

FC

Test Report

Product Name	Industrial PDA
Model No.	DOLPHIN 7600
FCC ID.	HD5760002

Applicant	Hand Held Products, Inc.
Address	700 Visions Drive P.O. Box 208 Skaneateles Falls, NY, 13153-0208 USA

Date of Receipt	Mar. 26, 2007
Issued Date	Sep. 28, 2007
Report No.	074L005-RFUSP06V01

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

Test Report Certification

Issued Date: Sep. 28, 2007

Report No.: 074L005-RFUSP06V01



Product Name	Industrial PDA
Applicant	Hand Held Products, Inc.
Address	700 Visions Drive P.O. Box 208 Skaneateles Falls, NY, 13153-0208 USA
Manufacturer	E-TEN Information Systems Co., Ltd.
Model No.	DOLPHIN 7600
FCC ID.	HD5760002
Rated Voltage	AC 120V/60Hz
Working Voltage	AC 120V/60Hz
Trade Name	Hand Held Products
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2006 ANSI C63.4: 2003
Test Result	Complied



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Documented By :



(Engineering Adm. Specialist /
Rita Huang)


Tested By :



(Engineer / T i m S u n g)



Approved By :



(Deputy Manager / Vincent Lin)



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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Industrial PDA
Trade Name	Hand Held Products
FCC ID.	HD5760002
Model No.	DOLPHIN 7600
Frequency Range	2402 - 2480MHz
Channel Number	79
Type of Modulation	FHSS
Antenna type	Connector
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Power Adapter	MFR: PHIHONG M/N: PSA15R-050 Cable out: Non-Shielded, 1.8m with one ferrite core bonded.

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	E-TEN	A700_BT_Antenna 2.4GHz	3.649dBi in 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. This device is a Industrial PDA with a built-in 2.4GHz Bluetooth 2.0+EDR(Enhanced Data Rate) transceiver.
2. The EUT is including two models for different marketing requirement.
3. These tests were conducted on a sample for the purpose of demonstrating compliance of bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
4. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
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 an Industrial PDA with a built-in 2.4GHz Bluetooth 2.0+EDR(Enhanced Data Rate) and WLAN transceiver. The Bluetooth number of the channels is 79 in 2402-2480MHz. The device adapts the frequency hopping spread spectrum modulation. The antenna is connector-type and provides diversity function to improve the receiving function.

This device 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 -1Mbps(GFSK)
	Mode 2: Transmitter -3Mbps(8DPSK)

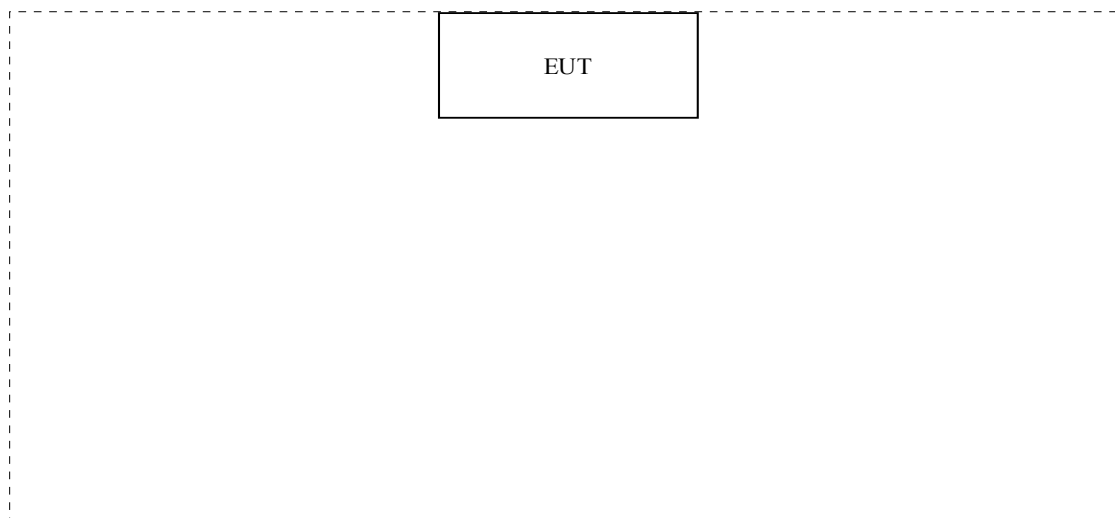
1.3. Tested System Details

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.	N/A	N/A	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A. N/A	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4
- (2) Power on the EUT.
- (3) Double-click the icon “My Device” on the desktop.
- (4) Double-click the file folder “IPSM”.
- (5) Execute EnterTestMode M600.exe.
- (6) Click on the test channel to transmit continuously.
- (7) 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: File on
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,
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E-Mail : service@quietek.com



FCC Accreditation Number: TW1014

2. Conducted Emission

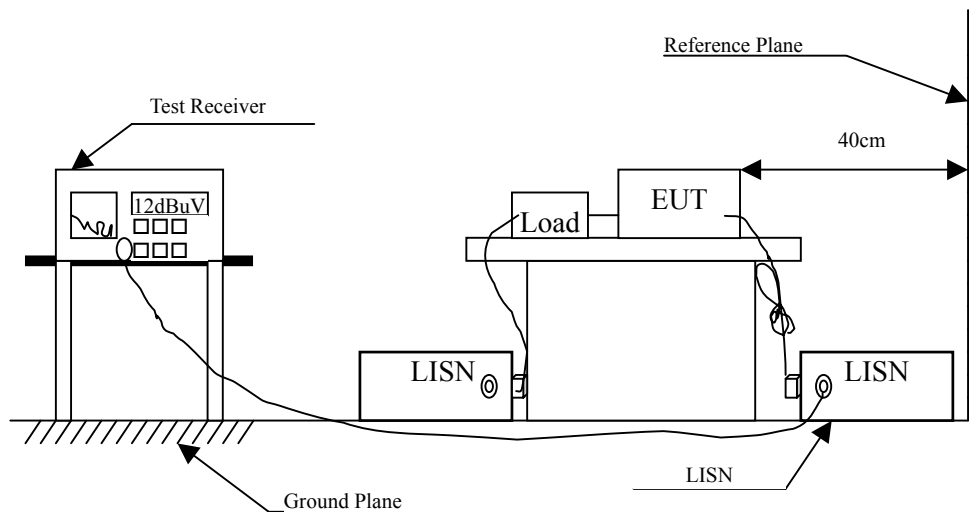
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2007	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2007	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2007	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2007	
5	No.1 Shielded Room			N/A	

Note: All instruments 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 refer 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 the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were investigated 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 : Industrial PDA
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.193	0.697	52.810	53.507	-11.264	64.771
0.771	0.310	38.060	38.370	-17.630	56.000
1.287	0.320	33.340	33.660	-22.340	56.000
2.959	0.370	37.180	37.550	-18.450	56.000
8.365	0.542	32.320	32.862	-27.138	60.000
18.986	1.080	29.940	31.020	-28.980	60.000
Average					
0.193	0.697	46.160	46.857	-7.914	54.771
0.771	0.310	31.370	31.680	-14.320	46.000
1.287	0.320	26.530	26.850	-19.150	46.000
2.959	0.370	33.150	33.520	-12.480	46.000
8.365	0.542	28.260	28.802	-21.198	50.000
18.986	1.080	25.780	26.860	-23.140	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 : Industrial PDA
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.193	0.300	52.410	52.710	-12.061	64.771
0.720	0.311	43.040	43.351	-12.649	56.000
1.673	0.340	35.710	36.050	-19.950	56.000
3.025	0.370	36.870	37.240	-18.760	56.000
7.591	0.460	35.360	35.820	-24.180	60.000
14.025	0.860	30.890	31.750	-28.250	60.000
Average					
0.193	0.300	45.480	45.780	-8.991	54.771
0.720	0.311	30.100	30.411	-15.589	46.000
1.673	0.340	32.500	32.840	-13.160	46.000
3.025	0.370	32.310	32.680	-13.320	46.000
7.591	0.460	33.560	34.020	-15.980	50.000
14.025	0.860	28.430	29.290	-20.710	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 : Industrial PDA
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV
	dB	dBuV	dBuV		
LINE 1					
Quasi-Peak					
0.185	0.753	49.070	49.823	-15.177	65.000
0.240	0.369	43.700	44.069	-19.360	63.429
0.300	0.300	35.700	36.000	-25.714	61.714
0.360	0.300	31.380	31.680	-28.320	60.000
0.963	0.310	28.730	29.040	-26.960	56.000
2.568	0.360	31.620	31.980	-24.020	56.000
Average					
0.185	0.753	42.020	42.773	-12.227	55.000
0.240	0.369	40.570	40.939	-12.490	53.429
0.300	0.300	28.890	29.190	-22.524	51.714
0.360	0.300	24.830	25.130	-24.870	50.000
0.963	0.310	16.120	16.430	-29.570	46.000
2.568	0.360	22.230	22.590	-23.410	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 : Industrial PDA
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.185	0.300	48.650	48.950	-16.050	65.000
0.245	0.300	44.800	45.100	-18.186	63.286
0.305	0.300	34.150	34.450	-27.121	61.571
0.365	0.310	31.720	32.030	-27.827	59.857
1.771	0.340	30.450	30.790	-25.210	56.000
2.623	0.360	29.910	30.270	-25.730	56.000
Average					
0.185	0.300	41.100	41.400	-13.600	55.000
0.245	0.300	41.820	42.120	-11.166	53.286
0.305	0.300	32.190	32.490	-19.081	51.571
0.365	0.310	28.210	28.520	-21.337	49.857
1.771	0.340	22.580	22.920	-23.080	46.000
2.623	0.360	20.280	20.640	-25.360	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

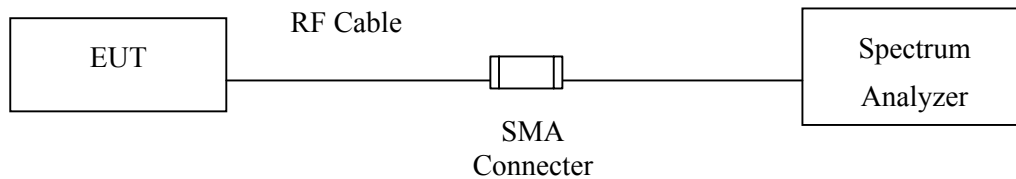
3.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	R & S	FSP40 / 100170	Nov, 2007
X	Power Meter	Agilent	E4416A /GB41291807	July, 2007
X	Power Meter Sensor	Agilent	E9323A/ US40411248	July, 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.

3.2. Test Setup



3.3. Limit

The maximum peak power shall be less 1Watt.

