



EMC TEST REPORT For FCC

Test Report No. : CTK02-F048

Date of Issue : May 8. 2002

Model/Type No: : B15BF

Kind of Product : LCD MONITOR

Applicant : Hansol Electronics Inc.

Applicant Address : 27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk,
365-840, Korea

Manufacturer : Hansol Electronics Inc.

Manufacturer Address : 27-29, Hanchon-Ri, Ducksan-Myun, Jinchon-Gun, Chungbuk,
365-840, Korea

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Telephone : +82-43-530-8503

Received Date : April 8. 2002

Test period : Start: April 29. 2002 End: April 29. 2002

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

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

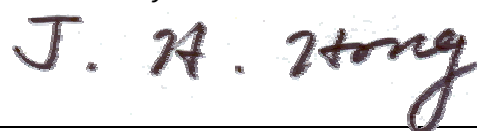
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Tested by



Michael Jang
EMC Test Engineer
Date: May 8. 2002

Reviewed by



James Hong
EMC Technical Manager
Date: May 8. 2002

REPORT REVISION HISTORY

Date	Revision	Page No
May 8. 2002	(CTK02-F048) Issued	All

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TABLE OF CONTENTS

1.0 General Product Description.....	4
1.1 Model Differences.....	4
1.2 Device Modifications	4
1.3 EUT Configuration(s)	5
1.4 Test Software.....	5
1.5 EUT Operating Mode(s)	5
1.6 Calibration Details of Equipment Used for Measurement.....	6
1.7 Test Facility	6
1.8 Measurement Procedure.....	6
1.9 Laboratory Accreditations and Listings	7
2.0 Emissions Test Regulations	8
2.1 Conducted Voltage Emissions.....	9
2.2 Radiated Electric Field Emissions	10
Configurations.....	11
APPENDIX A - TEST DATA	12
Conducted Voltage Emissions (Quasi-Peak reading)	12
Radiated Electric Field Emissions (Quasi-Peak reading)	18

1.0 General Product Description

This equipment use three invertors as below;

Mfr.: Green C & C, Model: GH027B

Mfr.: DONG IL TECHNOLOGY Ltd., Model: MGP161

Mfr.: Feelux, Model: FLI-15401

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model B15BF.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 358 by 128 by 346 ☒ mm ☐ in
Mobility: ☐ Hand-Held ☒ Table-top ☐ Floor-standing
Serial No.: Not Applicable

1.0.3 Electrical Ratings

Input: 100-240 V ac, 50/60 Hz
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: 120V
Frequency: 60Hz

1.0.5 Clock & Other Frequencies Utilized

78MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

- 1) R101 and R 103 were removed in main board.
- 2) R102 changed to 100 ohm from 22 ohm in main board.
- 3) C101 changed to 5 pF from 10 pF in main board.

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.
PC	Hewlett Packard	DTPC-17	SG01703009
Printer	Hewlett Packard	C4530A	US7A91703J
USB Mouse	PANWEST CHINA LIMITED	Cyber Beetle	PM1F144009941
USB Mouse	PANWEST CHINA LIMITED	Cyber Beetle	PM1F144009915
Serial Mouse	Microsoft	BASM1	4476266-20000
PS/2 Mouse	PANWEST CHINA LIMITED	Cyber Beetle	PM1F184045737
Keyboard	SAN HAWK TECHING CO., LTD	KB120	-
Game Pad	Microsoft	SideWinder™ game pad	03426853
Headset	CAMAC	CMK-C3	-

☒ Cable Description

#	Description	Ferrited	Length (m)	Other Details
1	EUT Power Cable, Unshielded	No	1.8	Connect to AC Power
2	PC Power Cable, Unshielded	No	1.8	Connect to AC Power
3	Printer Power Cable, Unshielded	No	1.8	Connect to AC Power
4	Monitor Cable, Shielded	Yes	1.5	Between EUT and PC
5	Printer Cable, Shielded	Yes	1.5	Between Monitor and PC
6	USB Mouse Cable, Shielded	No	1.8	Between USB Mouse and PC
7	USB Mouse Cable, Shielded	No	1.8	Between USB Mouse and PC
8	Serial Mouse Cable, Shielded	No	1.8	Between Serial Mouse and PC
9	PS/2 Mouse Cable, Shielded	No	1.8	Between PS/2 Mouse and PC
10	Keyboard Cable, Shielded	No	1.5	Between Keyboard and PC
11	Game Pad Cable, Shielded	No	1.8	Between Game Pad and PC
12	Headset Cable, Unshielded	No	3.0	Between Headset and PC
13	Line In Cable, Unshielded	No	1.5	Connect to PC

