

FCC/IC TEST REPORT

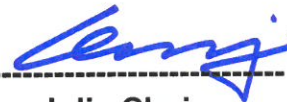
Job No. : GPWE2106000113EH
Applicant Name : Samsung Electronics Co., Ltd.
Equipment Under Test (EUT) :
Product Name : S PEN
Model Name : EJ-P5450
FCC Authorization Type : Certification
FCC ID : A3LEJP5450
IC Certification : 649E-EJP5450
Applied Standards : FCC Part 15 Subpart B, Class B
ANSI C63.4a:2017
ICES-003 Issue 7:2020
Date of Receipt : June 14, 2021
Date of Test : June 17, 2021 ~ June 24, 2021
Date of Issue : June 30, 2021
Test Results : Complied

Tested by :



Lucas Ku

Reviewed by :



Julia Choi

This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

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The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full

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Revision History

Revision	Report number	Description
0	F690501-RF-EMH001440	Initial

1. General Information

1.1 Client Information

Applicant	Samsung Electronics Co., Ltd.
Applicant Address	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea
Manufacturer	Samsung Electronics Co., Ltd.
Manufacturer Address	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea
Factory	RFTech Co., Ltd
Factory Address	60, Jugyang-daero 1763beon-gil, Wonsam-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, 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
FCC Registration No.	KR0150
IC Registration No.	7837B
Phone	+ 82 31 548 0710
Fax	+ 82 31 548 0719
e-mail	julia.choi@sgs.com

1.3 General Information of E.U.T.

Classification	Specification
Product Name	S PEN
Model Name	EJ-P5450
Serial No.	None
EMI Classification	Class B
Test Power	AC 120 V, 60 Hz
Rated Power	DC 5.0V, 100 mA (when it charging)
Operated Power	DC 3.4 V ~ DC 4.35 V
Internal Clock freq.	2 480 MHz
PCB version	Rev 1.0
H/W version	Rev 1.0
S/W Version	Rev 1.0
Port	USB(C-TYPE)
Function	It is touch pen that Bluetooth communication with mobile phone

1.4 Operating Modes and Conditions

Operating mode	Operating Condition
1) Charging	EUT is tested on the Charging status

1.5 Peripheral Equipments

Description	Model	Serial No.	Manufacturer
Travel Adapter	EP-TA800 001	-	DONGYANG E&P VIETNAM CO., LTD.

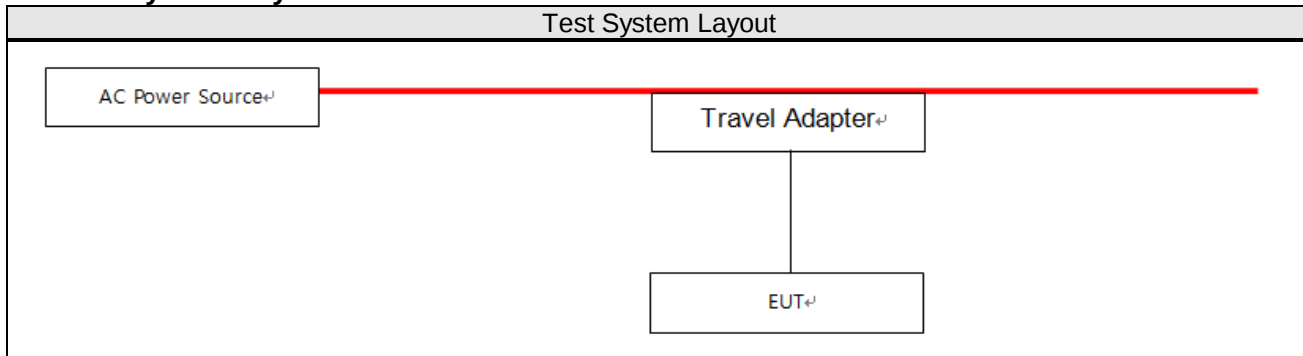
1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length (m)	Shield	
EUT	USB(C-TYPE)	Travel Adapter	USB (C-TYPE)	1.0	Shield	No
Travel Adapter	AC IN	AC POWER SOURCE	-	-	-	-

