

## ***FCC EVALUATION REPORT FOR CERTIFICATION***

**Applicant: LG Electronics Inc.**

**19-1, Cheongho-ri, Jinwi-myeon,**

**Pyeongteak-si, Gyeonggi-do, Korea.**

**Attn: Mr. Do-Hyung Kim, Chief research engineer**

**Date of Issue: January 3, 2013**

**Order Number: GETEC-C1-12-389**

**Test Report Number: GETEC-E3-12-148**

**Test Site: GUMI COLLEGE EMC CENTER**

**FCC Registration Number: (100749, 443957)**

**FCC ID. : BEJHECTONA**

**Applicant : LG Electronics Inc.**

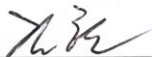
<b>Rule Part(s)</b>	<b>: FCC Part 15 Subpart B</b>
<b>Equipment Class</b>	<b>: Class B computing device peripheral (JBP)</b>
<b>EUT Type</b>	<b>: LASER TV</b>
<b>Type of Authority</b>	<b>: Certification</b>
<b>Model Name</b>	<b>: HECTO-NA</b>
<b>Trade Name</b>	<b>: LG</b>

**This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2009 / Canadian standard ICES-003**

**I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the vest 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.**

**Tested by,**

**Reviewed by,**



**Hyun Kim, Engineer**  
**GUMI COLLEGE EMC CENTER**



**Jae-Hoon Jeong, Senior Engineer**  
**GUMI COLLEGE EMC CENTER**





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

## 1. General Information

**Applicant: LG Electronics Inc.**

**Applicant Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.**

**Manufacturer: LG Electronics Inc.**

**Manufacturer Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.**

**Contact Person: Mr. Do-Hyung Kim, Chief research engineer**

**Tel Number: +82-31-610-9623**

● <b>FCC ID.</b>	BEJHECTONA
● <b>EUT Type</b>	LASER TV
● <b>Model Name</b>	HECTO-NA
● <b>Trade Name</b>	LG
● <b>Serial Number</b>	Prototype
● <b>Rule Part(s)</b>	FCC Part 15 Subpart B
● <b>Type of Authority</b>	Certification
● <b>Test Procedure(s)</b>	ANSI C63.4 (2009) / Canadian standard ICES-003
● <b>Dates of Test</b>	December 16 ~ 19, 2012
● <b>Place of Test</b>	<b>GUMI COLLEGE EMC CENTER</b> (FCC Registration Number: 100749, 443957) 37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 730-711, Republic of Korea
● <b>Test Report Number</b>	GETEC-E3-12-148
● <b>Dates of Issue</b>	January 3, 2013





## 2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2009) was used in determining radiated and conducted emissions emanating from **LG Electronics Inc.**

### **LASER TV (Model Name: HECTO-NA)**

These measurement tests were conducted at **GUMI COLLEGE EMC CENTER**

The site address is 37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 730-711, Republic of Korea.

This test site is one of the highest point of Gumi 1 college at about 200 km away from Seoul city and 40 km away from Daegu city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 (2009)

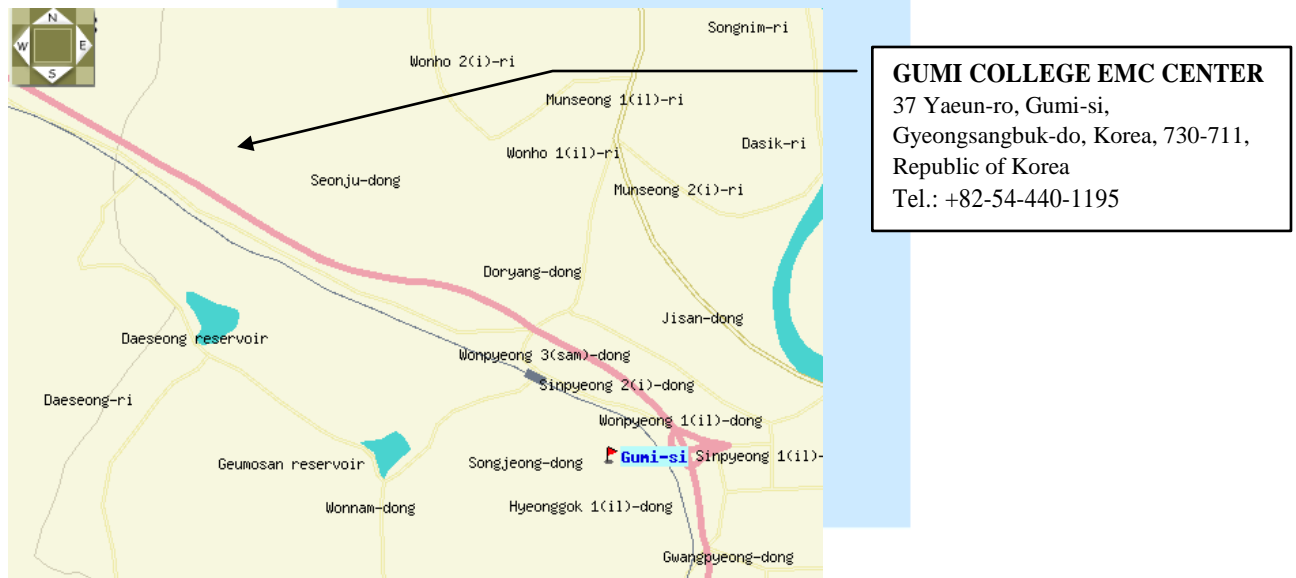


Fig 1. The map above shows the Gumi College in vicinity area.






