

# FCC

## Test Report

Product Name	Personal Navigation Device
Model No.	M-Nav 760
FCC ID.	XVOPNDMNAV760

Applicant	Navman Wireless Holdings
Address	2700 Patriot Boulevard, Suite 410, Glenview, IL 60026, USA

Date of Receipt	Mar. 12, 2009
Issued Date	Oct. 20, 2009
Report No.	09A280R-RFUSP43V01
Report Version	V1.0

The Test Results relate only to the samples tested.

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# Test Report Certification

Issued Date: Oct. 20, 2009

Report No.: 09A280R-RFUSP43V01



Product Name	Personal Navigation Device
Applicant	Navman Wireless Holdings
Address	2700 Patriot Boulevard, Suite 410, Glenview, IL 60026, USA
Manufacturer	Navman Wireless Holdings
Model No.	M-Nav 760
FCC ID.	XVOPNDMNAV760
EUT Rated Voltage	AC 100-240V/50-60Hz (For AC Adapter) DC 10.8V-30V (For Car Charger)
EUT Test Voltage	AC 120V/ 60Hz (For AC Adapter)
Trade Name	Navman Wireless 
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2008 ANSI C63.4: 2003
Test Result	Complied



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Testing Laboratory

0914

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Personal Navigation Device
Trade Name	Navman Wireless 
Model No.	M-Nav 760
FCC ID.	XVOPNDMNAV760
Frequency Range	2402 – 2480MHz
Channel Number	79
Type of Modulation	GFSK(1Mbps)/ $\pi/4$ DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	Printed on PCB
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Car Charger	MFR: Len Cheng, M/N: GER-2MK Input: DC 10.8V-30V Output: DC 5V Cable Out: Non-Shielded,0.9m
Power Adapter	MFR: PHIHONG, M/N: PSAA05A-050 Input: AC 100-240V, 50-60Hz,13-20VA, 200mA Output: DC 5V, 1A Cable Out: Non-Shielded,1.8m,with one ferrite core bonded.

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	RoyalTek	N/A	-1.88dBi 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		

Note:

1. This EUT is a Personal Navigation Device, The EUT Contains functions on Bluetooth 、GPS, this report for Bluetooth.
2. At result of pretests, Car Charger is the worst case is shown in the report.
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 a Personal Navigation Device ,The EUT Contains functions on Bluetooth 、GPS, this report for Bluetooth. The number of the channels is 79 in 2402-2480MHz. The device adapts the frequency hopping spread spectrum modulation. The antenna is Printed on PCB 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)
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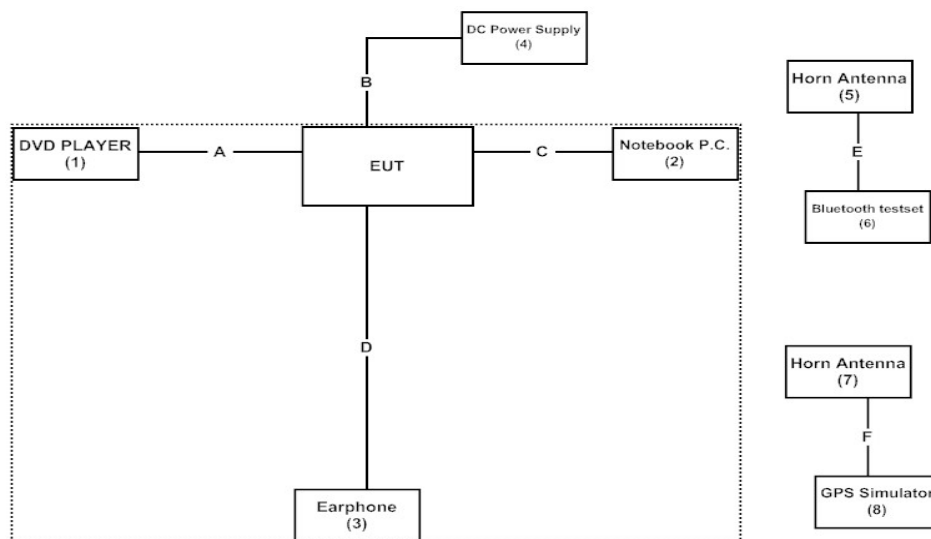
### 1.3. Tested System Details

