

EMC TEST REPORT



Project No.	LBE20200594	Issue No.	1
Applicant	Name of organization	Samsung Electronics Co., Ltd.	
	Address	(Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea	
	Date of receipt	May 29, 2020	
EUT	Type of device	<input checked="" type="checkbox"/> All other Receivers subject to part15 <input checked="" type="checkbox"/> Class B Personal Computers and peripherals <input checked="" type="checkbox"/> Other Class B digital devices and peripherals <input checked="" type="checkbox"/> FM Broadcast Receiver	
	Equipment authorization	<input checked="" type="checkbox"/> Certification <input type="checkbox"/> Supplier's Declaration of Conformity	
	FCC ID	A3LSMM515F	
	Kind of product	Mobile Phone	
	Model No.	SM-M515F/DSN	
	Variant Model No.	Refer to clause 4.6	
	Manufacturer	SAMSUNG ELECTRONICS VIETNAM CO.,LTD Yenphong 1 - I.P YenTrung Commune, Yenphong Dist., Bac Ninh Province, Vietnam	
Applied Standards		47 CFR Part 15, Subpart B, Class B / ANSI C63.4-2014	
Test Period		July 1, 2020 ~ July 6, 2020	
Issue date		July 15, 2020	
Test result : Complied The equipment under test has found to be compliant with the applied standards. (Refer to the attached test result for more detail.)			
Tested by : Chang-Eun Park 		Reviewed by : Sun-Ho Kim 	
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Samsung Electronics Co Ltd, Global CS Center (Maetan dong) 129, Samsung-ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 16677, Korea			

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1. Report Information

1.1 Revision history

No.	Date of Issue	Revised detailed information
Issue 0	July 13 2020	There are no revisions and this version is basic test report.
Issue 1	July 15 2020	EUT description is modified. (ANT+ is removed)

※ Remark

Compliance with Part 15B requirements for the receiver part of the licensed transmitter (equipment code CXX) is covered by other test report.

2. Summary of test results

2.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result
<input checked="" type="checkbox"/>	Conducted Disturbance (Mains port)	47 CFR Part 15 Subpart B / ANSI C63.4-2014 (Class B)	Complied
<input checked="" type="checkbox"/>	Radiated Disturbance		Complied

3. General Information

3.1 Test facility

The Global CS Center is located on Samsung Electronics Co., Ltd. at (Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea. All testing are performed in Semi-anechoic chambers conforming to the site attenuation characteristics defined by ANSI C63.4, CISPR 32, CISPR 16-1-4 and Shielded rooms. And all antennas are properly calibrated using ANSI C63.5:2017.

The Global CS Center is an ISO/IEC 17025 accredited testing laboratory by the National Radio Research Agency with designation No. KR0004. for EMC testing.

4. Test Setup configuration

4.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Mark	Description	Model No.	Serial No.	Manufacturer / Trademark	FCC ID
A	Mobile Phone	SM-M515F/DSN	-	SAMSUNG	A3LSMM515F
B	Battery	EB-BM415ABY	-	ALT	-
C	Headset	EHS64AVFWE	-	DOOWON	-
D	Data Cable	EP-DA705	-	RF Tech	-
E	Micro SD Card	64 GB	-	SAMSUNG	-
F	Laptop Computer	Latitude5580	1CHRYM2	Dell	DoC
			D3HRYM2	Dell	DoC
G	Laptop AC Adapter	LA65NM130	5D77	Dell	DoC
			5B3C	Dell	DoC
H	Mouse	AA-SM7PCPB	CNBA5903634ADV8J 31O3050	SAMSUNG	DoC
		SNJ-B138	Z5F8353	SAMSUNG	DoC
I	Router	DIR-806A	RF0F1D8011501	D-Link	DoC
			RF0F1D8011504	D-Link	DoC
J	Travel Adapter	EP-TA800	R37N6PA00C9RT3	RF Tech	-

4.2 EUT operating mode

To achieve compliance applied standard specification including CXX, JAB and JBP requirement, the following mode(s) were made during compliance testing:

4.2.1 Conducted Emission

No.	Operating mode
1	Camera (rear) + Charging (w/ TA) + Cellular receiver (LTE FDD26 Center Frequency) + FM (Low Ch.)
2	Camera (front) + Charging (w/ TA) + FM (Mid Ch.)
3	Charging (w/TA) + FM (High Ch.)
4	Video + Audio playback from internal memory data + Charging (w/ TA)
5	USB Data Communication with PC (from external memory data)

4.2.2 Radiated Emission

No.	Operating mode
1	Camera (rear) + Charging (w/ TA) + FM (Low Ch.)
2	Camera (front) + FM (Mid Ch.)
3	FM (High Ch.)
4	Video + Audio playback from internal memory data
5	USB Data Communication with PC (from external memory data)

4.3 Details of Sampling

Customer selected, single unit.

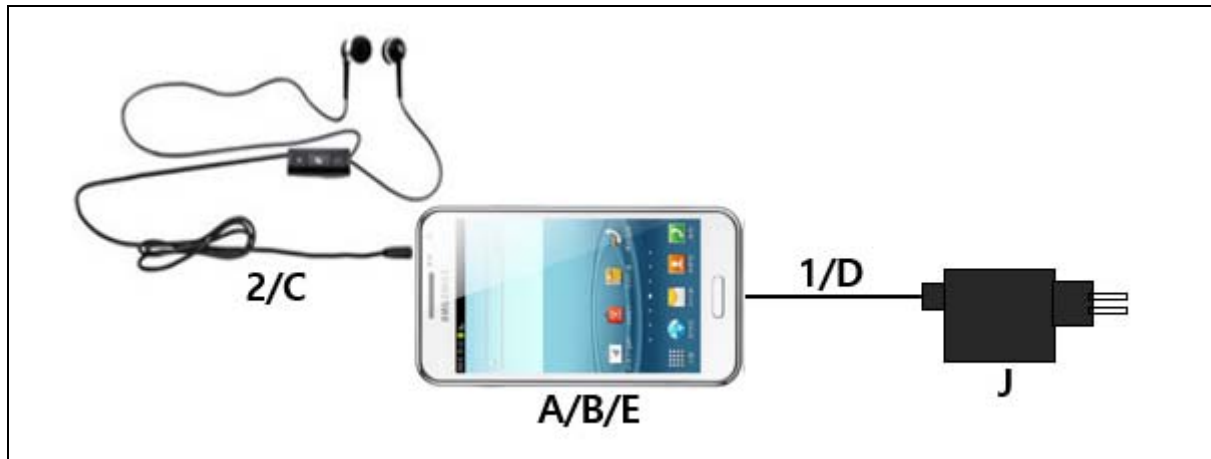
4.4 Used cable description

The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected:

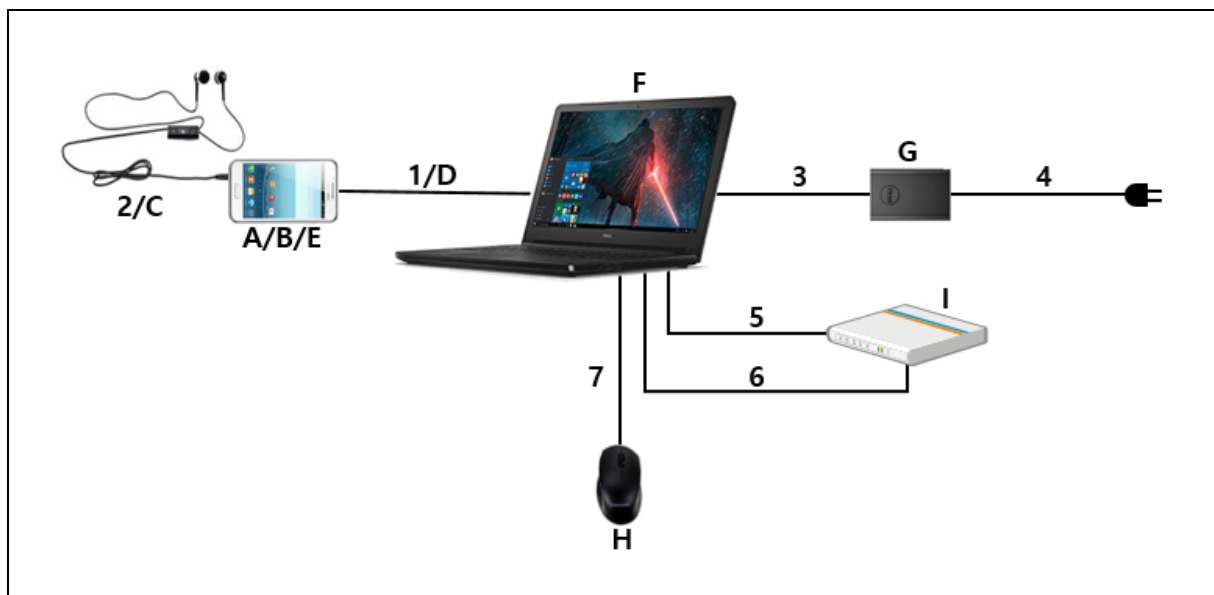
No.	Connected cable	Length [m]	Shielded [Y/N]	Note
1	Data Cable	1.0	Y	From EUT to Travel Adapter or Laptop Computer
2	Headset	1.3	N	For EUT
3	Power	1.8	N	From Laptop Computer to AC Adapter
4	Power	1.5	N	For Laptop AC Adapter
5	LAN	1.5	N	From Laptop Computer to Router
6	USB	0.8	Y	From Laptop Computer to Router for DC Power
7	USB	1.8	Y	From Laptop Computer to Mouse

