

| | | | |
|---|---|---|---|
| Product | M-1000 Bluetooth GPS Receiver | | |
| Test Item | Band Edge | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/22 | Test Site | No.1 OATS |

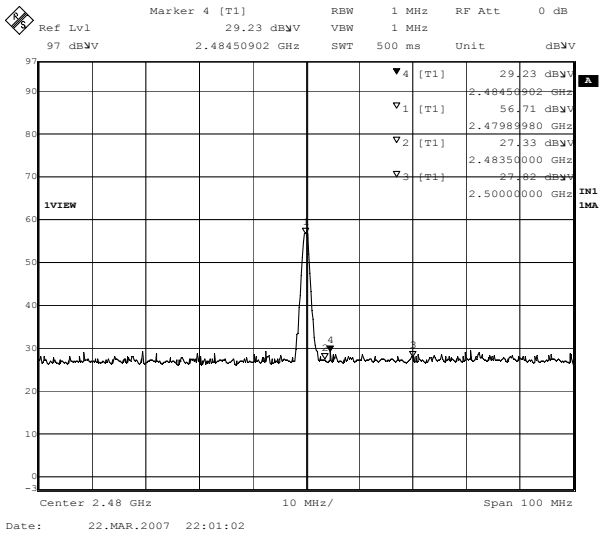
**RF Radiated Measurement: (Peak Detector)**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | PreAMP (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Result |
|---|---|---|---|---|---|---|---|
| 78(Horizontal) | 2488.110 | 31.360 | 29.306 | 0.00 | 60.667 | 74.000 | Pass |
| 78(Vertical) | 2484.500 | 29.230 | 27.696 | 0.00 | 56.926 | 74.000 | Pass |

**Horizontal**




**Vertical**



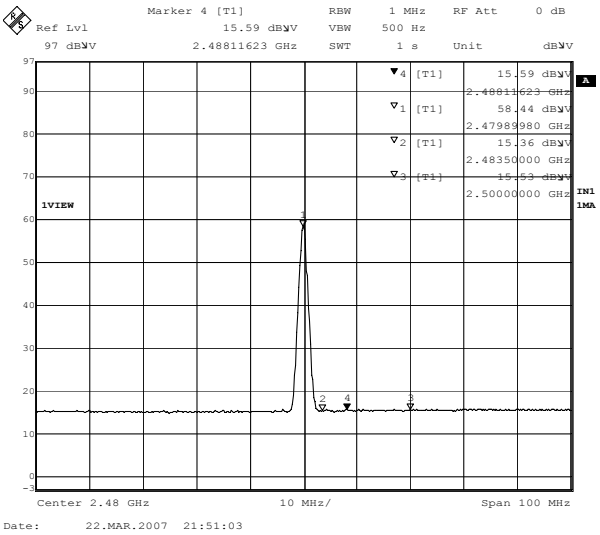

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

| | | | |
|---|---|---|---|
| Product | M-1000 Bluetooth GPS Receiver | | |
| Test Item | Band Edge | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/22 | Test Site | No.1 OATS |

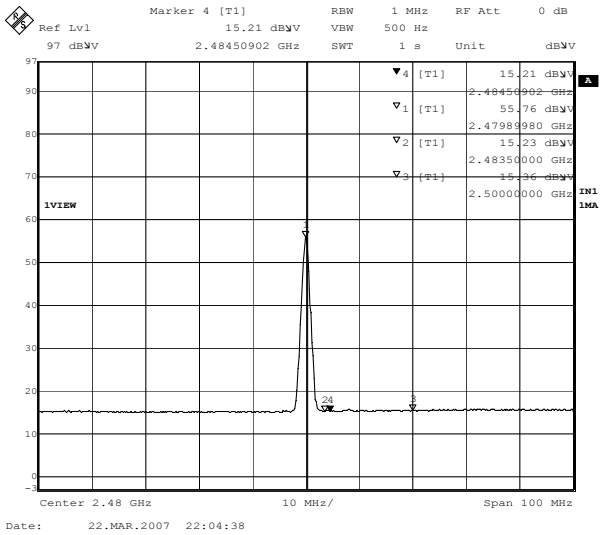
**RF Radiated Measurement: (Average Detector)**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | PreAMP (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Result |
|---|---|---|---|---|---|---|---|
| 78(Horizontal) | 2488.110 | 15.590 | 29.306 | 0.00 | 44.897 | 54.000 | Pass |
| 78(Vertical) | 2484.500 | 15.210 | 27.696 | 0.00 | 42.906 | 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.

