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EMC TEST REPORT For FCC

Test Report No.	:	CTK03-F031
Date of Issue	:	December 17, 2003
Model/Type No:	:	NMP-612T, NMP-612TD and NMP-612TG.
Kind of Product	:	MP3 Player
Applicant	:	NEXTWAY Co., Ltd.
Applicant Address	:	1.2F, Next Bldg., 736-40, Yeoksam-Dong, Kangnam-Ku, Seoul, Korea
Manufacturer	:	NEXTWAY Co., Ltd.
Manufacturer Address	:	1.2F, Next Bldg., 736-40, Yeoksam-Dong, Kangnam-Ku, Seoul, Korea
Contact Person	:	Mr. Jin. Kon. Ko (General Manager)
Telephone	:	+82-2-578-0733
Received Date	:	March 26, 2003
Test period	:	Start: November 21, 2003 End: December 16, 2003
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

CERTiTEK Standards Laboratory Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by

Young-Joon, Park
EMC Test Engineer
Date: December 17, 2003

Reviewed by

James Hong
EMC Technical Manager
Date: December 17, 2003

REPORT REVISION HISTORY

Date	Revision	Page No
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1.0 General Product Description

1.0.1 Tested Equipment

☒ Unless otherwise indicated, all tests were conducted on Model NMP-612T.

☒ Tests performed on Model NMP-612T were considered to be representative of Model(s) NMP-612TD and NMP-612TG.

1.0.2 Equipment Size, Mobility and Identification

Dimensions:	35.5 by 84 by 18.5 ☒ mm ☐ in
Mobility:	☒ Hand-Held ☐ Table-top ☐ Floor-standing ☐ prototype
Serial No.:	Prototype

1.0.3 Electrical Ratings

Input:	Dry Cell AA 1.5V×1
Output:	Not applicable

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage:	1.5Vdc
Frequency:	Not applicable

1.1 Model Differences

NMP-612T(256MB), NMP-612TD(512MB) and NMP-612TG(1GB) and identical to each other only except for memory chip capacity and model name for the marketing purposes.

1.2 Device Modifications

The following modifications were necessary for compliance: Not applicable

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
Adapter	HP	F1454A	4038000001003301	-
Notebook PC	I & B COM	Slim 5360	MB0VAA111100094	DOC
Keyboard	SAMSUNG	SEM-DT35	33008107	DOC
Mouse (Serial type)	Microsoft	BASM1	4475951-20000	DOC
Headset	PLANTRONICS	-	-	-

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC power cable, Unshielded	No	1.8	Connect to AC power
2	DC output cable, Unshielded	Yes	1.8	Between Adapter and Notebook PC
3	Earphone cable, Shielded	No	1.5	Connect to EUT
4	USB cable, Shielded	No	1.3	Between the EUT and Notebook PC
5	Mouse cable, Shielded	No	1.8	Serial type
6	Keyboard cable, Shielded	No	1.2	PS/2 type
7	Line-In cable, Unshielded	No	1.0	Connect to EUT
8	Headset cable, Unshielded	No	2.0	Connect to Notebook PC

n/a = not available

1.4 Test Software

☐ Pinging
☒ Not applicable (Used PC's OS is Windows 2000)

1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☐ Test program (H-Pattern)
☐ Test program (color bar)
☐ Standby
☐ Test program (customer specific)
☒ Practice operation - USB downloading mode (Used in radiation test data)
MP3 playing mode
Voice recording mode
Line-In recording mode
FM transmitter mode

1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested.
Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)
Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-1992 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	**FCC**	3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements.	93250
JAPAN	**VCCI**	10 meter Open Area Test Site and one conducted site.	R-948, C-986
KOREA	**MIC**	10 meter Open Area Test Site and EMS (ESD, RS, EFT/Burst, Surge)	No. 51, KR0025
International	**KOLAS**	EMC	
Europe	**GLAS**	EMC EN 55011, EN 55022, EN 55024, EN 61326, EN 50130-4, EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2, EN 61000-6-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-3-2, EN 61000-3-3	No.13000796-02

