

# Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC145982

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# FCC Radio Test Report FCC ID: 2AGHDLSP-297

### **Original Grant**

Report No. : TB-FCC145982

Applicant : ORE SMART TECHNOLOGY CO., LIMITED

**Equipment Under Test (EUT)** 

**EUT Name**: Water Resistant Shower Bluetooth Speaker

Model No. : LSP-297

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)

<b>EUT Name</b>		Water Resistant Shower Bluetooth Speaker			
Models No.		LSP-297			
Model Difference	1	N/A			
400		Operation Frequency: Bluetooth:2402~2480MHz			
		Number of Channel:	Bluetooth:79 Channels see note (2)		
Product Description		Max Peak Output Power:	GFSK:4.786dBm (Conducted Power)		
Description		Antenna Gain:	0 dBi PCB Antenna		
		Modulation Type:	GFSK 1Mbps(1 Mbps) π /4-DQPSK(2 Mbps) 8-DPSK(3 Mbps)		
Power Supply	:	DC Voltage supplied from Host System by USB cable.			
		DC power by Li-ion Battery	y.		
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
02	2404	29	2431	56	2458



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

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

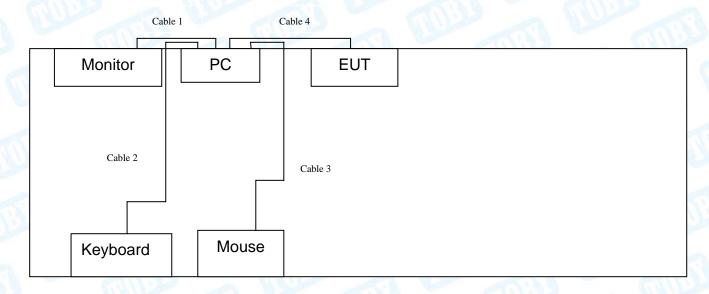
## 1.3 Block Diagram Showing the Configuration of System Tested

TX Mode	WIII 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	~	
PC	OPTIPLEX380	DOC	DELL	<b>√</b>	
Keyboard	L100	DOC	DELL	<b>√</b>	
Mouse	M-UARDEL7	DOC	DELL	<b>√</b>	
		Cable Information			
Number	Shielded Type	Ferrite Core	Length	Note	
Cable 1	YES	YES	1.5M	Will Draw	
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 00/39/7			
Mode 4 TX Mode(8-DPSK) Channel 00/39/78			
Mode 5	Hopping Mode(GFSK)		
Mode 6 Hopping Mode( π /4-DQPSK)			
Mode 7 Hopping Mode(8-DPSK)			

#### Note:

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

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

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 <sub>Lab</sub> )
	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	±4.60 dB
Padiated Emission	Level Accuracy:	±4.40 dB
Radiated Emission	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		T(11			
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:837.668kHz π/4-DQPSK: 909.6939kHz 8-DPSK: 1135.20kHz	

**Note:** 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					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.						
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 29, 2015	Aug. 28, 2016					
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016					
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 28, 2015	Mar. 27, 2016					
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 28, 2015	Mar. 27, 2016					
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 28, 2015	Mar. 27, 2016					
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 28, 2015	Mar. 27, 2016					
Pre-amplifier	Sonoma	310N	185903	Mar. 28, 2015	Mar. 27, 2016					
Pre-amplifier	HP	8447B	3008A00849	Mar. 28, 2015	Mar. 27, 2016					
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 28, 2015	Mar. 27, 2016					
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A					



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### 4. Conducted Emission Test

### 4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

#### 4.1.2 Test Limit

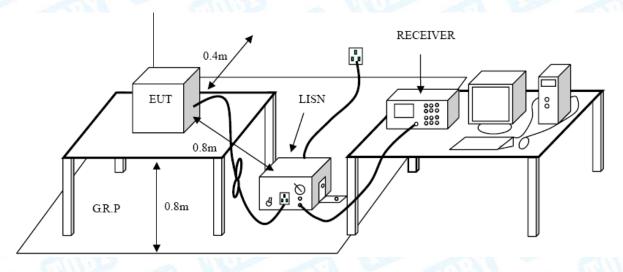
### **Conducted Emission Test Limit**

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

#### Notes:

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

### 4.2 Test Setup



### 4.3 Test Procedure

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

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



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

LISN at least 80 cm from nearest part of EUT chassis

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

### 4.4 EUT Operating Mode

Please refer to the description of test mode.

### 4.5 Test Data

Please see the next page.

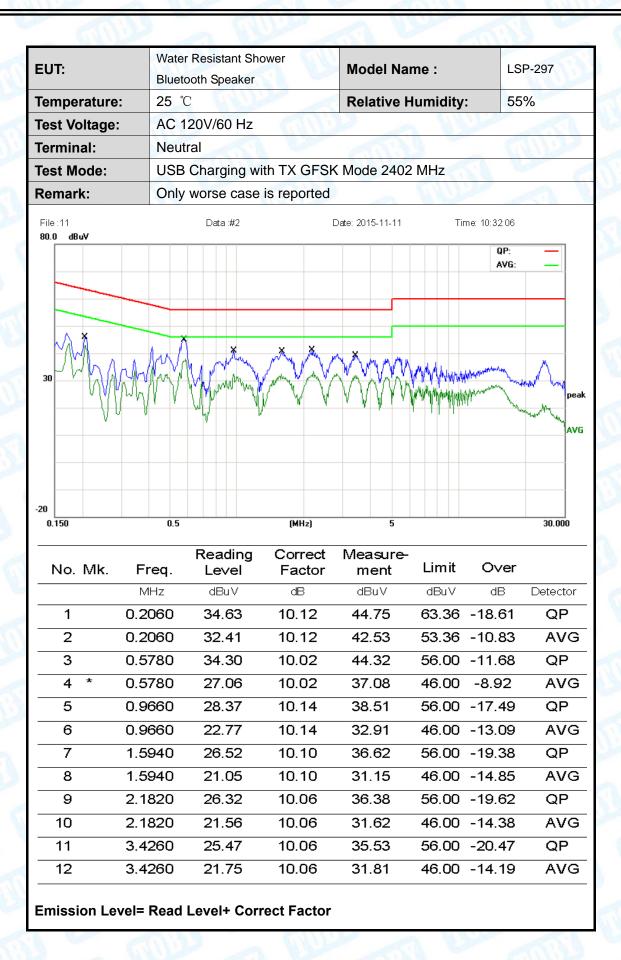


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UT:	7 // (7	r Resistant Shower ooth Speaker	197	Model Nam	e :	LS	P-297			
emperatu	re: 25 °C			Relative Hu	midity:	55	5%			
est Voltaç	ge: AC 1	20V/60 Hz	m III in							
erminal:	Line		1		9	_ 5	Miles			
est Mode	: USB	Charging with 7	X GFSK	Mode 2402	MHz	EV 18				
Remark:	Only	worse case is r	eported		CHI					
80.0 dBuV										
30				V/////////////////////////////////////	/ <b>^*/^ha</b> na/****	QP: AVG:	pea			
0.150	0.5		(MHz)	5			30.000			
		Reading C	orrect	Measure-						
No. Mk	k. Freq.	Level I	Factor	ment	Limit	O∨er				
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector			
1	0.2060	34.73 1	10.02	44.75		-18.61	QP			
2	0.2060	32.61 1	10.02	42.63	53.36	-10.73	AVG			
3	0.5700		10.05	44.25		-11.75	QP			
4 *	0.5700		10.05	36.97	46.00	-9.03	AVG			
	0.9620	27.87 1	10.07	37.94	56.00	-18.06	QP			
5							AVG			
6	0.9620	22.08 1	10.07	32.15		-13.85				
		22.08 1		32.15 37.29	46.00 56.00	-13.85 -18.71	QP			
6	0.9620	22.08 1 27.23 1	10.07		56.00		QP			
6 7	0.9620 1.5820	22.08 1 27.23 1 22.05 1	10.07 10.06	37.29	56.00 46.00	-18.71	QP			
6 7 8	0.9620 1.5820 1.5820	22.08 1 27.23 1 22.05 1 26.02 1	10.07 10.06 10.06	37.29 32.11	56.00 46.00	-18.71 -13.89	QP AVG			
6 7 8 9	0.9620 1.5820 1.5820 2.1340	22.08 1 27.23 1 22.05 1 26.02 1 20.93 1	10.07 10.06 10.06	37.29 32.11 36.08	56.00 46.00 56.00	-18.71 -13.89 -19.92	QP AVG QP			



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EUT:	Water Resistan Bluetooth Spea		Model Name :	LSP-297
Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	AC 240V/60	Hz		
Terminal:	Line	M C		WILL TO
Test Mode:	USB Chargin	g with TX GFS	SK Mode 2402 MHz	21
Remark:	Only worse c	ase is reported	b	
80.0 dBuV				
				QP: — AVG: —
x v				
MA	100 1	, X, X,	X	
30				Supplemental State of the State
\ \V\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	MM, A. K. Whish	JAM ( )		peak
V 0		Jk 0		AVG
				Ava
-20				
0.150	0.5	(MHz)	5	30.000

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∀	dB	dBu∀	dBu∀	dB	Detector
1	0.1740	35.86	9.97	45.83	64.76	-18.93	QP
2	0.1740	32.45	9.97	42.42	54.76	-12.34	AVG
3	0.2060	34.92	10.02	44.94	63.36	-18.42	QP
4	0.2060	31.46	10.02	41.48	53.36	-11.88	AVG
5	0.5860	32.87	10.06	42.93	56.00	-13.07	QP
6 *	0.5860	25.49	10.06	35.55	46.00	-10.45	AVG
7	1.5859	28.99	10.06	39.05	56.00	-16.95	QP
8	1.5859	21.17	10.06	31.23	46.00	-14.77	AVG
9	2.1340	29.01	10.06	39.07	56.00	-16.93	QP
10	2.1340	21.69	10.06	31.75	46.00	-14.25	AVG
11	2.8340	28.11	10.03	38.14	56.00	-17.86	QP
12	2.8340	21.81	10.03	31.84	46.00	-14.16	AVG



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EUT:	7.75.11	Resistant Shooth Speaker	ower	Model Nan	ne :	LS	P-297
Temperature:	25 °C			Relative H	umidity:	55	5%
Test Voltage:	AC 2	40V/60 Hz	CALL:		* M	1	
Terminal:	Neut	al	100			_ 6	Miles
Test Mode:	USB	Charging w	ith TX GFSI	K Mode 240	2 MHz	E. V .	
Remark:	Only	worse case	is reported		BILL		
80.0 dBuV							
						QP: AVG:	
30		Manus Janus		**************************************	Andria de la lite	Morrowan	peak
-20 0.150 No. Mk.	0.5	Reading Level	(MHz)  Correct Factor	Measure- ment	Limit	Over	30.000
	MHz	dBuV	dB	dBu∀	dBu∨	dB	Detector
1	0.1700	36.86	10.12	46.98	64.96	-17.98	QP
2	0.1700	33.03	10.12	43.15	54.96	-11.81	AVG
3	0.2059	34.72	10.12	44.84	63.37	-18.53	QP
4	0.2059	31.85	10.12	41.97	53.37	-11.40	AVG
5	0.5859	31.93	10.02	41.95	56.00	-14.05	QP
6 *	0.5859	24.91	10.02	34.93	46.00	-11.07	AVG
7	0.9659	29.80	10.14	39.94	56.00	-16.06	QP
8	0.9659	21.23	10.14	31.37	46.00	-14.63	AVG
9	1.5940	29.53	10.10	39.63	56.00	-16.37	QP
10	1.5940	21.21	10.10	31.31	46.00	-14.69	AVG
11	2.8380	29.16	10.06	39.22	56.00	-16.78	QP
12	2.8380	21.82	10.06	31.88	46.00	-14.12	AVG



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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				

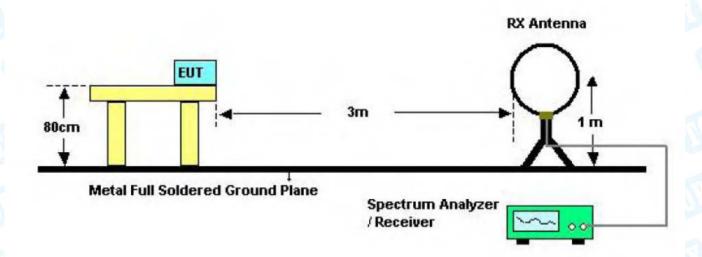
### Note:

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

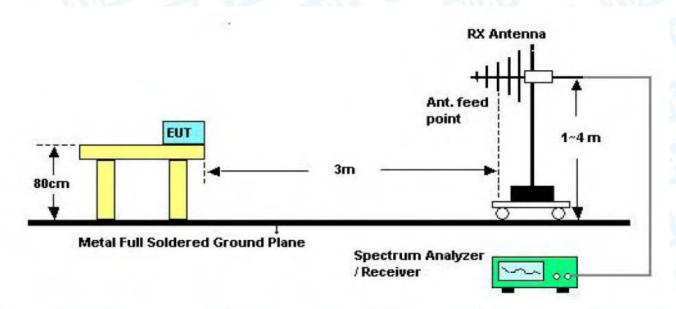


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# 5.2 Test Setup



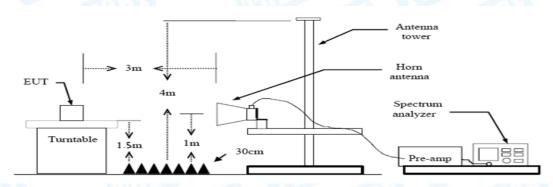
Bellow 30MHz Test Setup



**Bellow 1000MHz Test Setup** 



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**Above 1GHz Test Setup** 

### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz 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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:UT:	1 14 1	Resistant Sho oth Speaker	wer	Model Nar	LSP-297			
emperature:	25 ℃			Relative H	umidity:	55%		
est Voltage:	DC 5\	/	THE STATE OF		GHA			
Ant. Pol.	Horizo	ontal	1		3		100	
est Mode:	TX GF	SK Mode 2	2402MHz	A Britain		10	- 1	
Remark:	Only v	worse case	is reported		GHUS		1	
80.0 dBuV/m								
					(RF)FCC 150	3M Radiation		
						Margin -6 o	∄B ☐	
30					6			
1				_	X	. ut		
N X Z				5 X	Market Market Market	مراريه بالبهما لبليليم	Mallinger	
$V \sim V$		3 4 X		May had what had	T WANTED			
1	1,24,648/4 <sub>4</sub> ,876.0-444.44 <sup>10</sup> 16.44	A Company March March March Comment	Walking and and also as as a					
20 30.000 40 50	Artest of the second of	80	(MHz)	300	400 500	600 700	1000.00	
20	Artest of the second of	80	(MHz)	300	400 500	600 700	1000.00	
20 30.000 40 50	0 60 70				400 500 Limit	600 700 Over	1000.00	
20 30.000 40 50 No. Mk.	Artest of the second of	80 Reading	(MHz) Correct	300 Measure-				
20 30.000 40 50 No. Mk.	60 70 Freq.	Reading Level	(MHz) Correct Factor	Measure- ment	Limit	Over	Detector	
No. Mk.	Freq.	Reading Level	(MHz)  Correct Factor  dB/m	Measure- ment	<b>Limit</b> dBuV/m	<b>Over</b>	Detecto	
No. Mk. 1	Freq. MHz	Reading Level dBuV 38.63	Correct Factor dB/m -17.60	Measure- ment dBuV/m 21.03	Limit dBuV/m 40.00	Over dB -18.97	Detecto peal peal	
No. Mk. 1  1 35 2 40 3 78	Freq. MHz .8746	Reading Level dBuV 38.63 38.75	Correct Factor dB/m -17.60 -20.33	Measurement dBuV/m 21.03 18.42	Limit dBuV/m 40.00 40.00	Over  dB  -18.97  -21.58	Detector peal peal	
No. Mk.  1 35 2 40 3 78 4 119	Freq. MHz .8746 .4172	Reading Level dBuV 38.63 38.75 28.66	(MHz)  Correct Factor  dB/m -17.60 -20.33 -23.34	Measure- ment dBuV/m 21.03 18.42 5.32	Limit  dBuV/m  40.00  40.00  40.00	Over  dB  -18.97  -21.58  -34.68	Detector peal peal peal	
No. Mk.  1 35 2 40 3 78 4 119 5 256	Freq. MHz .8746 .4172 .4133	Reading Level dBuV 38.63 38.75 28.66 33.17	(MHz)  Correct Factor  dB/m -17.60 -20.33 -23.34 -22.50	300 Measurement dBuV/m 21.03 18.42 5.32 10.67	Limit  dBuV/m  40.00  40.00  40.00  43.50	Over  dB  -18.97  -21.58  -34.68  -32.83	Detecto <b>peal</b>	



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Page:

EUT:	1/3/1/1	Resistant Sho	ower	Model Nam	LSP-297					
		oth Speaker		<b>-</b>		FF0/				
Temperature:	25 ℃			Relative Hu	midity:	55%				
Test Voltage:	DC 5\		CALL.							
Ant. Pol.	Vertic				<u> </u>	The Carl	1			
Test Mode:		FSK Mode 2		Charles	The second					
Remark:	Only	worse case	is reported		MAIN					
80.0 dBuV/m										
					(RF)FCC 15	C 3M Radiation				
						Margin -6	dB			
30 5						6				
\(\sqrt{\sq}\sqrt{\sq}}}}}}}}}\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}\signtimes\sqrt{\sqrt{\sq}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}					per	Ž.,	JAM L			
1 A . M. A.		4 ×		5 Y , ,	J. Mary and Land	harrography (A) for free for a	NT 4			
<u></u>	w 1	.Art .	الله الاستاطي	Land to sent the sent the sent	WWH <sup>E</sup> "VENUE"					
	when we look	haling was the	Malli somat (string at)	4. 1						
-20										
30.000 40 50	60 70	80	(MHz)	300	400 50	0 600 700	1000.000			
		Reading	Correct	Measure-						
No. Mk. F	req.	Level	Factor	m ent	Limit	O∨er				
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector			
1 * 36.	.0007	46.69	-17.67	29.02	40.00	-10.98	peak			
2 36.	8952	45.78	-18.23	27.55	40.00	-12.45	peak			
3 46.	5030	46.05	-22.92	23.13	40.00	-16.87	peak			
4 119	.4360	37.12	-22.47	14.65	43.50	-28.85	peak			
5 199	.2855	36.96	-20.43	16.53	43.50	-26.97	peak			
6 625	.0778	35.08	-8.51	26.57	46.00	-19.43	peak			
*:Maximum data x	:Over limit	!:over margin								
Emission Level	- Bood I	ovol+ Com	ract Easter	,						
ziiiission Levei	- Reau L	ever+ COM	ect ractor							



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EU.	т.	100				Water Resistant Shower						Model Name :						LSP-297			
_0						th S	Speak	ker				nouel	ITAII				201 201				
Ten	npera	ture	<b>)</b> :	25			11/1					Relativ	ve H	umi	idity	<b>'</b> :	55	5%			
Tes	t Volt	tage	:	DC	5V	1			6						1				đ		
	. Pol.			Но								611									
	t Mod			TX	GF	SK	Mo	de 2	24411	MHz		12			1			Wed.			
Rer	nark:	i !		On	ly v	ors	se ca	ase	is re	oorted				W							
80.08 	) dBu∀	7m																		$\neg$	
														(R	F)FCC	150 3		diation gin -6		Ч	
											L						mdl	ym -0	30	Ħ	
											┢╸									4	
30											-			6 X						-	
	1 X.	2 X									ļ	5 X			W	الساح	HAMINA.	MMh	N	leg/ha	
	NW N	$\lambda_{\lambda}/$						3 *			Ž.	Yhaladd Haladd	A Market	M.	M. Mahan	Assolut.	_				
		'	Almora Carper	Maggirden	arg. Add	الإمالاميا	المها المدينة	Maredle	معالهايهم	godlaylayk/19lk	MIN	Y Was									
-20																					
L	.000	40	50	60	70	80			-	(MHz)			300	40	00	500	600	700	10	00.000	
						Re:	adir	na -	Col	rrect	М	easur									
١	۷o. ۱	Λk.	Fre	eq.			evel	_		ctor		m ent	_	Lin	nit	1	Ove	er			
_			MH	MHz		dl	BuV		dE	3/m		dBuV/n	n	dB	uV/n	1	dB		Det	ecto	
1			35.8	746		36	3.63	3	-17	7.60		19.03	3	40	0.00	) -	-20.	97	р	eak	
2			42.7	496		38	3.82	2	-21	.32		17.50	)	40	0.00	) -	-22.	50	р	eak	
3			119.8	3555	i	33	3.17	7	-22	2.50		10.67	,	43	3.50	١ -	-32.	83	р	eak	
4			207.8	3497	,	32	2.72	2	-20	0.05		12.67	,	43	3.50	) -	-30.	83	р	eak	
5			256.5	210		35	5.98	3	-17	'.98		18.00	)	46	3.00	- ا	-28.	00	р	eak	
6	*	;	375.9	384		4	1.94	1	-14	.40		27.54		46	3.00	- ا	-18.	46	р	eak	
*:M	laximun	n data	x:0	ver lin	nit	!:ove	er ma	ırgin													
Em	icein	n I a	wol=	Res	4 I	٥٧٠	\1+ <i>(</i>	Corr	oct [	actor	,										
	13310	6	, v CI-	. vea	u L	. v C	,,, ,	<i>-</i> 011	GUL I	actor											



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uetooth Speaker  5 °C  C 5V  ertical  K GFSK Mode 244  hly worse case is i		Relative Hu	umidity:	55%	
ertical K GFSK Mode 244					
GFSK Mode 244			mun's		a S
			MODA		1
nly worse case is	reported		MUE		
70 80	(MHz)	May from the form of the form			
		Measure- ment	Limit	Over	
dBuV	dB/m	dBuV/m	dBuV/m	dB	Detecto
45.69 -	17.67	28.02	40.00	-11.98	peak
44.05 -	22.92	21.13	40.00	-18.87	peak
<b>35.07</b> -:	23.20	11.87	40.00	-28.13	peak
5 36.96 -:	20.43	16.53	43.50	-26.97	peak
4 32.86 -	14.40	18.46	46.00	-27.54	peak
9 38.51 -	-6.54	31.97	46.00	-14.03	peak
	Reading C Level dBuV 45.69 - 44.05 - 35.07 - 5 36.96 - 4 32.86 -	Reading Correct Factor    Abu   Abu   Abu     Abu   Abu     Abu	Reading Correct Measure- Level Factor ment  dBuV dB/m dBuV/m  45.69 -17.67 28.02  44.05 -22.92 21.13  35.07 -23.20 11.87  5 36.96 -20.43 16.53  4 32.86 -14.40 18.46  9 38.51 -6.54 31.97	Reading Correct Measure- Level Factor ment Limit    dBuV   dB/m   dBuV/m   dBuV/m     45.69   -17.67   28.02   40.00     44.05   -22.92   21.13   40.00     35.07   -23.20   11.87   40.00     36.96   -20.43   16.53   43.50     4   32.86   -14.40   18.46   46.00     9   38.51   -6.54   31.97   46.00	Reading Correct Measure—ment Limit Over    dBuV   dB/m   dBuV/m   dBuV/m



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EUT:	Water Resistant Shower Bluetooth Speaker			Model	Name :	LSP-297	
Temperature:	25 ℃		1172	Relativ	Relative Humidity: 55		
Test Voltage:	DC 5	V	mill	333			
Ant. Pol.	Horiz	ontal			AD T	CIV.	11:12
Test Mode:	TX G	FSK Mo	de 2480MHz	I Alba		1 6	
Remark:	Only	worse ca	ase is reporte	d	amos		
80.0 dBuV/m							
					(RF)FCC 15C	3M Radiation Margin -6	dB
20 30.000 40 50	3 X Www.w 60 70	themplace to the spell a spell	4 X Varanjangalangalangan Varanjangalangan (MHz)	14 W / 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 X Market Market Marke	600 700	1000.000
20 30.000 40 50		Readin	(MHz)	Measure	00 400 500		1000.000
20 30.000 40 50	eq.		(MHz)	30	00 400 500 Elimit	600 700	1000.000
20 30.000 40 50 No. Mk. Fr	<b>eq</b> . ⊣z	Readin Level	(MHz) ng Correct Factor  dB/m	Measure ment	00 400 500 Elimit	600 700 Over	
20 30.000 40 50 No. Mk. Fr	eq. ⊣z 746	Readin Level	(MHz)  ng Correct Factor  dB/m  -17.60	Measure ment dBuV/m	200 400 500  Limit  dBuV/m	600 700  Over	Detecto
No. Mk. Fr	eq. ⊣z 746 496	Readir Level dBuV	(MHz)  ng Correct Factor  dB/m  -17.60 2 -21.32	Measure ment dBuV/m	200 400 500 2- Limit dBuV/m 40.00	000 700  Over  dB  -21.97	Detecto <b>peak</b>
No. Mk. Fr  1 35.8 2 42.7	eq. ⊣z 746 496 911	Readir Level dBuV 35.63	(MHz)  ng Correct Factor  dB/m  -17.60 2 -21.32 3 -24.48	Measure ment dBuV/m 18.03	Limit  dBuV/m  40.00  40.00	Over dB -21.97 -23.50	Detecto peak peak
No. Mk. Fr  Mi  1 35.8 2 42.7 3 56.9	eq	Readir Level dBuV 35.63 37.82 34.93	(MHz)  ng Correct Factor  dB/m  -17.60 2 -21.32 3 -24.48 7 -22.50	Measure ment  dBuV/m  18.03  16.50  10.45	Limit  dBuV/m  40.00  40.00  40.00	Over  dB  -21.97  -23.50  -29.55	Detecto peak peak peak