# 6. Channel of Number

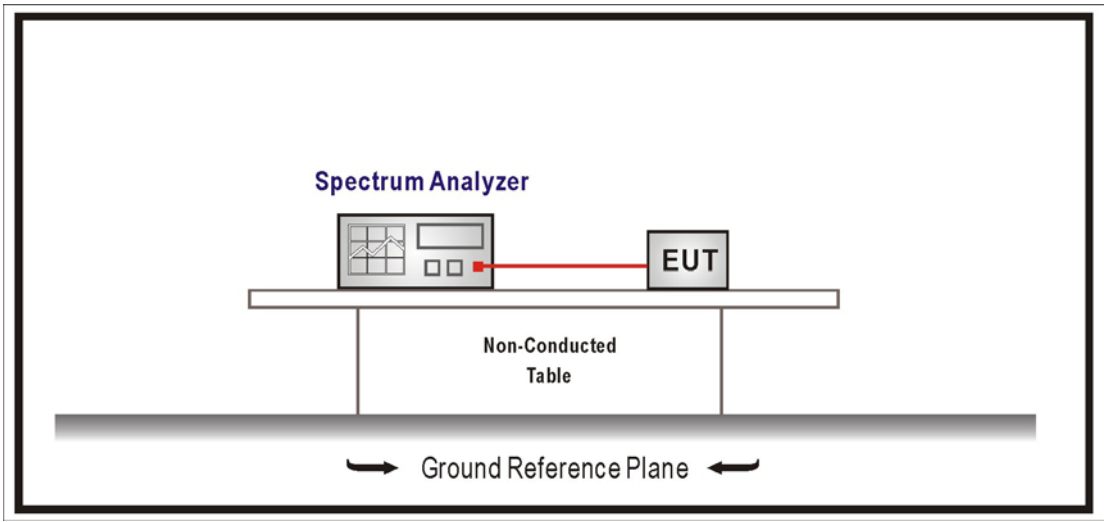
## 6.1. Test Equipment

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., 2007 |
| 2 | No.1 OATS | | | Sep., 2006 |

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

## 6.2. Test Setup




## 6.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

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

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

## 6.4. Test Specification

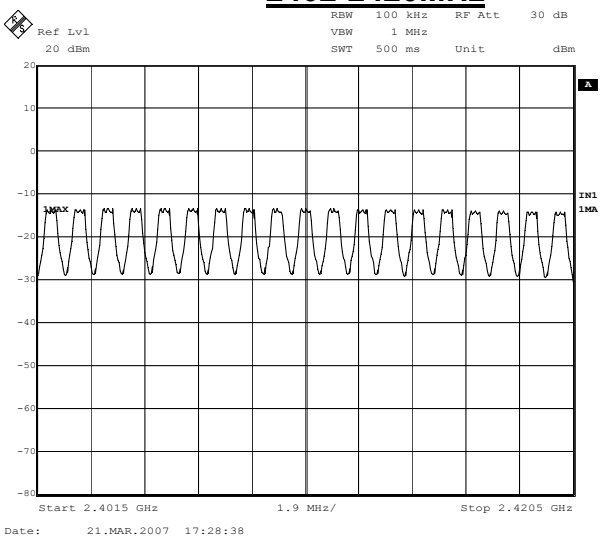
According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 6.5. Test Result

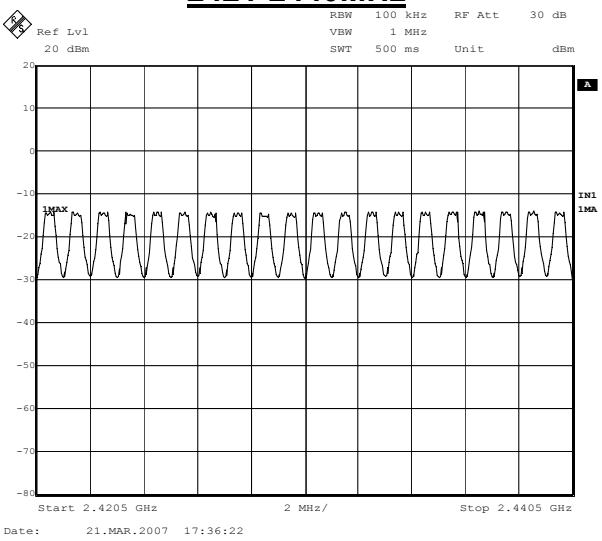
| Product | M-1000 Bluetooth GPS Receiver | | |
|---|---|---|---|
| Test Item | Channel of Number | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

