

Electromagnetic Emission

F C C M E A S U R E M E N T R E P O R T

CERTIFICATION OF COMPLIANCE

FCC Part 15 Certification Measurement

PRODUCT : PMP (Portable Multimedia Player)
MODEL/TYPE NO : NV-100
FCC ID : T2NNV-100
APPLICANT : SCIONTECH Ltd.
#801 Shinnae Techno-Town, 485, Sangbong-Dong,
Jungnang-Gu, Seoul, Korea
Attn. : Kyung Tae Lee / Manager
MANUFACTURER : SCIONTECH Ltd.
#801 Shinnae Techno-Town, 485, Sangdong-Dong,
Jungnang-Gu, Seoul, Korea
FCC CLASSIFICATION : Class B personal computers and peripherals
FCC RULE PART(S) : FCC Part 15 Subpart B
FCC PROCEDURE : Certification
TRADE NAME : N/A
TEST REPORT No. : ETLE060213.056
DATES OF TEST : March 06, 2006 – March 08, 2006
REPORT ISSUE DATE : March 21, 2006
TEST LABORATORY : ETL Inc. (FCC Registration Number : 95422)

This PMP, Model NV-100 has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 at the ETL/EMC Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart B:

I attest to the accuracy of data. All measurement herein was performed by me or was made under my supervision and is correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.



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FCC MEASUREMENT REPORT

Scope – *Measurement and determination of electromagnetic emission(EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)*

General Information

Applicant Name	: SCIONTECH Ltd.
Address	: #801 Shinnae Techno-Town, 485, Sangbong-Dong, Jungnang-Gu, Seoul, Korea
Attention	: Kyung Tae, Lee / Manager

- EUT Type :** PMP
- Model Number :** NV-100
- FCC ID :** T2NNV-100
- S/N :** N/A
- FCC Rule Part(s) :** FCC Part 15 Subpart B
- Test Procedure :** ANSI C63.4-2003
- FCC Classification :** Class B personal computers and peripherals
- Dates of Tests :** March 06, 2006 – March 08, 2006
- Place of Tests :**
ETL Inc.
EMC Testing Lab. (FCC Registration Number : 95422)
#584, Sangwhal-ri, Ganam-myun, Yeoju-gun,
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Tel : (031) 885-0072 Fax : (031) 885-0074
- Test Report No. :** ETLE060213.056

1. INTRODUCTION

The measurement test for radiated and conducted emission test were conducted at the open area test site of E-RAE Testing Laboratory Inc. facility located at 584, Sangwhal-ri, Ganam-myun, Youju-gun, Gyounggi-do, Korea. The site is constructed in conformance with the requirements of the ANSI C63.4-2003 and CISPR Publication 16. The ETL has site descriptions on file with the FCC for 3 and 10 m site configurations. Detailed description of test facility was found to be in compliance with the requirements of Section 2.948 FCC Rules according to the ANSI C63.4-2003 and registered to the Federal Communications Commission (Registration Number : 95422).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C.63.4-2003) was used in determining radiated and conducted emissions from the SCIONTECH Ltd.
Model: NV-100.

2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the SCIONTECH Ltd. PMP, Model: NV-100.

2.2 General Specification

Product Name	PMP
Chassis	Plastic
List of Each OSC. Or X-Tal. Freq.(≥ 1 MHz)	OSC : 30.000 MHz, 24.576 MHz, 13.500 MHz
General	Product name
	Dimension
	Weight
	HDD
	USB
	Internal Speaker
	Battery
	Adapter
Video	LCD
	Format supported
	Caption
	Frame
Audio	Format supported
	S/N Ratio
	Lyrics
GPS Navigation	GPS Receiver
	GPS Antenna
	Channel
Photo Album	Format supported
Text Viewer	Format supported
FM Radio	Frequency range
	Channel
TV-OUT	Types
	Format

3. DESCRIPTION OF TESTS

3.1 Conducted Emission Measurement

Conducted emissions measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2003. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50Ω / 50 uH LISN as the input transducer to a Spectrum Analyzer or a Test Receiver. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 9 kHz or for "quasi-peak" within a bandwidth of 9 kHz.

