

FCC WPT REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Address:

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16677, Rep. of Korea

Date of Issue:

20 January 2020

Test Site/Location:

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si,
Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2001-FC018-R1

FCC ID: A3LSMG988B

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model: SM-G988B/DS

Additional Model: SM-G988B

EUT Type: Mobile Phone

Frequency of Operation: 110 kHz ~ 148 kHz

Max. Transmit Power 6.88 dBuV/m @300 m

FCC Classification: Part 15 Low Power Transmitter Below 1705 kHz (DCD)

FCC Rule Part(s): FCC Part 15, Subpart C (15.209)

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a)



Report prepared by : Jung Ki Lim
Engineer of Telecommunication testing center



Approved by : Jong Seok Lee
Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2001-FC018	16 January 2020	- First Approval Report
HCT-RF-2001-FC018-R1	20 January 2020	- Revised the Max. Transmit Power (6.88 dBuV/m @300 m)

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.

The above Test Report is the accredited test result by KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Table of Contents

1. EUT DESCRIPTION	4
2. TEST METHODOLOGY	5
EUT CONFIGURATION	5
EUT EXERCISE	5
GENERAL TEST PROCEDURES	5
3. INSTRUMENT CALIBRATION.....	6
4. FACILITIES AND ACCREDITATIONS	6
FACILITIES	6
EQUIPMENT	6
5. ANTENNA REQUIREMENTS	6
6. MEASUREMENT UNCERTAINTY	7
7. Worst case configuration.....	8
8. TEST SUMMARY	10
9. RADIATED EMISSION MEASUREMENT	11
10. POWERLINE CONDUCTE EMISSIONS	20
11. EMISSION BANDWIDTH PLOT	29
12. LIST OF TEST EQUIPMENT	33
13. Annex A_TEST SETUP PHOTO	34

1. EUT DESCRIPTION

Model	SM-G988B/DS
Additional Model	SM-G988B
EUT Type	Mobile Phone
Power Supply	DC 3.86 V
Battery Information	Model: EB-BG988ABY Type: Li-ion Battery
Travel Adapter Information	Model : EP-TA800 Manufacture: SOLU-M
Data Cable Information	Model : EP-DG980BBE Manufacture: RF Tehck
Frequency of Operation	110 kHz ~ 148 kHz
Max. Transmit Power	6.88 dBuV/m @300 m
Date(s) of Tests	December 23, 2019 ~ January 10, 2020

2. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device (ANSI C63.10-2013) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3.75 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013).

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil,

Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.

The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- (1) The antennas of this E.U.T are permanently attached.
- (2) The E.U.T Complies with the requirement of §15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

7. Worst case configuration

EUT Mode	Position	Battery of Phone (Client device)
Charging from EUT to Phone (See Note 3)	Aligned	1 % ~ 20 %
		20 % ~ 50 %
		90 % ~ 100 %
	Cross	1 % ~ 20 %
		20 % ~ 50 %
		90 % ~ 100 %
Charging from EUT(Charging from TA) to Phone	Aligned	1 % ~ 20 %
		20 % ~ 50 %
		90 % ~ 100 %
	Cross	1 % ~ 20 %
		20 % ~ 50 %
		90 % ~ 100 %

Note:

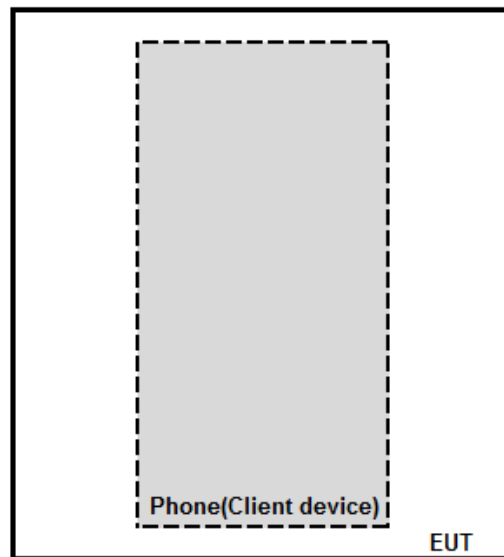
- Client device:
Of Phone and Wearable device, we tested on Phone.
- Phone(Client device):
 - Model : SM-N975F/DS
 - Manufacturer : SAMSUNG
 - FCC ID : A3LSMN975F
- EUT can operate the power sharing mode when battery level is over 30%.
Because test results are not different between fully charged status and battery level 30% status(EUT condition), test were performed fully charged condition.
- Battery of Phone(Client device):
All modes of operation were investigated and the worst case configuration results are reported.
(Worstcase : 1 % ~ 20 % of Battery)
- All position of loop antenna were investigated and the worst position results are reported.
 - Position : Horizontal, Vertical, Parallel to the ground plane
 - Worst Position : Horizontal
- The EUT was tested in three orthogonal axis(X, Y, Z) and the worst position results are reported.
 - Axis : X, Y, Z
 - Worst Axis : X
- SM-G988B/DS, SM-G988B were tested and the worst case results are reported.
(Worst case : SM-G988B/DS)

AC Power line Conducted Emissions

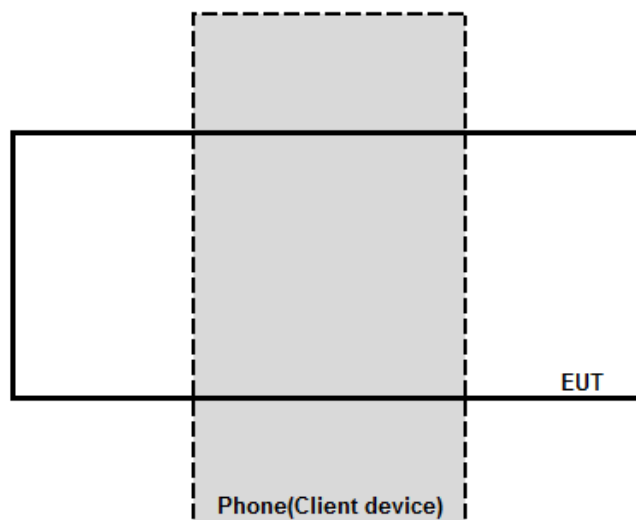
1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : EUT + External accessories(Earphone, etc) + Travel Adapter + Phone(Client device)
EUT + Travel Adapter + Phone(Client device)
 - Worstcase : EUT + Travel Adapter + Phone(Client device)
2. SM-G988B/DS, SM-G988B were tested and the worst case results are reported.
(Worst case : SM-G988B/DS)

Test Setup Diagram:

Aligned



Cross



8. TEST SUMMARY

Test Description	FCC Rule	Limit	Condition	Result
Radiated emission	§15.209	cf. Section 9	Radiated	Pass
AC Power Line Conducted Emission	§15.207	cf. Section 10		Pass
Emission bandwidth.	§2.1049	<u>See note1</u>		<u>See note1</u>

Note:

1. For reporting purposes only.

9. RADIATED EMISSION MEASUREMENT

Test Settings

1. Analyzer frequency set to the frequency of the radiated spurious emissipn of interst
2. RBW :
9kHz – 150kHz : 300Hz
150kHz – 30MHz : 10kHz
30MHz – 1GHz : 100kHz
3. VBW : $\geq 3 \times$ RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit(FCC)

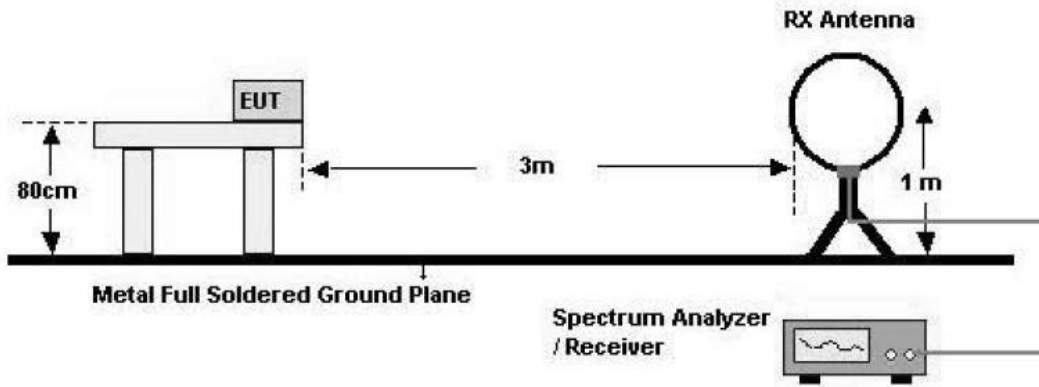
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Rule Part	Frequency (MHz)	Limit
Part 15.209	0.009 ~ 0.490	2400/F(kHz) uV/m@300 m
	0.490 ~1.705	24000/F(kHz) uV/m@30 m
	1.705 ~ 30	30 uV/m@30 m
	30 ~ 88	100 ** uV/m@3 m
	88 ~ 216	150 ** uV/m@3 m
	216 ~ 960	200 ** uV/m@3 m
	Above 960	500 uV/m@3 m

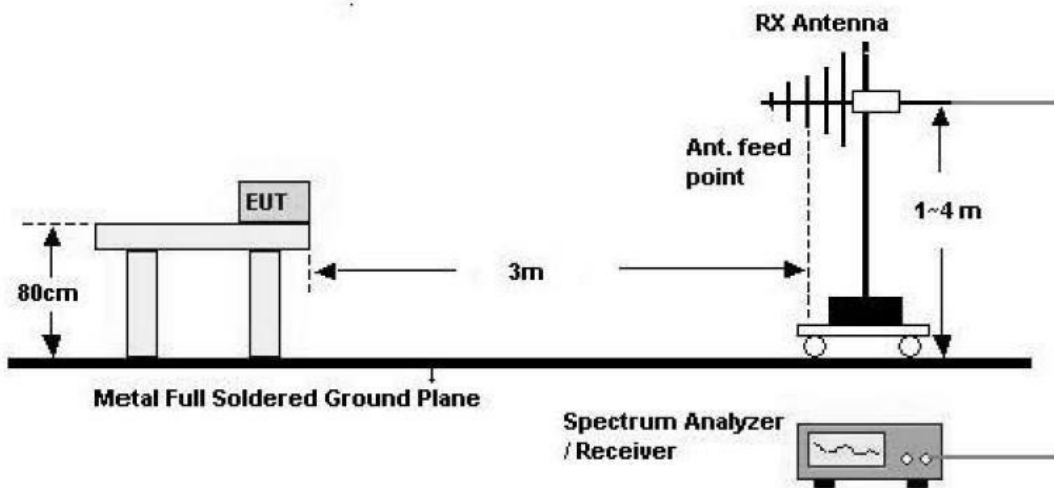
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Test Set-up

Below 30 MHz



30 MHz - 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT.
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:
 - * Result level(dBμV/m@30m)
= Reading level(dBμV/m@3m) + Ant factor(dB/m) + Cable Loss(dB) – Distance Correction Factor.
6. Distance Correction
 - * 0.009 MHz – 0.490 MHz :
 $40\log(3\text{ m}/300\text{ m}) = -80\text{ dB}$
 - * 0.490 MHz – 30MHz :
 $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$
7. Plots were taken without using any correction factors.
8. The worst case plots are reported.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting

Measurement Type(Peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW $\geq 3 \times$ RBW

6. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
7. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

■Test Result

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10.092	33.617	18.8	0.42	-80	-27.16	47.52	74.68
# 112.55	68.457	18.0	0.42	-80	6.88	26.58	19.70
114.55	32.874	18.0	0.42	-80	-28.71	26.42	55.13
338.1	44.746	18.1	0.42	-80	-16.73	17.03	33.76
3270	15.427	18.7	0.42	-40	-5.45	29.54	34.99

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
9.364	32.21	18.8	0.42	-80	-28.57	48.17	76.74
# 112.3	66.97	18.0	0.42	-80	5.39	26.60	21.21
114.3	31.01	18.0	0.42	-80	-30.57	26.44	57.01
335.25	44.37	18.1	0.42	-80	-17.11	17.10	34.21
3486	16.746	18.7	0.42	-40	-4.13	29.54	33.67

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to Phone
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
9.273	32.331	18.8	0.42	-80	-28.45	48.26	76.71
# 112.55	65.675	18.0	0.42	-80	4.10	26.58	22.49
114.6	29.007	18.0	0.42	-80	-32.57	26.42	58.99
338.1	41.931	18.1	0.42	-80	-19.55	17.03	36.58
3675	16.014	18.7	0.42	-40	-4.87	29.54	34.41

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone
3. Position: Cross
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10.911	31.712	18.8	0.42	-80	-29.07	46.85	75.92
# 112.35	62.568	18.0	0.42	-80	0.99	26.60	25.61
114.35	35.649	18.0	0.42	-80	-25.93	26.44	52.37
335.25	39.471	18.1	0.42	-80	-22.01	17.10	39.11
3027	20.356	18.7	0.42	-40	-0.52	29.54	30.06

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to Phone
3. Position: Cross
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
All fundamental frequency were investigated and the worst results are reported.

