



FCC EVALUATION REPORT FOR CERTIFICATION

FCC Class B (Class II Permissive Change)

Applicant: LG Electronics Inc.

222, LG-ro, Jinwi-myeon, Pyeongtaek-si,

Gyeonggi-do, 451-713, Korea

Attn: Mr. Sung-Wook Yoon / Chief research engineer

Date of Issue: June 13, 2014

Order Number: GETEC-C1-14-238

Test Report Number: GETEC-E3-14-049

Test Site: GUMI COLLEGE EMC CENTER

FCC Registration Number: (100749, 443957)

FCC ID. : BEJ55LA9700UA

Applicant : LG Electronics Inc.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: LED TV
Type of Authority	: Certification
Model Name	: 55LA9700-UA
Trade Name	: LG

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

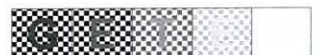
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking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

Tested by,

Reviewed by,


Seung Chul Lee, Senior Engineer
GUMI COLLEGE EMC CENTER


Jae-Hoon Jeong, Technical Manager
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: 222, LG-ro, Jinwi-myeon, Pyengtaek-si, Gyeonggi-do, 451-713, Korea.

Manufacturer: LG Electronics Inc.

Manufacturer Address: 222, LG-ro, Jinwi-myeon, Pyengtaek-si, Gyeonggi-do, 451-713, Korea.

Contact Person: Mr. Sung-Wook Yoon, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJ55LA9700UA
- **EUT Type** LED TV
- **Model Name** 55LA9700-UA
- **Trade Name** LG
- **Serial Number** Prototype
- **Rule Part(s)** FCC Part 15 Subpart B
- **Type of Authority** Certification
- **Test Procedure(s)** ANSI C63.4 (2009) / Canadian standard ICES-003
- **Dates of Test** June 03 ~ 04, 2014
- **Place of Test** GUMI COLLEGE EMC CENTER (FCC Registration Number: 100749, 443957)
37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 730-711, Republic of Korea.
- **Test Report Number** GETEC-E3-14-049
- **Date of Issue** June 13, 2014



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.**

LED TV (Model Name: 55LA9700-UA)

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 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)

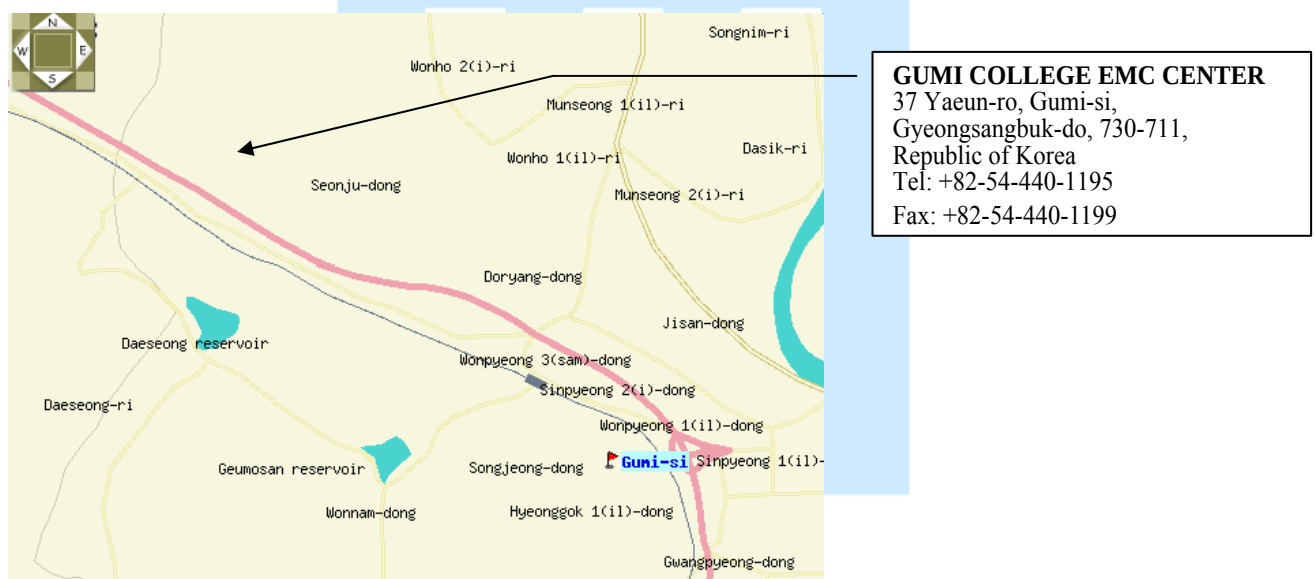


Fig 1. The map above shows the Gumi College in vicinity area.



3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **LG Electronics Inc.**
LED TV (Model Name: 55LA9700-UA) FCC ID.: BEJ55LA9700UA

Power requirement		AC 100 - 240 V ~ 50 / 60 Hz
Television System		NTSC-M, ATSC, 64 & 256 QAM
Program Coverage		VHF 2-13, UHF 14-69, CATV 1-135, DTV 2-69, CADTV 1-135
External Antenna Impedance		75 Ω
Environment condition	Operating Temperature	0 °C ~ 40 °C (32 °F ~ 104 °F)
	Operating Humidity	Less than 80 %
	Storage Temperature	-20 °C ~ 60 °C (-4 °F ~ 140 °F)
	Storage Humidity	Less than 85 %

MODELS		55LA9700 (55LA9700-UA)
Dimensions (Width x Height x Depth)	With stand	1,230 x 781 x 274 (mm)
		48.4 x 30.7 x 10.7 (inch)
	Without stand	1,230 x 714 x 40.2 (mm)
		48.4 x 28.1 x 1.5 (inch)
Weight	With stand	31 (Kg) (68.3 lbs)
	Without stand	27.9 (Kg) (61.5 lbs)
Current Value / Power consumption		2.8 A / 280 W

- Highest clock Frequency : 933 MHz

Wireless LAN module (WN8122E1) specification

Standard	IEEE802.11a/b/g/n
Frequency Range	2400 to 2483.5 MHz 5725 to 5850 MHz
Output Power (Max.)	802.11a: 16.5 dBm 802.11b: 16 dBm 802.11g: 15.5 dBm 802.11n - 2.4GHz: 15.5 dBm 802.11n - 5GHz: 16.5 dBm

