

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC143760
Page: 1 of 88

FCC Radio Test Report FCC ID: 2AEI6-ROCK

Original Grant

Report No. : TB-FCC143760

Applicant: Onyx Technology Co. Ltd

Equipment Under Test (EUT)

EUT Name : Bluetooth Speaker

Model No. : Rock

Series Model No. : Stereo-C, Stereo-X

Brand Name : AndroMedia

Receipt Date : 2015-03-18

Test Date : 2015-03-18 to 2015-04-09

Issue Date : 2015-04-10

Standards : FCC Part 15: 2014, Subpart C(15.247)

Test Method : ANSI C63.10: 2013

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



Contents

CON	NIENIS	
1.	GENERAL INFORMATION ABOUT EUT	4
	1.1 Client Information	∠
	1.2 General Description of EUT (Equipment Under Test)	∠
	1.3 Block Diagram Showing the Configuration of System Tested	5
	1.4 Description of Support Units	6
	1.5 Description of Test Mode	6
	1.6 Description of Test Software Setting	8
	1.7 Measurement Uncertainty	8
	1.8 Test Facility	9
2.	TEST SUMMARY	10
3.	CONDUCTED EMISSION TEST	1
	3.1 Test Standard and Limit	11
	3.2 Test Setup	11
	3.3 Test Procedure	11
	3.4 Test Equipment Used	12
	3.5 EUT Operating Mode	12
	3.6 Test Data	12
4.	RADIATED EMISSION TEST	15
	4.1 Test Standard and Limit	15
	4.2 Test Setup	16
	4.3 Test Procedure	17
	4.4 EUT Operating Condition	18
	4.5 Test Equipment	18
5 .	RESTRICTED BANDS REQUIREMENT	33
	5.1 Test Standard and Limit	33
	5.2 Test Setup	
	5.3 Test Procedure	
	5.4 EUT Operating Condition	34
	5.5 Test Equipment	32
6.	NUMBER OF HOPPING CHANNEL	47
	6.1 Test Standard and Limit	47
	6.2 Test Setup	47
	6.3 Test Procedure	
	6.4 EUT Operating Condition	47
	6.5 Test Equipment	47
	6.6 Test Data	47
7.	AVERAGE TIME OF OCCUPANCY	49
	7.1 Test Standard and Limit	49
	7.2 Test Setup	49



Page: 3 of 88

	7.3 Test Procedure	49
	7.4 EUT Operating Condition	49
	7.5 Test Equipment	49
	7.6 Test Data	50
8.	CHANNEL SEPARATION AND BANDWIDTH TEST	68
	8.1 Test Standard and Limit	68
	8.2 Test Setup	
	8.3 Test Procedure	
	8.4 EUT Operating Condition	68
	8.5 Test Equipment	69
	8.6 Test Data	69
9.	PEAK OUTPUT POWER TEST	81
	9.1 Test Standard and Limit	81
	9.2 Test Setup	81
	9.3 Test Procedure	81
	9.4 EUT Operating Condition	81
	9.5 Test Equipment	81
	9.6 Test Data	81
10.	ANTENNA REQUIREMENT	88
	10.1 Standard Requirement	88
	10.2 Antenna Connected Construction	
	10.2 Pagult	99



Page: 4 of 88

1. General Information about EUT

1.1 Client Information

Applicant: Onyx Technology Co. Ltd

Address: 11F.-1, No.343, Zhonghe Rd., Yonghe Dist., New Taipei City 23447,

Taiwan (R.O.C.)

Manufacturer : Idio Technology Co., Ltd

Address: 3/F, Building B, Nanchang the first industry Zone, Gushu, Bao'an

District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

FUT Name	. Divistanth Charles			
EUT Name	:	Bluetooth Speaker		
Models No.	:	Rock, Stereo-C, Stereo-X		
Brand Name	:	AndroMedia		
Model	:	The different models are ide	ntical in schematic, structure and critical	
difference		components, the only differe	ence is the out appearance of the product.	
		Operation Frequency:		
		Bluetooth:2402~2480MHz		
Don't of		Number of Channel:	Bluetooth:79 Channels see note (2)	
Product Description	:	Max Peak Output Power:	8-DPSK: 5.03dBm (Conducted Power)	
		Antenna Gain:	-1.70 dBi PCB Antenna	
		Modulation Type:	GFSK 1Mbps(1 Mbps)	
			π /4-DQPSK(2 Mbps)	
			8-DPSK(3 Mbps)	
Dower Supply		DC power by USB cable for	m Host System	
Power Supply		DC power by Li-ion battery		
Power Rating	:			
		DC 3.7V by 1500mAh Li-ion	Battery.	
Connecting	:	Please refer to the User's M	anual	
I/O Port(S)				

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 (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456

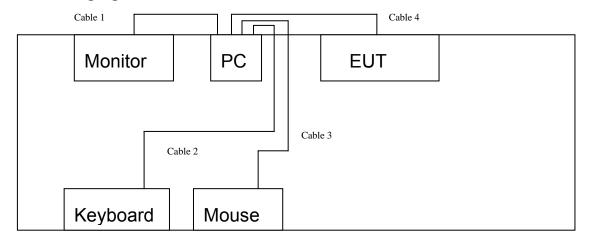


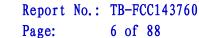
Report No.: TB-FCC143760 Page: 5 of 88

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 USB Charging with TX Mode







TX Mode

EUT

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 Ferr		Ferrite Core	Length	Note		
Cable 1	YES	YES	1.5M			
Cable 2	YES	YES	1.5M			
Cable 3	YES	NO	1.5M			
Cable 4	YES	YES	0.5M			

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.

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



Report No.: TB-FCC143760 Page: 7 of 88

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(IT /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: π /4-DQPSK(2 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.



Page: 8 of 88

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	RF-LINK RDA RF Control Kit V1.0		
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π /4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement y \pm U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Radiated Emission	Level Accuracy:	±4.60 dB
Radiated Ellission	9kHz to 30 MHz	±4.00 db
Dadiated Emission	Level Accuracy:	14 40 dD
Radiated Emission	30MHz to 1000 MHz	±4.40 dB
Dadiated Emission	Level Accuracy:	14 20 dB
Radiated Emission	Above 1000MHz	±4.20 dB



Page: 9 of 88

1.8 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.



Report No.: TB-FCC143760 Page: 10 of 88

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 abbreviation for Not Applicable.				



Page: 11 of 88

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 Lin	ne 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.



Report No.: TB-FCC143760 Page: 12 of 88

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

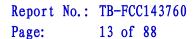
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date	
EMI Test	ROHDE&		400224	Aug. 08, 2014	Aug.07, 2015	
Receiver	SCHWARZ	ESCI 100321		Aug. 00, 2014	Aug.07, 2015	
50ΩCoaxial	Anritsu	MP59B	X10321	Aug. 08, 2014	Aug.07, 2015	
Switch	Aillitsu	MESSE	X10321	Aug. 08, 2014	Aug.07, 2015	
L.I.S.N	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.

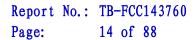
3.6 Test Data

Please see the next page.



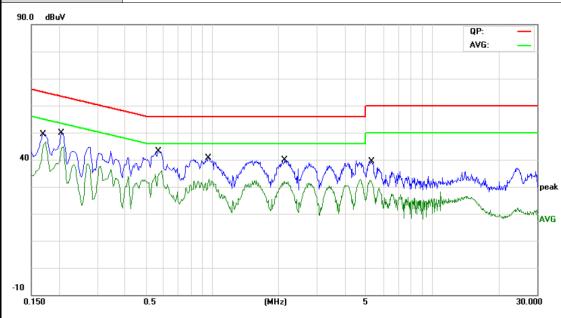


EUT: Bluetooth Speaker **Model Name:** Rock 25 ℃ **Relative Humidity:** Temperature: 55% **Test Voltage:** DC 5V Terminal: Line **Test Mode:** USB Charging with TX GFSK Mode 2402 MHz Remark: Only worse case is reported 90.0 dBuV QP: AVG: AVG -10 0.150 0.5 (MHz) 30.000 Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment MHz dBuV dΒ dBuV dBuV dΒ Detector 0.1700 35.52 10.12 45.64 64.96 -19.32 QΡ 1 2 0.1700 32.99 10.12 43.11 54.96 -11.85 AVG 3 0.2060 34.27 10.12 44.39 63.36 -18.97 QΡ 4 0.2060 32.00 10.12 42.12 53.36 -11.24 AVG 5 0.5660 33.47 10.02 43.49 56.00 -12.51 QΡ 6 0.5660 25.27 10.02 35.29 46.00 -10.71 AVG 7 0.9660 28.09 10.14 38.23 56.00 -17.77 QΡ 8 22.59 32.73 46.00 -13.27 0.9660 10.14 AVG 9 2.1180 24.77 10.06 34.83 56.00 -21.17 QΡ 10 2.1180 20.76 10.06 30.82 46.00 -15.18 AVG QΡ 11 4.0580 23.25 10.06 33.31 56.00 -22.69 12 4.0580 19.88 10.06 29.94 46.00 -16.06 AVG **Emission Level= Read Level+ Correct Factor**





EUT: Bluetooth Speaker **Model Name:** Rock Temperature: 25 ℃ **Relative Humidity:** 55% DC 5V **Test Voltage:** Terminal: Neutral **Test Mode:** USB Charging with TX GFSK Mode 2402 MHz Remark: Only worse case is reported



No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	0.1700	38.23	10.12	48.35	64.96	-16.61	QP
2	0.1700	35.91	10.12	46.03	54.96	-8.93	AVG
3	0.2060	37.82	10.12	47.94	63.36	-15.42	QP
4 *	0.2060	34.88	10.12	45.00	53.36	-8.36	AVG
5	0.5700	31.86	10.02	41.88	56.00	-14.12	QP
6	0.5700	24.48	10.02	34.50	46.00	-11.50	AVG
7	0.9620	27.77	10.14	37.91	56.00	-18.09	QP
8	0.9620	21.68	10.14	31.82	46.00	-14.18	AVG
9	2.1420	26.39	10.06	36.45	56.00	-19.55	QP
10	2.1420	21.56	10.06	31.62	46.00	-14.38	AVG
11	5.2860	24.53	10.06	34.59	60.00	-25.41	QP
12	5.2860	20.97	10.06	31.03	50.00	-18.97	AVG



Page: 15 of 88

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)

Natiated Lilission Lilit (3 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

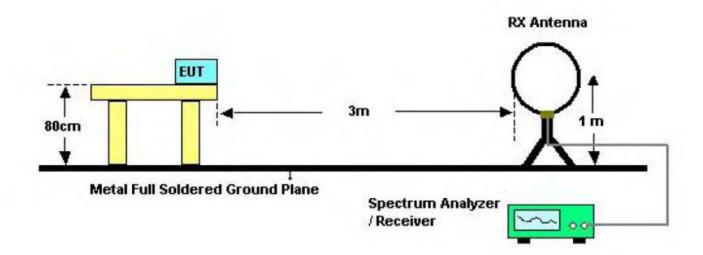
Note:

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

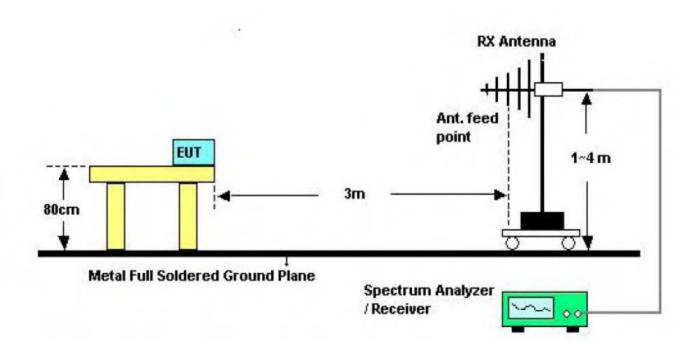


Page: 16 of 88

4.2 Test Setup



Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup



Antenna tower

Horn antenna

Spectrum analyzer

Turntable 1.5m A 30cm

Pre-amp

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 ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) 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.
- (5) 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.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) 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.
- (8) For the actual test configuration, please see the test setup photo.



Page: 18 of 88

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 Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 08, 2014	Aug.07, 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. 06, 2015	Mar.05, 2016
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	11909A	185903	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	8447B	3008A00849	Mar. 06, 2015	Mar.05, 2016
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 06, 2015	Mar.05, 2016
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 10, 2015	Feb.09, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

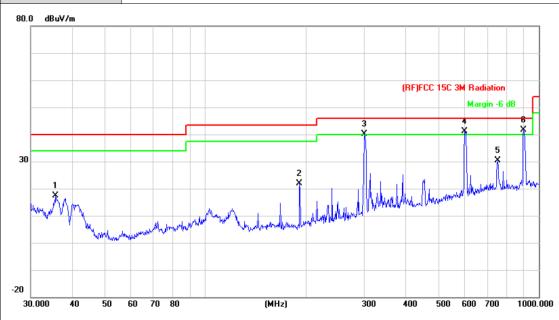
4.6 Test Data

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=1 kHz with Peak Detector for Average Values.

Test data please refer the following pages.



EUT: Bluetooth Speaker **Model Name:** Rock Temperature: 25 ℃ **Relative Humidity:** 55% DC 5V **Test Voltage:** Ant. Pol. Horizontal **Test Mode:** TX GFSK Mode 2402MHz Remark: Only worse case is reported



No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		35.6240	34.86	-17.45	17.41	40.00	-22.59	peak
2		191.7450	42.67	-20.81	21.86	43.50	-21.64	peak
3	İ	300.3672	57.18	-17.07	40.11	46.00	-5.89	peak
4	į	599.3212	50.68	-9.48	41.20	46.00	-4.80	peak
5		752.7432	37.40	-7.04	30.36	46.00	-15.64	peak
6	*	900.1474	46.64	-5.06	41.58	46.00	-4.42	peak

^{*:}Maximum data x:Over limit !:over margin



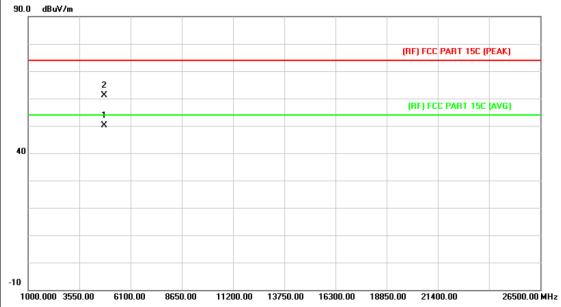
Report No.: TB-FCC143760 Page: 20 of 88

EUT:	Bluetooth S	Speaker	Model Name) :	Rock	
Temperature:	25 ℃		Relative Hui	midity:	55%	
Test Voltage:	DC 5V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK I	Mode 2402MHz				
Remark:	Only worse	e case is reported				
80.0 dBuV/m						
				(RF)FCC 1	5C 3M Radiation	
					Margin -6 5	dB
					×	6 X
30 1			4			
X 2		3 X			بالمناه ال	
M	way a	$\lambda / \lambda = 1$		ne John how have	where the state of	
V June	Mary 1997 April 1991	you had been have	which will make the service of the s	1		
-20						
30.000 40 50	60 70 80	(MHz)	300	400 5	00 600 700	1000.000
	Rea	ding Correct	Measure-		_	
No. Mk. Fre	eq. Lev	vel Factor	ment	Limit	Over	
MH	Hz dB	uV dB/m	dBuV/m	dBuV/m	dB	Detector
1 36.63	375 45.	.36 -18.07	27.29	40.00	-12.71	peak
2 39.7	146 44.	.08 -19.98	24.10	40.00	-15.90	peak
3 120.2	2766 46.	.35 -22.50	23.85	43.50	-19.65	peak
4 298.2	.681 47.	.07 -17.12	29.95	46.00	-16.05	peak
5 * 597.2	234 52	.58 -9.54	43.04	46.00	-2.96	peak
6 896.9	965 43.	.56 -5.17	38.39	46.00	-7.61	peak
*:Maximum data x:O	ver limit !:over	margin				
]_						
Emission Level=	Read Level	+ Correct Factor	•			



Page: 21 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock			
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.					

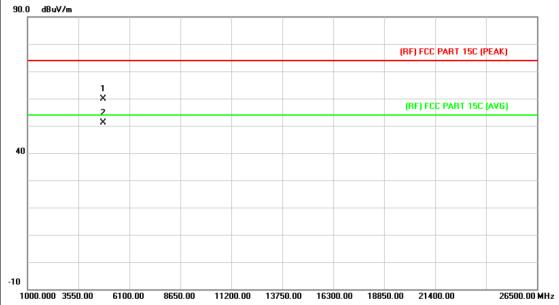


N	No.	Mk.	Freq.		Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4803.673	36.69	13.44	50.13	54.00	-3.87	AVG
2			4803.988	47.69	13.44	61.13	74.00	-12.87	peak



Page: 22 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical	Vertical					
Test Mode:	TX GFSK Mode 2402MHz						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						
000 10 111							

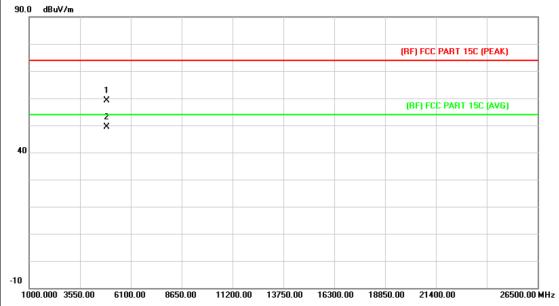


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.706	46.41	13.44	59.85	74.00	-14.15	peak
2	*	4803.718	37.67	13.44	51.11	54.00	-2.89	AVG



Page: 23 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock			
Temperature:	25 °C 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.					

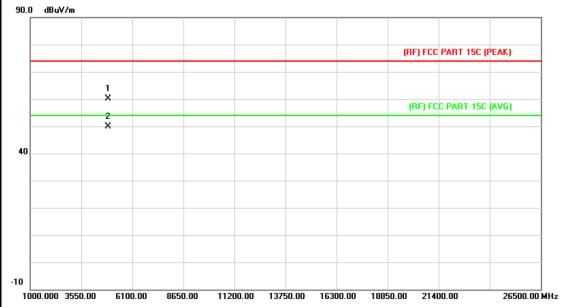


No	o. Mk	. Freq.	_		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.709	45.25	13.90	59.15	74.00	-14.85	peak
2	*	4881.733	35.36	13.90	49.26	54.00	-4.74	AVG



Page: 24 of 88

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

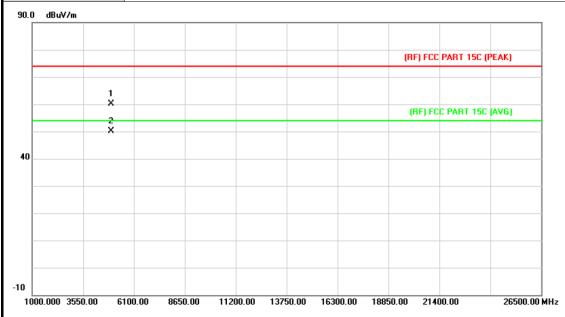


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.586	46.35	13.90	60.25	74.00	-13.75	peak
2	*	4881.778	36.09	13.90	49.99	54.00	-4.01	AVG



Report No.: TB-FCC143760 Page: 25 of 88

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

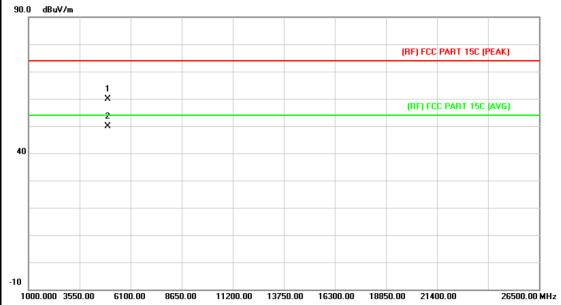


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.667	45.81	14.36	60.17	74.00	-13.83	peak
2	*	4959.670	35.79	14.36	50.15	54.00	-3.85	AVG



Page: 26 of 88

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

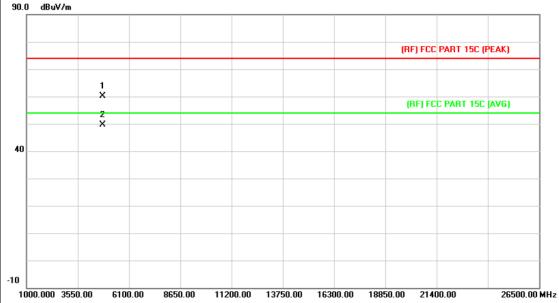


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.751	45.40	14.36	59.76	74.00	-14.24	peak
2	*	4959.778	35.50	14.36	49.86	54.00	-4.14	AVG



Page: 27 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock				
Temperature:	Temperature: 25 ℃		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.						

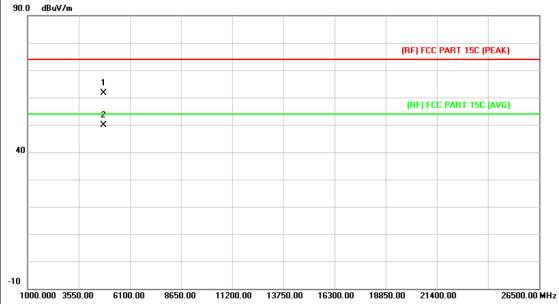


No	. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.712	46.81	13.44	60.25	74.00	-13.75	peak
2	*	4804.024	36.19	13.44	49.63	54.00	-4.37	AVG



Page: 28 of 88

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

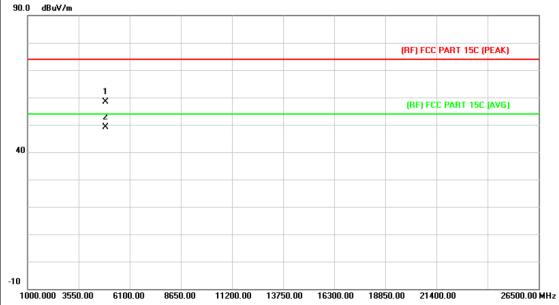


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.991	48.22	13.44	61.66	74.00	-12.34	peak
2	*	4804.012	36.46	13.44	49.90	54.00	-4.10	AVG



Page: 29 of 88

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

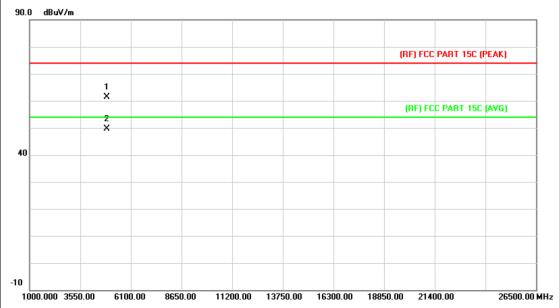


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.700	44.41	13.90	58.31	74.00	-15.69	peak
2	*	4881.976	35.21	13.90	49.11	54.00	-4.89	AVG



Page: 30 of 88

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

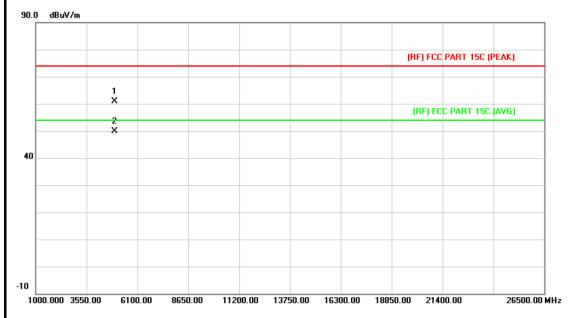


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.850	47.42	13.90	61.32	74.00	-12.68	peak
2	*	4881.892	35.81	13.90	49.71	54.00	-4.29	AVG



Page: 31 of 88

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

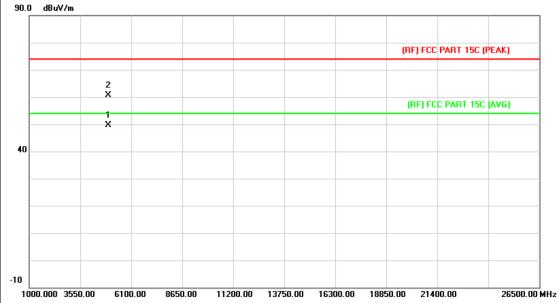


No	. Mk	. Freq.	Reading Level	Reading Correct Measure- Level Factor ment		Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.820	46.53	14.36	60.89	74.00	-13.11	peak
2	*	4960.057	35.59	14.36	49.95	54.00	-4.05	AVG



Page: 32 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock				
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.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4959.904	35.39	14.36	49.75	54.00	-4.25	AVG
2	2		4960.168	46.38	14.36	60.74	74.00	-13.26	peak



Report No.: TB-FCC143760 Page: 33 of 88

5. Restricted Bands Requirement

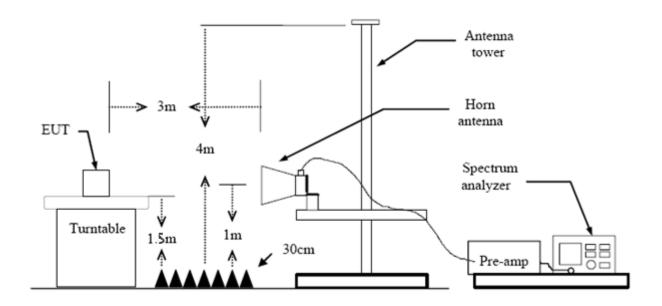
5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

5.1.2 Test Limit

Restricted Frequency	Class B (dBuV/m)(at 3m)						
Band (MHz)	Peak	Average					
2310 ~2390	74	54					
2483.5 ~2500	74	54					
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) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are



Page: 34 of 88

set to make measurement.

(4) 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.

- (5) 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.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) 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.
- (8) 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	Aug. 08, 2014	Aug.07, 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. 06, 2015	Mar.05, 2016	
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.05, 2016	
Pre-amplifier	HP	11909A	185903	Mar. 06, 2015	Mar.05, 2016	
Pre-amplifier	HP	8447B	3008A00849	Mar. 06, 2015	Mar.05, 2016	
Cable	HUBER+SUHNE R	100	SUCOFLEX	Mar. 06, 2015	Mar.05, 2016	
Signal	Rohde & Schwarz	SML03	IKW682-054	Feb. 10, 2015	Feb.09, 2016	
Generator	Tronde & Schwarz	OIVILOO	111111002-034	1 CD. 10, 2013	reb.09, 2016	
Positioning	ETS-LINDGREN	2090	N/A	N/A	N/A	
Controller	210 ENIDONEN	2000	14/1	14// \	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=1 KHz with Peak Detector for Average Values.

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



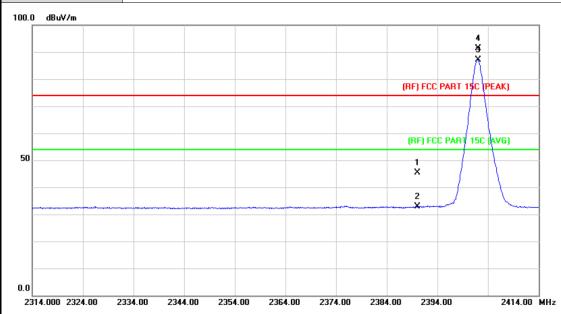
(1) Radiation Test

EUT	•		Bluet	tooth Sp	neake	er	ı	Mode	l Nan	ne .		Ro	ck		
	peratu	ro.	25 °C		Journe	-			ive H		dity:	55			
	t Voltag		DC 3				•	TOIGE	110 111	u	aity.		70		
	. Pol.	,		zontal											
	Mode:				odo 1	2402MH	7								
	nark:	-	N/A	JESK IVI	oue 2	240210111									
Ren	iark:		IN/A												
100.0) dBuV/m														1
													4		
													X		
											(RF) FCC	PART 1	C (PEAK	ij	
											(RF) FC	C PART	15C AVE	i)	-
50											1				1
											×		\perp		
								-			2 X		/	·	
															1
															1
0.0 23	314.000 232	24.00 2	334.00	2344.00	2354	1.00 2364	1.00	2374	1.00 2	2384.0	00 2394	1.00	2	414.00	_ MHz
	77 1.000 20.			2011.00	200			20.			200		_		
							_								
	lo. Mk	. Fre	20	Read Leve		Correc			asure ent		Limit	0	ver		
	NO. IVIK		•)i							D-4-	-4
		MH		dBu\		dB/m			uV/m		dBuV/m		dB	Dete	
1		2390.	.000	42.6	51	0.77		43	3.38		74.00	-3	0.62	pe	ak
2		2390.	000	31.7	2	0.77		32	2.49		54.00	-2	1.51	A۱	/G
3	*	2401.	900	82.6	9	0.82		83	3.51	F	undamen	tal Fre	quency	A۱	/G
4	Х	2402	000	86.4	9	0.82		8	7.31	F	undamen	ital Fre	quency	pe	ak



Page: 36 of 88

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

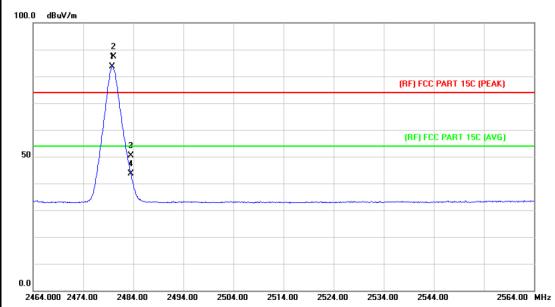


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	44.52	0.77	45.29	74.00	-28.71	peak
2		2390.000	32.21	0.77	32.98	54.00	-21.02	AVG
3	*	2402.000	86.41	0.82	87.23	Fundamental Frequency		AVG
4	Χ	2402.100	90.67	0.82	91.49	Fundamental Frequency		peak



Page: 37 of 88

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

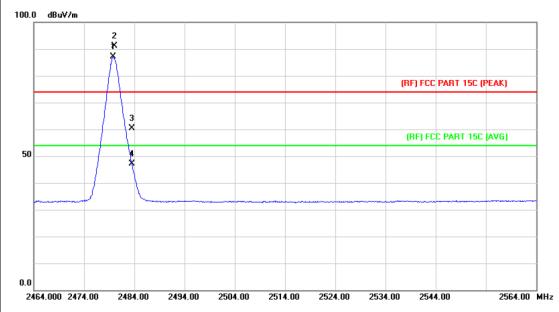


N	lo. Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.800	82.44	1.15	83.59	Fundamental	Frequency	AVG
2	Χ	2480.100	86.21	1.15	87.36	Fundamental	Frequency	peak
3		2483.500	49.30	1.17	50.47	74.00	-23.53	peak
4		2483.500	42.47	1.17	43.64	54.00	-10.36	AVG



Page: 38 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
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	*	2479.800	85.93	1.15	87.08	Fundamental Frequency		AVG
2	Χ	2480.100	90.06	1.15	91.21	Fundamental	Frequency	peak
3		2483.500	59.28	1.17	60.45	74.00	-13.55	peak
4		2483.500	46.07	1.17	47.24	54.00	-6.76	AVG



Page: 39 of 88

EUT	:		Blue	tooth Sp	eak	er		Mod	del Na	ıme :	Roc	k	
Tem	peratu	re:	25 °	C				Rela	ative	Humidity:	55%	0	
Test	t Voltag	je:	DC 3	3.7V									
Ant	Pol.		Horiz	zontal									
Test	Mode		TX 8	-DPSK	Mod	e 2402N	1Hz						
Ren	nark:		N/A										
100.0) dBuV/m								-				
l												3	
l											,	{	
										(RF) FCC	PART 150	(PEAK)
												+	
										(RF) FC	C PART 1	C AVG	<u> </u>
50										1			
										×		\perp	
										2 X		1	
0.0													
0.0 23	314.000 23	24.00 2	334.00	2344.00	235	4.00 236	4.00	2374	1.00	2384.00 239	14.00	2	414.00 MHz
N	lo. Mk	. Fre	eq.	Readi Leve	_	Correc			sure	Limit	Ov	er	
		MH	lz	dBu∖	/	dB/m		dB	uV/m	dBuV/n	n dl	3	Detector
1		2390.	000	43.0	4	0.77		43	3.81	74.00	-30	.19	peak
2		2390.	000	31.9	5	0.77		32	2.72	54.00	-21	.28	AVG
3	Х	2401.	900	88.0	9	0.82		88	3.91	Fundamer	ntal Frequ	iency	peak
4	*	2402.	100	82.1	9	0.82		83.01 Fundamental Frequency A		AVG			



Page: 40 of 88

EUT	:		Bluet	ooth S	peake	er		Mod	lel Nar	me :	Rock			
Tem	peratu	re:	25 °C	2				Rela	tive H	lumidity:	55%			
Test	Voltag	e:	DC 3	.7V										
Ant.	Pol.		Vertio	cal										
Test	Mode:		TX 8	-DPSK	Mode	e 2402N	1Hz							
Rem	nark:		N/A											
100.0	0 dBuV/m													
											3 X 4			
											Ť			
										(RF) FCC	PART 15C F	PEAK)	-	
										(DE) FC	PART 15C	hve		
50											PANT 13C	(RVG)		
										X X				
										2 X		1		
0.0				2344.00			4.00			384.00 2394			14.00	
	314.000 23	24.00 2	334.00	2344.00	2354	1.UU 236	4.00	2374	2.	384.00 2394	.00	24	14.UU P	мпг
N	lo. Mk	. Fr	eq.	Read Lev	-	Corre Facto			asure- ent	Limit	Ove	r		
		M	łz	dBu	V	dB/m		dB	uV/m	dBuV/m	dB		Detec	cto
1		2390	000	44.2	20	0.77		44	1.97	74.00	-29.	03	pea	ak
2		2390	000	32.0)3	0.77		32	2.80	54.00	-21.	20	ΑV	/G
3	Х	2402	.000	92.4	11	0.82		93	3.23	Fundament	al Frequer	псу	pea	ak
	а.													

2402.000

Emission Level= Read Level+ Correct Factor

86.07

0.82

86.89

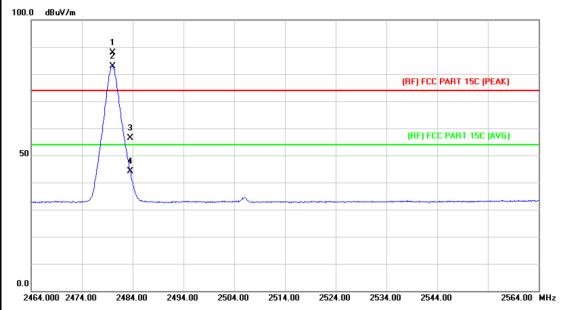
AVG

Fundamental Frequency



Page: 41 of 88

EUT:	Bluetooth Speaker	Rock					
Temperature:	25 ℃	55%					
Test Voltage:	DC 3.7V						
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2480MHz						
Remark:	emark: N/A						
100.0 dBuV/m							

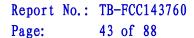


N	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2480.000	86.77	1.15	87.92	Fundamenta	Frequency	peak
2	*	2480.100	81.84	1.15	82.99	Fundamental	Frequency	AVG
3		2483.500	55.16	1.17	56.33	74.00	-17.67	peak
4		2483.500	43.00	1.17	44.17	54.00	-9.83	AVG



Page: 42 of 88

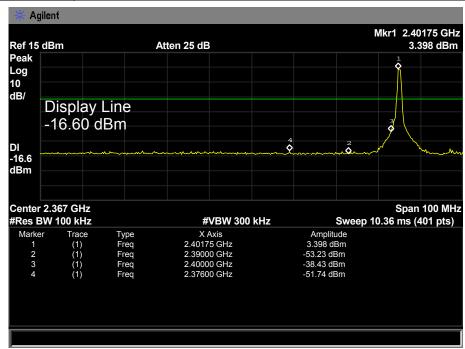
EUT:			Blue	tooth Speak	er	Model Na	ame :	Rock		
Temp	eratu	ıre:	25 °	C		Relative	Humidity:	55%		
Test \	/olta	ge:	DC 3	3.7V						
Ant. F	Pol.		Verti	cal						
Test N	Mode	:	TX 8	-DPSK Mod	le 2480MHz					
Rema	rk:		N/A							
100.0	dBuV/r	n								
		1 X 2								
		X								
		+ /\					(RF) FCC PAI	RT 15C (PEA)	g	
			3 X				(DE) ECC D	1DT 150 (1)	.,	
50			\ <u>4</u>				(RF) FLL PA	ART 15C (AV	ıJ	
			Ť							
		~~-								
-										
0.0										
2464	1.000 24	474.00 2	2484.00	2494.00 25	04.00 2514.00	2524.00 2	534.00 2544.00) 2	2564.00	MHz
No	Mk	. Fre		Reading	Correct Factor	Measure-	Limit	Over		
	IVIN		·	Level		ment			<u> </u>	_
		MH		dBuV	dB/m	dBuV/m	dBuV/m	dB	Detec	ctor
1	Χ	2480.	000	91.32	1.15	92.47	Fundamental F	requency	pea	ak
2	*	2480.	000	85.56	1.15	86.71	Fundamental F	requency	AV	G
3		2483.	500	59.30	1.17	60.47	74.00	-13.53	pea	ak
4		2483.	500	46.85	1.17	48.02	54.00	-5.98	AV	G
Emiss	sion	Level=	Read	Level+ Cor	rect Factor					

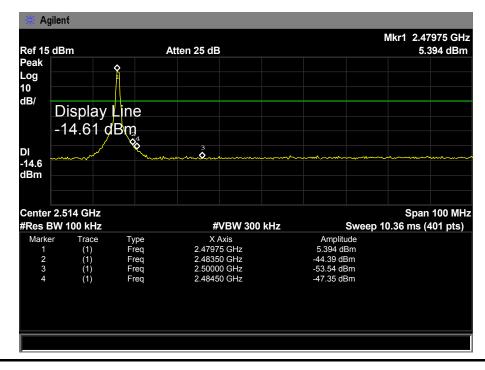


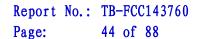


(1) Conducted Test

EUT:	Bluetooth Speaker	Model Name :	Rock			
Temperature:	25 °C Relative Humidity: 55%					
Test Voltage:	DC 3.7V					
Test Mode:	TX GFSK Mode 2402MHz / 2480 MHz					
Remark:	N/A					









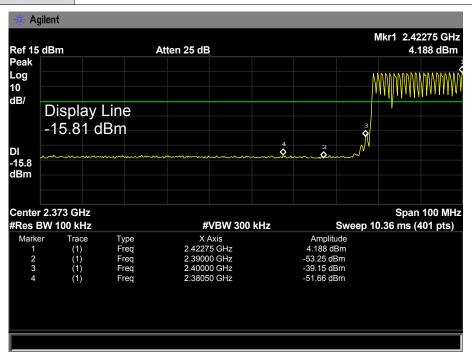
EUT: Bluetooth Speaker Model Name: Rock

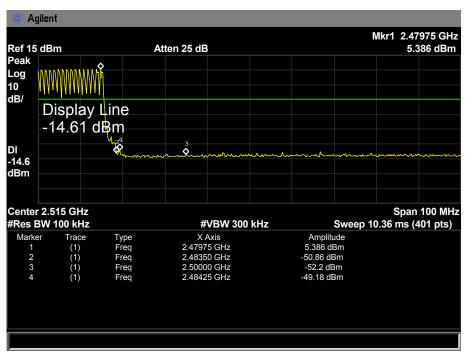
Temperature: 25 °C Relative Humidity: 55%

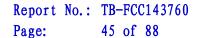
Test Voltage: DC 3.7V

Test Mode: GFSK Hopping Mode

Remark: N/A

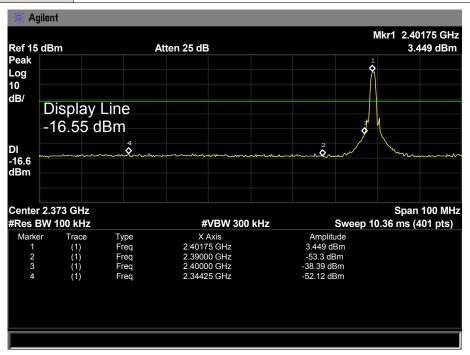


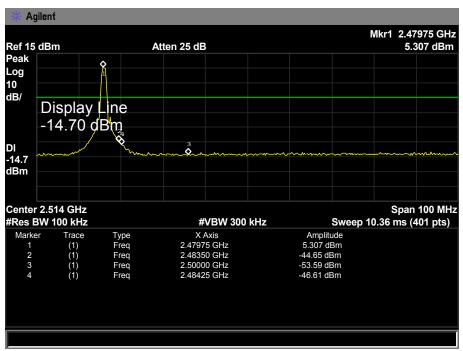


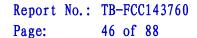




EUT:	Bluetooth Speaker	Model Name :	Rock			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Test Mode:	TX 8-DPSK Mode 2402MHz / 2480 MHz					
Remark:	N/A					

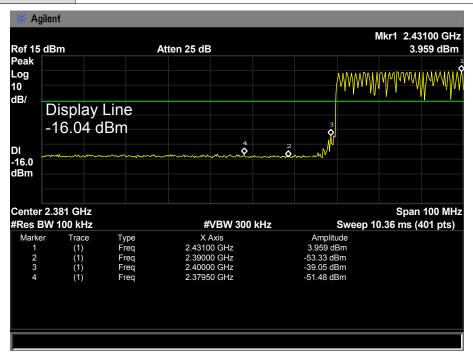


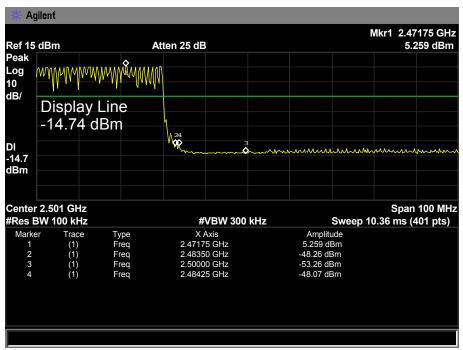






EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	8-DPSK Hopping Mode		
Remark:	N/A		







Page: 47 of 88

6. Number of Hopping Channel

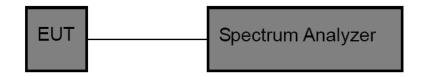
6.1 Test Standard and Limit

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.

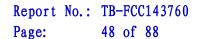
6.4 EUT Operating Condition

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	Aug. 08, 2014	Aug.07, 2015

6.6 Test Data



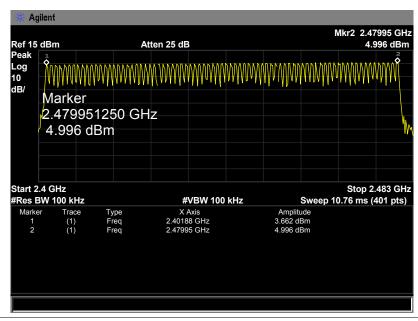


EUT:Bluetooth SpeakerModel Name :RockTemperature:25 °CRelative Humidity:55%Test Voltage:DC 3.7V

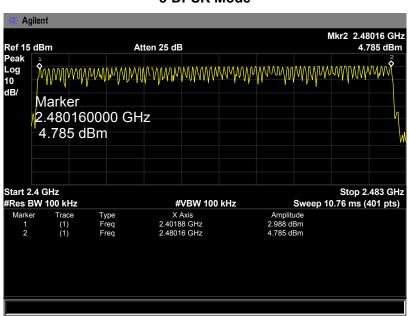
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
240211117~249011117	79	>1 E
2402MHz~2480MHz	79	>15

GFSK Mode



8-DPSK Mode





Page: 49 of 88

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

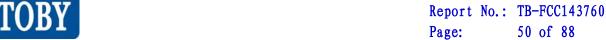
- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz.
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (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	Aug. 08, 2014	Aug.07, 2015



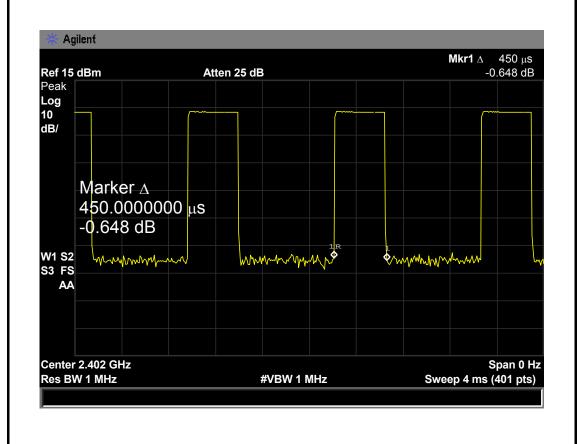
7.6 Test Data

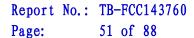
EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (GESK DH1

Test Mode:		Hopping i				
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		0.450	144.00			
2441		0.450	144.00	31.60	400	PASS
2480		0.450	144.00			

GFSK Hopping Mode DH1

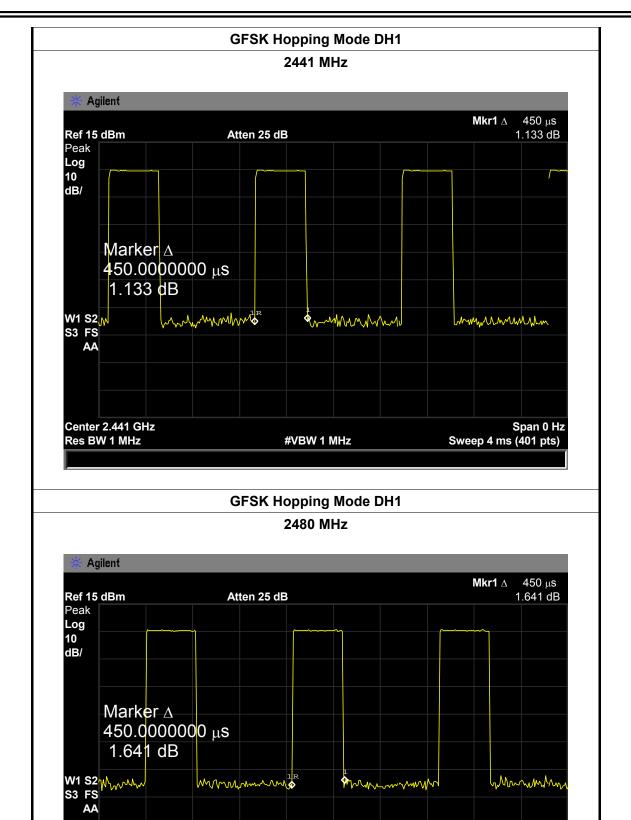






Center 2.48 GHz

Res BW 1 MHz



#VBW 1 MHz

Span 0 Hz

Sweep 4 ms (401 pts)

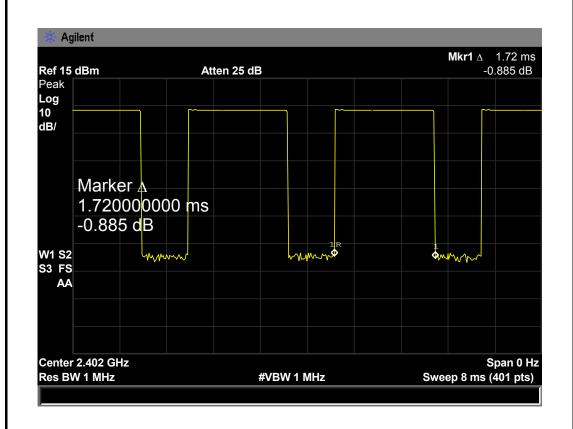


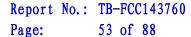
Report No.: TB-FCC143760 Page: 52 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	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	1.720	275.20			
2441	1.720	275.20	31.60	400	PASS
2480	1.720	275.20			

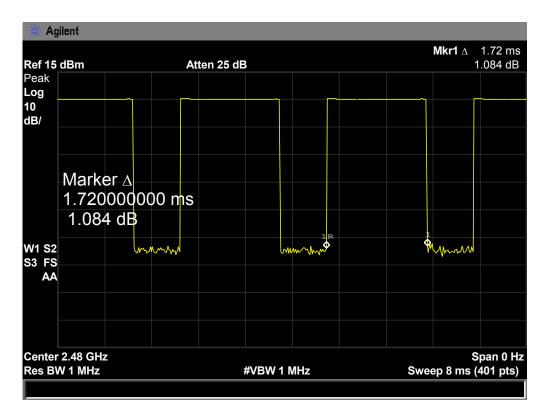
GFSK Hopping Mode DH3







GFSK Hopping Mode DH3 2441 MHz Agilent **Mkr1** Δ 1.72 ms 1.648 dB Ref 15 dBm Atten 25 dB Peak Log 10 dB/ Marker ∆ 1.720000000 ms 1.648 dB W1 S2 Lymn 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 1.72 ms 1.084 dB Ref 15 dBm Atten 25 dB



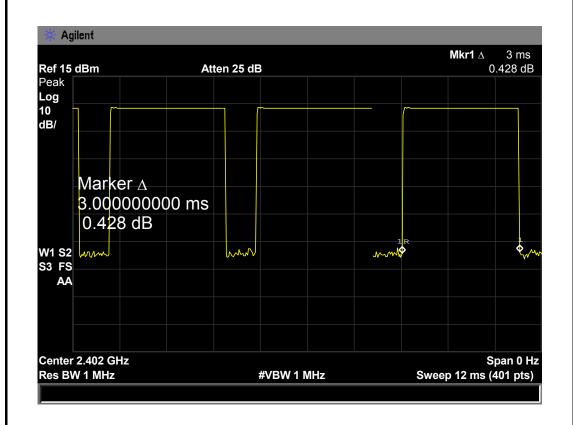


Page: 54 of 88

EUT:	Bluetooth	Speaker	Model Nar	ne :	Rock
Temperature:	25 ℃		Relative H	umidity:	55%
Test Voltage:	DC 3.7V				
Test Mode:	Hopping	Mode (GFSK DH5)			
			David		

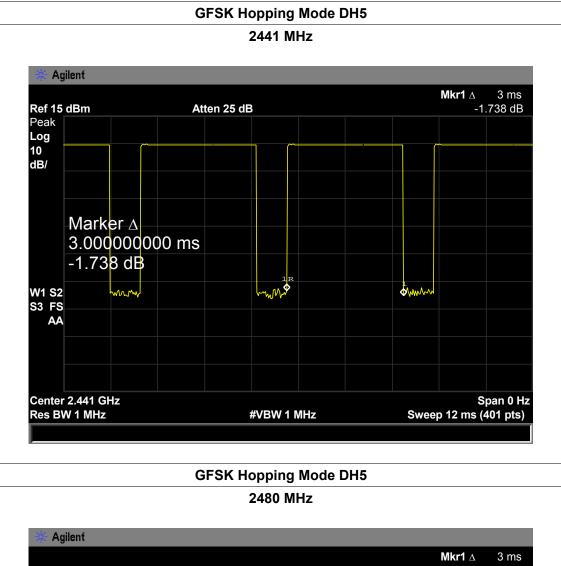
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

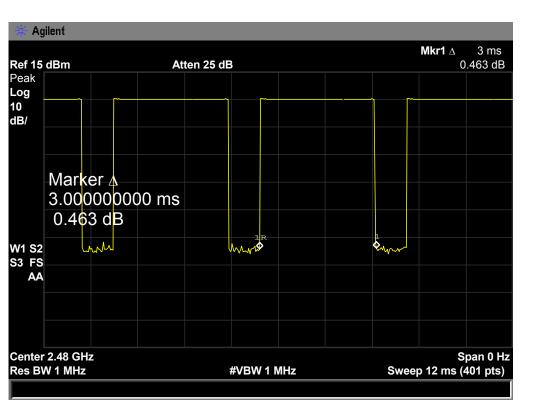
GFSK Hopping Mode DH5









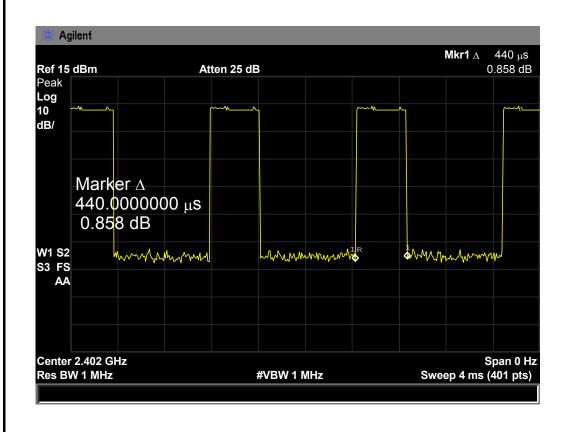


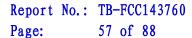


Page: 56 of 88

EUT:		Bluetooth Speaker		Model Name :		Rock
Temperature:		25 ℃		Relative Humidity:		55%
Test Voltage:	st Voltage: DC 3.7V					
Test Mode:		Hopping I	Hopping Mode (π/4-DQPSK DH1)			
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		0.440	140.80			
2441		0.440	140.80	31.60	400	PASS
2480		0.440	140.80			

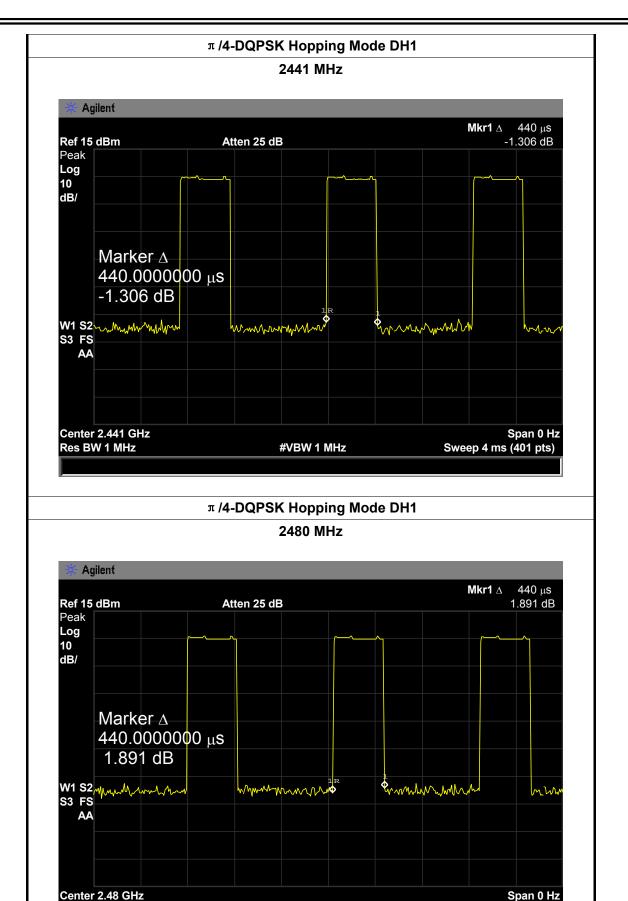
π /4-DQPSK Hopping Mode DH1







Res BW 1 MHz



#VBW 1 MHz

Sweep 4 ms (401 pts)

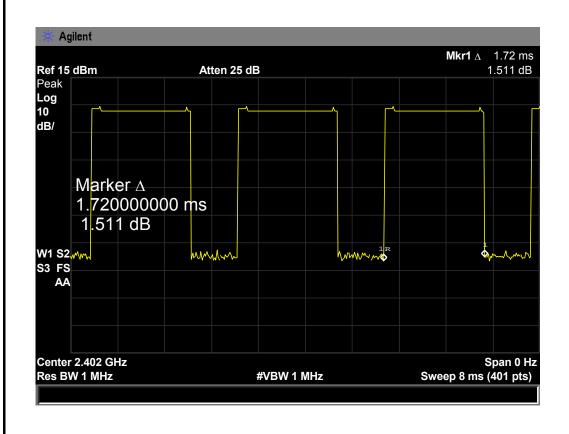


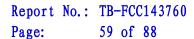
EUT:Bluetooth SpeakerModel Name :RockTemperature:25 °CRelative Humidity:55%Test Voltage:DC 3.7V

Test Mode: Hopping Mode (π /4-DQPSK DH3)

riopping mode (** / 1 2 d. e			(21.10)				
Channel	Pu	lse Time	Total	of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(1	ms)	(s)	(ms)	Result
2402		1.720	27	5.20			
2441		1.720	27	5.20	31.60	400	PASS
2480		1.720	27	5.20			

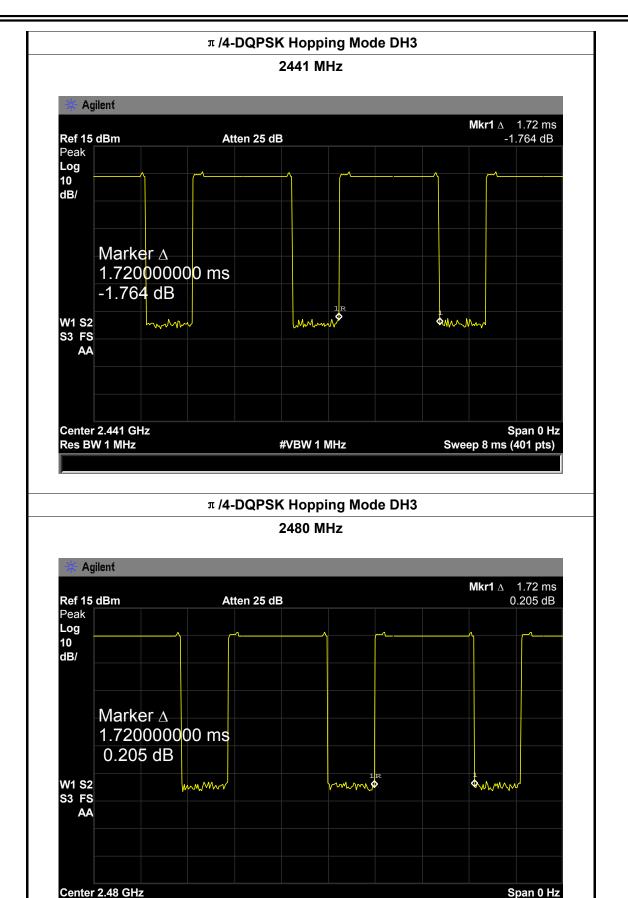
π /4-DQPSK Hopping Mode DH3







Res BW 1 MHz



#VBW 1 MHz

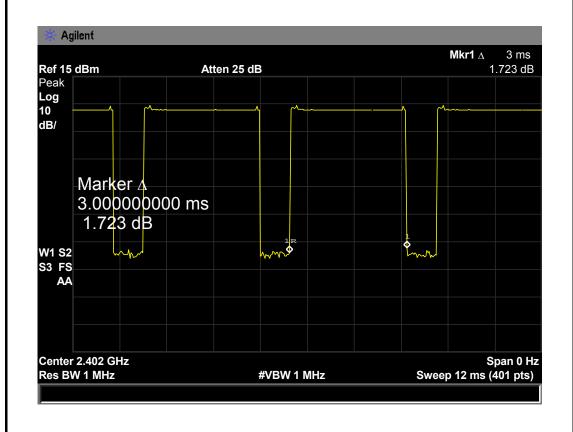
Sweep 8 ms (401 pts)

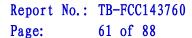


Page: 60 of 88

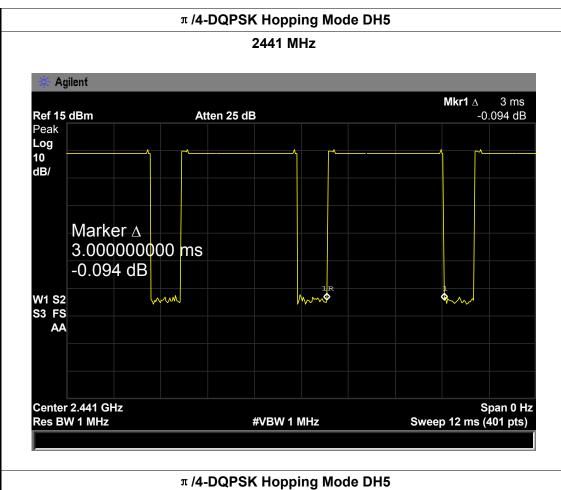
EUT:		Bluetooth	Speaker	Speaker Model Name :		Rock
Temperature:		25 ℃	25 ℃ Rela		Relative Humidity:	
Test Voltage:		DC 3.7V				
Test Mode:		Hopping I	Mode (π/4-DQPSI	K DH5)		
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		3.000	320.00			
2441		3.000	320.00	31.60	400	PASS
2480		3.000	320.00			

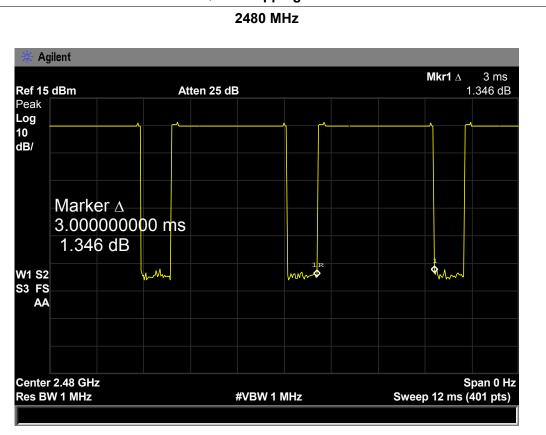
π /4-DQPSK Hopping Mode DH5







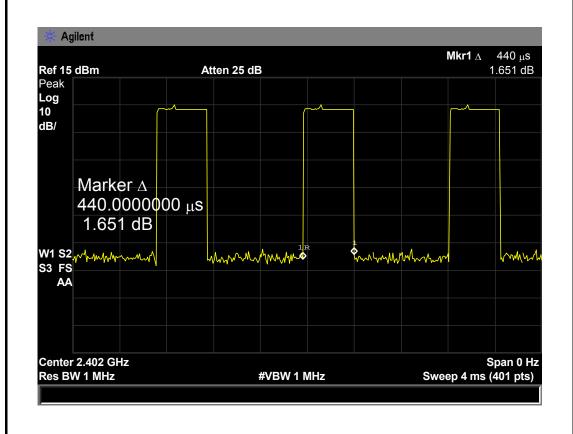


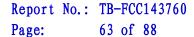




Report No.: TB-FCC143760 Page: 62 of 88

EUT:		Bluetooth Speaker		Model Name :		Rock
Temperature:	1	25 ℃		Relative Humidity:		55%
Test Voltage:		DC 3.7V				
Test Mode:		Hopping I	Mode (8-DPSK DH	11)		
Channel Pu (MHz)		Ise Time	Total of Dwell	Period Time	Limit	Result
		(ms)	(ms)	(s)	(ms)	Result
2402		0.440	140.80			
2441		0.440	140.80	31.60 400	PASS	
2480		0.440	140.80			
8-DPSK Hopping Mode DH1						

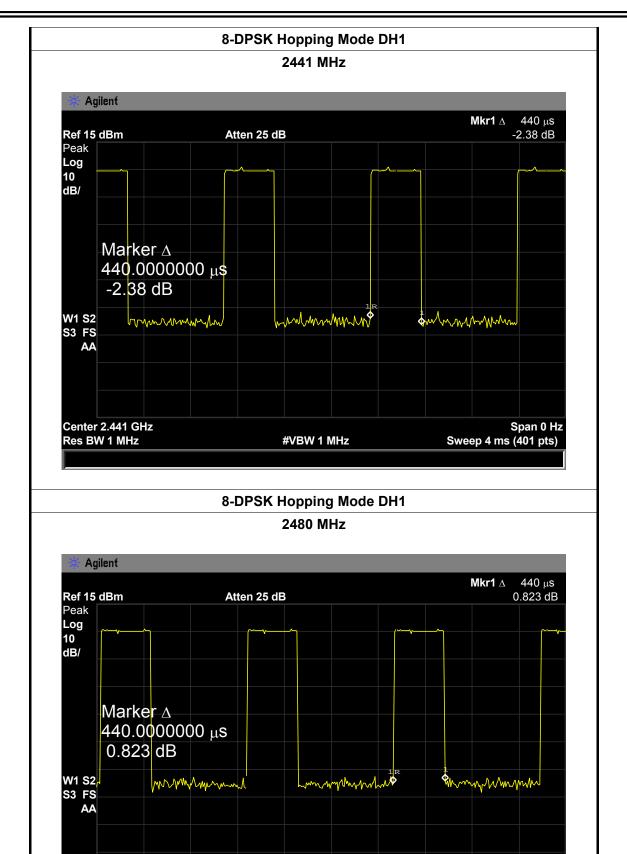






Center 2.48 GHz

Res BW 1 MHz



#VBW 1 MHz

Span 0 Hz

Sweep 4 ms (401 pts)



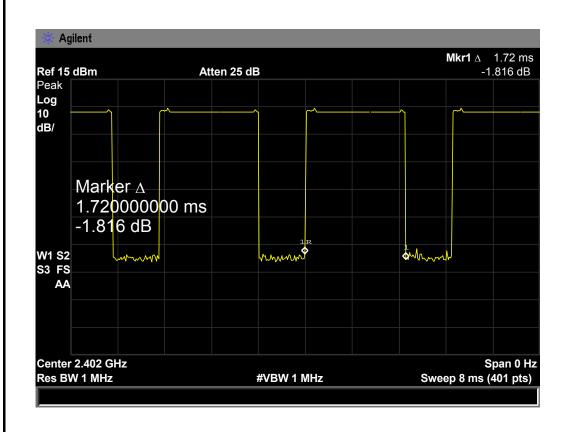
Report No.: TB-FCC143760 Page: 64 of 88

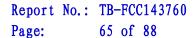
EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Tost Mode:	Honning Mode (8-DPSK DH3)		

Test Mode: Hopping Mode (8-DPSK DH3)

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.720	275.20			
2441	1.720	275.20	31.60	400	PASS
2480	1.720	275.20			

8-DPSK Hopping Mode DH3

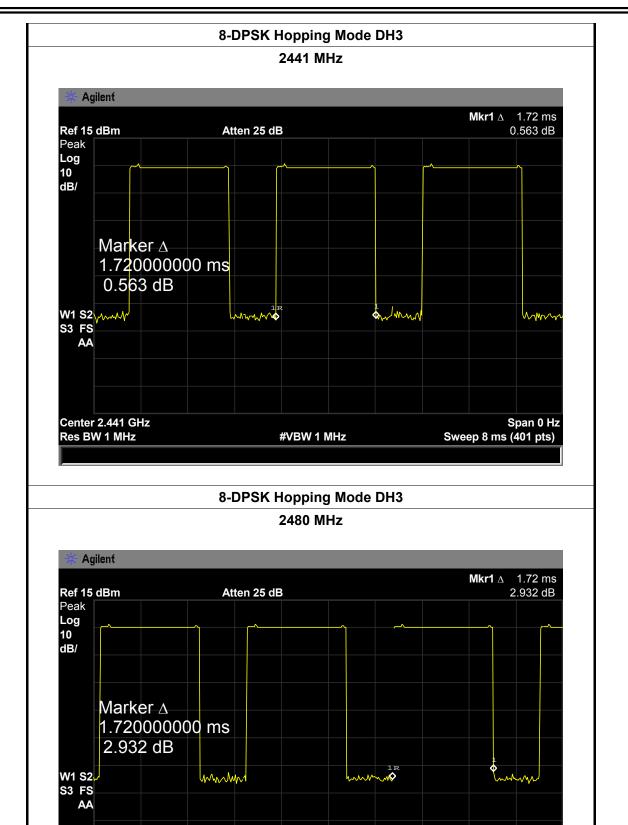






Center 2.48 GHz

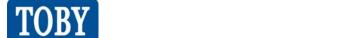
Res BW 1 MHz



#VBW 1 MHz

Span 0 Hz

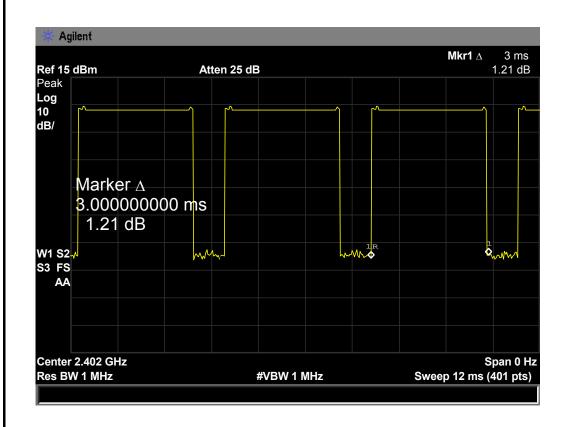
Sweep 8 ms (401 pts)

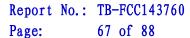


Report No.: TB-FCC143760 Page: 66 of 88

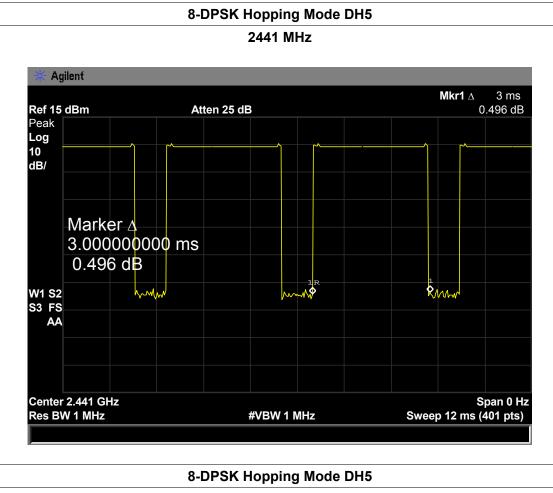
EUT:		Bluetooth Speaker		Model Name :		Rock
Temperature:		25 ℃		Relative Hu	midity:	55%
Test Voltage:		DC 3.7V				
Test Mode:		Hopping I	Mode (8-DPSK DH5)			
Channel (MHz)	Pu	lse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402		3.000	320.00			
2441		3.000	320.00	31.60	400	PASS
2480		3.000	320.00			

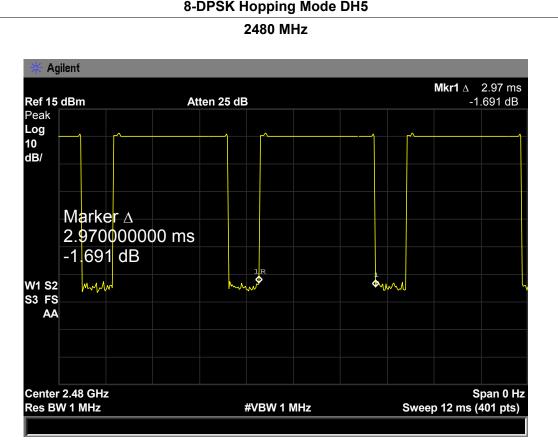
8-DPSK Hopping Mode DH5













Page: 68 of 88

8. Channel Separation and Bandwidth Test

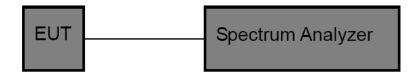
8.1 Test Standard and Limit

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:

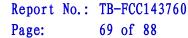
Channel Separation: RBW=30 kHz, VBW=100 kHz.

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.





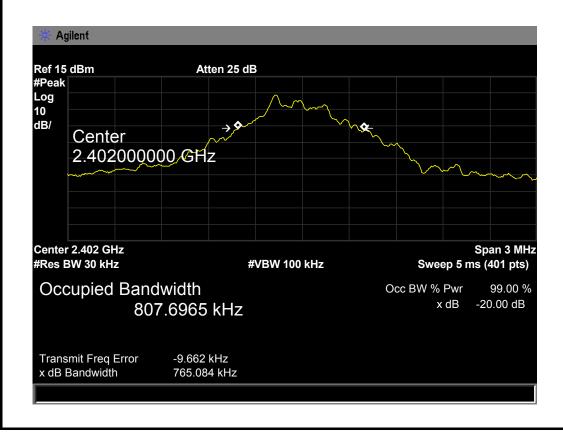
8.5 Test Equipment

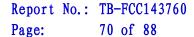
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 08, 2014	Aug.07, 2015

8.6 Test Data

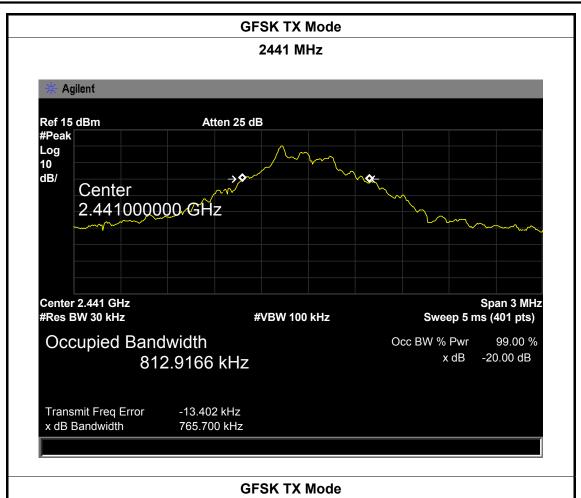
EUT:	Bluetooth Speaker	Model Name :	Rock			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Test Mode:	TX Mode (GFSK)					
Channel frequence	99% OBW	20dB Bandwidth	20dB			
(MHz)	(kHz)	(kHz)	Bandwidth *2/3			
			(kHz)			
2402	807.6965	765.084				
2441	812.9166	765.700				
2480	789.9254	762.689				
GFSK TX Mode						

GFSK TX Mode













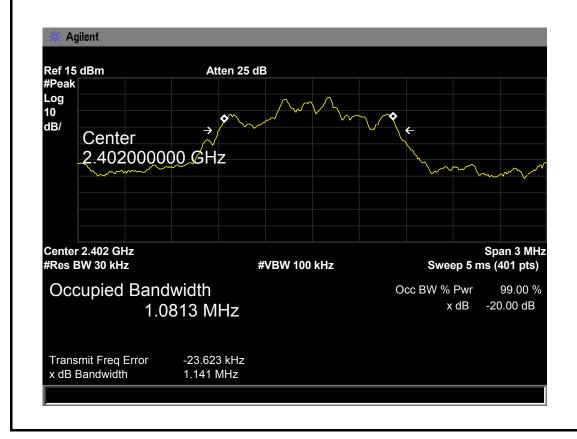
EUT: Bluetooth Speaker Model Name: Rock
Temperature: 25 °C Relative Humidity: 55%

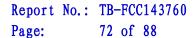
Test Voltage: DC 3.7V

Test Mode: TX Mode (▼ /4-DOPSK)

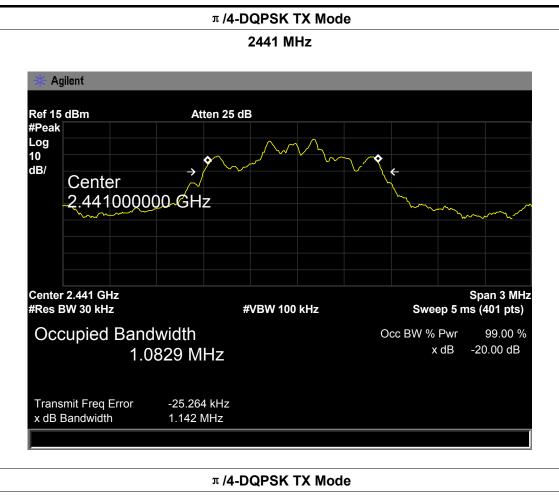
rest wode.	IX Mode (11/4-DQF3K)		
Channel frequence	ey 99% OBW	20dB Bandwidth	20dB
(MHz)	(kHz)	(kHz)	Bandwidth *2/3
			(kHz)
2402	1081.30	1141.00	760.67
2441	1082.90	1142.00	761.33
2480	1079.60	1139.00	759.33

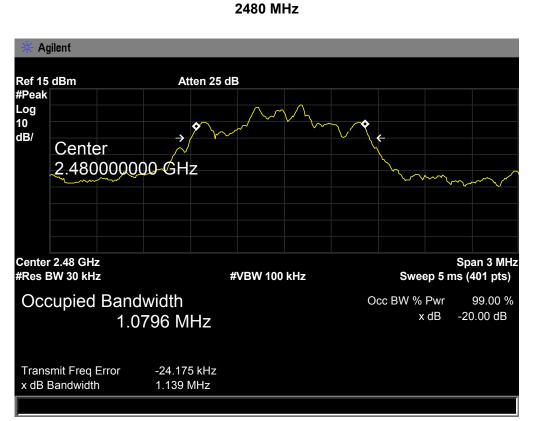
π /4-DQPSK TX Mode

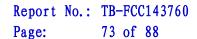












758.00



2480

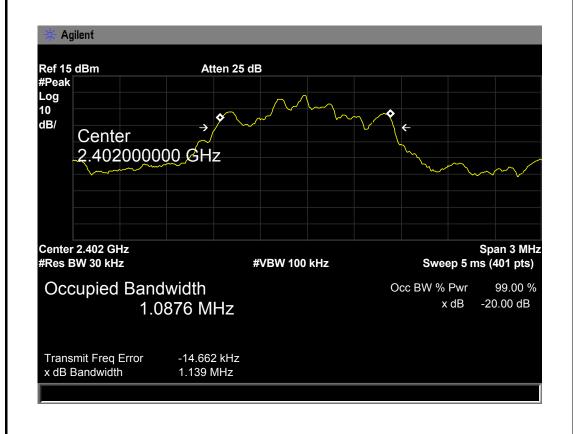
EUT:Bluetooth SpeakerModel Name :RockTemperature:25 °CRelative Humidity:55%Test Voltage:DC 3.7V

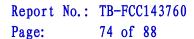
Test Mode:	TX Mode (8-DPSK)		
Channel frequence	99% OBW	20dB Bandwidth	20dB
(MHz)	(kHz)	(kHz)	Bandwidth *2/3
			(kHz)
0.400			
2402	1087.60	1139.00	759.33

8-DPSK TX Mode 2402 MHz

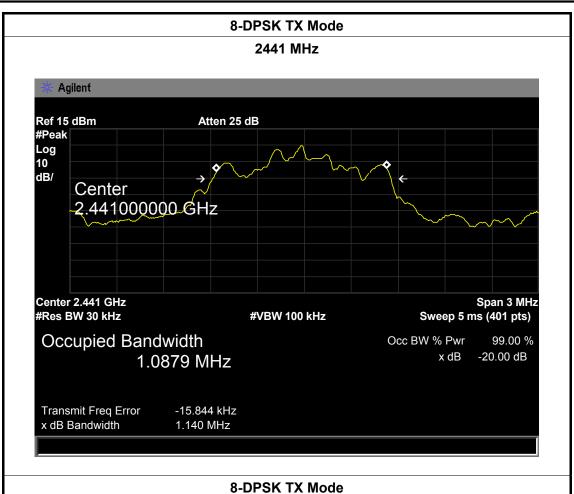
1137.00

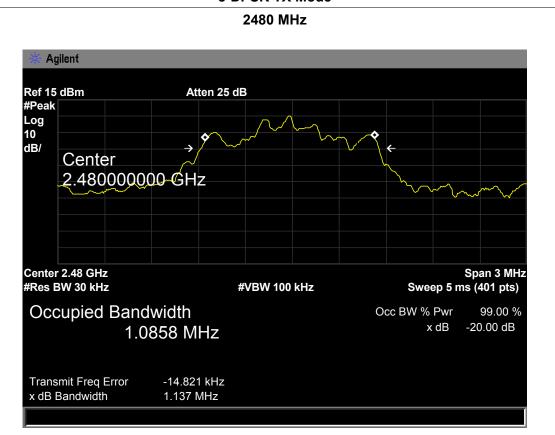
1085.80













Page: 75 of 88

EUT:	Bluetooth Speaker	Model Name :	Rock
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	765.084
2441	1005.00	765.700
2480	1005.00	762.689

GFSK Hopping Mode

2402 MHz











Report No.: TB-FCC143760 Page: 77 of 88

EUT: Bluetooth Speaker Model Name: Rock
Temperature: 25 °C Relative Humidity: 55%

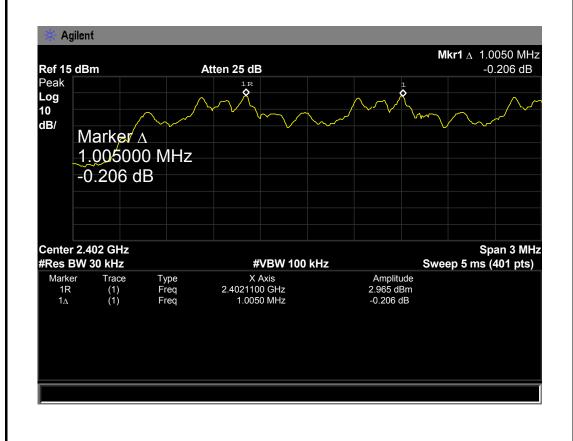
Test Voltage: DC 3.7V

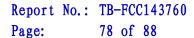
Test Mode: Hopping Mode (π /4-DQPSK)

• ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `		
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	760.67
2441	1005.00	761.33
2480	1005.00	759.33

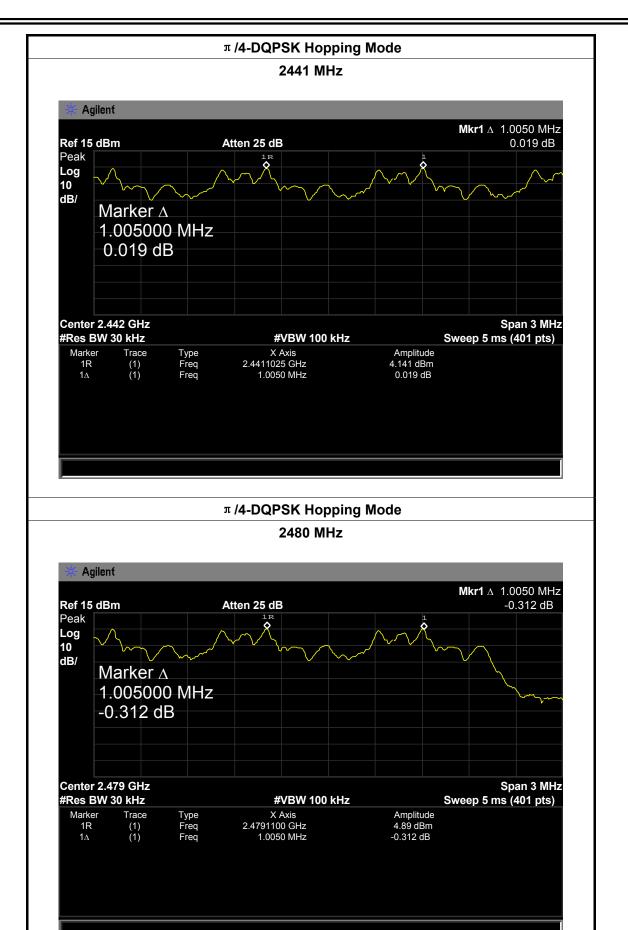
π /4-DQPSK Hopping Mode

2402 MHz











Page: 79 of 88

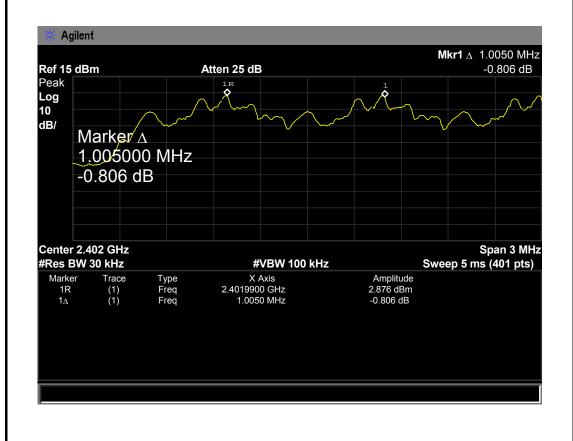
EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	Hopping Mode (8-DPSK)		

