FCC TEST REPORT

Reference No. : **G-44-2015-02935**

Applicant : **VARRAM SYSTEM**

Equipment Under Test (EUT) :

Product Name : HOME CAMERA

Model Name : APPBOT-LINK

Applied Standards : **FCC Part 15 Subpart B**

Date of Receipt : **September 17, 2015**

Date of Test : **September 30, 2015 ~ October 02, 2015**

Date of Issue : **November 02, 2015**

Test Results : **Complied**

Tested by : ---------- **Emily Lee**

Reviewed by : ---------- **Paul Kang**

Remarks :

SGS Korea Co.,Ltd. 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 435-040 Korea t+82 31 428 5700 f+82 31 427 2370 www.sgsgroup.kr

Contents

1. General Information

1.1 Client Information

Applicant : VARRAM SYSTEM
Address of Applicant : RM205,405, Venture town,105, shinildong-ro, Daedeok-gu, Daejeon, Republic of Korea

Manufacturer : VARRAM SYSTEM
Address of Manufacturer : RM205,405, Venture town, 105, shinildong-ro, Daedeok-gu, Daejeon, Republic of Korea

1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.
Giheung 1 Laboratory : 35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Giheung 2 Laboratory : 23, Giheungdanji-ro 24beon-gil, Giheung-gu,Yongin-si, Gyeonggi-do, Republic of Korea
Gunpo Laboratory : 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 435-040 Republic of Korea
Phone : + 82 31 428 5700
Fax : + 82 31 427 2370
e-mail : paul.kang@sgs.com

1.3 General Information of E.U.T.

Product Name	HOME CAMERA
Model Name	APPBOT-LINK
FCC ID	2AF4XAPPBOT-LINK
Serial No.	-
Rated Voltage	3 V d.c.
Test Voltage	120 V~, 60 Hz (Travel Adapter for Mobile phone)
Internal clock frequency	12 MHz
EMI Classification	Class B

1.4 Operating Modes and Conditions

Operating mode	Operating condition
1) Charging mode	charging by AC/DC ADAPTER
2) Cradle charging mode	cradle charging by AC/DC ADAPTER
3) operating mode	Operating continuously

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer
mobile phone	iPhone5	-	APPLE

