

# Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC150425 Page: 1 of 89

# FCC Radio Test Report FCC ID: 2ABHA0012

# **Original Grant**

Report No. : TB-FCC150425

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

**Equipment Under Test (EUT)** 

**EUT Name** : Bluetooth earbuds

Model No. : CT15211

Series Model No. : CPP-4142, 32065, PL-1210

Brand Name : Cstar

**Receipt Date** : 2016-10-25

**Test Date** : 2016-10-26 to 2016-11-03

Issue Date : 2016-11-04

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

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

Conclusions : PASS

In the configuration tested, the EUT complied with the standards specified above,

The EUT technically complies with the FCC requirements

Test/Witness Engineer :

Approved& Authorized :

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0



# Contents

ITENIS	
1.1 Client Information	4
1.2 General Description of EUT (Equipment Under Test)	4
1.3 Block Diagram Showing the Configuration of System Tested	5
TEST EQUIPMENT	10
CONDUCTED EMISSION TEST	11
4.1 Test Standard and Limit	11
4.2 Test Setup	11
4.4 EUT Operating Mode	12
4.5 Test Data	12
RADIATED EMISSION TEST	17
5.1 Test Standard and Limit	17
5.2 Test Setup	18
5.3 Test Procedure	19
5.4 EUT Operating Condition	19
RESTRICTED BANDS REQUIREMENT	34
6.1 Test Standard and Limit	34
6.2 Test Setup	34
6.3 Test Procedure	34
6.4 EUT Operating Condition	35
6.4 Test Data	35
NUMBER OF HOPPING CHANNEL	48
7.1 Test Standard and Limit	48
7.2 Test Setup	48
7.4 EUT Operating Condition	48
7.5 Test Data	48
AVERAGE TIME OF OCCUPANCY	50
8.1 Test Standard and Limit	50
8.2 Test Setup	50
8.3 Test Procedure	50
	GENERAL INFORMATION ABOUT EUT  1.1 Client Information  1.2 General Description of EUT (Equipment Under Test)  1.3 Block Diagram Showing the Configuration of System Tested  1.4 Description of Support Units  1.5 Description of Test Mode  1.6 Description of Test Software Setting  1.7 Measurement Uncertainty  1.8 Test Facility  TEST SUMMARY  TEST EQUIPMENT  CONDUCTED EMISSION TEST  4.1 Test Standard and Limit  4.2 Test Setup  4.3 Test Procedure  4.4 EUT Operating Mode  4.5 Test Data  RADIATED EMISSION TEST  5.1 Test Standard and Limit  5.2 Test Setup  5.3 Test Procedure  5.4 EUT Operating Condition  RESTRICTED BANDS REQUIREMENT  6.1 Test Standard and Limit  6.2 Test Setup  6.3 Test Procedure  6.4 EUT Operating Condition  RESTRICTED BANDS REQUIREMENT  6.1 Test Standard and Limit  6.2 Test Setup  6.3 Test Procedure  6.4 EUT Operating Condition  6.4 Test Data  NUMBER OF HOPPING CHANNEL  7.1 Test Standard and Limit  7.2 Test Setup  7.3 Test Procedure  7.4 EUT Operating Condition  7.5 Test Data  AVERAGE TIME OF OCCUPANCY  8.1 Test Standard and Limit  1.2 Test Setup  8.2 Test Setup  8.3 Test Procedure  8.4 Test Setup  8.5 Test Setup  8.5 Test Setup  8.7 Test Setup  8.8 Test Setup  8.9 Test Setup  8.9 Test Setup  8.1 Test Standard and Limit  1.1 Test Standard and Limit  1.2 Test Setup  8.1 Test Standard and Limit  8.2 Test Setup  8.3 Test Procedure



Report No.: TB-FCC150425
Page: 3 of 89

118	8.4 EUT Operating Condition	50
	8.5 Test Data	
9.	CHANNEL SEPARATION AND BANDWIDTH TEST	
	9.1 Test Standard and Limit	
	9.2 Test Setup	
	9.3 Test Procedure	
	9.4 EUT Operating Condition	
	9.5 Test Data	
10.	PEAK OUTPUT POWER TEST	82
	10.1 Test Standard and Limit	82
	10.2 Test Setup	
	10.3 Test Procedure	82
	10.4 EUT Operating Condition	
	10.5 Test Data	83
11.	ANTENNA REQUIREMENT	89
	11.1 Standard Requirement	89
	11.2 Antenna Connected Construction	



Page: 4 of 89

# 1. General Information about EUT

#### 1.1 Client Information

Applicant : NINGBO CSTAR IMP&EXP CO., LTD

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

Innovation Center, Ningbo, China

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

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

Community, Fuyong Town, Baoan District, Shenzhen, China

# 1.2 General Description of EUT (Equipment Under Test)

EUT Name		Bluetooth earbuds	Bluetooth earbuds			
Models No.		CT15211, CPP-4142, 3206	CT15211, CPP-4142, 32065, PL-1210			
Model Difference	:		All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.			
		Operation Frequency:	Bluetooth V2.1+EDR: 2402~2480 MHz			
	K	Number of Channel:	Bluetooth: 79 Channels see Note 2			
Product		Max Peak Output Power:	Bluetooth: 3.317 dBm(GFSK)			
Description		Antenna Gain:	1.5 dBi PCB Antenna			
		Modulation Type:	GFSK 1Mbps(1 Mbps)			
			π/4-DQPSK(2 Mbps)			
		111111111111111111111111111111111111111	8-DPSK(3 Mbps)			
Power Supply	:	DC power by USB cable.				
		DC power by Li-ion battery.				
Power Rating	:	DC 5V by USB Cable.				
The same of the sa		DC 3.7V by 55mAh Li-ion Battery.				
Connecting I/O Port(S)	6	Please refer to the User's	Manual			

#### Noto:

(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		



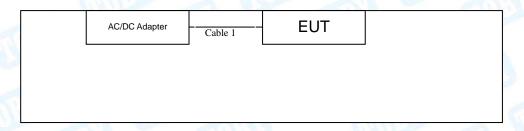
Page: 5 of 89

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

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

# 1.3 Block Diagram Showing the Configuration of System Tested

# **Charging with TX Mode**



#### **TX Mode**





Page: 6 of 89

# 1.4 Description of Support Units

Equipment Information							
Name Model FCC ID/DOC Manufacturer Used "√"							
AC/DC Adapter	TEKA012	a William	TEKA				
	Cable Information						
Number	Number Shielded Type Ferrite Core Length Note						
Cable 1	NO	NO	0.4M	1313			

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

#### Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate. We have pretested all the test 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)
TX Mode: 8-DPSK (3Mbps)

(2) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis,



Page: 7 of 89

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	Ap	poTech RF Control Kit	_v4.0
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π /4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

# 1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U <sub>Lab</sub> )
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
	Level Accuracy:	. 4 CO dD
Radiated Emission	9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy:	.4.40 dB
Radiated Emission	30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy:	±4.20 dB
Radiated E1111551011	Above 1000MHz	±4.20 UD



Page: 8 of 89

# 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.



Page: 9 of 89

# 2. Test Summary

	FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1					
Standard Section		T				
FCC	IC	Test Item	Judgment	Remark		
15.203	9	Antenna Requirement	PASS	N/A		
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A		
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A		
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A		
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A		
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A		
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A		
15.247(c)& 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:837.4148kHz π/4-DQPSK: 1152.10kHz 8-DPSK: 1138.10KHz		

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



Page: 10 of 89

# 3. Test Equipment

AC Main Conducted Emission						
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date	
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017	
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 22, 2016	Jul. 21, 2017	
L.I.S.N	Rohde & Schwarz	ENV216	101131	Jul. 22, 2016	Jul. 21, 2017	
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 22, 2016	Jul. 21, 2017	
Radiation  Description	Spurious Emiss  Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due	
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017	
EMI Test Receiver	Rohde & Schwarz	ESPI	10CT152110/007	Jul. 22, 2016	Jul. 21, 2017	
Bilog Antenna	ETS-LINDGREN	3142E	CT1521117537	Mar. 20, 2016	Mar. 19, 2017	
Horn Antenna	ETS-LINDGREN	3117	CT1521143207	Mar. 19, 2016	Mar. 18, 2017	
Pre-amplifier	Sonoma	310N	185903	Mar. 20, 2016	Mar. 19, 2017	
Pre-amplifier	HP	8449B	3008A00849	Mar. 26, 2016	Mar. 25, 2017	
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017	
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A	
Antenna C	onducted Emiss	sion				
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date	
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017	
EMI Test Receiver	Rohde & Schwarz	ESPI	10CT152110/007	Jul. 22, 2016	Jul. 21, 2017	



Page: 11 of 89

# 4. Conducted Emission Test

#### 4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

#### 4.1.2 Test Limit

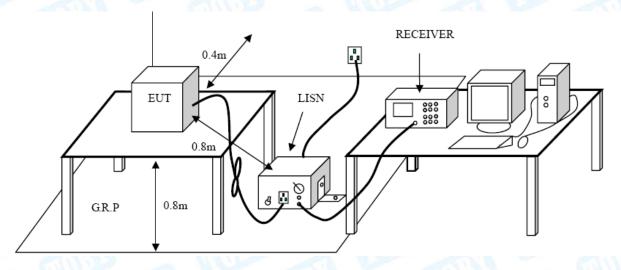
#### **Conducted Emission Test Limit**

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

#### Notes:

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

### 4.2 Test Setup



#### 4.3 Test Procedure

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

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



Page: 12 of 89

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.



Page: 13 of 89

EUT:	Blueto	oth earbuds	ERD.	Model Nam	ne :	CT15211
Temperature	: <b>25</b> ℃	TOU	11	Relative Hu	umidity:	55%
Test Voltage:	AC 12	0V/60 Hz		N. C.	TOTAL STATE	3
Terminal:	Line	3	anne		Miles -	
Test Mode:	USB (	Charging Mo	de	aniss.		MAIN
Remark:	Only v	vorse case is	s reported	Con 1	Comment of the Commen	
40 A 1 A 1				×		P: — V6: —
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		A Management		Mary Mary	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Markethin pea
-10 0.150	0.5	A guarant	(MHz)	5	Walter Committee	
		Reading		Measure-	mit Ov	30.000
0.150	0.5	Reading	Correct N	Measure- ment Lir	~~~~	30.000 /er
0.150	0.5	Reading Level	Correct N	Measure- ment Lir	mit Ov	30.000  /er  B Detector
0.150 No. Mk.	o.s Freq.	Reading Level	Correct N Factor	Measure- ment Lir dBuV dE 41.46 57	mit Ov	30.000  /er  B Detector
0.150 No. Mk.	0.5 Freq. MHz 0.4300	Reading Level dBuV 31.42	Correct Factor  dB  10.04	Measure- ment Lir dBuV dE 41.46 57 34.22 47	mit Ov BuV dE	30.000  /er  B Detector  79 QP  03 AVG
No. Mk.	0.5 Freq. MHz 0.4300 0.4300	Reading Level dBuV 31.42 24.18	Correct Factor  dB  10.04  10.04	Measure- ment Lind dBuV dE 41.46 57 34.22 47 44.97 56	mit Ov BuV dE .25 -15.7	30.000  /er  B Detector  79 QP  03 AVG  06 QP
No. Mk.  1 2 3 * 4	0.5 Freq. MHz 0.4300 0.4300 0.4980 0.4980	Reading Level dBuV 31.42 24.18 34.95 24.44	Correct Factor  dB  10.04  10.04  10.02  10.02	Measure- ment Lind dE 41.46 57 34.22 47 44.97 56 34.46 46	mit Ov BuV dE .25 -15.7 .25 -13.0 .03 -11.0	30.000  /er  B Detector  79 QP  03 AVG  06 QP  57 AVG
0.150  No. Mk.  1 2 3 * 4 5	0.5 Freq. MHz 0.4300 0.4300 0.4980 0.4980 0.8059	Reading Level dBuV 31.42 24.18 34.95 24.44 27.44	Correct Factor  dB  10.04  10.04  10.02  10.02  10.07	Measure- ment Lind de 41.46 57 34.22 47 44.97 56 34.46 46 37.51 56	mit Ov BuV dE .25 -15.7 .25 -13.0 .03 -11.0 .03 -11.5 .00 -18.4	30.000  /er  B Detector  79 QP  03 AVG  06 QP  57 AVG  49 QP
0.150  No. Mk.  1 2 3 * 4	0.5 Freq. MHz 0.4300 0.4300 0.4980 0.4980	Reading Level dBuV 31.42 24.18 34.95 24.44	Correct Factor  dB  10.04  10.04  10.02  10.02	Measurement Ling dBuV dE 41.46 57 34.22 47 44.97 56 34.46 46 37.51 56 27.98 46	mit Ov BuV dE .25 -15.7 .25 -13.0 .03 -11.0	30.000  /er  B Detector  79 QP  03 AVG  06 QP  57 AVG  49 QP  02 AVG

23.72

32.15

22.16

27.40

14.55

10.07

10.06

10.06

10.06

10.06

46.00 -22.28

56.00 -23.85

46.00 -23.84

60.00 -32.60

50.00 -35.45

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

13.65

22.09

12.10

17.34

4.49

1.9340

3.2420

3.2420

5.1140

5.1140

8

9

10

11

12

AVG

QΡ

AVG

QP

AVG



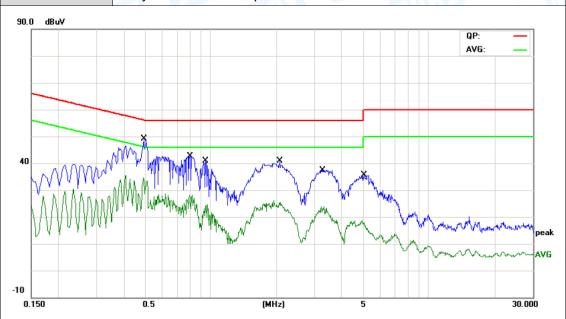
Page: 14 of 89

EUT:	Bluetooth earbu	ds	Model Name :	СТ	15211
Temperature:	<b>25</b> ℃	~ BAI	Relative Humid	lity: 55%	%
Test Voltage:	AC 120V/60 Hz	13			Alt.
Terminal:	Neutral			133	
Test Mode:	USB Charging M	lode			
Remark:	Only worse case	is reported	CIII DE	1 Y	MUL
90.0 dBuV				QP:	
				AVG:	_
	X				
L A D A A A A A A A A A A A A A	MANA MANAMAYA	and Market	,X, ,		
DAMAAAAA		h.h. \			
	Arris, Arris, Albert	Man was the A.	Mary Markhard	the hours by the particular	Malkyvalyva pea
A A A A A A A A A A A A A A A A A A A	1 "\	North 1	W. Janes	1 m	pea
				Vulva	AVG
10					
0.150	0.5	(MHz)	5		30.000
	Reading	Correct	Measure-		
No. Mk. F	req. Level	Factor	ment Limit	Over	
N	∕lHz dBuV	dB	dBuV dBuV	dB	Detector
1 0.4	940 35.85	10.02	45.87 56.10	-10.23	QP
2 * 0.4	940 29.14	10.02	39.16 46.10	-6.94	AVG
3 0.5	740 28.15	10.06	20.24 50.00	-17.79	QP
	77 10 20.10	10.00	38.21 56.00	-11.13	Q
4 0.5	7740 19.87	10.06		-16.07	AVG
	740 19.87	10.06	29.93 46.00	-16.07	AVG
5 0.8	740 19.87 8020 26.69	10.06 10.10	29.93 46.00 36.79 56.00	-16.07 -19.21	AVG QP
5 0.8 6 0.8	740 19.87 8020 26.69 8020 17.11	10.06 10.10 10.10	29.93 46.00 36.79 56.00 27.21 46.00	-16.07 -19.21 -18.79	AVG QP AVG
5 0.8 6 0.8 7 1.9	740 19.87 8020 26.69 8020 17.11 9420 25.64	10.06 10.10 10.10 10.06	29.93 46.00 36.79 56.00 27.21 46.00 35.70 56.00	-16.07 -19.21 -18.79 -20.30	AVG QP AVG QP
5 0.8 6 0.8 7 1.9 8 1.9	3740 19.87 3020 26.69 3020 17.11 3420 25.64 3420 15.43	10.06 10.10 10.10 10.06 10.06	29.93     46.00       36.79     56.00       27.21     46.00       35.70     56.00       25.49     46.00	-16.07 -19.21 -18.79 -20.30 -20.51	AVG QP AVG QP AVG
5 0.8 6 0.8 7 1.9 8 1.9 9 3.3	19.87 3020 26.69 3020 17.11 0420 25.64 0420 15.43 3940 21.94	10.06 10.10 10.10 10.06 10.06 10.01	29.93 46.00 36.79 56.00 27.21 46.00 35.70 56.00 25.49 46.00 31.95 56.00	-16.07 -19.21 -18.79 -20.30 -20.51 -24.05	AVG QP AVG QP AVG QP
5 0.8 6 0.8 7 1.9 8 1.9 9 3.3 10 3.3	19.87 3020 26.69 3020 17.11 0420 25.64 0420 15.43 3940 21.94	10.06 10.10 10.10 10.06 10.06	29.93 46.00 36.79 56.00 27.21 46.00 35.70 56.00 25.49 46.00 31.95 56.00 22.25 46.00	-16.07 -19.21 -18.79 -20.30 -20.51 -24.05 -23.75	AVG QP AVG QP AVG
5 0.8 6 0.8 7 1.9 8 1.9 9 3.3 10 3.3	19.87 3020 26.69 3020 17.11 0420 25.64 0420 15.43 3940 21.94	10.06 10.10 10.10 10.06 10.06 10.01	29.93 46.00 36.79 56.00 27.21 46.00 35.70 56.00 25.49 46.00 31.95 56.00 22.25 46.00	-16.07 -19.21 -18.79 -20.30 -20.51 -24.05	AVG QP AVG QP AVG QP



EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	AC 240V/60 Hz	400	3
Terminal:	Line		A STORE OF THE PARTY OF THE PAR
Test Mode:	USB Charging Mode		CHILL
_			

Remark: Only worse case is reported



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBu∀	dBu∀	dB	Detector
1 *	0.4940	36.06	10.02	46.08	56.10	-10.02	QP
2	0.4940	22.14	10.02	32.16	46.10	-13.94	AVG
3	0.8059	30.20	10.10	40.30	56.00	-15.70	QP
4	0.8059	16.59	10.10	26.69	46.00	-19.31	AVG
5	0.9460	26.05	10.07	36.12	56.00	-19.88	QP
6	0.9460	11.20	10.07	21.27	46.00	-24.73	AVG
7	2.0740	23.84	10.06	33.90	56.00	-22.10	QP
8	2.0740	11.56	10.06	21.62	46.00	-24.38	AVG
9	3.2659	24.03	10.02	34.05	56.00	-21.95	QP
10	3.2659	10.29	10.02	20.31	46.00	-25.69	AVG
11	5.0540	20.80	9.96	30.76	60.00	-29.24	QP
12	5.0540	5.48	9.96	15.44	50.00	-34.56	AVG



Page: 16 of 89

EUT:	Bluetooth earbud	ds	Model Na	me :	CT15	5211
Temperature:	25°C		Relative H		55%	
Test Voltage:	AC 240V/60 Hz	11		20		THE STATE OF
Terminal:	Neutral		1		13	
Test Mode:	USB Charging M	lode		Marie		577
Remark:	Only worse case	is reported	THE P		HA	1
90.0 dBuV			· · · · · · · · · · · · · · · · · · ·		Op.	
					QP: AVG:	
	+					
	×					
40	Mary Mary Mary Mary Mary Mary Mary Mary	protest and the same	Walnut AM			
AAAAAMAT!	THE TOTAL THE PROPERTY OF THE		ALL THE STATE OF T	n <sub>ex</sub>		
LAALLAA.	######################################	M. Market Market	white was	harm the star		· · · · · · · · · · · · · · · · · · ·
N A A A A A A A A A A A A A A A A A A A	111 11 11 11 11	my V	War	M. Janes	####Wedinger	AA-AA-MAAAAAA peak
					and the same	AVG
-10						
0.150	0.5	(MHz)	5			30.000
	Reading		Measure-			
	req. Level	Factor	ment		Over	
	MHz dBuV	dB	dBuV	dBu∀		Detector
	1060 27.56	10.05	37.61	57.73 -2	20.12	QP
2 0.4	16.62	10.05	26.67	47.73 -2	1.06	AVG
3 * 0.4	1900 32.76	10.02	42.78	56.17 -1	3.39	QP
4 0.4	1900 22.38	10.02	32.40	46.17 -1	3.77	AVG
5 0.7	7980 26.06	10.07	36.13	56.00 -1	9.87	QP
6 0.7	7980 11.92	10.07	21.99	46.00 -2	4.01	AVG
7 1.9	9860 22.84	10.06	32.90	56.00 -2	3.10	QP
8 1.9	9860 8.61	10.06	18.67	46.00 -2	7.33	AVG
	3780 19.31	10.06	29.37	56.00 -2		QP
	3780 5.81	10.06	15.87	46.00 -3		AVG
	1860 18.61	10.06	28.67	60.00 -3		QP
	1860 2.74	10.06	12.80	50.00 -3		AVG
Emission Level=	Read Level+ Cor	rect Factor				



Page: 17 of 89

# 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		

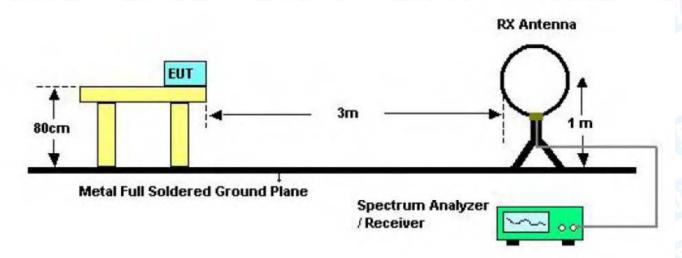
### Note:

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

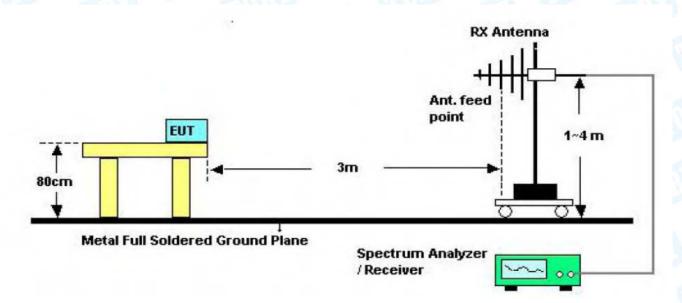


Page: 18 of 89

# 5.2 Test Setup



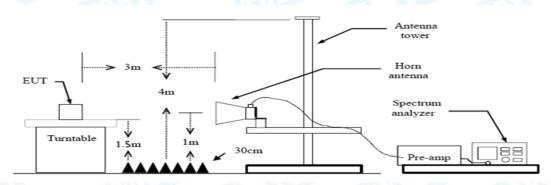
**Below 30MHz Test Setup** 



**Below 1000MHz Test Setup** 



Page: 19 of 89



**Above 1GHz Test Setup** 

#### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

# 5.4 EUT Operating Condition

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

#### 5.5 Test Data

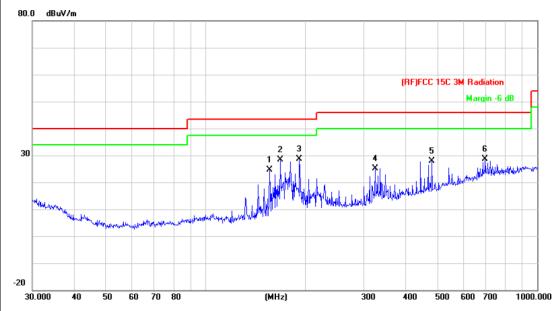
Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=1 kHz with Peak Detector for Average Values.

Test data please refer the following pages.



Page: 20 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz		MILLER
Remark:	Only worse case is reported		6



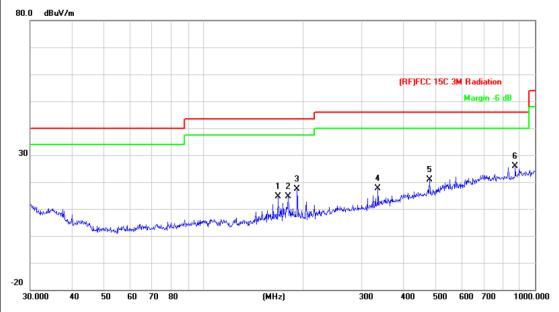
No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		155.9101	45.17	-20.58	24.59	43.50	-18.91	peak
2		167.8243	49.20	-20.78	28.42	43.50	-15.08	peak
3	*	191.7450	49.06	-20.45	28.61	43.50	-14.89	peak
4		324.4561	40.90	-15.72	25.18	46.00	-20.82	peak
5		480.5276	39.03	-11.13	27.90	46.00	-18.10	peak
6		696.8567	34.15	-5.53	28.62	46.00	-17.38	peak

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



Page: 21 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	THE STATE OF THE S	
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz		HILL
Remark:	Only worse case is reported		6



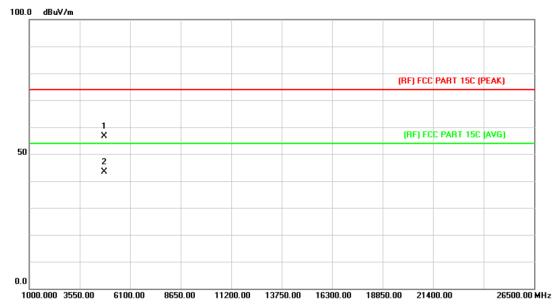
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		167.8243	35.30	-20.78	14.52	43.50	-28.98	peak
2		180.0165	34.91	-20.26	14.65	43.50	-28.85	peak
3		191.7450	37.94	-20.45	17.49	43.50	-26.01	peak
4		336.0352	32.57	-15.01	17.56	46.00	-28.44	peak
5		480.5276	32.11	-11.13	20.98	46.00	-25.02	peak
6	*	872.1832	30.47	-4.71	25.76	46.00	-20.24	peak

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



Page: 22 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211				
Temperature:	25℃	55%					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal		A STATE OF				
Test Mode:	TX GFSK Mode 2402MHz	10.39	MILLIA				
Remark:	No report for the emission which r	No report for the emission which more than 10 dB below the					
	prescribed limit.						

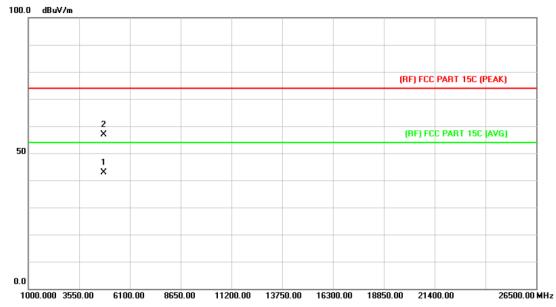


No	. Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4804.102	43.22	13.44	56.66	74.00	-17.34	peak
2	*	4804.756	30.05	13.44	43.49	54.00	-10.51	AVG



Page: 23 of 89

EUT:	Bluetooth earbuds Model Name : C							
Temperature:	25°C Relative Humidity: 5							
Test Voltage:	DC 3.7V	DC 3.7V						
Ant. Pol.	Vertical							
Test Mode:	TX GFSK Mode 2402MHz		HILL					
Remark:	No report for the emission which more than 10 dB below the prescribed limit.							

