FLC TEST REPORT

Test Report No.	:	KES-EM-21T0263
Date of Issue	:	Apr. 19, 2021
Product name	:	Cam.G Plus
Model/Type No.	:	CAMG1000
Variant Mode	:	-
Applicant	:	CPD GROUP
Applicant Address	:	Incheon IT Tower-1211, 229, Gyeongin-ro, Michuhol-gu, Incheon, Republic of Korea.
Manufacturer	:	CPD GROUP
Manufacturer Address	:	Incheon IT Tower-1211, 229, Gyeongin-ro, Michuhol-gu, Incheon, Republic of Korea.
FCC ID	:	2AYXV-CAGM1000
Date of Receipt	:	Mar. 29, 2021
Test date	:	Mar. 31, 2021 ~ Apr. 01, 2021
Test Results	:	☒ In Compliance ☐ Not in Compliance

Tested by

Dae Hyun, Kim
EMC Test Engineer

Reviewed by

Dong Hun, Jang
EMC Technical Manager

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Apr. 19, 2021	KES-EM-21T0263	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Item	Details
Operation Frequency	Bluetooth 2.4 ㎓
WEIGHT / SIZE	220 g / (100 * 100 * 4.5) mm
POWER SPECIFICATION	DC 5 V, 0.8 A
CHARGER TYPE	USB 'C' type
CHARGING TIME	7 hour
BATTERY CAPACITY	3500 ㎃h
VOLUME	85 ㏈ ~ 95 ㏈
LED BRIGHTNESS AND USING TIME	1- 150 Lm 10hour / 2 - 2 00 Lm 7hour / 3 - 2 50l Lm 5hour
DETECTION RANG OF	5 m
ULTRASONIC WAVES	17.4 ㎑ anti-mosquito
BLUTOOTH	4.0 distance of communication- 10 m

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 ㎐(CHARGE MODE) ☒ 3.6 V, 3500 ㎃h(OPERATION MODE)

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
Cam.G Plus	CAMG1000	-	CPD GROUP	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
SMARTPHONE	SM-G977N	-	Samsung Electronics	-
ADAPTER	MCS-02KR2	RA710037503	Weihai Sunlin Electronics Co.,Ltd	-

1.6 External I/O Cabling

■ CHARGE MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Cam.G Plus (EUT)	USB TYPE-C	ADAPTER	USB TYPE-C	1.2	U

* Unshielded = U, Shielded = S

■ OPERATION MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Cam.G Plus (EUT)	Wireless	SMARTPHONE	Wireless	-	-

* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

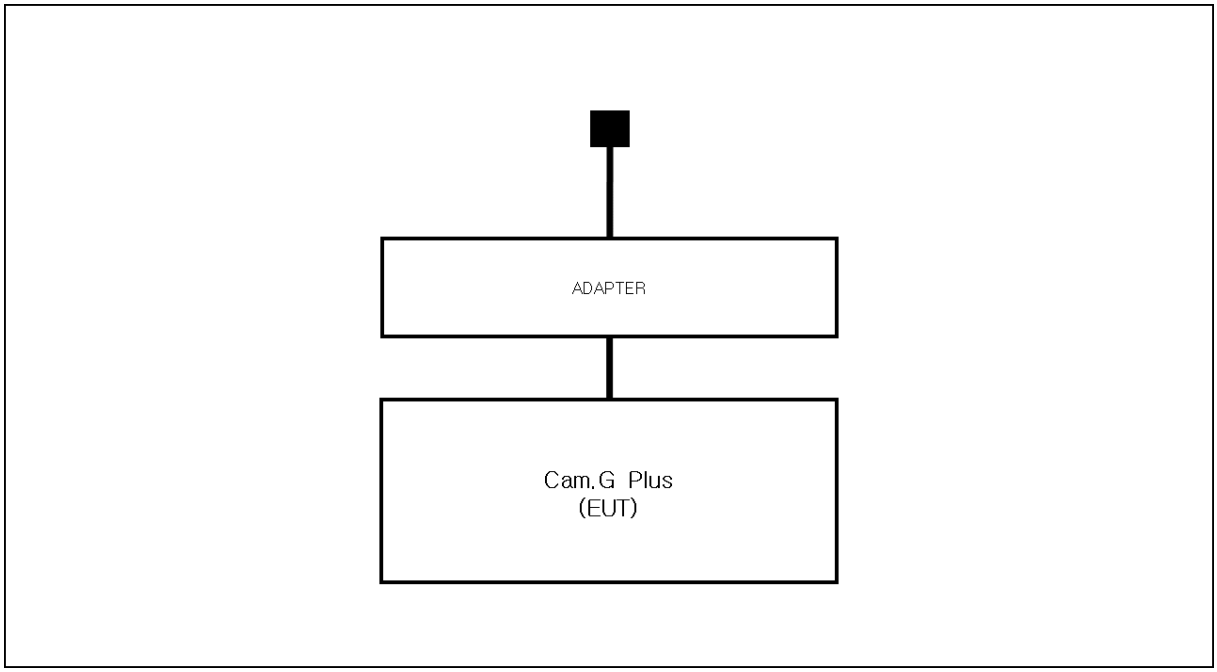
Test mode	operating
CHARGE	Confirmed the charge of the EUT through Led of the EUT.
OPERATION	Confirmed the operation of the EUT through 'Cam.G' Applications of the SMARTPHONE.

