Electromagnetic Emission

FCC MEASUREMENT REPORT

CERTIFICATION OF COMPLIANCE

FCC Part 15 Certification Measurement

PRODUCT	:	MONITOR
MODEL/TYPE NO	:	P278DPL / P278UPMLA84 01854
FCC ID	:	PJIP278DPL
MULTIPLE MODEL	:	-
BRAND NAME	:	HYUNDAI
APPLICANT	:	HYUNDAI IBT CORP. 106, Apogongdan-gil, Gimcheon-si, Gyeongsangbuk-do, 740-862, South Korea Attn.: Young Sil, Yoon / Assistance Manager
MANUFACTURER	:	HYUNDAI IBT CORP. 106, Apogongdan-gil, Gimcheon-si, Gyeongsangbuk-do, 740-862, South Korea
FCC CLASSIFICATION	:	JBP - Part 15 Class B Personal computers and peripherals
RULE PART(S)	:	FCC Part 15 Subpart B
TEST PROCEDURE	:	ANSI C63.4-2014
TEST REPORT No.	:	ETLE180604.0536
DATES OF TEST	:	June 14, 2018 to June 15, 2018
REPORT ISSUE DATE	:	June 22, 2018
TEST LABORATORY	:	ETL Inc. (FCC Designation Number: KR0022)

This MONITOR, Model P278DPL has been tested in accordance with the measurement procedures specified in ANSI C63.4-2014 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:

Jung Yeoul, Kim (Test Engineer)

June 22, 2018

Reviewed by:

Hyung Min, Choi (Chief Engineer)

June 22, 2018

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

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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, Gimcheon-si,
Gyeongsangbuk-do, 740-862, South Korea

Attention : Young Sil, Yoon / Assistance Manager

- **EUT Type :** MONITOR
- **Model Number :** P278DPL
- **S/N :** P278UPMLA84 01854
- **Rule Part(s) :** FCC Part 15 Subpart B
- **Test Procedure :** ANSI C63.4-2014
- **FCC Classification :** JBP - Part 15 Class B Personal computers and peripherals
- **Dates of Tests :** June 14, 2018 to June 15, 2018
- **Environmental of Tests:** Temperature: (25.1 ± 2.1) °C
  Humidity: (54 ± 6) % R.H.
  Atmospheric Pressure: (100.7 ± 0.1) 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. :** ETLE180604.0536

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1. INTRODUCTION

The measurement tests for radiated and conducted emission test were conducted at the ETL Inc. The site is constructed in conformance with the requirements of the ANSI C63.4-2014 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 C63.4-2014 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 C63.4-2014) was used in determining radiated and conducted emissions from the HYUNDAI IBT CORP., Model: P278DPL.

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2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the MONITOR (model: P278DPL).

The model P278DPL is basic model that was tested.

2.2 General Specification

Item		Specification
LCD	Visible Screen Area	596.16 mm (H) x 335.34 mm (V)
	Pixel Pitch	155.25 um (H) x 155.25 um (V)
	Recommended Resolution	3 840 x 2 160 @ 60 Hz
	Maximum Visible Angle	178°/178° (H/V)
	Displayed Color	1.07 Billion
	Brightness	300 cd/m^2
	Contrast Ratio	1 000:1
	Response Time	12 ms
Input Signal	Horizontal Frequency	31 kHz – 133.5 kHz
	Vertical Frequency	56 Hz – 75 Hz
	Video Signal	DVI, HDMI 1 (60 Hz), HDMI 2 (30 Hz), Display port (60 Hz)
	Connector	29pin DVI, 19pin HDMI, 20pin Display port
Power	Power Consumption	45 W (Max), 32 W (Typ)
	Stand by Power	0.5 W
	Input Power (Adapter)	AC 110 V – 240 V; 50 Hz/60 Hz; 1.5 A
		DC 24 V; 5 A
Multimedia Speakers		Yes (Option), Headphone out (Option)
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		Display clock → 554 MHz

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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 C63.4-2014. 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. 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.

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3.2 Radiated Emission Measurement

Radiated emission measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2014. 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.

