EMC TEST REPORT

Project No.	LBE20181997	**Issue No.**	0
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 application	November 07, 2018	
EUT	**Type of device**	☒ All other Receivers subject to part15 ☒ Class B Personal Computers and peripherals ☒ Other Class B digital devices and peripherals ☒ FM Broadcast Receiver	
	Equipment authorization	☒ Certification ☐ Supplier's Declaration of Conformity	
	FCC ID	A3LSMG970U	
	Kind of product	Mobile Phone	
	Model No.	SM-G970U	
	Variant Model No.	Refer to clause 4.6	
	Manufacturer	SAMSUNG ELECTRONICS CO., LTD 94-1, Imsu-dong, Gumi-si, Gyengsangbuk-do, 730-722, Republic of Korea	
		SAMSUNG ELECTRONICS HUIZHOU CO.,LTD. 516229, Chenjiang Town, HuiZhou City, Guangdong Province, China	
Applied Standards		47 CFR Part 15, Subpart B, Class B / ANSI C63.4-2014	
Test Period		November 09, 2018 ~ December 05, 2018	
Issue date		December 10, 2018	

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 : Mi-young Lee

Reviewed by : Young-Hun Kim

Y. H. Kim

The test results in this report only apply to the tested sample. This report must not be reproduced, except in full, without written permission from Global CS Center.

Global CS Center of Samsung Electronics Co., Ltd.
(Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea

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1. Report Information

1.1 Revision history

No.	Revised detailed information
Issue 0	There are no revisions and this version is basic test report.

1.2 RSE test report no.

No.	Remark
1M1810250193-15	The cellular receiver mode refers to the radiated Spurious emissions 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
☒	Conducted Disturbance (Mains port)	47 CFR Part 15 Subpart B / ANSI C63.4-2014 (Class B)	Complied
☒	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 operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

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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	Portable Device	SM-G970U	-	SAMSUNG	A3LSMG970U
B	Battery	EB-BG970ABU	-	SAMSUNG	-
C	Headset	EO-IG955	-	SAMSUNG	-
D	Data Cable	EP-DG970BBZ	-	SAMSUNG	-
		JCA141	BW2K1709000770	J5CREATE	
E	Micro SD Card	64GB	-	SAMSUNG	-
F	Travel Adapter	EP-TA200	R37KAVA00V1DK3	SAMSUNG	-
G	Desk-Top Computer	DM-C410	HFGD97AB700278X	SAMSUNG	-
		DM300S	A20100622	SAMSUNG	-
H	LCD TV Monitor	PE22BS	N849HVMP702249R	SAMSUNG	-
		EM23TS	NC26H1KSB01550B	SAMSUNG	-
I	DP Monitor	27DU88	711NTQD8H004	LG	
J	Power Supply	LCAP31	EH8NN629490055062	LG	
K	Mouse	SML-210PB	TAKD125024 V	SAMSUNG	-
			TAKD124911 M	SAMSUNG	-
L	Keyboard	SDM8500P	8M001183	SAMSUNG	-
			8M001033	SAMSUNG	-
M	Gigabit Switch 8	J9794A	CN33FQ703Q	HP	-
			CN33FQ71XK	HP	-
N	Power Supply	EADP-15DC A	DIKD1245096741	Delta	-
			DIKD1245096576	Delta	-
O	OTG Gender	EE-UG970	-	SAMSUNG	-

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4.2 EUT operating mode

To achieve compliance applied standard specification, 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 (GSM850 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) +USB OTG (w/USB gender: mouse) + FM (Mid Ch.)
3	FM (High Ch.)
4	Video + Audio playback from internal memory data + Display out(Direct DP Cable)
5	USB Data Communication with PC (from external memory data)

4.3 Details of Sampling

Customer selected, single unit.

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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	Yes	From EUT to Desk-Top Computer
2	DP Cable	1.1	Yes	From EUT to DP Monitor
3	Headset	1.2	No	For EUT
4	Power	1.8	No	For Desk-Top Computer
5	Power	1.2	No	From DP Monitor to Power Supply
6	Power	1.6	No	For Power Supply
7	Power	1.8	No	For LCD TV Monitor
8	Power	1.8	No	From Gigabit Switch 8 to Power Supply
9	Power	1.8	No	For Power Supply
10	LAN	1.5	No	From Desk-Top Computer to Gigabit Switch 8
11	LAN	1.5	No	From Gigabit Switch 8 to Local Area Network
12	RGB	1.8	Yes	From Desk-Top Computer to LCD TV Monitor
13	PS/2	1.5	Yes	From Desk-Top Computer to Mouse
14	PS/2	1.5	Yes	From Desk-Top Computer to Keyboard
15	USB	1.5	Yes	For USB OTG Gender

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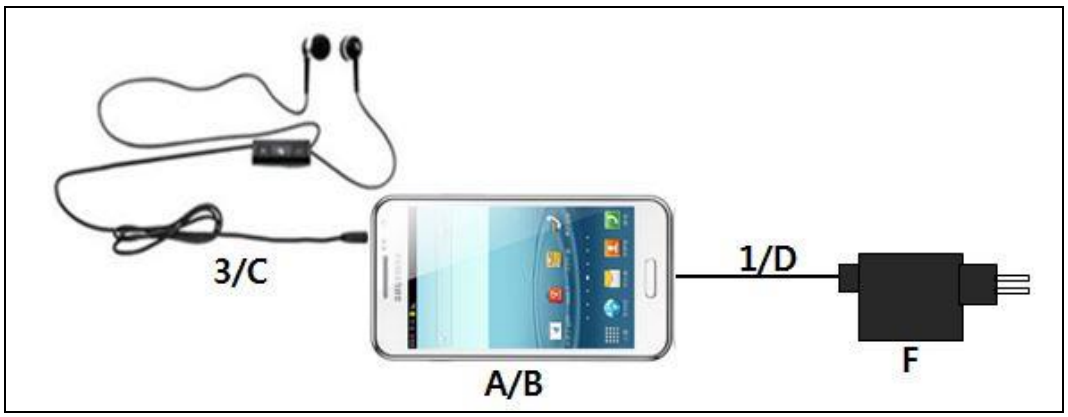
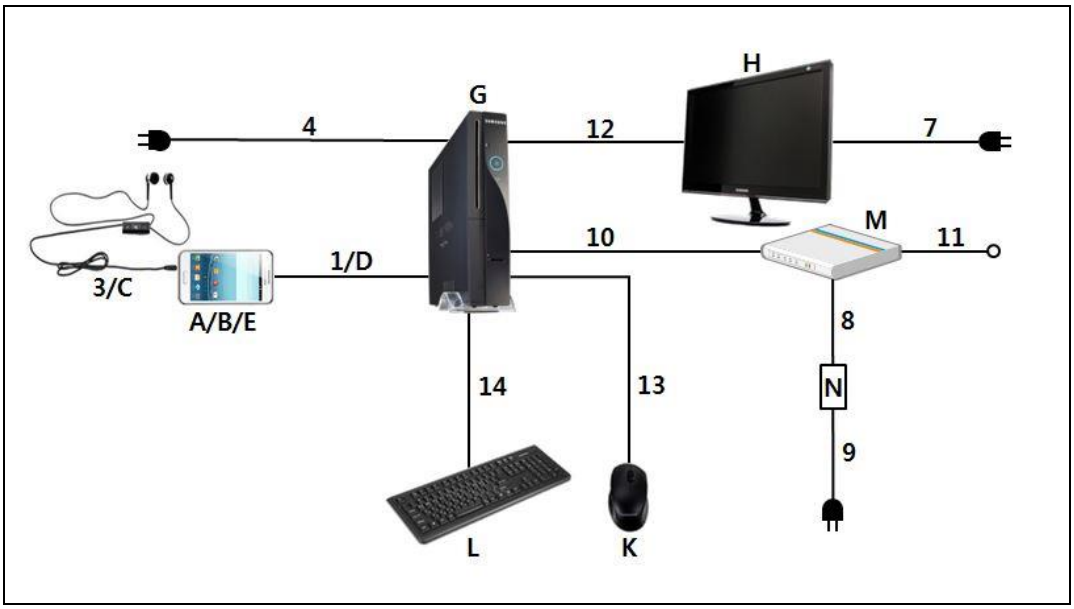
4.5 Test arrangement

4.5.1 Conducted Emission



[Mode 1 - 4]



[Mode 5]

