ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: E06NR-053**
AGR No.	**: A06NA-142**
Applicant	**: LG Electronics Inc.**
Address	**: 19-1 Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea**
Manufacturer	**: LG Electronics Inc.**
Address	**: 19-1, cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do Korea**
Type of Equipment	**: PDA with Bluetooth**
FCC ID.	**: BEJPDA-L05C-BT**
Model Name	**: HSTNH-L05C-BT**
Serial number	**: N/A**
Total page of Report	**: 19 pages (including this page)**
Date of Incoming	**: November 17, 2006**
Date of issue	**: November 22, 2006**

SUMMARY

The equipment complies with the regulation; **FCC Part 15 Subpart C Section 15.247.**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by: Young-Min, Choi / Senior Engineer
EMC Div.
ONETECH Corp.

Reviewed by: Y. K. Kwon / Director
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1. VERIFICATION OF COMPLIANCE

APPLICANT	: LG Electronics Inc.
ADDRESS	: 19-1 Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea
CONTACT PERSON	: Mr. Jonghoon Park / Chief Engineer
TELEPHONE NO	: +82-31-610-5335
FCC ID	: BEJPDA-L05C-BT
MODEL NAME	: HSTNH-L05C-BT
SERIAL NUMBER	: N/A
DATE	: November 22, 2006

EQUIPMENT CLASS	***DSS – PART 15 SPREAD SPECTRUM TRANSMITTER***
KIND OF EQUIPMENT	PDA with Bluetooth
THIS REPORT CONCERNS	CLASS II Permissive Change
MEASUREMENT PROCEDURES	ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None
FINAL TEST WAS CONDUCTED ON	3 METER(S) OPEN AREA TEST SITE

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (1)	Carrier Frequency Separation	Met the Limit / See Note 1
15.247 (a) (1) (iii)	Minimum Number of Hopping Channels	Met the Limit / See Note 1
15.247 (a) (1) (iii)	Average Time of Occupancy	Met the Limit / See Note 1
15.247 (a) (2)	Minimum 6dB Bandwidth	Met the Limit / See Note 1
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / See Note 1
15.247 (b) (5)	Radio Frequency Exposure Level	Met the Limit / PASS
15.247 (c)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (c)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (d)	Peak Power Spectral Density	Met the Limit / See Note 1
15.209 and 15.109	Radiated Emission Limits, General Requirement	Met the Limit / PASS
15.207 and 15.107	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

Note 1. The Equipment under Test was approved on November 02, 2004, but the gain of the antenna for Bluetooth portion was changed only, so the test was not performed.

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

CLASS II Permissive Change;

-. The used antenna type and module for WLAN and Bluetooth shall be same, but only the gain was changed as below.

Changed Item (s)	OLD Antenna		NEW Antenna	
	Antenna Type	Gain (dBi)	Antenna Type	Gain (dBi)
Antenna for Bluetooth	PIFA Antenna	-3.25	PIFA Antenna	-0.8

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2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4: 2003 at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The Electromagnetic compatibility measurement facilities are located on at 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Federal Communications Commission on August 31, 2005 (Registration Number: 92819 and 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.

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3. GENERAL INFORMATION

3.1 Product Description

The LG Electronics Inc., Model HSTNH-L05C-BT (referred to as the EUT in this report) is a PDA with Bluetooth, which has a function of battery charging and data uploading/downloading by USB cable. This report is for Bluetooth function. And the report for the Peripheral Device for Class B Computing Device will be issued by other report. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	PDA with Bluetooth
OPERATING FREQUENCY	2402~2480 MHz
RF OUTPUT POWER	1.83 dBm
NUMBER OF CHANNEL	79 Channels
MAX. DATA TRANSFER RATE	0.7 Mbps
MODULATION TYPE	GFSK
USED MODULE	MFR: Texas Instrument, Model No: BRF6150
USED ANTENNA	MFR.: WP Wireless., Model No.: WPANTPIFA013A
ANTENNA CONNECTOR TYPE	PIPA Type
ANTENNA GAIN	-0.8 dBi
LIST OF EACH OSC. OR CRYSTAL. FREQ.(FREQ.>=1MHz)	50 MHz,100 MHz, 19.2 MHz and 6.4 MHz
NUMBER OF LAYER	10 Layers
POWER REQUIREMENT	DC 5V, 2A from an AC/DC Adaptor Model Name: PSC11R-050, MFR: PHIHONG TECHNOLOGY CO., LTD. Rechargeable Lithium-ion 3.7V

Remark. The data for RF output power was obtained by the test report, which was issued by Compliance Certification Services.