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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 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
■	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)	HDMI mode (worst case)
■	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
Adapter (for EUT)	WTS-2405W	17A02320	Welltronics	DoC
PC	D08M	6GPJXBX	Dell Inc.	DoC
Keyboard	SKP-800B	TAKG902791 A	Monterey International Corp	-
Mouse	SKP-800B	TAKG902798 M	Monterey International Corp	-
Earphone	NONE	NONE	NONE	-

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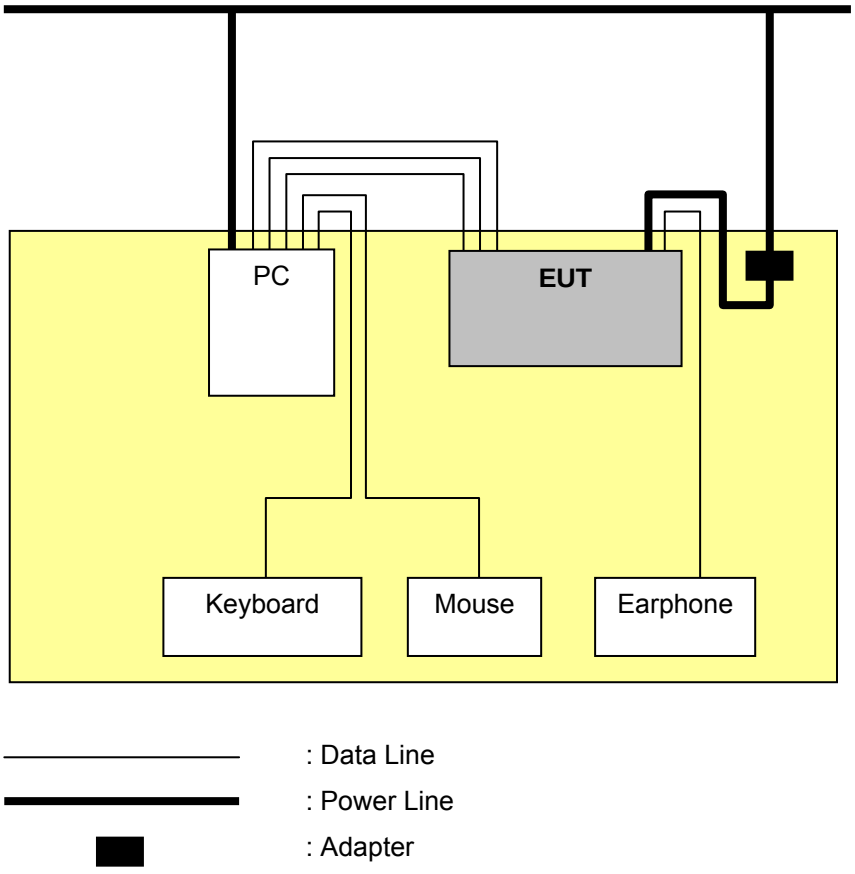
4.4 Type of Cables Used

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

4.5 The setup drawing(s)



: Data Line
: Power Line
: Adapter

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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 6.51 dB**
15.109(a)	Radiated Emission Measurement (Below 1 GHz)	**Passed by 2.25 dB**
15.109(a)	Radiated Emission Measurement (Above 1 GHz)	**Passed by 19.32 dB**

The data collected shows that the **HYUNDAI IBT CORP. / MONITOR / P278DPL** 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.

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5.2 Conducted Emissions Measurement

5.2.1 Conducted Emissions Data

EUT	MONITOR / P278DPL (S/N: P278UPMLA84 01854)
Limit apply to	FCC Part 15.107(a) Class B
Test Date	June 14, 2018
Environmental of Test	(23.0 ± 0.0) °C, (48 ± 0) % R.H., (100.6 ± 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) - HDMI mode (worst case)
Result	Passed by 6.51 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 Level (Result) value was included the reading, LISN factor and cable loss.**
3. **Delta (Margin) value = Limit - Level (Result)**
4. **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.**
5. **If the Quasi-Peak limit is met when using a Peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the Quasi-Peak detector receiver is unnecessary.**
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.**

