Test Report

Product Name	M-1200 Bluetooth GPS Receiver
Model No.	M-1200XX
FCC ID.	RJI M-1200XX

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

Date of Receipt	July 19, 2007
Issued Date	Aug. 27, 2007
Report No.	077272R-RFUSP06V01

Test Report Certification

Issued Date: Aug. 27, 2007
Report No.: 077272R-RFUSP06V01

Product Name	M-1200 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-1200XX
FCC ID.	RJI M-1200XX
Rated Voltage	AC 120V/60Hz
Working Voltage	AC 120V/60Hz, DC 3.0~3.6V, Battery 2.8~3.6V
Trade Name	HOLUX
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2006 ANSI C63.4: 2003 CISPR 22: 2005
Test Result	Complied

NVLAP Lab Code: 200533-0

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented By : Genie chang
(Engineering Adm. Specialist / Genie Chang)

Tested By : Molin huang
(Engineer / Molin Huang)

Approved By :
(Deputy Manager / Vincent Lin)

0914

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	M-1200 Bluetooth GPS Receiver
Trade Name	HOLUX
FCC ID.	RJI M-1200XX
Model No.	M-1200XX
Frequency Range	2402 - 2480MHz
Type of Modulation	FHSS
Channel Number	79
Channel Control	Auto
Antenna Type	Chip
Antenna Gain	Refer to the table "Antenna List"
Power Adapter	MFR: SWITCHING, M/N: SYS1196-0605-W2E Input: 100-240V, 50-60Hz 0.3A Output: 5V~1.0A

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	JOHANSON	2405AT42A100	0dBi for 2.4 GHz

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. The EUT is a M-1200 Bluetooth GPS Receiver with a built-in 2.4GHz transceiver.
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. Regarding to the operation frequency band, the lowest, middle, and highest frequency are selected to perform the test.
4. QuieTek verified constructions and functions, which are shown in the test report, in typical operation.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

1.2. Operational Description

The EUT is a M-1200 Bluetooth GPS Receiver with a built-in 2.4GHz transceiver.
The signals are modulated by frequency hopping spread spectrum. The number of channels is 79 in 2402-2480MHz.
The EUT provides wireless technology that revolutionizes personal connectivity. It is the solution for the seamless integration of Bluetooth technology into personal computer enabling short-range wireless connections between desktop/laptop computers, Bluetooth-enabled peripherals, and portable handheld devices.

Test Mode	Mode 1: Transmitter (AC Adapter) Mode 2: Transmitter(DC Adapter) Mode 3: Transmitter (PC Link)

1.3. Test System Details

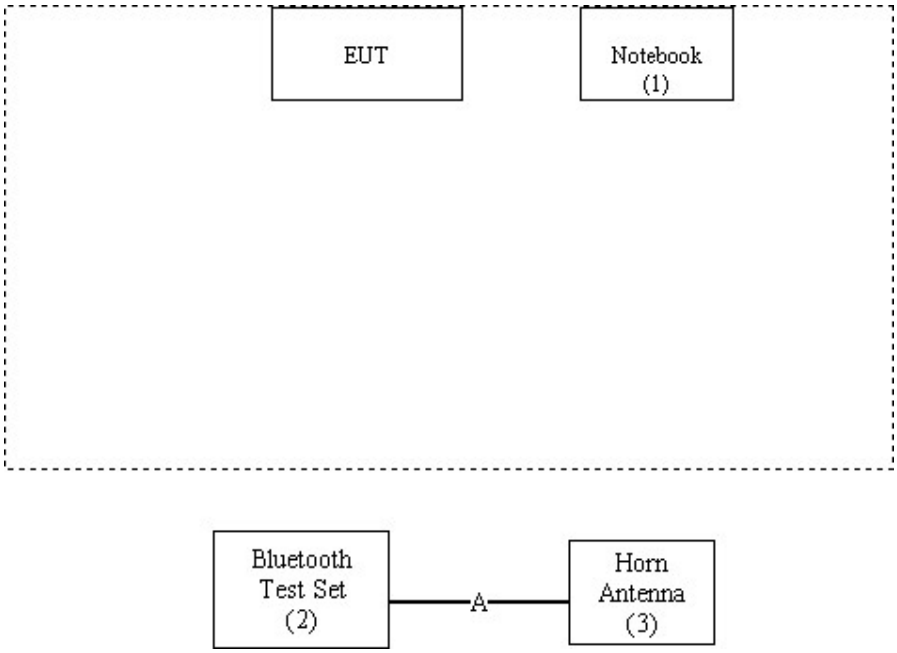
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
(2)	Bluetooth Test Set	Anritsu	MT-8852A	6K00003057	Non-Shielded, 1.8m
(3)	Horn Antenna	Schwarzbeck	9120D	306	N/A

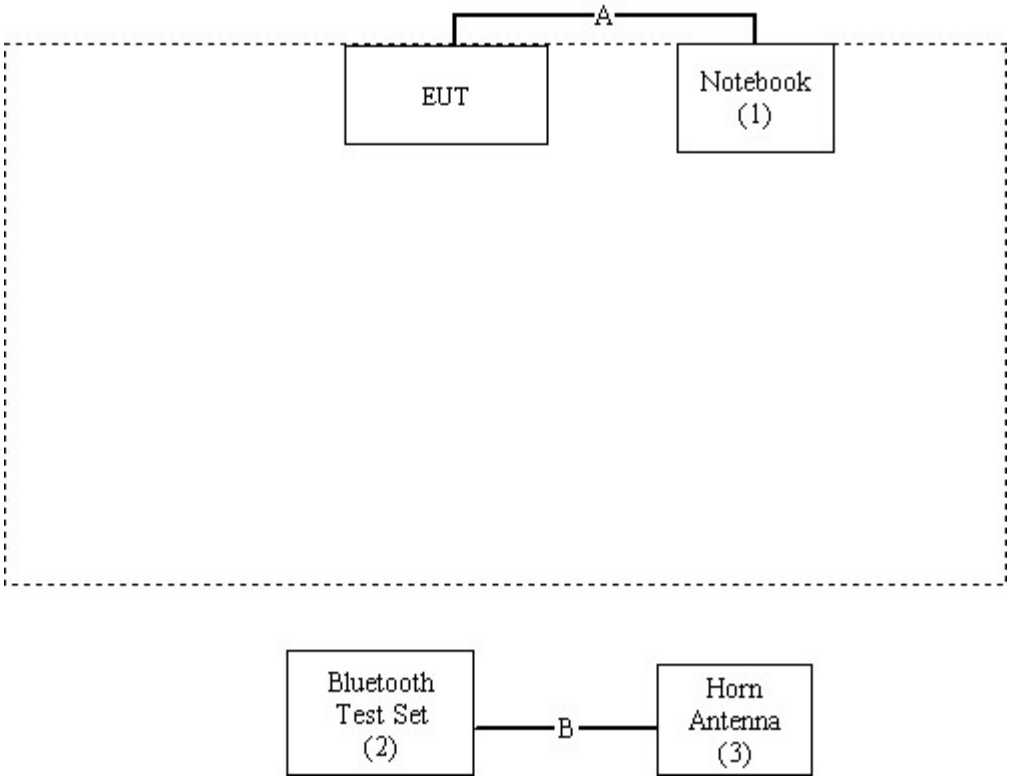
Signal Cable Type		Signal cable Description
A.	USB Cable	Non-Shielded, 1.0m two PCS
B.	RF Cable	Shielded, 1.5m

1.4. Configuration of Test System

Mode 1 & Mode 2



Mode3



1.5. EUT Exercise Software

1.	Setup the EUT as shown in section 1.4.
2.	EUT Power on enter RF test mode.
3.	Configure the test channel and the packet type.
4.	Press “OK” to start the continuous transmission.
5.	Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

Accreditation on NVLAP
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation
Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

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FCC Accreditation Number: TW1014

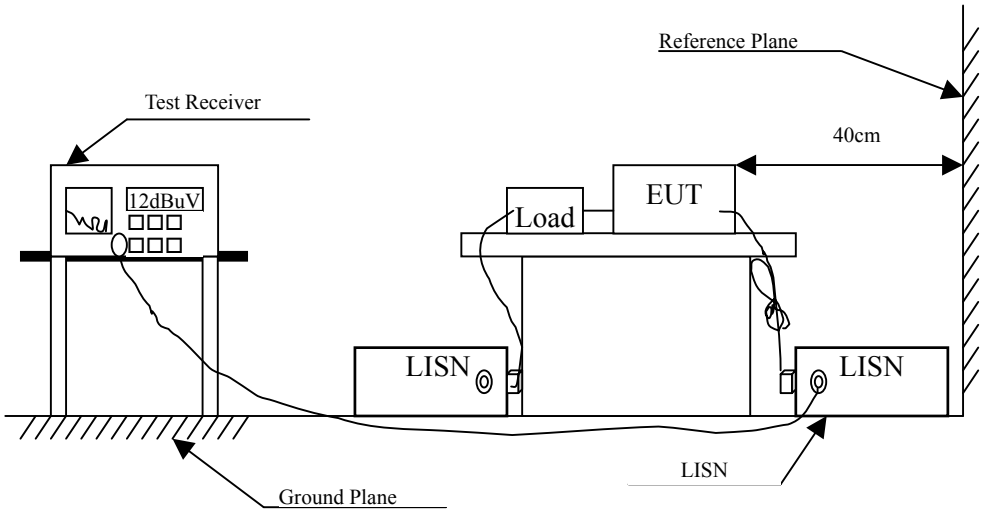
2. Conducted Emission

2.1. Test Equipment

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	EMI Test Receiver	R&S	ESCS 30/100367	Aug., 2007	
2	LISN	R&S	ESH3-Z5/836679/023	July, 2007	EUT
3	LISN	R&S	ESH3-Z5/836679/017	Feb., 2007	Peripherals
4	Pulse Limiter	R&S	ESH3-Z2/357.8810.52	Sep., 2006	
5	No.7 Shielded Room			N/A	

