FCC RADIO TEST REPORT

Applicant	: Summit Electronics LLC
Address	: 1 Rewe Street, Brooklyn,New York,11211 United States
Manufacturer	: Summit Electronics LLC
Address	: 1 Rewe Street, Brooklyn,New York,11211 United States
Factory	: Summit Electronics LLC
Address	: 1 Rewe Street, Brooklyn,New York,11211 United States
Product Nam	: Wireless Headphone
Brand Name	: COBY, COOLBUDS
Model No.	: CHBT590 (For model difference refer to section 1.1)
FCC ID	: 2AMSOHBT001
Measurement Standard	: 47 CFR FCC Part 15, Subpart C (Section 15.247)
Receipt Date of Samples	: October 15, 2021
Date of Tested	: October 15, 2021 to October 30, 2021
Date of Report	: November 11, 2021

This report shows that above equipment is technically compliant with the requirements of the standards above. All test results in this report apply only to the tested sample(s). Without prior written approval of Dongguan Nore Testing Center Co., Ltd, this report shall not be reproduced except in full.

Prepared by

Jenny Liu / Project Engineer

Approved by

Iori Fan / Authorized Signatory

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Revision History

Report Number	Description	Issued Date
NTC2110031FV00	Initial Issue	2021-11-11

1. Summary of Test Result

FCC Rules	Description of Test	Result	Remarks
§15.247(a)(1)	Channel Separation test	PASS	---
§15.247(a)(1)	20dB Bandwidth	PASS	---
§15.247(a)(1)(iii)	Hopping Channel Number	PASS	---
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	PASS	---
§15.247(b)	Max Peak output Power test	PASS	---
§15.247(d)	Band edge test	PASS	---
§15.207 (a)	AC Power Conducted Emission	Not applicable	Note
§15.247(d),§15.209, §15.205	Radiated Emission	PASS	---
§15.203	Antenna Requirement	PASS	---
§15.247(d)	Conducted Spurious Emission	PASS	---

Note: When the EUT charging that wireless function cann't working, the charging mode was tested in the FCC Part 15B (sDOC) report.

2. General Description of EUT

Product Information	
Product name:	Wireless Headphone
Main Model Name:	CHBT590
Additional Model Name:	CHBK850, CHBT711, CHBT715, CHBT716,CHBT717,CHBT790,CHBT792, CHBT800 ,CHBT801,CHBT802,CHBT808,CHBT810, CHBT812 ,CHBT820 , CHBT900, CHBT902, CPHBT805, CHBT805, CHBT835, CX590
Model Difference:	These models have the same circuit schematic, construction, PCB Layout and critical components. Their difference are model number to trading purpose.
S/N:	N/A
Brand Name	COBY, COOLBUDS
Hardware version:	Not Stated
Software version:	Not Stated
Rating:	DC3.7V from Battery or DC5V from USB Host Unit
Classification:	Class B
Typical arrangement:	Table-top
I/O Port:	Refer to the user manual
Accessories Information	
Adapter:	N/A
Cable:	USB Cable: 0.15m, unshielded AUX IN Cable: 0.95m, unshielded
Other:	N/A
Additional information	
Note:	According to the model difference, all tests were performed on model CHBT590.
Remark:	All the information above are provided by the manufacturer. More detailed feature of the EUT please refers to the user manual.

Technical Specification	
Bluetooth Version:	V5.0
Frequency Range:	2402-2480MHz
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Number of Channel:	79 (refer to following channel list for details)
Channel Space:	1MHz
Antenna Type:	PCB antenna*1
Antenna Gain:	-0.58dBi