n/a = not available

1.4 Test Software

☐ Pinging

☒ Name / Manufacturer / Version / Type of Pattern
- EMC Test / Compaq Computer / 1.0 / Scrolling 'H'

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

☒ Resolution / Refresh Rate - 1024 x 768 / 75Hz

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	EMI (CE, RE) EMS (ESD, BURST, RS, Surge, CS, Power-frequency Susceptibility, Voltage Dips and Short Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	 NO-119

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☐ EN 50081-1 /1992

☐ EN 55011 /1998

☐ Group 1

☐ Group 2

☐ Class A

☐ Class B

☐ EN 55013 /A12:1994

☐ EN 55014 /1987

☐ Household appliances and similar

☐ Portable tools

☐ Semiconductor devices

☐ EN 55014 /A2:1990

☐ EN 55014 /1993

☐ Household appliances and similar

☐ Portable tools

☐ Semiconductor devices

☐ EN 55015 /1987

☐ EN 55015 /A1:1990

☐ EN 55015 /1993

☐ EN 55022 /A1:1995

☐ Class A

☐ Class B

☐ EN 55022 /1998

☐ Class A

☐ Class B

☐ EN 61000-3-2 /1995 (EN 60555 Part 2 /4.87)

☐ EN 61000-3-3 /1995 (EN 60555 Part 3 /4.87)

☐ BS

☐ VCCI V-3/99.05 : 1999

☐ Class A

☐ Class B

☒ FCC Part 15 SUBPART B

☐ Class A

☒ Class B

☐ AS 3548 (1992)

☐ Class A

☐ Class B

☐ CISPR 11 (1990)

☐ Group 1

☐ Group 2

☐ Class A

☐ Class B

☒ CISPR 22 (1993)

☐ Class A

☒ Class B

The unit was tested to CISPR 22 and complies with the alternate methods allowed by FCC under paragraphs 15.107 and 15.109.

2.1 Conducted Voltage Emissions

Test Date

April 29, 2002

Test Location

EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde Schwarz	ESHS30	828144/002
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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 9.5dB μ V at 2.42MHz (GH027) minimum margin is 4.9dB μ V at 0.21MHz (MGP161) minimum margin is 8.7dB μ V at 3.60MHz (FLI-15401)
☐ NOT MET	limit exceeded by maximum of ____ dB μ V at ____ MHz
☐ NOT APPLICABLE	

Remarks

See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date

April 29, 2002

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	R & S	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