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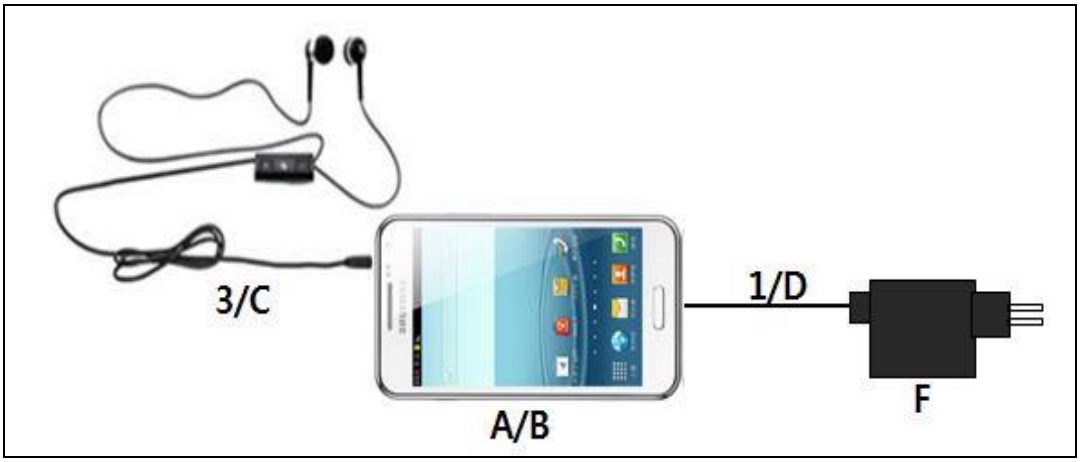
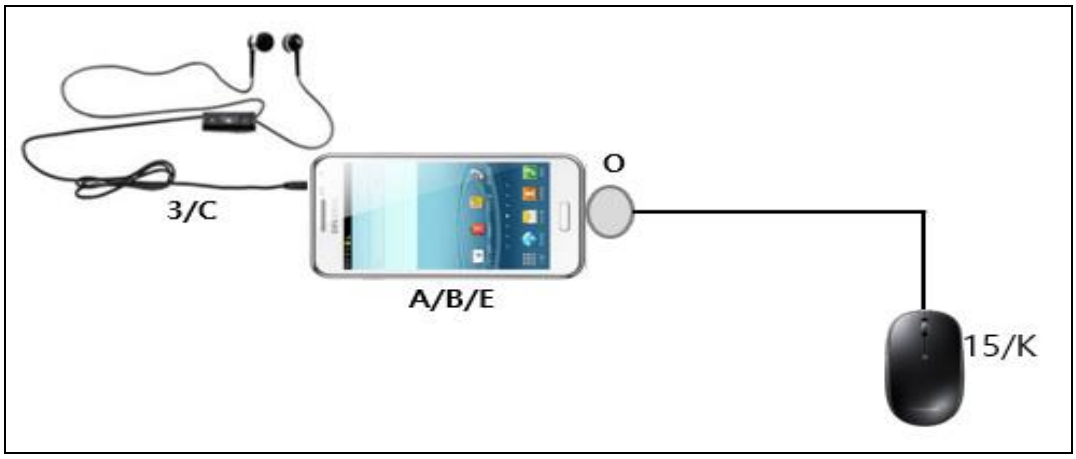
4.5.2 Radiated Emission



[Mode 1]



[Mode 2]

[Mode 3]

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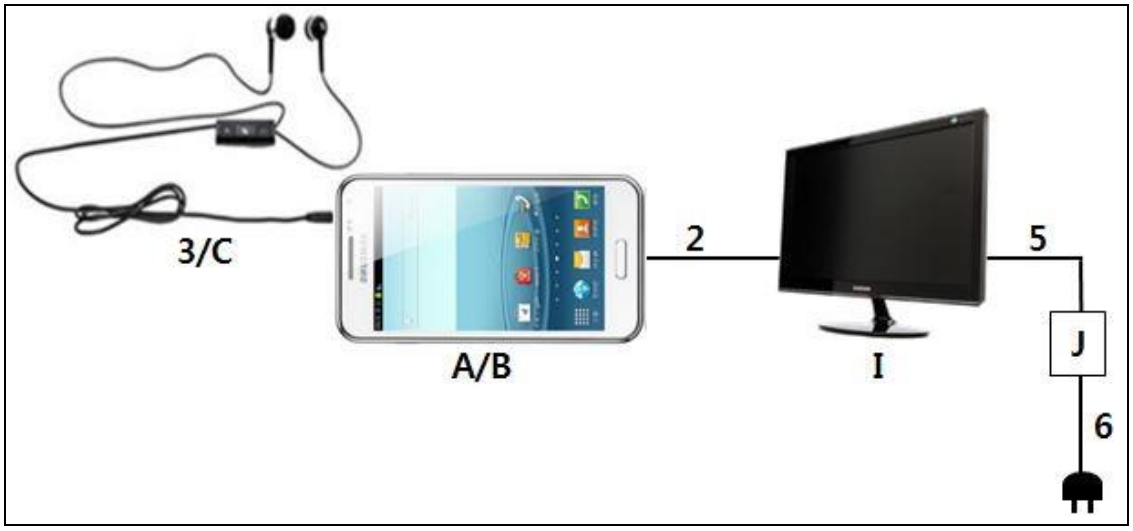
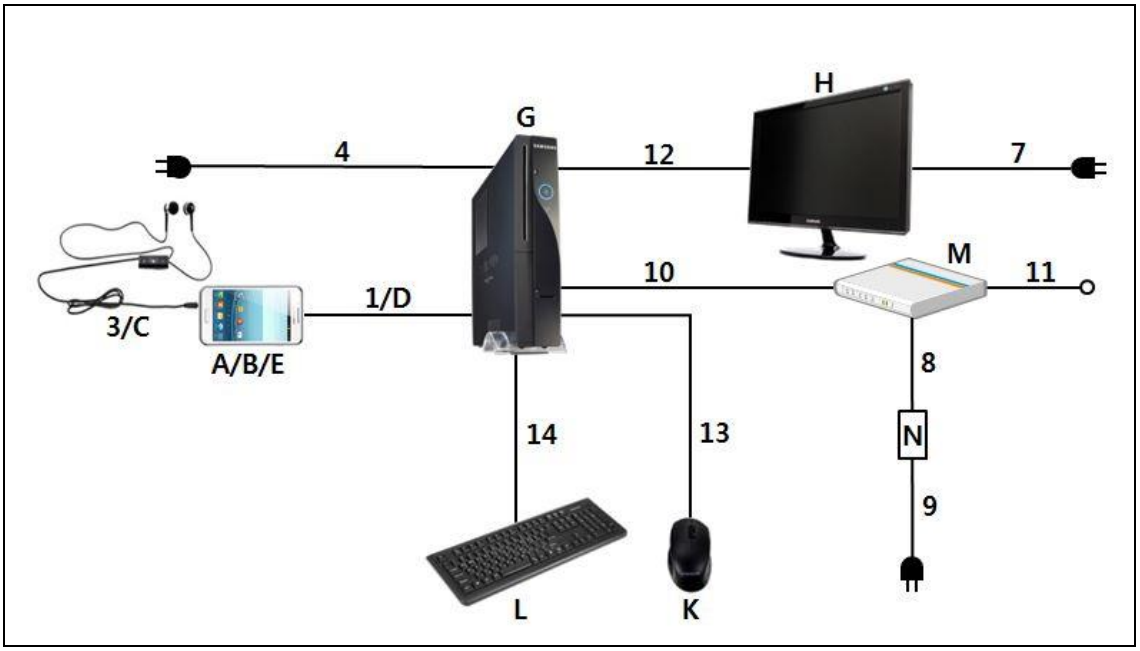


[Mode 4]



[Mode 5]

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4.6 EUT Description

The EUT is a bar type Mobile Phone which can operate on GSM 850/900/1800/1900, WCDMA FDD1/2/4/5/8, CDMA BC0/1/10, CDMA 1x EVDO BC0/1/10, TD-SCDMA B34/39, LTE FDD1/2/3/4/5/7/8/12/13/14/18/19/20/25/26/28/29/30/66/71, LTE TDD 38/39/40/41/46/48 and incorporate Bluetooth, GNSS, Wi-Fi, ANT+, FM Radio, NFC, Wireless Charging, MST, DP, OTG, DP, Camera, MP3 and MP4 player.

4.6.1 The variant models

- SM-G970U1, SM-G970W, SM-G970XU

4.7 EUT Frequencies

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

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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, 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) radiated testing was performed with the GSM850 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 music were repetitively played connected to the earphone.

The video and music were played on monitor through Display Out function using direct DP Cable or DP converter.

The EUT was connected to USB mouse using USB OTG gender

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. 95 %, k = 2)
Conducted disturbance	AC Mains	3.52 dB
Radiated Disturbance (Below 1 GHz)	Horizontal	4.99 dB
	Vertical	4.90 dB
Radiated Disturbance (Above 1 GHz)	Horizontal	5.33 dB
	Vertical	5.32 dB

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5. Results of individual test

5.1 Conducted disturbance

The EUT was connected to the Desk-Top Computer which was powered from one LISN for the measurements. The support equipment power cables were connected to a second 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.	Calibration	
					Date	Interval (Month)
E5I-002	Universal Radio Communicator	CMU200	R&S	100612	2018-08-31	12
E5I-043	LISN	ENV216	R&S	101630	2018-08-17	12
E5I-017	EMI Test Receiver	ESU8	R&S	100483	2018-01-12	12
E5I-127	LISN	ENV216	R&S	102061	2018-07-23	12
-	Test software	EMC32	R&S	Ver 9.26.01	-	-

5.1.2 Temperature and humidity condition

Test date	2018-11-28, 2018-12-05	**Test engineer**	Mi-Young Lee
Climate condition	Ambient temperature	(21.4 ~ 23.7) ℃	Limit (15.0 to 35.0) ℃
	Relative humidity	(44.1 ~ 45.0) % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	(101.1 ~ 101.4) kPa	Limit (86.0 to 106.0) kPa
Test place	Shield Room (SR8)		