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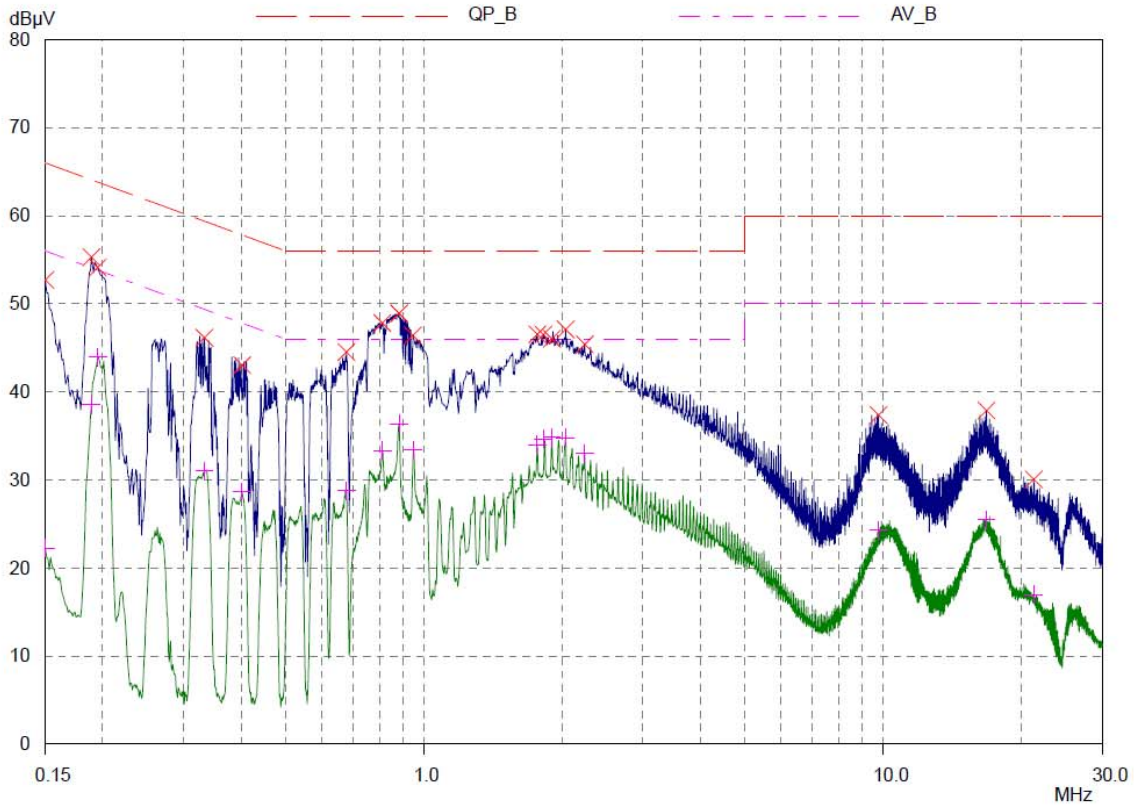
Line: HOT

ETL EMC Laboratory

Conducted Emission Test Result

EUT: ETLE180604.0536
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: HOT

Prescan Measurement:
Detectors: X PK / + AV
Meas Time: see scan settings
Peaks: 16
Acc Margin: 10 dB



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ETL EMC Laboratory

Conducted Emission Test Result

EUT: ETLE180604.0536
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: HOT

Prescan Measurement: Detectors: X PK / + AV
Meas Time: see scan settings
Peaks: 16
Acc Margin: 10 dB

Peak Search Results

Frequency MHz	PK Level dBµV	PK Limit dBµV	PK Delta dB
0.15	52.71	66.00	13.29
0.189	55.29	64.08	8.79
0.195	54.10	63.82	9.72
0.333	46.14	59.38	13.24
0.402	43.02	57.81	14.79
0.678	44.51	56.00	11.49
0.812	47.80	56.00	8.20
0.883	48.90	56.00	7.10
0.947	46.39	56.00	9.61
1.765	46.52	56.00	9.48
1.82	46.50	56.00	9.50
1.9	46.01	56.00	9.99
2.035	47.08	56.00	8.92
2.24	45.39	56.00	10.61
9.775	37.37	60.00	22.63
16.77	37.87	60.00	22.13
21.25	30.06	60.00	29.94