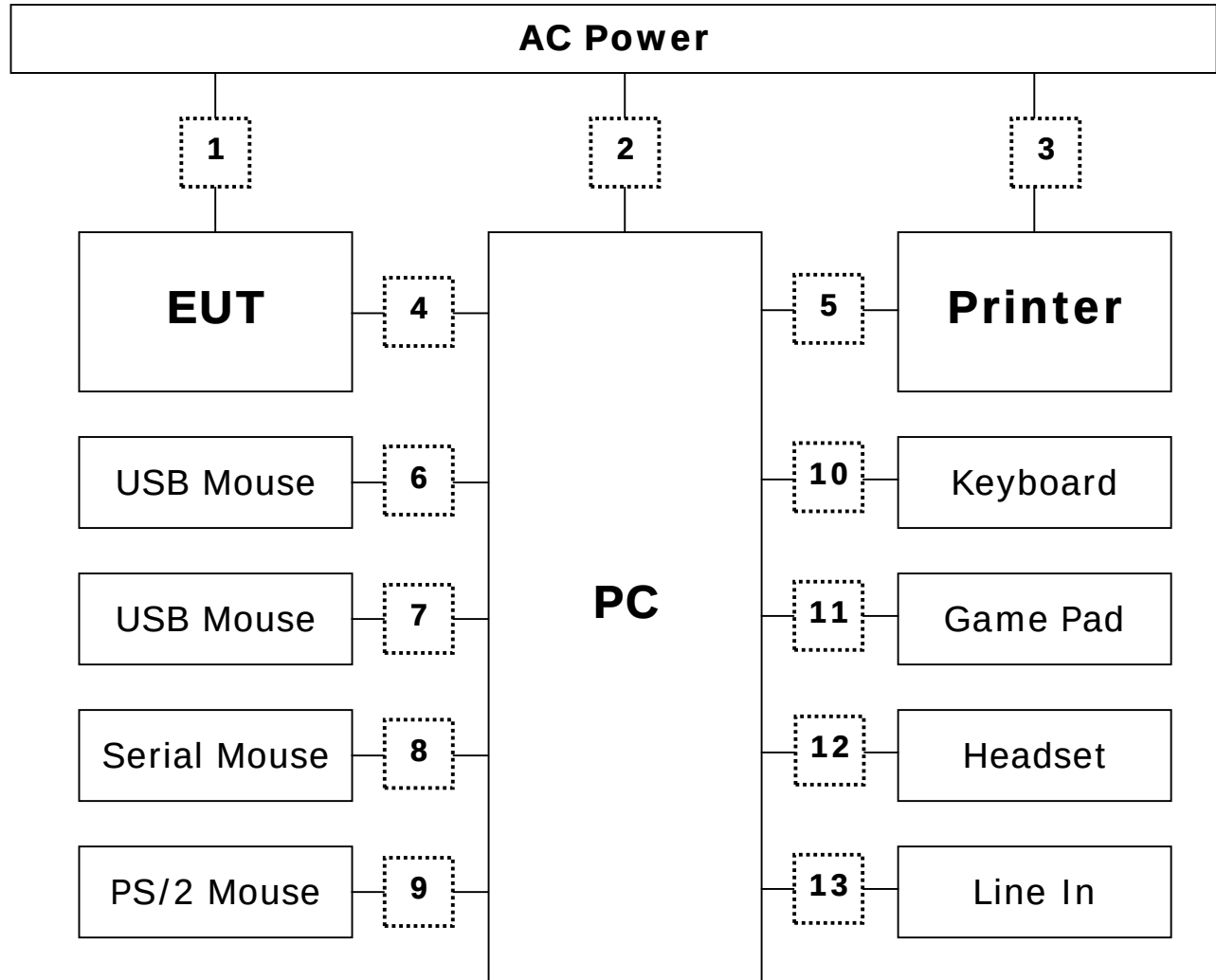
The requirements are:

- ☒ MET minimum margin is 4.9dB ($\mu\text{V/m}$) at 436.24MHz (GH027)
 minimum margin is 3.3dB ($\mu\text{V/m}$) at 436.24MHz (MGP161)
 minimum margin is 4.2dB ($\mu\text{V/m}$) at 145.42MHz (FLI-15401)
☐ NOT MET limit exceeded by maximum of ____ dB($\mu\text{V/m}$) at ____ MHz
☐ NOT APPLICABLE