The line-conducted emission test is conducted inside a shielded anechoic chamber room with 1 m x 1.5 m x 0.8 m wooden table which is placed 0.4 m away from the vertical wall and 1.5 m away from the side wall of the chamber room. Two LISN are bonded to the shielded room. The EUT is powered from the LISN and the support equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2 cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the LISN. Non-inductive bundling to a 1 m length shortened all interconnecting cables more than 1 m. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the EMI Test Receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using to set Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 to 30 MHz. The bandwidth of the spectrum analyzer was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission.

Photographs of the worst-case emission can be seen in photographs of conducted emission test setup in Appendix B.

3. DESCRIPTION OF TESTS

3.2 Radiated Emission Measurement

Radiated emission measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2003. The measurements were performed over the frequency range of 30 MHz to 1 GHz using antenna as the input transducer to a spectrum analyzer or a field intensity meter. The measurements were made with the detector set for "Quasi-peak" within a bandwidth of 120 kHz.

Preliminary measurements were made at 10 m using broadband antennas, and spectrum analyzer to determined the frequency producing the maximum emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using Log-Bicon antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site at 10 m. The test equipment was laced on a wooden turn-table. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR Quasi-peak mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency of type of signal. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8 m high nonmetallic 1 x 1.5 m table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 m and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or support equipment and changing the polarity of the antenna, whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in Photographs of the worst-case emission test setup can be seen in Appendix B.

4. TEST CONDITION

4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following conditions and configurations were used.

4.2 EUT operation

Operating Mode	The worst operating condition
Stand-by mode	x
Video file playing mode	x
MP3 Play mode	x
Data uploading & downloading mode	◎

◎: Worst case investigated during the Test

4.3 Support Equipment Used

Following peripheral devices and interface cables were connected during the measurement:

EUT – PMP

FCC ID	: T2NNV-100
Model Name	: NV-100
Serial No.	: N/A
Manufacturer	: SCIONTECH Ltd.
Power Supply Type	: Internal Battery Li-Polymer 3 000 mAh Input: AC 110-220 V, 50/60 Hz, 0.5A : AC/DC Adapter Output: DC 5 V, 2 A
Power Cord	: Shielded, Detachable: 1.2m
Data port	: USB 2.0 Device port : 1, USB 1.1 HOST port : 1, A/V Out port : 1 , Ear phone port : 1, Adapter In: 1

Support Unit 1 – Personal computer (DELL)

FCC ID	: N/A (DoC)
Model Name	: DHM
Serial No.	: H9MB71S
Manufacturer	: DELL
Power Supply Type	: Switching
Power Cord	: Non-Shielded, Detachable: 1.2m
Data Port	: RGB out: 1, DVI out: 1, Parallel: 1, RS-232: 1, PS/2: 2, USB: 4, RJ-45: 1 Audio in: 1, Audio out: 1, MIC in: 1

Support Unit 2 – LCD TV Monitor (Orion)

FCC ID	: N/A
Model Name	: OR2001TV
Serial No.	: N/A
Manufacturer	: Orion Communications Co., Ltd.
Power Supply Type	: Switching
Power Cord	: Non-Shielded, Detachable: 1.2m
Data Port	: RGB In: 1, A/V In:1

Support Unit 3 – Keyboard (COMPAQ)

FCC ID	: N/A (DoC)
Model Name	: KB-9963
Serial No.	: B26960GBUKO13F
Manufacturer	: COMPAQ
Power Supply Type	: N/A
Power Cord	: N/A
Data Cable	: Shielded, 1.5m

Support Unit 4 – Mouse (LOGITECH)

FCC ID	: DZL211029
Model Name	: M-S34
Serial No.	: LZC01002314
Manufacturer	: LOGITECH
Power Supply Type	: N/A
Power Cord	: N/A
Data Cable	: Shielded, 1.2m

Support Unit 5 – Serial Mouse (PETRA)

FCC ID	: JKGMUS5S01
Model Name	: MUS5S
Serial No.	: E183027
Manufacturer	: PETRA
Power Supply Type	: N/A
Power Cord	: N/A
Data Cable	: Shielded, 1.2m

Support Unit 6 – Printer (EPSON)

