

EMI TEST REPORT

FCC CERTIFICATION

Applicant:

SAMSUNG Electronics Co., Ltd.
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Korea

Date of Issue: February 28, 2019**Test Report No. HCT-EM-1902-FC004-R1****Test Site: HCT CO., LTD.****FCC ID :****A3LSMM105M**

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

EUT Type : Mobile Phone

Model Name : SM-M105M/DS

Series Model Name : SM-M105M, SM-M105Y/DS, SM-M105Y

Date of Test : February 13, 2019 to February 19, 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 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-1902-FC004	February 20, 2019	Initial Release
HCT-EM-1902-FC004-R1	February 28, 2019	Revised of Operating Mode



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1. GENERAL INFORMATION

1.1 Description of EUT

Its basic purpose is used for communications.

FCC ID	A3LSMM105M
Model name	SM-M105M/DS
Series model name	SM-M105M, SM-M105Y/DS, SM-M105Y
EUT type	Mobile Phone
Frequency band	GSM850/1900, WCDMA 850/1700/1900, LTE B2/4/5/12/17/41, WLAN 802.11 b/g/n, BT BDR/EDR/ LE 4.2
Power rating	Travel adaptor: Input: AC 100 to 240 V, 50/60 Hz, 0.15 A Output: DC 5.0 V 1.0 A Battery: Low : 3.6 V / Normal : 3.85 V / High : 4.35 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-M105M/DS	-	SAMSUNG	A3LSMM105M
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	ETA0U83JWS	-	DONGYANG E&P	-
Data Cable	ECB-DU68WE	-	RFTech	-
Earphone	EHS61ASFWE	-	YOUNGBO	-
Micro SD card (64 GB)	-	-	SAMSUNG	-



1.3 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	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	Micro USB	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>					
☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	06.25.2018
☒ LISN	Rohde & Schwarz	ENV216	102245	1 year	12.12.2018
☒ LISN	Rohde & Schwarz	ENV216	100073	1 year	05.03.2018
☒ Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
☒ Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
☒ Software	Rohde & Schwarz	EMC32 VER8.54.0	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
☒ EMI Test Receiver	Rohde & Schwarz	ESU40	100524	1 year	07.27.2018
☒ Trilog Antenna	Schwarzbeck	VULB 9168	00847	2 year	04.13.2018
☒ Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
☒ Antenna master controller	INNCO Systems	CO 3000	CO3000/870/ 35990515/L	N/A	-
☒ Turn Table	INNCO Systems	1060	-	N/A	-
☒ Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
☒ Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
☒ Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
☒ Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-
-For measurement above 1 GHz					
☒ EMI Test Receiver	Rohde & Schwarz	ESU40	100524	1 year	07.27.2018
☒ Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
☒ Antenna master controller	INNCO Systems	CO3000	CO3000/870/ 35990515/L	N/A	-
☒ Turn Table	INNCO Systems	1060	-	N/A	-
☒ Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	01836	2 year	05.14.2018
☒ Low Noise Amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.06.2018
☐ Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.17.2018
☐ Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170#786	2 year	12.05.2017
☒ Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
☒ Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
☐ Highpass Filter	Wainwright Instruments	WHKX1.0/15G-12SS	42	1 year	08.02.2018
☒ 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

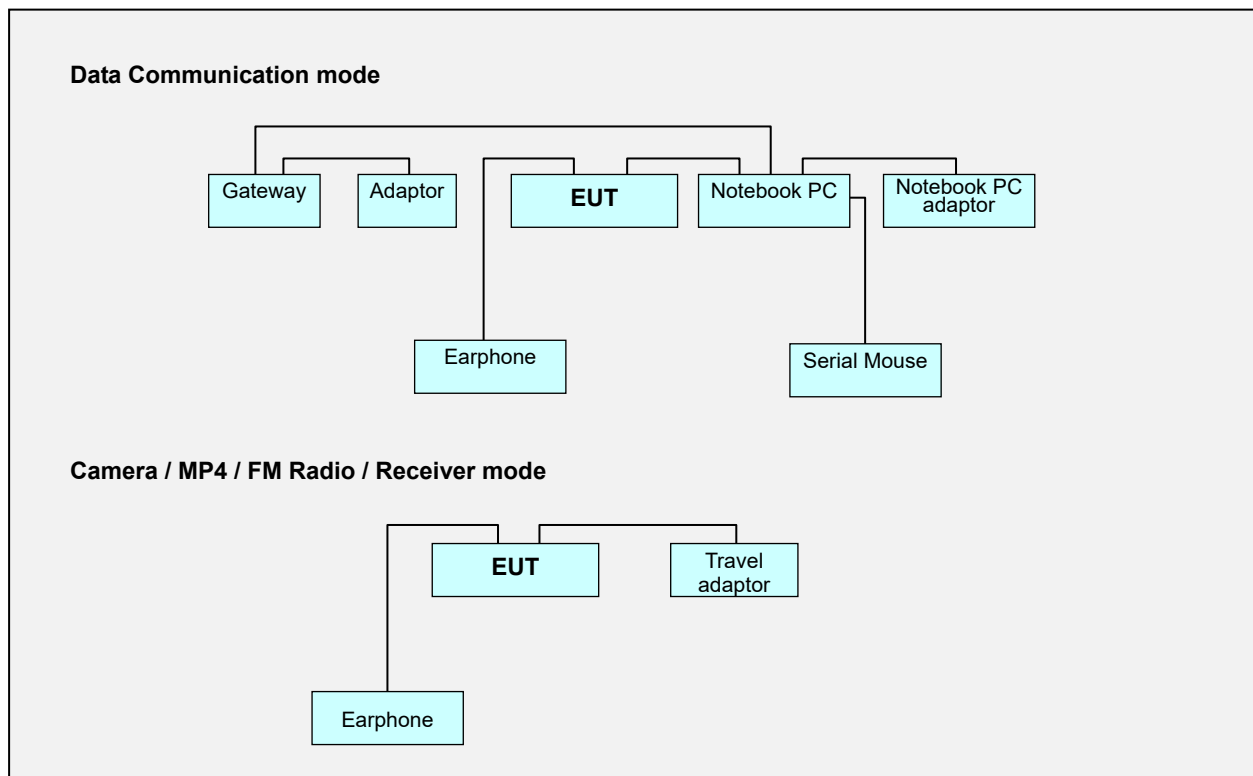


3.2.1 Frequency Range of Radiated Measurements

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



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



4. PRELIMINARY TEST

During preliminary tests, the following operating mode was investigated.

- Data Communication
- Front / Rear Camera (Preview/Recording)
- MP4 Play
- FM Radio (Low/Middle/High CH)
- WCDMA 850 Idle (Middle CH)
- GSM 850 Idle (Middle CH)
- LTE B5 Idle (Middle CH)
- LTE B12+B17 Idle (Low/Middle/High CH)

4.1 Conducted Emission

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

Operating Modes:

- Data Communication
- Rear Camera Preview+FM Radio (Low CH)
- Front Camera Preview+FM Radio (Middle CH)
- FM Radio (High CH)
- MP4 Play
- Receiver mode(LTE B5 Middle CH Idle)+Rear Camera Recording
- Receiver mode(LTE B12+B17 Low 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:

- Data Communication
- Rear Camera Preview+FM Radio (Low CH)
- Front Camera Preview+FM Radio (Middle CH)
- FM Radio (High CH)
- MP4 Play
- Receiver mode (LTE B5 Low CH Idle)
- Receiver mode (LTE B5 Middle CH Idle)+Rear Camera Recording
- Receiver mode (LTE B5 High CH Idle)
- Receiver mode (LTE B12+B17 Low CH Idle)+Front Camera Recording
- Receiver mode (LTE B12+B17 Middle CH Idle)
- Receiver mode (LTE B12+B17 High 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.



5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

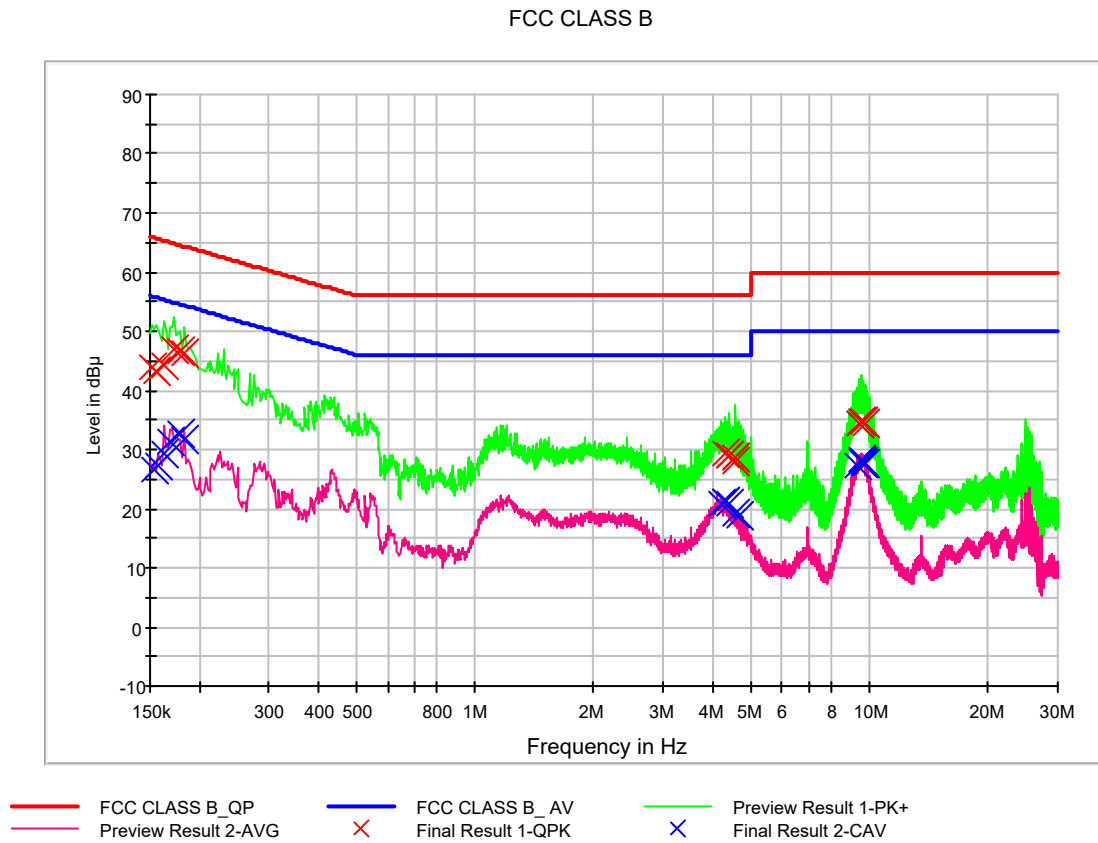
5.1 Conducted Emission

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 MP4 Play Front Camera Preview+ FM Radio (Middle CH) Receiver mode(LTE B5 Middle CH Idle)+Rear Camera Recording Receiver mode(LTE B12+B17 Low CH Idle)+Front Camera Recording
Kind of Test Site	Shielded Room
Temperature	21.3 °C
Relative Humidity	39.6 %
Test Date	February 13, 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)**



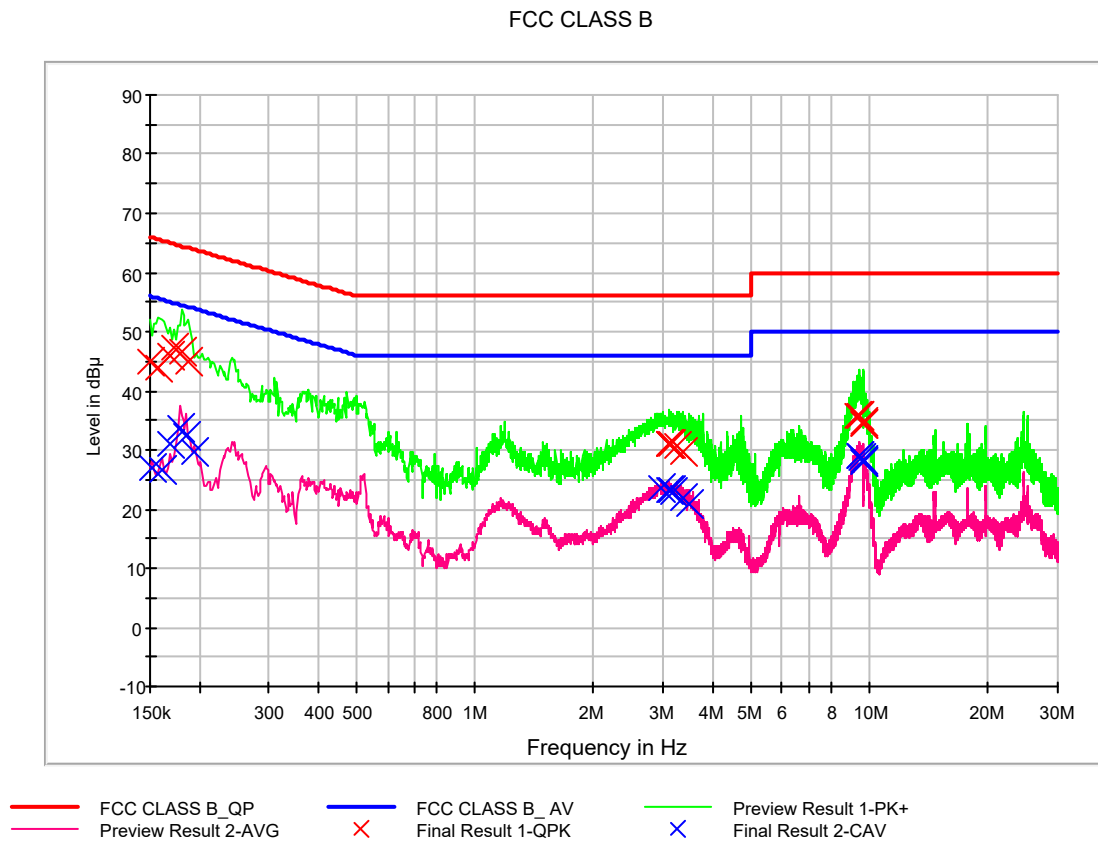
QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	43.9	9.000	L1	9.6	22.0	65.9
0.156000	43.3	9.000	L1	9.6	22.3	65.7
0.162000	44.1	9.000	L1	9.6	21.3	65.4
0.172000	47.0	9.000	L1	9.6	17.8	64.9
0.178000	46.7	9.000	L1	9.6	17.9	64.6
0.184000	46.1	9.000	L1	9.6	18.2	64.3
4.308000	29.4	9.000	L1	9.8	26.6	56.0
4.406000	29.0	9.000	L1	9.8	27.0	56.0
4.422000	28.8	9.000	L1	9.8	27.2	56.0
4.546000	28.8	9.000	L1	9.8	27.2	56.0
4.550000	28.6	9.000	L1	9.8	27.4	56.0
4.576000	28.1	9.000	L1	9.8	27.9	56.0
9.386000	34.3	9.000	L1	10.0	25.7	60.0
9.434000	34.5	9.000	L1	10.0	25.5	60.0
9.488000	34.6	9.000	L1	10.0	25.4	60.0
9.526000	34.6	9.000	L1	10.0	25.4	60.0
9.648000	34.7	9.000	L1	10.0	25.3	60.0
9.734000	34.3	9.000	L1	10.0	25.7	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	26.5	9.000	L1	9.6	29.3	55.8
0.158000	27.2	9.000	L1	9.6	28.4	55.6
0.162000	29.3	9.000	L1	9.6	26.1	55.4
0.168000	31.3	9.000	L1	9.6	23.7	55.1
0.178000	32.6	9.000	L1	9.6	22.0	54.6
0.184000	31.7	9.000	L1	9.6	22.6	54.3
4.222000	21.0	9.000	L1	9.8	25.0	46.0
4.302000	21.2	9.000	L1	9.8	24.8	46.0
4.310000	21.1	9.000	L1	9.8	24.9	46.0
4.406000	20.7	9.000	L1	9.8	25.3	46.0
4.576000	19.2	9.000	L1	9.8	26.8	46.0
4.666000	18.7	9.000	L1	9.8	27.3	46.0
9.336000	27.3	9.000	L1	10.0	22.7	50.0
9.526000	28.0	9.000	L1	10.0	22.0	50.0
9.552000	28.2	9.000	L1	10.0	21.8	50.0
9.648000	28.0	9.000	L1	10.0	22.0	50.0
9.684000	27.8	9.000	L1	10.0	22.2	50.0
9.724000	27.6	9.000	L1	10.0	22.4	50.0

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



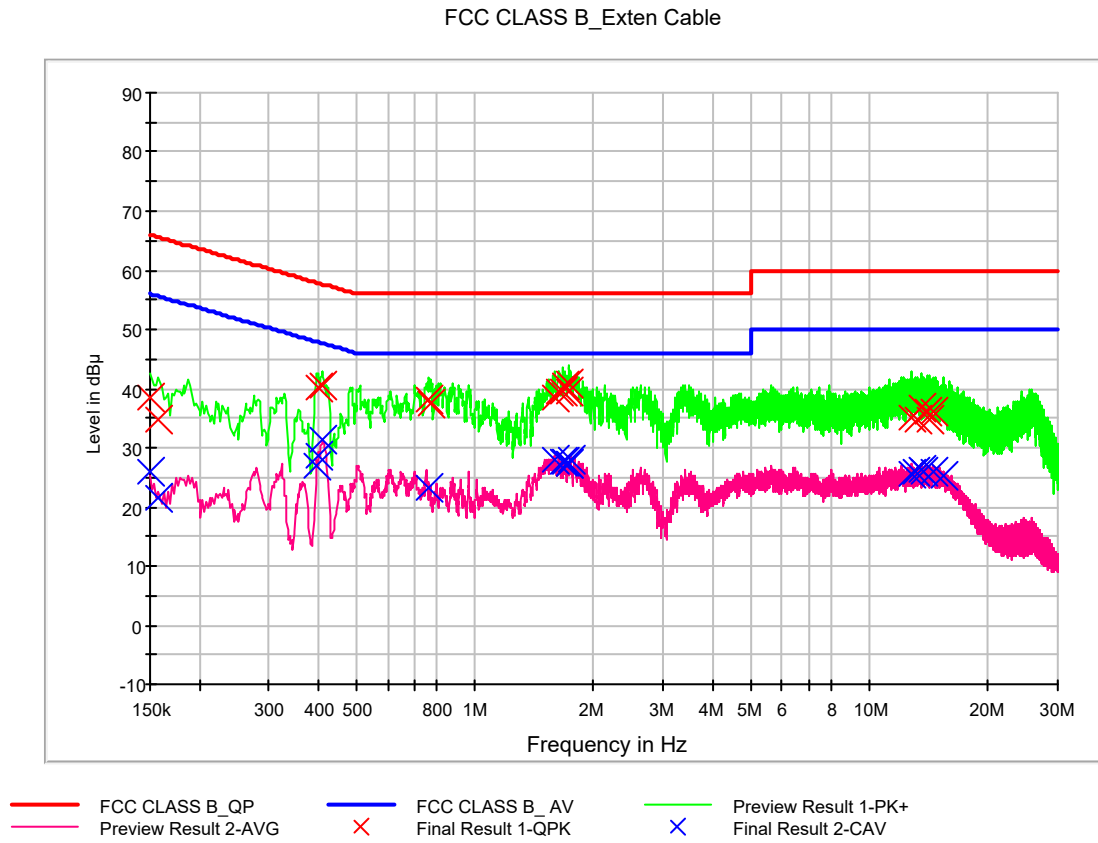
QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	44.8	9.000	N	9.6	21.2	66.0
0.158000	43.8	9.000	N	9.6	21.8	65.6
0.168000	45.9	9.000	N	9.6	19.2	65.1
0.172000	47.2	9.000	N	9.6	17.7	64.9
0.180000	46.5	9.000	N	9.6	18.0	64.5
0.188000	45.1	9.000	N	9.6	19.1	64.1
3.090000	31.1	9.000	N	9.8	24.9	56.0
3.108000	31.1	9.000	N	9.8	24.9	56.0
3.114000	31.1	9.000	N	9.8	24.9	56.0
3.152000	31.0	9.000	N	9.8	25.0	56.0
3.252000	30.6	9.000	N	9.8	25.4	56.0
3.384000	29.5	9.000	N	9.8	26.5	56.0
9.340000	35.8	9.000	N	9.9	24.2	60.0
9.408000	35.6	9.000	N	9.9	24.4	60.0
9.442000	35.6	9.000	N	9.9	24.4	60.0
9.594000	34.7	9.000	N	9.9	25.3	60.0
9.622000	34.5	9.000	N	9.9	25.5	60.0
9.628000	34.5	9.000	N	9.9	25.5	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	26.9	9.000	N	9.6	29.0	55.9
0.160000	26.6	9.000	N	9.6	28.9	55.5
0.168000	30.9	9.000	N	9.6	24.1	55.1
0.178000	33.8	9.000	N	9.6	20.8	54.6
0.186000	32.4	9.000	N	9.6	21.8	54.2
0.194000	29.7	9.000	N	9.6	24.1	53.9
2.964000	23.5	9.000	N	9.8	22.5	46.0
3.108000	23.3	9.000	N	9.8	22.7	46.0
3.152000	23.1	9.000	N	9.8	22.9	46.0
3.168000	22.8	9.000	N	9.8	23.2	46.0
3.384000	21.7	9.000	N	9.8	24.3	46.0
3.484000	20.9	9.000	N	9.8	25.1	46.0
9.398000	28.9	9.000	N	9.9	21.1	50.0
9.408000	28.9	9.000	N	9.9	21.1	50.0
9.520000	28.8	9.000	N	9.9	21.2	50.0
9.594000	28.1	9.000	N	9.9	21.9	50.0
9.622000	28.2	9.000	N	9.9	21.8	50.0
9.630000	28.0	9.000	N	9.9	22.0	50.0

**Figure 3: Conducted Emission, MP4 Play, Line (L1)**



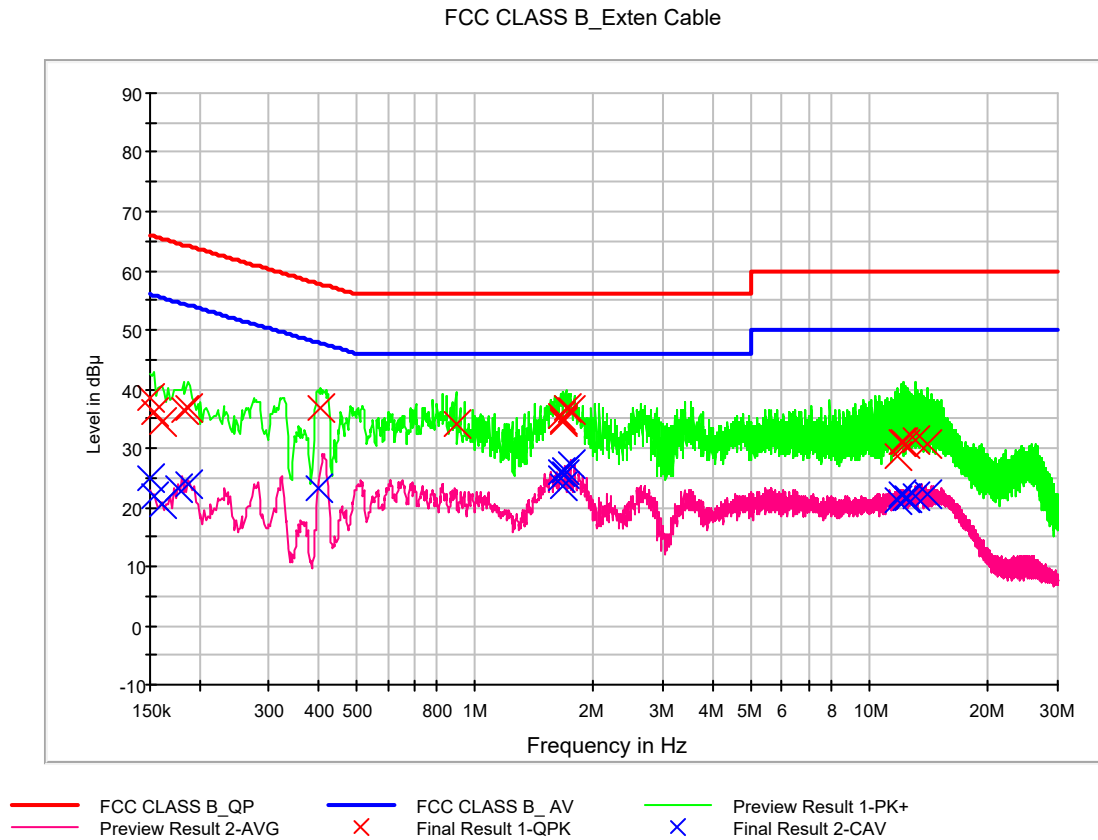
QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.5	9.000	L1	9.7	27.5	66.0
0.158000	34.7	9.000	L1	9.7	30.9	65.6
0.400000	40.0	9.000	L1	9.7	17.8	57.9
0.410000	40.5	9.000	L1	9.7	17.1	57.6
0.766000	38.1	9.000	L1	9.8	17.9	56.0
0.772000	37.6	9.000	L1	9.8	18.4	56.0
1.588000	38.4	9.000	L1	9.9	17.6	56.0
1.634000	39.4	9.000	L1	9.9	16.6	56.0
1.672000	39.4	9.000	L1	9.9	16.6	56.0
1.684000	40.4	9.000	L1	9.9	15.6	56.0
1.730000	40.7	9.000	L1	9.9	15.3	56.0
1.736000	39.5	9.000	L1	9.9	16.5	56.0
12.794000	35.2	9.000	L1	10.3	24.8	60.0
13.274000	34.6	9.000	L1	10.3	25.4	60.0
13.618000	36.6	9.000	L1	10.4	23.4	60.0
14.028000	35.9	9.000	L1	10.4	24.1	60.0
14.116000	34.8	9.000	L1	10.4	25.2	60.0
14.444000	36.2	9.000	L1	10.4	23.8	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	25.9	9.000	L1	9.7	30.1	56.0
0.158000	21.6	9.000	L1	9.7	33.9	55.6
0.398000	26.9	9.000	L1	9.7	21.0	47.9
0.402000	28.7	9.000	L1	9.7	19.1	47.8
0.410000	31.4	9.000	L1	9.7	16.3	47.6
0.766000	23.2	9.000	L1	9.8	22.8	46.0
1.588000	27.8	9.000	L1	9.9	18.2	46.0
1.674000	27.5	9.000	L1	9.9	18.5	46.0
1.684000	27.5	9.000	L1	9.9	18.5	46.0
1.732000	27.4	9.000	L1	9.9	18.6	46.0
1.736000	27.5	9.000	L1	9.9	18.5	46.0
1.740000	28.0	9.000	L1	9.9	18.0	46.0
12.794000	25.7	9.000	L1	10.3	24.3	50.0
13.150000	26.0	9.000	L1	10.3	24.0	50.0
13.618000	26.2	9.000	L1	10.4	23.8	50.0
13.740000	25.9	9.000	L1	10.4	24.1	50.0
14.446000	26.0	9.000	L1	10.4	24.0	50.0
15.322000	25.2	9.000	L1	10.4	24.8	50.0

**Figure 4: Conducted Emission, MP4 Play, Line (N)**



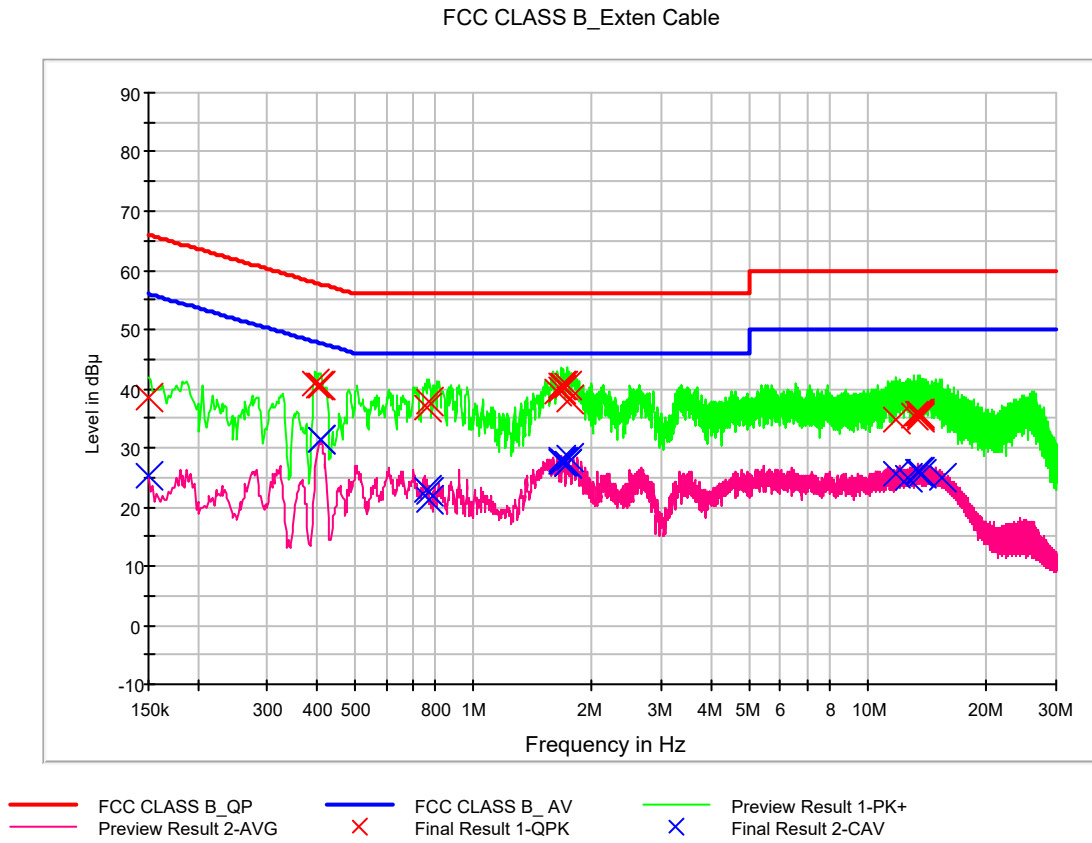
QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.6	9.000	N	9.8	27.4	66.0
0.154000	36.0	9.000	N	9.8	29.8	65.8
0.160000	34.3	9.000	N	9.8	31.2	65.5
0.182000	36.3	9.000	N	9.8	28.1	64.4
0.188000	36.7	9.000	N	9.8	27.4	64.1
0.406000	36.8	9.000	N	9.9	21.0	57.7
0.894000	34.2	9.000	N	10.0	21.8	56.0
1.656000	35.5	9.000	N	10.1	20.5	56.0
1.670000	34.7	9.000	N	10.1	21.3	56.0
1.676000	34.4	9.000	N	10.1	21.6	56.0
1.700000	36.9	9.000	N	10.1	19.1	56.0
1.742000	36.3	9.000	N	10.1	19.7	56.0
11.838000	28.5	9.000	N	10.5	31.5	60.0
11.990000	31.1	9.000	N	10.5	28.9	60.0
12.218000	31.0	9.000	N	10.5	29.0	60.0
12.272000	30.7	9.000	N	10.5	29.3	60.0
13.094000	31.3	9.000	N	10.6	28.7	60.0
13.972000	30.8	9.000	N	10.6	29.2	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	25.0	9.000	N	9.8	31.0	56.0
0.154000	21.9	9.000	N	9.8	33.9	55.8
0.160000	20.4	9.000	N	9.8	35.0	55.5
0.176000	23.3	9.000	N	9.8	31.3	54.7
0.188000	23.8	9.000	N	9.8	30.4	54.1
0.400000	23.2	9.000	N	9.9	24.6	47.9
1.652000	25.8	9.000	N	10.1	20.2	46.0
1.656000	24.9	9.000	N	10.1	21.1	46.0
1.670000	23.7	9.000	N	10.1	22.3	46.0
1.690000	25.5	9.000	N	10.1	20.5	46.0
1.698000	26.4	9.000	N	10.1	19.6	46.0
1.742000	27.3	9.000	N	10.1	18.7	46.0
11.838000	21.2	9.000	N	10.5	28.8	50.0
11.990000	22.0	9.000	N	10.5	28.0	50.0
12.270000	21.5	9.000	N	10.5	28.5	50.0
12.450000	21.7	9.000	N	10.6	28.3	50.0
13.094000	22.0	9.000	N	10.6	28.0	50.0
13.972000	22.1	9.000	N	10.6	27.9	50.0

**Figure 5: Conducted Emission, Front Camera Preview+ FM Radio (Middle CH), Line (L1)**



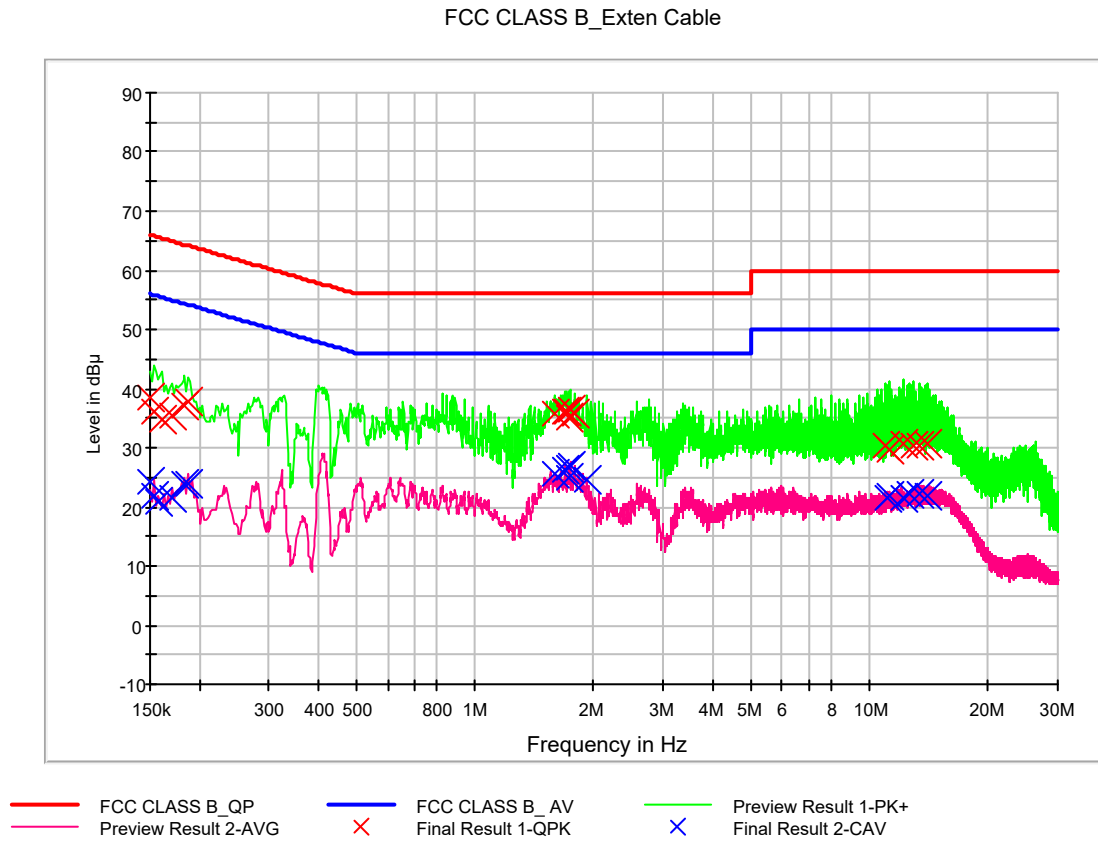
QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.3	9.000	L1	9.7	27.7	66.0
0.398000	41.0	9.000	L1	9.7	16.9	57.9
0.406000	40.5	9.000	L1	9.7	17.2	57.7
0.410000	40.6	9.000	L1	9.7	17.1	57.6
0.762000	36.7	9.000	L1	9.8	19.3	56.0
0.770000	37.9	9.000	L1	9.8	18.1	56.0
1.630000	39.5	9.000	L1	9.9	16.5	56.0
1.672000	39.7	9.000	L1	9.9	16.3	56.0
1.678000	40.6	9.000	L1	9.9	15.4	56.0
1.682000	40.6	9.000	L1	9.9	15.4	56.0
1.732000	40.6	9.000	L1	9.9	15.4	56.0
1.740000	38.3	9.000	L1	9.9	17.7	56.0
11.740000	34.8	9.000	L1	10.3	25.2	60.0
13.142000	35.5	9.000	L1	10.3	24.5	60.0
13.412000	35.8	9.000	L1	10.4	24.2	60.0
13.466000	35.3	9.000	L1	10.4	24.7	60.0
13.552000	35.9	9.000	L1	10.4	24.1	60.0
13.574000	35.0	9.000	L1	10.4	25.0	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	25.3	9.000	L1	9.7	30.7	56.0
0.408000	31.2	9.000	L1	9.7	16.5	47.7
0.412000	31.2	9.000	L1	9.7	16.4	47.6
0.762000	22.7	9.000	L1	9.8	23.3	46.0
0.770000	22.5	9.000	L1	9.8	23.5	46.0
0.774000	21.2	9.000	L1	9.8	24.8	46.0
1.674000	27.6	9.000	L1	9.9	18.4	46.0
1.678000	27.9	9.000	L1	9.9	18.1	46.0
1.682000	27.5	9.000	L1	9.9	18.5	46.0
1.730000	27.2	9.000	L1	9.9	18.8	46.0
1.734000	27.4	9.000	L1	9.9	18.6	46.0
1.740000	28.2	9.000	L1	9.9	17.8	46.0
11.740000	25.7	9.000	L1	10.3	24.3	50.0
12.622000	25.0	9.000	L1	10.3	25.0	50.0
13.410000	25.8	9.000	L1	10.4	24.2	50.0
13.552000	25.8	9.000	L1	10.4	24.2	50.0
13.726000	25.6	9.000	L1	10.4	24.4	50.0
15.342000	25.0	9.000	L1	10.4	25.0	50.0

**Figure 6: Conducted Emission, Front Camera Preview+ FM Radio (Middle CH), Line (N)**



QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.3	9.000	N	9.8	27.7	66.0
0.154000	36.2	9.000	N	9.8	29.6	65.8
0.160000	34.6	9.000	N	9.8	30.8	65.5
0.170000	35.4	9.000	N	9.8	29.6	65.0
0.184000	37.0	9.000	N	9.8	27.3	64.3
0.188000	37.9	9.000	N	9.8	26.2	64.1
1.600000	35.7	9.000	N	10.1	20.3	56.0
1.694000	36.0	9.000	N	10.1	20.0	56.0
1.700000	36.2	9.000	N	10.1	19.8	56.0
1.730000	35.1	9.000	N	10.1	20.9	56.0
1.740000	36.3	9.000	N	10.1	19.7	56.0
1.788000	35.9	9.000	N	10.1	20.1	56.0
10.968000	30.4	9.000	N	10.5	29.6	60.0
11.202000	29.8	9.000	N	10.5	30.2	60.0
12.252000	30.7	9.000	N	10.5	29.3	60.0
12.900000	30.4	9.000	N	10.6	29.6	60.0
13.358000	30.3	9.000	N	10.6	29.7	60.0
13.956000	30.6	9.000	N	10.6	29.4	60.0

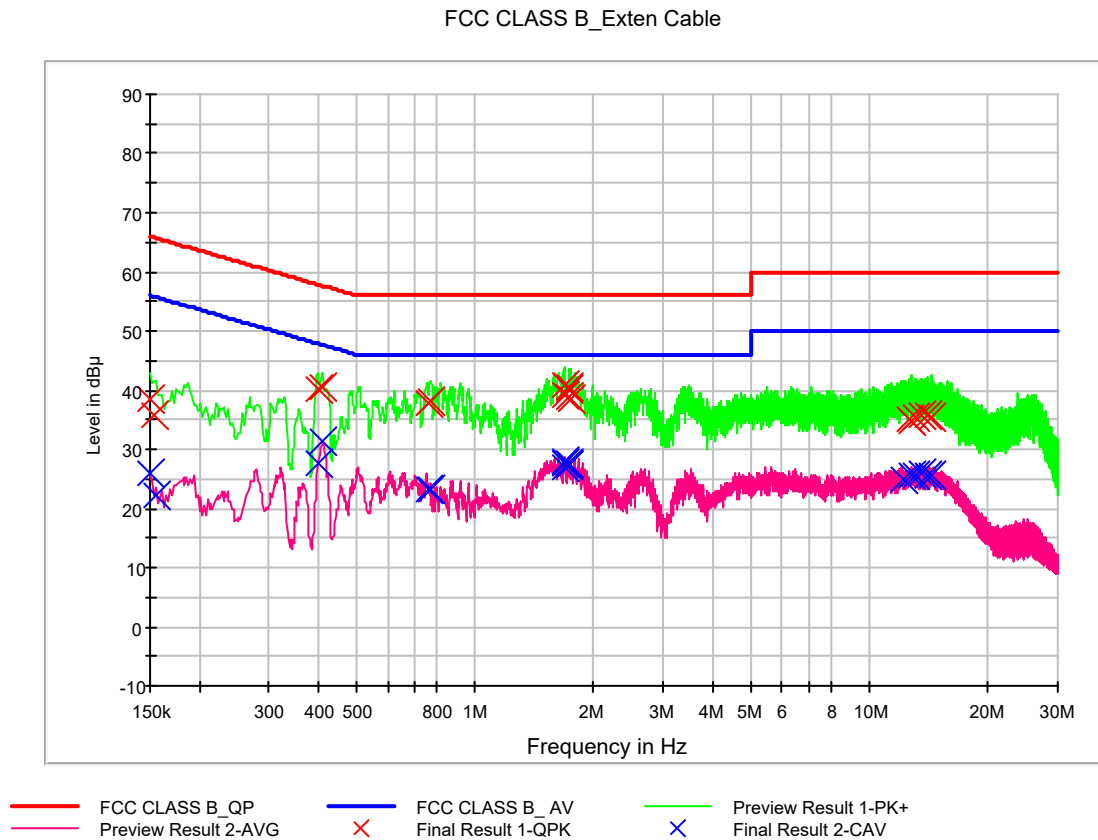


CAverage Final Result, Line (N)

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
0.154000	21.8	9.000	N	9.8	34.0	55.8
0.158000	20.8	9.000	N	9.8	34.8	55.6
0.170000	21.7	9.000	N	9.8	33.3	55.0
0.184000	24.0	9.000	N	9.8	30.3	54.3
0.188000	24.0	9.000	N	9.8	30.1	54.1
1.600000	25.5	9.000	N	10.1	20.5	46.0
1.694000	26.4	9.000	N	10.1	19.6	46.0
1.730000	24.8	9.000	N	10.1	21.2	46.0
1.738000	26.7	9.000	N	10.1	19.3	46.0
1.742000	27.0	9.000	N	10.1	19.0	46.0
1.924000	24.6	9.000	N	10.0	21.4	46.0
11.140000	21.5	9.000	N	10.5	28.5	50.0
11.202000	22.0	9.000	N	10.5	28.0	50.0
12.252000	21.4	9.000	N	10.5	28.6	50.0
12.664000	22.0	9.000	N	10.6	28.0	50.0
13.358000	22.2	9.000	N	10.6	27.8	50.0
13.956000	22.0	9.000	N	10.6	28.0	50.0



Figure 7: Conducted Emission, Receiver mode(LTE B5 Middle CH Idle)+Rear Camera Recording, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.4	9.000	L1	9.7	27.6	66.0
0.154000	35.8	9.000	L1	9.7	29.9	65.8
0.400000	40.1	9.000	L1	9.7	17.8	57.9
0.410000	40.6	9.000	L1	9.7	17.1	57.6
0.766000	37.9	9.000	L1	9.8	18.1	56.0
0.770000	38.0	9.000	L1	9.8	18.0	56.0
1.680000	40.8	9.000	L1	9.9	15.2	56.0
1.688000	39.3	9.000	L1	9.9	16.7	56.0
1.728000	40.4	9.000	L1	9.9	15.6	56.0
1.734000	40.3	9.000	L1	9.9	15.7	56.0
1.738000	38.8	9.000	L1	9.9	17.2	56.0
1.742000	38.4	9.000	L1	9.9	17.6	56.0
12.678000	35.2	9.000	L1	10.3	24.8	60.0
12.778000	34.8	9.000	L1	10.3	25.2	60.0
13.018000	35.5	9.000	L1	10.3	24.5	60.0
13.518000	35.8	9.000	L1	10.4	24.2	60.0
14.030000	35.9	9.000	L1	10.4	24.1	60.0
14.438000	35.4	9.000	L1	10.4	24.6	60.0

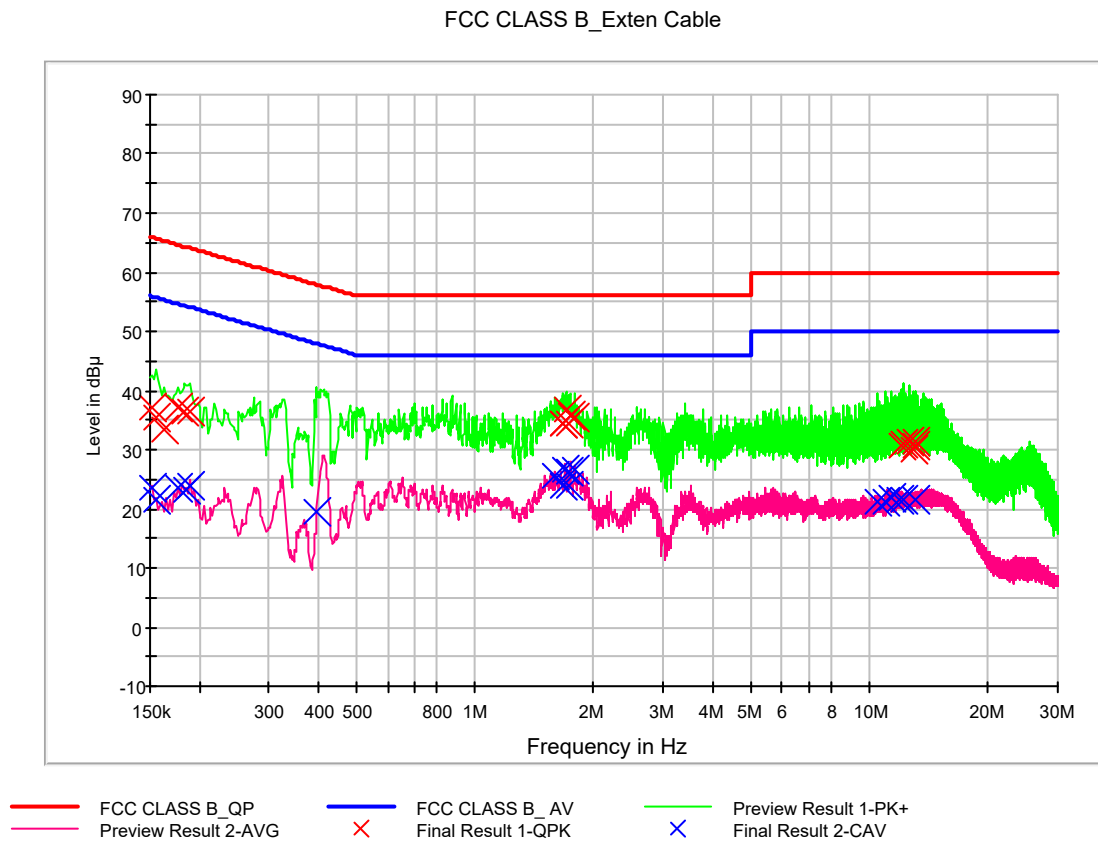


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	26.0	9.000	L1	9.7	30.0	56.0
0.156000	22.2	9.000	L1	9.7	33.5	55.7
0.400000	27.8	9.000	L1	9.7	20.1	47.9
0.410000	31.4	9.000	L1	9.7	16.3	47.6
0.762000	23.1	9.000	L1	9.8	22.9	46.0
0.768000	23.3	9.000	L1	9.8	22.7	46.0
1.680000	28.0	9.000	L1	9.9	18.0	46.0
1.684000	27.6	9.000	L1	9.9	18.4	46.0
1.688000	27.1	9.000	L1	9.9	18.9	46.0
1.728000	27.1	9.000	L1	9.9	18.9	46.0
1.732000	27.5	9.000	L1	9.9	18.5	46.0
1.736000	27.4	9.000	L1	9.9	18.6	46.0
12.148000	25.0	9.000	L1	10.3	25.0	50.0
12.778000	25.5	9.000	L1	10.3	24.5	50.0
13.018000	25.6	9.000	L1	10.3	24.4	50.0
13.518000	25.8	9.000	L1	10.4	24.2	50.0
14.030000	25.6	9.000	L1	10.4	24.4	50.0
14.438000	25.5	9.000	L1	10.4	24.5	50.0



Figure 8: Conducted Emission, Receiver mode(LTE B5 Middle CH Idle)+Rear Camera Recording, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	37.0	9.000	N	9.8	28.9	65.9
0.156000	35.4	9.000	N	9.8	30.3	65.7
0.162000	33.5	9.000	N	9.8	31.8	65.4
0.176000	37.0	9.000	N	9.8	27.7	64.7
0.184000	36.3	9.000	N	9.8	28.0	64.3
0.190000	36.5	9.000	N	9.8	27.5	64.0
1.668000	34.5	9.000	N	10.1	21.5	56.0
1.674000	34.4	9.000	N	10.1	21.6	56.0
1.700000	36.7	9.000	N	10.1	19.3	56.0
1.726000	34.5	9.000	N	10.1	21.5	56.0
1.740000	35.8	9.000	N	10.1	20.2	56.0
1.790000	35.5	9.000	N	10.1	20.5	56.0
12.004000	30.5	9.000	N	10.5	29.5	60.0
12.230000	30.9	9.000	N	10.5	29.1	60.0
12.646000	31.3	9.000	N	10.6	28.7	60.0
12.888000	30.0	9.000	N	10.6	30.0	60.0
13.104000	31.4	9.000	N	10.6	28.6	60.0
13.144000	30.7	9.000	N	10.6	29.3	60.0

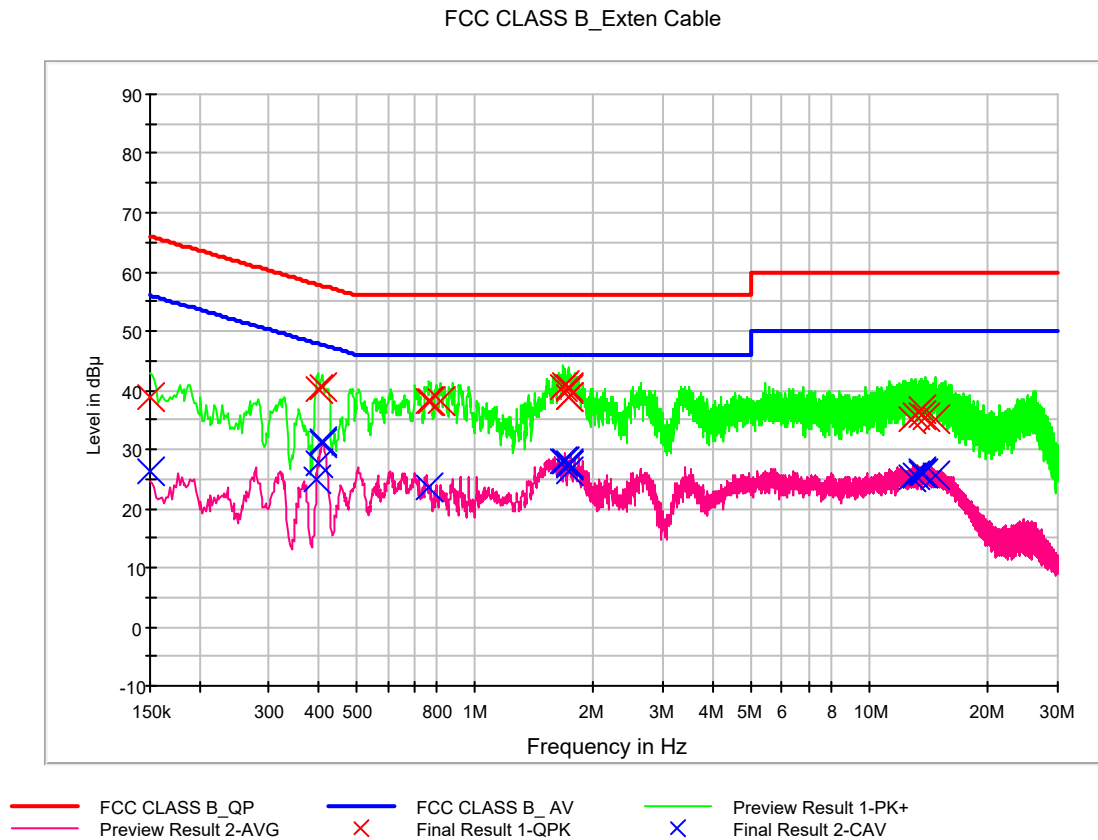


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	23.7	9.000	N	9.8	32.2	55.9
0.156000	21.6	9.000	N	9.8	34.1	55.7
0.176000	23.5	9.000	N	9.8	31.2	54.7
0.186000	23.1	9.000	N	9.8	31.1	54.2
0.190000	23.8	9.000	N	9.8	30.2	54.0
0.396000	19.6	9.000	N	9.9	28.3	47.9
1.602000	25.7	9.000	N	10.1	20.3	46.0
1.674000	23.8	9.000	N	10.1	22.2	46.0
1.698000	26.7	9.000	N	10.1	19.3	46.0
1.726000	23.9	9.000	N	10.1	22.1	46.0
1.738000	26.2	9.000	N	10.1	19.8	46.0
1.790000	26.6	9.000	N	10.1	19.4	46.0
10.528000	21.2	9.000	N	10.5	28.8	50.0
10.940000	21.3	9.000	N	10.5	28.7	50.0
11.402000	21.9	9.000	N	10.5	28.1	50.0
11.860000	21.5	9.000	N	10.5	28.5	50.0
12.230000	21.6	9.000	N	10.5	28.4	50.0
13.052000	21.6	9.000	N	10.6	28.4	50.0



Figure 9: Conducted Emission, Receiver mode(LTE B12+B17 Low 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)
0.150000	38.8	9.000	L1	9.7	27.2	66.0
0.400000	40.2	9.000	L1	9.7	17.7	57.9
0.410000	40.6	9.000	L1	9.7	17.1	57.6
0.766000	38.0	9.000	L1	9.8	18.0	56.0
0.770000	38.3	9.000	L1	9.8	17.7	56.0
0.818000	38.2	9.000	L1	9.8	17.8	56.0
1.678000	40.6	9.000	L1	9.9	15.4	56.0
1.682000	40.8	9.000	L1	9.9	15.2	56.0
1.720000	38.7	9.000	L1	9.9	17.3	56.0
1.728000	40.3	9.000	L1	9.9	15.7	56.0
1.734000	40.5	9.000	L1	9.9	15.5	56.0
1.738000	39.0	9.000	L1	9.9	17.0	56.0
12.822000	35.1	9.000	L1	10.3	24.9	60.0
13.110000	35.6	9.000	L1	10.3	24.4	60.0
13.568000	35.7	9.000	L1	10.4	24.3	60.0
13.576000	36.8	9.000	L1	10.4	23.2	60.0
13.812000	35.6	9.000	L1	10.4	24.4	60.0
14.686000	35.1	9.000	L1	10.4	24.9	60.0

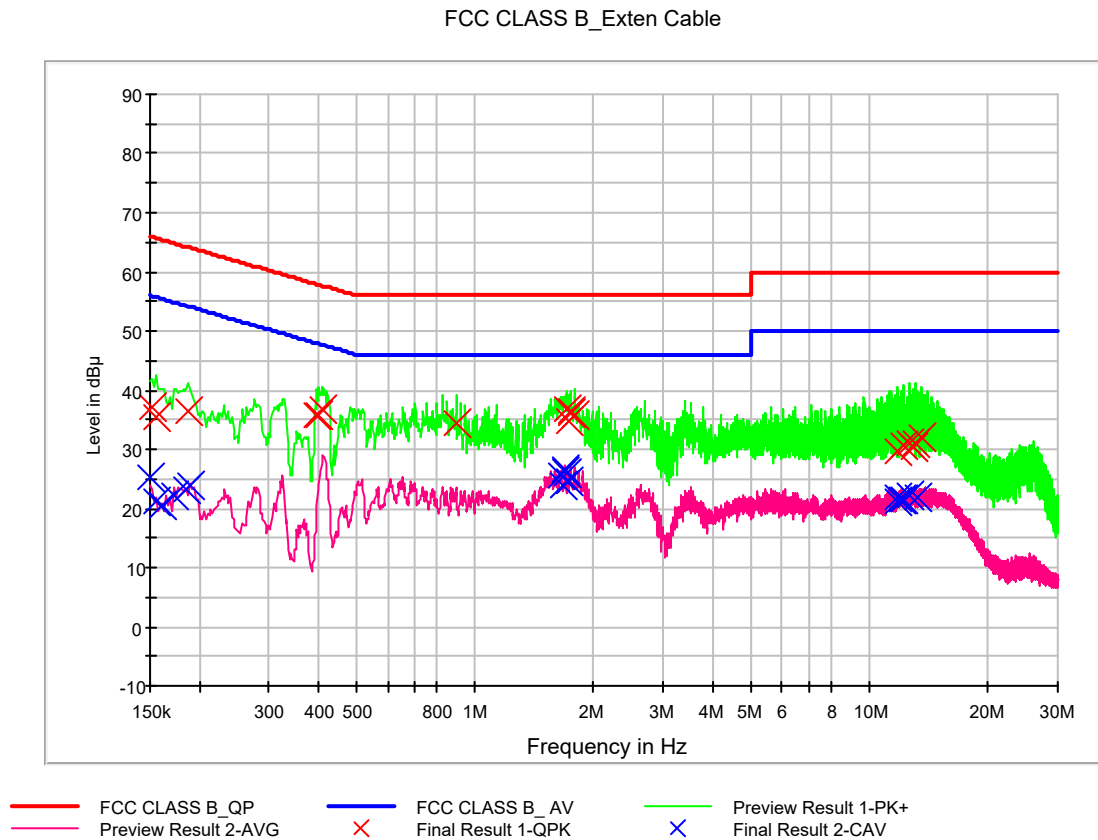


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	26.4	9.000	L1	9.7	29.6	56.0
0.396000	24.9	9.000	L1	9.7	23.0	47.9
0.400000	27.5	9.000	L1	9.7	20.3	47.9
0.408000	30.9	9.000	L1	9.7	16.8	47.7
0.412000	31.2	9.000	L1	9.7	16.4	47.6
0.766000	23.4	9.000	L1	9.8	22.6	46.0
1.678000	28.0	9.000	L1	9.9	18.0	46.0
1.682000	28.0	9.000	L1	9.9	18.0	46.0
1.720000	26.3	9.000	L1	9.9	19.7	46.0
1.730000	27.3	9.000	L1	9.9	18.7	46.0
1.734000	27.5	9.000	L1	9.9	18.6	46.0
1.738000	27.5	9.000	L1	9.9	18.5	46.0
12.822000	25.1	9.000	L1	10.3	24.9	50.0
13.110000	25.7	9.000	L1	10.3	24.4	50.0
13.568000	26.0	9.000	L1	10.4	24.0	50.0
13.576000	26.4	9.000	L1	10.4	23.6	50.0
13.648000	25.8	9.000	L1	10.4	24.2	50.0
14.688000	25.6	9.000	L1	10.4	24.4	50.0



Figure 10: Conducted Emission, Receiver mode(LTE B12+B17 Low 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)
0.152000	37.2	9.000	N	9.8	28.7	65.9
0.156000	35.4	9.000	N	9.8	30.3	65.7
0.188000	36.5	9.000	N	9.8	27.6	64.1
0.398000	35.9	9.000	N	9.9	22.0	57.9
0.402000	35.7	9.000	N	9.9	22.1	57.8
0.410000	36.9	9.000	N	9.9	20.8	57.6
0.896000	34.5	9.000	N	10.0	21.5	56.0
1.702000	36.9	9.000	N	10.1	19.2	56.0
1.732000	34.8	9.000	N	10.1	21.2	56.0
1.742000	36.1	9.000	N	10.1	19.9	56.0
1.746000	36.5	9.000	N	10.1	19.5	56.0
1.790000	35.6	9.000	N	10.1	20.4	56.0
11.810000	29.5	9.000	N	10.5	30.5	60.0
12.230000	30.8	9.000	N	10.5	29.2	60.0
12.688000	31.2	9.000	N	10.6	28.8	60.0
12.884000	30.3	9.000	N	10.6	29.7	60.0
13.100000	31.1	9.000	N	10.6	28.9	60.0
13.520000	32.0	9.000	N	10.6	28.0	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	25.3	9.000	N	9.8	30.7	56.0
0.156000	21.3	9.000	N	9.8	34.3	55.7
0.160000	20.6	9.000	N	9.8	34.8	55.5
0.172000	22.1	9.000	N	9.8	32.8	54.9
0.186000	23.2	9.000	N	9.8	31.0	54.2
0.190000	23.9	9.000	N	9.8	30.1	54.0
1.646000	25.7	9.000	N	10.1	20.3	46.0
1.672000	23.8	9.000	N	10.1	22.2	46.0
1.694000	26.3	9.000	N	10.1	19.7	46.0
1.698000	26.7	9.000	N	10.1	19.3	46.0
1.702000	25.9	9.000	N	10.1	20.1	46.0
1.732000	24.6	9.000	N	10.1	21.4	46.0
11.772000	21.9	9.000	N	10.5	28.2	50.0
11.810000	21.2	9.000	N	10.5	28.8	50.0
12.044000	21.7	9.000	N	10.5	28.3	50.0
12.230000	21.6	9.000	N	10.5	28.4	50.0
12.688000	22.2	9.000	N	10.6	27.8	50.0
13.282000	21.9	9.000	N	10.6	28.1	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 MP4 Play Front Camera Preview+FM Radio (Middle CH) Receiver mode (LTE B5 Middle CH Idle)+Rear Camera Recording Receiver mode (LTE B12+B17 Low CH Idle)+Front Camera Recording
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.5 / 22.3 °C
Relative Humidity	41.6 / 42.2 %
Test Date	February 18 / February 19, 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 (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
53.949600	26.6	100.0	V	255.0	20.1	13.4	40.0
79.308800	28.0	225.1	H	91.0	16.0	12.0	40.0
124.998400	33.3	275.0	H	230.0	18.2	10.2	43.5
276.494400	32.6	100.0	H	311.0	19.7	13.4	46.0
600.004800	38.5	100.0	V	341.0	27.4	7.5	46.0
750.020800	41.1	100.0	H	153.0	30.0	4.9	46.0

MP4 Play

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.121600	30.3	100.0	V	18.0	18.3	9.7	40.0
39.428000	20.8	174.9	V	288.0	19.8	19.2	40.0
66.070400	16.5	325.3	V	89.0	18.7	23.5	40.0
97.624800	16.8	225.1	H	135.0	15.2	26.7	43.5
312.700000	23.1	100.0	H	86.0	20.8	22.9	46.0
914.528800	31.3	225.1	H	30.0	31.4	14.7	46.0

Front Camera Preview+FM Radio (Middle CH)

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.164000	29.8	100.0	V	18.0	18.3	10.2	40.0
66.257600	16.6	175.0	V	324.0	18.7	23.4	40.0
94.707200	17.3	225.2	H	8.0	14.9	26.2	43.5
314.282400	23.7	100.0	H	54.0	20.9	22.3	46.0
474.283200	23.6	274.9	H	36.0	24.8	22.4	46.0
680.237600	28.3	191.8	H	315.0	28.5	17.7	46.0


Receiver mode (LTE B5 Middle CH Idle)+Rear Camera Recording

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.108691	28.6	100.0	V	354.0	18.3	11.4	40.0
42.853600	22.8	100.0	V	131.0	20.1	17.2	40.0
126.772000	16.0	225.1	V	249.0	18.4	27.5	43.5
306.858400	19.0	100.0	V	268.0	20.7	27.0	46.0
494.671200	23.9	175.0	H	305.0	25.1	22.1	46.0
649.381600	27.7	291.9	V	0.0	28.0	18.3	46.0

Receiver mode (LTE B12+B17 Low CH Idle)+Front Camera Recording

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.583200	28.2	100.0	V	73.0	18.3	11.8	40.0
43.700800	23.2	100.0	V	86.0	20.1	16.8	40.0
69.162400	16.2	100.0	V	293.0	18.3	23.8	40.0
152.222400	18.6	274.8	H	295.0	20.0	24.9	43.5
439.190400	22.6	325.1	H	329.0	24.1	23.4	46.0
700.902400	28.6	100.0	H	328.0	28.8	17.4	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	2 690 MHz
Tested Frequency Range	1 GHz to 18 GHz
Worst Case of Operating Mode	Data Communication MP4 Play Front Camera Preview+FM Radio (Middle CH) Receiver mode(LTE B5 Middle CH Idle)+Rear Camera Recording Receiver mode(LTE B12+B17 Low CH Idle)+Front Camera Recording
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.7 / 22.5 °C
Relative Humidity	42.1 / 41.6 %
Test Date	February 14 / February 18, 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)
1400.010000	47.6	199.8	V	237.0	-28.2	26.4	74.0
1997.420000	52.1	100.0	V	45.0	-26.7	21.9	74.0
2793.875000	47.2	198.7	V	19.0	-23.7	26.8	74.0
4481.720000	40.9	150.1	V	12.0	-19.6	33.1	74.0
5978.865000	41.5	100.0	V	117.0	-17.1	32.5	74.0
14804.375000	47.1	250.2	V	21.0	-1.4	26.9	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1400.010000	46.2	199.8	V	237.0	-28.2	7.8	54.0
1997.420000	28.6	100.0	V	45.0	-26.7	25.4	54.0
2793.875000	21.5	198.7	V	19.0	-23.7	32.5	54.0
4481.720000	25.3	150.1	V	12.0	-19.6	28.7	54.0
5978.865000	26.2	100.0	V	117.0	-17.1	27.8	54.0
14804.375000	33.8	250.2	V	21.0	-1.4	20.2	54.0

MP4 Play

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
3097.050000	33.5	125.8	H	95.0	-22.7	40.5	74.0
5613.940000	36.6	125.9	H	89.0	-17.7	37.4	74.0
7328.690000	40.3	113.4	V	52.0	-13.4	33.7	74.0
9857.070000	43.7	199.4	H	277.0	-9.5	30.3	74.0
11374.715000	44.5	149.9	H	233.0	-5.0	29.5	74.0
14967.995000	46.9	138.6	V	192.0	-1.3	27.1	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
3097.050000	21.2	125.8	H	95.0	-22.7	32.8	54.0
5613.940000	24.1	125.9	H	89.0	-17.7	29.9	54.0
7328.690000	27.9	113.4	V	52.0	-13.4	26.1	54.0
9857.070000	30.8	199.4	H	277.0	-9.5	23.2	54.0
11374.715000	32.2	149.9	H	233.0	-5.0	21.8	54.0
14967.995000	34.1	138.6	V	192.0	-1.3	19.9	54.0


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)
2097.280000	31.2	116.7	H	92.0	-26.4	42.8	74.0
5540.370000	36.7	150.2	H	256.0	-17.8	37.3	74.0
7451.325000	42.3	134.0	V	324.0	-12.9	31.7	74.0
9640.025000	44.4	230.8	H	160.0	-9.9	29.6	74.0
11285.330000	45.7	199.7	V	18.0	-5.1	28.3	74.0
14385.820000	46.4	250.2	H	209.0	-1.9	27.6	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2097.280000	18.6	116.7	H	92.0	-26.4	35.4	54.0
5540.370000	23.6	150.2	H	256.0	-17.8	30.4	54.0
7451.325000	28.6	134.0	V	324.0	-12.9	25.4	54.0
9640.025000	31.4	230.8	H	160.0	-9.9	22.6	54.0
11285.330000	33.0	199.7	V	18.0	-5.1	21.0	54.0
14385.820000	33.7	250.2	H	209.0	-1.9	20.3	54.0

Receiver mode(LTE B5 Middle CH Idle)+Rear Camera Recording

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2100.660000	36.1	100.0	H	57.0	-26.4	37.9	74.0
5526.945000	36.3	161.5	H	15.0	-17.8	37.7	74.0
7368.440000	40.8	124.8	H	3.0	-13.2	33.2	74.0
9872.650000	43.4	249.9	V	295.0	-9.5	30.6	74.0
11330.455000	45.3	110.4	H	140.0	-5.1	28.7	74.0
14400.375000	46.1	187.6	H	100.0	-1.9	27.9	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2100.660000	25.9	100.0	H	57.0	-26.4	28.1	54.0
5526.945000	23.6	161.5	H	15.0	-17.8	30.4	54.0
7368.440000	28.1	124.8	H	3.0	-13.2	25.9	54.0
9872.650000	30.8	249.9	V	295.0	-9.5	23.2	54.0
11330.455000	32.7	110.4	H	140.0	-5.1	21.3	54.0
14400.375000	33.6	187.6	H	100.0	-1.9	20.4	54.0



Receiver mode(LTE B12+B17 Low 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)
2099.065000	33.7	113.3	H	68.0	-26.4	40.3	74.0
4971.515000	36.2	125.8	H	255.0	-18.6	37.8	74.0
7441.440000	41.3	149.5	V	12.0	-12.9	32.7	74.0
9330.555000	42.7	100.0	V	261.0	-10.5	31.3	74.0
11606.125000	44.9	150.0	H	204.0	-4.9	29.1	74.0
14765.810000	46.5	199.5	H	12.0	-1.4	27.5	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2099.065000	20.4	113.3	H	68.0	-26.4	33.6	54.0
4971.515000	23.2	125.8	H	255.0	-18.6	30.8	54.0
7441.440000	28.5	149.5	V	12.0	-12.9	25.5	54.0
9330.555000	30.1	100.0	V	261.0	-10.5	23.9	54.0
11606.125000	32.3	150.0	H	204.0	-4.9	21.7	54.0
14765.810000	34.0	199.5	H	12.0	-1.4	20.0	54.0



6. CONCLUSION

The data collected shows that the **EUT Type: Mobile Phone, FCC ID: A3LSMM105M, Model: SM-M105M/DS** complies with §15.107 and §15.109 of the FCC rules.



7. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to Appendix A