Remarks

See Appendix A for test data

Configuration



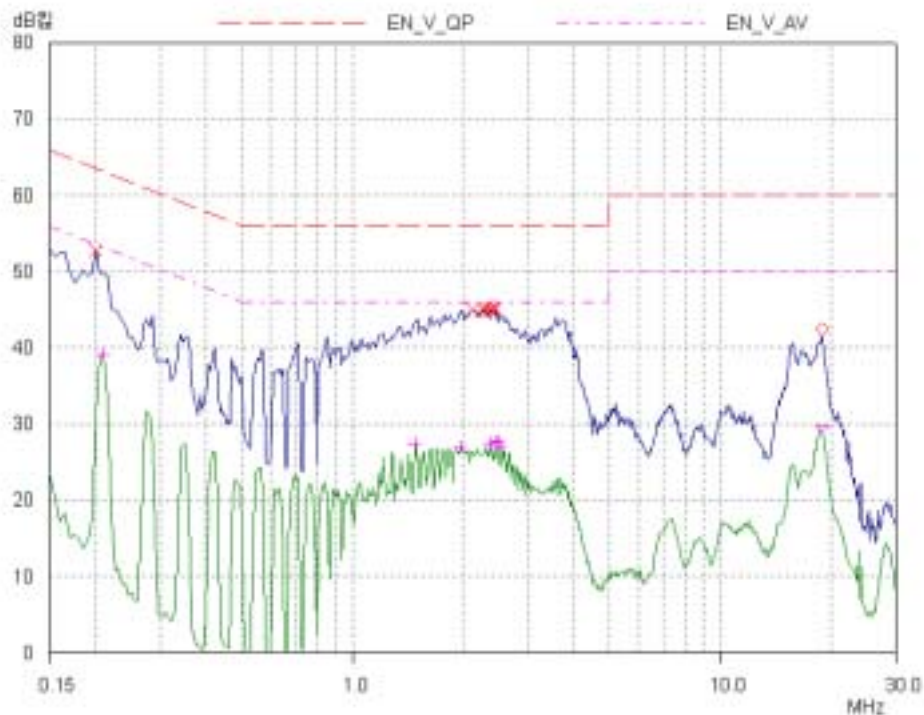
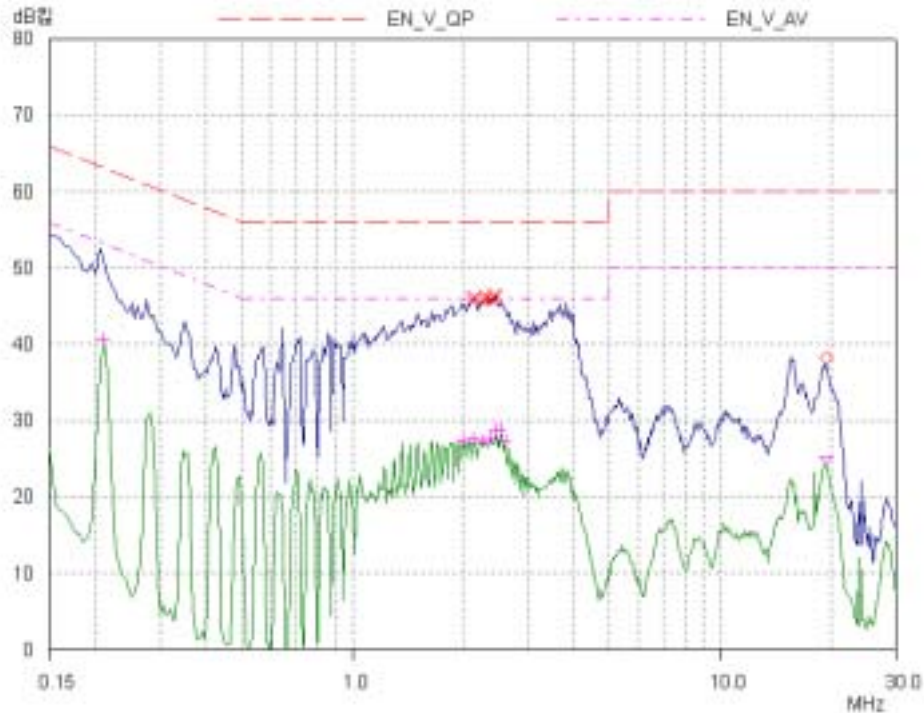
APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

- With Green C & C (GH027B)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.20	2.3	0.1	N	63.6	50.4	52.7	10.9	53.2	36.7	39.1	14.1
0.21	2.3	0.1	N								
2.11	0.3	0.1	N	56.0	44.5	44.9	11.1				
2.13	0.3	0.1	L	56.0	45.4	45.8	10.2				
2.15	0.3	0.1	L	56.0	45.8	46.2	9.8				
2.24	0.3	0.1	N	56.0	44.6	45.0	11.1				
2.27	0.3	0.1	N	56.0	44.7	45.1	10.9				
2.28	0.3	0.1	L	56.0	45.4	45.8	10.2				
2.30	0.3	0.1	L	56.0	45.8	46.2	9.8				
2.35	0.3	0.1	N	56.0	44.6	45.0	11.0				
2.38	0.3	0.1	L	56.0	45.5	45.9	10.2				
2.39	0.3	0.1	N	56.0	44.5	44.9	11.1				
2.40	0.3	0.1	L	56.0	45.6	46.0	10.0				
2.41	0.3	0.1	N	56.0	44.7	45.1	10.9				
2.42	0.3	0.1	L	56.0	46.1	46.5	9.5				
2.44	0.3	0.1	L	56.0	45.9	46.3	9.7				