- Because band channel used by the country could be different, the user can not change or adjust the operating frequency and this product is set for the regional frequency table.
- Contains FCC ID: BEJWN8122E1
Contains IC: 2703H-WN8122E1

Bluetooth module (BM-LDS401) specification

Standard	Bluetooth Version 3.0
Frequency Range	2400 ~ 2483.5 MHz
Output Power (Max.)	10 dBm or lower

- Contains FCC ID: BEJLDS401
Contains IC: 2703H-LDS401



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
Graphic card	ASUS Tek Computer inc	GTX660-DC2O-2GD5	S/N: CBC0YZ1001131 FCC ID.: DoC
DVD Player	ILIKE ELECTRONICS CO., LTD.	CVX-3800 Full-HD	S/N: CVX380020110110493 FCC ID.: Verification
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	Transcend Information Inc	jetFlash700	S/N: B10963 8059 FCC ID.: DoC
Cell phone	LG Electronics Inc.	LG-LU6200	S/N: 201KPNY0507743 FCC ID.: None.
TV Test Transmitter	Rohde & Schwarz	SFQ	S/N: 1000563 FCC ID.: Verification
Headphone	Philips	SBC HL140	S/N: None FCC ID.: None

See “Appendix C – Test Setup Photographs” for actual system test set-up

3.2.2 System configuration

Description	Manufacturer	Model Name	S/N & FCC ID.
Motion Remote Controller ¹⁾	LG Electronics Inc.	AN-MR500G	S/N; None. FCC ID.: BEJMR500G
Wi-Fi module ²⁾	LG Electronics Inc.	WN8122E1	S/N; None. FCC ID.: BEJWN8122E1
Bluetooth module ²⁾	LG Electronics Inc.	BM-LDS401	S/N; None. FCC ID.: BEJLDS401
Camera module ²⁾	LG Electronics Inc.	AN-BC500	S/N; None. FCC ID.: None.

1) External Component

2) Internal Component



3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power in	Connected to the EUT and Power supply	1.80 m unshielded
HDMI in	Connected to the EUT and PC	3.00 m shielded
HDMI in	Connected to the EUT and DVD Player	1.80 m shielded
Component	Connected to the EUT and DVD Player	3.00 m shielded
Video in	Connected to the EUT and DVD Player	3.00 m shielded
HDMI(MHL) in	Connected to the EUT and Cellphone	1.00 m shielded
Headphone out	Connected to the Headphone and EUT	1.20 m shielded
LAN	Connected to the EUT and Network	10.00 m unshielded
Antenna cable	Connected to the EUT and TV Signal generator	10.00 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)
 - Monitor resolution mode:
Radiated Emission : $4\,096 \times 2\,160 / 24$ Hz (HDMI: Digital),
Conducted Emission : $4\,096 \times 2\,160 / 24$ Hz, $1\,920 \times 1\,080 / 60$ Hz, $640 \times 480 / 60$ Hz (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
 - Network connecting (Network utilization rate was 10 percent(used traffic generator software TGEN))
 - Connected EUT and Smart Phone(Active MHL function)
 - Camera Video display mode



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, ESCI).

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.

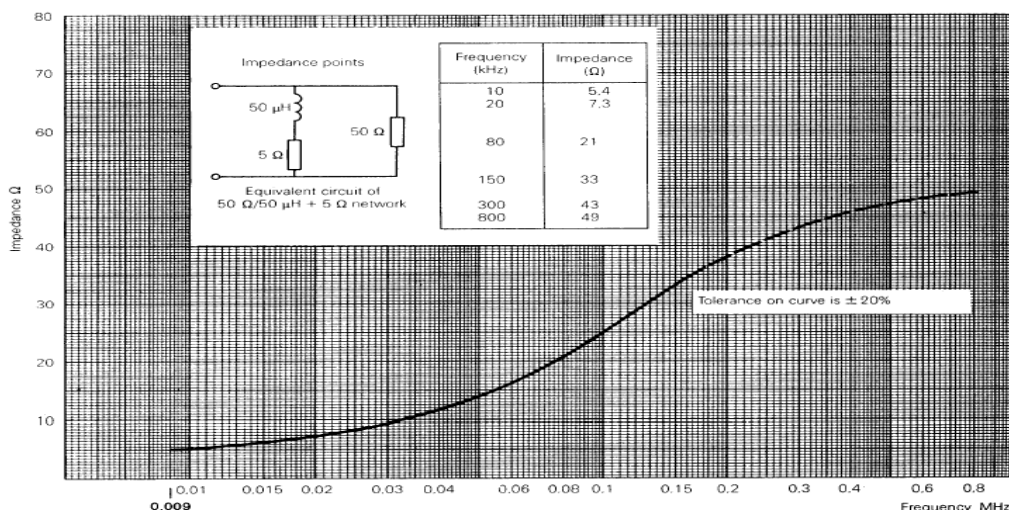


Fig 2. Impedance of LISN



4.3 Radiated Emission

Exploratory Radiated measurements were conducted at the 3 m 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 3 m Chamber (FCC Registration No.: 443957) or Open area test site (FCC Registration No.: 100749) that complies with CISPR 16/ANSI C63.4.

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

For measurements above 1GHz, the bottom side of 3 m 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 1 GHz) and Peak & Average mode (Above 1 GHz).

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.

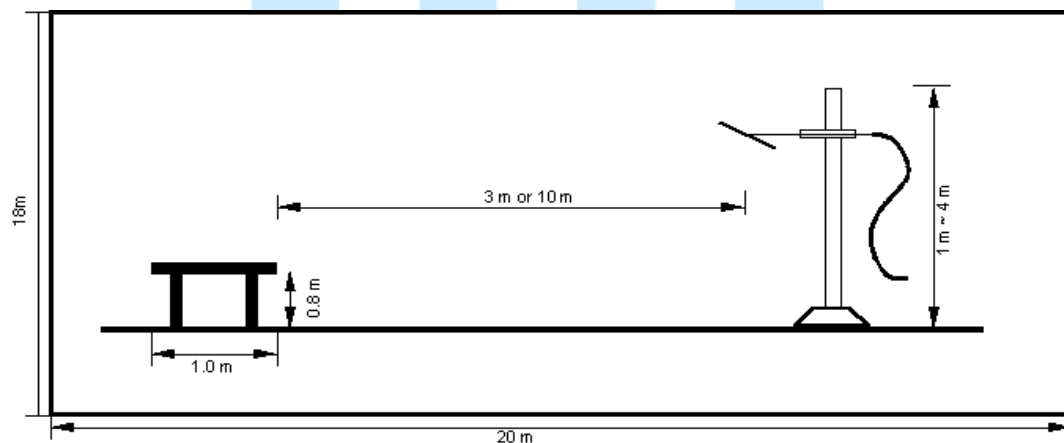


Fig 3. Dimensions of test site (Below 1 GHz)

