

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC145948

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FCC Radio Test Report FCC ID: 2AGHDLSP-298

Original Grant

Report No. : TB-FCC145948

Applicant : ORE SMART TECHNOLOGY CO., LIMITED

Equipment Under Test (EUT)

EUT Name: Water Resistant Shower Bluetooth Speaker

Model No. : LSP-298

Series Model No. : N/A

Brand Name : N/A

Receipt Date : 2015-11-11

Test Date : 2015-11-12 to 2015-11-16

Issue Date : 2015-11-17

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 :

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0

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1. General Information about EUT

1.1 Client Information

Applicant: ORE SMART TECHNOLOGY CO.,LIMITED

Address : BAIYUNSHAN ROAD, CHENJIANG TOWN, HUIZHOU, GUANGDONG,

CHINA

Manufacturer : ORE SMART TECHNOLOGY CO., LIMITED

Address : BAIYUNSHAN ROAD, CHENJIANG TOWN, HUIZHOU, GUANGDONG,

CHINA

1.2 General Description of EUT (Equipment Under Test)

EUT Name	4:	Water Resistant Shower Bluetooth Speaker				
Models No.	3	LSP-298				
Model Difference	:	N/A				
003	9		Operation Frequency: Bluetooth:2402~2480MHz			
	1	Number of Channel:	Bluetooth:79 Channels see note (2)			
Product Description		Max Peak Output Power:	π/4-DQPSK: 4.826 dBm (Conducted Power)			
		Antenna Gain:	-0.68 dBi PCB Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps) π/4-DQPSK(2 Mbps) 8-DPSK(3 Mbps)			
Power Supply	:	DC Voltage supplied from Host System by USB cable. DC power by Li-ion Battery.				
Power Rating) :	DC 5.0V by USB cable. DC 3.7V 400mAh Li-ion 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) This Test Report is FCC Part 15.247 for Bluetooth, and test procedure in accordance with Public Notice: DA 00-705.

(3) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457



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	-	CILLID			
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454	9	
26	2428	53	2455		MACH

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

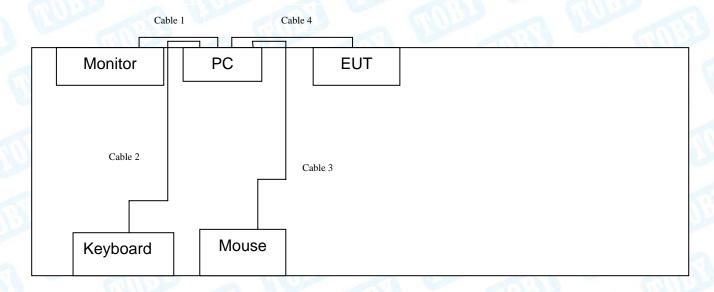
1.3 Block Diagram Showing the Configuration of System Tested

TX Mode		CIII DE	
	EUT		



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USB Charging with TX Mode



1.4 Description of Support Units

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



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1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

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

For Radiated Test			
Final Test Mode	Description		
Mode 1	USB Charging with TX GFSK Mode		
Mode 2 TX Mode(GFSK) Channel 00/39/78			
Mode 3 TX Mode(π /4-DQPSK) Channel 00/39/78			
Mode 4	TX Mode(8-DPSK) Channel 00/39/78		
Mode 5	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:

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.



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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	mn's	N/A	
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π/4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Radiated Emission	Level Accuracy:	±4.60 dB
Radiated Effilssion	9kHz to 30 MHz	±4.00 db
Radiated Emission	Level Accuracy:	±4.40 dB
Radiated Effilssion	30MHz to 1000 MHz	±4.40 db
Radiated Emission	Level Accuracy:	.4.20 dB
Radiated Emission	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		Total Manua					
FCC	IC	Test Item	Judgment	Remark			
15.203		Antenna Requirement	PASS	N/A			
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A			
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A			
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A			
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A			
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A			
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A			
15.247(c)	RSS 247 5.5	Radiated Spurious Emission	PASS	N/A			
15.247(a)	RSS 247 5.1 (1)	99% Occupied Bandwidth & 20dB Bandwidth	PASS	99%OBW GFSK:861.2964kHz π/4-DQPSK: 1081.00kHz 8-DPSK: 1076.80kHz			



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3. Test Equipment

Conducte	d Emission Te	est			
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	Emission Tes Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum	Agilent	E4407B	MY45106456	Aug. 29, 2015	Aug. 28, 2016
Analyzer 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

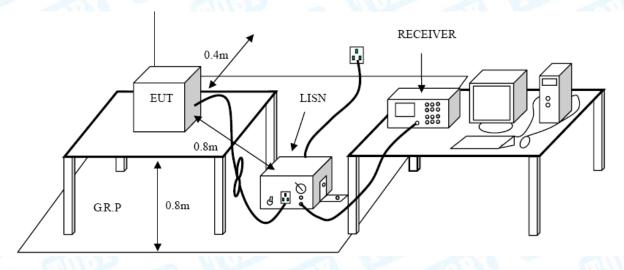
Conducted Emission Test Limit

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

Notes:

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

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

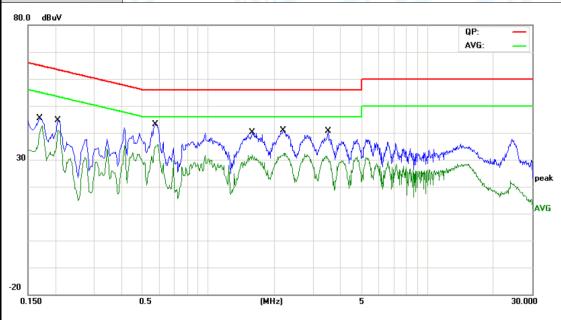
Please refer to the description of test mode.

4.5 Test Data

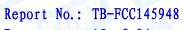
Please see the next page.



Water Resistant Shower EUT: LSP-298 **Model Name:** Bluetooth Speaker Temperature: 25 ℃ 55% **Relative Humidity:** AC 120V/60 Hz **Test Voltage:** Terminal: Line **Test Mode:** USB Charging with TX GFSK Mode 2402 MHz Remark: Only worse case is reported 80.0 dBuV



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
	MHz	dBu∀	dB	dBu∨	dBu∀	dB	Detector
1	0.1700	35.49	9.96	45.45	64.96	-19.51	QP
2	0.1700	32.56	9.96	42.52	54.96	-12.44	AVG
3	0.2059	34.65	10.02	44.67	63.37	-18.70	QP
4	0.2059	30.97	10.02	40.99	53.37	-12.38	AVG
5	0.5738	33.07	10.06	43.13	56.00	-12.87	QP
6 *	0.5738	25.58	10.06	35.64	46.00	-10.36	AVG
7	1.5859	30.07	10.06	40.13	56.00	-15.87	QP
8	1.5859	21.92	10.06	31.98	46.00	-14.02	AVG
9	2.1979	30.79	10.05	40.84	56.00	-15.16	QP
10	2.1979	22.37	10.05	32.42	46.00	-13.58	AVG
11	3.5139	30.66	10.01	40.67	56.00	-15.33	QP
12	3.5139	21.32	10.01	31.33	46.00	-14.67	AVG





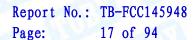
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EUT:	7/3/1/	Resistant Sho	ower	Model Na	ime :	LS	P-298
		oth Speaker					101
Temperature:	25 ℃			Relative Humidity: 5			5%
Test Voltage:		20V/60 Hz	WIII.				
Terminal:	Neutr				13	- 4	Milian
Test Mode:		Charging wi		Mode 240	2 MHz	7.7	
Remark:	Only	worse case	is reported	-	RAIN		
80.0 dBuV						QP:	_
						AVG:	_
u u							
A, A	X	×	× ×				
30		Late of the state		~\^\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Www.	May have the same of the same	$ \wedge $
30 / V\V/\V	Whill V	(May walled har of		$\mathcal{M}\mathcal{M}\mathcal{M}$	LI WANINKANI	Milleran	peak
V V	W	M W	, , ,	·	Mr. II a halican	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	March May 115
							AVG
-20							
0.150	0.5		(MHz)	5			30.000
		Reading	Correct	Measure		_	
No. Mk.	Freq.	Level	Factor	ment	Limit	O∨er	
	MHz	dBu∨	dB	dBu∀	dBu∨	dB	Detector
1	0.1739	36.31	10.12	46.43		-18.34	QP
2	0.1739	32.55	10.12	42.67		-12.10	AVG
3	0.2059	34.70	10.12	44.82	63.37	-18.55	QP
4	0.2059	31.40	10.12	41.52	53.37	-11.85	AVG
5	0.5738	33.56	10.02	43.58	56.00	-12.42	QP
6 *	0.5738	25.82	10.02	35.84	46.00	-10.16	AVG
7	0.9659	29.42	10.14	39.56	56.00	-16.44	QP
8	0.9659	21.53	10.14	31.67	46.00	-14.33	AVG
9	1.5859	29.95	10.10	40.05	56.00	-15.95	QP
10	1.5859	22.22	10.10	32.32	46.00	-13.68	AVG
11	2.2780	29.71	10.06	39.77	56.00	-16.23	QP
12	2.2780	21.98	10.06	32.04	46.00	-13.96	AVG



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	Water Resistant Show	er				D 000
EUT:	Bluetooth Speaker		Model Name	e :	LS	P-298
Temperature:	25 ℃		Relative Hu	midity:	55	%
Test Voltage:	AC 240V/60 Hz	MILL		1 1/1		
Terminal:	Line	1		9	_ 6	11 Page
Test Mode:	USB Charging with	TX GFSI	K Mode 2402	MHz	SA N	
Remark:	Only worse case is	reported		MIT.		A V
80.0 dBuV						
-20 0.150	0.5	(MHz)	5		QP: AVG:	peak AVG
	Reading	Correct	Measure-			
No. Mk. F	req. Level	Factor	ment	Limit	O∨er	
N	1Hz dBuV	dB	dBu∨	dBu∨	dB	Detector
1 0.5	740 34.09	10.06	44.15	56.00	-11.85	QP
2 * 0.5	740 27.01	10.06	37.07	46.00	-8.93	AVG
3 1.5	859 27.49	10.06	37.55	56.00	-18.45	QP
4 1.5	859 22.35	10.06	32.41	46.00	-13.59	AVG
5 2.1	980 25.73	10.05	35.78	56.00	-20.22	QP
6 2.1	980 21.53	10.05	31.58	46.00	-14.42	AVG
7 3.5	140 24.68	10.01	34.69	56.00	-21.31	QP
8 3.5	140 20.31	10.01	30.32	46.00	-15.68	AVG
9 14.1	500 21.83	10.24	32.07	60.00	-27.93	QP
10 14.1	500 17.36	10.24	27.60	50.00	-22.40	AVG
11 24.2	2260 22.15	10.16	32.31	60.00	-27.69	QP
12 24.2	260 9.08	10.16	19.24	50.00	-30.76	AVG
Emission Level=	Read Level+ Correc	ct Factor				





Water Resistant Shower EUT: LSP-298 **Model Name:** Bluetooth Speaker Temperature: **25** ℃ **Relative Humidity:** 55% AC 240V/60 Hz **Test Voltage:** Terminal: Neutral Test Mode: USB Charging with TX GFSK Mode 2402 MHz Remark: Only worse case is reported 80.0 dBuV AVG: AVG 0.150 0.5 30.000 (MHz) Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment dΒ MHz dBuV dΒ dBuV dBuV Detector 0.1740 34.64 10.12 44.76 64.76 -20.00 QΡ 1 2 0.1740 33.45 10.12 43.57 54.76 -11.19 AVG 3 0.2060 34.51 10.12 44.63 63.36 -18.73 QΡ 4 0.2060 32.36 10.12 42.48 53.36 -10.88 AVG 5 0.5740 34.05 10.02 44.07 56.00 -11.93 QP 6 0.5740 27.05 10.02 37.07 46.00 -8.93 AVG 7 0.9660 28.32 10.14 38.46 56.00 -17.54 QΡ 8 0.9660 22.58 10.14 32.72 46.00 -13.28 AVG 37.58 QΡ 9 1.5859 27.48 10.10 56.00 -18.42 10 1.5859 22.27 10.10 32.37 46.00 -13.63 AVG 11 2.2780 25.81 10.06 35.87 56.00 -20.13 QΡ 12 2.2780 21.31 10.06 31.37 46.00 -14.63 AVG **Emission Level= Read Level+ Correct Factor**



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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			

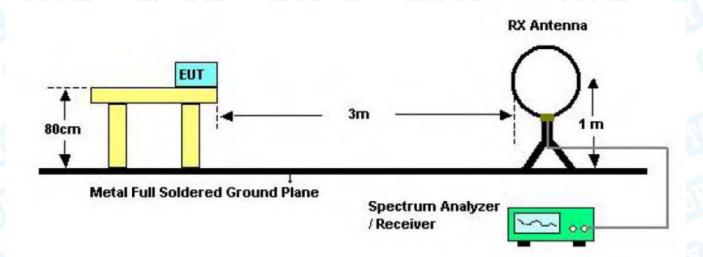
Note:

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

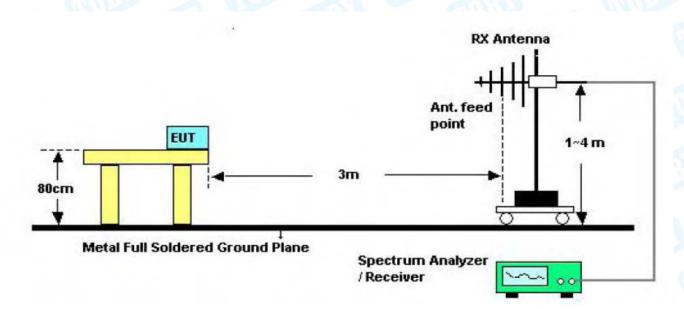


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5.2 Test Setup

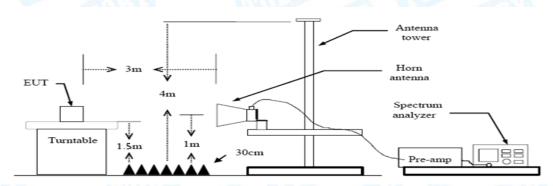


Bellow 30MHz Test Setup



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 /9 // [Resistant Sho oth Speaker	ower	Model Na	me :	LSP-2	98
Temperature:	25 °C			Relative I	-lumidity:	55%	
Test Voltage:	DC 5\					0070	
Ant. Pol.	Horizo		1100			Col	
Test Mode:		SK Mode 2	2402MHz	- 6100		A B	
Remark:	Only	worse case	is reported		OH DE		
80.0 dBuV/m							
30 1 2 2 30.000 40 50	4 60 70	adjust the division of the second of the sec	3 X X A A A A A A A A A A A A A A A A A	300	5 X	ended the second	
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 35	.4992	37.29	-17.37	19.92	40.00	-20.08	peak
	.0504	38.92	-21.45	17.47	40.00	-22.53	peak
	1.7450	47.54	-20.81	26.73	43.50	-16.77	peak
	9.9874	54.56	-18.59	35.97	46.00	-10.03	peak
).4476 I.4265	50.86 46.15	-14.55 -9.41	36.31 36.74	46.00 46.00	-9.69 -9.26	peak peak
	x:Over limit	!:over margin	-5.41	30.74	40.00	-9.20	peak



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UT:	7.844	esistant Sho th Speaker	ower	Model Name	e :	LSP-29	98
emperature:	25 °C			Relative Hu	55%		
est Voltage:	DC 5V		THE		(A)		
nt. Pol.	Vertica				3		Times
est Mode:	TX GF	SK Mode 2	2402MHz	A Trees	-	10	
emark:	Only w	orse case	is reported		MARINE		
0.0 dBuV/m							
					(RF)FCC 15	C 3M Radiation	
						Margin -6	dB
30					8 X		
30 ***			4 5				I AA
NA ANY	-	3 X	Ť 1	1	Mananahah	while water	AND TO
1 " North	and pos		. Makes	I I I I I I I I I I I I I I I I I I I	My Marchelle de	V. 7.	
	May my May	Marchage March	April All Arman or	Thinky hornande			
0							
30.000 40 50	60 70 8	30	(MHz)	300	400 500	0 600 700	1000.00
		Reading	Correct	Measure-			
No. Mk. Fi	req.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		_			Limit dBuV/m	Over	Detecto
М	req.	Level	Factor	m ent			Detector peal
1 * 35.6	req. 1Hz	Level dBuV	Factor dB/m	ment dBuV/m	dBuV/m	dB	
1 * 35.6 2 40.1	req. 1Hz 3240	Level dBu∨ 46.79	dB/m -17.45	ment dBuV/m 29.34	dBuV/m 40.00	dB -10.66	peal peal
1 * 35.6 2 40.1 3 96.0	req. 1Hz 6240 1347	dBuV 46.79 47.02	dB/m -17.45 -20.22	ment dBuV/m 29.34 26.80	dBuV/m 40.00 40.00	dB -10.66 -13.20	peal peal
1 * 35.6 2 40.1 3 96.0 4 143.	req. 1Hz 3240 1347 0986	dBuV 46.79 47.02 41.63	Hactor dB/m -17.45 -20.22 -22.16	ment dBuV/m 29.34 26.80 19.47	dBuV/m 40.00 40.00 43.50	-10.66 -13.20 -24.03	peal
1 * 35.6 2 40.1 3 96.0 4 143. 5 191.	req. 1Hz 5240 1347 0986 8293	dBuV 46.79 47.02 41.63 41.45	Hactor dB/m -17.45 -20.22 -22.16 -21.67	ment dBuV/m 29.34 26.80 19.47 19.78	dBuV/m 40.00 40.00 43.50 43.50	dB -10.66 -13.20 -24.03 -23.72	peal peal peal peal
1 * 35.6 2 40.1 3 96.0 4 143. 5 191.	req. 1Hz 5240 1347 0986 8293 7450	dBuV 46.79 47.02 41.63 41.45 43.51	Factor dB/m -17.45 -20.22 -22.16 -21.67 -20.81	ment dBuV/m 29.34 26.80 19.47 19.78 22.70	dBuV/m 40.00 40.00 43.50 43.50 43.50	dB -10.66 -13.20 -24.03 -23.72 -20.80	peal peal peal peal



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EUT:	Water Resistant Sho	ower	Model Na	me ·	LSP-29	8
	Bluetooth Speaker	Bluetooth Speaker				
Temperature:	25 ℃		Relative H	lumidity:	55%	
Test Voltage:	DC 5V	MILL		I HIII		1
Ant. Pol.	Horizontal		COUNTY OF	3		الماليا
Test Mode:	TX GFSK Mode 2	2441MHz	A Property		10	
Remark:	Only worse case	is reported		DATE		
80.0 dBuV/m						
-20 30.000 40 50	2 X 60 70 80 Reading	(MHz)	300 Measure-	(RF)FCC 15(Radiation Margin -6	1000.000
-	req. Level	Factor	ment	Limit	Over	
	ИHz dBuV	dB/m	dBuV/m	dBuV/m		Detector
1 43.0	0504 38.92	-21.45	17.47	40.00	-22.53	peak
2 72.0	0841 33.60	-23.54	10.06	40.00	-29.94	peak
3 191.	.7450 47.54	-20.81	26.73	43.50	-16.77	peak
4 239.	.9874 52.56	-18.59	33.97	46.00	-12.03	peak
5 360.	.4476 49.86	-14.55	35.31	46.00	-10.69	peak
6 * 601.	.4265 45.65	-9.41	36.24	46.00	-9.76	peak
	Over limit !:over margin	ect Factor				



Report No.: TB-FCC145948
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Page:

EUT:	7 /3/1/15	Resistant Sho	ower	Model Nar	me :	LSP-298	
_		th Speaker		5.1.0		550/	
Temperature:	25 ℃	A British		Relative H	lumidity:	55%	
Test Voltage:	DC 5V		UHIT.		AB		
Ant. Pol.	Vertica					011	1
Test Mode:		SK Mode 2		The same	10	1 0	
Remark:	Only w	orse case	is reported		MAIN		
80.0 dBuV/m							
					(RF)FCC 150	3M Radiation	
						Margin -6 o	iB
					- 6		
30 1 2					5 6 X X		
			1	*		مناها داد	M/CM
" YV	Ϋ́			l men	A holder war way of his had	MAN HANK MAN CO.	
,	What would	harmand Marine		White July July 1 114	, (1		
		- AMALILI I					
-20							
30.000 40 50	60 70	80	(MHz)	300	400 500	600 700	1000.000
		Reading	Correct	Measure-			
No. Mk. F	req.	Level	Factor	m ent	Limit	Over	
	ИHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detecto
1 * 35.	6240	45.79	-17.45	28.34	40.00	-11.66	peak
2 40.	1347	46.52	-20.22	26.30	40.00	-13.70	peak
3 71.	8319	39.79	-23.56	16.23	40.00	-23.77	peak
4 239	.9874	43.23	-18.59	24.64	46.00	-21.36	peak
5 360	.4476	46.48	-14.55	31.93	46.00	-14.07	peak
6 480	.5276	43.82	-11.62	32.20	46.00	-13.80	peak
*:Maximum data x:	:Over limit	!:over margin					



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Page:

EUT:	Water Resistant Sho	ower	Model Nar	ne :	LSP-29	8		
Tomporaturo	Bluetooth Speaker 25 °C		Polativo U	umiditu	55%			
Temperature: Test Voltage:	DC 5V							
Ant. Pol.	Horizontal	Man.		100	6.0			
Test Mode:	TX GFSK Mode 2	2490MU-z			FIN.			
Remark:						_ 6		
	Only worse case	is reported	-	RANGE		18		
80.0 dBuV/m								
				(RF)FCC 150	3M Radiation Margin -6	вЧ		
					1.0.3			
			4	5 X	×			
30		3 X	×					
1 2 X v				M/Mu	Jane Barrelly	well histories		
			A Markethan	A Man Luck Chank	holes .			
My	harden der genate breeze de	Mary March Land La	1 W					
-20 30.000 40 50	60 70 80	(MHz)	300	400 500	600 700	1000.000		
No Mio Em	Reading	Correct	Measure-	Limit	Over			
-	eq. Level	Factor	ment					
MH		dB/m	dBuV/m	dBuV/m	dB	Detector		
1 35.49	992 36.29	-17.37	18.92	40.00	-21.08	peak		
2 43.0	504 38.92	-21.45	17.47	40.00	-22.53	peak		
3 191.7	450 47.54	-20.81	26.73	43.50	-16.77	peak		
4 239.9	9874 51.06	-18.59	32.47	46.00	-13.53	peak		
5 360.4	1476 48.86	-14.55	34.31	46.00	-11.69	peak		
6 * 601.4	1265 46.15	-9.41	36.74	46.00	-9.26	peak		
	ver limit !:over margin	rect Factor						



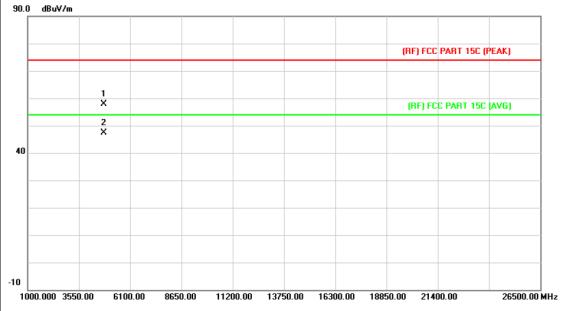
Page: 26 of 94

EUT:	Water Resistant Sh Bluetooth Speaker	ower	Model Nar	ne :	LSP-29	8
Temperature:	25 ℃		Relative H	umidity:	55%	
Test Voltage:	DC 5V	CIII.		BAD		-
Ant. Pol.	Vertical	10	100	9	611	100
Test Mode:	TX GFSK Mode	2480MHz	All Comments		1	6
Remark:	Only worse case	is reported		GHU		7
80.0 dBuV/m						
				(RF)FCC 15C		
					Margin -6	dB
					6	
30 1 X			4	5 X	×	
/\/\/\ _{\\}	2	3	×	Manyaga Adams	Mary July	_{NA})/V/\
W VAN		. ا ا اسلام ا	الماليان	Walley Charles	Mh.dass	
	AND THE PROPERTY OF THE PROPER	John J. Halling J. Johnson	Mallan J. Lander and Assault	11 1		
-20 30.000 40 50	60 70 80	(MHz)	300	400 500	600 700	1000.000
	Dooding	Correct	Measure-			
No. Mk. Fr	Reading eq. Level	Factor	m ent	Limit	Over	
M	Hz dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 35.6	240 44.79	-17.45	27.34	40.00	-12.66	peak
2 71.8	319 39.79	-23.56	16.23	40.00	-23.77	peak
3 143.	8291 40.45	-21.67	18.78	43.50	-24.72	peak
4 239.9	9874 43.23	-18.59	24.64	46.00	-21.36	peak
5 360.	4476 44.98	-14.55	30.43	46.00	-15.57	peak
6 * 601.	4265 42.84	-9.41	33.43	46.00	-12.57	peak
	Over limit !:over margin	rect Factor				



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Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298				
25 ℃	Relative Humidity:	55%				
DC 5V						
Horizontal						
TX GFSK Mode 2402MHz	The same of the sa					
: No report for the emission which more than 10 dB below the prescribed limit.						
	Bluetooth Speaker 25 °C DC 5V Horizontal TX GFSK Mode 2402MHz No report for the emission v	Bluetooth Speaker 25 °C Relative Humidity: DC 5V Horizontal TX GFSK Mode 2402MHz No report for the emission which more than 10 dB to				

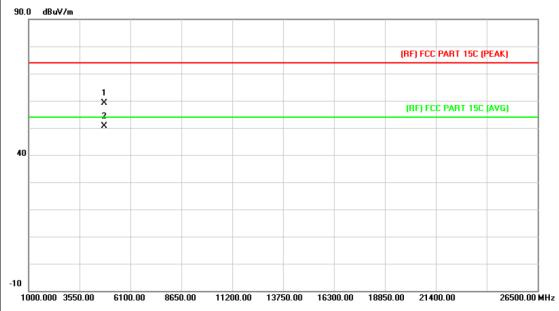


No	. Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.482	44.38	13.44	57.82	74.00	-16.18	peak
2	*	4804.368	33.90	13.44	47.34	54.00	-6.66	AVG



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Water Resistant Shower	Madal Nama	LSP-298		
Bluetooth Speaker	woder name .	LSF-296		
25 ℃	Relative Humidity:	55%		
DC 5V				
Vertical		W. Company		
TX GFSK Mode 2402MHz	The same			
Remark: No report for the emission which more than 10 dB below				
prescribed limit.				
	Bluetooth Speaker 25 °C DC 5V Vertical TX GFSK Mode 2402MHz No report for the emission wh	Bluetooth Speaker 25 °C Relative Humidity: DC 5V Vertical TX GFSK Mode 2402MHz No report for the emission which more than 10 dB below		

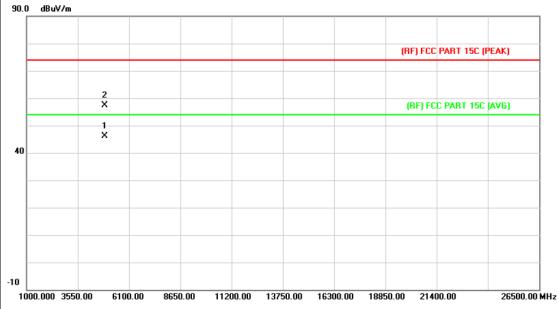


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.635	45.68	13.44	59.12	74.00	-14.88	peak
2	*	4804.432	37.27	13.44	50.71	54.00	-3.29	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker Model Name		LSP-298				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 5V						
Ant. Pol.	Horizontal		WILLIAM STATE				
Test Mode:	TX GFSK Mode 2441MHz	The same	1 -				
Remark:	Remark: No report for the emission which more than 10 dB below the prescribed limit.						

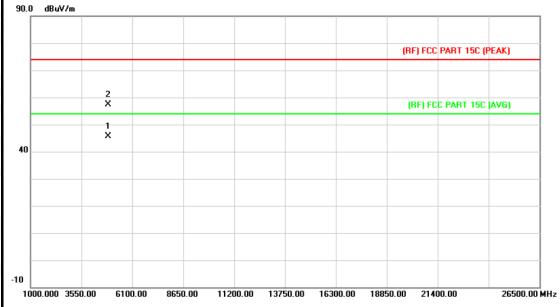


No	o. MI	κ. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.325	32.21	13.90	46.11	54.00	-7.89	AVG
2		4882.644	43.37	13.90	57.27	74.00	-16.73	peak



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EUT:	Water Resistant Shower Bluetooth Speaker Model Name:		LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V	NAME OF THE PERSON OF THE PERS	
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2441MHz	The same of the sa	
Remark:	No report for the emission v prescribed limit.	vhich more than 10 dB b	elow the

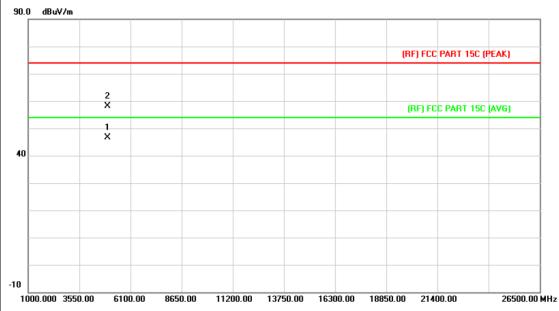


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.364	31.61	13.90	45.51	54.00	-8.49	AVG
2		4882.547	43.40	13.90	57.30	74.00	-16.70	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480MHz	The same of the sa	
Remark:	No report for the emission wh prescribed limit.	ich more than 10 dB be	elow the

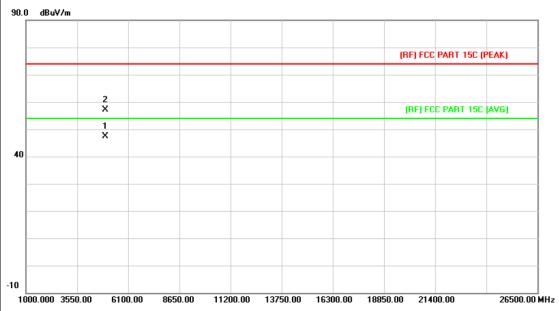


	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4959.514	32.17	14.36	46.53	54.00	-7.47	AVG
2	!		4960.247	43.86	14.36	58.22	74.00	-15.78	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2480MHz	1	1 -
Remark:	No report for the emission prescribed limit.	which more than 10 dB b	elow the

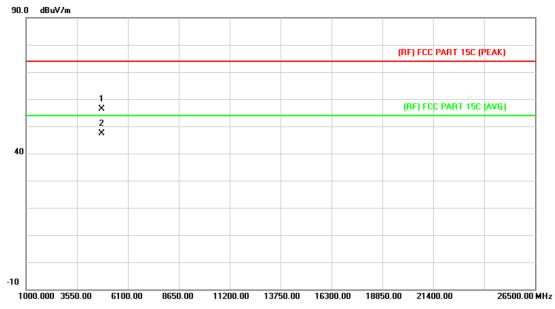


No. Mk.		. Freq.	Reading Level		Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.325	33.13	14.36	47.49	54.00	-6.51	AVG
2		4960.487	42.82	14.36	57.18	74.00	-16.82	peak



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EUT:	Water Resistant Shower Bluetooth Speaker Model Name:		LSP-298			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V	DC 5V				
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2402MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

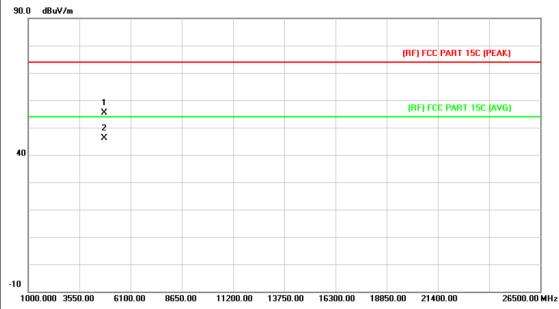


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.154	42.84	13.44	56.28	74.00	-17.72	peak
2	*	4804.547	34.05	13.44	47.49	54.00	-6.51	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Vertical				
Test Mode: TX 8-DPSK Mode 2402MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

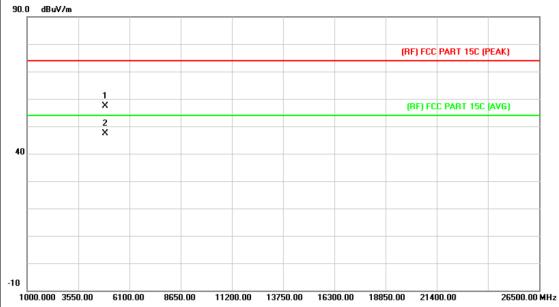


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.414	41.95	13.44	55.39	74.00	-18.61	peak
2	*	4804.671	32.80	13.44	46.24	54.00	-7.76	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol. Horizontal			WILL TO SERVICE		
Test Mode:	TX 8-DPSK Mode 2441MHz				
Remark: No report for the emission which more than 10 dB below the prescribed limit.					

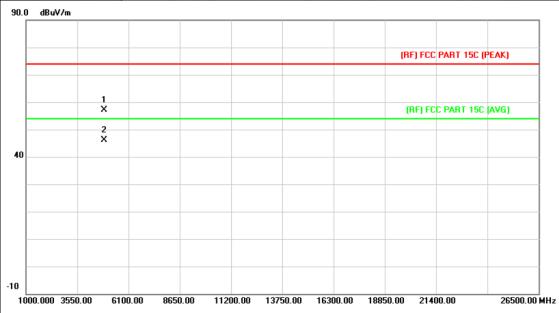


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.457	43.52	13.90	57.42	74.00	-16.58	peak
2	*	4882.627	33.47	13.90	47.37	54.00	-6.63	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V					
Ant. Pol.	Vertical	Vertical				
Test Mode:	TX 8-DPSK Mode 2441MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

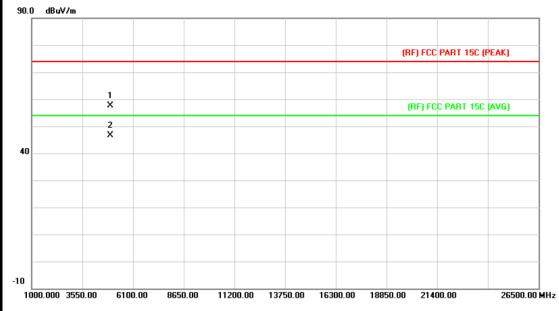


No. Mk.		. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.547	43.18	13.90	57.08	74.00	-16.92	peak
2	*	4882.854	32.24	13.90	46.14	54.00	-7.86	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V	DC 5V				
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2480MHz	The same	1			
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

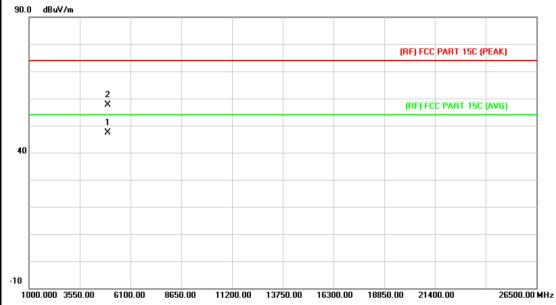


No	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.457	43.25	14.36	57.61	74.00	-16.39	peak
2	*	4959.621	32.17	14.36	46.53	54.00	-7.47	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V	D N	
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2480MHz	2	11
Remark:	No report for the emission v prescribed limit.	which more than 10 dB	below the



No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.351	33.13	14.36	47.49	54.00	-6.51	AVG
2		4960.214	43.25	14.36	57.61	74.00	-16.39	peak



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6. Restricted Bands Requirement

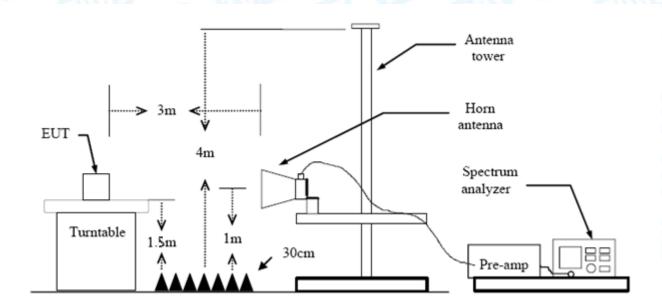
6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

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

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.



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(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.

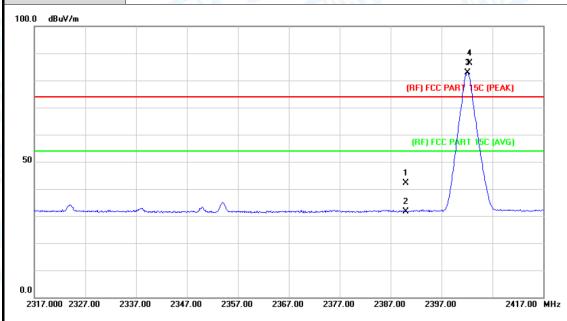
All restriction bands have been tested, only the worst case is reported.



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(1) Radiation Test

EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz		
Remark:	N/A		CONTRACTOR OF THE PARTY OF THE



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	41.30	0.77	42.07	74.00	-31.93	peak
2		2390.000	30.81	0.77	31.58	54.00	-22.42	AVG
3	*	2402.100	82.00	0.82	82.82	Fundamental	Frequency	AVG
4	Х	2402.500	85.51	0.82	86.33	Fundamental	Frequency	peak



3

4

Х

Report No.: TB-FCC145948

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EUT:	1 /3 / 1 / 2	Bluetooth Speaker			e:	LSP-298	
Temperature:	25 ℃	Willia		Relative Hu	midity:	55%	
Test Voltage:	DC 5V		THE STATE OF THE S		I WILL		1
Ant. Pol.	Vertical				3		Miles.
Test Mode:	TX GFS	K Mode 2	402MHz	Alle	-	The second	
Remark:	N/A		AMD !		CALL		a "
100.0 dBuV/m							
					3 *		
					(BF) FCC	PART 15C (PEA)	g
					(,)	,	-
					(RF) FCC	PART 15C (AVI	G)
50						1	
				1 X			
at the second or a second	Marian market market	and the feature of the same of		2 X		-	
2322.000 2332.00	2342.00 23	52.00 2362	.00 2372.00	2382.00 239	2.00 2402.	00 3	2422.00 MH
		2302	23.2.00	2002.00		·	
		eading	Correct	Measure-		_	
No. Mk. F	req.	Level	Factor	m ent	Limit	O∨er	
١	МНz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detecto
1 239	0.000	20.60	0.77	40.07	74.00	22.62	
1 200	0.000	39.60	0.77	40.37	74.00	-33.63	peak

Emission Level= Read Level+ Correct Factor

84.67

80.52

0.82

0.82

85.49

81.34

2402.000

2402.100

peak

AVG

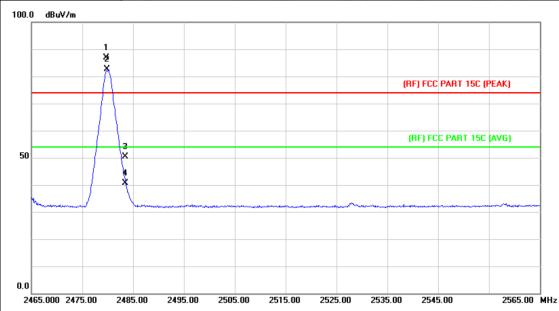
Fundamental Frequency

Fundamental Frequency



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480 MHz	The same of the sa	1 -
Remark:	N/A	THU	
	'		

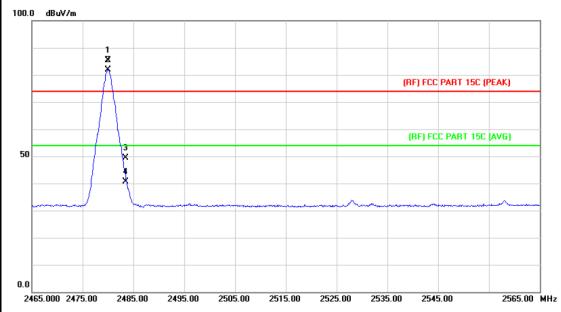


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.700	85.79	1.15	86.94	Fundamental	Frequency	peak
2	*	2479.900	81.60	1.15	82.75	Fundamental	Frequency	AVG
3		2483.500	49.25	1.17	50.42	74.00	-23.58	peak
4		2483.500	39.52	1.17	40.69	54.00	-13.31	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical	-m39	
Test Mode:	TX GFSK Mode 2480 MH	łz	
Remark:	N/A		
100.0 dBuV/m			
1			



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2480.000	84.16	1.15	85.31	Fundamental	Frequency	peak
2	*	2480.000	80.69	1.15	81.84	Fundamental	Frequency	AVG
3		2483.500	48.14	1.17	49.31	74.00	-24.69	peak
4		2483.500	39.42	1.17	40.59	54.00	-13.41	AVG



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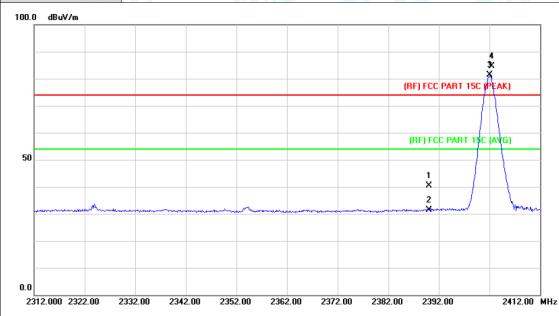
EUT:	Water Resistant Sho Bluetooth Speaker	ower	Model Name :	LSP-298
Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	DC 5V			
Ant. Pol.	Horizontal	1		THE PERSON NAMED IN
Test Mode:	TX 8-DPSK Mode	e 2402MHz		
Remark:	N/A	MINIS	The same	
100.0 dBuV/m				
			(RF) FCC P.	ART 15C (PEAK)
50			(RF) FCC	PART 15C (AVG)
30			1 X	
and the second			2	
0.0				
2312.000 2322.00 2	2332.00 2342.00 2352 Reading		2372.00 2382.00 2392.0 Measure-	00 2412.00 MH;
	req. Level	Factor	ment Limit dBuV/m dBuV/m	Over dB Detecto

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	41.35	0.77	42.12	74.00	-31.88	peak
2		2390.000	30.76	0.77	31.53	54.00	-22.47	AVG
3	*	2402.000	80.47	0.82	81.29	Fundamenta	Frequency	AVG
4	Χ	2402.300	84.89	0.82	85.71	Fundamenta	Frequency	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Vertical				
Test Mode:	TX 8-DPSK Mode 2402MHz				
Remark:	N/A				

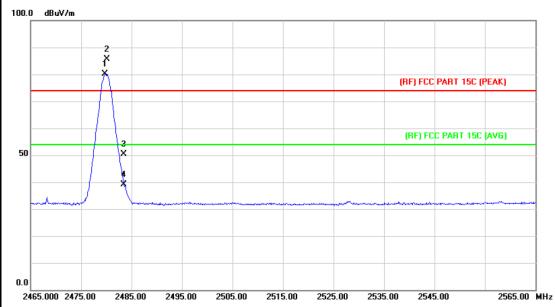


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	39.68	0.77	40.45	74.00	-33.55	peak
2		2390.000	30.51	0.77	31.28	54.00	-22.72	AVG
3	*	2402.100	80.57	0.82	81.39	Fundamental	Frequency	AVG
4	Х	2402.400	83.90	0.82	84.72	Fundamental	Frequency	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Horizontal				
Test Mode:	TX 8-DPSK Mode 2480MHz				
Remark:	N/A				

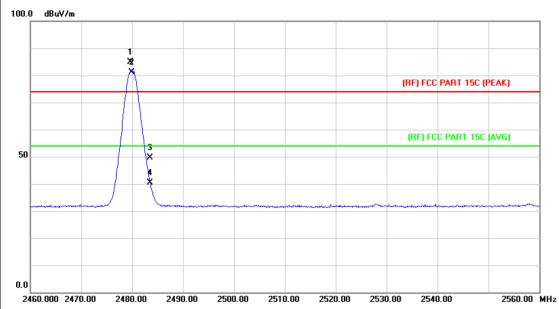


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.700	78.98	1.15	80.13	Fundamental	Frequency	AVG
2	Х	2480.100	84.54	1.15	85.69	Fundamental	Frequency	peak
3		2483.500	49.24	1.17	50.41	74.00	-23.59	peak
4		2483.500	37.94	1.17	39.11	54.00	-14.89	AVG

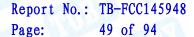


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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Vertical				
Test Mode:	TX 8-DPSK Mode 2480MHz				
Remark:	N/A				



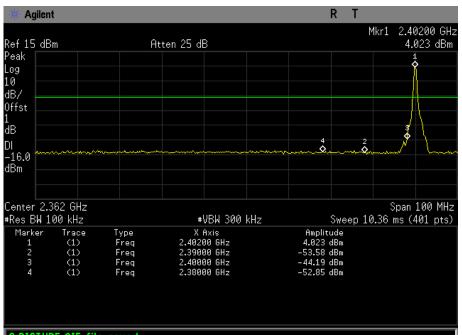
No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.700	83.74	1.15	84.89	Fundamental	Frequency	peak
2	*	2479.900	80.05	1.15	81.20	Fundamental	Frequency	AVG
3		2483.500	48.38	1.17	49.55	74.00	-24.45	peak
4		2483.500	39.15	1.17	40.32	54.00	-13.68	AVG



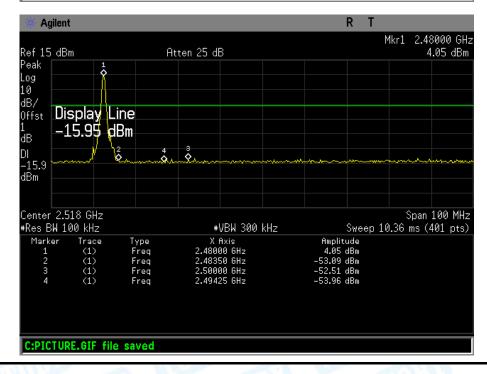


(2) Conducted Test

EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V	DC 3.7V				
Test Mode:	TX GFSK Mode 2402MHz / 2480 MHz					
Remark:	N/A					











EUT:

Water Resistant Shower
Bluetooth Speaker

Model Name:

LSP-298

Temperature:

25 °C

Relative Humidity:

55%

Test Voltage:

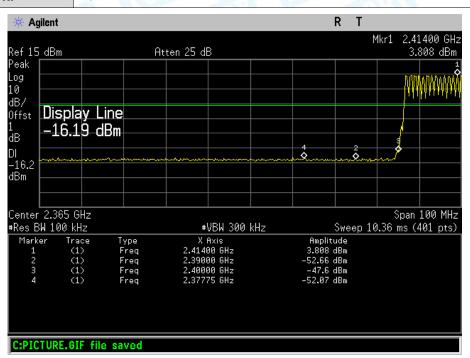
DC 3.7V

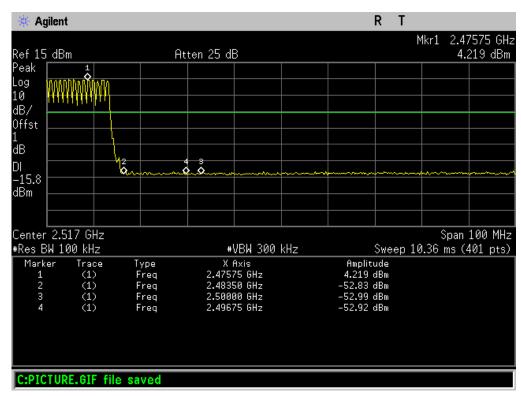
Test Mode:

GFSK Hopping Mode

Remark:

N/A







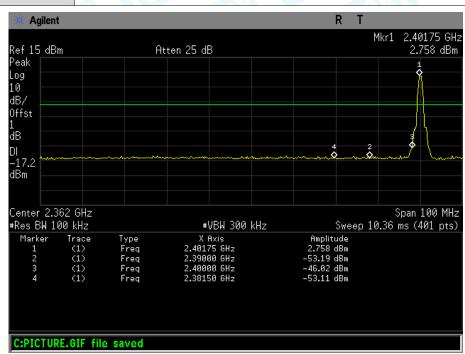


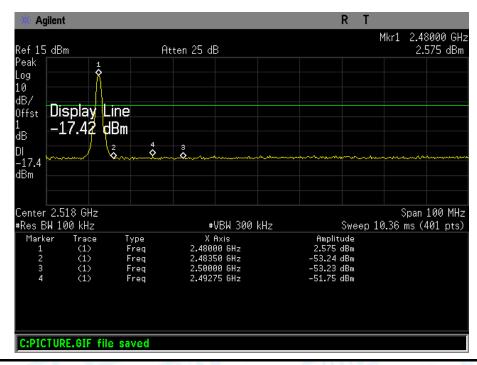
EUT: Water Resistant Shower LSP-298 **Model Name:** Bluetooth Speaker 25 ℃ 55% Temperature: **Relative Humidity:** DC 3.7V

Test Voltage:

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

N/A Remark:









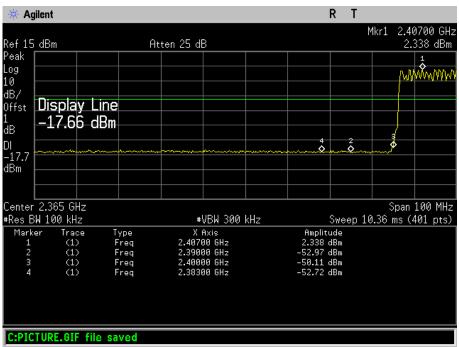
EUT: Water Resistant Shower Bluetooth Speaker Model Name: LSP-298

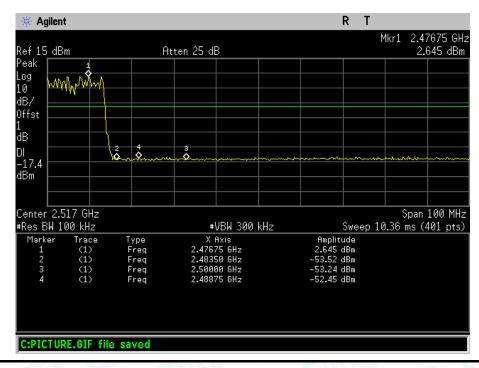
Temperature: 25 °C Relative Humidity: 55%

Test Voltage: DC 3.7V

Test Mode: 8-DPSK Hopping Mode

Remark: N/A







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7. Number of Hopping Channel

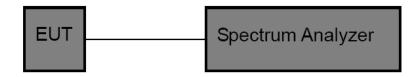
7.1 Test Standard and Limit

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



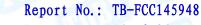
7.3 Test Procedure

- (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





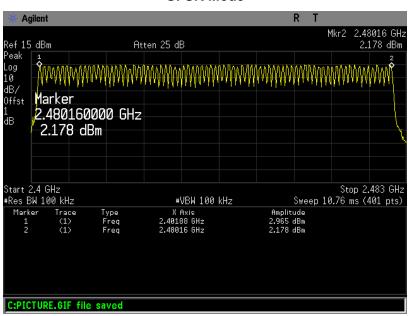
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	LIES ZULL	

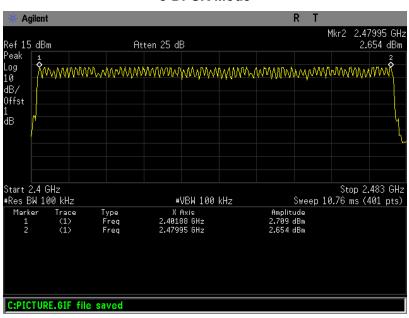
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
2402MHz~2480MHz	79	►4E
2402IVID2~2480IVID2	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.

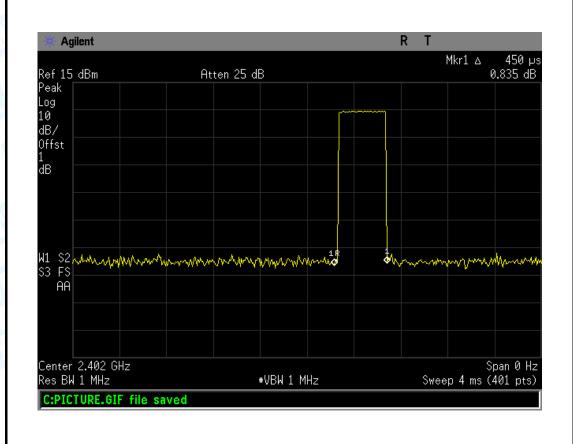


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8.5 Test Data

EUT:		Water Resi	stant Shower Speaker	Model Name :		LSP-298
Temperature	:	25 ℃	Relative Humidity:		55%	
Test Voltage:		DC 3.7V	100			O. M. C.
Test Mode:		Hopping N	Mode (GFSK DH1)			
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Nesuit
2402		0.450	144.00			
2441		0.440	140.80	31.60	400	PASS
2480		0.440	140.80			
			CESK Hanning	Mada DU1		

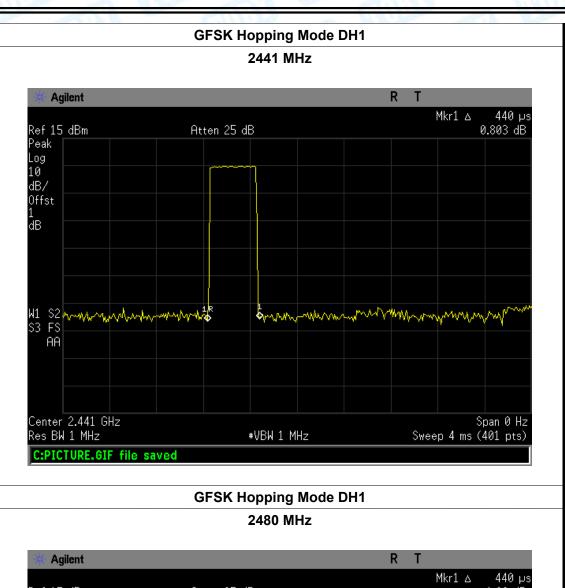
GFSK Hopping Mode DH1

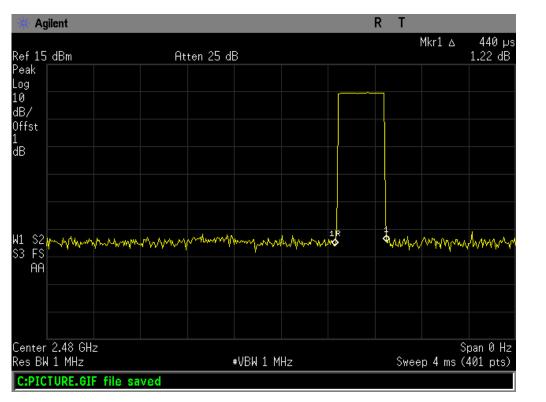






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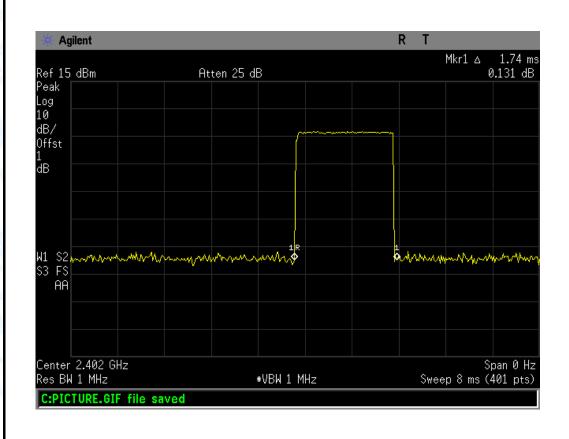


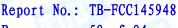
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Channel	Pu	lse Time	Total of Dwell	Pariod Time	Limit	
Test Mode:		Hopping N	Mode (GFSK DH3)			CALL TO SERVE
Test Voltage:		DC 3.7V	CHIE		Allen	
Temperature:		25 ℃		Relative Hum	idity:	55%
		Bluetooth S	Speaker	Widder Name		LSI -230
EUT:		Water Resis	stant Shower	Model Name :		LSP-298

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

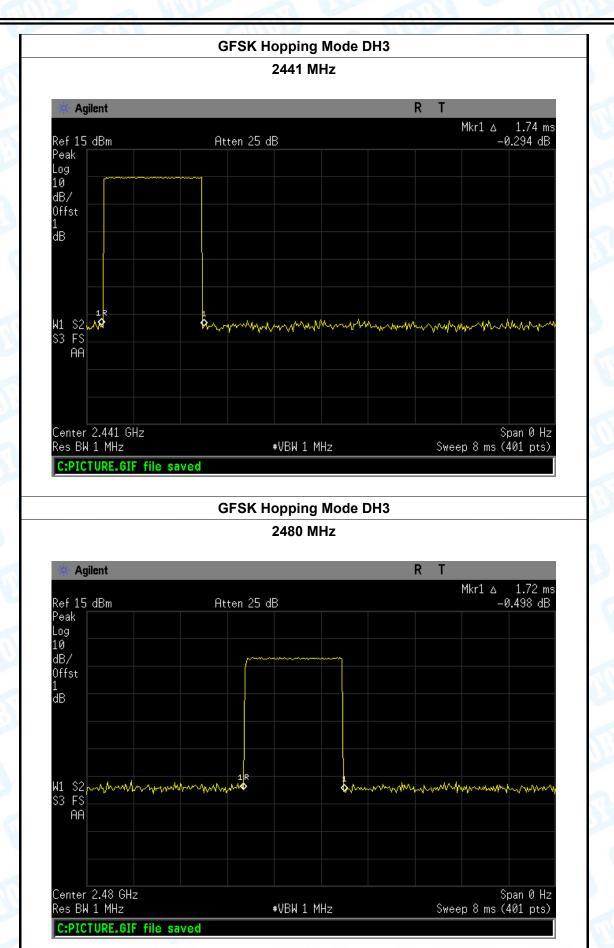
GFSK Hopping Mode DH3







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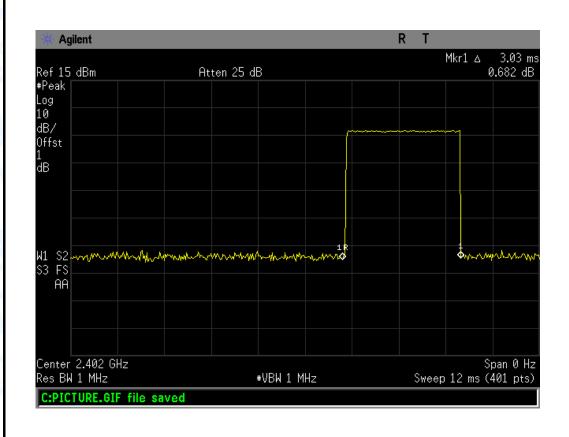
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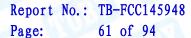
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
To at Manda.	Hamming at Marcha (OFOK DUE)		

Test Mode: Hopping Mode (GFSK DH5)

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	3.030	323.20	31.60	400 F	
2441	3.030	323.20			PASS
2480	3.030	323.20			

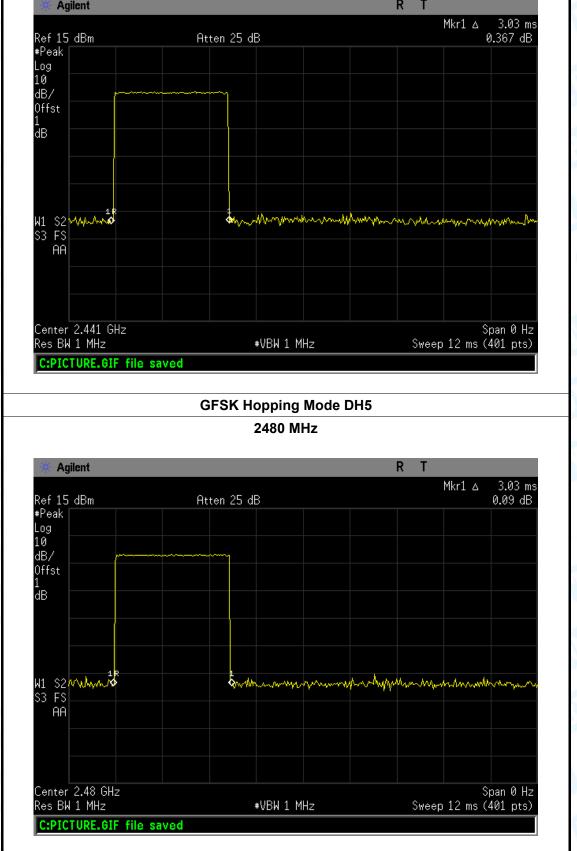
GFSK Hopping Mode DH5







GFSK Hopping Mode DH5 2441 MHz Agilent R Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB 0.367 dB Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Span 0 Hz Sweep 12 ms (401 pts) Center 2.441 GHz Res BW 1 MHz #VBW 1 MHz C:PICTURE.GIF file saved **GFSK Hopping Mode DH5** 2480 MHz Agilent R Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak 0.09 dB Atten 25 dB