### 3. Product Information

#### 3.1 Description of EUT

The Equipment under Test (EUT) is the **LG Electronics Inc.**  
**LASER TV(Model Name: HECTO-NA) FCC ID.: BEJHECTONA**

MODELS	HECTO-NA	
Resolution (Pixel)	1920 (Horizontal) × 1080 (Vertical)	
Aspect ratio	16:9 (Horizontal:Vertical)	
Panel size (mm)	14.515	
Projection distance (Video size)	0.53 m (2.54m)	
Ratio of upward projection	123 %	
Working range of the remote control	6 m	
Video input	NTSC, ATSC	
AC-DC Adaptor	19.5 V  , 4.62 A (Adaptor Input 100 ~ 240 @ 50 Hz/60 Hz)	
Audio Output	1 W + 1 W	
Television System	DTV-ATSC / TV-NTSC	
Program Coverage	VHF 2 - 13, UHF 14 - 69, CATV 1 - 135, DTV 2 - 69, CADTV 1 - 135	
External Antenna Impedance	75 Ω (VHF/ UHF)	
Height (mm)	145 (without foot), 156.1 (with foot)	
Width (mm)	546.3	
Depth (mm)	406.6	
Weight (g)	14.1	
USB Device	5 V, 0.5 A (Max.)	
Operation environment	<b>Temperature</b>	
	Operation	0 °C - 40 °C
	Storage	-20 °C - 60 °C
	<b>Relative Humidity</b>	
	Operation	0 % - 80 %
	Storage	0 % - 85 %

- Maximum Frequency Range : 900 MHz





### 3.2 Support Equipment / Cables used

#### 3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC(Main board)	ASROCK	770iCafe	S/N: 0AM0X3097310 FCC ID.: DoC
Video card	Rextechnology Co., Ltd.	HD4850	S/N: L0H041947 FCC ID.: DoC
PS2 keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
USB mouse	Microsoft Corporation	1484	S/N: 0352700289761 FCC ID.: DoC
USB memory stick	SAMSUNG	SUM-PSB4	S/N: TBBB202478F FCC ID.: DoC
DVD player	ILIKE ELECTRONICS CO., LTD.	CVX-3800 Full-HD	S/N: CVX380020110110493 FCC ID.: Verification
TV Test Transmitter	Rohde & Schwarz	SFQ	S/N: 100563 FCC ID: DoC
Headphone	PHILIPS	SBC HL140	S/N: None. FCC ID.: N/A

See "Appendix D – Test Setup Photographs" for actual system test set-up

#### 3.2.2 System configuration

Description	Manufacturer	Model Name	S/N & FCC ID.
Bluetooth module	LG Electronics Inc.	BM-LDS302	S/N: None FCC ID.: BEJLDS302
Wi-Fi module	LG Electronics Inc.	TWFM-B003D	S/N: None. FCC ID.: BEJTWFM-B003D
Motion remote controller	LG Electronics Inc.	AN-MR300J	S/N: None. FCC ID.: BEJMR3007
IR remote controller	LG Electronics Inc.	AKB73756543	S/N: None. FCC ID.: N/A





### 3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.00 m unshielded
RGB(Analog) in cable	Connected to the EUT and PC	1.50 m shielded
HDMI(Digital) in cable	Connected to the EUT and PC	1.80 m shielded
Audio in cable	Connected to the EUT and PC	1.50 m shielded
RS232C in cable	Connected to the EUT and PC	1.80 m shielded
Trigger in cable	Connected to the EUT and PC	1.50 m shielded
RJ45 in cable	Connected to the EUT and PC	1.80 m unshielded
HDMI in cable	Connected to the EUT and DVD player	1.80 m shielded
Component in cable	Connected to the EUT and DVD player	3.00 m shielded
AV in cable	Connected to the EUT and DVD player	3.00 m shielded
Antenna in cable	Connected to the EUT and TV test transmitter	10.00 m shielded with two ferrite cores
Headphone cable	Connected to the EUT and headphone	1.20 m shielded

### 3.3 Modification Item(s)

- None





## 4. Description of tests

### 4.1 Test Condition

The EUT was installed, arranged and operated in a manner that is most representative of equipment as typically used. The measurements were carried out while varying operating modes and cable positions within typically arrangement to determine maximum emission level.

The representative and worst test mode(s) were noted in the test report.

The test conditions of the noted test mode(s) in this test report are;

- Test Voltage / Frequency : AC 120 V / 60 Hz
- Test Mode(s)
  - **Projection resolution mode**
    - 1 920 × 1 080 / 60 Hz (RGB: Analog, HDMI: Digital)
  - **Operating test pattern**
    - “H” character scrolling mode (Font size: 10)
    - Black background white character
    - Brightness and contrast was adjusted as maximum level
    - Continuous playback of 1 kHz audio file with winamp player
    - USB memory stick was connected to the USB port

*“The verification report for TV/AV mode would be issued by LG Electronics Inc.”*





## 4.2 Conducted Emission

The Line conducted emission test facility is inside a 4 m × 8 m × 2.5 m shielded enclosure. (FCC Registration No.: 100749)

The EUT was placed on a non-conducting 1.0 m by 1.5 m table, which is 0.8 m in height and 0.4 m away from the vertical wall of the shielded enclosure.

The EUT is powered from the Rohde & Schwarz LISN (ESH2-Z5) and the support equipment is powered from the Rohde & Schwarz LISN (ESH3-Z5). Powers to the LISN are filtered by high-current high insertion loss power line filter.

Sufficient time for 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 (Rohde & Schwarz, ESCS30).

Exploratory measurements were conducted to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.

Based on exploratory measurements, the final measurements were conducted at the worst test conditions.

Exploratory measurements were scanned using Peak mode of EMI Test receiver from 150 kHz to 30 MHz with 20 ms sweep time. The final measurements were measured with Quasi-Peak and Average mode.

The bandwidth of EMI Test Receiver was set to 9 kHz. Interface cables were connected to the available interface ports of the test unit. Excess cable lengths were bundled at center with 30 cm ~ 40 cm.