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☐ EN 50081-1:1992

☐ EN 55011:1998 +A1:1999 ☐ Group 1 ☐ Group 2
☐ Class A ☐ Class B

☐ EN 55013:1990 +A12:1994 +A13:1996 +A14:1999
☐ EN 55013:2001

☐ EN 55014-1:1993 +A1:1997 +A2:1999 ☐ Household appliances and similar
☐ Portable tools
☐ Semiconductor devices

☐ EN 55014-1:2000
☐ EN 55014-2:1997

☐ EN 55015:1996 +A1:1997 +A2:1999
☐ EN 55015:2000

☐ EN 55020:1994 +A11:1996 +A13:1999 +A14:1999
☐ EN 55020:1994 +A11:1996 +A12:1999 +A13:1999 +A14:1999

☐ EN 55022:1994 +A1:1995 +A2:1997 ☐ Class A ☐ Class B
☐ EN 55022:1998 +A1:2000 ☐ Class A ☐ Class B

☐ EN 61000-3-2:1995 +A1:1998 +A2:1998
☐ EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000
☐ EN 61000-3-2:2000
☐ EN 61000-3-3:1995

☐ VCCI V-3/99.05 : 1999 ☐ Class A ☐ Class B

☒ FCC Part 15 SUBPART B ☐ Class A ☒ Class B

☒ FCC Part 15 SUBPART C

☐ AS 3548 (1992) ☐ Class A ☐ Class B

☒ CISPR 22 (1998 + A1:2000) ☐ Class A ☒ Class B
The unit was tested to CISPR 22 and complied with the alternate methods allowed by FCC under paragraphs 15.107.

2.1 Conducted Voltage Emissions

Test Date
December 16, 2003

Test Location
EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002

Test Accessories

☐ LISN	EMCO	3825/2	9206-1971
☒ LISN	EMCO	3825/2	9409-2246
☒ LISN	EMCO	3825/2	9607-2574
☒ Control PC	HP	Vectra 500	SG72000192

Frequency Range of Measurement
☒ 150 kHz to 30 MHz
☐ 450 kHz to 30 MHz
☐ _____

Instrument Settings
IF Band Width: 9 kHz

Test Results
The requirements are:

☒ MET minimum margin is 9.8 dBuV at 0.19MHz
☐ NOT MET limit exceeded by maximum of ___ dBuV at _____ MHz
☐ NOT APPLICABLE

Remarks
See Appendix A for test data

2.2 Radiated Electric Field Emissions

Test Date
November 18, 2003

Test Location
☐ EMI-OATS: Testing was performed at a test distance of 10 m
☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008

Test Accessories

☒ ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014
☐ Biconical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Biconical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

Frequency Range of Measurement
30 MHz to 1 GHz

Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ MET minimum margin is 4.8 dB (uV/m) at 505.19 MHz
☐ NOT MET limit exceeded by maximum of ___ dB(uV/m) at _____ MHz
☐ NOT APPLICABLE

Remarks
See Appendix A for test data

2.3 Emissions from the intentional radiator #1

Test Date
November 18, 2003

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008

TX Frequency Range
88.0 MHz to 95.0 MHz

Test Results
The requirements are:

☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks
Sec. 15.239 (a) 200KHz Bandwidth
See Appendix A for test data

2.4 Emissions from the intentional radiator #2

Test Date
November 18, 2003

Test Location
☐ EMI-OATS: Testing was performed at a test distance of 10 m
☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008

Test Accessories

☒ ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014
☐ Biconical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Biconical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

TX Frequency Range
88.0 MHz to 95.0 MHz

Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks
Sec. 15.239 (b) Field Strength of Radiation
See Appendix A for test data

2.5 Emissions from the intentional radiator #3

Test Date
November 18, 2003

Test Location
☐ EMI-OATS: Testing was performed at a test distance of 10 m
☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008

Test Accessories

☒ ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014
☐ Biconical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Biconical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

