

EMI TEST REPORT

FCC CERTIFICATION

Applicant:

SAMSUNG Electronics Co., Ltd.
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Date of Issue: December 06, 2018

Test Report No. HCT-EM-1811-FC014-R1

Test Site: HCT CO., LTD.

FCC ID :

A3LSMG8870

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

EUT Type : Mobile Phone

Model Name : SM-G8870

Date of Test : November 13, 2018 to November 21, 2018

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 denied 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-1811-FC014	November 22, 2018	Initial Release
HCT-EM-1811-FC014-R1	December 06, 2018	Revised operating mode (Clause 4.0)



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1. GENERAL INFORMATION

1.1 Description of EUT

Its basic purpose is used for communications.

FCC ID	A3LSMG8870
Model	SM-G8870
EUT Type	Mobile Phone
Frequency Band	GSM 850/1900, WCDMA B2/B5, LTE B4/B5/B12/B17/B41, WLAN 2.4 GHz/5 GHz, BT, NFC, ANT+

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-G8870	-	SAMSUNG	A3LSMG8870
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	-
RJ45 cable	-	-	-	-
TA	EP-TA200	-	SOLUM	-
Data Cable	EP-DR140AWE	-	KSDCO	-
Earphone	GHSM028-W3	-	GLONIC	-



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	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	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	90661
Radiated Field strength measurement facility 10 m Semi Anechoic chamber	

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	100584	1 year	06.25.2018
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	102245	1 year	12.20.2017
<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"/> Trilog Antenna	Schwarzbeck	VULB 9168	760	2 year	04.06.2017
<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	1060-2M	-	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"/> 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	1060-2M	-	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	05.14.2018
<input checked="" type="checkbox"/> Low Noise Amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.06.2018
<input checked="" type="checkbox"/> Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.20.2017
<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 checked="" 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 ($\mu\text{V}/\text{m}$)	Quasi-Peak ($\text{dB}(\mu\text{V})/\text{m}$)
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 ($\text{dB}(\mu\text{V})/\text{m}$)	Average ($\text{dB}(\mu\text{V})/\text{m}$)
Above 1 000	3	74	54

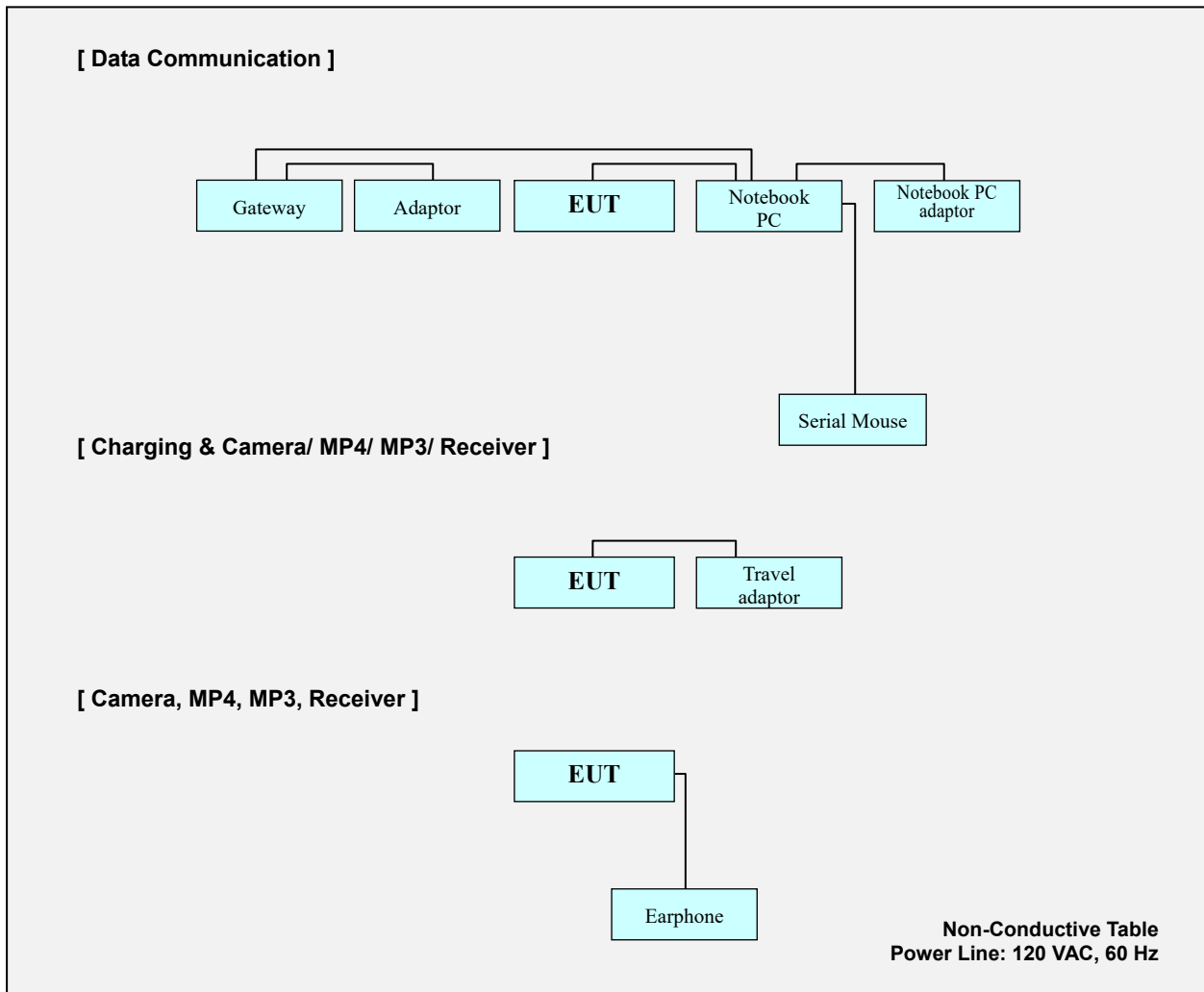


3.2.1 Frequency Range of Radiated Measurements

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. PRELIMINARY TEST

During preliminary tests, the following operating mode was investigated.

- Rear Camera (Preview / Recording) mode
- Front Camera (Preview / Recording) mode
- MP3 Play mode
- MP4 Play mode
- Data Communication (Read / Write) mode
- Charging mode
- Receiver mode at LTE B12, LTE B17 (Low CH / Middle CH / High CH Idle)
- Receiver mode at WCDMA 850, GSM 850, LTE B5 (Low CH / Middle CH / High CH Idle)

4.1 Operating Modes

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

4.1.1 Conducted Emission

[EUT & PC]

Data Communication (Read / Write)

[EUT & TA]

- Charging & Rear Camera Preview & MP3 Play
- Charging & Rear Camera Recording
- Charging & Front Camera Preview
- Charging & Front Camera Recording
- Charging & MP4 Play
- Charging & Receiver at LTE B12, LTE B17 (Low CH Idle / Middle CH Idle / High CH Idle)
- Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Low CH Idle / Middle CH Idle / High CH Idle)

4.1.2 Radiated Emission

[EUT & PC]

Data Communication (Read / Write)

[EUT & TA]

- Charging & Rear Camera Preview & MP3 Play
- Charging & Rear Camera Recording
- Charging & Front Camera Preview
- Charging & Front Camera Recording
- Charging & MP4 Play
- Charging & Receiver at LTE B12, LTE B17 (Low CH Idle / Middle CH Idle / High CH Idle)
- Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Low CH Idle / Middle CH Idle / High CH Idle)

[EUT & Earphone]

- Rear Camera Preview & MP3 Play
- Rear Camera Recording
- Front Camera Preview
- Front Camera Recording
- MP4 Play
- Receiver at LTE B12, LTE B17 (Low CH Idle / Middle CH Idle / High CH Idle)
- Receiver at WCDMA 850, GSM 850, LTE B5 (Low CH Idle / Middle CH Idle / High CH Idle)



5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

5.1 Conducted Emission

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

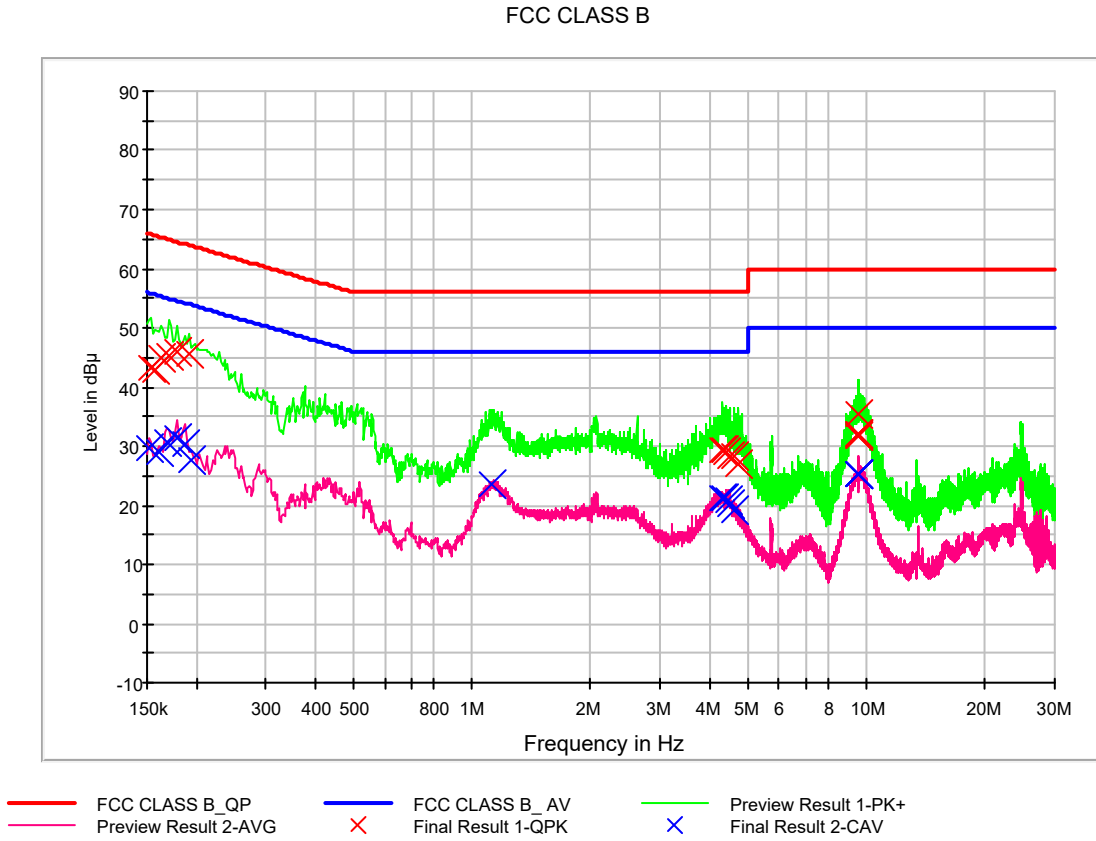
Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Worst Case of Operating Mode	Data communication (Read) Charging & Front Camera Recording Charging & Receiver at LTE B12, LTE B17 (Middle CH Idle) Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle) NOTE. The worst case of operating mode is reported.
Kind of Test Site	Shielded Room
Temperature	21.6-22.3 °C
Relative Humidity	41.9-43.8 %
Test Date	November 19, 2018 to November 21, 2018

- 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 (Read) mode, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	43.2	9.000	L1	9.6	22.6	65.8
0.158000	43.0	9.000	L1	9.6	22.6	65.6
0.162000	44.8	9.000	L1	9.6	20.5	65.4
0.170000	45.4	9.000	L1	9.6	19.5	65.0
0.178000	46.1	9.000	L1	9.6	18.5	64.6
0.192000	45.5	9.000	L1	9.6	18.4	63.9
4.328000	29.4	9.000	L1	9.8	26.6	56.0
4.338000	29.4	9.000	L1	9.8	26.6	56.0
4.420000	28.9	9.000	L1	9.8	27.1	56.0
4.502000	28.3	9.000	L1	9.8	27.7	56.0
4.608000	28.2	9.000	L1	9.8	27.8	56.0
4.706000	27.0	9.000	L1	9.8	29.0	56.0
9.518000	31.8	9.000	L1	10.0	28.2	60.0
9.524000	31.8	9.000	L1	10.0	28.2	60.0
9.534000	31.9	9.000	L1	10.0	28.1	60.0
9.540000	35.3	9.000	L1	10.0	24.7	60.0
9.546000	32.0	9.000	L1	10.0	28.0	60.0
9.554000	32.1	9.000	L1	10.0	27.9	60.0

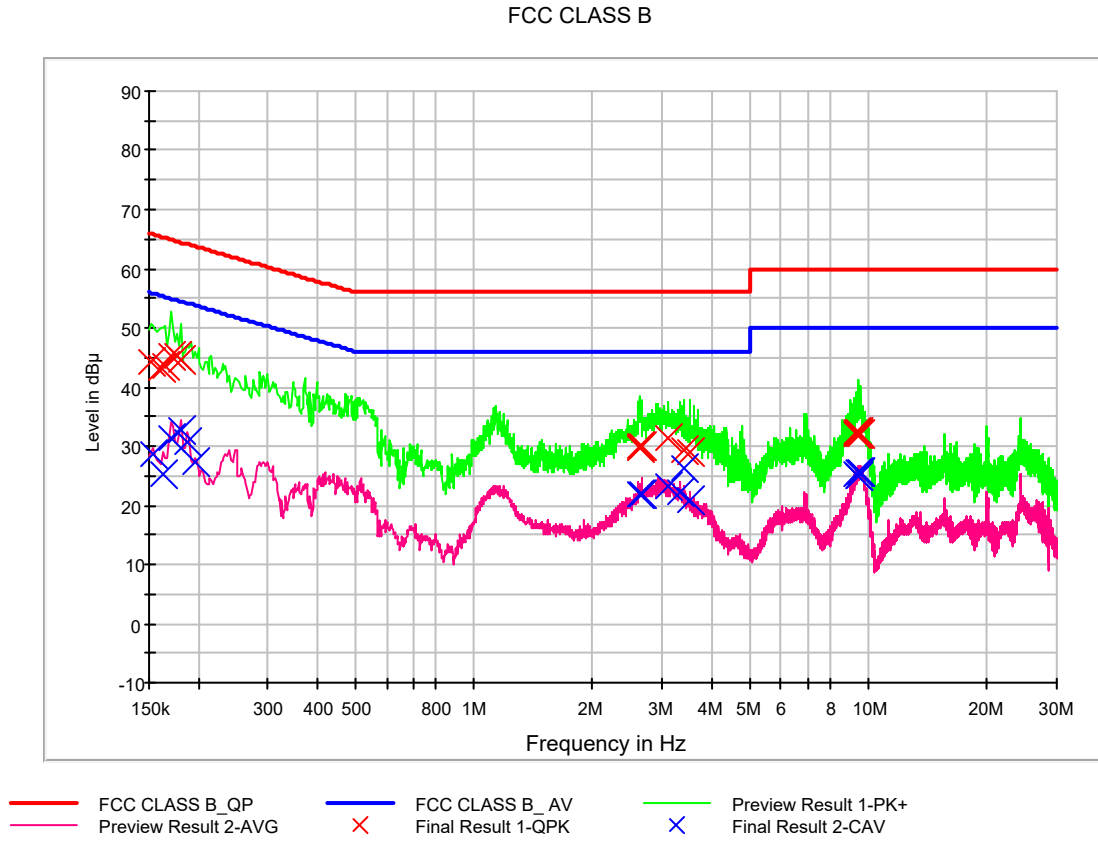


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	29.7	9.000	L1	9.6	26.2	55.9
0.160000	28.8	9.000	L1	9.6	26.6	55.5
0.168000	30.7	9.000	L1	9.6	24.3	55.1
0.178000	31.5	9.000	L1	9.6	23.1	54.6
0.188000	30.3	9.000	L1	9.6	23.8	54.1
0.194000	27.8	9.000	L1	9.6	26.1	53.9
1.116000	23.4	9.000	L1	9.7	22.6	46.0
4.328000	21.3	9.000	L1	9.8	24.7	46.0
4.338000	21.1	9.000	L1	9.8	24.9	46.0
4.456000	20.7	9.000	L1	9.8	25.3	46.0
4.502000	20.2	9.000	L1	9.8	25.8	46.0
4.608000	19.3	9.000	L1	9.8	26.7	46.0
9.518000	25.4	9.000	L1	10.0	24.6	50.0
9.534000	25.3	9.000	L1	10.0	24.7	50.0
9.540000	25.2	9.000	L1	10.0	24.8	50.0
9.548000	25.3	9.000	L1	10.0	24.7	50.0
9.552000	25.3	9.000	L1	10.0	24.7	50.0
9.562000	25.4	9.000	L1	10.0	24.6	50.0



Figure 2: Conducted Emission, Data communication (Read) mode, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	44.4	9.000	N	9.6	21.5	65.9
0.160000	43.2	9.000	N	9.6	22.3	65.5
0.164000	43.7	9.000	N	9.6	21.6	65.3
0.170000	45.1	9.000	N	9.6	19.9	65.0
0.176000	45.1	9.000	N	9.6	19.5	64.7
0.180000	44.6	9.000	N	9.6	19.8	64.5
2.620000	29.8	9.000	N	9.8	26.2	56.0
2.624000	30.1	9.000	N	9.8	25.9	56.0
2.650000	30.1	9.000	N	9.8	25.9	56.0
3.118000	31.2	9.000	N	9.8	24.8	56.0
3.416000	29.4	9.000	N	9.8	26.6	56.0
3.518000	29.0	9.000	N	9.8	27.0	56.0
9.312000	32.3	9.000	N	10.0	27.7	60.0
9.326000	32.2	9.000	N	10.0	27.8	60.0
9.382000	32.1	9.000	N	10.0	27.9	60.0
9.396000	32.5	9.000	N	10.0	27.5	60.0
9.416000	32.5	9.000	N	10.0	27.5	60.0
9.496000	32.1	9.000	N	10.0	27.9	60.0

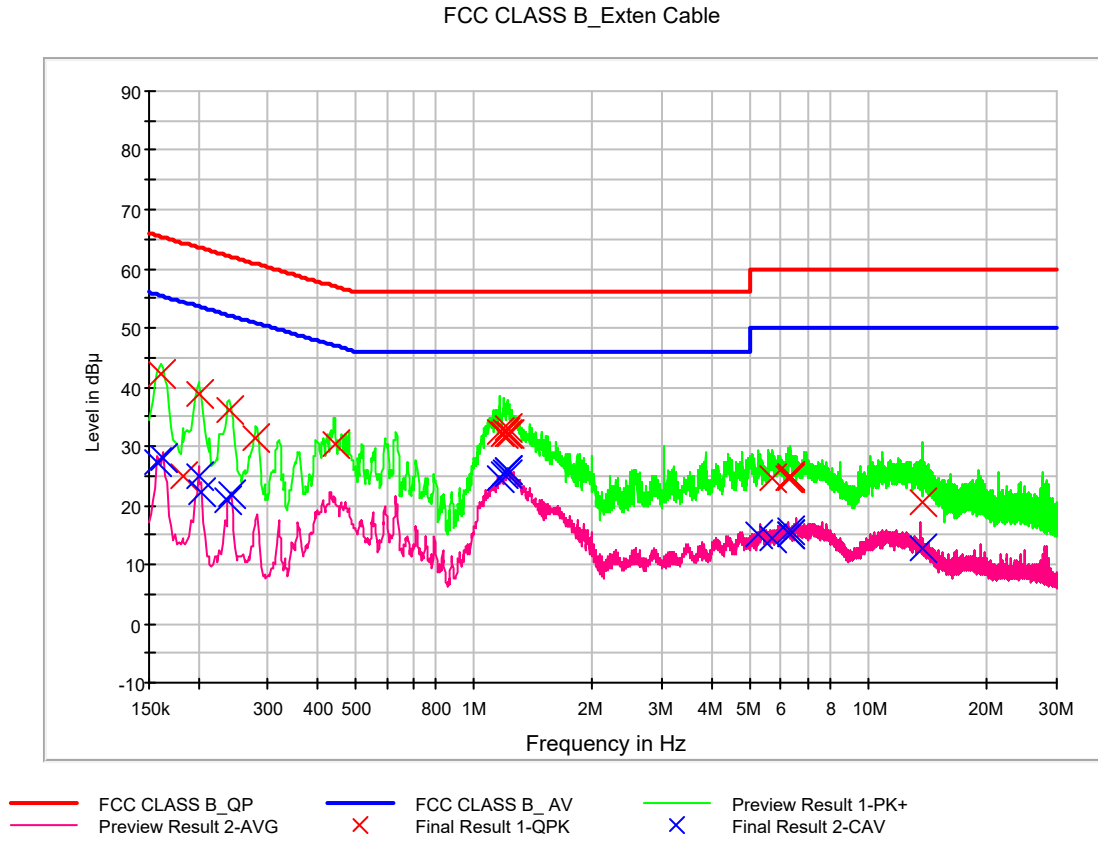


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	28.6	9.000	N	9.6	27.2	55.8
0.162000	25.1	9.000	N	9.6	30.2	55.4
0.170000	31.4	9.000	N	9.6	23.6	55.0
0.180000	32.7	9.000	N	9.6	21.8	54.5
0.188000	30.7	9.000	N	9.7	23.4	54.1
0.196000	27.3	9.000	N	9.7	26.5	53.8
2.624000	21.8	9.000	N	9.8	24.2	46.0
2.650000	21.8	9.000	N	9.8	24.2	46.0
3.118000	23.2	9.000	N	9.8	22.8	46.0
3.316000	22.2	9.000	N	9.8	23.8	46.0
3.414000	26.3	9.000	N	9.8	19.7	46.0
3.518000	20.8	9.000	N	9.8	25.2	46.0
9.312000	25.2	9.000	N	10.0	24.8	50.0
9.382000	25.0	9.000	N	10.0	25.0	50.0
9.394000	25.4	9.000	N	10.0	24.6	50.0
9.416000	25.1	9.000	N	10.0	24.9	50.0
9.486000	25.6	9.000	N	10.0	24.4	50.0
9.496000	25.4	9.000	N	10.0	24.6	50.0



Figure 3: Conducted Emission, Charging & Front Camera Recording mode, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.160000	42.2	9.000	L1	9.7	23.3	65.5
0.182000	24.8	9.000	L1	9.7	39.6	64.4
0.200000	38.8	9.000	L1	9.7	24.8	63.6
0.240000	36.1	9.000	L1	9.7	26.0	62.1
0.280000	31.4	9.000	L1	9.7	29.4	60.8
0.444000	30.5	9.000	L1	9.7	26.5	57.0
1.166000	32.5	9.000	L1	9.8	23.5	56.0
1.190000	32.1	9.000	L1	9.8	23.9	56.0
1.204000	32.5	9.000	L1	9.8	23.5	56.0
1.214000	33.1	9.000	L1	9.8	22.9	56.0
1.220000	32.2	9.000	L1	9.8	23.8	56.0
1.226000	31.9	9.000	L1	9.8	24.1	56.0
5.702000	24.6	9.000	L1	10.0	35.4	60.0
6.280000	24.7	9.000	L1	10.1	35.3	60.0
6.332000	24.9	9.000	L1	10.1	35.1	60.0
6.342000	24.5	9.000	L1	10.1	35.5	60.0
6.356000	24.8	9.000	L1	10.1	35.2	60.0
13.704000	20.4	9.000	L1	10.2	39.6	60.0

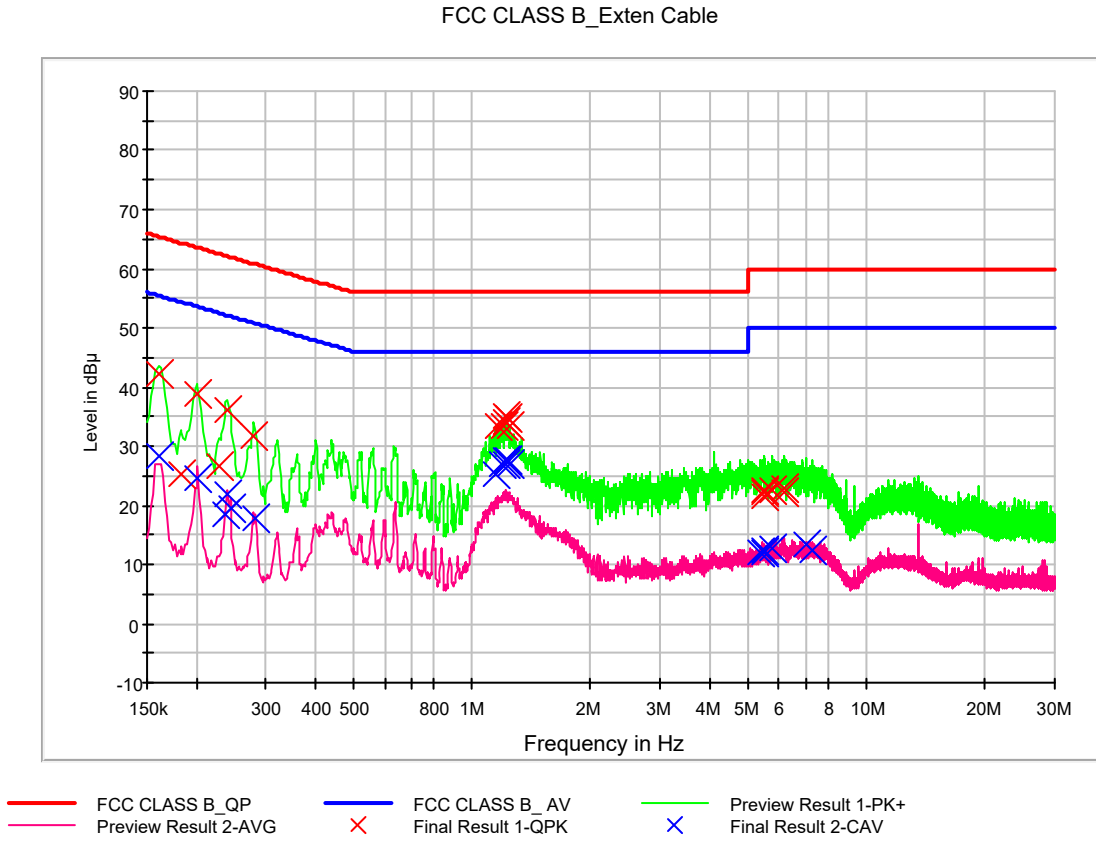


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.158000	27.2	9.000	L1	9.7	28.4	55.6
0.162000	27.9	9.000	L1	9.7	27.4	55.4
0.200000	25.1	9.000	L1	9.7	28.5	53.6
0.204000	22.1	9.000	L1	9.7	31.3	53.4
0.238000	20.8	9.000	L1	9.7	31.3	52.2
0.242000	21.7	9.000	L1	9.7	30.3	52.0
1.164000	24.5	9.000	L1	9.8	21.5	46.0
1.190000	25.2	9.000	L1	9.8	20.8	46.0
1.204000	25.5	9.000	L1	9.8	20.5	46.0
1.214000	25.8	9.000	L1	9.8	20.2	46.0
1.218000	25.8	9.000	L1	9.8	20.2	46.0
1.222000	25.4	9.000	L1	9.8	20.6	46.0
5.282000	15.0	9.000	L1	10.0	35.0	50.0
5.702000	14.4	9.000	L1	10.0	35.6	50.0
6.332000	15.6	9.000	L1	10.1	34.4	50.0
6.342000	15.0	9.000	L1	10.1	35.0	50.0
6.356000	15.1	9.000	L1	10.1	34.9	50.0
13.704000	12.7	9.000	L1	10.2	37.3	50.0



Figure 4: Conducted Emission, Charging & Front Camera Recording mode, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.160000	42.2	9.000	N	9.7	23.3	65.5
0.182000	25.3	9.000	N	9.7	39.1	64.4
0.200000	38.8	9.000	N	9.7	24.8	63.6
0.228000	26.7	9.000	N	9.7	35.9	62.5
0.240000	36.1	9.000	N	9.7	26.0	62.1
0.280000	31.5	9.000	N	9.7	29.3	60.8
1.162000	33.3	9.000	N	9.8	22.7	56.0
1.210000	33.4	9.000	N	9.8	22.6	56.0
1.216000	35.1	9.000	N	9.8	20.9	56.0
1.220000	34.2	9.000	N	9.8	21.8	56.0
1.226000	34.9	9.000	N	9.8	21.1	56.0
1.240000	33.3	9.000	N	9.8	22.7	56.0
5.498000	22.3	9.000	N	10.0	37.7	60.0
5.512000	22.4	9.000	N	10.0	37.6	60.0
5.532000	21.6	9.000	N	10.0	38.4	60.0
5.782000	22.5	9.000	N	10.1	37.5	60.0
6.180000	22.9	9.000	N	10.1	37.1	60.0
6.214000	22.3	9.000	N	10.1	37.7	60.0

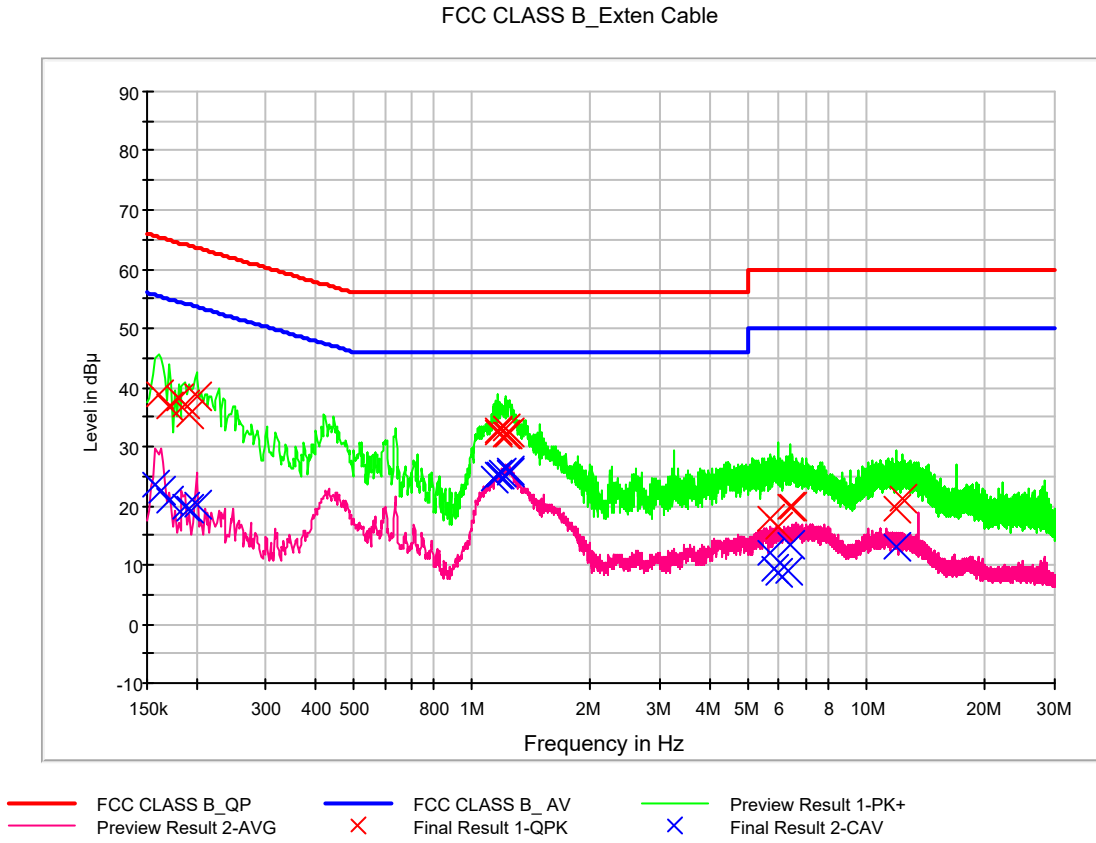


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.160000	28.2	9.000	N	9.7	27.3	55.5
0.202000	24.6	9.000	N	9.7	29.0	53.5
0.236000	18.3	9.000	N	9.7	33.9	52.2
0.240000	22.0	9.000	N	9.7	30.1	52.1
0.244000	19.4	9.000	N	9.7	32.5	52.0
0.282000	17.9	9.000	N	9.7	32.8	50.8
1.142000	25.3	9.000	N	9.8	20.7	46.0
1.192000	27.1	9.000	N	9.8	18.9	46.0
1.214000	27.6	9.000	N	9.8	18.4	46.0
1.222000	27.1	9.000	N	9.8	18.9	46.0
1.226000	27.5	9.000	N	9.8	18.5	46.0
1.240000	27.0	9.000	N	9.8	19.0	46.0
5.404000	12.1	9.000	N	10.0	37.9	50.0
5.490000	12.0	9.000	N	10.0	38.0	50.0
5.498000	12.4	9.000	N	10.0	37.6	50.0
5.782000	12.6	9.000	N	10.1	37.4	50.0
7.052000	13.4	9.000	N	10.1	36.6	50.0
7.302000	12.4	9.000	N	10.2	37.6	50.0



**Figure 5: Conducted Emission, Charging & Receiver mode at LTE B12, LTE B17 (Middle CH Idle),
Line (L1)**





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.160000	38.9	9.000	L1	9.7	26.5	65.5
0.170000	36.8	9.000	L1	9.7	28.2	65.0
0.180000	38.0	9.000	L1	9.7	26.4	64.5
0.188000	37.1	9.000	L1	9.7	27.0	64.1
0.192000	35.6	9.000	L1	9.7	28.4	63.9
0.200000	38.5	9.000	L1	9.7	25.1	63.6
1.162000	32.7	9.000	L1	9.8	23.3	56.0
1.166000	32.5	9.000	L1	9.8	23.5	56.0
1.212000	33.1	9.000	L1	9.8	22.9	56.0
1.222000	31.9	9.000	L1	9.8	24.1	56.0
1.238000	32.0	9.000	L1	9.8	24.0	56.0
1.250000	32.5	9.000	L1	9.8	23.5	56.0
5.698000	17.9	9.000	L1	10.0	42.1	60.0
5.958000	16.5	9.000	L1	10.0	43.5	60.0
6.390000	19.9	9.000	L1	10.1	40.1	60.0
6.514000	19.7	9.000	L1	10.1	40.3	60.0
11.972000	19.3	9.000	L1	10.2	40.7	60.0
12.356000	21.1	9.000	L1	10.2	38.9	60.0

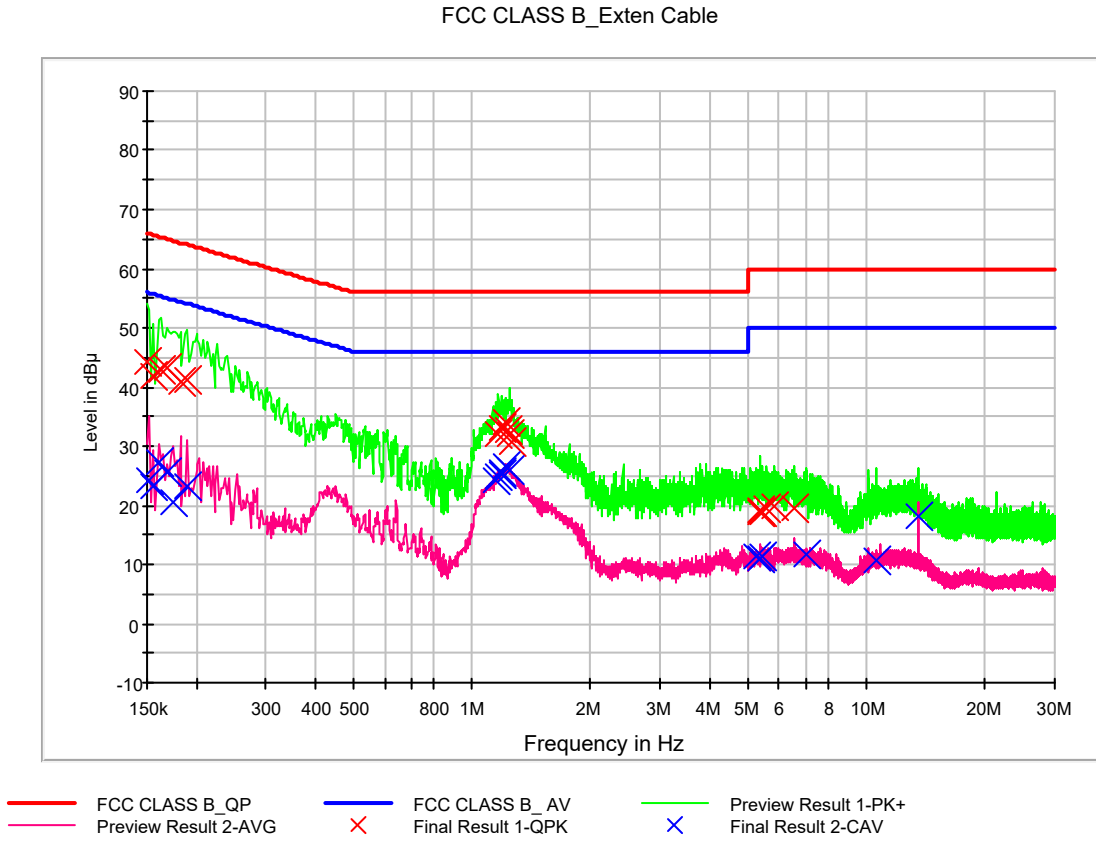


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.158000	23.5	9.000	L1	9.7	32.1	55.6
0.162000	22.4	9.000	L1	9.7	33.0	55.4
0.170000	20.7	9.000	L1	9.7	34.3	55.0
0.188000	20.0	9.000	L1	9.7	34.1	54.1
0.192000	19.6	9.000	L1	9.7	34.3	53.9
0.200000	20.2	9.000	L1	9.7	33.4	53.6
1.138000	24.6	9.000	L1	9.8	21.4	46.0
1.162000	25.1	9.000	L1	9.8	20.9	46.0
1.178000	25.2	9.000	L1	9.8	20.8	46.0
1.188000	25.6	9.000	L1	9.8	20.4	46.0
1.240000	25.8	9.000	L1	9.8	20.2	46.0
1.250000	25.7	9.000	L1	9.8	20.3	46.0
5.698000	12.0	9.000	L1	10.0	38.0	50.0
5.832000	9.5	9.000	L1	10.0	40.5	50.0
5.958000	8.5	9.000	L1	10.0	41.5	50.0
6.348000	9.1	9.000	L1	10.1	40.9	50.0
6.390000	13.3	9.000	L1	10.1	36.7	50.0
11.972000	13.0	9.000	L1	10.2	37.0	50.0



Figure 6: Conducted Emission, Charging & Receiver mode at LTE B12, LTE B17 (Middle CH Idle),
Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	44.2	9.000	N	9.7	21.8	66.0
0.156000	41.7	9.000	N	9.7	23.9	65.7
0.162000	43.0	9.000	N	9.7	22.3	65.4
0.168000	43.1	9.000	N	9.7	21.9	65.1
0.182000	41.0	9.000	N	9.7	23.4	64.4
0.190000	41.0	9.000	N	9.7	23.0	64.0
1.168000	32.1	9.000	N	9.8	23.9	56.0
1.192000	33.2	9.000	N	9.8	22.8	56.0
1.214000	34.0	9.000	N	9.8	22.0	56.0
1.228000	32.8	9.000	N	9.8	23.2	56.0
1.242000	32.2	9.000	N	9.8	23.8	56.0
1.262000	30.7	9.000	N	9.8	25.3	56.0
5.368000	19.1	9.000	N	10.0	40.9	60.0
5.372000	18.9	9.000	N	10.0	41.1	60.0
5.450000	18.9	9.000	N	10.0	41.1	60.0
5.600000	19.6	9.000	N	10.0	40.4	60.0
5.862000	19.7	9.000	N	10.1	40.3	60.0
6.534000	19.4	9.000	N	10.1	40.6	60.0

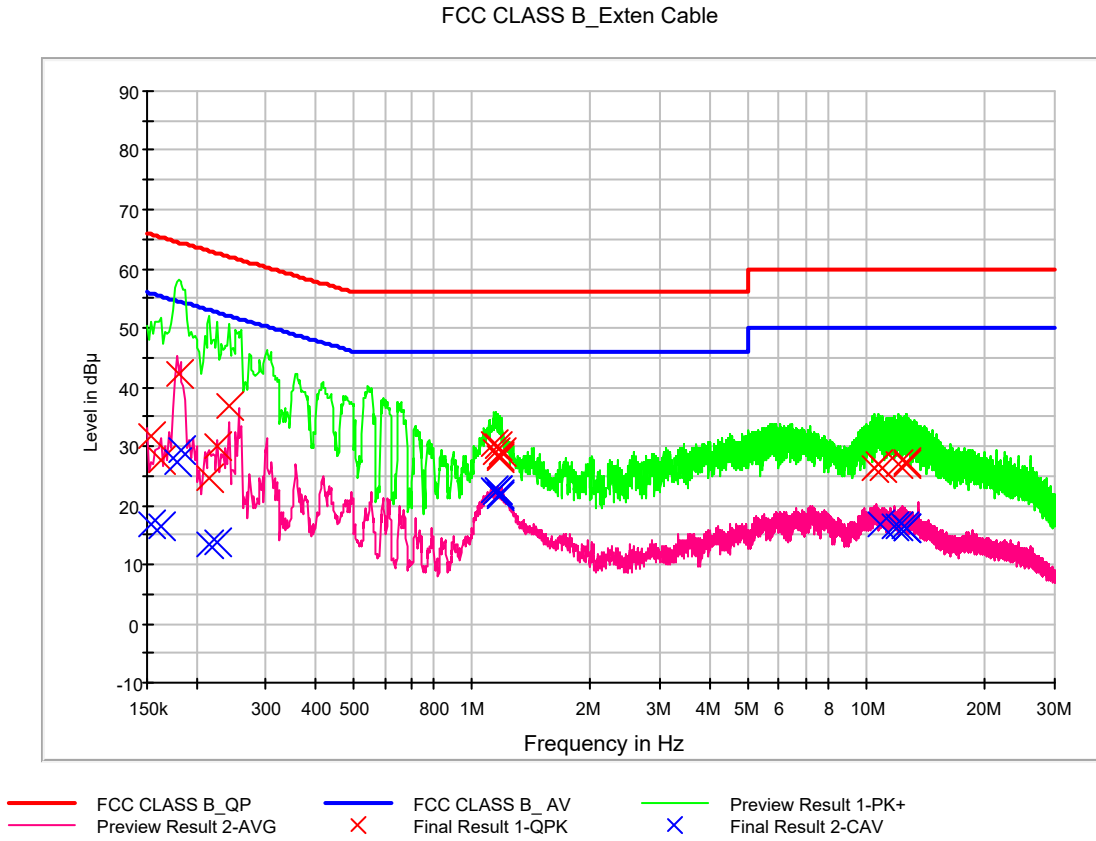


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	24.2	9.000	N	9.7	31.7	55.9
0.156000	23.3	9.000	N	9.7	32.3	55.7
0.160000	27.2	9.000	N	9.7	28.2	55.5
0.168000	25.7	9.000	N	9.7	29.4	55.1
0.174000	20.4	9.000	N	9.7	34.3	54.8
0.190000	23.1	9.000	N	9.7	30.9	54.0
1.154000	24.3	9.000	N	9.8	21.7	46.0
1.162000	24.9	9.000	N	9.8	21.1	46.0
1.184000	25.3	9.000	N	9.8	20.7	46.0
1.190000	25.6	9.000	N	9.8	20.4	46.0
1.216000	26.5	9.000	N	9.8	19.5	46.0
1.242000	25.9	9.000	N	9.8	20.1	46.0
5.270000	11.3	9.000	N	10.0	38.7	50.0
5.360000	11.0	9.000	N	10.0	39.0	50.0
5.450000	11.2	9.000	N	10.0	38.8	50.0
7.032000	11.8	9.000	N	10.1	38.2	50.0
10.602000	10.7	9.000	N	10.3	39.3	50.0
13.560000	18.1	9.000	N	10.4	31.9	50.0



Figure 7: Conducted Emission, Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle), Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	31.8	9.000	L1	9.7	34.0	65.8
0.162000	27.8	9.000	L1	9.7	37.6	65.4
0.180000	42.2	9.000	L1	9.7	22.2	64.5
0.216000	24.6	9.000	L1	9.7	38.3	63.0
0.226000	30.1	9.000	L1	9.7	32.5	62.6
0.242000	36.8	9.000	L1	9.7	25.2	62.0
1.140000	30.5	9.000	L1	9.8	25.6	56.0
1.150000	28.8	9.000	L1	9.8	27.2	56.0
1.164000	30.1	9.000	L1	9.8	25.9	56.0
1.172000	28.1	9.000	L1	9.8	27.9	56.0
1.182000	28.3	9.000	L1	9.8	27.7	56.0
1.188000	29.1	9.000	L1	9.8	26.9	56.0
10.520000	26.2	9.000	L1	10.2	33.8	60.0
10.690000	27.1	9.000	L1	10.2	32.9	60.0
10.966000	26.1	9.000	L1	10.2	33.9	60.0
12.012000	27.0	9.000	L1	10.2	33.0	60.0
12.600000	27.2	9.000	L1	10.2	32.8	60.0
12.658000	27.1	9.000	L1	10.2	32.9	60.0

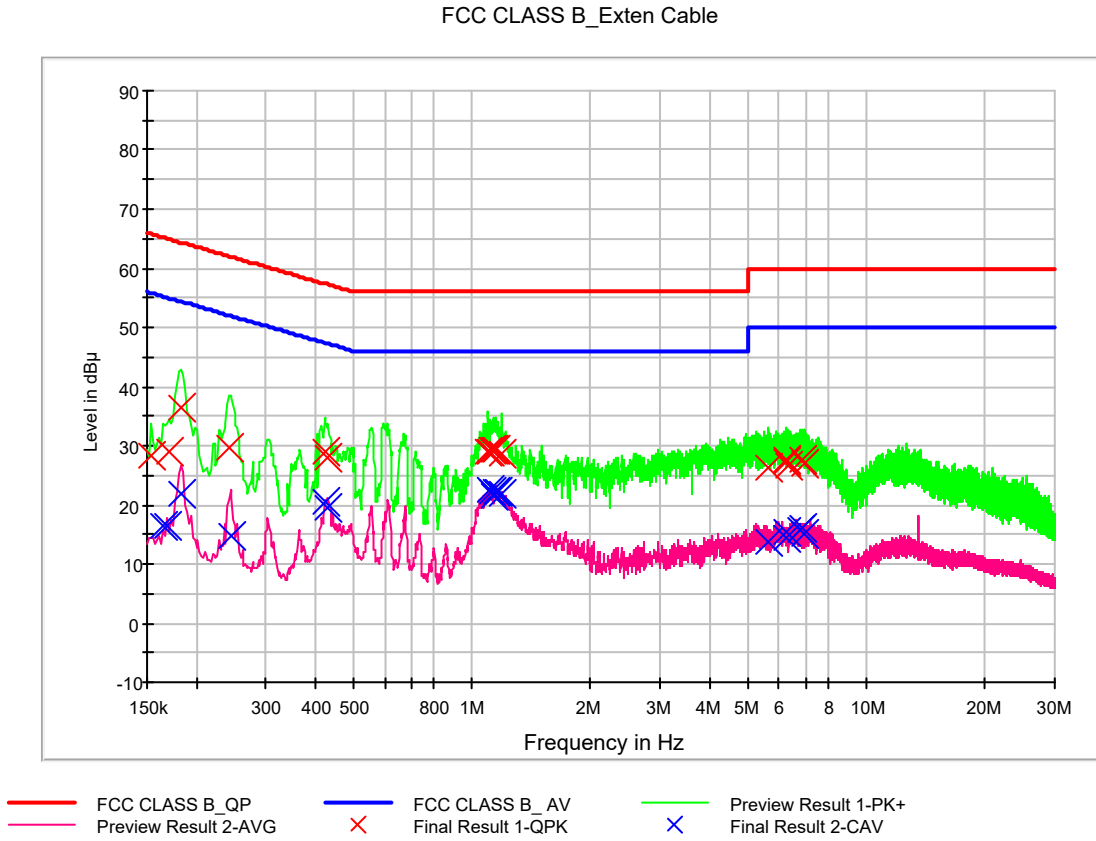


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	16.7	9.000	L1	9.7	39.1	55.8
0.162000	16.4	9.000	L1	9.7	38.9	55.4
0.178000	27.4	9.000	L1	9.7	27.2	54.6
0.182000	29.4	9.000	L1	9.7	25.0	54.4
0.216000	13.5	9.000	L1	9.7	39.5	53.0
0.226000	13.9	9.000	L1	9.7	38.7	52.6
1.136000	22.6	9.000	L1	9.8	23.4	46.0
1.152000	22.3	9.000	L1	9.8	23.7	46.0
1.160000	22.4	9.000	L1	9.8	23.6	46.0
1.164000	22.4	9.000	L1	9.8	23.6	46.0
1.172000	21.8	9.000	L1	9.8	24.2	46.0
1.182000	21.6	9.000	L1	9.8	24.4	46.0
10.888000	16.8	9.000	L1	10.2	33.2	50.0
11.796000	16.5	9.000	L1	10.2	33.5	50.0
12.012000	16.4	9.000	L1	10.2	33.6	50.0
12.536000	16.4	9.000	L1	10.2	33.6	50.0
12.600000	16.3	9.000	L1	10.2	33.7	50.0
12.658000	16.0	9.000	L1	10.2	34.0	50.0



Figure 8: Conducted Emission, Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle),
Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	28.2	9.000	N	9.7	37.6	65.8
0.170000	28.9	9.000	N	9.7	36.1	65.0
0.184000	36.4	9.000	N	9.7	27.9	64.3
0.242000	29.7	9.000	N	9.7	32.3	62.0
0.424000	28.8	9.000	N	9.7	28.5	57.4
0.432000	27.9	9.000	N	9.7	29.3	57.2
1.098000	28.8	9.000	N	9.8	27.2	56.0
1.114000	29.0	9.000	N	9.8	27.0	56.0
1.126000	29.3	9.000	N	9.8	26.7	56.0
1.132000	29.2	9.000	N	9.8	26.8	56.0
1.148000	29.3	9.000	N	9.8	26.7	56.0
1.186000	28.7	9.000	N	9.8	27.3	56.0
5.618000	26.1	9.000	N	10.1	33.9	60.0
6.250000	27.6	9.000	N	10.1	32.4	60.0
6.288000	27.3	9.000	N	10.1	32.7	60.0
6.296000	26.7	9.000	N	10.1	33.3	60.0
6.870000	27.5	9.000	N	10.1	32.5	60.0
6.924000	27.1	9.000	N	10.1	32.9	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.164000	16.3	9.000	N	9.7	39.0	55.3
0.168000	16.5	9.000	N	9.7	38.5	55.1
0.184000	21.9	9.000	N	9.7	32.4	54.3
0.244000	14.7	9.000	N	9.7	37.2	52.0
0.424000	20.4	9.000	N	9.7	27.0	47.4
0.432000	19.6	9.000	N	9.7	27.6	47.2
1.114000	22.5	9.000	N	9.8	23.5	46.0
1.126000	22.1	9.000	N	9.8	23.9	46.0
1.132000	21.6	9.000	N	9.8	24.4	46.0
1.150000	22.2	9.000	N	9.8	23.8	46.0
1.164000	22.3	9.000	N	9.8	23.7	46.0
1.186000	21.9	9.000	N	9.8	24.1	46.0
5.618000	13.7	9.000	N	10.1	36.3	50.0
6.250000	15.5	9.000	N	10.1	34.5	50.0
6.288000	14.5	9.000	N	10.1	35.5	50.0
6.792000	15.8	9.000	N	10.1	34.2	50.0
6.870000	15.9	9.000	N	10.1	34.1	50.0
6.924000	15.2	9.000	N	10.1	34.8	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 (Read) Charging & Front Camera Recording Charging & Receiver at LTE B12, LTE B17 (Middle CH Idle) Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle) Rear Camera Preview & MP3 Receiver at LTE B12, LTE B17 (Middle CH Idle) Receiver at WCDMA 850, GSM 850, LTE B5) (Middle CH Idle) NOTE: 1. Three orientations have been investigated and the worst case orientation is reported. 2. The worst case of operating mode is reported.
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.5 - 23.0 °C
Relative Humidity	41.8 - 43.8 %
Test Date	November 13, 2018 to November 20, 2018

- 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 (Read) mode

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)
61.623200	23.2	100.0	V	223.0	19.5	16.8	40.0
200.069600	24.5	100.0	V	76.0	16.8	19.0	43.5
266.537600	33.1	117.7	H	140.0	19.4	12.9	46.0
276.212000	31.6	100.0	H	324.0	19.7	14.4	46.0
600.024800	36.5	100.0	V	346.0	27.5	9.5	46.0
800.006400	38.7	100.0	H	92.0	30.2	7.3	46.0

Charging & Front Camera Recording mode

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)
32.216800	21.2	174.9	V	17.0	18.9	18.8	40.0
41.268800	24.9	175.0	V	46.0	19.7	15.1	40.0
150.367200	21.2	125.3	V	33.0	19.9	22.3	43.5
204.474400	23.1	100.0	V	198.0	17.0	20.4	43.5
500.097600	26.7	174.7	H	308.0	25.2	19.3	46.0
815.449600	30.4	174.9	V	106.0	30.4	15.6	46.0

Charging & Receiver mode at LTE B12, LTE B17 (Middle CH Idle)

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)
32.552000	20.3	190.0	V	31.0	18.9	19.7	40.0
40.864000	23.8	100.0	V	22.0	19.7	16.2	40.0
102.944000	22.2	191.3	V	256.0	17.2	21.3	43.5
227.880000	24.3	100.0	V	255.0	16.9	19.2	43.5
612.000000	27.4	200.0	V	90.0	27.6	18.6	46.0
922.400000	30.8	220.3	H	22.0	31.4	15.2	46.0



Charging & Receiver mode at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle)

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)
42.804000	23.5	100.0	V	130.0	19.7	16.5	40.0
51.728000	20.3	100.0	V	80.0	19.8	19.7	40.0
180.156000	23.6	180.0	V	33.0	14.5	19.9	43.5
223.224000	22.1	175.0	H	236.0	16.3	23.9	46.0
291.900000	21.3	100.0	H	151.0	25.2	24.7	46.0
801.000000	30.5	302.0	V	166.0	30.3	15.5	46.0

Rear Camera Preview & MP3 mode

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)
36.173600	16.9	116.8	H	50.0	19.3	23.1	40.0
45.694400	17.5	100.0	V	65.0	20.0	22.5	40.0
66.162400	16.3	100.0	V	269.0	18.7	23.7	40.0
495.374400	24.1	125.3	H	0.0	25.1	21.9	46.0
693.786400	28.4	100.0	V	76.0	28.6	17.6	46.0
938.936000	31.6	100.0	V	42.0	31.5	14.4	46.0

Receiver mode at LTE B12, LTE B17 (Middle CH Idle)

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)
34.268000	17.0	115.0	H	43.0	19.9	23.0	40.0
51.728000	17.3	100.0	V	63.0	14.8	22.7	40.0
72.292000	16.0	105.0	V	250.0	14.9	24.0	40.0
518.492000	24.0	121.3	H	10.0	20.2	22.0	46.0
602.688000	27.9	100.0	V	73.0	19.1	18.1	46.0
836.652000	31.3	100.0	V	44.0	30.2	14.7	46.0



Receiver mode at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle)

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)
33.173000	17.3	100.0	H	44.0	19.3	22.7	40.0
43.580000	17.5	100.0	V	78.0	20.0	22.5	40.0
68.177000	15.8	100.0	V	105.0	18.7	24.2	40.0
431.580000	24.0	113.0	H	53.0	25.1	22.0	46.0
721.880000	27.5	100.0	V	89.0	28.6	18.5	46.0
831.441000	30.4	100.0	V	30.0	31.5	15.6	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 (Read) Charging & Front Camera Recording Charging & Receiver at LTE B12, LTE B17 (Middle CH Idle) Charging & Receiver at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle) Rear Camera Preview & MP3 Receiver at LTE B12, LTE B17 (Middle CH Idle) Receiver at WCDMA 850, GSM 850, LTE B5) (Middle CH Idle) NOTE. 1. Three orientations have been investigated and the worst case orientation is reported. 2. The worst case of operating mode is reported.
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.5 - 22.7 °C
Relative Humidity	41.1 - 43.8 %
Test Date	November 15, 2018 to November 21, 2018

- 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 (Read) mode

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1399.955000	49.2	249.8	V	229.0	-28.2	24.8	74.0
2055.680000	48.2	100.0	V	56.0	-26.5	25.8	74.0
2663.820000	48.1	126.7	V	0.0	-24.2	25.9	74.0
4486.710000	42.8	100.0	V	0.0	-19.6	31.2	74.0
5990.540000	43.2	100.0	V	115.0	-17.1	30.8	74.0
9828.945000	43.7	174.5	V	210.0	-9.6	30.3	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)
1399.955000	48.0	249.8	V	229.0	-28.2	6.0	54.0
2055.680000	24.4	100.0	V	56.0	-26.5	29.6	54.0
2663.820000	22.1	126.7	V	0.0	-24.2	31.9	54.0
4486.710000	26.8	100.0	V	0.0	-19.6	27.2	54.0
5990.540000	27.2	100.0	V	115.0	-17.1	26.8	54.0
9828.945000	30.8	174.5	V	210.0	-9.6	23.2	54.0

Charging & Front Camera Recording mode

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1747.235000	31.4	100.0	H	19.0	-27.2	42.6	74.0
3948.105000	34.5	100.0	H	338.0	-21.1	39.5	74.0
5379.485000	36.9	203.6	H	322.0	-18.0	37.1	74.0
6684.950000	39.7	149.9	H	272.0	-14.9	34.3	74.0
8088.070000	41.8	244.4	H	71.0	-12.4	32.2	74.0
9842.750000	43.5	199.4	V	52.0	-9.6	30.5	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)
1747.235000	18.3	100.0	H	19.0	-27.2	35.7	54.0
3948.105000	22.0	100.0	H	338.0	-21.1	32.0	54.0
5379.485000	23.8	203.6	H	322.0	-18.0	30.2	54.0
6684.950000	26.2	149.9	H	272.0	-14.9	27.8	54.0
8088.070000	29.2	244.4	H	71.0	-12.4	24.8	54.0
9842.750000	30.9	199.4	V	52.0	-9.6	23.1	54.0



Charging & Receiver mode at LTE B12, LTE B17 (Middle CH Idle)

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1789.860000	30.5	150.0	H	57.0	-27.1	43.5	74.0
3609.435000	34.2	100.0	H	12.0	-22.0	39.8	74.0
5615.885000	37.0	100.0	H	0.0	-17.7	37.0	74.0
7566.025000	42.3	125.7	H	57.0	-12.6	31.7	74.0
9027.010000	42.9	100.0	H	248.0	-11.3	31.1	74.0
9825.425000	43.6	150.0	V	50.0	-9.6	30.4	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1789.860000	18.2	150.0	H	57.0	-27.1	35.8	54.0
3609.435000	21.5	100.0	H	12.0	-22.0	32.5	54.0
5615.885000	24.1	100.0	H	0.0	-17.7	29.9	54.0
7566.025000	28.5	125.7	H	57.0	-12.6	25.5	54.0
9027.010000	29.8	100.0	H	248.0	-11.3	24.2	54.0
9825.425000	30.6	150.0	V	50.0	-9.6	23.4	54.0

Charging & Receiver mode at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle)

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1399.500000	33.3	229.4	V	90.0	-28.2	40.7	74.0
3167.500000	33.5	100.0	V	57.0	-26.7	40.5	74.0
4580.200000	35.7	229.4	H	250.0	-25.3	38.3	74.0
6322.700000	36.0	204.6	V	44.0	-19.6	38.0	74.0
7698.000000	41.3	176.5	H	22.0	-17.1	32.7	74.0
9870.600000	43.8	111.4	V	152.0	-10.9	30.2	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1399.500000	17.3	229.4	V	90.0	-28.2	36.7	54.0
3167.500000	20.9	100.0	V	57.0	-26.7	33.1	54.0
4580.200000	23.1	229.4	H	250.0	-25.3	30.9	54.0
6322.700000	24.7	204.6	V	44.0	-19.6	19.3	54.0
7698.000000	27.6	176.5	H	22.0	-17.1	26.4	54.0
9870.600000	30.3	111.4	V	152.0	-10.9	23.7	54.0



Rear Camera Preview & MP3 mode

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1776.035000	31.0	150.0	V	160.0	-27.2	43.0	74.0
2858.650000	33.2	111.4	H	61.0	-23.4	40.8	74.0
4904.610000	35.8	112.4	V	211.0	-18.7	38.2	74.0
5978.950000	37.2	100.0	V	205.0	-17.1	36.8	74.0
8085.545000	41.9	140.6	H	76.0	-12.4	32.1	74.0
9491.650000	43.7	150.0	V	163.0	-10.1	30.3	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)
1776.035000	18.2	150.0	V	160.0	-27.2	35.8	54.0
2858.650000	20.4	111.4	H	61.0	-23.4	33.6	54.0
4904.610000	23.2	112.4	V	211.0	-18.7	30.8	54.0
5978.950000	24.4	100.0	V	205.0	-17.1	29.6	54.0
8085.545000	29.2	140.6	H	76.0	-12.4	24.8	54.0
9491.650000	31.3	150.0	V	163.0	-10.1	22.7	54.0

Receiver mode at LTE B12, LTE B17 (Middle CH Idle)

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1805.800000	30.8	150.0	V	139.0	-27.2	43.2	74.0
3109.700000	32.8	111.4	H	55.0	-23.4	41.2	74.0
5044.300000	35.3	112.4	V	201.0	-18.7	38.7	74.0
5607.000000	37.4	100.0	V	203.0	-17.1	36.6	74.0
8852.300000	42.0	140.6	H	79.0	-12.4	32.0	74.0
9535.700000	43.8	150.0	V	160.0	-10.1	30.2	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)
1805.800000	17.9	150.0	V	139.0	-27.2	36.1	54.0
3109.700000	20.2	111.4	H	55.0	-23.4	33.8	54.0
5044.300000	22.8	112.4	V	201.0	-18.7	31.2	54.0
5607.000000	25.0	100.0	V	203.0	-17.1	29.0	54.0
8852.300000	29.8	140.6	H	79.0	-12.4	24.2	54.0
9535.700000	31.4	150.0	V	160.0	-10.1	22.6	54.0


Receiver mode at WCDMA 850, GSM 850, LTE B5 (Middle CH Idle)

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1389.300000	28.0	150.0	V	100.0	-28.3	46.0	74.0
3017.900000	32.2	111.4	H	88.0	-27.7	41.8	74.0
4894.700000	34.0	112.4	V	176.0	-25.3	40.0	74.0
5471.000000	36.5	100.0	V	203.0	-20.6	37.5	74.0
7318.900000	41.3	140.6	H	33.0	-12.4	32.7	74.0
9824.700000	43.2	150.0	V	142.0	-9.9	30.8	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)
1389.300000	15.7	150.0	V	100.0	-28.3	38.3	54.0
3017.900000	18.7	111.4	H	88.0	-27.7	35.3	54.0
4894.700000	21.5	112.4	V	176.0	-25.3	32.5	54.0
5471.000000	26.1	100.0	V	203.0	-20.6	27.9	54.0
7318.900000	28.8	140.6	H	33.0	-12.4	25.2	54.0
9824.700000	30.9	150.0	V	142.0	-9.9	23.1	54.0



6. CONCLUSION

The data collected shows that the **EUT Type: Mobile Phone, FCC ID: A3LSMG8870, Model: SM-G8870** complies with §15.107 and §15.109 of the FCC rules.



7. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to Appendix A