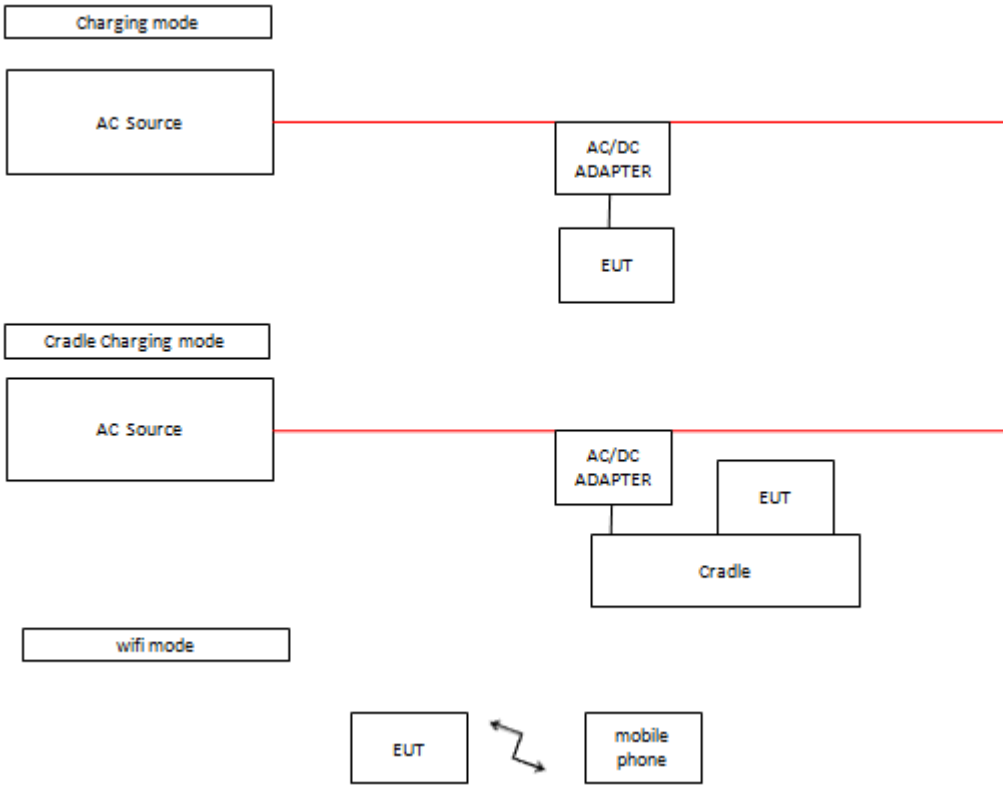
1.6 Cable List

Start		END		Cable Spec.	
Name	I/O Port	Name	I/O Port	Length	Shield
Charging mode					
EUT	DC IN	AC/DC ADAPTER	USB	1.2	Unshield
AC/DC ADAPTER	AC IN	AC Source	-	-	-
Cradle Charging mode					
EUT	-	Cradle	-	-	-
Cradle	DC IN	AC/DC ADAPTER	USB	1.2	Unshield
AC/DC ADAPTER	AC IN	AC Source	-	-	-
operating mode					
EUT	-	-	-	-	-
mobile phone	-	-	-	-	-

1.7 System Configurations

Description	Model	Serial No.	Manufacturer
Main Board	-	-	-
Lens Board	HEAD_V2.0	-	-
Sub Board	-	-	-
Battery	DTP 103040	G1022	-
AC/DC ADAPTER	RH-050100US	-	-
Cradle	-	-	-
USB Cable	-	-	-

1.8 Test System Layout



1.9 Modifications

- There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 Subpart B	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Basic Standards	Results
Conducted Emission	FCC Part 15 Subpart B, ANSI C63.4 : 2009	Complied
Radiated Emission	FCC Part 15 Subpart B, ANSI C63.4 : 2009	Complied

Note1: Test methods of all test items are performed according to the basic standards in this table.

Note2: The Radiated Emission measurement was performed at the position where the EUT emitted maximized RF energy.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Conducted Emission	ANSI C63.4 : 2009 FCC Part 15 Subpart B	**Complied**
Radiated Emission	ANSI C63.4 : 2009 FCC Part 15 Subpart B	**Complied**

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 ㎒ ~ 30 ㎒	9 ㎑	-
Radiated Emission	30 ㎒ ~ 1 ㎓	120 ㎑	10 m & 3 m
	Above 1 ㎓	1 ㎒	3 m

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 ㎒ ~ 1 ㎓. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 ㎒ ~ 1 ㎓ and Class A and Class B equipment above 1 ㎓.

2.2.2 Test Limits

-Conducted Emission Limits

Frequency Range	Limits(dB(㎶))		Class
	Quasi-peak	Average	
0.15 ㎒ ~ 0.5 ㎒	79	66	**Class A**
0.5 ㎒ ~ 30 ㎒	73	60	
0.15 ㎒ ~ 0.5 ㎒	66 to 56	56 to 46	**Class B**
0.5 ㎒ ~ 5 ㎒	56	46	
5 ㎒ ~ 30 ㎒	60	50	

Note : The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of the frequency in the range 0.15 ㎒ to 0.5 ㎒.

-Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB(μV/m))	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.1	**Class A**
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40	**Class B**
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46	
960 MHz ~ 1 GHz	54	

-Radiated Emission Limits above 1 GHz（3m method）

Frequency Range	Limits(dB(μV/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	**Class A**
Above 1 GHz	54	74	**Class B**

2.3 Conducted Emission

The initial preliminary exploratory scans were performed over the measuring frequency range(0.15㎒ to 30㎒) using a max hold mode incorporating a Peak detector and Average detector and using the software of EMC32(Version V9.12.00 from R&S). The final test data was measured using a Quasi-Peak detector and Average detector.

2.3.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal. Due Date
Two-Line V-Network	ENV216	R & S	100190	2015.12.25
Test Receiver	ESCI 7	R & S	100911	2015.12.24

Note : The calibration period of every equipment is 1 year.