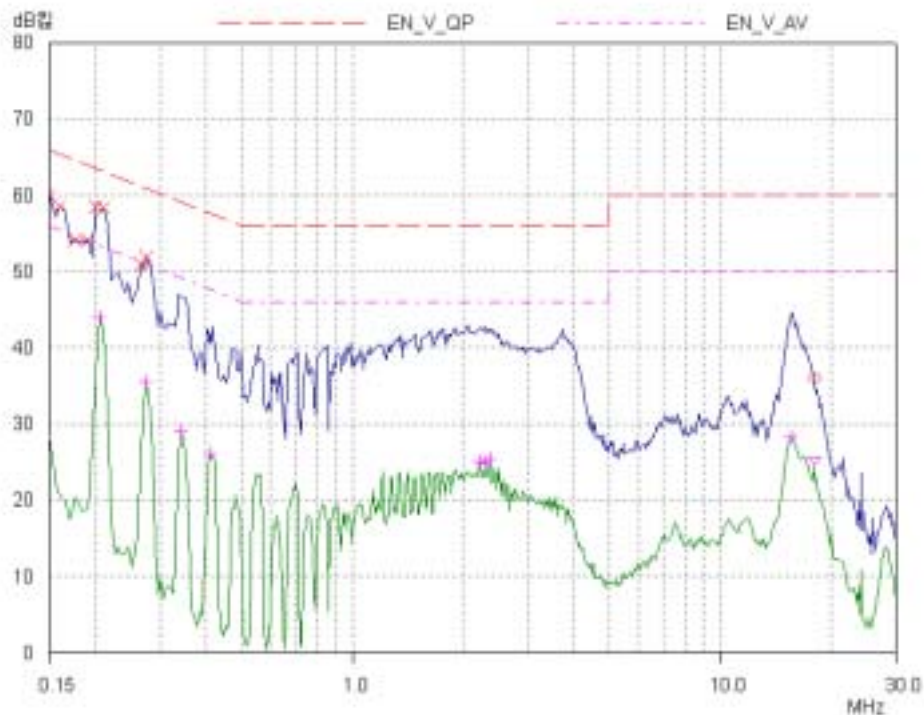
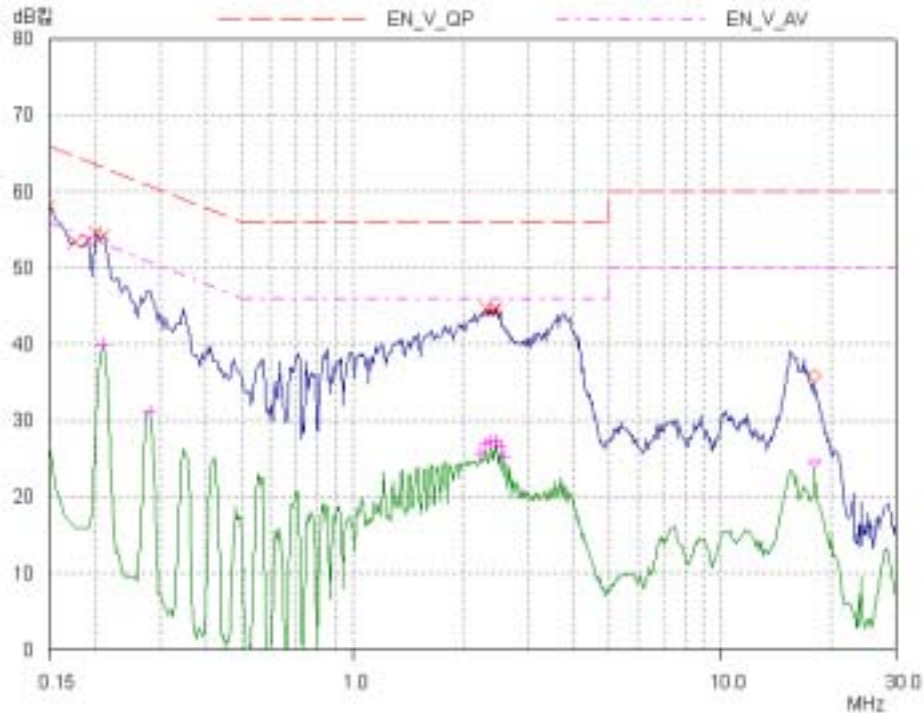
- With Green C & C (GH027B)



- With DONG IL TECHNOLOGY Ltd (MGP161)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.15	3.0	0.1	N	66.0	57.0	60.1	5.9				
0.15	3.0	0.1	L	66.0	55.0	58.1	7.9				
0.16	3.0	0.1	N	65.5	55.5	58.6	6.9				
0.18	3.0	0.1	N	64.7	51.1	54.2	10.5				
0.18	3.0	0.1	L	64.7	50.4	53.5	11.3				
0.19	2.3	0.1	N	64.0	51.7	54.0	10.0				
0.19	2.3	0.1	L	64.0	51.3	53.6	10.4				
0.20	2.3	0.1	N	63.6	56.2	58.5	5.1				
0.20	2.3	0.1	L	63.6	52.3	54.6	9.0				
0.21	2.3	0.1	L	63.2	51.9	54.2	9.0	53.2	37.5	39.9	13.3
0.21	2.3	0.1	N	63.2	56.0	58.4	4.9				
0.27	1.5	0.1	N	61.3	49.2	50.9	10.4				
0.28	0.8	0.1	N	61.0	51.0	51.9	9.1	51.0	34.7	35.6	15.4
2.29	0.3	0.1	L	56.0	44.2	44.6	11.4				
2.40	0.3	0.1	L	56.0	44.2	44.6	11.5				
2.44	0.3	0.1	L	56.0	44.2	44.6	11.4	46.0	26.9	27.3	18.7

