

FCC WPT REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: December 13, 2021
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	Report No.: HCT-RF-2112-FC017-R1

FCC ID:	A3LSMX800
APPLICANT:	SAMSUNG Electronics Co., Ltd.
According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMX808U report.	

Model:	SM-X800
EUT Type:	Tablet
Frequency of Operation & Max. Transmit Power:	530 kHz(S-pen Charging) : 20.53 dBμV/m @30 m
FCC Classification:	Part 15 Low Power Transmitter Below 1705 kHz (DCD)
FCC Rule Part(s):	FCC Part 15, Subpart C (15.209)

Engineering Statement:

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. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

Report No.: HCT-RF-2112-FC017-R1

REVIEWED BY



Report prepared by : Woong Jin Kim
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

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 (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2112-FC017	December 03, 2021	- First Approval Report
HCT-RF-2112-FC017-R1	December 13, 2021	- Page 1, 5, Revised - Page 16, Added Ant Pole & Revised - Page 16, Added Note

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1. EUT DESCRIPTION

Model	SM-X800
Additional Model	-
EUT Type	Tablet
Power Supply	DC 3.86 V
Frequency of Operation	530 kHz (S-pen Charging / S-Pen : Rx Only)
Max. Transmit Power	20.53 dB μ V/m @30 m (S-pen Charging)
Date(s) of Tests	September 13, 2021 ~ December 02, 2021
Serial number	Radiated : R32RD00VRVM

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 15.205, 15.207 and 15.209 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 30 MHz 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 1 GHz. Above 1 GHz with 1.5 m 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 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 equipment's, 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 (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, $k=2$)

7. WORST CASE CONFIGURATION

Mode	EUT State	Position of Client device	Battery of Client device	Client device
S-pen Charging (attached on the back of EUT)	Charging from EUT to Client device	Aligned	Non-fully charged condition	S-pen (530kHz Rx Only)
	Charging from EUT(Charging from TA) to Client device			

Note:

1. Client device:

S-pen(Rx Only)
- Model : EJ-PT870
- Manufacturer : SAMSUNG
- FCC ID : A3LEJPT870

2. 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

3. The EUT was tested in three orthogonal axis(X, Y, Z) and the worst position results are reported.

- Axis : X, Y, Z
- Worst Axis : Z

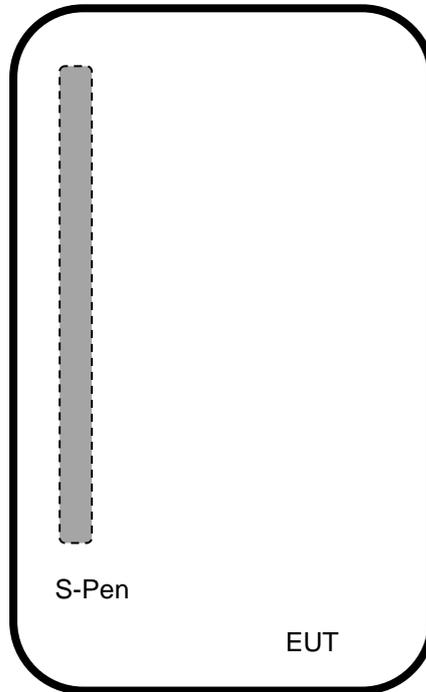
AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.

- Mode : EUT + External accessories(Earphone, Keyboard etc) + Travel Adapter + S-Pen(Client device),
EUT + Travel Adapter + S-Pen(Client device)
- Worstcase : EUT + Travel Adapter + S-Pen(Client device)

Test Setup Diagram:

1. S-pen charging mode



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

Note:

1. For reporting purposes only.

9. RADIATED EMISSION MEASUREMENT

Test Settings

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

Limit

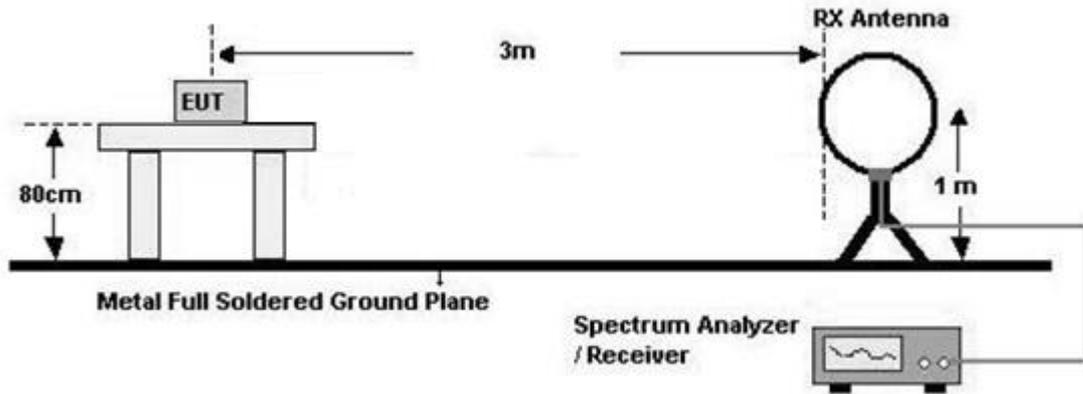
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

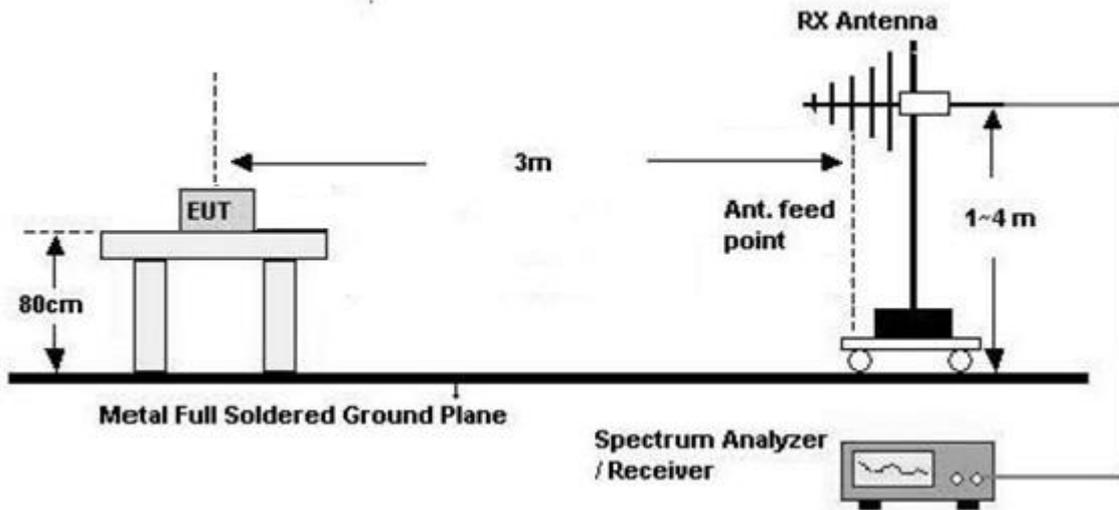
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, 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 3 m from the EUT.
3. The EUT is placed on a turntable, which is 0.8 m 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 Value(dBμV/m@30 m)
 - = Measured Value(dBμV/m@3 m) + Ant factor(dB/m) + Cable Loss(dB)
 - Distance Correction Factor(dB)
6. Distance Correction
 - * 0.009 MHz – 0.490 MHz :
 - $40\log(3\text{ m}/300\text{ m}) = - 80\text{ dB}$
 - * 0.490 MHz – 30 MHz :
 - $40\log(3\text{ m}/30\text{ m}) = - 40\text{ dB}$
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 1 GHz)

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. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. 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]	Measured Value [dB μ V/m] @3 m	Ant. Pole	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Value [dB μ V/m] @300 m	Limit [dB μ V/m]	Margin [dB]
19.010	34.803	H	19.10	0.53	-80	-25.57	42.02	67.59
114.30	15.069	H	19.30	0.53	-80	-45.10	26.44	71.54
Frequency [kHz]	Measured Value [dB μ V/m] @3 m	Ant. Pole	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Value [dB μ V/m] @30 m	Limit [dB μ V/m]	Margin [dB]
# 531.9	40.804	H	19.20	0.53	-40	20.53	33.09	12.55
577.5	24.097	H	19.20	0.53	-40	3.83	32.37	28.55
8022	16.414	H	19.56	0.53	-40	-3.50	29.54	33.04

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT to S-pen
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found

Frequency [kHz]	Measured Value [dB μ V/m] @3 m	Ant. Pole	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Value [dB μ V/m] @300 m	Limit [dB μ V/m]	Margin [dB]
41.123	46.575	H	19.10	0.53	-80	-13.80	35.32	49.12
113.25	33.122	H	19.30	0.53	-80	-27.05	26.52	53.57
158.55	37.994	H	19.30	0.53	-80	-22.18	23.60	45.78
Frequency [kHz]	Measured Value [dB μ V/m] @3 m	Ant. Pole	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Value [dB μ V/m] @30 m	Limit [dB μ V/m]	Margin [dB]
# 531.9	39.653	H	19.20	0.53	-40	19.38	33.09	13.70
8049	16.388	H	19.56	0.53	-40	-3.52	29.54	33.06

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to S-pen
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found
5. 41.123 kHz is higher than fundamental level. However, it is noise floor level and looks like higher than due to chamber characteristic.

■ **Test Plot**

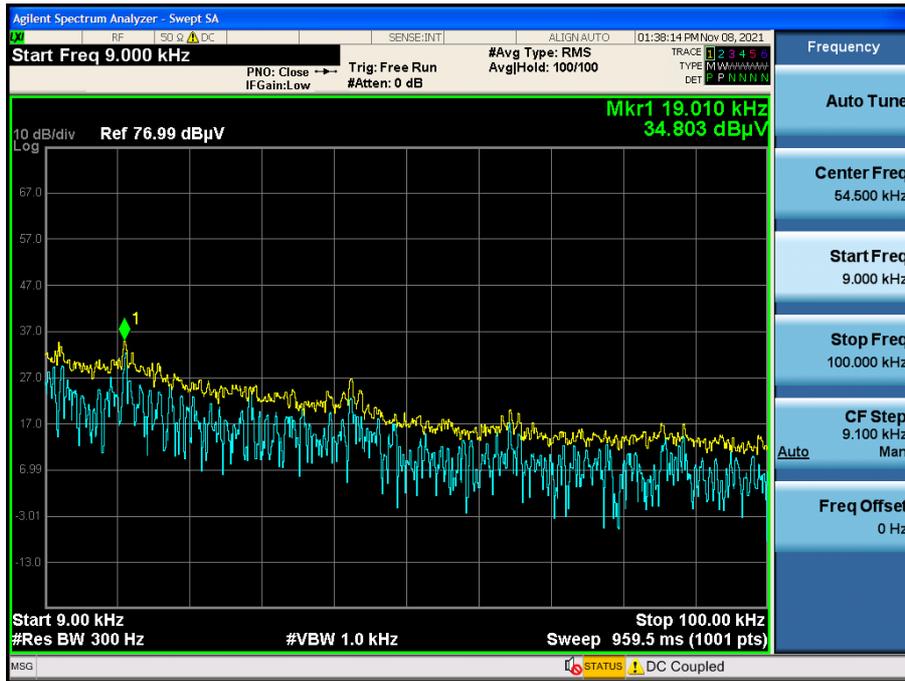
In order to simplify the report, the worst case results are reported.

1. S-pen Charging

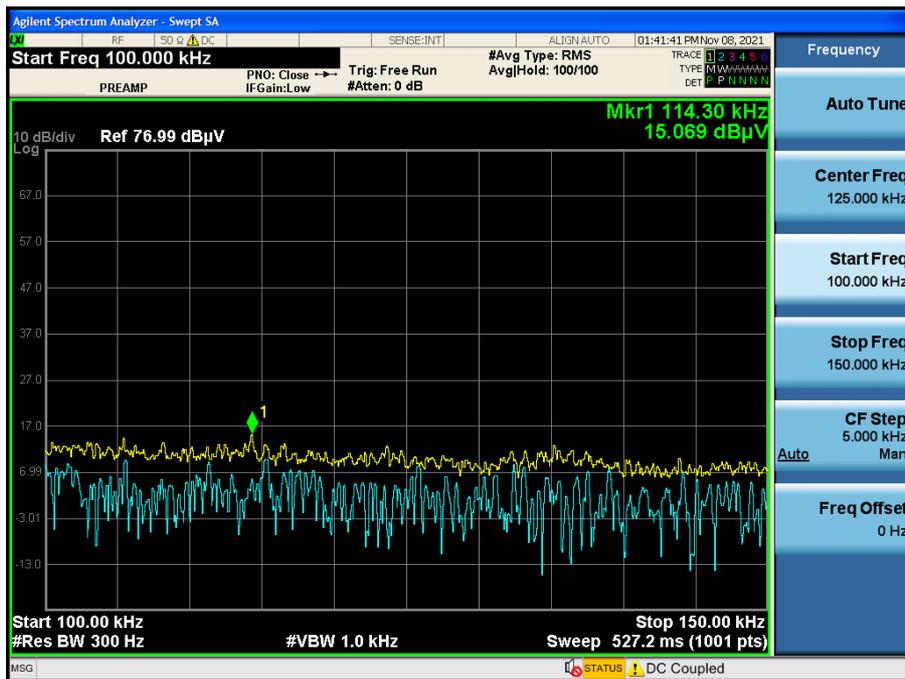
Worst case

- EUT Mode: Charging from EUT to Client device(S-pen)
- Position: Aligned

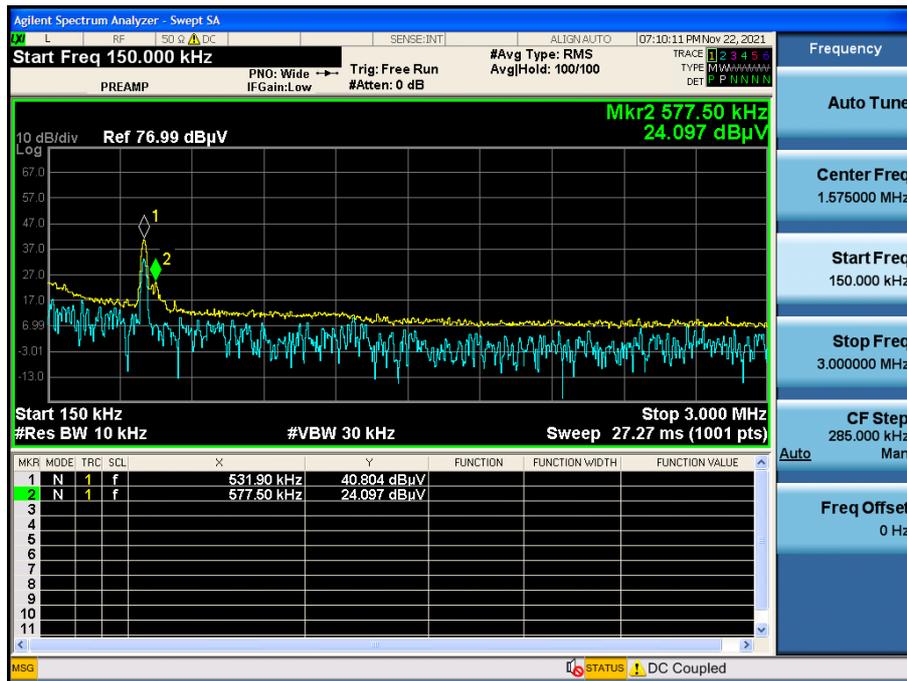
Frequency Range : 9 kHz – 100kHz



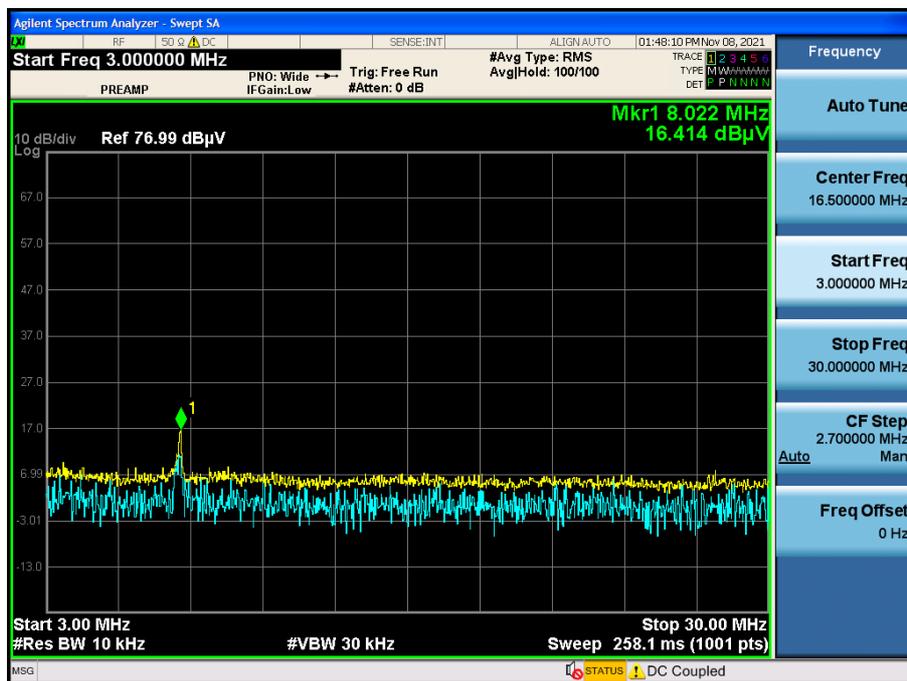
Frequency Range : 100 kHz – 150kHz



Frequency Range : 150 kHz – 3 MHz



Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz
(30 MHz – 1GHz : No Critical peaks found)

Note :

In order to simplify the report, attached plots were only the worstcase

10. POWERLINE CONDUCTED 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 ^(a)	56 to 46 ^(a)
0.50 to 5	56	46
5 to 30	60	50

^(a)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) = Measured Value + Correction Factor

Test Result & Plot (Mode: S-pen Charging)
Conducted Emissions (Line 1)

Test

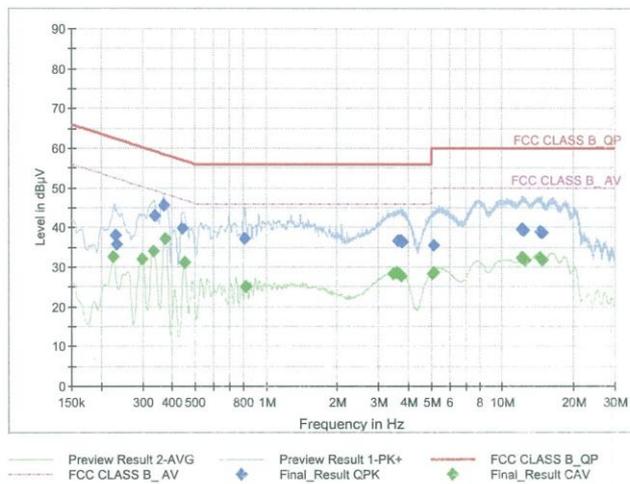
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Test Report

Common Information

EUT : SM-X808U
 Manufacturer : SAMSUNG
 Test Site : SHIELD ROOM
 Operating Conditions : S-PEN Charging Mode_L1
 Operator Name:
 Comment:

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2288	38.05	62.50	24.44	9.000	L1	OFF	9.6
0.2333	35.90	62.33	26.44	9.000	L1	OFF	9.6
0.3368	43.03	59.28	16.26	9.000	L1	OFF	9.6
0.3683	45.51	58.54	13.03	9.000	L1	OFF	9.6
0.4425	39.78	57.02	17.23	9.000	L1	OFF	9.6
0.8128	37.13	56.00	18.87	9.000	L1	OFF	9.7
3.6163	36.66	56.00	19.34	9.000	L1	OFF	9.8
3.7018	36.49	56.00	19.51	9.000	L1	OFF	9.8
3.7220	36.68	56.00	19.32	9.000	L1	OFF	9.8
3.7333	36.64	56.00	19.36	9.000	L1	OFF	9.8
3.7895	36.20	56.00	19.80	9.000	L1	OFF	9.8
5.1305	35.43	60.00	24.57	9.000	L1	OFF	9.9
12.0830	39.57	60.00	20.43	9.000	L1	OFF	10.1
12.2518	39.63	60.00	20.38	9.000	L1	OFF	10.1
12.3283	39.35	60.00	20.65	9.000	L1	OFF	10.1
14.4860	39.02	60.00	20.98	9.000	L1	OFF	10.2
14.7110	38.67	60.00	21.33	9.000	L1	OFF	10.2
14.7538	38.62	60.00	21.38	9.000	L1	OFF	10.2

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Test

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Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2243	32.64	52.66	20.02	9.000	L1	OFF	9.6
0.2985	32.13	50.28	18.16	9.000	L1	OFF	9.6
0.3345	34.00	49.34	15.34	9.000	L1	OFF	9.6
0.3728	37.25	48.44	11.19	9.000	L1	OFF	9.6
0.4515	31.14	46.85	15.71	9.000	L1	OFF	9.6
0.8218	25.17	46.00	20.83	9.000	L1	OFF	9.7
3.4498	28.34	46.00	17.66	9.000	L1	OFF	9.8
3.5623	28.54	46.00	17.46	9.000	L1	OFF	9.8
3.6523	28.14	46.00	17.86	9.000	L1	OFF	9.8
3.7423	27.76	46.00	18.24	9.000	L1	OFF	9.8
5.0675	28.28	50.00	21.72	9.000	L1	OFF	9.9
5.1373	28.43	50.00	21.57	9.000	L1	OFF	9.9
12.1123	32.42	50.00	17.58	9.000	L1	OFF	10.1
12.1415	32.18	50.00	17.82	9.000	L1	OFF	10.1
12.2518	32.22	50.00	17.78	9.000	L1	OFF	10.1
12.4880	31.73	50.00	18.27	9.000	L1	OFF	10.1
14.4365	32.39	50.00	17.61	9.000	L1	OFF	10.2
14.7110	31.77	50.00	18.23	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

Test

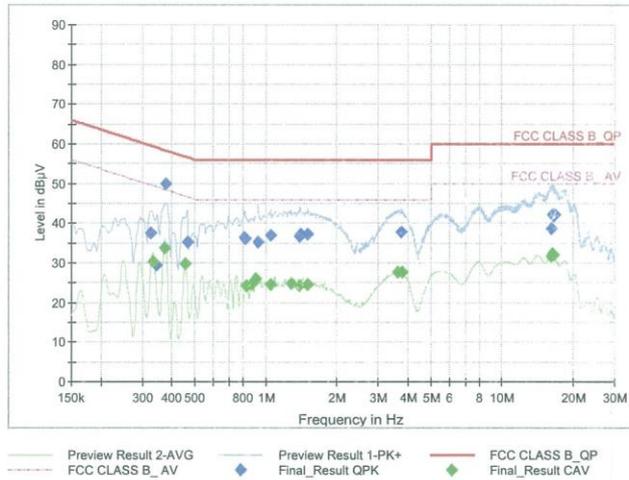
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Test Report

Common Information

EUT : SM-X808U
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : S-PEN Charging Mode_N
 Operator Name:
 Comment:

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.3278	37.39	59.51	22.12	9.000	N	OFF	9.6
0.3458	29.51	59.06	29.56	9.000	N	OFF	9.6
0.3773	50.01	58.34	8.33	9.000	N	OFF	9.6
0.4650	35.28	56.60	21.32	9.000	N	OFF	9.6
0.8128	36.23	56.00	19.77	9.000	N	OFF	9.7
0.8173	36.15	56.00	19.85	9.000	N	OFF	9.7
0.9298	35.26	56.00	20.74	9.000	N	OFF	9.7
1.0468	37.05	56.00	18.95	9.000	N	OFF	9.7
1.3955	36.67	56.00	19.33	9.000	N	OFF	9.7
1.4000	37.09	56.00	18.91	9.000	N	OFF	9.7
1.5125	37.13	56.00	18.87	9.000	N	OFF	9.7
3.7288	37.85	56.00	18.15	9.000	N	OFF	9.8
16.2343	38.63	60.00	21.37	9.000	N	OFF	10.3
16.2703	42.15	60.00	17.85	9.000	N	OFF	10.3
16.3738	42.22	60.00	17.78	9.000	N	OFF	10.3
16.4773	41.95	60.00	18.05	9.000	N	OFF	10.3
16.5043	42.10	60.00	17.90	9.000	N	OFF	10.3
16.6685	42.01	60.00	17.99	9.000	N	OFF	10.3

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Test

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.3323	30.37	49.40	19.03	9.000	N	OFF	9.6
0.3750	33.82	48.39	14.57	9.000	N	OFF	9.6
0.4560	29.78	46.77	16.98	9.000	N	OFF	9.6
0.8285	24.27	46.00	21.73	9.000	N	OFF	9.7
0.8690	24.66	46.00	21.34	9.000	N	OFF	9.7
0.9118	25.88	46.00	20.12	9.000	N	OFF	9.7
1.0468	24.54	46.00	21.46	9.000	N	OFF	9.7
1.2808	24.85	46.00	21.15	9.000	N	OFF	9.7
1.3933	24.15	46.00	21.85	9.000	N	OFF	9.7
1.5125	24.38	46.00	21.62	9.000	N	OFF	9.7
3.6253	27.62	46.00	18.38	9.000	N	OFF	9.8
3.8075	27.59	46.00	18.41	9.000	N	OFF	9.8
16.1083	31.78	50.00	18.22	9.000	N	OFF	10.3
16.1308	31.85	50.00	18.15	9.000	N	OFF	10.3
16.3288	32.20	50.00	17.80	9.000	N	OFF	10.3
16.3625	32.41	50.00	17.59	9.000	N	OFF	10.3
16.3738	32.25	50.00	17.75	9.000	N	OFF	10.3
16.4863	32.16	50.00	17.84	9.000	N	OFF	10.3

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11. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/23/2022	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/17/2022	Annual
Temperature Chamber	SU-642	ESPAC	0093008124	03/15/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	01/11/2022	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	101231	07/02/2022	Annual
Power Meter	N1911A	Agilent	MY45100523	04/08/2022	Annual
Power Sensor	N1921A	Keysight	MY57820067	04/08/2022	Annual
Directional Coupler	87300B	Agilent	3116A03621	11/02/2022	Annual
Power Splitter	11667B	Hewlett Packard	05001	05/20/2022	Annual
DC Power Supply	E3632A	Hewlett Packard	MY50360067	02/16/2022	Annual
Attenuator(10 dB)	8493C	Hewlett Packard	07560	06/18/2022	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/22/2023	Biennial
Spectrum Analyzer	FSV40-N	Rohde & Schwarz	102168	07/05/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	01/11/2022	Annual
Attenuator (3 dB)	18B-03	Api tech.	1	02/03/2022	Annual
Attenuator(10 dB)	8493C-10	Agilent	08285	02/03/2022	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

12. Annex A TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2112-FC017-P