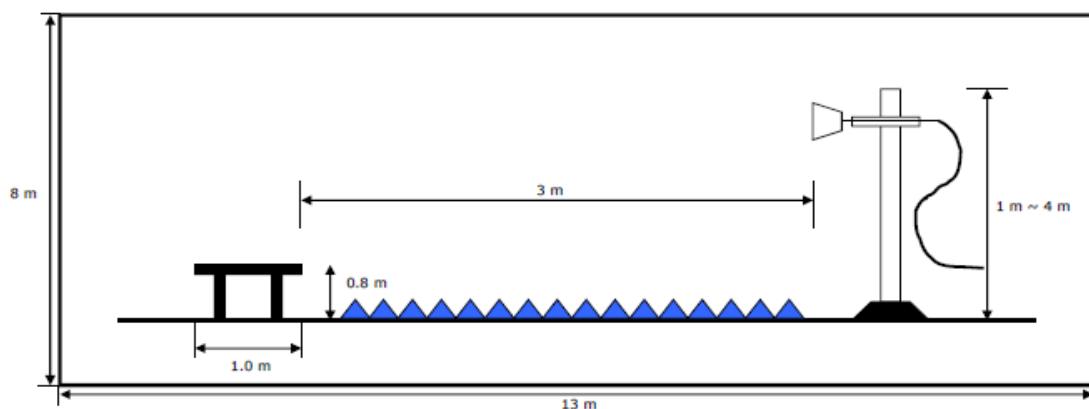


Fig 4. Dimensions of test site (Above 1 GHz)



5. Conducted Emission

5.1 Operating Environment

Temperature : 25.9 °C
Relative Humidity : 48.2 % 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)	± 3.89 dB	Confidence level of approximately 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	± 3.37 dB	Confidence level of approximately 95 % ($k = 2$)



5.4 Limit

RFI Conducted	FCC Limit(dB μ V/m) Class B	
Freq. Range	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

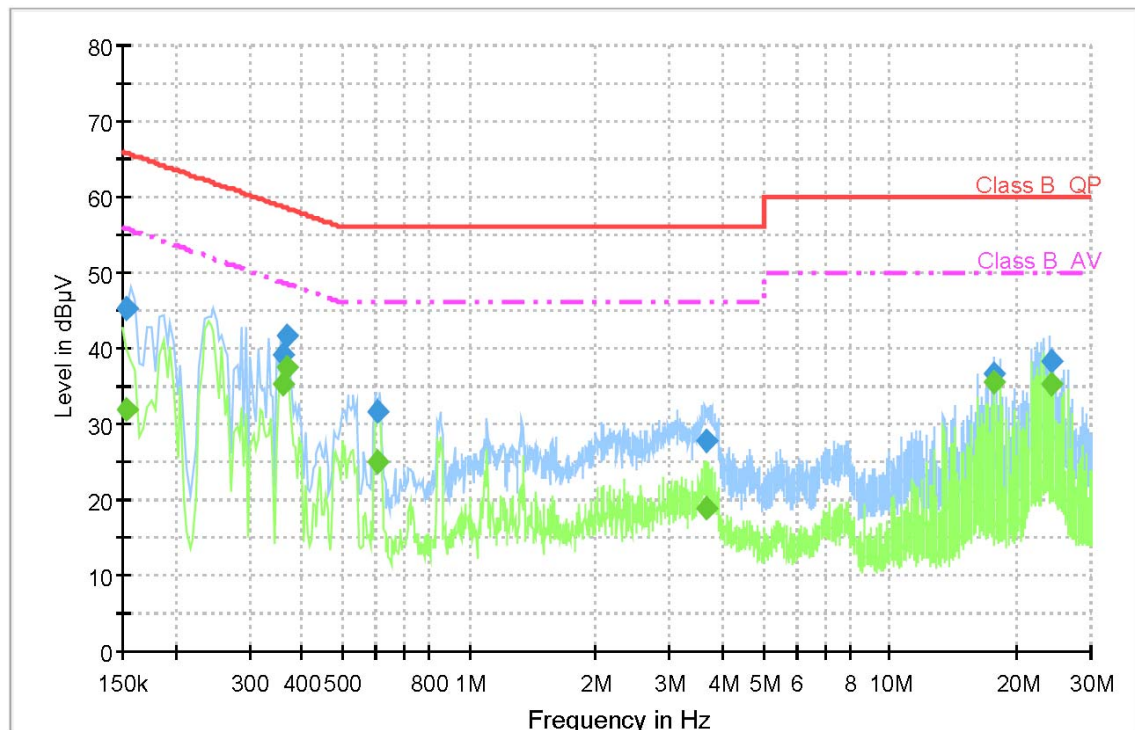
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCI	Rohde & Schwarz	EMI Test Receiver	100237	04. 30. 2015
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	04. 30. 2015
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	04. 30. 2015
■ - ISN T8	TESEQ.GmbH	ISN	24568	07. 10. 2014

5.6 Test data for Conducted Emission

- Test Date : June 04, 2014
- Resolution Bandwidth : 9 kHz
- Frequency Range : 0.15 MHz ~ 30 MHz
- Line : L1: Live, N: Neutral



- Operating condition: 4 096 × 2 160 / 24 Hz (HDMI: Digital)



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.152962	45.4	1000.0	9.000	GND	N	10.0	20.5	65.8	
0.361252	39.1	1000.0	9.000	GND	L1	10.0	19.6	58.7	
0.367924	41.5	1000.0	9.000	GND	N	10.0	17.0	58.5	
0.605358	31.6	1000.0	9.000	GND	L1	10.0	24.4	56.0	
3.643062	27.8	1000.0	9.000	GND	N	10.0	28.2	56.0	
17.692341	36.8	1000.0	9.000	GND	L1	10.4	23.2	60.0	
24.350575	38.4	1000.0	9.000	GND	N	10.5	21.6	60.0	