3.4. Uncertainty

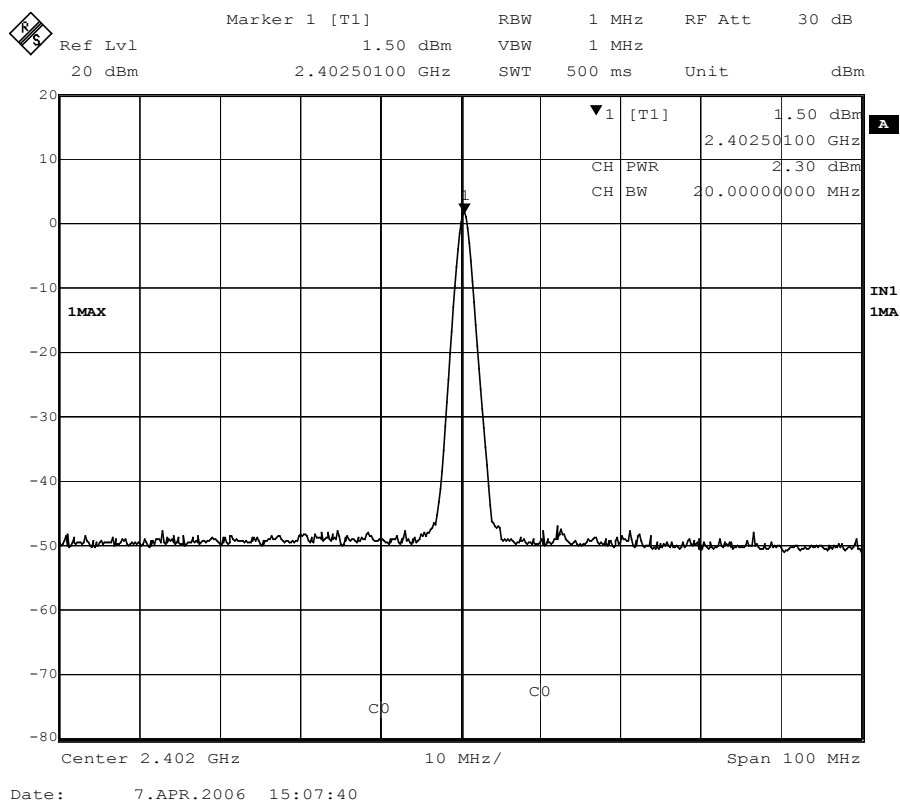
± 1.27 dB

3.5. Test Result of Peak Power Output

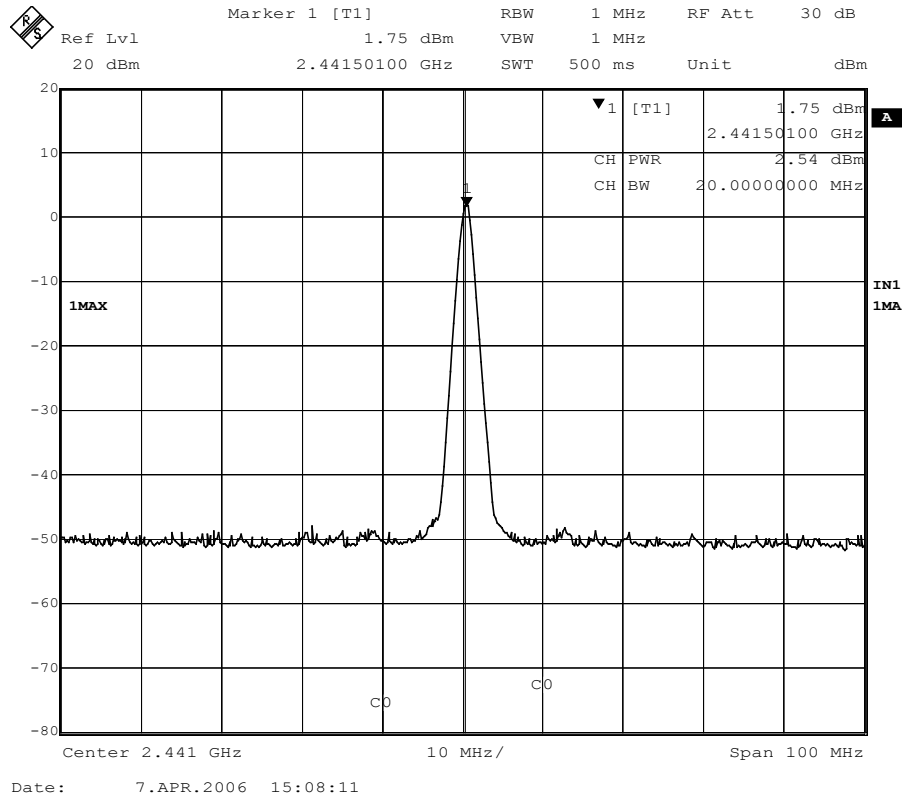
Product : Industrial PDA
 Test Item : Peak Power Output
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
Channel 00	2402.00	2.30dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	2.54dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	2.62dBm	1 Watt= 30 dBm	Pass

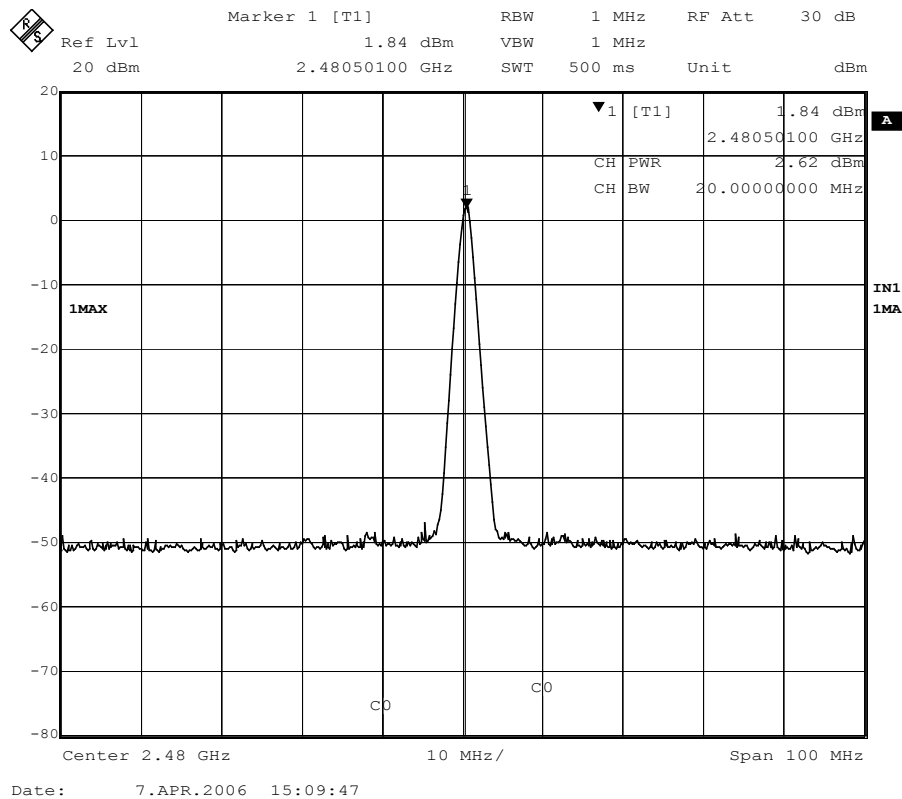
Channel 00



Channel 39



Channel 78



Product : Industrial PDA
Test Item : Peak Power Output
Test Site : No.3 OATS
Test Mode : Mode 2: Transmitter -3Mbps(8DPSK)

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
Channel 00	2402.00	1.98dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	1.95dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	1.89dBm	1 Watt= 30 dBm	Pass

Note: The measurement equipment is Power Meter.

4. Radiated Emission

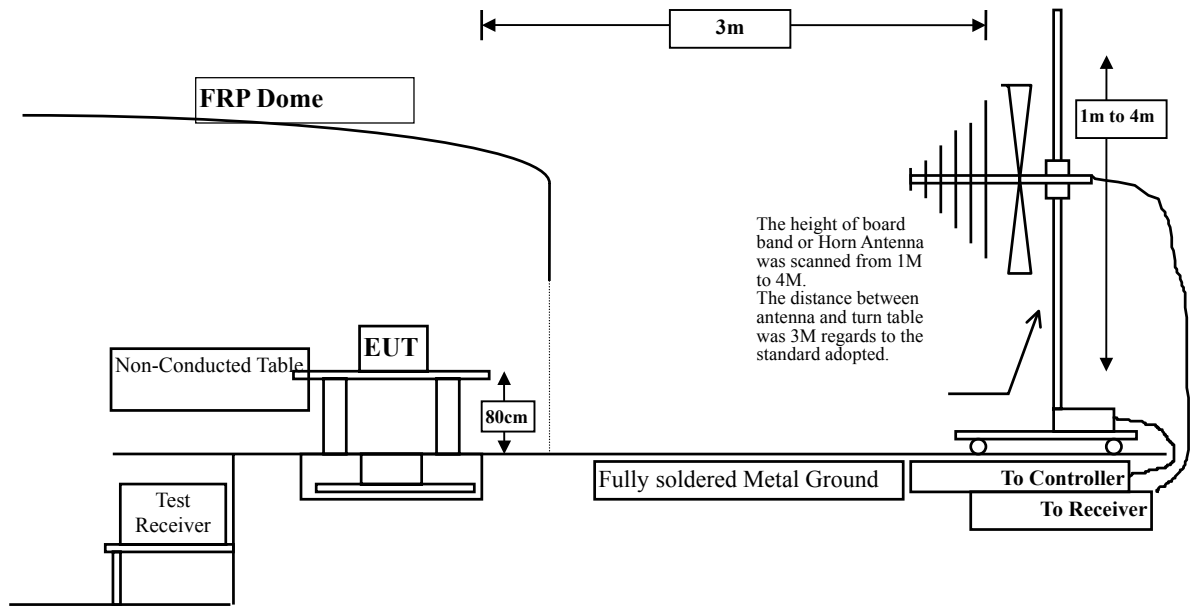
4.1. Test Equipment

The following test equipments are used during the radiated emission test:

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., 2007
☐ 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., 2007
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	May, 2007
☒ Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
	Spectrum Analyzer	HP	E4407B / US39440758	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
	Pre-Amplifier	HP	8449B / 3008A01123	July, 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.

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 strength 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 harmonics is checked.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Industrial PDA
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.663	45.657	49.320	-24.680	74.000
7206.000	9.357	37.954	47.310	-26.690	74.000
9608.000	11.842	37.538	49.380	-24.620	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4804.000	3.663	44.567	48.230	-25.770	74.000
7206.000	9.357	37.594	46.950	-27.050	74.000
9608.000	11.842	37.928	49.770	-24.230	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:3KHz; 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 : Industrial PDA
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.921	47.209	51.130	-22.870	74.000
7323.000	9.657	37.163	46.820	-27.180	74.000
9764.000	11.798	37.622	49.420	-24.580	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4882.000	3.921	46.399	50.320	-23.680	74.000
7323.000	9.657	37.253	46.910	-27.090	74.000
9764.000	11.798	36.452	48.250	-25.750	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:3KHz; 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 : Industrial PDA
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	4.197	49.414	53.610	-20.390	74.000
7440.000	9.951	36.379	46.330	-27.670	74.000
9920.000	11.856	38.564	50.420	-23.580	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4960.000	4.197	43.764	47.960	-26.040	74.000
7440.000	9.951	36.929	46.880	-27.120	74.000
9920.000	11.856	37.814	49.670	-24.330	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:3KHz; 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 : Industrial PDA
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		

Horizontal

Peak Detector:

4804.000	3.663	40.867	44.529	-29.471	74.000
7206.000	9.357	34.618	43.974	-30.026	74.000
9608.000	11.842	34.958	46.800	-27.200	74.000

Average

Detector:

--

Vertical

Peak Detector:

4804.000	3.663	39.052	42.714	-31.286	74.000
7206.000	9.357	35.048	44.404	-29.596	74.000
9608.000	11.842	33.907	45.749	-28.251	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:3KHz; 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 : Industrial PDA
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.921	41.650	45.571	-28.429	74.000
7323.000	9.657	33.989	43.646	-30.354	74.000
9764.000	11.798	33.985	45.783	-28.217	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4882.000	3.921	40.017	43.938	-30.062	74.000
7323.000	9.657	34.208	43.865	-30.135	74.000
9764.000	11.798	34.196	45.994	-28.006	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:3KHz; 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 : Industrial PDA
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	4.197	41.930	46.126	-27.874	74.000
7440.000	9.951	34.212	44.163	-29.837	74.000
9920.000	11.856	34.181	46.037	-27.963	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4960.000	4.197	39.390	43.586	-30.414	74.000
7440.000	9.951	33.330	43.281	-30.719	74.000
9920.000	11.856	34.099	45.955	-28.045	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:3KHz; 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 : Industrial PDA
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
107.600	13.064	22.469	35.533	-7.967	43.500
199.750	9.716	24.144	33.860	-9.640	43.500
313.725	13.717	25.390	39.107	-6.893	46.000
333.125	14.272	24.507	38.779	-7.221	46.000
738.100	21.049	14.062	35.111	-10.889	46.000
866.625	22.072	15.299	37.371	-8.629	46.000
Vertical					
97.900	10.460	29.238	39.698	-3.802	43.500
313.725	13.995	22.917	36.911	-9.089	46.000
350.100	15.082	19.268	34.350	-11.650	46.000
801.150	21.828	13.622	35.450	-10.550	46.000
839.950	21.403	13.260	34.663	-11.337	46.000
864.200	21.968	16.479	38.447	-7.553	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 : Industrial PDA
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
306.450	13.852	24.875	38.727	-7.273	46.000
485.900	18.545	22.373	40.918	-5.082	46.000
522.275	18.602	19.861	38.463	-7.537	46.000
548.950	20.383	17.816	38.199	-7.801	46.000
580.475	20.040	17.759	37.799	-8.201	46.000
599.875	19.999	19.941	39.940	-6.060	46.000
Vertical					
110.025	11.933	20.586	32.519	-10.981	43.500
267.650	14.199	20.484	34.683	-11.317	46.000
304.025	13.722	23.780	37.502	-8.498	46.000
313.725	13.995	25.988	39.982	-6.018	46.000
515.000	18.679	15.428	34.107	-11.893	46.000
934.525	24.106	12.863	36.970	-9.030	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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

The following test equipments are used during the band edge tests:

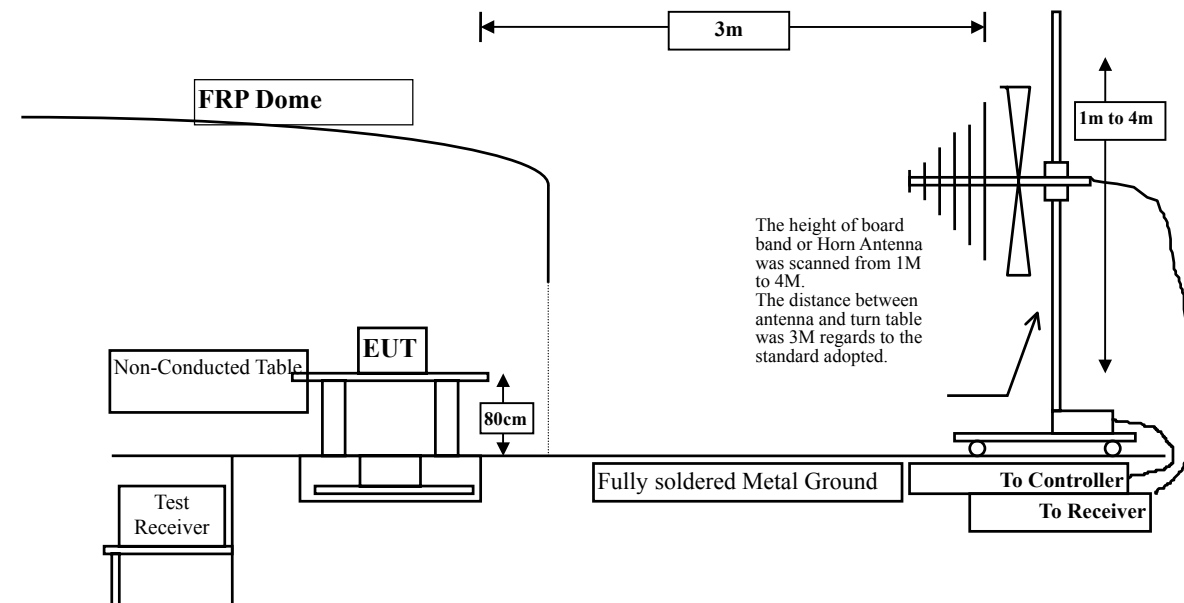
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
X	Spectrum Analyzer	HP	E4407B / US39440758	May, 2007
X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
X	Horn Antenna	Schwarzbeck	BBHA9170 / 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

Test Site Site 3

- Note:
1. All equipments are calibrated every one year.
 2. The test instruments 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 : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK) +WLAN CH01 RF on

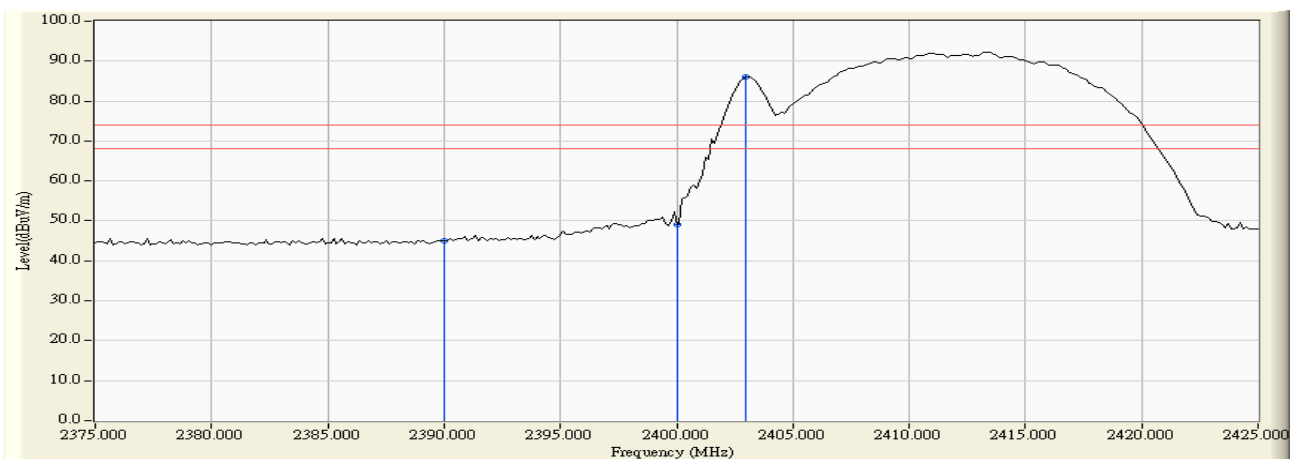
RF Radiated Measurement:

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

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2390.000	-2.378	47.346	44.969	74.00	54.00	Pass
00 (Peak)	2400.000	-2.328	51.355	49.027	74.00	54.00	Pass
00 (Peak)	2403.000	-2.312	88.269	85.956	74.00	54.00	Pass

Figure Channel 00: (Horizontal) (Peak)



Note:

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

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK) +WLAN CH01 RF on

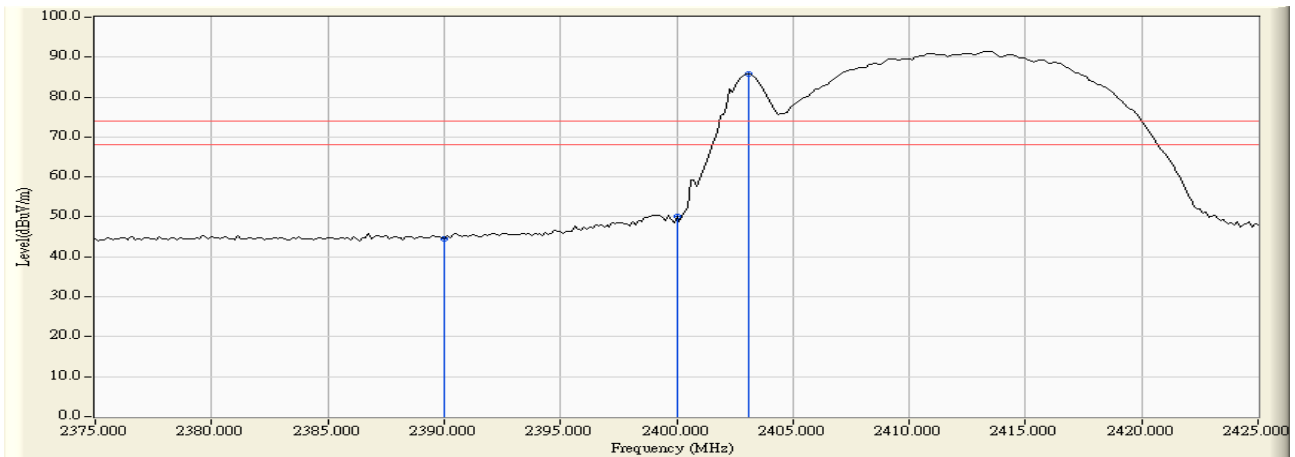
RF Radiated Measurement:

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

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2390.000	-2.378	46.921	44.544	74.00	54.00	Pass
00 (Peak)	2400.000	-2.328	52.454	50.126	74.00	54.00	Pass
00 (Peak)	2403.125	-2.312	88.144	85.832	74.00	54.00	Pass

Figure Channel 00: (Vertical) (Peak)



Note:

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

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK) +WLAN CH11 RF on

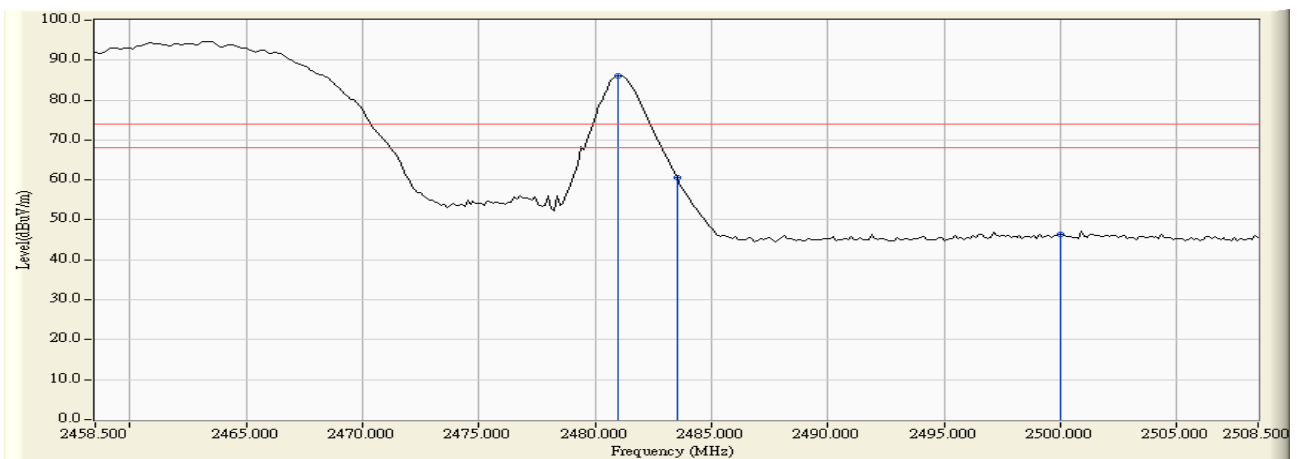
RF Radiated Measurement:

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

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2481.000	-1.946	87.943	85.996	74.00	54.00	Pass
78(Peak)	2483.500	-1.937	62.560	60.623	74.00	54.00	Pass
78(Peak)	2500.000	-1.886	48.175	46.289	74.00	54.00	Pass
78(Average)	2483.500	-1.937	53.985	52.048	74.00	54.00	Pass

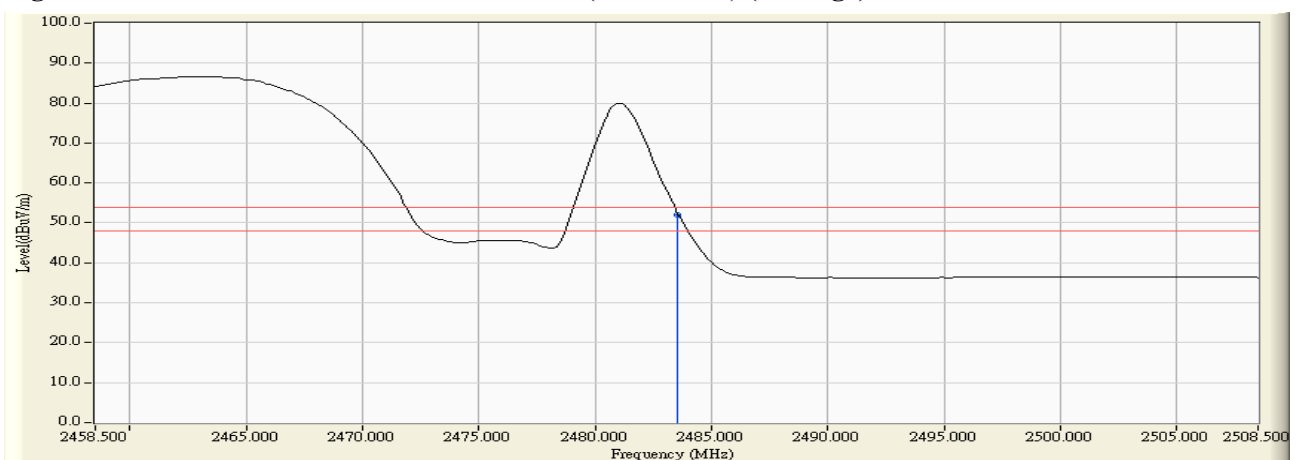
Figure Channel 78: (Horizontal) (Peak)



Note:

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

Figure Channel 78: (Horizontal) (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms.

