Test Report

Product Name	Portable Navigation Device
Model No.	RN2BF
FCC ID.	RCCRN2BF

Applicant	RoyalTek Company Ltd.
Address	4F,No.188 Wen Hwa 2nd Rd., Kuei Shan, Tao Yuan 33383, Taiwan, R.O.C.

Date of Receipt	Mar. 12, 2009
Issued Date	Apr. 22 , 2009
Report No.	093193R-RFUSP19V01
Report Version	V1.0

Test Report Certification

Test Date : Apr. 22 , 2009
Report No. : 093193R-RFUSP19V01

Product Name	Portable Navigation Device
Applicant	RoyalTek Company Ltd.
Address	4F,No.188 Wen Hwa 2nd Rd., Kuei Shan, Tao Yuan 33383, Taiwan, R.O.C.
Manufacturer	RoyalTek Company Ltd.
Model No.	RN2BF
FCC ID.	RCCRN2BF
Rated Voltage	DC 5V
Working Voltage	AC 120V/60Hz (For AC Adapter) DC 12V (For Car Charger)
Trade Name	RoyalTek
Measurement Standard	FCC CFR Title 47 Part 15 Subpart C: 2007
Measurement Procedure	ANSI C63.4: 2003
Test Result	Complied

NVLAP Lab Code: 200533-0

The Test Results relate only to the samples tested.
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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented By : Leven Huang
(Adm. Specialist / Leven Huang)

Tested By : Dino Chen
(Engineer / Dino Chen)

Approved By :
(Manager / Vincent Lin)

Testing Laboratory
0914

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Portable Navigation Device
Trade Name	RoyalTek
Model No.	RN2BF
FCC ID.	RCCRN2BF
Frequency Range	88.2-107.8 MHz
Channel Number	197
Channel Control	Auto
Type of Modulation	FM
Antenna Type	Printed on PCB
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-Shieled,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-Shieled,1.8m,with one ferrite core bonded.

Frequency of Each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	88.2 MHz	53	93.4 MHz	105	98.6 MHz	157	103.8 MHz
2	88.3 MHz	54	93.5 MHz	106	98.7 MHz	158	103.9 MHz
3	88.4 MHz	55	93.6 MHz	107	98.8 MHz	159	104.0 MHz
4	88.5 MHz	56	93.7 MHz	108	98.9 MHz	160	104.1 MHz
5	88.6 MHz	57	93.8 MHz	109	99.0 MHz	161	104.2 MHz
6	88.7 MHz	58	93.9 MHz	110	99.1 MHz	162	104.3 MHz
7	88.8 MHz	59	94.0 MHz	111	99.2 MHz	163	104.4 MHz
8	88.9 MHz	60	94.1 MHz	112	99.3 MHz	164	104.5 MHz
9	89.0 MHz	61	94.2 MHz	113	99.4 MHz	165	104.6 MHz
10	89.1 MHz	62	94.3 MHz	114	99.5 MHz	166	104.7 MHz
11	89.2 MHz	63	94.4 MHz	115	99.6 MHz	167	104.8 MHz
12	89.3 MHz	64	94.5 MHz	116	99.7 MHz	168	104.9 MHz
13	89.4 MHz	65	94.6 MHz	117	99.8 MHz	169	105.0 MHz
14	89.5 MHz	66	94.7 MHz	118	99.9 MHz	170	105.1 MHz
15	89.6 MHz	67	94.8 MHz	119	100.0 MHz	171	105.2 MHz
16	89.7 MHz	68	94.9 MHz	120	100.1 MHz	172	105.3 MHz
17	89.8 MHz	69	95.0 MHz	121	100.2 MHz	173	105.4 MHz
18	89.9 MHz	70	95.1 MHz	122	100.3 MHz	174	105.5 MHz
19	90.0 MHz	71	95.2 MHz	123	100.4 MHz	175	105.6 MHz
20	90.1 MHz	72	95.3 MHz	124	100.5 MHz	176	105.7 MHz
21	90.2 MHz	73	95.4 MHz	125	100.6 MHz	177	105.8 MHz
22	90.3 MHz	74	95.5 MHz	126	100.7 MHz	178	105.9 MHz
23	90.4 MHz	75	95.6 MHz	127	100.8 MHz	179	106.0 MHz
24	90.5 MHz	76	95.7 MHz	128	100.9 MHz	180	106.1 MHz
25	90.6 MHz	77	95.8 MHz	129	101.0 MHz	181	106.2 MHz
26	90.7 MHz	78	95.9 MHz	130	101.1 MHz	182	106.3 MHz
27	90.8 MHz	79	96.0 MHz	131	101.2 MHz	183	106.4 MHz
28	90.9 MHz	80	96.1 MHz	132	101.3 MHz	184	106.5 MHz
29	91.0 MHz	81	96.2 MHz	133	101.4 MHz	185	106.6 MHz
30	91.1 MHz	82	96.3 MHz	134	101.5 MHz	186	106.7 MHz
31	91.2 MHz	83	96.4 MHz	135	101.6 MHz	187	106.8 MHz
32	91.3 MHz	84	96.5 MHz	136	101.7 MHz	188	106.9 MHz
33	91.4 MHz	85	96.6 MHz	137	101.8 MHz	189	107.0 MHz
34	91.5 MHz	86	96.7 MHz	138	101.9 MHz	190	107.1 MHz
35	91.6 MHz	87	96.8 MHz	139	102.0 MHz	191	107.2 MHz
36	91.7 MHz	88	96.9 MHz	140	102.1 MHz	192	107.3 MHz
37	91.8 MHz	89	97.0 MHz	141	102.2 MHz	193	107.4 MHz
38	91.9 MHz	90	97.1 MHz	142	102.3 MHz	194	107.5 MHz
39	92.0 MHz	91	97.2 MHz	143	102.4 MHz	195	107.6 MHz
40	92.1 MHz	92	97.3 MHz	144	102.5 MHz	196	107.7 MHz
41	92.2 MHz	93	97.4 MHz	145	102.6 MHz	197	107.8 MHz
42	92.3 MHz	94	97.5 MHz	146	102.7 MHz		
43	92.4 MHz	95	97.6 MHz	147	102.8 MHz		
44	92.5 MHz	96	97.7 MHz	148	102.9 MHz		
45	92.6 MHz	97	97.8 MHz	149	103.0 MHz		
46	92.7 MHz	98	97.9 MHz	150	103.1 MHz		
47	92.8 MHz	99	98.0 MHz	151	103.2 MHz		
48	92.9 MHz	100	98.1 MHz	152	103.3 MHz		
49	93.0 MHz	101	98.2 MHz	153	103.4 MHz		
50	93.1 MHz	102	98.3 MHz	154	103.5 MHz		
51	93.2 MHz	103	98.4 MHz	155	103.6 MHz		
52	93.3 MHz	104	98.5 MHz	156	103.7 MHz		