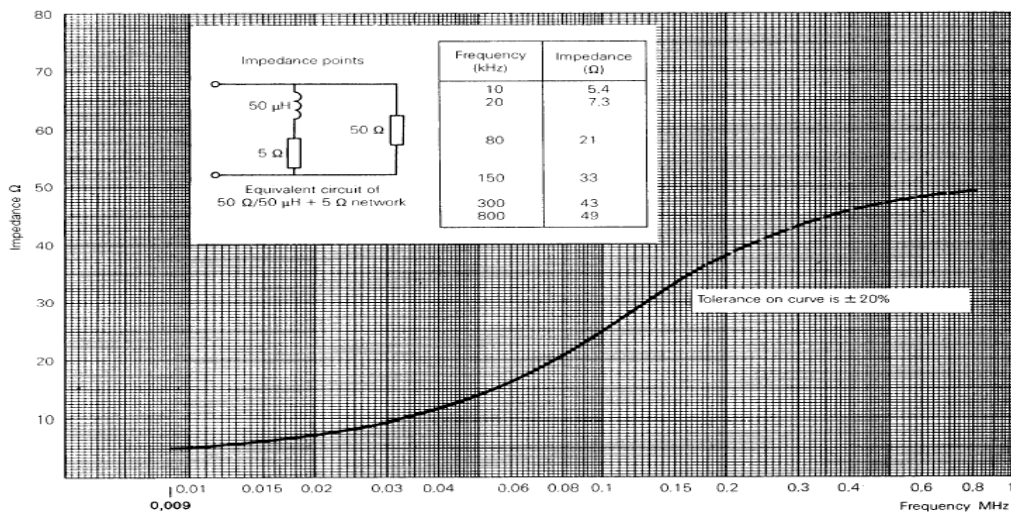


Fig 2. Impedance of LISN





### 4.3 Radiated Emission

Exploratory Radiated measurements were conducted at the 3m semi anechoic chamber in order to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.

Based on exploratory measurements, the final measurements were conducted at the worst test conditions.

Final measurements of below 1GHz were made at 3m Chamber (FCC Registration No.: 443957) or Open area test site (FCC Registration No.: 100749) that complies with CISPR 16/ANSI C63.4.

Above 1GHz final measurements were conducted at the 3m Chamber (FCC Registration No.: 443957) only.

For measurements above 1GHz, the bottom side of 3m chamber was installed with absorbers in order to meet SVSWR Limit.

Exploratory measurements were scanned using Peak mode of EMI Test receiver and final measurements were measured with Quasi-Peak mode (Below 1GHz) and Peak & Average mode (Above 1GHz).

The measurements were performed by rotating the EUT 360° and adjusting the receive antenna height from 1.0 m to 4.0 m. All frequencies were investigated in both horizontal and vertical antenna polarity.

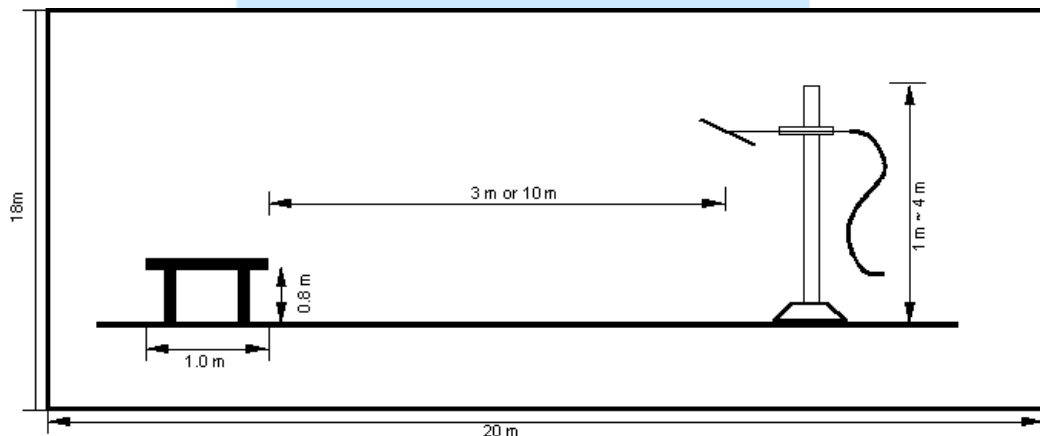


Fig 3. Dimensions of test site (Below 1GHz)

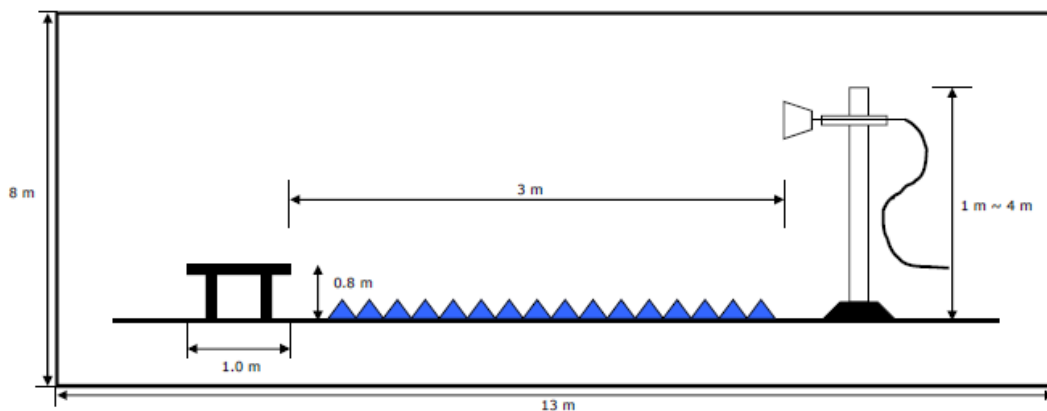


Fig 4. Dimensions of test site (Above 1GHz)





## 5. Conducted Emission

### 5.1 Operating Environment

Temperature : 24.0 °C  
Relative Humidity : 42.0 % R.H.

### 5.2 Test Set-up

The conducted emission measurements were performed in the shielded room.

The EUT was placed on wooden table, 0.8 m heights above the floor, 0.4 m from the reference ground plane (GRP) wall and 0.8 m from AMN & ISN.

AMN is bonded on horizontal reference ground plane.

The ground plane, which was electrically bonded to the shield room, ground system and all power lines entering the shield room, were filtered.

### 5.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO "Guide to the expression of uncertainty in measurement."

The measurement uncertainty was given with a confidence of 95 %.