TX Frequency Range
88.0 MHz to 95.0 MHz

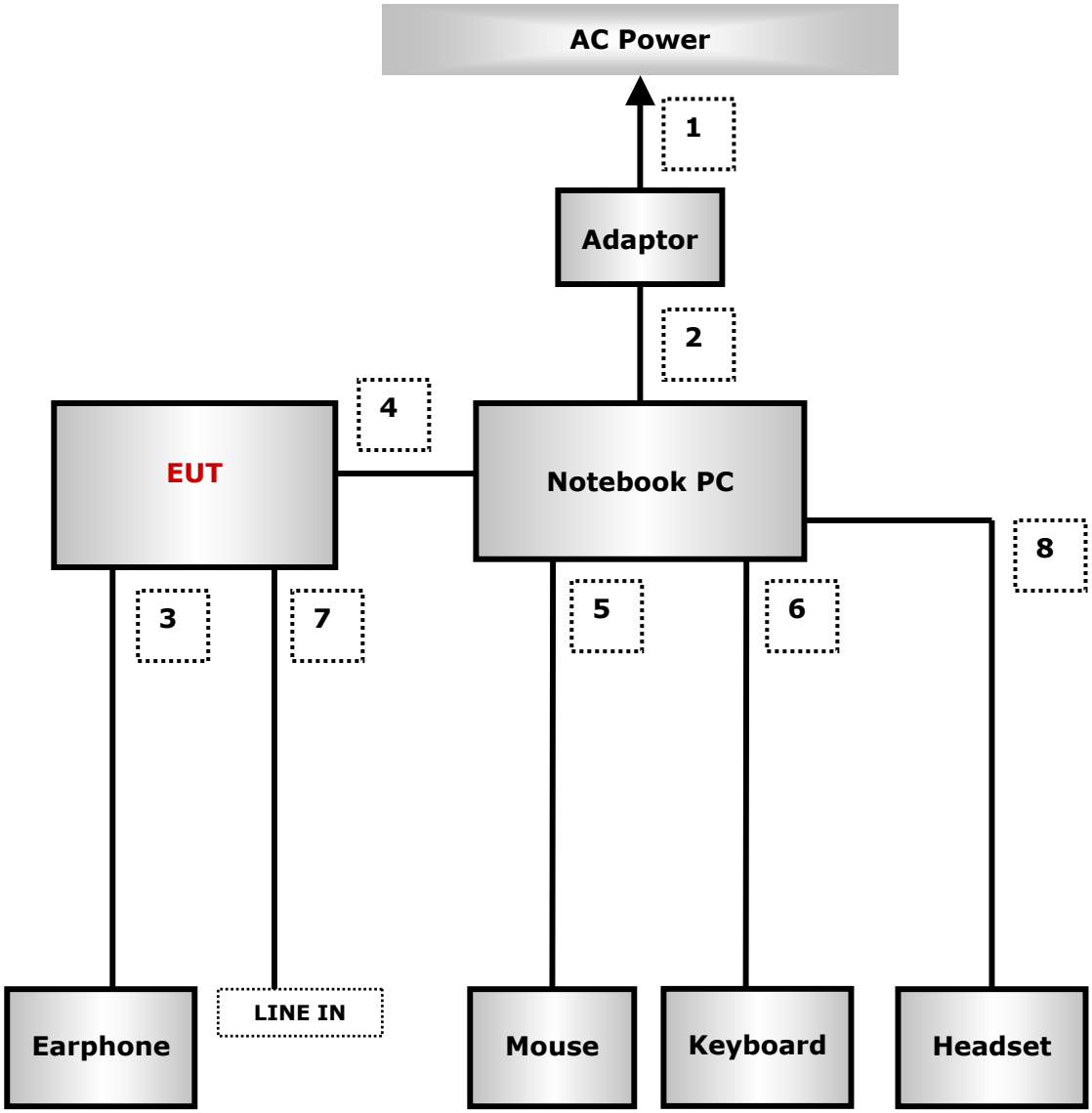
Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks
Sec. 15.239 (c) Field Strength of Spurious Radiation
See Appendix A for test data