Note:

1. This EUT is a Portable Navigation Device ,The EUT Contains functions on Bluetooth、GPS、FM Transmitter, this report for FM Transmitter.
2. At result of pretests, Car Charger is the worst case is shown in the report.
3. Regarding to the operation frequency, the lowest, middle, and highest channels are selected to perform the test.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.239.
5. QuieTek verified the construction and function in typical operation, and then shown in this test report.

   Mode 1: Transmitter

1.2. Operation Description

The EUT is a Portable Navigation Device ,The EUT Contains functions on Bluetooth、GPS、FM Transmitter, this report for FM Transmitter. The operation frequency is from 88.2 to 107.8MHz with FM modulation. 197 manually selectable channels were built in the EUT.
The channels are separated by 100kHz. The signals are modulated by FM. RF signals are transmitted from the Printed antenna. DC 12V (Car Charger) shall be provided for EUT operation.

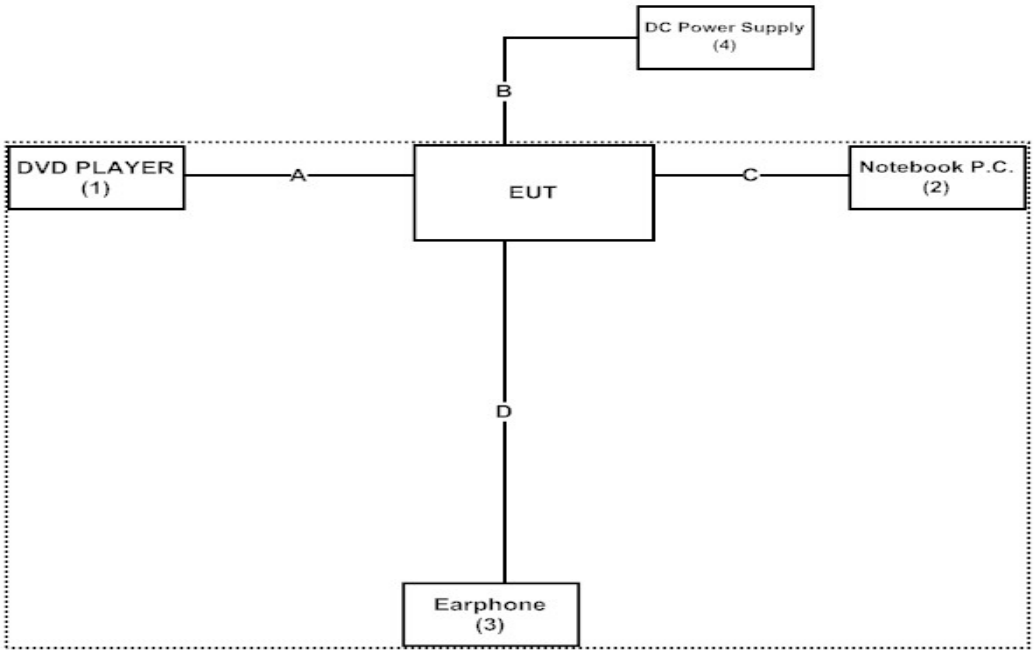
1.3. Test System Details

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.	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

	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

1.4. Configuration of Tested System



1.5. EUT Exercise Description

1	Setup the EUT as shown in Section 1.4.
2	Exercise FM Transmitter function after turn on FM Transmitter frequency.
3	Enter Mp3 player mode and individually player music and 1kHz tone from Micro SD.
4	Then find maximum bandwidth.
5	Tune set the maximum volume in EUT.
6	The EUT will start transmitting RF signals.
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	50-65
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
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

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

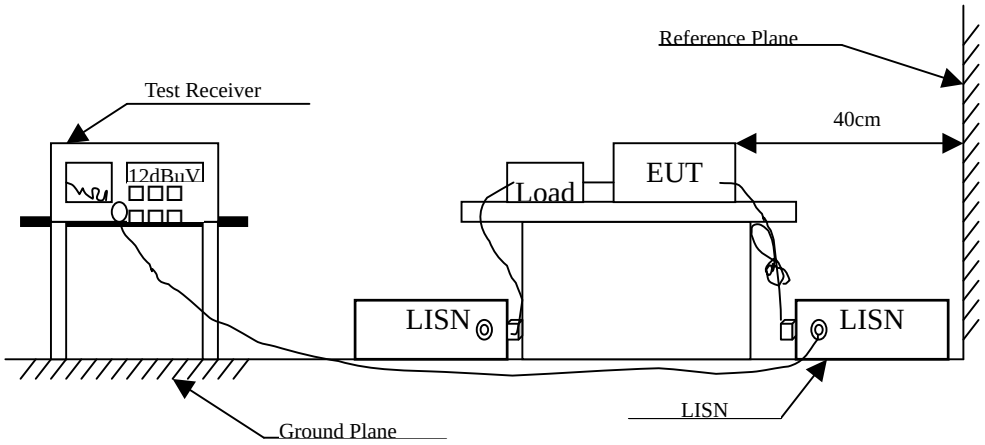
2.1. Test Equipment

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, 2008	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2008	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2008	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2008	
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	AVG
0.15 - 0.50	66-56(注)	56-46(注)
0.50-5.0	56	46
5.0 - 30	60	50