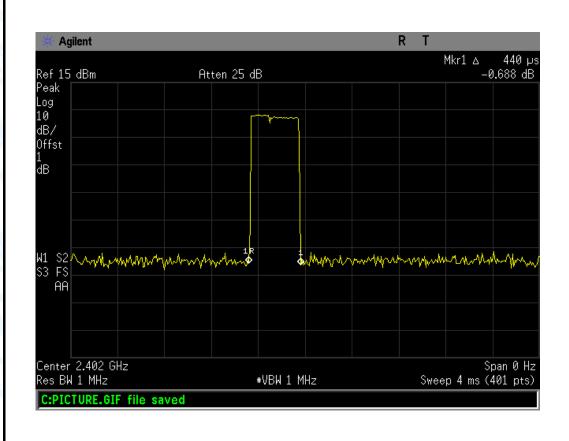
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Total Barrie	Hanning Made (= /4 DODOK DUA)			

Test Mode: Hopping Mode (π /4-DQPSK DH1)

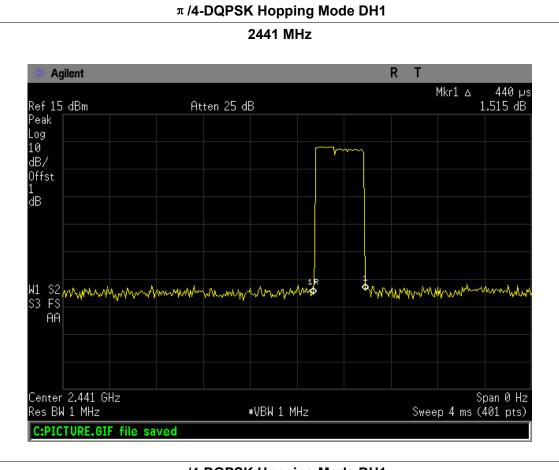
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Pocult
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	0.440	140.80	31.60	400 F	
2441	0.440	140.80			PASS
2480	0.440	140.80			

π /4-DQPSK Hopping Mode DH1

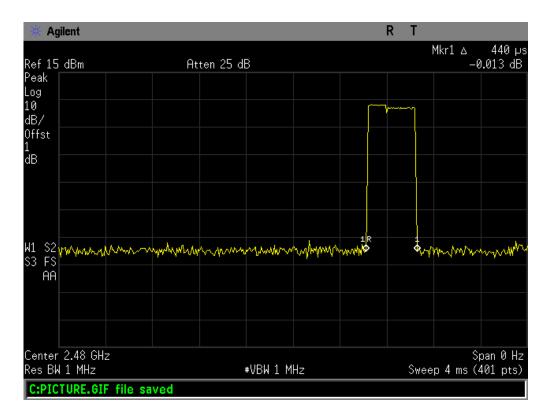




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π /4-DQPSK Hopping Mode DH1





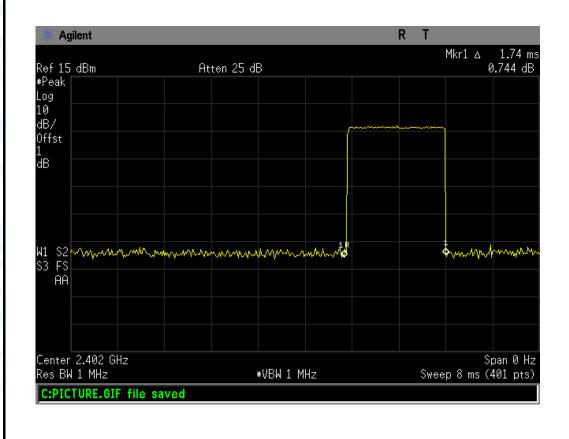
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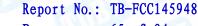
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V	THE NEW YORK		
Toot Mode:	Hanning Made (# /4 DORSK DH3)			

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

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

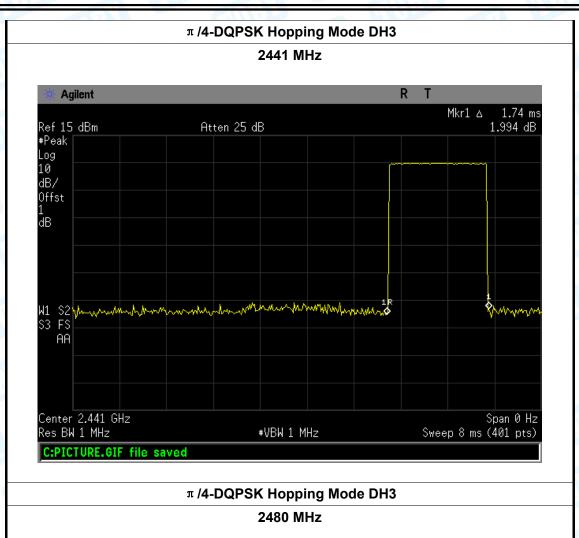
π /4-DQPSK Hopping Mode DH3

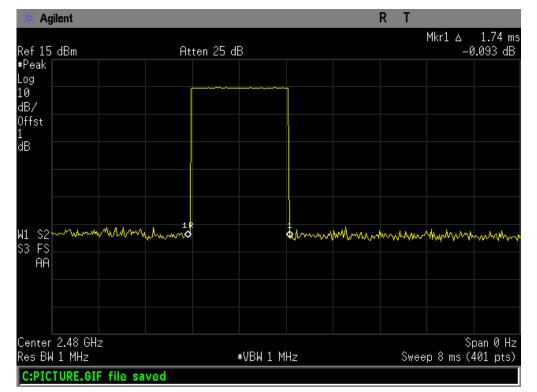






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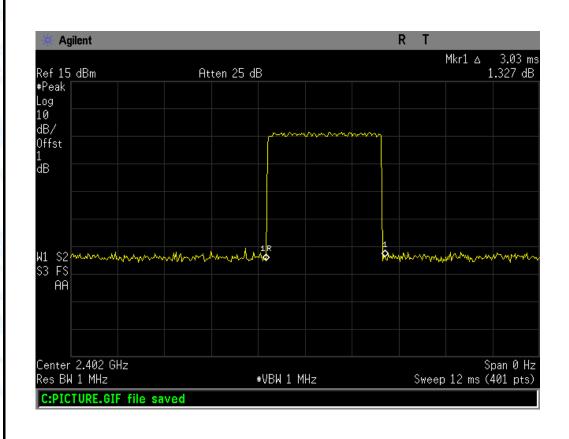
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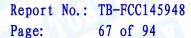
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Toot Modo:	Honning Mode (# // DODSK DH5)			

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

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	3.030	323.20	31.60	400 PASS	
2441	3.030	323.20			PASS
2480	3.030	323.20			

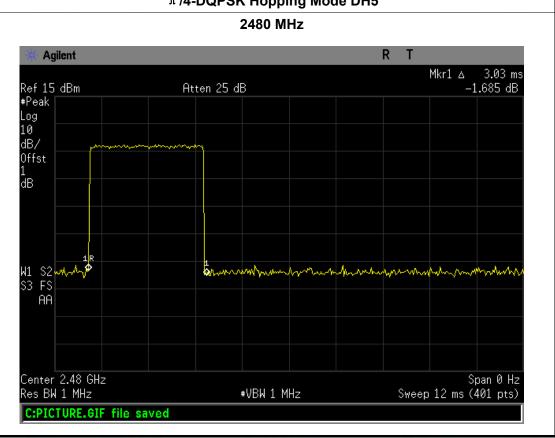
π /4-DQPSK Hopping Mode DH5







 π /4-DQPSK Hopping Mode DH5 2441 MHz R Agilent Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB 1.487 dB Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Span 0 Hz Sweep 12 ms (401 pts) Center 2.441 GHz Res BW 1 MHz #VBW 1 MHz C:PICTURE.GIF file saved π /4-DQPSK Hopping Mode DH5 2480 MHz Agilent Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB -1.685 dB





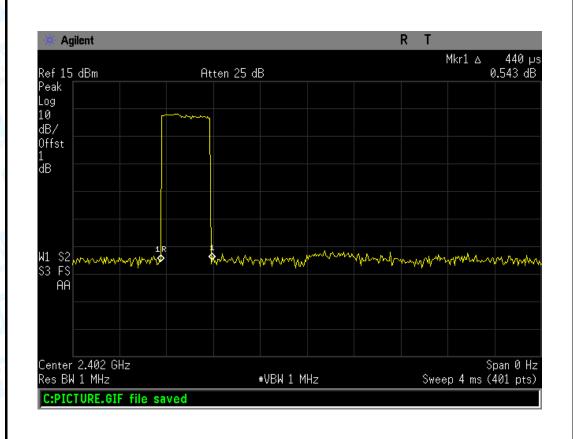
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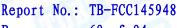
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298	
Temperature:	25 °C	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Toot Model	Hanning Made (9 DDCK DUIA)			

Test Mode: Hopping Mode (8-DPSK DH1)

Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	0.440	140.80			
2441	0.440	140.80	31.60	400	PASS
2480	0.440	140.80			

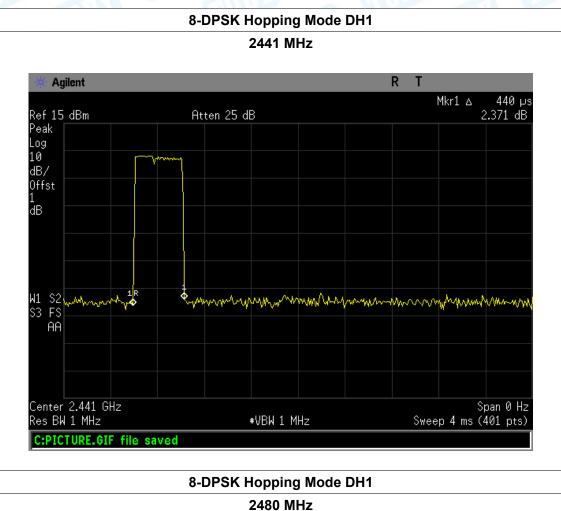
8-DPSK Hopping Mode DH1

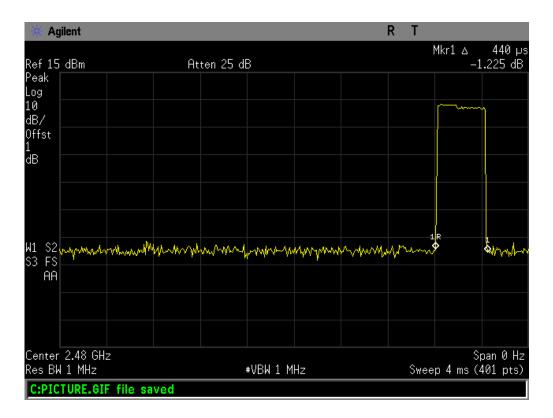






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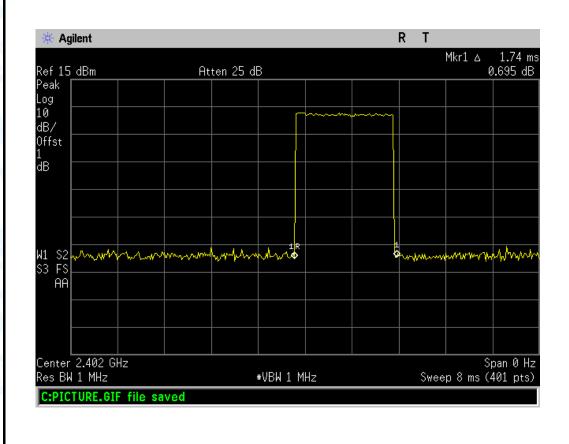
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EUT:	Water Resistant Shower	Model Name :	LSP-298
	Bluetooth Speaker	Widdel Name .	
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Took Mode: Henring Mode (0 DDCK DU2)			

Test Mode: Hopping Mode (8-DPSK DH3)

5					
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.740	278.40			
2441	1.740	278.40	31.60	400	PASS
2480	1.740	278.40			