1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note
BATTERY	-	-	Panasonic	-
MAIN BOARD	-	-	-	-
PORT BOARD	-	-	-	-

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 ICES-003 Issue 7:2020	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Standards	Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 Issue 7:2020	Complied
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020	Complied

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

EMISSION

2.1 Test Results

Test Items	Standards	Test Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 Issue 7:2020	Complied
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020	Complied

2.2 Test Method and Limits

2.2.1 Test Method

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

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

2.2.2 Test Limits

-Conducted Emission Limits

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

-Radiated Emission Limits below 1 GHz

[FCC Part 15 Subpart B]

Frequency Range	Limits(dB μ V/m)	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.0	Class A (10 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40.0	Class B (3 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.0	
960 MHz ~ 1 GHz	54.0	

[ICES-003 Issue 7 : 2020]

Frequency Range	Limits(dB μ V/m)	Class
	Quasi-peak	
30 MHz ~ 88 MHz	40.0	Class A (10 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 230 MHz	46.4	
230 MHz ~ 960 MHz	47.0	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	50.0	Class A (3 m method)
88 MHz ~ 216 MHz	54.0	
216 MHz ~ 230 MHz	56.9	
230 MHz ~ 960 MHz	57.0	
960 MHz ~ 1 GHz	60.0	
30 MHz ~ 88 MHz	30.0	Class B (10 m method)
88 MHz ~ 216 MHz	33.1	
216 MHz ~ 230 MHz	35.6	
230 MHz ~ 960 MHz	37.0	
960 MHz ~ 1 GHz	43.5	
30 MHz ~ 88 MHz	40.0	Class B (3 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 230 MHz	46.0	
230 MHz ~ 960 MHz	47.0	
960 MHz ~ 1 GHz	54.0	

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

[FCC Part 15 Subpart B]

Frequency Range	Limits(dB μ V/m)		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	Class A
Above 1 GHz	54.0	74.0	Class B

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3 m distance not 10 m distance.

[ICES-003 Issue 7 : 2020]

Frequency Range	Limits(dB μ V/m)		Class
	Average	Peak	
Above 1 GHz	60.0	80.0	Class A
Above 1 GHz	54.0	74.0	Class B

2.3 Conducted Disturbance

The initial preliminary exploratory scans were performed over the measuring frequency range(0.15 MHz to 30 MHz) using a max hold mode incorporating a Peak detector and CISPR-Average detector and using the EMI measuring software. The final test data was measured using a Quasi-Peak detector and CISPR-Average detector.

Note. Measuring software

- Giheung 1Lab. : EMC32(V10.40.10) from R&S
- Giheung 2Lab. : EMC32(V10.40.00) from R&S

2.3.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
EMI TEST RECEIVER	ESU26	R&S	100493	2021.08.25
2-LINE V-NETWORK	ENV216	R&S	101180	2021.08.22
PULSE LIMITER	ESH3-Z2	R&S	100283	2021.08.22