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK) +WLAN CH11 RF on

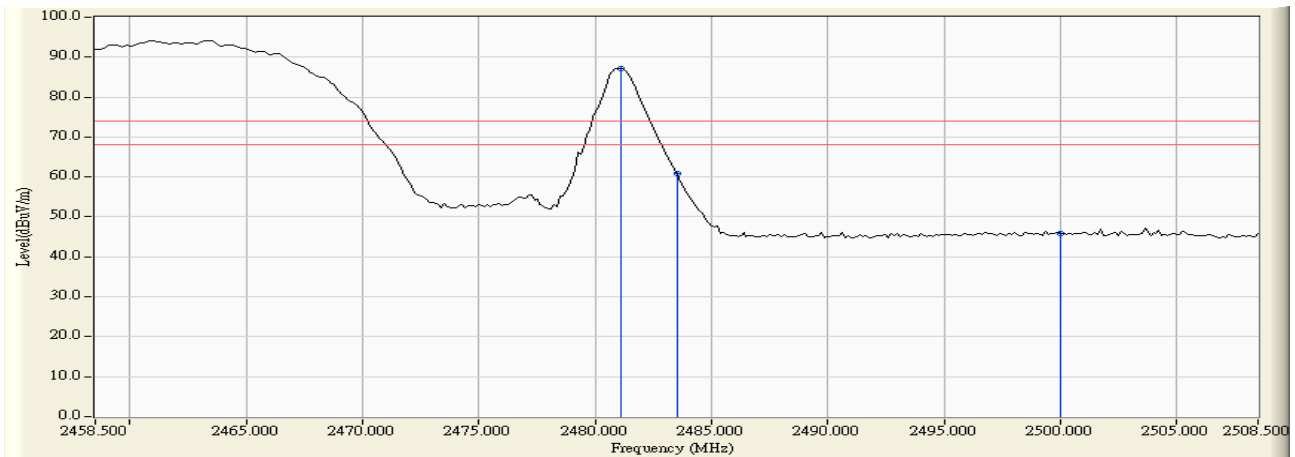
RF Radiated Measurement:

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

RF Radiated Measurement (Vertical):

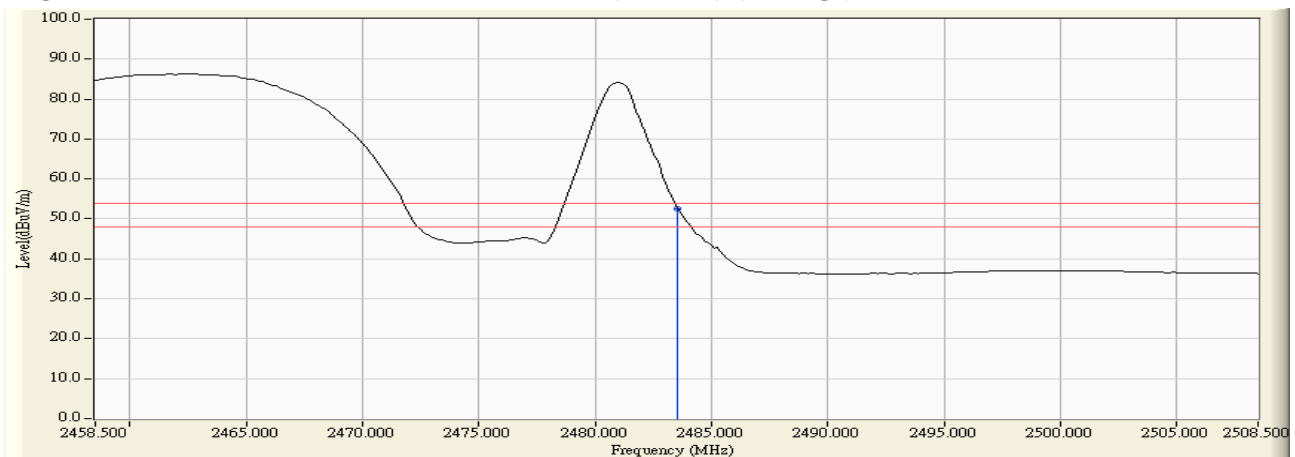
Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2481.125	-1.946	89.091	87.145	74.00	54.00	Pass
78(Peak)	2483.500	-1.937	62.669	60.732	74.00	54.00	Pass
78(Peak)	2500.000	-1.886	47.671	45.785	74.00	54.00	Pass
78(Average)	2483.500	-1.937	54.390	52.453	74.00	54.00	Pass

Figure Channel 78: (Vertical) (Peak)



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

Figure Channel 78: (Vertical) (Average)



Note:
 RBW=1MHz, VBW=300Hz, 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.

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) +WLAN CH01 RF on

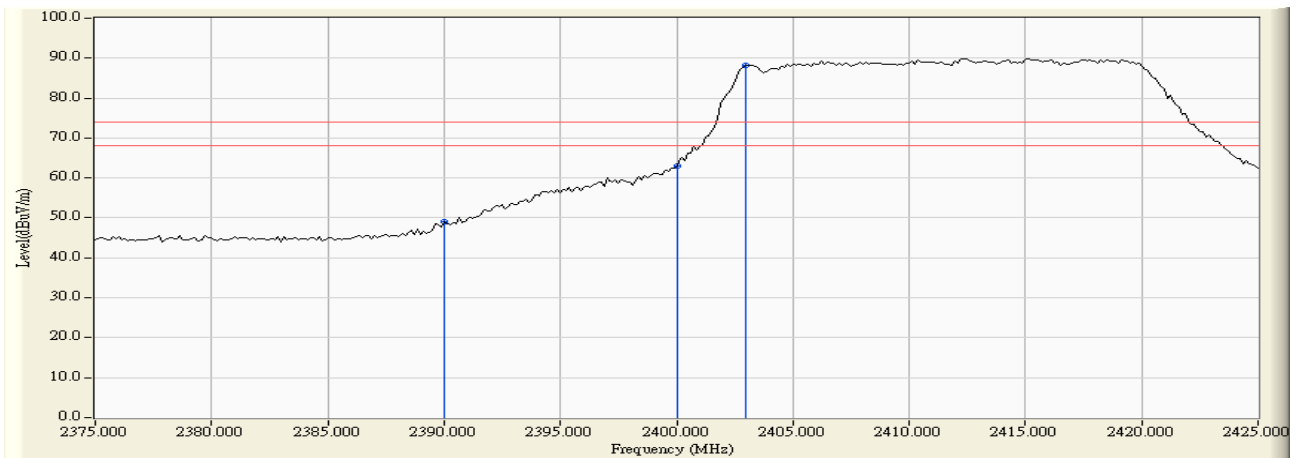
RF Radiated Measurement:

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

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2390.000	-2.378	51.404	49.027	74.00	54.00	Pass
00 (Peak)	2400.000	-2.328	65.272	62.944	74.00	54.00	Pass
00 (Peak)	2403.000	-2.312	90.590	88.277	74.00	54.00	Pass

Figure Channel 00: (Horizontal) (Peak)



Note:

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

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) +WLAN CH01 RF on

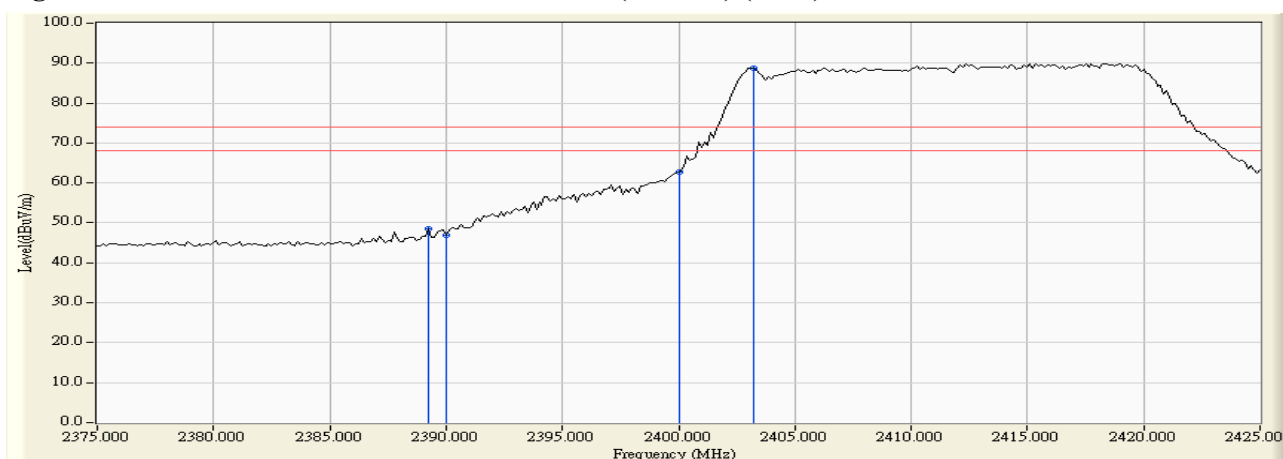
RF Radiated Measurement:

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

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2389.250	-2.381	51.012	48.631	74.00	54.00	Pass
00 (Peak)	2390.000	-2.378	49.349	46.972	74.00	54.00	Pass
00 (Peak)	2400.000	-2.328	65.022	62.694	74.00	54.00	Pass
00 (Peak)	2403.250	-2.311	90.999	88.687	74.00	54.00	Pass

Figure Channel 00: (Vertical) (Peak)



Note:

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

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) +WLAN CH11 RF on

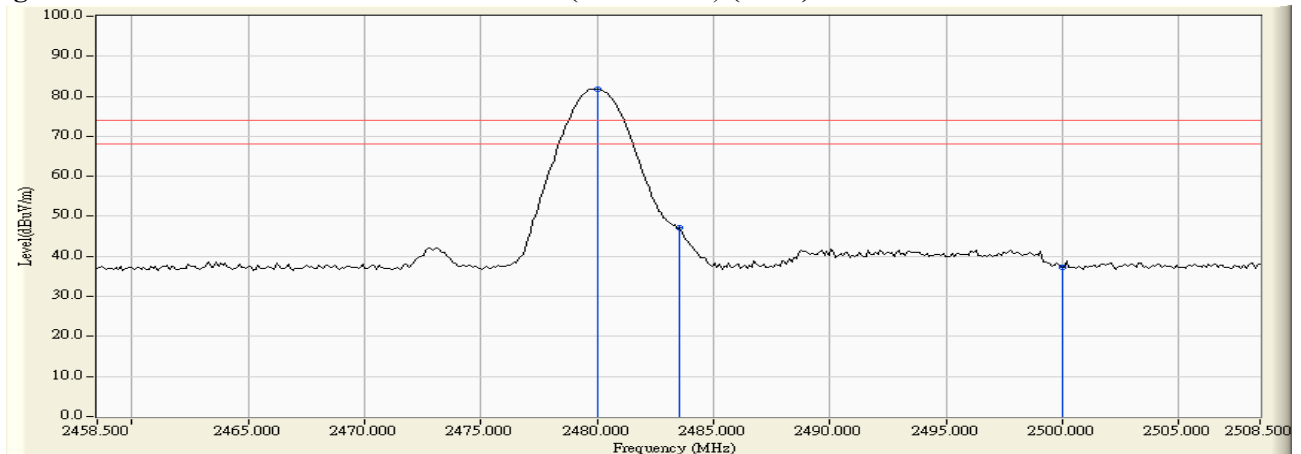
RF Radiated Measurement:

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

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2481.000	-1.946	88.865	86.918	74.00	54.00	Pass
78(Peak)	2483.500	-1.937	63.756	61.819	74.00	54.00	Pass
78(Peak)	2500.000	-1.886	47.309	45.423	74.00	54.00	Pass
78(Average)	2483.500	-1.937	54.658	52.721	74.00	54.00	Pass

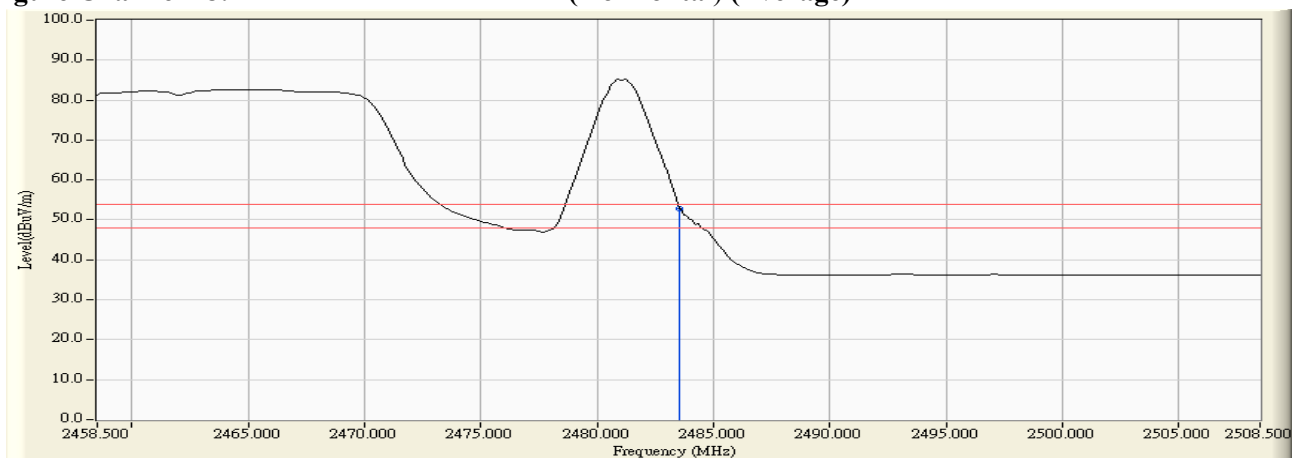
Figure Channel 78: (Horizontal) (Peak)



Note:

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

Figure Channel 78: (Horizontal) (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms.