4.5 Test arrangement

4.5.1 Conducted Emission

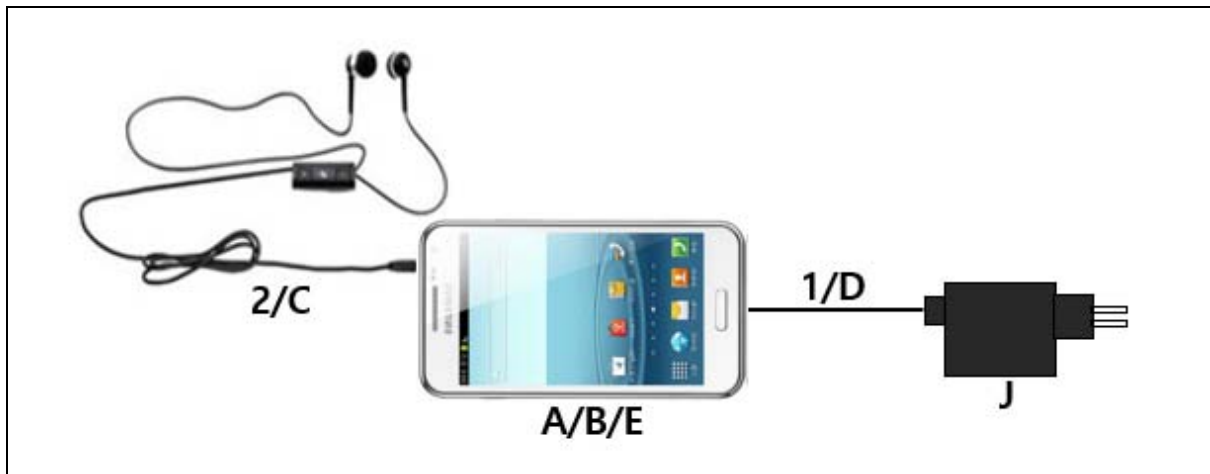


[Mode 1 - 4]

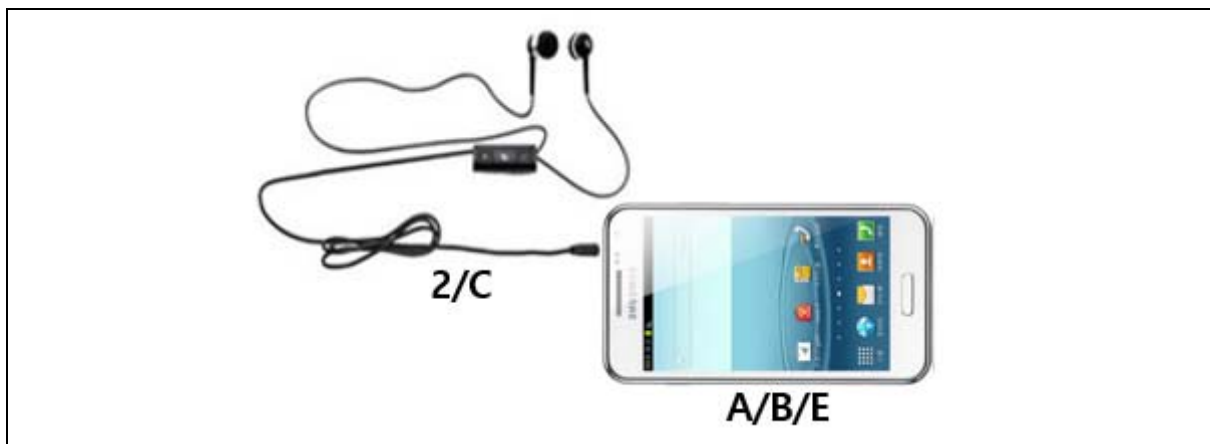


[Mode 5]

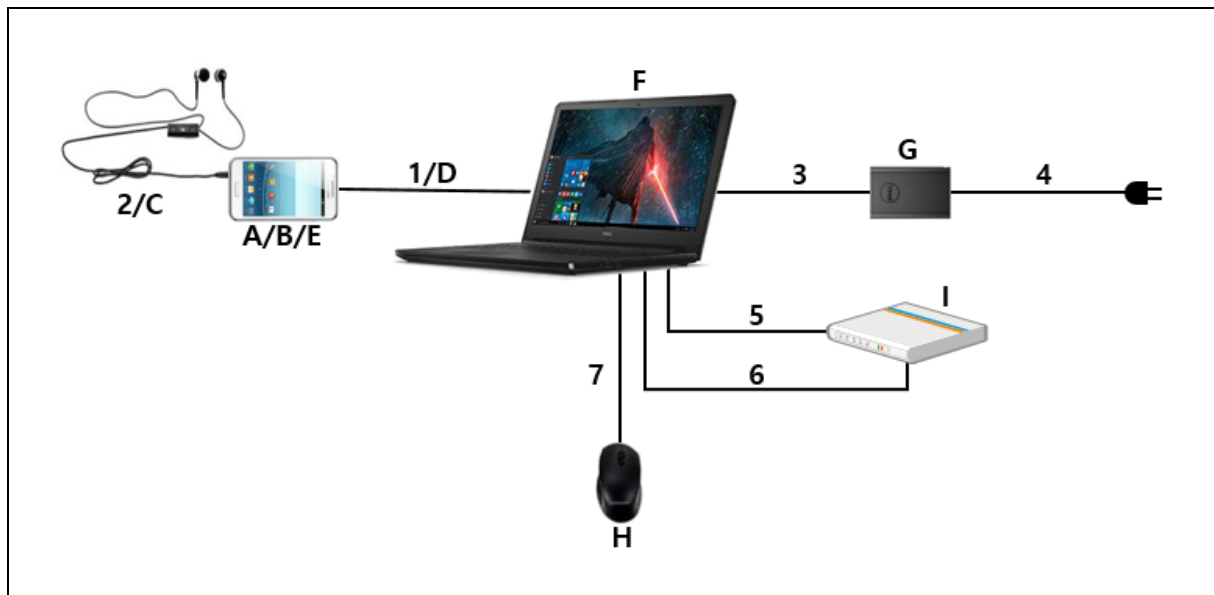
4.5.2 Radiated Emission



[Mode 1]



[Mode 2 - 4]



[Mode 5]

4.6 EUT Description

The EUT is a bar type mobile phone which can operate on GSM850/900/1800/1900, WCDMA FDD1/2/4/5/8, LTE FDD1/2/3/4/5/7/8/12/17/20/26/28/66, LTE TDD38/40/41 and incorporates a Bluetooth, Wi-Fi, Camera, GNSS, NFC, FM radio, Audio and Video.

4.6.1 The variant models

- None

4.7 EUT Frequencies

The highest frequencies (Generated and used)	Frequency [MHz]
Wi-Fi	5 825

4.8 Test configuration and condition

The system was configured for testing in a typical fashion that a customer would normally use. Cables were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. All the external I/O ports are exercised, as well as internal and the external SD card if available, by writing and reading arbitrary data or charging with TA.

The EUT was investigated in three orientations and the worst case orientation is reported.

RX mode(850MHz) testing was performed with the LTE FDD26 RX Test mode at center frequency. All licensed communication (850MHz) RX mode, GSM/WCDMA/LTE, test results are not significantly different.

The FM radio mode radiated testing was performed with the Low/Mid/High channel.

The video and audio were repetitively played with earphone connected.

The camera of the EUT was operated continuously.

Power source for the EUT operating was supplied by CVCF made by the Pacific Corp.

- Test Voltage : AC 120 V, 60 Hz

4.9 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4-2 and UKAS M3003)

4.9.1 Emission

Test type		Measurement uncertainty (C.L. approximately 95 %, $k = 2$)
Conducted disturbance	AC Mains	2.83 dB
Radiated Disturbance (Below 1 GHz)	Horizontal	4.08 dB
	Vertical	4.58 dB
Radiated Disturbance (Above 1 GHz)	Horizontal	5.21 dB
	Vertical	5.22 dB

* Remark

- 1) The values for uncertainty of conducted and radiated emissions are less than the Corresponding values of U_{cispr} given in CISPR 16-4-2. Therefore no adjustment of measurement results is necessary when comparing them with the relevant limits.

5. Results of individual test

5.1 Conducted disturbance

The EUT is connected to a LISN via travel adapter. If the EUT is connected to the Laptop Computer USB port, the Laptop AC adapter is connected to a LISN.

Both conducted lines are measured in Quasi-Peak and CISPR-Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

Limits for conducted disturbance at the mains ports of Class B ITE

Frequency range Limits [MHz]	Resolution Bandwidth [kHz]	Limits [dB(μV)]	
		Quasi-peak	Average
0.15 to 0.50	9	66 to 56	56 to 46
0.50 to 5	9	56	46
5 to 30	9	60	50
NOTE 1 The lower limit shall apply at the transition frequency.			
NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.			

5.1.1 Test instrumentation

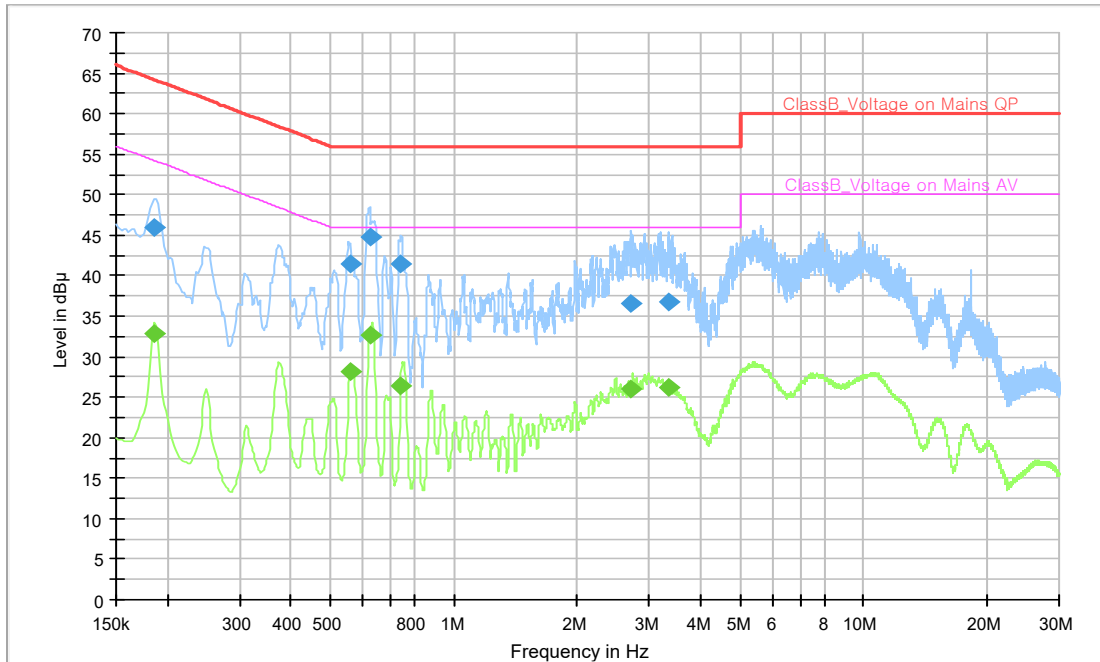
EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Next Calibration	
					Date	Interval (Month)
E5I-007	LTE Communicator	CMW500	R&S	132729	2021-03-27	12
E5I-017	EMI Test Receiver	ESU8	R&S	100483	2021-01-20	12
E5I-127	LISN	ENV216	R&S	102061	2020-08-01	12
-	Test software	EMC32	R&S	Ver 9.26.01	-	-