EUT Test operating S/W		
Name	Version	Manufacture Company
Cam.G	2.1.1	-

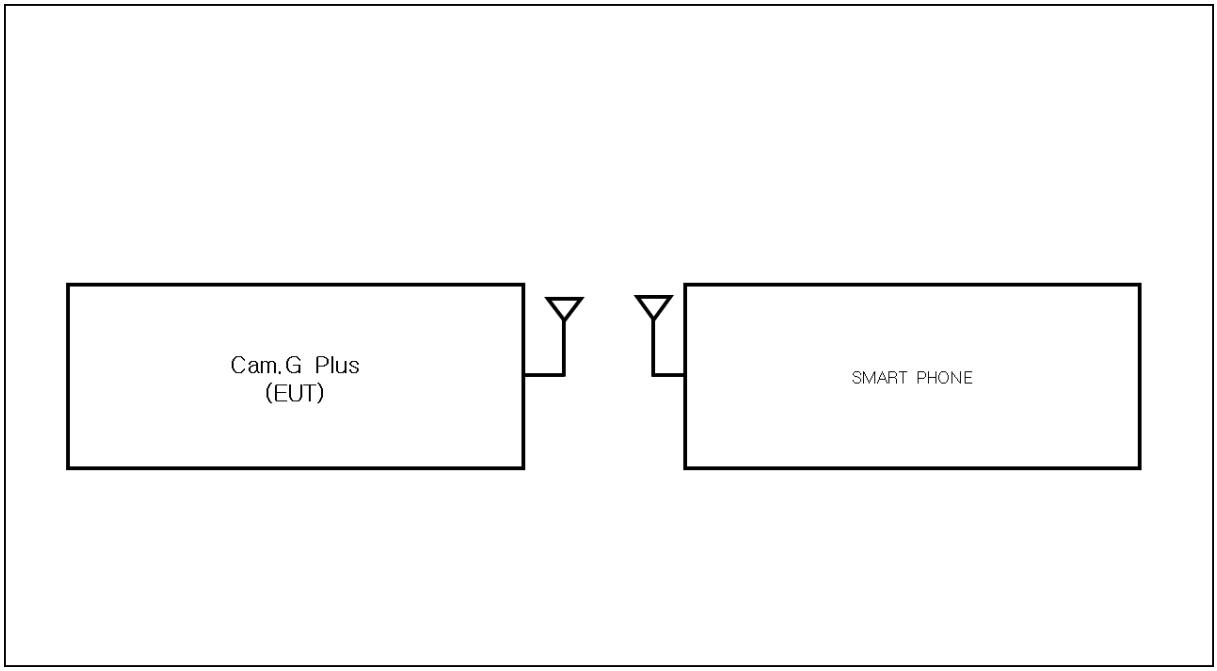
1.8 Configuration

■ AC Main
□ DC Main

■ CHARGE MODE



■ OPERATION 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 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 ㎑ to 30 ㎒. 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㎓ at 10 m or 3 m distance and a Peak and Average detector above 1 ㎓ 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-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	TÜ V SÜ D	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 0004

