

EMI TEST REPORT

FCC CERTIFICATION

Applicant:

SAMSUNG Electronics Co., Ltd.
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Gyeonggi-do, 16677, Korea

Date of Issue: February 03, 2022

Test Report No. HCT-EM-2201-FC019-R1

Test Site: HCT CO., LTD.

FCC ID :

A3LSMX808U

Rule Part(s) / Standard(s) : 47 CFR PART 15 Subpart B Class B
ANSI C63.4-2014

Product Name : Tablet

Model Name : SM-X808U

Date of Test : January 25, 2022 to January 26, 2022

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By



Geon-Hee Jeon
Test Engineer
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Reviewed



Gu-Cheol Yoon
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REVISION HISTORY

The revision history for this document is shown in table.

Rev No.	Issue Date	Information About Changes
0	January 27, 2022	Initial Release
1	February 03, 2022	Revised the Frequency Band in clause 1.1

The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS (Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA.

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr



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1. GENERAL INFORMATION

1.1 Description of EUT

Model Name	SM-X808U
Product Name	Tablet
Frequency Band	WCDMA B2/4/5, LTE B2/4/5/7/12/13/14/25/26/29(Rx)/30/41/46(Rx)/66/71 FR1 NR n2/5/25/30/41/66/71/77, FR2 NR n260/261, BT BDR/EDR/LE/LE Audio, 802.11b/g/n/ax WLAN, 802.11 a/n/ac/ax UNII (5 GHz and 6 GHz), WPT
Power Supply	Travel adaptor: Input: AC 100 V to 240 V, 50 Hz to 60 Hz, 0.7 A Output: (PDO) 5.0 V, 3.0 A or 9.0 V, 2.77 A (PPS) 3.3 V to 5.9 V, 3.0 A or 3.3 V to 11.0 V, 2.25 A

1.2 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Serial Number	Manufacturer	FCC ID
Tablet	SM-X808U	-	SAMSUNG	A3LSMX808U
TA	EP-TA800	-	SOLUM	-
Data Cable	EP-DW767	-	RFTECH	-
Earphone	GHSS028-K7	-	BUJEON	-
S-Pen	EJ-PT870	-	WACOM	A3LEJPT870
Book Cover Keyboard	EF-DT970	-	SAMSUNG	-
Micro SD Card	-	-	SAMSUNG	-



1.3 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Data Cable (USB Type C)	Y	N/A	(P) 1.8
	Earphone (USB Type C)	N/A	N	(D) 1.3
	Pogo Pin	N/A	N/A	(D) -

"(D)" Data Cable and "(P)" Power Cable.

1.4 Noise Suppression Parts on Cable. (I/O Cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	Data Cable (USB Type C)	N	N/A	Y	Both End
	Earphone (USB Type C)	N	N/A	Y	EUT End
	Pogo Pin	N/A	N/A	N/A	N/A



1.5 Test Facility

Test site is located at 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2014. The Normalized site attenuations (30 MHz to 1 GHz) and Site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014 and ANSI C63.4a-2017.

Our laboratories are accredited and designated in accordance with the provisions of Radio Waves ACT and International Standard ISO/IEC 17025:2017. (National Radio Research Agency, Designation No. KR0032)

1.6 Calibration of Measuring Instrument

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

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

1.7 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.

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.

Test Item	Test Site (Chamber)	Expanded Uncertainty
Radiated Emission (30 MHz to 1 GHz)	3 m Semi Anechoic Chamber #1	5.8 dB
Radiated Emission (1 GHz to 18 GHz)	3 m Semi Anechoic Chamber #1	4.8 dB
Radiated Emission (18 GHz to 40 GHz)	3 m Semi Anechoic Chamber #1	5.8 dB