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.	DVD PLAYER	Panasonic	DVD-S97	VC6GG001070R	Non-Shielded, 1.8m
2.	Notebook P.C.	DELL	PPT	N/A	Non-Shielded, 0.8m
3.	Earphone	RoyalTek	N/A	N/A	N/A
4.	DC Power Supply	Agilent	E3610A	MY40009845	N/A
5.	Horn Antenna	Schwarbeck	9120D	N/A	N/A
6.	Bluetooth Testset	Anritsu	MT8852A	N/A	N/A
7.	Horn Antenna	IFR	N/A	N/A	N/A
8.	GPS Simulator	IFR	GPS-101-2	264007013	Non-Shielded, 1.8m

	Signal Cable Type	Signal cable Description
A.	RCA Cable	Non-Shielded, 1.8m
B.	Power Line	Non-Shielded, 1.2m
C.	USB Cable	Non-Shielded, 1.2m
D.	Earphone & Microphone Cable	Non-Shielded, 1.2m
E.	RF Cable	Shielded, 0.8m
F.	RF Cable	Shielded, 0.8m

### 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) Control EUT by the bluetooth simulator (MT8852B)
- (4) Configure the test channel and the packet type.
- (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

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://tw.quietek.com/modules/myalbum/>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on  
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Accreditation on NVLAP  
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FCC Accreditation Number: TW1014



## 2. Conducted Emission

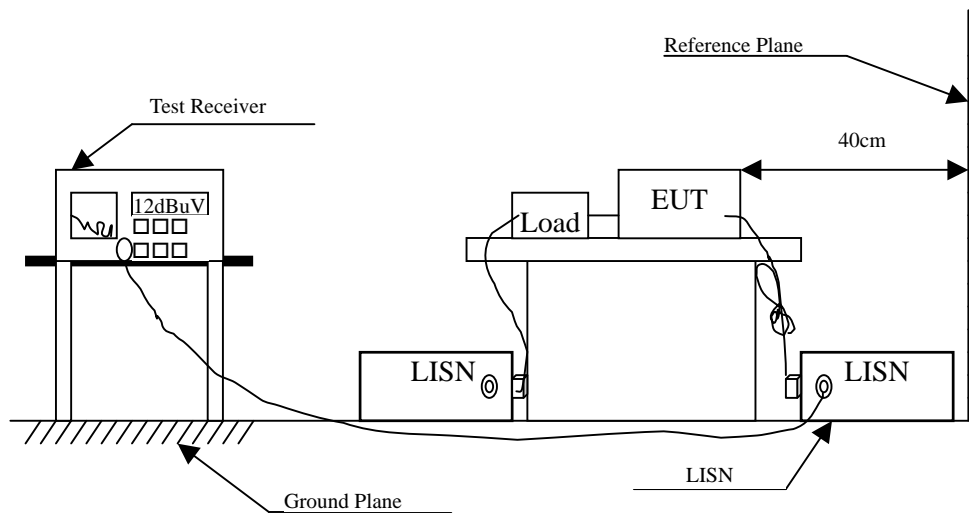
### 2.1. Test Equipment

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 30/825442/014	Feb., 2009	
2	L.I.S.N.	R & S	ESH3-Z5/825562/002	Feb., 2009	EUT
3	L.I.S.N.	R & S	ENV4200/848411/010	Feb., 2009	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2/100410	July, 2009	
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 Peripherals 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.

