



TEST REPORT



Report No. : KES-EM242448-R1

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1. Client

Applicant : JLU Co.,Ltd.

Applicant Address : 410~412, Busan Knowledge Industry Center, 111, Hyoyeol-ro, Buk-gu, Busan, Republic of Korea

2. Sample Description

Product name : EXMODE

Model/Type No. : JKM-C300B

Variant Model : -

Manufacturer : JLU Co.,Ltd.

Manufacturer Address : 410~412, Busan Knowledge Industry Center, 111, Hyoyeol-ro, Buk-gu, Busan, Republic of Korea

3. FCC ID : 2BHHE-JKM-C300B

4. Date of Receipt : Jul. 18, 2024

5. Test date : Jul. 18, 2024 ~ Jul. 20, 2024

6. Date of Issue : Dec. 06, 2024

7. Test Results : In Compliance

Tested by

Reviewed by

Jae Won, Lee
EMC Test Engineer

Dae Jung, Choi
EMC Technical Manager



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 07, 2024	KES-EM242448	Issued
Dec. 06, 2024	KES-EM242448-R1	Add Equipment (Cable)

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1.0 General Product Description

Main Specifications of EUT are:

Division		Specificity
Internal highest clock frequency		32 MHz
Power	Rated Power	Cradle Charging : DC 5 V (USB Type-C) Operation : DC 3.7 V / 500 mAh (Battery)
	Test Power	AC 120 V, 60 Hz
Wireless Function		Bluetooth 2.4 GHz
Components		Main body 1 EA



1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 120 V, 60 Hz (AC/DC Adapter Input Power), Battery

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
EXMODE	JKM-C300B	-	JLU Co.,Ltd.	EUT
Battery	TW502540	-	SHENZHEN TAIWOO BATTERY CO.,LTD	EUT, XU100690-17005

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC Adapter	MCS-02KR2	-	Weihai Sunlin Electronics Co.,Ltd	MSIP-REI-SLE-MCS-02KR2
Smartphone	SM-N986N		SAMSUNG	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
EXMODE (EUT)	USB Type-C	AC/DC Adapter	USB Type-A	1.0	U
	Wireless	Smartphone	Wireless	-	-