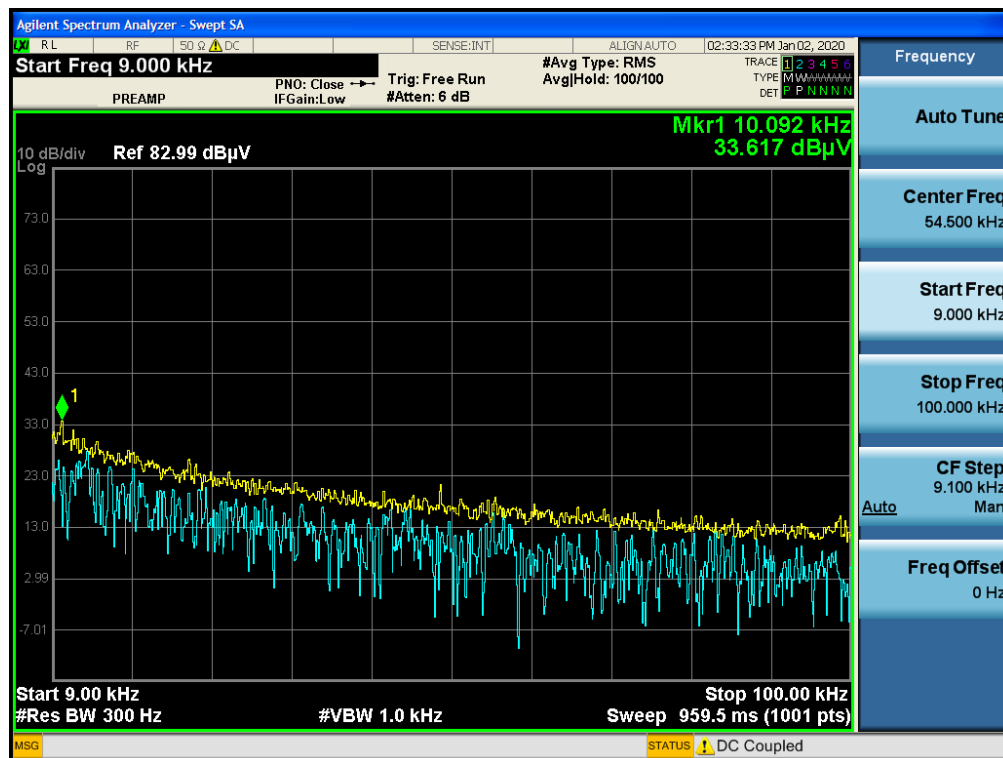
Test Plot

In order to simplify the report, the worst case results are reported.