2.3.2 Test Site

Shield Room in Gunpo Laboratory

2.3.3 Environment Conditions

Temperature: 25.5℃ ~ 25.7℃
Humidity: 46.0 %R.H. ~ 47.0 %R.H.
Atmospheric Pressure: 101.9 kPa

Test Date: October 01, 2015

Charging Mode

Freq.	Line	Level (dBμV)		CL	LISN	Result (dBμV)		Limit (dBμV)		Margin (dB)	
(MHz)	(H/N)	Q/P	A/V	(dB)	(dB)	Q/P	A/V	Q/P	A/V	Q/P	A/V
0.17	N	34.18	18.88	0.02	9.70	43.90	28.60	65.21	55.21	21.31	26.61
0.18	H	28.59	12.69	0.01	9.60	38.20	22.30	64.72	54.72	26.52	32.42
0.42	H	30.21	19.11	0.09	9.60	39.90	28.80	57.55	47.55	17.65	18.75
0.84	N	28.36	17.56	0.24	9.70	38.30	27.50	56.00	46.00	17.70	18.50
1.79	H	29.55	19.05	0.35	9.60	39.50	29.00	56.00	46.00	16.50	17.00
1.80	N	29.25	20.75	0.35	9.70	39.30	30.80	56.00	46.00	16.70	15.20

Cradle Charging Mode

Freq.	Line	Level (dBμV)		CL	LISN	Result (dBμV)		Limit (dBμV)		Margin (dB)	
(MHz)	(H/N)	Q/P	A/V	(dB)	(dB)	Q/P	A/V	Q/P	A/V	Q/P	A/V
0.17	H	41.18	25.78	0.02	9.60	50.80	35.40	64.96	54.96	14.16	19.56
0.17	N	38.98	23.58	0.02	9.70	48.70	33.30	64.96	54.96	16.26	21.66
0.25	H	40.97	25.67	0.03	9.60	50.60	35.30	61.76	51.76	11.16	16.46
0.51	N	32.88	21.78	0.12	9.70	42.70	31.60	56.00	46.00	13.30	14.40
1.81	H	35.75	21.05	0.35	9.60	45.70	31.00	56.00	46.00	10.30	15.00
1.89	N	32.34	21.74	0.36	9.70	42.40	31.80	56.00	46.00	13.60	14.20

Measurement Uncertainty : ± 3.21 dB (The confidential level is about 95%, *k*=2)

Note : • Line (H) : Hot • Line (N) : Neutral
• CL: Cable Loss • LISN : LISN Factor
• Result = Level + CL + LISN • Margin = Limit – Result

See Appendix A (Conducted Emission at the Mains Terminal)

2.4 Radiated Emission

The initial preliminary exploratory scans were performed at 3 ㎜ distance over the measuring frequency range(30 ㎒ to 1 ㎓) using a max hold mode incorporating a Peak detector and using the software of EP5RE(Version Ver3.10.20 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 ㎓ at 3 ㎜ distance and a peak and average detector above 1 ㎓ at 3m distance. 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.

2.4.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal. Due Date
Bilog Antenna	VULB9163	SCHWARZBECK MESS-ELEKTRONIK	396	2016.06.16
Test Receiver	ESU26	R & S	100109	2016.03.03
Amplifier	8447F	HP	2944A03909	2016.08.27

Note : Only the calibration period of Antennas is 2 years but the period of every equipment is 1 year.

2.4.2 Test Site

3m semi Anechoic chamber in Gunpo Laboratory

2.4.3 Environment Conditions

Below 1 GHz (3 m method)

Temperature: 27.1 ℃ ~ 27.3 ℃
Humidity: 37.0 %R.H. ~ 38.0 %R.H.
Atmospheric Pressure: 101.9 kPa

Test Date : September 30, 2015

Charging Mode

Freq. (MHz)	Level (dBμV)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
50.82	44.30	V	283	100	14.05	1.36	27.80	31.91	40.00	8.09
56.59	44.00	V	341	100	13.12	1.47	27.79	30.80	40.00	9.20
63.99	46.10	V	283	100	10.86	1.48	27.77	30.67	40.00	9.33
87.11	42.40	V	208	100	9.26	1.75	27.73	25.68	40.00	14.32
144.02	47.00	V	183	100	8.15	2.18	27.52	29.81	43.50	13.69
192.03	48.10	V	120	100	10.29	2.60	27.33	33.66	43.50	9.84

Cradle Charging Mode

Freq. (MHz)	Level (dBμV)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
46.57	42.60	V	211	100	14.11	1.29	27.82	30.18	40.00	9.82
58.09	46.80	V	214	100	12.88	1.50	27.78	33.40	40.00	6.60
87.03	43.80	V	211	100	9.24	1.75	27.73	27.06	40.00	12.94
132.90	55.10	V	29	100	8.72	2.08	27.57	38.33	43.50	5.17
159.01	47.00	V	122	100	8.18	2.55	27.46	30.27	43.50	13.23
192.03	46.00	V	15	100	10.29	2.60	27.33	31.56	43.50	11.94

