

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC148899

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FCC Radio Test Report FCC ID: 2ABHA0010

Original Grant

Report No. TB-FCC148899

NINGBO CSTAR IMP&EXP CO., LTD. **Applicant**

Equipment Under Test (EUT)

EUT Name Bluetooth Speaker with LED Lights

RM89627 Model No.

Series Model No. N/A

Brand Name Cstar

Receipt Date 2016-07-08

Test Date 2016-07-09 to 2016-07-27

Issue Date 2016-07-28

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: NINGBO CSTAR IMP&EXP CO., LTD.

Address : Floor 4, Building E, No. 655-90, Qiming Road, Yinzhou Investment &

Innovation Center, China

Manufacturer: ShenZhen C-Star Electronic Tech. co., Ltd

Address : 2, 3/F, Building B, No. 2 Bada Industrial Park, Yongfu Road, Heping

Community, Fuyong Town, Baoan District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	A	Bluetooth Speaker with LE	D Lights			
Models No.	odels No. : RM89627					
Model Difference	:	N/A				
THE STATE OF		Operation Frequency: Bluetooth 2.1+EDR: 2402~2480MHz				
1		Number of Channel:	Bluetooth:79 Channels see Note 2			
Product Description		Max Peak Output Power: Bluetooth: 2.256 dBm(π /4-DQPSK				
Description		Antenna Gain:	0 dBi PCB Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps) π /4-DQPSK(2 Mbps)			
Power Supply		DC Voltage supplied from DC power by Li-ion Battery	Host System by USB cable.			
Power Rating		DC 5.0V by USB cable. DC 3.7V by 450mAh Li-ion Battery.				
Connecting I/O Port(S)	b	Please refer to the User'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		



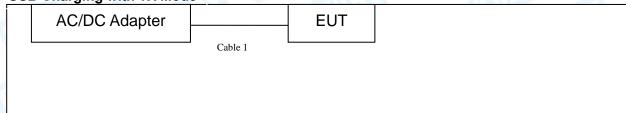
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					VI VI
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
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		1110
26	2428	53	2455		

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

1.3 Block Diagram Showing the Configuration of System Tested

USB Charging with TX Mode



EUT



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1.4 Description of Support Units

Equipment Information								
Name Model FCC ID/DOC Manufacturer Used "√"								
AC/DC Adapter TEKA012			TEKA	√				
	Cable Information							
Number Shielded Type Ferrite Core Length				Note				
Cable 1	NO	NO	0.8M	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	Hopping Mode(GFSK)			
Mode5	Hopping Mode(π /4-DQPSK)			

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)

(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	re Version FCC Assist 1.5		
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π /4-DQPSK	DEF	DEF	DEF

1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Radiated Emission	Level Accuracy:	±4.60 dB
Radiated Emission	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 Emilssion	Above 1000MHz	±4.20 UB



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1.8 Test Facility

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

CNAS (L5813)

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

FCC List No.: (811562)

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

IC Registration No.: (11950A-1)

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



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2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1					
Standard S	ection	T. (11)	1 1		
FCC	IC	Test Item	Judgment	Remark	
15.203	9	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:891.8281kHz π/4-DQPSK: 1194.20kHz	



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3. Test Equipment

d Emission Te	st			
Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Rohde & Schwarz	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016
Compliance Direction Systems Inc	RSU-A4	34403	Aug. 07, 2015	Aug. 06, 2016
SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016
Rohde & Schwarz	ENV216	101131	Aug. 08, 2015	Aug. 07, 2016
Emission Tes	t			
Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Agilent	E4407B	MY45106456	Aug. 07, 2015	Aug. 06, 2016
Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
ETS-LINDGREN	3142E	00117537	Mar. 26, 2016	Mar. 25, 2017
ETS-LINDGREN	3142E	00117542	Mar. 26, 2016	Mar. 25, 2017
ETS-LINDGREN	3117	00143207	Mar. 26, 2016	Mar. 25, 2017
ETS-LINDGREN	3117	00143209	Mar. 26, 2016	Mar. 25, 2017
Sonoma	310N	185903	Mar. 26, 2016	Mar. 25, 2017
HP	8447B	3008A00849	Mar. 26, 2016	Mar. 25, 2017
HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017
ETS-LINDGREN	2090	N/A	N/A	N/A
onducted Em	ission			
Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Agilent	E4407B	MY45106456	Aug. 07, 2015	Aug. 06, 2016
Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Anritsu	ML2495A	25406005	Aug.07, 2015	Aug.06, 2016
Anritsu	MALL	25406005	Aug.07, 2015	Aug.06, 2016
	Manufacturer Rohde & Schwarz Compliance Direction Systems Inc SCHWARZBECK Rohde & Schwarz Emission Tes Manufacturer Agilent Rohde & Schwarz ETS-LINDGREN ETS-LINDGREN ETS-LINDGREN ETS-LINDGREN Sonoma HP HUBER+SUHNER ETS-LINDGREN ETS-LINDGREN Sonoma HP HUBER+SUHNER ETS-LINDGREN Agilent Manufacturer Agilent Rohde & Schwarz Agilent Rohde & Schwarz	Rohde & Schwarz ESCI Compliance Direction Systems Inc SCHWARZBECK NNBL 8226-2 Rohde & Schwarz ENV216 Emission Test Manufacturer Model No. Agilent E4407B Rohde & Schwarz ESCI ETS-LINDGREN 3142E ETS-LINDGREN 3117 ETS-LINDGREN 3117 Sonoma 310N HP 8447B HUBER+SUHNER 100 ETS-LINDGREN 2090 Conducted Emission Manufacturer Model No. Agilent E4407B Rohde & Schwarz ESCI ETS-LINDGREN 3117 ETS-LINDGREN 3117 Sonoma 310N HP 8447B HUBER+SUHNER 100 ETS-LINDGREN 2090 Conducted Emission Manufacturer Model No. Agilent E4407B Rohde & Schwarz ESCI Anritsu ML2495A	Manufacturer Model No. Serial No. Rohde & Schwarz ESCI 100321 Compliance Direction Systems Inc RSU-A4 34403 SCHWARZBECK NNBL 8226-2 8226-2/164 Rohde & Schwarz ENV216 101131 Emission Test Manufacturer Model No. Serial No. Agilent E4407B MY45106456 Rohde & Schwarz ESCI 100010/007 ETS-LINDGREN 3142E 00117537 ETS-LINDGREN 3117 00143207 ETS-LINDGREN 3117 00143209 Sonoma 310N 185903 HP 8447B 3008A00849 HUBER+SUHNER 100 SUCOFLEX ETS-LINDGREN 2090 N/A **Conducted Emission Manufacturer Model No. Serial No. Agilent E4407B MY45106456 Rohde & Schwarz ESCI 100010/007 Anritsu ML2495A 25406005	Manufacturer Model No. Serial No. Last Cal. Rohde & Schwarz ESCI 100321 Aug. 07, 2015 Compliance Direction Systems Inc RSU-A4 34403 Aug. 07, 2015 SCHWARZBECK NNBL 8226-2 8226-2/164 Aug. 07, 2015 Rohde & Schwarz ENV216 101131 Aug. 08, 2015 Emission Test Manufacturer Model No. Serial No. Last Cal. Agilent E4407B MY45106456 Aug. 07, 2015 Rohde & Schwarz ESCI 100010/007 Aug. 07, 2015 ETS-LINDGREN 3142E 00117537 Mar. 26, 2016 ETS-LINDGREN 3117 00143207 Mar. 26, 2016 ETS-LINDGREN 3117 00143209 Mar. 26, 2016 Sonoma 310N 185903 Mar. 26, 2016 HP 8447B 3008A00849 Mar. 26, 2016 ETS-LINDGREN 2090 N/A N/A **Conducted Emission **Manufacturer** Model No. Serial No. Last Cal. Agilent E4



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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

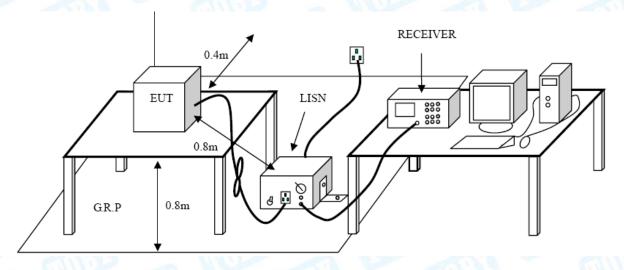
Conducted Emission Test Limit

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

Notes:

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

4.2 Test Setup



4.3 Test Procedure

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

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



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

LISN at least 80 cm from nearest part of EUT chassis

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

4.4 EUT Operating Mode

Please refer to the description of test mode.

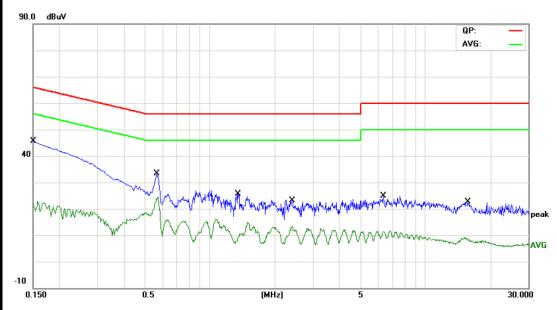
4.5 Test Data

Test data please refer the following pages.



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	AC 120V/60 Hz					
Terminal:	Line					
Test Mode:	USB Charging with TX GFSK Mode 2	2402 MHz				
Remark:	Only worse case is reported					

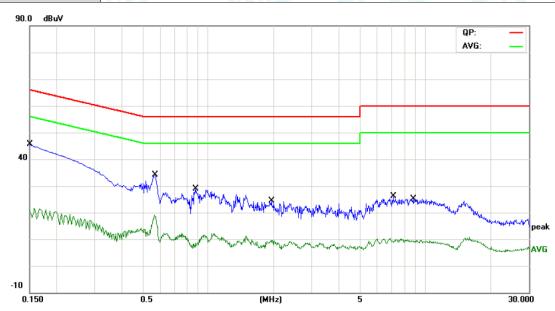


No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBu∀	dB	Detector
1	0.1500	30.48	10.12	40.60	65.99	-25.39	QP
2	0.1500	10.98	10.12	21.10	55.99	-34.89	AVG
3	0.5660	17.08	10.02	27.10	56.00	-28.90	QP
4 *	0.5660	13.85	10.02	23.87	46.00	-22.13	AVG
5	1.3500	6.70	10.13	16.83	56.00	-39.17	QP
6	1.3500	-1.59	10.13	8.54	46.00	-37.46	AVG
7	2.3980	6.27	10.06	16.33	56.00	-39.67	QP
8	2.3980	2.67	10.06	12.73	46.00	-33.27	AVG
9	6.3820	5.44	10.06	15.50	60.00	-44.50	QP
10	6.3820	1.12	10.06	11.18	50.00	-38.82	AVG
11	15.7380	3.96	10.06	14.02	60.00	-45.98	QP
12	15.7380	-2.67	10.06	7.39	50.00	-42.61	AVG