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.15	22.23	56.00	33.77
0.189	38.53	54.08	15.55
0.195	43.94	53.82	9.88
0.333	31.06	49.38	18.32
0.402	28.68	47.81	19.13
0.678	28.80	46.00	17.20
0.812	33.32	46.00	12.68
0.883	36.37	46.00	9.63
0.947	33.42	46.00	12.58
1.765	33.99	46.00	12.01
1.82	34.65	46.00	11.35

* limit exceeded

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Peak Search Results (continued)

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
1.9	34.84	46.00	11.16
2.035	34.79	46.00	11.21
2.24	32.99	46.00	13.01
9.775	24.29	50.00	25.71
16.77	25.49	50.00	24.51
21.25	16.99	50.00	33.01

* limit exceeded

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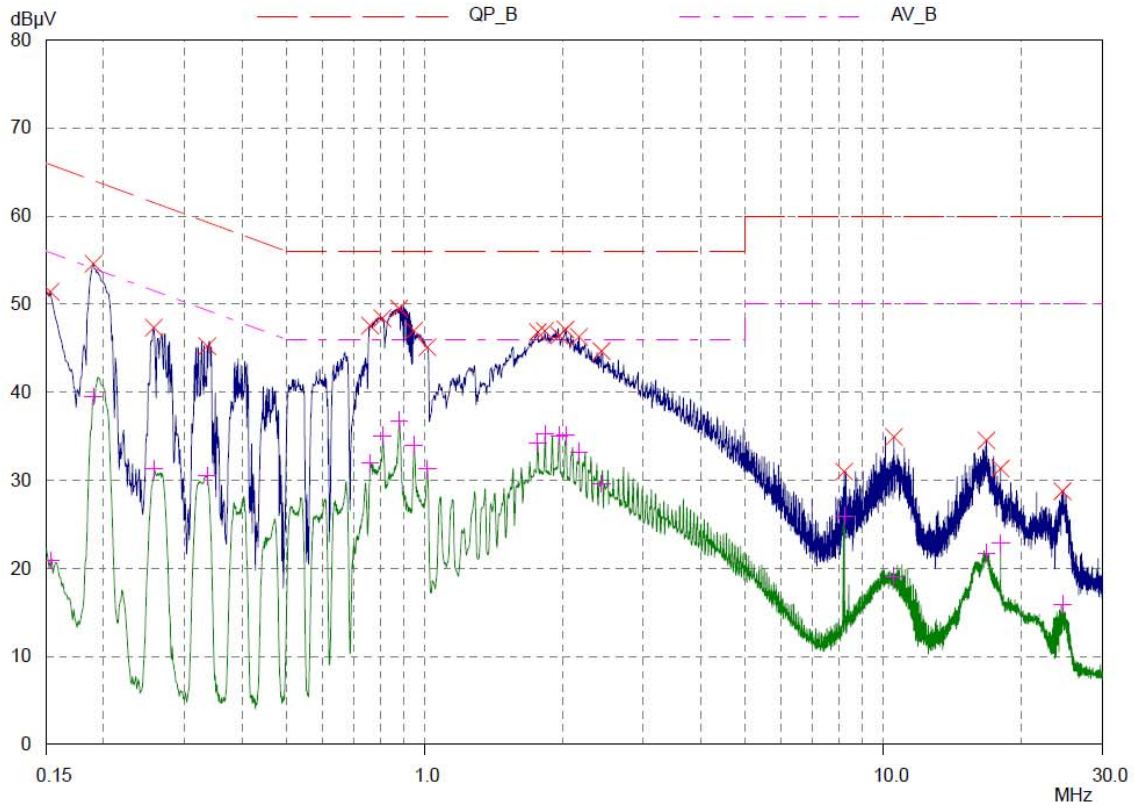
Line: Neutral

ETL EMC Laboratory

Conducted Emission Test Result

EUT:	ETLE180604.0536
Manuf:	
Op Cond:	
Operator:	
Test Spec:	
Comment:	N

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Peaks:	16
	Acc Margin:	10 dB