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

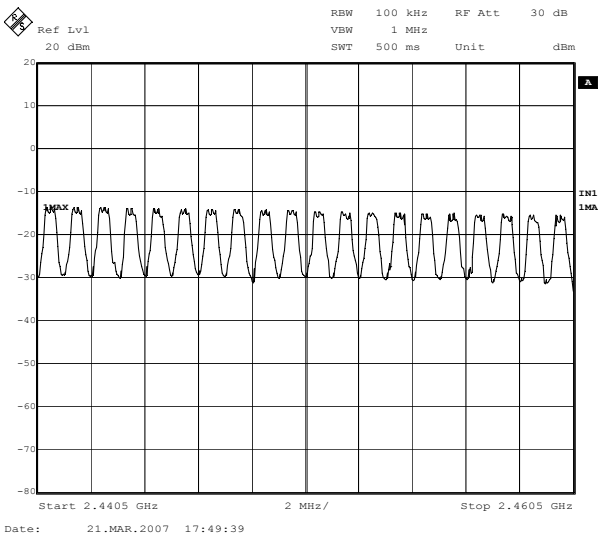
**2402-2420MHz**



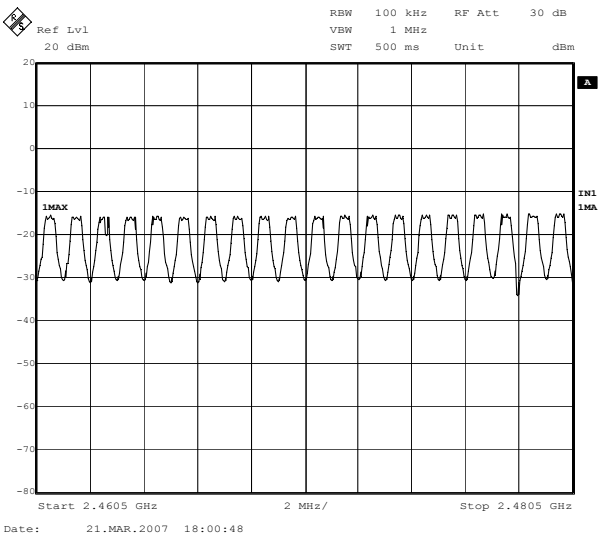

**2421-2440MHz**




**2441-2460MHz**




**2461-2480MHz**



# 7. Channel Separation

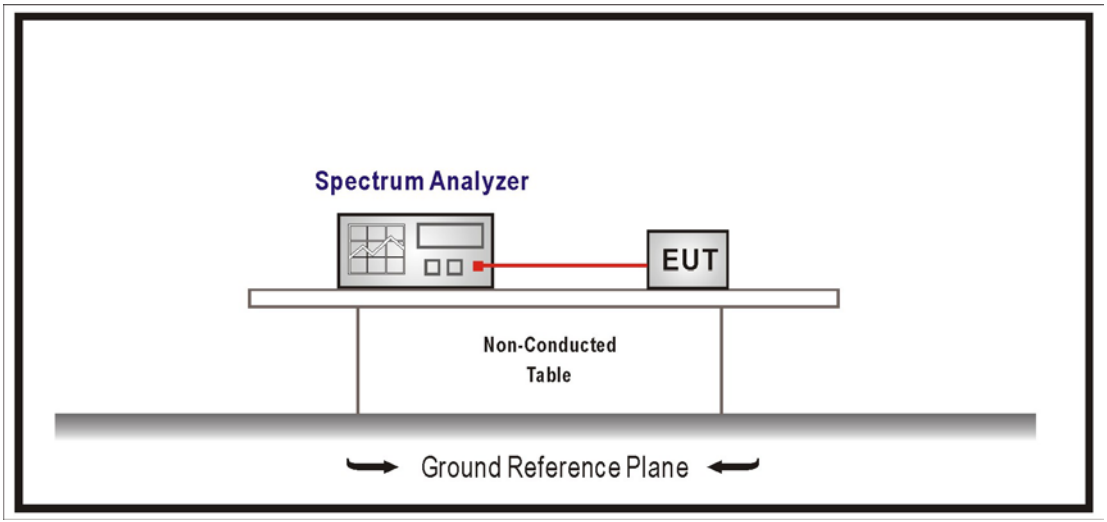
## 7.1. Test Equipment

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., 2007 |
| 2 | No.1 OATS | | | Sep., 2006 |

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

## 7.2. Test Setup




## 7.3. Limits

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

## 7.4. Test Specification

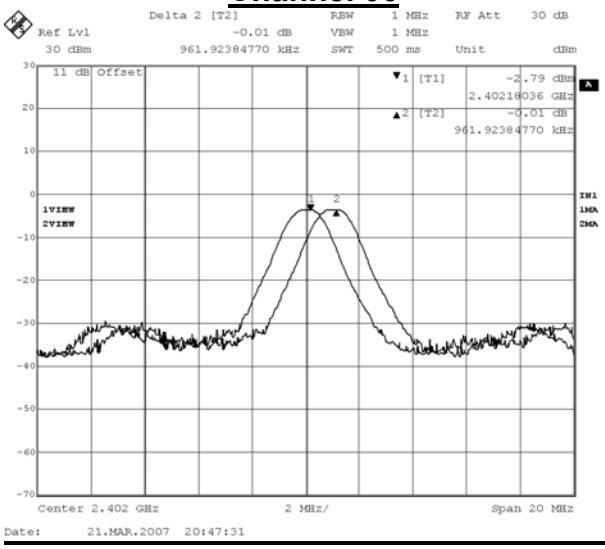
According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 7.5. Test Result

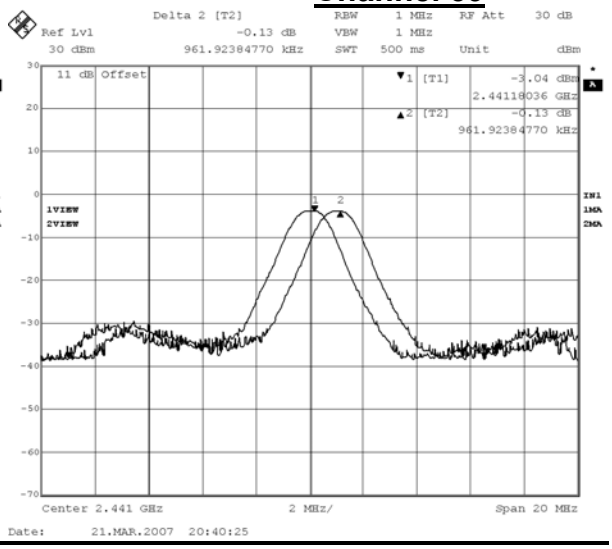
| Product | M-1000 Bluetooth GPS Receiver | | |
|---|---|---|---|
| Test Item | Channel Separation | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

| Channel No. | Frequency (MHz) | Measure Level (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| 00 | 2402.00 | 961 | 1000 | Pass |
| 39 | 2441.00 | 961 | 1000 | Pass |
| 78 | 2480.00 | 961 | 1000 | Pass |