Product : Industrial PDA
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) +WLAN CH11 RF on

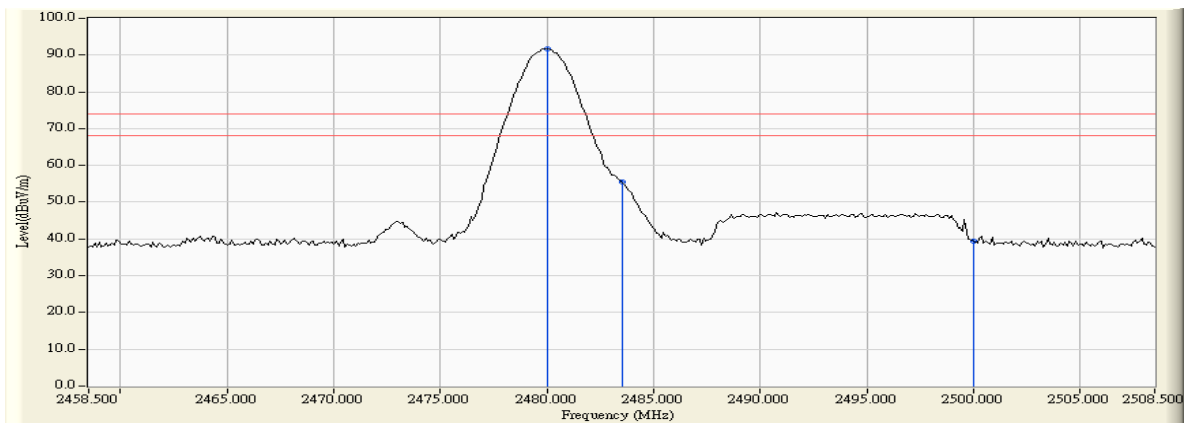
RF Radiated Measurement:

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

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2481.125	-1.946	88.463	86.517	74.00	54.00	Pass
78(Peak)	2483.500	-1.937	63.462	61.525	74.00	54.00	Pass
78(Peak)	2500.000	-1.886	47.353	45.467	74.00	54.00	Pass
78(Average)	2483.500	-1.937	54.490	52.553	74.00	54.00	Pass

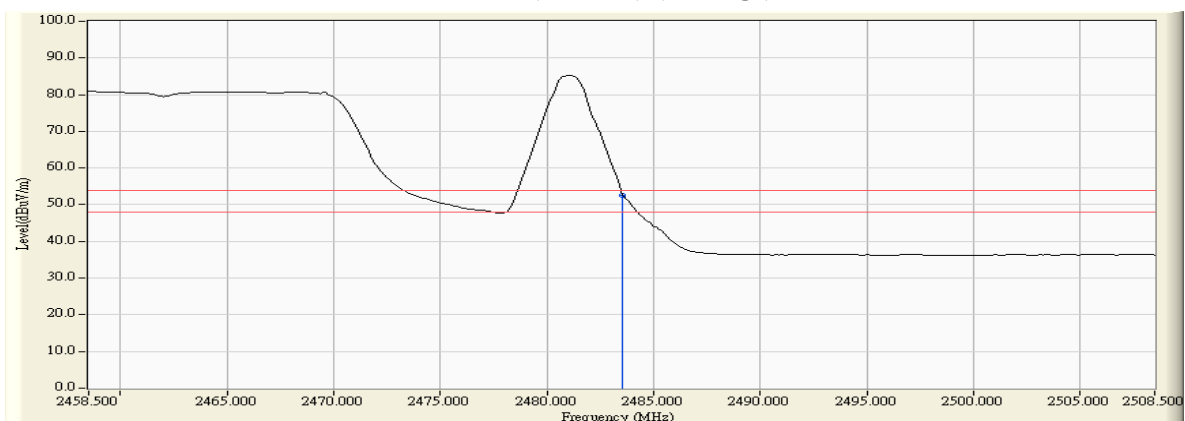
Figure Channel 78: (Vertical) (Peak)



Note:

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

Figure Channel 78: (Vertical) (Average)



Note:

RBW=1MHz, VBW=300Hz, 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

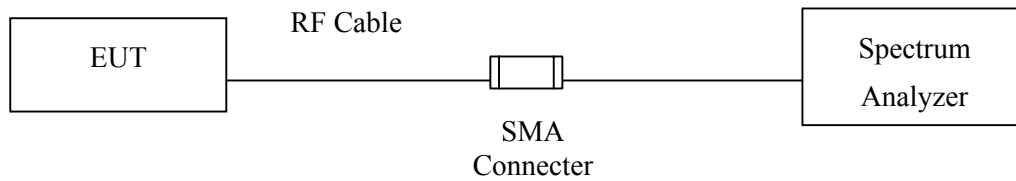
6.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	R & S	FSP40 / 100170	Nov, 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.

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

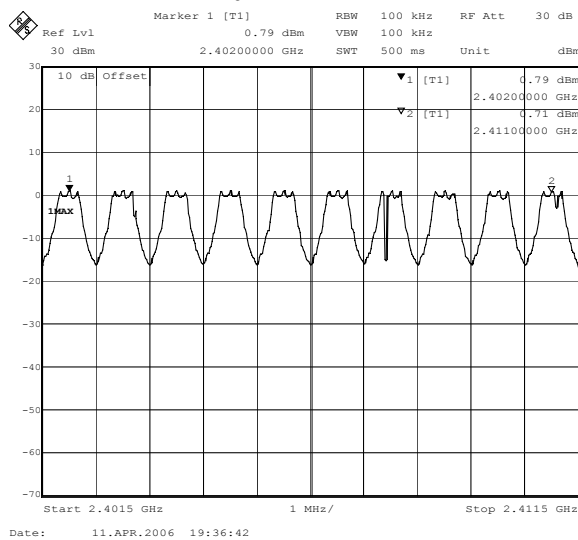
N/A

6.5. Test Result of Channel Number

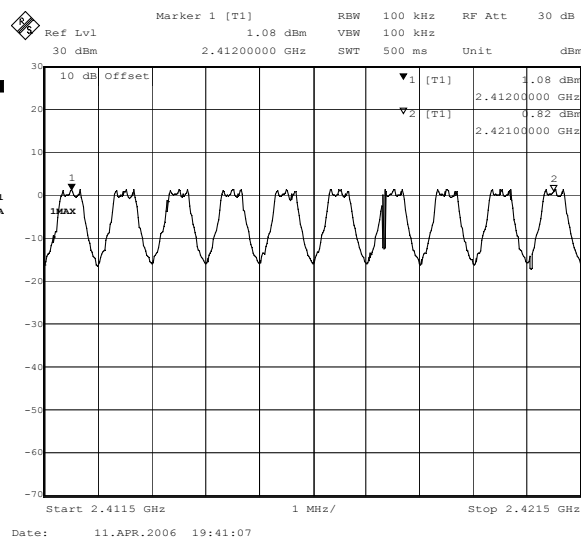
Product : Industrial PDA
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)

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

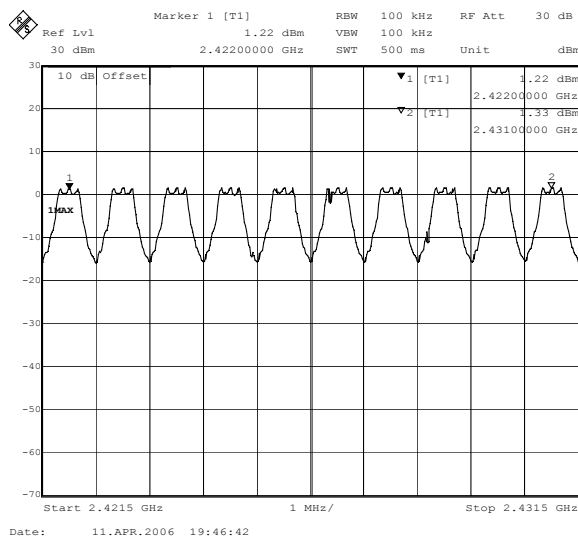
2402-2411MHz



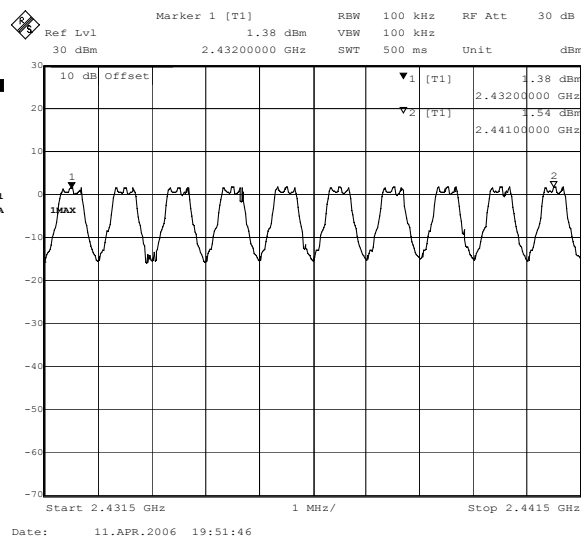
2412-2421MHz



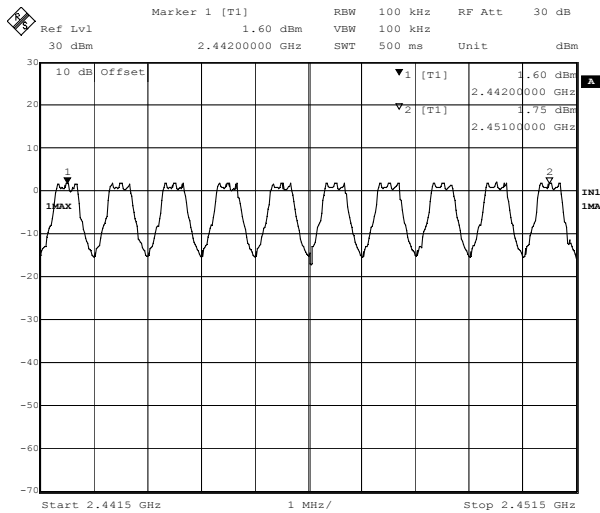
2422-2431MHz



2432-2441MHz

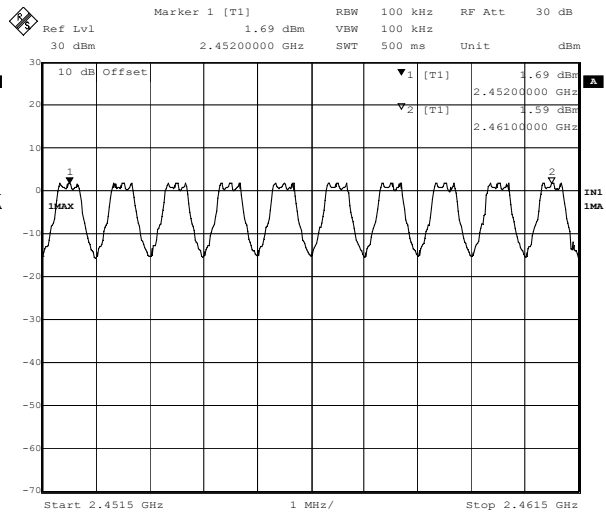


2442-2451MHz



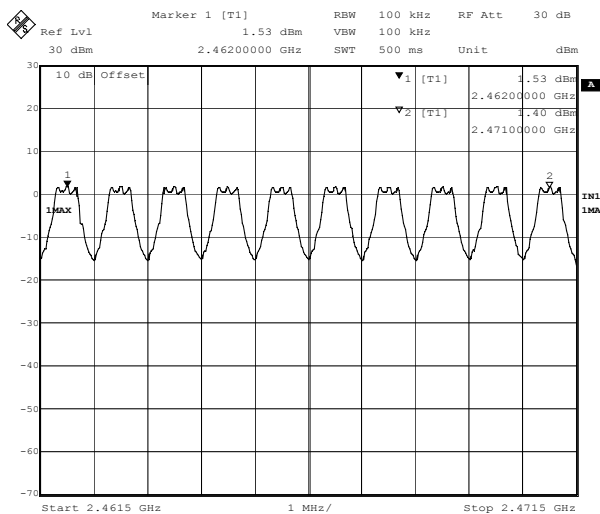
Date: 11.APR.2006 19:55:59

2452-2461MHz



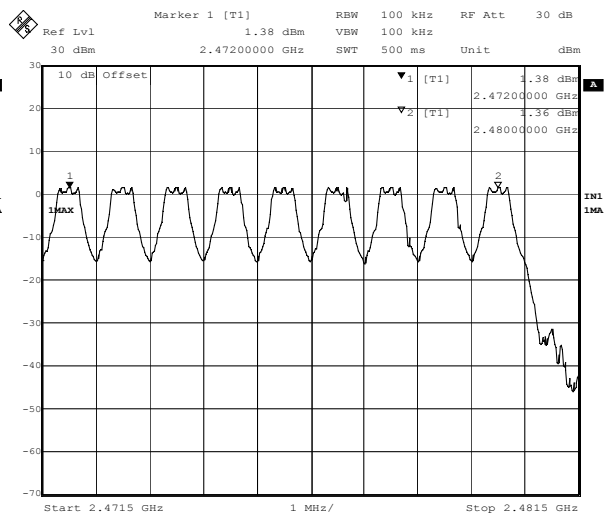
Date: 11.APR.2006 20:10:21

2462-2471MHz



Date: 11.APR.2006 20:18:17

2472-2480MHz

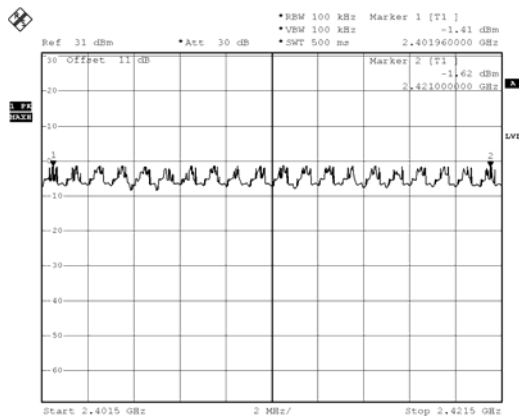


Date: 11.APR.2006 20:23:36

Product : Industrial PDA
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK)