Note: All equipments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	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. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : M-1200 Bluetooth GPS Receiver
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.220	0.505	38.090	38.595	-25.405	64.000
0.271	0.300	35.170	35.470	-27.073	62.543
0.310	0.300	35.300	35.600	-25.829	61.429
1.861	0.340	13.850	14.190	-41.810	56.000
13.603	0.940	15.390	16.330	-43.670	60.000
19.388	1.090	25.290	26.380	-33.620	60.000
Average					
0.220	0.505	21.720	22.225	-31.775	54.000
0.271	0.300	16.630	16.930	-35.613	52.543
0.310	0.300	17.110	17.410	-34.019	51.429
1.861	0.340	5.730	6.070	-39.930	46.000
13.603	0.940	6.940	7.880	-42.120	50.000
19.388	1.090	19.550	20.640	-29.360	50.000

Note:

1. All reading levels are quasi-peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.193	0.300	39.260	39.560	-25.211	64.771
0.279	0.300	35.570	35.870	-26.444	62.314
0.412	0.310	28.300	28.610	-29.904	58.514
1.291	0.330	14.360	14.690	-41.310	56.000
13.783	0.850	12.170	13.020	-46.980	60.000
19.728	0.900	26.520	27.420	-32.580	60.000
Average					
0.193	0.300	23.020	23.320	-31.451	54.771
0.279	0.300	14.800	15.100	-37.214	52.314
0.412	0.310	11.090	11.400	-37.114	48.514
1.291	0.330	4.940	5.270	-40.730	46.000
13.783	0.850	2.750	3.600	-46.400	50.000
19.728	0.900	19.270	20.170	-29.830	50.000

Note:

1. All reading levels are quasi-peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 2: Transmitter(DC Adapter) (Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.166	0.400	54.700	55.100	-10.443	65.543
0.275	0.400	51.020	51.420	-11.009	62.429
0.388	0.400	48.180	48.580	-10.620	59.200
0.595	0.370	44.130	44.500	-11.500	56.000
11.923	0.470	26.710	27.180	-32.820	60.000
18.857	0.600	28.590	29.190	-30.810	60.000
Average					
0.166	0.400	37.760	38.160	-17.383	55.543
0.275	0.400	32.960	33.360	-19.069	52.429
0.388	0.400	30.200	30.600	-18.600	49.200
0.595	0.370	26.990	27.360	-18.640	46.000
11.923	0.470	23.340	23.810	-26.190	50.000
18.857	0.600	23.990	24.590	-25.410	50.000

Note:

1. All reading levels are quasi-peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 2: Transmitter(DC Adapter) (Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.181	0.400	57.160	57.560	-7.554	65.114
0.291	0.400	53.050	53.450	-8.521	61.971
0.392	0.400	49.800	50.200	-8.886	59.086
0.689	0.350	44.120	44.470	-11.530	56.000
8.884	0.380	25.990	26.370	-33.630	60.000
18.904	0.600	30.600	31.200	-28.800	60.000
Average					
0.181	0.400	39.710	40.110	-15.004	55.114
0.291	0.400	35.180	35.580	-16.391	51.971
0.392	0.400	32.030	32.430	-16.656	49.086
0.689	0.350	27.760	28.110	-17.890	46.000
8.884	0.380	11.950	12.330	-37.670	50.000
18.904	0.600	25.170	25.770	-24.230	50.000

Note:

1. All reading levels are quasi-peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 3: Transmitter (PC Link)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.173	0.685	48.680	49.365	-15.978	65.343
0.228	0.450	42.080	42.530	-21.241	63.771
0.572	0.300	35.120	35.420	-20.580	56.000
1.084	0.320	32.930	33.250	-22.750	56.000
1.880	0.340	40.010	40.350	-15.650	56.000
3.541	0.390	39.360	39.750	-16.250	56.000
Average					
0.173	0.685	38.410	39.095	-16.248	55.343
0.228	0.450	33.800	34.250	-19.521	53.771
0.572	0.300	28.220	28.520	-17.480	46.000
1.084	0.320	28.910	29.230	-16.770	46.000
1.880	0.340	34.470	34.810	-11.190	46.000
3.541	0.390	25.480	25.870	-20.130	46.000

Note:

1. All reading levels are quasi-peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 3: Transmitter (PC Link)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.170	0.300	48.830	49.130	-16.299	65.429
0.287	0.300	37.120	37.420	-24.666	62.086
0.568	0.310	37.820	38.130	-17.870	56.000
0.853	0.320	37.490	37.810	-18.190	56.000
1.482	0.330	34.700	35.030	-20.970	56.000
3.470	0.390	41.620	42.010	-13.990	56.000
Average					
0.170	0.300	38.560	38.860	-16.569	55.429
0.287	0.300	32.270	32.570	-19.516	52.086
0.568	0.310	29.960	30.270	-15.730	46.000
0.853	0.320	28.510	28.830	-17.170	46.000
1.482	0.330	27.030	27.360	-18.640	46.000
3.470	0.390	32.660	33.050	-12.950	46.000

Note:

1. All reading levels are quasi-peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. Peak Power Output

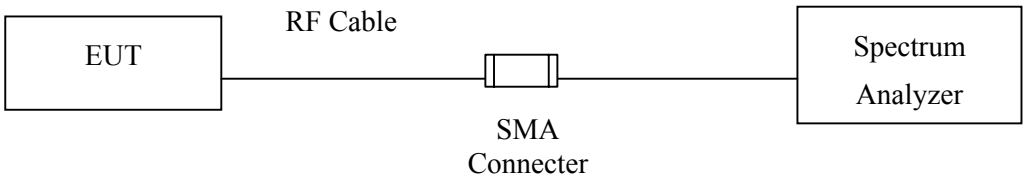
3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

Note: 1. All equipments are calibrated every one year.

2. Test instruments marked by "X" are used to measure the final test results.

3.2. Test Setup



3.3. Limit

The maximum peak power shall be less 1Watt.

3.4. Uncertainty

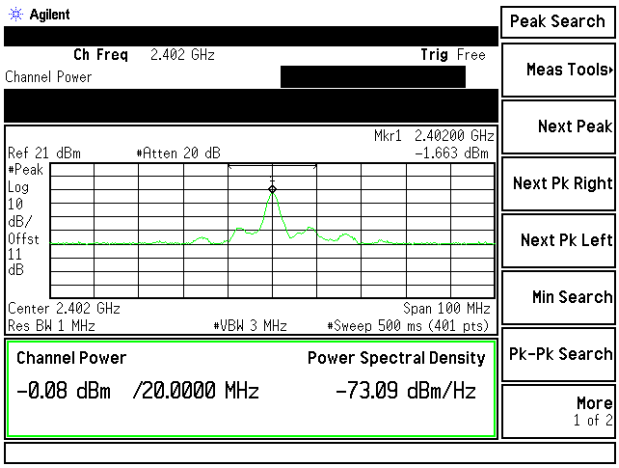
± 1.27 dB

3.5. Test Result of Peak Power Output

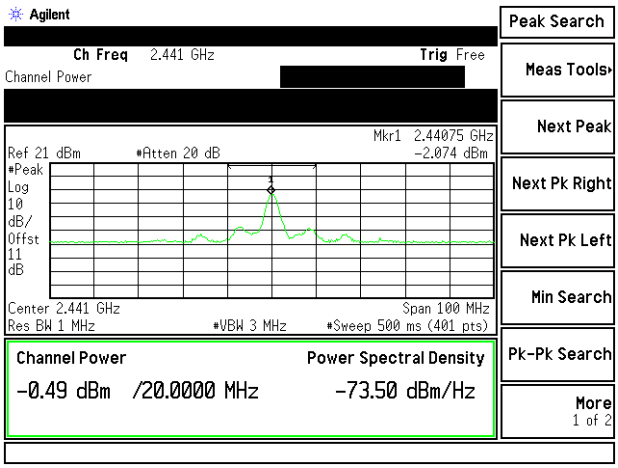
Product : M-1200 Bluetooth GPS Receiver
Test Item : Peak Power Output
Test Site : CTR1
Test Mode : Mode 1: Transmitter (AC Adapter)