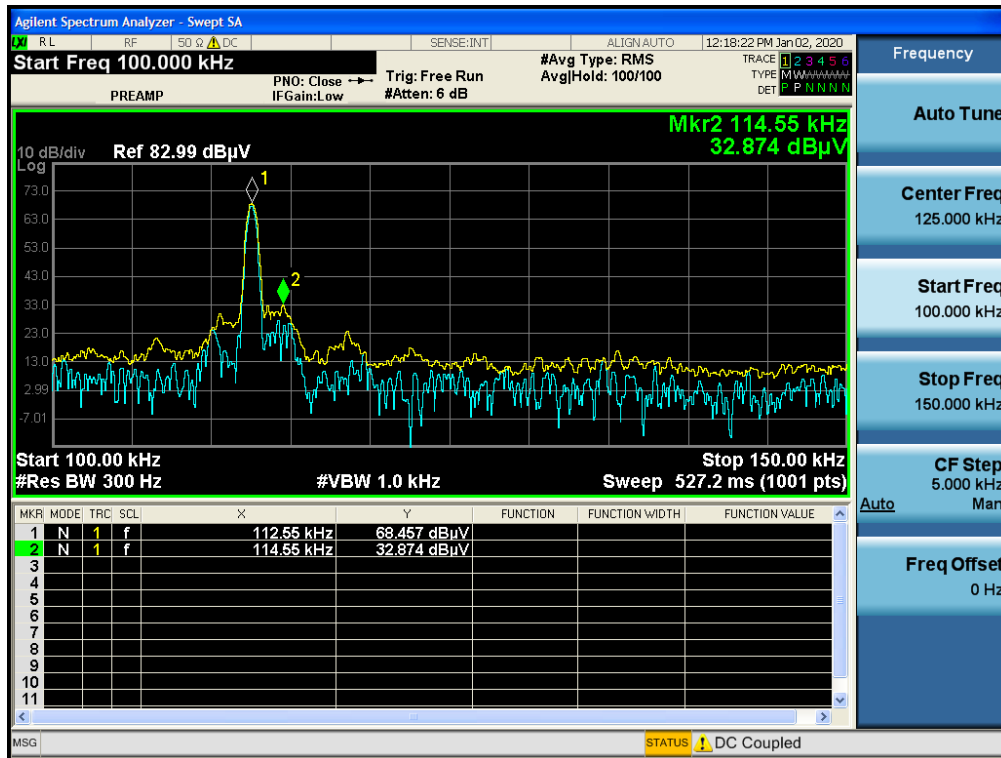
Worst case

- EUT Mode: Charging from EUT to Phone
- Position: Aligned

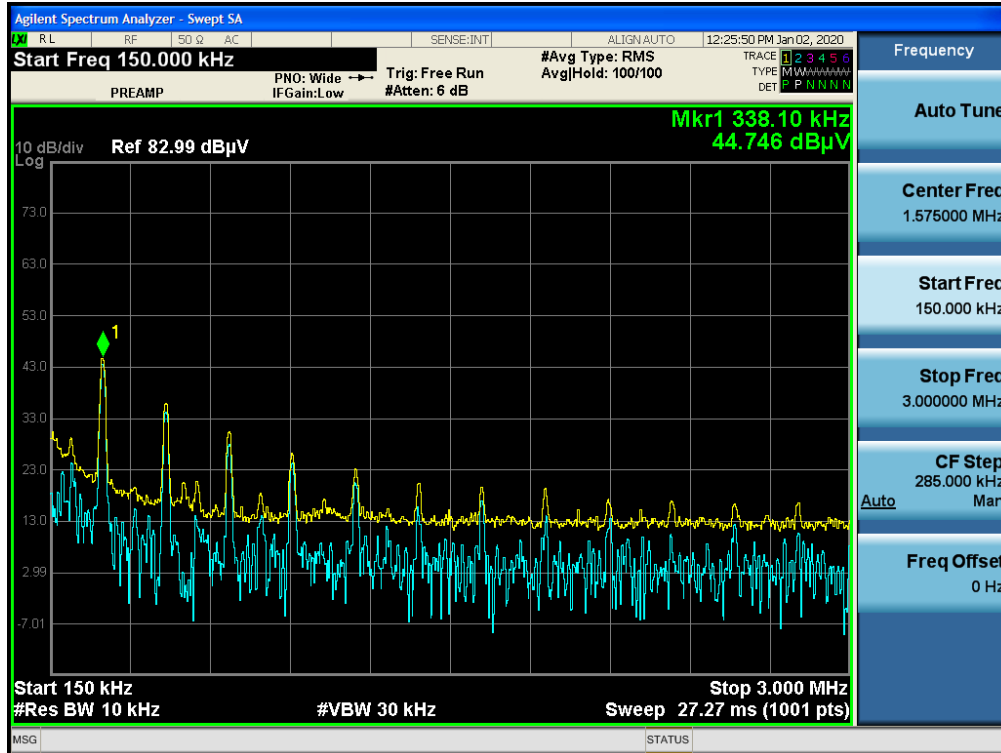
Frequency Range : 9 kHz – 100kHz



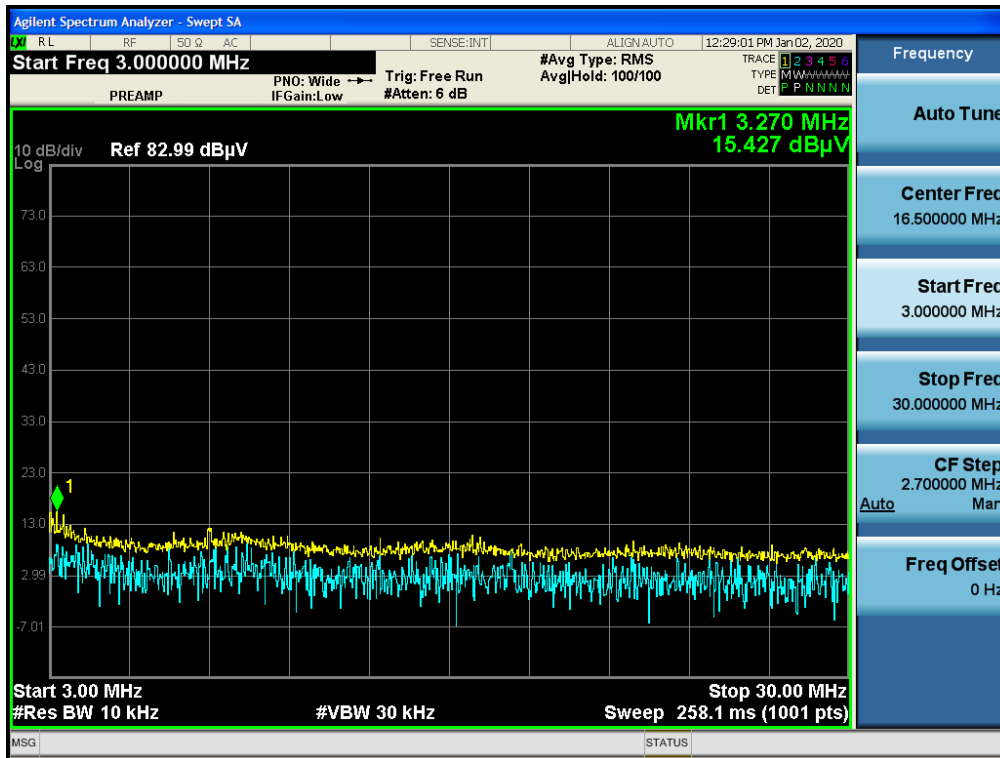
Frequency Range : 100 kHz – 150kHz



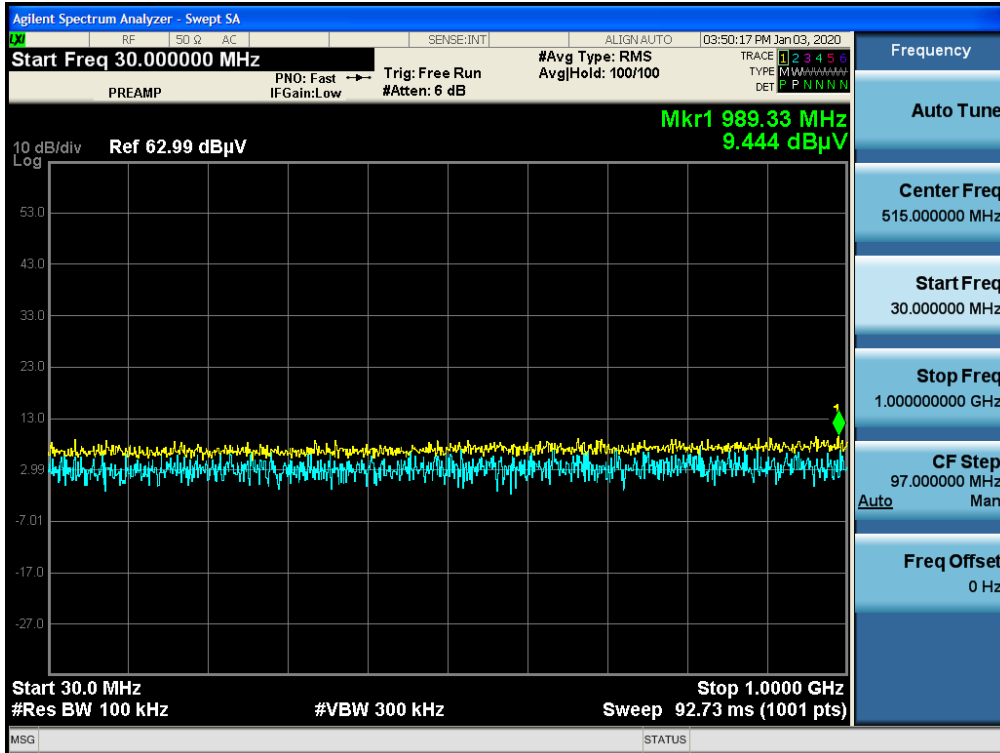
Frequency Range : 150 kHz – 3 MHz



Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz



10. POWERLINE CONDUCTE EMISSIONS

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.
5. The EUT is the device operating below 30 MHz.
 - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
 - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

Test Result & Plot (Position: Aligned)

Conducted Emissions (Line 1)

EUT+TA_Clinet Device(1~20%)_11_L1

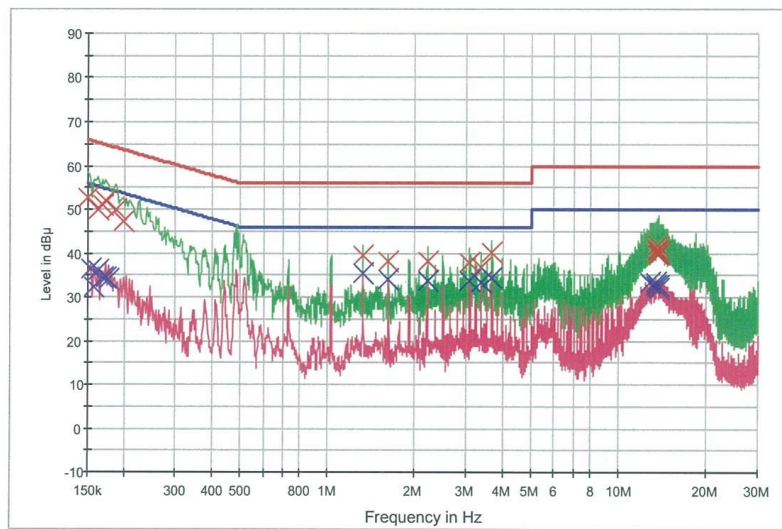
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HCT TEST Report

Common Information

EUT: SM-G988B/DS
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: EUT+TA_Clinet Device(1~20%)_11_L1

