

# Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC149224

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# **FCC Radio Test Report** FCC ID: 2AFXXGG-RBS

## **Original Grant**

Report No. TB-FCC149224

**Applicant** M&S Accessory Network

**Equipment Under Test (EUT)** 

**EUT Name** Gabba Goods Wireless Emoji Speaker

**GG-RBS** Model No.

Series Model No. N/A

**Brand Name** N/A

**Receipt Date** 2016-08-03

**Test Date** 2016-08-04 to 2016-08-07

**Issue Date** 2016-08-08

**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 : M&S Accessory Network

Address : 10 West 33rd Street, Suite 718, New York, NY 11223, USA

Manufacturer : Hong Kong Fanco Electronic Company Ltd.

Address: 5H, Rich Business Tower, No.108 Centre Road, Shajing, Baoan,

Shenzhen, China

## 1.2 General Description of EUT (Equipment Under Test)

<b>EUT Name</b>	:	Gabba Goods Wireless Emoji Speaker			
Models No.	•	GG-RBS			
<b>Model Difference</b>		N/A			
LOTT .		Operation Frequency: Bluetooth 2.1+EDR: 2402~2480MHz			
		Number of Channel:	Bluetooth:79 Channels see Note 2		
Product		Max Peak Output Power:	Bluetooth: 1.762 dBm(GFSK)		
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.			
Power Rating		DC 5.0V by USB cable. DC 3.7V by 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) Channel List:

Bluetooth Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)		
00	2402	27	2429	54	2456		
01	2403	28	2430	55	2457		
02	2404	29	2431	56	2458		
03	2405	30	2432	57	2459		
04	2406	31	2433	58	2460		



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		611111			
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		100

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

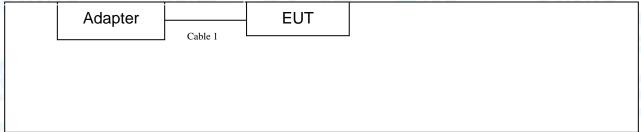
# 1.3 Block Diagram Showing the Configuration of System Tested





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## 1.4 Description of Support Units

Equipment Information							
Name Model FCC ID/DOC Manufacturer Used "√"							
AC/DC Adapter	TEKA012	W3	TEKA	<b>√</b>			
		Cable Informat	ion				
Number	Shielded Type	Ferrite Core	Length	Note			
Cable 1	NO	NO	0.5M	Accessorise			

## 1.5 Description of Test Mode

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

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

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



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#### 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 (3Mbps)

(2) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane as the normal use. Therefore only the test data of this X-plane was used for radiated emission measurement test.

## 1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of Bluetooth mode.

<b>Test Software Version</b>	A	ppo Tech RF Control Kit	V4.0
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π /4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

## 1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U <sub>Lab</sub> )	
	Level Accuracy:		
Conducted Emission	9kHz~150kHz	±3.42 dB	
	150kHz to 30MHz	±3.42 dB	
Dedicted Emission	Level Accuracy:	. 4 CO dD	
Radiated Emission	9kHz to 30 MHz	±4.60 dB	
Radiated Emission	Level Accuracy:	.4.40 dD	
Radiated Emission	30MHz to 1000 MHz	±4.40 dB	
Radiated Emission	Level Accuracy:	±4.20 dB	
Radiated Ellission	Above 1000MHz	±4.20 UD	



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## 1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

## **CNAS (L5813)**

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

## FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

## IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



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# 2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1						
Standard Section		<b>T</b> (11	1 1			
FCC	IC	Test Item	Judgment	Remark		
15.203	J	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:825.3759kHz π/4-DQPSK: 1143.70kHz 8-DPSK: 1127.70KHz		

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



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# 3. Test Equipment

Conducted	d Emission Te	st			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 22, 2016	Jul. 21, 2017
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 22, 2016	Jul. 21, 2017
LISN	Rohde & Schwarz	ENV216	101131	Jul. 22, 2016	Jul. 21, 2017
Radiation	Emission Tes	t			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 20, 2016	Mar. 19, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 20, 2016	Mar. 19, 2017
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 19, 2016	Mar. 18, 2017
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 19, 2016	Mar. 18, 2017
Pre-amplifier	Sonoma	310N	185903	Mar. 20, 2016	Mar. 19, 2017
Pre-amplifier	HP	8447B	3008A00849	Mar. 26, 2016	Mar. 25, 2017
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	onducted Em	ission			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Power Meter	Anritsu	ML2495A	25406005	Jul. 22, 2016	Jul. 21, 2017
Power Sensor	Anritsu	ML2411B	25406005	Jul. 22, 2016	Jul. 21, 2017



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## 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

#### 4.1.2 Test Limit

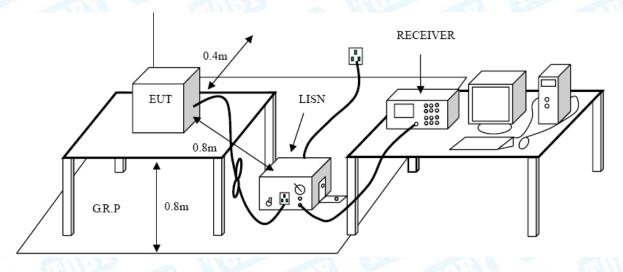
## **Conducted Emission Test Limit**

Eroguopov	Maximum RF 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

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.

overall length shall not exceed 1 m.

### 4.5 Test Data

Test data please refer the following pages.

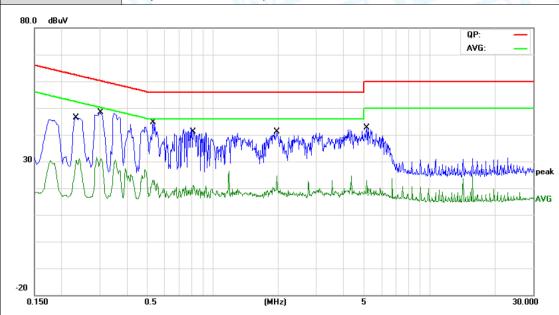


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100	EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
	Temperature:	25 ℃	Relative Humidity:	55%
	Test Voltage:	AC 120V/60 Hz		
	Terminal:	Line		

Test Mode: Charging with TX GFSK Mode 2402 MHz

Remark: Only worse case is reported



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBu∀	dBu∀	dB	Detector
1		0.2340	32.91	10.02	42.93	62.30	-19.37	QP
2		0.2340	18.38	10.02	28.40	52.30	-23.90	AVG
3	*	0.3020	34.03	10.02	44.05	60.19	-16.14	QP
4		0.3020	18.75	10.02	28.77	50.19	-21.42	AVG
5		0.5299	28.98	10.03	39.01	56.00	-16.99	QP
6		0.5299	12.32	10.03	22.35	46.00	-23.65	AVG
7		0.8100	25.25	10.10	35.35	56.00	-20.65	QP
8		0.8100	8.52	10.10	18.62	46.00	-27.38	AVG
9		1.9740	24.31	10.06	34.37	56.00	-21.63	QP
10		1.9740	13.93	10.06	23.99	46.00	-22.01	AVG
11		5.1340	22.98	9.97	32.95	60.00	-27.05	QP
12		5.1340	11.54	9.97	21.51	50.00	-28.49	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60 Hz	- WULL	
Terminal:	Neutral	7739	
Test Mode:	Charging with TX GFSK Mode 240	2 MHz	6
Remark:	Only worse case is reported		
30 dBuV		att gag Mahan had a had	G:
-20			
0.150	0.5 (MHz)	5	30.000

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBu∀	dB	Detector
1	0.1819	32.92	9.98	42.90	64.39	-21.49	QP
2	0.1819	19.19	9.98	29.17	54.39	-25.22	AVG
3	0.3500	32.77	10.02	42.79	58.96	-16.17	QP
4	0.3500	17.80	10.02	27.82	48.96	-21.14	AVG
5 *	0.5220	29.89	10.03	39.92	56.00	-16.08	QP
6	0.5220	12.84	10.03	22.87	46.00	-23.13	AVG
7	0.8100	26.02	10.10	36.12	56.00	-19.88	QP
8	0.8100	8.77	10.10	18.87	46.00	-27.13	AVG
9	1.3660	22.18	10.06	32.24	56.00	-23.76	QP
10	1.3660	7.09	10.06	17.15	46.00	-28.85	AVG
11	3.1780	22.09	10.02	32.11	56.00	-23.89	QP
12	3.1780	8.35	10.02	18.37	46.00	-27.63	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			

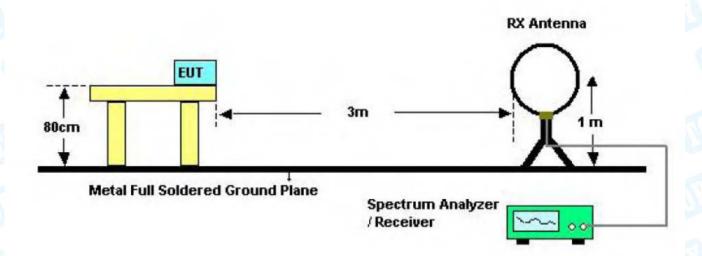
## Note:

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

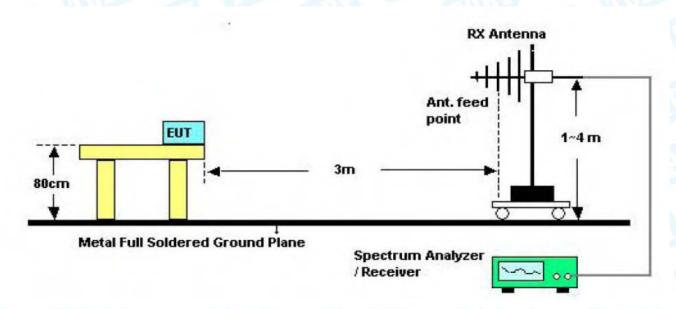


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## 5.2 Test Setup



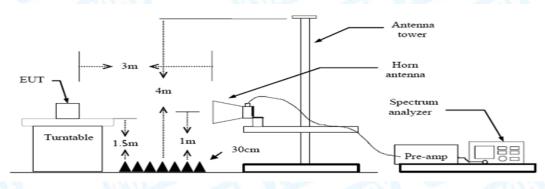
Below 30MHz Test Setup



**Below 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 kHz with Peak Detector for Average Values.

Test data please refer the following pages.



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EUT:	Gabba Goods Speaker	Wireless Er	moji <b>N</b>	lodel Naı	me:	GG-RBS
Temperature:	25 ℃		R	elative Hu	midity:	55%
Test Voltage:	DC 3.7V			~ V	MA	
Ant. Pol.	Horizontal	1 6				
Test Mode:	TX GFSK Mod	le 2402MHz	a W		130	The same of the sa
Remark:	Only worse ca	se is reporte	ed	Z WI		
80.0 dBuV/m						
30	The March of	2 × ×		(RF)FCC	15C 3M Radiati Margin	6 dB
-20						
No. Mk. Fre	•	Correct Factor	Measure- ment	Limit  dBuV/m	Over	Detector
1 96.09	986 53.19	-32.20	20.99	43.50	-22.51	peak
2 119.8	556 46.65	-32.44	14.21	43.50	-29.29	peak
3 191.7	450 46.29	-30.45	15.84	43.50	-27.66	peak
4 * 239.9	874 56.59	-28.18	28.41	46.00	-17.59	peak
5 336.0	352 47.12	-25.01				

19.89

46.00

-26.11

peak

480.5276

6

Emission Level= Read Level+ Correct Factor

41.02

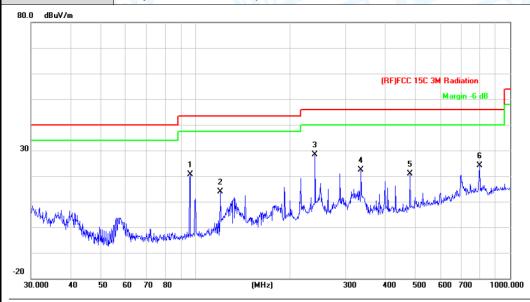
-21.13

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



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical	100	
Test Mode:	TX GFSK Mode 2402MHz	The state of the s	
Remark:	Only worse case is reported	THU .	
80.0 dRuV/m			



	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1			96.0986	52.86	-32.20	20.66	43.50	-22.84	peak
2			119.8556	46.29	-32.44	13.85	43.50	-29.65	peak
3		*	239.9874	56.59	-28.18	28.41	46.00	-17.59	peak
4			336.0352	47.46	-25.01	22.45	46.00	-23.55	peak
5	,		480.5276	41.92	-21.13	20.79	46.00	-25.21	peak
6	i		801.7863	39.45	-15.27	24.18	46.00	-21.82	peak