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
Channel 00	2402.00	-0.08dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	-0.49dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	0.42dBm	1 Watt= 30 dBm	Pass

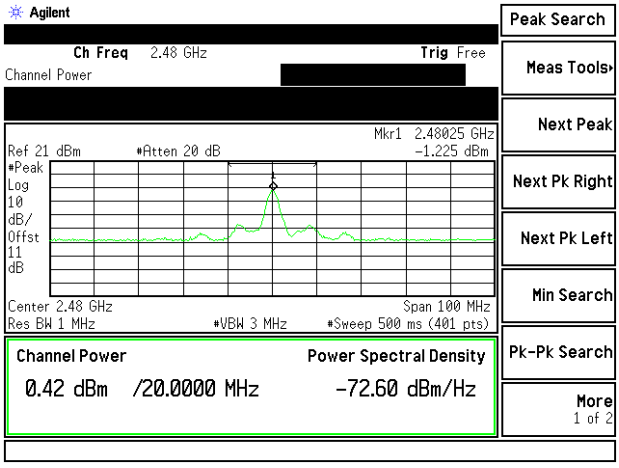
Channel 00



Channel 39



Channel 78



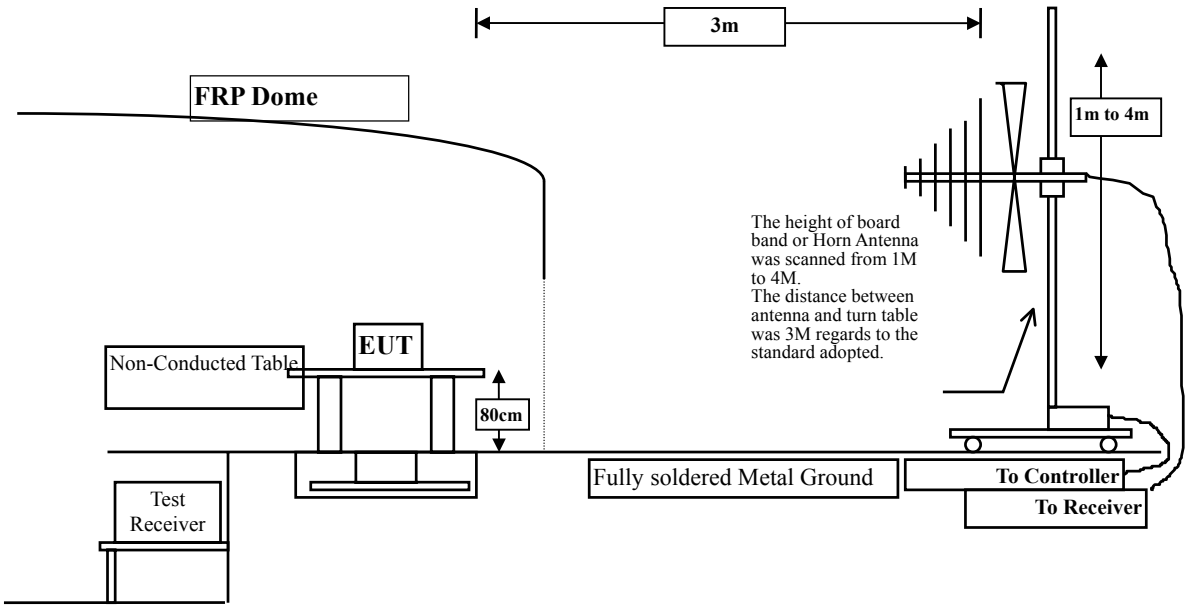
4. Radiated Emission

4.1. Test Equipment

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐Site # 1		Test Receiver	R & S	ESVS 10 / 834468/003	May, 2007
		Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2007
		Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2007
		Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Sep., 2006
☐Site # 2		Test Receiver	R & S	ESCS 30 / 836858 / 022	May, 2007
		Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2007
		Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2007
		Bilog Antenna	SCHAFFNER	CBL6112B / 2705	May, 2007
		Horn Antenna	ETS	3115 / 0005-6160	Sep., 2006
		Pre-Amplifier	QTK	QTK-AMP-01/ 0001	May, 2007
☒Site # 3	X	Test Receiver	R & S	ESI 26 / 838786/004	May, 2007
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007
	X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
	X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
	X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
	X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
	X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2007

Note: 1. All equipments are calibrated every one year.
2. Test equipments marked by “X” are used to measure the final test results.

4.2. Test Setup



4.3. Limits

➢ **General Radiated Emission 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 @3m	dBuV/m@3m
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 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 additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field dtrength of harmonics measurement.
The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz.
The frequency range from 30MHz to 10th harminics is checked.

4.5. Uncertainty

± 3.9 dB above 1GHz
± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : M-1200 Bluetooth GPS Receiver
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 00)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.663	41.545	45.207	-28.793	74.000
7206.000	9.357	40.446	49.802	-24.198	74.000
9608.000	13.153	40.450	53.603	-0.397	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4804.000	3.663	46.620	50.282	-23.718	74.000
7206.000	9.357	40.149	49.505	-24.495	74.000
9608.000	11.842	38.747	50.589	-23.411	74.000
Average Detector:					
--					

Note:

1. The reading levels below 1GHz and above 1GHz are quasi-peak values and peak/average values, respectively.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz。
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz。
4. Emission Level = Reading Level + Correct Factor.
5. 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-1200 Bluetooth GPS Receiver
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.921	39.883	43.804	-30.196	74.000
7323.000	9.657	38.020	47.677	-26.323	74.000
9764.000	11.798	37.371	49.169	-24.831	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	3.921	45.518	49.439	-24.561	74.000
7323.000	9.657	40.795	50.452	-23.548	74.000
9764.000	11.798	38.700	50.498	-23.502	74.000
Average Detector:					
--					

Note:

1. The reading levels below 1GHz and above 1GHz are quasi-peak values and peak/average values, respectively.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz。
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz。
4. Emission Level = Reading Level + Correct Factor.
5. 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-1200 Bluetooth GPS Receiver
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 78)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal Peak Detector:					
4960.000	4.197	38.004	42.200	-31.800	74.000
7440.000	9.951	37.112	47.063	-26.937	74.000
9920.000	11.856	38.419	50.275	-23.725	74.000
Average Detector:					
--					
Vertical Peak Detector:					
4960.000	4.197	37.534	41.730	-32.270	74.000
7440.000	9.951	38.170	48.121	-25.879	74.000
9920.000	11.856	38.045	49.901	-24.099	74.000
Average Detector:					
--					

Note:
1. Reading levels below 1GHz and above 1GHz are quasi-peak values and peak/average values, respectively.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz。
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz。
4. Emission Level = Reading Level + Correct Factor.
5. 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-1200 Bluetooth GPS Receiver
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
371.925	14.753	11.456	26.209	-19.791	46.000
515.000	17.649	11.510	29.159	-16.841	46.000
607.150	18.739	9.958	28.697	-17.303	46.000
745.000	19.301	10.946	30.246	-15.754	46.000
820.500	20.236	11.564	31.800	-14.200	46.000
944.000	21.043	11.337	32.380	-13.620	46.000
Vertical					
342.800	13.514	11.990	25.504	-20.496	46.000
544.100	19.294	6.373	25.667	-20.333	46.000
684.785	18.784	8.798	27.582	-18.418	46.000
750.225	21.590	6.243	27.833	-18.167	46.000
779.325	20.649	7.189	27.838	-18.162	46.000
808.425	20.136	8.654	28.790	-17.210	46.000

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : M-1200 Bluetooth GPS Receiver
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Transmitter(DC Adapter) (Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
371.925	14.753	11.456	26.209	-19.791	46.000
515.000	17.649	11.510	29.159	-16.841	46.000
607.150	18.739	9.958	28.697	-17.303	46.000
745.000	19.301	10.946	30.246	-15.754	46.000
820.500	20.236	11.564	31.800	-14.200	46.000
944.000	21.043	11.337	32.380	-13.620	46.000
Vertical					
342.800	13.514	11.990	25.504	-20.496	46.000
544.100	19.294	6.373	25.667	-20.333	46.000
684.785	18.784	8.798	27.582	-18.418	46.000
750.225	21.590	6.243	27.833	-18.167	46.000
779.325	20.649	7.189	27.838	-18.162	46.000
808.425	20.136	8.654	28.790	-17.210	46.000