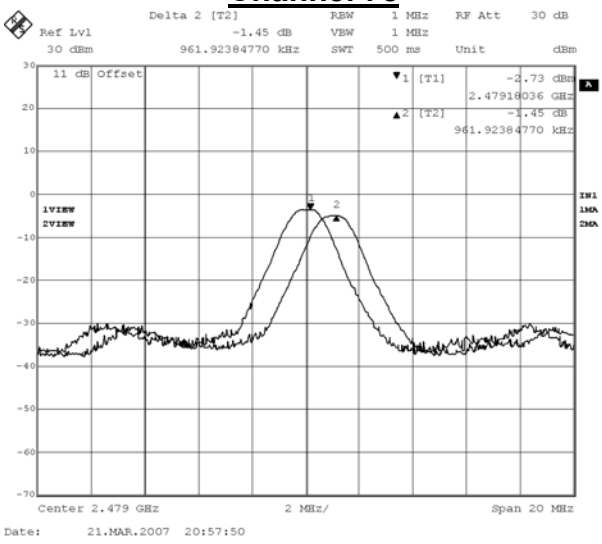
**Channel 00**




**Channel 39**




**Channel 78**



# 8. Occupied Bandwidth

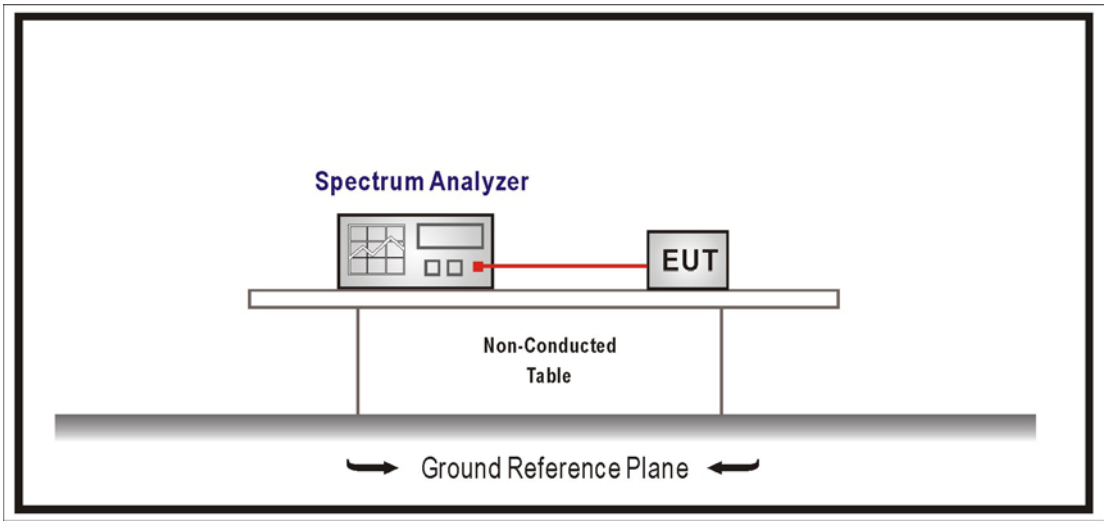
## 8.1. Test Equipment

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., 2007 |
| 2 | No.1 OATS | | | Sep., 2006 |

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

## 8.2. Test Setup




## 8.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

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

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

## 8.4. Test Specification

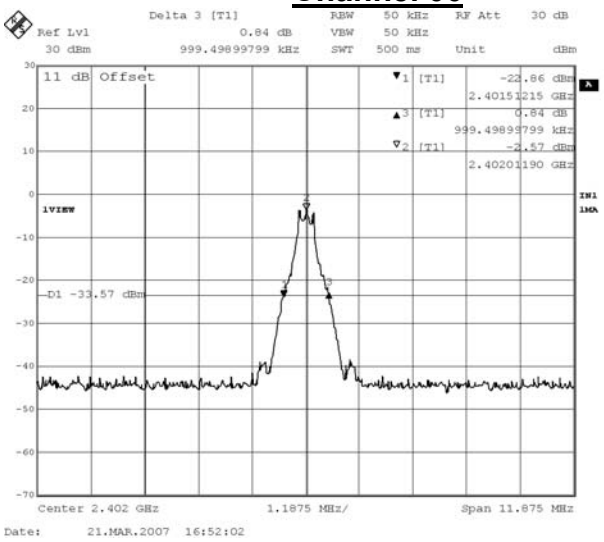
According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 8.5. Test Result