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
Mar. 31, 2021

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	101783	01, 15, 2022	1 Year
☒	LISN	ENV216	R & S	101787	12, 29, 2021	1 Year
☐	LISN	ESH2-Z5	R & S	100450	12, 29, 2021	1 Year
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021	1 Year

Test Conditions
Temperature: (24,1 ± 0,1) ℃
Relative Humidity: (45,8 ± 0,1) % 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
Apr. 01, 2021

Test Location
☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.120	-	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	04, 01, 2022	1 Year
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 11, 2022	2 Year
☒	ATTENUATOR	6806.17.A	HUBER+SUHNER	-	11, 03, 2021	1 Year
☒	AMPLIFIER	310N	SONOMA INSTRUMENT	401123	06, 08, 2021	1 Year

Test Conditions
Temperature: (23,9 ± 0,1) ℃
Relative Humidity: (44,8 ± 0,2) % 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.

2.3 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Apr. 01, 2021

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, 01, 2022	1 Year
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	12, 29, 2021	1 Year
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 14, 2021	1 Year

Test Conditions
Temperature: (23,9 ± 0,2) ℃
Relative Humidity: (44,8 ± 0,3) % R.H.

Frequency Range of Measurement
1 ㎓ to 12,4 ㎓

Instrument Settings
IF Band Width: 1 ㎒

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

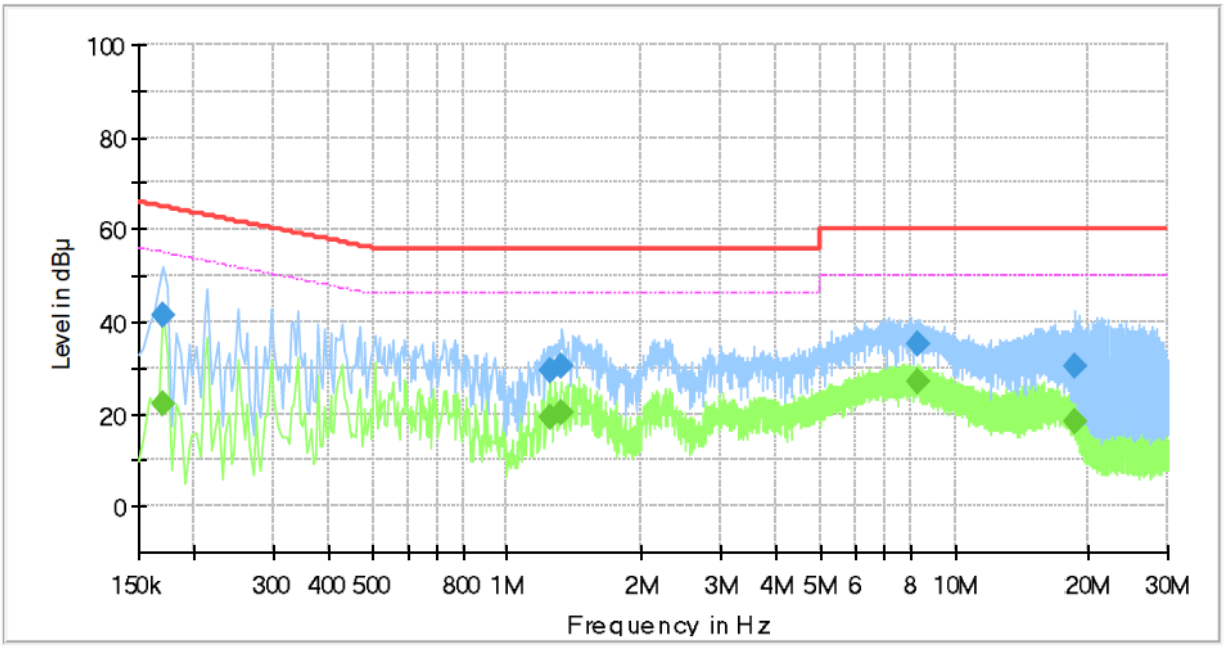
Conducted Emissions at Mains Power Ports

