TEST REPORT

Job No.	:	**GPEM2405000392EC**
Test Report No.	:	**F690501-RF-EMC002469_1**
Applicant	:	**SM LNS**
Product Name	:	**Cradle(ETEE Hybrid Toothbrush)**
Model Name	:	**SM-ETEE100**
Standards	:	**FCC Part 15 Subpart B**
FCC ID	:	**2BHRF-SM-ETEE100**
Date of Receipt	:	**May 24, 2024**
Date of Test	:	**May 30, 2024 ~ June 7, 2024**
Date of Issue	:	**July 31, 2024**
Test Result	:	**Complied**

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

	Tested by (Name, signature)	Approved by (Name, signature)
Affirmation	***DoHyeon Lee***	***Paul Kang***

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Revision History

Revision	Report Number	Description
0	F690501-RF-EMC002469	Initial
1	F690501-RF-EMC002469_1	FCC ID changed.

1. Test Laboratory

1.1 General information

Name	SGS Korea Co., Ltd.
- Branch Site	4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Republic of Korea Tel. 82 31 428 5700 Fax. 82 31 427 5370
- Branch Site-3	35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea Tel. 82 31 548 0710 Fax. 82 31 548 0719
- Branch Site-4	12, Dongtansandan 10-gil, Hwaseong-si, Gyeonggi-do, 18487, Republic of Korea Tel. 82 31 8007 5302 Fax. 82 31 427 2370
Website	http://www.sgsgroup.kr/ee

SGS Korea Co., Ltd. has been accredited by the agencies listed in the following table;

Accreditation	Accreditation bodies	Accreditation No.
KC	MSIT- RRA	KR0150
FCC	FCC (MRA)	
IC	IC (MRA)	
Vietnam-MIC	Vietnam-MIC	
Japan EMI	VCCI	C-14102, T-11156, R-13662, G-20037
KOLAS	KATS - KOLAS	Testing No.123
CBTL	IECEE	TL 146
SDPPI	SDPPI	-

2. General Information of E.U.T.

2.1 Applicant Information

Applicant	SM LNS
Applicant Address	501, 33, Gangnam-daero 112-gil, Gangnam-gu, Seoul, Republic of Korea
Manufacturer	SM LNS
Manufacturer Address	501, 33, Gangnam-daero 112-gil, Gangnam-gu, Seoul, Republic of Korea

2.2 General Information of E.U.T.

Classification	Description
Product Name	Cradle(ETEE Hybrid Toothbrush)
Model Name	SM-ETEE100
Alt. Model Name	-
Model Differences	-
Serial No.	-
EMI Classification	Class B
Internal Clock Frequency	16 ㎒
Rated Power	5 Vd.c.
Tested Power	Operating : 5 Vd.c. Charging : 120 V~, 60 ㎐
F/W Version	2.0
S/W Version	3.1
Port	USB A-Type
Components	Toothbrush Body, Charging Cradle, Toothbrush Head(3 type)
Function	Electric Toothbrush

2.3 Configurations of E.U.T

Description	Model	Serial No.	Manufacturer	Note
Main Board	GY-H1 REV:V3	-	-	-
Battery	14650-1100mAh	-	Shenzhen Shenchao New Energy Technology Co.,Ltd	-
Motor	-	-	-	-
Cradle Board	JGY-H1 charg REV2	-	-	-
Cradle_Coil	-	-	-	-

3. E.U.T. Operation and Test Configuration

3.1 Peripheral Equipments

Description	Model	Serial No.	Manufacturer	Note.
Travel Adapter	EP-TA200	R37KC8JBX41SE3	SAMSUNG	-

3.2 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length (m)	Shield	
01, 02 Mode						
EUT	-	-	-	-	-	-
03 Mode						
EUT	-	Charging Cradle (EUT)	-	-	-	-
Charging Cradle (EUT)	USB A-Type	Travel Adapter	USB A-Type	0.8	Unshielded	-