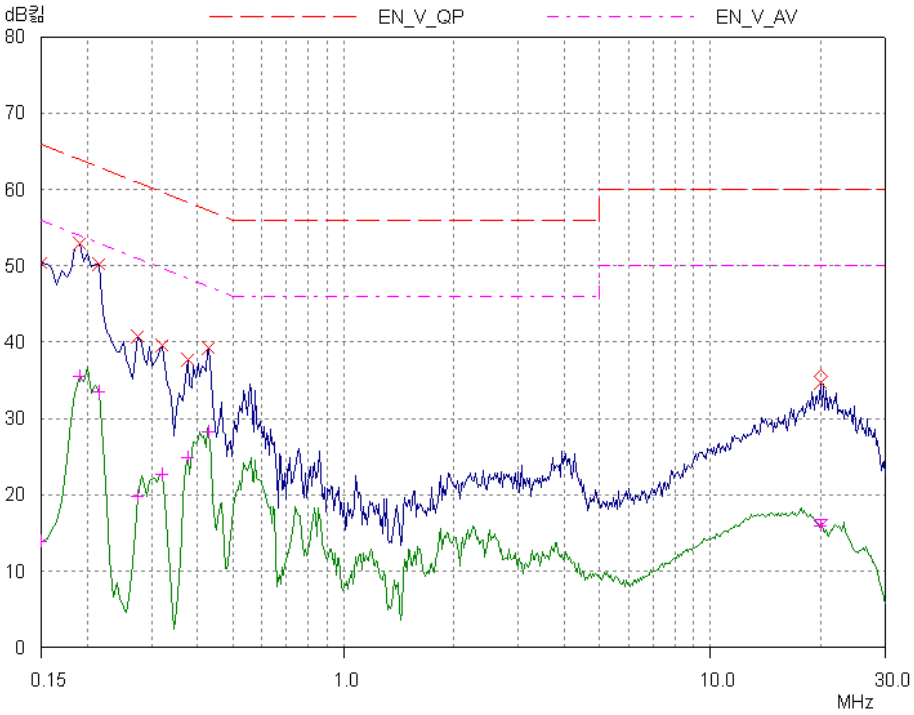
Configuration

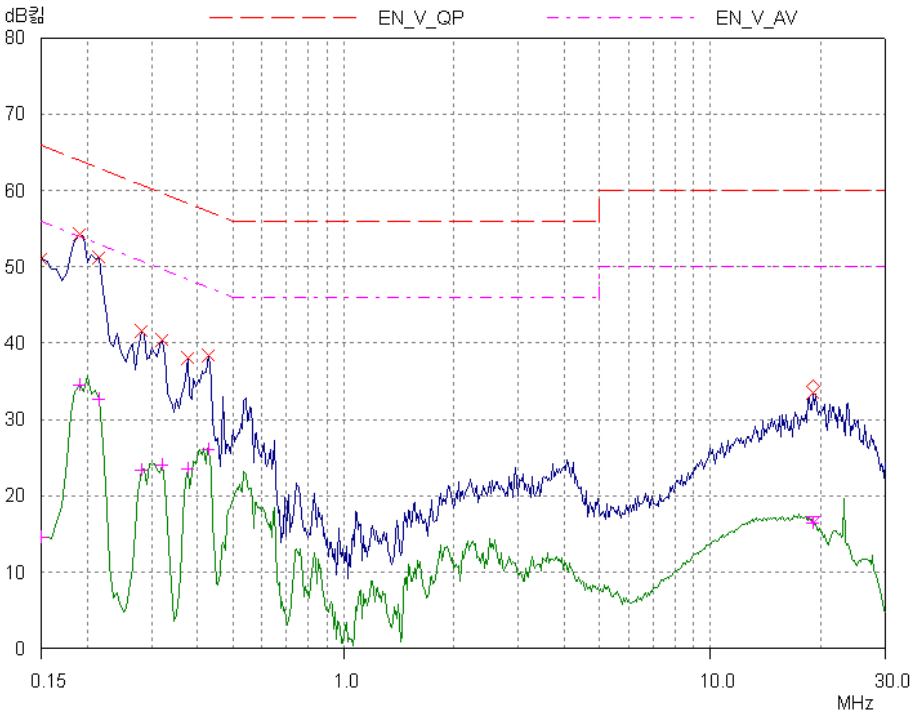


APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

Frequency	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.15	2.2	0.1	N	66.0	48.7	51.0	15.0	56.0	12.3	14.6	41.4
0.15	2.2	0.1	L	66.0	48.0	50.3	15.7	56.0	11.7	14.0	42.0
0.19	1.7	0.1	L	64.0	51.1	52.9	11.1	54.0	33.8	35.6	18.5
0.19	1.7	0.1	N	64.0	52.4	54.2	9.8	54.0	32.8	34.6	19.5
0.22	1.7	0.1	L	63.0	48.3	50.1	12.9	53.0	31.7	33.5	19.5
0.22	1.7	0.1	N	63.0	49.4	51.2	11.8	53.0	30.8	32.6	20.4
0.28	0.8	0.1	L	61.0	39.9	40.8	20.1	51.0	18.8	19.7	31.2
0.28	0.8	0.1	N	60.8	40.8	41.7	19.1	50.8	22.5	23.4	27.4
0.32	0.8	0.1	N	59.7	39.6	40.5	19.2	49.7	23.1	24.0	25.7
0.32	0.8	0.1	L	59.7	38.7	39.6	20.1	49.7	21.8	22.7	27.0
0.38	0.6	0.1	L	58.4	37.1	37.8	20.6	48.4	24.2	24.9	23.5
0.38	0.6	0.1	N	58.4	37.3	38.0	20.4	48.4	22.9	23.6	24.8
0.43	0.5	0.1	L	57.3	38.7	39.3	18.0	47.3	27.6	28.2	19.1
0.43	0.5	0.1	N	57.3	37.8	38.4	18.8	47.3	25.4	26.0	21.2
18.98	0.7	0.2	N	60.0	32.7	33.6	26.4	50.0	15.6	16.5	33.5
19.87	0.7	0.3	L	60.0	33.6	34.6	25.4	50.0	15.0	16.0	34.0