■ CHARGE MODE

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	CAMG1000
Phase:	
Mode:	CHARGE
Operator Name:	KES



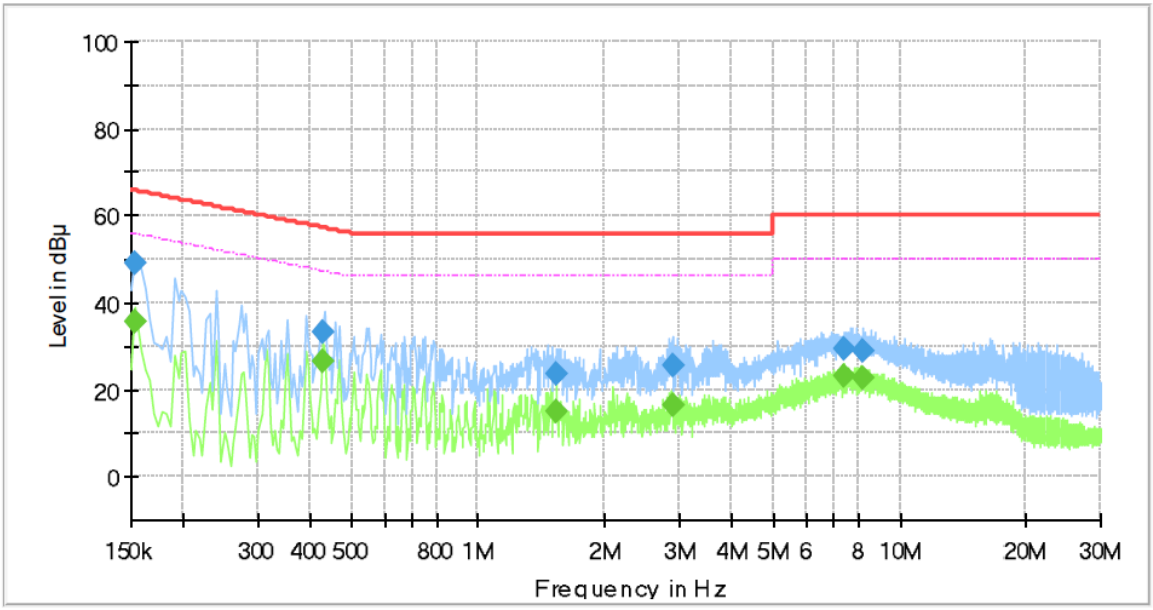
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	22.26	54.96	32.70	1000.0	9.000	L1	19.8
0.170000	41.17	---	64.96	23.79	1000.0	9.000	L1	19.8
1.242000	---	19.36	46.00	26.64	1000.0	9.000	L1	20.4
1.242000	29.40	---	56.00	26.60	1000.0	9.000	L1	20.4
1.326000	---	20.41	46.00	25.59	1000.0	9.000	L1	20.4
1.326000	30.20	---	56.00	25.80	1000.0	9.000	L1	20.4
8.318000	---	26.88	50.00	23.12	1000.0	9.000	L1	20.2
8.318000	34.99	---	60.00	25.01	1000.0	9.000	L1	20.2
18.602000	---	18.22	50.00	31.78	1000.0	9.000	L1	20.9
18.602000	30.48	---	60.00	29.52	1000.0	9.000	L1	20.9

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	CAMG1000
Phase:	
Mode:	CHARGE
Operator Name:	KES