3.2 Alternative type(s)/model(s); also covered by this test report.

No other model differences have been mentioned.

4. EUT MODIFICATIONS

None

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5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	LG Electronics	PN6870BU100AA	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
HSTNH-L05C-BT	LG Electronics Inc.	BEJPDA-L05C-BT	PDA with Bluetooth (EUT)	PC
PP01L	Dell Computer Corp.	DoC	PC	-
MO56UOA	Dell Computer Corp.	DoC	Mouse	PC

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting and receiving mode is programmed. For final testing, Bluetooth was set at Low Channel (2402MHz), Middle Channel (2441MHz), and High Channel (2480MHz). To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

5.4 Configuration of Test System

Line Conducted Test: The power cord of the EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power lines Conducted Emission tests were performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

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5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The transmitter antenna of the EUT is installed inside of the EUT, so no consideration of replacement by the user.

6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Stand-by mode	
Charging mode	
TX mode	X

6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Stand-by mode	
Charging mode	
TX mode	X

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7. TEST DATA FOR BLUETOOTH MODE

7.1 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

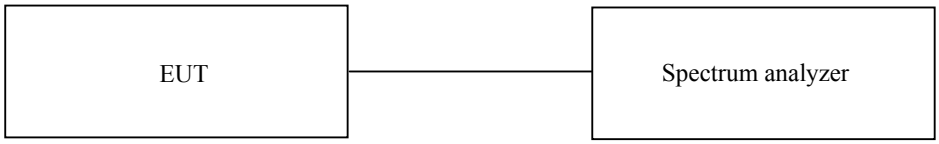
7.1.1 Operating environment

Temperature : 25°C

Relative humidity : 51 %

7.1.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



7.1.3 Test data

Please refer to test report, report no: 04I2825-1 on July 29, 2004, which was issued by the Compliance Certification Services.

7.1.4 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3meters, open-field test site. The EUT was placed on a non-conductive turntable approximately 0.8 meters above the ground plane. The frequency spectrum from 30MHz to 25GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

7.1.5 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	8564E	Hewlett-Packard	Spectrum Analyzer	3650A00756	June 22, 2006
■ -	8447D	Hewlett-Packard	Amplifier	2727A04987	June 14, 2006
□ -	83051A	Agilent	Preamplifier	3950M00201	June 23, 2006
■ -	F-40-5000-RF	RLC Electronics	Highpass Filter	0425	July 14, 2006
■ -	MA220	HD	Turn Table	N/A	N/A
■ -	HD240	HD	Antenna Mast	N/A	N/A
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D294	July 03, 2006
■ -	YSE 500B	YoungShin Eng.	Frequency Converter	950413001	N/A
■ -	ETCR-10	DaeHa	Automatic Voltage Com.	N/A	N/A

All test equipment used is calibrated on a regular basis.

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7.1.6. Test data

7.1.6.1. Radiated Emission which fall in the Restricted Band

-. Test Date : November 20, 2006
-. Resolution bandwidth : 1 MHz for Peak and Average Mode
-. Video bandwidth : 1 MHz for Peak Mode, 10Hz for Average Mode
-. Frequency range : 1 GHz ~ 25GHz
-. Measurement distance : 1m
-. Operating Condition : Low / High Channel
-. Result : PASSED

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Low Channel										
2389.87	35.83	Peak	H	27.64	1.33	26.1		38.70	74.00	-35.30
	26.17	Average	H					29.04	54.00	-24.96
	36.17	Peak	V					39.04	74.00	-34.96
	26.67	Average	V					29.54	54.00	-24.46
Test Data for High Channel										
2483.53	35.00	Peak	H	27.59	1.33	26.1		37.82	74.00	-36.18
	26.50	Average	H					29.32	54.00	-24.68
	42.50	Peak	V					45.32	74.00	-28.68
	28.00	Average	V					30.82	54.00	-23.18

