

# 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-RFUSP01V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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# Test Report

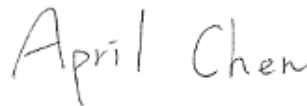
Issued Date: Dec. 20, 2018

Report No.: 1880389R-RFUSP01V00



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
FCC ID.	2AJAAAUSNDBR20BLK
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 KDB 558074 D01 15.247 Meas Guidance v05
Test Result	Complied

Documented By :



(Senior Adm. Specialist / April Chen)

Tested By :



(Engineer / Sam Hsu)

Approved By :



(Director / 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	2402-2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / $\pi$ / 4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	Monopole Antenna
Channel Control	Auto
Antenna Gain	Refer to the table "Antenna List"
RCA Cable	Non-shielded, 1.5m
Fiber Cable	Non-shielded, 1.5m
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 $\overline{\text{---}}$ 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 $\overline{\text{---}}$ 2.5A Cable out: Non-Shielded, 1.8m with one ferrite core bonded. Power cord: Non-Shielded, 1.8m.
Contain Module	CSR / BT05MM

#### Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	MAG..LAYERS	EDA-8709-2G4C1-C17	Monopole	2.31dBi for 2.4GHz

Note:

1. The antenna of EUT conforms to FCC 15.203.

## Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

## Note:

1. The EUT is a STREAMING SOUNDBAR with a built-in WLAN,Bluetooth and 5.8GHz transceiver, this report for Bluetooth V3.0, V2.1+EDR.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test
4. Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through pre-testing, to produce emissions similar to those for 3Mb/s.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK)
	Mode 2: Transmit - 3Mbps (8DPSK)

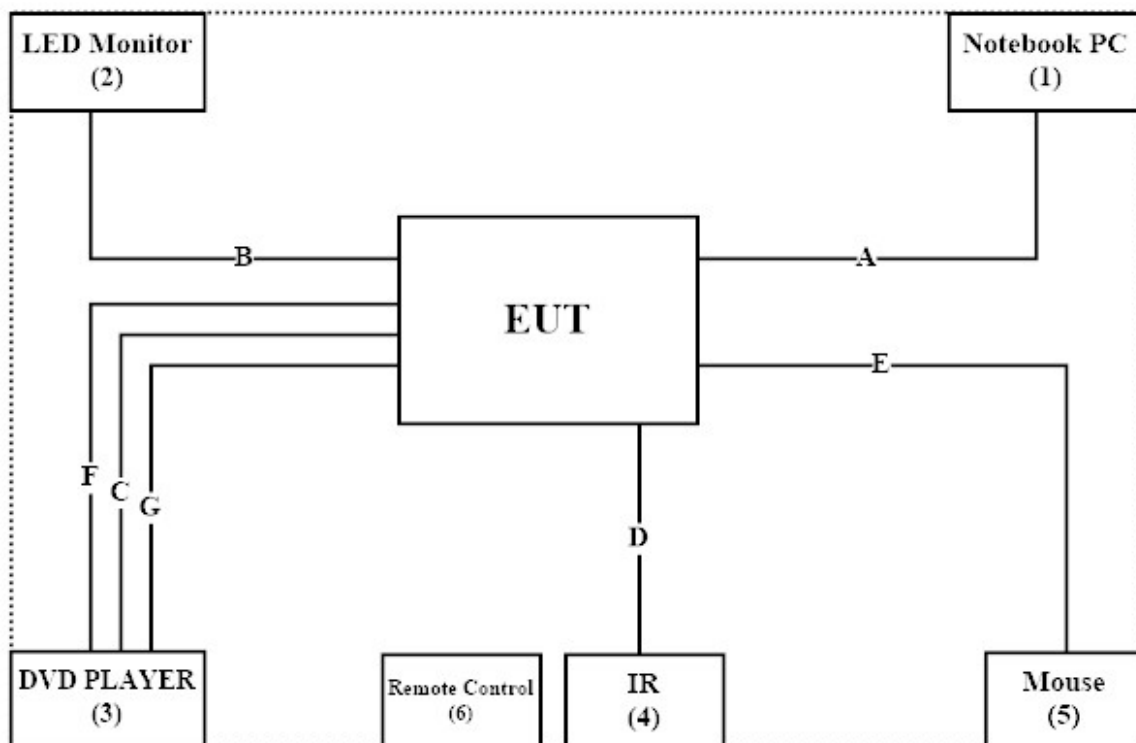
### 1.3. Tested System Details

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 Tested System



### **1.5. EUT Exercise Software**

1. Setup the EUT as shown in Section 1.4.
2. Execute software "Blue Test v2.6.2" on the Notebook PC.
3. Configure the test mode, the test channel, and the data rate.
4. Press "OK" to 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	30-65
Barometric pressure (mbar)	860-1060	950-1000

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Taiwan, R.O.C.  
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789  
E-Mail : [info.tw@dekra.com](mailto: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

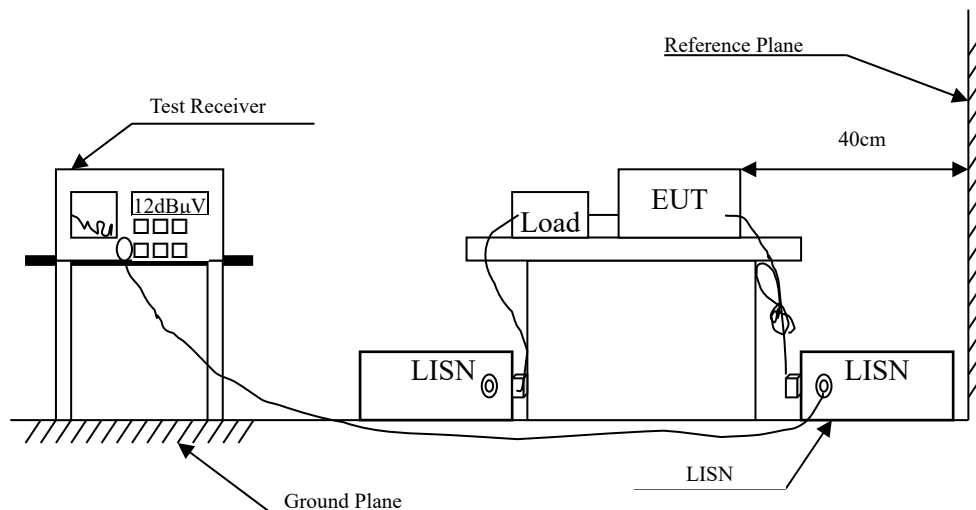
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
X	Loop Antenna	Teseq	HLA6121	37133	2018/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
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 (dBμV) 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 Peripherals 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 refer 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 the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

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

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

## 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 2: Transmit - 3Mbps (8DPSK) (2441MHz) (DYS602-240250-15714A)

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.170	9.743	31.800	41.543	-23.886	65.429
0.349	9.744	31.460	41.204	-19.110	60.314
2.345	9.833	19.970	29.803	-26.197	56.000
8.498	10.033	27.960	37.993	-22.007	60.000
13.943	10.143	20.250	30.393	-29.607	60.000
24.580	10.275	19.050	29.325	-30.675	60.000
<b>Average</b>					
0.170	9.743	17.300	27.043	-28.386	55.429
0.349	9.744	24.180	33.924	-16.390	50.314
2.345	9.833	11.490	21.323	-24.677	46.000
8.498	10.033	26.710	36.743	-13.257	50.000
13.943	10.143	11.110	21.253	-28.747	50.000
24.580	10.275	18.320	28.595	-21.405	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

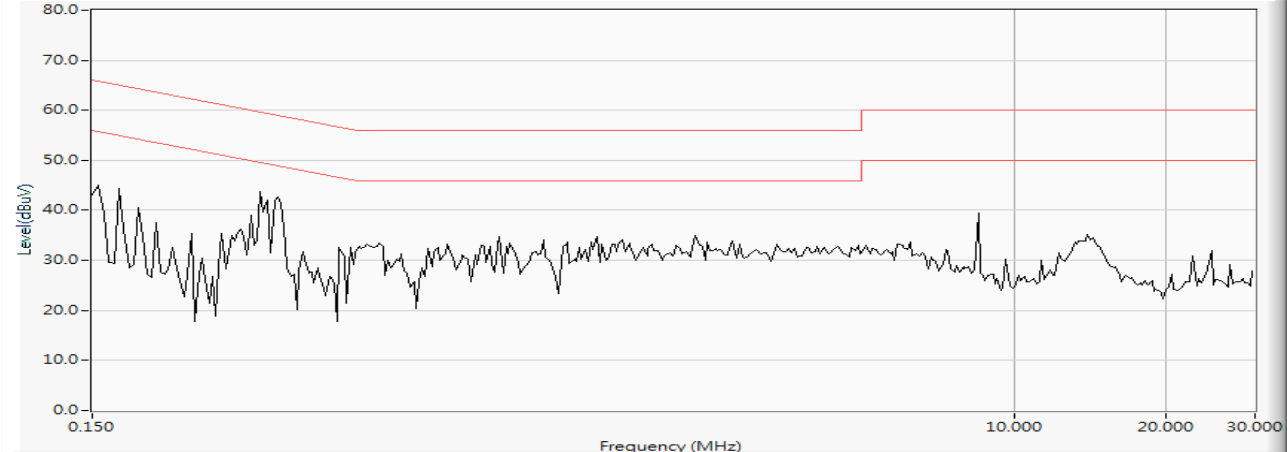
Product : STREAMING SOUNDBAR  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test date : 2018/11/15  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz) (DYS602-240250-15714A)

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.181	9.737	29.280	39.017	-26.097	65.114
0.338	9.733	32.110	41.843	-18.786	60.629
0.529	9.741	22.340	32.081	-23.919	56.000
8.505	10.043	27.820	37.863	-22.137	60.000
13.349	10.193	19.500	29.693	-30.307	60.000
24.580	10.455	18.990	29.445	-30.555	60.000
<b>Average</b>					
0.181	9.737	15.910	25.647	-29.467	55.114
0.338	9.733	26.970	36.703	-13.926	50.629
0.529	9.741	14.360	24.101	-21.899	46.000
8.505	10.043	26.310	36.353	-13.647	50.000
13.349	10.193	10.270	20.463	-29.537	50.000
24.580	10.455	18.750	29.205	-20.795	50.000

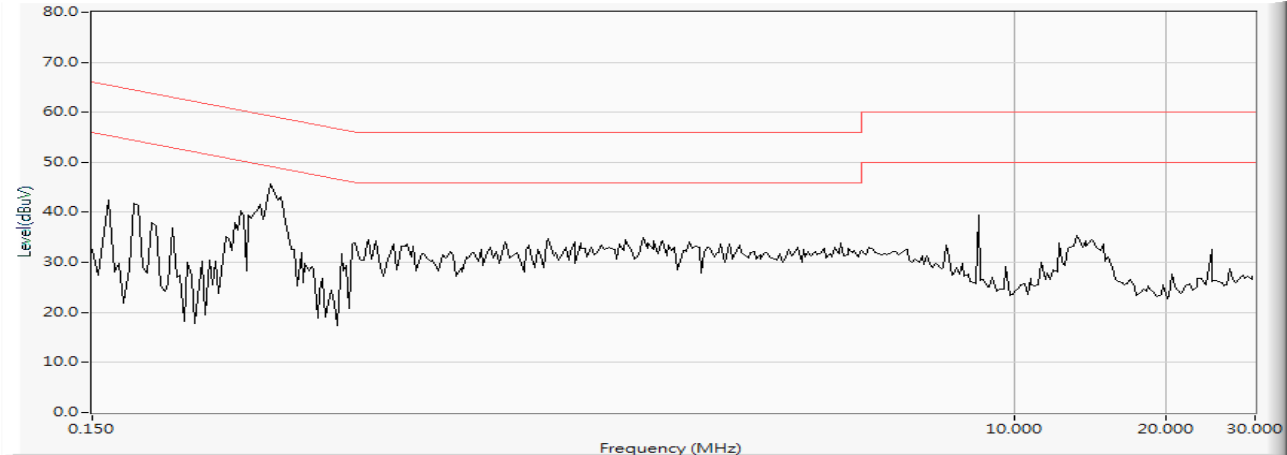
Note:

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



LINE 2



Product : STREAMING SOUNDBAR  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test date : 2018/12/19  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz) (F150602-A)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dB $\mu$ V	dB $\mu$ V	dB	dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.158	9.746	36.360	46.106	-19.665	65.771
0.201	9.738	29.360	39.098	-25.445	64.543
0.252	9.740	21.220	30.960	-32.126	63.086
0.330	9.743	17.520	27.263	-33.594	60.857
0.408	9.746	17.720	27.466	-31.163	58.629
0.853	9.775	3.380	13.155	-42.845	56.000
<b>Average</b>					
0.158	9.746	17.350	27.096	-28.675	55.771
0.201	9.738	8.500	18.238	-36.305	54.543
0.252	9.740	2.480	12.220	-40.866	53.086
0.330	9.743	4.710	14.453	-36.404	50.857
0.408	9.746	7.660	17.406	-31.223	48.629
0.853	9.775	-3.150	6.625	-39.375	46.000

## Note:

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



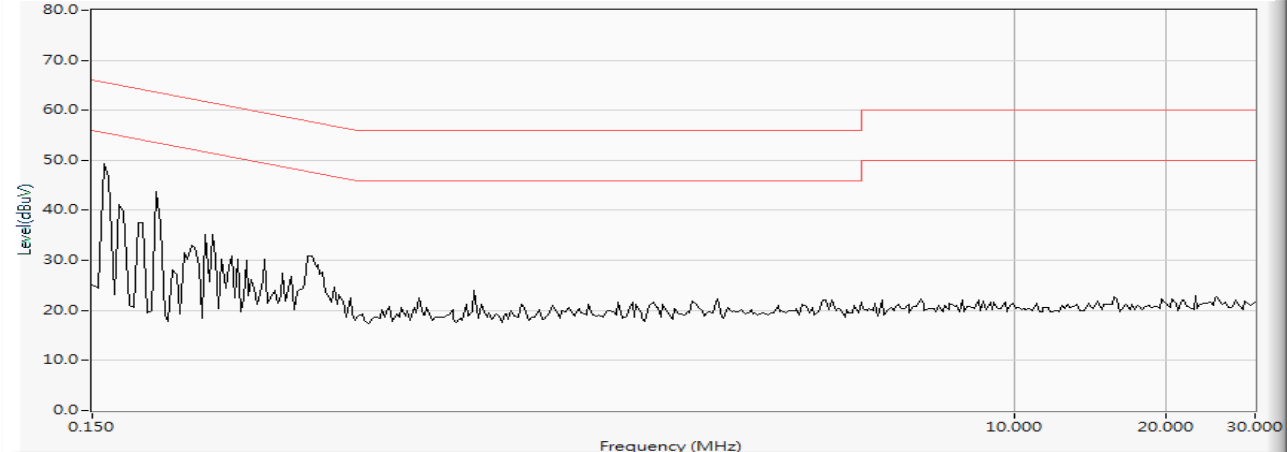
Product : STREAMING SOUNDBAR  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test date : 2018/12/19  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz) (F150602-A)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dB $\mu$ V	dB $\mu$ V	dB	dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.154	9.738	37.160	46.898	-18.988	65.886
0.189	9.737	33.200	42.937	-21.949	64.886
0.209	9.738	29.900	39.638	-24.676	64.314
0.248	9.740	22.620	32.360	-30.840	63.200
0.326	9.733	19.880	29.613	-31.358	60.971
0.420	9.737	19.940	29.677	-28.609	58.286
<b>Average</b>					
0.154	9.738	16.590	26.328	-29.558	55.886
0.189	9.737	14.040	23.777	-31.109	54.886
0.209	9.738	10.670	20.408	-33.906	54.314
0.248	9.740	3.490	13.230	-39.970	53.200
0.326	9.733	5.640	15.373	-35.598	50.971
0.420	9.737	7.360	17.097	-31.189	48.286

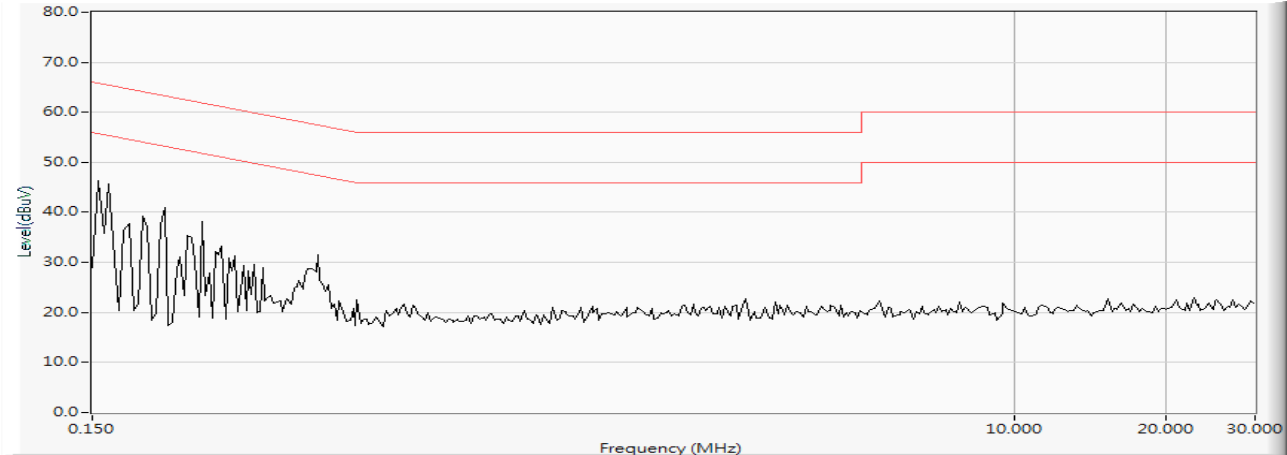
Note:

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

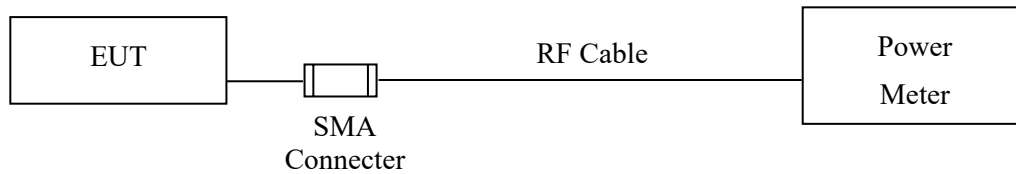


LINE 2



### 3. Peak Power Output

#### 3.1. Test Setup



#### 3.2. Limit

The maximum peak power shall be less 1Watt.

#### 3.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

#### 3.4. Uncertainty

$\pm 1.19$  dB

### 3.5. Test Result of Peak Power Output

Product : STREAMING SOUNDBAR  
Test Item : Peak Power Output  
Test Site : No.3 OATS  
Test date : 2018/10/30  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	7.79	1 Watt= 30 dBm	Pass
Channel 39	2441.00	7.51	1 Watt= 30 dBm	Pass
Channel 78	2480.00	6.91	1 Watt= 30 dBm	Pass

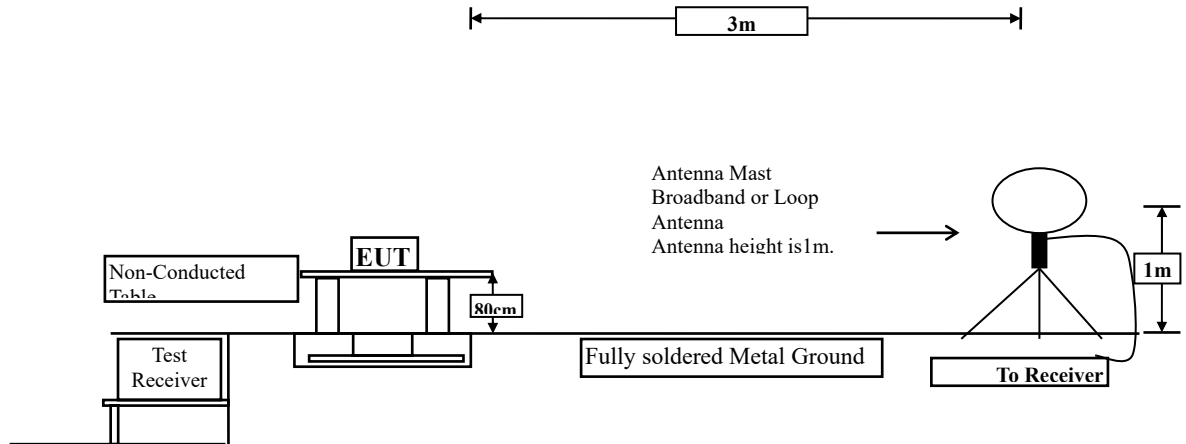
Product : STREAMING SOUNDBAR  
Test Item : Peak Power Output  
Test Site : No.3 OATS  
Test date : 2018/10/30  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	6.76	1 Watt= 30 dBm	Pass
Channel 39	2441.00	6.45	1 Watt= 30 dBm	Pass
Channel 78	2480.00	5.94	1 Watt= 30 dBm	Pass

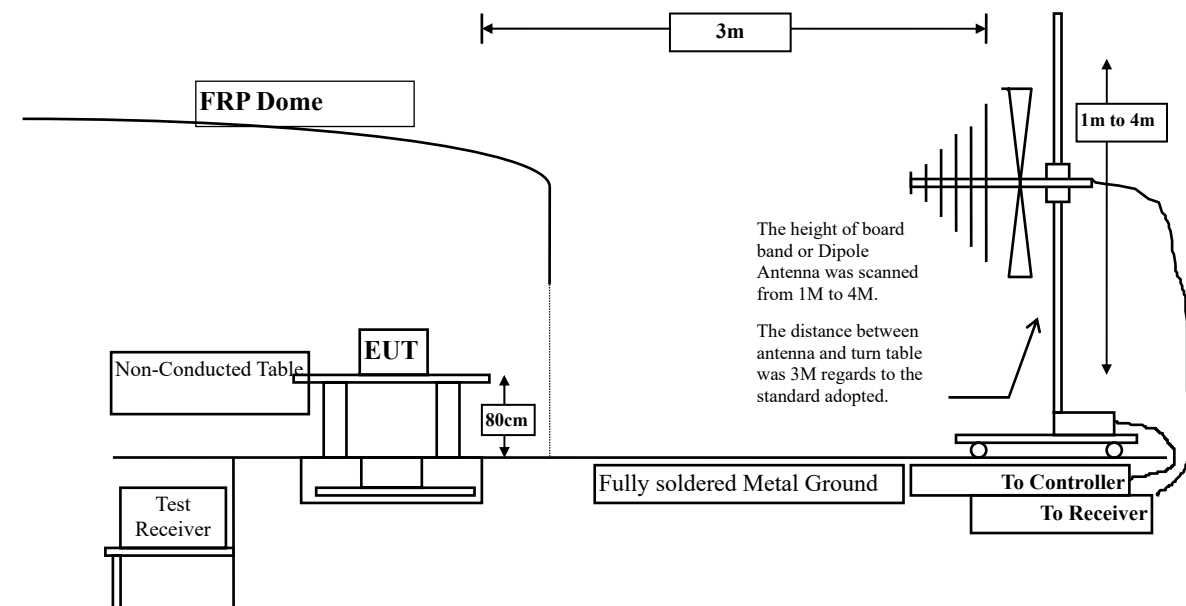
#### 4. Radiated Emission

##### 4.1. Test Setup

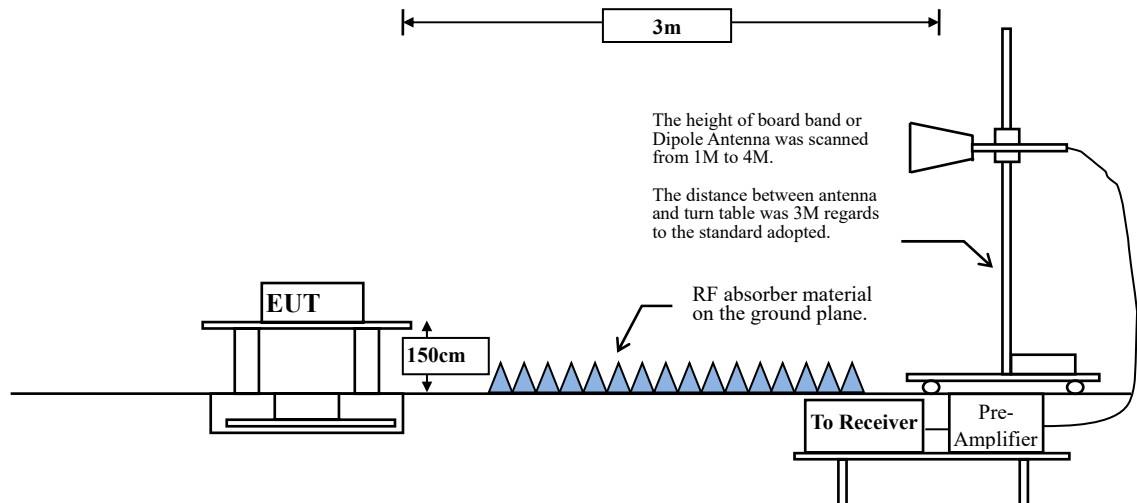
Under 30MHz



Below 1GHz



Above 1GHz



## 4.2. Limits

### ➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB 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 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:
1. RF Voltage (dB $\mu$ V) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

### 4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 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 from 9kHz - 10th Harmonic of fundamental was investigated.

### 4.4. Uncertainty

± 4.08 dB above 1GHz

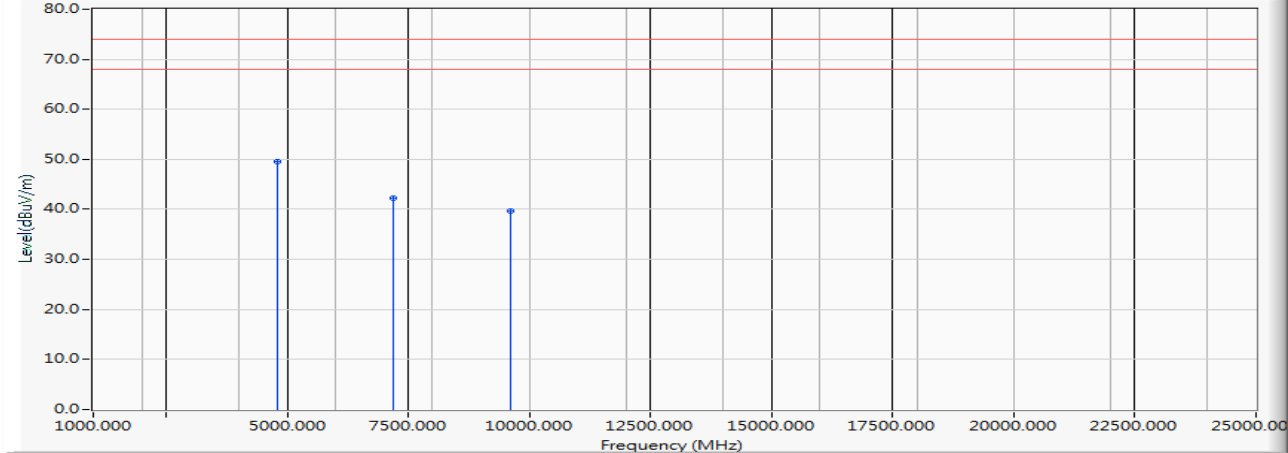
± 4.22 dB below 1GHz



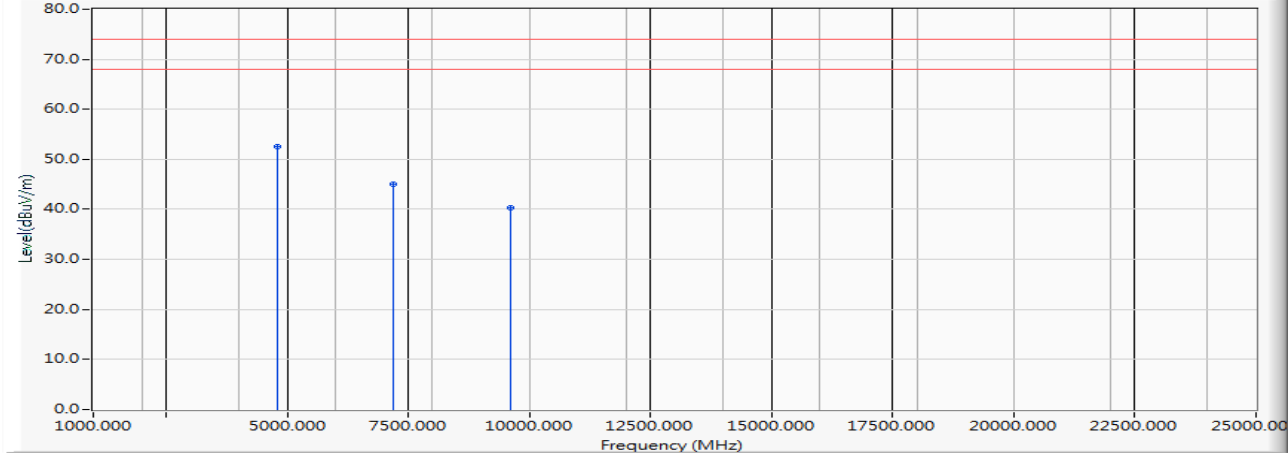
4.5. Test Result of Radiated Emission

Product : STREAMING SOUNDBAR  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/01  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Horizontal:



Vertical:



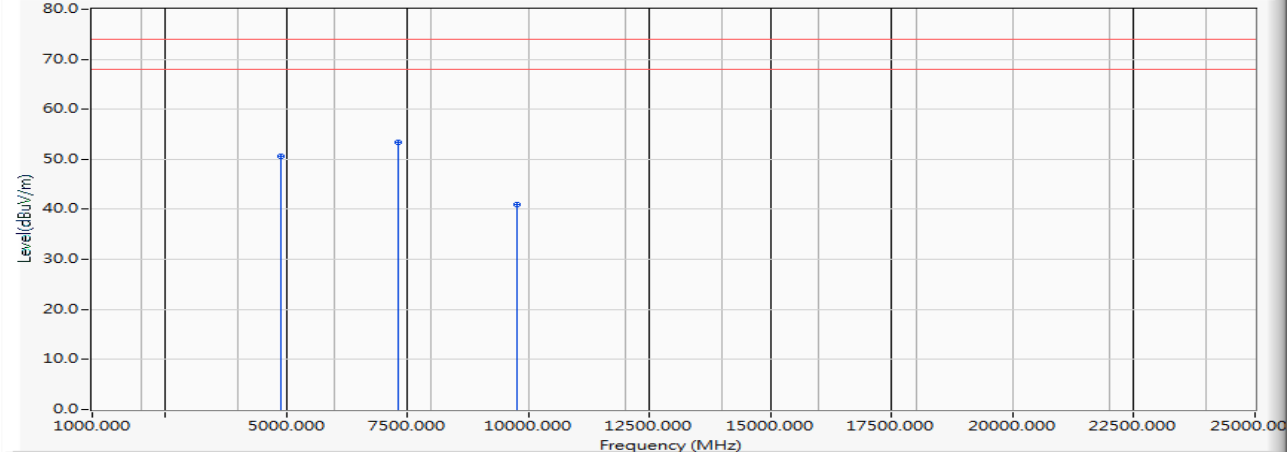
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4804.000	6.787	42.767	49.554	-24.446	74.000
7206.000	11.333	30.814	42.147	-31.853	74.000
9608.000	14.713	25.035	39.748	-34.252	74.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4804.000	6.787	45.736	52.523	-21.477	74.000
7206.000	11.333	33.779	45.112	-28.888	74.000
9608.000	14.713	25.712	40.425	-33.575	74.000
<b>Average Detector:</b>					
--					

## Note:

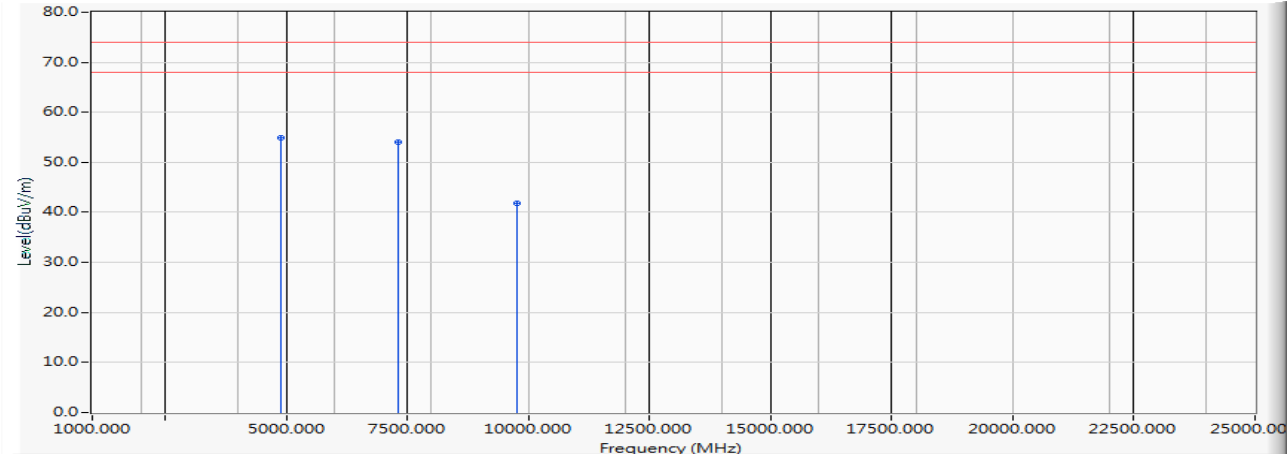
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/01  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Horizontal:



Vertical:



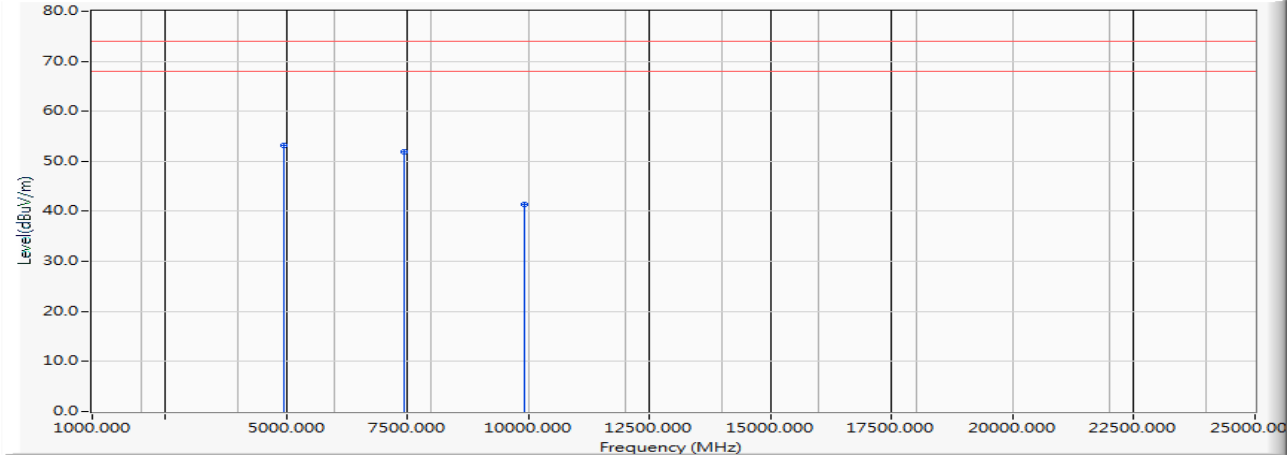
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4882.000	6.904	43.610	50.514	-23.486	74.000
7323.000	11.380	41.984	53.364	-20.636	74.000
9764.000	15.054	25.903	40.956	-33.044	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4882.000	6.904	48.068	54.972	-19.028	74.000
7323.000	11.380	42.562	53.942	-20.058	74.000
9764.000	15.054	26.783	41.836	-32.164	74.000
<b>Average</b>					
<b>Detector:</b>					
4882.000	6.904	40.412	47.316	-6.684	54.000

## Note:

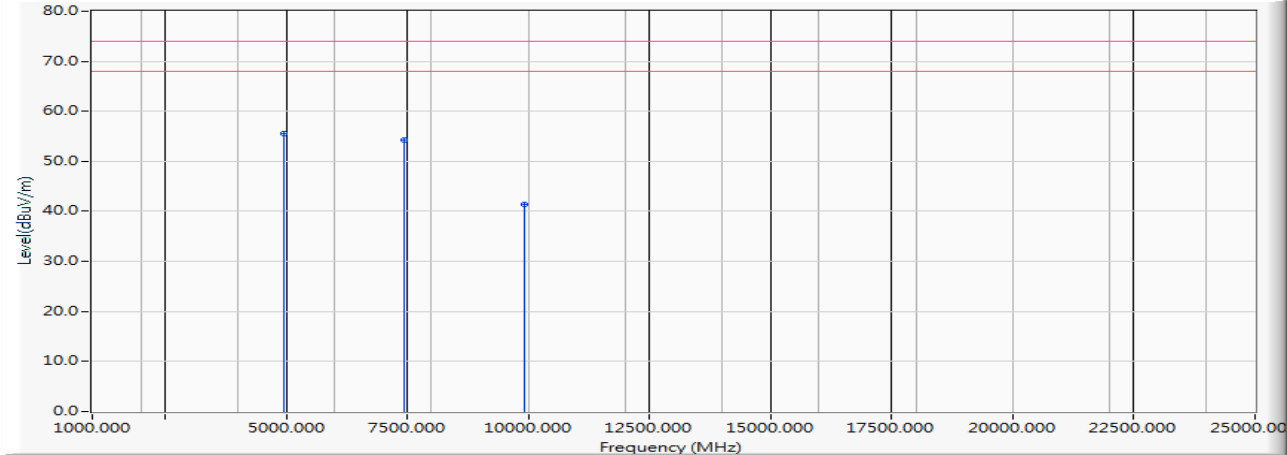
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/01  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Horizontal:



Vertical:



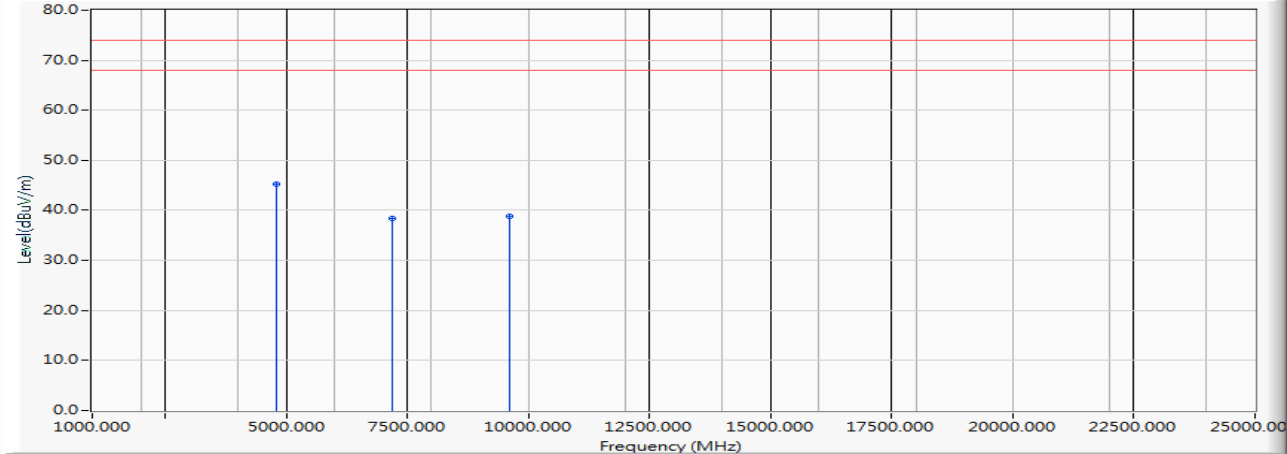
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4960.000	7.008	46.134	53.142	-20.858	74.000
7440.000	11.485	40.464	51.949	-22.051	74.000
9920.000	15.146	26.208	41.354	-32.646	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4960.000	7.008	48.535	55.543	-18.457	74.000
7440.000	11.485	42.725	54.210	-19.790	74.000
9920.000	15.146	26.258	41.404	-32.596	74.000
<b>Average</b>					
<b>Detector:</b>					
4960.000	7.008	40.786	47.794	-6.206	54.000
7440.000	11.485	34.570	46.055	-7.945	54.000

## Note:

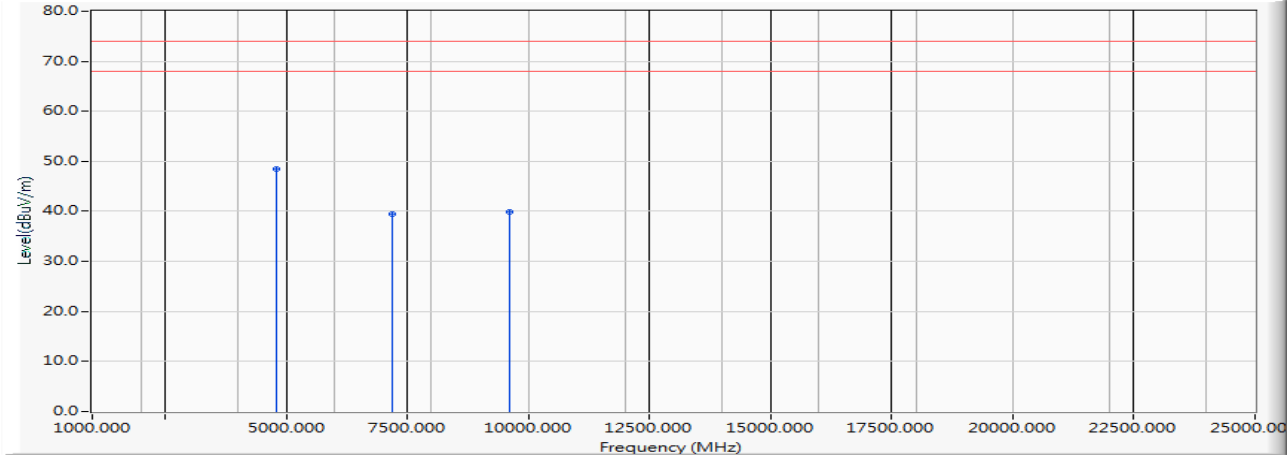
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/01  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Horizontal:



Vertical:



Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4804.000	6.787	38.399	45.186	-28.814	74.000
7206.000	11.333	27.029	38.362	-35.638	74.000
9608.000	14.713	24.213	38.926	-35.074	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4804.000	6.787	41.774	48.561	-25.439	74.000
7206.000	11.333	28.225	39.558	-34.442	74.000
9608.000	14.713	25.226	39.939	-34.061	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

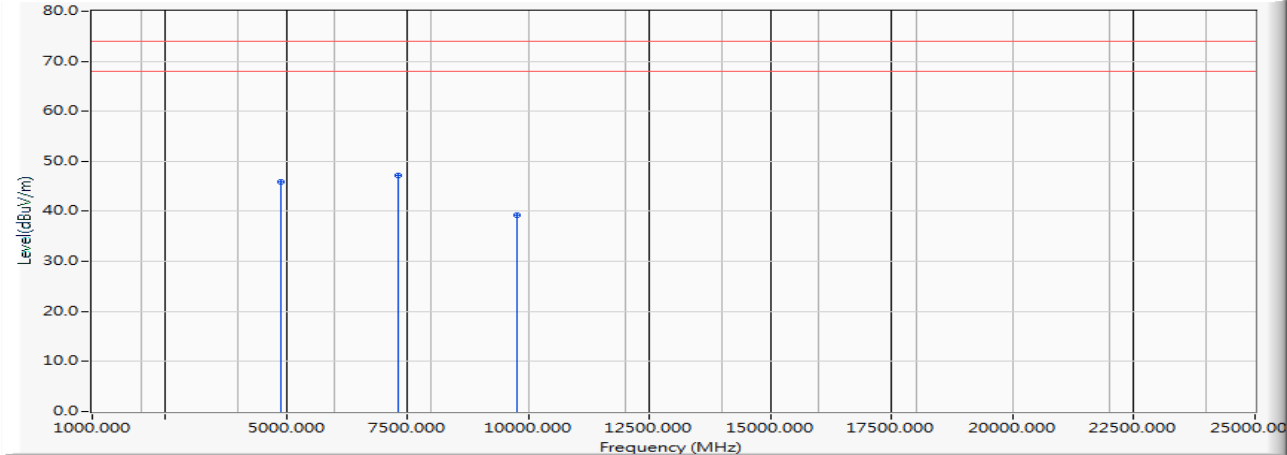
## Note:

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.

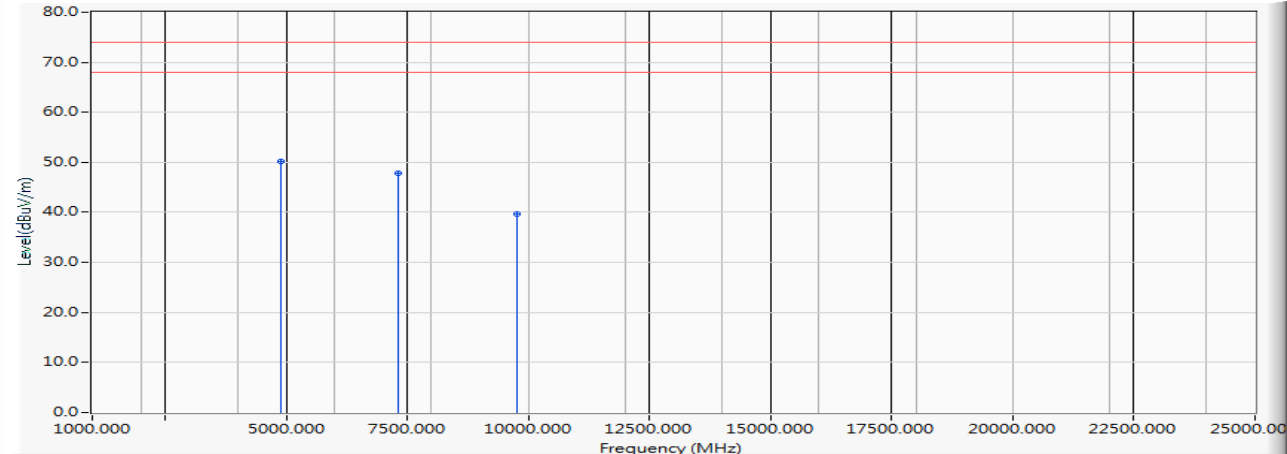


Product : STREAMING SOUNDBAR  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/01  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Horizontal:



Vertical:



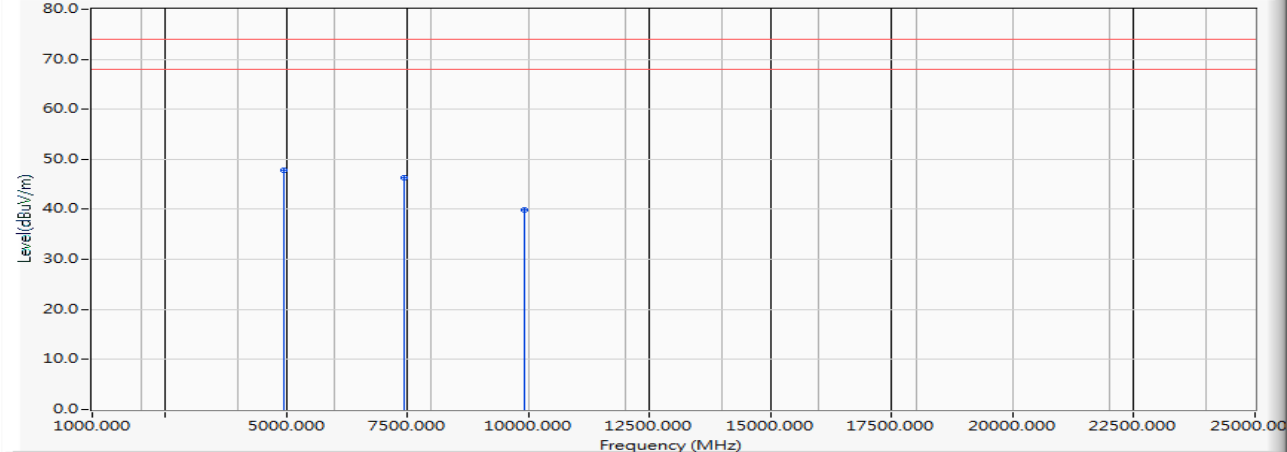
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4882.000	6.904	38.926	45.830	-28.170	74.000
7323.000	11.380	35.901	47.281	-26.719	74.000
9764.000	15.054	24.174	39.227	-34.773	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4882.000	6.904	43.234	50.138	-23.862	74.000
7323.000	11.380	36.421	47.801	-26.199	74.000
9764.000	15.054	24.598	39.651	-34.349	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

## Note:

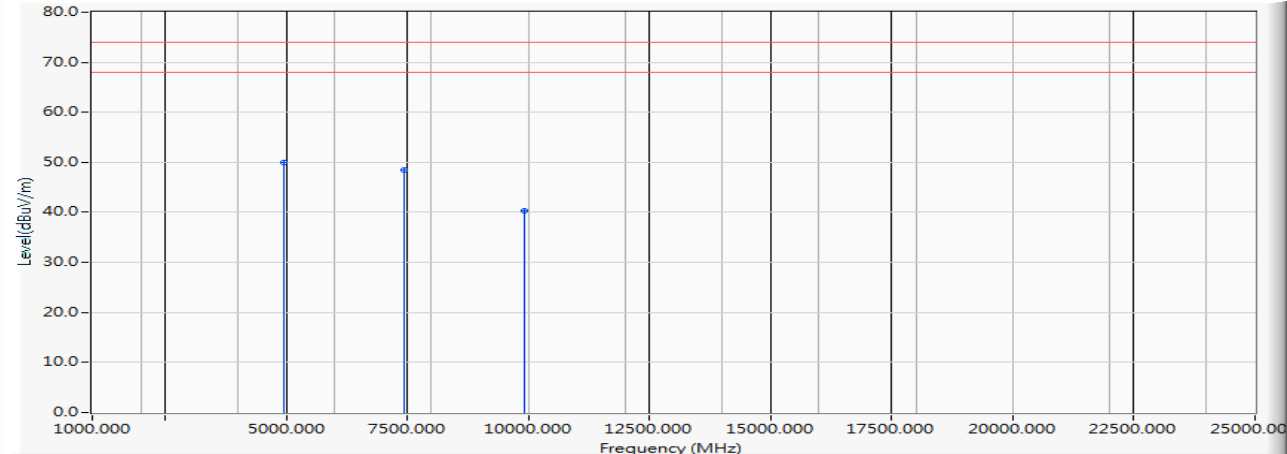
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/01  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal:



Vertical:



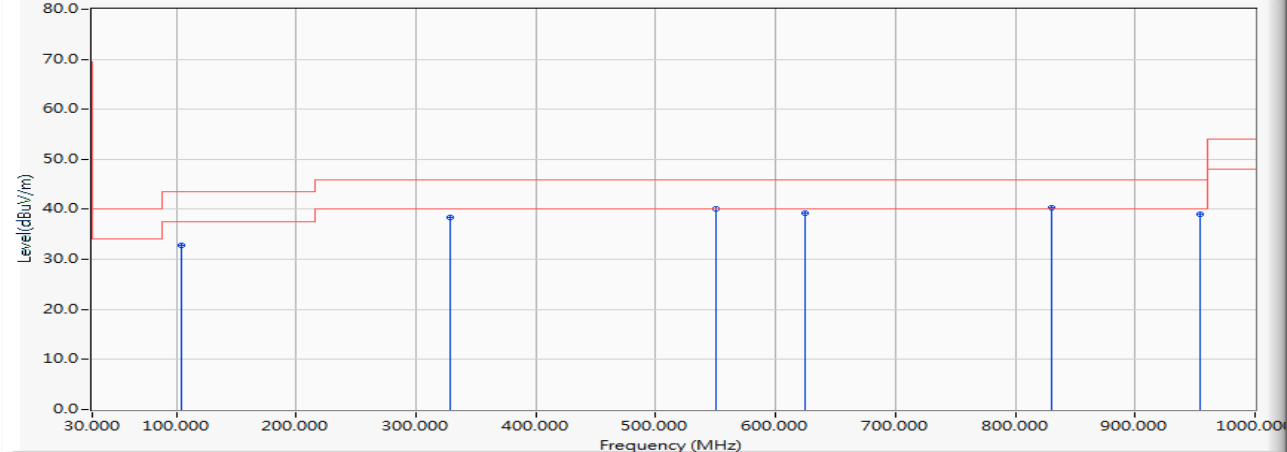
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4960.000	7.008	40.776	47.784	-26.216	74.000
7440.000	11.485	34.757	46.242	-27.758	74.000
9920.000	15.146	24.646	39.792	-34.208	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4960.000	7.008	42.913	49.921	-24.079	74.000
7440.000	11.485	36.888	48.373	-25.627	74.000
9920.000	15.146	25.280	40.426	-33.574	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

## Note:

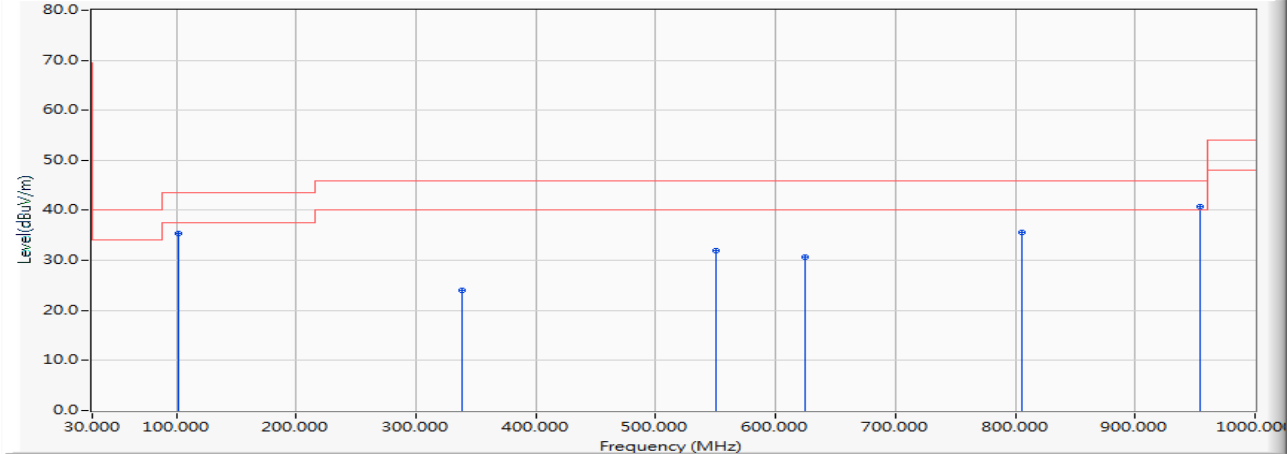
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : General Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/14  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz) (DYS602-240250-15714A)

Horizontal:



Vertical:



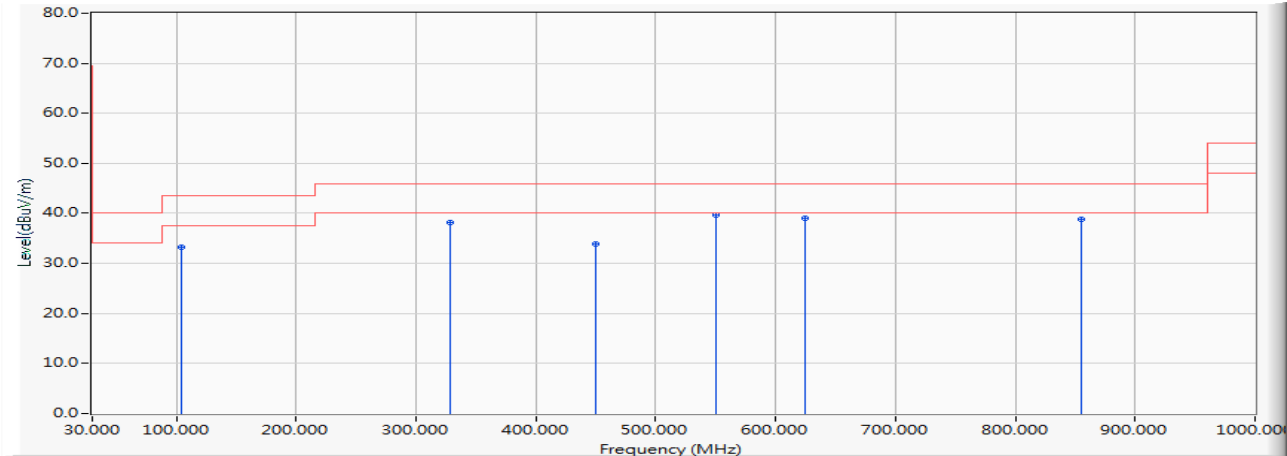
Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
<b>Horizontal</b>					
104.507	-13.703	46.493	32.790	-10.710	43.500
328.029	-7.275	45.770	38.495	-7.505	46.000
550.145	0.358	39.687	40.044	-5.956	46.000
624.652	3.103	36.220	39.323	-6.677	46.000
829.899	3.548	36.789	40.337	-5.663	46.000
953.609	6.997	32.092	39.089	-6.911	46.000
<b>Vertical</b>					
101.696	-13.537	49.032	35.495	-8.005	43.500
337.870	-7.189	31.254	24.065	-21.935	46.000
550.145	0.358	31.518	31.875	-14.125	46.000
624.652	3.103	27.580	30.683	-15.317	46.000
806.000	3.497	32.007	35.504	-10.496	46.000
953.609	6.997	33.844	40.841	-5.159	46.000

## Note:

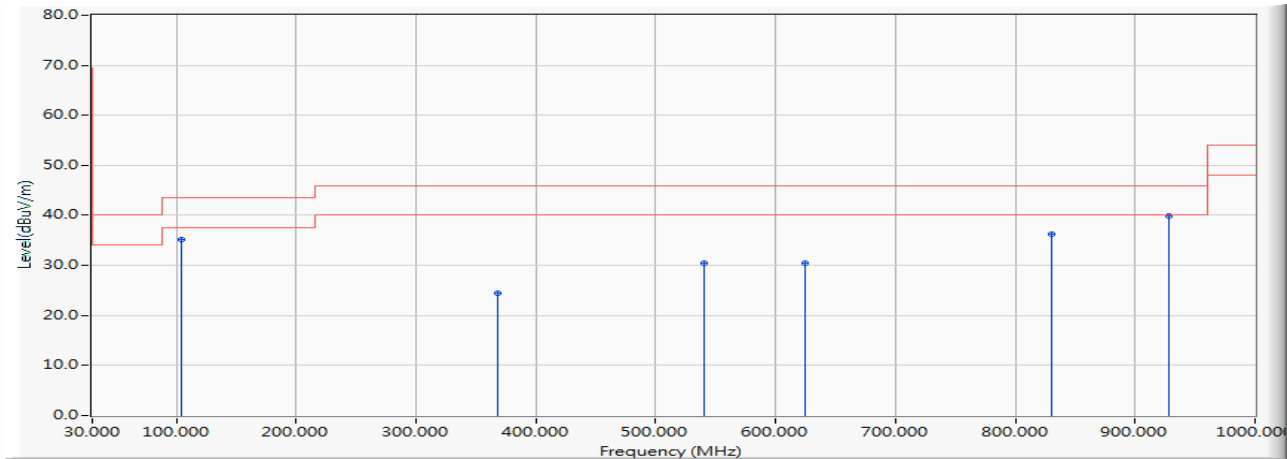
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : General Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/11/14  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz) (DYS602-240250-15714A)

Horizontal:



Vertical:



Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
104.507	-13.703	46.932	33.229	-10.271	43.500
328.029	-7.275	45.495	38.220	-7.780	46.000
450.333	-4.233	38.039	33.805	-12.195	46.000
550.145	0.358	39.251	39.608	-6.392	46.000
624.652	3.103	35.935	39.038	-6.962	46.000
855.203	3.477	35.381	38.858	-7.142	46.000
<b>Vertical</b>					
104.507	-13.703	48.933	35.230	-8.270	43.500
368.797	-6.212	30.610	24.398	-21.602	46.000
540.304	-0.793	31.213	30.420	-15.580	46.000
624.652	3.103	27.398	30.501	-15.499	46.000
829.899	3.548	32.720	36.268	-9.732	46.000
928.304	6.682	33.207	39.889	-6.111	46.000

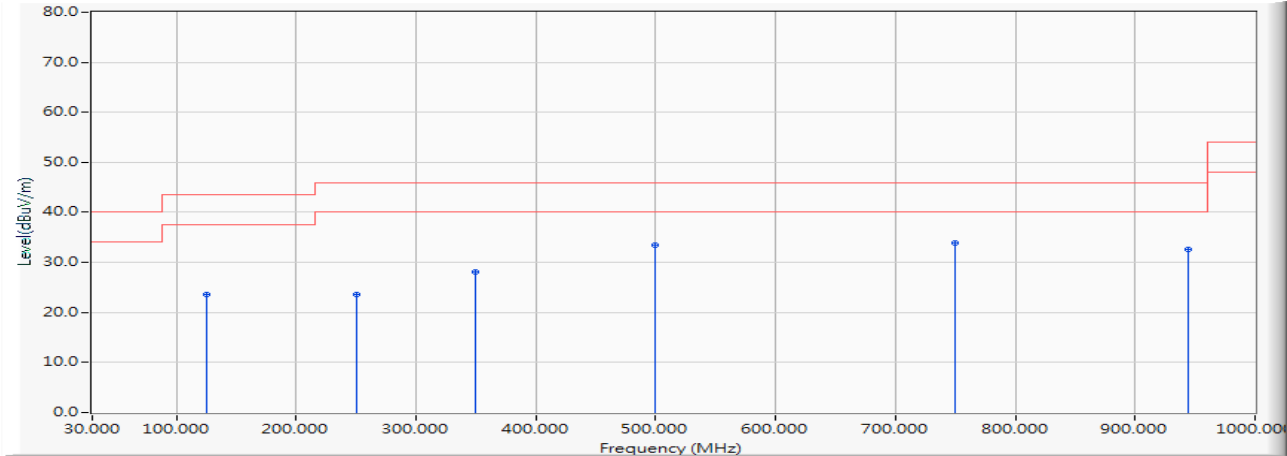
## Note:

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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

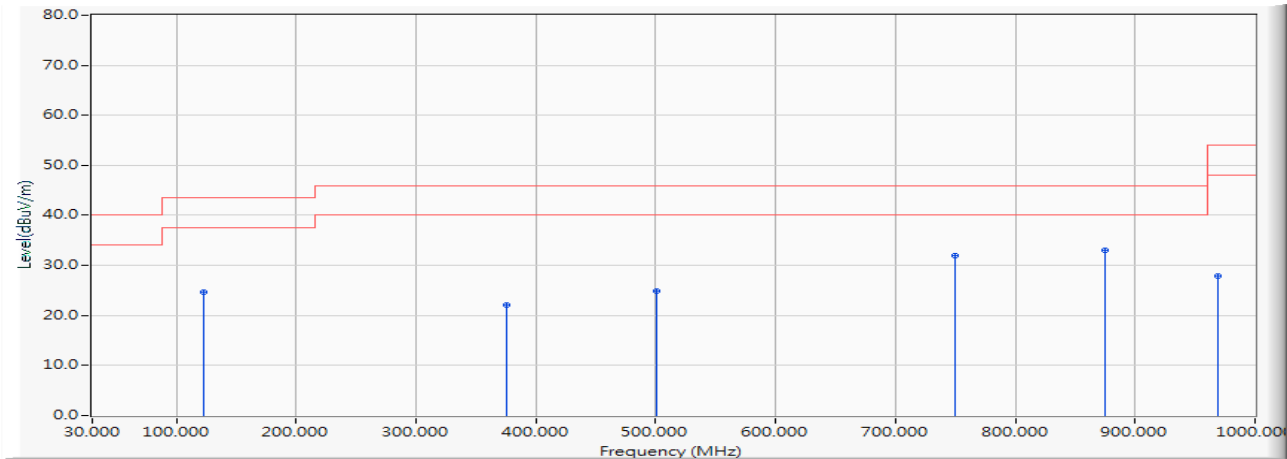


Product : STREAMING SOUNDBAR  
Test Item : General Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/12/20  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz) (F150602-A)

Horizontal:



Vertical:



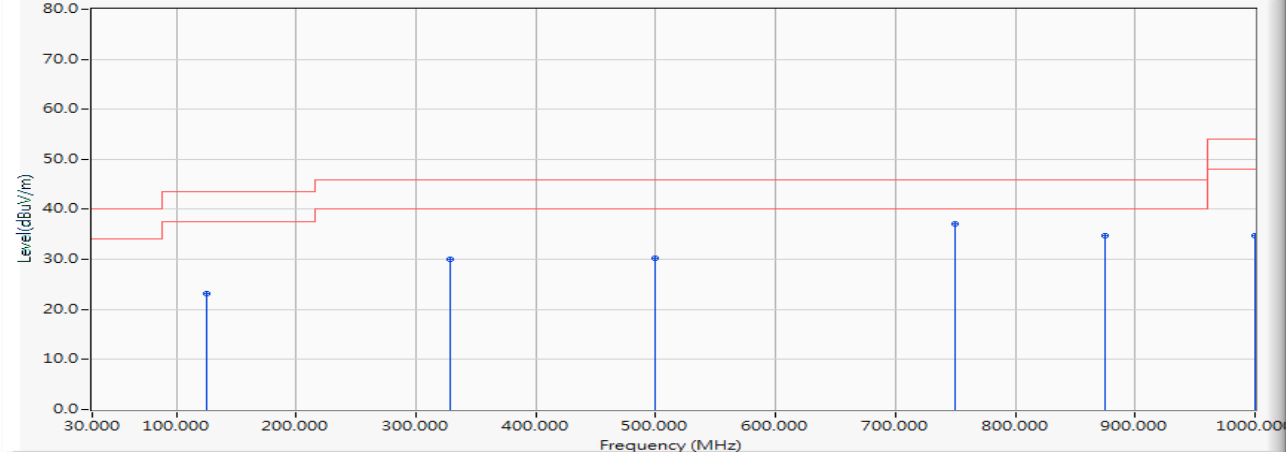
Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
<b>Horizontal</b>					
125.060	-8.411	32.084	23.673	-19.827	43.500
250.190	-6.410	30.018	23.608	-22.392	46.000
350.100	-7.089	35.243	28.154	-17.846	46.000
499.480	-2.684	36.141	33.457	-12.543	46.000
749.740	2.843	31.094	33.937	-12.063	46.000
943.740	6.982	25.586	32.568	-13.432	46.000
<b>Vertical</b>					
123.120	-9.492	34.077	24.585	-18.915	43.500
375.320	-5.909	27.953	22.044	-23.956	46.000
500.450	-2.601	27.480	24.879	-21.121	46.000
749.740	2.843	29.132	31.975	-14.025	46.000
874.870	4.821	28.133	32.954	-13.046	46.000
968.960	8.328	19.485	27.813	-26.187	54.000

## Note:

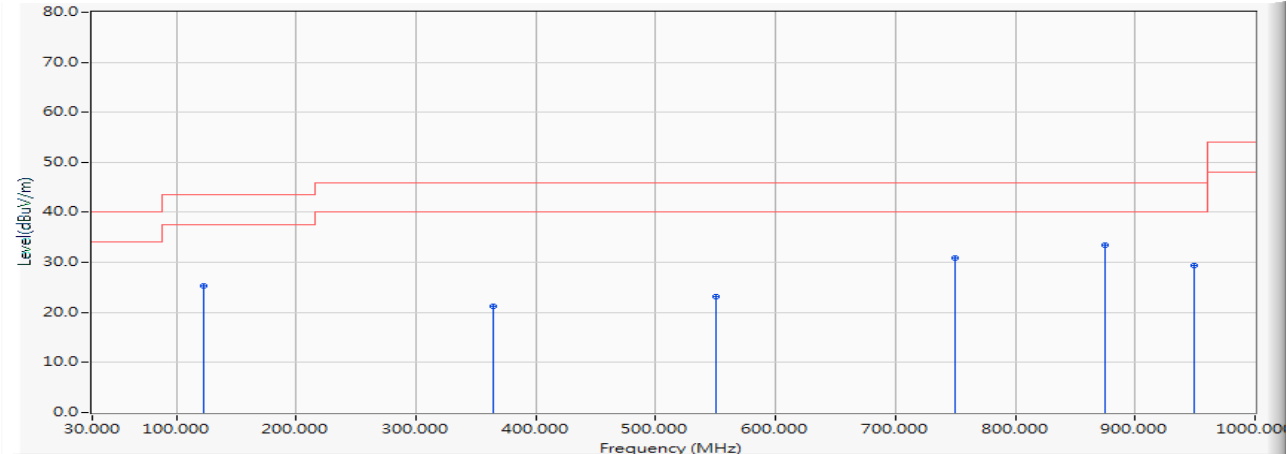
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. 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.

Product : STREAMING SOUNDBAR  
Test Item : General Radiated Emission  
Test Site : No.3 OATS  
Test date : 2018/12/20  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz) (F150602-A)

Horizontal:



Vertical:



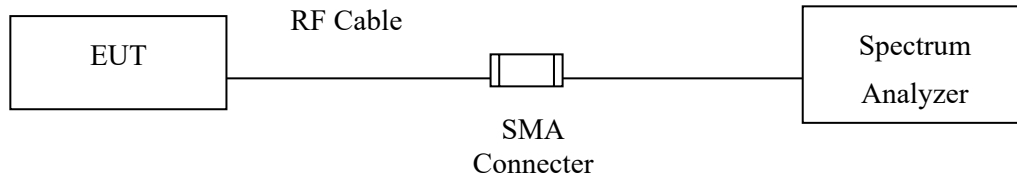
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m
<b>Horizontal</b>					
125.060	-8.411	31.521	23.110	-20.390	43.500
328.760	-7.272	37.374	30.102	-15.898	46.000
499.480	-2.684	32.993	30.309	-15.691	46.000
749.740	2.843	34.183	37.026	-8.974	46.000
874.870	4.821	29.958	34.779	-11.221	46.000
1000.000	9.639	25.211	34.850	-19.150	54.000
<b>Vertical</b>					
123.120	-9.492	34.712	25.220	-18.280	43.500
364.650	-6.406	27.583	21.177	-24.823	46.000
549.920	0.339	22.864	23.203	-22.797	46.000
749.740	2.843	27.968	30.811	-15.189	46.000
874.870	4.821	28.564	33.385	-12.615	46.000
949.560	7.085	22.250	29.335	-16.665	46.000

## 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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

## 5. RF Antenna Conducted Test

### 5.1. Test Setup



### 5.2. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### 5.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

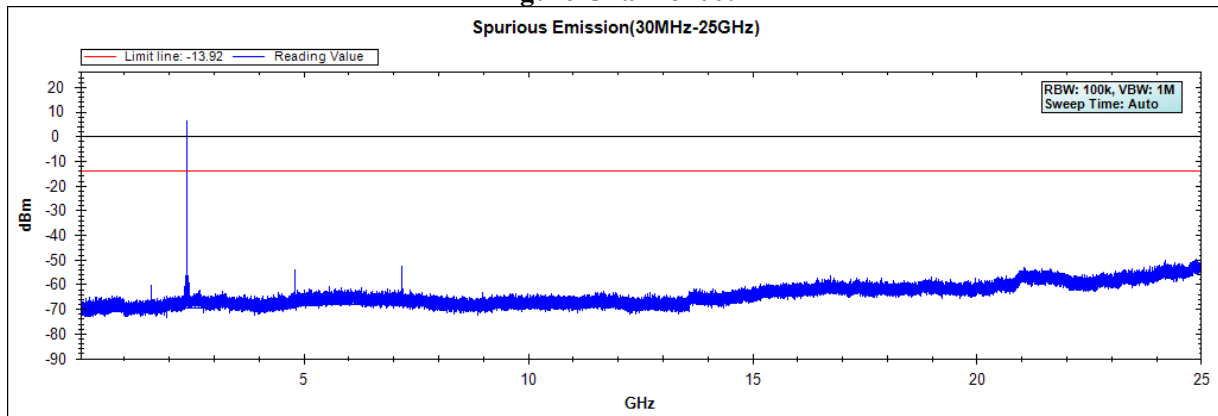
### 5.4. Uncertainty

$\pm 1.20\text{dB}$

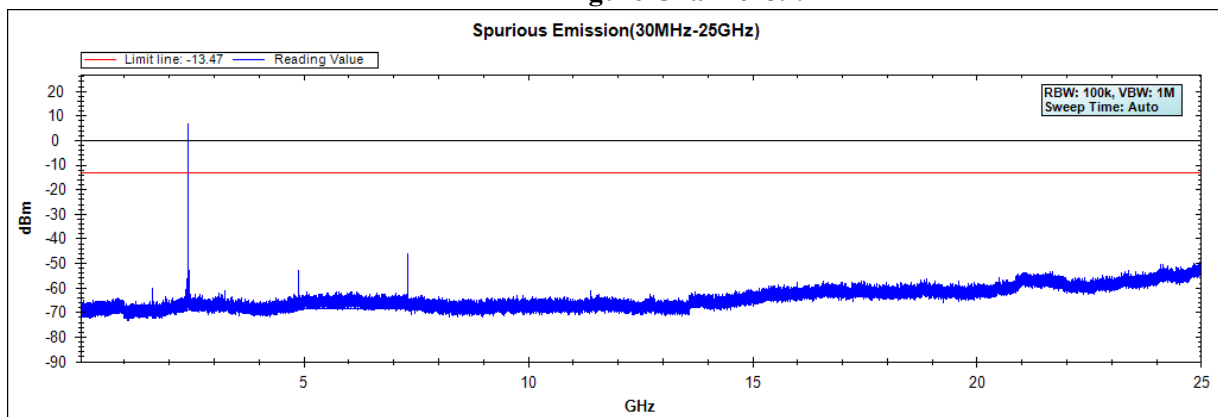
## 5.5. Test Result of RF Antenna Conducted Test

Product : STREAMING SOUNDBAR  
Test Item : RF Antenna Conducted Test  
Test Site : No.3 OATS  
Test date : 2018/10/26  
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

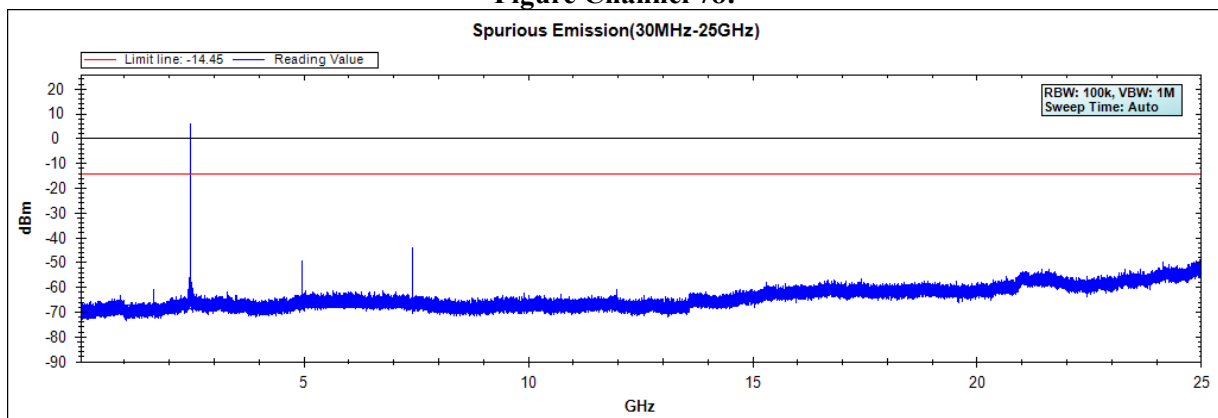
**Figure Channel 00:**



**Figure Channel 39:**

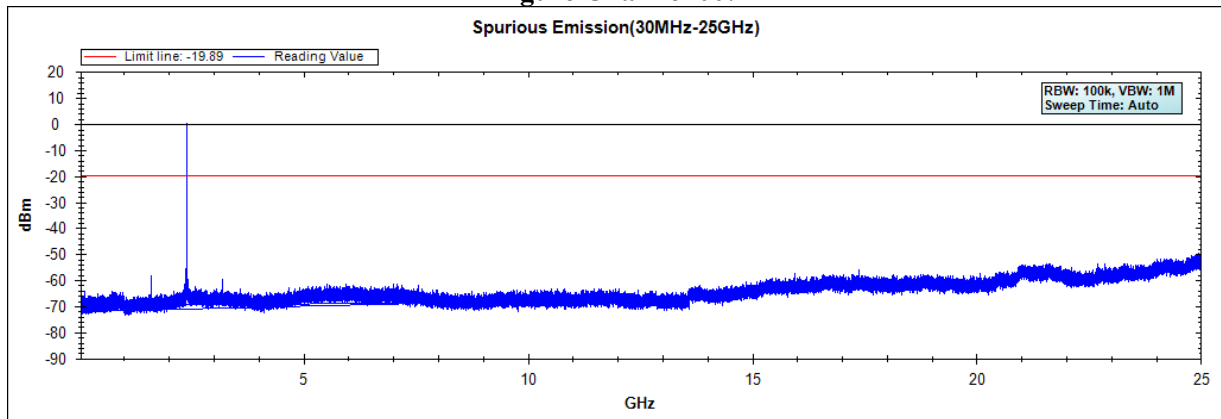
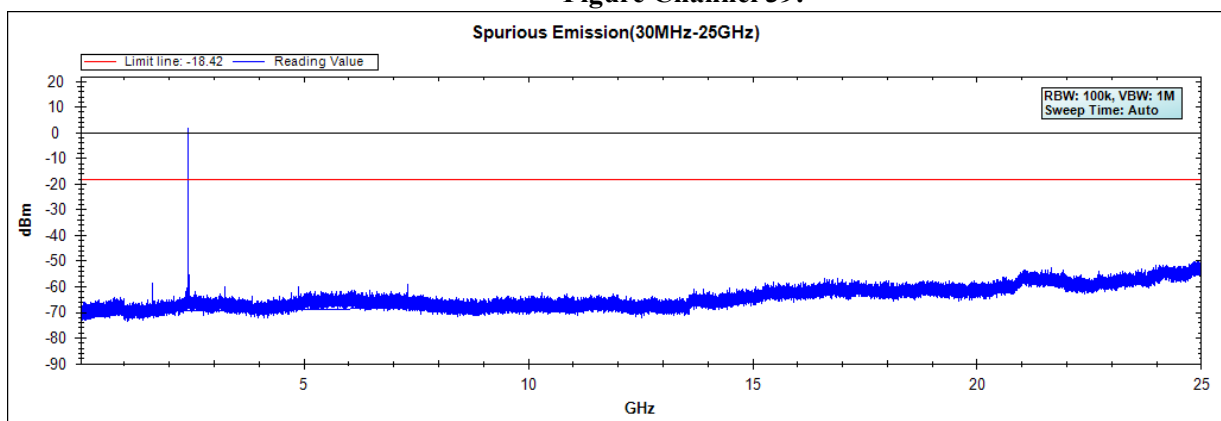
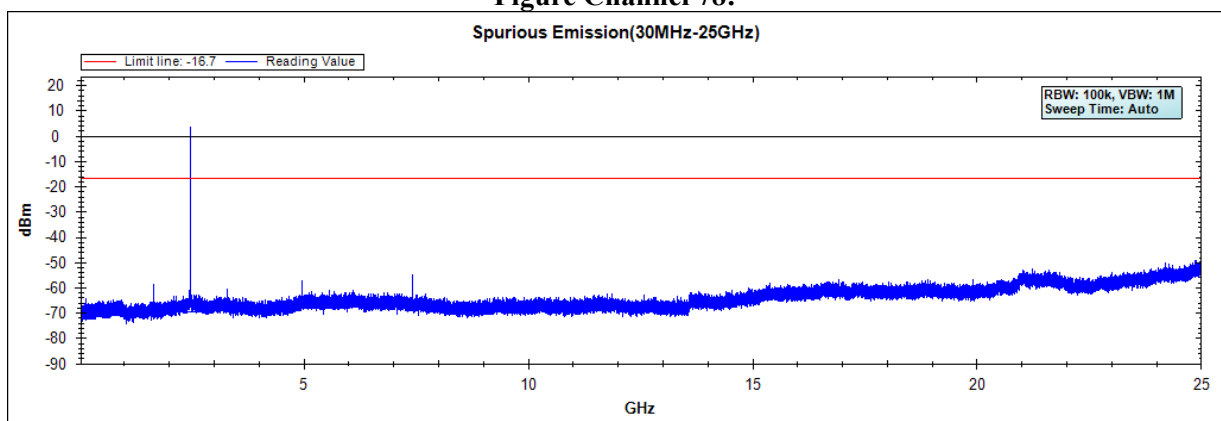


**Figure Channel 78:**



Note: The above test pattern is synthesized by multiple of the frequency range.

Product : STREAMING SOUNDBAR  
Test Item : RF Antenna Conducted Test  
Test Site : No.3 OATS  
Test date : 2018/10/26  
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

**Figure Channel 00:****Figure Channel 39:****Figure Channel 78:**

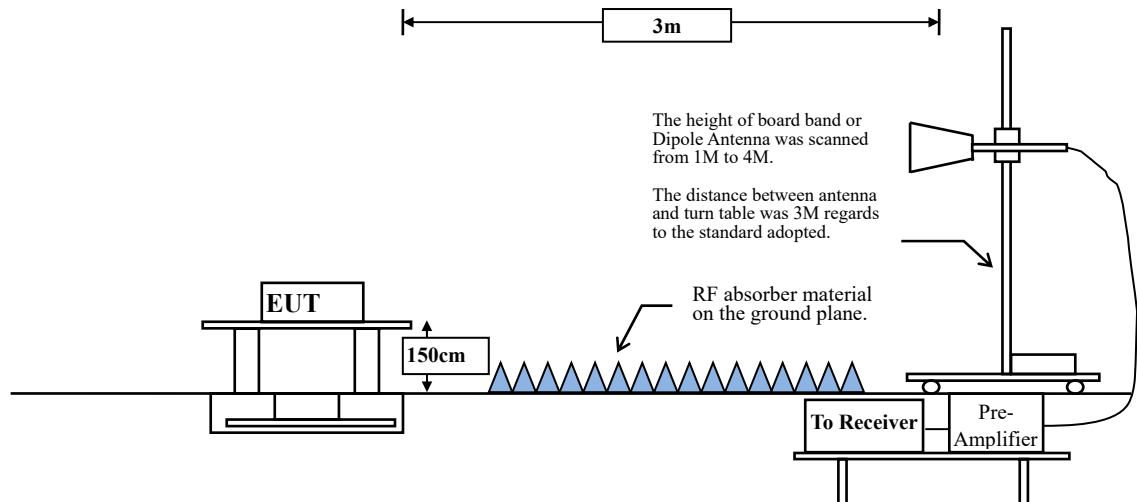
Note: The above test pattern is synthesized by multiple of the frequency range.

## 6. Band Edge

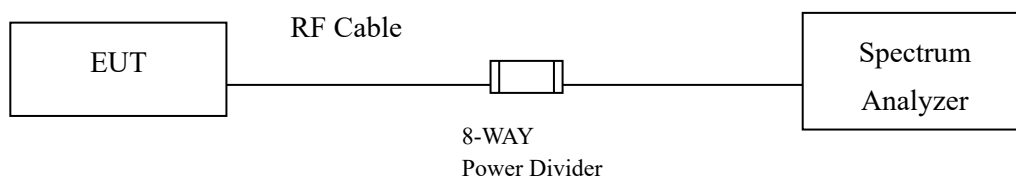
### 6.1. Test Setup

#### RF Radiated Measurement:

Above 1GHz



#### RF Conducted Measurement



### 6.2. Limit

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 20 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)).



### 6.3. 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.

### 6.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

## 6.5. Test Result of Band Edge

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

### 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
00 (Peak)	2385.652	6.456	43.347	49.803	74.00	54.00	Pass
00 (Peak)	2390.000	6.474	41.492	47.967	74.00	54.00	Pass
00 (Peak)	2400.000	6.528	58.844	65.372	--	--	--
00 (Peak)	2402.174	6.541	91.902	98.443	--	--	--
00 (Average)	2375.942	6.413	26.451	32.864	74.00	54.00	Pass
00 (Average)	2390.000	6.474	22.686	29.161	74.00	54.00	Pass
00 (Average)	2400.000	6.528	42.215	48.743	--	--	--
00 (Average)	2402.029	6.540	77.800	84.340	--	--	--

Figure Channel 00: Horizontal (Peak)

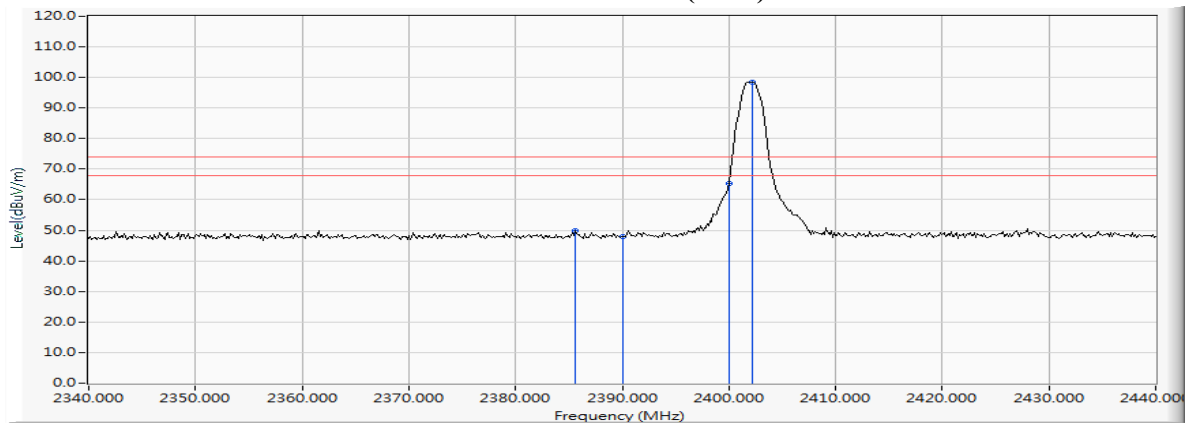
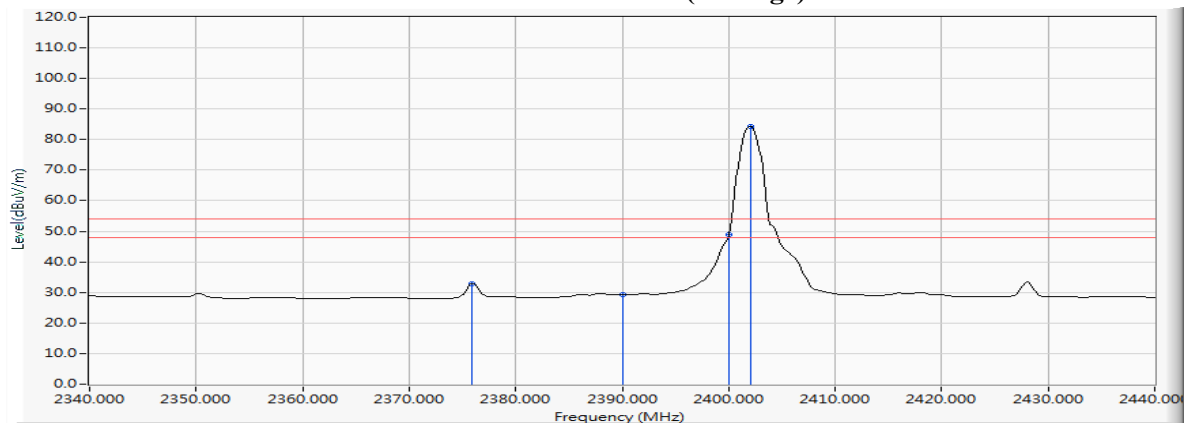


Figure Channel 00: Horizontal (Average)



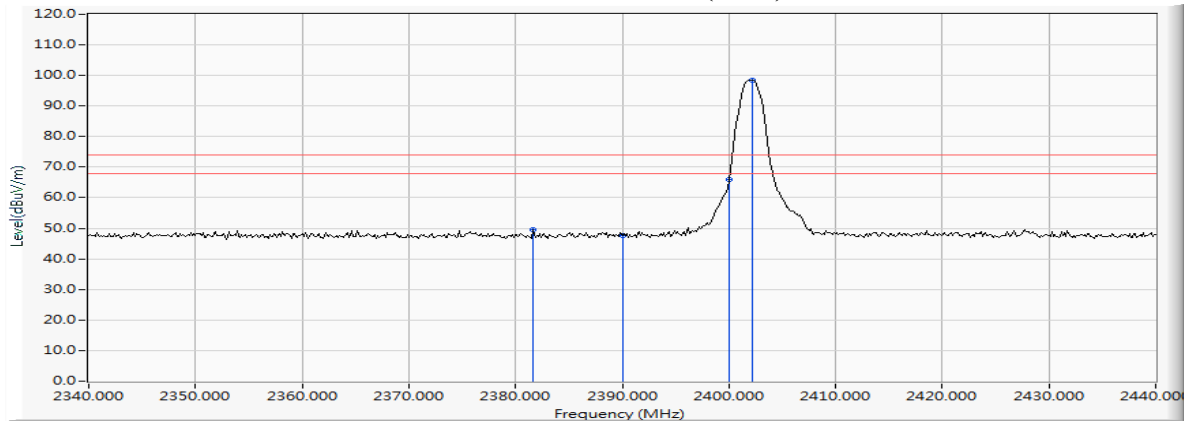
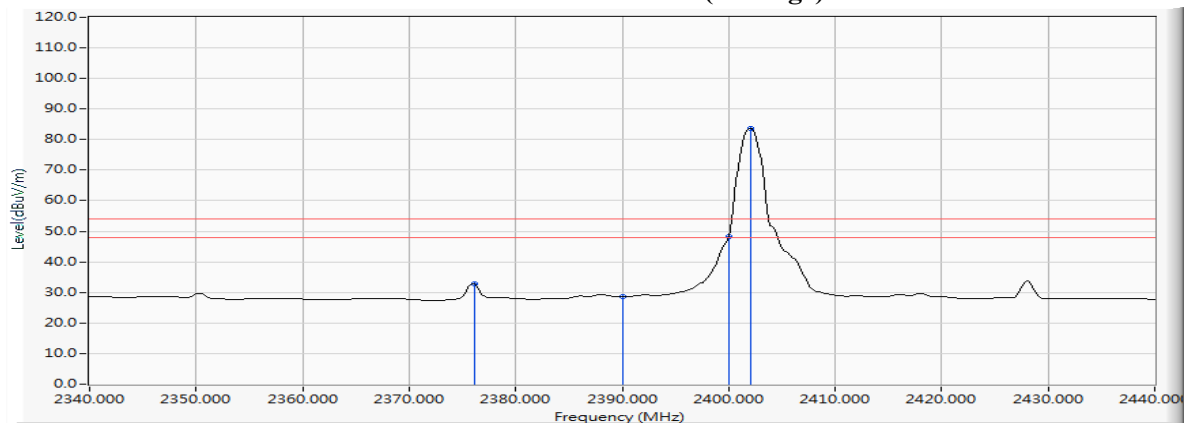
Note:

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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

**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
00 (Peak)	2381.594	5.915	43.469	49.384	74.00	54.00	Pass
00 (Peak)	2390.000	5.880	41.876	47.757	74.00	54.00	Pass
00 (Peak)	2400.000	5.879	59.946	65.825	--	--	--
00 (Peak)	2402.174	5.884	92.557	98.441	--	--	--
00 (Average)	2376.087	5.938	26.865	32.803	74.00	54.00	Pass
00 (Average)	2390.000	5.880	22.888	28.769	74.00	54.00	Pass
00 (Average)	2400.000	5.879	42.520	48.399	--	--	--
00 (Average)	2402.029	5.884	77.757	83.641	--	--	--

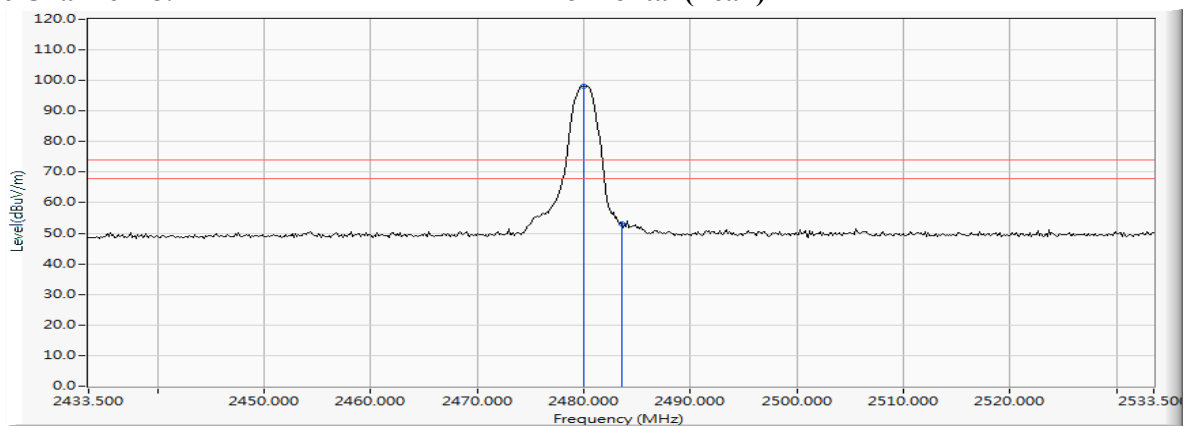
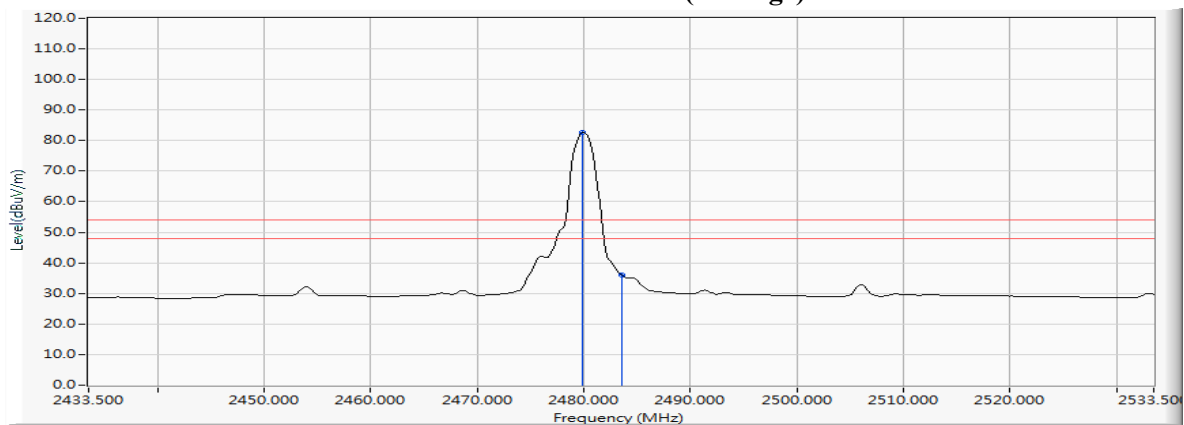
**Figure Channel 00:****VERTICAL (Peak)****Figure Channel 00:****VERTICAL (Average)****Note:**

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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

**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
78 (Peak)	2480.022	7.086	91.097	98.182	--	--	Pass
78 (Peak)	2483.500	7.110	46.016	53.126	74.00	54.00	Pass
78 (Average)	2479.877	7.085	75.528	82.612	--	--	Pass
78 (Average)	2483.500	7.110	29.080	36.190	74.00	54.00	Pass

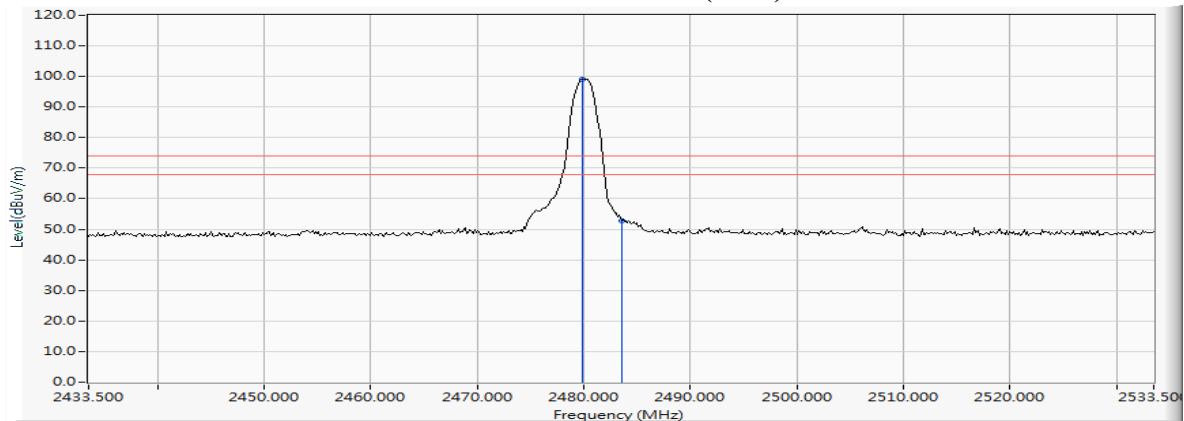
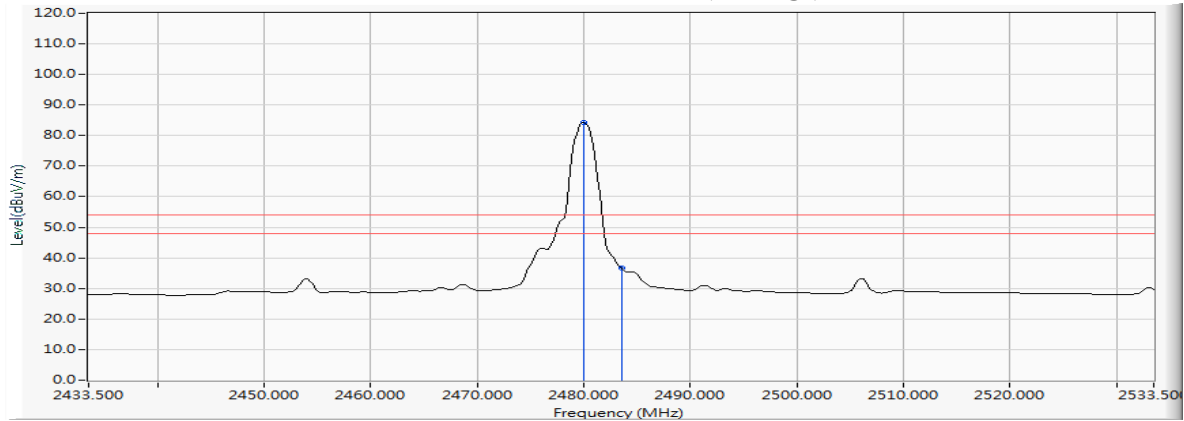
**Figure Channel 78:****Horizontal (Peak)****Figure Channel 78:****Horizontal (Average)****Note:**

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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

**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
78 (Peak)	2479.877	6.341	92.776	99.117	--	--	Pass
78 (Peak)	2483.500	6.363	46.508	52.871	74.00	54.00	Pass
78 (Average)	2480.022	6.342	78.002	84.344	--	--	Pass
78 (Average)	2483.500	6.363	30.310	36.673	74.00	54.00	Pass

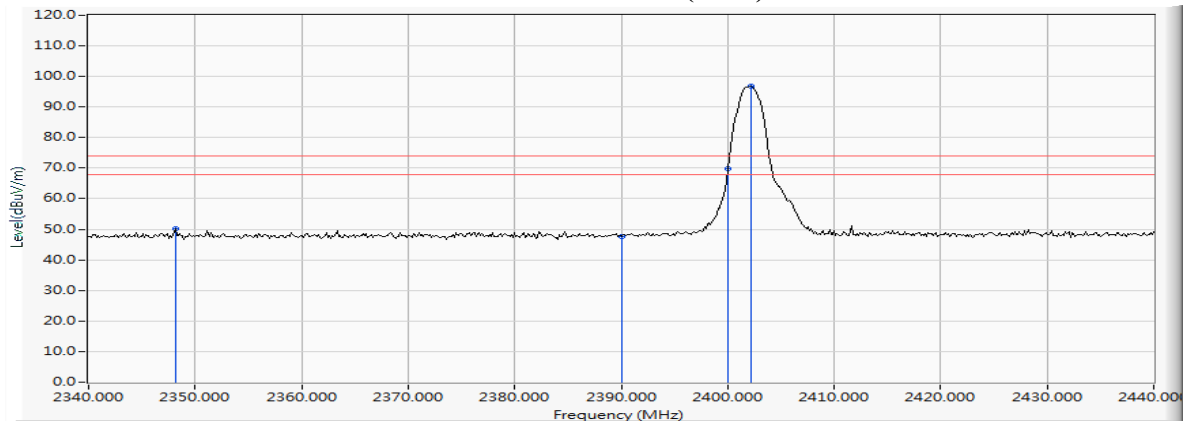
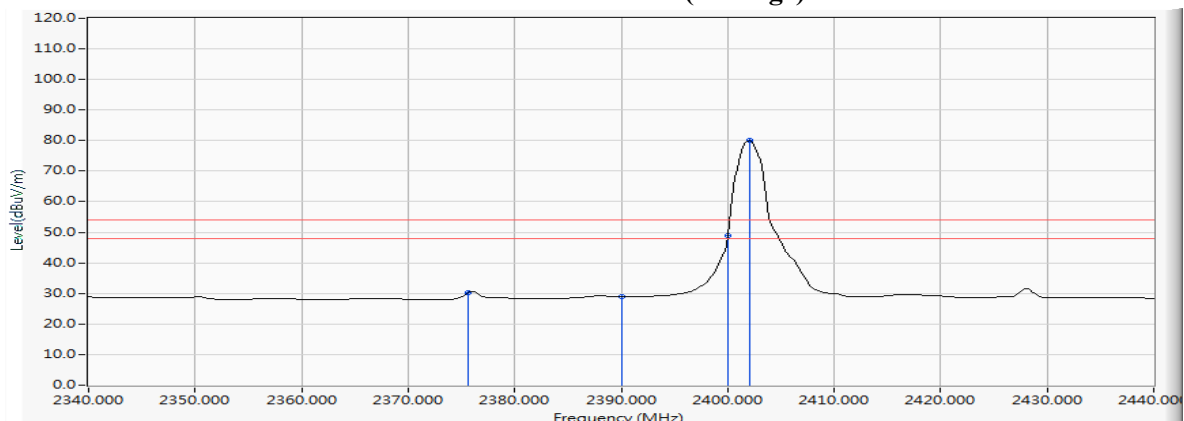
**Figure Channel 78:****VERTICAL (Peak)****Figure Channel 78:****VERTICAL (Average)****Note:**

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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

**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
00 (Peak)	2348.116	6.289	43.985	50.274	74.00	54.00	Pass
00 (Peak)	2390.000	6.474	41.251	47.726	74.00	54.00	Pass
00 (Peak)	2400.000	6.528	63.328	69.856	74.00	54.00	Pass
00 (Peak)	2402.174	6.541	90.349	96.890	--	--	--
00 (Average)	2375.652	6.412	23.855	30.266	74.00	54.00	Pass
00 (Average)	2390.000	6.474	22.505	28.980	74.00	54.00	Pass
00 (Average)	2400.000	6.528	42.305	48.833	--	--	--
00 (Average)	2402.029	6.540	73.455	79.995	--	--	--

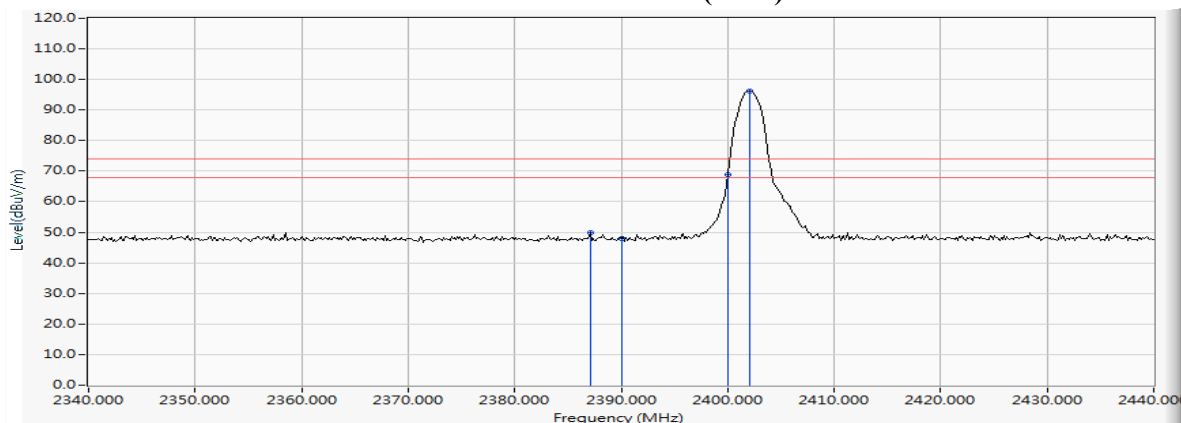
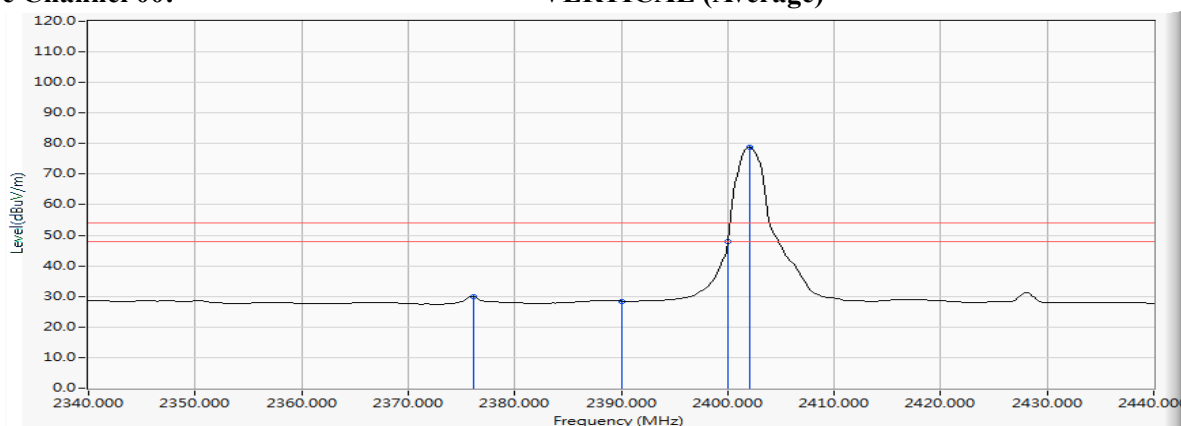
**Figure Channel 00:**
**Horizontal (Peak)**

**Figure Channel 00:**
**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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

**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
00 (Peak)	2387.101	5.893	43.967	49.860	74.00	54.00	Pass
00 (Peak)	2390.000	5.880	42.087	47.968	74.00	54.00	Pass
00 (Peak)	2400.000	5.879	63.127	69.006	74.00	54.00	Pass
00 (Peak)	2402.029	5.884	90.364	96.248	--	--	--
00 (Average)	2376.087	5.938	24.015	29.953	74.00	54.00	Pass
00 (Average)	2390.000	5.880	22.576	28.457	74.00	54.00	Pass
00 (Average)	2400.000	5.879	41.990	47.869	--	--	--
00 (Average)	2402.029	5.884	72.900	78.784	--	--	--

**Figure Channel 00:**
**VERTICAL (Peak)**

**Figure Channel 00:**
**VERTICAL (Average)**


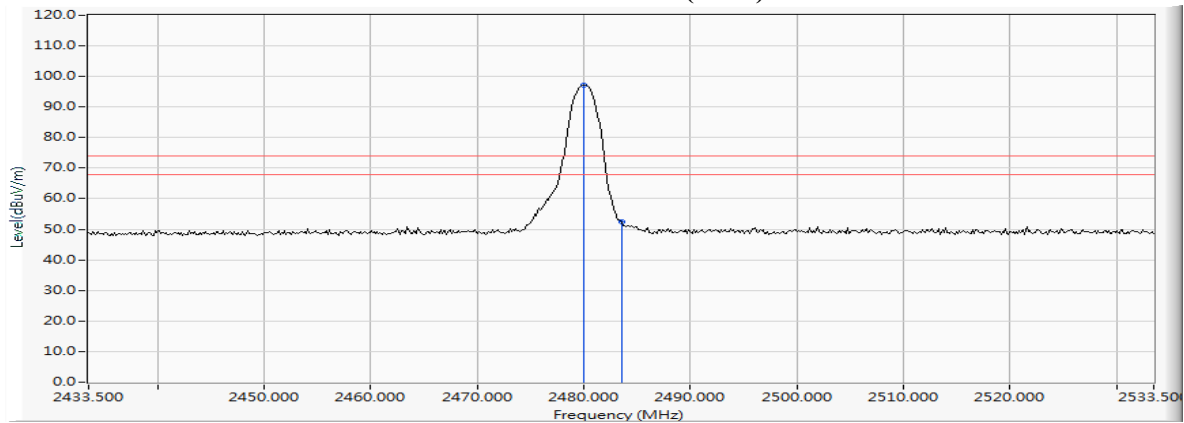
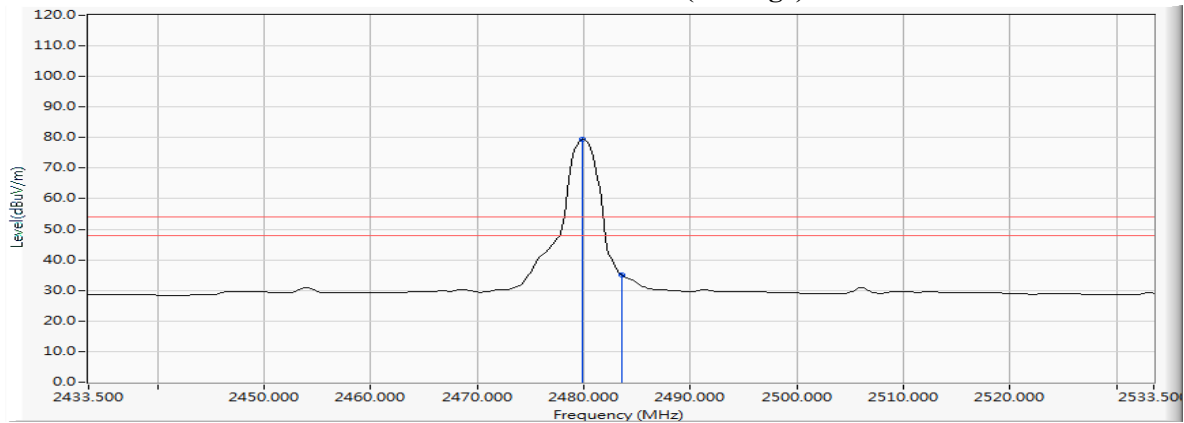
Note:

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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

**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
78 (Peak)	2480.022	7.086	90.124	97.209	--	--	Pass
78 (Peak)	2483.500	7.110	45.374	52.484	74.00	54.00	Pass
78 (Average)	2479.877	7.085	72.294	79.378	--	--	Pass
78 (Average)	2483.500	7.110	27.980	35.090	74.00	54.00	Pass

**Figure Channel 00:****Horizontal (Peak)****Figure Channel 00:****Horizontal (Average)****Note:**

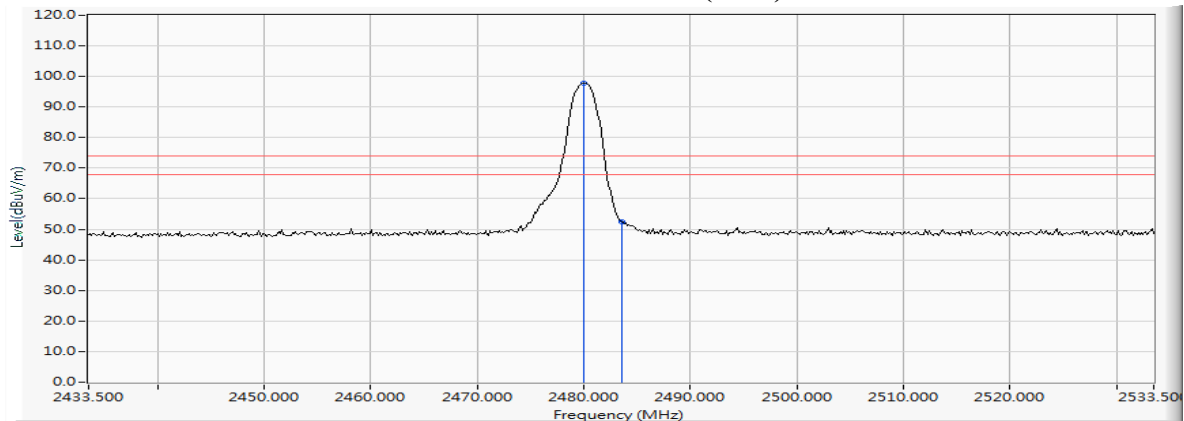
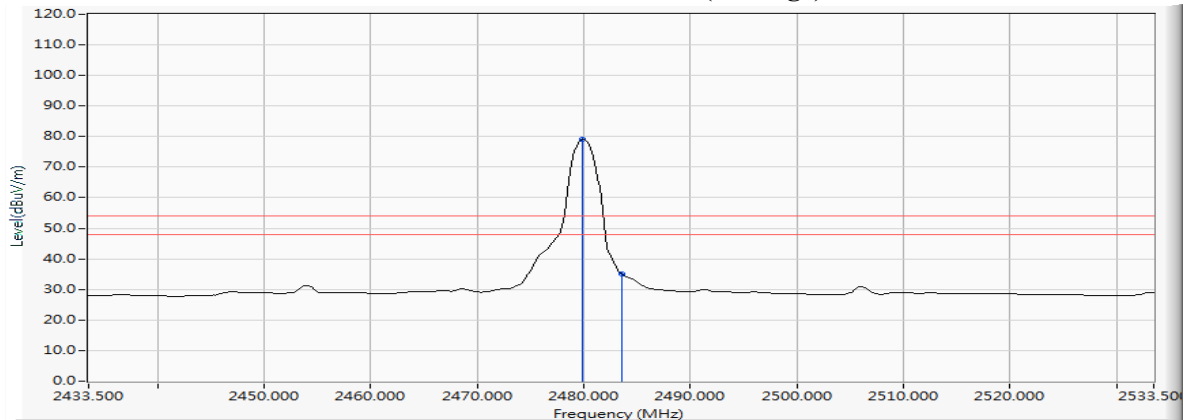
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " \* ", means this data is the worst emission level.
5. Measurement Level = Reading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



Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/31  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

**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
78 (Peak)	2480.022	6.342	91.434	97.776	--	--	Pass
78 (Peak)	2483.500	6.363	46.111	52.474	74.00	54.00	Pass
78 (Average)	2479.877	6.341	72.807	79.148	--	--	Pass
78 (Average)	2483.500	6.363	28.846	35.209	74.00	54.00	Pass

**Figure Channel 78:****VERTICAL (Peak)****Figure Channel 78:****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 + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)

Measurement Level	Result
$\Delta$ (dB)	
> 20	PASS

Figure Channel 00:

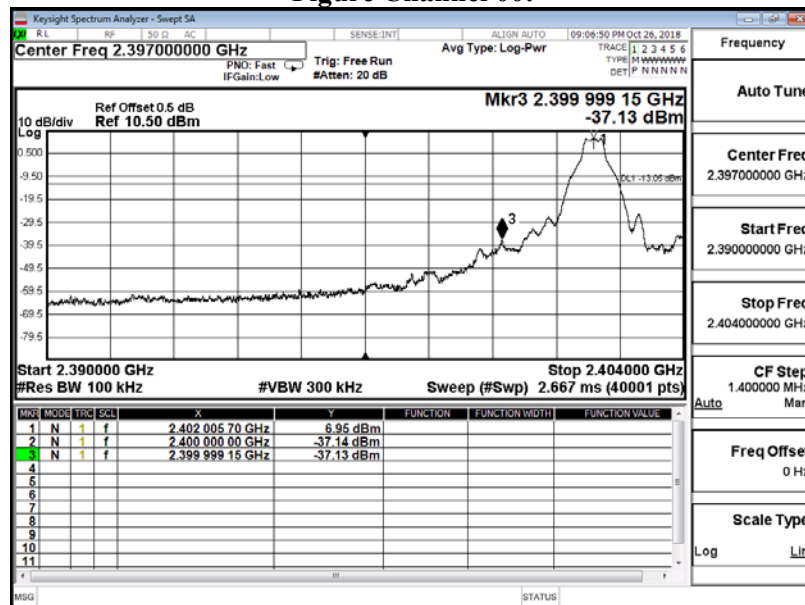
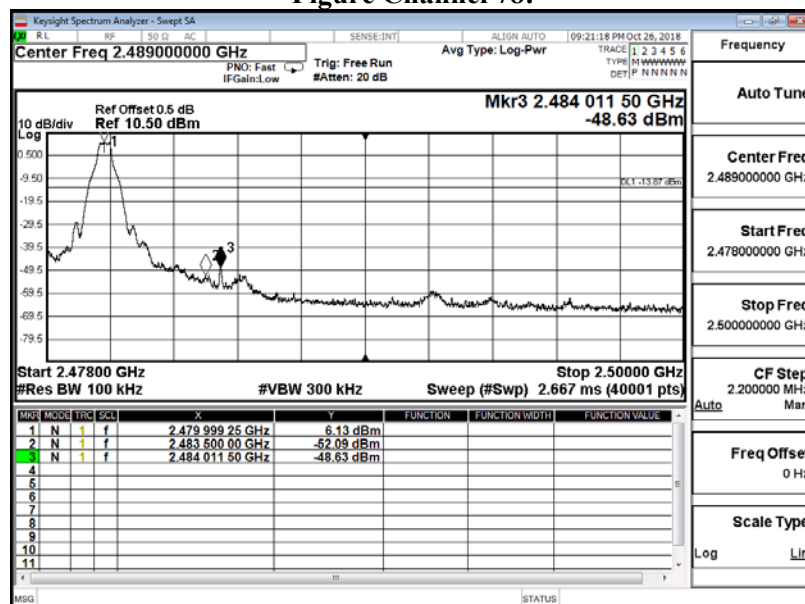


Figure Channel 78:



Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level	Result
$\Delta$ (dB)	
> 20	PASS

Figure Channel 00:

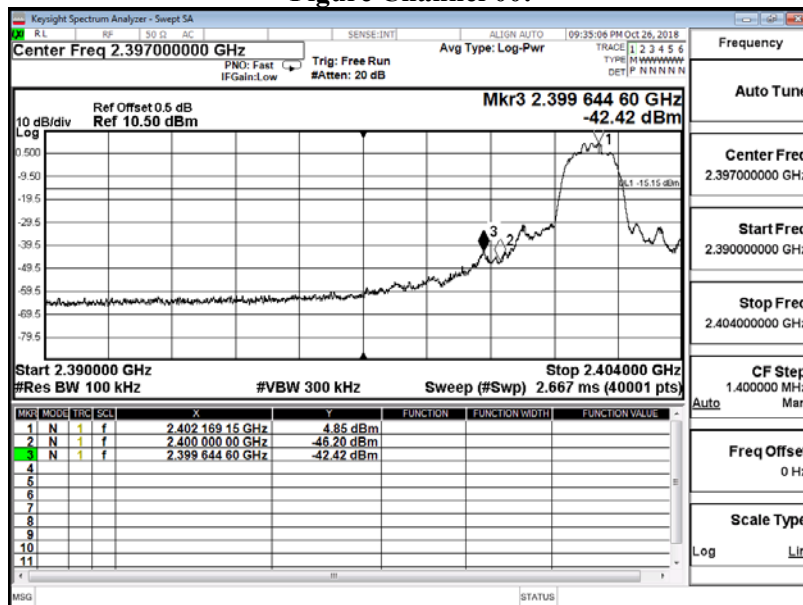
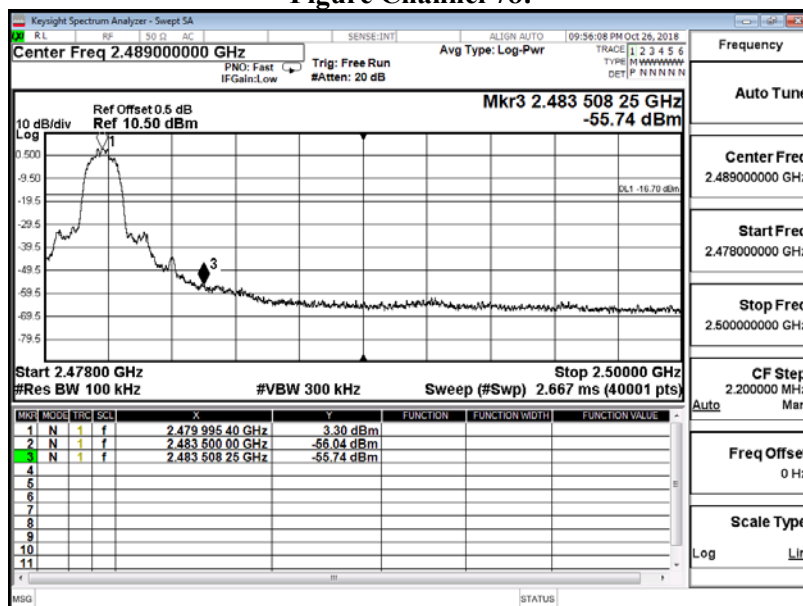


Figure Channel 78:



Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping on)

Measurement Level	Result
$\Delta$ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

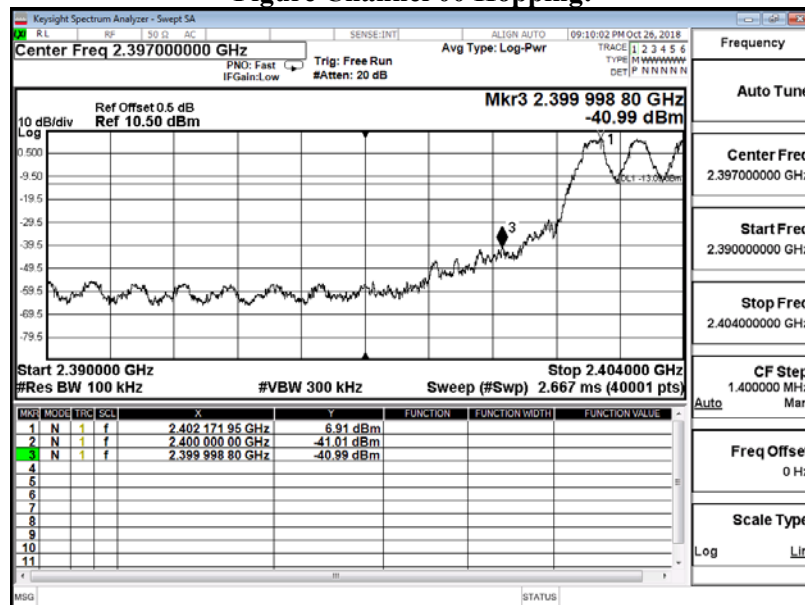
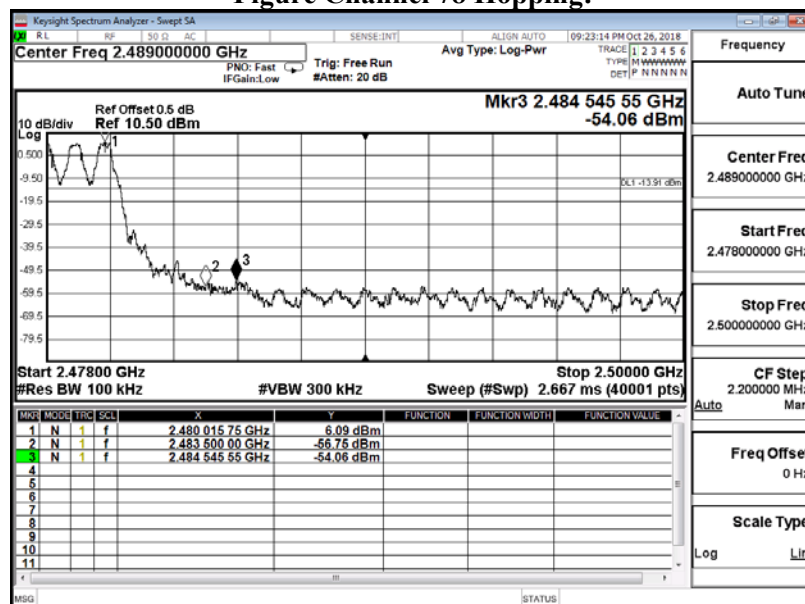


Figure Channel 78 Hopping:



Product : STREAMING SOUNDBAR  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level	Result
$\Delta$ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

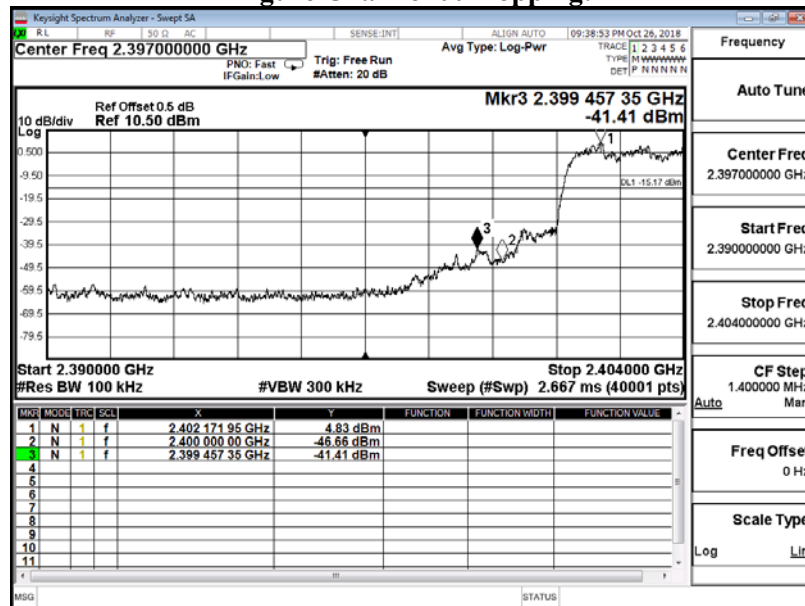
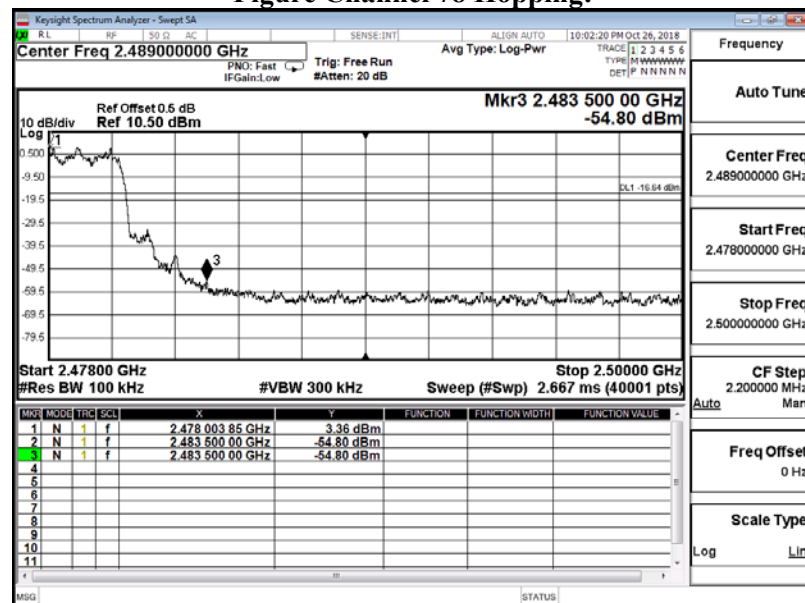
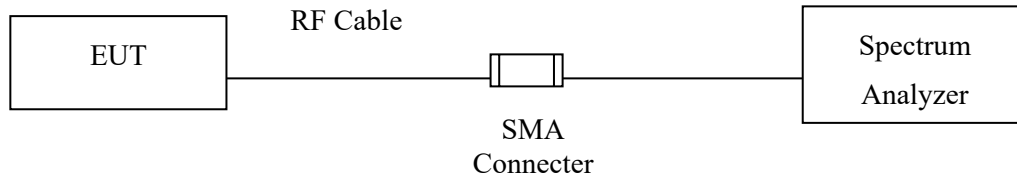


Figure Channel 78 Hopping:



## 7. Channel Number

### 7.1. Test Setup



### 7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

### 7.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

### 7.4. Uncertainty

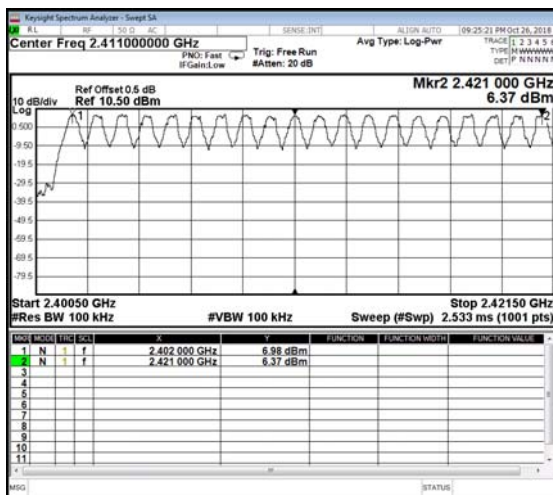
N/A

## 7.5. Test Result of Channel Number

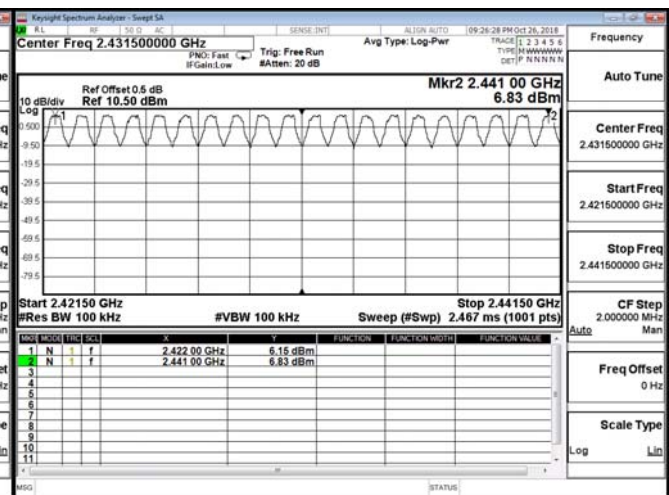
Product : STREAMING SOUNDBAR  
 Test Item : Channel Number  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

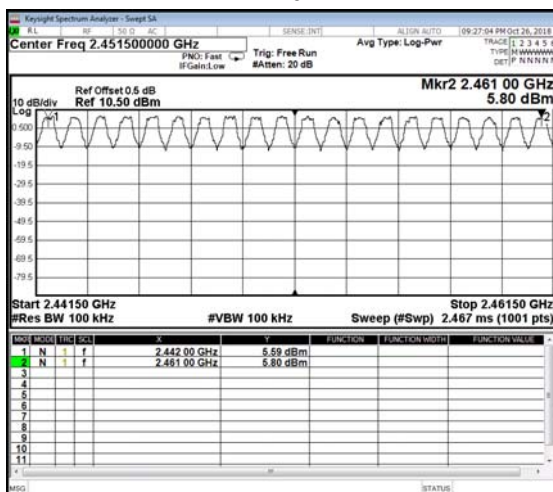
2402-2421MHz



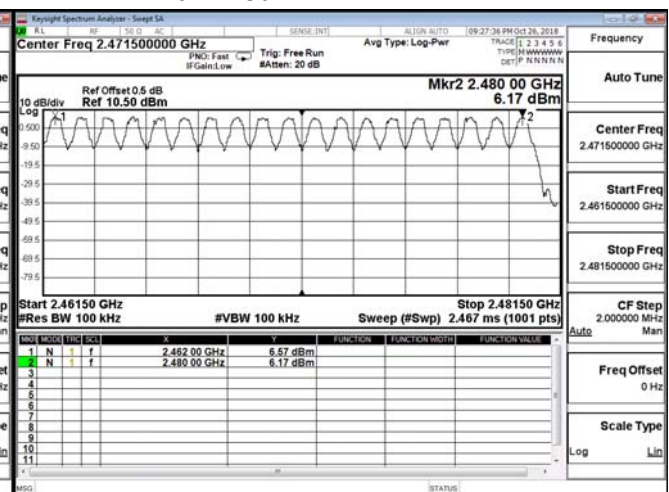
2422-2441MHz



2442-2461MHz



2462-2480MHz

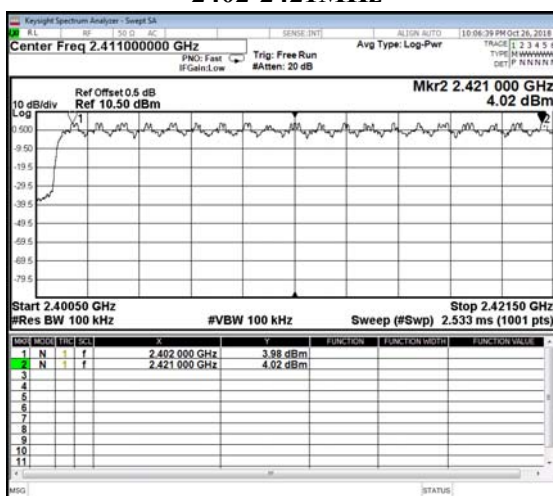




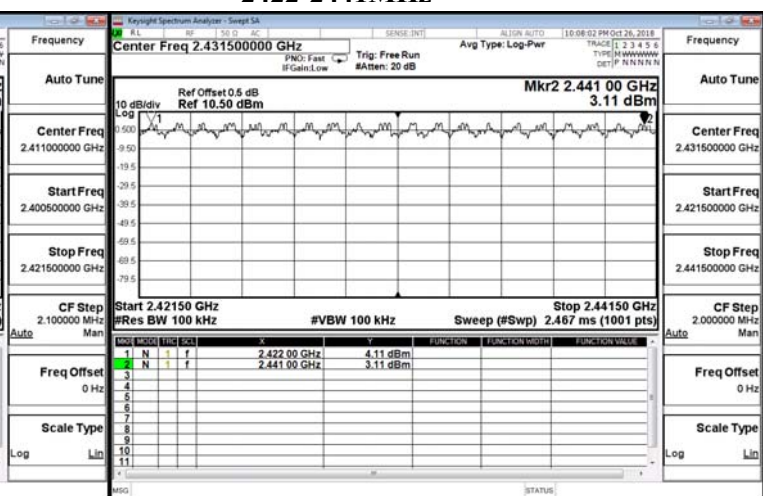
Product : STREAMING SOUNDBAR  
 Test Item : Channel Number  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

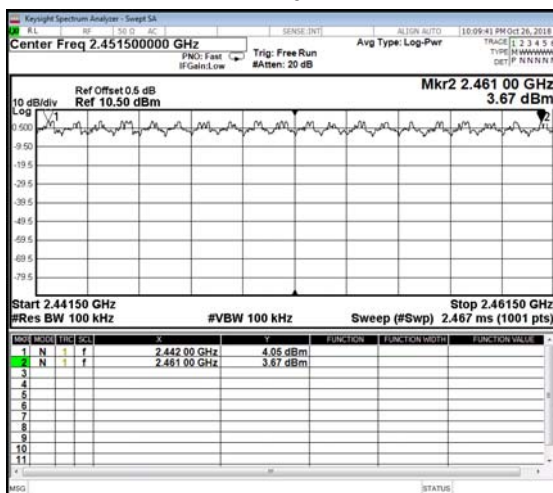
2402-2421MHz



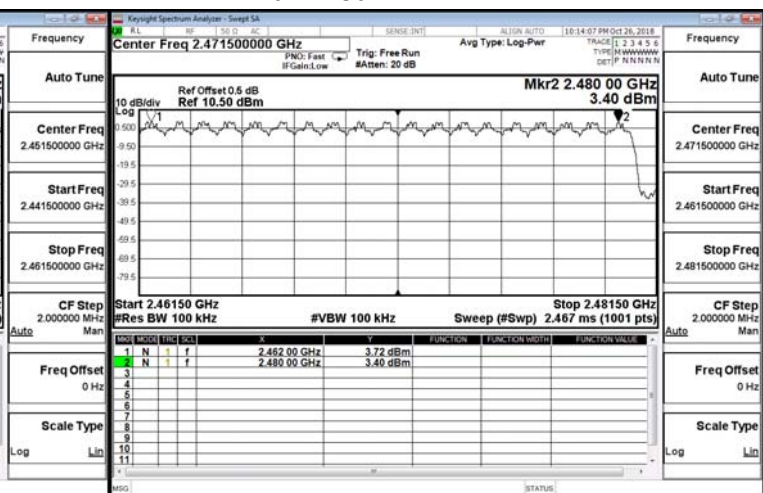
2422-2441MHz



2442-2461MHz



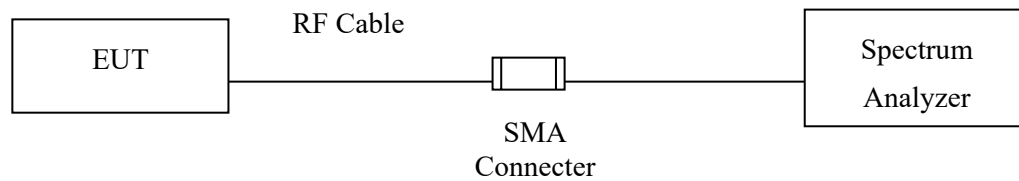
2462-2480MHz





## 8. Channel Separation

### 8.1. Test Setup



### 8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### 8.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

### 8.4. Uncertainty

$\pm 283\text{Hz}$

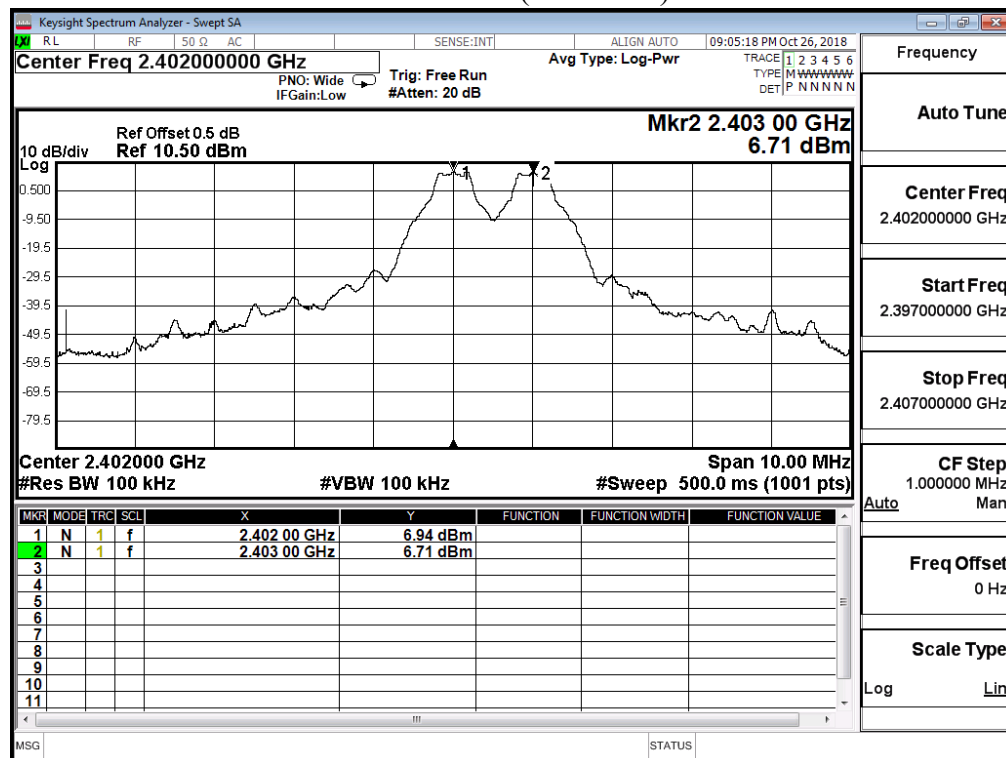
### 8.5. Test Result of Channel Separation

Product : STREAMING SOUNDBAR  
 Test Item : Channel Separation  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

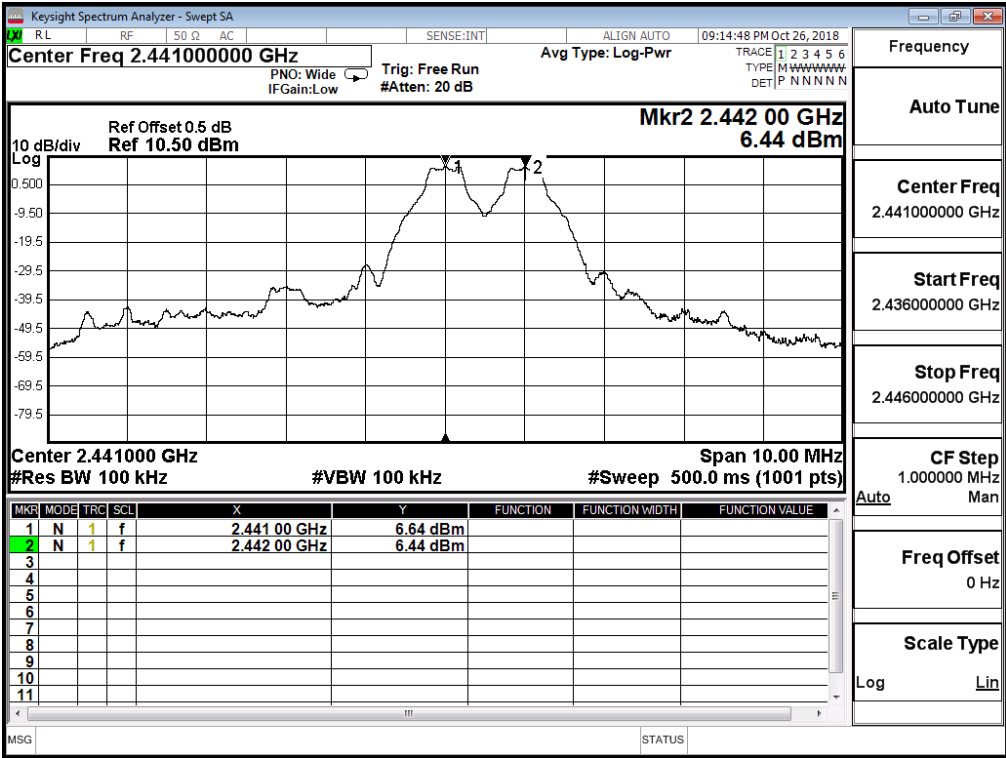
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	620.0	Pass
39	2441	1000	>25 kHz	620.0	Pass
78	2480	1000	>25 kHz	618.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

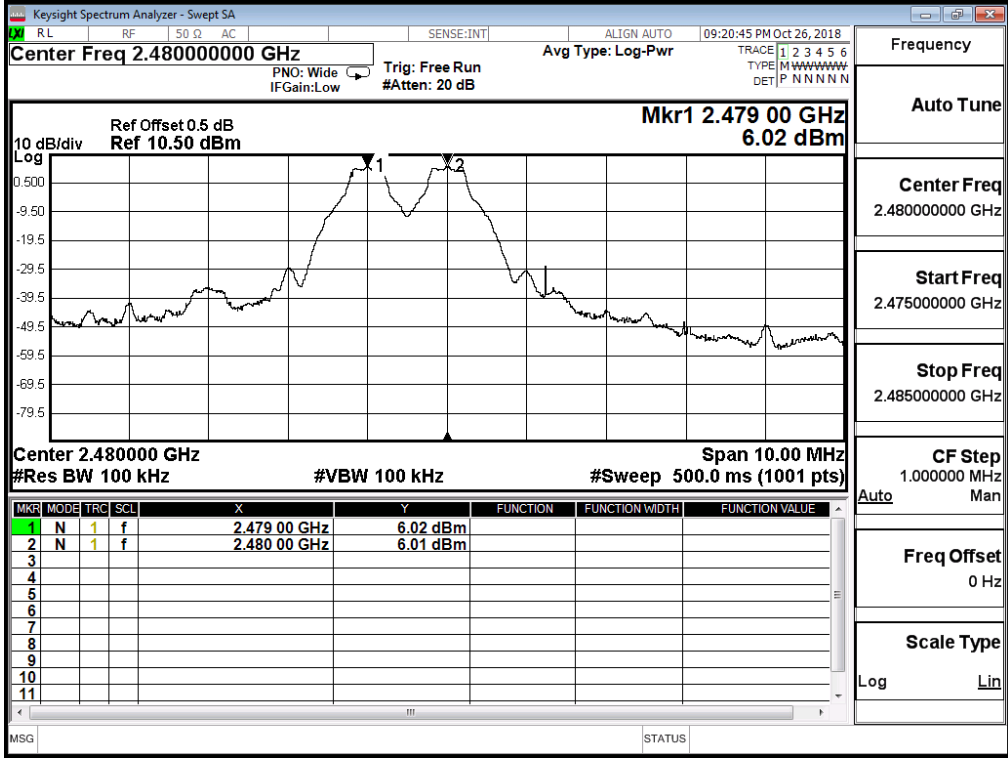
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)

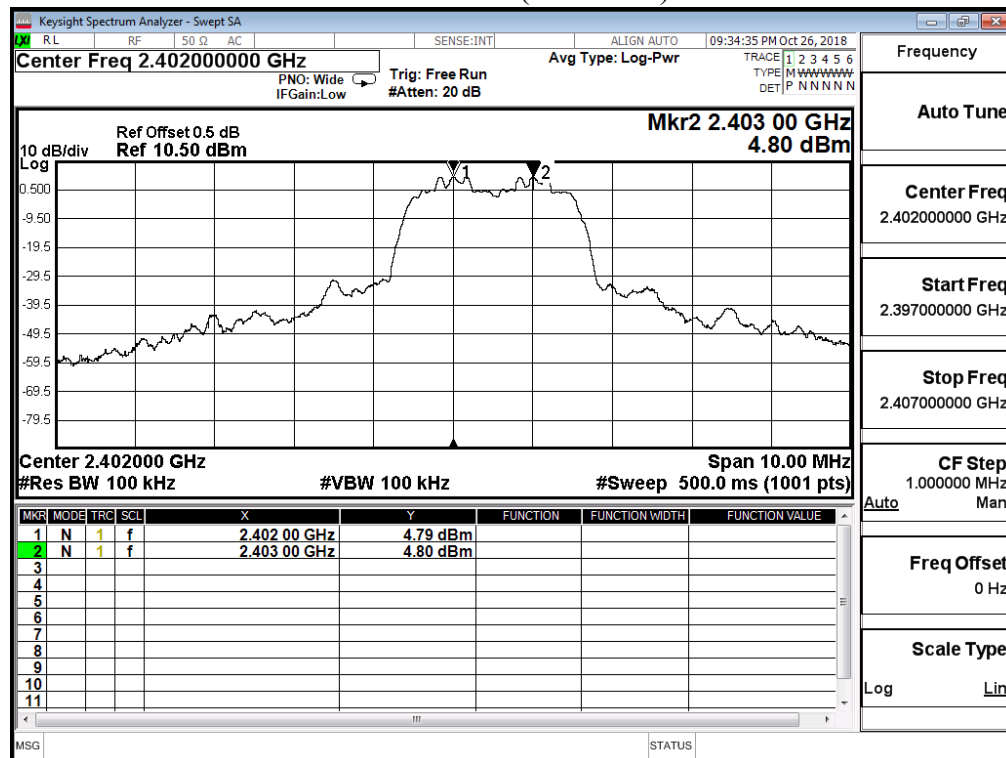


Product : STREAMING SOUNDBAR  
 Test Item : Channel Separation  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

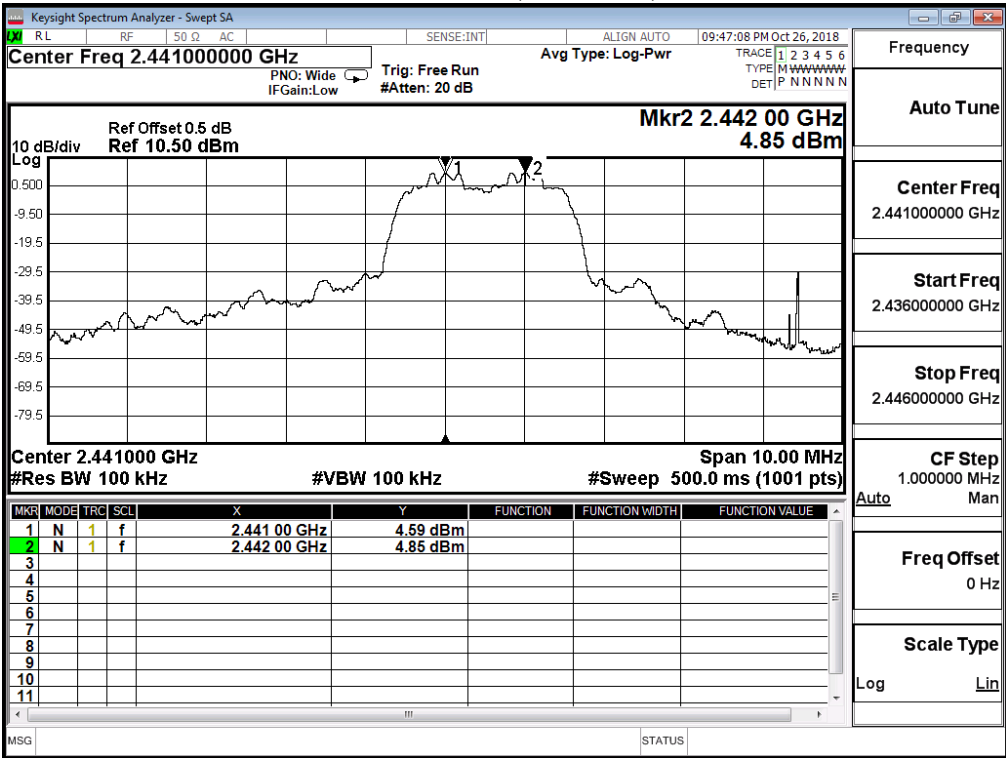
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	844.0	Pass
39	2441	1000	>25 kHz	842.0	Pass
78	2480	1000	>25 kHz	840.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

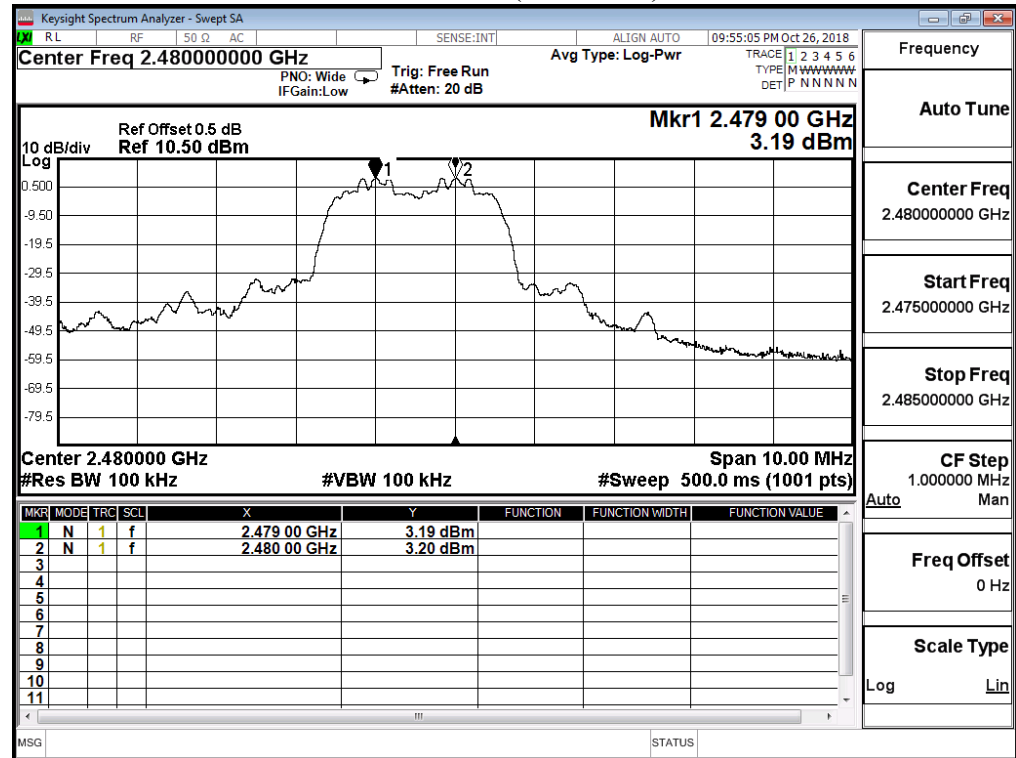
Channel 00 (2402MHz)



Channel 39 (2441MHz)

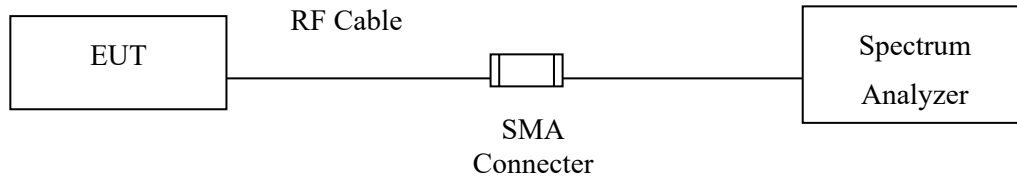


Channel 78 (2480MHz)



## 9. Dwell Time

### 9.1. Test Setup



### 9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### 9.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

### 9.4. Uncertainty

$\pm 25\text{msec}$

## 9.5. Test Result of Dwell Time

Product : STREAMING SOUNDBAR  
 Test Item : Dwell Time  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

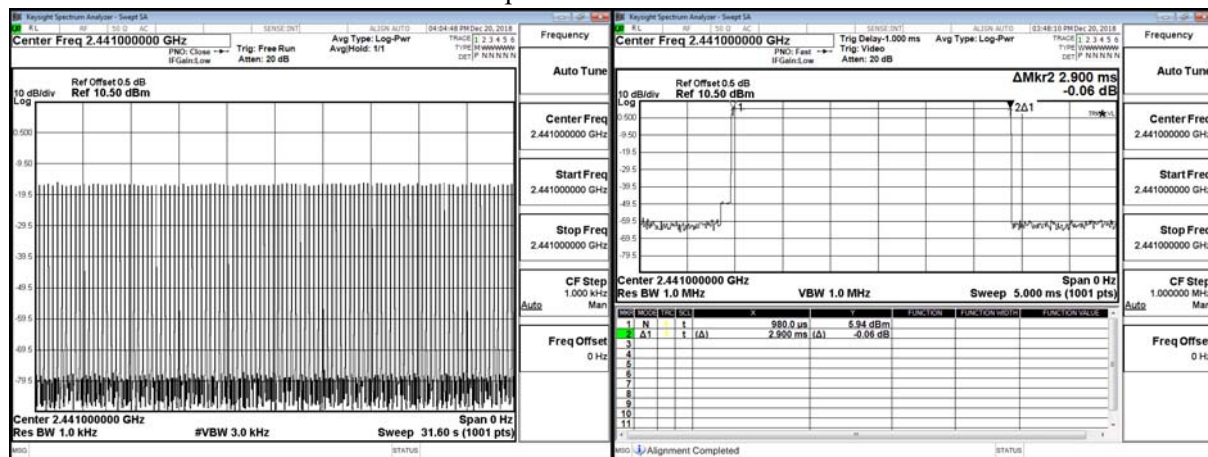
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2441	2.90	110	31600	319	400	Pass

Dwell time = ((Time slot length(ms)\*Hopping of Number)

Sweep time = 79 Channel \* 0.4

CH39 Time Interval between hops

CH 39Transmission Time



Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product : STREAMING SOUNDBAR  
 Test Item : Dwell Time  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

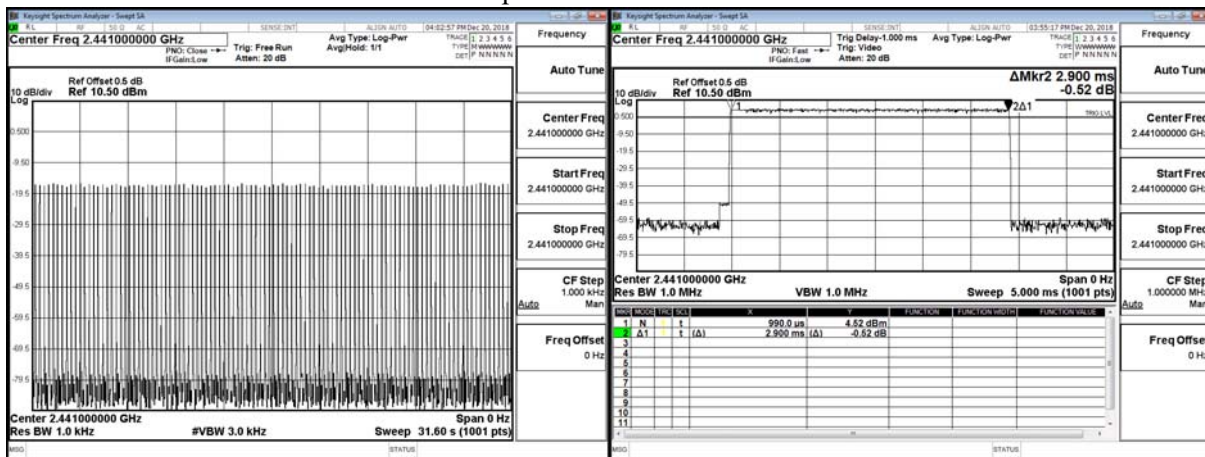
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2441	2.90	100	31600	290	400	Pass

Dwell time = ((Time slot length(ms)\*Hopping of Number)

Sweep time = 79 Channel \* 0.4

CH39 Time Interval between hops

CH 39Transmission Time



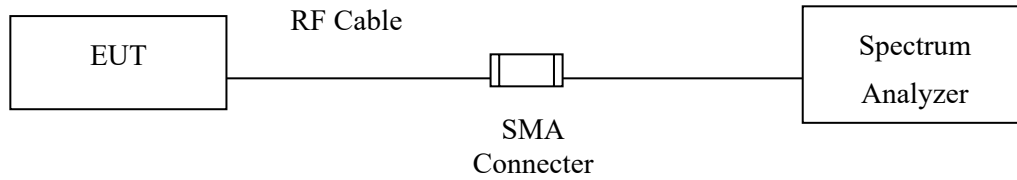
Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.



## 10. Occupied Bandwidth

### 10.1. Test Setup



### 10.2. Limits

N/A

### 10.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

### 10.4. Uncertainty

$\pm 283\text{Hz}$

### 10.5. Test Result of Occupied Bandwidth

Product : STREAMING SOUNDBAR  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	930	--	NA
39	2441	930	--	NA
78	2480	927	--	NA

Figure Channel 00:

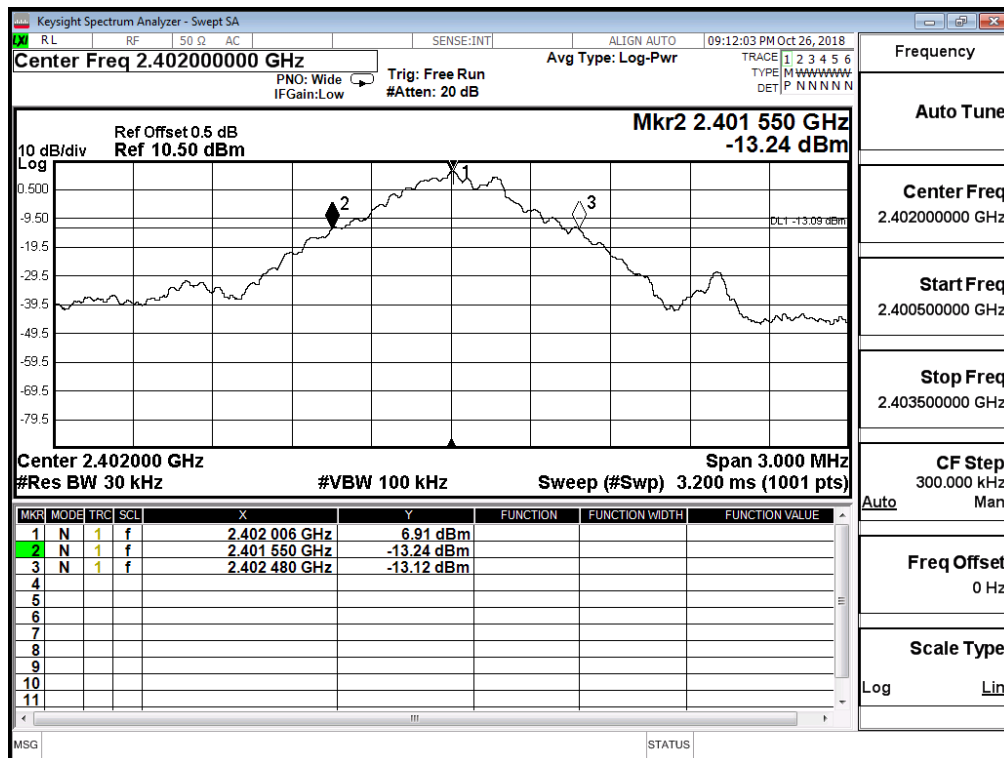


Figure Channel 39:

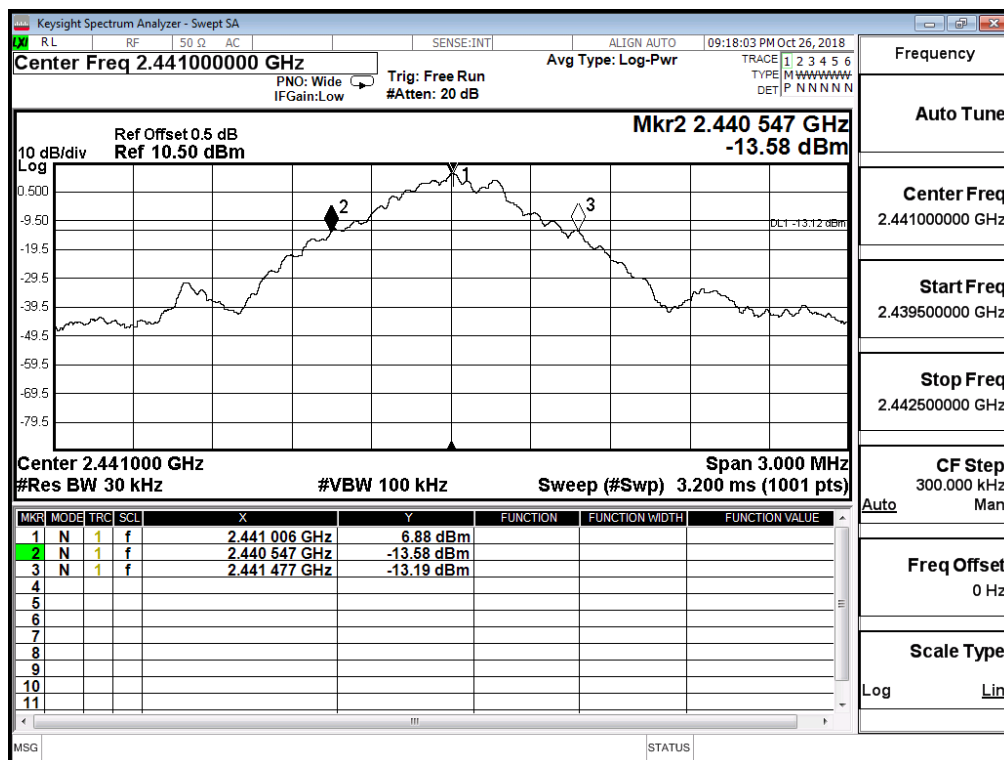
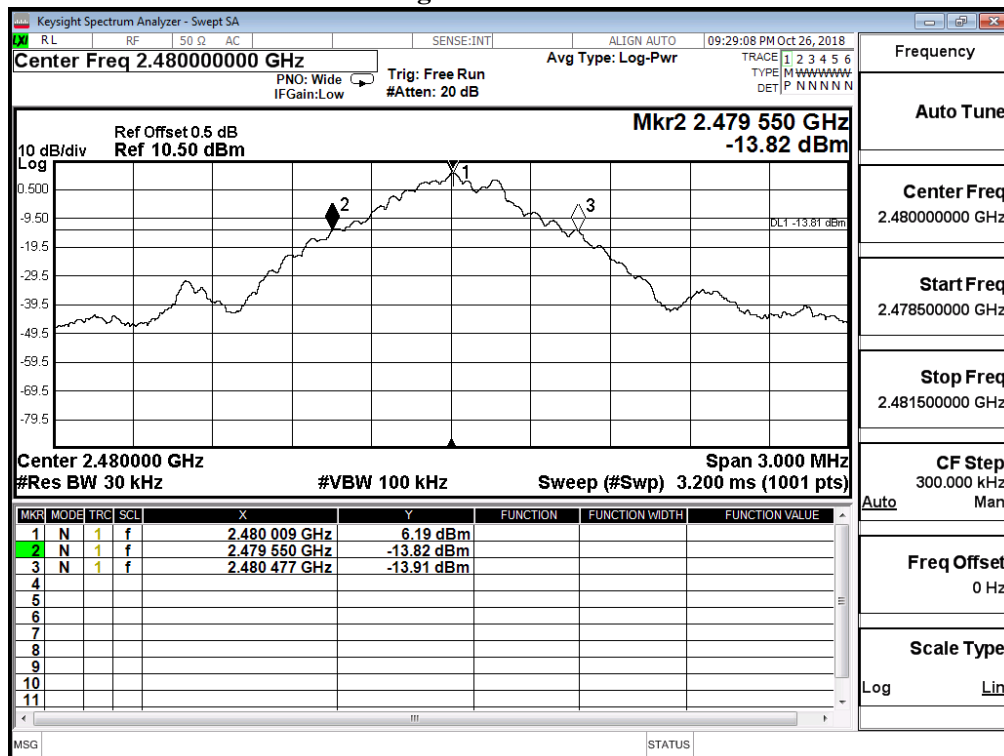


Figure Channel 78:



Product : STREAMING SOUNDBAR  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test date : 2018/10/30  
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1266	--	NA
39	2441	1263	--	NA
78	2480	1260	--	NA

Figure Channel 00:

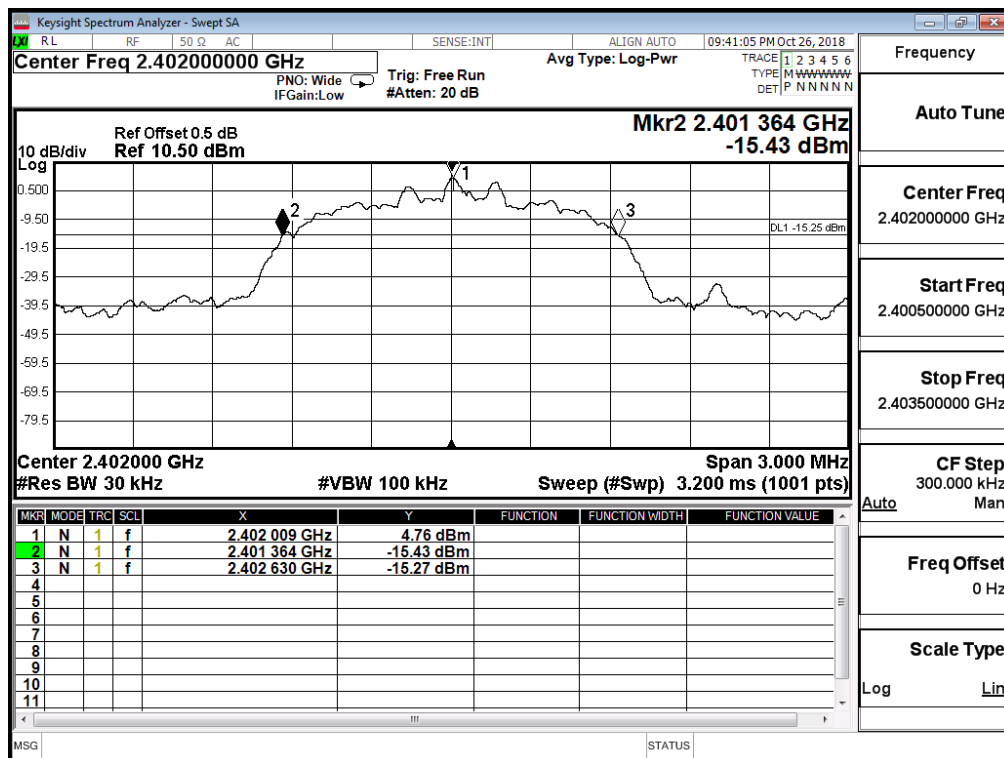


Figure Channel 39:

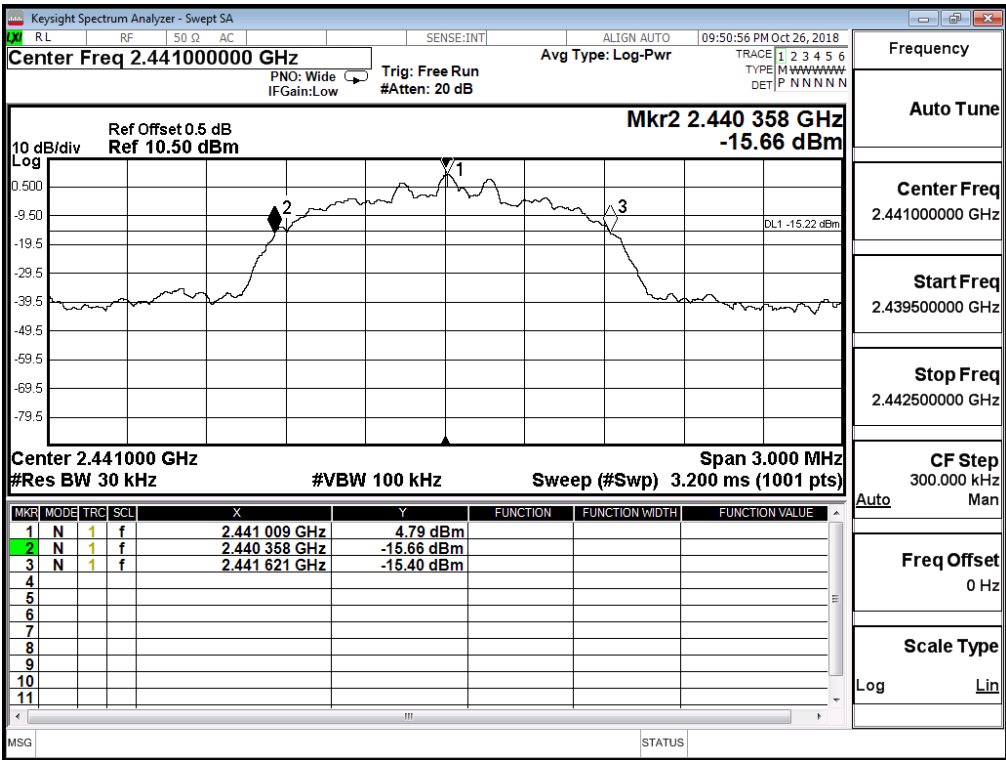
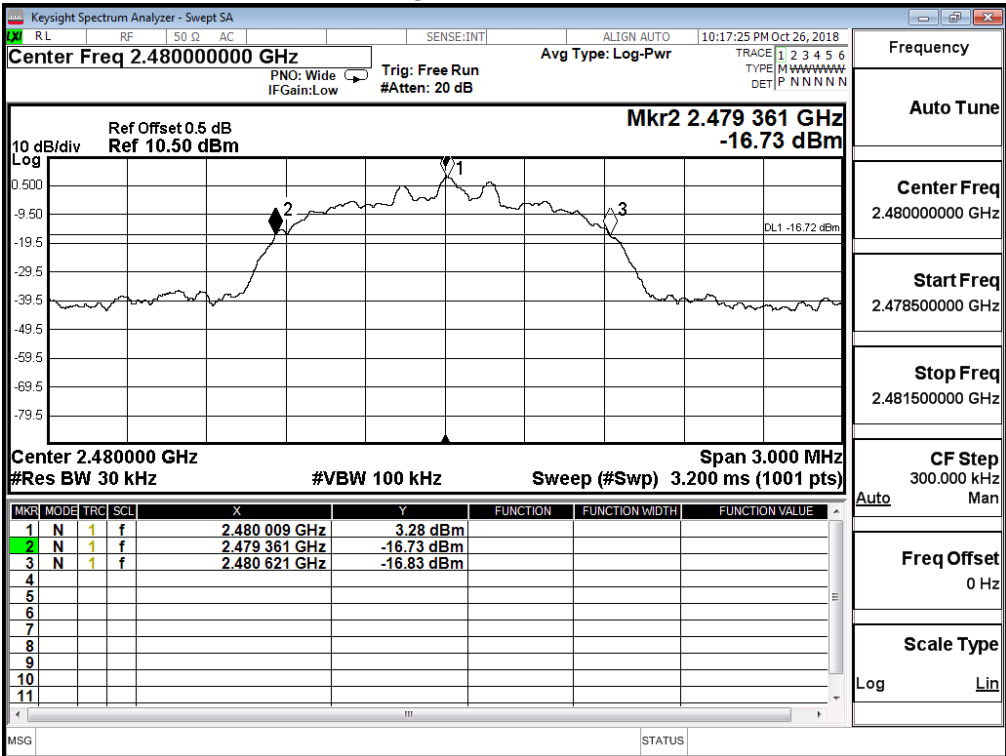


Figure Channel 78:



## **11. EMI Reduction Method During Compliance Testing**

No modification was made during testing.