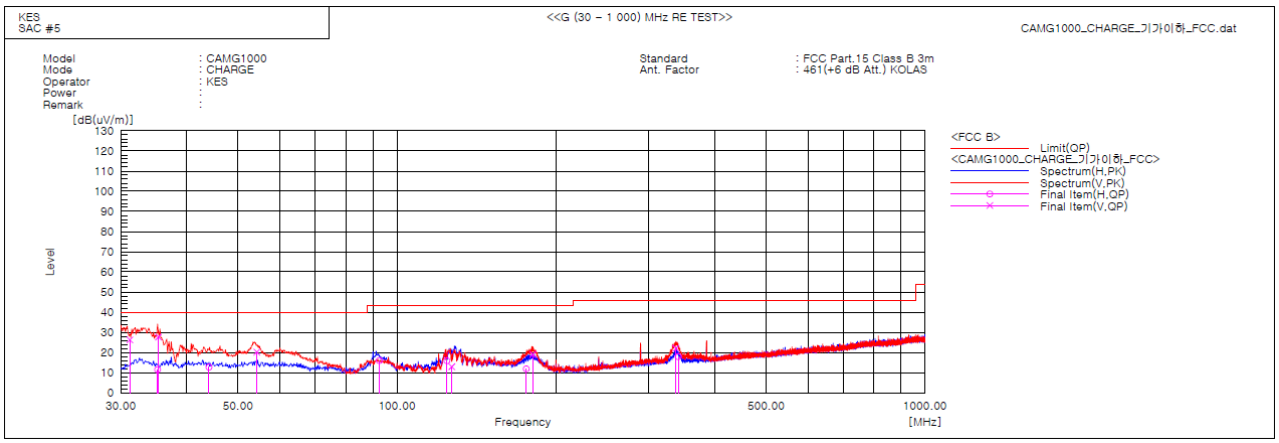
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.154000	---	35.65	55.78	20.13	1000.0	9.000	N	19.7
0.154000	48.89	---	65.78	16.89	1000.0	9.000	N	19.7
0.430000	---	26.29	47.25	20.96	1000.0	9.000	N	19.9
0.430000	33.39	---	57.25	23.86	1000.0	9.000	N	19.9
1.534000	---	15.01	46.00	30.99	1000.0	9.000	N	20.4
1.534000	23.78	---	56.00	32.22	1000.0	9.000	N	20.4
2.886000	---	16.50	46.00	29.50	1000.0	9.000	N	20.4
2.886000	25.64	---	56.00	30.36	1000.0	9.000	N	20.4
7.398000	---	23.15	50.00	26.85	1000.0	9.000	N	20.0
7.398000	29.45	---	60.00	30.55	1000.0	9.000	N	20.0
8.202000	---	22.69	50.00	27.31	1000.0	9.000	N	20.2
8.202000	28.82	---	60.00	31.18	1000.0	9.000	N	20.2

♦ 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)