Test Items	Uncertainty	Remark
Conducted emission (9 kHz ~ 150 kHz)	$\pm 2.74$ dB	Confidence level of approximately 95 % ( $k = 2$ )
Conducted emission (150 kHz ~ 30 MHz)	$\pm 4.25$ dB	Confidence level of approximately 95 % ( $k = 2$ )





#### 5.4 Limit

RFI Conducted	FCC Limit(dB $\mu$ V/m) Class B	
	Quasi-Peak	Average
150 kHz ~ 0.5 MHz	66 ~ 56*	56 ~ 46*
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

\*Limits decreases linearly with the logarithm of frequency.

#### 5.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	05. 22. 2013
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	05. 23. 2013
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	05. 23. 2013
□ - ISN T8	TESEQ. GmbH	ISN	24568	07. 04. 2013

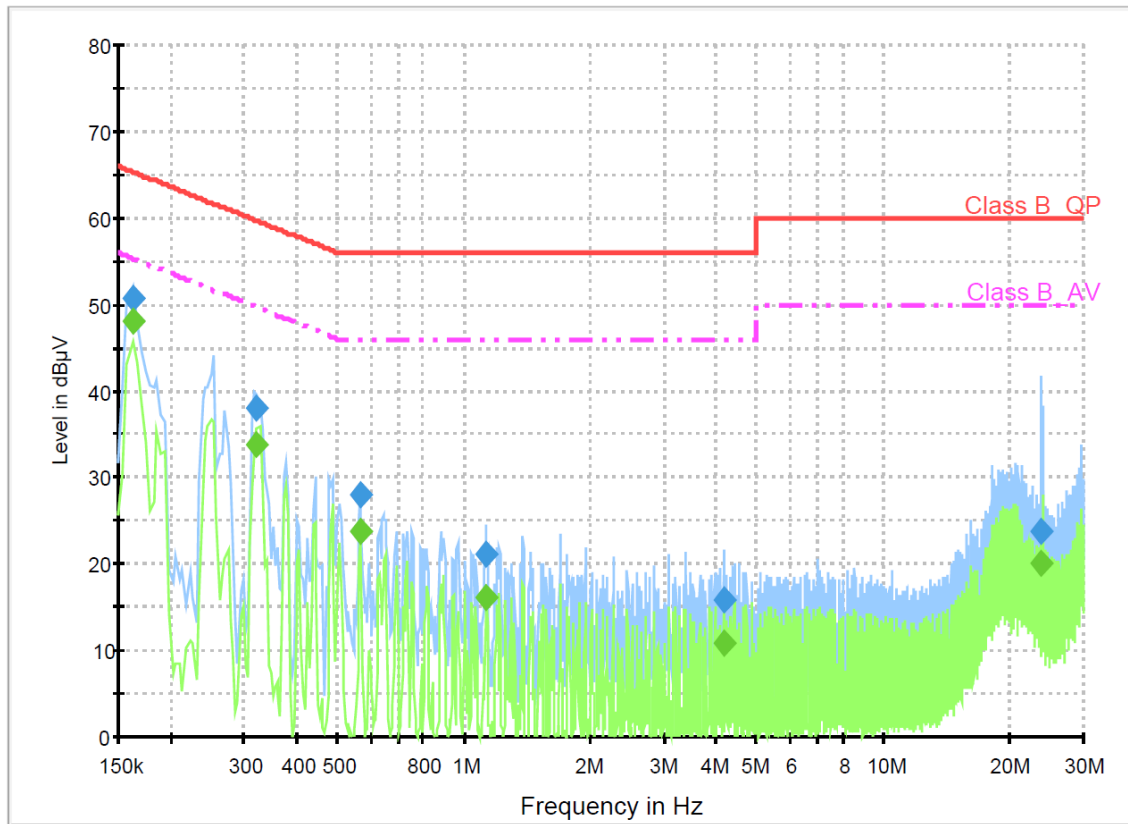
#### 5.6 Test data for Conducted Emission

- Test Date : December 19, 2012  
 - Resolution Bandwidth : 9 kHz  
 - Frequency Range : 0.15 MHz ~ 30 MHz  
 - Line : L1: Live, N: Neutral





Operating condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.162000	50.6	1000.0	9.000	GND	L1	10.1	14.7	65.4	
0.320000	38.0	1000.0	9.000	GND	N	10.1	21.7	59.7	
0.568000	27.9	1000.0	9.000	GND	N	10.1	28.1	56.0	
1.132000	21.2	1000.0	9.000	GND	N	10.1	34.8	56.0	
4.152000	15.9	1000.0	9.000	GND	N	10.1	40.1	56.0	
23.648000	23.8	1000.0	9.000	GND	N	10.6	36.2	60.0	