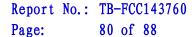
Test Mode:	Hopping Mode (8-DPSK)
------------	-----------------------

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	759.33
2441	1005.00	760.00
2480	1005.00	758.00

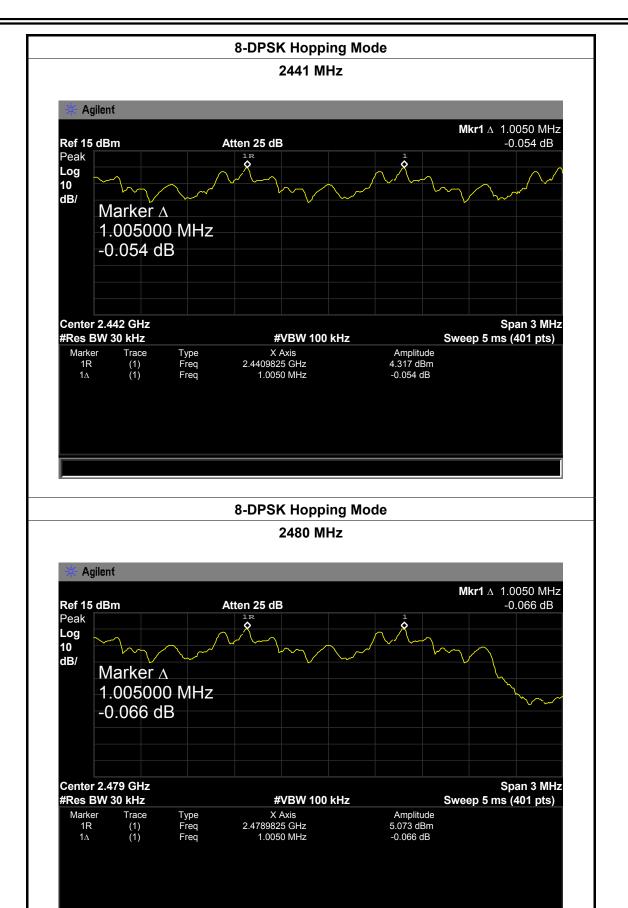
8-DPSK Hopping Mode

2402 MHz











Report No.: TB-FCC143760 Page: 81 of 88

Page: 81 of

9. Peak Output Power Test

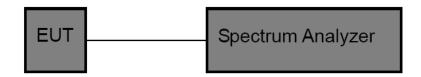
9.1 Test Standard and Limit

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	Aug. 08, 2014	Aug.07, 2015

9.6 Test Data



Page: 82 of 88

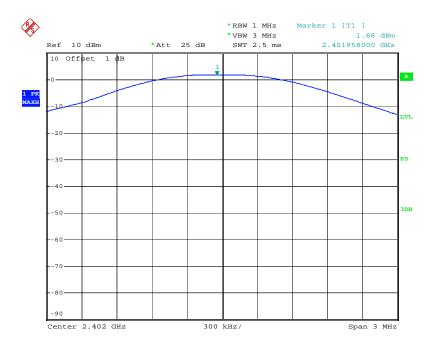
EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode:	TX Mode (GFSK)
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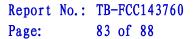
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	1.66	
2441	2.33	30
2480	2.97	

GFSK TX Mode

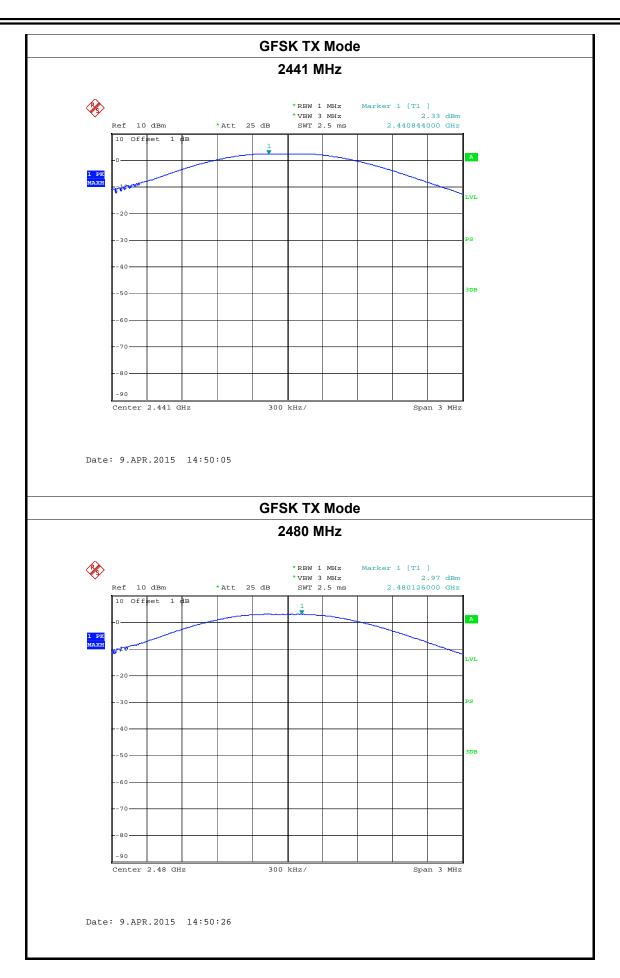
2402 MHz



Date: 9.APR.2015 14:49:36



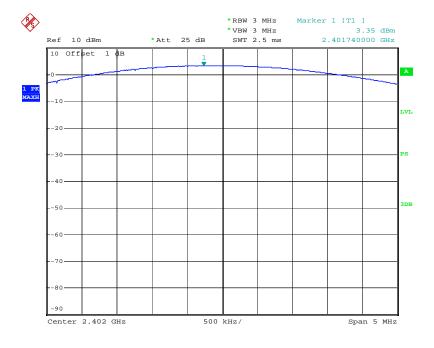




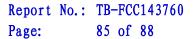


Page: 84 of 88

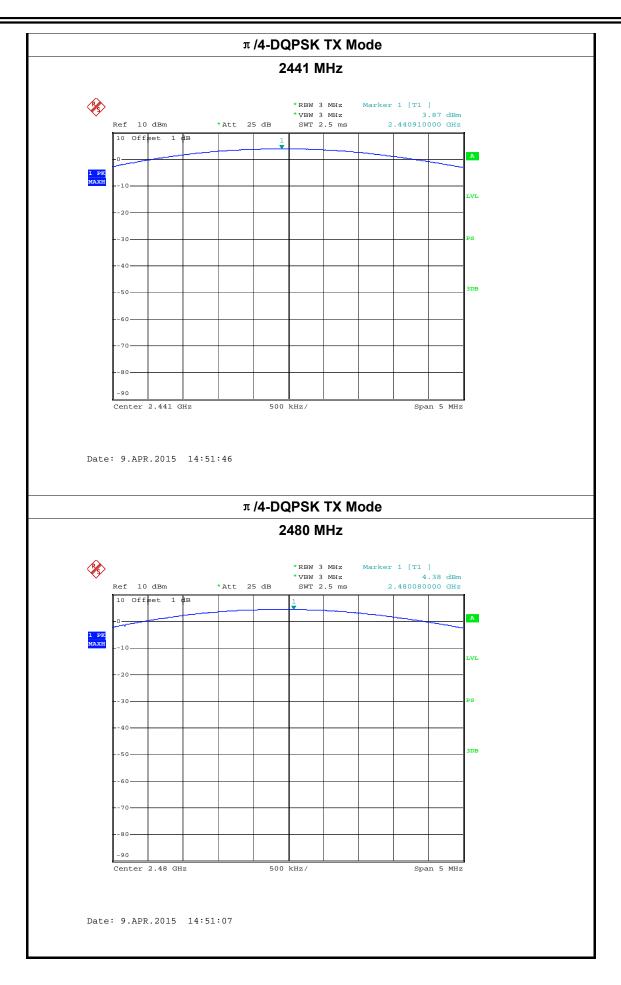
EUT:	Bluetooth Speaker		Model Name :		Rock
Temperature:	25 ℃		Relative Humidity:		55%
Test Voltage:	DC 3.7V				
Test Mode:	TX Mode	(π /4-DQPSK)			
Channel frequen	cy (MHz)	Test Result (d	dBm)	Lin	nit (dBm)
2402		3.35			
2441		3.87		21	21
2480		4.38			
		π /4-DQPSK TX	Mode		
		2402 MH	7		



Date: 9.APR.2015 14:52:28







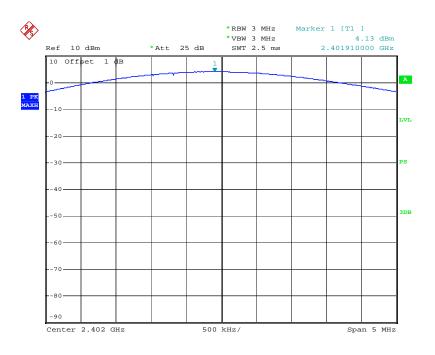


EUT:	Bluetooth Speaker	Model Name :	Rock
Temperature:	25 ℃	Relative Humidity: 55%	
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode (8-DPSK)		

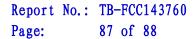
rest wode.	TX Wode (6-DF 3K)			
Channel frequency (MHz)		Test Result (dBm)	Limit (dBm)	
2402		4.13		
2441		4.59	21	
2480		5.03		

8-DPSK TX Mode

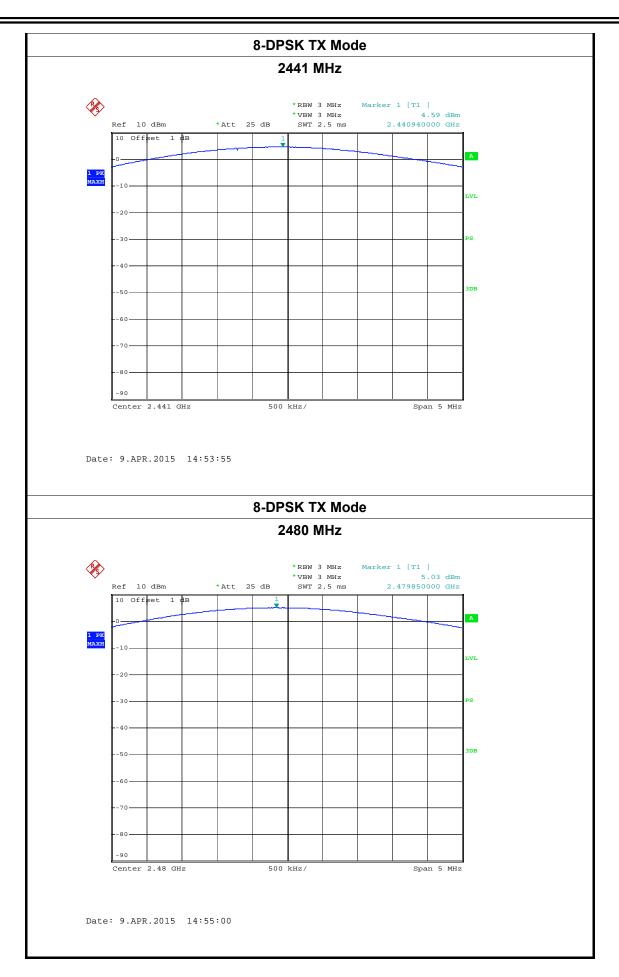
2402 MHz



Date: 9.APR.2015 14:53:08









Page: 88 of 88

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 gain of the PCB antenna used for transmitting is -1.70 dBi. And the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.3 Result

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

Antenna Type				
✓ Permanent attached antenna				
□ Unique connector antenna				
☐ Professional installation antenna				