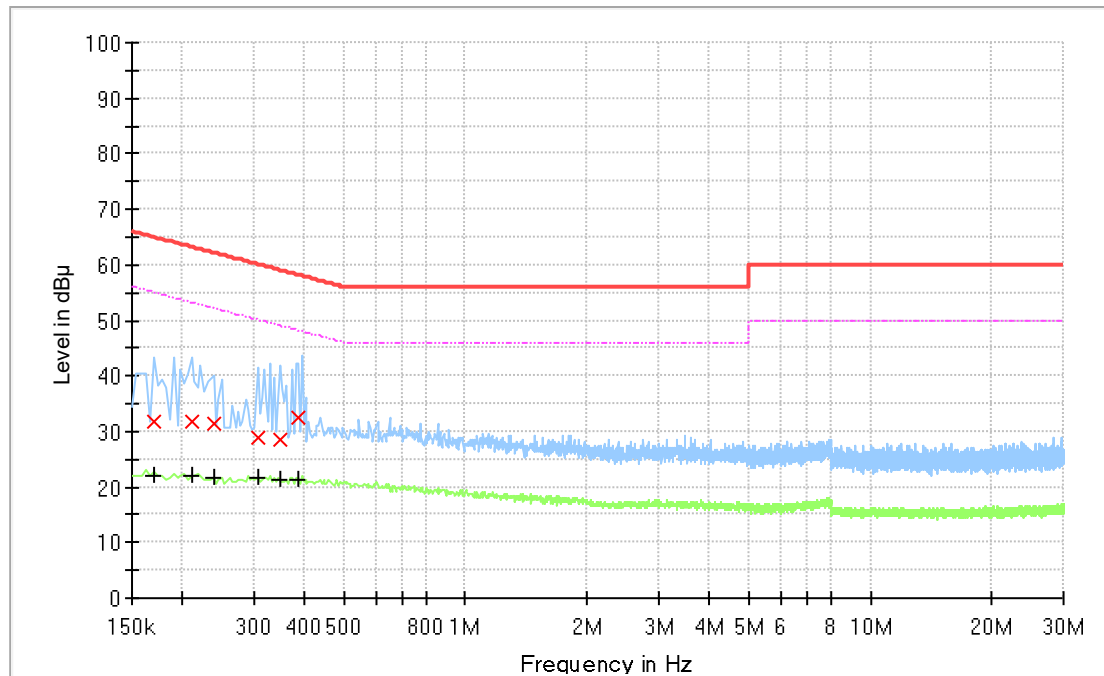
2.3.2 Test Site

Shield Room in Giheung 1 Laboratory

2.3.3 Environment Conditions

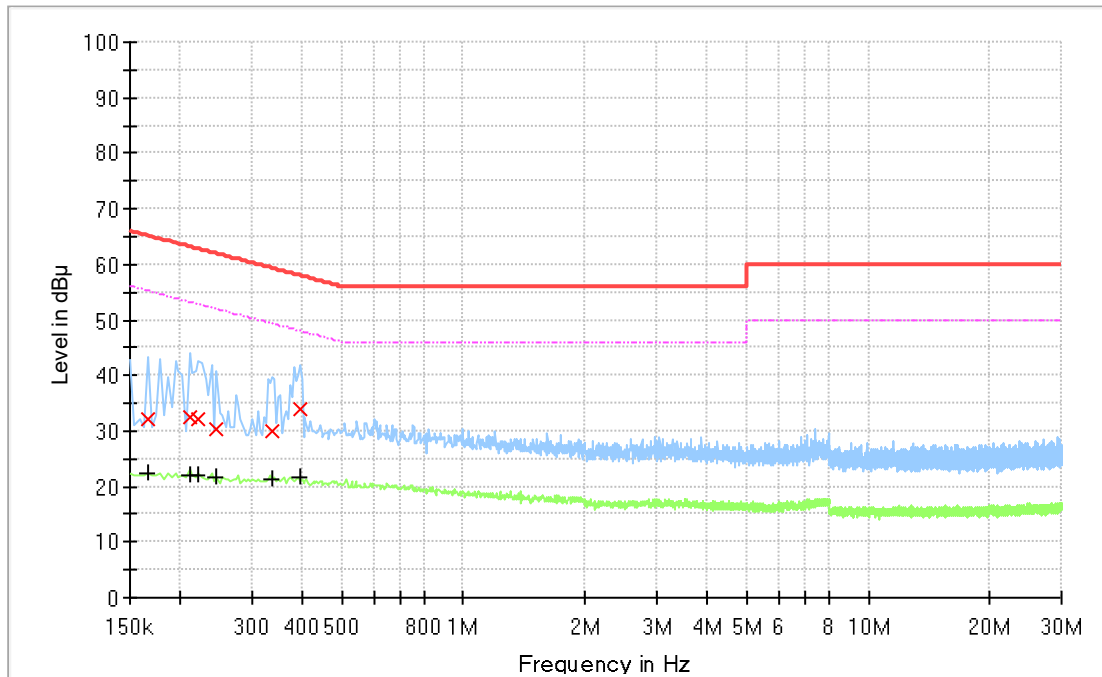
Temperature	(Minimum 22.6, Maximum 22.8) °C
Humidity	(Minimum 45.0, Maximum 46.0) %R.H.
Atmospheric Pressure	(Minimum 99.8, Maximum 99.8) kPa
Test Date	June 17, 2021