5.1.2 Temperature and humidity condition

Test date	2020-07-01	Test engineer	Chang-Eun Park
Climate condition	Ambient temperature	(20.1 ± 0.5) °C	Limit (15.0 to 35.0) °C
	Relative humidity	(55.7 ± 0.5) % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	(100.3 ± 0.5) kPa	Limit (86.0 to 106.0) kPa
Test place	Shield Room (SR8)		

5.1.3 Test results

☐ Operating Mode 1: AC Mains



QP / CAV final measurement results table:

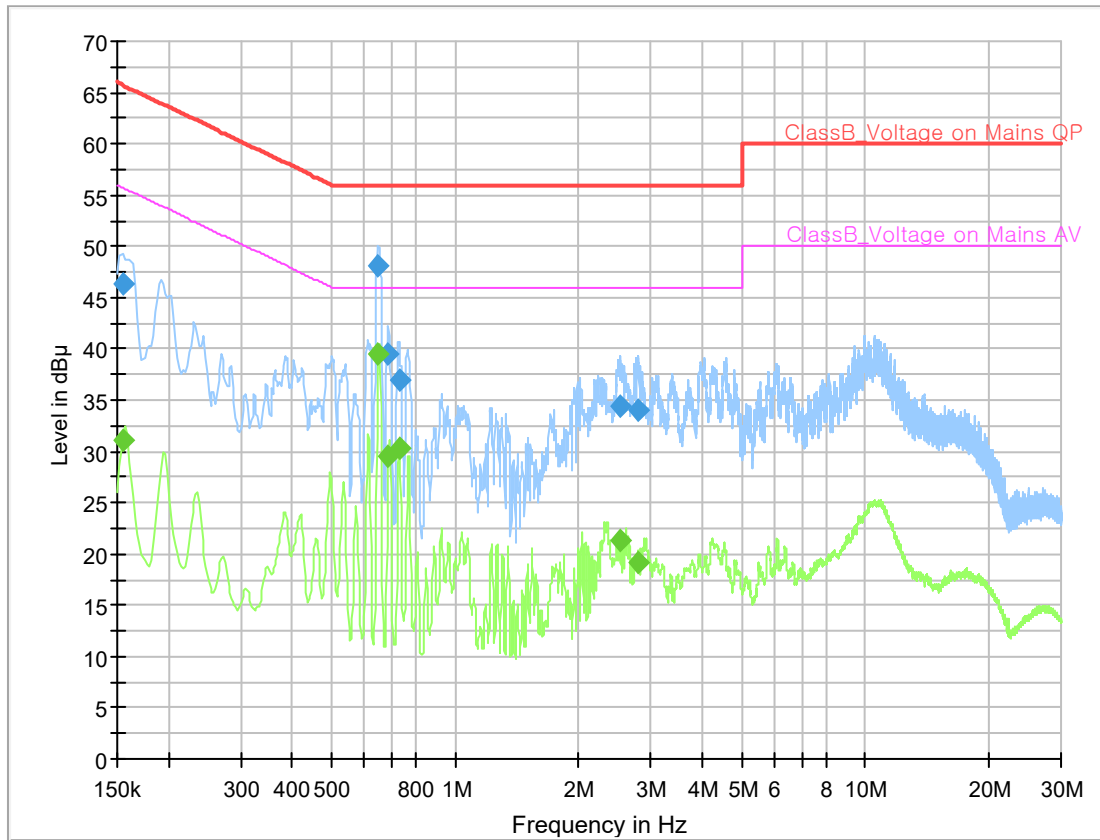
Frequency (MHz)	QP (dBμV)	CAV (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.186	---	32.81	54.21	21.40	N	10.2
0.186	45.85	---	64.21	18.36	N	10.2
0.557	---	28.08	46.00	17.92	N	10.2
0.557	41.39	---	56.00	14.61	N	10.2
0.623	---	32.60	46.00	13.40	N	10.2
0.623	44.74	---	56.00	11.26	N	10.2
0.744	---	26.35	46.00	19.65	N	10.1
0.744	41.49	---	56.00	14.51	N	10.1
2.715	---	25.97	46.00	20.03	N	9.9
2.715	36.58	---	56.00	19.42	N	9.9
3.350	---	26.20	46.00	19.80	N	9.9
3.350	36.82	---	56.00	19.18	N	9.9

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)

Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)

QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

☐ **Operating Mode 2: AC Mains**


QP / CAV final measurement results table:

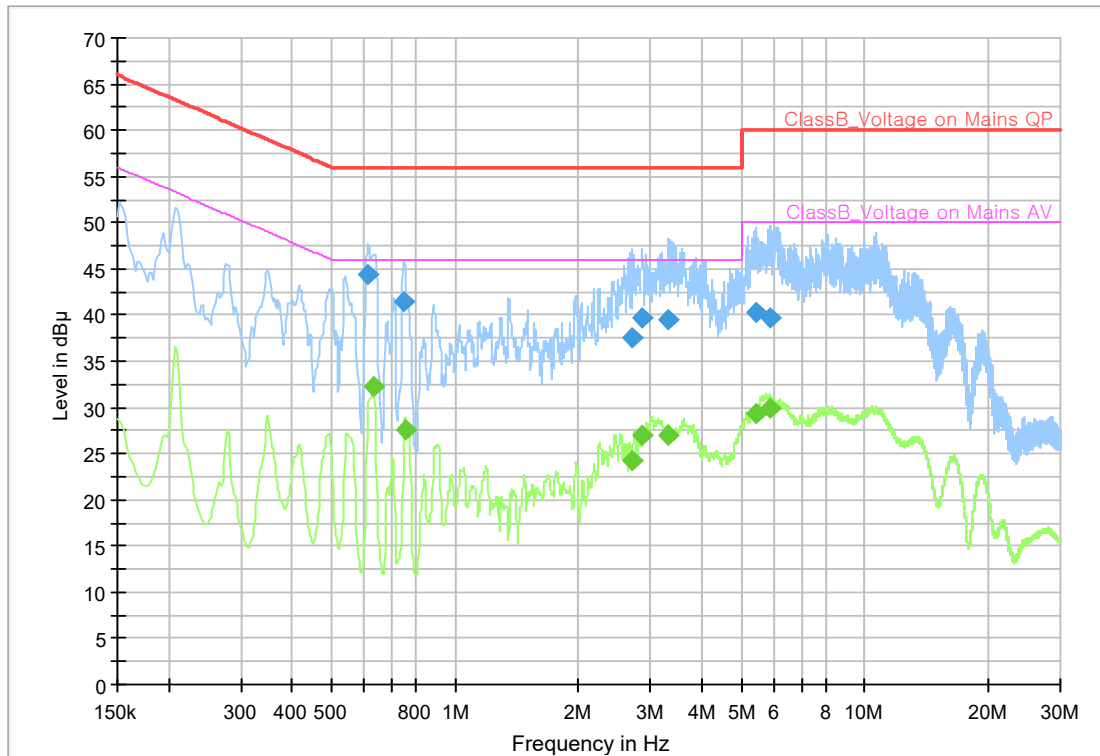
Frequency (MHz)	QP (dBμV)	CAV (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.155	---	31.07	55.75	24.68	N	10.0
0.155	46.41	---	65.75	19.34	N	10.0
0.650	---	39.58	46.00	6.42	N	10.2
0.650	48.05	---	56.00	7.95	N	10.2
0.688	---	29.54	46.00	16.46	N	10.2
0.688	39.47	---	56.00	16.53	N	10.2
0.731	---	30.22	46.00	15.78	N	10.1
0.731	37.04	---	56.00	18.96	N	10.1
2.522	---	21.37	46.00	24.63	N	9.9
2.522	34.35	---	56.00	21.65	N	9.9
2.785	---	19.08	46.00	26.92	N	9.9
2.785	33.94	---	56.00	22.06	N	9.9

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)

Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)

QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

☐ Operating Mode 3: AC Mains


QP / CAV final measurement results table:

Frequency (MHz)	QP (dBμV)	CAV (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.614	44.32	---	56.00	11.68	N	10.2
0.634	---	32.30	46.00	13.70	L1	10.0
0.751	41.47	---	56.00	14.53	N	10.1
0.762	---	27.52	46.00	18.48	L1	10.0
2.706	37.55	---	56.00	18.45	N	9.9
2.706	---	24.17	46.00	21.83	N	9.9
2.868	39.69	---	56.00	16.31	N	9.9
2.868	---	26.91	46.00	19.09	N	9.9
3.325	39.50	---	56.00	16.50	N	9.9
3.325	---	27.05	46.00	18.95	N	9.9
5.422	---	29.33	50.00	20.67	N	10.0
5.422	40.30	---	60.00	19.70	N	10.0
5.892	---	29.89	50.00	20.11	N	10.1
5.892	39.61	---	60.00	20.39	N	10.1