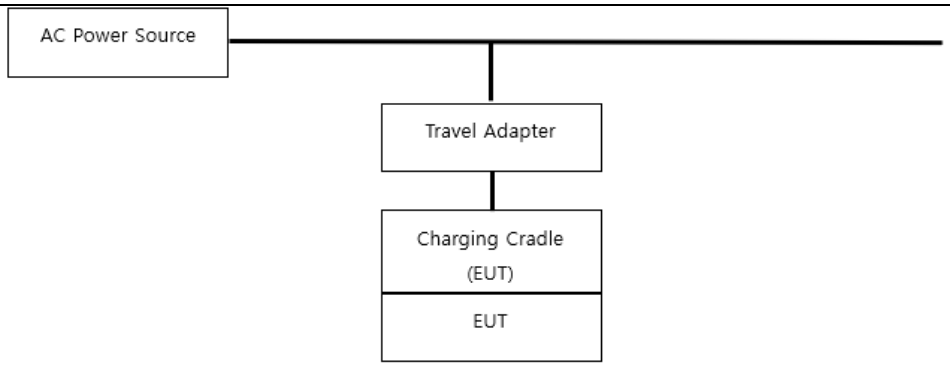
3.3 Operating Modes and Conditions

Operating mode		Operating condition
01	EM Wave + Hard	Operating state in EM wave + Hard.
02	EM Wave + Massage	Operating state in EM wave + Massage.
03	Wireless Charging	Wireless charging state through AC Adapter.

3.4 Test System Layout

01, 02 Mode

03 Mode



3.5 Modifications to the test items during testing

■	No modifications done during testing
□	Modification done during testing (see details below)
No.	Description of modification (if any)
1	
2	

4. Test Results

4.1 Summary

Test Items	Standards	Test Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ANSI C63.4a:2017	Complied
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ANSI C63.4a:2017	Complied

4.2 Note

1 Test Methods of all test items are performed according to the basic standard in subclause 4.1.

2

Emission Test

5.1 Test Method and Limits

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 or 3 m
	Above 1 GHz	1 MHz	3 m

5.2 Test Limits

Frequency Range	Limits(dBμV)		Class
	Quasi-peak	CISPR-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 Note1	56 to 46 Note1	Class B
0.5 MHz - 5 MHz	56	46	
5 MHz - 30 MHz	60	50	

[Table 2.1 Conducted Emission Limits]

Frequency Range	Limits(dBμV/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	

[Table 2.2 Radiated Emission Limits below 1 GHz_For FCC Part 15 Subpart B]

Frequency Range	Limits(dBμV/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 ㎒ - 88 ㎒	50.0	Class A (3 m method)
88 ㎒ - 216 ㎒	54.0	
216 ㎒ - 230 ㎒	56.9	
230 ㎒ - 960 ㎒	57.0	
960 ㎒ - 1 ㎓	60.0	
30 ㎒ - 88 ㎒	30.0	Class B (10 m method)
88 ㎒ - 216 ㎒	33.1	
216 ㎒ - 230 ㎒	35.6	
230 ㎒ - 960 ㎒	37.0	
960 ㎒ - 1 ㎓	43.5	
30 ㎒ - 88 ㎒	40.0	Class B (3 m method)
88 ㎒ - 216 ㎒	43.5	
216 ㎒ - 230 ㎒	46.0	
230 ㎒ - 960 ㎒	47.0	
960 ㎒ - 1 ㎓	54.0	

[Table 2.3 Radiated Emission Limits below 1 ㎓_For ICES-003 Issue 7 : 2020]

Frequency Range	Limits(dBμV)		Class
	Quasi-peak	CISPR-Average	
Above 1 ㎓	79.5	59.5	Class A
	74.0	54.0	Class B

[Table 2.4 Radiated Emission Limits Above 1 ㎓_ For FCC Part 15 Subpart B Note2]

Frequency Range	Limits(dBμV)		Class
	Quasi-peak	CISPR-Average	
Above 1 ㎓	80.0	60.0	Class A
	74.0	54.0	Class B

[Table 2.5 Radiated Emission Limits Above 1 ㎓_For ICES-003 Issue 7 : 2020]

Note 1. The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of that frequency.
Note 2. The limits of class A equipment is extrapolated using an extrapolation factor of 20 ㏈/decade because it was measured at 3 m distance not 10 m distance.