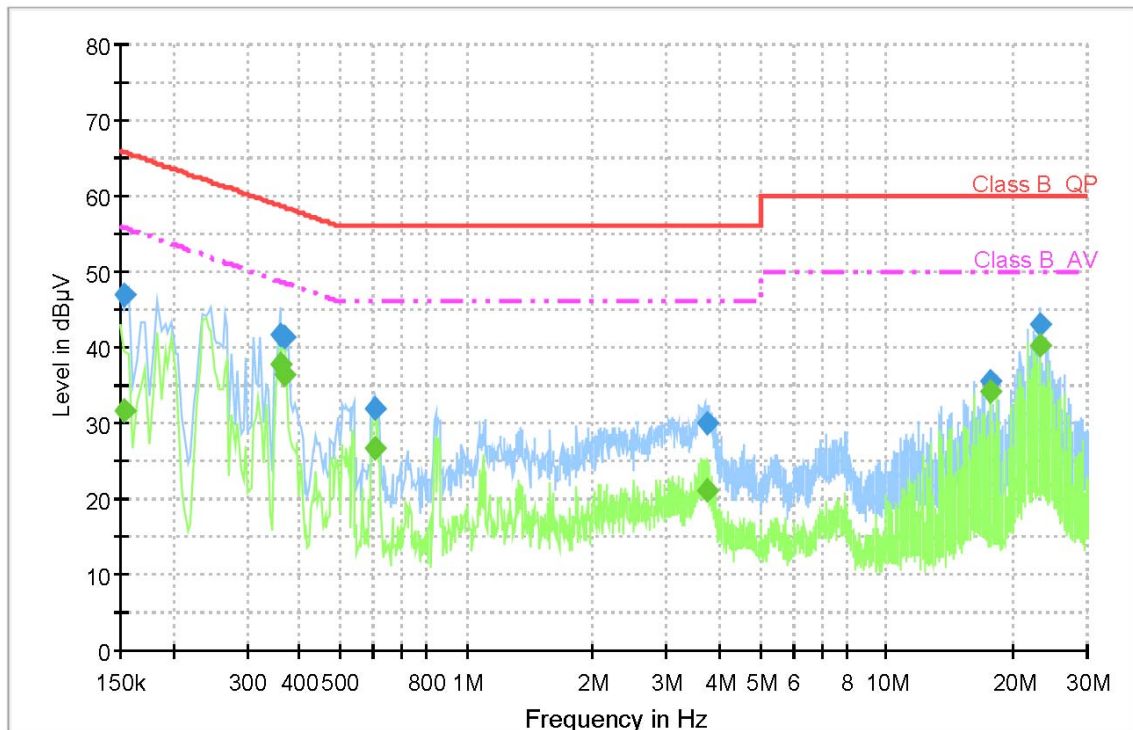
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.152962	32.0	1000.0	9.000	GND	N	10.0	23.9	55.8	
0.361252	35.2	1000.0	9.000	GND	L1	10.0	13.5	48.7	
0.367924	37.5	1000.0	9.000	GND	N	10.0	11.1	48.5	
0.605358	24.9	1000.0	9.000	GND	L1	10.0	21.1	46.0	
3.643062	18.9	1000.0	9.000	GND	N	10.0	27.1	46.0	
17.692341	35.5	1000.0	9.000	GND	L1	10.4	14.5	50.0	
24.350575	35.2	1000.0	9.000	GND	N	10.5	14.8	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
0.152962	46.8	1000.0	9.000	GND	L1	10.0	19.0	65.8	
0.360890	41.7	1000.0	9.000	GND	N	10.0	17.0	58.7	
0.367924	41.3	1000.0	9.000	GND	N	10.0	17.2	58.5	
0.606806	32.0	1000.0	9.000	GND	L1	10.0	24.0	56.0	
3.763406	29.9	1000.0	9.000	GND	L1	10.0	26.1	56.0	
17.691980	35.5	1000.0	9.000	GND	N	10.4	24.5	60.0	
23.129038	43.0	1000.0	9.000	GND	L1	10.5	17.0	60.0	

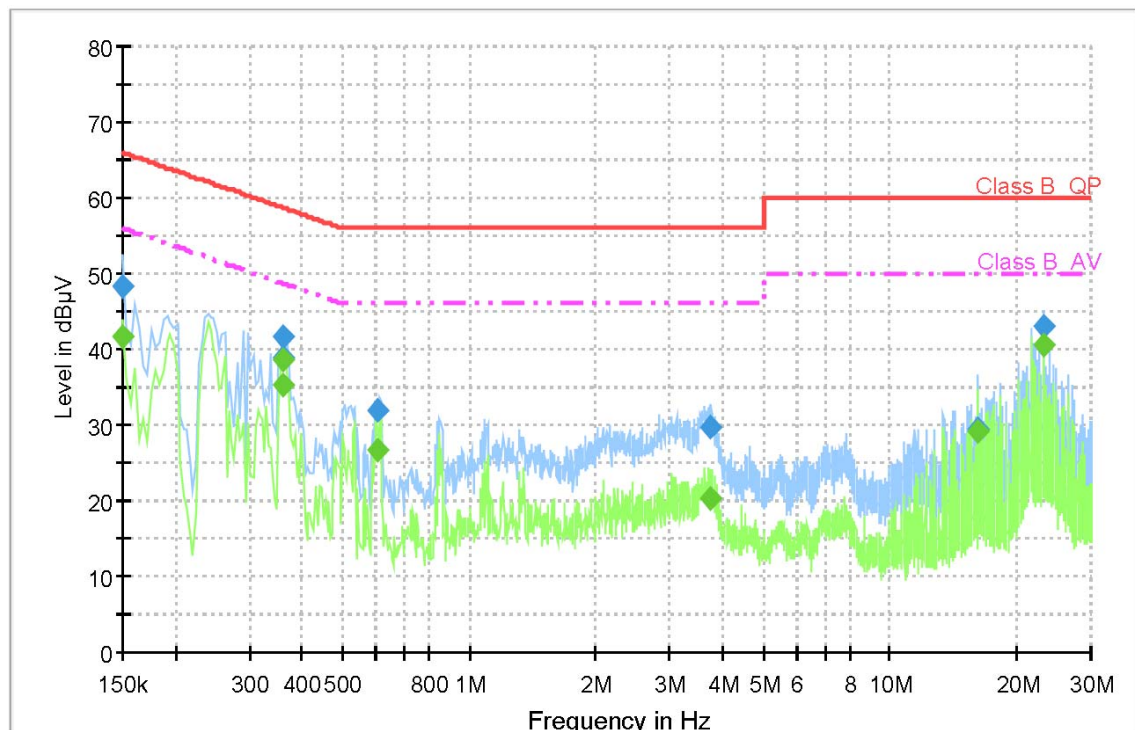
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.152962	31.6	1000.0	9.000	GND	L1	10.0	24.2	55.8	
0.360890	37.8	1000.0	9.000	GND	N	10.0	10.9	48.7	
0.367924	36.5	1000.0	9.000	GND	N	10.0	12.1	48.5	
0.606806	26.6	1000.0	9.000	GND	L1	10.0	19.4	46.0	
3.763406	21.1	1000.0	9.000	GND	L1	10.0	24.9	46.0	
17.691980	34.2	1000.0	9.000	GND	N	10.4	15.8	50.0	
23.129038	40.3	1000.0	9.000	GND	L1	10.5	9.7	50.0	