2. LIST OF TEST EQUIPMENT

<u>Type</u>	<u>Model Name</u>	<u>Manufacturer</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>Calibration Date</u>
<u>Conducted Emission</u>					
☐ EMI Test Receiver	ESR7	Rohde & Schwarz	101910	1 year	06.17.2021
☐ LISN	ENV216	Rohde & Schwarz	102245	1 year	08.23.2021
☐ LISN	ENV216	Rohde & Schwarz	100073	1 year	04.07.2021
☐ Radio communication analyzer	MT8821C	ANRITSU	6262192376	1 year	10.19.2021
☐ Antenna (for Communication)	HyperLOG7060	Aaronia	66450	-	-
☐ Antenna (for Communication)	HyperLOG7060	Aaronia	66451	-	-
☐ Software	EMC32	Rohde & Schwarz	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
☒ EMI Test Receiver	ESU40	Rohde & Schwarz	100524	1 year	05.10.2021
☒ Bi-Log Antenna	VULB9168	Schwarzbeck	255	2 year	03.15.2021
☒ Antenna master	MA4640-XP-ET	INNCO SYSTEM	-	N/A	-
☒ Antenna master controller	CO3000	INNCO SYSTEM	CO3000/870/ 35990515/L	N/A	-
☒ Turn Table	1060	INNCO SYSTEM	-	N/A	-
☒ Turn Table controller	CO2000	INNCO SYSTEM	CO2000/095/ 7590304/L	N/A	-
☒ Radio communication analyzer	MT8820C	ANRITSU	6201138643	1 year	10.07.2021
☐ UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	Rohde & Schwarz	107488	1 year	08.31.2021
☐ Radio communication analyzer	MT8821C	ANRITSU	6262192376	1 year	10.19.2021
☒ Antenna (for Communication)	HyperLOG7060	Aaronia	66450	-	-
☐ Radio communication analyzer	MT8000A	ANRITSU	6262208294	1 year	12.22.2021
☐ Antenna (for Communication)	HyperLOG7060	Aaronia	66451	-	-
☒ Software	EMC32	Rohde & Schwarz	-	-	-
-For measurement above 1 GHz					
☒ EMI Test Receiver	ESU40	Rohde & Schwarz	100524	1 year	05.10.2021
☒ Antenna master	MA4640-XP-ET	INNCO SYSTEM	-	N/A	-
☒ Antenna master controller	CO3000	INNCO SYSTEM	CO3000/870/ 35990515/L	N/A	-
☒ Turn Table	1060	INNCO SYSTEM	-	N/A	-
☒ Turn Table controller	CO2000	INNCO SYSTEM	CO2000/095/ 7590304/L	N/A	-
☒ Low Noise Amplifier	TK-PA18H	TESTEK	170034-L	1 year	03.02.2021
☒ Low Noise Amplifier	TK-PA1840H	TESTEK	170030-L	1 year	03.09.2021
☒ Horn Antenna	BBHA 9120D	Schwarzbeck	01836	1 year	07.20.2021
☒ Horn Antenna	BBHA 9170	Schwarzbeck	BBHA 9170 #786	1 year	11.16.2021
☒ Radio communication analyzer	MT8820C	ANRITSU	6201138643	1 year	10.07.2021
☐ Radio communication analyzer	MT8821C	ANRITSU	6262192376	1 year	10.19.2021
☒ Antenna (for Communication)	HyperLOG7060	Aaronia	66450	-	-
☐ Radio communication analyzer	MT8000A	ANRITSU	6262208294	1 year	12.22.2021
☐ Antenna (for Communication)	HyperLOG7060	Aaronia	66451	-	-
☒ Software	EMC32	Rohde & Schwarz	-	-	-



3. DESCRIPTION OF TEST

3.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 7.3

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN).
If the EUT is connected to the PC through USB, the AC power-line adapter of the PC is directly connected to a line impedance stabilization network (LISN).
Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
- c. The frequency ranges from 150 kHz to 30 MHz was searched.

[Conducted Emission Limits]

Frequency (MHz)	Resolution Bandwidth (kHz)	Quasi-Peak (dB(μ V))	Average (dB(μ V))
0.15 to 0.5	9	66 to 56*	56 to 46*
0.5 to 5	9	56	46
5 to 30	9	60	50

**Decreases with the logarithm of the frequency.*



3.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 8.3

- The EUT was placed on the top of a turn table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from 1 m to 4 m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. (1 GHz to 40 GHz)

[Radiated Emission Limits]

Frequency (MHz)	Antenna Distance (m)	Field Strength ($\mu V/m$)	Quasi-Peak (dB $\mu V/m$)
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0

Frequency (MHz)	Antenna Distance (m)	Peak (dB $\mu V/m$)	Average (dB $\mu V/m$)
Above 1 000	3	74	54