FCC CLASS B_Exten Cable



— FCC CLASS B_QP — FCC CLASS B_AV — Preview Result 1-PK+
— Preview Result 2-AVG — Final Result 1-QPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	52.7	9.000	Off	L1	9.8	13.3	66.0
0.162000	49.9	9.000	Off	L1	9.8	15.4	65.4
0.168000	51.2	9.000	Off	L1	9.8	13.9	65.1
0.172000	51.9	9.000	Off	L1	9.8	13.0	64.9
0.188000	50.0	9.000	Off	L1	9.8	14.1	64.1
0.198000	47.1	9.000	Off	L1	9.8	16.6	63.7
1.320000	39.5	9.000	Off	L1	9.9	16.5	56.0
1.614000	38.1	9.000	Off	L1	9.9	17.9	56.0
2.202000	38.2	9.000	Off	L1	9.9	17.8	56.0
3.082000	37.6	9.000	Off	L1	9.9	18.4	56.0
3.378000	36.9	9.000	Off	L1	9.9	19.1	56.0
3.670000	40.2	9.000	Off	L1	9.9	15.8	56.0
13.586000	40.9	9.000	Off	L1	10.4	19.1	60.0
13.612000	40.5	9.000	Off	L1	10.4	19.5	60.0
13.618000	41.7	9.000	Off	L1	10.4	18.3	60.0
13.622000	40.0	9.000	Off	L1	10.4	20.0	60.0
13.648000	39.8	9.000	Off	L1	10.4	20.2	60.0
13.658000	40.0	9.000	Off	L1	10.4	20.0	60.0

2019-12-26

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EUT+TA_Clinet Device(1~20%)_11_L1

2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	36.3	9.000	Off	L1	9.8	19.5	55.8
0.158000	32.4	9.000	Off	L1	9.8	23.1	55.6
0.162000	36.1	9.000	Off	L1	9.8	19.3	55.4
0.168000	34.3	9.000	Off	L1	9.8	20.8	55.1
0.172000	34.3	9.000	Off	L1	9.8	20.6	54.9
0.176000	34.0	9.000	Off	L1	9.8	20.6	54.7
1.320000	35.6	9.000	Off	L1	9.9	10.4	46.0
1.614000	34.1	9.000	Off	L1	9.9	11.9	46.0
2.202000	33.7	9.000	Off	L1	9.9	12.3	46.0
3.082000	33.7	9.000	Off	L1	9.9	12.3	46.0
3.376000	33.3	9.000	Off	L1	9.9	12.7	46.0
3.670000	34.4	9.000	Off	L1	9.9	11.6	46.0
12.770000	33.3	9.000	Off	L1	10.4	16.7	50.0
13.318000	33.3	9.000	Off	L1	10.4	16.7	50.0
13.358000	32.6	9.000	Off	L1	10.4	17.4	50.0
13.618000	32.5	9.000	Off	L1	10.4	17.5	50.0
13.650000	32.8	9.000	Off	L1	10.4	17.2	50.0
13.658000	32.1	9.000	Off	L1	10.4	17.9	50.0

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Conducted Emissions (Line 2)

EUT+TA_Clinet Device(1~20%)_11_N

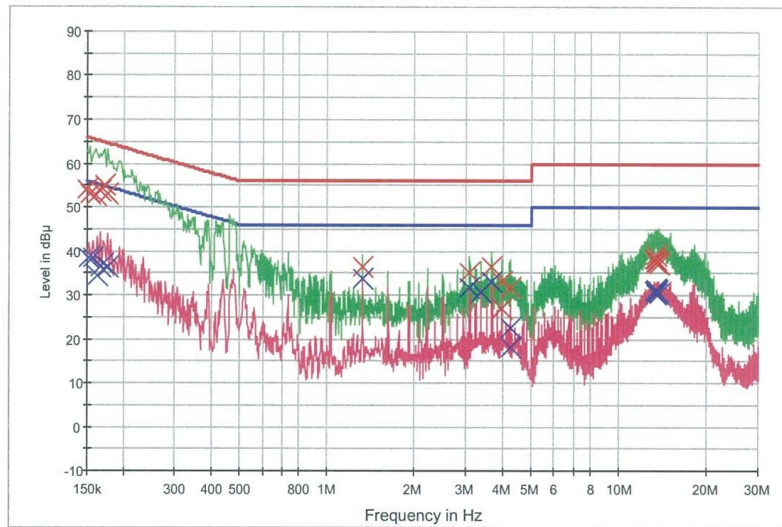
1 / 2

HCT TEST Report

Common Information

EUT: SM-G988B/DS
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: EUT+TA_Clinet Device(1~20%)_11_N

FCC CLASS B_Exten Cable



— FCC CLASS B_QP — Preview Result 2-AVG
— FCC CLASS B_AV — Final Result 1-QPK
— Preview Result 1-PK+ — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	54.2	9.000	Off	N	9.8	11.8	66.0
0.154000	53.0	9.000	Off	N	9.8	12.7	65.8
0.160000	52.6	9.000	Off	N	9.8	12.9	65.5
0.166000	53.7	9.000	Off	N	9.8	11.5	65.2
0.172000	54.9	9.000	Off	N	9.8	9.9	64.9
0.176000	53.1	9.000	Off	N	9.8	11.6	64.7
1.322000	36.3	9.000	Off	N	9.9	19.7	56.0
3.082000	35.0	9.000	Off	N	9.9	21.0	56.0
3.672000	36.4	9.000	Off	N	9.9	19.6	56.0
3.966000	33.0	9.000	Off	N	9.9	23.0	56.0
3.970000	27.0	9.000	Off	N	9.9	29.0	56.0
4.260000	31.7	9.000	Off	N	10.0	24.3	56.0
13.206000	38.3	9.000	Off	N	10.5	21.7	60.0
13.332000	38.3	9.000	Off	N	10.5	21.7	60.0
13.366000	39.3	9.000	Off	N	10.5	20.7	60.0
13.408000	37.5	9.000	Off	N	10.5	22.5	60.0
13.500000	37.5	9.000	Off	N	10.5	22.5	60.0
13.666000	37.0	9.000	Off	N	10.5	23.0	60.0

2019-12-26

오전 8:43:26

EUT+TA_Clinet Device(1~20%)_11_N

2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	38.4	9.000	Off	N	9.8	17.5	55.9
0.158000	38.5	9.000	Off	N	9.8	17.1	55.6
0.162000	34.6	9.000	Off	N	9.8	20.8	55.4
0.166000	36.3	9.000	Off	N	9.8	18.8	55.2
0.170000	37.3	9.000	Off	N	9.8	17.7	55.0
0.176000	36.5	9.000	Off	N	9.8	18.1	54.7
1.322000	33.6	9.000	Off	N	9.9	12.4	46.0
3.084000	31.7	9.000	Off	N	9.9	14.3	46.0
3.378000	30.6	9.000	Off	N	9.9	15.4	46.0
3.672000	33.1	9.000	Off	N	9.9	12.9	46.0
4.240000	18.2	9.000	Off	N	10.0	27.8	46.0
4.260000	22.6	9.000	Off	N	10.0	23.4	46.0
13.206000	31.1	9.000	Off	N	10.5	18.9	50.0
13.332000	31.3	9.000	Off	N	10.5	18.7	50.0
13.366000	31.0	9.000	Off	N	10.5	19.0	50.0
13.408000	30.5	9.000	Off	N	10.5	19.5	50.0
13.500000	31.2	9.000	Off	N	10.5	18.8	50.0
13.666000	30.4	9.000	Off	N	10.5	19.6	50.0