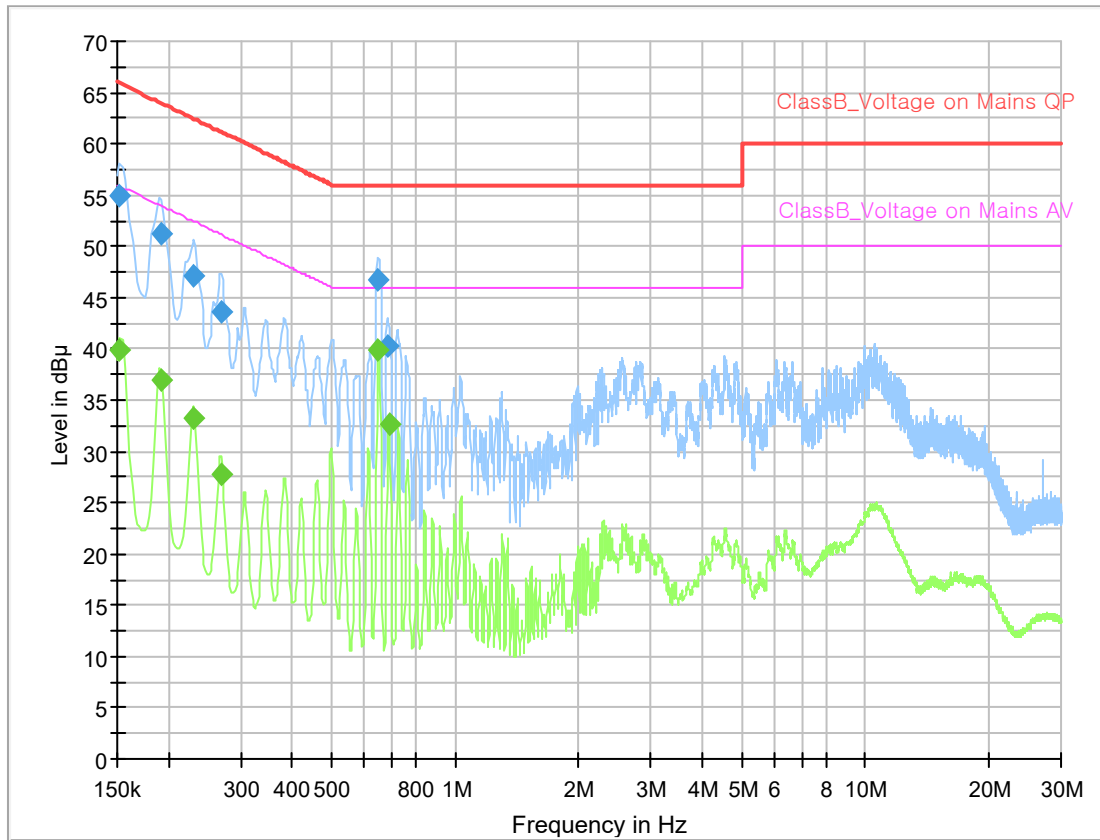
Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)

Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)

QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

□ Operating Mode 4: AC Mains



QP / CAV final measurement results table:

Frequency (MHz)	QP (dBμV)	CAV (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152	55.00	---	65.88	10.88	N	10.0
0.152	---	39.84	55.88	16.04	N	10.0
0.193	51.31	---	63.92	12.61	N	10.1
0.193	---	36.89	53.92	17.03	N	10.1
0.229	47.20	---	62.50	15.30	N	9.9
0.229	---	33.18	52.50	19.32	N	9.9
0.269	43.57	---	61.14	17.57	N	9.9
0.269	---	27.83	51.14	23.31	N	9.9
0.650	46.80	---	56.00	9.20	N	10.2
0.650	---	39.98	46.00	6.02	N	10.2
0.683	40.20	---	56.00	15.80	N	10.2
0.690	---	32.69	46.00	13.31	N	10.1

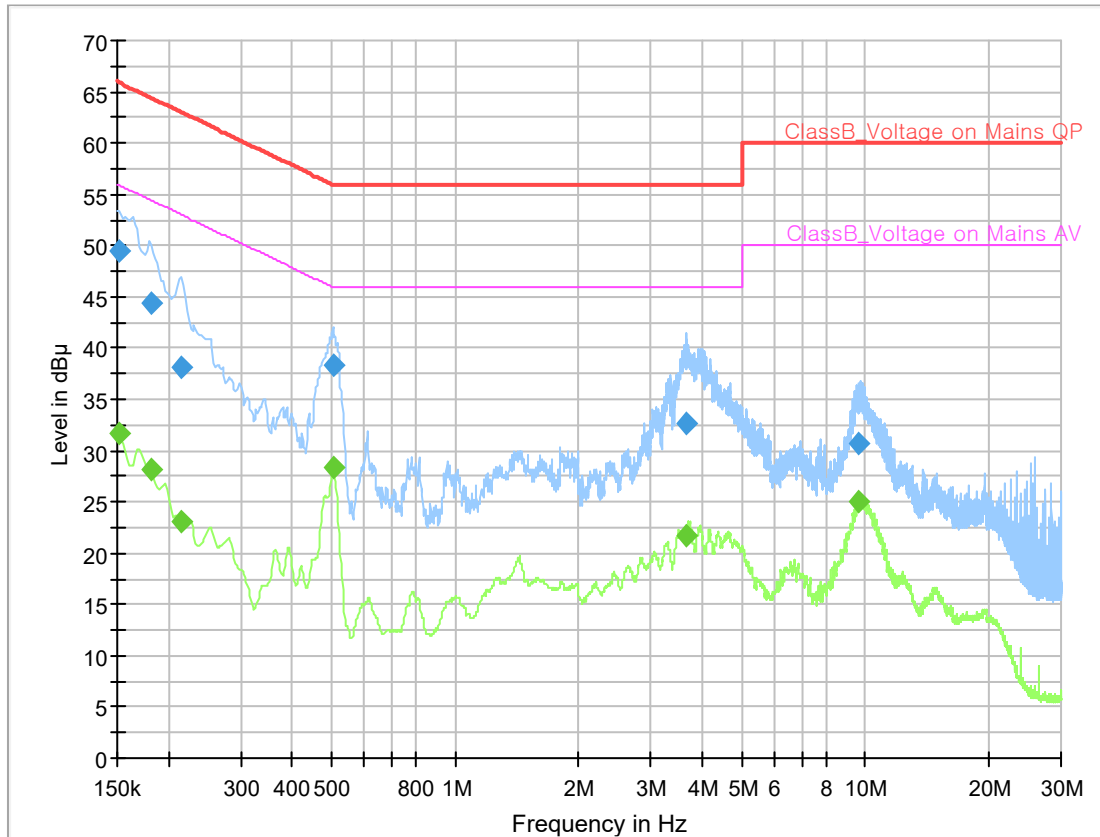
Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)

Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)

QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

□ Operating Mode 5: AC Mains



QP / CAV final measurement results table:

Frequency (MHz)	QP (dBμV)	CAV (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152	---	31.62	55.88	24.26	L1	9.9
0.152	49.51	---	65.88	16.37	L1	9.9
0.182	44.48	---	64.42	19.94	N	10.1
0.182	---	28.24	54.42	26.18	N	10.1
0.215	38.15	---	63.00	24.85	N	9.9
0.215	---	23.02	53.00	29.98	N	9.9
0.503	38.28	---	56.00	17.72	L1	10.1
0.503	---	28.37	46.00	17.63	L1	10.1
3.671	---	21.79	46.00	24.21	N	9.8
3.671	32.66	---	56.00	23.34	N	9.8
9.686	30.71	---	60.00	29.29	L1	9.8
9.686	---	25.00	50.00	25.00	L1	9.8

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)

Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)

QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

5.2 Radiated disturbance

The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin.

Peak measurements were made over the changeable frequency range 30 MHz to 1 GHz at a measurement distance of 10 m for the following antenna and turntable arrangements:

Antenna Height [cm]	Antenna Polarisation	Resolution Bandwidth [kHz]	Video Bandwidth [kHz]	Turntable position [degrees]
100 ~ 400	Horizontal, Vertical	120	300	Continuous

Measurements within 6 dB of the limit were then maximized by adjusting turntable position. Final measurements were made using quasi-peak detector.

Peak/CISPR-Average measurements were made over the changeable frequency range 1 GHz to 40 GHz or 5th harmonics of the highest frequency generated or used in the device or on which the device operates or tunes at a measurement distance of 3 m for the following antenna and turntable arrangements. The measurements above 1 GHz were performed with the bore-sighting antenna aimed at the EUT.

Antenna Height [cm]	Antenna Polarisation	Resolution Bandwidth [MHz]	Video Bandwidth [MHz]	Turntable position
100 ~ 400	Horizontal, Vertical	1	3	Continuous

Measurements within 6 dB of the limit were then maximized by adjusting turntable position. Final measurements were made using peak and CISPR-average detectors.

Limits for radiated disturbance of Class B ITE at a measuring distance of 3 m and 10 m

Frequency range Limits [MHz]	Field Strength		
	3 m [$\mu\text{V/m}$]	3 m [dB($\mu\text{V/m}$)]	10 m [dB($\mu\text{V/m}$)]
30 to 88	100	40.0	29.5
88 to 216	150	43.5	33.0
216 to 960	200	46.0	35.5
Above 960	500	54.0	43.5

Note) Distance correction formula from $D_1(3\text{m})$ to $D_2(10\text{m})$

: Limit at $D_2 = \text{Limit at } D_1 + 20\text{Log}(D_1 / D_2)$

Results checked manually; and points close to the limit line were re-measured.

