

## ***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: February 23, 2012**

**Order Number: GETEC-C1-12-051**

**Test Report Number: GETEC-E3-12-024**

**Test Site: GUMI COLLEGE EMC CENTER**

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

**FCC ID. : BEJM2382D**

**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>: LED LCD TV/Monitor</b>
<b>Type of Authority</b>	<b>: Certification</b>
<b>Model Name</b>	<b>: M2382D</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 C63.4-2003 / 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,**

  
\_\_\_\_\_  
**Soon-Hoon Jeong / Associate 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**

- **FCC ID.** BEJM2382D
- **EUT Type** LED LCD TV/Monitor
- **Model Name** M2382D
- **Trade Name** LG
- **Serial Number** Prototype
- **Rule Part(s)** FCC Part 15 Subpart B
- **Type of Authority** Certification
- **Test Procedure(s)** ANSI C63.4 (2003) / Canadian standard ICES-003
- **Dates of Test** February 13 ~ 15, 2012
- **Place of Test** **GUMI COLLEGE EMC CENTER** (FCC Registration Number: 100749, 443957)  
407, Bugok-Dong, Gumi-City, Gyungbok, 730-711, Republic of Korea
- **Test Report Number** GETEC-E3-12-024
- **Dates of Issue** February 23, 2012



## 2. Introduction

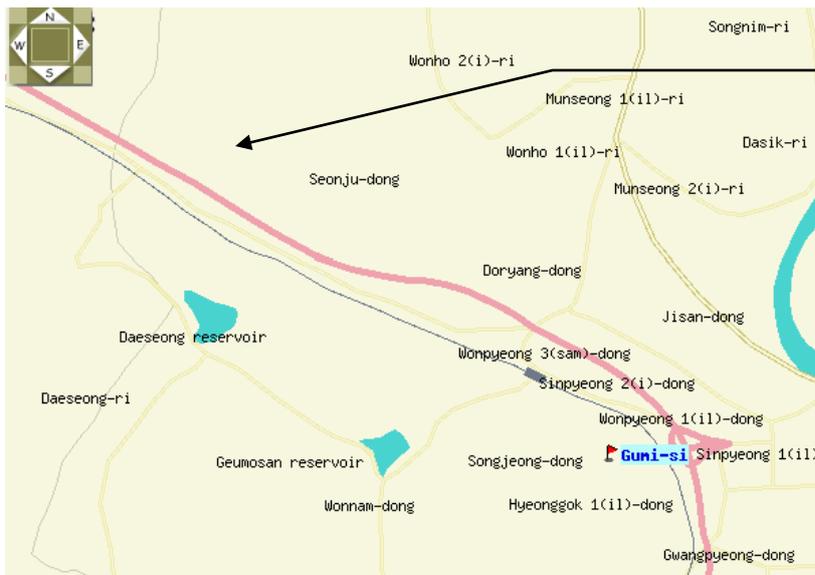
The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ASNI C63.4-2003) was used in determining radiated and conducted emissions emanating from **LG Electronics Inc.**

### **LED LCD TV/Monitor (Model Name: M2382D)**

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

The site address is 407, Bugok-Dong, Gumi-City, Gyungbok, 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 (2003)



**GUMI COLLEGE EMC CENTER**  
407, Bugok-Dong, Gumi-City,  
Gyungbok, 730-711, Republic of Korea  
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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 LCD TV/Monitor (Model Name: M2382D) FCC ID.: BEJM2382D**

Panel	Screen Type	584.2 mm Wide (23 inch) IPS(In-Plane Switching technology) Panel Visible diagonal size : 584.2 mm
	Pixel Pitch	0.265 mm (H) x 0.265 mm (V)
Video Signal	Max. Resolution	1920 x 1080 @ 60 Hz
	Recommended Resolution	1920 x 1080 @ 60 Hz
	Horizontal Frequency	30 kHz to 83 kHz
	Vertical Frequency	56 Hz to 75 Hz
	Synchronization Type	Separate Sync, Digital
Input Connector		TV, D-Sub Analog, SCART, PC Audio In, Component, CVBS, HDMI*2
Power	Rated Voltage	19 V === 2.0 A
	Power Consumption	On Mode : 40W (typ.) Off Mode ≤ 0.0 W
AC/DC Adapter		Manufacturer: LITE-ON, Model PA-1650-68
Tilt	Tilt Range	-5 to 20°

-. Maximum Frequency Range : 667 MHz



### 3.2 Support Equipment / Cables used

#### 3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC (Main board)	ASLOCK	770iCafe	S/N: 0AM0X3097310 FCC ID.: DoC
Video card	Rextechnology Co., Ltd.	HD4850	S/N: L5H041947 FCC ID.: DoC
PS2 keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
USB mouse	Great Pleasure Electronics Co., Ltd.	GP-M3100UE	S/N: 14036766 FCC ID: DoC
DVD player	ILIKE ELECTRONICS CO., LTD.	CVX-3800 Full-HD	S/N: CVX380020110110493 FCC ID.: Verification
USB memory stick	SAMSUNG	SUM-PSB4	S/N: TBBB202478F FCC ID.: DoC
Digital TV pattern generator	Televue	TPG430B	S/N: 93.01.20.05.09.00.00.02 FCC ID.: Verification
8-VSB modulator	Ktech	VSB-ENC-150E	S/N: 2005-726 FCC ID.: Verification

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.
IR remote controller	LG Electronics Inc.	AKB73275684	S/N: None. FCC ID.: N/A
Adapter #1 <sup>1)</sup>	LITE-ON TECHNOLOGY CORPORATION	PA-1650-64	S/N: OB9UVXXXXXXXXX0231 FCC ID.: None.
Adapter #2 <sup>1)</sup>	LG Innotek Co., Ltd.	PSAB-L101A	S/N: LC21I627104010160 FCC ID.: None.

1) Input ratings: AC (100 – 240) V~, (50 – 60) Hz, 1.4 A / Output ratings: DC 19 V, 2.53 A, 48 W



### 3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the adapter	1.80 m unshielded
Adapter cable	Connected to the EUT	1.50 m shielded with a ferrite core
RGB(Analog) in cable	Connected to the EUT and PC	1.80 m shielded with two ferrite cores
HDMI/DVI (Digital) in cable	Connected to the EUT and PC	2.00 m shielded
Audio(RGB/DVI) in cable	Connected to the EUT and PC	1.50 m shielded with a ferrite core
Component in cable	Connected to the EUT and DVD player	3.00 m shielded
Headset cable	Connected to the EUT and headset	1.20 m shielded
Antenna cable	Connected to the EUT and digital TV pattern generator	10.00 m shielded with two ferrite cores

### 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.

- Test Voltage / Frequency : AC 120 V / 60 Hz
  
- Test Mode(s)

#### **-. Monitor mode (with adapter #1(model name: PA-1650-64 or with adapter #2(model name: PSAB-L101A)**

Radiated emission: 1 920 × 1 080 / 60 Hz (RGB: Analog, HDMI/DVI: Digital)

Conducted emission: 1 920 × 1 080 / 60 Hz (RGB: Analog, HDMI/DVI: Digital),

1 024 × 768 / 60 Hz (RGB: Analog), 640 × 480 / 60 Hz (RGB: Analog)

#### ◆ 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 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).

The EMI test receiver was scanned from 150 kHz to 30 MHz with 20 ms sweep time to determine the frequency producing the maximum EME from the EUT. The frequency producing the maximum level was re-examined using Quasi-Peak mode of the EMI test receiver.

The bandwidth of Quasi-peak mode was set to 9 kHz. Each emission was maximized consistent with typical applications by varying the configuration of the test sample. Interface cables were connected to the available interface ports of the test unit. The effect of varying the position of cables was investigated to find the configuration that produces maximum diagram emission. Excess cable lengths were bundled at center with 30 cm ~ 40 cm.

Each EME reported was calibrated using the R/S signal generator

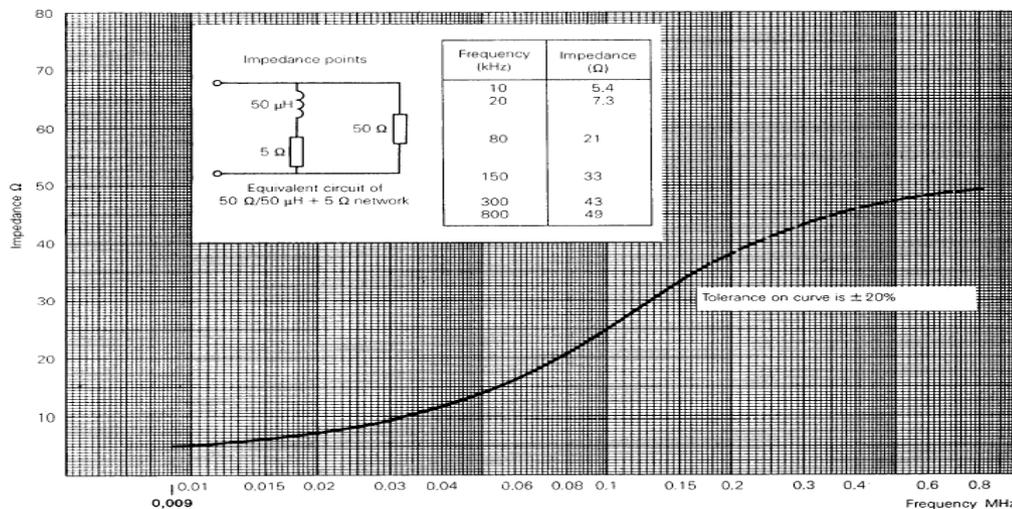


Fig 2. Impedance of LISN



### 4.3 Radiated Emission

Preliminary measurements were conducted 3 m semi anechoic chamber using broadband antennas to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The technology configuration, mode of operation and turntable azimuth with respect to antenna was note for each frequency found.