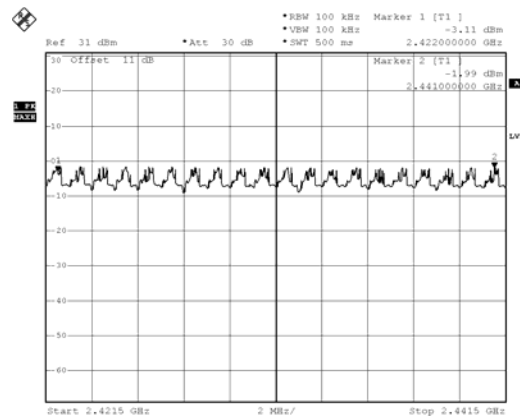
Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

2402-2421MHz



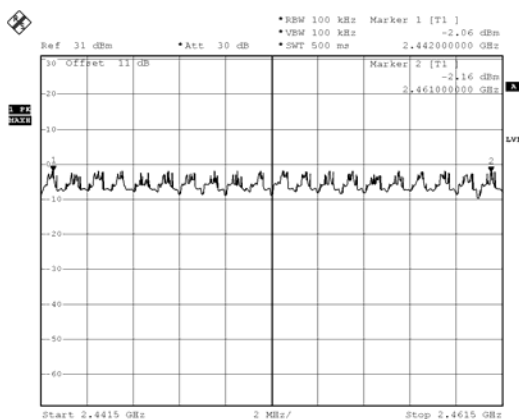
PN1
 Date: 1.SEP.2007 14:23:57

2422-2441MHz



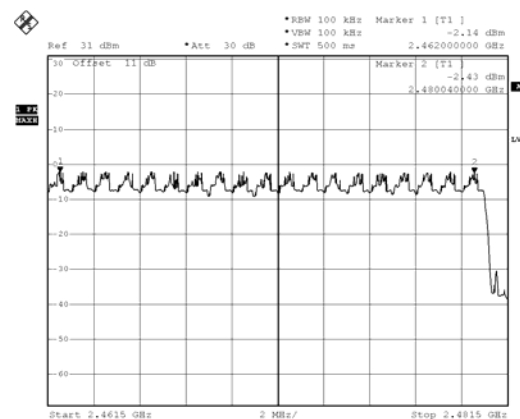
PN1
 Date: 1.SEP.2007 14:27:47

2442-2461MHz



PN1
 Date: 1.SEP.2007 14:30:33

2462-2480MHz



PN1
 Date: 1.SEP.2007 14:34:14

7. Channel Separation

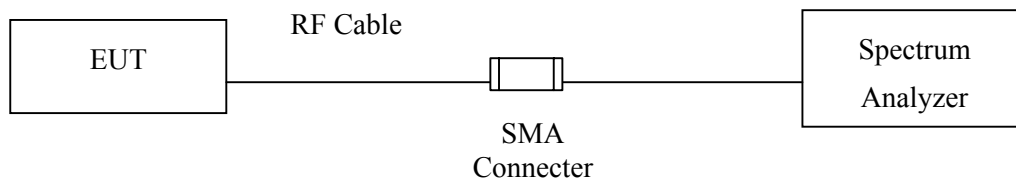
7.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	R & S	FSP40 / 100170	Nov, 2007

Note: 1. All equipments are calibrated every one year.
2. The test instruments mark 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.

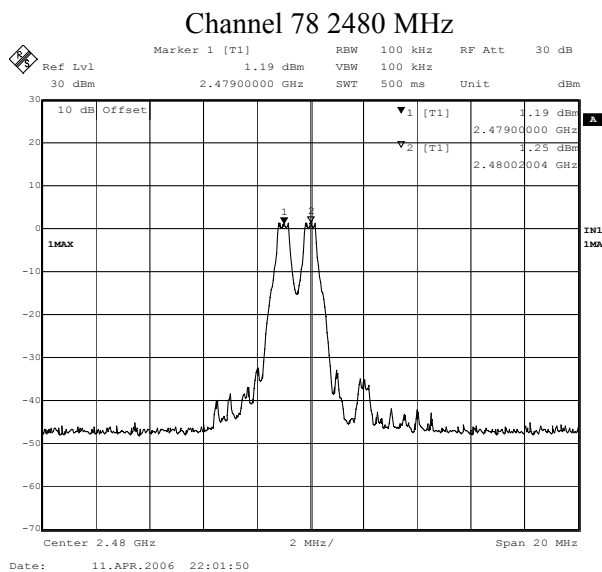
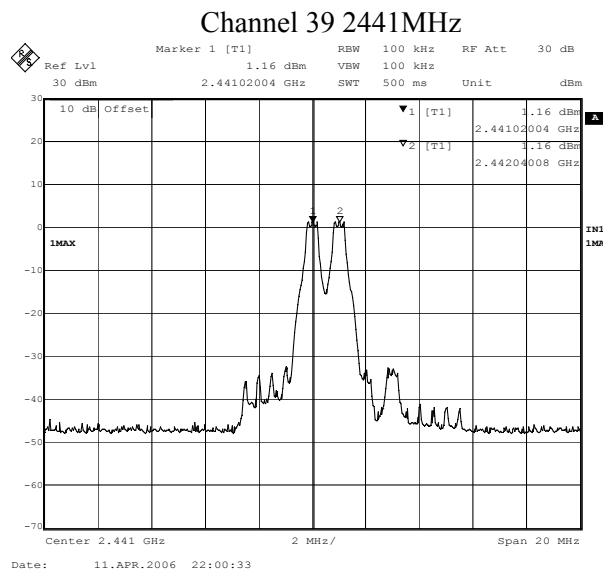
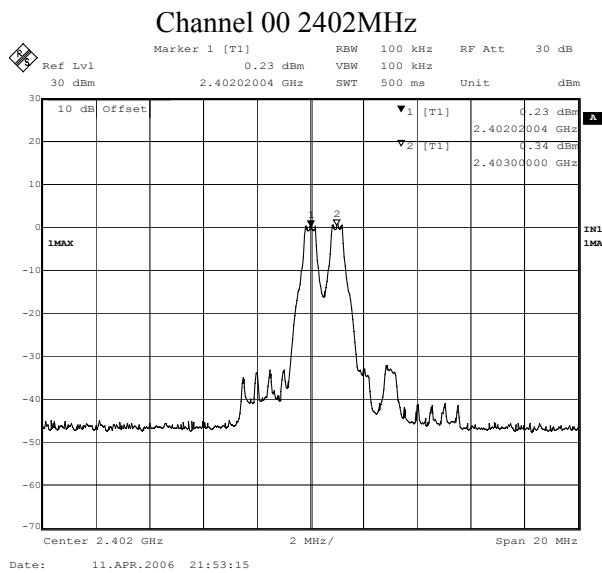
7.4. Uncertainty

$\pm 150\text{Hz}$

7.5. Test Result of Channel Separation

Product : Industrial PDA
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)

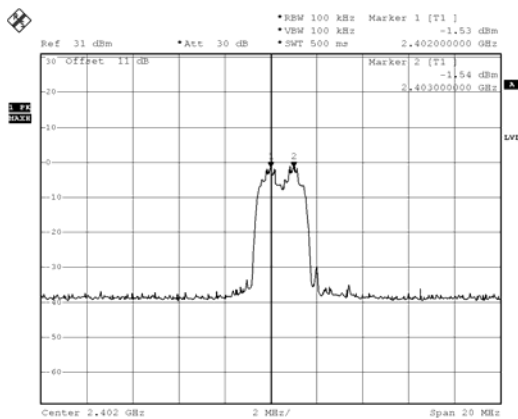
Frequency (MHz)	Measurement Level (MHz)	Required Limit	Result
2402	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2441	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2480	1.00	>25 kHz or 2/3 * 20 dB BW	Pass



Product : Industrial PDA
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK)

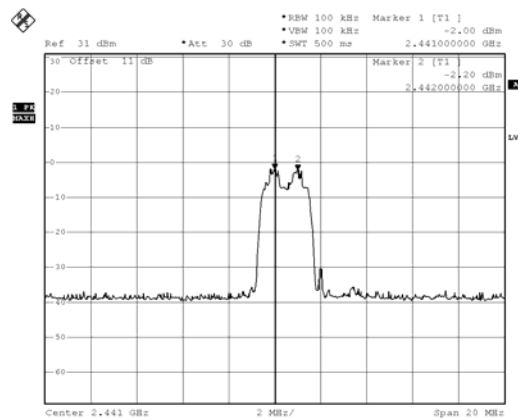
Frequency (MHz)	Measurement Level (MHz)	Required Limit	Result
2402	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2441	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2480	1.00	>25 kHz or 2/3 * 20 dB BW	Pass

Channel 00 2402MHz



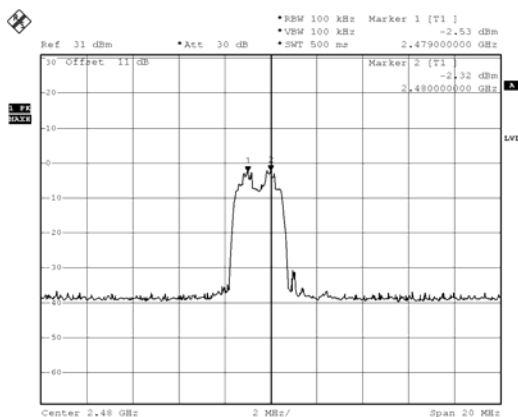
PN1
 Date: 1.SEP.2007 15:25:58

Channel 39 2441MHz



PN1
 Date: 1.SEP.2007 15:27:54

Channel 78 2480 MHz



PN1
 Date: 1.SEP.2007 15:28:32

8. Dwell Time

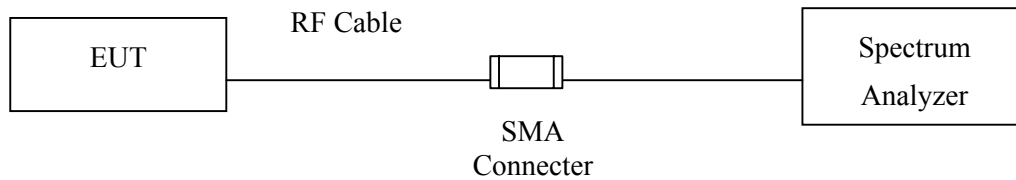
8.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	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.