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : M-1200 Bluetooth GPS Receiver
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 3: Transmitter (PC Link)(Channel 39)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
371.925	14.753	11.456	26.209	-19.791	46.000
515.000	17.649	11.510	29.159	-16.841	46.000
607.150	18.739	9.958	28.697	-17.303	46.000
745.000	19.301	10.946	30.246	-15.754	46.000
820.500	20.236	11.564	31.800	-14.200	46.000
944.000	21.043	11.337	32.380	-13.620	46.000
Vertical					
342.800	13.514	11.990	25.504	-20.496	46.000
544.100	19.294	6.373	25.667	-20.333	46.000
684.785	18.784	8.798	27.582	-18.418	46.000
750.225	21.590	6.243	27.833	-18.167	46.000
779.325	20.649	7.189	27.838	-18.162	46.000
808.425	20.136	8.654	28.790	-17.210	46.000

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

5. Band Edge

5.1. Test Equipment

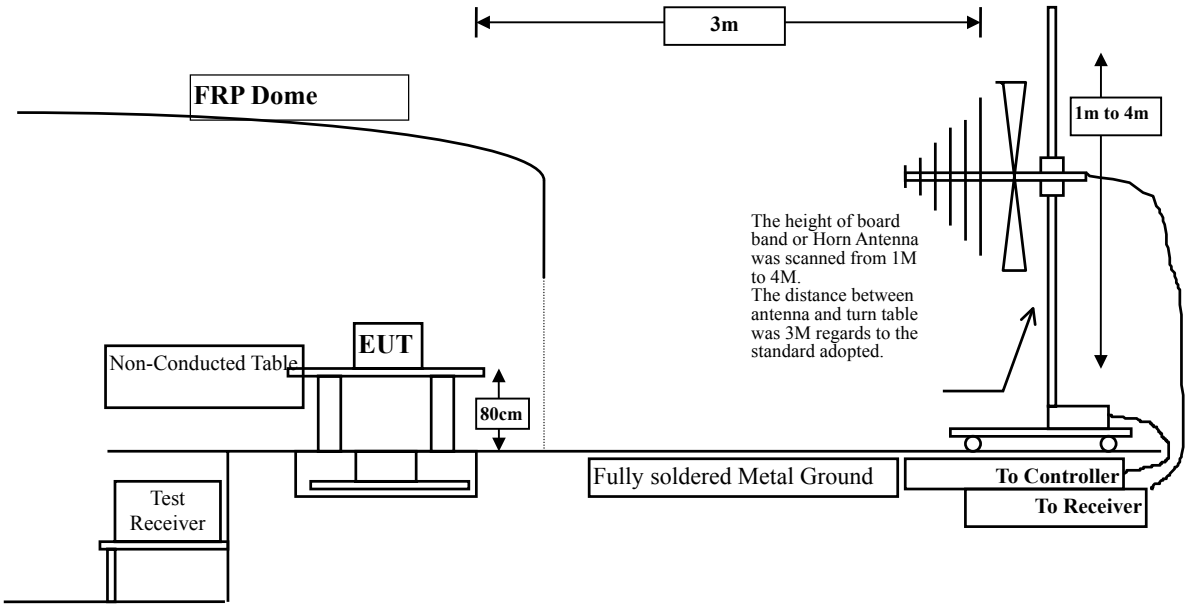
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Test Receiver	R & S	ESI 26 / 838786/004	May, 2007
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007
X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2007

OATS No.3

Note: 1. All equipments are calibrated every one year.
2. The test equipments marked by "X" are used to measure the final test results.

5.2. Test Setup

RF Radiated Measurement:



5.3. Limit

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. Uncertainty

± 3.9 dB above 1GHz
± 3.8 dB below 1GHz

5.6. Test Result of Band Edge

Product : M-1200 Bluetooth GPS Receiver
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 00)

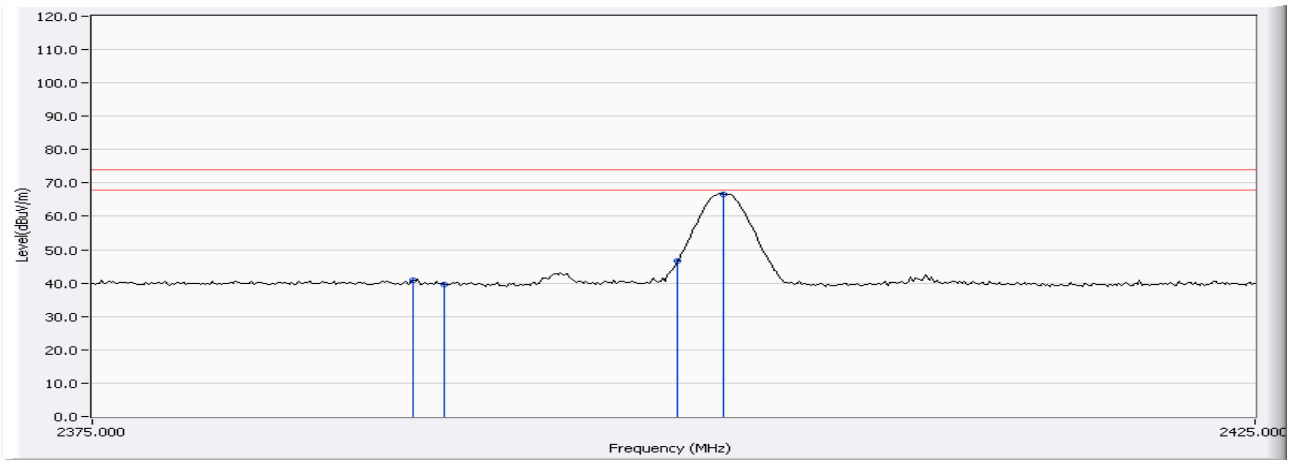
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
00	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00(Peak)	2388.700	-1.411	42.172	40.761	74.00	54.00	Pass
00(Peak)	2390.000	-1.407	40.927	39.520	74.00	54.00	Pass
00(Peak)	2400.000	-1.363	47.992	46.629	74.00	54.00	Pass
00(Peak)	2402.000	-1.357	68.004	66.647	74.00	54.00	Pass

Figure Channel 00: Horizontal (Peak)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 00)

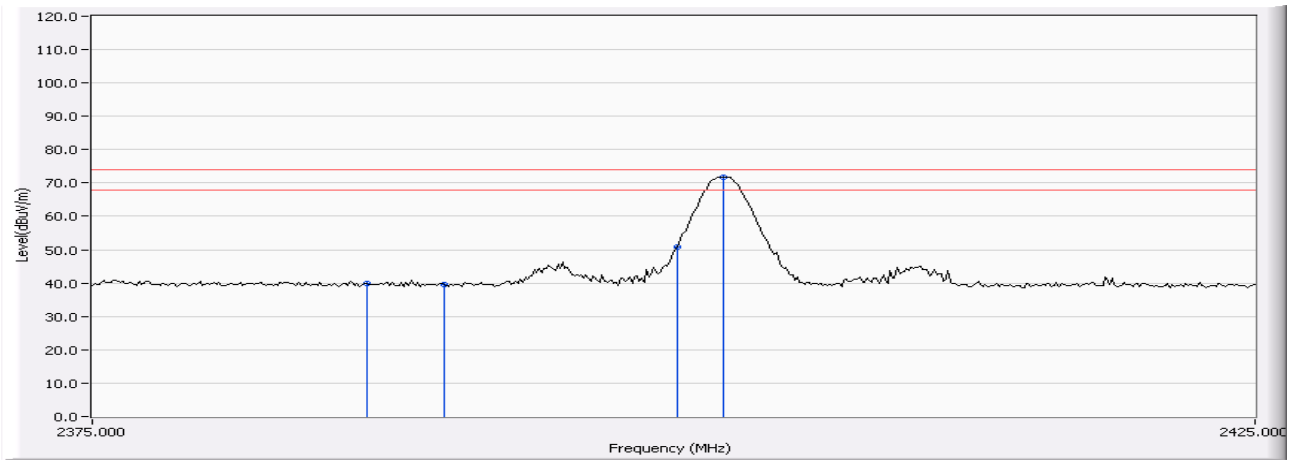
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
00	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00(Peak)	2386.700	-1.418	41.236	39.818	74.00	54.00	Pass
00(Peak)	2390.000	-1.407	40.972	39.565	74.00	54.00	Pass
00(Peak)	2400.000	-1.363	52.071	50.708	74.00	54.00	Pass
00(Peak)	2402.000	-1.357	73.090	71.733	74.00	54.00	Pass

Figure Channel 00: Vertical (Peak)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : M-1200 Bluetooth GPS Receiver
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 78)