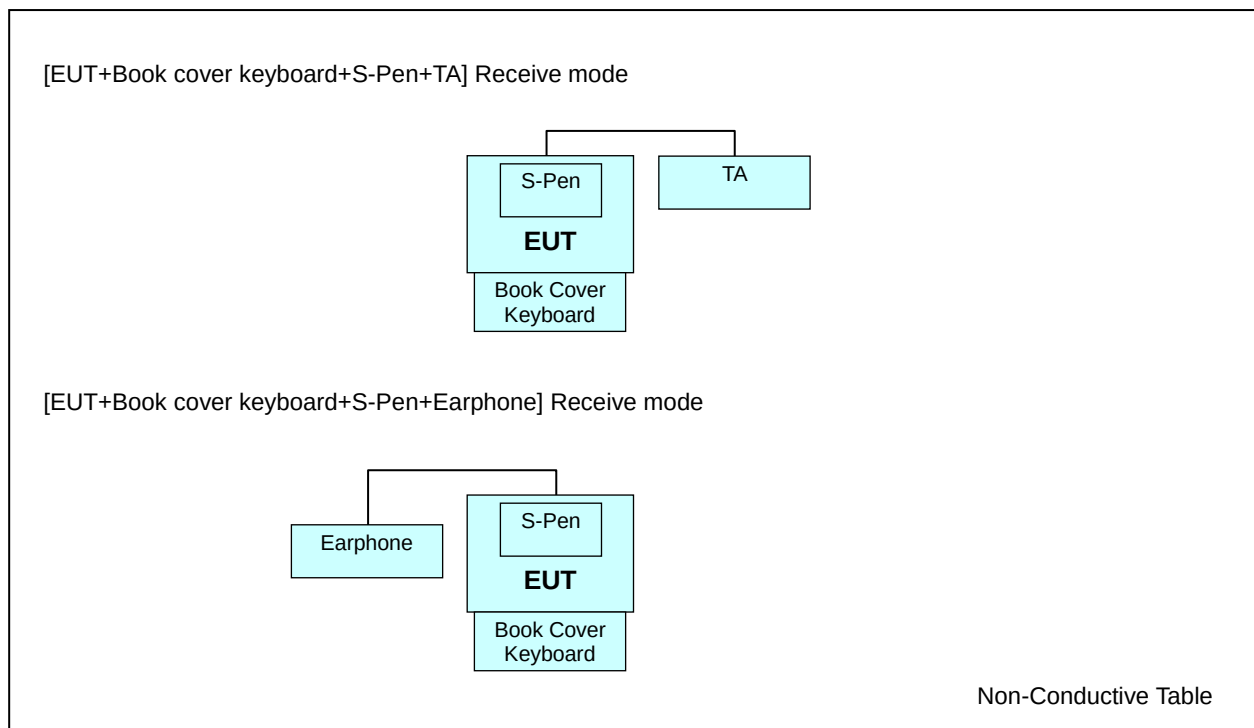


3.2.1 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

3.3 Configuration of Tested System





4. OPERATION OF THE EUT

During preliminary tests, the following operating mode was investigated.

Receiver mode(LTE B14_Low/Middle/High ch)
Earphone mode

NOTE. The worst band is tested.

4.1 Conducted Emission (Not Applicable)

It was final tested the following operating mode, after connecting all peripheral devices.

Operating Mode: Not applicable

4.2 Radiated Emission

It was final tested the following operating mode, after connecting all peripheral devices.

Operating Mode:

Radiated Emission below 1 GHz

[EUT+Book cover keyboard+S-Pen+TA]	LTE B14 Low ch Idle
	LTE B14 Middle ch Idle*
	LTE B14 High ch Idle
[EUT+Book cover keyboard+S-Pen+Earphone]	LTE B14 Low ch Idle
	LTE B14 Middle ch Idle*
	LTE B14 High ch Idle

Radiated Emission above 1 GHz

[EUT+Book cover keyboard+S-Pen+TA]	LTE B14 Middle ch Idle*
[EUT+Book cover keyboard+S-Pen+Earphone]	LTE B14 Middle ch Idle*

NOTE.

1. Three orientations have been investigated and the worst case orientation (x-axis: The display of EUT placed on the table is facing upwards) is reported.
2. The worst case of operating mode is reported. [*].