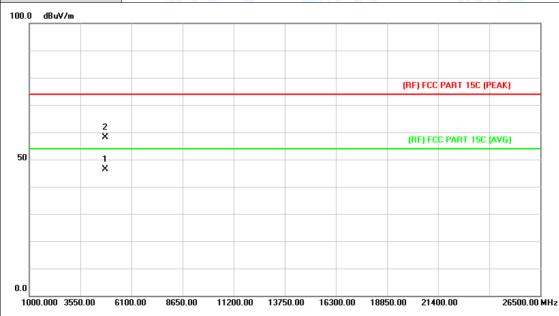
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EUT:	Water	Resistant Sho	ower	Model Na	me ·	LSP-2	97
		oth Speaker	11 0	Wodel Ha			
Temperature:	25 ℃			Relative F	lumidity:	55%	
Test Voltage:	DC 5	V	THE STATE OF		1 800		60
Ant. Pol.	Vertic				3	_ GV	
Test Mode:	TX G	FSK Mode	2480MHz				
Remark:	Only	worse case	is reported		AMO		
80.0 dBuV/m							
					(RF)FCC 15	C 3M Radiation	
						Margin -6	dB
30 1 2						6	1.1
				ī			MWW
1. 1. 1. V	3	,     7	: بالسنان	للدر ال	political and the second and	Ashar Maria and	
	Marky Market Land	Manufacture of the second	Ladit Level Leliande	Indian hamilately and			
	1,55						
20 30.000 40 50	60 70	80	(MHz)	300	400 50	0 600 700	1000.000
30.000 40 30	00 70	00	(MIIZ)	300	400 30	0 000 700	1000.000
NI- MI- E		Reading	Correct	Measure-	Limit	O∨er	
	req.	Level	Factor	ment			
N	1Hz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1 * 36.0	0007	45.69	-17.67	28.02	40.00	-11.98	peak
2 39.8	8541	45.71	-20.07	25.64	40.00	-14.36	peak
3 74.9	9191	34.92	-23.45	11.47	40.00	-28.53	peak
4 119.	4360	36.12	-22.47	13.65	43.50	-29.85	peak
5 199.	.2855	35.96	-20.43	15.53	43.50	-27.97	peak
6 625.	.0778	35.08	-8.51	26.57	46.00	-19.43	peak
*:Maximum data x:	:Over limit	!:over margin					



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Horizontal		CHILD .		
Test Mode:	TX GFSK Mode 2402MHz	A Property of the Party of the	1 6		
Remark:	k: No report for the emission which more than 10 dB below the prescribed limit.				

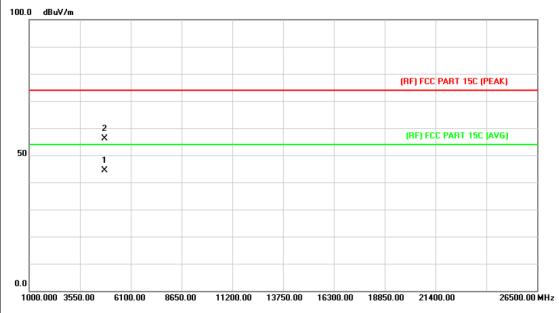


	lo. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.478	33.00	13.44	46.44	54.00	-7.56	AVG
2		4804.656	44.72	13.44	58.16	74.00	-15.84	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2402MHz	The same of the sa			
Remark: No report for the emission which more than 10 dB below the prescribed limit.					



No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.647	31.05	13.44	44.49	54.00	-9.51	AVG
2		4804.475	42.66	13.44	56.10	74.00	-17.90	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V					
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2441MHz	The same				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

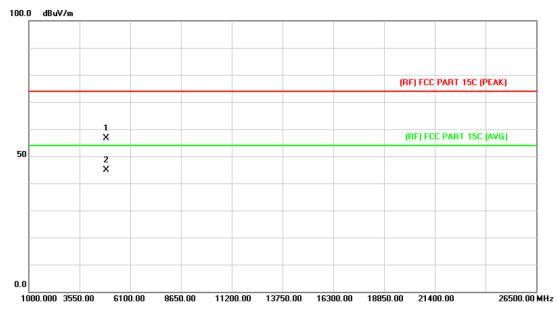


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.357	43.56	13.90	57.46	74.00	-16.54	peak
2	*	4881.643	30.22	13.90	44.12	54.00	-9.88	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Vertical		COLUMN TO SERVICE OF THE PERSON OF THE PERSO		
Test Mode:	TX GFSK Mode 2441MHz	VIII TO	1		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

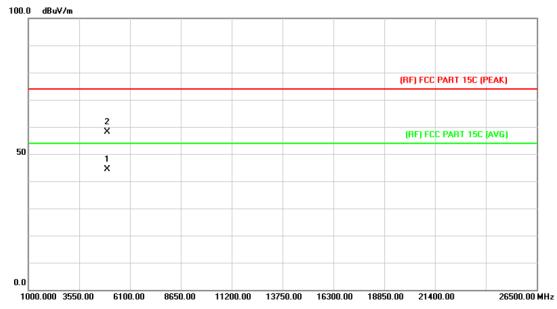


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.478	42.83	13.90	56.73	74.00	-17.27	peak
2	*	4882.577	30.99	13.90	44.89	54.00	-9.11	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	DC 5V					
Ant. Pol.	Horizontal		CIO LE			
Test Mode:	TX GFSK Mode 2480MHz	V.				
Remark: No report for the emission which more than 10 dB below the prescribed limit.						

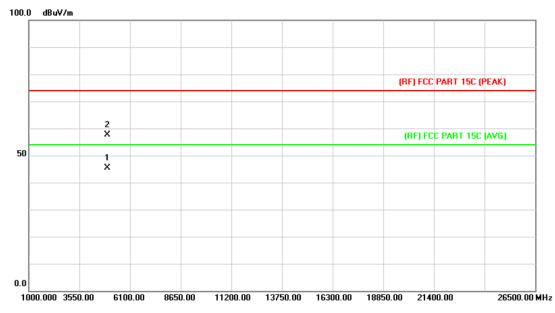


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.247	30.03	14.36	44.39	54.00	-9.61	AVG
2		4960.453	43.76	14.36	58.12	74.00	-15.88	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2480MHz				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

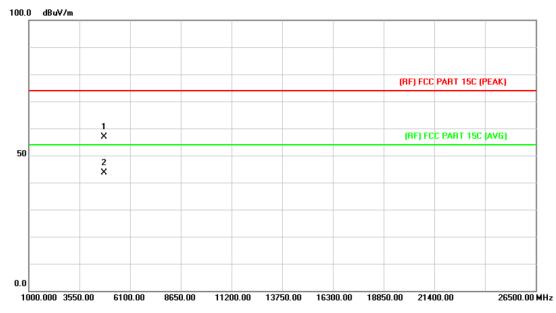


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.364	30.95	14.36	45.31	54.00	-8.69	AVG
2		4959.479	43.28	14.36	57.64	74.00	-16.36	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃ Relative Humidity:		55%		
Test Voltage:	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.				

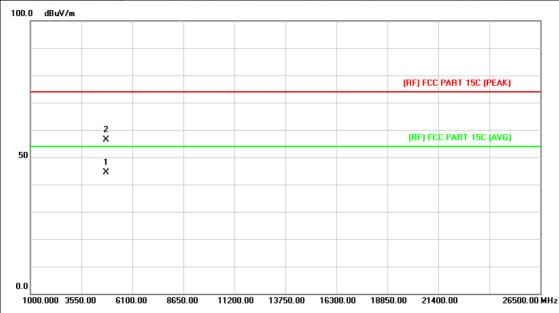


N	o. Mk	. Freq.	_		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.337	43.38	13.44	56.82	74.00	-17.18	peak
2	*	4804.286	30.23	13.44	43.67	54.00	-10.33	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
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.				

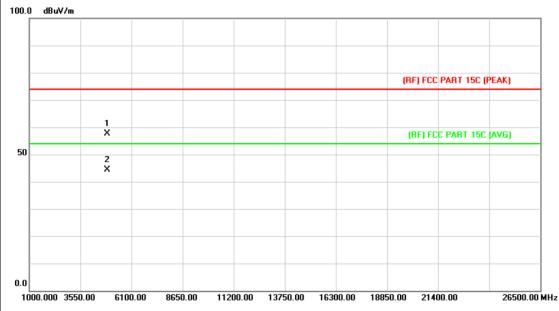


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.373	30.85	13.44	44.29	54.00	-9.71	AVG
2		4803.478	42.88	13.44	56.32	74.00	-17.68	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Horizontal				
Test Mode:	TX 8-DPSK Mode 2441MHz				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

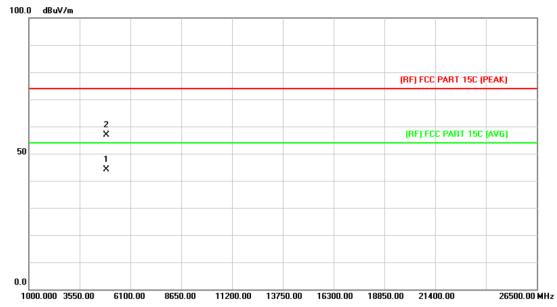


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.354	43.79	13.90	57.69	74.00	-16.31	peak
2	*	4882.369	30.48	13.90	44.38	54.00	-9.62	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker  Model Name:		LSP-297			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2441MHz	TX 8-DPSK Mode 2441MHz				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

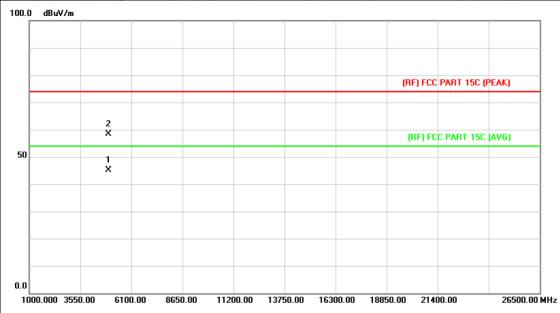


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.371	30.33	13.90	44.23	54.00	-9.77	AVG
2		4881.613	43.01	13.90	56.91	74.00	-17.09	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	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.					

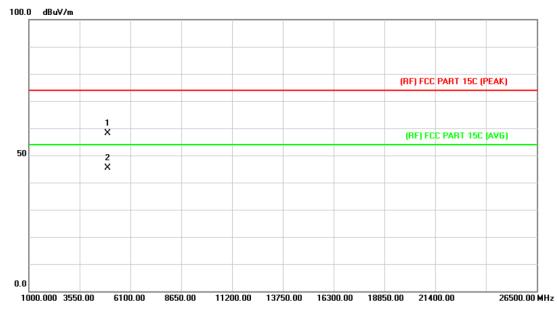


N	lo. Mi	κ. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.318	30.75	14.36	45.11	54.00	-8.89	AVG
2		4959.465	44.00	14.36	58.36	74.00	-15.64	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297				
Temperature:	25 °C Relative Humidity: 55%						
Test Voltage:	DC 5V						
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.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.347	43.85	14.36	58.21	74.00	-15.79	peak
2	*	4959.878	30.94	14.36	45.30	54.00	-8.70	AVG



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# 6. Restricted Bands Requirement

### 6.1 Test Standard and Limit

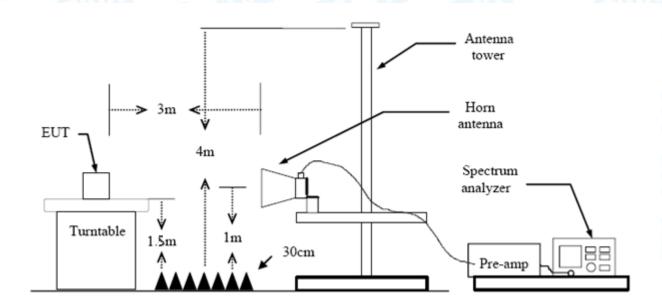
6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Class B (dE	BuV/m)(at 3m)
Band (MHz)	Peak	Average
310 ~2390	74	54
2483.5 ~2500	74	54

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

# 6.2 Test Setup



#### 6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz 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-FCC145982
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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.

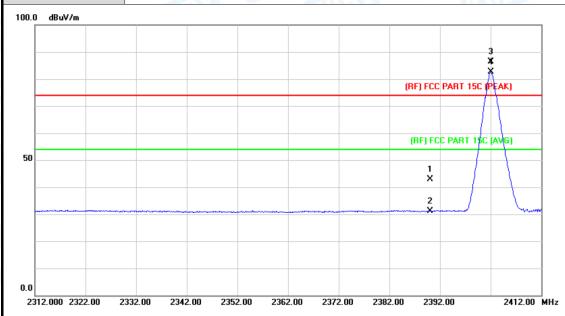
All restriction bands have been tested, only the worst case is reported.



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# (1) Radiation Test

EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 5V							
Ant. Pol.	Horizontal							
Test Mode:	TX GFSK Mode 2402MHz	TX GFSK Mode 2402MHz						
Remark:	N/A		CONTRACTOR OF THE PARTY OF THE					

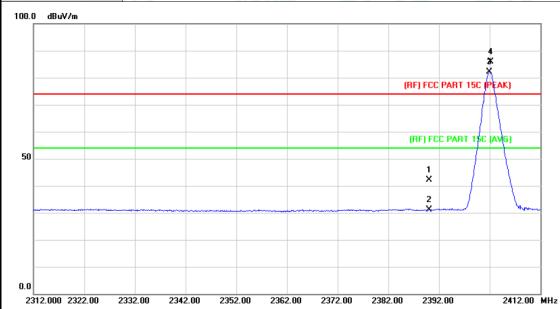


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.03	0.77	42.80	74.00	-31.20	peak
2		2390.000	30.44	0.77	31.21	54.00	-22.79	AVG
3	Х	2402.000	85.56	0.82	86.38	Fundamental	Frequency	peak
4	*	2402.100	81.71	0.82	82.53	Fundamental	Frequency	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2402MHz					
Remark:	N/A					

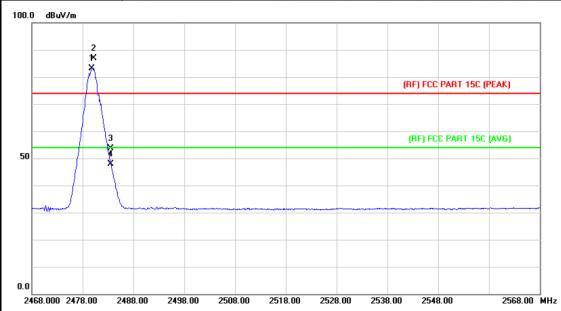


No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.29	0.77	42.06	74.00	-31.94	peak
2		2390.000	30.34	0.77	31.11	54.00	-22.89	AVG
3	*	2401.900	81.32	0.82	82.14	Fundamental Frequency		AVG
4	Χ	2402.200	85.04	0.82	85.86	Fundamental	Frequency	peak



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 5V						
Ant. Pol.	Horizontal						
Test Mode:	TX GFSK Mode 2480 MHz						
Remark:	N/A	TIVE	1				

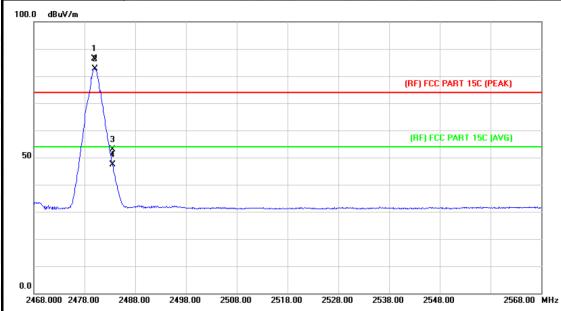


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.800	81.97	1.15	83.12	Fundamental	Frequency	AVG
2	Х	2480.200	85.77	1.15	86.92	Fundamental	Frequency	peak
3		2483.500	52.50	1.17	53.67	74.00	-20.33	peak
4		2483.500	46.59	1.17	47.76	54.00	-6.24	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 5V						
Ant. Pol.	Vertical	- Mills					
Test Mode:	TX GFSK Mode 2480 MHz	TX GFSK Mode 2480 MHz					
Remark:	N/A						

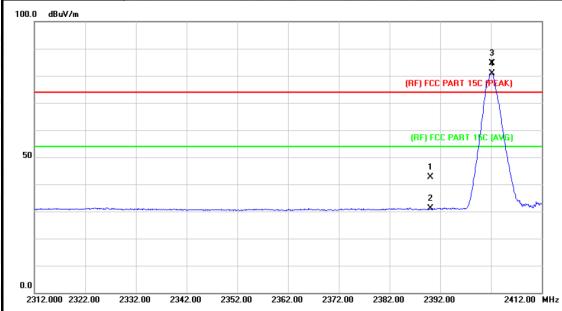


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.900	85.28	1.15	86.43	Fundamental	Frequency	peak
2	*	2480.000	81.51	1.15	82.66	Fundamental	Frequency	AVG
3		2483.500	51.69	1.17	52.86	74.00	-21.14	peak
4		2483.500	46.14	1.17	47.31	54.00	-6.69	AVG



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Horizontal		WILLIAM STATE		
Test Mode:	TX 8-DPSK Mode 2402MHz	The same of the sa			
Remark:	N/A				



No.	. Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.79	0.77	42.56	74.00	-31.44	peak
2		2390.000	30.35	0.77	31.12	54.00	-22.88	AVG
3	Χ	2402.200	83.91	0.82	84.73	Fundamental	Frequency	peak
4	*	2402.200	79.97	0.82	80.79	Fundamental	Frequency	AVG



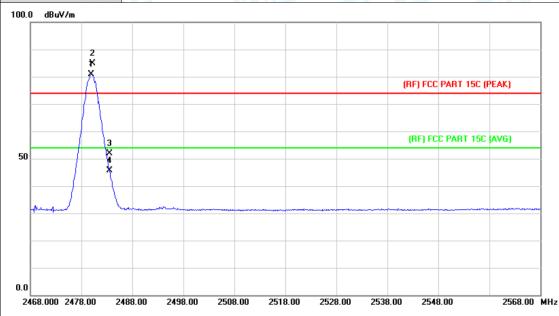
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EUT:				Water Resistant Shower Bluetooth Speaker		6.1	Mod	el Nan	ne :		LSP-29	97		
Temp	eratur	e:	25 °		W			Rela	tive H	umidit	ty:	55%		
	/oltag		DC 5	5V		611		333		8. 1	1///		1	h
Ant. F	Pol.		Verti	ical		8				3			111/5	
Test N	/lode:		TX 8	B-DPSK	Mod	e 2402	MHz	A	J. Jan		1	1		
Rema	rk:		N/A			70				01	772			
100.0	dBuV/m													_
												3 *		
$\vdash$										(RF	FCC PA	ART 15C (PE	AKJ	+
													\	
										(RF) FCC PART 15C (AVG)		v <sub>G)</sub>		
50											1		$\uparrow$	1
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	····	~~~									2 X		Homen	m
														4
0.0														
2312.	000 2322	2.00 2	332.00	2342.00	2352	2.00 2	362.00	2372.	.00 23	382.00	2392.0	00	2412.00	МН
No	. Mk.	Fr	eq.	Read Lev	_	Corr			sure- ent	Lim	ıit	Over		
		M	Ηz	dBu	V	dB/	m	dBı	uV/m	dBu	V/m	dB	Dete	ecto
1		2390	.000	41.8	37	0.7	7	42	2.64	74	.00	-31.36	) pe	ak
2		2390	.000	29.8	32	0.7	7	30	).59	54	.00	-23.41	I AV	/G
3	Χ	2401	.900	83.7	70	0.8	2	84	1.52	Funda	mental	l Frequency	, pe	ak
4	*	2402	.100	79.8	35	0.8	2	80	0.67	Funda	mental	Frequency	, A\	/G



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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 5V				
Ant. Pol.	Horizontal				
Test Mode:	TX 8-DPSK Mode 2480MH	Iz			
Remark:	N/A		1		
100.0 dBuV/m					

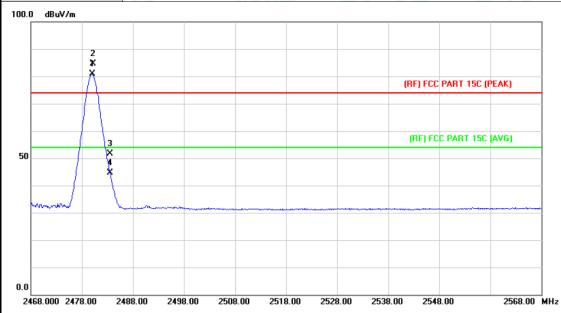


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.900	79.82	1.15	80.97	Fundamental	Frequency	AVG
2	Χ	2480.200	83.74	1.15	84.89	Fundamental	Frequency	peak
3		2483.500	50.67	1.17	51.84	74.00	-22.16	peak
4		2483.500	44.51	1.17	45.68	54.00	-8.32	AVG

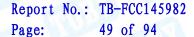


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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	: DC 5V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2480MH:	z				
Remark: N/A						
100.0 dBuV/m						



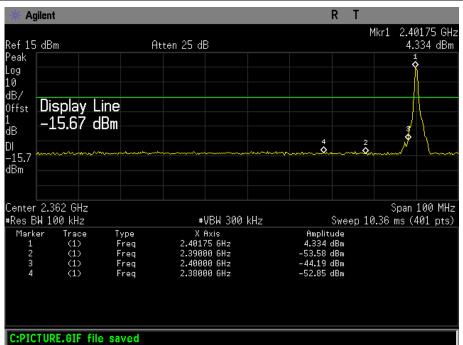
No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2480.100	79.62	1.15	80.77	Fundamental	Frequency	AVG
2	Х	2480.200	83.50	1.15	84.65	Fundamental	Frequency	peak
3		2483.500	50.42	1.17	51.59	74.00	-22.41	peak
4		2483.500	43.36	1.17	44.53	54.00	-9.47	AVG

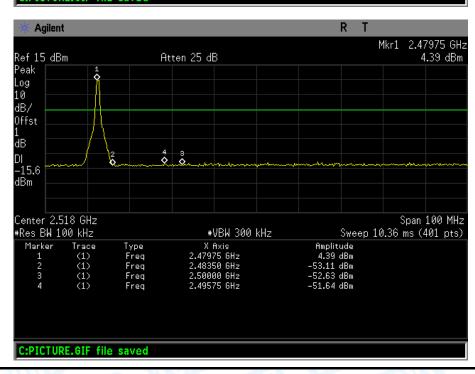




(2) Conducted Test

EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Test Mode:	TX GFSK Mode 2402MHz / 2480 MHz					
Remark:	N/A					







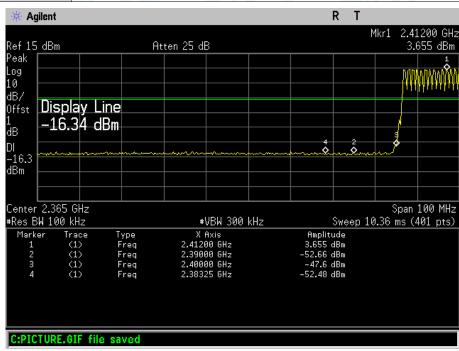
EUT: Water Resistant Shower
Bluetooth Speaker

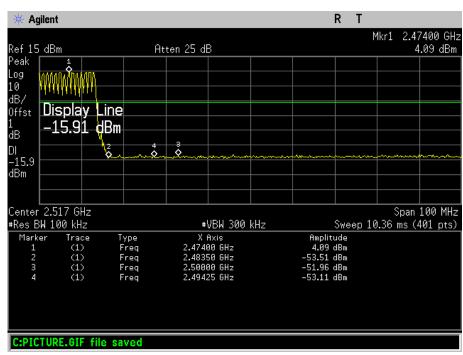
Temperature: 25 °C
Relative Humidity: 55%

Test Voltage: DC 3.7V

Test Mode: GFSK Hopping Mode

Remark: N/A







EUT:

Water Resistant Shower
Bluetooth Speaker

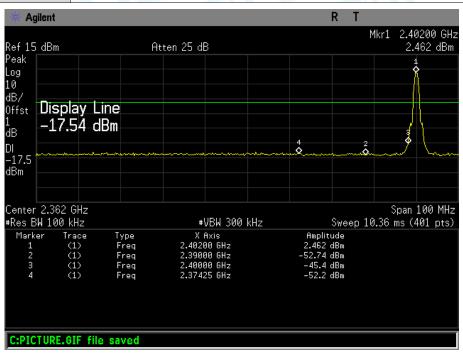
Temperature: 25 °C

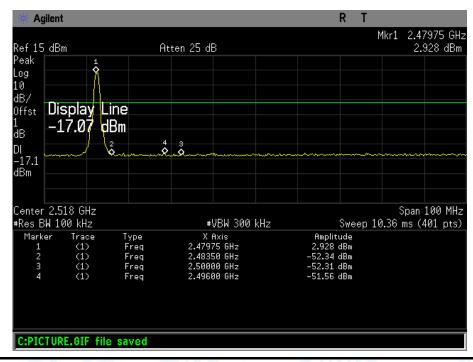
Relative Humidity: 55%

Test Voltage: DC 3.7V

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

Remark: N/A







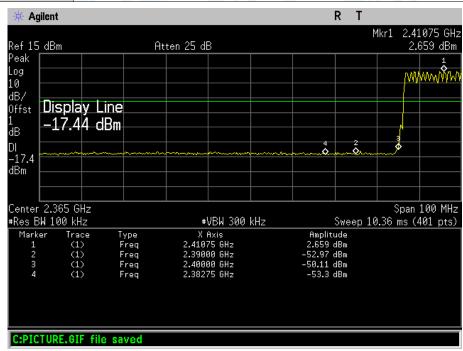
EUT: Water Resistant Shower Bluetooth Speaker Model Name: LSP-297

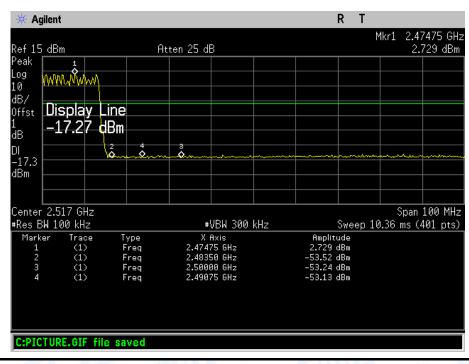
Temperature: 25 °C Relative Humidity: 55%

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



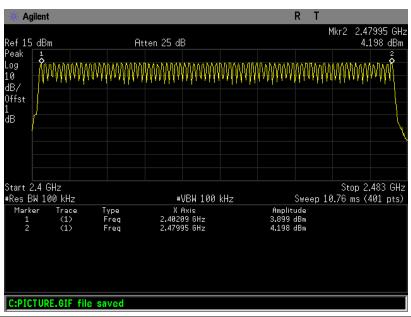
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Toot Voltage	DC 2.7\/	11.00	

Test Voltage: DC 3.7V

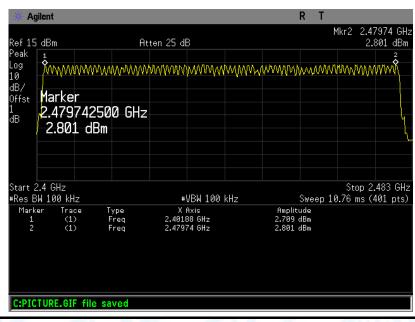
Test Mode: Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
2402MHz~2480MHz	79	>15
240210172~240010172	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.

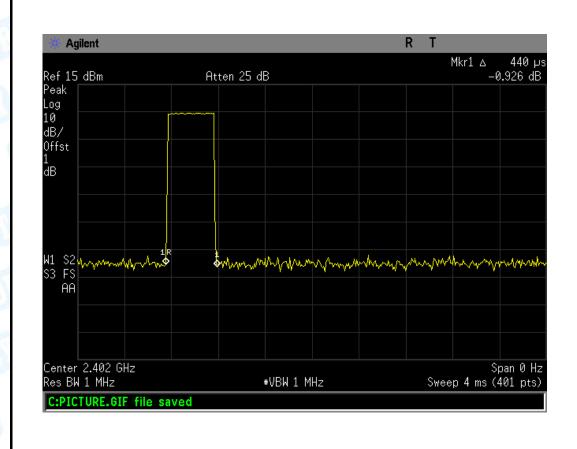


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# 8.5 Test Data

EUT:		Water Resis	stant Shower Speaker	Model Name :		LSP-297
Temperature		25 ℃		Relative Hum	idity:	55%
Test Voltage:		DC 3.7V	THE STATE OF THE S			A PAUL
Test Mode: Hopping Mode (GFSK DH1)						
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Nesuit
2402		0.440	140.80			
2441		0.440	140.80	31.60	400	PASS
2480		0.440	140.80			
	•		0=01/11			•

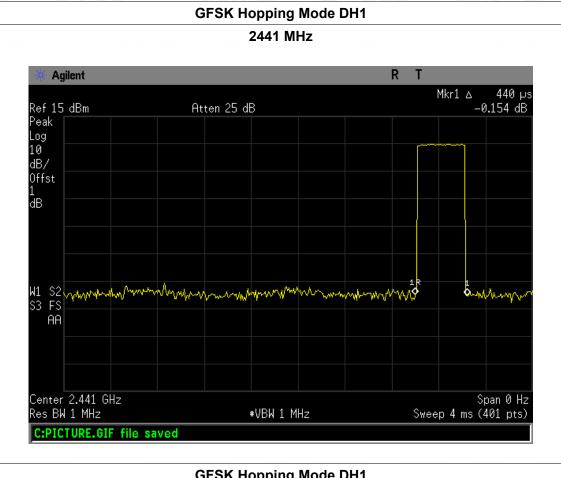
# **GFSK Hopping Mode DH1**



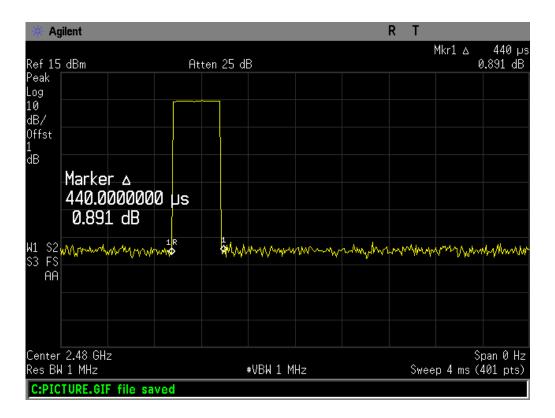




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# GFSK Hopping Mode DH1





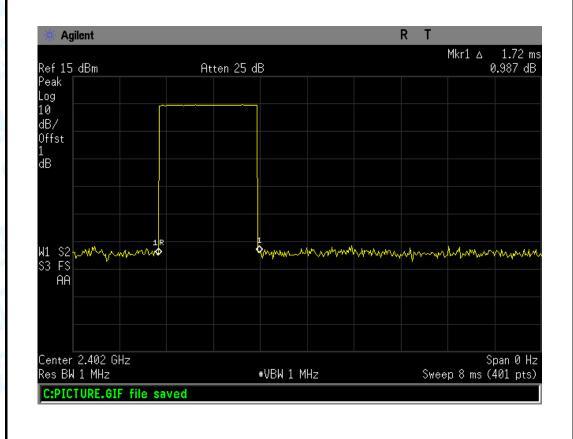
Page: 58 of 94

EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
To a 4 M a al a a	Hamming Marta (OFOK DUO)		

Test Mode: Hopping Mode (GFSK DH3)

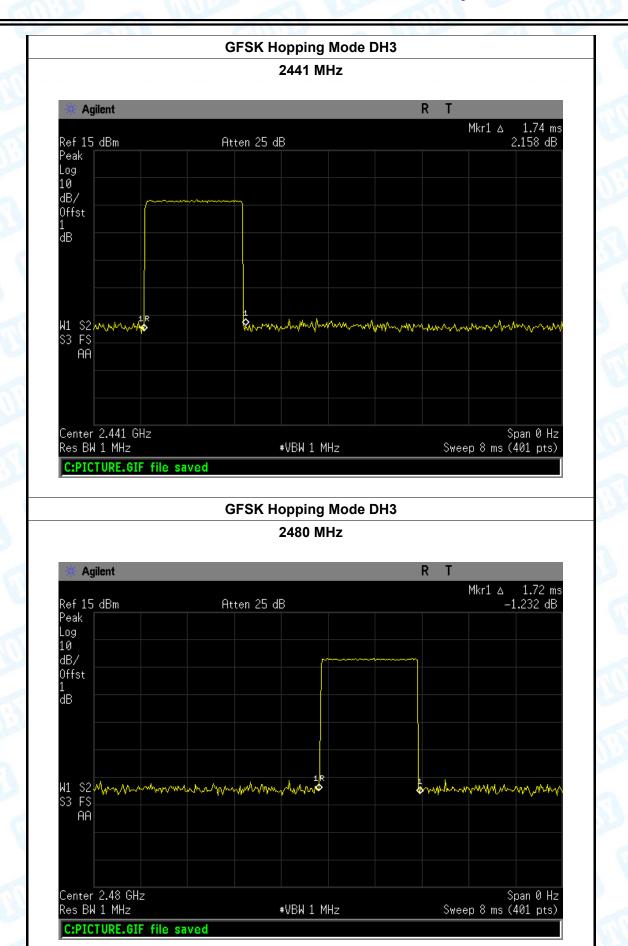
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.720	275.20	31.60	400 <b>PASS</b>	
2441	1.740	278.40			PASS
2480	1.720	275.20			

# **GFSK Hopping Mode DH3**











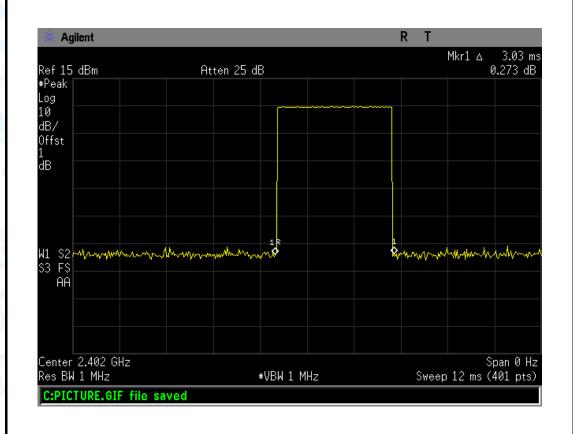
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EUT:	Water Resistant Shower	Model Name :	LSP-297
	Bluetooth Speaker		
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Tost Mode:	Hopping Mode (GESK DH5)		

Test Mode: Hopping Mode (GFSK DH5)

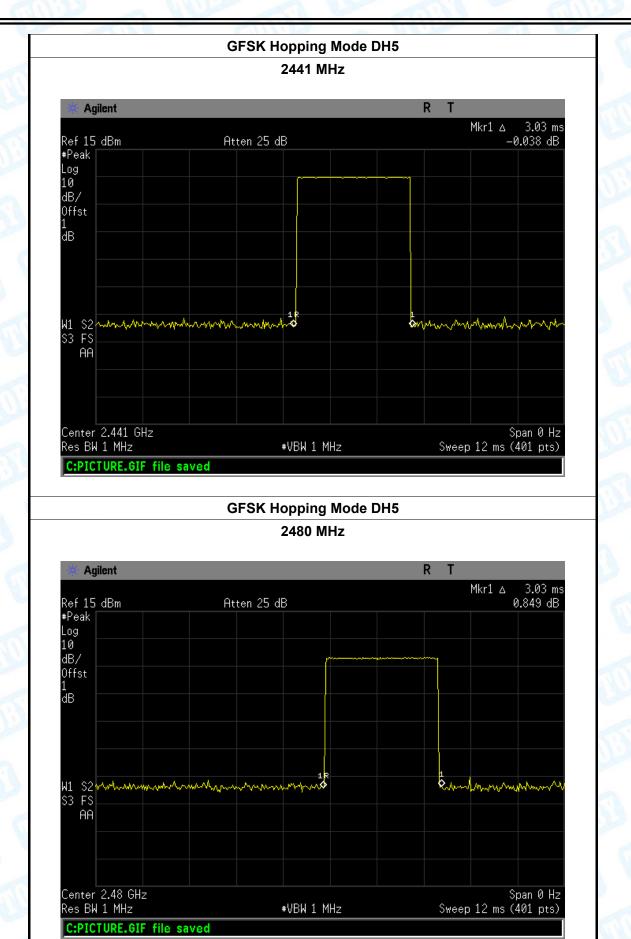
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.030	323.20	31.60	400 <b>PASS</b>	
2441	3.030	323.20			PASS
2480	3.030	323.20			

# **GFSK Hopping Mode DH5**











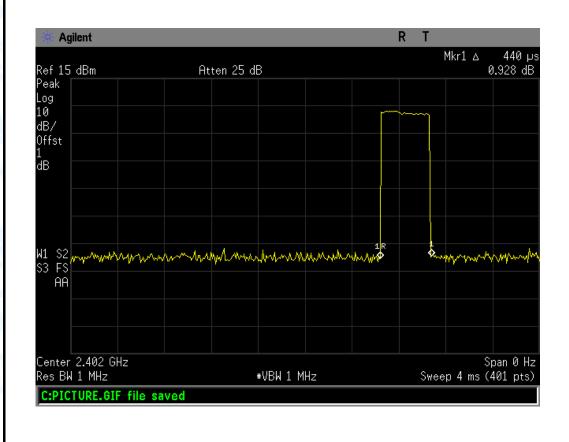
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EUT:	Water Resistant Shower	Model Name :	LSP-297	
	Bluetooth Speaker	Woder Name .	L3F-291	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Tost Mode:	Honning Mode ( T /4-DOF	Honning Mode ( T /4-DOPSK DH1)		

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

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

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





π/4-DQPSK Hopping Mode DH1 2441 MHz Agilent R Mkr1  $\Delta$ 440 µs Ref 15 dBm Atten 25 dB 0.428 dB Peak Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts) C:PICTURE.GIF file saved  $\pi$  /4-DQPSK Hopping Mode DH1 2480 MHz Agilent R Mkr1 ∆ -1.225 dB Ref 15 dBm Atten 25 dB Peak Log 10 dB/ Offst đΒ W1 S2 S3 FS AΑ Center 2.48 GHz Res BW 1 MHz Span 0 Hz #VBW 1 MHz Sweep 4 ms (401 pts) C:PICTURE.GIF file saved

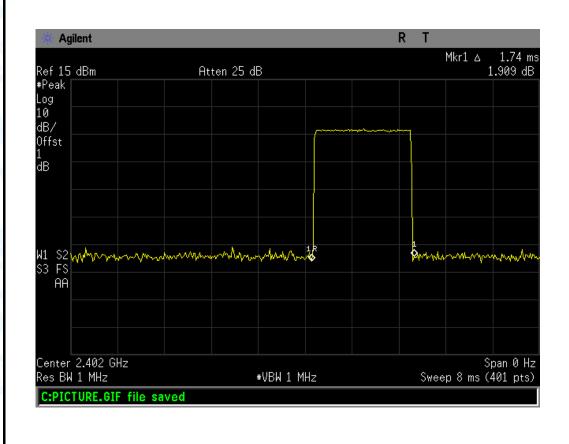


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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Test Mode:	Hopping Mode (π/4-DQPSK DH3)			

_					
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.740	278.40	31.60	400 <b>PASS</b>	
2441	1.740	278.40			PASS
2480	1.740	278.40			

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





 $\pi$  /4-DQPSK Hopping Mode DH3 2441 MHz R Agilent Mkr1 ∆ 1.74 ms Ref 15 dBm #Peak Atten 25 dB 1.244 dB Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Sweep 8 ms (401 pts) Res BW 1 MHz #VBW 1 MHz C:PICTURE.GIF file saved  $\pi$  /4-DQPSK Hopping Mode DH3 2480 MHz Agilent R Mkr1 ∆ 1.74 ms Ref 15 dBm #Peak -1.56 dB Atten 25 dB Log 10 dB/ Offst đΒ ₩1 S2 S3 FS & more many many many AΑ Center 2.48 GHz Res BW 1 MHz Span 0 Hz #VBW 1 MHz Sweep 8 ms (401 pts) C:PICTURE.GIF file saved



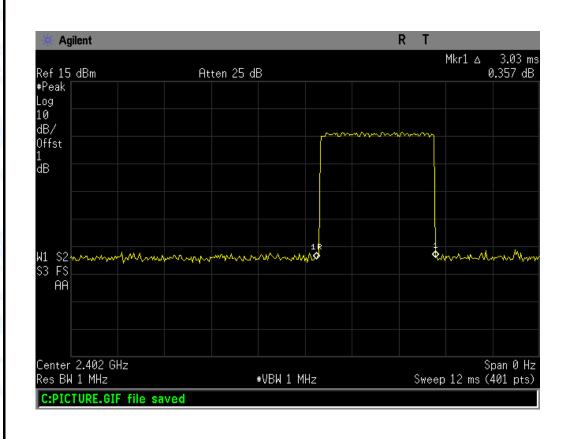
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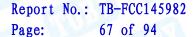
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297		
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V	THE PARTY NAMED IN			
Tost Mode:	Hopping Mode ( T /4 DOP)	Honning Mode ( # /4 DODSK DHE)			

Test Mode: Hopping Mode (π/4-DQPSK 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			

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







Center 2.48 GHz Res BW 1 MHz

C:PICTURE.GIF file saved

 $\pi$  /4-DQPSK Hopping Mode DH5 2441 MHz R Agilent Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB 0.805 dB Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Sweep 12 ms (401 pts) Res BW 1 MHz #VBW 1 MHz C:PICTURE.GIF file saved  $\pi$  /4-DQPSK Hopping Mode DH5 2480 MHz Agilent Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB 0.113 dB Log 10 dB/ Offst đΒ prangala Malaya W1 S2 S3 FS AA

#VBW 1 MHz

Span 0 Hz

Sweep 12 ms (401 pts)

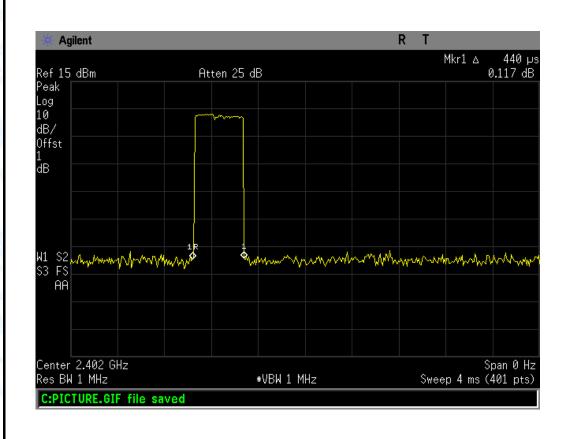


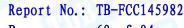
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EUT:		Water Resi	stant Shower	Model Name		LSP-297
		Bluetooth S	Speaker	Model Name :		LSF-291
Temperature:		<b>25</b> ℃	THE PARTY OF THE P	Relative Hum	idity:	55%
Test Voltage: DC 3.7V						
Test Mode:		Hopping Mode (8-DPSK DH1)				
Observat	D	l <b>T</b> !	Total of Devall	Davis d Times	1 !!4	

					Mark Table College
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

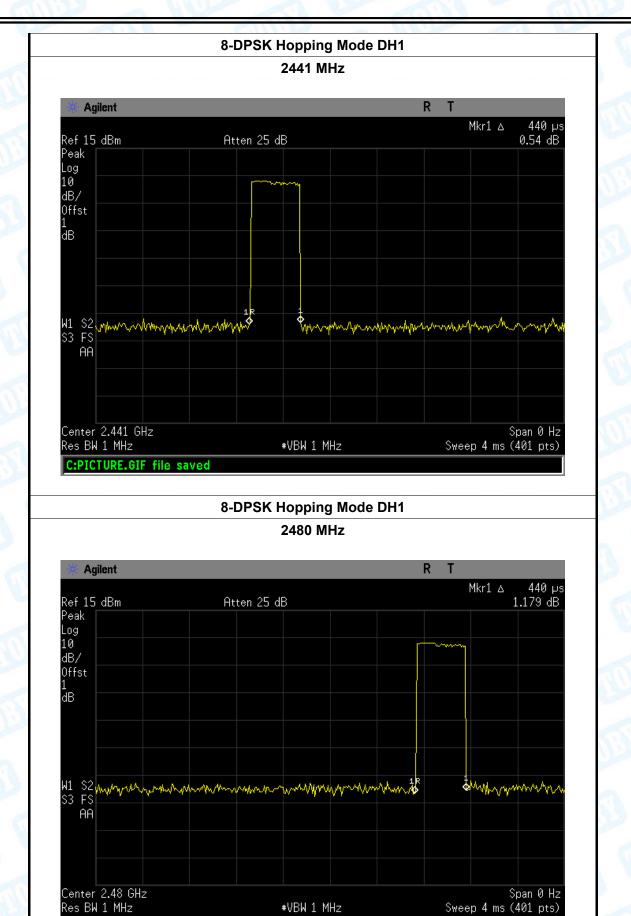






C:PICTURE.GIF file saved

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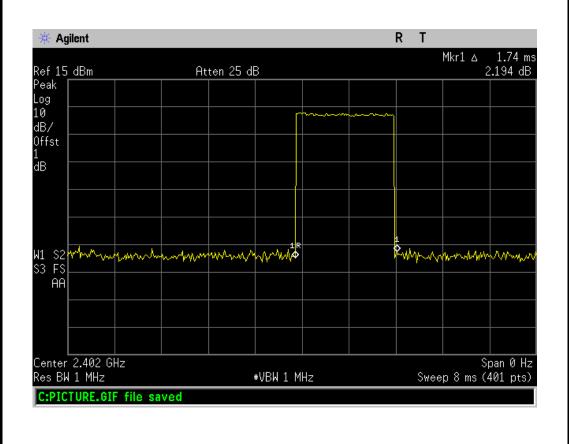


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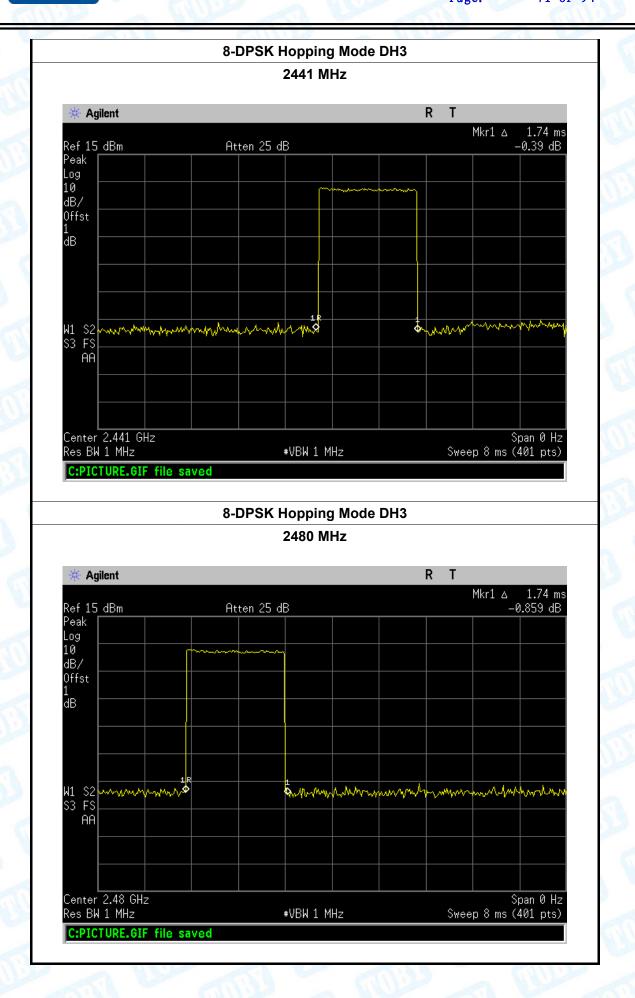
EUT:	Water Resistant Shower	Model Name :	LSP-297
	Bluetooth Speaker	Woder Name .	LSF-291
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	Hopping Mode (8-DPSK DH3)		

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









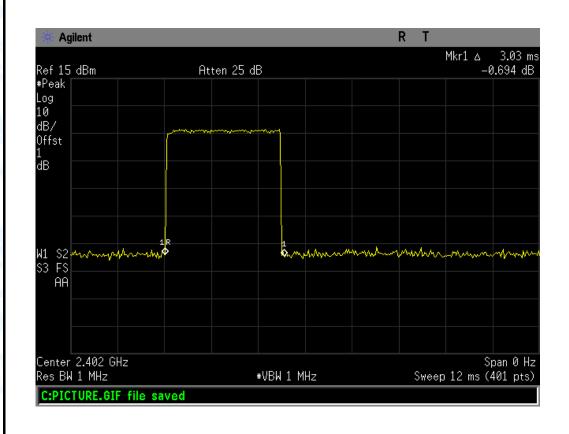
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

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 R Agilent Mkr1 ∆ 3.03 ms Ref 15 dBm #Peak Atten 25 dB 0.783 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 -0.778 dB Atten 25 dB Log 10 dB/ Offst đΒ W1 S2 S3 FS AA Center 2.48 GHz Res BW 1 MHz Span 0 Hz #VBW 1 MHz Sweep 12 ms (401 pts) C:PICTURE.GIF file saved



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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

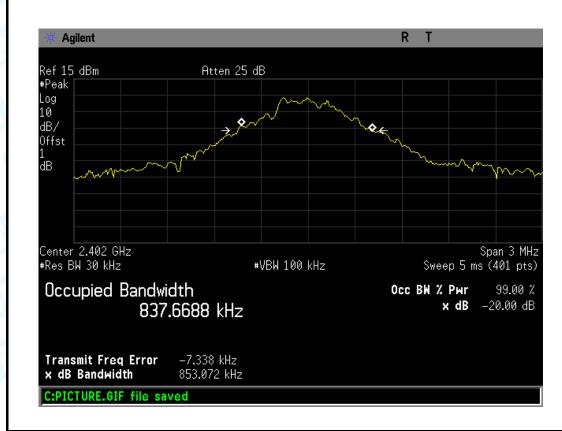
The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Bandwidth Test.



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## 9.5 Test Data

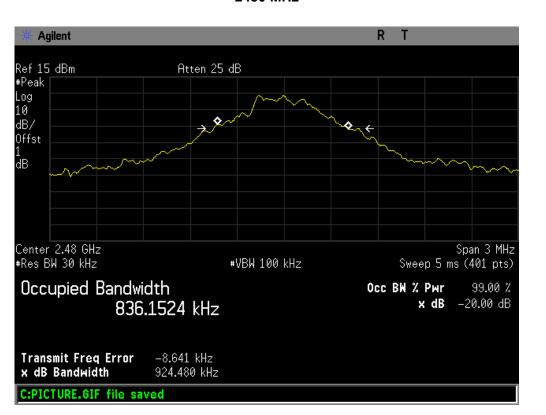
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		A DIVI
Test Mode:	TX Mode (GFSK)		
Channel frequen	cy 99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	837.6688	853.072	
2441	836.7044	859.674	
2480	836.1524	924.480	
GFSK TX Mode			







**GFSK TX Mode** 2441 MHz Agilent R Ref 15 dBm Atten 25 dB #Peak Log 10 × Q 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 % -20.00 dB x dB 836.7044 kHz Transmit Freq Error x dB Bandwidth -7.187 kHz 859.674 kHz C:PICTURE.GIF file saved **GFSK TX Mode** 2480 MHz R Agilent



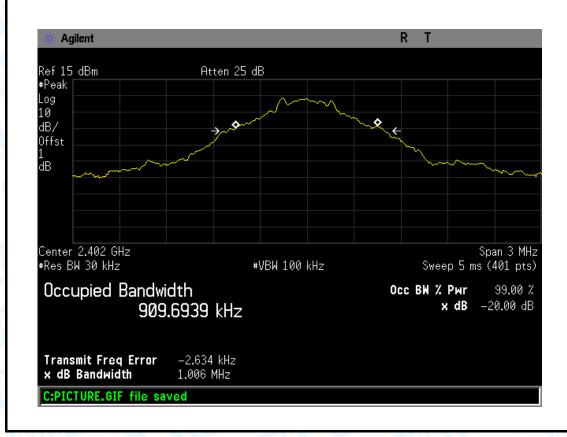


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	Channal fraguence	OOV OPW	20dP Pandwidth	20dP Pandwidth
	Test Mode:	TX Mode ( π /4-DQPSK)		
	Test Voltage:	DC 3.7V		
	Temperature:	25 ℃	Relative Humidity:	55%
Š	EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
	CIIT.	Water Pecietant Shower		

Channel frequency	99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	909.6939	1006.00	670.67
2441	908.6239	1003.00	668.67
2480	909.2866	955.242	636.83

#### π /4-DQPSK TX Mode







π/4-DQPSK TX Mode 2441 MHz Agilent R Ref 15 dBm Atten 25 dB #Peak Log 10 dB/ ٥ 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 % -20.00 dB 908.6239 kHz x dB Transmit Freq Error x dB Bandwidth -1.880 kHz 1.003 MHz C:PICTURE.GIF file saved π/4-DQPSK TX Mode 2480 MHz R Agilent Ref 15 dBm #Peak Atten 25 dB Log 10 dB/ ٥ Offst

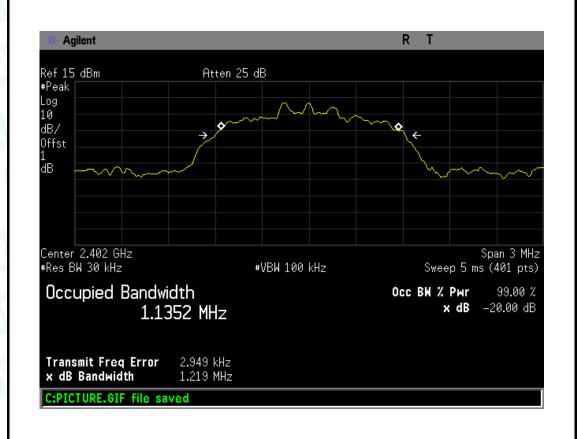


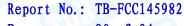
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Channel frequence	99% OBW	20dB Bandwidth	20dB Bandwidth
Test Mode:	TX Mode (8-DPSK)		
Test Voltage:	DC 3.7V		
Temperature:	25 ℃	Relative Humidity:	55%
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297

Channel frequency	99% OBW	20dB Bandwidth	20dB Bandwidth
(MHz)	(kHz)	(kHz)	*2/3 (kHz)
2402	1135.20	1219.00	812.67
2441	1132.70	1217.00	811.33
2480	1131.00	1219.00	812.67

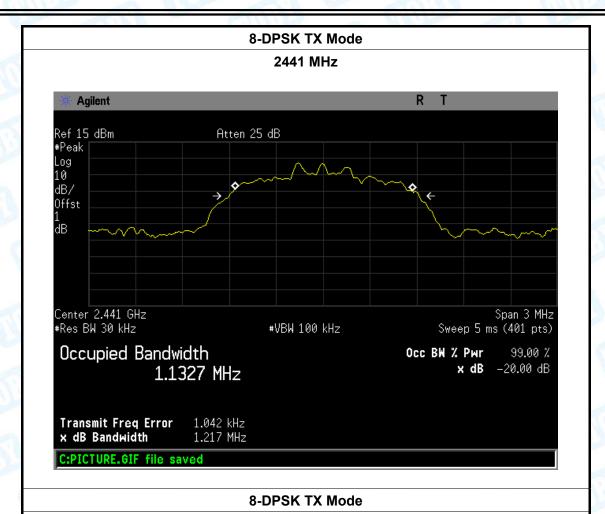
## 8-DPSK TX Mode 2402 MHz

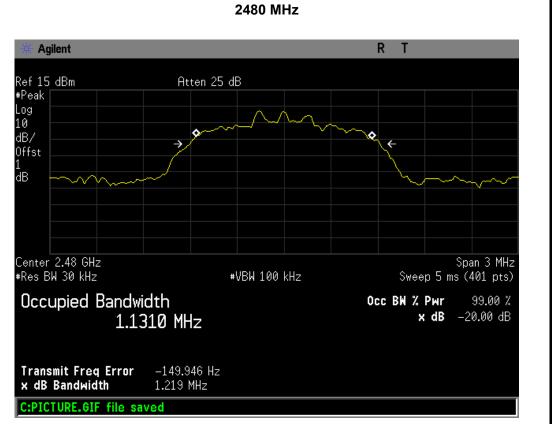






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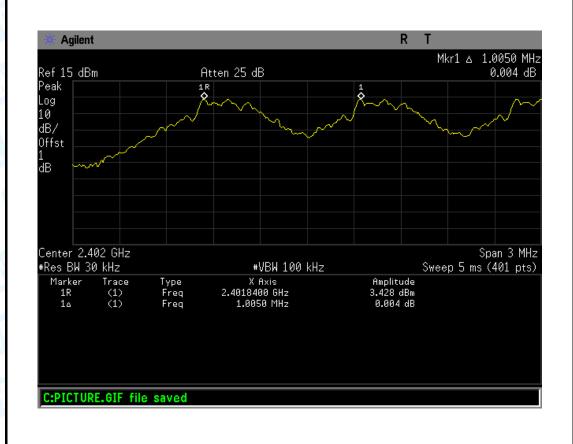
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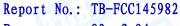
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Hopping Mode (GFSK) Test Mode:

Channel frequency	Separation Read Value	Separation Limit		
(MHz)	(kHz)	(kHz)		
2402	1005.00	853.072		
2441	1005.00	859.674		
2480	1005.00	924.480		

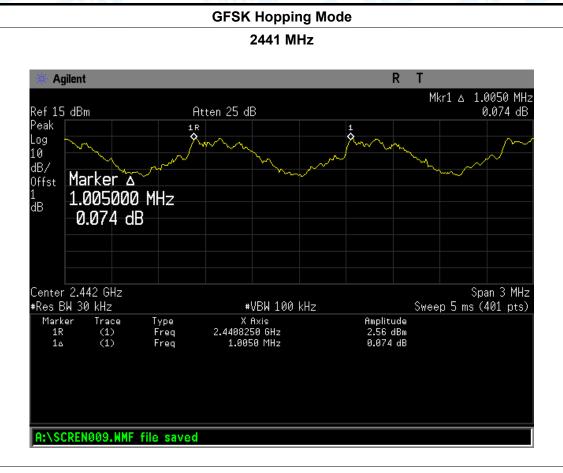
### **GFSK Hopping Mode**



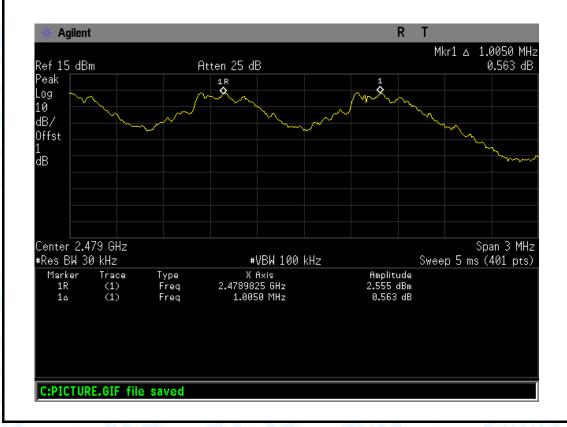




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# GFSK Hopping Mode





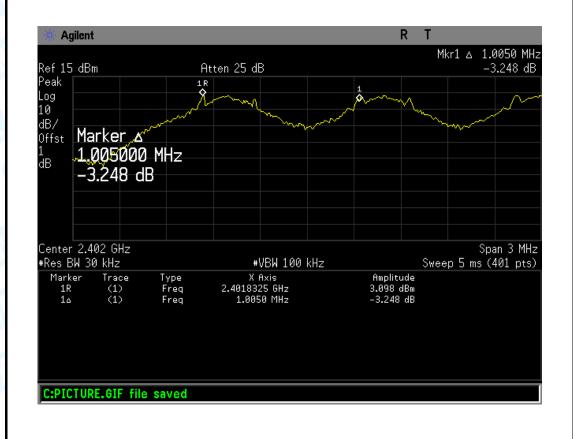
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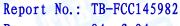
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode ( π /4-DQPSK)

Channel frequency	Separation Read Value	Separation Limit	
(MHz)	(kHz)	(kHz)	
2402	1005.00	670.67	
2441	1005.00	668.67	
2480	1005.00	636.83	

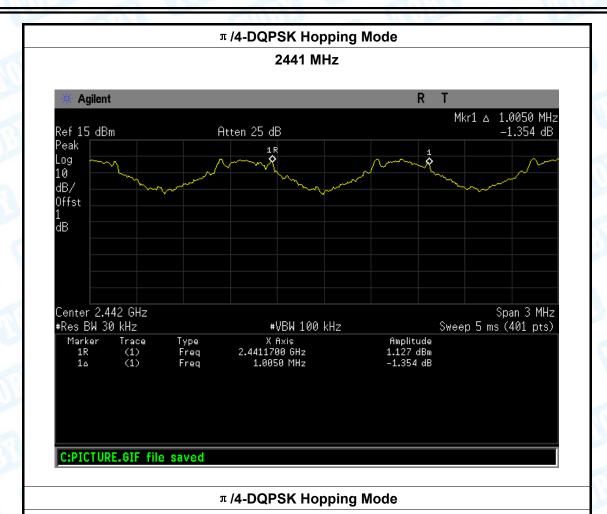
### $\pi$ /4-DQPSK Hopping Mode

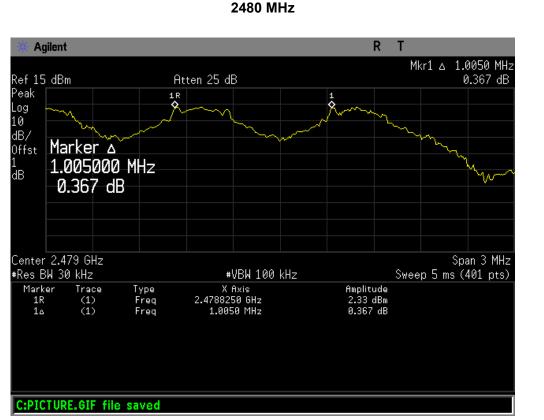






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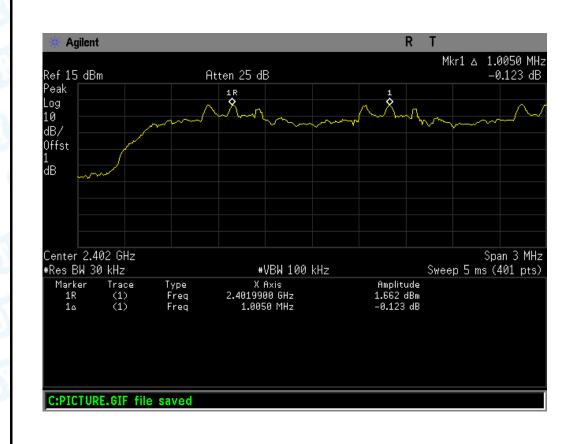
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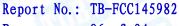
EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (8-DPSK)

Channel frequency	Separation Read Value	Separation Limit	
(MHz)	(kHz)	(kHz)	
2402	1005.00	812.67	
2441	1005.00	811.33	
2480	1005.00	812.67	

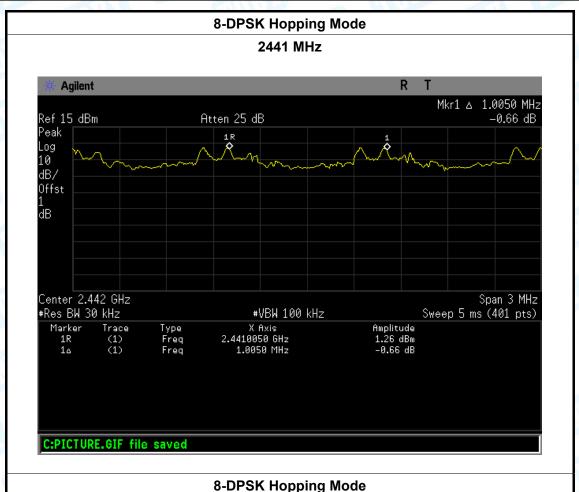
### 8-DPSK Hopping Mode

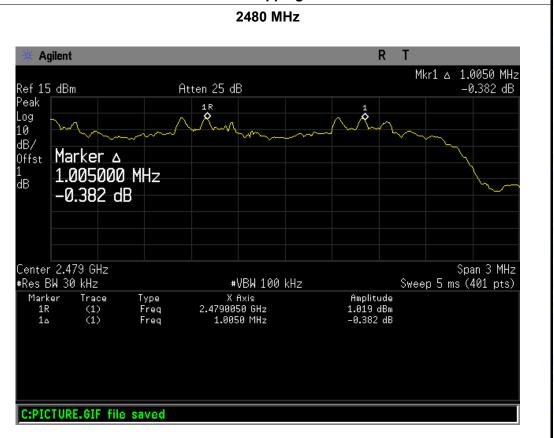






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# 10. Peak Output Power Test

## 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)
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

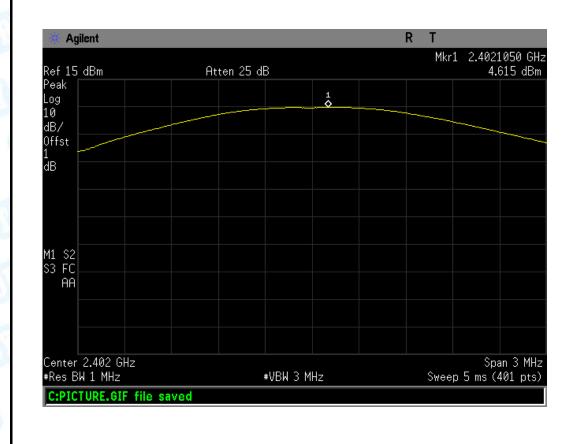
The EUT was set to continuously transmitting in the max power during the test.

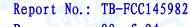


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# 10.5 Test Data

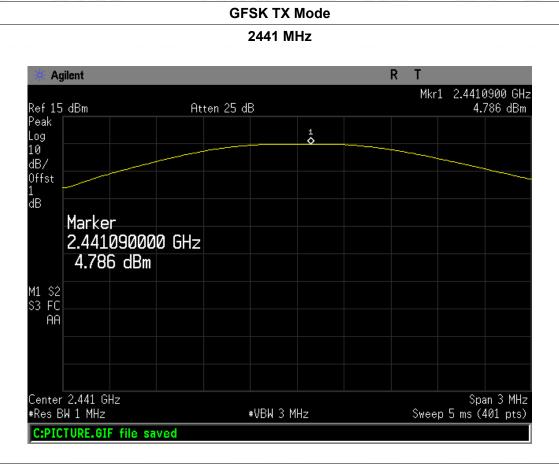
			Na. 2, 785, 71		
EUT:	Water Resis	stant Shower peaker	Model Na	ime :	LSP-297
Temperature:	25 ℃	5011	Relative	Humidity:	55%
Test Voltage:	DC 3.7V	DC 3.7V			
Test Mode:	TX Mode (GFSK)		AMO		
Channel frequen	cy (MHz)	Test Result (d	lBm)	Lir	mit (dBm)
2402		4.615			
2441		4.786			30
2480		4.586			
		GFSK TX M	ode		



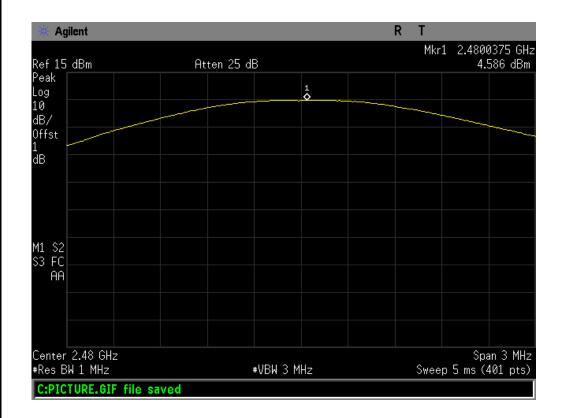




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#### **GFSK TX Mode**





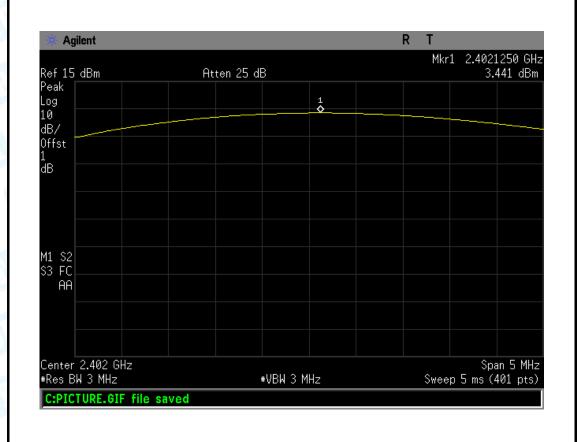
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: ΤΧ Mode ( π /4-DQPSK)

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.441	
2441	3.551	21
2480	3.425	

#### π /4-DQPSK TX Mode





π /4-DQPSK TX Mode 2441 MHz Agilent R Mkr1 2.4411000 GHz Ref 15 dBm Peak 3.551 dBm Atten 25 dB Log 10 dB/ Offst đΒ M1 S2 S3 FC AA Center 2.441 GHz Span 5 MHz Sweep 5 ms (401 pts) #Res BW 3 MHz #VBW 3 MHz C:PICTURE.GIF file saved π/4-DQPSK TX Mode 2480 MHz Agilent Mkr1 2.4800000 GHz Ref 15 dBm Atten 25 dB 3.425 dBm Peak Log 10 dB/ Offst đΒ M1 S2 S3 FC AA Center 2.48 GHz Span 5 MHz #Res BW 3 MHz #VBW 3 MHz Sweep 5 ms (401 pts) C:PICTURE.GIF file saved



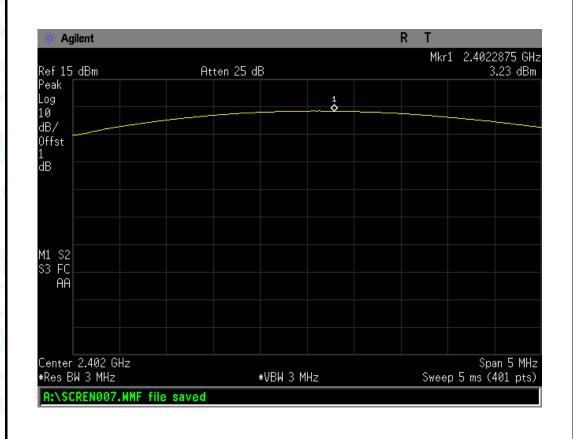
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EUT:	Water Resistant Shower Bluetooth Speaker	Model Name :	LSP-297
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

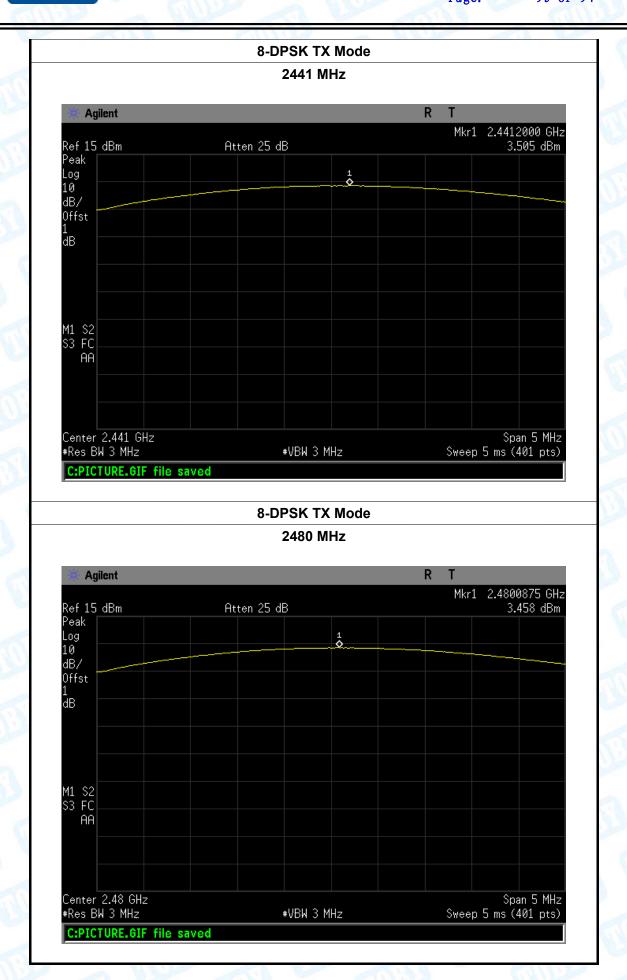
Test Mode: TX Mode (8-DPSK)

Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	3.230	
2441	3.505	21
2480	3.458	

## 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
en en	▼ Permanent attached antenna
	□ Unique connector antenna
1	☐ Professional installation antenna