2019-12-26

오전 8:43:26

Test Result & Plot (Position: Cross)

Conducted Emissions (Line 1)

EUT+TA_Clinet Device(1~20%)+_L1

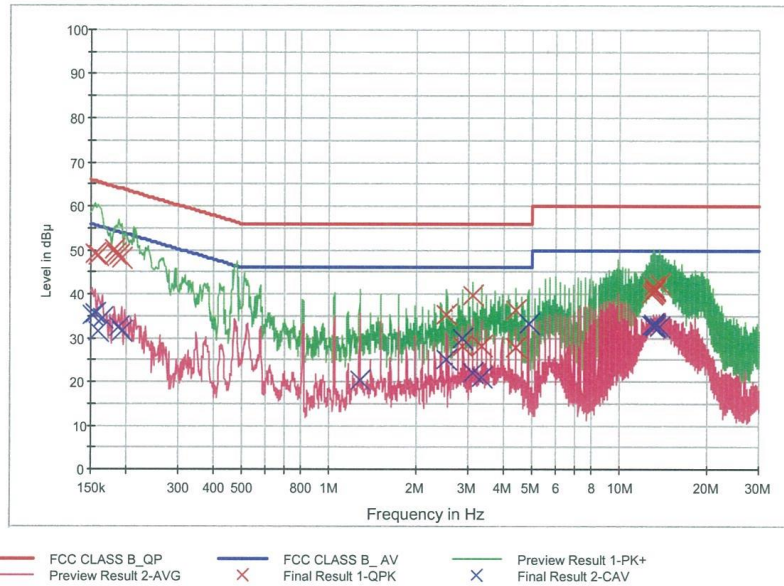
1 / 2

HCT TEST Report

Common Information

EUT: SM-G988B/DS
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: EUT+TA_Clinet Device(1~20%)+_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.156000	49.2	9.000	Off	L1	9.8	16.5	65.7
0.160000	48.8	9.000	Off	L1	9.8	16.6	65.5
0.180000	50.0	9.000	Off	L1	9.8	14.4	64.5
0.184000	49.2	9.000	Off	L1	9.8	15.1	64.3
0.188000	48.9	9.000	Off	L1	9.8	15.2	64.1
0.192000	48.3	9.000	Off	L1	9.8	15.7	63.9
2.530000	35.4	9.000	Off	L1	9.9	20.6	56.0
2.876000	28.1	9.000	Off	L1	9.9	27.9	56.0
3.104000	39.6	9.000	Off	L1	9.9	16.4	56.0
3.346000	28.0	9.000	Off	L1	9.9	28.0	56.0
4.366000	27.9	9.000	Off	L1	10.0	28.1	56.0
4.370000	36.2	9.000	Off	L1	10.0	19.8	56.0
12.912000	39.9	9.000	Off	L1	10.4	20.1	60.0
13.012000	40.4	9.000	Off	L1	10.4	19.6	60.0
13.104000	41.7	9.000	Off	L1	10.4	18.3	60.0
13.180000	40.9	9.000	Off	L1	10.4	19.1	60.0
13.238000	40.7	9.000	Off	L1	10.4	19.3	60.0
13.654000	42.4	9.000	Off	L1	10.4	17.6	60.0

2019-12-26

오전 9:01:29

EUT+TA_Clinet Device(1~20%)+_L1

2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	35.1	9.000	Off	L1	9.8	20.8	55.9
0.156000	35.5	9.000	Off	L1	9.8	20.2	55.7
0.160000	31.6	9.000	Off	L1	9.8	23.8	55.5
0.164000	34.5	9.000	Off	L1	9.8	20.7	55.3
0.188000	32.7	9.000	Off	L1	9.8	21.5	54.1
0.192000	31.5	9.000	Off	L1	9.8	22.4	53.9
1.270000	20.4	9.000	Off	L1	9.9	25.6	46.0
2.530000	25.1	9.000	Off	L1	9.9	20.9	46.0
2.876000	29.7	9.000	Off	L1	9.9	16.3	46.0
3.106000	22.1	9.000	Off	L1	9.9	23.9	46.0
3.348000	20.9	9.000	Off	L1	9.9	25.1	46.0
4.828000	33.2	9.000	Off	L1	10.0	12.8	46.0
12.912000	32.9	9.000	Off	L1	10.4	17.1	50.0
13.012000	32.9	9.000	Off	L1	10.4	17.1	50.0
13.104000	33.2	9.000	Off	L1	10.4	16.8	50.0
13.180000	32.8	9.000	Off	L1	10.4	17.2	50.0
13.238000	32.4	9.000	Off	L1	10.4	17.6	50.0
13.654000	32.5	9.000	Off	L1	10.4	17.5	50.0

2019-12-26

오전 9:01:29

Conducted Emissions (Line 2)

EUT+TA_Clinet Device(1~20%)+_N

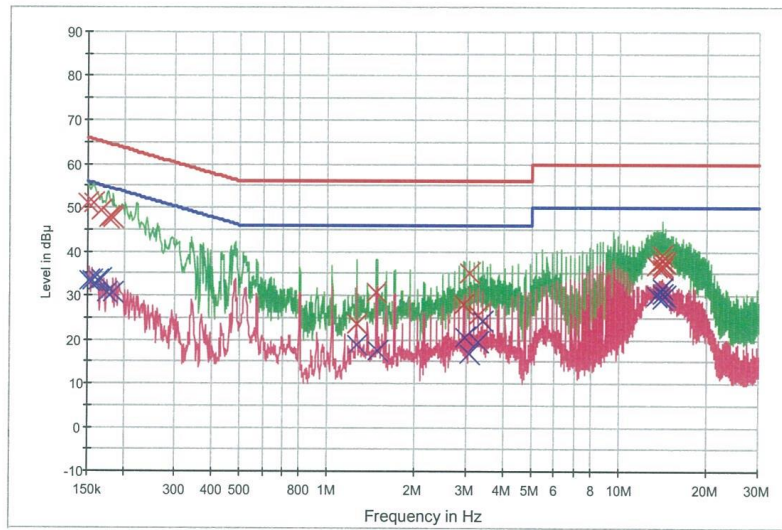
1 / 2

HCT TEST Report

Common Information

EUT: SM-G988B/DS
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: EUT+TA_Clinet Device(1~20%)+_N