5. EMI TEST SUMMARY

5.1 Conducted Emission (Not Applicable)

5.1.1 Test Condition

The test results of conducted emission at mains ports provide the following information:

Used Test Standard	47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Frequency Range	150 kHz to 30 MHz
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operating Mode	-
Test Site	EMI Shield Room
Temperature	min. - °C, max. - °C
Humidity	min. - % R.H., max. - % R.H.
Test Date	-

Calculation Formula:

1. Conductor L1 = Hot, Conductor N = Neutral
2. Corr. = LISN Factor+Cable Loss
3. QuasiPeak or CAverage= Receiver Reading+Corr.
4. Margin = Limit – QuasiPeak or CAverage

5.1.2 Measuring Data

Not applicable



5.2 Radiated Emission Below 1 GHz

5.2.1 Test Condition

The test results of radiated emission provide the following information:

Used Test Standard	47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Frequency Range	30 MHz to 1 000 MHz
Detector / Bandwidth	Quasi-Peak / Bandwidth: 120 kHz (6 dB)
Measurement Distance	3 m
Worst Case of Operating Mode	[EUT+Book cover keyboard+S-Pen+TA] LTE B14 Middle ch Idle [EUT+Book cover keyboard+S-Pen+Earphone] LTE B14 Middle ch Idle
Test Site	3 m Semi Anechoic Chamber #1
Temperature	min. 19.5 °C, max. 21.6 °C
Humidity	min. 24.1 % R.H., max. 28.9 % R.H.
Test Date	January 25 / January 26, 2022

Calculation Formula:

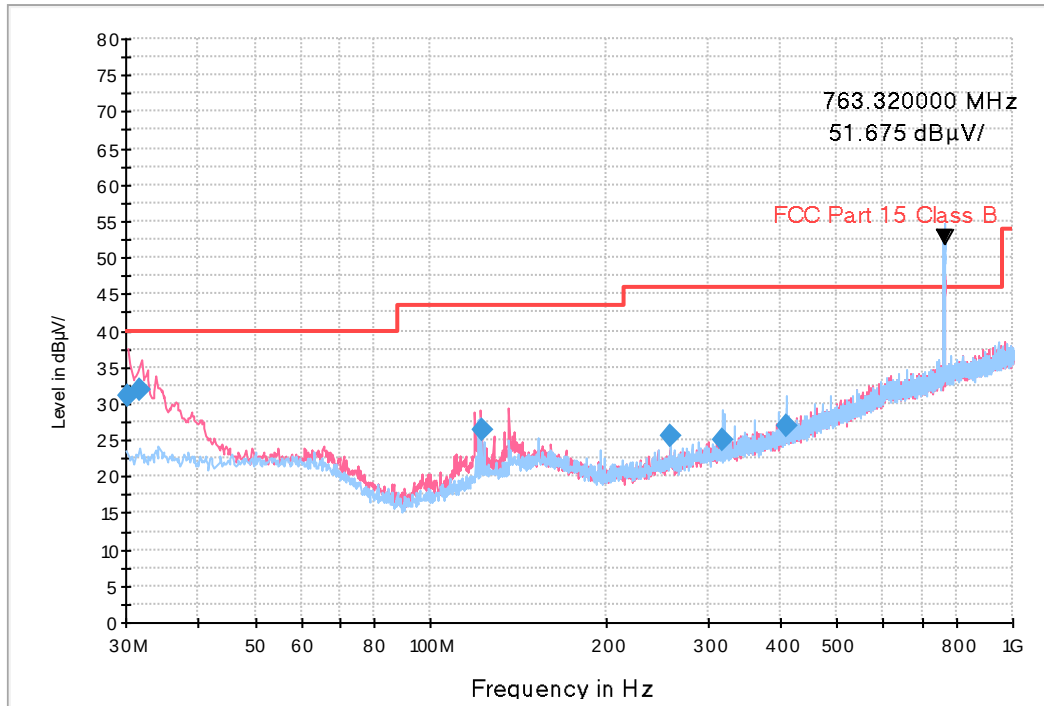
1. POL. H = Horizontal, POL. V = Vertical
2. QuasiPeak = Reading (Receiver Reading)+Corr.
3. Corr. (Correction Factor) = Antenna Factor+Cable Loss
4. Margin = Limit - QuasiPeak