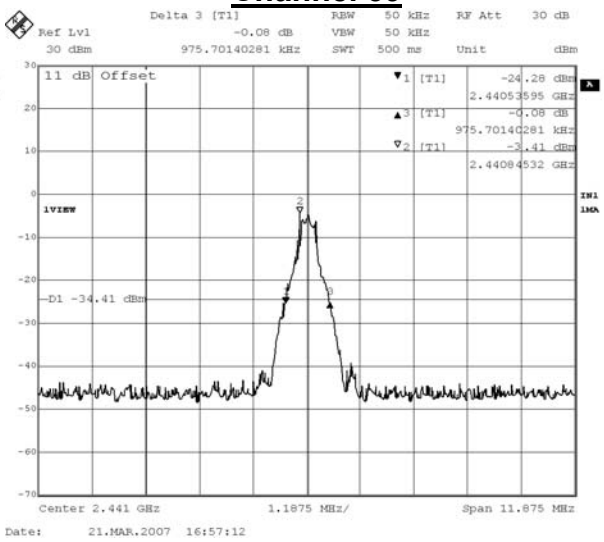
| | | | |
|---|---|---|---|
| Product | M-1000 Bluetooth GPS Receiver | | |
| Test Item | Occupied Bandwidth | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

| Channel No. | Frequency (MHz) | Measure Level (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|
| 00 | 2402.00 | 0.999 | 1 | Pass |
| 39 | 2441.00 | 0.975 | 1 | Pass |
| 78 | 2480.00 | 0.975 | 1 | Pass |

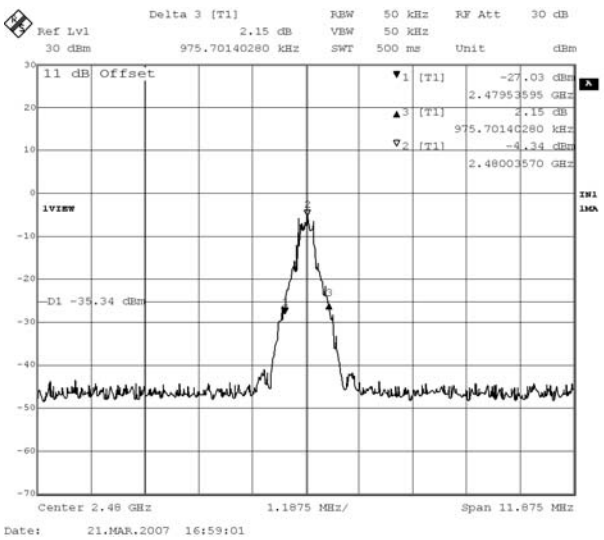
**Channel 00**




**Channel 39**




**Channel 78**



# 9. Dwell Time

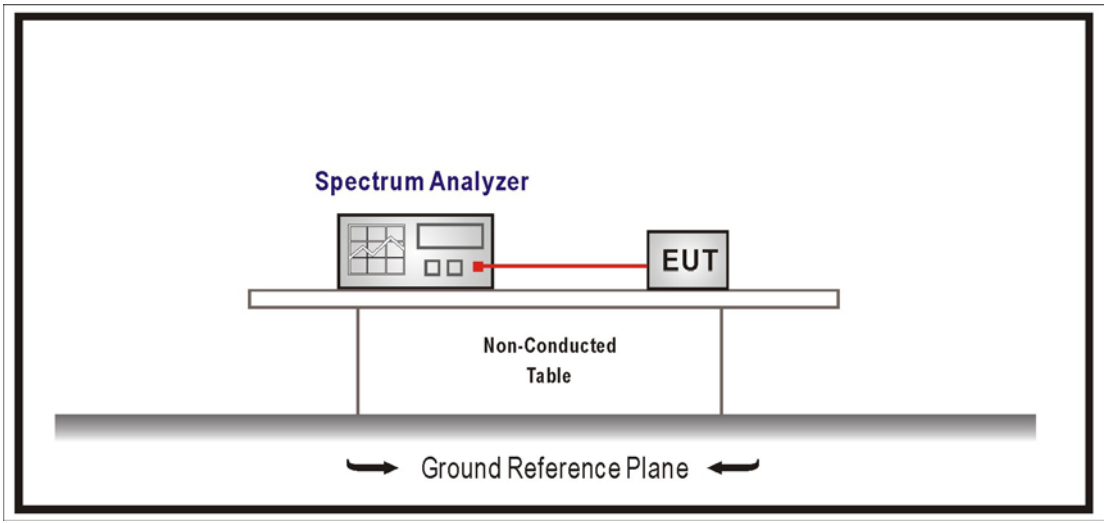
## 9.1. Test Equipment

The following test equipment are used during the test:

| Item | Equipment | Manufacturer | Model No. / Serial No. | Last Cal. |
|---|---|---|---|---|
| 1 | Spectrum Analyzer | R & S | FSP / 100561 | Mar., 2007 |
| 2 | No.1 OATS | | | Sep., 2006 |

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

## 9.2. Test Setup




## 9.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.
For frequency hopping systems operating in the 2400-2483.5 MHz bands. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
For frequency hopping systems operating in the 5725-5850 MHz bands. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

## 9.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2004

## 9.5. Test Result

| | | | |
|---|---|---|---|
| Product | Bluetooth | | |
| Test Item | Dwell Time | | |
| Test Mode | Mode 1: Transmit | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