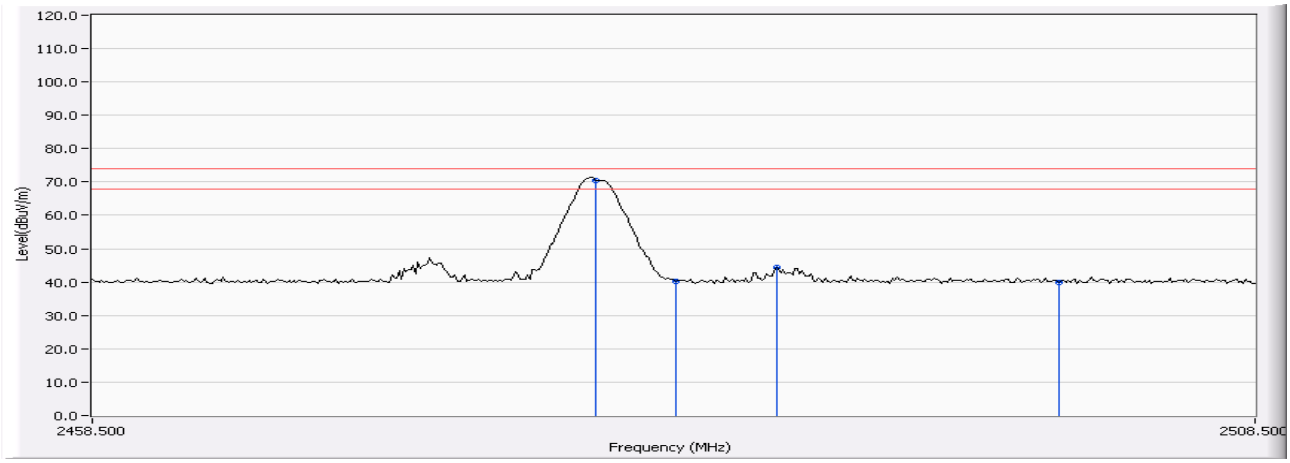
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2480.000	-1.048	71.593	70.545	74.00	54.00	Pass
78(Peak)	2483.500	-1.037	41.225	40.188	74.00	54.00	Pass
78(Peak)	2487.800	-1.027	45.552	44.525	74.00	54.00	Pass
78(Peak)	2500.000	-0.988	40.822	39.834	74.00	54.00	Pass

Figure Channel 78: Horizontal (Peak)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : M-1200 Bluetooth GPS Receiver
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 78)

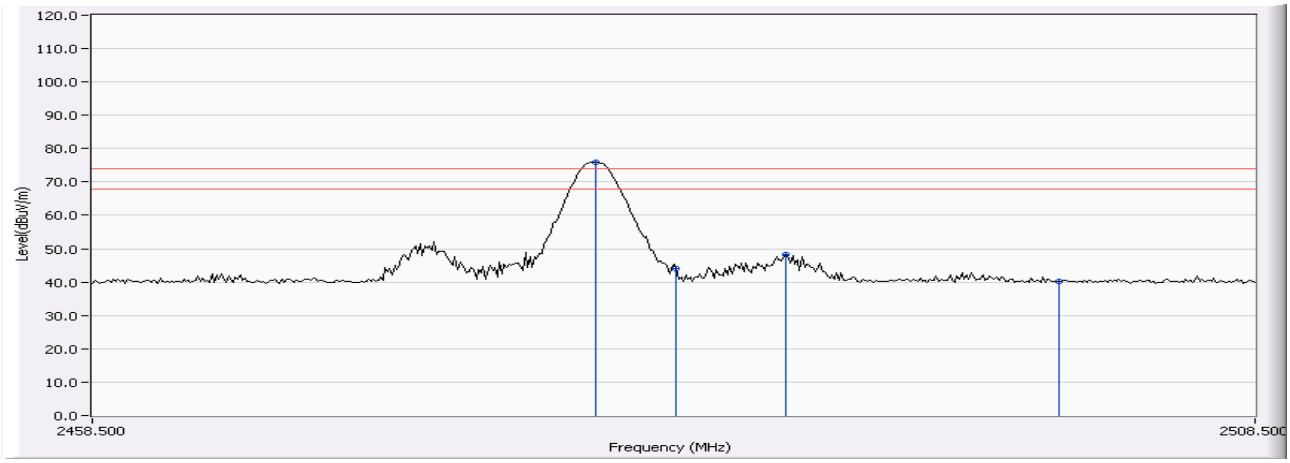
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2480.000	-1.048	76.820	75.772	74.00	54.00	Pass
78(Peak)	2483.500	-1.037	44.994	43.957	74.00	54.00	Pass
78(Peak)	2488.200	-1.026	49.310	48.284	74.00	54.00	Pass
78(Peak)	2500.000	-0.988	41.226	40.238	74.00	54.00	Pass

Figure Channel 78: Vertical (Peak)



Note:
RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

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 Number

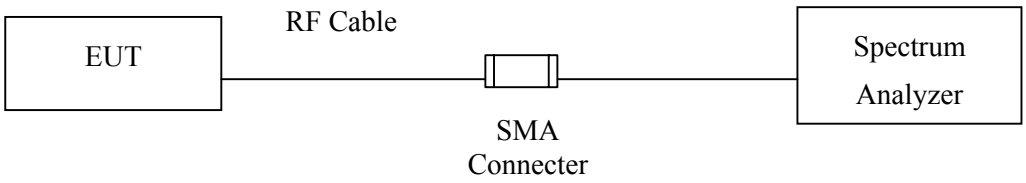
6.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

Note: 1. All equipments are calibrated every one year.

2. The test equipments marked by "X" are used to measure the final test results.

6.2. Test Setup



6.3. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

6.4. Uncertainty

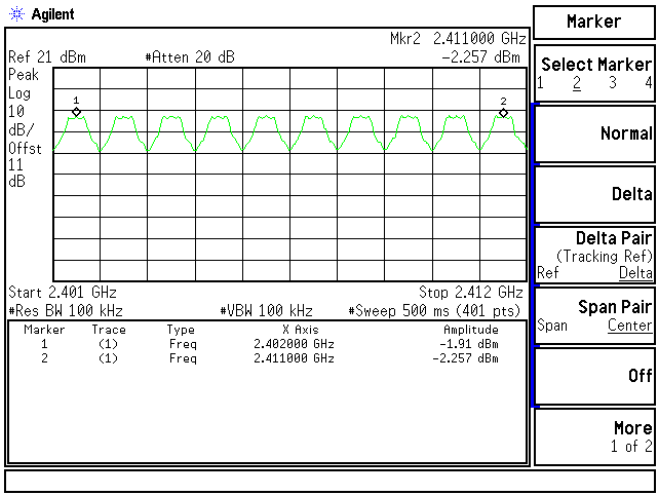
N/A

6.5. Test Result of Channel Number

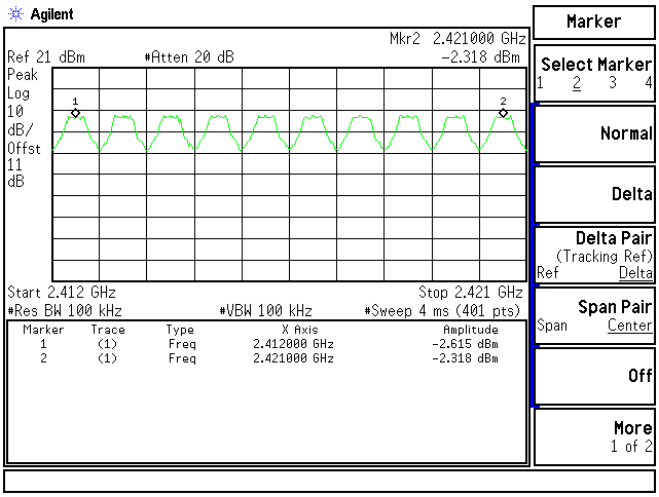
Product : M-1200 Bluetooth GPS Receiver
Test Item : Channel Number
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)