5.2.1 Test instrumentation

EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Next Calibration	
					Date	Interval (Month)
E5I-021	EMI Test Receiver	ESU40	R&S	100376	2021-01-31	12
E5I-018	EMI Test Receiver	ESU8	R&S	100484	2021-05-22	12
E5I-069	BiLog Antenna	CBL6112D	TESEQ	35382	2021-08-30	24
E5I-071	BiLog Antenna	CBL6112D	TESEQ	35384	2021-08-30	24
E5I-093	Preamplifier	310N	SONOMA	273122	2021-01-23	12
E5I-094	Preamplifier	310N	SONOMA	282363	2021-01-23	12
E5I-036	Horn Antenna	HF907	R&S	100507	2022-04-23	24
E5I-039	Signal Conditioning Unit	SCU-18	R&S	10211	2021-01-23	12
E5I-037	WideBand Horn Antenna	WBH 18-40K	R&S	11201	2021-01-31	24
E5I-042	Signal Conditioning Unit	SCU-40A	R&S	10004	2020-09-11	12
-	Test software	EP7RE	TOYO	Ver 5.8.2	-	-
-	Test software	EMC32	R&S	Ver 9.25.00	-	-

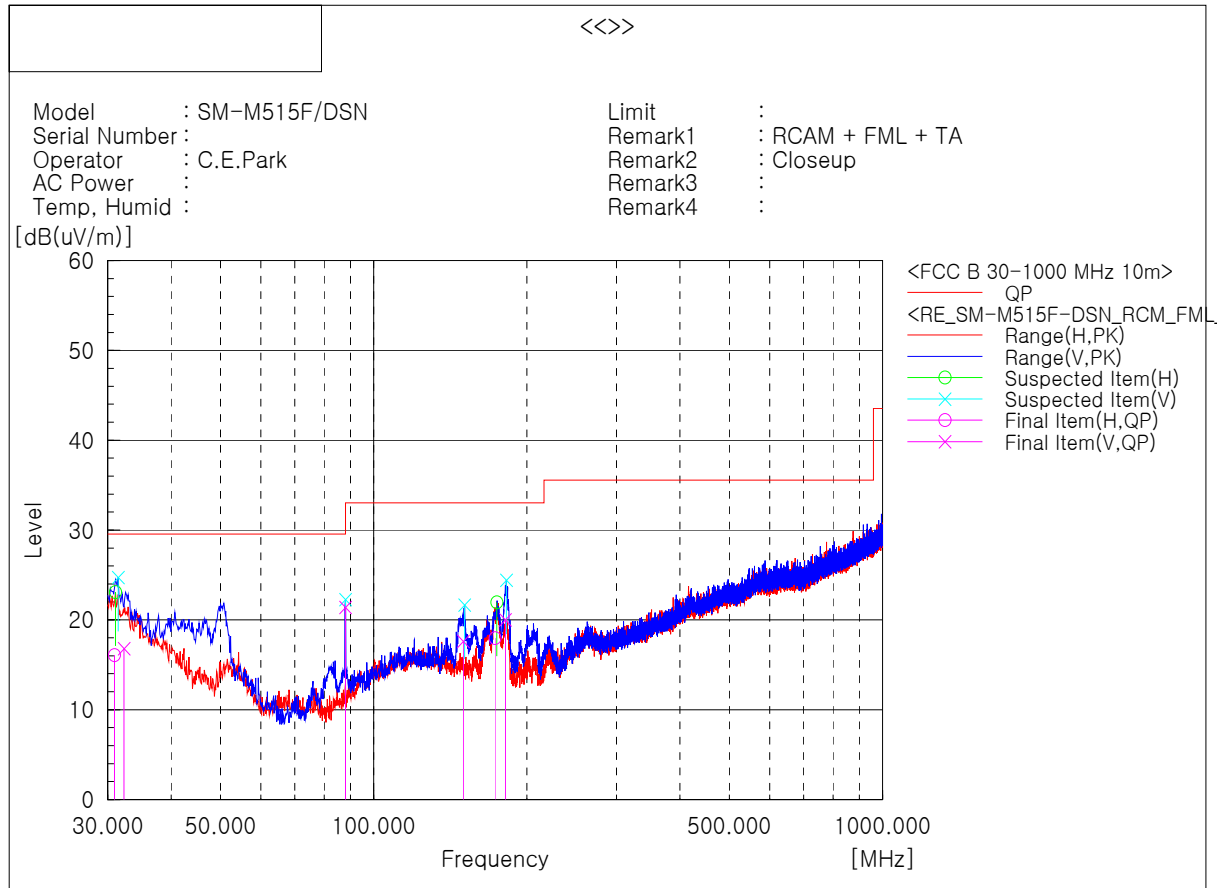
5.2.2 Temperature and humidity condition

Test date	2020-07-03 ~ 2020-07-06	Test engineer	Chang-Eun Park
Climate condition	Ambient temperature	(21.1 ± 0.5) °C	Limit (15.0 to 35.0) °C
	Relative humidity	(50.7 ± 0.5) % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	(100.8 ± 0.5) kPa	Limit (86.0 to 106.0) kPa
Test place	Semi-Anechoic Chamber (SAC4)		

5.2.3 Test results

☐ Operating Mode 1

- Frequencies below 1 GHz



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]	System
1	30.926	H	23.3	-7.2	16.1	29.5	13.4	271	191	1
2	32.299	V	24.0	-7.2	16.8	29.5	12.7	103	311	2
3	87.973	V	36.9	-15.5	21.4	29.5	8.1	171	185	2
4	150.012	V	30.5	-12.9	17.6	33.0	15.4	100	43	2
5	173.114	H	33.0	-15.0	18.0	33.0	15.0	400	268	1
6	181.560	V	34.0	-14.0	20.0	33.0	13.0	100	13	2

Remark : Radiated emission (Rx frequency - 87.973 MHz) from the transceiver shall be ignored.

Note1) Receiving antenna polarization : Horizontal, Vertical

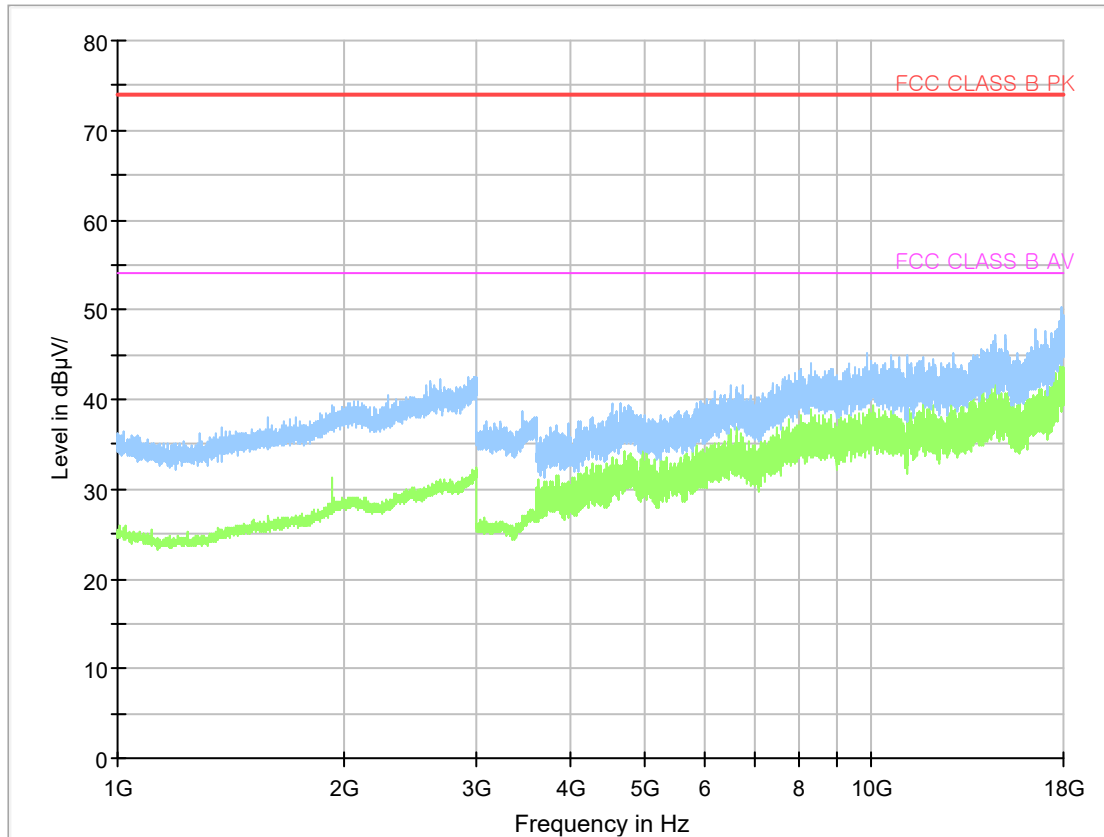
Test Distance : 10 m, Antenna Height : 1 to 4 meters

Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (QP) = Limit - Level (QP)