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 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 : Portable Navigation Device
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmitter (98MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
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
Average					
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 : Portable Navigation Device
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Transmitter (98MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
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
Average					
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. Radiated Emission

3.1. Test Equipment

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

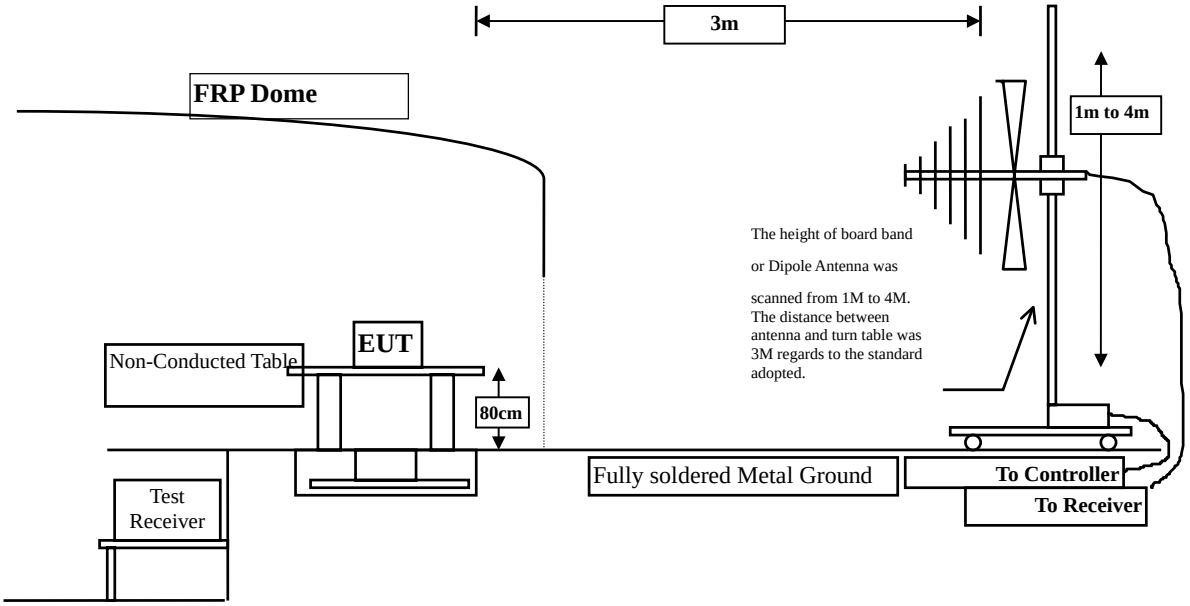
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1		Test Receiver	R & S	ESCS 30 / 825442/14	May, 2008
		Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2008
		Pre-Amplifier	HP	8447D/3307A01812	May, 2008
		Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2008
		Horn Antenna	EM	EM6917 / 103325	May, 2008
Site # 2		Test Receiver	R & S	ESCS 30 / 825442/17	May, 2008
		Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2008
		Pre-Amplifier	HP	8447D/3307A01814	May, 2008
		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2008
		Horn Antenna	EM	EM6917 / 103325	May, 2008
Site # 3	X	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2008
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
	X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2008
	X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2008
	X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2008
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
	X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2008

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

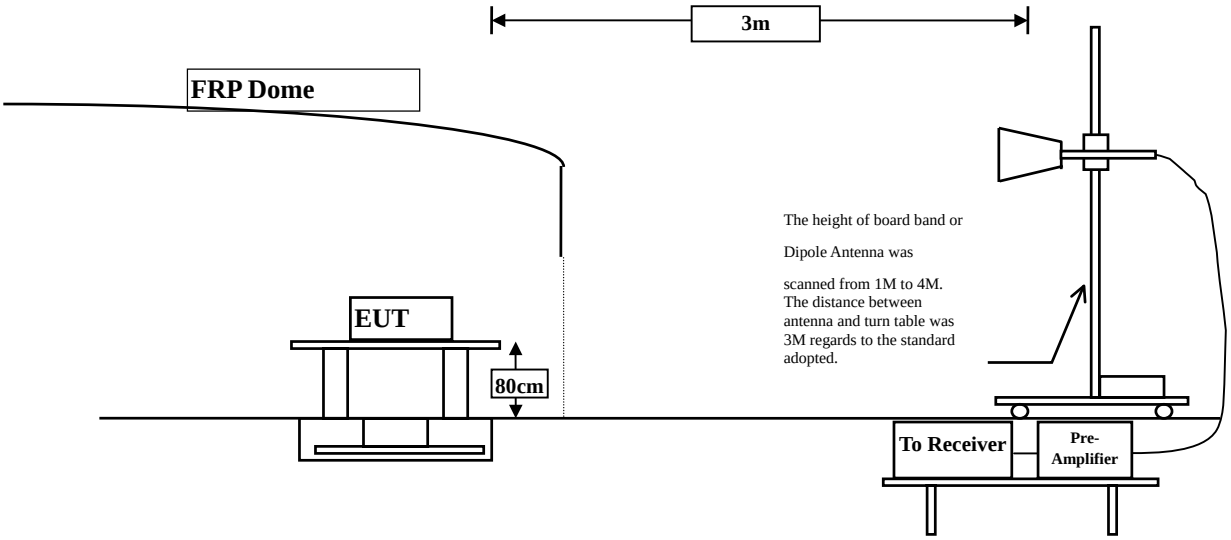
2. The test instruments marked by “X” are used to measure the final test results.

3.2. Test Setup

Below 1GHz



Above 1GHz



3.3. 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(a) 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.