Final measurements were made 3 m chamber (FCC registration No.: 443957) and/or 10 m OATS (FCC registration No.: 100749).

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 and investigated using EMI test receiver. The detector function was set to CISPR quasi-peak mode average mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency or type of signal.

The EUT, support equipment and interconnecting cables were reconfigured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non-metallic 1.0 m × 1.5 m table.

The turntable containing the test sample was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission.

Each EME reported was calibrated using the R/S signal generator

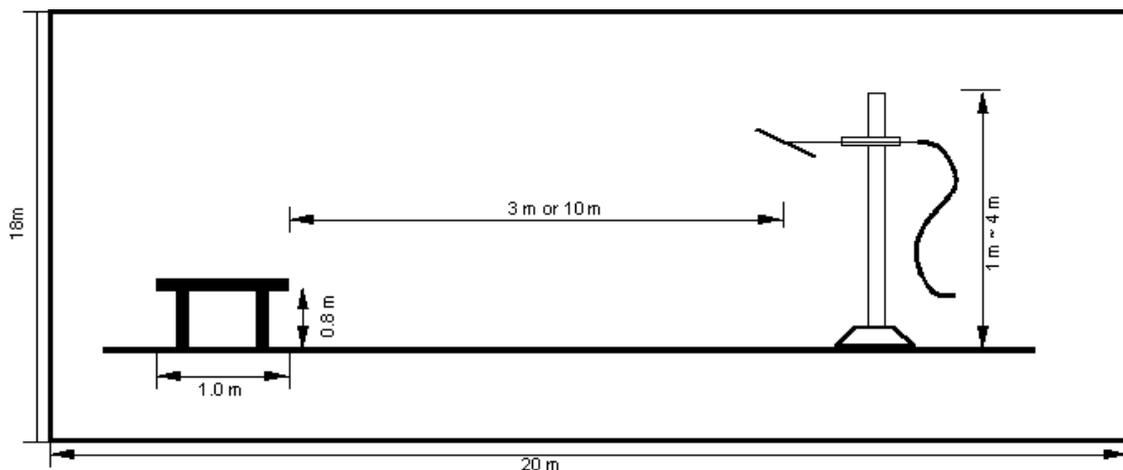


Fig 3. Dimensions of test site



## 5. Conducted Emission

### 5.1 Operating Environment

Temperature : 25.0 °C  
Relative Humidity : 41.0 % 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)	$\pm 2.71$ dB	Confidence level of approximately 95 % ( $k = 2$ )
Conducted emission (150 kHz ~ 30 MHz)	$\pm 3.34$ 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

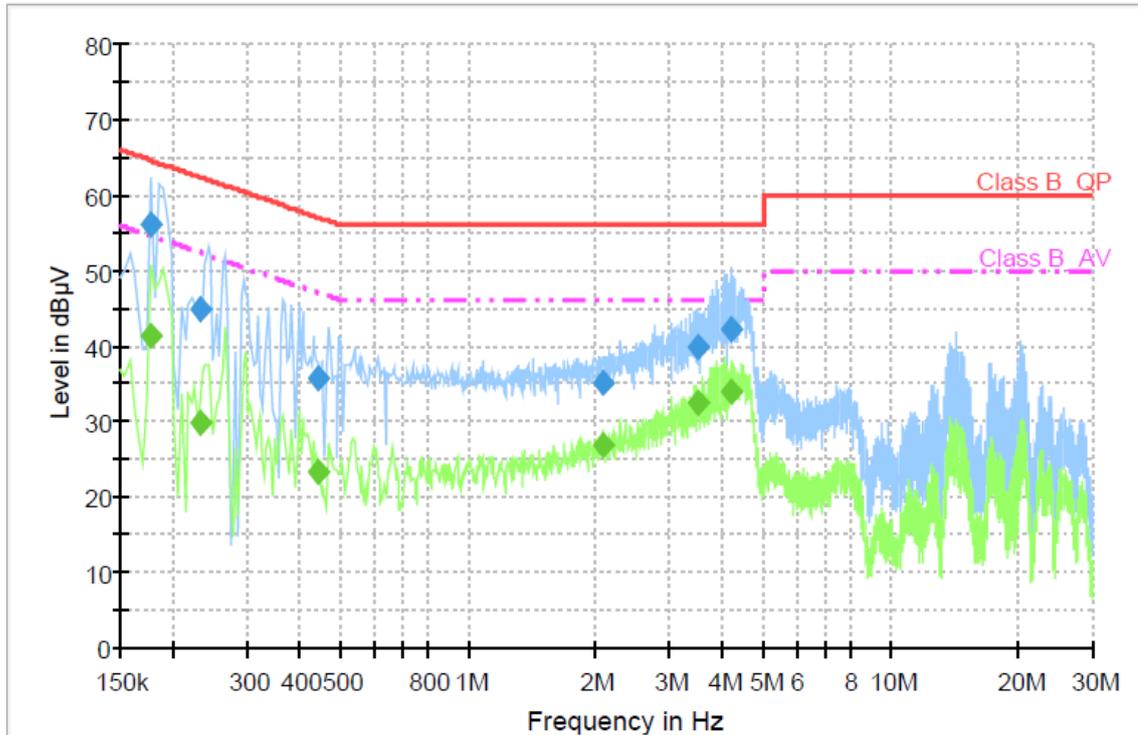
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 05. 2012
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 07. 2012
■ - ENV216	Rohde & Schwarz	LISN	100173	12. 07. 2012
□ - ENY81-CA6	Rohde & Schwarz	ISN	101573	10. 19. 2012

#### 5.6 Test data for Conducted Emission

- Test Date : February 14, 2012  
- Resolution Bandwidth : 9 kHz  
- Frequency Range : 0.15 MHz ~ 30 MHz  
- Line : L1: Live, N: Neutral



◆ Operating condition: Monitor with adapter #1, 1 920 × 1 080 / 60 Hz(RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.178000	56.0	1000.0	9.000	On	N	9.7	8.5	64.6	
0.232000	44.8	1000.0	9.000	On	N	9.7	17.5	62.4	
0.440000	35.7	1000.0	9.000	On	L1	9.7	21.4	57.1	
2.096000	35.1	1000.0	9.000	On	N	9.7	20.9	56.0	
3.516000	39.8	1000.0	9.000	On	N	9.7	16.2	56.0	
4.180000	42.2	1000.0	9.000	On	N	9.7	13.8	56.0	

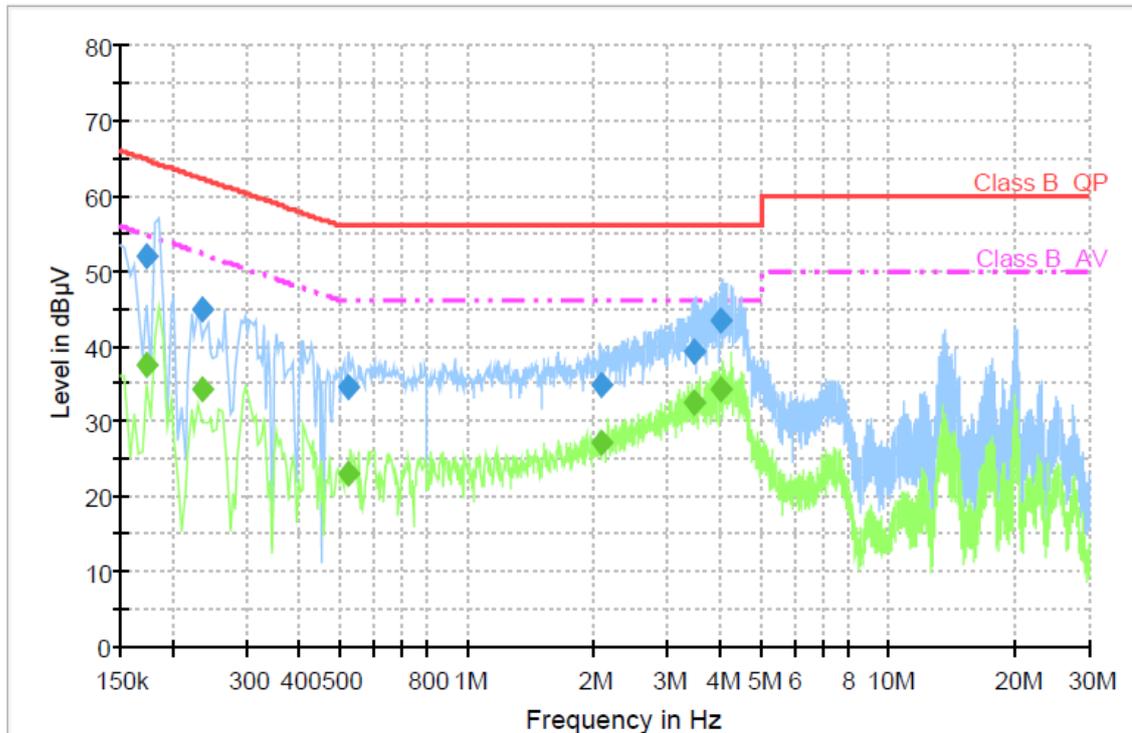
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.178000	41.3	1000.0	9.000	On	N	9.7	13.3	54.6	
0.232000	29.9	1000.0	9.000	On	N	9.7	22.4	52.4	
0.440000	23.4	1000.0	9.000	On	L1	9.7	23.7	47.1	
2.096000	26.8	1000.0	9.000	On	N	9.7	19.2	46.0	
3.516000	32.4	1000.0	9.000	On	N	9.7	13.6	46.0	
4.180000	33.9	1000.0	9.000	On	N	9.7	12.1	46.0	