FCC ID	: N/A
Model Name	: PHOTO 750
Serial No.	: 11-03098
Manufacturer	: EPSON
Power Supply Type	: AC 110V~220V
Power Cord	: Non-Shield, 1.5m
Data Cable	: Shielded, 1.5m

Support Unit 7 – USB Drive (N/A)

FCC ID	: N/A
Model Name	: N/A
Serial No.	: N/A
Manufacturer	: N/A
Power Supply Type	: N/A
Power Cord	: N/A
Data Cable	: N/A

5. TEST RESULTS

5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

Test Rule Parts	Measurement Required	Result
15.107	Conducted Emissions Measurement	Passed by 3.00 dB
15.109	Radiated Emissions Measurement	Passed by 4.60 dB

The data collected shows that the **SCIONTECH Ltd., PMP, NV-100** complies with technical requirements of above rules part 15.107 and 15.109 Class B Limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement. No EMI suppression device(s) was added and/or modified during testing.

5. TEST RESULTS

5.2 Conducted Emissions Measurement

EUT	PMP / NV-100 (SN :N/A)		
Limit apply to	FCC Part 15. 107(CISPR Pub.22 Class B)		
Test Date	March 06, 2006		
Operating Condition	Data uploading & downloading mode		
Environment Condition	Humidity Level: 36 % R.H., Temperature: 18 °C		
Result	Passed by 3.0 dB		

Conducted Emission Test Data

The following table shows the highest levels of conducted emissions on both polarizations of hot and neutral line.

Detector mode: CISPR Quasi-Peak mode (6dB Bandwidth : 9 kHz)

Frequency [MHz]	Result [dBuV]		Phase (*H/**N)	Limit [dBuV]		Margin [dB]	
	Quasi-peak	Average		Quasi-peak	Average	Quasi-peak	Average
0.199	49.9	—	N	63.7	53.7	13.8	—
0.332	47.7	—	N	59.4	49.4	11.7	—
0.465	46.9	42.7	N	56.6	46.6	9.7	3.9
0.527	50.6	41.3	N	56.0	46.0	5.4	4.7
0.663	49.4	42.8	N			6.6	3.2
2.263	51.8	43.0	H			4.2	3.0
6.111	44.3	—	H	60.0	50.0	15.7	—
11.090	42.6	—	H			17.4	—