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



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EUT:	Gabba Goods W Speaker	ireless Emoji	Model Nam	ne: G	G-RBS			
Temperature:	25 ℃		Relative Hur	nidity: 55	5%			
Test Voltage:	DC 3.7V	WHI P		AUL .				
Ant. Pol.	Horizontal	1			Mr. Comment			
Test Mode: TX π/4-DQPSK Mode 2402MHz								
Remark: Only worse case is reported								
80.0 dBuV/m								
-20 30.000 40 50	60 70 80	(MHz)	2 3 4 × 3 4 × 3 300 400	500 600 700				
No. Mk. Fr	Reading req. Level		asure- nent Limit	Over				
M	Hz dBu∨	dB/m d	BuV/m dBuV/	/m dB	Detector			
1 96.0	986 51.19	-32.20 1	8.99 43.5	0 -24.51	peak			
2 * 239.	9874 56.09	-28.18 2	27.91 46.0	0 -18.09	peak			
3 287.	9904 52.47	-26.89 2	25.58 46.0	0 -20.42	peak			
4 336.0	0350 47.12	-25.01 2	22.11 46.0	0 -23.89	peak			
5 699.3	3046 35.88	-15.40 2	20.48 46.0	0 -25.52	peak			
6 801.	7862 39.85	-15.27 2	24.58 46.0	0 -21.42	peak			
	Over limit !:over margin	rect Factor						



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EUT:	Gabb Spea		ireless Emo	jji	Mode	el Name :	G	G-RBS
Temperature:	25 ℃			10	Relati	ve Humidi	i <b>ty:</b> 55	5%
Test Voltage:	DC 3	.7V	MIL	15.30		AH.		
Ant. Pol.	Vertic	al	1		Tim.	3		11111
Test Mode:	TX J	4-DQPSK	Mode 2402	2MHz			1 6	
Remark:	Only	worse case	is reported			allin		0 B
80.0 dBuV/m								
						(RF)FCC 15C	3M Radiation	
							Margin -6	dB
30				1 2				6
				Χ×	3 3	4 *		ž
			A.L. I	1 14	1 1 1 1		I have by his	Jone Harris
-20	Will for the second	projekternisis l	M	UW Y	We y	http://www.programmer.		
30.000 40 5	0 60 70	80	(MHz)		300	400 500	600 700	1000.000
		Reading	Correct	Mea	sure-		_	
No. Mk.	Freq.	Level	Factor	me	ent	Limit	Over	
	MHz	dBu∨	dB/m	dBu	ıV/m	dBuV/m	dB	Detector
1 216	3.0240	53.31	-29.29	24	.02	46.00	-21.98	peak
2 239	9.9874	52.09	-28.18	23	.91	46.00	-22.09	peak
3 336	3.0350	47.46	-25.01	22	.45	46.00	-23.55	peak
4 480	0.5276	41.92	-21.13	20	.79	46.00	-25.21	peak
5 699	9.3046	36.29	-15.91	20	.38	46.00	-25.62	peak
6 * 801	1.7862	39.45	-15.27	24	.18	46.00	-21.82	peak
*:Maximum data	x:Over limit	!:over margin	rect Factor					



Page: 22 of 91

EUT:	Gabba Speak		reless Emo	Mo	del Name :	GG-RBS
Temperature:	25 ℃	25 ℃ Relative Humidity			ative Humidity	: 55%
Test Voltage:	DC 3.7	7V	CHILL:		2 Hilliam	
Ant. Pol.	Horizo	ntal	100		33	W. Carlotte
Test Mode:	TX 8-0	PSK Mode	e 2402MHz	Min		
Remark:	Only w	orse case	is reported		CHAR	
80.0 dBuV/m						
-20 30.000 40	50 60 70	Round Juneary	1   	3 2 X X	per a a appelling to London Vision hards	6 X X MM, Mary 1000, 000
No. Mk.	Freq.	Reading Level	Correct Factor	Measure ment		ver
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1 12	9.9225	53.40	-32.08	21.32	43.50 -2	22.18 peak
2 21	6.0240	52.98	-29.29	23.69	46.00 -2	22.31 peak
3 * 23	9.9874	56.09	-28.18	27.91	46.00 -1	8.09 peak
4 28	7.9904	52.47	-26.89	25.58	46.00 -2	20.42 peak
5 48	0.5276	46.52	-21.13	25.39	46.00 -2	20.61 peak
6 80	1.7862	39.85	-15.27	24.58	46.00 -2	21.42 peak
*:Maximum data	x:Over limit	!:over margin	ect Factor			



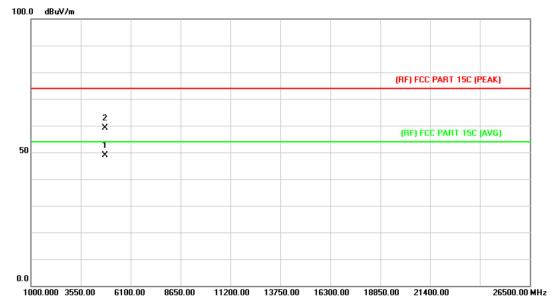
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EUT:	Gabba Goods Wi	reless Emoji	Model	Name :	GG-	RBS
Temperature:	25 ℃		Relativ	e Humidity:	: 55%	
Test Voltage:	DC 3.7V	CONTRACT OF STREET		diam		1
Ant. Pol.	Vertical	1			MI	1700
Test Mode:	TX 8-DPSK Mode	2402MHz			Contract of the second	
Remark:	Only worse case i	is reported		MARKET	1	1 1
80.0 dBuV/m						
-20 30.000 40 50	0 60 70 80	1 2 X		(RF)FCC 15C 3	Margin -6	dB C
No. Mk.	Reading Freq. Level	Correct M Factor	leasure- ment	Limit	Over	
	MHz dBuV	dB/m	dBuV/m	dBuV/m	dB	Detecto
1 134	1.0882 53.43	-31.97	21.46	43.50	-22.04	peak
2 216	5.0240 53.31	-29.29	24.02	46.00	-21.98	peak
3 239	9.9874 52.09	-28.18	23.91	46.00	-22.09	peak
4 * 287	7.9904 52.16	-26.89	25.27	46.00	-20.73	peak
5 336	3.0350 47.46	-25.01	22.45	46.00	-23.55	peak
6 801	1.7862 39.45	-15.27	24.18	46.00	-21.82	peak
	Over limit !:over margin	ect Factor				



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EUT:	Gabba Goods Wireless Emoji Speaker Model Name :		GG-RBS		
Temperature:	<b>25</b> ℃	Relative Humidity: 55%			
Test Voltage:	DC 3.7V				
Ant. Pol.	Horizontal				
Test Mode:	TX GFSK Mode 2402MHz				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

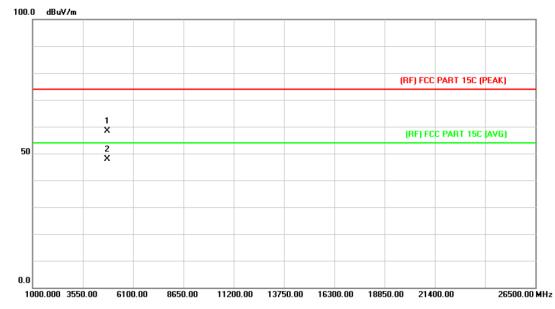


N	lo.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4803.461	35.54	13.44	48.98	54.00	-5.02	AVG
2			4804.360	45.72	13.44	59.16	74.00	-14.84	peak



Page: 25 of 91

EUT:	Gabba Goods Wireless Emoji Speaker	GG-RBS				
Temperature:	<b>25</b> ℃	Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2402MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

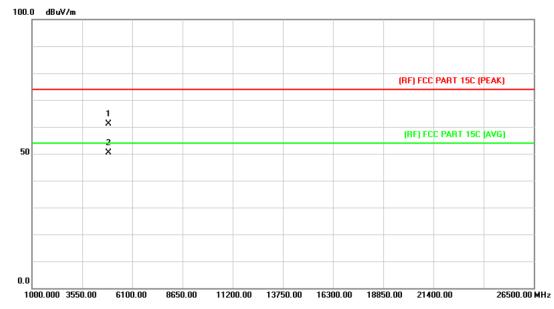


No	o. Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4804.010	44.90	13.44	58.34	74.00	-15.66	peak
2	*	4804.310	34.54	13.44	47.98	54.00	-6.02	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS			
Temperature:	25 ℃	Relative Humidity: 55				
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2441MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

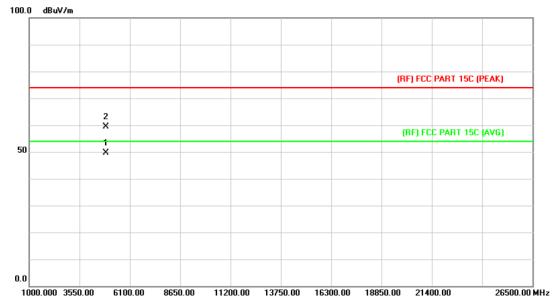


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.694	47.33	13.90	61.23	74.00	-12.77	peak
2	*	4881.870	36.41	13.90	50.31	54.00	-3.69	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2441MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

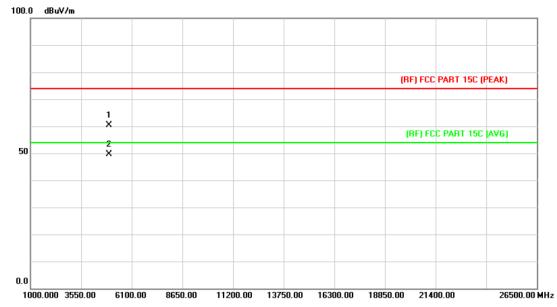


N	o. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4882.300	35.79	13.90	49.69	54.00	-4.31	AVG
2		4882.310	45.41	13.90	59.31	74.00	-14.69	peak



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS		
Temperature:	<b>25</b> ℃	Relative Humidity: 55%			
Test Voltage:	DC 3.7V				
Ant. Pol.	Horizontal	(1) L			
Test Mode:	TX GFSK Mode 2480MHz				
Remark: No report for the emission which more than 10 dB below the prescribed limit.					

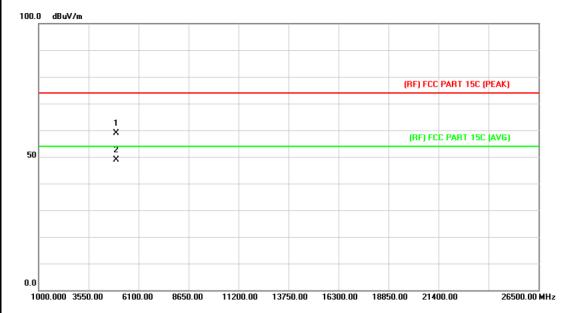


No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.210	45.99	14.36	60.35	74.00	-13.65	peak
2	*	4960.320	35.33	14.36	49.69	54.00	-4.31	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS			
Temperature:	<b>25</b> ℃	°C Relative Humidity: 55				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical		THE PERSON			
Test Mode:	TX GFSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

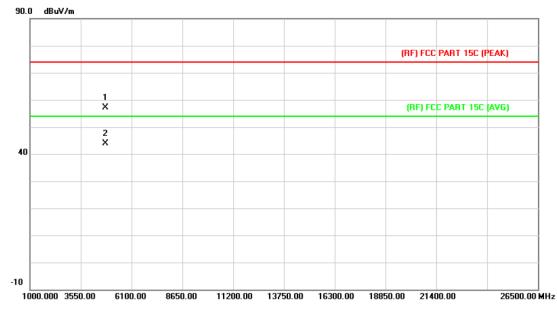


No	. Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.850	44.60	14.36	58.96	74.00	-15.04	peak
2	*	4960.310	34.49	14.36	48.85	54.00	-5.15	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS			
Temperature:	25 ℃	°C Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
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.					

