

FCC EVALUATION REPORT FOR CERTIFICATION

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: December 19, 2013

Order Number: GETEC-C1-13-403

Test Report Number: GETEC-E3-13-102

Test Site: GUMI COLLEGE EMC CENTER

FCC Registration Number: (100749, 443957)

FCC ID. : BEJ84LM9600UB

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 | : 84LM9600-UB |
| 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,

Soon Hoon

**Soon-Hoon Jeong, Associate Engineer
GUMI COLLEGE EMC CENTER**

Jae-Hoon Jeong

**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, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea

Manufacturer: LG Electronics Inc.

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

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

Tel Number: +82-31-610-9623

- **FCC ID.** BEJ84LM9600UB
- **EUT Type** LED TV
- **Model Name** 84LM9600-UB
- **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** November 18, 2013
- **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-E3-13-102
- **Date of Issue** December 19, 2013

EUT Type: LED TV

FCC ID.: BEJ84LM9600UB





2. Introduction

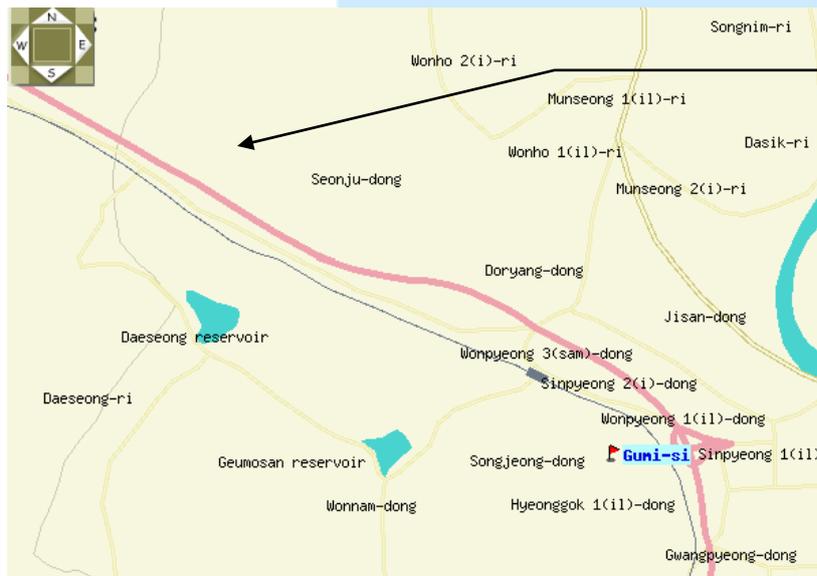
The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2009) was used in determining radiated and conducted emissions emanating from **LG Electronics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

LED TV (Model Name: 84LM9600-UB)

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)



GUMI COLLEGE EMC CENTER
37 Yaeun-ro, Gumi-si,
Gyeongsangbuk-do, 730-711,
Republic of Korea
Tel: +82-54-440-1195
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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 TV (Model Name: 84LM9600-UB) FCC ID.: BEJ84LM9600UB

| | | |
|----------------------------|-----------------------|--|
| Power requirement | | AC 120 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 | | 84LM9600 (84LM9600-UB) |
|-------------------------------------|---------------|---------------------------|
| Dimensions (Width x Height x Depth) | With stand | 1,916 x 1214 x 399 (mm) |
| | Without stand | 1,916 x 1120 x 39.9 (mm) |
| Weight | With stand | 81.7 Kg |
| | Without stand | 70.4 Kg |
| Current Value / Power consumption | | 5.2 A / 520 W |

- Highest clock Frequency : 792 MHz

Wireless LAN module(WN8122E1) specification

| | |
|---------------------|---|
| Standard | IEEE802.11a/b/g/n |
| Frequency Range | 2400 to 2483.5 MHz 5150 to 5250 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: 0AX0X3097310 FCC ID.: DoC |
| Graphic card | ASUSTEK COMPUTER INC. | GTX660-DC20-2GD5 | S/N:CBC0YZ100131 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 |
| DVD player | ILIKE ELECTRONICS CO., LTD. | CVX-3800 Full-HD | S/N: CVX380020110110493 FCC ID.: Verification |
| USB memory stick | Transcend Information Inc. | jitFlash700 | S/N: B01963 8059 FCC ID.: DoC |
| USB memory stick | LG Electronics Inc. | SUM-PSB4 | S/N: TBBB202478F FCC ID.: DoC |
| Headphone | PHILIPS | SBC HL140 | S/N: None FCC ID.: None. |
| Cell phone | LG Electronics | LG-F180K | S/N: 301KPMZ0214835 FCC ID.: None. |
| TV Signal generator | Rohde & schwarz | SFQ | S/N: 100563 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. |
|--------------------------|---------------------|------------|------------------------------------|
| Motion Remote Controller | LG Electronics Inc. | AN-MR400P | S/N: None. FCC ID.: BEJMR400P |
| Wi-Fi module | LG Electronics Inc. | WN8122E1 | S/N: None. FCC ID.: BEJWN8122E1 |
| Bluetooth module | LG Electronics Inc. | BM-LDS401 | S/N: None. FCC ID.: BEJLDS401 |

- External components: IR Remote controller, Motion Remote controller, External camera
- Built-in components: Wi-Fi module, Bluetooth module

3.2.3 Used Cable(s)

| Cable Name | Condition | Description |
|-----------------|--|---|
| Power cable | Connected to the EUT and Power supply | 1.80 m unshielded |
| HDMI cable | Connected to the EUT and PC | 1.80 m shielded |
| HDMI cable | Connected to the EUT and DVD Player | 1.80 m shielded |
| Component cable | Connected to the EUT and DVD Player | 3.00 m shielded |
| Video cable | Connected to the EUT and DVD Player | 3.00 m shielded |
| Headphone | Connected to the EUT and Headphone | 1.20 m shielded |
| HDMI(MHL) cable | Connected to the EUT and Cell phone | 1.00 m shielded with a ferrite core |
| LAN cable | Connected to the EUT and Network | 10.00 m unshielded |
| Antenna cable | Connected to the EUT and TV Signal generator | 10.00 m shielded with two ferrite cores |
| USB memory | Connected to the EUT and USB memory | - |

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)
 - **Camera view mode:** Camera video display mode
 - **Monitor mode:**
 - Radiated Emission: 2 560 × 1 440 / 30 Hz (HDMI: Digital)
 - Conducted Emission: 2 560 × 1 440 / 30 Hz (HDMI: Digital)
 - 1 024 × 768 / 60 Hz, 640 × 350 / 70 Hz(HDMI: Digital)
 - . “H” character scrolling mode (Font size: 10)
 - . Black background white character
 - . Brightness and contrast was adjusted as maximum level
 - . USB memory stick was connected to the USB port
 - . Connected Network

“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, 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.

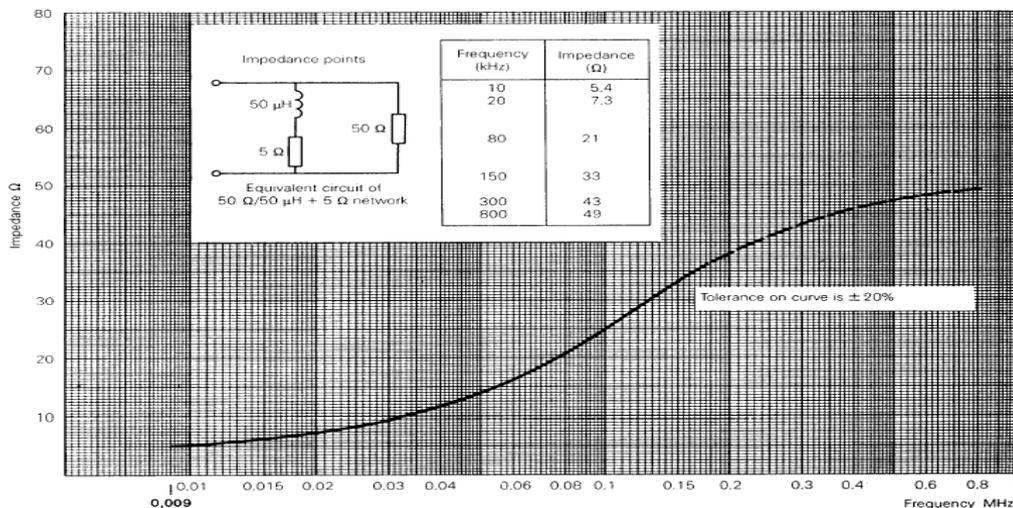


Fig 2. Impedance of LISN





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.

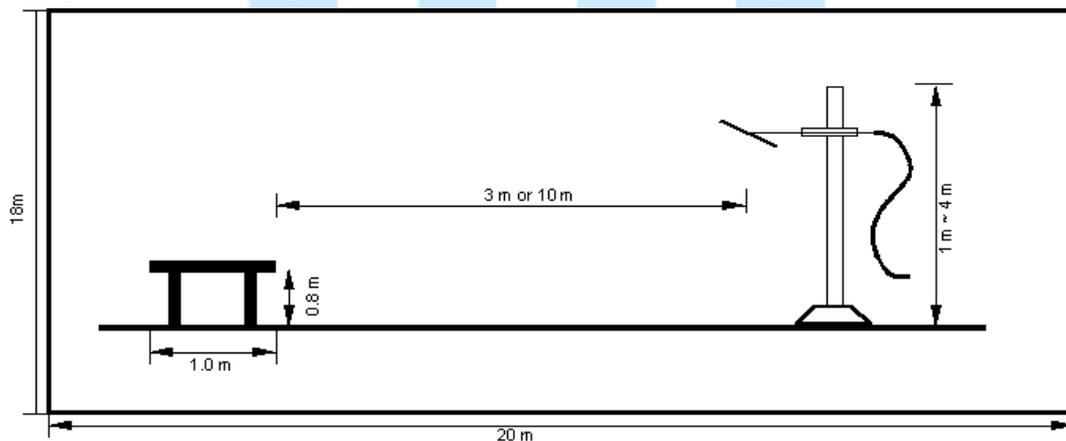


Fig 3. Dimensions of test site (Below 1 GHz)

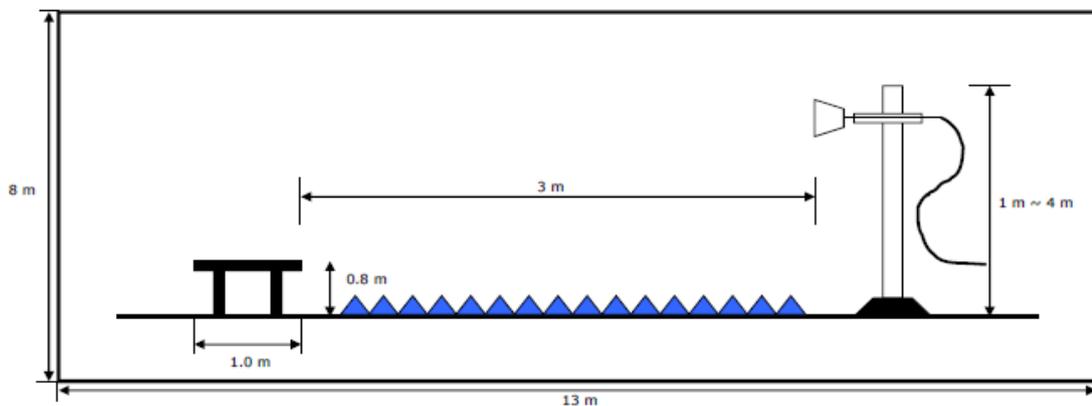


Fig 4. Dimensions of test site (Above 1 GHz)





5. Conducted Emission

5.1 Operating Environment

Temperature : 23.9 °C
Relative Humidity : 33.7 % 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) | ± 2.74 dB | Confidence level of approximately 95 % ($k = 2$) |
| Conducted emission (150 kHz ~ 30 MHz) | ± 4.25 dB | Confidence level of approximately 95 % ($k = 2$) |





5.4 Limit

| RFI Conducted | FCC Limit(dB μ 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 |
|-------------|-----------------|-------------------|---------------|--------------------|
| ■ - ESCI | Rohde & Schwarz | EMI Test Receiver | 100237 | 05. 03. 2014 |
| ■ - ESH3-Z5 | Rohde & Schwarz | LISN | 838979/020 | 05. 03. 2014 |
| ■ - ESH2-Z5 | Rohde & Schwarz | LISN | 829991/009 | 05. 03. 2014 |
| ■ - ISN T8 | TESEQ.GmbH | ISN | 24568 | 07. 10. 2014 |

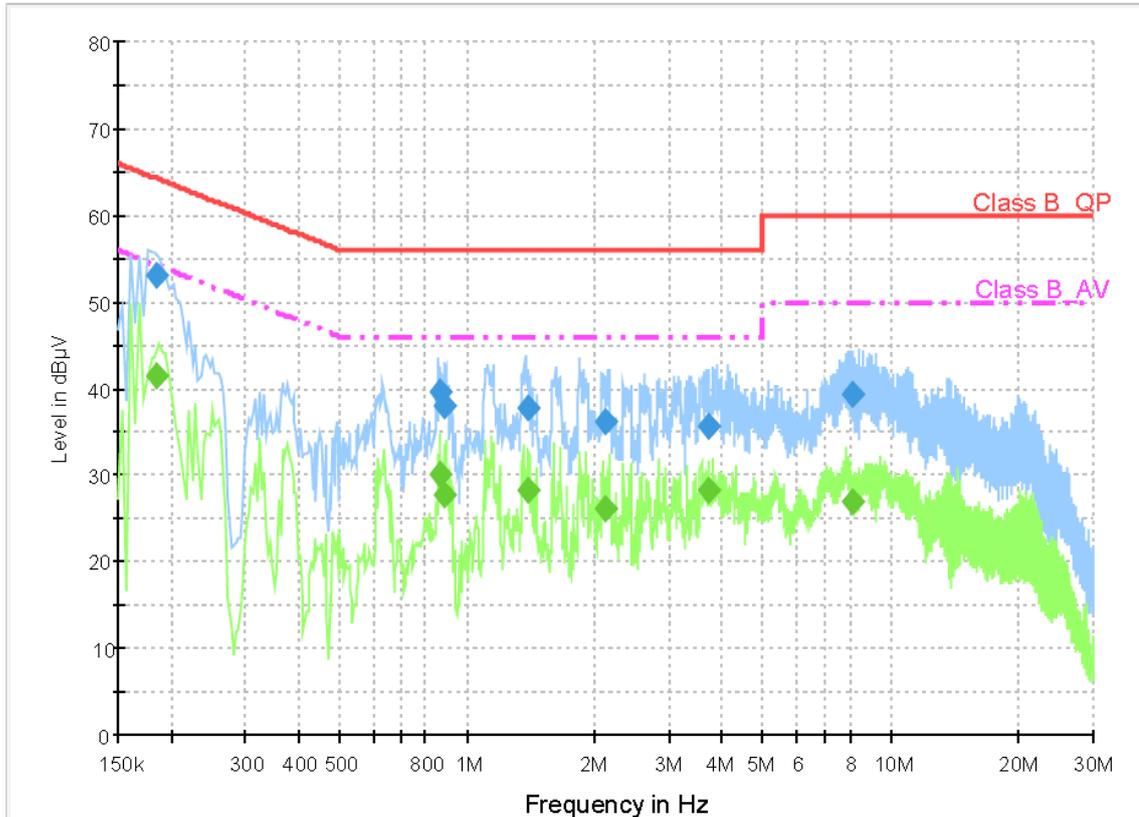
5.6 Test data for Conducted Emission

- Test Date : December 18, 2013
- Resolution Bandwidth : 9 kHz
- Frequency Range : 0.15 MHz ~ 30 MHz
- Line : L1: Live, N: Neutral





- Operating condition: 2 560 × 1 440 / 30 Hz (HDMI: Digital)



Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|------------------|-----------------|-----------------|-----|------|------------|-------------|--------------|---------|
| 0.185223 | 53.2 | 1000.0 | 9.000 | GND | N | 10.0 | 11.1 | 64.2 | |
| 0.860550 | 39.5 | 1000.0 | 9.000 | GND | N | 10.0 | 16.5 | 56.0 | |
| 0.881686 | 38.0 | 1000.0 | 9.000 | GND | N | 10.0 | 18.0 | 56.0 | |
| 1.393107 | 37.7 | 1000.0 | 9.000 | GND | L1 | 10.1 | 18.3 | 56.0 | |
| 2.111104 | 36.2 | 1000.0 | 9.000 | GND | N | 10.1 | 19.8 | 56.0 | |
| 3.702558 | 35.7 | 1000.0 | 9.000 | GND | N | 10.0 | 20.3 | 56.0 | |
| 8.151031 | 39.2 | 1000.0 | 9.000 | GND | N | 10.1 | 20.8 | 60.0 | |

Final Result 2

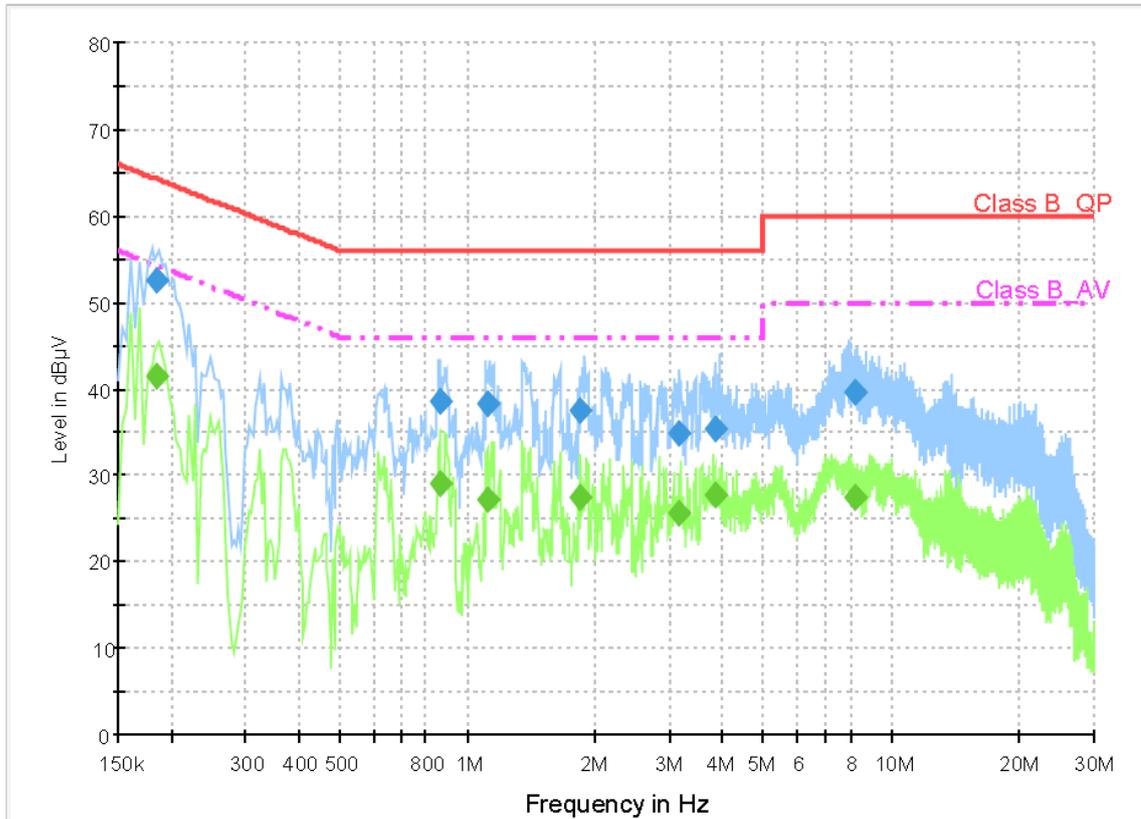
| Frequency (MHz) | CAverage (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|-----------------|-----------------|-----------------|-----|------|------------|-------------|--------------|---------|
| 0.185223 | 41.6 | 1000.0 | 9.000 | GND | N | 10.0 | 12.7 | 54.2 | |
| 0.860550 | 30.1 | 1000.0 | 9.000 | GND | N | 10.0 | 15.9 | 46.0 | |
| 0.881686 | 27.8 | 1000.0 | 9.000 | GND | N | 10.0 | 18.2 | 46.0 | |
| 1.393107 | 28.2 | 1000.0 | 9.000 | GND | L1 | 10.1 | 17.8 | 46.0 | |
| 2.111104 | 26.2 | 1000.0 | 9.000 | GND | N | 10.1 | 19.8 | 46.0 | |
| 3.702558 | 28.3 | 1000.0 | 9.000 | GND | N | 10.0 | 17.7 | 46.0 | |
| 8.151031 | 27.0 | 1000.0 | 9.000 | GND | N | 10.1 | 23.0 | 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 |
|-----------------|------------------|-----------------|-----------------|-----|------|------------|-------------|--------------|---------|
| 0.185865 | 52.7 | 1000.0 | 9.000 | GND | N | 10.0 | 11.6 | 64.2 | |
| 0.865686 | 38.5 | 1000.0 | 9.000 | GND | N | 10.0 | 17.5 | 56.0 | |
| 1.114680 | 38.2 | 1000.0 | 9.000 | GND | N | 10.1 | 17.8 | 56.0 | |
| 1.846602 | 37.4 | 1000.0 | 9.000 | GND | N | 10.1 | 18.6 | 56.0 | |
| 3.171081 | 35.0 | 1000.0 | 9.000 | GND | N | 10.0 | 21.0 | 56.0 | |
| 3.829571 | 35.4 | 1000.0 | 9.000 | GND | N | 10.0 | 20.6 | 56.0 | |
| 8.260656 | 39.6 | 1000.0 | 9.000 | GND | N | 10.1 | 20.4 | 60.0 | |

Final Result 2

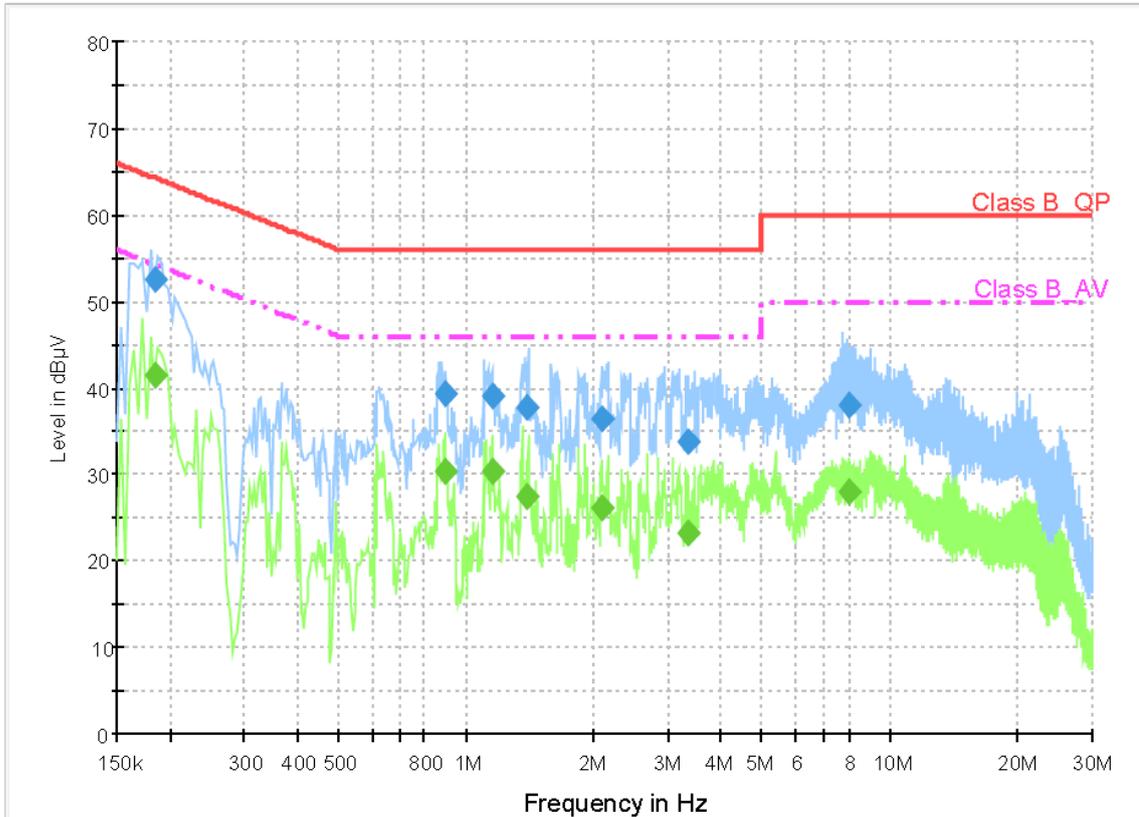
| Frequency (MHz) | CAverage (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|-----------------|-----------------|-----------------|-----|------|------------|-------------|--------------|---------|
| 0.185865 | 41.5 | 1000.0 | 9.000 | GND | N | 10.0 | 12.7 | 54.2 | |
| 0.865686 | 29.0 | 1000.0 | 9.000 | GND | N | 10.0 | 17.0 | 46.0 | |
| 1.114680 | 27.2 | 1000.0 | 9.000 | GND | N | 10.1 | 18.8 | 46.0 | |
| 1.846602 | 27.5 | 1000.0 | 9.000 | GND | N | 10.1 | 18.5 | 46.0 | |
| 3.171081 | 25.7 | 1000.0 | 9.000 | GND | N | 10.0 | 20.3 | 46.0 | |
| 3.829571 | 27.8 | 1000.0 | 9.000 | GND | N | 10.0 | 18.2 | 46.0 | |
| 8.260656 | 27.5 | 1000.0 | 9.000 | GND | N | 10.1 | 22.5 | 50.0 | |

< Fig 6. Conducted emission result >





Operating condition: 640 × 350 / 70 Hz (HDMI: Digital)



Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|------------------|-----------------|-----------------|-----|------|------------|-------------|--------------|---------|
| 0.185865 | 52.5 | 1000.0 | 9.000 | GND | N | 10.0 | 11.7 | 64.2 | |
| 0.896402 | 39.2 | 1000.0 | 9.000 | GND | N | 10.0 | 16.8 | 56.0 | |
| 1.150680 | 39.0 | 1000.0 | 9.000 | GND | N | 10.1 | 17.0 | 56.0 | |
| 1.399330 | 37.7 | 1000.0 | 9.000 | GND | N | 10.1 | 18.3 | 56.0 | |
| 2.107104 | 36.4 | 1000.0 | 9.000 | GND | N | 10.1 | 19.6 | 56.0 | |
| 3.360373 | 33.9 | 1000.0 | 9.000 | GND | L1 | 10.0 | 22.1 | 56.0 | |
| 7.980325 | 38.0 | 1000.0 | 9.000 | GND | N | 10.1 | 22.0 | 60.0 | |

Final Result 2

| Frequency (MHz) | CAverage (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|-----------------|-----------------|-----------------|-----|------|------------|-------------|--------------|---------|
| 0.185865 | 41.4 | 1000.0 | 9.000 | GND | N | 10.0 | 12.8 | 54.2 | |
| 0.896402 | 30.5 | 1000.0 | 9.000 | GND | N | 10.0 | 15.5 | 46.0 | |
| 1.150680 | 30.5 | 1000.0 | 9.000 | GND | N | 10.1 | 15.6 | 46.0 | |
| 1.399330 | 27.5 | 1000.0 | 9.000 | GND | N | 10.1 | 18.5 | 46.0 | |
| 2.107104 | 26.0 | 1000.0 | 9.000 | GND | N | 10.1 | 20.0 | 46.0 | |
| 3.360373 | 23.1 | 1000.0 | 9.000 | GND | L1 | 10.0 | 22.9 | 46.0 | |
| 7.980325 | 28.1 | 1000.0 | 9.000 | GND | N | 10.1 | 21.9 | 50.0 | |

< Fig 7. Conducted emission result >





6. Radiated Emission

6.1 Operating Environment

Temperature : 23.9 °C
 Relative Humidity : 33.7 % 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) | ± 4.66 dB | Confidence level of approximately 95 % ($k = 2$) |
| Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal) | ± 4.44 dB | Confidence level of approximately 95 % ($k = 2$) |
| Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical) | ± 4.73 dB | Confidence level of approximately 95 % ($k = 2$) |
| Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal) | ± 4.77 dB | Confidence level of approximately 95 % ($k = 2$) |
| Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m) | ± 4.89 dB | Confidence level of approximately 95 % ($k = 2$) |





6.4 Limit

| Frequency (MHz) | FCC Limit @ 3 m. dB μ V/m | CISPR Limit @ 10 m. dB μ 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. 02. 2014 |
| ■ - VULB9160 | Schwarzbeck | Broadband Test Antenna | 3193 | 03. 15. 2014 |
| ■ - BBHA9120D | Schwarzbeck | Horn Antenna | 597 | 02. 28. 2015 |
| ■ - 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 | 1. 24. 2014 |

6.6 Test data for Radiated Emission

- Test Date : December 18, 2013
- Measurement Distance : 3 m
- Note : The EUT was tested made up 6 GHz, because, it was required from the client

- Measurement setting

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

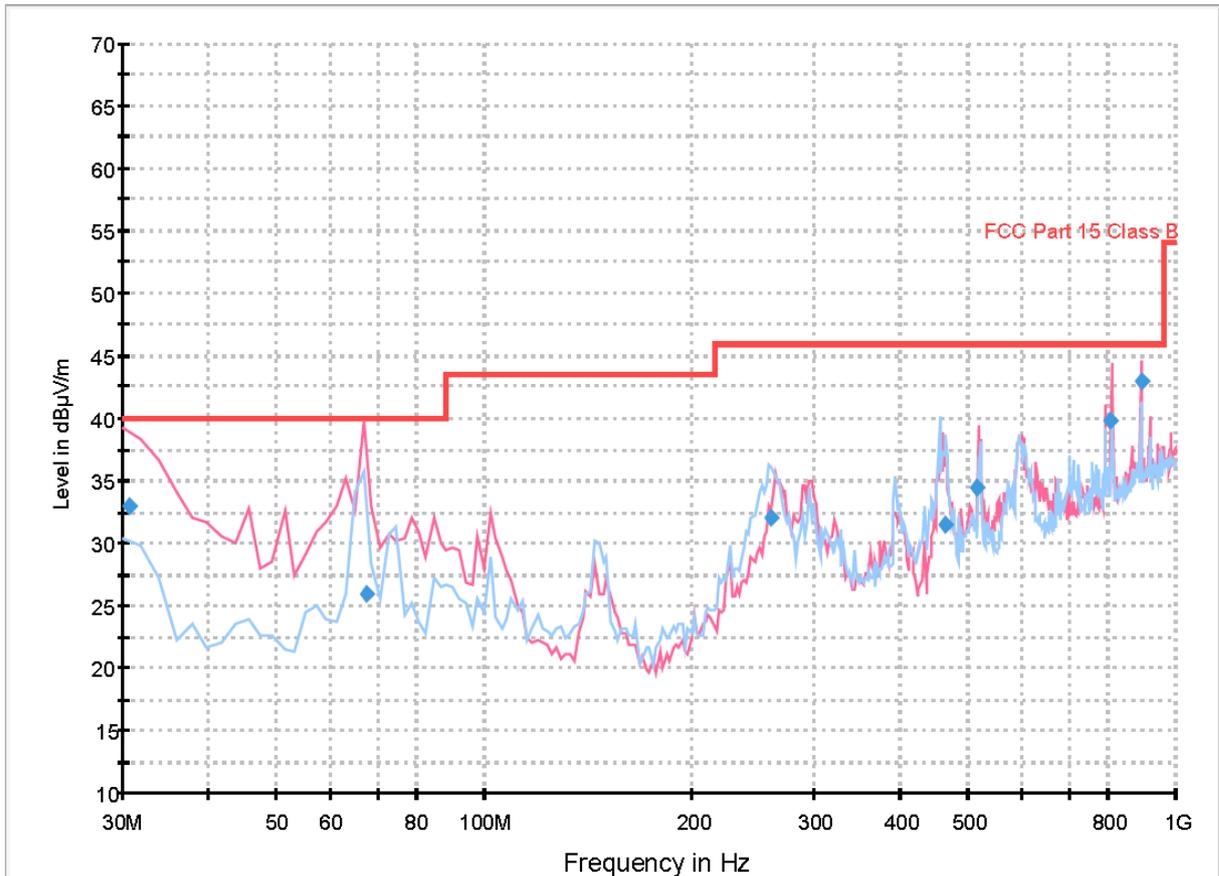
EUT Type: LED TV

FCC ID.: BEJ84LM9600UB





- Operating condition: 2 560 × 1 440 / 30 Hz (HDMI: Digital)



Final Result 1

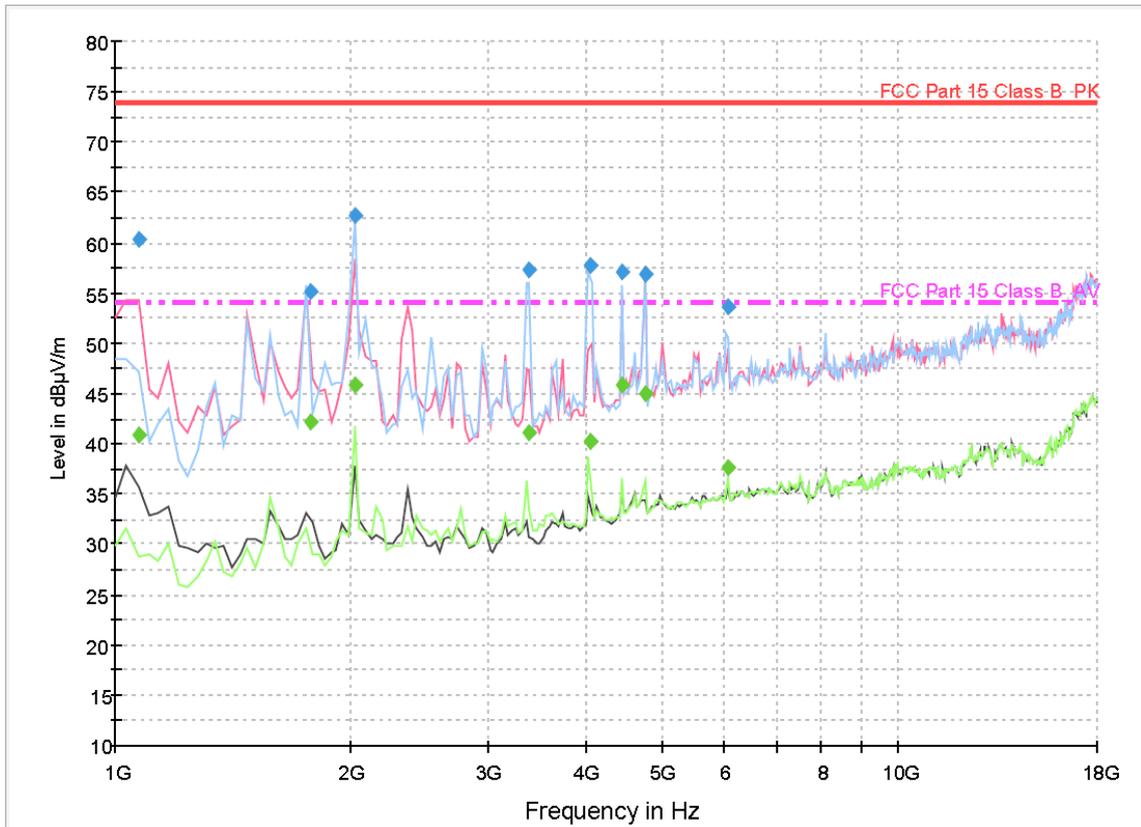
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 30.640000 | 33.0 | 1000.0 | 100.000 | 125.0 | V | 85.0 | 11.3 | 7.0 | 40.0 |
| 67.660368 | 25.9 | 1000.0 | 100.000 | 100.0 | V | 82.0 | 11.9 | 14.1 | 40.0 |
| 259.798870 | 32.1 | 1000.0 | 100.000 | 100.0 | H | 83.0 | 15.2 | 13.9 | 46.0 |
| 463.518423 | 31.4 | 1000.0 | 100.000 | 100.0 | H | 276.0 | 21.4 | 14.6 | 46.0 |
| 517.327832 | 34.4 | 1000.0 | 100.000 | 100.0 | V | 2.0 | 22.7 | 11.6 | 46.0 |
| 806.126110 | 39.8 | 1000.0 | 100.000 | 100.0 | V | 199.0 | 28.5 | 6.2 | 46.0 |
| 890.103785 | 42.9 | 1000.0 | 100.000 | 190.0 | V | 194.0 | 29.6 | 3.1 | 46.0 |

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





- Operating condition: 2 560 × 1 440 / 30 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) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1068.5363 | 60.3 | 1000.0 | 1000.000 | 175.0 | V | 193.0 | -13.9 | 13.7 | 74.0 |
| 1780.2990 | 55.3 | 1000.0 | 1000.000 | 100.0 | H | 138.0 | -9.9 | 18.7 | 74.0 |
| 2030.0441 | 62.7 | 1000.0 | 1000.000 | 100.0 | H | 226.0 | -8.5 | 11.3 | 74.0 |
| 3383.9014 | 57.3 | 1000.0 | 1000.000 | 100.0 | H | 186.0 | -3.0 | 16.7 | 74.0 |
| 4057.6641 | 57.7 | 1000.0 | 1000.000 | 115.0 | H | 234.0 | -0.6 | 16.3 | 74.0 |
| 4450.4818 | 57.0 | 1000.0 | 1000.000 | 125.0 | H | 149.0 | 0.4 | 17.0 | 74.0 |
| 4747.4950 | 56.8 | 1000.0 | 1000.000 | 100.0 | H | 204.0 | 1.0 | 17.2 | 74.0 |
| 6067.7523 | 53.7 | 1000.0 | 1000.000 | 100.0 | H | 234.0 | 3.0 | 20.3 | 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) |
|-----------------|-------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1068.5363 | 40.8 | 1000.0 | 1000.000 | 175.0 | V | 193.0 | -13.9 | 13.2 | 54.0 |
| 1780.2990 | 42.1 | 1000.0 | 1000.000 | 100.0 | H | 138.0 | -9.9 | 11.9 | 54.0 |
| 2030.0441 | 45.9 | 1000.0 | 1000.000 | 100.0 | H | 226.0 | -8.5 | 8.1 | 54.0 |
| 3383.9014 | 41.1 | 1000.0 | 1000.000 | 100.0 | H | 186.0 | -3.0 | 12.9 | 54.0 |
| 4057.6641 | 40.2 | 1000.0 | 1000.000 | 115.0 | H | 234.0 | -0.6 | 13.8 | 54.0 |
| 4450.4818 | 45.9 | 1000.0 | 1000.000 | 125.0 | H | 149.0 | 0.4 | 8.1 | 54.0 |
| 4747.4950 | 44.9 | 1000.0 | 1000.000 | 100.0 | H | 204.0 | 1.0 | 9.1 | 54.0 |
| 6067.7523 | 37.6 | 1000.0 | 1000.000 | 100.0 | H | 234.0 | 3.0 | 16.4 | 54.0 |

< Fig 9. Radiated emission result (1 000 MHz ~ 18 000 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

| | |
|--|--|
| Class B Limit | = 250 μV = 48 dBμV |
| Reading | = 39.2 dBμV |
| $10^{(39.2\text{dB}\mu\text{V}/20)}$ | = 91.2 μV |
| Margin | = 48 dBμV - 39.2 dBμV |
| | = 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 dBμV |
| 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: 84LM9600-UB)** was complies with §15.107 and 15.109 of the FCC Rules.

- The end -