QP = Quasi-Peak, c.f = Correction Factor

- Frequencies above 1 GHz



Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

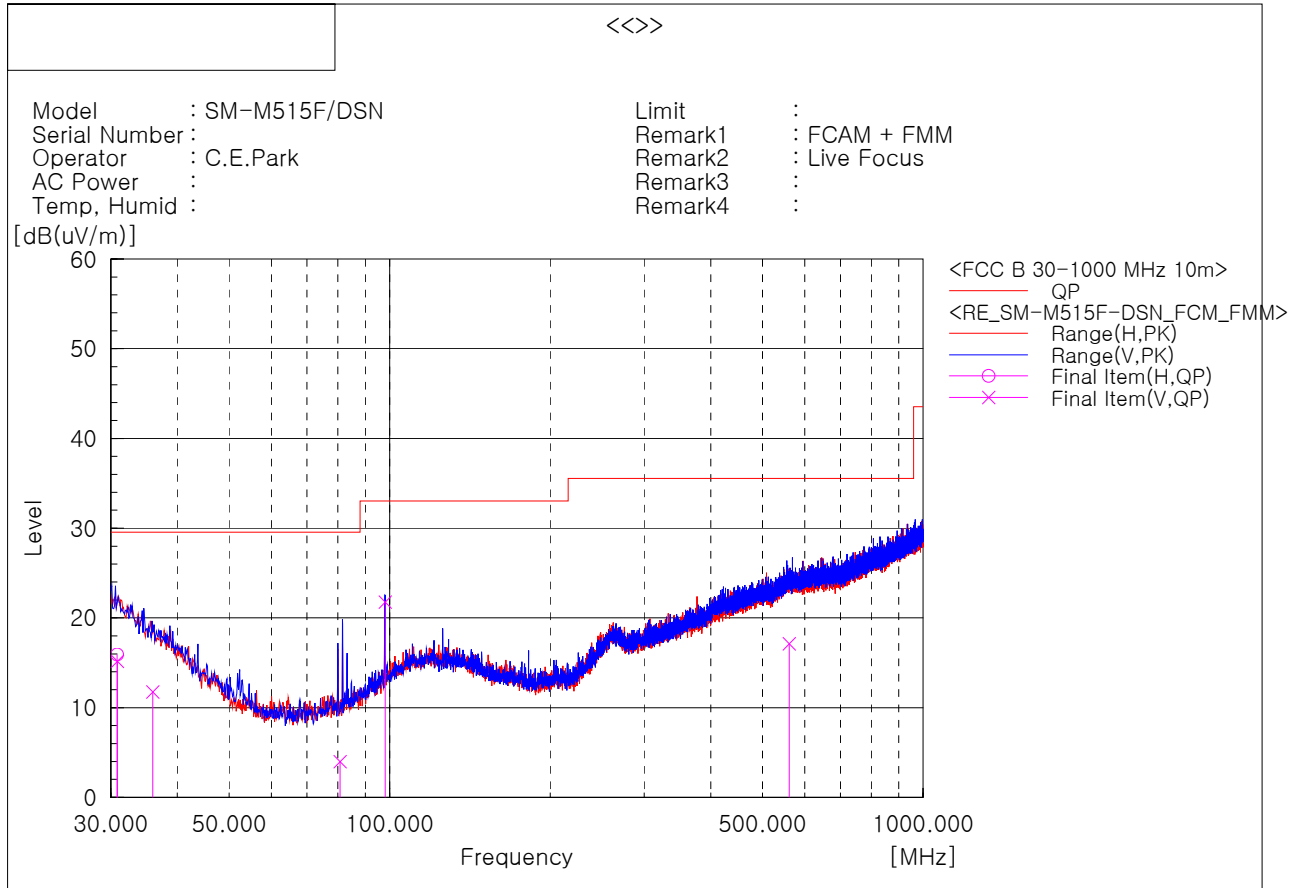
Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor

☐ Operating Mode 2**- Frequencies below 1 GHz**

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]	System
1	30.845	H	23.0	-7.1	15.9	29.5	13.6	219	301	1
2	30.852	V	21.7	-6.5	15.2	29.5	14.3	116	114	2
3	35.942	V	20.9	-9.1	11.8	29.5	17.7	102	343	2
4	80.729	V	20.8	-16.8	4.0	29.5	25.5	113	355	2
5	98.018	V	35.3	-13.5	21.8	33.0	11.2	110	315	2
6	561.037	V	19.7	-2.6	17.1	35.5	18.4	131	88	2

Remark : Radiated emission (Rx frequency - 98.018 MHz) from the transceiver shall be ignored.

Note1) Receiving antenna polarization : Horizontal, Vertical

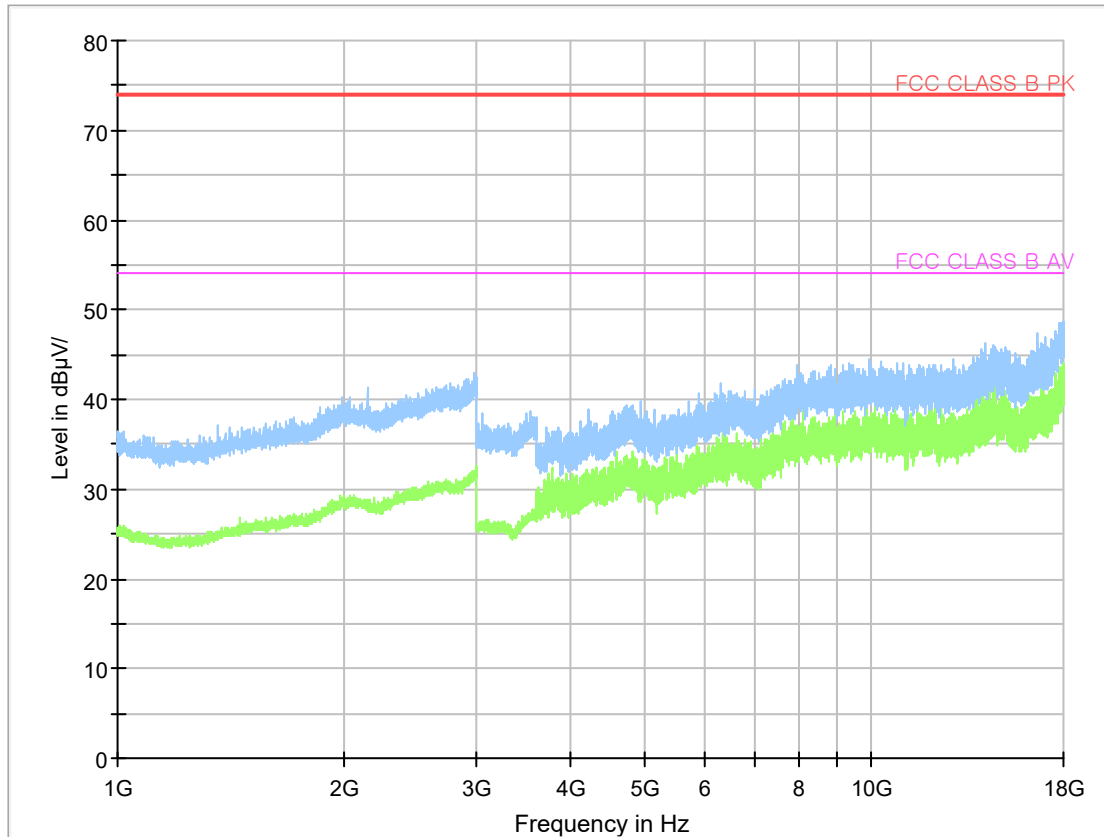
Test Distance : 10 m, Antenna Height : 1 to 4 meters

Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (QP) = Limit - Level (QP)

QP = Quasi-Peak, c.f = Correction Factor

- Frequencies above 1 GHz



Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

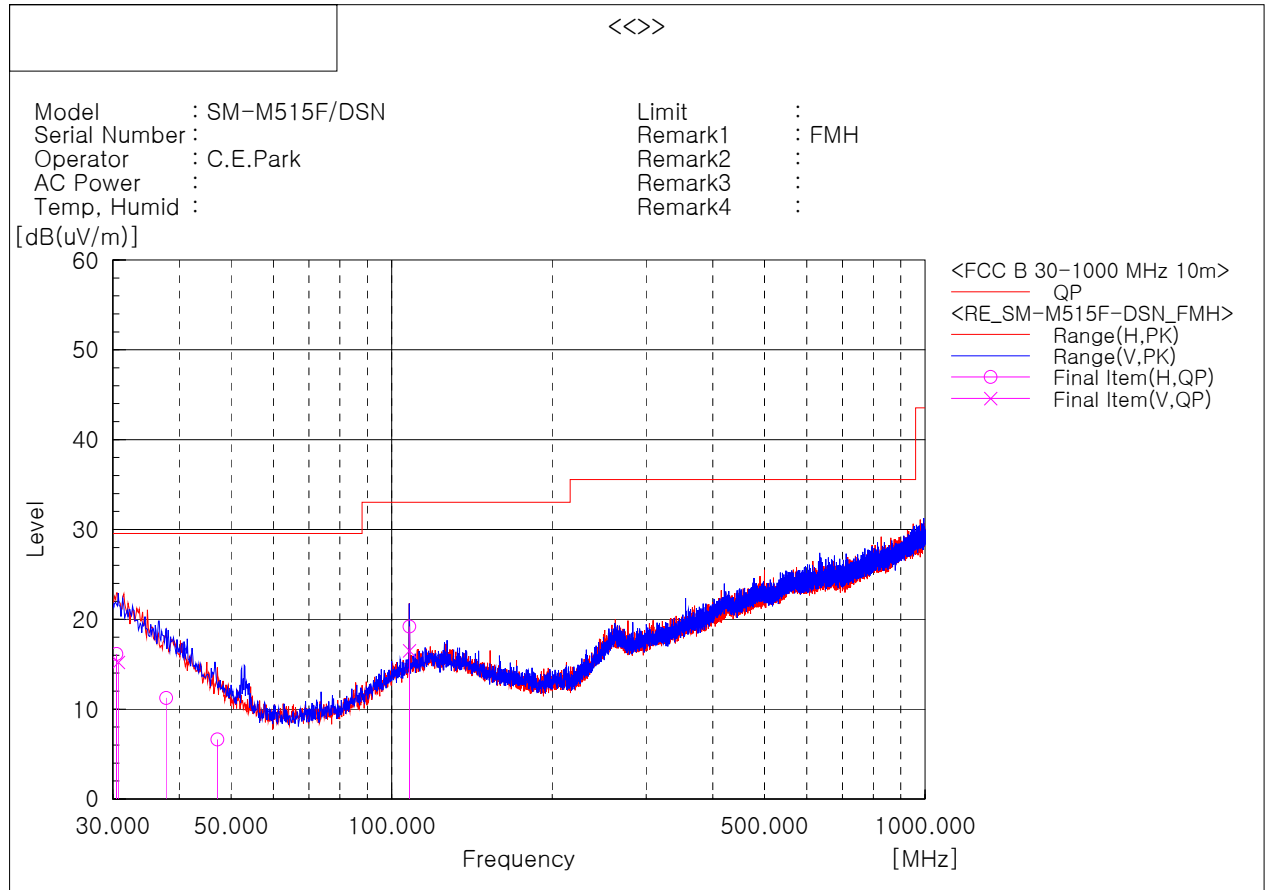
Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor

☐ Operating Mode 3**- Frequencies below 1 GHz**

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]	System
1	30.485	H	23.0	-6.9	16.1	29.5	13.4	226	1	1
2	30.728	V	21.7	-6.5	15.2	29.5	14.3	119	1	2
3	37.760	H	22.4	-11.2	11.2	29.5	18.3	394	1	1
4	47.096	H	22.9	-16.3	6.6	29.5	22.9	325	2	1
5	107.964	V	28.7	-12.2	16.5	33.0	16.5	114	1	2
6	107.964	H	32.5	-13.3	19.2	33.0	13.8	400	251	1

Remark : Radiated emission (Rx frequency - 107.964 MHz) from the transceiver shall be ignored.

