



FCC EVALUATION REPORT FOR CERTIFICATION

Manufacturer : KIM ELECTRONIC CO., LTD.

Date of Issue : June 22, 2009

293-4, Gongdan -dong, Gumi-si,
Gyeongbuk, Korea.

Order Number: GETEC-C1-09-146

Test Report Number: GETEC-E3-09-080

Attn : Mr. Se-bong Jang, General Manager

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: TGEPT50U7

Applicant: KIMIN ELECTRONIC CO., LTD.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: PDP TV/Monitor
Type of Authority	: Certification
Model Name	: PT50U71H, KPP-50SAT, KPP-50XXX
Brand Name	: KIMIN, HCT

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,

Hyoung Seop Kim, Associate Engineer
GUMI College EMC center

Tae-Sig Park, 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: KIMIN ELECTRONIC CO., LTD.

Applicant Address: 293-4, Gongdan-dong, Gumi-si, Gyeongbuk, Korea.

Manufacturer: KIMIN ELECTRONIC CO., LTD.

Manufacturer Address: 293-4, Gongdan-dong, Gumi-si, Gyeongbuk, Korea.

Contact Person: Mr. Se-bong Jang, General Manager

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- **FCC ID.** TGEPT50U7
- **EUT Type** PDP TV/Monitor
- **Model Name** PT50U71H, KPP-50SAT, KPP-50XXX
- **Trade Name** KIMIN, HCT
- **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** June 10 ~ 12, 2009
- **Place of Test** **Gumi College EMC Center** (FCC Registration No.: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-09-080
- **Dates of Issue** June 22, 2009



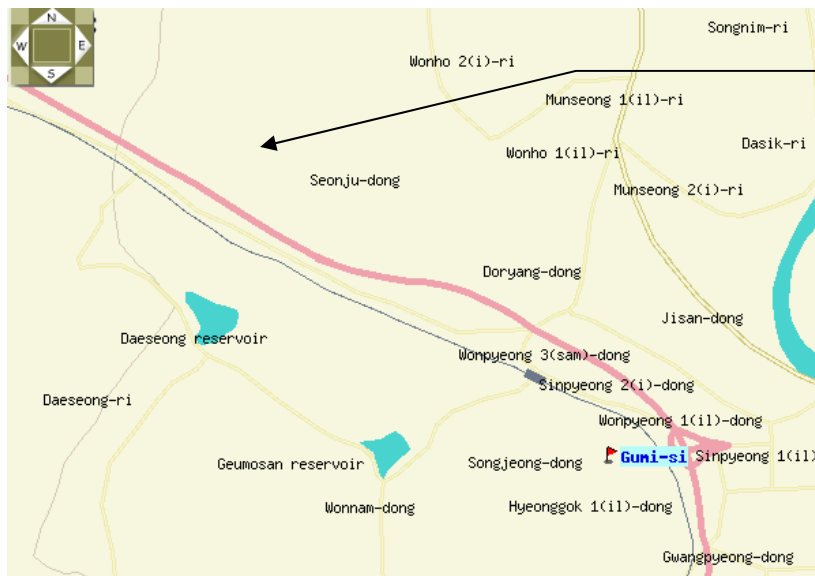
2. Introduction

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 **KIMIN ELECTRONIC CO., LTD. PDP TV/Monitor (Model Name: PT50U71H, KPP-50SAT, KPP-50XXX)**

These measurement tests were conducted at **Gumi College EMC Center**.

The site address is 407, Bugok-dong, Gumi-si, Gyeongbuk, 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 FCC §2.948 according to ANSI C63.4 (2003)



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Gyeongbuk 730-711, 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 **KIMIN ELECTRONIC CO., LTD. PDP TV/Monitor (Model Name: PT50U71H, KPP-50SAT, KPP-50XXX) FCC ID.: TGEPT50U7**

Model		KPP-50SAT
Dimension (Width x Height x Depth)	Without Stand	1241.0 mm (48.86") x 841.0 mm (33.11") x 399.0 mm (15.71")
	With Stand	1241.0 mm (48.86") x 900.0 mm (35.43") x 774.0 mm (30.47")
Weight (kg / lbs)	Without Stand	45.0 kg (99.20 lbs)
	With Stand	50.3 kg (110.89 lbs)
Broadcast Signal System		ATSC / NTSC
Contrast Ratio		30,000:1
Brightness		1,500 cd/m ²
Power Rating		AC100-240V ~50/60Hz
Consumption		430W
Audio Output		10W + 10W
Operating Temperature		0°C ~ 40°C
Accessories		<ul style="list-style-type: none">• Batteries & Remote• Owner's Manual• Power Cord• Plug Adaptor(UL to VDE)
External Port		<ul style="list-style-type: none">• 3 x HDMI• USB IN• RGB IN (PC)• DIGITAL AUDIO OUT (OPTICAL)• AUDIO IN (RGB / DVI)• ANTENNA / CABLE IN• AV IN• AC IN• S-VIDEO• SERVICE• COMPONENT 1• COMPONENT 2

PDP module : PDP50G1 (LG PDP)

TV Tuner : TD1636(E)F MK2 (NXP)

Highest Frequency : 54 MHz
(Used in the device)

EUT Type: PDP TV/Monitor

FCC ID.: TGEPT50U7



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID
PC	Hewlett Packard	D530	S/N: CNG34800PY FCC ID: DoC
Video card	ATI	ATI RV360(9600)	S/N: SN0402017176 FCC ID: DoC
Key-board	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID: JNZ211443
Joystick	Microsoft	X05-92626	S/N: 9262600296169 FCC ID: DoC
DVD player	LG Electronics Inc	LC-954	S/N: 3850R-Z674K FCC ID: DoC
Printer	Hewlett Packard	970CXI	S/N: MY9B01F1FG FCC ID: DoC
Digital TV pattern generator	PI International	TPG430TB	S/N: 93.01.20.05.09.00.00.02 FCC ID: DoC
8-VSB modulator	Telecommunication Inc.	VSBE-ENC-150E	S/N: 2005-726 FCC ID: DoC
USB memory stick	SM Electronics	UDD-32M	S/N: N/A FCC ID: DoC

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



3.2.2 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.8 m unshielded
RGB(Analog) cable	Connected to the EUT and PC	1.8 m shielded with two ferrite cores
HDMI/DVI(Digital) cable	Connected to the EUT and PC	1.95 m shielded
PC Sound cable	Connected to the EUT and PC	1.8 m shielded with a ferrite core
AV input cable	Connected to the EUT and DVD player	1.8 m shielded
Component cable	Connected to the EUT and DVD player	3.0 m shielded
Component sound cable	Connected to the EUT and DVD player	3.0 m shielded
Antenna cable	Connected to the EUT and TV signal generator	10 m shielded
S-Video cable	Connected to the EUT and DVD player	1.8 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.

- Test Voltage / Frequency : AC 120 V / 60 Hz
- Test Mode(s)
 - . Monitor mode
 - . Radiated emission: 1 024 * 768 / 60 Hz (RGB: Analog), 1 024 * 768 / 60 Hz (HDMI/DVI: Digital)
 - . Conducted emission: 1 024 * 768 / 60 Hz (RGB: Analog), 1 024 * 768 / 60 Hz (HDMI/DVI: Digital)
800 * 600 / 60 Hz (RGB: Analog), 640 * 480 / 60 Hz (RGB: Analog)
 - . USB memory stick play mode: Continuous play mode of Picture file and 1 kHz audio file.
- Operating test pattern
 - . "H" character scrolling mode (Font size: 10)
 - . Black background white character
 - . Brightness and contrast was adjusted as maximum level
 - . 1 kHz sound tone with winamp player
- TV & AV portion of this equipment will be applied the "Verification" procedure.



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

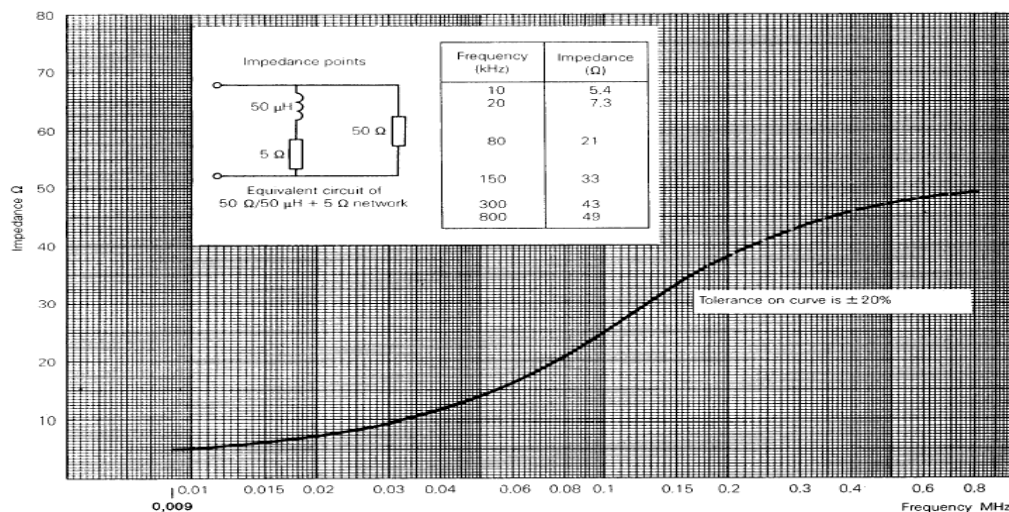


Fig 2. Impedance of LISN



4.3 Radiated Emission

The measurements were conducted 3 m anechoic chamber (FCC Registration No.: 443957) 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.

The spectrum was scanned from 30 to 1000 MHz, using bicornical log antenna (Schwarzbeck, VULB9160).

Above 1 GHz, horn antenna (Schwarzbeck, BBHA9120D / EMCO 3160) was used.

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 1MHz 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 m to 4 m and stopped at the azimuth or height producing the maximum emission.

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

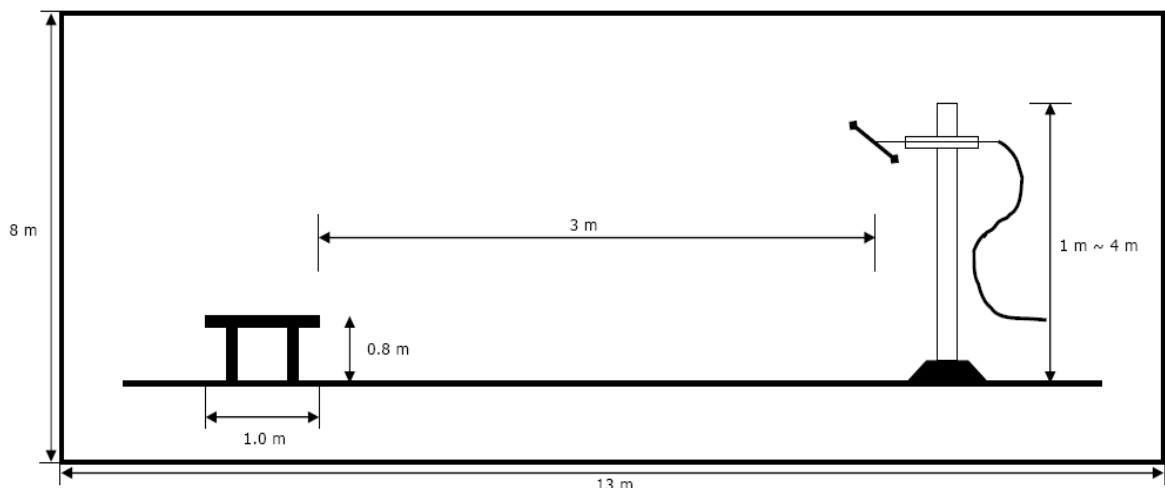


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 24 °C
Relative Humidity : 36 % 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.

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)	± 2.97 dB	Confidence levels of 95 % (k=2)
Conducted emission (150 kHz ~ 30 MHz)	± 4.05 dB	Confidence levels of 95 % (k=2)



5.4 Limit

RFI Conducted	FCC Limit(dB) 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
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 13. 2009
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 12. 2009
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 12. 2009

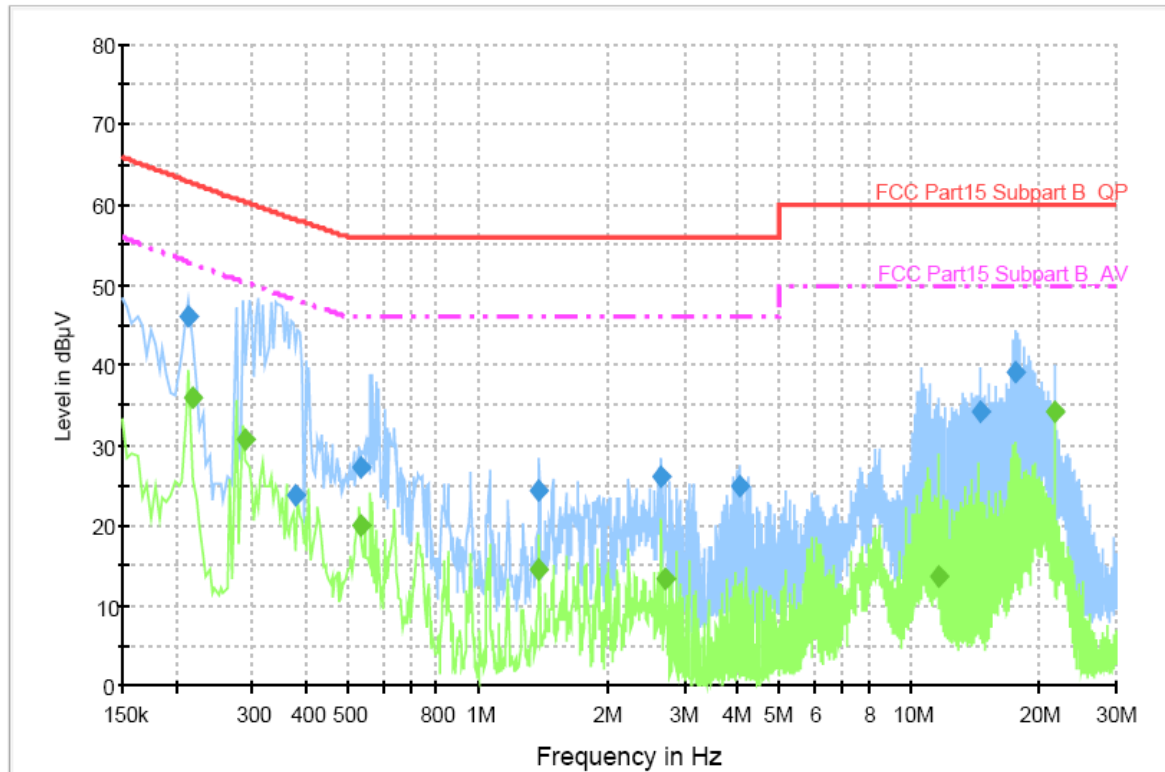
5.6 Test data for Conducted Emission

- . Test Date : June 12, 2009
- . Resolution Bandwidth : 9 kHz
- . Frequency Range : 0.15 MHz ~ 30 MHz



◆ Test resolution: 1 024 * 768 / 60 Hz (RGB: Analog mode)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.213500	46.2	1000.000	9.000	GND	L1	9.9	16.7	62.9	
0.379000	23.8	1000.000	9.000	GND	L1	10.0	34.4	58.2	
0.533500	27.3	1000.000	9.000	GND	L1	10.0	28.7	56.0	
1.381500	24.4	1000.000	9.000	GND	L1	10.0	31.6	56.0	
2.661500	26.1	1000.000	9.000	GND	L1	10.1	30.0	56.0	
4.041500	25.0	1000.000	9.000	GND	L1	10.2	31.0	56.0	
14.573500	34.2	1000.000	9.000	GND	L1	10.6	25.8	60.0	
17.605500	39.2	1000.000	9.000	GND	L1	10.7	20.8	60.0	

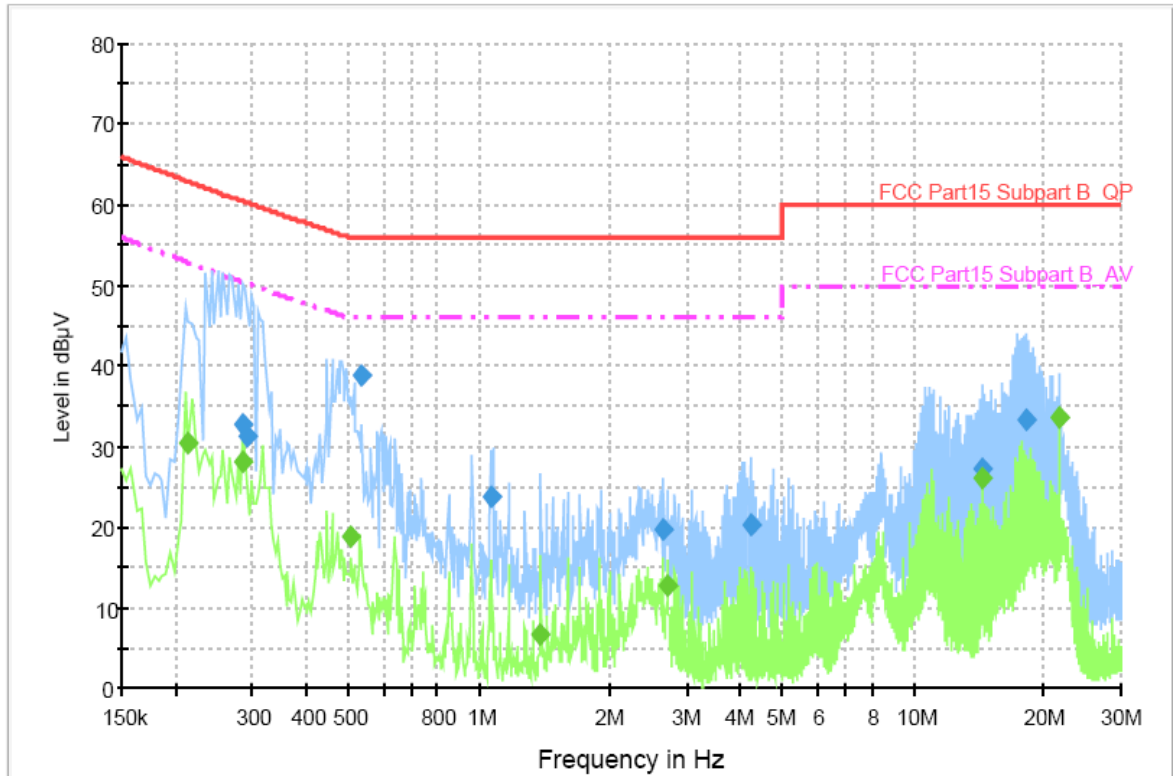
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.218000	35.8	1000.000	9.000	GND	L1	9.9	16.9	52.7	
0.287000	30.6	1000.000	9.000	GND	L1	10.0	19.8	50.4	
0.534500	20.1	1000.000	9.000	GND	L1	10.0	25.9	46.0	
1.381500	14.5	1000.000	9.000	GND	L1	10.0	31.5	46.0	
2.712000	13.4	1000.000	9.000	GND	L1	10.1	32.6	46.0	
11.642000	13.6	1000.000	9.000	GND	L1	10.4	36.4	50.0	
21.601500	34.2	1000.000	9.000	GND	L1	10.9	15.8	50.0	

< Fig 4. Conducted emission result (Live line)>



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.284500	32.8	1000.000	9.000	GND	N	10.0	27.7	60.5	
0.292500	31.2	1000.000	9.000	GND	N	10.0	29.1	60.3	
0.537500	38.9	1000.000	9.000	GND	N	10.0	17.1	56.0	
1.064500	23.7	1000.000	9.000	GND	N	10.0	32.3	56.0	
2.657500	19.8	1000.000	9.000	GND	N	10.1	36.2	56.0	
4.201500	20.2	1000.000	9.000	GND	N	10.2	35.8	56.0	
14.361500	27.3	1000.000	9.000	GND	N	10.5	32.7	60.0	
18.137500	33.3	1000.000	9.000	GND	N	10.6	26.7	60.0	

Final Measurement Detector 2

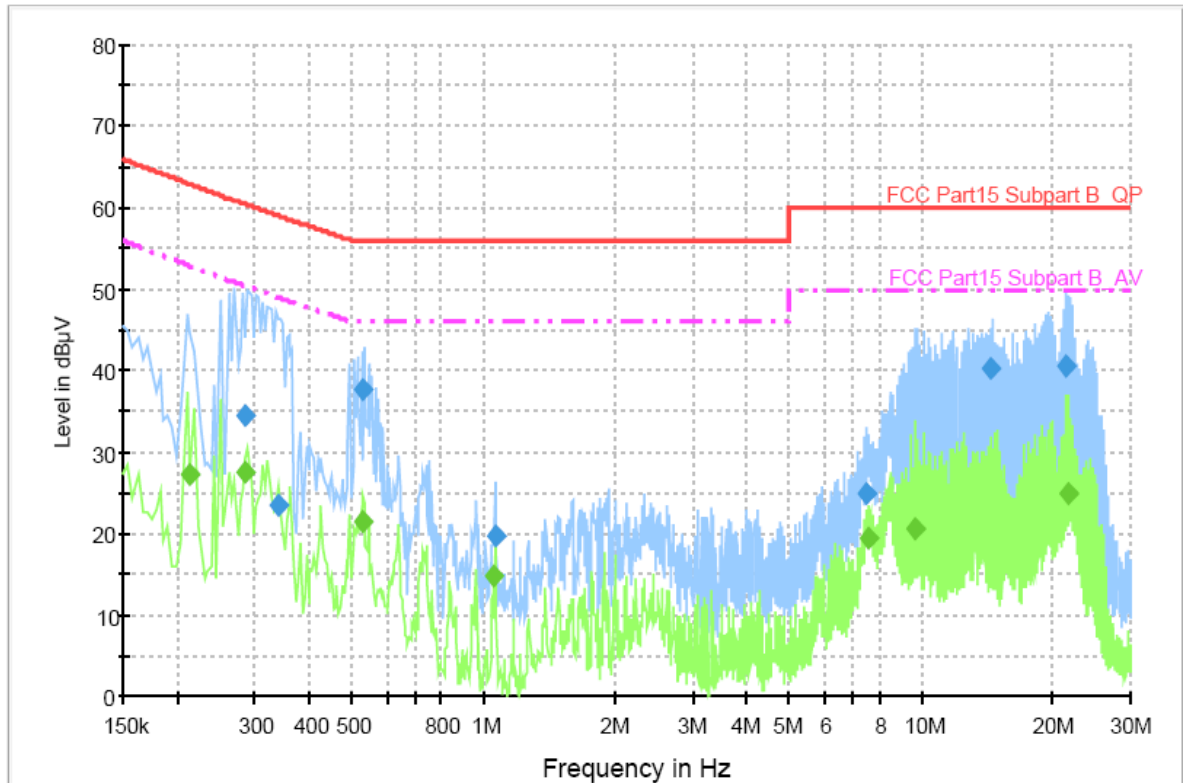
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.214000	30.5	1000.000	9.000	GND	N	9.9	22.3	52.8	
0.285500	28.0	1000.000	9.000	GND	N	10.0	22.4	50.4	
0.502500	19.0	1000.000	9.000	GND	N	10.0	27.0	46.0	
1.381500	6.6	1000.000	9.000	GND	N	10.1	39.4	46.0	
2.707000	12.8	1000.000	9.000	GND	N	10.1	33.2	46.0	
14.418000	26.1	1000.000	9.000	GND	N	10.5	23.9	50.0	
21.602000	33.5	1000.000	9.000	GND	N	10.8	16.5	50.0	

< Fig 5. Conducted emission result (Neutral line)>



◆ Test resolution: 1 024 * 768 / 60 Hz (HDMI/DVI: Digital mode)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.284000	34.6	1000.000	9.000	GND	L1	10.0	25.9	60.5	
0.339000	23.4	1000.000	9.000	GND	L1	10.0	35.6	59.0	
0.529000	37.7	1000.000	9.000	GND	L1	10.0	18.3	56.0	
1.066000	19.8	1000.000	9.000	GND	L1	10.0	36.2	56.0	
7.517500	25.0	1000.000	9.000	GND	L1	10.3	35.0	60.0	
14.424500	40.4	1000.000	9.000	GND	L1	10.6	19.6	60.0	
21.489500	40.6	1000.000	9.000	GND	L1	10.9	19.4	60.0	

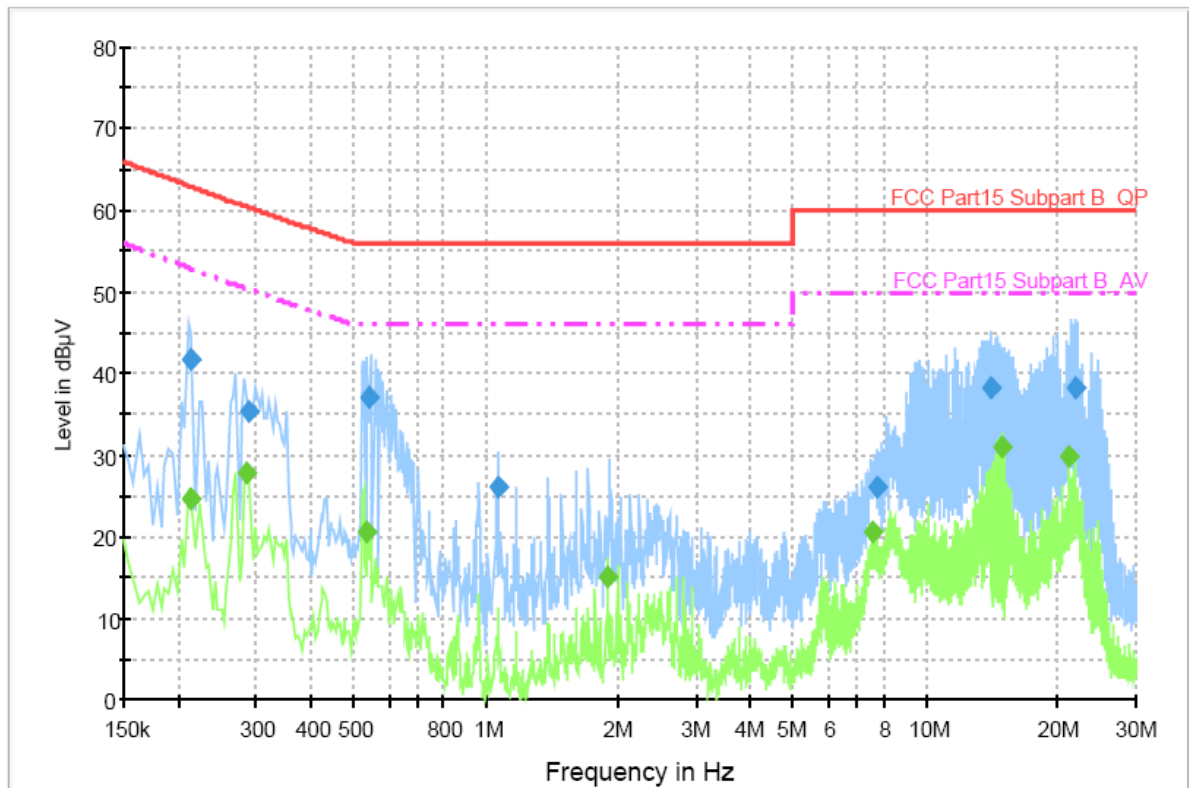
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.213500	27.2	1000.000	9.000	GND	L1	9.9	25.7	52.9	
0.285000	27.4	1000.000	9.000	GND	L1	10.0	23.0	50.4	
0.529500	21.5	1000.000	9.000	GND	L1	10.0	24.5	46.0	
1.052500	14.7	1000.000	9.000	GND	L1	10.0	31.3	46.0	
7.547000	19.6	1000.000	9.000	GND	L1	10.3	30.4	50.0	
9.681500	20.4	1000.000	9.000	GND	L1	10.3	29.6	50.0	
21.594000	25.0	1000.000	9.000	GND	L1	10.9	25.0	50.0	

< Fig 6. Conducted emission result (Live line)



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.214000	41.8	1000.000	9.000	GND	N	9.9	21.1	62.9	
0.287500	35.4	1000.000	9.000	GND	N	10.0	25.0	60.4	
0.541000	37.1	1000.000	9.000	GND	N	10.0	18.9	56.0	
1.065500	26.2	1000.000	9.000	GND	N	10.0	29.8	56.0	
7.726000	26.2	1000.000	9.000	GND	N	10.3	33.8	60.0	
13.984500	38.3	1000.000	9.000	GND	N	10.5	21.7	60.0	
21.810000	38.4	1000.000	9.000	GND	N	10.8	21.6	60.0	

Final Measurement Detector 2

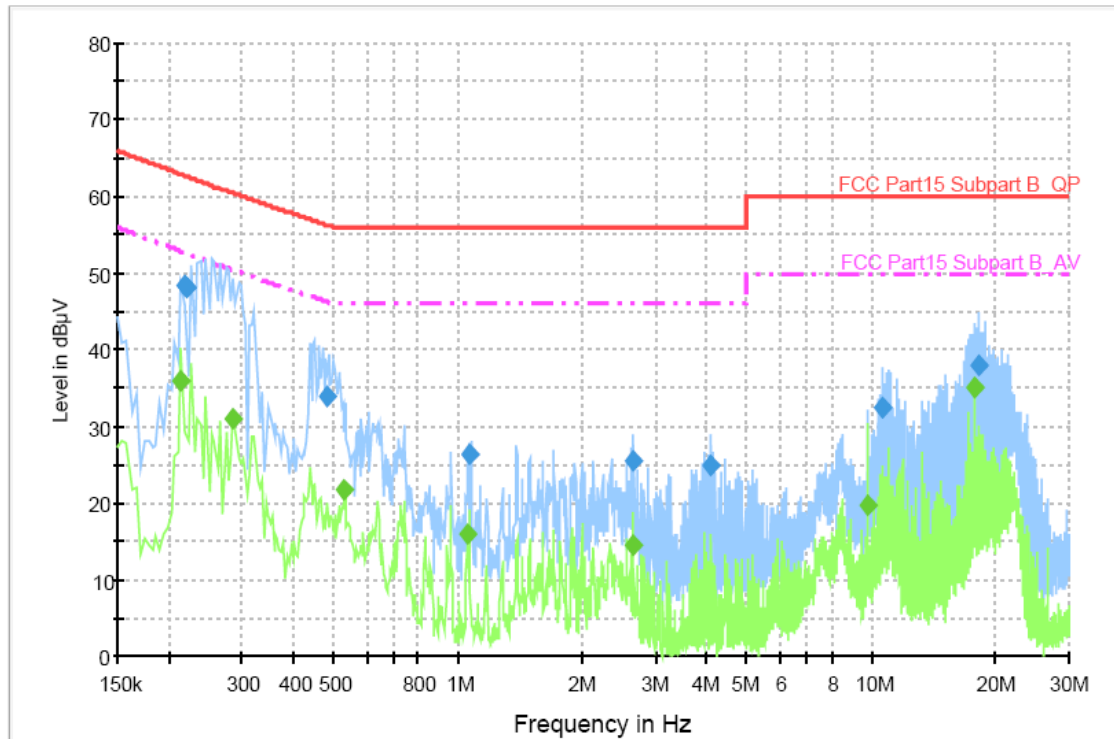
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.214000	24.7	1000.000	9.000	GND	N	9.9	28.1	52.8	
0.285500	27.7	1000.000	9.000	GND	N	10.0	22.7	50.4	
0.534500	20.4	1000.000	9.000	GND	N	10.0	25.6	46.0	
1.881500	15.1	1000.000	9.000	GND	N	10.1	30.9	46.0	
7.600500	20.6	1000.000	9.000	GND	N	10.3	29.4	50.0	
14.865000	31.1	1000.000	9.000	GND	N	10.6	18.9	50.0	
21.109500	29.7	1000.000	9.000	GND	N	10.8	20.3	50.0	

< Fig 7. Conducted emission result (Neutral line)>



◆ Test resolution: 800 * 600 / 60 Hz (RGB: Analog mode)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.217500	48.4	1000.000	9.000	GND	L1	9.9	14.3	62.7	
0.220500	48.0	1000.000	9.000	GND	L1	9.9	14.6	62.6	
0.484000	33.8	1000.000	9.000	GND	L1	10.0	22.4	56.2	
1.064000	26.4	1000.000	9.000	GND	L1	10.0	29.6	56.0	
2.662000	25.4	1000.000	9.000	GND	L1	10.1	30.6	56.0	
4.097500	25.0	1000.000	9.000	GND	L1	10.2	31.0	56.0	
10.637500	32.4	1000.000	9.000	GND	L1	10.3	27.6	60.0	
18.246000	37.9	1000.000	9.000	GND	L1	10.8	22.2	60.0	

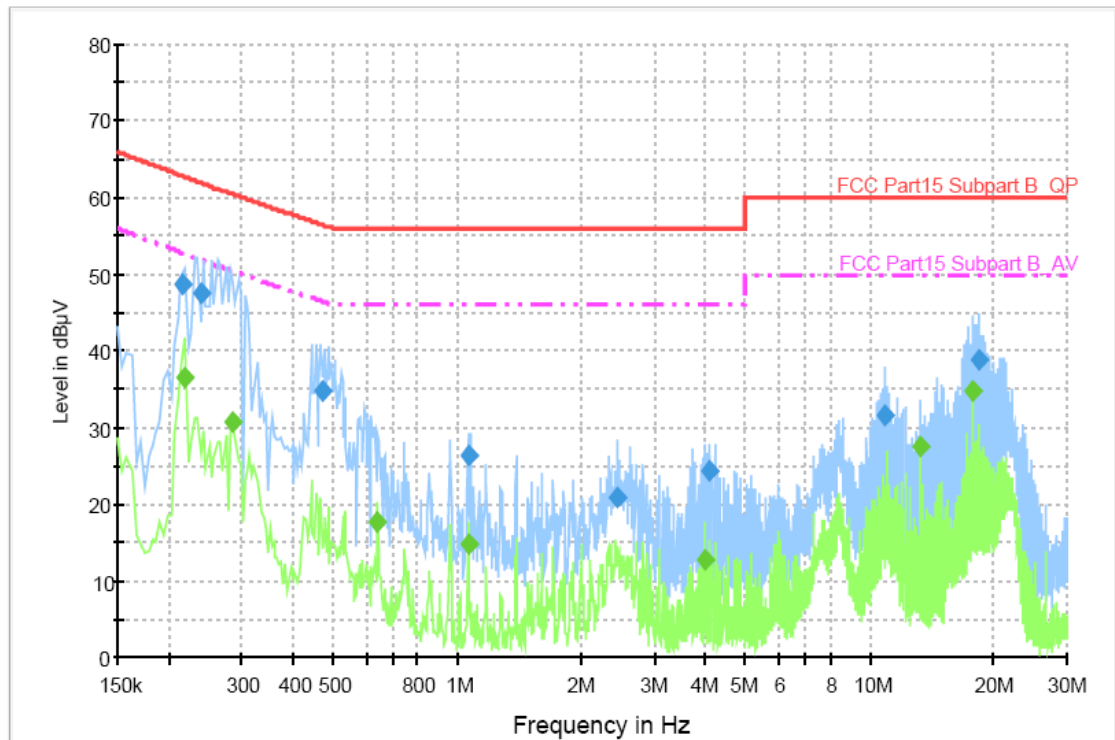
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.213500	35.9	1000.000	9.000	GND	L1	9.9	17.0	52.9	
0.285500	30.9	1000.000	9.000	GND	L1	10.0	19.5	50.4	
0.529000	21.7	1000.000	9.000	GND	L1	10.0	24.3	46.0	
1.052000	16.0	1000.000	9.000	GND	L1	10.0	30.0	46.0	
2.662000	14.6	1000.000	9.000	GND	L1	10.1	31.4	46.0	
9.763000	19.7	1000.000	9.000	GND	L1	10.3	30.3	50.0	
17.705500	35.1	1000.000	9.000	GND	L1	10.7	14.9	50.0	

< Fig 8. Conducted emission result (Live line)>



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.216000	48.6	1000.000	9.000	GND	N	9.9	14.2	62.8	
0.239000	47.5	1000.000	9.000	GND	N	10.0	14.4	61.9	
0.472000	34.7	1000.000	9.000	GND	N	10.0	21.7	56.4	
1.065500	26.4	1000.000	9.000	GND	N	10.0	29.6	56.0	
2.445500	20.8	1000.000	9.000	GND	N	10.1	35.2	56.0	
4.097500	24.5	1000.000	9.000	GND	N	10.2	31.5	56.0	
10.849500	31.7	1000.000	9.000	GND	N	10.3	28.3	60.0	
18.349500	38.9	1000.000	9.000	GND	N	10.6	21.1	60.0	

Final Measurement Detector 2

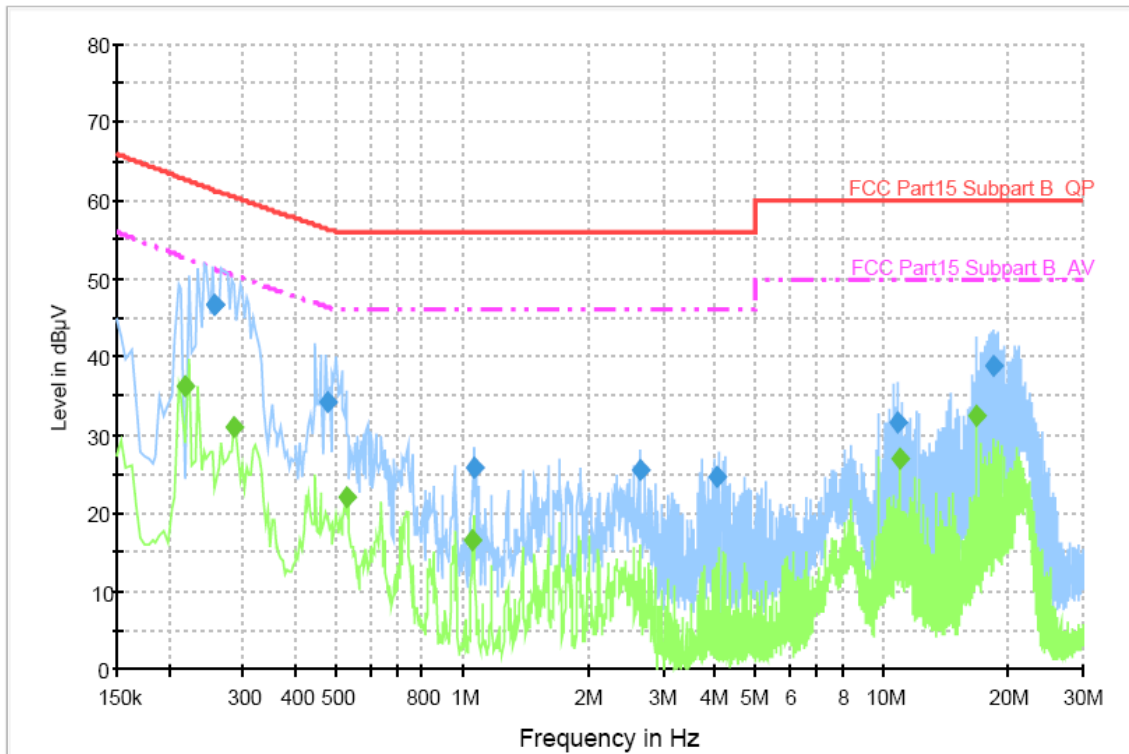
Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.217500	36.4	1000.000	9.000	GND	N	9.9	16.3	52.7	
0.285500	30.8	1000.000	9.000	GND	N	10.0	19.6	50.4	
0.637500	17.8	1000.000	9.000	GND	N	10.0	28.2	46.0	
1.066000	14.8	1000.000	9.000	GND	N	10.0	31.2	46.0	
3.989500	12.7	1000.000	9.000	GND	N	10.2	33.3	46.0	
13.289500	27.5	1000.000	9.000	GND	N	10.5	22.5	50.0	
17.705500	34.8	1000.000	9.000	GND	N	10.6	15.2	50.0	

< Fig 9. Conducted emission result (Neutral line)>



◆ Test resolution: 640 * 480 / 60 Hz (RGB: Analog mode)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256500	46.7	1000.000	9.000	GND	L1	10.0	14.6	61.3	
0.258000	46.7	1000.000	9.000	GND	L1	10.0	14.6	61.3	
0.476000	34.1	1000.000	9.000	GND	L1	10.0	22.3	56.4	
1.065500	25.9	1000.000	9.000	GND	L1	10.0	30.1	56.0	
2.657500	25.5	1000.000	9.000	GND	L1	10.1	30.5	56.0	
4.044000	24.5	1000.000	9.000	GND	L1	10.2	31.5	56.0	
10.849500	31.6	1000.000	9.000	GND	L1	10.3	28.4	60.0	
18.349000	38.9	1000.000	9.000	GND	L1	10.8	21.1	60.0	

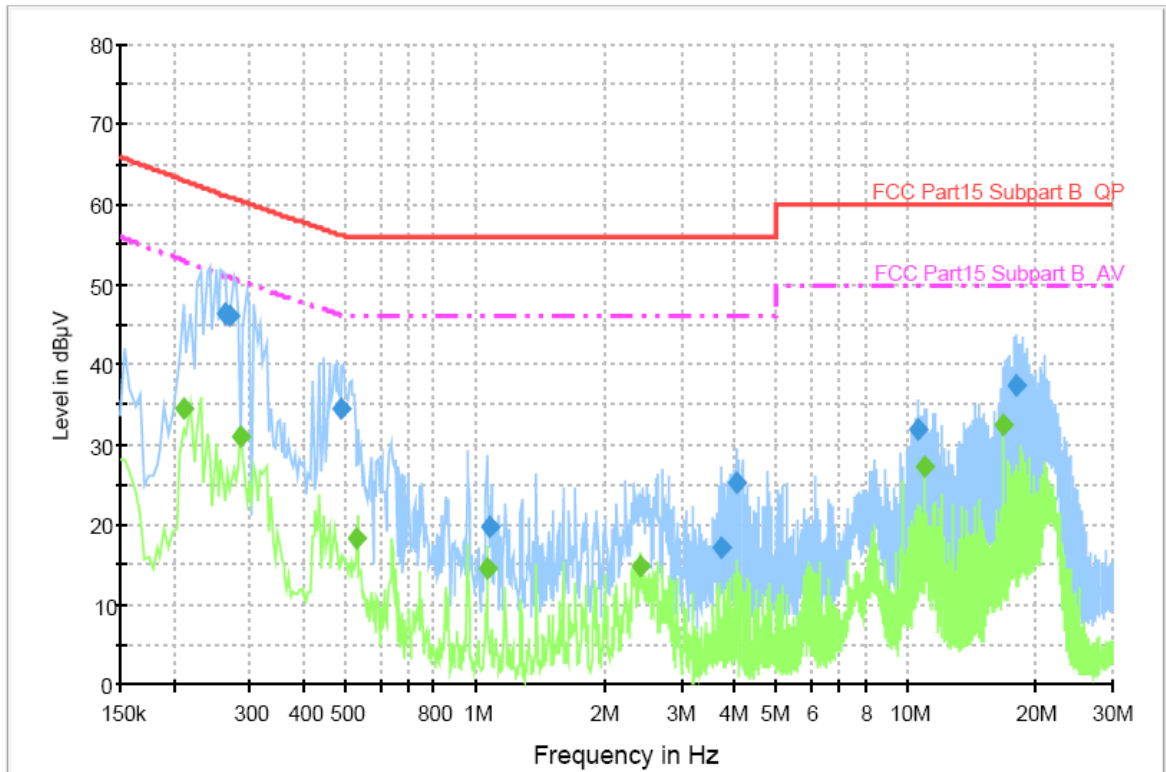
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.217000	36.2	1000.000	9.000	GND	L1	9.9	16.5	52.7	
0.285500	31.1	1000.000	9.000	GND	L1	10.0	19.3	50.4	
0.529500	22.1	1000.000	9.000	GND	L1	10.0	23.9	46.0	
1.052500	16.5	1000.000	9.000	GND	L1	10.0	29.5	46.0	
10.981500	27.1	1000.000	9.000	GND	L1	10.3	22.9	50.0	
16.706000	32.5	1000.000	9.000	GND	L1	10.7	17.5	50.0	

< Fig 10. Conducted emission result (Live line)>



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.262000	46.3	1000.000	9.000	GND	N	10.0	14.9	61.2	
0.269000	46.0	1000.000	9.000	GND	N	10.0	14.9	60.9	
0.485500	34.5	1000.000	9.000	GND	N	10.0	21.7	56.2	
1.079000	19.7	1000.000	9.000	GND	N	10.0	36.3	56.0	
3.709000	17.0	1000.000	9.000	GND	N	10.2	39.0	56.0	
4.041500	25.1	1000.000	9.000	GND	N	10.2	30.9	56.0	
10.637500	31.9	1000.000	9.000	GND	N	10.3	28.1	60.0	
17.921500	37.3	1000.000	9.000	GND	N	10.6	22.7	60.0	

Final Measurement Detector 2

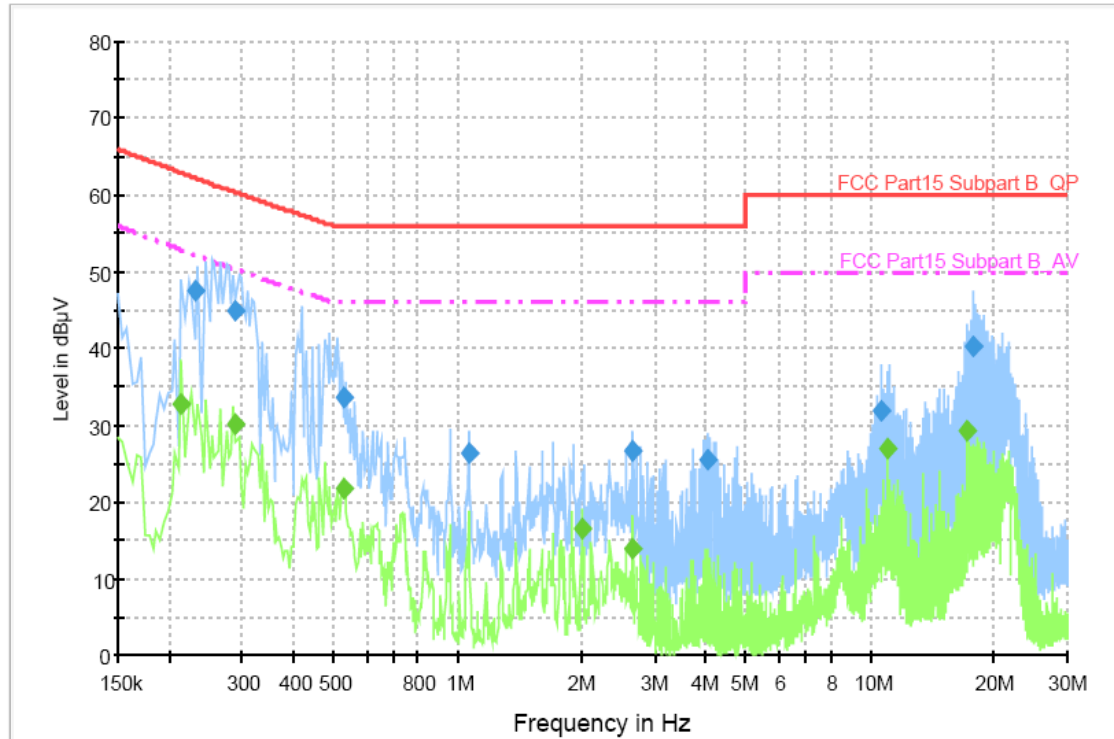
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.211500	34.6	1000.000	9.000	GND	N	9.9	18.3	52.9	
0.285500	31.0	1000.000	9.000	GND	N	10.0	19.4	50.4	
0.529000	18.4	1000.000	9.000	GND	N	10.0	27.6	46.0	
1.065500	14.5	1000.000	9.000	GND	N	10.0	31.5	46.0	
2.425500	14.8	1000.000	9.000	GND	N	10.1	31.2	46.0	
10.981500	27.1	1000.000	9.000	GND	N	10.3	22.9	50.0	
16.705500	32.6	1000.000	9.000	GND	N	10.6	17.4	50.0	

< Fig 11. Conducted emission result (Neutral line)>



◆ Test resolution: USB play mode

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.231000	47.5	1000.000	9.000	GND	L1	9.9	14.7	62.2	
0.287000	45.0	1000.000	9.000	GND	L1	10.0	15.4	60.4	
0.526000	33.7	1000.000	9.000	GND	L1	10.0	22.3	56.0	
1.066000	26.4	1000.000	9.000	GND	L1	10.0	29.6	56.0	
2.661500	26.6	1000.000	9.000	GND	L1	10.1	29.4	56.0	
4.041500	25.4	1000.000	9.000	GND	L1	10.2	30.6	56.0	
10.637500	31.9	1000.000	9.000	GND	L1	10.3	28.1	60.0	
17.709500	40.2	1000.000	9.000	GND	L1	10.7	19.8	60.0	

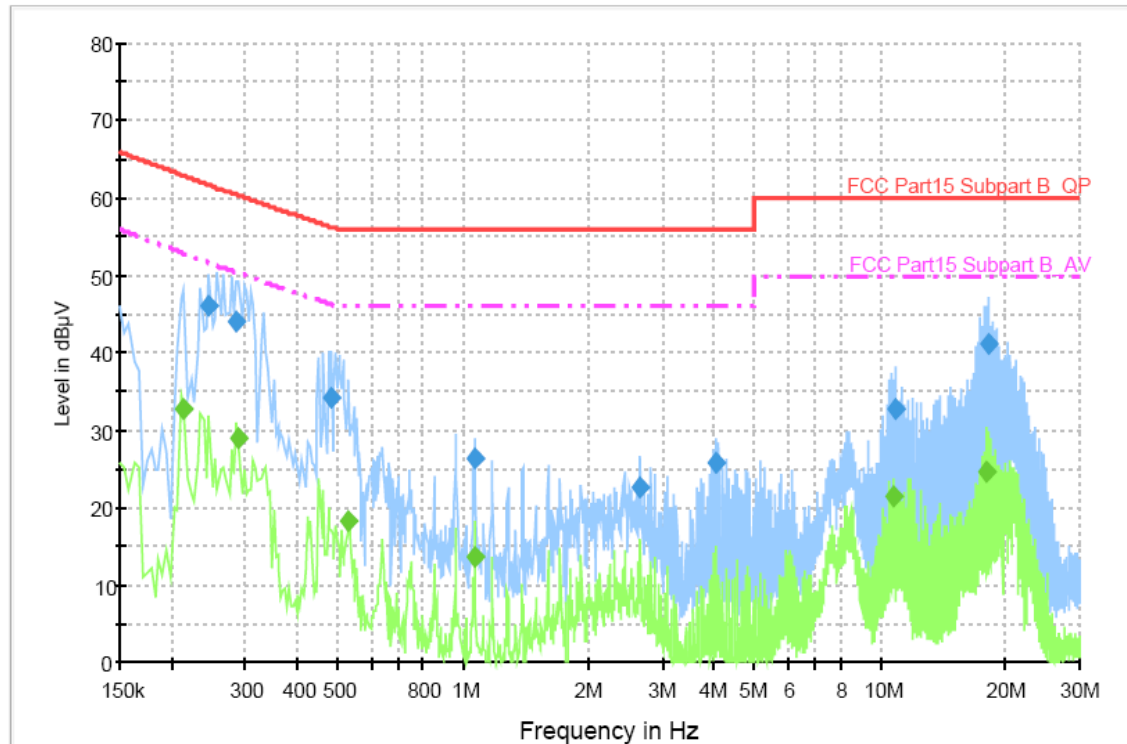
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.213500	32.9	1000.000	9.000	GND	L1	9.9	20.0	52.9	
0.290000	30.1	1000.000	9.000	GND	L1	10.0	20.2	50.3	
0.529500	21.9	1000.000	9.000	GND	L1	10.0	24.1	46.0	
1.993500	16.4	1000.000	9.000	GND	L1	10.1	29.6	46.0	
2.661500	13.9	1000.000	9.000	GND	L1	10.1	32.1	46.0	
10.985500	26.9	1000.000	9.000	GND	L1	10.3	23.1	50.0	
17.085500	29.3	1000.000	9.000	GND	L1	10.7	20.7	50.0	

< Fig 12. Conducted emission result (Live line)>



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.246000	46.0	1000.000	9.000	GND	N	10.0	15.7	61.7	
0.284500	44.0	1000.000	9.000	GND	N	10.0	16.5	60.5	
0.484500	34.2	1000.000	9.000	GND	N	10.0	22.0	56.2	
1.065500	26.4	1000.000	9.000	GND	N	10.0	29.6	56.0	
2.657000	22.6	1000.000	9.000	GND	N	10.1	33.4	56.0	
4.041500	25.7	1000.000	9.000	GND	N	10.2	30.3	56.0	
10.849500	32.8	1000.000	9.000	GND	N	10.3	27.2	60.0	
18.137500	41.2	1000.000	9.000	GND	N	10.6	18.8	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.214000	32.7	1000.000	9.000	GND	N	9.9	20.1	52.8	
0.290000	28.9	1000.000	9.000	GND	N	10.0	21.4	50.3	
0.529500	18.4	1000.000	9.000	GND	N	10.0	27.6	46.0	
1.065500	13.7	1000.000	9.000	GND	N	10.0	32.3	46.0	
10.797500	21.4	1000.000	9.000	GND	N	10.3	28.6	50.0	
17.869500	24.6	1000.000	9.000	GND	N	10.6	25.4	50.0	

< Fig 13. Conducted emission result (Neutral line)>



6. Radiated Emission

6.1 Operating Environment

Temperature : 21 °C
Relative Humidity : 48 % 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	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 3.54 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 3.49 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.85 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.76 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 3.21 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.32 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 3.77 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.84 dB	Confidence levels of 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
■ - ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 14. 2009
■ - VULB9160	Schwarzbeck	Broaband test antenna	3193	12. 11. 2009
■ - MCU066	maturo GmbH	Position Controller	100/692/01	N/A
■ - AM4.0	maturo GmbH	Antenna Mast	415/657/01	N/A
■ - TT2.5SI	maturo GmbH	Turntable	240/565/01	N/A

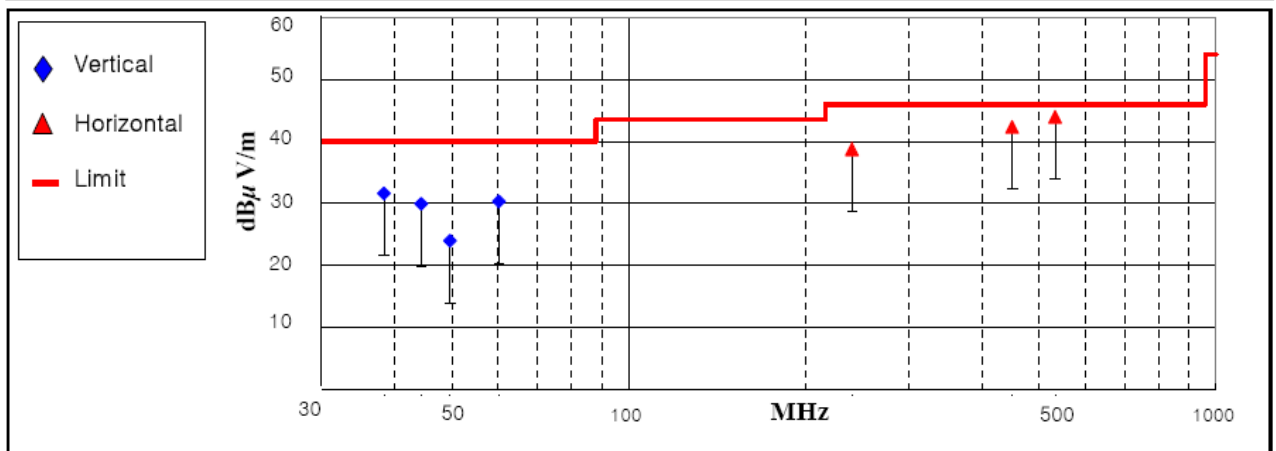
6.6 Test data for Radiated Emission

- . Test Date : June 10, 2009
- . Resolution Bandwidth : 120 kHz
- . Frequency Range : 30 MHz ~ 1 000 MHz
- . Measurement Distance : 3 m



- ◆ Operating Condition: 1 024 * 768 / 60 Hz (RGB: Analog mode)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
38.33	19.15	11.29	1.17	31.61	40.00	8.39	V	113	234
44.36	16.68	11.97	1.28	29.93	40.00	10.07	V	100	226
49.70	10.26	12.33	1.37	23.96	40.00	16.04	V	102	247
60.16	17.44	11.36	1.53	30.33	40.00	9.67	V	100	301
239.99	25.23	10.81	2.69	38.73	46.00	7.27	H	144	288
450.03	22.50	16.31	3.51	42.32	46.00	3.68	H	105	176
532.55	22.70	17.49	3.76	43.95	46.00	2.05	H	100	213

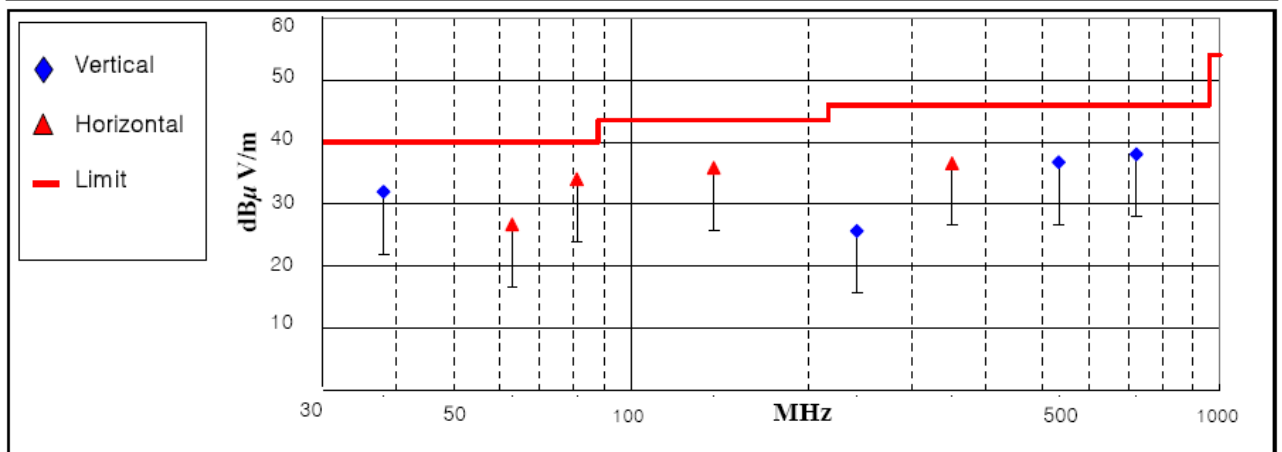


< Fig 14. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 024 * 768 / 60 Hz (HDMI/DVI: Digital mode)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
38.03	19.53	11.25	1.17	31.95	40.00	8.05	V	100	191
62.91	14.23	10.89	1.59	26.71	40.00	13.29	H	208	12
80.99	24.45	7.81	1.76	34.02	40.00	5.98	H	213	88
138.25	21.50	12.51	1.84	35.85	43.50	7.65	H	221	2
241.88	12.09	10.87	2.70	25.66	46.00	20.34	V	199	192
351.02	19.61	13.82	3.16	36.59	46.00	9.41	H	100	289
532.55	15.53	17.49	3.76	36.78	46.00	9.22	V	100	301
721.55	12.70	20.59	4.73	38.02	46.00	7.98	V	230	33

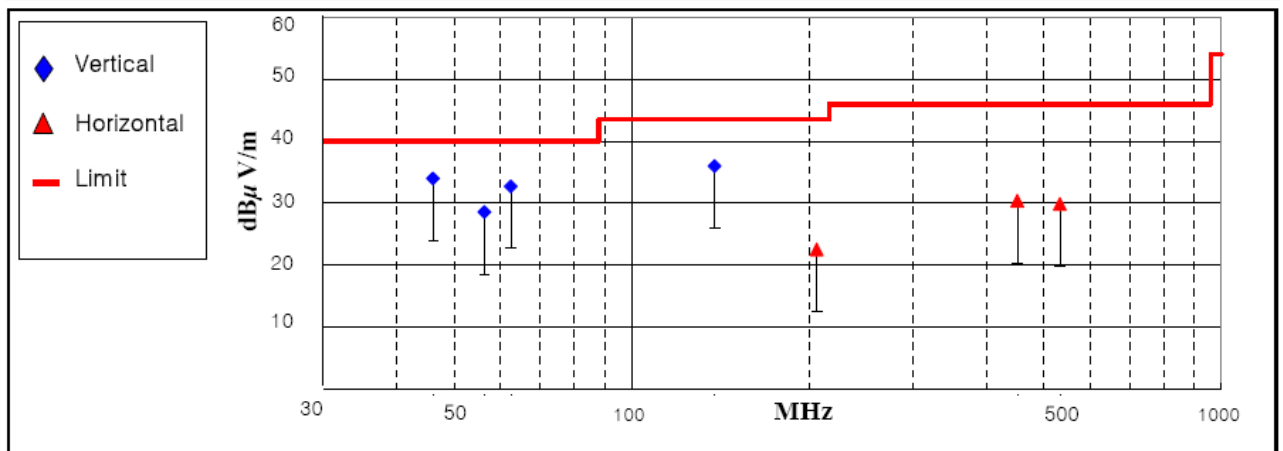


< Fig 15. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: USB play mode
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
46.05	20.54	12.11	1.31	33.96	40.00	6.04	V	100	195
56.30	15.34	11.75	1.47	28.56	40.00	11.44	V	100	283
62.39	20.15	10.98	1.58	32.71	40.00	7.29	V	106	291
138.25	21.64	12.51	1.84	35.99	43.50	7.51	V	197	3
205.93	10.49	9.57	2.45	22.51	43.50	20.99	H	100	105
450.85	10.53	16.32	3.51	30.36	46.00	15.64	H	196	288
532.61	8.59	17.50	3.76	29.85	46.00	16.15	H	220	291



< Fig 16. Radiated emission result (30 MHz ~ 1 000 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 **KIMIN ELECTRONIC CO., LTD. PDP TV/Monitor (Model Name: PT50U71H, KPP-50SAT, KPP-50XXX)** was complies with §15.107 and 15.109 of the FCC Rules.