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ETL EMC Laboratory

Conducted Emission Test Result

EUT: ETLE180604.0536
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: N

Prescan Measurement:
Detectors: X PK / + AV
Meas Time: see scan settings
Peaks: 16
Acc Margin: 10 dB

Peak Search Results

Frequency MHz	PK Level dBµV	PK Limit dBµV	PK Delta dB
0.153	51.40	65.84	14.44
0.19	54.58	64.04	9.46
0.257	47.32	61.53	14.21
0.336	45.21	59.30	14.09
0.761	47.55	56.00	8.45
0.809	48.41	56.00	7.59
0.88	49.49	56.00	6.51
0.948	46.97	56.00	9.03
1.015	45.08	56.00	10.92
1.765	46.83	56.00	9.17
1.83	46.94	56.00	9.06
1.965	46.44	56.00	9.56
2.03	47.10	56.00	8.90
2.17	46.26	56.00	9.74
2.43	44.66	56.00	11.34
8.22	30.98	60.00	29.02
10.54	34.91	60.00	25.09
16.77	34.52	60.00	25.48
18.0	31.32	60.00	28.68
24.57	28.75	60.00	31.25

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.153	20.89	55.84	34.95
0.19	39.49	54.04	14.55
0.257	31.25	51.53	20.28
0.336	30.49	49.30	18.81
0.761	31.92	46.00	14.08
0.809	35.03	46.00	10.97
0.88	36.74	46.00	9.26
0.948	33.99	46.00	12.01

* limit exceeded

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Peak Search Results (continued)

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
1.015	31.32	46.00	14.68
1.765	34.22	46.00	11.78
1.83	35.25	46.00	10.75
1.965	35.06	46.00	10.94
2.03	35.08	46.00	10.92
2.17	33.16	46.00	12.84
2.43	29.59	46.00	16.41
8.22	25.94	50.00	24.06
10.54	19.10	50.00	30.90
16.77	21.74	50.00	28.26
18.0	22.81	50.00	27.19
24.57	15.90	50.00	34.10

* limit exceeded

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5.3 Radiated Emissions Measurement

5.3.1 Radiated Emissions Data

- Below 1 GHz

EUT	MONITOR / P278DPL (S/N: P278UPMLA84 01854)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 15, 2018
Environmental of Test	(26.5 ± 0.6) °C, (56 ± 0) % R.H., (100.8 ± 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) - HDMI mode (worst case)
Result	Passed by 2.25 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]
34.25	57.74	V	10.32	-32.94	110	35.12	40.00	4.88
135.26	59.11	V	8.07	-31.97	110	35.21	43.50	8.29
142.59	65.38	V	7.77	-31.90	120	41.25	43.50	2.25
148.56	64.90	V	7.96	-31.84	120	41.02	43.50	2.48
155.69	63.92	V	8.18	-31.78	120	40.32	43.50	3.18
743.68	53.32	H	20.67	-30.41	190	43.58	46.00	2.42

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 value = 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.**

