

EMI TEST REPORT

FCC CERTIFICATION

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

Date of Issue: April 30, 2019
Test Report No. HCT-EM-1904-FC030
Test Site: HCT CO., LTD.

FCC ID:

A3LSMV310

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

Model : SM-V310

EUT Type : AI Speaker

Manufacturer : SAMSUNG Electronics Co., Ltd.

Date of Test : April 02, 2019 to April 08, 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.

Test Report No.	Issue Date	Description
HCT-EM-1904-FC030	April 30, 2019	Initial Release



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1. GENERAL INFORMATION

1.1 Description of EUT

The EUT is AI Speaker

FCC ID	A3LSMV310
Model	SM-V310
EUT type	AI Speaker
Frequency band	WiFi: 2 412 MHz to 2 462 MHz Bluetooth: 2 402 MHz to 2 480 MHz
Power voltage	9 VDC, 1.67 A
Manufacturer	SAMSUNG Electronics Co., Ltd.

1.2 Tested System Details

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

Equipment	Model No.	Serial Number	Manufacturer
EUT	SM-V310	-	SAMSUNG
TA	EP-TA200		SOLUM VINA COMPANY
Notebook PC	SEC-NT35OXAA	OWRX91AK900582Y	SAMSUNG
Notebook PC Adaptor	PA-1400-96	-	LITE-ON TECHNOLOGY (CHANGZHOU)
Gateway	TL-WR747N	-	TP Link
Gateway Adaptor	T090060-2H1	-	TP Link
Mouse	AA-SM7PCP	CN57BA5903634BDV8JK 7B5029	Acrox
RJ45 cable	-	-	-



1.3 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	USB	N	N	(D),(P) 1.2
TA	AC IN	N	N/A	-
Notebook PC	USB	N/A	N	(D) 1.2
	RJ 45	N/A	N	(D) 1.6
	Mouse	N/A	Y	(D) 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	N/A	N/A	Y	Both end
TA	AC IN	N/A	N/A	Y	TA end
Notebook PC	USB	N/A	N/A	Y	Both end
	RJ 45	N/A	N/A	Y	Both end
	Mouse	N/A	N/A	Y	Both end
	DC IN	Y	Notebook PC end	Y	Both 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 1GHz) and Site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014

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

1.6 Instrument Calibration

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's, 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
3 m Radiated Emissions (30 MHz to 1 GHz)	5.20 dB
3 m Radiated Emissions (1 GHz to 18 GHz)	5.24 dB
3 m Radiated Emissions (18 GHz to 40 GHz)	5.40 dB



2 LIST OF TEST EQUIPMENT

Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	CAL Date
<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
☒ 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
☐ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	10.31.2018
☒ Trilog Antenna	Schwarzbeck	VULB 9168	760	2 year	03.22.2019
☐ Trilog Antenna	Schwarzbeck	VULB 9168	255	2 year	03.26.2019
☐ Trilog Antenna	Schwarzbeck	VULB 9168	847	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	1060-2M	-	N/A	-
☒ Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
☐ Turn Table	INNCO Systems	-	-	N/A	-
☐ Low Noise Amplifier	TESTEK	TK-PA01S	160014-L	1 year	01.21.2019
☐ EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	08.14.2018
☐ EMI Test Receiver	Rohde & Schwarz	ESU40	100361	1 year	10.11.2018
☒ Software	Rohde & Schwarz	EMC32 VER.9.20.00	-	-	-
-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	CO 3000	CO 3000/870/ 35990515/L	N/A	-
☒ Turn Table	INNCO Systems	1060-2M	-	N/A	-
☒ Turn Table controller	INNCO Systems	CO2000	CO2000/095/ 5790304/L	N/A	-
☐ Horn Antenna	Schwarzbeck	BBHA 9120D	847	2 year	04.13.2018
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	01836	2 year	07.20.2018
☒ Low Noise Amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.04.2019
☐ Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.17.2018
☐ Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170#786	2 year	12.05.2017
☐ Antenna master	HD GmbH	MA240	240/520	N/A	-
☐ EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	08.14.2018
☐ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☒ Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-



3. DESCRIPTION OF TEST

3.1 Measurement of Conducted Emission

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

- 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 Limit]

Frequency (MHz)	Resolution Bandwidth (kHz)	Class A		Class B	
		Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)
0.15 to 0.5	9	79	66	66 to 56*	56 to 46*
0.5 to 5	9	73	60	56	46
5 to 30	9	73	60	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

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

[Radiated Emission Limits]

Frequency (MHz)	Class A			Class B		
	Antenna Distance (m)	Field Strength (μ V/m)	Quasi-Peak (dB μ V/m)	Antenna Distance (m)	Field Strength (μ V/m)	Quasi-Peak (dB μ V/m)
30 to 88	10	90	39.0	3	100	40.0
88 to 216	10	150	43.5	3	150	43.5
216 to 960	10	210	46.4	3	200	46.0
Above 960	10	300	49.5	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Class A		Class B		
		Peak (dB μ V/m)	Average (dB μ V/m)	Peak (dB μ V/m)	Average (dB μ V/m)	
Above 1 000	3	80	60	74	54	

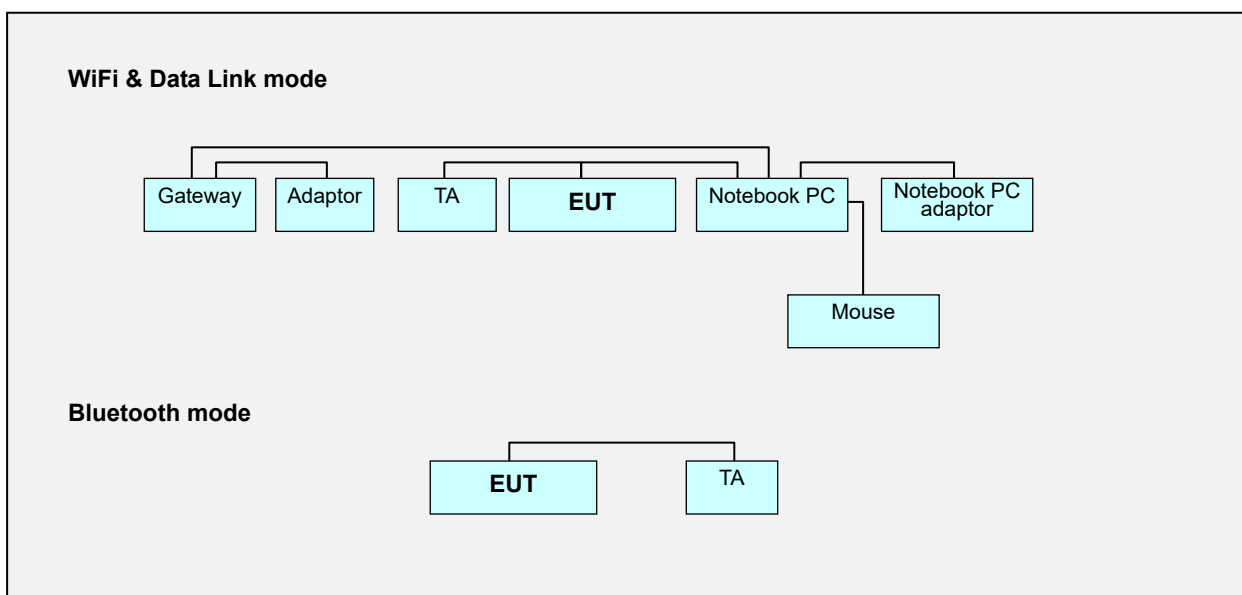


3.2.1 Frequency Range of Radiated Measurements

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

4.1 Conducted Emission

During preliminary tests, the following operating mode was investigated:

Operation Mode: Bluetooth mode
WiFi (2.4 GHz) IDLE+DATA LINK mode

4.2 Radiated Emission

During preliminary tests, the following operating mode was investigated:

Operation Mode: Bluetooth mode
WiFi (2.4 GHz) IDLE+DATA LINK mode



5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

5.1 Conducted Emission

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

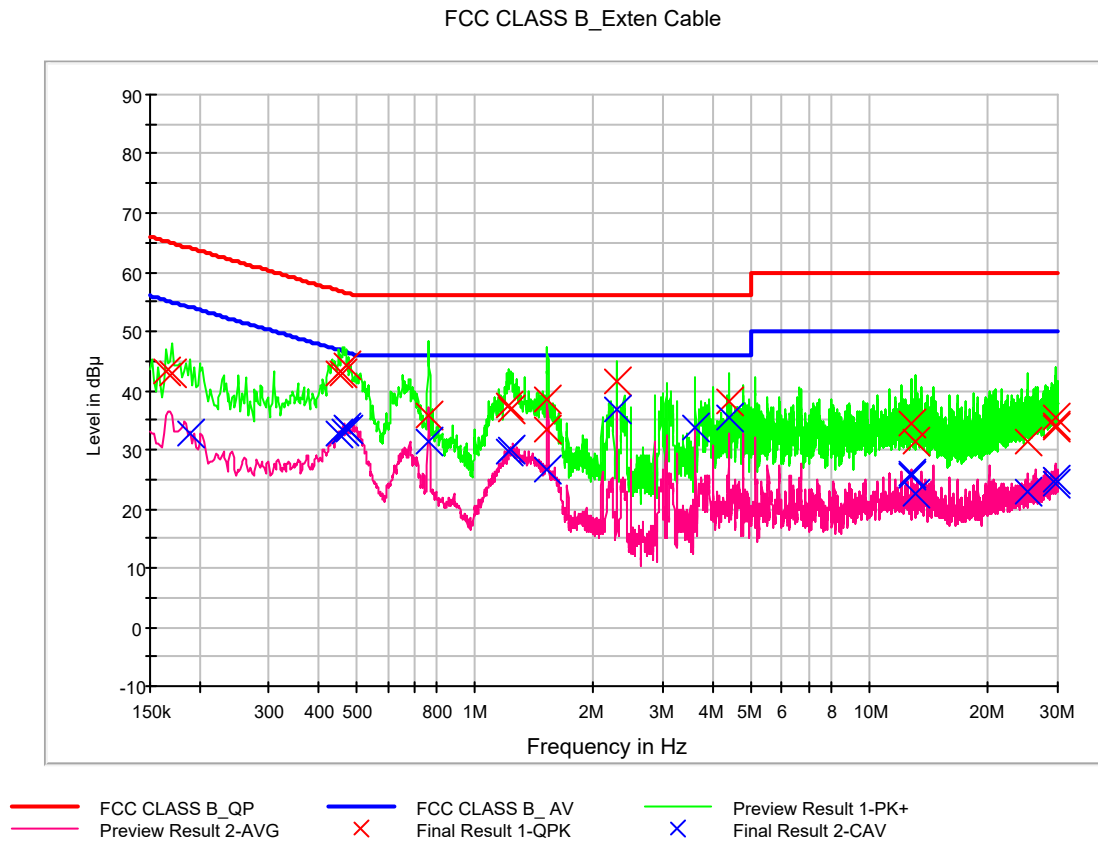
Applicable Standards	FCC PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Kind of Test Site	Shielded Room
Temperature	20.7 °C
Relative Humidity	43.2 %
Test Date	April 02, 2019

- 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, Bluetooth Mode, Line (L1)



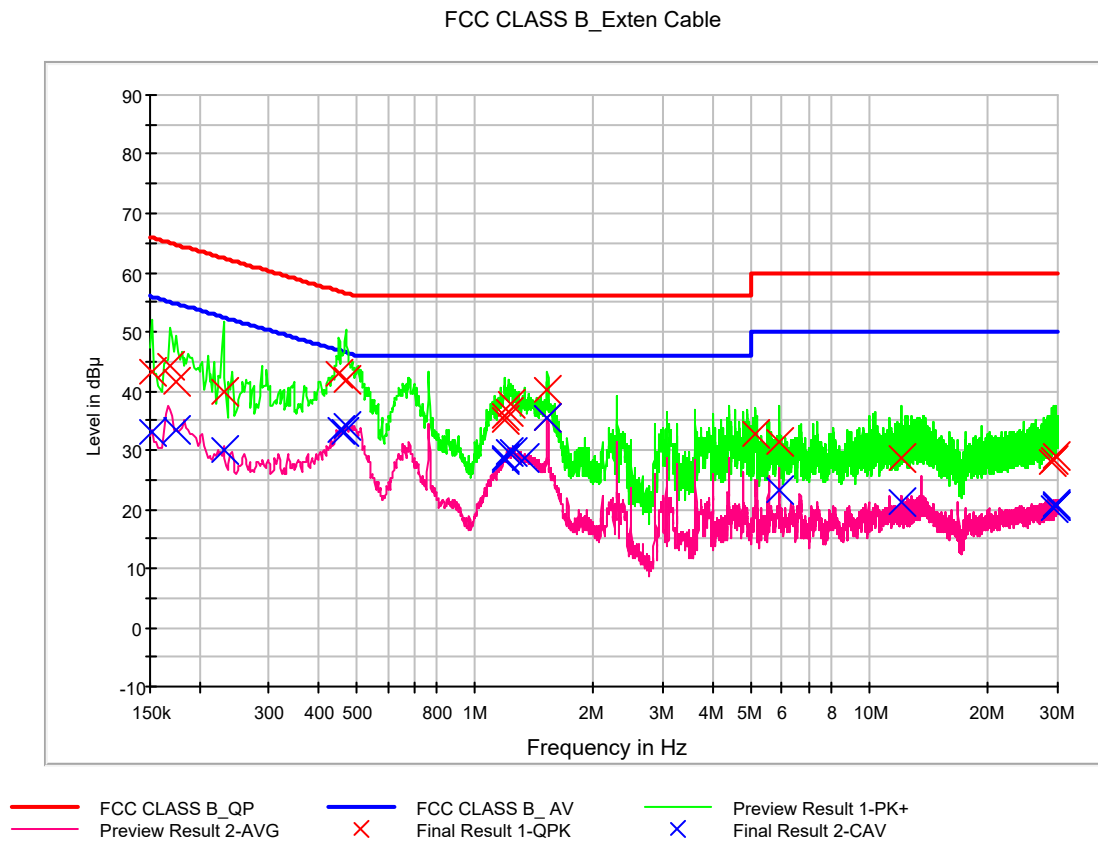

QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.164000	43.3	9.000	L1	9.7	21.9	65.3
0.170000	42.8	9.000	L1	9.7	22.1	65.0
0.452000	43.0	9.000	L1	9.8	13.8	56.8
0.462000	42.9	9.000	L1	9.8	13.8	56.7
0.470000	44.1	9.000	L1	9.8	12.4	56.5
0.762000	35.8	9.000	L1	9.8	20.2	56.0
1.216000	37.5	9.000	L1	9.8	18.5	56.0
1.226000	36.8	9.000	L1	9.8	19.2	56.0
1.518000	33.6	9.000	L1	9.9	22.4	56.0
1.524000	38.6	9.000	L1	9.9	17.4	56.0
2.290000	41.6	9.000	L1	9.9	14.4	56.0
4.386000	38.2	9.000	L1	10.0	17.8	56.0
12.780000	34.3	9.000	L1	10.3	25.7	60.0
13.122000	31.4	9.000	L1	10.3	28.6	60.0
25.182000	31.2	9.000	L1	10.7	28.8	60.0
29.542000	33.8	9.000	L1	10.9	26.2	60.0
29.578000	34.1	9.000	L1	10.9	25.9	60.0
29.584000	35.3	9.000	L1	10.9	24.7	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.190000	32.8	9.000	L1	9.7	21.2	54.0
0.452000	32.8	9.000	L1	9.8	14.1	46.8
0.464000	33.1	9.000	L1	9.8	13.5	46.6
0.472000	33.6	9.000	L1	9.8	12.9	46.5
0.478000	33.4	9.000	L1	9.8	13.0	46.4
0.762000	31.5	9.000	L1	9.8	14.5	46.0
1.216000	29.7	9.000	L1	9.8	16.4	46.0
1.226000	30.1	9.000	L1	9.8	15.9	46.0
1.528000	26.6	9.000	L1	9.9	19.4	46.0
2.292000	36.8	9.000	L1	9.9	9.2	46.0
3.626000	33.7	9.000	L1	9.9	12.3	46.0
4.386000	35.5	9.000	L1	10.0	10.5	46.0
12.780000	25.7	9.000	L1	10.3	24.3	50.0
12.784000	25.8	9.000	L1	10.3	24.2	50.0
13.122000	22.4	9.000	L1	10.3	27.6	50.0
25.182000	23.0	9.000	L1	10.7	27.0	50.0
29.542000	24.3	9.000	L1	10.9	25.7	50.0
29.612000	24.9	9.000	L1	10.9	25.1	50.0

**Figure 2: Conducted Emission, Bluetooth Mode, Line (N)**

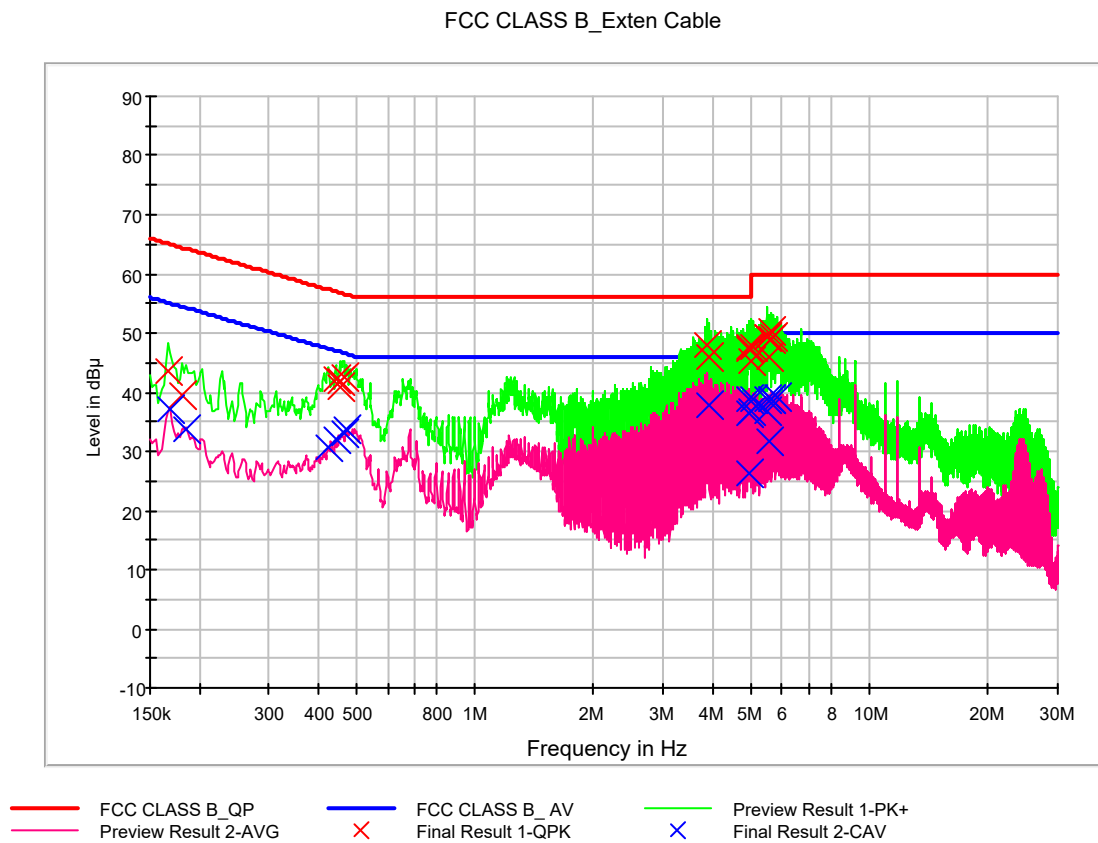

QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	43.3	9.000	N	9.8	22.6	65.9
0.168000	44.3	9.000	N	9.8	20.8	65.1
0.174000	41.5	9.000	N	9.8	23.3	64.8
0.230000	39.9	9.000	N	9.9	22.6	62.4
0.452000	42.9	9.000	N	9.9	13.9	56.8
0.470000	42.0	9.000	N	9.9	14.5	56.5
1.186000	35.1	9.000	N	10.0	20.9	56.0
1.190000	35.7	9.000	N	10.0	20.3	56.0
1.214000	36.5	9.000	N	10.0	19.5	56.0
1.226000	37.8	9.000	N	10.0	18.2	56.0
1.522000	35.5	9.000	N	10.1	20.5	56.0
1.528000	40.0	9.000	N	10.1	16.0	56.0
5.156000	32.8	9.000	N	10.2	27.2	60.0
5.918000	31.4	9.000	N	10.3	28.6	60.0
12.026000	28.8	9.000	N	10.5	31.2	60.0
29.010000	28.1	9.000	N	11.1	31.9	60.0
29.148000	28.4	9.000	N	11.1	31.6	60.0
29.784000	29.0	9.000	N	11.2	31.0	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	32.9	9.000	N	9.8	22.9	55.9
0.174000	33.4	9.000	N	9.8	21.4	54.8
0.230000	30.0	9.000	N	9.9	22.4	52.4
0.454000	33.5	9.000	N	9.9	13.3	46.8
0.466000	33.1	9.000	N	9.9	13.5	46.6
0.472000	34.0	9.000	N	9.9	12.5	46.5
1.186000	28.6	9.000	N	10.0	17.4	46.0
1.190000	28.5	9.000	N	10.0	17.5	46.0
1.212000	29.6	9.000	N	10.0	16.4	46.0
1.248000	29.8	9.000	N	10.0	16.2	46.0
1.340000	28.8	9.000	N	10.1	17.2	46.0
1.528000	35.4	9.000	N	10.1	10.6	46.0
5.918000	23.1	9.000	N	10.3	26.9	50.0
12.026000	21.3	9.000	N	10.5	28.7	50.0
29.148000	20.2	9.000	N	11.1	29.8	50.0
29.696000	20.4	9.000	N	11.2	29.6	50.0
29.780000	20.7	9.000	N	11.2	29.3	50.0
29.784000	20.6	9.000	N	11.2	29.4	50.0

**Figure 3: Conducted Emission, WiFi (2.4 GHz) IDLE+DATA LINK Mode, Line (L1)**

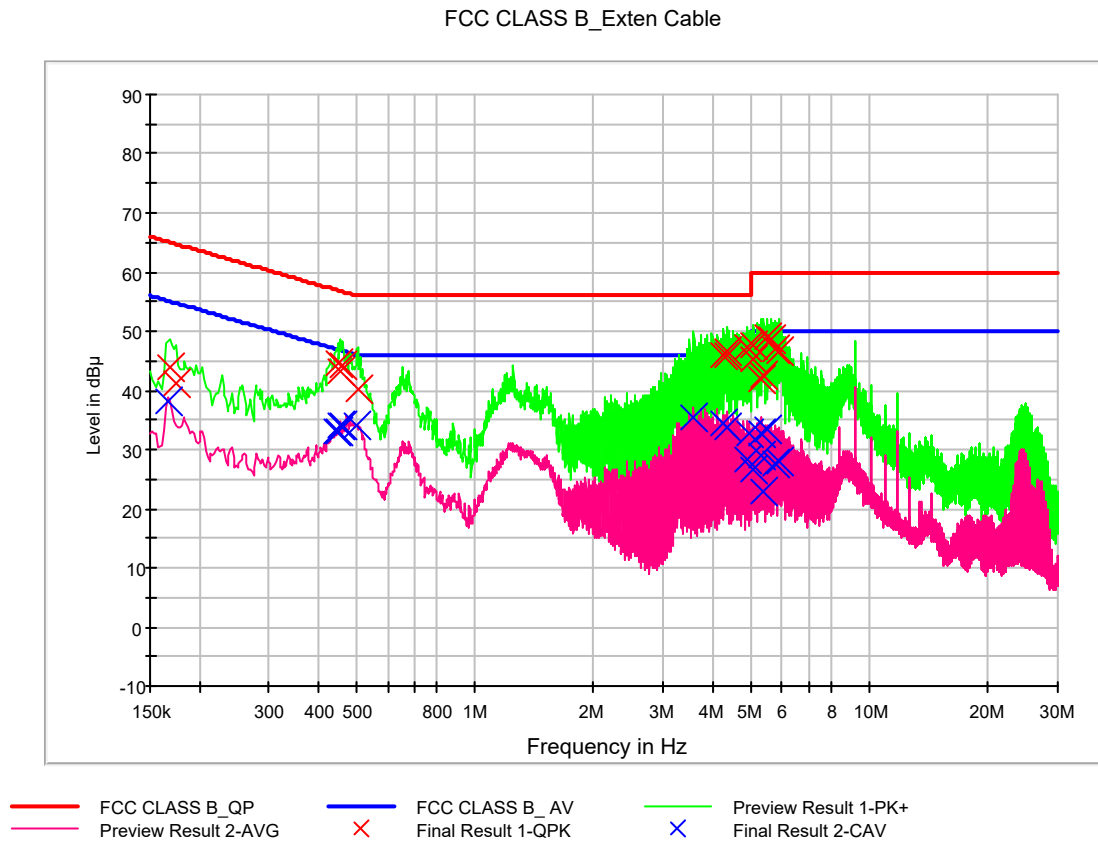

QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.166000	43.6	9.000	L1	9.7	21.5	65.2
0.180000	39.4	9.000	L1	9.7	25.1	64.5
0.444000	42.1	9.000	L1	9.7	14.9	57.0
0.454000	41.9	9.000	L1	9.8	14.9	56.8
0.458000	40.8	9.000	L1	9.8	16.0	56.7
0.464000	42.7	9.000	L1	9.8	13.9	56.6
3.872000	48.1	9.000	L1	10.0	7.9	56.0
3.928000	46.1	9.000	L1	10.0	9.9	56.0
4.954000	47.4	9.000	L1	10.0	8.6	56.0
4.962000	47.6	9.000	L1	10.0	8.4	56.0
4.992000	45.3	9.000	L1	10.0	10.7	56.0
5.072000	47.5	9.000	L1	10.0	12.5	60.0
5.472000	49.4	9.000	L1	10.0	10.6	60.0
5.524000	49.4	9.000	L1	10.0	10.6	60.0
5.574000	46.1	9.000	L1	10.1	13.9	60.0
5.616000	49.1	9.000	L1	10.1	10.9	60.0
5.666000	50.4	9.000	L1	10.1	9.6	60.0
5.670000	49.4	9.000	L1	10.1	10.6	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.168000	37.0	9.000	L1	9.7	18.0	55.1
0.186000	33.6	9.000	L1	9.7	20.6	54.2
0.426000	30.8	9.000	L1	9.7	16.5	47.3
0.444000	32.1	9.000	L1	9.7	14.8	47.0
0.464000	33.0	9.000	L1	9.8	13.6	46.6
0.472000	33.6	9.000	L1	9.8	12.9	46.5
3.928000	37.7	9.000	L1	10.0	8.3	46.0
4.956000	38.8	9.000	L1	10.0	7.2	46.0
4.962000	36.5	9.000	L1	10.0	9.5	46.0
4.968000	26.4	9.000	L1	10.0	19.6	46.0
5.010000	36.9	9.000	L1	10.0	13.1	50.0
5.072000	38.9	9.000	L1	10.0	11.1	50.0
5.472000	38.8	9.000	L1	10.0	11.2	50.0
5.524000	36.8	9.000	L1	10.0	13.2	50.0
5.574000	31.8	9.000	L1	10.1	18.2	50.0
5.616000	38.9	9.000	L1	10.1	11.1	50.0
5.666000	38.7	9.000	L1	10.1	11.3	50.0
5.810000	39.0	9.000	L1	10.1	11.0	50.0

**Figure 4: Conducted Emission, WiFi (2.4 GHz) IDLE+DATA LINK Mode, Line (N)**


QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.168000	43.9	9.000	N	9.8	21.2	65.1
0.174000	41.3	9.000	N	9.8	23.5	64.8
0.450000	44.7	9.000	N	9.9	12.2	56.9
0.456000	43.3	9.000	N	9.9	13.5	56.8
0.462000	44.3	9.000	N	9.9	12.3	56.7
0.504000	40.1	9.000	N	9.9	15.9	56.0
4.272000	46.0	9.000	N	10.2	10.0	56.0
4.356000	46.8	9.000	N	10.2	9.2	56.0
4.360000	46.0	9.000	N	10.2	10.0	56.0
4.902000	47.4	9.000	N	10.2	8.6	56.0
5.048000	45.2	9.000	N	10.2	14.8	60.0
5.098000	47.6	9.000	N	10.2	12.4	60.0
5.336000	41.8	9.000	N	10.2	18.2	60.0
5.364000	42.4	9.000	N	10.2	17.6	60.0
5.524000	49.1	9.000	N	10.3	10.9	60.0
5.664000	48.6	9.000	N	10.3	11.4	60.0
5.758000	46.9	9.000	N	10.3	13.1	60.0
5.888000	46.7	9.000	N	10.3	13.3	60.0



CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.166000	38.1	9.000	N	9.8	17.0	55.2
0.444000	32.9	9.000	N	9.9	14.1	47.0
0.448000	33.0	9.000	N	9.9	13.9	46.9
0.454000	34.0	9.000	N	9.9	12.8	46.8
0.462000	34.0	9.000	N	9.9	12.7	46.7
0.502000	34.0	9.000	N	9.9	12.0	46.0
3.590000	35.6	9.000	N	10.1	10.4	46.0
4.272000	34.4	9.000	N	10.2	11.6	46.0
4.360000	33.9	9.000	N	10.2	12.1	46.0
4.904000	28.2	9.000	N	10.2	17.8	46.0
4.954000	32.8	9.000	N	10.2	13.2	46.0
5.048000	26.5	9.000	N	10.2	23.5	50.0
5.328000	32.8	9.000	N	10.2	17.2	50.0
5.334000	29.0	9.000	N	10.2	21.0	50.0
5.364000	23.0	9.000	N	10.2	27.0	50.0
5.524000	33.5	9.000	N	10.3	16.5	50.0
5.760000	27.5	9.000	N	10.3	22.5	50.0
5.888000	28.0	9.000	N	10.3	22.0	50.0



5.2 Radiated Emission

The test results of radiated emission provide the following information:

For Measurement Below 1 GHz

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Measuring Distance	3 m
Kind of Test Site	Semi anechoic chamber
Temperature	23.8 °C
Relative Humidity	43.2 %
Test Date	April 08, 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

**Bluetooth Mode**

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
43.152800	23.5	117.9	V	40.0	19.7	16.5	40.0
58.244800	26.4	99.8	V	356.0	19.8	13.6	40.0
62.123200	26.0	125.3	V	331.0	19.3	14.0	40.0
144.543200	26.5	99.8	V	242.0	19.6	17.0	43.5
162.500000	25.6	99.8	V	278.0	19.7	17.9	43.5
470.551200	32.5	99.9	H	267.0	24.6	13.5	46.0

WiFi (2.4 GHz) IDLE+DATA LINK Mode

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.156288	29.0	99.8	V	332.0	18.7	11.0	40.0
61.122400	32.0	374.8	H	278.0	19.5	8.0	40.0
61.247200	33.0	325.1	H	248.0	19.5	7.0	40.0
147.881600	33.5	99.8	V	160.0	19.7	10.0	43.5
194.360800	34.5	99.8	V	200.0	17.7	9.0	43.5
800.009600	39.7	100.0	H	46.0	30.4	6.3	46.0



For Measurement Above 1 GHz

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Operating Frequency	2 480 MHz
Tested Frequency Range	1 GHz to 18 GHz
Measuring Distance	3 m
Kind of Test Site	3 m semi anechoic chamber
Temperature	23.8 °C
Relative Humidity	43.2 %
Test Date	April 08, 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

**Bluetooth Mode**

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1396.560000	32.2	336.5	H	268.0	-26.1	41.8	74.0
3112.270000	35.1	289.6	H	101.0	-21.0	38.9	74.0
3819.385000	35.7	199.4	V	166.0	-20.1	38.3	74.0
6270.210000	40.8	217.5	H	0.0	-13.4	33.2	74.0
7802.040000	45.5	350.0	H	124.0	-9.2	28.5	74.0
9417.345000	48.5	149.6	V	258.0	-5.6	25.5	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1396.560000	19.8	336.5	H	268.0	-26.1	34.2	54.0
3112.270000	22.5	289.6	H	101.0	-21.0	31.5	54.0
3819.385000	23.4	199.4	V	166.0	-20.1	30.6	54.0
6270.210000	28.1	217.5	H	0.0	-13.4	25.9	54.0
7802.040000	32.0	350.0	H	124.0	-9.2	22.0	54.0
9417.345000	35.5	149.6	V	258.0	-5.6	18.5	54.0

WiFi (2.4 GHz) IDLE+DATA LINK Mode

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1199.150000	44.4	199.4	V	25.0	-27.0	29.6	74.0
1400.145000	50.8	321.6	V	184.0	-26.1	23.2	74.0
1792.475000	50.3	307.5	V	97.0	-25.4	23.7	74.0
1996.835000	43.1	100.1	V	148.0	-25.3	30.9	74.0
2655.280000	45.8	100.0	V	111.0	-22.7	28.2	74.0
2812.845000	50.0	99.9	V	301.0	-22.0	24.0	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1199.150000	24.3	199.4	V	25.0	-27.0	29.7	54.0
1400.145000	47.7	321.6	V	184.0	-26.1	6.3	54.0
1792.475000	26.3	307.5	V	97.0	-25.4	27.7	54.0
1996.835000	22.0	100.1	V	148.0	-25.3	32.0	54.0
2655.280000	22.5	100.0	V	111.0	-22.7	31.5	54.0
2812.845000	23.2	99.9	V	301.0	-22.0	30.8	54.0



6. CONCLUSION

The data collected shows that the **EUT Type: AI Speaker, Model: SM-V310** complies with §15.107 and §15.109 of the FCC rules.



7. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to ANNEX A_Test Setup Photo