3.4. Test Procedure

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

3.5. Uncertainty

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

3.6. Test Result of Radiated Emission

Product : Portable Navigation Device
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
88.200	-10.898	52.570	41.672	-26.278	67.950
98.000	-6.291	44.000	37.709	-30.241	67.950
107.800	-7.702	40.660	32.958	-34.992	67.950
Average Detector:					
--					
Vertical					
Peak Detector:					
88.200	-9.288	48.630	39.342	-28.608	67.950
98.000	-5.875	43.530	37.655	-30.295	67.950
107.800	-7.011	47.100	40.088	-27.862	67.950
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:120KHz。
3. Receiver setting (AVG Detector) : RBW:120KHz。
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 : Portable Navigation Device
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (88.2 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
191.020	-12.936	42.379	29.443	-14.057	43.500
233.700	-9.404	38.704	29.300	-16.700	46.000
268.620	-8.050	38.868	30.818	-15.182	46.000
346.220	-4.865	36.167	31.302	-14.698	46.000
439.340	-1.002	36.638	35.636	-10.364	46.000
528.580	0.807	31.881	32.688	-13.312	46.000
Vertical					
173.560	-6.303	38.811	32.508	-10.992	43.500
268.620	-5.410	42.863	37.453	-8.547	46.000
311.300	-8.310	40.436	32.126	-13.874	46.000
344.280	-6.042	42.834	36.792	-9.208	46.000
431.580	-2.008	39.558	37.550	-8.450	46.000
528.580	-1.043	35.981	34.938	-11.062	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.

Product : Portable Navigation Device
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (98 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
191.020	-12.936	41.221	28.285	-15.215	43.500
233.700	-9.404	39.844	30.440	-15.560	46.000
268.620	-8.050	39.966	31.916	-14.084	46.000
344.280	-4.992	33.956	28.964	-17.036	46.000
439.340	-1.002	37.448	36.446	-9.554	46.000
524.700	0.616	26.227	26.843	-19.157	46.000
Vertical					
173.560	-6.303	39.996	33.693	-9.807	43.500
225.940	-2.830	41.915	39.085	-6.915	46.000
268.620	-5.410	42.794	37.384	-8.616	46.000
353.980	-5.370	42.012	36.642	-9.358	46.000
439.340	-1.962	38.482	36.520	-9.480	46.000
499.480	-1.809	37.500	35.691	-10.309	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.

Product : Portable Navigation Device
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (107.8 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
191.020	-12.936	41.016	28.080	-15.420	43.500
233.700	-9.404	38.897	29.493	-16.507	46.000
268.620	-8.050	37.348	29.298	-16.702	46.000
353.980	-4.360	32.894	28.534	-17.466	46.000
447.100	-0.916	33.522	32.606	-13.394	46.000
524.700	0.616	29.229	29.845	-16.155	46.000
Vertical					
233.700	-2.954	42.208	39.254	-6.746	46.000
268.620	-5.410	43.914	38.504	-7.496	46.000
353.980	-5.370	40.675	35.305	-10.695	46.000
431.580	-2.008	32.832	30.824	-15.176	46.000
482.020	-1.838	32.206	30.368	-15.632	46.000
532.460	-0.938	32.065	31.127	-14.873	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.

Product : Portable Navigation Device
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (107.8 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
1078.000	-6.415	38.090	31.675	-42.325	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
1078.000	-6.415	37.910	31.495	-42.505	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.

4. Occupied Bandwidth

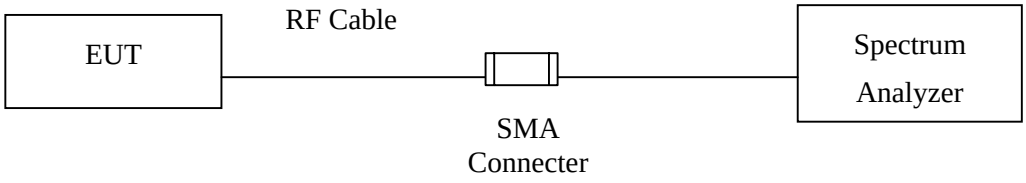
4.1. Test Equipment

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

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
	Spectrum Analyzer	R & S	FSP40 / 100170	Nov, 2008
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2009

Note: 1. All instruments 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

The minimum bandwidth shall be at least 200kHz.