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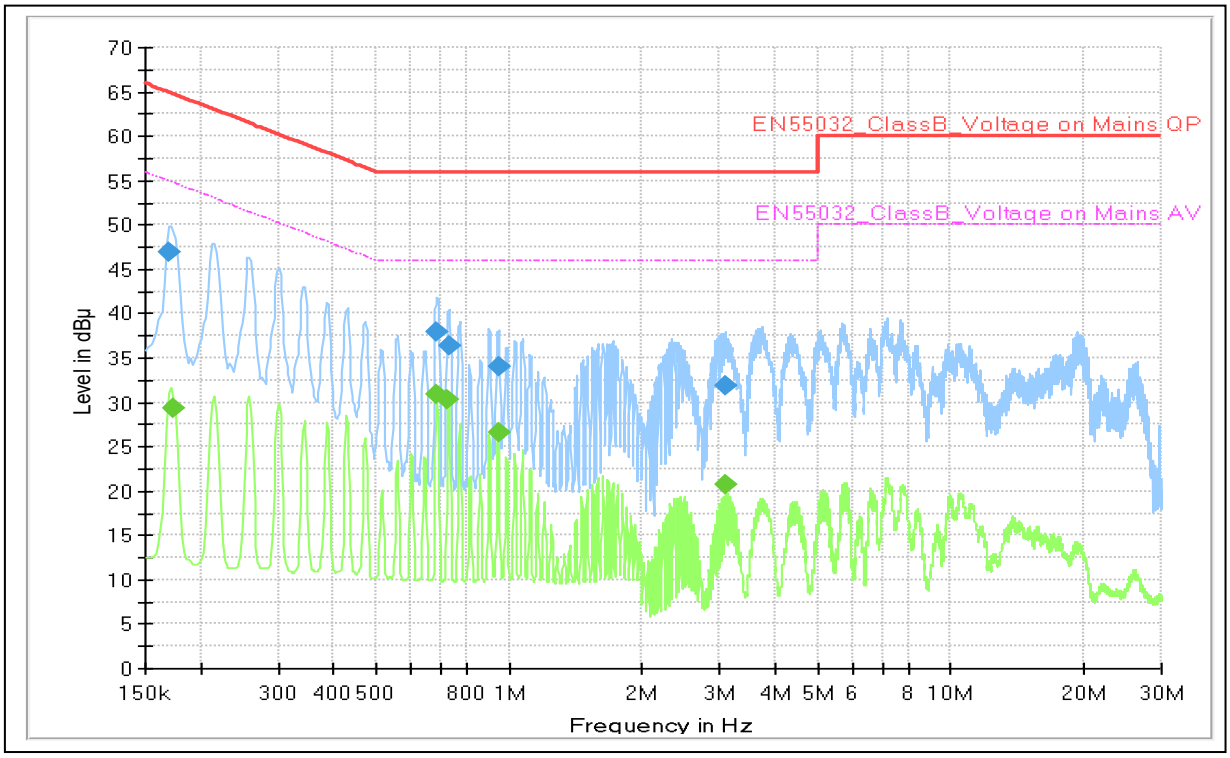
5.1.3 Test results

☐ Operating Mode 1: AC Mains



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

QP / CAV final measurement results table:

Frequency (MHz)	QP (dBµV)	CAV (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.178	46.0	---	64.6	18.6	N	10.0
0.178	---	32.4	54.6	22.2	N	10.0
0.221	---	29.1	52.8	23.7	N	9.9
0.221	41.9	---	62.8	20.9	N	9.9
0.685	---	31.7	46.0	14.3	N	10.1
0.685	38.8	---	56.0	17.2	L1	10.2
0.729	36.7	---	56.0	19.3	L1	10.1
0.733	---	29.9	46.0	16.1	L1	10.1
7.709	---	18.9	50.0	31.1	L1	10.1
7.749	28.7	---	60.0	31.3	L1	10.1
12.481	19.5	---	60.0	40.5	N	10.4
12.625	---	11.8	50.0	38.2	N	10.4

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

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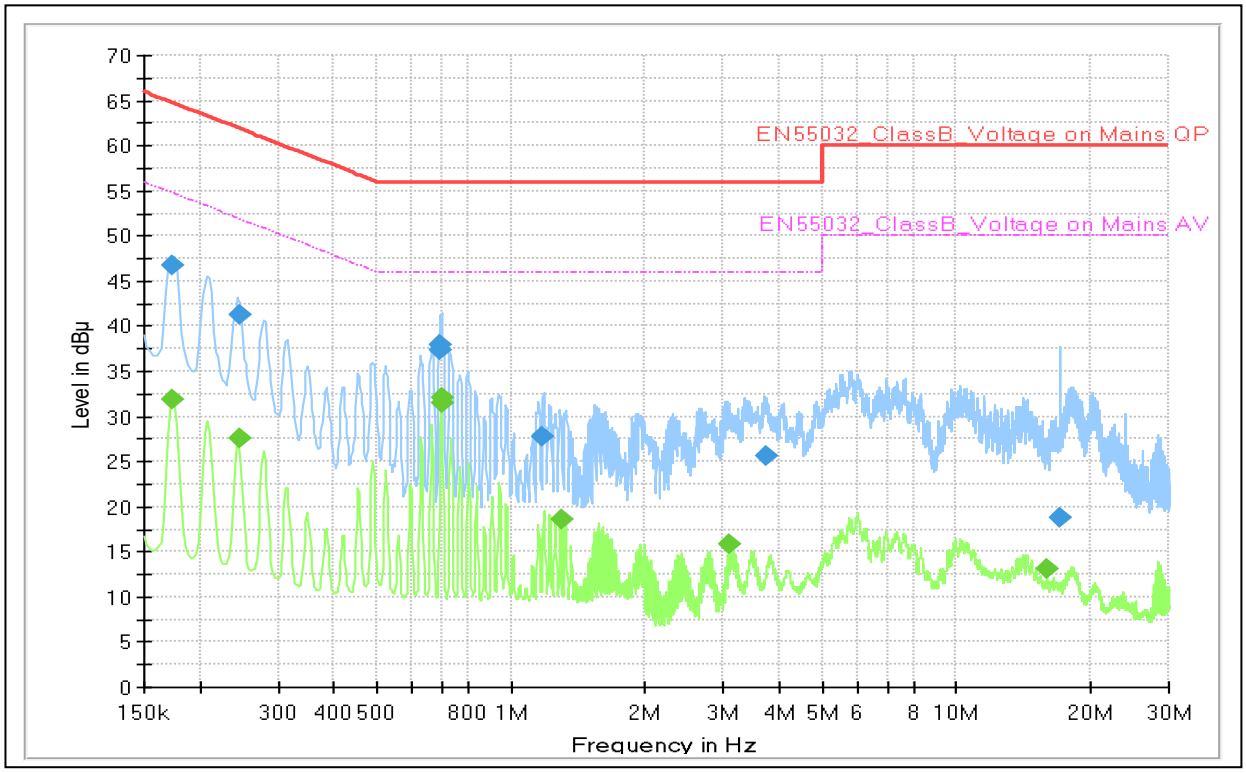
☐ Operating Mode 2: AC Mains



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

QP / CAV final measurement results table:

Frequency (MHz)	QP (dBµV)	CAV (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174	---	31.9	54.8	22.9	L1	9.9
0.174	46.8	---	64.8	18.0	L1	9.9
0.245	---	27.5	51.9	24.4	L1	9.8
0.245	41.3	---	61.9	20.6	L1	9.8
0.694	37.4	---	56.0	18.6	L1	10.1
0.696	38.0	---	56.0	18.0	L1	10.1
0.698	---	32.1	46.0	13.9	L1	10.1
0.700	---	31.5	46.0	14.5	L1	10.1
1.181	27.8	---	56.0	28.2	L1	10.0
1.294	---	18.6	46.0	27.4	L1	10.0
3.106	---	15.8	46.0	30.2	L1	10.0
3.735	25.6	---	56.0	30.4	L1	10.0
16.050	---	13.0	50.0	37.0	L1	10.4
17.181	18.8	---	60.0	41.2	N	10.6

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

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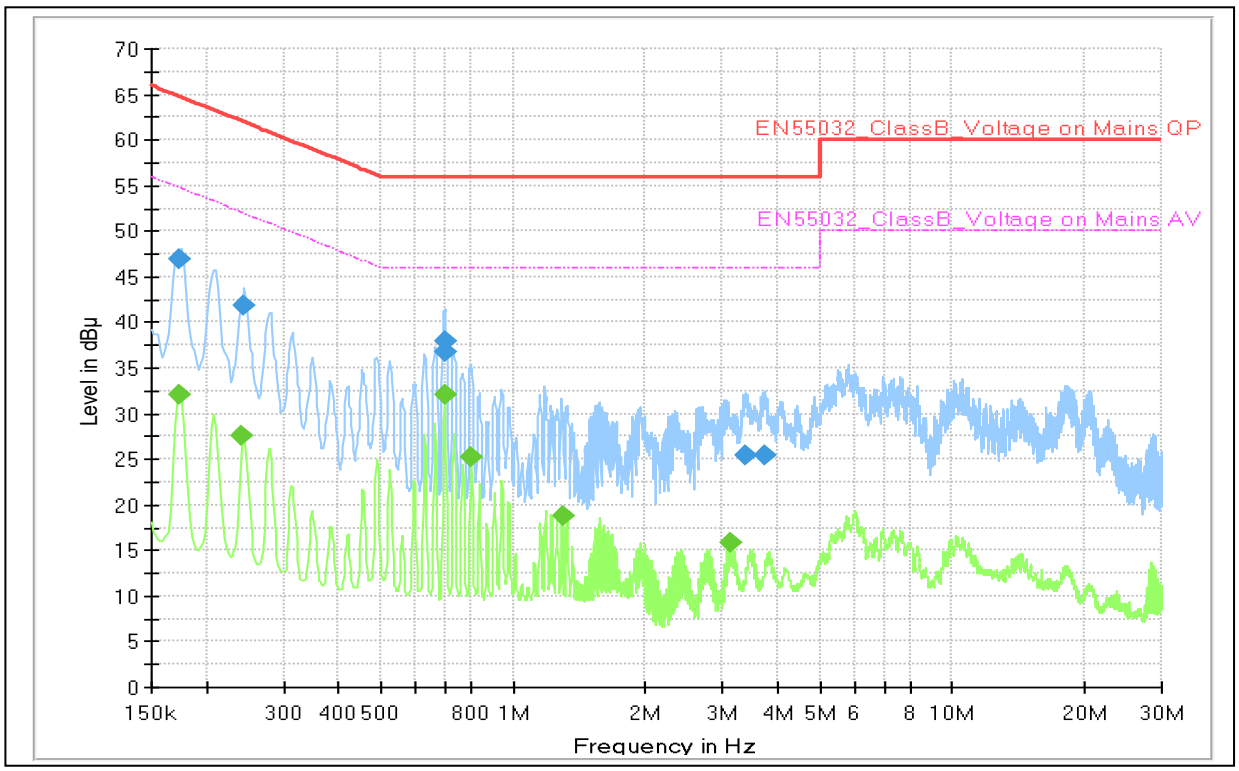
☐ Operating Mode 3: AC Mains