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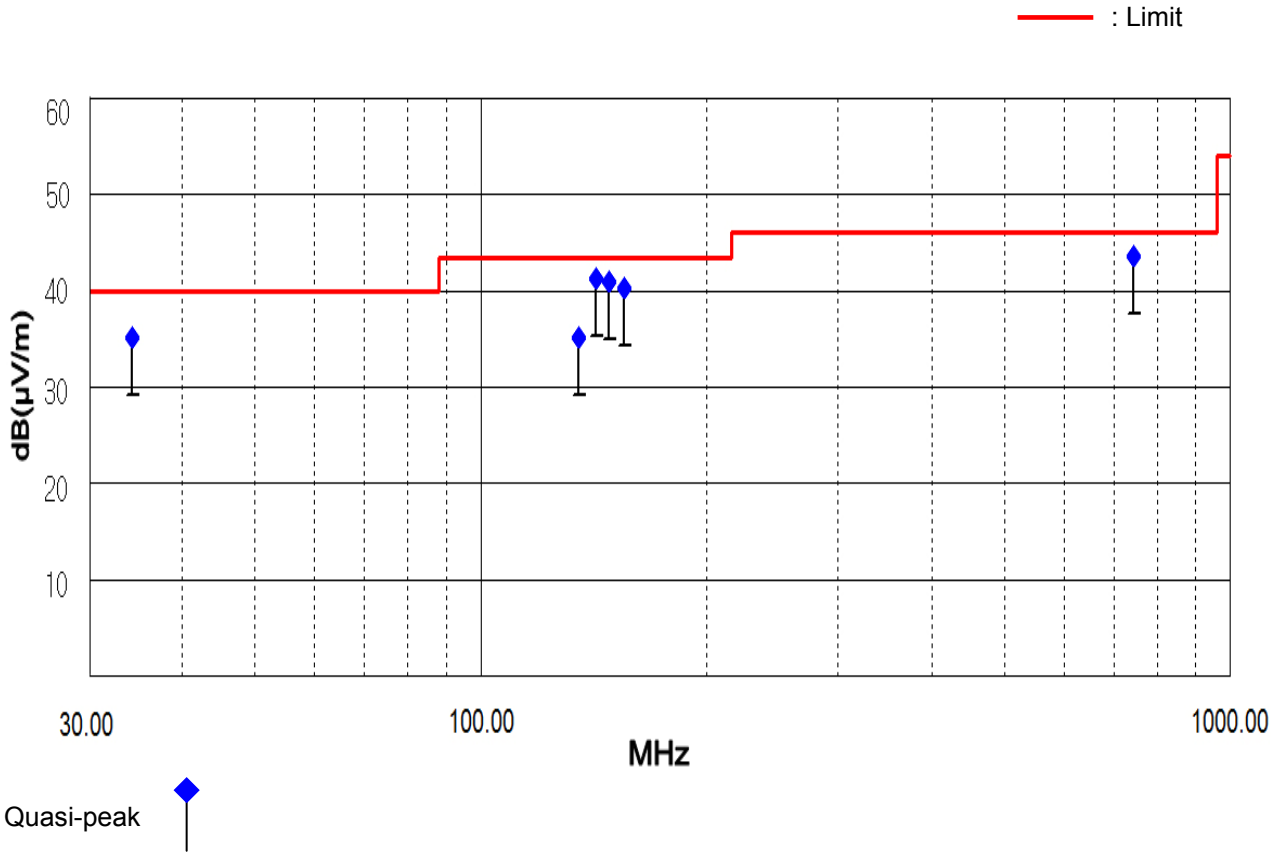

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- Above 1 GHz

EUT	MONITOR / P278DPL (S/N: P278UPMLA84 01854)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 15, 2018
Environmental of Test	(25.0 ± 0.5) °C, (58 ± 1) % R.H., (100.8 ± 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) - HDMI mode (worst case)
Result	Passed by 19.32 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

Frequency [MHz]	Reading [dB(μV)]		Polarity (*H/**V)	Height [cm]	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB(μV/m)]		Limit [dB(μV/m)]		Margin [dB]	
	Peak	Average					Peak	Average	Peak	Average	Peak	Average
1 048.83	64.55	46.42	V	100	24.98	-40.15	49.38	31.25	74.00	54.00	24.62	22.75
1 601.14	66.97	44.39	V	100	26.01	-39.36	53.62	31.04	74.00	54.00	20.38	22.96
2 005.64	64.94	42.54	H	110	26.27	-38.74	52.47	30.07	74.00	54.00	21.53	23.93
3 230.86	60.90	38.68	V	100	28.81	-36.50	53.21	30.99	74.00	54.00	20.79	23.01
4 527.79	58.61	36.68	V	120	30.83	-34.76	54.68	32.75	74.00	54.00	19.32	21.25
5 593.72	54.23	32.11	H	120	31.99	-33.89	52.34	30.22	74.00	54.00	21.66	23.78

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 value = Limit - Result**
5. **The measurement was performed for the frequency range 1 GHz ~ 6 GHz according to FCC Part 15.109(a) Class B.**
6. **Upper frequency of measurement range: 5th harmonic of the highest frequency.**

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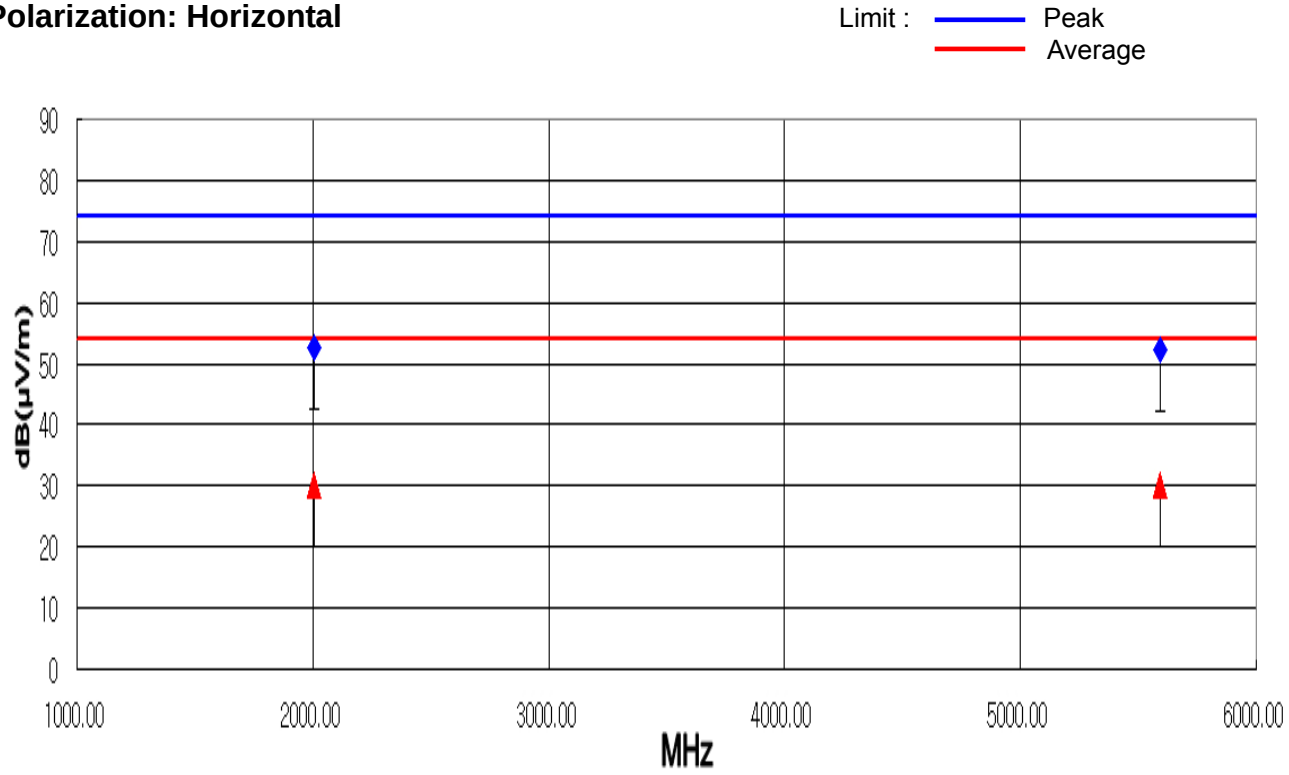
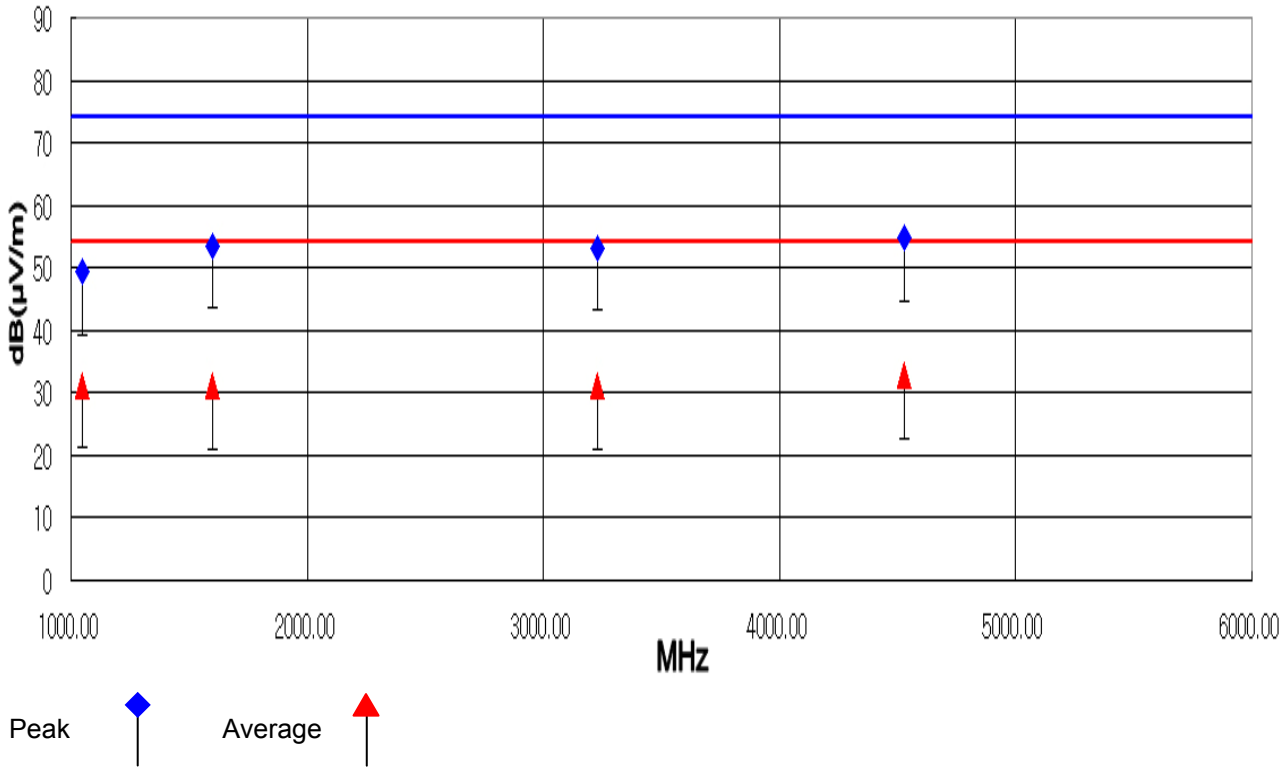
Polarization: Horizontal



Polarization: Vertical



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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(μV) = dBm + 107

Example : @ 142.59 MHz

Class B Limit	= 43.50 dB(μV/m)	
Reading	= 65.38 dB(μV)	
Antenna Factor + (Cable Loss - Amp. Gain.)		= 7.77 + (-31.90) = -24.13 dB(μV/m)
Total		= 41.25 dB(μV/m)
Margin	= 43.50 – 41.25 = 2.25 dB	
	= 2.25 dB below Limit	

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7. List of test equipments used for measurements

Test Equipment		Model	Mfg.	Serial No.	Cal. Date	Cal. Due Date
☒	EMI Test Receiver	ESPI3	R&S	100478	17.08.31	18.08.31
☒	EMI Test Receiver	ESCS30	R&S	100087	18.03.12	19.03.12
☒	EMI Test Receiver	ESCI7	R&S	100851	17.08.31	18.08.31
☒	Amplifier	BLWA 0310-1	BONN Elektronik	045672	18.01.31	19.01.31
☒	Two-Line V-Network	ENV216	R&S	102055	18.03.12	19.03.12
☒	Two-Line V-Network	ENV216	R&S	101715	18.03.12	19.03.12
☒	Horn Antenna	BBHA 9120D	Schwarzbeck	826	18.03.29	20.03.29
☒	Amplifier	TK-PA18	TESTEK.	120020	17.09.01	18.09.01
☒	Bi-Log Antenna	VULB9163	Schwarzbeck	01069	17.02.17	19.02.17
☒	Turn-Table	TT 1.35 SI	SES	-	N/A	N/A
☒	Antenna Master	AM 4.5	SES	-	N/A	N/A

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