

# Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC144300

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# **FCC Radio Test Report** FCC ID: 2ADXM5B103BT

### **Original Grant**

TB-FCC144300 Report No.

SHENZHEN TEKSUN TECHNOLOGY CO.,LTD **Applicant** 

**Equipment Under Test (EUT)** 

**EUT Name** : Bluetooth speaker

5B103BT Model No. Series No. 14008BT

**Brand Name** N/A

**Receipt Date** 2015-05-23

**Test Date** 2015-05-23 to 2015-06-08

**Issue Date** 2015-06-09

FCC Part 15: 2014, Subpart C(15.247) **Standards** 

**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 : SHENZHEN TEKSUN TECHNOLOGY CO.,LTD

Address: 3F, bldg F7, F518 Idea Land, Baoyuan Road, Xixiang Avenue, Bao'

an District, Shenzhen, China

Manufacturer : SHENZHEN TEKSUN TECHNOLOGY CO.,LTD

Address: 3F, bldg F7, F518 Idea Land, Baoyuan Road, Xixiang Avenue, Bao'

an District, Shenzhen, China

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

EUT Name	:	Bluetooth speaker				
Models No.	1	5B103BT, 14008BT  All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.				
Model Difference						
4000		Operation Frequency: Bluetooth:2402~2480MHz				
		Number of Channel:	Bluetooth:79 Channels see note (2)			
Product Description		Max Peak Output Power: 8-DPSK: -0.435 dBm				
Besonption		Antenna Gain:	1.2 dBi PCB Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps)			
China Contraction			π /4-DQPSK(2 Mbps) 8-DPSK(3 Mbps)			
Power Supply		DC Voltage supplied from	Host System by USB cable			
		DC power by Li-ion Battery				
Power Rating	1	DC 5.0V by USB cable.				
		DC 3.7V Li-ion Battery.				
Connecting I/O Port(S)		Please refer to the User's Manual				

#### Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### (2) Channel List

( )					
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



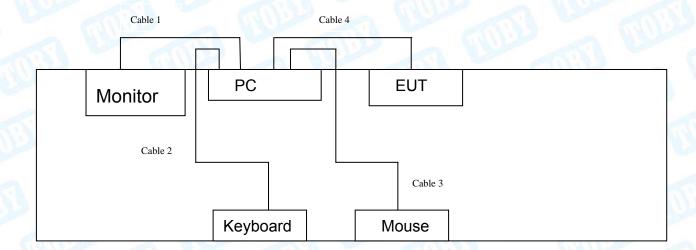
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		CIII II	- 44		
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442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

# TX Mode





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### 1.4 Description of Support Units

Equipment Information							
Name	Name Model FCC ID/DOC Manufacturer						
LCD Monitor	E170Sc	DOC	DELL	1			
PC	OPTIPLEX380	DOC	DELL	<b>√</b>			
Keyboard	L100	DOC	DELL	1			
Mouse	M-UARDEL7	DOC	DELL	1			
		Cable Information					
Number	Shielded Type	Ferrite Core	Length	Note			
Cable 1	YES	YES	1.5M				
Cable 2	YES	YES	1.5M				
Cable 3	YES	NO	1.5M	A PILL			
Cable 4	NO	NO	1.5M	Accessorise			

## 1.5 Description of Test Mode

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

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

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

Note:



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(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: 8-DPSK (3 Mbps)

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

### 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	A	ppotech RF Control Kit V	3.62
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π /4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

## 1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U <sub>Lab</sub> )
Conducted Emission	Level Accuracy: 9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±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 was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

### **CNAS (L5813)**

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

### FCC List No.: (811562)

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

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

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



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# 2. Test Summary

	FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1						
Standard Section							
FCC	IC	Test Item	Judgment	Remark			
15.203		Antenna Requirement	PASS	N/A			
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A			
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A			
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A			
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A			
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A			
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A			
15.247(c)	RSS 247 5.5	Radiated Spurious Emission	PASS	N/A			
15.247(a)	RSS 247 5.1 (1)	99% Occupied Bandwidth & 20dB Bandwidth	PASS	99%OBW GFSK:985.0659kHz π/4-DQPSK: 1050.3kHz 8-DPSK:1123.40kHz			

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



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# 3. Test Equipment

AC Main Cond	ucted Emission				
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Aug. 08, 2014	Aug. 07, 2015
50ΩCoaxial Switch	Anritsu	MP59B	X10321	Aug. 08, 2014	Aug. 07, 2015
L.I.S.N	Rohde & Schwarz	ENV216	101131	Aug. 08, 2014	Aug. 07, 2015
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 08, 2014	Aug. 07, 2015
Radiation Spui	rious Emission				
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Sep. 01, 2014	Aug. 31, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 08, 2014	Aug.07, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 08, 2014	Aug.07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 06, 2015	Mar.05, 2016
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	11909A	185903	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	8447B	3008A00849	Mar. 06, 2015	Mar.05, 2016
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 06, 2015	Mar.05, 2016
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Mar. 28, 2015	Mar. 27, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A



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### 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

4.1.1Test Standard FCC 15.207

#### 4.1.2 Test Limit

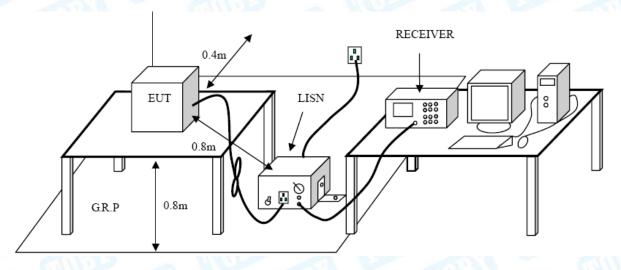
### **Conducted Emission Test Limit**

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

#### Notes:

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

### 4.2 Test Setup



### 4.3 Test Procedure

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

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



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

LISN at least 80 cm from nearest part of EUT chassis

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

### 4.4 EUT Operating Mode

Please refer to the description of test mode.

### 4.5 Test Data

Please see the next page.



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EUT:	Bluet	ooth speake	er	Model Na	ıme :	5B10	3ВТ
Temperature	: 25 °C	25 ℃ Relative Humidity:				: 55%	MAIL
Test Voltage:	AC 1	20V/60 Hz		1		EEF?	
Terminal:	Line	3	CAIL:		a W		
Test Mode:	USB	Charging wi	th TX GFSk	K Mode 240	2 MHz	~ 6	Millian
Remark:	Only	worse case	is reported	Com	THE REAL PROPERTY.	88 3	
30 dBuV		Mary Mary Mary Mary Mary Mary Mary Mary			WWW WWW	QP: AVG:	peak
-20 0.150 No. Mk.	o.5	Reading Level	(MHz)  Correct Factor	Measure- ment	Limit	Over	30.000
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	0.1740	37.83	9.97	47.80	64.76	-16.96	QP
2 *	0.1740	37.10	9.97	47.07	54.76	-7.69	AVG
3	0.2140	37.31	10.02	47.33	63.04	-15.71	QP
4	0.2140	33.75	10.02	43.77	53.04	-9.27	AVG
5	0.5540	34.62	10.05	44.67	56.00	-11.33	QP
6	0.5540	27.03	10.05	37.08	46.00	-8.92	AVG
7	0.8300	29.93	10.09	40.02	56.00	-15.98	QP
8	0.8300	21.36	10.09	31.45	46.00	-14.55	AVG
9	1.5580	27.74	10.06	37.80	56.00	-18.20	QP
10	1.5580	21.75	10.06	31.81	46.00	-14.19	AVG

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

26.80

21.50

10.03

10.03

36.83

31.53

56.00 -19.17

46.00 -14.47

2.7620

2.7620

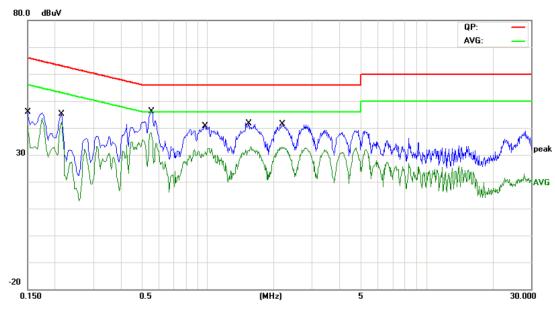
11 12 QP

AVG



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60 Hz	TO THE REAL PROPERTY.	33
Terminal:	Neutral		
Test Mode:	USB Charging with TX GFSI	K Mode 2402 MHz	LILL
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBu∀	dBuV	dB	Detector
1		0.1500	31.49	10.12	41.61	65.99	-24.38	QP
2		0.1500	30.63	10.12	40.75	55.99	-15.24	AVG
3		0.2140	33.47	10.12	43.59	63.04	-19.45	QP
4		0.2140	31.67	10.12	41.79	53.04	-11.25	AVG
5		0.5540	35.62	10.02	45.64	56.00	-10.36	QP
6	*	0.5540	27.95	10.02	37.97	46.00	-8.03	AVG
7		0.9740	28.98	10.15	39.13	56.00	-16.87	QP
8		0.9740	20.94	10.15	31.09	46.00	-14.91	AVG
9		1.5420	27.99	10.11	38.10	56.00	-17.90	QP
10		1.5420	21.47	10.11	31.58	46.00	-14.42	AVG
11		2.1900	28.31	10.06	38.37	56.00	-17.63	QP
12		2.1900	22.60	10.06	32.66	46.00	-13.34	AVG



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# 5. Radiated Emission Test

### 5.1 Test Standard and Limit

5.1.1 Test Standard FCC 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	(dBuV/m)(a	t 3m)
(MHz)	Peak	Average
Above 1000	74	54

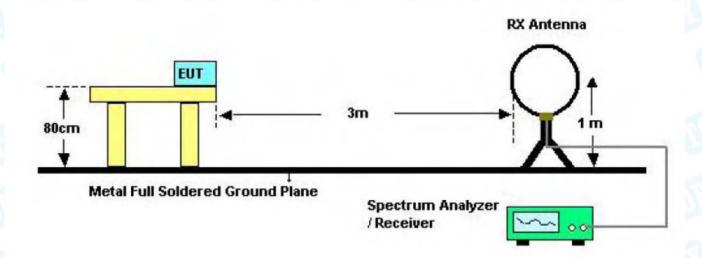
### Note:

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

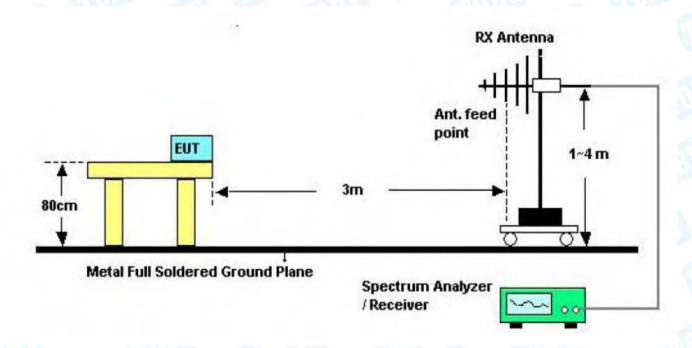


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# 5.2 Test Setup



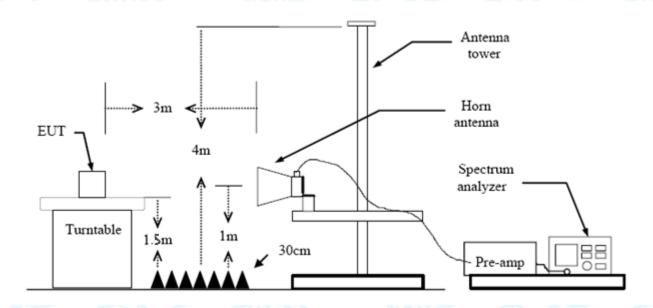
Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup



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Above 1GHz Test Setup

### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. The EUT was placed on a rotating 0.8m high above the 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.



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### 5.4 EUT Operating Condition

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

### 5.5 Test Data

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

Test data please refer the following pages.



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EUT:	Bluet	ooth speake	er	Model Nam	ne :	5B103B1	
Temperature:	25 ℃			Relative Hu	umidity:	55%	MIT.
Гest Voltage:	DC 5	V		WI CO		133	
Ant. Pol.	Horiz	ontal	CHI.		W		1
Test Mode:	: TX GFSK Mode 2402MHz						Mr.
Remark:	Only	worse case	is reported	The second		13	
80.0 dBuV/m							
					(RF)FCC	15C 3M Radiation	, _
						Margin -6	dB
				_ 5			
30				34 X	× e		
1 2				1.1/ <sup>M</sup> /hu.		. 8.8	may Marke
A MAN			n jakah	Million of the state of the sta		who who and the state of the st	2 1 Nogh
r w 'y			— John Mary	'			
	ماده .	downtown when the	MARINANA L				
Muma	was a street of the street of	adressed and anothernor	Majali Anjali Angara				
- Winner	war philadelphia	agternografication by a residence of	<sup>h</sup> oduli <sup>A</sup> filibraut (				
-20	way was the	gdergolfskrivet og her sedermedt	mydeligiddinaeth C				
20 30.000 40 50	60 70		(MHz)	300	400 5	500 600 700	1000.00
-20 30.000 40 50		80			400 5	500 600 700	1000.00
30.000 40 50			(MHz)	300	400 s	000 600 700 Over	1000.00
30.000 40 50 No. Mk. Fr	60 70	80 Reading	(MHz) Correct	300 Measure-		Over	1000.00
30.000 40 50 No. Mk. Fr	60 70 req.	Reading Level	(MHz) Correct Factor	Measure- ment	Limit	Over	Detecto
No. Mk. Fr M	60 70 req.	Reading Level	(MHz)  Correct Factor  dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over	Detecto peak
No. Mk. Fr M	req. Hz	Reading Level dBuV 37.05	Correct Factor dB/m -17.67	Measure- ment dBuV/m	Limit dBuV/m 40.00	Over dB -20.62	
No. Mk. Fr  M  1 36.0 2 42.6 3 221.3	req. Hz	Reading Level dBuV 37.05 39.62	Correct Factor dB/m -17.67	Measure- ment dBuV/m 19.38 18.36	Limit  dBuV/m  40.00  40.00	Over  dB  -20.62  -21.64	Detecto peak peak peak
No. Mk. Fr M 1 36.0 2 42.6 3 221.3 4 230.9	req. Hz 0007 6000 3921	Reading Level dBuV 37.05 39.62 50.26	(MHz)  Correct Factor dB/m -17.67 -21.26 -19.46	Measure- ment dBuV/m 19.38 18.36 30.80	Limit  dBuV/m  40.00  40.00  46.00	Over  dB  -20.62  -21.64  -15.20	Detector peak peak

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EUT:	Bluetooth spe	eaker	Model Name	e :	5B103B1	
Temperature:	ure: 25 ℃ Relative Humidity:			midity:	55%	
Test Voltage:	DC 5V	War and the same of the same o		-	130	
Ant. Pol.	Vertical					STATE OF THE PARTY
Test Mode:	TX GFSK Mo	de 2402MHz		9	a W	معال
Remark:	Only worse ca	ase is reported	t		13	
80.0 dBuV/m						
				(RF)FCC 1	5C 3M Radiation	1
					Margin -6	dB [
2			+			
30 1 × 3 4 X × X			_		6 Y	
					I III a Billia	Jin. L. Hall
VIV VV			5		attenders at Marine	ud/Whan
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V VV	- marine other than the first	numan made	Jan	daniel Witherstein de Landerstein der Leine de	operand had been	NA Managa
	when the stay of your	mulmahn	Mary Mary Market	de marille de la completa del completa de la completa de la completa del completa de la completa del la completa de la completa del la completa de la comple	ogeneral light of lighter	NAVA-A-O
V V V	was and the property of the party of the par	mudan baah	John Made met and dark	de established de la constitución de la constitució	plane plane	MANA O
-20	- was and the of the of the office of the original of the orig	mundual n	Mary Mary dalo	dense Marie Constant de la constant	Mark Jacks	, , , , , , , , , , , , , , , , , , ,
-20 30.000 40 50	60 70 80	(MHz)	300		00 600 700	1000.000
	60 70 80		300			
	60 70 80 Readir	ng Correct				
	Readir eq. Level	ng Correct I Factor	300 Measure-	400 5	00 600 700	
No. Mk. Fre	Readir eq. Leve	ng Correct I Factor	Measure- ment	400 5	000 600 700 Over	1000.000
No. Mk. Fre	Readir eq. Level dz dBuV 798 42.13	Correct Factor dB/m -14.69	Measure- ment	400 5 Limit dBuV/m	Over	1000.000
No. Mk. Fre	Readir eq. Level dz dBuV 798 42.13	Correct Factor dB/m -14.69	Measure- ment dBuV/m 27.44	400 5 Limit dBuV/m 40.00	Over dB -12.56	Detector peak
No. Mk. Fre	Readir Level dBuV 798 42.13 46.93	Correct Factor dB/m 3 -14.69 -17.60 3 -20.07	Measure- ment dBuV/m 27.44 30.17	400 5 Limit dBuV/m 40.00 40.00	Over  dB  -12.56  -9.83	Detector peak peak
No. Mk. Fre	Readir Level dBuV 798 42.13 46.96 46.96	Correct Factor dB/m 3 -14.69 7 -17.60 3 -20.07 6 -21.32	300 Measure- ment dBuV/m 27.44 30.17 26.86	400 5 Limit dBuV/m 40.00 40.00	Over  dB  -12.56  -9.83  -13.14	Detector peak peak peak

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



Page: 21 of 92

EUT:		Blueto	oth spe	eaker	Model I	Name :		5	B10	3BT	
Temperature	):	25 ℃		MIL.	Relativ	e Hum	idity:	5	5%	N	111
Test Voltage	:	DC 5V	- Mi								
Ant. Pol.		Horizo	ntal	_ ([//])		-	187				
Test Mode:		TX π /4	I-DQP	SK Mode 2402	MHz	CEN			. 1	1/1/1	
Remark:		Only w	orse c	ase is reported							
80.0 dBuV/m											
							(RF)FC	150 3	3M Rad	diation	
									Mar	gin -6 d	вД
30			$\perp$		34 XV	5 X S					
					J/M/V						أراسال
× 2					wa "Yal		Maria de la composición dela composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición dela composición de la composición dela	hallwarens	Market	on the state of	~VIII.
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	W. HAVEL	Mary Mary Mary	skilding all bear								
-20											
30.000 40	50	60 70	80	(MHz)		300	400	500	600	700	1000.0

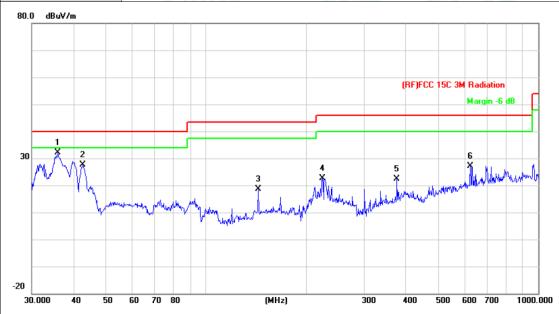
No	. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		36.0007	37.05	-17.67	19.38	40.00	-20.62	peak
2		42.6000	39.62	-21.26	18.36	40.00	-21.64	peak
3		221.3921	50.26	-19.46	30.80	46.00	-15.20	peak
4		230.9068	49.21	-19.03	30.18	46.00	-15.82	peak
5	*	300.3672	49.86	-17.07	32.79	46.00	-13.21	peak
6		375.9385	45.49	-14.40	31.09	46.00	-14.91	peak

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



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		THE REAL PROPERTY OF THE PERTY
Ant. Pol.	Vertical		1:33
Test Mode:	TX π /4-DQPSK Mode 24	l02MHz	
Remark:	Only worse case is repor	ted	THU .



Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
*	35.8746	49.77	-17.60	32.17	40.00	-7.83	peak
	42.7496	48.96	-21.32	27.64	40.00	-12.36	peak
	143.8292	40.41	-21.67	18.74	43.50	-24.76	peak
	224.5192	42.01	-19.33	22.68	46.00	-23.32	peak
	375.9384	36.67	-14.40	22.27	46.00	-23.73	peak
	625.0778	35.71	-8.51	27.20	46.00	-18.80	peak
	*	MHz * 35.8746 42.7496	MHz dBuV  * 35.8746 49.77  42.7496 48.96  143.8292 40.41  224.5192 42.01  375.9384 36.67	MHz dBuV dB/m  * 35.8746 49.77 -17.60  42.7496 48.96 -21.32  143.8292 40.41 -21.67  224.5192 42.01 -19.33  375.9384 36.67 -14.40	MHz dBuV dB/m dBuV/m  * 35.8746 49.77 -17.60 32.17  42.7496 48.96 -21.32 27.64  143.8292 40.41 -21.67 18.74  224.5192 42.01 -19.33 22.68  375.9384 36.67 -14.40 22.27	MHz         dBuV         dBuV/m         dBuV/m         dBuV/m           * 35.8746         49.77         -17.60         32.17         40.00           42.7496         48.96         -21.32         27.64         40.00           143.8292         40.41         -21.67         18.74         43.50           224.5192         42.01         -19.33         22.68         46.00           375.9384         36.67         -14.40         22.27         46.00	MHz dBuV dB/m dBuV/m dBuV/m dB * 35.8746 49.77 -17.60 32.17 40.00 -7.83 42.7496 48.96 -21.32 27.64 40.00 -12.36 143.8292 40.41 -21.67 18.74 43.50 -24.76 224.5192 42.01 -19.33 22.68 46.00 -23.32 375.9384 36.67 -14.40 22.27 46.00 -23.73

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



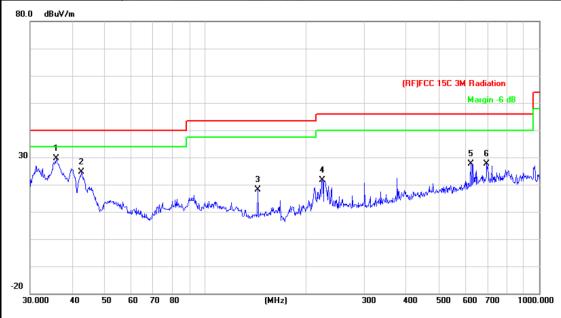
Page: 23 of 92

EUT:		Blue	lootii	Speake		Model Name :		5B103B		
<b>Temperat</b>	ure:	25 °C	C		11	Relative Hu	umidity:	55%		
Test Volta	ige:	DC 5	5V	MAN.						
Ant. Pol.		Horiz	zontal		(1)					
Test Mode	e:	TX 8	-DPS	K Mod	e 2402MHz	Hz				
Remark:		Only	wors	e case	is reported					
80.0 dBuV/r	m									
							(RF)FCC 1	5C 3M Radiation	n	
								Margin -6	dB	
						3 5				
30						<b>M</b> . 4 *	8 8			
1 X	2 X					,	J. John L.	was a state of the	man de la como	
/ \m	1 77							"dirir decidies.	1 190	
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~ '\	Mary Carry	and sometimes by	aggin vilon.	Markens	waganish kan hiji ka	, , , , , , , , , , , , , , , , , , ,	All Advant			
-20 30.000	40 50	60 70		Markan	(MHz)	300	400 5	00 600 700	1000.00	
	40 50		0 80		(MHz)	300	400 5	00 600 700	1000.00	
		60 70	Rea	ading			400 5	00 600 700 Over	1000.00	
30.000		60 70 eq.	Rea Le	ading	(MHz)	300 Measure-			1000.00	
30.000	k. Fre	60 70 eq.	Rea Le	ading evel	(MHz) Correct Factor	Measure- ment	Limit	Over		
30.000 A	k. Fre	eq.	Rea Le	ading evel	(MHz)  Correct Factor  dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over	Detecto	
No. MI	k. Fre	eq.	Rea Le dB 38	ading evel BuV B.05	(MHz)  Correct Factor  dB/m -17.67	Measure- ment dBuV/m 20.38	Limit dBuV/m 40.00	Over dB -19.62	Detecto	
No. MI	k. Fre	eq. lz 007 000 918	Rea Le dE 38 41	ading evel BuV B.05	Correct Factor dB/m -17.67	Measure- ment dBuV/m 20.38 20.36	Limit  dBuV/m  40.00  40.00	Over  dB  -19.62  -19.64	Detector peak peak	
No. MI  1  2  3  *	k. Fre MH 36.00 42.60 221.3	eq. lz 007 000 918 235	Rea Le dE 38 41 52 43	ading evel BuV 8.05 .62	(MHz)  Correct Factor  dB/m -17.67 -21.26 -19.46	Measure- ment dBuV/m 20.38 20.36 32.80	Limit  dBuV/m  40.00  40.00  46.00	Over  dB  -19.62  -19.64  -13.20	Detector peak peak peak	
No. MI  1  2  3  4	k. Fre MH 36.00 42.60 221.3 276.1	eq. deq. deq. deq. deq. deq. deq. deq. d	Rea Le dE 38 41 52 43 49	ading evel BuV 3.05 .62 2.26 3.42	(MHz)  Correct Factor  dB/m -17.67 -21.26 -19.46 -17.55	Measure- ment dBuV/m 20.38 20.36 32.80 25.87	Limit  dBuV/m  40.00  40.00  46.00  46.00	Over  dB  -19.62  -19.64  -13.20  -20.13	Detector peak peak peak peak	



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EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 5V	DC 5V					
Ant. Pol.	Vertical	D ON W					
Test Mode:	TX 8-DPSK Mode 2402MHz	TX 8-DPSK Mode 2402MHz					
Remark:	Only worse case is reported	Only worse case is reported					



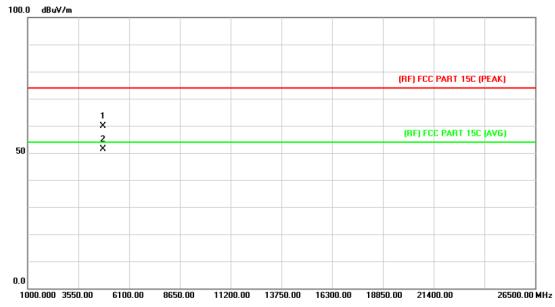
No	o. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	35.8746	47.27	-17.60	29.67	40.00	-10.33	peak
2		42.7496	45.96	-21.32	24.64	40.00	-15.36	peak
3		143.8293	39.91	-21.67	18.24	43.50	-25.26	peak
4		224.5192	41.01	-19.33	21.68	46.00	-24.32	peak
5		625.0778	36.21	-8.51	27.70	46.00	-18.30	peak
6		696.8567	34.49	-6.95	27.54	46.00	-18.46	peak

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



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EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	10	13.0				
Ant. Pol.	Horizontal						
Test Mode:	TX GFSK Mode 2402MHz		LITTLE OF				
Remark:	No report for the emission w prescribed limit.	No report for the emission which more than 10 dB below the					
100 0 ID VI							

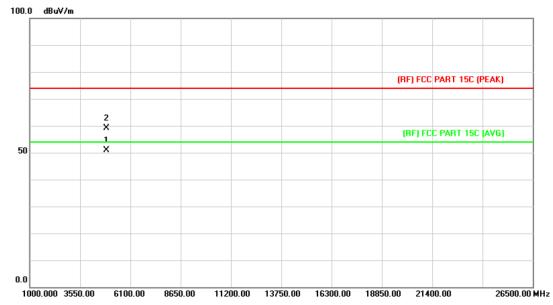


No.	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.865	46.34	13.44	59.78	74.00	-14.22	peak
2	*	4804.033	37.92	13.44	51.36	54.00	-2.64	AVG



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	1	
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz		- TILL
Remark:	No report for the emission w prescribed limit.	hich more than 10 dB	below the

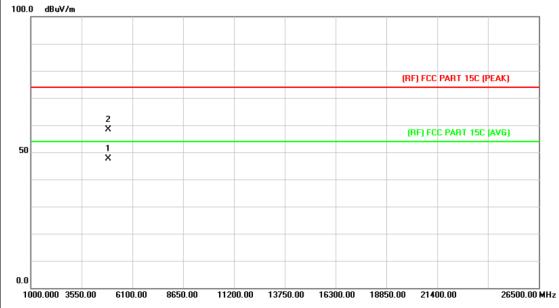


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.988	36.90	13.90	50.80	54.00	-3.20	AVG
2		4882.282	45.14	13.90	59.04	74.00	-14.96	peak



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EUT:	Bluetooth speaker	Model Name :	5B103BT					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V	1	(39)					
Ant. Pol.	Horizontal							
Test Mode:	TX GFSK Mode 2441MHz		LILL TO					
Remark:	No report for the emission w prescribed limit.	No report for the emission which more than 10 dB below the						

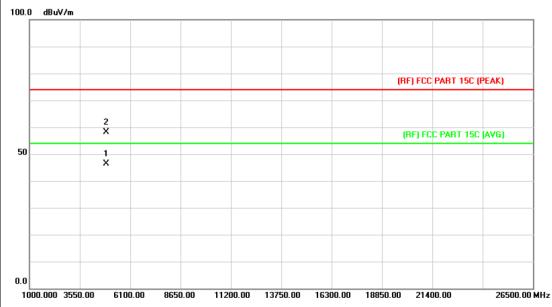


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4882.048	33.68	13.90	47.58	54.00	-6.42	AVG
2		4882.099	44.36	13.90	58.26	74.00	-15.74	peak



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	1	(39)
Ant. Pol.	Vertical	D ON W	
Test Mode:	TX GFSK Mode 2441MHz		- THE
Remark:	No report for the emission w prescribed limit.	hich more than 10 dB	below the

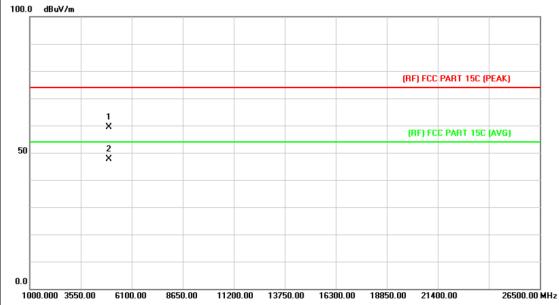


	No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4882.030	32.48	13.90	46.38	54.00	-7.62	AVG
2			4882.342	44.14	13.90	58.04	74.00	-15.96	peak



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EUT:	Bluetooth speaker	Model Name :	5B103BT					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V	1	(39)					
Ant. Pol.	Horizontal							
Test Mode:	TX GFSK Mode 2480MHz		LILL TO					
Remark:	No report for the emission was prescribed limit.	No report for the emission which more than 10 dB below the						

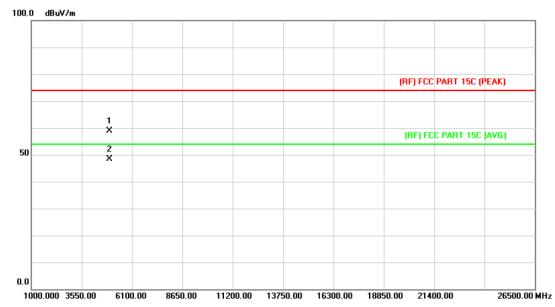


No.	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.910	45.12	14.36	59.48	74.00	-14.52	peak
2	*	4960.012	33.28	14.36	47.64	54.00	-6.36	AVG



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EUT:	Bluetooth speaker	Model Name :	5B103BT			
Temperature:	25 ℃	Relative Humidity: 55%				
Test Voltage:	Test Voltage: DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX GFSK Mode 2480MHz		L. C. L.			
Remark:	elow the					

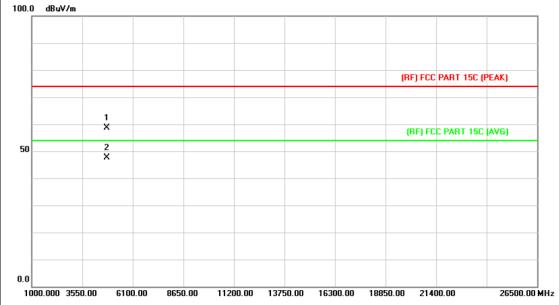


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.808	44.57	14.36	58.93	74.00	-15.07	peak
2	*	4960.051	34.07	14.36	48.43	54.00	-5.57	AVG



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EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2402MHz		LILL TO				
Remark: No report for the emission which more than 10 dB below the prescribed limit.							

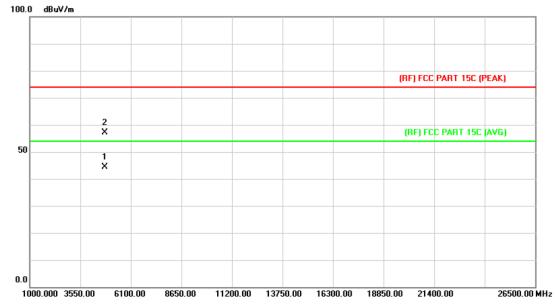


No	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.862	45.21	13.44	58.65	74.00	-15.35	peak
2	*	4804.030	34.22	13.44	47.66	54.00	-6.34	AVG



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EUT:	Bluetooth speaker	Model Name :	5B103BT					
Temperature:	25 ℃	Relative Humidity:	55%					
Test Voltage:	DC 3.7V							
Ant. Pol.	Vertical							
Test Mode:	TX 8-DPSK Mode 2402MHz							
Remark: No report for the emission which more than 10 dB below the prescribed limit.								

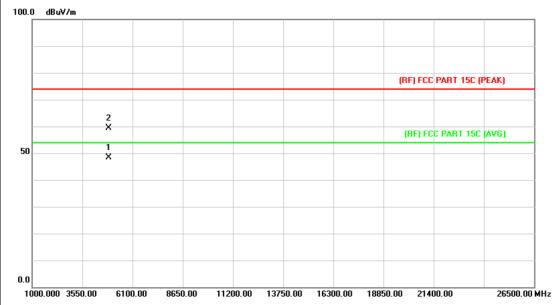


No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4804.069	30.84	13.44	44.28	54.00	-9.72	AVG
2		4804.420	43.59	13.44	57.03	74.00	-16.97	peak



Page: 33 of 92

EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Horizontal	D ON W					
Test Mode:	TX 8-DPSK Mode 2441MHz		- TILLE				
Remark: No report for the emission which more than 10 dB below the prescribed limit.							

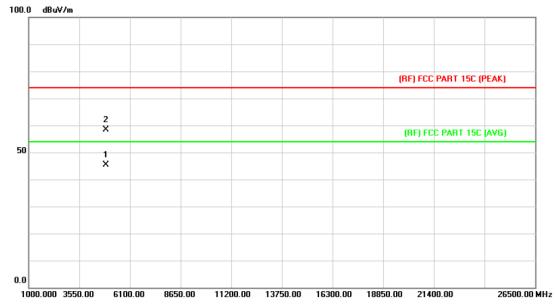


No	. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4882.032	34.44	13.90	48.34	54.00	-5.66	AVG
2		4882.861	45.48	13.90	59.38	74.00	-14.62	peak



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EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical						
Test Mode:	TX 8-DPSK Mode 2441MHz		L. C. L.				
Remark: No report for the emission which more than 10 dB below the prescribed limit.							

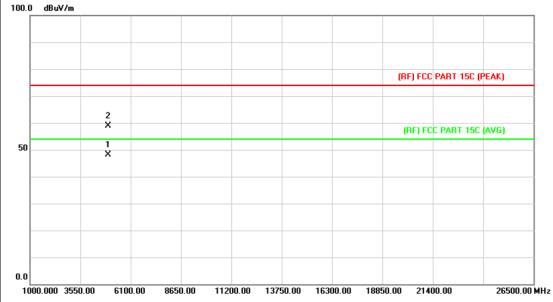


No.	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4882.067	31.41	13.90	45.31	54.00	-8.69	AVG
2		4882.480	44.41	13.90	58.31	74.00	-15.69	peak



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EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V						
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2480MHz		LI TOUR				
Remark: No report for the emission which more than 10 dB below the prescribed limit.							

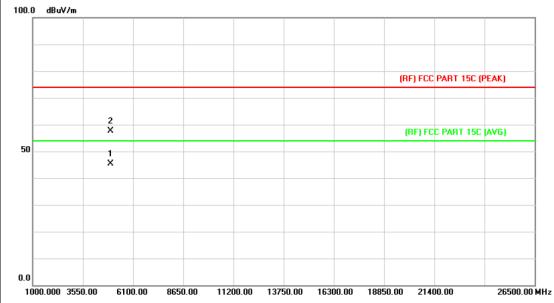


No. Mk.		Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*		4960.036	33.76	14.36	48.12	54.00	-5.88	AVG
2			4960.865	44.61	14.36	58.97	74.00	-15.03	peak



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EUT:	Bluetooth speaker Model Name :		5B103BT			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2480MHz					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					



N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.065	31.02	14.36	45.38	54.00	-8.62	AVG
2		4960.440	43.32	14.36	57.68	74.00	-16.32	peak



Report No.: TB-FCC144300 Page: 37 of 92

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# 6. Restricted Bands Requirement

#### 6.1 Test Standard and Limit

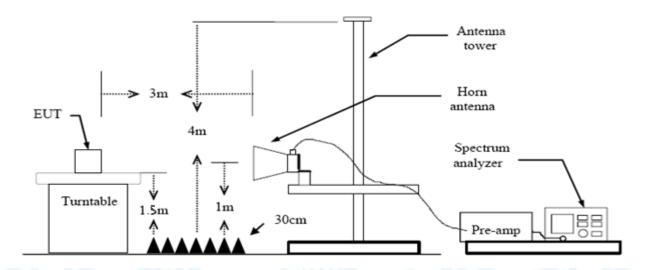
6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

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

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. The EUT was placed on a rotating 0.8m high above the 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.



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(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.

### 6.5 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.

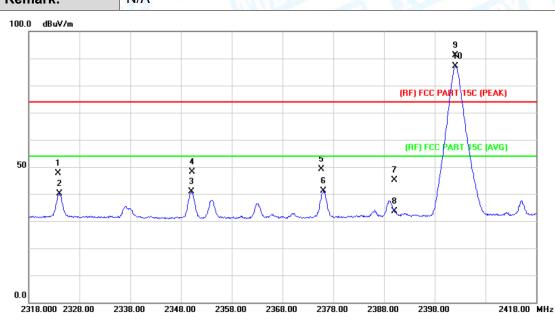
All restriction bands have been tested, only the worst case is reported.



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# (1) Radiation Test

EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		THE PARTY OF THE P
Test Mode:	TX GFSK Mode 2402MHz		
Remark:	N/A		A District
	•		

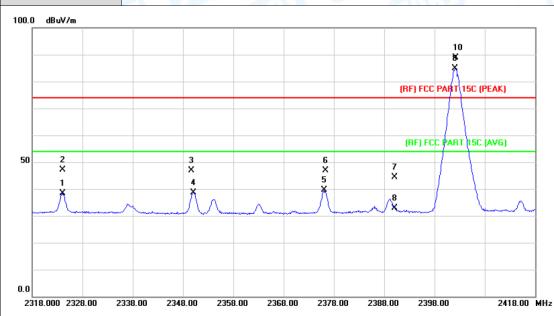


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2323.800	47.04	0.49	47.53	74.00	-26.47	peak
2		2324.000	39.57	0.49	40.06	54.00	-13.94	AVG
3		2350.000	40.22	0.61	40.83	54.00	-13.17	AVG
4		2350.200	47.58	0.61	48.19	74.00	-25.81	peak
5		2375.700	48.36	0.70	49.06	74.00	-24.94	peak
6		2376.100	40.36	0.70	41.06	54.00	-12.94	AVG
7		2390.000	44.32	0.77	45.09	74.00	-28.91	peak
8		2390.000	32.93	0.77	33.70	54.00	-20.30	AVG
9	Χ	2402.100	90.26	0.82	91.08	Fundamenta	al Frequeny	peak
10	*	2402.100	86.24	0.82	87.06	Fundamenta	al Frequeny	AVG



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	The same	18.
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz		LITTLE OF
Remark:	N/A	Contract of the second	



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2324.000	37.87	0.49	38.36	54.00	-15.64	AVG
2		2324.100	46.60	0.49	47.09	74.00	-26.91	peak
3		2349.700	46.23	0.61	46.84	74.00	-27.16	peak
4		2350.100	38.03	0.61	38.64	54.00	-15.36	AVG
5		2376.000	38.84	0.70	39.54	54.00	-14.46	AVG
6		2376.300	46.22	0.71	46.93	74.00	-27.07	peak
7		2390.000	43.73	0.77	44.50	74.00	-29.50	peak
8		2390.000	32.03	0.77	32.80	54.00	-21.20	AVG
9	*	2402.100	83.99	0.82	84.81	Fundamental	Frequeny	AVG
10	Х	2402.200	87.94	0.82	88.76	Fundamental	Frequeny	peak



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EUT	Blue			tooth speak	er	Model N	ame :	5B103	ВТ
Tem	peratu	re:	25 °	C	NI -	Relative	Humidity:	55%	MAIN.
Test	Voltag	je:	DC 3	3.7V		VI VE	0.0	199	
Ant.	Pol.		Horiz	zontal	0/11		a W		
Test	Mode		TX	GFSK Mode	2480 MHz		29	- EV	My de
Rem	nark:		N/A	differ		The same		1	
100.0	dBuV/m								
50		1 % X	3 X					ART 15C (PEA	
0.0									
24	66.000 24	76.00	2486.00	2496.00 25	D6.00 2516.00	2526.00	2536.00 2546.0	00	2566.00 MH
N	o. Mk	. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		N	1Hz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detecto
1	Х	2480	0.000	86.11	1.15	87.26	Fundamental	Frequeny	peak
2	*	2480	0.000	82.24	1.15	83.39	Fundamental	Frequeny	AVG
3		2483	3.500	53.99	1.17	55.16	74.00	-18.84	peak
4		2483	3.500	42.86	1.17	44.03	54.00	-9.97	AVG



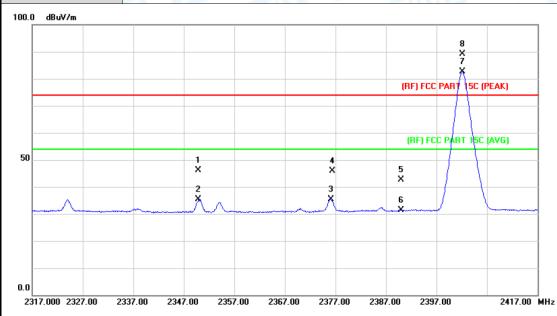
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EUT: Bluetoot		ooth speak	er	Model Na	ame :	5B103	ВТ	
Temperature: 25 °C			111	Relative Humidity: 55%				
Test Volt	age:	DC 3	.7V		VI V		19.11	
Ant. Pol.	. Vertical			01/11		3 HR.		1
Test Mod	de:	TX G	FSK Mode	2480 MHz	CITE S		- 111	111
Remark:		N/A	MILL		The same		1	
100.0 dBuV	7m							
50	1	3 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6					ART 15C (PEAI	
0.0	2476.00 2	2486.00		6.00 2516.00		36.00 2546.00	D 2	2566.00 MH
No. N	Иk. Fr	eq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	M	Hz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detecto
1 X	2480	0.000	84.81	1.15	85.96	Fundamental	Frequeny	peak
2 *	2480	.100	81.04	1.15	82.19	Fundamental	Frequeny	AVG
	2483	3.500	53.14	1.17	54.31	74.00	-19.69	peak
3	2-100							



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		189
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2402MHz		LINE TO SERVICE
Remark:	N/A		

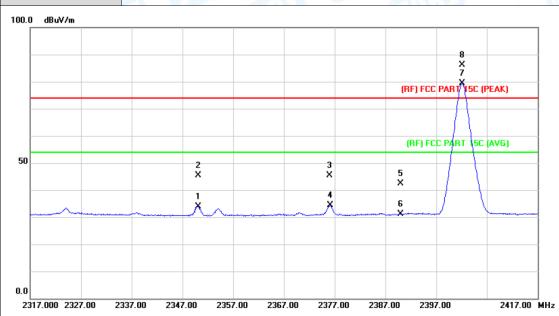


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2349.800	45.63	0.61	46.24	74.00	-27.76	peak
2		2349.900	34.67	0.61	35.28	54.00	-18.72	AVG
3		2376.100	34.80	0.70	35.50	54.00	-18.50	AVG
4		2376.400	45.12	0.71	45.83	74.00	-28.17	peak
5		2390.000	41.95	0.77	42.72	74.00	-31.28	peak
6		2390.000	30.63	0.77	31.40	54.00	-22.60	AVG
7	*	2402.100	81.71	0.82	82.53	Fundamental	Frequeny	AVG
8	Χ	2402.200	88.41	0.82	89.23	Fundamental	Frequeny	peak



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EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		130
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2402MHz		LINE .
Remark:	N/A	Charles and the second	



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2350.100	33.38	0.61	33.99	54.00	-20.01	AVG
2		2350.200	44.88	0.61	45.49	74.00	-28.51	peak
3		2376.000	44.77	0.70	45.47	74.00	-28.53	peak
4		2376.100	33.66	0.70	34.36	54.00	-19.64	AVG
5		2390.000	41.71	0.77	42.48	74.00	-31.52	peak
6		2390.000	30.27	0.77	31.04	54.00	-22.96	AVG
7	*	2402.100	78.58	0.82	79.40	Fundamenta	l Frequeny	AVG
8	Χ	2402.200	85.22	0.82	86.04	Fundamenta	I Frequeny	peak



0.0

2466.000 2476.00

2486.00

2496.00

Report No.: TB-FCC144300

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EUT:	Bluetooth speaker	Model Name :	5B103BT			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V		33.3			
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode 2480MH	z	- CILLER			
Remark:	N/A					
100.0 dBuV/m						
1 X 2 X		(RF) FCC PA	IRT 15C (PEAK)			
Λ						
	3	(RF) FCC P	PART 15C (AVG)			
50	X					

No	No. Mk. Freq.		Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2480.000	85.95	1.15	87.10	Fundamenta	I Frequeny	peak
2	*	2480.000	79.17	1.15	80.32	Fundamenta	I Frequeny	AVG
3		2483.500	50.07	1.17	51.24	74.00	-22.76	peak
4		2483.530	39.03	1.17	40.20	54.00	-13.80	AVG

2516.00

2526.00

2536.00

2546.00

2566.00 MHz

2506.00



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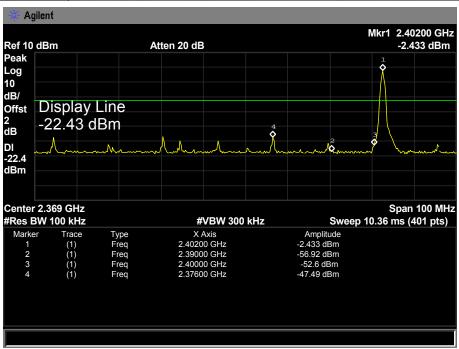
EUT			Blue	tooth s	peak	er	M	odel N	lame :	5B103BT	
Tem	peratur	rature: 25 °C Relative Humidity:				55%					
Test	Voltage	<b>)</b> :	DC 3	3.7V	W				0.0	130	
Ant.	Pol.		Verti	cal		W.	العالم		2 M		
Test	Mode:		TX 8	B-DPSK	Mod	e 2480MH	łz	an'		- E1	M. See
Rem	ark:		N/A	1111	1		1			1	
100.0	dBuV/m										
		1									
		X 2									
		Ň							(RF) FCC F	PART 15C (PEAI	()
		$\overline{A}$									
		+							(DE) FCC	DADT 15C (AV	
50		+	X 3						(NF) FCC	PART 15C (AVI	2)
		1 1	4 *								
								Α.			
ľ											
			_								
-											
0.0	20.000.0470		2400.00	2400.00	250	0.00 0510	20 25	20.00	2520.00	00	2500.00.141
240	66.000 2476	.00 2	2486.00	2496.00	250	6.00 2516.	JU 25	26.00 2	2536.00 2546.	UU 2	2566.00 MI
				Read	ling	Correc	Me	asure-			
N	o. Mk.	Fre	eq.	Lev		Factor	n	nent	Limit	Over	
		MH	Нz	dBu	ıV	dB/m	dl	BuV/m	dBuV/m	dB	Detecto
1	X	2480.	.000	87.3	32	1.15	8	8.47	Fundamental	Frequeny	peak
2	*	2480.	.000	80.	54	1.15	8	1.69	Fundamental	Frequeny	AVG
3		2483.	.500	49.2	25	1.17	5	0.42	74.00	-23.58	peak
4		2483.	500	41.2	29	1.17	Δ	2.46	54.00	-11.54	AVG

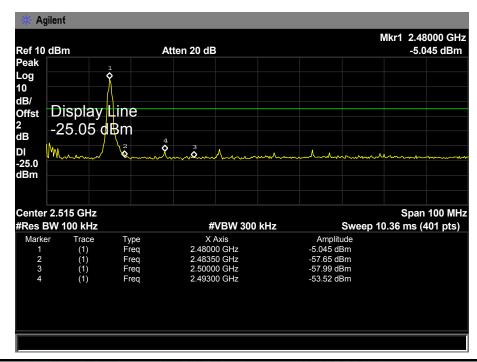




(2) Conducted Test

EUT:	Bluetooth speaker	Model Name :	5B103BT				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Test Mode:	TX GFSK Mode 2402MHz / 2	480 MHz	CHILL STREET				
Remark:	N/A						







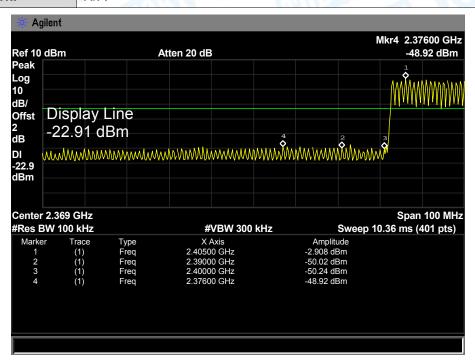
EUT: Bluetooth speaker Model Name: 5B103BT

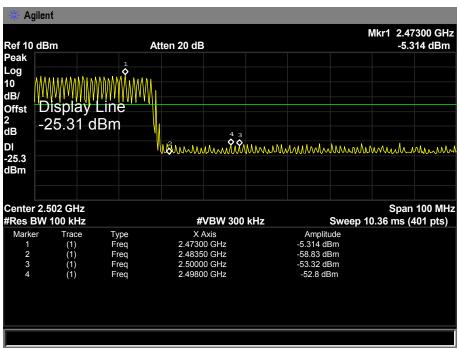
Temperature: 25 °C Relative Humidity: 55%

Test Voltage: DC 3.7V

Test Mode: GFSK Hopping Mode

Remark: N/A







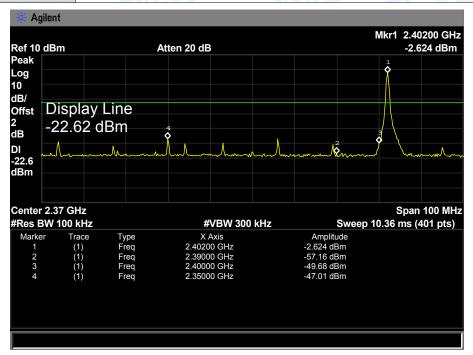


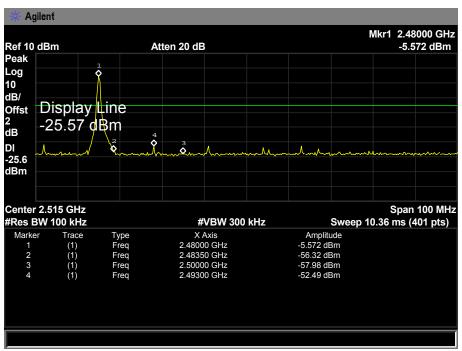
EUT:Bluetooth speakerModel Name :5B103BTTemperature:25 °CRelative Humidity:55%

Test Voltage: DC 3.7V

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

Remark: N/A







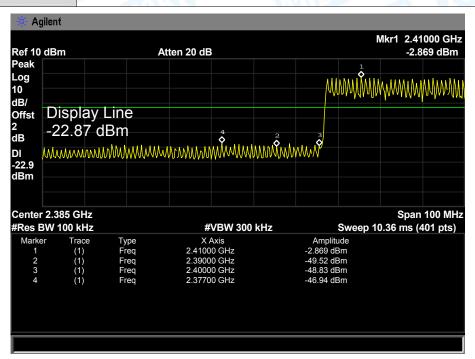
EUT: Bluetooth speaker Model Name: 5B103BT

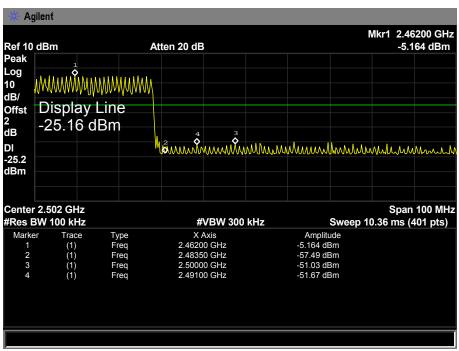
Temperature: 25 °C Relative Humidity: 55%

Test Voltage: DC 3.7V

Test Mode: 8-DPSK Hopping Mode

Remark: N/A







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# 7. Number of Hopping Channel

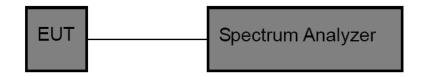
## 7.1 Test Standard and Limit

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

7.1.2 Test Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

# 7.2 Test Setup



## 7.3 Test Procedure

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

# 7.4 EUT Operating Condition

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

# 7.5 Test Data



EUT: Bluetooth speaker Model Name: 5B103BT

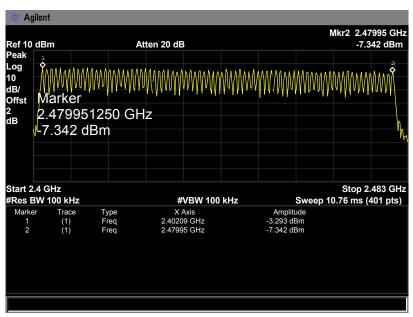
Temperature: 25 ℃ Relative Humidity: 55%

Test Voltage: DC 3.7V

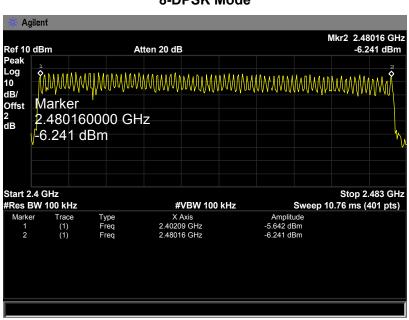
**Test Mode:** Hopping Mode (GFSK/ 8-DPSK)

Frequency Range	Quantity of Hopping Channel	Limit
240211117-24001117	79	<b>&gt;4</b> E
2402MHz~2480MHz	79	>15

#### **GFSK Mode**



#### 8-DPSK Mode





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# 8. Average Time of Occupancy

#### 8.1 Test Standard and Limit

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

8.1.2 Test Limit

Section	Test Item	Limit
15.247(a)(1)/ RSS-210	Average Time of	0.4.000
Annex 8(A8.1d)	Occupancy	0.4 sec

# 8.2 Test Setup



#### 8.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz.
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the center frequency on any frequency would be measure and set the frequency span to zero.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.

# 8.4 EUT Operating Condition

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

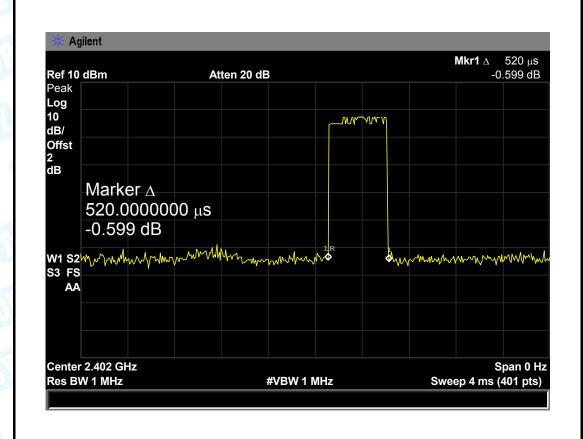


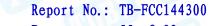
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## 8.5 Test Data

EUT:		Bluetooth speaker		Model Name :		5B103BT	
Temperature		25 ℃		Relative Humidity: 55%			
Test Voltage: DC 3.7V			A MILL		6.3		
Test Mode:		Hopping N	Mode (GFSK DH1)			A HILL	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)	Resuit	
2402		0.520	166.40				
2441		0.510 163.20 31.6		31.60	400	PASS	
2480		0.510	163.20				
			GESK Honning	Modo DU1		•	

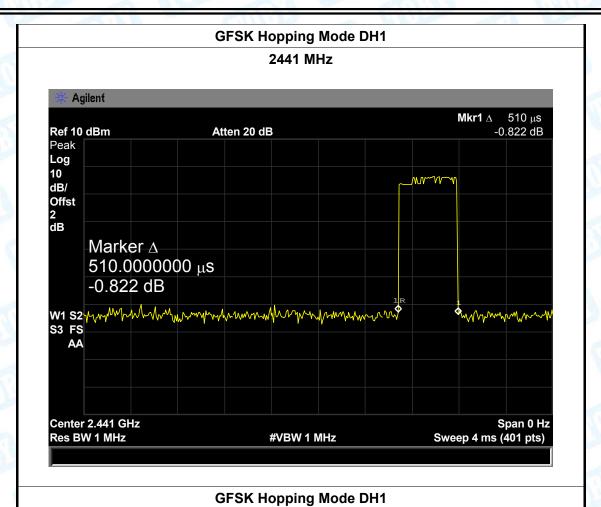
## **GFSK Hopping Mode DH1**

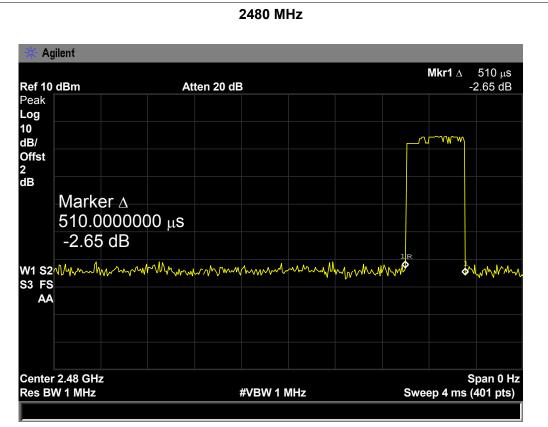






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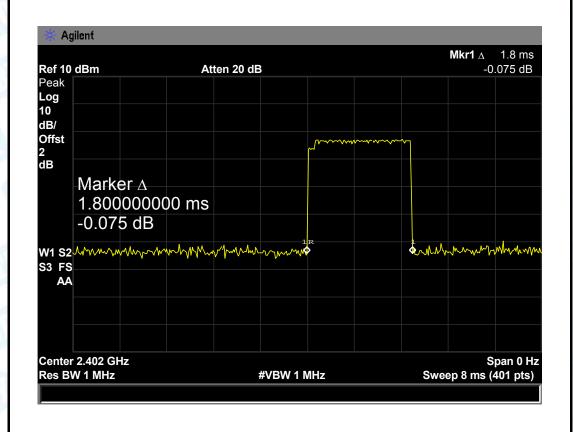


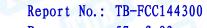


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EUT:		Bluetooth	speaker	Model Name :		5B103BT
Temperature:	Temperature: 25 ℃ Relative Humidity:				idity:	55%
Test Voltage:		DC 3.7V		VI C	-	13.3
Test Mode:		Hopping N	Mode (GFSK DH3	)	R.D.	
Channel Pu		lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Result
2402		1.800	288.00			
2441		1.780	284.80	284.80 31.60		PASS
2480		1.700	272.00			
	*		GESK Hopping	Mode DH3		

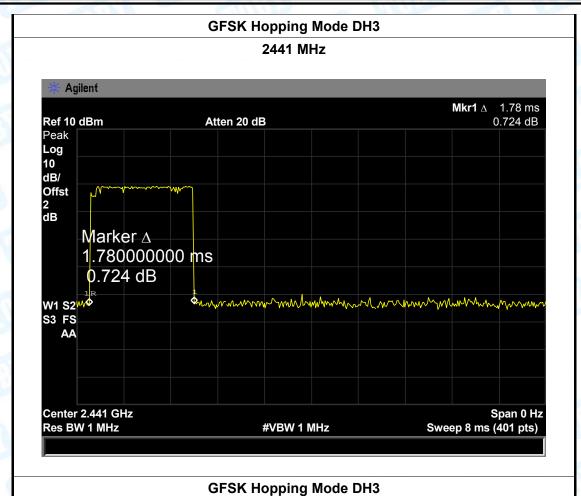
### **GFSK Hopping Mode DH3**

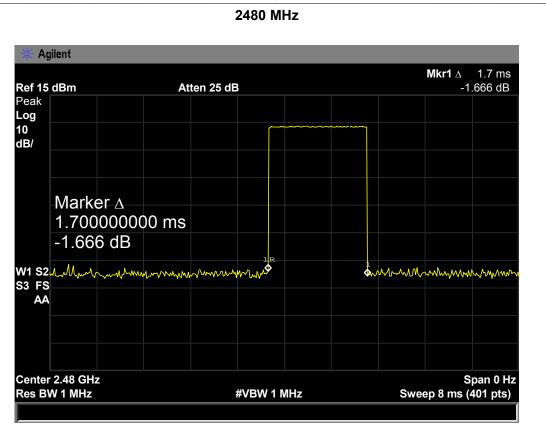






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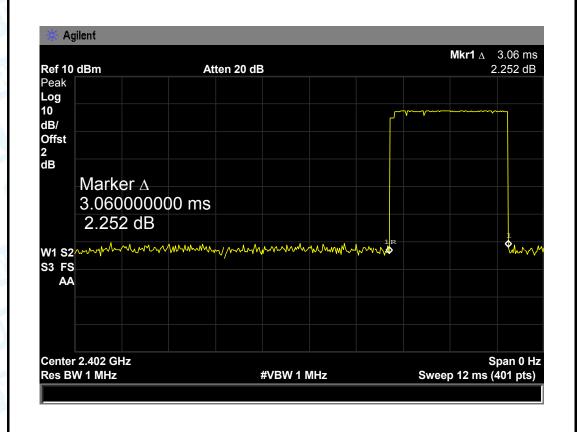


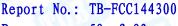


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EUT:		Bluetooth	speaker	Model Name	:	5B103BT
Temperature: 25 °C				Relative Hum	55%	
Test Voltage:		DC 3.7V	N. W.	WILL ASSESSMENT	-0	18.0
Test Mode:		Hopping N	Mode (GFSK DH5)		H. W.	
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result
(MHz)		(ms)	(ms)	(s)	(ms)	Resuit
2402		3.060	326.40			
2441	2441		326.40	31.60	400	PASS
2480		3.060	326.40			
GFSK Hopping Mode DH5						

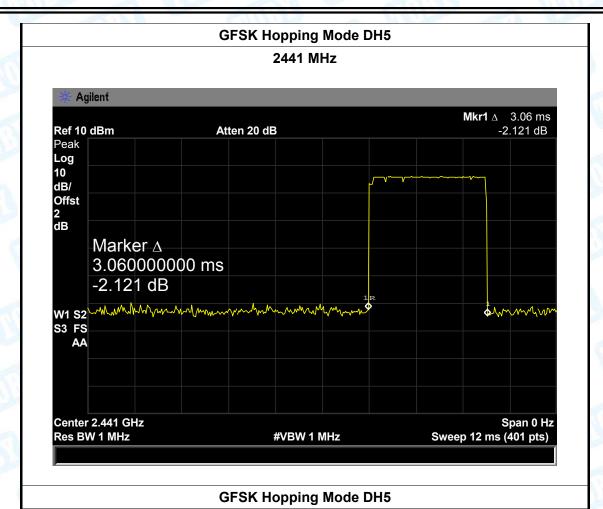
#### - 1-1- 5







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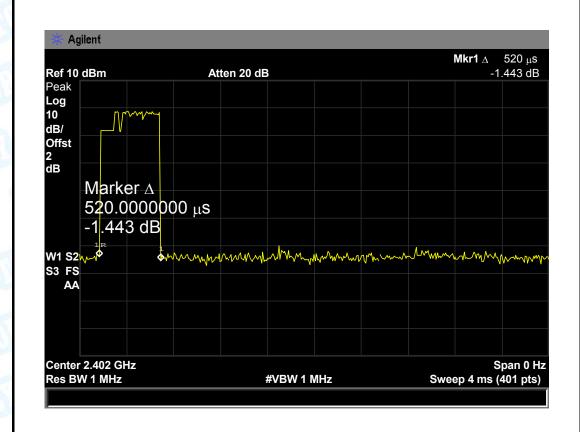


2480 MHz Agilent **Mkr1**  $\Delta$  3.06 ms -0.284 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Offst 2 dB Marker A 3.060000000 ms -0.284 dB &hymmenty. W1 S2 S3 FS AΑ Center 2.48 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 12 ms (401 pts)



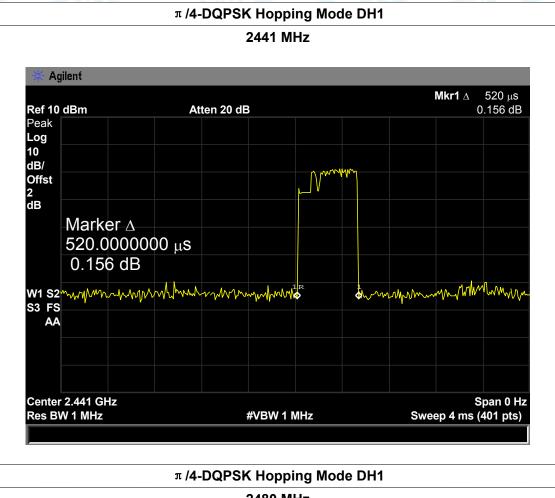
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EUT:		Bluetooth speaker		Model Name :		5B103BT	
Temperature: 25 ℃ Relative Humi			idity:	55%			
Test Voltage: DC 3.7V				189			
Test Mode:		Hopping N	Mode (π/4-DQPSI	K DH1)	M.D.		
Channel	Channel Pulse Time		Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)	Result	
2402		0.520	166.40				
2441	2441		0.520 166.40		400	PASS	
2480		0.530	169.60				
	π /4-DQPSK Hopping Mode DH1						

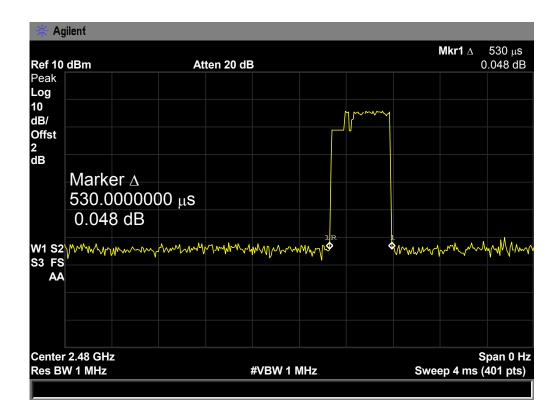










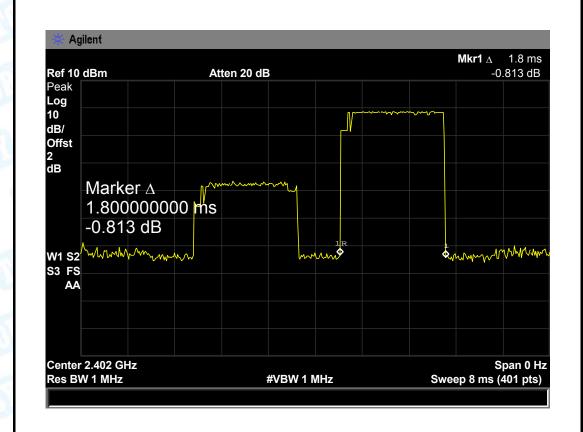




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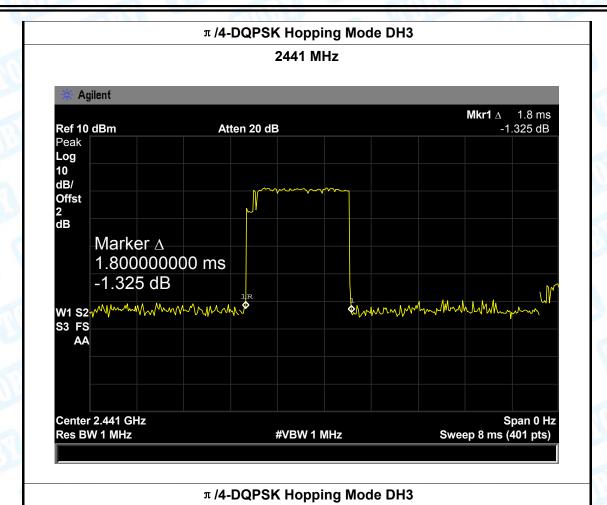
EUT: Bluetooth speaker			Model Name	5B103BT			
Temperature		25 ℃		Relative Humidity: 55%			
Test Voltage: DC 3.7V			N. C.				
Test Mode: Hopping Mode ( π /4-DQPSK DH3)				K DH3)	Hill.		
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Decult	
(MHz)		(ms)	(ms)	(s)	(ms)	Result	
2402		1.800	288.00				
2441	2441		288.00	31.60	400	PASS	
2480		1.820	291.20				
	ı	π	//_DODSK Honni	na Mode DH3		1	

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





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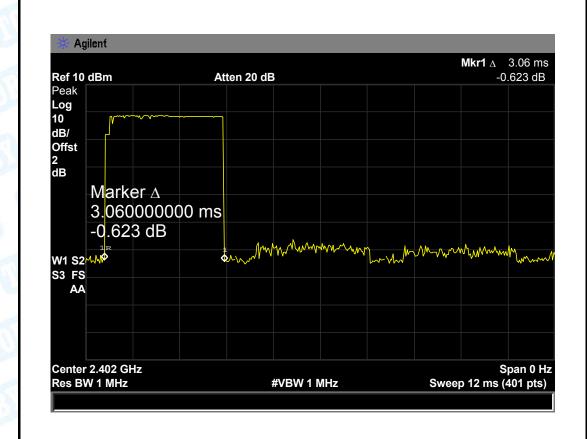


2480 MHz Agilent Mkr1  $\Delta$ 1.82 ms Ref 10 dBm Atten 20 dB -1.4 dB Peak Log 10 dB/ Offst 2 dB Marker A 1.820000000 ms -1.4 dB W1 S2mbmhammphlammmhhpmmhlymmhmmmh S3 FS AΑ Center 2.48 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 8 ms (401 pts)



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EUT:		Bluetooth speaker		Model Name :		5B103BT	
Temperature	perature: 25 °C Relative Humidity:				55%		
Test Voltage:		DC 3.7V	N. S. C.	WIN I COMPANY	-	33	
Test Mode:		Hopping N	Mode (π/4-DQPSI	K DH5)	H.D.		
Channel	Pu	Ise Time	Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)	Result	
2402		3.060	326.40				
2441	2441		3.060 326.40		400	PASS	
2480		3.090	329.60				
	π /4-DQPSK Hopping Mode DH5						







 $\pi$  /4-DQPSK Hopping Mode DH5 2441 MHz Agilent **Mkr1**  $\Delta$  3.06 ms Ref 10 dBm 0.586 dB Atten 20 dB Peak Log 10 dB/ Offst 2 dB Marker ∆ 3.060000000 ms 0.586 dB wally will make the walk with the walk with the walk will be a supplied to the walk will be a W1 S2<mark>√√</mark> S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 12 ms (401 pts) π /4-DQPSK Hopping Mode DH5

2480 MHz

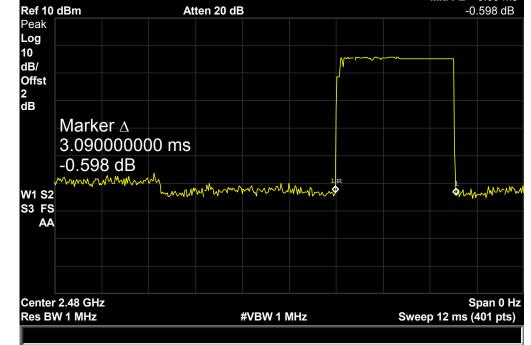
Agilent

Mkr1 Δ 3.09 ms

Ref 10 dBm

Atten 20 dB

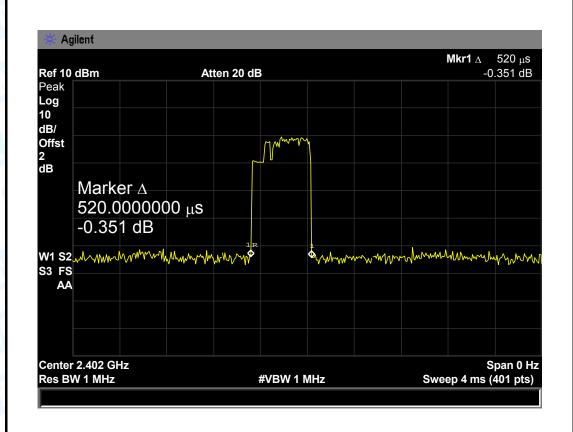
-0.598 dB





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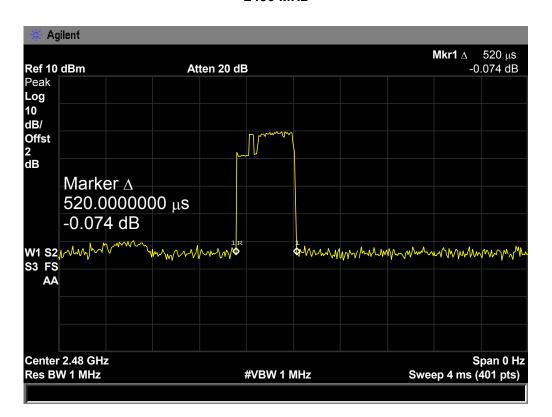
EUT:		Bluetooth speaker		Model Name :		5B103BT	
Temperature:		25 ℃		Relative Humidity:		55%	
Test Voltage:		DC 3.7V	A Property of	VI		13.9	
Test Mode:		Hopping Mode (8-DPSK DH1)					
Channel	Pu	Ise Time	Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)	Result	
2402		0.520	166.40	31.60	400	PASS	
2441		0.520	166.40				
2480		0.520	166.40				
8-DPSK Hopping Mode DH1							







8-DPSK Hopping Mode DH1 2441 MHz Agilent Mkr1  $\Delta$  520  $\mu$ s -2.959 dB Ref 10 dBm Atten 20 dB Peak Log 10 dB/ Offst 2 dB Marker ∆ 520.0000000 μs -2.959 dB W1 S2 MM MM MANNEY MANNEY and how when while we have S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 4 ms (401 pts) 8-DPSK Hopping Mode DH1 2480 MHz Agilent **Mkr1** Δ 520 μs Ref 10 dBm Atten 20 dB -0.074 dB

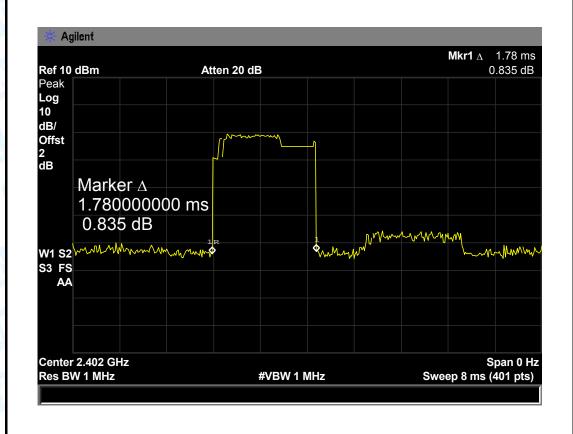


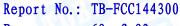


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EUT:		Bluetooth speaker		Model Name :		5B103BT	
Temperature:		25 ℃		Relative Humidity:		55%	
Test Voltage:		DC 3.7V					
Test Mode:		Hopping Mode (8-DPSK DH3)					
Channel	Pu	Ise Time	Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)		
2402		1.780	284.80	31.60	400	PASS	
2441		1.800	288.00				
2480		1.780	284.80				
8-DPSK Hopping Mode DH3							

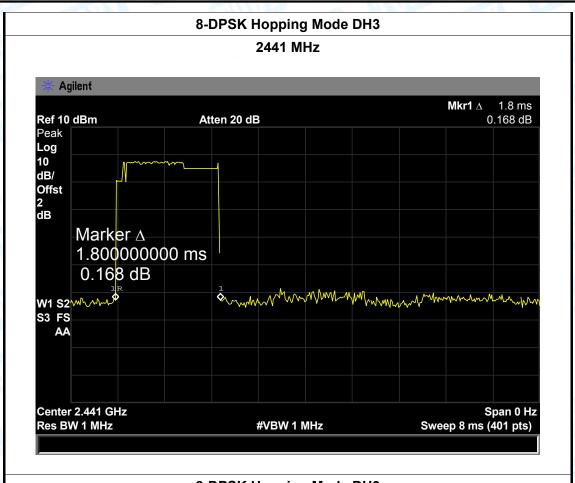
### 8-DPSK Hopping Mode DH3

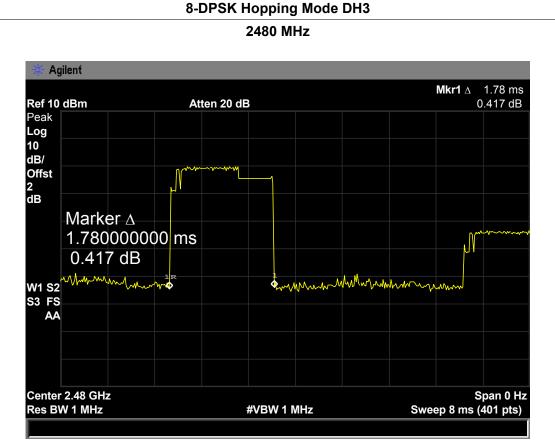






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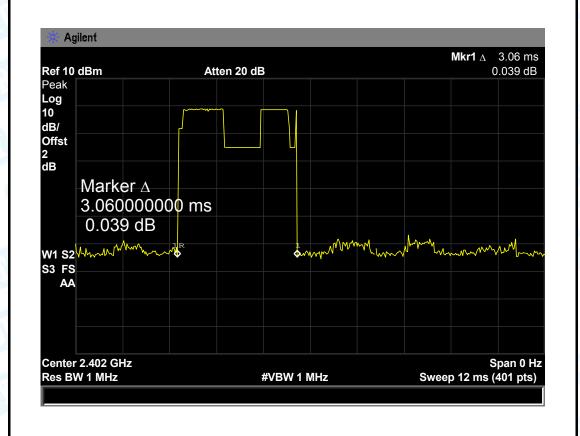


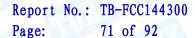




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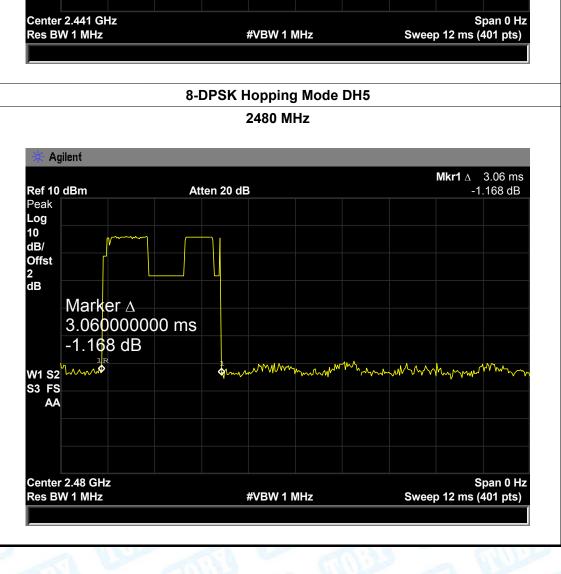
EUT:		Bluetooth speaker		Model Name :		5B103BT	
Temperature:		25 ℃		Relative Humidity:		55%	
Test Voltage:		DC 3.7V	N. C.	VI C		33	
Test Mode:		Hopping Mode (8-DPSK DH5)					
Channel	Pu	lse Time	Total of Dwell	Period Time	Limit	Result	
(MHz)		(ms)	(ms)	(s)	(ms)	Result	
2402		3.060	326.40	31.60	400	PASS	
2441		3.060	326.40				
2480		3.060	326.40				
8-DPSK Hopping Mode DH5							







8-DPSK Hopping Mode DH5 2441 MHz Agilent **Mkr1**  $\Delta$  3.06 ms Ref 10 dBm 0.402 dB Atten 20 dB Peak Log 10 dB/ Offst 2 dB Marker ∧ 3.060000000 ms 0.402 dB W1 S2 S3 FS AA Center 2.441 GHz Span 0 Hz Res BW 1 MHz #VBW 1 MHz Sweep 12 ms (401 pts) 8-DPSK Hopping Mode DH5 2480 MHz Agilent **Mkr1**  $\Delta$  3.06 ms Ref 10 dBm Atten 20 dB -1.168 dB Peak Log





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# 9. Channel Separation and Bandwidth Test

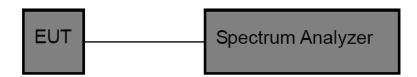
#### 9.1 Test Standard and Limit

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.

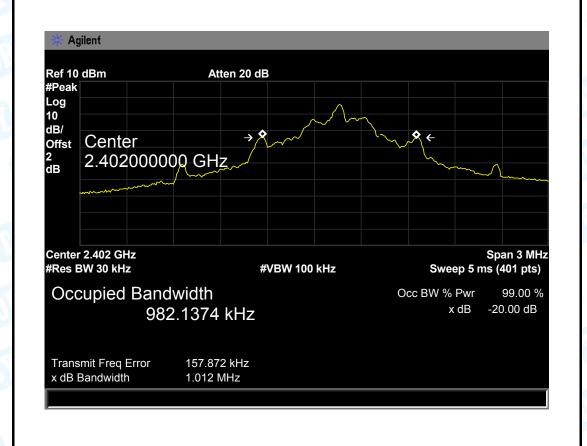


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# 9.5 Test Data

EUT:	Bluetooth speaker	Model Name :	5B103BT	
Temperature:	25 ℃	Relative Humidity:	55%	
Test Voltage:	DC 3.7V			
Test Mode:	TX Mode (GFSK)			
Channel frequen	99% OBW	20dB Bandwidth	20dB Bandwidth	
(MHz)	(kHz)	(kHz)	*2/3 (kHz)	
		` '		
2402	982.1374	1012.00	674.67	
2402 2441	982.1374 983.4155	1012.00 1015.00	674.67 676.67	

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GFSK TX Mode

2441 MHz



### **GFSK TX Mode** 2480 MHz Agilent Ref 10 dBm Atten 20 dB #Peak Log 10 dB/ Center Offst 2 dB 2.480000000 GHz Center 2.48 GHz Span 3 MHz #Res BW 30 kHz **#VBW 100 kHz** Sweep 5 ms (401 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -20.00 dB 985.0659 kHz

Transmit Freq Error

x dB Bandwidth

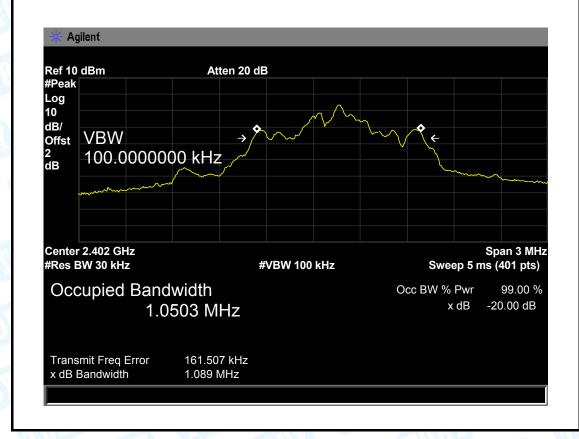
163.826 kHz

1.019 MHz



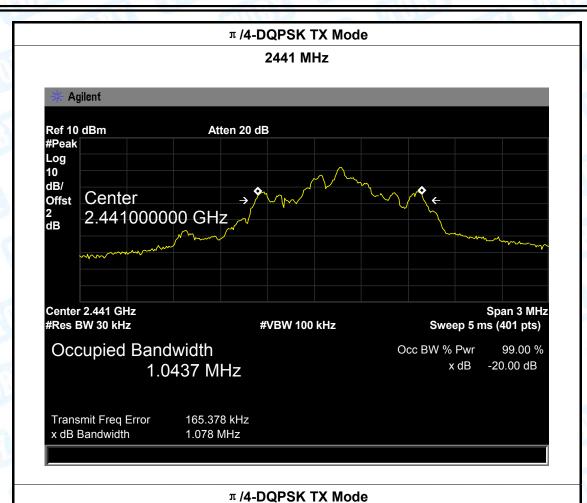
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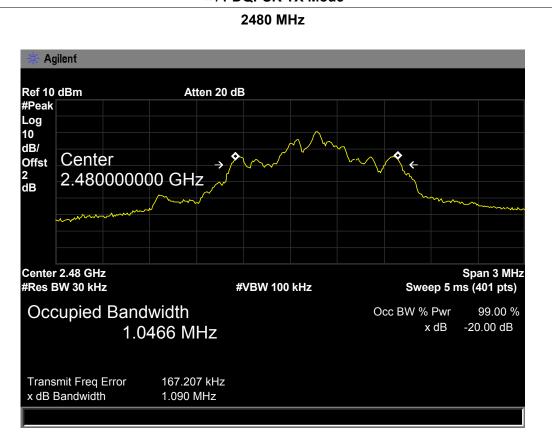
EUT:	Bluetooth speaker	Model Name :	5B103BT			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V		18.			
Test Mode:	Test Mode: ΤΧ Mode ( π /4-DQPSK)					
Channel frequence	99% OBW	20dB Bandwidth	20dB			
(MHz)	(kHz)	(kHz)	Bandwidth			
			*2/3 (kHz)			
2402	1050.30	1089.00	726.00			
2441	1043.70	1078.00	718.67			
2480	1046.60 1090.00 726.67					
	π /4-DQPSK TX Mode					





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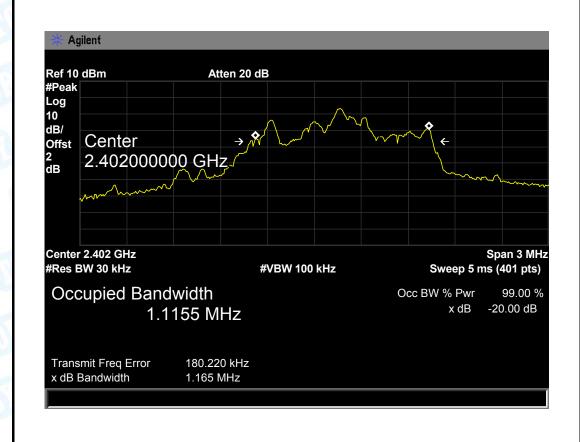


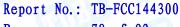


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Bluetooth speaker	Model Name :	5B103BT	
25 ℃	Relative Humidity	: 55%	
DC 3.7V			
TX Mode (8-DPSK)			
99% OBW	20dB Bandwidth	20dB Bandwidth	
(kHz)	(kHz)	*2/3 (kHz)	
1115.50	1165.00	776.67	
1123.40	1162.00	774.67	
1120.40	1166.00	777.33	
	25 °C  DC 3.7V  TX Mode (8-DPSK)  29 99% OBW (kHz)  1115.50  1123.40	25 °C  DC 3.7V  TX Mode (8-DPSK)  cy 99% OBW (kHz) (kHz) (kHz)  1115.50 1165.00  1123.40 1162.00	

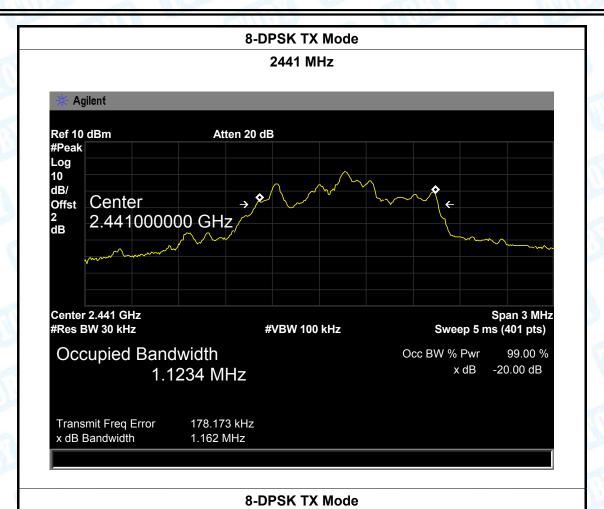
# 8-DPSK TX Mode 2402 MHz







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### 2480 MHz Agilent Ref 10 dBm Atten 20 dB #Peak Log 10 dB/ Center Offst 2 dB 2.480000000 GHz Center 2.48 GHz Span 3 MHz #Res BW 30 kHz **#VBW 100 kHz** Sweep 5 ms (401 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % -20.00 dB 1.1204 MHz Transmit Freq Error 182.322 kHz x dB Bandwidth 1.166 MHz



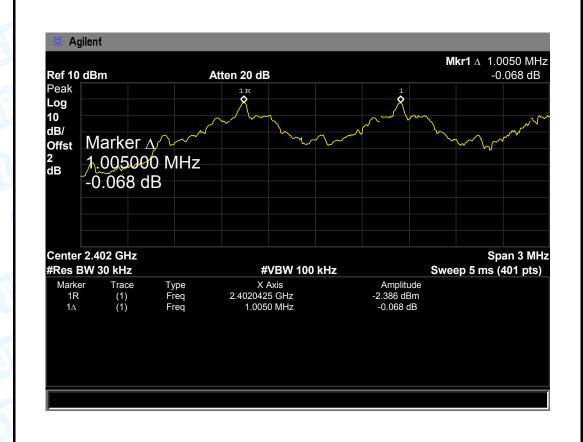
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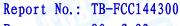
EUT:	Bluetooth speaker	Model Name :	5B103BT
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	Carlling .	MALL

Test Mode: Hopping Mode (GFSK)

Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	1005.00	674.67
2441	1005.00	676.67
2480	1005.00	679.33

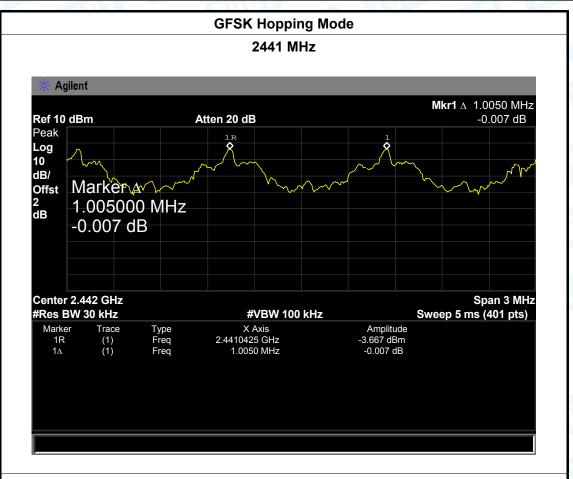
### **GFSK Hopping Mode**



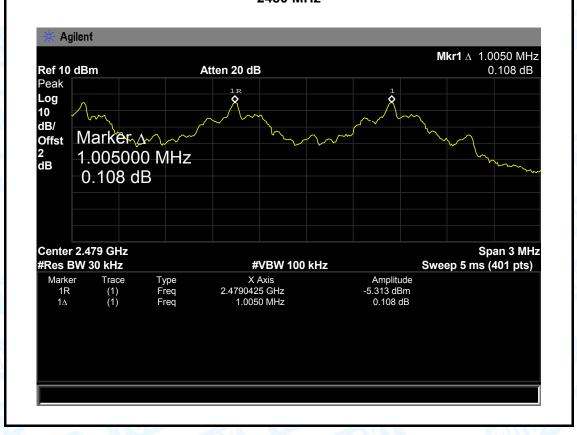




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# GFSK Hopping Mode 2480 MHz



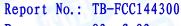


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EUT:	Bluetooth speaker		Model Name :		5B103BT
Temperature:	25 ℃		Relative H	lumidity:	55%
Test Voltage:	DC 3.7V		10		30
Test Mode:	Hopping N	Mode (π/4-DQPSK)		I AM	
Channel frequ	iency	Separation Read	d Value	Sepa	ration Limit
(MHz)		(kHz)			(kHz)
2402		1005.00		•	726.00
2441		1005.00		•	718.67
2480		1005.00			726.67

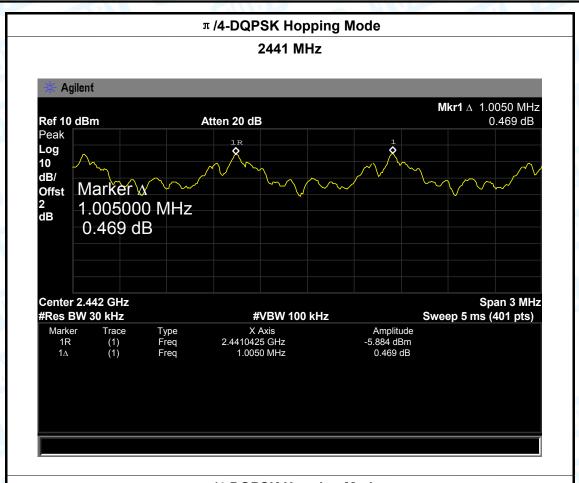
### $\pi$ /4-DQPSK Hopping Mode



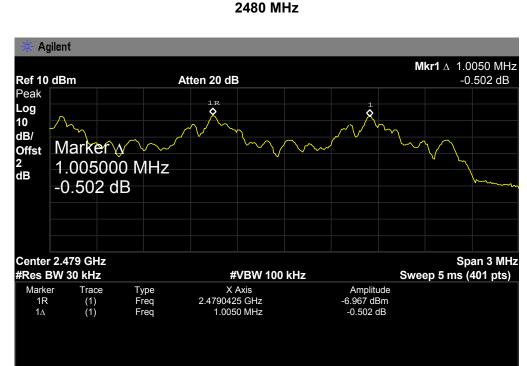




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# π /4-DQPSK Hopping Mode

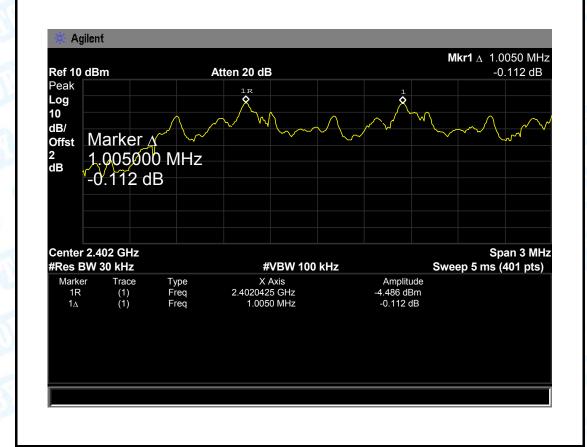


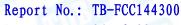


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EUT:	Bluetooth speaker		Model Nam	e :	5B103BT
Temperature:	25 ℃		Relative Humidity:		55%
Test Voltage:	DC 3.7V		1 6	-	30
Test Mode:	Hopping Mode (8-DPSK)				
Channel frequ	Channel frequency Separation Read Value Separation Limit			ration Limit	
(MHz)		(kHz)			(kHz)
2402 1005.00 776.67		776.67			
2441 1005.00 774.67		774.67			
2480 1005.00 777.33			777.33		
8-DPSK Hopping Mode					

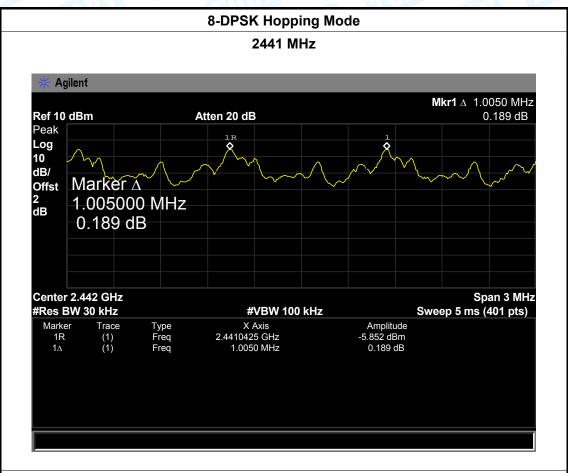
#### 0.400.1411



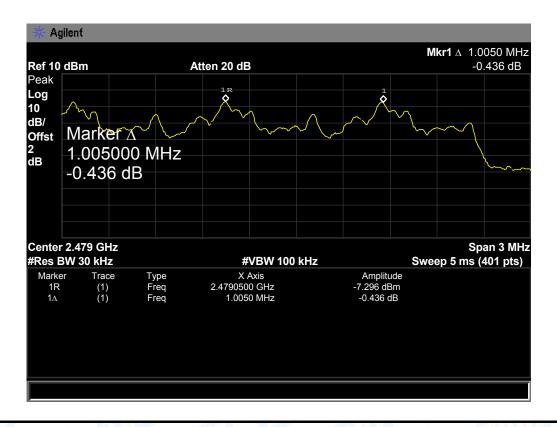




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# 8-DPSK Hopping Mode





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# 10. Peak Output Power Test

### 10.1 Test Standard and Limit

10.1.1 Test Standard FCC Part 15.247 (b) (1)

10.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125 mW(21dBm)	2400~2483.5

# 10.2 Test Setup



### 10.3 Test Procedure

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

Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz. RBW=3 MHz, VBW=3 MHz for bandwidth more than 1MHz.

# 10.4 EUT Operating Condition

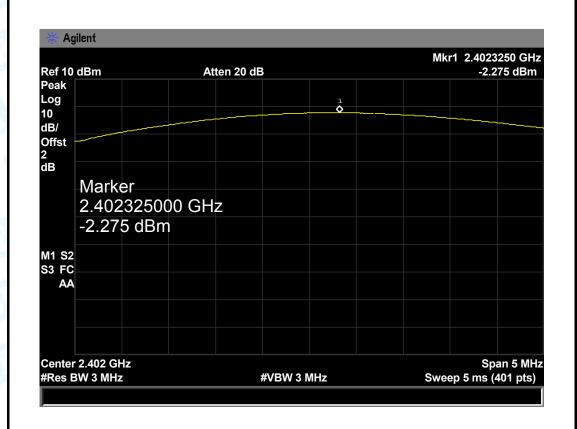
The EUT was set to continuously transmitting in the max power during the test.



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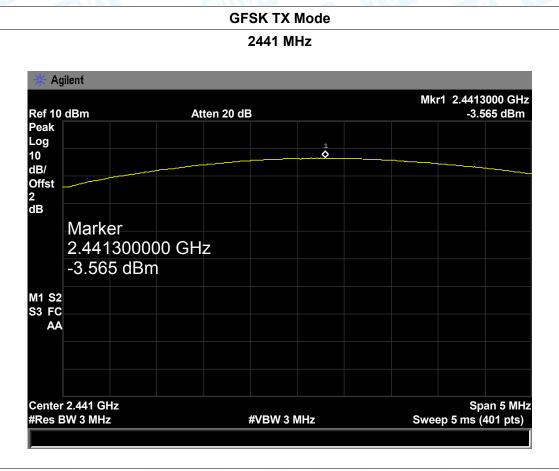
# 10.5 Test Data

EUT:	Bluetooth	speaker	Model Name :	5B103BT
Temperature:	25 ℃	Relative Humidity:		55%
Test Voltage:	DC 3.7V	777		a William
Test Mode:	TX Mode	(GFSK)		B _ M
Channel frequer	ncy (MHz)	Test Result (	dBm) Liı	mit (dBm)
2402		-2.275		
2441		-3.565		21
2480		-5.491		
		GFSK TX M	ode	
		2402 MH	Z	

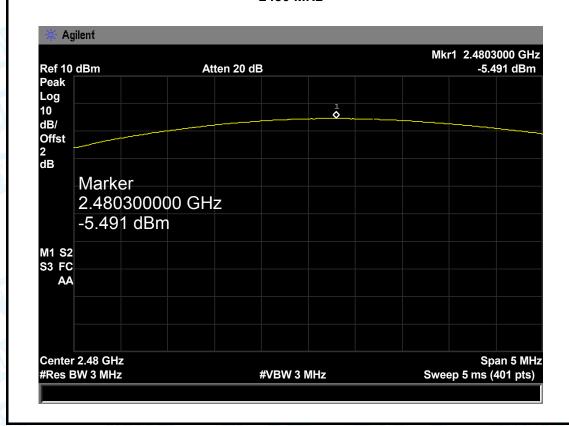




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### **GFSK TX Mode**

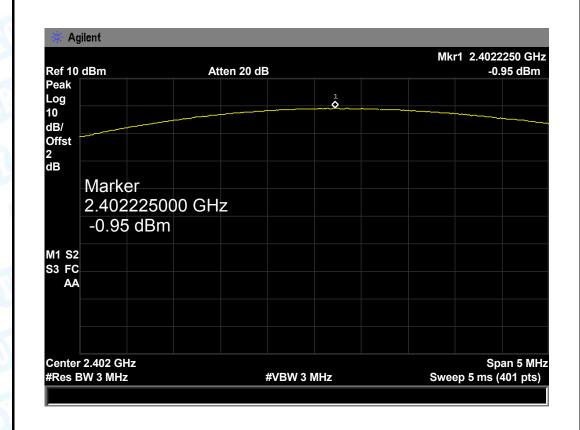




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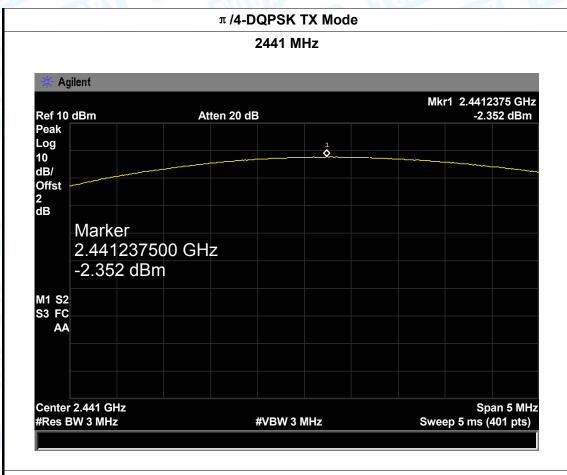
EUT:	Bluetooth	speaker	Model Name :	5B103BT
Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	DC 3.7V			33
Test Mode:	TX Mode	( π /4-DQPSK)		
Channel frequen	cy (MHz)	Test Result (d	dBm) Lin	nit (dBm)
2402		-0.950		
2441	-2.352		2	21
2480 -4.015				
		π /4-DOPSK TX	Mode	

#### π /4-DQPSK TX Mode

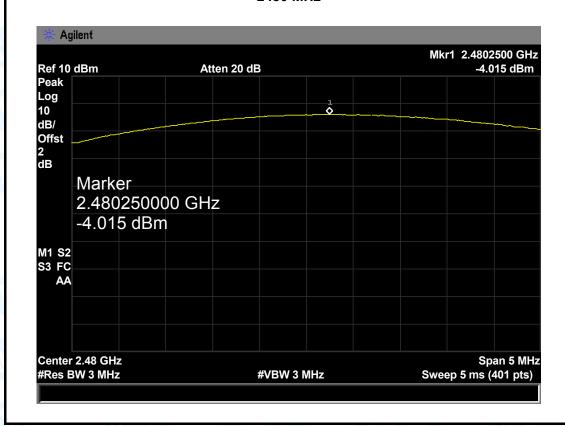




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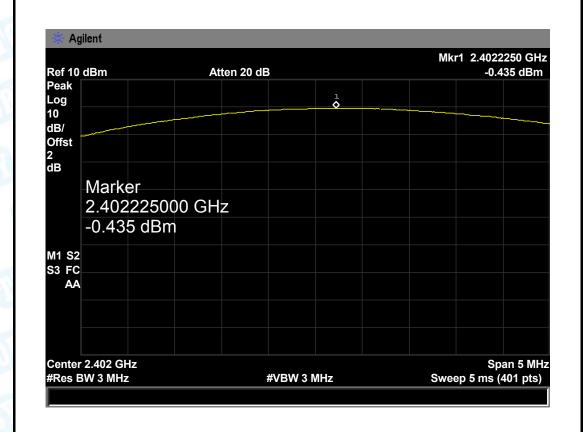


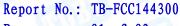


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EUT:	Bluetooth	speaker	Model N	ame :	5B103BT
Temperature:	25 ℃		Relative	Humidity:	55%
Test Voltage:	DC 3.7V				33
Test Mode:	TX Mode	(8-DPSK)	Marie Control	a W	
Channel frequen	cy (MHz)	Test Re	sult (dBm)	Lin	nit (dBm)
2402		-0	.435		
2441		-2.048		21	
2480		-3	3.554		
		8-DDCK	TY Mode		

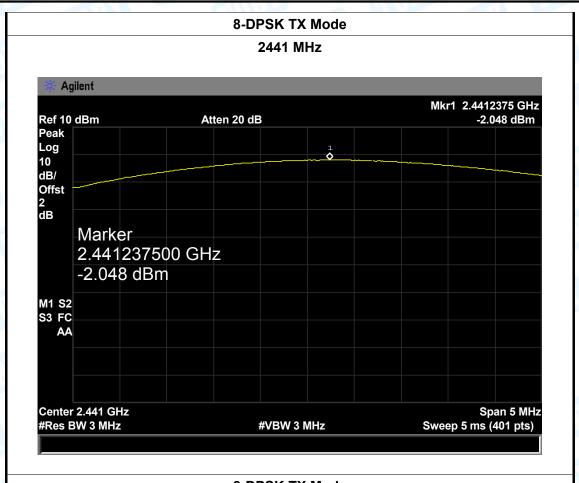
### 8-DPSK TX Mode



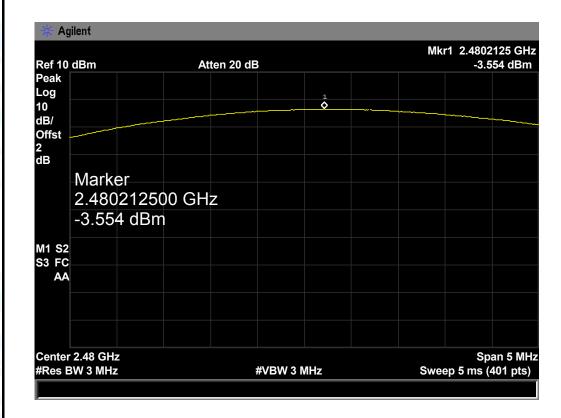




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## 8-DPSK TX Mode





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# 11. Antenna Requirement

# 10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

### 10.1.2 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.

### 10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 1.2 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

### Result

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

	Antenna Type
1 Em	▶ Permanent attached antenna
	□ Unique connector antenna
	☐ Professional installation antenna