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

### 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : Personal Navigation Device  
 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
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.205	9.703	37.650	47.353	-17.076	64.429
0.349	9.650	43.340	52.990	-7.324	60.314
0.541	9.640	41.530	51.170	-4.830	56.000
0.810	9.650	38.610	48.260	-7.740	56.000
1.517	9.680	37.080	46.760	-9.240	56.000
4.084	9.700	32.600	42.300	-13.700	56.000
<b>Average</b>					
0.205	9.703	31.770	41.473	-12.956	54.429
0.349	9.650	36.930	46.580	-3.734	50.314
0.541	9.640	34.210	43.850	-2.150	46.000
0.810	9.650	30.920	40.570	-5.430	46.000
1.517	9.680	28.900	38.580	-7.420	46.000
4.084	9.700	24.910	34.610	-11.390	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 : Personal Navigation Device  
 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
	dB	dBuV	dBuV		
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.177	9.736	36.800	46.536	-18.693	65.229
0.365	9.651	45.760	55.411	-4.446	59.857
0.580	9.640	36.620	46.260	-9.740	56.000
0.920	9.670	35.780	45.450	-10.550	56.000
2.377	9.680	35.170	44.850	-11.150	56.000
3.904	9.700	31.820	41.520	-14.480	56.000
<b>Average</b>					
0.177	9.736	28.150	37.886	-17.343	55.229
0.365	9.651	36.790	46.441	-3.416	49.857
0.580	9.640	25.600	35.240	-10.760	46.000
0.920	9.670	25.110	34.780	-11.220	46.000
2.377	9.680	25.040	34.720	-11.280	46.000
3.904	9.700	20.950	30.650	-15.350	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 : Personal Navigation Device  
 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	dBuV	dB	dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.189	9.714	37.830	47.544	-17.342	64.886
0.377	9.650	45.440	55.090	-4.424	59.514
0.533	9.640	37.610	47.250	-8.750	56.000
0.857	9.660	37.570	47.230	-8.770	56.000
2.349	9.680	36.690	46.370	-9.630	56.000
3.810	9.700	32.790	42.490	-13.510	56.000
<b>Average</b>					
0.189	9.714	29.510	39.224	-15.662	54.886
0.377	9.650	33.910	43.560	-5.954	49.514
0.533	9.640	27.880	37.520	-8.480	46.000
0.857	9.660	29.660	39.320	-6.680	46.000
2.349	9.680	28.290	37.970	-8.030	46.000
3.810	9.700	24.790	34.490	-11.510	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 : Personal Navigation Device  
 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
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.232	9.695	33.400	43.095	-20.562	63.657
0.373	9.650	46.140	55.790	-3.839	59.629
0.576	9.640	33.400	43.040	-12.960	56.000
0.908	9.670	36.040	45.710	-10.290	56.000
2.384	9.680	34.920	44.600	-11.400	56.000
4.150	9.700	32.570	42.270	-13.730	56.000
<b>Average</b>					
0.232	9.695	24.270	33.965	-19.692	53.657
0.373	9.650	34.540	44.190	-5.439	49.629
0.576	9.640	23.100	32.740	-13.260	46.000
0.908	9.670	26.150	35.820	-10.180	46.000
2.384	9.680	24.710	34.390	-11.610	46.000
4.150	9.700	22.720	32.420	-13.580	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

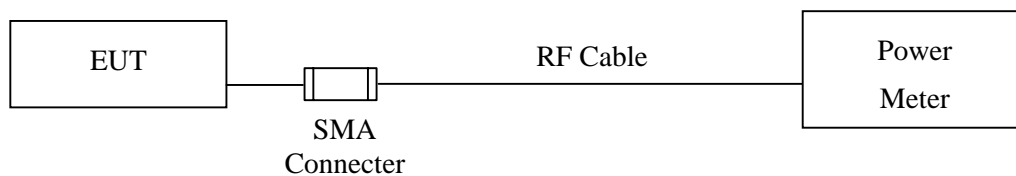
#### 3.1. Test Equipment

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

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2009
X	Power Sensor	Anritsu	MA2491A/034457	May, 2009

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. Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

#### 3.5. Uncertainty

$\pm 1.27$  dB

### 3.6. Test Result of Peak Power Output

Product : Personal Navigation Device  
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	-2.72 dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	-0.19 dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	0.64 dBm	1 Watt= 30 dBm	Pass

Product : Personal Navigation Device  
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	1.02 dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	2.35 dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	2.81 dBm	1 Watt= 30 dBm	Pass