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

QP / CAV final measurement results table:

Frequency (MHz)	QP (dBµV)	CAV (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174	---	32.0	54.8	22.8	L1	9.9
0.174	46.9	---	64.8	17.9	L1	9.9
0.241	---	27.6	52.1	24.5	L1	9.9
0.244	41.9	---	62.0	20.1	L1	9.9
0.698	37.9	---	56.0	18.1	L1	10.1
0.698	---	32.1	46.0	13.9	L1	10.1
0.700	36.8	---	56.0	19.2	N	10.0
0.802	---	25.2	46.0	20.8	L1	10.0
1.294	---	18.7	46.0	27.3	L1	10.0
3.142	---	15.9	46.0	30.1	L1	10.0
3.366	25.5	---	56.0	30.5	L1	10.0
3.741	25.5	---	56.0	30.5	L1	10.0

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

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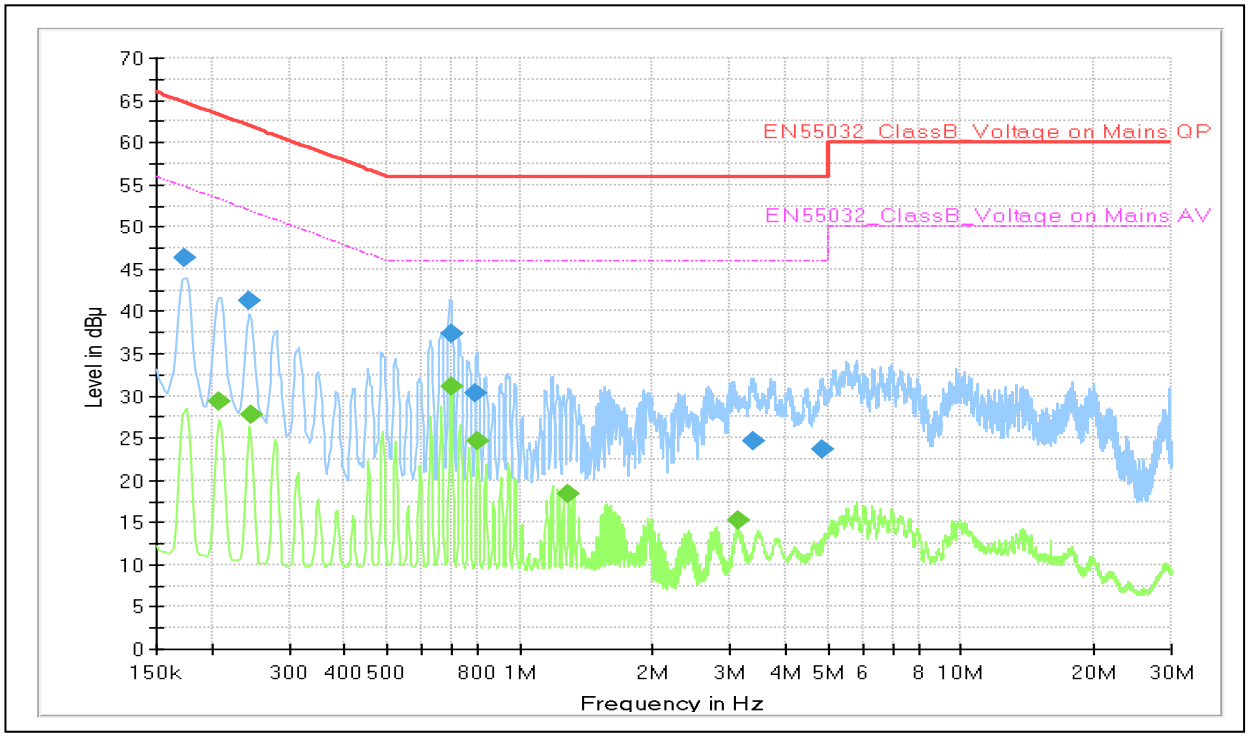
☐ Operating Mode 4: AC Mains



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

QP / CAV final measurement results table:

Frequency (MHz)	QP (dBµV)	CAV (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174	46.3	---	64.8	18.5	L1	9.9
0.208	---	29.3	53.3	24.0	L1	10.0
0.244	41.3	---	62.0	20.7	L1	9.9
0.245	---	27.7	51.9	24.2	L1	9.8
0.698	37.3	---	56.0	18.7	L1	10.1
0.700	---	31.0	46.0	15.0	L1	10.1
0.797	30.3	---	56.0	25.7	L1	10.0
0.802	---	24.7	46.0	21.3	L1	10.0
1.290	---	18.4	46.0	27.6	L1	10.0
3.141	---	15.3	46.0	30.7	L1	10.0
3.392	24.6	---	56.0	31.4	L1	10.0
4.836	23.7	---	56.0	32.3	L1	10.0

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

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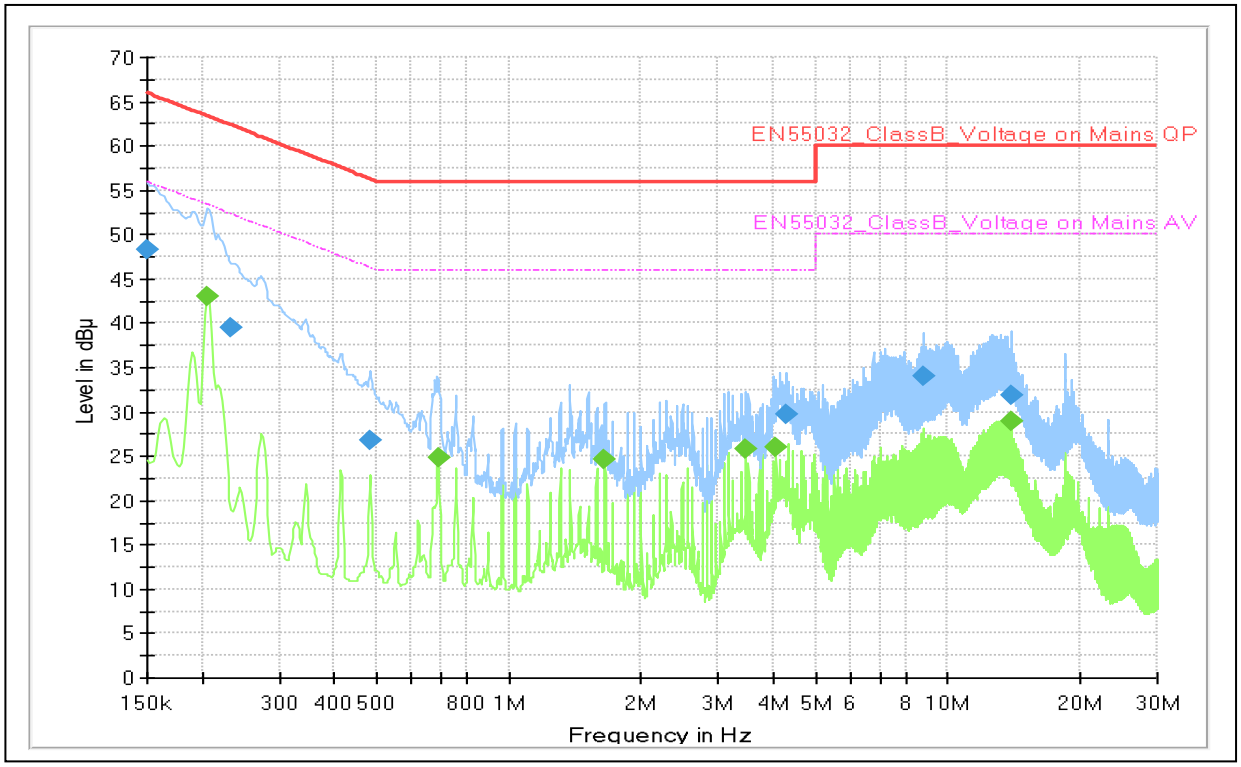
☐ Operating Mode 5: AC Mains



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

QP / CAV final measurement results table:

Frequency (MHz)	QP (dBµV)	CAV (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.150	48.4	---	66.0	17.6	N	9.9
0.205	---	43.1	53.4	10.3	L1	10.0
0.233	39.4	---	62.4	23.0	L1	9.9
0.482	26.9	---	56.3	29.4	N	10.2
0.689	---	24.9	46.0	21.1	N	10.0
1.654	---	24.7	46.0	21.3	N	9.9
3.448	---	25.7	46.0	20.3	N	9.9
4.069	---	26.0	46.0	20.0	N	9.9
4.276	29.7	---	56.0	26.3	N	9.9
8.841	34.0	---	60.0	26.0	L1	10.1
13.917	31.8	---	60.0	28.2	N	10.4
13.923	---	28.9	50.0	21.1	L1	10.3

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

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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 operate 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 [μV/m]	3 m [dB(μV/m)]	10 m [dB(μV/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