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

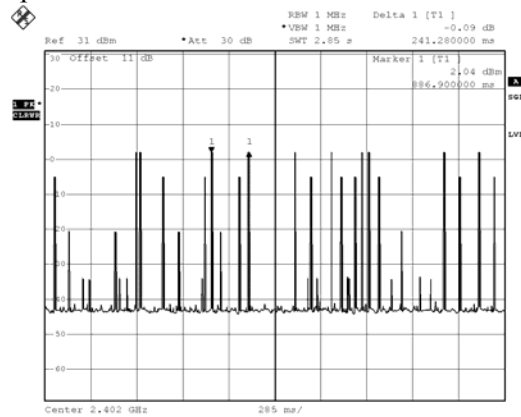
8.5. Test Result of Dwell Time

Product : Industrial PDA
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(Channel 00,39,78 –DH5)

Channel No.	Frequency (MHz)	Time Interval between hops (ms)	Transmission Time (us)	Dwell Time (ms)	Limit (ms)	Result
00	2402	241.280	2852	373.5212202	400	Pass
39	2441	244.392	2912	376.5229631	400	Pass
78	2480	245.012	2900	374.0224969	400	Pass

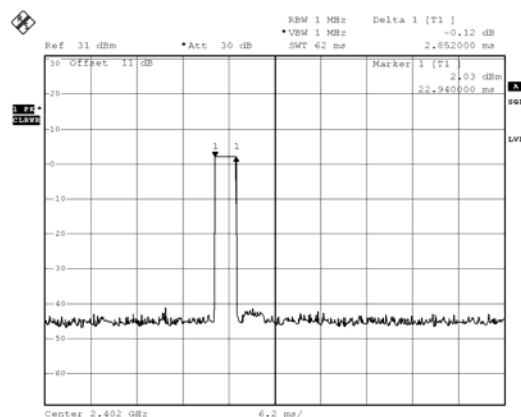
Note: Dwell Time = $79 * 400 / \text{Time Interval Between Hops} * \text{Transmission Time} / 1000$

CH00 Time Interval between hops



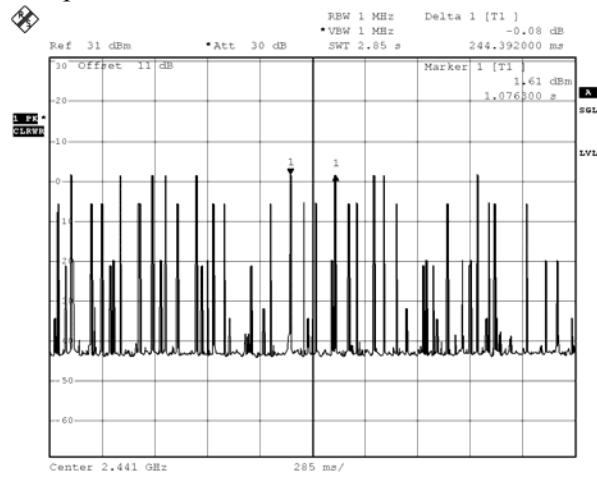
PN1
 Date: 1.SEP.2007 13:36:14

CH 00 Transmission Time



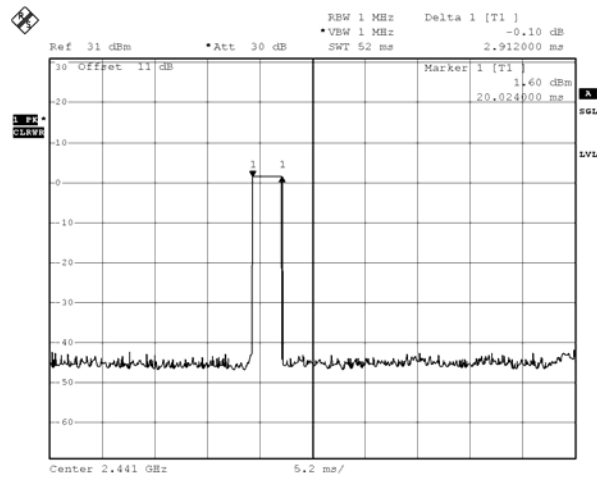
PN1
 Date: 1.SEP.2007 13:37:03

CH39 Time Interval between hops



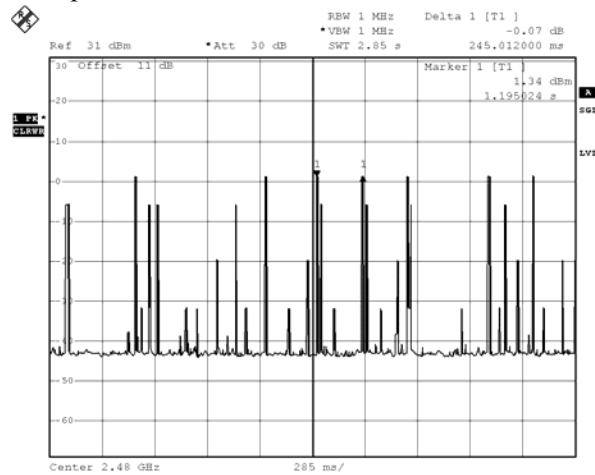
FN1
Date: 1.SEP.2007 13:38:06

CH39 Transmission Time



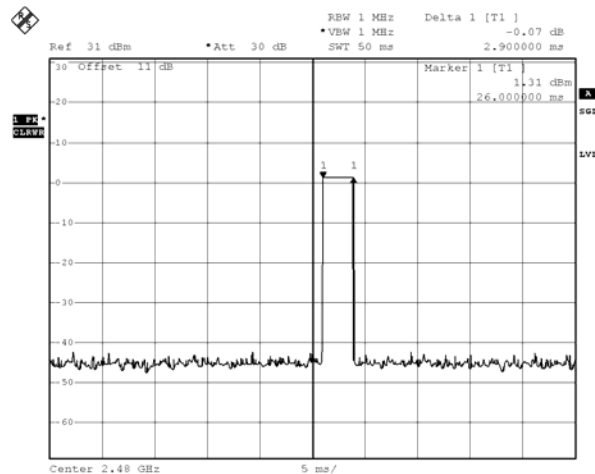
FN1
Date: 1.SEP.2007 13:38:50

CH 78 Time Interval between hops



FN1
 Date: 1.SEP.2007 13:39:42

CH 78 Transmission Time



FN1
 Date: 1.SEP.2007 13:40:16

Note:

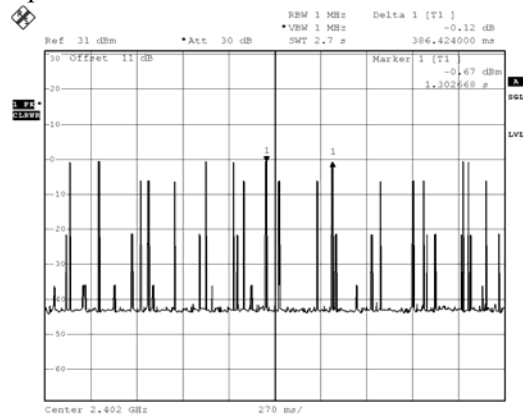
The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product : Industrial PDA
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK)(Channel 00,39,78 -DH5)

Channel No.	Frequency (MHz)	Time Interval between hops (ms)	Transmission Time (us)	Dwell Time (ms)	Limit (ms)	Result
00	2402	386.42	2944	240.7494436	400	Pass
39	2441	408.104	3024	234.1520789	400	Pass
78	2480	402.624	2852	223.8396121	400	Pass

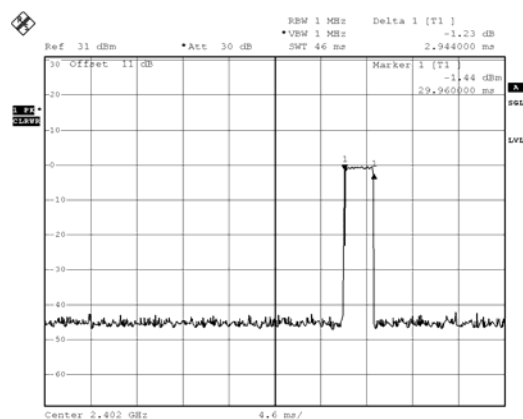
Note: Dwell Time = 79 * 400 / Time Interval Between Hops * Transmission Time / 1000

CH 00 Time Interval between hops



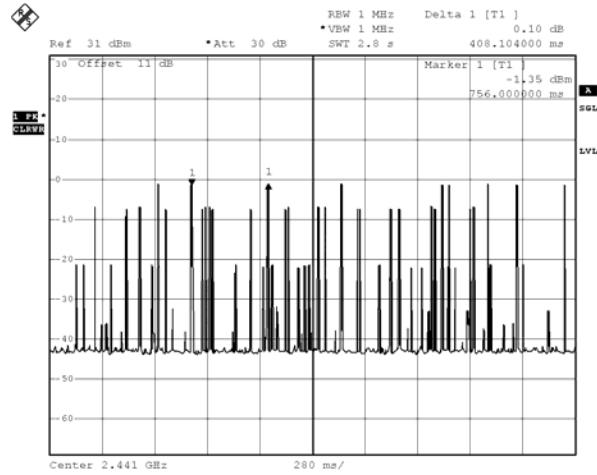
PN1
 Date: 1.SEP.2007 13:46:41

CH 00 Transmission Time



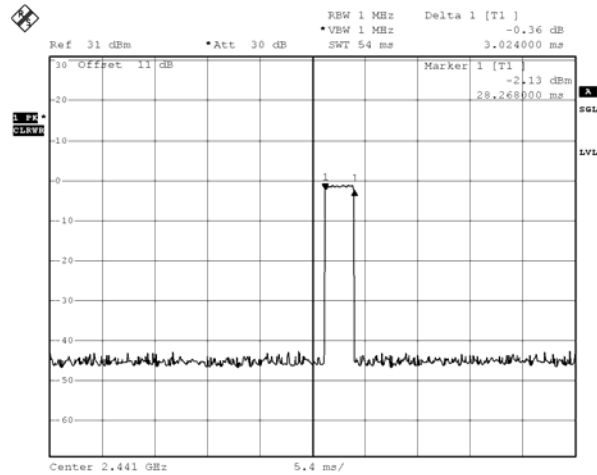
PN1
 Date: 1.SEP.2007 13:43:59

CH 39 Time Interval between hops



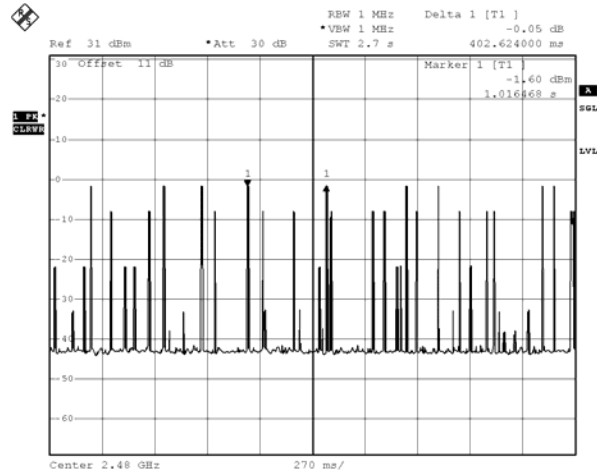
FN1
 Date: 1.SEP.2007 13:45:09

CH 39 Transmission Time



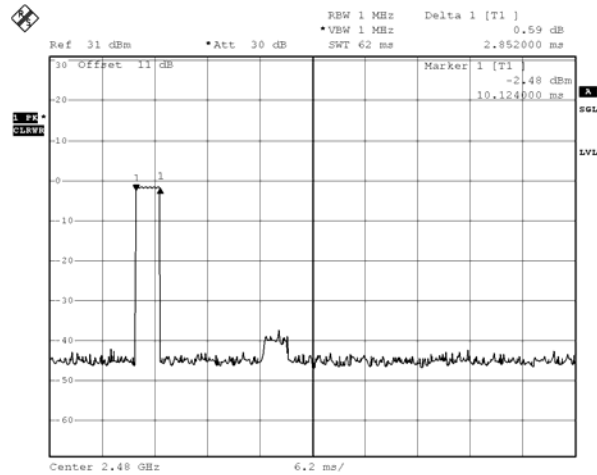
FN1
 Date: 1.SEP.2007 13:45:39

CH 78 Time Interval between hops



FN1
Date: 1.SEP.2007 13:47:12

CH 78 Transmission Time



FN1
Date: 1.SEP.2007 13:47:43

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

9. Occupied Bandwidth

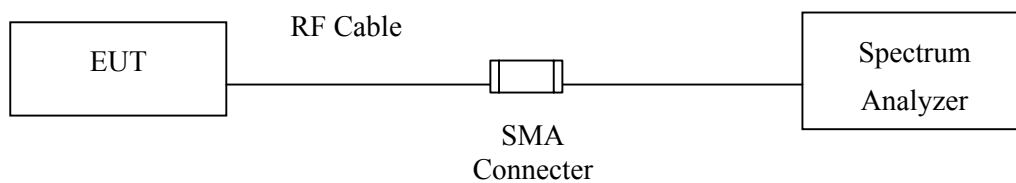
9.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	R & S	FSP40 / 100170	Nov, 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.