## 4. Radiated Emission

### 4.1. Test Equipment

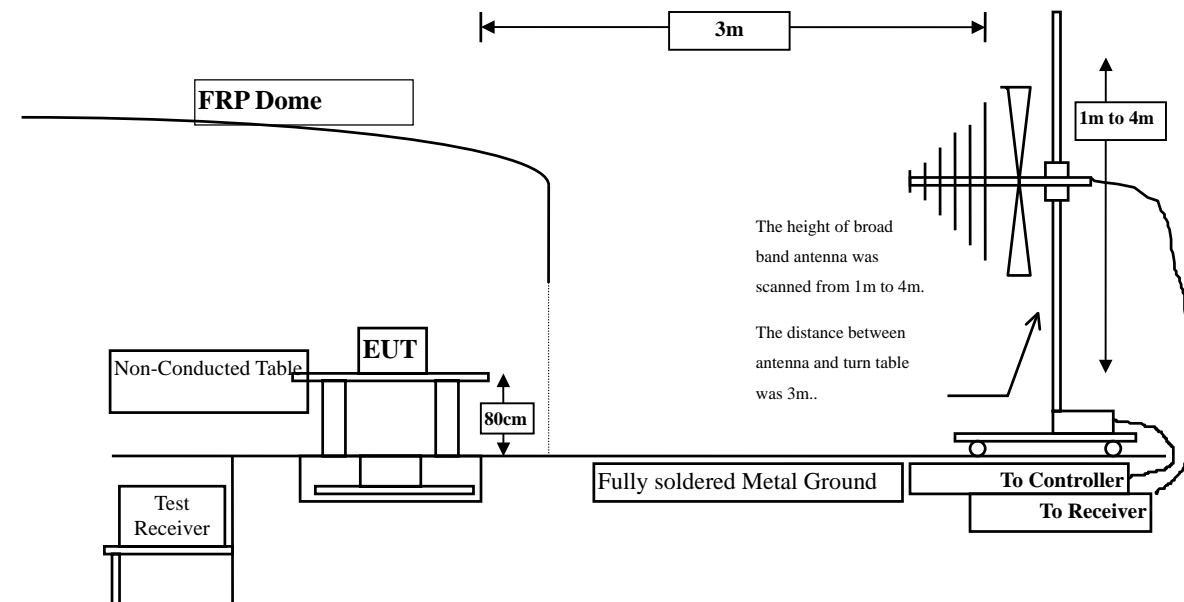
The following test equipments are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2009
	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2009
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2009
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2009
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

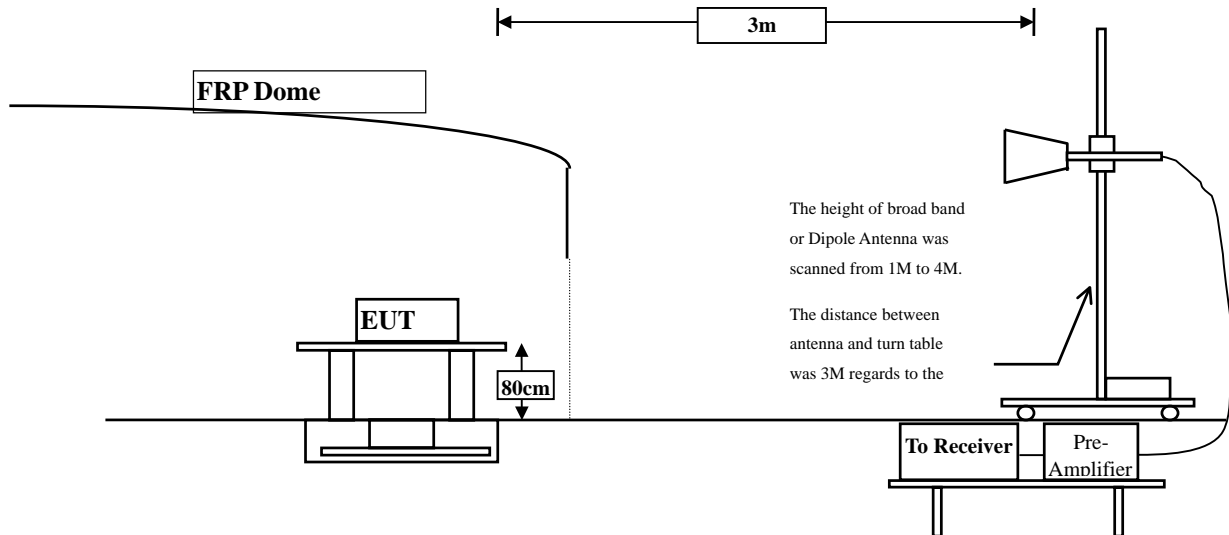
- Note: 1. All equipments are calibrated every one year.  
 2. The test instruments marked by "X" are used to measure the final test results.

