

# Shenzhen Toby Technology Co., Ltd.

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# **FCC Radio Test Report** FCC ID: 2AAZR-HSD8032A

## **Original Grant**

Report No. TB-FCC156317

**Applicant** Shenzhen Highstar Electrical Co., Ltd

**Equipment Under Test (EUT)** 

ICAN OUTDOOR BLUETOOTH SPEAKER WITH **EUT Name** 

LED LIGHT

Model No. HSD8032A

Series Model No. HSD8032B, HSD8032C

**Brand Name** N/A

2017-06-22 **Receipt Date** 

**Test Date** 2017-06-23 to 2017-06-30

**Issue Date** 2017-07-05

**Standards** FCC Part 15: 2016, Subpart C(15.247)

ANSI C63.10: 2013 **Test Method** 

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**: Shenzhen Highstar Electrical Co., Ltd

Address : 2F&4F, Building 6, Highstar Industrial zone, Gangtou, Bantian Street,

Longgang District, Shenzhen, China

Manufacturer : Shenzhen Highstar Electrical Co., Ltd

Address : 2F&4F, Building 6, Highstar Industrial zone, Gangtou, Bantian Street,

Longgang District, Shenzhen, China

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

<b>EUT Name</b>	:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT				
Models No.	:	HSD80312A, HSD8032B, HSD8032C				
Model Difference			ical in the same PCB, layout and electrical is model name for commercial.			
	3	Operation Frequency:	Bluetooth V2.1+EDR: 2402~2480 MHz			
	1	Number of Channel:	Bluetooth: 79 Channels see Note 2			
Product	9	Max Peak Output Power: Bluetooth: -0.827dBm ( π /4-DQPS				
Description		Antenna Gain:	0dBi PCB Antenna			
		Modulation Type:	GFSK (1 Mbps)			
			π /4-DQPSK (2 Mbps)			
Power Supply		DC Voltage supplied by US	SB cable			
		DC Voltage supplied by Li-ion battery				
Power Rating	:	DC 5.0V from the USB cable				
		DC 3.7V by 2200mAh Li-io	on battery			
Connecting I/O Port(S)	3	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			



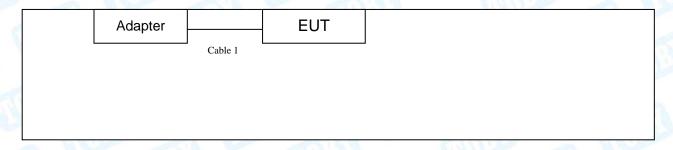
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	ALL DE LANGE		- W		
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41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

<sup>(3)</sup> The Antenna information about the equipment is provided by the applicant.

## 1.3 Block Diagram Showing the Configuration of System Tested

## **Charging + TX Mode**



## **TX Mode**





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### 1.4 Description of Support Units

Equipment Information								
Name	Model	Model FCC ID/VOC Manufac		Used "√"				
133	4000	a Wu						
	Cable Information							
Number	Shielded Type	Ferrite Core	Length	Note				
Cable 1	NO	NO	0.45M	100				

#### 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			
F	Mode 1	Charging + TX Mode			

For Radiated Test					
Final Test Mode	Description				
Mode 1	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)				
Mode 5	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 modes 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	FCCAssist.exe			
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 <sub>Lab</sub> )	
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB	
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB	
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB	
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB	



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### 1.8 Test Facility

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

#### **CNAS (L5813)**

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

#### FCC List No.: (811562)

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

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

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



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# 2. Test Summary

	F	CC Part 15 Subpart C(15.247)/ RSS	247 Issue 1		
Standard Section		Test Hom	ludament		
FCC	IC	Test Item	Judgment	Remark	
15.203		Antenna Requirement	PASS	N/A	
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A	
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A	
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A	
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A	
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A	
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A	
15.247(d)	RSS 247 5.5	Band Edge	PASS	N/A	
15.247(c)& 15.209	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: 832.6060kHz π/4-DQPSK: 1165.6kHz	



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# 3. Test Equipment

AC Main C	onducted Emiss	sion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Jul. 20, 2016	Jul. 21, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 20, 2016	Jul. 21, 2017
L.I.S.N	Rohde & Schwarz	ENV216	101131	Jul. 20, 2016	Jul. 21, 2017
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 20, 2016	Jul. 21, 2017
Description	Spurious Emiss  Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 20, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	10HSD8032A0/0 07	Jul. 20, 2016	Jul. 21, 2017
Bilog Antenna	ETS-LINDGREN	3142E	HSD8032A17537	Mar.25, 2017	Mar. 24, 2018
Horn Antenna	ETS-LINDGREN	3117	HSD8032A43207	Mar.25, 2017	Mar. 24, 2018
Pre-amplifier	Sonoma	310N	185903	Mar.24, 2017	Mar. 23, 2018
Pre-amplifier	HP	8449B	3008A00849	Mar.24, 2017	Mar. 23, 2018
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.24, 2017	Mar. 23, 2018
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	conducted Emiss	sion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 20, 2016	Jul. 21, 2017
Spectrum Analyzer	Rohde & Schwarz	ESPI	100321	Jul. 20, 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

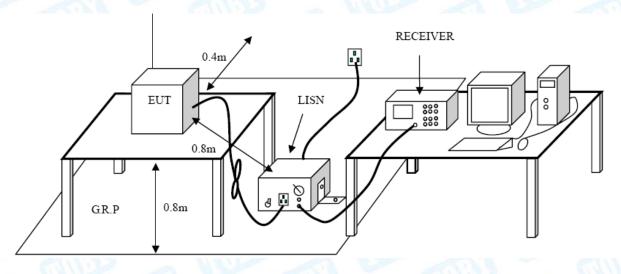
#### **Conducted Emission Test Limit**

Evanuanav	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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	ICAN	OUTDOOR	01								
EUT:	BLUE	ETOOTH SPI	EAKER	Model Nam	ie:	HSD	8032A				
	WITH	LED LIGHT				1 S.P					
Temperature:	25℃	25℃ Relative Humidity:					55%				
Test Voltage:	AC 1	20V/60 Hz	100		9	_ 6	1000				
Terminal:	Line	Line									
Test Mode:	USB	Charging Mo	de		OH)						
Remark:	Only	worse case i	s reported		95	631	133				
90.0 dBuV											
						QP: AVG:					
40 × × ×											
<b>~</b>	, , , ,	×									
V _ N _ N _ N   II	₩₩	TO A A LILLAND AND AND AND AND AND AND AND AND AND	Attandille ad <mark>K. Ji</mark> lk d	AND PROPERTY OF THE SAME AND A	h						
MAAAA	,			L. M. M. M. A. Main	Matherson Approved with	Harthy Hardy of the colon	manyaghad				
$1 \vee 1 \vee$	//////////////////////////////////////	ANTICKA ANTICA TATA			h		peak				
, v v	1111111111	/CVTVVVIIIIIIVVVIIIIIIIIIIIIIIIIIIIIIIII	יעייווי זי יכ(יוומאָאוּאָאוֹעוּאַןאָאוּאָאוּאַאוּאַאוּאַאוּאַאַאַאַאַאַאַאַאַאַאַ	AMILIA A A MANA	Charles and Market Alabath	haraker at Marie Janes Assessing	AVG				
-10 0.150	0.5	<u> </u>	(MHz)	5			30.000				
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over					
110	MHz	dBuV	dB	dBuV	dBuV	dB	Detector				
1 0	.1620	26.83	9.58	36.41		-28.95	QP				
	.1620	10.21	9.58	19.79		-35.57	AVG				
	.2260	17.49	9.58	27.07		-35.52	QP				
	.2260	2.86	9.58	12.44		-40.15	AVG				
5 0.	.4900	16.61	9.60	26.21		-29.96	QP				
	.4900 .4900	16.61 3.76			56.17	-29.96 -32.81	QP AVG				
6 0			9.60	26.21	56.17 46.17						
6 0	.4900	3.76	9.60 9.60	26.21 13.36	56.17 46.17 64.03	-32.81	AVG				
6 0 7 * 0 8 0	.4900 .1900	3.76 29.75	9.60 9.60 9.58	26.21 13.36 39.33	56.17 46.17 64.03 54.03	-32.81 -24.70	AVG QP				
6 0 7 * 0 8 0 9 0	.4900 .1900 .1900	3.76 29.75 12.45	9.60 9.60 9.58 9.58	26.21 13.36 39.33 22.03	56.17 46.17 64.03 54.03 61.49	-32.81 -24.70 -32.00	AVG QP AVG				
6 0 7 * 0 8 0 9 0	.4900 .1900 .1900 .2580	3.76 29.75 12.45 10.43	9.60 9.60 9.58 9.58 9.59	26.21 13.36 39.33 22.03 20.02	56.17 46.17 64.03 54.03 61.49 51.49	-32.81 -24.70 -32.00 -41.47	AVG QP AVG QP				
6 0 7 * 0 8 0 9 0 10 0	.4900 .1900 .1900 .2580	3.76 29.75 12.45 10.43 -2.28	9.60 9.60 9.58 9.58 9.59 9.59	26.21 13.36 39.33 22.03 20.02 7.31	56.17 46.17 64.03 54.03 61.49 51.49 56.00	-32.81 -24.70 -32.00 -41.47 -44.18	AVG QP AVG QP AVG				
6 0 7 * 0 8 0 9 0 10 0	.4900 .1900 .1900 .2580 .2580	3.76 29.75 12.45 10.43 -2.28 20.44	9.60 9.60 9.58 9.58 9.59 9.59 9.60	26.21 13.36 39.33 22.03 20.02 7.31 30.04	56.17 46.17 64.03 54.03 61.49 51.49 56.00	-32.81 -24.70 -32.00 -41.47 -44.18 -25.96	AVG QP AVG QP AVG				



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	ICA	N OUTDOO	R			1011	)
EUT:	BLU	JETOOTH S	PEAKER	Model Nam	ie:	HSD80	)32A
	WIT	TH LED LIGH	IT.				MILL
Temperature	e: 25°			Relative Hu	ımidity:	55%	
Test Voltage	AC	120V/60 Hz	THE STATE OF		1 111		
Terminal:	Neu	utral				_ (1	Militar
Test Mode:	USI	3 Charging N	/lode	13:00		1 13	
Remark:	Onl	y worse case	e is reported		AND		
90.0 dBuV							
						QP: AVG:	
-10 0.150				th you of the wall the was a survey	harring the paper	agency and the same of book the same of th	Mannaham peak
0.130	0.5		(MHz)	5			30.000
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	30.000
		Reading	Correct	Measure-	Limit dBuV	Over dB	30.000 Detector
	Freq.	Reading Level	Correct Factor	Measure- ment			
	Freq.	Reading Level dBuV	Correct Factor	Measure- ment dBuV	dBuV 64.76	dB	Detector
No. Mk.	Freq. MHz 0.1740	Reading Level dBuV 14.75	Correct Factor dB 9.64	Measure- ment dBuV 24.39	dBuV 64.76 54.76	dB -40.37	Detector QP
No. Mk.	Freq. MHz 0.1740 0.1740	Reading Level dBuV 14.75 -1.18	Correct Factor dB 9.64 9.64	Measure- ment dBuV 24.39 8.46	dBuV 64.76 54.76 62.89	dB -40.37 -46.30	Detector QP AVG
No. Mk.  1 2 3	Freq. MHz 0.1740 0.1740 0.2180	Reading Level dBuV 14.75 -1.18 11.30	Correct Factor dB 9.64 9.64 9.64	Measure- ment dBuV 24.39 8.46 20.94	dBuV 64.76 54.76 62.89 52.89	dB -40.37 -46.30 -41.95	Detector QP AVG QP AVG
No. Mk.  1 2 3 4	Freq. MHz 0.1740 0.1740 0.2180 0.2180	Reading Level dBuV 14.75 -1.18 11.30 -2.49	Correct Factor dB 9.64 9.64 9.64 9.64	Measure- ment dBuV 24.39 8.46 20.94 7.15	dBuV 64.76 54.76 62.89 52.89 61.36	dB -40.37 -46.30 -41.95 -45.74	Detector QP AVG QP AVG
No. Mk.  1 2 3 4 5	Freq. MHz 0.1740 0.1740 0.2180 0.2180 0.2620	Reading Level dBuV 14.75 -1.18 11.30 -2.49 11.33	Correct Factor dB 9.64 9.64 9.64 9.64 9.60	Measure- ment dBuV 24.39 8.46 20.94 7.15 20.93	dBuV 64.76 54.76 62.89 52.89 61.36	dB -40.37 -46.30 -41.95 -45.74 -40.43	Detector QP AVG QP AVG
No. Mk.  1 2 3 4 5	Freq. MHz 0.1740 0.1740 0.2180 0.2180 0.2620 0.2620	Reading Level dBuV 14.75 -1.18 11.30 -2.49 11.33 -3.14	Correct Factor dB 9.64 9.64 9.64 9.64 9.60 9.60	Measure- ment dBuV 24.39 8.46 20.94 7.15 20.93 6.46	dBuV 64.76 54.76 62.89 52.89 61.36 51.36 60.08	dB -40.37 -46.30 -41.95 -45.74 -40.43 -44.90	Detector QP AVG QP AVG QP AVG
No. Mk.  1 2 3 4 5 6 7	Freq. MHz 0.1740 0.1740 0.2180 0.2180 0.2620 0.2620 0.3060	Reading Level dBuV 14.75 -1.18 11.30 -2.49 11.33 -3.14 11.26	Correct Factor dB 9.64 9.64 9.64 9.60 9.60 9.57	Measure- ment dBuV 24.39 8.46 20.94 7.15 20.93 6.46 20.83	dBuV 64.76 54.76 62.89 52.89 61.36 51.36 60.08	dB -40.37 -46.30 -41.95 -45.74 -40.43 -44.90 -39.25	Detector QP AVG QP AVG QP AVG QP
No. Mk.  1 2 3 4 5 6 7 8	Freq. MHz 0.1740 0.1740 0.2180 0.2180 0.2620 0.2620 0.3060 0.3060	Reading Level dBuV 14.75 -1.18 11.30 -2.49 11.33 -3.14 11.26 -1.13	Correct Factor dB 9.64 9.64 9.64 9.60 9.60 9.57 9.57	Measure- ment dBuV 24.39 8.46 20.94 7.15 20.93 6.46 20.83 8.44	dBuV 64.76 54.76 62.89 52.89 61.36 51.36 60.08 50.08	dB -40.37 -46.30 -41.95 -45.74 -40.43 -44.90 -39.25 -41.64	Detector QP AVG QP AVG QP AVG AVG
No. Mk.  1 2 3 4 5 6 7 8	Freq. MHz 0.1740 0.1740 0.2180 0.2180 0.2620 0.2620 0.3060 0.3060 0.4340	Reading Level dBuV 14.75 -1.18 11.30 -2.49 11.33 -3.14 11.26 -1.13 23.77	Correct Factor dB 9.64 9.64 9.64 9.60 9.60 9.57 9.57	Measure- ment dBuV 24.39 8.46 20.94 7.15 20.93 6.46 20.83 8.44 33.35	dBuV 64.76 54.76 62.89 52.89 61.36 51.36 60.08 50.08 57.18 47.18	dB -40.37 -46.30 -41.95 -45.74 -40.43 -44.90 -39.25 -41.64 -23.83	Detector QP AVG QP AVG QP AVG QP AVG QP AVG

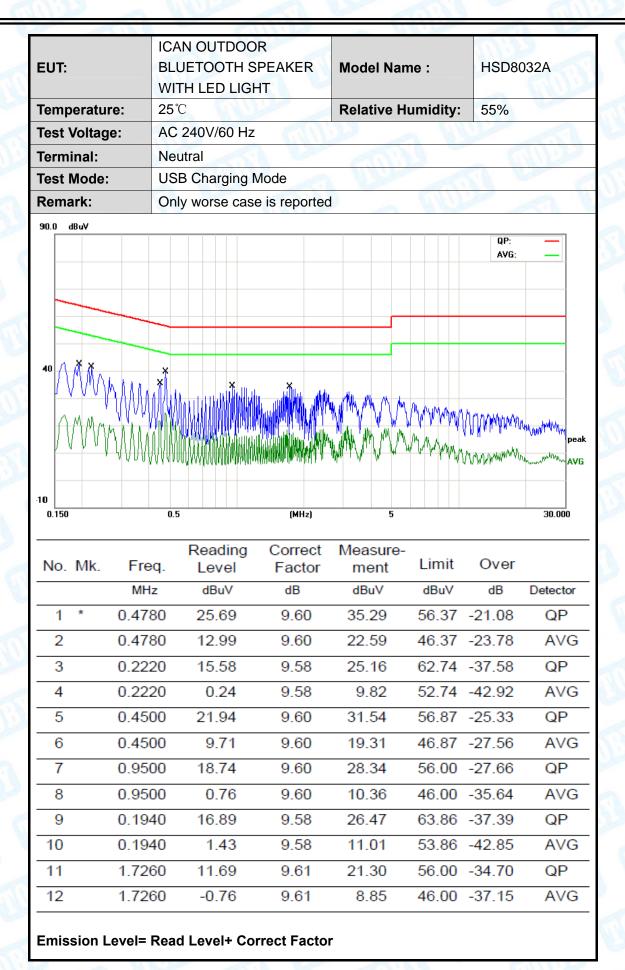


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	ICAN OUTDOOR	(171)	120								
EUT:	BLUETOOTH SP		Model Nam	ne :	HSD80	32A					
	WITH LED LIGHT		6								
Temperature:	<b>25</b> ℃	25°C Relative Humidity: 55%									
Test Voltage:	AC 240V/60 Hz	1 6		9	- 6	Miles					
Terminal:	Line		Millian		1 18						
Test Mode:	USB Charging M	ode		O. D.							
Remark:	Only worse case is reported										
90.0 dBuV											
					QP: AVG:						
40 %											
*** \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	x. *										
A A A A A A A A A A A A A A A A A A A	Mayakili malikilir	dd anddda arw	L MM M M A	4 .							
A A A A A A MAMMA			MAAM	$\mu^{\lambda} \lambda^{\lambda} \mu^{\mu} \mu^{\mu} \nu^{\nu}$	Contrales on the contrales of the contra	u dan pulan, amplipated					
	anaka Malaya			Marken.	י מורווף די	peak					
	, , ո/հՀիմինինինինինությու	יואר זייר דייניקויקונאן און יון זי "	IM A A. L.	a. A. A. A. Alabaha	you what had you	AVG					
-10 0.150	0.5	(MHz)	5			30.000					
	Reading	Correct	Measure-								
No. Mk. Fi	req. Level	Factor	ment	Limit	Over						
M	MHz dBuV	dB	dBuV	dBuV	dB	Detector					
1 0.4	820 24.85	10.23	35.08	56.30	-21.22	QP					
2 * 0.4	820 15.39	10.23	25.62	46.30	-20.68	AVG					
3 0.4	660 15.12	10.23	25.35	56.58	-31.23	QP					
4 0.4	660 2.78	10.23	13.01	46.58	-33.57	AVG					
5 0.2	380 11.16	10.20	21.36	62.16	-40.80	QP					
6 0.2	380 -2.26	10.20	7.94	52.16	-44.22	AVG					
7 0.3	660 6.78	10.21	16.99	58.59	-41.60	QP					
8 0.3	660 -3.75	10.21	6.46	48.59	-42.13	AVG					
9 0.2	26.48	10.21	36.69	63.36	-26.67	QP					
10 0.2	9.60	10.21	19.81	53.36	-33.55	AVG					
11 0.1	539 29.68	10.21	39.89	65.78	-25.89	QP					
12 0.1	539 11.87	10.21	22.08	55.78	-33.70	AVG					
Emission Level	= Read Level+ Co	rrect Factor									



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## 5. Radiated Emission Test

## 5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.209

5.1.2 Test Limit

#### Radiated Emission Limit (9 kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

## Radiated Emission Limit (Above 1000MHz)

Frequency	Class B (dBuV/	m)(at 3m)
(MHz)	Peak	Average
Above 1000	74	54

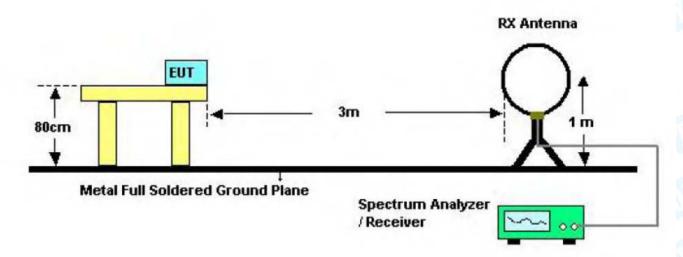
#### Note:

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

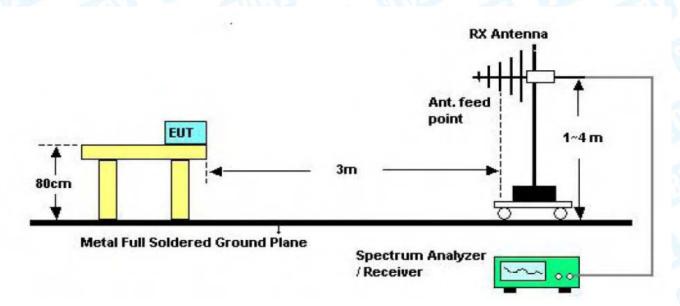


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## 5.2 Test Setup



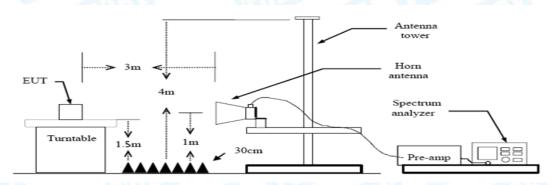
**Below 30MHz Test Setup** 



**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=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.



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#### 9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB

below the permissible value has no need to be reported.

## 30MHz~1GHz

	ICAN	OUTDOOF	3			601	
EUT:	BLUETOOTH SPEAKER Model Name :		HSD8032A				
	WITH	TH LED LIGHT		3			
Temperature:	<b>25</b> ℃		OH)	Relative Humidity:		55%	63
Test Voltage:	DC 3	3.7V		MILES	-	filler	
Ant. Pol.	Horiz	contal		C.	MAD		
Test Mode:	TX G	FSK Mode	2402MHz			1	
Remark:	Only	worse case	is reported			Hilliam	
80.0 dBuV/m							
					(RF)FCC 15	C 3M Radiation	
						Margin -6	dB
30		<b></b>	2	4	5 ×	6	
4			X,	3		and the state of t	money from
Commander de la commanda de la comma		بالهبيم	1 hammen	Mary Mary Carlotte Company	A Children Control of the Control		
a proposition of the south of the	Aphter a works which	and when the party of the second	,				
30.000 40 50	60 70	80	(MHz)	300	400 50	0 600 700	1000.000
		Reading	Correct	Measure-			
No. Mk. Fr	eq.	Level	Factor	ment	Limit	Over	
М	Hz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detecto
1 30.9	619	30.10	-14.37	15.73	40.00	-24.27	QP
2 131.	2965	45.85	-21.71	24.14	43.50	-19.36	QP
3 239.	9874	39.17	-17.89	21.28	46.00	-24.72	QP
4 * 300.	3672	43.24	-16.27	26.97	46.00	-19.03	QP
5 360.4	4476	40.35	-13.75	26.60	46.00	-19.40	QP
6 689.	5644	30.66	-5.82	24.84	46.00	-21.16	QP
*:Maximum data x:	Over limit	!:over margin	-				



Report No.: TB-FCC156317
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Page:

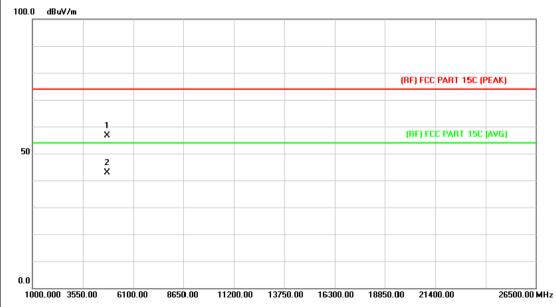
EUT:	ICAN OUTDOO BLUETOOTH S WITH LED LIG	SPEAKER	Model Na	ame :	HSD803	32A	
Temperature:	25℃ Relative Humidity: 55%				55%		
Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical	Vertical					
Test Mode:	TX GFSK Mod	e 2402MHz		WHID?		a \	
Remark:	Only worse cas	se is reported	1100			10	
30 1 2 X X X X X X X X X X X X X X X X X X	60 70 80	5 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	6 ×	(RF)FCC 15		dB	
	Readin	_	Measure-	1::4	0		
	req. Level	Factor	ment	Limit	Over		
	MHz dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	
1 33.0	0950 38.23	-15.68	22.55	40.00	-17.45	QP	
2 47.4	4918 45.64	-23.02	22.62	40.00	-17.38	QP	
3 * 71.8	3320 46.27	-23.22	23.05	40.00	-16.95	QP	
4 102.	0014 42.94	-21.38	21.56	43.50	-21.94	QP	
5 133.	6188 45.07	-21.66	23.41	43.50	-20.09	QP	
6 300.	3672 40.06	-16.27	23.79	46.00	-22.21	QP	
*:Maximum data x	::Over limit !:over ma						



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## Above 1GHz(Only worse case is reported)

EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V							
Ant. Pol.	Horizontal	VIII TO						
Test Mode:	TX GFSK Mode 2402MHz							
Remark:	No report for the emission when prescribed limit.	nich more than 10 dB b	elow the					

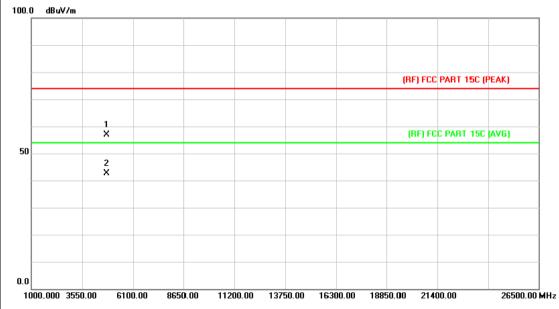


No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.258	43.14	13.44	56.58	74.00	-17.42	peak
2	*	4803.788	29.32	13.44	42.76	54.00	-11.24	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V							
Ant. Pol.	Vertical	a Villa						
Test Mode:	TX GFSK Mode 2402MHz		A Comment					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							

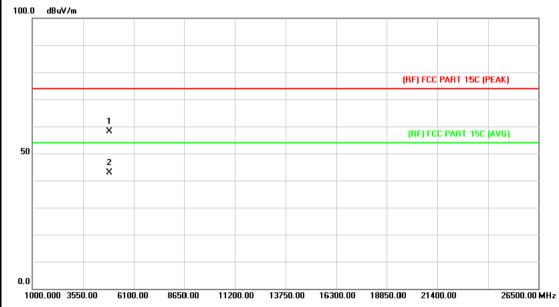


No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.260	43.36	13.44	56.80	74.00	-17.20	peak
2	*	4803.848	29.30	13.44	42.74	54.00	-11.26	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A		
Temperature:	25℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Horizontal	a Villa			
Test Mode:	TX GFSK Mode 2441MHz		A COL		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

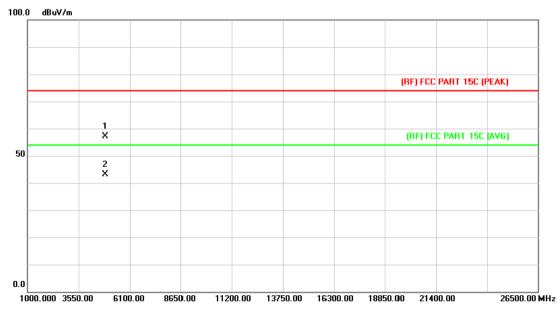


No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.124	44.26	13.90	58.16	74.00	-15.84	peak
2	*	4882.716	29.08	13.90	42.98	54.00	-11.02	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A		
Temperature:	25℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Vertical	The same of the sa	100		
Test Mode:	TX GFSK Mode 2441MHz				
Remark:	Remark: No report for the emission which more than 10 dB below the prescribed limit.				

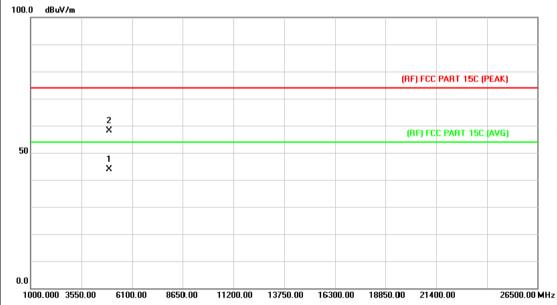


No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.124	43.28	13.90	57.18	74.00	-16.82	peak
2	*	4882.676	29.18	13.90	43.08	54.00	-10.92	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal	The same of the sa	1
Test Mode:	TX GFSK Mode 2480MHz	THUE STATE OF THE PARTY OF THE	
Remark:	No report for the emission was prescribed limit.	hich more than 10 dB b	elow the

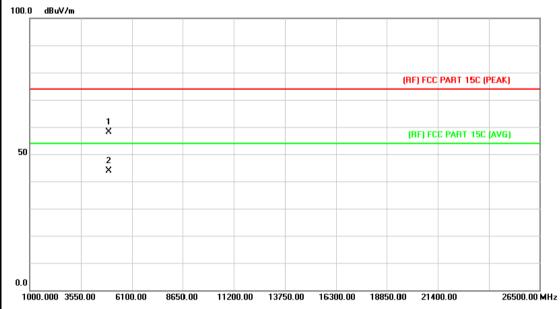


N	o. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.464	29.50	14.36	43.86	54.00	-10.14	AVG
2		4960.862	43.89	14.36	58.25	74.00	-15.75	peak



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A		
Temperature:	25℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Ant. Pol.	Vertical	The same of			
Test Mode:	TX GFSK Mode 2480MHz				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.				

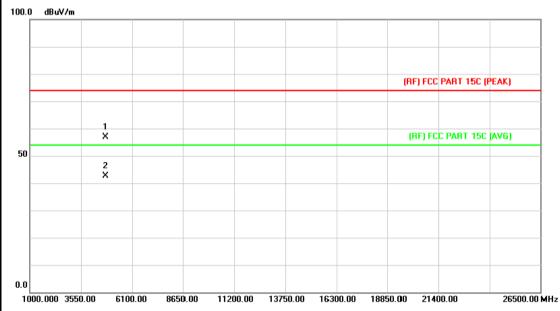


No.	Mk.	Freq.		Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.312	43.78	14.36	58.14	74.00	-15.86	peak
2	*	4959.828	29.59	14.36	43.95	54.00	-10.05	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal	The same of					
Test Mode:	TX π /4-DQPSK Mode 2402	2MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						

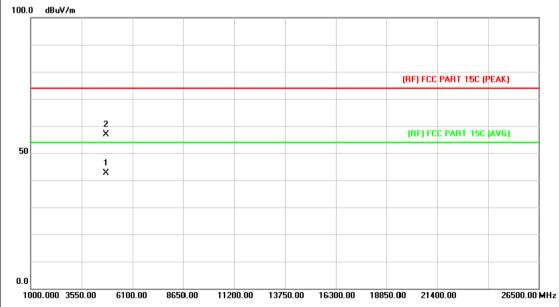


No.	Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.182	43.33	13.44	56.77	74.00	-17.23	peak
2	*	4803.930	29.26	13.44	42.70	54.00	-11.30	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A			
Temperature:	25℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical	a Villa				
Test Mode:	TX π /4-DQPSK Mode 240	2MHz	A V			
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

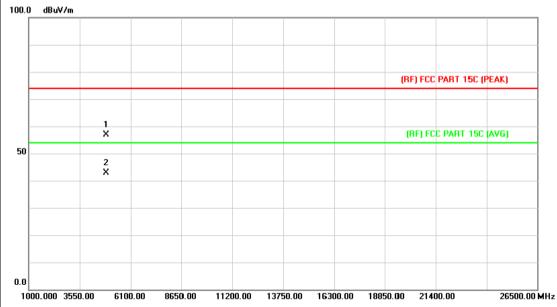


No.	Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.908	29.27	13.44	42.71	54.00	-11.29	AVG
2		4804.112	43.39	13.44	56.83	74.00	-17.17	peak



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A							
Temperature:	25℃	Relative Humidity:	55%							
Test Voltage:	DC 3.7V	DC 3.7V								
Ant. Pol.	Horizontal	N. V.								
Test Mode:	TX π /4-DQPSK Mode 244	1MHz								
Remark:	No report for the emission prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.								

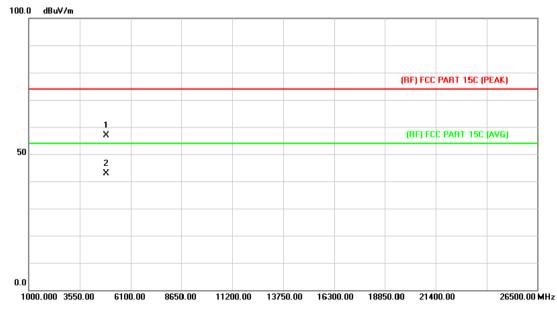


No.	Mk.	Freq.	Reading Correct Measure- Level Factor ment		Limit Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.562	42.89	13.90	56.79	74.00	-17.21	peak
2	*	4881.748	29.04	13.90	42.94	54.00	-11.06	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A							
Temperature:	25℃	Relative Humidity:	55%							
Test Voltage:	DC 3.7V	DC 3.7V								
Ant. Pol.	Vertical	The same of								
Test Mode:	TX π /4-DQPSK Mode 2441	IMHz	A V							
Remark:	No report for the emission of prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.								

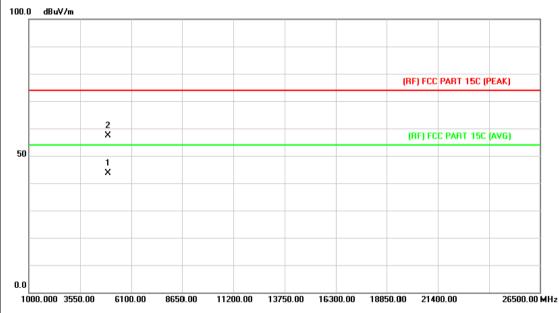


No.	Mk.	Freq.	Reading Correct Measure- Freq. Level Factor ment		Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.396	43.03	13.90	56.93	74.00	-17.07	peak
2	*	4882.716	29.05	13.90	42.95	54.00	-11.05	AVG



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A							
Temperature:	25℃	Relative Humidity:	55%							
Test Voltage:	DC 3.7V	DC 3.7V								
Ant. Pol.	Horizontal	The same of the sa								
Test Mode:	TX π /4-DQPSK Mode 2480	MHz	- W							
Remark:	No report for the emission was prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.								
1000 10 111										

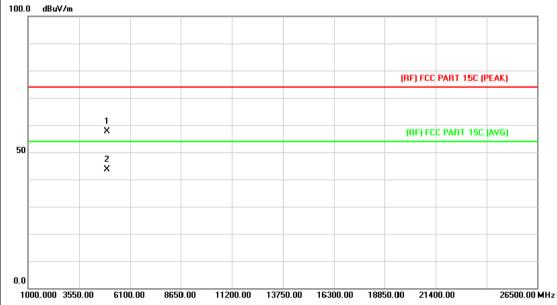


No. Mk.		. Freq.	Reading Correct Measure- Level Factor ment		Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.102	29.27	14.36	43.63	54.00	-10.37	AVG
2		4959.350	43.14	14.36	57.50	74.00	-16.50	peak



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A							
Temperature:	25℃	Relative Humidity:	55%							
Test Voltage:	DC 3.7V	DC 3.7V								
Ant. Pol.	Vertical	Vertical								
Test Mode:	TX π /4-DQPSK Mode 2480	MHz								
Remark:	No report for the emission w prescribed limit.	No report for the emission which more than 10 dB below the prescribed limit.								
100.0 40.44										



No.	Mk.	Freq.	Reading Correct Measure- Level Factor ment		Limit Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.144	43.34	14.36	57.70	74.00	-16.30	peak
2	*	4959.264	29.28	14.36	43.64	54.00	-10.36	AVG



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# 6. Restricted Bands Requirement

#### 6.1 Test Standard and Limit

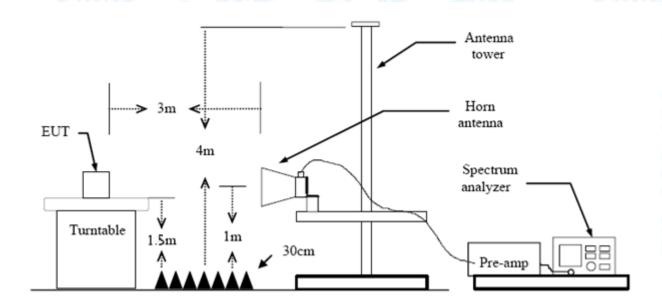
6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

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				

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

## 6.2 Test Setup



#### 6.3 Test Procedure

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



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

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

#### 6.5 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=10 Hz 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

	<b>-</b> .			OUTD				Ma	adal N	Jama .		LICDO	20204	1.8
EU	1:		BLUETOOTH SPEAKER WITH LED LIGHT				Model Name :			HSD8032A		1		
Temperature: 25°C						160		Re	lative	Humidi	ity:	55%	$M_i$	
Tes	t Voltag	je:	DC 3	3.7V										
Ant	. Pol.		Horiz	zontal		Ant				ON!	M			19
Tes	t Mode		TX	SFSK M	ode 2	402MH	z		1130	1		600	1132	
Ren	nark:		Only	worse o	case i	is report	ted	M			1	112		
100.	0 dBuV/m													
												3		
										(RF)	FCC PA	RT 15C (PE	AK)	-
50								(RF) FCC P				ART 15C/(A	Waj	-
											4 ×	$\mathcal{N}$		
											2	$\sqrt{f}$		
											×			
														-
0.0														
23	311.000 23	21.00 2	331.00	2341.00	2351.	.00 2361	1.00	2371	.00 2	381.00	2391.00	)	2411.00	MHz
	lo. Mk	Erz	200	Read		Corre			sure-	Limi	iŧ	Over		
	IO. IVIK			Leve		Facto	or		ent					
		MH	łz	dBu\	/	dB/m			uV/m	dBu\	//m	dB	Det	ector
1	X	2402.	100	74.9	8	0.82		75	5.80	Fundan	nental	Frequenc	cy (	QΡ
2		2390.	000	29.9	7	0.77		30	).74	74.	00	-43.2	6 (	QР
3	*	2402.	200	85.8	2	0.82		86	6.64	Fundan	nental	Frequenc	р р	eak
4		2390.	000	41.2	7	0.77		42	2.04	74.	00	-31.9	6 p	eak



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-,,,-				OUTDOO		Madal	lawa :	Heber	224
EUT:				ETOOTH S H LED LIGH		Model N	iame :	HSD80	132A
Гетр	eratu		25℃		mn	Relative	Humidity:	55%	
· Fest \			DC 3	3 7V	1			0.11	
Ant. F			Verti			The same	100	10	
Test N				SFSK Mode	2402MHz		CALL S		a '
Rema	rk:		Only	worse case	e is reported			(III)	130
100.0	dBuV/m								
								4 ×	
							(RF) FCC PA	ART 15C (PE&	K)
							(RF) FCC F	PART 15C (AV	<b>b</b>
50							-		
							×	-N	
-	_		-				2 X	$\sim$	Muse
0.0									
	000 232		30.00	Reading	50.00 2360.00  Correct	2370.00 2: Measure-	380.00 2390.0		2410.00 Mi
No.	Mk.			Level	Factor	ment	Limit	Over	<u> </u>
		MHz		dBuV	dB/m	dBuV/m	dBuV/m	dB	Detecto
1		2390.0		40.67	0.77	41.44	74.00	-32.56	peak
2		2390.0	000	30.01	0.77	30.78	54.00	-23.22	AVG
3	*	2402.1	00	71.33	0.82	72.15	Fundamental	Frequency	AVG
	Χ	2402.2		82.16	0.82	82.98	Fundamental	_	peak



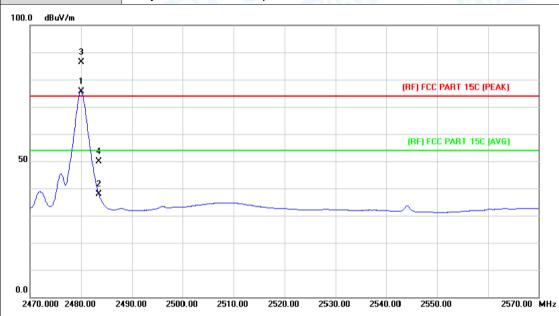
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EUT:	BLUETOOTH WITH LED L	H SPEAKER	Model	Name :	HSD80	)32A
Temperature:	25℃		Relative	Humidity:	55%	
Test Voltage:	DC 3.7V	M	COLLEGE		· 61	11111
Ant. Pol.	Horizontal		1		8	(
Test Mode:	TX GFSK Mo	ode 2480 MHz		AMILE		A I
Remark:	Only worse of	ase is reported	ATTAN S		OH)	
100.0 dBuV/m						
0.0 2471.000 2481.00	2491.00 2501.00	2511.00 2521.00	2531.00 2		ART 15C (AVE	
No. Mk. Fre	Readir eq. Level		Measure- ment	Limit	Over	
MI	Hz dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 * 2480.	.000 74.10	1.15	75.25	Fundamental	Frequency	AVG
	E00 20 40	1.17	37.57	54.00	-16.43	AVG
2 2483.	.500 36.40					
2 2483. 3 X 2480.			86.16	Fundamental	Frequency	peak



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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A			
Temperature:	25℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V		CILITION OF			
Ant. Pol.	Vertical	VIV	1			
Test Mode:	TX GFSK Mode 2480 MHz					
Remark:	Only worse case is reported					



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2480.000	74.57	1.15	75.72	Fundamenta	I Frequency	AVG
2		2483.500	36.81	1.17	37.98	54.00	-16.02	AVG
3	Χ	2480.000	85.15	1.15	86.30	Fundamenta	l Frequency	peak
4		2483.500	48.59	1.17	49.76	74.00	-24.24	peak

**Emission Level= Read Level+ Correct Factor** 



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EU	T:		BLU	OUTD ETOOTI LED L	H SPEAKER	Model N	ame :	HSD803	2A
Ten	npera	ture:	25℃			Relative H	lumidity:	55%	
Tes	t Volt	age:	DC 3.7V					M. Carrie	
Ant	t. Pol.		Horiz	zontal		The same		13	
Tes	t Mod	le:	ТХ π	/4-DQP	SK Mode 2402	2MHz	Hilling		2 6
Rer	mark:		Only	worse o	case is reported	d			13.3
100.0	) dBuV.	/m							
50		Vid.						PART 15C (PEA)	K)
0.0									
	o. M		330.00 eq.	Readir Level	_	Measure- ment	2380.00 2390 Limit	Over	2410.00 MHz
		MH	Z	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2402.	100	73.93	0.82	74.75	Fundamenta	al Frequency	AVG
2		2390.	000	30.23	0.77	31.00	54.00	-23.00	AVG
3	Χ	2402.	100	83.14	0.82	83.96	Fundamenta	al Frequency	peak
4		2390.	000	42.23	0.77	43.00	74.00	-31.00	peak
Em	issior	ı Level=	Read	Level+	Correct Facto	r			



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EUT:	BLUETO	JTDOOR OTH SPE D LIGHT	AKER	Model N	ame :	HSD803	32A
Temperature:	25℃		mn b	Relative H	lumidity:	55%	
Test Voltage:	DC 3.7V			CITES	3	THE STREET	100
Ant. Pol.	Vertical	Million		62	TO CO	1	- 60
Test Mode:	TX π /4-[	QPSK M	ode 2402M	Hz	Alle		A 6
Remark:	Only wor	se case is	reported	THE STATE OF		CAIR:	See See
100.0 dBuV/m							
0.0 2310.000 2320.00	2330.00 234	0.00 2350.0	0 2360.00	2370.00 238		ART 15C (PEAK)	10.00 MHz
No. Mk. Fr		ading ( evel	Correct N Factor	Measure- ment	Limit	Over	
M	Hz d	BuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 * 2402	.100 7	0.07	0.82	70.89	Fundamental	Frequency	AVG
2 2390	.000 2	9.86	0.77	30.63	54.00	-23.37	AVG
3 X 2402	.200 8	2.99	0.82	83.81	Fundamental	Frequency	peak
4 2390	.000 4	0.64	0.77	41.41	74.00	-32.59	peak
Emission Levels	= Read Lev	el+ Corre	ct Factor				



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EUT:	ICAN OUTDOO BLUETOOTH S WITH LED LIGH	PEAKER	Model N	lame :	HSD80	)32A
Temperature:	25℃		Relative	Humidity: 55%		
Test Voltage:	DC 3.7V			19	10	The same
Ant. Pol.	Horizontal		Charles		3	- 6
Test Mode:	TX π /4-DQPSK	Mode 2480N	lHz	HARM		A I
Remark:	Only worse case	e is reported			OM)	
3 X 1 1 2 2 4 50 2 4 7 0.0 2 2470.000 2480.00 2	2490.00 2500.00 251	0.00 2520.00	2530.00 25		ART 15C (PEAK	
No. Mk. Fre	Reading eq. Level	Correct I	Measure- ment	Limit	Over	
No. Mk. Fre	eq. Level			Limit dBuV/m	Over	Detector
	eq. Level Iz dBuV	Factor	ment		dB	Detector AVG
MF	eq. Level dz dBuV 000 72.89	Factor dB/m	ment dBuV/m	dBuV/m	dB	
MH 1 * 2480.	eq. Level dz dBuV 000 72.89 500 36.57	Factor dB/m 1.15	ment dBuV/m 74.04	dBuV/m Fundamental	dB Frequency -16.26	AVG

**Emission Level= Read Level+ Correct Factor** 



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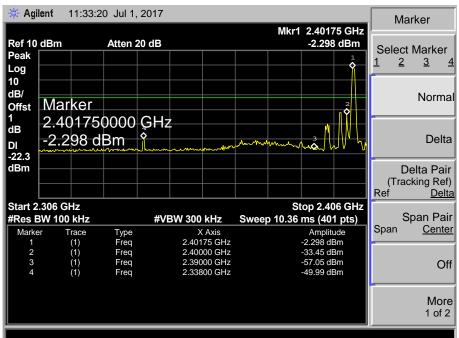
EUT:	ICAN O		R PEAKER	Model Na	ame ·	HSD803	2A
	WITH LE			model it		1102000	
Temperature:	25℃			Relative F	lumidity:	55%	
Test Voltage:	DC 3.7V	1			33	a W	M. Comment
Ant. Pol.	Vertical	MILL OF THE PERSON NAMED IN		The second		13	
Test Mode:	TX π /4-I	DQPSK I	Mode 2480	MHz	Ann		
Remark:	Only wo	rse case	is reported				1800
100.0 dBuV/m							
3							
×							
1					(RF) FCC	PART 15C (PEA	K)
					(RF) FCC	PART 15C (AV	(G)
50 / X					(11)		
V /2							
$\sim$							
0.0 2470.000 2480.00 2	2490.00 250	)0.00 251	0.00 2520.00	2530.00 2	2540.00 2550	00	2570.00 MHz
No. Mk. Fre		eading evel	Correct Factor	Measure- ment	Limit	Over	
MH	z (	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1 * 2480.	000 7	3.32	1.15	74.47	Fundamental	Frequency	AVG
2 2483.	500 3	6.79	1.17	37.96	54.00	-16.04	AVG
3 X 2480.	200 8	5.77	1.15	86.92	Fundamental	Frequency	peak
4 2483.	500 4	9.32	1.17	50.49	74.00	-23.51	peak
Emission Level=	Read Lev	el+ Cor	rect Factor				

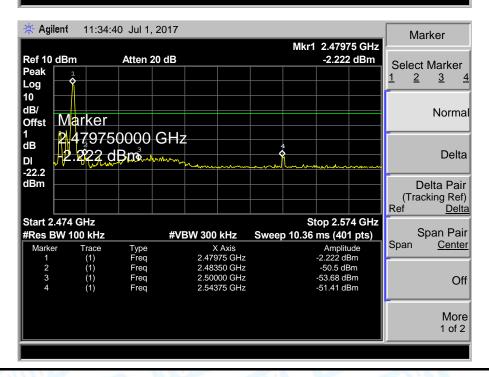


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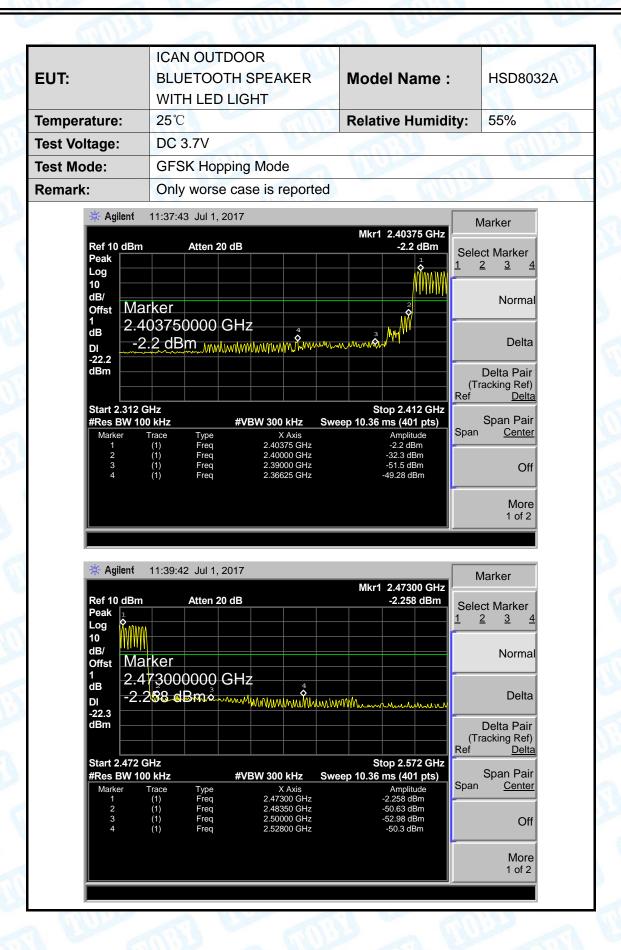
#### (2) Conducted Test



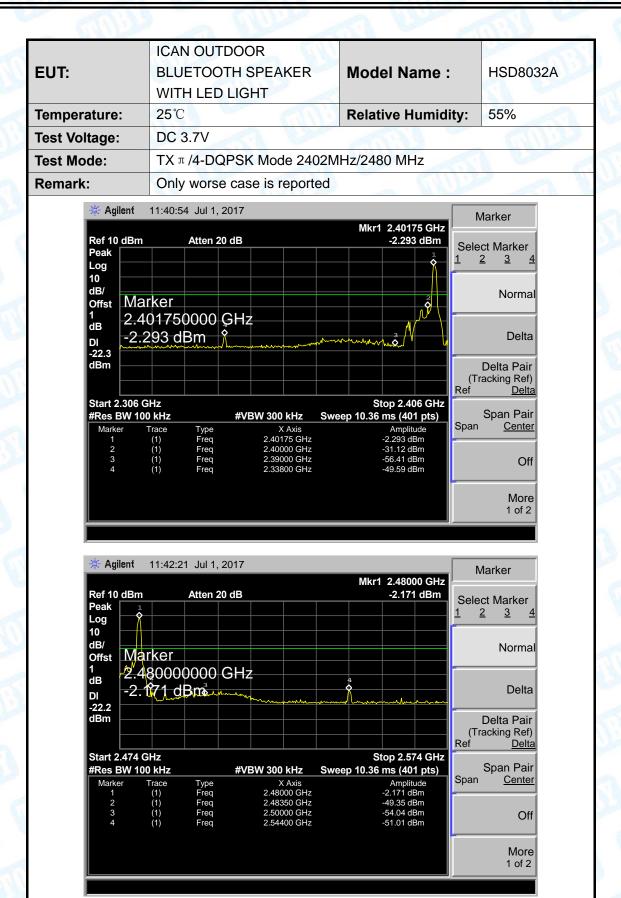




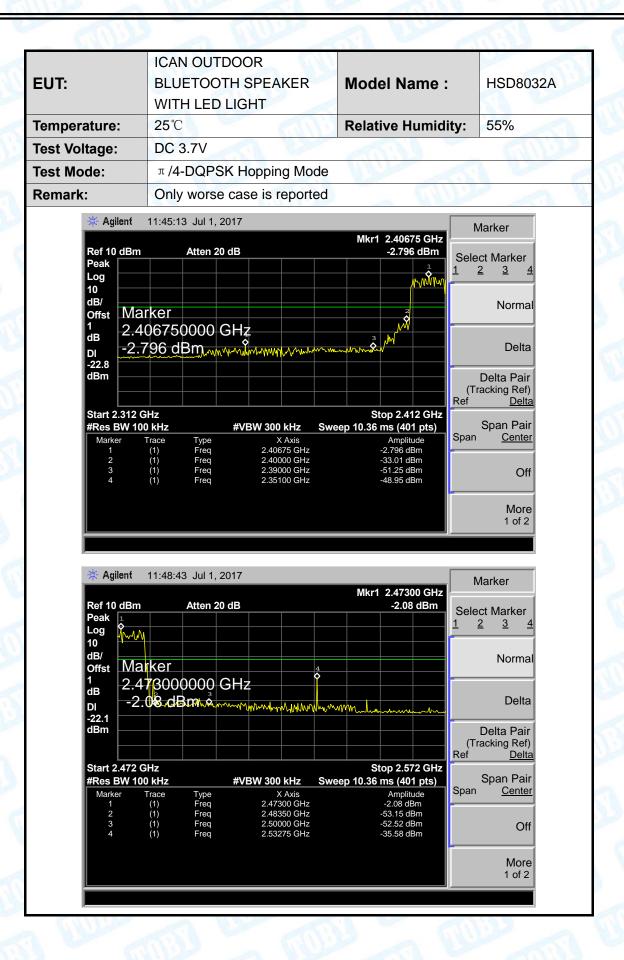














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# 7. Number of Hopping Channel

# 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



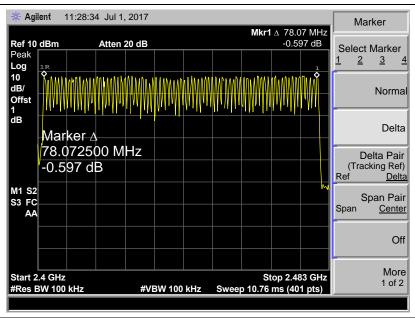
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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	W. 1977	LINE TO SERVICE

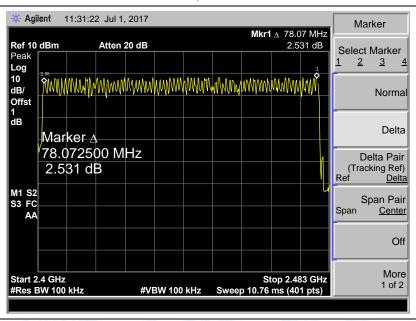
Test Mode: Hopping Mode

Frequency Range	Test Mode	Quantity of Hopping Channel	Limit
2402MHz~2480MHz	GFSK	79	>15
24UZIVIMZ~240UIVIMZ	π /4-DQPSK	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} {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:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	100	
Test Mode:	Hopping Mode (GFSK)		

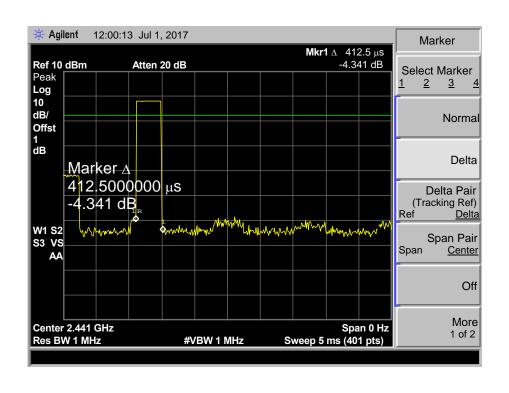
Test	Channel	Pulse	Total of Dwell	Period Time	Limit	Result
Mode	(MHz)	Time (ms)	(ms)	(s)	(ms)	Result
1DH1	2441	0.4125	132.00	31.60	400	PASS
1DH3	2441	1.675	268.00	31.60	400	PASS
1DH5	2441	2.925	312.00	31.60	400	PASS

1DH1 Total of Dwell= Pulse Time\*(1600/2)\*31.6/79

1DH3 Total of Dwell= Pulse Time\*(1600/4)\*31.6/79

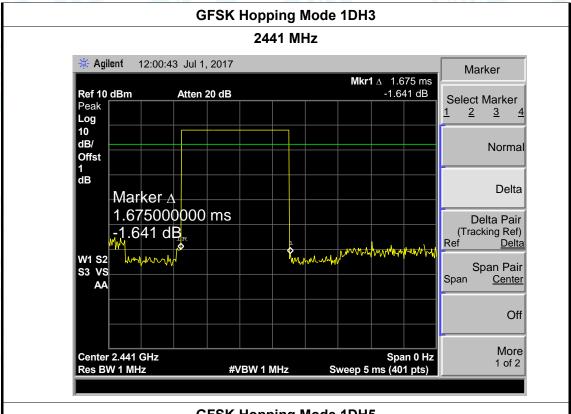
1DH5 Total of Dwell= Pulse Time\*(1600/6)\*31.6/79

#### **GFSK Hopping Mode 1DH1**

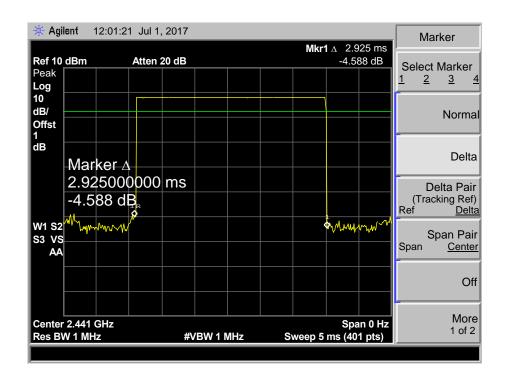




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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

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

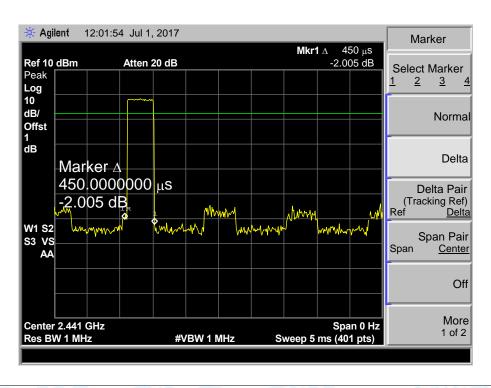
Test	Channel	Pulse	Total of Dwell	Period Time	Limit	Result
Mode	(MHz)	Time (ms)	(ms)	(s)	(ms)	Result
2DH1	2441	0.45	144.00	31.60	400	PASS
2DH3	2441	1.662	265.92	31.60	400	PASS
2DH5	2441	2.912	310.61	31.60	400	PASS

2DH1 Total of Dwell= Pulse Time\*(1600/2)\*31.6/79

2DH3 Total of Dwell= Pulse Time\*(1600/4)\*31.6/79

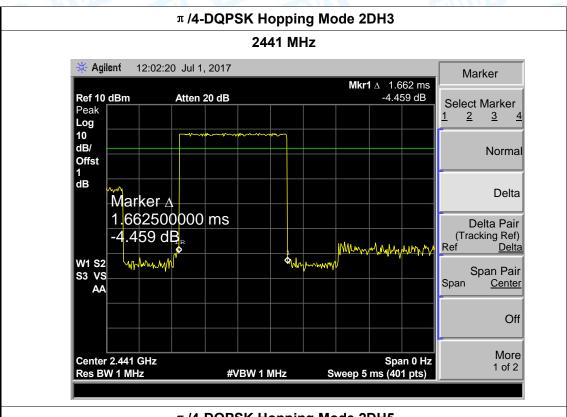
2DH5 Total of Dwell= Pulse Time\*(1600/6)\*31.6/79

### π /4-DQPSK Hopping Mode 2DH1

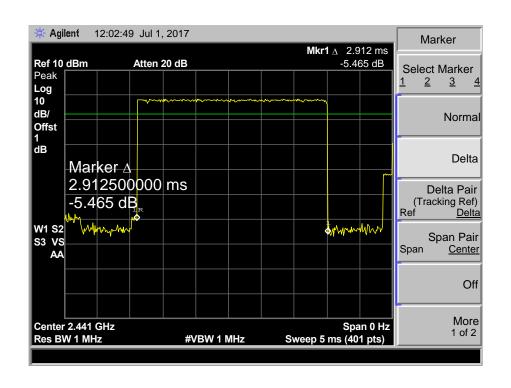




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### $\pi$ /4-DQPSK Hopping Mode 2DH5





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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=100 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.

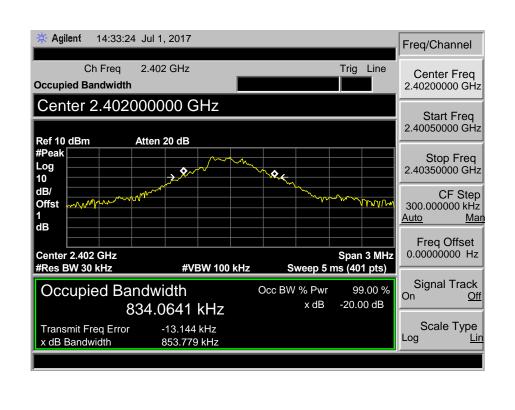


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# 9.5 Test Data

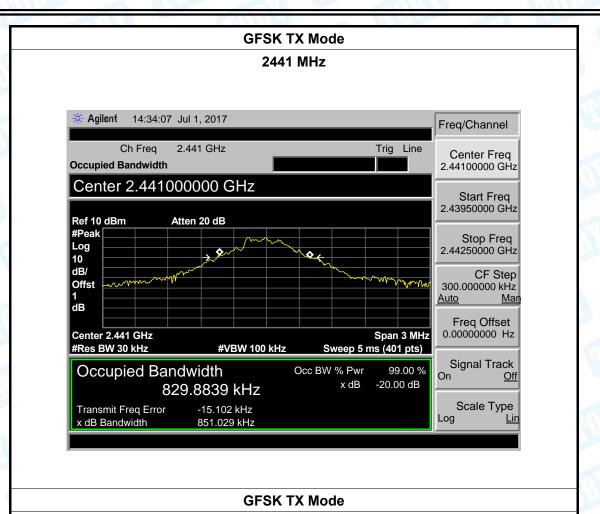
EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT		Model Name :	HSD8032A
Temperature:	25℃		Relative Humidity:	55%
Test Voltage:	DC 3.7V		100	63
Test Mode:	TX Mode (GFSK)			1
				00.10
Channel freque (MHz)	ncy	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
•	ncy			Bandwidth *2/3
(MHz)	ncy	(kHz)	(kHz)	Bandwidth *2/3

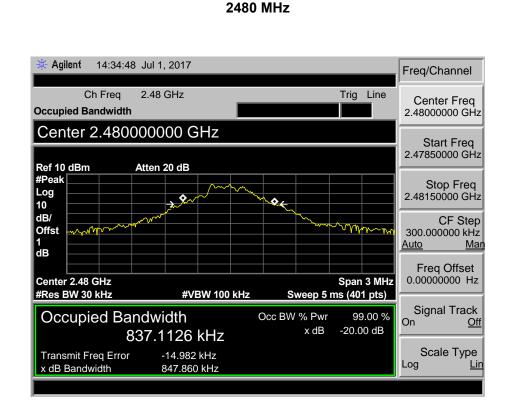
#### **GFSK TX Mode**





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2441

2480

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842.67

844.00

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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A		
Temperature:	25℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V	OC 3.7V			
Test Mode:	TX Mode (π/4-DQPSK)				
Channel frequer (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)		
2402	1166.9	1260	840.00		

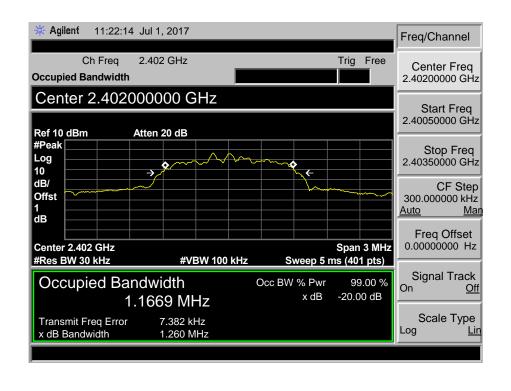
 $\pi$  /4-DQPSK TX Mode

1264

1266

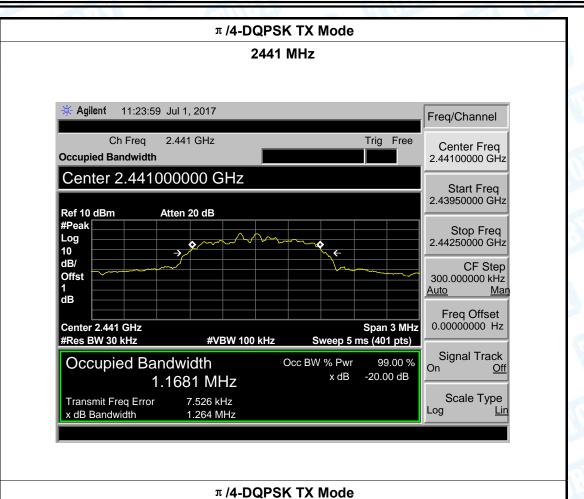
1168.1

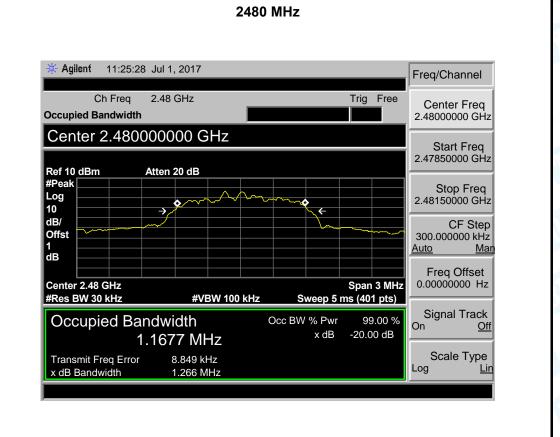
1167.7





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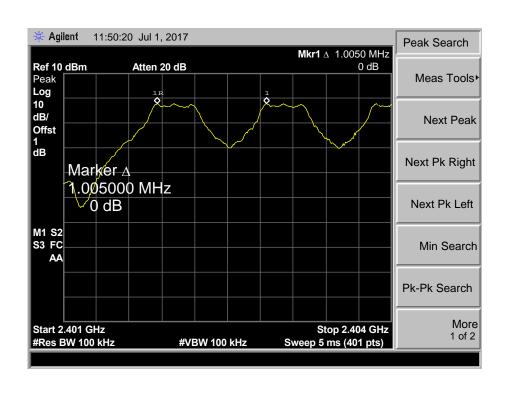


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EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT	Model Name :	HSD8032A		
Temperature:	25℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V				
Test Mode:	Hopping Mode (GFSK)				

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005	853.779
2441	1005	851.029
2480	1005	847.860
		•

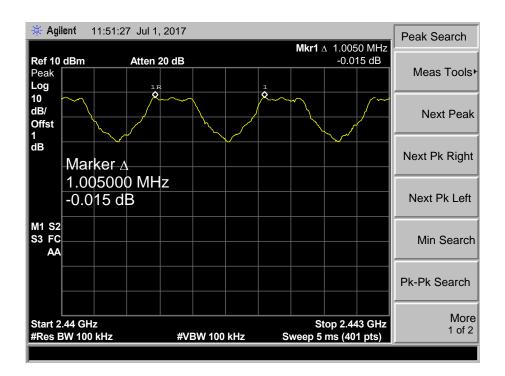
# **GFSK Hopping Mode**



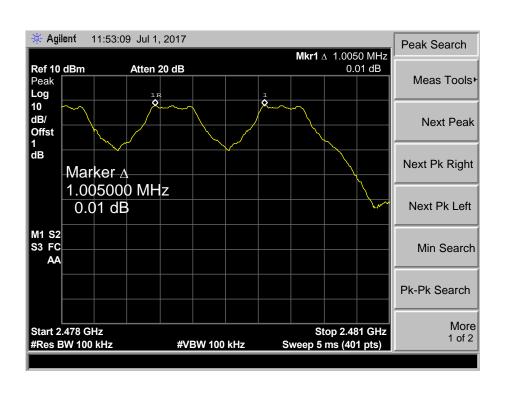




#### 2441 MHz



### **GFSK Hopping Mode**



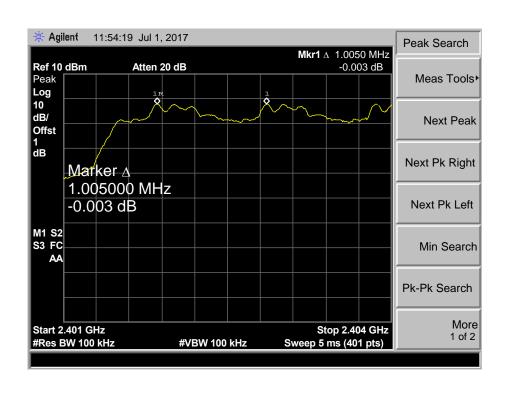


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Channel freq	uency Separation Rea			ad Value	Sep	aration Limit
Test Mode:	Hopping Mode ( π /4-DQPSK)					
Test Voltage:	DC 3.7V	DC 3.7V				
Temperature:	<b>25</b> ℃		6.20	Relative H	umidity:	55%
EUT:	BLUETO WITH LEI	OTH SPEA D LIGHT	AKER	Model Na	ame :	HSD8032A
	ICAN OU	TDOOR				THE THINK

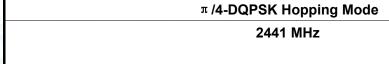
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005	840.00
2441	1005	842.67
2480	1005	844.00
1		

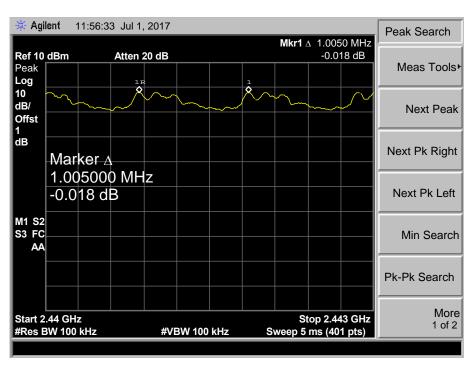
# $\pi$ /4-DQPSK Hopping Mode



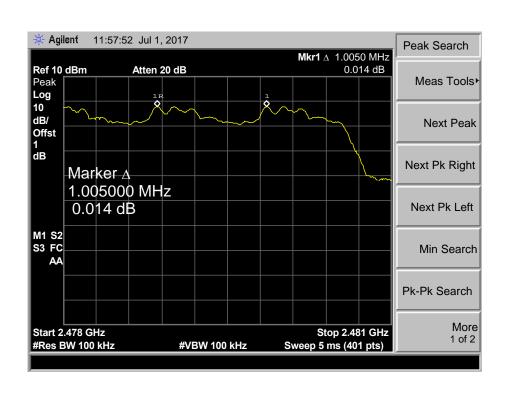


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# $\pi$ /4-DQPSK Hopping Mode





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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

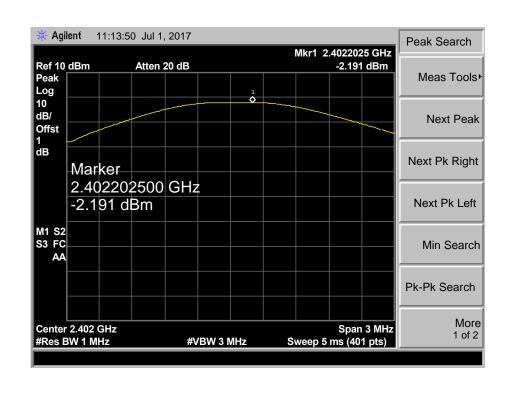
The EUT was set to continuously transmitting in the max power during the test.



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# 10.5 Test Data

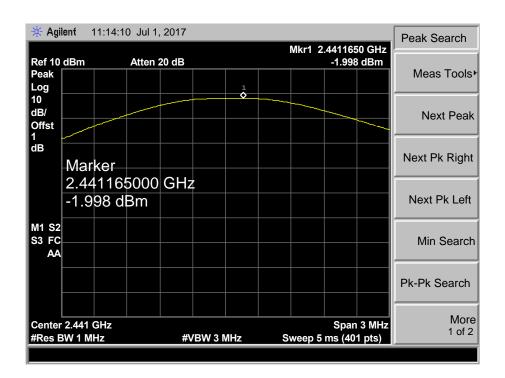
			The last the same of the same		
EUT:	ICAN OUTDOOR BLUETOOTH SPEAKER WITH LED LIGHT		Model Name :	HSD8032A	
Temperature:	25℃	The same of	Relative Humidity:	55%	
Test Voltage:	DC 3.7V				
Test Mode:	TX Mode (GFSK)				
Channel frequency (MHz)		Test Result (dBm) L		₋imit (dBm)	
2402		-2.191			
2441		-1.998		30	
2480		-2.090			
GFSK TX Mode					



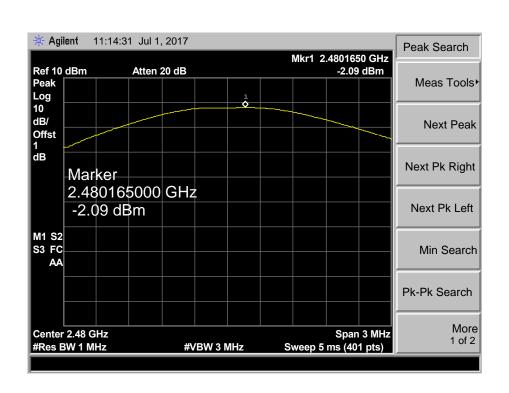


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# GFSK TX Mode 2441 MHz



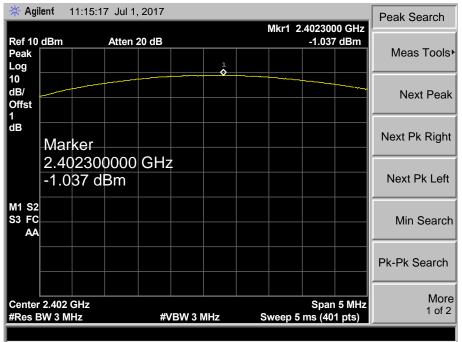
#### **GFSK TX Mode**





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EUT:	ICAN OUT BLUETOO WITH LED	TH SPEAKER	Model Name :	HSD8032A	
Temperature:	25℃		Relative Humidity:	55%	
Test Voltage:	DC 3.7V				
Test Mode:	TX Mode (π/4-DQPSK)				
Channel frequen	icy (MHz)	Test Result	(dBm) L	imit (dBm)	
2402		-1.037	7		
2441		-0.827		21	
2480		-0.92			
		π/4-DQPSK	TX Mode		
		2402 M	Hz		

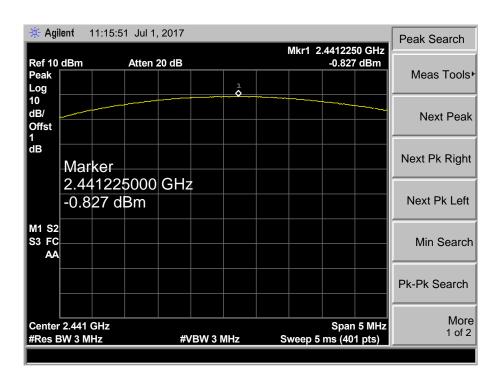




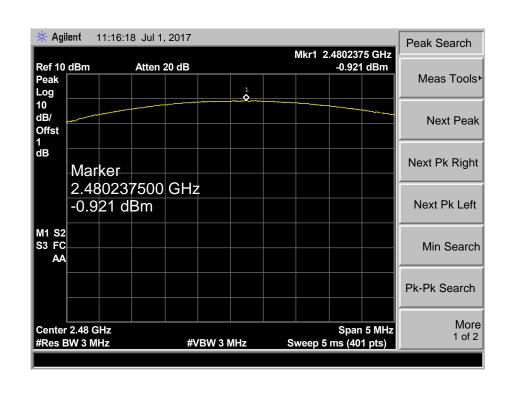
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#### 2441 MHz



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

### 11.3 Result

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

Antenna Type				
July 1	⊠Permanent attached antenna			
A COURT	☐Unique connector antenna			
	☐Professional installation antenna			

----END OF REPORT----