< Fig 4. Conducted emission result >



◆ Operating condition: Monitor with adapter #1, 1 024 × 768 / 60 Hz(RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.174000	52.1	1000.0	9.000	On	N	9.7	12.7	64.8	
0.236000	44.9	1000.0	9.000	On	N	9.7	17.4	62.2	
0.520000	34.5	1000.0	9.000	On	N	9.7	21.5	56.0	
2.084000	34.9	1000.0	9.000	On	N	9.7	21.1	56.0	
3.464000	39.3	1000.0	9.000	On	N	9.7	16.7	56.0	
4.020000	43.3	1000.0	9.000	On	N	9.7	12.7	56.0	

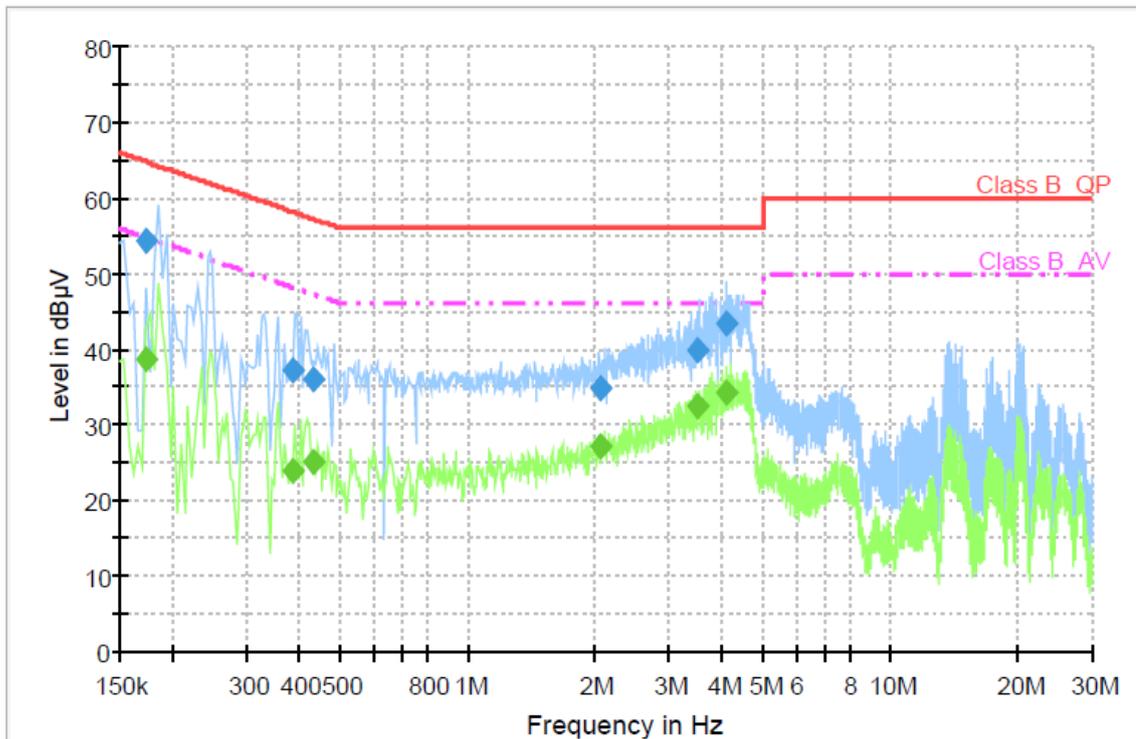
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.174000	37.6	1000.0	9.000	On	N	9.7	17.2	54.8	
0.236000	34.2	1000.0	9.000	On	N	9.7	18.0	52.2	
0.520000	23.2	1000.0	9.000	On	N	9.7	22.8	46.0	
2.084000	27.2	1000.0	9.000	On	N	9.7	18.8	46.0	
3.464000	32.4	1000.0	9.000	On	N	9.7	13.6	46.0	
4.020000	34.3	1000.0	9.000	On	N	9.7	11.7	46.0	

< Fig 5. Conducted emission result >



◆ Operating condition: Monitor with adapter #1, 640 × 480 / 60 Hz(RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.174000	54.3	1000.0	9.000	On	N	9.7	10.4	64.8	
0.384000	37.2	1000.0	9.000	On	N	9.7	21.0	58.2	
0.432000	35.9	1000.0	9.000	On	N	9.7	21.3	57.2	
2.064000	34.8	1000.0	9.000	On	N	9.7	21.2	56.0	
3.504000	39.8	1000.0	9.000	On	N	9.7	16.2	56.0	
4.088000	43.5	1000.0	9.000	On	N	9.7	12.5	56.0	

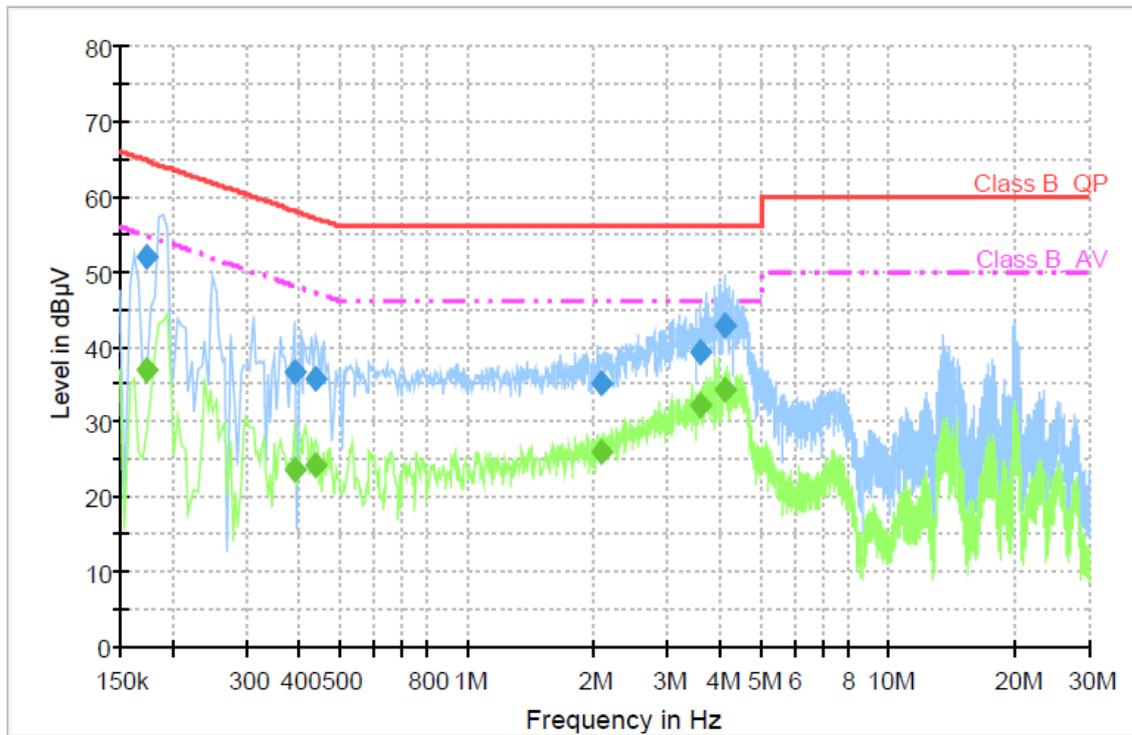
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.174000	38.6	1000.0	9.000	On	N	9.7	16.1	54.8	
0.384000	23.9	1000.0	9.000	On	N	9.7	24.3	48.2	
0.432000	25.0	1000.0	9.000	On	N	9.7	22.3	47.2	
2.064000	27.1	1000.0	9.000	On	N	9.7	18.9	46.0	
3.504000	32.4	1000.0	9.000	On	N	9.7	13.6	46.0	
4.088000	34.4	1000.0	9.000	On	N	9.7	11.6	46.0	

< Fig 6. Conducted emission result >



◆ Operating condition: Monitor with adapter #1, 1 920 × 1 080 / 60 Hz(HDMI/DVI: Digital)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.174000	52.0	1000.0	9.000	On	N	9.7	12.8	64.8	
0.392000	36.5	1000.0	9.000	On	N	9.7	21.6	58.0	
0.436000	35.8	1000.0	9.000	On	L1	9.7	21.3	57.1	
2.084000	35.2	1000.0	9.000	On	N	9.7	20.8	56.0	
3.592000	39.4	1000.0	9.000	On	N	9.7	16.6	56.0	
4.084000	42.8	1000.0	9.000	On	N	9.7	13.2	56.0	

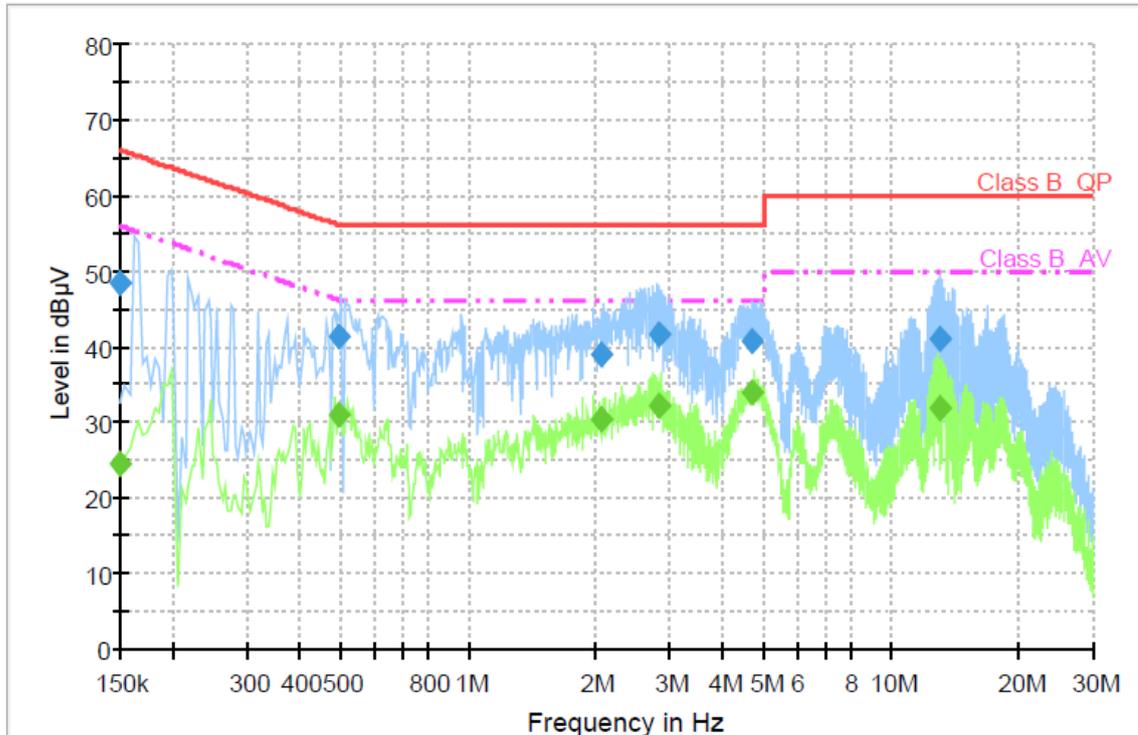
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.174000	37.0	1000.0	9.000	On	N	9.7	17.8	54.8	
0.392000	23.5	1000.0	9.000	On	N	9.7	24.5	48.0	
0.436000	24.2	1000.0	9.000	On	L1	9.7	23.0	47.1	
2.084000	26.1	1000.0	9.000	On	N	9.7	19.9	46.0	
3.592000	32.3	1000.0	9.000	On	N	9.7	13.7	46.0	
4.084000	34.3	1000.0	9.000	On	N	9.7	11.7	46.0	

< Fig 7. Conducted emission result >



◆ Operating condition: Monitor with adapter #2, 1 920 × 1 080 / 60 Hz(RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	48.4	1000.0	9.000	On	L1	9.7	17.6	66.0	
0.492000	41.4	1000.0	9.000	On	N	9.7	14.8	56.1	
2.068000	39.1	1000.0	9.000	On	L1	9.7	16.9	56.0	
2.828000	41.7	1000.0	9.000	On	N	9.7	14.3	56.0	
4.692000	40.8	1000.0	9.000	On	N	9.7	15.2	56.0	
13.036000	41.1	1000.0	9.000	On	N	9.8	18.9	60.0	

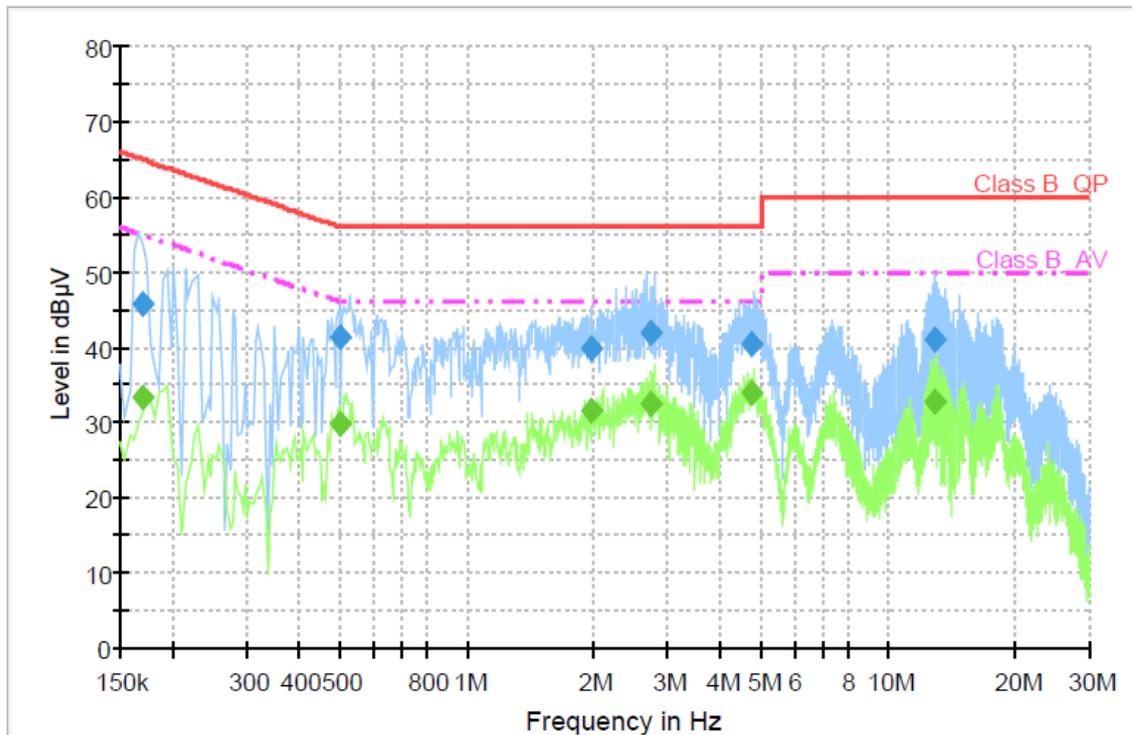
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	24.6	1000.0	9.000	On	L1	9.7	31.4	56.0	
0.492000	31.0	1000.0	9.000	On	N	9.7	15.2	46.1	
2.068000	30.3	1000.0	9.000	On	L1	9.7	15.7	46.0	
2.828000	32.3	1000.0	9.000	On	N	9.7	13.7	46.0	
4.692000	34.0	1000.0	9.000	On	N	9.7	12.0	46.0	
13.036000	32.0	1000.0	9.000	On	N	9.8	18.0	50.0	

< Fig 8. Conducted emission result >



◆ Operating condition: Monitor with adapter #2, 1 024 × 768 / 60 Hz(RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.170000	45.9	1000.0	9.000	On	N	9.7	19.1	65.0	
0.500000	41.4	1000.0	9.000	On	N	9.7	14.6	56.0	
1.972000	39.9	1000.0	9.000	On	N	9.7	16.1	56.0	
2.724000	42.0	1000.0	9.000	On	N	9.7	14.0	56.0	
4.748000	40.6	1000.0	9.000	On	L1	9.7	15.4	56.0	
12.888000	41.0	1000.0	9.000	On	L1	9.8	19.0	60.0	

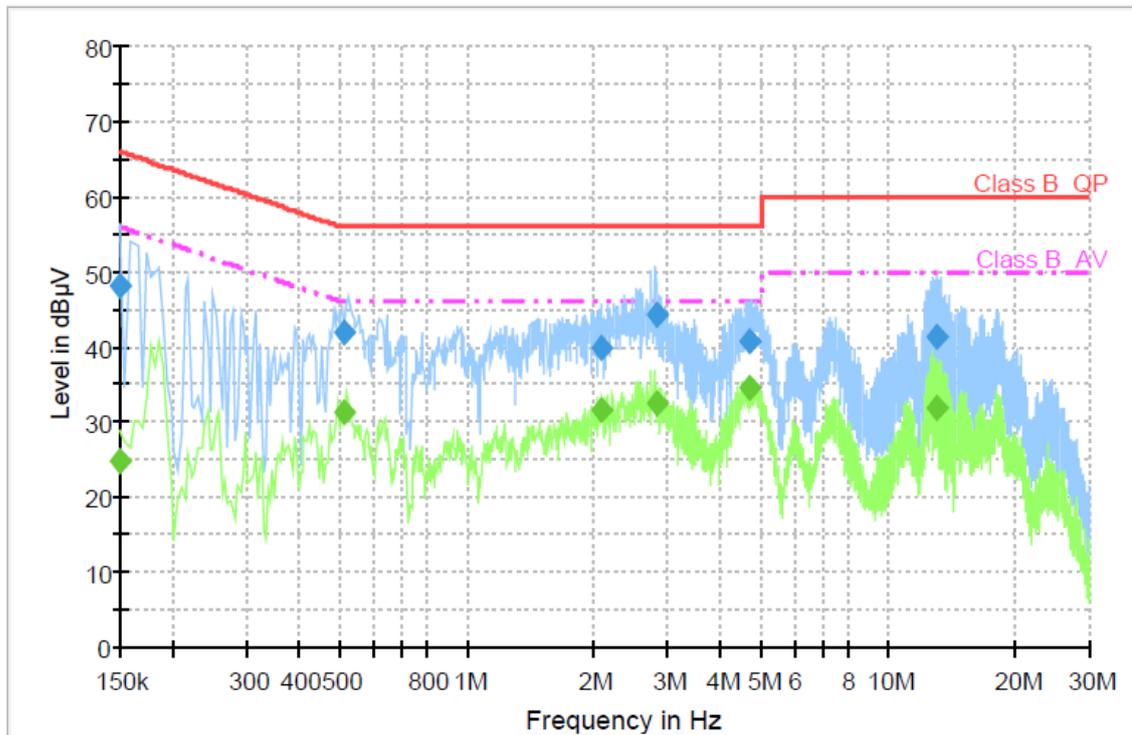
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.170000	33.2	1000.0	9.000	On	N	9.7	21.7	55.0	
0.500000	29.8	1000.0	9.000	On	N	9.7	16.2	46.0	
1.972000	31.6	1000.0	9.000	On	N	9.7	14.4	46.0	
2.724000	32.6	1000.0	9.000	On	N	9.7	13.4	46.0	
4.748000	34.1	1000.0	9.000	On	L1	9.7	11.9	46.0	
12.888000	32.6	1000.0	9.000	On	L1	9.8	17.4	50.0	

< Fig 9. Conducted emission result >



◆ Operating condition: Monitor with adapter #2, 640 × 480 / 60 Hz(RGB: Analog)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	48.2	1000.0	9.000	On	L1	9.7	17.8	66.0	
0.512000	42.0	1000.0	9.000	On	N	9.7	14.0	56.0	
2.088000	40.0	1000.0	9.000	On	N	9.7	16.0	56.0	
2.816000	44.3	1000.0	9.000	On	N	9.7	11.7	56.0	
4.684000	40.8	1000.0	9.000	On	N	9.7	15.2	56.0	
13.020000	41.2	1000.0	9.000	On	N	9.8	18.8	60.0	

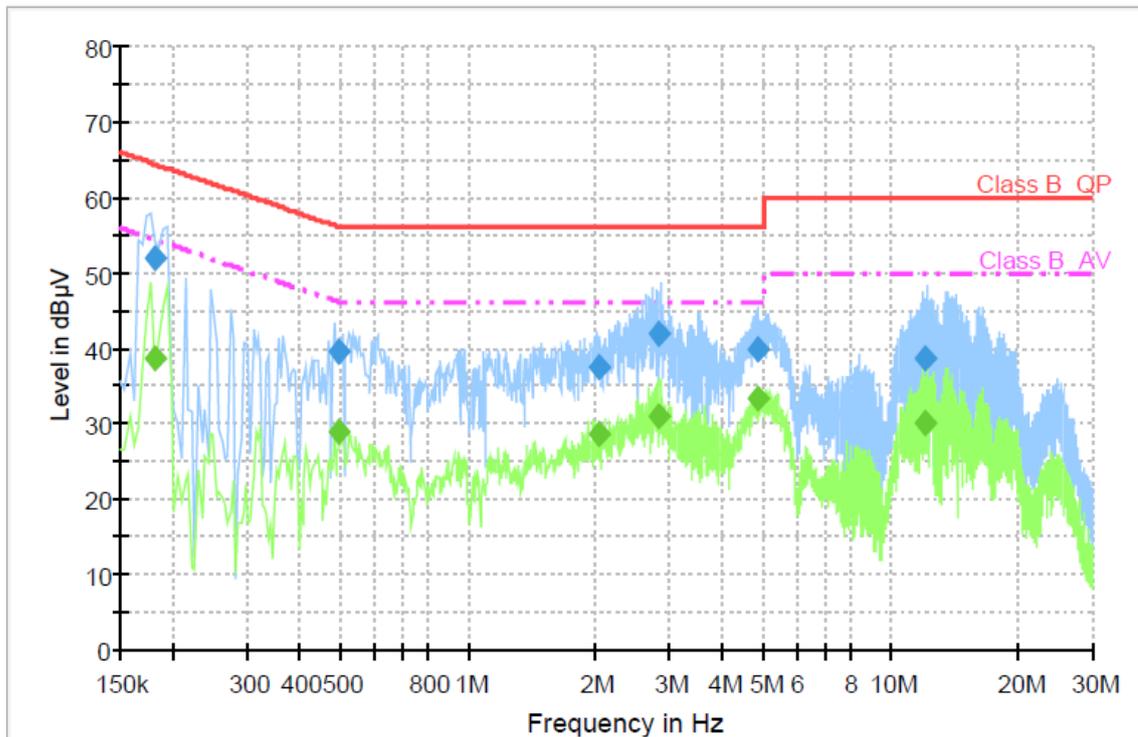
### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	24.7	1000.0	9.000	On	L1	9.7	31.3	56.0	
0.512000	31.4	1000.0	9.000	On	N	9.7	14.6	46.0	
2.088000	31.5	1000.0	9.000	On	N	9.7	14.5	46.0	
2.816000	32.4	1000.0	9.000	On	N	9.7	13.6	46.0	
4.684000	34.5	1000.0	9.000	On	N	9.7	11.5	46.0	
13.020000	31.9	1000.0	9.000	On	N	9.8	18.1	50.0	

< Fig 10. Conducted emission result >



◆ Operating condition: Monitor with adapter #2, 1 920 × 1 080 / 60 Hz(HDMI/DVI: Digital)



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.182000	52.0	1000.0	9.000	On	N	9.7	12.4	64.4	
0.492000	39.5	1000.0	9.000	On	L1	9.7	16.7	56.1	
2.048000	37.6	1000.0	9.000	On	N	9.7	18.4	56.0	
2.832000	42.0	1000.0	9.000	On	N	9.7	14.0	56.0	
4.868000	39.9	1000.0	9.000	On	N	9.7	16.1	56.0	
12.124000	38.5	1000.0	9.000	On	L1	9.8	21.5	60.0	

### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.182000	38.6	1000.0	9.000	On	N	9.7	15.8	54.4	
0.492000	28.9	1000.0	9.000	On	L1	9.7	17.2	46.1	
2.048000	28.7	1000.0	9.000	On	N	9.7	17.3	46.0	
2.832000	30.9	1000.0	9.000	On	N	9.7	15.1	46.0	
4.868000	33.4	1000.0	9.000	On	N	9.7	12.6	46.0	
12.124000	30.2	1000.0	9.000	On	L1	9.8	19.8	50.0	

< Fig 11. Conducted emission result >



## 6. Radiated Emission

### 6.1 Operating Environment

Temperature : - 3.0 °C  
Relative Humidity : 35.0 % 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)	± 4.38 dB	Confidence level of approximately 95 % ( $k = 2$ )
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 3.50 dB	Confidence level of approximately 95 % ( $k = 2$ )
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.75 dB	Confidence level of approximately 95 % ( $k = 2$ )
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.59 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	12. 05. 2012
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 15. 2012
■ - BBHA9120D	Schwarzbeck	Horn Antenna	597	01. 23. 2013
■ - MCU066	matur GmbH	Position Controller	1390306	N/A
■ - TT2.5SI	matur GmbH	Turntable	1390307	N/A
■ - AM 4.0	matur GmbH	Antenna Mast	1390308	N/A
■ - AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	11. 12. 2012

#### 6.6 Test data for Radiated Emission

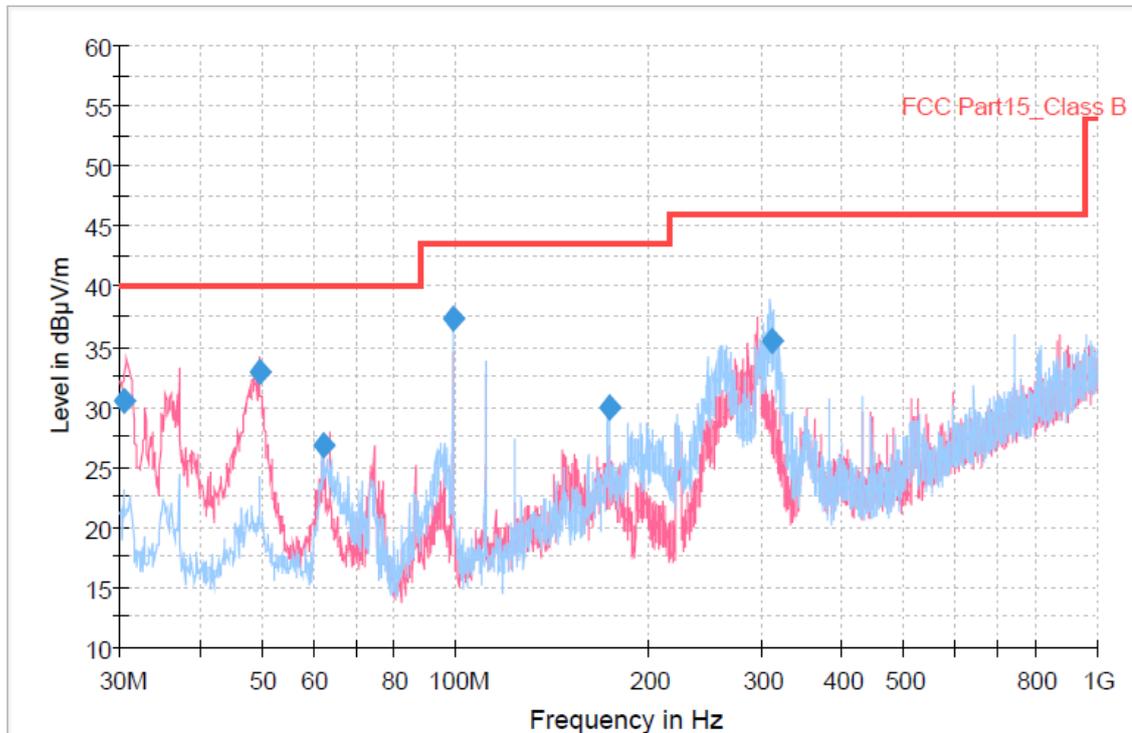
- Test Date : February 13 ~ 15, 2012
- Measurement Distance : 3 m
- Note : The highest frequency of the internal source of the EUT is between 500 MHz and 1 000 MHz (667 MHz). The measurement was made up to 5 000 MHz

#### - Measurement

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



◆ Operating condition: Monitor with adapter #1, 1 920 × 1 080 / 60 Hz(RGB: Analog)



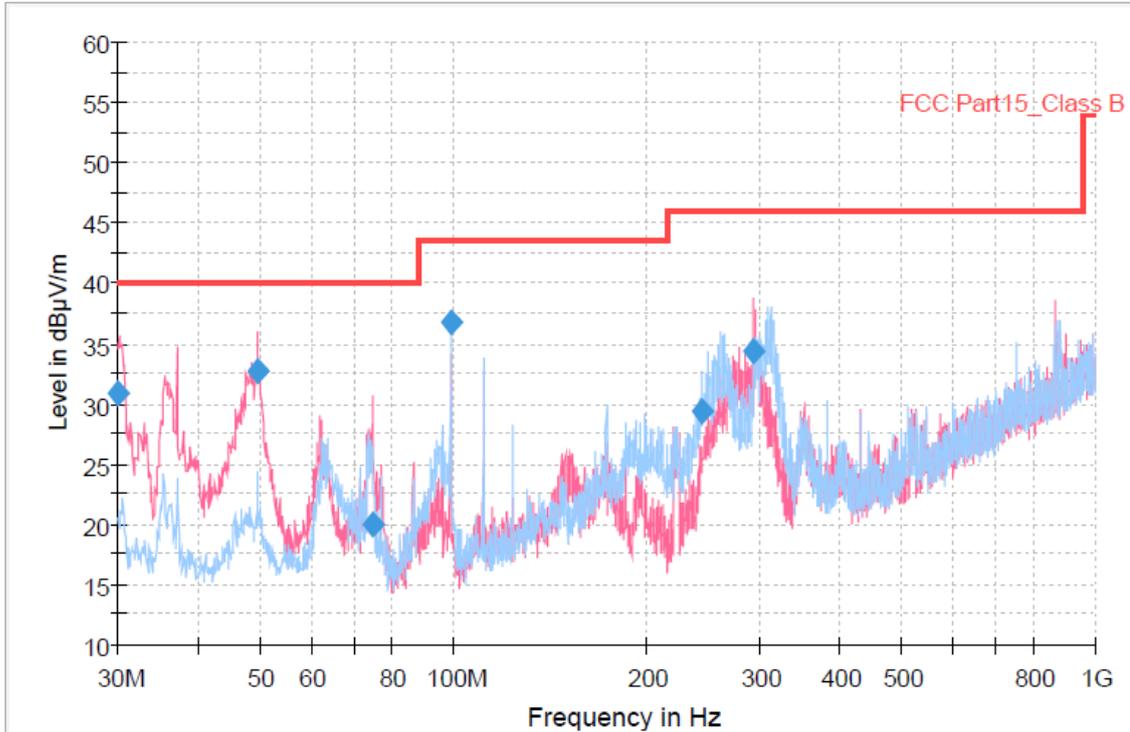
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.440000	30.5	1000.0	120.000	100.0	V	216.0	12.8	9.5	40.0
49.501250	32.9	1000.0	120.000	109.0	V	127.0	13.5	7.1	40.0
62.327500	26.8	1000.0	120.000	110.0	V	189.0	12.8	13.2	40.0
99.051250	37.3	1000.0	120.000	200.0	H	248.0	10.9	6.2	43.5
173.297500	30.0	1000.0	120.000	150.0	H	242.0	14.2	13.5	43.5
311.110000	35.5	1000.0	120.000	104.0	H	169.0	16.3	10.5	46.0

< Fig 12. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating condition: Monitor with adapter #1, 1 920 × 1 080 / 60 Hz(HDMI/DVI: Digital)



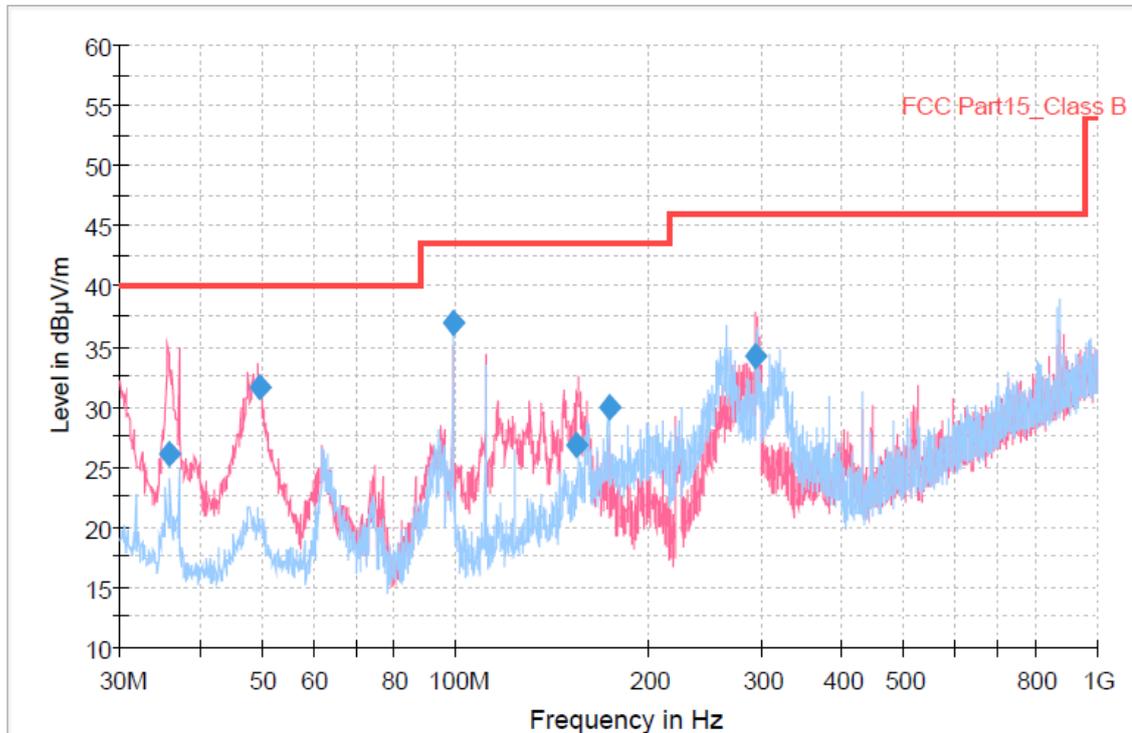
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.040000	30.9	1000.0	120.000	100.0	V	272.0	12.8	9.1	40.0
49.501250	32.7	1000.0	120.000	100.0	V	138.0	13.5	7.3	40.0
75.003750	20.0	1000.0	120.000	150.0	V	-4.0	10.4	20.0	40.0
99.011250	36.8	1000.0	120.000	200.0	H	251.0	10.9	6.7	43.5
244.953750	29.4	1000.0	120.000	123.0	H	148.0	13.8	16.6	46.0
294.426250	34.4	1000.0	120.000	150.0	V	16.0	15.8	11.6	46.0

< Fig 13. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating condition: Monitor with adapter #2, 1 920 × 1 080 / 60 Hz(RGB: Analog)



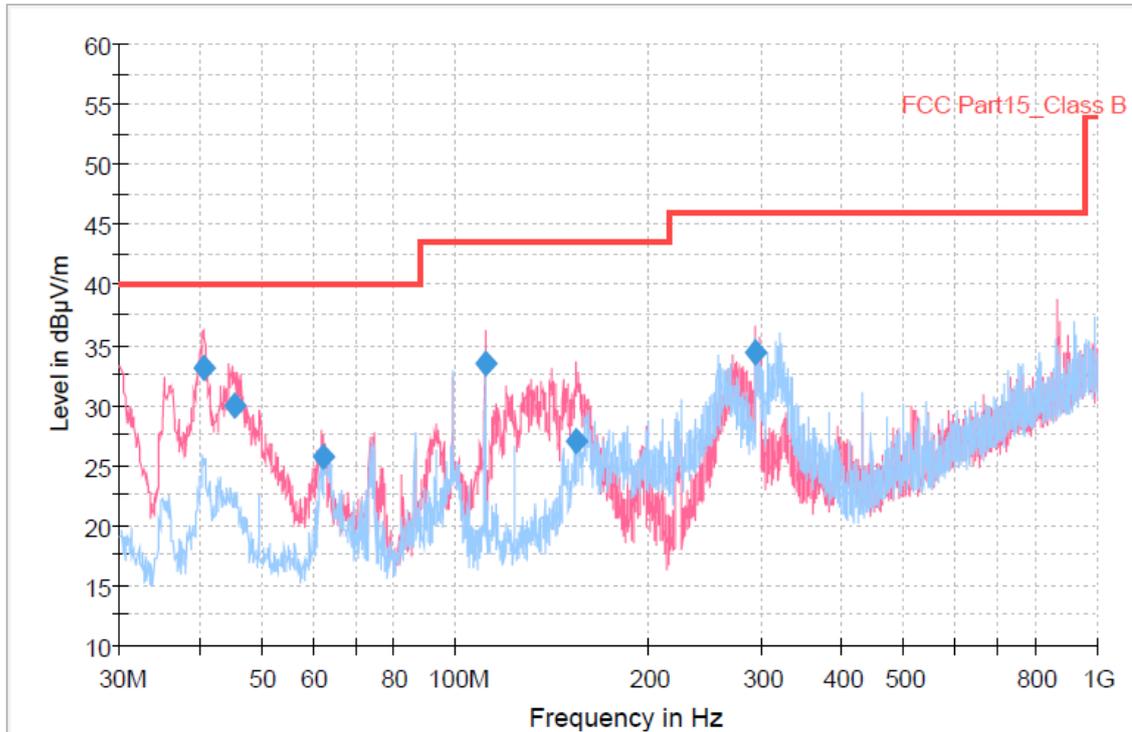
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
35.717500	26.1	1000.0	120.000	100.0	V	308.0	12.8	13.9	40.0
49.497500	31.6	1000.0	120.000	100.0	V	143.0	13.5	8.4	40.0
99.011250	36.9	1000.0	120.000	198.0	H	244.0	10.9	6.6	43.5
154.155000	26.8	1000.0	120.000	100.0	V	57.0	14.7	16.7	43.5
173.297500	29.9	1000.0	120.000	140.0	H	232.0	14.2	13.6	43.5
294.547500	34.2	1000.0	120.000	198.0	V	35.0	15.8	11.8	46.0

< Fig 14. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating condition: Monitor with adapter #2, 1 920 × 1 080 / 60 Hz(HDMI/DVI: Digital)



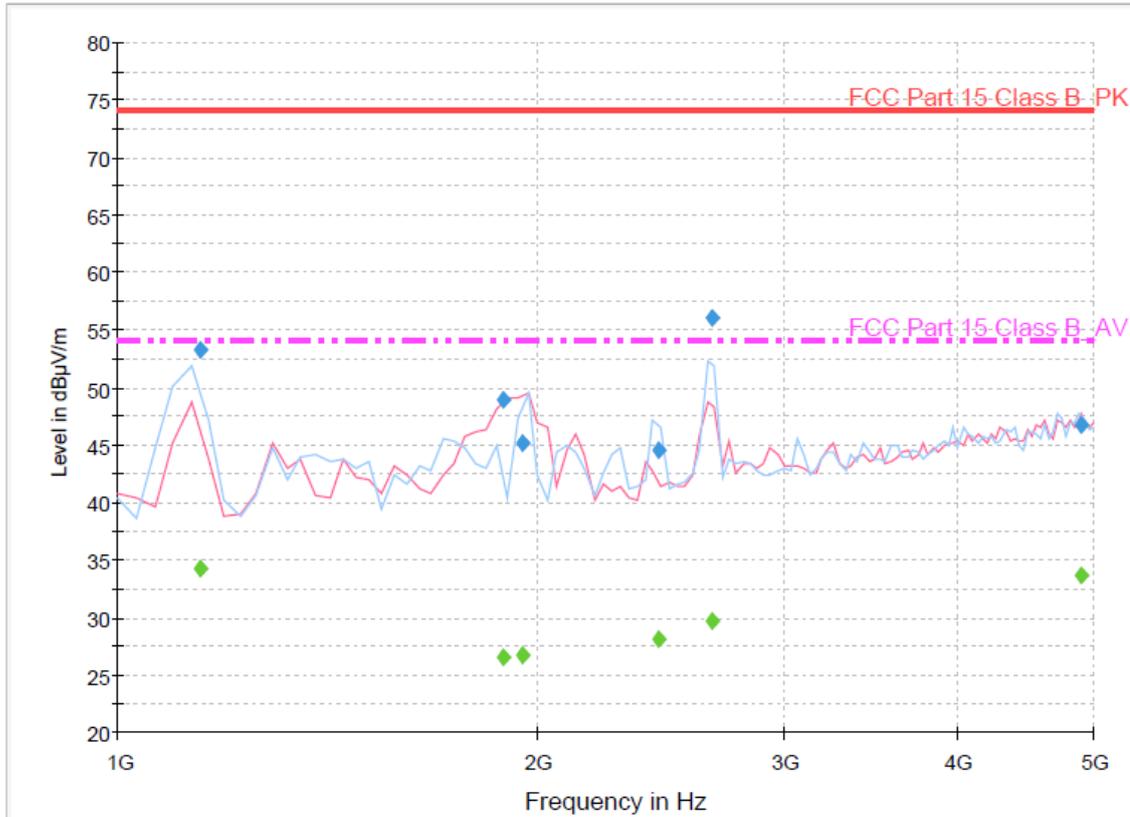
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
40.688750	33.0	1000.0	120.000	100.0	V	226.0	13.0	7.0	40.0
45.328750	30.0	1000.0	120.000	100.0	V	99.0	13.2	10.0	40.0
62.347500	25.6	1000.0	120.000	100.0	V	78.0	12.8	14.4	40.0
111.418750	33.3	1000.0	120.000	100.0	V	57.0	12.2	10.2	43.5
154.942500	27.0	1000.0	120.000	100.0	V	62.0	14.7	16.5	43.5
294.465000	34.4	1000.0	120.000	150.0	V	28.0	15.8	11.6	46.0

< Fig 15. Radiated emission result (30 MHz ~ 1 000 MHz) >



- ◆ Operating condition: Monitor with adapter #1, 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)
1145.632258	53.3	1000.0	1000.000	187.0	H	192.0	-13.6	20.7	74.0
1889.025807	48.9	1000.0	1000.000	100.0	V	176.0	-11.6	25.1	74.0
1949.141936	45.2	1000.0	1000.000	100.0	H	213.0	-11.4	28.8	74.0
2437.954839	44.5	1000.0	1000.000	117.0	H	192.0	-8.9	29.5	74.0
2666.161290	56.0	1000.0	1000.000	150.0	H	172.0	-7.8	18.0	74.0
4892.225806	46.8	1000.0	1000.000	176.0	V	100.0	-0.5	27.2	74.0

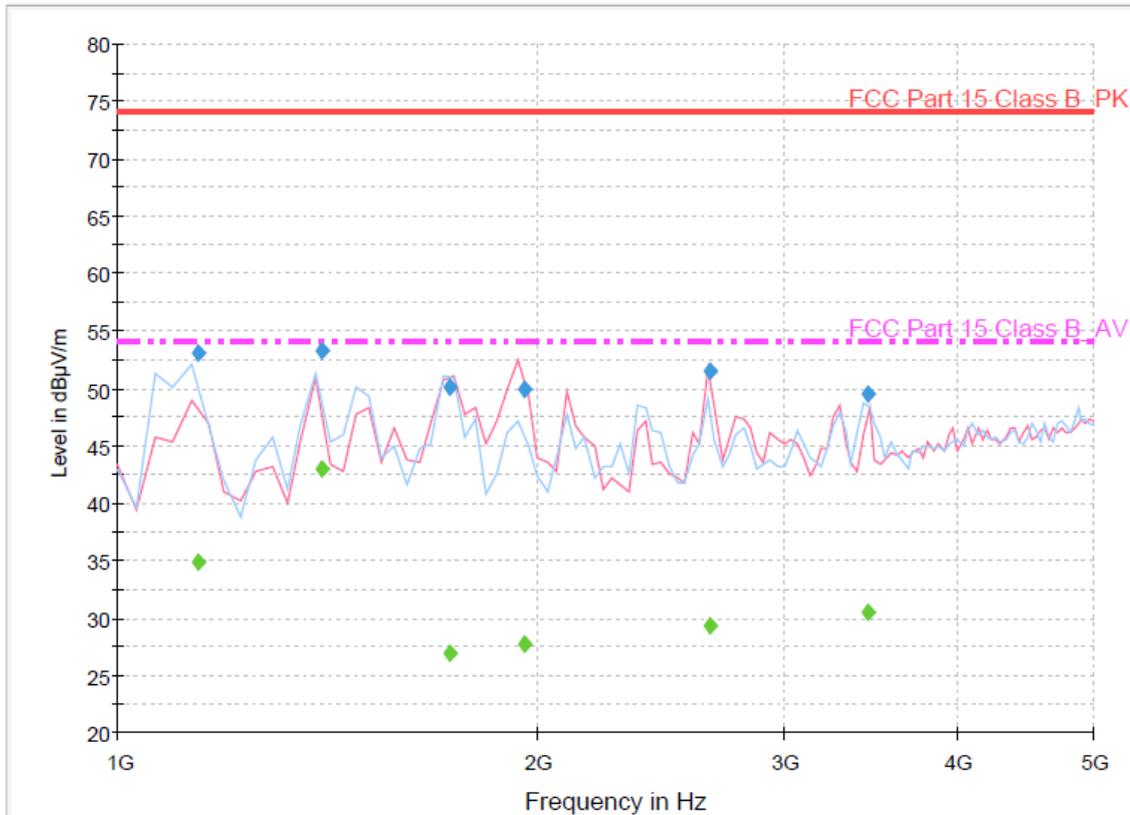
### Final Result 2

Frequency (MHz)	CAverage (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1145.632258	34.2	1000.0	1000.000	187.0	H	192.0	-13.6	19.8	54.0
1889.025807	26.6	1000.0	1000.000	100.0	V	176.0	-11.6	27.4	54.0
1949.141936	26.8	1000.0	1000.000	100.0	H	213.0	-11.4	27.2	54.0
2437.954839	28.2	1000.0	1000.000	117.0	H	192.0	-8.9	25.8	54.0
2666.161290	29.8	1000.0	1000.000	150.0	H	172.0	-7.8	24.2	54.0
4892.225806	33.7	1000.0	1000.000	176.0	V	100.0	-0.5	20.3	54.0

< Fig 16. Radiated emission result (1 000 MHz ~ 5 000 MHz) >



- ◆ Operating condition: Monitor with adapter #1, 1 920 × 1 080 / 60 Hz(HDMI/DVI: 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)
1144.832258	53.2	1000.0	1000.000	189.0	H	191.0	-13.6	20.8	74.0
1401.296774	53.3	1000.0	1000.000	150.0	H	209.0	-12.8	20.7	74.0
1730.535484	50.0	1000.0	1000.000	137.0	V	171.0	-11.9	24.0	74.0
1955.283871	49.9	1000.0	1000.000	100.0	V	192.0	-11.4	24.1	74.0
2654.161290	51.6	1000.0	1000.000	100.0	V	195.0	-7.8	22.4	74.0
3439.154839	49.4	1000.0	1000.000	100.0	H	151.0	-4.8	24.6	74.0

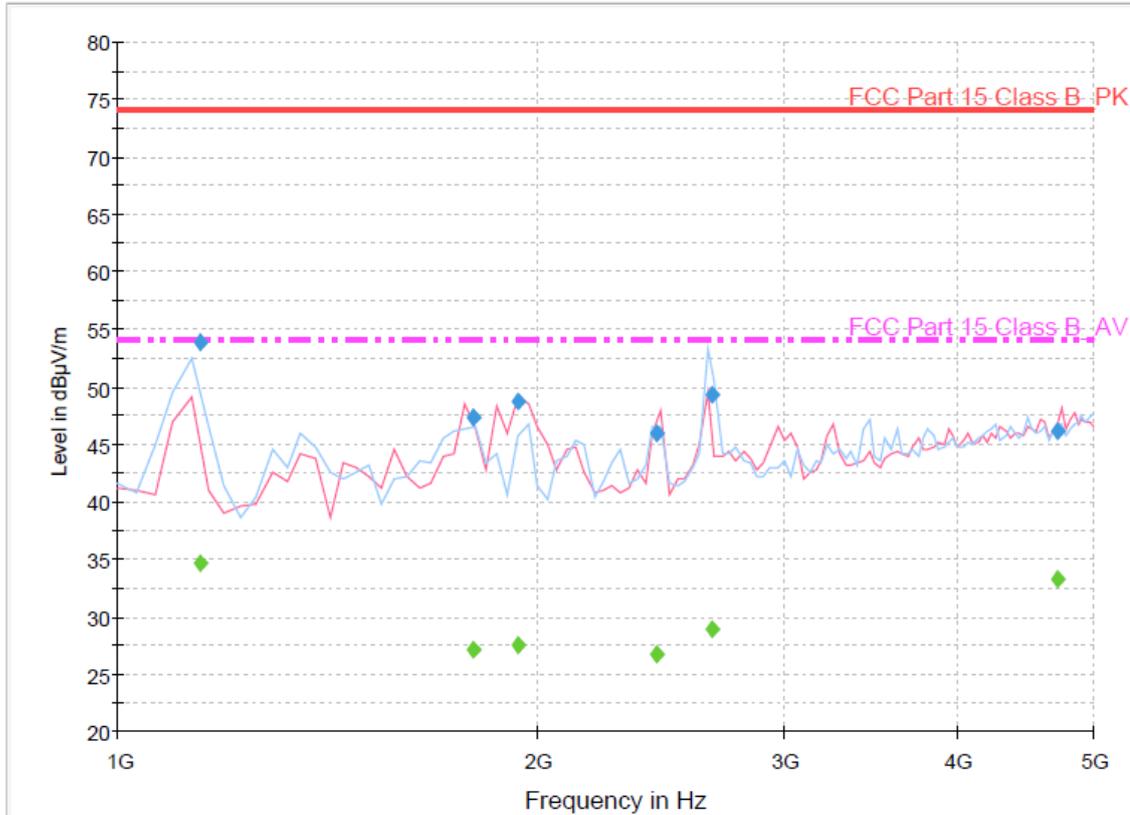
### Final Result 2

Frequency (MHz)	CAverage (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1144.832258	34.8	1000.0	1000.000	189.0	H	191.0	-13.6	19.2	54.0
1401.296774	43.1	1000.0	1000.000	150.0	H	209.0	-12.8	10.9	54.0
1730.535484	26.9	1000.0	1000.000	137.0	V	171.0	-11.9	27.1	54.0
1955.283871	27.7	1000.0	1000.000	100.0	V	192.0	-11.4	26.3	54.0
2654.161290	29.3	1000.0	1000.000	100.0	V	195.0	-7.8	24.7	54.0
3439.154839	30.6	1000.0	1000.000	100.0	H	151.0	-4.8	23.4	54.0

< Fig 17. Radiated emission result (1 000 MHz ~ 5 000 MHz) >



- ◆ Operating condition: Monitor with adapter #2, 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)
1145.232258	53.8	1000.0	1000.000	187.0	H	191.0	-13.6	20.2	74.0
1799.193548	47.4	1000.0	1000.000	115.0	V	174.0	-11.6	26.6	74.0
1933.283871	48.8	1000.0	1000.000	190.0	V	151.0	-11.5	25.2	74.0
2436.612903	45.8	1000.0	1000.000	100.0	V	47.0	-8.9	28.2	74.0
2664.161290	49.2	1000.0	1000.000	126.0	H	144.0	-7.8	24.8	74.0
4717.735484	46.2	1000.0	1000.000	150.0	V	88.0	-1.0	27.8	74.0

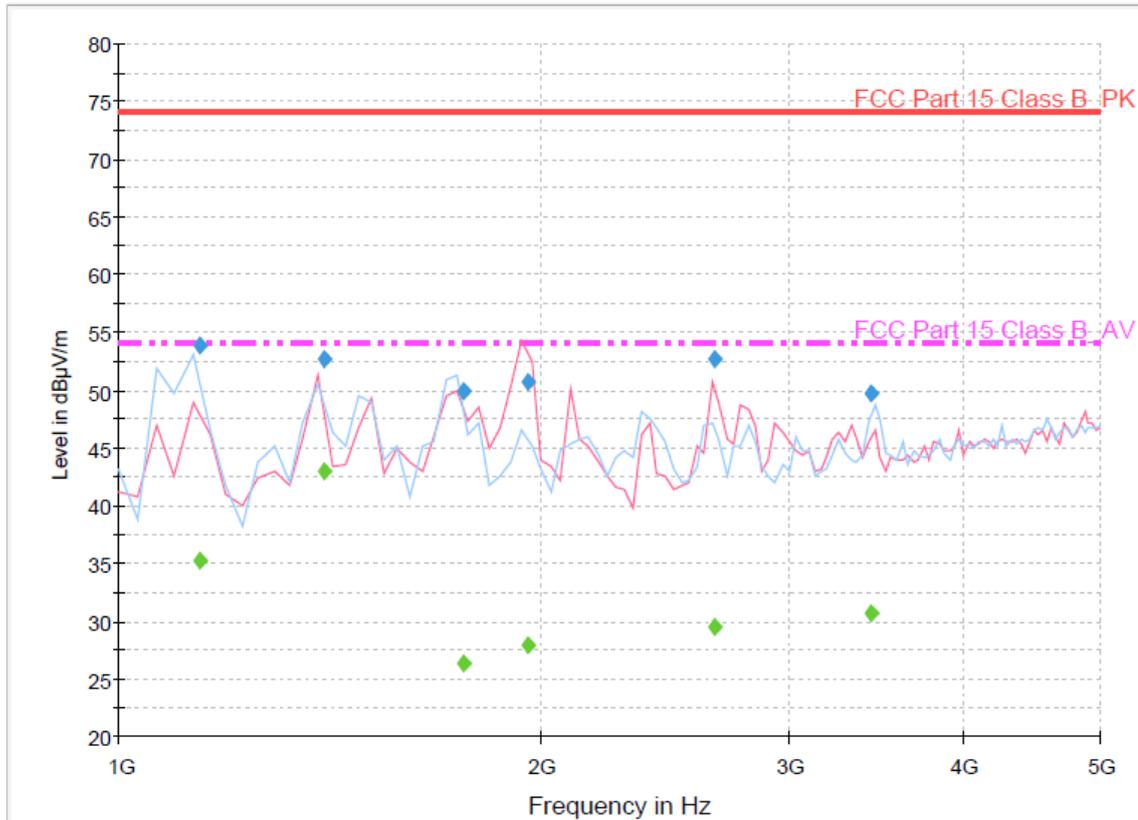
### Final Result 2

Frequency (MHz)	CAverage (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1145.232258	34.7	1000.0	1000.000	187.0	H	191.0	-13.6	19.3	54.0
1799.193548	27.2	1000.0	1000.000	115.0	V	174.0	-11.6	26.8	54.0
1933.283871	27.6	1000.0	1000.000	190.0	V	151.0	-11.5	26.4	54.0
2436.612903	26.7	1000.0	1000.000	100.0	V	47.0	-8.9	27.3	54.0
2664.161290	28.9	1000.0	1000.000	126.0	H	144.0	-7.8	25.1	54.0
4717.735484	33.3	1000.0	1000.000	150.0	V	88.0	-1.0	20.7	54.0

< Fig 18. Radiated emission result (1 000 MHz ~ 5 000 MHz) >



- ◆ Operating condition: Monitor with adapter #2, 1 920 × 1 080 / 60 Hz(HDMI/DVI: 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)
1144.032258	53.8	1000.0	1000.000	187.0	H	188.0	-13.6	20.2	74.0
1401.296774	52.7	1000.0	1000.000	100.0	V	212.0	-12.8	21.3	74.0
1763.335484	49.9	1000.0	1000.000	100.0	H	191.0	-11.8	24.1	74.0
1954.883871	50.7	1000.0	1000.000	100.0	V	191.0	-11.4	23.4	74.0
2654.561290	52.7	1000.0	1000.000	100.0	V	233.0	-7.8	21.3	74.0
3433.412903	49.8	1000.0	1000.000	100.0	H	227.0	-4.9	24.2	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)
1144.032258	35.2	1000.0	1000.000	187.0	H	188.0	-13.6	18.8	54.0
1401.296774	43.0	1000.0	1000.000	100.0	V	212.0	-12.8	11.0	54.0
1763.335484	26.4	1000.0	1000.000	100.0	H	191.0	-11.8	27.6	54.0
1954.883871	27.9	1000.0	1000.000	100.0	V	191.0	-11.4	26.1	54.0
2654.561290	29.6	1000.0	1000.000	100.0	V	233.0	-7.8	24.4	54.0
3433.412903	30.7	1000.0	1000.000	100.0	H	227.0	-4.9	23.3	54.0

< Fig 19. Radiated emission result (1 000 MHz ~ 5 000 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 $\mu\text{V}$ = 48 dB $\mu\text{V}$
Reading	= 39.2 dB $\mu\text{V}$
$10^{(39.2\text{dB}\mu\text{V}/20)}$	= 91.2 $\mu\text{V}$
Margin	= 48 dB $\mu\text{V}$ - 39.2 dB $\mu\text{V}$
	= 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 $\mu\text{V}$
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 LCD TV/Monitor (Model Name: M2382D)** was complies with §15.107 and 15.109 of the FCC Rules.

- The end -