FCC Test Report

Product Name	STREAMING SOUNDBAR
Model No.	AU-SNDBR-2.0-BLK
FCC ID	2AJAAAUSNDBR20BLK

Applicant	DONGGUAN MEILOON ACOUSTIC EQUIPMENTS CO., LTD.
Address	77, Yuanlin Road, Fenghuanggang Ind. Estate,Tangxia Town, Guangdong Province, Dongguan City, 523727, China

Date of Receipt	Aug. 30, 2018
Issued Date	Dec. 20, 2018
Report No.	1880389R-RFUSP67V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issued Date: Dec. 20, 2018
Report No.: 1880389R-RFUSP67V00

Product Name	STREAMING SOUNDBAR
Applicant	DONGGUAN MEILOON ACOUSTIC EQUIPMENTS CO., LTD.
Address	77, Yuanlin Road, Fenghuanggang Ind. Estate,Tangxia Town, Guangdong Province, Dongguan City, 523727, China
Manufacturer	Wirepath Home Systems, LLC – doing business as SnapAV
Model No.	AU-SNDBR-2.0-BLK
EUT Rated Voltage	AC 100-240V, 50/60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	AUTONOMIC
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : April Chen

(Senior Adm. Specialist / April Chen)

Tested By : Sam Hsu

(Engineer / Sam Hsu)

Approved By :

(Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	STREAMING SOUNDBAR
Trade Name	AUTONOMIC
Model No.	AU-SNDBR-2.0-BLK
FCC ID	2AJAAAUSNDBR20BLK
Frequency Range	5730~5845MHz
Channel Control	Auto
Antenna Type	Printed on PCB
Channel Number	16
Type of Modulation	GFSK
Power Adapter #1	MFR: Dongguan Dongsong Electronic Co., Ltd, M/N: DYS602-240250-15714A Input: AC 100-240V~50-60Hz 1.5A MAX Output: 24.0V⎓2.5A Cable out: Non-Shielded, 1.8m with one ferrite core bonded. Power cord: Non-Shielded, 1.8m.
Power Adapter #2	MFR: EPS, M/N: F150602-A Input: AC 100-240V~1.8A 50-60Hz Output: 24V⎓2.5A Cable out: Non-Shielded, 1.8m with one ferrite core bonded. Power cord: Non-Shielded, 1.8m.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	MEILOON	CSM5_V3.2	Printed on PCB	1.6 dBi for 5.725~5.85 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel

Channel 01: 5730 MHz	Channel 02: 5733 MHz	Channel 03: 5739 MHz	Channel 04: 5745 MHz
Channel 05: 5751 MHz	Channel 06: 5757 MHz	Channel 07: 5763 MHz	Channel 08: 5769 MHz
Channel 09: 5777 MHz	Channel 10: 5785 MHz	Channel 11: 5793 MHz	Channel 12: 5805 MHz
Channel 13: 5825 MHz	Channel 14: 5831 MHz	Channel 15: 5837 MHz	Channel 16: 5845 MHz

Note:

1. The EUT is a STREAMING SOUNDBAR with a built-in WLAN,Bluetooth and 5.8GHz transceiver,this report for 5.8GHz.
2. Sounderbar built-in 5.8GHz transmitter, sub speaker built-in 5.8GHz receiver.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
5. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.

Test Mode	Mode 1: Transmit

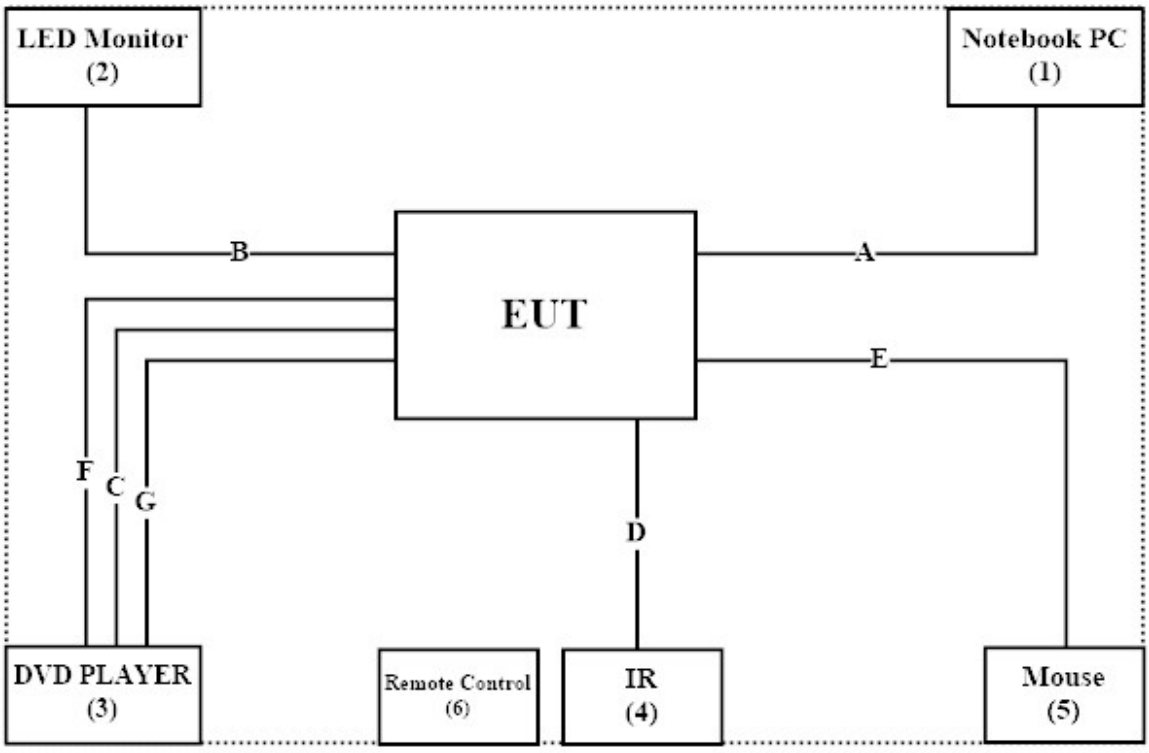
1.3. Tested System Datails

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5580	2HRD7H2	Non-Shielded, 0.8m
2	LED Monitor	ViewSonic	VX2257-mhd	UFY163502150	Non-Shielded, 1.8m
3	DVD PLAYER	Pioneer	DV-600AV	GJKD006463LS	Non-Shielded, 1.8m
4	IR	N/A	N/A	N/A	N/A
5	Mouse	Logitech	M-SBM96B	810-000439	N/A
6	Remote Control	N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 0.7m
B	HDMI Cable	Non-Shielded, 1.8m
C	Signal Cable	Non-Shielded, 1.8m
D	IR Cable	Non-Shielded, 1.8m
E	Mouse Cable	Shielded, 1.8m
E	Fiber Cable	Non-Shielded, 1.5m
F	RCA Cable	Non-Shielded, 1.5m

1.4. Configuration of Test System



1.5. EUT Exercise Software

(1) Setup the EUT as shown in Section 1.4.
(2) Press and hold the button.
(3) Configure the test mode and the test channel
(4) start the continuous Transmit.
(5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/02/12	2019/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2018/09/27	2019/09/26
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19	2019/11/18
X	LISN	R&S	ESH3-Z5	836679/017	2018/02/09	2019/02/08
X	LISN	R&S	ENV216	100097	2018/02/09	2019/02/08
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

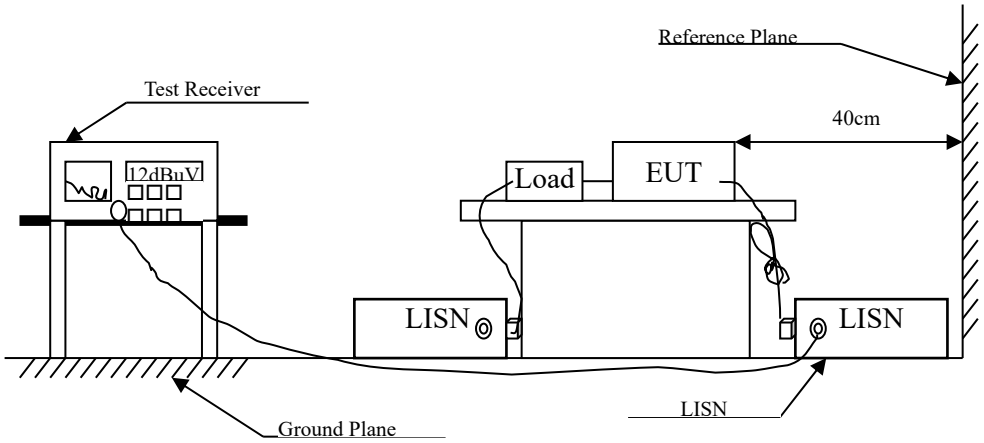
For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
X	Loop Antenna	Teseq	HLA6121	37133	2018/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/06/14	2019/06/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2018/11/30	2019/11/29
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
X	Horn Antenna	Com-Power	AH-840	101043	2018/01/09	2019/01/08
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
X	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version :QuieTek EMI 2.0 V2.1.113.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : STREAMING SOUNDBAR
Test Item : Conducted Emission Test
Power Line : Line 1
Test Date : 2018/11/15
Test Mode : Mode 1: Transmit (5785MHz) (DYS602-240250-15714A)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.185	9.738	28.460	38.198	-26.802	65.000
0.341	9.744	33.440	43.184	-17.359	60.543
0.494	9.750	22.270	32.020	-24.151	56.171
1.521	9.802	21.580	31.382	-24.618	56.000
8.505	10.033	28.060	38.093	-21.907	60.000
13.521	10.136	19.600	29.736	-30.264	60.000
Average					
0.185	9.738	15.070	24.808	-30.192	55.000
0.341	9.744	26.780	36.524	-14.019	50.543
0.494	9.750	14.510	24.260	-21.911	46.171
1.521	9.802	13.880	23.682	-22.318	46.000
8.505	10.033	26.650	36.683	-13.317	50.000
13.521	10.136	10.320	20.456	-29.544	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

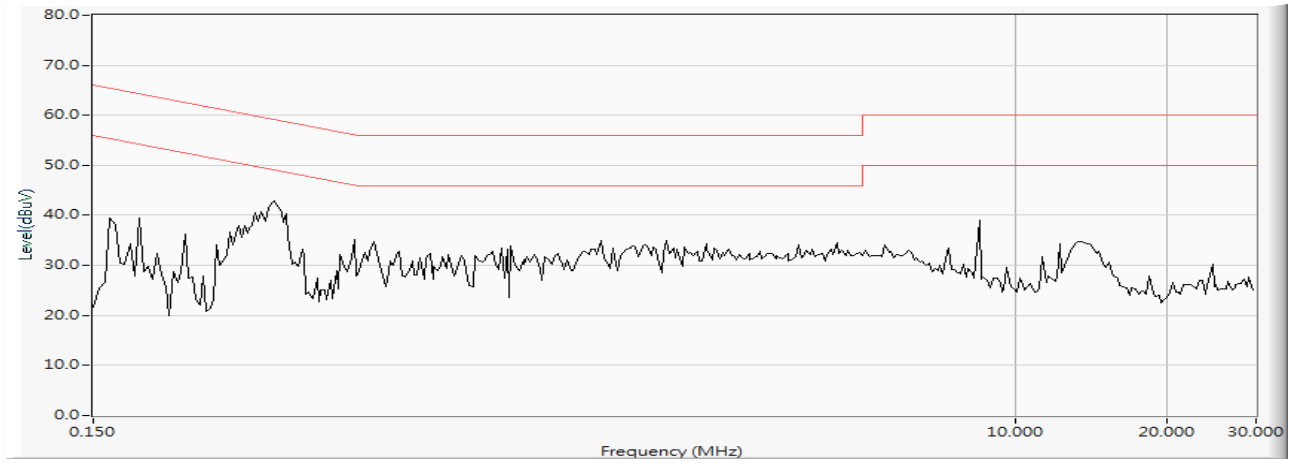
Product : STREAMING SOUNDBAR
Test Item : Conducted Emission Test
Power Line : Line 2
Test Date : 2018/11/15
Test Mode : Mode 1: Transmit (5785MHz) (DYS602-240250-15714A)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.158	9.736	33.190	42.926	-22.845	65.771
0.334	9.733	32.250	41.983	-18.760	60.743
1.966	9.820	21.470	31.290	-24.710	56.000
8.505	10.043	27.400	37.443	-22.557	60.000
13.771	10.200	19.870	30.070	-29.930	60.000
24.580	10.455	19.840	30.295	-29.705	60.000
Average					
0.158	9.736	18.090	27.826	-27.945	55.771
0.334	9.733	25.740	35.473	-15.270	50.743
1.966	9.820	13.500	23.320	-22.680	46.000
8.505	10.043	24.220	34.263	-15.737	50.000
13.771	10.200	10.800	21.000	-29.000	50.000
24.580	10.455	19.150	29.605	-20.395	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

LINE 1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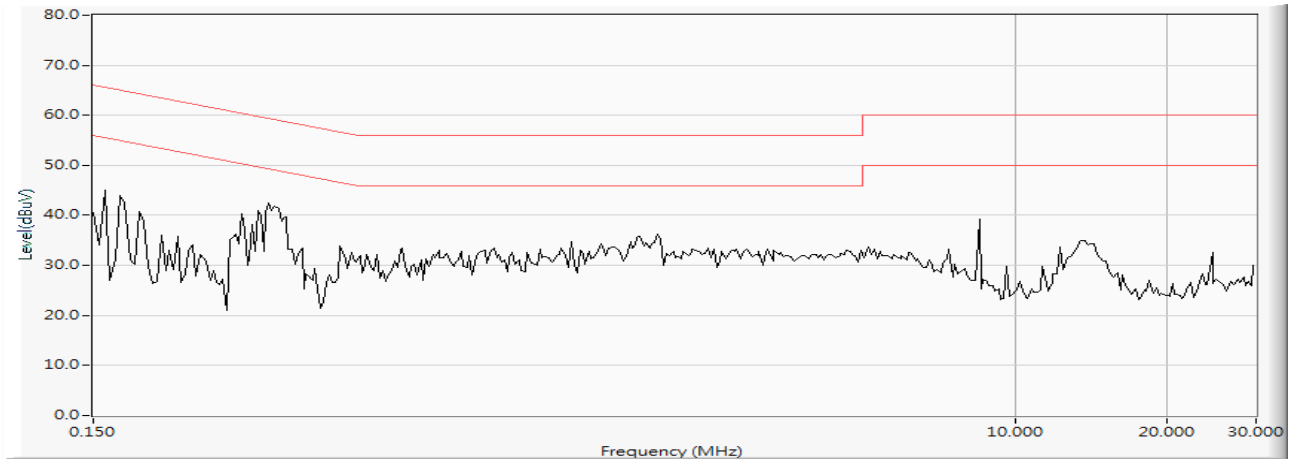
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Level(dBuV)
0.150
10.000
20.000
30.000
Frequency (MHz)

LINE 2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70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Level(dBuV)
0.150
10.000
20.000
30.000
Frequency (MHz)

Product : STREAMING SOUNDBAR
Test Item : Conducted Emission Test
Power Line : Line 1
Test Date : 2018/12/20
Test Mode : Mode 1: Transmit (5785MHz) (F150602-A)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.154	9.748	37.340	47.088	-18.798	65.886
0.177	9.741	33.240	42.981	-22.248	65.229
0.193	9.738	31.060	40.798	-23.973	64.771
0.216	9.738	28.020	37.758	-26.356	64.114
0.275	9.741	20.060	29.801	-32.628	62.429
0.412	9.746	19.680	29.426	-29.088	58.514
Average					
0.154	9.748	17.950	27.698	-28.188	55.886
0.177	9.741	13.150	22.891	-32.338	55.229
0.193	9.738	12.070	21.808	-32.963	54.771
0.216	9.738	9.330	19.068	-35.046	54.114
0.275	9.741	3.840	13.581	-38.848	52.429
0.412	9.746	10.300	20.046	-28.468	48.514

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

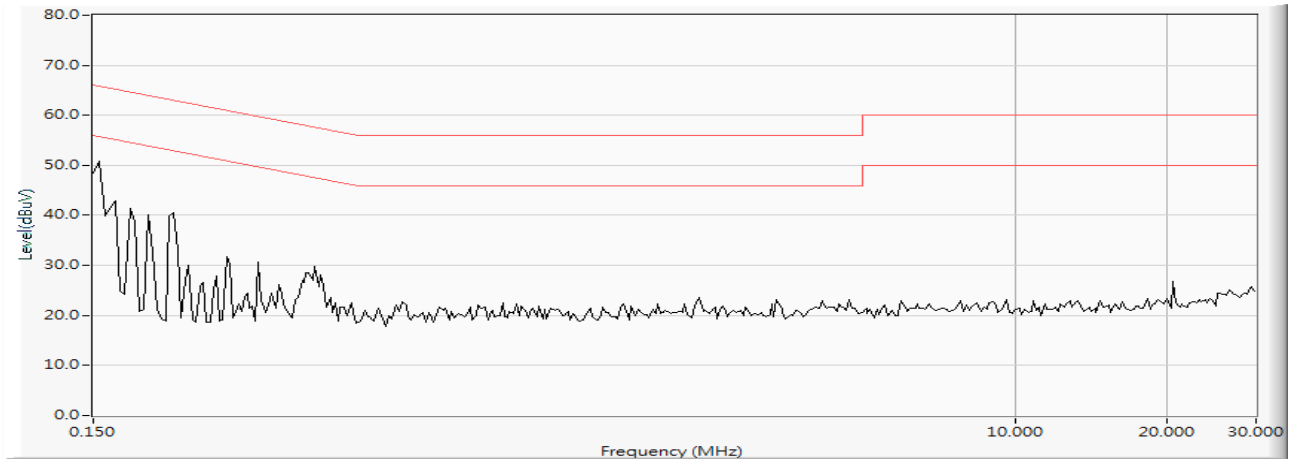
Product : STREAMING SOUNDBAR
Test Item : Conducted Emission Test
Power Line : Line 2
Test Date : 2018/12/20
Test Mode : Mode 1: Transmit (5785MHz) (F150602-A)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.150	9.739	37.940	47.679	-18.321	66.000
0.166	9.736	35.920	45.656	-19.887	65.543
0.193	9.738	30.940	40.678	-24.093	64.771
0.271	9.741	21.420	31.161	-31.382	62.543
0.400	9.736	21.040	30.776	-28.081	58.857
20.478	10.386	16.200	26.586	-33.414	60.000
Average					
0.150	9.739	18.930	28.669	-27.331	56.000
0.166	9.736	16.950	26.686	-28.857	55.543
0.193	9.738	12.070	21.808	-32.963	54.771
0.271	9.741	4.600	14.341	-38.202	52.543
0.400	9.736	11.930	21.666	-27.191	48.857
20.478	10.386	15.350	25.736	-24.264	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

LINE 1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50.0
40.0
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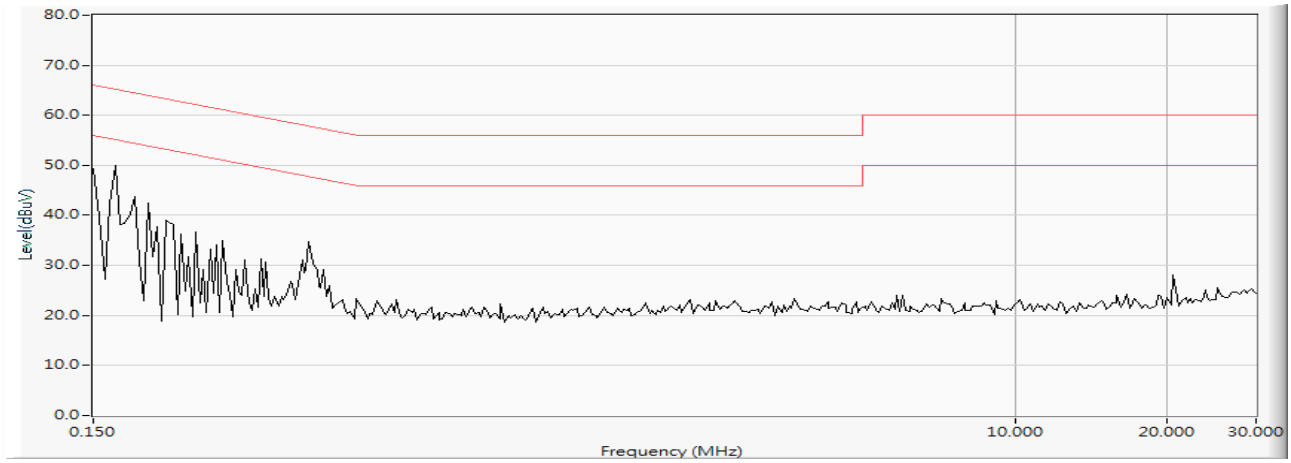
Level(dBuV)
0.150
10.000
20.000
30.000
Frequency (MHz)

LINE 2


80.0
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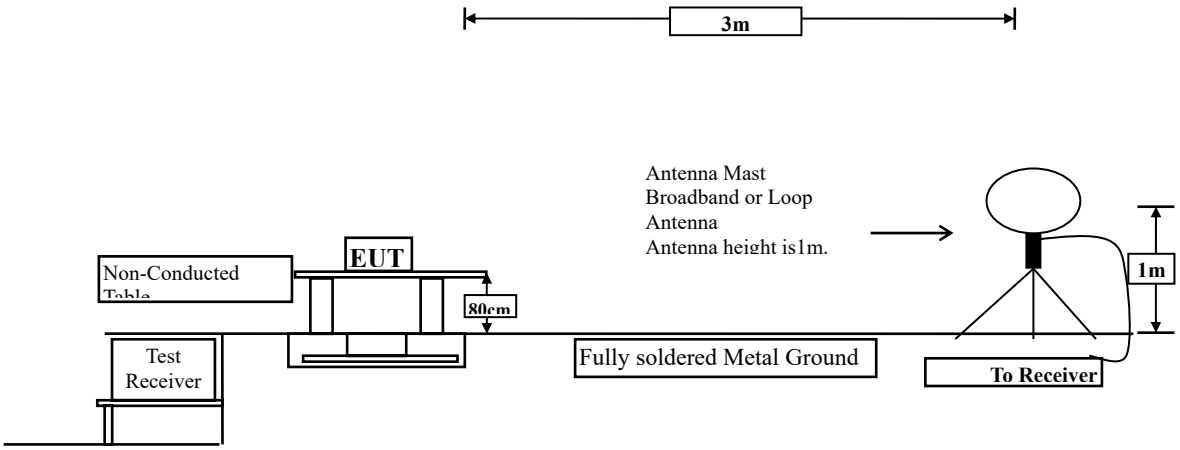
50.0
40.0
30.0
20.0
10.0
0.0
Level(dBuV)
0.150
10.000
20.000
30.000
Frequency (MHz)

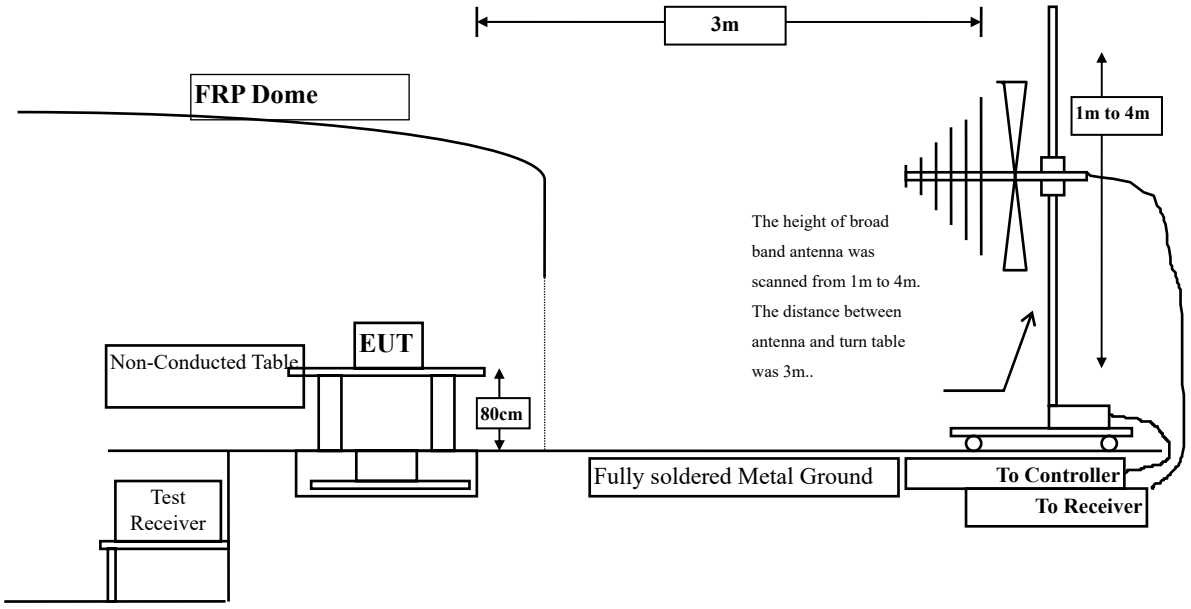
3. Radiated Emission

3.1. Test Setup

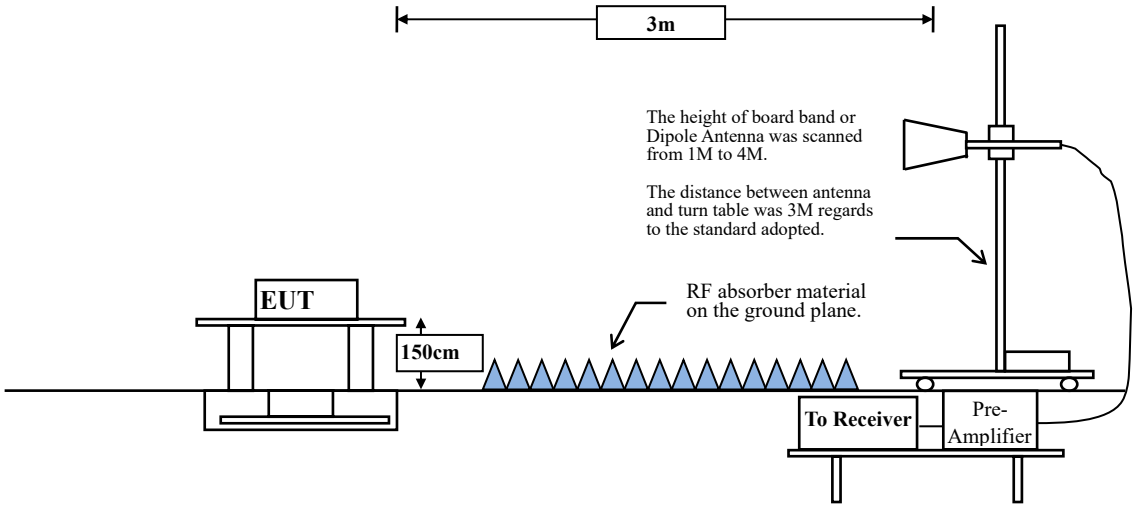
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.2. Limits

➢ **Fundamental and Harmonics Emission Limits**

FCC Part 15 Subpart C Paragraph 15.249 Limits				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dBuV/m @3m)	(uV/m @3m)	(dBuV/m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

Remarks : 1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➢ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.249 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

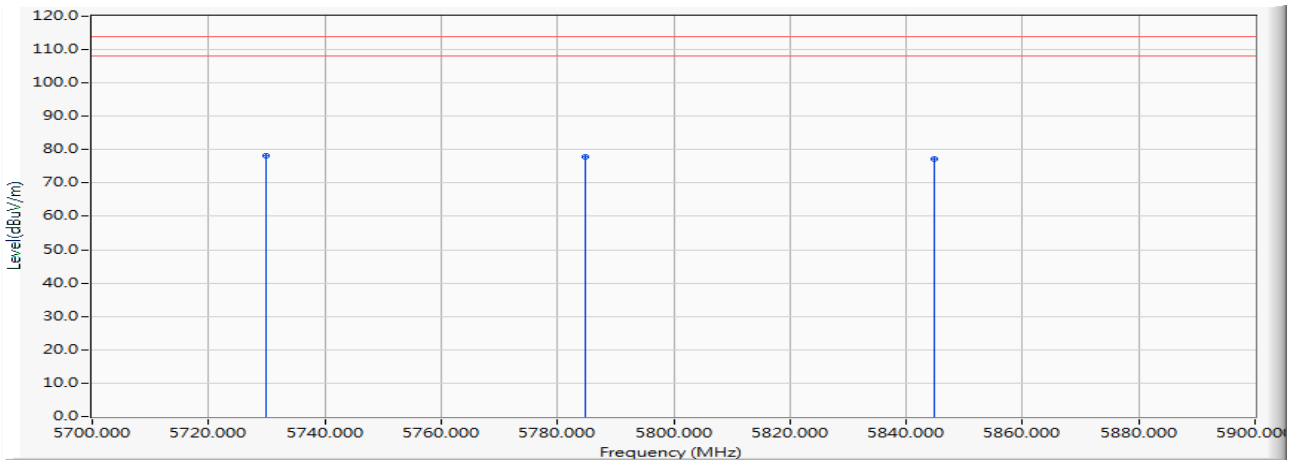
3.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : STREAMING SOUNDBAR
Test Item : Fundamental Radiated Emission
Test Site : No.3OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
5730.000	11.577	66.730	78.307	-35.693	114.000
5785.000	11.403	66.520	77.922	-36.078	114.000
5845.000	11.665	65.520	77.185	-36.815	114.000

Note:

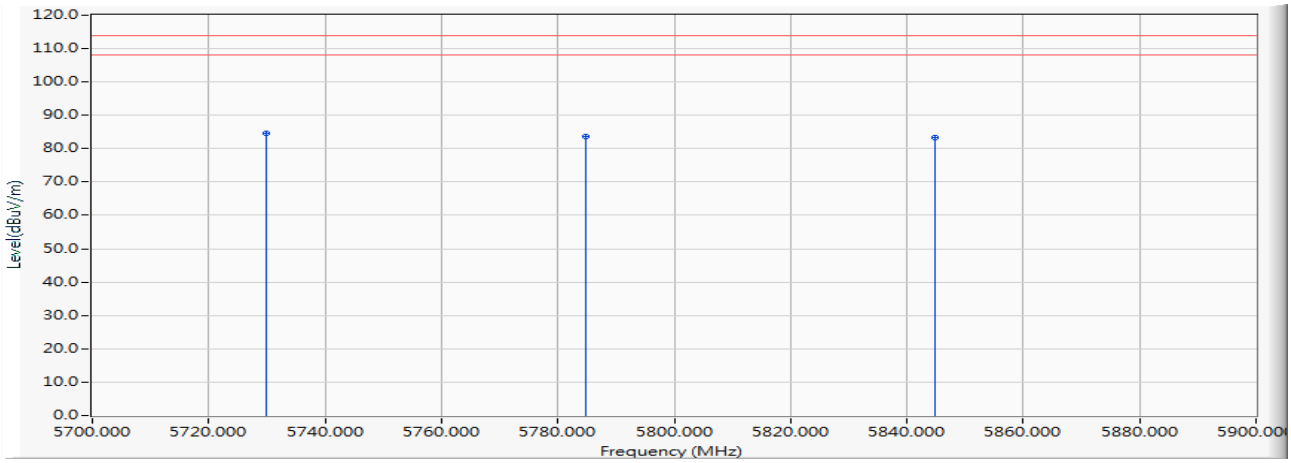
1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Horizontal					
Average Detector:					
5730	78.307	-19.879	58.428	-35.572	94.000
5785	77.922	-19.879	58.043	-35.957	94.000
5845	77.185	-19.879	57.306	-36.694	94.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	STREAMING SOUNDBAR
Test Item	:	Fundamental Radiated Emission
Test Site	:	No.3OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Vertical					
Peak Detector:					
5730.000	12.914	71.790	84.704	-29.296	114.000
5785.000	12.721	71.020	83.741	-30.259	114.000
5845.000	12.763	70.710	83.473	-30.527	114.000

Note:

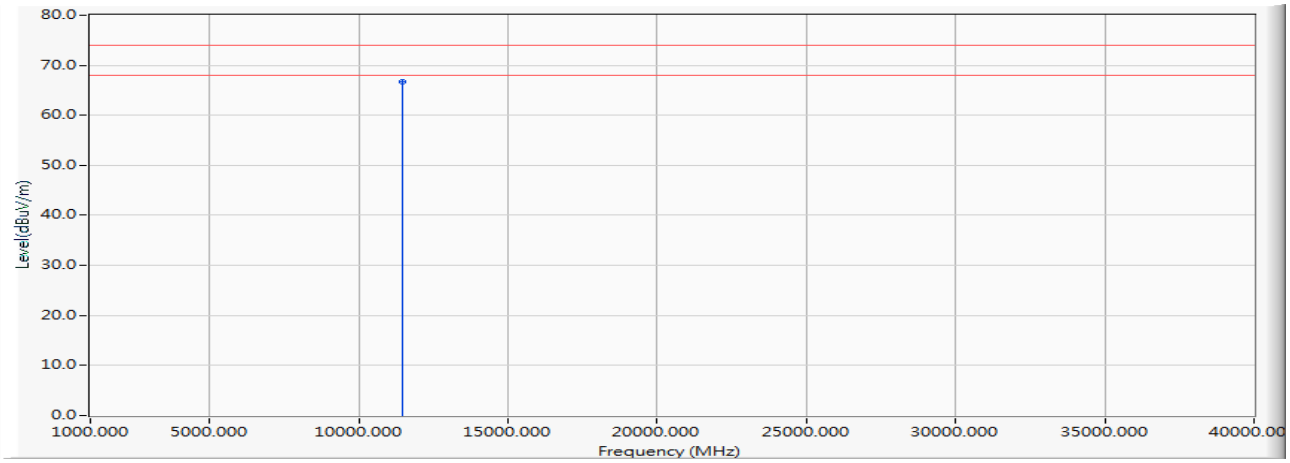
1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Vertical					
Average Detector:					
5730	84.704	-19.879	64.825	-29.175	94.000
5785	83.741	-19.879	63.862	-30.138	94.000
5845	83.473	-19.879	63.594	-30.406	94.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	STREAMING SOUNDBAR
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5729.8MHz)



Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11460.000	2.476	64.120	66.597	-7.403	74.000

Note:

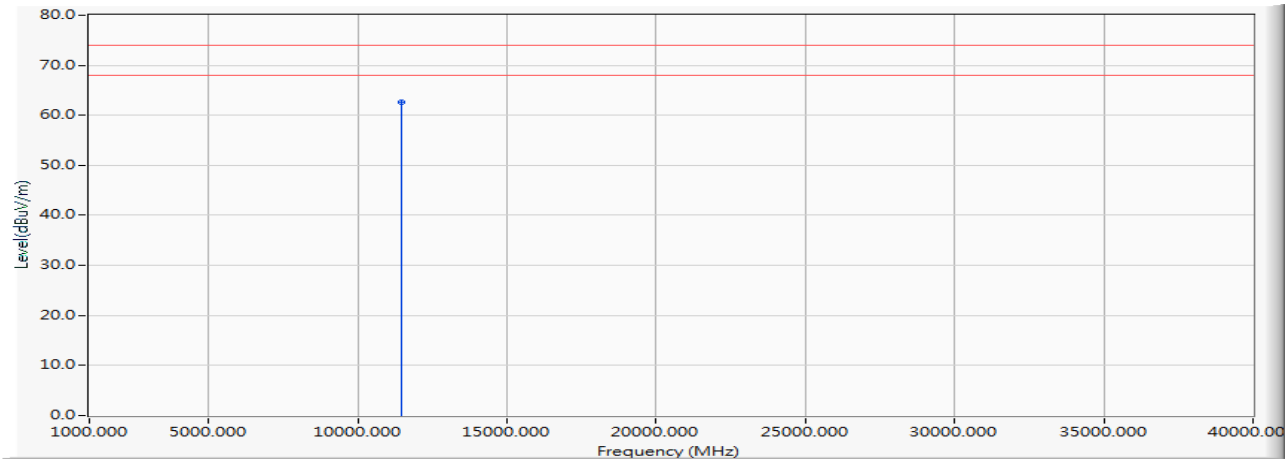
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Horizontal					
Average Detector:					
11460	66.597	-19.879	46.718	-7.282	54.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : STREAMING SOUNDBAR
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit (5729.8MHz)



Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical					
Peak Detector:					
11460.000	3.290	59.270	62.561	-11.439	74.000

Note:

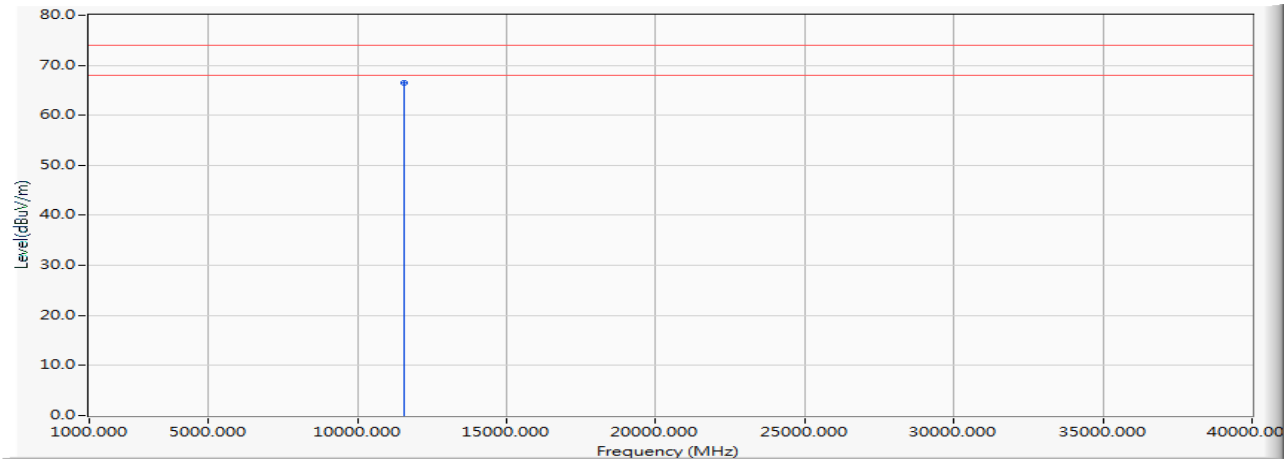
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Vertical					
Average Detector:					
11460	62.561	-19.879	42.682	-11.318	54.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	STREAMING SOUNDBAR
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5784.8MHz)



Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11570.000	2.338	64.050	66.388	-7.612	74.000

Note:

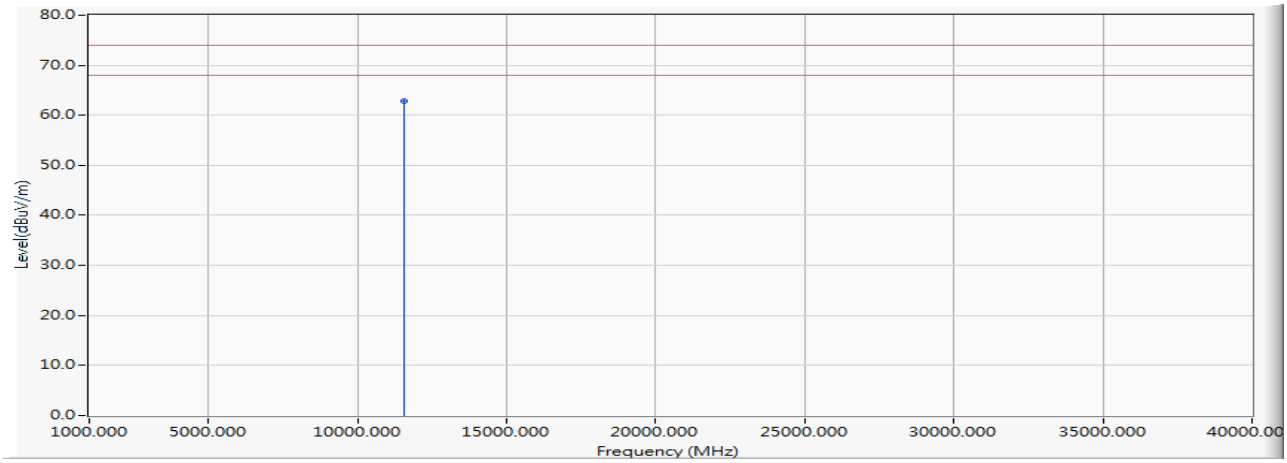
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Horizontal					
Average Detector:					
11569.6	66.388	-19.879	46.509	-7.491	54.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : STREAMING SOUNDBAR
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit (5784.8MHz)



Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical					
Peak Detector:					
11570.000	3.227	59.630	62.857	-11.143	74.000

Note:

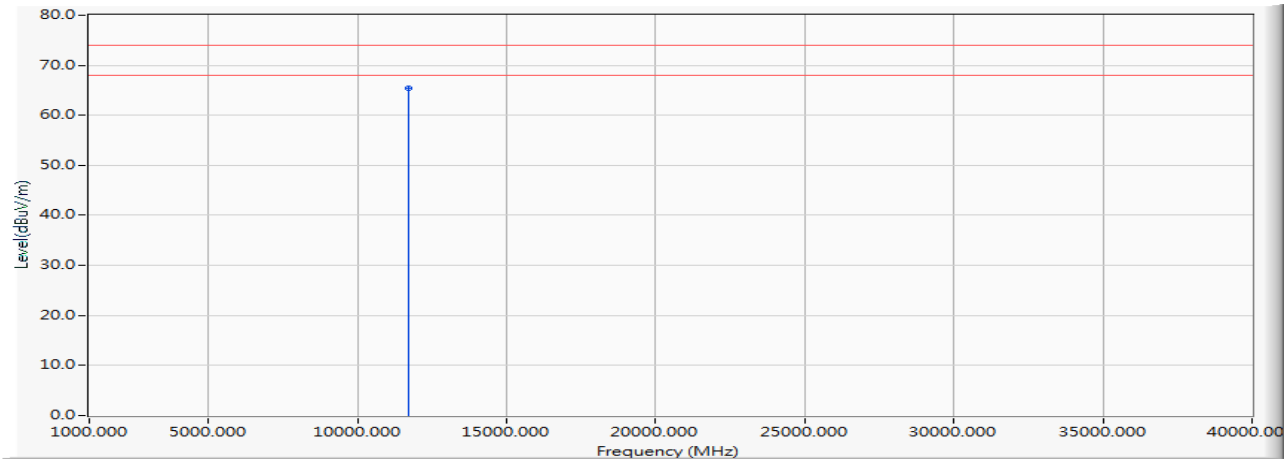
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Vertical					
Average Detector:					
11569.6	62.857	-19.879	42.978	-11.022	54.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : STREAMING SOUNDBAR
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit (5844.8 MHz)



Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11690.000	1.171	64.340	65.512	-8.488	74.000

Note:

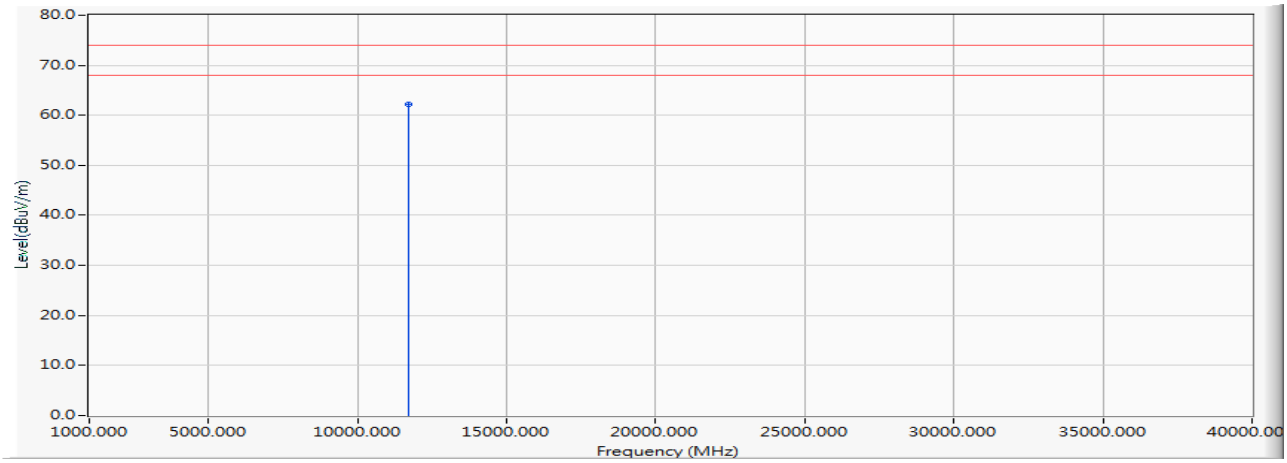
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Horizontal					
Average Detector:					
11689.6	65.512	-19.879	45.633	-8.367	54.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	STREAMING SOUNDBAR
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5844.8 MHz)



Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical					
Peak Detector:					
11690.000	2.495	59.810	62.306	-11.694	74.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

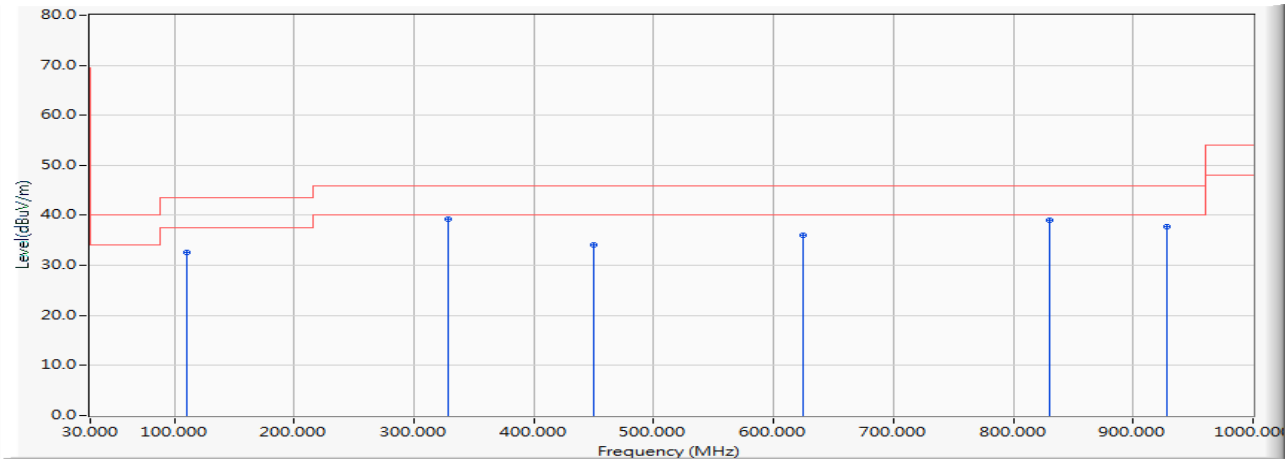
Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dBuV/m	dB	dBuV/m	dB	dBuV/m
Vertical					
Average Detector:					
11689.6	62.306	-19.879	42.427	-11.573	54.000

Note:

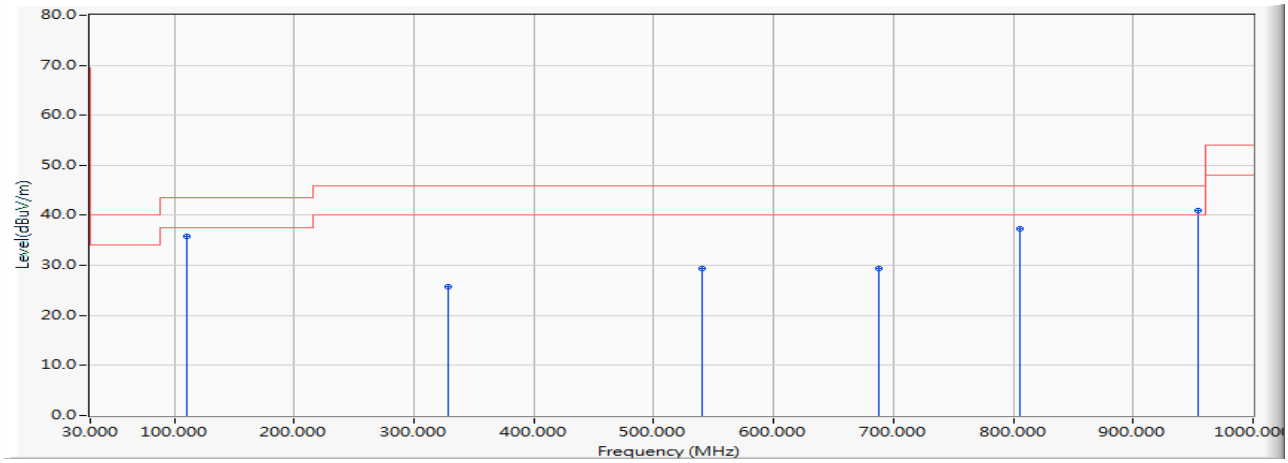
1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	STREAMING SOUNDBAR
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5730MHz) (DYS602-240250-15714A)

Horizontal:



Vertical:



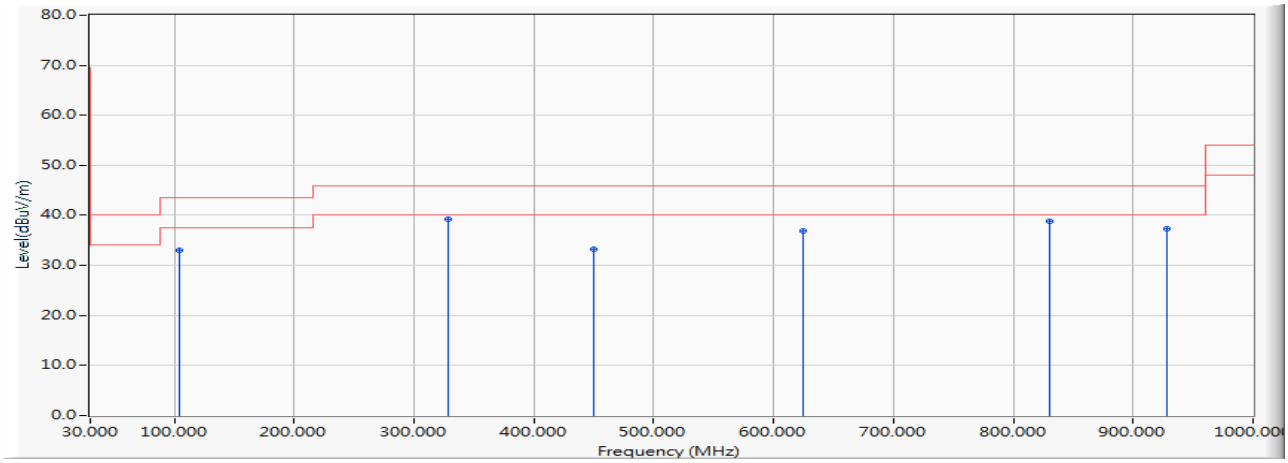
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
110.130	-16.959	49.650	32.691	-10.809	43.500
328.029	-14.079	53.373	39.294	-6.706	46.000
450.333	-11.568	45.717	34.149	-11.851	46.000
624.652	-8.049	44.047	35.998	-10.002	46.000
829.899	-3.806	42.888	39.082	-6.918	46.000
928.304	-3.101	40.944	37.842	-8.158	46.000
Vertical					
110.130	-9.871	45.605	35.734	-7.766	43.500
328.029	-14.728	40.460	25.732	-20.268	46.000
540.304	-9.695	39.114	29.419	-16.581	46.000
687.913	-7.542	36.952	29.410	-16.590	46.000
806.000	-6.249	43.643	37.394	-8.606	46.000
953.609	-3.353	44.243	40.890	-5.110	46.000

Note:

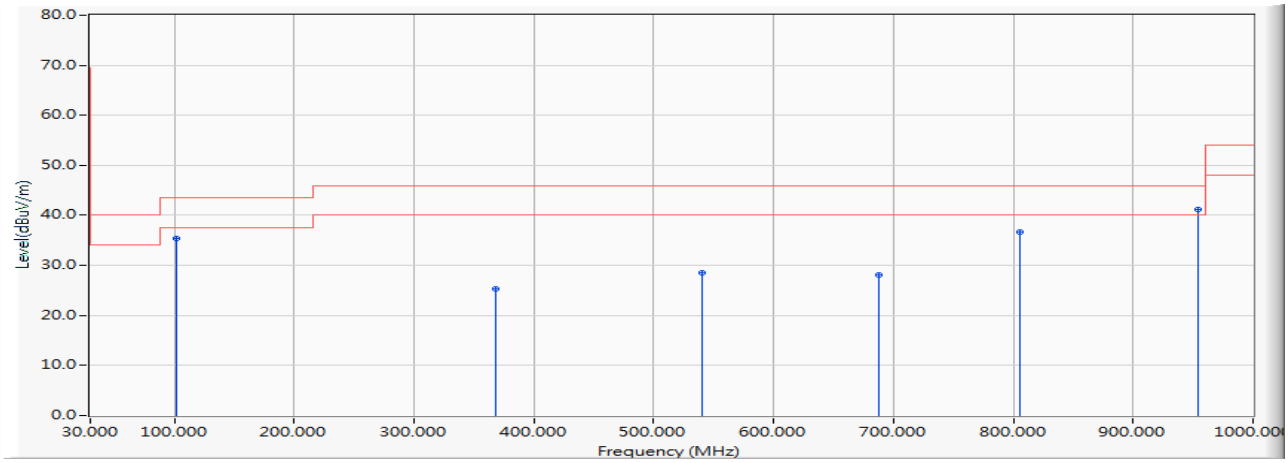
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	STREAMING SOUNDBAR
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5785MHz) (DYS602-240250-15714A)

Horizontal:



Vertical:



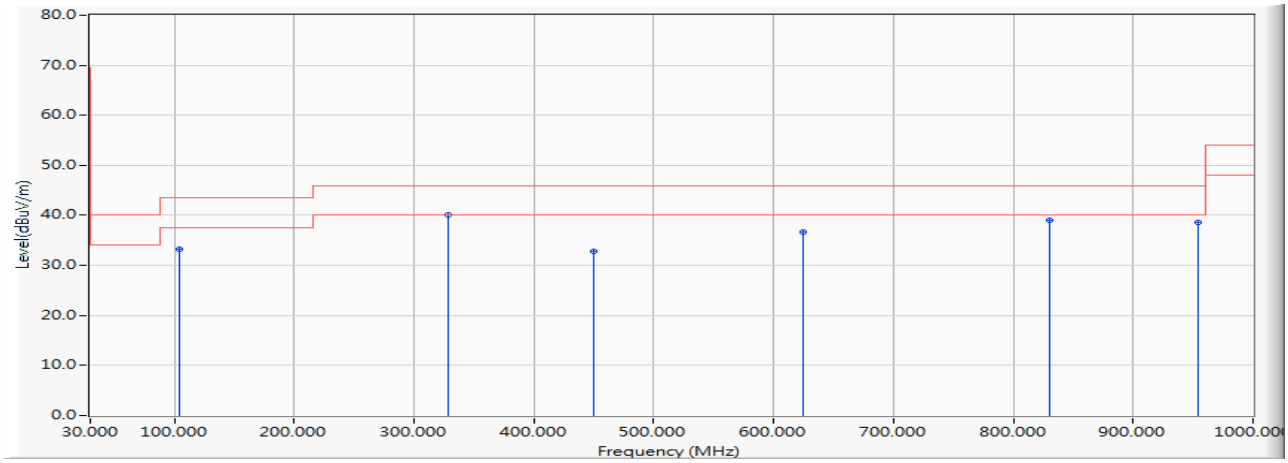
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
104.507	-15.969	49.017	33.049	-10.451	43.500
328.029	-14.079	53.347	39.268	-6.732	46.000
450.333	-11.568	44.778	33.210	-12.790	46.000
624.652	-8.049	44.971	36.922	-9.078	46.000
829.899	-3.806	42.587	38.781	-7.219	46.000
928.304	-3.101	40.367	37.265	-8.735	46.000
Vertical					
101.696	-9.363	44.665	35.302	-8.198	43.500
368.797	-12.291	37.616	25.325	-20.675	46.000
540.304	-9.695	38.260	28.565	-17.435	46.000
687.913	-7.542	35.714	28.172	-17.828	46.000
806.000	-6.249	42.956	36.707	-9.293	46.000
953.609	-3.353	44.427	41.074	-4.926	46.000

Note:

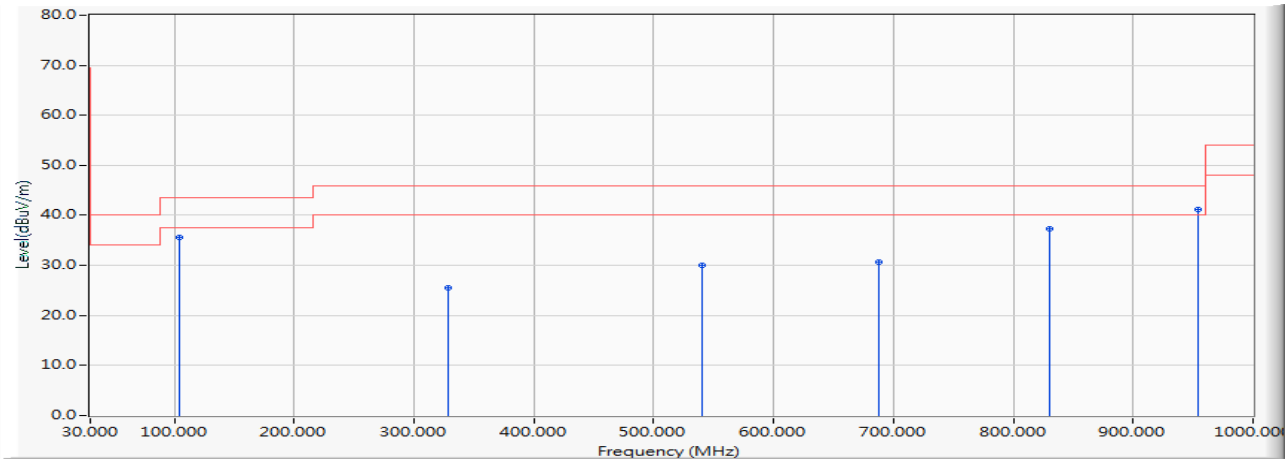
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	STREAMING SOUNDBAR
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5845MHz) (DYS602-240250-15714A)

Horizontal:



Vertical:



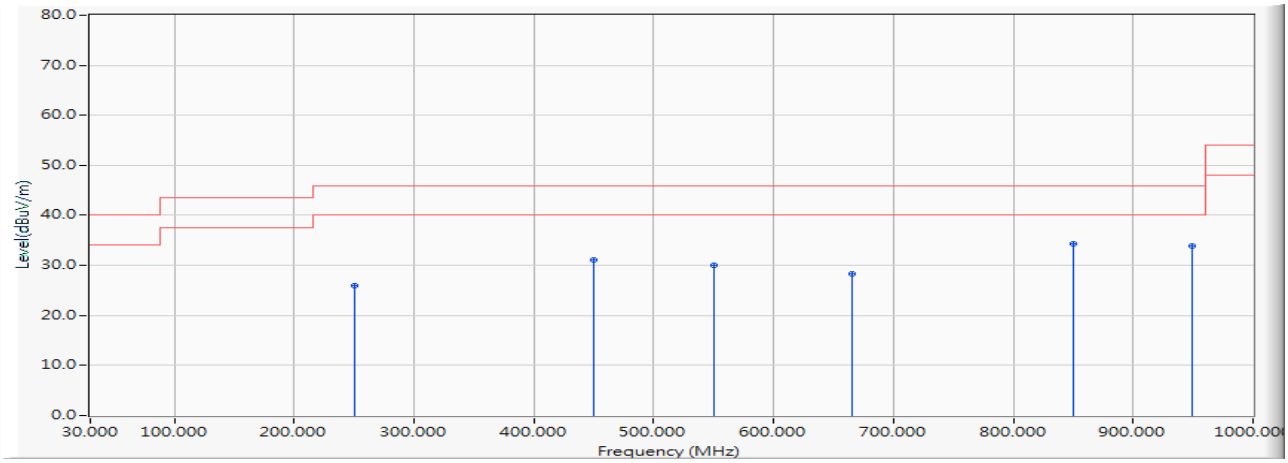
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
104.507	-15.969	49.283	33.315	-10.185	43.500
328.029	-14.079	54.286	40.207	-5.793	46.000
450.333	-11.568	44.322	32.754	-13.246	46.000
624.652	-8.049	44.725	36.676	-9.324	46.000
829.899	-3.806	42.744	38.938	-7.062	46.000
953.609	-3.622	42.162	38.540	-7.460	46.000
Vertical					
104.507	-9.523	45.054	35.531	-7.969	43.500
328.029	-14.728	40.195	25.467	-20.533	46.000
540.304	-9.695	39.664	29.969	-16.031	46.000
687.913	-7.542	38.236	30.694	-15.306	46.000
829.899	-7.362	44.659	37.297	-8.703	46.000
953.609	-3.353	44.467	41.114	-4.886	46.000

Note:

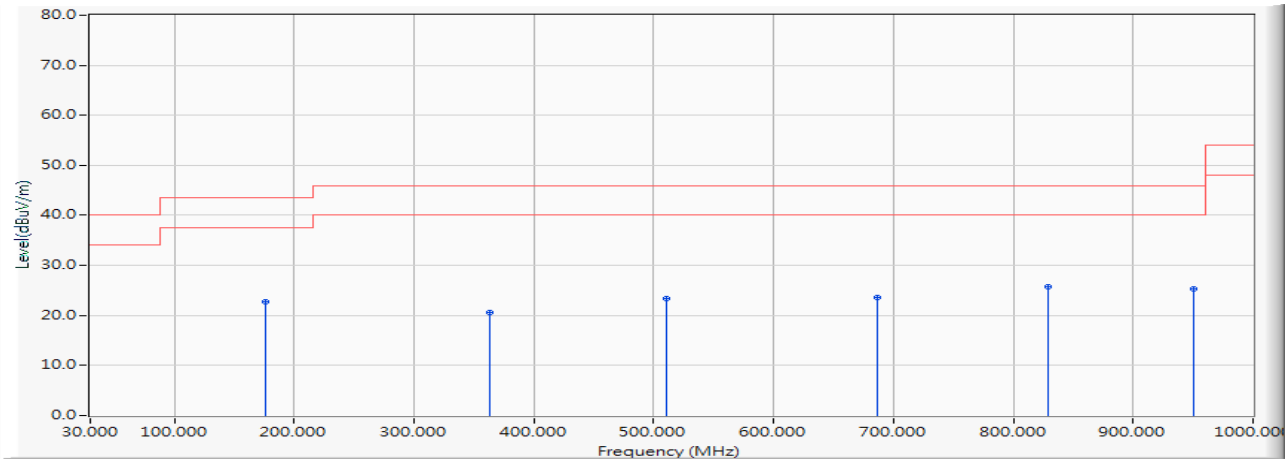
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	STREAMING SOUNDBAR
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/20
Test Mode	:	Mode 1: Transmit (5730MHz) (F150602-A)

Horizontal:



Vertical:



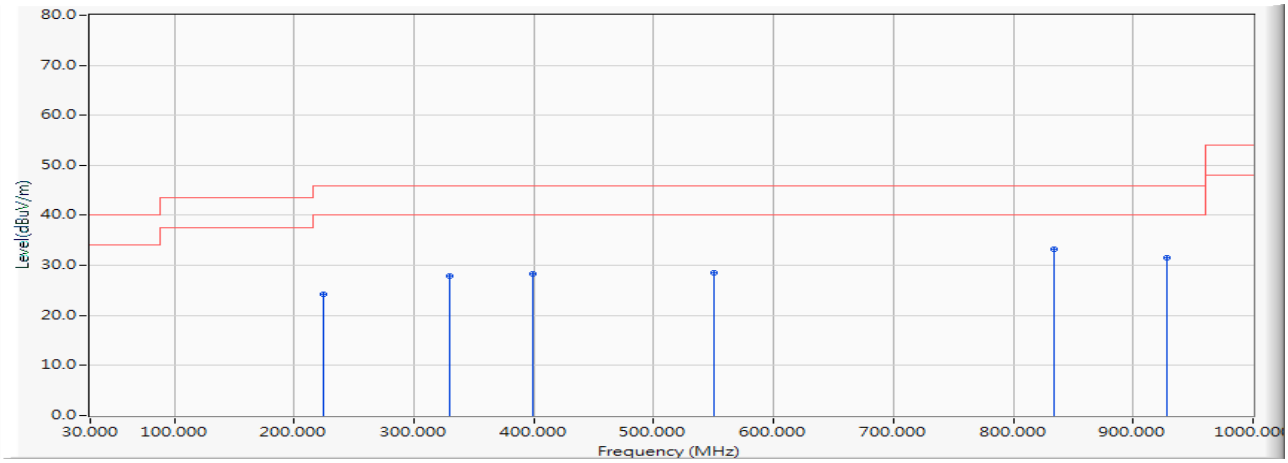
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
250.190	-15.365	41.383	26.018	-19.982	46.000
450.010	-8.813	39.987	31.174	-14.826	46.000
549.920	-5.879	35.854	29.975	-16.025	46.000
665.350	-7.837	36.078	28.241	-17.759	46.000
849.650	-3.479	37.807	34.328	-11.672	46.000
949.560	-3.033	36.896	33.863	-12.137	46.000
Vertical					
176.470	-10.775	33.454	22.679	-20.821	43.500
362.710	-9.626	30.112	20.486	-25.514	46.000
510.150	-8.560	31.876	23.316	-22.684	46.000
686.690	-7.469	31.020	23.551	-22.449	46.000
829.280	-7.722	33.355	25.633	-20.367	46.000
950.530	-6.942	32.146	25.204	-20.796	46.000

Note:

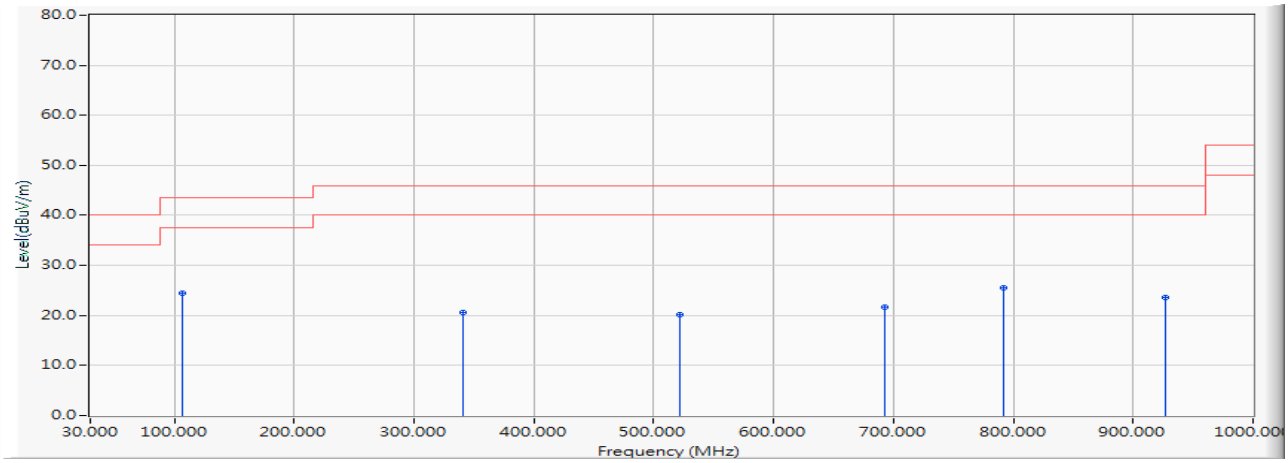
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.
7. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	STREAMING SOUNDBAR
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/20
Test Mode	:	Mode 1: Transmit (5785MHz) (F150602-A)

Horizontal:



Vertical:



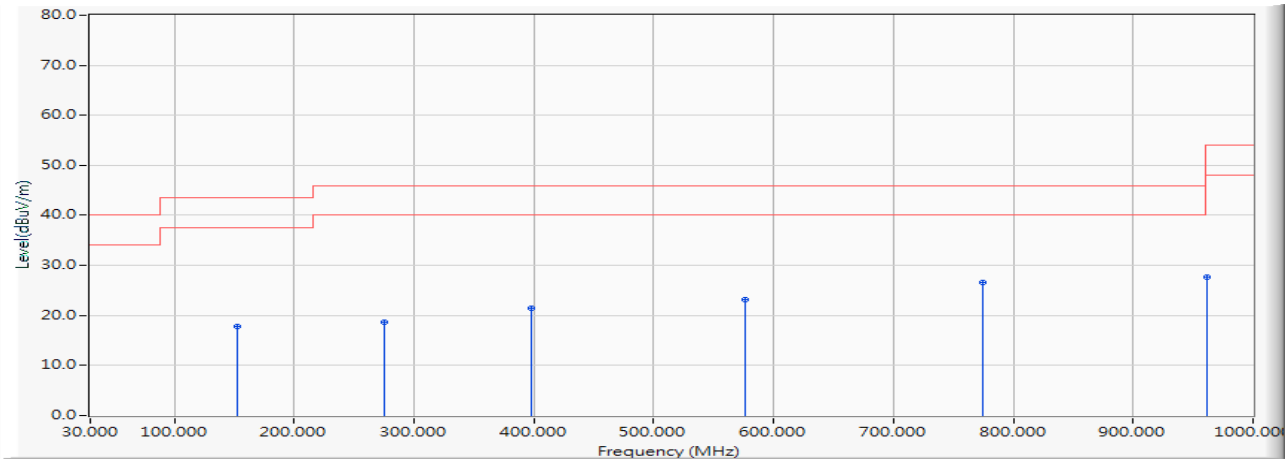
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
224.970	-19.253	43.529	24.276	-21.724	46.000
329.730	-13.733	41.547	27.814	-18.186	46.000
399.570	-8.469	36.752	28.283	-17.717	46.000
549.920	-5.879	34.496	28.617	-17.383	46.000
834.130	-3.732	37.002	33.270	-12.730	46.000
928.220	-2.872	34.330	31.458	-14.542	46.000
Vertical					
106.630	-13.520	37.918	24.398	-19.102	43.500
341.370	-10.432	31.043	20.611	-25.389	46.000
521.790	-8.398	28.643	20.245	-25.755	46.000
692.510	-7.846	29.461	21.615	-24.385	46.000
792.420	-7.374	32.970	25.596	-20.404	46.000
927.250	-6.612	30.257	23.645	-22.355	46.000

Note:

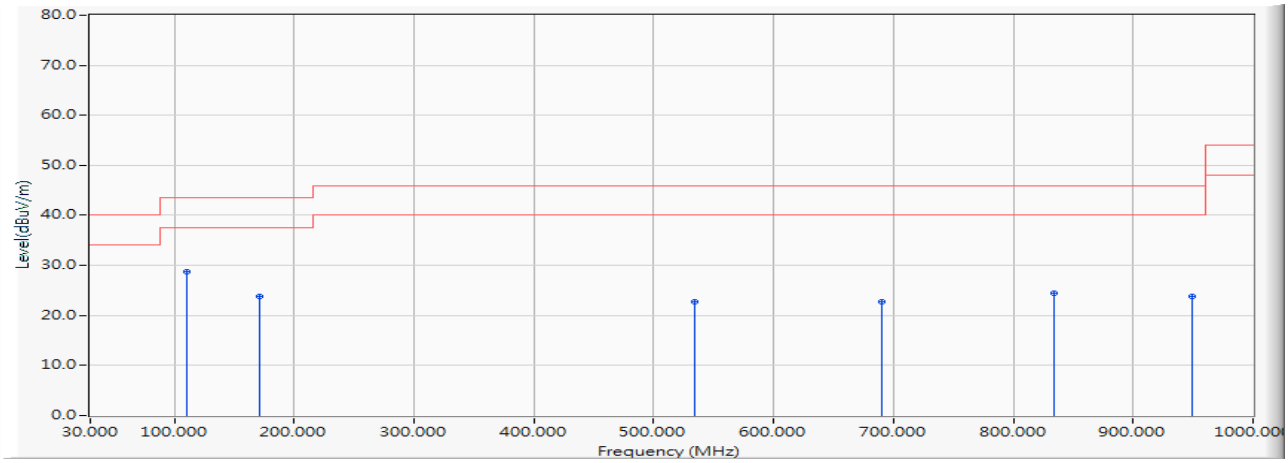
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.
7. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	STREAMING SOUNDBAR
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/20
Test Mode	:	Mode 1: Transmit (5845MHz) (F150602-A)

Horizontal:



Vertical:



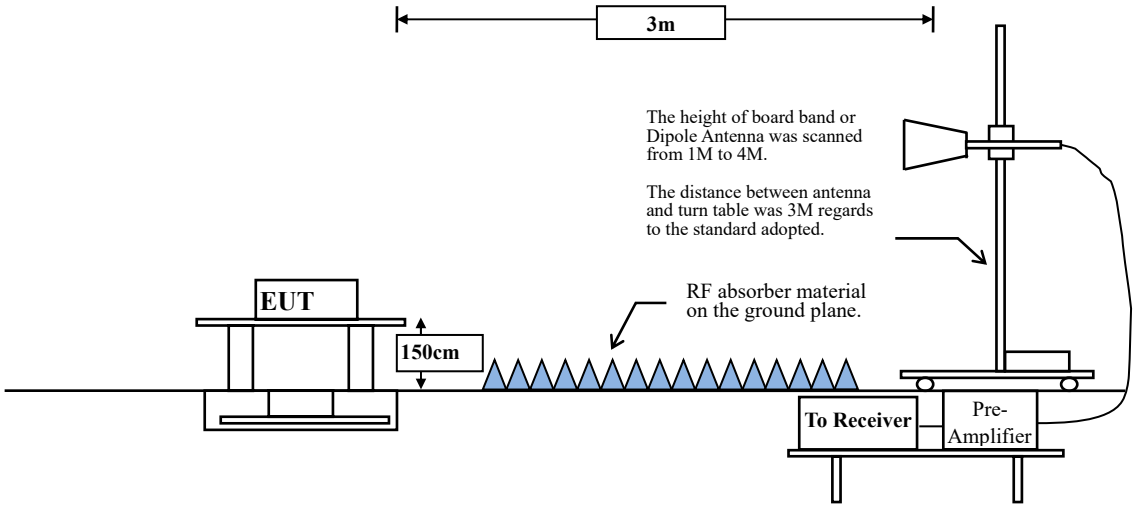
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
152.220	-17.178	34.957	17.779	-25.721	43.500
275.410	-15.772	34.496	18.724	-27.276	46.000
397.630	-8.562	30.007	21.445	-24.555	46.000
576.110	-6.458	29.668	23.210	-22.790	46.000
773.990	-4.848	31.542	26.694	-19.306	46.000
961.200	-3.242	31.013	27.771	-26.229	54.000
Vertical					
110.510	-12.608	41.260	28.652	-14.848	43.500
171.620	-12.934	36.820	23.886	-19.614	43.500
534.400	-8.245	31.003	22.758	-23.242	46.000
690.570	-7.521	30.247	22.726	-23.274	46.000
834.130	-8.552	33.071	24.519	-21.481	46.000
949.560	-6.913	30.664	23.751	-22.249	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.
7. No emission found between lowest internal used/generated frequency to 30MHz.

4. Band Edge

4.1. Test Setup



4.2. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 50 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.
The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

4.4. Uncertainty

± 4.08 dB above 1GHz
± 4.22 dB below 1GHz

4.5. Test Result of Band Edge

Product	:	STREAMING SOUNDBAR
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5730MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	5725.000	11.592	37.990	49.582	74.00	54.00	Pass
01 (Peak)	5729.348	11.578	66.583	78.161	--	--	--
01 (Average)	5725.000	11.592	19.730	31.322	74.00	54.00	Pass
01 (Average)	5729.348	11.578	66.217	77.795	--	--	--

Figure Channel 01: Horizontal (Peak)

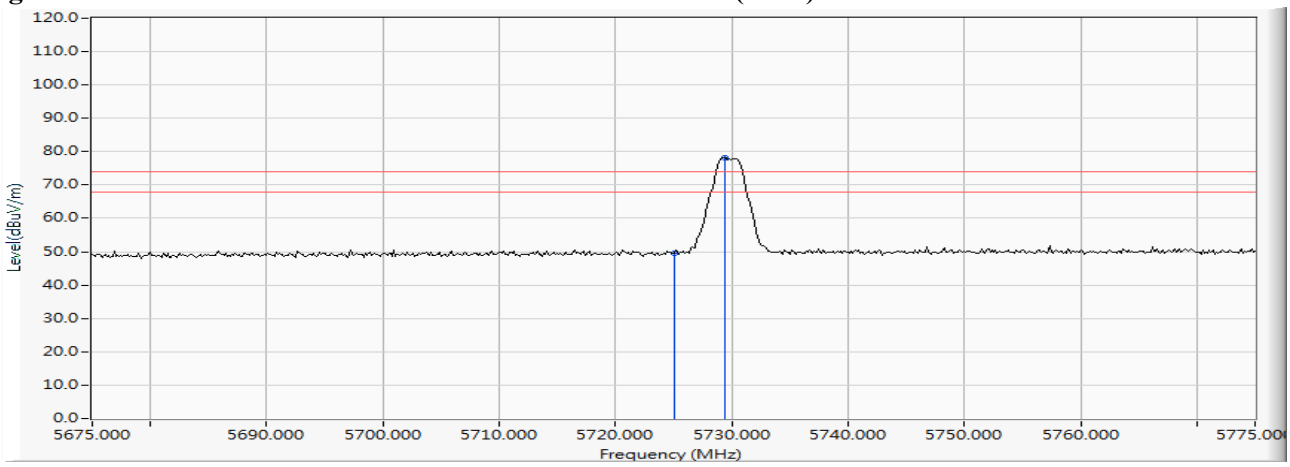
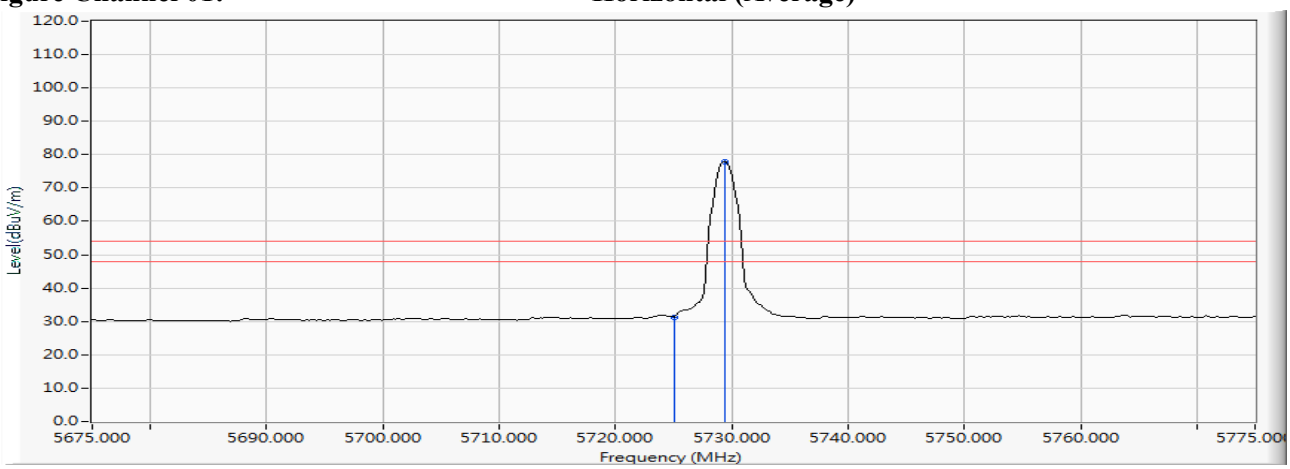


Figure Channel 01: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : STREAMING SOUNDBAR
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit (5730MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	5725.000	12.930	39.063	51.993	74.00	54.00	Pass
01 (Peak)	5729.348	12.915	72.591	85.506	--	--	--
01 (Average)	5725.000	12.930	21.399	34.329	74.00	54.00	Pass
01 (Average)	5729.348	12.915	72.359	85.274	--	--	--

Figure Channel 01: Vertical (Peak)

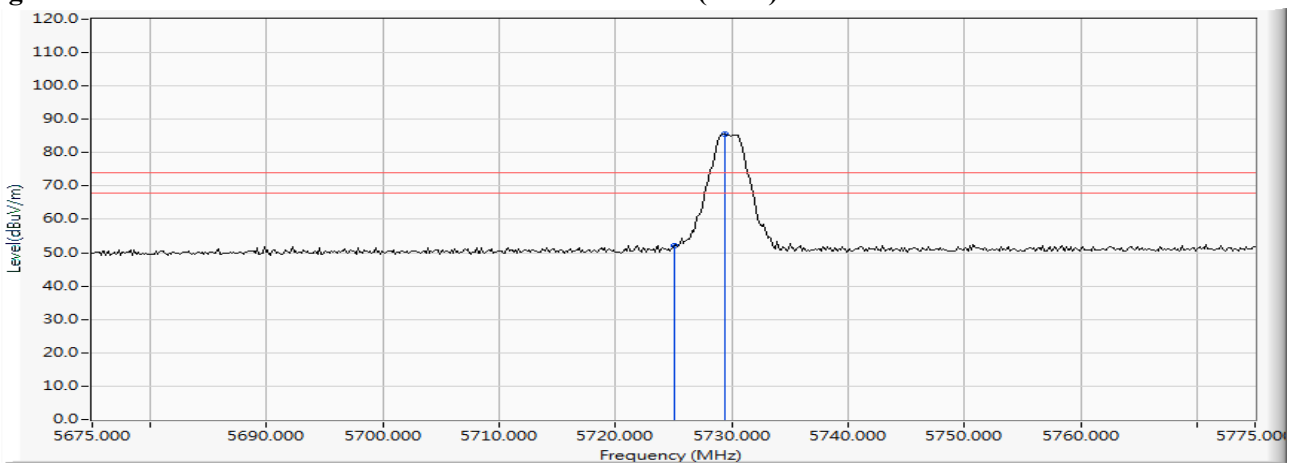
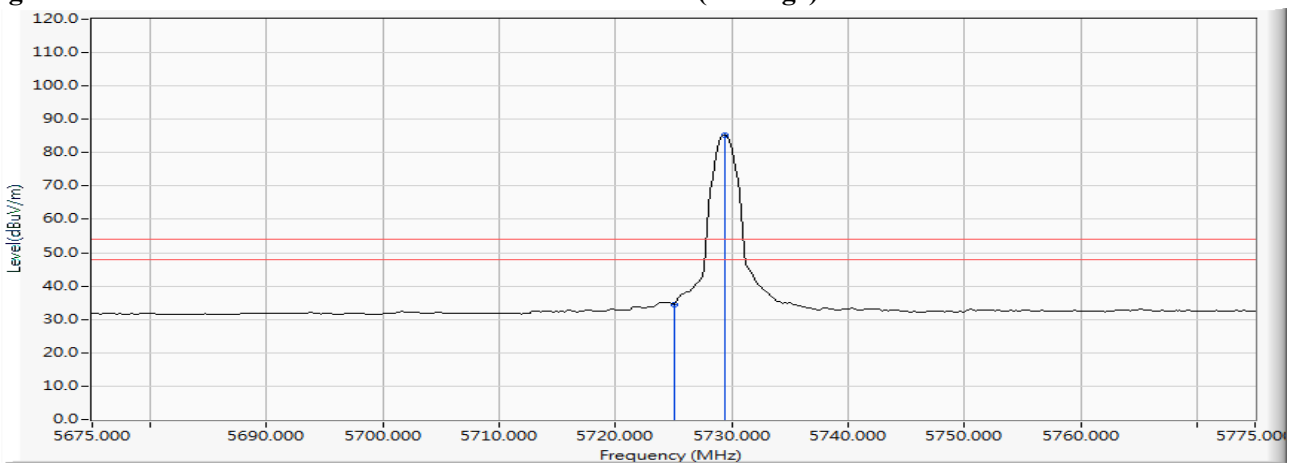


Figure Channel 01: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	STREAMING SOUNDBAR
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2018/12/11
Test Mode	:	Mode 1: Transmit (5845MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
16 (Peak)	5844.348	11.662	68.151	79.813	--	--	--
16 (Peak)	5850.000	11.701	38.497	50.198	74.00	54.00	Pass
16 (Average)	5844.348	11.662	67.563	79.225	--	--	--
16 (Average)	5850.000	11.701	19.281	30.982	74.00	54.00	Pass

Figure Channel 16: Horizontal (Peak)

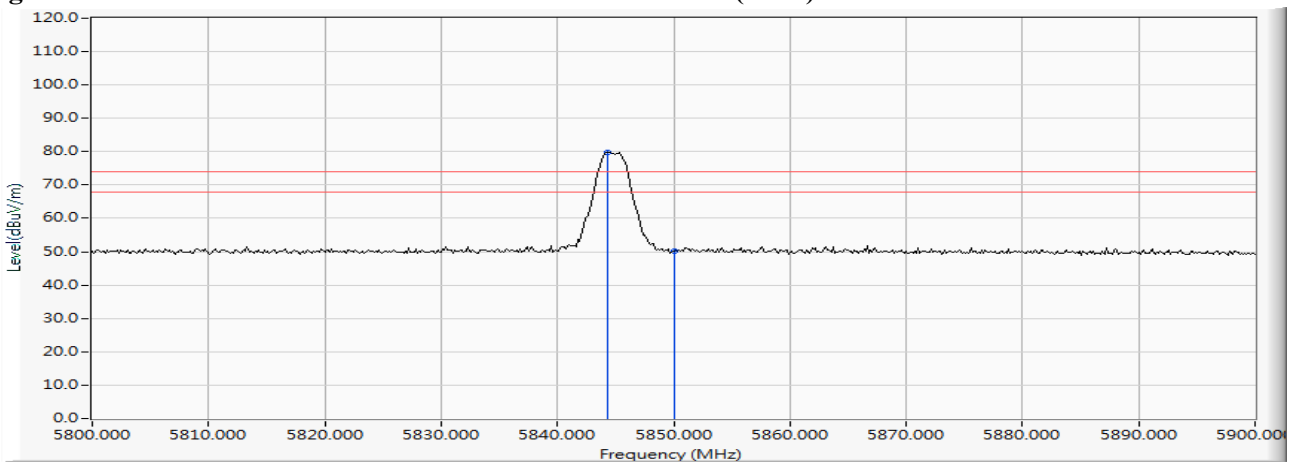
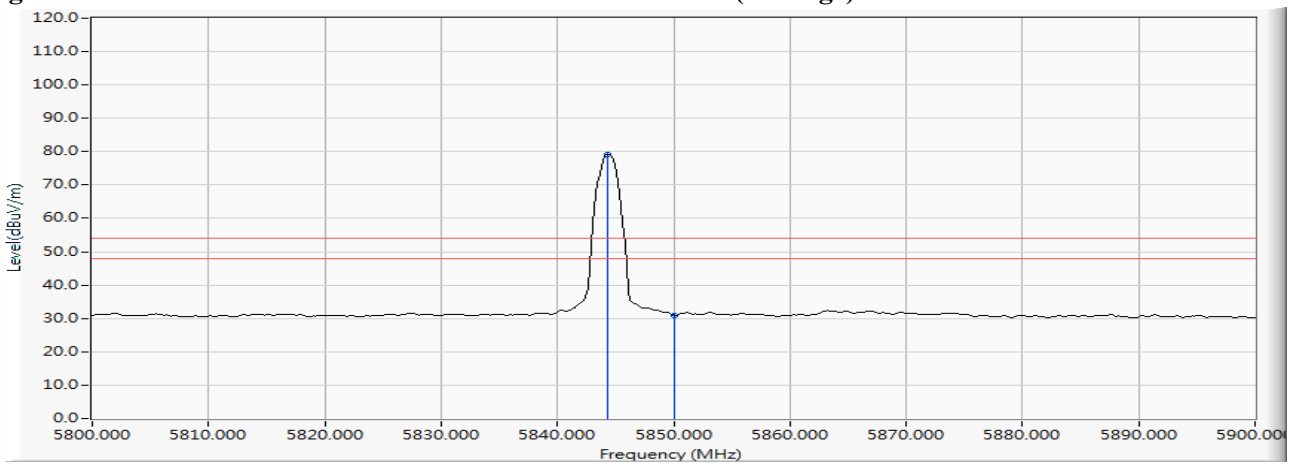


Figure Channel 16: Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : STREAMING SOUNDBAR
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit (5845MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
16 (Peak)	5844.348	12.762	70.667	83.429	--	--	--
16 (Peak)	5850.000	12.774	38.969	51.743	74.00	54.00	Pass
16 (Peak)	5855.362	12.785	39.989	52.774	74.00	54.00	Pass
16 (Average)	5844.348	12.762	69.897	82.659	--	--	--
16 (Average)	5850.000	12.774	20.387	33.161	74.00	54.00	Pass
16 (Average)	5862.899	12.799	20.472	33.272	74.00	54.00	Pass

Figure Channel 16: Vertical (Peak)

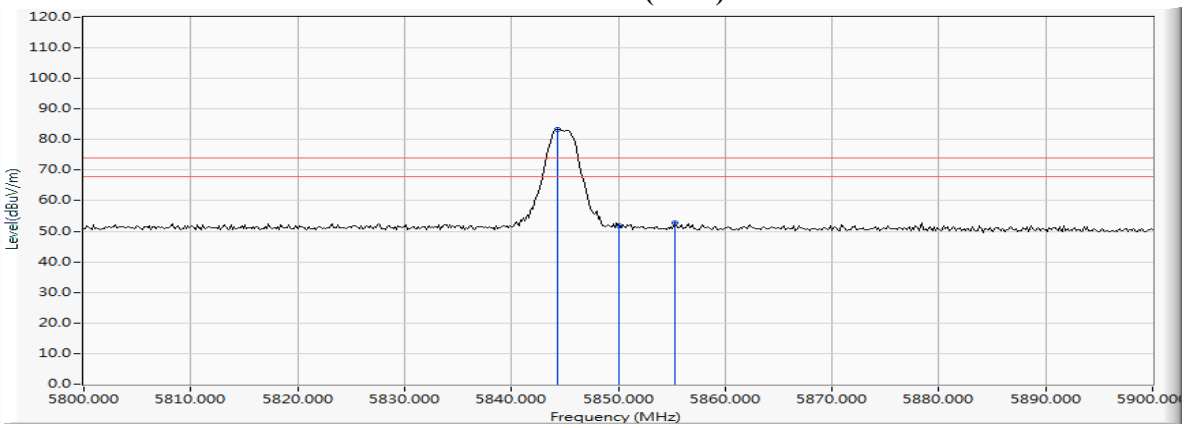
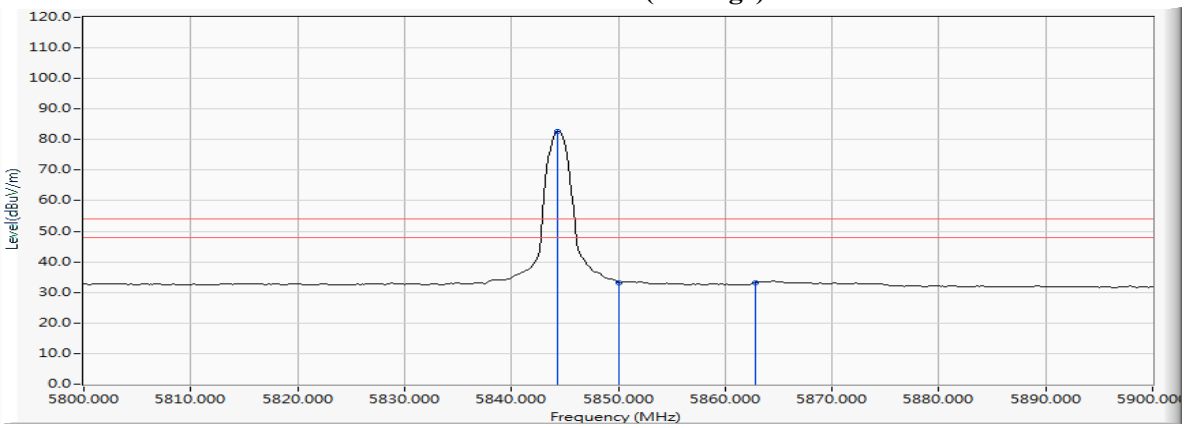


Figure Channel 16: Vertical (Average)

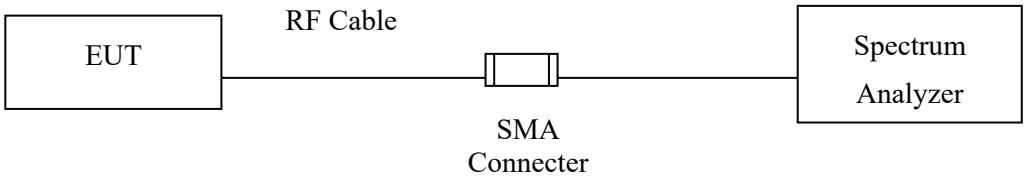


Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

5. Duty Cycle

5.1. Test Setup



5.2. Test Specification

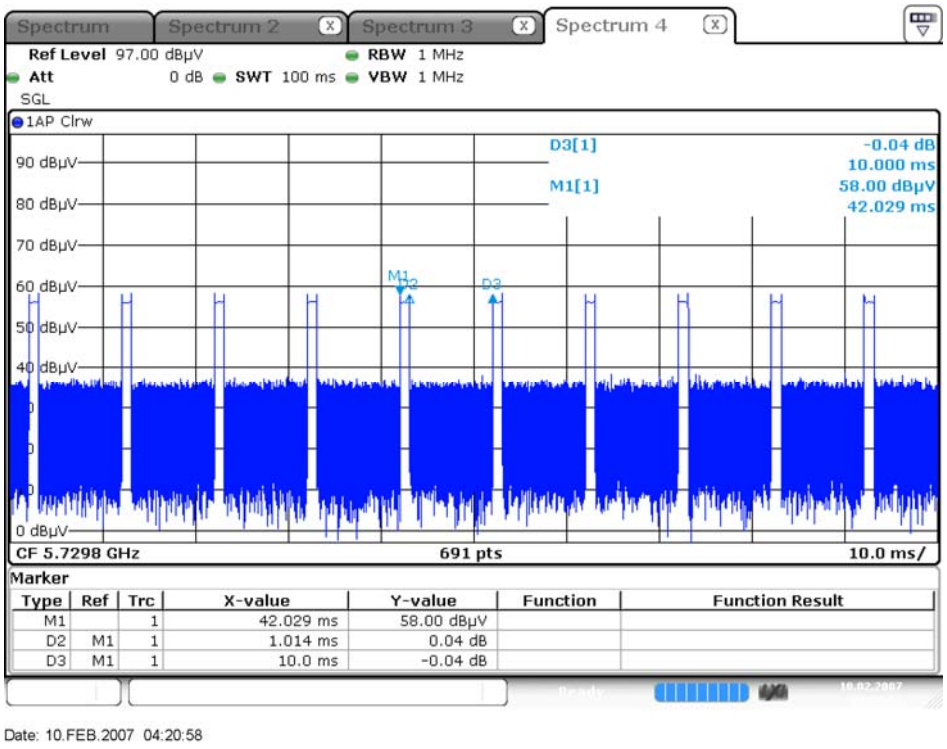
According to FCC Part 15 Subpart C Paragraph 15.231

5.3. Uncertainty

± 2.31ms

5.4. Test Result

Product : STREAMING SOUNDBAR
Test Item : Duty Cycle
Test Site : No.3 OATS
Test Date : 2018/12/11
Test Mode : Mode 1: Transmit



Time on of 100ms= 1.014ms*10= 10.14ms

Duty Cycle=10.14ms / 100ms= 0.1014

Duty Cycle correction factor= 20 LOG 0.1014= -19.879 dB

Duty Cycle correction factor	**-19.879**	**dB**

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.