2.3.4 Test Results



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.170	---	22.16	54.96	32.80	15 000.0	9.000	L1	ON	19.7
0.170	31.87	---	64.96	33.09	15 000.0	9.000	L1	ON	19.7
0.210	---	22.12	53.21	31.09	15 000.0	9.000	L1	ON	19.8
0.210	31.95	---	63.21	31.26	15 000.0	9.000	L1	ON	19.8
0.238	---	21.73	52.17	30.44	15 000.0	9.000	L1	ON	19.6
0.238	31.34	---	62.17	30.82	15 000.0	9.000	L1	ON	19.6
0.306	---	21.56	50.08	28.52	15 000.0	9.000	L1	ON	19.7
0.306	28.88	---	60.08	31.19	15 000.0	9.000	L1	ON	19.7
0.350	---	21.32	48.96	27.64	15 000.0	9.000	L1	ON	19.8
0.350	28.70	---	58.96	30.26	15 000.0	9.000	L1	ON	19.8
0.386	---	21.41	48.15	26.74	15 000.0	9.000	L1	ON	19.8
0.386	32.57	---	58.15	25.58	15 000.0	9.000	L1	ON	19.8



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.166	---	22.22	55.16	32.94	15 000.0	9.000	N	ON	19.7
0.166	32.30	---	65.16	32.86	15 000.0	9.000	N	ON	19.7
0.210	---	22.19	53.21	31.01	15 000.0	9.000	N	ON	19.8
0.210	32.47	---	63.21	30.73	15 000.0	9.000	N	ON	19.8
0.222	---	21.99	52.74	30.76	15 000.0	9.000	N	ON	19.7
0.222	32.29	---	62.74	30.46	15 000.0	9.000	N	ON	19.7
0.246	---	21.61	51.89	30.28	15 000.0	9.000	N	ON	19.6
0.246	30.34	---	61.89	31.56	15 000.0	9.000	N	ON	19.6
0.338	---	21.42	49.25	27.83	15 000.0	9.000	N	ON	19.8
0.338	30.05	---	59.25	29.20	15 000.0	9.000	N	ON	19.8
0.394	---	21.56	47.98	26.42	15 000.0	9.000	N	ON	19.8
0.394	34.09	---	57.98	23.89	15 000.0	9.000	N	ON	19.8

Measurement Uncertainty : See Appendix A

Note1 : • Line (L1) : Hot • Line (N) : Neutral

- Margin = Limit – Quasi Peak or CAverage
- Corr. = LISN Factor + Cable loss + Pulse Limiter Factor

Ex) In case

Freq ; 0.5 MHz, level ; 30 dB(μ V), CL ; 0.2 dB, LISN ; 9.5 dB, P/L: 9.8 dB

Result = Level + CL + LISN + P/L

= 30 + 0.2 + 9.5 + 9.8

= 49.5

Margin = Limit – Result

= 79 - 49.5

= 29.5

2.4 Radiated Emission

The initial preliminary exploratory scans were performed over the measuring frequency range (30 MHz to 13 GHz) using a max hold mode incorporating a Peak detector by using the EMI measuring software. The final test data was measured using a Quasi-Peak detector below 1 GHz, Peak and CISPR-Average detector above 1 GHz.