### Final Result 2

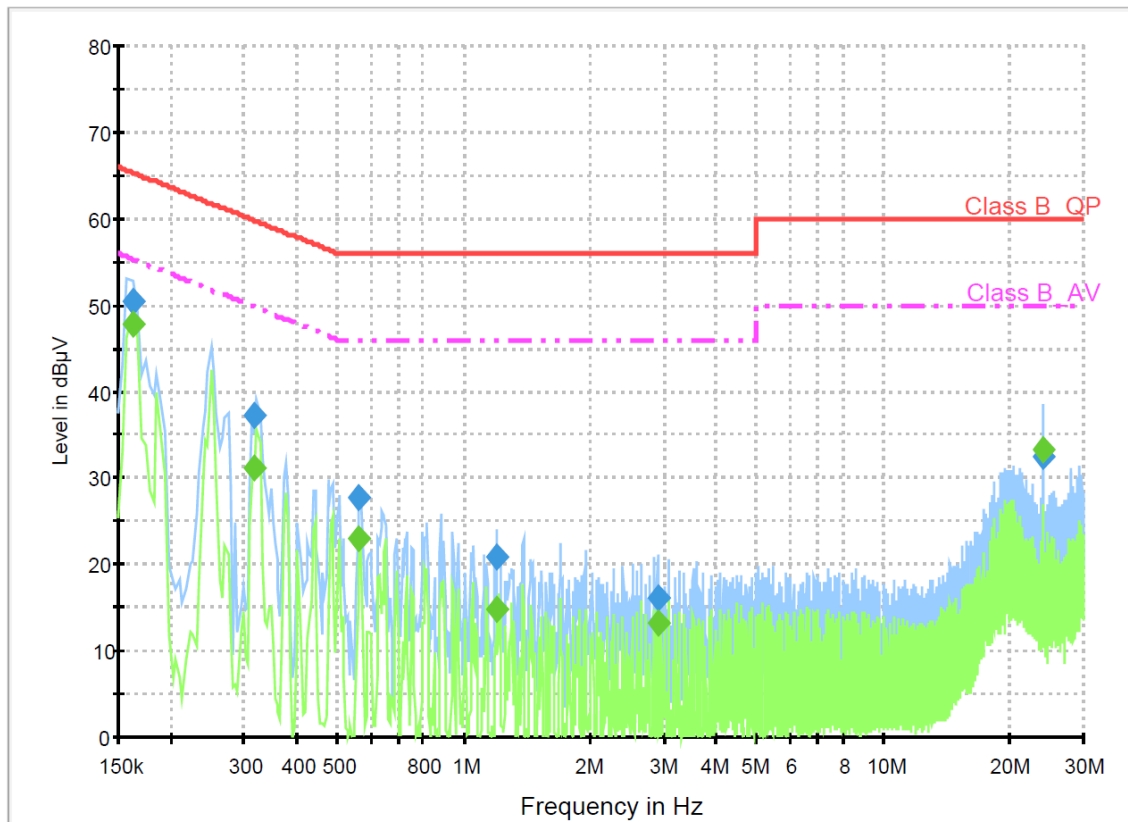
Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.162000	48.0	1000.0	9.000	GND	L1	10.1	7.3	55.4	
0.320000	33.8	1000.0	9.000	GND	N	10.1	15.9	49.7	
0.568000	23.7	1000.0	9.000	GND	N	10.1	22.3	46.0	
1.132000	16.0	1000.0	9.000	GND	N	10.1	30.0	46.0	
4.152000	10.8	1000.0	9.000	GND	N	10.1	35.2	46.0	
23.648000	20.1	1000.0	9.000	GND	N	10.6	29.9	50.0	

< Fig 5. Conducted emission result >





- Operating condition: 1 920 × 1 080 / 60 Hz (HDMI: Digital)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.162000	50.5	1000.0	9.000	GND	N	10.1	14.8	65.4	
0.316000	37.2	1000.0	9.000	GND	N	10.1	22.6	59.8	
0.564000	27.8	1000.0	9.000	GND	N	10.1	28.2	56.0	
1.196000	20.8	1000.0	9.000	GND	L1	10.1	35.2	56.0	
2.892000	16.0	1000.0	9.000	GND	L1	10.1	40.0	56.0	
24.012000	32.5	1000.0	9.000	GND	N	10.6	27.5	60.0	

### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.162000	47.9	1000.0	9.000	GND	N	10.1	7.4	55.4	
0.316000	31.1	1000.0	9.000	GND	N	10.1	18.7	49.8	
0.564000	23.0	1000.0	9.000	GND	N	10.1	23.0	46.0	
1.196000	14.7	1000.0	9.000	GND	L1	10.1	31.3	46.0	
2.892000	13.3	1000.0	9.000	GND	L1	10.1	32.7	46.0	
24.012000	33.2	1000.0	9.000	GND	N	10.6	16.8	50.0	

< Fig 6. Conducted emission result >





## 6. Radiated Emission

### 6.1 Operating Environment

Temperature : 22.0 °C  
Relative Humidity : 42.0 % R.H.

### 6.2 Test Set-up

A preliminary and final measurement was at 3 m anechoic chamber.

The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane.

The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels.

This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

### 6.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty was given with a confidence of 95 %.

Test Items (Anechoic chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 4.35 dB	Confidence level of approximately 95 % ( $k = 2$ )
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 4.29 dB	Confidence level of approximately 95 % ( $k = 2$ )
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 4.43 dB	Confidence level of approximately 95 % ( $k = 2$ )
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 4.21 dB	Confidence level of approximately 95 % ( $k = 2$ )





**6.4 Limit**

Frequency (MHz)	FCC Limit @ 3 m. dB $\mu$ V/m	CISPR Limit @ 10 m. dB $\mu$ V/m
30 ~ 88	40.0	30.0
88 ~ 216	43.5	30.0
216 ~ 230	46.0	30.0
230 ~ 960	46.0	37.0
960 ~ 1 000	54.0	37.0
> 1 000	54.0	No Specified limit

**6.5 Test Equipment used**

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	05. 23. 2013
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	08. 07. 2013
■ - BBHA9120D	Schwarzbeck	Horn Antenna	597	01. 29. 2014
■ - MCU066	maturo GmbH	Position Controller	1390306	N/A
■ - TT2.5SI	maturo GmbH	Turntable	1390307	N/A
■ - AM 4.0	maturo GmbH	Antenna Mast	1390308	N/A
■ - AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	11. 12. 2013

**6.6 Test data for Radiated Emission**

- Test Date : December 16 ~ 17, 2012
- Measurement Distance : 3 m
- Note : The highest frequency of the internal source of the EUT is between 500 MHz and 1 000 MHz (900 MHz). The measurement was made up to 5 000 MHz