NOTES :* H : HOT Line , **N : Neutral Line

Margin value = Limit – Result

Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15 and CISPR 22 Class B

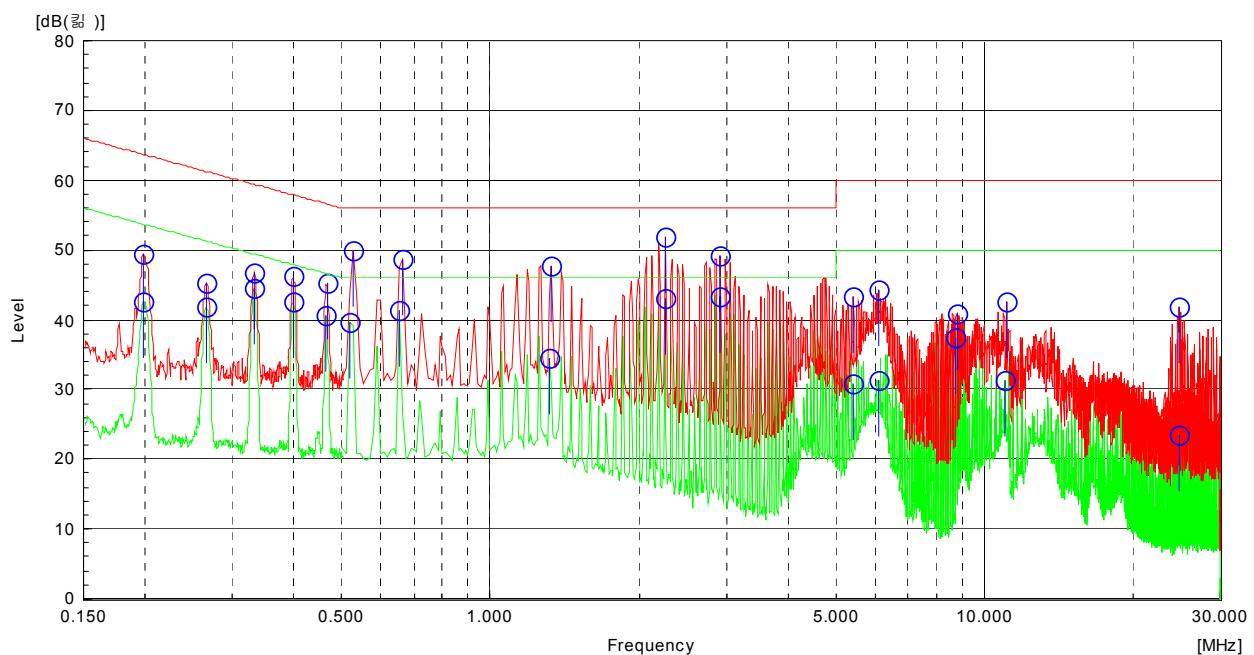
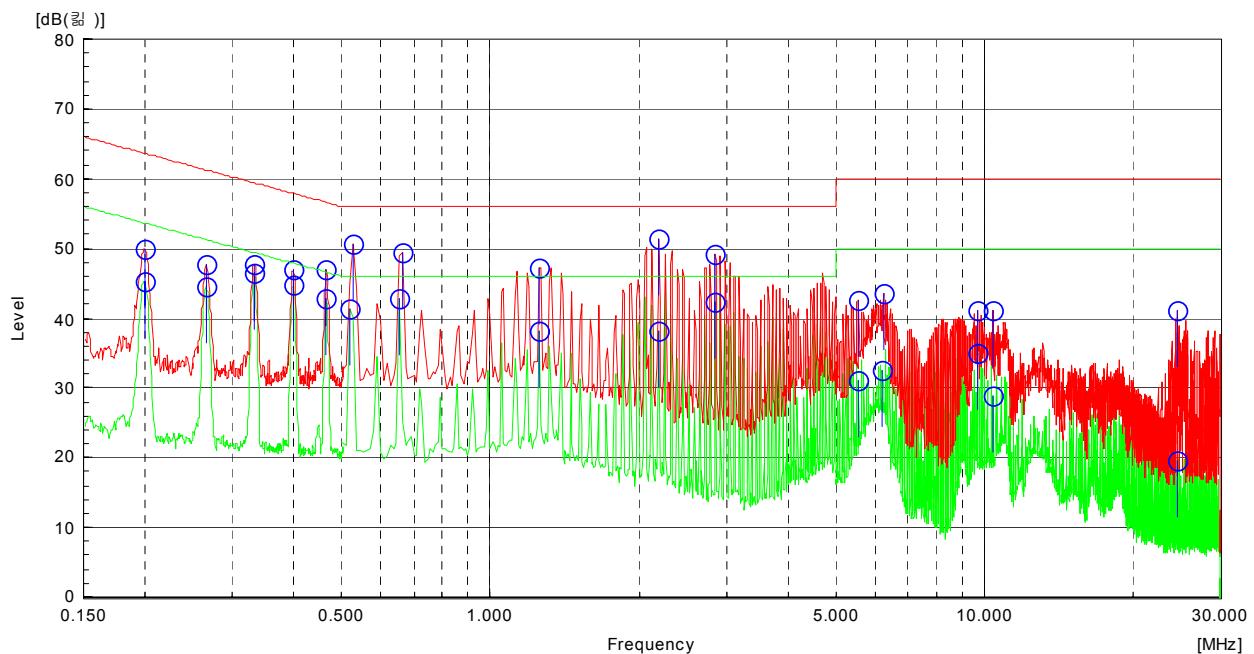
If the Reading Quasi-Peak value is below the Average Limit, Do not test Average Mode.