* Unshielded = U, Shielded = S

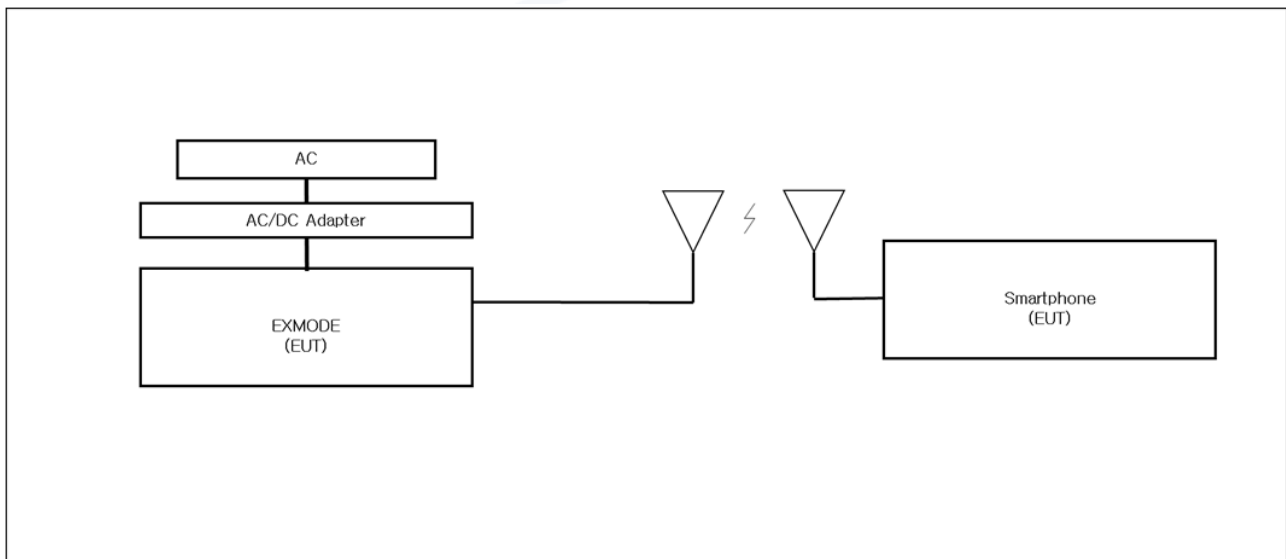


1.7 EUT Operating Mode(s)

Test mode	operating
Operation	-After connecting the EUT and AC/DC adapter, I tested it by checking the charging status with the LED, pressing the button to confirm normal operation, and checking the Bluetooth connection status with the BLE scanner app.

EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

1.8 Configuration



EUT –Smartphone : Bluetooth 2.4 GHz



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Measurement Procedure

- Conducted Emissions

The conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emission exceed the average limit with the instrument set to the quasi-peak mode, the measurements are made in the average mode. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded. Quasi-peak readings are distinguished with a "QP".

- Radiated Electric Field Emissions

The test was done at a SEMI ANECHOIC CHAMBER with quasi-peak detector. The final test data was measured using a Quasi-Peak detector below 1 GHz at 10 m or 3 m distance and a Peak and Average detector above 1 GHz at 3 m distance. Test was proceeded worst case test mode and cable configuration.

Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

Measurement procedures was In accordance with ANSI C63.4-2014 7.3.3, 7.3.4, 8.3.1.1, 8.3.1.2, 8.3.2.1, 8.3.2.2



1.13 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0008



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **47 CFR Part 15, Subpart B**

☒ ANSI C63.4a-2017

☐ Class A

☒ Class B





2.1 Conducted Emissions at Mains Power Ports

Test Date

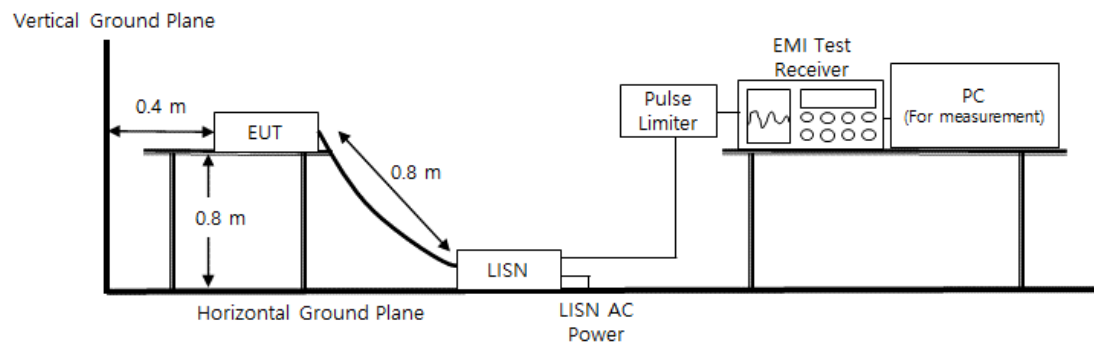
Jul. 18, 2024

Test Location

SHIELD ROOM #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	EMC32	R & S	9.12.00	-	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 08, 2024	1 Year
☒	LISN	ENV216	R & S	101787	11, 08, 2024	1 Year
☐	LISN	ESH2-Z5	R & S	100450	11, 08, 2024	1 Year
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024	1 Year
☒	Cable	RG 400	-	-	14, 07, 2024	0,5 Year

Diagram of test setup

**Test Conditions**

Temperature: (25,5 ± 0,1) °C
Relative Humidity: (50,0 ± 0,1) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 19, 2024