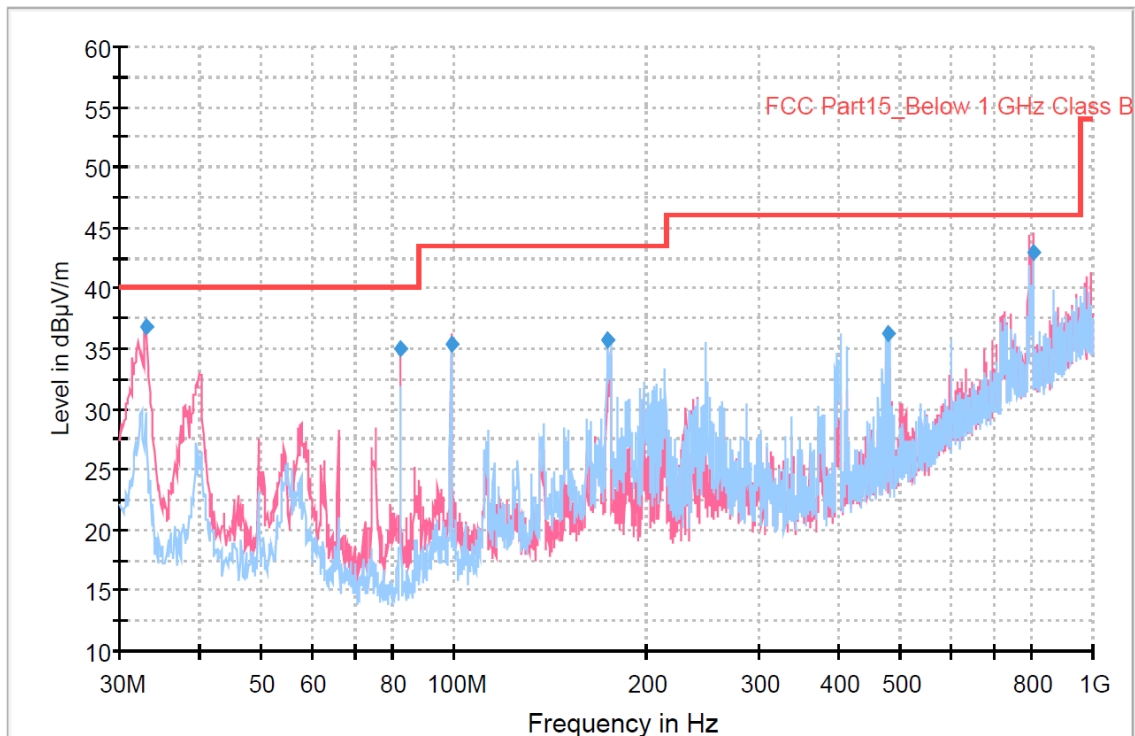
- Measurement

Frequency range	30 MHz ~ 1 GHz	Above 1 GHz
Detector mode	Quasi peak	Peak / Average
Resolution bandwidth	120 kHz	1 MHz





- Operating condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)



### Final Result 1

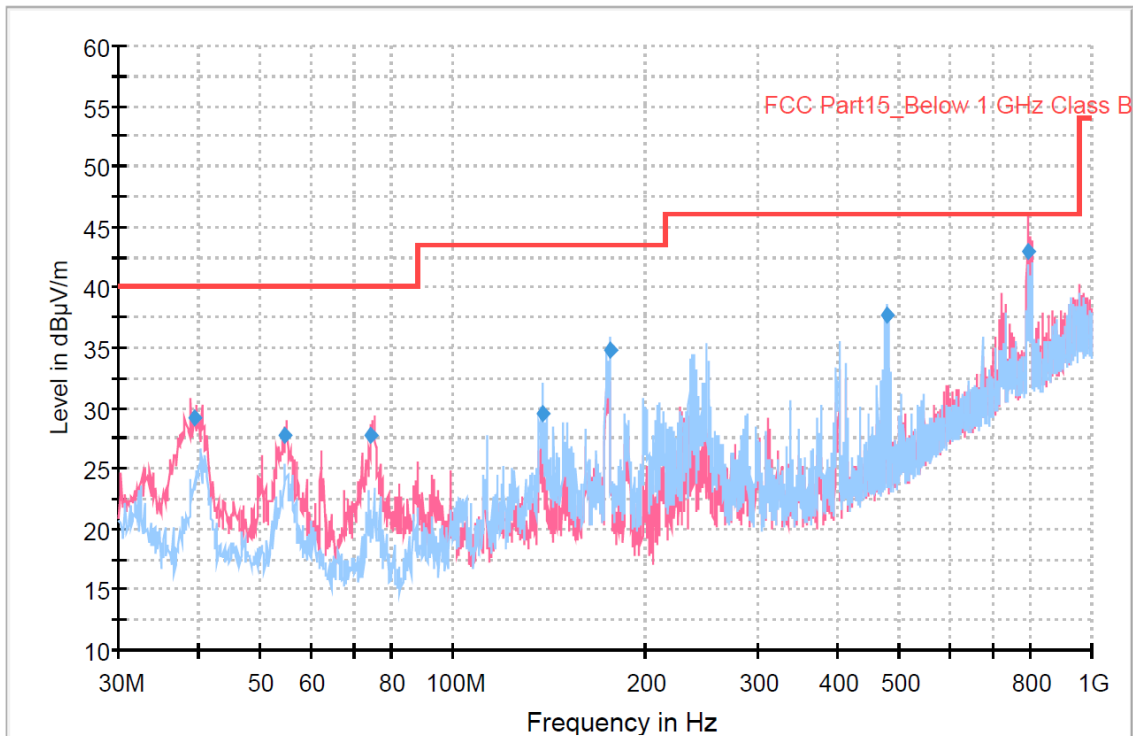
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.008750	36.7	1000.0	120.000	100.0	V	211.0	12.4	3.3	40.0
82.481250	35.0	1000.0	120.000	130.0	V	279.0	8.9	5.0	40.0
99.011250	35.4	1000.0	120.000	119.0	V	53.0	10.3	8.1	43.5
173.536250	35.7	1000.0	120.000	170.0	H	157.0	13.3	7.8	43.5
173.538750	35.6	1000.0	120.000	170.0	H	157.0	13.3	7.9	43.5
477.675000	36.3	1000.0	120.000	100.0	H	148.0	19.4	9.7	46.0
806.666250	43.0	1000.0	120.000	150.0	V	194.0	25.9	3.0	46.0

< Fig 7. Radiated emission result (30 MHz ~ 1 000 MHz) >





- Operating condition: 1 920 × 1 080 / 60 Hz (HDMI: Digital)