Test Engineer: Jae Young, Kwon

Line Polarity: Hot

Limit: Quasi-Peak ——————
Average ——————

Line Polarity: Neutral

Quasi-peak —————— Average ——————

5. TEST RESULTS

5.3 Radiated Emissions Measurement

EUT	PMP / NV-100 (SN :N/A)
Limit apply to	FCC Part 15. 109(CISPR Pub.22 Class B)
Test Date	March 07, 2006
Operating Condition	Data uploading & downloading mode
Environment Condition	Humidity Level: 38 % R.H., Temperature: 08 °C
Result	Passed by 4.60 dB

Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.
Detector mode: CISPR Quasi – Peak mode (6dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dBuV]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
69.30	13.86	V	7.65	2.19	23.70	30.0	6.30
122.70	7.62	H	11.04	3.14	21.80		8.20
137.68	8.84	V	11.59	3.37	23.80		6.20
170.13	8.18	V	10.92	3.80	22.90		7.10
192.80	11.03	H	9.71	3.96	24.70		5.30
215.49	8.99	V	10.02	4.39	23.40		6.60
299.73	9.99	H	12.81	5.50	28.30	37.0	8.70
362.30	7.53	H	13.84	6.22	27.60		9.40
385.40	9.82	H	14.23	6.45	30.50		6.50
396.60	10.22	H	14.41	6.57	31.20		5.80
407.80	11.03	H	14.68	6.69	32.40		4.60
498.80	7.07	H	17.04	7.59	31.70		5.30

NOTES :* H : Horizontal polarization , ** V : Vertical polarization

Result = Reading + Antenna factor + Cable loss

Margin value = Limit - Result

The measurement was performed for the frequency range 30 MHz ~ 1000 MHz according to the CISPR 22 Class B



Test Engineer: Jae Young, Kwon

6. SAMPLE CALCULATION

Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

$$dB(\mu V) = 20 \log_{10} (uV) : \text{Equation}$$

Example : @ 407.80 MHz

Class B Limit	=	37.00 dBuV/m
Reading	=	11.03 dBuV
Antenna Factor + Cable Loss	=	14.68 + 6.69 = 21.37 dBuV/m
Total	=	32.40 dBuV/m
Margin	=	37.0 – 32.40 = 4.60 dB
	=	4.60 dB below Limit

7. List of test equipments used for measurements

Test Equipment		Model	Mfg.	Serial No.	Cal. Due Date
<input checked="" type="checkbox"/>	Spectrum Analyzer	E7402A	H.P	US39110107	06-10-17
<input type="checkbox"/>	Spectrum Analyzer	R3261A	Advantest	21720033	06-10-17
<input checked="" type="checkbox"/>	Receiver	ESVS 10	R & S	835165/001	06-04-07
<input checked="" type="checkbox"/>	EMI TEST Receiver	ESPI	Rohde & Schwarz	100478	06-10-17
<input type="checkbox"/>	Preamplifier	HP 8347A	HP	2834A00544	06-04-07
<input checked="" type="checkbox"/>	LISN	3825/2	EMCO	9006-1669	06-04-06
<input checked="" type="checkbox"/>	LISN	3825/2	EMCO	9208-1995	06-04-07
<input type="checkbox"/>	TriLog Antenna	VULB9160	Schwarz Beck	3082	06-07-19
<input checked="" type="checkbox"/>	LogBicon	VULB9165	Schwarz Beck	2023	06-07-05
<input type="checkbox"/>	Dipole Antenna	VHAP	Schwarz Beck	964	06-06-24
<input type="checkbox"/>	Dipole Antenna	VHAP	Schwarz Beck	965	06-07-05
<input type="checkbox"/>	Dipole Antenna	UHAP	Schwarz Beck	949	06-06-24
<input type="checkbox"/>	Dipole Antenna	UHAP	Schwarz Beck	950	06-07-05
<input type="checkbox"/>	Broad-band Horn Antenna	BBHA 9120D	Schwarz Beck	227	06-04-04
<input checked="" type="checkbox"/>	Turn-Table	DETT-03	Daeil EMC	-	N/A
<input checked="" type="checkbox"/>	Antenna Master	DEAM-03	Daeil EMC	-	N/A
<input type="checkbox"/>	Plotter	7440A	H.P	2725A 75722	N/A
<input checked="" type="checkbox"/>	Chamber	DTEC01	DAETONG	-	N/A
<input type="checkbox"/>	Thermo Hygrograph	3-3122	ISUZU	3312201	06-04-07
<input type="checkbox"/>	BaroMeter	-	Regulus	-	06-03-15

End of Test Report

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