

FCC AND ISED CERTIFICATION TEST REPORT

FOR

Applicant	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Multi-Channel Soundbar with wireless subwoofer
Model No.	:	BAR 700
Trade Mark	:	JBL
FCC ID	:	APIBAR800
IC	:	6132A-BAR800
Manufacturer	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,
Dongguan City, Guangdong Province, China, 523808

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REPORT

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Test Report Declare

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Test Standard Used:

FCC Rules and Regulations Part 15 Subpart E, RSS-247 Issue 2 February 2017.

Test procedure used: ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01, 662911 D01 Multiple Transmitter Output v02r01, RSS-Gen Issue 5 April 2018

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&ISED standards.

Report No:	DDT-R22112306-2E05		
Date of Receipt:	Nov. 23, 2022	Date of Test:	Nov. 23, 2022 ~ Dec. 05, 2022

Prepared By:

Ella Gong

Ella Gong/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Dec. 08, 2022	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.

Description of Test Item	Standard	Results
Emissions in restricted frequency bands	FCC 15.407 (a) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	Pass
Power Line Conducted Emission	FCC 15.207 RSS-GEN Clause 8.8	Pass

Note:

- This report added a model BAR 700 based on the report DDT-R21123117-2E05, the difference is that BAR 700 has two less overhead speakers and one less power amplifier IC on Power amplifier board than BAR 800. This change based on engineering judgment that only Radiated Emission (below 1 GHz) and Power Line Conducted Emissions need to test.
- Please refer to report DDT-R21123117-2E05 for the other original data.

2. General test information

2.1. Description of EUT

EUT* Name	: Multi-Channel Soundbar with wireless subwoofer
Model Number	: BAR 700
EUT function description	: Please reference user manual of this device
Power Supply	: AC 100-240V-50/60Hz 70W
Radio Technology	: IEEE 802.11a/n/ac/ax
Operation frequency	: IEEE 802.11a: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11n HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11n HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz IEEE 802.11ac HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11ac HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz IEEE 802.11ac HT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5775MHz IEEE 802.11ax HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11ax HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz IEEE 802.11ax HT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5775MHz
Modulation	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Transmitter rate	: IEEE 802.11a: up to 54 Mbps IEEE 802.11n HT20: up to 144.4 Mbps IEEE 802.11n HT40: up to 300 Mbps IEEE 802.11ac VHT20: up to 173.4 Mbps IEEE 802.11ac VHT40: up to 400 Mbps IEEE 802.11ac VHT80: up to 866.6 Mbps IEEE 802.11ax HE20: up to 286.8 Mbps IEEE 802.11ax HE40: up to 573.5 Mbps IEEE 802.11ax HE80: up to 1201 Mbps
Antenna Gain	: Antenna 1: FPC antenna, Maximum PK gain: 3.26 dBi Antenna 2: FPC antenna, Maximum PK gain: 3.24 dBi
Sample Number	: S22112306-03

Note 1: EUT is the ab. of equipment under test.

Note 2: Band 5600-5650MHz will be disabled when shipped to Canada.

Antenna information			
	Ant1 gain	Ant2 gain	MIMO
IEEE 802.11a	3.26	3.24	/
IEEE 802.11n HT20	3.26	3.24	6.26
IEEE 802.11n HT40	3.26	3.24	6.26
IEEE 802.11ac VHT20	3.26	3.24	6.26
IEEE 802.11ac VHT40	3.26	3.24	6.26
IEEE 802.11ac VHT80	3.26	3.24	6.26
IEEE 802.11ax HE20	3.26	3.24	6.26
IEEE 802.11ax HE40	3.26	3.24	6.26
IEEE 802.11ax HE80	3.26	3.24	6.26

Channel information					
IEEE 802.11a		IEEE 802.11n (HT40)		IEEE 802.11ac (VHT80)	
IEEE 802.11n (HT20)		IEEE 802.11ac (VHT40)		IEEE 802.11ax (HE80)	
IEEE 802.11ac (VHT20)		IEEE 802.11ax (HE40)			
IEEE 802.11ax (HE20)					
UNII-1					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	/	/
44	5220	/	/	/	/
48	5240	/	/	/	/
UNII-2A					
52	5260	54	5270	58	5290
56	5280	62	5310	/	/
60	5300	/	/	/	/
64	5320	/	/	/	/
UNII-2C					
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	/	/
112	5560	126	5630	/	/
116	5580	134	5670	/	/
120	5600	/	/	/	/
124	5620	/	/	/	/
128	5640	/	/	/	/
132	5660	/	/	/	/
134	5680	/	/	/	/
140	5700	/	/	/	/
UNII-3					
149	5745	151	5755	155	5725
153	5765	159	5795	/	/
157	5785	/	/	/	/
161	5805	/	/	/	/
165	5825	/	/	/	/

IEEE 802.11ax(HE20)	Operating Mode	Resource Unit	26 Tone(2M)	
	Specific Resource Unit		0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
		9		
		Resource Unit	52 Tone(4M)	
	Specific Resource Unit		37	
			38	
		39		
		40		
	Resource Unit	106 Tone(8M)		
Specific Resource Unit		53		
		54		
	Resource Unit	242 Tone(20M)		
	Specific Resource Unit	61		
IEEE 802.11ax(HE40)	Operating Mode	Resource Unit	26 Tone(2M)	
	Specific Resource Unit		0	9
			1	10
			2	11
			3	12
			4	13
			5	14
			6	15
			7	16
			8	17
		Resource Unit	52 Tone(4M)	
	Specific Resource Unit		37	41
			38	42
			39	43
		40	44	
	Resource Unit	106 Tone(8M)		
Specific Resource Unit		53	55	
		54	56	
	Resource Unit	242 Tone(20M)		
	Specific Resource Unit	61	62	
	Resource Unit	484 Tone(40M)		
	Specific Resource Unit	65		
IEEE 802.11ax(HE80)	Operating Mode	Resource Unit	26 Tone(2M)	
	Specific Resource Unit		0	19
			1	20
			2	21
			3	22
			4	23
		5	24	

		6	25
		7	26
		8	27
		9	28
		10	29
		11	30
		12	31
		13	32
		14	33
		15	34
		16	35
		17	36
		18	
	Resource Unit	52 Tone(4M)	
	Specific Resource Unit	37	45
		38	46
		39	47
		40	48
		41	49
		42	50
		43	51
	44	52	
	Resource Unit	106 Tone(8M)	
	Specific Resource Unit	53	57
		54	58
		55	59
		56	60
	Resource Unit	242 Tone(20M)	
	Specific Resource Unit	61	62
		63	64
	Resource Unit	484 Tone(40M)	
	Specific Resource Unit	65	66
	Resource Unit	996 Tone(80M)	
	Specific Resource Unit	67	

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Other
AC cable	Harman	N/A	N/A	Length: 1.85m,
HDMI cable	Harman	N/A	N/A	Length: 1.15m, with two magnetic rings
Remote control	Harman	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
N/A	N/A	N/A	N/A	N/A

2.4. Block diagram of EUT configuration for test



Test software: adb.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

The pathloss of external cable: 0.5dB (According to the manufacturer's claims)

Tested mode, channel, and data rate information				
Mode	Setting Tx Power	data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11a	15	6	Low: CH36	5180
	15	6	Middle: CH40	5200
	15	6	High: CH48	5240
	15	6	Low: CH52	5260
	15	6	Middle: CH56	5280
	15	6	High: CH64	5320
	15	6	Low: CH100	5500
	15	6	Middle: CH116	5580
	15	6	High: CH140	5700
	15	6	Low: CH149	5745
	15	6	Middle: CH157	5785
IEEE 802.11n HT20	15	MCS 0	Low: CH36	5180
	15	MCS 0	Middle: CH40	5200
	15	MCS 0	High: CH48	5240
	15	MCS 0	Low: CH52	5260
	15	MCS 0	Middle: CH56	5280
	15	MCS 0	High: CH64	5320
	15	MCS 0	Low: CH100	5500
	15	MCS 0	Middle: CH116	5580

	15	MCS 0	High: CH140	5700
	15	MCS 0	Low: CH149	5745
	15	MCS 0	Middle: CH157	5785
	15	MCS 0	High: CH165	5825
IEEE 802.11n HT40	15	MCS 0	Low: CH38	5190
	15	MCS 0	Middle: CH46	5230
	15	MCS 0	High: CH54	5270
	15	MCS 0	Low: CH62	5310
	15	MCS 0	Middle: CH102	5510
	15	MCS 0	High: CH110	5550
	15	MCS 0	Low: CH134	5670
	15	MCS 0	Middle: CH151	5755
	15	MCS 0	High: CH159	5795
	IEEE 802.11ac HT20	15	MCS 0	Low: CH36
15		MCS 0	Middle: CH40	5200
15		MCS 0	High: CH48	5240
15		MCS 0	Low: CH52	5260
15		MCS 0	Middle: CH56	5280
15		MCS 0	High: CH64	5320
15		MCS 0	Low: CH100	5500
15		MCS 0	Middle: CH116	5580
15		MCS 0	High: CH140	5700
15		MCS 0	Low: CH149	5745
IEEE 802.11ac HT40	15	MCS 0	Middle: CH157	5785
	15	MCS 0	High: CH165	5825
	15	MCS 0	Low: CH38	5190
	15	MCS 0	Middle: CH46	5230
	15	MCS 0	High: CH54	5270
	15	MCS 0	Low: CH62	5310
	15	MCS 0	Middle: CH102	5510
	15	MCS 0	High: CH110	5550
IEEE 802.11ac HT80	15	MCS 0	Low: CH134	5670
	15	MCS 0	Middle: CH151	5755
	15	MCS 0	High: CH159	5795
	15	MCS 0	CH42	5210
	15	MCS 0	CH58	5290
IEEE 802.11ax HE20	15	MCS 0	CH106	5530
	15	MCS 0	CH122	5610
	15	MCS 0	CH155	5775
	SU:15 RU:07	MCS 0	Low: CH36	5180
	SU:15 RU:07	MCS 0	Middle: CH40	5200
	SU:15 RU:07	MCS 0	High: CH48	5240
	SU:15 RU:07	MCS 0	Low: CH52	5260
	SU:15 RU:07	MCS 0	Middle: CH56	5280
	SU:15 RU:07	MCS 0	High: CH64	5320
	SU:15 RU:07	MCS 0	Low: CH100	5500
	SU:15 RU:07	MCS 0	Middle: CH116	5580
	SU:15 RU:07	MCS 0	High: CH140	5700
SU:15 RU:09	MCS 0	Low: CH149	5745	
SU:15 RU:09	MCS 0	Middle: CH157	5785	
SU:15 RU:09	MCS 0	High: CH165	5825	

IEEE 802.11ax HE40	SU:15 RU:07	MCS 0	Low: CH38	5190
	SU:15 RU:07	MCS 0	Middle: CH46	5230
	SU:15 RU:07	MCS 0	High: CH54	5270
	SU:15 RU:07	MCS 0	Low: CH62	5310
	SU:15 RU:07	MCS 0	Middle: CH102	5510
	SU:15 RU:07	MCS 0	High: CH110	5550
	SU:15 RU:07	MCS 0	Low: CH134	5670
	SU:15 RU:07	MCS 0	Middle: CH151	5755
IEEE 802.11ax HE80	SU:15 RU:07	MCS 0	High: CH159	5795
	SU:15 RU:09	MCS 0	CH42	5210
	SU:15 RU:09	MCS 0	CH58	5290
	SU:15 RU:09	MCS 0	CH106	5530
	SU:15 RU:07	MCS 0	CH122	5610
	SU:15 RU:07	MCS 0	CH155	5775

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.5. Deviations of test standard

No Deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	+21 °C to +25 °C
Humidity range:	40% to 75%
Pressure range:	86 kPa to 106 kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Addr.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7 × 10 ⁻⁸ (Antenna couple method)
	5.5 × 10 ⁻⁸ (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz ≤ f < 3.6GHz);
	1.40 dB (3.6 GHz ≤ f < 8 GHz)
	1.66 dB (8 GHz ≤ f < 22 GHz)
Uncertainty for radio frequency (RBW<20kHz)	3×10 ⁻⁸
Temperature	0.4℃
Humidity	2%
Uncertainty for Radiation Emission Test (9 kHz - 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz-40GHz)	4.10 dB (1-6 GHz)
	4.40 dB (6 GHz-18 GHz)
	3.54 dB (18 GHz-26 GHz)
	4.30 dB (26 GHz-40 GHz)
Uncertainty for Power line conduction emission test	3.32 dB (150 kHz-30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

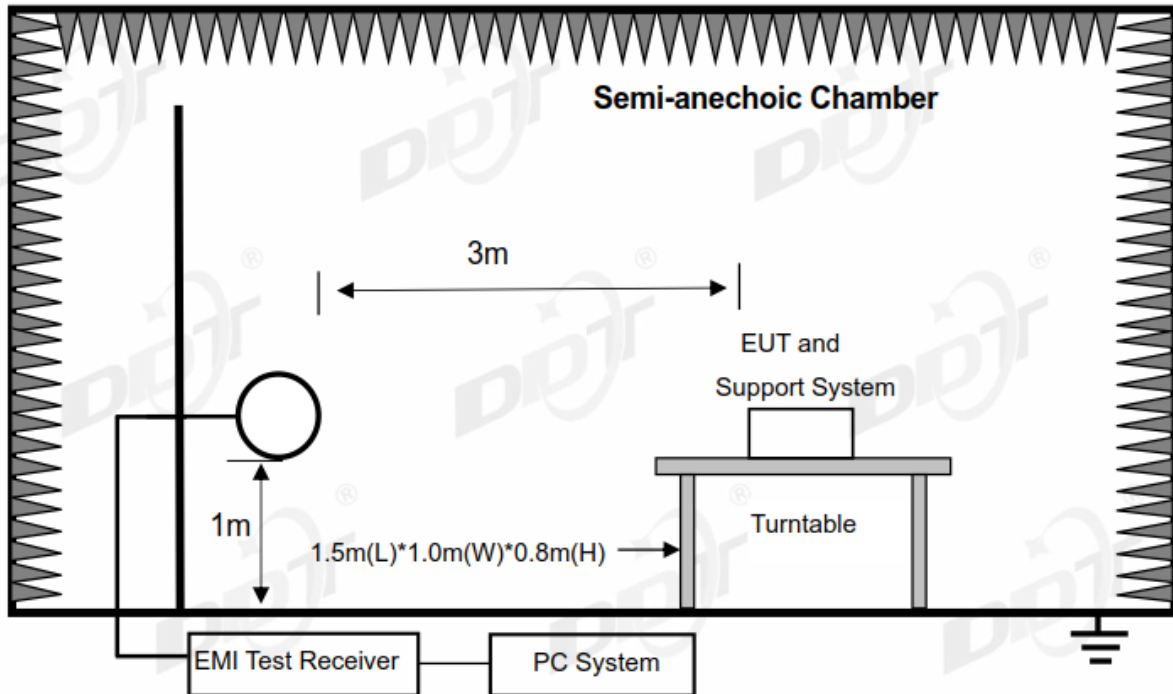
3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑Radiation 3#chamber					
EMI Test Receiver	R&S	ESU26	100472	May 19, 2022	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	May 17, 2022	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2022	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	01429	Jul. 22, 2022	1 Year
Double Ridged Horn Antenna	Schwarzbeck	BBHA9120 D	02468	Sep. 29, 2022	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	May 06, 2022	1 Year
Pre-amplifier	COM-POWER	PAM-118A	18040084	Aug.17, 2022	1 Year
Pre-amplifier	COM-POWER	PAM-840A	461369	Apr. 11, 2022	1 Year
RE Cable	N/A	W23.02 CP1-X2 + W23.09 AP1-X8+ JCT26S-NJ-NJ-1.5 M+ JCT26S-NJ-NJ-1.5 M	4.5M+8M+1.5 M+1.5M	Aug.17, 2022	1 Year
RF Cable	Yuhu Technology	JCTB810-NJ-NJ-9 M	21123964	May. 19,2022	1 Year
RF Cable	Yuhu Technology	ZT26S-SMAJ-SMA J-1M	21073466	Aug.17, 2022	1 Year
Test software	Tonscend	JS32-RE	V 5.0.0.1	N/A	N/A
Test software	Audix	E3	V 6.1.1.1	N/A	N/A
☑Power Line Conducted Emissions Test 1#					
Test Receiver	R&S	ESCI	100551	Aug. 26, 2022	1 Year
LISN 1	R&S	ENV216	101109	Aug. 26, 2022	1 Year
LISN 2	R&S	ESH2-Z5	100309	Aug. 26, 2022	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Aug. 26, 2022	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Aug. 26, 2022	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Test Receiver	R&S	ESCI	100551	Aug. 26, 2022	1 Year

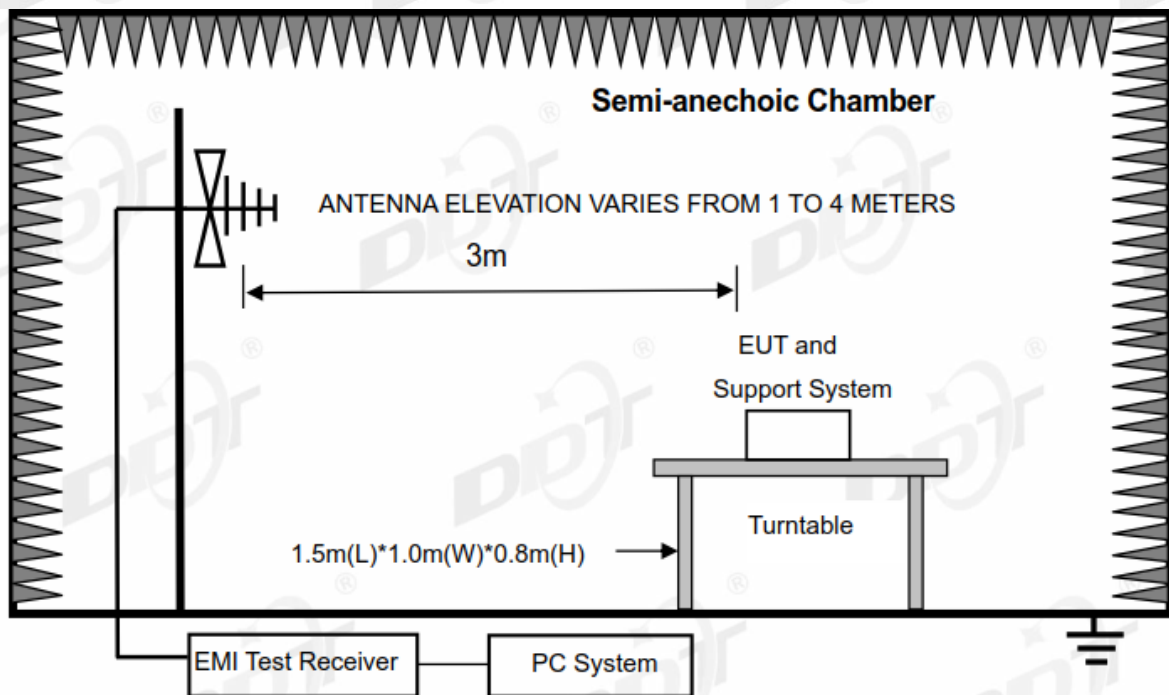
4. Emissions in restricted frequency bands

4.1. Block diagram of test setup

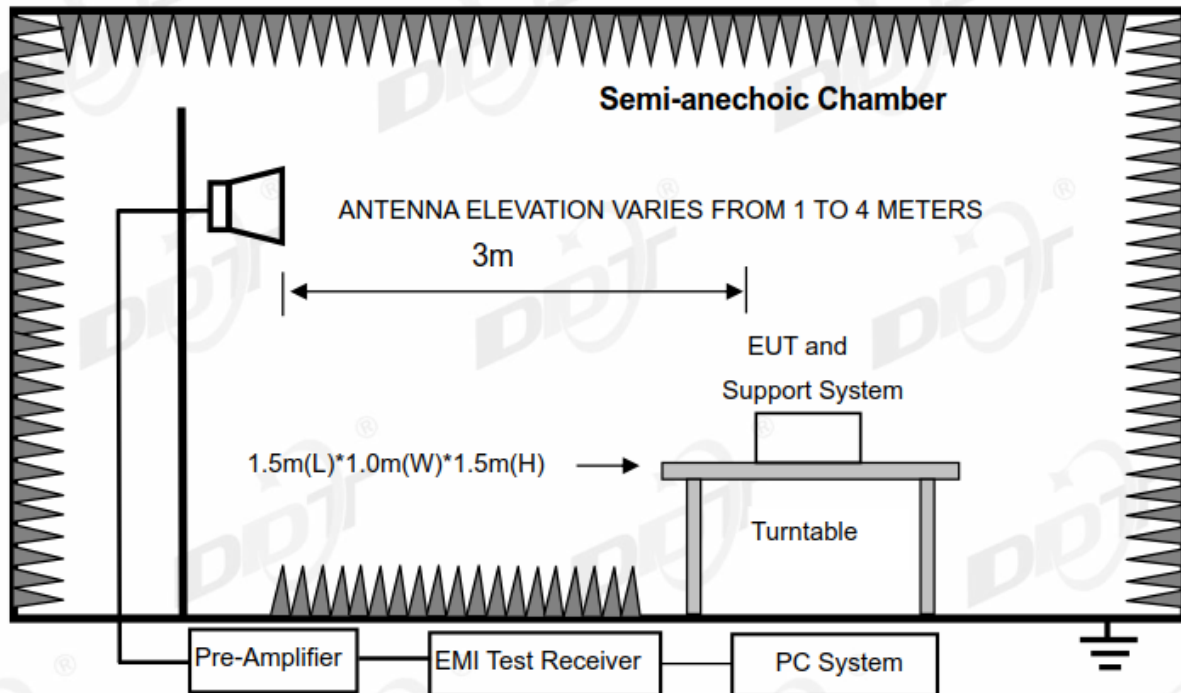
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

4.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6

RSS-Gen section 8.10 Restricted frequency bands*

MHz	MHz	MHz	GHz
0.090-0.110	12.51975-12.52025	240-285	3.5-4.4
0.495-0.505	12.57675-12.57725	322-335.4	4.5-5.15
2.1735-2.1905	13.36-13.41	399.9-410	5.35-5.46
3.020-3.026	16.42-16.423	608-614	7.25-7.75
4.125-4.128	16.69475-16.69525	960-1427	8.025-8.5
4.1772&4.17775	16.80425-16.80475	1435-1626.5	9.0-9.2
4.2072&4.20775	25.5-25.67	1645.5-1646.5	9.3-9.5
5.677-5.683	37.5-38.25	1660-1710	10.6-12.7
6.215-6.218	73-74.6	1718.8-1722.2	13.25-13.4
6.26775-6.26825	74.8-75.2	2200-2300	14.47-14.5
6.31175-6.31225	108-138	2310-2390	15.35-16.2
8.291-8.294	149.9-150.05	2483.5-2500	17.7-21.4
8.362-8.366	156.52475-156.52525	2655-2900	22.01-23.12
8.37625-8.38675	156.7-156.9	3260-3267	23.6-24.0
8.41425-8.41475	162.0125-167.17	3332-3339	31.2-31.8
12.29-12.293	167.72-173.2	3345.8-3358	36.43-36.5
			Above 38.6

* Certain frequency bands listed in table and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

(2) FCC 15.209 Limit & RSS-Gen section 8.9 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V}/\text{m}) + 40\text{Log}(30\text{m}/3\text{m})$$

(3) Limit for this EUT

The emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, and the emissions appearing within RSS-Gen section 8.10 Restricted frequency

bands shall not exceed the limits shown in RSS-Gen section 8.9, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits..

4.3. Test Procedure

- (1) EUT height should be 0.8 m for below 1 GHz at a semi - anechoic chamber while EUT height should be 1.5 m for above 1 GHz at full chamber or semi - anechoic chamber ground with absorbers
- (2) Setup EUT and assistant system according clause 2.3 and 8.2
- (3) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test distance
9 kHz-30 MHz	Active Loop antenna	3 m
30 MHz-1 GHz	Trilog Broadband Antenna	3 m
1 GHz-18 GHz	Double Ridged Horn Antenna(1GHz-18GHz)	3 m
18 GHz-40 GHz	Horn Antenna(18GHz-40GHz)	1 m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, antenna was located 3 m from EUT, the loop antenna was positioned in three antenna orientations (parallel, perpendicular, and round-parallel), for each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable, and the lowest height of the magnetic antenna shall be 1 m above the ground. For measurement above 30 MHz, the trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

- (4) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 40 GHz:

- (a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)

- (b) Change work frequency or channel of device if practicable.

- (c) Change modulation type of device if practicable.

- (d) Change power supply range from 85% to 115% of the rated supply voltage

- (e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 40 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so below final test was performed with frequency range from 30 MHz to 18 GHz.

- (5) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.
- (6) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9 kHz-90kHz, 110kHz-490kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.
- (7) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9 kHz-150 kHz	200 Hz
150 kHz-30 MHz	9 kHz
30 MHz-1 GHz	120 kHz

- (8) For emissions above 1 GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3MHz for Peak measure, the RBW is set at 1 MHz, VBW is set at 10 Hz for AV value.

4.4. Test result

Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limits and RSS-Gen section 8.9 limits.

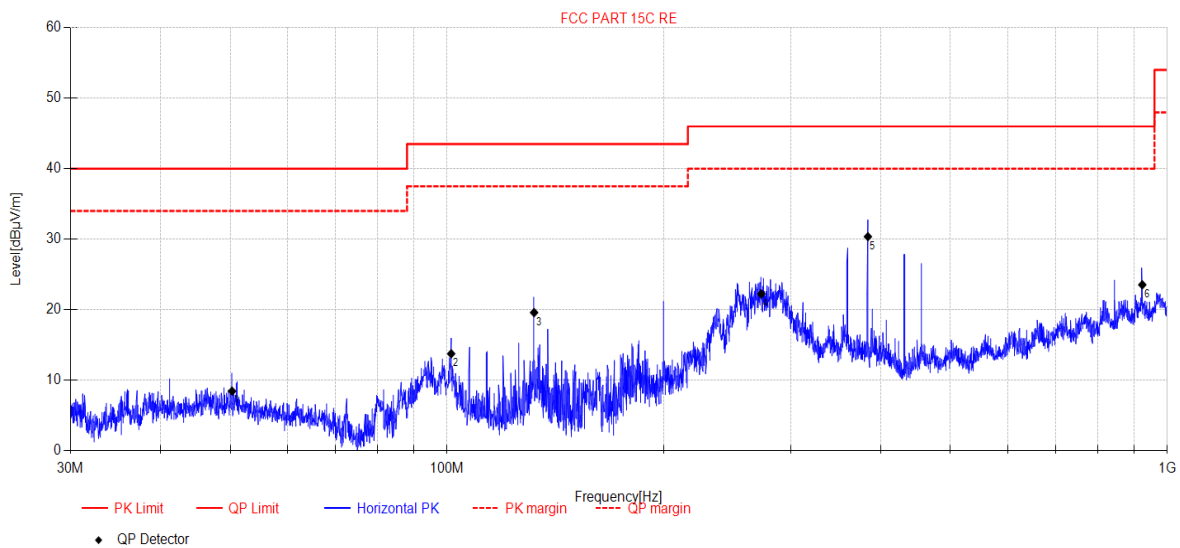
Note1: According exploratory test no any obvious emission was detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 802.11n20, 802.11ax20 mode.

Note3: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit. And the BT+SRD+5GWIFI is the worst simultaneous case and reported.

Radiated Emission test (below 1GHz) TR-4-E-009 Radiated Emission Test Result

Test Date: 2022-11-28 **Tested By:** Johnson Huang
EUT: Multi-Channel Soundbar with wireless subwoofer **Model Number:** BAR 700
Test Mode: TX Mode **Power Supply:** AC 120V/60Hz
Condition: Temp:23.4°C;Humi:46.5%;Press:100.3kPa **Test Site:** DDT 3# Chamber
File Path: d:\ts\2022 report data\Q22112306-BAR700\FCC BELOW 1G\20221128-112200_H
Memo: 5G WIFI



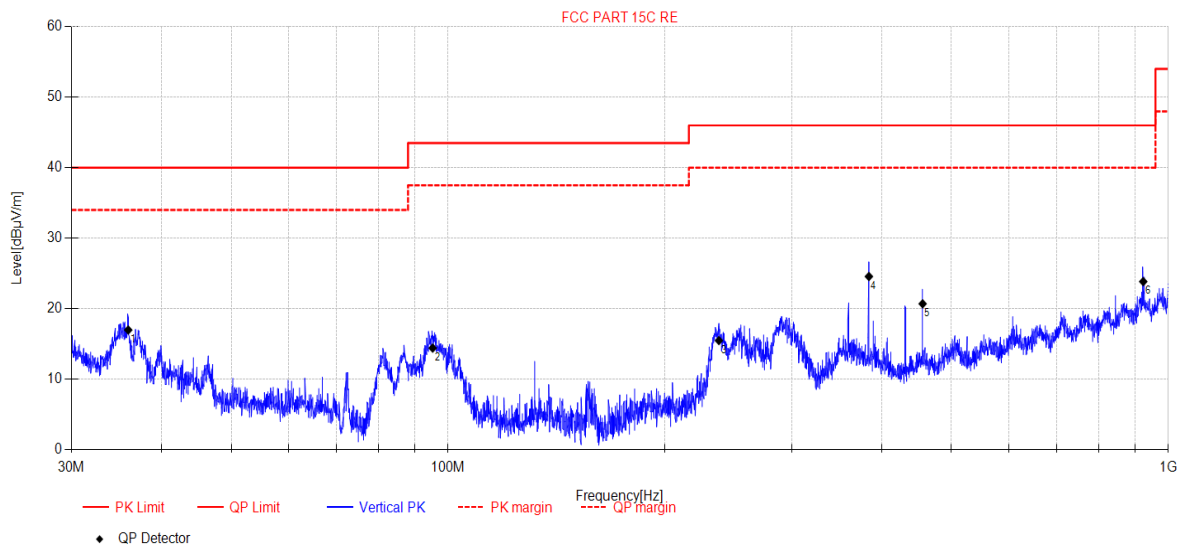
Final Data List								
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Polarity
1	50.30	26.9	-18.47	8.43	40.00	31.57	QP	Horizontal
2	101.33	33.94	-20.20	13.74	43.50	29.76	QP	Horizontal
3	132.09	42.91	-23.33	19.58	43.50	23.92	QP	Horizontal
4	273.11	39.97	-17.74	22.23	46.00	23.77	QP	Horizontal
5	384.01	45.49	-15.13	30.36	46.00	15.64	QP	Horizontal
6	923.18	29.4	-5.87	23.53	46.00	22.47	QP	Horizontal

Note:

1. Result Level = Read Level + Factor
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2022-11-28 **Tested By:** Johnson Huang
EUT: Multi-Channel Soundbar with wireless subwoofer **Model Number:** BAR 700
Test Mode: TX Mode **Power Supply:** AC 120V/60Hz
Condition: Temp:23.4°C;Humi:46.5%;Press:100.3kPa **Test Site:** DDT 3# Chamber
File Path: d:\ts\2022 report data\Q22112306-BAR700\FCC BELOW 1G\20221128-112219_V
Memo: 5G WIFI

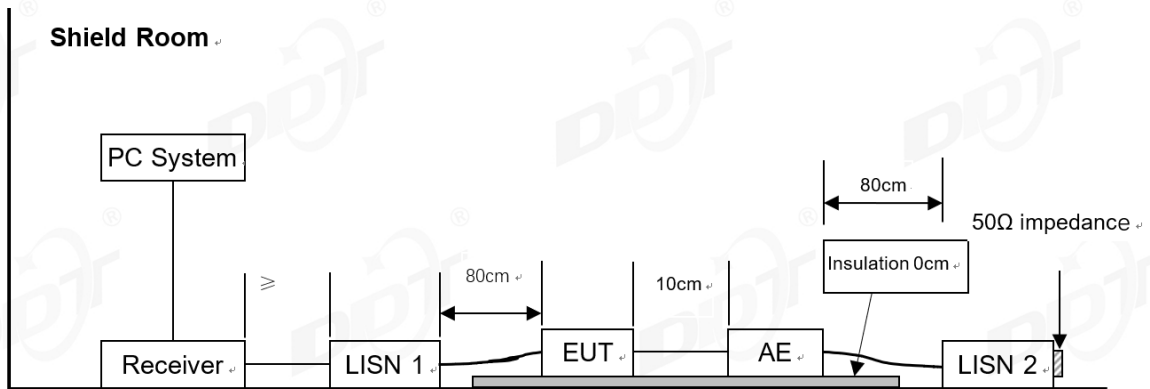


Final Data List								
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Polarity
1	35.97	37.5	-20.53	16.97	40.00	23.03	QP	Vertical
2	95.20	35.3	-20.90	14.40	43.50	29.10	QP	Vertical
3	237.71	34.08	-18.61	15.47	46.00	30.53	QP	Vertical
4	384.01	39.69	-15.13	24.56	46.00	21.44	QP	Vertical
5	455.98	34.58	-13.89	20.69	46.00	25.31	QP	Vertical
6	923.18	29.71	-5.87	23.84	46.00	22.16	QP	Vertical

Note:
 1. Result Level = Read Level + Factor
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

5. Power Line Conducted Emission

5.1. Block diagram of test setup



5.2. Power Line Conducted Emission Limits (Class B)

Frequency	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

5.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 5.1 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.3 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest

emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

5.4. Test Result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

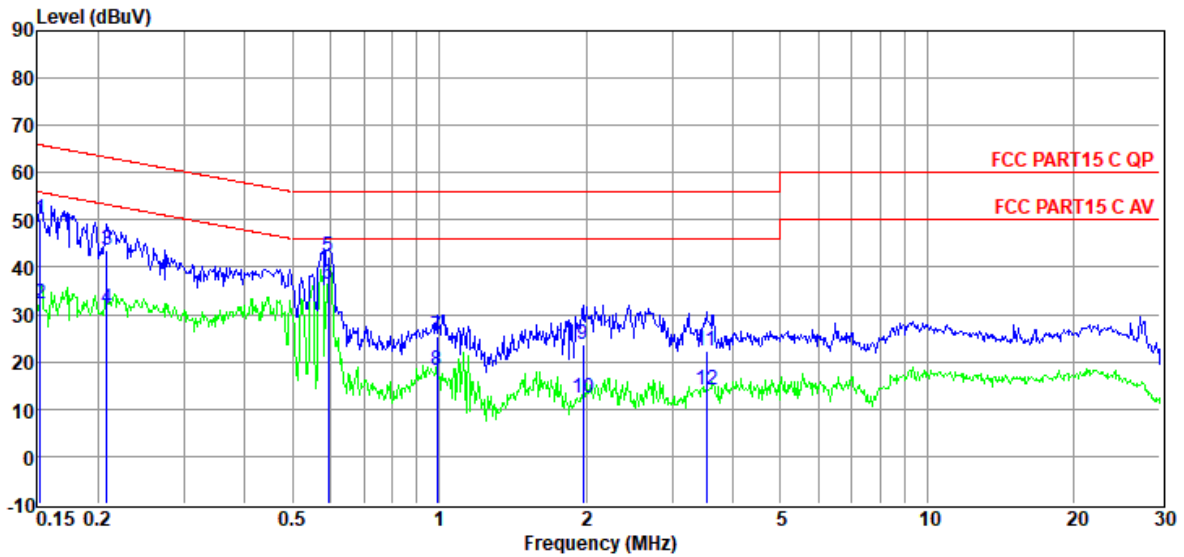
Note2: "----" means peak detection; "----" means average detection

Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worse case (AC 120V/60Hz).

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room D:\2022 CE report date\Q22112306-2E BAR 700\FCC.EM6
Test Date : 2022-12-01 **Tested By** : Bairong
EUT : Multi-Channel Soundbar with wireless subwoofer **Model Number** : BAR 700
Power Supply : AC 120V/60Hz **Test Mode** : TX mode
Condition : TEMP:24.6°C, RH:54.1%, BP:101.1kPa **LISN** : 2021 1# ENV216/NEUTRAL
Memo : 5G WIFI

Data: 10



Item (Mark)	Freq. (MHz)	Read Level (dBUV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBUV)	Limit Line (dBUV)	Over Limit (dB)	Detector	Phase
1	0.15	30.45	9.80	0.01	9.92	50.18	65.87	-15.69	QP	NEUTRAL
2	0.15	12.58	9.80	0.01	9.92	32.31	55.87	-23.56	Average	NEUTRAL
3	0.21	23.78	9.79	0.01	9.92	43.50	63.27	-19.77	QP	NEUTRAL
4	0.21	11.35	9.79	0.01	9.92	31.07	53.27	-22.20	Average	NEUTRAL
5	0.59	22.78	9.65	0.02	9.91	42.36	56.00	-13.64	QP	NEUTRAL
6	0.59	16.76	9.65	0.02	9.91	36.34	46.00	-9.66	Average	NEUTRAL
7	0.99	5.70	9.70	0.03	9.89	25.32	56.00	-30.68	QP	NEUTRAL
8	0.99	-1.42	9.70	0.03	9.89	18.20	46.00	-27.80	Average	NEUTRAL
9	1.97	4.00	9.60	0.04	9.89	23.53	56.00	-32.47	QP	NEUTRAL
10	1.97	-7.30	9.60	0.04	9.89	12.23	46.00	-33.77	Average	NEUTRAL
11	3.53	2.71	9.76	0.05	9.91	22.43	56.00	-33.57	QP	NEUTRAL
12	3.53	-5.78	9.76	0.05	9.91	13.94	46.00	-32.06	Average	NEUTRAL

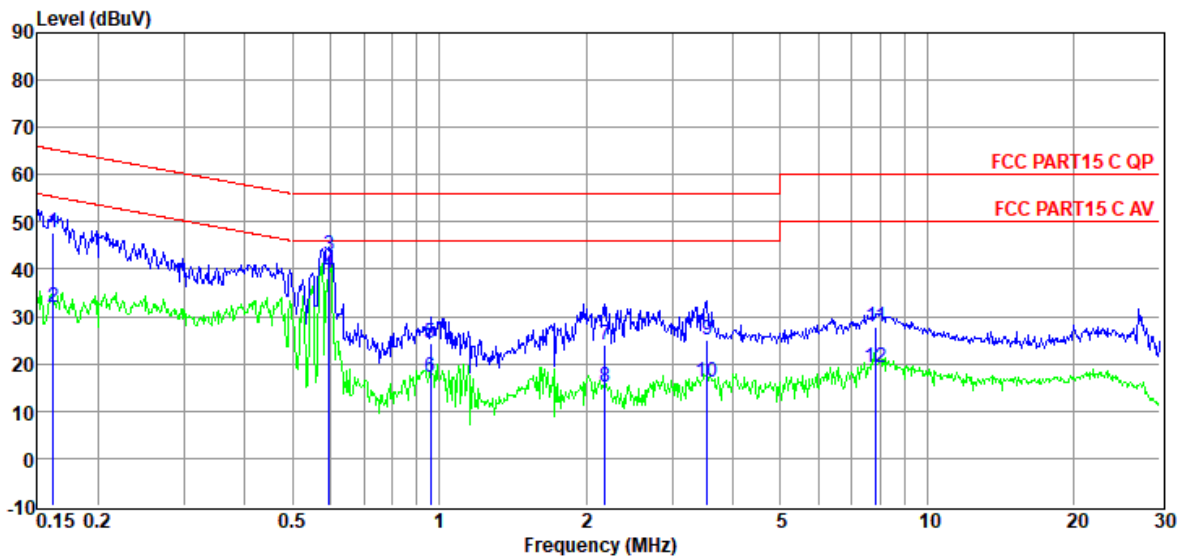
Note:

1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room D:\2022 CE report date\Q22112306-2E BAR 700\FCC.EM6
Test Date : 2022-12-01 **Tested By** : Bairong
EUT : Multi-Channel Soundbar with wireless subwoofer **Model Number** : BAR 700
Power Supply : AC 120V/60Hz **Test Mode** : TX mode
Condition : TEMP:24.6°C, RH:54.1%, BP:101.1kPa **LISN** : 2021 1# ENV216/LINE
Memo : 5G WIFI

Data: 16



Item (Mark)	Freq. (MHz)	Read Level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Detector	Phase
1	0.16	28.16	9.65	0.01	9.92	47.74	65.38	-17.64	QP	LINE
2	0.16	12.42	9.65	0.01	9.92	32.00	55.38	-23.38	Average	LINE
3	0.59	23.44	9.55	0.02	9.91	42.92	56.00	-13.08	QP	LINE
4	0.59	19.76	9.55	0.02	9.91	39.24	46.00	-6.76	Average	LINE
5	0.96	4.96	9.59	0.03	9.89	24.47	56.00	-31.53	QP	LINE
6	0.96	-2.20	9.59	0.03	9.89	17.31	46.00	-28.69	Average	LINE
7	2.19	4.45	9.51	0.04	9.89	23.89	56.00	-32.11	QP	LINE
8	2.19	-4.31	9.51	0.04	9.89	15.13	46.00	-30.87	Average	LINE
9	3.55	5.37	9.58	0.05	9.91	24.91	56.00	-31.09	QP	LINE
10	3.55	-3.46	9.58	0.05	9.91	16.08	46.00	-29.92	Average	LINE
11	7.85	8.38	9.50	0.09	9.94	27.91	60.00	-32.09	QP	LINE
12	7.85	-0.34	9.50	0.09	9.94	19.19	50.00	-30.81	Average	LINE

Note:

1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

7. Photos of the EUT

Please refer to appendix III

END OF REPORT