< Fig 6. Conducted emission result >



- Operating condition: 640 × 480 / 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
0.150000	48.2	1000.0	9.000	GND	N	10.0	17.8	66.0	
0.360890	38.8	1000.0	9.000	GND	L1	10.0	19.9	58.7	
0.361614	41.7	1000.0	9.000	GND	N	10.0	17.0	58.7	
0.605358	31.8	1000.0	9.000	GND	L1	10.0	24.2	56.0	
3.759804	29.7	1000.0	9.000	GND	L1	10.0	26.3	56.0	
16.230257	29.5	1000.0	9.000	GND	L1	10.3	30.5	60.0	
23.128269	43.1	1000.0	9.000	GND	L1	10.5	16.9	60.0	

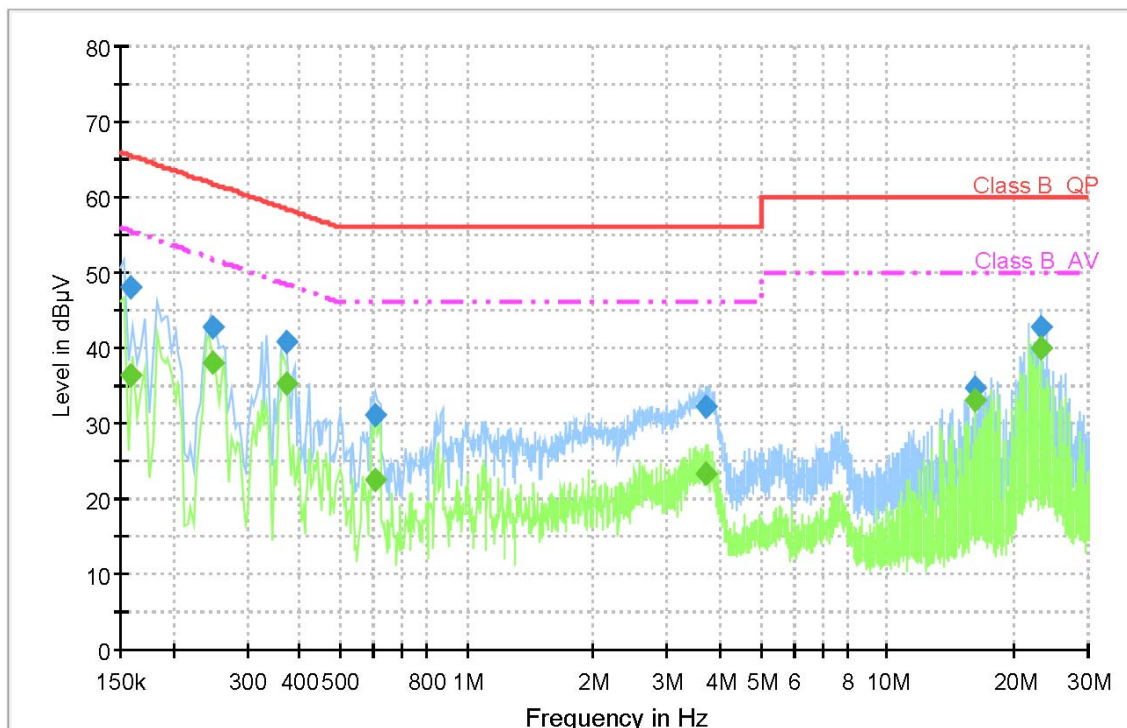
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	41.6	1000.0	9.000	GND	N	10.0	14.4	56.0	
0.360890	35.3	1000.0	9.000	GND	L1	10.0	13.5	48.7	
0.361614	38.5	1000.0	9.000	GND	N	10.0	10.2	48.7	
0.605358	26.5	1000.0	9.000	GND	L1	10.0	19.5	46.0	
3.759804	20.2	1000.0	9.000	GND	L1	10.0	25.8	46.0	
16.230257	29.3	1000.0	9.000	GND	L1	10.3	20.7	50.0	
23.128269	40.4	1000.0	9.000	GND	L1	10.5	9.6	50.0	

< Fig 7. Conducted emission result >



- Operating condition: Camera video display mode



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.158231	48.0	1000.0	9.000	GND	L1	10.0	17.6	65.6	
0.248836	42.8	1000.0	9.000	GND	N	10.0	19.0	61.8	
0.373252	40.9	1000.0	9.000	GND	N	10.0	17.5	58.4	
0.606082	31.1	1000.0	9.000	GND	L1	10.0	24.9	56.0	
3.698321	32.3	1000.0	9.000	GND	N	10.0	23.7	56.0	
16.226257	34.6	1000.0	9.000	GND	L1	10.3	25.4	60.0	
23.129038	42.8	1000.0	9.000	GND	L1	10.5	17.2	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.158231	36.3	1000.0	9.000	GND	L1	10.0	19.2	55.6	
0.248836	38.1	1000.0	9.000	GND	N	10.0	13.7	51.8	
0.373252	35.2	1000.0	9.000	GND	N	10.0	13.3	48.4	
0.606082	22.4	1000.0	9.000	GND	L1	10.0	23.6	46.0	
3.698321	23.4	1000.0	9.000	GND	N	10.0	22.6	46.0	
16.226257	33.0	1000.0	9.000	GND	L1	10.3	17.0	50.0	
23.129038	40.0	1000.0	9.000	GND	L1	10.5	10.0	50.0	

< Fig 8. Conducted emission result >



6. Radiated Emission

6.1 Operating Environment

Temperature : 23.4 °C
Relative Humidity : 43.4 % 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)	± 4.47 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 4.46 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 4.74 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 4.70 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m)	± 5.28 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (6 000 MHz ~ 18 000 MHz, 3 m)	± 5.37 dB	Confidence level of approximately 95 % ($k = 2$)



6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dBμV/m	CISPR Limit @ 10 m. dBμV/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	04. 29. 2015
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 25. 2016
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	03. 06. 2016
■ - 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	01. 15. 2015

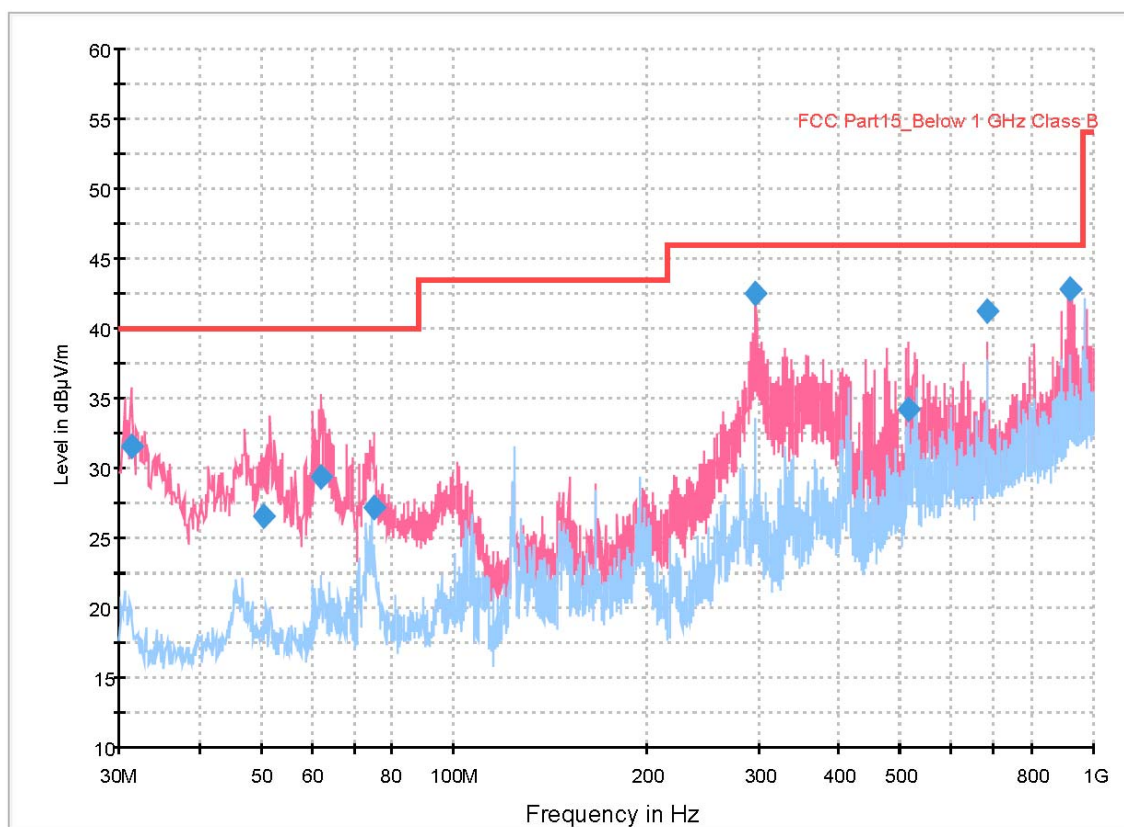
6.6 Test data for Radiated Emission

- Test Date : June 03, 2014
- Measurement Distance : 3 m
- Note : The EUT was tested made up 18 GHz, Because, it was required from the client
- Measurement

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



- Operating condition: 4 096 × 2 160 / 24 Hz (HDMI: Digital)



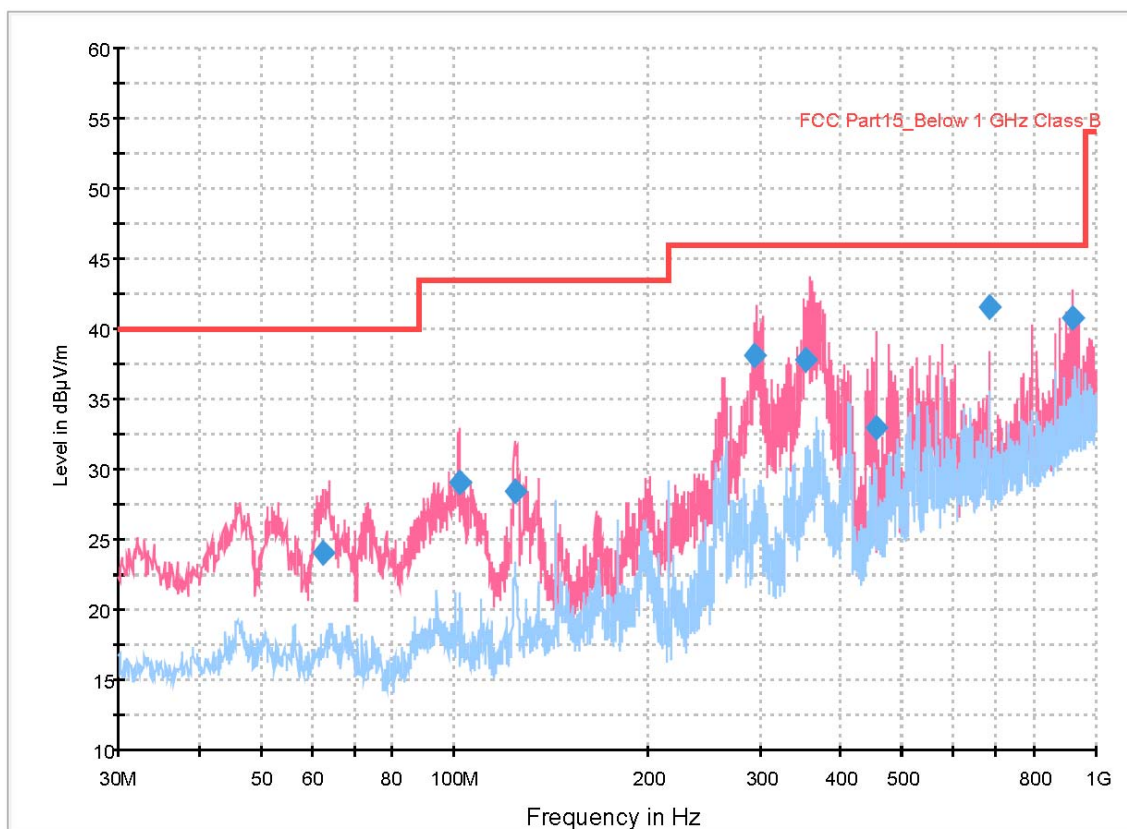
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.440000	31.5	1000.0	120.000	112.0	V	129.0	11.8	8.5	40.0
50.617500	26.6	1000.0	120.000	100.0	V	159.0	12.8	13.4	40.0
62.050000	29.4	1000.0	120.000	100.0	V	221.0	11.7	10.6	40.0
75.325000	27.2	1000.0	120.000	114.0	V	190.0	9.6	12.8	40.0
296.972500	42.5	1000.0	120.000	132.0	V	168.0	15.7	3.5	46.0
513.343750	34.2	1000.0	120.000	100.0	V	172.0	21.4	11.8	46.0
680.002500	41.2	1000.0	120.000	150.0	V	195.0	25.2	4.8	46.0
918.006250	42.9	1000.0	120.000	100.0	V	186.0	29.3	3.1	46.0

< Fig 9. Radiated emission result (30 MHz ~ 1 000 MHz) >



- Operating condition: Camera video display mode



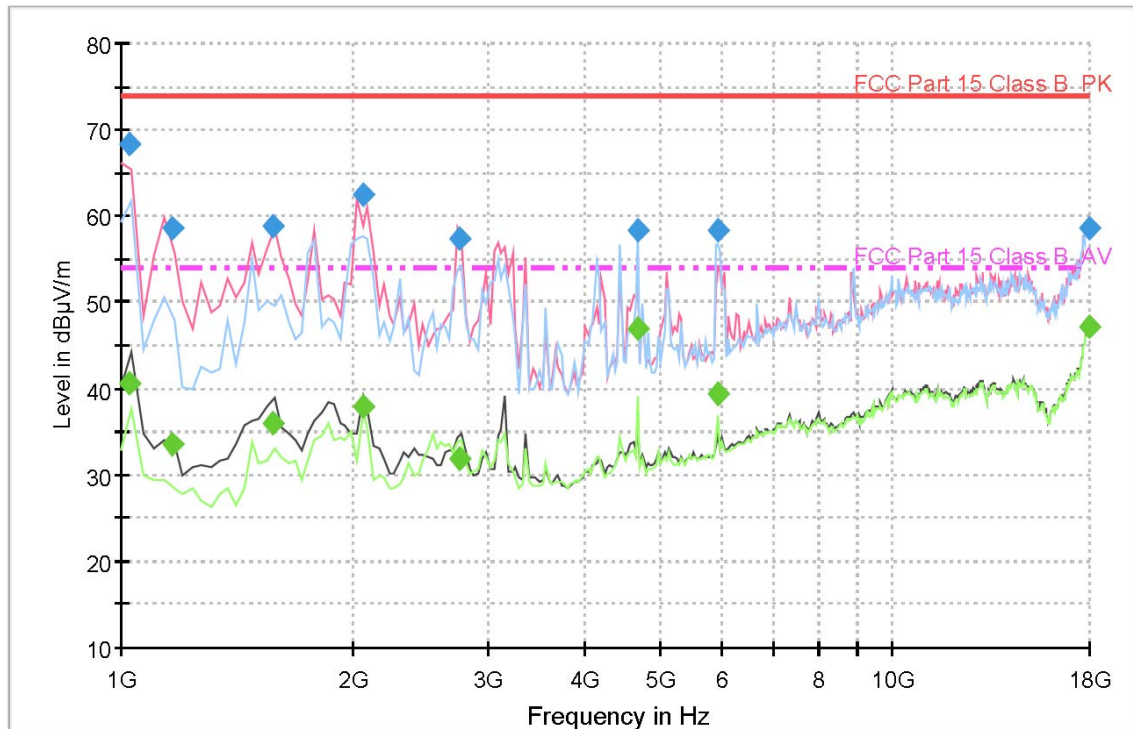
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
62.551250	24.0	1000.0	120.000	100.0	V	203.0	11.6	16.0	40.0
102.123750	29.0	1000.0	120.000	100.0	V	185.0	9.9	14.5	43.5
124.731250	28.4	1000.0	120.000	100.0	V	7.0	12.1	15.1	43.5
293.532500	38.1	1000.0	120.000	140.0	V	187.0	15.6	7.9	46.0
352.613750	37.9	1000.0	120.000	100.0	V	143.0	17.2	8.1	46.0
453.695000	32.9	1000.0	120.000	100.0	V	170.0	19.9	13.1	46.0
680.002500	41.6	1000.0	120.000	150.0	V	170.0	25.2	4.4	46.0
918.016250	40.8	1000.0	120.000	100.0	V	206.0	29.3	5.2	46.0

< Fig 10. Radiated emission result (30 MHz ~ 1 000 MHz) >



- Operating condition: 4 096 × 2 160 / 24 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)
1022.00000	68.2	1000.0	1000.000	100.0	V	189.0	-14.1	5.8	74.0
1167.07255	58.7	1000.0	1000.000	100.0	V	156.0	-13.7	15.3	74.0
1573.15832	58.9	1000.0	1000.000	200.0	V	143.0	-12.2	15.1	74.0
2058.84409	62.5	1000.0	1000.000	100.0	V	135.0	-10.4	11.5	74.0
2739.87495	57.5	1000.0	1000.000	200.0	V	189.0	-7.9	16.5	74.0
4687.75872	58.3	1000.0	1000.000	100.0	H	248.0	-2.1	15.7	74.0
5939.81162	58.3	1000.0	1000.000	100.0	H	109.0	0.6	15.7	74.0
18000.00000	58.6	1000.0	1000.000	200.0	V	66.0	23.1	15.4	74.0