### 4.2. Test Setup

Radiated Emission Below 1GHz



## Radiated Emission Above 1GHz



### 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 was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 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 is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

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

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB beamwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

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 : Personal Navigation Device  
 Test Item : Harmonic Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - 1Mbps (GFSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4804.000	3.663	39.050	42.713	-31.287	74.000
7206.000	9.357	37.020	46.376	-27.624	74.000
9608.000	11.842	36.540	48.382	-25.618	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4804.000	3.663	39.600	43.263	-30.737	74.000
7206.000	9.357	37.260	46.616	-27.384	74.000
9608.000	11.842	37.090	48.932	-25.068	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

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: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 : Personal Navigation Device  
 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
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4882.000	3.921	38.340	42.261	-31.739	74.000
7323.000	9.657	38.940	48.597	-25.403	74.000
9764.000	11.798	38.630	50.428	-23.572	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4882.000	3.921	39.480	43.401	-30.599	74.000
7323.000	9.657	38.760	48.417	-25.583	74.000
9764.000	11.798	39.410	51.208	-22.792	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

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: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 : Personal Navigation Device  
 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
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4960.000	4.197	38.310	42.506	-31.494	74.000
7440.000	9.951	37.450	47.401	-26.599	74.000
9920.000	11.856	37.680	49.536	-24.464	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4960.000	4.197	37.630	41.826	-32.174	74.000
7440.000	9.951	38.040	47.991	-26.009	74.000
9920.000	11.856	38.490	50.346	-23.654	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

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: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 : Personal Navigation Device  
 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

#### Horizontal

##### Peak Detector:

4804.000	3.663	38.970	42.633	-31.367	74.000
7206.000	9.357	37.000	46.356	-27.644	74.000
9608.000	11.842	36.690	48.532	-25.468	74.000

#### Average

##### Detector:

--

#### Vertical

##### Peak Detector:

4804.000	3.663	39.400	43.063	-30.937	74.000
7206.000	9.357	38.220	47.576	-26.424	74.000
9608.000	11.842	36.280	48.122	-25.878	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: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 : Personal Navigation Device  
 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
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4882.000	3.921	38.530	42.451	-31.549	74.000
7323.000	9.657	38.890	48.547	-25.453	74.000
9764.000	11.798	37.720	49.518	-24.482	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4882.000	3.921	40.370	44.291	-29.709	74.000
7323.000	9.657	38.250	47.907	-26.093	74.000
9764.000	11.798	37.800	49.598	-24.402	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

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: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 : Personal Navigation Device  
 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
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4960.000	4.197	37.920	42.116	-31.884	74.000
7440.000	9.951	37.860	47.811	-26.189	74.000
9920.000	11.856	37.790	49.646	-24.354	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4960.000	4.197	38.520	42.716	-31.284	74.000
7440.000	9.951	38.890	48.841	-25.159	74.000
9920.000	11.856	37.670	49.526	-24.474	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

