

EMI TEST REPORT FCC CERTIFICATION

Applicant:

SAMSUNG Electronics Co., Ltd.
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Date of Issue: April 29, 2019

Test Report No. HCT-EM-1904-FC029

Test Site: HCT CO., LTD.

FCC ID :

A3LSMA6060

Applicable Standards : FCC CFR 47 PART 15 Subpart B Class B
ANSI C63.4-2014

EUT Type : Mobile Phone

Model Name : SM-A6060

Series Model Name : SM-M405F/DS

Date of Test : April 19, 2019 to April 28, 2019

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.

HCT certifies that no party to application has been denial the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By



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REVISION HISTORY

The revision history for this document is shown in table.

Report No.	Issue Date	Information About Changes
HCT-EM-1904-FC029	April 29, 2019	Initial Release



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1. GENERAL INFORMATION

1.1 Description of EUT

Its basic purpose is used for communications.

FCC ID	A3LSMA6060
Model name	SM-A6060
Series Model Name	SM-M405F/DS
EUT type	Mobile Phone
Frequency band	GSM 850/1900, WCDMA 850/1900, LTE B5/41, BT 5.0, WLAN a/b/g/n/ac, NFC, ANT+
Power supply	Travel adaptor: Input: AC 100 to 240 V, 50/60 Hz, 0.5 A Output: DC 9.0 V 1.67 A or DC 5.0 V 2.0 A Battery: Low : 3.6 V / Normal :3.85 V / High : 4.4 V, Li-ion Battery

1.2 Equipment Units Tested

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

Device Type	Model Name	Serial Number	Manufacturer	FCC ID / DoC
EUT	SM-A6060	-	SAMSUNG	A3LSMA6060
Notebook PC	ProBook6560b	5CB2053MXF	HP	-
Notebook PC adaptor	Series PPP009L-E	-	LITE-ON TECHNOLOGY (CHANGZHOU)	-
Gateway	TL-WR747N	-	TP Link	-
Gateway adaptor	T090060-2H1	-	TP Link	-
Serial mouse	Serial 2 Button mouse	02031069	Radio Shack	FSUGMZE3
RJ45 cable	-	-	-	-
TA	EP-TA200	-	DYREL	-
Data Cable	EP-DR140AWE	-	KSD	-
Earphone	GHSS028-W4	-	BUJOEN	-
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	USB Type C	Y	Y	(P,D) 1.0
	Earphone (Type C)	N/A	N	(D) 1.2
Notebook PC	RJ 45	N/A	N	(D) 1.6
	Serial(Mouse)	N/A	Y	(D) 1.8
	DC IN	N	N/A	(P) 1.8
Gateway	DC IN	N	N/A	(P) 1.8

* The marked “(D)” means the data cable and “(P)” means the 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	USB Type C	N	N/A	Y	Both End
	Earphone (Type C)	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial(Mouse)	N	N/A	Y	Notebook End



1.5. Test Facility

Test site is located at 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, SOUTH 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

Measurement Facilities	Registration Number
Radiated Field strength measurement facility 3 m Semi Anechoic chamber	KR0032
Radiated Field strength measurement facility 10 m Semi Anechoic chamber #1	
Radiated Field strength measurement facility 10 m Semi Anechoic chamber #2	

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 (Version : 2006).

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.

Parameter	Expanded Uncertainty (dB)
Conducted Emission (0.15 MHz to 30 MHz)	1.82 dB
Radiated Emissions (30 MHz to 1 GHz)	5.20 dB
Radiated Emissions (1 GHz to 18 GHz)	5.24 dB
Radiated Emissions (18 GHz to 40 GHz)	5.40 dB



2. LIST OF TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>CAL Date</u>
<u>Conducted Emission</u>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	06.27.2018
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	102245	1 year	12.12.2018
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	05.03.2018
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.54.0	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU40	100524	1 year	07.27.2018
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	10.31.2018
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB 9168	760	2 year	03.22.2019
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB 9168	255	2 year	03.26.2019
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO 3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-
-For measurement above 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU40	100524	1 year	07.27.2018
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	10.31.2018
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	01836	2 year	07.20.2018
<input checked="" type="checkbox"/> Low Noise Amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.04.2019
<input checked="" type="checkbox"/> Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.17.2018
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170#786	2 year	12.05.2017
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input type="checkbox"/> Highpass Filter	Wainwright Instruments	WHKX1.0/15G-12SS	42	1 year	08.02.2018
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-



3. DESCRIPTION OF MEASUREMENTS

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 range from 150 kHz to 30 MHz was searched.

[Conducted Emission Limits]

Frequency (MHz)	Resolution Bandwidth (kHz)	Quasi-Peak (dB(μV))	Average (dB(μV))
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

- a. 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.
- b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. 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.
- f. 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.
- g. 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 (µV/m)	Quasi-Peak (dB(µV)/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(µV)/m)	Average (dB(µV)/m)
Above 1 000	3	74	54

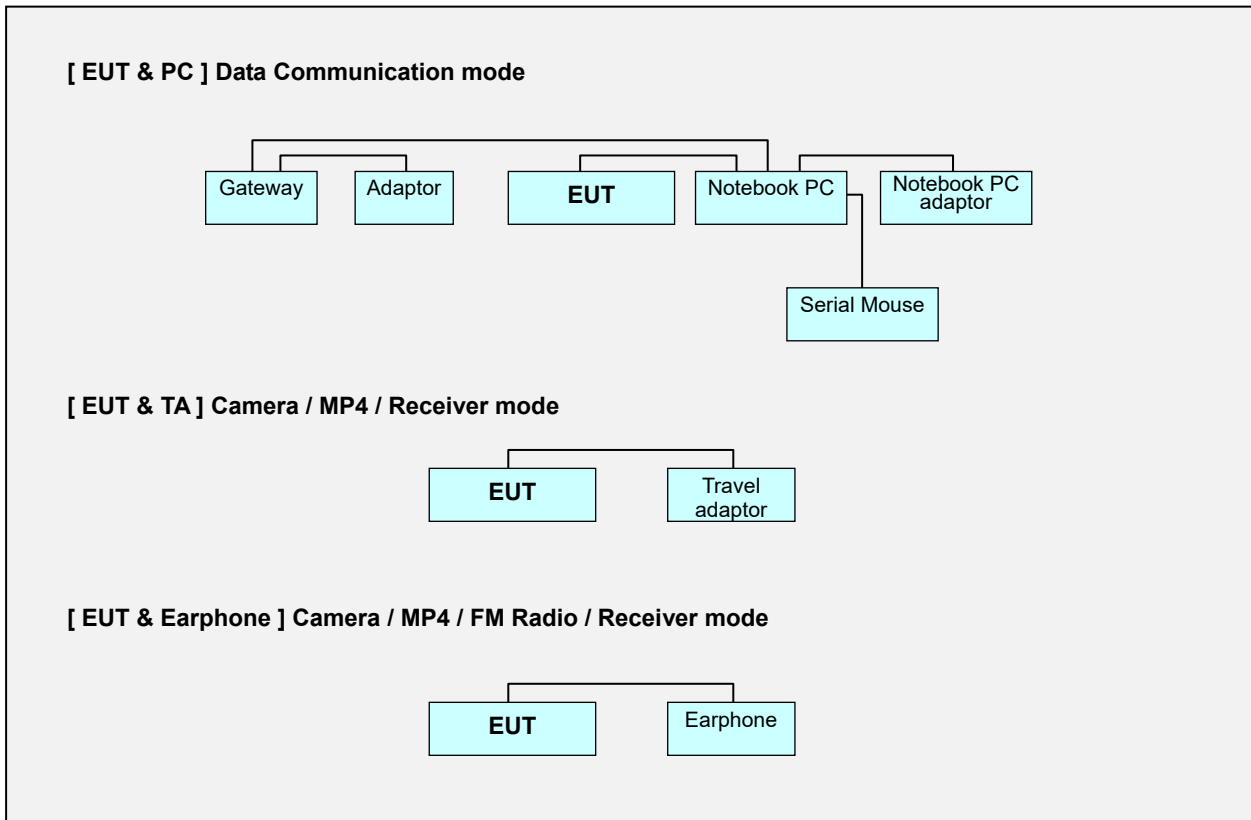


3.2.1 Frequency Range of Radiated Measurements

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



Non-Conductive Table
Power Line: 120 VAC, 60 Hz



4. PRELIMINARY TEST

During preliminary tests, the following operating mode was investigated.

- Data Communication
- Rear / Front Camera (Preview / Recording)
- MP4 Play
- FM Radio mode (Low / Middle / High CH)
- GSM 850 Idle (Low / Middle / High CH)
- WCDMA 850 Idle (Low / Middle / High CH)
- LTE B5 Idle (Low / Middle / High CH)

4.1 Conducted Emission

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

Operating Modes:

[EUT & PC]

- Data Communication

[EUT & TA]

- Rear / Front Camera Preview
- Receiver mode (LTE B5 Low CH Idle) + MP4 Play
- Receiver mode (LTE B5 Middle CH Idle) + Rear Camera Recording
- Receiver mode (LTE B5 High CH Idle) + Front Camera Recording

NOTE.

1. The worst case of operating mode is reported.

4.2 Radiated Emission

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

Operating Modes:

[EUT & PC]

- Data Communication

[EUT & TA]

- Rear / Front Camera Preview
- Receiver mode (LTE B5 Low CH Idle) + MP4 Play
- Receiver mode (LTE B5 Middle CH Idle) + Rear Camera Recording
- Receiver mode (LTE B5 High CH Idle) + Front Camera Recording

**[EUT & Earphone]**

Rear Camera Preview +FM Radio (Low CH)
Front Camera Preview + FM Radio (Middle CH)
FM Radio (High CH)
Receiver mode (LTE B5 Low CH Idle) + MP4 Play
Receiver mode (LTE B5 Middle CH Idle) + Rear Camera Recording
Receiver mode (LTE B5 High CH Idle) + Front Camera Recording

NOTE.

1. Three orientations have been investigated and the worst-case orientation is reported.
2. The worst case of operating mode is reported.



5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

5.1 Conducted Emission

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

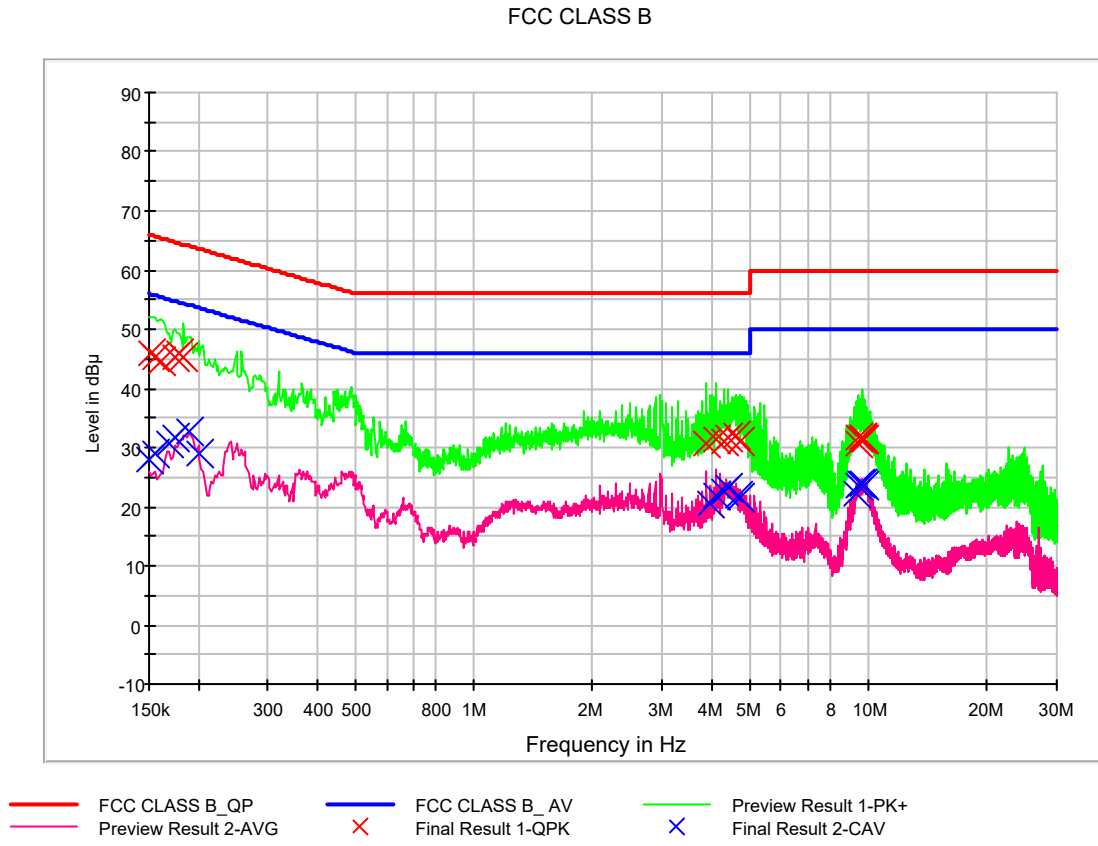
Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Worst Case of Operating Mode	Data Communication Front Camera Preview Receiver mode (LTE B5 High CH Idle) + Front Camera Recording
Kind of Test Site	Shielded Room
Temperature	22.3 °C
Relative Humidity	41.8 %
Test Date	April 23, 2019

- 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



Figure 1: Conducted Emission, Data Communication, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	45.8	9.000	L1	9.6	20.1	65.9
0.156000	45.1	9.000	L1	9.6	20.5	65.7
0.160000	44.5	9.000	L1	9.6	20.9	65.5
0.174000	45.2	9.000	L1	9.6	19.5	64.8
0.178000	45.9	9.000	L1	9.6	18.7	64.6
0.184000	45.3	9.000	L1	9.6	19.0	64.3
3.888000	30.5	9.000	L1	9.8	25.5	56.0
4.092000	31.2	9.000	L1	9.8	24.8	56.0
4.296000	31.1	9.000	L1	9.8	24.9	56.0
4.400000	31.8	9.000	L1	9.8	24.2	56.0
4.594000	32.1	9.000	L1	9.8	23.9	56.0
4.714000	30.9	9.000	L1	9.8	25.1	56.0
9.396000	30.7	9.000	L1	10.0	29.3	60.0
9.464000	31.6	9.000	L1	10.0	28.4	60.0
9.604000	31.5	9.000	L1	10.0	28.5	60.0
9.668000	31.6	9.000	L1	10.0	28.4	60.0
9.694000	31.8	9.000	L1	10.0	28.2	60.0
9.738000	31.3	9.000	L1	10.0	28.7	60.0

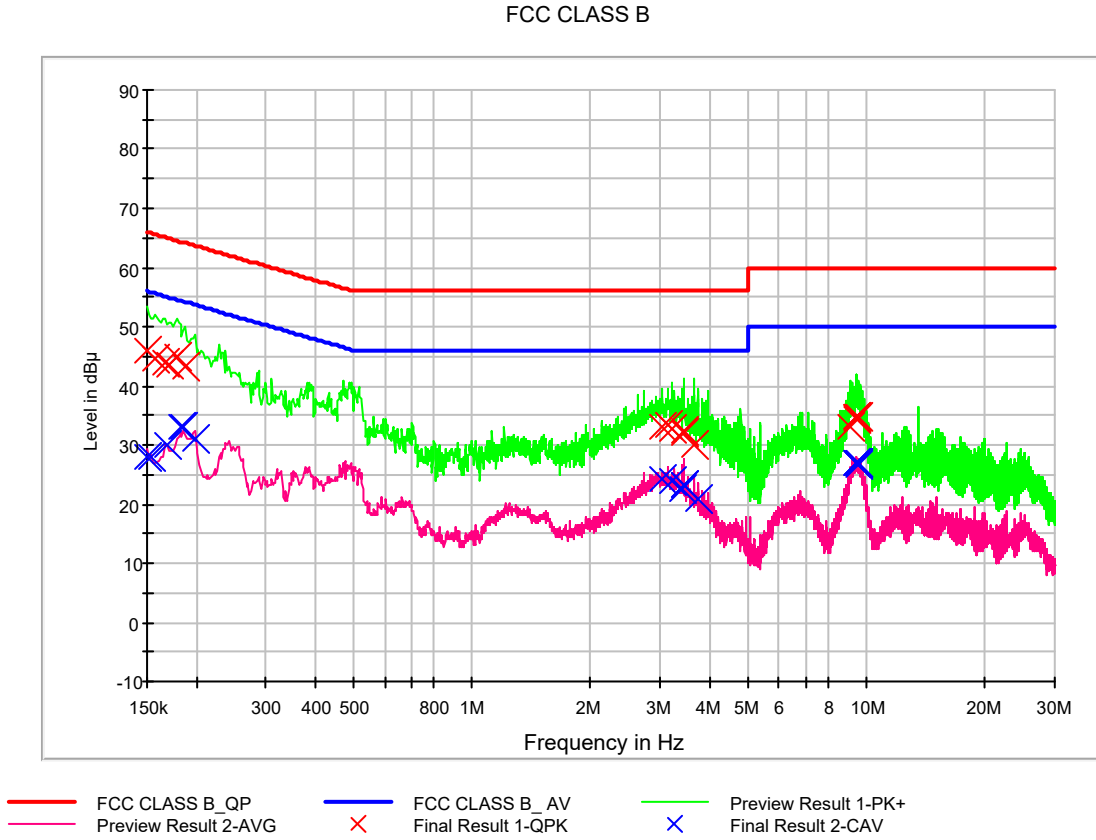


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	27.8	9.000	L1	9.6	28.2	56.0
0.156000	29.0	9.000	L1	9.6	26.7	55.7
0.168000	30.7	9.000	L1	9.6	24.4	55.1
0.174000	31.6	9.000	L1	9.6	23.2	54.8
0.190000	32.8	9.000	L1	9.7	21.3	54.0
0.200000	29.0	9.000	L1	9.7	24.6	53.6
3.958000	20.4	9.000	L1	9.8	25.6	46.0
4.090000	21.9	9.000	L1	9.8	24.1	46.0
4.296000	22.7	9.000	L1	9.8	23.3	46.0
4.400000	23.3	9.000	L1	9.8	22.7	46.0
4.660000	22.0	9.000	L1	9.8	24.0	46.0
4.714000	21.5	9.000	L1	9.8	24.5	46.0
9.276000	22.3	9.000	L1	10.0	27.7	50.0
9.464000	23.6	9.000	L1	10.0	26.4	50.0
9.576000	23.8	9.000	L1	10.0	26.2	50.0
9.604000	24.0	9.000	L1	10.0	26.0	50.0
9.694000	23.8	9.000	L1	10.0	26.2	50.0
9.738000	23.7	9.000	L1	10.0	26.3	50.0



Figure 2: Conducted Emission, Data Communication, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	46.0	9.000	N	9.6	20.0	66.0
0.158000	44.7	9.000	N	9.6	20.8	65.6
0.166000	43.9	9.000	N	9.6	21.2	65.2
0.170000	43.6	9.000	N	9.6	21.4	65.0
0.178000	45.1	9.000	N	9.6	19.5	64.6
0.188000	43.3	9.000	N	9.6	20.8	64.1
3.044000	33.1	9.000	N	9.8	22.9	56.0
3.134000	33.5	9.000	N	9.8	22.5	56.0
3.228000	32.7	9.000	N	9.8	23.3	56.0
3.442000	32.2	9.000	N	9.8	23.8	56.0
3.450000	31.9	9.000	N	9.8	24.1	56.0
3.642000	30.2	9.000	N	9.8	25.8	56.0
9.102000	33.1	9.000	N	9.9	26.9	60.0
9.436000	34.7	9.000	N	9.9	25.3	60.0
9.448000	34.7	9.000	N	9.9	25.3	60.0
9.454000	34.3	9.000	N	9.9	25.7	60.0
9.474000	34.8	9.000	N	9.9	25.2	60.0
9.522000	34.8	9.000	N	9.9	25.2	60.0

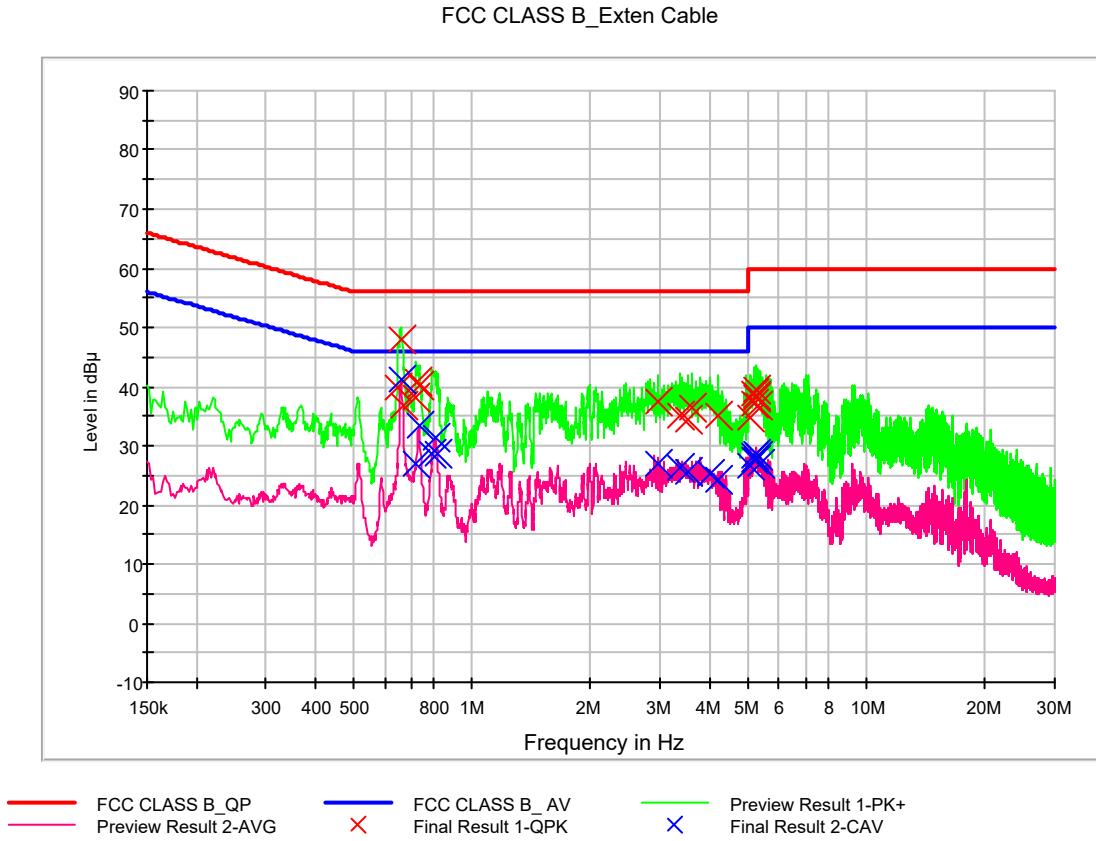


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	27.9	9.000	N	9.6	28.1	56.0
0.154000	28.1	9.000	N	9.6	27.7	55.8
0.168000	30.0	9.000	N	9.6	25.1	55.1
0.182000	32.9	9.000	N	9.6	21.5	54.4
0.186000	33.2	9.000	N	9.6	21.1	54.2
0.198000	31.1	9.000	N	9.6	22.6	53.7
3.044000	24.4	9.000	N	9.8	21.6	46.0
3.228000	23.8	9.000	N	9.8	22.2	46.0
3.418000	22.7	9.000	N	9.8	23.3	46.0
3.440000	23.1	9.000	N	9.8	22.9	46.0
3.448000	23.1	9.000	N	9.8	22.9	46.0
3.732000	21.0	9.000	N	9.8	25.0	46.0
9.436000	27.0	9.000	N	9.9	23.0	50.0
9.448000	26.8	9.000	N	9.9	23.2	50.0
9.474000	26.8	9.000	N	9.9	23.2	50.0
9.496000	26.9	9.000	N	9.9	23.1	50.0
9.504000	26.9	9.000	N	9.9	23.1	50.0
9.518000	26.6	9.000	N	9.9	23.4	50.0



Figure 3: Conducted Emission, Front Camera Preview, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.650000	40.0	9.000	L1	9.8	16.0	56.0
0.660000	48.1	9.000	L1	9.8	7.9	56.0
0.674000	36.8	9.000	L1	9.8	19.2	56.0
0.722000	38.0	9.000	L1	9.8	18.0	56.0
0.730000	40.9	9.000	L1	9.8	15.1	56.0
0.734000	40.2	9.000	L1	9.8	15.8	56.0
2.964000	37.3	9.000	L1	9.9	18.7	56.0
3.378000	34.9	9.000	L1	9.9	21.1	56.0
3.514000	34.4	9.000	L1	9.9	21.6	56.0
3.614000	36.3	9.000	L1	9.9	19.7	56.0
4.214000	34.9	9.000	L1	10.0	21.1	56.0
5.070000	34.7	9.000	L1	10.0	25.3	60.0
5.186000	38.7	9.000	L1	10.0	21.3	60.0
5.196000	37.2	9.000	L1	10.0	22.8	60.0
5.256000	38.3	9.000	L1	10.0	21.7	60.0
5.260000	39.5	9.000	L1	10.0	20.5	60.0
5.266000	38.0	9.000	L1	10.0	22.0	60.0
5.322000	36.8	9.000	L1	10.0	23.2	60.0

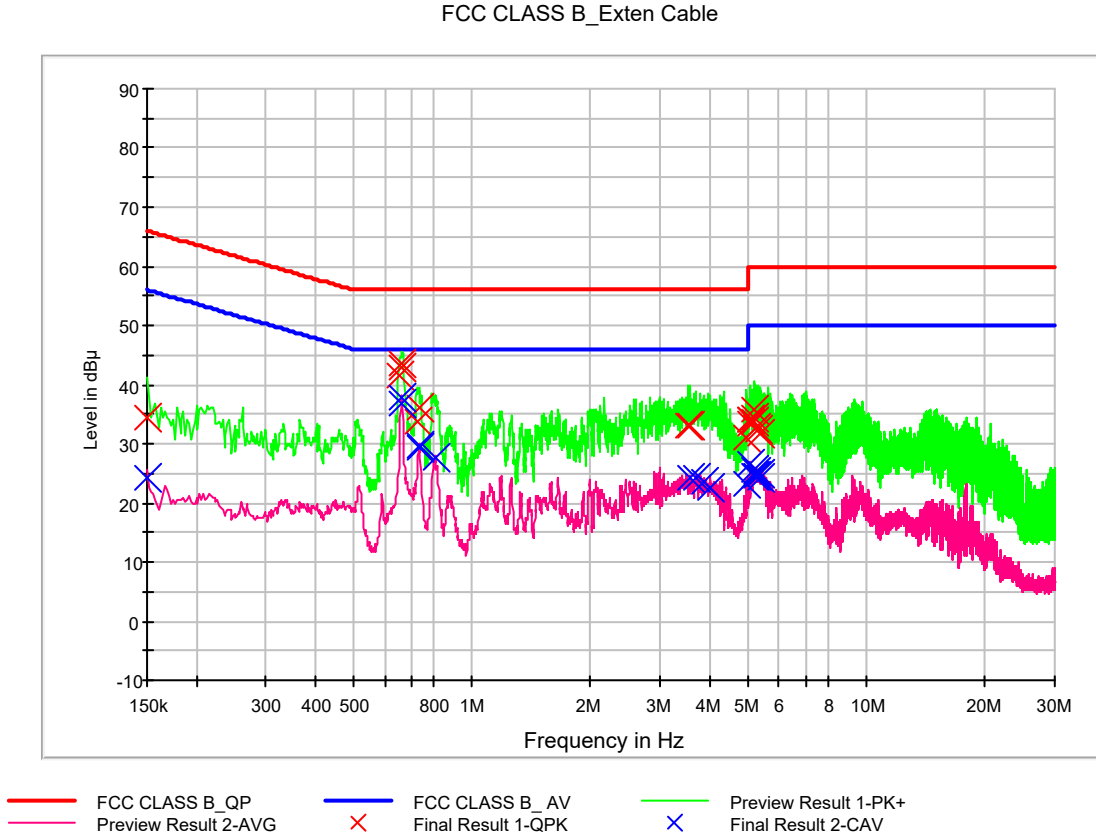


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.660000	41.1	9.000	L1	9.8	4.9	46.0
0.720000	27.1	9.000	L1	9.8	18.9	46.0
0.734000	33.3	9.000	L1	9.8	12.7	46.0
0.794000	28.6	9.000	L1	9.8	17.4	46.0
0.806000	31.3	9.000	L1	9.8	14.7	46.0
0.816000	28.5	9.000	L1	9.8	17.5	46.0
2.964000	26.9	9.000	L1	9.9	19.1	46.0
3.378000	26.4	9.000	L1	9.9	19.6	46.0
3.514000	25.6	9.000	L1	9.9	20.4	46.0
4.002000	25.4	9.000	L1	10.0	20.6	46.0
4.214000	24.4	9.000	L1	10.0	21.6	46.0
5.052000	26.6	9.000	L1	10.0	23.4	50.0
5.186000	28.4	9.000	L1	10.0	21.6	50.0
5.196000	27.5	9.000	L1	10.0	22.5	50.0
5.266000	28.5	9.000	L1	10.0	21.5	50.0
5.274000	27.7	9.000	L1	10.0	22.3	50.0
5.328000	28.4	9.000	L1	10.0	21.6	50.0
5.360000	26.8	9.000	L1	10.0	23.2	50.0



Figure 4: Conducted Emission, Front Camera Preview, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	34.4	9.000	N	9.8	31.6	66.0
0.656000	41.5	9.000	N	9.9	14.5	56.0
0.662000	43.0	9.000	N	9.9	13.0	56.0
0.666000	43.4	9.000	N	9.9	12.6	56.0
0.724000	33.6	9.000	N	9.9	22.4	56.0
0.732000	36.1	9.000	N	9.9	19.9	56.0
3.512000	33.1	9.000	N	10.1	22.9	56.0
3.586000	33.0	9.000	N	10.1	23.0	56.0
4.982000	31.1	9.000	N	10.2	24.9	56.0
5.076000	33.4	9.000	N	10.2	26.6	60.0
5.088000	34.2	9.000	N	10.2	25.8	60.0
5.092000	34.1	9.000	N	10.2	25.9	60.0
5.168000	35.7	9.000	N	10.2	24.3	60.0
5.172000	34.4	9.000	N	10.2	25.6	60.0
5.190000	33.7	9.000	N	10.2	26.3	60.0
5.244000	32.8	9.000	N	10.2	27.2	60.0
5.306000	32.3	9.000	N	10.2	27.7	60.0
5.370000	31.8	9.000	N	10.2	28.2	60.0

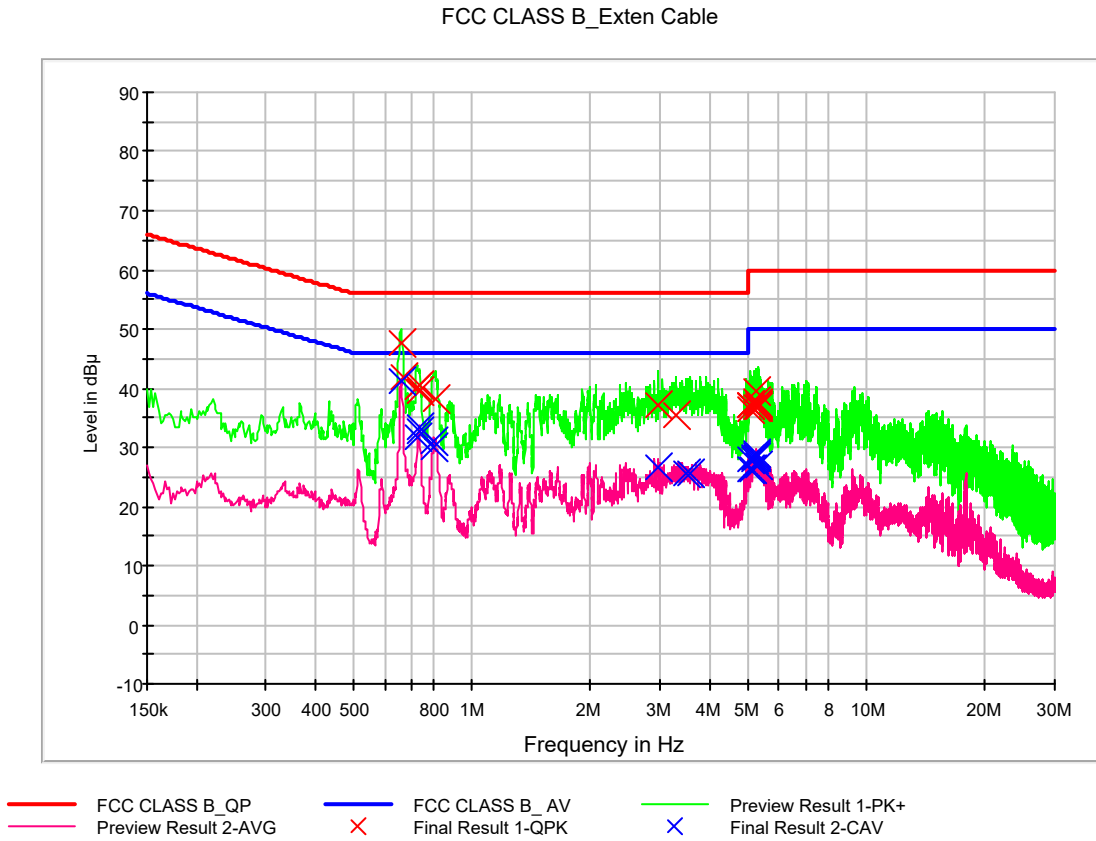


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	24.1	9.000	N	9.8	31.9	56.0
0.662000	37.9	9.000	N	9.9	8.1	46.0
0.666000	36.7	9.000	N	9.9	9.3	46.0
0.732000	29.3	9.000	N	9.9	16.7	46.0
0.736000	29.6	9.000	N	9.9	16.4	46.0
0.806000	27.7	9.000	N	9.9	18.3	46.0
3.582000	24.1	9.000	N	10.1	21.9	46.0
3.702000	24.3	9.000	N	10.2	21.7	46.0
3.852000	23.7	9.000	N	10.2	22.3	46.0
4.032000	22.7	9.000	N	10.2	23.3	46.0
4.982000	23.2	9.000	N	10.2	22.8	46.0
5.082000	26.5	9.000	N	10.2	23.5	50.0
5.162000	25.6	9.000	N	10.2	24.4	50.0
5.190000	24.6	9.000	N	10.2	25.4	50.0
5.244000	24.6	9.000	N	10.2	25.4	50.0
5.260000	25.4	9.000	N	10.2	24.6	50.0
5.370000	24.2	9.000	N	10.2	25.8	50.0
5.406000	25.0	9.000	N	10.2	25.0	50.0



Figure 5: Conducted Emission, Receiver mode (LTE B5 High CH Idle) + Front Camera Recording, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.662000	47.7	9.000	L1	9.8	8.3	56.0
0.670000	41.8	9.000	L1	9.8	14.2	56.0
0.726000	40.1	9.000	L1	9.8	16.0	56.0
0.732000	40.7	9.000	L1	9.8	15.3	56.0
0.736000	39.7	9.000	L1	9.8	16.3	56.0
0.810000	38.0	9.000	L1	9.8	18.0	56.0
2.964000	37.0	9.000	L1	9.9	19.0	56.0
3.306000	35.6	9.000	L1	9.9	20.4	56.0
5.048000	37.2	9.000	L1	10.0	22.8	60.0
5.052000	37.2	9.000	L1	10.0	22.8	60.0
5.060000	37.1	9.000	L1	10.0	22.9	60.0
5.064000	36.5	9.000	L1	10.0	23.5	60.0
5.252000	36.9	9.000	L1	10.0	23.1	60.0
5.260000	39.3	9.000	L1	10.0	20.7	60.0
5.272000	37.6	9.000	L1	10.0	22.4	60.0
5.310000	36.7	9.000	L1	10.0	23.3	60.0
5.316000	37.2	9.000	L1	10.0	22.8	60.0
5.328000	37.4	9.000	L1	10.0	22.6	60.0

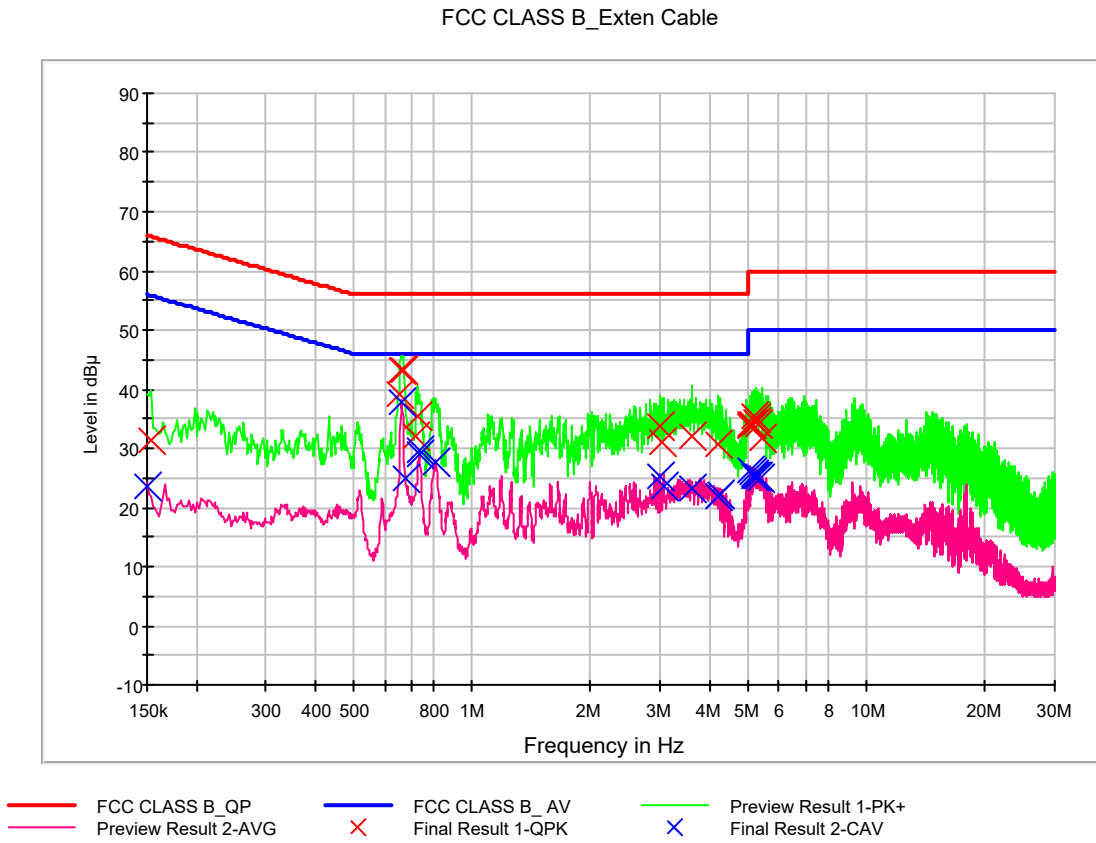


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.662000	41.2	9.000	L1	9.8	4.8	46.0
0.728000	31.6	9.000	L1	9.8	14.4	46.0
0.732000	33.3	9.000	L1	9.8	12.7	46.0
0.736000	32.7	9.000	L1	9.8	13.3	46.0
0.798000	30.1	9.000	L1	9.8	15.9	46.0
0.802000	31.1	9.000	L1	9.8	14.9	46.0
2.964000	26.7	9.000	L1	9.9	19.3	46.0
3.472000	25.7	9.000	L1	9.9	20.3	46.0
3.588000	25.8	9.000	L1	9.9	20.2	46.0
5.052000	26.4	9.000	L1	10.0	23.6	50.0
5.064000	28.0	9.000	L1	10.0	22.0	50.0
5.118000	26.3	9.000	L1	10.0	23.7	50.0
5.184000	27.9	9.000	L1	10.0	22.1	50.0
5.188000	28.4	9.000	L1	10.0	21.6	50.0
5.256000	28.6	9.000	L1	10.0	21.4	50.0
5.262000	29.0	9.000	L1	10.0	21.0	50.0
5.268000	28.3	9.000	L1	10.0	21.7	50.0
5.304000	27.1	9.000	L1	10.0	22.9	50.0



Figure 6: Conducted Emission, Receiver mode (LTE B5 High CH Idle) + Front Camera Recording, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	31.5	9.000	N	9.8	34.3	65.8
0.654000	39.3	9.000	N	9.9	16.7	56.0
0.664000	43.2	9.000	N	9.9	12.8	56.0
0.668000	43.1	9.000	N	9.9	12.9	56.0
0.722000	32.0	9.000	N	9.9	24.0	56.0
0.728000	35.5	9.000	N	9.9	20.5	56.0
2.986000	33.7	9.000	N	10.1	22.3	56.0
3.048000	31.2	9.000	N	10.1	24.8	56.0
3.594000	32.1	9.000	N	10.1	23.9	56.0
4.216000	30.5	9.000	N	10.2	25.5	56.0
5.080000	34.2	9.000	N	10.2	25.8	60.0
5.088000	33.8	9.000	N	10.2	26.2	60.0
5.156000	34.1	9.000	N	10.2	25.9	60.0
5.172000	35.4	9.000	N	10.2	24.6	60.0
5.256000	34.5	9.000	N	10.2	25.5	60.0
5.260000	35.1	9.000	N	10.2	24.9	60.0
5.334000	34.1	9.000	N	10.2	25.9	60.0
5.448000	31.7	9.000	N	10.2	28.3	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	23.7	9.000	N	9.8	32.3	56.0
0.664000	37.9	9.000	N	9.9	8.1	46.0
0.678000	24.8	9.000	N	9.9	21.2	46.0
0.734000	29.6	9.000	N	9.9	16.4	46.0
0.738000	29.0	9.000	N	9.9	17.0	46.0
0.804000	27.5	9.000	N	9.9	18.5	46.0
2.986000	25.3	9.000	N	10.1	20.7	46.0
3.066000	23.6	9.000	N	10.1	22.4	46.0
3.594000	23.2	9.000	N	10.1	22.8	46.0
4.216000	21.8	9.000	N	10.2	24.2	46.0
4.242000	22.3	9.000	N	10.2	23.7	46.0
5.080000	26.4	9.000	N	10.2	23.6	50.0
5.156000	25.9	9.000	N	10.2	24.1	50.0
5.166000	25.7	9.000	N	10.2	24.3	50.0
5.172000	25.3	9.000	N	10.2	24.7	50.0
5.256000	25.1	9.000	N	10.2	24.9	50.0
5.334000	25.4	9.000	N	10.2	24.6	50.0
5.402000	24.9	9.000	N	10.2	25.1	50.0



5.2 Radiated Emission

The test results of radiated emission provide the following information:

-For Measurement Below 1 GHz

Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Worst Case of Operating Mode	Data Communication [TA] Front Camera Preview Receiver mode (LTE B5 High CH Idle) + Front Camera Recording [Earphone] Front Camera Preview + FM Radio(Middle CH) Receiver mode (LTE B5 Low CH Idle) + MP4 Play
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.8 – 24.4 °C
Relative Humidity	42.3 – 43.7%
Test Date	April 19, 2019 to April 28, 2019

- 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



Data Communication

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
30.879760	24.5	225.1	V	0.0	18.8	15.5	40.0
66.611223	23.4	125.3	V	265.0	18.5	16.6	40.0
132.819639	30.6	174.7	H	326.0	18.8	12.9	43.5
266.551103	30.5	100.0	H	179.0	19.5	15.5	46.0
601.388778	26.1	100.0	V	220.0	27.6	19.9	46.0
930.807615	30.9	174.9	V	187.0	32.0	15.1	46.0

[TA] Front Camera Preview

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
32.880800	20.9	100.0	V	140.0	18.9	19.1	40.0
45.054400	22.0	100.0	V	284.0	19.8	18.0	40.0
150.441600	26.5	100.0	V	114.0	19.7	17.0	43.5
201.214400	21.6	100.0	V	223.0	17.4	21.9	43.5
231.558400	26.9	100.0	V	45.0	18.4	19.1	46.0
808.693600	30.6	174.8	H	0.0	30.6	15.4	46.0

[TA] Receiver mode (LTE B5 High CH Idle) + Front Camera Recording

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
30.698442	22.1	100.0	V	356.0	18.3	17.9	40.0
45.457600	20.8	191.7	V	317.0	19.4	19.2	40.0
65.994400	17.5	100.0	V	35.0	18.5	22.5	40.0
122.380000	22.9	116.8	V	20.0	17.6	20.6	43.5
159.341600	23.9	100.0	V	130.0	19.8	19.6	43.5
677.937600	28.1	100.0	H	354.0	28.3	17.9	46.0


[Earphone] Front Camera Preview + FM Radio (Middle CH)

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
31.863200	22.3	174.9	V	17.0	18.8	17.7	40.0
58.253600	18.0	116.8	V	153.0	19.8	22.0	40.0
64.636000	16.5	225.0	H	215.0	18.8	23.5	40.0
153.260000	18.0	174.9	V	342.0	19.8	25.5	43.5
494.592800	24.0	100.0	V	312.0	25.2	22.0	46.0
703.120800	28.5	174.7	V	297.0	28.9	17.5	46.0

[Earphone] Receiver mode (LTE B5 Low CH Idle) + MP4 Play

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
30.687893	21.5	174.9	V	320.0	18.3	18.5	40.0
43.478400	17.3	100.0	V	296.0	19.2	22.7	40.0
64.840800	17.1	225.0	V	57.0	18.7	22.9	40.0
114.561600	21.7	174.9	V	17.0	16.8	21.8	43.5
477.128800	23.5	100.0	V	189.0	24.6	22.5	46.0
662.329600	27.9	117.7	H	24.0	28.1	18.1	46.0



-For Measurement Above 1 GHz

Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Frequency	5 825 MHz
Tested Frequency Range	1 GHz to 30 GHz
Worst Case of Operating Mode	Data Communication [TA] Front Camera Preview Receiver mode (LTE B5 High CH Idle) + Front Camera Recording [Earphone] Front Camera Preview + FM Radio(Middle CH) Receiver mode (LTE B5 Low CH Idle) + MP4 Play
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.8- 23.8 °C
Relative Humidity	42.3 – 43.9 %
Test Date	April 19, 2019 to April 28, 2019

- 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



Data Communication

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1399.749499	48.9	231.7	V	222.0	-26.1	25.1	74.0
1995.541082	46.2	100.0	V	50.0	-25.3	27.8	74.0
2659.368737	46.2	100.0	V	0.0	-22.7	27.8	74.0
5996.342686	45.1	100.0	V	319.0	-14.9	28.9	74.0
10172.795591	48.5	183.9	V	145.0	-4.7	25.5	74.0
17897.795591	52.1	245.8	H	122.0	6.9	13.3	54.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1399.749499	46.2	231.7	V	222.0	-26.1	7.8	54.0
1995.541082	21.9	100.0	V	50.0	-25.3	32.1	54.0
2659.368737	21.4	100.0	V	0.0	-22.7	32.6	54.0
5996.342686	28.5	100.0	V	319.0	-14.9	25.5	54.0
10172.795591	35.1	183.9	V	145.0	-4.7	18.9	54.0
17883.316633	40.7	245.8	H	122.0	6.9	13.3	54.0

[TA] Front Camera Preview

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
3251.152305	34.5	218.4	H	188.0	-20.9	39.5	74.0
5476.202405	38.6	149.5	V	185.0	-15.4	35.4	74.0
7423.897795	44.5	150.0	H	287.0	-9.7	29.5	74.0
9561.573147	48.3	100.0	V	326.0	-5.4	25.7	74.0
10933.416833	48.2	141.5	V	332.0	-2.8	25.8	74.0
14788.026052	49.1	249.8	V	0.0	0.8	24.9	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
3251.152305	22.2	218.4	H	188.0	-20.9	31.8	54.0
5476.202405	25.8	149.5	V	185.0	-15.4	28.2	54.0
7423.897795	31.9	150.0	H	287.0	-9.7	22.1	54.0
9561.573147	35.6	100.0	V	326.0	-5.4	18.4	54.0
10933.416833	35.6	141.5	V	332.0	-2.8	18.4	54.0
14788.026052	36.4	249.8	V	0.0	0.8	17.6	54.0


[TA] Receiver mode (LTE B5 High CH Idle) + Front Camera Recording

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2793.637274	34.1	160.5	V	158.0	-22.1	39.9	74.0
5258.667335	39.8	125.8	V	248.0	-15.6	34.2	74.0
7410.871743	44.7	100.0	V	356.0	-9.7	29.3	74.0
9508.567134	48.3	230.6	V	339.0	-5.4	25.7	74.0
10524.398797	49.5	113.3	V	83.0	-3.5	24.5	74.0
15041.733467	49.3	202.4	V	208.0	0.9	24.7	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2793.637274	21.9	160.5	V	158.0	-22.1	32.1	54.0
5258.667335	26.4	125.8	V	248.0	-15.6	27.6	54.0
7410.871743	32.3	100.0	V	356.0	-9.7	21.7	54.0
9508.567134	35.8	230.6	V	339.0	-5.4	18.2	54.0
10524.398797	36.6	113.3	V	83.0	-3.5	17.4	54.0
15041.733467	36.8	202.4	V	208.0	0.9	17.2	54.0

[Earphone] Front Camera Preview + FM Radio (Middle CH)

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2705.695000	34.6	140.6	V	175.0	-22.5	39.4	74.0
4975.435000	39.4	100.0	H	170.0	-16.0	34.6	74.0
7320.800000	43.9	200.4	V	243.0	-10.0	30.1	74.0
8981.370000	47.1	100.0	V	68.0	-6.8	26.9	74.0
10929.285000	48.6	217.4	V	324.0	-2.8	25.4	74.0
14712.300000	48.9	149.5	V	198.0	0.8	25.1	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2705.695000	21.7	140.6	V	175.0	-22.5	32.3	54.0
4975.435000	26.4	100.0	H	170.0	-16.0	27.6	54.0
7320.800000	31.3	200.4	V	243.0	-10.0	22.7	54.0
8981.370000	34.6	100.0	V	68.0	-6.8	19.4	54.0
10929.285000	35.8	217.4	V	324.0	-2.8	18.2	54.0
14712.300000	36.0	149.5	V	198.0	0.8	18.0	54.0


[Earphone] Receiver mode (LTE B5 Low CH Idle) + MP4 Play

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2980.905000	35.2	150.0	H	272.0	-21.2	38.8	74.0
5561.070000	39.4	99.9	V	46.0	-15.3	34.6	74.0
7442.965000	44.2	150.0	H	316.0	-9.6	29.8	74.0
9542.385000	49.1	99.9	V	30.0	-5.4	24.9	74.0
10236.725000	47.8	150.0	V	291.0	-4.5	26.2	74.0
14749.220000	48.8	149.8	V	0.0	0.8	25.2	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)
2980.905000	22.3	150.0	H	272.0	-21.2	31.7	54.0
5561.070000	26.2	99.9	V	46.0	-15.3	27.8	54.0
7442.965000	31.6	150.0	H	316.0	-9.6	22.4	54.0
9542.385000	36.0	99.9	V	30.0	-5.4	18.0	54.0
10236.725000	35.2	150.0	V	291.0	-4.5	18.8	54.0
14749.220000	36.0	149.8	V	0.0	0.8	18.0	54.0



6. CONCLUSION

The data collected shows that the **EUT Type: Mobile Phone, FCC ID: A3LSMA6060, Model: SM-A6060** complies with §15.107 and §15.109 of the FCC rules.



7. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to ANNEX A_Test Setup Photo