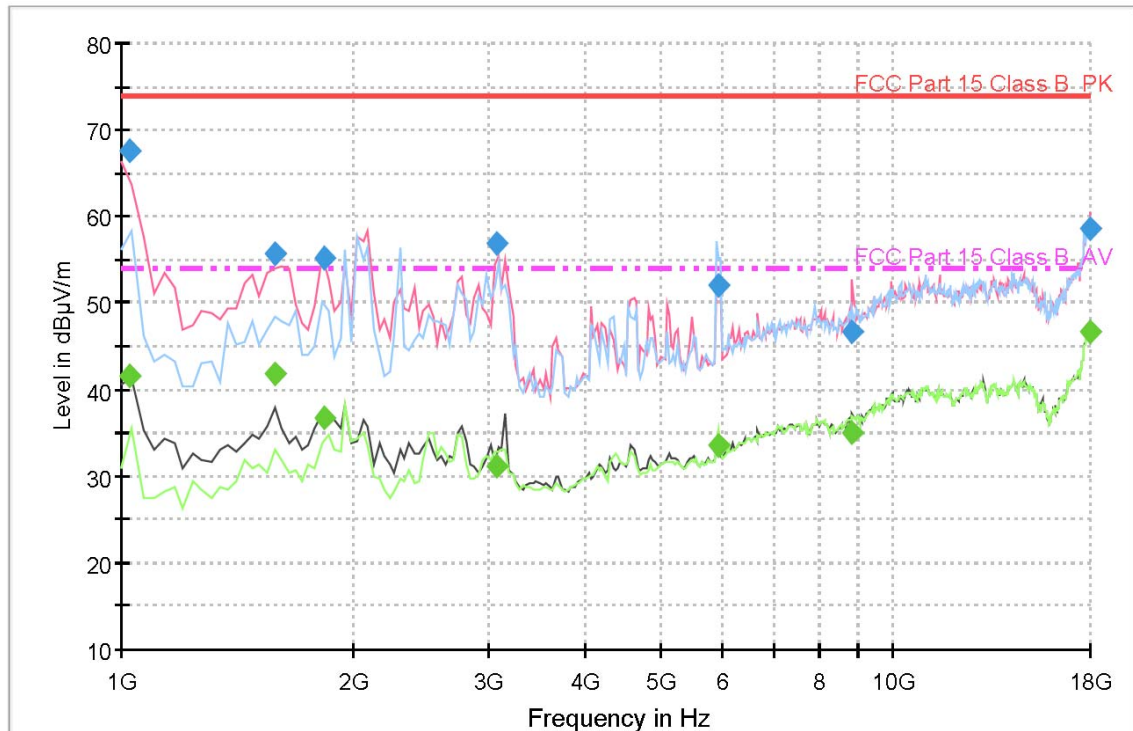
Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1022.00000	40.6	1000.0	1000.000	100.0	V	189.0	-14.1	13.4	54.0
1167.07255	33.6	1000.0	1000.000	100.0	V	156.0	-13.7	20.4	54.0
1573.15832	35.9	1000.0	1000.000	200.0	V	143.0	-12.2	18.1	54.0
2058.84409	37.9	1000.0	1000.000	100.0	V	135.0	-10.4	16.1	54.0
2739.87495	31.9	1000.0	1000.000	200.0	V	189.0	-7.9	22.1	54.0
4687.75872	46.9	1000.0	1000.000	100.0	H	248.0	-2.1	7.1	54.0
5939.81162	39.4	1000.0	1000.000	100.0	H	109.0	0.6	14.6	54.0
18000.00000	47.2	1000.0	1000.000	200.0	V	66.0	23.1	6.8	54.0

< Fig 11. Radiated emission result (1 000 MHz ~ 18 000 MHz) >



- Operating condition: Camera video display mode
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)
1022.80000	67.6	1000.0	1000.000	100.0	V	196.0	-14.1	6.4	74.0
1584.02645	55.6	1000.0	1000.000	100.0	V	220.0	-12.2	18.4	74.0
1836.43527	55.1	1000.0	1000.000	100.0	V	133.0	-11.2	18.9	74.0
3072.95631	57.0	1000.0	1000.000	200.0	V	136.0	-6.7	17.0	74.0
5939.41162	52.0	1000.0	1000.000	200.0	H	243.0	0.6	22.0	74.0
8860.53948	46.7	1000.0	1000.000	200.0	V	196.0	10.2	27.3	74.0
17997.20000	58.7	1000.0	1000.000	100.0	V	171.0	23.1	15.3	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)
1022.80000	41.5	1000.0	1000.000	100.0	V	196.0	-14.1	12.5	54.0
1584.02645	42.0	1000.0	1000.000	100.0	V	220.0	-12.2	12.0	54.0
1836.43527	36.8	1000.0	1000.000	100.0	V	133.0	-11.2	17.2	54.0
3072.95631	31.2	1000.0	1000.000	200.0	V	136.0	-6.7	22.8	54.0
5939.41162	33.7	1000.0	1000.000	200.0	H	243.0	0.6	20.3	54.0
8860.53948	34.9	1000.0	1000.000	200.0	V	196.0	10.2	19.1	54.0
17997.20000	46.6	1000.0	1000.000	100.0	V	171.0	23.1	7.4	54.0

< Fig 12. Radiated emission result (1 000 MHz ~ 18 000 MHz) >



7. Sample Calculations

$$\begin{aligned} \text{dB}\mu\text{V} &= 20 \text{ Log}_{10}(\mu\text{V}/\text{m}) \\ \text{dB}\mu\text{V} &= \text{dBm} + 107 \\ \mu\text{V} &= 10^{(\text{dB}\mu\text{V}/20)} \end{aligned}$$

7.1 Example 1 :

■ 20.3 MHz

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

7.2 Example 2 :

■ 66.7 MHz

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



8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. LED TV (Model Name: 55LA9700-UA)** was complies with §15.107 and 15.109 of the FCC Rules.

- The end -