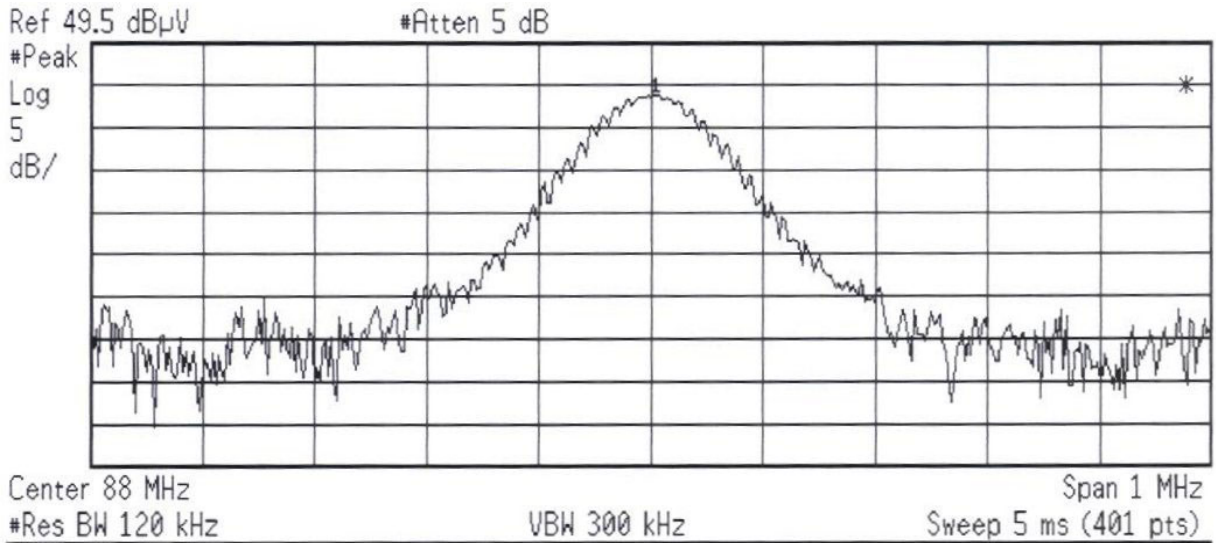


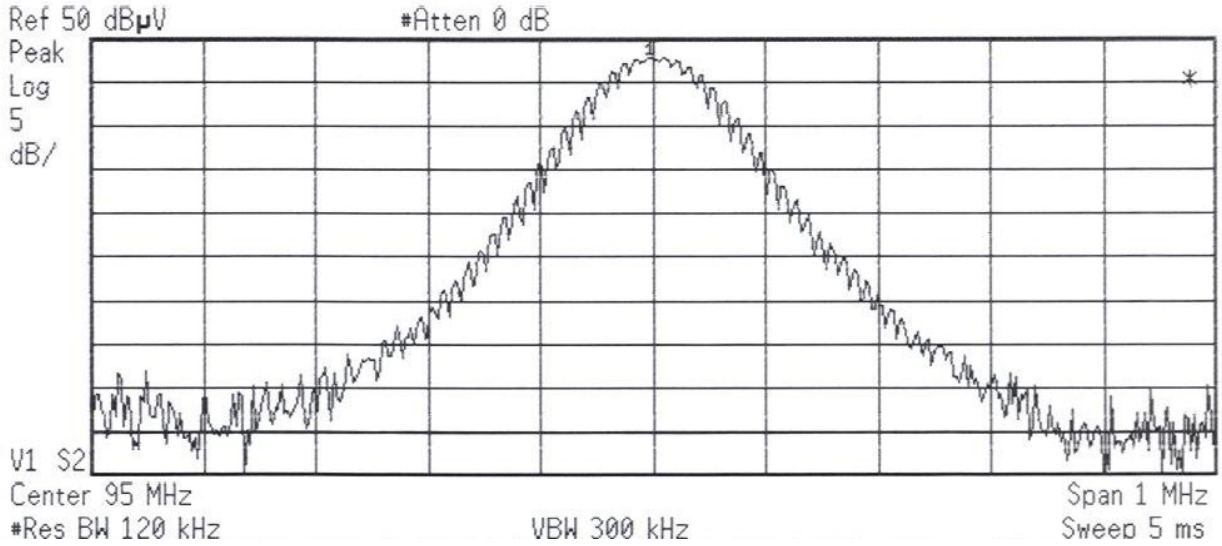


Radiated Electric Field Emissions (Quasi-Peak reading)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
36.12	17.2	V	1.0	17.2	0.5	40.0	34.9	5.1
119.84	22.2	H	4.0	9.7	1.1	43.5	33.0	10.5
438.56	22.1	V	2.0	14.4	3.0	46.0	39.5	6.5
451.24	21.6	V	1.8	14.6	3.1	46.0	39.3	6.7
468.94	21.6	H	3.5	15.0	3.3	46.0	39.9	6.1
493.67	21.5	H	4.0	15.3	3.3	46.0	40.1	5.9
505.19	22.0	H	4.0	15.7	3.5	46.0	41.2	4.8

Emissions from the intentional radiator #1





Emissions from the intentional radiator #2 (Quasi-Peak reading)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
88.00	33.8	H	2.0	9.5	1.0	48.0	44.3	3.7
88.00	33.4	V	1.0	9.5	1.0	48.0	43.9	4.1
95.00	31.4	H	2.0	9.9	0.9	48.0	42.2	5.8
95.00	33.5	V	1.0	9.9	0.9	48.0	44.3	3.7

Emissions from the intentional radiator #3 (Quasi-Peak reading)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
176.00	8.6	H	2.0	13.1	1.6	43.5	23.3	20.2
176.00	2.9	V	1.0	13.1	1.6	43.5	17.6	25.9
190.00	12.0	H	4.0	14.0	1.7	43.5	27.7	15.8
190.00	2.1	V	1.0	14.0	1.7	43.5	17.8	25.7