### Final Result 1

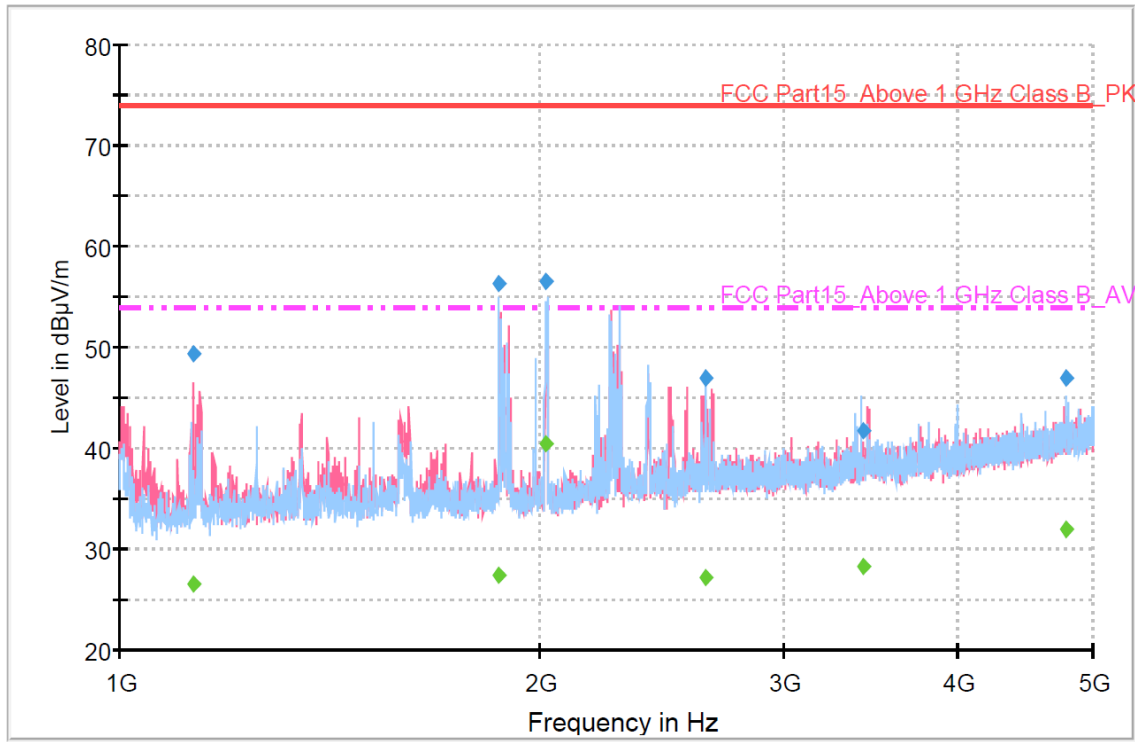
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
39.552500	29.2	1000.0	120.000	100.0	V	275.0	12.5	10.8	40.0
54.637500	27.7	1000.0	120.000	100.0	V	249.0	13.0	12.3	40.0
74.408750	27.7	1000.0	120.000	131.0	V	160.0	10.1	12.3	40.0
138.133750	29.7	1000.0	120.000	161.0	H	-3.0	13.7	13.8	43.5
176.130000	34.7	1000.0	120.000	161.0	H	17.0	13.2	8.8	43.5
478.451250	37.7	1000.0	120.000	100.0	H	332.0	19.4	8.3	46.0
793.491250	43.0	1000.0	120.000	100.0	V	78.0	25.8	3.0	46.0

< Fig 8. Radiated emission result (30 MHz ~ 1 000 MHz) >





- Operating condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)
- Green marker: Average detector, Blue marker: Peak detector



### Final Result 1

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1128.820000	49.4	1000.0	1000.000	100.0	V	91.0	-10.6	24.6	74.0
1871.200000	56.2	1000.0	1000.000	100.0	H	146.0	-7.6	17.8	74.0
2024.240000	56.6	1000.0	1000.000	110.0	H	298.0	-7.5	17.4	74.0
2635.000000	46.9	1000.0	1000.000	200.0	H	78.0	-5.1	27.1	74.0
3417.280000	41.7	1000.0	1000.000	191.0	H	78.0	-3.2	32.3	74.0
4787.320000	47.0	1000.0	1000.000	120.0	H	303.0	0.4	27.0	74.0

### Final Result 2

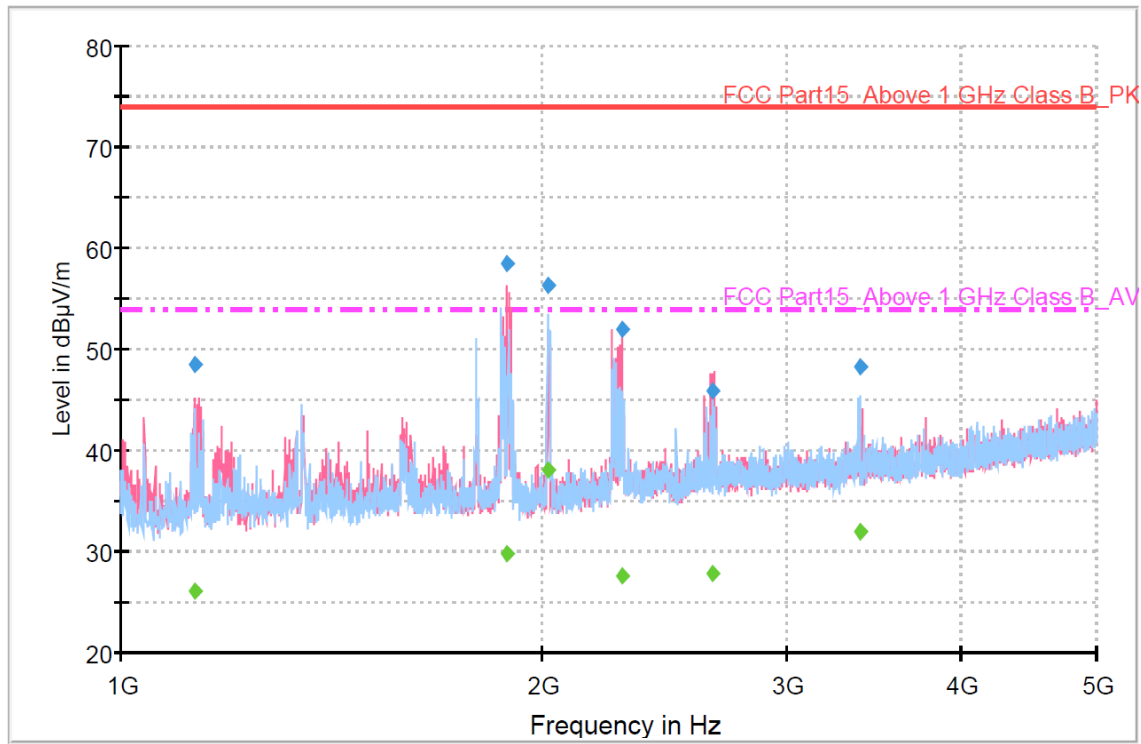
Frequency (MHz)	CAverage (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1128.820000	26.5	1000.0	1000.000	100.0	V	91.0	-10.6	27.5	54.0
1871.200000	27.3	1000.0	1000.000	100.0	H	146.0	-7.6	26.7	54.0
2024.240000	40.4	1000.0	1000.000	110.0	H	298.0	-7.5	13.6	54.0
2635.000000	27.3	1000.0	1000.000	200.0	H	78.0	-5.1	26.7	54.0
3417.280000	28.3	1000.0	1000.000	191.0	H	78.0	-3.2	25.7	54.0
4787.320000	31.9	1000.0	1000.000	120.0	H	303.0	0.4	22.1	54.0