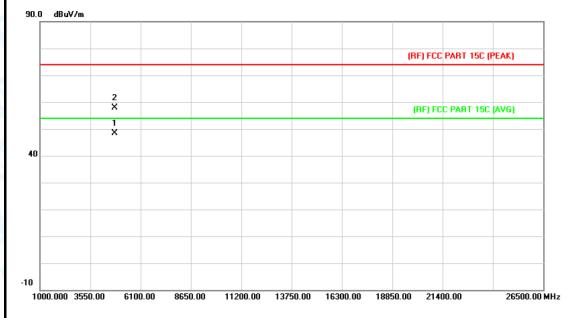


No.	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4802.848	43.68	13.43	57.11	74.00	-16.89	peak
2	*	4802.848	30.47	13.43	43.90	54.00	-10.10	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS			
Temperature:	25 ℃	5 ℃ Relative Humidity: 5				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	10.33				
Test Mode:	TX 8-DPSK Mode 2402MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

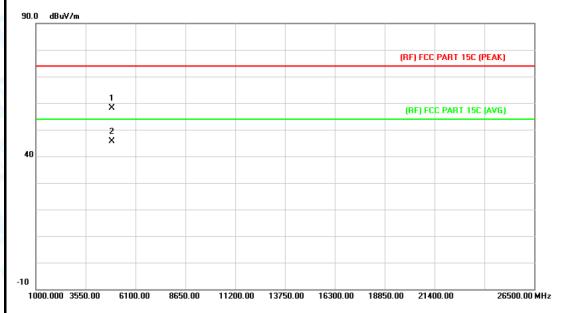


N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.985	34.85	13.44	48.29	54.00	-5.71	AVG
2		4804.027	44.35	13.44	57.79	74.00	-16.21	peak



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EUT:	Gabba Goods Wireless Emoji Speaker	ds Wireless Emoji Model Name :				
Temperature:	<b>25</b> ℃	°C Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
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.					

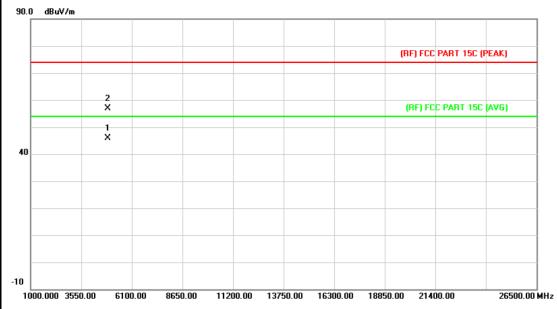


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.166	44.24	13.90	58.14	74.00	-15.86	peak
2	*	4882.246	31.69	13.90	45.59	54.00	-8.41	AVG



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2441MHz					
Remark:	rk: No report for the emission which more than 10 dB below the prescribed limit.					

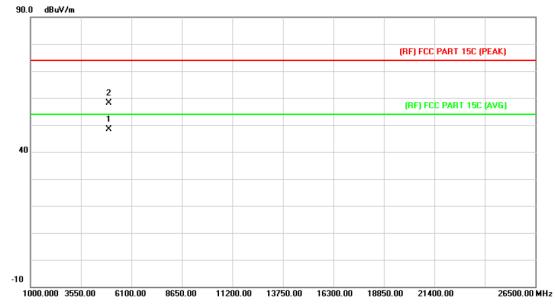


N	lo.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4881.322	32.00	13.90	45.90	54.00	-8.10	AVG
2			4881.970	43.01	13.90	56.91	74.00	-17.09	peak



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EUT:	Gabba Goods Wireless Emoji Speaker Model N		GG-RBS			
Temperature:	25 ℃	Relative Humidity: 5				
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

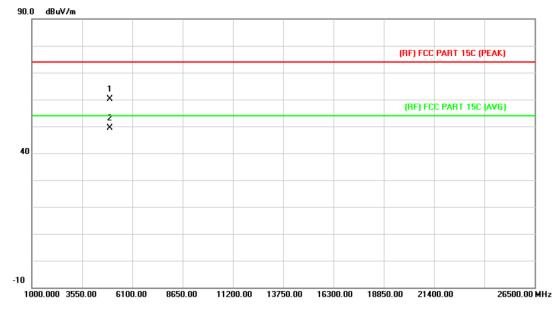


	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4959.205	34.00	14.36	48.36	54.00	-5.64	AVG
2			4960.690	43.79	14.36	58.15	74.00	-15.85	peak



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2480MHz	Trans.	
Remark:	No report for the emission which mo prescribed limit.	ore than 10 dB below th	ne



No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4958.590	45.66	14.35	60.01	74.00	-13.99	peak
2	*	4961.413	34.93	14.38	49.31	54.00	-4.69	AVG



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# 6. Restricted Bands Requirement

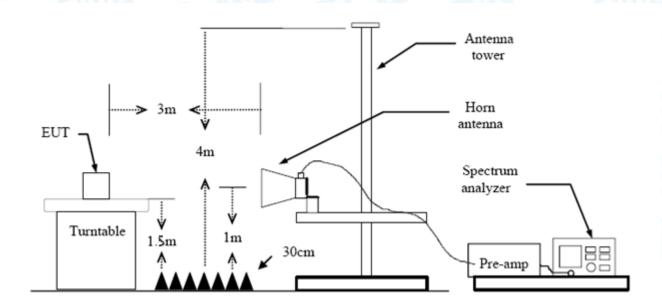
### 6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

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

## 6.2 Test Setup



## 6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.



Report No.: TB-FCC149224 Page: 37 of 91

(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.

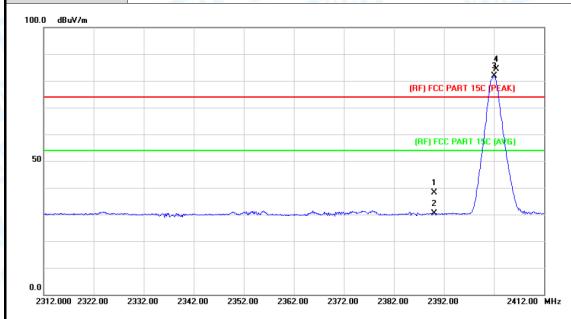
All restriction bands have been tested, only the worst case is reported.



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# (1) Radiation Test

EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		11115
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz	MILLER	
Remark:	N/A	TI TO	1:33



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	37.35	0.77	38.12	74.00	-35.88	peak
2		2390.000	29.60	0.77	30.37	54.00	-23.63	AVG
3	*	2402.000	81.05	0.82	81.87	Fundamental I	Frequency	AVG
4	Χ	2402.500	83.49	0.82	84.31	Fundamental l	Frequency	peak



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EUT:				abba eake		ods V	/ireles	3 Emo	OJI	Mode	Model Name : GG-			RBS	
Гетре	ratur	e:	_	°C	6	11)			23	Relati	ve Hun	nidity	y: 55%	ò	
Test Vo			DC	3.7	V		5		323		a 1		l		
Ant. Po	ol.		Ve	rtica			L Y		6		3			MO	7
Test M	ode:		ТХ	GF	SK N	/lode	2402N	ЛНz	. //	JA-		M.	10		é
Remar	k:		N/	A					)		ON.			0	١
100.0	dBuV/	m													_
													3 ×		1
											(R	F) FCC I	PART 15C (PE	AK)	
															1
-											(1	RF) FCC	PART 15C (A	<b>v</b> G)	$\frac{1}{1}$
50					_										1
												1 X			
							A					2 X	- L	Lum	
							and the								
															1
0.0															1
_	2.000 2	322.00	2332	2.00	2342.	00	2352.00	2362.0	00 23	72.00	2382.00	2392.	00	2412.00	_ MI
				F	2021	ding	Cor	rect	Mes	asure-					
No.	Mk.	Fr	eq.		Lev			ctor		ent	Lim	it	Over		
		М	Hz		dΒι	υV	dB	/m	dB	uV/m	dBu\	//m	dB	Detec	to
1		2390	0.00	0	37.	90	0.7	77	38	3.67	74.	00	-35.33	pea	ak
2		2390	0.00	0	29.	57	0.7	77	30	0.34	54.	00	-23.66	AV	G
3	Χ	2402	2.000	0	83.	50	0.8	32	84	1.32	Fundar	nental	Frequency	pea	ak
4	*	2402	2.000	0	75.	02	0.8	32	75	5.84	Fundar	nental	Frequency	AV	G



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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal	-m:29	
Test Mode:	TX GFSK Mode 2480 MHz	A VIII	
Remark:	N/A		
100.0 dBuV/m			

ŀ	2 X								
	1								
	ň						(RF) F	CC PART 150	C (PEAK)
ł									
		\					(RF)	FCC PART 1	5C (AVG)
50		×							
	1	<u>)</u>							
		1							
ŀ	~_ <i>\</i>	- Louis	 	 ****	 Newmon	 	-chronophy		
0.0									

No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.300	77.83	1.15	78.98	Fundamental	Frequency	AVG
2	Χ	2479.900	85.79	1.15	86.94	Fundamental	Frequency	peak
3		2483.500	48.84	1.17	50.01	74.00	-23.99	peak
4		2483.500	39.10	1.17	40.27	54.00	-13.73	AVG



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EUT:				oa Goods V i Speaker	Vireless	Model N	lame :	GG-RBS	TOB
Tempe	ratur	e:	25 °C			Relative	Humidity:	55%	
Test Vo	ltage	<b>)</b> :	DC 3	.7V	CIVI)		a W	1	
Ant. Po	ol.		Vertic	cal	1		33		11.15
Test M	ode:		TX G	FSK Mode	2480 MHz	Miles			6
Remar	k:		N/A		COMP.		CALL		
100.0 dl	BuV/m								
	1 ¥ 2						(RF) FCC F	PART 15C (PEAK	1
50		3 × 4		The state of the s			(RF) FCC	PART 15C AVG	)
0.0	DO 2481	.00 2	491.00	2501.00 25	11.00 2521.00	2531.00	2541.00 2551.	00 2	571.00 MHz
No.	Mk.	Fr	eq.	Reading Level	Correct Factor	Measure ment	- Limit	Over	
		MI	Ηz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
	Χ	2479	900	83.21	1.15	84.36	Fundamental	Frequency	peak
1				77.69	1.15	78.84	Fundamental		AVG
2	*	2479	.900	11.09					
	*	2479 2483		46.18	1.17	47.35	74.00	-26.65	peak



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EUT:			1.74.1	ba Go ji Spe		'ireless		Mod	del Na	ıme :		GG-RE	BS	
Temp	eratu	re:	25 °	С				Rela	itive H	umidi	ty:	55%		
Test \	Voltag	je:	DC 3	3.7V				10		a 1				A
Ant. I	Pol.		Horiz	zontal									11115	W
Test I	Mode		TX 8	B-DPS	K Mod	e 2402N	1Hz		1		6	A V		6
Rema	ark:		N/A							01			1	
100.0	dBuV/m													_
												¥		
										(RI	F) FCC P.	ART 15C P	AK)	1
										-	)E) ECC	PART 15C (/	We)	-
50										, ,	irjrcc	rani iac p	1	_
											1		)	
											2			
-				+>+000				Orange Company of the Company	والموادي والموادية الموادية والموادية	eben marriagoritage	_X			٦
														+
														-
0.0														
231	2.000 23	22.00	2332.00	2342.	00 23!	52.00 236	2.00	2372	2.00 23	382.00	2392.0	10	2412.00	) МН:
				Rea	ading	Corre	ct	Mea	asure-					
No	. Mk	. Fr	eq.		vel	Facto		m	ent	Lin	nit	Over		
		MI	Ηz	dE	Bu∨	dB/m		dB	uV/m	dBı	ıV/m	dB	Det	ecto
1		2390	.000	38	3.37	0.77		39	9.14	74	.00	-34.8	6 pe	eak
2		2390	.000	29	.59	0.77		30	0.36	54	.00	-23.6	4 A	VG
3	X	2401	.800	85	.39	0.82		86	3.21	Funda	amenta	l Frequen	су ре	eak
4	*	2401	800	80	.90	0.82		81	1.72	Funds	monta	l Frequenc	ov A	VG



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EU1	Γ:		4.53.3	oa Goods V ji Speaker	Vireless	Model Nan	ne:	GG-RBS	MOE		
Tem	peratui	e:	25 °C			Relative Hui	midity:	55%			
Test	Voltag	e:	DC 3	3.7V	611		0 N	VIV.			
Ant.	Pol.		Vertic	cal			33		111111111111111111111111111111111111111		
Test	Mode:		TX 8	-DPSK Mod	de 2402M	Hz					
Rem	nark:		N/A		THE STATE OF THE S		011	سر سننزل			
100.0	) dBuV/m										
							(RF) F	3 X CC PART 15C (PEA)	K)		
50							(RF)	FCC PART 15C (AV	G)		
				(h.dysg <sub>a</sub> ,	Friedrich (Arbeite and Arbeite	and the second house of the second		1 X 2 X	- America		
0.0 23	812.000 232	2.00	2332.00	2342.00 23	52.00 2362	.00 2372.00	2382.00 2	392.00	2412.00 MHz		
N	lo. Mk	. Fr	eq.	Reading Level	Correc		- Limi	t Over			
		M	Hz	dBuV	dB/m	dBuV/m	dBu\	//m dB	Detecto		
1		2390	.000	38.35	0.77	39.12	74.	00 -34.88	peak		
2		2390	.000	29.34	0.77	30.11	54.	00 -23.89	AVG		
	X	2402	.000	86.19	0.82	87.01	Fundam	ental Frequency	peak		
3	, ,										



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EUT:	Gabba Goods V Emoji Speaker	/ireless M	lodel Name	e :	GG-RBS	W.		
Temperature:	25 ℃	R	elative Hum	idity:	55%			
Test Voltage:	DC 3.7V	CHI)		1/1		5		
Ant. Pol.	Horizontal	6.30	ATT A					
Test Mode:	TX 8-DPSK Mod	de 2480MHz	The same		A C			
Remark:	N/A	WILL STATE		GALLE	1	1 1		
100.0 dBuV/m								
50					FCC PART 15C (PE			
0.0	2491.00 2501.00	2511.00 2521.	00 2531.00	2541.00	2551.00	2571.00		
2471.000 2481.00	Reading req. Level		00 2531.00 Measure- ment	2541.00 Limit		2571.00		
2471.000 2481.00 No. Mk.	Readin	g Correct	Measure-		Over			
2471.000 2481.00 No. Mk.	Reading	g Correct Factor	Measure- ment	Limit dBuV/	Over	Detect		
No. Mk. F	Reading Freq. Level  MHz dBuV	g Correct Factor	Measure- ment	Limit dBuV/	Over m dB	Detector peal		
No. Mk. F	Reading Level MHz dBuV 79.800 83.24	g Correct Factor dB/m 1.15	Measure- ment dBuV/m 84.39	Limit dBuV/	Over m dB ntal Frequency	Detecto		



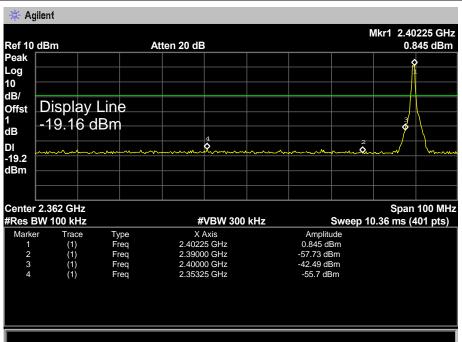
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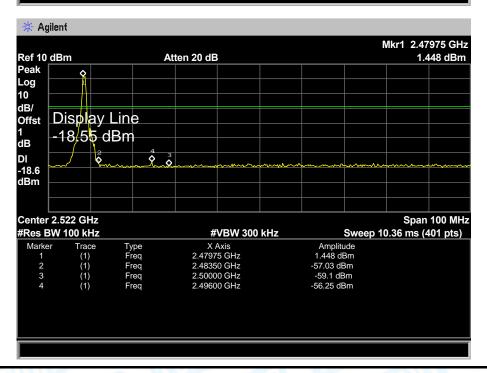
EUT:	Gabba Goods V Emoji Speaker	Vireless	Model Name	9:	GG-RBS	TOB
Temperature:	25 ℃		Relative Hum	idity:	55%	
Test Voltage:	DC 3.7V	WIII.		M		1
Ant. Pol.	Vertical	100		3		11.30
Test Mode:	TX 8-DPSK Mo	de 2480MHz	Z			
Remark:	N/A	and it		BIII.		a '
100.0 dBuV/m						
0.0 2471.000 2481.00 2	2491.00 2501.00 25	11.00 2521.00	2531.00 2541	(RF) FC	PART 15C (PEAK C PART 15C (AVG	
No. Mk. Fr	Reading eq. Level	Correct Factor	Measure- ment	Limit	Over	
MI	Hz dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 X 2479	.800 86.19	1.15	87.34 <sub>Fr</sub>	undamenta	I Frequency	peak
2 * 2479	.800 81.89	1.15			I Frequency	AVG
				74.00		peak
3 2483	.500 51.17	1.17	52.34	74.00	-21.00	pcan



#### (2) Conducted Test

EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		11111111
Test Mode:	TX GFSK Mode 2402MHz / 2480 M	lHz	
Remark:	N/A	Million	







EUT:

Gabba Goods Wireless Emoji
Speaker

Temperature:

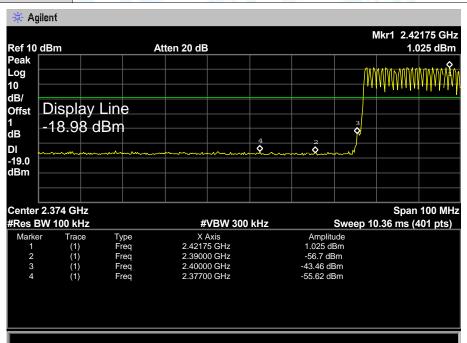
25 °C
Relative Humidity:

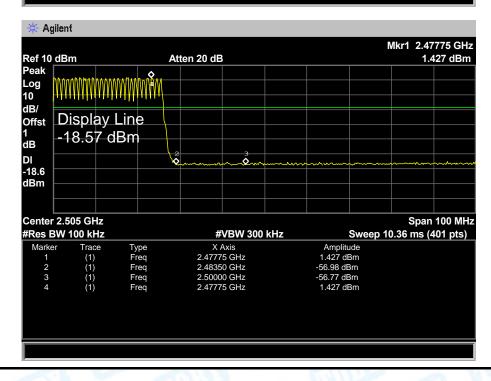
55%

Test Voltage:
DC 3.7V

Test Mode:
GFSK Hopping Mode

Remark:
N/A







EUT:

Gabba Goods Wireless Emoji
Speaker

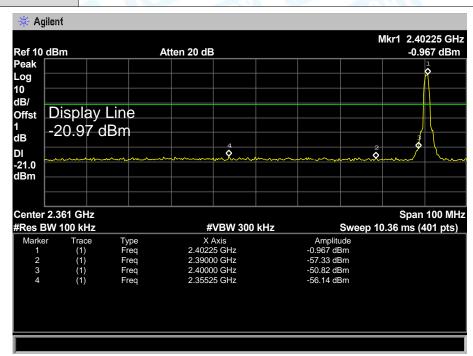
Model Name:
GG-RBS

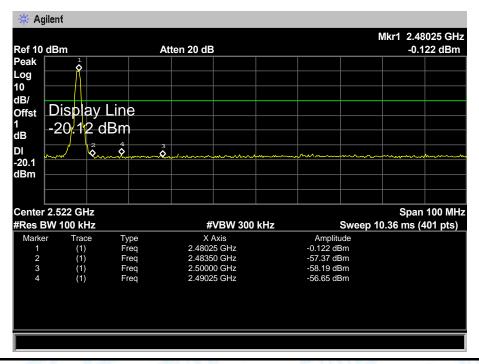
Temperature: 25 °C
Relative Humidity: 55%

Test Voltage: DC 3.7V

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

Remark: N/A







EUT:

Gabba Goods Wireless Emoji
Speaker

Temperature:

25 ℃

Relative Humidity:

55%

Test Voltage:

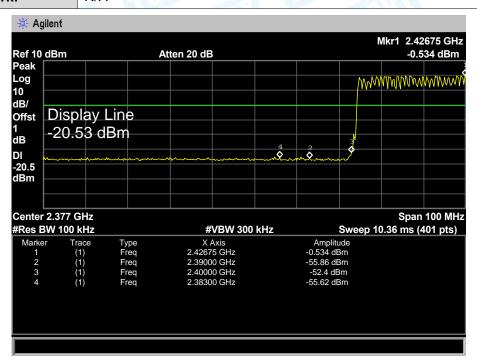
DC 3.7V

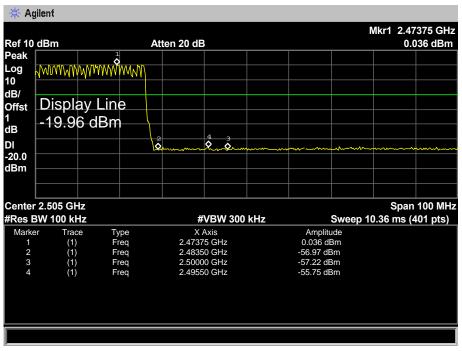
Test Mode:

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

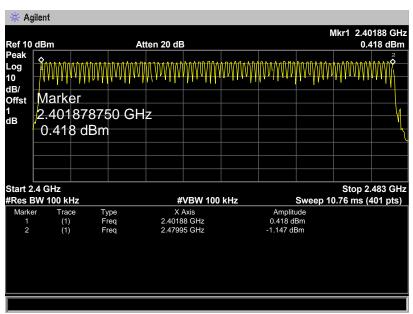


EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	The same	
Toot Model	Hanning Made (CECK/O DDCK)		STATE OF THE STATE

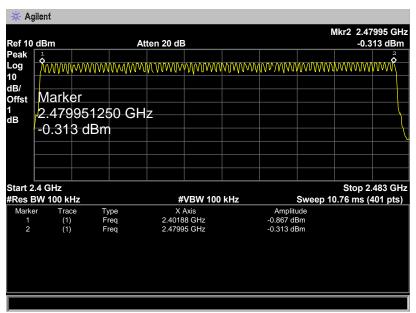
	Quantity of Honni
Test Mode:	Hopping Mode (GFSK/8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
2402MHz~2480MHz	79	<b>&gt;4</b> E
2402WH2~2400WHZ	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 average time of occupancy on any channel within the Period can be calculated with formulas:

 $\{Total \ of \ Dwell\} = \{Pulse \ Time\} * (1600 / X) / \{Number \ of \ Hopping \ Frequency\} * \{Period\} = 0.4s * \{Number \ of \ Hopping \ Frequency\}$ 

Note: X=2 or 4 or 6 (1DH1=2, 1DH3=4, 1DH5=6. 2DH1=2, 2DH3=4, 2DH5=6. 3DH1=2,3DH3=4, 3DH5=6)

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

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



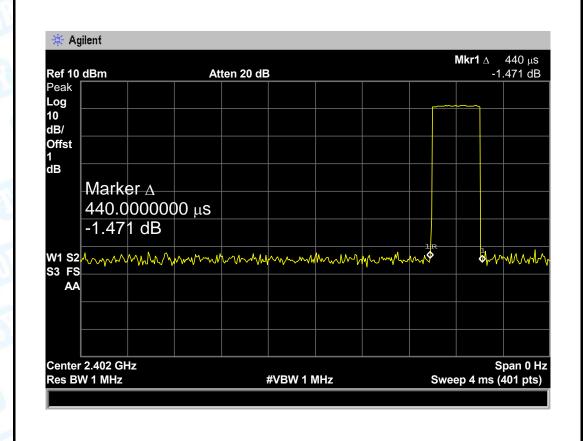
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### 8.5 Test Data

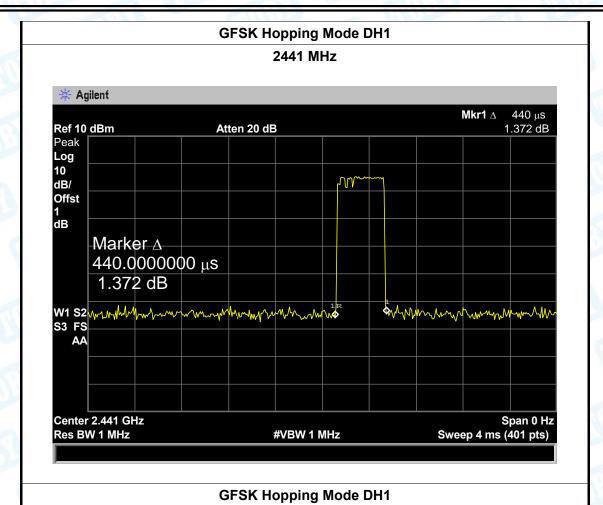
Speaker	s Wireless Emoji	<b>Model Name</b>	Model Name :	
25 °C	CHO'S	Relative Humic	Relative Humidity:	
DC 3.7V	500	COLUMN TO SERVICE		MARTINE
Hopping Mode (GFSK DH1)				
Pulse Time	Total of Dwell	Period Time	Limit	Result
(ms)	(ms)	(s)	(ms)	Nesuit
0.440	140.80			
0.440	140.80	31.60	400	PASS
0.440	140.80			
	25 ℃ DC 3.7V Hopping Mod Pulse Time (ms) 0.440 0.440 0.440	DC 3.7V Hopping Mode (GFSK DH1)  Pulse Time (ms) (ms)  0.440 140.80  0.440 140.80  0.440 140.80	25 ℃ Relative Humic  DC 3.7V  Hopping Mode (GFSK DH1)  Pulse Time (ms) (ms) (s)  0.440 140.80  0.440 140.80 31.60	25 ℃ Relative Humidity:  DC 3.7V  Hopping Mode (GFSK DH1)  Pulse Time (ms) (ms) (s) (ms)  0.440 140.80  0.440 140.80  0.440 140.80  0.440 140.80

Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  2  $\div$  79)  $\times$ 31.6

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







# 2480 MHz \* Agilent **Mkr1** $\Delta$ 440 $\mu$ s -1.813 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Offst 1 dB Marker ∆ 440.0000000 μs -1.813 dB &mmmmm M S3 FS AΑ Center 2.48 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts)



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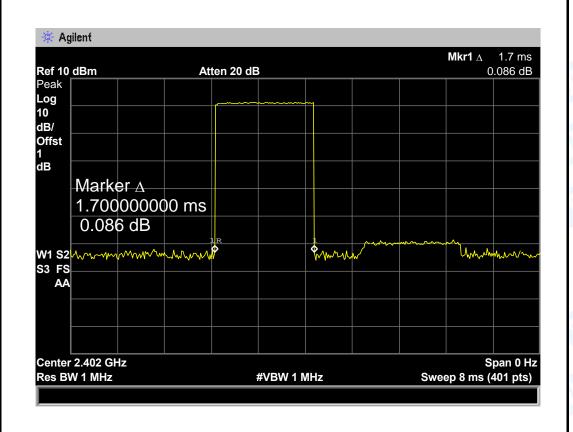
EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	THE PARTY OF THE P	

Test Mode: Hopping Mode (GFSK DH3)

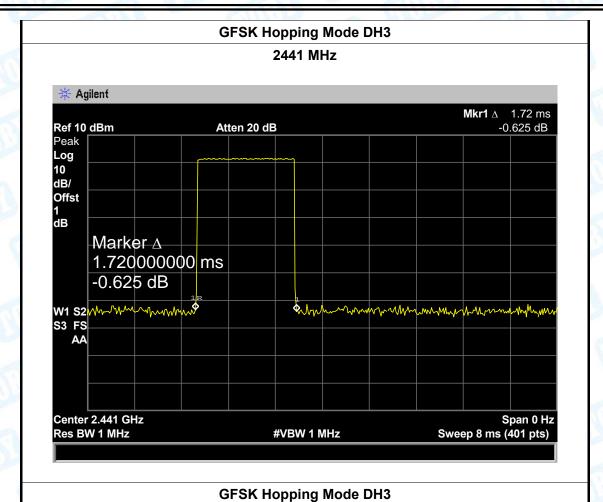
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.700	272.00			
2441	1.720	275.20	31.60	400	PASS
2480	1.700	272.00			

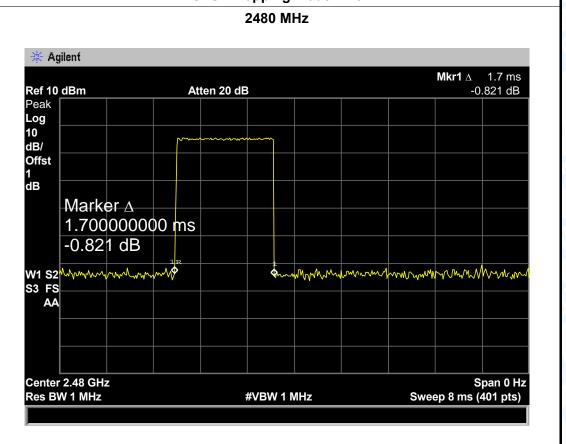
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  4  $\div$  79)  $\times$ 31.6

#### **GFSK Hopping Mode DH3**











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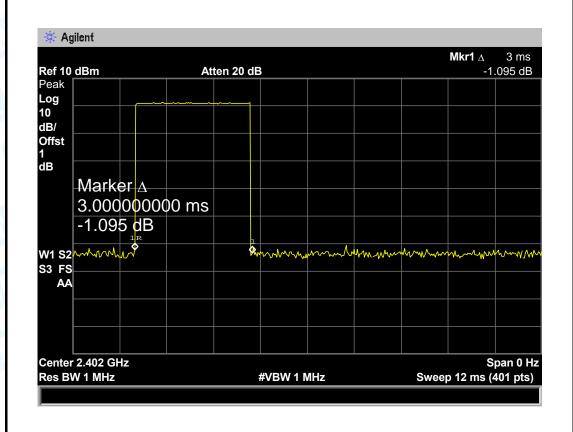
	EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
1	Temperature:	<b>25</b> ℃	Relative Humidity:	55%
	Test Voltage:	DC 3.7V		
ı				

**Test Mode:** Hopping Mode (GFSK DH5)

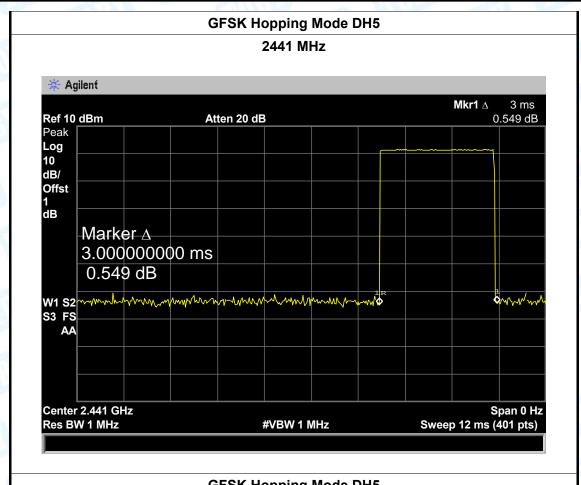
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

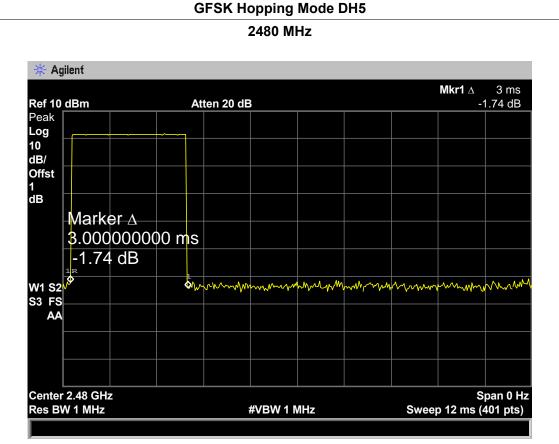
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  6  $\div$  79)  $\times$ 31.6

#### **GFSK Hopping Mode DH5**











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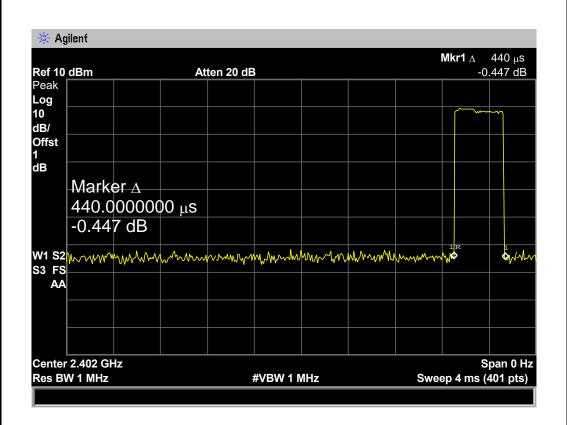
EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	NU VIII	

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

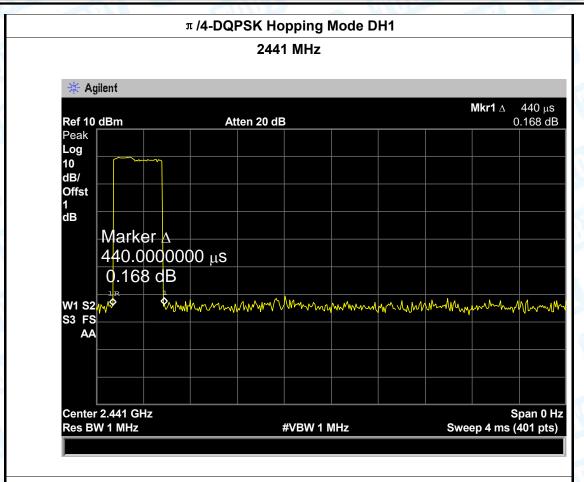
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	0.440	140.80			
2441	0.440	140.80	31.60	400	PASS
2480	0.440	140.80			

Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  2  $\div$  79)  $\times$ 31.6

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

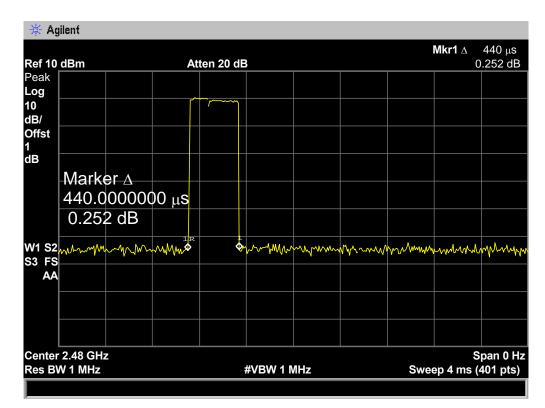






# π/4-DQPSK Hopping Mode DH1







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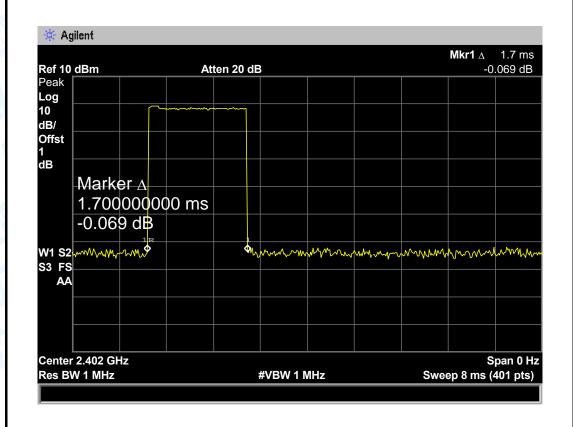
EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	A VILLE	

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

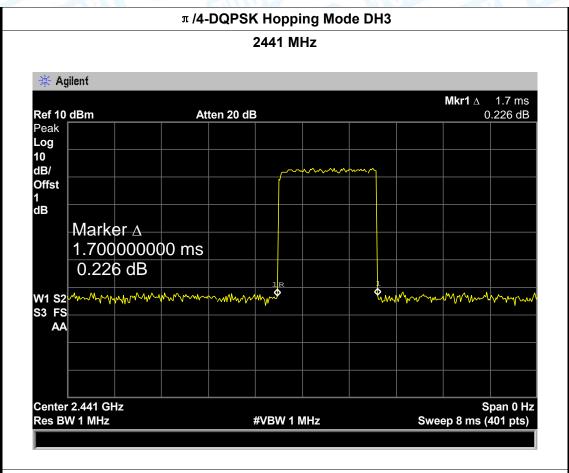
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.700	272.00			
2441	1.700	272.00	31.60	400	PASS
2480	1.700	272.00			

Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  4  $\div$  79)  $\times$ 31.6

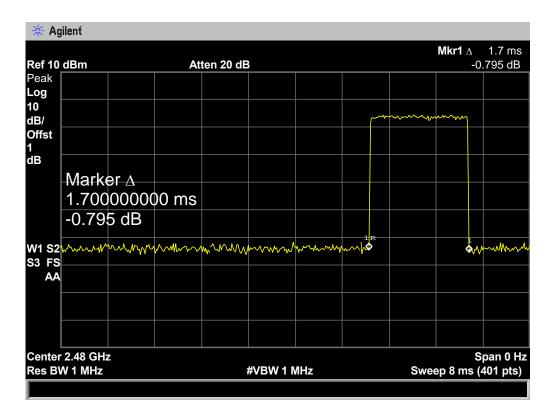
#### $\pi$ /4-DQPSK Hopping Mode DH3













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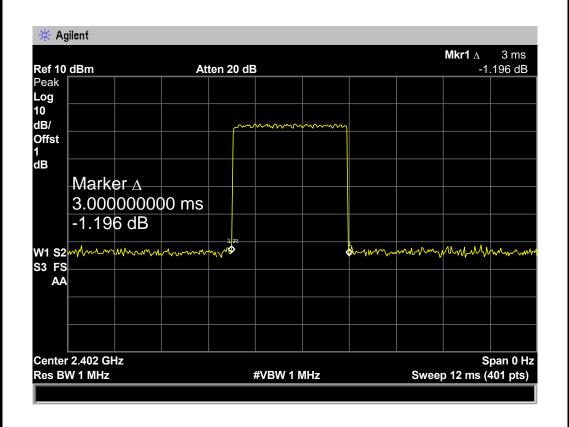
EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	A VIII	
	11 1 14 1 / /4 DODOM DUE	-1	

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

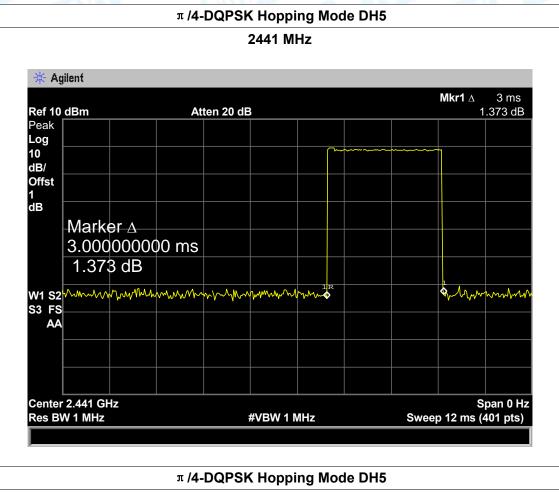
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

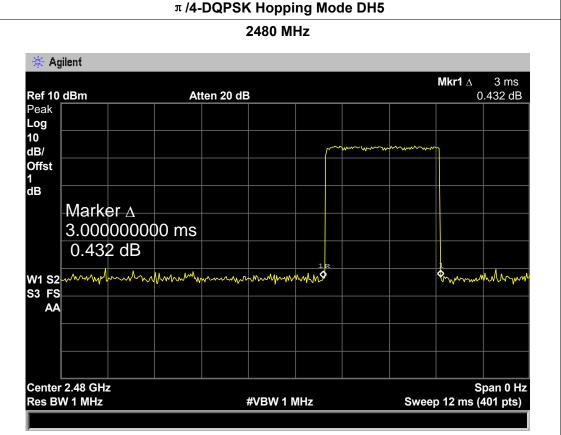
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  6  $\div$  79)  $\times$ 31.6

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











2480

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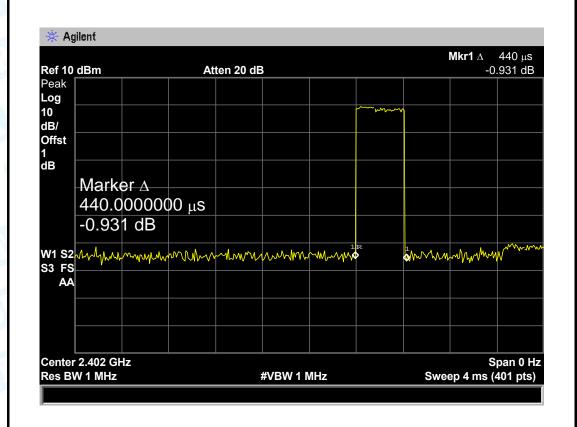
EUT:		Gabba Goods Wireless Emoji Speaker		Model Name :		GG-RBS
Temperature	25 ℃	25 ℃		Relative Hum	idity:	55%
Test Voltage:	DC 3.7	DC 3.7V		Charles		
Test Mode:	Hoppin	Hopping Mode (8-DPSK DH1)			N. C.	
Channel	Pulse Tin	ne Total of Dwel	l (me)	Period Time	Limit	Result
(MHz)	(ms)	Total of Dwell	1 (1115)	(s)	(ms)	Nesuit
2402	0.440	140.80				
2441	0.440	140.80		31.60	400	PASS

Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  2  $\div$  79)  $\times$ 31.6

0.440

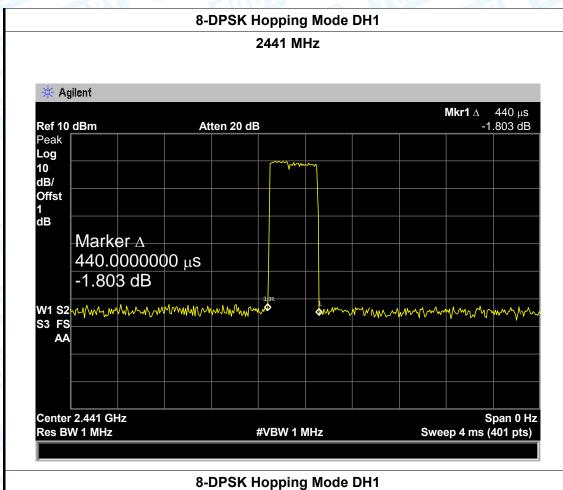
### 8-DPSK Hopping Mode DH1

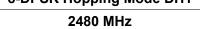
140.80

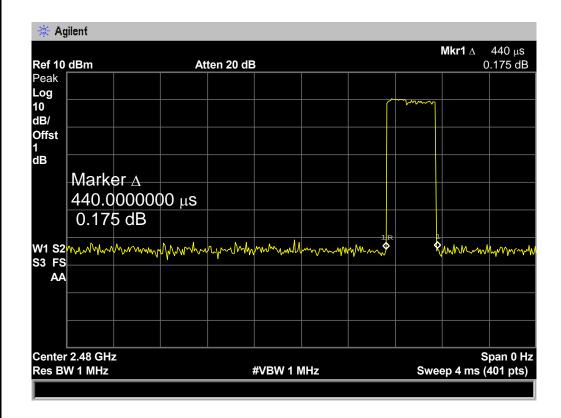




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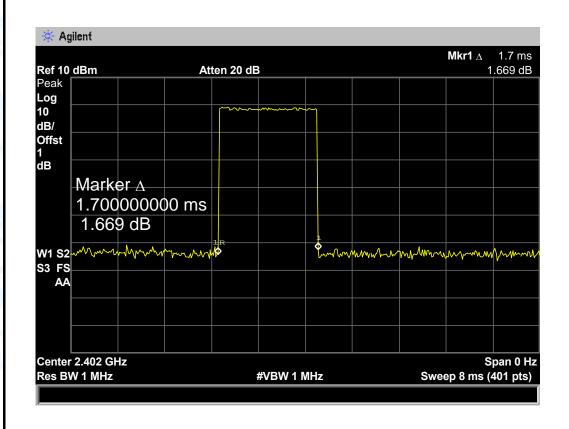
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EUT:	Gabba Go Speaker	ods Wireless Emoji	Model Name :		GG-RBS
Temperature:	25 ℃		Relative Hum	idity:	55%
Test Voltage:	DC 3.7V	WILL STATE OF THE	A All	1	
Test Mode:	Hopping M	lode (8-DPSK DH3)	The second	_ 6	111111
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result

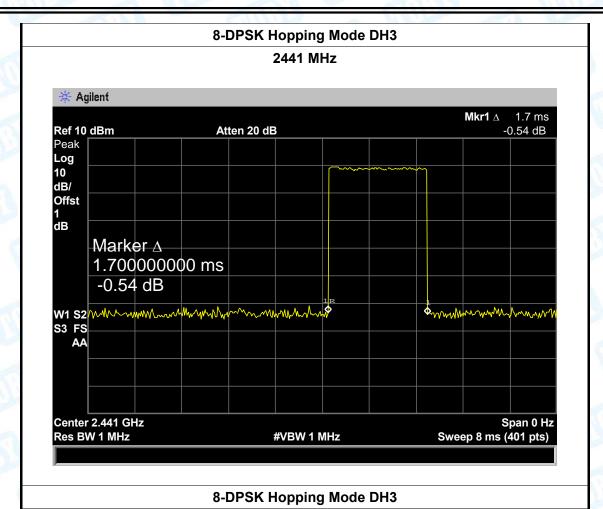
Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.700	272.00			
2441	1.700	272.00	31.60	400	PASS
2480	1.700	272.00			

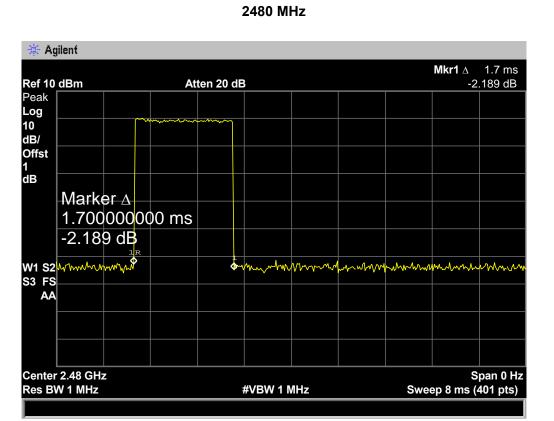
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  4  $\div$  79)  $\times$ 31.6

#### 8-DPSK Hopping Mode DH3











2441

2480

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EUT:	Gabba God Speaker	ods Wireless Emoji	Model Name : GG-		GG-RBS
Temperature	: 25 °C	<b>25</b> ℃		idity:	55%
Test Voltage:	DC 3.7V	WIII)		U.	
Test Mode:	Hopping M	Hopping Mode (8-DPSK DH5)		_ (	MILLER
Channel	Pulse Time	ulse Time Total of Dwell		Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.000	320.00			
				l	

Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  6  $\div$  79)  $\times$ 31.6

3.000

3.000

#### 8-DPSK Hopping Mode DH5

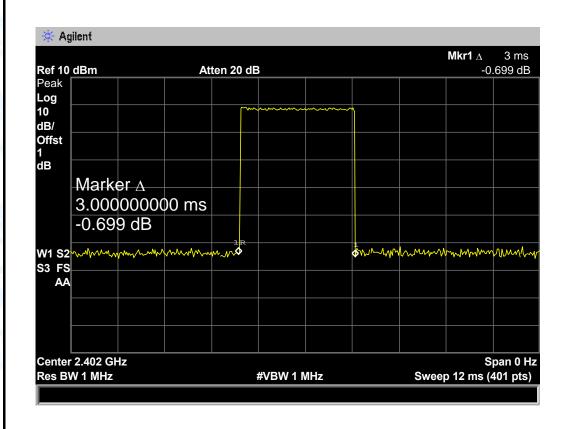
31.60

400

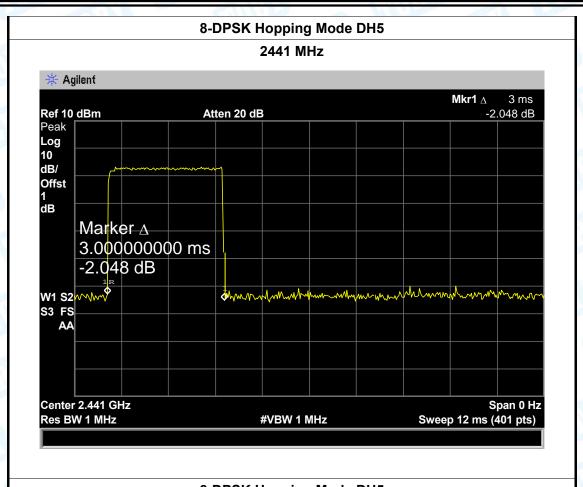
**PASS** 

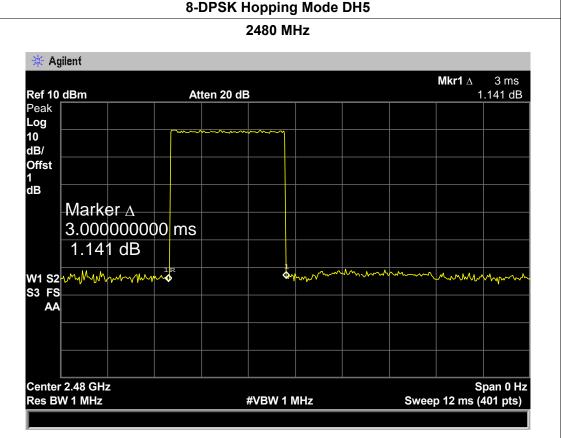
320.00

320.00











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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.

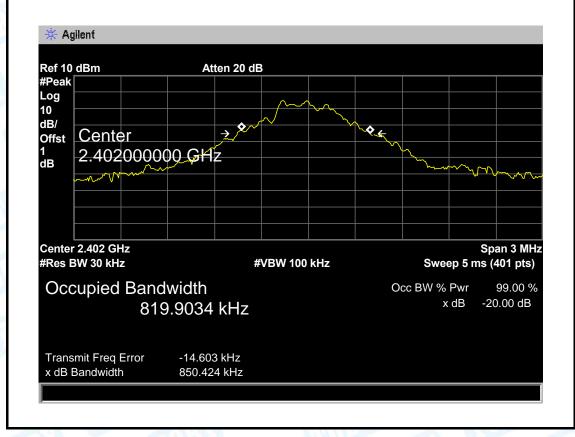


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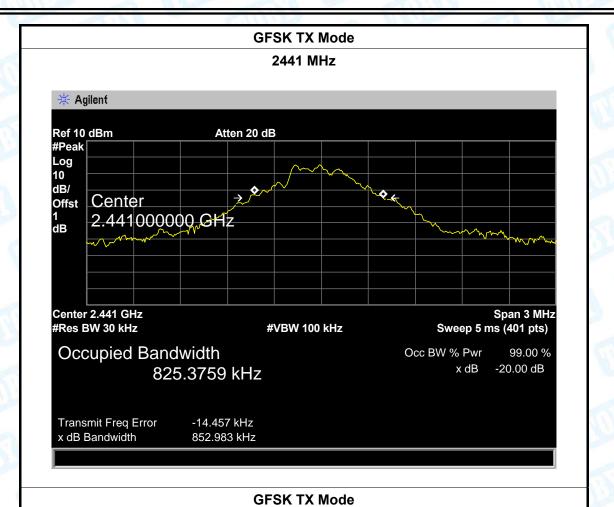
# 9.5 Test Data

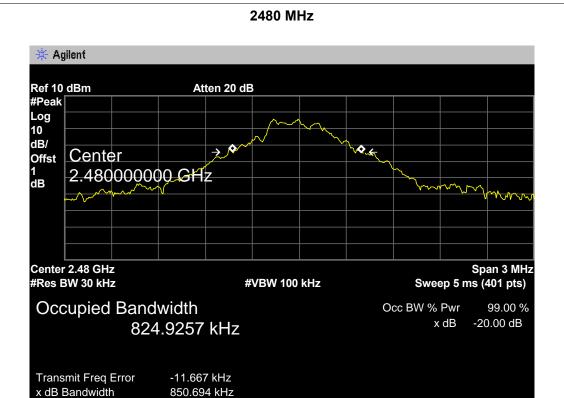
EUT:	Gabba Goods Wireless Emoji Speaker		Model Name :	GG-RBS
Temperature:	perature: 25 °C		Relative Humidity:	55%
Test Voltage:	DC 3.7V			A PIUL
Test Mode:	TX Mode (	(GFSK)	a Comment	
Channel frequer	псу	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402		819.9034	850.424	
2441		825.3759	852.983	
2480				

#### **GFSK TX Mode**











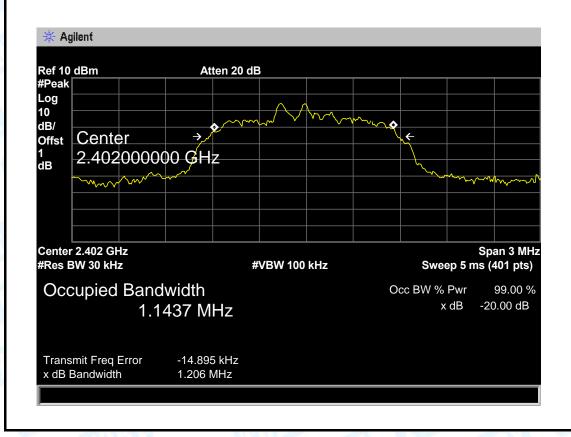
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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Took Made:	TV Made ( = /4 DODCK)		

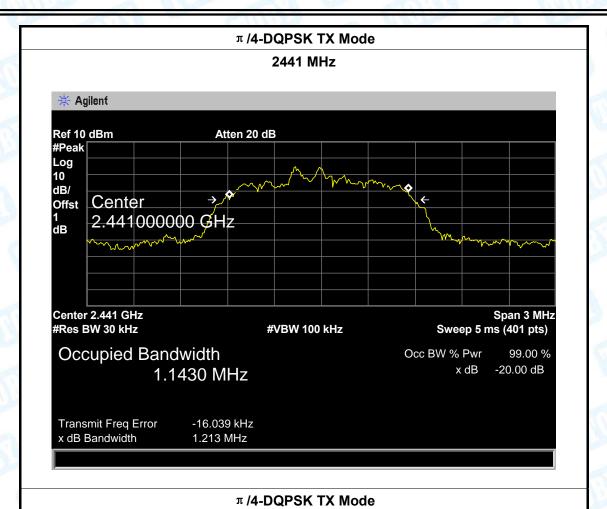
**Test Mode**: TX Mode ( π /4-DQPSK)

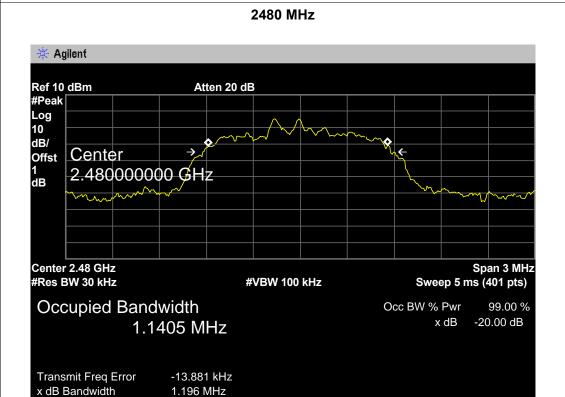
Channel frequency (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402	1143.70	1206.00	804.00
2441	1143.00	1213.00	808.67
2480	1140.50	1196.00	797.33

## π/4-DQPSK TX Mode











2402

2441

2480

Report No.: TB-FCC149224

804.00

806.00

808.67

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Channel frequence (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
Test Mode:	TX Mode (8-DPSK)	The state of the s	
Test Voltage:	DC 3.7V		
Temperature:	25 ℃	Relative Humidity:	55%
EUT:	Emoji Speaker	Model Name :	GG-RBS

## 8-DPSK TX Mode

1206.00

1209.00

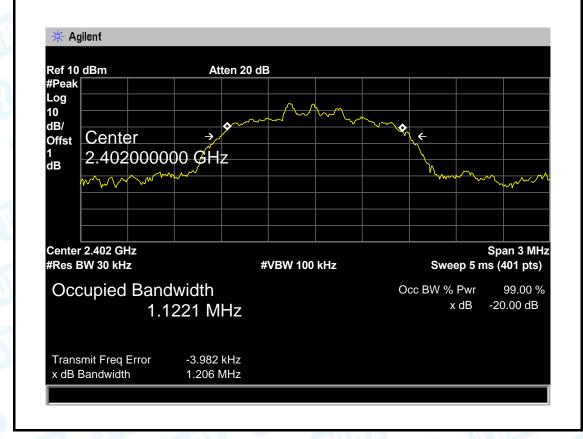
1213.00

#### 2402 MHz

1122.10

1127.70

1124.20





8-DPSK TX Mode 2441 MHz \* Agilent Ref 10 dBm Atten 20 dB #Peak Log 10 dB/ offst Center **←** 2.441000000 GHz 1 dB wwww Center 2.441 GHz Span 3 MHz #Res BW 30 kHz **#VBW 100 kHz** Sweep 5 ms (401 pts) Occupied Bandwidth 99.00 % Occ BW % Pwr x dB -20.00 dB 1.1277 MHz

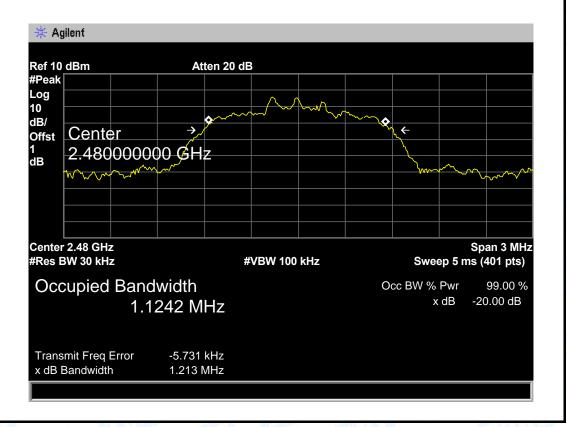
## 8-DPSK TX Mode

-3.489 kHz

1.209 MHz

Transmit Freq Error

x dB Bandwidth





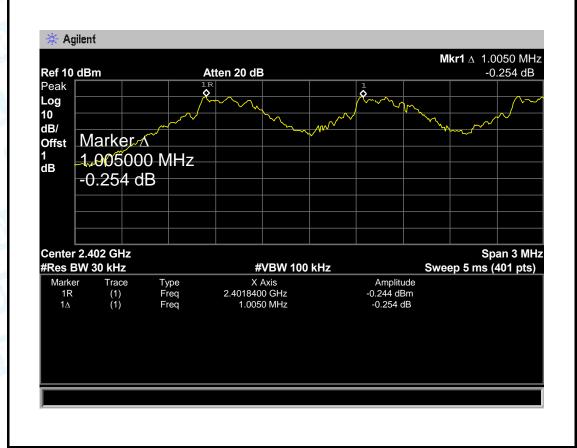
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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 3.7V		WILLIAM TO THE

Test Mode: Hopping Mode (GFSK)

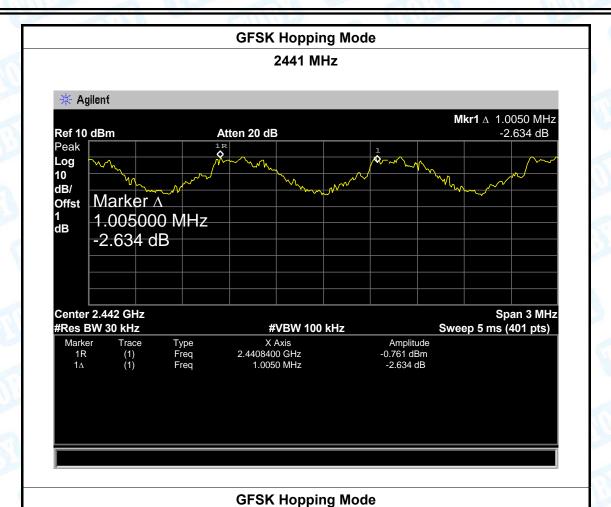
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	850.424
2441	1005.00	852.983
2480	1005.00	850.694

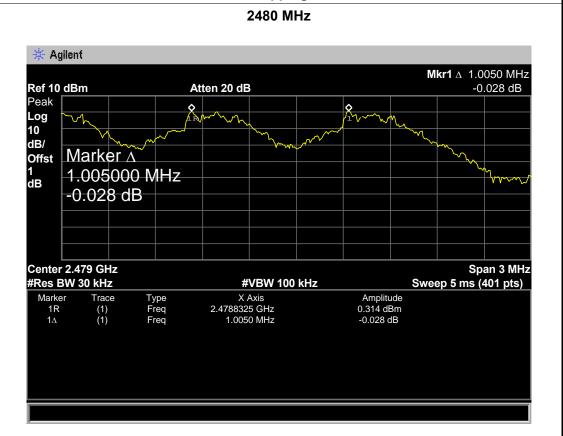
## **GFSK Hopping Mode**









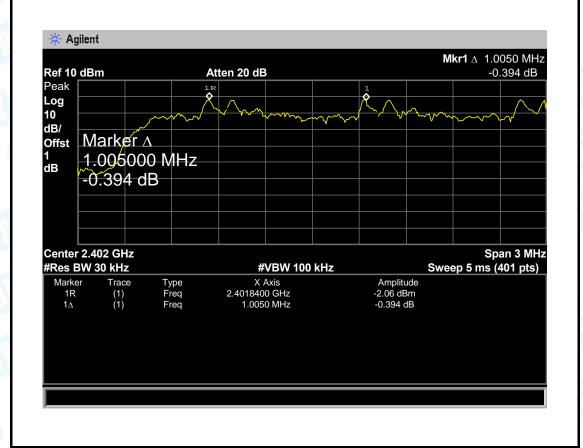


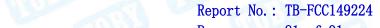


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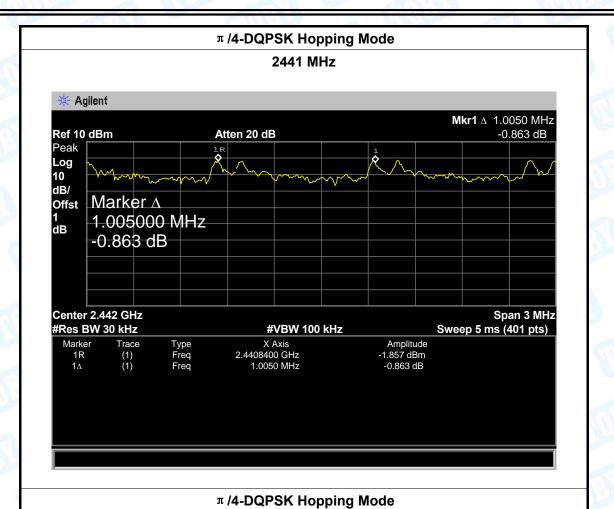
EUT:	Gabba Go Speaker	oods Wireless Emoji	Мо	del Name :	GG-RBS
Temperature:	25 ℃		Rel	ative Humidity:	55%
Test Voltage:	DC 3.7V			3	Miss
Test Mode:	Hopping N	Mode (π/4-DQPSK)			
Channel frequ	uency	Separation Read Valu	е	Separation	Limit
(MHz)		(kHz)		(kHz)	
2402		1005.00		804.00	)
2441		1005.00		808.67	7
2480		1005.00		797 33	3

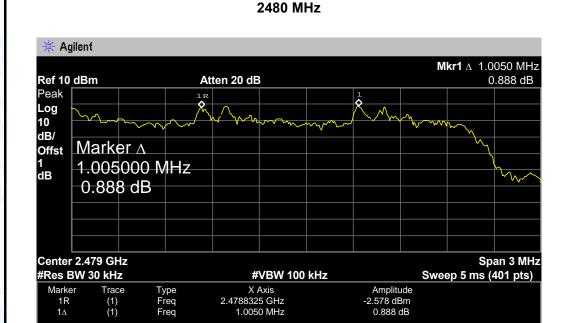
## $\pi$ /4-DQPSK Hopping Mode







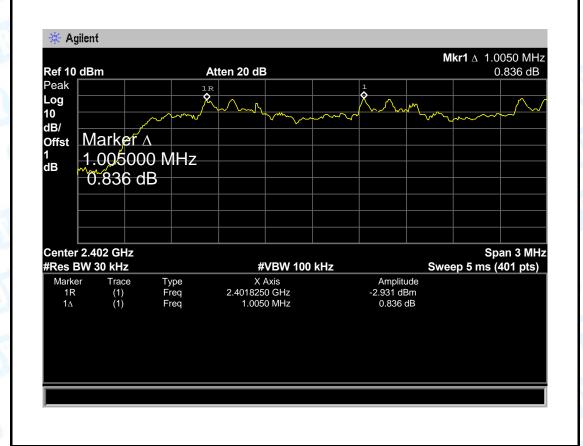




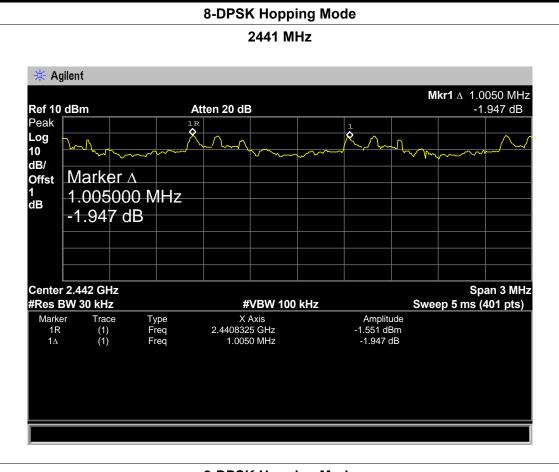


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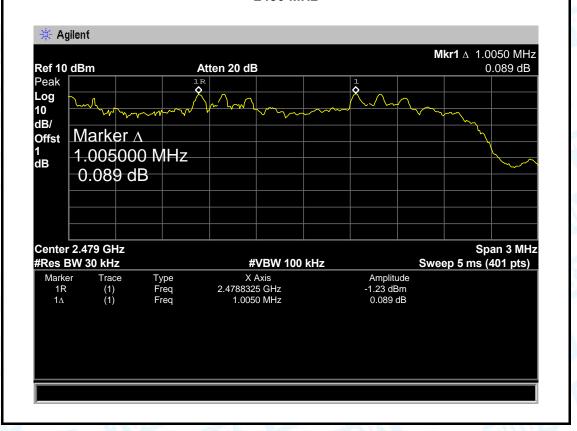
EUT:	Gabba Go Speaker	oods Wireless Emoji	Мо	del Name :	GG-RBS
Temperature:	25 ℃		Relative Humidity: 55%		55%
Test Voltage:	DC 3.7V		1	3	111111111
Test Mode:	Hopping I	Mode (8-DPSK)			
Channel frequ	lency	Separation Read Valu	alue Separation Limit		Limit
(MHz)		(kHz)		(kHz)	
2402		1005.00		804.00	)
2441		1005.00	806.00		)
2480		1005.00		808.67	7
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

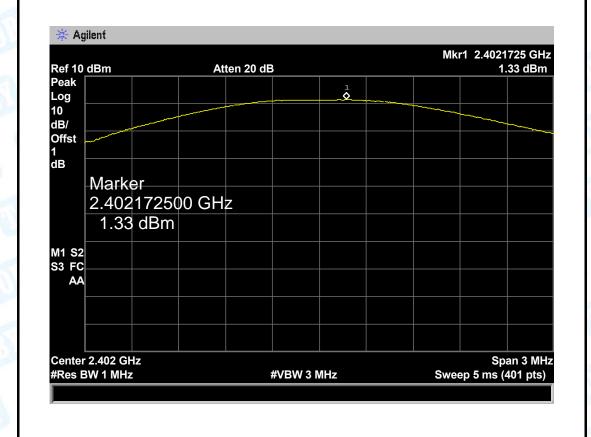
The EUT was set to continuously transmitting in the max power during the test.



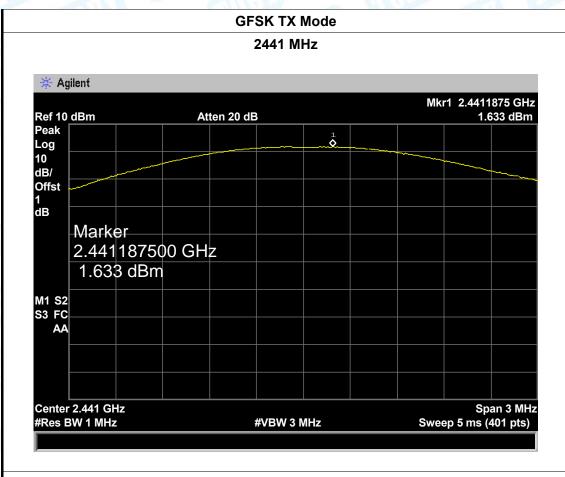
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## 10.5 Test Data

EUT:	Gabba Go Speaker	oods Wireless Emoji	Mod	lel Name :	GG-RBS
Temperature:	25 ℃	- TON	Rela	tive Humidity:	55%
Test Voltage:	DC 3.7V	William Indiana	1		
Test Mode:	TX Mode	(GFSK)	-2	AMO	
Channel frequen	cy (MHz)	Test Result (dBm	1)	Limit (d	Bm)
2402		1.330			
2441		1.633		30	
2480		1.762			
		GFSK TX Mode			

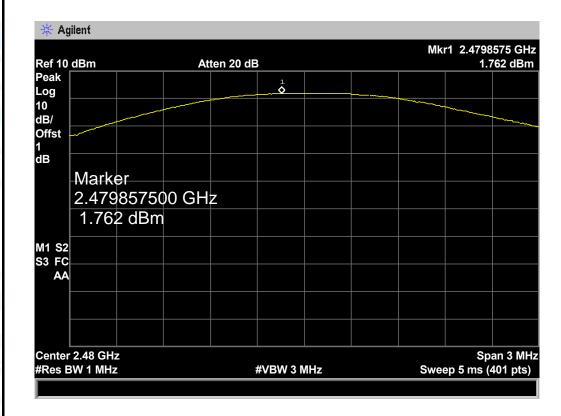














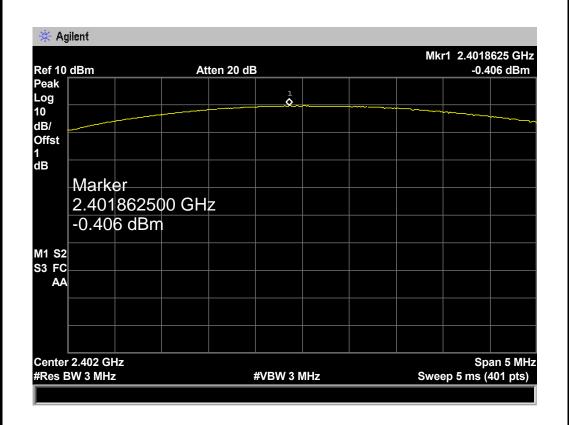
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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
	T)(14 1 / // DODOI()		

Test Mode: ΤΧ Mode ( π /4-DQPSK)

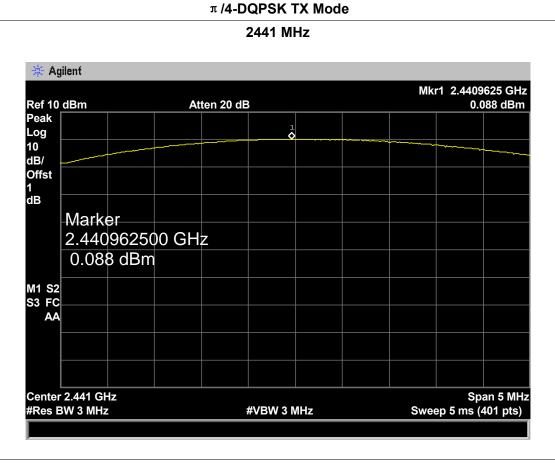
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	-0.406	
2441	0.088	21
2480	0.412	

#### π /4-DQPSK TX Mode

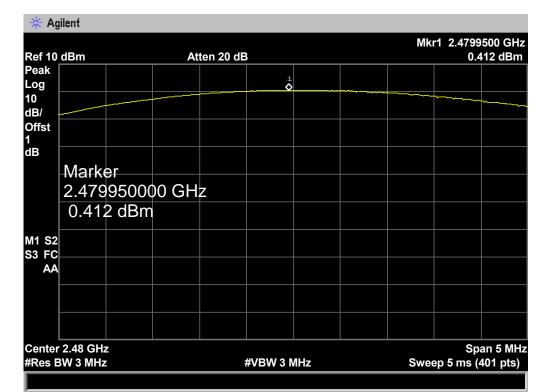




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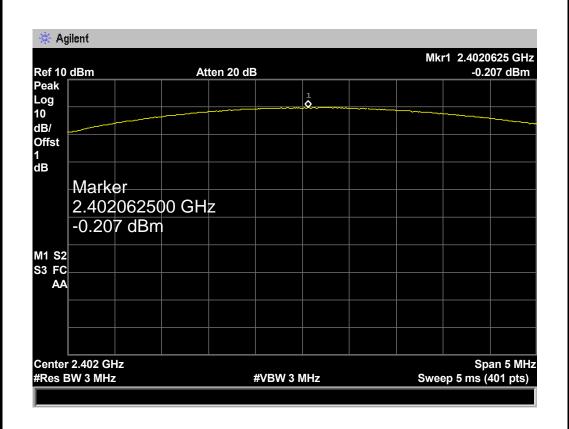
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EUT:	Gabba Goods Wireless Emoji Speaker	Model Name :	GG-RBS
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	A WU	

Test Mode: TX Mode (8-DPSK)

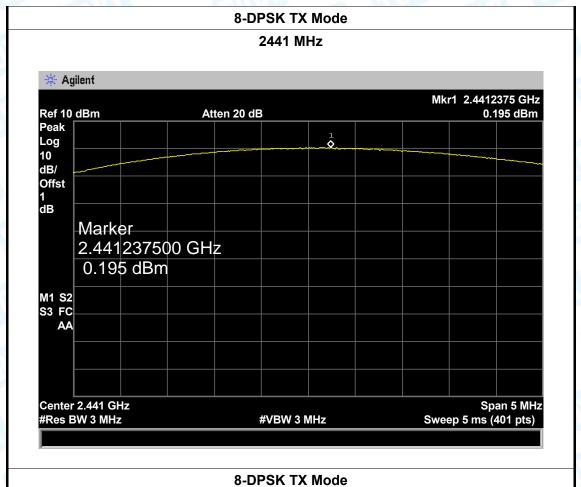
Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
2402	-0.207	
2441	0.195	21
2480	0.532	

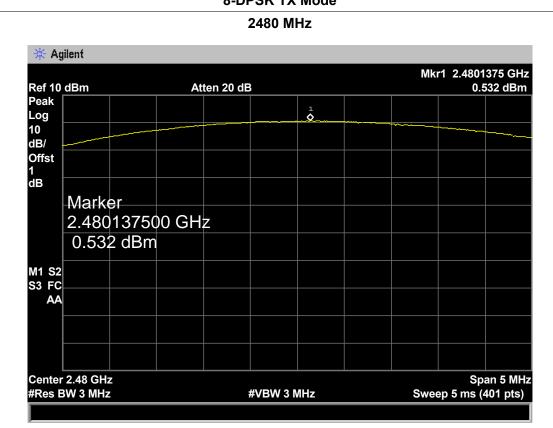
## 8-DPSK TX Mode





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# 11. Antenna Requirement

## 11.1 Standard Requirement

11.1.1 Standard FCC Part 15.203

## 11.1.2 Requirement

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

## 11.2 Antenna Connected Construction

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

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

Antenna Type		
▶ Permanent attached antenna	1000	
☐ Unique connector antenna		
☐ Professional installation anten	nna	