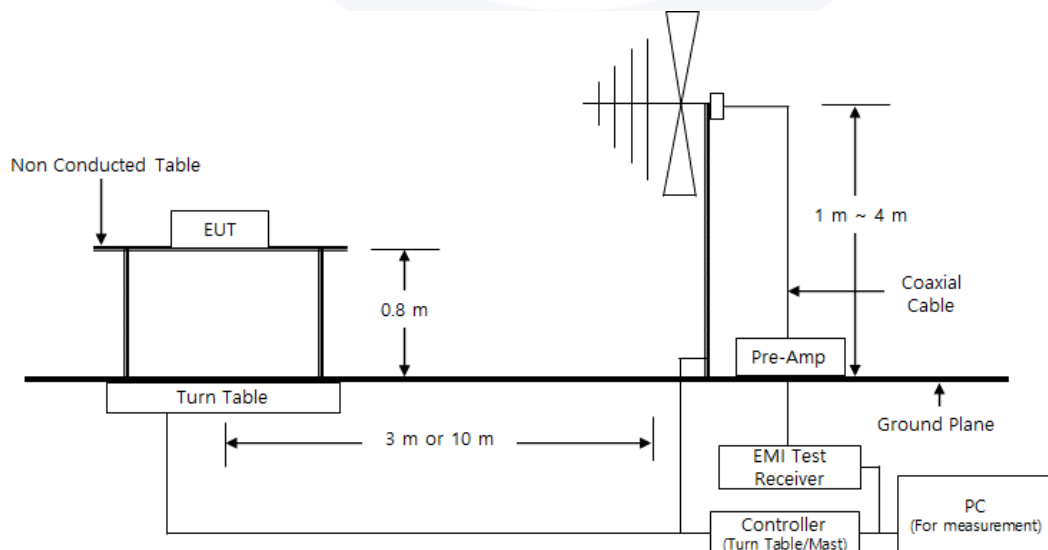
Test Location

SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	02, 13, 2025	1 Year
☒	AMPLIFIER	SCU 01	R & S	100603	11, 08, 2024	1 Year
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024	2 Year
☒	ATTENUATOR	8491A	HP	32173	02, 13, 2025	1 Year
☒	Cable	NMS111-GL200sC-NMS111	GIGALANE	-	12, 07, 2024	0,5 Year
☒	Cable	SUCOFLEX104	HUBER_SUHNER	-	12, 07, 2024	0,5 Year
☒	Cable	-	-	-	12, 07, 2024	0,5 Year

Diagram of test setup





Test Conditions

Temperature: (24,3 ± 0,1) °C
Relative Humidity: (48,3 ± 0,1) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jul. 20, 2024

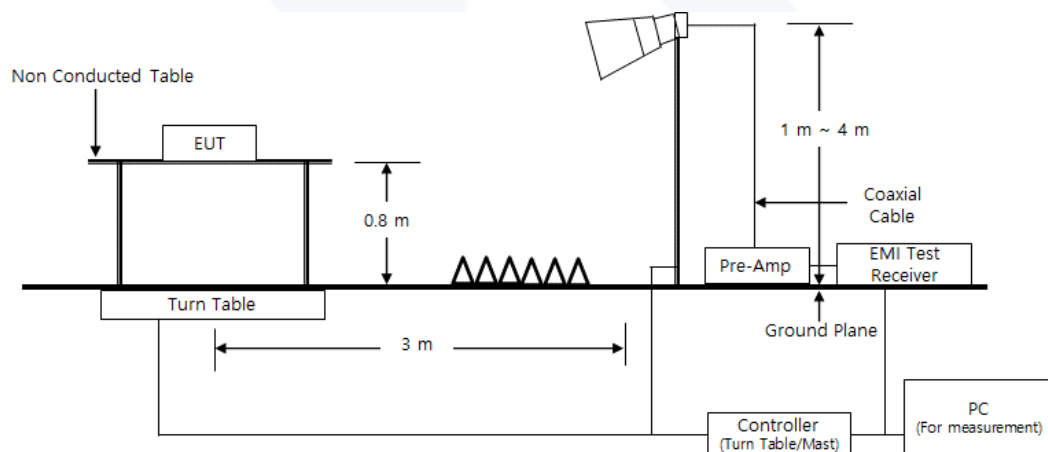
Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	ES10/RE	TOYO Corporation	2022.01.000	-	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	02, 13, 2025	1 Year
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 03, 2024	1 Year
☒	PREAMPLIFIER	8449B	HP	3008A00538	04, 30, 2025	1 Year
☒	ATTENUATOR	8491B	HP	23094	02, 13, 2025	1 Year
☒	Cable	SUCOFLEX106	HUBER_SUHNER	-	12, 07, 2024	0,5 Year
☒	Cable	SUCOFLEX106	HUBER_SUHNER	-	12, 07, 2024	0,5 Year
☒	Cable	LH21D/2xSMA	OSI Cable	-	12, 07, 2024	0,5 Year

Diagram of test setup





Test Conditions

Temperature: (22,9 ± 0,1) °C
Relative Humidity: (47,3 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 12,5 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

The Average of the test data is the cispr average result.



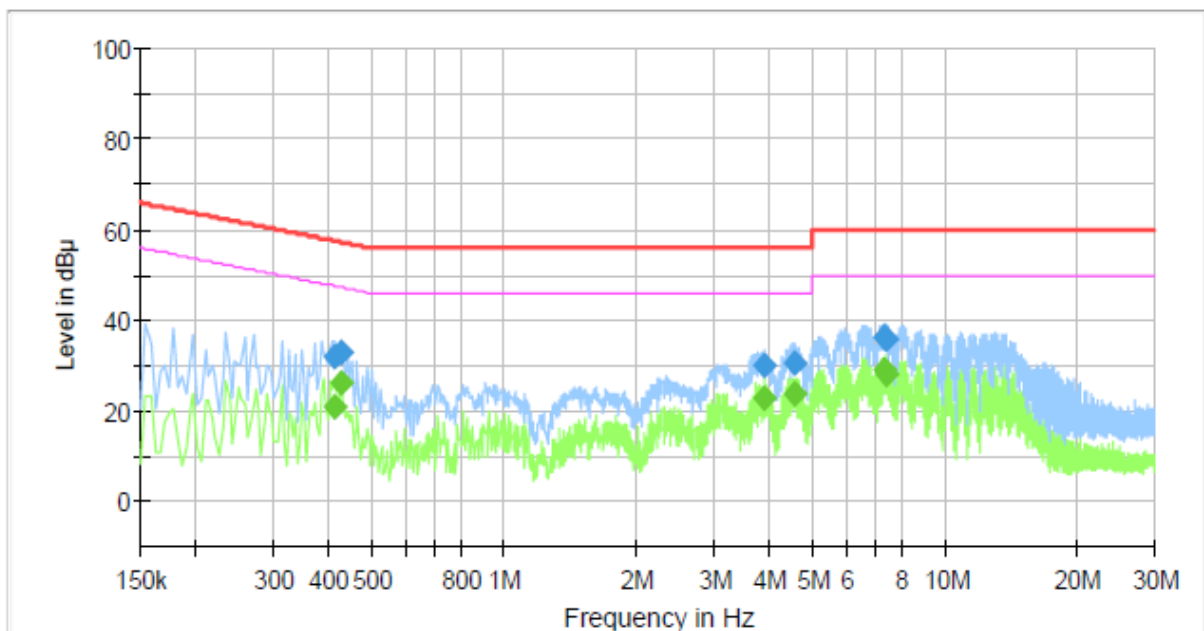
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM242448
Phase: L
Mode:
Operator Name: KES



Final Result

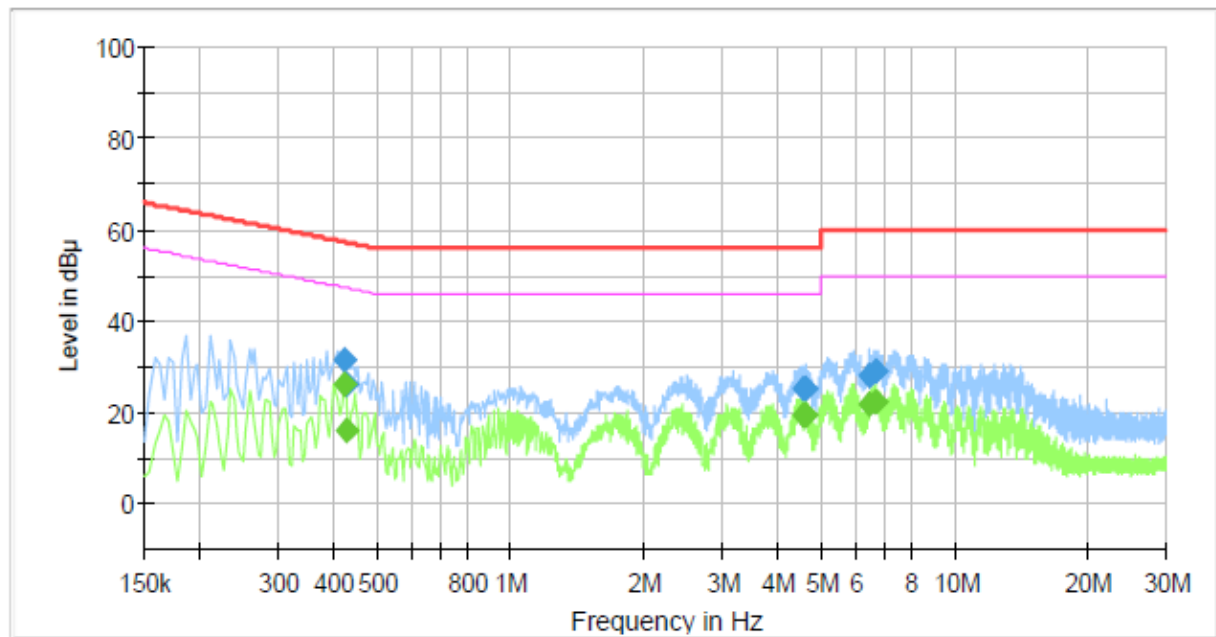
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.414000	---	20.88	47.57	26.69	1000.0	9.000	L1	19.7
0.414000	32.08	---	57.57	25.49	1000.0	9.000	L1	19.7
0.426000	---	26.08	47.33	21.25	1000.0	9.000	L1	19.7
0.426000	32.98	---	57.33	24.35	1000.0	9.000	L1	19.7
3.886000	---	22.93	46.00	23.07	1000.0	9.000	L1	20.1
3.886000	29.82	---	56.00	26.18	1000.0	9.000	L1	20.1
4.566000	---	23.56	46.00	22.44	1000.0	9.000	L1	20.1
4.566000	30.71	---	56.00	25.29	1000.0	9.000	L1	20.1
7.274000	---	28.85	50.00	21.15	1000.0	9.000	L1	20.4
7.274000	36.29	---	60.00	23.71	1000.0	9.000	L1	20.4
7.382000	---	28.04	50.00	21.96	1000.0	9.000	L1	20.4
7.382000	35.61	---	60.00	24.39	1000.0	9.000	L1	20.4



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Job No.: KES-EM242448
Phase: N
Mode:
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.422000	---	26.27	47.41	21.14	1000.0	9.000	N	19.7
0.422000	31.34	---	57.41	26.07	1000.0	9.000	N	19.7
0.426000	---	16.15	47.33	31.18	1000.0	9.000	N	19.7
0.426000	26.31	---	57.33	31.02	1000.0	9.000	N	19.7
4.554000	---	19.52	46.00	26.48	1000.0	9.000	N	20.2
4.554000	25.44	---	56.00	30.56	1000.0	9.000	N	20.2
4.634000	---	19.30	46.00	26.70	1000.0	9.000	N	20.2
4.634000	25.34	---	56.00	30.66	1000.0	9.000	N	20.2
6.434000	---	21.68	50.00	28.32	1000.0	9.000	N	20.3
6.434000	28.00	---	60.00	32.00	1000.0	9.000	N	20.3
6.698000	---	22.45	50.00	27.55	1000.0	9.000	N	20.4
6.698000	28.98	---	60.00	31.02	1000.0	9.000	N	20.4

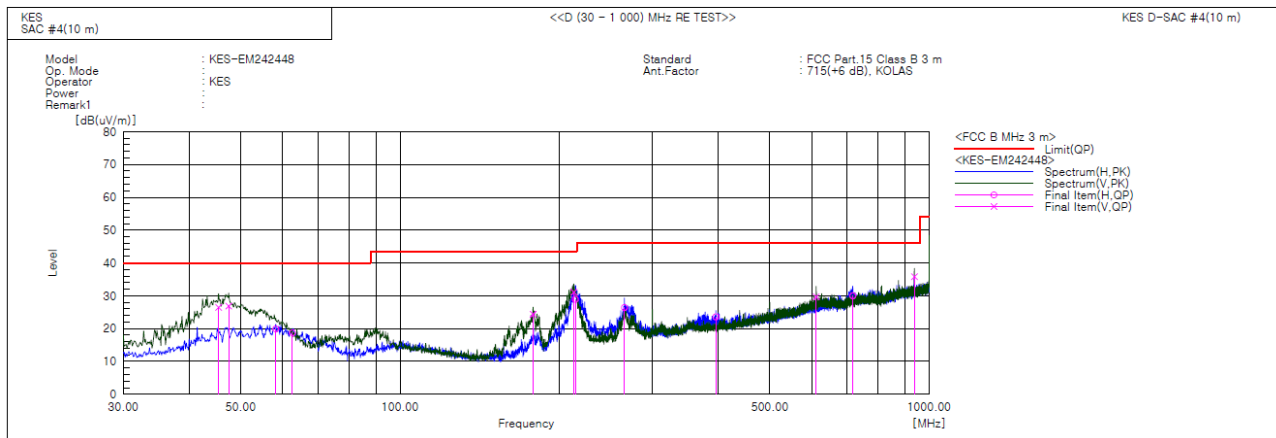
◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Radiated Electric Field Emissions(Below 1 GHz)****Final Result**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	45.399	V	48.0	-21.5	26.5	40.0	13.5	114.0	101.0	
2	47.460	V	48.1	-21.2	26.9	40.0	13.1	146.0	206.0	
3	58.251	H	41.7	-21.8	19.9	40.0	20.1	195.0	26.0	
4	62.616	H	41.4	-22.7	18.7	40.0	21.3	397.0	152.0	
5	178.410	V	47.7	-23.3	24.4	43.5	19.1	115.0	352.0	
6	213.088	V	50.9	-19.8	31.1	43.5	12.4	141.0	217.0	
7	214.421	H	48.6	-19.7	28.9	43.5	14.6	195.0	272.0	
8	265.589	H	44.9	-18.5	26.4	46.0	19.6	396.0	63.0	
9	395.448	H	37.6	-14.0	23.6	46.0	22.4	196.0	111.0	
10	611.636	V	37.5	-7.8	29.7	46.0	16.3	141.0	12.0	
11	717.609	H	36.0	-6.0	30.0	46.0	16.0	398.0	231.0	
12	938.284	V	38.5	-2.7	35.8	46.0	10.2	106.0	105.0	

◆ Calculation

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

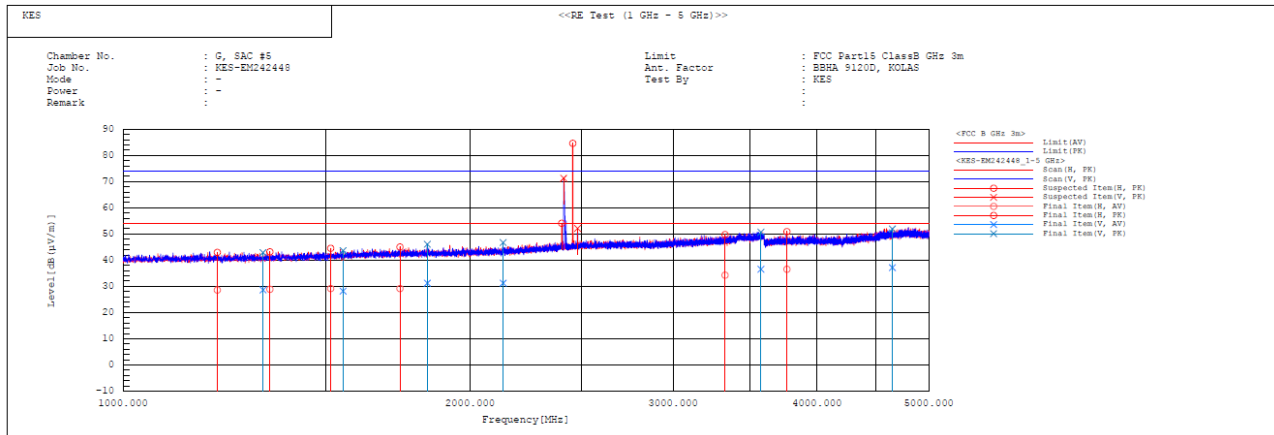
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

**Radiated Electric Field Emissions(Above 1 GHz)**

- (1 ~ 5) GHz

**Final Result**

No.	Frequency [MHz]	Pol	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1207.578	H	29.3	43.7	-0.7	28.6	43.0	54.0	74.0	25.4	31.0	197.0	47.5	
2	1322.887	V	28.7	43.0	-0.1	28.6	42.9	54.0	74.0	25.4	31.1	104.0	106.9	
3	1341.278	H	28.9	43.2	0.0	28.9	43.2	54.0	74.0	25.1	30.8	395.0	87.8	
4	1514.387	H	28.5	43.8	0.7	29.2	44.5	54.0	74.0	24.8	29.5	396.0	189.0	
5	1552.375	V	27.3	42.7	0.9	28.2	43.6	54.0	74.0	25.8	30.4	106.0	163.0	
6	1739.239	H	27.5	43.3	1.7	29.2	45.0	54.0	74.0	24.8	29.0	397.0	154.9	
7	1836.897	V	29.1	44.0	2.1	31.2	46.1	54.0	74.0	22.8	27.9	105.0	198.2	
8	2136.872	V	27.8	43.3	3.4	31.2	46.7	54.0	74.0	22.8	27.3	105.0	9.7	
9	3328.752	H	27.6	43.1	6.7	34.3	49.8	54.0	74.0	19.7	24.2	379.0	322.3	
10	3576.038	V	29.3	43.5	7.2	36.5	50.7	54.0	74.0	17.5	23.3	102.0	155.5	
11	3766.787	H	28.8	43.2	7.7	36.5	50.9	54.0	74.0	17.5	23.1	387.0	304.2	
12	4648.887	V	26.2	40.9	11.0	37.2	51.9	54.0	74.0	16.8	22.1	105.0	228.0	
13	2402.000	H	-----	-----	4.4	-----	-----	-----	-----	-----	-----	400.0	162.2	
14	2412.000	V	-----	-----	4.4	-----	-----	-----	-----	-----	-----	100.0	352.9	
15	2456.000	H	-----	-----	4.6	-----	-----	-----	-----	-----	-----	400.0	28.2	
16	2480.000	V	-----	-----	4.7	-----	-----	-----	-----	-----	-----	100.0	0.6	

* Exclusion bands

- Fundamental Frequency: (2 402 ~ 2 480) MHz



- (5 ~ 12,5)

- PK

Frequency (MHz)	Reading PK (dBuV)	Polarization	Height (m)	ANT Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
6 650.947	40.200	V	1.000	34.750	9.250	34.760	49.440	74.000	24.560
10 868.257	39.200	H	1.000	40.270	11.880	32.800	58.550	74.000	15.450

- CISPR AV

Frequency (MHz)	Reading CISPR AV (dBuV)	Polarization	Height (m)	ANT Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
6 650.947	27.100	V	1.000	34.750	9.250	34.760	36.340	54.000	17.660
10 868.257	25.900	H	1.000	40.270	11.880	32.800	45.250	54.000	8.750

◆ Calculation

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value