

# Shenzhen Toby Technology Co., Ltd.

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# FCC Radio Test Report FCC ID: 2AE5P-SP1

# **Original Grant**

Report No. : TB-FCC144550

**Applicant**: SW Technology Limited

**Equipment Under Test (EUT)** 

**EUT Name** : Bluetooth stereo headphone

Model No. : SP1

Series No. : HZ2654

Brand Name : SW

**Receipt Date** : 2015-06-16

**Test Date** : 2015-06-16 to 2015-06-26

**Issue Date** : 2015-06-27

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



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# 1. General Information about EUT

## 1.1 Client Information

Applicant : SW Technology Limited

Address : Unit 1202, 12/F Mirror Tower 61 Mody RD TST East KL, Hong Kong

Manufacturer : SW Technology Limited

Address : Unit 1202, 12/F Mirror Tower 61 Mody RD TST East KL, Hong Kong

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Bluetooth stereo headphor	ne			
Models No.	:	SP1, HZ2654	SP1, HZ2654			
Model Difference		All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.				
The state of the s		Operation Frequency: Bluetooth:2402~2480MHz				
		Number of Channel:	Bluetooth:79 Channels see note (2)			
Product Description	3	Max Peak Output Power:	GFSK: 5.01 dBm			
Boomption	Ń	Antenna Gain:	1 dBi Integral Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps)			
			π /4-DQPSK(2 Mbps)			
		CHILL STORY	8-DPSK(3 Mbps)			
Power Supply	:	DC Voltage supplied from	Host System by USB cable			
		DC power by Li-ion Battery				
Power Rating		DC 5.0V by USB cable.				
		DC 3.7V Li-ion Battery.				
Connecting I/O Port(S)	:	Please refer to the User's	Please refer to the User's Manual			

#### Note

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

#### (2) Channel List

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



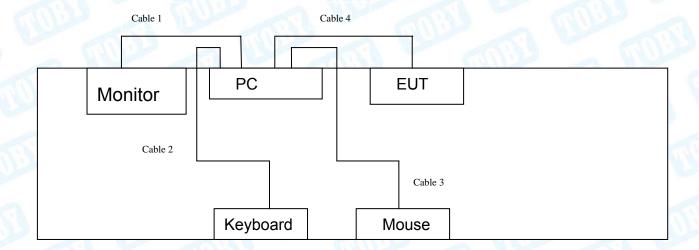
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		SILIVE			
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
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	301	
26	2428	53	2455	U.	The same

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

# 1.3 Block Diagram Showing the Configuration of System Tested

# TX Mode





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# 1.4 Description of Support Units

Equipment Information								
Name Model FCC ID/DOC Manufacturer Used								
LCD Monitor	E170Sc	DOC	DELL	1				
PC	OPTIPLEX380	DOC	DELL	1				
Keyboard	L100	DOC	DELL	1				
Mouse	M-UARDEL7	DOC	DELL	1				
		Cable Information						
Number	Shielded Type	Ferrite Core	Length	Note				
Cable 1	YES	YES	1.5M					
Cable 2	YES	YES	1.5M	The same of				
Cable 3	YES	NO	1.5M					
Cable 4	YES	YES	0.8M	1133				

# 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					

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:



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(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 C63.10 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		BlueTest V2.4.8	a Dillian
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 <sub>Lab</sub> )
Conducted Emission	Level Accuracy: 9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB



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#### 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.



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# 2. Test Summary

	F	CC Part 15 Subpart C(15.247)/ RSS	247 Issue 1		
Standard Section		<b>-</b>		D	
FCC	IC	Test Item	Judgment	Remark	
15.203		Antenna Requirement	PASS	N/A	
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A	
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A	
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A	
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A	
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A	
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A	
15.247(c)	RSS 247 5.5	Radiated Spurious Emission	PASS	N/A	
15.247(a)	RSS 247 5.1 (1)	99% Occupied Bandwidth & 20dB Bandwidth	PASS	99%OBW GFSK:852.00kHz π/4-DQPSK: 1326.00kHz 8-DPSK:1278.00kHz	

**Note:** N/A is an abbreviation for Not Applicable.



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# 3. Test Equipment

AC Main C	onducted Emis	ssion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Aug. 08, 2014	Aug. 07, 2015
50ΩCoaxial Switch	Anritsu	MP59B	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
Radiation  Description	Spurious Emiss  Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4407B	MY45106456	Sep. 01, 2014	Aug. 31, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 08, 2014	Aug.07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Aug. 08, 2014	Aug.07, 2015
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	Sonoma	310N	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
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	onducted Emis	ssion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Sep. 01, 2014	Aug. 31, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 08, 2014	Aug. 07, 2015



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# 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

4.1.1Test Standard FCC 15.207

#### 4.1.2 Test Limit

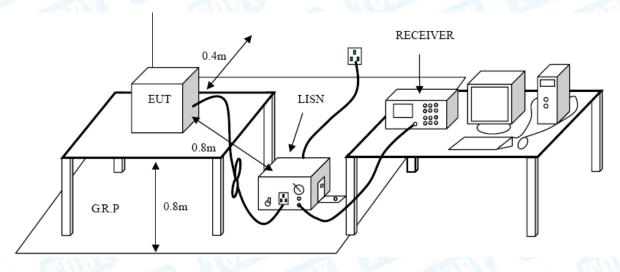
#### **Conducted Emission Test Limit**

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

#### Notes:

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

#### 4.2 Test Setup



#### 4.3 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.

## 4.4 EUT Operating Mode

Please refer to the description of test mode.

#### 4.5 Test Data

Please see the next page.



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	AC 120V/60 Hz	V/60 Hz				
Terminal:	Line					
Test Mode:	USB Charging with TX GFSK	Mode 2402 MHz	CHILL ST			
Remark:	Only worse case is reported					
90.0 dBuV						
			QP: — AVG: —			

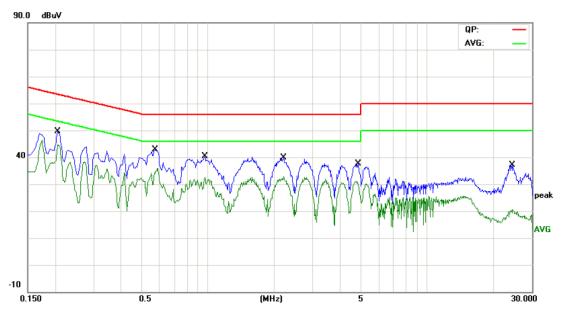
				AVG: —
*				
	WWW.	X X X		Marine Marine Marine
40	VV , VV		A A A A A A A A A A A A A A A A A A A	Mariana

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∀	dB	dBu∀	dBu∨	dB	Detector
1	0.2060	37.52	10.02	47.54	63.36	-15.82	QP
2 *	0.2060	34.69	10.02	44.71	53.36	-8.65	AVG
3	0.5820	31.84	10.06	41.90	56.00	-14.10	QP
4	0.5820	25.09	10.06	35.15	46.00	-10.85	AVG
5	0.9620	27.97	10.07	38.04	56.00	-17.96	QP
6	0.9620	21.65	10.07	31.72	46.00	-14.28	AVG
7	1.5859	27.70	10.06	37.76	56.00	-18.24	QP
8	1.5859	22.62	10.06	32.68	46.00	-13.32	AVG
9	2.1380	26.69	10.06	36.75	56.00	-19.25	QP
10	2.1380	21.77	10.06	31.83	46.00	-14.17	AVG
11	4.0020	23.53	9.99	33.52	56.00	-22.48	QP
12	4.0020	19.60	9.99	29.59	46.00	-16.41	AVG



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
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					



Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∀	dB	dBuV	dBu∀	dB	Detector
	0.2060	37.50	10.02	47.52	63.36	-15.84	QP
*	0.2060	34.61	10.02	44.63	53.36	-8.73	AVG
	0.5740	31.64	10.06	41.70	56.00	-14.30	QP
	0.5740	24.49	10.06	34.55	46.00	-11.45	AVG
	0.9660	28.18	10.07	38.25	56.00	-17.75	QP
	0.9660	22.47	10.07	32.54	46.00	-13.46	AVG
	2.2060	25.98	10.05	36.03	56.00	-19.97	QP
	2.2060	22.42	10.05	32.47	46.00	-13.53	AVG
	4.8340	23.39	9.97	33.36	56.00	-22.64	QP
	4.8340	19.65	9.97	29.62	46.00	-16.38	AVG
	24.4420	21.15	10.16	31.31	60.00	-28.69	QP
	24.4420	8.64	10.16	18.80	50.00	-31.20	AVG
		MHz 0.2060 * 0.2060 0.5740 0.5740 0.9660 2.2060 2.2060 4.8340 4.8340 24.4420	Mk. Freq. Level  MHz dBuV  0.2060 37.50  * 0.2060 34.61  0.5740 31.64  0.5740 24.49  0.9660 28.18  0.9660 22.47  2.2060 25.98  2.2060 22.42  4.8340 23.39  4.8340 19.65  24.4420 21.15	Mk.         Freq.         Level         Factor           MHz         dBuV         dB           0.2060         37.50         10.02           *         0.2060         34.61         10.02           0.5740         31.64         10.06           0.5740         24.49         10.06           0.9660         28.18         10.07           0.9660         22.47         10.07           2.2060         25.98         10.05           2.2060         22.42         10.05           4.8340         23.39         9.97           4.8340         19.65         9.97           24.4420         21.15         10.16	Mk.         Freq.         Level         Factor         ment           MHz         dBuV         dB         dBuV           0.2060         37.50         10.02         47.52           *         0.2060         34.61         10.02         44.63           0.5740         31.64         10.06         41.70           0.5740         24.49         10.06         34.55           0.9660         28.18         10.07         38.25           0.9660         22.47         10.07         32.54           2.2060         25.98         10.05         36.03           2.2060         22.42         10.05         32.47           4.8340         23.39         9.97         33.36           4.8340         19.65         9.97         29.62           24.4420         21.15         10.16         31.31	Mk.         Freq.         Level         Factor         ment         Limit           MHz         dBuV         dBuV         dBuV         dBuV           0.2060         37.50         10.02         47.52         63.36           *         0.2060         34.61         10.02         44.63         53.36           0.5740         31.64         10.06         41.70         56.00           0.5740         24.49         10.06         34.55         46.00           0.9660         28.18         10.07         38.25         56.00           0.9660         22.47         10.07         32.54         46.00           2.2060         25.98         10.05         36.03         56.00           4.8340         23.39         9.97         33.36         56.00           4.8340         19.65         9.97         29.62         46.00           24.4420         21.15         10.16         31.31         60.00	Mk.         Freq.         Level         Factor         ment         Limit         Over           MHz         dBuV         dB         dBuV         dBuV         dB           0.2060         37.50         10.02         47.52         63.36         -15.84           *         0.2060         34.61         10.02         44.63         53.36         -8.73           0.5740         31.64         10.06         41.70         56.00         -14.30           0.5740         24.49         10.06         34.55         46.00         -11.45           0.9660         28.18         10.07         38.25         56.00         -17.75           0.9660         22.47         10.07         32.54         46.00         -13.46           2.2060         25.98         10.05         36.03         56.00         -19.97           2.2060         22.42         10.05         32.47         46.00         -13.53           4.8340         23.39         9.97         29.62         46.00         -16.38           24.4420         21.15         10.16         31.31         60.00         -28.69



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# 5. Radiated Emission Test

## 5.1 Test Standard and Limit

5.1.1 Test Standard FCC 15.209

5.1.2 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	(dBuV/m)(at 3m)			
(MHz)	Peak	Average		
Above 1000	74	54		

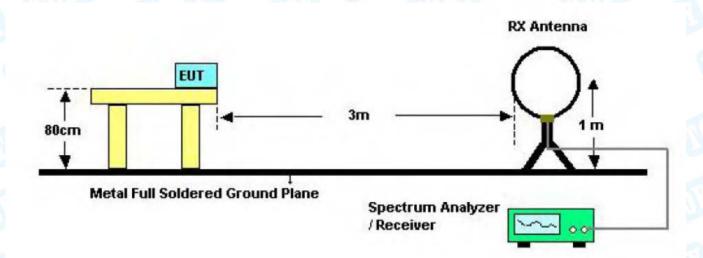
#### Note:

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

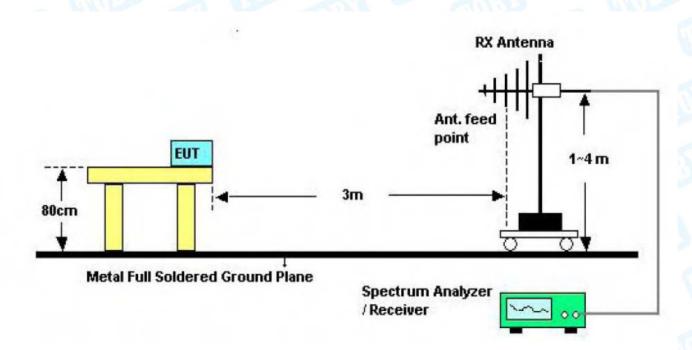


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# 5.2 Test Setup



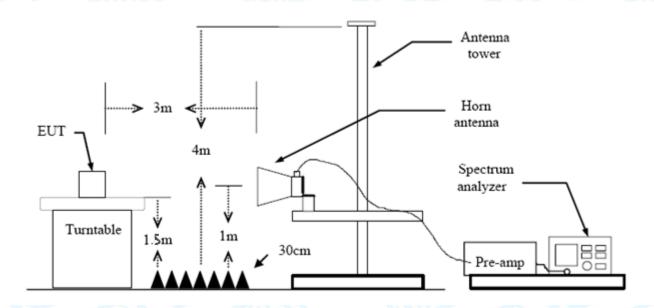
Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup



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Above 1GHz Test Setup

#### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. 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) 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.



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# 5.4 EUT Operating Condition

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

## 5.5 Test Data

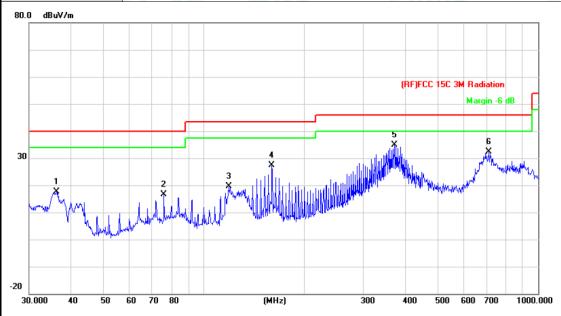
Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=1 KHz with Peak Detector for Average Values.

Test data please refer the following pages.



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EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz		DITT.
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		36.2541	35.46	-17.83	17.63	40.00	-22.37	peak
2		75.9773	40.08	-23.42	16.66	40.00	-23.34	peak
3		118.6014	42.17	-22.42	19.75	43.50	-23.75	peak
4		159.7844	47.95	-20.52	27.43	43.50	-16.07	peak
5	*	372.0045	49.31	-14.48	34.83	46.00	-11.17	peak
6		711.6734	39.31	-6.99	32.32	46.00	-13.68	peak

<sup>\*:</sup>Maximum data x:Over limit !:over margin



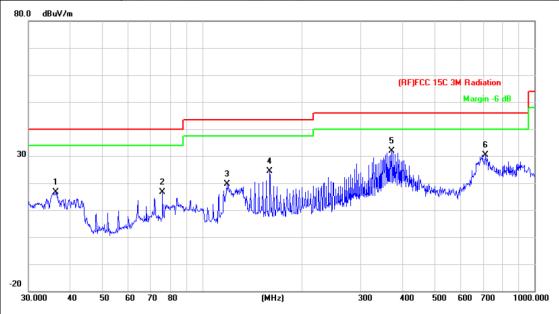
Page: 20 of 92

		Bluet	ooth stereo	headphone	Model N	ame :	SP1	1
Temper	rature:	25 ℃		811	Relative	Humidity:	55%	MAR
Test Vo	ltage:	DC 5	V				M.	
Ant. Po	ol.	Vertic	cal	(III)		A Allen		5
Test Mo	ode:	TX G	FSK Mode	2402MHz	COTTO!	3	ON.	M. Janes
Remark	C:	Only	worse case	is reported	17			
80.0 dB	uV/m							
30	**************************************	Interfed al		3	history by a substitute of the	(RF)FCC 15C :	Margin -6	
-20 30.000	40 50	60 70	80	(MHz)	300	400 500	600 700	1000.00
		60 70 req.	Reading Level		vleasure- ment		600 700 Over	1000.000
30.000	Mk. Fr		Reading	Correct 1	/leasure-			Detecto
No.	Mk. Fr	req.	Reading Level	Correct 1 Factor	vleasure- ment	Limit	Over	
No.	Mk. Fr M * 36.0	r <b>eq</b> .	Reading Level	Correct f Factor	<b>/leasure-</b> <b>ment</b> dBuV/m	Limit dBuV/m 40.00	<b>Over</b>	Detecto
No.	Mk. Fr M * 36.0	req. Hz 0007	Reading Level dBuV 47.95	Correct fractor	Measure- ment dBuV/m	Limit  dBuV/m  40.00  43.50	Over	Detecto peak peak
No.	Mk. Fr M * 36.0 119.	req. Hz 0007 8556	Reading Level dBuV 47.95 51.10 47.73	Correct Factor  dB/m -17.67 -22.50 -20.52	Measure- ment dBuV/m 30.28 28.60 27.21	Limit  dBuV/m  40.00  43.50  43.50	Over  dB  -9.72  -14.90  -16.29	Detecto peak peak peak
No.  1 2 3 4	Mk. Fr * 36.0 119. 159. 375.	req. Hz 0007 8556 7844 9385	Reading Level dBuV 47.95 51.10 47.73 42.31	Correct Factor  dB/m -17.67 -22.50 -20.52 -14.40	Measure- ment dBuV/m 30.28 28.60 27.21 27.91	Limit  dBuV/m  40.00  43.50  43.50  46.00	Over  dB  -9.72  -14.90  -16.29  -18.09	Detecto peak peak peak peak
No.	Mk. Fr * 36.0 119. 159. 375. 714.	req. Hz 0007 8556 7844	Reading Level dBuV 47.95 51.10 47.73	Correct Factor  dB/m -17.67 -22.50 -20.52	Measure- ment dBuV/m 30.28 28.60 27.21	Limit  dBuV/m  40.00  43.50  43.50  46.00  46.00	Over  dB  -9.72  -14.90  -16.29	Detecto <b>peak</b>



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EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal	TO VIEW	
Test Mode:	TX π /4-DQPSK Mode 2402MHz	W. 10	AMI.
Remark:	Only worse case is reported		
80.0 dBuV/m			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		36.2541	34.46	-17.83	16.63	40.00	-23.37	peak
2		75.9770	40.08	-23.42	16.66	40.00	-23.34	peak
3		118.6012	42.17	-22.42	19.75	43.50	-23.75	peak
4		159.7844	44.95	-20.52	24.43	43.50	-19.07	peak
5	*	372.0045	46.31	-14.48	31.83	46.00	-14.17	peak
6		711.6734	37.31	-6.99	30.32	46.00	-15.68	peak

<sup>\*:</sup>Maximum data x:Over limit !:over margin



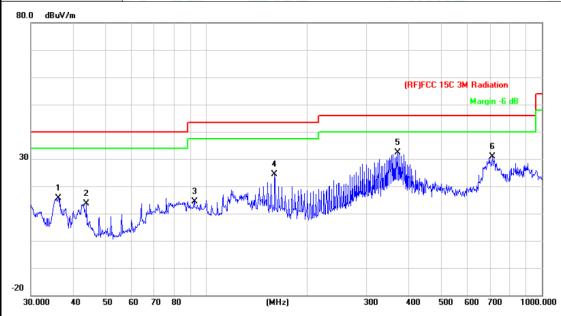
Page: 22 of 92

EUT:	Bluetooth	stereo headphone	Model Nam	e:	SP1	
Temperature:	25 ℃	2 All	Relative Hu	ımidity:	55%	
Test Voltage:	DC 5V	TOPA S	CHILD'S		A Allen	
Ant. Pol.	Vertical					
Test Mode:	TX π /4-D0	QPSK Mode 2402M	2MHz			
Remark:	Only wors	se case is reported	COUNTY OF THE PARTY OF THE PART		MILLER	
80.0 dBuV/m						
30 1	2 X	3 4 * X	(R	F)FCC 15C 3M	Radiation Margin -6 dB	
			the hospital section with the complete property of	White phase statement the	· · · · · · · · · · · · · · · · · · ·	
-20 30.000 40 5	0 60 70 80	1. 1 7° \ 1111101	300 40		00 700 1000.0	
30.000 40 5	0 60 70 80 Rea	(MHz)	there are	00 500 60	00 700 1000.00 Ver	
30.000 40 5 No. Mk.	0 60 70 80 Re: Freq. Le	(MHz)	300 40  Vieasure- ment Lin	00 500 60		
30.000 40 5 No. Mk.	Re: Freq. Le	ading Correct I	300 40  Vieasure- ment Lin  dBuV/m dBu	oo 500 60 nit O	ver	
No. Mk. I	Rea Freq. Lea MHz di .0007 48	(MHz)  ading Correct I evel Factor  BuV dB/m	300 40  Vleasure- ment Lim dBuV/m dBu  28.28 40	nit O	<b>ver</b> dB Detecto	
No. Mk. I	Reaction Rea	ading Correct I Factor BuV dB/m 5.95 -17.67	7300 40  Vleasure- ment Lim dBuV/m dBu 28.28 40 24.02 40	nit Oruv/m 0.000 -1	ver dB Detecto 1.72 peal	
No. Mk. I  1 * 36  2 63  3 119	Real Real Real Real Real Real Real Real	ading Correct I Factor BuV dB/m 5.95 -17.67 B.18 -24.16	300 40  Veasure- ment Lim dBu∀/m dBu  28.28 40  24.02 40  25.10 43	nit Or uV/m o 0.00 -1 0.00 -1	ver  dB Detecto  1.72 peal  5.98 peal  8.40 peal	
No. Mk. I  1 * 36 2 63 3 119 4 159	Real Real Real Real Real Real Real Real	mHz)  ading Correct Factor  BuV dB/m  5.95 -17.67  8.18 -24.16  7.60 -22.50	Measurement Lim dBuV/m dBu 28.28 40 24.02 40 25.10 43	nit Or u//m or 0.00 -1 0.00 -1 0.50 -1	ver  dB Detecto  1.72 peal  5.98 peal  8.40 peal	



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EUT:	Bluetooth stereo headphone	Model Name :	SP1				
Temperature: 25 °C		Relative Humidity:	55%				
Test Voltage:	DC 5V	DC 5V					
Ant. Pol.	Horizontal	THE RESERVE TO SERVE					
Test Mode:	TX 8-DPSK Mode 2402MHz						
Remark: Only worse case is reported							



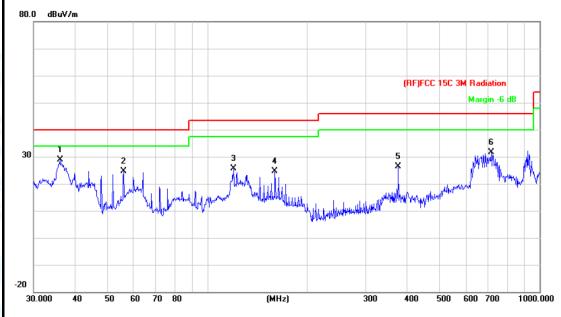
No	o. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		36.2541	33.46	-17.83	15.63	40.00	-24.37	peak
2		43.9658	35.56	-21.84	13.72	40.00	-26.28	peak
3		92.1388	37.00	-22.50	14.50	43.50	-29.00	peak
4		159.7844	44.95	-20.52	24.43	43.50	-19.07	peak
5	*	372.0045	46.81	-14.48	32.33	46.00	-13.67	peak
6		711.6734	37.81	-6.99	30.82	46.00	-15.18	peak

<sup>\*:</sup>Maximum data x:Over limit !:over margin



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EUT:	EUT: Bluetooth stereo headphone		SP1	
Temperature:	cure: 25 °C Relative Humidity:		55%	
Test Voltage:	DC 5V		3	
Ant. Pol.	Vertical			
Test Mode: TX 8-DPSK Mode 2402MHz				
Remark:	Only worse case is reported		1	



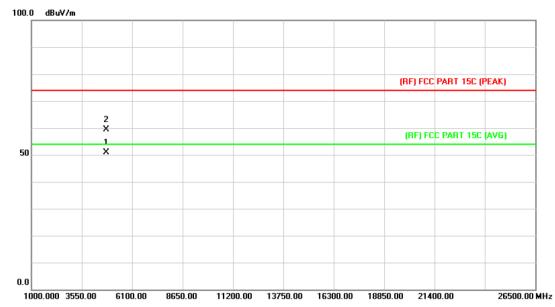
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	36.0007	46.45	-17.67	28.78	40.00	-11.22	peak
2		56.0007	49.01	-24.47	24.54	40.00	-15.46	peak
3		119.8555	48.10	-22.50	25.60	43.50	-17.90	peak
4		159.7844	45.23	-20.52	24.71	43.50	-18.79	peak
5		375.9384	40.81	-14.40	26.41	46.00	-19.59	peak
6		714.1734	38.64	-7.02	31.62	46.00	-14.38	peak

<sup>\*:</sup>Maximum data x:Over limit !:over margin



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EUT:			SP1				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	TX GFSK Mode 2402MHz		LITTLE TO				
Remark:	No report for the emission wh prescribed limit.	ich more than 10 dB bo	elow the				

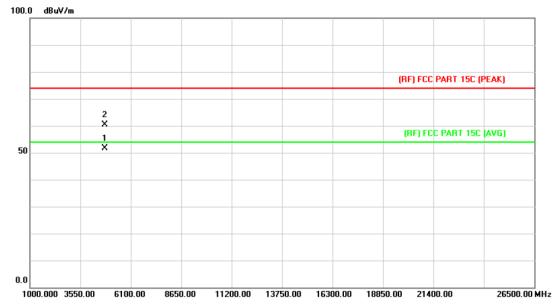


No	р. МI	k. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.934	37.45	13.44	50.89	54.00	-3.11	AVG
2		4804.204	46.06	13.44	59.50	74.00	-14.50	peak



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃	Relative Humidity: 55				
Test Voltage:	: DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2402MHz		DIOT: N			
Remark:	No report for the emission which prescribed limit.	ch more than 10 dB belo	ow the			

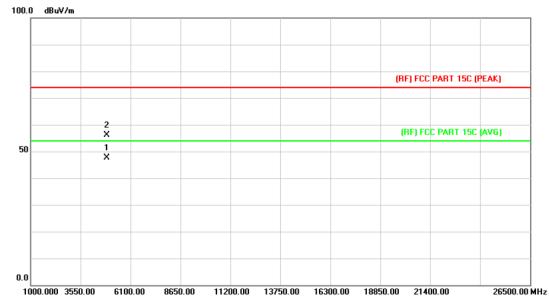


No	o. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.883	38.14	13.44	51.58	54.00	-2.42	AVG
2		4804.009	46.90	13.44	60.34	74.00	-13.66	peak



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃	Relative Humidity:				
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal	Horizontal				
Test Mode:	TX GFSK Mode 2441MHz		DITT.			
Remark:	No report for the emission which prescribed limit.	h more than 10 dB belo	w the			

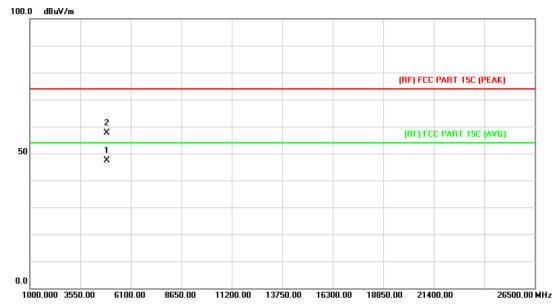


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.871	33.78	13.90	47.68	54.00	-6.32	AVG
2		4882.069	42.19	13.90	56.09	74.00	-17.91	peak



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EUT:	Bluetooth stereo headphone	SP1				
Temperature:	25 ℃	°C Relative Humidity: 55%				
Test Voltage:	DC 3.7V		19			
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2441MHz		CHIT:			
Remark:	No report for the emission which prescribed limit.	h more than 10 dB belo	w the			

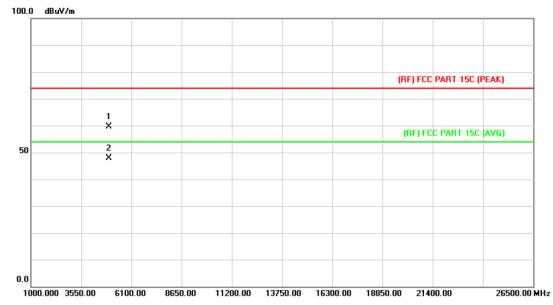


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4882.348	33.58	13.90	47.48	54.00	-6.52	AVG
2		4882.360	43.69	13.90	57.59	74.00	-16.41	peak



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EUT:	Bluetooth stereo headphone	SP1	
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	The same	13
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480MHz		UMILLE
Remark:	No report for the emission which prescribed limit.	h more than 10 dB bel	ow the

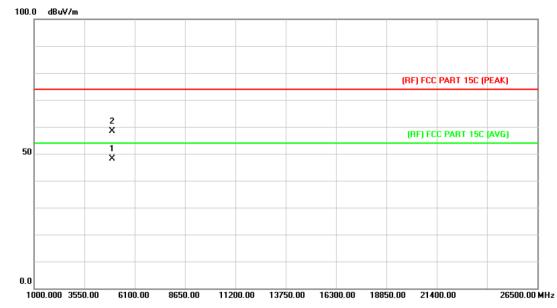


No	o. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.850	45.26	14.36	59.62	74.00	-14.38	peak
2	*	4959.862	33.54	14.36	47.90	54.00	-6.10	AVG



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EUT:	Bluetooth stereo headphone	Bluetooth stereo headphone   Model Name :					
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V		339				
Ant. Pol.	Vertical						
Test Mode:	TX GFSK Mode 2480MHz		CHITTE OF				
Remark:	No report for the emission wh prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.					

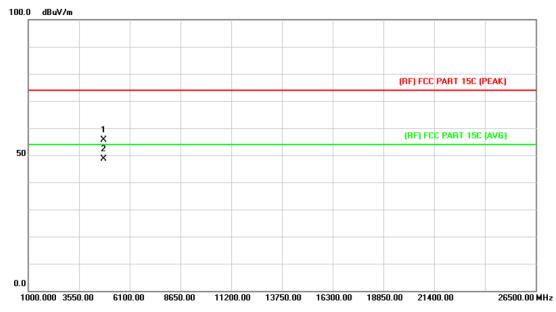


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.835	33.67	14.36	48.03	54.00	-5.97	AVG
2		4960.090	44.09	14.36	58.45	74.00	-15.55	peak



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EUT:	Bluetooth stereo headphone	SP1	
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		3
Ant. Pol.	Horizontal	THE RESERVE	
Test Mode:	TX 8-DPSK Mode 2402MHz	(1)33	DATE:
Remark:	No report for the emission which prescribed limit.	h more than 10 dB belo	w the

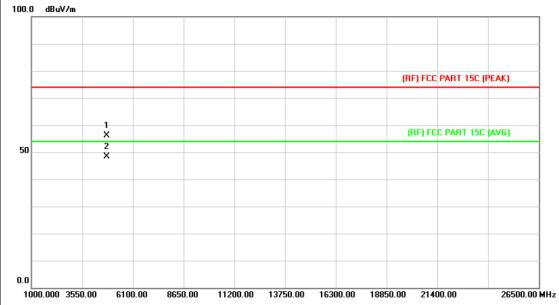


No	. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.808	42.23	13.44	55.67	74.00	-18.33	peak
2	*	4803.808	35.20	13.44	48.64	54.00	-5.36	AVG



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EUT:	Bluetooth stereo headphone Model Name :		SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	TO B	19
Ant. Pol.	Vertical	THE RESERVE TO SERVE	
Test Mode:	TX 8-DPSK Mode 2402MHz		D. M. C.
Remark:	No report for the emission which prescribed limit.	ch more than 10 dB belo	w the

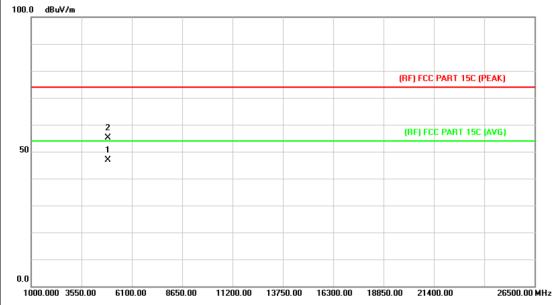


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4804.135	42.74	13.44	56.18	74.00	-17.82	peak
2	*	4804.153	35.01	13.44	48.45	54.00	-5.55	AVG



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11170
13
Call State
P

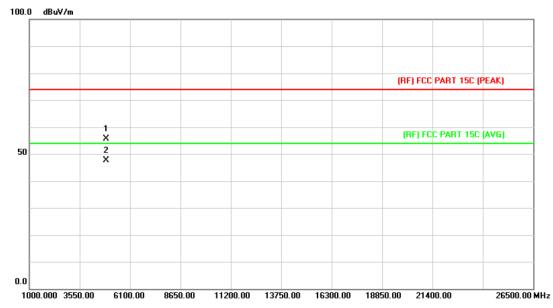


N	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4882.018	32.99	13.90	46.89	54.00	-7.11	AVG
2		4882.030	41.14	13.90	55.04	74.00	-18.96	peak



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EUT:	Bluetooth stereo headphone	etooth stereo headphone   Model Name :						
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.							

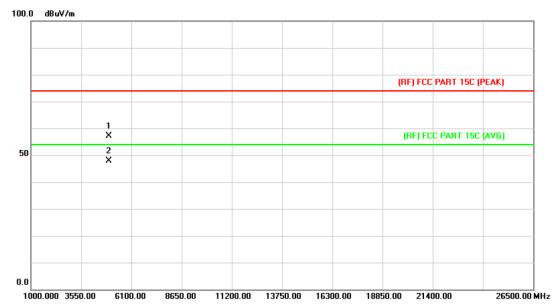


No.	Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.030	41.78	13.90	55.68	74.00	-18.32	peak
2	*	4882.084	33.66	13.90	47.56	54.00	-6.44	AVG



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EUT:	Bluetooth stereo headphone   Model Name :		SP1				
Temperature:	<b>25</b> ℃	25 °C Relative Humidity:					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2480MHz						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						

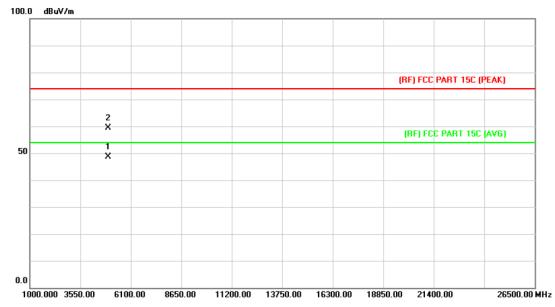


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.925	42.80	14.36	57.16	74.00	-16.84	peak
2	*	4959.943	33.50	14.36	47.86	54.00	-6.14	AVG



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.225	34.28	14.36	48.64	54.00	-5.36	AVG
2		4960.273	45.05	14.36	59.41	74.00	-14.59	peak



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# 6. Restricted Bands Requirement

#### 6.1 Test Standard and Limit

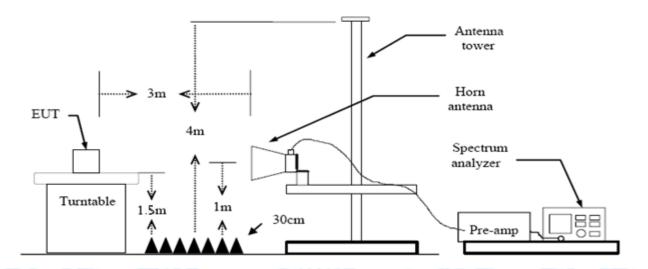
6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Class B (dE	BuV/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.

## 6.2 Test Setup



#### 6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. 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) 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.



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(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.

## 6.4 EUT Operating Condition

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

#### 6.5 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.



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## (1) Radiation Test

EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃ Relative Humidity: 55%					
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal		Millian			
Test Mode:	TX GFSK Mode 2402MHz					
Remark:	N/A	THU.	1			

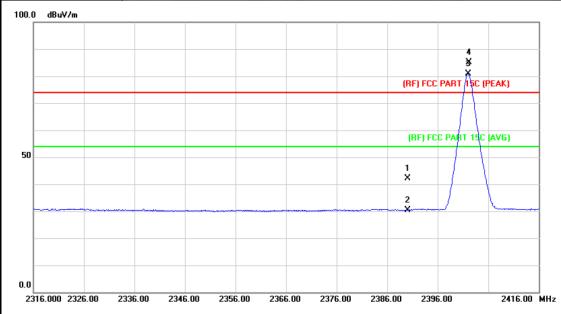


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	40.54	0.77	41.31	74.00	-32.69	peak
2		2390.000	29.70	0.77	30.47	54.00	-23.53	AVG
3	*	2402.000	83.32	0.82	84.14	Fundamental Frequency		AVG
4	Х	2402.100	87.71	0.82	88.53	Fundamenta	I Frequency	peak



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2402MHz					
Remark:	N/A					

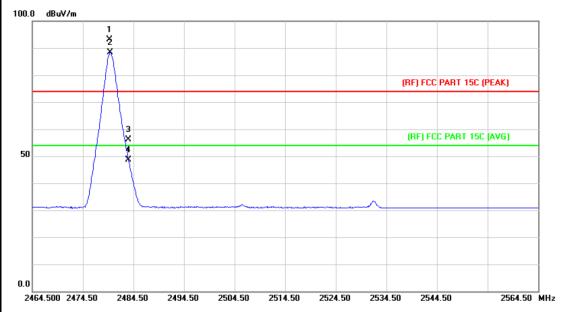


No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.44	0.77	42.21	74.00	-31.79	peak
2		2390.000	29.61	0.77	30.38	54.00	-23.62	AVG
3	*	2402.000	80.04	0.82	80.86	Fundamental	Frequency	AVG
4	Х	2402.200	84.19	0.82	85.01	Fundamental	Frequency	peak



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EUT:	Bluetooth stereo headphone	Model Name :	SP1						
Temperature:	25 ℃	Relative Humidity:	55%						
Test Voltage:	est Voltage: DC 3.7V								
Ant. Pol.	Horizontal	Horizontal							
Test Mode:	TX GFSK Mode 2480 MHz		L. C. L.						
Remark:	Remark: N/A								
100.0 dBuV/m									
1									



No	o. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.800	91.87	1.15	93.02	Fundamental Frequency		peak
2	*	2479.900	87.26	1.15	88.41	Fundamental	Frequency	AVG
3		2483.500	54.85	1.17	56.02	74.00	-17.98	peak
4		2483.500	47.45	1.17	48.62	54.00	-5.38	AVG



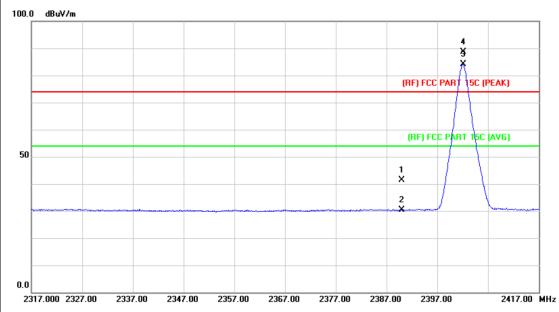
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EUT:			Blue	etooth ste	reo hea	dphone	Model	Name :	SP1	
Tem	peratu	re:	25	°C			Relati	ve Humidity	: 55%	MAIL
Test	Voltag	e:	DC	3.7V	War.			1	TO B	
Ant.	Pol.		Vert	ical	_ (		No.			
Test	Mode		TX	TX GFSK Mode 2480 MHz					Millian	
Rem	ark:		N/A	All		1	A.D.		27	
100.0	dBuV/m									
		1 2								
		χ								
								(RF) FCC	PART 15C (PEA	ıK)
		+								
		+	3					(BE) EC	C PART 15C (AV	(G)
50			4					().		-
			1							
		J								
0.0 246	64.500 24	74.50	2484.50	2494.50	2504.50	2514.50	2524.50	2534.50 2544	1.50	2564.50 MHz
				Readi	na C	orrect	Measur	·		
Ν	o. Mk	. Fi	req.	Leve	_	actor	ment		O∨er	
		М	Hz	dBu V	d	B/m	dBuV/r	n dBuV/m	ı dB	Detector
1	Х	2479	008.6	90.43	3 1	.15	91.58	3 Fundamen	tal Frequency	peak
2	*	2479	9.900	85.9	5 1	.15	87.10	Fundamen	tal Frequency	AVG
3		2483	3.500	53.40	0 1	.17	54.57	7 74.00	-19.43	peak
4		2483	3.500	46.49	9 1	.17	47.66	54.00	-6.34	AVG



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EUT:	Bluetooth stereo headphone	Model Name :	SP1			
Temperature:	25 ℃ Relative Humidity: 55%					
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2402MHz					
Remark:	N/A					
	<u> </u>					

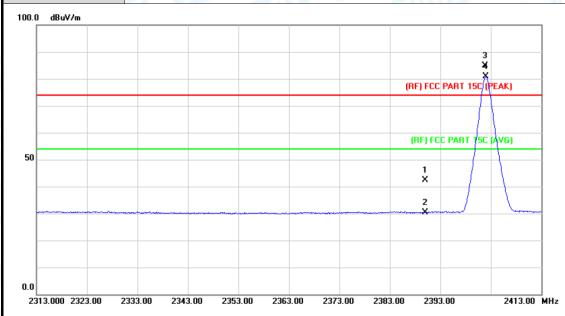


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	40.51	0.77	41.28	74.00	-32.72	peak
2		2390.000	29.67	0.77	30.44	54.00	-23.56	AVG
3	*	2402.100	83.27	0.82	84.09	Fundamental Frequency		AVG
4	Х	2402.200	87.73	0.82	88.55	Fundamental	Frequency	peak



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EUT:	Bluetooth stereo headphone	Model Name :	SP1				
Temperature:	25 °C Relative Humidity: 55%						
Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical	Vertical					
Test Mode:	TX 8-DPSK Mode 2402MHz	TX 8-DPSK Mode 2402MHz					
Remark:	N/A						
100 0 ID VI							



٨	lo. N	/lk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		:	2390.000	41.64	0.77	42.41	74.00	-31.59	peak
2			2390.000	29.67	0.77	30.44	54.00	-23.56	AVG
3	Х		2401.900	84.18	0.82	85.00	Fundamental	Frequency	peak
4	*		2402.000	80.05	0.82	80.87	Fundamental	Frequency	AVG

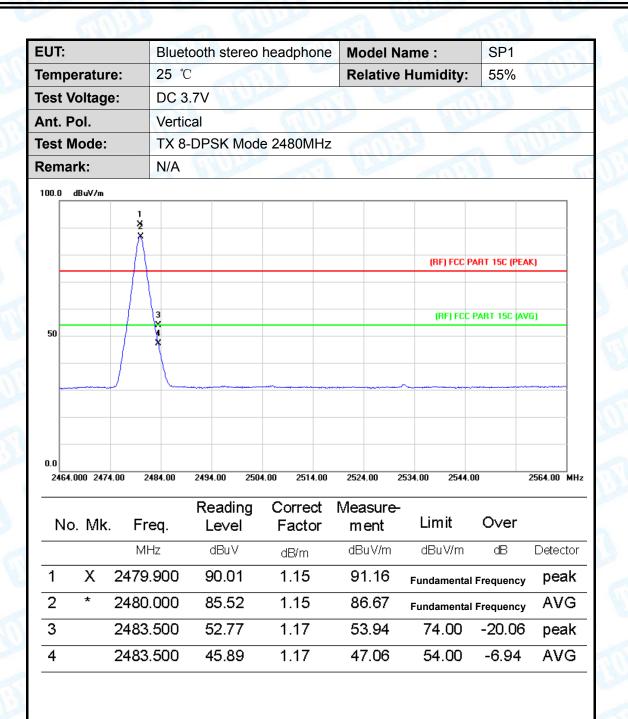


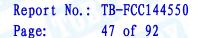
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UT:			Bluet	ooth ste	ereo	headpho	ne	Мо	del Na	ame :		SP1	A	5
Tempe	ratur	e:	25 °C					Re	lative	Humidit	y:	55%	1111	Ž
est Vo	oltage	<b>ə</b> :	DC 3	.7V			1		Vis.		1	18.0		
nt. Po	ol.		Horiz	zontal		(11/1				a V			1	Ŋ,
est M	ode:		TX 8	-DPSK	Mode	e 2480M	Hz	6	ATT.	13		CA.	المنال	
Remar	k:		N/A	1111			A	V	1	-		1		C
100.0 dE	BuV/m													
0.0	00 2474	1 3 3	3 × 4	2494.00	2504	.00 2514	.00	2524	.00 25	(RF)		ART 15C (PEAK		MHz
	Mk.	Fr	eq.	Read Leve	_	Corre Facto			asure- ent	Limit		O∨er		
	14114.	M		dBu\		dB/m			uV/m	dBuV/		dB	Detec	 tot:
1	Χ	2479	.900	91.0	12	1.15		92	2.17	Fundame	ental	Frequency	pea	яk
2	*	2480	.000	86.4	-8	1.15		87	7.63	Fundame	ental	Frequency	AV	G
3		2483	.500	54.2	26	1.17		5	5.43	74.0	0	-18.57	pea	яk
		2483		47.0	_	1.17		- 4	3.20	54.0	_	-5.80	ΑV	$\overline{}$



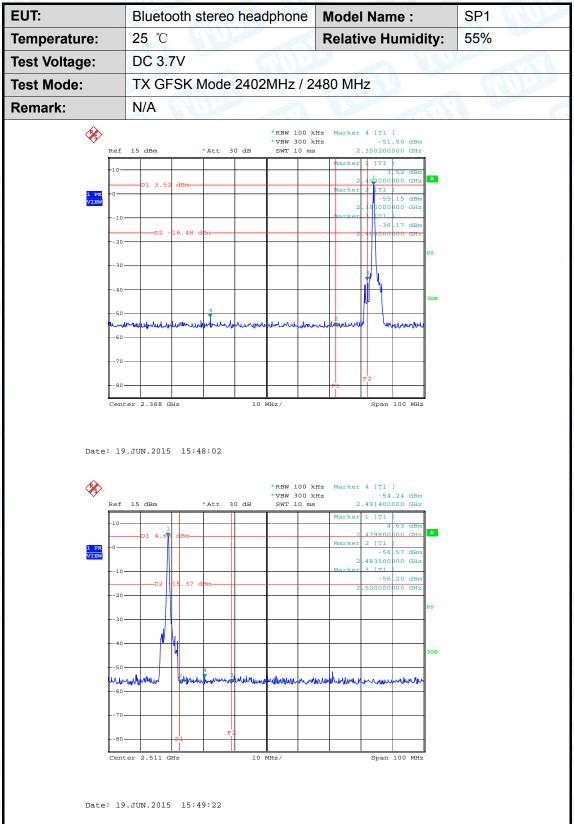
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(2) Conducted Test





EUT: Bluetooth stereo headphone SP1 **Model Name:** Temperature: 25 ℃ **Relative Humidity:** 55% DC 3.7V **Test Voltage: Test Mode: GFSK Hopping Mode** Remark: N/A \*RBW 100 kHz \*VBW 300 kHz 30 dB SWT 10 ms 1 PK VIEW waller warmen northeantenne Span 100 MHz Center 2.379 GHz Date: 19.JUN.2015 16:05:39 \*RBW 100 kHz Marker 4 [T1 ]

\*VBW 300 kHz -50.88 dBm
SWT 10 ms 2.495200000 GHz 30 dB \*Att -54.21 dBm 483500000 GHz the waster and the supplemental the supp Date: 19.JUN.2015 15:56:22



EUT: Bluetooth stereo headphone SP1 **Model Name:** Temperature: 25 ℃ **Relative Humidity:** 55% **Test Voltage:** DC 3.7V **Test Mode:** TX 8-DPSK Mode 2402MHz / 2480 MHz Remark: N/A \*RBW 100 kHz Marker 4 [T1 ]

\*VBW 300 kHz -52. \*Att 30 dB Span 100 MHz Center 2.368 GHz 10 MHz/ Date: 19.JUN.2015 15:38:40 \*RBW 100 kHz Marker 4 [T1 ]

\*VBW 300 kHz -53.26 dBm
SWT 10 ms 2.495400000 GHz Ref 15 dBm \*Att 30 dB .479800000 GHz 1 PK VIEW -54.57 dBm 483500000 GHz 3 [T1 ] -54.98 dBm 500000000 GHz Date: 19.JUN.2015 15:35:52



EUT: SP1 Bluetooth stereo headphone **Model Name:** Temperature: 25 ℃ **Relative Humidity:** 55% DC 3.7V **Test Voltage: Test Mode:** 8-DPSK Hopping Mode Remark: N/A \*RBW 100 kHz \*VBW 300 kHz SWT 10 ms 1 3.9 6.03 Span 100 MHz Center 2.379 GHz Date: 19.JUN.2015 16:11:23 \*RBW 100 kHz Marker 4 [T1 ]

\*VBW 300 kHz -52.25 dBm
SWT 10 ms 2.490000000 GHz Ref 15 dBm \*Att 30 dB .457000000 GHz -53.87 dBm 483500000 GHz 3 [T1 ] -53.64 dBm 500000000 GHz Mille March Date: 19.JUN.2015 16:16:01



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# 7. Number of Hopping Channel

## 7.1 Test Standard and Limit

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

7.1.2 Test Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

## 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=100 KHz, VBW=100 KHz, Sweep time= Auto.

## 7.4 EUT Operating Condition

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

## 7.5 Test Data



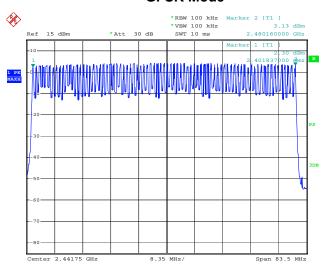
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EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		33
•		Rolativo Flamilaity.	3070

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

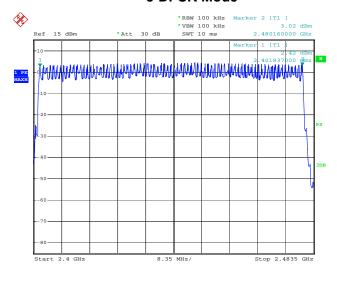
Frequency Range	Quantity of Hopping Channel	Limit
240204117-24900417	79	>15
2402MHz~2480MHz	79	>15

#### **GFSK Mode**



Date: 19.JUN.2015 16:24:59

#### 8-DPSK Mode



Date: 19.JUN.2015 16:20:52



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# 8. Average Time of Occupancy

#### 8.1 Test Standard and Limit

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

8.1.2 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

## 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: 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.

## 8.4 EUT Operating Condition

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



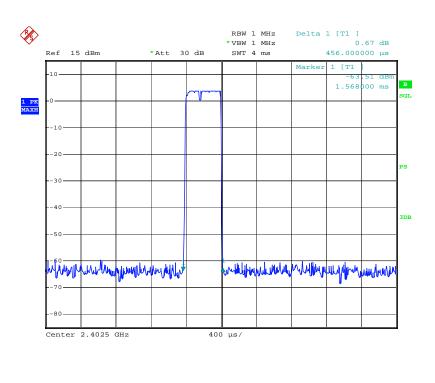
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## 8.5 Test Data

EUT:		Bluetooth stereo headphone		Model Name :		SP1	
Temperature:		25 ℃		Relative Humidity:		55%	
Test Voltage:		DC 3.7V	A VIVE		600		
Test Mode:		Hopping N	Mode (GFSK DH1)	CHILL ST		Alter	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)	Result	
2402		0.456	145.92				
2441		0.456	145.92	31.60	400	PASS	
2480		0.456	145.92				
GESK Hopping Mode DH1							

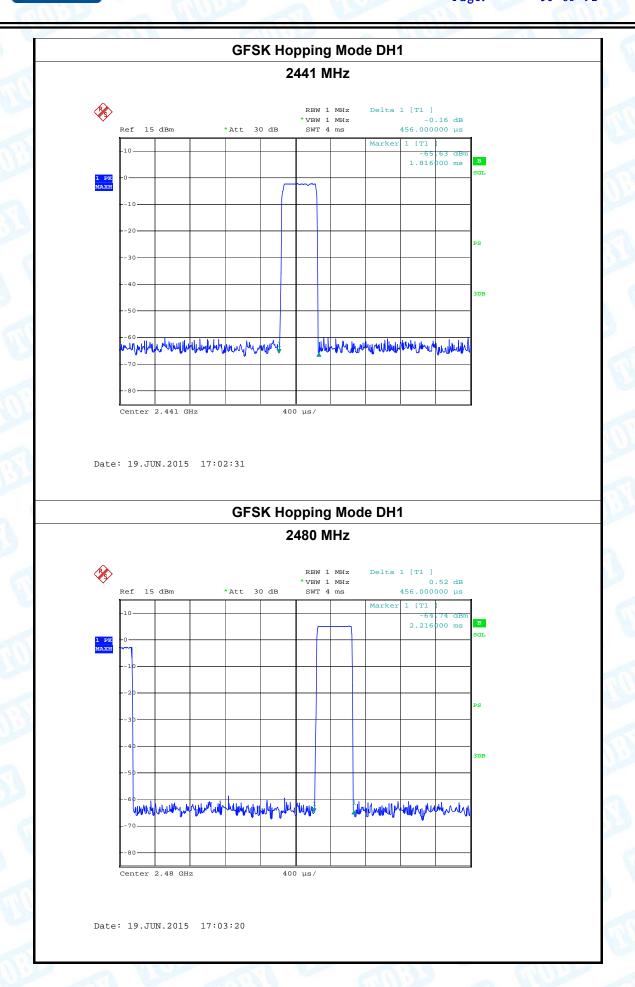
#### **GFSK Hopping Mode DH1**

#### 2402 MHz



Date: 19.JUN.2015 17:00:30







2441

2480

1.736

1.736

Report No.: TB-FCC144550

**PASS** 

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EUT:		Bluetooth	stereo headphone	Model Name	:	SP1
Temperature:		25 ℃		Relative Hum	idity:	55%
Test Voltage:		DC 3.7V				
Test Mode:		Hopping I	Mode (GFSK DH3)		N. S. L.	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		1.736	277.76			

## **GFSK Hopping Mode DH3**

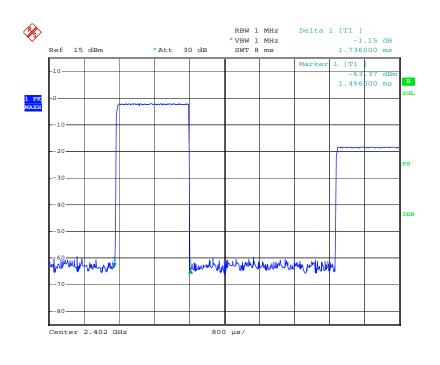
31.60

400

277.76

277.76

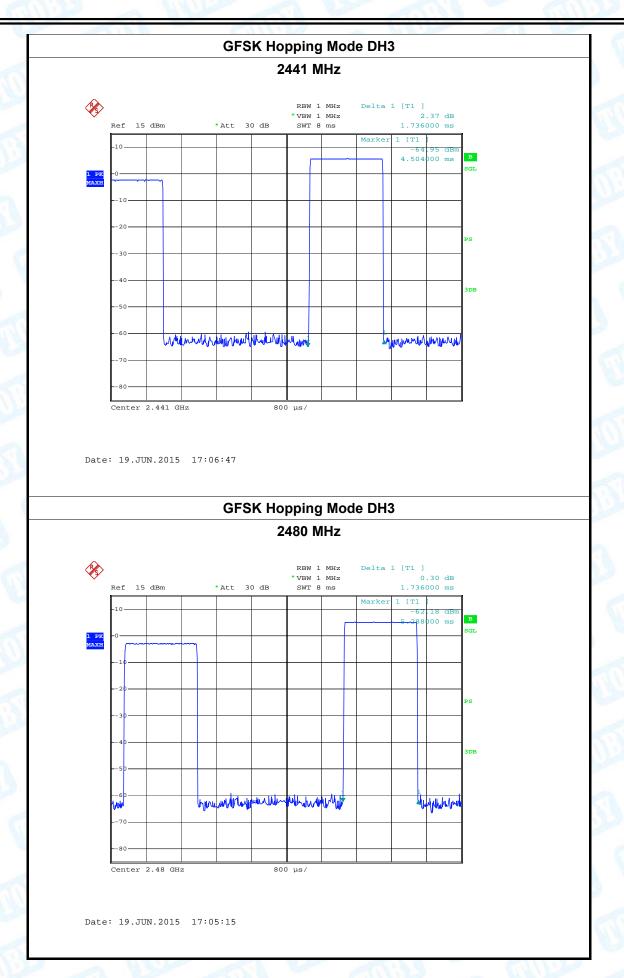
#### 2402 MHz



Date: 19.JUN.2015 17:07:52









2441

2480

2.960

2.960

Report No.: TB-FCC144550

**PASS** 

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EUT:		Bluetooth	stereo headphone	Model Name	:	SP1
Temperature		25 ℃		Relative Hum	idity:	55%
Test Voltage:		DC 3.7V				
Test Mode:		Hopping N	Mode (GFSK DH5)		Allen	
Channel	Pu	Ise Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		2.960	315.73			

## **GFSK Hopping Mode DH5**

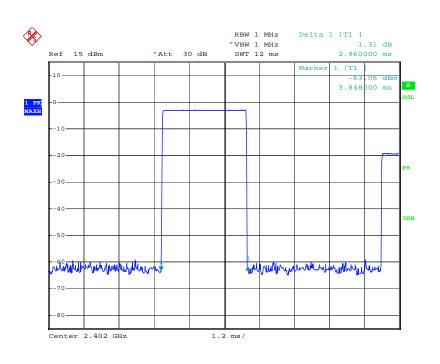
315.73

315.73

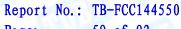
31.60

400

#### 2402 MHz

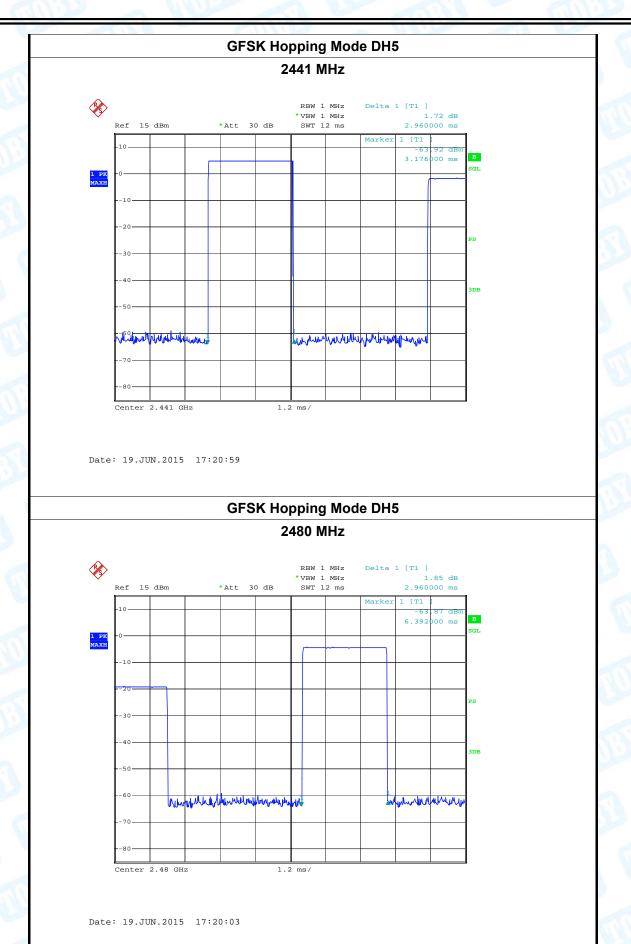


Date: 19.JUN.2015 17:22:14





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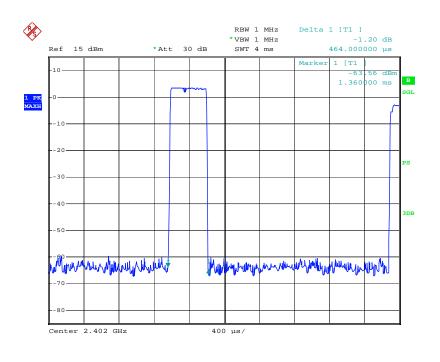
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EUT:	Bluetooth stereo headphone	Model Name :	SP1				
Temperature:	<b>25</b> ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Test Mode:	Hopping Mode (π/4-DQPSK DH1)						

rest wode.	1 lopping i				
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Popult
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	0.464	148.48			
2441	0.464	148.48	31.60	400	PASS
2480	0.464	148.48			

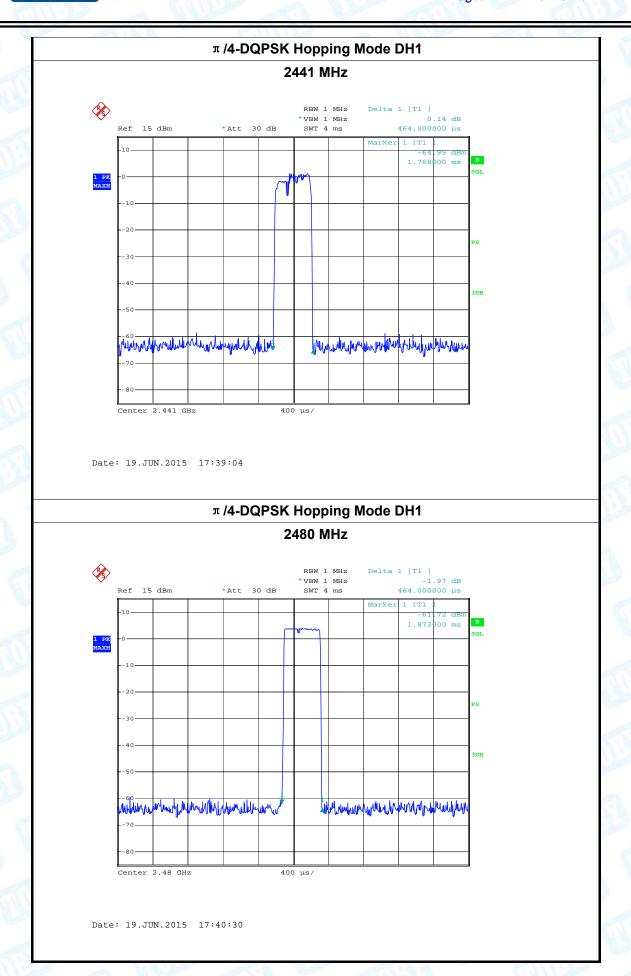
## $\pi$ /4-DQPSK Hopping Mode DH1

#### 2402 MHz



Date: 19.JUN.2015 17:38:18







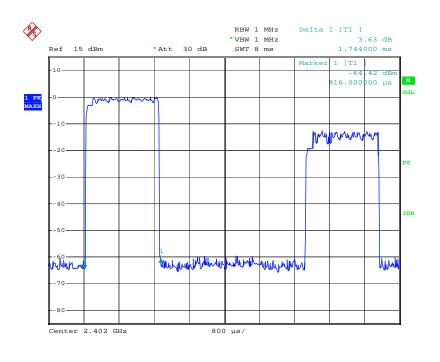
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EUT:	Bluetooth	stereo headphone	Model Name :	SP1			
Temperature:	25 ℃	25 °C Relative Humidity:					
Test Voltage:	DC 3.7V	DC 3.7V					
Test Mode: Hopping Mode ( π /4-DQPSK DH3)							
Channel	Pulse Time	Total of Dwell	Period Time	Limit			

rest mode.	i lopping i	node ( " / I Bar en			
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.744	279.04			
2441	1.744	279.04	31.60	400	PASS
2480	1.744	279.04			

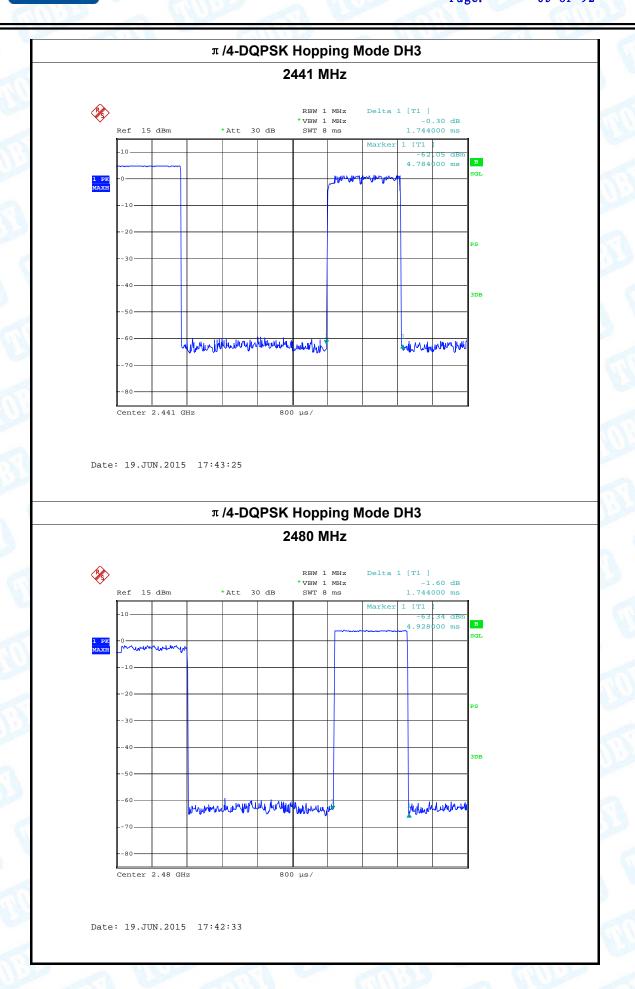
## $\pi$ /4-DQPSK Hopping Mode DH3

#### 2402 MHz



Date: 19.JUN.2015 17:47:09







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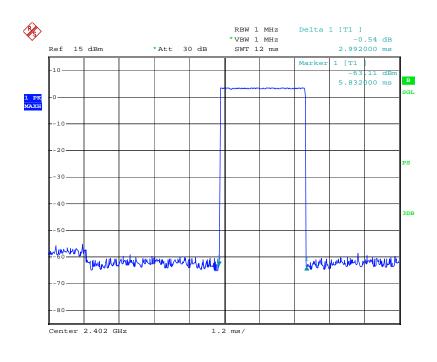
EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode:	Hopping Mode	( π /4-DQPSK DH5)
------------	--------------	-------------------

1000000		Tropping mean ( Tropping)			
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	2.992	319.15			
2441	2.992	319.15	31.60	400	PASS
2480	2.992	319.15			

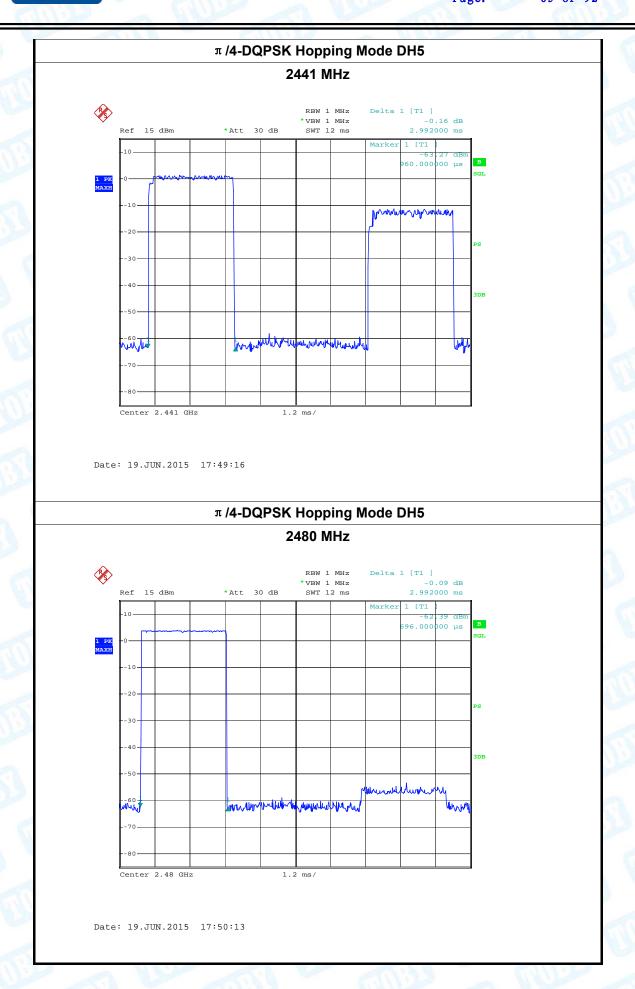
## $\pi$ /4-DQPSK Hopping Mode DH5

#### 2402 MHz



Date: 19.JUN.2015 17:48:26





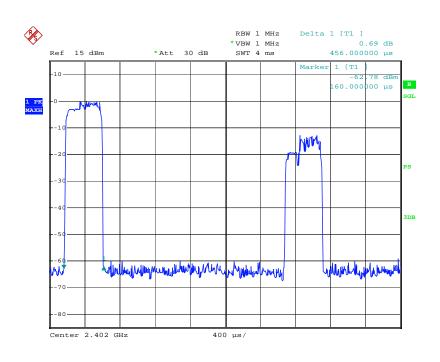


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EUT:		Bluetooth stereo headphone		Model Name :		SP1
Temperature	:	25 ℃		Relative Humidity:		55%
Test Voltage:		DC 3.7V				
Test Mode:		Hopping I	Mode (8-DPSK DH1	)	Riber	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		0.456	145.92			
2441		0.464	148.48	31.60	400	PASS
2480		0.472	151.04			

## 8-DPSK Hopping Mode DH1

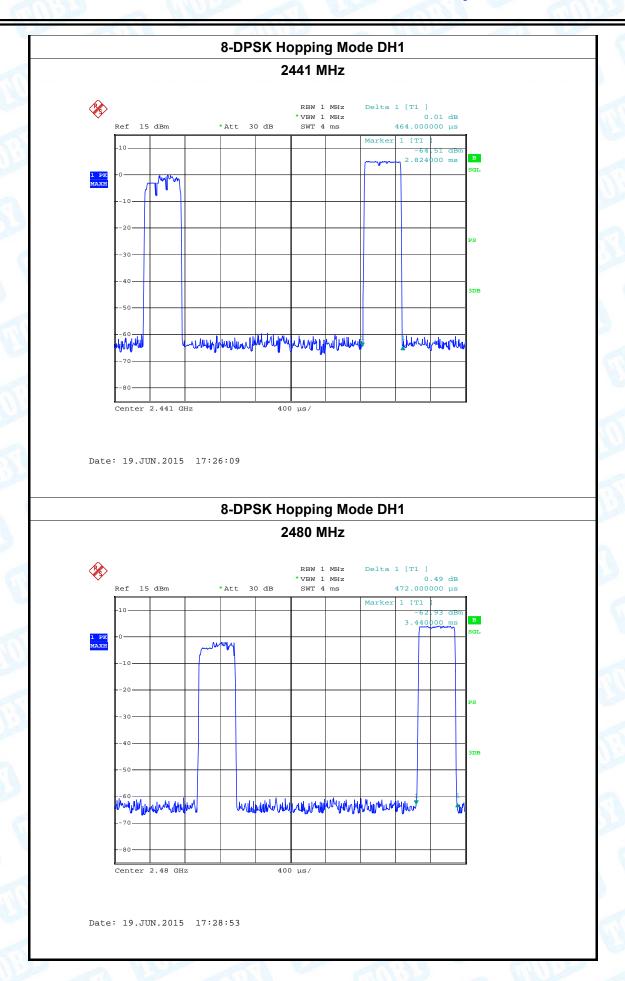
## 2402 MHz



Date: 19.JUN.2015 17:24:27







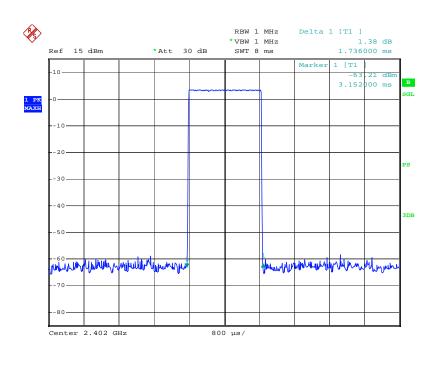


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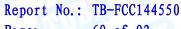
EUT:		Bluetooth stereo headphone		Model Name :		SP1
Temperature	:	25 ℃		Relative Humidity:		55%
Test Voltage:		DC 3.7V	DC 3.7V			3
Test Mode:		Hopping I	Mode (8-DPSK DH3	5)	Riber	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		1.736	277.76			
2441		1.720	275.20	31.60	400	PASS
2480		1.720	275.20			

## 8-DPSK Hopping Mode DH3

#### 2402 MHz

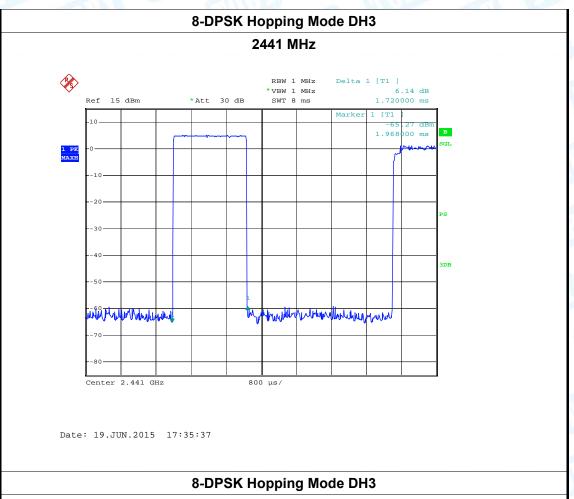


Date: 19.JUN.2015 17:36:40

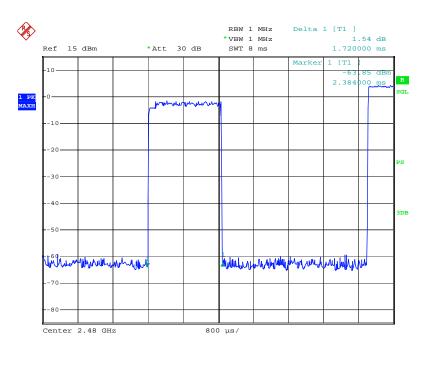




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## 2480 MHz



Date: 19.JUN.2015 17:34:30



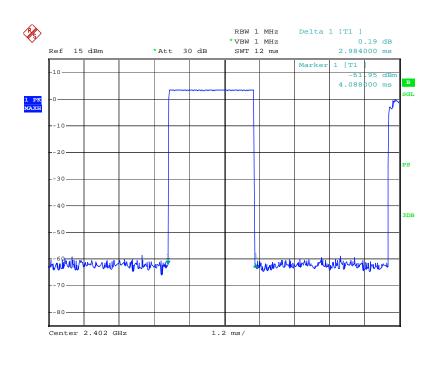
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EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	Honning Mode (8-DPSK DH5)		

iest Mode.	Tropping Mode (0-Dr 3K Dr 13)				100
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	2.984	318.29			
2441	2.984	318.29	31.60	400	PASS
2480	2.984	318.29			

## 8-DPSK Hopping Mode DH5

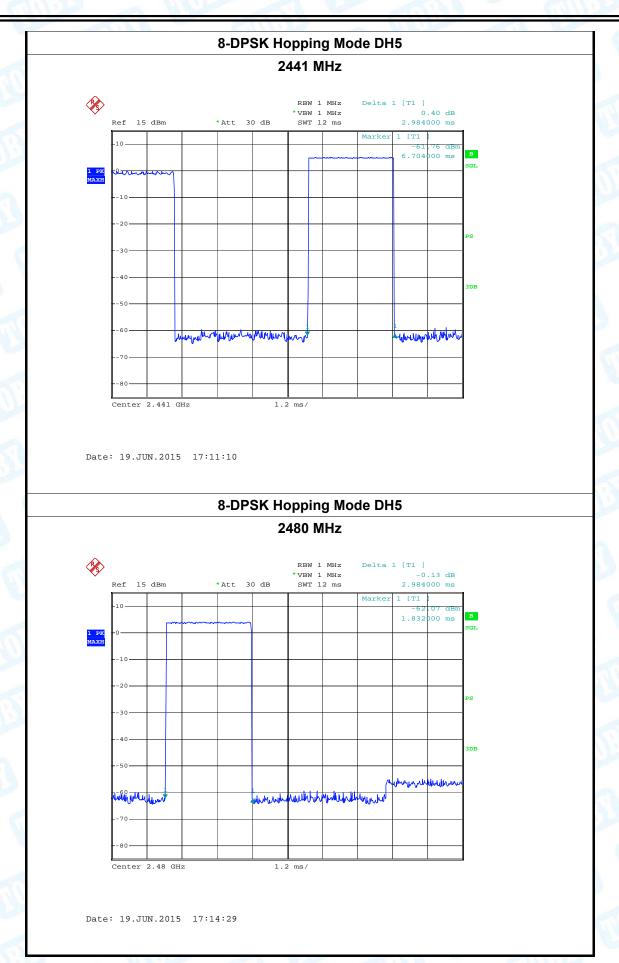
#### 2402 MHz



Date: 19.JUN.2015 17:09:48



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# 9. Channel Separation and Bandwidth Test

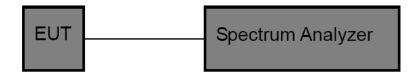
#### 9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247

9.1.2 Test Limit

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

## 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:

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.

## 9.4 EUT Operating Condition

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

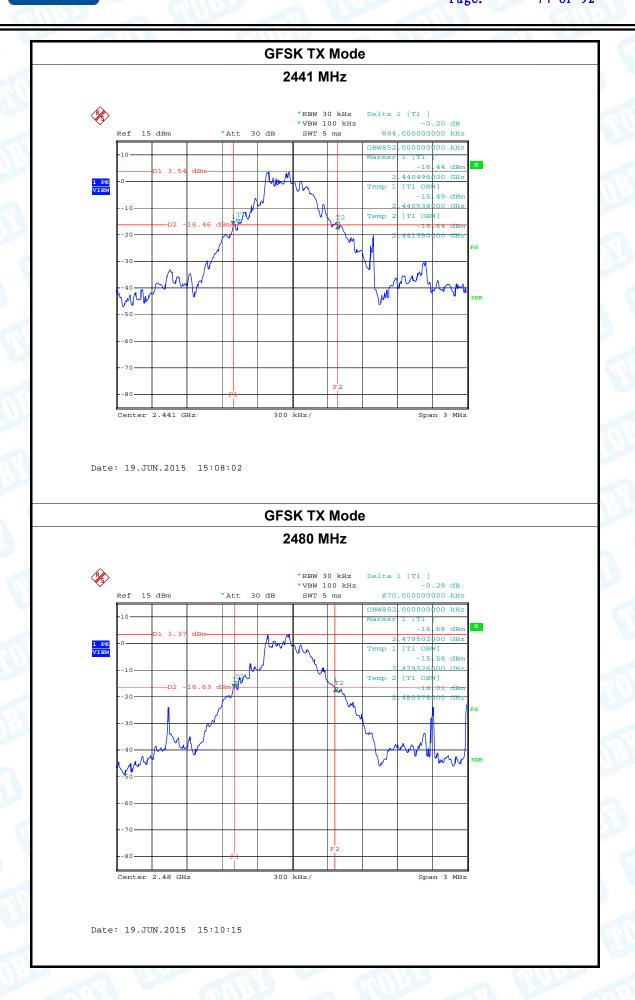


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## 9.5 Test Data

EUT:		Bluetooth stereo headphone		е	Model Name :			SP1	The same				
Temperatur	e:	25 ℃			Relative Humidity:		<b>'</b> :	55%					
Test Voltage	<b>)</b> :	DC 3.7V			WW.								
Test Mode:		TX N	/lode	(GFS	K)			CILI	12/2		1	W.	
Channel fre	quend	у	;	99% (	OBW		2	20dB E	Bandw	idth	20	dB Ba	andwid
(MHz	)			(kF	lz)			(	kHz)			*2/3	(kHz)
2402				846	.00			8	70.00				
2441				852	.00			8	94.00				
2480				852	.00			8	70.00				
					GFS	K TX	Мо	de					
					2	402 N	lHz						
						*RBW 3	U KH2	z Delta					
1 PK VIEW	Ref 15	D1 2.9	dBm————————————————————————————————————	*Att 3	0 dB	*RBW 3 *VBW 1 SWT 5	00 kI	Ηz	0.000000	0.02 dB 0000 kHz 0000 kHz 7.33 dBm 0000 GHz 8W] 5.22 dBm 8000 GHz	В		
1 PK VIEW	-10	01 2.9	iBm-	*Att 3	0 dB	*VBW 1	00 kI	87 OBW84 Marke	(0.00000) (6.00000) (7.1   TT   1T1   2.401520 1   [T1 oi   -1e 2.401532 2   [T1 oi   -1'   2.402381	0.02 dB 0000 kHz 0000 kHz 7.33 dBm 0000 GHz 8W] 5.22 dBm RNNO GHZ	]		







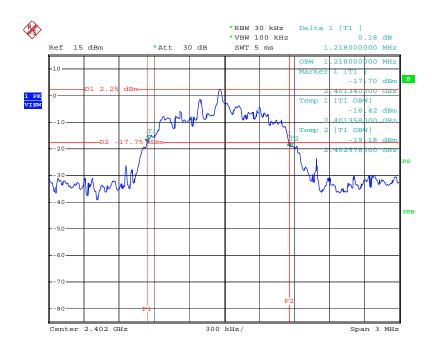
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EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		(A)
Test Mode:	TX Mode (π/4-DOPSK)		

Channel frequency	99% OBW	20dB Bandwidth	20dB
(MHz)	(kHz)	(kHz)	Bandwidth
			*2/3 (kHz)
2402	1218.00	1218.00	812.00
2441	1326.00	1266.00	844.00
2480	1230.00	1224.00	816.00

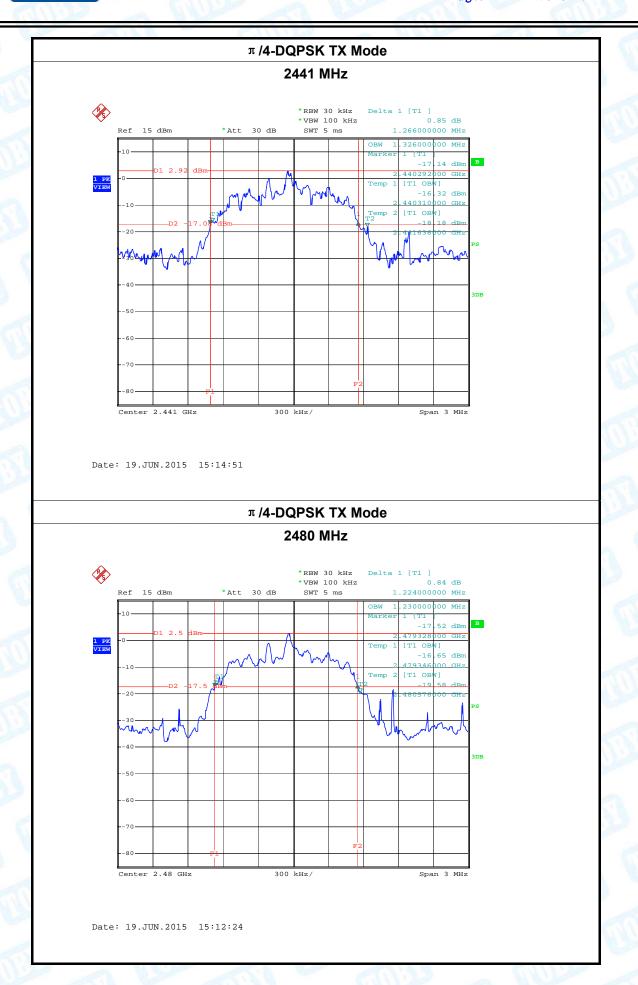
#### π/4-DQPSK TX Mode

#### 2402 MHz



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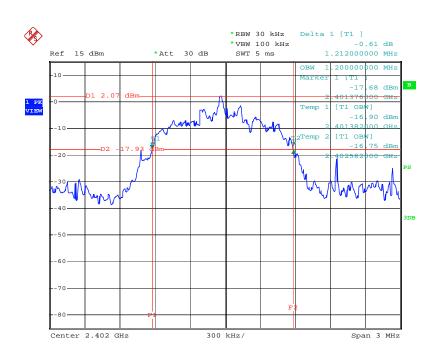


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EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		18
Test Mode:	TX Mode (8-DPSK)		

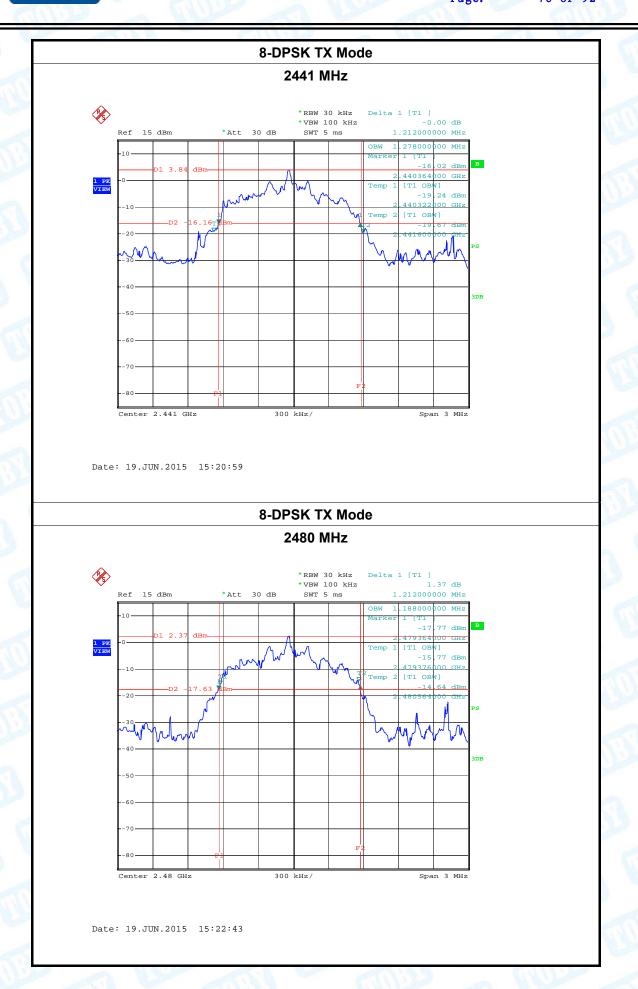
111111111111111111111111111111111111111			
Channel frequency	99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	1200.00	1212.00	808.00
2441	1278.00	1212.00	808.00
2480	1188.00	1212.00	808.00

### 8-DPSK TX Mode 2402 MHz



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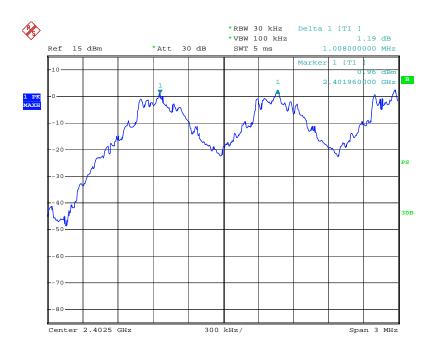
EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	6.011175	A VIVI

Test Mode: Hopping Mode (GFSK)

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1008.00	870.00
2441	1008.00	894.00
2480	1008.00	870.00

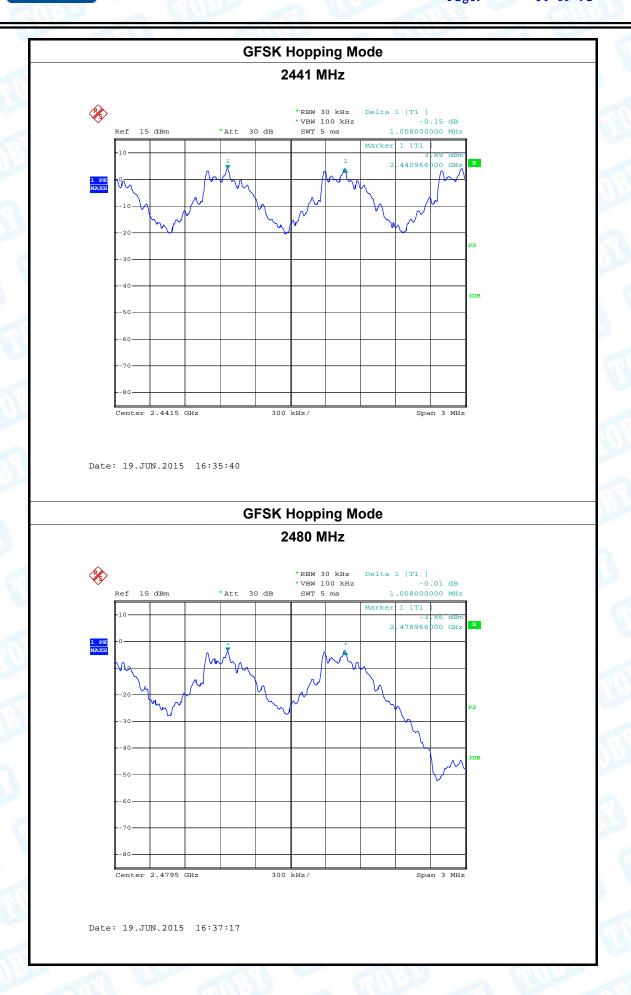
### **GFSK Hopping Mode**

### 2402 MHz



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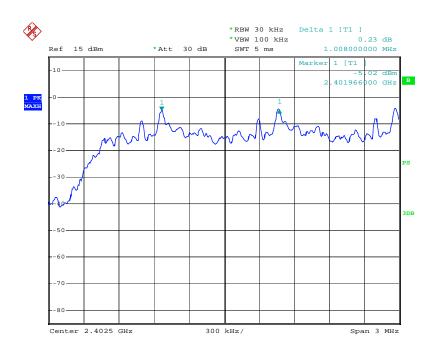
EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	1	33

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

171 3		
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1008.00	812.00
2441	1008.00	844.00
2480	1008.00	816.00

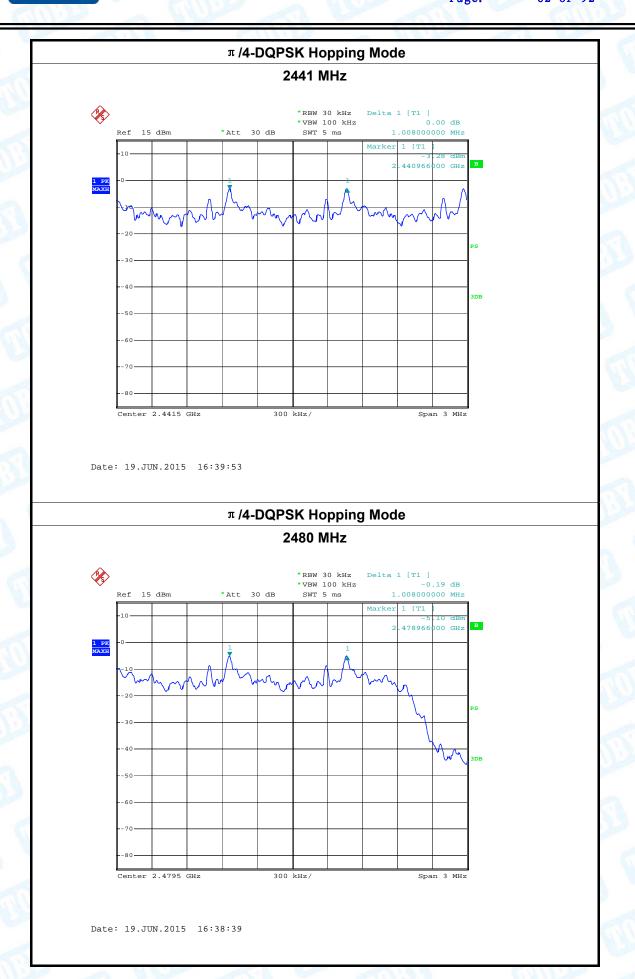
### $\pi$ /4-DQPSK Hopping Mode

#### 2402 MHz



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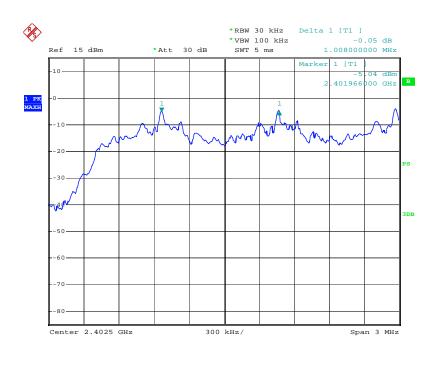
EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		18

Test Mode: Hopping Mode (8-DPSK)

Channel francisco	Concretion Dood Value	Compandian Limit
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1008.00	808.00
2441	1008.00	808.00
2480	1008.00	808.00

### 8-DPSK Hopping Mode

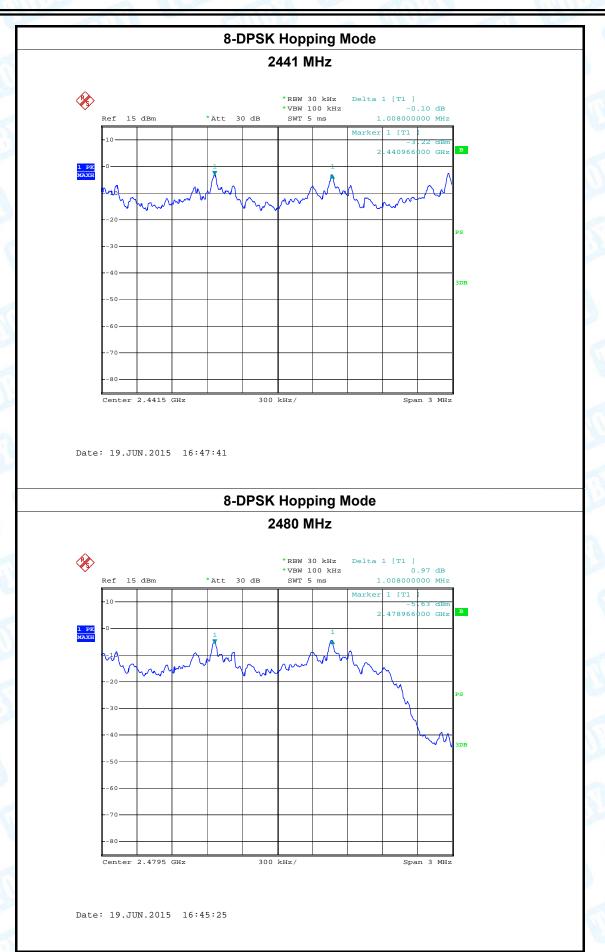
#### 2402 MHz



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## 10. Peak Output Power Test

### 10.1 Test Standard and Limit

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

10.1.2 Test Limit

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

## 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:

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

## 10.4 EUT Operating Condition

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



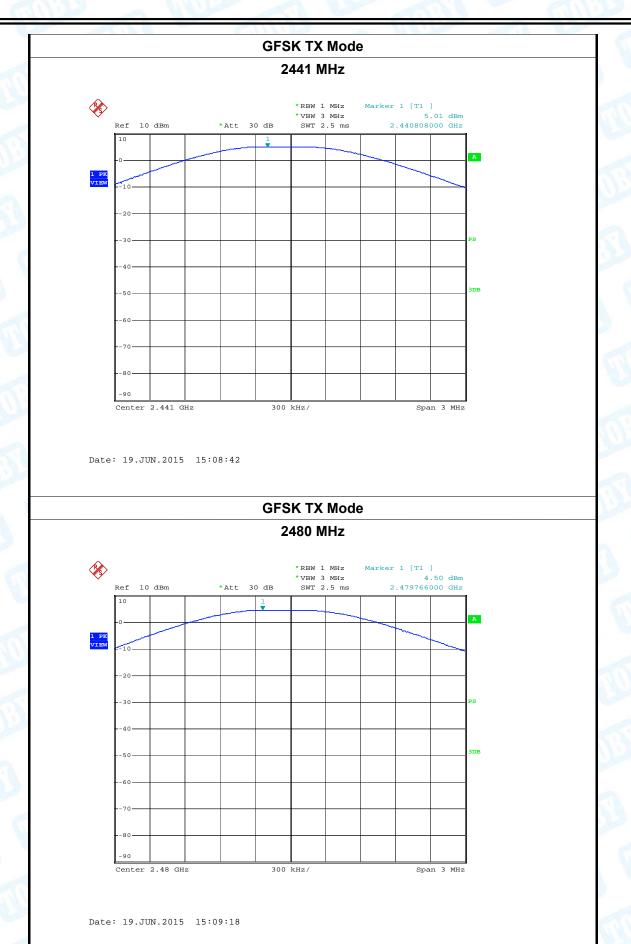
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# 10.5 Test Data

UT:		Bluetooth stereo head 25 °C			dphor	е	Model Name :			SP1				
emperature	<b>)</b> :				11/1	Relative Humidity:		<b>/</b> :	55%	4				
est Voltage	:	DC 3	3.7V	10	1	100		6	11		1		. \	10
est Mode:		TX N	/lode	(GFS	K)	1		W		0				
hannel fre	quen	су (М	Hz)		Test	Resul	t (di	3m)			L	_im	it (dl	3m)
2	402					3.70	)							
2	441					5.01							30	
2480					4.50	)				-				
				1	GFS	SK TX	Мо	de						
					2	2402 N	lHz							
<b>P</b> S						*RBW 1		Маз	rker	1 [T1 3	] .70 dBm			
	Ref 10	dBm		*Att 3	30 dB	SWT 2	.5 ms		2.	402132	000 GHz			
	10					1						1		
	10					1 ▼						A		
						1						A		
1 PK VIEW						1						A		
						1						A		
	-0					1						A PS		
	-20					1								
	-2030					1 ¥								
						1						- PS		
	-30					1						- PS		
						1 V						- PS		
						1						- PS		
1 PK VIEW		2.402 GE				1 V					an 3 MH	- PS		









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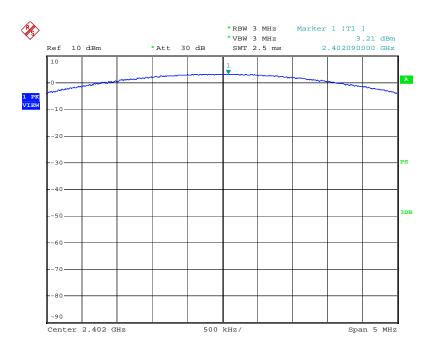
EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		3.9
	TV M. J. / /A DODOM	1.3 L. A. M. A. A.	

Test Mode:	Mode (π	t /4-DQPSK)
------------	---------	-------------

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.21	
2441	4.60	21
2480	3.73	

#### π/4-DQPSK TX Mode

#### 2402 MHz

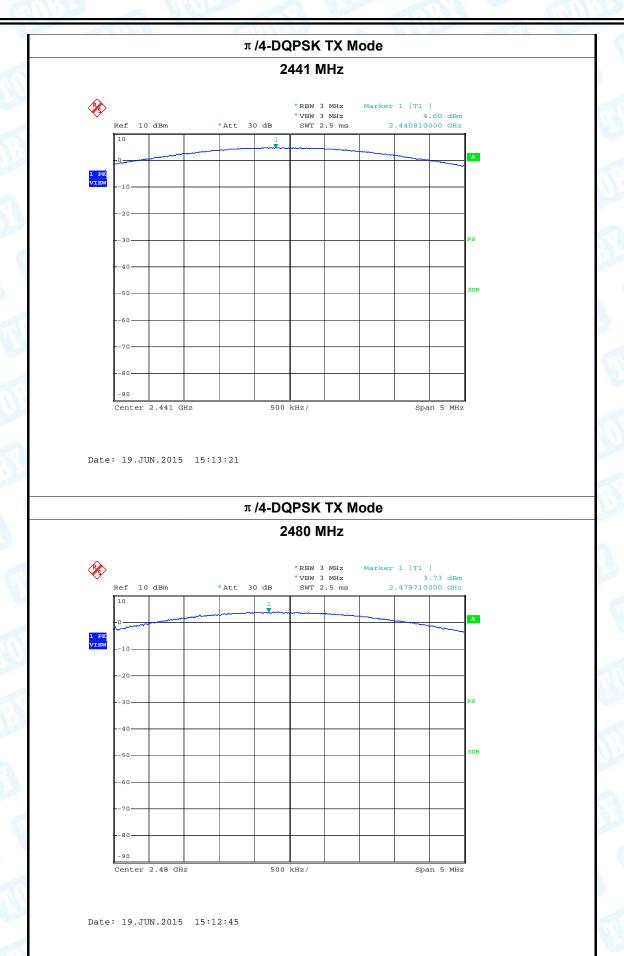


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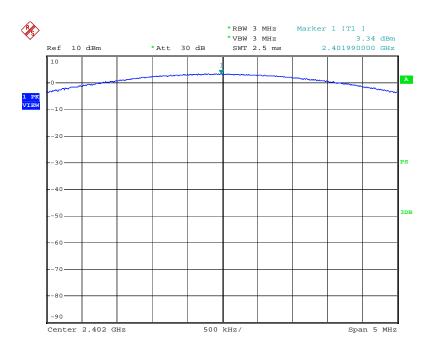
EUT:	Bluetooth stereo headphone	Model Name :	SP1
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		.73

Test Mode: TX Mode (8-DPSK)

	(* = : • : -)		
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)	
2402	3.34		
2441	4.70	21	
2480	3.97		

#### 8-DPSK TX Mode

#### 2402 MHz



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8-DPSK TX Mode 2441 MHz \*RBW 3 MHz Marker 1 [T1 ] \*VBW 3 MHz SWT 2.5 ms 4.70 dBm 2.440910000 GHz Ref 10 dBm \*Att 30 dB Center 2.441 GHz 500 kHz/ Span 5 MHz Date: 19.JUN.2015 15:21:16 8-DPSK TX Mode 2480 MHz Marker 1 [T1 ] 3.97 dBm 2.479820000 GHz \*RBW 3 MHz \*VBW 3 MHz SWT 2.5 ms \*Att 30 dB Ref 10 dBm Center 2.48 GHz 500 kHz/ Date: 19.JUN.2015 15:21:46



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# 11. Antenna Requirement

### 10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

### 10.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### 10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 1.0 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

#### Result

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

	Antenna Type
E EUR	▶ Permanent attached antenna
	□ Unique connector antenna
1	□ Professional installation antenna