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: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 : Personal Navigation Device  
 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
<b>Horizontal</b>					
200.720	-10.004	42.577	32.573	-10.927	43.500
350.100	-1.345	37.140	35.795	-10.205	46.000
458.740	3.157	35.125	38.282	-7.718	46.000
575.140	2.788	34.805	37.593	-8.407	46.000
718.700	3.662	32.496	36.158	-9.842	46.000
881.660	6.584	29.537	36.121	-9.879	46.000
<b>Vertical</b>					
200.720	-5.834	40.456	34.622	-8.878	43.500
379.200	0.616	33.109	33.725	-12.275	46.000
542.160	1.633	30.781	32.414	-13.586	46.000
604.240	1.964	32.500	34.465	-11.535	46.000
685.720	2.131	30.441	32.572	-13.428	46.000
883.600	1.151	33.932	35.083	-10.917	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 : Personal Navigation Device  
 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
<b>Horizontal</b>					
208.480	-10.591	39.048	28.457	-15.043	43.500
385.020	0.902	34.023	34.925	-11.075	46.000
546.040	4.164	33.267	37.431	-8.569	46.000
712.880	3.646	33.416	37.063	-8.937	46.000
883.600	6.391	25.836	32.227	-13.773	46.000
986.420	8.024	32.735	40.759	-13.241	54.000
<b>Vertical</b>					
200.720	-5.834	37.977	32.143	-11.357	43.500
379.200	0.616	33.037	33.653	-12.347	46.000
538.280	1.774	29.530	31.304	-14.696	46.000
604.240	1.964	32.887	34.852	-11.148	46.000
687.660	2.166	32.288	34.455	-11.545	46.000
885.540	1.109	35.992	37.101	-8.899	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.

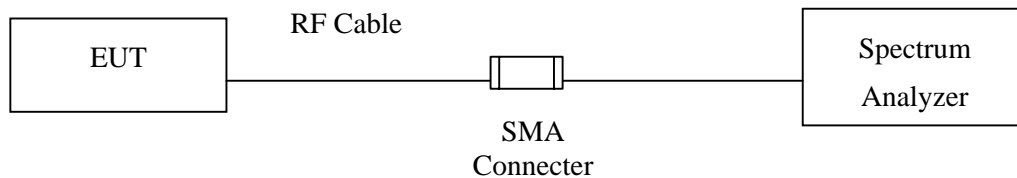
## 5. RF Antenna Conducted Test

### 5.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100339	Jun, 2009
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2009
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2009

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

### 5.2. Test Setup



### 5.3. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### 5.4. Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