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.

Note. Measuring software

-Giheung 1Lab. : EMC32(V9.26.01) from R&S

-Giheung 2Lab. : EMC32(V10.40.10) from R&S

2.4.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
EMI TEST RECEIVER	ESU40	R&S	100075	2021.08.18
Hybrid ANTENNA	VULB 9163	SCHWARZBECK	9163-390	2022.02.15
Double Ridged Horn Antenna	HF907	R&S	102578	2022.04.15
AMPLIFIER	8447D	HP	2727A05297	2021.07.10
Microwave Preamplifier	PAM-118A	Com-Power	551074	2021.10.13

2.4.2 Test Site

3m SEMI-ANECHOIC CHAMBER in Giheung 2 Laboratory

2.4.3 Environment Conditions

① Below 1 GHz

Temperature	(Minimum 17.0, Maximum 18.0) °C
Humidity	(Minimum 35.0, Maximum 37.0) % R.H.
Atmospheric Pressure	(Minimum 99.8, Maximum 99.8) kPa
Test Date	June 17, 2021

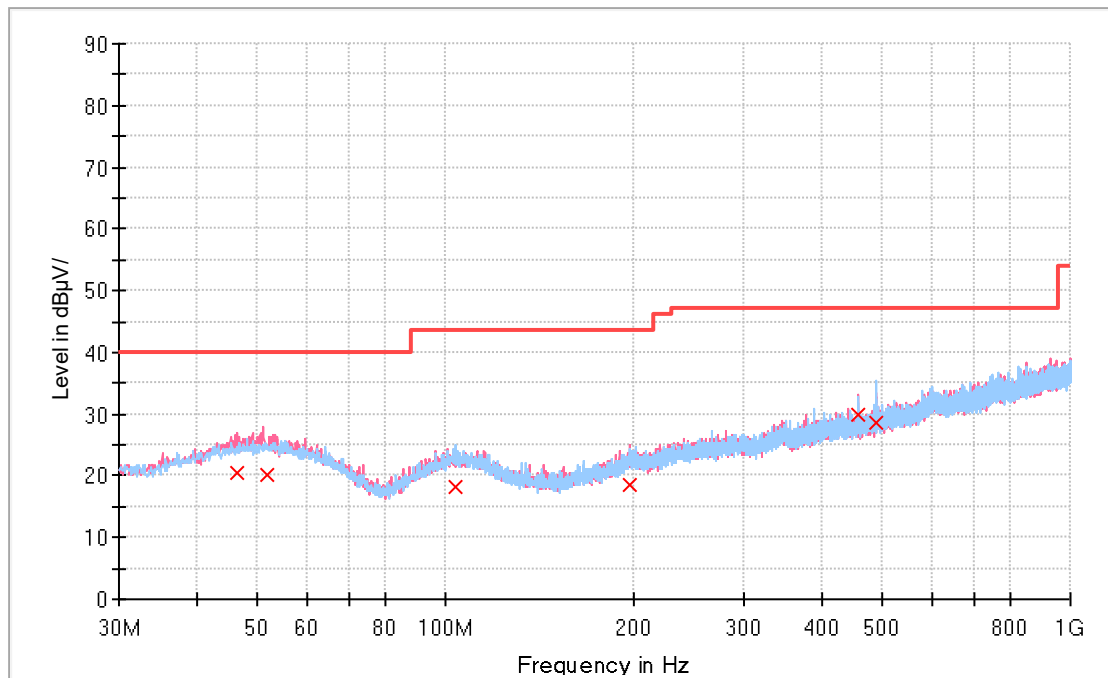
② Above 1 GHz

Temperature	(Minimum 17.0, Maximum 18.0) °C
Humidity	(Minimum 35.0, Maximum 37.0) % R.H.
Atmospheric Pressure	(Minimum 99.8, Maximum 99.8) kPa
Test Date	June 17, 2021