FCC CLASS B_Exten Cable



— FCC CLASS B_OP
— Preview Result 2-AVG
— FCC CLASS B_AV
— Final Result 1-QPK
— Preview Result 1-PK+
— Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	50.9	9.000	Off	N	9.8	15.1	66.0
0.158000	50.9	9.000	Off	N	9.8	14.6	65.6
0.166000	49.4	9.000	Off	N	9.8	15.7	65.2
0.176000	47.7	9.000	Off	N	9.8	17.0	64.7
0.180000	47.8	9.000	Off	N	9.8	16.6	64.5
0.184000	47.6	9.000	Off	N	9.8	16.7	64.3
1.260000	23.6	9.000	Off	N	9.9	32.4	56.0
1.476000	30.6	9.000	Off	N	9.9	25.4	56.0
2.942000	27.9	9.000	Off	N	9.9	28.1	56.0
3.058000	35.1	9.000	Off	N	9.9	20.9	56.0
3.286000	25.7	9.000	Off	N	9.9	30.3	56.0
3.400000	24.4	9.000	Off	N	9.9	31.6	56.0
13.342000	36.8	9.000	Off	N	10.5	23.2	60.0
14.032000	36.1	9.000	Off	N	10.5	23.9	60.0
14.052000	37.9	9.000	Off	N	10.5	22.1	60.0
14.058000	39.3	9.000	Off	N	10.5	20.7	60.0
14.068000	36.8	9.000	Off	N	10.5	23.2	60.0
14.388000	37.5	9.000	Off	N	10.5	22.5	60.0

2019-12-26

오전 9:09:46

EUT+TA_Clinet Device(1~20%)+_N

2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	33.5	9.000	Off	N	9.8	22.4	55.9
0.156000	33.5	9.000	Off	N	9.8	22.2	55.7
0.162000	33.3	9.000	Off	N	9.8	22.0	55.4
0.166000	33.9	9.000	Off	N	9.8	21.3	55.2
0.174000	30.7	9.000	Off	N	9.8	24.1	54.8
0.184000	30.7	9.000	Off	N	9.8	23.6	54.3
1.260000	19.0	9.000	Off	N	9.9	27.0	46.0
1.478000	17.3	9.000	Off	N	9.9	28.7	46.0
2.946000	20.5	9.000	Off	N	9.9	25.5	46.0
3.060000	16.8	9.000	Off	N	9.9	29.2	46.0
3.286000	19.3	9.000	Off	N	9.9	26.7	46.0
3.398000	24.2	9.000	Off	N	9.9	21.8	46.0
13.342000	30.1	9.000	Off	N	10.5	19.9	50.0
14.032000	29.3	9.000	Off	N	10.5	20.7	50.0
14.052000	31.6	9.000	Off	N	10.5	18.4	50.0
14.058000	30.2	9.000	Off	N	10.5	19.8	50.0
14.068000	29.5	9.000	Off	N	10.5	20.5	50.0
14.386000	30.1	9.000	Off	N	10.5	19.9	50.0

2019-12-26

오전 9:09:46

11. EMISSION BANDWIDTH PLOT

Test Settings

1. Analyzer frequency set to the frequency of the radiated spurious emissipn of interst
2. RBW : 300 Hz
(Becasuse the measured signal is CW/CW-like,adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.)
3. VBW : $\geq 3 \times \text{RBW}$
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit

None

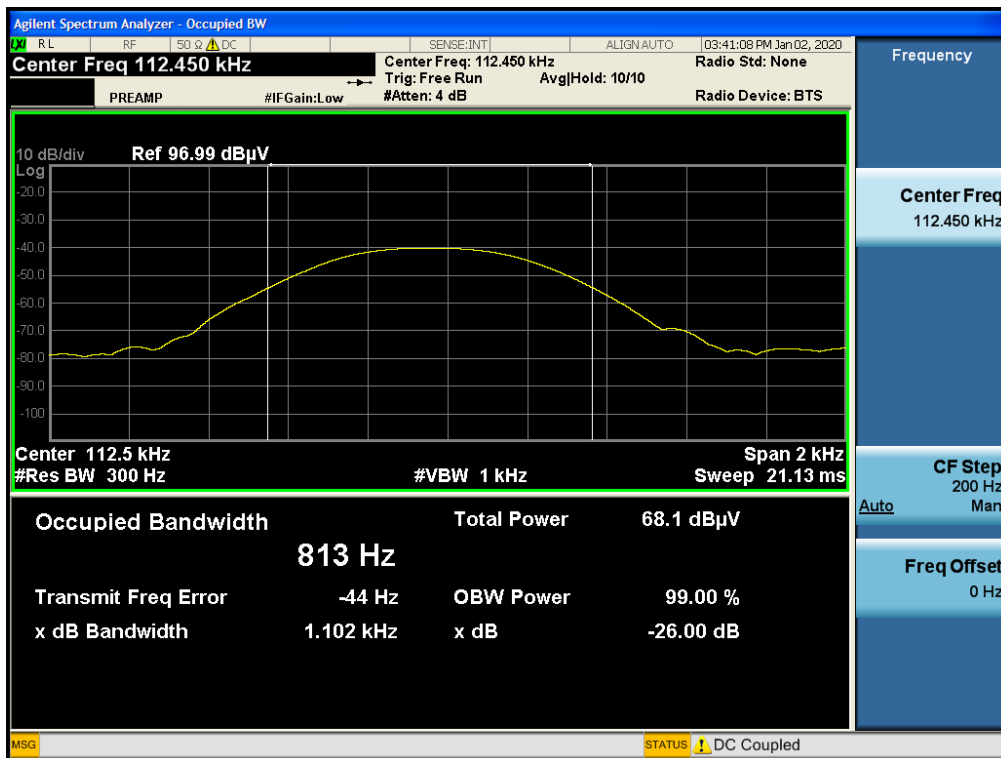
(for reporting purposes only.)

■Test Result

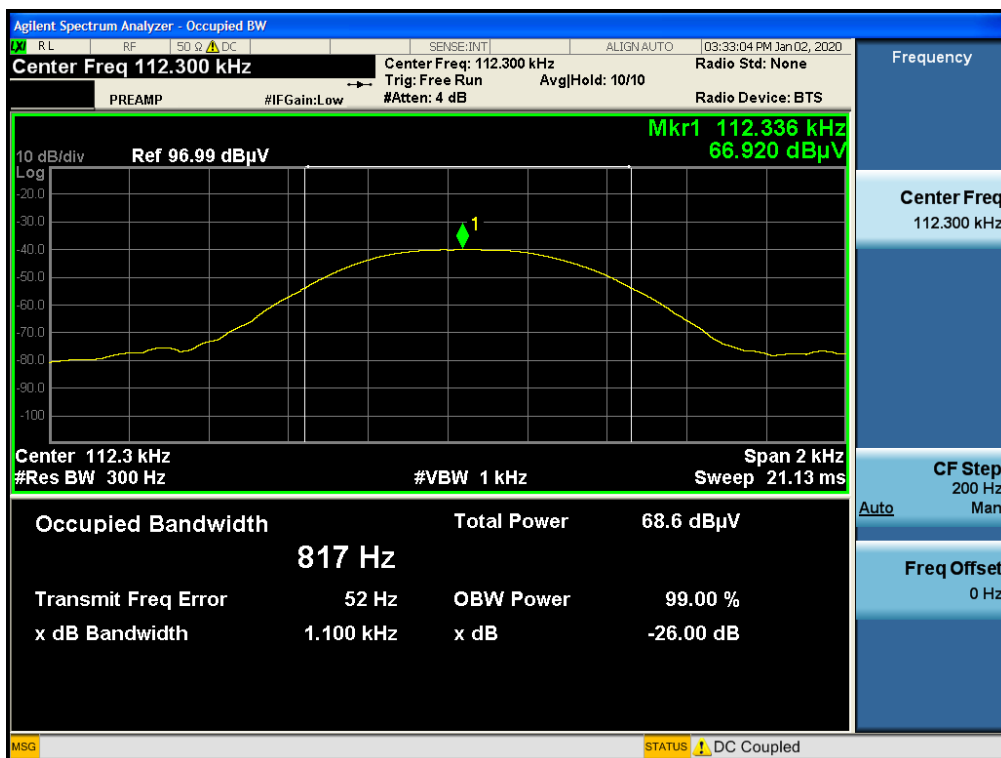
EUT Mode	Position	Test Frequency (kHz)	26dB Bandwidth (kHz)	Occupied Bandwidth (kHz)
Charging from EUT to Phone	Aligned	112.45	1.102	0.813
	Cross	112.30	1.100	0.817
Charging from EUT(Charging from TA) to Phone	Aligned	112.45	1.582	0.854
	Cross	112.40	1.102	0.832