Operating Mode

Freq. (MHz)	Level (dBμV)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
40.32	33.20	H	228	400	14.30	1.20	27.85	20.85	40.00	19.15
44.11	33.30	H	180	300	14.12	1.26	27.83	20.85	40.00	19.15
56.64	33.00	H	255	200	13.11	1.47	27.79	19.79	40.00	20.21
107.64	38.60	V	0	100	10.68	2.06	27.67	23.67	43.50	19.83
191.99	41.50	V	196	100	10.28	2.60	27.33	27.05	43.50	16.45
595.87	34.30	H	273	200	19.97	5.25	28.49	31.03	43.50	12.47

Measurement Uncertainty (Horizontal) : ± 5.31 dB (The confidential level is about 95%, *k*=2)
Measurement Uncertainty (Vertical) : ± 5.73 dB (The confidential level is about 95%, *k*=2)

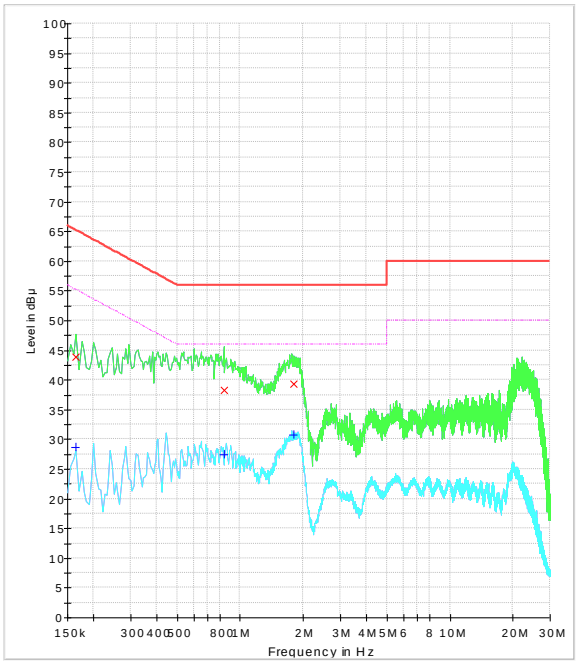
Note: • AF = Antenna Factor • CL = Cable Loss • F/S = Field Strength
• Pol.(H) = Horizontal • Pol.(V) = Vertical • Amp. = Amplifier Gain
• Margin = Limit – F/S • F/S = Level + AF + CL – Amp.
• A : Angle • H : Height

See Appendix B (Radiated Emission)

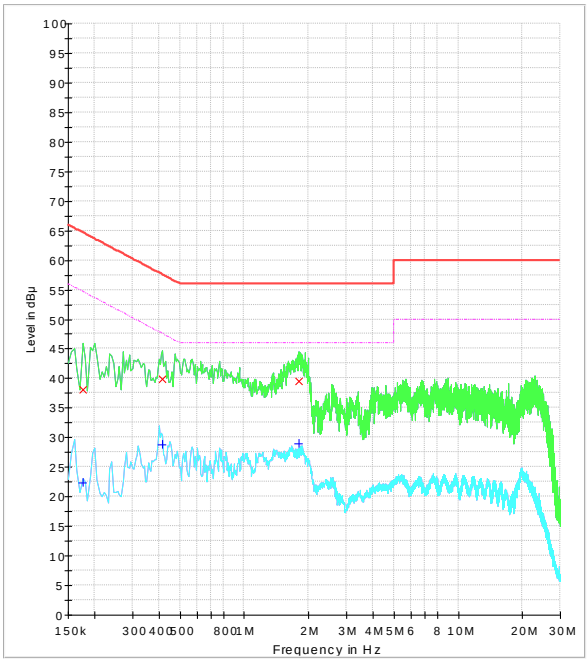
Appendix A : Conducted Emission at the Mains Terminal