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

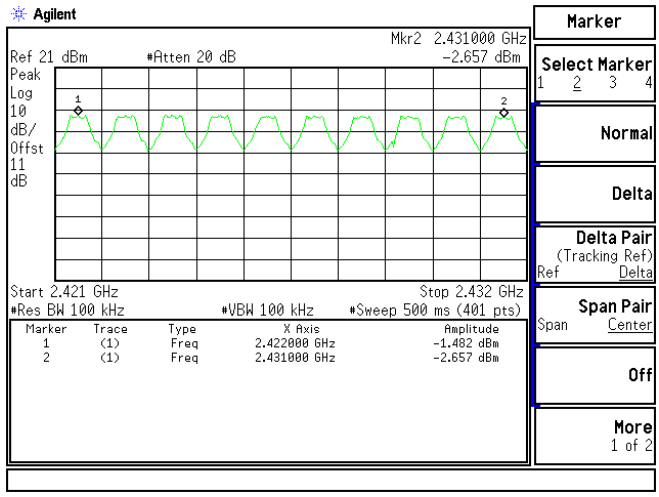
2402-2411MHz



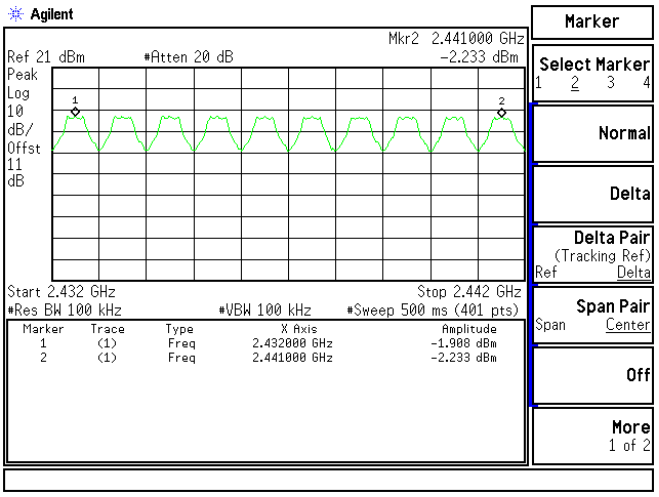
2412-2421MHz



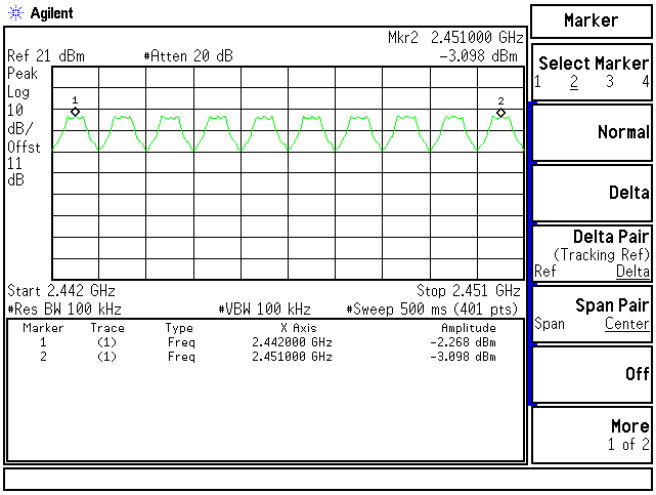
2422-2431MHz



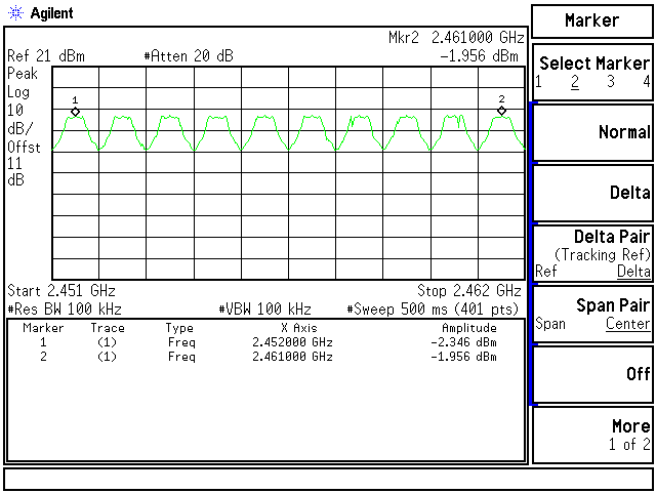
2432-2441MHz



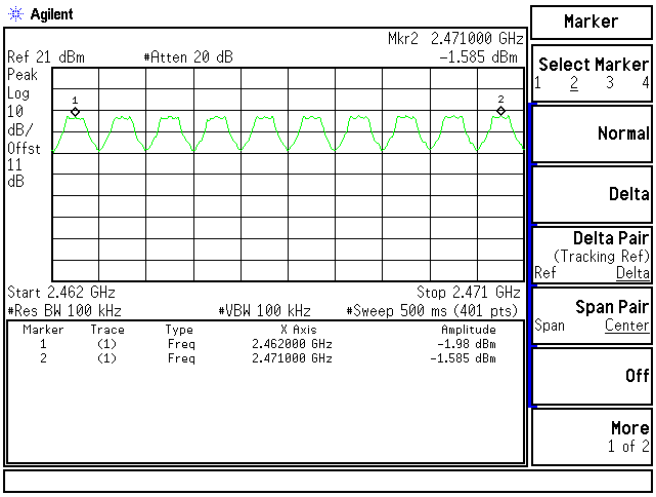
2442-2451MHz



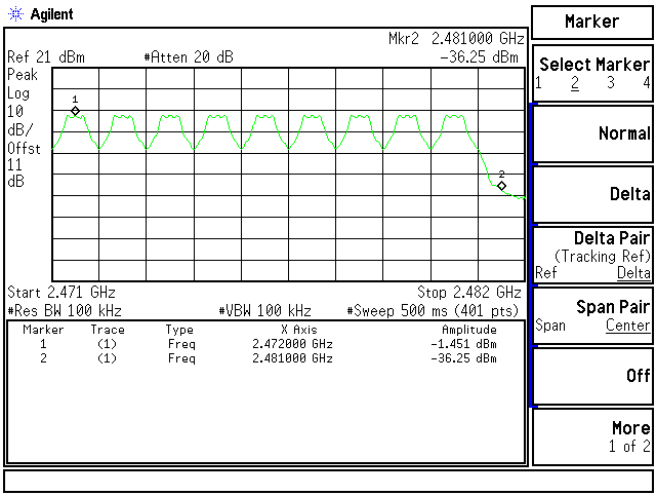
2452-2461MHz



2462-2471MHz



2472-2480MHz



7. Channel Separation

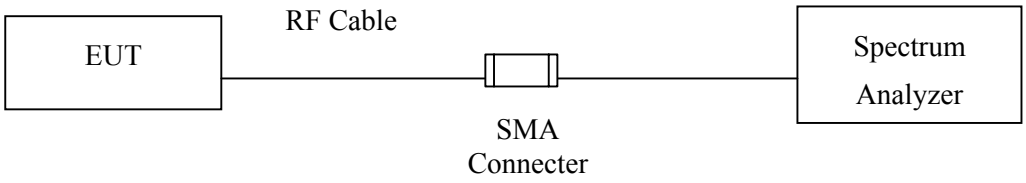
7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

Note: 1. All equipments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

7.2. Test Setup



7.3. Limit

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. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

7.4. Uncertainty

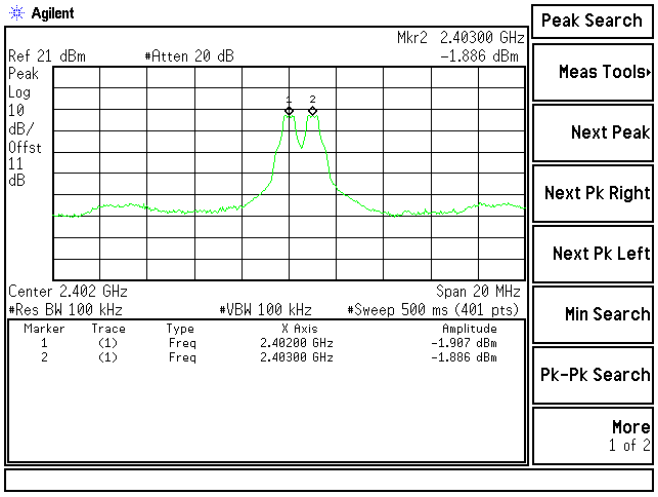
± 150Hz

7.5. Test Result of Channel Separation

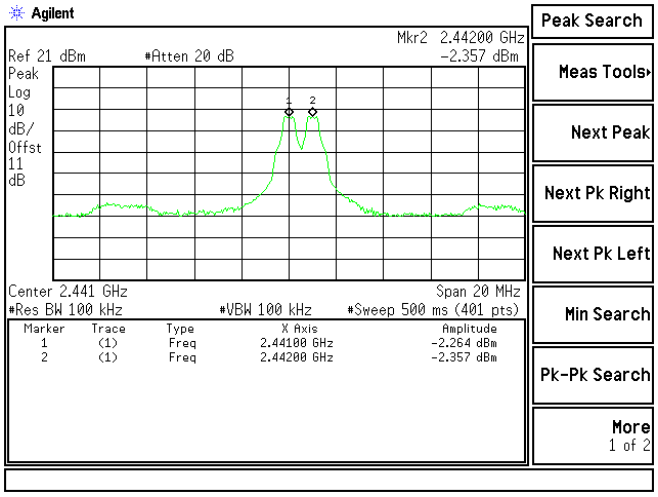
Product : M-1200 Bluetooth GPS Receiver
Test Item : Channel Separation
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)

Frequency (MHz)	Measurement Level (MHz)	Required Limit	Result
2402	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2441	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2480	1.00	>25 kHz or 2/3 * 20 dB BW	Pass

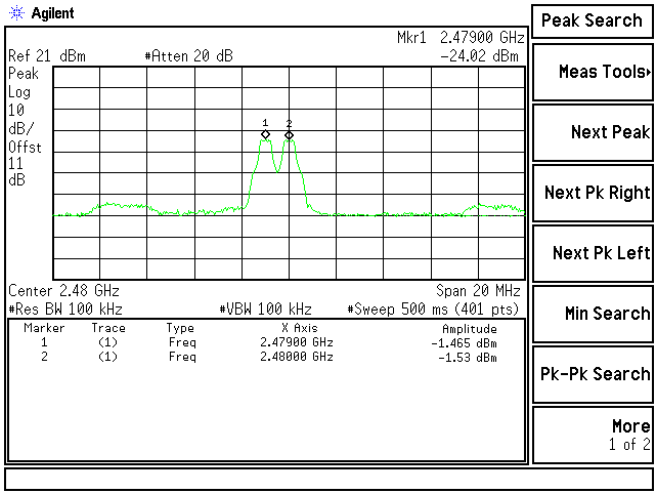
Channel 00 2402MHz



Channel 39 2441MHz



Channel 78 2480 MHz



8. Dwell Time

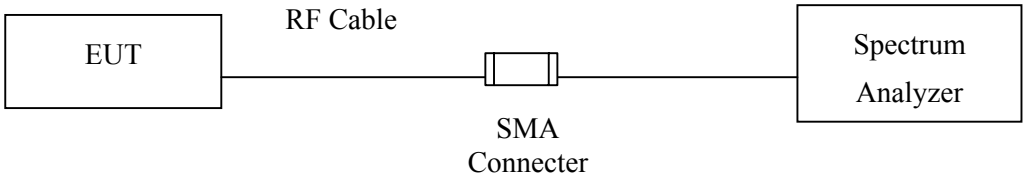
8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

Note: 1. All equipments are calibrated every one year.