■ Test Plot

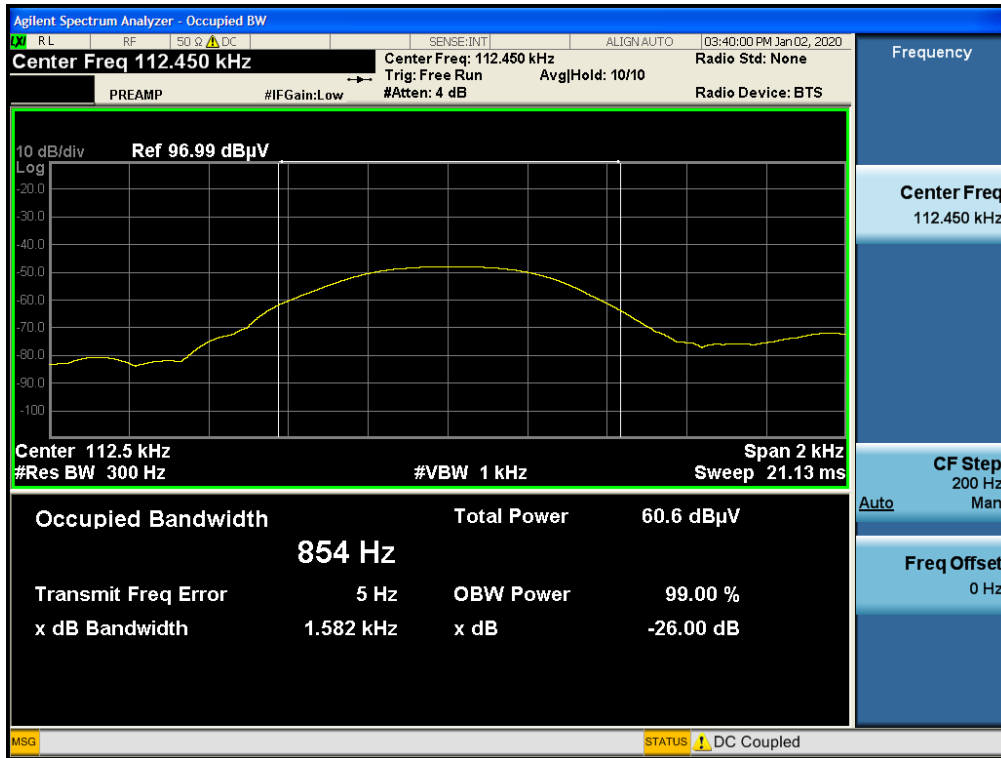
Charging from EUT to Phone – Position : Aligned



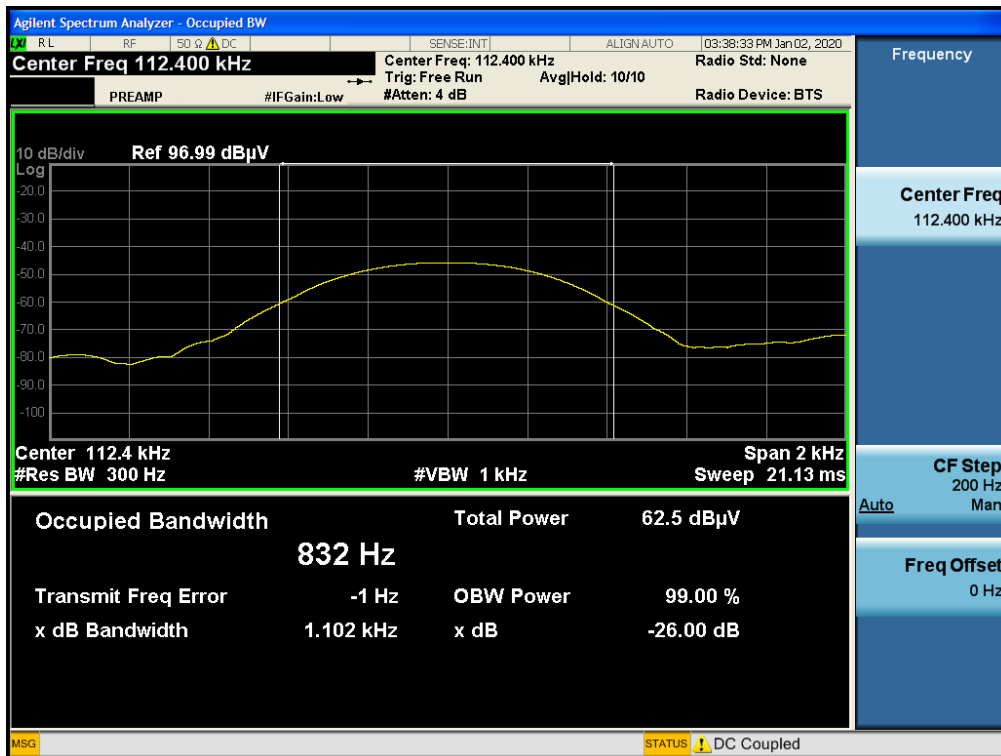
Charging from EUT to Phone – Position : Cross



Charging from EUT(Charging from TA) to Phone– Position : Aligned



Charging from EUT(Charging from TA) to Phone– Position : Cross



12. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/26/2019	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	VULB 9160 / TRILOG Antenna	08/09/2018	Biennial	9160-3368
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	05/09/2019	Annual	100854
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/26/2019	Annual	101068-SZ
Agilent	N9020A / Signal Analyzer	05/23/2019	Annual	MY51110085
Api tech.	18B-03 / Attenuator (3 dB)	06/04/2019	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/15/2019	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	07/01/2019	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/01/2019	Annual	22965

13. Annex A_TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2001-FC018-P