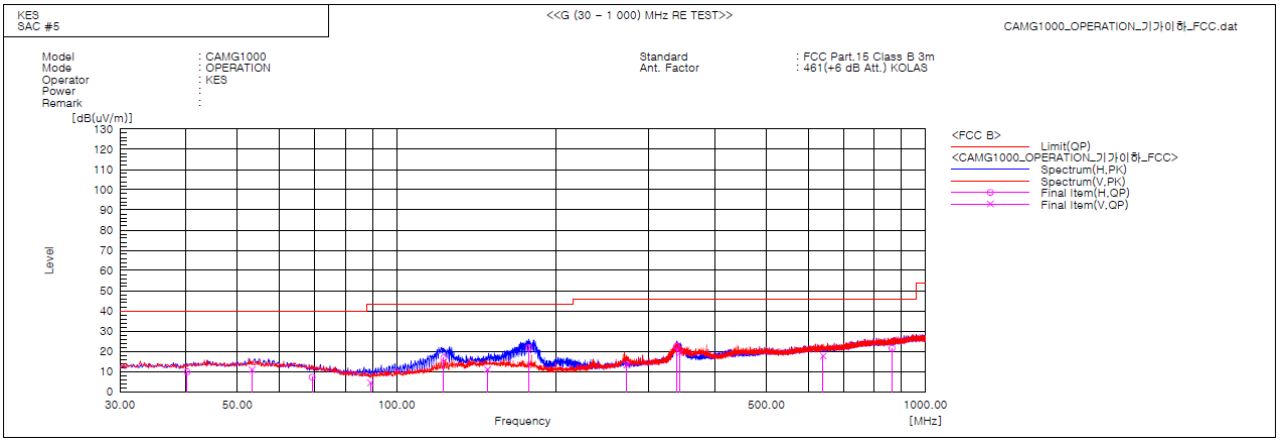
■ CHARGE MODE



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	31.213	V	40.2	-13.9	26.3	40.0	13.7	148.0	27.9	
2	35.214	H	25.3	-13.8	11.5	40.0	28.5	400.0	240.1	
3	35.335	V	41.5	-13.8	27.7	40.0	12.3	100.0	191.3	
4	44.065	H	25.6	-12.9	12.7	40.0	27.3	231.0	324.3	
5	54.250	V	32.8	-12.6	20.2	40.0	19.8	103.0	148.9	
6	92.565	H	34.2	-18.2	16.0	43.5	27.5	400.0	336.4	
7	124.333	H	30.7	-14.8	15.9	43.5	27.6	396.0	355.3	
8	127.035	V	27.5	-14.5	13.0	43.5	30.5	146.0	99.8	
9	175.743	H	25.9	-14.0	11.9	43.5	31.6	163.0	105.7	
10	180.714	V	33.5	-14.5	19.0	43.5	24.5	100.0	358.3	
11	337.248	V	33.5	-11.4	22.1	46.0	23.9	100.0	1.4	
12	340.885	H	29.2	-11.3	17.9	46.0	28.1	400.0	269.9	

■ OPERATION MODE



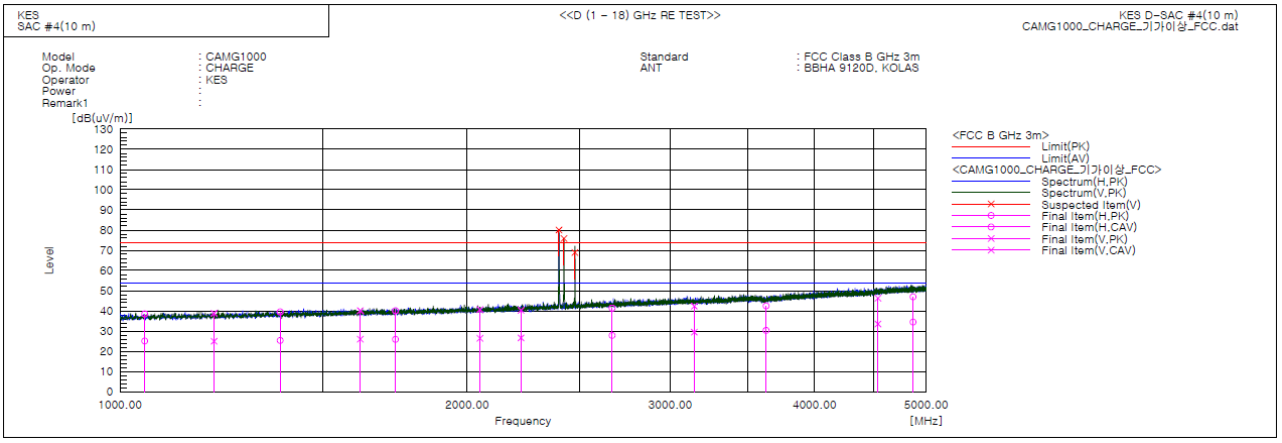
Final Result

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	40.185	H	22.9	-13.1	9.8	40.0	30.2	223.0	1.7	
2	53.283	V	23.5	-12.6	10.9	40.0	29.1	149.0	280.7	
3	69.285	H	21.6	-14.4	7.2	40.0	32.8	400.0	168.0	
4	89.291	V	22.6	-18.2	4.4	43.5	39.1	100.0	322.4	
5	122.753	H	31.7	-15.0	16.7	43.5	26.8	389.0	14.7	
6	148.583	V	23.4	-12.4	11.0	43.5	32.5	100.0	358.0	
7	178.046	H	36.1	-14.2	21.9	43.5	21.6	388.0	1.7	
8	272.379	V	26.0	-12.8	13.2	46.0	32.8	100.0	166.3	
9	338.460	H	33.8	-11.3	22.5	46.0	23.5	400.0	118.0	
10	343.310	V	30.5	-11.2	19.3	46.0	26.7	149.0	21.1	
11	640.494	V	22.3	-4.6	17.7	46.0	28.3	100.0	352.0	
12	864.079	H	22.3	-0.8	21.5	46.0	24.5	396.0	114.2	