2.4.4 Test Results

① Below 1 GHz (3 m method)

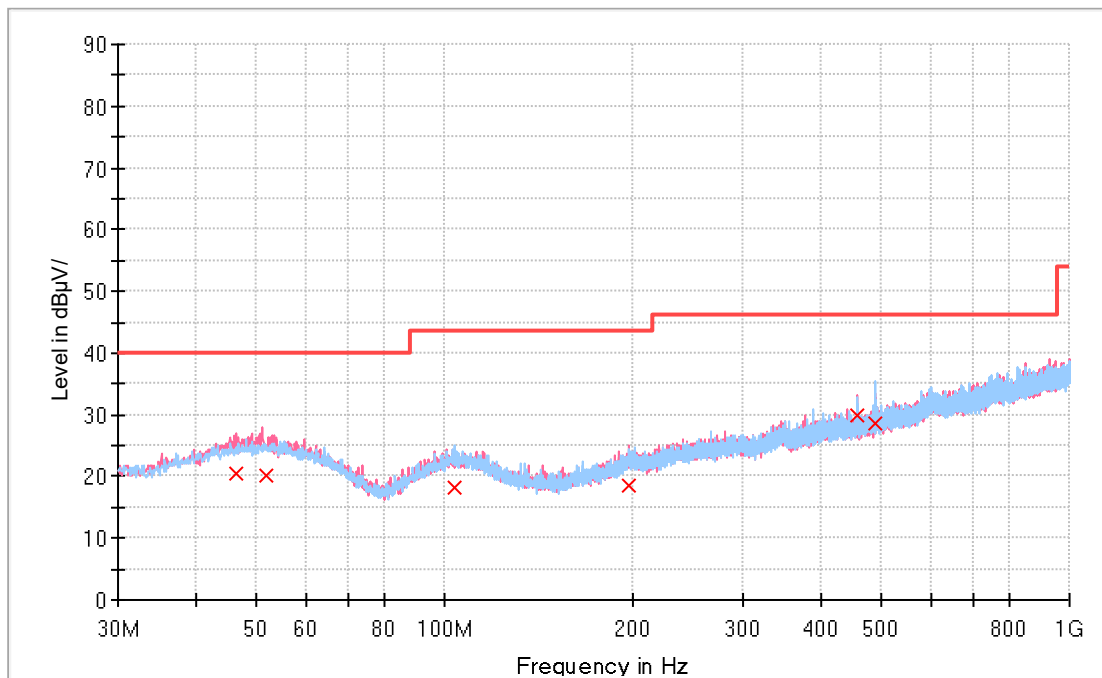
[FCC Part 15 Subpart B]



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
46.393	20.36	40.00	19.64	15 000.0	120.000	106.0	V	142.0	-1.9
51.653	20.06	40.00	19.94	15 000.0	120.000	100.0	V	292.0	-1.6
103.555	18.27	43.50	25.23	15 000.0	120.000	250.0	V	1.0	-3.2
197.206	18.64	43.50	24.86	15 000.0	120.000	226.0	V	126.0	-2.7
457.788	29.75	47.00	17.25	15 000.0	120.000	224.0	V	211.0	1.9
489.637	28.66	47.00	18.34	15 000.0	120.000	203.0	H	126.0	2.6

[ICES-003 Issue 7 : 2020]



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
46.393	20.36	40.00	19.64	15 000.0	120.000	106.0	V	142.0	-1.9
51.653	20.06	40.00	19.94	15 000.0	120.000	100.0	V	292.0	-1.6
103.555	18.27	43.50	25.23	15 000.0	120.000	250.0	V	1.0	-3.2
197.206	18.64	43.50	24.86	15 000.0	120.000	226.0	V	126.0	-2.7
457.788	29.75	46.00	16.25	15 000.0	120.000	224.0	V	211.0	1.9
489.637	28.66	46.00	17.34	15 000.0	120.000	203.0	H	126.0	2.6

Measurement Uncertainty : See Appendix A

Note : • POL H = Horizontal

• Margin = Limit – Quasi Peak

• POL V = Vertical

• Corr. = Antenna Factor + Cable loss – Amplifier Gain

Ex) In case

Freq ; 100 MHz, level ; 30 dB(μV/m), AF ; 10 dB/m, CL ; 4 dB, Amp ; 25 dB

Result = Level + AF + CL – Amp

= 30 + 10 + 4 - 25

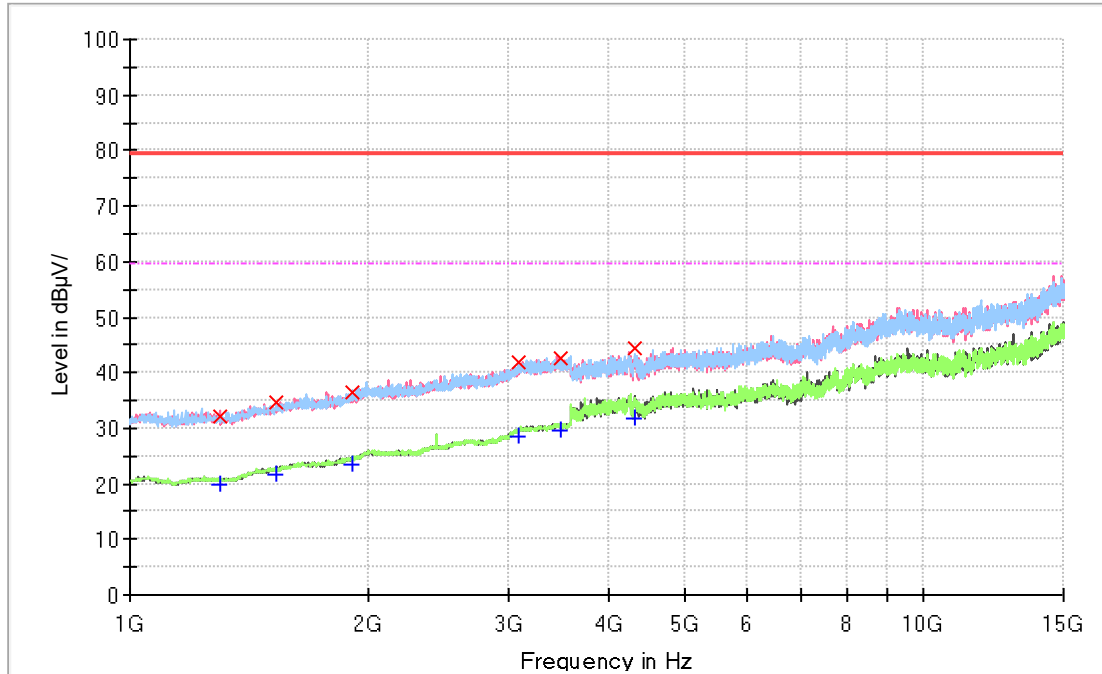
= 19

Margin = Limit – Result

= 43.5 – 19

= 24.5

② Above 1 GHz (3 m method)



Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 295.800	32.14	---	79.50	47.36	15 000.0	1 000.000	200.0	V	217.0	-13.9
1 295.800	---	19.71	59.50	39.79	15 000.0	1 000.000	200.0	V	217.0	-13.9
1 528.700	34.74	---	79.50	44.76	15 000.0	1 000.000	300.0	H	211.0	-12.1
1 528.700	---	21.71	59.50	37.79	15 000.0	1 000.000	300.0	H	211.0	-12.1
1 902.700	---	23.49	59.50	36.01	15 000.0	1 000.000	300.0	H	301.0	-10.5
1 902.700	36.42	---	79.50	43.08	15 000.0	1 000.000	300.0	H	301.0	-10.5
3 080.800	41.89	---	79.50	37.61	15 000.0	1 000.000	100.0	H	350.0	-6.0
3 080.800	---	28.61	59.50	30.89	15 000.0	1 000.000	100.0	H	350.0	-6.0
3 497.300	42.48	---	79.50	37.02	15 000.0	1 000.000	300.0	H	246.0	-5.3
3 497.300	---	29.48	59.50	30.02	15 000.0	1 000.000	300.0	H	246.0	-5.3
4 328.600	---	31.82	59.50	27.68	15 000.0	1 000.000	300.0	H	10.0	-2.5
4 328.600	44.55	---	79.50	34.95	15 000.0	1 000.000	300.0	H	10.0	-2.5

