

EMI TEST REPORT FCC CERTIFICATION

Applicant:

SAMSUNG Electronics Co., Ltd.
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Date of Issue: November 27, 2018

Test Report No. HCT-EM-1811-FC015

Test Site: HCT CO., LTD.

FCC ID :

A3LSMA920N

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

EUT Type : Smart Phone

Model Name : SM-A920N

Date of Test : November 20, 2018 to November 26, 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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Certification Division

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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-FC015	November 27, 2018	Initial Release



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1. GENERAL INFORMATION

1.1 Description of EUT

Its basic purpose is used for communications.

FCC ID	A3LSMA920N
Model	SM-A920N
EUT Type	Smart Phone
Frequency Band	GSM 1900, WCDMA 850/1700/1900, LTE B4/5/17/26/41, 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-A920N	-	SAMSUNG	A3LSMA920N
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-TA20KWK	-	SOLUM	-
Data Cable	EP-DR140AWE	-	KSD	-
Earphone	EHS64AVFWE	-	ALMUS	-
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	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 (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

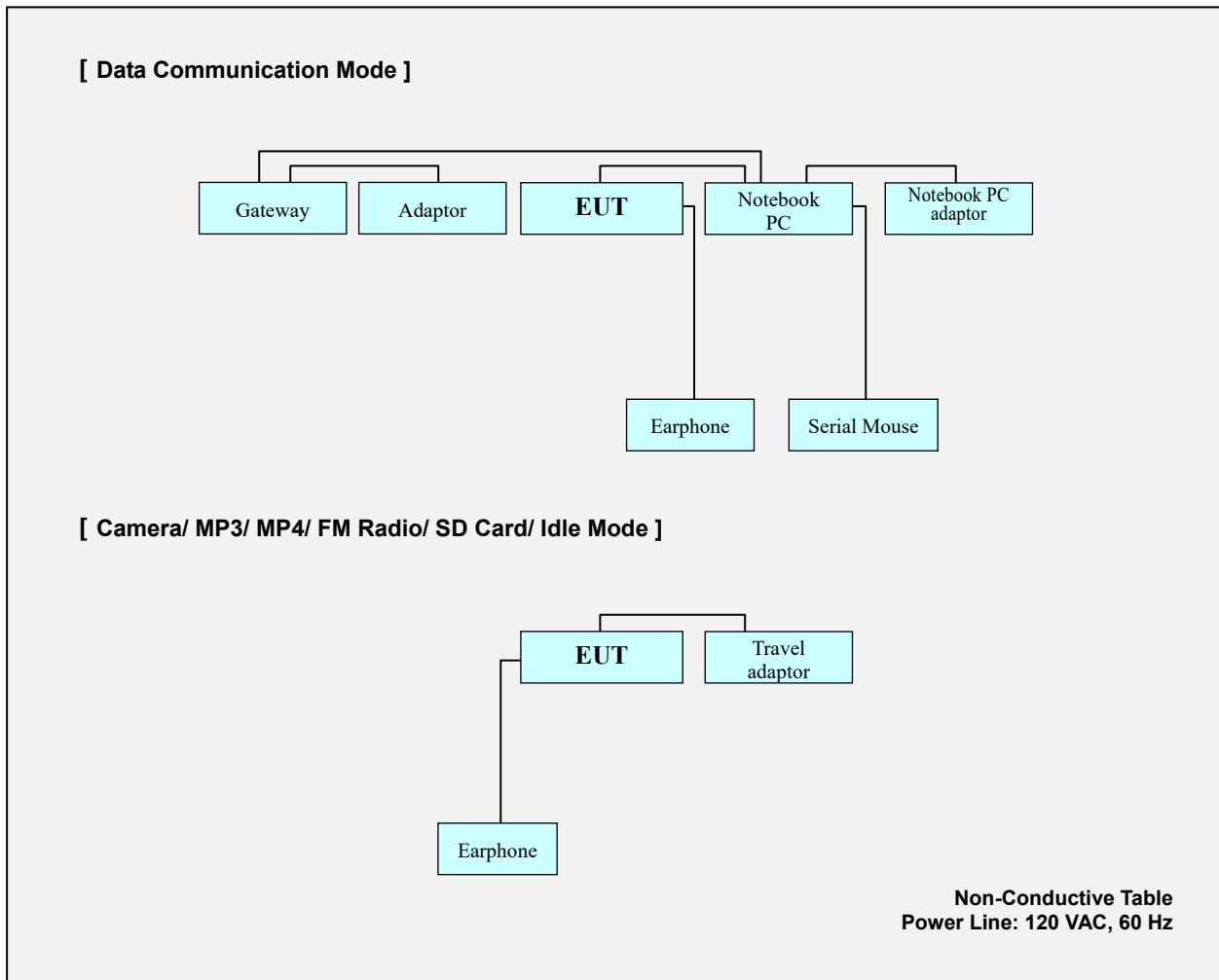


3.2.1 Frequency Range of Radiated Measurements

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





4. OPERATING MODES

4.1 Conducted Emission

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

[EUT & PC]

Data communication mode (READ)

Data communication mode (WRITE)

[EUT & TA]

SD Card (READ) & FM Radio (Low CH)

Rear Camera Preview & MP3

Rear Camera Recording

MP4 Play

SD Card (WRITE) & FM Radio (Middle CH)

Front Camera Preview & FM Radio (High CH)

Front Camera Recording

Idle mode

NOTE. The worst case of operating mode is reported.

4.2 Radiated Emission

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

[EUT & PC]

Data communication mode (READ)

Data communication mode (WRITE)

[EUT & TA]

SD Card (READ) & FM Radio (Low CH)

Rear Camera Preview & MP3

Rear Camera Recording

MP4 Play

SD Card (WRITE) & FM Radio (Middle CH)

Front Camera Preview & FM Radio (High CH)

Front Camera Recording

Idle mode

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:

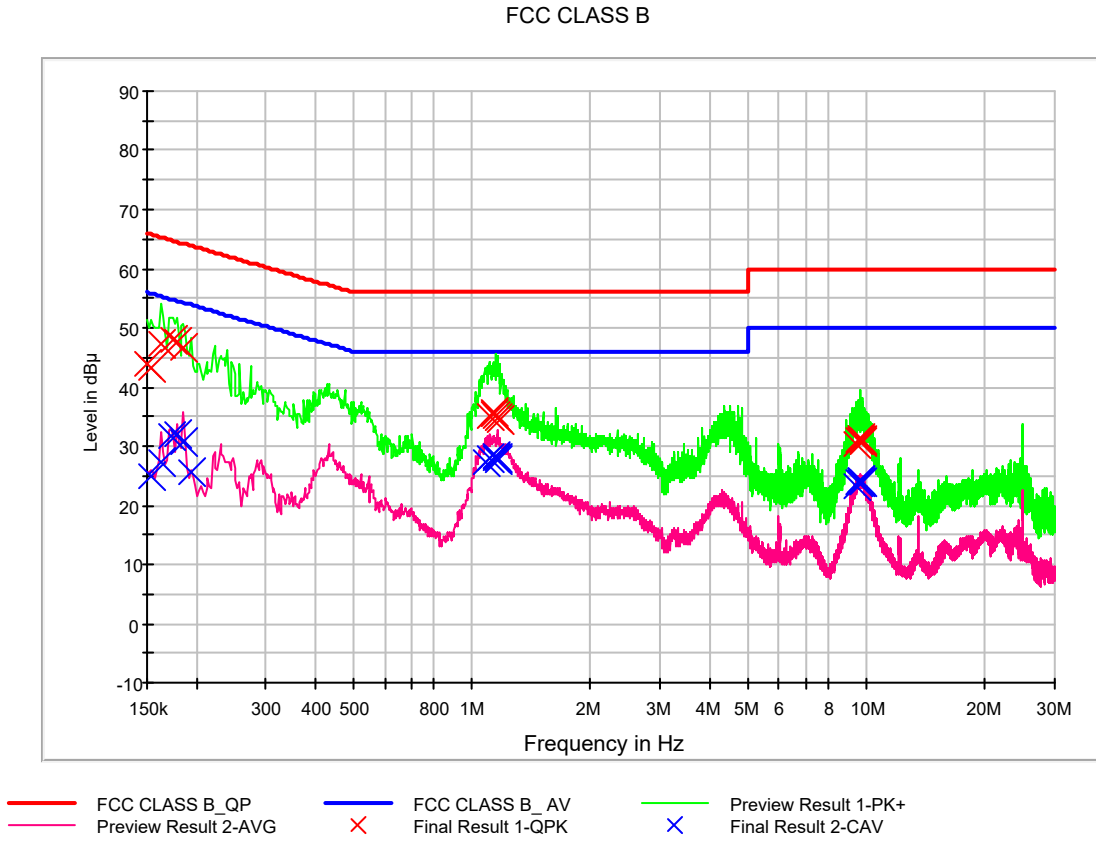
Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Worst Case of Operation Mode	[EUT & PC] Data communication (WRITE) [EUT & TA] Front Camera Preview & FM Radio (High CH)
Kind of Test Site	Shielded Room
Temperature	21.1 °C
Relative Humidity	43.7 %
Test Date	November 26, 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 mode (WRITE), Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	44.0	9.000	L1	9.6	22.0	66.0
0.154000	43.4	9.000	L1	9.6	22.4	65.8
0.162000	47.2	9.000	L1	9.6	18.2	65.4
0.174000	48.1	9.000	L1	9.6	16.7	64.8
0.178000	47.6	9.000	L1	9.6	16.9	64.6
0.186000	46.5	9.000	L1	9.6	17.7	64.2
1.104000	35.1	9.000	L1	9.7	20.9	56.0
1.130000	35.3	9.000	L1	9.7	20.7	56.0
1.134000	35.6	9.000	L1	9.7	20.4	56.0
1.152000	35.2	9.000	L1	9.7	20.8	56.0
1.158000	34.7	9.000	L1	9.7	21.3	56.0
1.172000	34.5	9.000	L1	9.7	21.5	56.0
9.418000	30.3	9.000	L1	10.0	29.7	60.0
9.578000	30.9	9.000	L1	10.0	29.1	60.0
9.626000	31.3	9.000	L1	10.0	28.7	60.0
9.632000	30.9	9.000	L1	10.0	29.1	60.0
9.730000	30.9	9.000	L1	10.0	29.1	60.0
9.802000	30.7	9.000	L1	10.0	29.3	60.0

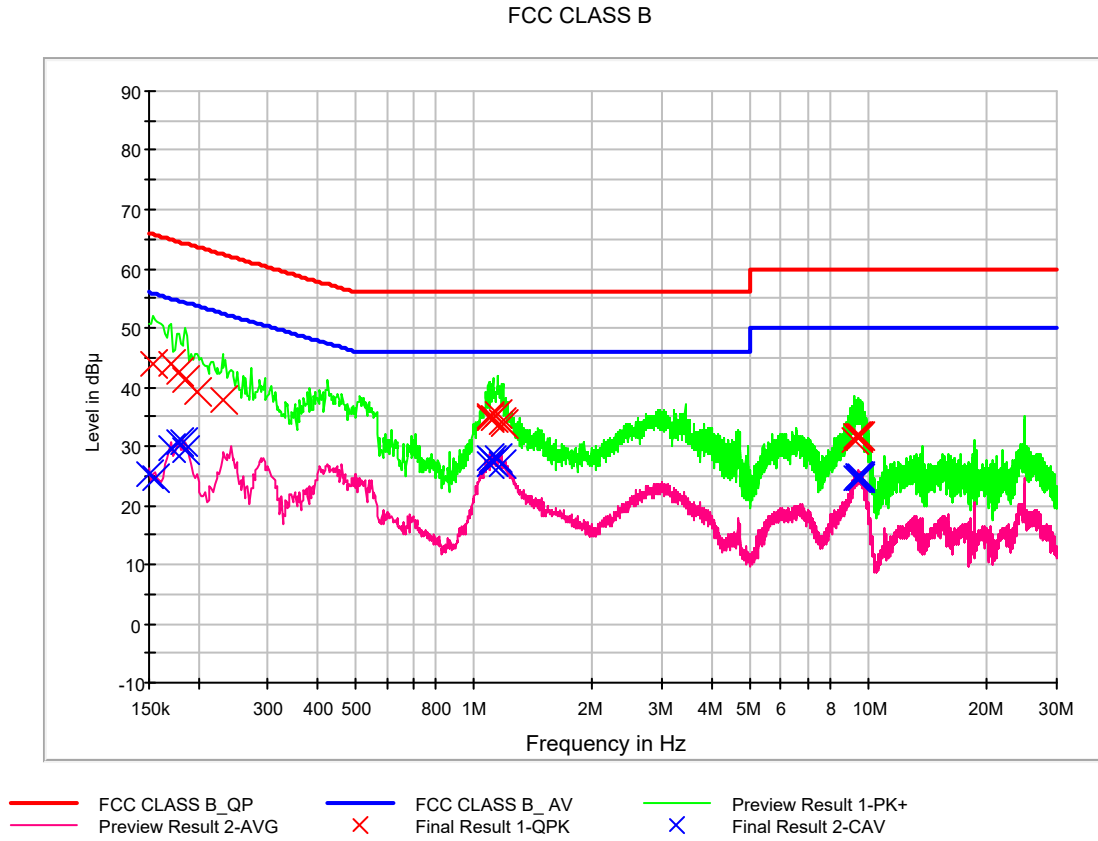


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	25.0	9.000	L1	9.6	30.8	55.8
0.162000	27.4	9.000	L1	9.6	27.9	55.4
0.172000	31.8	9.000	L1	9.6	23.0	54.9
0.178000	32.1	9.000	L1	9.6	22.5	54.6
0.186000	30.6	9.000	L1	9.6	23.6	54.2
0.194000	25.5	9.000	L1	9.6	28.3	53.9
1.078000	27.1	9.000	L1	9.7	18.9	46.0
1.104000	28.0	9.000	L1	9.7	18.0	46.0
1.144000	27.9	9.000	L1	9.7	18.1	46.0
1.152000	28.2	9.000	L1	9.7	17.8	46.0
1.158000	27.5	9.000	L1	9.7	18.5	46.0
1.166000	27.8	9.000	L1	9.7	18.2	46.0
9.418000	23.3	9.000	L1	10.0	26.7	50.0
9.586000	24.0	9.000	L1	10.0	26.0	50.0
9.618000	23.9	9.000	L1	10.0	26.1	50.0
9.626000	24.2	9.000	L1	10.0	25.8	50.0
9.632000	24.1	9.000	L1	10.0	25.9	50.0
9.738000	23.8	9.000	L1	10.0	26.2	50.0



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





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	44.0	9.000	N	9.6	21.8	65.8
0.170000	44.0	9.000	N	9.6	21.0	65.0
0.178000	42.5	9.000	N	9.6	22.1	64.6
0.186000	41.3	9.000	N	9.7	22.9	64.2
0.198000	39.0	9.000	N	9.7	24.7	63.7
0.230000	37.8	9.000	N	9.7	24.6	62.4
1.090000	34.8	9.000	N	9.7	21.2	56.0
1.098000	35.0	9.000	N	9.7	21.0	56.0
1.116000	34.8	9.000	N	9.7	21.2	56.0
1.152000	35.3	9.000	N	9.8	20.7	56.0
1.178000	33.9	9.000	N	9.8	22.1	56.0
1.184000	33.7	9.000	N	9.8	22.3	56.0
9.254000	31.1	9.000	N	10.0	28.9	60.0
9.292000	31.6	9.000	N	10.0	28.4	60.0
9.390000	31.8	9.000	N	10.0	28.2	60.0
9.430000	31.6	9.000	N	10.0	28.4	60.0
9.468000	31.4	9.000	N	10.0	28.6	60.0
9.516000	31.6	9.000	N	10.0	28.4	60.0

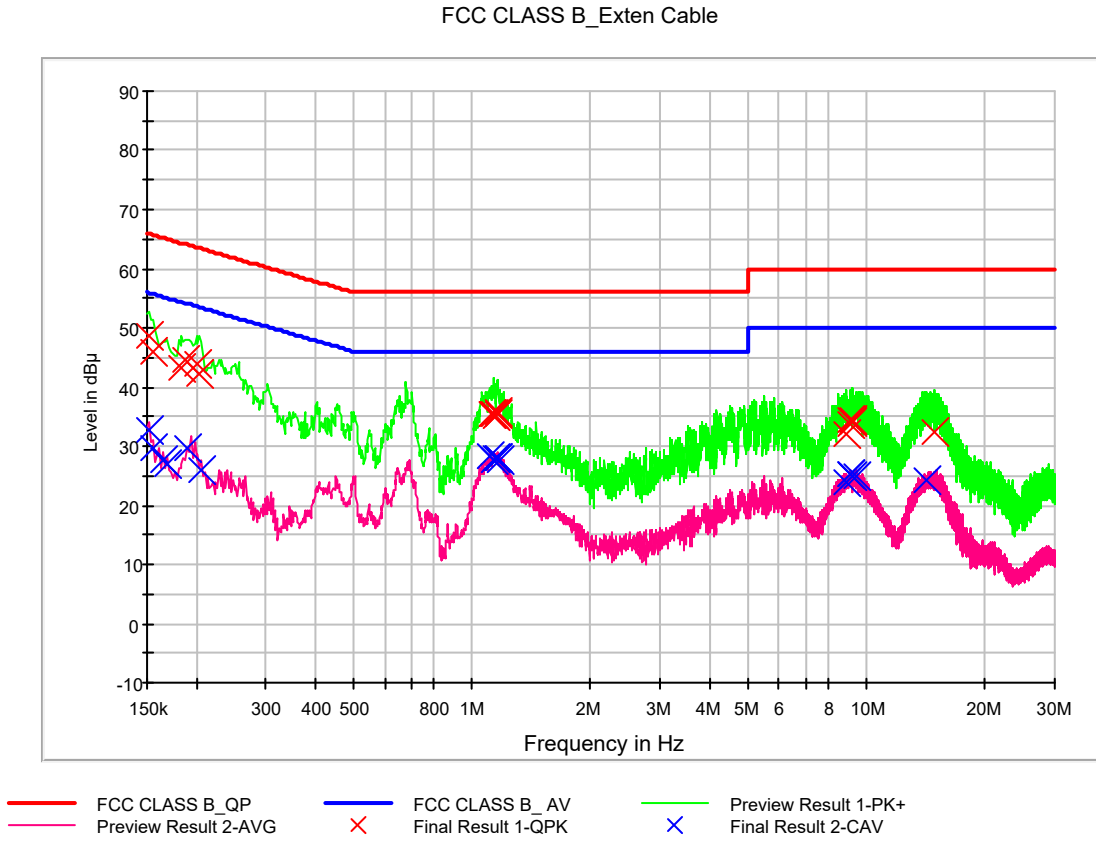


CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	25.1	9.000	N	9.6	30.9	56.0
0.156000	24.7	9.000	N	9.6	31.0	55.7
0.170000	29.6	9.000	N	9.6	25.4	55.0
0.178000	30.8	9.000	N	9.6	23.8	54.6
0.182000	30.8	9.000	N	9.6	23.6	54.4
0.186000	29.3	9.000	N	9.7	24.9	54.2
1.090000	26.9	9.000	N	9.7	19.1	46.0
1.098000	27.9	9.000	N	9.7	18.1	46.0
1.102000	27.6	9.000	N	9.7	18.4	46.0
1.116000	27.3	9.000	N	9.7	18.7	46.0
1.152000	28.0	9.000	N	9.8	18.0	46.0
1.178000	27.1	9.000	N	9.8	18.9	46.0
9.292000	24.4	9.000	N	10.0	25.6	50.0
9.390000	24.7	9.000	N	10.0	25.3	50.0
9.436000	24.8	9.000	N	10.0	25.2	50.0
9.468000	24.8	9.000	N	10.0	25.2	50.0
9.510000	24.7	9.000	N	10.0	25.3	50.0
9.516000	24.8	9.000	N	10.0	25.2	50.0



Figure 3: Conducted Emission, Front Camera Preview & FM Radio (High CH) mode, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	48.8	9.000	L1	9.7	17.1	65.9
0.156000	45.8	9.000	L1	9.7	19.9	65.7
0.184000	43.1	9.000	L1	9.7	21.2	64.3
0.188000	44.7	9.000	L1	9.7	19.4	64.1
0.200000	43.9	9.000	L1	9.7	19.8	63.6
0.204000	42.3	9.000	L1	9.7	21.1	63.4
1.116000	35.5	9.000	L1	9.8	20.5	56.0
1.126000	35.4	9.000	L1	9.8	20.6	56.0
1.132000	35.3	9.000	L1	9.8	20.7	56.0
1.142000	35.1	9.000	L1	9.8	20.9	56.0
1.156000	35.5	9.000	L1	9.8	20.5	56.0
1.162000	35.7	9.000	L1	9.8	20.3	56.0
8.882000	32.1	9.000	L1	10.1	27.9	60.0
9.110000	33.8	9.000	L1	10.1	26.2	60.0
9.118000	34.4	9.000	L1	10.1	25.6	60.0
9.170000	34.4	9.000	L1	10.1	25.6	60.0
9.174000	34.1	9.000	L1	10.1	25.9	60.0
14.844000	32.4	9.000	L1	10.3	27.6	60.0

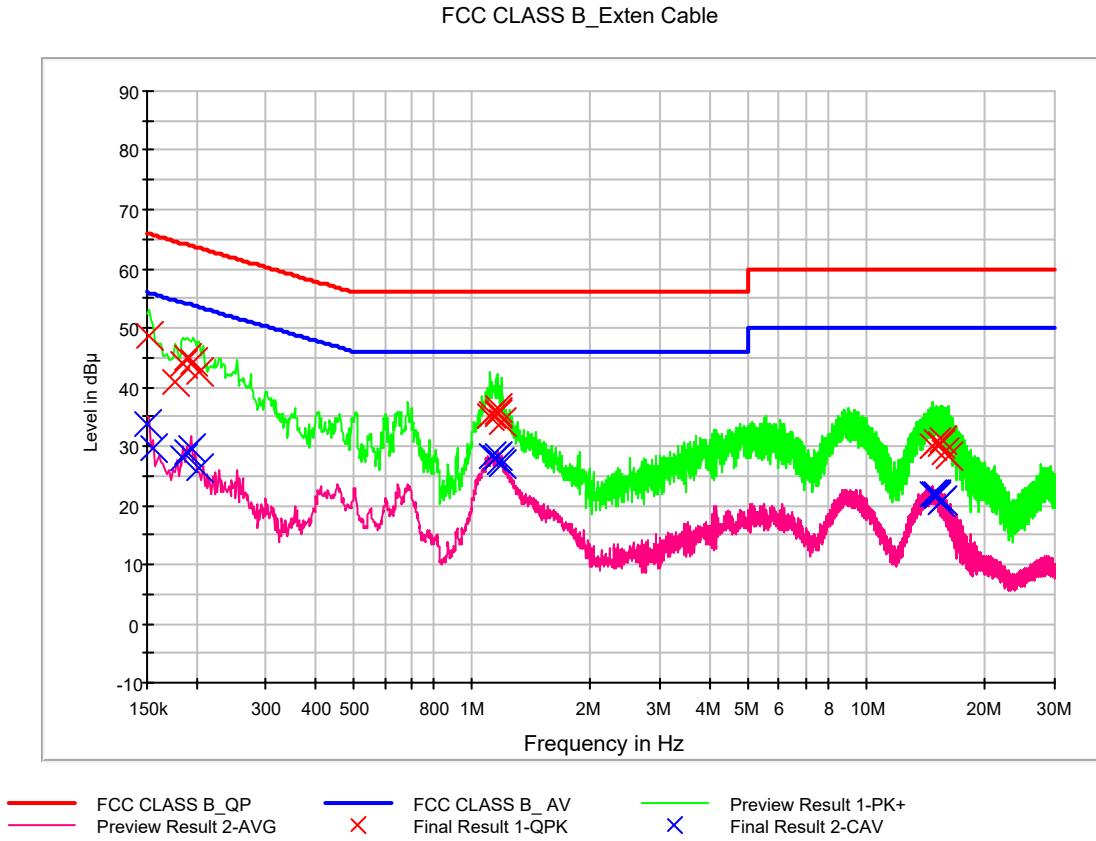


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	32.6	9.000	L1	9.7	23.2	55.9
0.156000	29.6	9.000	L1	9.7	26.0	55.7
0.164000	27.6	9.000	L1	9.7	27.7	55.3
0.168000	27.0	9.000	L1	9.7	28.1	55.1
0.190000	29.6	9.000	L1	9.7	24.4	54.0
0.206000	25.8	9.000	L1	9.7	27.5	53.4
1.114000	28.2	9.000	L1	9.8	17.8	46.0
1.132000	27.5	9.000	L1	9.8	18.5	46.0
1.142000	27.9	9.000	L1	9.8	18.1	46.0
1.156000	28.0	9.000	L1	9.8	18.0	46.0
1.164000	28.0	9.000	L1	9.8	18.0	46.0
1.174000	27.7	9.000	L1	9.8	18.3	46.0
8.882000	23.9	9.000	L1	10.1	26.1	50.0
9.110000	25.2	9.000	L1	10.1	24.8	50.0
9.114000	25.2	9.000	L1	10.1	24.8	50.0
9.166000	24.8	9.000	L1	10.1	25.2	50.0
9.418000	24.8	9.000	L1	10.1	25.2	50.0
14.240000	24.2	9.000	L1	10.3	25.8	50.0



Figure 4: Conducted Emission, Front Camera Preview & FM Radio (High CH) mode, Line (N)




QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	48.7	9.000	N	9.7	17.2	65.9
0.176000	40.8	9.000	N	9.7	23.9	64.7
0.186000	44.0	9.000	N	9.7	20.2	64.2
0.190000	44.8	9.000	N	9.7	19.2	64.0
0.196000	44.3	9.000	N	9.7	19.4	63.8
0.204000	42.6	9.000	N	9.7	20.9	63.4
1.114000	35.2	9.000	N	9.8	20.8	56.0
1.118000	35.4	9.000	N	9.8	20.6	56.0
1.156000	35.3	9.000	N	9.8	20.7	56.0
1.162000	36.3	9.000	N	9.8	19.7	56.0
1.168000	35.6	9.000	N	9.8	20.4	56.0
1.192000	33.9	9.000	N	9.8	22.1	56.0
14.620000	30.1	9.000	N	10.5	29.9	60.0
14.994000	30.6	9.000	N	10.5	29.4	60.0
15.430000	30.4	9.000	N	10.5	29.6	60.0
15.506000	31.0	9.000	N	10.5	29.0	60.0
15.832000	29.0	9.000	N	10.5	31.0	60.0
16.088000	28.3	9.000	N	10.5	31.7	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	33.9	9.000	N	9.7	22.1	56.0
0.156000	29.5	9.000	N	9.7	26.2	55.7
0.186000	27.8	9.000	N	9.7	26.4	54.2
0.190000	29.1	9.000	N	9.7	24.9	54.0
0.194000	29.6	9.000	N	9.7	24.2	53.9
0.204000	26.1	9.000	N	9.7	27.3	53.4
1.120000	28.2	9.000	N	9.8	17.8	46.0
1.144000	27.8	9.000	N	9.8	18.2	46.0
1.154000	28.1	9.000	N	9.8	17.9	46.0
1.162000	28.3	9.000	N	9.8	17.7	46.0
1.178000	27.4	9.000	N	9.8	18.6	46.0
1.192000	27.0	9.000	N	9.8	19.0	46.0
14.776000	21.9	9.000	N	10.5	28.1	50.0
14.824000	21.8	9.000	N	10.5	28.2	50.0
14.960000	21.6	9.000	N	10.5	28.4	50.0
14.994000	21.7	9.000	N	10.5	28.3	50.0
15.360000	20.6	9.000	N	10.5	29.4	50.0
15.634000	20.8	9.000	N	10.5	29.2	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 Operation Mode	[EUT & PC] Data communication (WRITE) [EUT & TA] Front Camera Preview & FM Radio (High CH)
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.0-23.2 °C
Relative Humidity	41.1-42.8 %
Test Date	November 20, 2018 - November 23, 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 (WRITE) 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)
30.808435	27.5	100.0	V	141.0	18.8	12.5	40.0
74.392000	21.3	116.8	V	345.0	17.0	18.7	40.0
133.242400	31.6	225.2	H	286.0	19.0	11.9	43.5
265.584000	33.4	125.0	H	153.0	19.4	12.6	46.0
593.533600	42.8	100.0	H	7.0	27.3	3.2	46.0
800.005600	38.7	100.0	H	60.0	30.2	7.3	46.0

Front Camera Preview & FM Radio (High CH) 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)
41.198400	20.4	174.7	V	31.0	19.7	19.6	40.0
58.856000	26.1	100.0	V	25.0	19.8	13.9	40.0
91.190400	28.6	191.8	H	342.0	14.5	14.9	43.5
106.503200	21.2	117.8	V	34.0	16.3	22.3	43.5
499.480800	40.2	225.3	H	48.0	25.2	5.8	46.0
802.360000	30.3	100.0	V	332.0	30.3	15.7	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 Operation Mode	[EUT & PC] Data communication (WRITE) [EUT & TA] Front Camera Preview & FM Radio (High CH)
Kind of Test Site	3 m semi anechoic chamber
Temperature	21.0-23.2 °C
Relative Humidity	41.1-42.8 %
Test Date	November 21, 2018 - November 23, 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



[EUT & PC] Data communication (WRITE) mode

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1400.025000	48.3	307.5	H	183.0	-28.2	25.7	74.0
1996.710000	50.2	100.0	V	51.0	-26.7	23.8	74.0
2399.595000	44.9	290.5	V	45.0	-25.3	29.1	74.0
4481.590000	45.0	189.6	V	0.0	-19.6	29.0	74.0
5986.270000	44.7	100.0	V	106.0	-17.1	29.3	74.0
9160.310000	43.3	307.4	V	269.0	-10.9	30.7	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1400.025000	47.1	307.5	H	183.0	-28.2	6.9	54.0
1996.710000	20.6	100.0	V	51.0	-26.7	33.4	54.0
2399.595000	22.2	290.5	V	45.0	-25.3	32.8	54.0
4481.590000	27.7	189.6	V	0.0	-19.6	26.3	54.0
5986.270000	27.7	100.0	V	106.0	-17.1	26.3	54.0
9160.310000	30.7	307.4	V	269.0	-10.9	23.3	54.0

Front Camera Preview & FM Radio (High CH) mode

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1292.110000	33.6	299.5	V	167.0	-28.6	40.4	74.0
3020.570000	34.0	199.6	V	142.0	-22.8	40.0	74.0
6532.180000	39.1	393.6	V	264.0	-15.0	34.9	74.0
7751.755000	41.7	150.0	V	230.0	-12.5	32.3	74.0
8835.755000	42.7	150.0	V	227.0	-11.8	31.3	74.0
9904.735000	43.4	395.6	V	134.0	-9.5	30.6	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1292.110000	17.8	299.5	V	167.0	-28.6	36.2	54.0
3020.570000	21.0	199.6	V	142.0	-22.8	33.0	54.0
6532.180000	26.2	393.6	V	264.0	-15.0	27.8	54.0
7751.755000	28.7	150.0	V	230.0	-12.5	25.3	54.0
8835.755000	29.5	150.0	V	227.0	-11.8	24.5	54.0
9904.735000	30.9	395.6	V	134.0	-9.5	23.1	54.0



6. CONCLUSION

The data collected shows that the **EUT Type: Smart Phone, FCC ID: A3LSMA920N, Model: SM-A920N** complies with §15.107 and §15.109 of the FCC rules.



7. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to Appendix A