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

Tested by: Ki-Hong, Nam / Test Engineer

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7.1.6.2. Spurious & Harmonic Radiated Emission

-. Test Date : November 20, 2006
-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
-. Video bandwidth : 1 MHz for Peak Mode, 10Hz for Average Mode
-. Frequency range : 1 GHz ~ 25 GHz
-. Measurement distance : 1m
-. Result : PASSED

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for Low Channel										
2402.00	56.00	Peak	H	27.30	1.50			84.80	-	
	57.00	Peak	V					85.80	-	
4804.00*	33.83	Peak	H	31.60	3.30	26.10		42.63	74.00	-31.37
	24.33	Average	H					33.13	54.00	-20.87
	33.33	Peak	V					42.13	74.00	-31.87
	24.17	Average	V					32.97	54.00	-21.03
Other frequencies were not observed up to 25 GHz.										
Test Data for Middle Channel										
2441.00	56.33	Peak	H	27.42	1.50			85.25	-	
	57.50	Peak	V					86.42	-	
4882.00*	33.67	Peak	H	31.74	3.38	26.10		42.69	74.00	-31.31
	25.50	Average	H					34.52	54.00	-19.48
	32.50	Peak	V					41.52	74.00	-32.48
	25.00	Average	V					34.02	54.00	-19.98
Other frequencies were not observed up to 25 GHz.										

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical, “*” Frequency fall in restricted band

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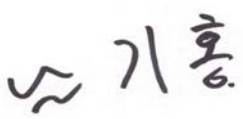
-Continued

Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Dist. Factor	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Test Data for High Channel										
2480.00	56.33	Peak	H	27.53	1.50			85.36	-	
	57.67	Peak	V					86.70	-	
4960.00*	34.83	Peak	H	31.87	3.46	26.10		44.06	74.00	-29.94
	25.83	Average	H					35.06	54.00	-18.94
	35.17	Peak	V					44.40	74.00	-29.60
	26.17	Average	V					35.40	54.00	-18.60
Other frequencies were not observed up to 25 GHz.										

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical, “*” Frequency fall in restricted band



Tested by: Ki-Hong, Nam / Test Engineer

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8. RADIO FREQUENCY EXPOSURE

8.1 RF Exposure Limit

According to the FCC rule §1.1310, the limit for General Population/Uncontrolled exposure is 1mW/cm² for the device operating 1,500~100,000 MHz.

8.2 EUT Description

Kind of EUT	PDA with Bluetooth
Operating Frequency Band	☐ WLAN: 2412 ~ 2462 MHz ☐ WLAN: 5180 ~ 5320 MHz / 5500 ~ 5700 MHz ☐ WLAN: 5745 ~ 5825 MHz ■ Bluetooth: 2402 ~ 2480 MHz
Device Category	■ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☐ Others
Max. Output Power	1.52 mW
Used Antenna	MFR.: WP Wireless., Model No.: WPANTPIFA013A
Used Antenna Gain	Bluetooth: -0.8 dBi
Exposure Evaluation Applied	☐ MPE ☐ SAR ■ N/A

8.3 Test Result

According to the rule, §1.1307(b) (1) and §2.1093, PORTABLE devices using WLAN and Bluetooth technology according to §15.247 are exempt from the regulation.

So, the device meets the RF exposure requirement.

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9. RADIATED EMISSION TEST, GENERAL REQUIREMENT

9.1 Operating environment

Temperature : 15 °C

Relative humidity : 57 %

9.2 Test set-up

The radiated emissions measurements were on the 3 meters, open-field test site. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30MHz to 1000MHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

9.3 Measurement uncertainty

Radiated emission electric field intensity, 30 MHz ~ 300 MHz : ± 4.43 dB

Radiated emission electric field intensity, 300 MHz ~ 1000 MHz : ± 3.80 dB

Measurement uncertainty is calculated in accordance with WECC 19-1990. The measurement uncertainty is given with a confidence of 95% with the coverage factor, k=2.