Charging Mode

Neutral

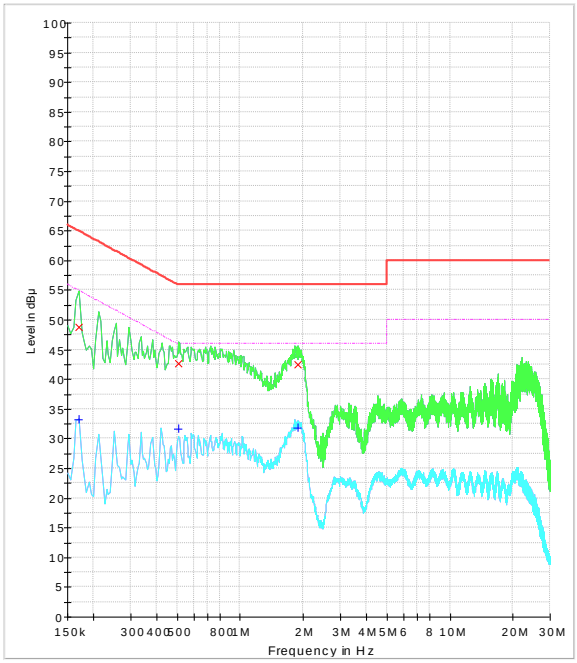


Hot

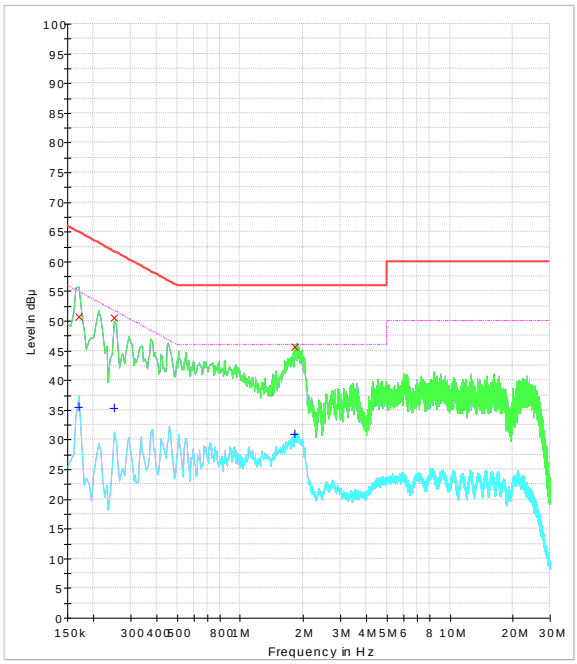


Cradle Charging Mode

Neutral



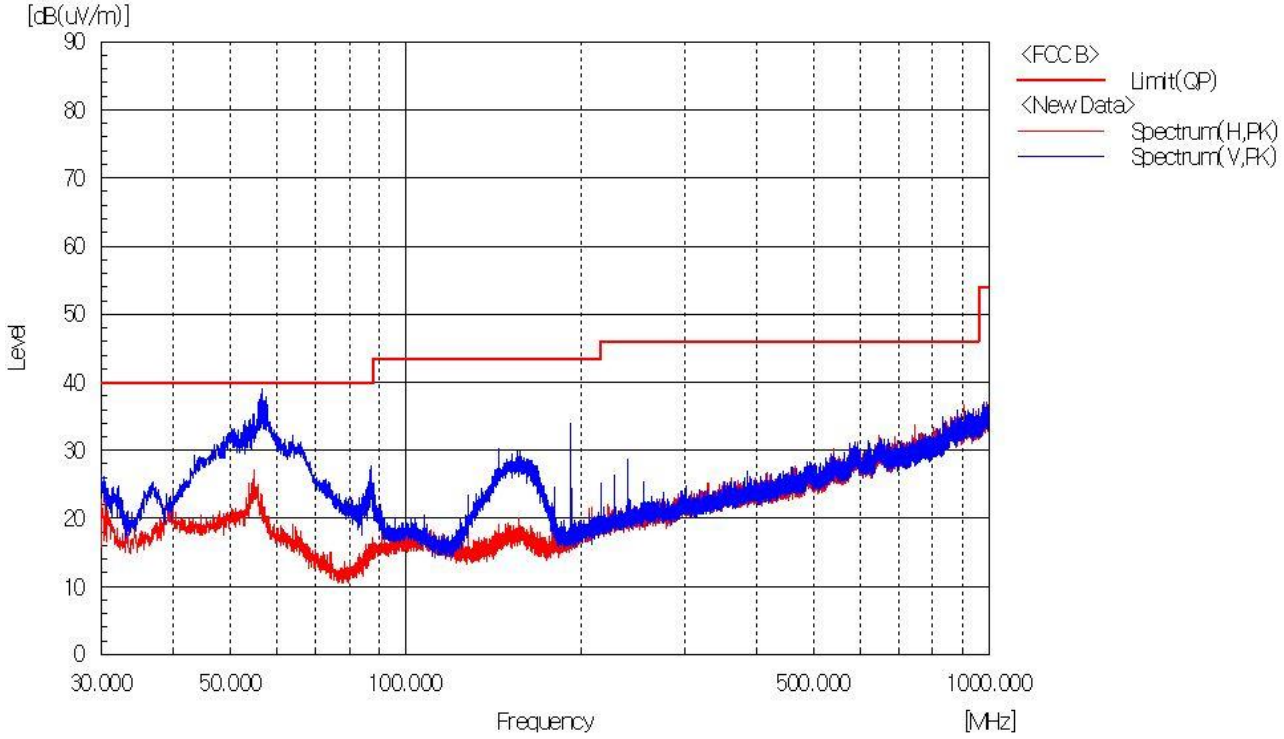