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

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5.2.1 Test instrumentation

EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Calibration	
					Date	Interval (Month)
E5I-002	Universal Radio Communicator	CMU200	R&S	100612	2018-08-31	12
E5I-016	EMI Test Receiver	ESU8	R&S	100482	2018-06-08	12
E5I-021	EMI Test Receiver	ESU40	R&S	100376	2018-01-31	12
E5I-149	Horn Antenna	HF907	R&S	102525	2018-06-15	24
E5I-039	Signal Conditioning Unit	SCU-18	R&S	10211	2018-01-22	12
E5I-037	Wide Band Horn Antenna	WBH 18-40K	R&S	11201	2017-10-13	24
E5I-042	Signal Conditioning Unit	SCU-40A	R&S	10004	2018-09-05	12
E5I-120	BiLog Antenna	CBL6112D	TESEQ	36997	2018-04-23	24
E5I-072	BiLog Antenna	CBL6112D	TESEQ	36009	2018-04-23	24
E5I-073	Preamplifier	310N	SONOMA	332016	2018-05-09	12
E5I-074	Preamplifier	310N	SONOMA	332017	2018-05-09	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	2018-11-09, 2018-11-13~14	**Test engineer**	Mi-Young Lee
Climate condition	Ambient temperature	(22.1 ~ 23.5) ℃	Limit (15.0 to 35.0) ℃
	Relative humidity	(49.4 ~ 50.6) % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	(101.4~ 102.2) kPa	Limit (86.0 to 106.0) kPa
Test place	Semi-Anechoic Chamber (SAC4)		

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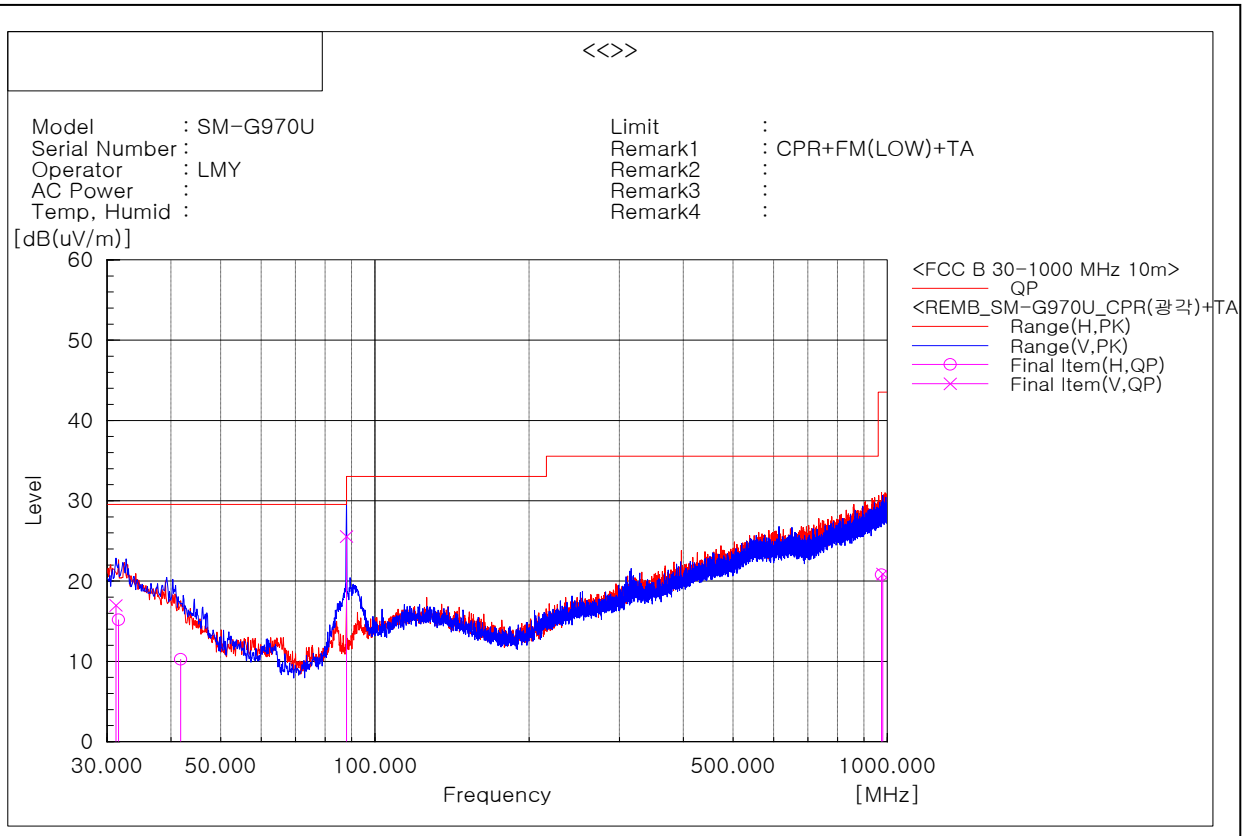
5.2.3 Test results

☐ 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	31.213	V	24.7	-7.7	17.0	29.5	12.5	100	224	2
2	31.576	H	23.1	-7.9	15.2	29.5	14.3	100	222	1
3	41.761	H	22.7	-12.4	10.3	29.5	19.2	100	97	1
4	87.958	V	41.8	-16.2	25.6	29.5	4.0	100	282	2
5	974.174	H	20.0	0.8	20.8	43.5	22.7	300	75	1
6	980.236	V	19.5	1.4	20.9	43.5	22.6	400	128	2

* Radiated emissions (Rx frequency 87.958 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

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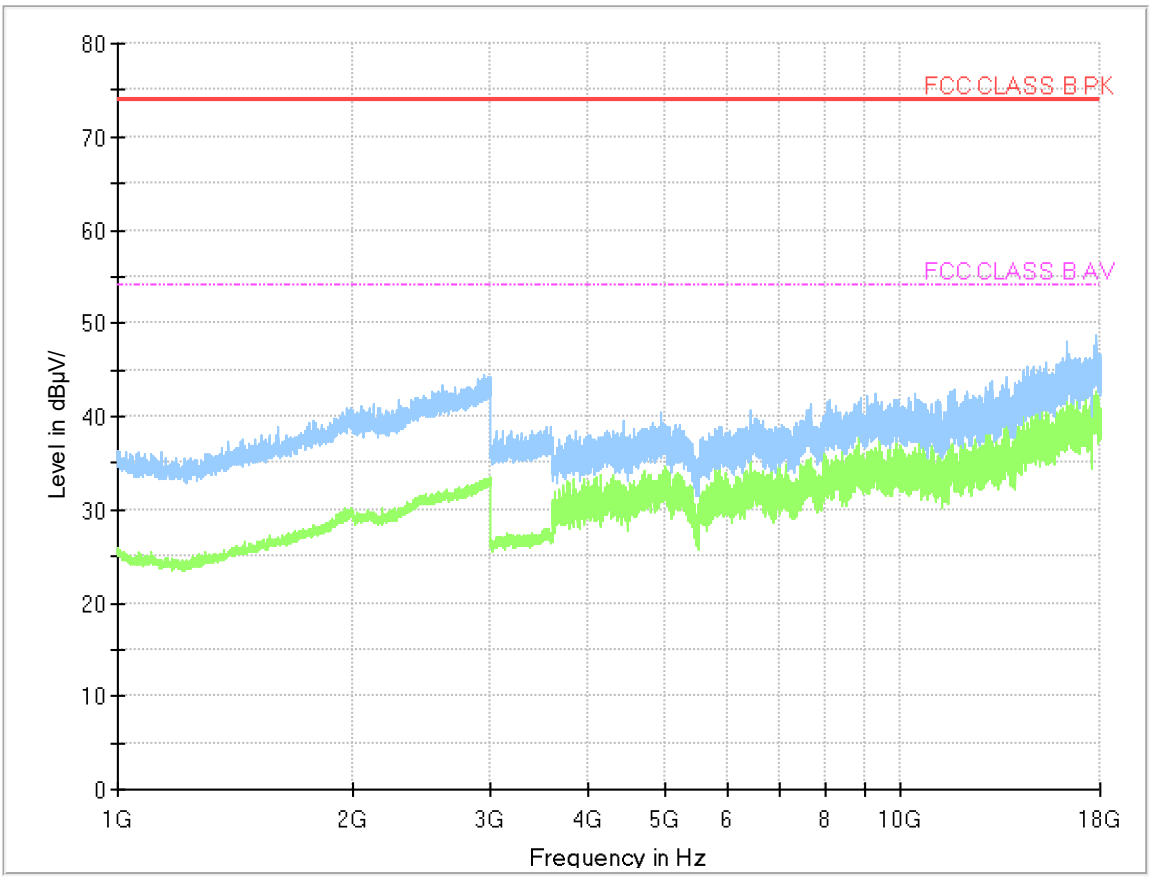
- Frequencies above 1 GHz