5.2.2 Measuring Data

Figure 1: [EUT+Book cover keyboard+S-Pen+TA] LTE B14 Middle ch Idle

FCC PART 15 CLASS B



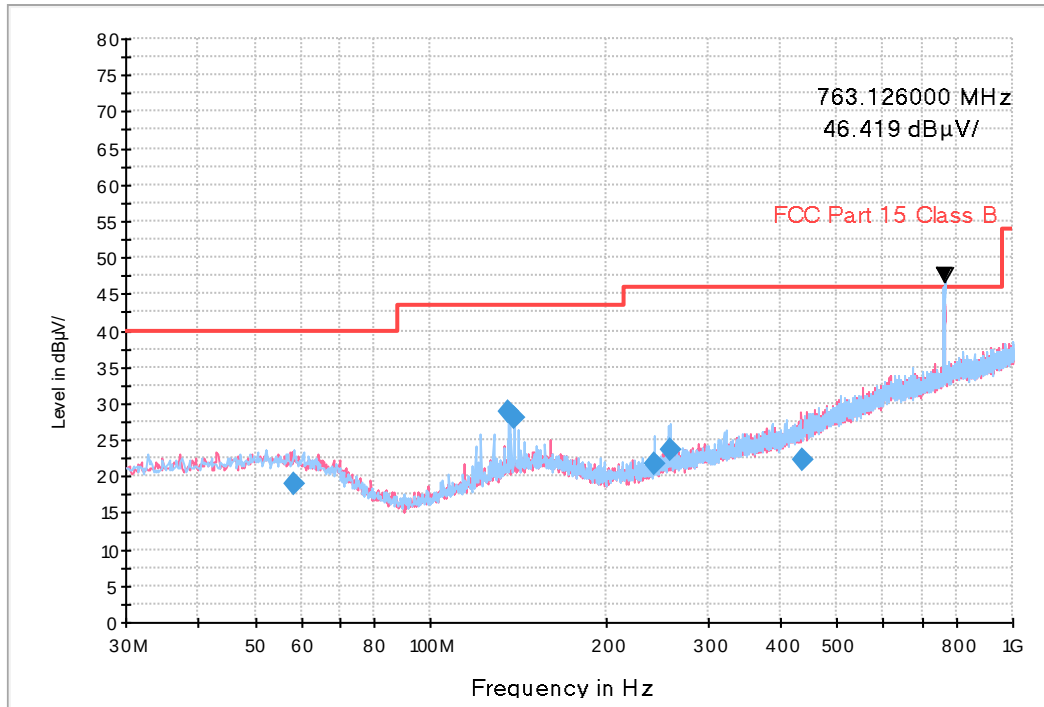
NOTE. 1. Carrier Frequency: RX 763.320 MHz
2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.2549	31.1	100.0	V	179.0	18.5	8.9	40.0
31.7439	32.0	100.0	V	201.0	18.6	8.0	40.0
122.3430	26.5	275.0	H	45.0	17.3	17.0	43.5
258.7632	25.5	116.8	H	265.0	19.0	20.5	46.0
318.2635	25.0	100.0	H	25.0	20.9	21.0	46.0
409.9624	27.0	100.0	H	0.0	23.1	19.0	46.0



Figure 2: [EUT+Book cover keyboard+S-Pen+Earphone] LTE B14 Middle ch Idle

FCC PART 15 CLASS B



NOTE. 1. Carrier Frequency: RX 763.126 MHz
2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
58.2961	19.0	291.8	H	166.0	19.7	21.0	40.0
136.4582	29.0	225.1	H	329.0	18.8	14.5	43.5
139.4986	28.0	174.8	H	120.0	19.1	15.5	43.5
241.7134	21.8	100.0	H	311.0	18.4	24.2	46.0
258.6822	23.5	100.0	H	301.0	19.0	22.5	46.0
433.8544	22.2	291.8	V	275.0	23.7	23.8	46.0



5.3 Radiated Emission Above 1 GHz

5.3.1 Test Condition

The test results of radiated emission provide the following information:

Used Test Standard	47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Detector / Bandwidth	Peak / Bandwidth: 1 MHz CISPR-Average / Bandwidth: 1 MHz
Highest Frequency	40 GHz
Tested Frequency Range	1 GHz to 40 GHz
Measurement Distance	3 m
Test Site	3 m Semi Anechoic Chamber #1
Temperature	min. 19.5 °C, max. 21.6 °C
Humidity	min. 24.1 % R.H., max. 28.8 % R.H.
Test Date	January 26, 2022

Calculation Formula:

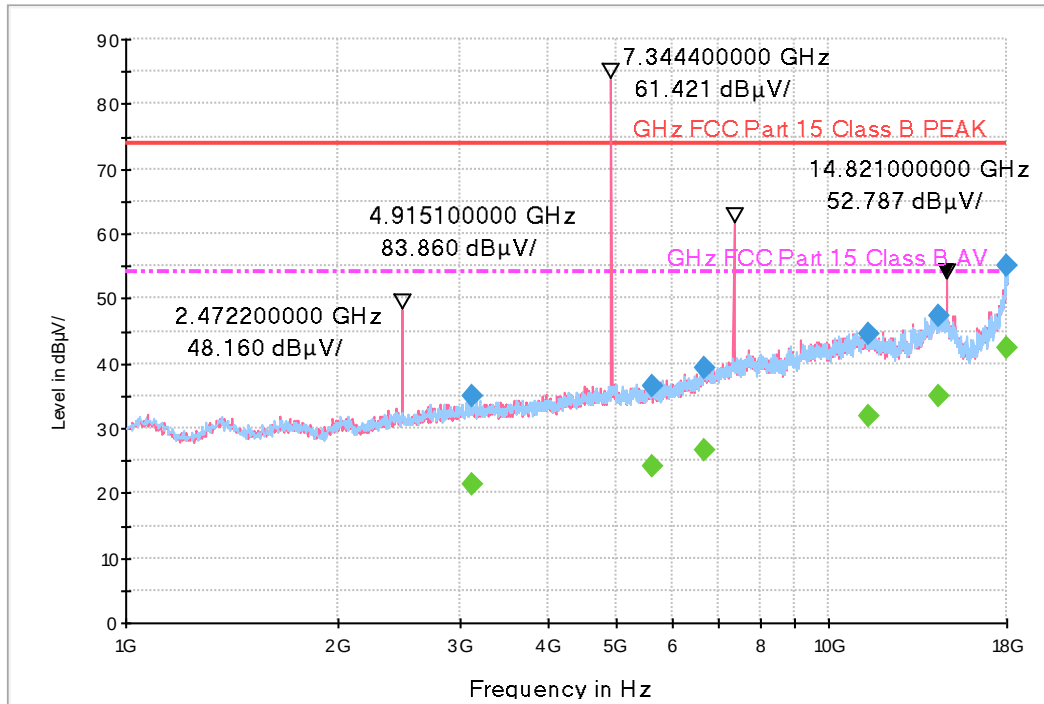
1. POL. H = Horizontal, POL. V = Vertical
2. Peak or CAverage = Reading (Receiver Reading)+Corr.
3. Corr. (Correction Factor) = Antenna Factor+ Cable Loss –Amplifier Gain
4. Margin = Limit - Peak or CAverage



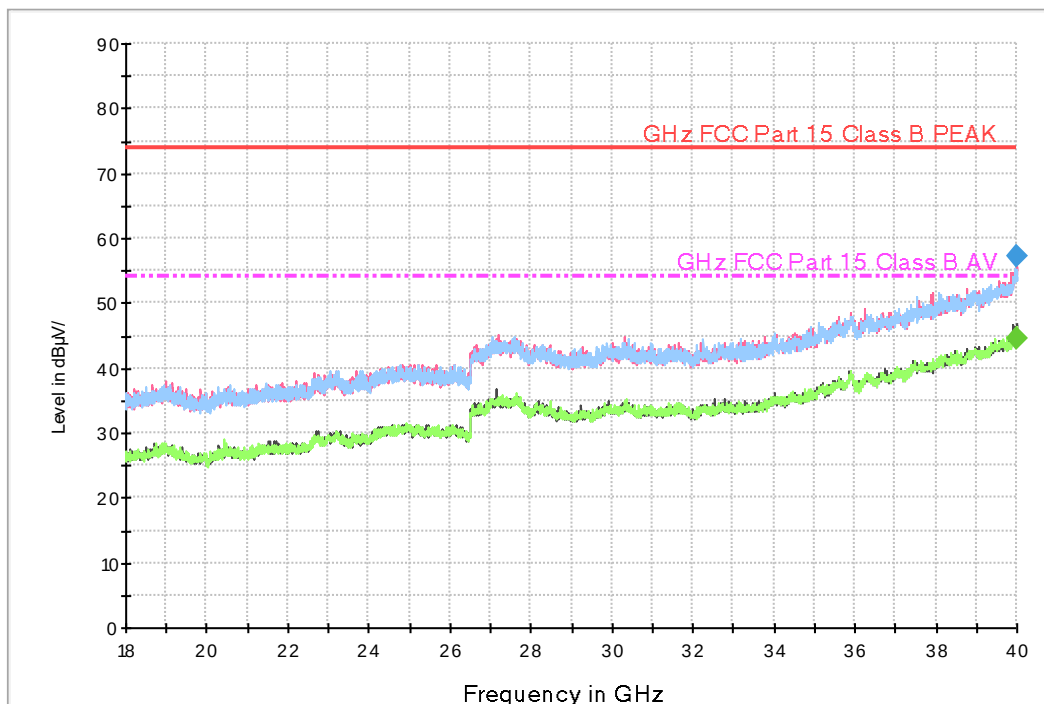
5.3.2 Measuring Data

Figure 3: [EUT+Book cover keyboard+S-Pen+TA] LTE B14 Middle ch Idle

Tilting of GHz FCC PART 15 CLASS B



NOTE: Carrier Frequency: 2.4722 GHz, 4.9151 GHz, 7.3444 GHz, 14.8210 GHz
(S-Pen Bluetooth fundamental and harmonic frequency.)





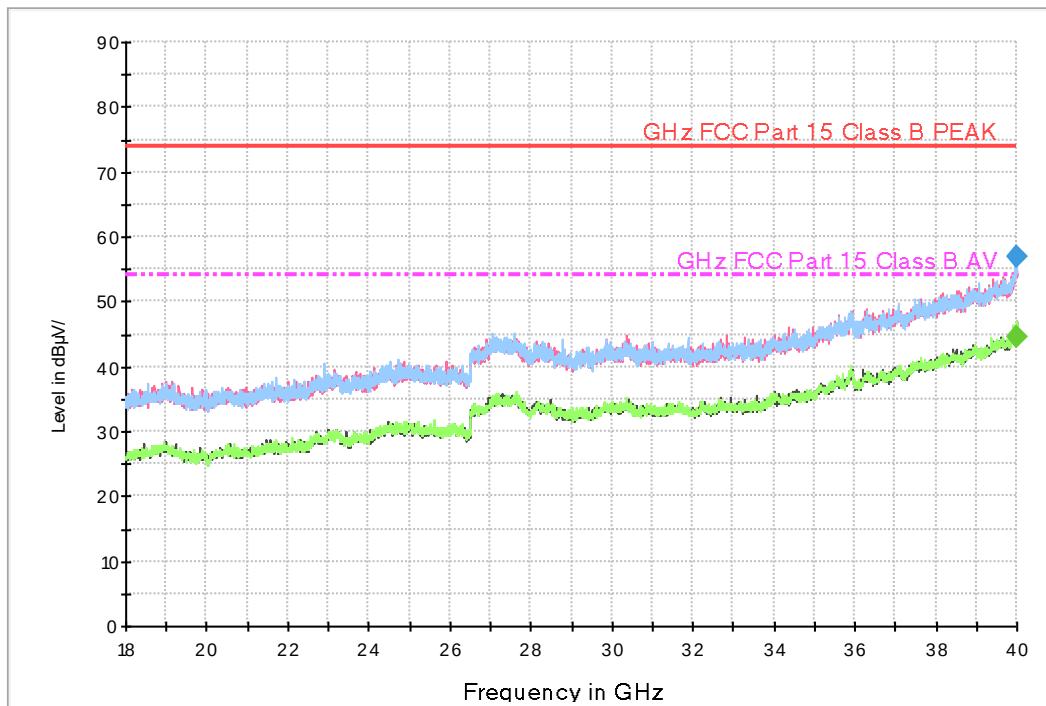
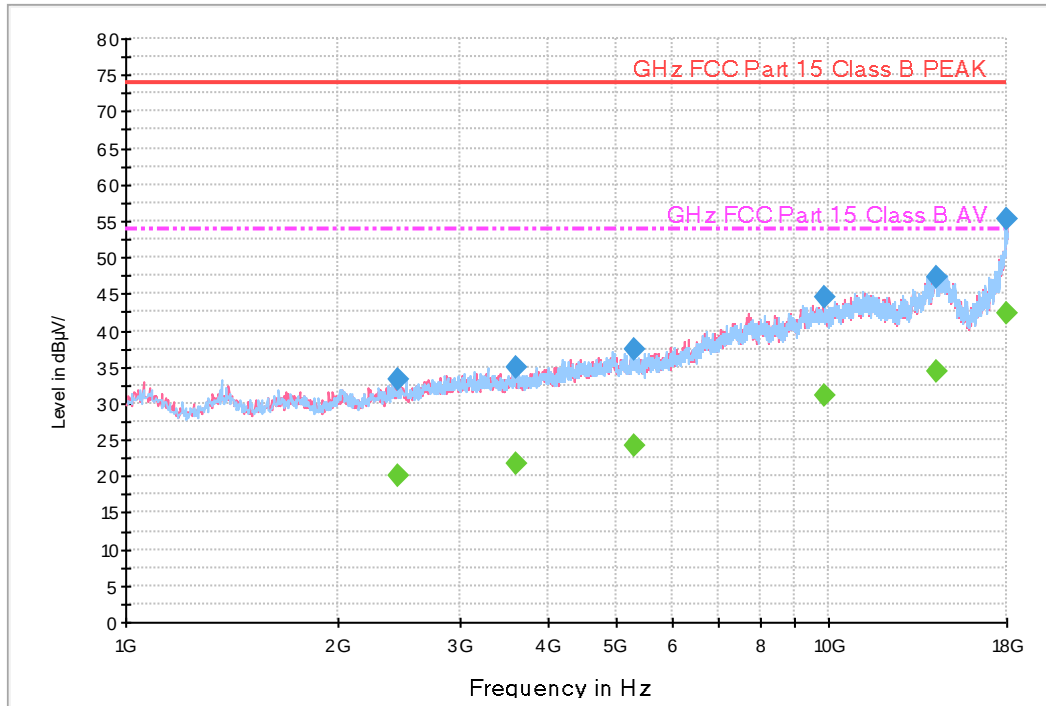
Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
3108.9350	35.0	128.6	H	127.0	-21.3	39.0	74.0
5642.3400	36.4	176.6	H	0.0	-15.7	37.6	74.0
6676.1850	39.2	350.0	V	296.0	-12.8	34.8	74.0
1 1415.4850	44.7	350.0	V	112.0	-3.8	29.3	74.0
1 4396.1000	47.3	337.5	H	181.0	0.3	26.7	74.0
1 7977.4509	55.2	150.0	H	279.0	9.2	18.8	74.0
3 9994.1259	57.4	150.0	V	0.0	19.3	16.6	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
3108.9350	21.4	128.6	H	127.0	-21.3	32.6	54.0
5642.3400	24.2	176.6	H	0.0	-15.7	29.8	54.0
6676.1850	26.5	350.0	V	296.0	-12.8	27.5	54.0
1 1415.4850	31.9	350.0	V	112.0	-3.8	22.1	54.0
1 4396.1000	34.9	337.5	H	181.0	0.3	19.1	54.0
1 7977.4509	42.4	150.0	H	279.0	9.2	11.6	54.0
3 9999.2656	44.5	100.0	V	342.0	19.4	9.5	54.0