2. The test equipments marked "X" are used to measure the final test results.

8.2. Test Setup



8.3. Limit

The dwell time shall be the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

8.4. Uncertainty

± 25msec

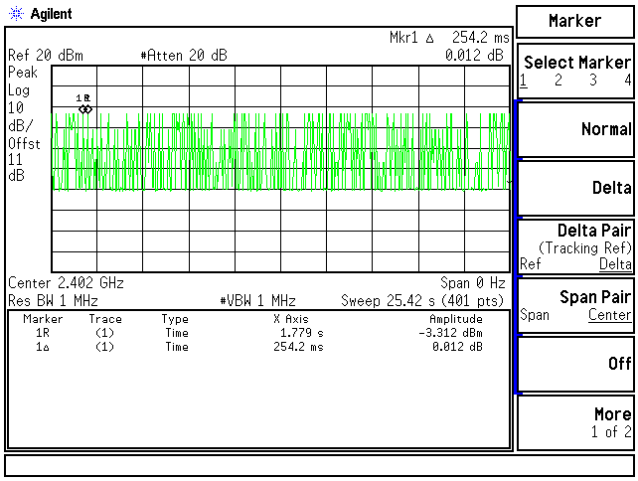
8.5. Test Result of Dwell Time

Product : M-1200 Bluetooth GPS Receiver
Test Item : Dwell Time
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(Channel 0,39,78 –DH5)

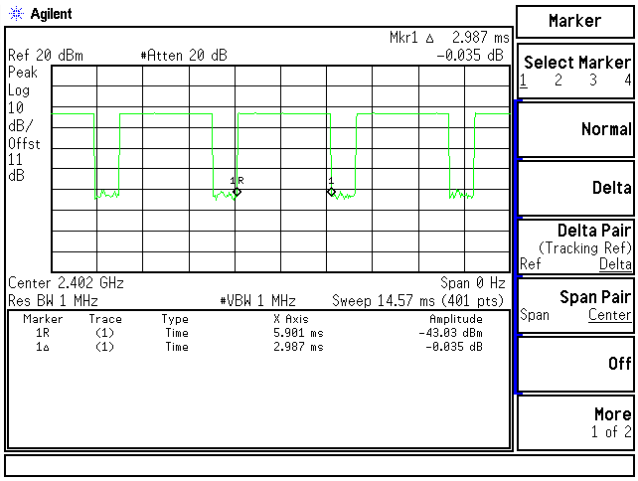
Channel No.	Frequency (MHz)	Time Interval between hops (ms)	Transmission Time (us)	Dwell Time (ms)	Limit (ms)	Result
00	2402	254.2	2987	371.3186467	400	Pass
39	2441	254.2	3024	375.9181747	400	Pass
78	2480	381.3	3096	256.5790716	400	Pass

Note: Dwell Time = 38 * 400ms / Time Interval Between Hops * Transmission Time / 1000

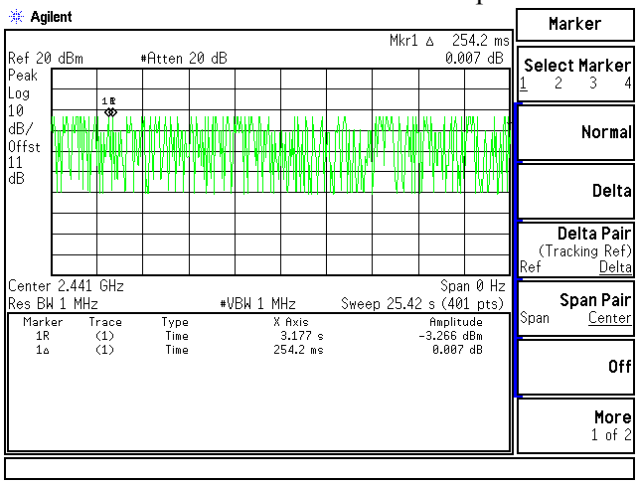
CH 2402MHz Time Interval between hops



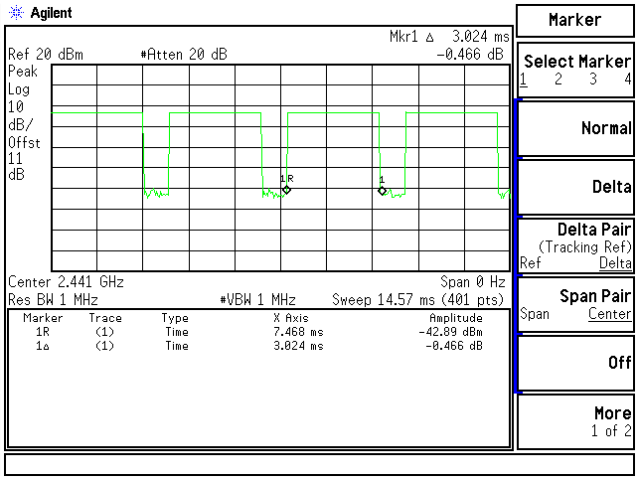
Transmission Time



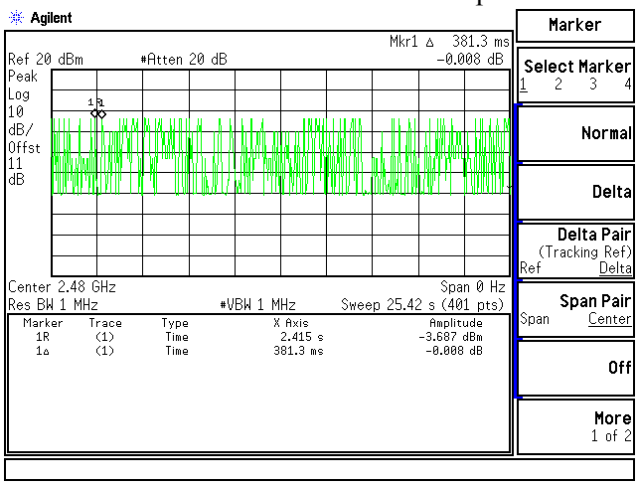
CH 2441MHz Time Interval between hops



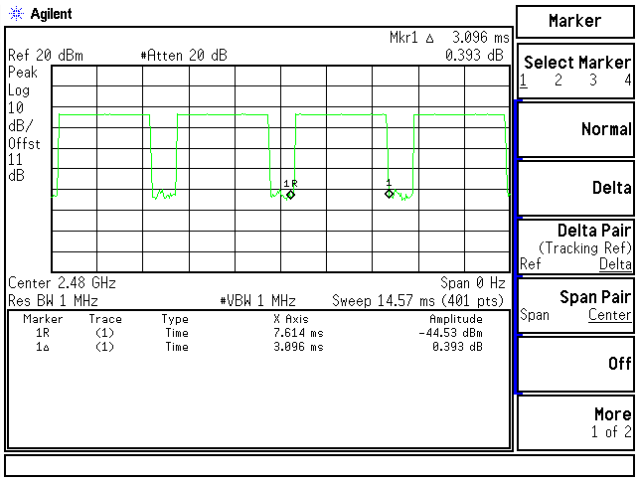
Transmission Time



CH 2480MHz Time Interval between hops



Transmission Time



9. Occupied Bandwidth

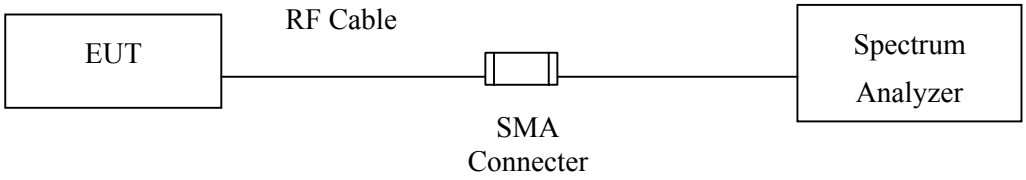
9.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

Note: 1. All equipments are calibrated every one year.

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

9.2. Test Setup



9.3. Limits

N/A

9.4. Uncertainty

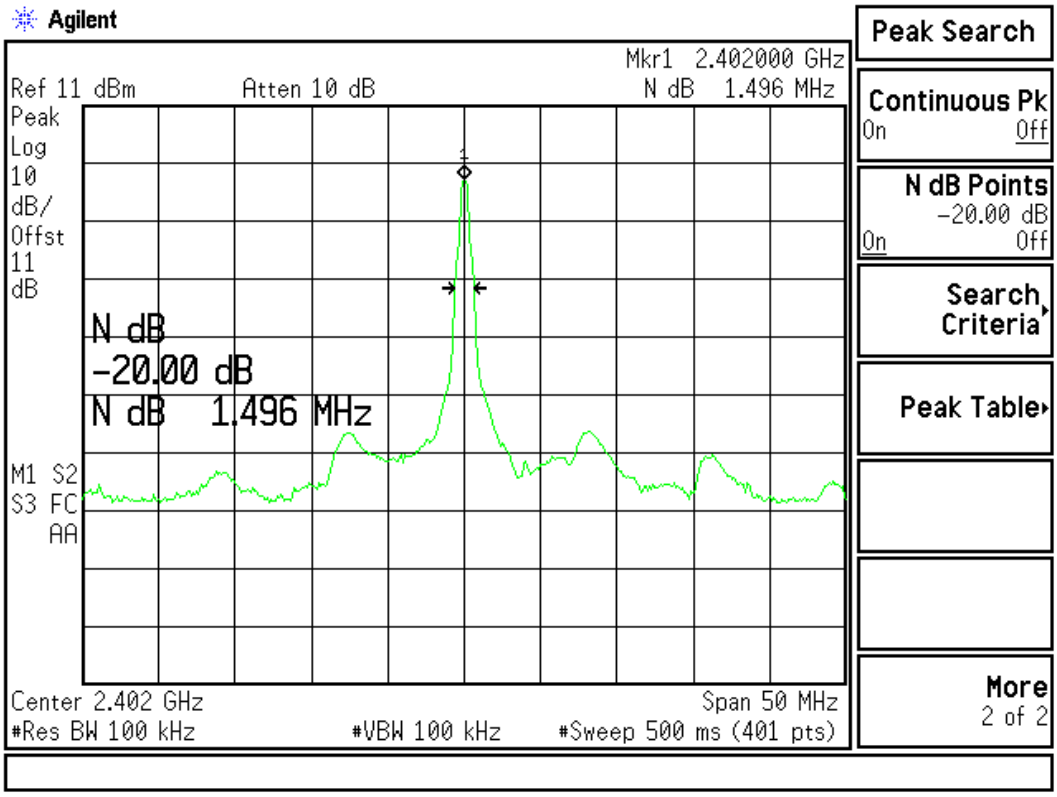
± 150Hz

9.5. Test Result of Occupied Bandwidth

Product : M-1200 Bluetooth GPS Receiver
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1496	--	N/A

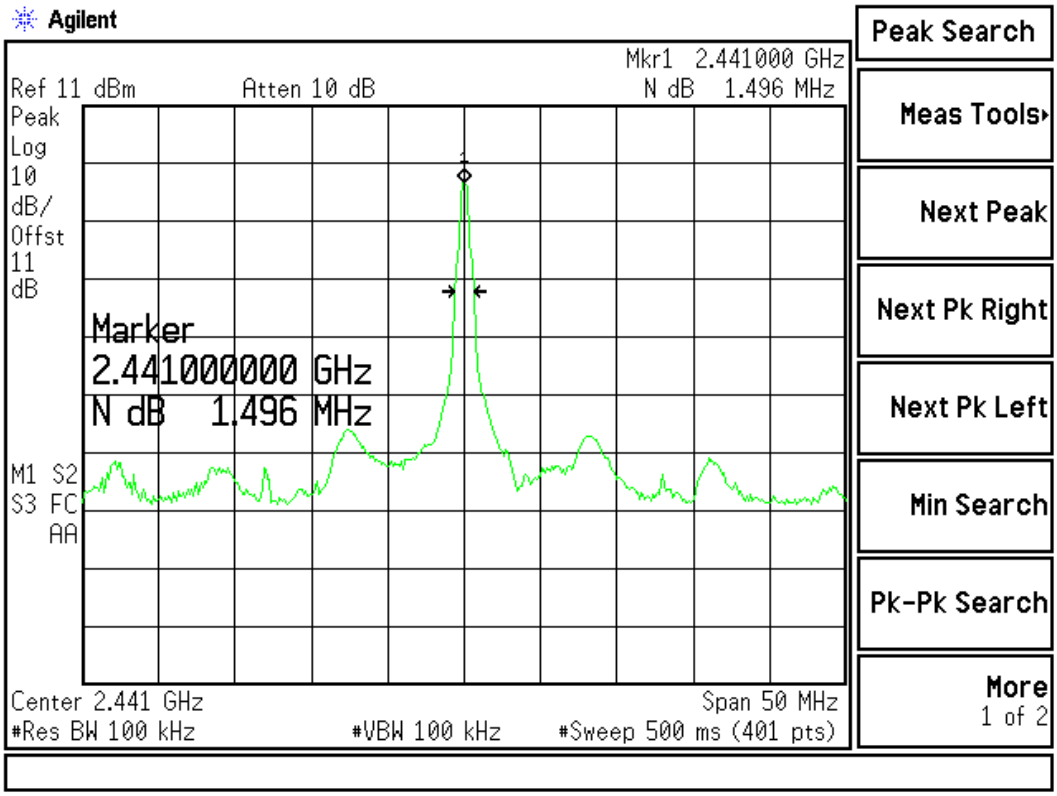
Figure Channel 00:



Product : M-1200 Bluetooth GPS Receiver
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1496	--	N/A

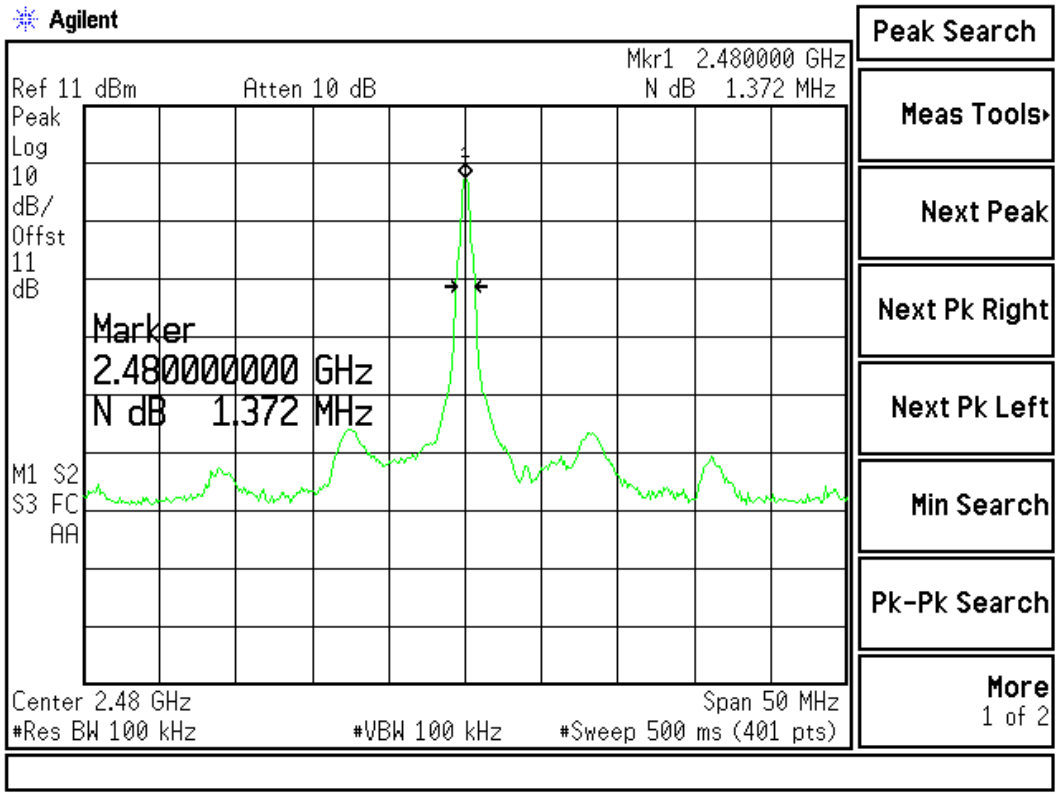
Figure Channel 39:



Product : M-1200 Bluetooth GPS Receiver
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (AC Adapter)(2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1372	--	N/A

Figure Channel 78:



10. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs