

Shenzhen Toby Technology Co., Ltd.

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FCC Radio Test Report FCC ID: 2AGGTV4BBT14

Original Grant

Report No. : TB-FCC146324

Applicant: Austin-Whitman Mfg. Group LLC

Equipment Under Test (EUT)

EUT Name : Bluetooth Subwoofer(Speaker Box)

Model No. : CS-P80A150V4BBT

Series Model No. : CS-P80A150V4BBT-HB, CS-P80A150V4BBT-HC,

CS-P80A150V4BBTX2, CS-P80A150V4BBTX3

Brand Name : SPA BULLET

Receipt Date : 2015-12-17

Test Date : 2015-12-18 to 2015-12-24

Issue Date : 2015-12-25

Standards : FCC Part 15: 2015, 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 :

the report.

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

TB-RF-074-1.0



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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		Bluetooth Subwoofer(Spea	ker Box)				
Models No.	1		CS-P80A150V4BBT, CS-P80A150V4BBT-HB,CS-P80A150V4BBT-HC, CS-P80A150V4BBTX2, CS-P80A150V4BBTX3				
Model Difference		All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.					
	3	Operation Frequency: Bluetooth 2.1+EDR: 2402~	2480MHz				
600	6	Number of Channel:	Bluetooth:79 Channels see Note 3				
Product Description	l.	Max Peak Output Power:	Bluetooth: 4.413 dBm(GFSK)				
Description	ŀ	Antenna Gain:	0 dBi PCB Antenna				
	63	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	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		

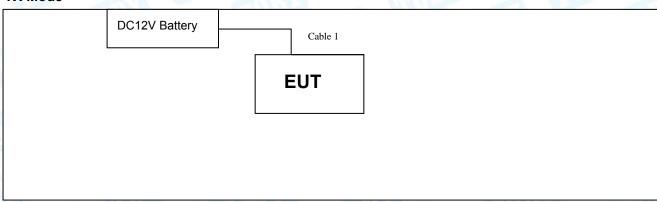


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04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	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		- 00
26	2428	53	2455	Will a	- NE

- (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	EE	10	V			
	Cable Information						
Number Shielded Type Ferrite Core Length Note							
Cable 1	NO	NO	0.2m	6000			

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				
N/A	N/A			

For Radiated Test					
Final Test Mode Description					
DC Power with TX GFSK Mode					
TX Mode(GFSK) Channel 00/39/78					
TX Mode(π /4-DQPSK) Channel 00/39/78					
TX Mode(8-DPSK) Channel 00/39/78					
Hopping Mode(GFSK)					
Hopping Mode(II /4-DQPSK)					
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	(M) 33	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
2 100	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.



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2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1					
Standard S	ection			Remark	
FCC	IC	Test Item	Judgment		
15.203	9	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:828.2266kHz π/4-DQPSK: 1180.30kHz 8-DPSK: 1164.40kHz	

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

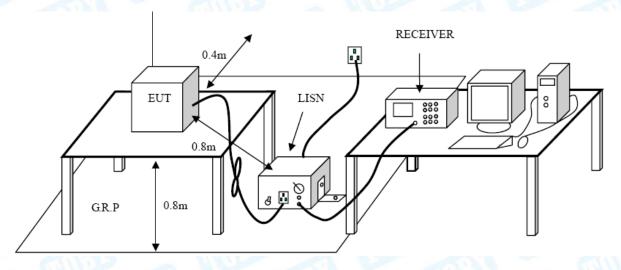
Conducted Emission Test Limit

Eroguopov	Maximum RF Lin	e 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

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

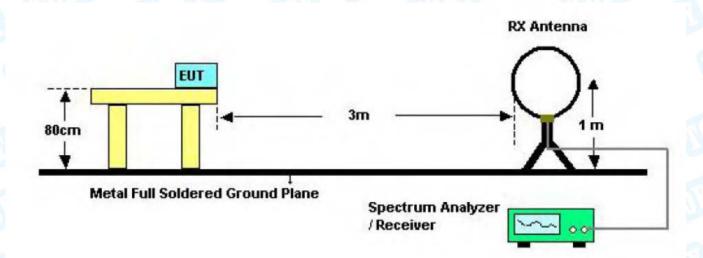
Note:

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

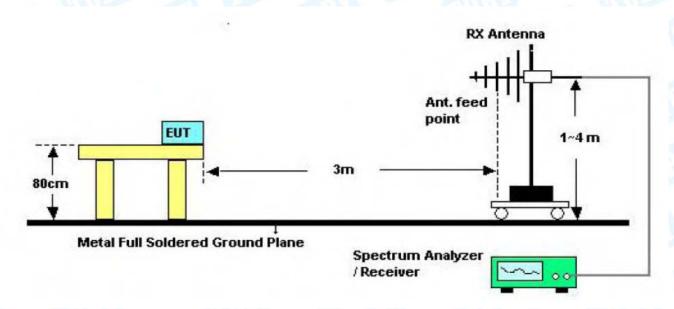


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5.2 Test Setup

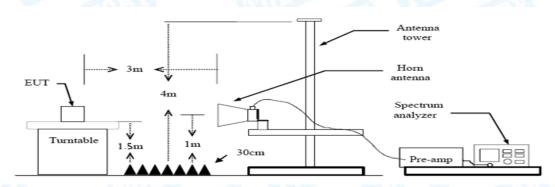


Bellow 30MHz Test Setup



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 kHz with Peak Detector for Average Values.

Test data please refer the following pages.



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UT:	1 /4 / 1	oth Subwoofe ker Box)		Model Name	e :	CS-P80A150V4BB	
emperature:	25 °C			Relative Hu	elative Humidity: 55%		
est Voltage:	DC 12			Relative Hu	imaity.	3370	
nt. Pol.	Horiz		MH II			61	
est Mode:		FSK Mode 2	2402MHz	- CHILL		a W	
emark:		worse case			CHIL!		- 1
0.0 dBuV/m	J,		io roportou				18
					(RF)FCC 15	iC 3M Radiation	
						Margin -6	
30		4					
30						_ 6	
1			2 3		بىيىدى ئىلىدىدى .	5 AMMON AMMON	Hiphan Juneston
mappine my radia			2 3 X X	magalada Malalang Magalang Sayarakhan	MANN MANNEY AT .		
"My medity and	to the property of the second of the second	gardadarin (dayahada aygana dara	Harry Superior Superi				
0							
30.000 40	50 60 70	80	(MHz)	300	400 50	0 600 700	1000.000
		Reading	Correct	Measure-			
No. Mk.	Freq.	Level	Factor	ment	Limit	O∨er	
	MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detecto
1 3	5.4993	28.54	-17.37	11.17	40.00	-28.83	peak
2 1	53.7385	31.28	-20.92	10.36	43.50	-33.14	peak
3 19	91.7450	31.38	-20.81	10.57	43.50	-32.93	peak
4 30	00.3672	33.99	-17.07	16.92	46.00	-29.08	peak
5 5	56.7744	27.97	-10.12	17.85	46.00	-28.15	peak
6 * 6	77.5798	27.73	-7.48	20.25	46.00	-25.75	peak
*:Maximum data	x:Over limit	!:over margin					



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EUT:	Bluetoc (Speak	oth Subwoofer er Box)	a W	Model Nam	e :	CS-P80A1	50V4BBT
Temperature:	25 ℃	" WITT		Relative Hu	Relative Humidity: 55%		
Test Voltage:	DC 12	:V	THE STATE OF		I BH		1
Ant. Pol.	Vertica	al			3		الماليا
Test Mode:	TX GF	SK Mode 2	402MHz	Millian			6
Remark:	Only v	vorse case is	s reported)	BILL		31 Y
80.0 dBuV/m							
-20 30.000 40 50			2 X M _M M _M	3 *************************************	ar for a serving or the sta	5C 3M Radiation Margin -6	1000.000
No. Mk. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	ИНz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 30.	1054	25.31	-14.03	11.28	40.00	-28.72	peak
2 125	.4457	29.79	-22.33	7.46	43.50	-36.04	peak
3 250	.3012	30.19	-18.11	12.08	46.00	-33.92	peak
	.2241	33.33	-17.14	16.19	46.00	-29.81	peak
	.8882	27.60	-10.40	17.20	46.00	-28.80	peak
6 * 737	.0714	27.81	-7.11	20.70	46.00	-25.30	peak
*:Maximum data	x:Over limit	!:over margin	-				



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UT:				tooth eaker		owoofe)	r	Model	Name	:	CS-F	980A15	50V4BE
empei	rature):	25		Вох			Relativ	ve Hur	nidity:	ty: 55%		
est Vo			DC	12V	,		CITI I	733		4/7			A
nt. Po			Hor	izon	tal		1000	A.	100				V
est Mo	ode:		TX	π /4	I-DC	PSK	Mode 240	2MHz	7				
Remark	K :		Onl	y wc	orse	case	is reported	t		OND.			1
30.0 dBu	V/m												
										(RF)FCC	15C 3M Ra		
											Ma	argin -6 d	В
-	_				4								
30					_		2 3	4	,				
					1		XX	i x	5 *	5		and the same of th	marriage 4
h					×	1	//////	M. Jane	المليم السالم	Mary Northead Mary No.	. N. of the September of		
Kapaliter Hance	Mary wald	والمعروب والمعمود وا	الإيلام	and the	سيبسيا	Muhalla	with the work of	Way-up Apple	· Opcor				
		TOPIC SHATE											
30.000	40	50	60 7	0 80	<u> </u> 		(MHz)		300	400 5	500 600	700	1000.00
No.	Mk.	Fre	eq.		ceac Lev	ding 'el	Correct Factor	Measu men		Limit	Ove	er	
		MH			dBu		dB/m	dBuV.		dBuV/m	dE	3 [Detector
1		85.29	980		37.	51	-22.97	14.5	54	40.00	-25	.46	peak
2	*	177.5	5092		46.	20	-20.72	25.4	18	43.50	-18	.02	peak
3		191.7	450		45.8	89	-20.81	25.0)8	43.50	-18		peak
4	:	272.2	2776		42.	37	-17.63	24.7	74	46.00	-21	.26	peak
5	:	297.2	2241		37.	37	-17.14	20.2	23	46.00	-25	.77	peak
6	;	361.7	7139		33.	26	-14.54	18.7	′2	46.00	-27	.28	peak



Bluetooth Subwoofer EUT: CS-P80A150V4BBT **Model Name:** (Speaker Box) Temperature: 25 ℃ **Relative Humidity:** 55% **DC 12V Test Voltage:** Ant. Pol. Vertical Test Mode: TX π/4-DQPSK Mode 2402MHz Remark: Only worse case is reported dBuV/m (RF)FCC 15C 3M Radiation Margin -6 dB 30 (MHz) 1000.000 30.000 60 70 80 400 500 600 700 Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor m ent MHz $dBu\,V$ dBuV/m dBuV/m dΒ Detector dB/m 30.1054 26.43 -14.03 12.40 -27.60 1 40.00 peak 2 34.6385 28.05 -16.84 11.21 40.00 -28.79 peak 3 191.7450 36.90 -20.81 16.09 43.50 -27.41 peak 4 37.74 -25.62 212.2695 -19.8617.88 43.50 peak 5 231.7179 34.86 -18.99 15.87 46.00 -30.13 peak 6 510.0436 27.12 -11.07 16.05 46.00 -29.95peak *:Maximum data x:Over limit !:over margin **Emission Level= Read Level+ Correct Factor**



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	Bluetooth Subwoofer (Speaker Box) Model Name :		CS-P80A150V4BB7				
Faa.	(Spear			Relative Humidity: 55%			18170
Temperature:	DC 12			Relative F	iumiaity:	55%	
Test Voltage:			- talin		4 M		
Ant. Pol.	Horiz				7.3	- W	11
Test Mode:			le 2402 MH				_ 6
Remark:	Only	worse case	is reported		HALL		
80.0 dBuV/m							
					(RF)FCC 1	5C 3M Radiation Margin -6	
						margin -o	
30							
	3 4			6		بريالها المساورة	what
* 2 * **	Ž Ž	5 1.4 y X		X .	. something high my	Algorithidae Adalanda Islanda	
May proposition	al limby, A	An HARMANIAN WATER	Magazitespangggbbo/2 gadibb	hapanduningan hadal	porter production of the second		
20 30.000 40 50	60 70	80	(MHz)	300) 400 5	600 600 700	1000.000
							1000.000
Na Mia Eu		Reading	Correct	Measure-	Limit	O∨er	
No. Mk. Fre		Level	Factor	ment			_
MH	1z 	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1 * 30.10	054	29.48	-14.03	15.45	40.00	-24.55	peak
2 37.28	855	32.13	-18.47	13.66	40.00	-26.34	peak
3 59.23	325	38.99	-24.51	14.48	40.00	-25.52	peak
4 72.84	466	37.99	-23.52	14.47	40.00	-25.53	peak
5 109.0	286	33.34	-21.86	11.48	43.50	-32.02	peak
6 230.0	985	35.15	-19.06	16.09	46.00	-29.91	peak
*Maximum d-t-)		_				
*:Maximum data x:C	over limit	!:over margin					
Emission Level=	Read I	_evel+ Cor	rect Factor	r			

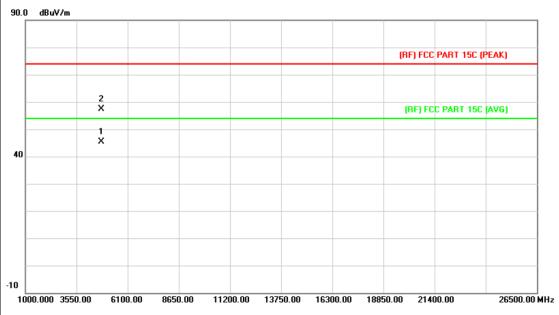


Bluetooth Subwoofer EUT: CS-P80A150V4BBT **Model Name:** (Speaker Box) Temperature: 25 ℃ 55% **Relative Humidity: DC 12V Test Voltage:** Ant. Pol. Vertical Test Mode: TX 8-DPSK Mode 2402MHz Remark: Only worse case is reported 80.0 dBuV/m (RF)FCC 15C 3M Radiation Margin -6 dB agestral-ductor, specifical property and the consensation of the configuration of the configu 30.000 60 70 80 (MHz) 400 500 600 700 1000.000 Correct Reading Measure-Limit Over No. Mk. Freq. Level Factor ment dBuV MHz dBuV/m dBuV/m ďΒ Detector dB/m 30.3173 29.52 -14.15 15.37 -24.63 1 40.00 peak 2 36.8953 33.96 -18.2315.73 40.00 -24.27 peak 3 49.5328 36.66 -24.20 12.46 40.00 -27.54 peak 37.04 -23.49-26.454 73.6170 13.55 40.00 peak 5 104.1701 35.86 -21.84 14.02 43.50 -29.48peak 6 616.3718 27.32 -8.84 18.48 46.00 -27.52peak *:Maximum data x:Over limit !:over margin **Emission Level= Read Level+ Correct Factor**



Page: 22 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V	W _	U				
Ant. Pol.	Horizontal						
Test Mode:	TX GFSK Mode 2402MHz	a Vision					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						
00.0 10.41							

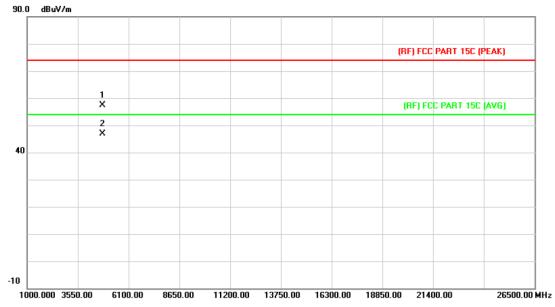


No	. Mk	. Freq.	_		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4804.010	31.94	13.44	45.38	54.00	-8.62	AVG
2		4804.326	43.94	13.44	57.38	74.00	-16.62	peak



Page: 23 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V						
Ant. Pol.	Vertical						
Test Mode:	TX GFSK Mode 2402MHz	I VIII	51				
Remark:	No report for the emission value prescribed limit.	which more than 10 dl	3 below the				

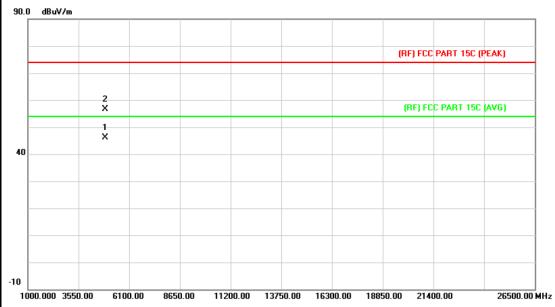


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.967	43.89	13.44	57.33	74.00	-16.67	peak
2	*	4804.066	33.55	13.44	46.99	54.00	-7.01	AVG



Page: 24 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 12V	DC 12V						
Ant. Pol.	Horizontal	- Till						
Test Mode:	TX GFSK Mode 2441MHz	a University						
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							

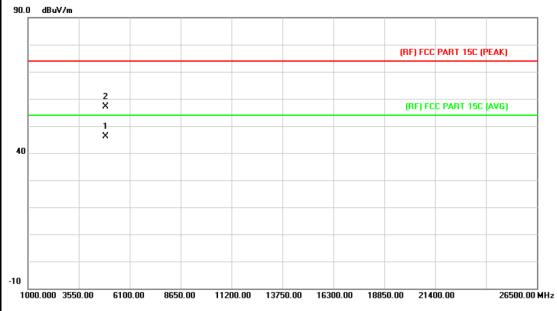


N	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.941	32.25	13.90	46.15	54.00	-7.85	AVG
2		4881.950	42.76	13.90	56.66	74.00	-17.34	peak



Page: 25 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V						
Ant. Pol.	Vertical						
Test Mode:	TX GFSK Mode 2441MHz	1	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	*	4881.529	32.33	13.90	46.23	54.00	-7.77	AVG
2		4882.121	43.30	13.90	57.20	74.00	-16.80	peak



Report No.: TB-FCC146324
Page: 26 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name : CS-P80A150				
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V	U STATE OF THE STA				
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2480MHz	A VICE				
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	*	4959.818	32.37	14.36	46.73	54.00	-7.27	AVG
2		4960.156	43.78	14.36	58.14	74.00	-15.86	peak



Report No.: TB-FCC146324
Page: 27 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT			
Temperature:	25 ℃	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 of prescribed limit.	which more than 10 dB	below the			

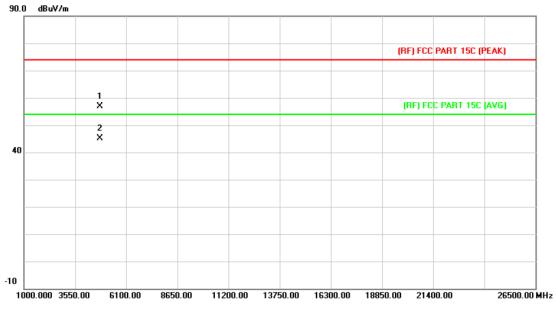


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.714	32.99	14.36	47.35	54.00	-6.65	AVG
2		4960.189	44.31	14.36	58.67	74.00	-15.33	peak



Page: 28 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT					
Temperature:	25 ℃	55%						
Test Voltage:	DC 12V	DC 12V						
Ant. Pol.	Horizontal							
Test Mode:	TX 8-DPSK Mode 2402M	Hz	20					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							
90.0 dRuV/m								

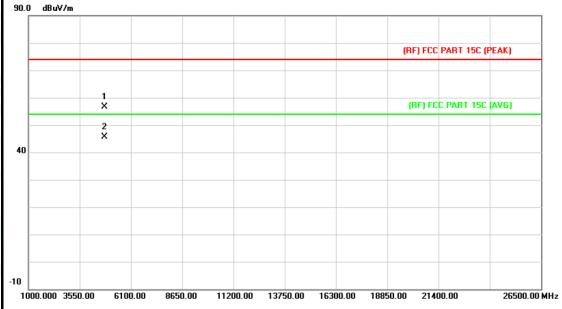


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.994	43.36	13.44	56.80	74.00	-17.20	peak
2	*	4804.418	31.62	13.44	45.06	54.00	-8.94	AVG



Page: 29 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT					
Temperature:	25 ℃	55%						
Test Voltage:	DC 12V	DC 12V						
Ant. Pol.	Vertical	-m:19						
Test Mode:	TX 8-DPSK Mode 2402M	Hz	20					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							
90.0 dRuV/m								

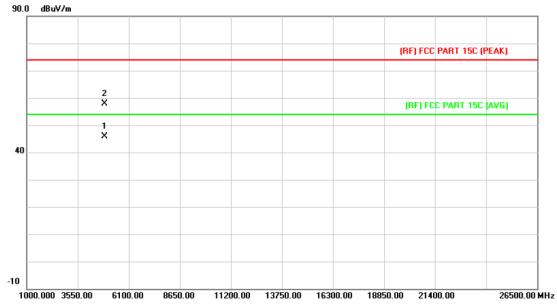


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.997	43.16	13.44	56.60	74.00	-17.40	peak
2	*	4804.488	32.08	13.44	45.52	54.00	-8.48	AVG



Page: 30 of 89

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 12V					
Ant. Pol.	Horizontal	100				
Test Mode:	TX 8-DPSK Mode 2441MI	-lz				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

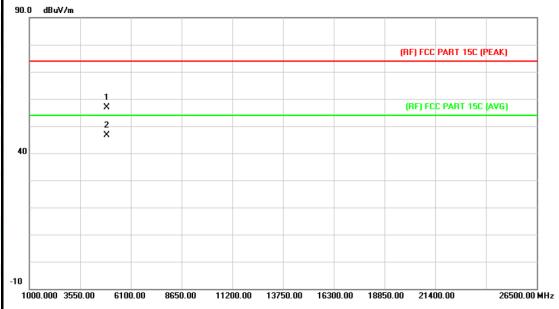


No. Mk.		. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.805	31.92	13.90	45.82	54.00	-8.18	AVG
2		4882.156	43.96	13.90	57.86	74.00	-16.14	peak



Page: 31 of 89

EUT:	Bluetooth Subwoofer	Model Name :	CS-P80A150V4BBT				
Temperature:	(Speaker Box) 25 °C Relative Humidity:		55%				
Test Voltage:	DC 12V						
Ant. Pol.	Vertical						
Test Mode:	TX 8-DPSK Mode 2441MHz	Z					
Remark:	Remark: No report for the emission which more than 10 dB below the						
prescribed limit.							
00.0 10.111							

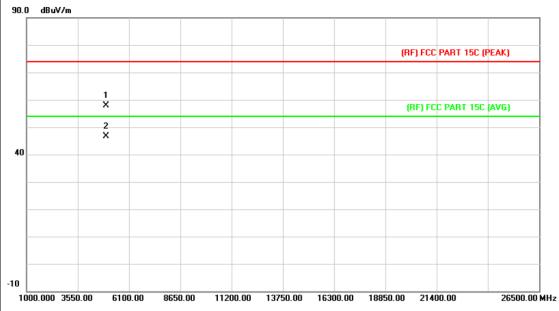


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.469	42.91	13.90	56.81	74.00	-17.19	peak
2	*	4882.497	32.71	13.90	46.61	54.00	-7.39	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V						
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.						

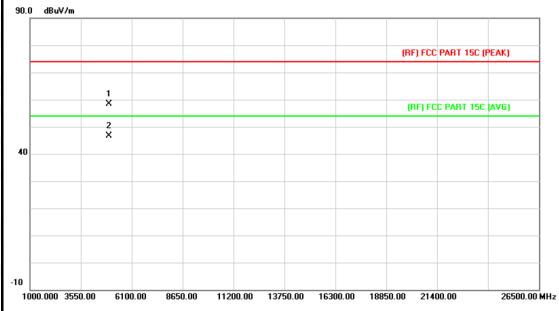


No	. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.705	43.57	14.36	57.93	74.00	-16.07	peak
2	*	4959.816	32.26	14.36	46.62	54.00	-7.38	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage: DC 12V						
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2480MH	z				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					



No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.026	44.09	14.36	58.45	74.00	-15.55	peak
2	*	4960.382	32.22	14.36	46.58	54.00	-7.42	AVG



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6. Restricted Bands Requirement

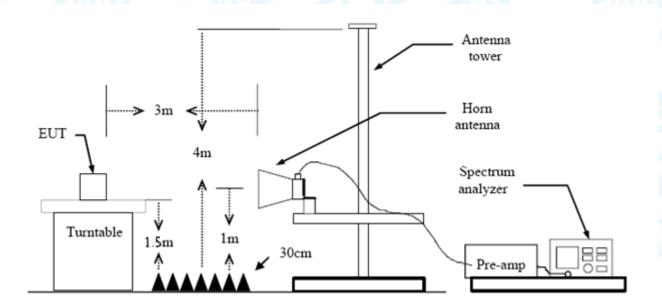
6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	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-FCC146324 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

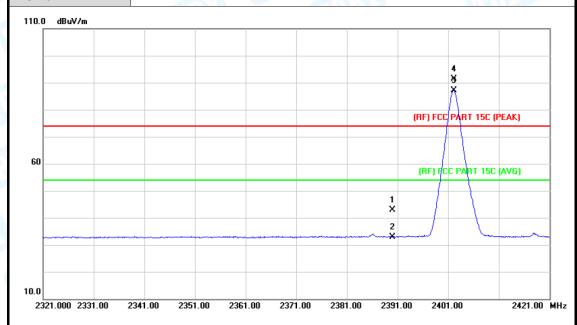
Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=1 KHz with Peak Detector for Average Values.

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



(1) Radiation Test

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 12V	DC 12V					
Ant. Pol.	Horizontal	The same of the sa					
Test Mode:	TX GFSK Mode 2402MHz						
Remark:							

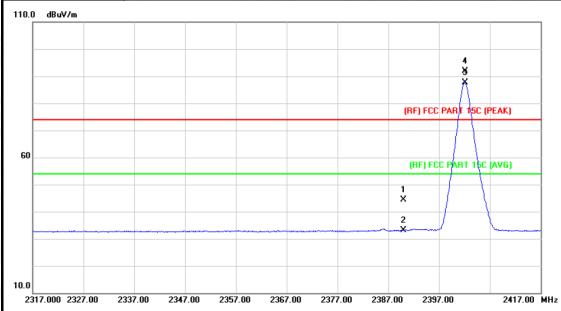


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.19	0.77	42.96	74.00	-31.04	peak
2		2390.000	32.09	0.77	32.86	54.00	-21.14	AVG
3	*	2402.100	86.33	0.82	87.15	Fundamental Frequency		AVG
4	Х	2402.200	90.51	0.82	91.33	Fundamental Frequency		peak



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		- CILIDES
Test Mode:	TX GFSK Mode 2402MHz	The same of	
Remark:	N/A		
110.0 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		2390.000	43.61	0.77	44.38	74.00	-29.62	peak
2		2390.000	32.32	0.77	33.09	54.00	-20.91	AVG
3	*	2402.100	86.74	0.82	87.56	Fundamenta	I Frequency	AVG
4	Х	2402.200	91.05	0.82	91.87	Fundamenta	l Frequency	peak



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal	-m:39	
Test Mode:	TX GFSK Mode 2480 MHz		
Remark:	N/A		
110.0 dBuV/m			
	2		
	K		
			PART 15C (PEAK)

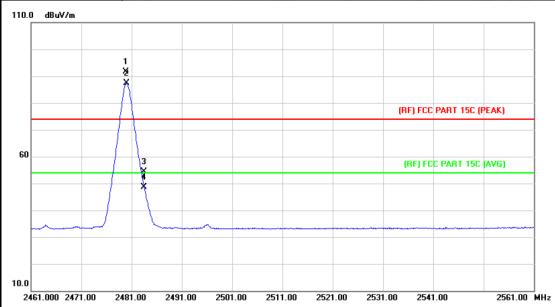
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			- 1	3							(RF) FC	C PART 15C	(AVG)
		-	- }	į.									
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462	2.000 2472	2.00	2482.0	00 24	92.00	2502.0	0 251	2.00	2522.00	2532.0	0 2542	2.00	2562.00

N	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2480.000	84.34	1.15	85.49	Fundamental	Frequency	AVG
2	Х	2480.200	88.70	1.15	89.85	Fundamental	Frequency	peak
3		2483.500	51.93	1.17	53.10	74.00	-20.90	peak
4		2483.500	45.24	1.17	46.41	54.00	-7.59	AVG



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2480 MHz	100	
Remark:	N/A		



No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.800	90.49	1.15	91.64	Fundamental F	requency	peak
2	*	2480.000	86.22	1.15	87.37	Fundamental F	requency	AVG
3		2483.500	53.29	1.17	54.46	74.00	-19.54	peak
4		2483.500	47.49	1.17	48.66	54.00	-5.34	AVG



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≣UT:			1 19 1	ooth Subv aker Box)	voofer		N	lodel	Nam	ne :		CS-	P80A1	50V4	1BB
Temp	eratur	e:	25 °C		MIL		R	elativ	e Ηι	ımidi	ty:	55%			
	/oltag		DC 1	2V		6711		2			1///			A	A
Ant. P	Pol.		Horiz	zontal				1		Ŋ,			611	W	
Test N	/lode:		TX 8	-DPSK I	Mode 2	402M	Hz	AR	7		1	3	W		
Rema	rk:		N/A				13							a	
110.0	dBuV/m														
															7
												3			1
												4			1
										ſŖĘ) FCC F	ART 15	C (PEAK	1	-
										(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		o (i Eriik	,	-
60															
										(F	F) FCC	PART 1	EC (AVG)	-
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10.0															
2317.	000 2327	7.00 2	337.00	2347.00	2357.00	2367.	00	2377.00	238	37.00	2397.	00	2	417.00	МН
				Dandi	(R	1							
No	. Mk.	Fr	eq.	Readi Leve	_	Correct Facto		/leasu men		Lin	nit	O۱	/er		
			Hz	dBu\		dB/m		dBu∀		dBı	ıV/m	-	:B	Dete	ecto
1		2390	.000	42.4	3	0.77		43.2	20	74	.00	-30	08.0	pe	ak
2		2390	.000	32.1	5	0.77		32.9	2	54	.00	-2 ⁻	1.08	Α١	/G
	Χ	2402	.000	89.7	5	0.82		90.5	7	Funda	ament	al Freq	luency	pe	ak
3				83.5		0.82		84.3	-			al Fred		Α١	10



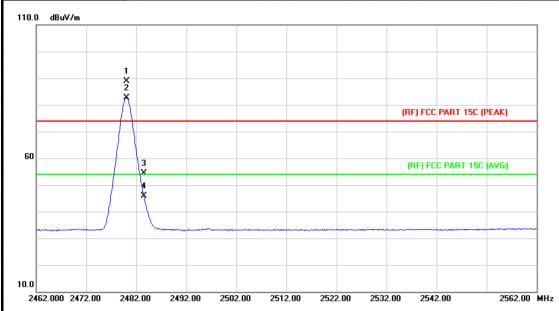
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EUT:			7 /3 /1	ooth Subwoo aker Box)	fer	Mo	odel I	Name	:	CS-	P80A150	V4BBT
Tempe	eratur	e:	25 °C			Re	Relative Humidity:				%	
Test V	oltag	e:	DC 1	2V	677	11/2			a \			
Ant. P	ol.		Verti	cal	1						61	Mill
Test N	lode:		TX 8	-DPSK Mod	de 2402	MHz	N	J. La			10	
Rema	rk:		N/A		(31)	13.5			ON.			
110.0	dBuV/m											
											4	
											X 3	
									(RE)	FCC PAI	RT 15C (PEA)	0
									()	CCTA	II ISC (I EAR	,
60											/ \	
									(RF)	FCC P	ART 15C (AVI	G)
									1 X	$\dashv f$		
									2	+		
									X			
10.0												
2317.0	000 232	7.00 2	337.00	2347.00 23	57.00 2	367.00	2377	.00 2	387.00	2397.00	2	2417.00 MH
				Reading	Corr	ect	Mea	sure-				
No	. Mk	Fr	eq.	Level	Fac	tor	m	ent	Limi	t	Over	
		MH	Hz	dBu∀	dB/i	m	dB	uV/m	dBu∖	//m	dB	Detecto
1		2390	.000	43.12	0.7	7	43	3.89	74.0	00	-30.11	peak
		2390	.000	32.38	0.7	7	33	3.15	54.0	00	-20.85	AVG
2			400	83.91	0.8	2	84	1.73	Fundam	nental l	Frequency	AVG
3	*	2402	.100	00.01								



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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2480MF	НZ	
Remark:	N/A		

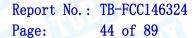


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2480.000	87.82	1.15	88.97	Fundamental	Frequency	peak
2	*	2480.100	81.55	1.15	82.70	Fundamental	Frequency	AVG
3		2483.500	53.17	1.17	54.34	74.00	-19.66	peak
4		2483.500	44.59	1.17	45.76	54.00	-8.24	AVG



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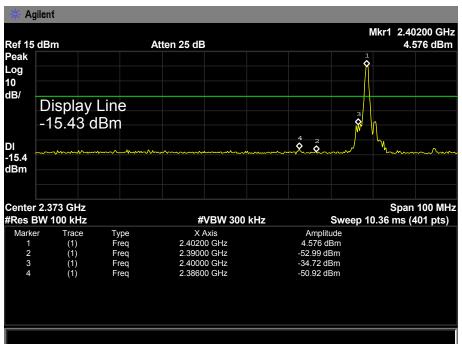
EUT:			1 1 1 1 1	ooth Subwaker Box)	oofer	Мо	del Nam	ie:	CS-P80A1	50V4BBT
Tempe	eratu	re:	25 °	C	A STATE OF THE PARTY OF THE PAR	Rel	ative Hu	ımidity:	55%	
Test V	oltag	e:	DC	12V	511	Mills	ر الا	2 W		
Ant. P	ol.		Vert	ical	W F			13	_ (1)	
Test N	lode:		TX 8	B-DPSK N	/lode 2480	MHz	MA		28 6	
Rema	rk:		N/A		mn)	33		EM)		1
110.0 d	BuV/m									
			1							
			1 X 2 X							
			\wedge					(RF) FCC	PART 15C (PEA	K)
								. ,	ì	
60			_\							
_		 	3 X					(RF) FC	C PART 15C (AV	G)
			*							
			$+ \downarrow$							
10.0										
2461.0	000 247	1.00 2	481.00	2491.00	2501.00 25	11.00 2	2521.00 2	531.00 254	1.00	2561.00 MH
				Readir			easure-		_	
No.	Mk.	. Fr	eq.	Leve	I Fact	tor	ment	Limit	O∨er	
		MH	Ηz	dBu∀	dB/m	1	dBuV/m	dBuV/n	n dB	Detecto
1	Χ	2479.	.900	89.13	3 1.15	5	90.28	Fundamen	tal Frequency	peak
'						_	20.05	F	tal Frequency	AVG
2	*	2480	.000	82.70	1.18	•	83.85	Fundamen	tal Frequency	,,,,
	*	2480 2483		82.70 53.35			54.52	74.00		

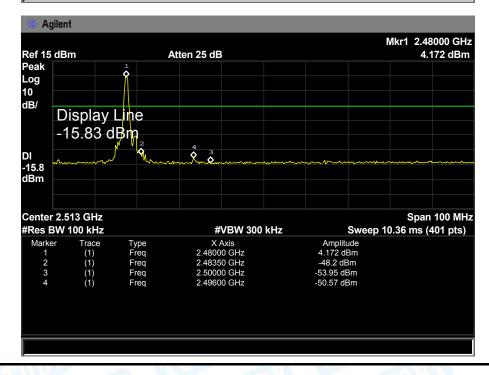




(2) Conducted Test

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX GFSK Mode 2402MHz / 2480 MHz		
Remark:	N/A		









EUT:

Bluetooth Subwoofer (Speaker Box)

Temperature:

25 °C

Relative Humidity:

55%

Test Voltage:

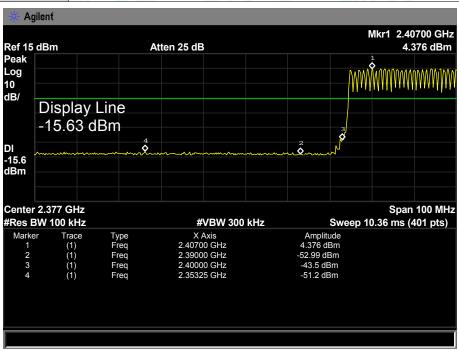
DC 12V

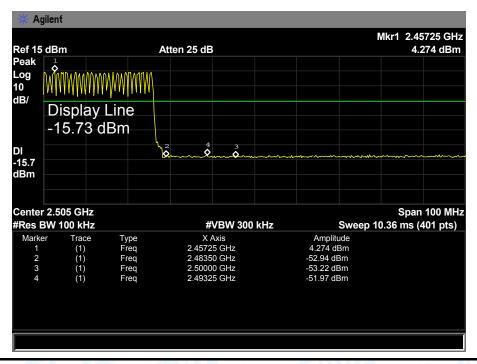
Test Mode:

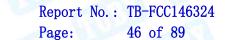
GFSK Hopping Mode

Remark:

N/A









EUT:

Bluetooth Subwoofer (Speaker Box)

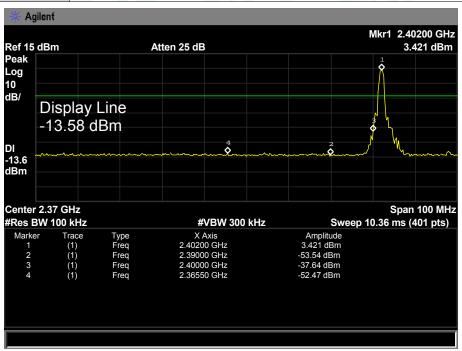
Temperature: 25 °C

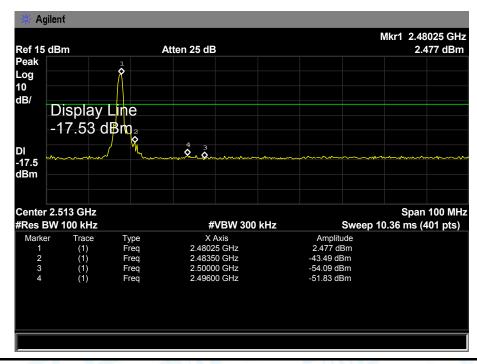
Relative Humidity: 55%

Test Voltage: DC 12V

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

Remark: N/A









EUT:

Bluetooth Subwoofer (Speaker Box)

Temperature:

25 °C

Relative Humidity:

55%

Test Voltage:

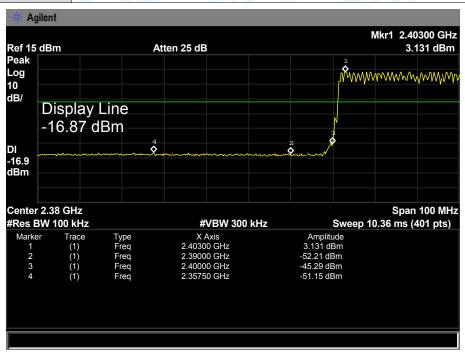
DC 12V

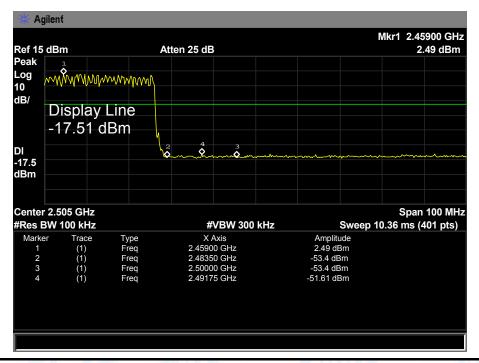
Test Mode:

8-DPSK Hopping Mode

Remark:

N/A







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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



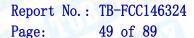
7.3 Test Procedure

- (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





EUT:

Bluetooth Subwoofer (Speaker Box)

Model Name:

CS-P80A150V4BBT

Temperature:

25 °C

Relative Humidity:

55%

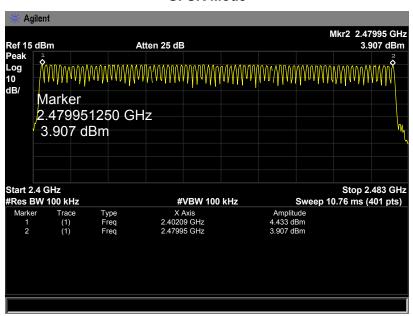
Test Voltage:

DC 12V

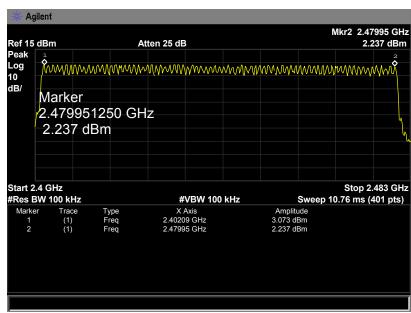
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
2402MHz~2480MHz	79	\1E
2402IVIII12~240UIVIII12	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.

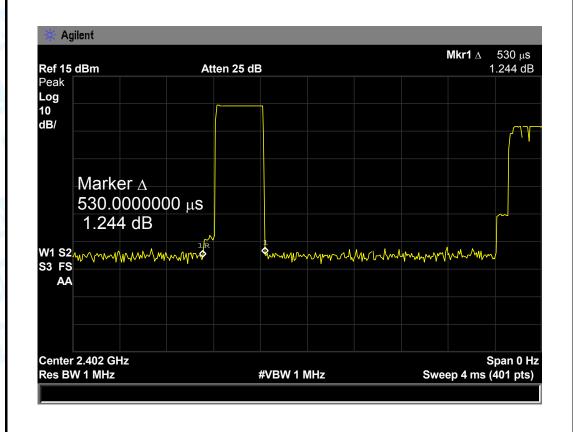


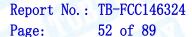
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8.5 Test Data

EUT:		Bluetooth S (Speaker B		Model Name :		CS-P80A150V4BBT
Temperature	Temperature: 25 ℃		Z OH	Relative Hum	idity:	55%
Test Voltage:		DC 12V				
Test Mode: Hopping Mode (GFSK DH1)						
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		0.530	169.60			
2441		0.530	169.60	31.60	400	PASS
2480		0.540	172.80			
			CECK Hanning	Mada DU4		

GFSK Hopping Mode DH1







0.986 dB

W1 S2 S3 FS AA

Center 2.48 GHz

Res BW 1 MHz

GFSK Hopping Mode DH1 2441 MHz Agilent Mkr1 Δ 530 μ s Ref 15 dBm -1.181 dB Atten 25 dB Peak Log 10 dB/ Marker A 530.0000000 μs -1.181 dB W1 S2mmy/hmpm my many mander of the second o S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts) **GFSK Hopping Mode DH1** 2480 MHz Agilent Mkr1 Δ 540 μs Ref 15 dBm 0.986 dB Atten 25 dB Peak Log 10 dB/ Marker ∆ 540.0<mark>000000 μs</mark>

of manufacture and a supply of the supply of

#VBW 1 MHz

& many many

Sweep 4 ms (401 pts)

Span 0 Hz

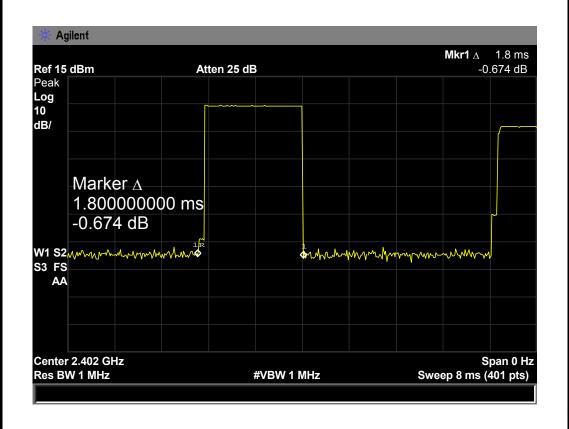


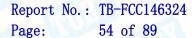
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	Hopping Mode (GFSK DH	3)	

rest widge.	1 lopping i	vious (Of OK Diti	0)		
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.800	288.00			
2441	1.820	291.20	31.60	400	PASS
2480	1.800	288.00			

GFSK Hopping Mode DH3







GFSK Hopping Mode DH3 2441 MHz Agilent **Mkr1** Δ 1.82 ms Ref 15 dBm Atten 25 dB 3.443 dB Peak Log 10 dB/ Marker ∧ 1.820000000 ms 3.443 dB W1 S2<mark>™</mark> S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 8 ms (401 pts) **GFSK Hopping Mode DH3**

2480 MHz Agilent Mkr1 \triangle 1.8 ms Ref 15 dBm Atten 25 dB 2.227 dB Peak Log 10 dB/ Marker ∆ 1.800000000 ms 2.227 dB W1 S2 my mande my mander and S3 FS AΑ Center 2.48 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 8 ms (401 pts)



2441

2480

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PASS

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EUT:		Bluetooth S (Speaker B		Model Name	:	CS-P80A150V4BBT
Temperature:		25 ℃	A TOP SOME	Relative Hum	idity:	55%
Test Voltage:		DC 12V	0.11	ور الزان	I WIN	
Test Mode:		Hopping I	Mode (GFSK DH	5)	3	W. Carrier
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Nesuit
2402		3.060	326.40			

GFSK Hopping Mode DH5

326.40

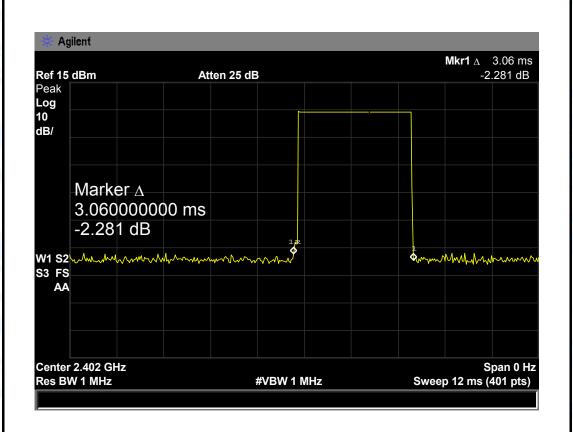
326.40

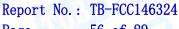
31.60

400

3.060

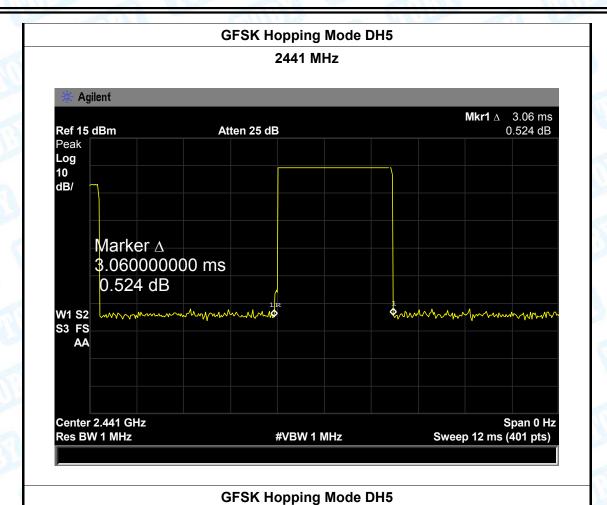
3.060

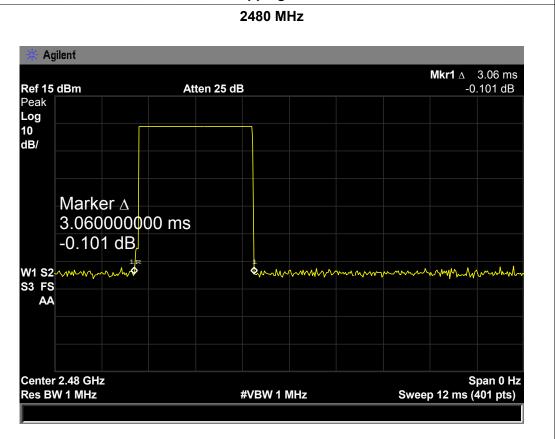






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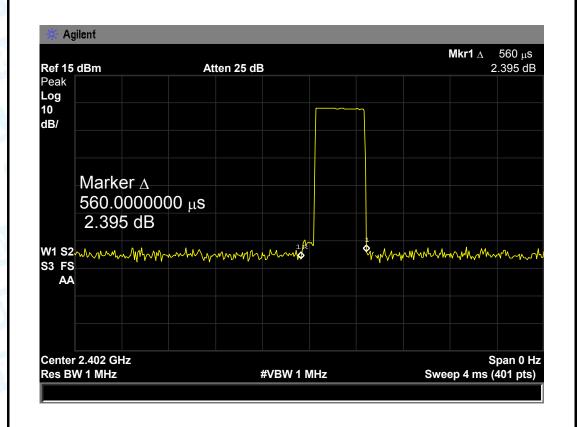


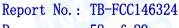
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 12V			
Test Mode:	Hopping Mode (π /4-DQPSK DH1)			

				1	
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	0.560	179.20			
2441	0.550	176.00	31.60	400	PASS
2480	0.550	176.00			

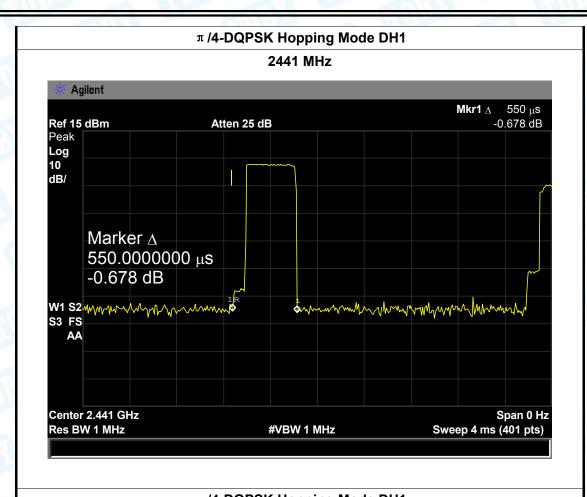
 π /4-DQPSK Hopping Mode DH1



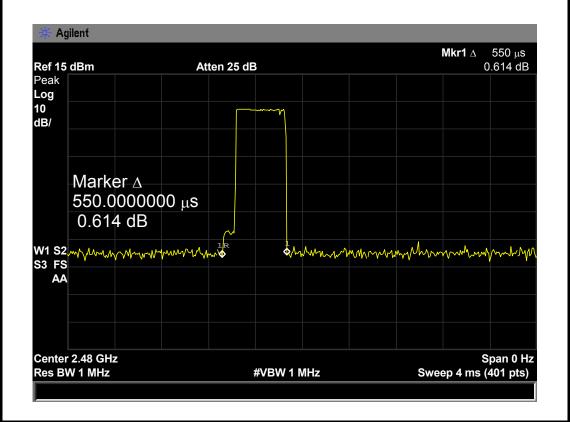




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π /4-DQPSK Hopping Mode DH1 2480 MHz



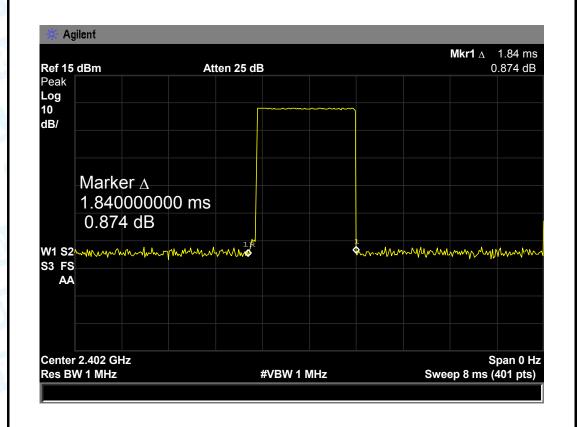


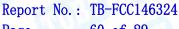
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	Hopping Mode (π /4-DQP	SK DH3)	

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.840	294.40			
2441	1.820	291.20	31.60	400	PASS
2480	1.820	291.20			

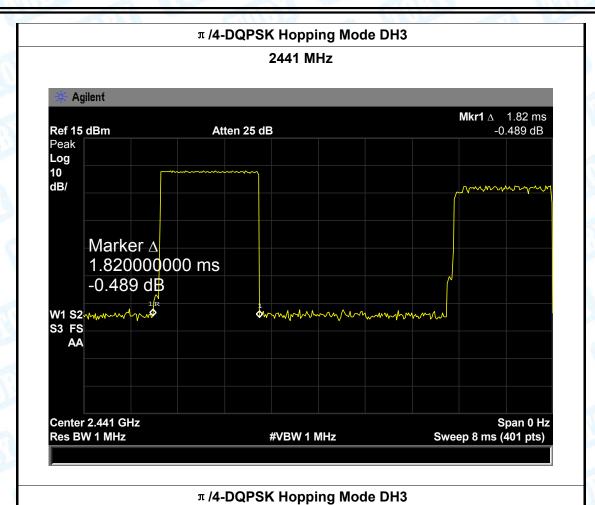
π /4-DQPSK Hopping Mode DH3

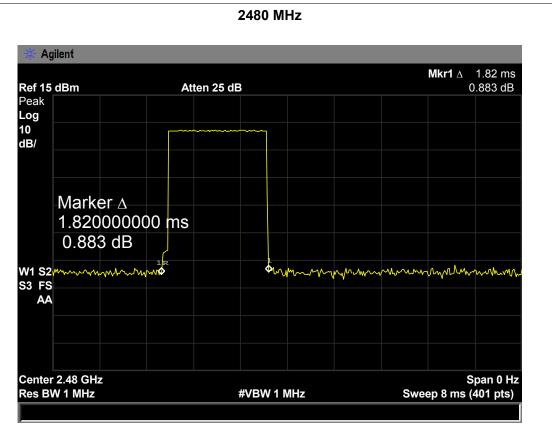






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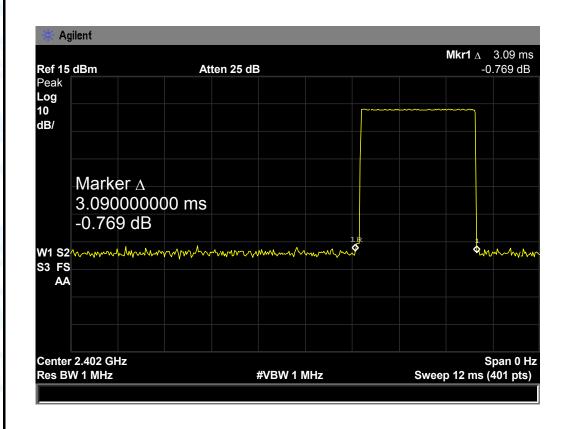


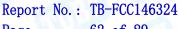
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 12V			
Test Mode:	Hopping Mode (π /4-DQPSK DH5)			

rest mode.	1 lopping i	- William			
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Popult
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.090	329.60			
2441	3.090	329.60	31.60	400	PASS
2480	3.090	329.60			

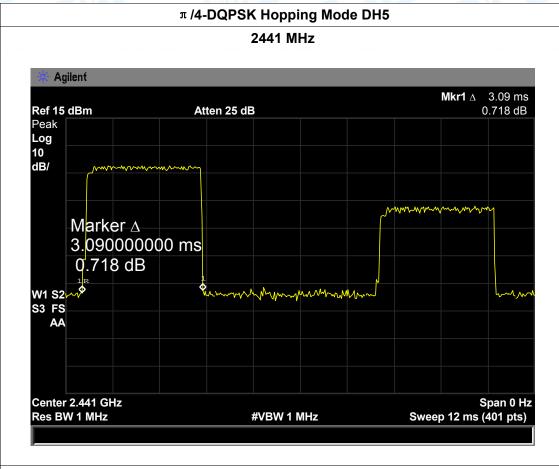
 π /4-DQPSK Hopping Mode DH5

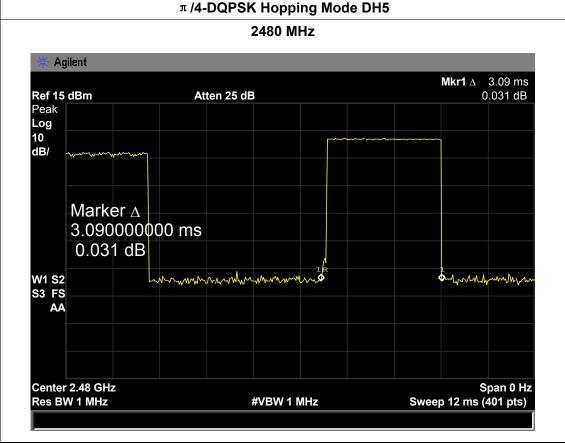






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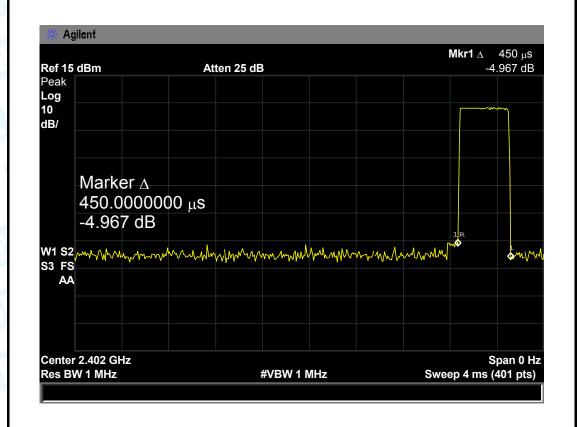


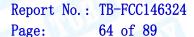
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(MHz)		(ms)	(ms)	(s)	(ms)	Result
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
Test Mode:		Hopping I	Hopping Mode (8-DPSK DH1)			
Test Voltage:		DC 12V	THE PARTY	مر الزار	I WILL	
Temperature:		25 ℃	A LOS	Relative Hum	idity:	55%
EUT:		Bluetooth S (Speaker B		Model Name :		CS-P80A150V4BBT

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

8-DPSK Hopping Mode DH1

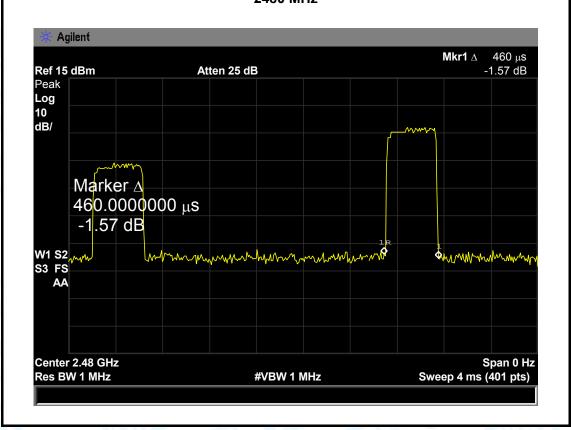






8-DPSK Hopping Mode DH1 2441 MHz Agilent Mkr1 Δ 450 μ s -0.035 dB Ref 15 dBm Atten 25 dB Peak Log 10 dB/ Marker ∆ 450.0000000 μs -0.035 dB S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts)

8-DPSK Hopping Mode DH1 2480 MHz



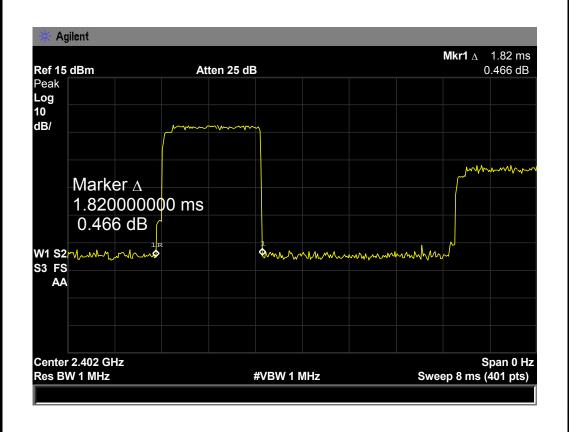


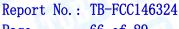
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	Hopping Mode (8-DPSK D	H3)	

Channel	Pulse Time	Total of Dwell	Period Time	Limit	
					Result
(MHz)	(ms)	(ms)	(s)	(ms)	
2402	1.820	291.20			
2441	1.820	291.20	31.60	400	PASS
2480	1.840	294.40			

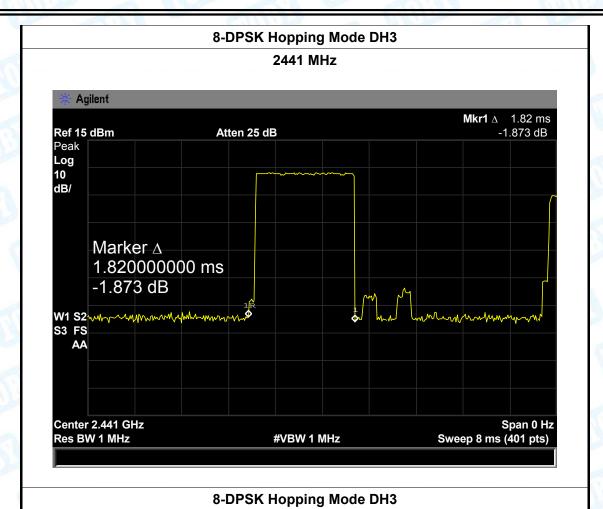
8-DPSK Hopping Mode DH3

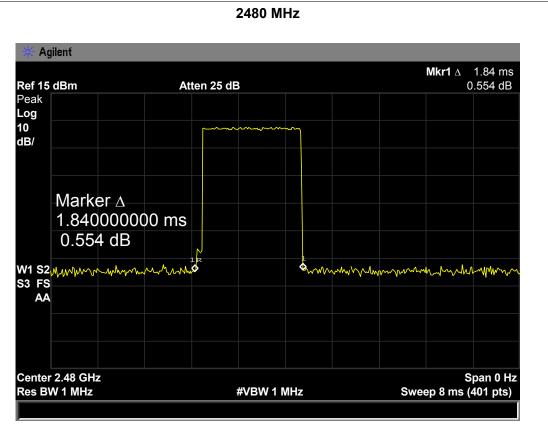






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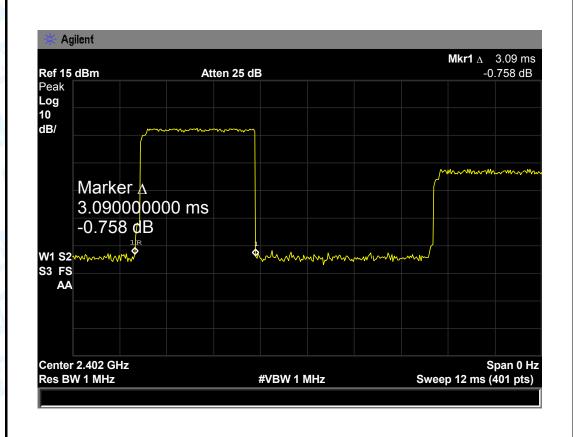


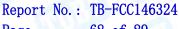
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Cł	hannel	Pu	Ise Time	Total of Dwell	Period Time	Limit	
Test	t Mode:		Hopping N	Mode (8-DPSK D	H5)		
Test	t Voltage:		DC 12V			All	
Tem	perature:		25 ℃	THE PARTY OF	Relative Hum	idity:	55%
EUT	ī:		Bluetooth S (Speaker B		Model Name		CS-P80A150V4BBT

Channel	Pulse Time	Total of Dwell	Period Time	Limit	
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.090	329.60			
2441	3.090	329.60	31.60	400	PASS
2480	3.090	329.60			

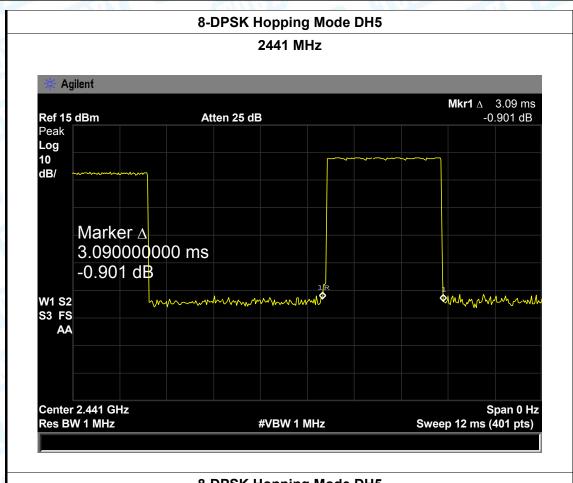
8-DPSK Hopping Mode DH5

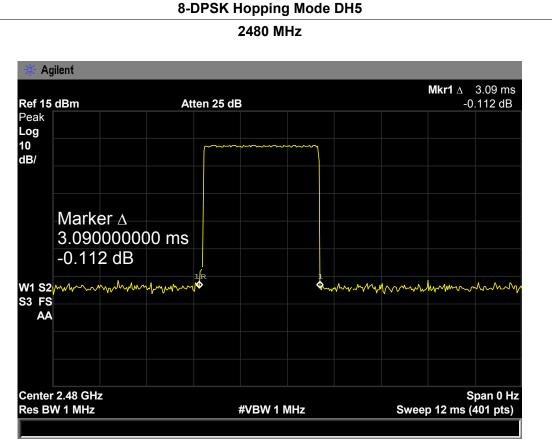






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9. Channel Separation and Bandwidth Test

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.



2441

2480

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9.5 Test Data

EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 12V				
Test Mode:	TX Mode (GFSK)				
Channel frequence (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)		
2402	826.8354	855.981			

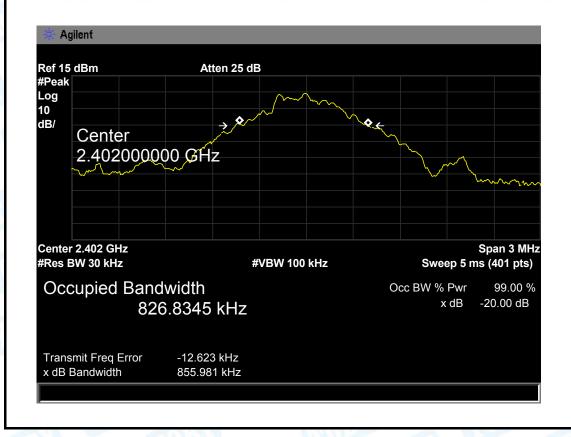
GFSK TX Mode

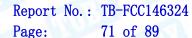
851.540

851.905

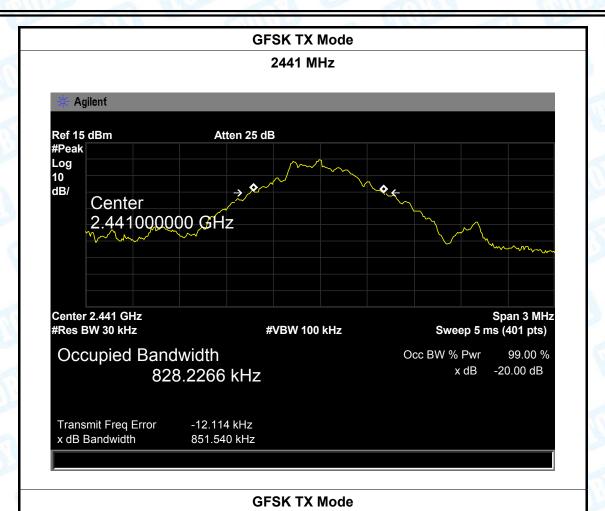
828.2266

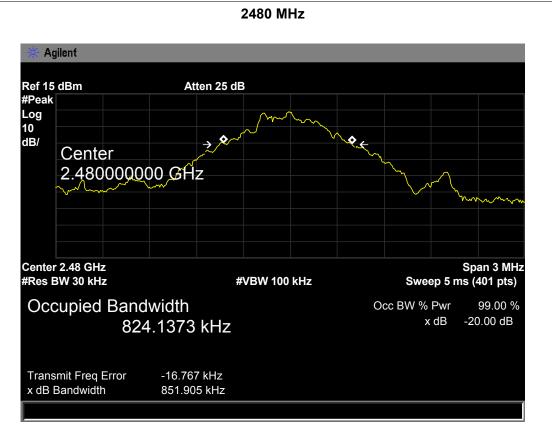
813.1373













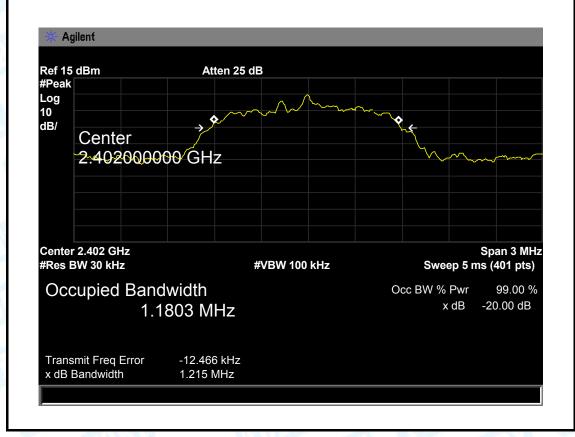
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: ΤΧ Mode (π /4-DQPSK)

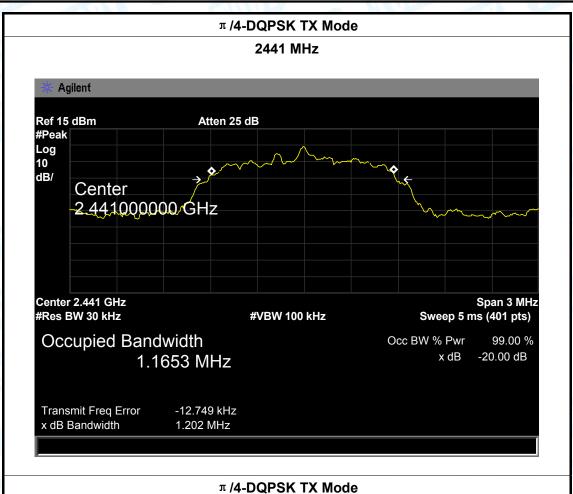
Channel frequency (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402	1180.30	1215.00	810.00
2441	1165.30	1202.00	801.33
2480	1160.20	1208.00	805.33

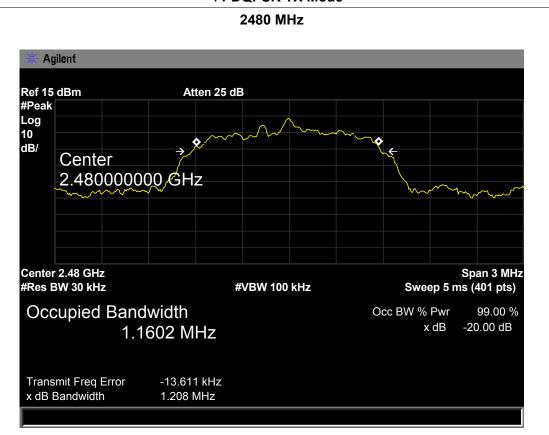
π/4-DQPSK TX Mode













2441

2480

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806.67

810.67

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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX Mode (8-DPSK)		
Channel frequence	99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	1164.40	1213.00	808.67

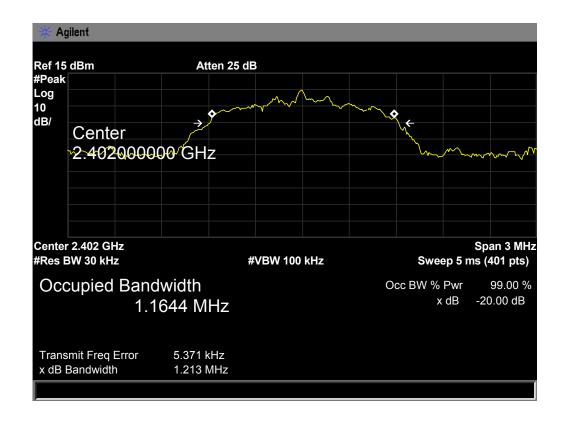
8-DPSK TX Mode 2402 MHz

1210.00

1216.00

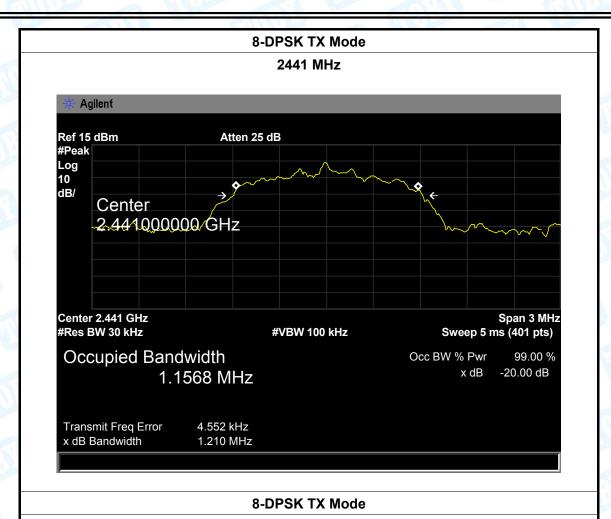
1156.80

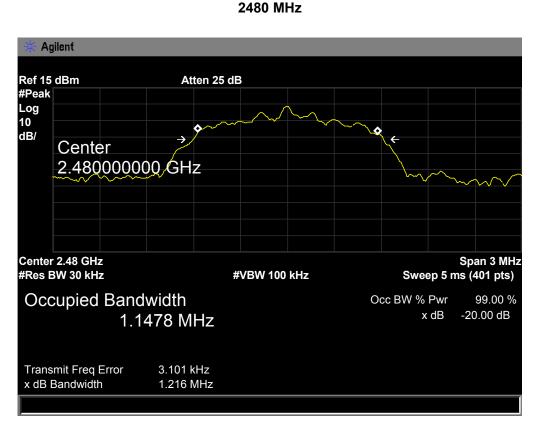
1147.80













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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

lest voltage: DC 12V

Test Mode: Hopping Mode (GFSK)

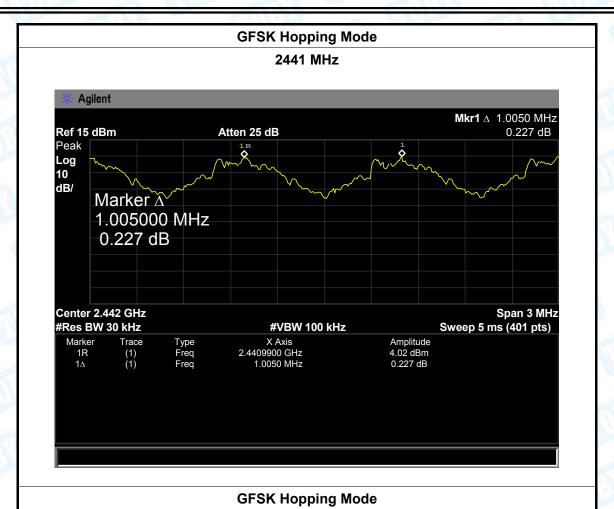
Channel frequency (MHz)	Separation Read Value	Separation Limit
	(kHz)	(kHz)
2402	1005.00	855.981
2441	1005.00	851.540
2480	1005.00	851.905

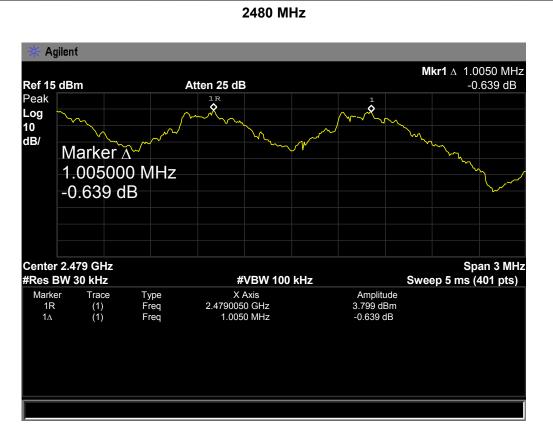
GFSK Hopping Mode













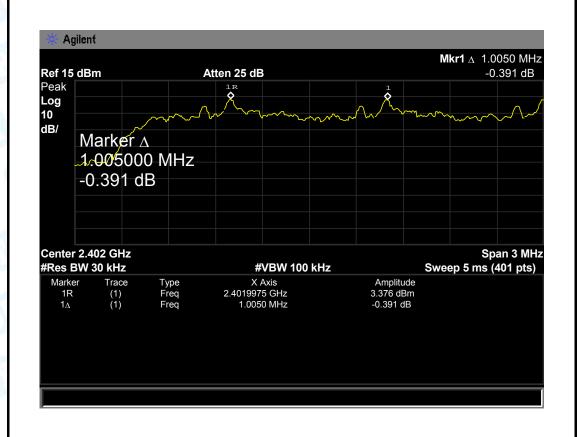
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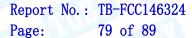
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: Hopping Mode (π /4-DQPSK)

Channel frequency (MHz)	Separation Read Value	Separation Limit	
	(kHz)	(kHz)	
2402	1005.00	810.00	
2441	1005.00	801.33	
2480	1005.00	805.33	

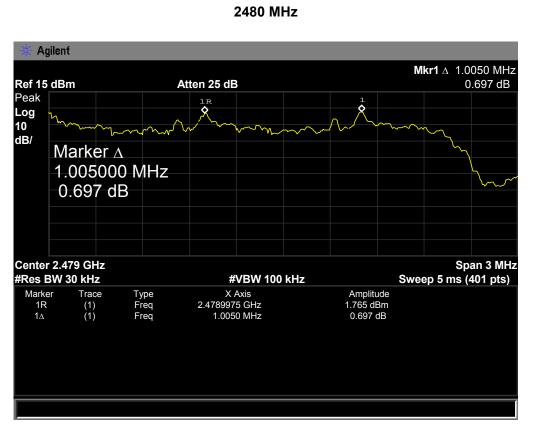
π /4-DQPSK Hopping Mode













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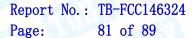
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: Hopping Mode (8-DPSK)

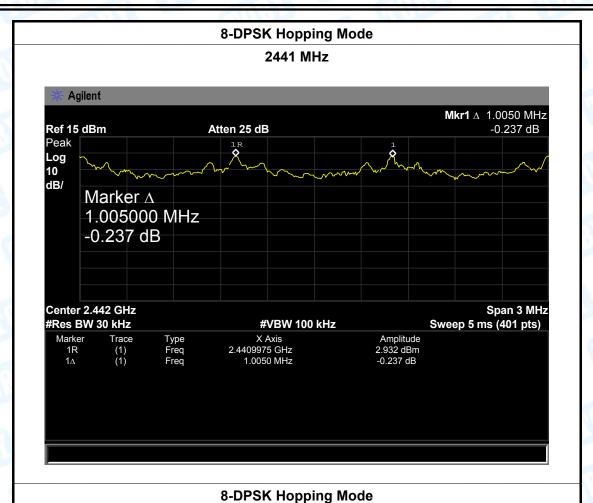
Channel frequency (MHz)	Separation Read Value	Separation Limit
()	(kHz)	(kHz)
2402	1005.00	808.67
2441	1005.00	806.67
2480	1005.00	810.67

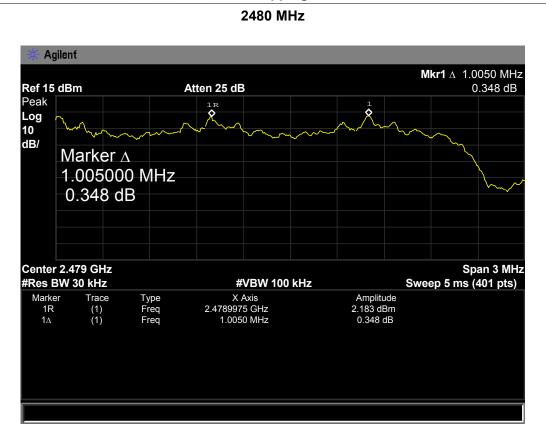
8-DPSK Hopping Mode













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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)
Pook Output Power	Hopping Channels>75	2400~2483.5
Peak Output Power	Power<1W(30dBm) Other <125 mW(21dBm)	2400~2463.5

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

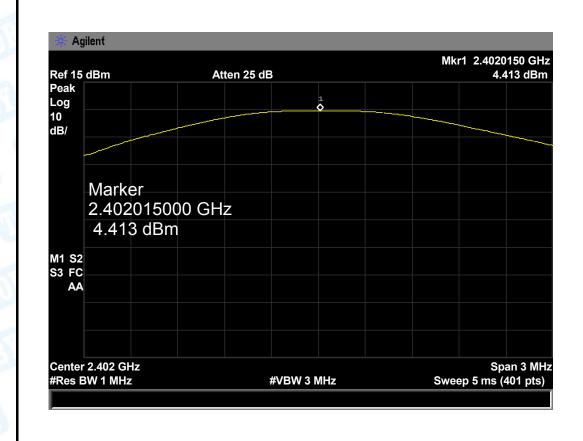
The EUT was set to continuously transmitting in the max power during the test.

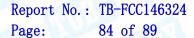


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10.5 Test Data

			MA 28 1		
EUT:	Bluetooth S (Speaker Be		Model Nam	ie :	CS-P80A150V4BBT
Temperature:	25 ℃		Relative Hu	ımidity:	55%
Test Voltage:	DC 12V		Charles		13
Test Mode:	TX Mode (GFSK)			AMA	
Channel frequen	nnel frequency (MHz) Test Result		(dBm)	L	imit (dBm)
2402		4.413			
2441		4.403			30
2480		4.093			
		GFSK TX I	Mode		

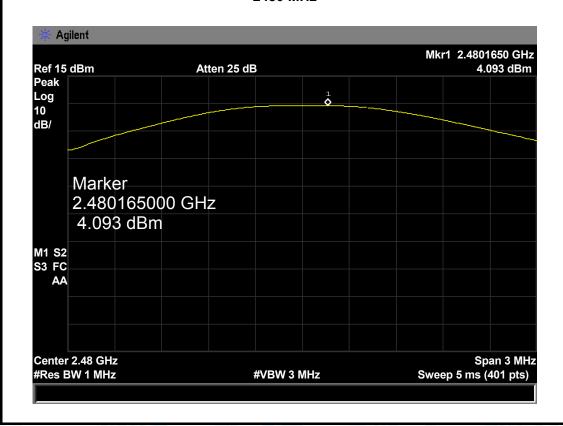






GFSK TX Mode 2441 MHz Agilent Mkr1 2.4410000 GHz Ref 15 dBm 4.403 dBm Atten 25 dB Peak Log 10 dB/ Marker 2.441000000 GHz 4.403 dBm M1 S2 S3 FC AA Center 2.441 GHz Span 3 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 5 ms (401 pts)

GFSK TX Mode





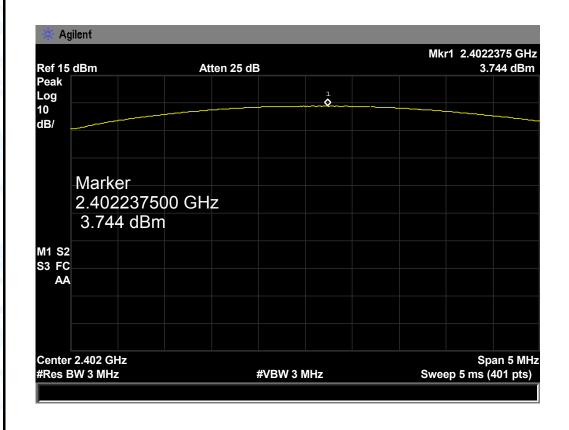
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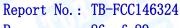
EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		

Test Mode: ΤΧ Mode (π /4-DQPSK)

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.744	
2441	3.621	21
2480	3.011	

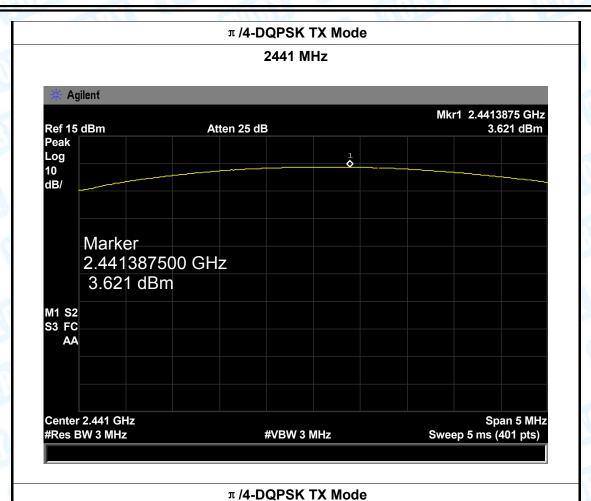
π /4-DQPSK TX Mode

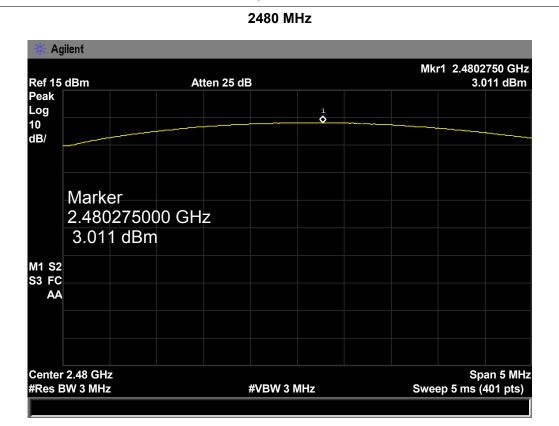






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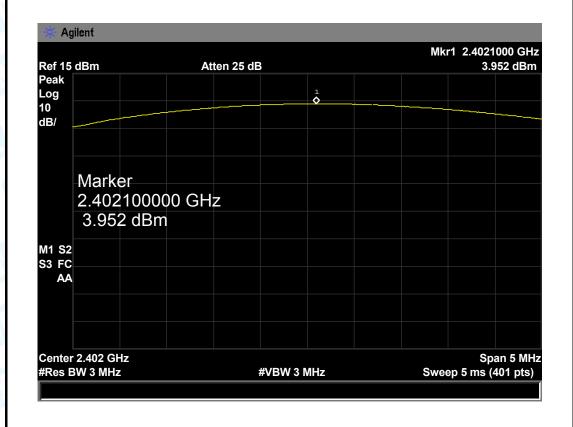


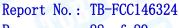
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EUT:	Bluetooth Subwoofer (Speaker Box)	Model Name :	CS-P80A150V4BBT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX Mode (8-DPSK)		

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.952	
2441	3.847	21
2480	3.355	

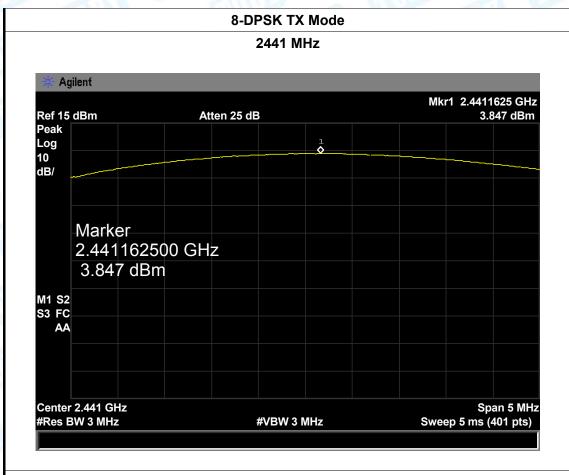
8-DPSK TX Mode



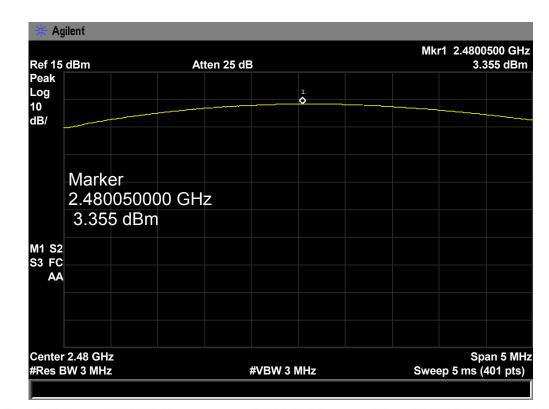




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8-DPSK TX Mode





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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
▼ Permanent attached antenna
□ Unique connector antenna
□ Professional installation antenna