Occupancy Time of Frequency Hopping System-DH 1

A) 2402MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 16/20msec=800 /sec

The Maximum Occupancy Time Within 31.6sec: 0.0004509*(800/79)*31.6=0.1442sec。

B) 2441MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 16/20msec=800 /sec

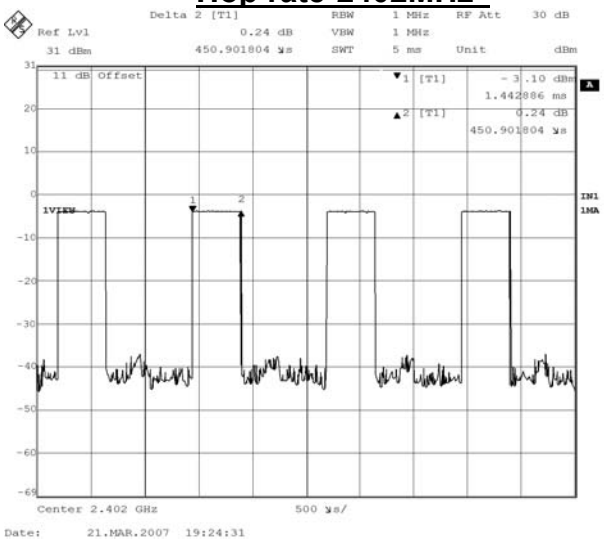
The Maximum Occupancy Time Within 31.6sec: 0.0004509*(800/79)*31.6=0.1442sec。

C) 2480MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 16/20msec=800 /sec

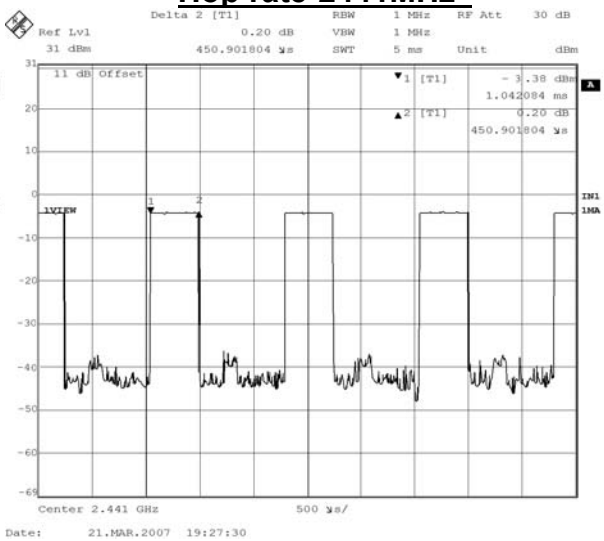
The Maximum Occupancy Time Within 31.6sec: 0.0004509*(800/79)*31.6=0.1442sec。

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

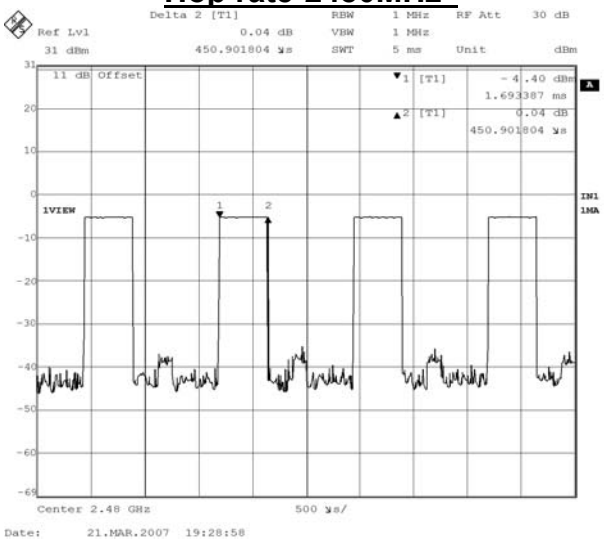
**Hop rate-2402MHz**



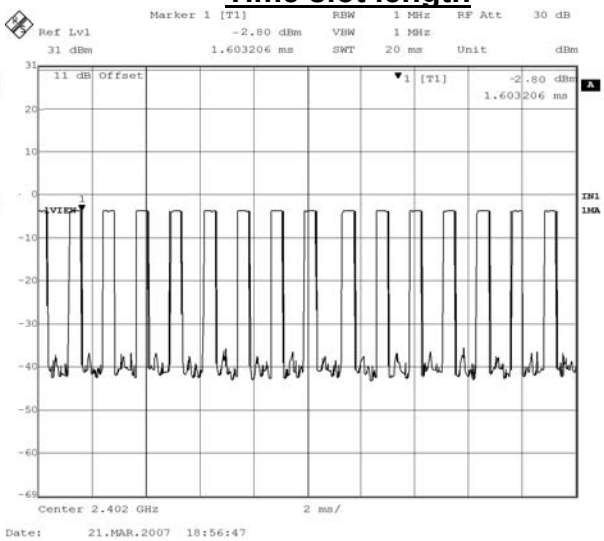

**Hop rate-2441MHz**




**Hop rate-2480MHz**




**Time slot length**




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

| Product | M-1000 Bluetooth GPS Receiver | | |
|---|---|---|---|
| Test Item | Dwell Time | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

Occupancy Time of Frequency Hopping System-DH 3

A) 2402MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 8/20msec=400 /sec

The Maximum Occupancy Time Within 31.6sec: 0.001703*(400/79)*31.6=0.2724sec。

B) 2441MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 8/20msec=400 /sec

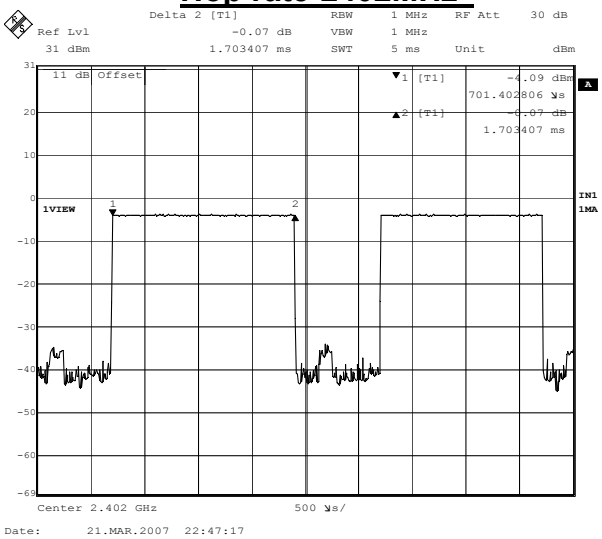
The Maximum Occupancy Time Within 31.6sec: 0.001713*(400/79)*31.6=0.2740sec。

C) 2480MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 8/20msec=400 /sec

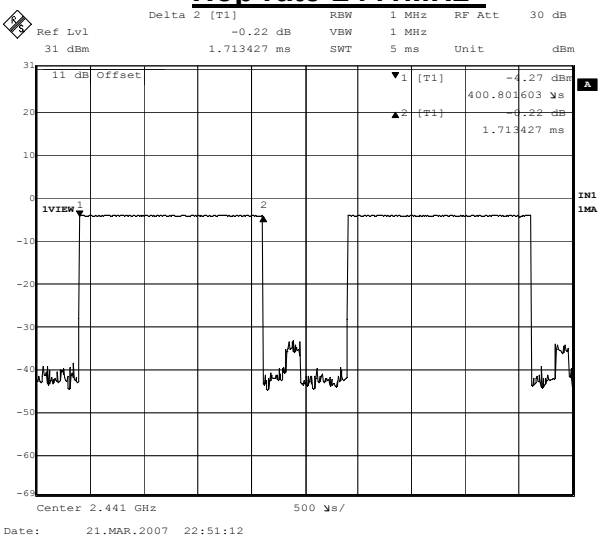
The Maximum Occupancy Time Within 31.6sec: 0.001833*(400/79)*31.6=0.2932sec。

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

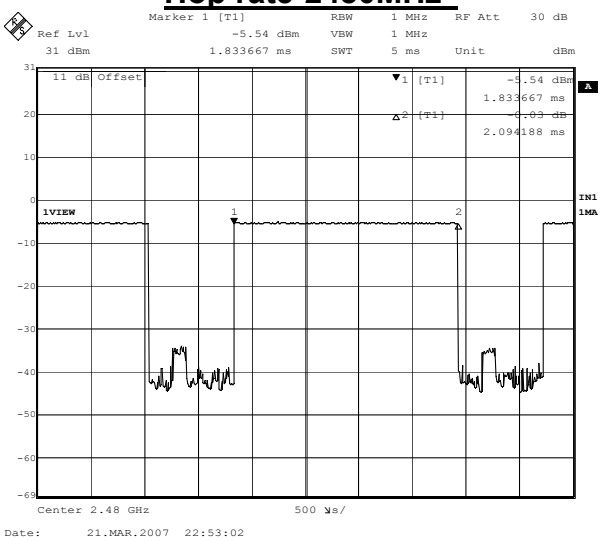
**Hop rate-2402MHz**



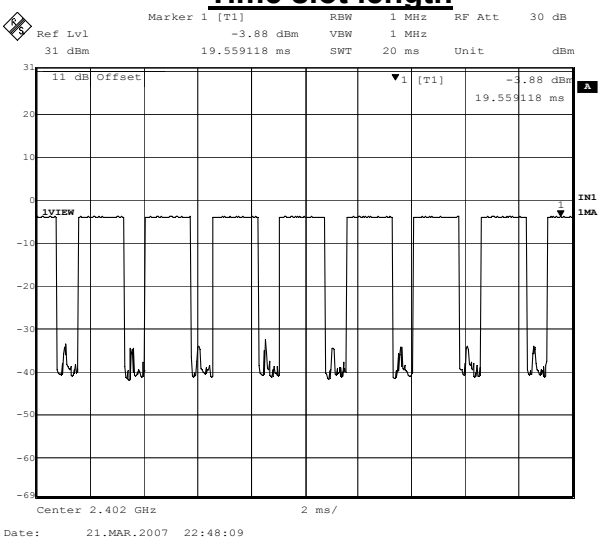

**Hop rate-2441MHz**




**Hop rate-2480MHz**




**Time slot length**




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

| Product | M-1000 Bluetooth GPS Receiver | | |
|---|---|---|---|
| Test Item | Dwell Time | | |
| Test Mode | Mode 1: Transmit (Adapter) | | |
| Date of Test | 2007/03/21 | Test Site | No.1 OATS |

