

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC142205
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FCC Radio Test Report FCC ID: 2ABNJ-BV200

Original Grant

Report No. : TB-FCC142205

Applicant: ShenZhen SeeMeHere Electronic Co., Ltd.

Equipment Under Test (EUT)

EUT Name: Bluetooth Speaker

Model No. : BV200 Series Model : N/A

No.

Brand Name: See me here

Receipt Date : 2014-09-29

Test Date : 2014-09-29 to 2014-10-23

Issue Date : 2014-10-25

Standards: FCC Part 15, Subpart C(15.247)

Test Method : ANSI C63.4:2003

Conclusions : PASS

In the configuration tested, the EUT complied with the standards specified above,

The EUT technically complies with the FCC requirements

Test/Witness Engineer :

Approved& Authorized

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0



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1. General Information about EUT

1.1 Client Information

Applicant: ShenZhen SeeMeHere Electronic Co., Ltd.

Address: 3-4th Floor, Building D, TongFuYu Industrial Park, HangKong Road,

Xixiang Town, Bao'an District, Shenzhen, China.

Manufacturer : ShenZhen SeeMeHere Electronic Co., Ltd.

Address : 3-4th Floor, Building D, TongFuYu Industrial Park, HangKong Road,

Xixiang Town, Bao'an District, Shenzhen, China.

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Bluetooth Speaker	Bluetooth Speaker			
Models No.	:	BV200				
Model	:	N/A				
Difference						
		Operation Frequency: Bluetooth:2402~2480MHz	Operation Frequency: Bluetooth:2402~2480MHz			
Product		Number of Channel:	Bluetooth:79 Channels see note (2)			
Description	:	Max Peak Output Power:	GFSK:0.459 dBm (Conducted Power)			
		Antenna Gain:	2 dBi PCB Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps) π /4-DQPSK(2 Mbps) 8-DPSK(3 Mbps)			
Power Supply	:	DC Voltage supplied from	Host System by USB cable			
		DC power by Li-ion Battery	,			
Power Rating	:	DC 5.0V by USB cable.				
		DC 3.7V Li-ion Battery.				
Connecting I/O Port(S)	:	Please refer to the User's Manual				
Note:	•					

Note:

- (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (2) This Test Report is FCC Part 15.247 for Bluetooth, and test procedure in accordance with Public Notice: DA 00-705.
- (3) Channel List:



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

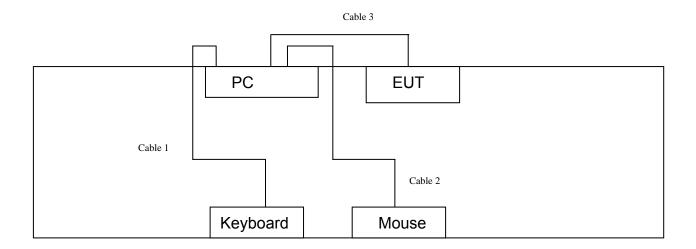
⁽⁴⁾ The Antenna information about the equipment is provided by the applicant.



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1.3 Block Diagram Showing the Configuration of System Tested

TX Mode



1.4 Description of Support Units

Equipment Information							
Name Model		FCC ID/DOC	Manufacturer	Used "√"			
LCD Monitor	E170Sc	DOC	DELL	√			
PC	OPTIPLEX380	DOC	DELL	√			
Keyboard	L100	DOC	DELL	√			
Mouse	M-UARDEL7	DOC	DELL	√			
		Cable Information					
Number	Shielded Type	Ferrite Core	Length	Note			
Cable 1	YES	NO	1.5M				
Cable 2 YES NO		1.5M					
Cable 3 NO		YES	0.25M	Accessories			

1.5 Description of Test Mode

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 follow was evaluated respectively.



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For Conducted Test				
Final Test Mode	Description			
Mode 1	USB Charging with TX GFSK Mode			

For Radiated Test					
Final Test Mode	Description				
Mode 1	USB Charging with TX GFSK Mode				
Mode 2	TX Mode(GFSK) Channel 00/39/78				
Mode 3	TX Mode(π /4-DQPSK) Channel 00/39/78				
Mode 4	TX Mode(8-DPSK) Channel 00/39/78				
Mode 5	Hopping Mode(GFSK)				
Mode 6	Hopping Mode(π /4-DQPSK)				
Mode 7	Hopping Mode(8-DPSK)				

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate. We have pretested all the test mode above.

According to ANSI C63.4 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

TX Mode: GFSK (1 Mbps)
TX Mode: 8-DPSK (3 Mbps)

(2) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane as the normal use. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of Bluetooth mode.

Test Software Version	RDA Bluetooth Test Tool				
Frequency	2402 MHz	2441MHz	2480 MHz		
GFSK	DEF	DEF	DEF		
π /4-DQPSK	DEF	DEF	DEF		
8-DPSK	DEF	DEF	DEF		



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1.7 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



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2. Test Summary

FCC Part 15 Subpart C(15.247)							
Standard Section	Test Item	Judgment	Remark				
15.203	Antenna Requirement	PASS	N/A				
15.207	Conducted Emission	PASS	N/A				
15.205	Restricted Bands	PASS	N/A				
15.247(a)(1)	Hopping Channel Separation PASS		N/A				
15.247(a)(1)	Dwell Time	PASS	N/A				
15.247(b)(1)	Peak Output Power	PASS	N/A				
15.247(b)(1) Number of Hopping Frequency		PASS	N/A				
15.247(c)	Radiated Spurious Emission	PASS N/A					
Antenna Conducted Spurious Emission		PASS	N/A				
15.247(a) 20dB Bandwidth PASS N/A		N/A					
Note: N/A is an abbreviat	Note: N/A is an abbreviation for Not Applicable.						



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3. Conducted Emission Test

3.1 Test Standard and Limit

3.1.1Test Standard FCC Part 15.207

3.1.2 Test Limit

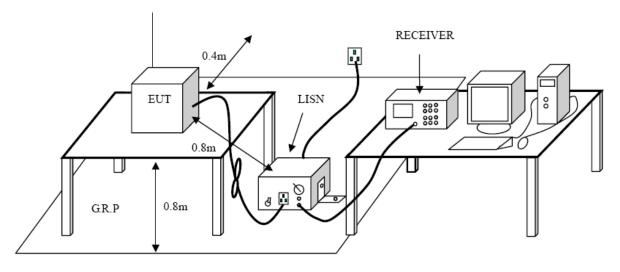
Conducted Emission Test Limit

Eroguanov	Maximum RF Line Voltage (dBμV)			
Frequency	Quasi-peak Level	Average Level		
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *		
500kHz~5MHz	56	46		
5MHz~30MHz	60	50		

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.2 Test Setup



3.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

3.4 Test Equipment Used

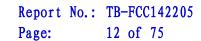
Description	escription Manufacturer		Serial No.	Cal. Date	Cal. Due Date
EMI Test	ROHDE&		400004	Aug. 09. 2014	Aug.07, 2015
Receiver	SCHWARZ	ESCI	100321	Aug. 08, 2014	Aug.07, 2015
50ΩCoaxial	Anritsu	MP59B	X10321	Aug. 08, 2014	Aug.07, 2015
Switch			X10321	Aug. 06, 2014	Aug.07, 2015
L.I.S.N	Rohde & Schwarz	ENV216	101131	Aug. 08, 2014	Aug.07, 2015
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 08, 2014	Aug.07, 2015

3.5 EUT Operating Mode

Please refer to the description of test mode.

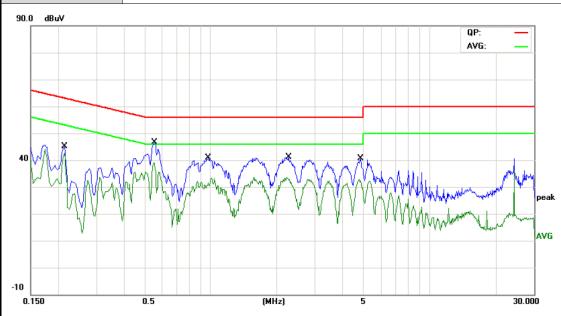
3.6 Test Data

Please see the next page.





EUT: Bluetooth Speaker **Model Name:** BV200 25 ℃ Temperature: **Relative Humidity:** 55% AC 120V/60 Hz **Test Voltage:** Terminal: Line **Test Mode:** USB Charging with TX GFSK Mode 2402 MHz Remark: Only worse case is reported



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	0.2140	33.72	10.02	43.74	63.04	-19.30	QP
2	0.2140	32.05	10.02	42.07	53.04	-10.97	AVG
3	0.5540	36.39	10.05	46.44	56.00	-9.56	QP
4 *	0.5540	28.72	10.05	38.77	46.00	-7.23	AVG
5	0.9740	29.58	10.07	39.65	56.00	-16.35	QP
6	0.9740	21.57	10.07	31.64	46.00	-14.36	AVG
7	2.2620	26.80	10.05	36.85	56.00	-19.15	QP
8	2.2620	22.72	10.05	32.77	46.00	-13.23	AVG
9	4.8260	25.25	9.97	35.22	56.00	-20.78	QP
10	4.8260	22.23	9.97	32.20	46.00	-13.80	AVG





EUT: BV200 Bluetooth Speaker **Model Name:** 25 ℃ **Relative Humidity:** Temperature: 55% **Test Voltage:** AC 120V/60 Hz Terminal: Neutral **Test Mode:** USB Charging with TX GFSK Mode 2402 MHz Remark: Only worse case is reported 90.0 dBuV QP: AVG: AVG 0.150 0.5 (MHz) 30.000 Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment dBuV dΒ MHz dΒ dBuV dBuV Detector 1 0.2140 33.81 10.02 43.83 63.04 -19.21 QΡ 2 0.2140 32.15 10.02 42.17 53.04 -10.87 AVG 36.34 3 0.5540 10.05 46.39 56.00 -9.61 QΡ 4 0.5540 28.71 10.05 38.76 46.00 -7.24 AVG QΡ 5 0.9740 29.64 10.07 39.71 56.00 -16.29 6 31.73 46.00 -14.27 AVG 0.9740 21.66 10.07 7 2.1900 28.73 10.05 38.78 56.00 -17.22 QΡ 8 2.1900 23.05 10.05 33.10 46.00 -12.90 **AVG** QΡ 9 4.8220 26.09 9.97 36.06 56.00 -19.94 22.20 32.17 10 4.8220 9.97 46.00 -13.83 AVG **Emission Level= Read Level+ Correct Factor**



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4. Radiated Emission Test

4.1 Test Standard and Limit

4.1.1 Test Standard FCC Part 15.209

4.1.2 Test Limit

Radiated Emission Limit (9 kHz~1000MHz)

(* 1111 1111								
Frequency (MHz	Field Strength (microvolt/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						

Radiated Emission Limit (Above 1000MHz)

Frequency	Class B (dBuV/m)(at 3m)				
(MHz)	Peak	Average			
Above 1000	74	54			

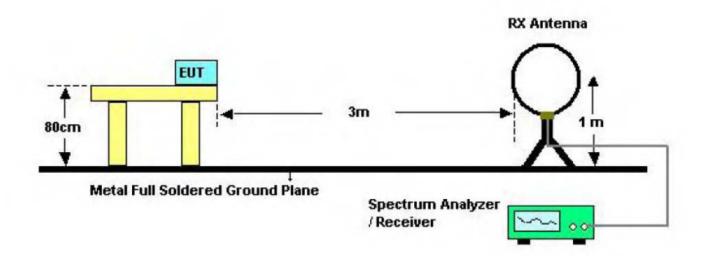
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m)

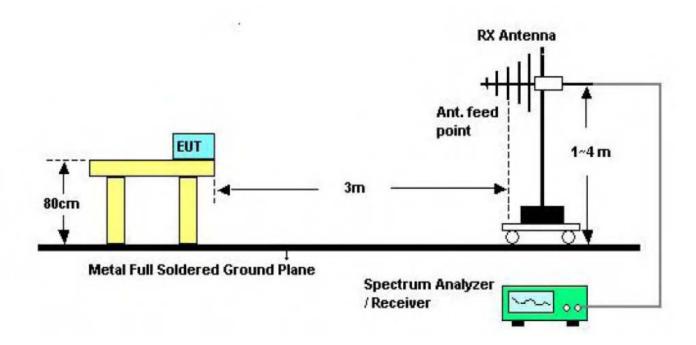


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4.2 Test Setup



Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup



Turntable

EUT

0.8 m lm to 4m

Coaxial Cable

Above 1GHz Test Setup

4.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above the ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) 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.
- (4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (6) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (7) For the actual test configuration, please see the test setup photo.

4.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power in TX mode.



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4.5 Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 08, 2014	Aug.07, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 08, 2014	Aug.07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 07, 2014	Mar.06, 2015
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 07, 2014	Mar.06, 2015
Pre-amplifier	HP	11909A	185903	Mar. 07, 2014	Mar.06, 2015
Pre-amplifier	HP	8447B	3008A00849	Mar. 07, 2014	Mar.06, 2015
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 07, 2014	Mar.06, 2015
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 11, 2014	Feb.10, 2015
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

4.6 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.



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UT:			Blu	etoc	oth S	Speak	er			Mod	del N	lame	:		BV2	00	
empe	ratur	ə :	25	$^{\circ}$ C					Relative Humidity: 55%								
est Vo	ltage):	DC	5V										·			
nt. Po	ol.		Hor	izor	ntal												
est M	ode:		TX	GF	SK I	Mode	2402	MHz									
Remar	k:		Onl	y w	orse	e case	e is re	ported									
80.0 dB	uV/m																_
												(RF)F	CC 15C	3M Ra			_
														Ma	rgin -6	dB	H
-					7							4 X					4
30					_					3	3		5 X	6 X	الإماراناليد	reknyterisch.	***
1 ~X	the state of the s						2 ¥	ner medal pelar series.		>	(MM	potalis	14 th All Control			
20 30.000	40	50	60	70 8	0			(MHz)		3	300	400	500	600	700	100	00.000
No.	Mk.	Fr	eq.	ſ		ading vel		orrect actor		asur nent	e-	Limi	t	Ov	er		
		M	Ηz		dE	Bu∀	d	B/m	dl	BuV/m	1	dBu∖	′/m	dE	3	Det	ecto
1		32.0	667		37	'.26	-1:	5.24	2	2.02		40.0	00	-17	.98	ре	eak
2		143.8	3295	5	43	3.72	-2	1.67	2	2.05		43.	50	-21	.45	ре	eak
3		300.3	3672	2	41	.48	-1	7.07	2	4.41		46.0	00	-21	.59	ре	eak
4	*	375.9	9385	5	51	.66	-14	4.40	3	7.26		46.0	00	-8.	74	ре	eak
5		513.6	331		38	3.66	-10	0.85	2	7.81		46.0	00	-18	.19	ре	eak
6		627.2	2738	3	38	.98	-8	3.53	3	0.45		46.0	00	-15	.55	ре	eak
							_										
*. 1. /	um data	a x:0\		.:4 1	.01/01	r margir	1										



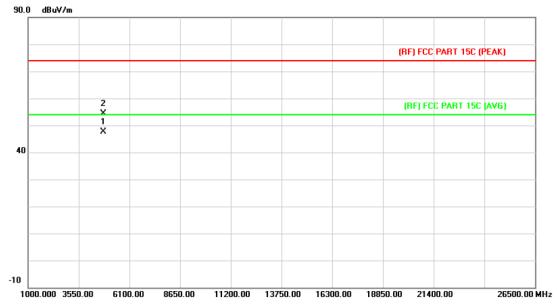
EUT: Bluetooth Speaker **Model Name:** BV200 25 ℃ **Relative Humidity:** Temperature: 55% **Test Voltage:** DC 5V Ant. Pol. Vertical **Test Mode:** TX GFSK Mode 2402MHz Remark: Only worse case is reported 80.0 dBuV/m (RF)FCC 15C 3M Radiation Margin -6 dB 30 -20 60 70 80 (MHz) 300 400 500 600 700 1000.000 30.000 40 50 Reading Correct Measure-Limit Over No. Mk. Freq. Factor Level ment MHz dBuV dBuV/m dBuV/m dΒ Detector dB/m 40.00 1 31.3992 48.45 -14.83 33.62 -6.38peak 2 42.3022 54.68 -21.14 33.54 40.00 -6.46 peak 3 71.8320 44.74 -23.56 21.18 40.00 -18.82 peak 4 124.5690 42.71 -22.35 20.36 -23.14 43.50 peak 5 143.8295 46.63 -21.67 24.96 43.50 -18.54 peak 6 375.9385 40.76 -14.40 26.36 46.00 -19.64 peak 7 996.4996 38.64 -4.41 34.23 54.00 -19.77 peak *:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor



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EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2402MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

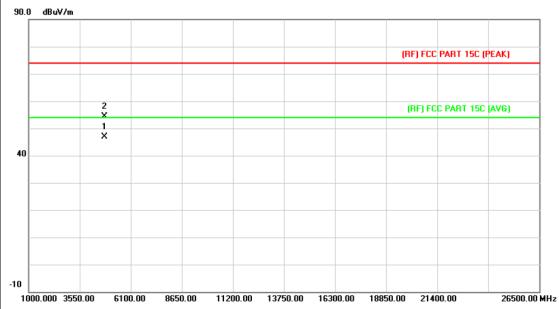


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.987	39.45	8.18	47.63	54.00	-6.37	AVG
2		4804.120	46.31	8.18	54.49	74.00	-19.51	peak



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EUT:	Bluetooth Speaker	Model Name :	BV200				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Vertical						
Test Mode:	TX GFSK Mode 2402MHz						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						

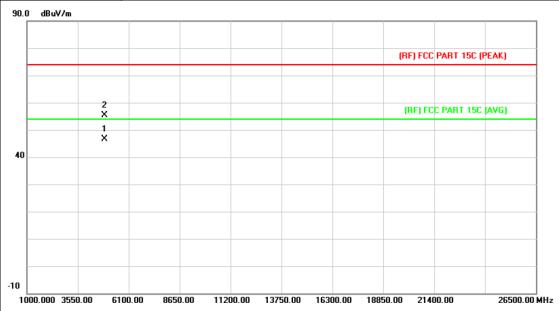


	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
•	1	*	4803.624	38.80	8.18	46.98	54.00	-7.02	AVG
2	2		4803.894	46.14	8.18	54.32	74.00	-19.68	peak



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EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2441MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

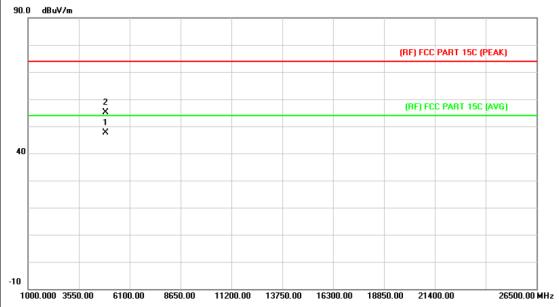


No	. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.368	38.47	8.21	46.68	54.00	-7.32	AVG
2		4882.112	47.12	8.21	55.33	74.00	-18.67	peak



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EUT:	Bluetooth Speaker	Model Name :	BV200				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Vertical						
Test Mode:	TX GFSK Mode 2441MHz						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						
	1						

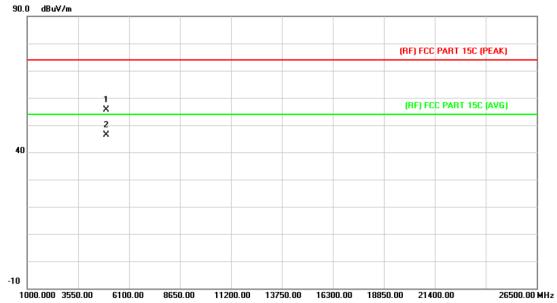


No	o. Mk	. Freq.		Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.986	39.35	8.21	47.56	54.00	-6.44	AVG
2		4882.010	46.90	8.21	55.11	74.00	-18.89	peak



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EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal	Horizontal				
Test Mode:	TX GFSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the					
	prescribed limit.					

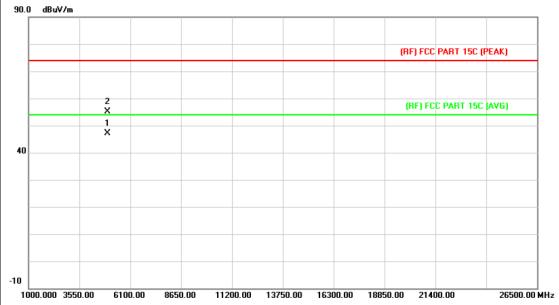


	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	1		4959.368	47.40	8.23	55.63	74.00	-18.37	peak
2	2	*	4959.899	38.15	8.23	46.38	54.00	-7.62	AVG



Page: 25 of 75

EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	Vertical				
Test Mode:	TX GFSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					
	•					

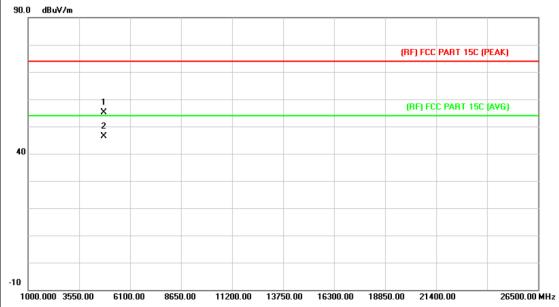


-	No.	Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4959.677	38.99	8.23	47.22	54.00	-6.78	AVG
2			4960.241	46.91	8.23	55.14	74.00	-18.86	peak



Page: 26 of 75

EUT:	Bluetooth Speaker	Model Name :	BV200		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Horizontal				
Test Mode:	TX 8-DPSK Mode 2402MHz				
Remark:	No report for the emission which more than 10 dB below the				
	prescribed limit.				

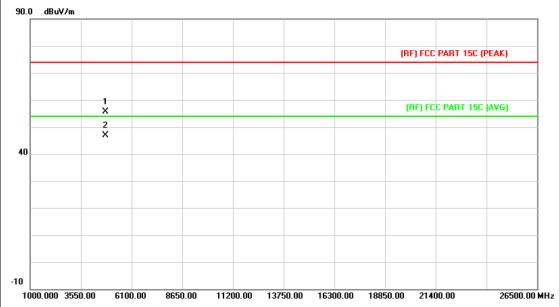


No	o. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.854	46.83	8.18	55.01	74.00	-18.99	peak
2	*	4803.967	38.19	8.18	46.37	54.00	-7.63	AVG



Page: 27 of 75

EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	Vertical				
Test Mode:	TX 8-DPSK Mode 2402MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

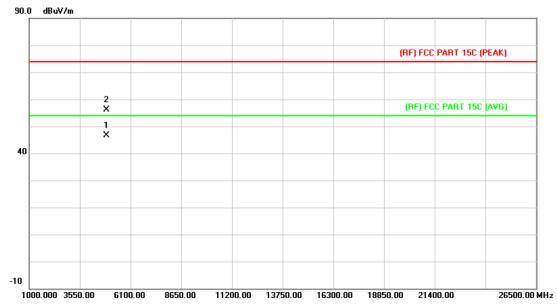


No	o. Mk	. Freq.	-		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.614	47.48	8.18	55.66	74.00	-18.34	peak
2	*	4803.684	38.74	8.18	46.92	54.00	-7.08	AVG



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EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal	Horizontal				
Test Mode:	TX 8-DPSK Mode 2441MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

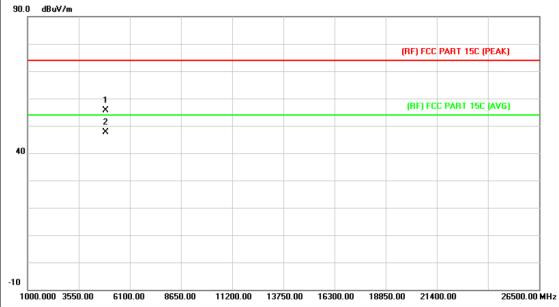


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.866	38.35	8.21	46.56	54.00	-7.44	AVG
2		4882.024	48.01	8.21	56.22	74.00	-17.78	peak



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EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	Vertical				
Test Mode:	TX 8-DPSK Mode 2441MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					
p. coo.i.s ca iii.iii.						

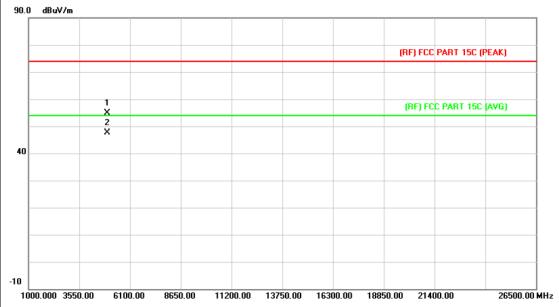


	No.	Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1			4881.687	47.46	8.21	55.67	74.00	-18.33	peak
2	2	*	4881.854	39.32	8.21	47.53	54.00	-6.47	AVG



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EUT:	Bluetooth Speaker	Model Name :	BV200			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

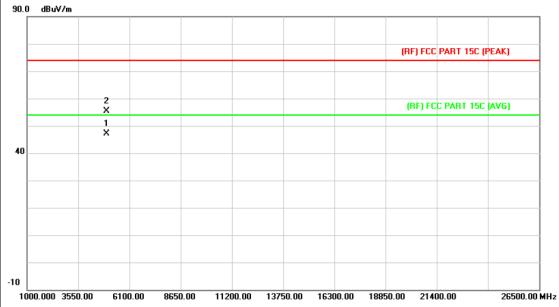


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.698	46.74	8.23	54.97	74.00	-19.03	peak
2	*	4959.932	39.30	8.23	47.53	54.00	-6.47	AVG



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EUT:	Bluetooth Speaker	Model Name :	BV200				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical						
Test Mode:	TX 8-DPSK Mode 2480MHz						
Remark:	Remark: No report for the emission which more than 10 dB below the prescribed limit.						



	No.	Mk.	Freq.	_		Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
_	1	*	4959.871	38.87	8.23	47.10	54.00	-6.90	AVG
-	2		4959.992	47.25	8.23	55.48	74.00	-18.52	peak



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5. Restricted Bands Requirement

5.1 Test Standard and Limit

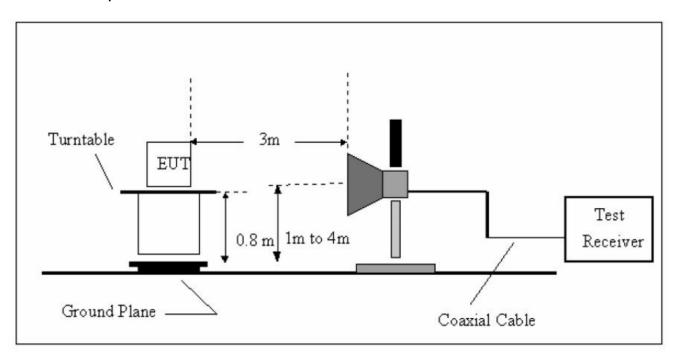
5.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

5.1.2 Test Limit

Restricted Frequency	Class B (dBu	uV/m)(at 3m)				
Band (MHz)	Peak	Average				
2310 ~2390	74	54				
2483.5 ~2500	74	54				
Note: All rectriction hands have been tooled only the yearst age is non-orted						

Note: All restriction bands have been tested, only the worst case is reported.

5.2 Test Setup



5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) 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



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and then Quasi Peak detector mode re-measured.

(4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

- (5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (6) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (7) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 08, 2014	Aug. 07, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 08, 2014	Aug.07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 07, 2014	Mar.06, 2015
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 07, 2014	Mar.06, 2015
Pre-amplifier	HP	11909A	185903	Mar. 07, 2014	Mar.06, 2015
Pre-amplifier	HP	8447B	3008A00849	Mar. 07, 2014	Mar.06, 2015
Cable	HUBER+SUHNE R	100	SUCOFLEX	Mar. 07, 2014	Mar.06, 2015
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 11, 2014	Feb.10, 2015
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

5.6 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

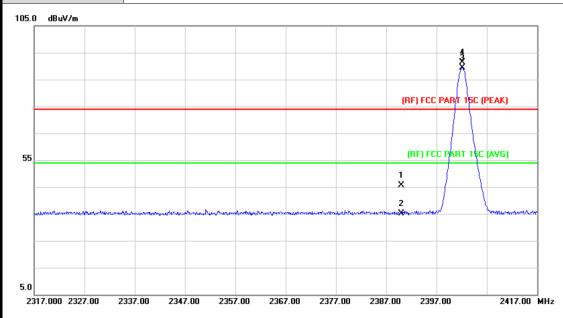
All restriction bands have been tested, only the worst case is reported.



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(1) Radiation Test

EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz		
Remark:	N/A		



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	44.95	0.77	45.72	74.00	-28.28	peak
2		2390.000	34.40	0.77	35.17	54.00	-18.83	AVG
3	*	2402.100	88.63	0.82	89.45	Fundamental Frequency		AVG
4	Χ	2402.200	90.54	0.82	91.36	Fundamenta	Frequency	peak



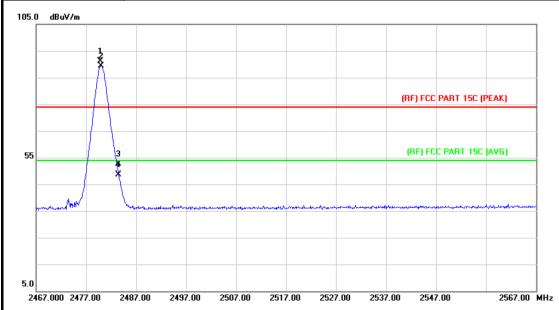
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EUT	:		Blue	tooth Speak	ker	N	/lodel	odel Name : BV2				
Tem	peratu	re:	25 °	25 ℃ Relative Humidity: 55%						5%		
Test	t Voltag	e:	DC 3	OC 3.7V								
Ant.	Pol.		Verti	cal								
Test	t Mode:		TX	SFSK Mode	2402MHz							
Ren	nark:		N/A									
105.0	0 dBuV/m											
									34			
								(DE) FO		-110		
								(RF) FCI	C PARIT 15C (PI	EAKJ		
55								(RF) F	CC PART 15C (WG)		
								1 X				
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5.0												
	 317.000 232	27.00 2	2337.00	2347.00 23	57.00 2367.0	0 2377.0	00 238	37.00 239	97.00	2417.00 MHz		
	lo. Mk.	Fre	eq.	Reading Level	Correct Factor	Meas		Limit	Over			
		MH	•	dBu∀	dB/m	dBu\		dBuV/n	n dB	Detector		
1		2390	.000	44.57	0.77	45.	34	74.00	-28.6	6 peak		
2		2390	.000	34.80	0.77	35.	57	54.00	-18.4	3 AVG		
3	Х	2402	.000	89.10	0.82	89.	92	Fundamen	tal Frequenc	y peak		
	*	2402		86.44	0.82	87.26 Fundam				y AVG		



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EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480 MHz		
Remark:	N/A		

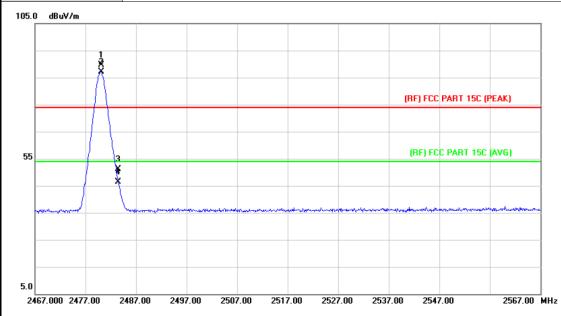


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.800	90.05	1.15	91.20	Fundamenta	I Frequency	peak
2	*	2480.000	88.19	1.15	89.34	Fundamenta	I Frequency	AVG
3		2483.500	51.45	1.17	52.62	74.00	-21.38	peak
4		2483.500	47.49	1.17	48.66	54.00	-5.34	AVG



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EUT:	Bluetooth Speaker	Model Name :	BV200		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2480 MHz				
Remark:	N/A				



No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2480.100	88.55	1.15	89.70	Fundamenta	I Frequency	peak
2	*	2480.100	85.91	1.15	87.06	Fundamenta	I Frequency	AVG
3		2483.500	49.85	1.17	51.02	74.00	-22.98	peak
4		2483.500	45.26	1.17	46.43	54.00	-7.57	AVG



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EUT	:	Bluetooth Speaker Model Name : BV20				V200				
Tem	peratu	re:	25 °C	C			Relat	ive Humi	dity: 5	5%
Test	Voltag	e:	DC 3	3.7V						
Ant.	Pol.		Horiz	zontal						
Test	Mode:		TX 8-DPSK Mode 2402MHz							
Rem	nark:		N/A							
105.0) dBuV/m									
55	Manager 10 habita	friedding commence				man			3 X X X X X X X X X X X X X X X X X X X	
5.0	319.000 232	00.00 2	339.00	2349.00	2359.00 23	869.00 2	2379.00	2389.00 23	99.00	2419.00 MH
				Readin			easure-	-		
_ N	lo. Mk		•	Level	Fact		ment	Limit	Over	
_ N	lo. Mk	. Fre	•		-		ment dBuV/m	Limit dBuV/r		Detector
	lo. Mk		łz	Level	Fact dB/m) C			n dB	Detector
_	lo. Mk	MH	Iz 000	Level dBu∨	Fact dB/m 0.77	7	dBuV/m	dBuV/r	n dB) -29.3	Detector 0 peak
1	V X	MH 2390.	1z 000 000	dBuV 43.93	Fact dB/m 0.77 0.77	7	dBuV/m 44.70	dBuV/r 74.00 54.00	n dB) -29.3	Detector 60 peak 97 AVG



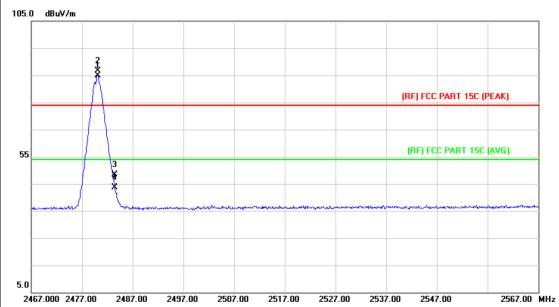
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EUT	:			Blue	tooth Speak	er	Mode	Model Name : BV2			
Гет	per	atur	e:	25 °	C		Relati	ve Humidit	t y: 55%	0	
Гest	Vo	Itage) :	DC 3	3.7V						
۹nt.	Ро	I.		Verti	cal						
Гest	Мо	de:		TX 8	B-DPSK Mod	e 2402MHz	<u>z</u>				
Rem	nark	:		N/A							
105.0) dВ	uV/m									
									48		
								(RF) FCC P	ART 15C (PEA	K)	
								(BE) FOR	PART 15C (AV	6)	
55								1 X	TAIL TSC AV		
	ween the results	en god beregned		aged from the plants	Magnesuladjalistjestessoledicumenty	en transport to the production	ight and an armed a ground the state ground it.	2		and the same of th	
5.0	19 00	0 2329	2 00 -	2339.00	2349.00 235	9.00 2369.00	2379.00 2	2389.00 2399.0	10	2419.00 MH:	
		Mk.		eq.	Reading Level	Correct Factor	Measure- ment		Over	2773.00	
				Hz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector	
1			2390	.000	45.05	0.77	45.82	74.00	-28.18	peak	
2			2390	.000	34.78	0.77	35.55	54.00	-18.45	AVG	
3		*	2402	.000	84.48	0.82	85.30	Fundamental	Frequency	AVG	
4		X	2402	.100	86.87	0.82	87.69	Fundamental	Frequency	peak	



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EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2480MHz		
Remark:	N/A		
105.0 dBuV/m			

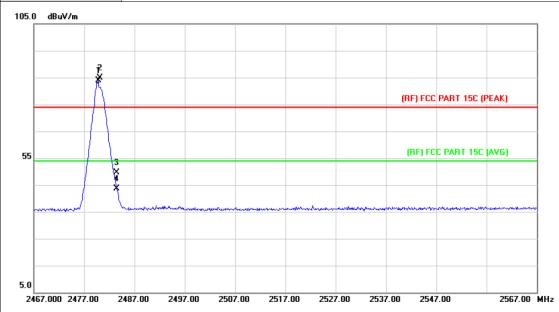


No.	. Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2480.100	83.80	1.15	84.95	Fundamental	Frequency	AVG
2	Χ	2480.200	85.53	1.15	86.68	Fundamental	Frequency	peak
3		2483.500	47.09	1.17	48.26	74.00	-25.74	peak
4		2483.500	42.39	1.17	43.56	54.00	-10.44	AVG

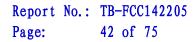


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EUT:	Bluetooth Speaker	Model Name :	BV200		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Vertical				
Test Mode:	TX 8-DPSK Mode 2480MHz				
Remark:	N/A				



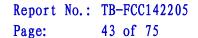
N	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.800	82.68	1.15	83.83	Fundamental	Frequency	AVG
2	Χ	2480.100	83.85	1.15	85.00	Fundamental	Frequency	peak
3		2483.500	48.57	1.17	49.74	74.00	-24.26	peak
4		2483.500	42.39	1.17	43.56	54.00	-10.44	AVG