Measurement Uncertainty : See Appendix A

Note : • AF = Antenna Factor

• POL H = Horizontal

• H = Height

• CL = Cable Loss

• POL V = Vertical

• Margin = Limit – Result

• AMP = Amplifier Gain

• A = Angle

• Result = Level + AF + CL – AMP

Appendix A : Measurement Uncertainty

- Giheung 1 Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.70 dB (The confidential level is 95 %, k=2)
		ESH2-Z5	3.58 dB (The confidential level is 95 %, k=2)
		ESH3-Z6	3.54 dB (The confidential level is 95 %, k=2)
Conducted Emission - Signal		ISN T800	5.12 dB (The confidential level is 95 %, k=2)
		ISNT8-Cat6	5.14 dB (The confidential level is 95 %, k=2)
		ISN S751	5.20 dB (The confidential level is 95 %, k=2)
Radiated Emission	9 kHz ~30 MHz (3m chamber)	Horizontal	3.64 dB (The confidential level is 95 %, k=2)
		Vertical	3.64 dB (The confidential level is 95 %, k=2)
	30 MHz ~ 1 000 MHz (10m chamber)	Horizontal	4.26 dB (The confidential level is 95 %, k=2)
		Vertical	4.39 dB (The confidential level is 95 %, k=2)
	1 GHz ~ 18 GHz (3m chamber)	Horizontal	3.59 dB (The confidential level is 95 %, k=2)
		Vertical	3.59 dB (The confidential level is 95 %, k=2)
Radiated Immunity Test		0.86 dB (The confidential level is 95 %, k=2)	
Conducted Immunity Test		2.23 dB (The confidential level is 95 %, k=2)	
Magnetic Field		5.78 dB (The confidential level is 95 %, k=2)	

- Giheung 2 Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.54 dB (The confidential level is 95 %, k=2)
		ESH2-Z5	3.53 dB (The confidential level is 95 %, k=2)
		ESH3-Z6	3.49 dB (The confidential level is 95 %, k=2)
Conducted Emission - Signal		ISN T800	5.03 dB (The confidential level is 95 %, k=2)
		ISNT8-Cat6	5.15 dB (The confidential level is 95 %, k=2)
		ISN S751	5.15 dB (The confidential level is 95 %, k=2)
Discontinuous		3.02 dB (The confidential level is 95 %, k=2)	
Disturbance Power		3.66 dB (The confidential level is 95 %, k=2)	
Radiated Emission	9 kHz ~30 MHz (3m chamber)	Horizontal	3.84 dB (The confidential level is 95 %, k=2)
		Vertical	3.84 dB (The confidential level is 95 %, k=2)
	30 MHz ~ 1 000 MHz (10m chamber)	Horizontal	5.18 dB (The confidential level is 95 %, k=2)
		Vertical	5.32 dB (The confidential level is 95 %, k=2)
	1 GHz ~ 18 GHz (3m chamber)	Horizontal	3.62 dB (The confidential level is 95 %, k=2)
		Vertical	3.67 dB (The confidential level is 95 %, k=2)
Radiated Immunity Test		1.47 dB (The confidential level is 95 %, k=2)	
Conducted Immunity Test		2.23 dB (The confidential level is 95 %, k=2)	
Magnetic Field		5.78 dB (The confidential level is 95 %, k=2)	

- End of Test Report -