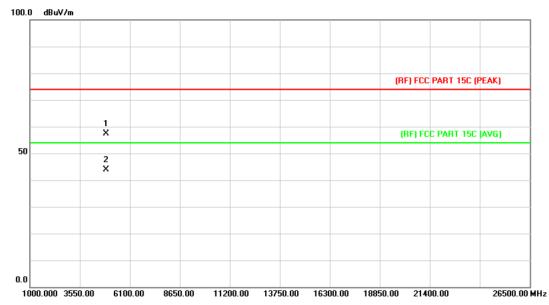


N	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4802.500	29.54	13.43	42.97	54.00	-11.03	AVG
2			4802.668	43.48	13.43	56.91	74.00	-17.09	peak



Page: 24 of 89

EUT:	Bluetooth earbuds Model Name : CT1					
Temperature:	25℃ Relative Humidity: 55%					
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX GFSK Mode 2441MHz		MILLER			
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					

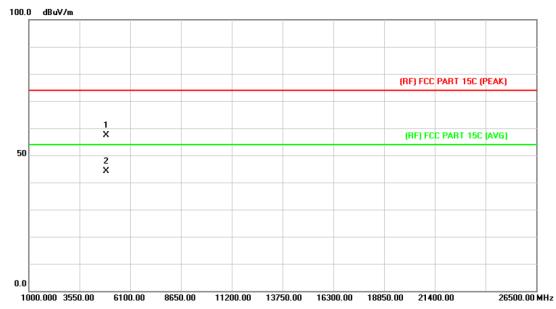


No	o. Mk	Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.006	43.57	13.90	57.47	74.00	-16.53	peak
2	*	4882.822	30.07	13.90	43.97	54.00	-10.03	AVG



Page: 25 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211					
Temperature:	25℃	55%						
Test Voltage:	DC 3.7V	DC 3.7V						
Ant. Pol.	Vertical							
Test Mode:	TX GFSK Mode 2441MHz		MILLER					
Remark: No report for the emission which more than 10 dB below the prescribed limit.								

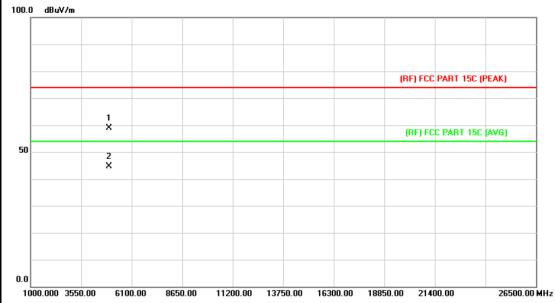


No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.064	43.60	13.90	57.50	74.00	-16.50	peak
2	*	4881.787	30.21	13.90	44.11	54.00	-9.89	AVG



Page: 26 of 89

EUT:	Bluetooth earbuds	CT15211						
Temperature:	25℃	55%						
Test Voltage:	DC 3.7V	DC 3.7V						
Ant. Pol.	Horizontal							
Test Mode:	TX GFSK Mode 2480MHz	W. P.	MILLIAM					
Remark:	mark: No report for the emission which more than 10 dB below the prescribed limit.							

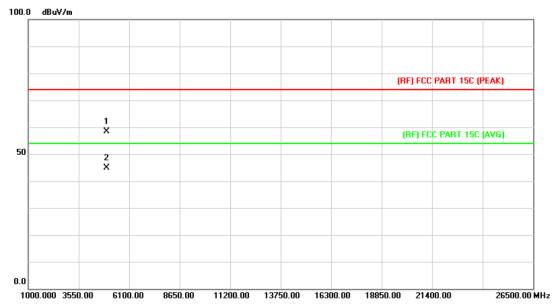


No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.913	44.46	14.36	58.82	74.00	-15.18	peak
2	*	4961.485	30.30	14.38	44.68	54.00	-9.32	AVG



Page: 27 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211						
Temperature:	25℃ Relative Humidity: 55								
Test Voltage:	DC 3.7V	DC 3.7V							
Ant. Pol.	Vertical								
Test Mode:	TX GFSK Mode 2480MHz		MILLER						
Remark:	Remark: No report for the emission which more than 10 dB below the prescribed limit.								
400.0 10.111									

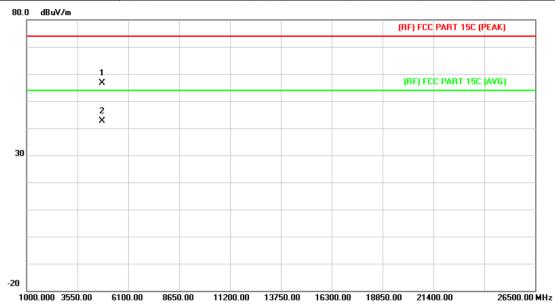


No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4958.917	43.92	14.35	58.27	74.00	-15.73	peak
2	*	4960.093	30.54	14.36	44.90	54.00	-9.10	AVG



Page: 28 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2402MHz		THURSDAY				
Remark:	No report for the emission which more than 10 dB below the						
	prescribed limit.						

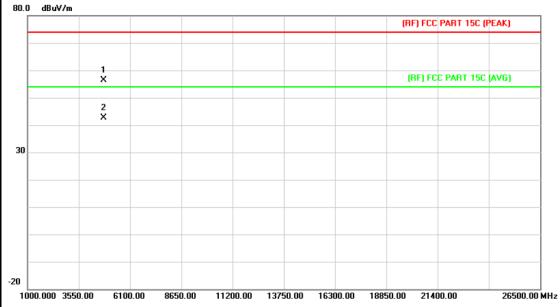


No	. Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4802.635	43.30	13.43	56.73	74.00	-17.27	peak
2	*	4804.156	29.13	13.44	42.57	54.00	-11.43	AVG



Page: 29 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211			
Temperature:	25℃	55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX 8-DPSK Mode 2402MHz		MILLER			
Remark:	No report for the emission which more than 10 dB below the prescribed limit.					
00.0 40-3/4-						



N	o. Mł	k. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.127	42.93	13.44	56.37	74.00	-17.63	peak
2	*	4804.861	29.12	13.44	42.56	54.00	-11.44	AVG



Page: 30 of 89

EUT:	Bluetooth earbuds Model Nan		CT15211				
Temperature:	25℃	25℃ Relative Humidity:					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2441MHz		HILL				
Remark:	Remark: No report for the emission which more than 10 dB below the prescribed limit.						



No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.034	44.12	13.90	58.02	74.00	-15.98	peak
2	*	4883.461	30.49	13.92	44.41	54.00	-9.59	AVG



Page: 31 of 89

EUT: Bluetooth earbuds		Model Name :	CT15211			
Temperature:	25℃	55%				
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical		A STATE OF			
Test Mode:	TX 8-DPSK Mode 2441MHz		CHILL			
Remark: No report for the emission which more than 10 dB below the prescribed limit.						

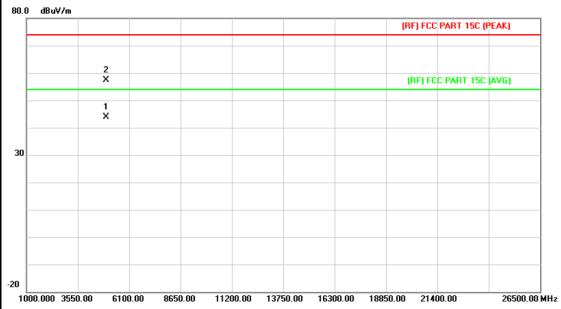


No	. Mk	. Freq.			Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.109	42.59	13.90	56.49	74.00	-17.51	peak
2	*	4881.772	29.47	13.90	43.37	54.00	-10.63	AVG



Page: 32 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Horizontal						
Test Mode:	TX 8-DPSK Mode 2480MHz	W. P.	MILLER				
Remark:	No report for the emission which more than 10 dB below the prescribed limit.						
80.0 dBuV/m							

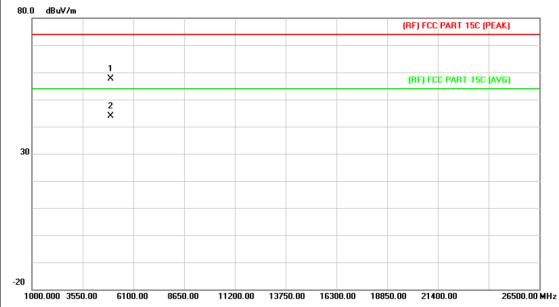


No	o. MI	k. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4958.545	29.60	14.35	43.95	54.00	-10.05	AVG
2		4961.347	43.07	14.38	57.45	74.00	-16.55	peak



Page: 33 of 89

EUT:	Bluetooth earbuds Model Name :		CT15211				
Temperature:	25℃	25℃ Relative Humidity:					
Test Voltage:	DC 3.7V	DC 3.7V					
Ant. Pol.	Vertical		1377				
Test Mode:	TX 8-DPSK Mode 2480MHz		HILL				
Remark:	Remark: No report for the emission which more than 10 dB below the prescribed limit.						



No	o. Mk	. Freq.			Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.504	43.31	14.36	57.67	74.00	-16.33	peak
2	*	4960.636	29.57	14.36	43.93	54.00	-10.07	AVG



Page: 34 of 89

# 6. Restricted Bands Requirement

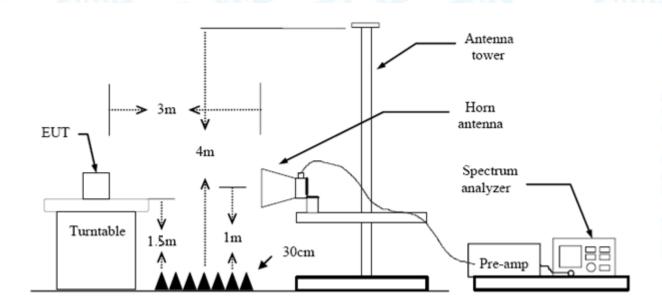
#### 6.1 Test Standard and Limit

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 54		
2310 ~2390	74			
2483.5 ~2500	74	54		

# 6.2 Test Setup



#### 6.3 Test Procedure

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



Report No.: TB-FCC150425 Page: 35 of 89

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

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

# 6.4 EUT Operating Condition

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

#### 6.4 Test Data

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

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



Page: 36 of 89

# (1) Radiation Test

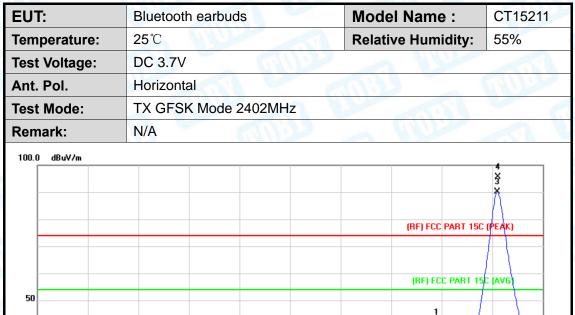
0.0

2311.000 2321.00

2331.00

2341.00

2351.00



No.	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.16	0.77	41.93	74.00	-32.07	peak
2		2390.000	30.20	0.77	30.97	54.00	-23.03	AVG
3	*	2402.000	89.37	0.82	90.19	Fundamental Frequency		AVG
4	Χ	2402.200	94.73	0.82	95.55	Fundamental	Frequency	peak

2361.00

2371.00

2381.00

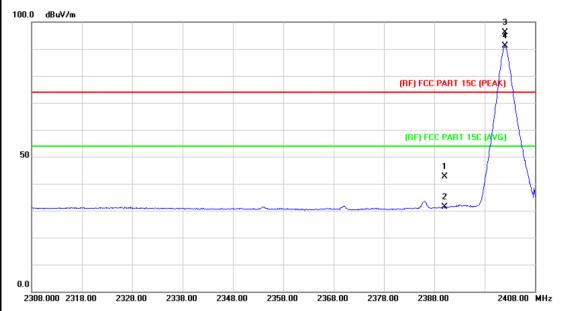
2391.00

2411.00 MHz



Page: 37 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211		
Temperature:	25℃	Relative Humidity:	55%		
Test Voltage:	DC 3.7V	WILL ST			
Ant. Pol.	Vertical				
Test Mode:	TX GFSK Mode 2402MHz		RROW		
Remark: N/A					
100.0 dBuV/m					

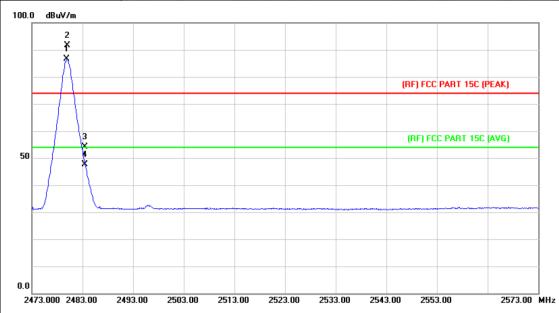


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.93	0.77	42.70	74.00	-31.30	peak
2		2390.000	30.58	0.77	31.35	54.00	-22.65	AVG
3	Χ	2402.000	95.24	0.82	96.06	Fundamental	Frequency	peak
4	*	2402.000	90.30	0.82	91.12	Fundamental	Frequency	AVG



Page: 38 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	and the	
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480 MHz	The second	MAN
Remark:	N/A	an B	