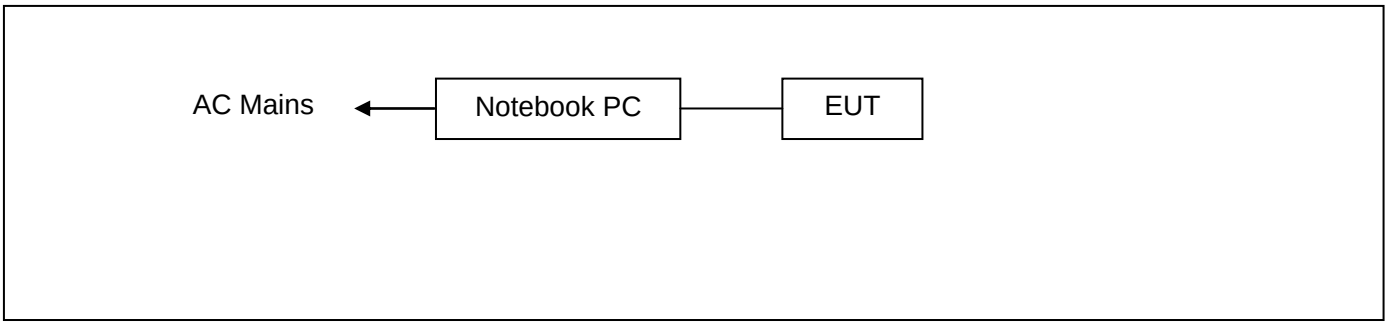
Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	24721
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	----	----

3. Test Channels and Modes Detail

No.	Mode	Channel	Frequency (MHz)	Modulation
1	TX	Hopping	2402-2480	GFSK/π/4-DQPSK /8DPSK
2	TX	Low	2402	GFSK/π/4-DQPSK /8DPSK
3	TX	Mid	2441	GFSK/π/4-DQPSK /8DPSK
4	TX	High	2480	GFSK/π/4-DQPSK /8DPSK
5.	Normal Mode	---	---	---

Note: TX mode means that the EUT was programmed to be in continuously transmitting mode.

4. Configuration of EUT



5. Modification of EUT

No modifications are made to the EUT during all test items.

6. Description of Support Device

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.

No.	Equipment	Brand	M/N	S/N	Cable Specification	Remarks
1.	Notebook PC	Lenovo	R720-151K BN	PF0Z35FH	AC Line: 1.10m unshielded, DC Line: 1.15m unshielded with a core	Provided by manufacturer

No.	Test Software	Modulation	Power Setting
1.	Engineering Mode (No need software)	GFSK	Default
2.		π/4-DQPSK	Default
3.		8DPSK	Default

7. Test Facility and Location

Test Site	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Accreditations and Authorizations	:	The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 Listed by CNAS, August 13, 2018 The Certificate Registration Number is L5795. The Certificate is valid until August 13, 2024 The Laboratory has been assessed and proved to be in compliance with ISO17025 Listed by A2LA, November 01, 2017 The Certificate Registration Number is 4429.01 The Certificate is valid until December 31, 2021 Listed by FCC, November 06, 2017 Test Firm Registration Number: 907417 Listed by Industry Canada, June 08, 2017 The Certificate Registration Number. Is 46405-9743A
Test Site Location	:	Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China

8. Applicable Standards and References

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Test Standards:

47 CFR Part 15, Subpart C, 15.247

ANSI C63.10-2013

References Test Guidance:

DTS KDB 558074 D01 15.247 Meas Guidance v05r02

Remark:

The EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

9. Deviations and Abnormalities from Standard Conditions

No additions, deviations and exclusions from the standard.

10. Test Conditions

No.	Test Item	Test Mode	Test Voltage	Tested by	Remarks
1.	Channel Separation test	1	DC 3.7V	Ray	See note [1]
2.	20dB Bandwidth	2-4	DC 3.7V	Ray	See note [1]
3.	Hopping Channel Number	1	DC 3.7V	Ray	See note [1]
4.	Time of Occupancy (Dwell Time)	1	DC 3.7V	Ray	See note [1]
5.	Max Peak output Power test	2-4	DC 3.7V	Ray	See note [1]
6.	Band edge test	1-4	DC 3.7V	Ray	See note [1]
7.	AC Power Conducted Emission	---	---	---	See note 3
8.	Radiated Emission	1-4	DC 3.7V	Ray	See note [1]
9.	Antenna Requirement	---	---	---	See note [1]
10.	Conducted Spurious Emission	1-4	DC 3.7V	Ray	See note [1]

Note:

1. The testing climatic conditions for temperature, humidity, and atmospheric pressure are within: 15~35℃, 30~70%, 86~106kPa
2. As the EUT can be operated multiple positions, all X,Y,Z axis were considered during the test and only the worst case X was recorded.
3. This product will not be connected to the AC mains during normal use, therefore the AC Power Conducted Emission test is not applicable.

