

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC141182
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FCC Radio Test Report FCC ID: 2ACUS-2733

Original Grant

Report No. : TB-FCC141182

Applicant: Shenzhen ShengHeDa Electronic Technology Co., Ltd

Equipment Under Test (EUT)

EUT Name: Bluetooth Speaker

Model No. : 2733 Series Model : N/A

No.

Brand Name : N/A

Receipt Date : 2014-07-21

Test Date : 2014-07-22 to 2014-07-28

Issue Date : 2014-07-29

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 ShengHeDa Electronic Technology Co., Ltd

Address: 2nd Floor, Bada Industrial, Heping, Fuyong, Baoan District,

Shenzhen, Guangdong, China

Manufacturer : Shenzhen ShengHeDa Electronic Technology Co., Ltd

Address: 2nd Floor, Bada Industrial, Heping, Fuyong, Baoan District,

Shenzhen, Guangdong, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Bluetooth Speaker			
Models No.	:	2733			
Model	:	N/A	N/A		
Difference					
		Operation Frequency:			
		Bluetooth:2402~2480MHz			
Product		Number of Channel:	Bluetooth:79 Channels see note (2)		
Description	:	Max Peak Output Power:	GFSK:-2.043 dBm (Conducted Power)		
		Antenna Gain:	0 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	DC power by Li-ion Battery		
Power Rating	:	DC 5.0V by USB cable.			
		DC 3.7V Li-ion Battery.			
Connecting I/O	:	Please refer to the User's Manual			
Port(S)					
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:

Channel	Frequency	Channel	Frequency	Channel	Frequency
	(MHz)		(MHz)		(MHz)



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00	2402	27	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		

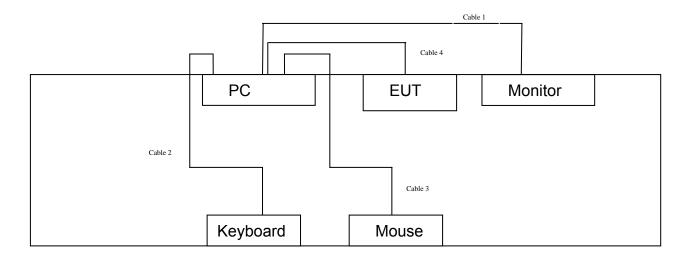
⁽⁴⁾ The Antenna information about the equipment is provided by the applicant.





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	Number Shielded Type Ferrite Core Length Note							
Cable 1	YES	YES(2)	1.8M					
Cable 2	YES	NO	1.5M					
Cable 3	YES	NO	1.5M					
Cable 4	NO	NO	0.2M	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	Test Program: RF Control Kit V1.0. exe			
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		
15.247(c) Antenna Conducted Spurious Emission		PASS	N/A		
15.247(a) 20dB Bandwidth PASS		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

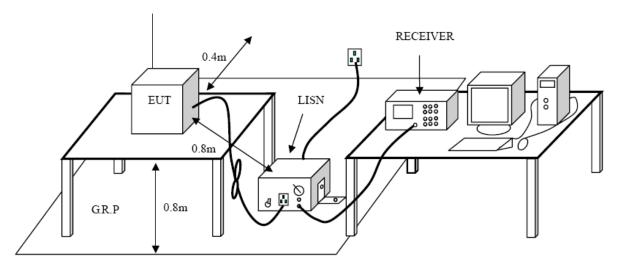
Conducted Emission Test Limit

Fraguanay	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

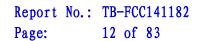
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test	ROHDE&		400004	2013-08-10	2014-08-09
Receiver	SCHWARZ	ESCI	100321	2013-00-10	2014-08-09
50ΩCoaxial	Anritsu	MP59B	X10321	2013-08-10	2014-08-09
Switch	Aillitsu	MESSE	X10321	2013-06-10	2014-00-09
L.I.S.N	Rohde & Schwarz	ENV216	101131	2013-08-10	2014-08-09
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	2013-08-10	2014-08-09

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: 2733

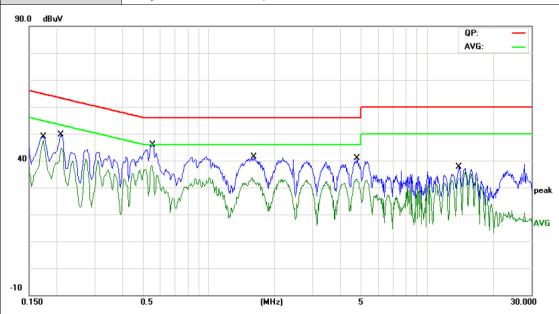
Temperature: 25 °C Relative Humidity: 55%

Test Voltage: AC 120V/60 Hz

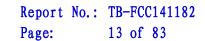
Terminal: Line

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	dBu∀	dB	dBu∀	dBuV	dB	Detector	Comment
1		0.1740	48.06	0.00	48.06	64.76	-16.70	QP	
2	*	0.1740	47.59	0.00	47.59	54.76	-7.17	AVG	
3		0.2100	48.20	0.00	48.20	63.20	-15.00	QP	
4		0.2100	44.89	0.00	44.89	53.20	-8.31	AVG	
5		0.5540	45.22	0.00	45.22	56.00	-10.78	QP	
6		0.5540	37.34	0.00	37.34	46.00	-8.66	AVG	
7		1.6100	39.57	0.00	39.57	56.00	-16.43	QP	
8		1.6100	32.58	0.00	32.58	46.00	-13.42	AVG	
9		4.7980	36.03	0.00	36.03	56.00	-19.97	QP	
10		4.7980	32.41	0.00	32.41	46.00	-13.59	AVG	
11		13.9460	33.98	0.00	33.98	60.00	-26.02	QP	
12		13.9460	33.24	0.00	33.24	50.00	-16.76	AVG	





EUT: Bluetooth Speaker Model Name: 2733

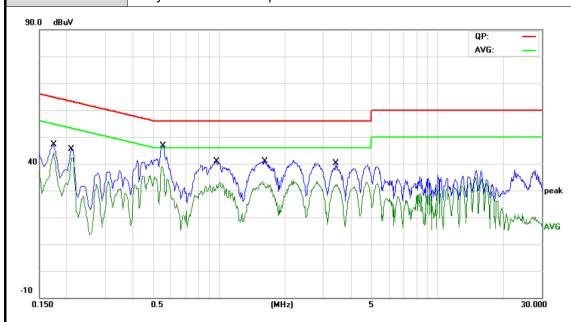
Temperature: 25 ℃ Relative Humidity: 55%

Test Voltage: AC 120V/60 Hz

Terminal: Neutral

Test Mode: USB Charging with TX GFSK Mode 2402 MHz

Remark: Only worse case is reported



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1740	34.59	10.12	44.71	64.76	-20.05	QP	
2	0.1740	33.99	10.12	44.11	54.76	-10.65	AVG	
3	0.2100	34.11	10.12	44.23	63.20	-18.97	QP	
4	0.2100	32.19	10.12	42.31	53.20	-10.89	AVG	
5	0.5540	36.17	10.02	46.19	56.00	-9.81	QP	
6 *	0.5540	28.29	10.02	38.31	46.00	-7.69	AVG	
7	0.9700	29.24	10.15	39.39	56.00	-16.61	QP	
8	0.9700	21.08	10.15	31.23	46.00	-14.77	AVG	
9	1.6220	28.78	10.10	38.88	56.00	-17.12	QP	
10	1.6220	21.97	10.10	32.07	46.00	-13.93	AVG	
11	3.4180	26.06	10.06	36.12	56.00	-19.88	QP	
12	3.4180	22.32	10.06	32.38	46.00	-13.62	AVG	



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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)

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	

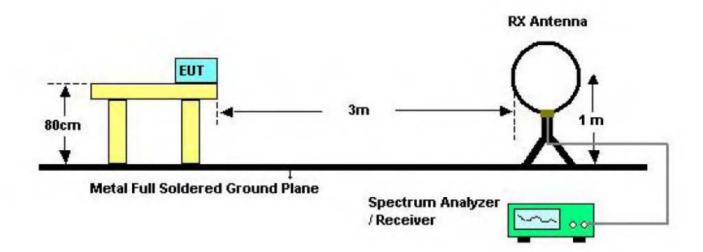
Note:

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

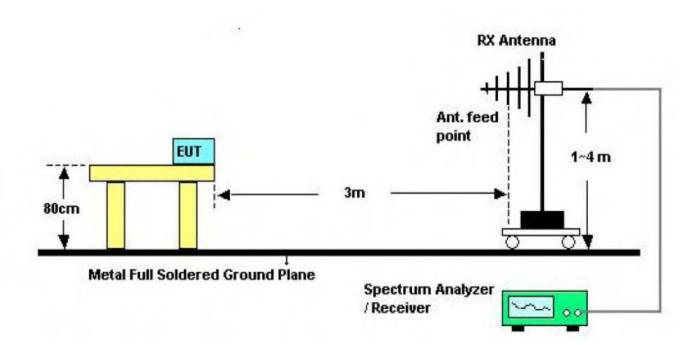


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4.2 Test Setup

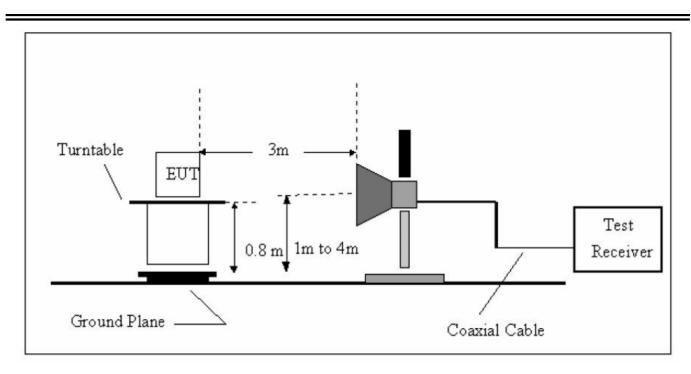


Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup





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 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.
- (6) 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.

4.5 Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
Equipment	Manufacturer	woder No.	Serial No.	Last Gal.	Date



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		1	1	T	1	
Spectrum	Agilent		MY45106456	Mar. 20, 2014	Mar. 19, 2015	
Analyzer	Agiletit	E4407B	W1145100450	Iviai. 20, 2014	Mar. 19, 2015	
Spectrum	Dalada 8 Oakuusuu		DE05404	A 40, 0040		
Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 10, 2013	Aug.09, 2014	
EMI Test	Rohde & Schwarz		404405	Aug. 10, 2012	Aug 00, 2014	
Receiver	Ronde & Schwarz	ESCI	101165	Aug. 10, 2013	Aug.09, 2014	
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	Rohde & Schwarz	SML03	IKW682-054	Feb. 11, 2014	Feb.10, 2015	
Generator	Nonde & Schwarz	GIVILOS	11(1/1002-034	1 CD. 11, 2014	1 CD. 10, 2013	
Positioning	ETS-LINDGREN	2090	N/A	N/A	N/A	
Controller	E13-LINDGREIN	2090	IN/A	IN/A	IN/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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EUT:	Bluetooth Speake	er Mo	del Name :	2733
Temperature:	25 ℃	Re	lative Humidity:	55%
Test Voltage:	DC 5V			
Ant. Pol.	Horizontal			
Test Mode:	TX GFSK Mode 2	2402MHz		
Remark:	Only worse case	is reported		
80.0 dBuV/m				
			(RF)F	CC 15C 3M Radiation
				Margin -6 dB
30	1	3 X	4 5 X	
30	2	/ \		
	, / \ , <u>*</u> / \	March March Alle	""Valled Inhibit	Marine Control of the
No annia de la company de la c	John John John John John John John John	water out	Alamon to addald illan	Madha
AND WANTER STATE	Pr. La			
-20				
30.000 40 50	60 70 80	(MHz)	300 400	500 600 700 1000.000
	Da a din n	0	N.4 · · · · ·	
No. Mk. Fr	Reading eq. Level	Correct Factor	Measure- ment Limi	t Over
	Hz dBuV		dBuV/m dBuV	
		dB/m		
1 * 80.9	275 56.89	-23.22	33.67 40.0	00 -6.33 peak
2 108.2	2667 43.32	-21.86	21.46 43.5	50 -22.04 peak
3 186.4	4409 54.59	-20.79	33.80 43.5	50 -9.70 peak
4 216.0	0240 51.31	-19.70	31.61 46.0	00 -14.39 peak
			- 10.0	To pour

Emission Level= Read Level+ Correct Factor

44.69

45.98

-14.14

-12.78

30.55

33.20

46.00 -15.45

-12.80

46.00

peak

peak

379.9141

432.5457

5



Emission Level= Read Level+ Correct Factor

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EUT:	Bluetooth Speak	er M o	odel Name :	2733				
Temperature:	25 ℃	Re	lative Humidity:	55%				
Test Voltage:	DC 5V							
Ant. Pol.	Vertical							
Test Mode:	TX GFSK Mode	2402MHz						
Remark:	Only worse case	Only worse case is reported						
80.0 dBuV/m								
-20 30.000 40 50	2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	3 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	300 400	6 X X 500 600 700 1000.000				
No. Mk. Fr	Reading req. Level	Correct Factor	Measure- ment Limi	t Over				
M	lHz dBuV	dB/m	dBuV/m dBuV	/m dB Detector				
1 * 80.9	9275 56.89	-23.22	33.67 40.0	00 -6.33 peak				
2 108.	2667 43.32	-21.86	21.46 43.5	50 -22.04 peak				
3 186.	4409 54.59	-20.79	33.80 43.5	50 -9.70 peak				
4 216.	0240 51.31	-19.70	31.61 46.0	00 -14.39 peak				
5 379.	9141 44.69	-14.14	30.55 46.0	00 -15.45 peak				
6 432.	5457 45.98	-12.78	33.20 46.0	00 -12.80 peak				



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EUT:	Bluetooth Speaker	Model Name :	2733				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	TX GFSK Mode 2402MH	z					
Remark:	No report for the emissio prescribed limit.	n which more than 10 c	dB below the				

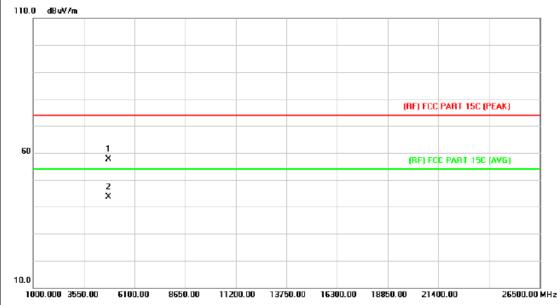


N	lo. M	1k.	Freq.		Correct Factor	Measure- ment	Limit	Ov er	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1	*		1804.112	29.28	13.44	42.72	54.00	-11.28	AVG
2		7	4804.291	43.68	13.44	57.12	74.00	-16.88	peak



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EUT:	Bluetooth Speaker	Model Name :	2733				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Vertical	Vertical					
Test Mode:	TX GFSK Mode 2402MH	Z					
Remark:	No report for the emission prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.					

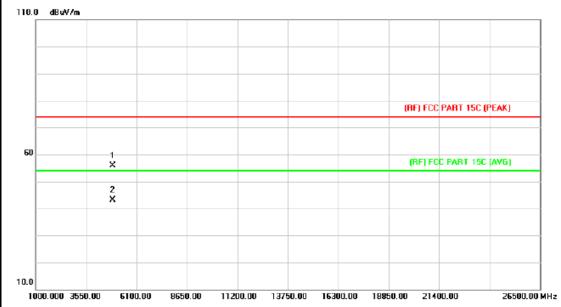


No	. Mk.	Freq.	_		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αB	Detector
1		4803.450	44.12	13.44	57.56	74.00	-16.44	peak
2	*	4804.020	30.21	13.44	43.65	54.00	-10.35	AVG



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EUT:	Bluetooth Speaker	Model Name :	2733			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V	DC 3.7V				
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2441MH	TX GFSK Mode 2441MHz				
Remark:	No report for the emissio prescribed limit.	n which more than 10 c	dB below the			

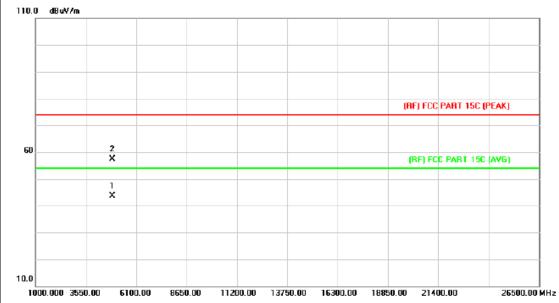


No	. Mk.	Freq.	Reading Level		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αB	Detector
1		4881.940	41.96	13.90	55.86	74.00	-18.14	peak
2	*	4881.940	29.14	13.90	43.04	54.00	-10.96	AVG



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EUT:	Bluetooth Speaker	Model Name :	2733			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	Vertical				
Test Mode:	TX GFSK Mode 2441MH	Z				
Remark:	No report for the emissio prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.				

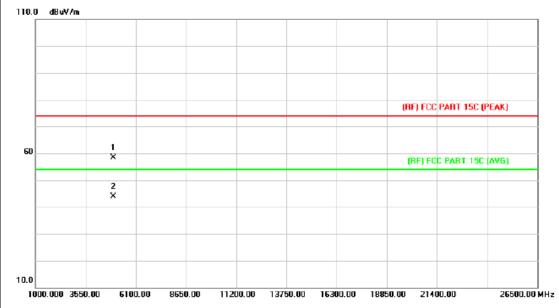


N	o. M	lk. Freq.	Reading Level		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αB	Detector
1	*	4881.990	29.78	13.90	43.68	54.00	-10.32	AVG
2		4882.170	43.46	13.90	57.36	74.00	-16.64	peak



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EUT:	Bluetooth Speaker	Model Name :	2733			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V	DC 3.7V				
Ant. Pol.	Horizontal	Horizontal				
Test Mode:	TX GFSK Mode 2480MH	TX GFSK Mode 2480MHz				
Remark:	No report for the emissio prescribed limit.	n which more than 10 c	dB below the			

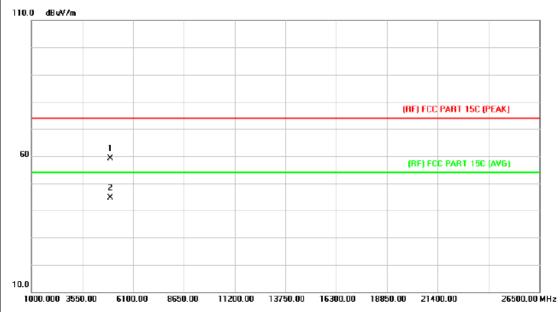


No.	. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1		4959.580	44.00	14.36	58.36	74.00	-15.64	peak
2	*	4959.820	29.50	14.36	43.86	54.00	-10.14	AVG



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EUT:	Bluetooth Speaker	Model Name :	2733			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	Vertical				
Test Mode:	TX GFSK Mode 2480MH	Z				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					
110.0 40.4/4-	prescribed littlit.					

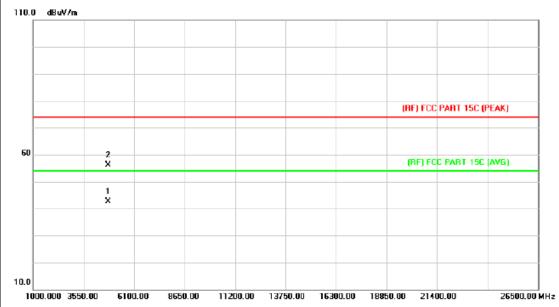


N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1		4959.800	44.86	14.36	59.22	74.00	-14.78	peak
2	*	4959.910	30.20	14.36	44.56	54.00	-9.44	AVG



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EUT:	Bluetooth Speaker	Model Name :	2733				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	TX 8-DPSK Mode 2402N	1Hz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						
Remark:	•	n which more than 10 o	dB below the				

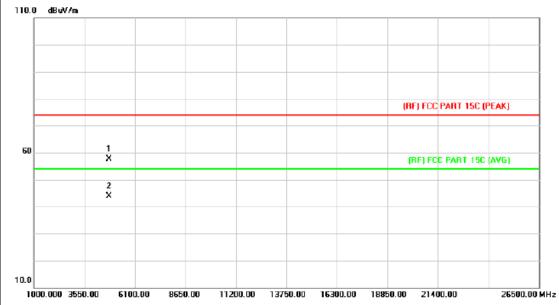


No	. Mk	. Freq.		Correct Factor	Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1	*	4803.940	29.12	13.44	42.56	54.00	-11.44	AVG
2		4804.200	42.79	13.44	56.23	74.00	-17.77	peak



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EUT:	Bluetooth Speaker	Model Name :	2733		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Vertical	Vertical			
Test Mode:	TX 8-DPSK Mode 2402M	1Hz			
Remark:	No report for the emissio prescribed limit.	n which more than 10 c	dB below the		
	1 -				

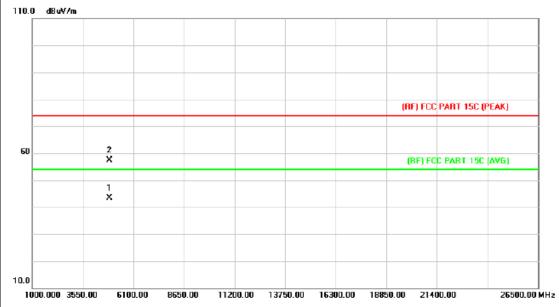


N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αB	Detector
1		4804.010	44.24	13.44	57.68	74.00	-16.32	peak
2	*	4804.120	30.45	13.44	43.89	54.00	-10.11	AVG



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EUT:	Bluetooth Speaker	Model Name :	2733						
Temperature:	25 ℃	Relative Humidity:	55%						
Test Voltage:	DC 3.7V	DC 3.7V							
Ant. Pol.	Horizontal								
Test Mode:	TX 8-DPSK Mode 2441M	1Hz							
Remark:	No report for the emission which more than 10 dB below the prescribed limit.								

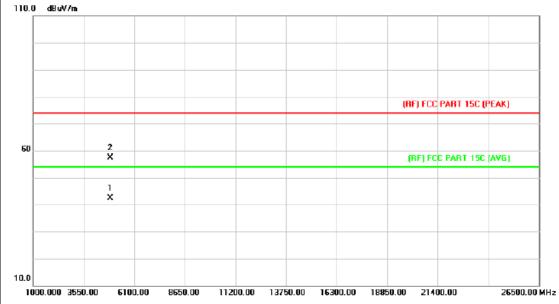


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αB	Detector
1	*	4881.963	29.36	13.90	43.26	54.00	-10.74	AVG
2		4881.985	43.46	13.90	57.36	74.00	-16.64	peak



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EUT:	Bluetooth Speaker	Model Name :	2733					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V							
Ant. Pol.	Vertical	Vertical						
Test Mode:	TX 8-DPSK Mode 2441N	1Hz						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							
	prescribed illilit.							

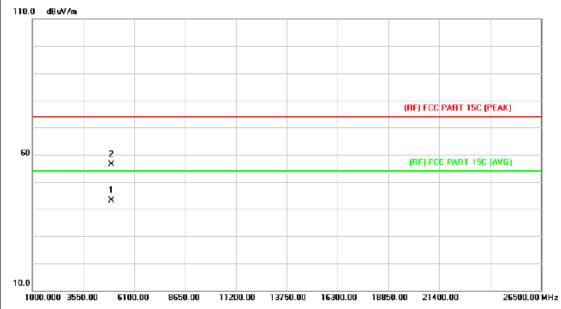


N	o. Mk	Freq.	Reading Level		Measure- ment	Limit	Ov er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1	*	4881.967	28.46	13.90	42.36	54.00	-11.64	AVG
2		4881.987	43.41	13.90	57.31	74.00	-16.69	peak



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EUT:	Bluetooth Speaker	Model Name :	2733						
Temperature:	25 ℃	Relative Humidity:	55%						
Test Voltage:	DC 3.7V	DC 3.7V							
Ant. Pol.	Horizontal								
Test Mode:	TX 8-DPSK Mode 2480N	1Hz							
Remark:	No report for the emission which more than 10 dB below the								
	prescribed limit.								

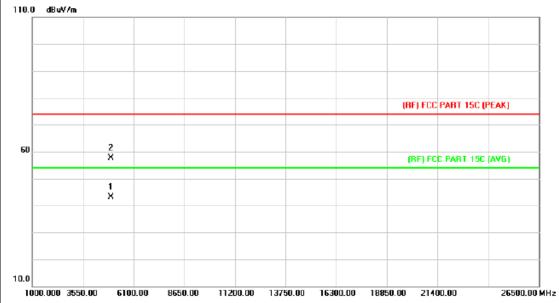


	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Ov er	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1	1	*	4959.854	28.76	14.36	43.12	54.00	-10.88	AVG
- 2	2		4959.932	42.00	14.36	56.36	74.00	-17.64	peak



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EUT:	Bluetooth Speaker	Model Name :	2733						
Temperature:	25 ℃	Relative Humidity:	55%						
Test Voltage:	DC 3.7V	DC 3.7V							
Ant. Pol.	Vertical								
Test Mode:	TX 8-DPSK Mode 2480N	1Hz							
Remark:	No report for the emissio prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.							



N	۷o.	Mk.	Freq.		Correct Factor	Measure- ment	Limit	Ov er	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	αÐ	Detector
1		*	4959.963	28.76	14.36	43.12	54.00	-10.88	AVG
2			4959.971	43.33	14.36	57.69	74.00	-16.31	peak



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5. Restricted Bands Requirement

5.1 Test Standard and Limit

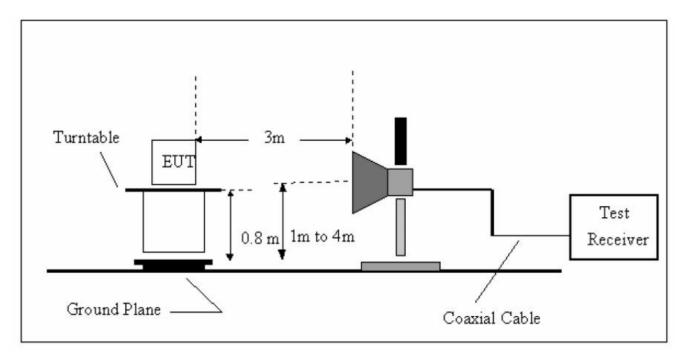
5.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

5.1.2 Test Limit

Class B (dBuV/m)(at 3m)					
Peak	Average				
74	54				
74	54				
	Peak 74				

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 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.
- (6) 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. 10, 2013	Aug.09, 2014	
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 10, 2013	Aug.09, 2014	
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	Rohde & Schwarz	SML03	IKW682-054	Feb. 11, 2014	Feb.10, 2015	
Generator	rtondo a conwaiz	0200		. 55. 11, 2011	. 55.15, 2016	
Positioning	ETS-LINDGREN	2090	N/A	N/A	N/A	
Controller			1		IN/A	

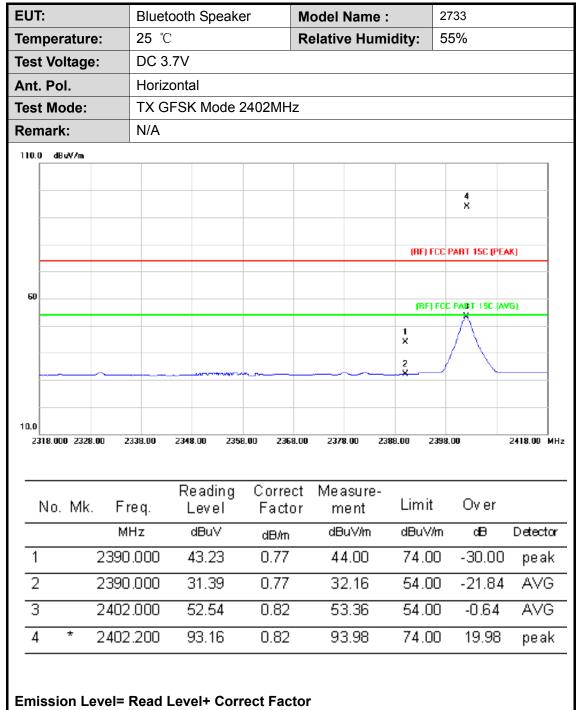
5.6 Test Data

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



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(1) Radiation Test





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EUT:			Blue	tooth	Spea	ker	M	odel l	Name	e :	2	733		
Temp	perature	:	25 °C	C			Re	elativ	e Hu	midity:	5	5%		
Test	Voltage		DC 3	3.7V			•							
Ant.	Pol.		Verti	cal										
Test	Mode:		TX G	FSK	Mode	e 2402M	Hz							
Rema	ark:		N/A											
110.0	dBuV/m													
												4		
Ì												×		
ŀ														
ŀ										(B	F) FCC	PART 15C (PE	AK)	
60												3		
-											RF) FC	C PART 15C (A)	/G)	
										×		$/ \setminus$		
		_								2			_	
		_			بلزومجلكمس	Mann Take Town Server								
ŀ														
10.0 23	18.000 2328	.00	2338.00	2348	.00	2358.00 2	2368.00	237	8.00	2388.00	2398	E. 00	2418.00	 MHz
					adisa	a Cori	t	Maa	sure					
N	o. Mk.	Fr	eq.		ading evel	Fac			ent	Lin	nit	Ov er		
		MI	Hz	dl	Bu∀	dB/	m	dB	uV/m	dB∪	ıV/m	a⊞	Detec	tor
1		2390	.000	44	4.35	0.7	7	45	5.12	74	.00	-28.88	pea	ak
2	:	2390	.000	32	2.06	0.7	7	32	2.83	54	.00	-21.17	ΑV	G
3	Χ :	2402	.120	54	4.48	0.8	2	55	5.30	54	.00	1.30	ΑV	G
4	* :	2402	.230	98	3.16	0.8	2	98	3.98	74	.00	24.98	pea	ak
Emis	sion Le	vel=	Read	Leve	I+ Co	orrect Fa	ctor							



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EUT:	Bluetooth Speake	er M	odel Name :	2733						
Temperature:	25 ℃	R	elative Humidity:	55%						
Test Voltage:	DC 3.7V									
Ant. Pol.	Horizontal									
Test Mode:	TX GFSK Mode 2	2480 MHz								
Remark:	N/A									
110.0 dBuV/m										
10.0 2450.000 2470.00 2	2 X 3 1 X X 4 X 4 X 4 X 4 X 4 X 4 X 4 X 4 X 4	0.00 2510.00	(R	2540.00 2560.00 MHz						
No. Mk. Fr	Reading req. Level	Correct Factor	Measure- ment Lim	it Over						
MI	Hz dBu∨	dB/m	dBuV/m dBu	V/m dB Detector						
1 2480	.000 50.99	1.15	52.14 54	.00 -1.86 AVG						
2 * 2480	.100 92.53	1.15	93.68 74	.00 19.68 peak						
3 2483	53.95	1.17	55.12 74	.00 -18.88 peak						
4 2483	.500 37.06	1.17	38.23 54	.00 -15.77 AVG						



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EUT			Bluet	ooth Speak	er	Мо	del Na	me :		2733						
Tem	peratur	e:	25 °C	C		Re	lative H	Humic	dity:	55%						
Test	t Voltage	e:	DC 3	.7V												
Ant.	Pol.		Verti	cal												
Test	t Mode:		TX G	FSK Mode	2480 MF	łz										
Ren	nark:		N/A													
110.0) dBuV/m															
			2													
			*													
									(RF) FC	C PART 15C (P	EAK)					
60			3 1 X						(DE) E	C DADT 150	11/51					
			Å						(RF) F	CC PART 15C (AVG					
		,	/ \ ₄													
			×		47											
					,											
10.0	160.000 2470	0. 0 0 2	480.00	2490.00 25	00.00 251	0.00	2520.00	253	0.00 254	10.00	2560.00 MH					
_				Reading	Corre	ct	Meas	ure-								
	No. Mk	. F	re q.	Level	Fact	or	mer	nt	Limit	Ov ei	r					
		М	Hz	dBu∀	dB/m		dBu∖	//m	dBu∀/i	n dB	Detecto					
1		2480	.000	52.61	1.15		53.7	76	54.00	-0.2	4 AVG					
2	*	2480).210	97.21	1.15		98.3	36	74.00	24.3	6 peak					
3		2483	3.500	57.52	1.17		58.6	69	74.00	-15.3	11 peak					
4		2483	3.500	38.28	1.17	1	39.4	45	54.00	-14.5	5 AVG					
_																

Emission Level= Read Level+ Correct Factor



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EUT	:		Bluet	ooth Sp	eake	er	М	odel	Name	e :		2733					
Tem	perature	:	25 °C	C			Re	lativ	e Hu	mid	ity:	55%					
Test	Voltage:		DC 3	.7V													
Ant.	Pol.		Horiz	ontal													
Test	Mode:		TX 8	-DPSK I	Node	e 2402M	lHz										
Ren	nark:		N/A														
110.0) dBuV/m														1		
												3					
												×					
											(RF) FO	CC PART 15C	(PEAI	K)			
60											(BE) I	FCC PARK 15	CIAVI	G)			
											1						
											×	\bot / \setminus					
					TUNANN-				~~		2 X						
10.0																	
	817.000 2327.0	00 2	337.00	2347.00	2357	7.00 236	7.00	237	7.00	2387	.00 23	897.00	-	2417.00	J MHz		
1	No. Mk.	Fr	eq.	Re adi Leve		Corre Facto			asure ent	9-	Limit	Ov e	er				
		MI	Hz	dBu∖	/	dB/m		dB	uV/m		dBu∀/l	m dB		Detec	tor		
1	2	2390	.000	43.4	9	0.77		4.	4.26		74.00	3 -29.	74	pea	ak		
2	2	2390	.000	31.3	5	0.77		32	2.12		54.00	3 -21.	88	ΑV	G		
3	* 2	2402	.000	97.3	1	0.82		98	3.13		74.00	0 24.1	13	pea	ak		
4	2	2402	.000	52.3	2	0.82		53	3.14		54.00	3.0-	36	ΑV	G		
Emi	ssion Le	vel=	Read	Level+	Corr	ect Fac	tor										



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UT:			Blue	tooth Spe	aker	Mo	odel N	lame :		2733					
emp	eratur	e:	25 °C	C		Re	lative	Humi	dity:	55%					
est \	Voltage	e :	DC 3	5.7V		•									
\nt. F	Pol.		Verti	cal											
est l	Mode:		TX 8	-DPSK M	ode 2402	MHz									
Rema	ark:														
110.0	dBuV/m					_									
										4 ×					
									(BF) F	CC PART 15C	(PEAK)			
60									(BF)	FCC PAPE 15	C (AVG)			
									1.	À					
									×	_/_\					
		~~		~		-			2 X	-/	\				
10.0															
2317	7.000 232	7.00 2	337.00	2347.00	2357.00 23	367.00	2377.	00 23	87.00 2	397.00	24	417.00	MHz		
N	o. Mk	. Fr	eq.	Readin Level			Me a me	sure- ent	Limit	: Ove	er				
		M	Hz	dBu∀	dB/r	n	dB∪	iV/m	dBuV.	/m dB		Detect	tor		
1		2390	.000	44.35	0.7	7	45	.12	74.0	0 -28.	88	pea	k		
2		2390	.000	31.65	0.73	7	32	.42	54.0	0 -21.	58	AV	<u> </u>		
3	Х	2402	.000	53.30	0.82	2	54	.12	54.0	0 0.1	2	ΑV	<u>G</u>		
4	*	2402	.200	99.16	0.82	2	99	.98	74.0	0 25.9	98	pea	k		
mic	sion I	ovol–	Poad	ا میرما+ ۵	orrect Fa	ctor									
.11113	SIUII L	CAGI-	ı ve au	Feagl+ C	on c ct ra	CLUI									



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EUT:			Bluet	ooth Speake	er N	lodel Name :		2733		
emp	peratur	e:	25 ℃	2	F	Relative Humi	idity:	55%		
Test '	Voltage) :	DC 3	.7V	1					
۹nt. ا	Pol.		Horiz	ontal						
Test	Mode:		TX 8-	DPSK Mode	e 2480MH	Z				
Rema	ark:		N/A							
110.0	dBuV/m									
			,							
			2 X							
-							(BF) FO	C PART 15C (PEA	AK)	
							,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		-	
60			3							
			1 ^				(RF) I	CC PART 15C (A)	/G)	
			/\\.							
			*							
							**	_		
10.0										
	50.000 2470		480.00	Reading	0.00 2510.00 Correct	0 2520.00 25 Measure-		40.00	2560.00 MR	
N	lo. Mk.	. Fr	eq.	Level	Factor	ment	Limit	Ov er		
		MH	Ηz	dBu∀	dB/m	dBuV/m	dBu∀/n	n dB	Detector	
1		2479	.899	51.01	1.15	52.16	54.00	-1.84	AVG	
2	*	2480	.000	96.98	1.15	98.13	74.00	24.13	peak	
2					4 4 7	58.62	74.00	-15.38	peak	
3		2483	.500	57.45	1.17	50.62	14.00	, ,0.00	pean	

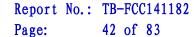
Emission Level= Read Level+ Correct Factor



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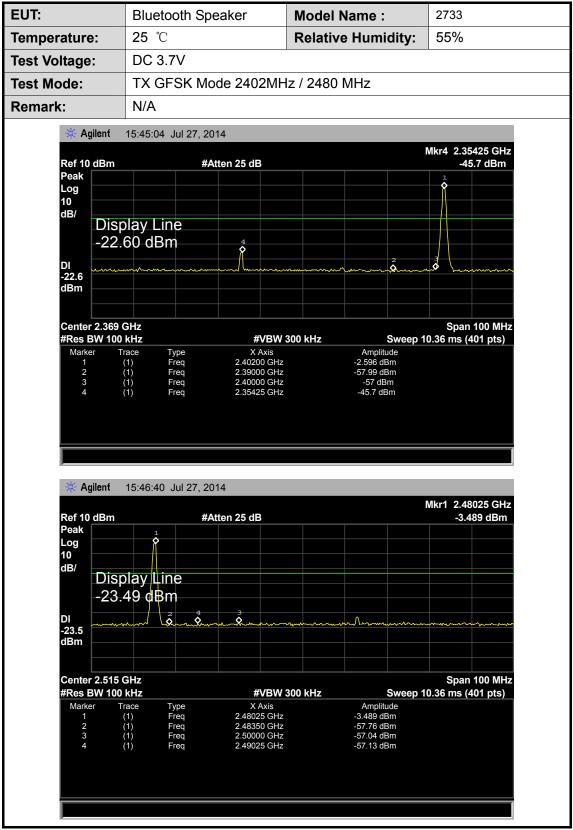
EUT			Blueto	ooth Speake	er I	Model Name	:	2733	
Tem	peratur	e:	25 ℃		ı	Relative Hun	nidity:	55%	
Test	Voltage	ə :	DC 3.	7V	,				
Ant.	Pol.		Vertic	al					
Test	Mode:		TX 8-	DPSK Mode	2480MH	łz			
Rem	nark:		N/A						
110.0) dBuV/m								
			1						
Ì			*						
							(BF) F	CC PART 15C (PE	AK)
			3						
60			2 ×				(DE)	ECC DADT 15C (A	MEX
			Å				(RF)	FCC PART 15C (A	VG)
		,	/ \ <u>.</u>						
			*						
10.0	160.000 2471	D. 0 0 2	480.00	2490.00 250	0.00 2510.	00 2520.00 2	2530.00 2	540.00	2560.00 MH
_				Reading	Correc	t Measure-			
1	No. Mk	. Fr	eq.	Level	Facto		Limit	Ov er	
		MI	Hz	dBu∀	dB/m	dBuV/m	dBuV/	m dB	Detector
1	*	2479	.700	98.83	1.15	99.98	74.0	0 25.98	peak
2		2479	.900	52.63	1.15	53.78	54.0	0 -0.22	AVG
3		2483	.500	60.95	1.17	62.12	74.0	0 -11.88	peak
4		2483	500	38.40	1.17	39.57	54.0	0 -14.43	AVG

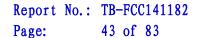
Emission Level= Read Level+ Correct Factor





(2) Conducted Test







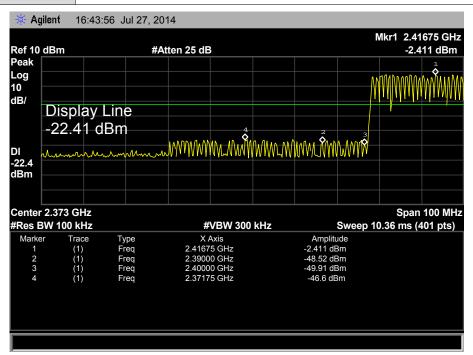
EUT: Bluetooth Speaker Model Name: 2733

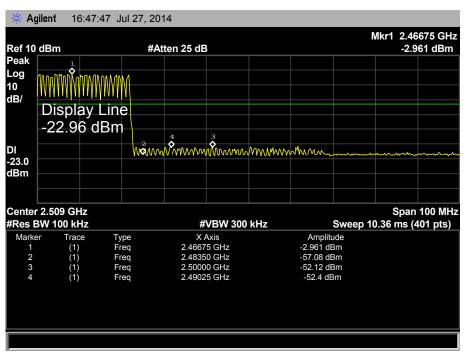
Temperature: 25 ℃ Relative Humidity: 55%

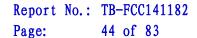
Test Voltage: DC 3.7V

Test Mode: GFSK Hopping Mode

Remark: N/A









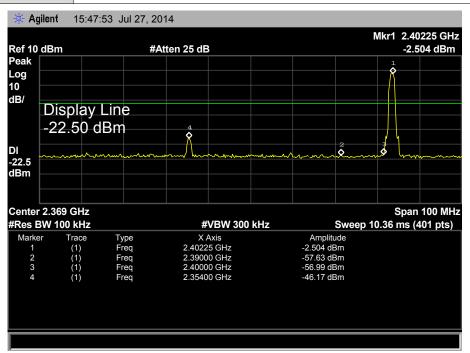
EUT: Bluetooth Speaker Model Name: 2733

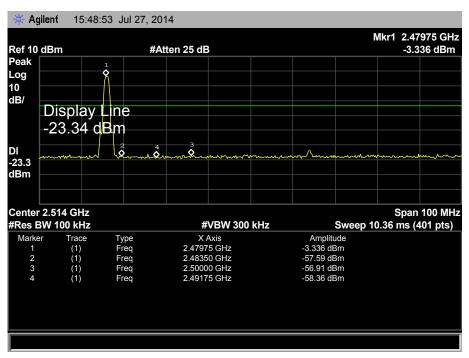
Temperature: 25 °C Relative Humidity: 55%

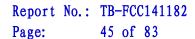
Test Voltage: DC 3.7V

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

Remark: N/A









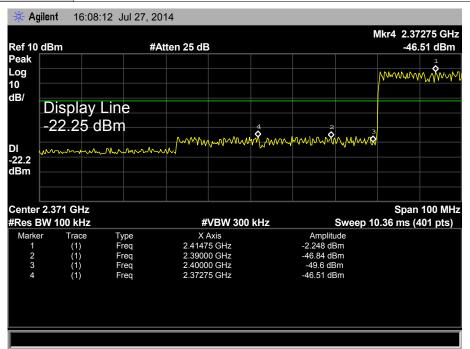
EUT: Bluetooth Speaker Model Name: 2733

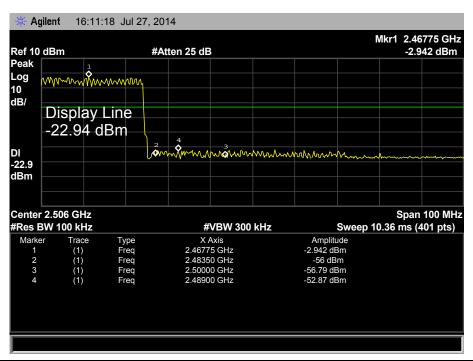
Temperature: 25 °C Relative Humidity: 55%

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.

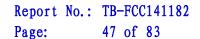
6.4 EUT Operating Condition

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 Speaker Model Name: 2733

Temperature: 25 °C Relative Humidity: 55%

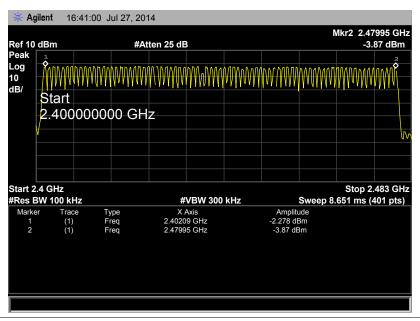
Test Voltage: DC 3.7V

Test Mode: Hopping Mode (GESK/ 8 DPSK)

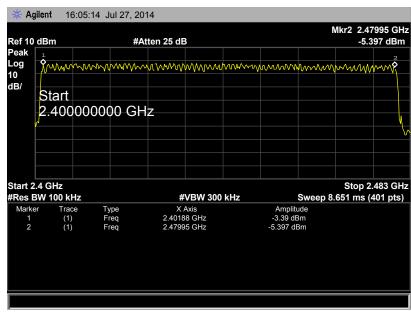
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
2402000-2400000-	79	>4 E
2402MHz~2480MHz	79	>15

GFSK Mode



D-8PSK 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	Agilent		MY45106456	Mar. 20, 2014	Mar. 19. 2015	
Analyzer	Agiletti	E4407B	W 1 45 100456	Mai. 20, 2014	Mai. 19, 2015	

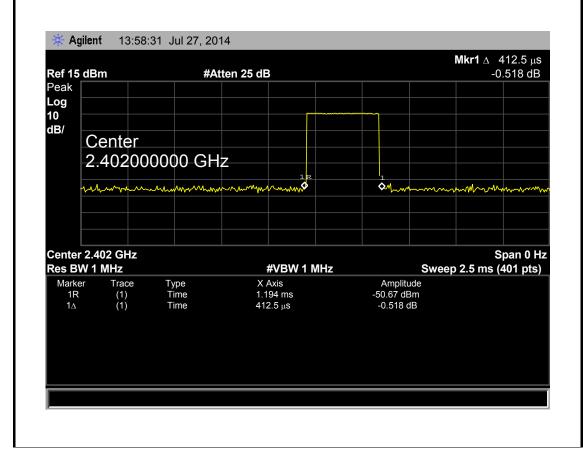


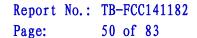
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7.6 Test Data

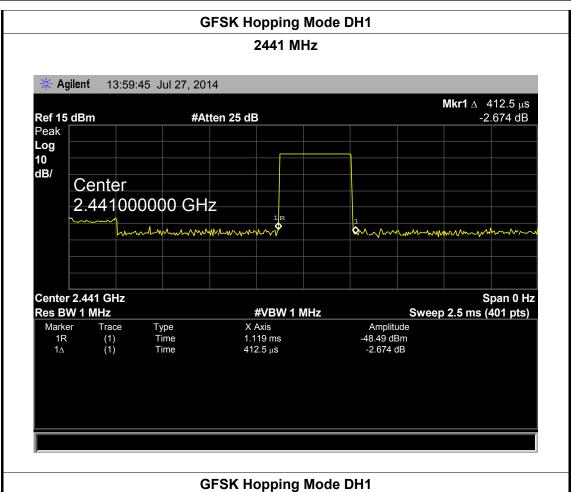
EUT:		Bluetooth	Speaker	Model Name		2733	
Temperature:		25 ℃		Relative Humidity: 55%			
Test Voltage:		DC 3.7V					
Test Mode:		Hopping I	Mode (GFSK D	H1)			
Channel	Pu	lse Time	Total of	Period Time	Lir	nit	Result
(MHz)		(ms)	Dwell (ms)	(s)	(m	ıs)	Result
2402		0.413	132.16				
2441		0.413	132.16	31.60	400		PASS
2480		0.413	132.16				
			GESK Honni	na Modo DU1			-

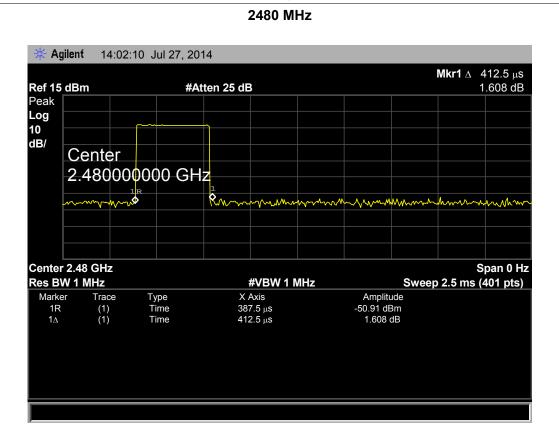
GFSK Hopping Mode DH1









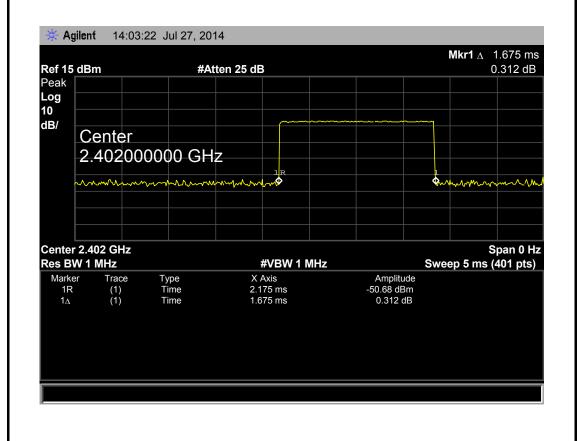


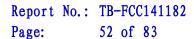


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EUT:		Bluetooth	Speaker	Model Name		2733				
Temperature:		25 ℃		Relative Humidity: 55%						
Test Voltage:		DC 3.7V								
Test Mode:		Hopping I	Mode (GFSK D	H3)						
Channel	Pu	Ise Time	Total of	Period Time	Lir	nit	Result			
(MHz)		(ms)	Dwell (ms)	(s)	(m	ıs)	Result			
2402		1.675	268.00							
2441		1.675	268.00	31.60	40	00	PASS			
2480		1.675	268.00							
	GFSK Hopping Mode DH3									

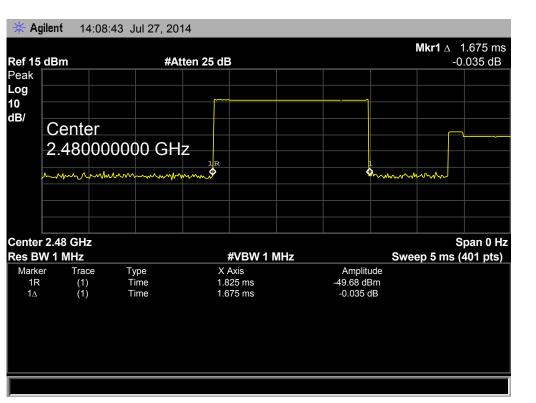
11 0







GFSK Hopping Mode DH3 2441 MHz Agilent 14:04:22 Jul 27, 2014 Mkr1 A 1.675 ms 2.902 dB Ref 15 dBm #Atten 25 dB Peak Log 10 dB/ Center 2.441000000 GHz Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 5 ms (401 pts) Amplitude -51.91 dBm 2.902 dB Marker X Axis Trace Туре 2.013 ms 1.675 ms (1) (1) Time Time 1R 1Δ **GFSK Hopping Mode DH3** 2480 MHz

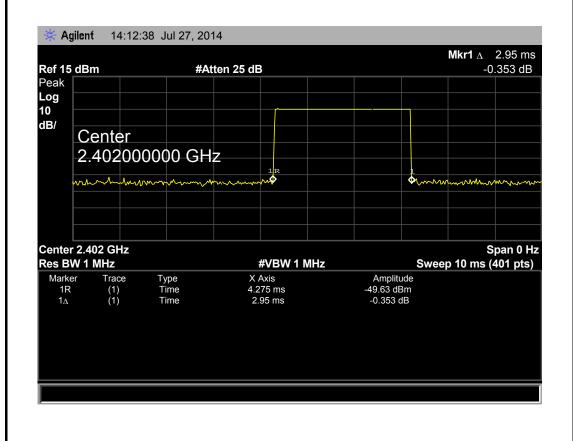


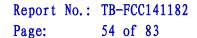


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EUT:		Bluetooth	Speaker	Model Name: 2		2733	
Temperature:		25 °C Relative Humidity:			idity:	55%	
Test Voltage:	DC 3.7V						
Test Mode:	Test Mode: Hopping Mode (GFSK DH5)						
Channel	Pu	Ise Time	Total of	Period Time	Lir	nit	Result
(MHz)		(ms)	Dwell (ms)	(s)	(m	ıs)	Result
2402		2.950	314.67				
2441		2.950	314.67	31.60	40	00	PASS
2480		2.950	314.67				
GESK Hopping Mode DH5							

GFSK Hopping Mode DH5







GFSK Hopping Mode DH5

2441 MHz

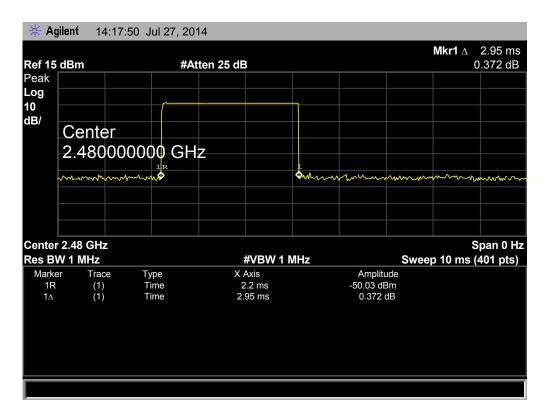
Agilent 14:14:05 Jul 27, 2014

Mkr1 △ 2.95 ms
Ref 15 dBm #Atten 25 dB 1.621 dB

Peak
Log
10
dB/
Center
2.441000000 GHz

Center 2.441 GHz Res BW 1 MHz Marker Trace Type X Axis Amplitude 1R (1) Time 5.75 ms -49.7 dBm 1Δ (1) Time 2.95 ms 1.621 dB

GFSK Hopping Mode DH5

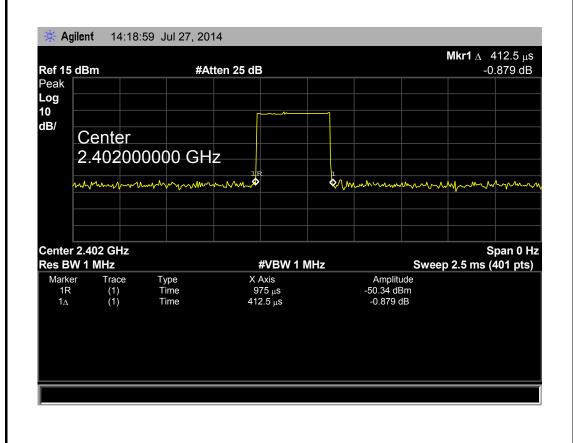


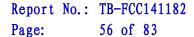


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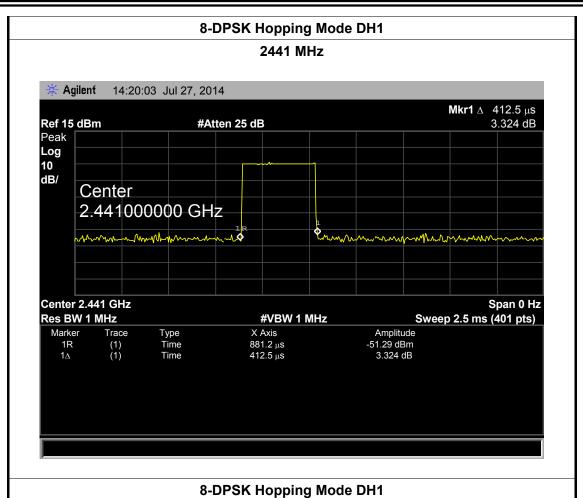
EUT:		Bluetooth	Speaker	Model Name: 2		2733	
Temperature:		25 ℃		Relative Humidity: 55%			
Test Voltage:		DC 3.7V					
Test Mode:		Hopping I	ng Mode (8-DPSK DH1)				
Channel	Pu	Ise Time	Total of	Period Time	Lir	nit	Result
(MHz)		(ms)	Dwell (ms)	(s)	(m	ıs)	Result
2402		0.413	132.16				
2441		0.413	132.16	31.60	40	00	PASS
2480		0.413	132.16				

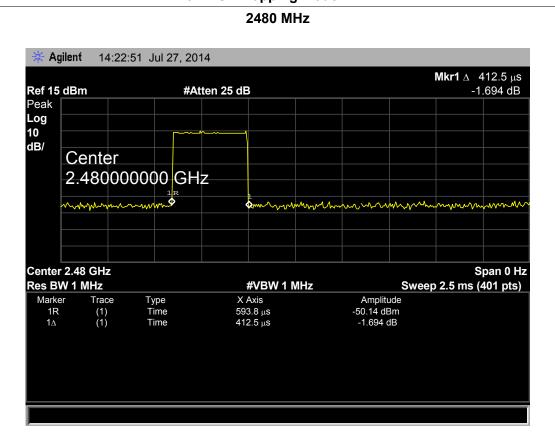
8-DPSK Hopping Mode DH1









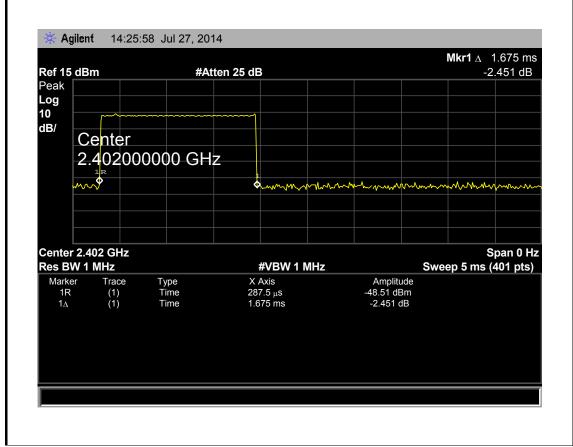


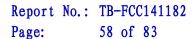


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EUT:		Bluetooth	Model Name	:	2733		
Temperature:		25 ℃ Relative Humidity: 55%					
Test Voltage:		DC 3.7V					
Test Mode:		Hopping I	Mode (8-DPSK	DH3)			
Channel	Pu	Ise Time	Total of	Period Time	Lir	nit	Result
(MHz)		(ms)	Dwell (ms)	(s)	(m	ıs)	Result
2402		1.675	268.00				
2441		1.675	268.00	31.60	40	00	PASS
2480		1.675	268.00				

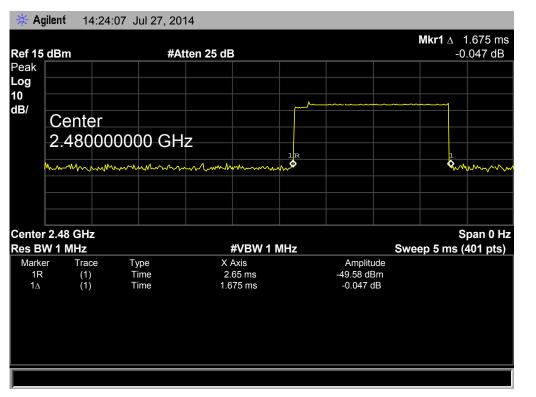
8-DPSK Hopping Mode DH3







8-DPSK Hopping Mode DH3 2441 MHz Agilent 14:25:12 Jul 27, 2014 Mkr1 A 1.675 ms -1.026 dB Ref 15 dBm #Atten 25 dB Peak Log 10 dB/ Center 2.441000000 GHz ammun Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 5 ms (401 pts) Amplitude -49.97 dBm -1.026 dB X Axis Marker Trace Туре (1) (1) Time Time 850 μs 1.675 ms 1R 1Δ 8-DPSK Hopping Mode DH3 2480 MHz Agilent 14:24:07 Jul 27, 2014 **Mkr1** Δ 1.675 ms

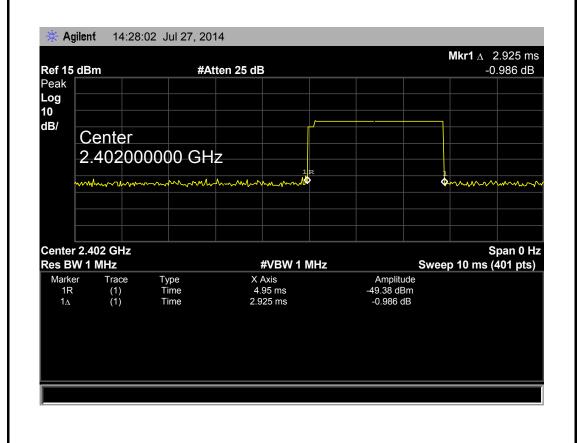


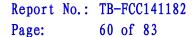


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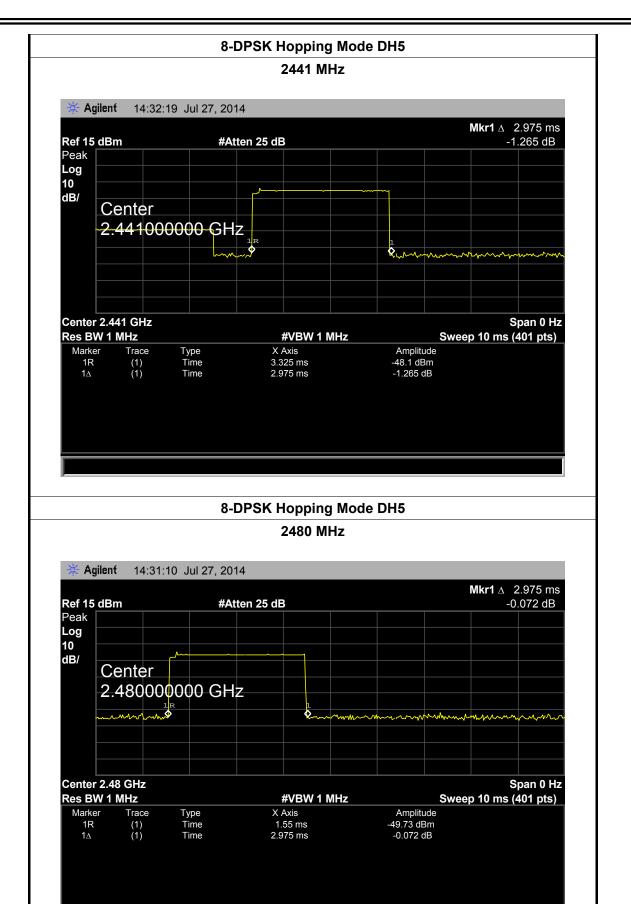
EUT:		Bluetooth Speaker		Model Name :		2733	
Temperature:		25 ℃		Relative Hum	Relative Humidity: 55%		
Test Voltage:		DC 3.7V					
Test Mode: Hopping Mode (8-DPSK DH5)							
Channel	Pu	Ise Time	Total of	Period Time	Lir	nit	Result
(MHz)		(ms)	Dwell (ms)	(s)	(m	ıs)	Result
2402		2.925	312.00				
2441		2.975	317.33	31.60	40	00	PASS
2480		2.975	317.33				
9 DDSK Honning Mode DHE							

8-DPSK Hopping Mode DH5











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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	2400~2483.5
	(20dB bandwidth)	
	>25KHz or >two-thirds of	
Channel Separation	the 20 dB bandwidth	2400~2483.5
	Which is greater	

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.



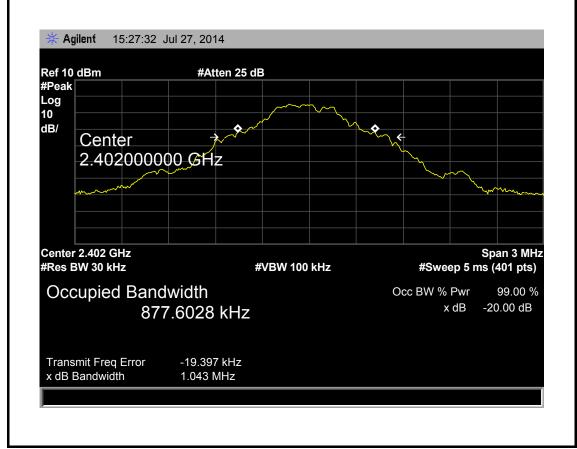
8.5 Test Equipment

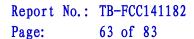
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015

8.6 Test Data

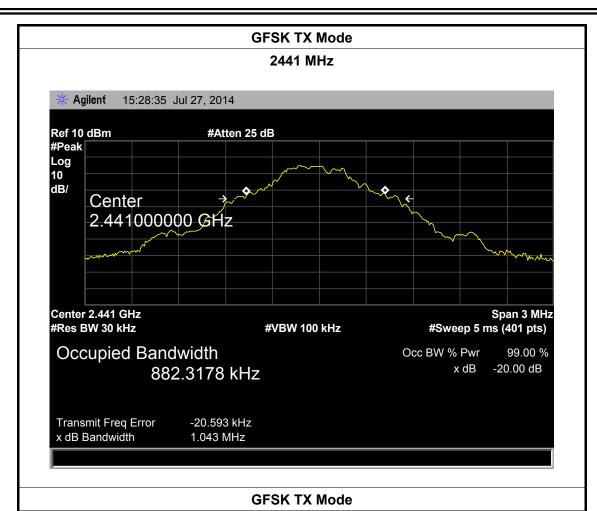
EUT:	Bluetooth Speaker	Model Name :	2733		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V	DC 3.7V			
Test Mode:	TX Mode (GFSK)				
Channel frequence	ey 99% OBW (kHz)	20dB Bandwidth	20dB Bandwidth		
•	• • • • • • • • • • • • • • • • • • • •				
(MHz)		(kHz)	*2/3 (kHz)		
-	877.6028	(kHz) 1043.00	* 2/3 (kHz) 695.33		
(MHz)	,	,	` ,		
(MHz) 2402	877.6028	1043.00	695.33		

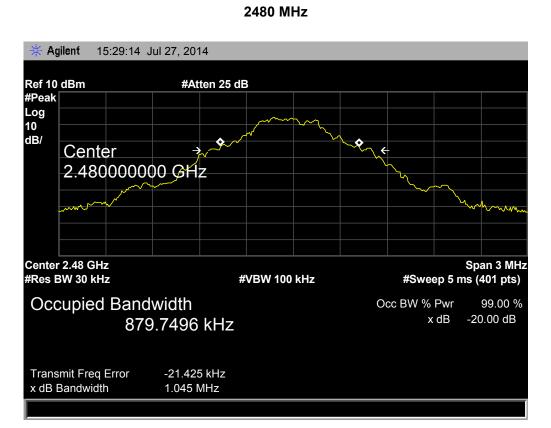
0400 BALL-











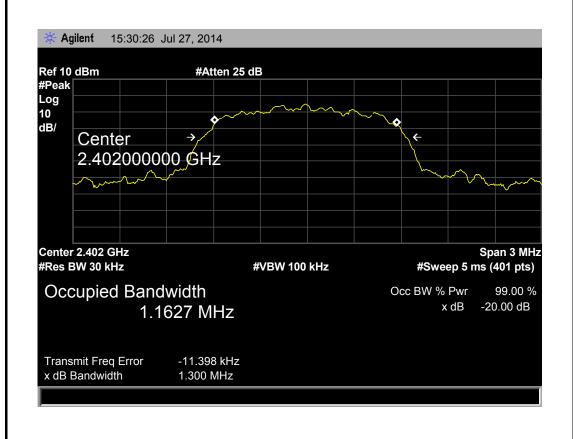


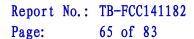
EUT:	Bluetooth Speaker	Model Name :	2733
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode:	1)	Mode	(8-DPSK)	
Channal fragues	,	000/	ODW/I/L	_/

	(= 1 = 1)		
Channel frequency	99% OBW (kHz)	20dB Bandwidth	20dB Bandwidth
(MHz)		(kHz)	*2/3 (kHz)
2402	1162.70	1300.00	866.67
2441	1159.00	1296.00	864.00
2480	1161.30	1296.00	864.00

8-DPSK TX Mode 2402 MHz







8-DPSK TX Mode 2441 MHz 15:31:15 Jul 27, 2014 Agilent Ref 10 dBm #Atten 25 dB #Peak Log 10 dB/ \rightarrow 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 Occ BW % Pwr 99.00 % -20.00 dB 1.1590 MHz x dB Transmit Freq Error -12.463 kHz x dB Bandwidth 1.296 MHz 8-DPSK TX Mode

2480 MHz 15:31:52 Jul 27, 2014 Agilent Ref 10 dBm #Atten 25 dB #Peak Log 10 dB/ Center 2.480000000 GHz Center 2.48 GHz Span 3 MHz #Res BW 30 kHz **#VBW 100 kHz** #Sweep 5 ms (401 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % x dB -20.00 dB 1.1613 MHz Transmit Freq Error -12.299 kHz x dB Bandwidth 1.296 MHz



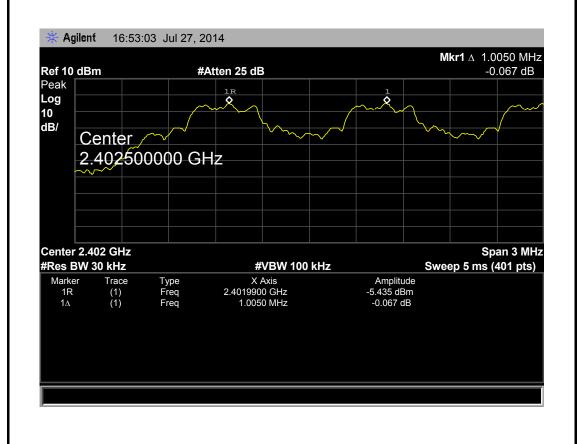
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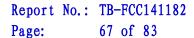
EUT:	Bluetooth Speaker	Model Name :	2733
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (GFSK)

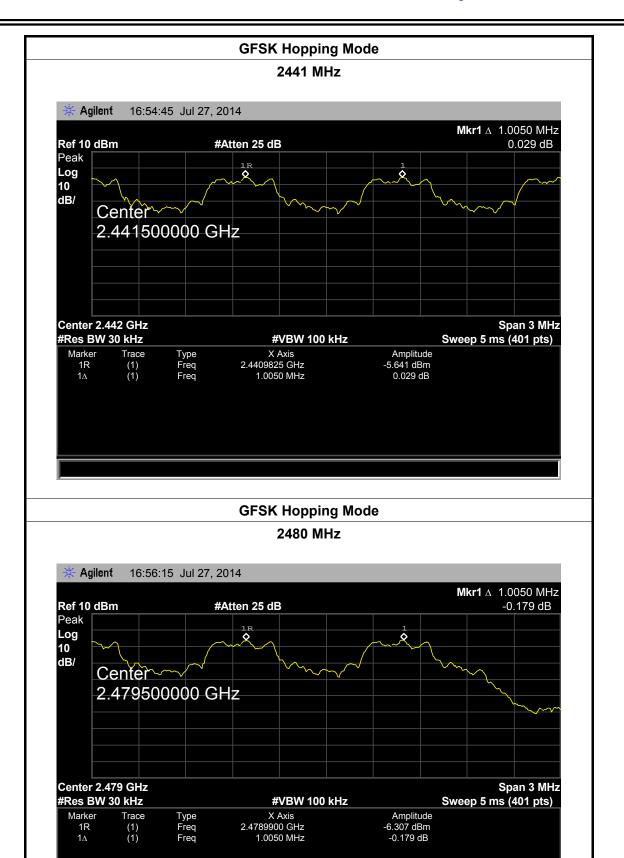
Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit (kHz)	
2402	1005.00	695.33	
2441	1005.00	695.33	
2480	1005.00	696.67	

GFSK Hopping Mode









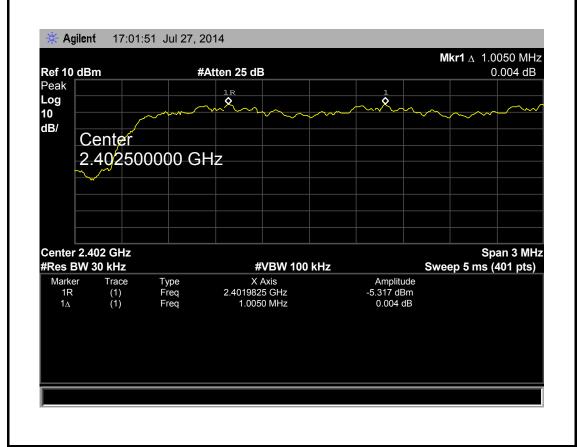


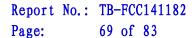
Report No.: TB-FCC141182

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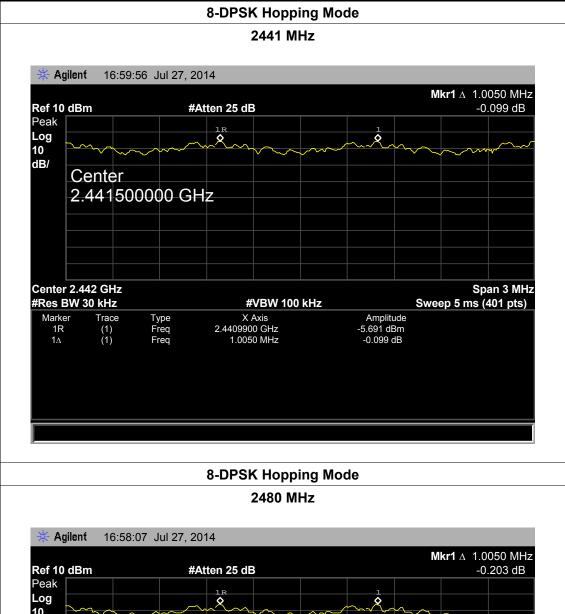
EUT:	Bluetooth Speaker		Model Name :		2733	
Temperature:	25 ℃		Relative Humidity:		55%	
Test Voltage:	DC 3.7V					
Test Mode:	Hopping Mode (8-DPSK)					
Channel frequency (MHz)		Separation Read Value		Sep	Separation Limit (kHz)	
		(kHz)				
2402		1005.00			866.67	
2441		1005.00		864.00		
2480		1005.00		864.00		

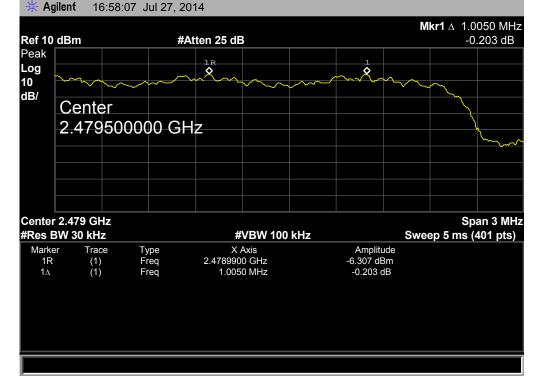
8-DPSK Hopping Mode













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9. Peak Output Power Test

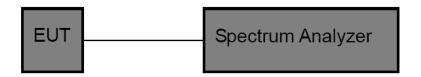
9.1 Test Standard and Limit

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



2441

2480

Report No.: TB-FCC141182

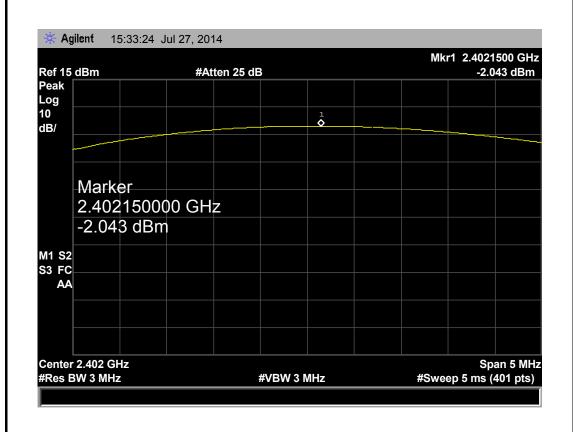
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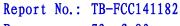
21

EUT:	Bluetooth Speaker		Model Name	•	2733
Temperature:	25 ℃		Relative Humidity:		55%
Test Voltage:	DC 3.7V				
Test Mode:	TX Mode (GFSK)				
Channel frequency (MHz) Test Res		ult (dBm)		Limit (dBm)	
2402		-2.0	043		

-2.971 GFSK TX Mode

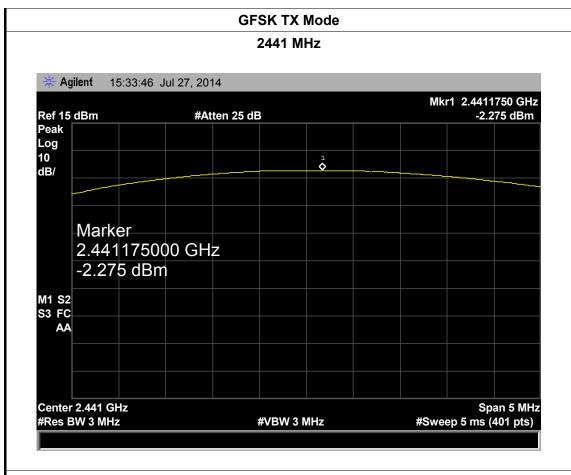
-2.275



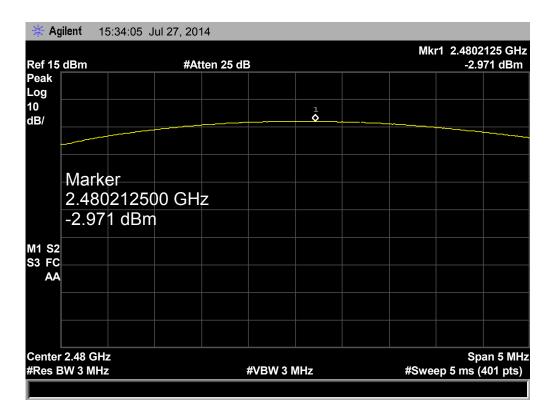




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GFSK TX Mode



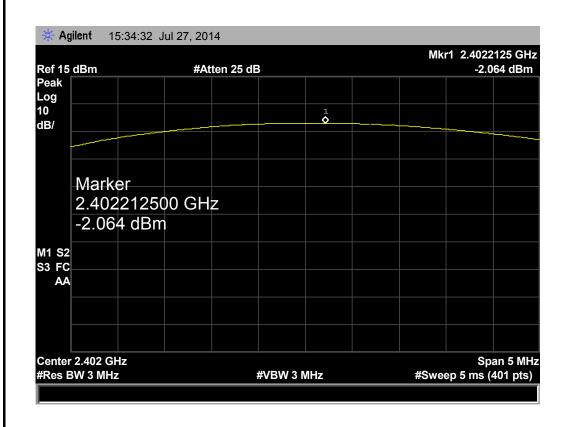


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EUT:	Bluetooth Speaker	Model Name :	2733		
Temperature:	25 ℃	Relative Humidit	ty : 55%		
Test Voltage:	DC 3.7V				
Test Mode:	TX Mode (8-DPSK)				
01 16	(1411) 4	14 (15)	L ' '(/ JD)		

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)	
2402	-2.064		
2441	-2.275	21	
2480	-3.049		

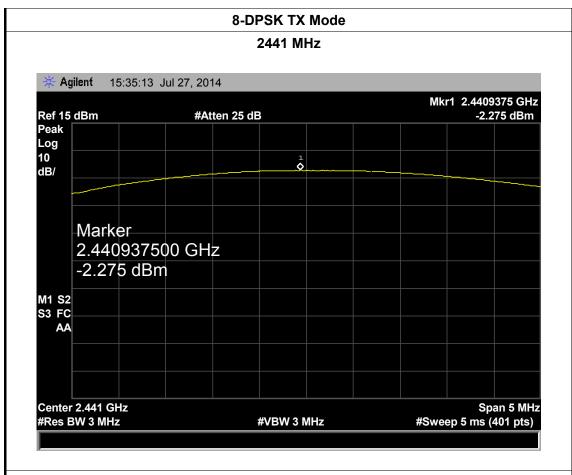
8-DPSK TX Mode



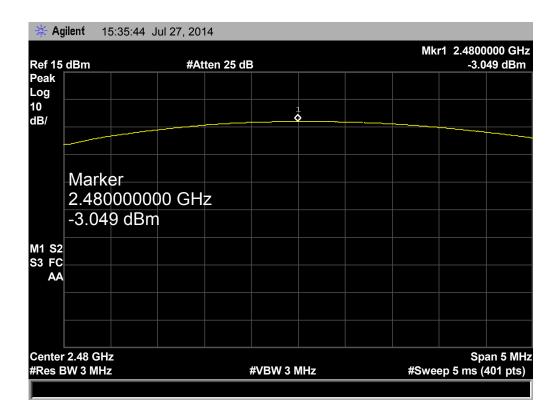




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8-DPSK TX Mode





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10. Antenna Conducted Spurious Emission

10.1 Test Standard and Limit

10.1.1 Test Standard FCC Part 15.247 (d)

10.1.2 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (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

10.2 Test Setup



10.3 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=300 KHz.

Frequency range: from 30MHz to 25 GHz



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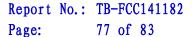
10.4 EUT Operating Condition

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

10.5 Test Equipment

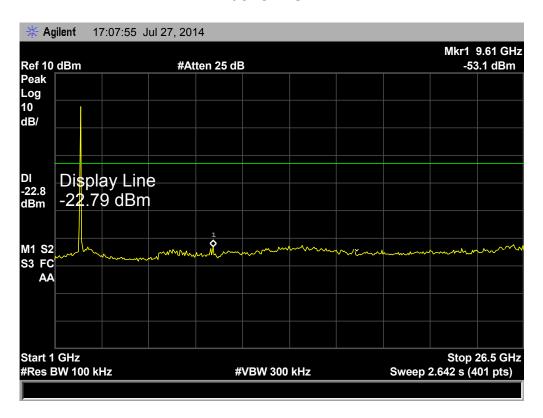
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum	Agilent	E440ED	MY45106456	Mar. 20. 2014	Mar. 19. 2015
Analyzer	rigilorit	E4407B	W1143100430	Mai. 20, 2014	Wai. 10, 2010

10.6 Test Data

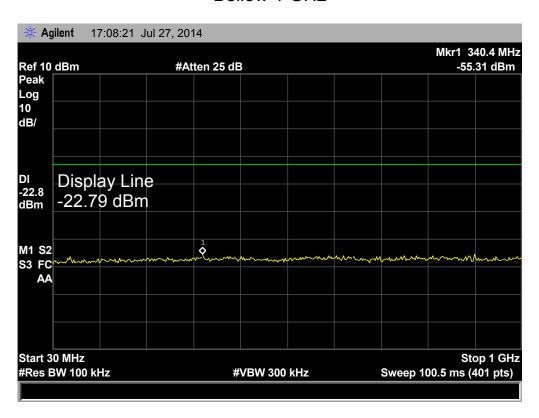


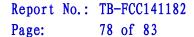


TX CH 00 2402MHz (1 Mbps)



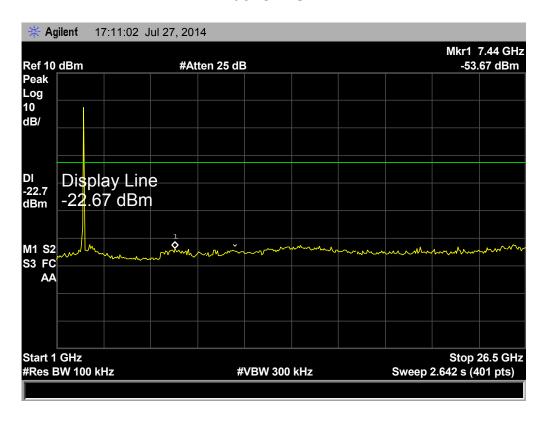
Bellow 1 GHz



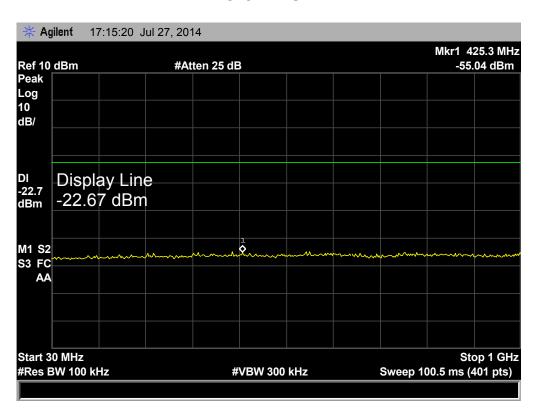


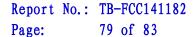


TX CH 39 2441MHz (1 Mbps)



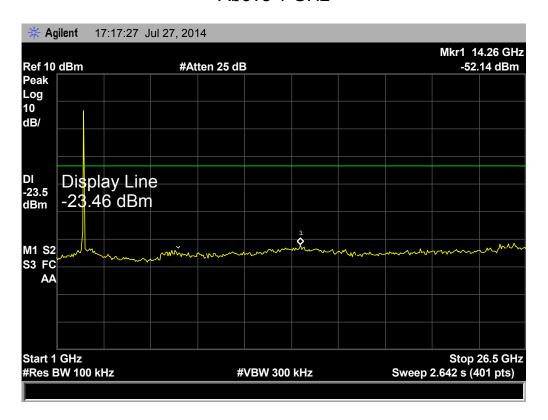
Bellow 1 GHz



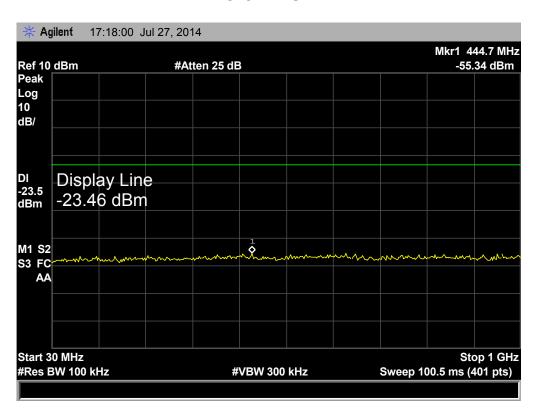


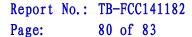


TX CH 78 2480MHz (1 Mbps)



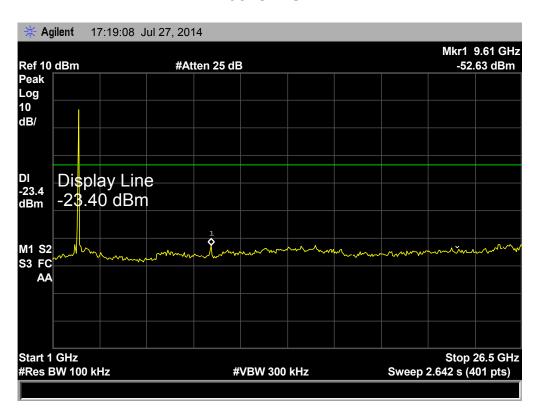
Bellow 1 GHz



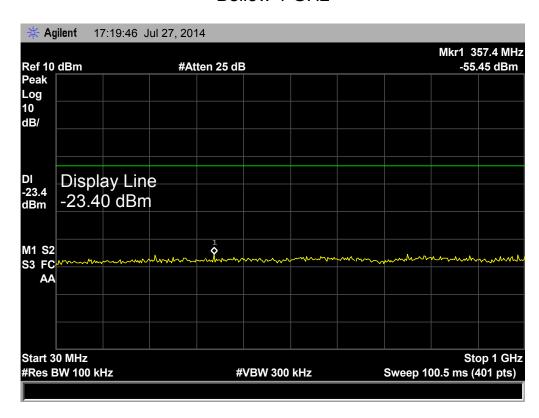


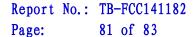


TX CH 00 2402MHz (3 Mbps)



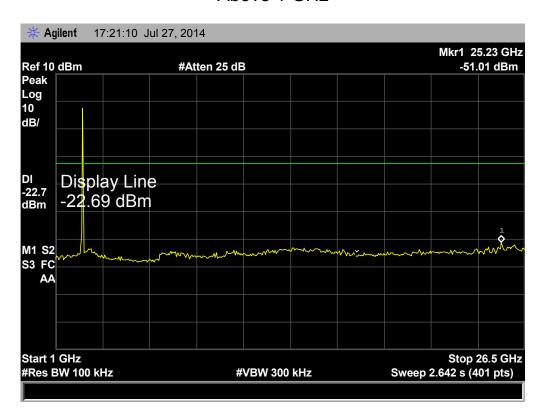
Bellow 1 GHz



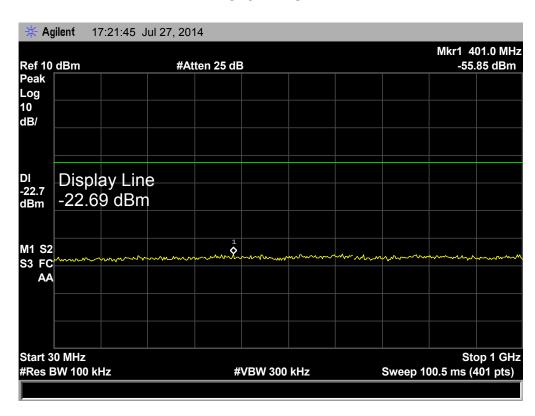


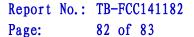


TX CH 39 2441MHz (3 Mbps)



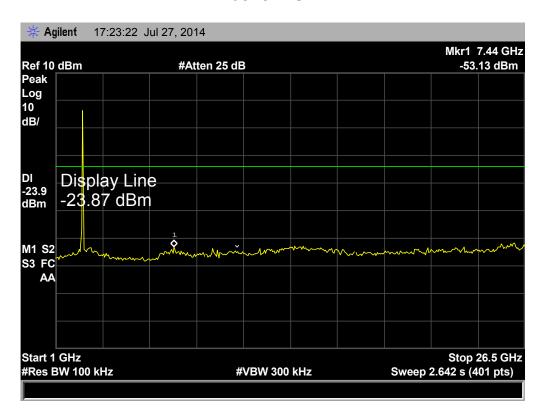
Bellow 1 GHz



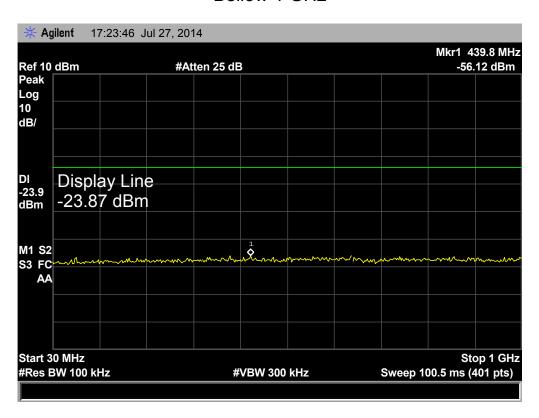




TX CH 78 2480MHz (3 Mbps)



Bellow 1 GHz





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11. Antenna Requirement

11.1 Standard Requirement

11.1.1 Standard

FCC Part 15.203 11.1.2 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.

11.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

11.2 Result

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