9.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESVS10	Rohde & Schwarz	EMI Test Receiver	827864/005	Dec 20, 2005
■ -	MA240	HD GmbH	Antenna Master	N/A	N/A
■ -	HD100	HD GmbH	Position Controller	N/A	N/A
■ -	DS420S	HD GmbH	Turn Table	N/A	N/A
■ -	VHA9103	Schwarzbeck	Biconical Antenna	91031852	Feb 13, 2006
■ -	9108-A(494)	Schwarzbeck	Log Periodic Antenna	62281001	Feb 13, 2006

All test equipment used is calibrated on a regular basis.

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9.5 Test data

-. Test Date : November 20, 2006

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30MHz ~ 1000MHz

-. Measurement distance : 3m

-. Operating Condition : Tx Mode

-. Test result : Passed by -7.43 dB at 701.55 MHz

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
241.50	13.10	H	17.04	3.40	33.54	46.02	-12.48
258.70	14.60	H	17.28	3.54	35.42	46.02	-10.60
447.72	12.40	H	18.17	4.89	35.46	46.02	-10.56
675.40	10.10	V	21.85	6.25	38.20	46.02	-7.82
701.55	9.80	V	22.38	6.41	38.59	46.02	-7.43
727.70	10.50	V	22.46	6.51	39.47	46.02	-6.55

Tabulated test data for Radiated Electromagnetic Field

Remark: “H”: Horizontal, “V”: Vertical

Tested by: Ki-Hong, Nam / Test Engineer

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10. CONDUCTED EMISSION TEST

10.1 Operating environment

Temperature : 20°C

Relative humidity : 46 %

10.2 Test set-up

The EUT was placed on a wooden table, 0.8 meters height above the floor. The power of the EUT was connected through a 50 ohm/ 50 uH Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

10.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	May 15, 2006
■ -	NSLK 8126	Schwarzbeck	AMN	8126-404	July. 04, 2006
□ -	3825/2	EMCO	AMN	9109-1867	June 23, 2006

All test equipment used is calibrated on a regular basis.

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10.4 Test data

-. Type of Test : FCC Class B

-. Test Date : November 20, 2006

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

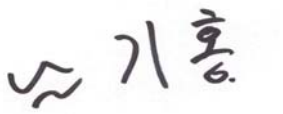
-. Test Result : PASSED BY –10.24dB at 1.77 MHz under peak mode

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Limits		Emission level	Limits	
0.25	N	43.97	61.76	-17.79	35.10	51.76	-16.66
0.50	N	41.19	56.00	-14.81	23.77	46.00	-22.23
0.76	N	38.42	56.00	-17.58	20.29	46.00	-25.71
1.52	N	38.61	56.00	-17.39	24.76	46.00	-21.24
1.77	N	45.76	56.00	-10.24	29.67	46.00	-16.33
1.91	H	37.95	56.00	-18.05	17.83	46.00	-28.17

Line Conducted Emissions Tabulated Data

Remark : “H”: Hot Line, “N”: Neutral line

See next page for an overview sweep performed with peak and average detector modes.