11. Measurement Uncertainty

No.	Test Item	Frequency	Uncertainty	Remarks
1.	Conducted Emission	150KHz ~ 30MHz	±2.52 dB	---
2.	Radiated Emission Test	9kHz ~ 30MHz	±2.60 dB	---
		30MHz ~ 1GHz	±4.68 dB	---
		1GHz ~ 18GHz	±5.14 dB	---
		18GHz ~ 40GHz	±5.14 dB	---
3.	RF Conducted Test	10Hz ~ 40GHz	±1.06 dB	---

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The measurement uncertainly levels above are estimated and calculated according to CISPR 16-4-2.
3. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

12. Sample Calculations

Conducted Emission						
Freq. (MHz)	**Reading Level (dBuV)**	**Correct Factor (dB)**	**Measurement (dBuV)**	**Limit (dBuV)**	**Over (dB)**	**Detector**
4.1900	30.10	10.60	40.70	56.00	-15.30	QP

Where,

Freq.	= Emission frequency in MHz
Reading Level	= Uncorrected Analyzer/Receiver reading
Corrector Factor	= Insertion loss of LISN + Cable Loss + RF Switching Unit attenuation
Measurement	= Reading + Corrector Factor
Limit	= Limit stated in standard
Margin	= Measurement - Limit
Detector	= Reading for Quasi-Peak / Average / Peak

Radiated Spurious Emissions and Restricted Bands						
Freq. (MHz)	**Reading Level (dBuV)**	**Correct Factor (dB/m)**	**Measurement (dBuV/m)**	**Limit (dBuV/m)**	**Over (dB)**	**Detector**
233.0700	45.88	-18.38	27.50	46.00	-18.50	QP

Where,

Freq.	= Emission frequency in MHz
Reading Level	= Uncorrected Analyzer/Receiver reading
Corrector Factor	= Antenna Factor + Cable Loss - Pre-amplifier
Measurement	= Reading + Corrector Factor
Limit	= Limit stated in standard
Over	= Margin, which calculated by Measurement - Limit
Detector	= Reading for Quasi-Peak / Average / Peak

Note: For all conducted test items, the spectrum analyzer offset or transducer is derived from RF cable loss and attenuator factor. The offset or transducer is equal to the RF cable loss plus attenuator factor.

13. Test Items and Results

13.1 Conducted Emissions Measurement

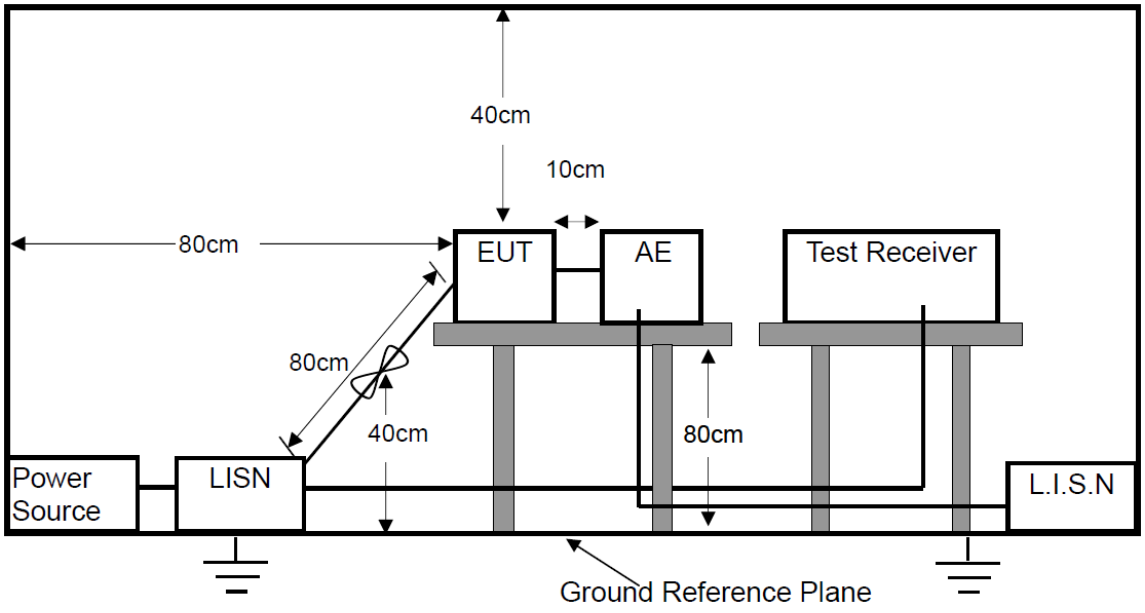
LIMIT

According to the requirements of FCC PART 15.207, the limits are as follows:

Frequency (MHz)	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

Note: 1. If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurements with the average detector are considered to be met.
2. The lower limit shall apply at the transition frequencies.
3. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. The EUT was placed on a wooden table 0.8m height from the metal ground plan and 0.4m from the conducting wall of the shielding room and it was kept at 0.8m from any other grounded conducting surface.

b. All I/O cables and support devices were positioned as per ANSI C63.10.

c. Connect mains power port of the EUT to a line impedance stabilization network (LISN).

d. Connect all support devices to the other LISN and AAN, if needed.

e. Scan the frequency range from 150KHz to 30MHz at both sides of AC line for maximum conducted interference checking and record the test data.

TEST RESULTS

N/A

13.2 Radiated Spurious Emissions and Restricted Bands Measurement

LIMIT

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)
		μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

Remark: (1) Emission level (dB)μV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

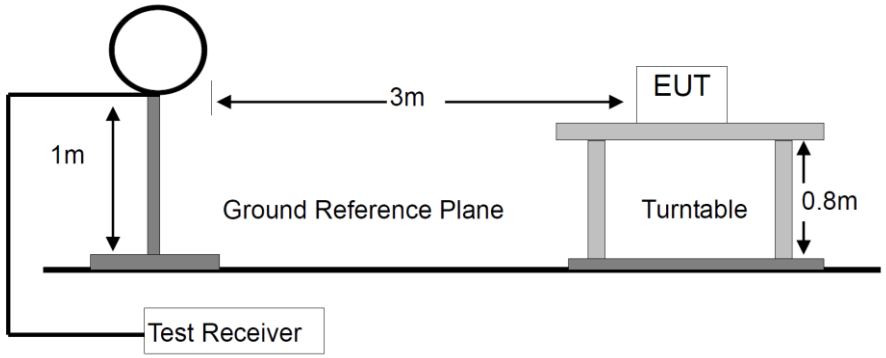
(3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

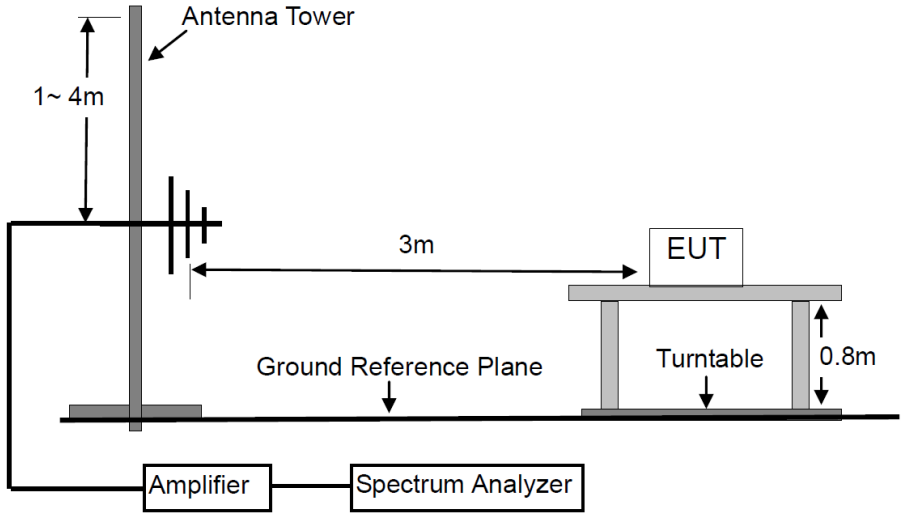
(5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

BLOCK DIAGRAM OF TEST SETUP

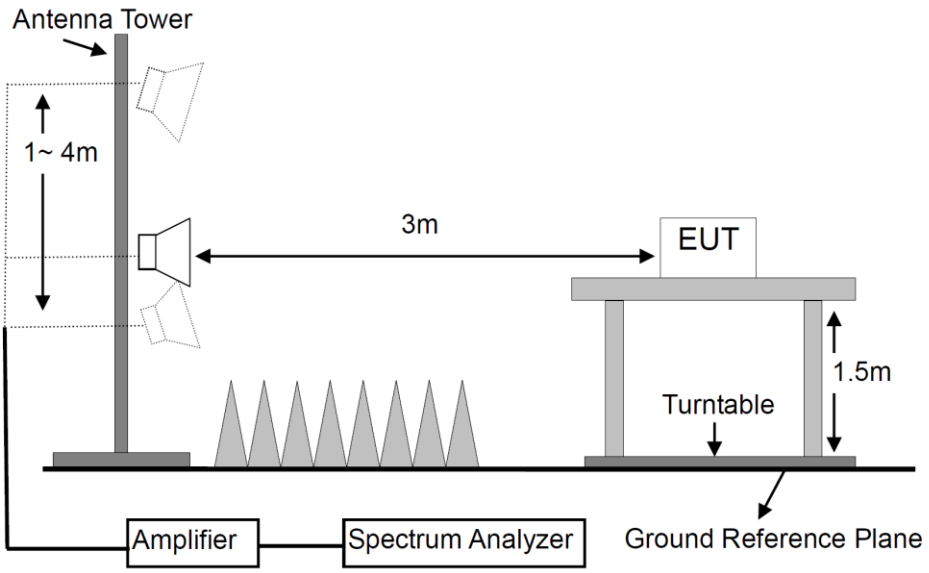
For Radiated Emission below 30MHz



For Radiated Emission 30-1000MHz



For Radiated Emission Above 1000MHz.



TEST PROCEDURES

a. Below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.

b. For the radiated emission test above 1GHz:

The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum

value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.

f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

g. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type.
The worst case was found when the EUT was positioned on X axis for radiated emission.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Detector	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

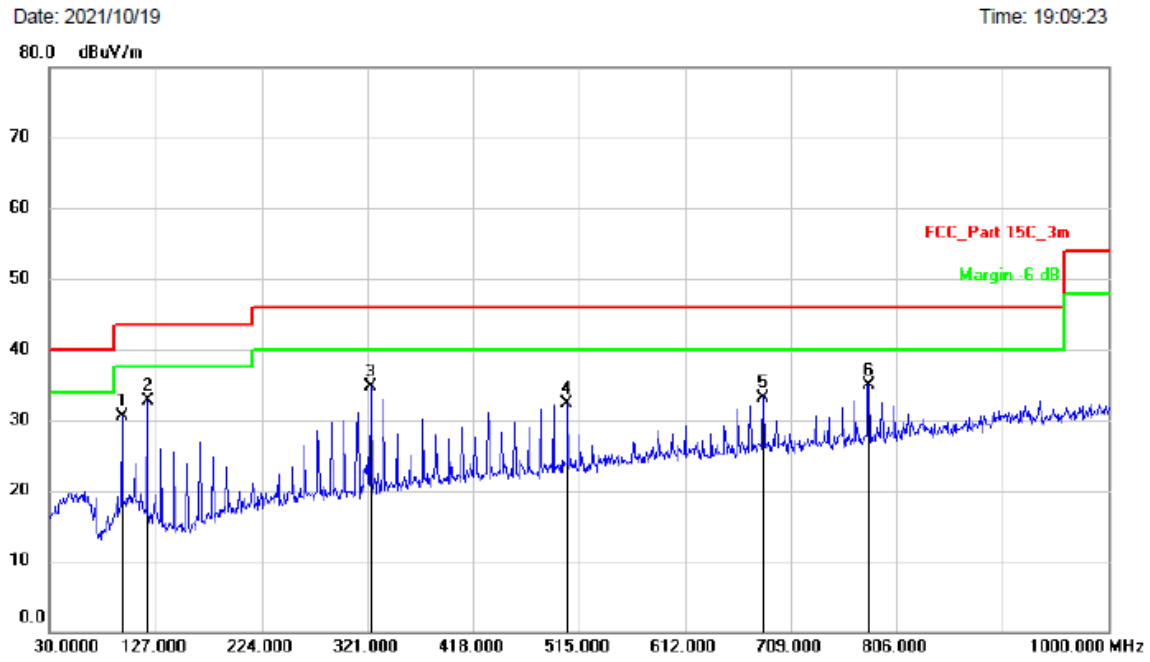
TEST RESULTS

PASS

Please refer to the following pages.

M/N: CHBT590	Testing Voltage: DC 3.7V
Polarization: Horizontal	Detector: QP
Test Mode: 5 (the worst case)	Distance: 3m

Radiated Emission Measurement

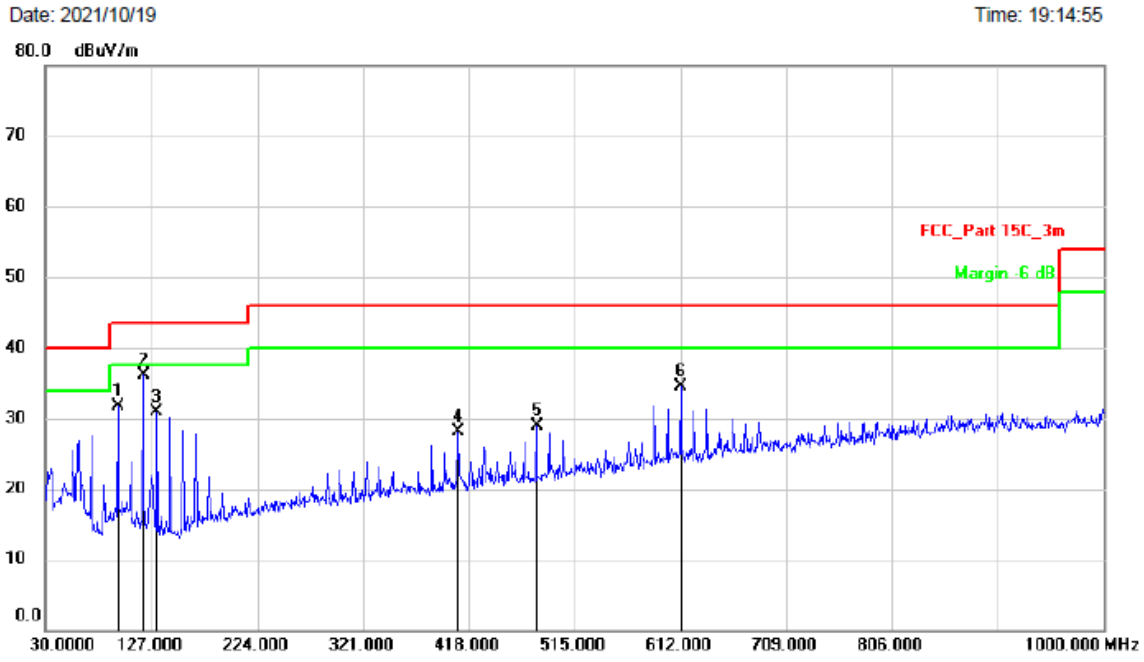


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		95.9600	38.66	-8.07	30.59	43.50	-12.91	QP	
2	*	119.2400	42.03	-9.27	32.76	43.50	-10.74	QP	
3		323.9100	39.51	-4.86	34.65	46.00	-11.35	QP	
4		504.3300	33.91	-1.70	32.21	46.00	-13.79	QP	
5		683.7800	31.31	1.89	33.20	46.00	-12.80	QP	
6		780.7800	31.25	3.62	34.87	46.00	-11.13	QP	

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

M/N: CHBT590	Testing Voltage: DC 3.7V
Polarization: Vertical	Detector: QP
Test Mode: 5 (the worst case)	Distance: 3m

Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		95.9600	40.71	-9.05	31.66	43.50	-11.84	QP	
2	*	119.2400	47.18	-11.05	36.13	43.50	-7.37	QP	
3		131.8500	42.19	-11.31	30.88	43.50	-12.62	QP	
4		408.3000	32.39	-4.19	28.20	46.00	-17.80	QP	
5		480.0800	31.99	-3.05	28.94	46.00	-17.06	QP	
6		612.0000	34.59	-0.12	34.47	46.00	-11.53	QP	

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

Modulation: 8DPSK(the worst case)				Test Result: PASS			Test frequency range: 1-25GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
4804	H	50.56	39.40	6.30	56.86	45.70	74.00	54.00	-17.14	-8.30
7206	H	48.98	36.29	10.44	59.42	46.73	74.00	54.00	-14.58	-7.27

4804	V	47.49	36.33	6.30	53.79	42.63	74.00	54.00	-20.21	-11.37
7206	V	47.04	36.09	10.44	57.48	46.53	74.00	54.00	-16.52	-7.47

Operation Mode: TX Mode (Mid)										
4882	H	51.50	40.80	6.60	58.10	47.40	74.00	54.00	-15.90	-6.60
7323	H	49.33	37.65	10.55	59.88	48.20	74.00	54.00	-14.12	-5.80

4882	V	52.50	37.47	6.60	59.10	44.07	74.00	54.00	-14.90	-9.93
7323	V	48.98	35.83	10.55	59.53	46.38	74.00	54.00	-14.47	-7.62

Operation Mode: TX Mode (High)										
4960	H	53.35	42.61	6.89	60.24	49.50	74.00	54.00	-13.76	-4.50
7440	H	49.08	36.31	10.60	59.68	46.91	74.00	54.00	-14.32	-7.09

4960	V	48.90	38.74	6.89	55.79	45.63	74.00	54.00	-18.21	-8.37
7440	V	47.46	36.07	10.60	58.06	46.67	74.00	54.00	-15.94	-7.33

Spurious Emission in restricted band										
2390.000	H	53.11	42.47	0.09	53.20	42.56	74.00	54.00	-20.80	-11.44
2390.000	V	54.80	36.73	0.09	54.89	36.82	74.00	54.00	-19.11	-17.18
2483.500	H	63.83	49.94	0.35	64.18	50.29	74.00	54.00	-9.82	-3.71
2483.500	V	53.18	41.91	0.35	53.53	42.26	74.00	54.00	-20.47	-11.74

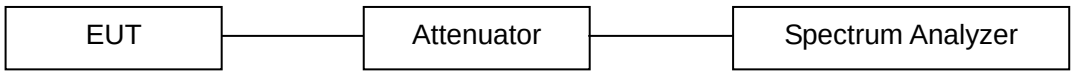
Remark: Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

13.3 Channel Separation test

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.

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. 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.

b. Set to the maximum power setting and enable the EUT transmit continuously.

c. Enable the EUT hopping function.

d. Set spectrum analyzer and perform testing according to ANSI C63.10-2013 clause 7.8.2.

TEST RESULTS

PASS

Please refer to the following table.

Modulation	Channel	Frequency (MHz)	Hopping Separation Measurement (MHz)	Hopping Separation Limit (MHz)	Test Result
GFSK	Low	2402	0.999	>0.636	Pass
	Mid	2441	0.999	>0.636	Pass
	High	2480	0.999	>0.638	Pass
π/4-DQPSK	Low	2402	1.002	>0.873	Pass
	Mid	2441	1.002	>0.873	Pass
	High	2480	0.999	>0.873	Pass
8DPSK	Low	2402	0.999	>0.867	Pass
	Mid	2441	0.999	>0.867	Pass
	High	2480	0.999	>0.867	Pass