



# **RADIO TEST REPORT**

## **FCC ID: XN6-SB3831C6M**

**Product :** 38" Sound Bar 3.1 System

**Trade Name :** VIZIO

**Model Name :** SB3831-C6M soundbar

**Serial Model :** N/A

**Report No. :** NTEK-2015NT0128333F2

### **Prepared for**

Zylux Acoustic Corporation  
3F, 22, Lane 35, Jihu Road, Taipei Neihu Technology Park, 114 Taipei  
Taiwan-R.O.C

### **Prepared by**

Shenzhen NTEK Testing Technology Co., Ltd.  
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street  
Bao'an District, Shenzhen P.R. China  
Tel.: +86-0755-61156588 Fax.: +86-0755-61156599  
Website: [www.ntek.org.cn](http://www.ntek.org.cn)

**TEST RESULT CERTIFICATION****Applicant's name** ..... Zylux Acoustic CorporationAddress ..... 3F,22,Lane 35,Jihu Road,Taipei NeiHu Technology Park,  
114 Taipei Taiwan-R.O.C**Manufacture's Name**... Zhao Yang Electronic(Shenzhen)Co., Ltd.Address ..... Sec.A, 4F, Building 1&2, De Yong Jia Ind. Park, GuangQiao Rd. Yu Lv  
Com., GongMing St. 518100 Guang Ming New Distr., Shenzhen, China**Product description**

Product name ..... 38"Sound Bar 3.1 System

Model and/or type ..... SB3831-C6M soundbar  
reference .....

Serial Model ..... N/A

**Standards** ..... FCC Part15.247:01 Oct. 2014  
IC RSS-210,Issue 8, December 2010Test procedure ..... ANSI C63.4-2009, ANSI C63.10-2009  
RSS-Gen ISSUE 4 November 2014 and KDB 558074:June 5, 2014,

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements/ the Industry Canada requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personal only, and shall be noted in the revision of the document.

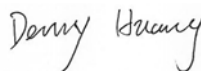
**Date of Test** .....

Date (s) of performance of tests ..... 28 Jan. 2015 ~06 Feb. 2015

Date of Issue..... 06 Feb. 2015

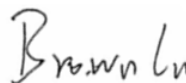
Test Result..... **Pass**

Testing Engineer :



Denny Huang

Technical Manager :



(Brown Lu)

Authorized Signatory :



(Bill Yao)

## Table of Contents

	Page
<b>1 . SUMMARY OF TEST RESULTS</b>	<b>5</b>
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
<b>2 . GENERAL INFORMATION</b>	<b>7</b>
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	9
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	11
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
<b>3 . EMC EMISSION TEST</b>	<b>13</b>
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
3.1.2 TEST PROCEDURE	14
3.1.3 DEVIATION FROM TEST STANDARD	14
3.1.4 TEST SETUP	14
3.1.5 EUT OPERATING CONDITIONS	14
3.1.6 TEST RESULTS	15
3.2 RADIATED EMISSION MEASUREMENT	19
3.2.1 RADIATED EMISSION LIMITS	19
3.2.2 TEST PROCEDURE	20
3.2.3 DEVIATION FROM TEST STANDARD	20
3.2.4 TEST SETUP	21
3.2.5 EUT OPERATING CONDITIONS	22
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	23
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	24
3.2.8 TEST RESULTS (ABOVE 1000 MHZ)	28
<b>4 . POWER SPECTRAL DENSITY TEST</b>	<b>30</b>
4.1 APPLIED PROCEDURES / LIMIT	30
4.1.1 TEST PROCEDURE	30
4.1.2 DEVIATION FROM STANDARD	30
4.1.3 TEST SETUP	30
4.1.4 EUT OPERATION CONDITIONS	30
4.1.5 TEST RESULTS	31
<b>5 . BANDWIDTH TEST</b>	<b>33</b>
5.1 APPLIED PROCEDURES / LIMIT	33
5.1.1 TEST PROCEDURE	33

<b>Table of Contents</b>	<b>Page</b>
5.1.2 EUT OPERATION CONDITIONS	33
5.1.3 TEST RESULTS	34
<b>6 . MAX CONDUCTED OUTPUT POWER TEST</b>	<b>36</b>
6.1 APPLIED PROCEDURES / LIMIT	36
6.1.1 TEST PROCEDURE	36
6.1.2 DEVIATION FROM STANDARD	36
6.1.3 TEST SETUP	36
6.1.4 EUT OPERATION CONDITIONS	36
6.1.5 TEST RESULTS	37
<b>7 . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE</b>	<b>38</b>
7.1 DEVIATION FROM STANDARD	38
7.2 TEST SETUP	38
7.3 EUT OPERATION CONDITIONS	38
7.4 TEST RESULTS	39
<b>8 . ANTENNA REQUIREMENT</b>	<b>41</b>
8.1 STANDARD REQUIREMENT	41
8.2 EUT ANTENNA	41
<b>9 . EUT TEST PHOTO</b>	<b>42</b>
<b>APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS</b>	

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C/ RSS-210 & RSS-Gen Rules			
Standard Section	Test Item	Judgment	Remark
15.207/ RSS-Gen §7.2.4	Conducted Emission	PASS	
15.247 (a)(2)/ RSS-Gen§4.6.1&RSS-210§A8.2 (a)	99% Occupied Bandwidth & 6dB Bandwidth	PASS	
15.247 (b)/ RSS-210 §A8.4 (4)	Peak Output Power	PASS	
15.247 (c)/ RSS-210 §2.2, §A8.5	Radiated Spurious Emission	PASS	
15.247 (d)/ RSS-210 §A8.2 (b)	Power Spectral Density	PASS	
15.205/ RSS-210 §2.2, §A8.5	Band Edge Emission	PASS	
15.203/ RSS-Gen §7.1.2	Antenna Requirement	PASS	

### NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

## 1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	38"Sound Bar 3.1 System	
Trade Name	VIZIO	
Model Name	SB3831-C6M soundbar	
Serial Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a 38"Sound Bar 3.1 System	
	Operation Frequency:	2402~2480MHz
	Modulation Type:	GFSK
	Number Of Channel	40CH
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	1.0dbi
Channel List	Please refer to the Note 2.	
Ratings	AC 120V,60Hz	
Adapter	Adapter 1: main test    Adapter 2: Deputy test	
Battery	N/A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel	Frequency (MHz)
00	2402
01	2404
.....	.....
.....	.....
.....	...
.....	.....
38	2478
39	2480

3.

Table for Filed Antenna

Ant .	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	PCB Antenna	N/A	1.0	BT Antenna



## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39
Mode 4	Keeping TX mode

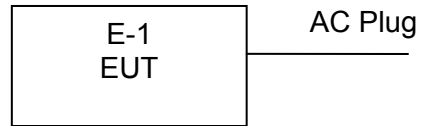
For Conducted Emission	
Final Test Mode	Description
Mode 4	Keeping TX mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39
Mode 4	Keeping TX mode

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	38"Sound Bar 3.1 System	VIZIO	SB3831-C6M soundbar	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.07	2015.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.07	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.07	2015.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	1 year

### Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2014.06.06	2015.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.07	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.07	2015.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.08	2015.06.07	1 year

1	Attenuation	MCE	24-10-34	BN9258	2014.06.08	2015.06.07	1 year
---	-------------	-----	----------	--------	------------	------------	--------

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC/ RSS-210
0.50 -5.0	73.00	60.00	56.00	46.00	FCC/ RSS-210
5.0 -30.0	73.00	60.00	60.00	50.00	FCC/ RSS-210

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



**Note: 1.**Support units were connected to second LISN .

**2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

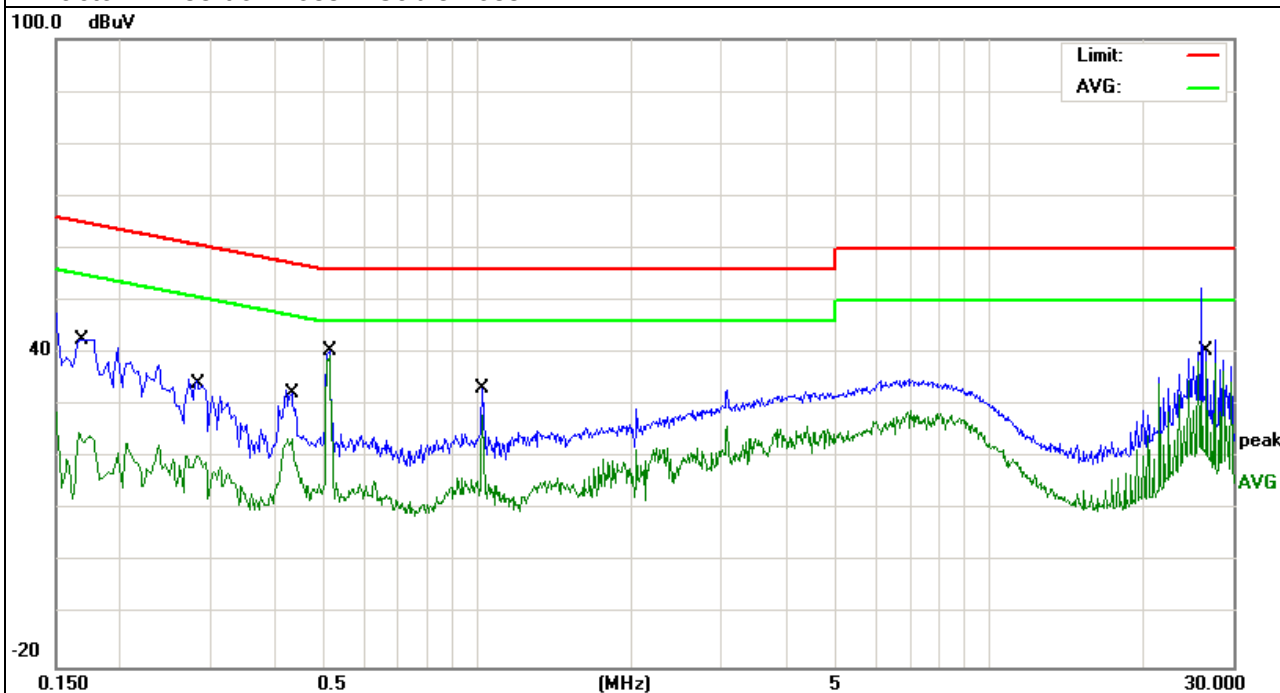
### 3.1.6 TEST RESULTS

EUT :	38"Sound Bar 3.1 System	Model Name. :	SB3831-C6M soundbar
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz- Adapter 1	Test Mode :	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1660	32.84	9.62	42.46	65.15	-22.69	QP
0.1660	15.25	9.62	24.87	55.15	-30.28	AVG
0.2859	25.42	9.72	35.14	60.64	-25.50	QP
0.2859	10.59	9.72	20.31	50.64	-30.33	AVG
0.4339	23.45	9.50	32.95	57.18	-24.23	QP
0.4339	14.29	9.50	23.79	47.18	-23.39	AVG
0.5140	30.83	9.77	40.60	56.00	-15.40	QP
0.5140	29.70	9.77	39.47	46.00	-6.53	AVG
1.0260	23.50	9.73	33.23	56.00	-22.77	QP
1.0260	18.55	9.73	28.28	46.00	-17.72	AVG
26.6260	42.64	9.94	52.58	60.00	-7.42	QP
26.6260	28.44	9.94	38.38	50.00	-11.62	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



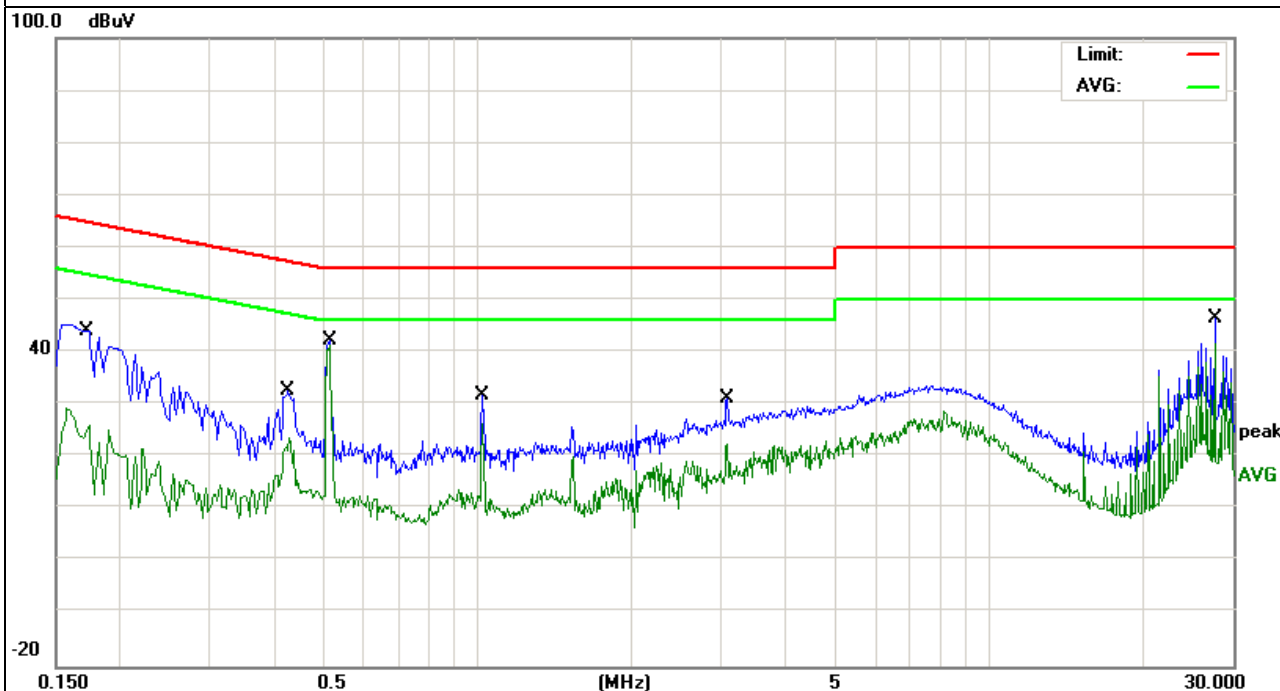
EUT :	38"Sound Bar 3.1 System	Model Name. :	SB3831-C6M soundbar
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz- Adapter 1	Test Mode :	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1740	34.35	9.61	43.96	64.76	-20.80	QP
0.1740	16.44	9.61	26.05	54.76	-28.71	AVG
0.4300	22.91	9.65	32.56	57.25	-24.69	QP
0.4300	14.08	9.65	23.73	47.25	-23.52	AVG
0.5140	32.49	9.68	42.17	56.00	-13.83	QP
0.5140	31.56	9.68	41.24	46.00	-4.76	AVG
1.0220	22.21	9.61	31.82	56.00	-24.18	QP
1.0220	16.67	9.61	26.28	46.00	-19.72	AVG
3.0740	21.56	9.52	31.08	56.00	-24.92	QP
3.0740	12.80	9.52	22.32	46.00	-23.68	AVG
27.6500	36.60	9.99	46.59	60.00	-13.41	QP
27.6500	31.63	9.99	41.62	50.00	-8.38	AVG

Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.



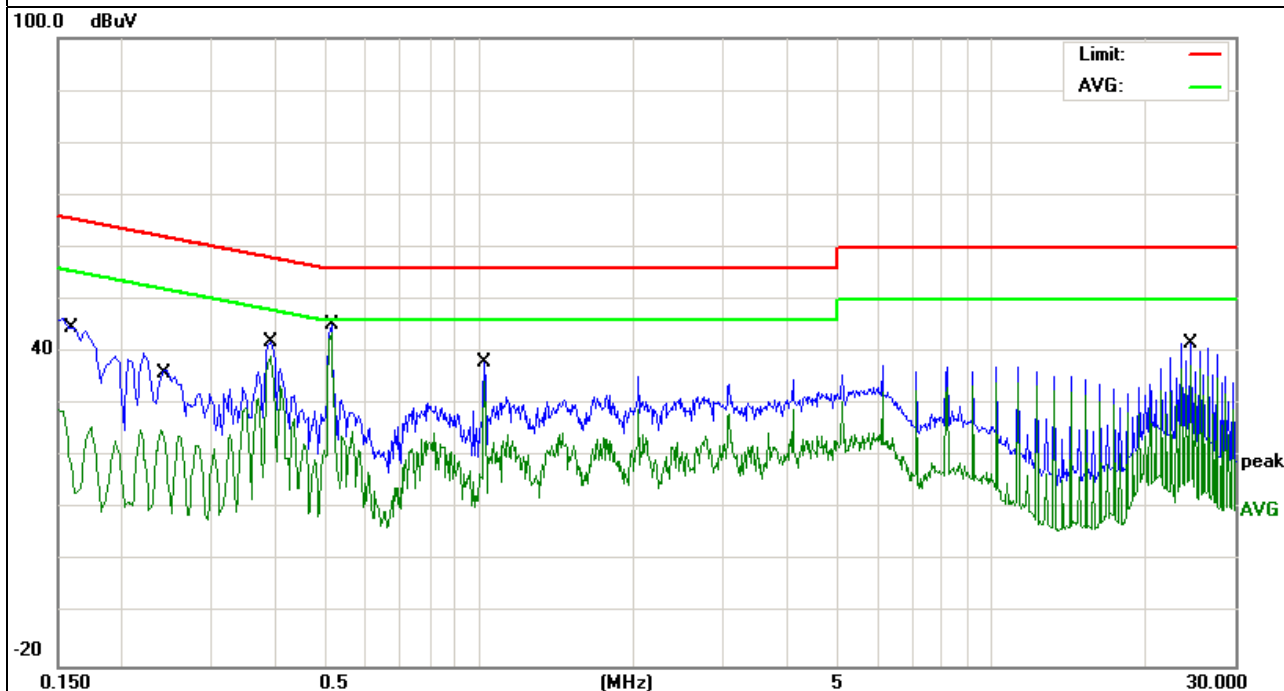


EUT :	38"Sound Bar 3.1 System	Model Name. :	SB3831-C6M soundbar
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz- Adapter 2	Test Mode :	Mode 4

Frequency (MHz)	Meter Reading+Factor (dBμV)	N/A (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1607	44.59	0.00	44.59	65.42	-20.83	QP
0.1607	29.02	0.00	29.02	55.42	-26.40	AVG
0.2379	39.94	0.00	39.94	62.17	-22.23	QP
0.2379	25.25	0.00	25.25	52.17	-26.92	AVG
0.3899	41.94	0.00	41.94	58.06	-16.12	QP
0.3899	39.16	0.00	39.16	48.06	-8.90	AVG
0.5140	45.30	0.00	45.30	56.00	-10.70	QP
0.5140	43.30	0.00	43.30	46.00	-2.70	AVG
1.0260	37.94	0.00	37.94	56.00	-18.06	QP
1.0260	34.41	0.00	34.41	46.00	-11.59	AVG
24.5778	41.76	0.00	41.76	60.00	-18.24	QP
24.5778	37.56	0.00	37.56	50.00	-12.44	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

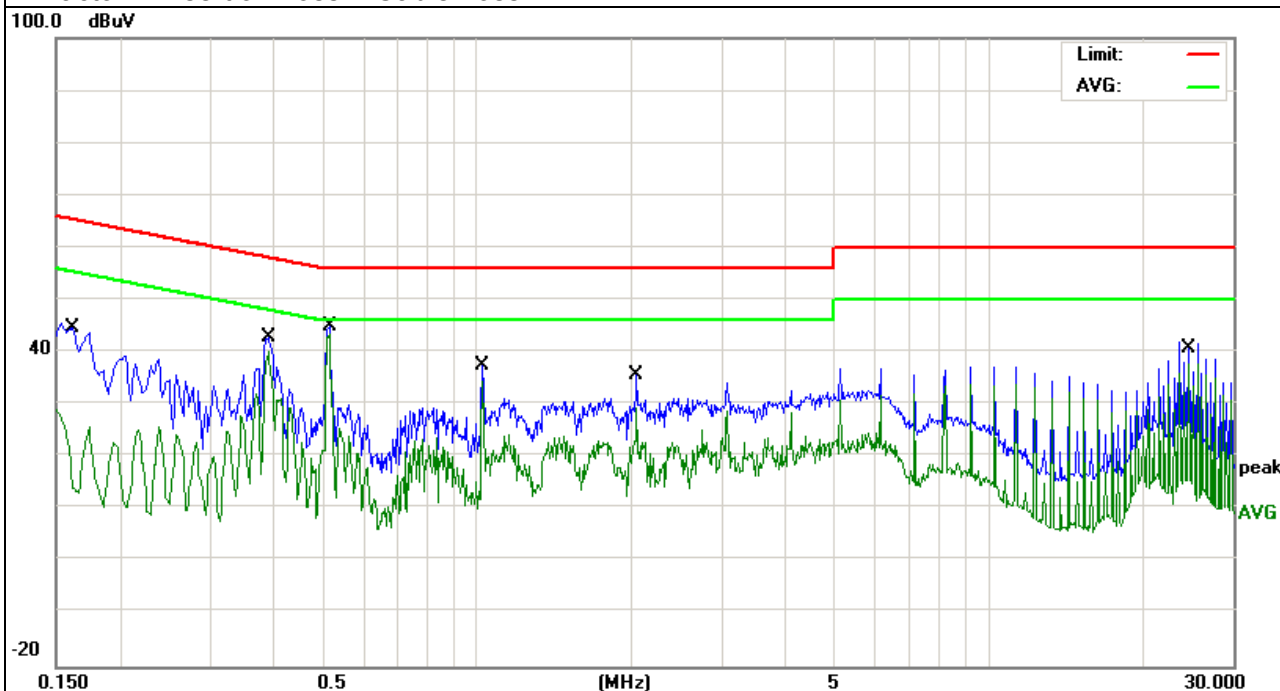


EUT :	38"Sound Bar 3.1 System	Model Name. :	SB3831-C6M soundbar
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz- Adapter 2	Test Mode :	Mode 4

Frequency (MHz)	Meter Reading+Factor (dBμV)	N/A (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1620	44.77	0.00	44.77	65.36	-20.59	QP
0.1620	29.01	0.00	29.01	55.36	-26.35	AVG
0.3899	42.87	0.00	42.87	58.06	-15.19	QP
0.3899	40.16	0.00	40.16	48.06	-7.90	AVG
0.5140	44.95	0.00	44.95	56.00	-11.05	QP
0.5140	43.20	0.00	43.20	46.00	-2.80	AVG
1.0260	37.46	0.00	37.46	56.00	-18.54	QP
1.0260	34.35	0.00	34.35	46.00	-11.65	AVG
2.0499	35.78	0.00	35.78	56.00	-20.22	QP
2.0499	29.38	0.00	29.38	46.00	-16.62	AVG
24.5777	41.87	0.00	41.87	60.00	-18.13	QP
24.5777	37.73	0.00	37.73	50.00	-12.27	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a)/ RSS-210 §2.2& A8.5, then the 15.209(a)/ RSS-210 & A8.5 limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C/ RSS-Gen.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic

The frequency spectrum from 30 MHz to 25 GHz was investigated.

All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=1MHz VBW=3MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector.

**3.2.2 TEST PROCEDURE**

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

**Note:**

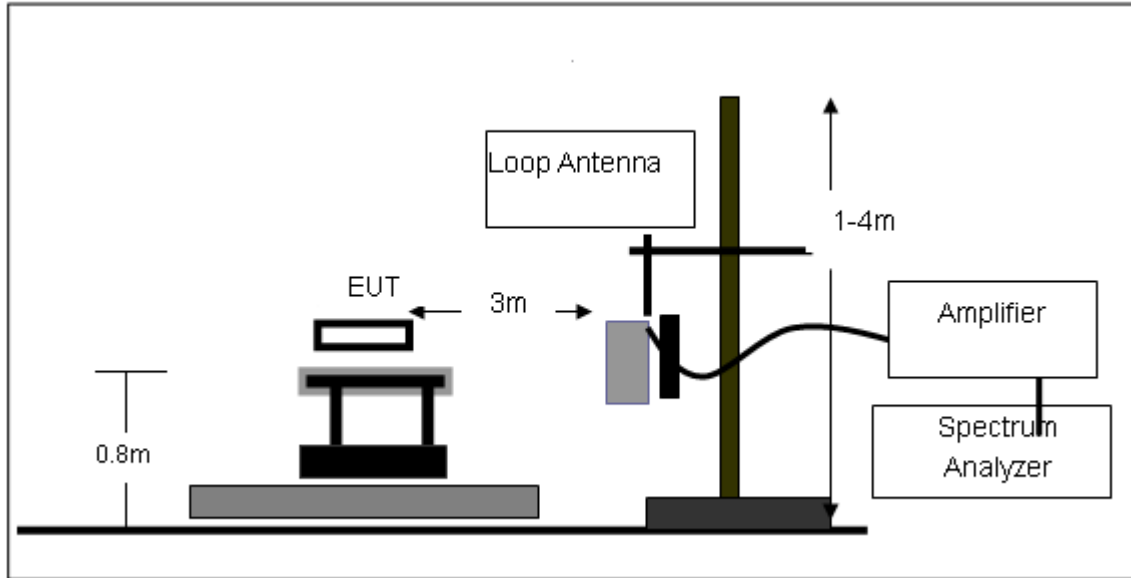
Both horizontal and vertical antenna polarities were tested  
and performed pretest to three orthogonal axis. The worst case emissions were reported

**3.2.3 DEVIATION FROM TEST STANDARD**

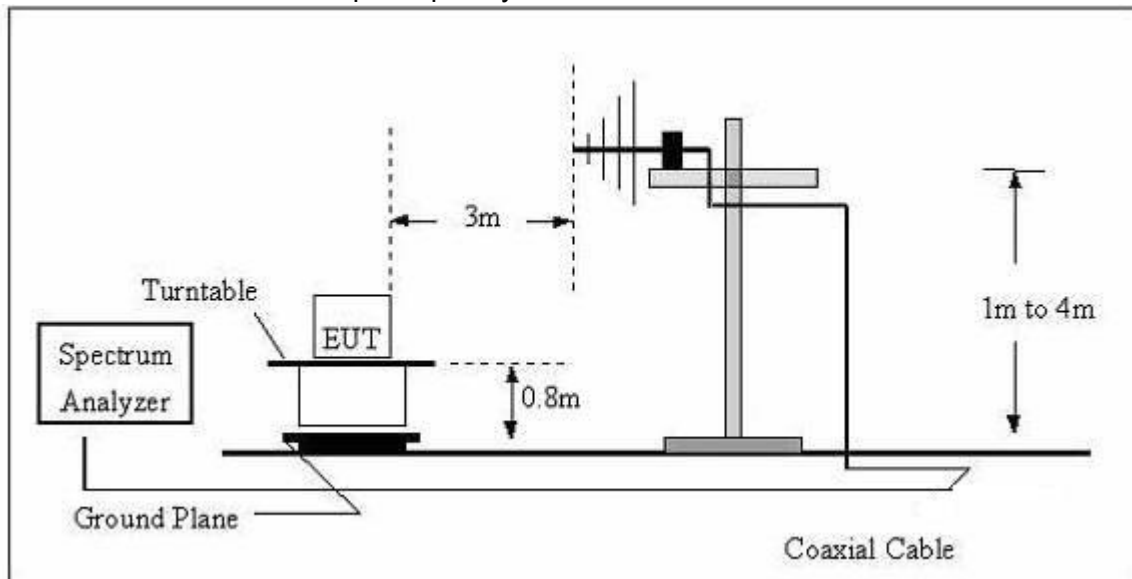
No deviation

### 3.2.4 TEST SETUP

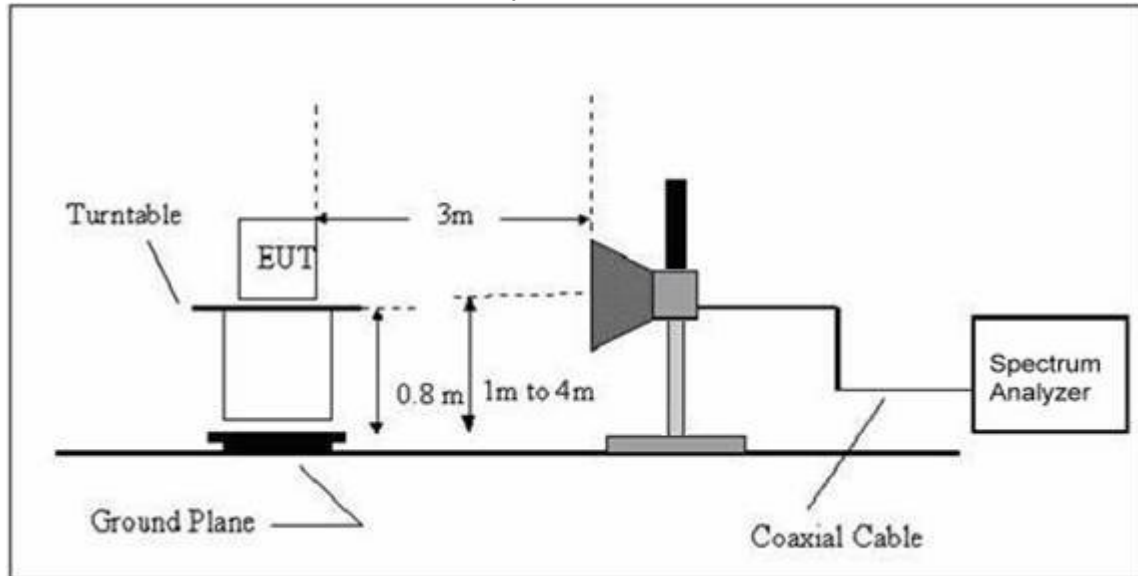
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



## (C) Radiated Emission Test-Up Frequency Above 1GHz

**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	38"Sound Bar 3.1 System	Model Name. :	SB3831-C6M soundbar
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

#### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})(\text{dB})$ ;

Limit line = specific limits(dBuv) + distance extrapolation factor.

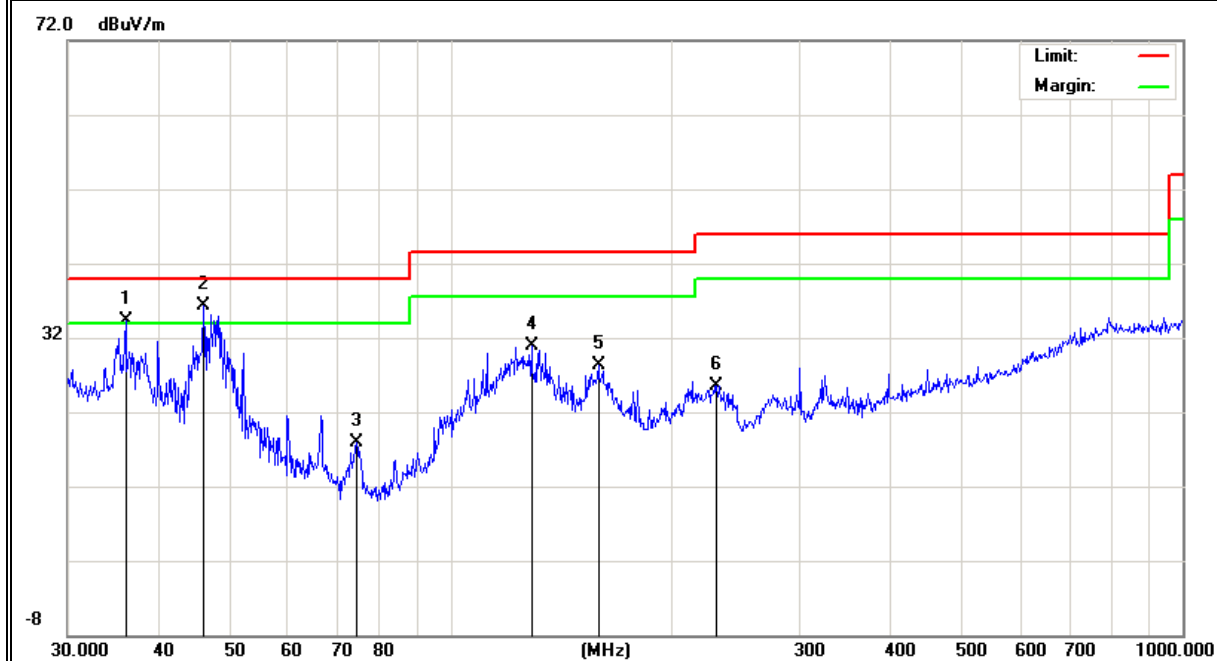
### 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz- Adapter 1
Test Mode :	TX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	36.0007	18.19	16.06	34.25	40.00	-5.75	QP
V	46.0162	24.71	11.67	36.38	40.00	-3.62	QP
V	74.3953	12.18	5.69	17.87	40.00	-22.13	QP
V	129.0146	19.06	11.91	30.97	43.50	-12.53	QP
V	159.2248	17.84	10.48	28.32	43.50	-15.18	QP
V	230.9068	12.72	12.87	25.59	46.00	-20.41	QP

#### Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

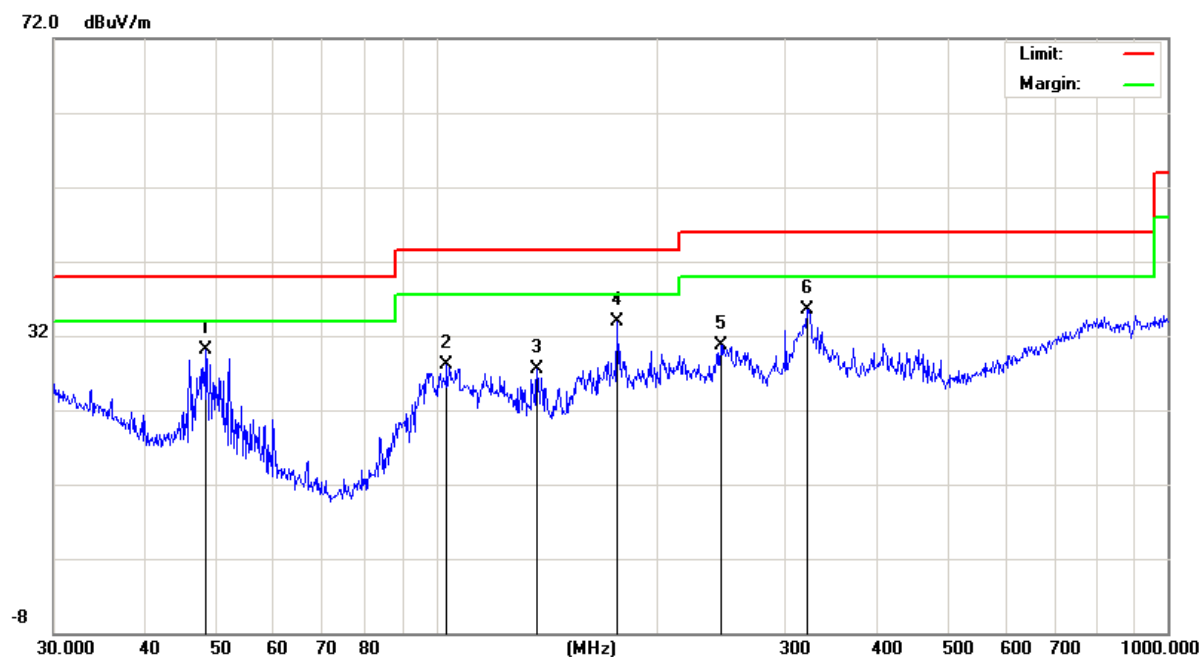




Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBUV)	(dB)	(dBUV/m)	(dBUV/m)	(dB)	
H	48.5016	19.03	11.06	30.09	40.00	-9.91	QP
H	103.4419	18.87	9.31	28.18	43.50	-15.32	QP
H	137.4199	15.92	11.53	27.45	43.50	-16.05	QP
H	176.8875	23.35	10.60	33.95	43.50	-9.55	QP
H	245.0900	17.17	13.54	30.71	46.00	-15.29	QP
H	321.0605	20.46	15.03	35.49	46.00	-10.51	QP

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

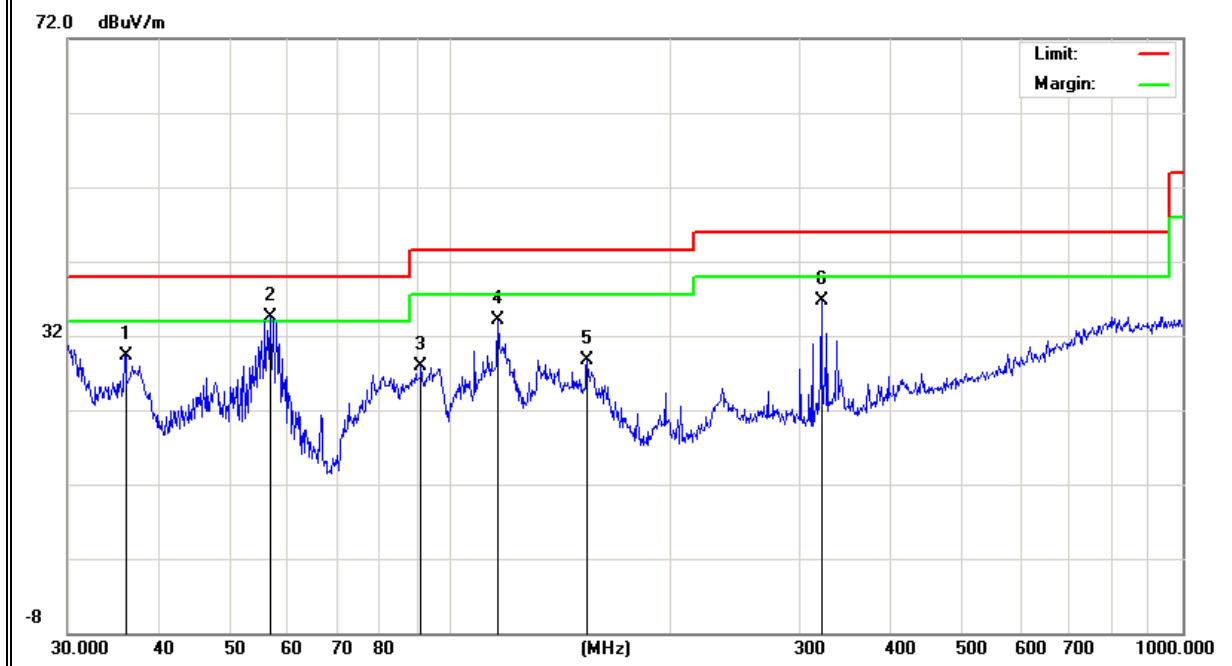


EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz- Adapter 2
Test Mode :	TX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	36.0007	13.25	16.06	29.31	40.00	-10.69	QP
V	56.7917	25.85	8.75	34.60	40.00	-5.40	QP
V	91.1744	19.85	8.05	27.90	43.50	-15.60	QP
V	116.1321	22.74	11.27	34.01	43.50	-9.49	QP
V	153.7384	18.20	10.44	28.64	43.50	-14.86	QP
V	321.0608	21.76	15.03	36.79	46.00	-9.21	QP

#### Remark:

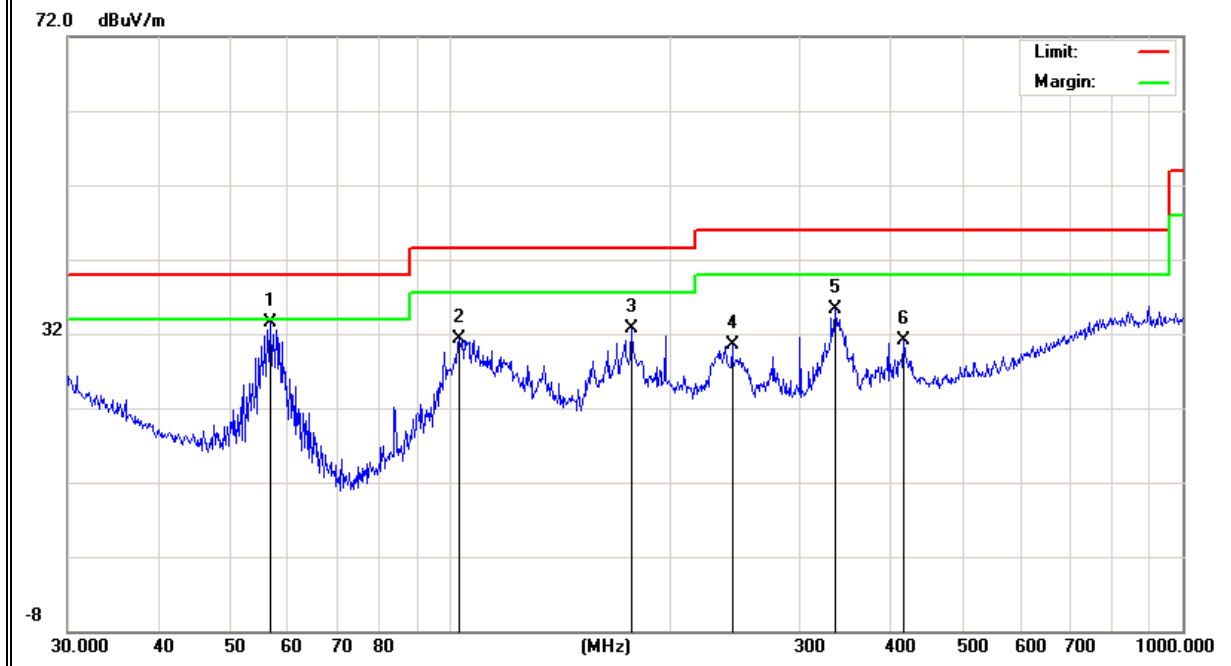
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	56.7917	24.81	8.75	33.56	40.00	-6.44	QP
H	102.7192	22.06	9.24	31.30	43.50	-12.20	QP
H	176.8878	22.11	10.60	32.71	43.50	-10.79	QP
H	242.5252	16.95	13.52	30.47	46.00	-15.53	QP
H	336.0352	19.55	15.66	35.21	46.00	-10.79	QP
H	416.1791	12.47	18.63	31.10	46.00	-14.90	QP

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



### 3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz- Adapter 1
Test Mode :	TX		

Frequency (MHz)	Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Polar (H/V)
Low Channel (2402 MHz)-Above 1G							
4804.211	59.66	-3.64	56.02	74.00	-17.98	Pk	Vertical
4804.211	42.36	-3.64	38.72	54.00	-15.28	AV	Vertical
7206.078	59.81	-0.95	58.86	74.00	-15.14	Pk	Vertical
7206.078	37.96	-0.95	37.01	54.00	-16.99	AV	Vertical
4804.304	60.05	-3.64	56.41	74.00	-17.59	Pk	Horizontal
4804.304	42.97	-3.64	39.33	54.00	-14.67	AV	Horizontal
7206.169	58.01	-0.95	57.06	74.00	-16.94	Pk	Horizontal
7206.169	37.83	-0.95	36.88	54.00	-17.12	AV	Horizontal
Mid Channel (2440 MHz)-Above 1G							
4880.134	59.51	-3.68	55.83	74.00	-18.17	Pk	Vertical
4880.134	41.58	-3.68	37.90	54.00	-16.10	AV	Vertical
7320.207	58.95	-0.82	58.13	74.00	-15.87	Pk	Vertical
7320.207	40.06	-0.82	39.24	54.00	-14.76	AV	Vertical
4880.309	61.41	-3.68	57.73	74.00	-16.27	Pk	Horizontal
4880.309	44.61	-3.68	40.93	54.00	-13.07	AV	Horizontal
7320.066	58.96	-0.82	58.14	74.00	-15.86	Pk	Horizontal
7320.066	39.01	-0.82	38.19	54.00	-15.81	AV	Horizontal
High Channel (2480MHz)- Above 1G							
4960.178	58.83	-3.59	55.24	74.00	-18.76	Pk	Vertical
4960.178	41.68	-3.59	38.09	54.00	-15.91	AV	Vertical
7440.245	57.33	-0.68	56.65	74.00	-17.35	Pk	Vertical
7440.245	41.56	-0.68	40.88	54.00	-13.12	AV	Vertical
4960.169	58.66	-3.59	55.07	74.00	-18.93	Pk	Horizontal
4960.169	41.88	-3.59	38.29	54.00	-15.71	AV	Horizontal
7440.279	60.19	-0.68	59.51	74.00	-14.49	Pk	Horizontal
7440.279	39.03	-0.68	38.35	54.00	-15.65	AV	Horizontal

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz- Adapter 2
Test Mode :	TX		

Frequency (MHz)	Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark	Polar (H/V)
Low Channel (2402 MHz)-Above 1G							
4804.204	58.82	-3.64	55.18	74.00	-18.82	Pk	Vertical
4804.204	41.16	-3.64	37.52	54.00	-16.48	AV	Vertical
7206.196	58.97	-0.95	58.02	74.00	-15.98	Pk	Vertical
7206.196	37.12	-0.95	36.17	54.00	-17.83	AV	Vertical
4804.305	59.56	-3.64	55.92	74.00	-18.08	Pk	Horizontal
4804.305	42.06	-3.64	38.42	54.00	-15.58	AV	Horizontal
7206.097	57.17	-0.95	56.22	74.00	-17.78	Pk	Horizontal
7206.097	36.99	-0.95	36.04	54.00	-17.96	AV	Horizontal
Mid Channel (2440 MHz)-Above 1G							
4880.163	58.67	-3.68	54.99	74.00	-19.01	Pk	Vertical
4880.163	40.71	-3.68	37.03	54.00	-16.97	AV	Vertical
7320.088	58.06	-0.82	57.24	74.00	-16.76	Pk	Vertical
7320.088	38.92	-0.82	38.10	54.00	-15.90	AV	Vertical
4880.263	60.57	-3.68	56.89	74.00	-17.11	Pk	Horizontal
4880.263	43.71	-3.68	40.03	54.00	-13.97	AV	Horizontal
7320.307	58.04	-0.82	57.22	74.00	-16.78	Pk	Horizontal
7320.307	38.17	-0.82	37.35	54.00	-16.65	AV	Horizontal
High Channel (2480MHz)- Above 1G							
4960.309	57.99	-3.59	54.40	74.00	-19.60	Pk	Vertical
4960.309	40.84	-3.59	37.25	54.00	-16.75	AV	Vertical
7440.175	56.46	-0.68	55.78	74.00	-18.22	Pk	Vertical
7440.175	40.72	-0.68	40.04	54.00	-13.96	AV	Vertical
4960.207	57.82	-3.59	54.23	74.00	-19.77	Pk	Horizontal
4960.207	41.02	-3.59	37.43	54.00	-16.57	AV	Horizontal
7440.244	59.35	-0.68	58.67	74.00	-15.33	Pk	Horizontal
7440.244	38.19	-0.68	37.51	54.00	-16.49	AV	Horizontal

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

Margin = Emission Level- Limit

## 4. POWER SPECTRAL DENSITY TEST

### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247/ RSS-210§A8. 2 (b)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

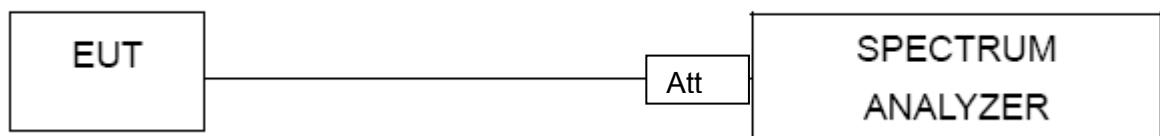
#### 4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW  $\geq 3$  kHz.
4. Set the VBW  $\geq 3 \times$  RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



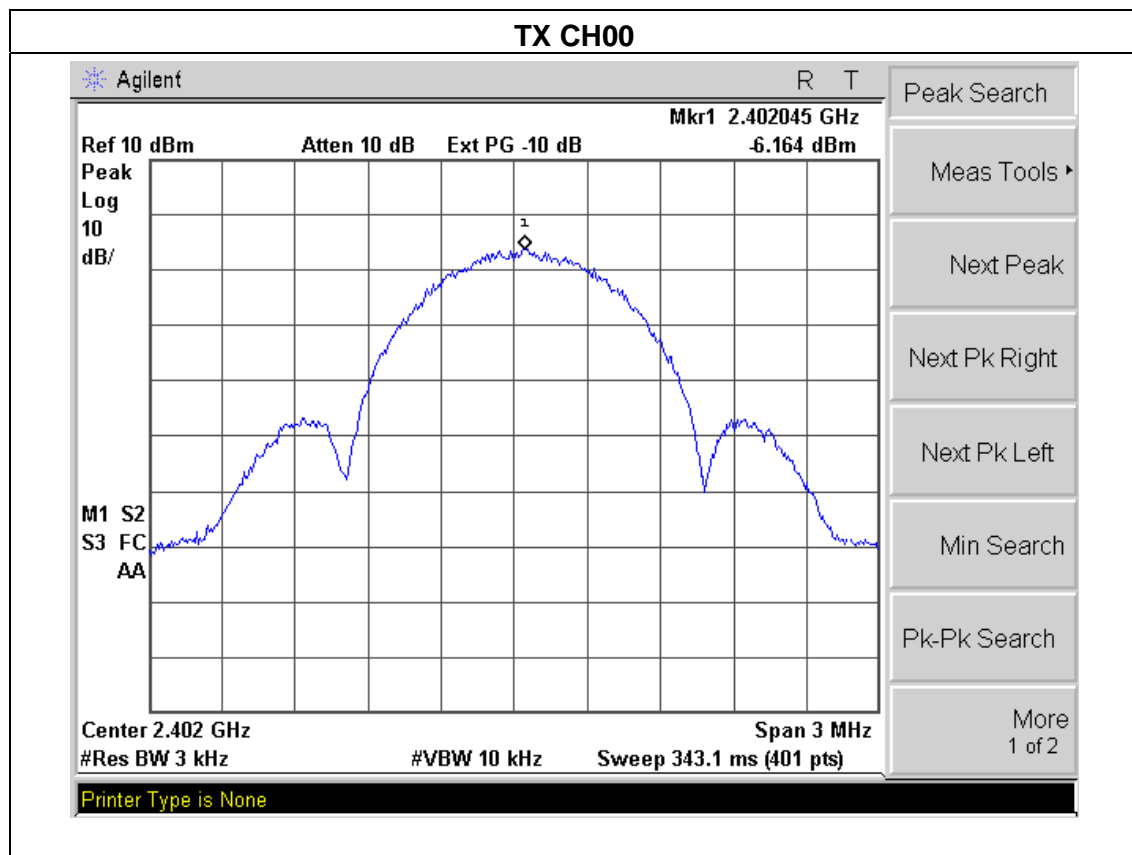
#### 4.1.4 EUT OPERATION CONDITIONS

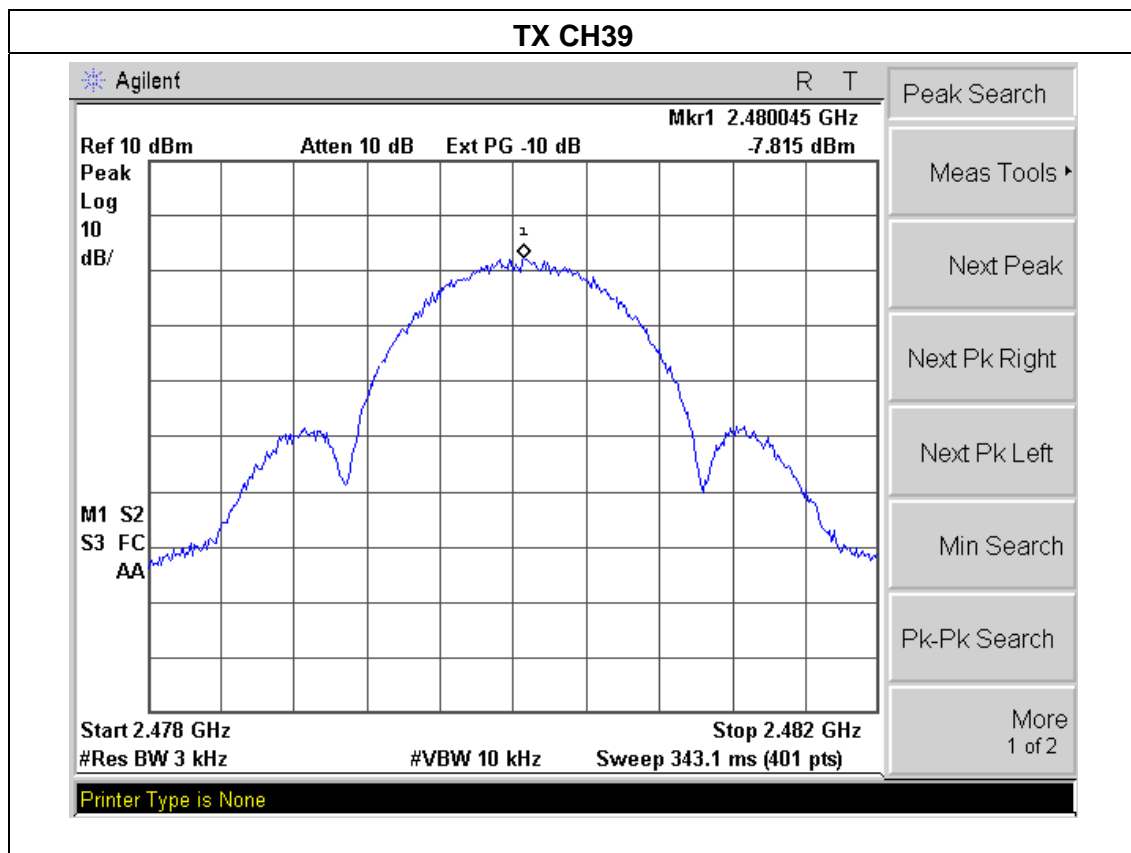
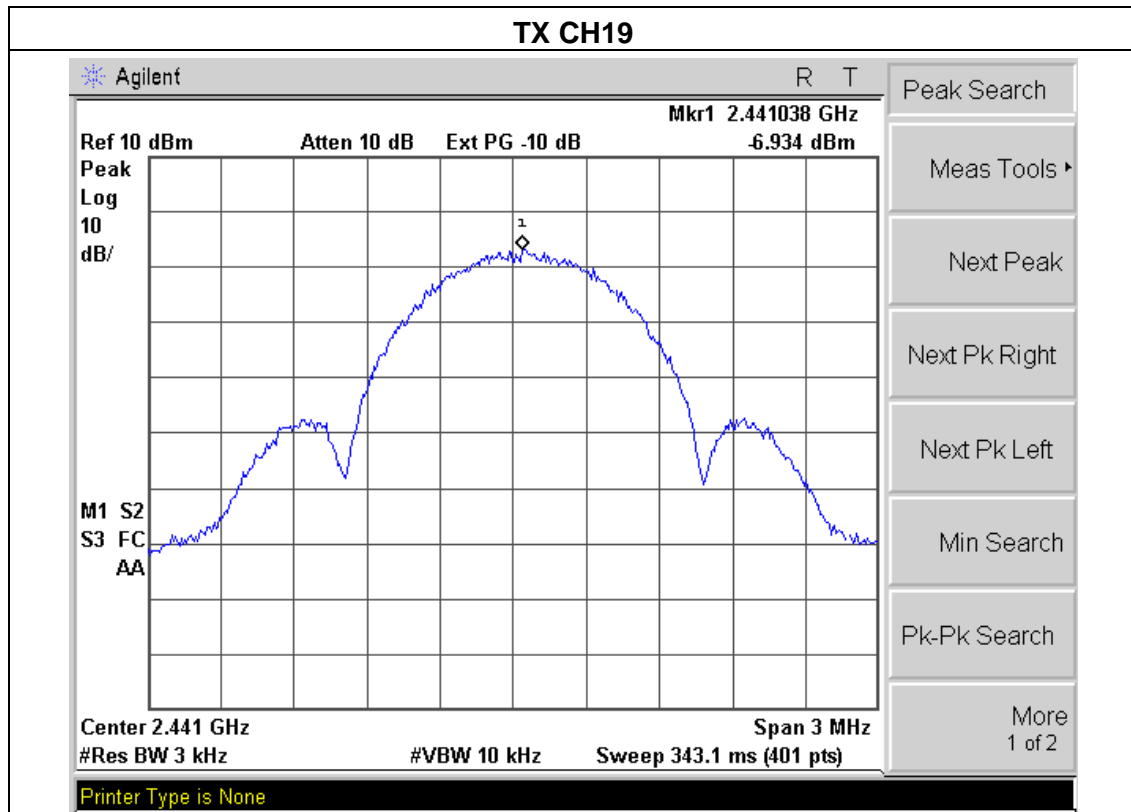
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.1.5 TEST RESULTS

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode /CH00, CH19, CH39		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2402 MHz	-6.164	8	PASS
2441 MHz	-6.934	8	PASS
2480 MHz	-7.815	8	PASS







## 5. BANDWIDTH TEST

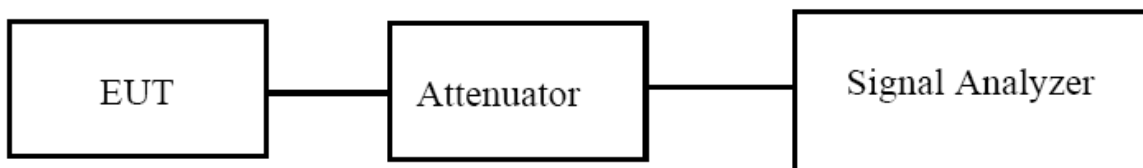
### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)/ RSS-Gen§4.6 .1&RSS-210§ A8.2 (a)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

#### 5.1.1 TEST PROCEDURE

According to KDB 558074 D01 DTS Meas Guidance v03r01

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



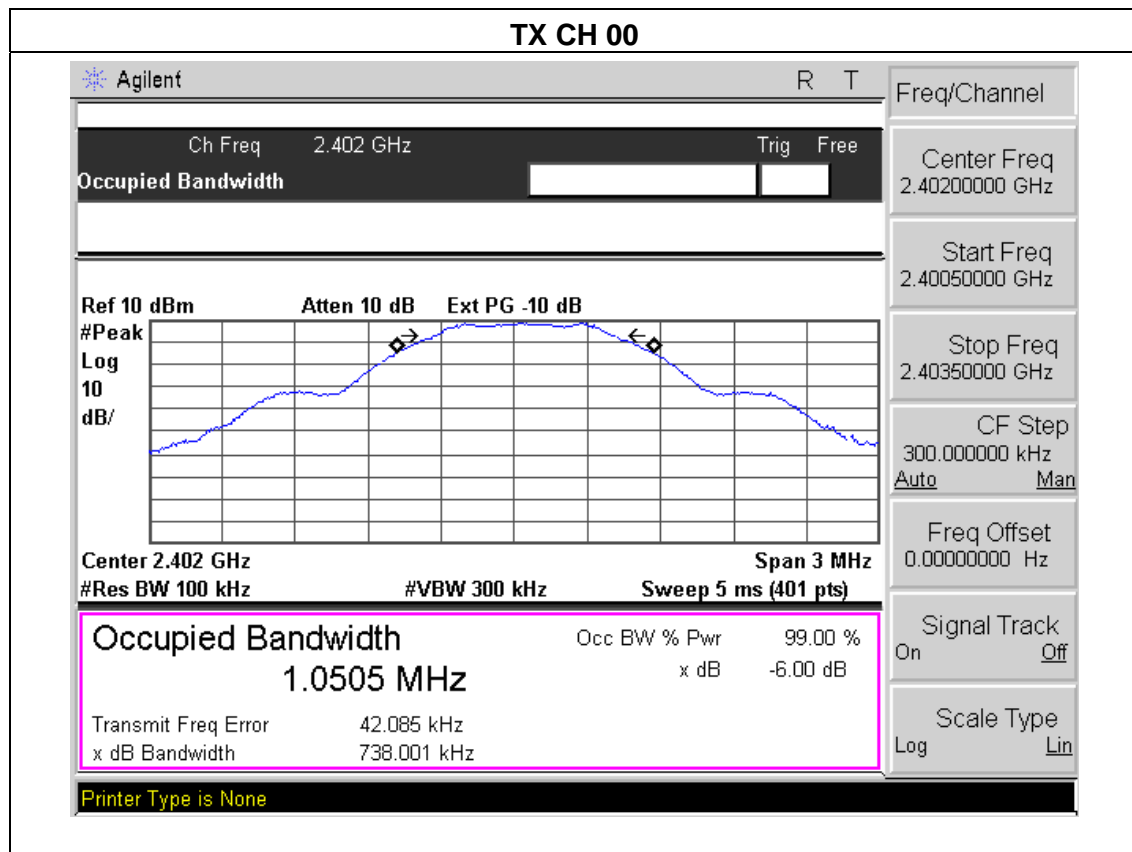
#### 5.1.2 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

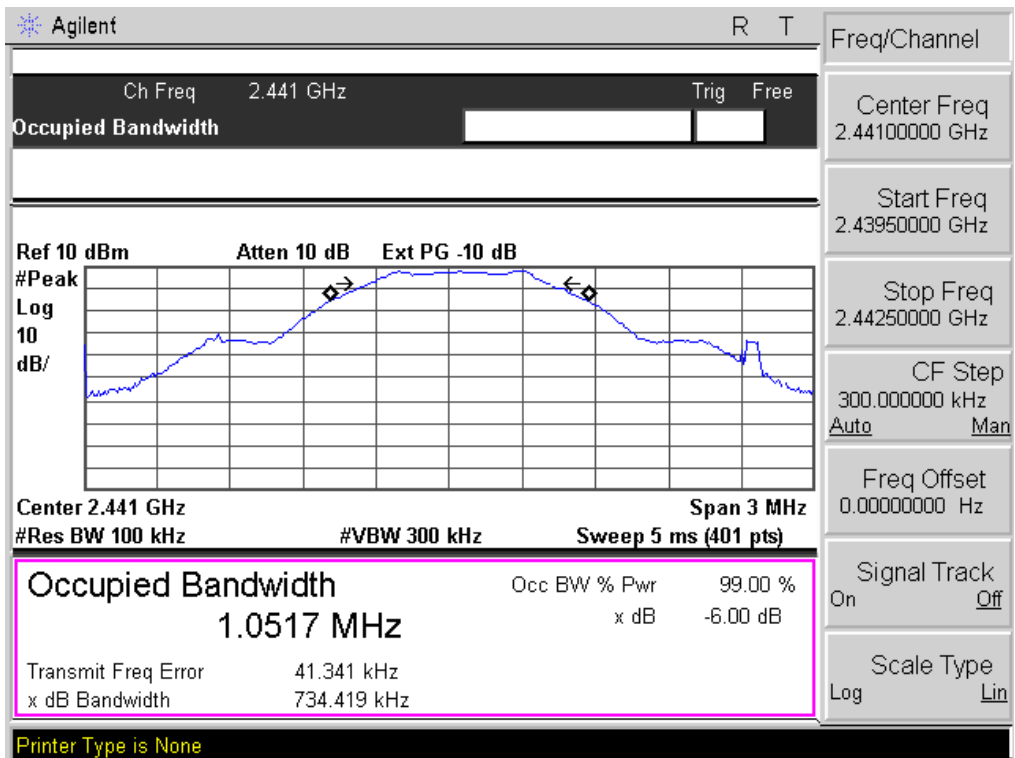
### 5.1.3 TEST RESULTS

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode /CH00, CH19, CH39		

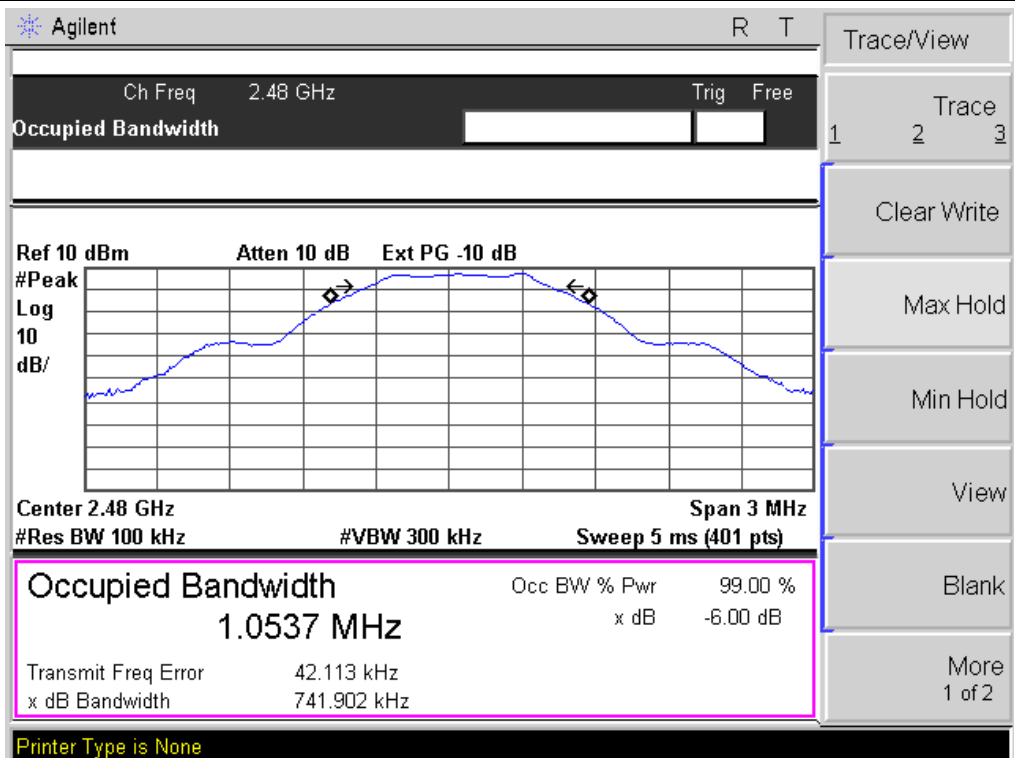
Channel	Frequency (MHz)	6dB bandwidth (kHz)	99% Bandwidth (MHz)	Limit (kHz)	Result
Low	2402	738.001	1.051	500	Pass
Middle	2441	734.419	1.052	500	Pass
High	2480	741.902	1.054	500	Pass



### TX CH 19



### TX CH 39



## 6. MAX CONDUCTED OUTPUT POWER TEST

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)/ RSS-210 §A8.4 (4)	Max Conducted output power	1 watt or 30dBm	2400-2483.5	PASS

#### 6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### 6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 6.1.5 TEST RESULTS

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode		

Test Channe	Frequency	Maximum Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2402	7.447	30
CH19	2441	7.424	30
CH39	2480	7.604	30

## 7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

### APPLICABLE STANDARD

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 a radiated 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, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

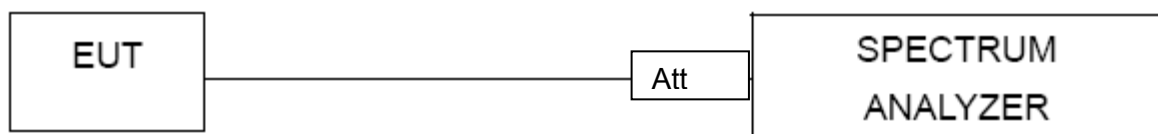
### TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

### 7.1 DEVIATION FROM STANDARD

No deviation.

### 7.2 TEST SETUP



### 7.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

## 7.4 TEST RESULTS

EUT :	38"Sound Bar 3.1 System	Model Name :	SB3831-C6M soundbar
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz

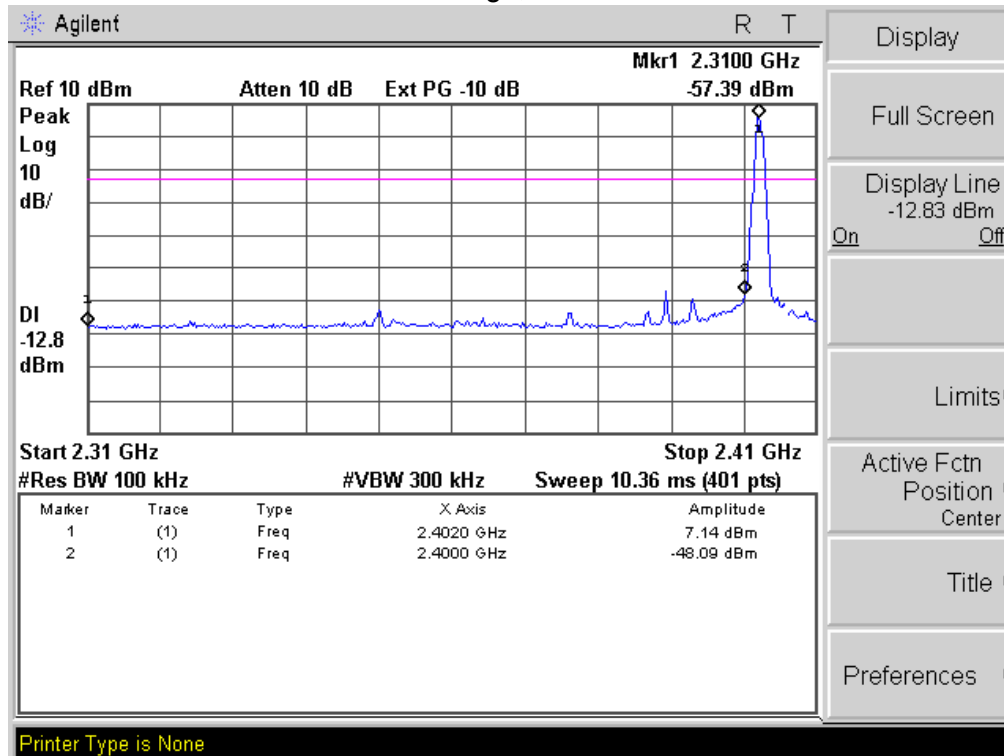
Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
2400	55.23	30	Pass
2483.5	61.25	30	Pass

Radiated band edge:

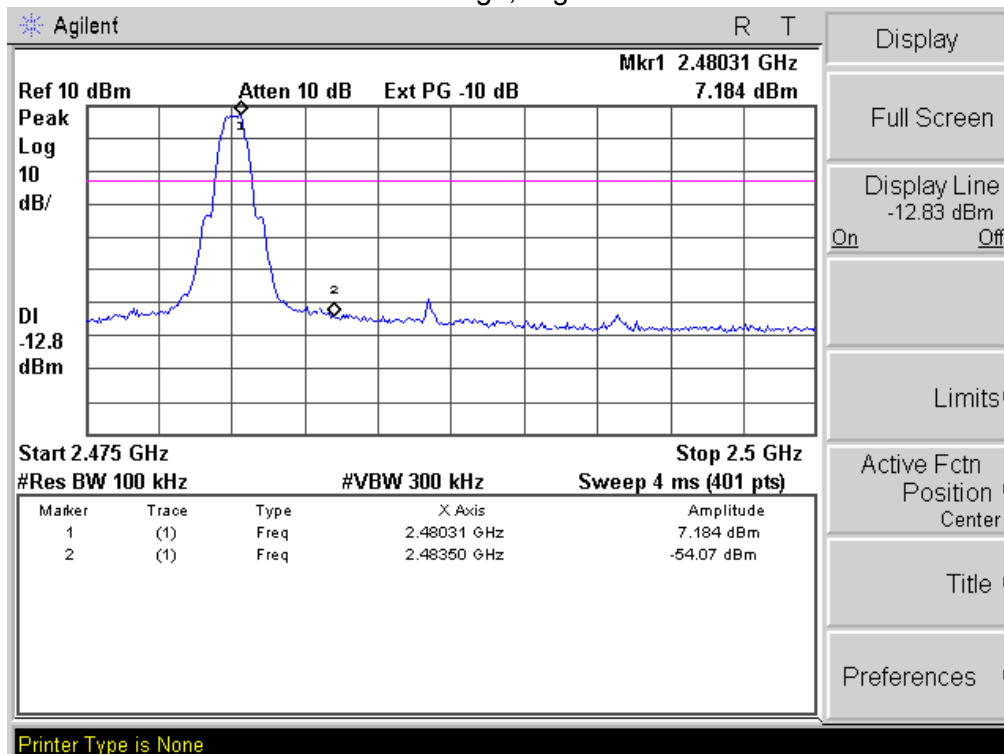
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	Comment
2390	60.46	-13.06	47.4	74	-26.60	peak	Vertical
2390	60.72	-13.06	47.66	74	-26.34	peak	Horizontal
2483.5	61.43	-12.78	48.65	74	-25.35	peak	Vertical
2483.5	61.44	-12.78	48.66	74	-25.34	peak	Horizontal

Note: Test method to see chapter 3.2 . When PK value is lower than the Average value limit, average not record.

### Band Edge, Left Side



### Band Edge, Right Side





## **8. ANTENNA REQUIREMENT**

### **8.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **8.2 EUT ANTENNA**

The EUT antenna is permanent attached antenna. It comply with the standard requirement.