4.4. Uncertainty

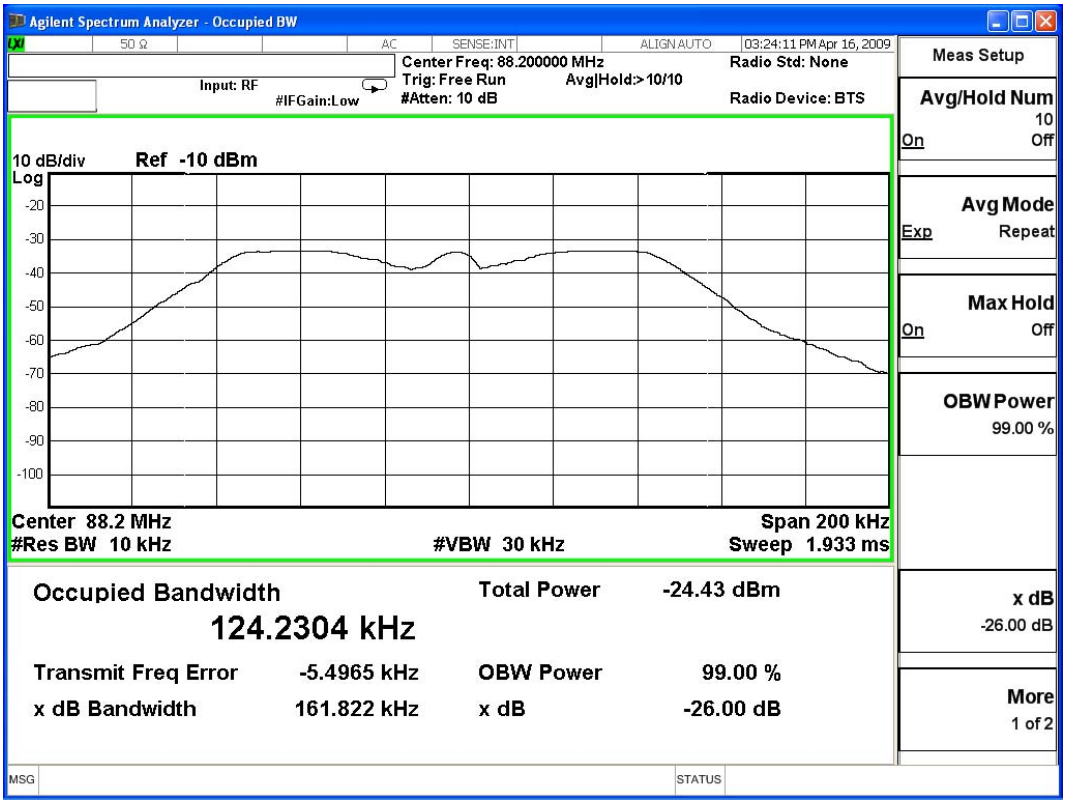
± 150Hz

4.5. Test Result of Occupied Bandwidth

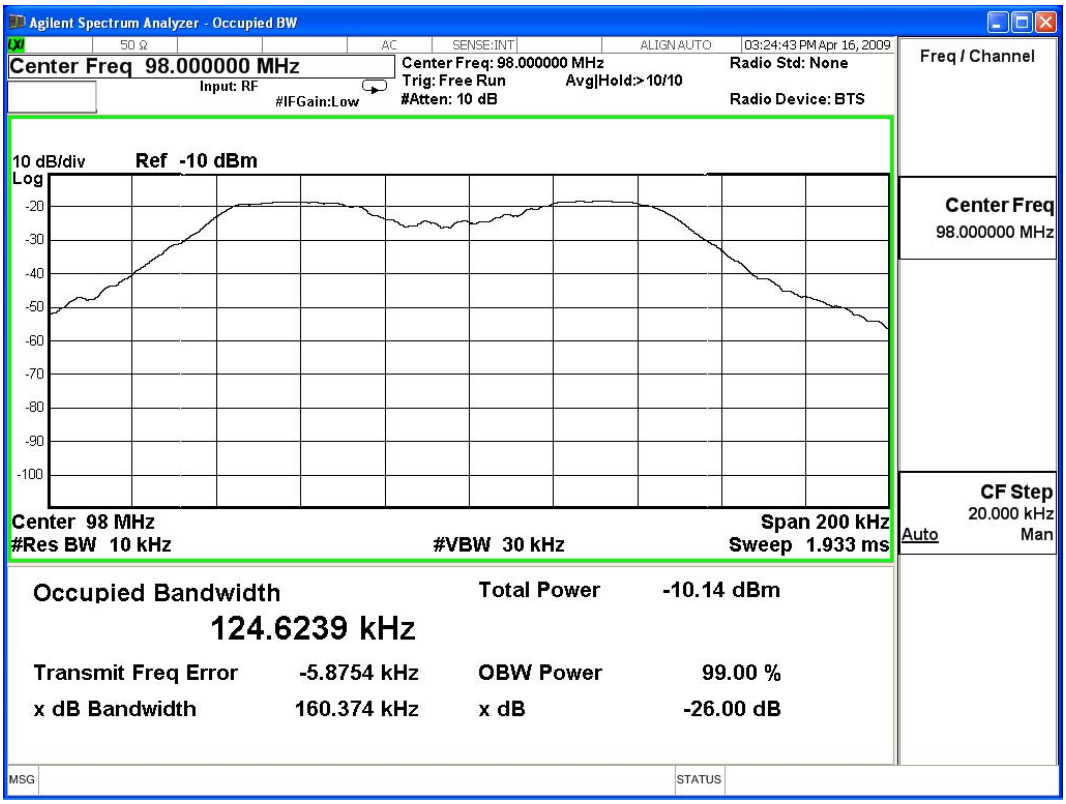
Product : Portable Navigation Device
Test Item : Occupied Bandwidth (modulation)
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	88.2	124.2304	200	Pass
99	98.0	124.6239	200	Pass
197	107.8	124.8120	200	Pass

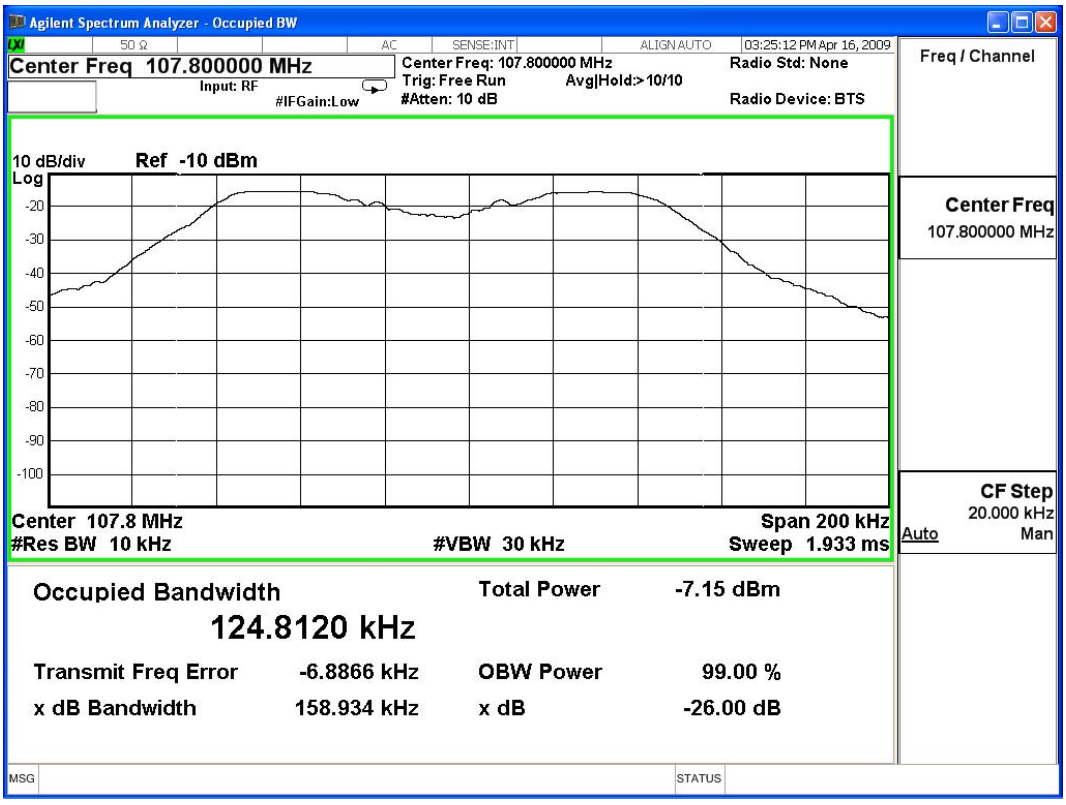
Channel 01:



Channel 99:



Channel 197:



5. Band Edge

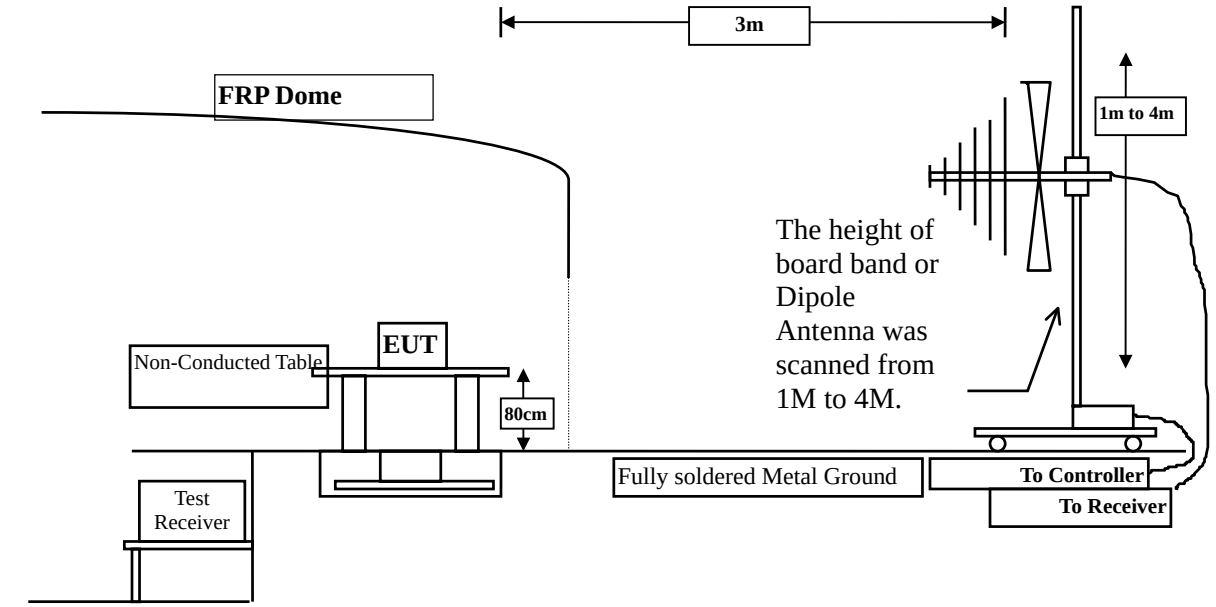
5.1. Test Equipment

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, 2008
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2008
X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2008
X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2008
X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2008

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

5.2. Test Setup



Below 1GHz

5.3. Limits

The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in Section 15.239.

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

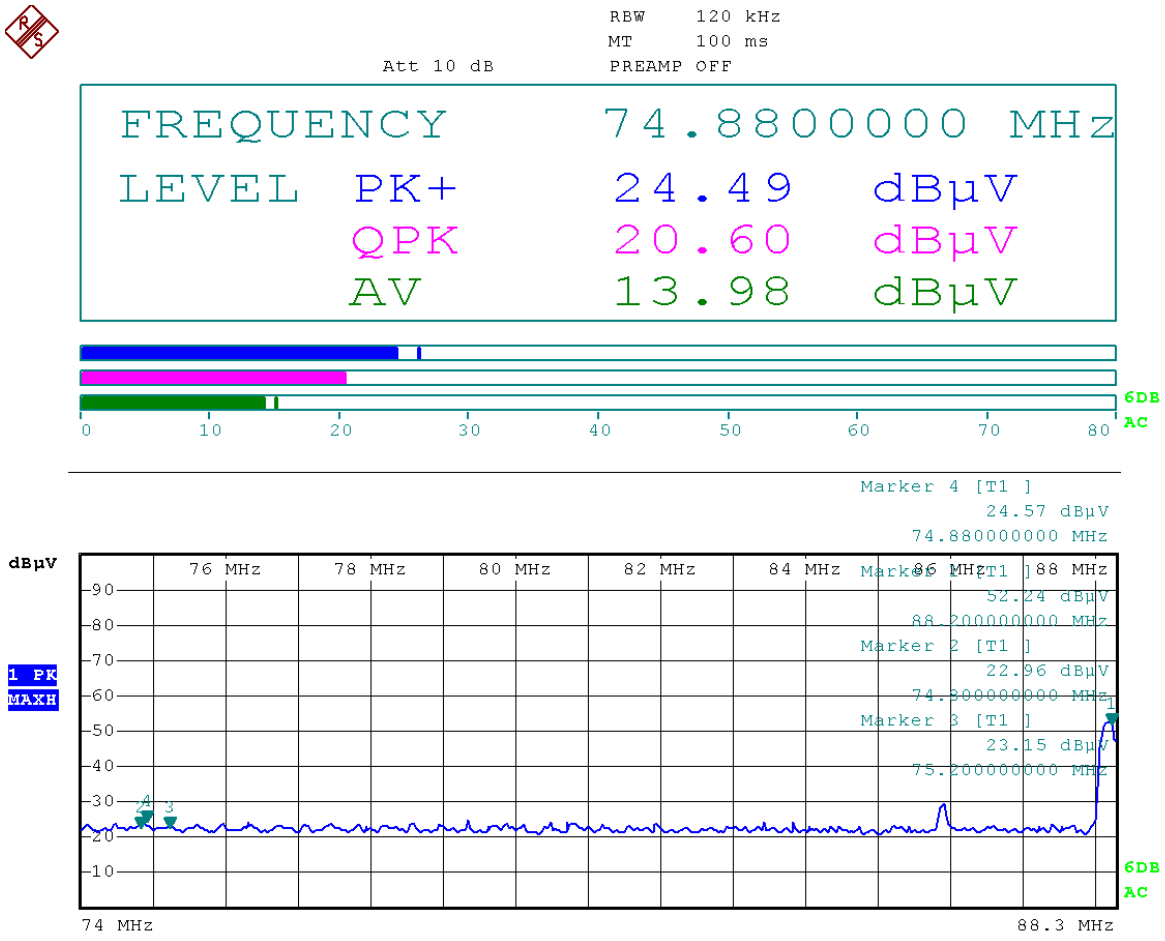
5.6. Test Result of Band Edge

Product : Portable Navigation Device
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (88.2 MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
1	74.880	-10.398	20.600	10.202	40.000	Pass