Note1) Receiving antenna polarization : Horizontal, Vertical

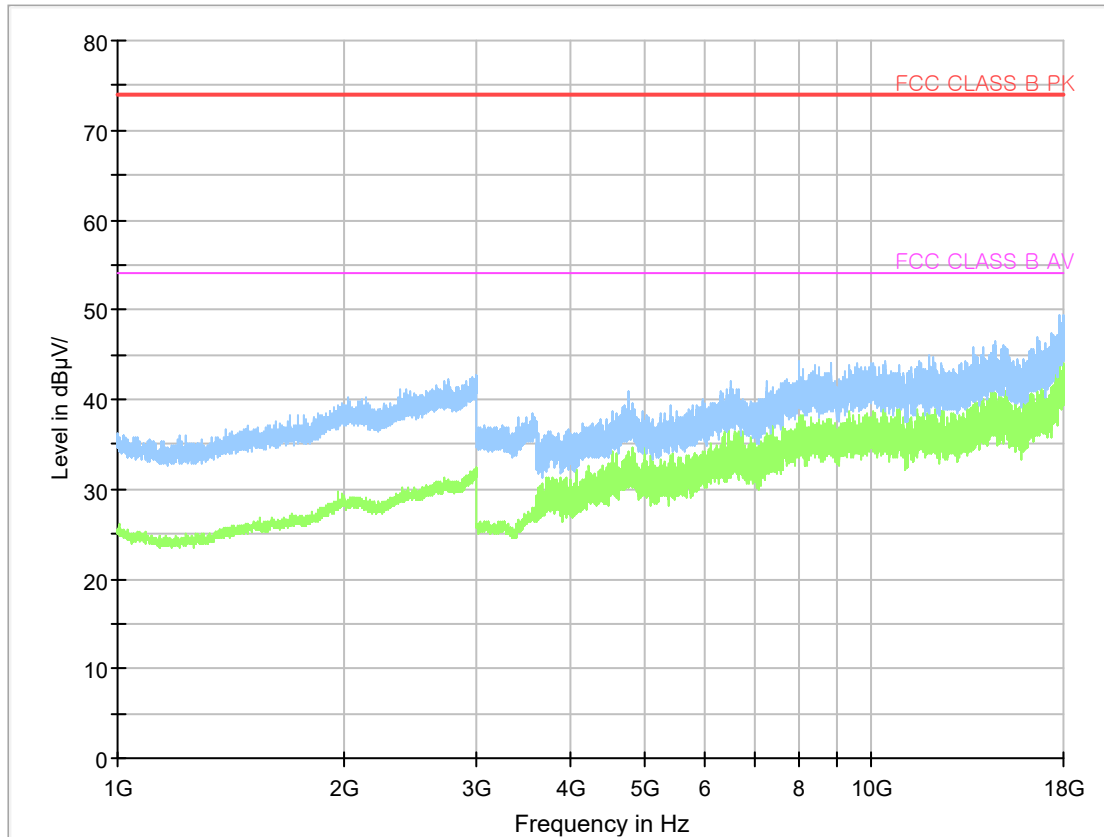
Test Distance : 10 m, Antenna Height : 1 to 4 meters

Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (QP) = Limit - Level (QP)

QP = Quasi-Peak, c.f = Correction Factor

- Frequencies above 1 GHz



Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

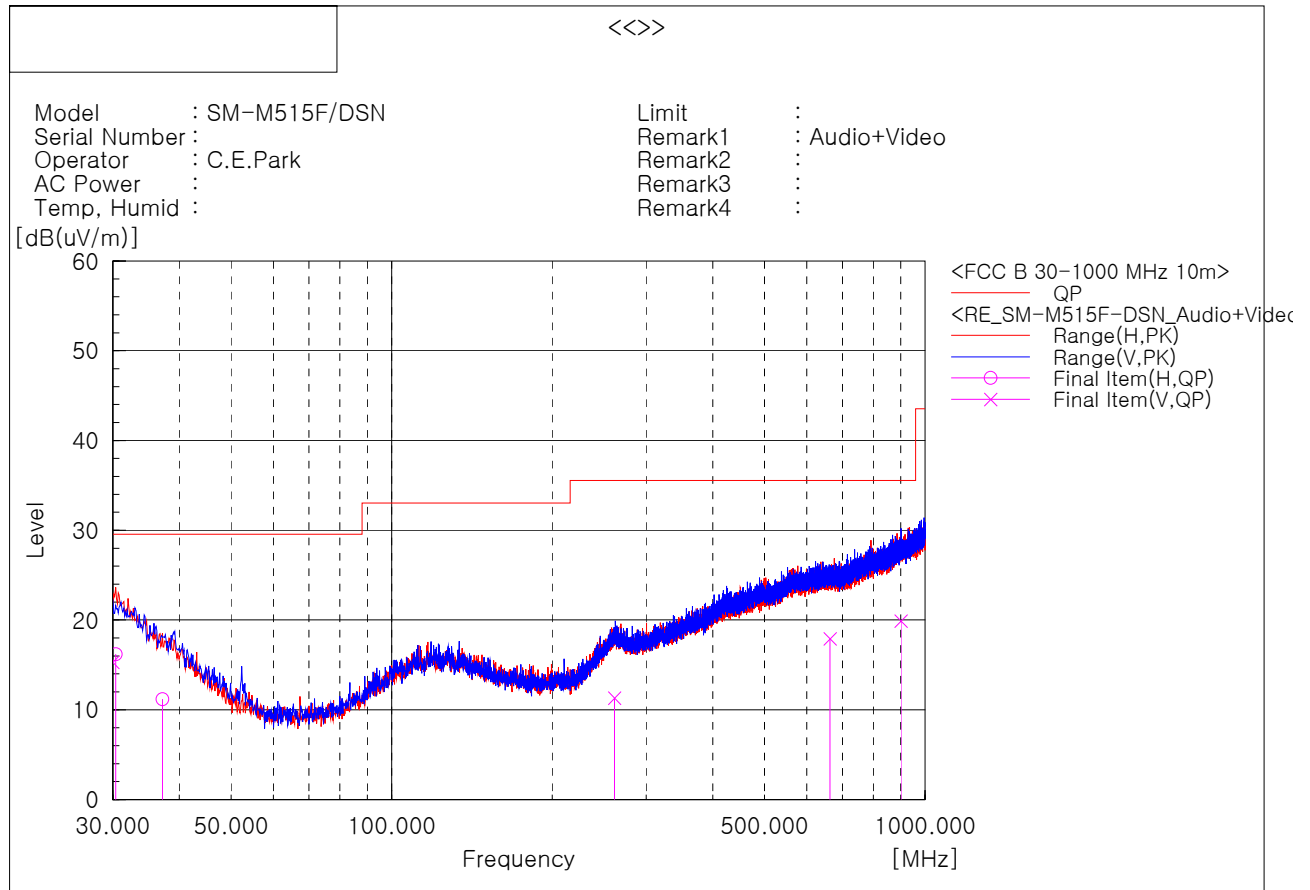
Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor

☐ Operating Mode 4

- Frequencies below 1 GHz



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]	System
1	30.000	V	21.4	-6.1	15.3	29.5	14.2	330	278	2
2	30.364	H	23.0	-6.8	16.2	29.5	13.3	390	182	1
3	37.154	H	22.1	-10.9	11.2	29.5	18.3	100	263	1
4	261.830	V	20.2	-8.9	11.3	35.5	24.2	271	145	2
5	663.531	V	20.0	-2.1	17.9	35.5	17.6	130	0	2
6	901.302	V	19.2	0.7	19.9	35.5	15.6	370	161	2