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

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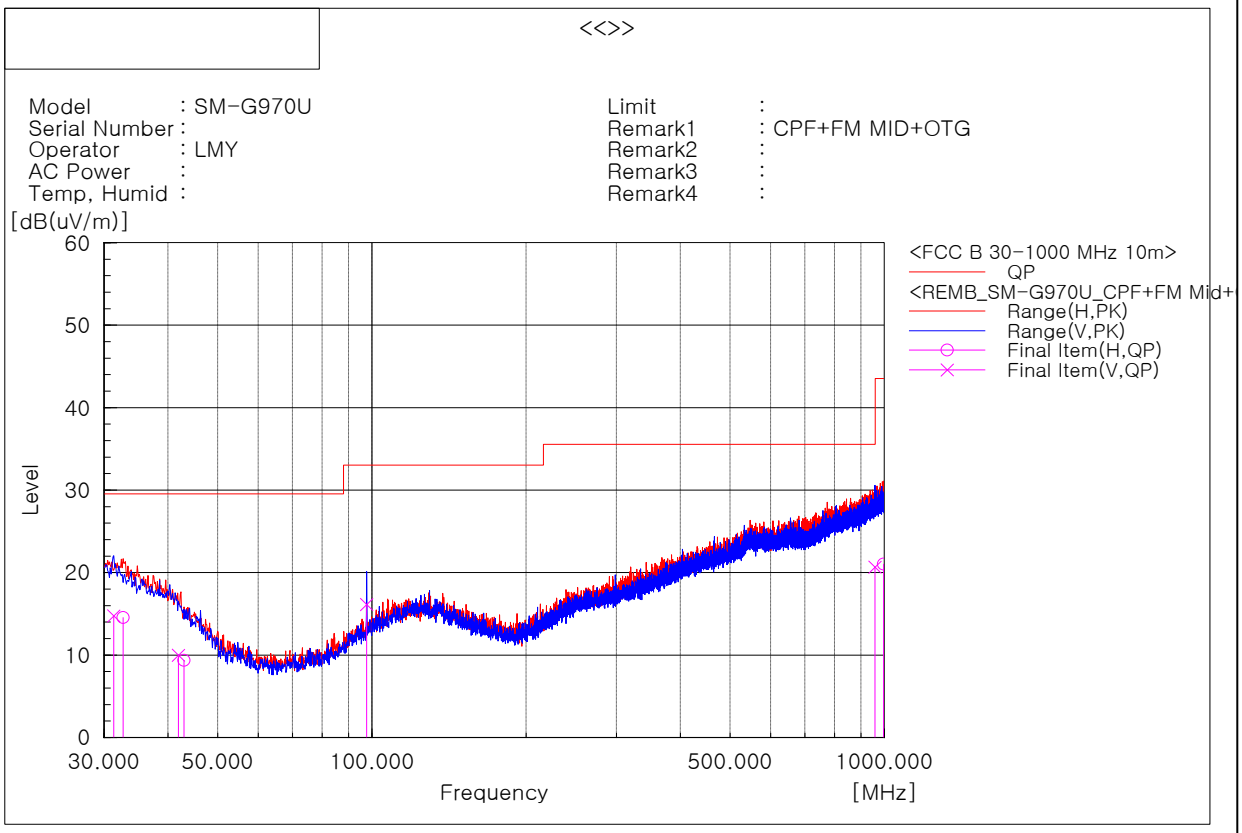
☐ Operating Mode 2

- 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	31.334	V	22.6	-7.8	14.8	29.5	14.7	300	222	2
2	32.668	H	22.9	-8.3	14.6	29.5	14.9	300	272	1
3	41.883	V	22.1	-12.1	10.0	29.5	19.5	200	67	2
4	42.974	H	22.5	-13.1	9.4	29.5	20.1	400	196	1
5	97.658	V	30.4	-14.3	16.1	33.0	16.9	100	313	2
6	959.017	V	19.7	1.0	20.7	35.5	14.8	300	32	2
7	996.726	H	19.6	1.4	21.0	43.5	22.5	300	275	1

* Radiated emissions (Rx frequency 97.658 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

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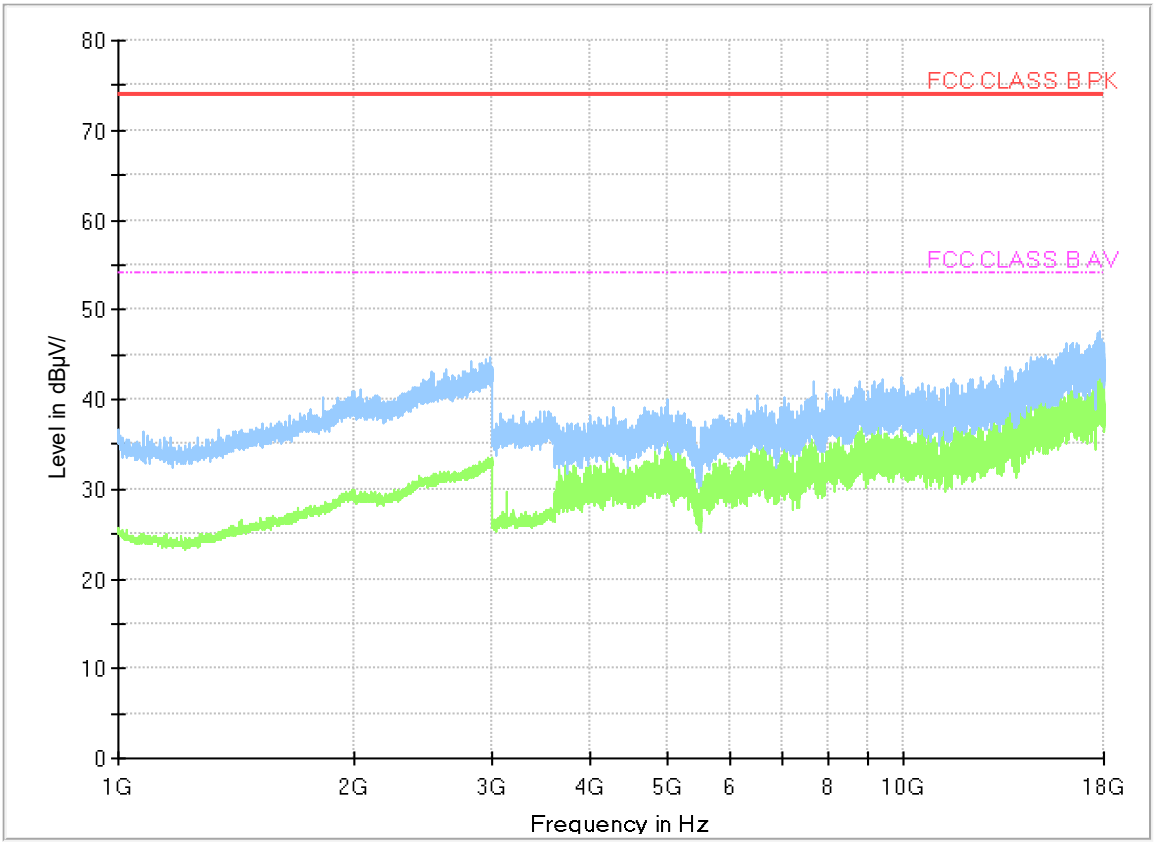
- Frequencies above 1 GHz



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

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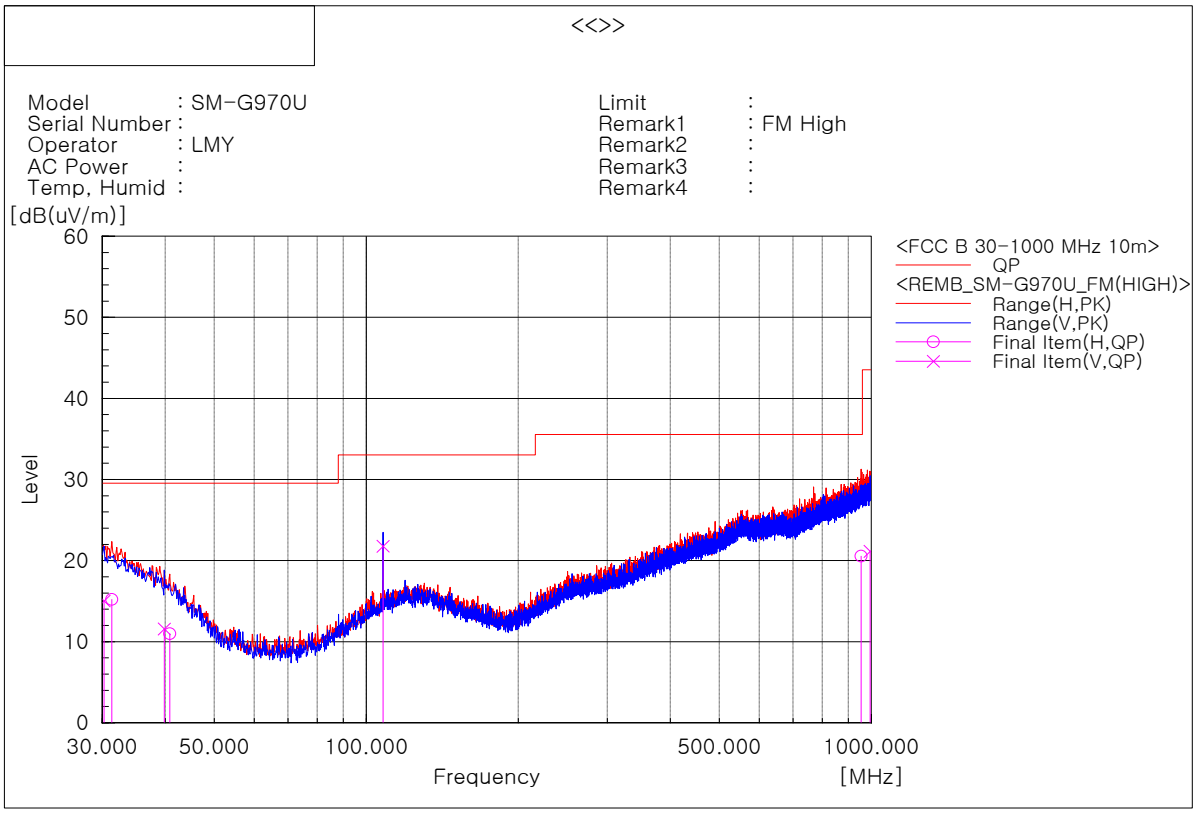
☐ Operating Mode 3