Figure Channel 1: Horizontal (Quasi-Peak)



Date: 17.APR.2009 00:47:30

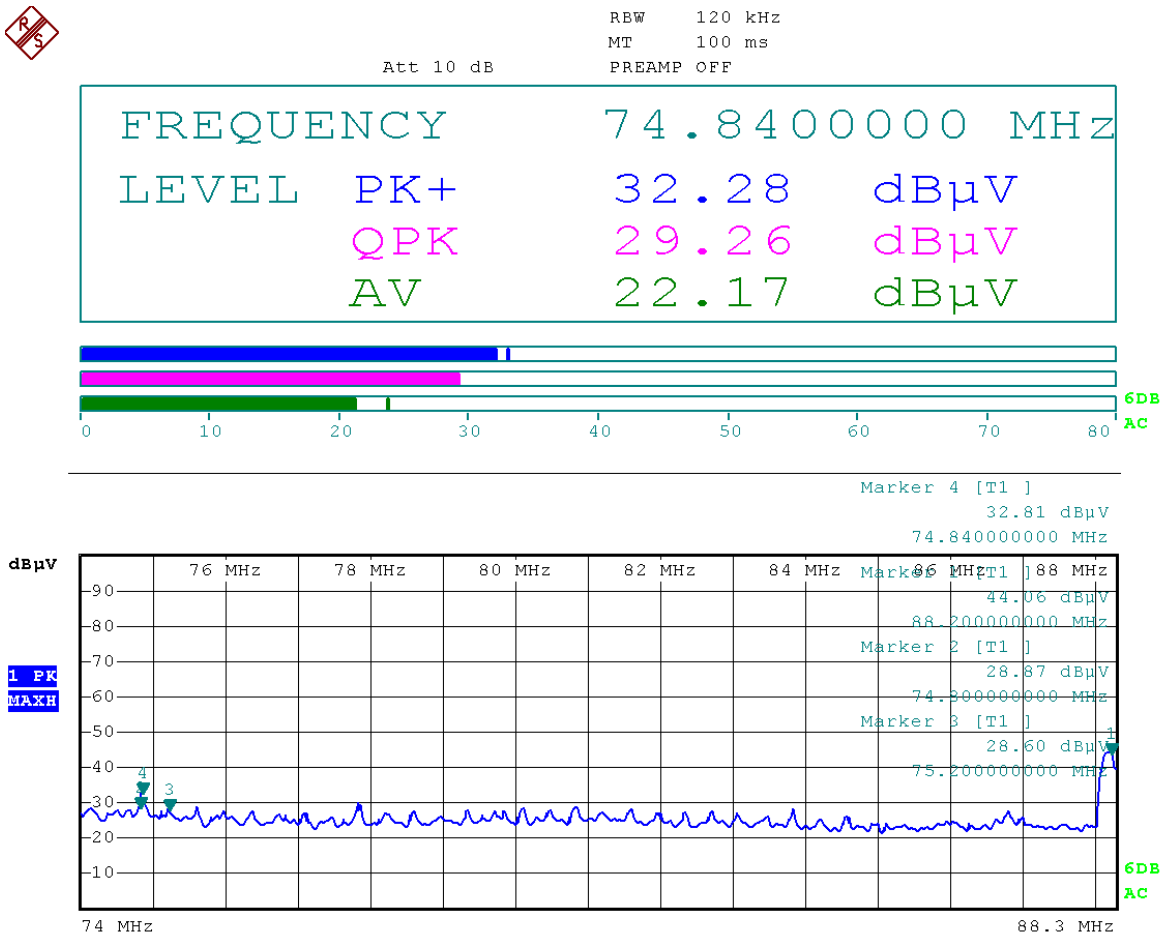
Note: RBW=120KHz

Product : Portable Navigation Device
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (88.2 MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
1	74.840	-12.434	29.260	16.826	40.000	Pass

Figure Channel 1: Vertical (Quasi-Peak)



