EMC TEST REPORT

Test Report No.	:	KES-E1-19T0731
Date of Issue	:	Nov. 05, 2019
Product name	:	ASM
Model/Type No.	:	ASM
Variant Mode	:	-
Applicant	:	Aram Huvis Co.,LTD.
Applicant Address	:	Jung-ja Dong-Rm401-402, Seoul National University Hospital's Health Care Innovation Park, 172, Dolma-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
Manufacturer	:	Aram Huvis Co.,LTD.
Manufacturer Address	:	Jung-ja Dong-Rm401-402, Seoul National University Hospital's Health Care Innovation Park, 172, Dolma-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
FCC ID	:	XYCASM
Date of Receipt	:	Sep. 20, 2019
Test date	:	Oct. 25, 2019 ~ Oct. 28, 2019
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Hyun, Won
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 05, 2019	KES-E1-19T0731	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Item	spec
Communication method	Wifi 2.4 ㎓ / Wifi 5 ㎓ / Bluetooth
Power	DC 5 V (USB)
Size	(170 x 80 x 50) ㎜
Weight	670 g

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.

Voltage ☐ 230 Vac ☒ 120 Vac ☐ 12 Vdc ☐ DC 3.7 V (Battery)

Frequency ☐ 50 Hz ☒ 60 Hz ☐ Hz

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
ASM	ASM	-	Aram Huvis Co.,LTD.	EUT
Notebook	NT730U3E	JJRE91CF200065A	삼성전자㈜	-
Notebook Adapter	PA-1600-66	AD-6019P	LITEON	-
Router	A2004plus	-	IpTIME	-
Router Adapter	TY-2007	-	Zioncoin Electronics (Shenzhen) Ltd.	-
Bluetooth Speaker	HX-P430PK	-	-	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Cradle	-	-	-	-
Adapter	KSAPK0110500200D5	-	SHENZHEN RUIYU TECHNOLOGY CO.,LTD	-

1.6 External I/O Cabling

■ Cradle Charge Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
ASM (EUT)	Micro 5 pin	Cradle	Micro 5 pin	-	-
Cradle	Micro 5 pin	Adapter	USB	1.2	U

■ Charge Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
ASM (EUT)	Micro 5 pin	Adapter	USB	1.2	U

■ Operation Mode, Camera 1 Mode, Camera 2 Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
ASM (EUT)	-	-	-	-	-

■ Data Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
ASM (EUT)	Micro 5 pin	Notebook	USB	1.2	U

■ 5 ㎓ + Bluetooth Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
ASM (EUT)	Wireless	Bluetooth Speaker	Wireless	-	-
	Wireless	Router	Wireless	-	-
Notebook	RJ-45 (LAN)	Router	RJ-45 (LAN)	1.0	U

■ 2.4 ㎓ Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
Digital Audio Player (EUT)	Wireless	Router	Wireless	-	-
Notebook	RJ-45 (LAN)	Router	RJ-45 (LAN)	1.0	U

1.7 EUT Charge Mode(s)

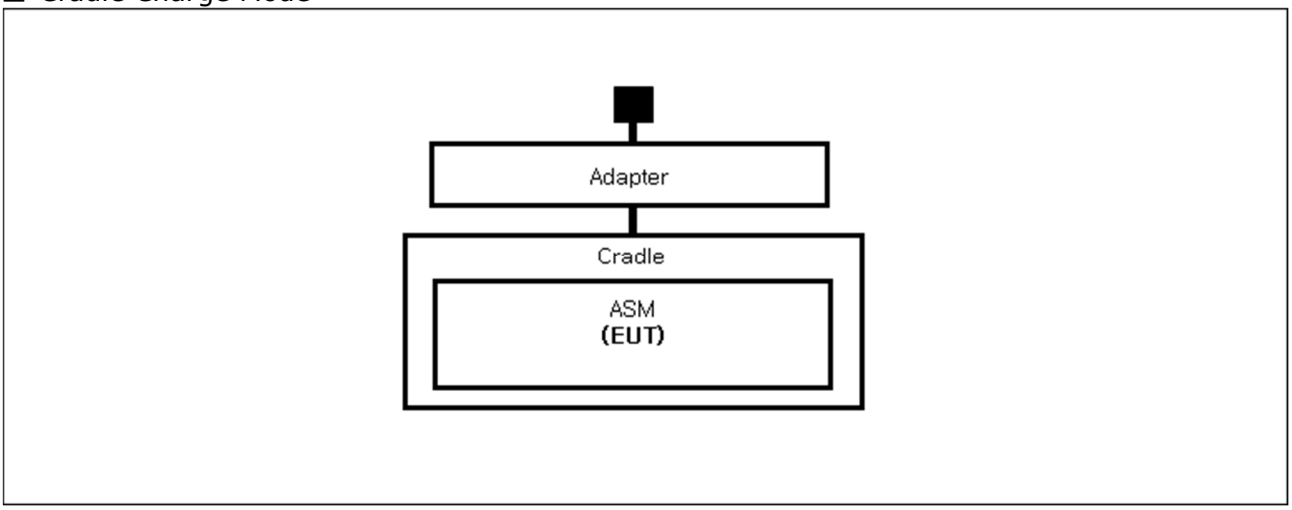
Test mode	operating
Cradle Charge	The eut checked the charging status through the Cradle LED
Charge	The eut checked the charging status through the LED
Operation	The eut checked the operation status through the Eut Sound
Camera 1	The eut checked the operation status through the Eut camera and Light
Camera 2	The eut checked the operation status through the Eut camera and Light
Data	The eut checked the operation through up/download the file of the Notebook
5 ㎓ + Bluetooth	The eut checked the operation through sound of the Bluetooth Speaker Check the operation by continuous pingtest on the IP assigned through the router
2.4 ㎓	Check the operation by continuous pingtest on the IP assigned through the router

EUT Test operating S/W		
Name	**Version**	**Manufacture Company**
ASM	1.2.8	-

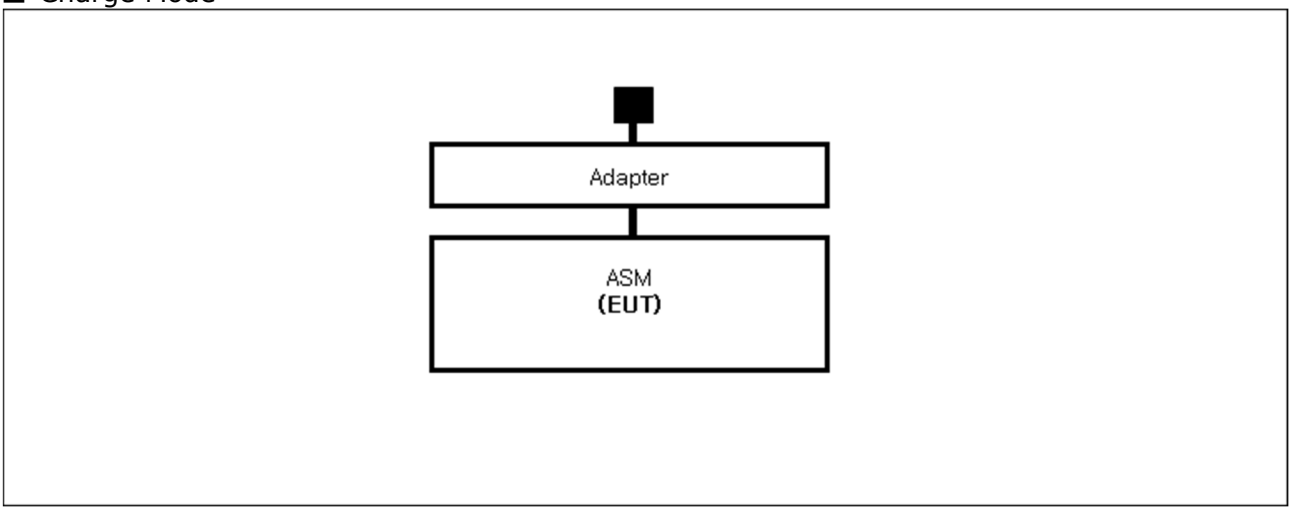
1.8 Configuration

■ AC Main
□ DC Main

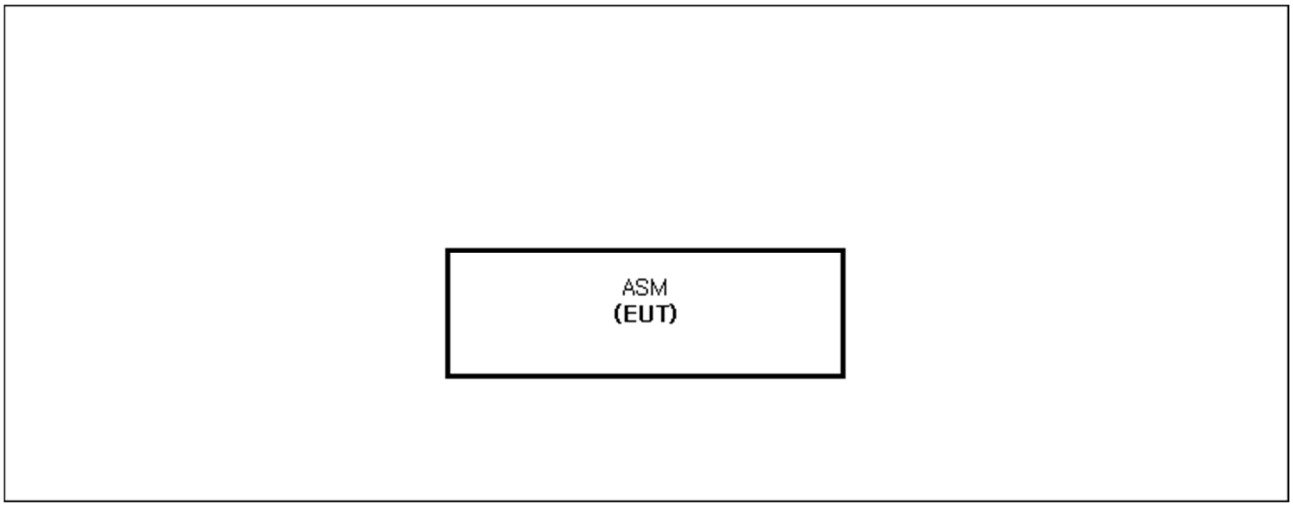
■ Cradle Charge Mode



■ Charge Mode



■ Operation Mode, Camera 1 Mode, Camera 2 Mode



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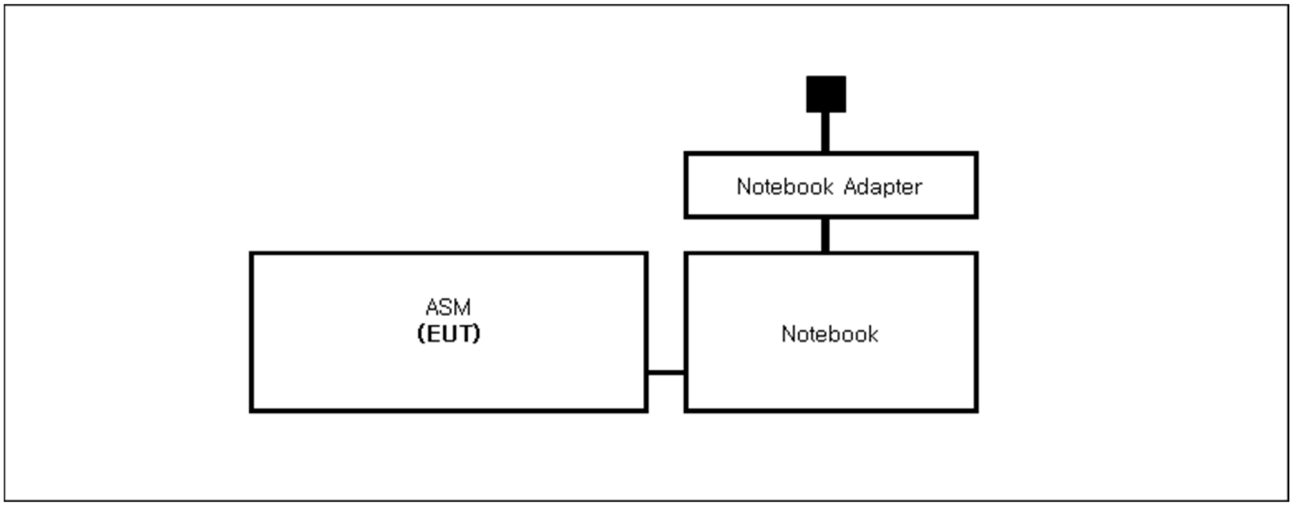
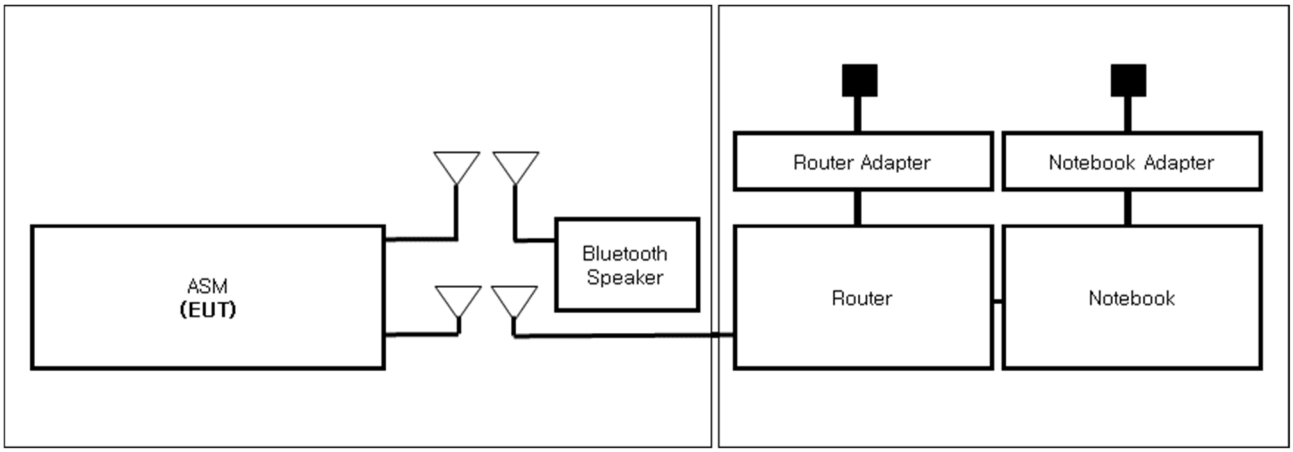
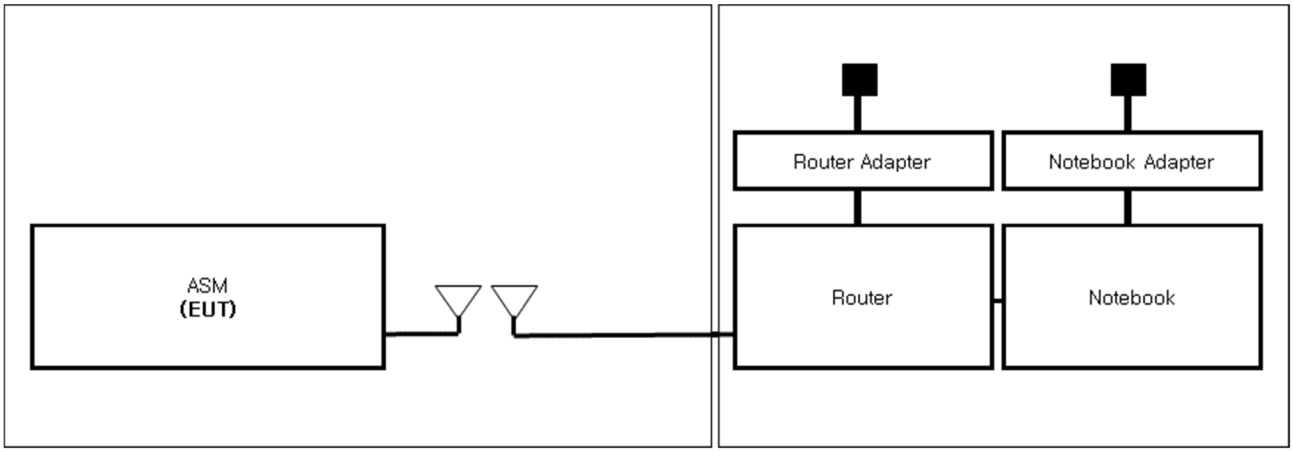


■ 5 ㎓ + Bluetooth Mode



■ 2.4 ㎓ Mode



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, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Aechoic Chamber ,10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
International	**KOLAS**	EMI (3 m & 10 m Semi-Aechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KT489
USA	**FCC**	3 m & 10 m Semi-Aechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Aechoic Chamber and Conducted test site	23298-1
JAPAN	**VCCI**	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	R-20056, C-20036 T-20040, G-20057
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Aechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 001633 0003

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010 ☐ Group 1 ☐ Class A ☐ Group 2 ☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015 ☐ Class A ☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

☐ **VCCI V-3 / 2015.04**	☐ Class A	☐ Class B
☐ **AS/NZS:2013**	☐ Class A	☐ Class B
☒ **47 CFR Part 15, Subpart B**		
☐ CISPR 22:2009 +A1:2010	☐ Class A	☐ Class B
☒ ANSI C63.4-2014	☐ Class A	☒ Class B
☐ **IC Regulation ICES-003 : 2016**		
☐ CAN/CSA CISPR 22-10	☐ Class A	☐ Class B
☐ ANSI C63.4-2014	☐ Class A	☐ Class B

☐ **RE– Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

2.1 Conducted Emissions at Mains Power Ports

Test Date
Oct. 28, 2019

Test Location
Electro wave Shieldroom #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	101781	04, 22, 2020	1 Year
☒	LISN	ENV216	R & S	101787	01, 04, 2020	1 Year
☐	LISN	ESH2-Z5	R & S	100450	04, 22, 2020	1 Year
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019	1 Year

Test Conditions
Temperature: 24,2 ℃
Relative Humidity: 53,6 % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

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 ㎓)

Test Date

■ 5 ㎓ + Bluetooth, 2.4 ㎓, Operation, Data Mode
Oct. 25, 2019

■ Cradle Charge, Charge, Camera 1, Camera 2 Mode
Oct. 26, 2019

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	04, 09, 2020	1 Year
☒	AMPLIFIER	SCU 01	R & S	100603	11, 26, 2019	1 Year
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020	2 Year
☒	ATTENUATOR	8491A	HP	32173	03, 11, 2020	1 Year

Test Conditions

■ 5 ㎓ + Bluetooth, 2.4 ㎓, Operation, Data Mode
Temperature: 24,7 ℃
Relative Humidity: 53,2 % R.H.

■ Cradle Charge, Charge, Camera 1, Camera 2 Mode
Temperature: 24,4 ℃
Relative Humidity: 53,5 % R.H.

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
- See Appendix A for test data.
- The fundamental of the EUT was investigated in thre orthogonal orientations X, Y and Z.

2.3 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date

■ 5 ㎓ + Bluetooth, 2.4 ㎓, Operation, Data Mode
Oct. 27, 2019

■ Cradle Charge, Charge, Camera 1, Camera 2 Mode
Oct. 28, 2019

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	04, 09, 2020	1 Year
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 08, 2020	1 Year
☒	ATTENUATOR	8491A	HP	35496	03, 11, 2020	1 Year
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	03, 12, 2020	2 Year
☒	HORN ANTENNA	BBHA 9170	SCHWARZBECK	BBHA9170551	02, 19, 2020	2 Year
☒	BROADBAND AMPLIFIER	BBV9721	SCHWARZBECK	PS9721-003	01, 16, 2020	1 Year

Test Conditions

■ 5 ㎓ + Bluetooth, 2.4 ㎓, Operation, Data Mode
Temperature: 24,3 ℃
Relative Humidity: 53,7 % R.H.

■ Cradle Charge, Charge, Camera 1, Camera 2 Mode
Temperature: 24,5 ℃
Relative Humidity: 54,0 % R.H.

Frequency Range of Measurement
1 GHz to 30 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 fundamental of the EUT was investigated in thre orthogonal orientations X, Y and Z.

APPENDIX A – TEST DATA

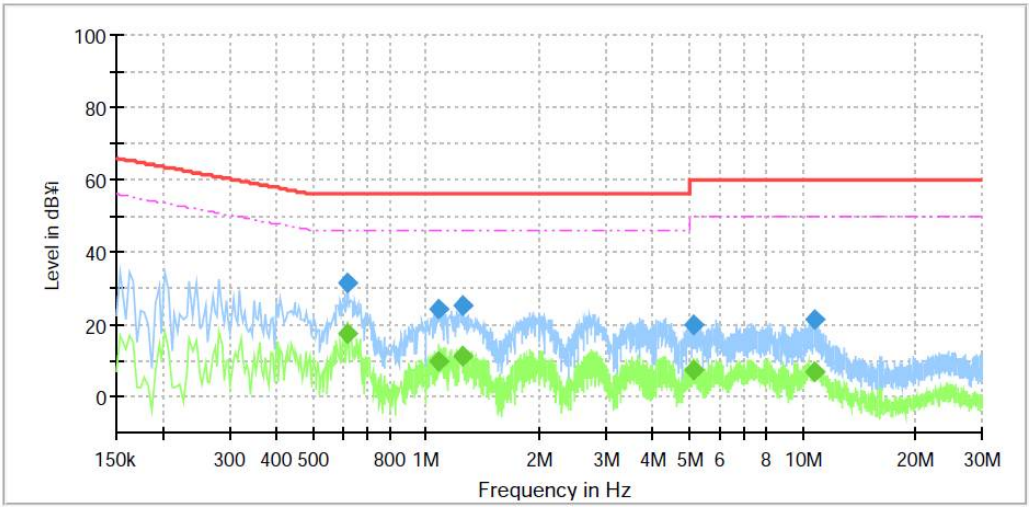
Conducted Emissions at Mains Power Ports

■ Cradle Charge Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ASM
Phase:	
Mode:	Cradle Charger_L1
Operator Name:	KES



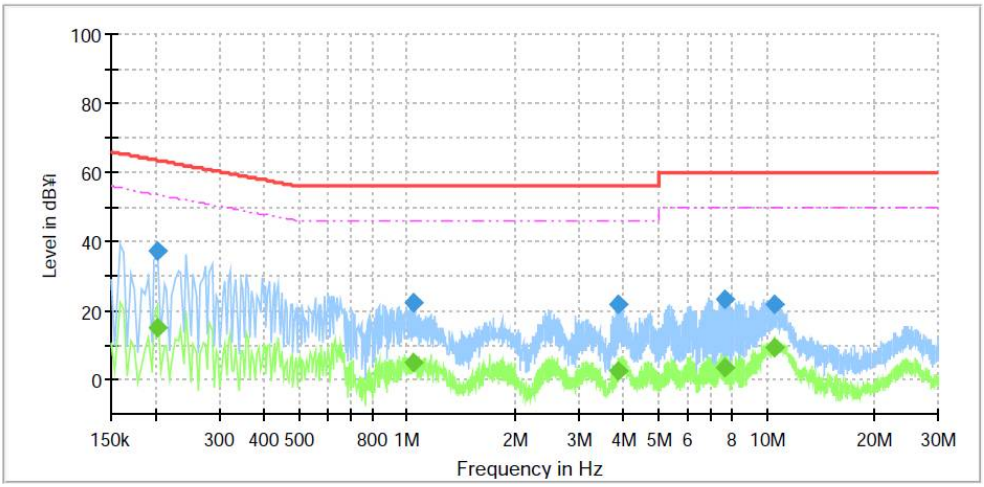
Final_Result

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.618000	---	17.42	46.00	28.58	1000.0	9.000	L1	9.7
0.618000	31.50	---	56.00	24.50	1000.0	9.000	L1	9.7
1.078000	---	9.65	46.00	36.35	1000.0	9.000	L1	9.7
1.078000	24.23	---	56.00	31.77	1000.0	9.000	L1	9.7
1.242000	---	11.13	46.00	34.87	1000.0	9.000	L1	9.7
1.242000	25.46	---	56.00	30.54	1000.0	9.000	L1	9.7
5.138000	---	7.35	50.00	42.65	1000.0	9.000	L1	9.8
5.138000	20.07	---	60.00	39.93	1000.0	9.000	L1	9.8
10.702000	---	7.01	50.00	42.99	1000.0	9.000	L1	10.0
10.702000	21.44	---	60.00	38.56	1000.0	9.000	L1	10.0

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ASM
Phase:	
Mode:	Cradle Charger_N
Operator Name:	KES



Final_Result

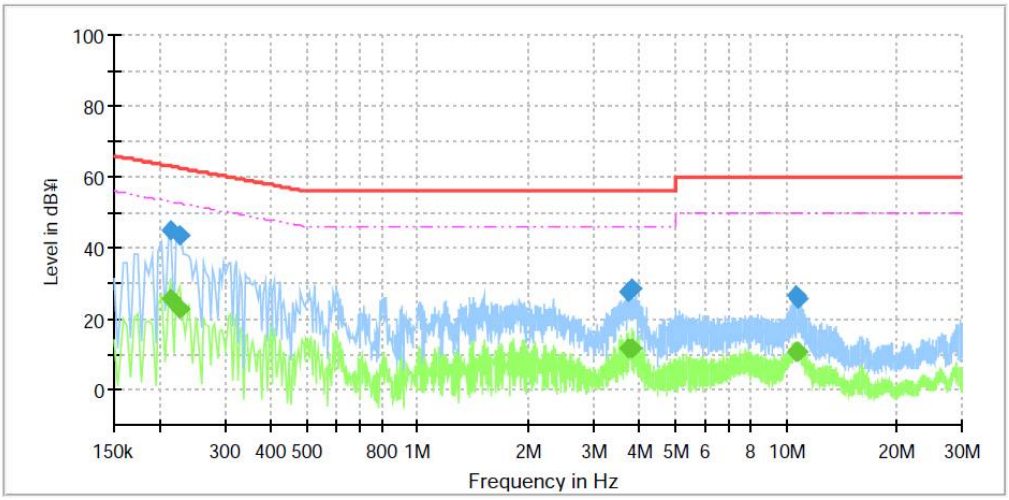
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.202000	---	15.20	53.53	38.33	1000.0	9.000	N	9.6
0.202000	37.25	---	63.53	26.28	1000.0	9.000	N	9.6
1.038000	---	4.77	46.00	41.23	1000.0	9.000	N	9.7
1.038000	22.22	---	56.00	33.78	1000.0	9.000	N	9.7
3.874000	---	2.38	46.00	43.62	1000.0	9.000	N	9.7
3.874000	21.94	---	56.00	34.06	1000.0	9.000	N	9.7
7.602000	---	3.44	50.00	46.56	1000.0	9.000	N	9.9
7.602000	23.24	---	60.00	36.76	1000.0	9.000	N	9.9
10.478000	---	9.16	50.00	40.84	1000.0	9.000	N	10.0
10.478000	22.01	---	60.00	37.99	1000.0	9.000	N	10.0

■ Charge Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ASM
Phase:	
Mode:	Charge_L1
Operator Name:	KES



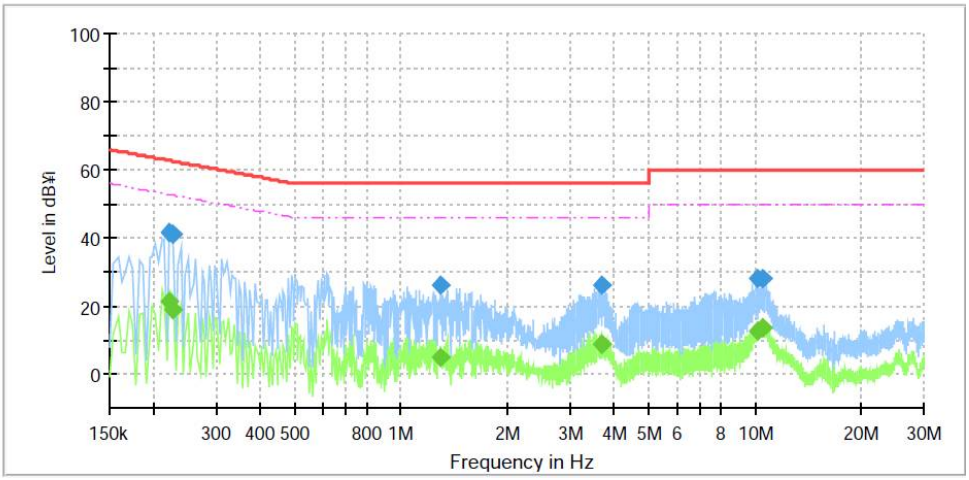
Final_Result

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.214000	---	25.48	53.05	27.57	1000.0	9.000	L1	9.7
0.214000	45.11	---	63.05	17.94	1000.0	9.000	L1	9.7
0.226000	---	22.77	52.60	29.83	1000.0	9.000	L1	9.7
0.226000	43.63	---	62.60	18.97	1000.0	9.000	L1	9.7
3.738000	---	11.51	46.00	34.49	1000.0	9.000	L1	9.8
3.738000	27.71	---	56.00	28.29	1000.0	9.000	L1	9.8
3.818000	---	11.62	46.00	34.38	1000.0	9.000	L1	9.8
3.818000	28.39	---	56.00	27.61	1000.0	9.000	L1	9.8
10.586000	---	10.86	50.00	39.14	1000.0	9.000	L1	10.0
10.586000	26.73	---	60.00	33.27	1000.0	9.000	L1	10.0
10.702000	---	10.75	50.00	39.25	1000.0	9.000	L1	10.0
10.702000	25.90	---	60.00	34.10	1000.0	9.000	L1	10.0

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ASM
Phase:	
Mode:	Charge_N
Operator Name:	KES



Final_Result

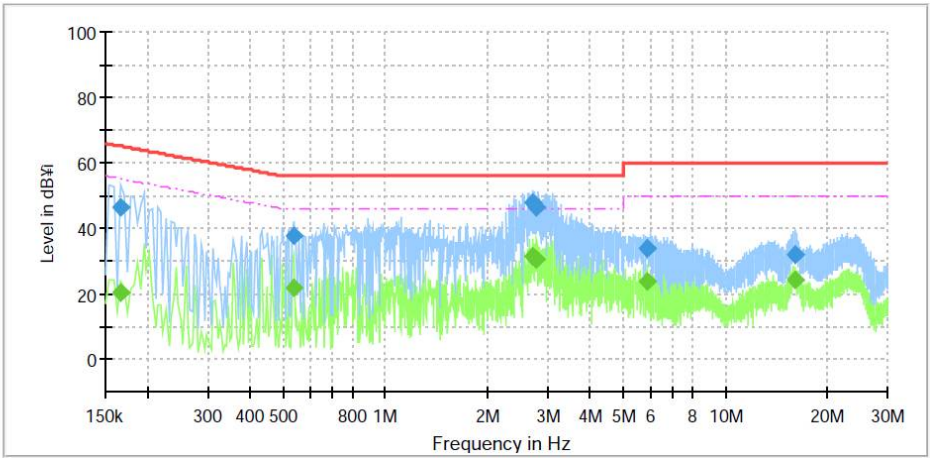
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.222000	---	21.25	52.74	31.49	1000.0	9.000	N	9.6
0.222000	41.64	---	62.74	21.10	1000.0	9.000	N	9.6
0.226000	---	18.97	52.60	33.63	1000.0	9.000	N	9.6
0.226000	41.04	---	62.60	21.56	1000.0	9.000	N	9.6
1.298000	---	4.74	46.00	41.26	1000.0	9.000	N	9.7
1.298000	26.17	---	56.00	29.83	1000.0	9.000	N	9.7
3.678000	---	8.76	46.00	37.24	1000.0	9.000	N	9.7
3.678000	26.11	---	56.00	29.89	1000.0	9.000	N	9.7
10.162000	---	12.56	50.00	37.44	1000.0	9.000	N	10.0
10.162000	28.21	---	60.00	31.79	1000.0	9.000	N	10.0
10.458000	---	13.41	50.00	36.59	1000.0	9.000	N	10.0
10.458000	28.04	---	60.00	31.96	1000.0	9.000	N	10.0

■ Data Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ASM
Phase:	
Mode:	Data_L1
Operator Name:	KES



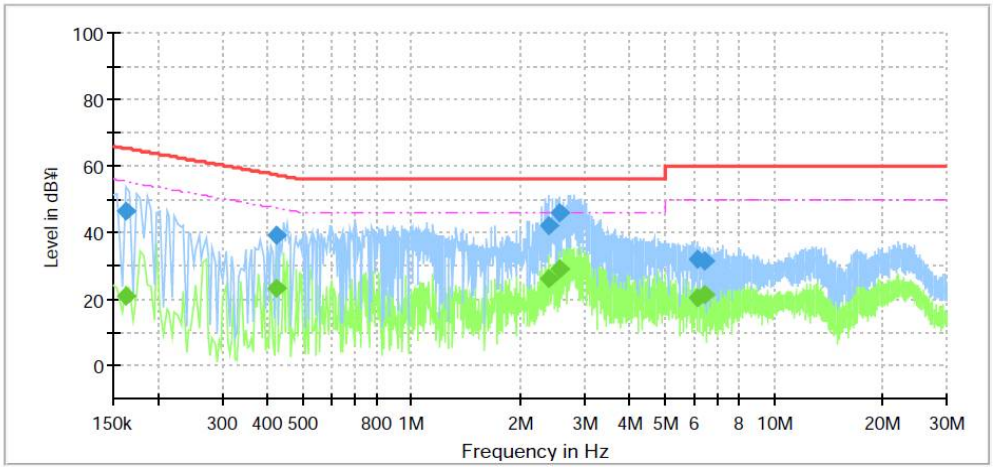
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.166000	---	20.60	55.16	34.56	1000.0	9.000	L1	19.5
0.166000	46.46	---	65.16	18.70	1000.0	9.000	L1	19.5
0.538000	---	22.02	46.00	23.98	1000.0	9.000	L1	19.9
0.538000	37.70	---	56.00	18.30	1000.0	9.000	L1	19.9
2.702000	---	31.58	46.00	14.42	1000.0	9.000	L1	20.2
2.702000	47.67	---	56.00	8.33	1000.0	9.000	L1	20.2
2.786000	---	30.43	46.00	15.57	1000.0	9.000	L1	20.2
2.786000	46.28	---	56.00	9.72	1000.0	9.000	L1	20.2
5.906000	---	23.63	50.00	26.37	1000.0	9.000	L1	19.7
5.906000	33.95	---	60.00	26.05	1000.0	9.000	L1	19.7
16.026000	---	24.34	50.00	25.66	1000.0	9.000	L1	20.3
16.026000	32.12	---	60.00	27.88	1000.0	9.000	L1	20.3

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	ASM
Phase:	
Mode:	Data_N
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.162000	---	20.84	55.36	34.52	1000.0	9.000	N	19.5
0.162000	46.61	---	65.36	18.75	1000.0	9.000	N	19.5
0.422000	---	23.29	47.41	24.12	1000.0	9.000	N	19.8
0.422000	39.10	---	57.41	18.31	1000.0	9.000	N	19.8
2.394000	---	26.12	46.00	19.88	1000.0	9.000	N	20.3
2.394000	42.11	---	56.00	13.89	1000.0	9.000	N	20.3
2.546000	---	29.20	46.00	16.80	1000.0	9.000	N	20.3
2.546000	45.77	---	56.00	10.23	1000.0	9.000	N	20.3
6.122000	---	20.58	50.00	29.42	1000.0	9.000	N	19.8
6.122000	31.86	---	60.00	28.14	1000.0	9.000	N	19.8
6.446000	---	21.44	50.00	28.56	1000.0	9.000	N	19.9
6.446000	31.35	---	60.00	28.65	1000.0	9.000	N	19.9

♦ 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))

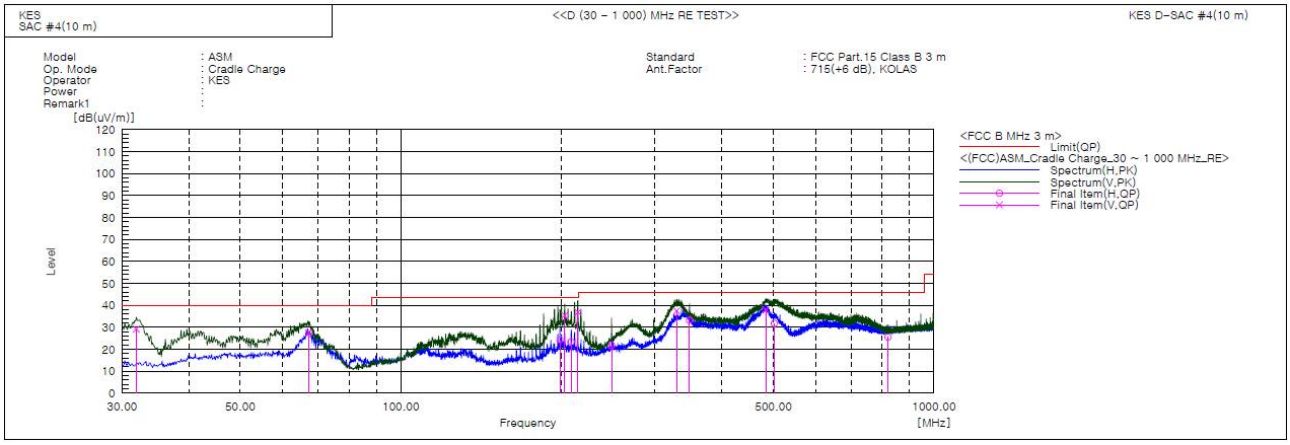
Uncertainty of measurement

HOT Line : Uncertainty of measurement 2.38 dB
(Confidence level: Approx. 95 %, *k*=2)

Neutral Line : Uncertainty of measurement 2.38 dB
(Confidence level: Approx. 95 %, *k*=2)

Radiated Electric Field Emissions(Below 1 ㎓)

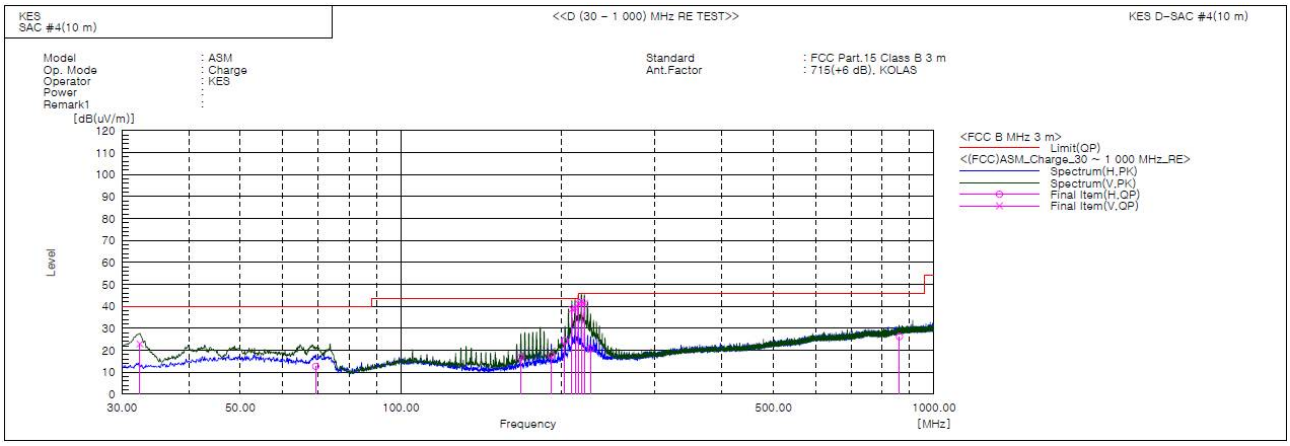
■ Cradle Charge Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	31.911	V	54.8	-25.6	29.2	40.0	10.8	100.0	359.0	
2	67.121	V	52.4	-24.8	27.6	40.0	12.4	100.0	39.0	
3	198.882	H	47.4	-23.0	24.4	43.5	19.1	377.0	109.0	
4	203.078	V	58.0	-22.6	35.4	43.5	8.1	100.0	110.0	
5	208.814	H	45.7	-22.3	23.4	43.5	20.1	382.0	10.0	
6	214.925	V	58.8	-21.9	36.9	43.5	6.6	100.0	317.0	
7	248.589	H	43.0	-21.2	21.8	46.0	24.2	371.0	173.0	
8	329.051	V	55.8	-18.3	37.5	46.0	8.5	135.0	344.0	
9	347.924	H	50.8	-17.6	33.2	46.0	12.8	377.0	281.0	
10	483.925	V	52.8	-14.9	37.9	46.0	8.1	100.0	277.0	
11	501.925	H	46.1	-14.3	31.8	46.0	14.2	372.0	169.0	
12	820.325	H	34.9	-9.4	25.5	46.0	20.5	378.0	165.0	

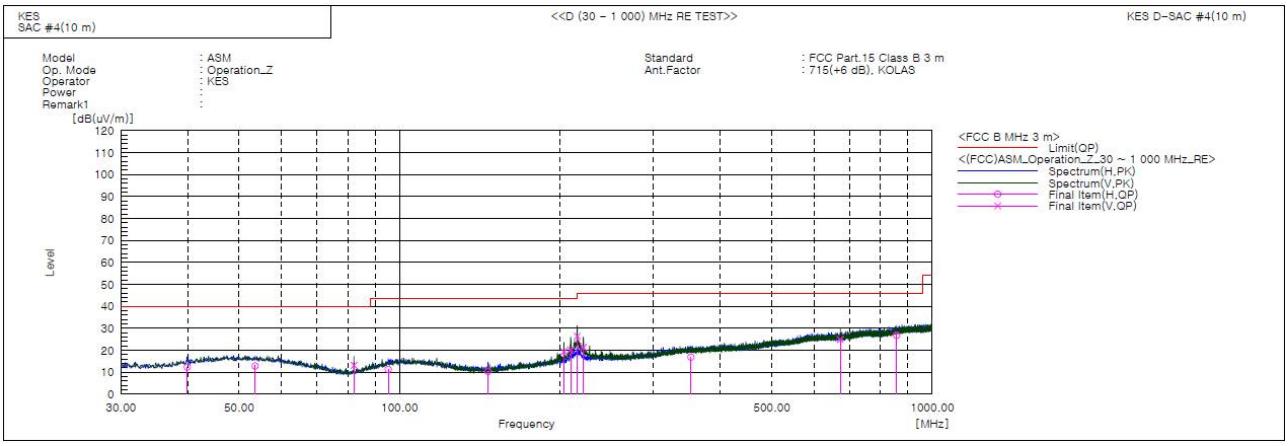
■ Charge Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	32.414	V	48.5	-25.6	22.9	40.0	17.1	100.0	39.0	
2	69.258	H	38.2	-25.5	12.7	40.0	27.3	392.0	11.0	
3	167.958	H	42.4	-25.5	16.9	43.5	26.6	388.0	277.0	
4	191.652	H	41.4	-23.7	17.7	43.5	25.8	365.0	301.0	
5	203.182	H	47.0	-22.6	24.4	43.5	19.1	358.0	297.0	
6	209.352	V	60.9	-22.2	38.7	43.5	4.8	100.0	46.0	
7	212.358	V	61.3	-22.1	39.2	43.5	4.3	100.0	23.0	
8	215.225	V	63.2	-21.9	41.3	43.5	2.2	100.0	59.0	
9	218.147	V	64.1	-21.8	42.3	46.0	3.7	100.0	26.0	
10	221.058	V	63.2	-21.7	41.5	46.0	4.5	100.0	261.0	
11	227.050	H	42.4	-21.5	20.9	46.0	25.1	361.0	345.0	
12	861.858	H	34.5	-8.3	26.2	46.0	19.8	381.0	198.0	

■ Operation Mode

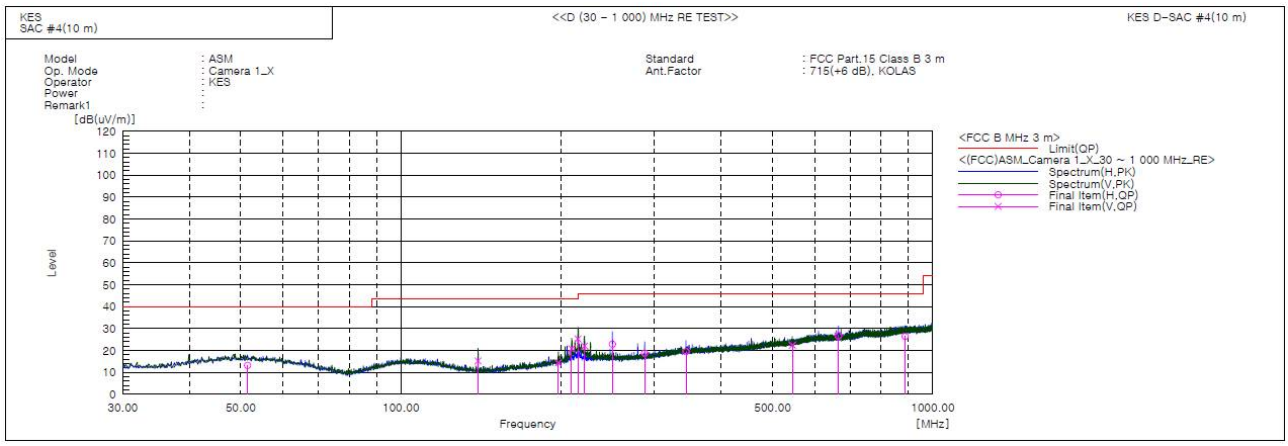


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	39.978	H	35.9	-23.5	12.4	40.0	27.6	358.0	114.0	
2	53.614	H	35.1	-22.2	12.9	40.0	27.1	392.0	30.0	
3	82.165	V	41.1	-28.0	13.1	40.0	26.9	134.0	114.0	
4	95.251	H	35.4	-24.1	11.3	43.5	32.2	368.0	98.0	
5	146.614	H	37.3	-26.9	10.4	43.5	33.1	366.0	218.0	
6	203.612	V	42.0	-22.6	19.4	43.5	24.1	100.0	11.0	
7	209.558	V	42.4	-22.2	20.2	43.5	23.3	100.0	354.0	
8	215.611	V	48.3	-21.9	26.4	43.5	17.1	100.0	35.0	
9	221.310	V	43.1	-21.7	21.4	46.0	24.6	100.0	15.0	
10	352.428	H	34.5	-17.6	16.9	46.0	29.1	354.0	91.0	
11	672.052	V	35.8	-10.9	24.9	46.0	21.1	100.0	186.0	
12	857.424	H	35.2	-8.4	26.8	46.0	19.2	367.0	161.0	

it was determined that Z orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in Z orientation.

■ Camera 1 Mode

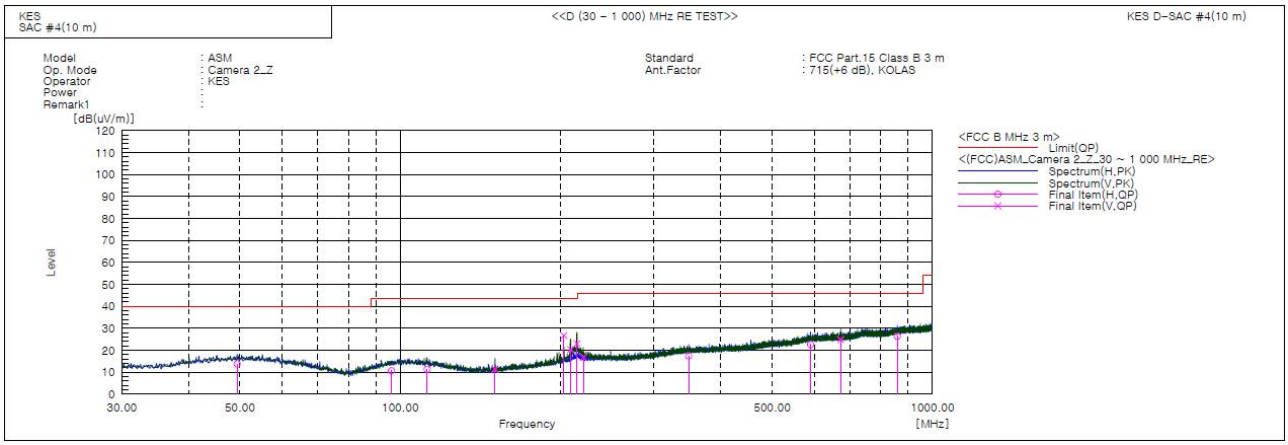


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	51.512	H	35.2	-22.0	13.2	40.0	26.8	361.0	253.0	
2	139.714	V	42.3	-27.0	15.3	43.5	28.2	100.0	257.0	
3	197.682	V	37.5	-23.1	14.4	43.5	29.1	100.0	355.0	
4	209.428	V	43.1	-22.2	20.9	43.5	22.6	100.0	55.0	
5	215.314	V	47.2	-21.9	25.3	43.5	18.2	100.0	55.0	
6	221.478	V	43.8	-21.7	22.1	46.0	23.9	100.0	11.0	
7	249.911	H	44.1	-21.2	22.9	46.0	23.1	388.0	280.0	
8	287.268	H	39.2	-20.4	18.8	46.0	27.2	382.0	257.0	
9	343.655	H	37.2	-17.7	19.5	46.0	26.5	366.0	284.0	
10	544.428	V	36.0	-13.6	22.4	46.0	23.6	100.0	67.0	
11	664.859	H	37.8	-11.0	26.8	46.0	19.2	382.0	288.0	
12	887.358	H	34.4	-7.9	26.5	46.0	19.5	352.0	48.0	

it was determined that X orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.

■ Camera 2 Mode

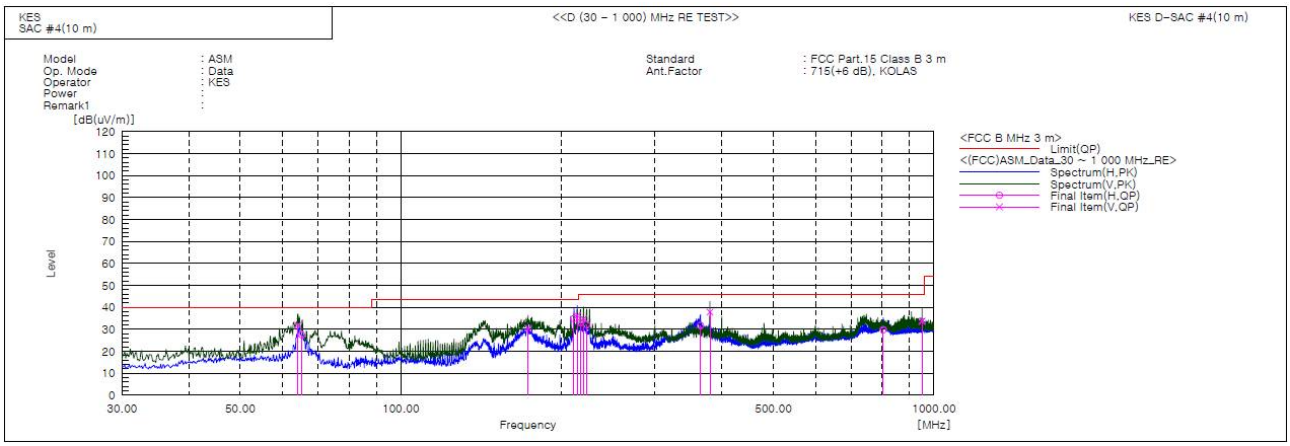


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	49.417	H	35.8	-22.0	13.8	40.0	26.2	392.0	23.0	
2	96.314	H	34.6	-23.9	10.7	43.5	32.8	392.0	286.0	
3	112.418	H	35.1	-23.7	11.4	43.5	32.1	352.0	203.0	
4	150.772	V	38.3	-26.9	11.4	43.5	32.1	100.0	143.0	
5	203.182	V	49.3	-22.6	26.7	43.5	16.8	100.0	63.0	
6	208.952	V	42.6	-22.2	20.4	43.5	23.1	100.0	115.0	
7	214.758	V	44.9	-21.9	23.0	43.5	20.5	100.0	28.0	
8	220.829	V	38.5	-21.7	16.8	46.0	29.2	100.0	281.0	
9	348.411	H	35.1	-17.6	17.5	46.0	28.5	392.0	310.0	
10	590.268	H	34.5	-11.8	22.7	46.0	23.3	388.0	59.0	
11	672.051	V	35.8	-10.9	24.9	46.0	21.1	133.0	194.0	
12	858.824	H	34.8	-8.4	26.4	46.0	19.6	399.0	154.0	

it was determined that Z orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in Z orientation.

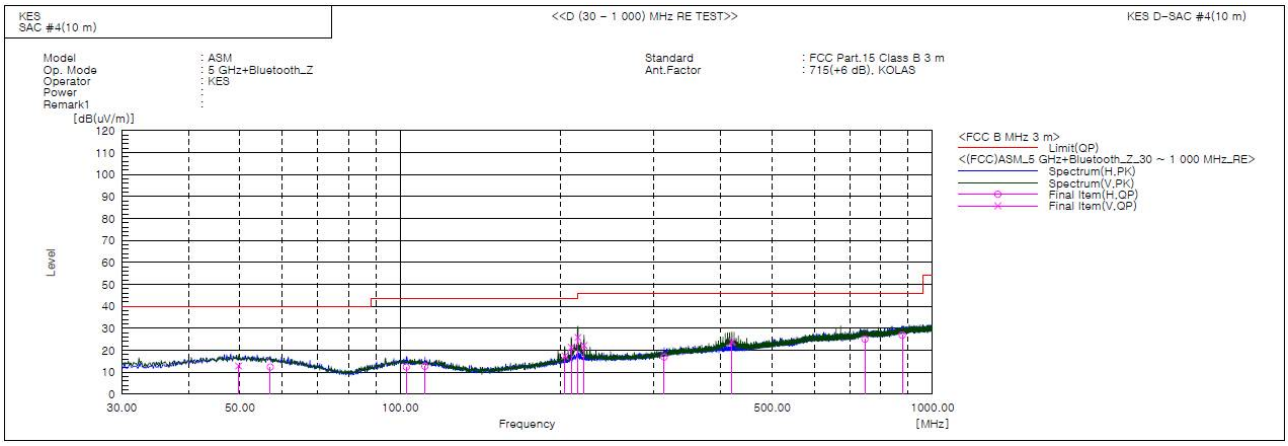
■ Data Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	64.102	V	55.9	-24.0	31.9	40.0	8.1	100.0	114.0	
2	65.152	H	51.8	-24.3	27.5	40.0	12.5	356.0	149.0	
3	173.325	V	55.7	-25.3	30.4	43.5	13.1	100.0	337.0	
4	211.258	H	57.0	-22.1	34.9	43.5	8.6	366.0	332.0	
5	214.321	V	58.2	-22.0	36.2	43.5	7.3	142.0	233.0	
6	217.328	H	54.9	-21.8	33.1	46.0	12.9	363.0	317.0	
7	220.109	V	56.5	-21.7	34.8	46.0	11.2	100.0	19.0	
8	223.141	H	53.8	-21.6	32.2	46.0	13.8	371.0	317.0	
9	364.871	H	49.2	-17.4	31.8	46.0	14.2	373.0	62.0	
10	380.027	V	55.0	-17.1	37.9	46.0	8.1	100.0	154.0	
11	803.424	H	39.5	-9.7	29.8	46.0	16.2	356.0	332.0	
12	950.017	V	41.4	-7.6	33.8	46.0	12.2	100.0	86.0	

■ 5 ㎓ + Bluetooth Mode

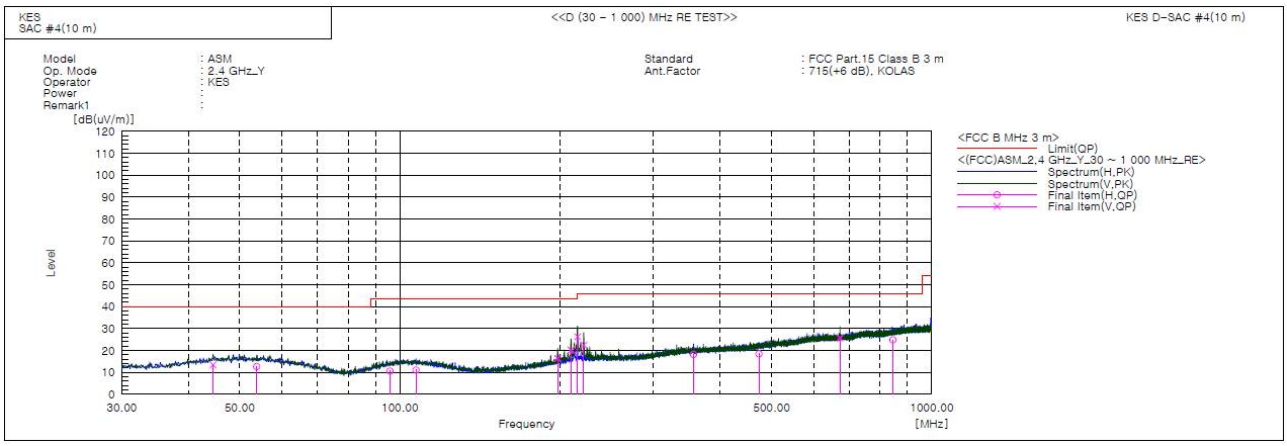


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	49.714	V	34.9	-22.0	12.9	40.0	27.1	141.0	48.0	
2	57.038	H	35.0	-22.6	12.4	40.0	27.6	389.0	313.0	
3	102.714	H	35.7	-23.3	12.4	43.5	31.1	366.0	68.0	
4	111.321	H	36.3	-23.6	12.7	43.5	30.8	300.0	211.0	
5	203.851	V	40.0	-22.6	17.4	43.5	26.1	100.0	349.0	
6	209.651	V	43.6	-22.2	21.4	43.5	22.1	100.0	8.0	
7	215.724	V	47.8	-21.9	25.9	43.5	17.6	100.0	238.0	
8	221.559	V	43.9	-21.7	22.2	46.0	23.8	100.0	36.0	
9	313.358	H	36.1	-19.2	16.9	46.0	29.1	374.0	186.0	
10	420.041	V	40.4	-16.5	23.9	46.0	22.1	100.0	71.0	
11	746.524	H	34.4	-9.3	25.1	46.0	20.9	371.0	154.0	
12	877.454	H	35.0	-8.1	26.9	46.0	19.1	362.0	357.0	

it was determined that Z orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in Z orientation.

■ 2.4 ㎓ Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	44.528	V	35.9	-22.5	13.4	40.0	26.6	100.0	59.0	
2	53.825	H	34.9	-22.2	12.7	40.0	27.3	368.0	95.0	
3	95.811	H	34.6	-24.0	10.6	43.5	32.9	371.0	297.0	
4	107.225	H	34.5	-23.4	11.1	43.5	32.4	392.0	222.0	
5	198.077	V	39.5	-23.1	16.4	43.5	27.1	100.0	119.0	
6	209.828	V	42.4	-22.2	20.2	43.5	23.3	100.0	119.0	
7	215.774	V	48.2	-21.9	26.3	43.5	17.2	100.0	306.0	
8	221.686	V	44.1	-21.7	22.4	46.0	23.6	100.0	75.0	
9	356.611	H	35.7	-17.5	18.2	46.0	27.8	398.0	138.0	
10	473.424	H	33.8	-15.3	18.5	46.0	27.5	383.0	281.0	
11	672.041	V	36.6	-10.9	25.7	46.0	20.3	100.0	294.0	
12	845.192	H	33.6	-8.7	24.9	46.0	21.1	382.0	150.0	

it was determined that Y orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in Y orientation.

♦ Calculation – SAC #4(10 m)
Result(QP) [㏈(㎶/m)] = (Reading(QP)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(QP)[㏈] = Limit[㏈(㎶/m)] - Result(QP) [㏈(㎶/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

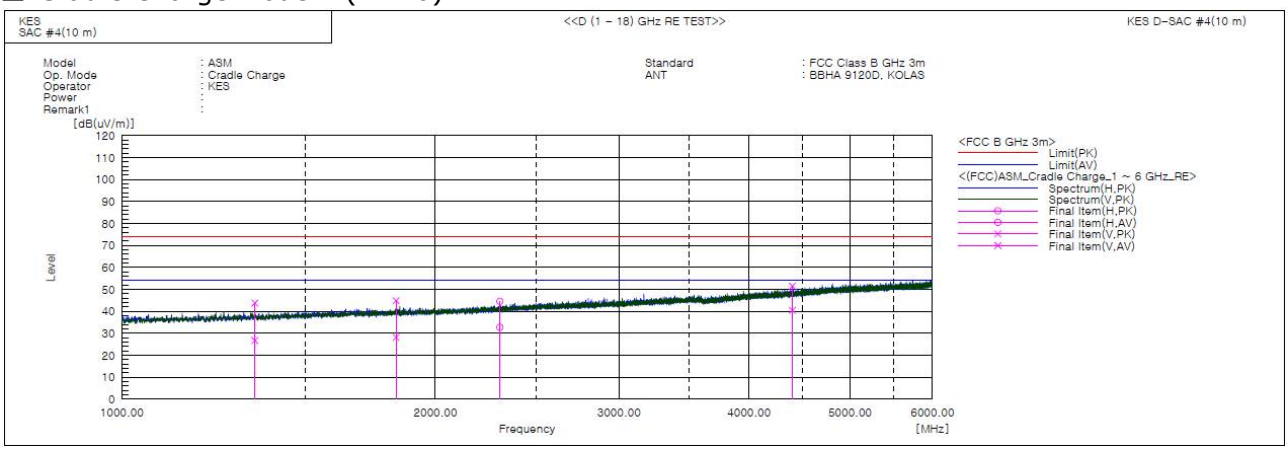
Uncertainty of measurement

Horizontal : Uncertainty of measurement 4.16 ㏈
(Confidence level: Approx. 95 %, *k*=2)

Vertical : Uncertainty of measurement 4.24 ㏈
(Confidence level: Approx. 95 %, *k*=2)

Radiated Electric Field Emissions(Above 1 ㎓)

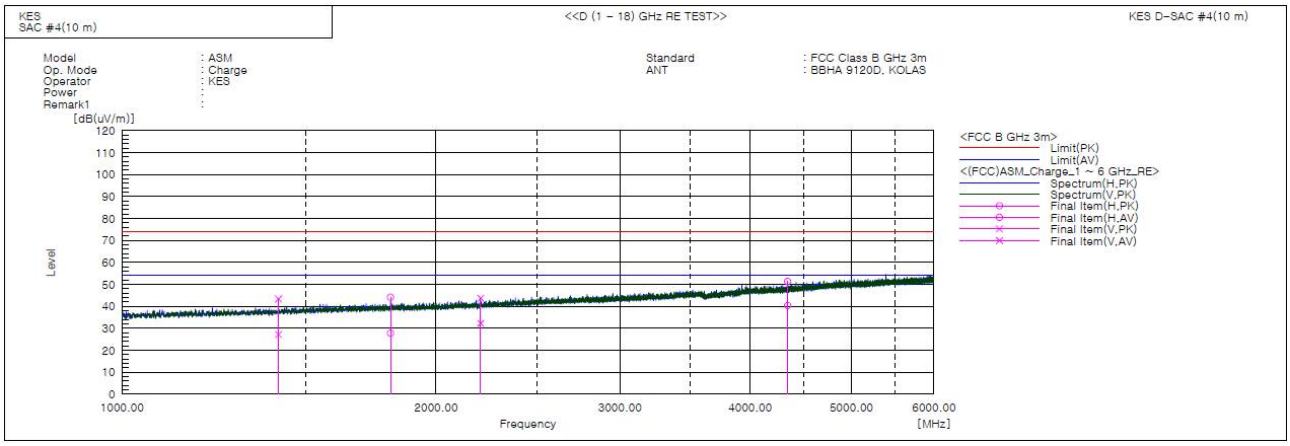
■ Cradle Charge Mode – (1 ~ 6) ㎓



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1341.580	V	47.7	30.7	-3.9	43.8	26.8	74.0	54.0	30.2	27.2	100.0	3.0	
2	1833.340	V	46.1	29.4	-1.2	44.9	28.2	74.0	54.0	29.1	25.8	100.0	322.0	
3	2306.350	H	43.7	31.9	0.9	44.6	32.8	74.0	54.0	29.4	21.2	324.0	55.0	
4	4402.620	V	42.3	31.3	9.2	51.5	40.5	74.0	54.0	22.5	13.5	100.0	294.0	

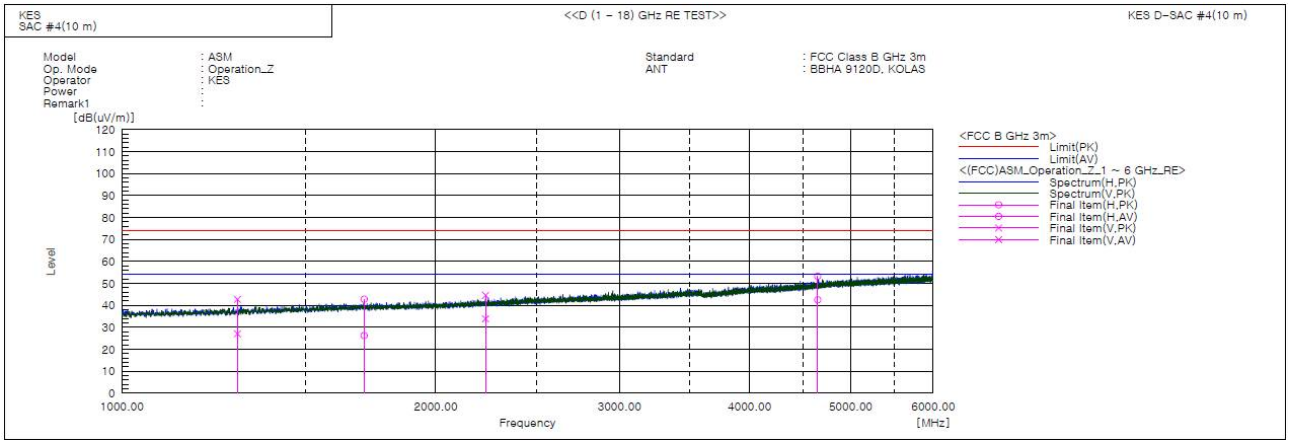
■ Charge Mode – (1 ~ 6) GHz



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1412.350	V	46.8	30.6	-3.4	43.4	27.2	74.0	54.0	30.6	26.8	100.0	333.0	
2	1808.650	H	45.5	29.1	-1.3	44.2	27.8	74.0	54.0	29.8	26.2	362.0	297.0	
3	2206.850	V	43.2	31.8	0.5	43.7	32.3	74.0	54.0	30.3	21.7	100.0	309.0	
4	4343.690	H	42.5	31.5	8.9	51.4	40.4	74.0	54.0	22.6	13.6	371.0	257.0	

■ Operation Mode – (1 ~ 6) GHz

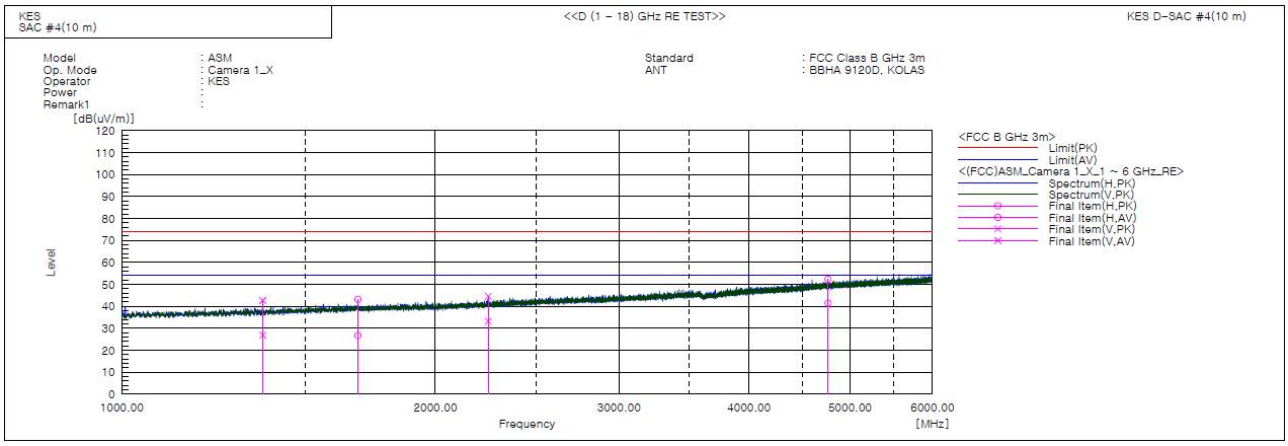


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1290.610	V	47.0	31.3	-4.2	42.8	27.1	74.0	54.0	31.2	26.9	100.0	5.0	
2	1707.480	H	44.6	28.1	-1.8	42.8	26.3	74.0	54.0	31.2	27.7	362.0	115.0	
3	2232.560	V	44.0	33.3	0.6	44.6	33.9	74.0	54.0	29.4	20.1	100.0	103.0	
4	4649.350	H	43.2	32.4	10.1	53.3	42.5	74.0	54.0	20.7	11.5	366.0	258.0	

it was determined that Z orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in Z orientation.

■ Camera 1 Mode – (1 ~ 6) GHz

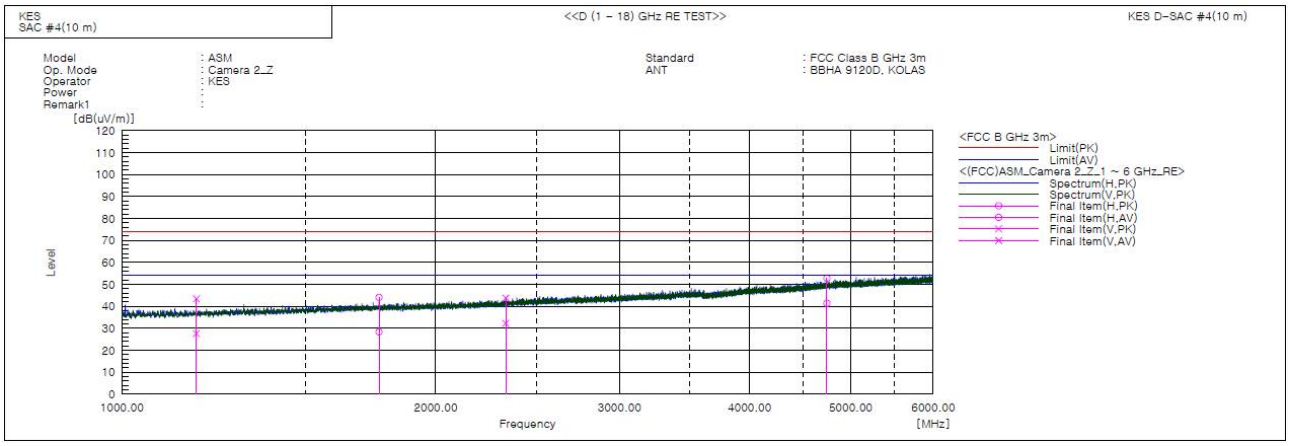


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1365.570	V	46.4	30.6	-3.7	42.7	26.9	74.0	54.0	31.3	27.1	100.0	42.0	
2	1685.180	H	45.1	28.6	-1.9	43.2	26.7	74.0	54.0	30.8	27.3	366.0	257.0	
3	2247.470	V	44.0	32.7	0.6	44.6	33.3	74.0	54.0	29.4	20.7	100.0	117.0	
4	4762.610	H	41.7	30.9	10.6	52.3	41.5	74.0	54.0	21.7	12.5	361.0	126.0	

it was determined that X orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.

■ Camera 2 Mode – (1 ~ 6) GHz

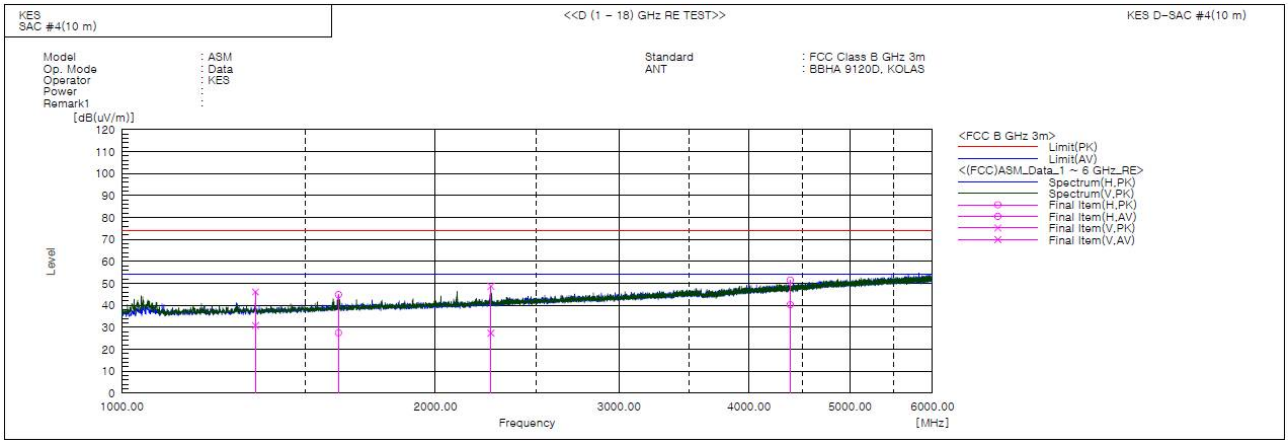


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1178.690	V	48.4	32.6	-5.0	43.4	27.6	74.0	54.0	30.6	26.4	100.0	7.0	
2	1764.390	H	45.6	29.9	-1.5	44.1	28.4	74.0	54.0	29.9	25.6	351.0	27.0	
3	2334.350	V	42.7	31.2	1.1	43.8	32.3	74.0	54.0	30.2	21.7	100.0	210.0	
4	4744.360	H	42.3	30.9	10.5	52.8	41.4	74.0	54.0	21.2	12.6	378.0	181.0	

it was determined that Z orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in Z orientation.

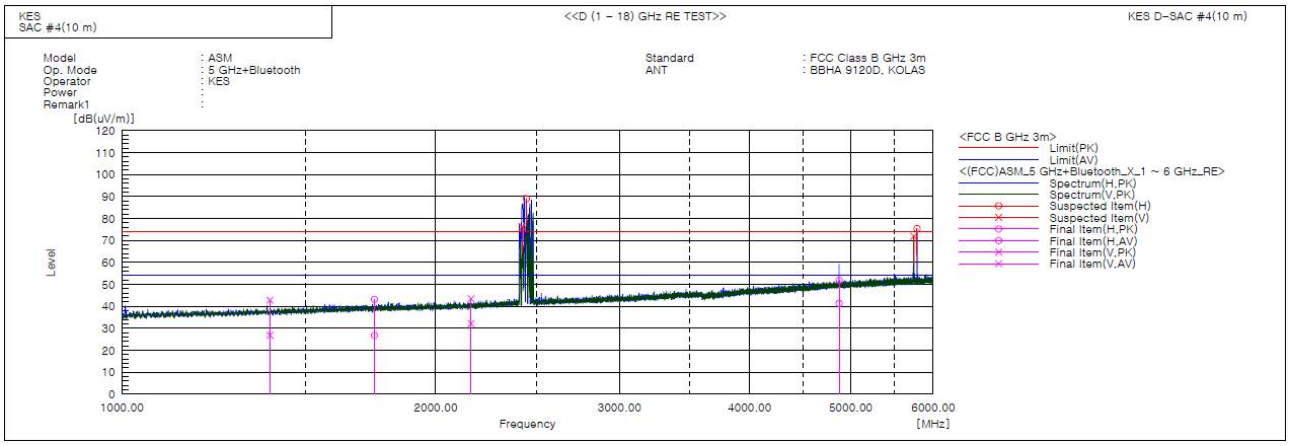
■ Data Mode – (1 ~ 6) GHz



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1343.710	V	50.0	34.7	-3.9	46.1	30.8	74.0	54.0	27.9	23.2	100.0	158.0	
2	1614.330	H	47.2	29.8	-2.3	44.9	27.5	74.0	54.0	29.1	26.5	366.0	62.0	
3	2261.280	V	48.0	26.7	0.7	48.7	27.4	74.0	54.0	25.3	26.6	100.0	305.0	
4	4381.830	H	42.4	31.2	9.1	51.5	40.3	74.0	54.0	22.5	13.7	371.0	130.0	

■ 5 GHz + Bluetooth Mode – (1 ~ 6) GHz

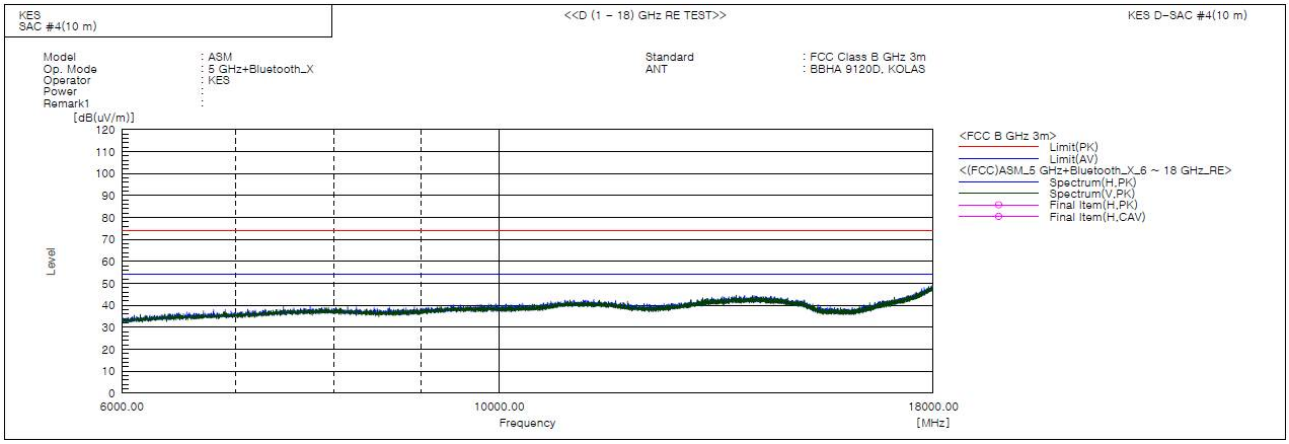


Final Result

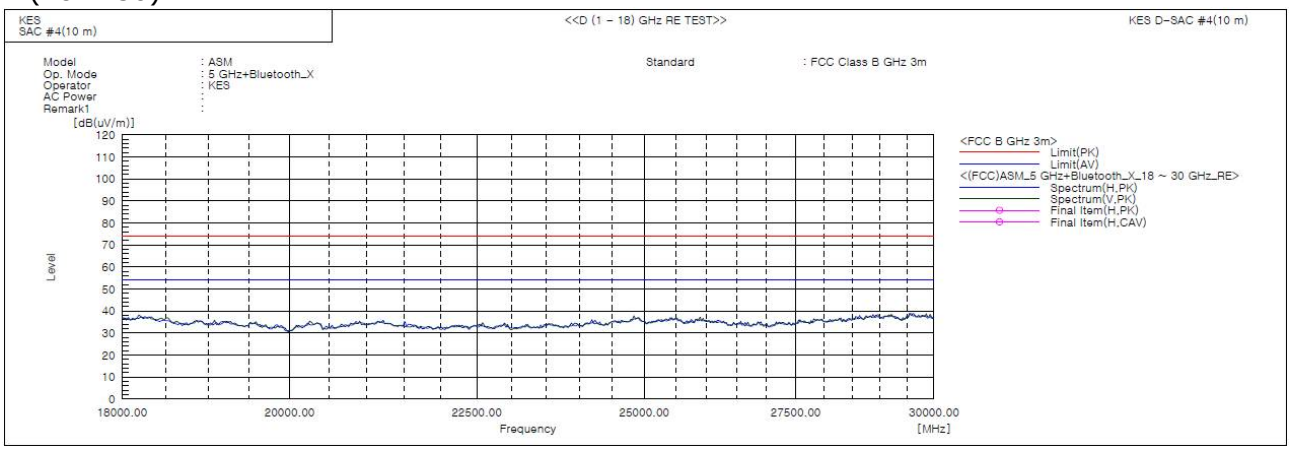
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1386.780	V	46.4	30.5	-3.6	42.8	26.9	74.0	54.0	31.2	27.1	100.0	126.0	
2	1746.770	H	44.8	28.4	-1.6	43.2	26.8	74.0	54.0	30.8	27.2	361.0	43.0	
3	2162.470	V	43.3	32.0	0.2	43.5	32.2	74.0	54.0	30.5	21.8	100.0	114.0	
4	4874.320	H	40.9	30.3	11.0	51.9	41.3	74.0	54.0	22.1	12.7	366.0	251.0	
5	2419.375	V	--------	--------	1.5	--------	--------	74.0	54.0	--------	--------	100.0	214.0	
6	2443.125	H	--------	--------	1.6	--------	--------	74.0	54.0	--------	--------	100.0	227.0	
7	5748.750	V	--------	--------	13.0	--------	--------	74.0	54.0	--------	--------	100.0	274.0	
8	5789.375	H	--------	--------	13.1	--------	--------	74.0	54.0	--------	--------	100.0	107.0	

* 5 GHz + Bluetooth Mode Exclusion Band
- Fundamental Frequency: 2.4 GHz, 5.7 GHz

- (6 ~ 18) GHz



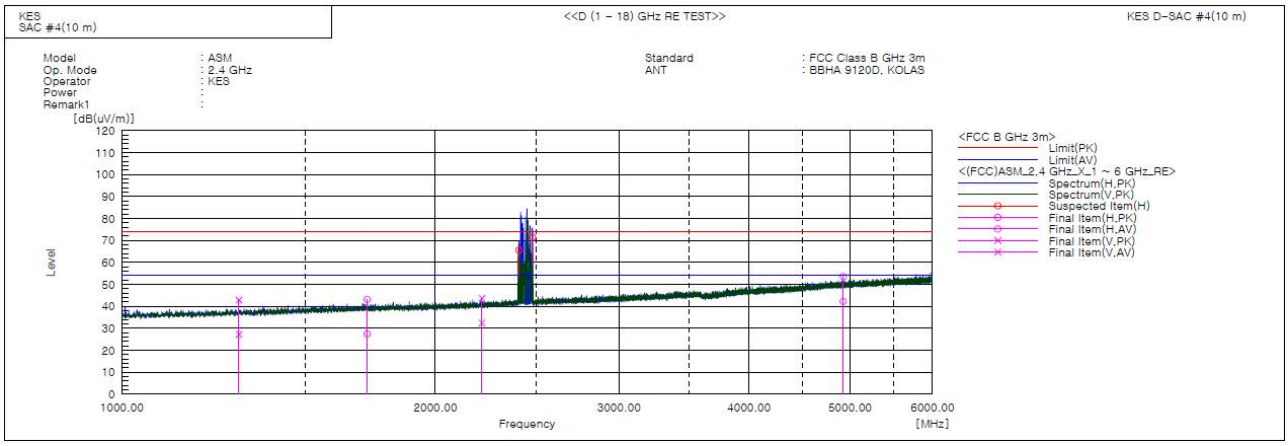
- (18 ~ 30) GHz



it was determined that X orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.

* No spurious emission were detected above 5 GHz.

■ 2.4 GHz Mode – (1 ~ 6) GHz

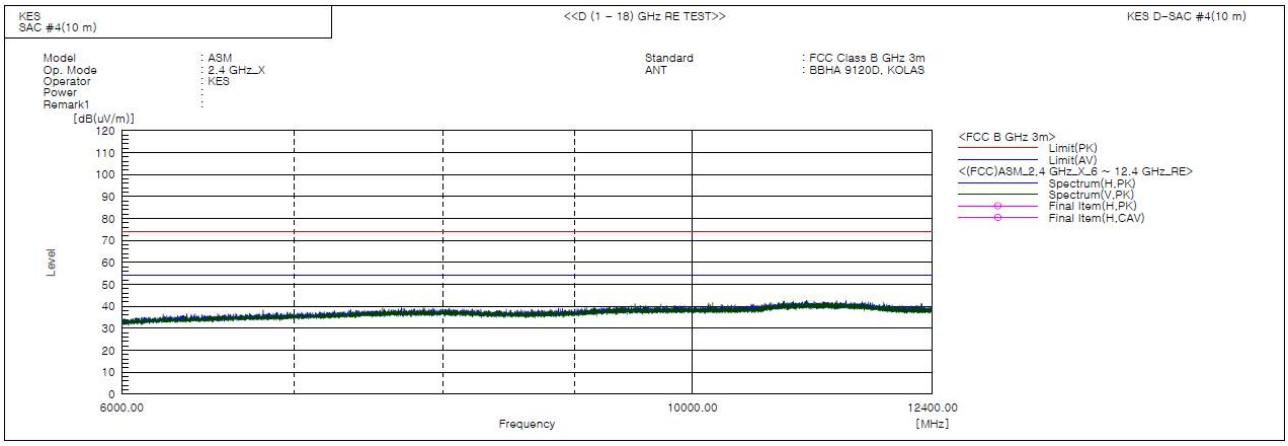


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1295.610	V	47.1	31.4	-4.2	42.9	27.2	74.0	54.0	31.1	26.8	100.0	202.0	
2	1720.110	H	44.9	29.2	-1.7	43.2	27.5	74.0	54.0	30.8	26.5	361.0	159.0	
3	2216.220	V	43.2	32.0	0.5	43.7	32.5	74.0	54.0	30.3	21.5	100.0	35.0	
4	4925.080	H	42.5	31.2	11.1	53.6	42.3	74.0	54.0	20.4	11.7	351.0	39.0	
5	2405.000	H	--------	--------	1.4	--------	--------	74.0	54.0	--------	--------	100.0	51.0	
6	2478.750	H	--------	--------	1.7	--------	--------	74.0	54.0	--------	--------	100.0	103.0	

* 2.4 GHz Mode Exclusion Band
- Fundamental Frequency: 2.4 GHz

– (6 ~ 12.4) ㎓



it was determined that X orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.

* No spurious emission were detected above 5 ㎓.

♦ Calculation – SAC #4(10 m)
Result(PK/CAV) [㏈(㎶/m)] = (Reading(PK/CAV)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(PK/CAV)[㏈] = Limit[㏈(㎶/m)] - Result(PK/CAV) [㏈(㎶/m)]
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss + ATT Factor - Preamp Factor), Margin: Marjin value

Uncertainty of measurement

Uncertainty of measurement 5.76 ㏈
(Confidence level: Approx. 95 %, *k*=2)