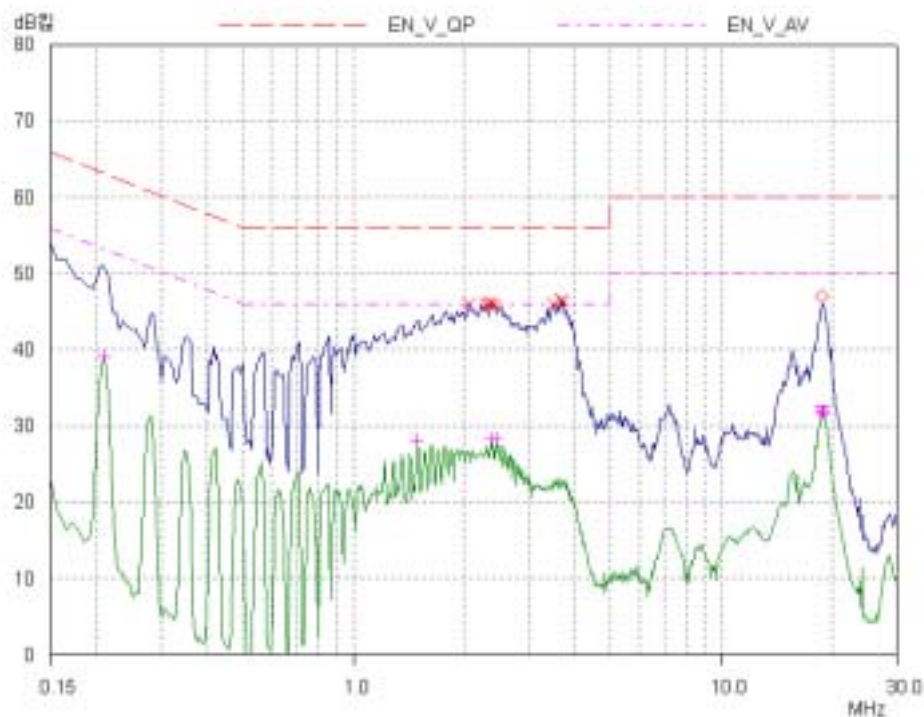
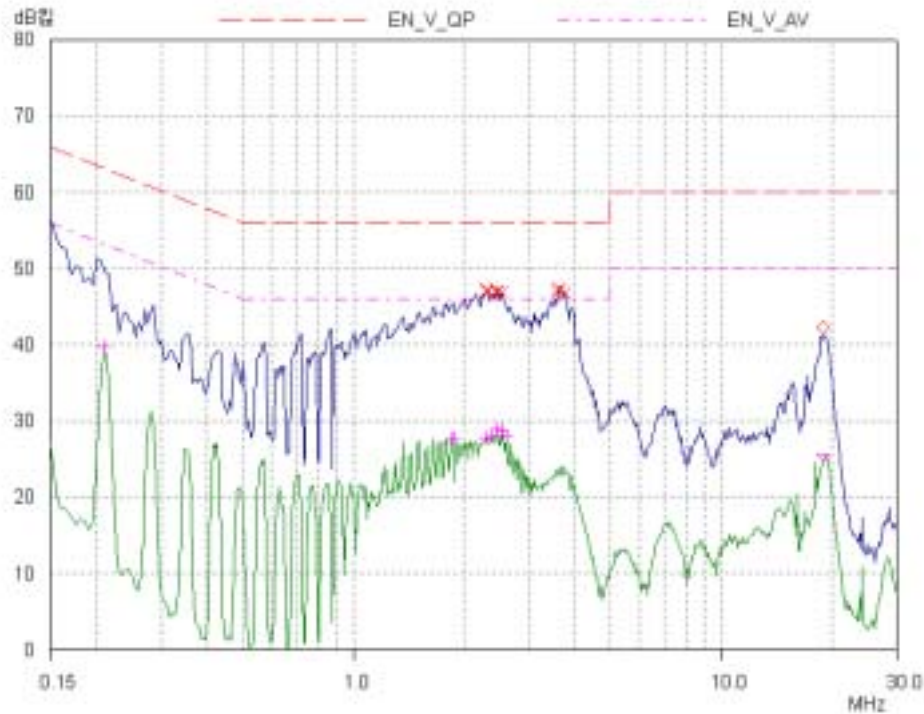
- With DONG IL TECHNOLOGY Ltd (MGP161)



- With Feelux (FLI-15401)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.21	2.3	0.1	N					53.2	36.8	39.1	14.1
2.07	0.3	0.1	N	56.0	45.6	46.0	10.0				
2.27	0.3	0.1	N	56.0	45.5	45.9	10.1				
2.29	0.3	0.1	L	56.0	46.5	46.9	9.1				
2.30	0.3	0.1	L	56.0	46.7	47.1	8.9				
2.33	0.3	0.1	N	56.0	45.4	45.8	10.2				
2.35	0.3	0.1	N	56.0	45.8	46.2	9.8				
2.40	0.3	0.1	N	56.0	45.5	45.9	10.1				
2.43	0.3	0.1	L	56.0	46.7	47.1	8.9				
2.44	0.3	0.1	L	56.0	46.7	47.1	8.9				
2.50	0.3	0.1	L	56.0	46.4	46.8	9.2				
3.48	0.3	0.1	N	56.0	45.5	45.9	10.1				
3.58	0.3	0.1	L	56.0	46.6	47.0	9.0				
3.60	0.3	0.1	L	56.0	46.9	47.3	8.7				
3.65	0.3	0.1	N	56.0	46.0	46.4	9.6				
3.74	0.3	0.1	L	56.0	46.5	46.9	9.2				

- With Feelux (FLI-15401)3



Radiated Electric Field Emissions (Quasi-Peak reading)

- With Green C & C (GH027B)

[illegible]

- With DONG IL TECHNOLOGY Ltd (MGP161)

[illegible]

- With Feelux (FLI-15401)

[illegible]