Date: 17.APR.2009 00:50:10

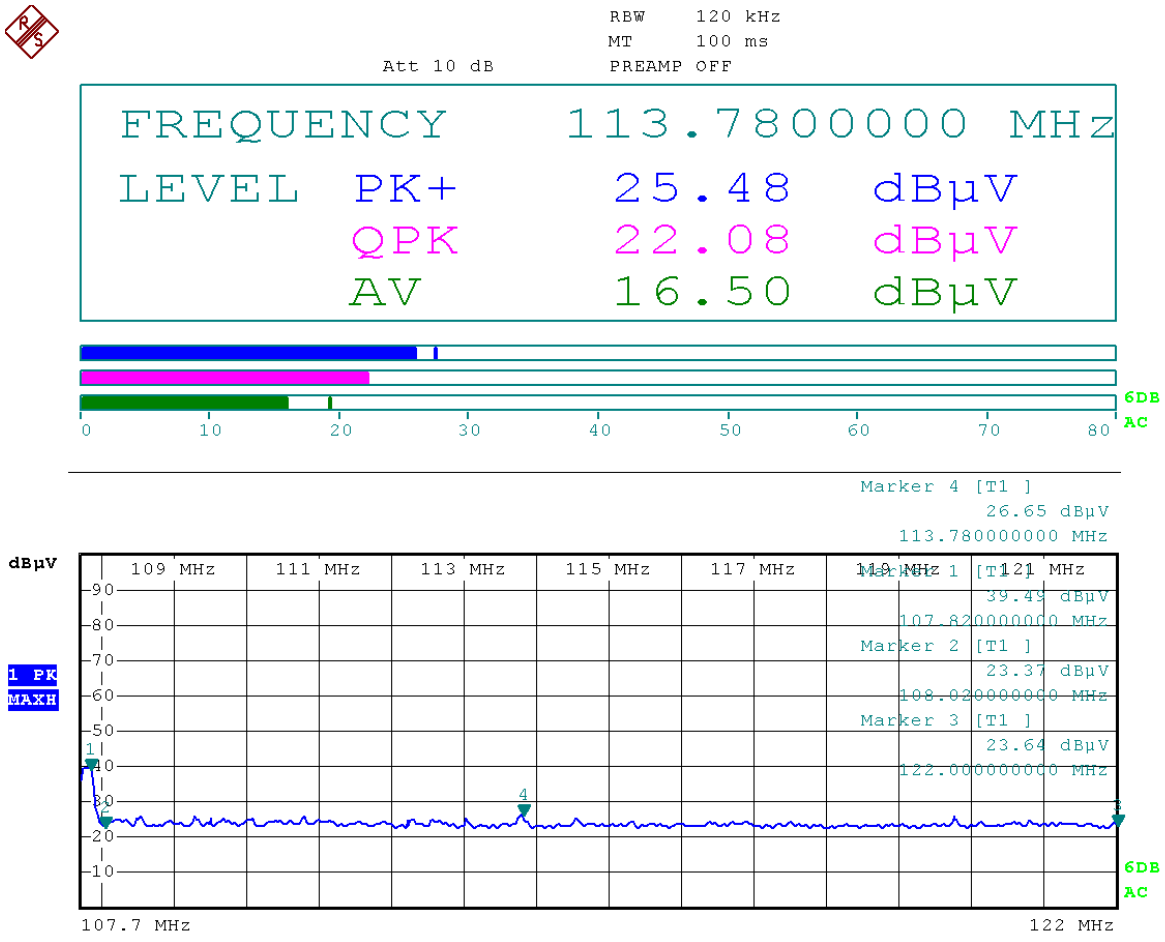
Note: RBW=120KHz

Product : Portable Navigation Device
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (107.8 MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
197	113.780	-9.682	22.080	12.397	43.500	Pass

Figure Channel 197: Horizontal (Quasi-Peak)



Date: 17.APR.2009 00:41:10

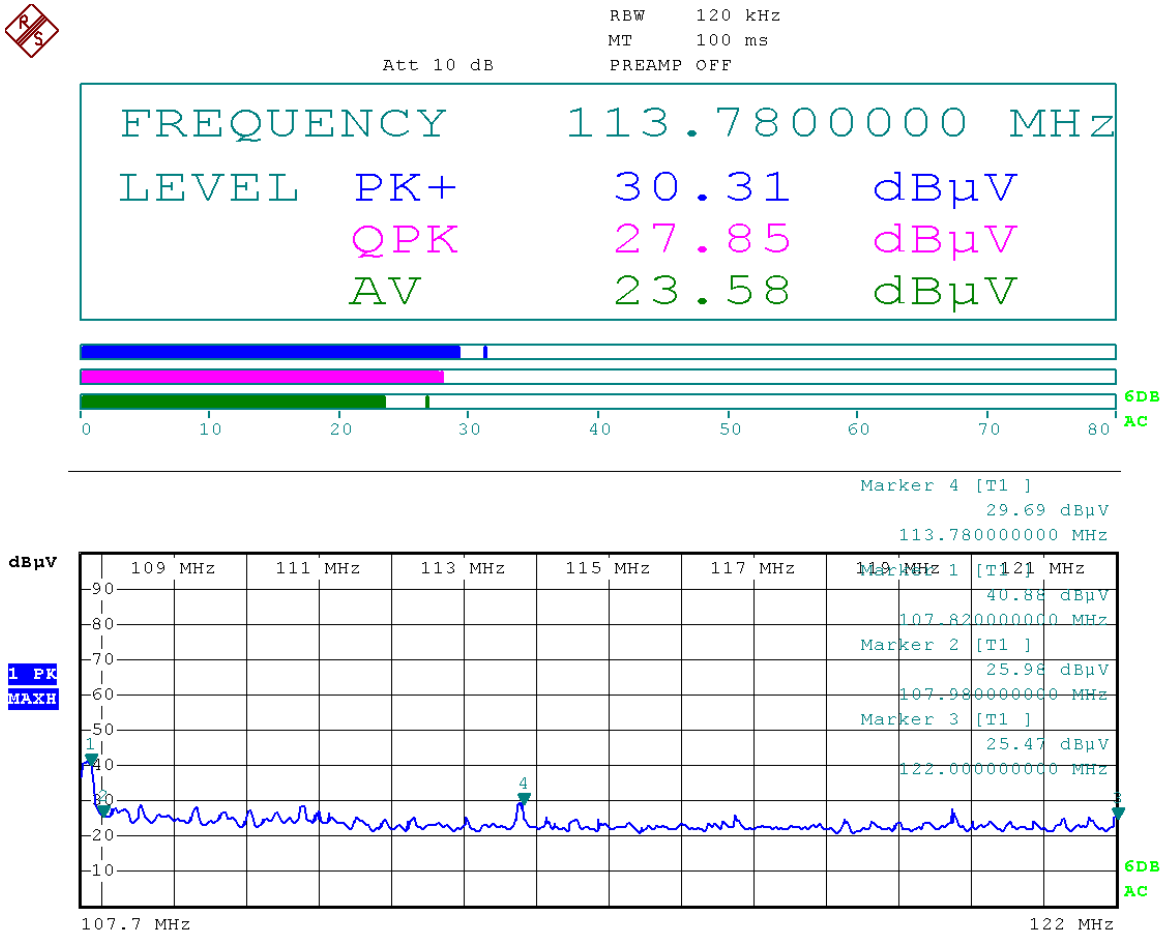
Note: RBW=120KHz

Product : Portable Navigation Device
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (107.8 MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
197	113.780	-8.413	27.850	19.437	43.500	Pass

Figure Channel 197: Vertical (Quasi-Peak)



Date: 17.APR.2009 00:43:48

Note: RBW=120KHz

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.