9.2. Test Setup



9.3. Limits

N/A

9.4. Uncertainty

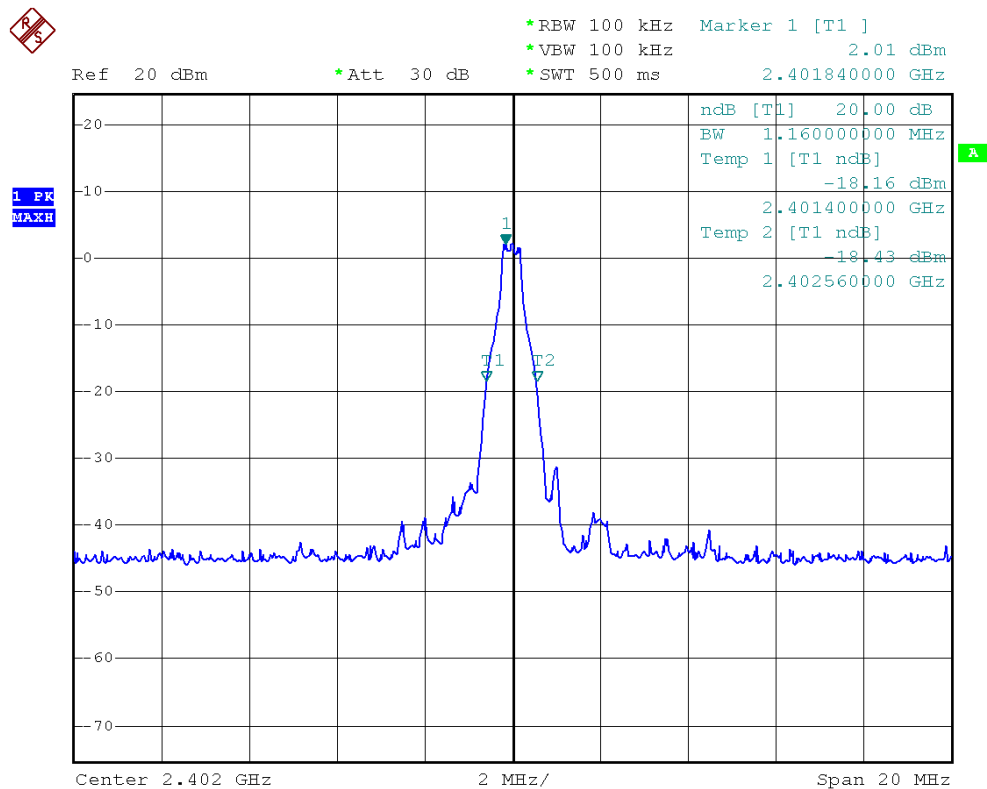
$\pm 150\text{Hz}$

9.5. Test Result of Occupied Bandwidth

Product : Industrial PDA
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1160	--	NA

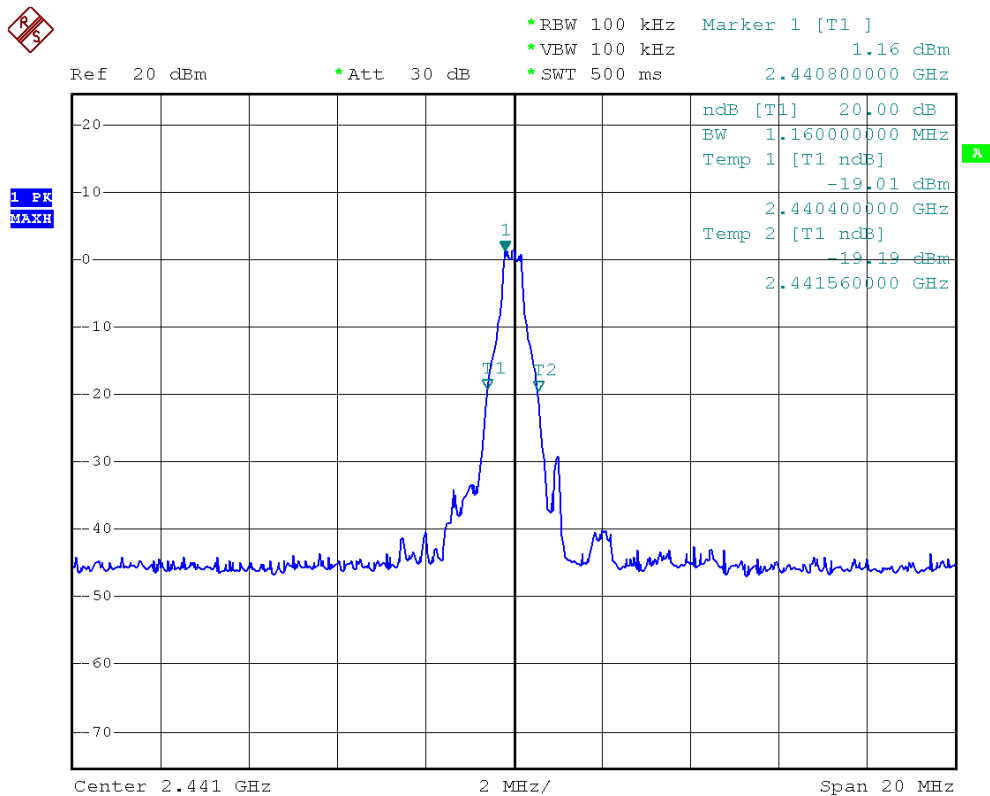
Figure Channel 00:



Product : Industrial PDA
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1160	--	NA

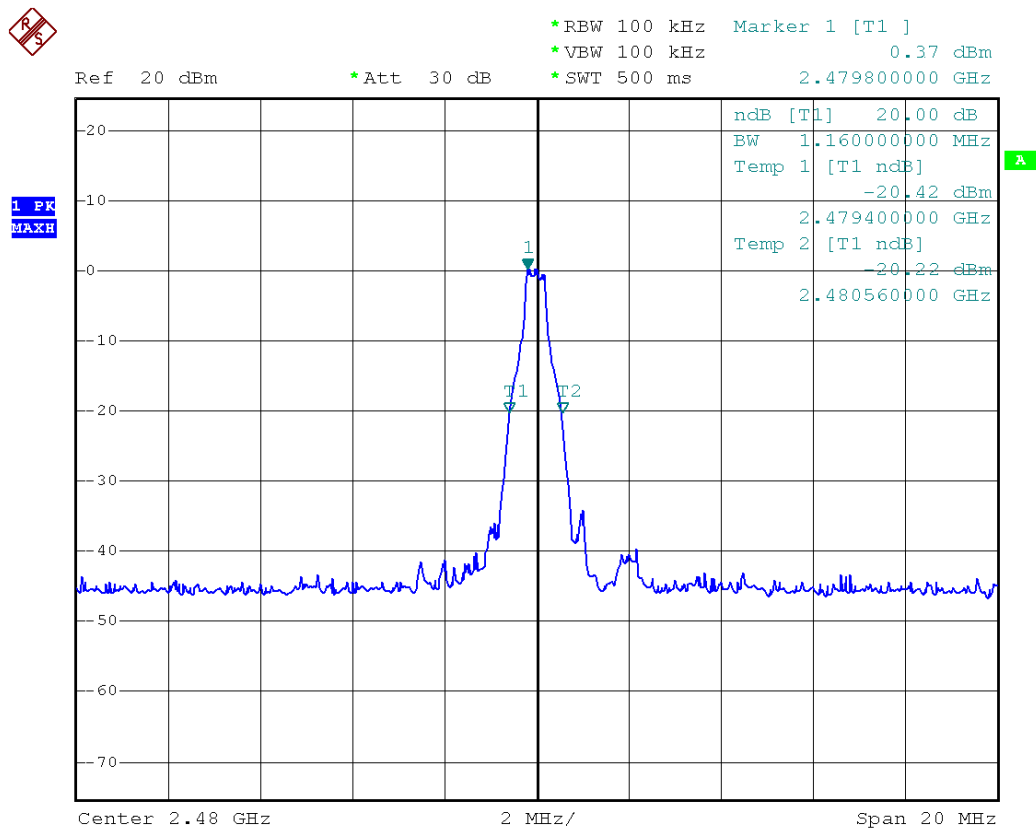
Figure Channel 39:



Product : Industrial PDA
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter -1Mbps(GFSK)(2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1160	--	NA

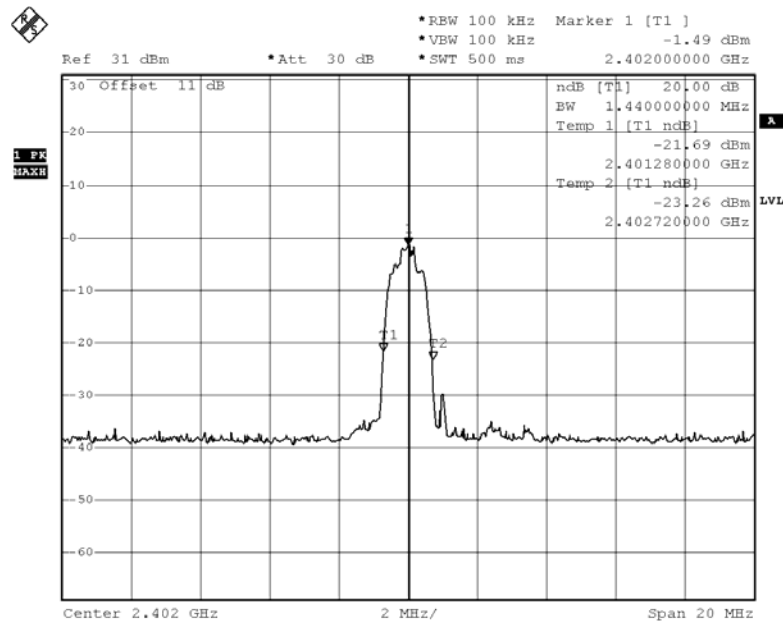
Figure Channel 78:



Product : Industrial PDA
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1440	--	NA

Figure Channel 00:



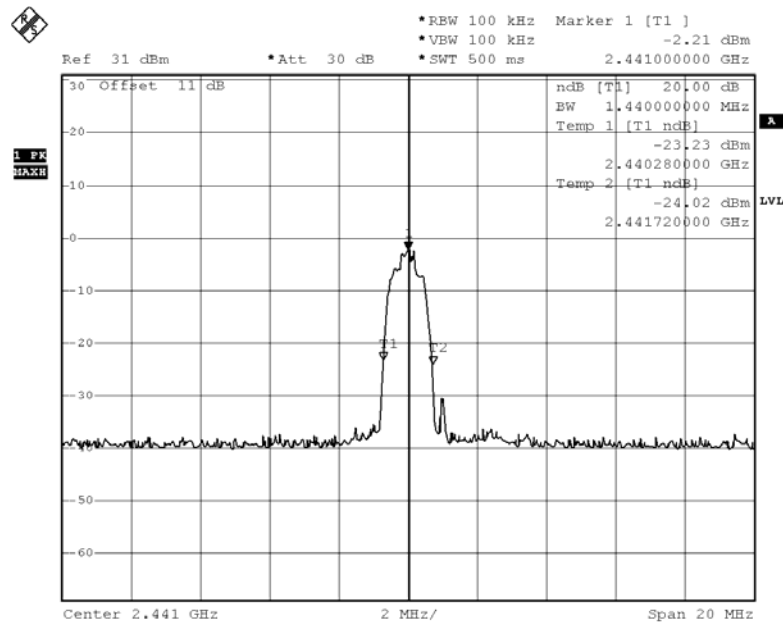
PN1

Date: 1.SEP.2007 14:35:45

Product : Industrial PDA
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1440	--	NA

Figure Channel 39:



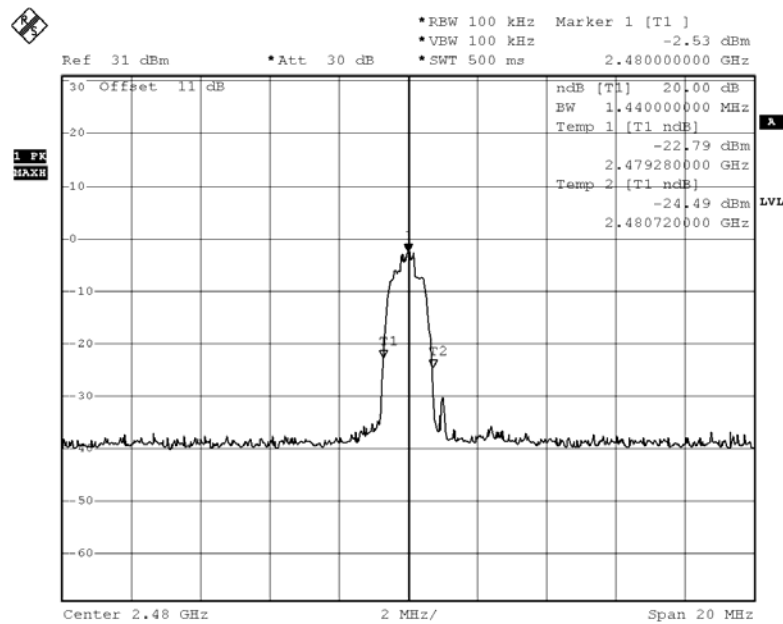
PN1

Date: 1.SEP.2007 14:36:08

Product : Industrial PDA
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter -3Mbps(8DPSK) (2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1440	--	NA

Figure Channel 78:



PN1

Date: 1.SEP.2007 14:36:38

10. EMI Reduction Method During Compliance Testing

No modification was made during testing.