# FCC PART 15C TEST REPORT FOR CERTIFICATION On Behalf of

TCL Technoly Electronics (Huizhou) Co., Ltd.

Sound Bar System

Model Number: SB3621n-E8M

Additional Model: SB3621n-E8

FCC ID: ZVASB000017

Prepared for: TCL Technoly Electronics (Huizhou) Co., Ltd.

Section 37, Zhongkai High-tech Development Zone, Huizhou City, Guang Dong Province, China, 516006

Prepared By: EST Technology Co., Ltd.

San Tun Management Zone, Houjie District, Dongguan, China

Tel: 86-769-83081888-808

Report Number: ESTE-R1703009 Date of Test: February 20 ~ 28, 2017 Date of Report: March 08, 2017



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**Test Report Verification** 

	Test Report Vernication					
Applicant:	TCL Technoly Electronics (Huizhou) Co., Ltd.					
Address:	Section 37, Zhongkai High-tech Development Zone, Huizhou City, Guang Dong					
Audiess.	Province, China, 516006					
Manufacturer:	TCL Technoly Electronics (Huizhou) Co., Ltd.					
Address:	Section 37, Zhongkai High-tech Development Zone, Huizhou City, Guang	Dong				
Address:	Province, China, 516006					
E.U.T:	Sound Bar System					
<b>Model Number:</b>	SB3621n-E8M					
	SB3621n-E8					
	Note: The two models have the same technical construction including circuit	it				
Additional	diagram, PCB Layout, components and component layout, all electrical					
Model:	construction and mechanical construction, except the different Model No., a	and				
	"SB3621n-E8" remote control without LCD display, while the "SB3621n-E	28M"				
	remote control with LCD display.					
<b>Power Supply:</b>	AC 120V/60Hz					
<b>Test Voltage:</b>	AC 120V/60Hz					
Trade Name:	VIZIO Serial No.:					
<b>Date of Receipt:</b>	January 15, 2017 Date of Test: February 20 ~ 28, 2017					
Test	FCC Rules and Regulations Part 15 Subpart C:2016					
<b>Specification:</b>	ANSI C63.10:2013					
	The device described above is tested by EST Technology Co., Ltd The					
Test Result:	measurement results were contained in this test report and EST Technology Co.,					
rest Result:	Ltd. was assumed full responsibility for the accuracy and completeness of these					
	measurements. Also, this report shows that the EUT to be technically comp	liance				
	with the FCC Rules and Regulations Part 15 Subpart C requirements.					
	1084					
	This report applies to above tested sample only and shall not be reproduced	in				
	part without written approval of EST Technology Co., Ltd.					
	Date: March 07, 201					
Prepared by:	Tested by: Approved by:					
,	10 th or					
A /2	Trementher					
Ran	Som					
Ada / Assistant	Tony.Tang/ Engineer IcemanHu / Manager					
O(1) - A 4						
Other Aspects:						
None.						
Abbreviations: OK/P=	-passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested					
This test veneut is been	ed on a single avaluation of one sample of above mentioned medicate. It is not no wited to be					
	ed on a single evaluation of one sample of above mentioned products ,It is not permitted to be without written approval of EST Technology Co., Ltd.	E				
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# 1. GENERAL INFORMATION

# 1.1. Description of Device (EUT)

Product Name : Sound Bar System				
FCC ID	:	ZVASB000017		
Model Number :		SB3621n-E8M		
Operation frequency :		2402MHz~2480MHz		
Number of channel :		79	40	
Antenna	ntenna : Integral antenna, 2.00 dBi gair		2.00 dBi gain	
Modulation :		Dual-mode Bluetooth 4.0 BT BDR: GFSK BT EDR: π/4-DQPSK BT EDR: 8-DPSK	Dual-mode Bluetooth 4.0 BLE: GFSK	
G 1 T		<b>D</b>		
Sample Type	:	Prototype pro	oduction	



# 2. SUMMARY OF TEST

# 2.1. Summary of test result

<b>Description of Test Item</b>	Standard	Results
	FCC Part 15: 15.207	DACC
Power Line Conducted Emission	ANSI C63.10:2013	PASS
	FCC Part 15: 15.209	
Radiated Emission	ANSI C63.10:2013	PASS
	KDB 558074	
	FCC Part 15: 15.247	
Band Edge Compliance	ANSI C63.10:2013	PASS
	KDB 558074	
	FCC Part 15: 15.247	
6dB Bandwidth	ANSI C63.10:2013	PASS
	KDB 558074	
	FCC Part 15: 15.247	
Peak Output Power	ANSI C63.10:2013	PASS
	KDB 558074	
	FCC Part 15: 15.247	
Power Spectral Density	ANSI C63.10:2013	PASS
	KDB 558074	
Antenna requirement	FCC Part 15: 15.203	PASS

Note: KDB 558074 D01 DTS Meas Guidance v03r05



#### 2.2. Test Facilities

EMC Lab : Certificated by CNAL, CHINA

Registration No.: L5288

Date of registration: December 07, 2015

Certificated by FCC, USA Registration No.: 989591

Date of registration: November 15, 2016

Certificated by Industry Canada Registration No.: 9405A-1

Date of registration: December 30, 2015

Certificated by VCCI, Japan

Registration No.: R-3663 & C-4103 Date of registration: July 25, 2011

Certificated by TUV Rheinland, Germany Registration No.: UA 50195514 0001 Date of registration: January 07, 2011

Certificated by TUV/PS, Shenzhen

Registration No.: SCN1017

Date of registration: January 27, 2011

Certificated by Intertek ETL SEMKO Registration No.: 2011-RTL-L1-18 Date of registration: April 28, 2011

Certificated by Siemic, Inc. Registration No.: SLCN021

Date of registration: November 8, 2011

Certificated by Nemko, Hong Kong

Registration No.: 175193

Date of registration: May 4, 2011

Name of Firm : EST Technology Co., Ltd.

Site Location : San Tun Management Zone, Houjie Town, Dongguan,

Guangdong, China



# 2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.54dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	3.62
Uncertainty for Radiation Emission test (1GHz to 18GHz)	4.86
Uncertainty for radio frequency	7×10-8
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

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

# 2.4. Assistant equipment used for test

# 2.4.1. N/A

# 2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 or 1.5 meter high above ground. EUT was be set into Bluetooth test mode by software before test.

AC Mains	FIIT
AC Mains	LUI

(EUT: Sound Bar System)



# 2.6. Test mode

A special test software was used to control EUT work in Continuous TX mode(100% duty cycle), and select test channel, wireless mode and data rate.

Mode	Channel	Frequency
	Low	2402MHz
BT 4.0-BLE GFSK	Middle	2440MHz
	High	2480MHz

# 2.7. Channel List for Bluetooth

Channel	Frequency	Channel	Frequency
No.	(MHz)	No.	(MHz)
1	2402	2	2404
3	2406	4	2408
5	2410	6	2412
7	2414	8	2416
9	2418	10	2420
11	2422	12	2424
13	2426	14	2428
15	2430	16	2432
17	2434	18	2436
19	2438	20	2440
21	2442	22	2444
23	2446	24	2448
25	2450	26	2452
27	2454	28	2456
29	2458	30	2460
31	2462	32	2464
33	2466	34	2468
35	2470	36	2472
37	2474	38	2476
39	2478	40	2480



# 2.8. Test Equipment

# 2.8.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	June 25,16	1 Year
Artificial Mains Networ	Rohde & Schwarz	ENV216	101260	June 25,16	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101100	June 25,16	1 Year

# 2.8.2. For radiated emission test(9 kHz-30MHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI	100435	June 25,16	1 Year
Loop Antenna	ETS-LINDGREN	6502	00071730	June 25,16	3 Year
RF Cable	MIYAZAKI	5D-2W	966 Chamber No.1	June 25,16	1 Year

# 2.8.3. For radiated emissions test (30-1000MHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESVS10	100004	June 25,16	1 Year
Spectrum Analyzer	Agilent	E4411B	MY50140697	June 25,16	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	June 28,15	3 Year
Signal Amplifier	Agilent	310N	187037	June 25,16	1 Year
RF Cable	MIYAZAKI	5D-2W	966 Chamber No.1	June 25,16	1 Year

# 2.8.4. For radiated emission test(above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna		BBHA 9120 D		June 28,15	3 Year
	ECK		002	·	
Board-Band Horn Antenna	SCHWARZB ECK	BBHA 9170	9170-497	June 28,15	3Year
Signal Amplifier	SCHWARZB ECK	BBV9718	9718-212	June 25,16	1 Year
Spectrum Analyzer	Agilent	E4408B	MY44211139	June 25,16	1 Year
Spectrum Analyzer	Rohde &Schwarz	FSV	103173	June 25,16	1 Year
RF Cable	Hubersuhner	RG 214/U	513423	June 25,16	1 Year



# 3 POWER LINE CONDUCTED EMISSION TEST

# 3.1Limit

	Maximum RF Line Voltage				
Frequency	Quasi-Peak Level	Average Level			
	$dB(\mu V)$	$dB(\mu V)$			
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*			
500kHz ~ 5MHz	56	46			
5MHz ~ 30MHz	60	50			

Notes: 1. \* Decreasing linearly with logarithm of frequency.

# 3.2 Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS30) is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked.

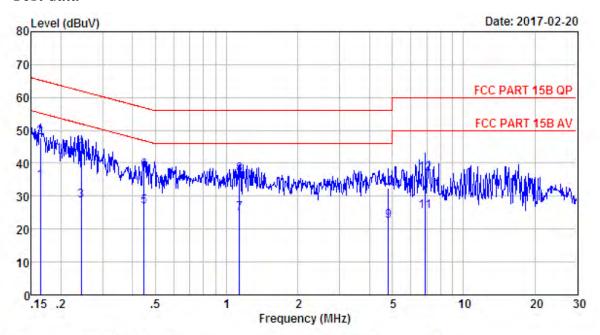
### 3.3. Test Result

**PASS.** (All emissions not reported below are too low against the prescribed limits.)



<sup>2.</sup> The lower limit shall apply at the transition frequencies.

#### 3.4. Test data



Site no : 844 Shield Room Data no. : 373 Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : LINE

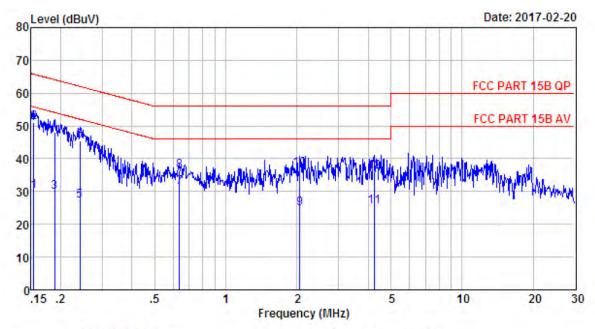
: FCC PART 15B QP : Tony Limit

Engineer

: Sound Bar System EUT : AC 120V/60Hz Power M/N : SB3621n-E8M Test Mode : TX Mode

	Freq.	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.16	9.61	9.81	15,07	34.49	55.30	20.81	Average
2	0.16	9.61	9.81	28.45	47.87	65.30	17.43	QP
3	0.24	9.61	9.82	9.25	28.68	52.00	23.32	Average
4	0.24	9.61	9.82	25.07	44.50	62.00	17.50	QP
5	0.45	9.61	9.81	7.35	26.77	46.89	20.12	Average
6	0.45	9.61	9.81	18.43	37.85	56.89	19.04	QP
7	1.14	9.63	9.81	5.30	24.74	46.00	21.26	Average
8	1.14	9.63	9.81	17.07	36.51	56.00	19.49	QP
9	4.82	9.65	9.85	3.08	22.58	46.00	23.42	Average
10	4.82	9.65	9.85	12.93	32.43	56.00	23.57	QP
11	6.91	9.66	9.86	5.81	25.33	50.00	24.67	Average
12	6.91	9.66	9.86	17.47	36.99	60.00	23.01	QP





Site no : 844 Shield Room Data no. : 375 Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : NEUTRAL

: FCC PART 15B QP : Tony Limit

Engineer

: Sound Bar System EUT Power : AC 120V/60Hz M/N : SB3621n-E8M Test Mode : TX Mode

	Freq.	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin	Remark
1	0.15	9.47	9.81	10.69	29.97	55.78	25.81	Average
2	0.15	9.47	9.81	31,92	51.20	65.78	14.58	QP
3	0.19	9.57	9.80	10.39	29.76	54,11	24.35	Average
4	0.19	9.57	9.80	28.64	48.01	64.11	16.10	QP
5	0.24	9.60	9.82	7.63	27.05	52.04	24.99	Average
6	0.24	9.60	9.82	26.12	45.54	62.04	16.50	QP
7	0.64	9.62	9.81	11.76	31.19	46.00	14.81	Average
8	0.64	9.62	9.81	16.82	36.25	56.00	19.75	QP
9	2.05	9.62	9.84	5.37	24.83	46.00	21.17	Average
10	2.05	9.62	9.84	17.42	36.88	56.00	19.12	QP
11	4.25	9.64	9.85	5.99	25.48	46.00	20.52	Average
12	4.25	9.64	9.85	16.46	35.95	56.00	20.05	QP



# 4 RADIATED EMISSION TEST

#### 4.1 Limit

#### 4.1.1 15.209 limits

Frequency (MHz)	Field strength (μV/m)	Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark : (1) Emission level  $dB\mu V = 20 \log Emission$  level  $\mu V/m$ 

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

# 4.1.2 15.205 Restricted bands of operation

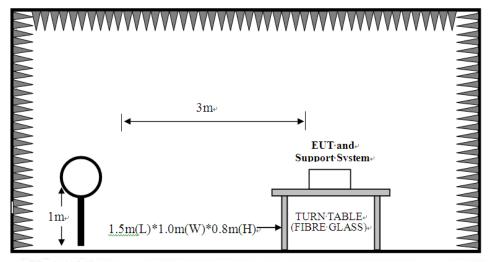
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
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	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	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	( <sup>2</sup> )

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

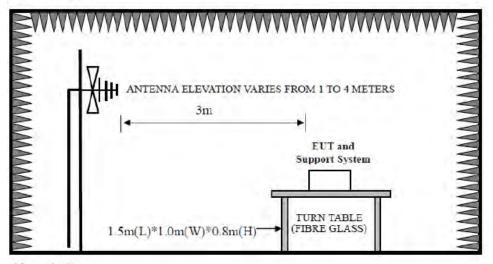


# 4.2. Block Diagram of Test setup

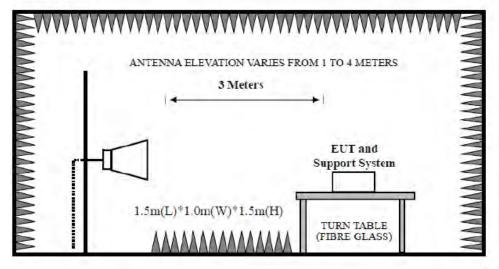
9kHz~30MHz



30~1000MHz



Above 1GHz



#### 4.3. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground for 9kHz~1000MHz test, and wiich is 1.5 meter high above ground for above 1GHz test. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

The test frequency analyzer system was set to Peak Detect (300Hz RBW in 9kHz to 150kHz and 10kHz RBW in 150kHz to 30MHz) Function and Specified Bandwidth with Maximum Hold Mode.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,

PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10th harmonic (25GHz) are checked.

#### 4.4. Test Result

#### PASS.

All the emissions from 30MHz to 25 GHz were comply with 15.209 limits.

- Note: 1. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
  - 2. The frequency 2402MHz \, 2440MHz and 2480 MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.



# 4.5. Test Data

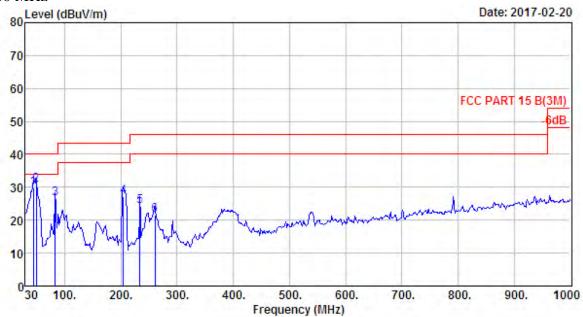
9 kHz – 30 MHz

Pass

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



#### 30-1000 MHz



Site no. : 1# 966 Chamber Dis. / Ant. : 3m 27137 Data no. : 109 Ant. pol. : VERTICAL

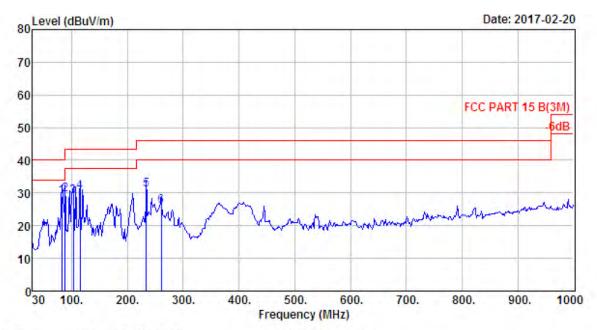
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

: Tony Engineer

EUT : Sound Bar System : AC 120V/60Hz Power M/N : SB3621-E8M : GFSK TX 2402MHz Test Mode

	Freq.	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	44.55	10.07	0.85	18.90	29.82	40.00	10.18	QP
2	49.40	7.90	0.95	21.80	30.65	40.00	9.35	QP
3	83.35	7.47	1.23	17.74	26.44	40.00	13.56	QP
4	204.60	7.91	1.88	17.25	27.04	43.50	16.46	QP
5	233.70	9.64	2.09	12.52	24.25	46.00	21.75	QP
6	260.86	12.96	2.22	6.37	21.55	46.00	24.45	QP





Site no. : 1# 966 Chamber Dis. / Ant. : 3m 27137 Data no. : 110 Ant. pol. : HORIZONTAL

Limit : FCC PART 15 B(3M)

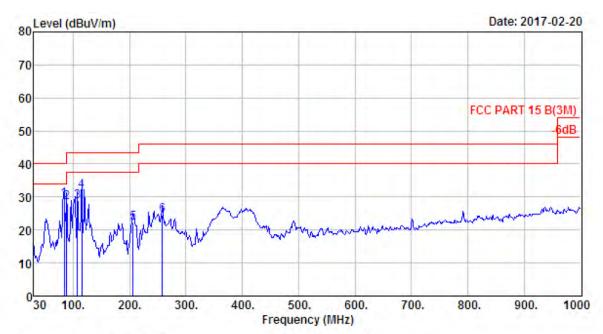
Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

EUT : Sound Bar System
Power : AC 120V/60Hz
M/N : SB3621-E8M
Test Mode : GFSK TX 2402MHz

	Freq.	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	82.38	7.34	1.25	20.36	28.95	40.00	11.05	QF
2	88.20	8.11	1.31	20.15	29.57	43.50	13.93	QP
3	102.75	9.75	1.35	17.90	29.00	43.50	14.50	QP
4	115.36	10.93	1.46	18.12	30.51	43.50	12.99	QP
5	233.70	9.64	2.09	19.25	30.98	46.00	15.02	QP
6	260.86	12.96	2.22	10.75	25.93	46.00	20.07	QP





Site no. : 1# 966 Chamber

Data no. : 111 Ant. pol. : HORIZONTAL Dis. / Ant. : 3m 27137

: FCC PART 15 B (3M) Limit

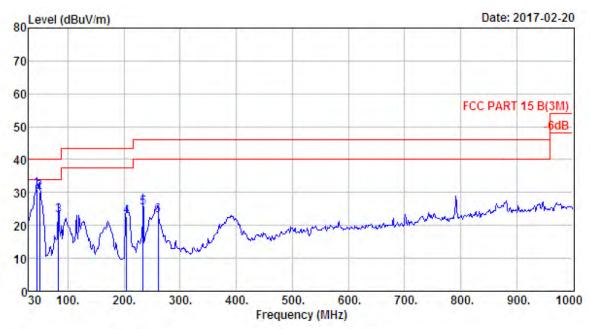
Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

EUT : Sound Bar System Power : AC 120V/60Hz M/N : SB3621-E8M Test Mode : GFSK TX 2440MHz

	Freq.	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	84.32	7.60	1.21	20.29	29.10	40.00	10.90	QP
2	88.20	8.11	1.31	18.96	28.38	43.50	15.12	QP
3	107.60	10.24	1.39	16.97	28.60	43.50	14.90	QP
4	115.36	10.93	1.46	19.54	31.93	43.50	11.57	QP
5	206.54	8.09	1.81	12.28	22.18	43.50	21.32	QP
6	257.95	12.75	2.19	9.62	24.56	46.00	21.44	QP





Site no. : 1# 966 Chamber Data no. : 112
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL

Limit : FCC PART 15 B (3M)

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

EUT : Sound Bar System

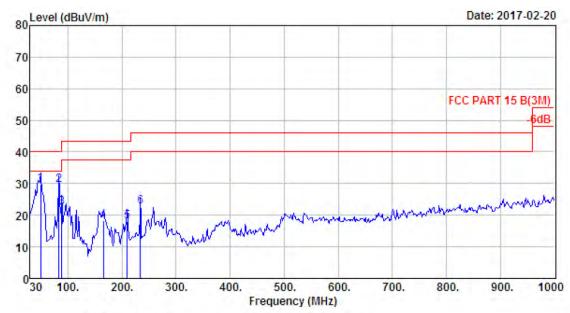
Power : AC 120V/60Hz

M/N : SB3621-E8M

Test Mode : GFSK TX 2440MHz

	Freq.	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	44.55	10.07	0.85	19.99	30.91	40.00	9.09	QP
2	49.40	7.90	0.95	21.26	30.11	40.00	9.89	QP
3	83.35	7.47	1.23	14.47	23.17	40.00	16.83	QP
4	204.60	7.91	1.88	13.06	22.85	43.50	20.65	QP
5	233.70	9.64	2.09	13.77	25.50	46.00	20.50	QP
6	260.86	12.96	2.22	7.90	23.08	46.00	22.92	QP





Site no. : 1# 966 Chamber Data no. : 113
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL

Limit : FCC PART 15 B (3M)

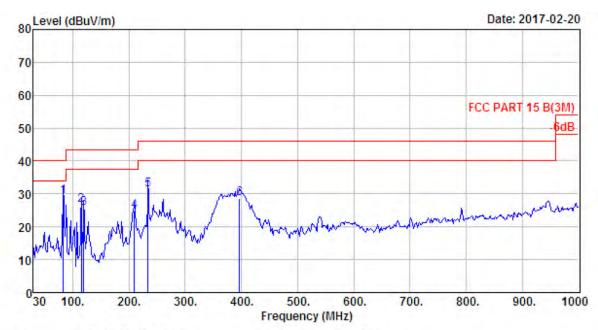
Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

EUT : Sound Bar System
Power : AC 120V/60Hz
M/N : SB3621-E8M
Test Mode : GFSK TX 2480MHz

	Freq.	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	49.40	7.90	0.95	20.98	29.83	40.00	10.17	QP
2	83.35	7.47	1.23	20.73	29.43	40.00	10.57	QP
3	88.20	8.11	1.31	12.90	22.32	43.50	21.18	QP
4	165.80	9.66	1.68	7.09	18.43	43.50	25.07	QP
5	209.45	8.37	1.91	7.66	17.94	43.50	25.56	QP
6	233.70	9.64	2.09	10.91	22.64	46.00	23.36	QP





Site no. : 1# 966 Chamber Dis. / Ant. : 3m 27137

Data no. : 114 Ant. pol. : HORIZONTAL

Limit : FCC PART 15 B(3M)

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

EUT : Sound Bar System
Power : AC 120V/60Hz
M/N : SB3621-E8M
Test Mode : GFSK TX 2480MHz

	Freq.	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	83.35	7.47	1.23	20.53	29.23	40.00	10.77	QP
2	115.36	10.93	1.46	14.19	26.58	43.50	16.92	QP
3	119.24	11.11	1.42	13.16	25.69	43.50	17.81	QP
4	209.45	8.37	1.91	14.37	24.65	43.50	18.85	QP
5	233.70	9.64	2.09	19.45	31.18	46.00	14.82	QP
6	396.66	15.91	2.63	10.00	28.54	46.00	17.46	QP



#### Above 1000MHz

Site no. : 966 Chamber Data no. : 71

Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL

: FCC PART 15C PEAK

Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony

EUT : Sound Bar System Power : AC 120V/60Hz M/N : SB3621n-E8M Test Mode : GFSK TX 2402MHz

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	6.62	34.64	103.24	102.83	74.00	-28.83	Peak
2	4804.00	31.25	11.77	35.64	41.39	48.77	74.00	25.23	Peak
3	7206.00	36.52	11.54	33.95	34.13	48.24	74.00	25.76	Peak
4	11200.00	39.39	11.14	33.24	25.67	42.96	74.00	31.04	Peak
5	13444.00	39.95	11.49	32.74	24.59	43.29	74.00	30.71	Peak
6	18000.00	46.45	11.38	32.12	21.47	47.18	74.00	26.82	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. The emission levels that are 20dB below the official limit are not reported.

: 966 Chamber Data no. : 72 Site no.

Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL

: FCC PART 15C PEAK Limit

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

: Tony Engineer

EUT : Sound Bar System Power : AC 120V/60Hz M/N : SB3621n-E8M Test Mode : GFSK TX 2402MHz

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	6.62	34.64	106.96	106.55	74.00	-32.55	Peak
2	4804.00	31.25	11.77	35.64	40.47	47.85	74.00	26.15	Peak
3	7206.00	36.52	11.54	33.95	33.85	47.96	74.00	26.04	Peak
4	11200.00	39.39	11.14	33.24	26.23	43.52	74.00	30.48	Peak
5	13835.00	41.02	11.10	33.06	25.91	44.97	74.00	29.03	Peak
6	17864.00	45.12	11.22	30.66	22.57	48.25	74.00	25.75	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.



Data no. : 73 Site no. : 966 Chamber
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL

: FCC PART 15C PEAK Limit

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

: Tony Engineer

EUT : Sound Bar System Power : AC 120V/60Hz M/N : SB3621n-E8M Test Mode : GFSK TX 2440MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.00	27.60	6.67	34.85	102.56	101.98	74.00	-27.98	Peak
2	4880.00	31.37	12.07	35.76	40.68	48.36	74.00	25.64	Peak
3	7320.00	36.55	11.57	34.14	34.54	48.52	74.00	25.48	Peak
4	11251.00	39.35	11.10	33.25	25.49	42.69	74.00	31.31	Peak
5	14430.00	41.82	10.93	33.41	23.61	42.95	74.00	31.05	Peak
6	18000.00	46.45	11.38	32.12	21.43	47.14	74.00	26.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. The emission levels that are 20dB below the official limit are not reported.

Data no. : 74

Site no. : 966 Chamber
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL

: FCC PART 15C PEAK Limit

Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa Engineer : Tony

: Sound Bar System EUT : AC 120V/60Hz Power M/N : SB3621n-E8M Test Mode : GFSK TX 2440MHz

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.00	27.60	6.67	34.85	105.63	105.05	74.00	-31.05	Peak
2	4880.00	31.37	12.07	35.76	39.19	46.87	74.00	27.13	Peak
3	7320.00	36.55	11.57	34.14	33.40	47.38	74.00	26.62	Peak
4	10996.00	39.52	11.29	34.11	25.90	42.60	74.00	31.40	Peak
5	14430.00	41.82	10.93	33.41	25.81	45.15	74.00	28.85	Peak
6	17677.00	43.29	11.00	31.79	25.03	47.53	74.00	26.47	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.



Site no. : 966 Chamber Data no. : 75
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HOP Ant. pol. : HORIZONTAL

: FCC PART 15C PEAK

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

: Sound Bar System EUT : AC 120V/60Hz Power M/N : SB3621n-E8M Test Mode : GFSK TX 2480MHz

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.58	6.71	35.11	106.30	105.48	74.00	-31.48	Peak
2	4960.00	31.49	12.44	36.01	43.73	51.65	74.00	22.35	Peak
3	7440.00	36.54	11.61	34.22	34.90	48.83	74.00	25.17	Peak
4	9109.00	37.59	11.51	34.10	29.42	44.42	74.00	29.58	Peak
5	13835.00	41.02	11.10	33.06	25.94	45.00	74.00	29.00	Peak
6	17983.00	46.28	11.36	31.94	25.21	50.91	74.00	23.09	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

2. The emission levels that are 20dB below the official limit are not reported.

: 966 Chamber Data no. : 76 Site no. Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Sound Bar System

EUT Power : AC 120V/60Hz
M/N : SB3621n-E8M
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.58	6.71	35.11	101.93	101.11	74.00	-27.11	Peak
2	4960.00	31.49	12.44	36.01	41.37	49.29	74.00	24.71	Peak
3	7440.00	36.54	11.61	34.22	31.06	44.99	74.00	29.01	Peak
4	10690.00	39.18	11.30	34.22	24.88	41.14	74.00	32.86	Peak
5	14294.00	41.71	10.92	33.42	25.06	44.27	74.00	29.73	Peak
6	17966.00	46.12	11.34	31.76	22.24	47.94	74.00	26.06	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

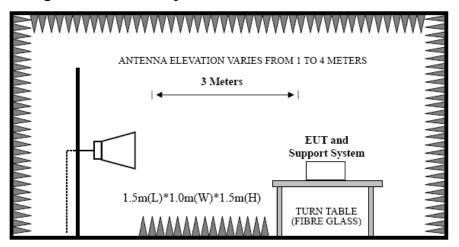


# 5 BAND EDGE COMPLIANCE TEST

# 5.1 Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits

# 5.2 Block Diagram of Test setup



# 5.3 Test Procedure

- 1. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.
- 2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

Peak: RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto. AV: RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto.

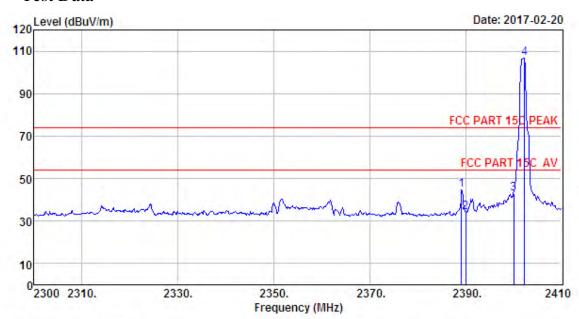
#### 5.4 Test Result

Pass (The testing data was attached in the next pages.)

- Note: 1. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
  - 2. The frequency 2402MHz and 2480 MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.



# 5.5 Test Data



Site no. : 966 Chamber Data no. : 77

Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

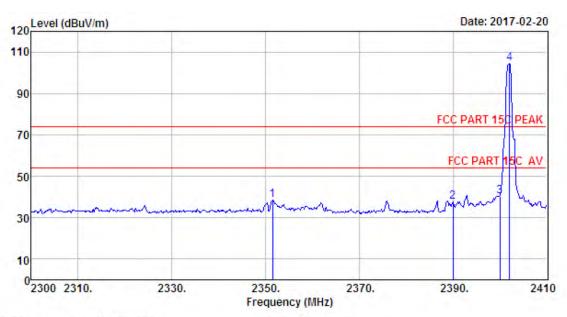
Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony
EUT : Sound Bar System
Power : AC 120V/60Hz
M/N : SB3621n-E8M
Test Mode : GFSK TX 2402MHz

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2389.10	27.64	6.62	34.62	44.96	44.60	74.00	29.40	Peak
2	2390.00	27.64	6.62	34.62	34.50	34.14	74.00	39.86	Peak
3	2400.00	27.61	6.62	34.64	43.29	42.88	74.00	31.12	Peak
4	2402.30	27.61	6.62	34.64	107.25	106.84	74.00	-32.84	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.





Site no. : 966 Chamber Data no. : 78
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

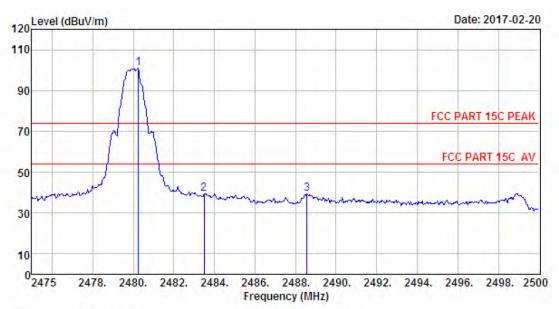
Engineer : Tony

EUT : Sound Bar System
Power : AC 120V/60Hz
M/N : SB3621n-E8M
Test Mode : GFSK TX 2402MHz

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2351.48	27.70	6.56	34.57	38.94	38.63	74.00	35.37	Peak
2	2390.00	27.64	6.62	34.62	37.87	37.51	74.00	36.49	Peak
3	2400.00	27.61	6.62	34.64	40.89	40.48	74.00	33.52	Peak
4	2402.08	27.61	6.62	34.64	104.75	104.34	74.00	-30.34	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.





Site no. : 966 Chamber Data no. : 79
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

Engineer : Tony

EUT : Sound Bar System

Power : AC 120V/60Hz

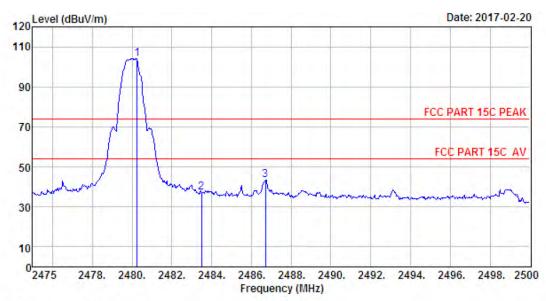
M/N : SB3621n-E8M

Test Mode : GFSK TX 2480MHz

		Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1	2480.25	27.58	6.71	35.11	101.57	100.75	74.00	-26.75	Peak
	2	2483.50	27.58	6.71	35.11	40.41	39.59	74.00	34.41	Peak
	3	2488.55	27,58	6.73	35.11	39.99	39.19	74.00	34.81	Peak

Remarks: 1, Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.





Site no. : 966 Chamber Data no. : 80

Dis. / Ant. : 3m ANT 1-18G Limit : FCC PART 15C PEAK Ant. pol. : HORIZONTAL

Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa

: Tony Engineer

EUT : Sound Bar System Power : AC 120V/60Hz M/N : SB3621n-E8M : GFSK TX 2480MHz Test Mode

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.25	27.58	6.71	35.11	105.01	104.19	74.00	-30.19	Peak
2	2483.50	27.58	6,71	35.11	37.97	37.15	74.00	36.85	Peak
3	2486.70	27.58	6.71	35.11	44.06	43.24	74.00	30.76	Peak

Remarks: 1, Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.



# 6 6dB Bandwidth Test

# 6.1 Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

# 6.2 Test Procedure

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
- 2, Follow the test procedure as described in KDB 558074
  - (1). Set resolution bandwidth (RBW) = 100 kHz.
  - (2). Set the video bandwidth (VBW)  $\geq 3 \times RBW$ .
  - (3). Detector = Peak.
  - (4). Trace mode = max hold.
  - (5). Sweep = auto couple.
  - (6). Allow the trace to stabilize.
  - (7). Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

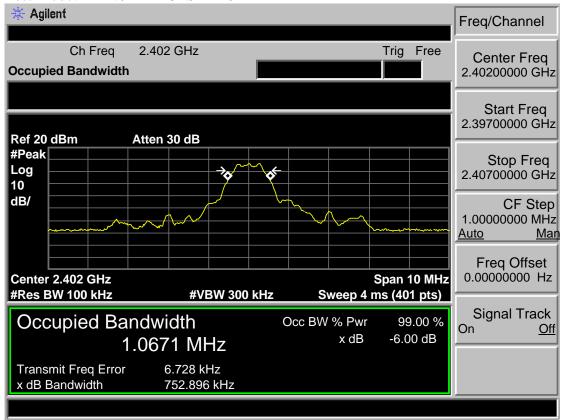
# 6.3 Test Result

EUT: Sound Bar System									
M/N: SB36211	n-E8M								
Test date: 2017-02-25 Tested by: Tony.Tang Test site: RF Site									
Test Mode CH 6dB bandwidth (MHz) Limit (KHz)									
DT 4 0 DI E	CH1	0.753	>500						
BT 4.0-BLE CH20 0.763 >500									
OFSIX	CH40	0.755	>500						
Conclusion: PASS									

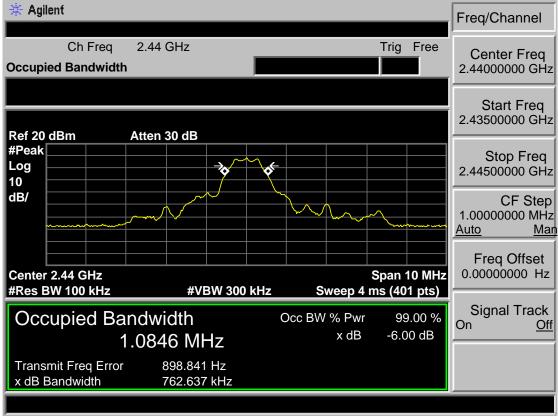


#### 6.4 Test Data

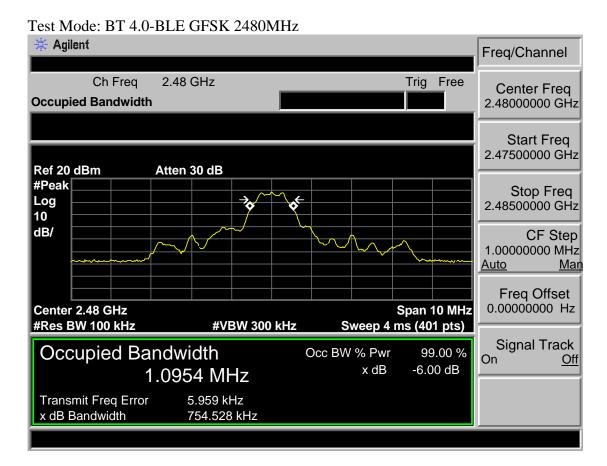
Test Mode: BT 4.0-BLE GFSK 2402MHz



Test Mode: BT 4.0-BLE GFSK 2440MHz









# 7 OUTPUT POWER TEST

#### 7.1 Limit

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

### 7.2 Test Procedure

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
- 2, Follow the test procedure as described in KDB 558074
  - (1). Set the RBW  $\geq$  DTS bandwidth.
  - (2). Set VBW  $\geq$  3 x RBW.
  - (3). Set span  $\geq$  3 x RBW.
  - (4). Sweep time = auto couple.
  - (5). Detector = peak.
  - (6). Trace mode = max hold.
  - (7). Allow trace to fully stabilize.
  - (8). Use peak marker function to determine the peak amplitude level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offs

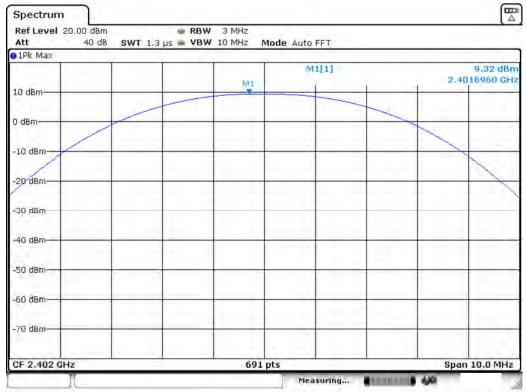
# 7.3 Test Result

EUT:Sound Bar System									
M/N:SB3621n-E8M									
Test date: 2017-02-25 Test site: 3m Chamber Tested by: Tony Tang									
		Pass							
Test Mode CH Peak output Power (dBm)  Limit (dBm)									
DT 4 O DI E	CH1	9.32	30						
BT 4.0-BLE CH20 8.95 30									
OFSK	CH40	8.76	30						
Conclusion: PASS									

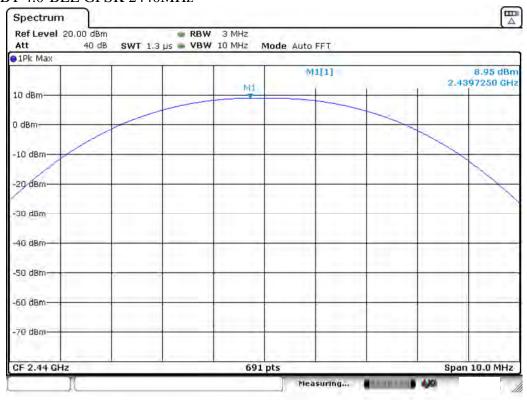


# 7.4 Test Data

# Test Mode: BT 4.0-BLE GFSK 2402MHz

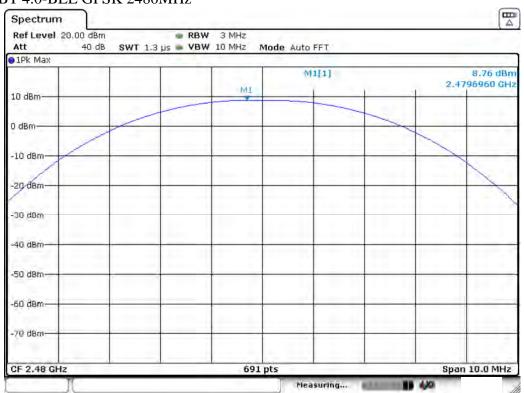


# Test Mode: BT 4.0-BLE GFSK 2440MHz





### Test Mode: BT 4.0-BLE GFSK 2480MHz





### 8 POWER SPECTRAL DENSITY TEST

#### 8.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

#### 8.2 Test Procedure

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
- 2, Follow the test procedure as described in KDB 558074
- (1). Set analyzer center frequency to DTS channel center frequency.
- (2). Set the span to 1.5 times the DTS bandwidth.
- (3). Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- (4). Set the VBW  $\geq$  3 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.

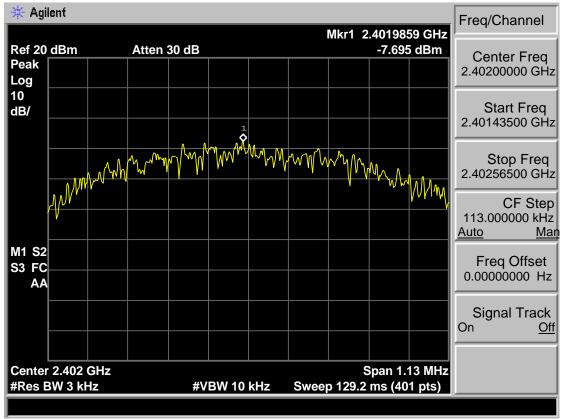
### 8.3 Test Result

EUT: Sound Bar System			
M/N: SB3621n-E8M			
Test date: 2017-02-25		Test site: 3m Chamber	Tested by: Tony Tang
Pass			
Test Mode	СН	Power density (dBm/3kHz)	Limit (dBm/3kHz)
BT 4.0-BLE GFSK	CH1	-7.695	8
	CH20	-6.566	8
	CH40	-5.972	8
Conclusion: PASS			

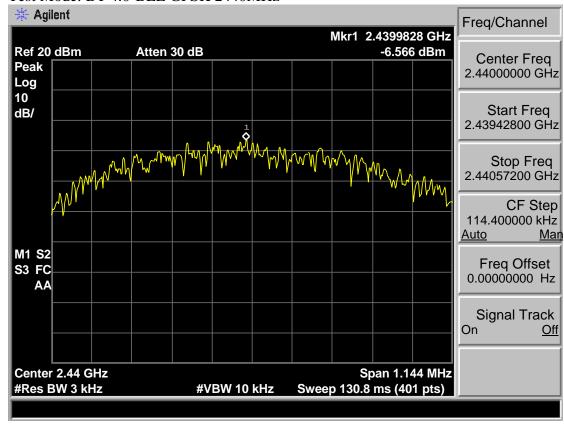


### 8.4 Test Data

Test Mode: BT 4.0-BLE GFSK 2402MHz

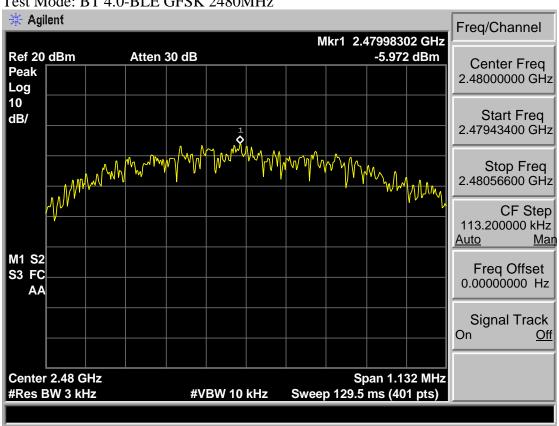


Test Mode: BT 4.0-BLE GFSK 2440MHz





### Test Mode: BT 4.0-BLE GFSK 2480MHz





## 9 ANTENNA REQUIREMENTS

### 9.1 Limit

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 9.2 Result

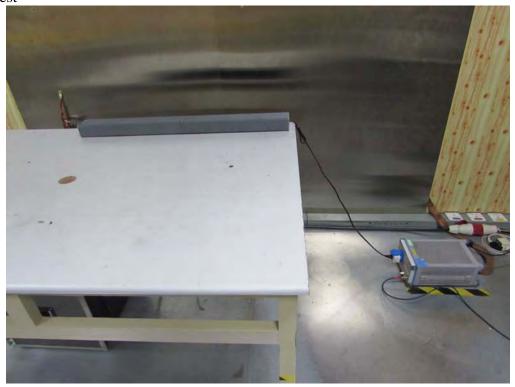
The antennas used for this product are integral antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 2.00 dBi.



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# 10 TEST SETUP PHOTO

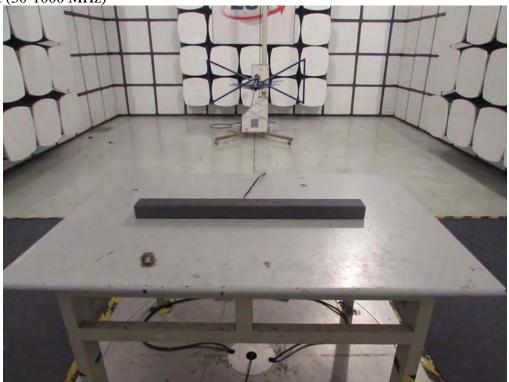
## Conducted Test



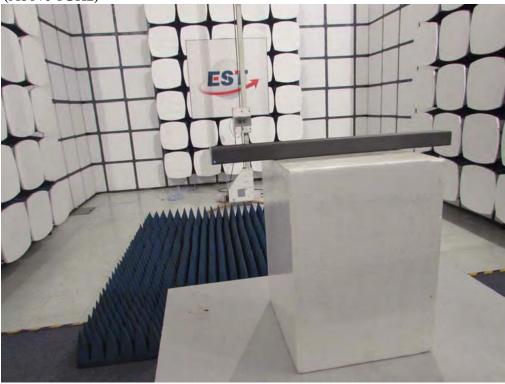




Radiated Test (30-1000 MHz)



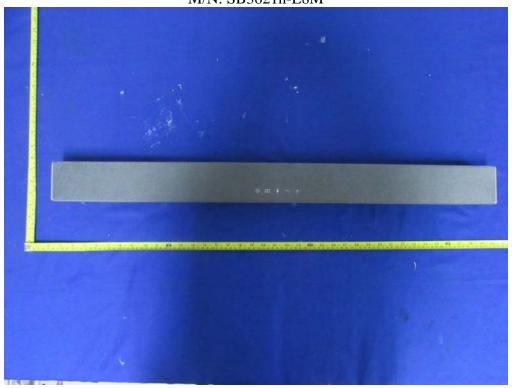
## Radiated Test (Above 1GHz)

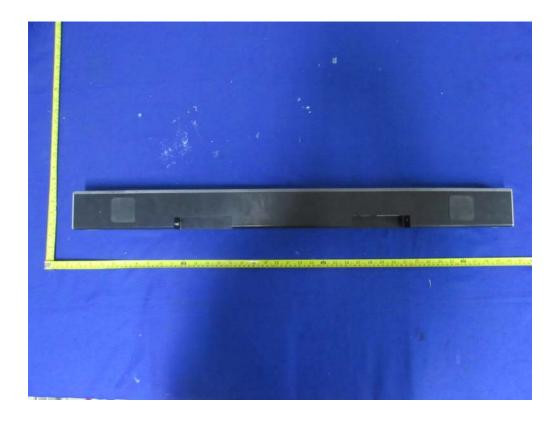




# 11 PHOTO EUT

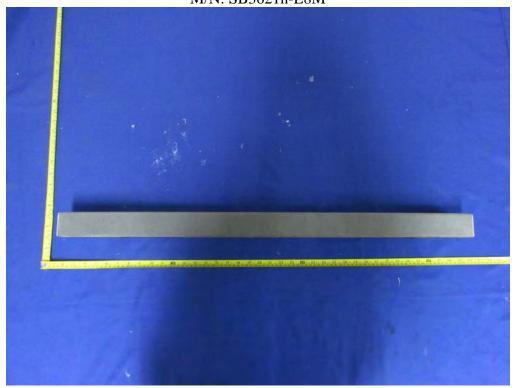
External Photos M/N: SB3621n-E8M

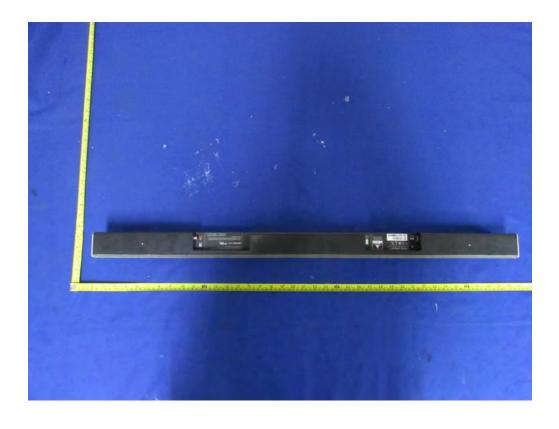






External Photos M/N: SB3621n-E8M

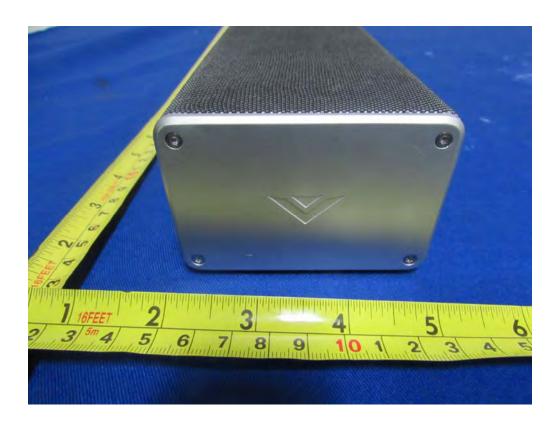






External Photos M/N: SB3621n-E8M







External Photos M/N: SB3621n-E8M

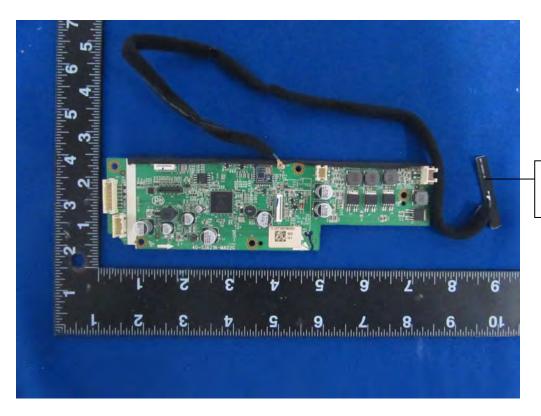






Internal Photos M/N: SB3621n-E8M





Bluetooth Antenna

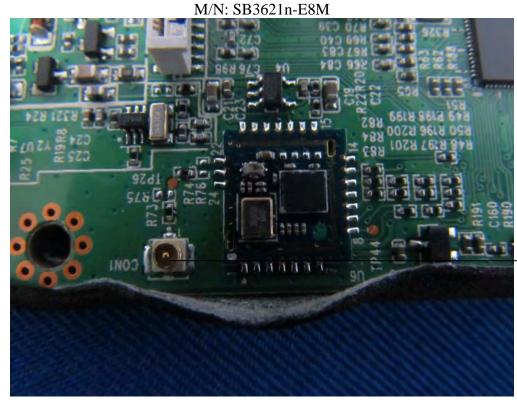




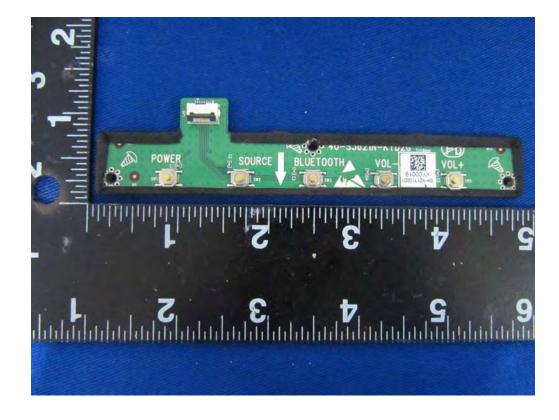




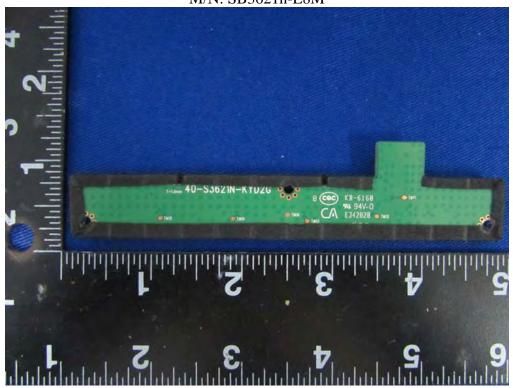
# Internal Photos

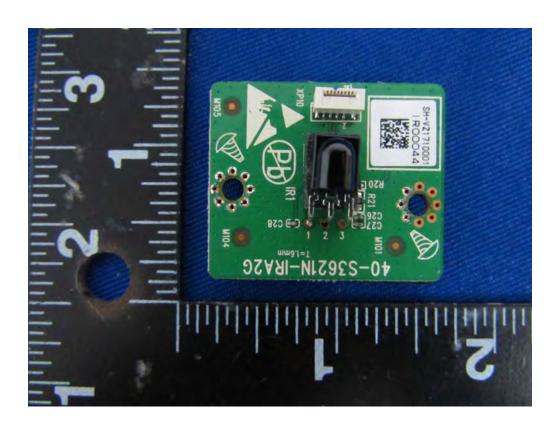


ipex connector

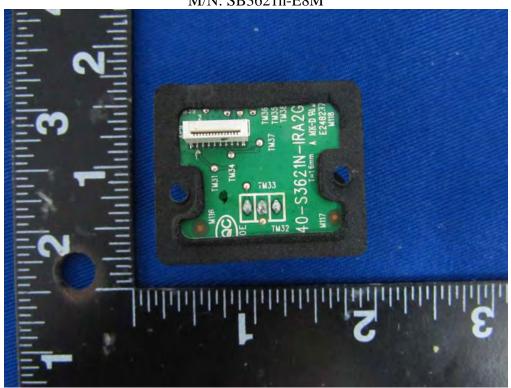


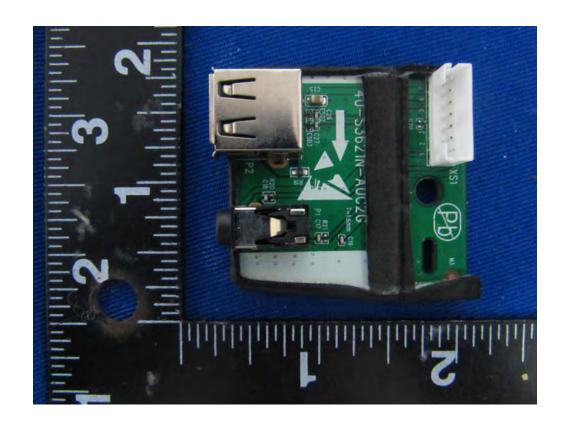






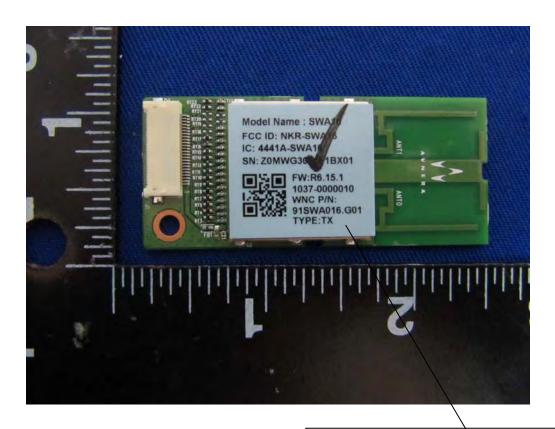








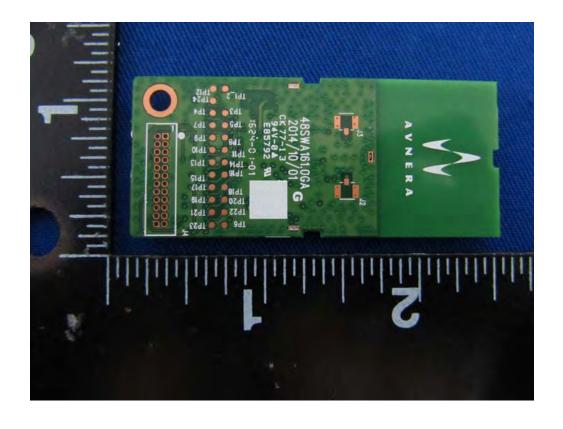




This's 2.4G wireless module, has been completed FCC and IC RF approval.

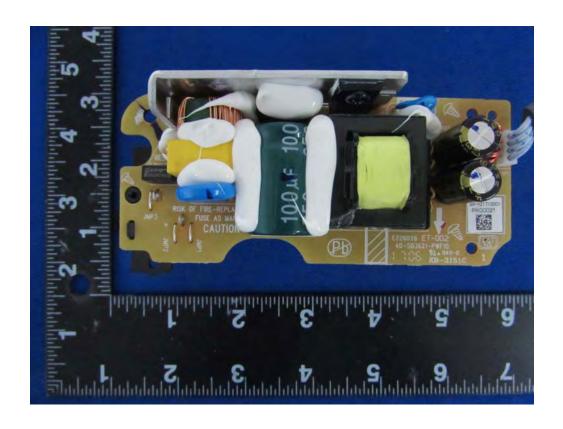




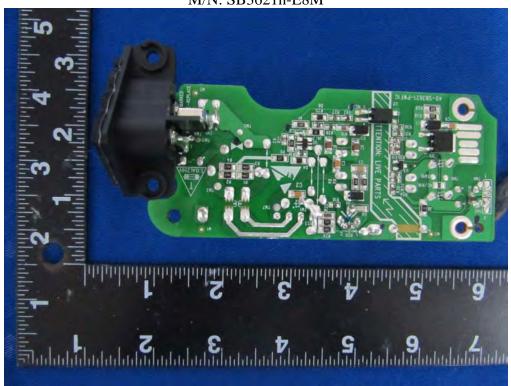














## **Remote control Photos**





