

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC145905 1 of 89 Page:

FCC Radio Test Report FCC ID: 2AGGTV4B1512

Original Grant

TB-FCC145905 Report No.

Applicant Austin-Whitman Mfg. Group LLC

Equipment Under Test (EUT)

EUT Name Bluetooth Subwoofer(Speaker Box)

CS-P80A150V4BT4 Model No.

Series Model No. CS-P80A150V4BT4-HB, CS-P80A150V4BT4-HC,

CS-P80A150V4BT5, CS-P80A150V4BT6

Brand Name SPA BULLET

2015-11-02 **Receipt Date**

2015-11-03 to 2015-11-12 **Test Date**

Issue Date 2015-11-13

FCC Part 15: 2015, Subpart C(15.247) **Standards**

ANSI C63.10: 2013 **Test Method**

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

Tel: +86 75526509301



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1. General Information about EUT

1.1 Client Information

Applicant: Austin-Whitman Mfg. Group LLC

Address : 508 Performance Rd. Mooresville, NC 28115

Manufacturer : Tongxiang Welldragon Co., Ltd.

Address: No.9 East Park Road, Tudian, Tongxiang, Zhejiang, China P.C.

1.2 General Description of EUT (Equipment Under Test)

EUT Name	1	Bluetooth Subwoofer(Spea	ker Box)			
Models No.		CS-P80A150V4BT4, CS-P80A150V4BT4-HB, CS-P80A150V4BT4-HC CS-P80A150V4BT5, CS-P80A150V4BT6				
Model Difference	:		All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.			
		Operation Frequency: Bluetooth 4.0:2402~2480M	Operation Frequency: Bluetooth 4.0:2402~2480MHz			
		Number of Channel:	Bluetooth:79 Channels see Note 3			
Product Description	I Max Peak Output Powe	Max Peak Output Power:	Bluetooth: 9.668 dBm(8-DPSK)			
Description		Antenna Gain:	0 dBi PCB Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps) π /4-DQPSK(2 Mbps) 8-DPSK(3 Mbps)			
Power Supply		DC power by DC Battery.				
Power Rating	:	DC 12V DC Battery.				
Connecting I/O Port(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) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(3) Channel List:

Bluetooth Channel List							
Channel	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		



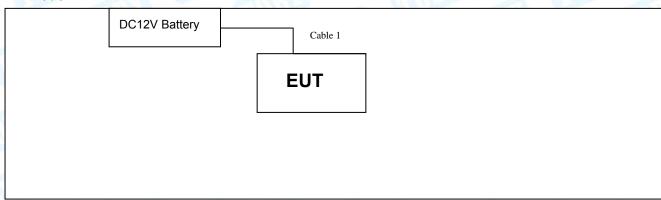
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04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	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		60
26	2428	53	2455	W. Commercial Commerci	A WS

(4) 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 "√"							
12V DC Battery	FM1212		10	V			
	Cable Information						
Number Shielded Type Ferrite Core Length Note							
Cable 1	NO	NO	0.2m	6,000			

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	Final Test Mode Description						
N/A	N/A	(11) DE					

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

Note:

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

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:



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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.

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		CSR BlueSuite 2.5.0	
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})	
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 report were 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.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.



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2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1						
Standard Section		T	1 1			
FCC	IC	Test Item	Judgment	Remark		
15.203		Antenna Requirement	PASS	N/A		
15.207	RSS-GEN 7.2.2	Conducted Emission	N/A	(1)		
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:835.2684kHz π/4-DQPSK: 1157.60kHz 8-DPSK: 1189.20kHz		

Note: (1) The EUT is powered by DC battery, no requirement for this test item. N/A is an abbreviation for Not Applicable.



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3. Test Equipment

Conducted Emission Test							
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date		
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016		
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Aug. 07, 2015	Aug. 06, 2016		
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016		
LISN	Rohde & Schwarz	ENV216	101131	Aug. 07, 2015	Aug. 06, 2016		
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date		
	Manufacturer	Model No.	Serial No.	Last Cal.			
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 29, 2015	Aug. 28, 2016		
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016		
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 28, 2015	Mar. 27, 2016		
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 28, 2015	Mar. 27, 2016		
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 28, 2015	Mar. 27, 2016		
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 28, 2015	Mar. 27, 2016		
Pre-amplifier	Sonoma	310N	185903	Mar. 28, 2015	Mar. 27, 2016		
Pre-amplifier	HP	8447B	3008A00849	Mar. 28, 2015	Mar. 27, 2016		
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 28, 2015	Mar. 27, 2016		
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A		



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4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

4.1.2 Test Limit

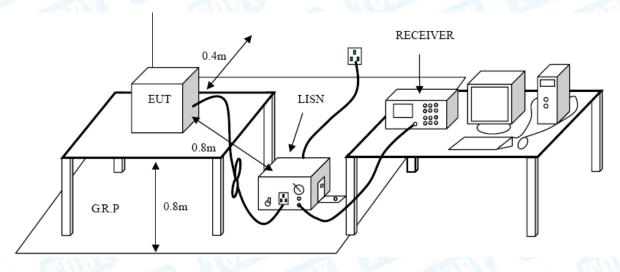
Conducted Emission Test Limit

Eroguanov	Maximum RF Line Voltage (dBμV)			
Frequency	Quasi-peak Level	Average Leve		
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

The EUT is powered by DC battery, no requirement for this test item.



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5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 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	Class B (dBuV/m)(at 3m)				
(MHz)	Peak	Average			
Above 1000	74	54			

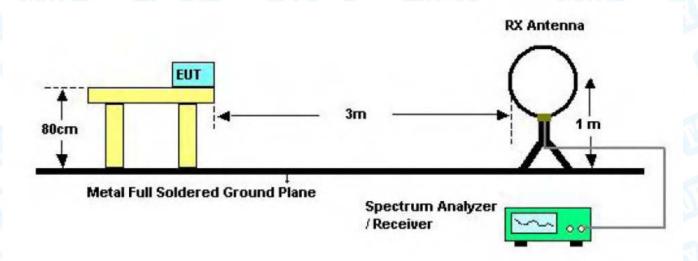
Note:

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

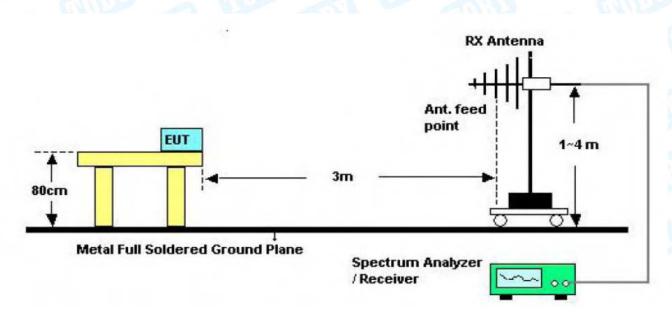


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5.2 Test Setup

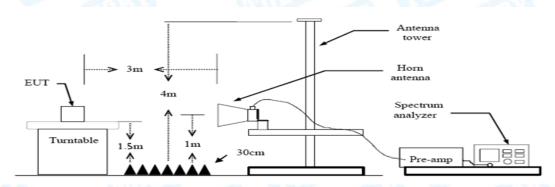


Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup





Above 1GHz 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 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 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 Kz with Peak Detector for Average Values.

Test data please refer the following pages.



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EUT:	7 BATE	th Subwoofe	er	Model Nam	e :	CS-P80A	150V4BT4
	(Speake	er Box)				====	THIN
Temperature:	25 ℃	HALL		Relative Hu	imidity:	55%	
Test Voltage:	DC 12		OUT I		1 80		
Ant. Pol.	Horizo				3	T DI	1111
Test Mode:		SK Mode 2		Line		7 0	
Remark:	Only w	vorse case	is reported		MAIN		
80.0 dBuV/m							
-20 30.000 40 50	60 70	80	3 (MHz)	300	(RF)FCC 15	C 3M Radiation Margin 6 S W	
		Reading	Correct	Measure-			
No. Mk. F	req.	Level	Factor	m ent	Limit	O∨er	
M	IHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1 43.3	3534	53.59	-21.58	32.01	40.00	-7.99	peak
2 74.3	3954	56.44	-23.46	32.98	40.00	-7.02	peak
3 149.	4857	57.14	-21.22	35.92	43.50	-7.58	peak
4 372.	0045	53.44	-14.48	38.96	46.00	-7.04	peak
5 * 446.	4141	53.72	-12.53	41.19	46.00	-4.81	peak
6 ! 750.	1082	47.92	-7.08	40.84	46.00	-5.16	peak
*:Maximum data x:		!:over margin	ect Factor				



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EUT:	Bluetoot	h Subwoofer	2 61	Model Name	٠ .	CS-P80A1	150V4RT4
	(Speake	r Box)		Wiodel Halli	·	00-1 00A	100 1 7 1 1 1
Temperature:	25 ℃	Um		Relative Hu	midity:	55%	
Test Voltage:	DC 12\	1	THE STATE OF		N. W.		
Ant. Pol.	Vertica						117
Test Mode:	TX GF	SK Mode 24	02MHz	The same		il c	
Remark:	Only w	orse case is	reported		BHIT.		
80.0 dBuV/m							
					(DE)Ecc 15	iC 3M Radiation	
					(REJECC 1:	Margin -6	
					5 6 X X	.	
30 ************************************	×		, M.		Milli	, M	k .
30 Milliand Anna Hally Market	YLDAMADAMAY	What will be	ANAMA PARKAPATURI		Mr M	MMINI	al Walk
	1 1	, M.J. M.	, ,,,,,,,	h. Marah	-	WL 44	
20							
30.000 40 50	60 70	80	(MHz)	300	400 50	0 600 700	1000.000
		Reading	Correct	Measure-			
No. Mk. F	Freq.	Level	Factor	ment	Limit	O∨er	
1	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 I 20	.4371	55.82	-19.81			-3.99	peak
1 : 39.	.7371	33.62	-13.01	36.01	40.00	-3.99	peak
	.6615	60.14	-24.42	36.01 35.72	40.00	-4.28	
2 ! 51.						-4.28	peak
2 ! 51. 3 ! 70.	.6615	60.14	-24.42	35.72	40.00	-4.28	peak peak
2 ! 51. 3 ! 70. 4 149	.6615 .8315	60.14 58.65	-24.42 -23.59	35.72 35.06	40.00 40.00	-4.28 -4.94	peak peak peak
2 ! 51. 3 ! 70. 4 149 5 ! 372	.6615 .8315 0.4857	60.14 58.65 57.27	-24.42 -23.59 -21.22	35.72 35.06 36.05	40.00 40.00 43.50	-4.28 -4.94 -7.45 -3.79	peak peak peak peak peak



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Bluetooth Subwoofer (Speaker Box) Model Name:		er	Model Nam	e :	CS-P80A1	50V4BT		
25 °C			Relative Hu	ımidity:	55%			
		6711			0070			
Horizo	ontal		100	\ <u> </u>	. (1)			
ТХ л	/4-DQPSK	Mode 2402	2MHz					
Only	worse case	is reported		MAR		1		
hillion was a second	Towns of the state	1 (MHz)	300	5 M	Margin -6			
60 70	80	()	300	400 3	600 600 700	1000.00		
60 70				400 5	600 600 700	1000.00		
60 70 req.	Reading Level	Correct Factor	Measure- ment	Limit	Over	1000.00		
	Reading	Correct	Measure-		Over			
req.	Reading Level	Correct Factor	Measure- ment	Limit	Over	Detector peak		
req. 1Hz	Reading Level	Correct Factor	Measure- ment dBuV/m	Limit dBuV/m	Over	Detecto		
req. 1Hz 2786	Reading Level dBuV 57.34	Correct Factor dB/m -20.89	Measure- ment dBuV/m 36.45	Limit dBuV/m 43.50	O∨er dB -7.05	Detector peal		
req. 1Hz 2786 9500	Reading Level dBuV 57.34 55.44	Correct Factor dB/m -20.89 -19.40	Measure- ment dBuV/m 36.45 36.04	Limit dBuV/m 43.50 46.00	Over dB -7.05 -9.96	Detector peal		
req. 1Hz 2786 9500 1886	Reading Level dBuV 57.34 55.44 51.52	Correct Factor dB/m -20.89 -19.40 -16.25	Measure- ment dBuV/m 36.45 36.04 35.27	Limit dBuV/m 43.50 46.00 46.00	Over dB -7.05 -9.96 -10.73	Detector peal peal peal		
	DC 12 Horizo	DC 12V Horizontal TX π/4-DQPSK	DC 12V Horizontal	DC 12V Horizontal TX π/4-DQPSK Mode 2402MHz Only worse case is reported	DC 12V Horizontal TX π/4-DQPSK Mode 2402MHz Only worse case is reported (RF)FCC 1	DC 12V Horizontal TX π/4-DQPSK Mode 2402MHz Only worse case is reported (RF)FCC 15C 3M Radiation Margin -6		



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EUT:	Bluetooth Subwoofe (Speaker Box)	er N	lodel Name :	CS	S-P80A15	0V4BT4			
Temperature:	25 ℃	F	Relative Humidit	y: 55	5%				
Test Voltage:	DC 12V	COLUE TO SERVICE	D _	N/V					
Ant. Pol.	Vertical	Vertical Vertical							
Test Mode:	TX π/4-DQPSK	X π/4-DQPSK Mode 2402MHz							
Remark:	Only worse case	Only worse case is reported							
80.0 dBuV/m									
-20 30.000 40 50	50 70 80	4 ////////////////////////////////////	5 × × × × × × × × × × × × × × × × × × ×		3M Radiation Margin -6				
No Billo II	Reading	Correct	Measure-	mit	Over				
	req. Level	Factor	- III GITE			Datastas			
	1Hz dBuV	dB/m		Bu∨/m	dB	Detector			
	4371 55.32	-19.81		0.00	-4.49	peak			
	60.14	-24.42	35.72 4	0.00	-4.28	peak			
3 ! 77.0	0503 59.40	-23.38	36.02 4	0.00	-3.98	peak			
4 149.	4857 56.27	-21.22	35.05 4	3.50	-8.45	peak			
5 272.	2776 55.04	-17.63	37.41 4	6.00	-8.59	peak			
6 * 372.	.0045 56.69	-14.48	42.21 4	6.00	-3.79	peak			
	Over limit !:over margin	rect Factor							



Page: 20 of 89

emperatu est Voltaç .nt. Pol. est Mode emark:	je:	25 °C DC 12 Horizo	2V		Relative Hu	midity:	55%			
est Voltag int. Pol. est Mode emark:	je:	DC 12	2V	<u>WILL</u>	Relative nu	midity:	55%			
nt. Pol. est Mode emark:		Horizo		DALL.						
est Mode emark:	1		ontai							
emark:		1 1 ^ ^-	TX 8-DPSK Mode 2402 MHz							
					2					
80.0 dBuV/m		Offig	worse case	is reported		REFER		1		
						(DE)ECC 15	C 3M Radiation			
						(Hr)rcc 13	Margin -6	dB Г		
						3 4 5 X X X	6			
	1			2	ha l	MINI	jul Pri			
30	Marilla J	MANA MAYAY	h	WHAT HAME I		/ \\\ \\\ \\	J.M. [W. L	A. March		
	Mariabh	True Marcini	**************************************	Note that the state of the stat	*** /(, Mo.	MUN WIN	, M.A.		
			II. ANAMATIN		Marchy .					
			- his							
20										
30.000 4	0 50	60 70	80	(MHz)	300	400 500	0 600 700	1000.000		
			Reading	Correct	Measure-					
No. MI	۲. Fr	req.	Level	Factor	m ent	Limit	Over			
	М	Hz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector		
1	43.5	056	54.68	-21.64	33.04	40.00	-6.96	peak		
2	154.3	2786	56.34	-20.89	35.45	43.50	-8.05	peak		
3 *	372.0	0045	56.44	-14.48	41.96	46.00	-4.04	peak		
4 !	446.	4141	53.22	-12.53	40.69	46.00	-5.31	peak		
	520.	8881	50.17	-10.40	39.77	46.00	-6.23	peak		
5					40.24	46.00	-5.66	n o o le		
5 6 !	750.	1082	47.42	-7.08	40.34	40.00	-5.00	peak		



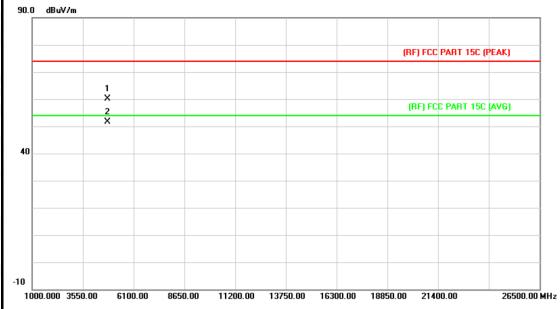
Page: 21 of 89

UT:						woofe	3 8	Model	Nam	e:	(CS-P8	80A1	50V4BT
omno	rotur	<u> </u>	25 °	aker	BOX)			Relativ	,, U.,	midity		55%		
empe			DC		- 10	N. As	T. T.	Relativ	/e пu	muity	. (00%		
est Vo).					DHI.			1 10			1	
ant. Po			Vert		OCK	Mada	04000411-		13					
est M							2402MHz							
Remar			Only	y wo	rse	case	is reported	1	<u> </u>	MIN				1
80.0 dB	uV/m													
										(RF)FC	C 15C	3M Rad	liation gin -6	
					Ţ					ь		1700		
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30	HAND THAN	wall f				Aug. 1	MARKET	14/1				JJ (V	ALL
		arla, A	YI	٠ ۱۱/۱	$V_{ar{m{y}}}$		AL JANA	Aller Physical	YU PYYYY		MUN	M.M	, ,	Marka
						יוףו								
20														
30.000	40	50	60 7	70 80			(MHz)		300	400	500	600	700	1000.00
30.000	40	50	60 7		ead	lina		Measi		400	500	600	700	1000.00
	40 Mk.		60 7 eq.	R	ead Lev	ling el	(MHz) Correct Factor	Measu mer	ure-	400 Limit		600 Ove		1000.00
			eq.	R		el	Correct		ure- nt				er	1000.00
		Fr	eq . ⊣z	R	Lev	el V	Correct Factor	mer	ure- nt	Limit	'm	Ove	er	
	Mk.	Fr Mi	eq. ⊣z 371	R	Le∨ dBu	el ∨ 32	Correct Factor	mer dBuV	ure- nt //m 51	Limit dBuV	′m 10	Ove	er 19	Detecto peak
No.	Mk.	Fr Mi 39.4	eq. 371 052	R	dBu 55 .3	el v 32 08	Correct Factor dB/m -19.81	mer dBuV 35 .5	ure- nt 7/m 51	Limit dBuV	/m 100	O∨e dB -4.4	er 19	Detecto
No. 1 2	Mk.	Fr MH 39.4 53.5	eq. 371 052 325	R	dBu 55.3	el v 32 08	Correct Factor dB/m -19.81 -24.44	35.5 36.6	ure- nt 51 54	Limit dBu V 40.0	/m 10 10	Ove dB -4.4 -3.3	er 19 36	Detecto peak peak
No. 1 2 3	Mk. ! * !	Fr 39.4 53.5 59.2	eq. 371 052 325 502	R	Lev dBu 55.3 61.0 58.9	el v 32 08	Correct Factor dB/m -19.81 -24.44 -24.51	mer dBuV 35.5 36.6 34.4 35.5	ure- nt 51 54 14	Limit dBuV 40.0 40.0	'm 100 100 100	Ove dB -4.4 -3.3	ir 19 36 56	Detecto peak peak peak
No. 1 2 3 4	Mk. ! * !	Fr 39.4 53.5 59.2 77.0	eq. 371 052 325 502 4857	R	dBu 55.3 61.0 58.9 58.9	el v 32 08 95	Correct Factor dB/m -19.81 -24.44 -24.51 -23.38	mer dBuV 35.5 36.6 34.4 35.5	ure- nt 51 54 44 52	Limit dBu V. 40.0 40.0 40.0 40.0	/m 100 100 100 100	Ove -4.4 -3.3 -5.5 -4.4	19 36 56 48	Detecto peak peak peak peak



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 12V							
Ant. Pol.	Horizontal							
Test Mode:	TX GFSK Mode 2402MHz	A VIII						
Remark:	No report for the emission prescribed limit.	which more than 10 dE	3 below the					

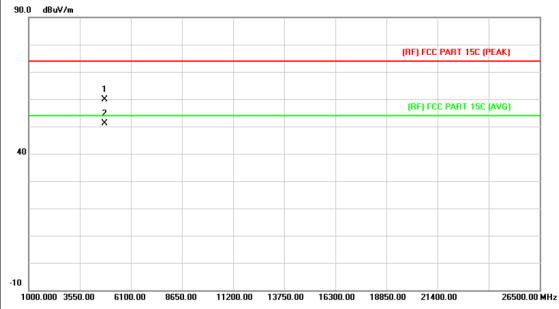


No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.733	46.61	13.44	60.05	74.00	-13.95	peak
2	*	4803.733	38.31	13.44	51.75	54.00	-2.25	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 12V							
Ant. Pol.	Vertical							
Test Mode:	TX GFSK Mode 2402MHz	a Vision						
Remark:	No report for the emission prescribed limit.	which more than 10 dE	3 below the					

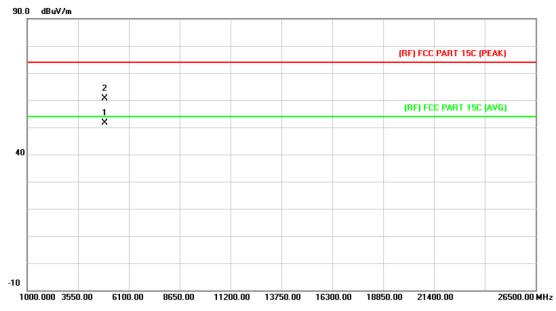


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.562	46.49	13.44	59.93	74.00	-14.07	peak
2	*	4803.748	37.69	13.44	51.13	54.00	-2.87	AVG



Page: 24 of 89

EUT:	Bluetooth Subwoofer (Speaker Box) Model Name :		CS-P80A150V4BT4		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage: DC 12V					
Ant. Pol.	Horizontal				
Test Mode:	TX GFSK Mode 2441MHz	J. KILL			
Remark: No report for the emission which more than 10 dB below the prescribed limit.					

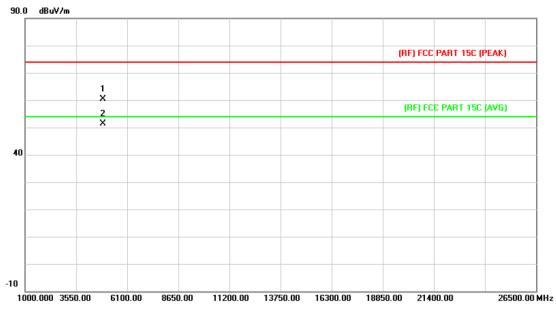


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.879	37.69	13.90	51.59	54.00	-2.41	AVG
2		4881.965	46.81	13.90	60.71	74.00	-13.29	peak



Page: 25 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:					
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2441MH:	Z	51		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

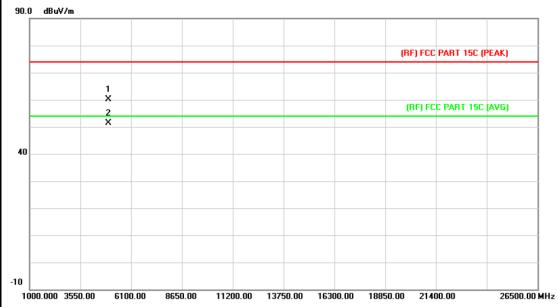


No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.597	46.44	13.90	60.34	74.00	-13.66	peak
2	*	4881.849	37.47	13.90	51.37	54.00	-2.63	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	U STATE OF THE STA				
Ant. Pol.	Horizontal				
Test Mode:	TX GFSK Mode 2480MHz	A VIV			
Remark: No report for the emission which more than 10 dB below the prescribed limit.					

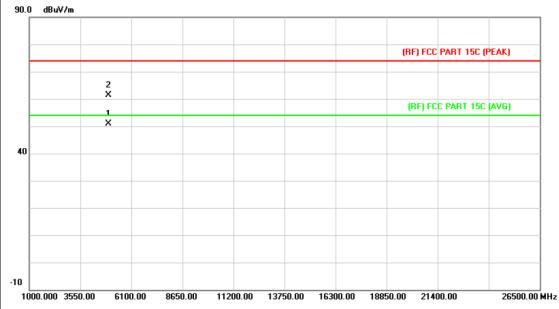


No	o. Mk.	Freq.	Reading Level		Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.674	45.76	14.36	60.12	74.00	-13.88	peak
2	*	4959.874	37.05	14.36	51.41	54.00	-2.59	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage: DC 12V					
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2480MHz	The same of the sa			
Remark: No report for the emission which more than 10 dB below the prescribed limit.					

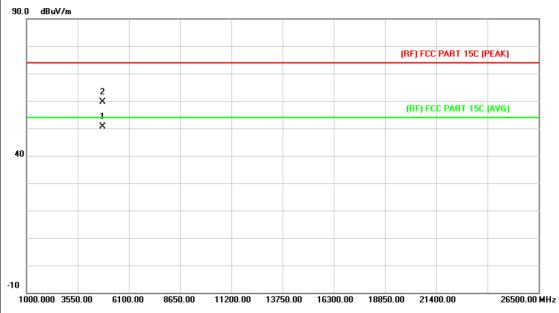


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.714	36.62	14.36	50.98	54.00	-3.02	AVG
2		4959.841	46.95	14.36	61.31	74.00	-12.69	peak



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4		
Temperature:	25 °C Relative Humidity:		55%		
Test Voltage:	DC 12V				
Ant. Pol.	Horizontal	THE STATE OF THE S			
Test Mode:	TX 8-DPSK Mode 2402M	Hz			
Remark: No report for the emission which more than 10 dB below the prescribed limit.					

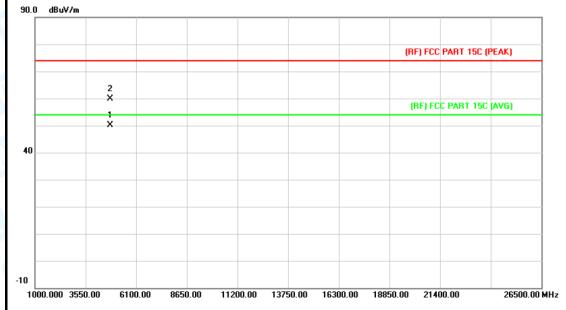


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.648	37.09	13.44	50.53	54.00	-3.47	AVG
2		4803.677	46.24	13.44	59.68	74.00	-14.32	peak



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EUT:	Bluetooth Subwoofer (Speaker Box) Model Name :		CS-P80A150V4BT4			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2402MI	Hz	31			
Remark: No report for the emission which more than 10 dB below the prescribed limit.						

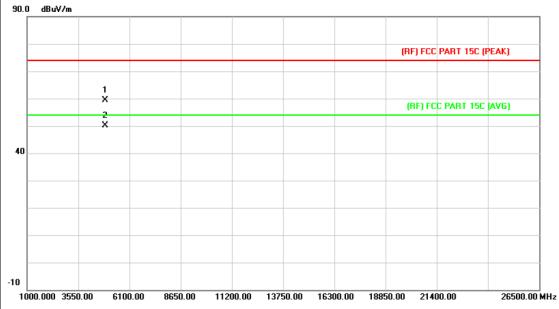


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.614	36.77	13.44	50.21	54.00	-3.79	AVG
2		4803.984	46.35	13.44	59.79	74.00	-14.21	peak



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EUT:	Bluetooth Subwoofer (Speaker Box) Model Name :		CS-P80A150V4BT4			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2441MI	-lz				
Remark: No report for the emission which more than 10 dB below the prescribed limit.						

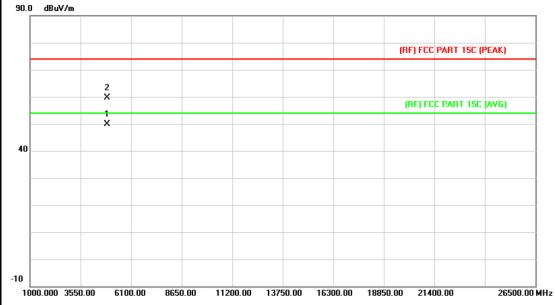


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.102	45.51	13.90	59.41	74.00	-14.59	peak
2	*	4882.121	36.22	13.90	50.12	54.00	-3.88	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box) Model Name :		CS-P80A150V4BT4			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Vertical	- Times				
Test Mode:	TX 8-DPSK Mode 2441MHz	7				
Remark:	ark: No report for the emission which more than 10 dB below the prescribed limit.					

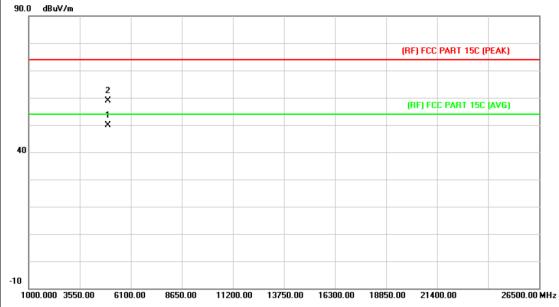


1	No.	Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4881.697	35.96	13.90	49.86	54.00	-4.14	AVG
2			4881.784	45.84	13.90	59.74	74.00	-14.26	peak



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2480MF	-lz				
Remark: No report for the emission which more than 10 dB below the prescribed limit.						

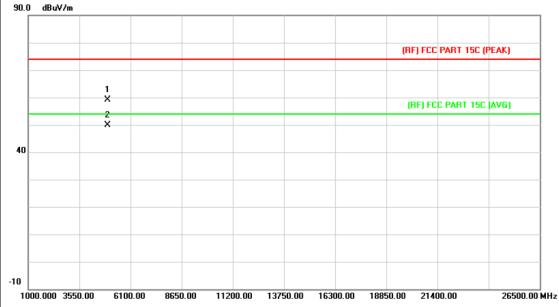


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.124	35.52	14.36	49.88	54.00	-4.12	AVG
2		4960.341	44.61	14.36	58.97	74.00	-15.03	peak



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EUT:	Bluetooth Subwoofer (Speaker Box) Model Name :		CS-P80A150V4BT4			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2480MHz	W. W.				
Remark: No report for the emission which more than 10 dB below the prescribed limit.						



N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.547	44.85	14.36	59.21	74.00	-14.79	peak
2	*	4959.856	35.51	14.36	49.87	54.00	-4.13	AVG



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6. Restricted Bands Requirement

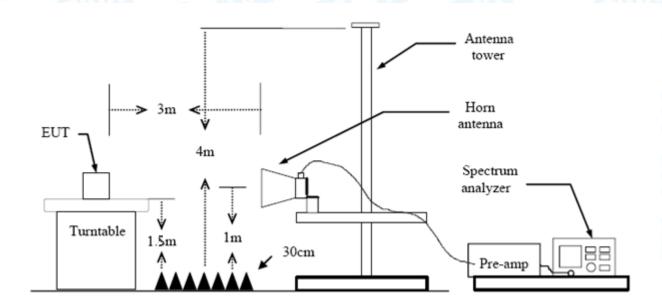
6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	ency Class B (dBuV/m)(at 3m				
Band (MHz)	Peak	Average			
2310 ~2390	74	54			
2483.5 ~2500	74	54			

6.2 Test Setup



6.3 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.



Report No.: TB-FCC145905 Page: 35 of 89

(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.

6.4 EUT Operating Condition

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

6.4 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.

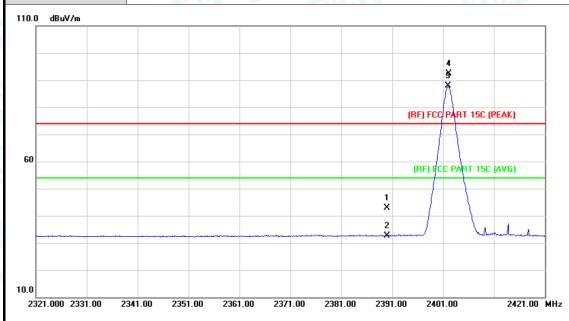
All restriction bands have been tested, only the worst case is reported.



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(1) Radiation Test

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Horizontal	W.				
Test Mode:	TX GFSK Mode 2402MHz					
Remark:	N/A	100	CITE:			



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	42.19	0.77	42.96	74.00	-31.04	peak
2		2390.000	31.91	0.77	32.68	54.00	-21.32	AVG
3	*	2402.000	86.95	0.82	87.77	Fundamental	Frequency	AVG
4	Х	2402.200	91.61	0.82	92.43	Fundamental	Frequency	peak



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Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
25 ℃	Relative Humidity:	55%
DC 12V	Will be a little of the little	
Vertical		
TX GFSK Mode 2402Mi	Hz	
N/A		
		4 X 3 X
	25 ℃ DC 12V Vertical TX GFSK Mode 2402MI	(Speaker Box) 25 °C Relative Humidity: DC 12V Vertical TX GFSK Mode 2402MHz

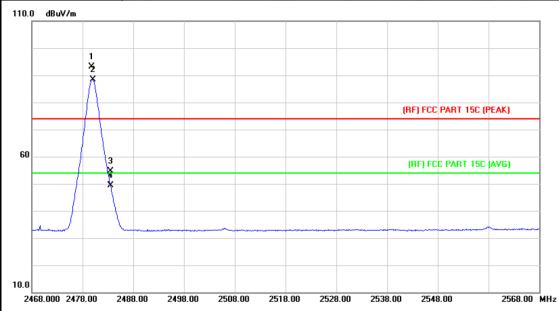
ŀ			-				4		
							X 3		
							Ă		
						(RF)	FCC PAR	T 15C (PEAK)
							$1 \setminus$		
60						(RF	CC PA	RT 15C	(AVG)
					1 X			\vdash	
	 	 	 	 	 2 X				
ŀ									
0.0									

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	43.03	0.77	43.80	74.00	-30.20	peak
2		2390.000	32.18	0.77	32.95	54.00	-21.05	AVG
3	*	2401.900	89.00	0.82	89.82	Fundamental	Frequency	AVG
4	Х	2402.200	93.86	0.82	94.68	Fundamental	Frequency	peak



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Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
25 ℃	Relative Humidity:	55%
DC 12V	N M	
Horizontal		
TX GFSK Mode 2480 MHz	100	
N/A		
	(Speaker Box) 25 ℃ DC 12V Horizontal TX GFSK Mode 2480 MHz	(Speaker Box) 25 °C Relative Humidity: DC 12V Horizontal TX GFSK Mode 2480 MHz



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.800	92.02	1.15	93.17	Fundamental	Frequency	peak
2	*	2480.000	87.30	1.15	88.45	Fundamental	Frequency	AVG
3		2483.500	53.52	1.17	54.69	74.00	-19.31	peak
4		2483.500	48.09	1.17	49.26	54.00	-4.74	AVG



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	Bluetooth Subw	oofer			3			
EUT:	(Speaker Box)		Model Name	:	CS-P80A1	150V4BT4		
Temperature:	25 ℃	Market Control	Relative Hum	idity:	55%			
Test Voltage:	DC 12V			Nin				
Ant. Pol.	Vertical					115		
Test Mode:	TX GFSK Mo	de 2480 MHz	N. S.		21			
Remark:	N/A			MIL				
110.0 dBuV/m								
1 %								
Ž Ž								
				(RF) FCC P	ART 15C (PEAK	9		
60								
				(RF) FCC	PART 15C (AVE	i)		
1								
10.0 2467.000 2477.00 2	2487.00 2497.00	2507.00 2517.00	2527.00 2537.0	0 2547.0	nn a	2567.00 MHz		
2407.000 2477.00 2	.407.00 2437.00	2307.00 2317.00	2327.00 2337.0	0 2547.0	2	.307.00 MII2		
	Readir	ng Correct	Measure-					
No. Mk. Fr	eq. Level	_		_imit	Over			
MI	Hz dBuV	dB/m	dBuV/m (dBuV/m	dB	Detector		
1 X 2479	.800 92.56	1.15	93.71 Fun	damental F	Frequency	peak		
2 * 2479	.900 87.77	1.15	88.92 Fun	damental I	Frequency	AVG		
3 2483	.500 54.01	1.17	55.18	74.00	-18.82	peak		
4 2483	.500 48.59	1.17	49.76	54.00	-4.24	AVG		



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UT:			174.4.1	ooth Subwoof ker Box)	er	Model Nan	ne:	CS-P80A1	50V4BT4		
empe	eratur	e:	25 °C			Relative H	umidity:	55%			
	oltag		DC 1	2V	(TI)		a WH				
nt. P	ol.		Horiz	zontal							
est N	lode:		TX 8	-DPSK Mod	le 2402MH	Z					
Rema	rk:		N/A		And S		ann		2		
110.0	dBuV/m										
								3			
								× 4 ×			
							(BE) ECC B	ART 15C (PEAK)			
							(NF) FCC F	ANT TOC (FEAK)			
60											
							(RF) FC	PART 15C (AVG)			
							1 X				
							2	-			
							- X				
10.0											
2319.0	000 2329	9.00 2	339.00	2349.00 235	9.00 2369.00	2379.00 23	89.00 2399.0	00 24	19.00 MHz		
		_		Reading	Correct	Measure-	1 : :4	O			
No	. Mk.		eq.	Level	Factor	ment	Limit	O∨er			
		Mi	⊣z	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector		
1		2390	.000	42.72	0.77	43.49	74.00	-30.51	peak		
2		2390	.000	31.83	0.77	32.60	54.00	-21.40	AVG		
	Х	2402	200	92.43	0.82	93.25	Fundament	al Frequency	peak		
3	^	2402	.200								



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EUT:			7.54	ooth Subwoof ker Box)	er	Model Name	:	CS-P80A150V4BT4		
em	peratu	re:	25 °C		I	Relative Hun	nidity:	: 55%		
est	t Voltag	e:	DC 1	2V	(mill)		2 1			
\nt.	. Pol.		Verti	cal	10		19		11/11/20	
est	t Mode:		TX 8	-DPSK Mod	e 2402MH	lz				
Ren	nark:		N/A		AND O	3	DATE			
110.0	D dBuV/m									
								4 X		
								3 X		
							(05) 50	70 00 150 054		
							(HF) FL	C PART 15C (PEA	KJ	
60							(RF)	CC PART 15C (AV	G)	
							1 X			
							2			
							ž	<u></u>		
10.0										
	321.000 233	31.00	2341.00	2351.00 236	51.00 2371.0	00 2381.00 2	391.00 24	01.00	2421.00 MF	
				Reading	Correct	Measure-				
Ν	lo. Mk	. Fr	eq.	Level	Factor	m ent	Limit	Over		
		М	Hz	dBuV	dB/m	dBuV/m	dBuV/	m dB	Detecto	
1		2390	.000	43.63	0.77	44.40	74.0	0 -29.60	peak	
2		2390	.000	32.01	0.77	32.78	54.0	0 -21.22	AVG	
3	*	2402	.100	87.61	0.82	88.43	Fundame	ntal Frequency	AVG	
4	Х	2402	.200	94.68	0.82	95.50	Fundame	ntal Frequency	peak	



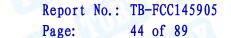
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EUT	:		1 14 1	ooth Subw aker Box)	oofer	Mode	el Name	:	CS-P80A15	50V4BT4		
Tem	peratur	e:	25 °C	C	Market Control	Relat	ive Hur	midity:	: 55%			
Test	t Voltag	e:	DC 1	I2V		100		2 W	The same of the sa			
Ant.	Pol.		Horiz	zontal				3				
Test	t Mode:		TX 8	-DPSK M	lode 2480N	/lHz						
Ren	nark:		N/A			33		ann				
110.0) dBuV/m											
60		1 X 2 X							PART 15C (PEA			
10.0	A	1										
24	167.000 247	7.00 2	487.00	2497.00				37.00 2547	7.00	2567.00 MHz		
N	lo. Mk.	Fre	eq.	Readir Level			asure- ent	Limit	O∨er			
		MH		dBuV	dB/m		BuV/m	dBuV/m	dB	Detector		
1	Х	2479.	900	94.56			5.71	Fundament	al Frequency	peak		
	*	2479.	900	87.82	2 1.15	8	8.97	Fundament	al Frequency	AVG		
2												
3		2483	500	56.07	1.17	5	7.24	74.00	-16.76	peak		



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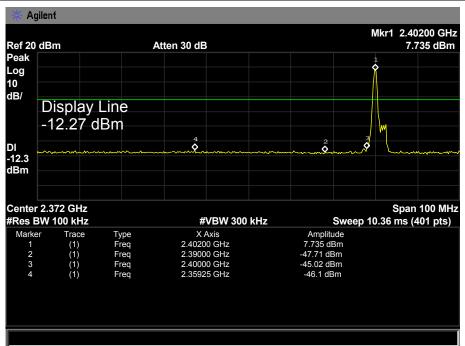
UT:			1.6.4.	ooth So aker Bo	ubwoot x)	fer	M	lodel N	Namo	e :	CS-P80A15	0V4BT4	
Temper	ature) :	25 ℃				R	Relative Humidity:			55%		
est Vol			DC 12V										
Ant. Po			Verti	cal		10					(a)		
Test Mo	de:		TX 8	-DPS	K Mod	de 2480N	1Hz	W					
Remark	:		N/A	W							2		
110.0 dBu	uV/m												
10.0	D 2477.	2 X 1 X 3 X *	187.00	2497.0	00 25	07.00 251	7.00	2527.00	0 2	(RF) FO	C PART 15C (PEAL		
No I	Mk.	Fre	eq.		ading vel	Corre Fact		Meas mer		Limit	Over		
110. 1		MH	フ	dE	3u V	dB/m		dBu∖	//m	dBuV/r	n dB	Detect	
140. 1		1711											
1 *	+ 2	2479.		86	5.10	1.15	i	87.:	25	Fundament	al Frequency	AVC	
1 *			900		6.10 2.73	1.15 1.15		93.8			al Frequency	AV0 pea	
1 *	X 2	2479.	900	92			j		88		al Frequency		

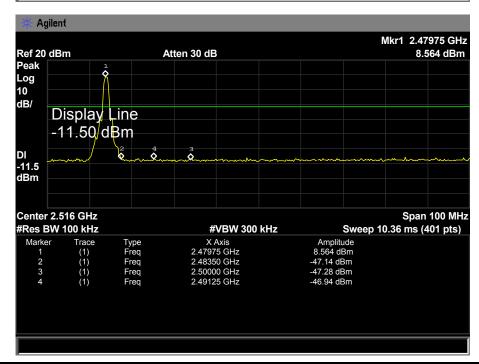




(2) Conducted Test

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 12V							
Test Mode:	TX GFSK Mode 2402MH	TX GFSK Mode 2402MHz / 2480 MHz						
Remark:	N/A							







EUT:

Bluetooth Subwoofer (Speaker Box)

Temperature:

25 ℃

Relative Humidity:

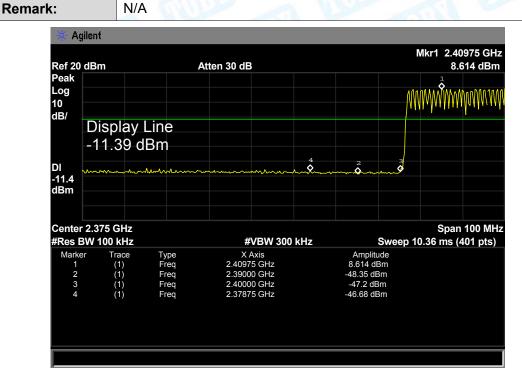
55%

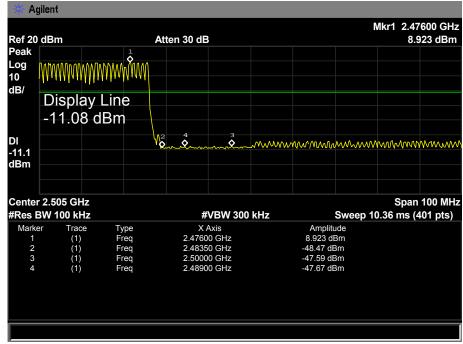
Test Voltage:

DC 12V

Test Mode:

GFSK Hopping Mode

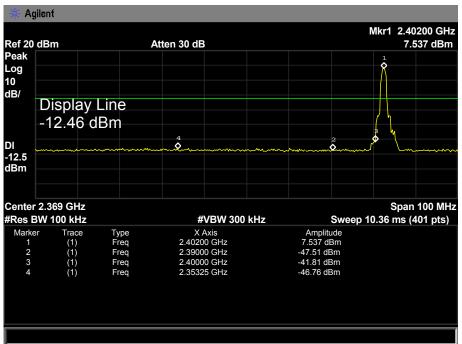


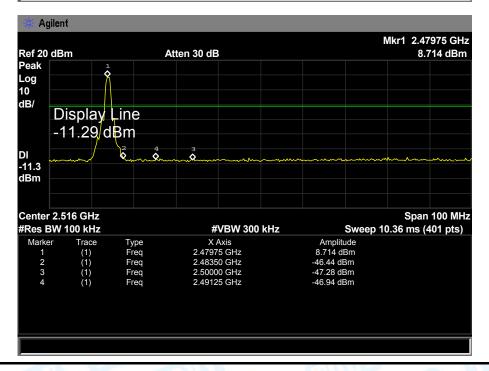




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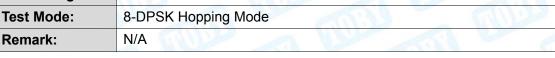
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V						
Test Mode:	TX 8-DPSK Mode 2402N	//Hz / 2480 MHz					
Remark:	N/A	9 100					

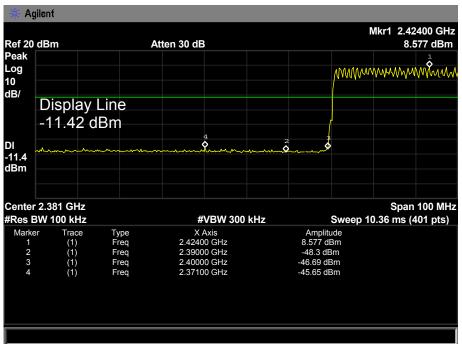


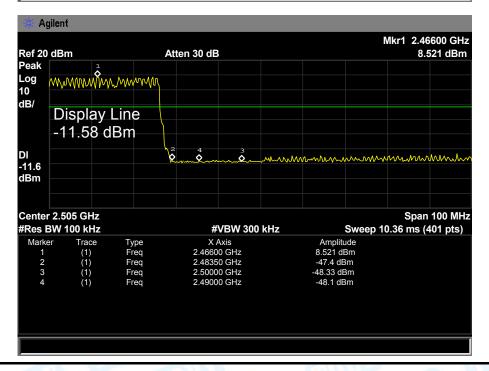




Bluetooth Subwoofer EUT: CS-P80A150V4BT4 **Model Name:** (Speaker Box) **25** ℃ 55% Temperature: **Relative Humidity: DC 12V Test Voltage: Test Mode:** 8-DPSK Hopping Mode









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7. Number of Hopping Channel

7.1 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

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



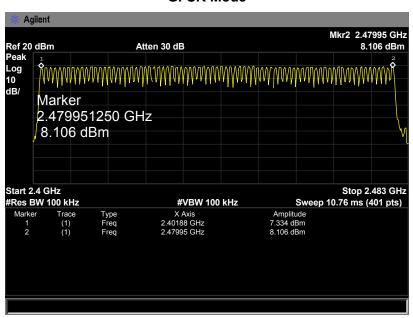


Bluetooth Subwoofer EUT: CS-P80A150V4BT4 **Model Name:** (Speaker Box) Temperature: 25 ℃ 55% **Relative Humidity: DC 12V Test Voltage:**

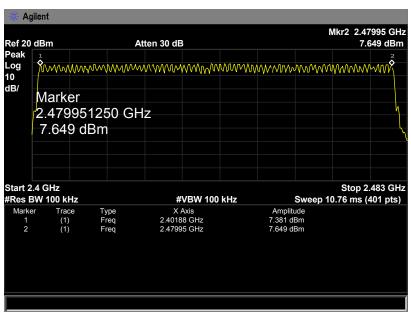
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
24020012490011-	79	>4 E
2402MHz~2480MHz	79	>15

GFSK Mode



8-DPSK Mode





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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.

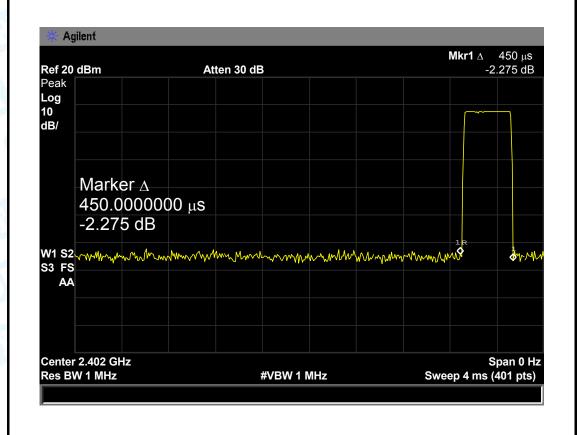


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8.5 Test Data

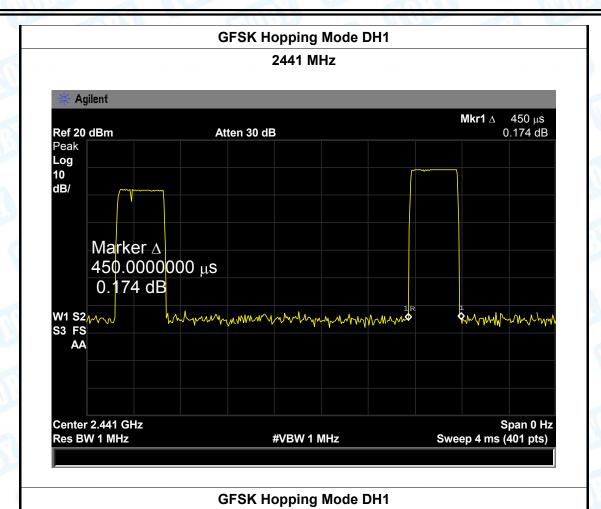
EUT:	Bluetooth Subwoofer (Speaker Box)		Model Name :		CS-P80A150V4BT4	
Temperature		25 ℃	The Contraction of the Contracti	Relative Hum	idity:	55%
Test Voltage:		DC 12V				
Test Mode: Hopping Mode (GFSK DH1)					13	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Kesuit
2402		0.450	144.00			
2441		0.450	144.00	31.60	400	PASS
2480		0.450	144.00			
			CECK Honning	Mode DU1		•

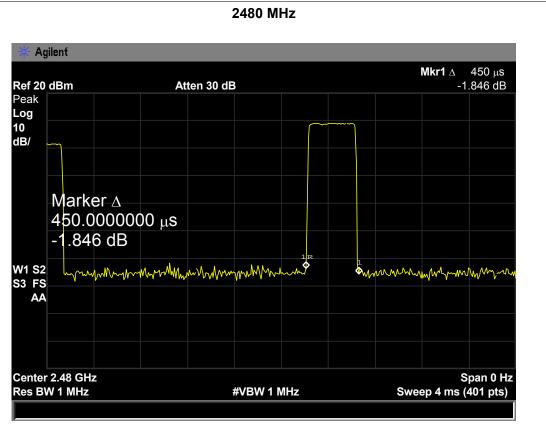
GFSK Hopping Mode DH1





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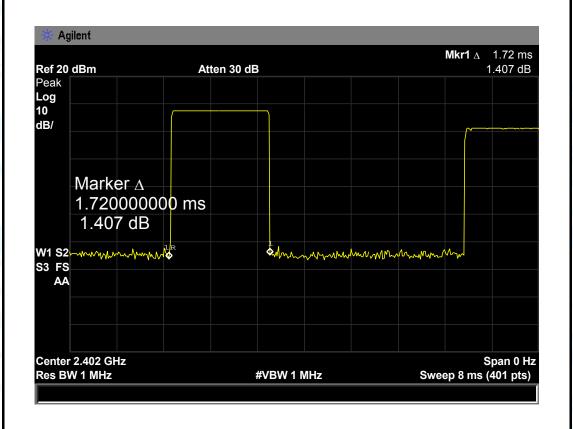


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Channol	Dulco Timo	Total of Dwall	Daried Time	Limit			
Test Mode:	Hopping	Hopping Mode (GFSK DH3)					
Test Voltage:	DC 12V	0111	مر الالا	18			
Temperature:	25 ℃	UM	Relative Hum	idity:	55%		
EUT:	Bluetooth (Speaker E	Model Name :			CS-P80A150V4BT4		

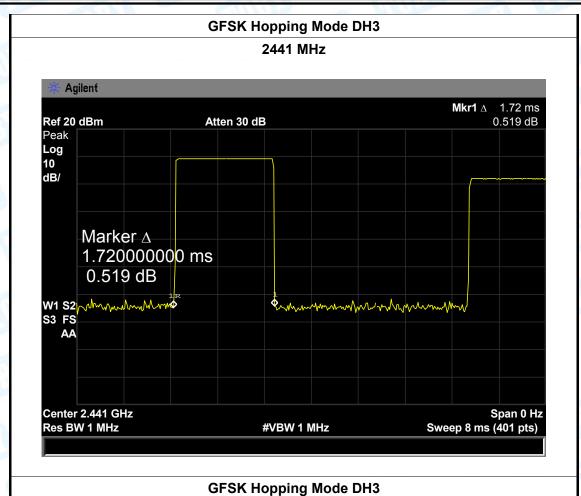
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.720	275.20			
2441	1.720	275.20	31.60 400	PASS	
2480	1.720	275.20			

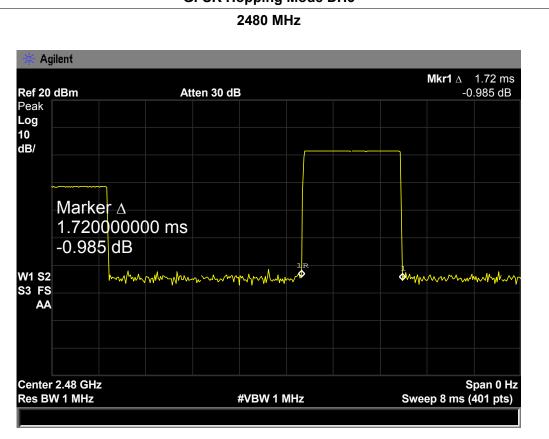
GFSK Hopping Mode DH3





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2441

2480

Report No.: TB-FCC145905

PASS

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1	EUT:		Bluetooth S (Speaker B		Model Name :		CS-P80A150V4BT4
	Temperature: 25 ℃ Relative Hum		idity:	55%			
	Test Voltage:		DC 12V	0111	ور الزان	I WIN	
	Test Mode:		Hopping I	Mode (GFSK DH	5)	3	WILLIAM TO
	Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
	(MHz)		(ms)	(ms)	(s)	(ms)	Result
	2402		3.000	320.00			

GFSK Hopping Mode DH5

320.00

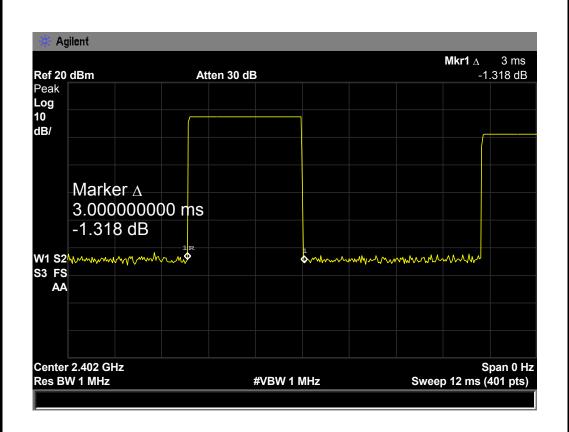
320.00

31.60

400

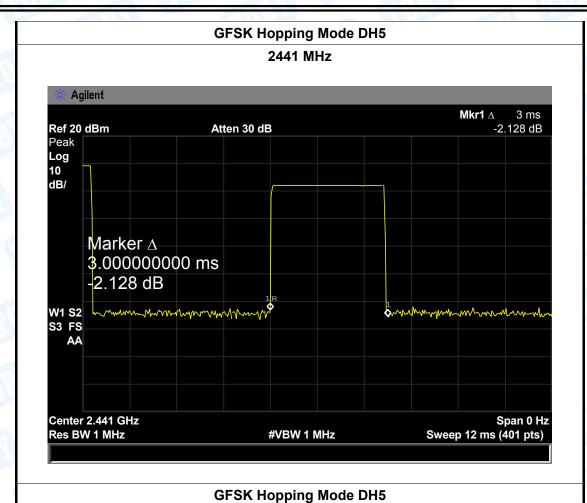
3.000

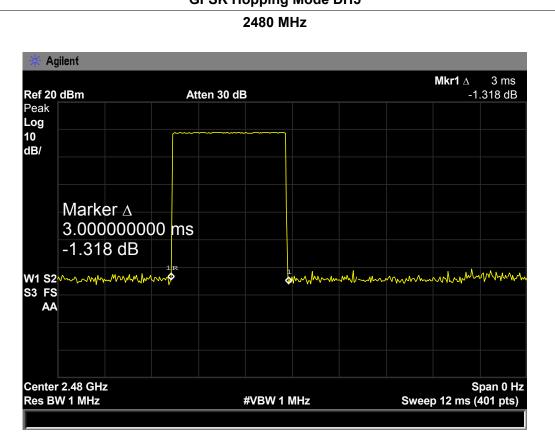
3.000





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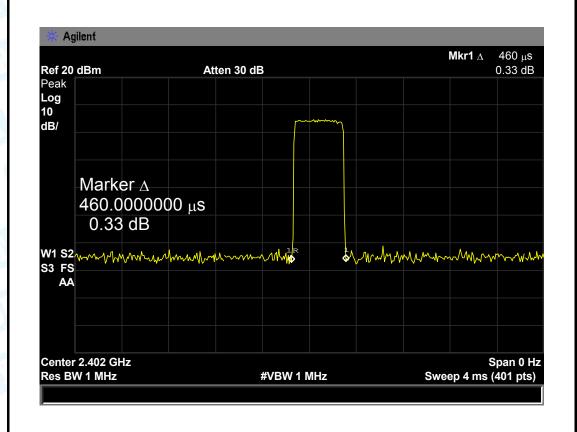


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EUT:		Bluetooth S (Speaker B		Model Name :		CS-P80A150V4BT4
Temperature:		25 ℃	Chillian Control	Relative Humidity:		55%
Test Voltage: DC 12V						
Test Mode: Hopping Mode (π /4-DQPSK DH1)						
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Popult

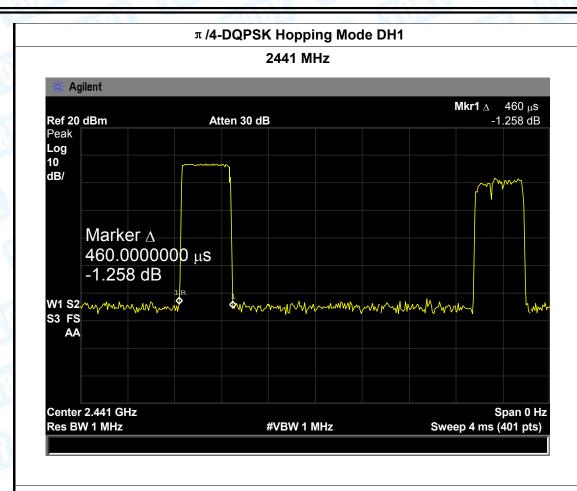
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	0.460	147.20			
2441	0.460	147.20	31.60	400	PASS
2480	0.460	147.20			

π /4-DQPSK Hopping Mode DH1

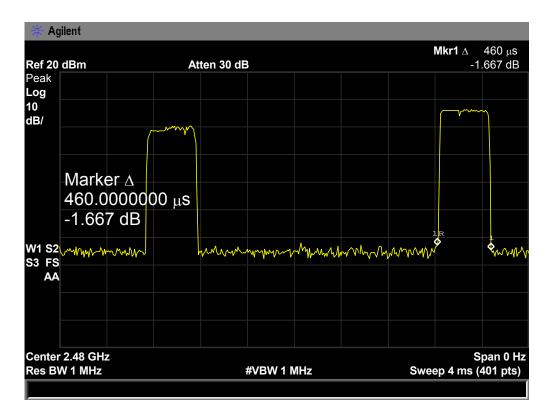




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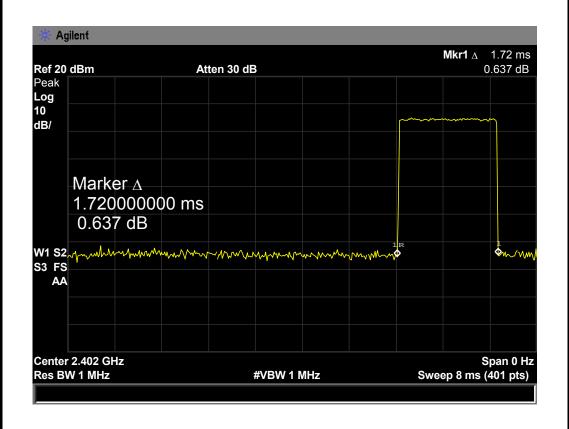


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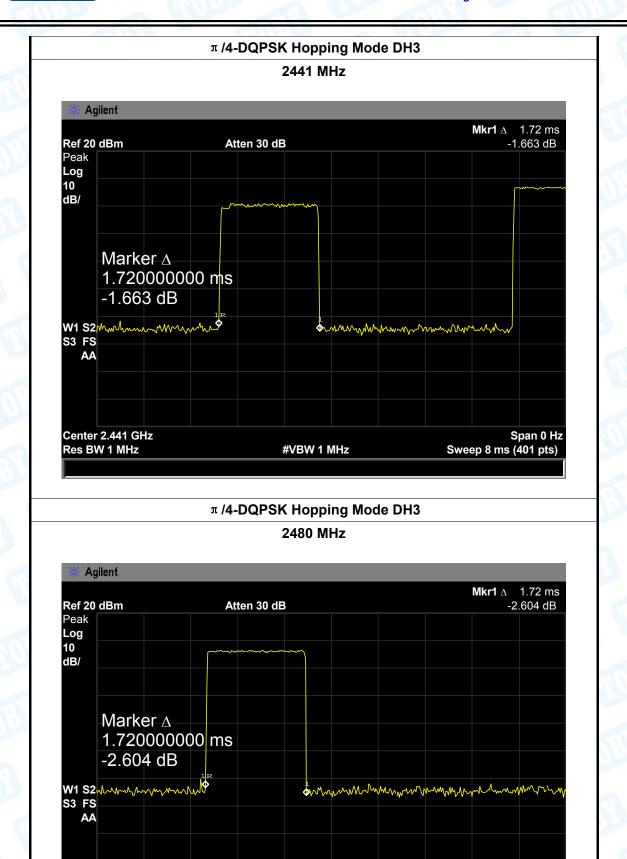
EUT:		Bluetooth S (Speaker B		Model Name :		CS-P80A150V4BT4
Temperature: 25 °C			LINE TO SERVICE STATE OF THE PERSON AND PERS	Relative Humidity:		55%
Test Voltage:		DC 12V				
Test Mode:	de: Hopping Mode (π /4-DQPSK DH3)				CHILD ST	
Channel	Pu	Ise Time	Total of Dwell	Period Time	Limit	Result

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

π /4-DQPSK Hopping Mode DH3







#VBW 1 MHz

Center 2.48 GHz

Res BW 1 MHz

Span 0 Hz

Sweep 8 ms (401 pts)

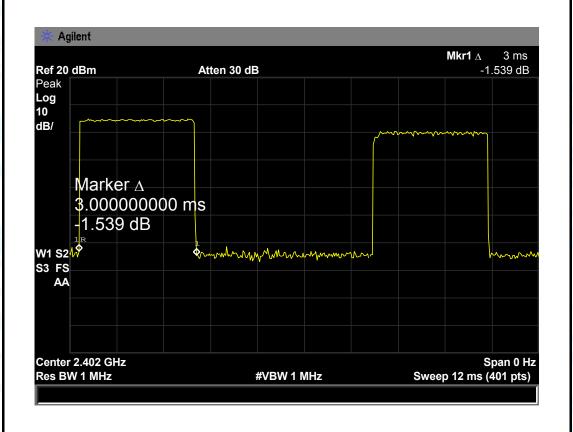


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EUT:	Bluetooth Subwoofer (Speaker Box) Model Name :		:	CS-P80A150V4BT4		
Temperature:		25 ℃	M. C.	Relative Humidity:		55%
Test Voltage:	Test Voltage: DC 12V				N. W.	
Test Mode:		Hopping I	Mode (π/4-DQP	SK DH5)	3	CHILD STORY
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result

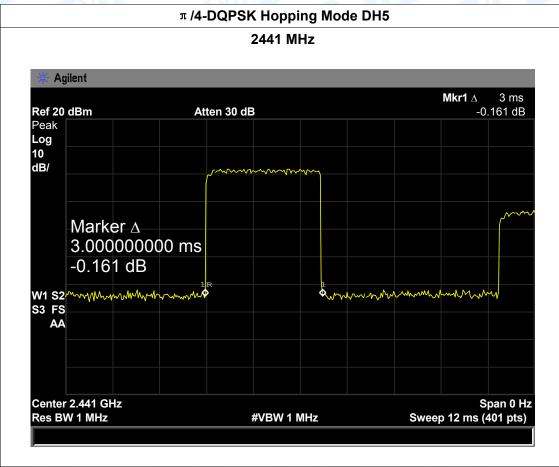
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result		
(MHz)	(ms)	(ms)	(s)	(ms)	Result		
2402	3.000	320.00					
2441	3.000	320.00	31.60	400	PASS		
2480	3.000	320.00					

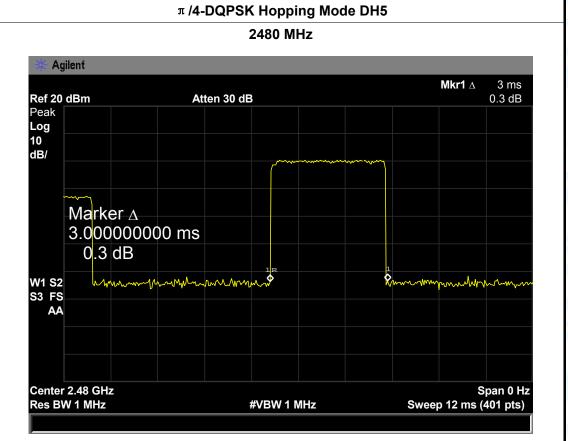
π /4-DQPSK Hopping Mode DH5





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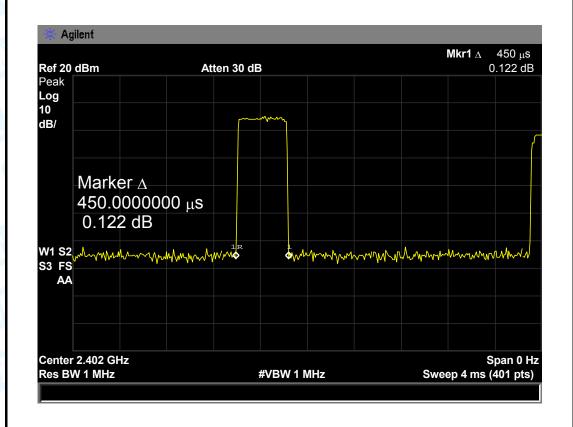


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(MHz)		(ms)	(ms)	(s)	(ms)	Nesuit
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
Test Mode:		Hopping I	Mode (8-DPSK D	H1)	3	
Test Voltage:		DC 12V		مر لان	18	
Temperature:		25 ℃		Relative Humidity:		55%
EUT:		Bluetooth S (Speaker B		Model Name	:	CS-P80A150V4BT4

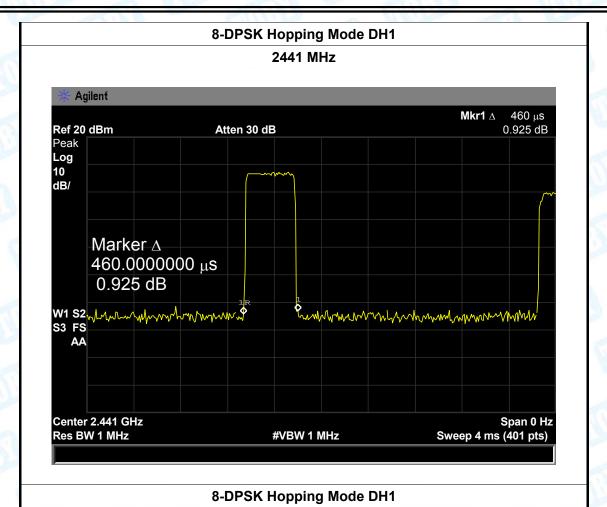
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	
2402	0.450	144.00			
2441	0.460	147.20	31.60	400	PASS
2480	0.450	144.00			

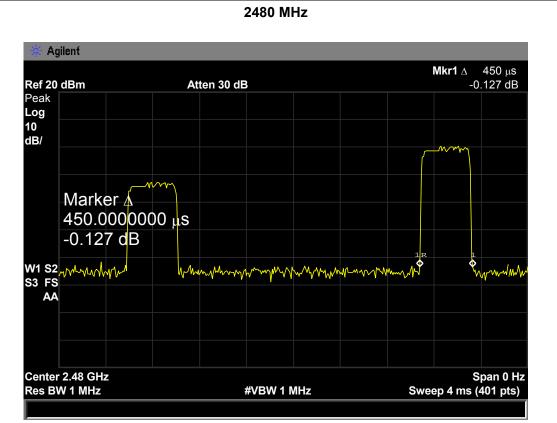
8-DPSK Hopping Mode DH1





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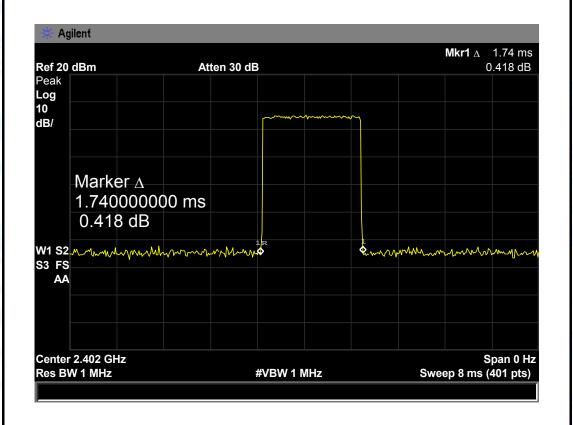


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Test Mode:			Mode (8-DPSK D	H3)		
Temperature: Test Voltage:		25 ℃ DC 12V	OM TO	Relative Hum	idity:	55%
EUT:		Bluetooth S (Speaker B		Model Name	:	CS-P80A150V4BT4

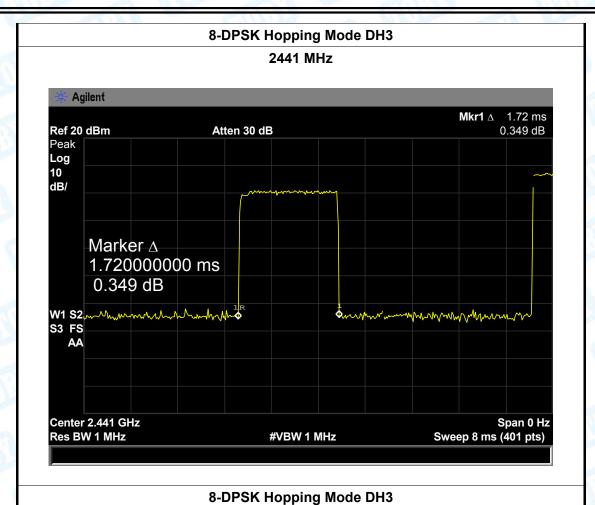
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.740	278.40			
2441	1.720	275.20	31.60	400	PASS
2480	1.740	278.40			

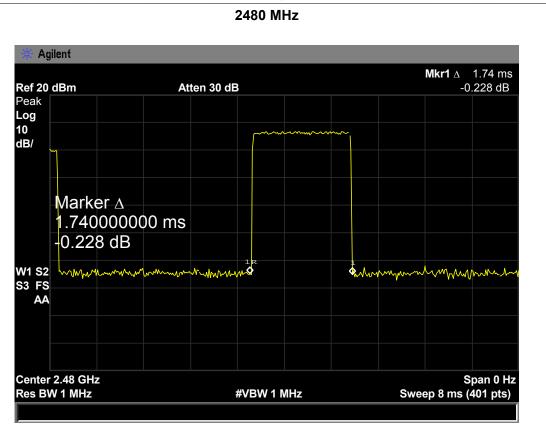
8-DPSK Hopping Mode DH3





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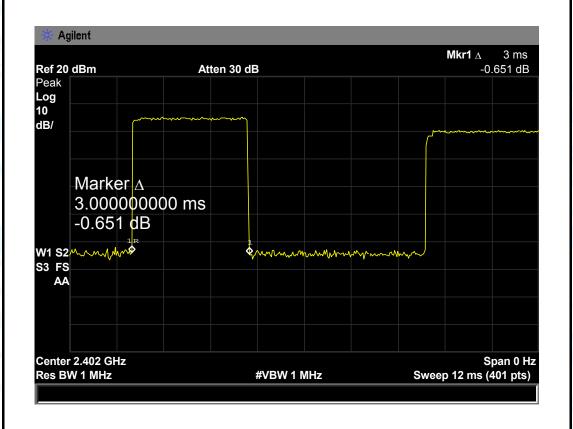


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Channel	Pu	lea Tima	Total of Dwell	Pariod Time	Limit	
Test Mode:		Hopping N	Mode (8-DPSK D	H5)	3	CHILD .
Test Voltage:		DC 12V	The same	مر الان	N. A. A. A.	
Temperature:		25 ℃	ALT THE	Relative Hum	idity:	55%
EUT:		Bluetooth S (Speaker B		Model Name		CS-P80A150V4BT4

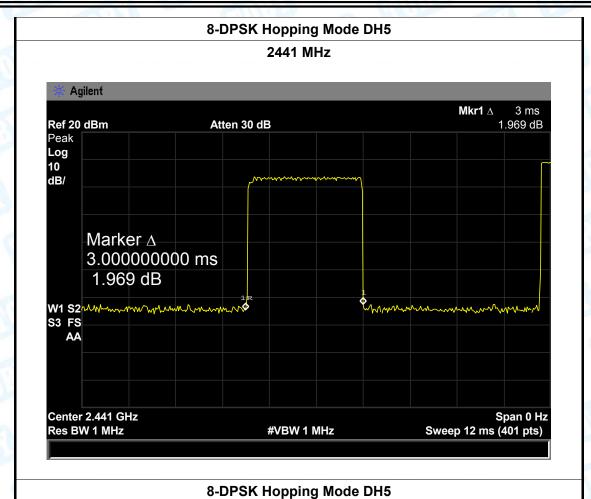
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result		
(MHz)	(ms)	(ms)	(s)	(ms)	Result		
2402	3.000	320.00					
2441	3.000	320.00	31.60	400	PASS		
2480	3.000	320.00					

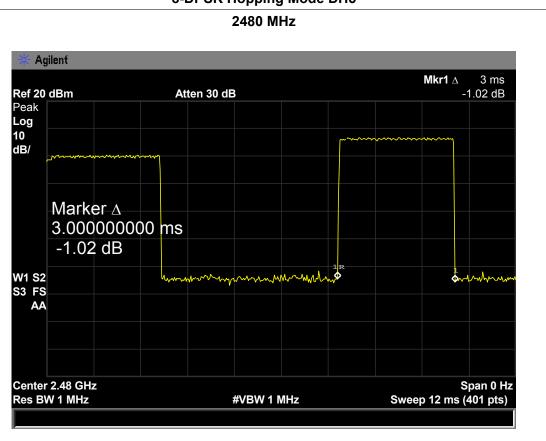
8-DPSK Hopping Mode DH5





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9. Channel Separation and Bandwidth Test

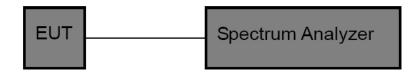
9.1 Test Standard and Limit

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.



2402

2441

2480

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9.5 Test Data

Channel frequence (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)		
Test Mode:	TX Mode (GFSK)				
Test Voltage:	DC 12V				
Temperature:	25 ℃	Relative Humidity:	55%		
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4		

GFSK TX Mode

926.136

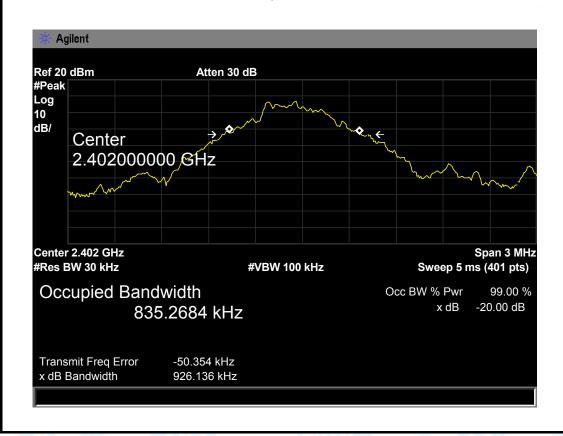
866.054

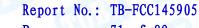
858.868

835.2684

832.5823

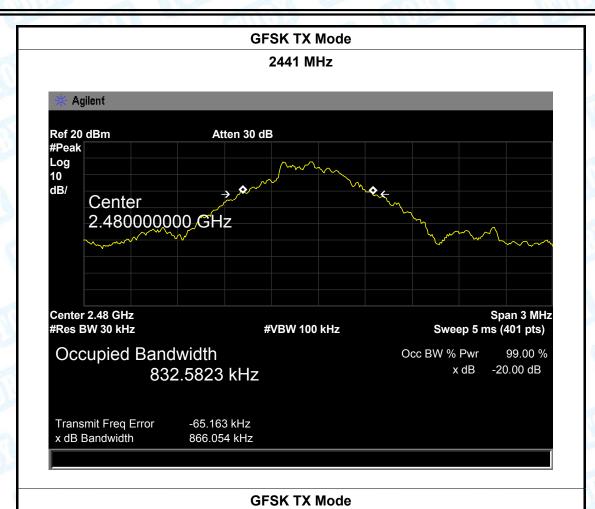
826.1359

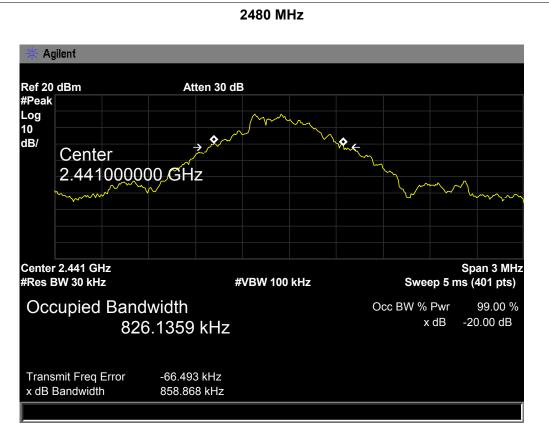






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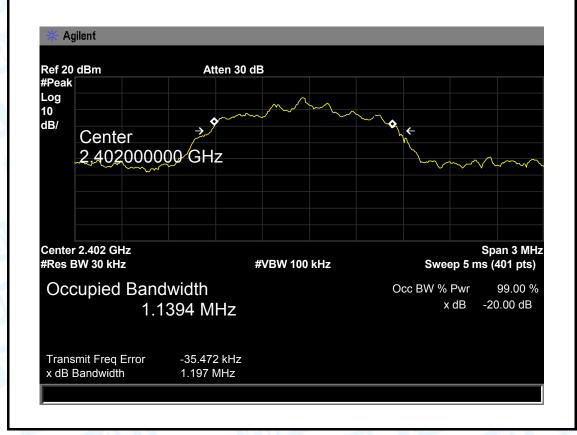
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: ΤΧ Mode (π /4-DQPSK)

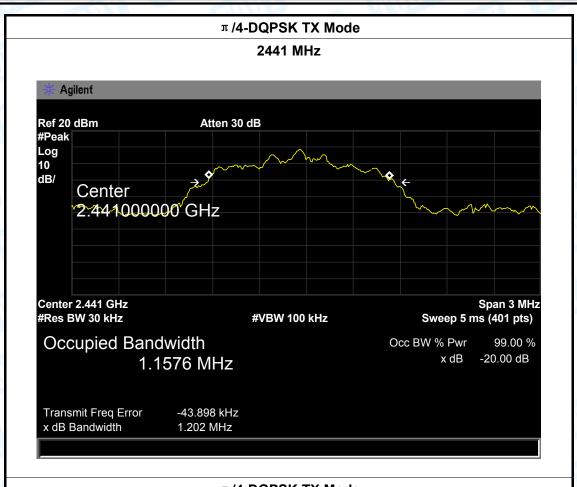
Channel frequency (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402	1139.40	1197.00	798.00
2441	1157.60	1202.00	801.33
2480	1152.10	1203.00	802.00

π/4-DQPSK TX Mode

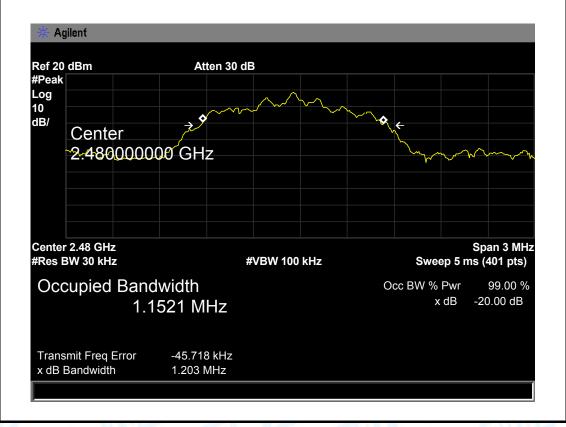




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π/4-DQPSK TX Mode



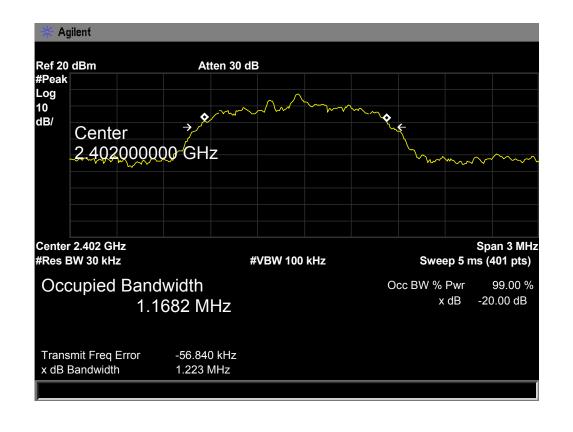


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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX Mode (8-DPSK)		
Channel frequence	99% OBW	20dB Bandwidth	20dB Bandwidth
/= = · · ·			

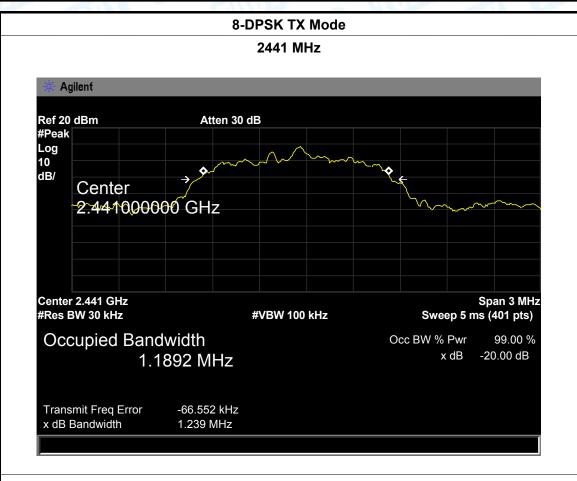
Channel frequency	99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	1168.20	1223.00	815.33
2441	1189.20	1239.00	826.00
2480	1179.90	1230.00	820.00

8-DPSK TX Mode 2402 MHz

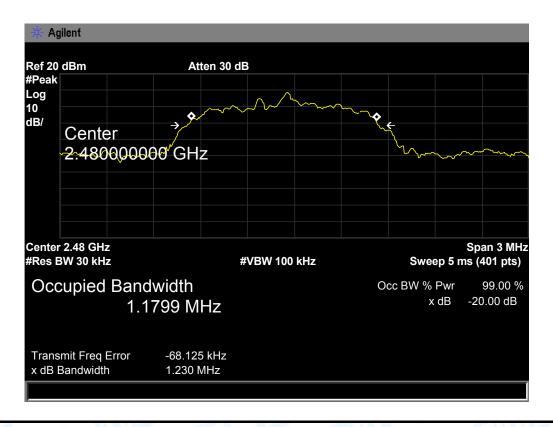




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8-DPSK TX Mode





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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		081

Test Mode: Hopping Mode (GFSK)

Channel frequency (MHz)	Separation Read Value	Separation Limit
	(kHz)	(kHz)
2402	1005.00	926.136
2441	1005.00	866.054
2480	1005.00	858.868

GFSK Hopping Mode

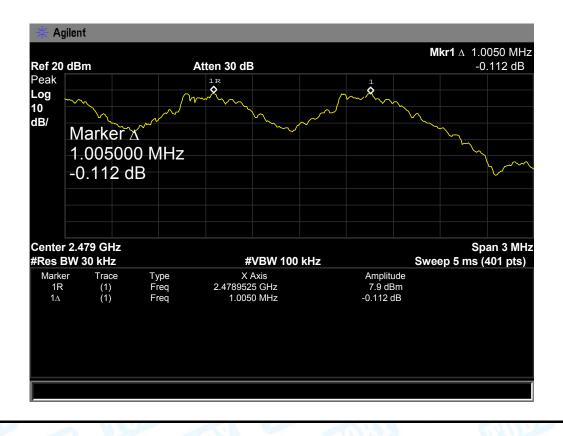






GFSK Hopping Mode 2441 MHz Agilent Mkr1 A 1.0050 MHz -0.003 dB Ref 20 dBm Atten 30 dB Peak Log 10 dB/ Marker X 1.005000 MHz -0.003 dB Center 2.442 GHz Span 3 MHz #Res BW 30 kHz **#VBW 100 kHz** Sweep 5 ms (401 pts) X Axis 2.4409525 GHz 1.0050 MHz Amplitude Marker 8.283 dBm -0.003 dB (1) (1)

GFSK Hopping Mode





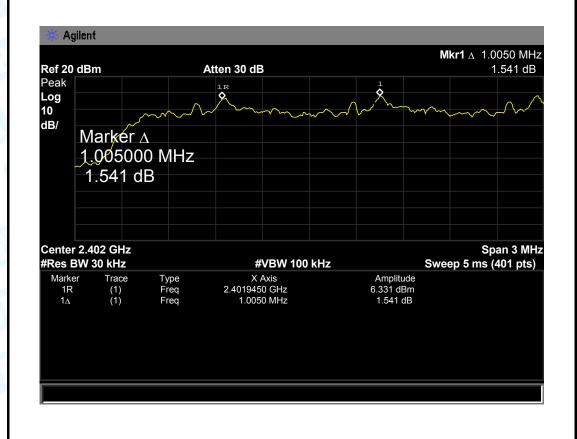
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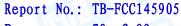
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: Hopping Mode (π /4-DQPSK)

Channel frequency (MHz)	Separation Read Value	Separation Limit
	(kHz)	(kHz)
2402	1005.00	798.00
2441	1005.00	801.33
2480	1005.00	802.00

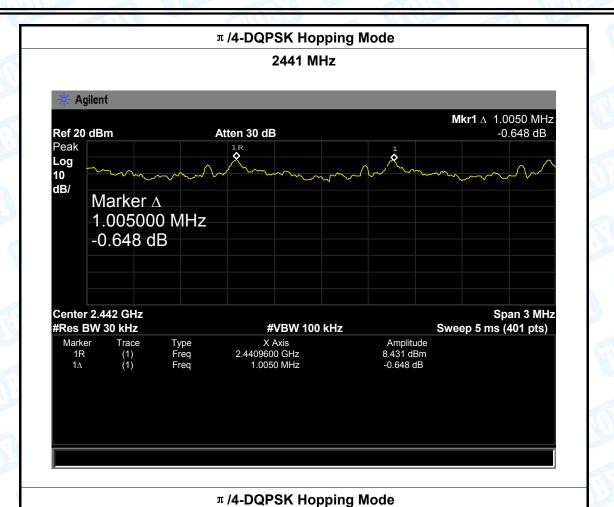
π /4-DQPSK Hopping Mode

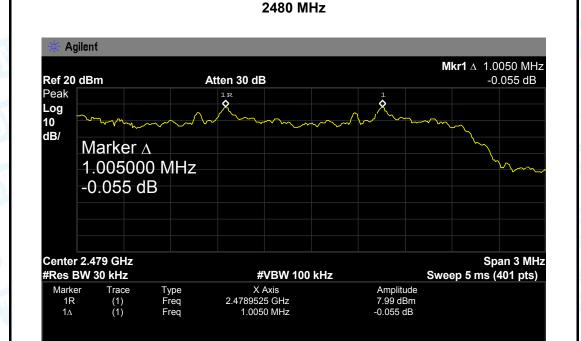






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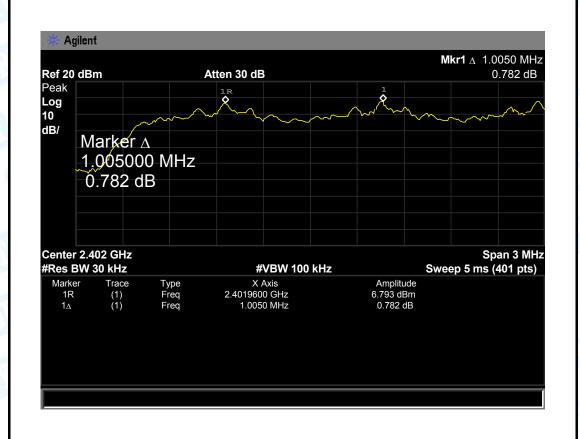
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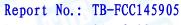
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V	11.35	

Test Mode: Hopping Mode (8-DPSK)

Channel frequency (MHz)	Separation Read Value	Separation Limit
	(kHz)	(kHz)
2402	1005.00	815.33
2441	1005.00	826.00
2480	1005.00	820.00

8-DPSK Hopping Mode

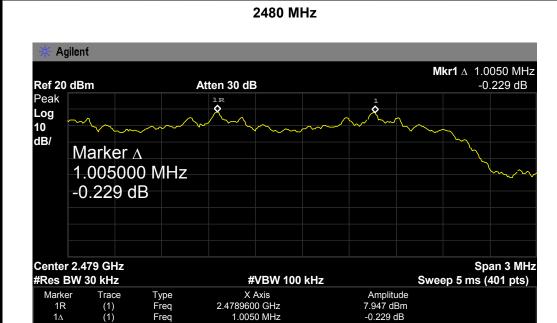






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10. Peak Output Power Test

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

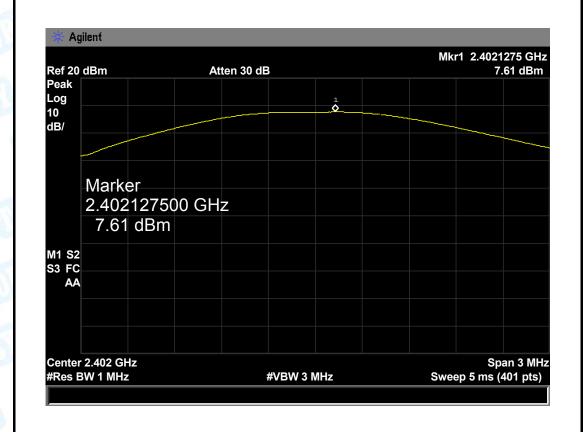
The EUT was set to continuously transmitting in the max power during the test.



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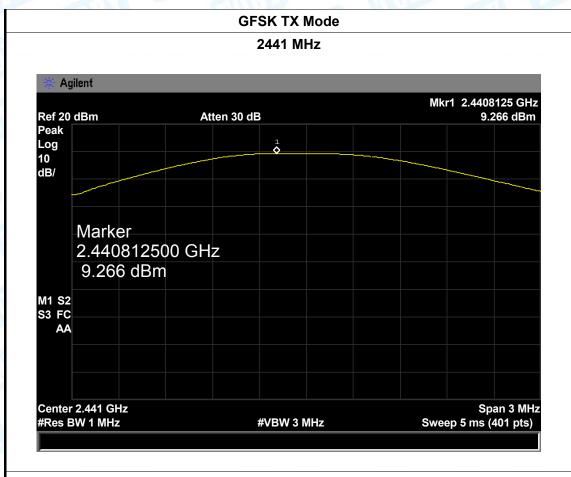
10.5 Test Data

			100 100 100 100 100 100 100 100 100 100	Land Service Control	
EUT:	Bluetooth S (Speaker B		Model Nan	ne:	CS-P80A150V4BT4
Temperature:	25 ℃	100	Relative H	umidity:	55%
Test Voltage:	DC 12V	U.S.	U		
Test Mode:	TX Mode	(GFSK)		AM	
Channel frequen	cy (MHz)	Test Result	(dBm)	L	imit (dBm)
2402		7.610			
2441		9.266			30
2480		8.954			
GFSK TX Mode					



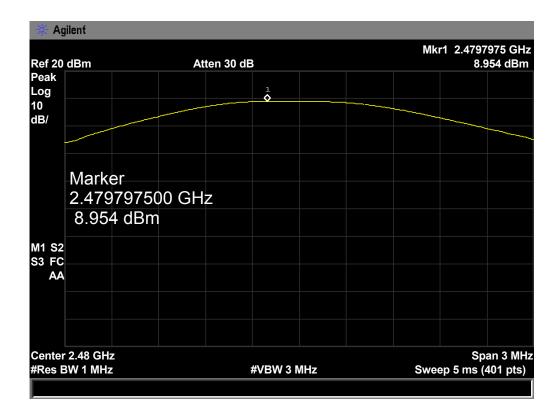


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GFSK TX Mode







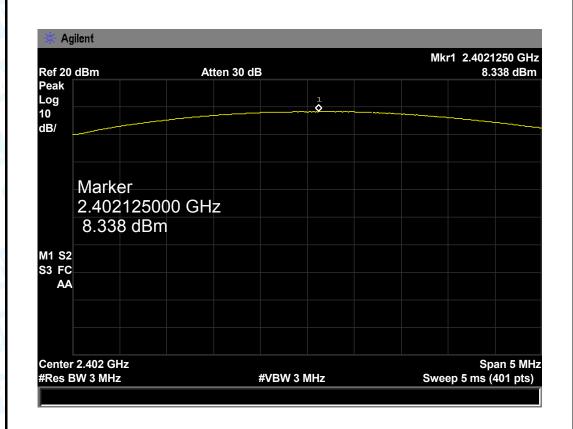
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		W. S.
Test Mode:	TX Mode (T /4-DOPSK)		

Test Mode: TX Mode (π /4-DQPSK)

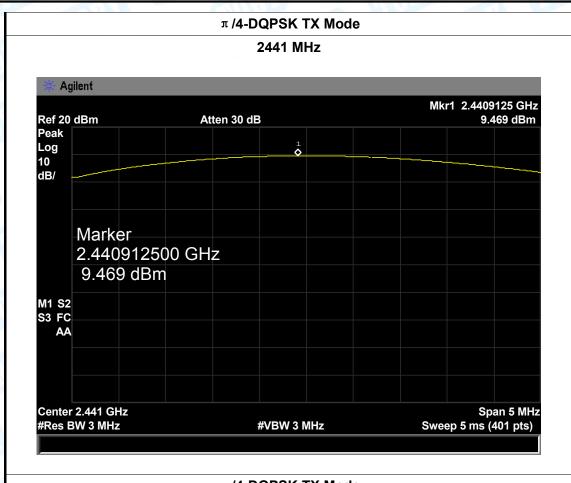
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	8.338	
2441	9.469	21
2480	9.251	

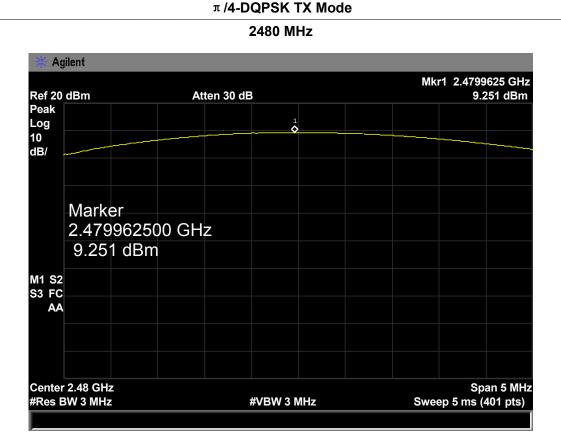
π /4-DQPSK TX Mode





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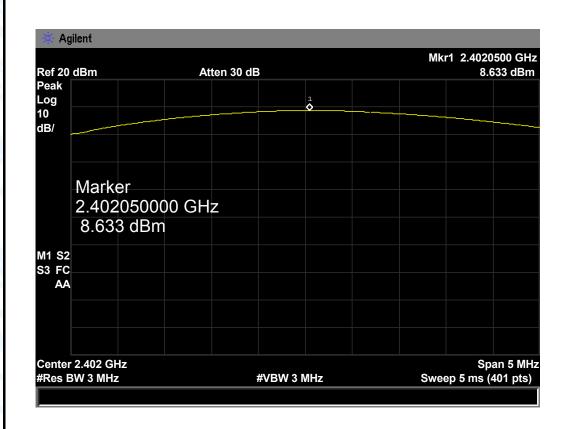
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BT4
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: TX Mode (8-DPSK)

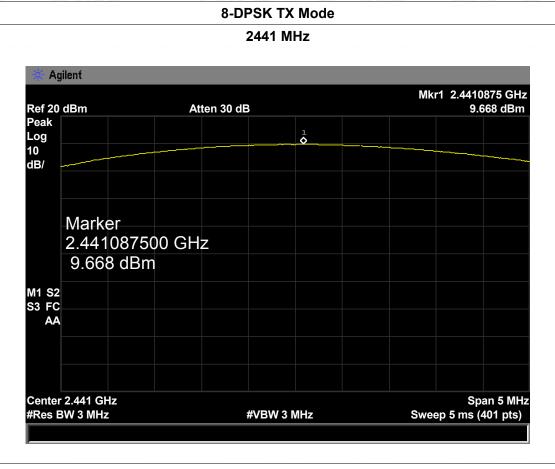
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	8.633	
2441	9.668	21
2480	9.473	

8-DPSK TX Mode

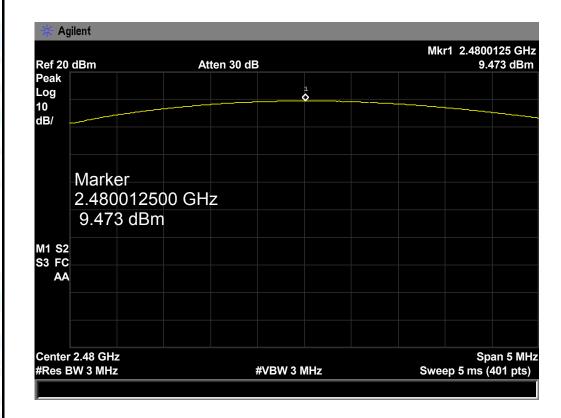




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8-DPSK TX Mode





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11. Antenna Requirement

11.1 Standard Requirement

11.1.1 Standard FCC Part 15.203

11.1.2 Requirement

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

11.2 Antenna Connected Construction

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

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

	Antenna Type
a Eu	▼ Permanent attached antenna
	□ Unique connector antenna
	□ Professional installation antenna