

## FCC TEST REPORT

FOR

Shenzhen L&Y Aduio Co., LTD

2.1 Channel Sound Bar

Test Model: SB-BT21

Prepared for : Shenzhen L&Y Aduio Co., LTD  
Address : No.2 Bldg, No.2 Industrial Zone, Tong Fu Yu Industrial, Tang Xia Yong, Songgang, Bao'an District, Shenzhen, Guangdong, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd  
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Date of receipt of test sample : July 19, 2015  
Number of tested samples : 1  
Serial number : DH1TKAM02F8100001  
Date of Test : July 19, 2015 - August 04, 2015  
Date of Report : August 04, 2015

**FCC TEST REPORT****FCC CFR 47 PART 15 C(15.249): 2014****Report Reference No. .... : LCS1508030078E**

Date of Issue ..... : August 04, 2015

**Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.**Address..... : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,  
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure..... : Full application of Harmonised standards   
Partial application of Harmonised standards   
Other standard testing method **Applicant's Name ..... : Shenzhen L&Y Aduio Co., LTD**Address..... : No.2 Bldg, No.2 Industrial Zone, Tong Fu Yu Industrial, Tang  
Xia Yong, Songgang, Bao'an District, Shenzhen, Guangdong,  
China**Test Specification**

Standard..... : FCC CFR 47 PART 15 C(15.249): 2014 / ANSI C63.10: 2013

Test Report Form No..... : LCSEMC-1.0

TRF Originator ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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**Test Item Description..... : 2.1 Channel Sound Bar**

Trade Mark ..... : Haier

Test Model..... : SB-BT21

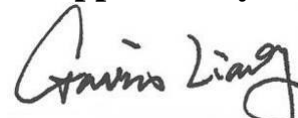
Ratings..... : AC 100~240V, 50/60Hz

**Result ..... : Positive****Compiled by:**

Leo Lee/ File administrators

**Supervised by:**

Glin Lu/ Technique principal

**Approved by:**

Gavin Liang/ Manager

## FCC -- TEST REPORT

<b>Test Report No. : LCS1508030078E</b>	<u>August 04, 2015</u> Date of issue
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Test Model..... : SB-BT21  EUT..... : 2.1 Channel Sound Bar
<b>Applicant..... : Shenzhen L&amp;Y Aduio Co., LTD</b> Address..... : No.2 Bldg, No.2 Industrial Zone, Tong Fu Yu Industrial, Tang Xia Yong, Songgang, Bao'an District, Shenzhen, Guangdong, China  Telephone..... : / Fax..... : /
<b>Manufacturer..... : Shenzhen L&amp;Y Aduio Co., LTD</b> Address..... : No.2 Bldg, No.2 Industrial Zone, Tong Fu Yu Industrial, Tang Xia Yong, Songgang, Bao'an District, Shenzhen, Guangdong, China  Telephone..... : / Fax..... : /
<b>Factory..... : Shenzhen L&amp;Y Aduio Co., LTD</b> Address..... : No.2 Bldg, No.2 Industrial Zone, Tong Fu Yu Industrial, Tang Xia Yong, Songgang, Bao'an District, Shenzhen, Guangdong, China  Telephone..... : / Fax..... : /

<b>Test Result</b>	<b>Positive</b>
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The test report merely corresponds to the test sample.  
 It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT	: 2.1 Channel Sound Bar
Test Model	: SB-BT21
Hardware Version	: DR-T202B8635 AMP
Software Version	: DR-T202B8635
Power Supply	: AC 100~240V, 50/60Hz
EUT Support	: Bluetooth / 2.4G Wireless Technology / NFC(Only RX)
Radios Application	
2.4G Wireless Technology	:
Frequency Range	: 2403.00-2478.00MHz
Channel Number	: 76 channels
Channel Spacing	: 1MHz
Modulation Type	: GFSK
Antenna Description	: PIFA antenna, 2.0dBi(Max.)

### 1.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Shenzhen L&Y Audio Co., LTD	Subwoofer	SB-BT21	/	VOC

### 1.3. External I/O

I/O Port Description	Quantity	Cable
AUX Stereo Right Audio Input Port	1	1.2m, unshielded
AUX Stereo Left Audio Input Port	1	
Coax Input Port	1	1.2m
Optical Input Port	1	N/A

## 1.4. Description of Test Facility

CNAS Registration Number. is L4595.  
 FCC Registration Number. is 899208.  
 Industry Canada Registration Number. is 9642A-1.  
 VCCI Registration Number. is C-4260 and R-3804.  
 ESMD Registration Number. is ARCB0108.  
 UL Registration Number. is 100571-492.  
 TUV SUD Registration Number. is SCN1081.  
 TUV RH Registration Number. is UA 50296516-001

## 1.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## 1.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty	9KHz~30MHz	3.10dB	(1)
	30MHz~200MHz	2.96dB	(1)
	200MHz~1000MHz	3.10dB	(1)
	1GHz~26.5GHz	4.00dB	(1)
Conduction Uncertainty	150kHz~30MHz	1.63dB	(1)
Power disturbance	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 1.7. Description Of Test Modes

The EUT operates in the unlicensed ISM band at 2.4GHz. The following operating modes were applied for the related test items.

For pre-testing, the input Voltage/Frequency AC 120V/60Hz and AC 240V/60Hz were used.

All test modes were tested, only the result of the worst case was recorded in the report. The EUT was set to transmit at 100% duty cycle.

Mode of Operations	Transmitting Frequency (MHz)
GFSK	2403
	2439
	2478
For Conducted Emission	
Test Mode	TX Mode
For Radiated Emission	
Test Mode	TX Mode

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be TX-2403MHz.

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX-2403MHz.

\*\*\*Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

## 2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.249 under the FCC Rules Part 15 Subpart C.

### 2.3. General Test Procedures

#### 2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013



### 3. CONNECTION DIAGRAM OF TEST SYSTEM

#### 3.1. Justification

The system was configured for testing in a continuous transmit condition.

#### 3.2. EUT Exercise Software

N/A

#### 3.3. Special Accessories

N/A

#### 3.4. Block Diagram/Schematics

Please refer to the related document

#### 3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

#### 3.6. Test Setup

Please refer to the test setup photo.

#### 4. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Compliant
§15.205(a), §15.209(a), §15.249(a), §15.249(c)	Radiated Emissions Measurement	Compliant
§15.249	Band Edges Measurement	Compliant
§15.249, §15.215	20 dB Bandwidth	Compliant

## 5. ANTENNA REQUIREMENT

### 5.1. Standard Applicable

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### 5.2. Antenna Connected Construction

The antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.

Result: Compliance.

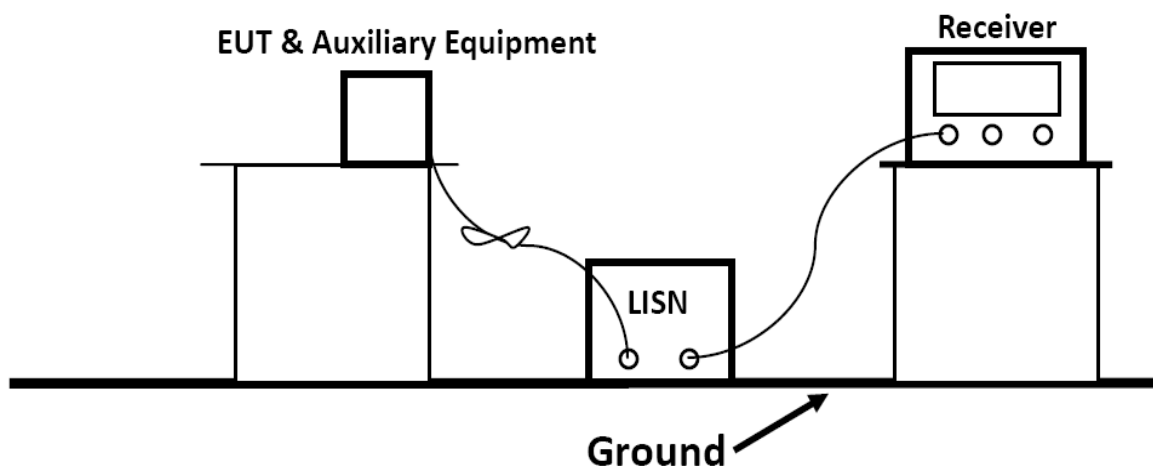
## 6. LINE CONDUCTED EMISSIONS

### 6.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range(MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

### 6.2 Block Diagram of Test Setup

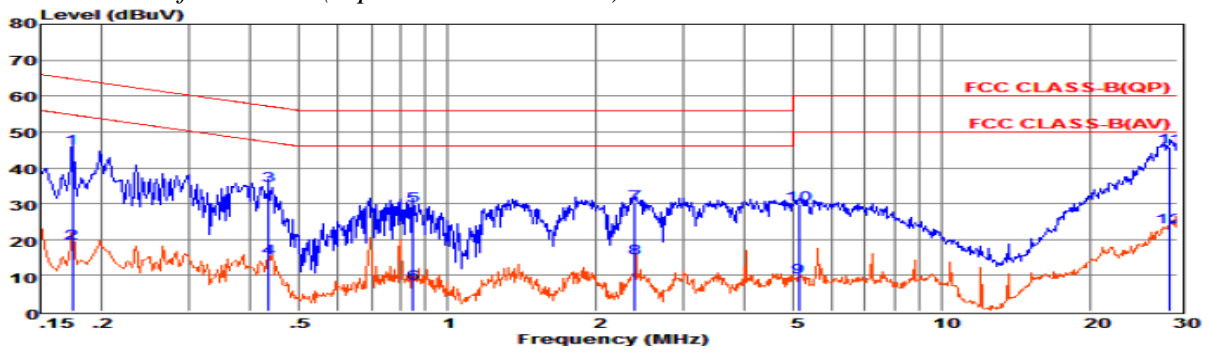


### 6.3 Test Results

PASS.

*The test data please refer to following page.*

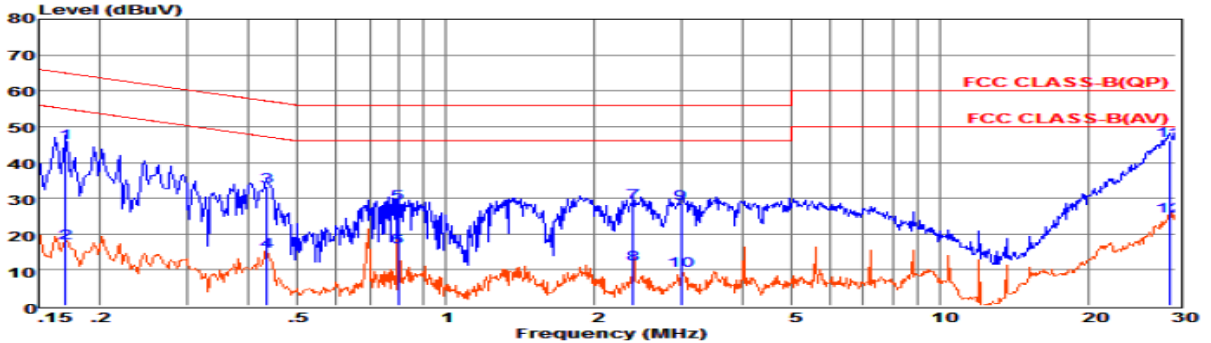
Test Result Of The EUT (Input: AC 240V/60Hz)



Env. Ins: 24\*/56%  
 EUT: 2.1 Channel Sound Bar  
 M/N: SB-BT21  
 Power Rating: AC 240V/60Hz  
 Test Mode: TX-Low Channel (2403MHz)  
 Operator: Leo  
 Memo:  
 Pol: NEUTRAL

Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark	
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB		
1	0.17399	25.83	9.64	0.02	10.00	45.49	64.77	-19.28	QP
2	0.17409	-0.70	9.64	0.02	10.00	18.96	54.76	-35.80	Average
3	0.43511	15.29	9.62	0.04	10.00	34.95	57.15	-22.20	QP
4	0.43521	-4.79	9.62	0.04	10.00	14.87	47.15	-32.28	Average
5	0.85276	9.92	9.63	0.04	10.00	29.59	56.00	-26.41	QP
6	0.85286	-11.85	9.63	0.04	10.00	7.82	46.00	-38.18	Average
7	2.39624	10.30	9.64	0.05	10.00	29.99	56.00	-26.01	QP
8	2.39724	-4.90	9.64	0.05	10.00	14.79	46.00	-31.21	Average
9	5.13910	-10.21	9.66	0.06	10.00	9.51	50.00	-40.49	Average
10	5.13900	9.95	9.66	0.06	10.00	29.67	60.00	-30.33	QP
1128.90773	25.81	9.85	0.14	10.00	45.80	60.00	-14.20	QP	
1228.90873	3.36	9.85	0.14	10.00	23.35	50.00	-26.65	Average	

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten\_Fac.  
 2. The emission levels that are 20dB below the official limit are not reported.

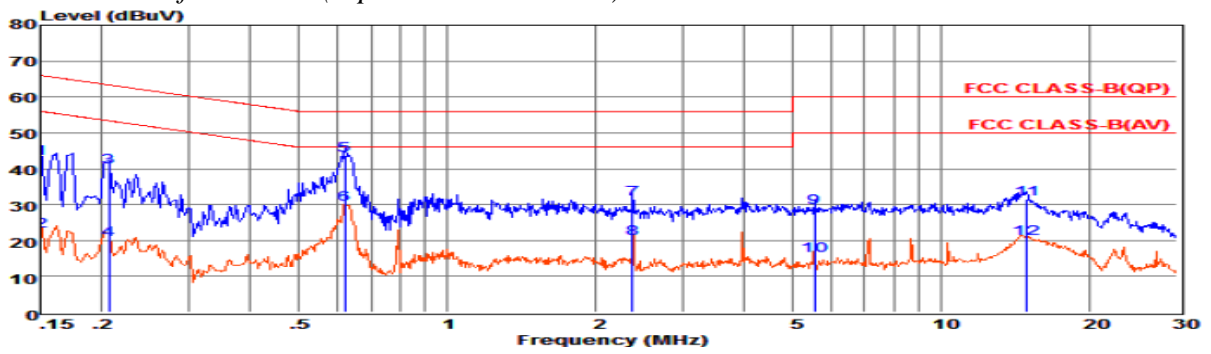


Env. Ins: 24\*/56%  
 EUT: 2.1 Channel Sound Bar  
 M/N: SB-BT21  
 Power Rating: AC 240V/60Hz  
 Test Mode: TX-Low Channel (2403MHz)  
 Operator: Leo  
 Memo:  
 Pol: LINE

Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark	
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB		
1	0.17034	25.82	9.60	0.02	10.00	45.44	64.94	-19.50	QP
2	0.17044	-1.99	9.60	0.02	10.00	17.63	54.94	-37.31	Average
3	0.43511	13.75	9.62	0.04	10.00	33.41	57.15	-23.74	QP
4	0.43521	-4.50	9.62	0.04	10.00	15.16	47.15	-31.99	Average
5	0.80023	8.94	9.64	0.04	10.00	28.62	56.00	-27.38	QP
6	0.80033	-3.35	9.64	0.04	10.00	16.33	46.00	-29.67	Average
7	2.39624	9.10	9.64	0.05	10.00	28.79	56.00	-27.21	QP
8	2.39724	-7.97	9.64	0.05	10.00	11.72	46.00	-34.28	Average
9	2.99346	8.90	9.64	0.06	10.00	28.60	56.00	-27.40	QP
10	2.99446	-10.02	9.64	0.06	10.00	9.68	46.00	-36.32	Average
1129.06130	26.34	9.71	0.14	10.00	46.19	60.00	-13.81	QP	
1229.06230	5.11	9.71	0.14	10.00	24.96	50.00	-25.04	Average	

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten\_Fac.  
 2. The emission levels that are 20dB below the official limit are not reported.

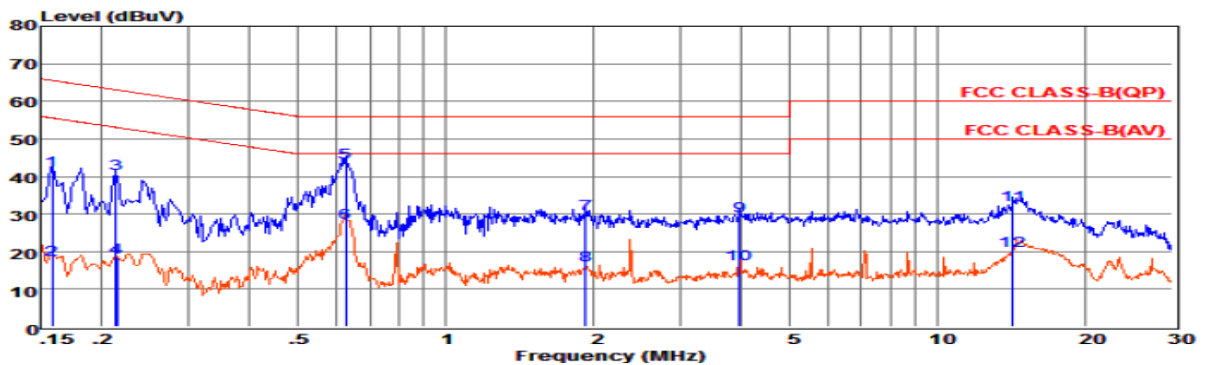
Test Result Of The EUT (Input: AC 120V/60Hz)



Env. Ins: 24\*/56%  
 EUT: 2.4 Channel Sound Bar  
 M/N: SB-BT21  
 Power Rating: AC 120V/60Hz  
 Test Mode: TX-Low Channel (2403MHz)  
 Operator: Leo  
 Memo:  
 Pol: NEUTRAL

Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1 0.15000	23.19	9.70	0.02	10.00	42.91	66.00	-23.09	QP
2 0.15010	2.99	9.70	0.02	10.00	22.71	55.99	-33.28	Average
3 0.20614	20.71	9.59	0.03	10.00	40.33	63.36	-23.03	QP
4 0.20624	0.49	9.59	0.03	10.00	20.11	53.36	-33.25	Average
5 0.62054	24.10	9.63	0.04	10.00	43.77	56.00	-12.23	QP
6 0.62064	10.45	9.63	0.04	10.00	30.12	46.00	-15.88	Average
7 2.37098	11.73	9.64	0.05	10.00	31.42	56.00	-24.58	QP
8 2.37198	0.96	9.64	0.05	10.00	20.65	46.00	-25.35	Average
9 5.53468	9.43	9.67	0.06	10.00	29.16	60.00	-30.84	QP
10 5.53568	-4.03	9.67	0.06	10.00	15.70	50.00	-34.30	Average
1114.90683	11.79	9.74	0.10	10.00	31.63	60.00	-28.37	QP
1214.90783	0.62	9.74	0.10	10.00	20.46	50.00	-29.54	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten\_Fac.  
 2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24\*/56%  
 EUT: 2.4 Channel Sound Bar  
 M/N: SB-BT21  
 Power Rating: AC 120V/60Hz  
 Test Mode: TX-Low Channel (2403MHz)  
 Operator: Leo  
 Memo:  
 Pol: LINE

Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1 0.15816	21.97	9.58	0.02	10.00	41.57	65.56	-23.99	QP
2 0.15826	-1.82	9.58	0.02	10.00	17.78	55.55	-37.77	Average
3 0.21392	20.98	9.63	0.03	10.00	40.64	63.05	-22.41	QP
4 0.21402	-1.21	9.63	0.03	10.00	18.45	53.05	-34.60	Average
5 0.62715	23.91	9.63	0.04	10.00	43.58	56.00	-12.42	QP
6 0.62725	8.07	9.63	0.04	10.00	27.74	46.00	-18.26	Average
7 1.92836	10.48	9.64	0.05	10.00	30.17	56.00	-25.83	QP
8 1.92936	-3.48	9.64	0.05	10.00	16.21	46.00	-29.79	Average
9 3.96395	9.67	9.65	0.06	10.00	29.38	56.00	-26.62	QP
10 3.96495	-3.01	9.65	0.06	10.00	16.70	46.00	-29.30	Average
1114.21268	12.56	9.71	0.10	10.00	32.37	60.00	-27.63	QP
1214.21368	0.43	9.71	0.10	10.00	20.24	50.00	-29.76	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten\_Fac.  
 2. The emission levels that are 20dB below the official limit are not reported.

Note: Pre-scan all modes and recorded the worst case results in this report.

## 7. RADIATED EMISSION MEASUREMENT

### 7.1. Standard Applicable

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

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) and 15.249 limit in the table below has to be followed.

Fundamental Frequency	Field Strength of fundamental (millivolts/meter)	Field Strength of harmonics (microvolts/meter)
902-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

Frequencies (MHz)	Field Strength (microvolts/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

### 7.2. Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

Spectrum 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

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

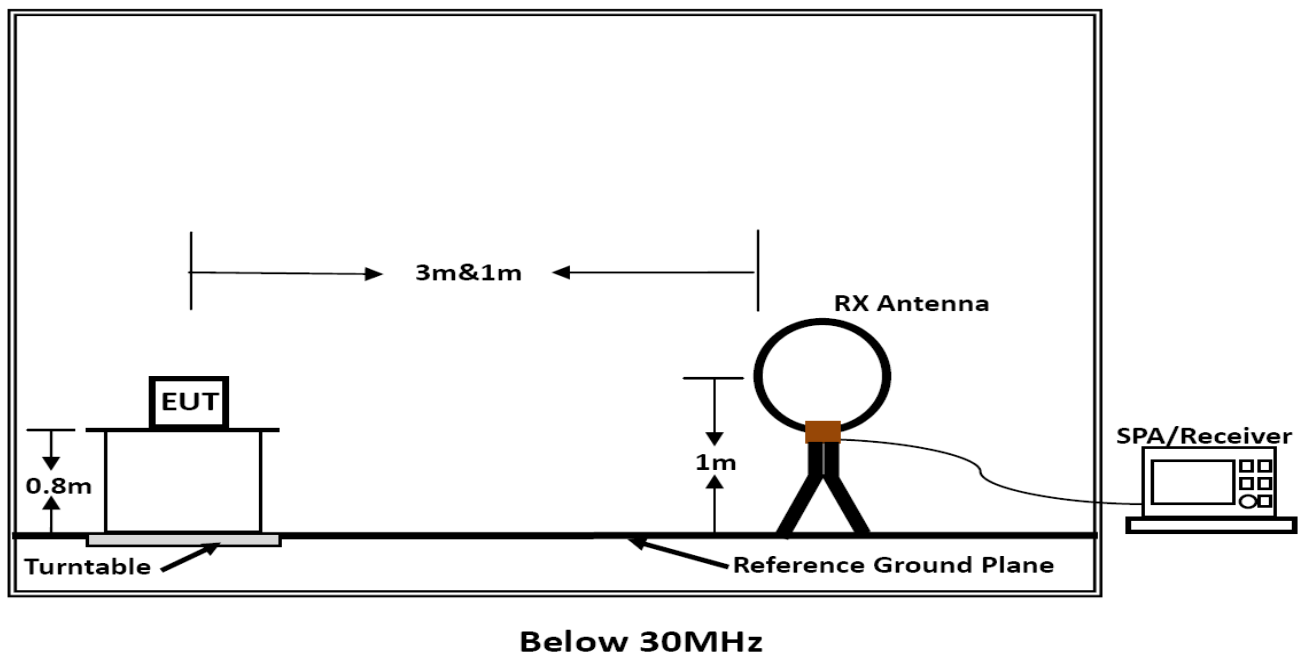
### 7.3. Test Procedure

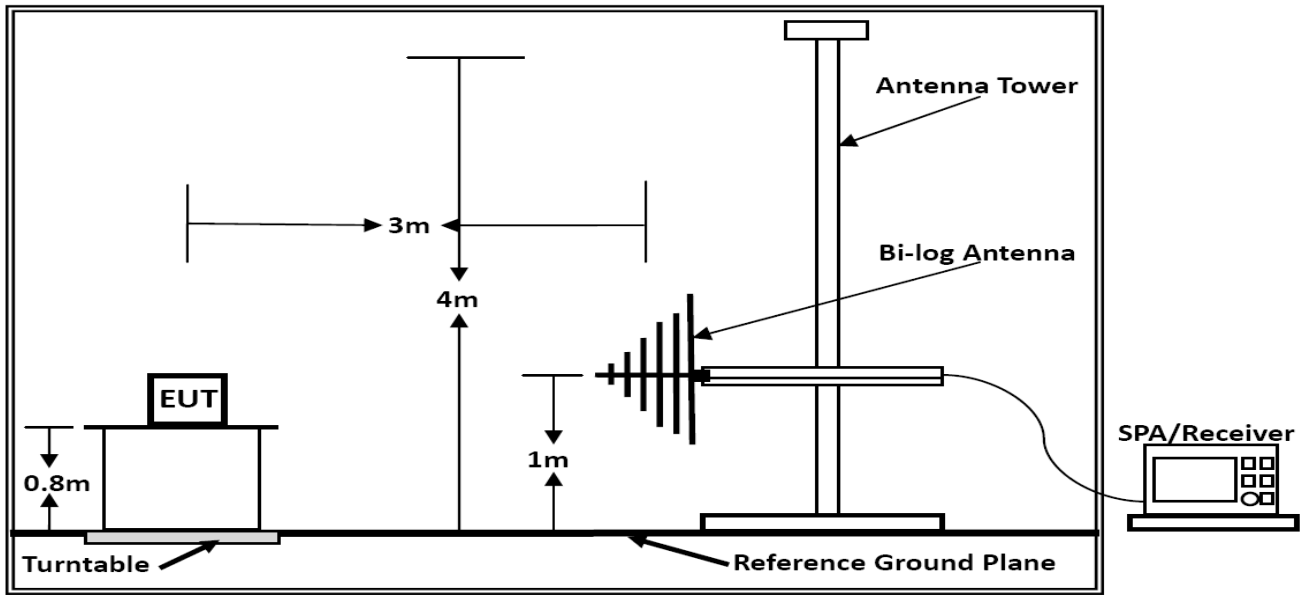
- 1) Configure the EUT according to ANSI C63.10: 2013. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2) Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4) For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6) For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 7) When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
- 8) If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.



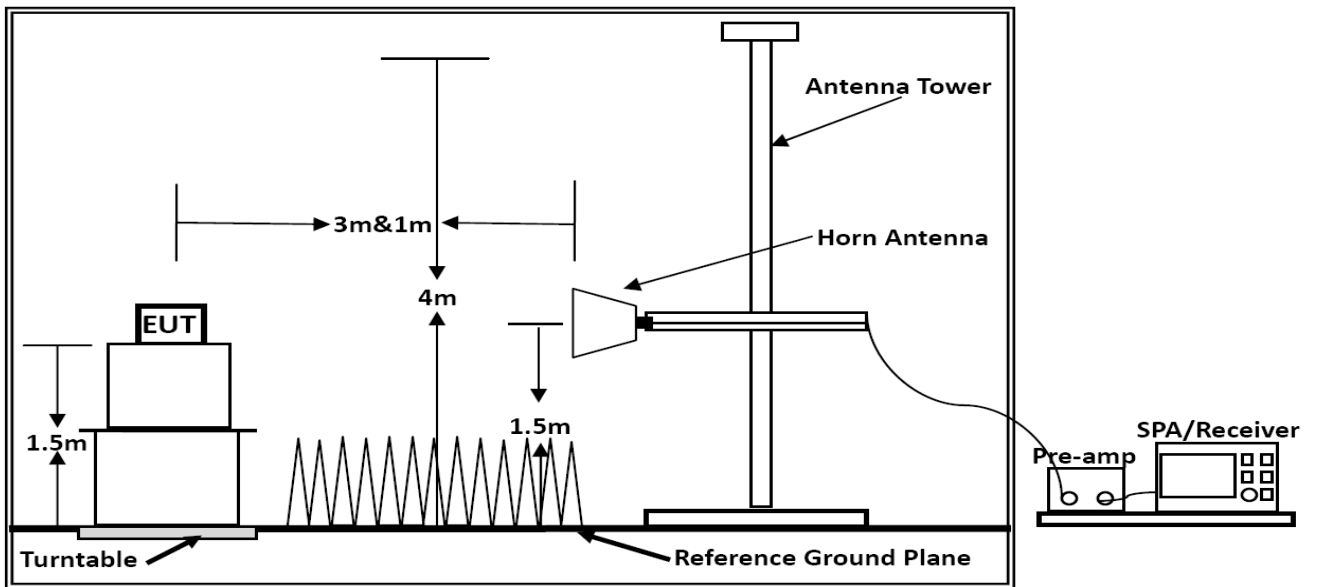
- 9) For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emission at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, 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 emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10) In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

#### 7.4. Block Diagram of Test Setup





Below 1GHz



Above 1GHz

### 7.5. Test Results

#### Results of Radiated Emissions (9kHz~30MHz)

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

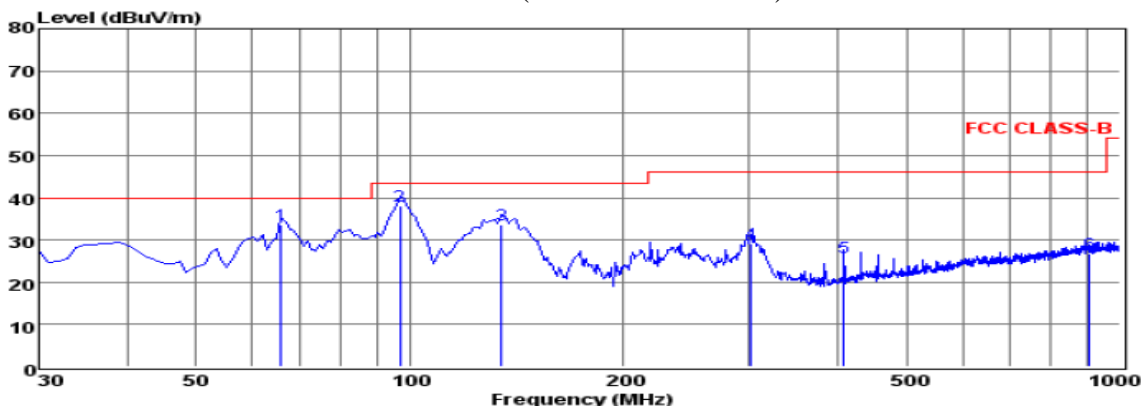
Note:

The radiated emissions from 9kHz to 30MHz are at least 20dB below the official limit and no need to report.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

#### Results of Radiated Emissions (30MHz~1000MHz)

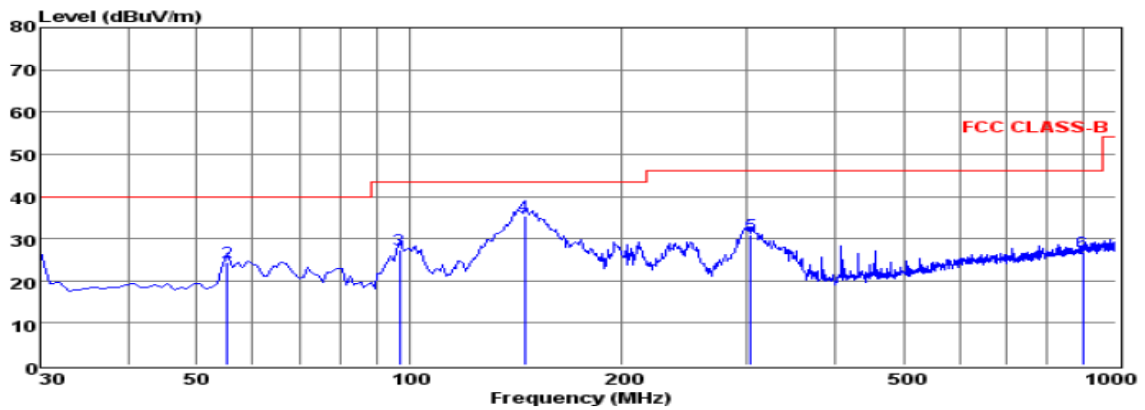


```

Env./Ins:          24°C/56%
EUT:              2.1 Channel Sound Bar
M/N:             SB-BT21
Power Rating:    AC 120V/60Hz
Test Mode:      TX-Low Channel (2403MHz)
Operator:       Leo
Memo:
pol:            VERTICAL
    
```

	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	65.89	22.61	0.52	10.34	33.47	40.00	-6.53	QP
2	96.93	24.53	0.61	12.96	38.10	43.50	-5.40	QP
3	134.76	24.37	0.74	8.58	33.69	43.50	-9.81	QP
4	302.57	15.07	1.03	13.09	29.19	46.00	-16.81	QP
5	408.30	9.40	1.17	15.23	25.80	46.00	-20.20	QP
6	906.88	3.66	2.03	21.13	26.82	46.00	-19.18	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that are 20db below the official limit are not reported



Env./Ins: 24°C/56%  
 EUT: 2.1 Channel Sound Bar  
 M/N: SB-BT21  
 Power Rating: AC 120V/60Hz  
 Test Mode: TX-Low Channel (2403MHz)  
 Operator: Leo  
 Memo:  
 pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	30.00	12.37	0.39	12.33	25.09	40.00	-14.91	QP
2	55.22	10.87	0.46	13.01	24.34	40.00	-15.66	QP
3	96.93	13.75	0.61	12.96	27.32	43.50	-16.18	QP
4	145.43	26.33	0.77	8.23	35.33	43.50	-8.17	QP
5	304.51	16.70	1.03	13.12	30.85	46.00	-15.15	QP
6	896.21	3.61	1.97	21.05	26.63	46.00	-19.37	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that ate 20db blow the official limit are not reported

\*\*\*Note: Pre-scan all mode and recorded the worst case results in this report (TX- 2403MHz).

## 7.6. Results for Radiated Emissions (Above 1GHz)

Field Strength Of Fundamental (TX-2404MHz)

Frequency (MHz)	Pol.	Measure Result (PK, dBuV/m)	Measure Result (AVG, dBuV/m)	Peak Limit (dBuV/m)	AVG Limit (dBuV/m)	Result
2403	H	89.46	85.79	114	94	Pass
2403	V	92.81	89.67	114	94	Pass

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4806.14	49.74	33.06	35.04	3.94	51.70	74	-22.30	Peak	Horizontal
4806.16	39.06	33.06	35.04	3.94	41.02	54	-12.98	Average	Horizontal
4806.14	53.49	33.06	35.04	3.94	55.45	74	-18.55	Peak	Vertical
4806.16	44.36	33.06	35.04	3.94	46.32	54	-7.68	Average	Vertical

Field Strength Of Fundamental (TX-2440MHz)

Frequency (MHz)	Pol.	Measure Result (PK, dBuV/m)	Measure Result (AVG, dBuV/m)	Peak Limit (dBuV/m)	AVG Limit (dBuV/m)	Result
2439	H	87.16	83.85	114	94	Pass
2439	V	90.34	87.16	114	94	Pass

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4878.21	47.82	33.16	35.15	3.96	49.79	74	-24.21	Peak	Horizontal
4878.23	38.25	33.16	35.15	3.96	40.22	54	-13.78	Average	Horizontal
4878.21	51.67	33.16	35.15	3.96	53.64	74	-20.36	Peak	Vertical
4878.23	42.33	33.16	35.15	3.96	44.30	54	-9.70	Average	Vertical

Field Strength Of Fundamental (TX-2480MHz)

Frequency (MHz)	Pol.	Measure Result (PK, dBuV/m)	Measure Result (AVG, dBuV/m)	Peak Limit (dBuV/m)	AVG Limit (dBuV/m)	Result
2478	H	86.51	82.77	114	94	Pass
2478	V	89.73	85.61	114	94	Pass

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4956.27	48.31	33.26	35.14	3.98	50.41	74	-23.59	Peak	Horizontal
4956.29	38.57	33.26	35.14	3.98	40.67	54	-13.33	Average	Horizontal
4956.27	51.54	33.26	35.14	3.98	53.64	74	-20.36	Peak	Vertical
4956.29	41.79	33.26	35.14	3.98	43.89	54	-10.11	Average	Vertical

**Notes:**

1. Measuring frequencies from 9k~10th harmonic (ex. 26GHz), No emission found between lowest internal used/generated frequency to 30MHz.
2. Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 26GHz) were made with an instrument using Peak detector mode.
3. No emission was recorded above 18GHz means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## 7.7. Results for Band edge Testing (Radiated)

Only record the worst test case as following:

### TX-2403MHz

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
2376.67	49.83	32.89	35.16	3.51	51.07	74	-22.93	Peak	Horizontal
2376.70	40.21	32.9	35.16	3.51	41.46	54	-12.54	Average	Horizontal
2390.00	45.47	32.92	35.16	3.54	46.77	74	-27.23	Peak	Horizontal
2389.99	36.13	32.92	35.16	3.54	37.43	54	-16.57	Average	Horizontal
2400.00	52.64	32.92	35.16	3.54	53.94	74	-20.06	Peak	Horizontal
2399.97	42.89	32.92	35.16	3.54	44.19	54	-9.81	Average	Horizontal
2376.67	51.78	32.89	35.16	3.51	53.02	74	-20.98	Peak	Vertical
2376.70	42.33	32.9	35.16	3.51	43.58	54	-10.42	Average	Vertical
2390.00	47.56	32.92	35.16	3.54	48.86	74	-25.14	Peak	Vertical
2389.99	37.74	32.92	35.16	3.54	39.04	54	-14.96	Average	Vertical
2400.00	54.68	32.92	35.16	3.54	55.98	74	-18.02	Peak	Vertical
2399.97	44.93	32.92	35.16	3.54	46.23	54	-7.77	Average	Vertical

### TX-2478MHz

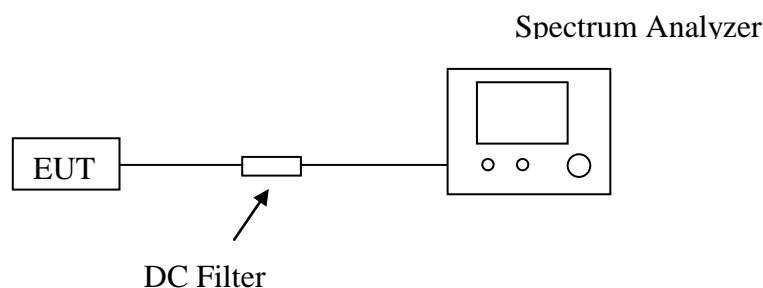
Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
2483.50	50.77	33.06	35.18	3.60	52.25	74	-21.75	Peak	Horizontal
2483.86	41.26	33.08	35.18	3.60	42.76	54	-11.24	Average	Horizontal
2486.92	52.43	33.08	35.18	3.62	53.95	74	-20.05	Peak	Horizontal
2486.95	42.78	33.08	35.18	3.62	44.30	54	-9.70	Average	Horizontal
2483.50	52.11	33.06	35.18	3.60	53.59	74	-20.41	Peak	Vertical
2483.51	42.47	33.08	35.18	3.60	43.97	54	-10.03	Average	Vertical
2486.92	55.19	33.08	35.18	3.62	56.71	74	-17.29	Peak	Vertical
2486.95	45.62	33.08	35.18	3.62	47.14	54	-6.86	Average	Vertical

## 8. 20 DB BANDWIDTH MEASUREMENT

### 8.1. Standard Applicable

According to §15.215

### 8.2. Block Diagram of Test Setup



### 8.3. Test Procedure

Use the following spectrum analyzer settings:

Span = 3MHz

RBW = 30KHz

VBW = 100KHz

Sweep = auto

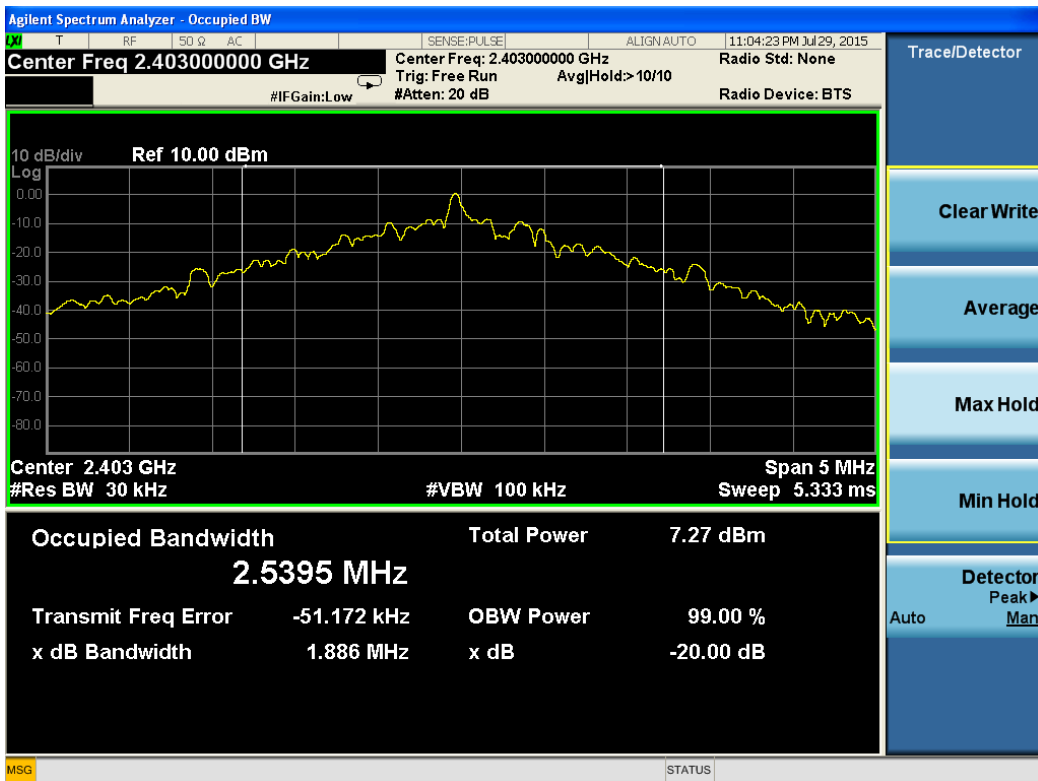
Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

### 8.4. Test Results

Test Result Of 20dB Bandwidth Measurement		
Test Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
2403	1.886	Non-Specified
2439	1.763	
2478	1.513	







## 9. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2015	June 17,2016
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2015	July 15,2016
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2015	June 17,2016
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2015	June 17,2016
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2015	June 17,2016
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2015	June 17,2016
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2015	June 17,2016
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHz	June 18,2015	June 17,2016
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2015	July 15,2016
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2015	July 15,2016
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2015	July 15,2016
MAX Signal Analyzer	Agilent	N9020A	MY50510140	20Hz~26.5GHz	Oct. 27, 2014	Oct. 26, 2015
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2015	June 17,2016
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2015	June 09,2015
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2015	June 09,2015
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2015	June 09,2015
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2015	June 17,2016
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2015	June 17,2016
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2015	June 17,2016
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	June 18,2015	June 17,2016

Note: All equipment through GRGT EST calibration

-----THE END OF REPORT-----