Note1) Receiving antenna polarization : Horizontal, Vertical

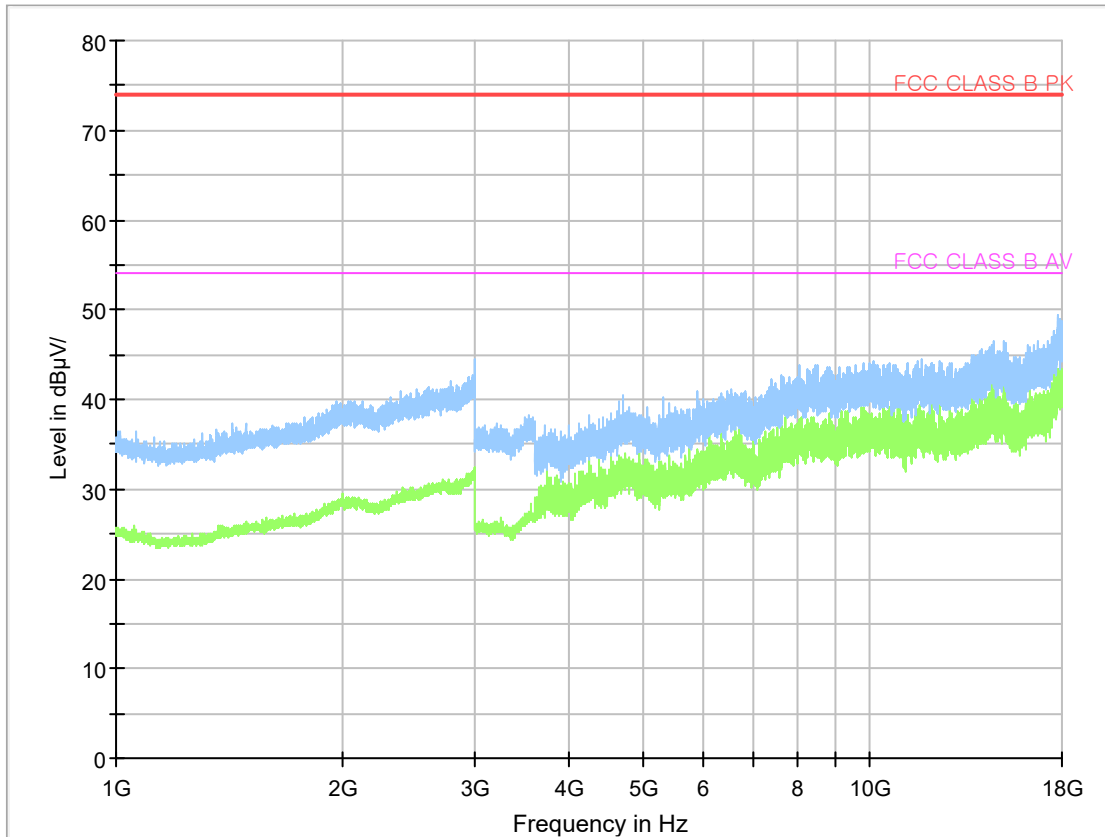
Test Distance : 10 m, Antenna Height : 1 to 4 meters

Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (QP) = Limit - Level (QP)

QP = Quasi-Peak, c.f = Correction Factor

- Frequencies above 1 GHz



Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

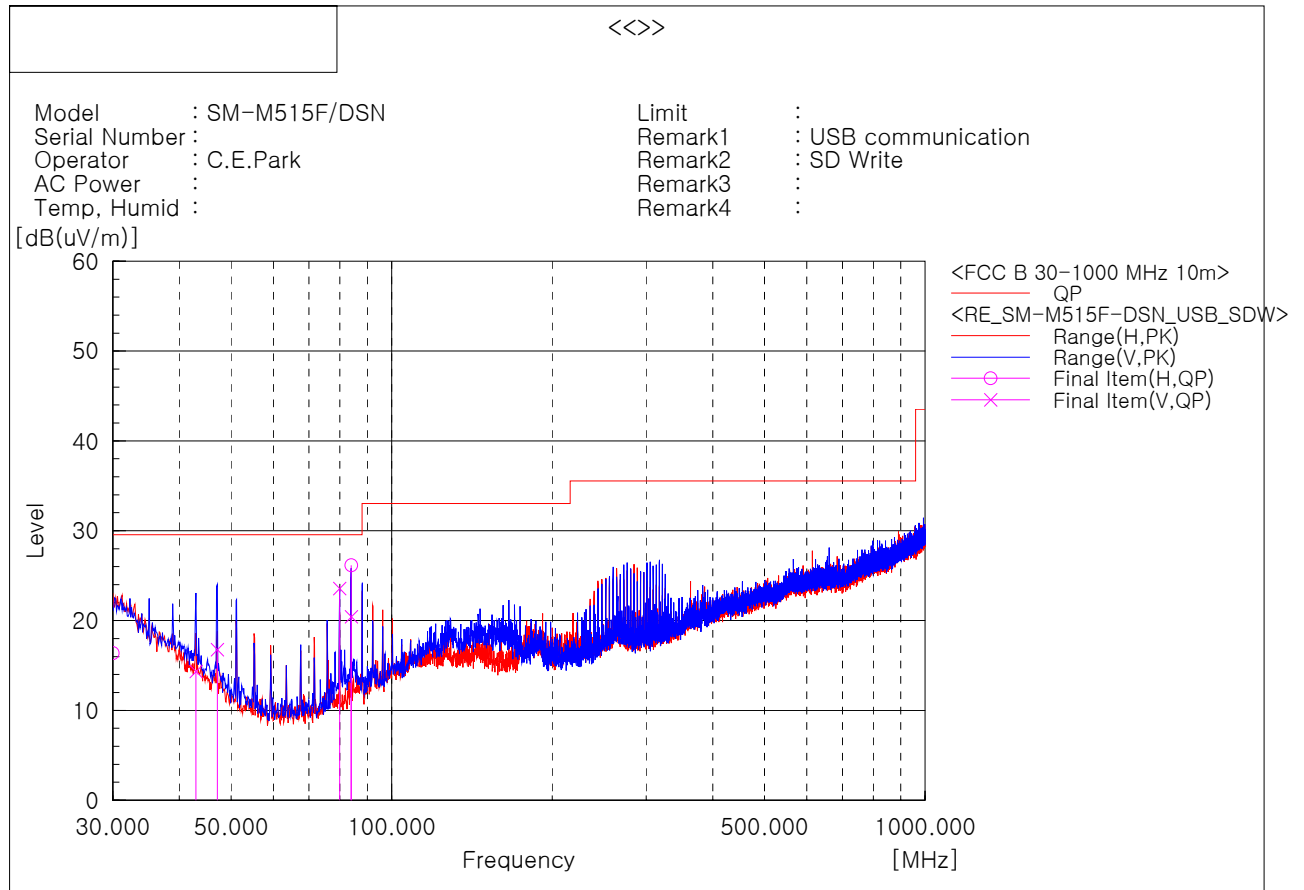
Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor

□ Operating Mode 5

- Frequencies below 1 GHz



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]	System
1	30.000	H	23.0	-6.6	16.4	29.5	13.1	109	132	1
2	42.974	V	27.1	-12.8	14.3	29.5	15.2	109	97	2
3	47.096	V	31.8	-15.0	16.8	29.5	12.7	101	89	2
4	79.834	V	40.5	-16.9	23.6	29.5	5.9	190	70	2
5	83.956	H	43.8	-17.6	26.2	29.5	3.3	399	6	1
6	83.956	V	36.7	-16.3	20.4	29.5	9.1	129	89	2

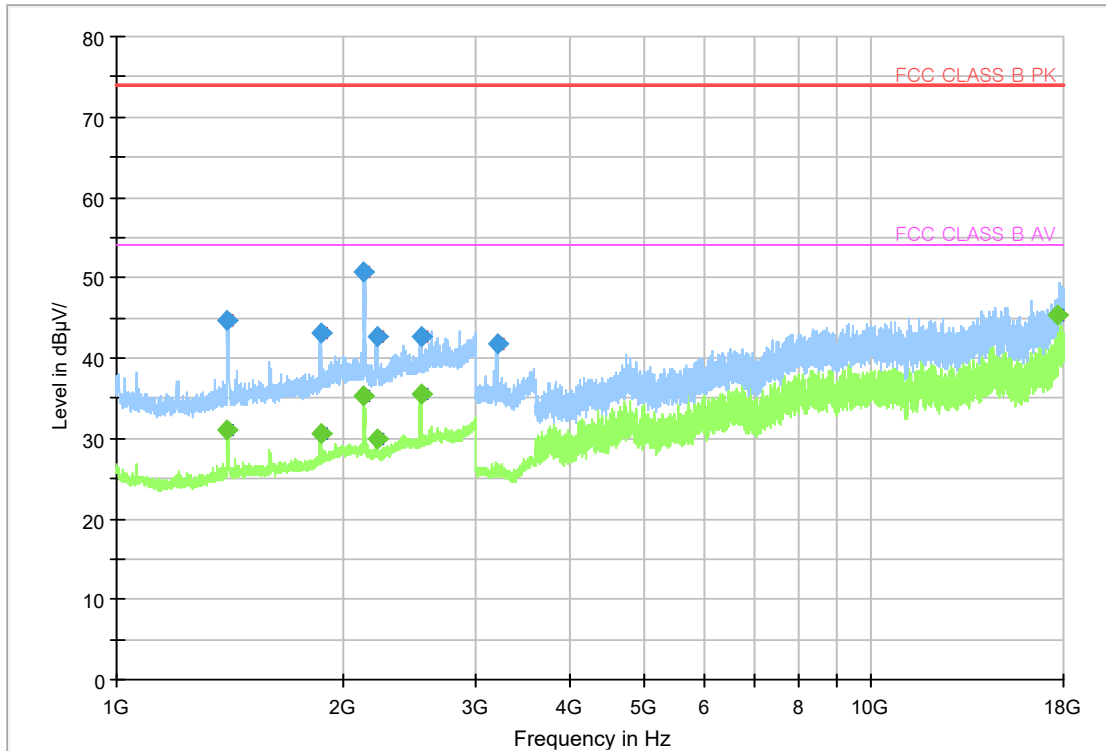
Note1) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 10 m, Antenna Height : 1 to 4 meters

Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (QP) = Limit - Level (QP)

QP = Quasi-Peak, c.f = Correction Factor

- Frequencies above 1 GHz

Frequency (MHz)	PK (dBμV/)	CAV (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 400.800	---	31.08	54.00	22.92	101.2	H	89.0	8.9
1 401.600	44.72	---	74.00	29.28	102.3	H	78.0	8.9
1 862.000	43.18	---	74.00	30.82	105.1	V	68.0	11.8
1 864.000	---	30.60	54.00	23.40	100.8	V	105.0	11.8
2 126.000	---	35.36	54.00	18.64	101.7	V	338.0	13.0
2 130.000	50.80	---	74.00	23.20	103.5	V	328.0	13.0
2 217.200	---	30.00	54.00	24.00	101.6	H	358.0	12.7
2 217.200	42.62	---	74.00	31.38	101.0	H	358.0	12.7
2 528.800	42.59	---	74.00	31.41	100.3	H	0.0	14.4
2 530.800	---	35.42	54.00	18.58	104.6	V	222.0	14.4
3 191.500	41.76	---	74.00	32.24	102.9	V	292.0	0.4
17 725.000	---	45.30	54.00	8.70	101.1	H	151.0	34.6

Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor