

FCC WPT REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: December 14, 2021
Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Test Site/Location: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon- si, Gyeonggi-do, 17383 KOREA
	Report No.: HCT-RF-2112-FC008-R1

FCC ID:	A3LSMX700
APPLICANT:	SAMSUNG Electronics Co., Ltd.
According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMX706B report.	

Model:	SM-X700
EUT Type:	Tablet
Frequency of Operation & Max. Transmit Power:	530 kHz(S-pen Charging) : 13.12 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-FC008-R1

REVIEWED BY



Report prepared by : Sang Hoon Lee
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)

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2112-FC008	December 01, 2021	- First Approval Report
HCT-RF-2112-FC008-R1	December 14, 2021	- Page.1, 5, 16 : Test distance revised - Page.6 : delete rule part 15.247 - Page.9 : Revised the note (Num.1) - Page.16 : Test result revised - Page. 20 : Test result plot added.

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1. EUT DESCRIPTION

Model	SM-X700
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	13.12 dB μ V/m @30 m (S-pen Charging)
Date(s) of Tests	October 28, 2021 ~ December 03, 2021
Serial number	Radiated: R32R8005JJT

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 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: Only S-pen , we tested attached S-pen.
2. Client device:

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

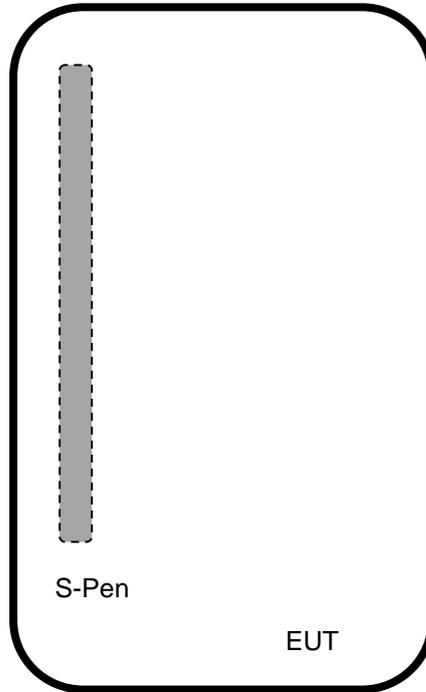
3. All position of loop antenna were investigated and the worst position results are reported.
 - Position : Horizontal, Vertical, Parallel to the ground plane
 - Worst Position : Horizontal
4. The EUT was tested in three orthogonal axis(X, Y, Z) and the worst position results are reported.
 - Axis : 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(FCC)

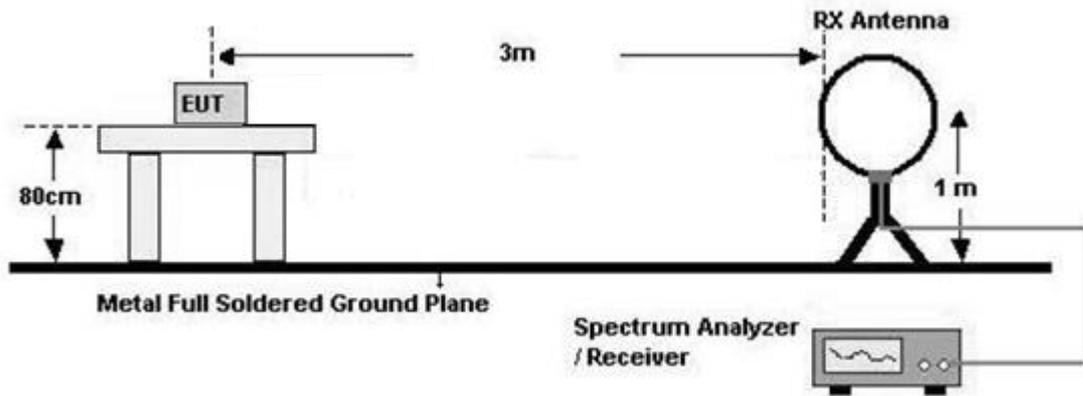
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Rule Part	Frequency (MHz)	Limit
Part 15.209	0.009 ~ 0.490	2400/F(kHz) 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

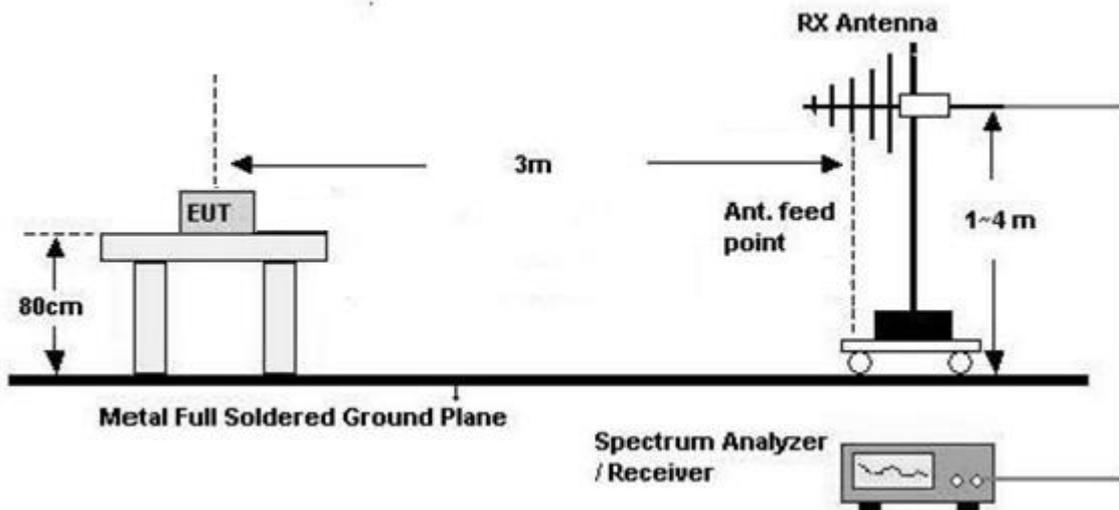
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, 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 level(dB μ V/m@30 m)
= Measured level(dB μ V/m@3 m) + 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 – 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]	Reading Level [dB μ V/m] @3 m	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Level [dB μ V/m] @300 m	Limit [dB μ V/m]	Margin [dB]
9.59	16.84	18.96	0.69	-80.00	-43.51	47.97	91.48
115.09	5.16	19.29	0.69	-80.00	-54.86	26.38	81.24
Frequency [kHz]	Reading Level [dB μ V/m] @3 m	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Level [dB μ V/m] @30 m	Limit [dB μ V/m]	Margin [dB]
#531.5	33.23	19.20	0.69	-40.00	13.12	33.09	19.97
1636.9	27.02	19.26	0.69	-40.00	6.97	23.32	16.35
3254	12.80	19.41	0.69	-40.00	-7.10	29.54	36.64

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]	Reading Level [dB μ V/m] @3 m	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Level [dB μ V/m] @300 m	Limit [dB μ V/m]	Margin [dB]
9.33	14.04	18.93	0.69	-80.00	-46.34	48.21	94.54
111.252	6.03	19.29	0.69	-80.00	-53.99	26.68	80.66
Frequency [kHz]	Reading Level [dB μ V/m] @3 m	Ant. Factor [dB/m]	Cable Loss [dB]	Distance Correction [dB]	Result Level [dB μ V/m] @30 m	Limit [dB μ V/m]	Margin [dB]
**531.5	33.03	19.20	0.69	-40.00	12.92	33.09	20.17
1603.9	23.83	19.26	0.69	-40.00	3.78	27.45	23.67
3410	12.08	19.42	0.69	-40.00	-7.81	29.54	37.35

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

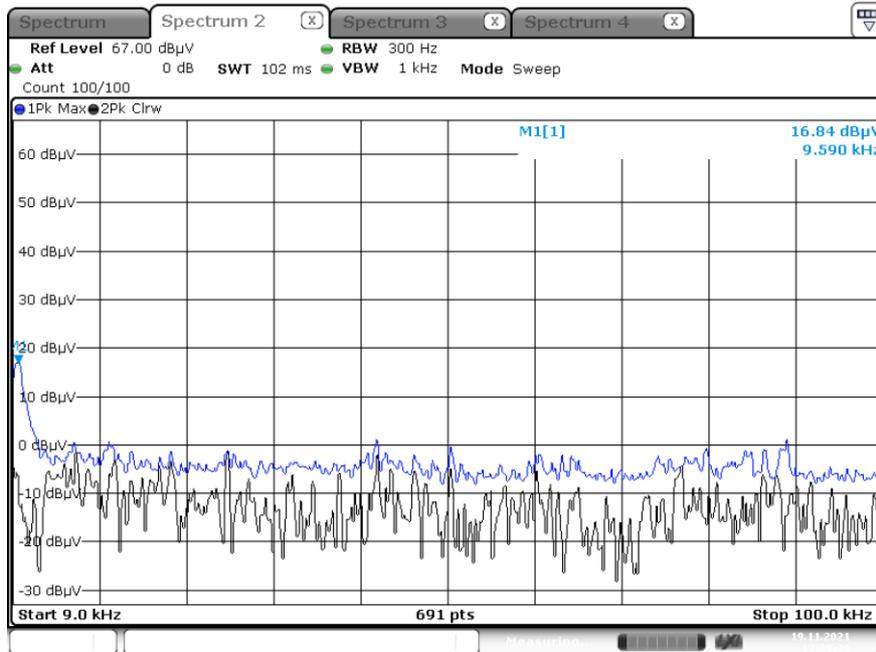
Test Plot

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

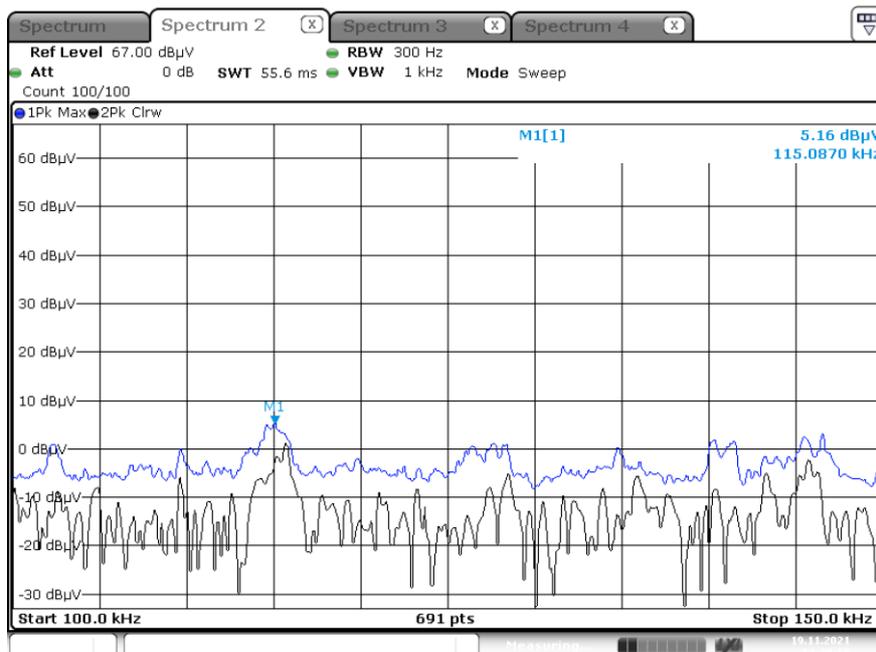
Worst case

- EUT Mode: Charging from EUT to S-pen
- Position: Aligned

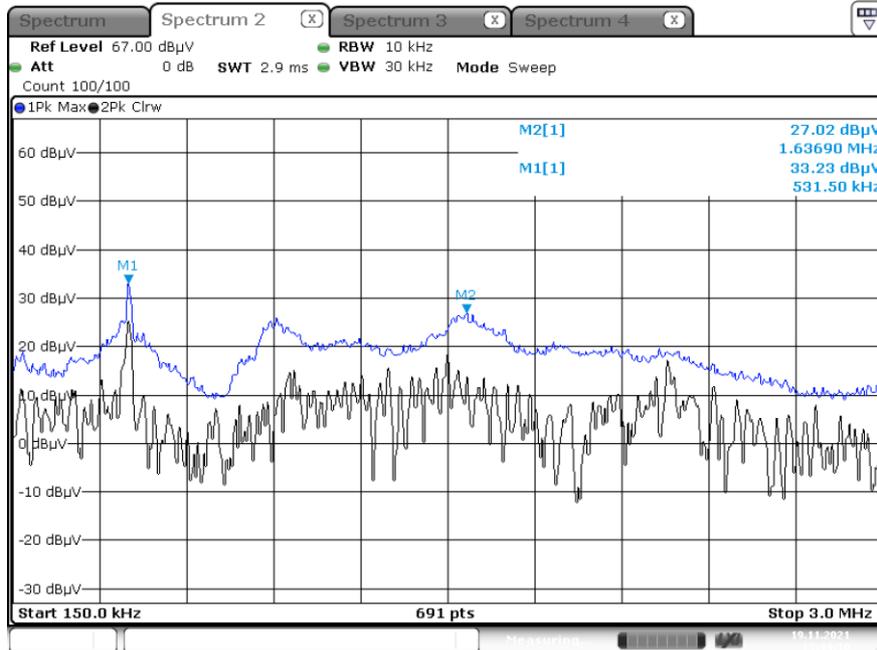
Frequency Range : 9 kHz – 100 kHz



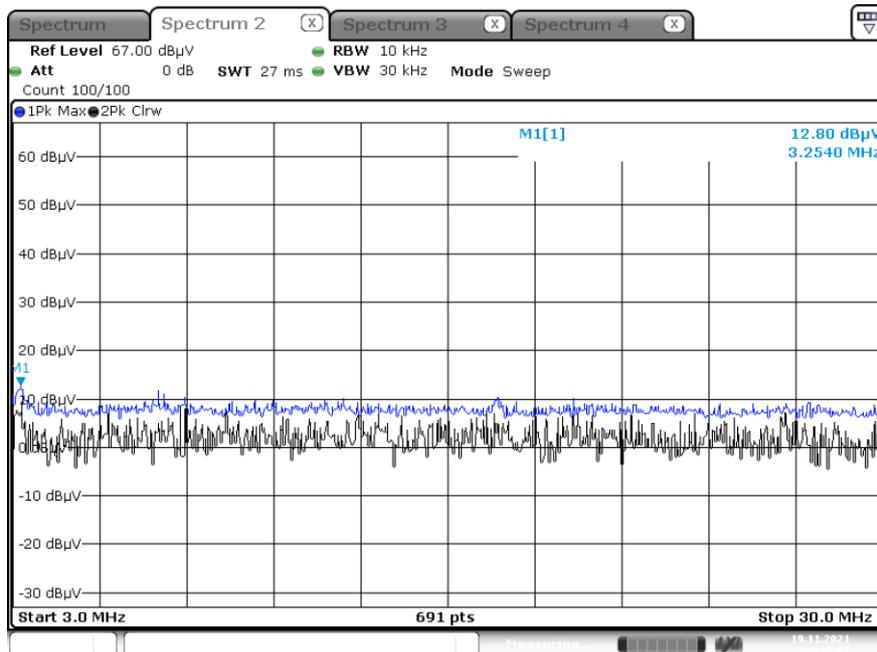
Frequency Range : 100 kHz – 150 kHz



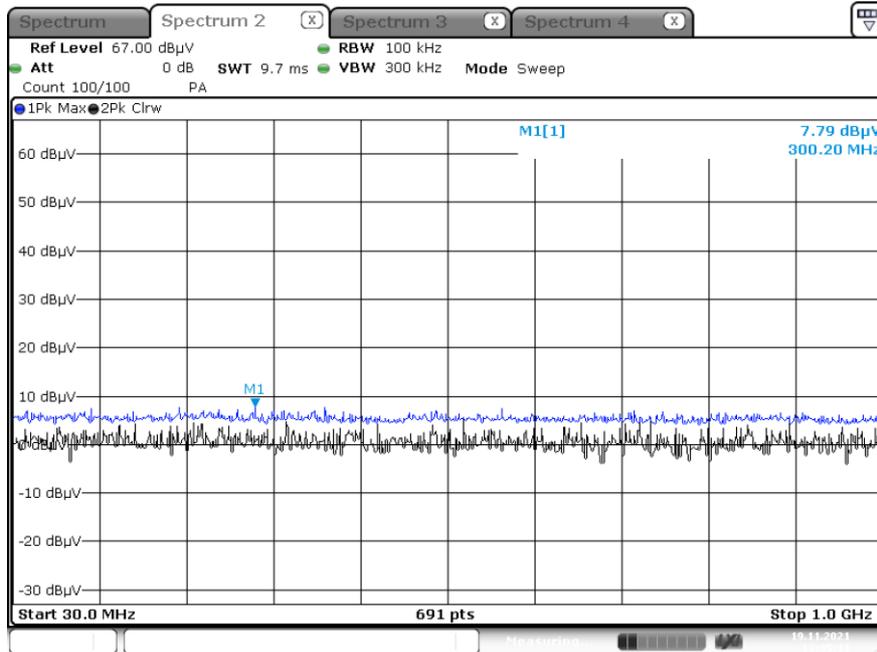
Frequency Range : 150 kHz – 3 MHz



Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz



Note :

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

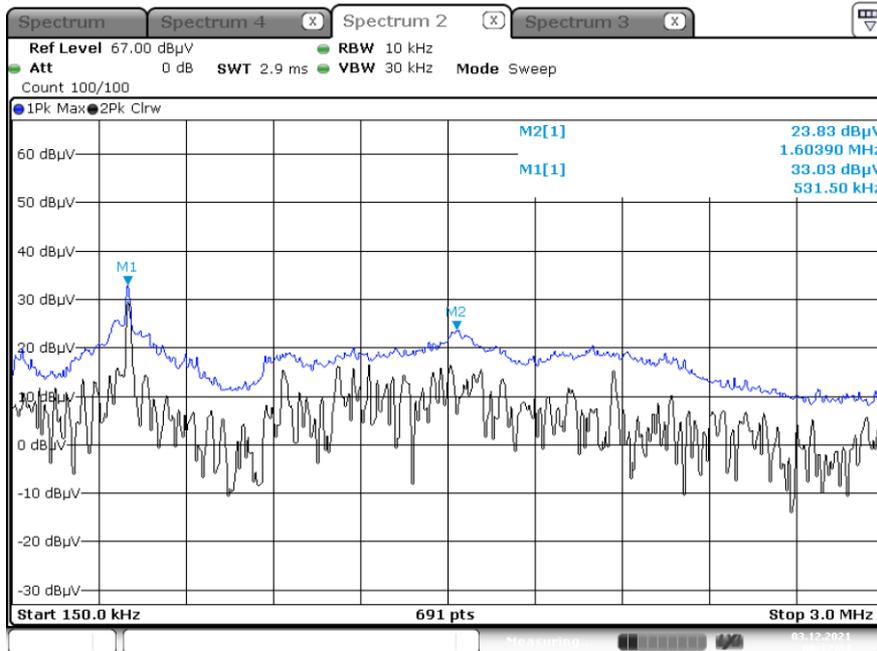
Test Plot

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

Worst case

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

Frequency Range : 150 kHz – 3 MHz



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 (Position: Aligned)
Conducted Emissions (Line 1)

S-PEN CHARGING MODE_L1

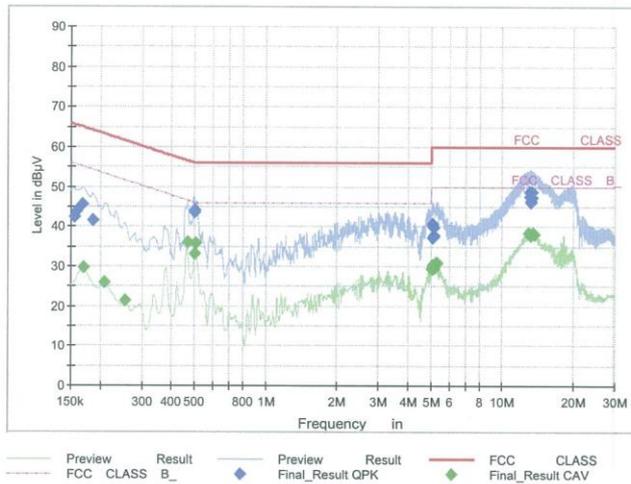
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Test Report

Common Information

EUT : SM-X706B
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : S-PEN CHARGING MODE_L1

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	42.49	65.75	23.26	9.000	L1	OFF	9.6
0.1590	43.85	65.52	21.67	9.000	L1	OFF	9.6
0.1680	45.47	65.06	19.59	9.000	L1	OFF	9.6
0.1860	41.42	64.21	22.79	9.000	L1	OFF	9.6
0.4988	43.43	56.02	12.60	9.000	L1	OFF	9.6
0.5000	44.02	56.00	11.98	9.000	L1	OFF	9.7
5.0720	40.65	60.00	19.35	9.000	L1	OFF	9.9
5.0810	40.35	60.00	19.65	9.000	L1	OFF	9.9
5.0945	37.31	60.00	22.69	9.000	L1	OFF	9.9
5.1283	39.84	60.00	20.16	9.000	L1	OFF	9.9
5.1350	37.55	60.00	22.45	9.000	L1	OFF	9.9
5.1418	37.77	60.00	22.23	9.000	L1	OFF	9.9
12.9943	47.48	60.00	12.52	9.000	L1	OFF	10.2
13.1000	48.71	60.00	11.29	9.000	L1	OFF	10.2
13.1923	46.47	60.00	13.53	9.000	L1	OFF	10.2
13.2260	46.09	60.00	13.91	9.000	L1	OFF	10.2
13.2755	47.25	60.00	12.75	9.000	L1	OFF	10.2
13.3340	48.80	60.00	11.20	9.000	L1	OFF	10.2

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S-PEN CHARGING MODE_L1

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1703	29.68	54.95	25.27	9.000	L1	OFF	9.6
0.2085	25.95	53.27	27.32	9.000	L1	OFF	9.6
0.2535	21.44	51.64	30.20	9.000	L1	OFF	9.6
0.4650	36.03	46.60	10.57	9.000	L1	OFF	9.6
0.5000	33.12	46.00	12.88	9.000	L1	OFF	9.7
0.5068	35.83	46.00	10.17	9.000	L1	OFF	9.7
5.0270	29.53	50.00	20.47	9.000	L1	OFF	9.9
5.0765	30.17	50.00	19.83	9.000	L1	OFF	9.9
5.1395	29.51	50.00	20.49	9.000	L1	OFF	9.9
5.2183	30.57	50.00	19.43	9.000	L1	OFF	9.9
5.2655	30.77	50.00	19.23	9.000	L1	OFF	9.9
5.3150	30.81	50.00	19.19	9.000	L1	OFF	9.9
12.8660	38.39	50.00	11.61	9.000	L1	OFF	10.2
12.9110	38.31	50.00	11.69	9.000	L1	OFF	10.2
13.2305	37.93	50.00	12.07	9.000	L1	OFF	10.2
13.2733	37.94	50.00	12.06	9.000	L1	OFF	10.2
13.4240	38.34	50.00	11.66	9.000	L1	OFF	10.2
13.6130	38.14	50.00	11.86	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

S-PEN CHARGING MODE_N

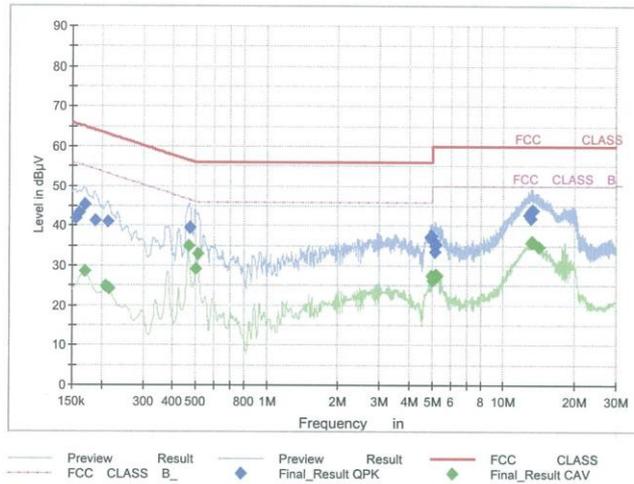
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Test Report

Common Information

EUT : SM-X706B
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : S-PEN CHARGING MODE_N

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	41.80	65.75	23.95	9.000	N	OFF	9.6
0.1613	43.37	65.40	22.03	9.000	N	OFF	9.6
0.1703	45.43	64.95	19.52	9.000	N	OFF	9.6
0.1883	41.16	64.11	22.96	9.000	N	OFF	9.6
0.2130	40.96	63.09	22.13	9.000	N	OFF	9.6
0.4740	39.46	56.44	16.99	9.000	N	OFF	9.6
4.9123	37.16	56.00	18.84	9.000	N	OFF	9.9
4.9595	37.56	56.00	18.44	9.000	N	OFF	9.9
5.0068	36.40	60.00	23.60	9.000	N	OFF	9.9
5.1238	35.04	60.00	24.96	9.000	N	OFF	9.9
5.1463	33.49	60.00	26.51	9.000	N	OFF	9.9
5.1688	35.08	60.00	24.92	9.000	N	OFF	9.9
12.7513	42.81	60.00	17.19	9.000	N	OFF	10.2
13.0325	41.86	60.00	18.14	9.000	N	OFF	10.2
13.0550	43.32	60.00	16.68	9.000	N	OFF	10.2
13.1000	43.45	60.00	16.55	9.000	N	OFF	10.2
13.2688	43.91	60.00	16.09	9.000	N	OFF	10.2
13.3138	43.93	60.00	16.07	9.000	N	OFF	10.2

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S-PEN CHARGING MODE_N

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1703	28.59	54.95	26.36	9.000	N	OFF	9.6
0.2085	24.94	53.27	28.32	9.000	N	OFF	9.6
0.2153	24.30	53.00	28.70	9.000	N	OFF	9.6
0.4673	34.85	46.56	11.72	9.000	N	OFF	9.6
0.5000	29.28	46.00	16.72	9.000	N	OFF	9.6
0.5090	32.97	46.00	13.03	9.000	N	OFF	9.6
4.9595	27.41	46.00	18.59	9.000	N	OFF	9.9
5.0000	26.28	46.00	19.72	9.000	N	OFF	9.9
5.1238	27.37	50.00	22.63	9.000	N	OFF	9.9
5.1598	27.53	50.00	22.47	9.000	N	OFF	9.9
5.2025	27.62	50.00	22.38	9.000	N	OFF	9.9
5.2588	27.30	50.00	22.70	9.000	N	OFF	9.9
13.0528	35.75	50.00	14.25	9.000	N	OFF	10.2
13.1765	35.95	50.00	14.05	9.000	N	OFF	10.2
13.2193	35.82	50.00	14.18	9.000	N	OFF	10.2
13.2710	35.78	50.00	14.22	9.000	N	OFF	10.2
13.3160	35.72	50.00	14.28	9.000	N	OFF	10.2
14.1193	34.55	50.00	15.45	9.000	N	OFF	10.2

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11. LIST OF TEST EQUIPMENT

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
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	1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	09/04/2022	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/14/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49432108	03/09/2022	Annual
ATT(10dB) + LNA1(1~18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual
ATT(3dB) + LNA1(1~18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual
LNA1(1~18GHz)	FMSR -05B	TNM system	25540	01/20/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/04/2021	Annual

12. Annex A_TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2112-FC008-P