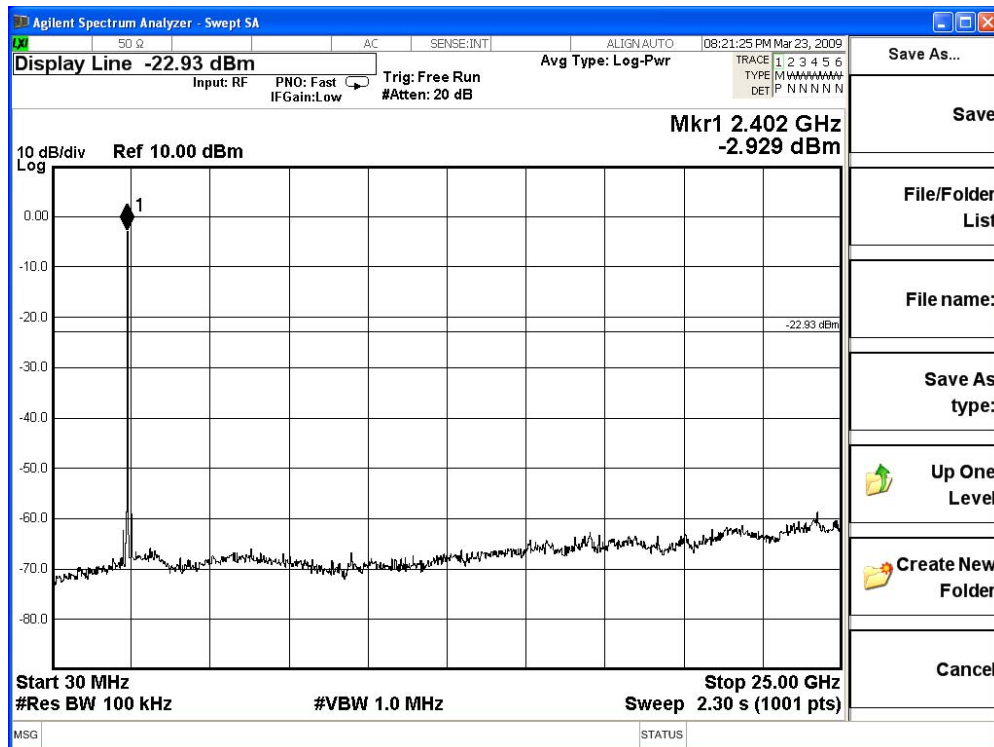
### 5.5. Uncertainty

± 150Hz

## 5.6. Test Result of RF Antenna Conducted Test

Product : Personal Navigation Device  
 Test Item : RF Antenna Conducted Test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - 1Mbps (GFSK)

Figure Channel 00: 30MHz-25GHz



Product : Personal Navigation Device  
 Test Item : RF Antenna Conducted Test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - 1Mbps (GFSK)

Figure Channel 39: 30MHz-25GHz



Product : Personal Navigation Device  
 Test Item : RF Antenna Conducted Test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - 1Mbps (GFSK)

Figure Channel 78: 30MHz-25GHz



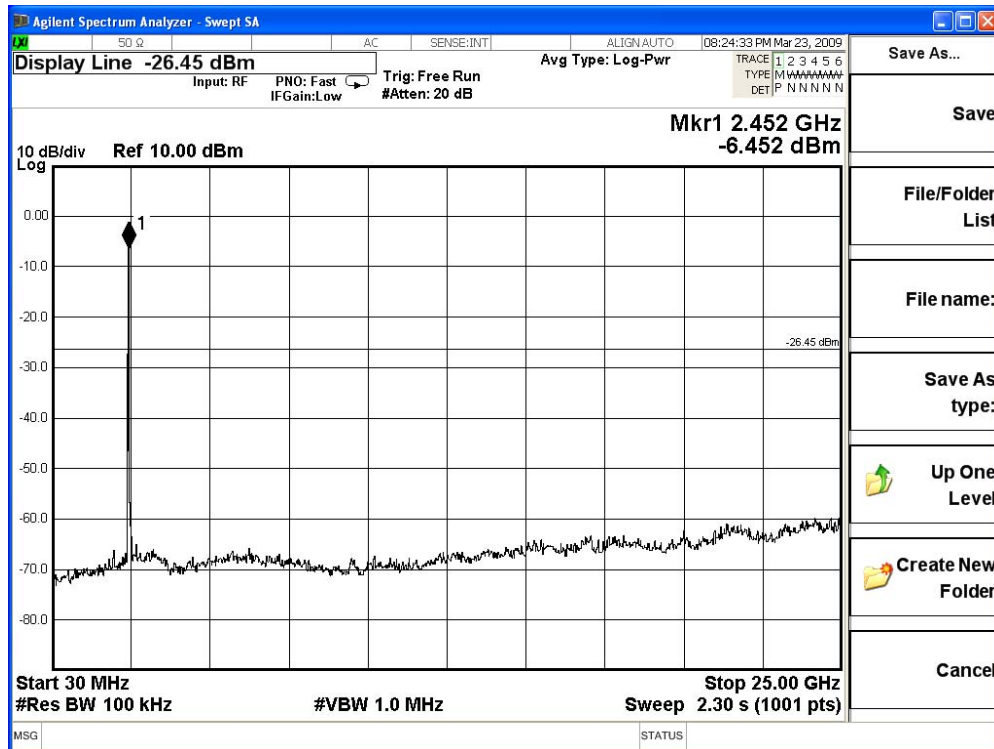
Product : Personal Navigation Device  
 Test Item : RF Antenna Conducted Test  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter - 3Mbps (8DPSK)

Figure Channel 00: 30MHz-25GHz



Product : Personal Navigation Device  
 Test Item : RF Antenna Conducted Test  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter - 3Mbps (8DPSK)

Figure Channel 39: 30MHz-25GHz



Product : Personal Navigation Device  
 Test Item : RF Antenna Conducted Test  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter - 3Mbps (8DPSK)

**Figure Channel 78: 30MHz-25GHz**