Tested by: Ki-Hong, Nam / Test Engineer

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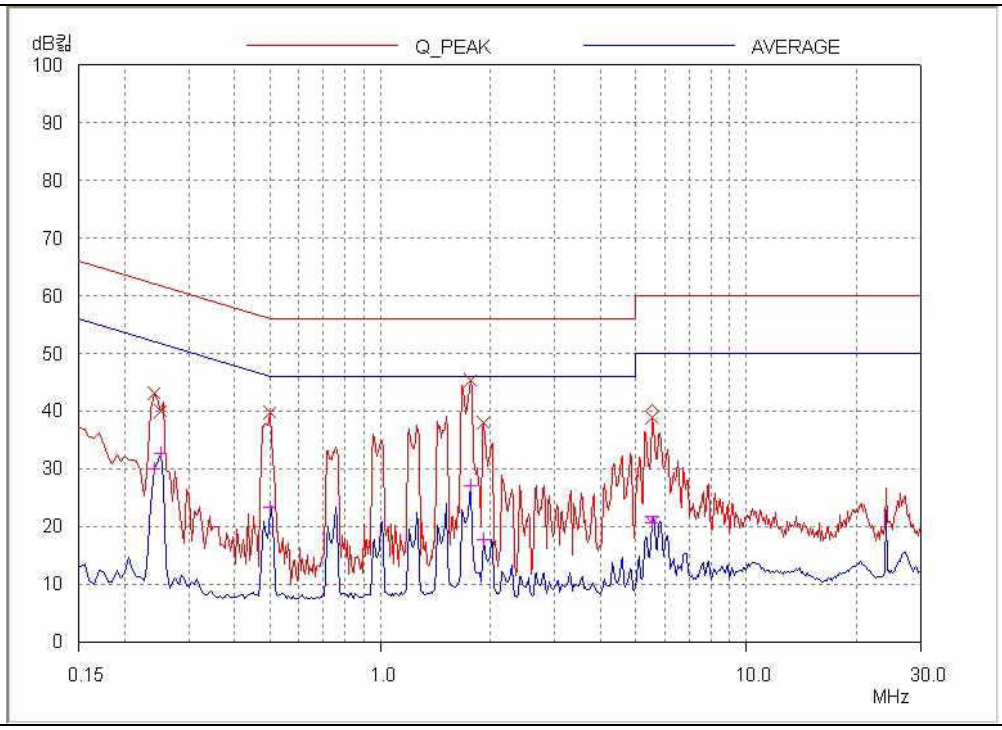
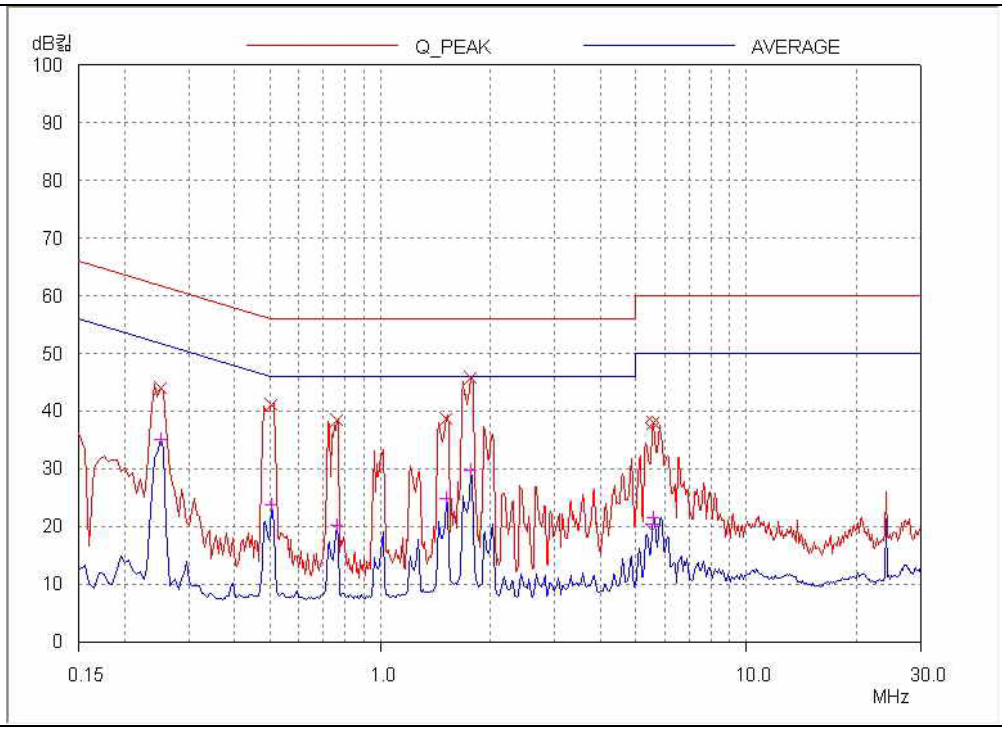


HOT LINE



NEUTRAL LINE

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