Occupancy Time of Frequency Hopping System-DH 5

A) 2402MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 5/20msec=250 /sec

The Maximum Occupancy Time Within 31.6sec: 0.002965*(250/79)*31.6=0.2965sec。

B) 2441MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 5/20msec=250 /sec

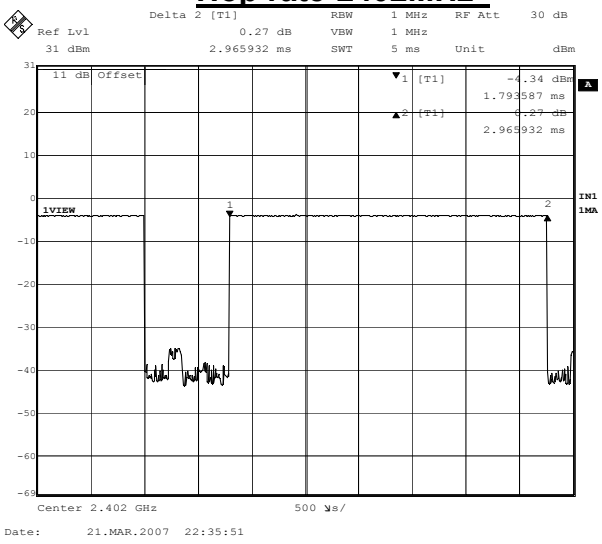
The Maximum Occupancy Time Within 31.6sec: 0.002955*(250/79)*31.6=0.2955sec。

C) 2480MHz Test Time Period: 0.4*79=31.6sec，Hopping Times Within 1sec: 5/20msec=250 /sec

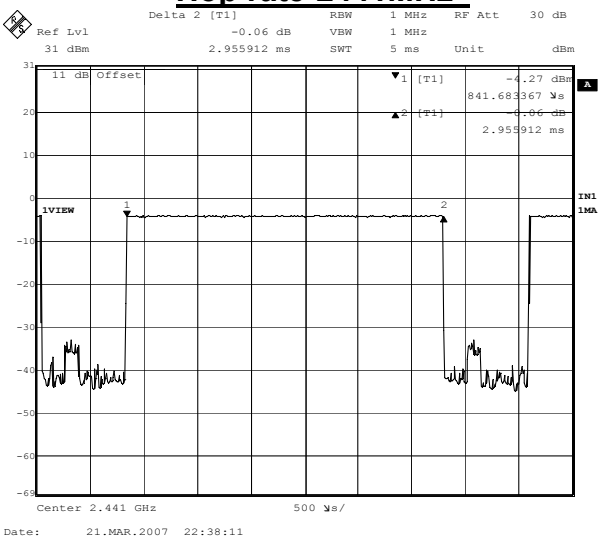
The Maximum Occupancy Time Within 31.6sec: 0.002955*(250/79)*31.6=0.2955sec。

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

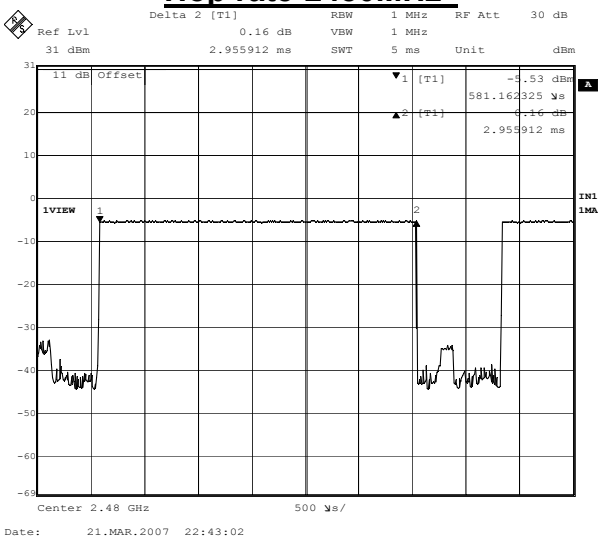
**Hop rate-2402MHz**



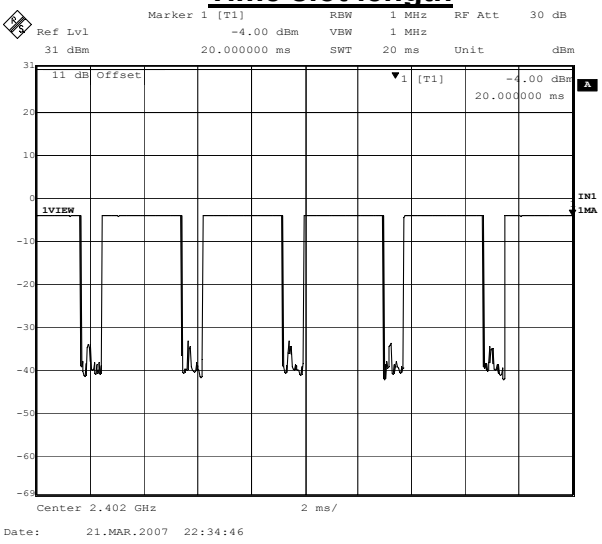

**Hop rate-2441MHz**




**Hop rate-2480MHz**




**Time slot length**




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