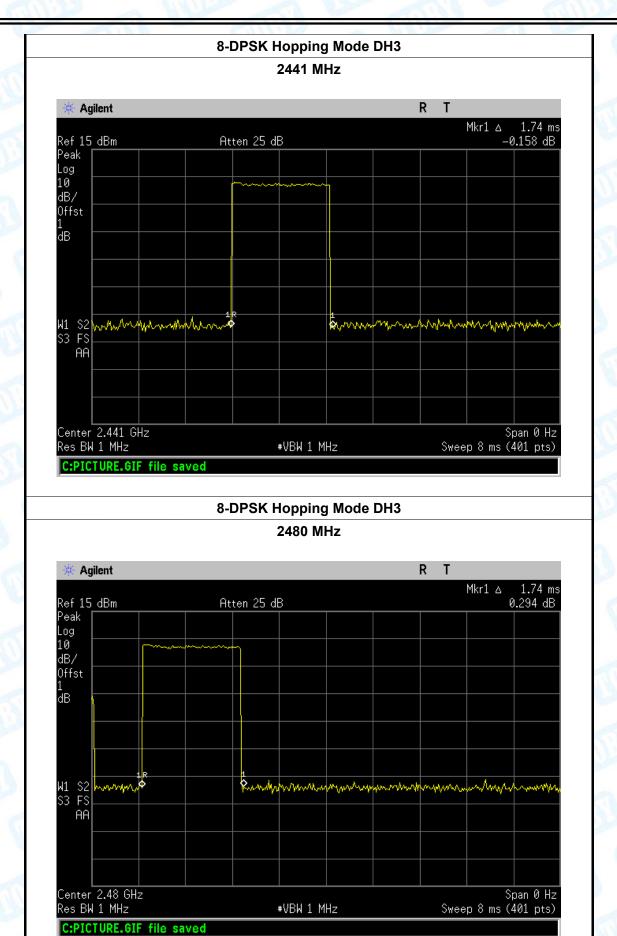
8-DPSK Hopping Mode DH3







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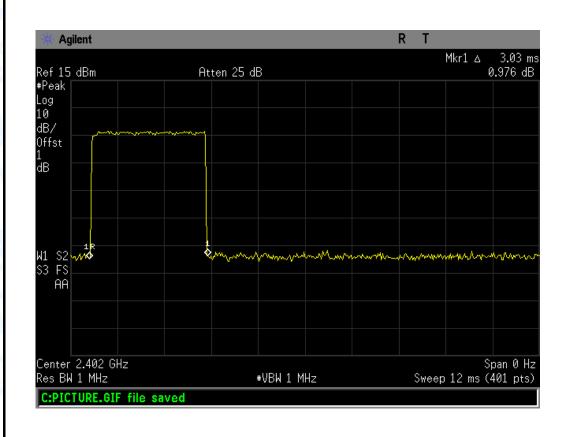
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			

Test Mode: Hopping Mode (8-DPSK DH5)

Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.030	323.20			
2441	3.030	323.20	31.60	400	PASS
2480	3.030	323.20			

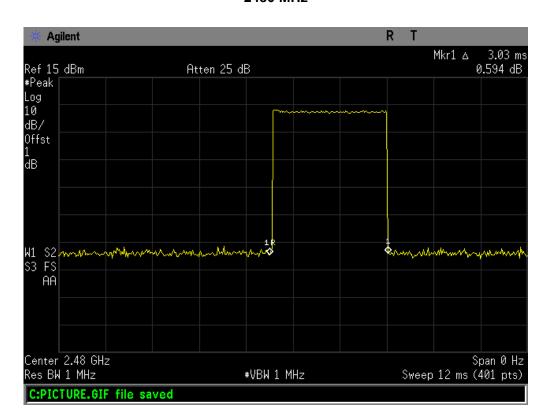
8-DPSK Hopping Mode DH5







8-DPSK Hopping Mode DH5 2441 MHz Agilent R Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB -0.682 dB Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Span 0 Hz Sweep 12 ms (401 pts) Center 2.441 GHz Res BW 1 MHz #VBW 1 MHz C:PICTURE.GIF file saved 8-DPSK Hopping Mode DH5 2480 MHz Agilent R Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak 0.594 dB Atten 25 dB





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9. Channel Separation and Bandwidth Test

9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247

9.1.2 Test Limit

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

9.2 Test Setup



9.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:

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

Bandwidth: RBW=30 kHz, VBW=100 kHz.

- (3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
 - (4) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:30 kHz, and Video Bandwidth:100 kHz. Sweep Time set auto.

9.4 EUT Operating Condition

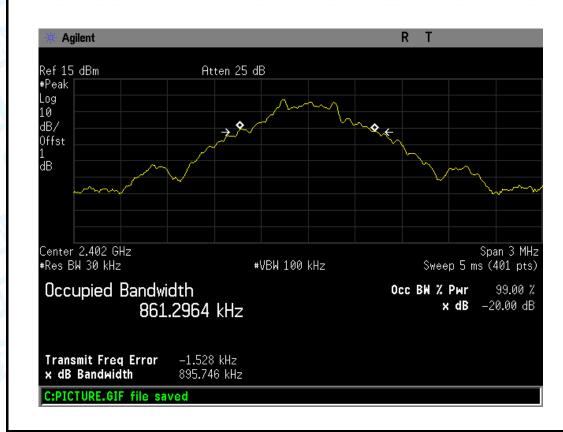
The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Bandwidth Test.

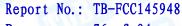


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9.5 Test Data

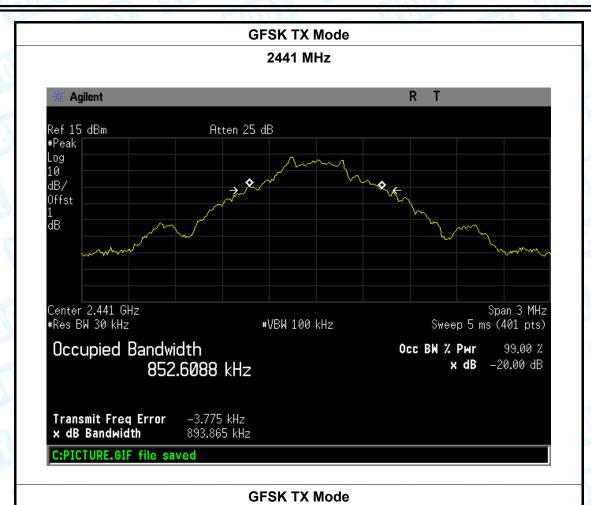
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode (GFSK)		
Channel frequer	ncy 99% OBW 20dB Bandwidth 20dB Bandwidth		
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	861.2964	895.746	
2441	852.6088	893.865	
2480	856.2371	894.009	
GFSK TX Mode			







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2480 MHz R Agilent Ref 15 dBm #Peak Atten 25 dB Log 10 dB/ Offst đΒ Center 2.48 GHz #Res BW 30 kHz Span 3 MHz #VBW 100 kHz Sweep 5 ms (401 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -20.00 dB x dB 856.2371 kHz Transmit Freq Error x dB Bandwidth -1.953 kHz 894.009 kHz C:PICTURE.GIF file saved

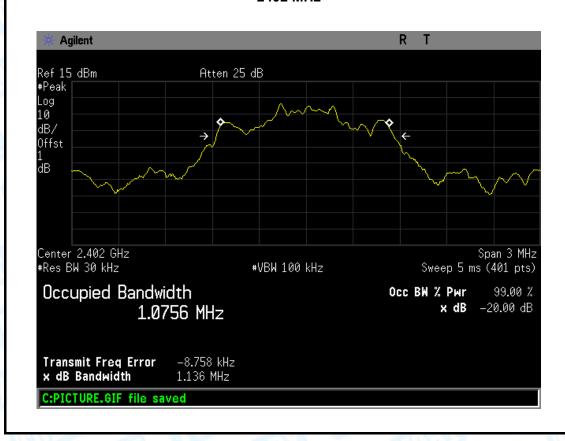


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	EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Ī	Temperature:	25 ℃	Relative Humidity:	55%
	Test Voltage:	DC 3.7V		
I	Test Mode:	TX Mode (π/4-DQPSK)		

Channel frequency	99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	1075.60	1136.00	757.33
2441	1073.60	1137.00	758.00
2480	1076.80	1146.00	764.00
	(MHz) 2402 2441	(MHz) (kHz) 2402 1075.60 2441 1073.60	(MHz) (kHz) (kHz) 2402 1075.60 1136.00 2441 1073.60 1137.00

π /4-DQPSK TX Mode







Center 2.48 GHz #Res BW 30 kHz

Occupied Bandwidth

Transmit Freq Error x dB Bandwidth

C:PICTURE.GIF file saved

1.0768 MHz

-9.518 kHz 1.146 MHz

π/4-DQPSK TX Mode 2441 MHz Agilent Ref 15 dBm Atten 25 dB #Peak Log 10 10 dB/ Offst đΒ Center 2.441 GHz #Res BW 30 kHz Span 3 MHz Sweep 5 ms (401 pts) #VBW 100 kHz Occupied Bandwidth Occ BW % Pwr 99.00 % x dB -20.00 dB 1.0736 MHz Transmit Freq Error x dB Bandwidth -9.370 kHz 1.137 MHz C:PICTURE.GIF file saved π/4-DQPSK TX Mode 2480 MHz Agilent R Ref 15 dBm #Peak Atten 25 dB Log 10 dB/ Offst đΒ

#VBW 100 kHz

Span 3 MHz

99.00 % -20.00 dB

Sweep 5 ms (401 pts)

Occ BW % Pwr

x dB



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774.67

776.00

EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX Mode (8-DPSK)		
Channel frequence	ey 99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	1078.70	1161.00	774.00

8-DPSK TX Mode 2402 MHz

1162.00

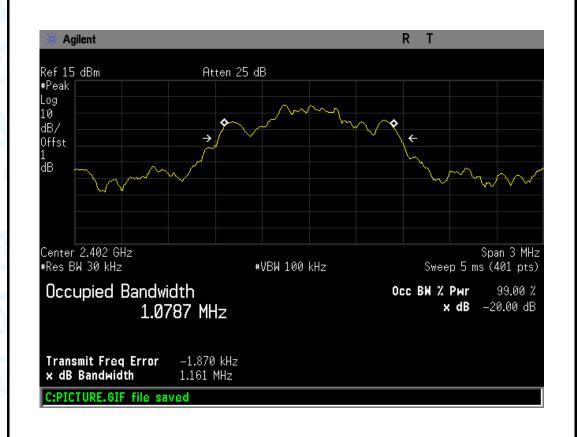
1164.00

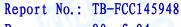
1081.00

1077.90

2441

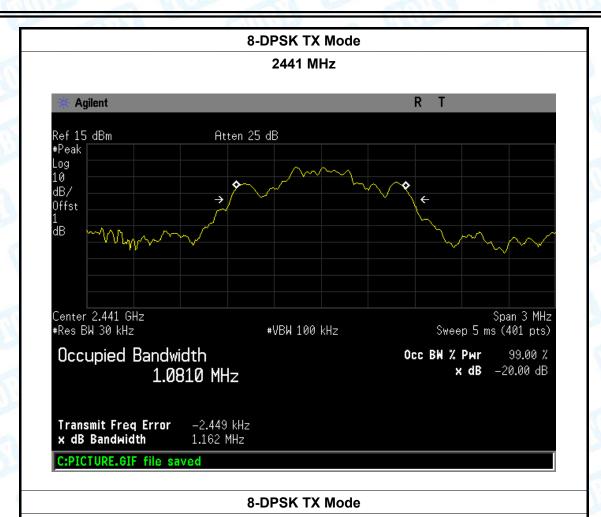
2480

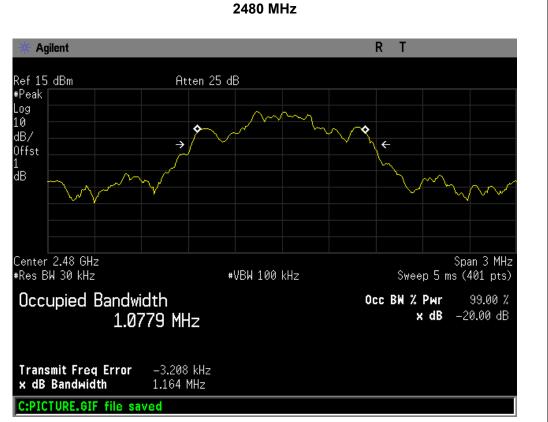






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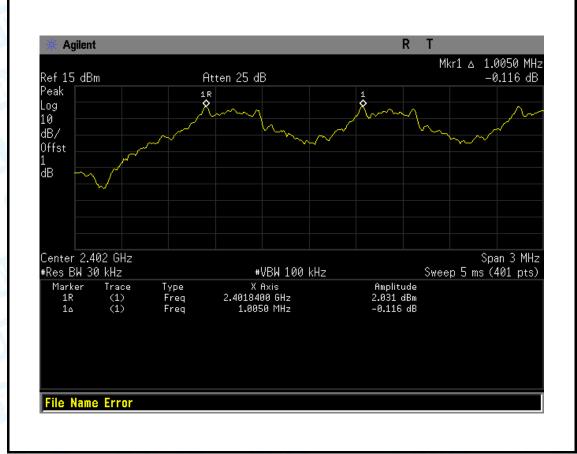
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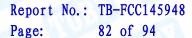
Bluetooth Speaker	Model Name :	LSP-298
25 ℃	Relative Humidity:	55%
DC 3.7V		181
2	Bluetooth Speaker	Bluetooth Speaker Relative Humidity:

Test Mode: Hopping Mode (GFSK)

11 3		
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	895.746
2441	1005.00	893.865
2480	1005.00	894.009

GFSK Hopping Mode







GFSK Hopping Mode 2441 MHz Agilent Mkr1 🛕 1.0050 MHz -0.005 dB Ref 15 dBm Atten 25 dB Peak Log 10 dB/ Marker 🔉 Offst 1.005000 MHz đΒ -0.005 dB Center 2.442 GHz #Res BW 30 kHz Span 3 MHz Sweep 5 ms (401 pts) #VBW 100 kHz Marker 1R 1۵ Trace (1) (1) Amplitude 3.018 dBm -0.005 dB Type Freq Freq X Axis 2.4408400 GHz 1.0050 MHz C:PICTURE.GIF file saved **GFSK Hopping Mode** 2480 MHz Agilent Mkr1 A 1.0050 MHz Ref 15 dBm Peak Atten 25 dB 0.044 dB Log 10 dB/



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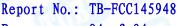
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (π /4-DQPSK)

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	757.33
2441	1005.00	758.00
2480	1005.00	764.00

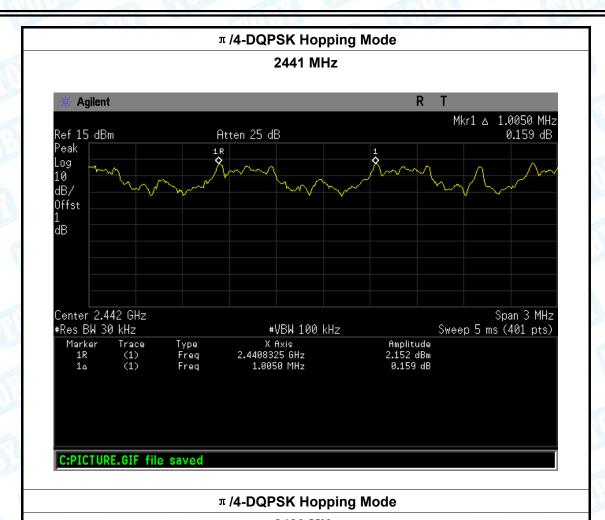
π /4-DQPSK Hopping Mode







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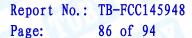
EUT:	Water Resistant Shower	Model Name :	LSP-298
	Bluetooth Speaker	Widder Hairie .	LOI -290
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (8-DPSK)

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	774.00
2441	1005.00	774.67
2480	1005.00	776.00

8-DPSK Hopping Mode







Center 2.479 GHz

Trace (1) (1) Type Freq Freq

#Res BW 30 kHz

Marker

8-DPSK Hopping Mode 2441 MHz Agilent Mkr1 🛕 1.0050 MHz -0.003 dB Ref 15 dBm Atten 25 dB Peak Log 10 dB/ Offst đΒ Center 2.442 GHz #Res BW 30 kHz Span 3 MHz Sweep 5 ms (401 pts) #VBW 100 kHz Marker 1R 1۵ Trace (1) (1) Amplitude 0.646 dBm -0.003 dB Type Freq Freq X Axis 2.4408400 GHz 1.0050 MHz C:PICTURE.GIF file saved 8-DPSK Hopping Mode 2480 MHz Agilent Mkr1 A 1.0050 MHz Ref 15 dBm Peak Atten 25 dB -0.105 dB Log 10 dB/ Offst đΒ

#VBW 100 kHz

X Axis 2.4788400 GHz 1.0050 MHz Span 3 MHz

Sweep 5 ms (401 pts)

Amplitude 1.073 dBm -0.105 dB



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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) Other <125 mW(21dBm)	2400~2483.5

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

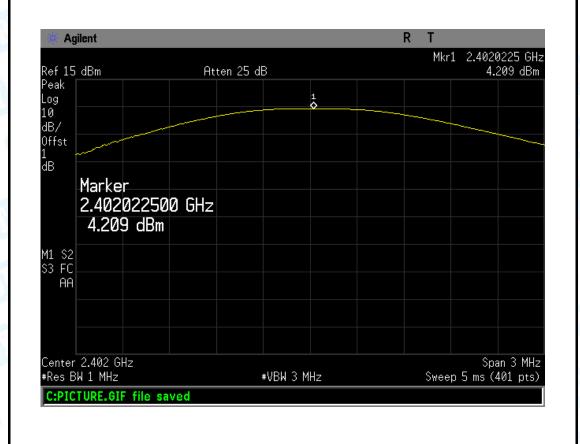
The EUT was set to continuously transmitting in the max power during the test.



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10.5 Test Data

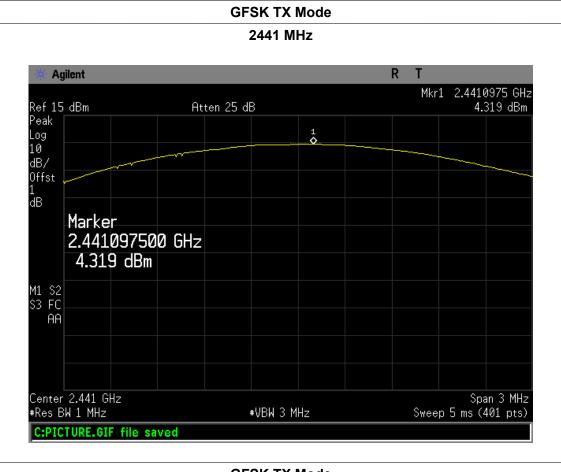
EUT:	Water Resis	stant Shower peaker	Model Name :		LSP-298
Temperature:	25 ℃	Relative H		Humidity:	55%
Test Voltage:	DC 3.7V				
Test Mode:	TX Mode (GFSK)				
Channel frequen	cy (MHz)	Test Result (d	lBm)	Lir	mit (dBm)
2402		4.209			
2441		4.319			30
2480		4.587			
		GFSK TX M	ode		



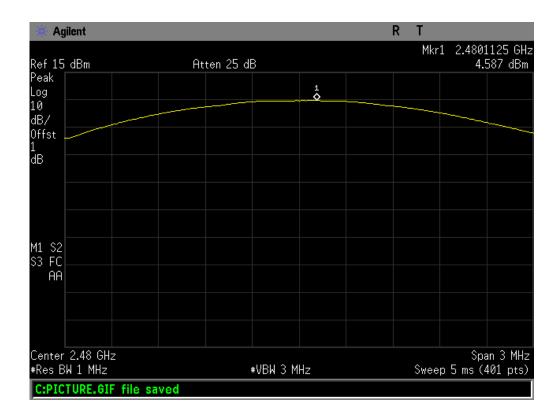




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GFSK TX Mode





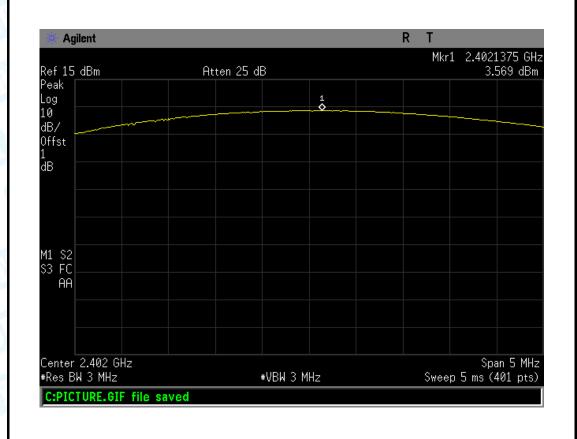
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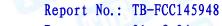
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: ΤΧ Mode (π /4-DQPSK)

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.569	
2441	4.513	21
2480	4.826	

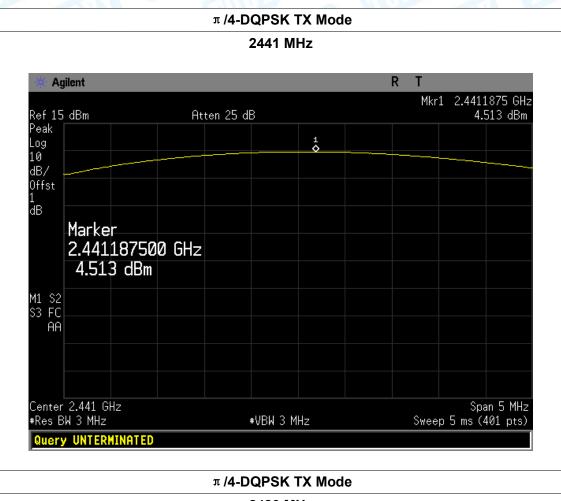
π /4-DQPSK TX Mode

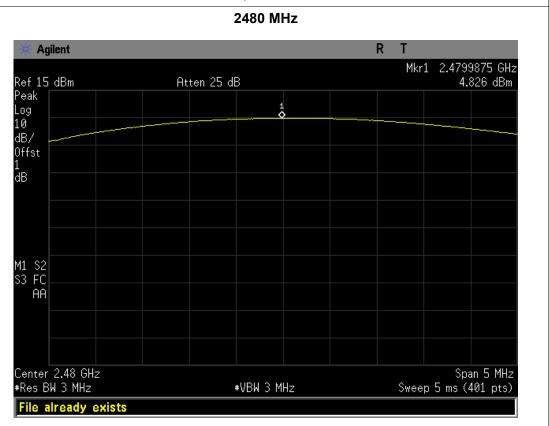






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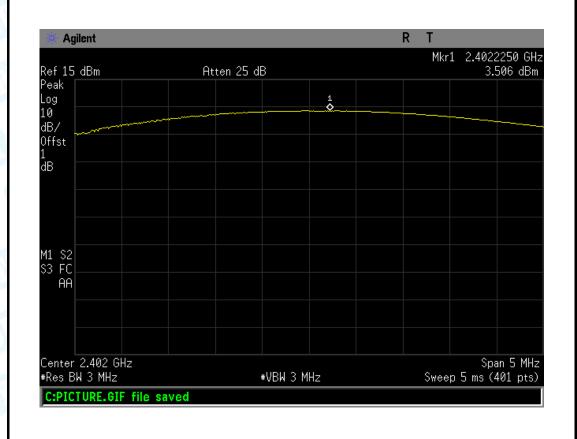
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-298
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: TX Mode (8-DPSK)

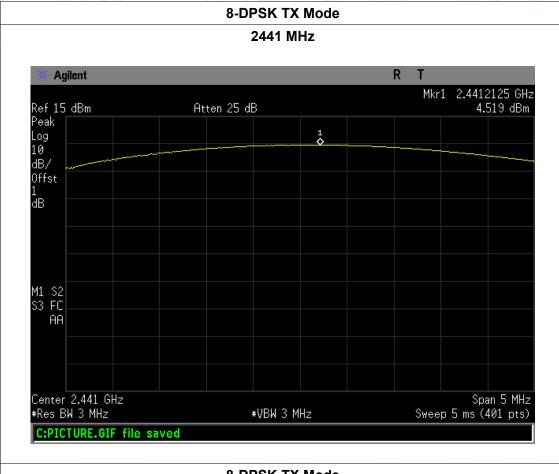
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.506	
2441	4.519	21
2480	4.771	

8-DPSK TX Mode

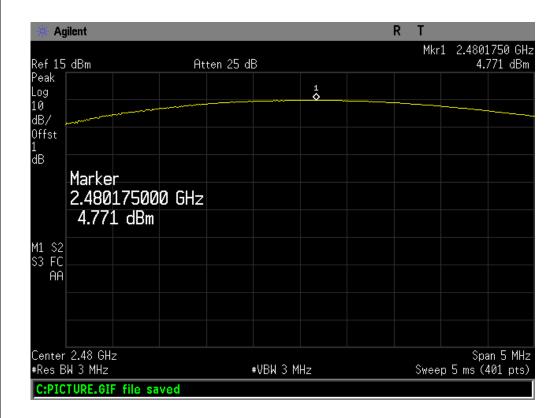




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8-DPSK TX Mode





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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 -0.68 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	1000
□ Unique connector antenna	The same of
☐ Professional installation antenn	a