Figure 4: [EUT+Book cover keyboard+S-Pen+Earphone] LTE B14 Middle ch Idle

Tilting of GHz FCC PART 15 CLASS B





Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2441.3900	33.2	249.5	V	116.0	-23.6	40.8	74.0
3592.2500	35.0	319.5	V	0.0	-20.3	39.0	74.0
5294.3900	37.3	150.0	H	303.0	-16.2	36.7	74.0
9908.8250	44.6	350.0	V	80.0	-7.6	29.4	74.0
1 4257.2000	47.2	305.4	H	122.0	0.0	26.8	74.0
1 7975.6710	55.2	299.4	V	196.0	9.2	18.8	74.0
3 9994.2800	56.9	100.0	H	114.0	19.3	17.1	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2441.3900	20.2	249.5	V	116.0	-23.6	33.8	54.0
3592.2500	21.7	319.5	V	0.0	-20.3	32.3	54.0
5294.3900	24.2	150.0	H	303.0	-16.2	29.8	54.0
9908.8250	31.2	350.0	V	80.0	-7.6	22.8	54.0
1 4257.2000	34.4	305.4	H	122.0	0.0	19.6	54.0
1 7975.6710	42.4	299.4	V	196.0	9.2	11.6	54.0
3 9994.9385	44.4	100.0	V	10.0	19.3	9.6	54.0



6. CONCLUSION

The data collected shows that the **Product Name: Tablet and Model Name: SM-X808U** complies §15.109 of the FCC rules.



7. APPENDIX A. TEST SETUP PHOTO

Please refer to EMI Test Setup Photo and test setup photo file no. as follows;

Rev. No.	Issue Date	File No.
0	January 27, 2022	HCT-EM-2201-FC019-P

End of report