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

■ CHARGE MODE



Final Result

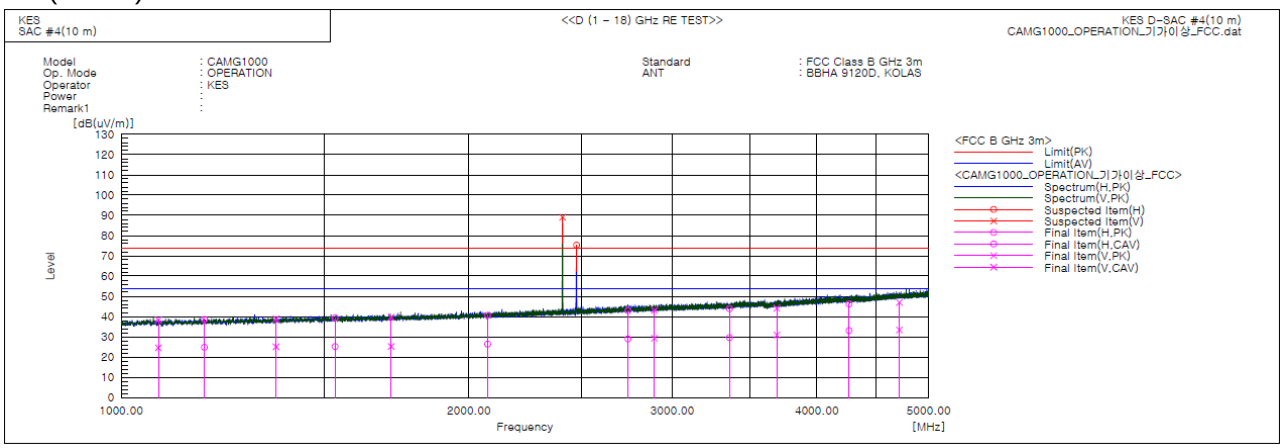
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1050.632	H	43.6	30.2	-5.1	38.5	25.1	74.0	54.0	35.5	28.9	382.0	13.0	
2	1206.443	V	43.1	29.2	-4.2	38.9	25.0	74.0	54.0	35.1	29.0	100.0	120.0	
3	1376.543	H	42.7	28.6	-3.2	39.5	25.4	74.0	54.0	34.5	28.6	391.0	262.0	
4	1615.443	V	42.1	27.9	-1.9	40.2	26.0	74.0	54.0	33.8	28.0	104.0	147.0	
5	1732.979	H	41.5	27.3	-1.4	40.1	25.9	74.0	54.0	33.9	28.1	400.0	247.0	
6	2051.035	V	40.7	26.5	0.0	40.7	26.5	74.0	54.0	33.3	27.5	232.0	120.0	
7	2226.043	V	39.5	25.8	0.9	40.4	26.7	74.0	54.0	33.6	27.3	100.0	124.0	
8	2670.677	H	38.4	24.9	3.0	41.4	27.9	74.0	54.0	32.6	26.1	100.0	211.0	
9	3145.827	V	37.5	24.6	4.9	42.4	29.5	74.0	54.0	31.6	24.5	100.0	109.0	
10	3632.005	H	36.1	23.9	6.4	42.5	30.3	74.0	54.0	31.5	23.7	400.0	349.0	
11	4540.052	V	35.8	23.1	10.5	46.3	33.6	74.0	54.0	27.7	20.4	100.0	124.0	
12	4869.993	H	35.2	22.7	11.8	47.0	34.5	74.0	54.0	27.0	19.5	219.0	336.0	
13	2402.000	V	--------	--------	1.9	--------	--------	74.0	54.0	--------	--------	150.0	139.0	
14	2426.000	V	--------	--------	2.0	--------	--------	74.0	54.0	--------	--------	100.0	189.0	
15	2479.000	V	--------	--------	2.2	--------	--------	74.0	54.0	--------	--------	100.0	105.0	