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627				
Temperature	25 ℃	55%					
:	The state of the s						
Test Voltage:	AC 120V/60 Hz	AC 120V/60 Hz					
Terminal:	Neutral						
Test Mode:	USB Charging with TX GFSK Mode	2402 MHz	6				
Remark:	Only worse case is reported	THE PARTY OF THE P					
90.0 dBuV		a	D				



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBu∀	dBu∀	dB	Detector
1	*	0.1500	30.53	9.92	40.45	65.99	-25.54	QP
2		0.1500	10.37	9.92	20.29	55.99	-35.70	AVG
3		0.5700	18.51	10.05	28.56	56.00	-27.44	QP
4		0.5700	7.66	10.05	17.71	46.00	-28.29	AVG
5		0.8780	7.90	10.08	17.98	56.00	-38.02	QP
6		0.8780	-2.61	10.08	7.47	46.00	-38.53	AVG
7		1.9540	6.66	10.06	16.72	56.00	-39.28	QP
8		1.9540	-1.53	10.06	8.53	46.00	-37.47	AVG
9		7.1180	6.79	10.06	16.85	60.00	-43.15	QP
10		7.1180	-2.20	10.06	7.86	50.00	-42.14	AVG
11		8.8180	6.61	10.12	16.73	60.00	-43.27	QP
12		8.8180	-2.04	10.12	8.08	50.00	-41.92	AVG



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EUT:	Bluetooth	Speaker w	ith LED Lig	hts Mod	lel Name	:	RM89627
Temperature:	25 ℃		13	Rela	ative Hun	nidity:	55%
Test Voltage:	AC 240V	/60 Hz					
Terminal:	Line		WALL !		3 W		
Test Mode:	USB Cha	rging with T	X GFSK M	ode 2402 l	MHz		TULL
Remark: Only worse case is reported							
90.0 dBuV		WANTE TO SERVICE	er weller to the state of the s		X	QP: AVG:	
-10 0.150	O.5	Name of the second	(MHz)	5 Measure-		and and	peak AVG
No. Mk.	Freq.	Reading Level	Factor	ment	Limit	Over	
	MHz	dBuV	dB	dBu∀	dBu∀	dB	Detector
1	0.4740	17.21	10.02	27.23	56.44	-29.21	QP
2	0.4740	5.27	10.02	15.29	46.44	-31.15	AVG
3 *	0.5780	19.96	10.06	30.02	56.00	-25.98	QP
4	0.5780	7.69	10.06	17.75	46.00	-28.25	AVG
5	1.0339	11.08	10.06	21.14	56.00	-34.86	QP
6	1.0339	-0.78	10.06	9.28	46.00	-36.72	AVG
7	2.4580	9.29	10.04	19.33	56.00	-36.67	QP
8	2.4580	-0.41	10.04	9.63	46.00	-36.37	AVG
9	6.6340	5.91	10.04	15.95	60.00	-44.05	QP
10	6.6340	-2.32	10.04	7.72	50.00	-42.28	AVG

Emission Level= Read Level+ Correct Factor

9.18

-1.62

10.23

10.23

19.41

8.61

13.2580

13.2580

11

12

60.00 -40.59

50.00 -41.39

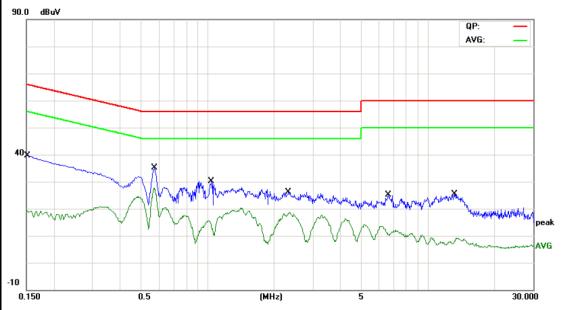
QP

AVG



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EUT:	Bluetooth Speaker with LED Lights	RM89627			
Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	AC 240V/60 Hz				
Terminal:	Neutral	The state of the s			
Test Mode:	USB Charging with TX GFSK Mode 2	2402 MHz	MILL		
Remark:	Only worse case is reported				
90.0 dBuV					



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBu∀	dBu∀	dB	Detector
1		0.1539	24.88	9.93	34.81	65.78	-30.97	QP
2		0.1539	8.05	9.93	17.98	55.78	-37.80	AVG
3		0.5740	19.65	10.06	29.71	56.00	-26.29	QP
4	*	0.5740	17.21	10.06	27.27	46.00	-18.73	AVG
5		1.0380	10.69	10.06	20.75	56.00	-35.25	QP
6		1.0380	3.21	10.06	13.27	46.00	-32.73	AVG
7		2.3300	10.34	10.05	20.39	56.00	-35.61	QP
8		2.3300	8.08	10.05	18.13	46.00	-27.87	AVG
9		6.6140	5.01	10.04	15.05	60.00	-44.95	QP
10		6.6140	-0.19	10.04	9.85	50.00	-40.15	AVG
11		13.1940	5.57	10.22	15.79	60.00	-44.21	QP
12		13.1940	-3.24	10.22	6.98	50.00	-43.02	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

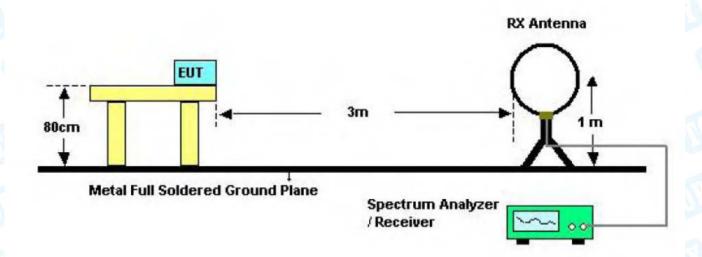
Note:

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

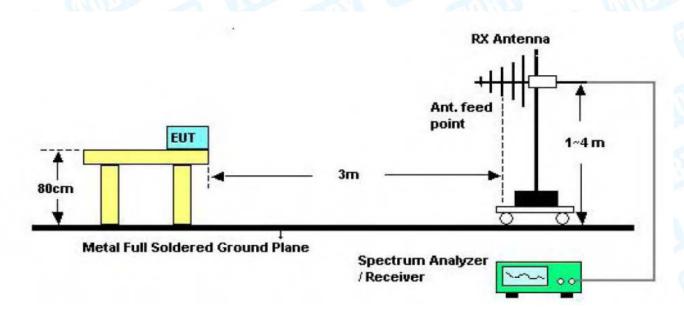


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5.2 Test Setup



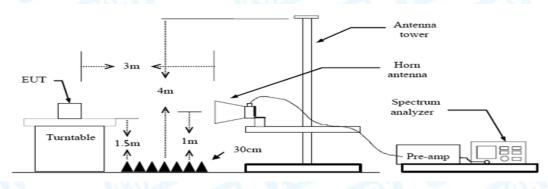
Below 30MHz Test Setup



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

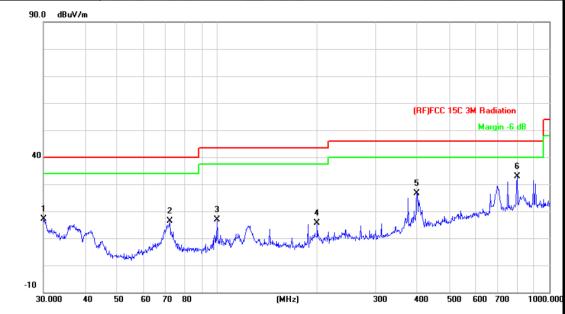
Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=1 kHz with Peak Detector for Average Values.

Test data please refer the following pages.



Page: 20 of 79

į	EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627		
l	Temperature:	25 ℃	Relative Humidity:	55%		
	Test Voltage:	est Voltage: DC 3.7V				
	Ant. Pol.	Horizontal				
	Test Mode:	TX GFSK Mode 2402MHz	M:N	THE PARTY OF		
	Remark:	Only worse case is reported		6		



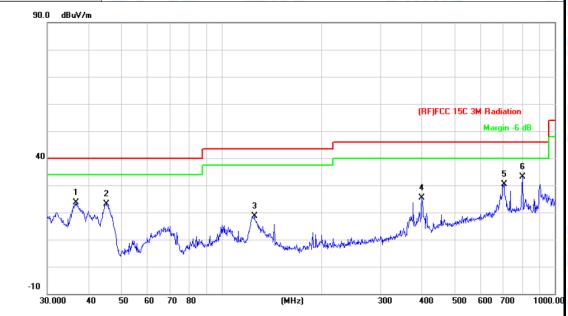
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		30.1054	31.21	-14.03	17.18	40.00	-22.82	peak
2		72.0843	39.98	-23.54	16.44	40.00	-23.56	peak
3		99.8777	38.77	-21.83	16.94	43.50	-26.56	peak
4		199.9856	35.95	-20.39	15.56	43.50	-27.94	peak
5		399.0302	39.48	-12.87	26.61	46.00	-19.39	peak
6	*	801.7863	39.34	-6.49	32.85	46.00	-13.15	peak

^{*:}Maximum data x:Over limit !:over margin



Page: 21 of 79

	EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
	Temperature:	25 ℃	Relative Humidity:	55%
	Test Voltage:	DC 3.7V	MA	
	Ant. Pol.	Vertical	The state of the s	
1	Test Mode:	TX GFSK Mode 2402MHz	11.37	MILLER
	Remark:	Only worse case is reported		6



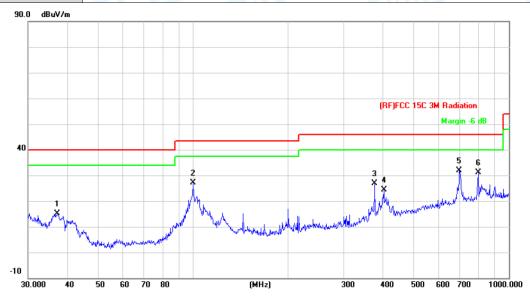
No	. Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		36.5092	41.63	-17.99	23.64	40.00	-16.36	peak
2		45.2166	45.55	-22.37	23.18	40.00	-16.82	peak
3		125.4457	40.84	-22.33	18.51	43.50	-24.99	peak
4		399.0302	38.33	-12.87	25.46	46.00	-20.54	peak
5		704.2261	37.35	-6.91	30.44	46.00	-15.56	peak
6	*	798.9797	39.72	-6.52	33.20	46.00	-12.80	peak

^{*:}Maximum data x:Over limit !:over margin



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX π/4-DQPSK Mode 2402MHz	11:32	Millian
Remark:	Only worse case is reported		- 6



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		37.1550	33.47	-18.39	15.08	40.00	-24.92	peak
2		99.8777	48.96	-21.83	27.13	43.50	-16.37	peak
3		375.9385	41.24	-14.40	26.84	46.00	-19.16	peak
4		401.8385	37.21	-12.81	24.40	46.00	-21.60	peak
5	*	696.8567	38.78	-6.95	31.83	46.00	-14.17	peak
6		798.9797	37.64	-6.52	31.12	46.00	-14.88	peak

^{*:}Maximum data x:Over limit !:over margin



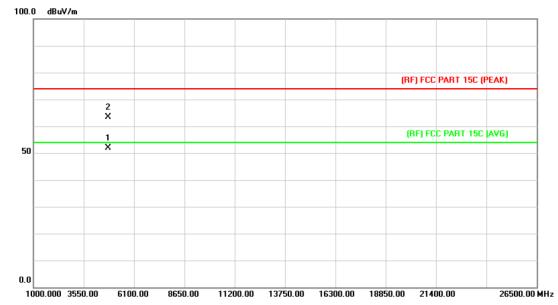
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EUT: Bluetooth Speaker with LED Lights		Speaker wit	h LED Light	s Mode	el Name :	RI	RM89627	
emperature:	25 ℃		3	Relati	ve Humidit	y : 55	%	
est Voltage:	DC 3.7V	MAGINE				N. A.		
Ant. Pol.	Vertical		WILLIAM TO		A Million			
est Mode:	TX π/4-D	QPSK Mod	e 2402MHz		3	TIV TO	1111	
Remark:	Only worse	case is re	ported	17		10		
90.0 dBuV/m								
					(RF)FCC 15	iC 3M Radia	tion	
						Margin	-6 dB	
40							5 6	
					3	*	× ×	
1 X	2 X				X ₁	J,	of Mary Property	
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	100	~						
-10								
30.000 40	50 60 70	Reading	(MHz) Correct	зо Measure-	00 400 50	0 600 70	00 1000.0	
No. Mk.	Freq.	Level	Factor	ment	Limit	Over		
	MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector	
1	36.8953	41.40	-18.23	23.17		-16.83	peak	
2	45.2166							
		45.06	-22.37	22.69		-17.31	peak	
	375.9385	42.40	-14.40	28.00		-18.00	peak	
4	696.8567	39.24	-6.95	32.29	46.00	-13.71	peak	
5	798.9797	40.36	-6.52	33.84	46.00	-12.16	peak	
6 *	932.2715	40.37	-4.82	35.55	46.00	-10.45	peak	
							1	



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with LED Lights Model Name : RM89627
Relative Humidity: 55%
TO THE PARTY OF TH
02MHz
nission which more than 10 dB below the prescribed
(

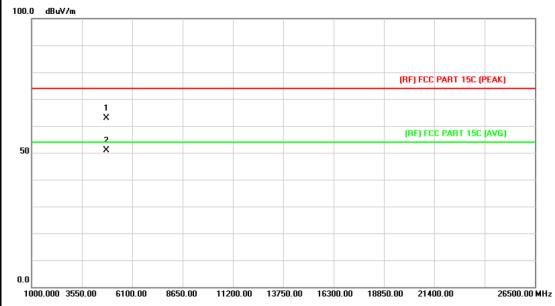


No	o. M	1k.	Freq.	_	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4	804.048	38.51	13.44	51.95	54.00	-2.05	AVG
2		4	804.282	49.99	13.44	63.43	74.00	-10.57	peak



Page: 25 of 79

EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627		
Temperature:	25 °C Relative Humidity: 55%				
Test Voltage:	DC 3.7V				
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2402MHz	M:N	MILLER		
Remark:	No report for the emission which mor limit.	re than 10 dB below the	prescribed		

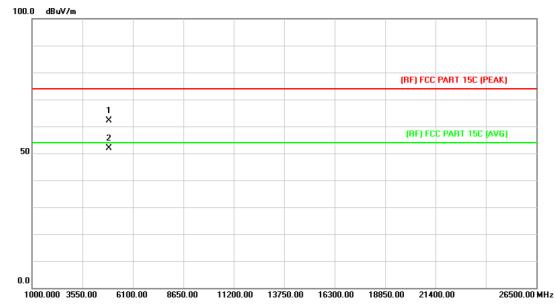


No	. Mk	. Freq.			Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.682	49.34	13.44	62.78	74.00	-11.22	peak
2	*	4804.093	37.36	13.44	50.80	54.00	-3.20	AVG



Page: 26 of 79

EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V	DC 3.7V						
Ant. Pol.	Horizontal	TO VIDE						
Test Mode:	TX GFSK Mode 2441MHz		Millian					
Remark:	No report for the emission which more limit.	than 10 dB below the p	orescribed					

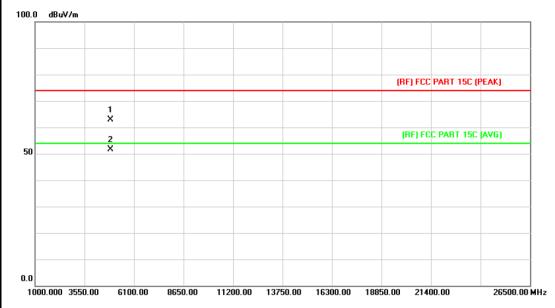


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.808	48.18	13.90	62.08	74.00	-11.92	peak
2	*	4881.961	37.89	13.90	51.79	54.00	-2.21	AVG



Page: 27 of 79

EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627						
Temperature:	25 °C Relative Humidity: 55								
Test Voltage:	DC 3.7V	DC 3.7V							
Ant. Pol.	Vertical								
Test Mode:	TX GFSK Mode 2441MHz	11:30	Miles						
Remark:	No report for the emission which more limit.	than 10 dB below the p	orescribed						

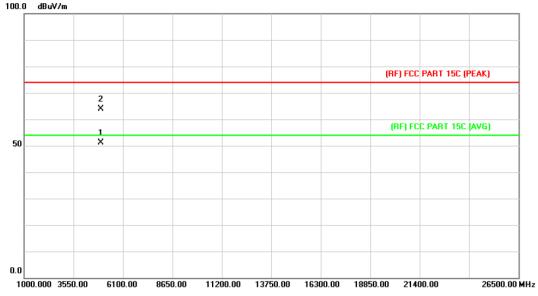


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.214	48.96	13.90	62.86	74.00	-11.14	peak
2	*	4882.099	37.76	13.90	51.66	54.00	-2.34	AVG



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2480MHz	71:30	Millian			
Remark: No report for the emission which more than 10 dB below the prescribed limit.						
100.0 dBuV/m						

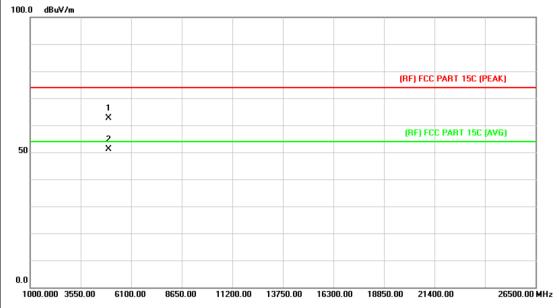


N	lo. N	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*		4960.159	36.87	14.36	51.23	54.00	-2.77	AVG
2			4960.456	49.62	14.36	63.98	74.00	-10.02	peak



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V	DC 3.7V						
Ant. Pol.	Vertical							
Test Mode:	TX GFSK Mode 2480MHz	11:32	Millian					
Remark:	No report for the emission which more limit.	than 10 dB below the p	orescribed					

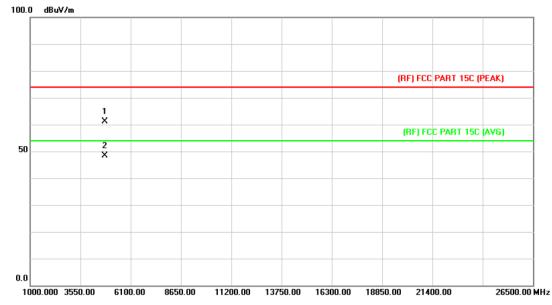


No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.850	48.24	14.36	62.60	74.00	-11.40	peak
2	*	4960.009	36.76	14.36	51.12	54.00	-2.88	AVG



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627					
Temperature:	25 °C Relative Humidity: 55%							
Test Voltage:	DC 3.7V	DC 3.7V						
Ant. Pol.	Horizontal							
Test Mode:	TX π /4-DQPSK Mode 2402MHz		MILLER					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							

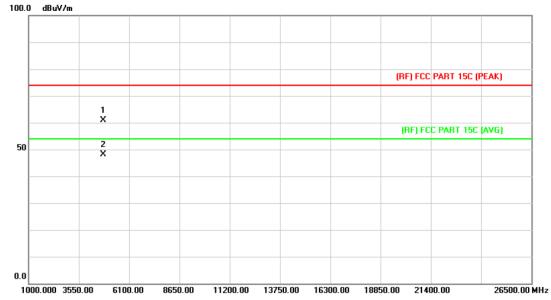


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.643	47.78	13.44	61.22	74.00	-12.78	peak
2	*	4804.915	34.82	13.44	48.26	54.00	-5.74	AVG



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical						
Test Mode:	TX π/4-DQPSK Mode 2402MHz	11:32	Millian				
Remark:	No report for the emission which more limit.	than 10 dB below the p	orescribed				

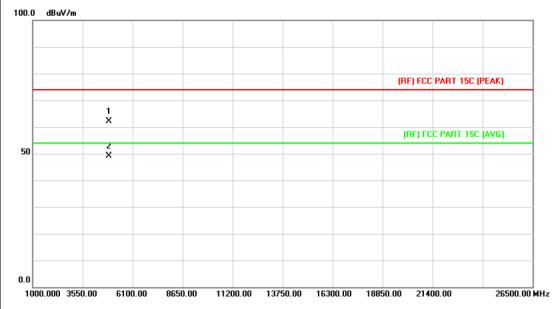


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.568	47.41	13.44	60.85	74.00	-13.15	peak
2	*	4804.795	34.64	13.44	48.08	54.00	-5.92	AVG



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627				
Temperature:	25 °C Relative Humidity: 55%						
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	TX π/4-DQPSK Mode 2441MHz	10:30	THURSDAY				
Remark:	No report for the emission which mor limit.	No report for the emission which more than 10 dB below the prescribed limit.					

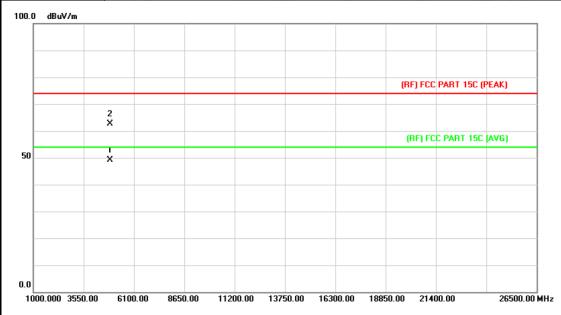


No.	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.298	48.11	13.90	62.01	74.00	-11.99	peak
2	*	4882.966	35.21	13.90	49.11	54.00	-4.89	AVG



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	THE PARTY OF THE P	
Ant. Pol.	Vertical		
Test Mode:	TX π/4-DQPSK Mode 2441MHz		MILLER
Remark:	No report for the emission which mor limit.	re than 10 dB below the	prescribed

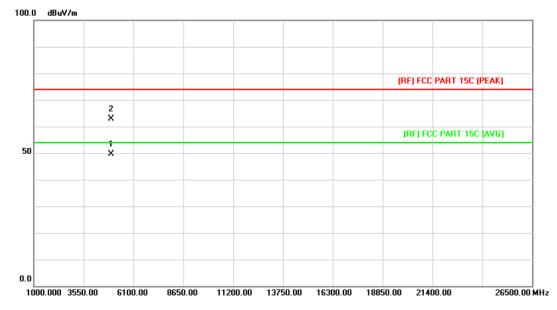


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.562	35.18	13.90	49.08	54.00	-4.92	AVG
2		4883.488	48.64	13.92	62.56	74.00	-11.44	peak



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	THE STATE OF THE S	
Ant. Pol.	Horizontal	The state of the s	
Test Mode:	TX π/4-DQPSK Mode 2480MHz	11:33	MILLER
Remark:	No report for the emission which mor limit.	e than 10 dB below the	prescribed

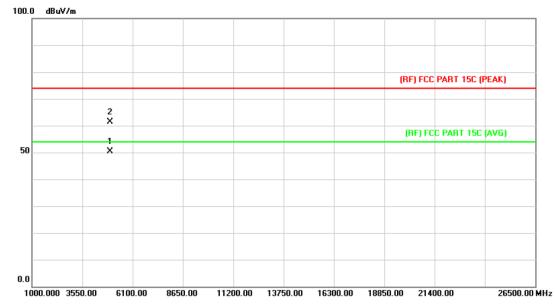


N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.501	35.19	14.36	49.55	54.00	-4.45	AVG
2		4961.203	48.50	14.38	62.88	74.00	-11.12	peak



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	THE STATE OF THE S	
Ant. Pol.	Vertical	The state of the s	
Test Mode:	TX π/4-DQPSK Mode 2480MHz	11.30	MILLER
Remark:	No report for the emission which mor limit.	e than 10 dB below the	prescribed



No	o. Mł	c. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.421	36.10	14.36	50.46	54.00	-3.54	AVG
2		4960.631	47.13	14.36	61.49	74.00	-12.51	peak



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6. Restricted Bands Requirement

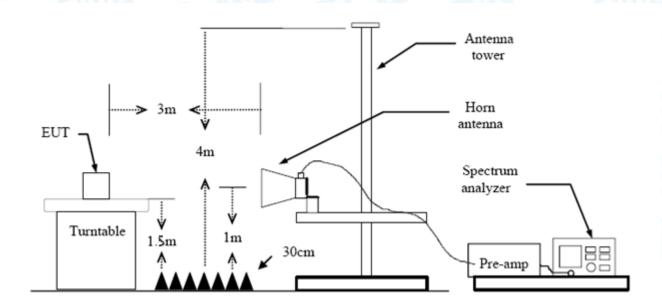
6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Class B (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.



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Page:

(3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

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

6.4 Test Data

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

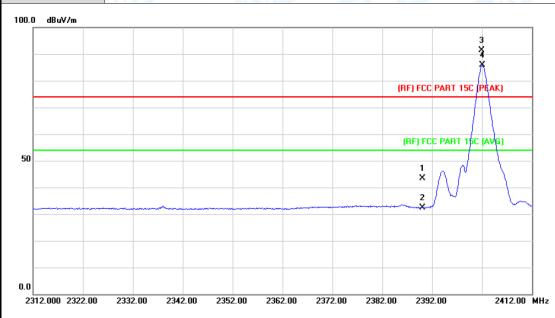
All restriction bands have been tested, only the worst case is reported.



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(1) Radiation Test

EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal	m:D	
Test Mode:	TX GFSK Mode 2402MHz		
Remark:	N/A	All	2



No.	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.53	0.77	43.30	74.00	-30.70	peak
2		2390.000	31.67	0.77	32.44	54.00	-21.56	AVG
3	Χ	2401.900	90.66	0.82	91.48	Fundamenta	I Frequency	peak
4	*	2402.000	84.94	0.82	85.76	Fundamenta	I Frequency	AVG



Page: 39 of 79

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	Voltag	e:		3.7\					4										
Ant.	Pol.		Ver	tical				- 1	1///			1	٩	M			1	1	
Test	Mode:		TX	GFS	SK M	ode	240)2MF	Ηz		6				À	. 1	11/1		
Rem	nark:		N/A	9	111					ì.	W			K					6
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					Re	adir	ng	Со	rrect	: N	leas	ure-							
N	o. Mk.	F	req		Le	evel	1	F	actor		mer	nt	L	imit		Ov	er		
			MHz		d	BuV		dl	B/m		dBu\	//m	d	BuV/	m	dE	3	Det	ector
1		239	0.00	00	4	4.36	3	0	.77		45.	13	7	74.0	0	-28	.87	pe	eak
2		239	0.00	00	3	1.99)	0	.77		32.	76	Ę	54.0	0	-21	.24	Α	VG
3	X	240	2.00	00	88	8.26	;	0	.82		89.0	80	Fun	damer	ntal Fı	reque	ncy	pe	eak
4	*	240	2.00	00	82	2.60)	0	.82		83.4	42	Fun	damer	ntal Fı	reque	псу	Α	VG



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EUT:	Bluetooth S	peaker with	LED Lights	Model Na	me: R	M89627
Temperature:	25 ℃			Relative H	umidity: 5	5%
Test Voltage:	DC 3.7V	MAN		Carried States		
Ant. Pol.	Horizontal		MOOF			
Test Mode:	TX GFSK M	1ode 2480 M	1Hz	M. B.		The same
Remark:	N/A	Millian		1	W. 180	6
100.0 dBuV/m						
50 3 x					F) FCC PART 15C (PEA	
0.0 2470.000 2480.00	2490.00 250	0.00 2510.00	2520.00 253	0.00 2540.00	2550.00	2570.00 MHz
No. Mk.				asure- nent Lim	it Over	
	MHz	dBuV (dB/m dE	BuV/m dBu	V/m dB	Detector
1 X 24	79.900 8	37.17 <i>′</i>	1.15 8	8.32 _{Fundam}	ental Frequency	peak
2 * 24	80.000	31.80	1.15 8	2.95 Fundam	ental Frequency	AVG
3 24	83.500 5	3.92	1.17 5	5.09 74.		peak
						1-2-211



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EUT:	Bluetoo	th Speaker v	with LED Lig	hts Mod	lel Name :	RM89627
Temperature:	25 ℃		18	Rela	tive Humidity:	55%
Test Voltage:	DC 3.7\	/		1		
Ant. Pol.	Vertical	, ,	THU:		a Min	
Test Mode:	TX GFS	K Mode 248	30 MHz			amir
Remark:	N/A	allin		Charles	TOTAL S	
100.0 dBuV/m						
50	3 < 1				(RF) FCC PART 15	
2470.000 2480.00	2490.00	2500.00 251	0.00 2520.00	2530.00 25	540.00 2550.00	2570.00 MH
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit O	ver
1 X 24	179.900	89.50	1.15	90.65	Fundamental Frequ	
	180.000	83.90	1.15	85.05		A)/O
	183.500	56.15	1.17	57.32	Fundamental Frequency 74.00 -16	ency
						<u>'</u>
	183.500	47.56	1.17	48.73	54.00 -5	5.27 AVG



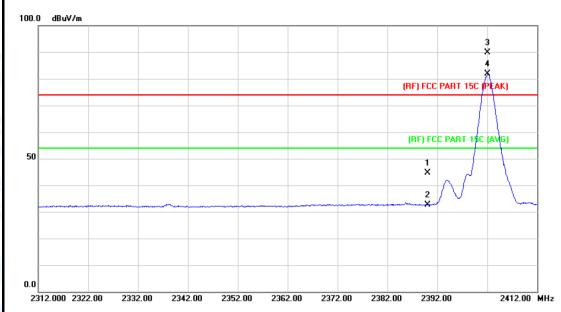
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EUT:			Blue	etoo	th Sp	eake	er with	h LEC) Lig	hts	N	/lod	el N	lam	e :	F	RM89	627
Temp	eratur	e:	25	$^{\circ}$ C			mi	3			R	Relat	ive	Hun	nidity:	5	55%	افرا
Test V	/oltag	e:	DC	3.7\	/				1	WII.	U			1	M			
Ant. P	ol.		Hor	izon	tal			E. H.	77			<u> </u>			des		961	3
Test N	/lode:		TX	π /4	l-DQ	PSK	Mod	e 240	2MF	l z								100
Rema	rk:		N/A	L.					0		W		A		N.			6
100.0	dBuV/m																	_
																3 X		
																4 ×		
													(RF) FCC F	PART 15C	PEAK)	1
																1		1
50													Η	FJFCC	PART 150	. IAVG)	-
														1 X	~ /	'		
														2			T_	
						A				-								
																		-
																		-
0.0																		
2312.	.000 232	2.00	2332	2.00	2342.	.00	2352.00	236	2.00	2372	2.00	2382.0	00	2392.	00	2	412.00	MHz
					Re	adin	g (Corre	ct	Mea	asure							
No	o. Mk		Fred	٦.	L	evel		Facto	or	m	ent		Lim	iit	Ove	er		
			MHz		d	lBu∀		dB/m		dB	uV/m		dBu	V/m	dB		Dete	ctor
1		23	90.0	00	4	3.09		0.77		43	3.86		74.	.00	-30.	14	pea	ak
2		23	90.0	00	3	1.84		0.77		32	2.61		54.	.00	-21.	39	ΑV	/G
3	Χ	24	01.8	00	9	0.79		0.82		9	1.61	Fun	ıdam	ental	Frequen	су	pea	ak



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX π/4-DQPSK Mode 2402MHz	1133	MILL
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	43.80	0.77	44.57	74.00	-29.43	peak
2		2390.000	31.85	0.77	32.62	54.00	-21.38	AVG
3	X	2402.000	88.95	0.82	89.77	Fundamental I	Frequency	peak
4	*	2402.100	80.99	0.82	81.81	Fundamental I	Frequency	AVG



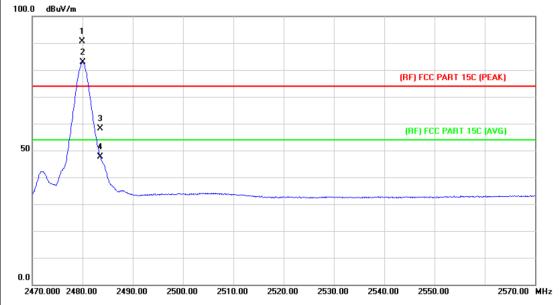
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UT		Blue	etooth Spea	aker with LE	D Lights	Mode	I Name	: F	RM8962	
emp	peratu	re: 25	\mathbb{C}	THE PARTY		Relativ	ve Humi	dity: 5	55%	
Test	Voltag	je: DC	3.7V				-	WE		
۹nt.	Pol.	Hori	izontal		Miles.		Alla			
Гest	Mode:	TX	π /4-DQPS	SK Mode 24	30MHz	M:N			111	
Rem	ark:	N/A	J AN	Line of the last	a V	No.	4000	3	- (
100.0	dBuV/m	·								
50		2 X 1 1 X X X X X X X X X X X X X X X X					(RF) FCC PA	RT 15C (PEAK		
0.0										
247	70.000 248	80.00 2490	.00 2500.00	2510.00 25	2530.	00 2540.00	2550.00	2	2570.00 MHz	
No	o. Mk	. Freq	Read Lev	_		sure- ent L	imit	Over		
		MHz	dBu	V dB/n	n dBu	ıV/m o	dBuV/m	dB	Detecto	
1	*	2480.00	00 84.7	75 1.1	5 85	.90 Fund	amental Fre	equency	AVG	
2	X	2480.20	00 92.7	76 1.1	5 93	.91 Fund	amental Fre	equency	peak	
		2483.50	00 59.7	79 1.1	7 60	.96	74.00	-13.04	peak	
3				30 1.1	7 50	.77	54.00	-3.23	AVG	



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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical	A VIII	
Test Mode:	TX π/4-DQPSK Mode 2480MHz	111:30	MILLER
Remark:	N/A		
100.0 dBuV/m			

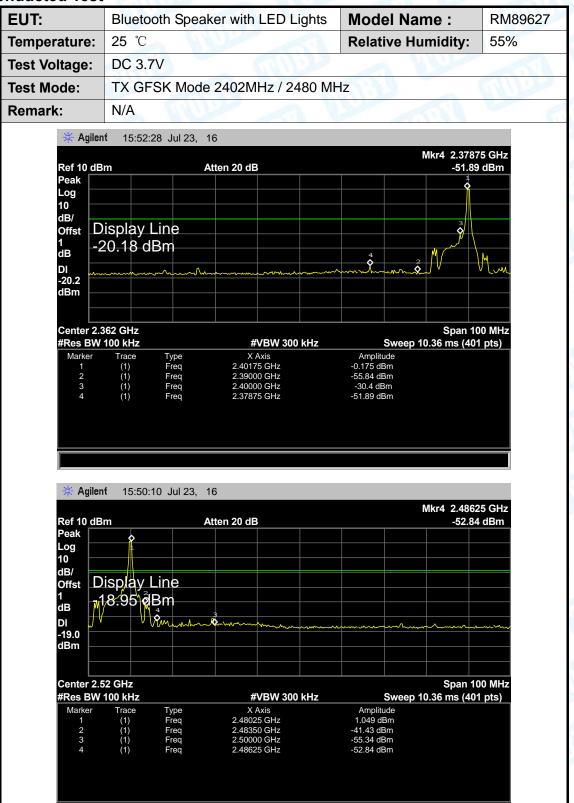


No	o. Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.900	89.54	1.15	90.69	Fundamental	Frequency	peak
2	*	2480.000	81.72	1.15	82.87	Fundamental	Frequency	AVG
3		2483.500	56.92	1.17	58.09	74.00	-15.91	peak
4		2483.500	46.53	1.17	47.70	54.00	-6.30	AVG



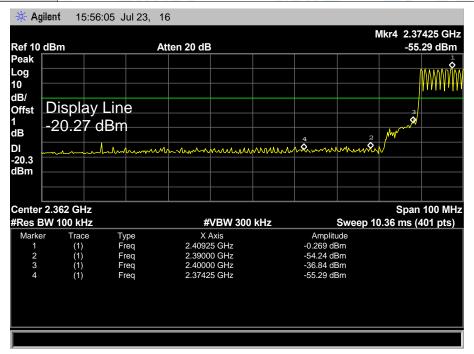
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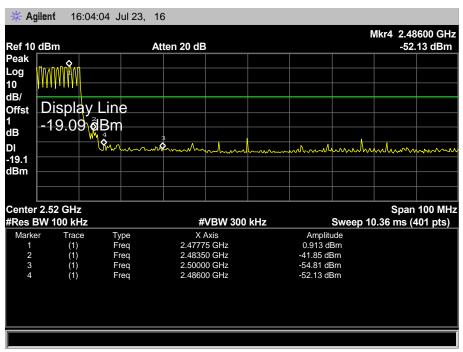
(2) Conducted Test





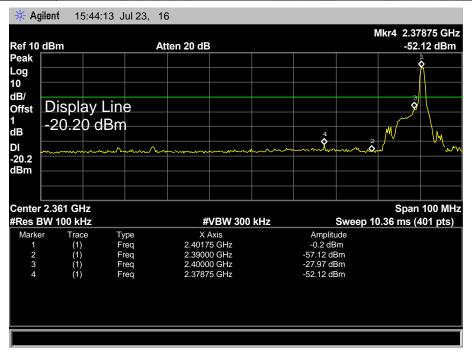
EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	THE STATE OF THE S	
Test Mode:	GFSK Hopping Mode	The state of the s	
Remark:	N/A		MILLER

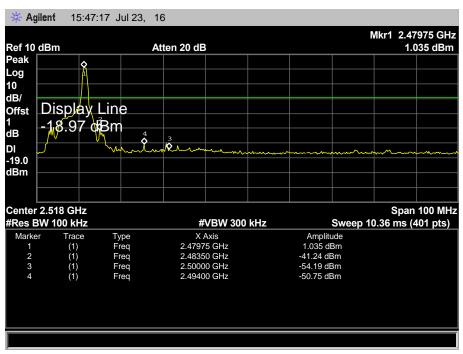






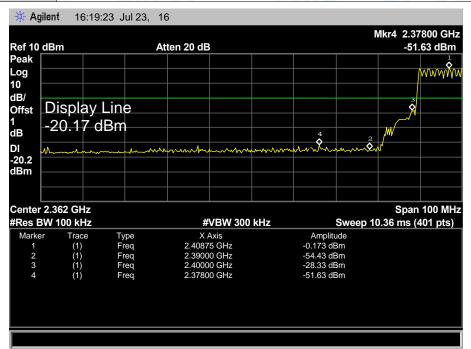
EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX π/4-DQPSK Mode 2402MHz / 2480 MHz		
Remark:	N/A	11:30	MILL

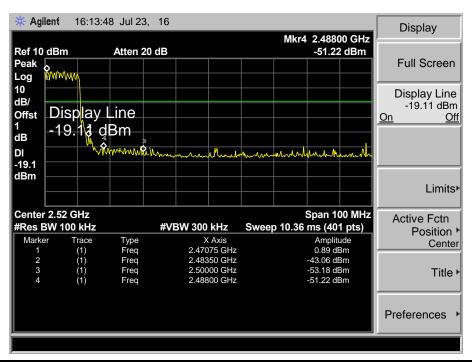






EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Test Mode:	π/4-DQPSK Hopping Mode			
Remark:	N/A	W. 30	MILL	







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7. Number of Hopping Channel

7.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.247 (a)(1)

6.1.2 Test Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 KHz, VBW=100 KHz, Sweep time= Auto.

7.4 EUT Operating Condition

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

7.5 Test Data

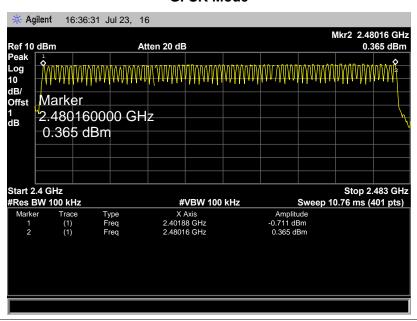


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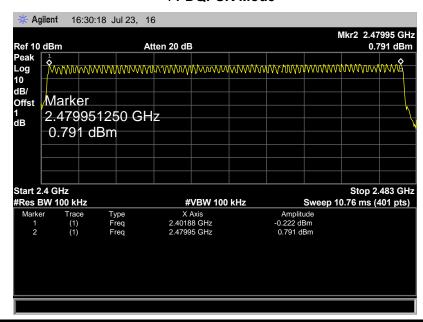
EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Test Mode:	Hopping Mode (GFSK/ π /4-DQPSK)			

Frequency Range	Quantity of Hopping Channel	Limit
2402MHz~2480MHz	79	>4 E
2402WINZ~248UWINZ	79	>15

GFSK Mode



π/4-DQPSK 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.

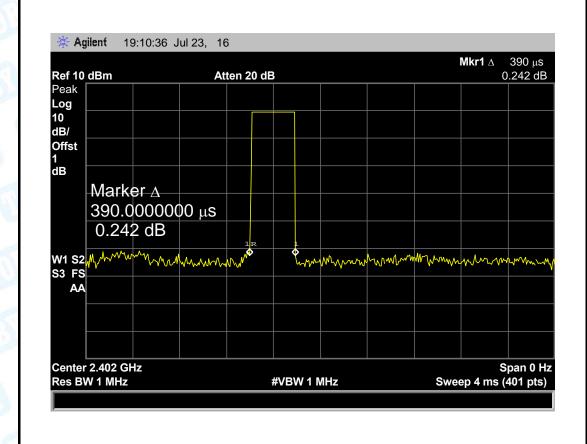


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8.5 Test Data

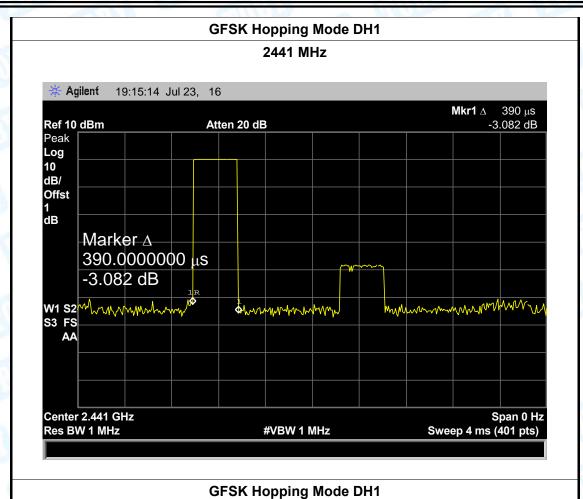
EUT:	Bluetooth Speaker with LED Lights		UT:		Model Name :		RM89627
Temperature:	25 ℃		Relative Hum	idity:	55%		
Test Voltage:	DC 3.7V	DC 3.7V			DITTE OF		
Test Mode:	Hopping Mod	de (GFSK DH1)					
Channel	Pulse Time	Total of Dwell	Period Time Limit		Result		
(MHz)	(ms)	(ms)	(s)	(ms)	Result		
2402	0.390	124.80					
2441	0.390	124.80	31.60	400	PASS		
2480	0.390	124.80					
Note: Dwell time=Pulse Time (ms) × (1600 ÷ 2 ÷ 79) ×31.6							

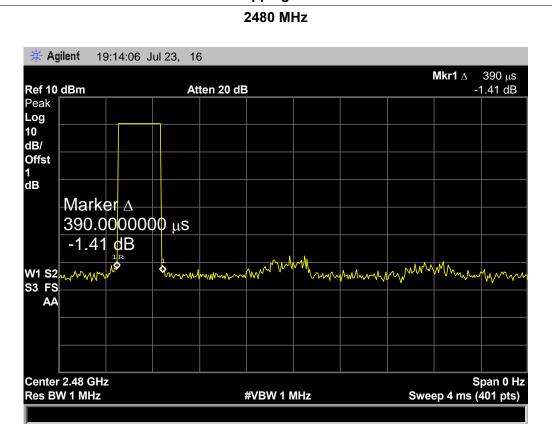
GFSK Hopping Mode DH1





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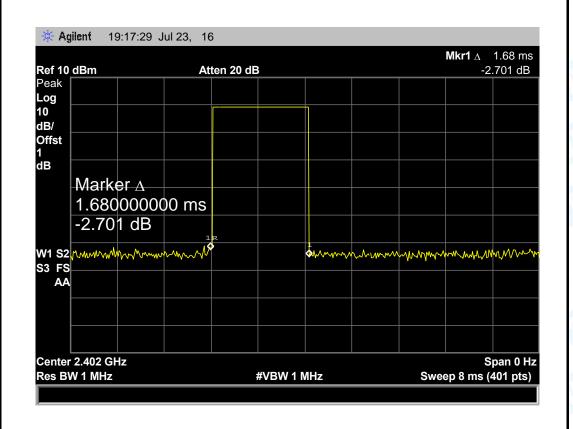
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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Test Mode:	Hopping Mode (GFSK DH3)			

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	1.680	268.80			
2441	1.680	268.80	31.60	400	PASS
2480	1.680	268.80			

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

GFSK Hopping Mode DH3

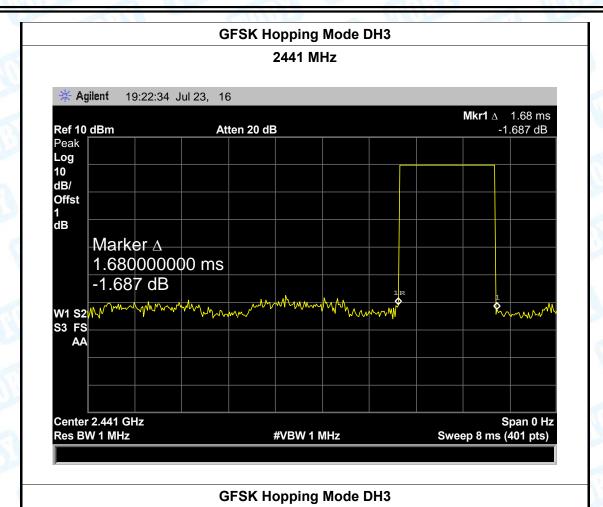




Res BW 1 MHz

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2480 MHz * Agilent 19:20:07 Jul 23, 16 **Mkr1** Δ 1.68 ms Ref 10 dBm Atten 20 dB -0.383 dB Peak Log 10 dB/ Offst 1 dB Marker ∆ 1.680000000 ms -0.383 dB W1 S2~^\\\\\\\ mannon makan wan mannon makan S3 FS AA Center 2.48 GHz Span 0 Hz

#VBW 1 MHz

Sweep 8 ms (401 pts)



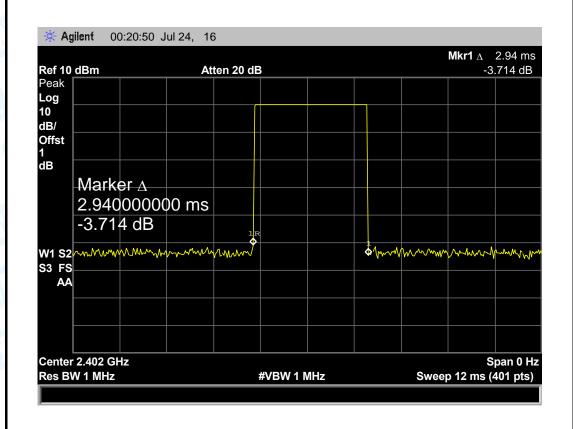
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EUT:	Bluetooth S Lights	Speaker with LED	Model Name :		RM89627
Temperature:	25 ℃	THE PARTY OF THE P	Relative Hum	idity:	55%
Test Voltage:	DC 3.7V	WILL STATE		BRA	
Test Mode:	Hopping M	ode (GFSK DH5)	A. Tarana		
Channel	Pulse Time	Total of Dwell	Period Time	Limit	D14

Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	2.940	313.60			
2441	2.940	313.60	31.60	400	PASS
2480	2.940	313.60			

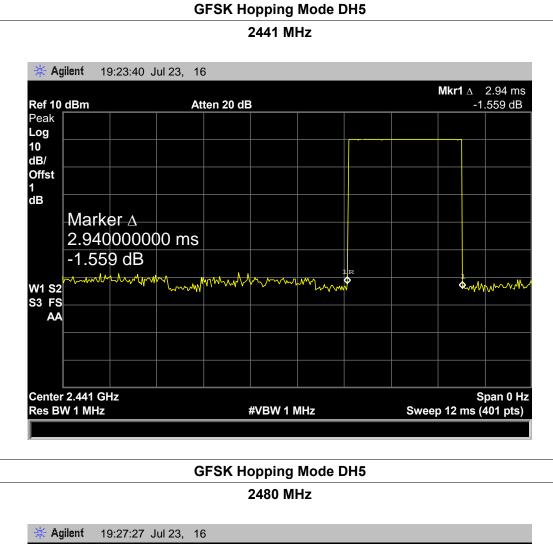
Note: Dwell time=Pulse Time (ms) \times (1600 \div 6 \div 79) \times 31.6

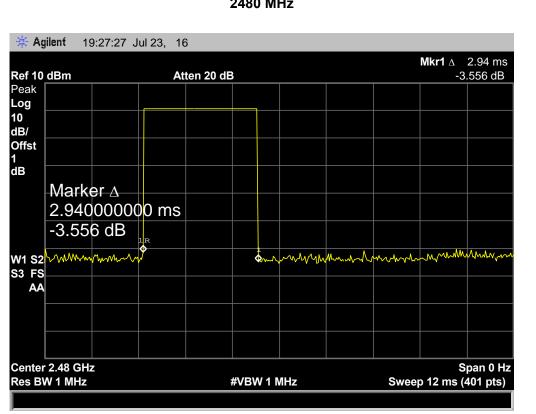
GFSK Hopping Mode DH5





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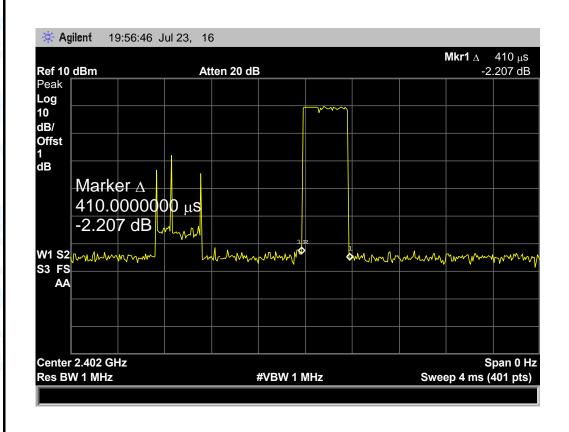
EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Tost Modo:	Hopping Mode (T //-DOPSK	DH1)	

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

Channel (MHz)	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2402	0.410	131.20	()	, ,	
2441	0.410	131.20	31.60	400	PASS
2480	0.410	131.20			

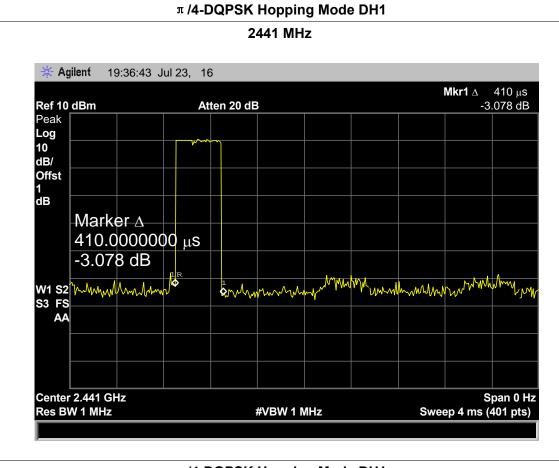
Note: Dwell time=Pulse Time (ms) \times (1600 \div 2 \div 79) \times 31.6

π/4-DQPSK Hopping Mode DH1

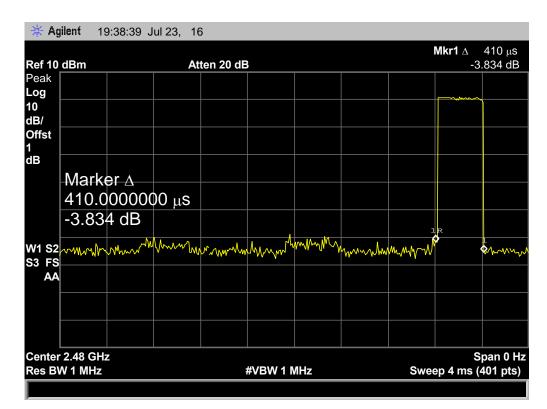




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π /4-DQPSK Hopping Mode DH1





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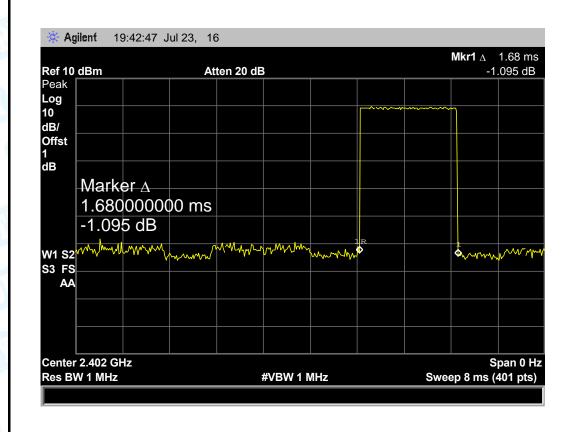
	EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
•	Temperature:	25 ℃	Relative Humidity:	55%
•	Test Voltage:	DC 3.7V		
١.	Test Mode:	Hopping Mode (II /4-DOPSK D)H3)	

Hopping Mode (17/4-DQPSK DH3)

Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.680	268.80			
2441	1.680	268.80	31.60	400	PASS
2480	1.680	268.80			

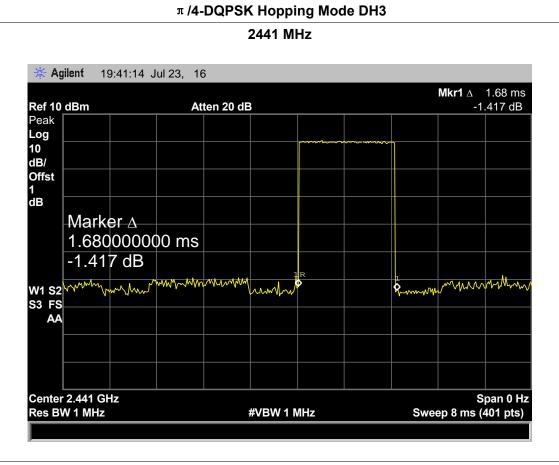
Note: Dwell time=Pulse Time (ms) \times (1600 \div 4 \div 79) \times 31.6

π /4-DQPSK Hopping Mode DH3

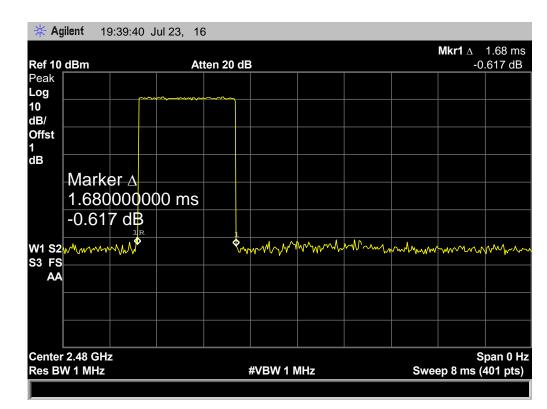




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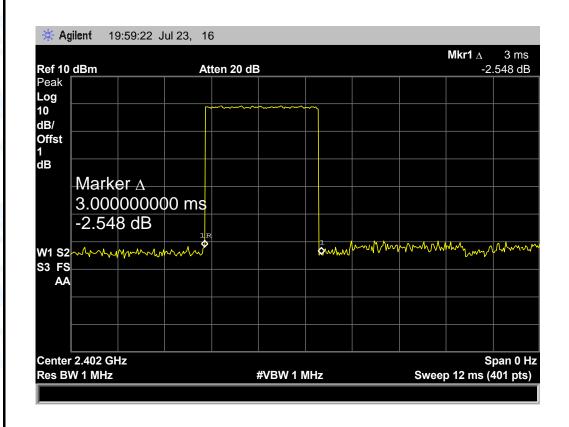
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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Test Mode:	Hopping Mode (π /4-DQPSK DH5)			

Channel	Pulse Time	Total of Dwell	Period Time	Limit	Popult
(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			

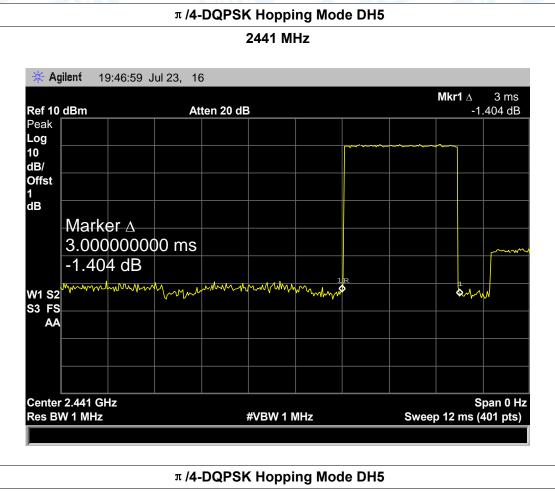
Note: Dwell time=Pulse Time (ms) \times (1600 \div 6 \div 79) \times 31.6

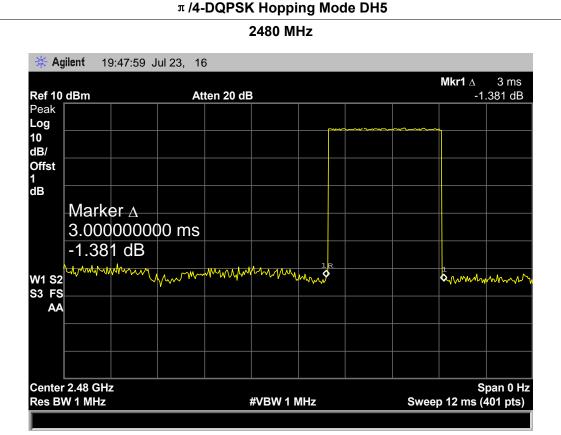
π /4-DQPSK Hopping Mode DH5





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9. Channel Separation and Bandwidth Test

9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247

9.1.2 Test Limit

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

9.2 Test Setup



9.3 Test Procedure

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

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

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

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

9.4 EUT Operating Condition

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

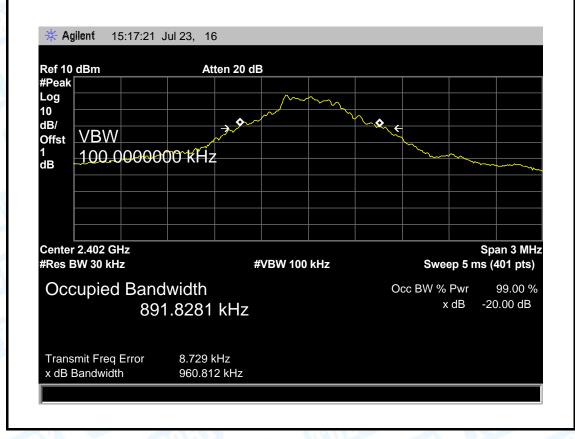


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9.5 Test Data

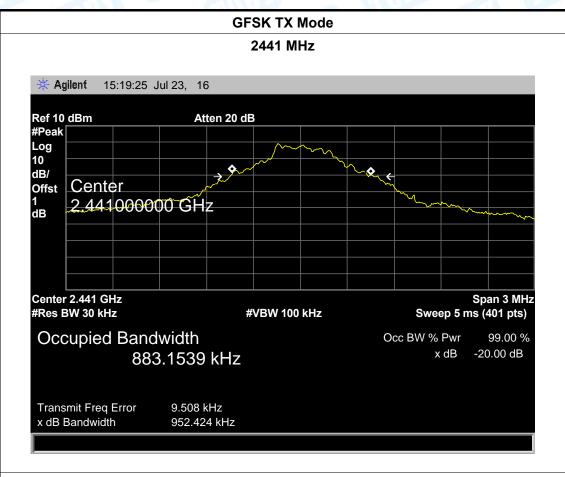
EUT:	Bluetooth Spe Lights	eaker with LED	Model Name :	RM89627
Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	DC 3.7V			A PRULE
Test Mode:	TX Mode (GF	SK)	TO TO	13 6
Channel freque	1cy 99	% OBW	20dB Bandwidth	20dB
(MHz)		(kHz)	(kHz)	Bandwidth *2/3 (kHz)
(MHz) 2402		(kHz) 91.8281	(kHz) 960.812	
	89	` '	, ,	

GFSK TX Mode

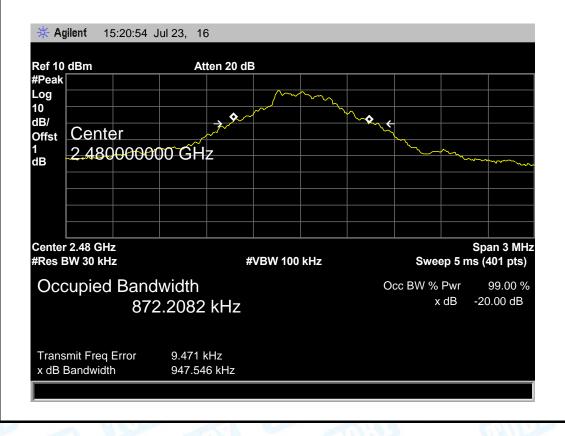




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GFSK TX Mode



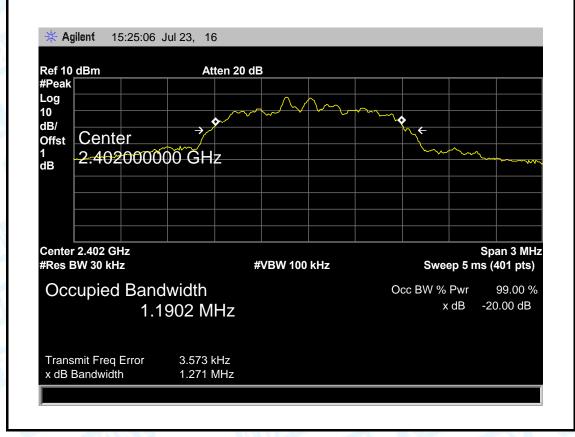


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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	W CO	
Test Mode:	TX Mode (π/4-DQPSK)		

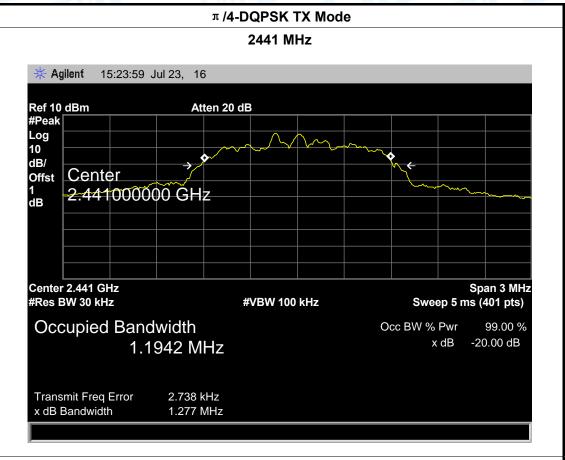
Channel frequency (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402	1190.20	1271.00	847.33
2441	1194.20	1277.00	851.33
2480	1184.50	1260.00	840.00

π/4-DQPSK TX Mode

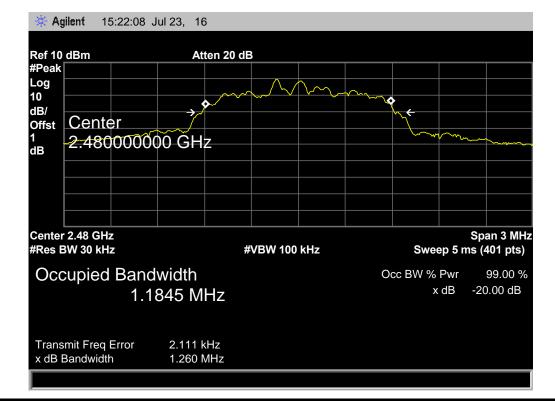




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π/4-DQPSK TX Mode





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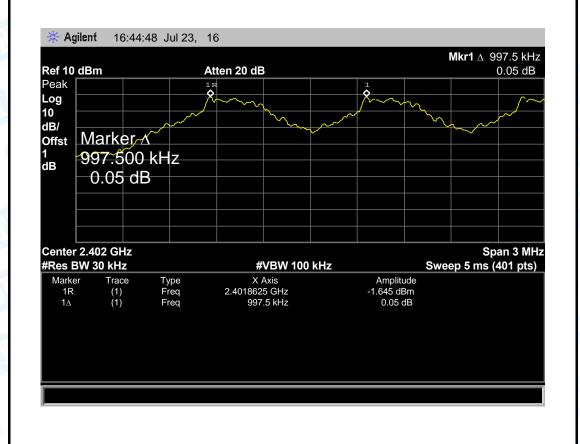
EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

rest voltage:

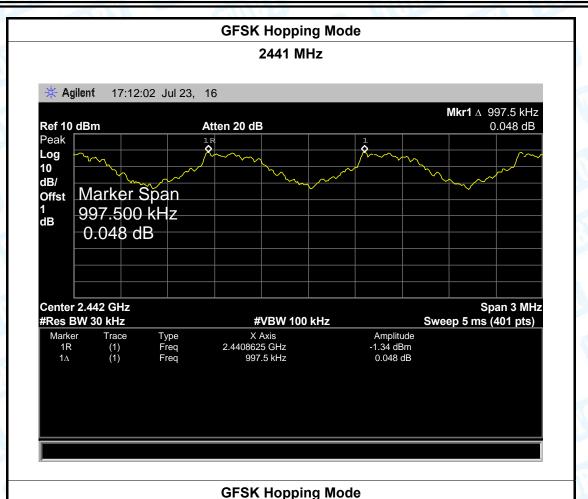
Test Mode: Hopping Mode (GFSK)

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	997.500	960.812
2441	997.500	952.424
2480	997.500	947.546

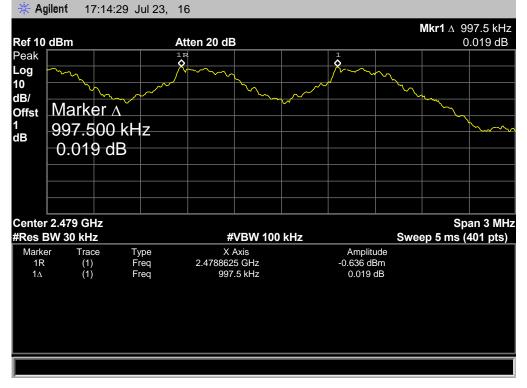
GFSK Hopping Mode













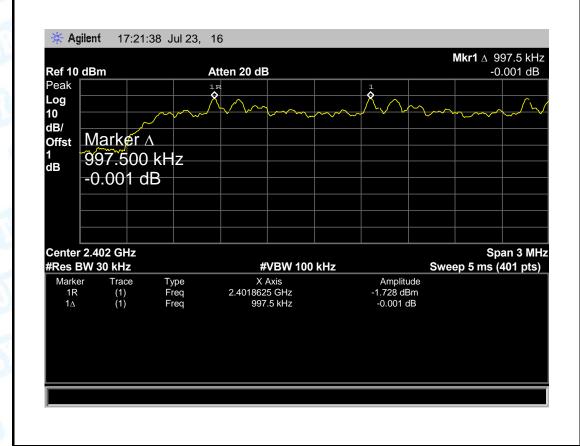
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EUT:	Bluetooth Speaker with LED Lights	Model Name :	RM89627
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (π /4-DQPSK)

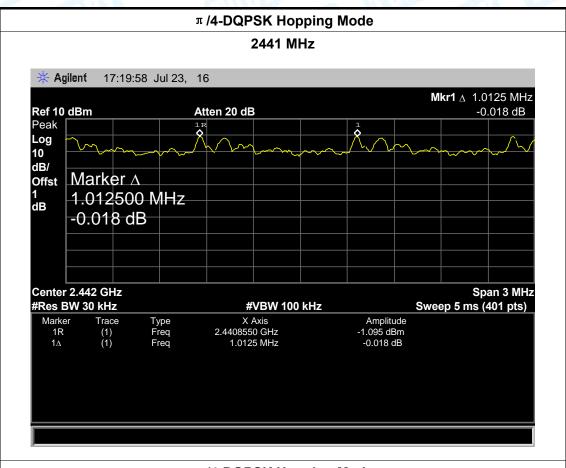
Channel frequency	Separation Read Value	Separation Limit		
(MHz)	(kHz)	(kHz)		
2402	997.500	847.33		
2441	1012.50	851.33		
2480	997.500	840.00		

π /4-DQPSK Hopping Mode

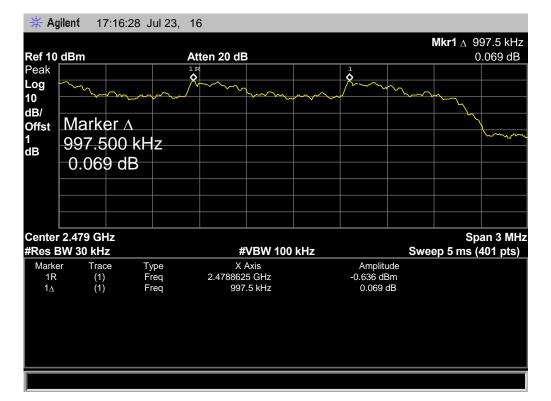




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π /4-DQPSK Hopping Mode





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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.



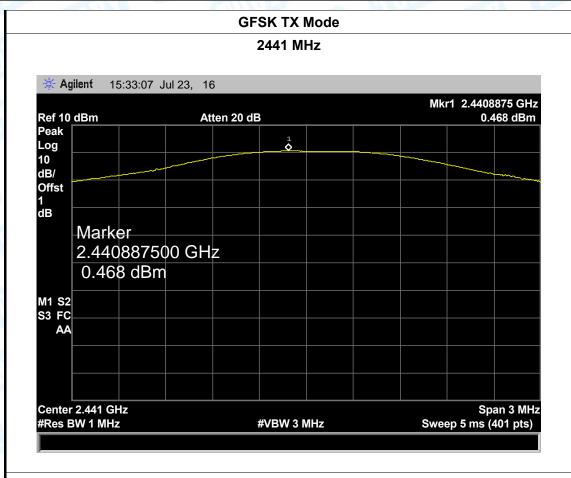
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10.5 Test Data

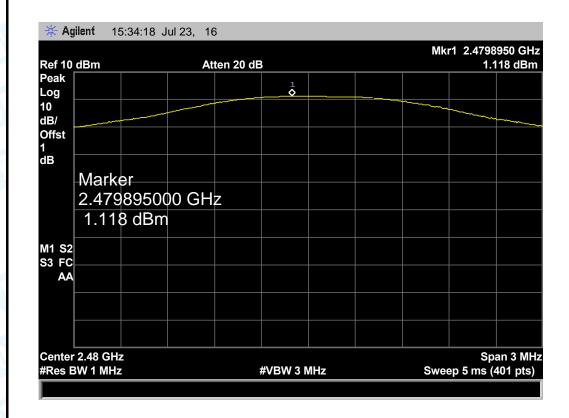
UT:		Bluetooth Speaker with LED Lights			nts	Model Name:		RM8962		
mperati	ure:	25 ℃				Relative Humidity:		55%		
st Volta	ge:	DC 3.7V			6	Nil	3	a 1	MOL	
st Mode) :	TX Mod	de (GF	SK)		V		CALL!	10	
Channel frequency (MHz)			Hz)	Test Result (dBm)			Limit (dBm)			
	2402			-0.138						
2441			0.468			30				
	2480			1.118						
				G	FSK TX M	ode				
					2402 MHz	<u>z</u>				
Ref 10 c	1Bm			Atten 20	dB			Mk	r1 2.4018 0 1-	3875 GHz 138 dBm
	JDIII			ALLEIT ZU	ub				-0.	30 UDIII
Peak										
Log					, 1 Q		<u> </u>			
Log 10 dB/					<u> </u>					
Log 10 dB/ Offst					•					
Log 10 dB/ Offst 1 dB	Mark	er			1					
Log 10 dB/ Offst 1 dB	Mark 2.40		00 GI	-lz	1					
Log 10 dB/ Offst 1 dB	2.40´	er 188750 8 dBm	00 GI	-lz	1					
Log 10 dB/ Offst 1 dB	2.40´	188750	00 GH	-lz	1					
Log 10 dB/ Offst 1 dB	2.40´	188750	00 GH	-lz	1					
Log 10 dB/ Offst 1 dB	2.40´	188750	00 GH	-lz	1					
Log 10 dB/ Offst 1 dB	2.40´	188750	00 GH	-lz						
Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA	2.40 ⁻	188750 8 dBm	00 GH	-lz	1					
Log 10 dB/ Offst 1 dB	2.40 ¹ -0.13	188750 8 dBm	00 GH	-lz	#VBW 3 MH			Swe	Spep 5 ms (an 3 MHz



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GFSK TX Mode

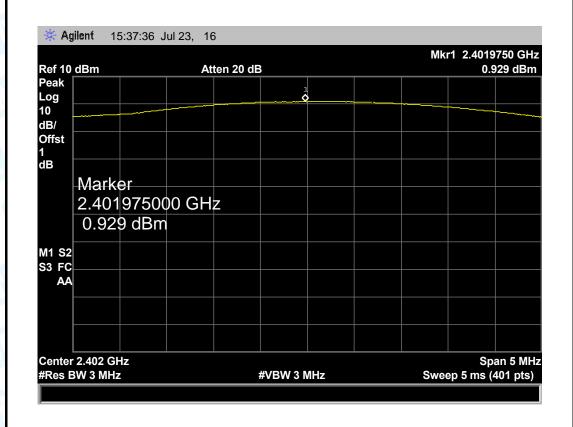




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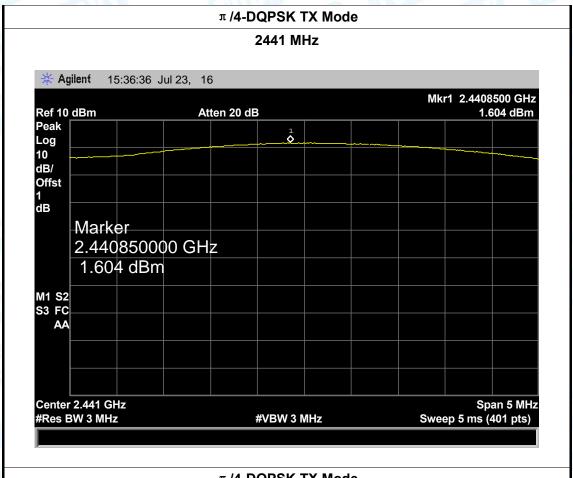
EUT:	Bluetooth Sp	eaker with LED Lights	Model Name :		RM89627
Temperature:	25 ℃		Relat	ive Humidity:	55%
Test Voltage:	DC 3.7V	NO.	1		
Test Mode:	TX Mode (π	/4-DQPSK)		A RIVER	
Channel frequ	ency (MHz)	Test Result (dBm)		Limit (dBm)	
240	2	0.929			
2441		1.604		21	
248	0	2.256	2.256		
		π /4-DOPSK TX Mo	db		

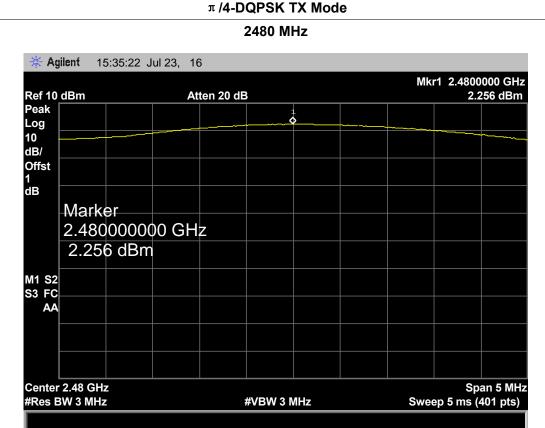
π /4-DQPSK TX Mode





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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 an	▶ Permanent attached antenna
	□ Unique connector antenna
	☐ Professional installation antenna

----End of Report----