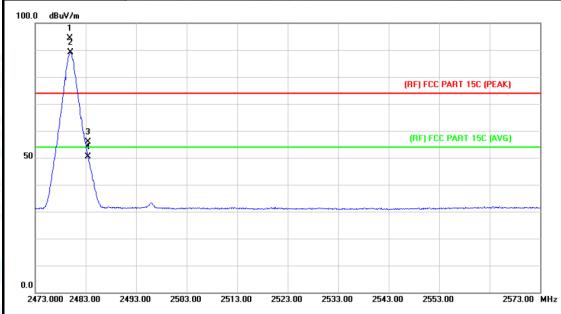


No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.900	85.54	1.15	86.69	Fundamenta	I Frequency	AVG
2	X	2480.000	90.55	1.15	91.70	Fundamenta	al Frequency	peak
3		2483.500	53.00	1.17	54.17	74.00	-19.83	peak
4		2483.500	46.38	1.17	47.55	54.00	-6.45	AVG



Page: 39 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		1377
Test Mode:	TX GFSK Mode 2480 MHz		CHILL
Remark:	N/A		

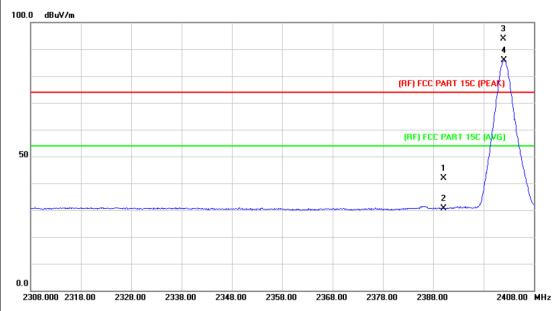


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.900	93.32	1.15	94.47	Fundamenta	I Frequency	peak
2	*	2480.000	87.98	1.15	89.13	Fundamenta	I Frequency	AVG
3		2483.500	54.73	1.17	55.90	74.00	-18.10	peak
4		2483.500	49.25	1.17	50.42	54.00	-3.58	AVG



Page: 40 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	and it	
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2402MHz	The same of the sa	A Property
Remark:	N/A		

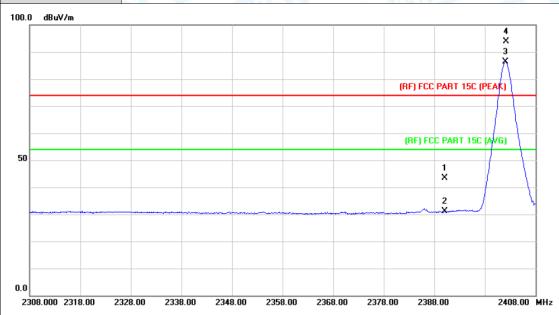


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.07	0.77	41.84	74.00	-32.16	peak
2		2390.000	29.81	0.77	30.58	54.00	-23.42	AVG
3	X	2401.900	93.00	0.82	93.82	Fundamental	Frequency	peak
4	*	2402.100	85.10	0.82	85.92	Fundamental	I Frequency	AVG



Page: 41 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	WILL ST	
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2402MHz		MAN
Remark:			
100.0 dBuV/m			
			4

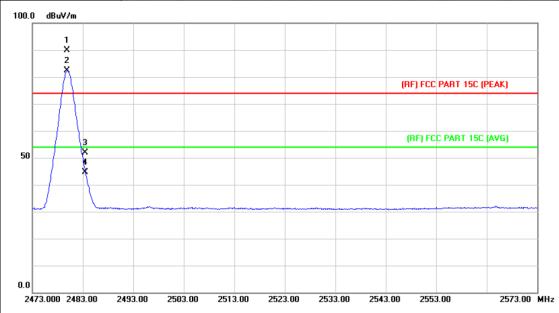


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.68	0.77	43.45	74.00	-30.55	peak
2		2390.000	30.32	0.77	31.09	54.00	-22.91	AVG
3	*	2402.100	85.47	0.82	86.29	Fundamental	Frequency	AVG
4	Χ	2402.200	93.13	0.82	93.95	Fundamental	Frequency	peak



Page: 42 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	will be	
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2480MHz		A Brown
Remark:	N/A		
Remark:	IN/A		



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2479.900	88.67	1.15	89.82	Fundamental	Frequency	peak
2	*	2479.900	81.27	1.15	82.42	Fundamental	Frequency	AVG
3		2483.500	50.60	1.17	51.77	74.00	-22.23	peak
4		2483.500	43.43	1.17	44.60	54.00	-9.40	AVG



3

4

Report No.: TB-FCC150425

Page: 43 of 89

EUT:	Blue	tooth earbuc	ls	Mod	del Name :	CT15211
Temperature:	<b>25</b> ℃			Rela	tive Humidity:	55%
Test Voltage:	DC 3	3.7V		10	WILL ST	
Ant. Pol.	Verti	cal	Alle			
Test Mode:	TX 8	-DPSK Mod	e 2480MHz			ARTIC
Remark:	N/A	N. S.			CONTRACTOR OF THE PARTY OF THE	
100.0 dBuV/m						
1 X 2 X						
					(RF) FCC PART 150	C (PEAK)
3					(RF) FCC PART 19	5C (AVG)
50 4						
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<u></u>					
0.0						
2473.000 2483.00	2493.00	2503.00 251	3.00 2523.00	2533.00 2	2543.00 2553.00	2573.00 MHz
		Reading	Correct	Measure-		
No. Mk.	Freq.	Level	Factor	ment	Limit Ov	er
	MHz	dBu∀	dB/m	dBuV/m	dBuV/m d€	B Detector
1 X 2	479.900	91.39	1.15	92.54	Fundamental Freque	ency peak
2 * 24	480.000	83.66	1.15	84.81	Fundamental Freque	ency AVG

53.88

47.60

74.00

54.00

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

52.71

46.43

1.17

1.17

2483.500

2483.500

peak

AVG

-20.12

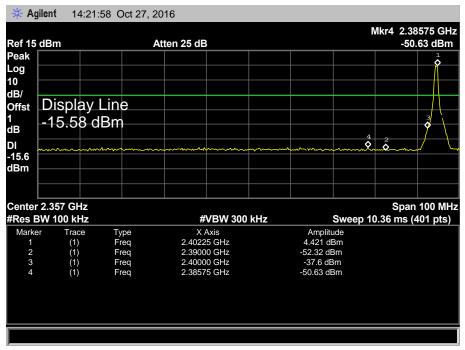
-6.40

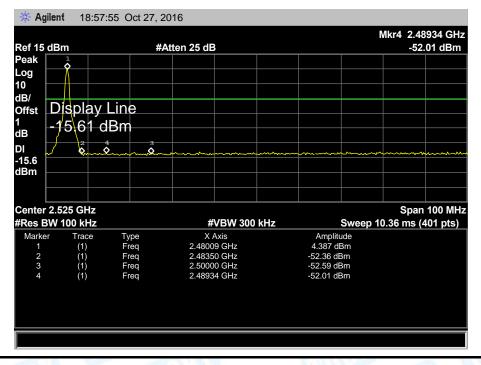


Page: 44 of 89

# (2) Conducted Test

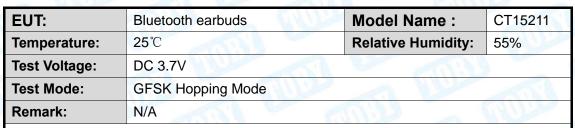
EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX GFSK Mode 2402MHz / 2480	MHz	
Remark:	N/A		5

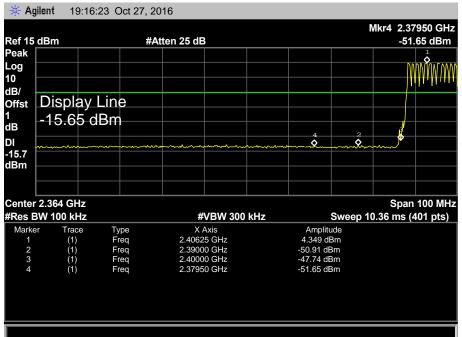


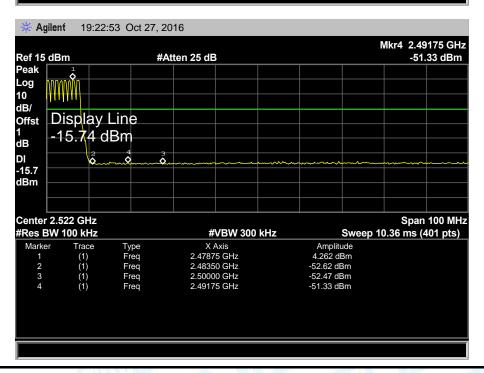




Page: 45 of 89



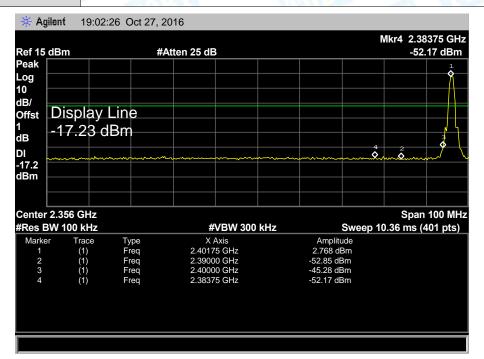


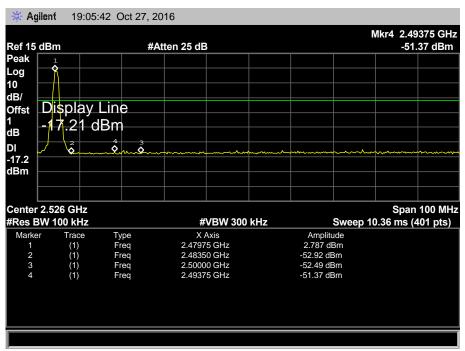




Report No.: TB-FCC150425 Page: 46 of 89

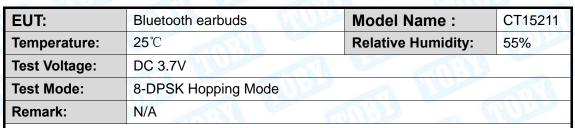
EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	TO B	
Test Mode:	TX 8-DPSK Mode 2402MHz / 248	80 MHz	A STATE OF
Remark:	N/A		THE STATE OF

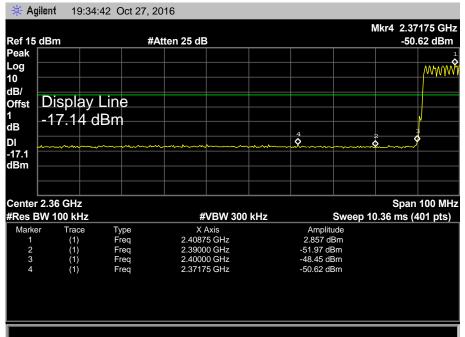


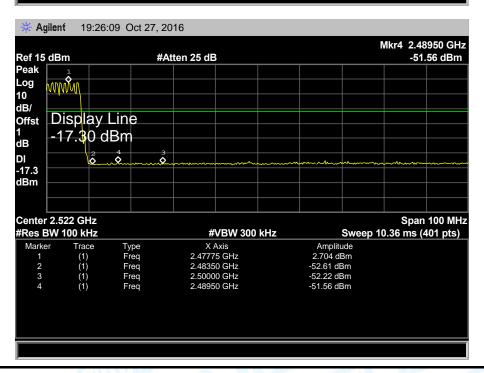




Page: 47 of 89









Page: 48 of 89

# 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

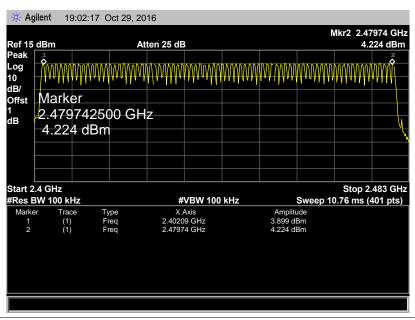


Page: 49 of 89

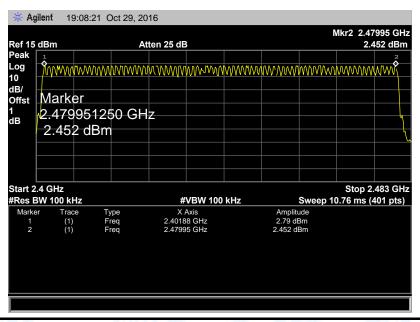
EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	WILL ST	
Test Mode:	Hopping Mode (GFSK/8-DPSK)		0.677

Frequency Range	Quantity of Hopping Channel	Limit
2402MH= 2400MH=	79	<b>- 4</b> F
2402MHz~2480MHz	79	>15

#### **GFSK Mode**



#### 8-DPSK Mode





Page: 50 of 89

# 8. Average Time of Occupancy

### 8.1 Test Standard and Limit

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

8.1.2 Test Limit

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

# 8.2 Test Setup



#### 8.3 Test Procedure

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

### 8.4 EUT Operating Condition

The average time of occupancy on any channel within the Period can be calculated with formulas:

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

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

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

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



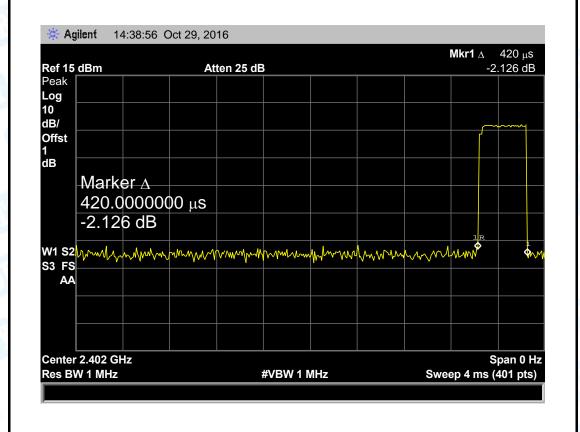
Page: 51 of 89

### 8.5 Test Data

EUT:	Bluetooth ea	Bluetooth earbuds		Model Name :	
Temperature:	25℃		Relative Hum	idity:	55%
Test Voltage:	DC 3.7V	MILL			
Test Mode:	Hopping Mod	de (GFSK DH1)	CILLER		Millian
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Pocult
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	0.420	134.40			
2441	0.420	134.40	31.60	400	PASS
2480	0.420	134.40			
Note: Dwell time. Dules Time (ms) (4000 2 70) 24.0					

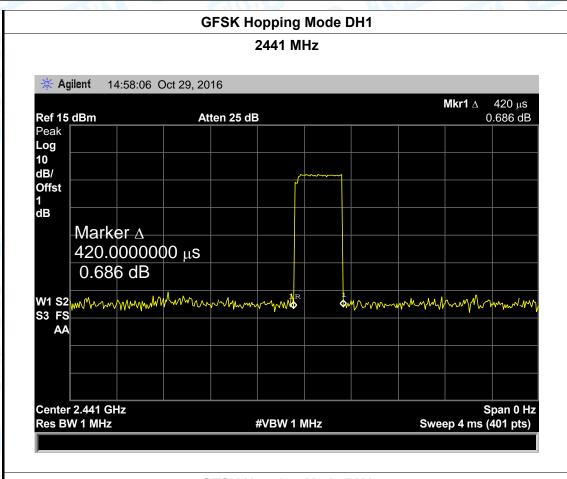
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  2  $\div$  79)  $\times$ 31.6

### **GFSK Hopping Mode DH1**

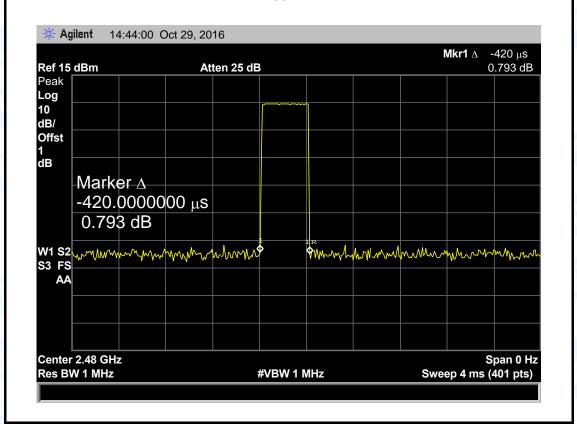




Page: 52 of 89







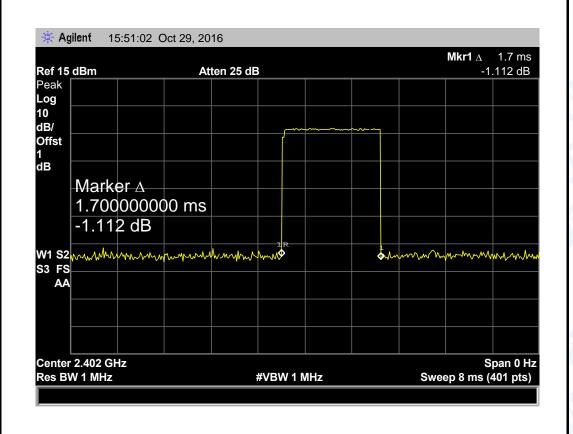


Page: 53 of 89

EUT:	Bluetooth e	Bluetooth earbuds		e :	CT15211
Temperature:	25℃	25℃		idity:	55%
Test Voltage:	DC 3.7V	130	1	1	
Test Mode:	Hopping M	ode (GFSK DH3)			
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Nesuit
2402	1.700	272.00			
2441	1.700	272.00	31.60	400	PASS
2480	1.700	272.00			

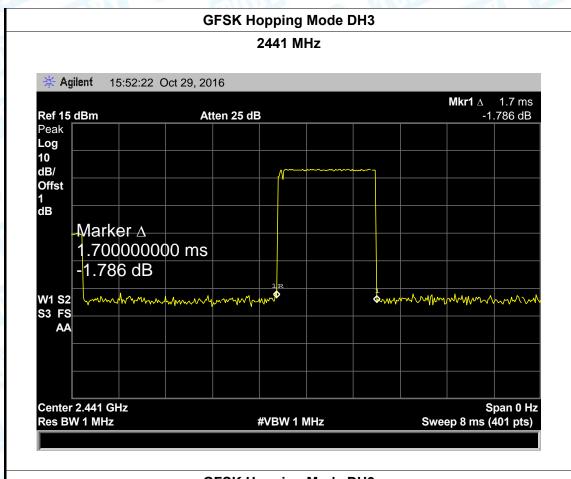
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  4  $\div$  79)  $\times$ 31.6

### **GFSK Hopping Mode DH3**

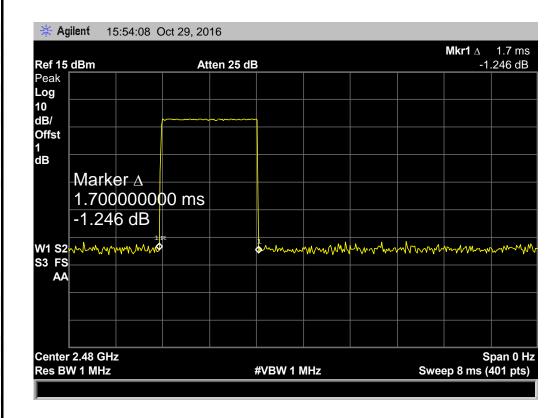




Page: 54 of 89







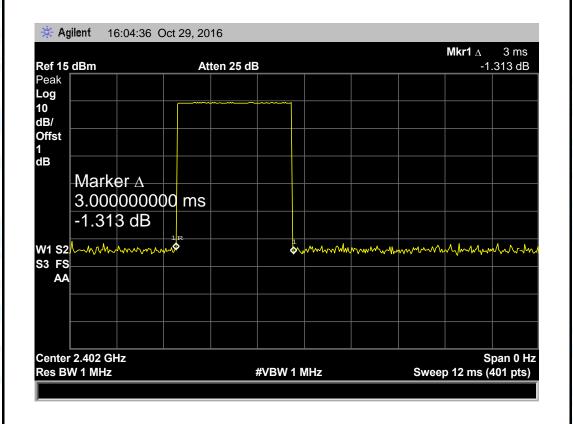


Page: 55 of 89

EUT:	Bluetooth e	Bluetooth earbuds		e :	CT15211
Temperature	: 25°C	25℃		idity:	55%
Test Voltage:	DC 3.7V	130	1		
Test Mode:	Hopping M	ode (GFSK DH5)			
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

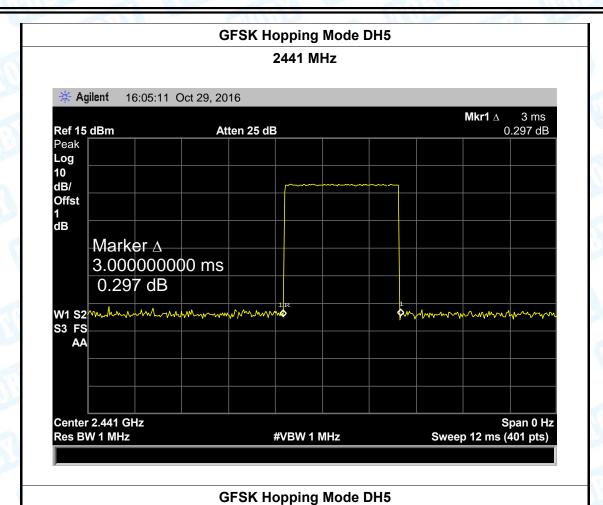
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  6  $\div$  79)  $\times$ 31.6

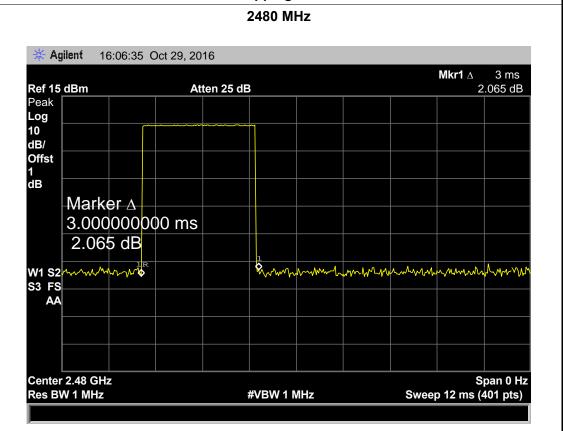
### **GFSK Hopping Mode DH5**





Page: 56 of 89





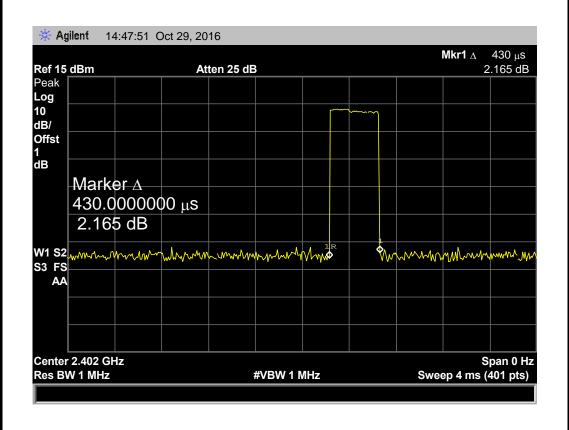


Page: 57 of 89

EUT:	Bluetooth e	Bluetooth earbuds		Model Name :	
Temperature	: <b>25</b> ℃		Relative Hum	idity:	55%
Test Voltage:	DC 3.7V	133	1		
Test Mode:	Hopping M	ode (π/4-DQPSK DH	1)	301	
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	0.430	137.60			
2441	0.430	137.60	31.60	400	PASS
2480	0.430	137.60			

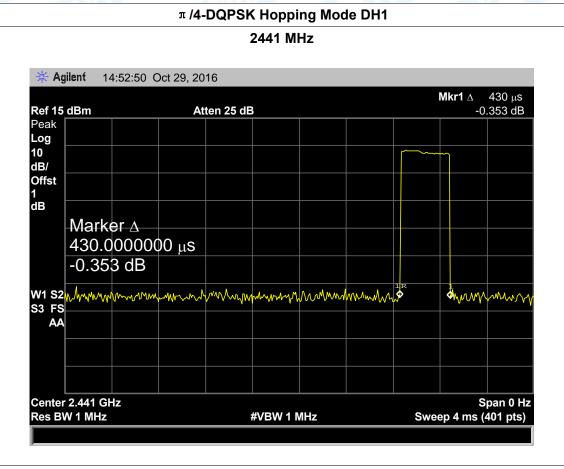
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  2  $\div$  79)  $\times$ 31.6

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

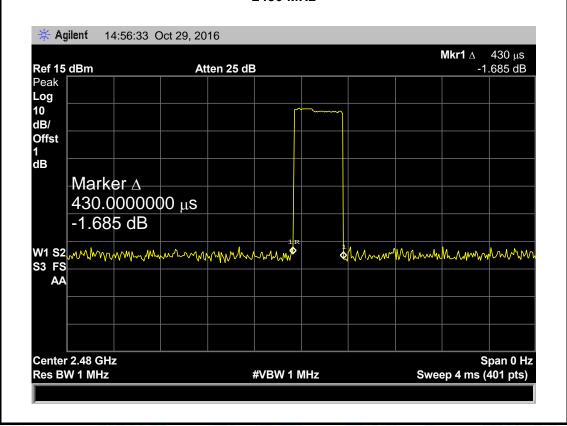




Page: 58 of 89



#### π /4-DQPSK Hopping Mode DH1





Page: 59 of 89

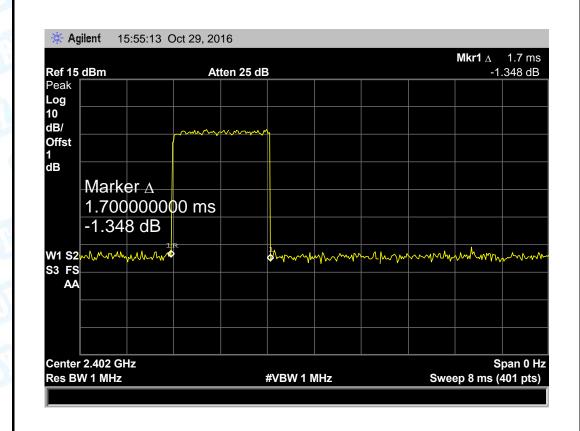
EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

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

root mode.	rispping meas ( 7, 2 d. e. e. e. e.				
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.700	272.00			
2441	1.700	272.00	31.60	400	PASS
2480	1.700	272.00			

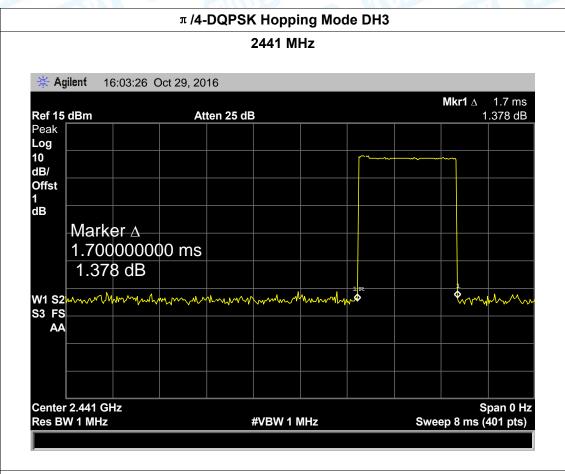
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  4  $\div$  79)  $\times$ 31.6

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

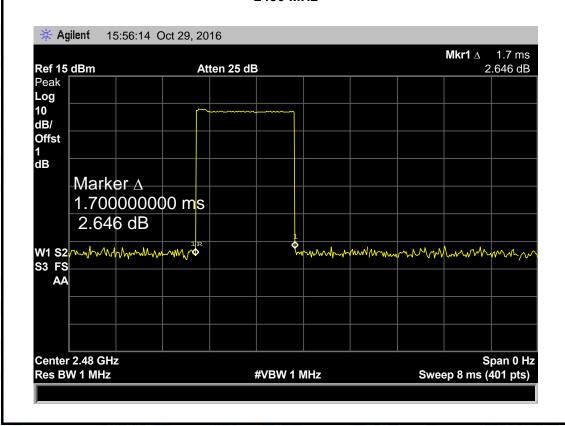




Page: 60 of 89







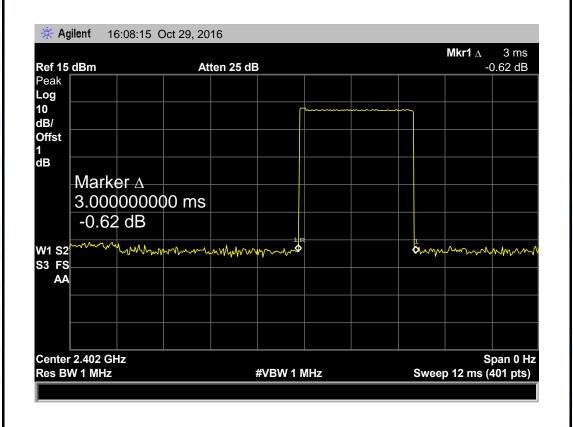


Page: 61 of 89

EUT:	Bluetooth e	earbuds	Model Name :		CT15211
Temperature	: <b>25</b> ℃		Relative Humidity:		55%
Test Voltage:	DC 3.7V	DC 3.7V			
Test Mode:	Hopping M	ode ( $\pi$ /4-DQPSK DH	5)	1	
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

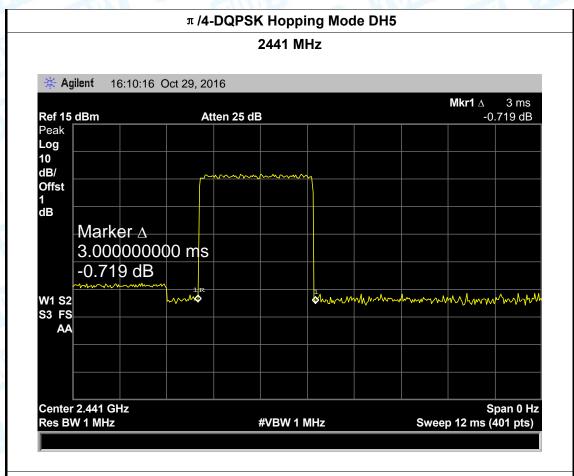
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  6  $\div$  79)  $\times$ 31.6

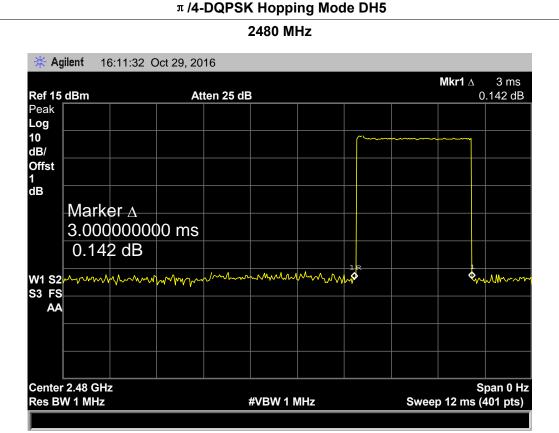
### $\pi$ /4-DQPSK Hopping Mode DH5





Page: 62 of 89





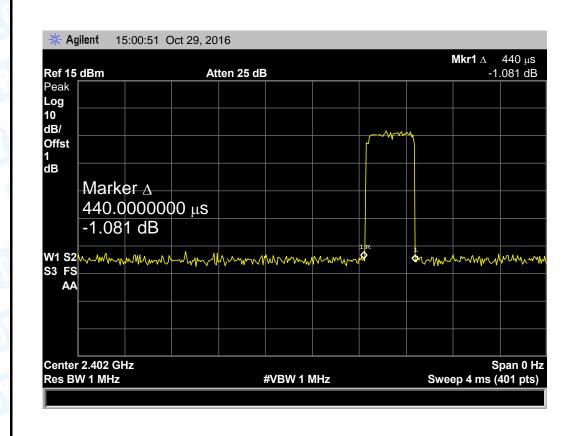


Page: 63 of 89

Bluetooth e	arbuds	Model Name	e :	CT15211
25℃	E(1) 112			
		Relative Hum	idity:	55%
DC 3.7V			Aller	
Hopping M	ode (8-DPSK DH1)		M'S	
Pulse Time	Total of Dwell (ma)	Period Time	Limit	Result
(ms)	Total of Dwell (IIIs)	(s)	(ms)	Result
0.440	140.80			
0.440	140.80	31.60	400	PASS
0.440	140.80			
	Hopping Morulse Time (ms) 0.440 0.440	Hopping Mode (8-DPSK DH1)  Pulse Time (ms)  0.440  140.80  0.440  140.80	Hopping Mode (8-DPSK DH1)  Pulse Time (ms)  0.440  140.80  0.440  140.80  31.60	Hopping Mode (8-DPSK DH1)  Pulse Time (ms)  0.440  140.80  0.440  140.80  31.60  400

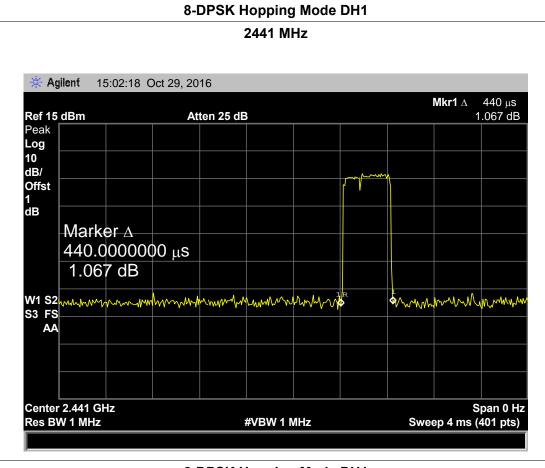
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  2  $\div$  79)  $\times$ 31.6

## 8-DPSK Hopping Mode DH1

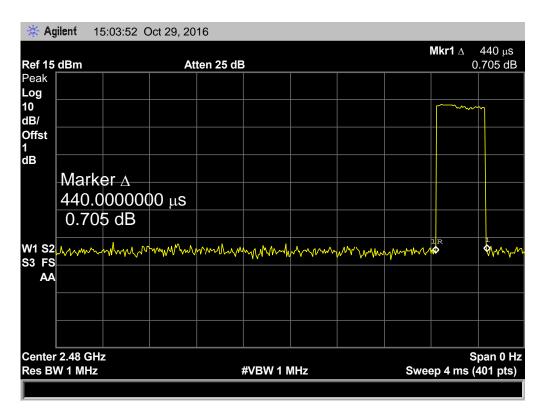




Page: 64 of 89



### 8-DPSK Hopping Mode DH1



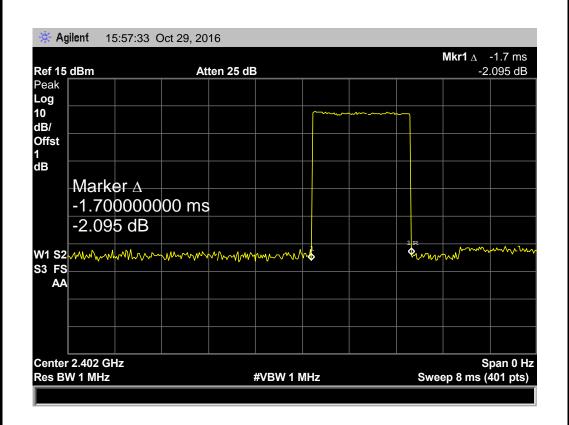


Page: 65 of 89

EUT:	Bluetooth e	earbuds	<b>Model Name</b>	CT15211	
Temperature:	: <b>25</b> ℃		Relative Humidity:		55%
Test Voltage:	DC 3.7V	HILL STATE	1	133	
Test Mode:	Hopping M	ode (8-DPSK DH3)			1000
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	1.700	272.00			
2441	1.700	1.700 272.00 3		31.60 400	PASS
2480	1.700	272.00			

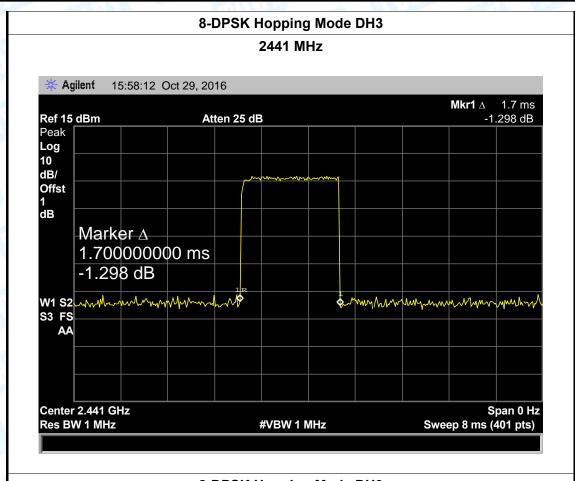
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  4  $\div$  79)  $\times$ 31.6

### 8-DPSK Hopping Mode DH3

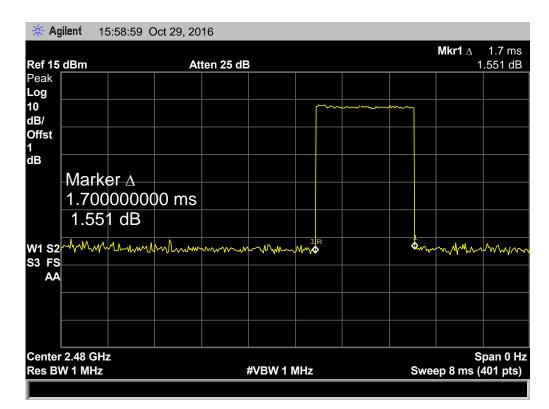




Page: 66 of 89







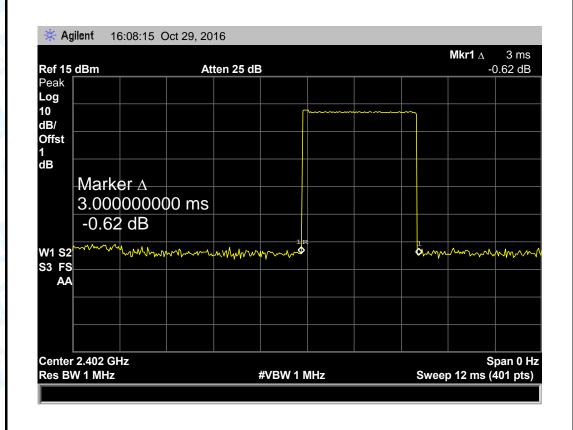


Page: 67 of 89

EUT:	Bluetooth e	earbuds	Model Name	e :	CT15211
Temperature:	: <b>25</b> ℃		Relative Hum	Relative Humidity:	
Test Voltage:	DC 3.7V	DC 3.7V			
Test Mode:	Hopping M	ode (8-DPSK DH5)			A STORY
Channel	Pulse Time	Total of Dwell	Period Time	Limit	Result
(MHz)	(ms)	(ms)	(s)	(ms)	Result
2402	3.000	320.00			
2441	3.000	320.00	31.60	400	PASS
2480	3.000	320.00			

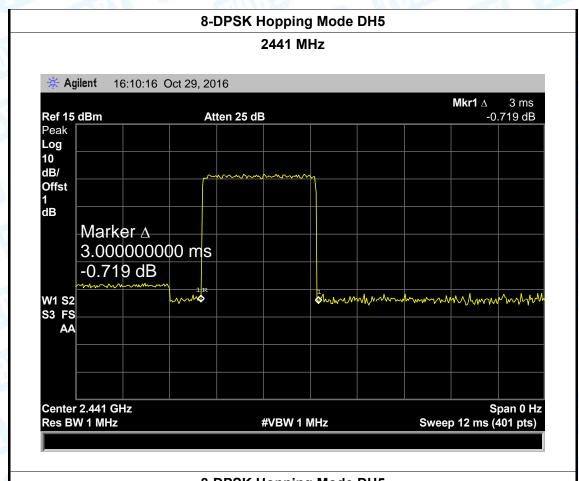
Note: Dwell time=Pulse Time (ms)  $\times$  (1600  $\div$  6  $\div$  79)  $\times$ 31.6

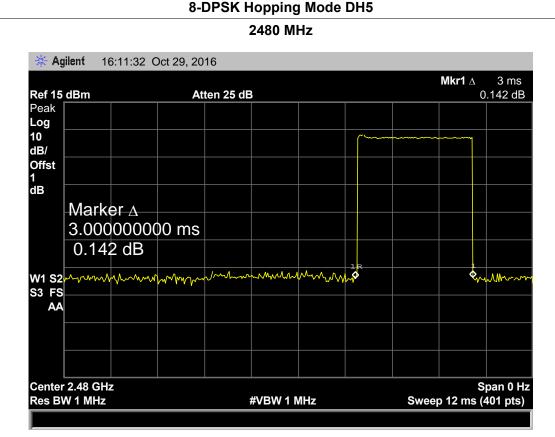
### 8-DPSK Hopping Mode DH5





Page: 68 of 89







Page: 69 of 89

# 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.

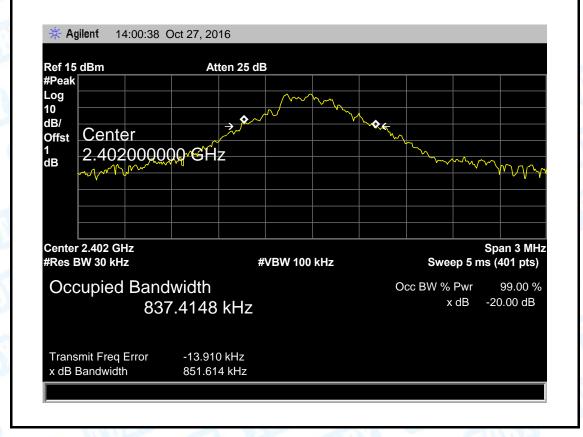


Page: 70 of 89

### 9.5 Test Data

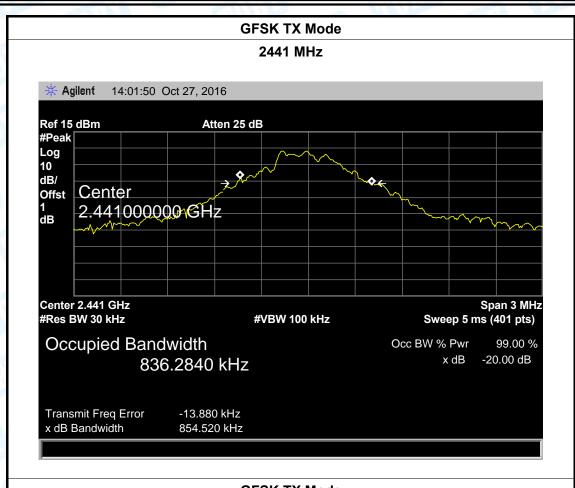
EUT: Bluetooth earbuds		etooth earbuds	Model Name :	CT15211
Temperature: 25°C		C	Relative Humidity:	55%
Test Voltage: DC 3.7V				Comment of the Commen
Test Mode:	TX	Mode (GFSK)	CILL DO	MAC
Channel frequency (MHz)		99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402		837.4148	851.614	
2441		836.2840	854.520	
2480		826.1818	846.045	

#### **GFSK TX Mode**

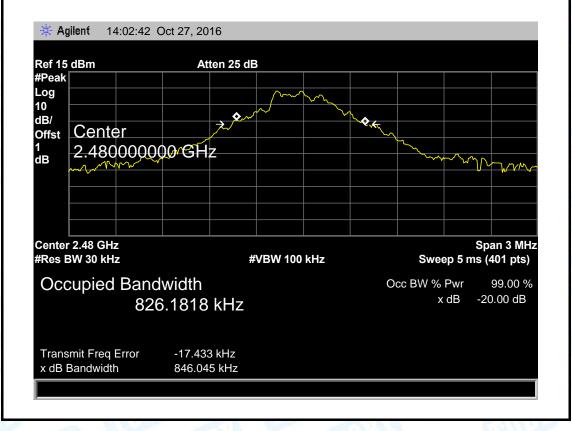




Page: 71 of 89



# GFSK TX Mode 2480 MHz





2480

Report No.: TB-FCC150425

820.00

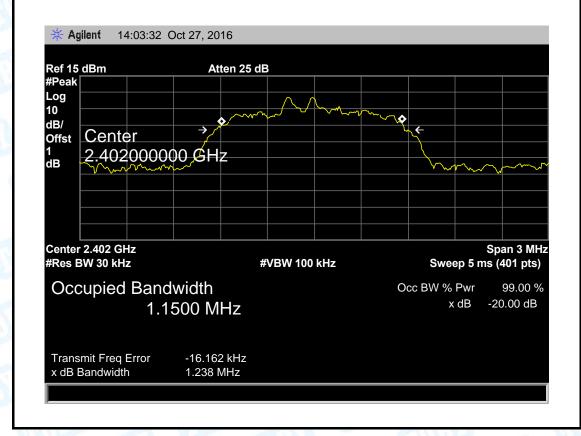
Page: 72 of 89

EUT:	UT: Bluetooth earbuds		Model Name :	CT15211
Temperature:	Temperature: 25°C			55%
Test Voltage:	DC	3.7V		3
Test Mode: ΤΧ Mode ( π /4-DQPSK)				1337
Channel frequency (MHz)		99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402		1150.00	1238.00	825.33
2441		1151.70	1239.00	826.00

#### π/4-DQPSK TX Mode

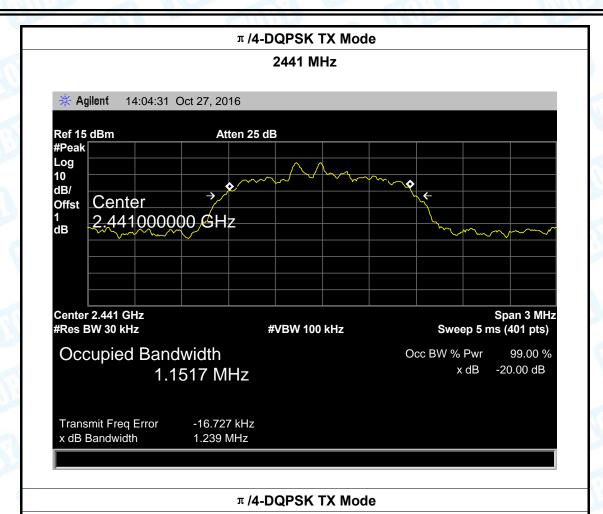
1230.00

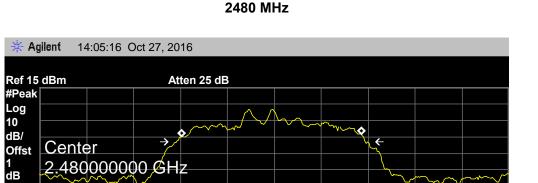
1152.10





73 of 89 Page:





## Center 2.48 GHz #Res BW 30 kHz Occupied Bandwidth

**#VBW 100 kHz** 

Sweep 5 ms (401 pts) Occ BW % Pwr 99.00 %

Span 3 MHz

-20.00 dB

Transmit Freq Error -17.573 kHz x dB Bandwidth 1.230 MHz

1.1521 MHz

TB-RF-074-1.0

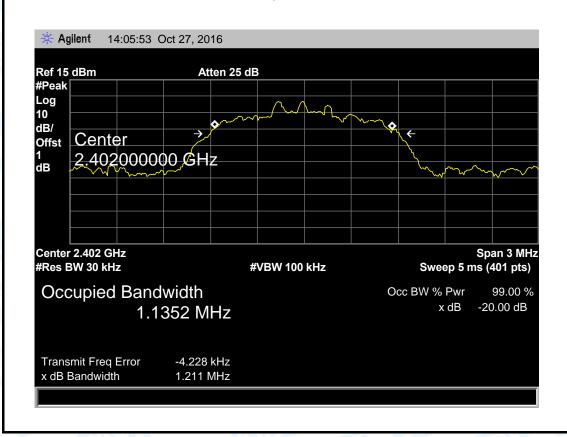


Page: 74 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	<b>25</b> ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		A STEEL
Test Mode:	TX Mode (8-DPSK)		CHILITIES
			00.15

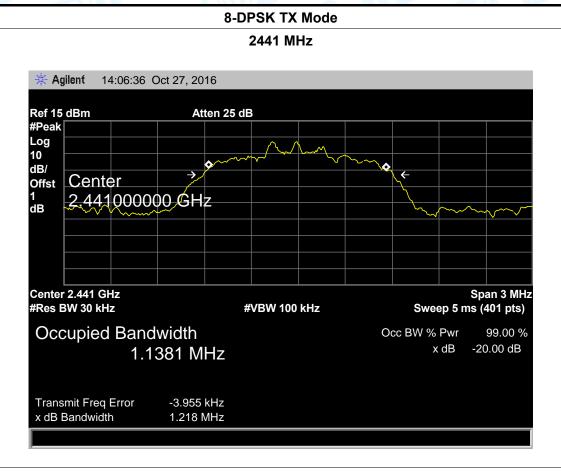
Channel frequency (MHz)	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402	1135.20	1211.00	807.33
2441	1138.10	1218.00	812.00
2480	1126.80	1216.00	810.67

### 8-DPSK TX Mode

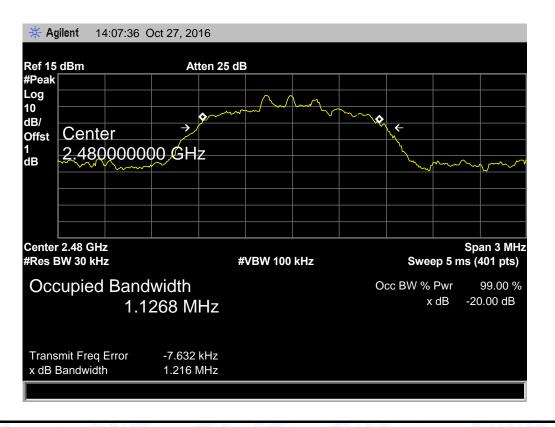




Page: 75 of 89



## 8-DPSK TX Mode





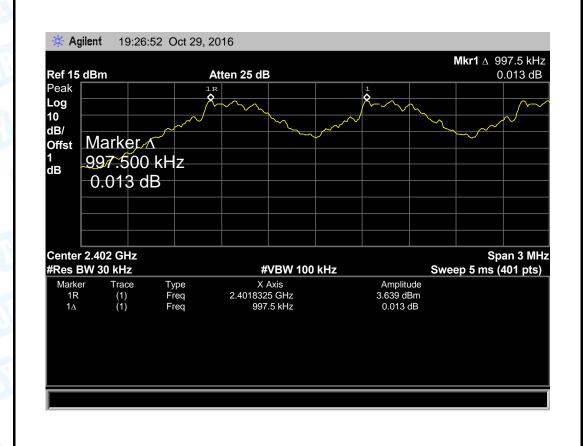
Page: 76 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	A WWW	

Test Mode: Hopping Mode (GFSK)

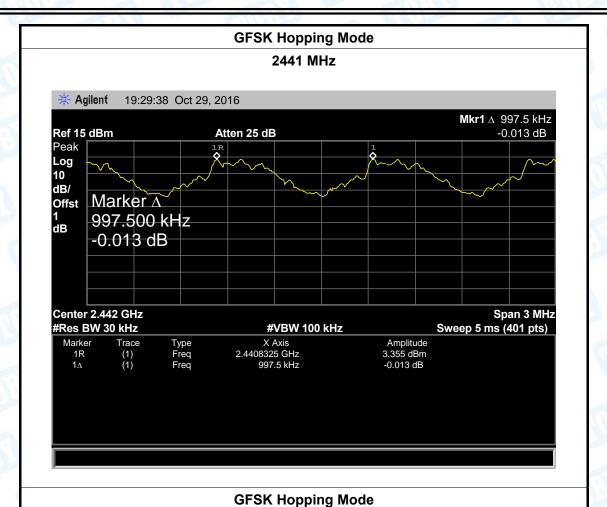
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	997.50	851.614
2441	997.50	854.520
2480	997.50	846.045

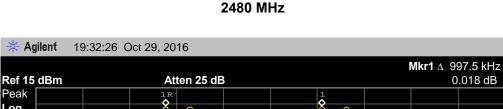
## **GFSK Hopping Mode**





77 of 89 Page:









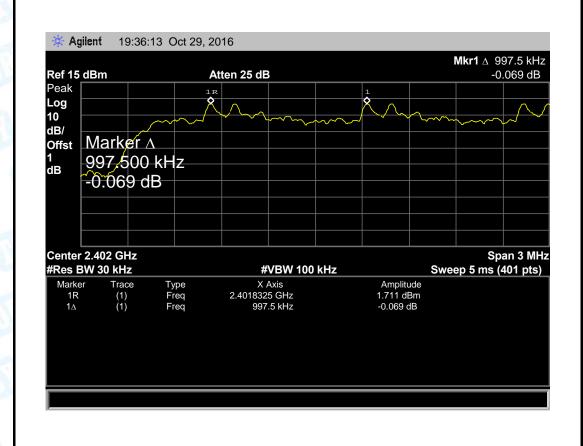
Page: 78 of 89

EUT:	Bluetooth earbuds	Model Name :	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V	WW.	

Test Mode: Hopping Mode ( π /4-DQPSK)

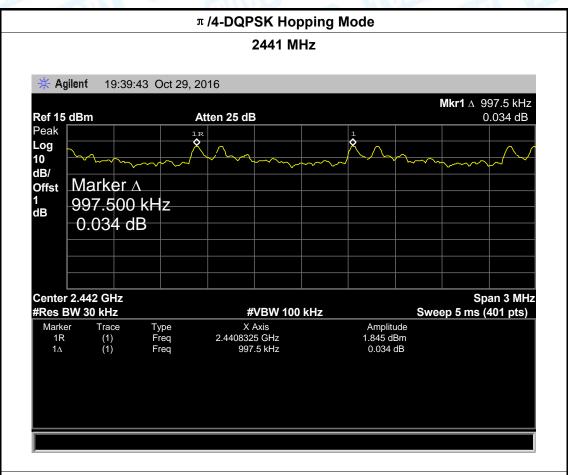
		and the same of th
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	997.50	825.33
2441	997.50	826.00
2480	997.50	820.00

### π /4-DQPSK Hopping Mode

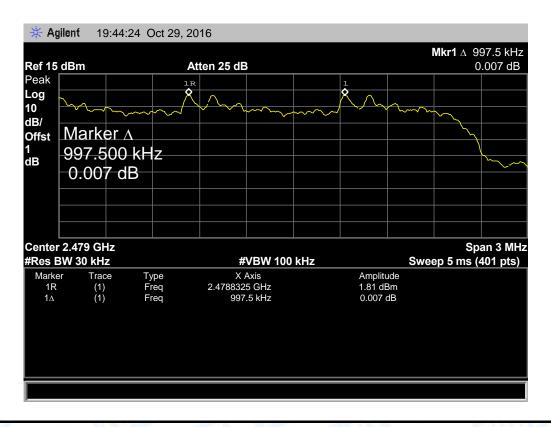




79 of 89 Page:



# π /4-DQPSK Hopping Mode





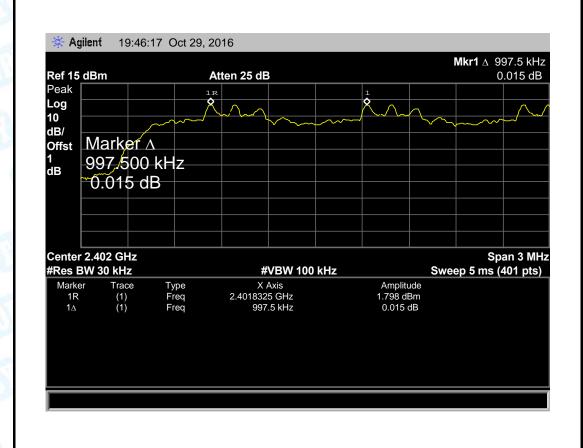
Page: 80 of 89

EUT:	Bluetooth earbuds	Model Name:	CT15211
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

Test Mode: Hopping Mode (8-DPSK)

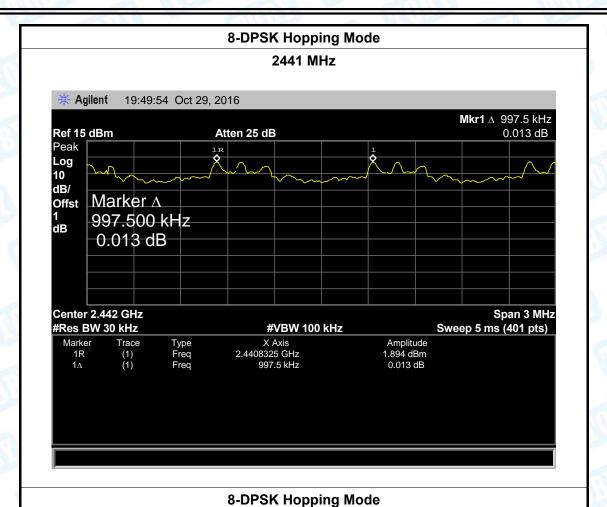
Channel frequency	Separation Read Value	Separation Limit
(MHz)	(kHz)	(kHz)
2402	997.50	807.33
2441	997.50	812.00
2480	997.50	810.67

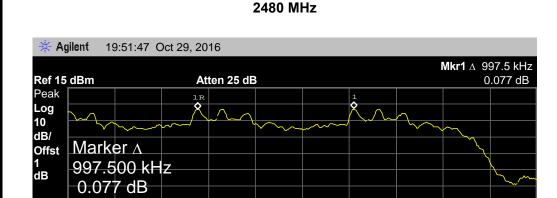
## 8-DPSK Hopping Mode





81 of 89 Page:





enter 2.4 Res BW	179 GHz		#VBW 100	kU=		Sura	Sp ep 5 ms (4	an 3 M
				КПZ			ep a ms (4	401 pts
Marker 1R	Trace	Type Freq	X Axis 2.4788325 GHz		Amplitud 1.78 dBn			
1Α 1Δ	(1) (1)	Freq	997.5 kHz		0.077 dE			



Page: 82 of 89

# 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)	2400~2483.5
	Other <125 mW(21dBm)	

# 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.



3.035 dBm

M1 S2 S3 FC AA

Center 2.402 GHz #Res BW 1 MHz Report No.: TB-FCC150425

Page: 83 of 89

# 10.5 Test Data

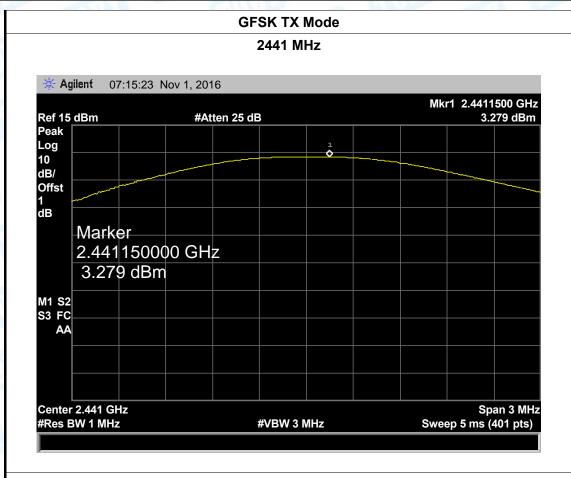
Bluetooth ea	arbuds	Model Name :		CT15211		
25℃	ann.		Relative Humidity:		55%	
DC 3.7V	33	6	119.00		MAIN	
TX Mode (G	SFSK)	18		THE STATE		
ncy (MHz)	Test Result (	(dBm)		Limit (	dBm)	
	3.035					
	3.279			30	)	
	3.317	3.317				
	GFSK TX N	lode	·			
	2402 MF	lz				
	2402 MF	lz				
14:59 Nov 1 20		Iz				
:14:58 Nov 1, 20		Iz		Mkr1 2.40	21200 GHz	
		Iz			21200 GHz 3.035 dBm	
	16	1				
	16					
	16	1				
	16	1				
	16	1				
	25°C DC 3.7V TX Mode (G	DC 3.7V TX Mode (GFSK)  (cy (MHz) Test Result (  3.035 3.279 3.317 GFSK TX M	25℃ DC 3.7V TX Mode (GFSK)  ccy (MHz) Test Result (dBm) 3.035 3.279 3.317 GFSK TX Mode	25℃ Relative  DC 3.7V  TX Mode (GFSK)  cy (MHz) Test Result (dBm)  3.035  3.279  3.317  GFSK TX Mode	25 °C Relative Humidity:  DC 3.7V  TX Mode (GFSK)  cy (MHz) Test Result (dBm) Limit (dBm)  3.035  3.279  3.317	

#VBW 3 MHz

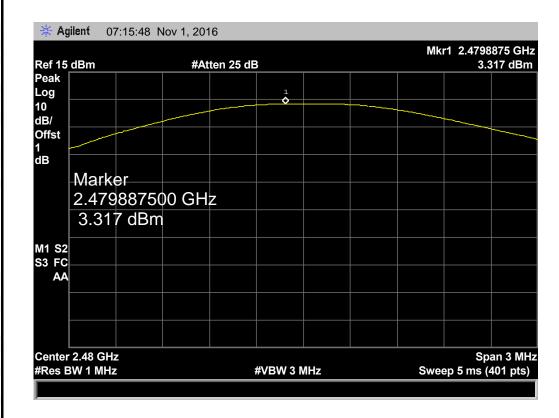
Span 3 MHz Sweep 5 ms (401 pts)



Page: 84 of 89



# **GFSK TX Mode**

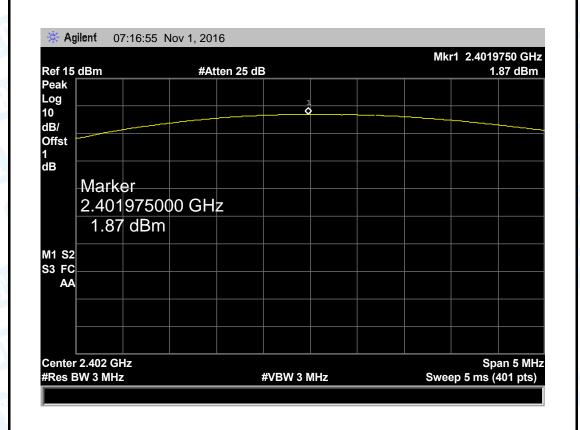




Page: 85 of 89

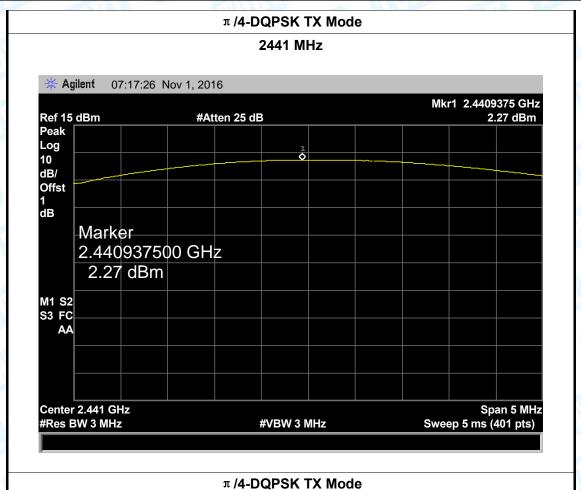
EUT:	Bluetooth	earbuds Model Name :		CT15211	
Temperature:	25℃	100		ive Humidity:	55%
Test Voltage:	DC 3.7V	THE PARTY OF THE P	1	181	
Test Mode:	TX Mode	(π/4-DQPSK)		1 Million	
Channel frequen	cy (MHz)	Test Result (dBm)	)	Limit (	dBm)
2402		1.870			
2441		2.270	21		
2480		2.336			
		π /4-DOPSK TX Mo	de		

#### π/4-DQPSK TX Mode

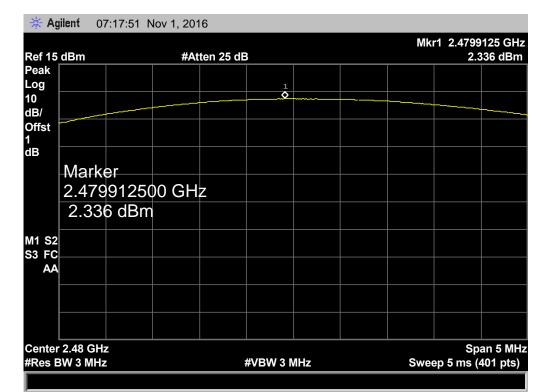




Page: 86 of 89





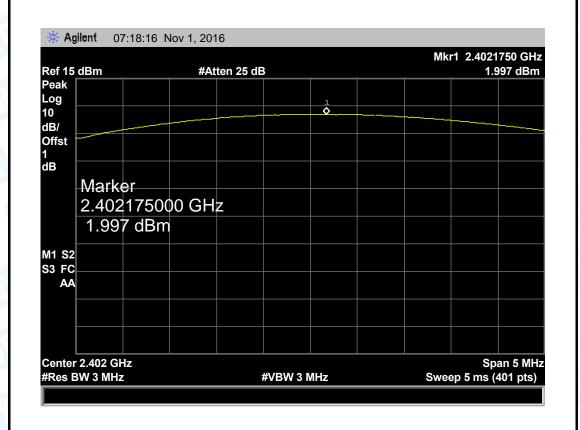




Page: 87 of 89

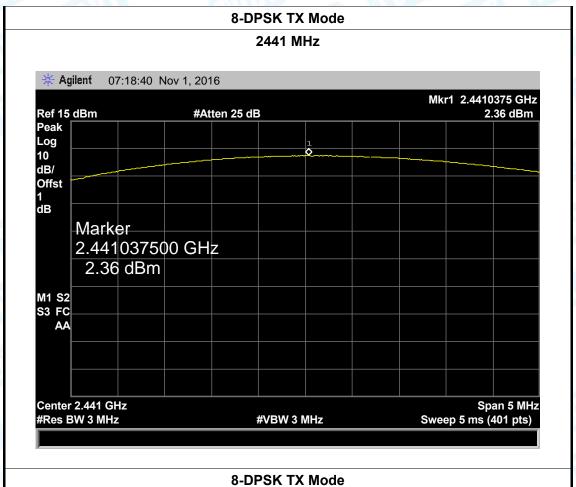
EUT:	Bluetooth earbuds		Model Name :		CT15211
Temperature:	25℃		Relative Humidity:		55%
Test Voltage:	DC 3.7V	The same of the sa	1		
Test Mode:	TX Mode (8-DPSK)				
Channel frequency (MHz)		Test Result (dBm)		Limit (dBm)	
2402		1.997			
2441		2.360		21	
2480		2.421			
		O DDCK TV Mode			

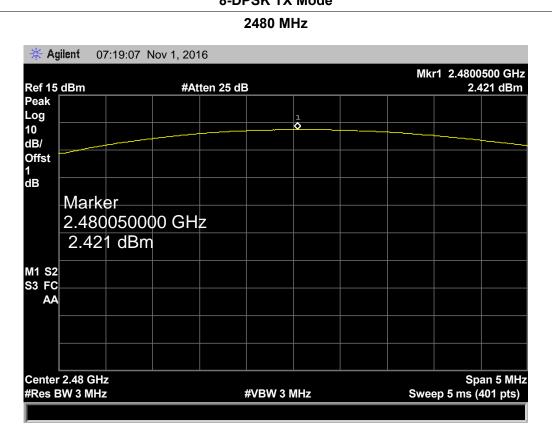
## 8-DPSK TX Mode





Page: 88 of 89







Page: 89 of 89

# 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 1.5dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

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

Antenna Type				
A DU	▼ Permanent attached antenna			
	□ Unique connector antenna			
3	□ Professional installation antenna			

----END OF REPORT----