



RADIO TEST REPORT
(Class II Permissive Change)
FCC ID: XN6-SB2821D6

Product: 28 inch Sound Bar 2.1 System
Trade Mark: VIZIO
Model No.: SB2821n-D6
Serial Model: SB2821-D6
Report No.: NTEK-2016NT07287908F2-01
Issue Date: 21 Nov. 2016

Prepared for

ZYLUX ACOUSTIC CORPORATION

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Prepared by

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1 TEST RESULT CERTIFICATION

Applicant's name	Zylux Acoustic Corporation
Address	3F, 22, Lane 35, Jihu Road Taipei Neihs Technology Park, 114 Taipei Taiwan
Manufacturer's Name	Zylux Acoustic Corporation
Address	3F, 22, Lane 35, Jihu Road Taipei Neihs Technology Park, 114 Taipei Taiwan
Factory's Name	Zhao Yang Electronic (Shenzhen) Co., Ltd.
Address	Building 2,De Yong Jia Industrial Park,Guang Qiao Road,Yu Lv Community,Gong Ming Street,Guang Ming New District, Shenzhen, 518132, China
Product description	
Product name	28 inch Sound Bar 2.1 System
Model and/or type reference	SB2821n-D6
Serial Model	SB2821-D6

Measurement Procedure Used:

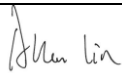
APPLICABLE STANDARDS	
STANDARD/ TEST PROCEDURE	TEST RESULT
FCC 47 CFR Part 2, Subpart J:2016 FCC 47 CFR Part 15, Subpart C:2016 KDB 174176 D01 Line Conducted FAQ v01r01 ANSI C63.10-2013 DA 00-705	Complied

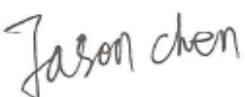
This device described above has been tested by NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

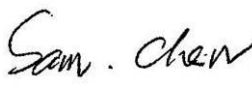
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The test results of this report relate only to the tested sample identified in this report.

Date of Test : 21 Nov. 2016 ~ 29 Nov. 2016

Testing Engineer : 
(Allen Liu)

Technical Manager : 
(Jason Chen)

Authorized Signatory : 
(Sam Chen)

2 SUMMARY OF TEST RESULTS

FCC Part15 (15.247), Subpart C			
Standard Section	Test Item	Verdict	Remark
15.207	Conducted Emission	PASS	
15.247(c)	Radiated Spurious Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	N/A	
15.247(b)(1)	Peak Output Power	N/A	
15.247(a)(iii)	Number of Hopping Frequency	N/A	
15.247(a)(iii)	Dwell Time	N/A	
15.247(a)(1)	Bandwidth	N/A	
15.205	Band Edge Emission	N/A	
15.203	Antenna Requirement	PASS	

Remark:

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.
3. This report is a Class II Permissive Change, update an external power source, RF section without any changes, retesting conducted and radiated data

3 FACILITIES AND ACCREDITATIONS

3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : Accredited by CNAS, 2014.09.04
The certificate is valid until 2017.09.03
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L5516.

Accredited by FCC, September 6, 2013
The Certificate Registration Number is 238937.

Accredited by Industry Canada, August 29, 2012
The Certificate Registration Number is 9270A-1.

Name of Firm : NTEK Testing Technology Co., Ltd
Site Location : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

3.3 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	$\pm 2\%$

4 GENERAL DESCRIPTION OF EUT

Product Feature and Specification	
Equipment	28 inch Sound Bar 2.1 System
Trade Mark	VIZIO
FCC ID	XN6-SB2821D6
Model No.	SB2821n-D6
Serial Model	SB2821-D6
Model Difference	All the model are the same circuit and RF module, except the model No.
Operating Frequency	2402MHz~2480MHz
Modulation	GFSK, $\pi/4$ -DQPSK, 8DPSK
Number of Channels	79 Channels
Antenna Type	PCB Antenna
Antenna Gain	0 dBi
Power supply	<input type="checkbox"/> DC supply:
	<input checked="" type="checkbox"/> New Adapter supply: Model: MSA-C1500CS16.0-24Q-US Input: 100-240V~, 50/60Hz, 0.6A Max Output: DC16V---1.5A
HW Version	A
SW Version	4.1

Note: Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.

[illegible]

5 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.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (1Mbps for GFSK modulation; 2Mbps for $\pi/4$ -DQPSK modulation; 3Mbps for 8DPSK modulation) were used for all test.

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The Y-plane results were found as the worst case and were shown in this report.

Carrier Frequency and Channel list:

Channel	Frequency(MHz)
0	2402
1	2403
...	...
39	2441
40	2442
...	...
77	2479
78	2480

Note: $f_c=2402\text{MHz}+k\times 1\text{MHz}$ $k=0$ to 78

The following summary table is showing all test modes to demonstrate in compliance with the standard.

For AC Conducted Emission	
Final Test Mode	Description
Mode 4	normal link mode

Note: AC power line Conducted Emission was tested under maximum output power.

For Radiated Test Cases	
Final Test Mode	Description
Mode 1	CH00(2402MHz)
Mode 2	CH39(2441MHz)
Mode 3	CH78(2480MHz)

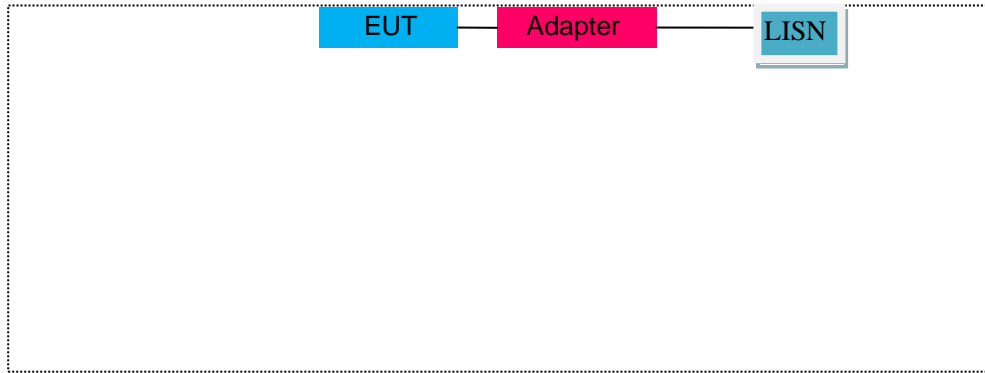
Note: For radiated test cases, the worst mode data rate 1Mbps was reported only, because this data rate has the highest RF output power at preliminary tests, and no other significantly frequencies found in conducted spurious emission.

This report is a Class II Permissive Change, update an external power source, RF section without any changes, retesting conducted and radiated data

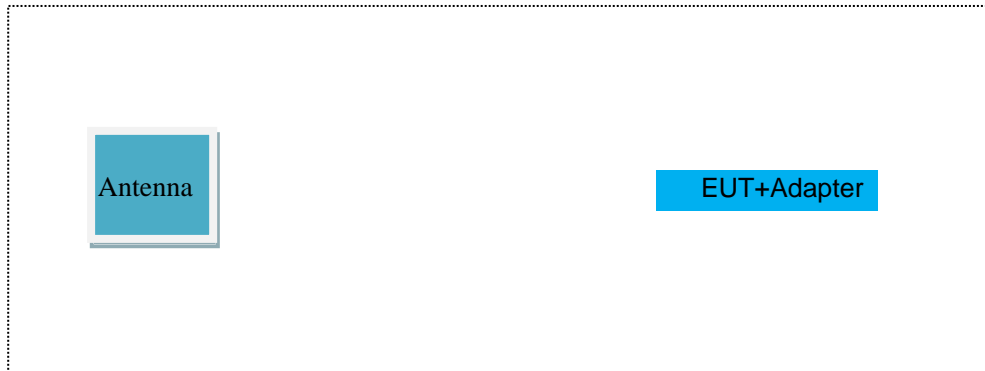
6 SETUP OF EQUIPMENT UNDER TEST

6.1 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM

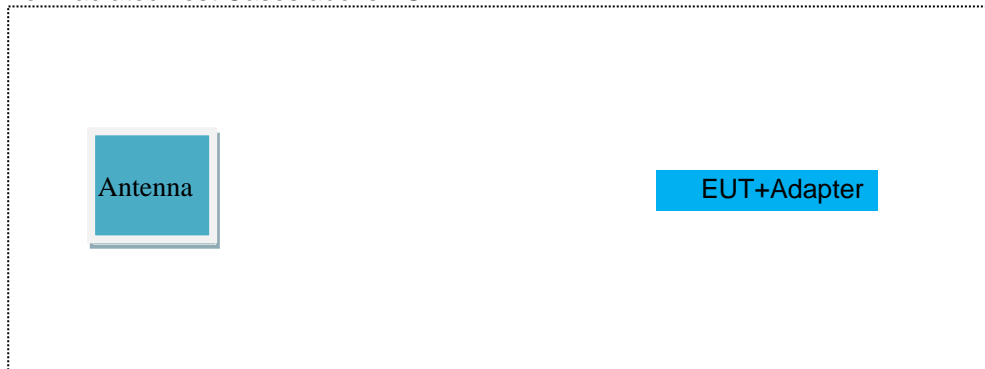
For AC Conducted Emission Mode



For Radiated Test Cases 30M-1G



For Radiated Test Cases above 1G



6.2 SUPPORT EQUIPMENT

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	Mfr/Brand	Model/Type No.	FCC ID	Note
E-1	28 inch Sound Bar 2.1 System	VIZIO	SB2821n-D6	XN6-SB2821D6	EUT
E-2	Adapter	N/A	MSA-C1500CS16.0-2 4Q-US	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	USB Cable	NO	NO	1.0m
C-2	RF Cable	NO	NO	0.5m

Notes:

- (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.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

6.3 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	2016.07.06	2017.07.05	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2016.11.19	2017.11.18	1 year
3	Test Receiver	R&S	ESPI	101318	2016.06.07	2017.06.06	1 year
4	Bilog Antenna	TESEQ	CBL6111D	31216	2016.07.06	2017.07.05	1 year
5	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2016.06.07	2017.06.06	1 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2016.07.06	2017.07.05	1 year
8	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2016.07.06	2017.07.05	1 year
9	Pre-Amplifier	EMC	EMC051835SE	980246	2016.08.09	2017.08.09	1 year
10	Loop Antenna	ARA	PLA-1030/B	1029	2016.06.08	2017.06.07	1 year
11	Test Cable (9KHz-30MHz)	N/A	R-04	N/A	2016.06.06	2017.06.05	1 year
12	Test Cable (30MHz-1GHz)	N/A	R-01	N/A	2016.07.06	2017.07.05	1 year
13	Test Cable (1-18GHz)	N/A	R-02	N/A	2016.07.06	2017.07.05	1 year
14	High Test Cable(18G-40 GHz)	N/A	R-03	N/A	2016.06.06	2017.06.05	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	2016.06.06	2017.06.05	1 year
2	LISN	R&S	ENV216	101313	2016.08.24	2017.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2016.08.24	2017.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2016.06.07	2017.06.06	1 year
7	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2016.06.08	2017.06.07	1 year
8	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2016.06.08	2017.06.07	1 year
9	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2016.06.08	2017.06.07	1 year

Note: Each piece of equipment is scheduled for calibration once a year.

7 TEST REQUIREMENTS

7.1 CONDUCTED EMISSIONS TEST

7.1.1 Applicable Standard

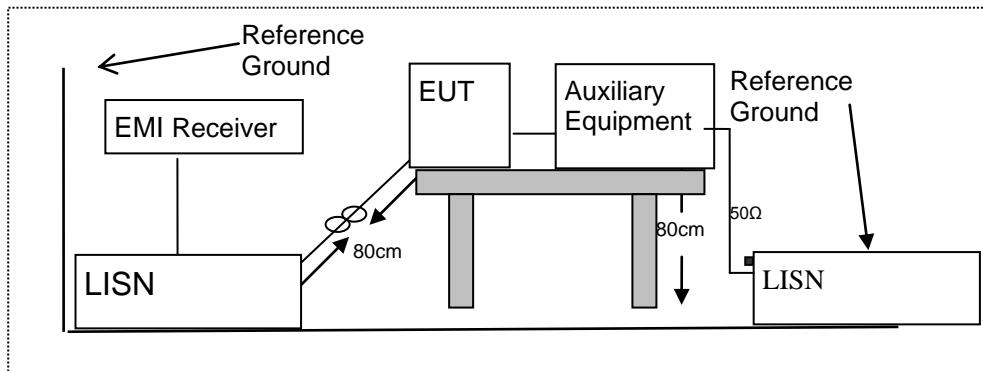
According to FCC Part 15.207(a) and KDB 174176 D01 Line Conducted FAQ v01r01

7.1.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. *Decreases with the logarithm of the frequency
 2. The lower limit shall apply at the transition frequencies
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

7.1.3 Test Configuration



7.1.4 Test Procedure

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT 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.
4. 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 40cm long.
5. 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.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

7.1.5 Test Results

Pass

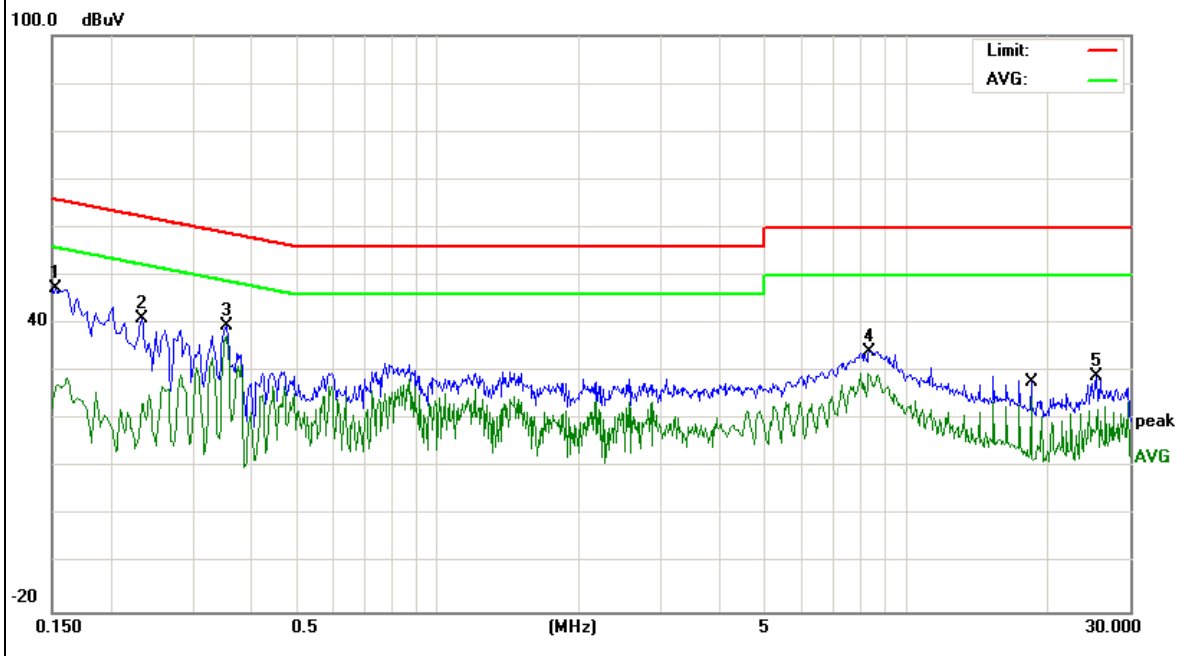
7.1.6 Test Results

EUT:	28 inch Sound Bar 2.1 System	Model Name :	SB2821n-D6
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	DC 16.0V form Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1524	37.28	10.13	47.41	65.86	-18.45	peak
0.2340	30.99	10.15	41.14	62.30	-21.16	peak
0.3539	29.62	10.02	39.64	58.87	-19.23	peak
8.3459	24.45	9.85	34.30	60.00	-25.70	peak
25.3299	19.01	10.09	29.10	60.00	-30.90	peak
0.3539	27.42	10.02	37.44	48.87	-11.43	AVG
8.3218	19.85	9.85	29.70	50.00	-20.30	AVG
18.4339	14.34	10.16	24.50	50.00	-25.50	AVG

Remark:

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

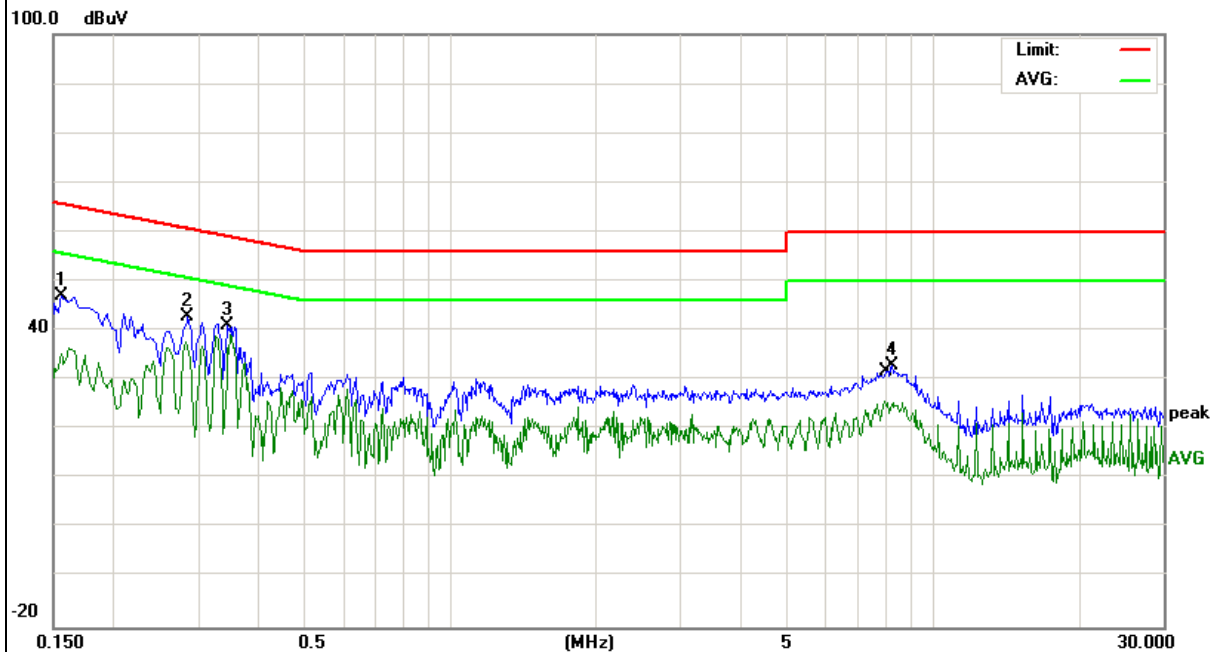


EUT:	28 inch Sound Bar 2.1 System	Model Name :	SB2821n-D6
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	DC 16.0V form Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1556	37.06	10.13	47.19	65.69	-18.50	peak
0.2860	32.73	10.13	42.86	60.64	-17.78	peak
0.3460	31.07	10.03	41.10	59.06	-17.96	peak
8.1939	22.97	9.85	32.82	60.00	-27.18	peak
0.3500	29.31	10.02	39.33	48.96	-9.63	AVG
0.2820	27.52	10.13	37.65	50.75	-13.10	AVG
7.9579	15.83	9.85	25.68	50.00	-24.32	AVG

Remark:

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

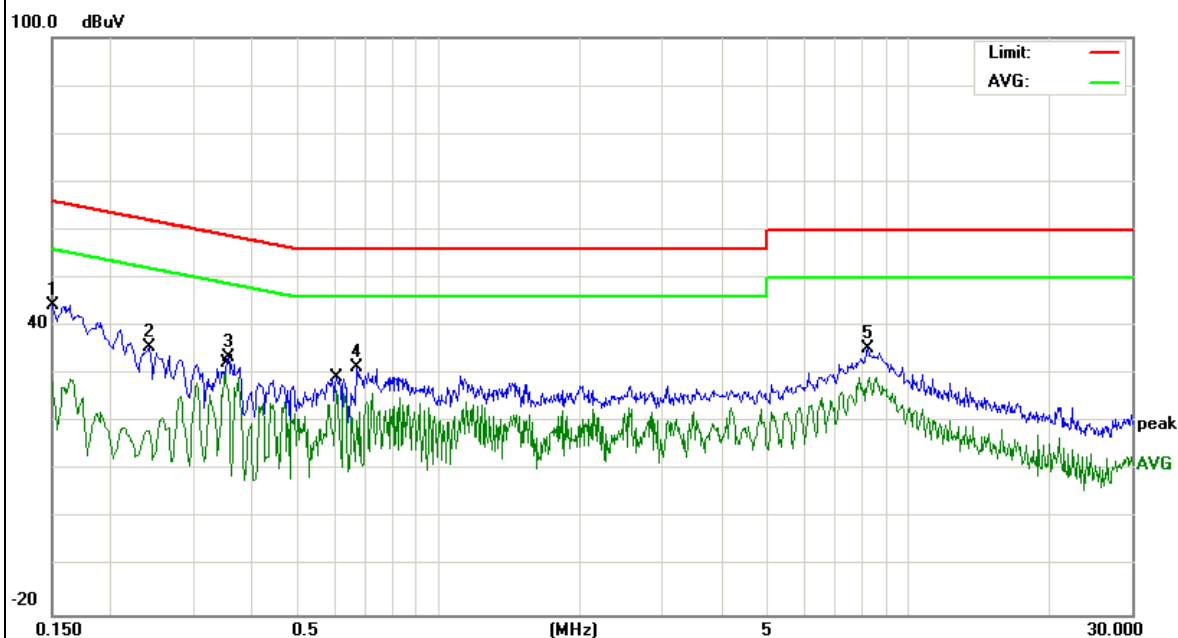


EUT:	28 inch Sound Bar 2.1 System	Model Name :	SB2821n-D6
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	DC 16.0V form Adapter AC 240V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1499	34.34	10.13	44.47	66.00	-21.53	peak
0.2420	25.61	10.15	35.76	62.02	-26.26	peak
0.3557	23.63	10.01	33.64	58.83	-25.19	peak
0.6700	21.72	9.78	31.50	56.00	-24.50	peak
8.1979	25.51	9.85	35.36	60.00	-24.64	peak
0.3501	20.67	10.02	30.69	48.96	-18.27	AVG
0.6060	16.75	9.80	26.55	46.00	-19.45	AVG
8.2459	19.61	9.85	29.46	50.00	-20.54	AVG

Remark:

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

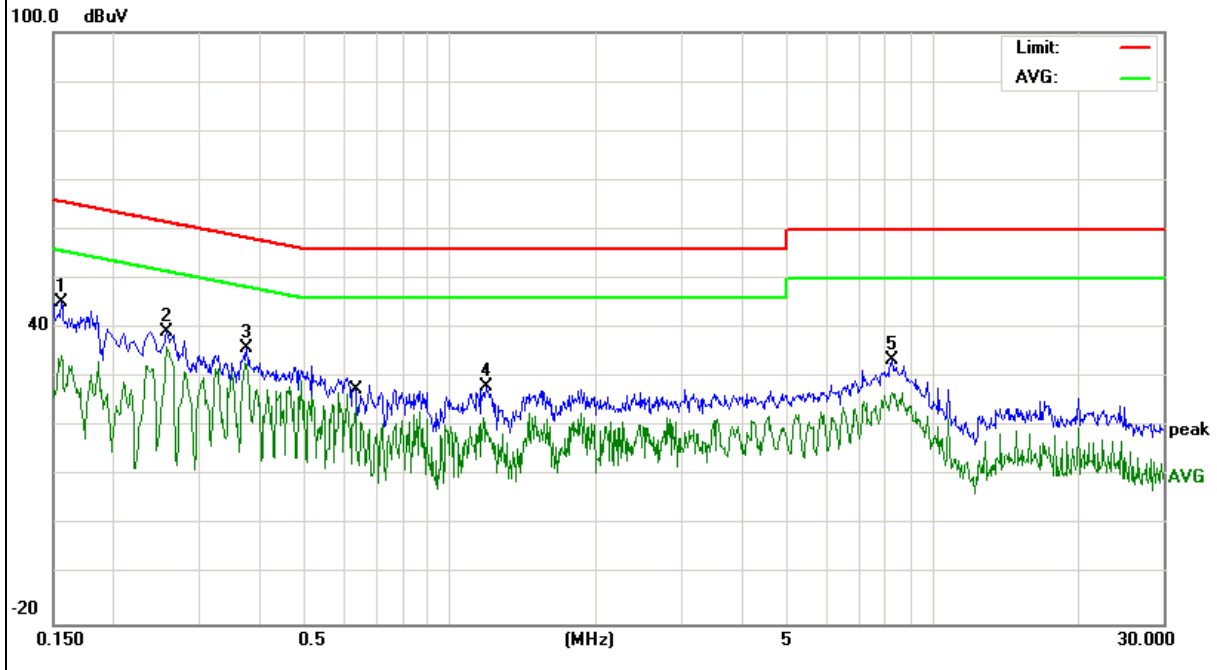


EUT:	28 inch Sound Bar 2.1 System	Model Name :	SB2821n-D6
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	DC 16.0V form Adapter AC 240V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1556	35.09	10.13	45.22	65.69	-20.47	peak
0.2580	28.97	10.14	39.11	61.49	-22.38	peak
0.3780	25.93	9.97	35.90	58.32	-22.42	peak
1.1860	18.25	9.76	28.01	56.00	-27.99	peak
8.2219	23.67	9.85	33.52	60.00	-26.48	peak
0.2580	25.99	10.14	36.13	51.49	-15.36	AVG
0.3740	22.86	9.98	32.84	48.41	-15.57	AVG
0.6340	14.86	9.79	24.65	46.00	-21.35	AVG
8.2219	17.19	9.85	27.04	50.00	-22.96	AVG

Remark:

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



7.2 RADIATED SPURIOUS EMISSION

7.2.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and ANSIC63.10-2013

7.2.2 Conformance Limit

According to FCC Part 15.247(d): 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)).

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

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), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Remark : 1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

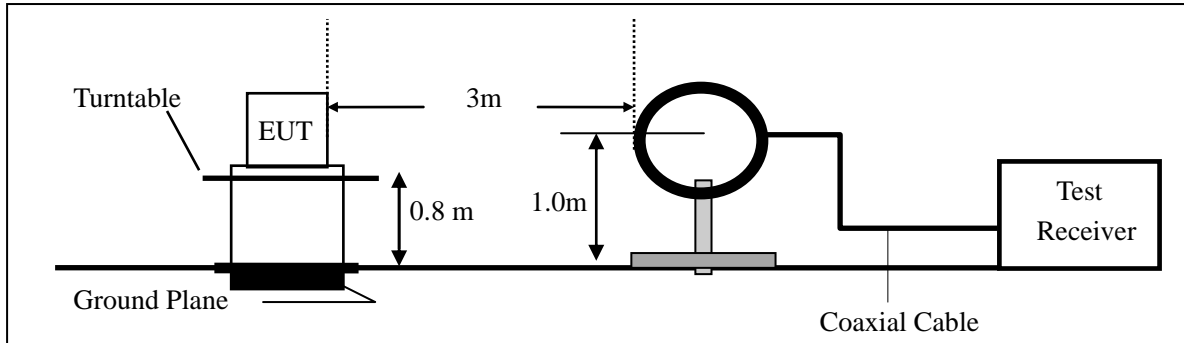
Limit line=Specific limits(dBuV) + distance extrapolation factor.

7.2.3 Measuring Instruments

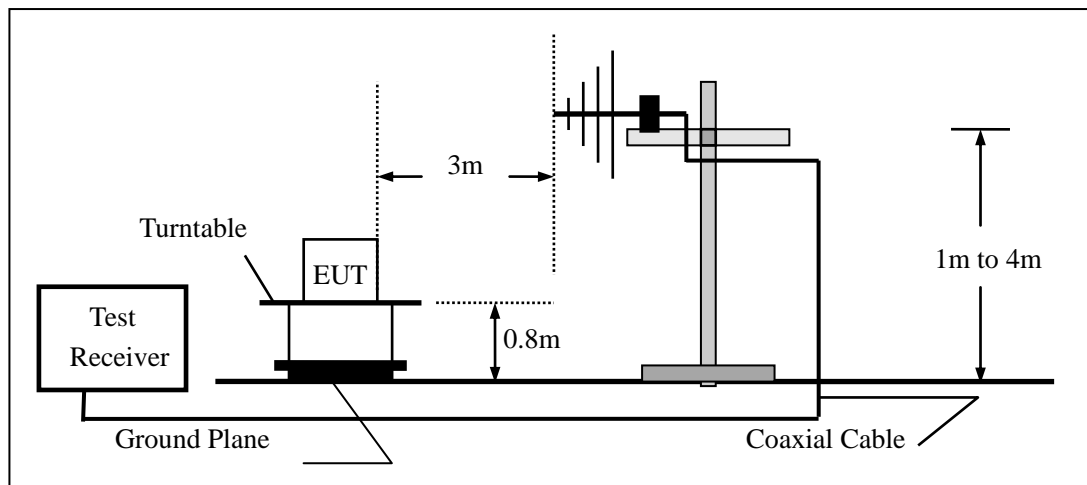
The Measuring equipment is listed in the section 6.3 of this test report.

7.2.4 Test Configuration

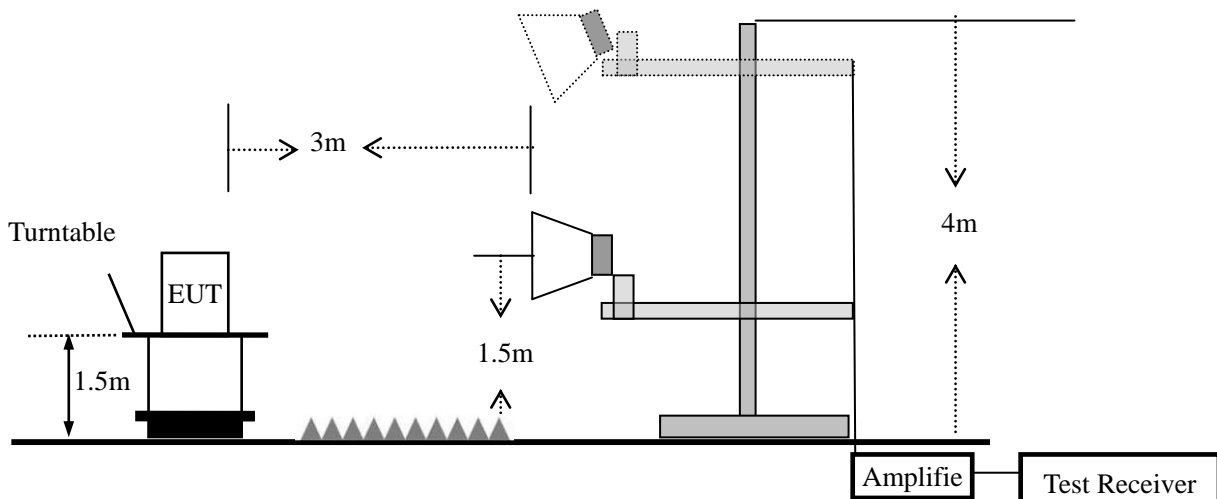
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



7.2.5 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.

Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- 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.
- The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; 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.
- For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 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.
- 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.
- 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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \cdot \lg(100 [kHz]/\text{narrower RBW [kHz]})$. , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

7.2.6 Test Results

■ Spurious Emission below 30MHz (9KHz to 30MHz)

EUT:	28 inch Sound Bar 2.1 System	Model No.:	SB2821n-D6
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode1/Mode2/Mode3	Test By:	Allen Liu

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $20 \log(\text{Specific distance/ test distance})$ (dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission below 1GHz (30MHz to 1GHz)

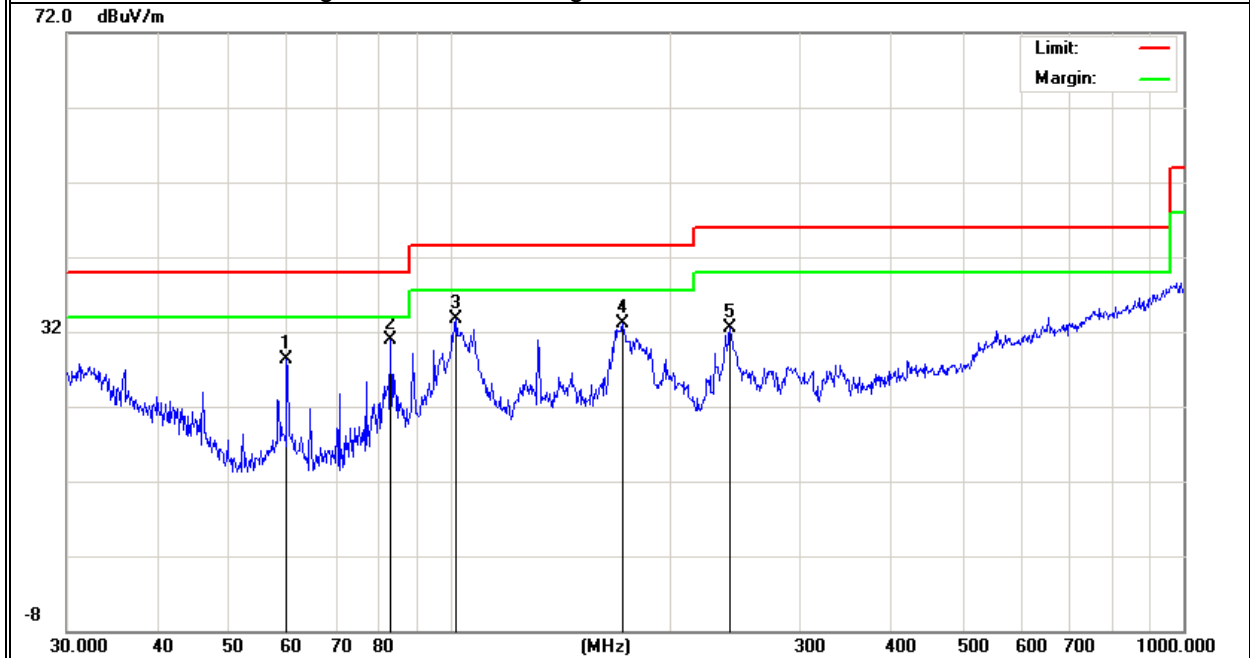
All the modulation modes have been tested, and the worst result was report as below:

EUT:	28 inch Sound Bar 2.1 System	Model Name :	SB2821n-D6
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010hPa	Test Mode:	Mode 1
Test Voltage :	DC 16.0V form Adapter AC 230V/50Hz		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	59.8588	21.91	6.40	28.31	40.00	-11.69	peak
V	82.9385	21.71	9.15	30.86	40.00	-9.14	peak
V	102.0014	21.69	12.02	33.71	43.50	-9.79	peak
V	171.9946	21.60	11.56	33.16	43.50	-10.34	peak
V	240.8304	19.09	13.35	32.44	46.00	-13.56	peak

Remark:

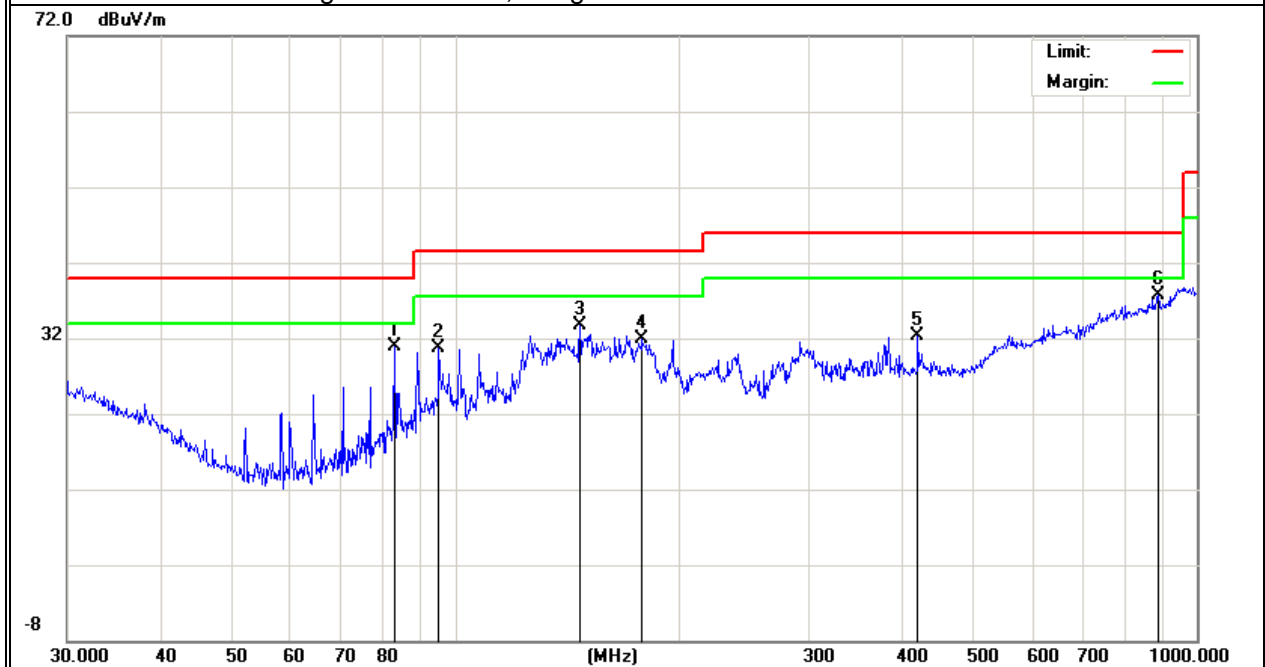
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	82.9385	21.71	9.15	30.86	40.00	-9.14	peak
H	95.0930	19.25	11.48	30.73	43.50	-12.77	peak
H	147.4036	20.66	13.02	33.68	43.50	-9.82	peak
H	178.7584	20.29	11.55	31.84	43.50	-11.66	peak
H	420.5803	11.86	20.50	32.36	46.00	-13.64	peak
H	887.6099	8.43	29.30	37.73	46.00	-8.27	peak

Remark:

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



■ Spurious Emission Above 1GHz (1GHz to 25GHz)

EUT:	28 inch Sound Bar 2.1 System	Model No.:	SB2821n-D6
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Allen Liu

All the modulation modes have been tested, and the worst result was report as below:

Frequency (MHz)	Read Level (dBμV)	Cable loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	Comment
Low Channel (2402 MHz)(GFSK)--Above 1G									
4804.142	62.34	5.21	35.59	44.30	58.84	74.00	-15.16	Pk	Vertical
4804.142	42.25	5.21	35.59	44.30	38.75	54.00	-15.25	AV	Vertical
7206.115	60.67	6.48	36.27	44.60	58.82	74.00	-15.18	Pk	Vertical
7206.115	42.36	6.48	36.27	44.60	40.51	54.00	-13.49	AV	Vertical
4804.203	61.61	5.21	35.55	44.30	58.07	74.00	-15.93	Pk	Horizontal
4804.203	42.27	5.21	35.55	44.30	38.73	54.00	-15.27	AV	Horizontal
7206.246	60.25	6.48	36.27	44.52	58.48	74.00	-15.52	Pk	Horizontal
7206.246	39.54	6.48	36.27	44.52	37.77	54.00	-16.23	AV	Horizontal
Mid Channel (2441 MHz)(GFSK)--Above 1G									
4880.254	60.21	5.21	35.66	44.20	56.88	74.00	-17.12	Pk	Vertical
4880.254	43.05	5.21	35.66	44.20	39.72	54.00	-14.28	AV	Vertical
7320.302	63.19	7.10	36.50	44.43	62.36	74.00	-11.64	Pk	Vertical
7320.302	41.17	7.10	36.50	44.43	40.34	54.00	-13.66	AV	Vertical
4880.289	60.46	5.21	35.66	44.20	57.13	74.00	-16.87	Pk	Horizontal
4880.289	41.25	5.21	35.66	44.20	37.92	54.00	-16.08	AV	Horizontal
7320.145	59.63	7.10	36.50	44.43	58.80	74.00	-15.20	Pk	Horizontal
7320.145	47.58	7.10	36.50	44.43	46.75	54.00	-7.25	AV	Horizontal
High Channel (2480 MHz)(GFSK)-- Above 1G									
4960.284	60.77	5.21	35.52	44.21	57.29	74.00	-16.71	Pk	Vertical
4960.284	42.45	5.21	35.52	44.21	38.97	54.00	-15.03	AV	Vertical
7440.137	62.36	7.10	36.53	44.60	61.39	74.00	-12.61	Pk	Vertical
7440.137	47.42	7.10	36.53	44.60	46.45	54.00	-7.55	AV	Vertical
4960.241	61.15	5.21	35.52	44.21	57.67	74.00	-16.33	Pk	Horizontal
4960.241	42.36	5.21	35.52	44.21	38.88	54.00	-15.12	AV	Horizontal
7440.192	62.16	7.10	36.53	44.60	61.19	74.00	-12.81	Pk	Horizontal
7440.192	43.44	7.10	36.53	44.60	42.47	54.00	-11.53	AV	Horizontal

Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
(2) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
(3)All other emissions more than 20dB below the limit.

Spurious Emission in Band edge

EUT:	28 inch Sound Bar 2.1 System	Model No.:	SB2821n-D6
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2/ Mode4	Test By:	Allen Liu

All the modulation modes have been tested, and the worst result was report as below:

Frequency (MHz)	Meter Reading (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
1Mbps (GFSK)- hopping									
2310.00	61.45	2.97	27.80	43.80	48.42	74	-25.58	Pk	Horizontal
2310.00	41.34	2.97	27.80	43.80	28.31	54	-25.69	AV	Horizontal
2310.00	59.75	2.97	27.80	43.80	46.72	74	-27.28	Pk	Vertical
2310.00	42.84	2.97	27.80	43.80	29.81	54	-24.19	AV	Vertical
2390.00	61.21	3.14	27.21	43.80	47.76	74	-26.24	Pk	Vertical
2390.00	41.66	3.14	27.21	43.80	28.21	54	-25.79	AV	Vertical
2390.00	60.52	3.14	27.21	43.80	47.07	74	-26.93	Pk	Horizontal
2390.00	42.31	3.14	27.21	43.80	28.86	54	-25.14	AV	Horizontal
2483.50	60.86	3.58	27.70	44.00	48.14	74	-25.86	Pk	Vertical
2483.50	40.45	3.58	27.70	44.00	27.73	54	-26.27	AV	Vertical
2483.50	60.56	3.58	27.70	44.00	47.84	74	-26.16	Pk	Horizontal
2483.50	41.02	3.58	27.70	44.00	28.30	54	-25.70	AV	Horizontal
1Mbps (GFSK)- Non-hopping									
2310.00	58.64	2.97	27.80	43.80	45.61	74	-28.39	Pk	Horizontal
2310.00	43.94	2.97	27.80	43.80	30.91	54	-23.09	AV	Horizontal
2310.00	56.49	2.97	27.80	43.80	43.46	74	-30.54	Pk	Vertical
2310.00	42.87	2.97	27.80	43.80	29.84	54	-24.16	AV	Vertical
2390.00	57.46	3.14	27.21	43.80	44.01	74	-29.99	Pk	Vertical
2390.00	41.69	3.14	27.21	43.80	28.24	54	-25.76	AV	Vertical
2390.00	57.82	3.14	27.21	43.80	44.37	74	-29.63	Pk	Horizontal
2390.00	43.16	3.14	27.21	43.80	29.71	54	-24.29	AV	Horizontal
2483.50	58.13	3.58	27.70	44.00	45.41	74	-28.59	Pk	Vertical
2483.50	43.69	3.58	27.70	44.00	30.97	54	-23.03	AV	Vertical
2483.50	58.12	3.58	27.70	44.00	45.40	74	-28.60	Pk	Horizontal
2483.50	41.83	3.58	27.70	44.00	29.11	54	-24.89	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.

■ Spurious Emission in Restricted Band 3260MHz-18000MHz

EUT:	28 inch Sound Bar 2.1 System	Model No.:	SB2821n-D6
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2/ Mode4	Test By:	Allen Liu

All the modulation modes have been tested, and the worst result was report as below:

Frequency	Reading Level	Cable Loss	Antenna	Preamplifier Factor	Emission Level	Limits	Margin	Detect or	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
(1Mbps)(GFSK Mode)- Non-hopping									
3260	60.47	4.04	29.57	44.70	49.38	74	-24.62	Pk	Vertical
3260	56.68	4.04	29.57	44.70	45.59	54	-8.41	AV	Vertical
3260	61.23	4.04	29.57	44.70	50.14	74	-23.86	Pk	Horizontal
3260	57.63	4.04	29.57	44.70	46.54	54	-7.46	AV	Horizontal
3332	65.24	4.26	29.87	44.40	54.97	74	-19.03	Pk	Vertical
3332	53.35	4.26	29.87	44.40	43.08	54	-10.92	AV	Vertical
3332	62.38	4.26	29.87	44.40	52.11	74	-21.89	Pk	Horizontal
3332	52.35	4.26	29.87	44.40	42.08	54	-11.92	AV	Horizontal
17797	42.54	10.99	43.95	43.50	53.98	74	-20.02	Pk	Vertical
17797	32.62	10.99	43.95	43.50	44.06	54	-9.94	AV	Vertical
17788	42.84	11.81	43.69	44.60	53.74	74	-20.26	Pk	Horizontal
17788	32.33	11.81	43.69	44.60	43.23	54	-10.77	AV	Horizontal
(1Mbps)(GFSK Mode)- hopping									
3260	64.11	4.04	29.57	44.70	53.02	74	-20.98	Pk	Vertical
3260	55.38	4.04	29.57	44.70	44.29	54	-9.71	AV	Vertical
3260	63.26	4.04	29.57	44.70	52.17	74	-21.83	Pk	Horizontal
3260	54.07	4.04	29.57	44.70	42.98	54	-11.02	AV	Horizontal
3332	63.14	4.26	29.87	44.40	52.87	74	-21.13	Pk	Vertical
3332	57.40	4.26	29.87	44.40	47.13	54	-6.87	AV	Vertical
3332	64.33	4.26	29.87	44.40	54.06	74	-19.94	Pk	Horizontal
3332	56.42	4.26	29.87	44.40	46.15	54	-7.85	AV	Horizontal
17789	61.48	10.99	43.95	43.50	72.92	74	-1.08	Pk	Vertical
17789	50.97	10.99	43.95	43.50	62.41	54	8.41	AV	Vertical
17957	60.88	11.81	43.69	44.60	71.78	74	-2.22	Pk	Horizontal
17957	53.77	11.81	43.69	44.60	64.67	54	10.67	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.

7.3 ANTENNA APPLICATION

7.3.1 Antenna 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.

7.3.2 Result

The EUT antenna is PCB Antenna. It comply with the standard requirement.

END OF REPORT