(2) Conducted Test

JT:	Bluetooth	n Speaker		Model Nam	ie:	BV200
mperature:	25 ℃			Relative Hu	ımidity:	55%
st Voltage:	DC 3.7V					
st Mode:	TX GFSk	K Mode 240	2MHz / 24	30 MHz		
mark:	N/A					
* Agile	nf					
					Mkr1 2.40	
Ref 10 de	3m	Atten 20 d	В		-0.1	19 dBm
Log						
10 dB/						
	Display Line					
	20.12 dBm				*	
DI			4 Q	2	- 	
-20.1				<u> </u>	W home	
dBm						
	37 GHz				Span	100 MHz
Center 2.	100 kHz		#VRW 300 kHz	Sweet	n 10 36 ms <i>(4</i>	(01 nts)
#Res BW Marker	Trace Type	X	#VBW 300 kHz Axis	Amplitude	p 10.36 ms (4	l01 pts)
#Res BW Marker 1	Trace Type	X 2.401			p 10.36 ms (4	l01 pts)
#Res BW Marker	Trace Type	X 2.401 2.390 2.400	Axis 75 GHz	Amplitude -0.119 dBm	o 10.36 ms (4	101 pts)
#Res BW Marker 1 2 3	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400	Axis 75 GHz 00 GHz 00 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm		
#Res BW Marker 1 2 3 4 Agile	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	
#Res BW Marker 1 2 3 4 Agile Ref 10 de Peak	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10 dB/	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq Trace Type (1) Freq (1) Freq (1) Freq	2 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 dE Peak Log 10 dB/	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq	X 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10 dB/	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq Trace Type (1) Freq (1) Freq (1) Freq	2 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10 dB/ Di -19.9	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq Trace Type (1) Freq (1) Freq (1) Freq	2 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47	975 GHz
#Res BW Marker 1 2 3 4 Ref 10 de Peak Log 10 dB/ Di -19.9	nf Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq 19.90 dBm	2 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm	Mkr1 2.47 0.1	975 GHz 104 dBm
#Res BW Marker 1 2 3 4 Ref 10 dB Peak Log 10 dB/ DI -19.9 dBm Center 2. #Res BW	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq (1) Fred Trace Type (1) Freq (1) Freq (1) Fred (1) Fred (1) Fred (1) Fred (1) Fred	X 2 401 2 390 2 400 2 366 4 4 3 4 3 4 3 4 3	Axis 75 GHz 00 GHz 00 GHz 25 GHz B B #VBW 300 kHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm -56.85 dBm	Mkr1 2.47 0.1	975 GHz 04 dBm
#Res BW Marker 1 2 3 4 Ref 10 dB Peak Log 10 dB/ DI -19.9 dBm	nt Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq (1) Fred Trace Type Trace Type	X 2.401 2.390 2.400 2.366	Axis 75 GHz 00 GHz 00 GHz 25 GHz	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm -56.85 dBm	Mkr1 2.47 0.1	975 GHz 104 dBm
#Res BW Marker 1 2 3 4 Ref 10 dB Peak Log 10 dB/ DI -19.9 dBm Center 2. #Res BW Marker	Trace Type (1) Freq (1) Freq (1) Freq (1) Freq (1) Freq (1) Fred Trace Type (1) Freq (1) Freq (1) Fred (1) Fred (1) Fred (1) Fred (1) Fred	X 2.401 2.390 2.400 2.366 Atten 20 d	Axis 75 GHz 00 GHz 00 GHz 25 GHz B #VBW 300 kHz Axis	Amplitude -0.119 dBm -58.94 dBm -44.73 dBm -56.85 dBm	Mkr1 2.47 0.1	975 GHz 04 dBm





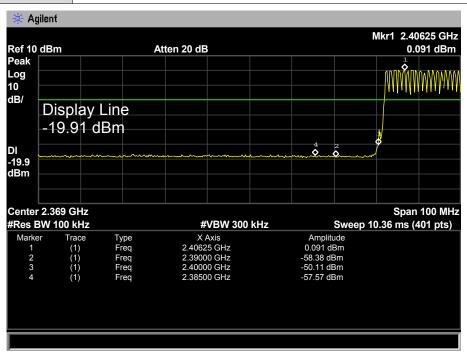
EUT: Bluetooth Speaker Model Name: BV200

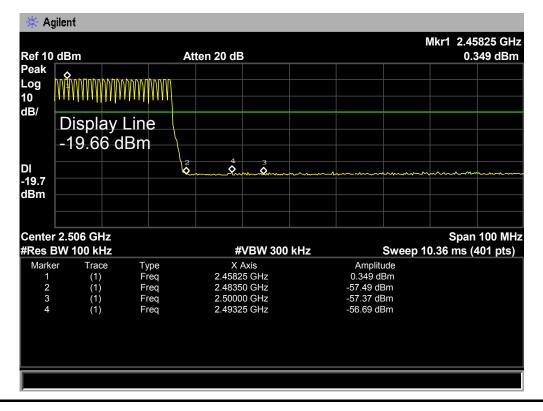
Temperature: 25 ℃ Relative Humidity: 55%

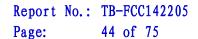
Test Voltage: DC 3.7V

Test Mode: GFSK Hopping Mode

Remark: N/A









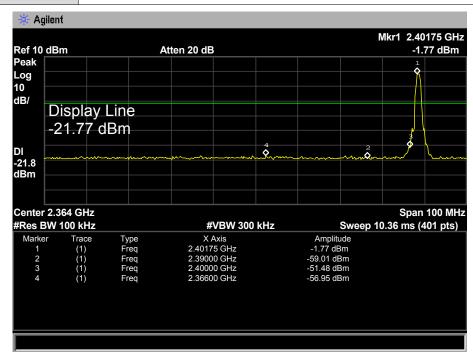
EUT: Bluetooth Speaker Model Name: BV200

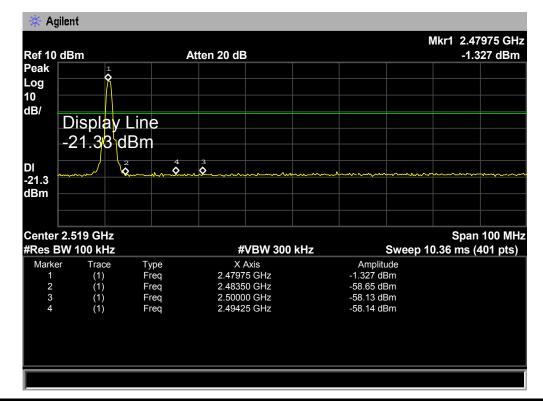
Temperature: 25 °C Relative Humidity: 55%

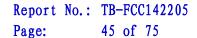
Test Voltage: DC 3.7V

Test Mode: TX 8-DPSK Mode 2402MHz / 2480 MHz

Remark: N/A









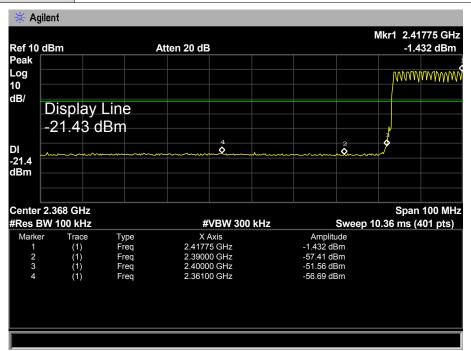
EUT: Bluetooth Speaker Model Name: BV200

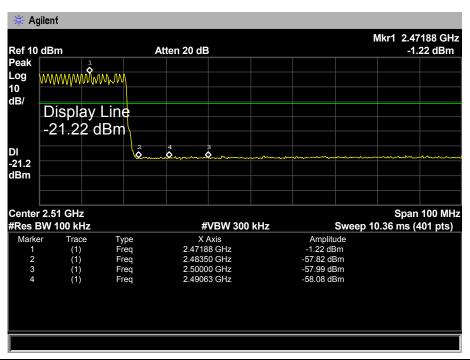
Temperature: 25 ℃ Relative Humidity: 55%

Test Voltage: DC 3.7V

Test Mode: 8-DPSK Hopping Mode

Remark: N/A







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6. Number of Hopping Channel

6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.247 (a)(1)

6.1.2 Test Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

6.2 Test Setup



6.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 KHz, VBW=100 KHz, Sweep time= Auto.

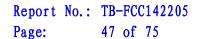
6.4 EUT Operating Condition

The EUT was set to the Hopping Mode by the Customer.

6.5 Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015

6.6 Test Data



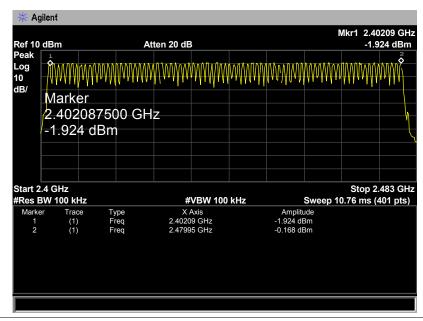


EUT:Bluetooth SpeakerModel Name:BV200Temperature:25 °CRelative Humidity:55%Test Voltage:DC 3.7V

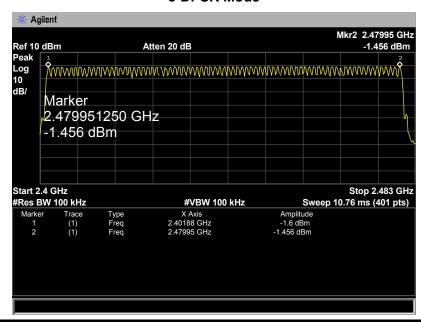
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
2402MU¬- 2400MU¬	79	\1 E
2402MHz~2480MHz	79	>15

GFSK Mode



8-DPSK Mode





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7. Average Time of OcCupancy

7.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.247 (a)(1)

5.1.2 Test Limit

Section	Test Item	Limit
15.247(a)(1)/ RSS-210	Average Time of	0.4.000
Annex 8(A8.1d)	OcCupancy	0.4 sec

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz.
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the center frequency on any frequency would be measure and set the frequency span to zero.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.

7.4 EUT Operating Condition

The EUT was set to the Hopping Mode by the Customer.

7.5 Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015

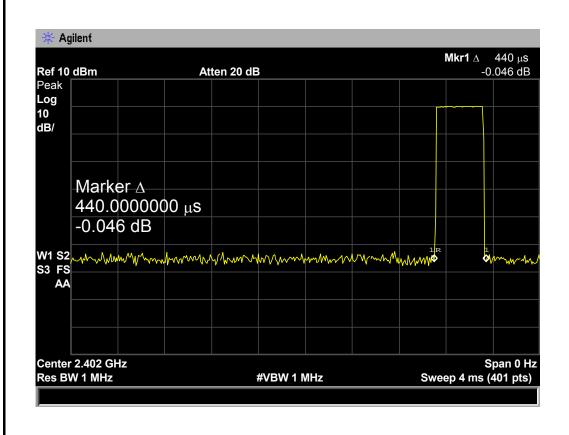


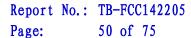
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7.6 Test Data

EUT: Bluetooth Speaker		Model Name :		BV200		
Temperature:		25 ℃		Relative Humidity:		55%
Test Voltage:		DC 3.7V				
Test Mode:		Hopping N	Mode (GFSK DH1)			
Channel (MHz)	Pu	lse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
0.400						
2402		0.440	140.80			
2402		0.440 0.440	140.80 140.80	31.60	400	PASS

GFSK Hopping Mode DH1







GFSK Hopping Mode DH1 2441 MHz Agilent Mkr1 Δ $440~\mu s$ 2.256 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Marker A $440.0000000 \, \mu s$ 2.256 dB S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts) **GFSK Hopping Mode DH1** 2480 MHz * Agilent Mkr1 Δ 440 μ s -0.208 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Marker ∆ $440.0000000 \, \mu s$ -0.208 dB

#VBW 1 MHz

AΑ

Center 2.48 GHz

Res BW 1 MHz

Span 0 Hz

Sweep 4 ms (401 pts)

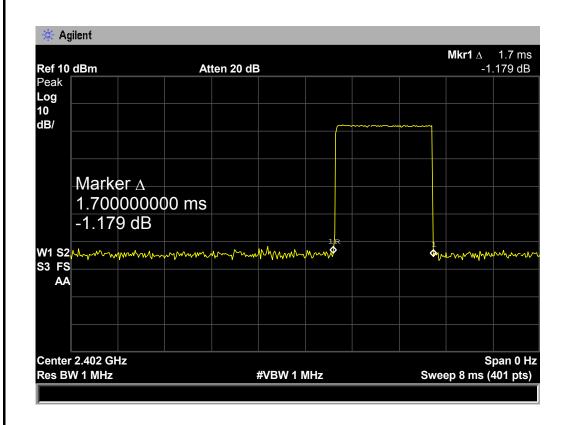


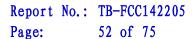
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EUT:	Bluetooth Speaker	Model Name :	BV200		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V	DC 3.7V			
Test Mode:					
	Hopping Mode (GFSK DH3)				

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.700	272.00			
2441	1.700	272.00	31.60	400	PASS
2480	1.700	272.00			

GFSK Hopping Mode DH3







Marker ∆

-0.395 dB

W1 S2 S3 FS AA

Center 2.48 GHz

Res BW 1 MHz

1.700000000 ms

#VBW 1 MHz

GFSK Hopping Mode DH3 2441 MHz Agilent Mkr1 Δ 1.7 ms 0.292 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Marker A 1.7000000000 ms 0.292 dB my monder and a market was more warmer and the same of W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 8 ms (401 pts) **GFSK Hopping Mode DH3** 2480 MHz # Agilent Mkr1 \triangle 1.7 ms Ref 10 dBm Atten 20 dB -0.395 dB Peak Log 10 dB/

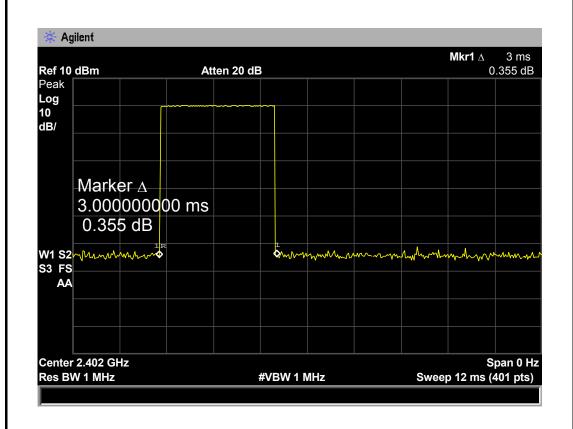


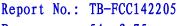
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EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	Hopping Mode (GFSK DH5)		

	0	,			
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

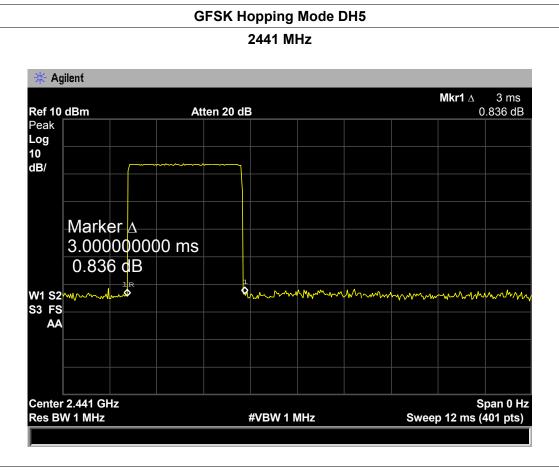
GFSK Hopping Mode DH5

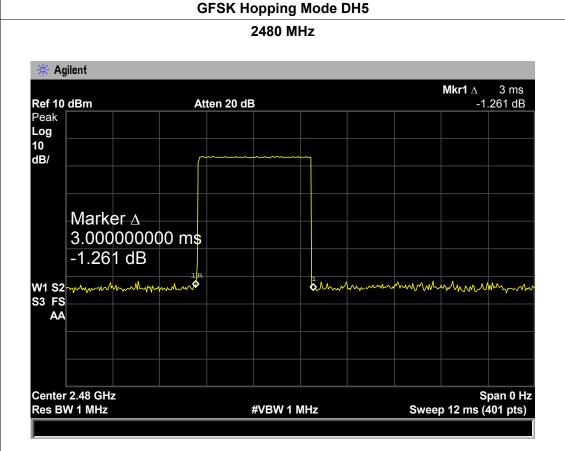






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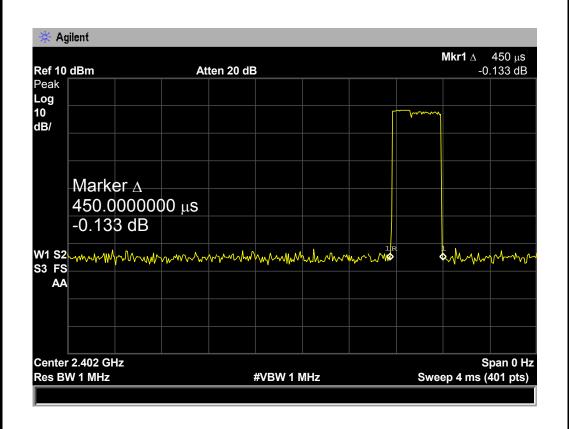


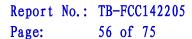
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Channel	Pu	Ise Time	Total of Dwell (ms)	Period Time	Limit	Result
Test Mode: Ho		Hopping I	Mode (8-DPSK DH1)			
Test Voltage: DC 3.7V						
Temperature: 25 ℃		Relative Humidity:		55%		
EUT:		Bluetooth Speaker		Model Name :		BV200

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	0.450	144.00	24.6		
2441	0.450	144.00	31.6	400	PASS
2480	0.450	144.00			

8-DPSK Hopping Mode DH1







8-DPSK Hopping Mode DH1 2441 MHz Agilent Mkr1 Δ 450 μ s -2.203 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Marker ∆ 450.0000000 μs -2.203 dB W1 S2 Wyhnhormhym S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts) 8-DPSK Hopping Mode DH1 2480 MHz * Agilent Mkr1 Δ 450 μ s Ref 10 dBm Atten 20 dB -0.614 dB Peak Log



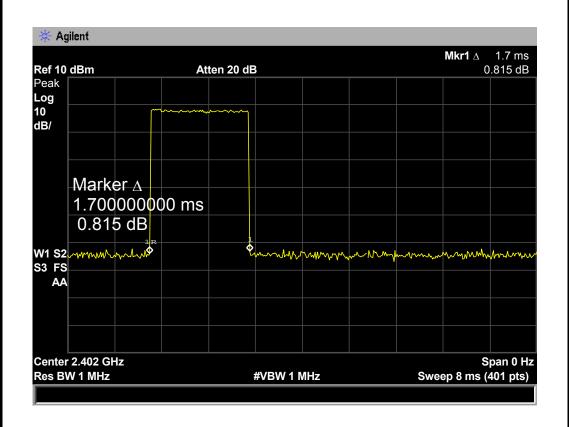
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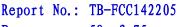
EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	Honning Mode (8-DPSK DH3)		

Test Mode: Hopping Mode (8-DPSK DH3)

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.700	272.00			
2441	1.700	272.00	31.60	400	PASS
2480	1.700	272.00			

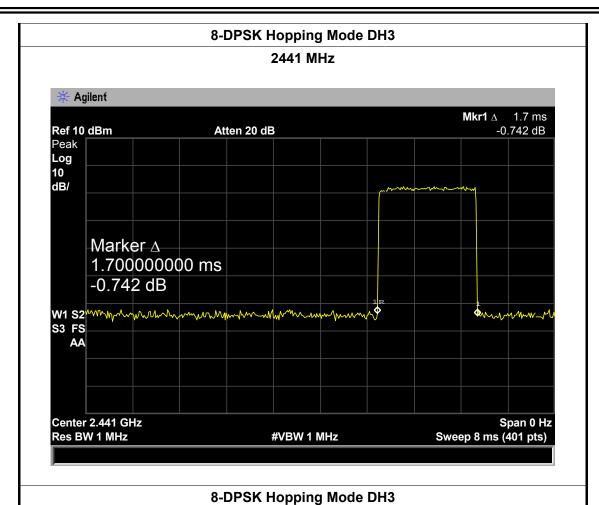
8-DPSK Hopping Mode DH3







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2480 MHz # Agilent Mkr1 \triangle 1.7 ms Ref 10 dBm Atten 20 dB -0.727 dB Peak Log 10 dB/ Marker ∆ 1.700000000 ms -0.727 dB mhyllms. W1 S2 & Mymmy mr myww S3 FS AΑ Center 2.48 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 8 ms (401 pts)

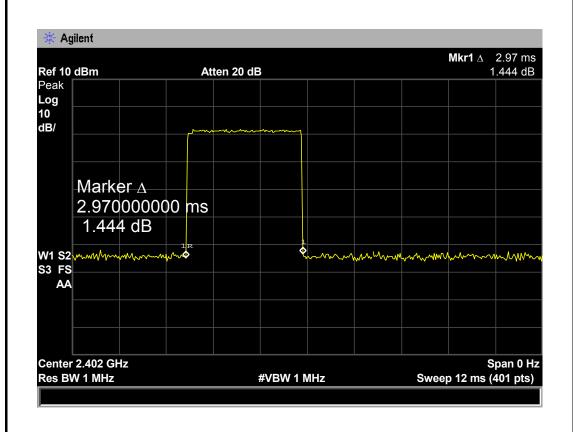


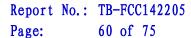
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EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	Honning Mode (8-DPSK DH5)		

	-11-15	(/			
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	2.970	316.80			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

8-DPSK Hopping Mode DH5







8-DPSK Hopping Mode DH5 2441 MHz Agilent Mkr1 Δ 3 ms -1.394 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Marker A 3.000<mark>000000 ms</mark> -1.394 dB W1 S2 mymmunumummumm S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 12 ms (401 pts) 8-DPSK Hopping Mode DH5 2480 MHz # Agilent Mkr1 Δ 3 ms Ref 10 dBm Atten 20 dB 0.304 dB Peak Log 10 dB/ Marker ∆ 3.000000000 ms 0.304 dB

#VBW 1 MHz

wwwwwwwhillow

W1 S2 S3 FS AA

Center 2.48 GHz

Res BW 1 MHz

& worthware

Sweep 12 ms (401 pts)

Span 0 Hz



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8. Channel Separation and Bandwidth Test

8.1 Test Standard and Limit

8.1.1 Test Standard FCC Part 15.247

8.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Bandwidth	<=1 MHz (20dB bandwidth)	2400~2483.5
Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

8.2 Test Setup



8.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:

Channel Separation: RBW=30 kHz, VBW=100 kHz.

Bandwidth: RBW=30 kHz, VBW=100 kHz.

- (3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (4) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:30 kHz, and Video Bandwidth:100 kHz. Sweep Time set auto.

8.4 EUT Operating Condition

The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Bandwidth Test.



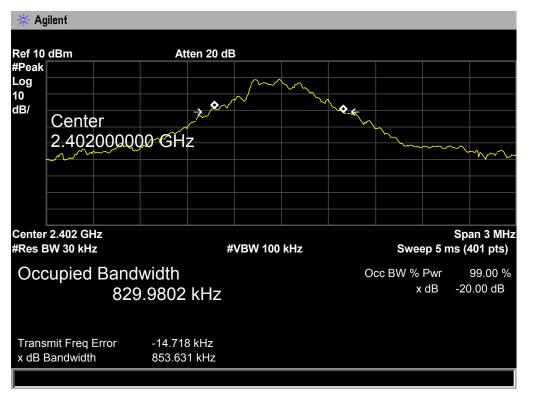


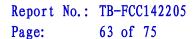
8.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015

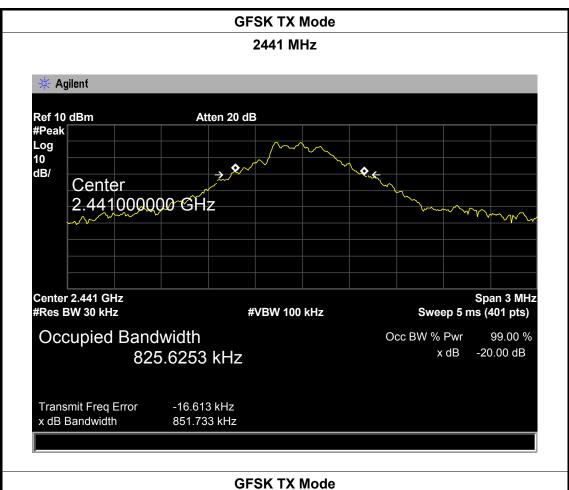
8.6 Test Data

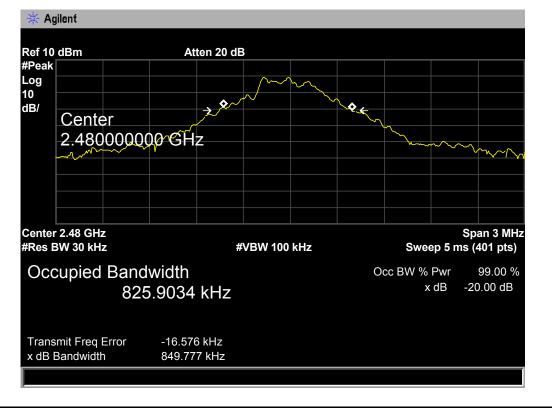
EUT:	Blι	uetooth Speaker	Model Name :	BV200	
Temperature:	25	${\mathbb C}$	Relative Humidity:	55%	
Test Voltage:	DC	C 3.7V			
Test Mode:	TX	(Mode (GFSK)			
Channel frequence	Channel frequency 99% OBW (kHz)		20dB Bandwidth		
(MHz)			(kHz)		
2402		829.9802	853.631		
2441		825.6253	851.733		
2480 528.9034		849.777			
GFSK TX Mode					
2402 MHz					









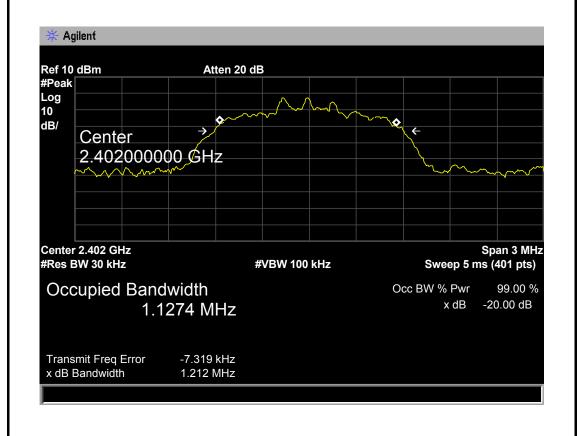


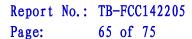


EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode (8-DPSK)		

	TX Mode (6 B) GIV)					
	Channel frequency	99% OBW (kHz)	20dB Bandwidth	20dB		
(MHz)			(kHz)	Bandwidth		
				*2/3 (kHz)		
	2402	1127.40	1212.00	808.00		
	2441	1128.60	1212.00	808.00		
	2480	1125.10	1213.00	808.66		

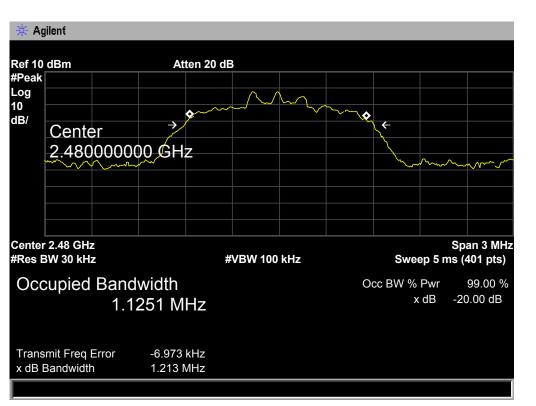
8-DPSK TX Mode 2402 MHz







8-DPSK TX Mode 2441 MHz 🔆 Agilent Ref 10 dBm Atten 20 dB #Peak Log 10 dB/ Center 2.441000000 GHz Center 2.441 GHz Span 3 MHz #Res BW 30 kHz **#VBW 100 kHz** Sweep 5 ms (401 pts) Occupied Bandwidth 99.00 % Occ BW % Pwr -20.00 dB 1.1286 MHz x dB Transmit Freq Error -6.329 kHz x dB Bandwidth 1.212 MHz 8-DPSK TX Mode 2480 MHz





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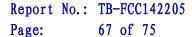
EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (GFSK)

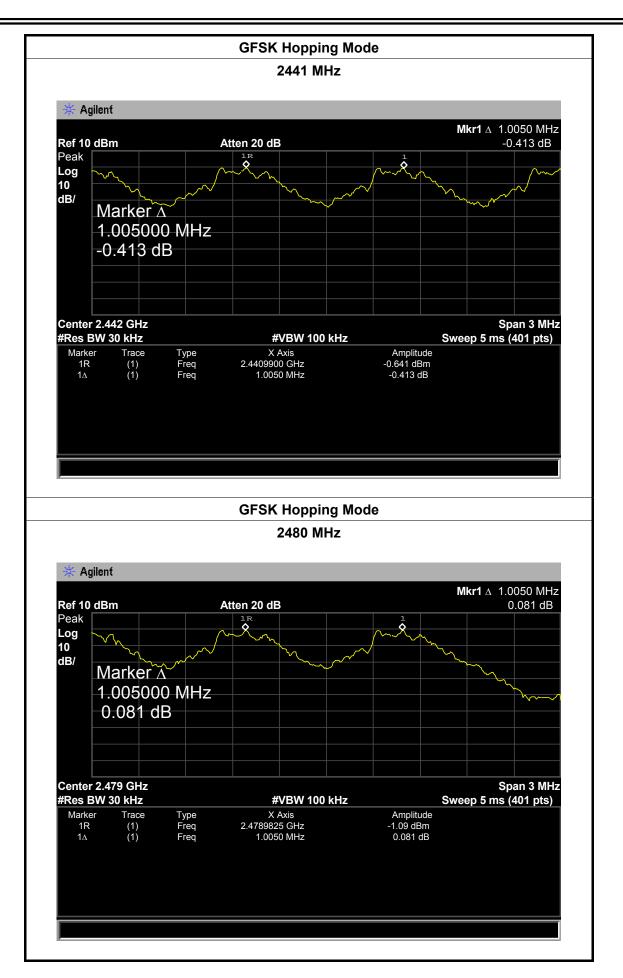
Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit (kHz)
2402	1005.00	853.631
2441	1005.00	851.733
2480	1005.00	849.777

GFSK Hopping Mode





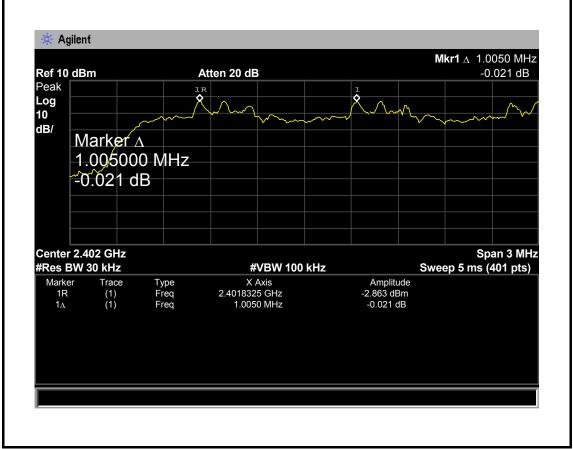


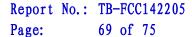




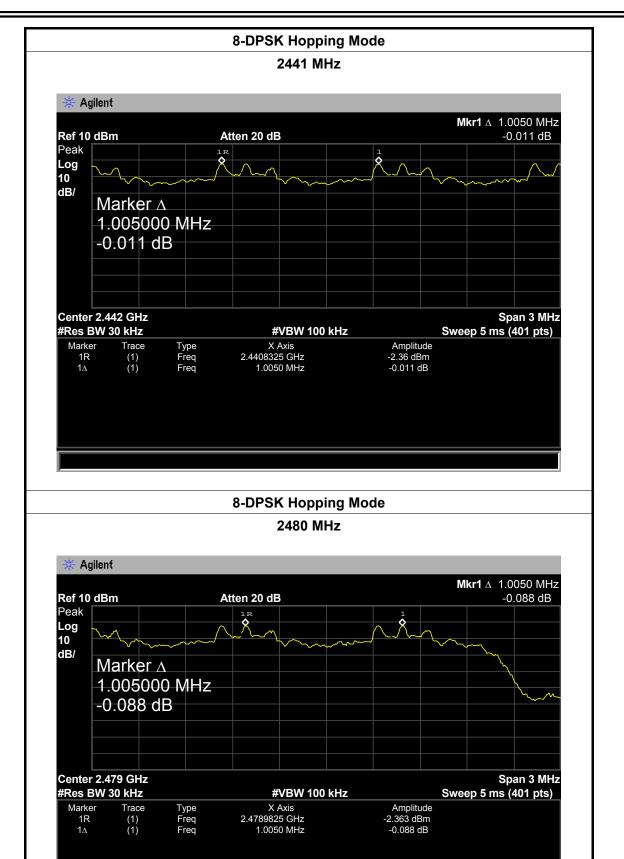
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EUT:	T: Bluetooth Speaker		Model Name :		BV200
Temperature:	25 ℃		Relati	ve Humidity:	55%
Test Voltage:	DC 3.7V				
Test Mode:	Hopping Mode (8-DPSK)				
Channel frequency (MHz)		Separation Read V	ation Read Value S		Limit (kHz)
		(kHz)			
2402		1005.00		808	3.00
2441		1005.00		808	3.00
2480		1005.00 8		808	3.66
8-DPSK Hopping Mode					
2402 MHz					











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9. Peak Output Power Test

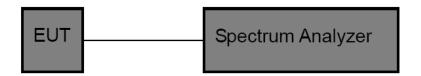
9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247 (b) (1)

9.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	Hopping Channels>75 Power<1W(30dBm)	2400~2483.5
	Other <125 mW(21dBm)	

9.2 Test Setup



9.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:

Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz. RBW=3 MHz, VBW=3 MHz for bandwidth more than 1MHz.

9.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

9.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015

9.6 Test Data

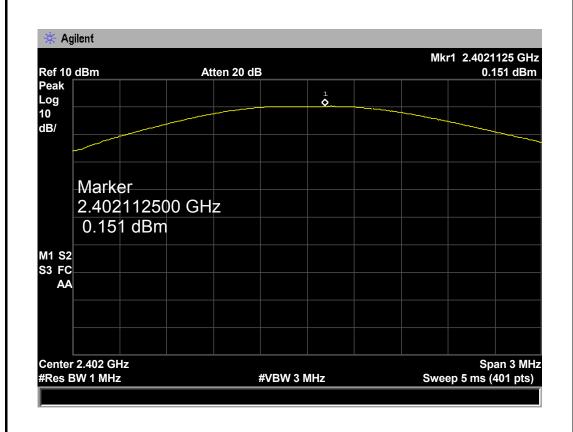


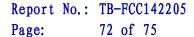
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EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode (GFSK)		

	· /	
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	0.151	
2441	0.459	30
2480	0.348	

GFSK TX Mode

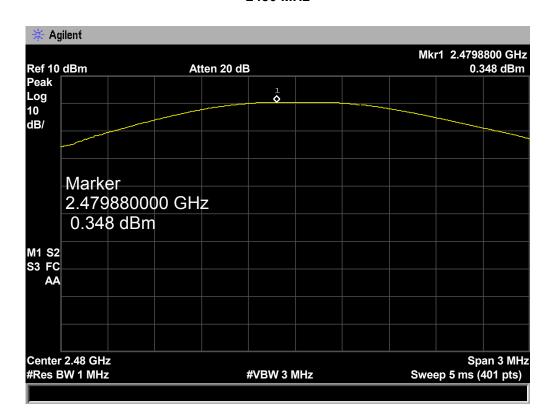






GFSK TX Mode 2441 MHz Agilent Mkr1 2.4408725 GHz 0.459 dBm Ref 10 dBm Atten 20 dB Peak 1 • Log 10 dB/ Marker 2.440872500 GHz 0.459 dBm M1 S2 S3 FC AA Center 2.441 GHz Span 3 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 5 ms (401 pts)

GFSK TX Mode



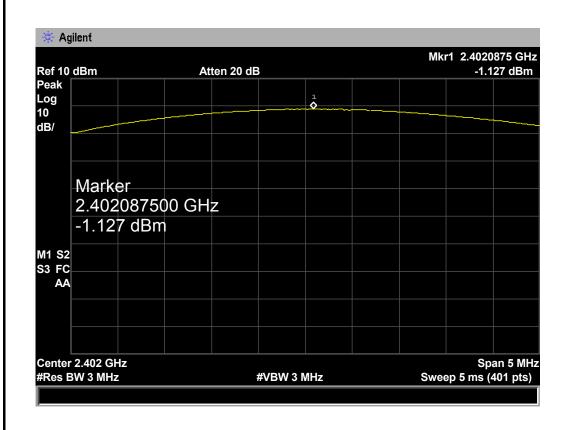


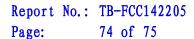
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EUT:	Bluetooth Speaker	Model Name :	BV200
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode (8-DPSK)		

	,	
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	-1.127	
2441	-0.700	21
2480	-0.798	

8-DPSK TX Mode

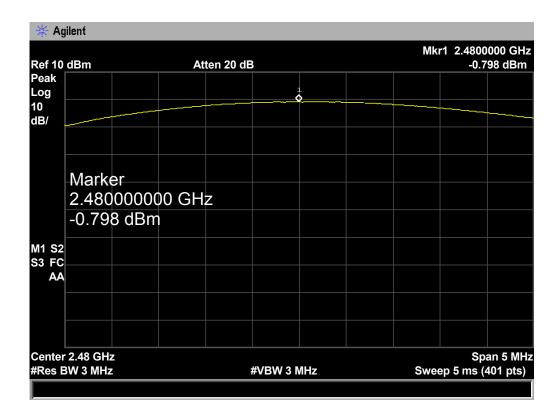






8-DPSK TX Mode 2441 MHz Agilent Mkr1 2.4410750 GHz -0.7 dBm Ref 10 dBm Atten 20 dB Peak 1 **Q** Log 10 dB/ Marker 2.441075000 GHz -0.7 dBm M1 S2 S3 FC AA Center 2.441 GHz Span 5 MHz #Res BW 3 MHz #VBW 3 MHz Sweep 5 ms (401 pts)

8-DPSK TX Mode





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10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

10.1.2 Requirement

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.

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 2 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.2 Result

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