< Fig 9. Radiated emission result (1 000 MHz ~ 5 000 MHz) >





- Operating condition: 1 920 × 1 080 / 60 Hz (HDMI: Digital)
- Green marker: Average detector, Blue marker: Peak detector



### Final Result 1

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1128.600000	48.5	1000.0	1000.000	100.0	V	97.0	-10.6	25.5	74.0
1889.340000	58.4	1000.0	1000.000	160.0	V	143.0	-7.6	15.6	74.0
2020.980000	56.2	1000.0	1000.000	150.0	H	278.0	-7.5	17.8	74.0
2282.780000	52.0	1000.0	1000.000	120.0	V	19.0	-6.3	22.0	74.0
2657.360000	45.9	1000.0	1000.000	150.0	V	31.0	-5.0	28.1	74.0
3381.040000	48.3	1000.0	1000.000	109.0	H	199.0	-3.3	25.7	74.0

### Final Result 2

Frequency (MHz)	CAverage (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1128.600000	26.1	1000.0	1000.000	100.0	V	97.0	-10.6	27.9	54.0
1889.340000	29.7	1000.0	1000.000	160.0	V	143.0	-7.6	24.3	54.0
2020.980000	38.0	1000.0	1000.000	150.0	H	278.0	-7.5	16.0	54.0
2282.780000	27.5	1000.0	1000.000	120.0	V	19.0	-6.3	26.5	54.0
2657.360000	27.7	1000.0	1000.000	150.0	V	31.0	-5.0	26.3	54.0
3381.040000	32.0	1000.0	1000.000	109.0	H	199.0	-3.3	22.0	54.0

< Fig 10. Radiated emission result (1 000 MHz ~ 5 000 MHz) >





## 7. Sample Calculations

$$\text{dB}\mu\text{V} = 20 \text{ Log}_{10}(\mu\text{V}/\text{m})$$

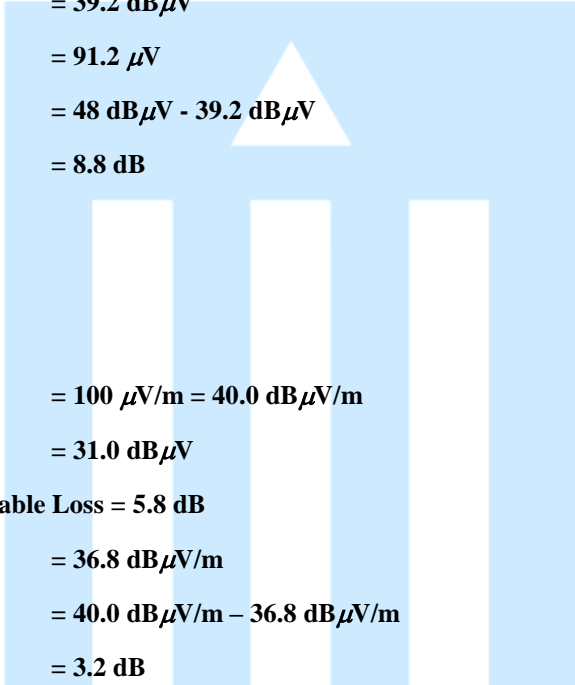
$$\text{dB}\mu\text{V} = \text{dBm} + 107$$

$$\mu\text{V} = 10^{(\text{dB}\mu\text{V}/20)}$$

### 7.1 Example 1 :

#### ■ 20.3 MHz

<b>Class B Limit</b>	<b>= 250 <math>\mu\text{V}</math> = 48 dB<math>\mu\text{V}</math></b>
<b>Reading</b>	<b>= 39.2 dB<math>\mu\text{V}</math></b>
<b><math>10^{(39.2\text{dB}\mu\text{V}/20)}</math></b>	<b>= 91.2 <math>\mu\text{V}</math></b>
<b>Margin</b>	<b>= 48 dB<math>\mu\text{V}</math> - 39.2 dB<math>\mu\text{V}</math></b> <b>= 8.8 dB</b>



### 7.2 Example 2 :

#### ■ 66.7 MHz

<b>Class B Limit</b>	<b>= 100 <math>\mu\text{V}/\text{m}</math> = 40.0 dB<math>\mu\text{V}/\text{m}</math></b>
<b>Reading</b>	<b>= 31.0 dB<math>\mu\text{V}</math></b>
<b>Antenna Factor + Cable Loss</b>	<b>= 5.8 dB</b>
<b>Total</b>	<b>= 36.8 dB<math>\mu\text{V}/\text{m}</math></b>
<b>Margin</b>	<b>= 40.0 dB<math>\mu\text{V}/\text{m}</math> - 36.8 dB<math>\mu\text{V}/\text{m}</math></b> <b>= 3.2 dB</b>





## 8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. LASER TV(Model Name: HECTO-NA)** was complies with §15.107 and 15.109 of the FCC Rules.

- The end -

