

TEST REPORT

FCC ID: 2AMSOCHBT-707

Product: BLUETOOTH HEADPHONE

Model No.: CHBT-707

Additional Model No.: CHBT-707-BLK, CHBT-707-RED, CHBT-707-WHT

Trade Mark: COBY

Report No.: TCT180411E023

Issued Date: Apr. 17, 2018

Issued for:

Summit Electronics LLC

1 Rewe Street, Brooklyn, New York, 11211 United States

Issued By:

Shenzhen Tongce Testing Lab.

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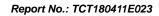




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1. Test Certification

Report No.: TCT180411E023

Product:	BLUETOOTH H	IEADPHONE			
Model No.:	CHBT-707		()	(2)	(, c)
Additional Model:	CHBT-707-BLK	, CHBT-707-RE	D, CHBT-707-	WHT	
Trade Mark:	COBY				
Applicant:	Summit Electron	nics LLC			
Address:	1 Rewe Street,	Brooklyn, New `	York, 11211 Ur	nited States	(c)
Manufacturer:	Summit Electron	nics LLC	7		
Address:	1 Rewe Street,	Brooklyn, New `	York, 11211 Ur	nited States	
Date of Test:	Apr. 12, 2018 –	Apr. 16, 2018			
Applicable Standards:	FCC CFR Title	47 Part 15 Subp	part C Section	15.247	

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

	1 (0) 100			
Tested By:	Jerry Lie	Date:	Apr. 16, 2018	
(c)	Jerry Xie	Q	(4)	
Reviewed By:	Bery zharo	Date:	Apr. 17, 2018	
	Beryl Zhao			
Approved By:	Tomsin	Date:	Apr. 17, 2018	
(,0)	Tomsin	7	.C)	



2. Test Result Summary

Requirement	CFR 47 Section		Result
Antenna Requirement	§15.203/§15.247 (c)	(3)	PASS
AC Power Line Conducted Emission	§15.207		PASS
Conducted Peak Output Power	§15.247 (b)(1) §2.1046		PASS
20dB Occupied Bandwidth	§15.247 (a)(1) §2.1049	(5)	PASS
Carrier Frequencies Separation	§15.247 (a)(1)		PASS
Hopping Channel Number	§15.247 (a)(1)		PASS
Dwell Time	§15.247 (a)(1)	(5)	PASS
Radiated Emission	§15.205/§15.209 §2.1053, §2.1057		PASS
Band Edge	§15.247(d) §2.1051, §2.1057		PASS

Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.



3. EUT Description

	 Report No.: TOT 10041120	,23

Product Name:	BLUETOOTH HEADPHONE		
Model:	CHBT-707		
Additional Model:	CHBT-707-BLK, CHBT-707-RED, CHBT-707-WHT		
Trade Mark:	СОВҮ		
Hardware Version:	V1.0		
Software Version:	V1.0		
Bluetooth version:	V3.0		
Operation Frequency:	2402MHz~2480MHz		
Transfer Rate:	1/2/3 Mbits/s		
Number of Channel:	79		
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK		
Modulation Technology:	FHSS		
Antenna Type:	PCB Antenna		
Antenna Gain:	0dBi		
Power Supply:	Rechargeable Li-ion Battery DC3.7V		
Remark:	All models above are identical in interior structure, electrical circuits and components, just colors are different for the marketing requirement.		

Operation Frequency each of channel for GFSK, π/4-DQPSK, 8DPSK

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	- 60	2462MHz
9)1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
	<u></u>						···
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		-
	Channel 0, 3 on mode.	9 &78 ha	ve been tes	ted for G	FSK, π/4-D0	QPSK, 8D	PSK



4. Genera Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery

The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
1	1	/ /		

Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

• FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

• IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

Tel: 86-755-27673339

5.3. 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 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

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6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement: FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

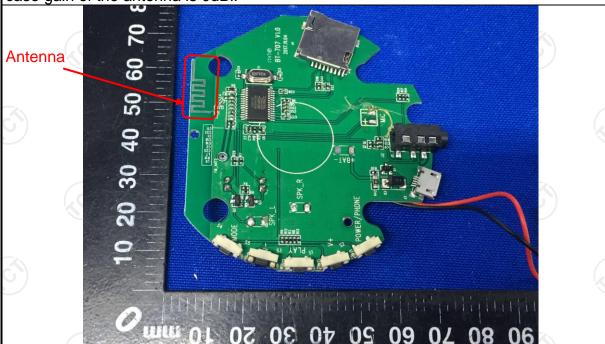
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

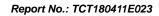
15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:

The Bluetooth antenna is PCB antenna which permanently attached, and the best case gain of the antenna is 0dBi.







6.2. Conducted Emission

6.2.1. Test Specification

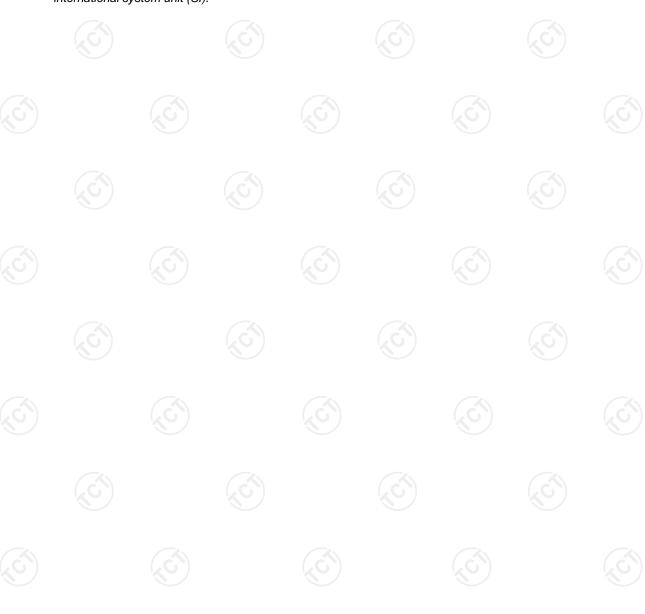
Test Requirement:	FCC Part15 C Section	15.207	100				
Test Method:	ANSI C63.10:2013						
Frequency Range:	150 kHz to 30 MHz	150 kHz to 30 MHz					
Receiver setup:	RBW=9 kHz, VBW=30	kHz, Sweep time	e=auto				
	Frequency range	Limit (dBuV)				
	(MHz)	Quasi-peak	Average				
Limits:	0.15-0.5	66 to 56*	56 to 46*				
	0.5-5	56	46				
	5-30	60	50				
	Referenc	e Plane					
Test Setup:	E.U.T AC power Test table/Insulation plane Remark: E.U.T. Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m						
Test Mode:	Refer to item 4.1						
Test Procedure:	1. The E.U.T is connermoniated impedance stabilized provides a 50 ohm/s measuring equipme 2. The peripheral deviced power through a Lift coupling impedanced refer to the block photographs). 3. Both sides of A.C. conducted interfered emission, the relative the interface cables ANSI C63.10:2013 of the conducted interface cables.	cation network 50uH coupling im nt. ces are also conne ISN that provides with 50ohm terr diagram of the line are checkence. In order to fi e positions of equ must be changed	(L.I.S.N.). This appedance for the ected to the main a 500hm/50uH mination. (Please test setup and ed for maximum and the maximum alipment and all of according to				
Test Result:	PASS						



6.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)									
Equipment	Manufacturer	Model	Serial Number	Calibration Due					
Test Receiver	R&S	ESPI	101401	Jun. 12, 2018					
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 27, 2018					
Coax cable (9KHz-30MHz)	тст	CE-05	N/A	Sep. 27, 2018					
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A					

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

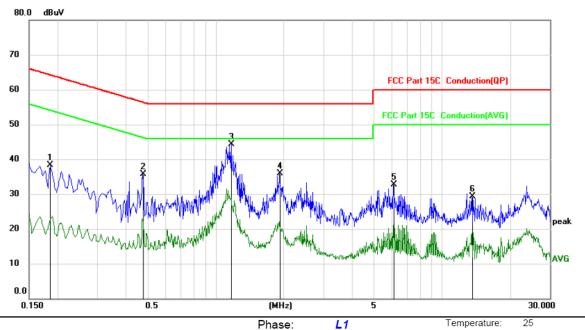




6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site Limit: FCC Part 15C Conduction(QP)

Power:

Humidity: 55 %

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No. M	lk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBu∀	dB	Detector	Comment
1	0.	.1860	26.89	11.48	38.37	64.21	-25.84	peak	
2	0.	.4785	24.37	11.32	35.69	56.37	-20.68	peak	
3 *	1.	.1760	32.96	11.30	44.26	56.00	-11.74	peak	
4	1.	.9185	24.28	11.66	35.94	56.00	-20.06	peak	
5	6.	.1125	21.83	10.80	32.63	60.00	-27.37	peak	
6	13.	.6050	17.68	11.57	29.25	60.00	-30.75	peak	

Note:

Freq. = Emission frequency in MHz

Reading level $(dB\mu V)$ = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement $(dB\mu V)$ = Reading level $(dB\mu V)$ + Corr. Factor (dB)

Limit (dBµV) = Limit stated in standard

 $Margin (dB) = Measurement (dB\mu V) - Limits (dB\mu V)$

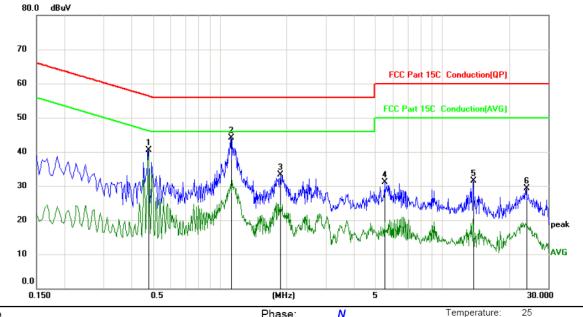
Q.P. =Quasi-Peak

AVG =average

^{*} is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz



Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Limit: FCC Part 15C Conduction(QP)

Pnase:	N	
Power:		

Humidity:

55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBu∀	dB	Detector	Comment
1		0.4785	29.27	11.32	40.59	56.37	-15.78	peak	
2	*	1.1174	32.83	11.27	44.10	56.00	-11.90	peak	
3		1.8690	21.60	11.64	33.24	56.00	-22.76	peak	
4		5.5230	20.32	10.70	31.02	60.00	-28.98	peak	
5		13.8030	20.00	11.60	31.60	60.00	-28.40	peak	
6		23.9550	18.59	10.75	29.34	60.00	-30.66	peak	

Note1:

Freq. = Emission frequency in MHz

Reading level $(dB\mu V)$ = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement $(dB\mu V)$ = Reading level $(dB\mu V)$ + Corr. Factor (dB)

Limit (dBµV) = Limit stated in standard

 $Margin (dB) = Measurement (dB\mu V) - Limits (dB\mu V)$

Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Note2:

Measurements were conducted in all three channels (high, middle, low) and three modulation (GFSK, Pi/4 DQPSK, 8DPSK), and the worst case Mode (Lowest channel and GFSK) was submitted only.

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6.3. Conducted Output Power

6.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)					
Test Method:	ANSI C63.10:2013					
Limit:	Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.					
Test Setup:	Spectrum Analyzer EUT					
Test Mode:	Transmitting mode with modulation					
Test Procedure:	Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.					
Test Result:	PASS					

6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	тст	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



6.3.3. Test Data

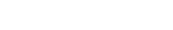
TESTING CENTRE TECHNOLOGY Report No.: TCT180411E023

GFSK mode							
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result				
Lowest	-3.87	21.00	PASS				
Middle	-4.77	21.00	PASS				
Highest	-6.04	21.00	PASS				

Pi/4DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-3.90	21.00	PASS
Middle	-4.47	21.00	PASS
Highest	-6.00	21.00	PASS

8DPSK mode						
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result			
Lowest	-3.92	21.00	PASS			
Middle	-4.79	21.00	PASS			
Highest	-6.02	21.00	PASS			

Test plots as follows:



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Lowest channel



Middle channel



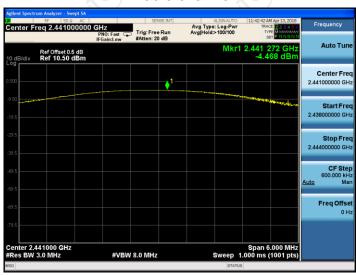


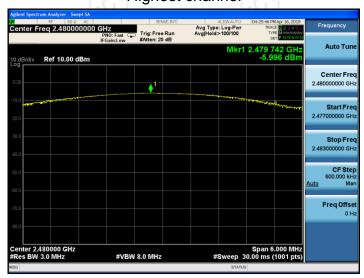


Lowest channel



Middle channel



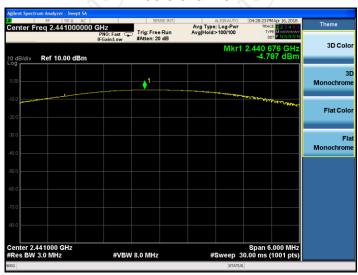




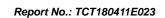
Lowest channel



Middle channel









6.4. 20dB Occupy Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)							
Test Method:	ANSI C63.10:2013							
Limit:	N/A							
Test Setup:	Spectrum Analyzer	EUT						
Test Mode:	Transmitting mode with mod	lulation						
Test Procedure:	analyzer by RF cable and was compensated to the measurement. 3. Set to the maximum power EUT transmit continuous. 4. Use the following spectrum Bandwidth measurement. Span = approximately 2 to bandwidth, centered on a RBW≤5% of the 20 dB to the second secon	s connected to the spectrum d attenuator. The path loss results for each er setting and enable the ly. m analyzer settings for 20dB t. to 5 times the 20 dB a hopping channel; 1% so andwidth; VBW≥3RBW; function = peak; Trace = max						
Test Result:	PASS							

6.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	тст	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



Test channel

GFSK

6.4.3. Test data

Conclusion

(C)	Lowest	951.1	1304.0	1343.0	PASS	(60)
	Middle	950.9	1293.0	1348.0	PASS	
	Highest	953.3	1334.0	1337.0	PASS	
Test pl	lots as follows:					

20dB Occupy Bandwidth (kHz)

π/4-DQPSK

8DPSK



Lowest channel



Middle channel







Lowest channel



Middle channel









Lowest channel



Middle channel







6.5. Carrier Frequencies Separation

6.5.1. Test Specification

A1 / A1				
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)			
Test Method:	ANSI C63.10:2013			
Limit:	Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.			
Test Setup:	Spectrum Analyzer EUT			
Test Mode:	Hopping mode			
Test Procedure:	 The testing follows ANSI C63.10:2013 Measurement Guidelines. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Enable the EUT hopping function. Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels; RBW is set to approximately 30% of the channel spacing, adjust as necessary to best identify the center of each individual channel; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report. 			
Test Result:	PASS			

6.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	тст	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



6.5.3. Test data

GFSK mode				
Test channel Carrier Frequencies Separation (kHz) Limit (kHz)			Result	
Lowest	1002	635.53	PASS	
Middle	1000	635.53	PASS	
Highest	1000	635.53	PASS	

Pi/4 DQPSK mode				
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result	
Lowest	1000	889.33	PASS	
Middle	1004	889.33	PASS	
Highest	1008	889.33	PASS	

8DPSK mode				
Test channel Carrier Frequencies Separation (kHz)		Limit (kHz)	Result	
Lowest	998	898.67	PASS	
Middle	1004	898.67	PASS	
Highest	1004	898.67	PASS	

Note: According to section 6.4

Note. According to section 0.4		
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	953.3	635.53
π/4-DQPSK	1334.0	889.33
8DPSK	1348.0	898.67

Test plots as follows:



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Lowest channel



Middle channel







Lowest channel



Middle channel







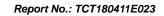
Lowest channel



Middle channel









6.6. Hopping Channel Number

6.6.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10:2013		
Limit:	Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.		
Test Setup:			
	Spectrum Analyzer EUT		
Test Mode:	Hopping mode		
Test Procedure:	 The testing follows ANSI C63.10:2013 Measurement Guidelines. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Enable the EUT hopping function. Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. The number of hopping frequency used is defined as the number of total channel. Record the measurement data in report. 		
Test Result:	PASS		
Test Result:	the number of total channel. 7. Record the measurement data in report.		

6.6.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF Cable (9KHz-26.5GHz)	тст	RE-06	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-01	N/A	Sep. 27, 2018

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



6.6.3. Test data

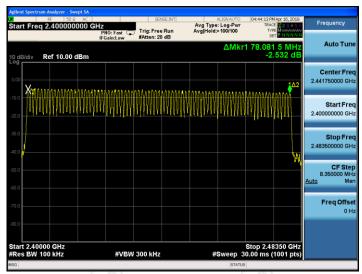
Mode	Hopping channel numbers	Limit	Result
GFSK, Pi/4-DQPSK, 8DPSK	79	15	PASS

Test plots as follows:

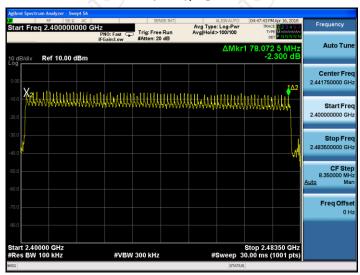




GFSK



Pi/4DQPSK



8DPSK