Hot



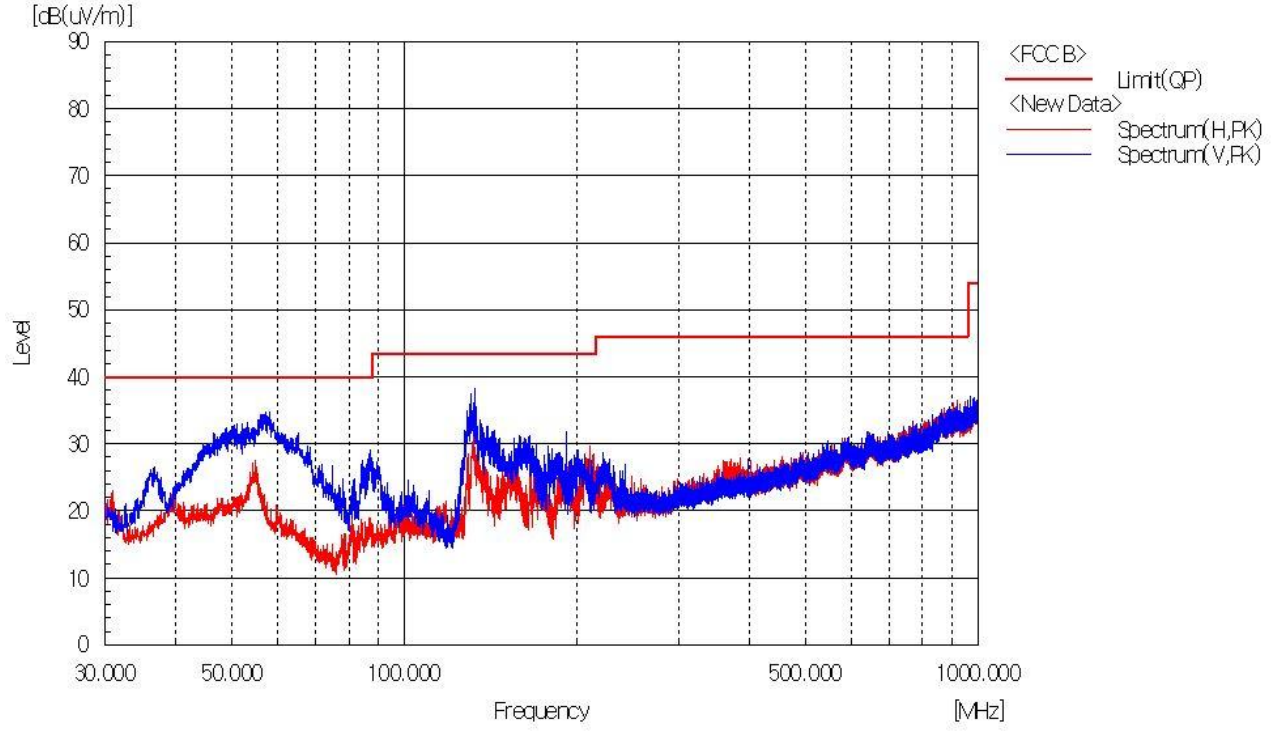
Appendix B : Radiated Emission (3 ㎜ Scan Data)

Below 1 ㎓ (3 ㎜ Scan Data)

Charging Mode



Cradle Charging Mode



Operating Mode