- 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	954.167	H	20.2	0.4	20.6	35.5	14.9	200	110	1
2	30.243	V	22.5	-7.5	15.0	29.5	14.5	200	129	2
3	31.334	H	23.0	-7.8	15.2	29.5	14.3	300	68	1
4	107.964	V	34.7	-12.9	21.8	33.0	11.2	100	6	2
5	40.791	H	22.8	-11.8	11.0	29.5	18.5	200	347	1
6	39.821	V	22.5	-10.9	11.6	29.5	17.9	200	156	2
7	993.937	V	19.4	1.8	21.2	43.5	22.3	400	254	2

* Radiated emissions (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

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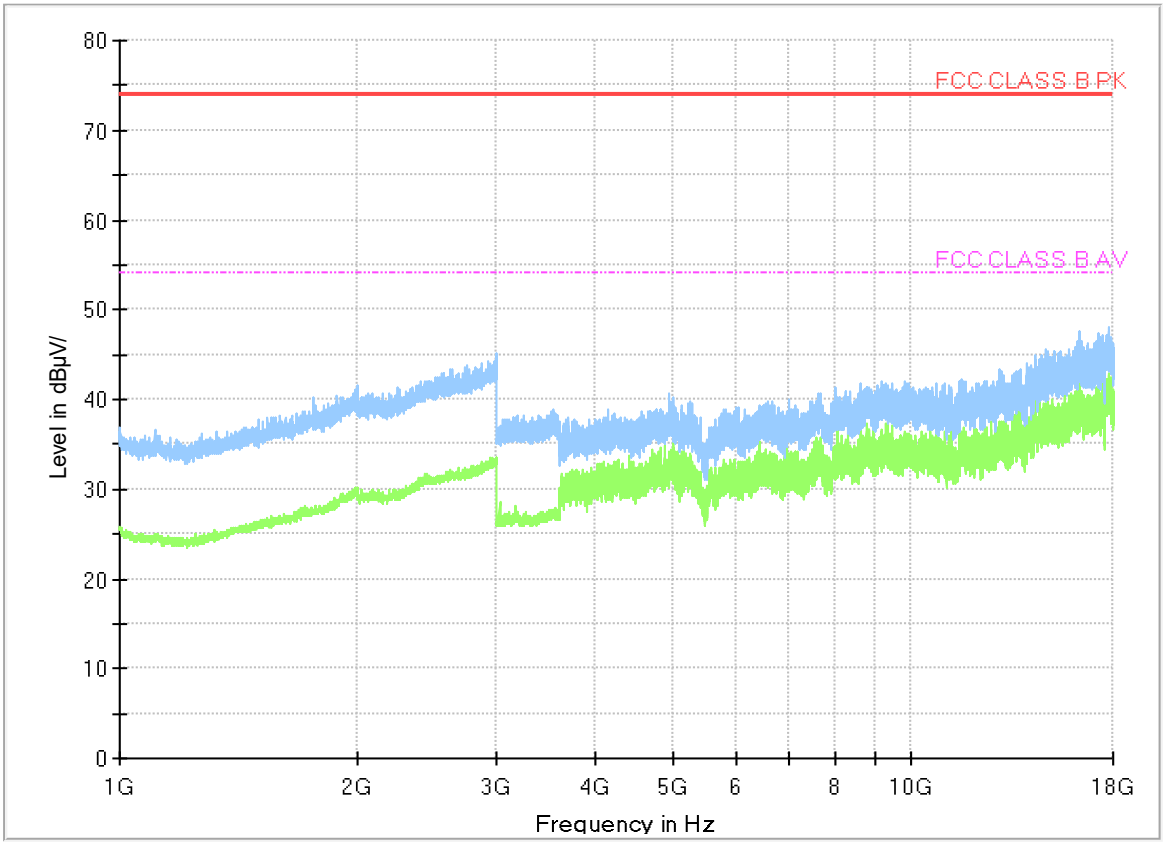
- Frequencies above 1 GHz



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

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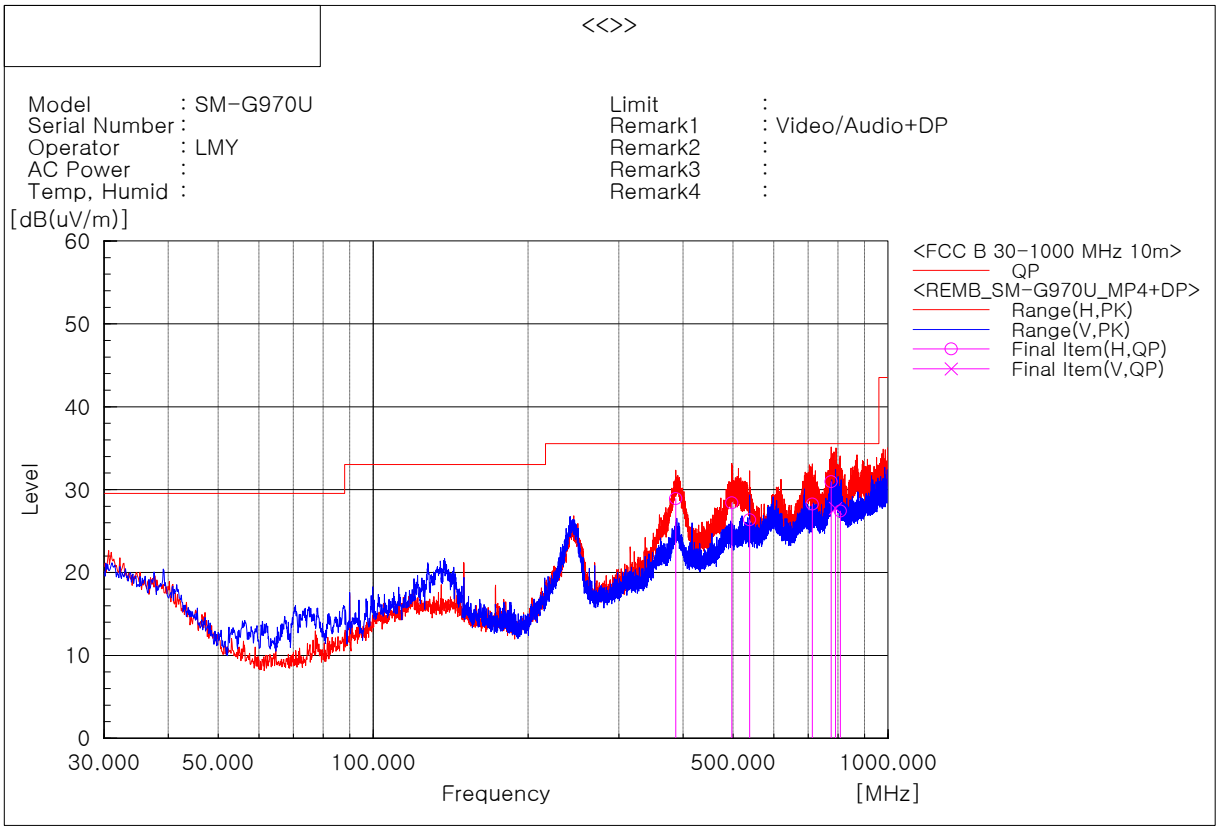
☐ Operating Mode 4

- 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	386.839	H	36.8	-7.9	28.9	35.5	6.6	200	263	1
2	497.176	H	34.2	-5.8	28.4	35.5	7.1	200	242	1
3	538.644	H	30.6	-4.2	26.4	35.5	9.1	200	67	1
4	712.880	H	31.3	-3.0	28.3	35.5	7.2	100	244	1
5	775.688	H	32.9	-1.9	31.0	35.5	4.5	100	217	1
6	790.844	V	28.9	-1.2	27.7	35.5	7.8	300	212	2
7	807.819	H	29.2	-1.8	27.4	35.5	8.1	100	129	1

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

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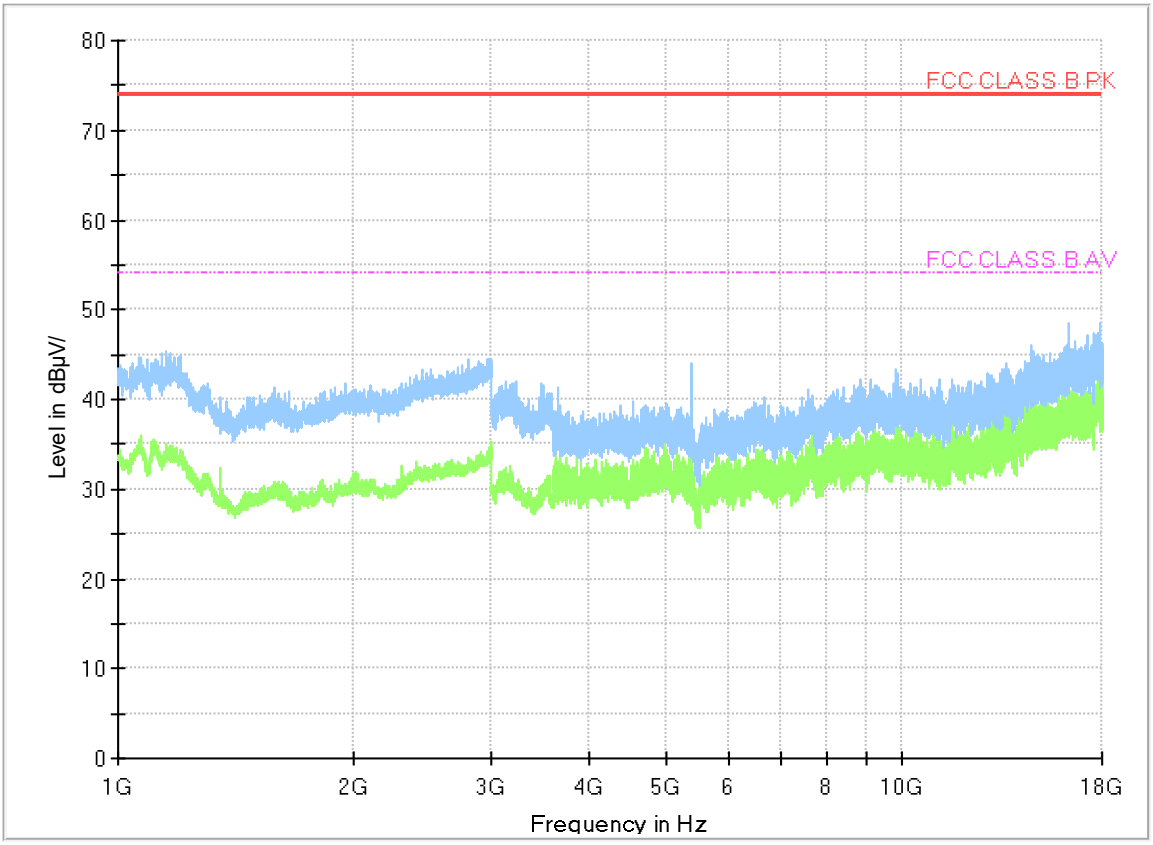
- Frequencies above 1 GHz



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

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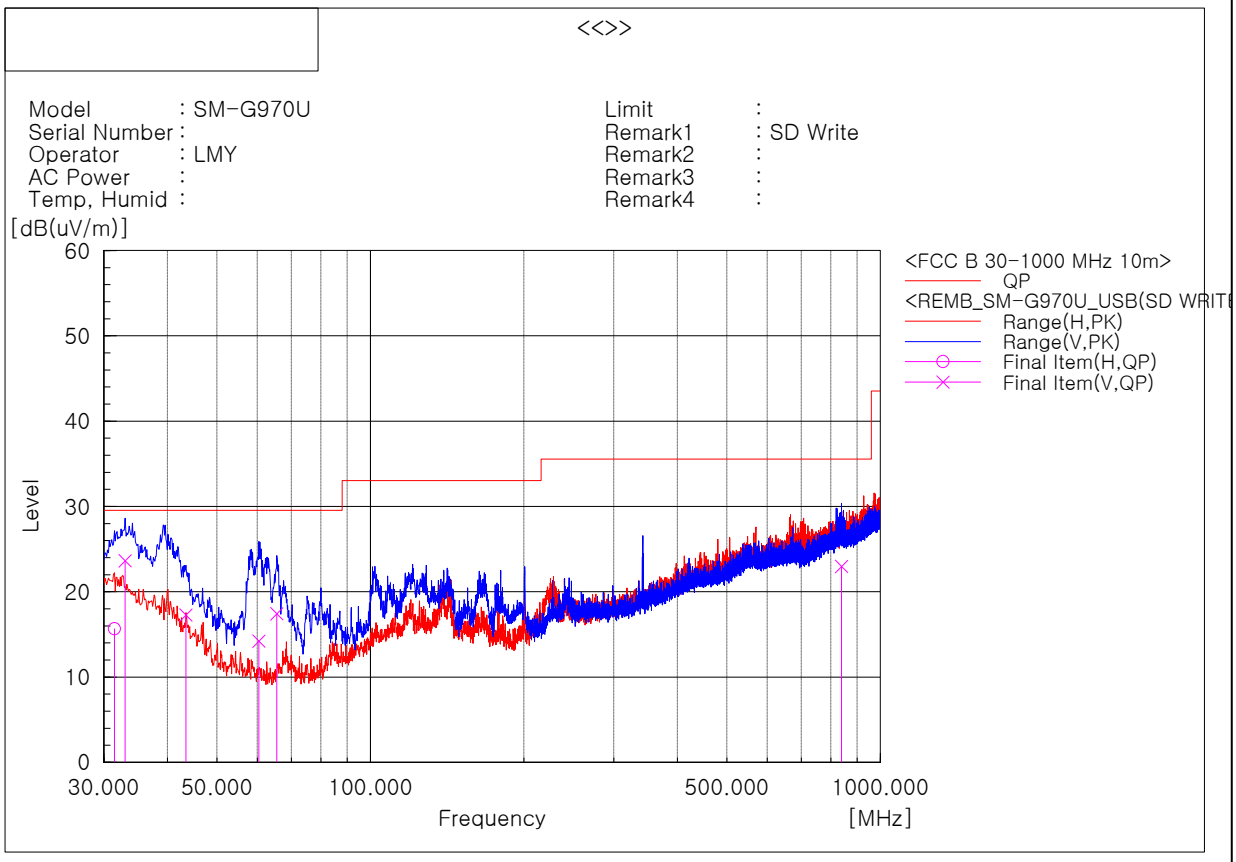
☐ Operating Mode 5

- 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	31.455	H	23.6	-7.9	15.7	29.5	13.8	200	317	1
2	33.031	V	31.9	-8.3	23.6	29.5	5.9	100	82	2
3	43.459	V	30.3	-13.0	17.3	29.5	12.2	100	288	2
4	60.434	V	32.9	-18.7	14.2	29.5	15.3	100	3	2
5	65.526	V	36.0	-18.6	17.4	29.5	12.1	200	266	2
6	838.738	V	23.9	-0.9	23.0	35.5	12.5	300	157	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

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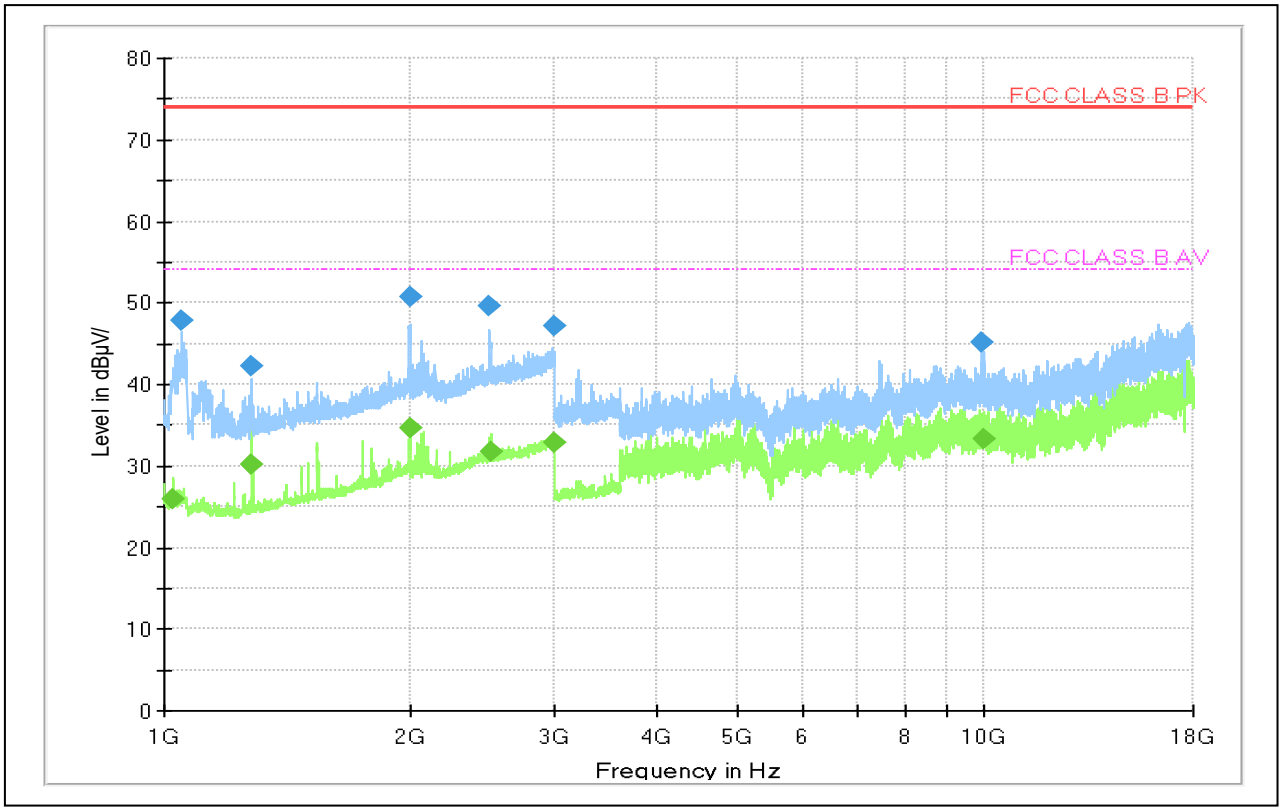
- Frequencies above 1 GHz



Frequency (MHz)	PK (dBµV/m)	CAV (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 025.500	---	25.8	54.0	28.2	100	H	101.0	6.4
1 050.000	47.8	---	74.0	26.2	100	H	113.0	6.1
1 278.000	42.2	---	74.0	31.8	100	H	59.0	6.8
1 280.000	---	30.2	54.0	23.8	100	H	75.0	6.8
1 993.000	---	34.6	54.0	19.4	100	H	358.0	12.3
1 995.500	50.8	---	74.0	23.2	100	H	358.0	12.3
2 493.000	49.5	---	74.0	24.5	100	H	253.0	13.7
2 500.000	---	31.8	54.0	22.2	100	H	113.0	13.7
2 993.000	---	32.9	54.0	21.1	100	V	9.0	16.3
2 997.000	47.1	---	74.0	26.9	100	V	242.0	16.3
9 964.000	45.2	---	74.0	28.8	100	H	253.0	15.9
9 990.500	---	33.4	54.0	20.6	100	H	231.0	16.0

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

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