* Exclusion bands

- Fundamental Frequency: 2.4 ㎓

■ OPERATION MODE

- (1 ~ 6) GHz



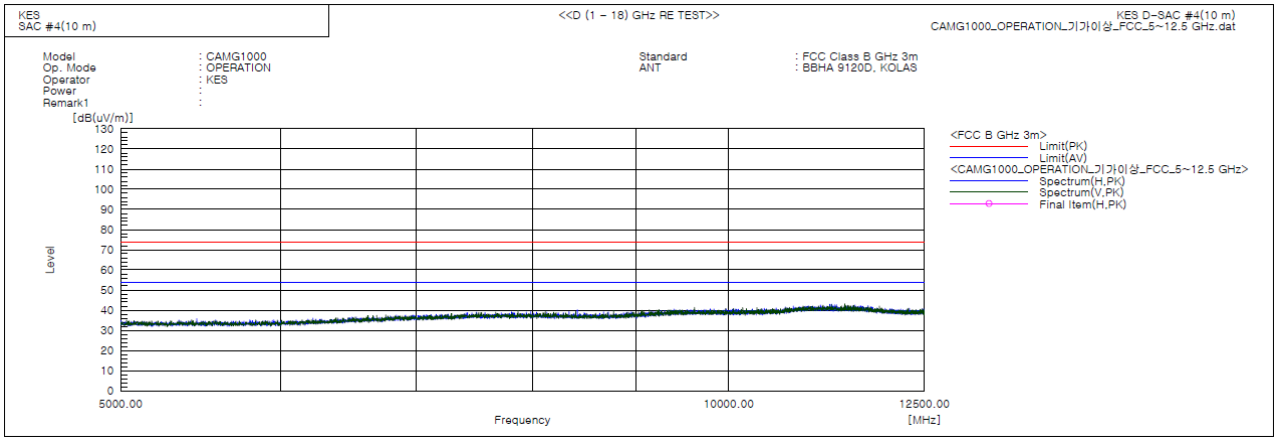
Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1076.632	V	43.4	29.6	-5.0	38.4	24.6	74.0	54.0	35.6	29.4	100.0	25.0	
2	1180.362	H	42.9	29.1	-4.3	38.6	24.8	74.0	54.0	35.4	29.2	396.0	340.0	
3	1361.327	V	42.1	28.3	-3.2	38.9	25.1	74.0	54.0	35.1	28.9	100.0	183.0	
4	1531.537	H	41.7	27.5	-2.3	39.4	25.2	74.0	54.0	34.6	28.8	400.0	225.0	
5	1712.275	V	41.2	26.8	-1.5	39.7	25.3	74.0	54.0	34.3	28.7	103.0	121.0	
6	2076.074	H	40.5	26.3	0.1	40.6	26.4	74.0	54.0	33.4	27.6	391.0	152.0	
7	2745.274	H	39.6	25.7	3.3	42.9	29.0	74.0	54.0	31.1	25.0	400.0	31.0	
8	2894.000	V	39.1	25.3	4.0	43.1	29.3	74.0	54.0	30.9	24.7	100.0	145.0	
9	3362.108	H	38.4	24.1	5.5	43.9	29.6	74.0	54.0	30.1	24.4	271.0	266.0	
10	3694.046	V	37.3	24.1	6.8	44.1	30.9	74.0	54.0	29.9	23.1	100.0	272.0	
11	4266.745	H	36.8	23.7	9.4	46.2	33.1	74.0	54.0	27.8	20.9	400.0	12.0	
12	4715.955	V	35.7	22.1	11.3	47.0	33.4	74.0	54.0	27.0	20.6	100.0	6.0	
13	2410.000	V	--------	--------	1.9	--------	--------	74.0	54.0	--------	--------	100.0	102.0	
14	2478.000	H	--------	--------	2.2	--------	--------	74.0	54.0	--------	--------	200.0	86.0	

* Exclusion bands

- Fundamental Frequency: 2.4 GHz

- (6 ~ 12.4) ㎓



* No spurious emission were detected above 6 ㎓.

♦ Calculation

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

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