

Electromagnetic Emission

FCC MEASUREMENT REPORT

CERTIFICATION OF COMPLIANCE

FCC Part 15 Verification Measurement

PRODUCT : LCD MONITOR
MODEL/TYPE NO : P276L / NONE
FCC ID : PJIP276L
MULTIPLE MODEL : L27DPFLP0
BRAND NAME : **HYUNDAI**
APPLICANT : HYUNDAI IBT CORP.
106, Apogongdan-gil, Apo-eup, Gimcheon-si,
Gyeongsangbuk-do, 740-862 Republic of Korea
Attn.: Yoon Suk Lee / Manager
MANUFACTURER : HYUNDAI IBT CORP.
106, Apogongdan-gil, Apo-eup, Gimcheon-si,
Gyeongsangbuk-do, 740-862 Republic of Korea
FCC CLASSIFICATION : Class B Personal computers and peripherals
RULE PART(S) : FCC Part 15 Subpart B
FCC PROCEDURE : ANSI C63.4-2009
TEST REPORT No. : ETLE160609.0496
DATES OF TEST : June 11, 2016 to June 16, 2016
REPORT ISSUE DATE : June 29, 2016
TEST LABORATORY : ETL Inc. (FCC Designation Number : KR0022)

This LCD MONITOR, Model P276L has been tested in accordance with the measurement procedures specified in ANSI C63.4-2009 at the ETL/EMC Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart B:

I attest to the accuracy of data. All measurement herein was performed by me or was made under my supervision and is 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.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Prepared by:

Chul Min, Ji (Test Engineer)

June 29, 2016

Reviewed by:

Hyung Min, Choi (Chief Engineer)

June 29, 2016

ETL Inc.

Head office: #371-51, Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea

Open site: #499-1, Sagot-ri, Seosin-myeon, Hwaseong-si, Gyeonggi-do, 445-882, Korea

Tel: 82-2-858-0786 Fax: 82-2-858-0788

The test report merely corresponds to the test sample(s).

This report shall not be reproduced, in whole or in part without the written approval of ETL Inc.

Table of Contents

FCC Measurement Report

- 1. Introduction**
- 2. Product Information**
- 3. Description of Tests**
- 4. Test Condition**
- 5. Test Results**
 - 5.1 Summary of Test Results**
 - 5.2 Conducted Emissions Measurement**
 - 5.3 Radiated Emissions Measurement**
- 6. Sample Calculation**
- 7. List of test Equipment used for Measurement**

Appendix B. Test Setup Photographs

Appendix C. External Photographs

Appendix D. Internal Photographs

FCC MEASUREMENT REPORT

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

General Information

Applicant Name : HYUNDAI IBT CORP.	
Address	: 106, Apogongdan-gil, Apo-eup, Gimcheon-si, Gyeongsangbuk-do, 740-862 Republic of Korea
Attention	: Yoon Suk Lee / Manager

- EUT Type :** LCD MONITOR
- Model Number :** P276L
- S/N :** NONE
- Rule Part(s) :** FCC Part 15 Subpart B
- Test Procedure :** ANSI C63.4-2009
- FCC Classification :** Class B Personal computers and peripherals
- Dates of Tests :** June 11, 2016 to June 16, 2016
- Environmental of Tests :**
Temperature: $(23.0 \pm 1.3) ^\circ\text{C}$
Humidity: $(59 \pm 18) \% \text{ R.H.}$
Atmospheric Pressure: $(100.2 \pm 0.4) \text{ kPa}$
- Place of Tests :**
ETL Inc. Testing Lab. (FCC Designation Number : KR0022)

Radiated Emission test 1;
#499-1, Sagot-ri, Seosin-myeon, Hwaseong-si,
Gyeonggi-do, 445-882, Korea

Radiated Emission test 2 and Conducted Emission test;
#371-51, Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea
- Test Report No. :** ETLE141124.1685

1. INTRODUCTION

The measurement test for radiated and conducted emission test was conducted at the ETL Inc. The site is constructed in conformance with the requirements of the ANSI C63.4-2009 and CISPR Publication 16. The ETL has site descriptions on file with the FCC for 3 m and 10 m site configurations. Detailed description of test facility was found to be in compliance with the requirements of Section 2.948 FCC Rules according to the ANSI C63.4-2009 and registered to the Federal Communications Commission (FCC Designation Number : KR0022).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission 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 from the HYUNDAI IBT CORP., Model: P276L.

2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the LCD MONITOR (model: P276L).

The model P276L is basic model that was tested.

The multiple models L27DPFLP0 is identical to basic model, except for model designation.

2.2 General Specification

Item		Specification
LCD	Visible Screen Area	597.89 mm (H) x 336.31 mm (V)
	Pixel Pitch	0.311 4 mm (H) x 0.311 4 mm (V)
	Recommended Resolution	1 920 x 1 080 @ 60 Hz
	Maximum Visible Angle	170°/160° (H/V)
	Displayed Color	16.7 M
	Brightness	300 cd/m ²
	Contrast Ratio	1 000:1
	Response Time	5 msec
Input Signal	Horizontal Frequency	31 kHz – 80 kHz
	Vertical Frequency	60 Hz – 75 Hz
	Video Signal	Analog VGA, DVI
	Connector	DVI-D, AUDIO, Display Port, D-SUB
Power	Power Consumption	< 24 W (Typ.)
	Stand by Power	< 0.5 W
	Input Power	AC 100 V – 240 V; 50 Hz/60 Hz; 1.5 A
Multimedia Speakers		1 W x 2
Operating Environment	Operation	Temperature: (25 ± 15) °C
		Humidity: (50 ± 30) % (non-condensing)
	Storage	Temperature: (20 ± 30) °C
		Humidity: (50 ± 40) % (non-condensing)
High Internal Frequency		F/MEMORY clock → 75 MHz

3. DESCRIPTION OF TESTS

3.1 Conducted Emission Measurement

Conducted emissions measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2009. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω/50 μH LISN as the input transducer to a Spectrum Analyzer or a Test Receiver. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 9 kHz or for "quasi-peak" within a bandwidth of 9 kHz.

The line-conducted emission test is conducted inside a shielded anechoic chamber room with 1 m x 1.5 m x 0.8 m wooden table which is placed 40 cm away from the vertical wall and 1.5 m away from the side wall of the chamber room. Two LISN are bonded to the shielded room. The EUT is powered from the LISN and the support equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2 cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the LISN. Non-inductive bundling to a 1 m length shortened all interconnecting cables more than 1 m. Sufficient time for the 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 to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using to set Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 MHz to 30 MHz. The bandwidth of the spectrum analyzer was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission.

Photographs of the worst-case emission can be seen in photographs of conducted emission test setup in Appendix B.

3.2 Radiated Emission Measurement

Radiated emission measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2009. The measurements were performed over the frequency range of 30 MHz to 40 GHz (or 5th harmonic of the highest frequency) in using antenna as the input transducer to a spectrum analyzer or a field intensity meter. The measurements below 1 GHz were made with the detector set for "Quasi-peak" within a bandwidth of 120 kHz. The measurements above 1 GHz were made with the detector set for "Peak and Average" within a bandwidth of 1 MHz.

Preliminary measurements were made at 3 m using broadband antennas, and spectrum analyzer to determined the frequency producing the maximum emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 MHz to 1 000 MHz using Log-Bicon antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site or SVSWR chamber at 3 m. The test equipment was placed on a styrofoam table. 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 by manual. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8 m high nonmetallic 1 m x 1.5 m table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 m to 4 m and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or support equipment and changing the polarity of the antenna, whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in Photographs of the worst-case emission test setup can be seen in Appendix B.

4. TEST CONDITION

4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner and which tends to maximize its emission level in a typical application.

4.2 EUT operation

The equipment under test was operated during the measurement under following conditions:

	Conditions	Remark
■	Stand by	
■	The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on monitor. (BurnIn Test program)	VGA mode
■	The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on monitor. (BurnIn Test program)	DVI mode
■	The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on monitor. (BurnIn Test program)	DP mode

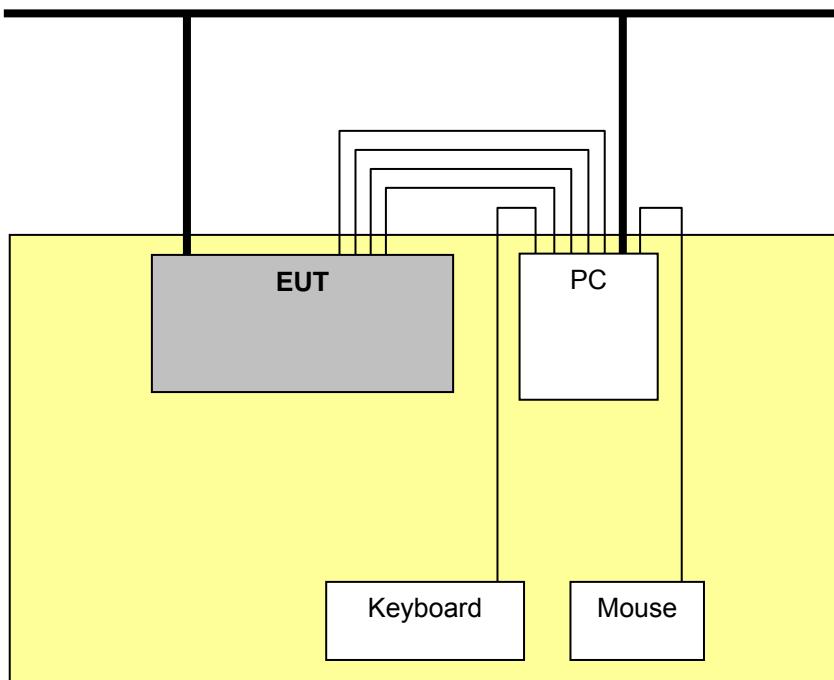
4.3 Support Equipment Used

Description	Model Name	Serial No.	Manufacturer	FCC
PC	D08M	6GPJXBX	Dell Inc.	DoC
Keyboard	SWT1200US	27314C2600967	Great Pleasure Electronics Co., Ltd.	-
Mouse	M-U0039	1347LZ0C7NR8	LOGITECH Inc.	DoC

4.4 Type of Cables Used

Device from	Device to	Type of I/O port	Length[m]	Type of shield	Used ferrite core
EUT	PC	VGA	1.2	Shielded	O
EUT	PC	DVI	1.2	Shielded	O
EUT	PC	DP	1.2	Shielded	X
EUT	PC	Audio In	1.2	Shielded	O
EUT	Power socket	AC Input	1.5	Unshielded	X
PC	Keyboard	USB	1.5	Shielded	X
PC	Mouse	USB	1.5	Shielded	X
PC	Power socket	AC Input	1.5	Unshielded	X

4.5 The setup drawing(s)



— : Data Line

— : Power Line

■ : Adapter

5. TEST RESULTS

5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

FCC Rule	Measurement Required	Result
15.107(a)	Conducted Emission Measurement	Passed by 19.00 dB
15.109(a)	Radiated Emission Measurement (Below 1 GHz)	Passed by 5.63 dB
15.109(a)	Radiated Emission Measurement (Above 1 GHz)	Passed by 11.60 dB

The data collected shows that the **HYUNDAI IBT CORP. / LCD MONITOR / P276L** complied with technical requirements of above rules part 15.107(a) and 15.109(a) Class B Limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement. No EMI suppression device(s) was added and/or modified during testing.

5.2 Conducted Emissions Measurement

5.2.1 Conducted Emissions Data

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.107(a) Class B
Test Date	June 15, 2016
Environmental of test	(23.6 ± 0.1) °C, (43 ± 0) % R.H., (100.3 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - VGA mode
Result	Passed by 19.10 dB

Conducted Emission Test Data

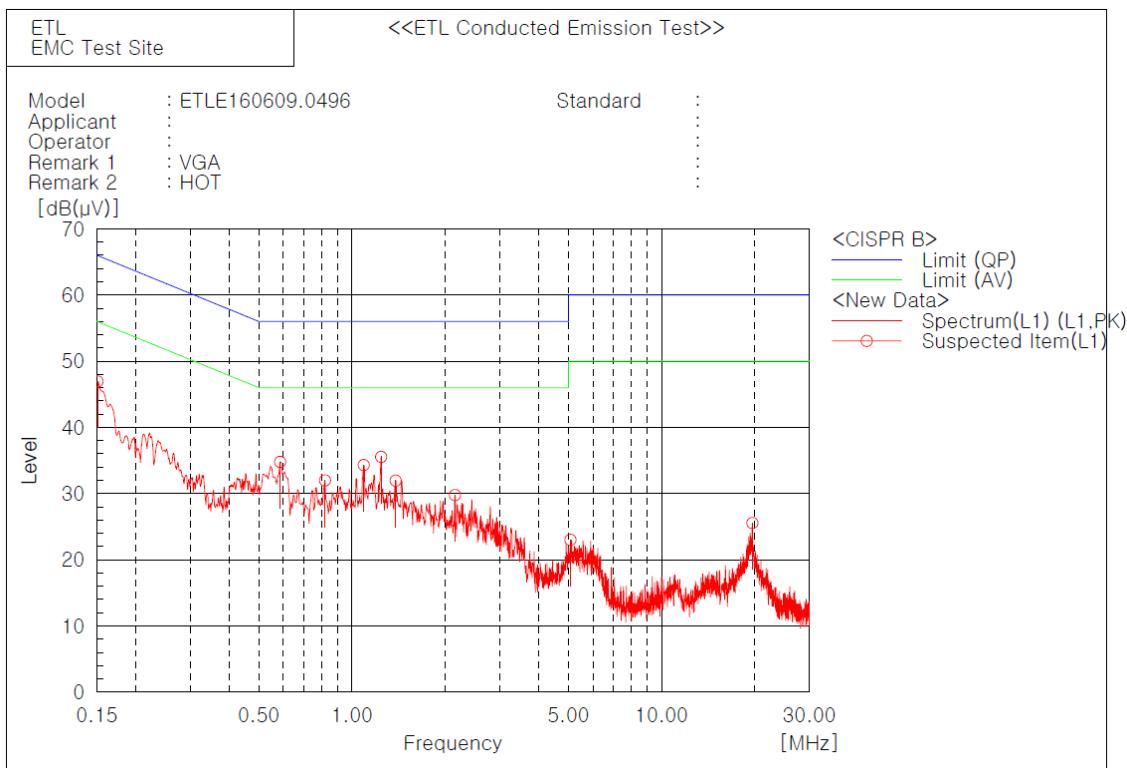
The following data and graph shows the highest levels of conducted emissions on both polarizations of hot and neutral line.

Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 9 kHz)

NOTES:

1. Please see the measured data and graph in next page.
2. The c.f value was included the LISN factor and cable loss.
3. Result value = Reading + c.f
4. Margin value = Limit - Result
5. Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15.107(a) Class B.
6. If the average limit is met when using a Quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

Line: HOT

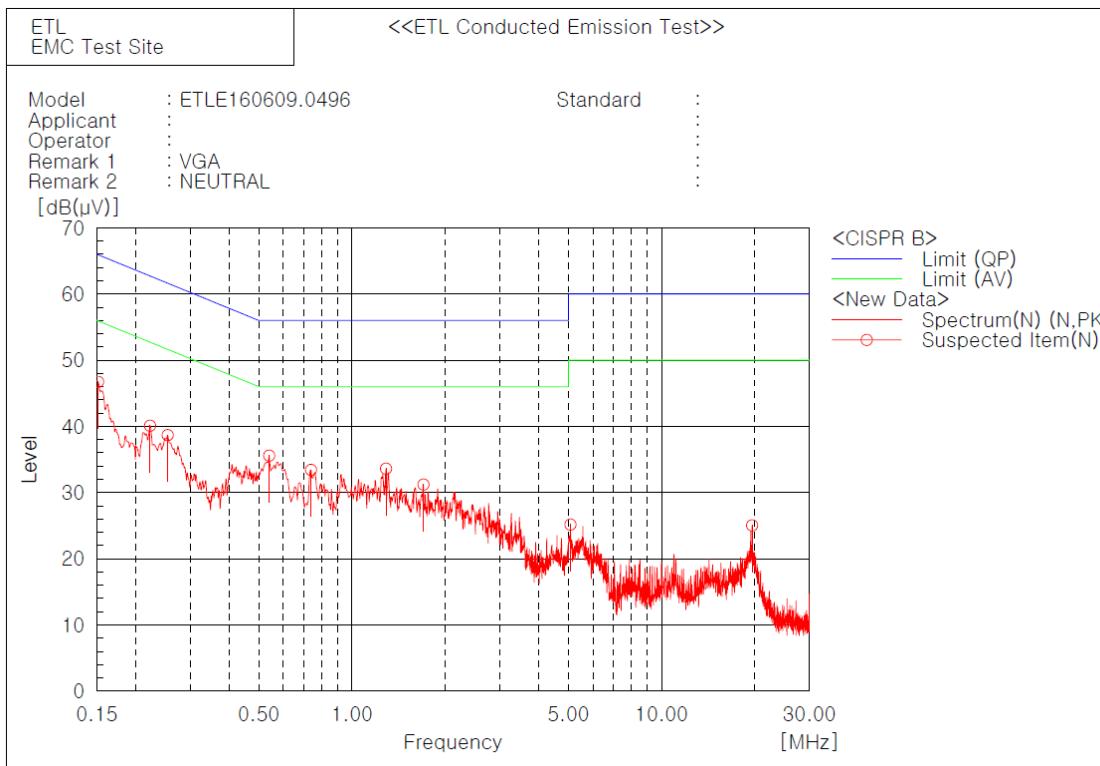


Spectrum Selection

--- L1 Phase ---

No.	Frequency [MHz]	Reading [dB(μV)]	c. f	Result PK [dB(μV)]	Limit		Margin QP
					QP [dB(μV)]	AV [dB(μV)]	
1	0.15071	46.5	0.4	46.9	66.0	56.0	19.1
2	0.58585	34.6	0.2	34.8	56.0	46.0	21.2
3	0.81815	31.8	0.2	32.0	56.0	46.0	24.0
4	1.09085	34.1	0.2	34.3	56.0	46.0	21.7
5	1.24235	35.3	0.2	35.5	56.0	46.0	20.5
6	1.38375	31.8	0.2	32.0	56.0	46.0	24.0
7	2.15135	29.5	0.3	29.8	56.0	46.0	26.2
8	5.07858	22.7	0.3	23.0	60.0	50.0	37.0
9	19.6354	25.0	0.6	25.6	60.0	50.0	34.4

Line: Neutral



Spectrum Selection

--- N Phase ---								
No.	Frequency	Reading	c. f	Result	Limit	Limit	Margin	
	[MHz]	[dB(μV)]	[dB]	PK	QP	AV	QP	
1	0.15141	46.3	0.4	46.7	65.9	55.9	19.2	
2	0.22282	39.8	0.3	40.1	62.7	52.7	22.6	
3	0.25393	38.4	0.3	38.7	61.6	51.6	22.9	
4	0.5404	35.4	0.2	35.6	56.0	46.0	20.4	
5	0.73735	33.2	0.2	33.4	56.0	46.0	22.6	
6	1.2878	33.4	0.2	33.6	56.0	46.0	22.4	
7	1.7019	31.0	0.2	31.2	56.0	46.0	24.8	
8	5.07858	24.9	0.3	25.2	60.0	50.0	34.8	
9	19.6152	24.4	0.6	25.0	60.0	50.0	35.0	

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.107(a) Class B
Test Date	June 15, 2016
Environmental of test	(23.4 ± 0.0) °C, (41 ± 0) % R.H., (100.3 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - DVI mode
Result	Passed by 19.00 dB

Conducted Emission Test Data

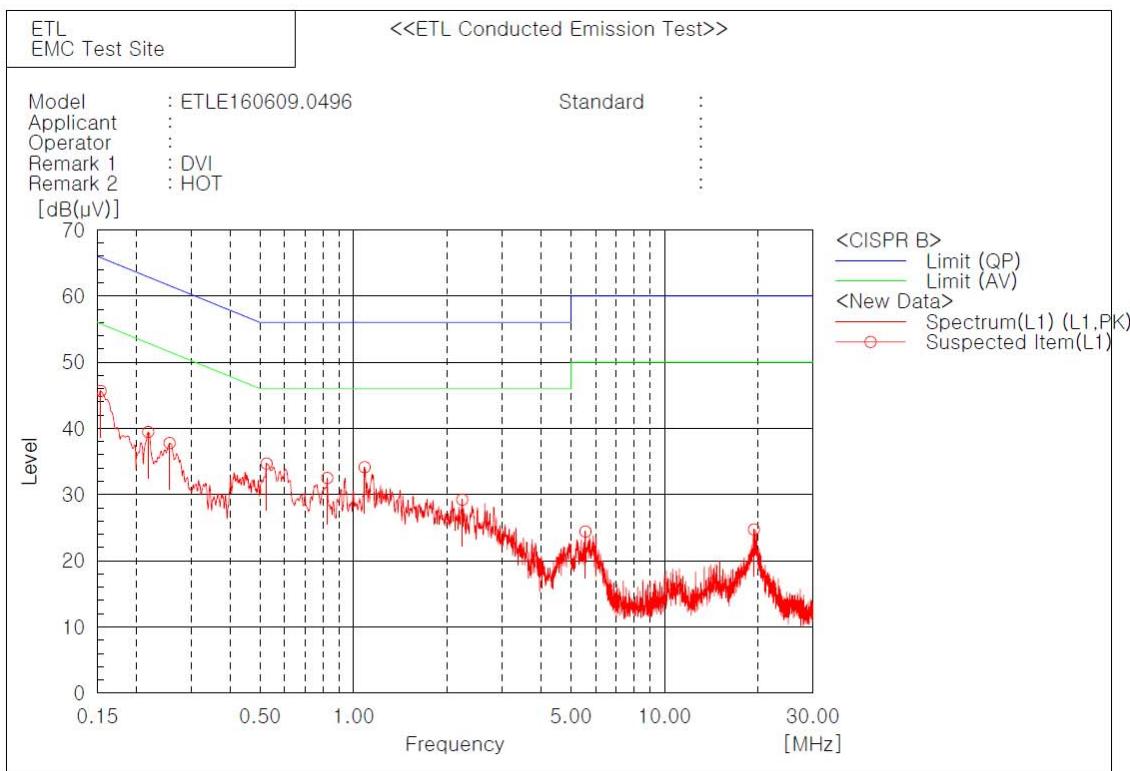
The following data and graph shows the highest levels of conducted emissions on both polarizations of hot and neutral line.

Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 9 kHz)

NOTES:

1. Please see the measured data and graph in next page.
2. The c.f value was included the LISN factor and cable loss.
3. Result value = Reading + c.f
4. Margin value = Limit - Result
5. Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15.107(a) Class B.
6. If the average limit is met when using a Quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

Line: HOT

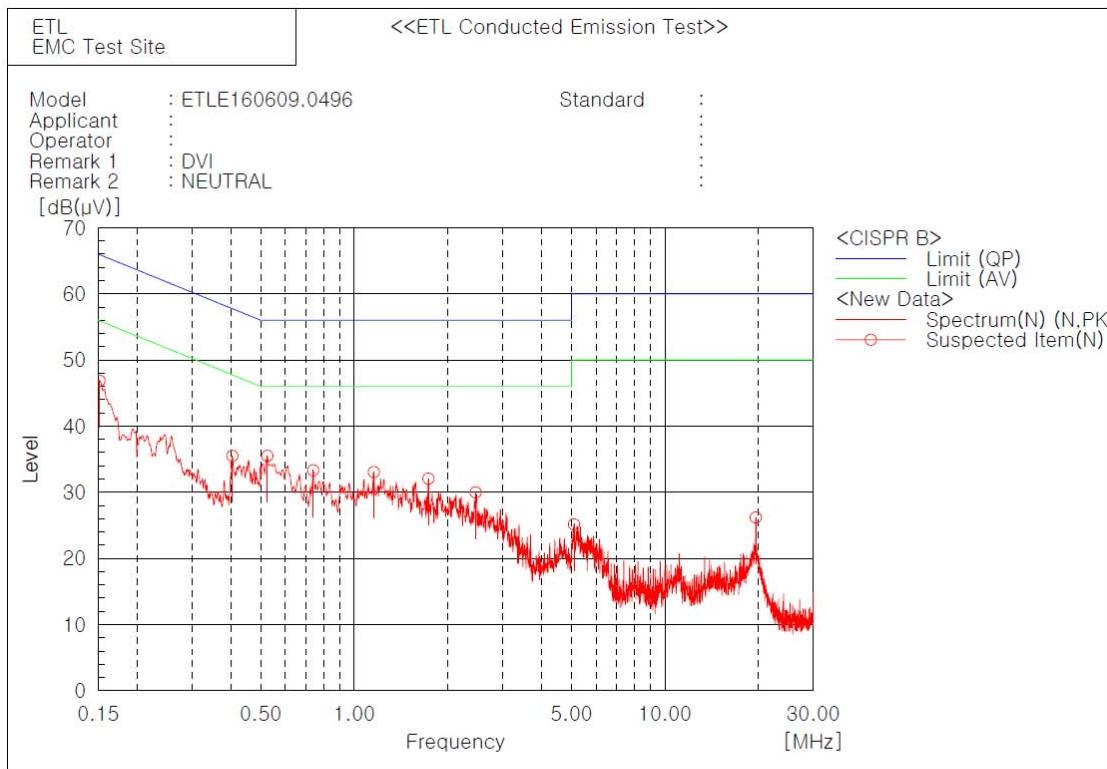


Spectrum Selection

— L1 Phase —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f	Result PK [dB(μV)]	Limit		Margin [dB]
					QP [dB(μV)]	AV [dB(μV)]	
1	0.15354	45.3	0.4	45.7	65.8	55.8	20.1
2	0.21858	39.2	0.3	39.5	62.9	52.9	23.4
3	0.25605	37.5	0.3	37.8	61.6	51.6	23.8
4	0.52525	34.5	0.2	34.7	56.0	46.0	21.3
5	0.8232	32.3	0.2	32.5	56.0	46.0	23.5
6	1.0858	33.9	0.2	34.1	56.0	46.0	21.9
7	2.2372	28.9	0.3	29.2	56.0	46.0	26.8
8	5.56944	24.1	0.3	24.4	60.0	50.0	35.6
9	19.393	24.1	0.6	24.7	60.0	50.0	35.3

Line: Neutral



Spectrum Selection

--- N Phase ---								
No.	Frequency	Reading	c.f	Result	Limit	Limit	Margin	
	[MHz]	[dB(μV)]	[dB]	PK	QP	AV	QP	
1	0.15141	46.5	0.4	46.9	65.9	55.9	19.0	
2	0.40523	35.3	0.2	35.5	57.7	47.7	22.2	
3	0.52525	35.3	0.2	35.5	56.0	46.0	20.5	
4	0.73735	33.1	0.2	33.3	56.0	46.0	22.7	
5	1.1565	32.9	0.2	33.1	56.0	46.0	22.9	
6	1.7322	31.9	0.2	32.1	56.0	46.0	23.9	
7	2.4594	29.8	0.2	30.0	56.0	46.0	26.0	
8	5.09676	24.8	0.3	25.1	60.0	50.0	34.9	
9	19.6152	25.6	0.6	26.2	60.0	50.0	33.8	

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.107(a) Class B
Test Date	June 15, 2016
Environmental of test	(23.5 ± 0.0) °C, (44 ± 0) % R.H., (100.3 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - DP mode
Result	Passed by 19.30 dB

Conducted Emission Test Data

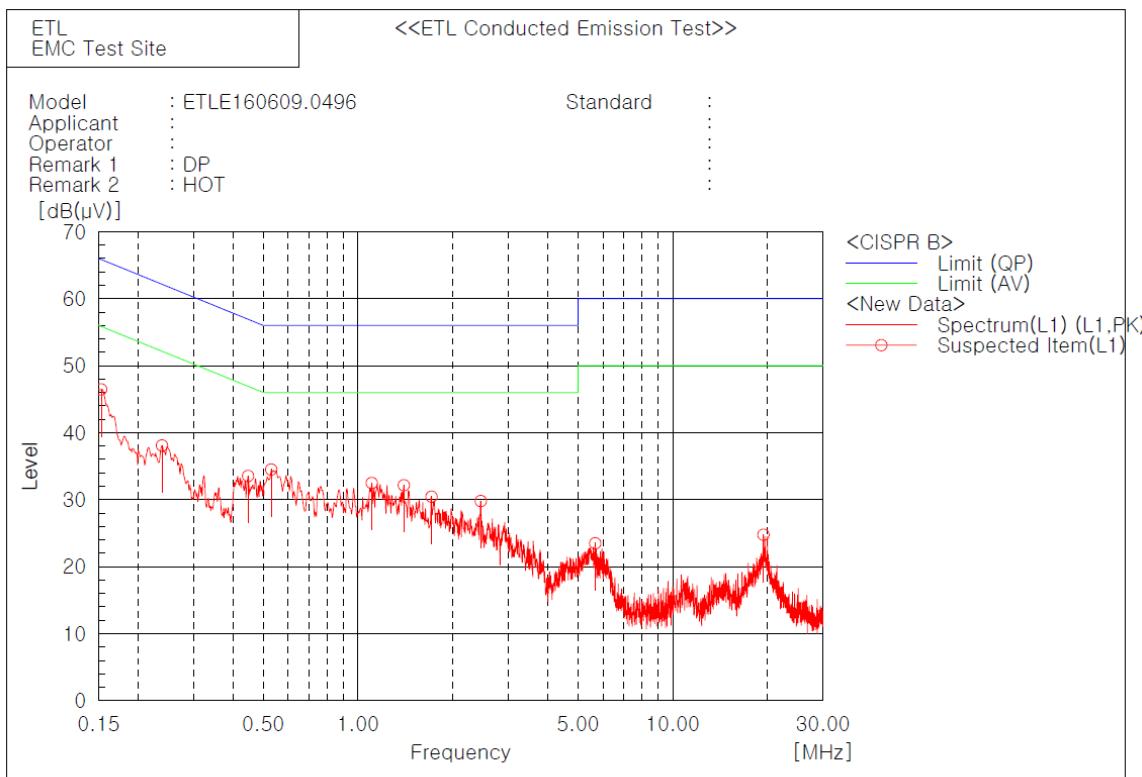
The following data and graph shows the highest levels of conducted emissions on both polarizations of hot and neutral line.

Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 9 kHz)

NOTES:

1. Please see the measured data and graph in next page.
2. The c.f value was included the LISN factor and cable loss.
3. Result value = Reading + c.f
4. Margin value = Limit - Result
5. Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15.107(a) Class B.
6. If the average limit is met when using a Quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

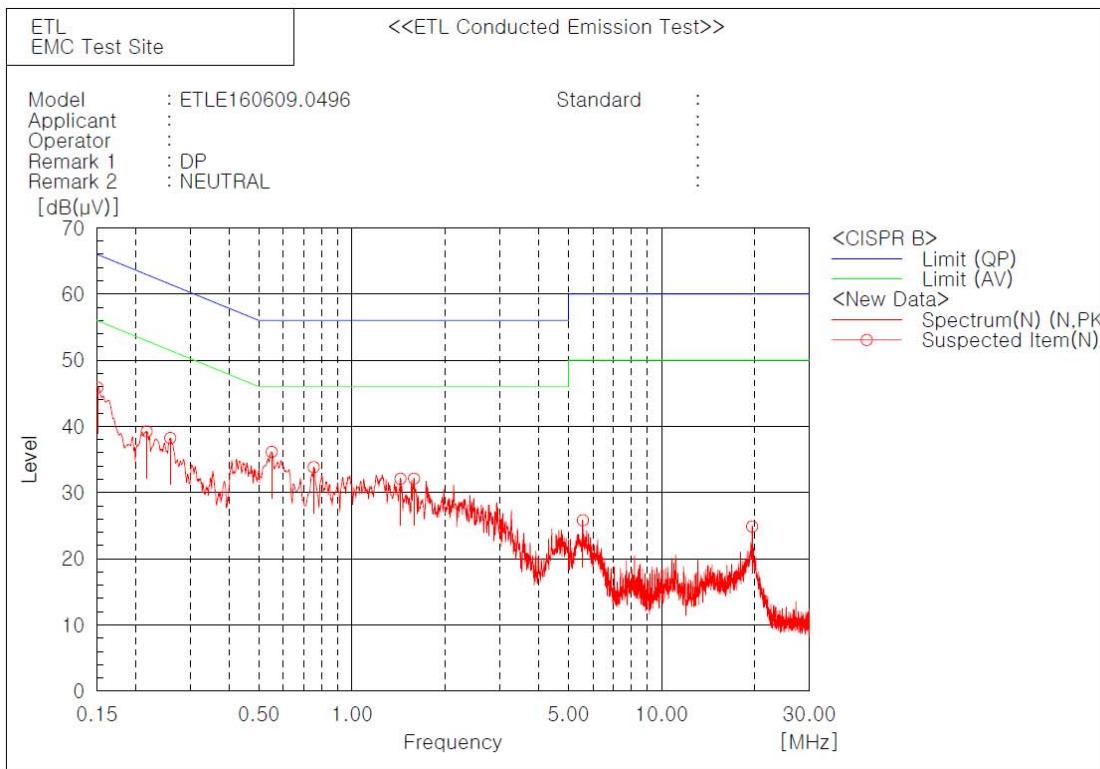
Line: HOT



Spectrum Selection

--- L1 Phase ---								
No.	Frequency	Reading	c.f	Result	Limit	Limit	Margin	
	[MHz]	[dB(μV)]	[dB]	PK	QP	AV	QP	
1	0.15283	46.1	0.4	46.5	65.8	55.8	19.3	
2	0.23838	37.8	0.3	38.1	62.2	52.2	24.1	
3	0.44765	33.3	0.2	33.5	56.9	46.9	23.4	
4	0.5303	34.3	0.2	34.5	56.0	46.0	21.5	
5	1.106	32.3	0.2	32.5	56.0	46.0	23.5	
6	1.3989	31.9	0.2	32.1	56.0	46.0	23.9	
7	1.712	30.2	0.2	30.4	56.0	46.0	25.6	
8	2.45435	29.5	0.3	29.8	56.0	46.0	26.2	
9	5.67246	23.2	0.3	23.5	60.0	50.0	36.5	
10	19.4132	24.2	0.6	24.8	60.0	50.0	35.2	

Line: Neutral



Spectrum Selection

— N Phase —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f	Result PK [dB]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]
1	0.15071	45.5	0.4	45.9	66.0	56.0	20.1
2	0.21717	38.9	0.3	39.2	62.9	52.9	23.7
3	0.25888	37.9	0.3	38.2	61.5	51.5	23.3
4	0.5505	35.9	0.2	36.1	56.0	46.0	19.9
5	0.7525	33.6	0.2	33.8	56.0	46.0	22.2
6	1.43425	31.9	0.2	32.1	56.0	46.0	23.9
7	1.58575	31.9	0.2	32.1	56.0	46.0	23.9
8	5.56944	25.5	0.3	25.8	60.0	50.0	34.2
9	19.6152	24.3	0.6	24.9	60.0	50.0	35.1

5.3 Radiated Emissions Measurement

5.3.1 Radiated Emissions Data

- Below 1 GHz

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 16, 2016
Environmental of test	(22.9 ± 0.8) °C, (77 ± 0) % R.H., (99.8 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - VGA mode
Result	Passed by 8.32 dB

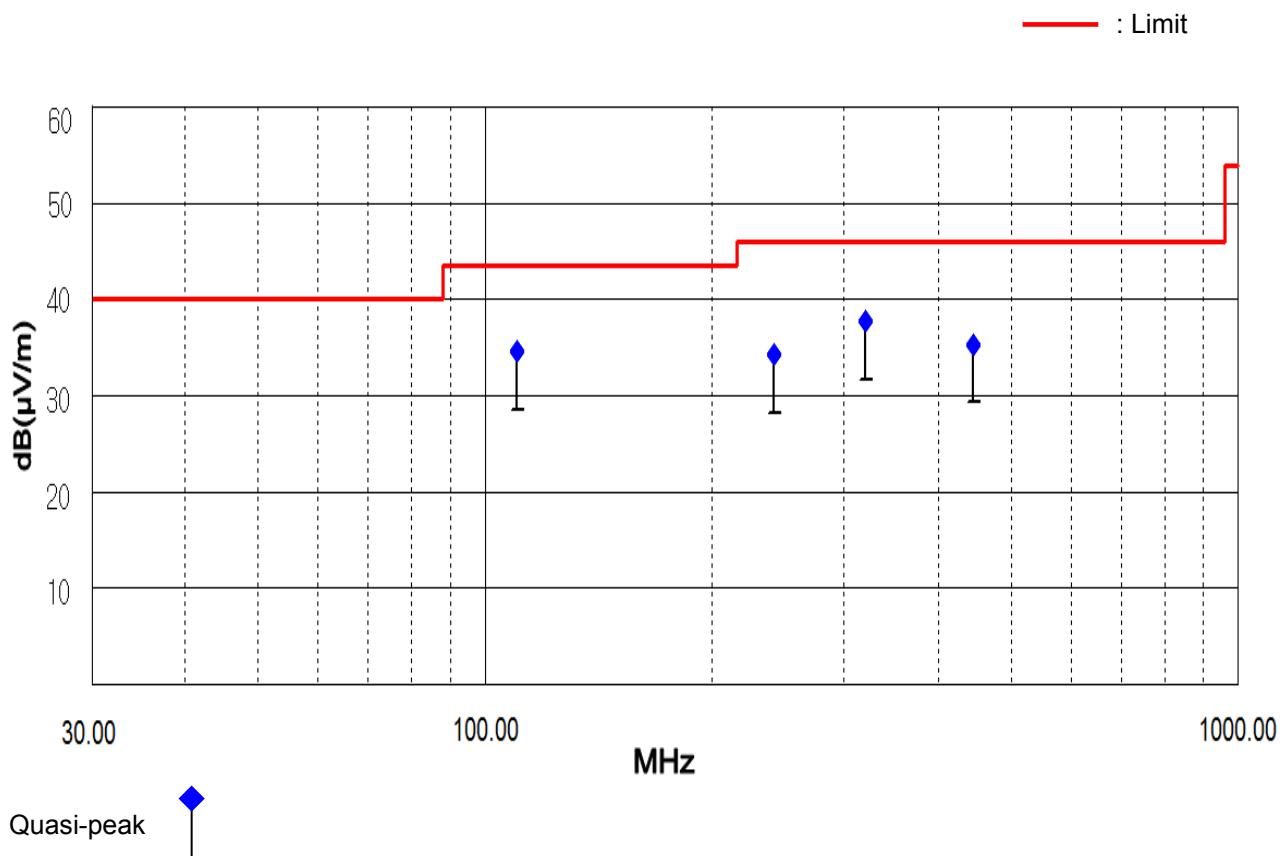
Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical. Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dB(µV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB(µV)]	Height [cm]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]
110.48	55.10	V	9.32	-29.87	115	34.55	43.50	8.95
242.06	51.40	V	11.31	-28.45	126	34.26	46.00	11.74
319.80	51.50	V	14.02	-27.84	135	37.68	46.00	8.32
445.03	45.20	V	16.94	-26.81	148	35.33	46.00	10.67

NOTES:

1. * H : Horizontal polarization , ** V : Vertical polarization
2. The cable loss value was included the Amp. Gain.
3. Result = Reading + Antenna factor + Cable loss
4. Margin = Limit - Result
5. The measurement was performed for the frequency range 30 MHz ~ 1 000 MHz according to the FCC Part 15.109(a) Class B.



- Below 1 GHz

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 16, 2016
Environmental of test	(23.0 ± 1.3) °C, (77 ± 0) % R.H., (99.8 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - DVI mode
Result	Passed by 5.63 dB

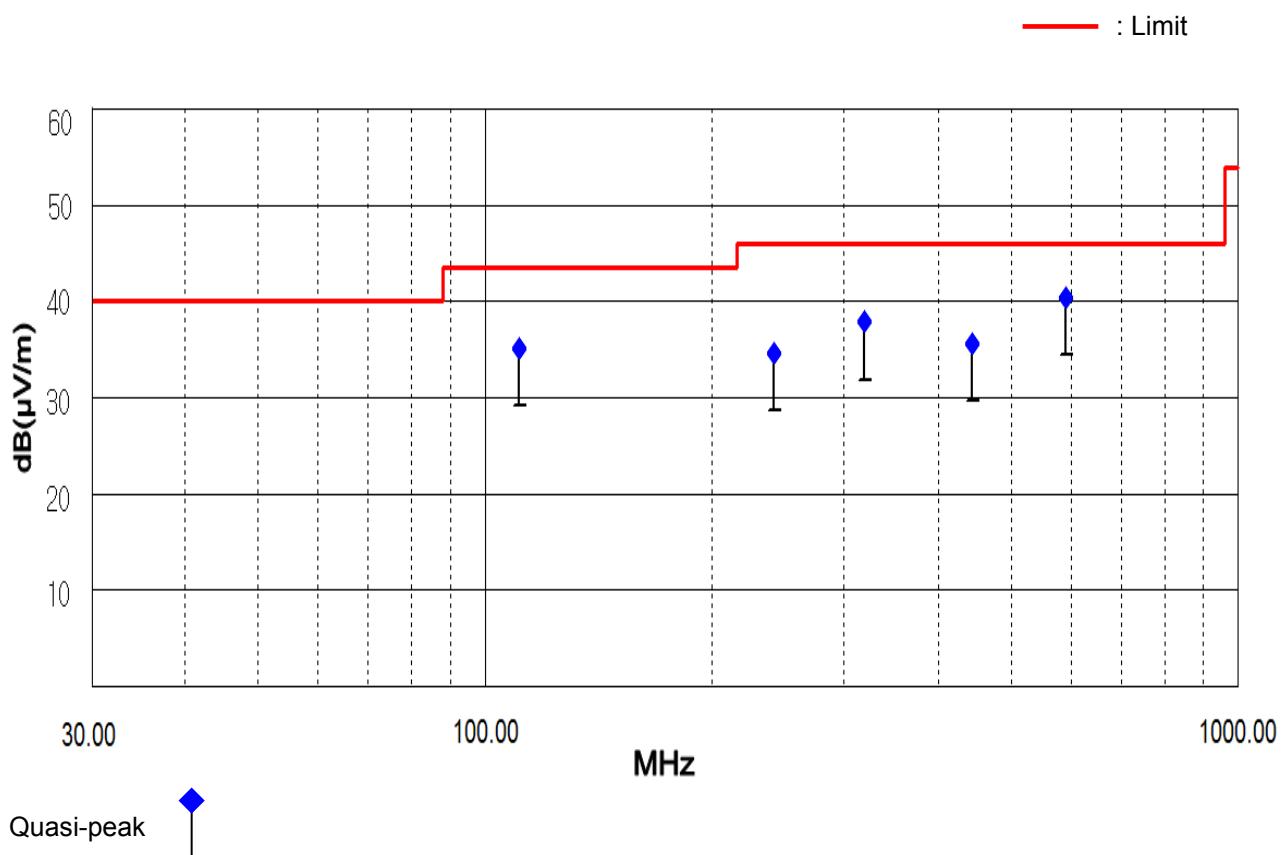
Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical. Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dB(µV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB(µV)]	Height [cm]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]
111.20	55.60	V	9.37	-29.86	115	35.11	43.50	8.39
242.04	51.80	V	11.31	-28.45	127	34.66	46.00	11.34
319.31	51.70	V	14.00	-27.85	135	37.85	46.00	8.15
444.39	45.50	V	16.93	-26.82	147	35.61	46.00	10.39
590.70	46.10	V	19.91	-25.64	154	40.37	46.00	5.63

NOTES:

1. * H : Horizontal polarization , ** V : Vertical polarization
2. The cable loss value was included the Amp. Gain.
3. Result = Reading + Antenna factor + Cable loss
4. Margin = Limit - Result
5. The measurement was performed for the frequency range 30 MHz ~ 1 000 MHz according to the FCC Part 15.109(a) Class B.



- Below 1 GHz

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 16, 2016
Environmental of test	(23.2 ± 1.0) °C, (76 ± 1) % R.H., (99.8 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - DP mode
Result	Passed by 7.94 dB

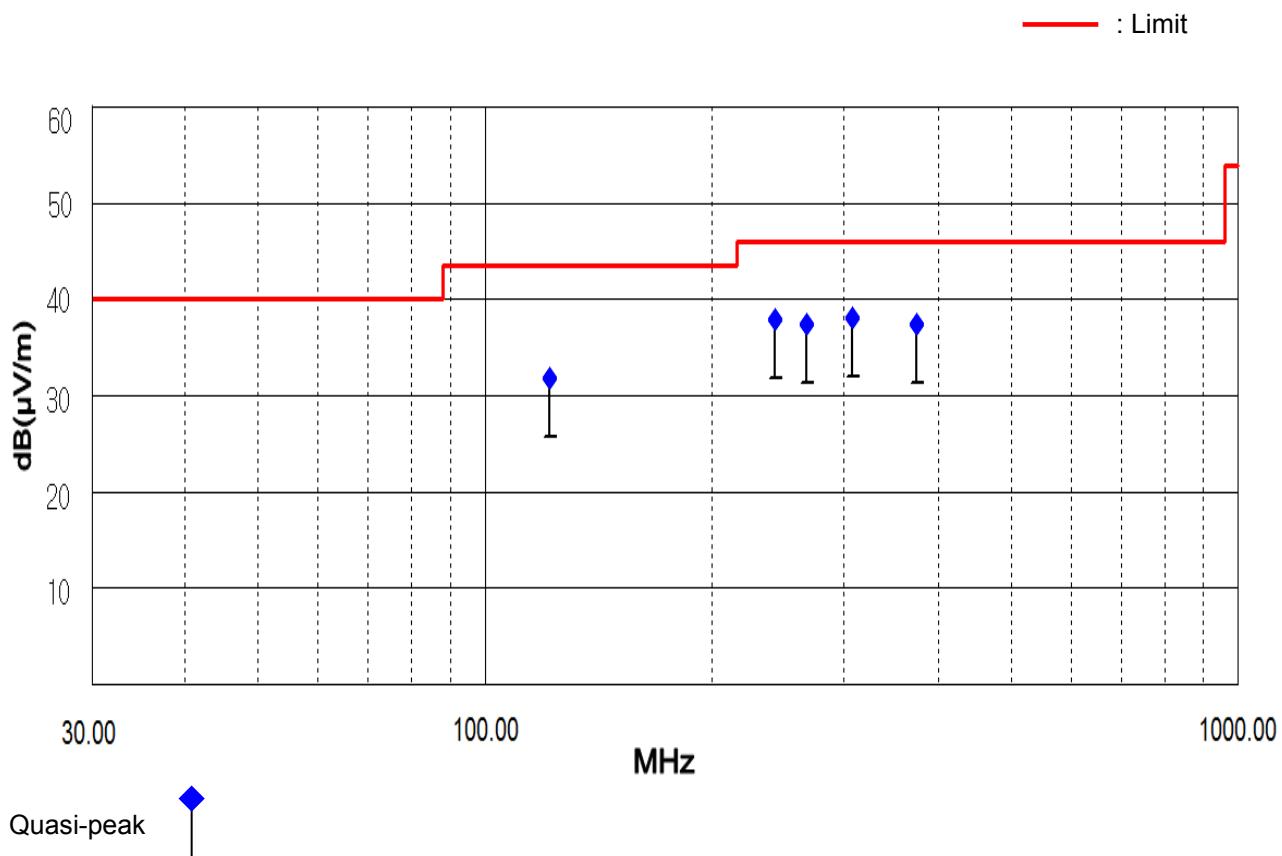
Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical. Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dB(µV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB(µV)]	Height [cm]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]
122.04	51.30	V	10.24	-29.76	135	31.78	43.50	11.72
243.11	54.90	H	11.36	-28.43	380	37.83	46.00	8.17
267.14	53.30	H	12.31	-28.24	376	37.37	46.00	8.63
307.16	52.30	H	13.71	-27.95	365	38.06	46.00	7.94
375.06	49.40	V	15.34	-27.38	143	37.36	46.00	8.64

NOTES:

1. * H : Horizontal polarization , ** V : Vertical polarization
2. The cable loss value was included the Amp. Gain.
3. Result = Reading + Antenna factor + Cable loss
4. Margin = Limit - Result
5. The measurement was performed for the frequency range 30 MHz ~ 1 000 MHz according to the FCC Part 15.109(a) Class B.



- Above 1 GHz

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 11, 2016
Environmental of test	(23.5 ± 0.2) °C, (42 ± 0) % R.H., (100.5 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - VGA mode
Result	Passed by 11.70 dB

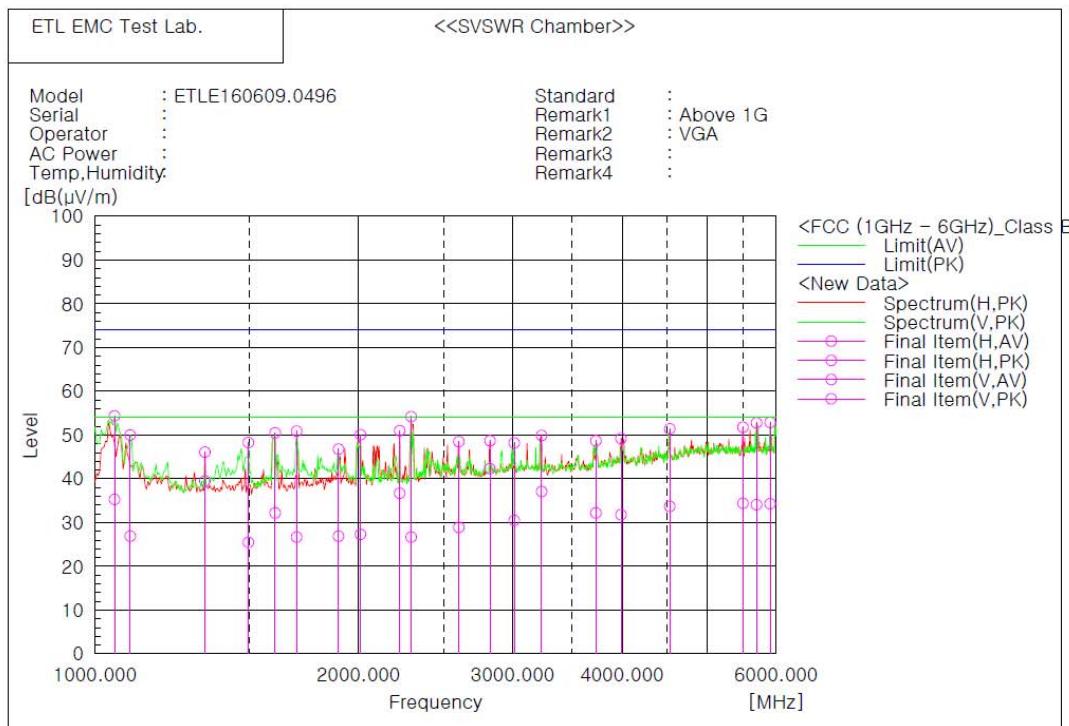
Radiated Emission Test Data

The following data and graph shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Detector mode: CISPR Peak mode, Average mode

NOTES:

1. Please see the measured data and graph in next page.
2. H : Horizontal polarization , V : Vertical polarization
3. The c.f value was included the antenna factor, cable loss and Amp. Gain.
4. Result value = Reading + c.f
5. Margin value = Limit - Result
6. The measurement was performed for the frequency range 1 GHz ~ 6 GHz according to FCC Part 15.109(a) Class B.
7. Upper frequency of measurement range: 5th harmonic of the highest frequency.



Final Result

— Horizontal Polarization (AV) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1335.320	53.3	-13.8	39.5	54.0	14.5
2	2010.000	39.0	-11.7	27.3	54.0	26.7
3	2228.160	47.4	-10.7	36.7	54.0	17.3
4	2603.880	37.7	-8.8	28.9	54.0	25.1
5	2826.080	50.1	-7.8	42.3	54.0	11.7
6	3236.340	43.7	-6.6	37.1	54.0	16.9
7	3987.780	36.1	-4.3	31.8	54.0	22.2
8	5496.720	35.3	-0.9	34.4	54.0	19.6
9	5696.700	34.8	-0.7	34.1	54.0	19.9

— Horizontal Polarization (PK) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1335.320	59.9	-13.8	46.1	74.0	27.9
2	2010.000	61.8	-11.7	50.1	74.0	23.9
3	2228.160	61.7	-10.7	51.0	74.0	23.0
4	2603.880	57.3	-8.8	48.5	74.0	25.5
5	2826.080	56.5	-7.8	48.7	74.0	25.3
6	3236.340	56.5	-6.6	49.9	74.0	24.1
7	3987.780	53.5	-4.3	49.2	74.0	24.8
8	5496.720	52.7	-0.9	51.8	74.0	22.2
9	5696.700	53.5	-0.7	52.8	74.0	21.2

— Vertical Polarization (AV) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1052.520	49.9	-14.6	35.3	54.0	18.7
2	1096.960	41.4	-14.5	26.9	54.0	27.1
3	1496.920	38.8	-13.3	25.5	54.0	28.5
4	1606.000	45.2	-13.0	32.2	54.0	21.8
5	1698.920	39.4	-12.7	26.7	54.0	27.3
6	1896.880	39.0	-12.1	26.9	54.0	27.1

Final Result

--- Vertical Polarization (AV) ---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
7	2296.840	37.0	-10.3	26.7	54.0	27.3
8	3011.920	37.6	-7.1	30.5	54.0	23.5
9	3733.260	37.4	-5.2	32.2	54.0	21.8
10	4533.180	36.3	-2.6	33.7	54.0	20.3
11	5902.740	34.6	-0.3	34.3	54.0	19.7

--- Vertical Polarization (PK) ---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1052.520	69.0	-14.6	54.4	74.0	19.6
2	1096.960	64.5	-14.5	50.0	74.0	24.0
3	1496.920	61.6	-13.3	48.3	74.0	25.7
4	1606.000	63.5	-13.0	50.5	74.0	23.5
5	1698.920	63.6	-12.7	50.9	74.0	23.1
6	1896.880	58.9	-12.1	46.8	74.0	27.2
7	2296.840	64.5	-10.3	54.2	74.0	19.8
8	3011.920	55.3	-7.1	48.2	74.0	25.8
9	3733.260	53.9	-5.2	48.7	74.0	25.3
10	4533.180	54.0	-2.6	51.4	74.0	22.6
11	5902.740	53.2	-0.3	52.9	74.0	21.1

- Above 1 GHz

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 11, 2016
Environmental of test	(23.7 ± 0.1) °C, (43 ± 0) % R.H., (100.5 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - DVI mode
Result	Passed by 11.60 dB

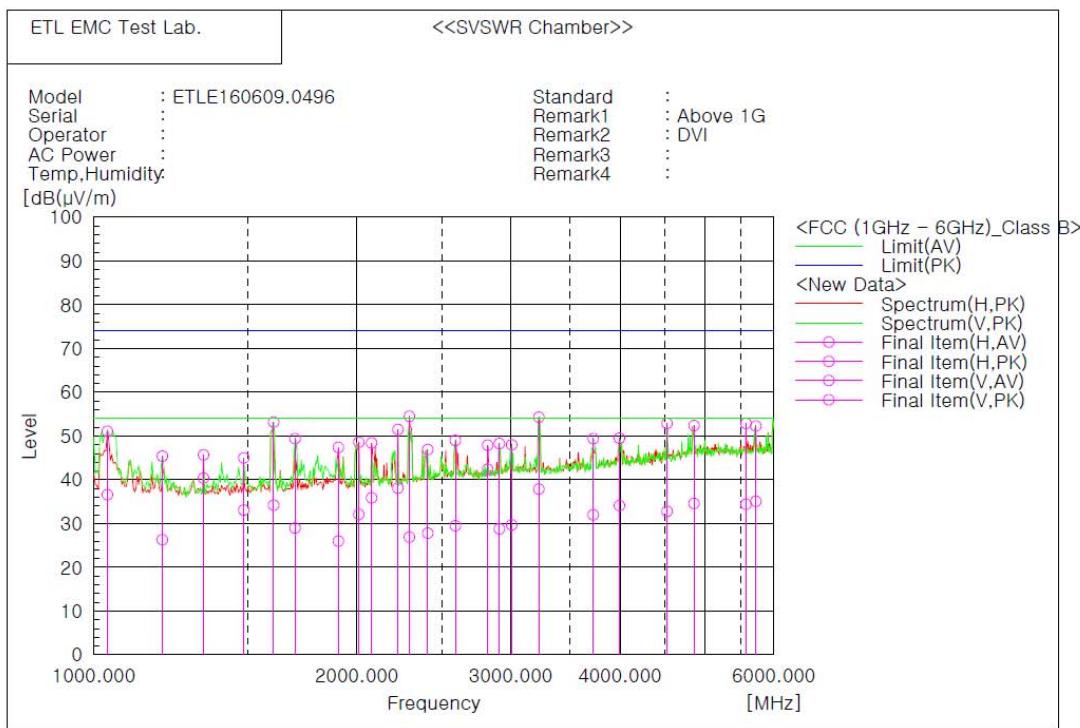
Radiated Emission Test Data

The following data and graph shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Detector mode: CISPR Peak mode, Average mode

NOTES:

1. Please see the measured data and graph in next page.
2. H : Horizontal polarization , V : Vertical polarization
3. The c.f value was included the antenna factor, cable loss and Amp. Gain.
4. Result value = Reading + c.f
5. Margin value = Limit - Result
6. The measurement was performed for the frequency range 1 GHz ~ 6 GHz according to FCC Part 15.109(a) Class B.
7. Upper frequency of measurement range: 5th harmonic of the highest frequency.



Final Result

— Horizontal Polarization (AV) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1335.320	54.2	-13.8	40.4	54.0	13.6
2	1904.960	38.1	-12.1	26.0	54.0	28.0
3	2010.000	43.8	-11.7	32.1	54.0	21.9
4	2078.680	47.3	-11.4	35.9	54.0	18.1
5	2228.160	48.8	-10.7	38.1	54.0	15.9
6	2296.840	37.2	-10.3	26.9	54.0	27.1
7	2822.040	50.2	-7.8	42.4	54.0	11.6
8	5575.500	35.3	-0.9	34.4	54.0	19.6

— Horizontal Polarization (PK) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1335.320	59.5	-13.8	45.7	74.0	28.3
2	1904.960	59.5	-12.1	47.4	74.0	26.6
3	2010.000	60.3	-11.7	48.6	74.0	25.4
4	2078.680	59.8	-11.4	48.4	74.0	25.6
5	2228.160	62.2	-10.7	51.5	74.0	22.5
6	2296.840	64.8	-10.3	54.5	74.0	19.5
7	2822.040	55.7	-7.8	47.9	74.0	26.1
8	5575.500	53.8	-0.9	52.9	74.0	21.1

— Vertical Polarization (AV) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1036.360	51.3	-14.7	36.6	54.0	17.4
2	1197.960	40.5	-14.2	26.3	54.0	27.7
3	1484.800	46.5	-13.4	33.1	54.0	20.9
4	1606.000	47.2	-13.0	34.2	54.0	19.8
5	1698.920	41.7	-12.7	29.0	54.0	25.0
6	2409.960	37.5	-9.7	27.8	54.0	26.2
7	2591.760	38.3	-8.8	29.5	54.0	24.5
8	2910.920	36.3	-7.5	28.8	54.0	25.2

Final Result

--- Vertical Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c,f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
9	3006.060	36.9	-7.2	29.7	54.0	24.3
10	3230.280	44.5	-6.6	37.9	54.0	16.1
11	3727.200	37.2	-5.2	32.0	54.0	22.0
12	3993.840	38.3	-4.2	34.1	54.0	19.9
13	4527.120	35.4	-2.6	32.8	54.0	21.2
14	4860.420	36.0	-1.4	34.6	54.0	19.4
15	5720.940	35.8	-0.7	35.1	54.0	18.9

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c,f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1036.360	65.8	-14.7	51.1	74.0	22.9
2	1197.960	59.6	-14.2	45.4	74.0	28.6
3	1484.800	58.4	-13.4	45.0	74.0	29.0
4	1606.000	66.2	-13.0	53.2	74.0	20.8
5	1698.920	62.1	-12.7	49.4	74.0	24.6
6	2409.960	56.6	-9.7	46.9	74.0	27.1
7	2591.760	57.8	-8.8	49.0	74.0	25.0
8	2910.920	55.8	-7.5	48.3	74.0	25.7
9	3006.060	55.2	-7.2	48.0	74.0	26.0
10	3230.280	60.9	-6.6	54.3	74.0	19.7
11	3727.200	54.6	-5.2	49.4	74.0	24.6
12	3993.840	53.7	-4.2	49.5	74.0	24.5
13	4527.120	55.5	-2.6	52.9	74.0	21.1
14	4860.420	53.8	-1.4	52.4	74.0	21.6
15	5720.940	53.0	-0.7	52.3	74.0	21.7

- Above 1 GHz

EUT	LCD MONITOR / P276L (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 11, 2016
Environmental of test	(23.4 ± 0.0) °C, (43 ± 0) % R.H., (100.5 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H pattern" display on monitor. (BurnIn Test program) - DP mode
Result	Passed by 17.60 dB

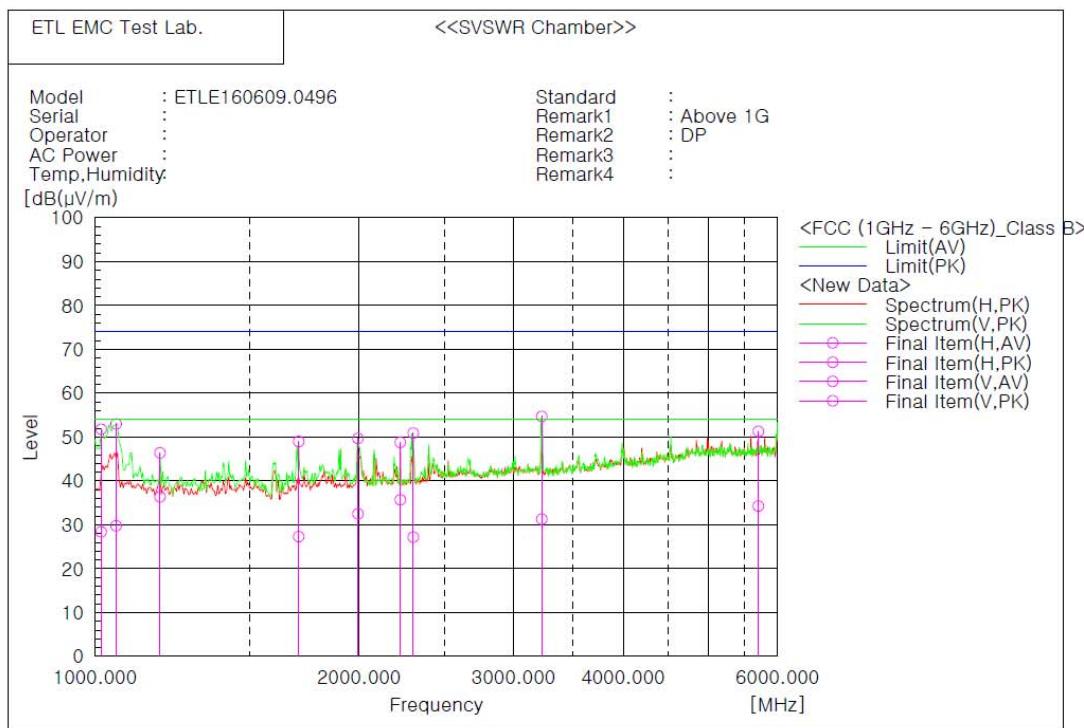
Radiated Emission Test Data

The following data and graph shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Detector mode: CISPR Peak mode, Average mode

NOTES:

1. Please see the measured data and graph in next page.
2. H : Horizontal polarization , V : Vertical polarization
3. The c.f value was included the antenna factor, cable loss and Amp. Gain.
4. Result value = Reading + c.f
5. Margin value = Limit - Result
6. The measurement was performed for the frequency range 1 GHz ~ 6 GHz according to FCC Part 15.109(a) Class B.
7. Upper frequency of measurement range: 5th harmonic of the highest frequency.



Final Result

— Horizontal Polarization (AV) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2228.160	46.4	-10.7	35.7	54.0	18.3
2	5702.760	35.0	-0.7	34.3	54.0	19.7

— Horizontal Polarization (PK) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2228.160	59.5	-10.7	48.8	74.0	25.2
2	5702.760	52.0	-0.7	51.3	74.0	22.7

— Vertical Polarization (AV) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1016.160	43.2	-14.8	28.4	54.0	25.6
2	1056.560	44.4	-14.6	29.8	54.0	24.2
3	1185.840	50.6	-14.2	36.4	54.0	17.6
4	1707.000	40.0	-12.7	27.3	54.0	26.7
5	1993.840	44.2	-11.7	32.5	54.0	21.5
6	2304.920	37.5	-10.3	27.2	54.0	26.8
7	3230.280	37.9	-6.6	31.3	54.0	22.7

— Vertical Polarization (PK) —

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	1016.160	66.6	-14.8	51.8	74.0	22.2
2	1056.560	67.6	-14.6	53.0	74.0	21.0
3	1185.840	60.6	-14.2	46.4	74.0	27.6
4	1707.000	61.7	-12.7	49.0	74.0	25.0
5	1993.840	61.4	-11.7	49.7	74.0	24.3
6	2304.920	61.2	-10.3	50.9	74.0	23.1
7	3230.280	61.3	-6.6	54.7	74.0	19.3

6. SAMPLE CALCULATION

Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor - Preamplifier Factor

$dB(\mu V) = 20 \log_{10} (\mu V)$: Equation

$dB(\mu V) = dBm + 107$

Example : @ 590.70 MHz

Class B Limit = 46.00 dB($\mu V/m$)

Reading = 46.10 dB(μV)

Antenna Factor + (Cable Loss - Amp. Gain) = $19.91 + (-25.64) = -5.73$ dB($\mu V/m$)

Total = 40.37 dB($\mu V/m$)

Margin = $46.00 - 40.37 = 5.63$ dB

= 5.63 dB below Limit

7. List of test equipments used for measurements

Test Equipment		Model	Mfg.	Serial No.	Cal. Date	Cal. Due Date
<input checked="" type="checkbox"/>	EMI Test Receiver	ESCS30	R&S	100087	16.01.12	17.01.12
<input checked="" type="checkbox"/>	EMI Test Receiver	ESPI3	R&S	100478	15.09.03	16.09.03
<input checked="" type="checkbox"/>	EMI Test Receiver	ESCI7	R&S	100851	15.09.04	16.09.04
<input checked="" type="checkbox"/>	Amplifier	310N	Sonoma Instrument	284750	15.12.08	16.12.08
<input checked="" type="checkbox"/>	Two-Line V-Network	ENV216	R&S	102053	16.04.04	17.04.04
<input checked="" type="checkbox"/>	Two-Line V-Network	ENV216	R&S	958599/106	16.03.15	17.03.15
<input checked="" type="checkbox"/>	Horn Antenna	BBHA 9120D	Schwarzbeck	826	16.03.23	18.03.23
<input checked="" type="checkbox"/>	Amplifier	TK-PA18	TESTEK.	120020	15.09.03	16.09.03
<input checked="" type="checkbox"/>	LogBicon Antenna	VULB9160	Schwarzbeck	3164	15.06.08	17.06.08
<input checked="" type="checkbox"/>	Turn-Table	DS1200-S	Innco Systems GmbH	2740311	N/A	N/A
<input checked="" type="checkbox"/>	Turn-Table	TT 1.35 SI	SES	-	N/A	N/A
<input checked="" type="checkbox"/>	Antenna Master	AM 4.5	SES	-	N/A	N/A