5.3 Conducted Emission

5.3.1 Test Equipments

Description	Model No.	Manufacturer	Serial No	Cal Due. Date
Two-Line V-Network	ENV216	R & S	100190	2025-05-23
Test Receiver	ESCI 7	R & S	100911	2025-02-26

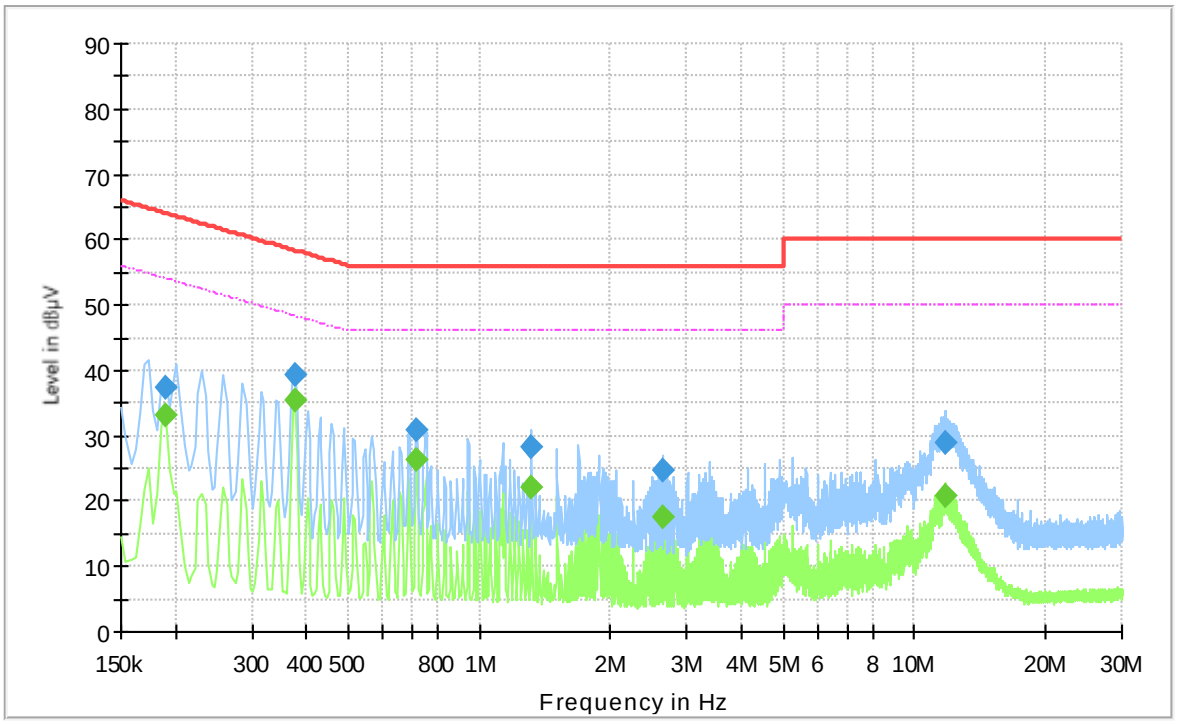
Note. Measuring software is below
- Branch Site : EMC32(V10.60.20) from R&S
- Branch Site-3 : EMC32(V10.40.10) from R&S
- Branch Site-4 : EMC32(V10.40.00) from R&S

5.3.2 Environment Conditions

Test Site	Shield Room in Branch site
Temperature	(Minimum 22.0, Maximum 22.5) ℃
Humidity	(Minimum 49.0, Maximum 50.1) % R.H.
Atmospheric Pressure	(Minimum 101.0, Maximum 101.0) ㎪
Test Date	2024-06-07

5.3.3 Test Results

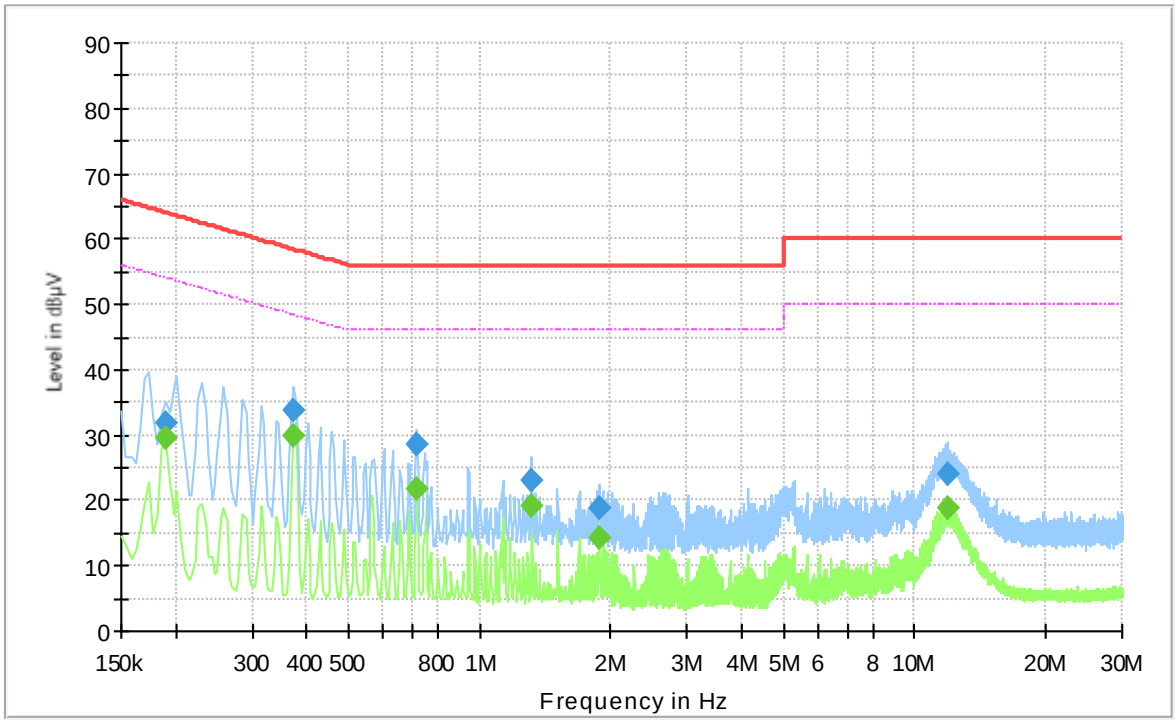
Live Line_03 Mode



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.190	---	33.17	54.04	20.87	15 000.0	9.000	L1	OFF	9.7
0.190	37.26	---	64.04	26.77	15 000.0	9.000	L1	OFF	9.7
0.378	---	35.50	48.32	12.83	15 000.0	9.000	L1	OFF	9.7
0.378	39.39	---	58.32	18.93	15 000.0	9.000	L1	OFF	9.7
0.714	---	26.19	46.00	19.81	15 000.0	9.000	L1	OFF	9.7
0.714	30.89	---	56.00	25.11	15 000.0	9.000	L1	OFF	9.7
1.318	---	22.08	46.00	23.92	15 000.0	9.000	L1	OFF	9.8
1.318	28.19	---	56.00	27.81	15 000.0	9.000	L1	OFF	9.8
2.634	---	17.46	46.00	28.54	15 000.0	9.000	L1	OFF	9.9
2.634	24.66	---	56.00	31.34	15 000.0	9.000	L1	OFF	9.9
11.746	---	20.84	50.00	29.16	15 000.0	9.000	L1	OFF	10.4
11.746	28.83	---	60.00	31.17	15 000.0	9.000	L1	OFF	10.4

Neutral Line_03 Mode



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.190	---	29.63	54.04	24.40	15 000.0	9.000	N	OFF	9.6
0.190	31.98	---	64.04	32.05	15 000.0	9.000	N	OFF	9.6
0.374	---	29.99	48.41	18.43	15 000.0	9.000	N	OFF	9.7
0.374	33.69	---	58.41	24.72	15 000.0	9.000	N	OFF	9.7
0.718	---	21.89	46.00	24.11	15 000.0	9.000	N	OFF	9.7
0.718	28.64	---	56.00	27.36	15 000.0	9.000	N	OFF	9.7
1.318	---	19.19	46.00	26.81	15 000.0	9.000	N	OFF	9.8
1.318	23.14	---	56.00	32.86	15 000.0	9.000	N	OFF	9.8
1.890	---	14.25	46.00	31.75	15 000.0	9.000	N	OFF	9.8
1.890	18.91	---	56.00	37.09	15 000.0	9.000	N	OFF	9.8
11.962	---	18.70	50.00	31.30	15 000.0	9.000	N	OFF	10.5
11.962	24.08	---	60.00	35.92	15 000.0	9.000	N	OFF	10.5

Note. Measurement Uncertainty : See Appendix A

- Line (L1) : Live Line of AC Power
- Line (N) : Neutral Line of AC Power
- Margin = Limit – Quasi Peak or CAverage
- Corr. = LISN Factor + Cable loss + Pulse Limiter factor

Ex) In case

Freq ; 0.5 MHz, level ; 30 dB(µV), 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

5.4 Radiated Emission

5.4.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
Hybrid Antenna	VULB9163	SCHWARZBECK	01126	2025-02-26
AMPLIFIER	317	SONOMA	243246	2024-12-08
EMI TEST RECEIVER	ESU40	R&S	100075	2025-01-17
RF Cable(CA-04)	-	-	-	2024-10-03
RF Cable(CA-06)	MWX221-NMSNMS (4m)	RF ONE	J023142	2024-10-03
RF Cable(CA-08)	PL520-NMNM-10M (10m)	RF ONE	0200324001	2024-10-03

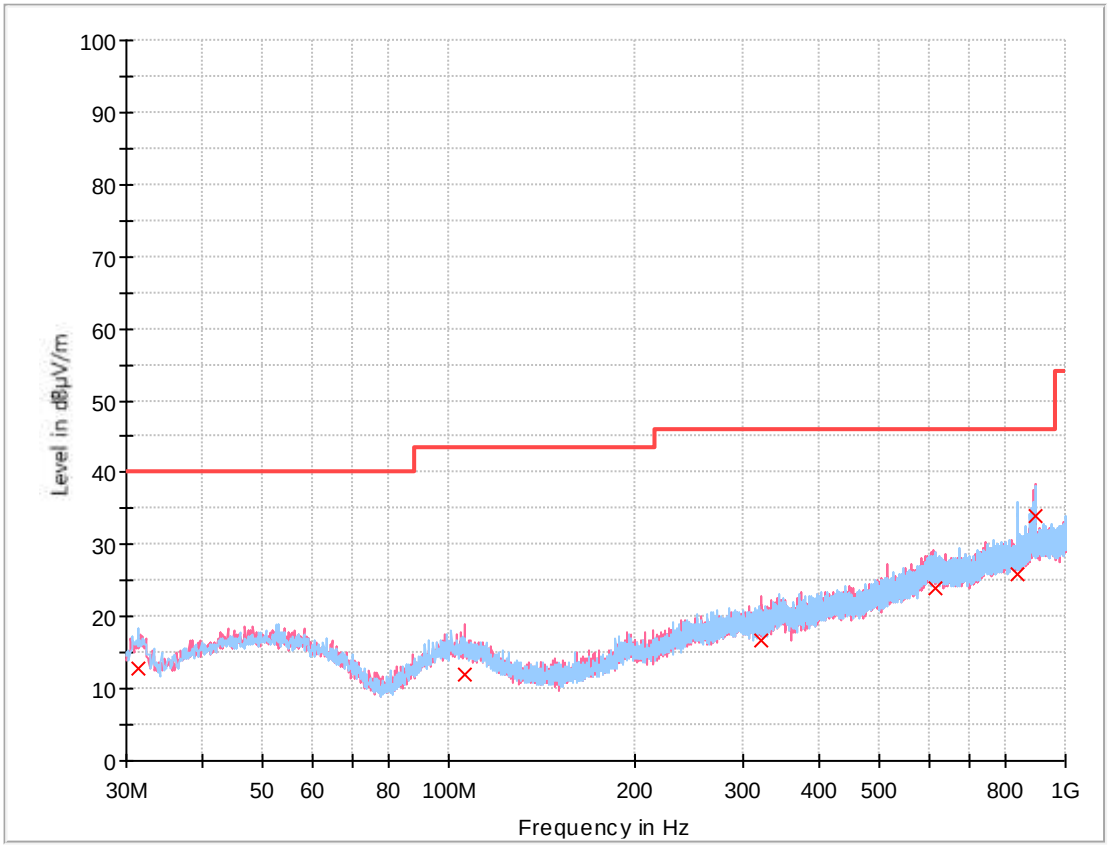
Note. Measuring software is below
- Branch Site : ELECTRA(V5.02.0) from R&S
- Branch Site-3 : EMC32(V10.40.10) from R&S
- Branch Site-4 : EMC32(V10.40.10) from R&S

5.4.2 Environment Conditions

Test SIte	10 m SEMI-ANECHOIC CHAMBER in Branch site-3
Temperature	(Minimum 22.0, Maximum 23.0) ℃
Humidity	(Minimum 33.0, Maximum 34.0) % R.H.
Atmospheric Pressure	(Minimum 101.3, Maximum 101.4) ㎪
Test Date	2024-05-30

5.4.3 Test Result

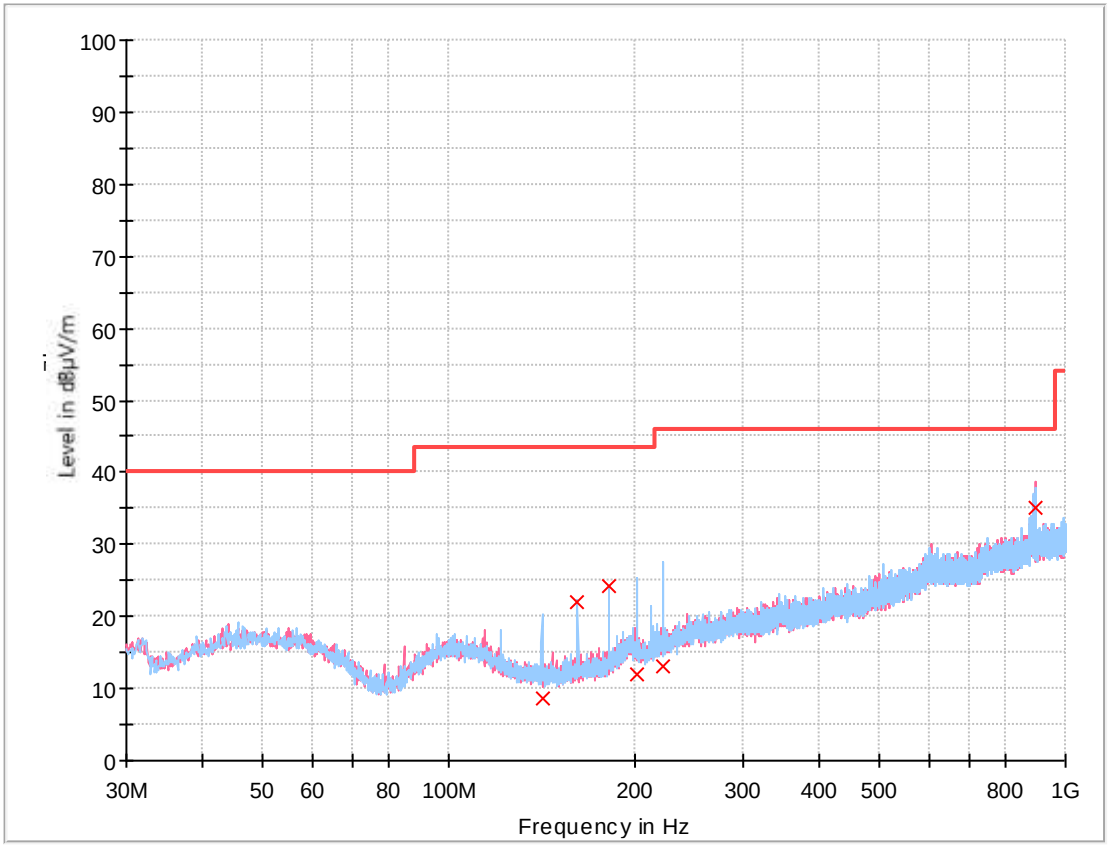
01 Mode



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.358	12.79	40.00	27.21	15 000.0	120.000	200.0	H	62.0	-20.2
106.339	12.09	43.50	31.41	15 000.0	120.000	200.0	V	267.0	-17.5
321.194	16.63	46.00	29.37	15 000.0	120.000	100.0	V	24.0	-13.0
614.619	23.86	46.00	22.14	15 000.0	120.000	100.0	V	0.0	-5.7
836.070	25.86	46.00	20.14	15 000.0	120.000	100.0	H	282.0	-3.7
891.360	33.86	46.00	12.14	15 000.0	120.000	200.0	V	83.0	-2.7

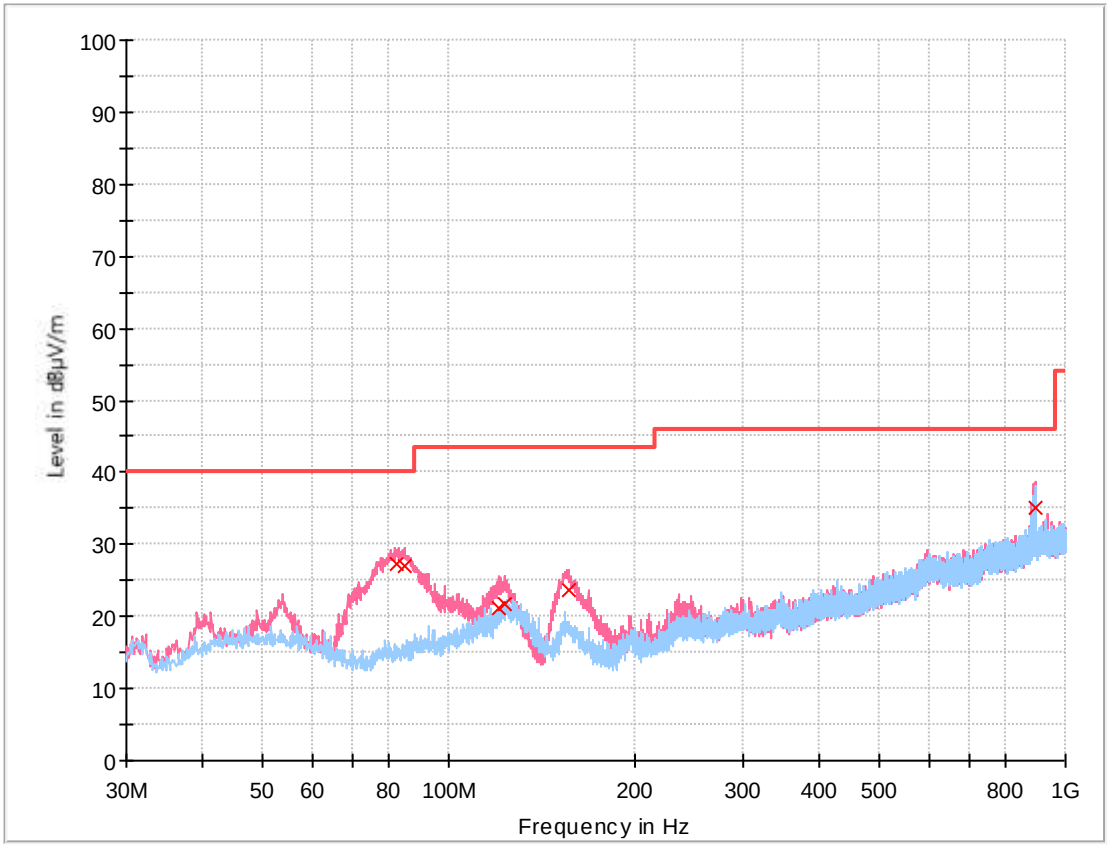
02 Mode



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
141.550	8.51	43.50	34.99	15 000.0	120.000	100.0	H	310.0	-21.0
161.823	22.07	43.50	21.43	15 000.0	120.000	100.0	H	74.0	-20.0
181.999	24.29	43.50	19.21	15 000.0	120.000	100.0	H	275.0	-19.1
202.272	12.05	43.50	31.45	15 000.0	120.000	100.0	H	275.0	-17.5
222.545	12.96	46.00	33.04	15 000.0	120.000	100.0	H	301.0	-16.6
890.972	35.10	46.00	10.90	15 000.0	120.000	200.0	V	82.0	-2.7

03 Mode



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
82.477	27.20	40.00	12.80	15 000.0	120.000	100.0	V	38.0	-22.0
84.611	27.11	40.00	12.89	15 000.0	120.000	100.0	V	38.0	-21.3
120.889	21.19	43.50	22.31	15 000.0	120.000	100.0	V	0.0	-19.6
123.120	21.75	43.50	21.75	15 000.0	120.000	100.0	V	309.0	-20.0
156.391	23.70	43.50	19.80	15 000.0	120.000	100.0	V	272.0	-20.4
891.166	35.12	46.00	10.88	15 000.0	120.000	200.0	V	44.0	-2.7

Note. Measurement Uncertainty: See Appendix A

- POL H = Horizontal
- POL V = Vertical
- Margin = Limit – Quasi Peak
- Corr. = Antenna Factor + Cable loss – Amplifier Gain

Ex) In case

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

Result = Level + AF + CL – Amp
= 30 + 10 + 4 - 25
= 19

Margin = Limit – Result
= 43.5 – 19
= 24.5

Appendix A: Measurement Uncertainty

Test Method			Measurement Uncertainty
Conducted Emission		ENV216	3.1 dB (The confidential level is 95 %, *k*=2)
		ESH2-Z5	2.8 dB (The confidential level is 95 %, *k*=2)
		ESH3-Z6	3.0 dB (The confidential level is 95 %, *k*=2)
Conducted Emission - Signal		ISN T800	5.3 dB (The confidential level is 95 %, *k*=2)
		ISNT8-Cat6	5.4 dB (The confidential level is 95 %, *k*=2)
		ISN S751	7.1 dB (The confidential level is 95 %, *k*=2)
Disturbance Voltage at Antenna Terminal		2.2 dB (The confidential level is 95 %, *k*=2)	
Radiated Emission	9 kHz - 30 MHz	Horizontal	3.6 dB (The confidential level is 95 %, *k*=2)
		Vertical	3.6 dB (The confidential level is 95 %, *k*=2)
	30 MHz - 1 000 MHz	Horizontal	4.6 dB (The confidential level is 95 %, *k*=2)
		Vertical	4.9 dB (The confidential level is 95 %, *k*=2)
	1 GHz - 18 GHz	Horizontal	3.9 dB (The confidential level is 95 %, *k*=2)
		Vertical	3.8 dB (The confidential level is 95 %, *k*=2)

Table A.1 Measurement Uncertainty of Branch Site

Test Method			Measurement Uncertainty
Conducted Emission		ENV216	3.2 dB (The confidential level is 95 %, *k*=2)
		ESH3-Z6	3.2 dB (The confidential level is 95 %, *k*=2)
		ESH2-Z5	3.0 dB (The confidential level is 95 %, *k*=2)
		NNLK8129	3.0 dB (The confidential level is 95 %, *k*=2)
Conducted Emission - Signal		ISN T800	5.5 dB (The confidential level is 95 %, *k*=2)
		ISN ST08	6.6 dB (The confidential level is 95 %, *k*=2)
Radiated Emission	9 kHz - 30 MHz	Horizontal	3.3 dB (The confidential level is 95 %, *k*=2)
		Vertical	3.3 dB (The confidential level is 95 %, *k*=2)
	30 MHz - 1 000 MHz	Horizontal	4.3 dB (The confidential level is 95 %, *k*=2)
		Vertical	4.6 dB (The confidential level is 95 %, *k*=2)
	1 GHz - 18 GHz	Horizontal	3.9 dB (The confidential level is 95 %, *k*=2)
		Vertical	4.0 dB (The confidential level is 95 %, *k*=2)

Table A.2 Measurement Uncertainty of Branch Site-3

Test Method			Measurement Uncertainty
Conducted Emission		ENV216	3.5 dB (The confidential level is 95 %, *k*=2)
		ESH2-Z5	3.3 dB (The confidential level is 95 %, *k*=2)
		ESH3-Z6	3.3 dB (The confidential level is 95 %, *k*=2)
		NNLK8129	3.4 dB (The confidential level is 95 %, *k*=2)
Conducted Emission - Signal		ISN T800	5.6 dB (The confidential level is 95 %, *k*=2)
		ISN ST08	5.5 dB (The confidential level is 95 %, *k*=2)
Radiated Emission	9 kHz - 30 MHz (Triple Loop Ant.)	3.7 dB (The confidential level is 95 %, *k*=2)	
	9 kHz - 30 MHz (Loop Ant.)	Horizontal	4.2 dB (The confidential level is 95 %, *k*=2)
		Vertical	4.2 dB (The confidential level is 95 %, *k*=2)
	30 MHz - 1 000 MHz	Horizontal	4.8 dB (The confidential level is 95 %, *k*=2)
		Vertical	5.2 dB (The confidential level is 95 %, *k*=2)
	1 GHz - 18 GHz	Horizontal	4.5 dB (The confidential level is 95 %, *k*=2)
		Vertical	4.5 dB (The confidential level is 95 %, *k*=2)

Table A.3 Measurement Uncertainty of Branch Site-4

- End of Test Report -