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Report Template Version: V05 Report Template Revision Date: 2021-11-03

Test Report

Report No. : Applicant:	CQASZ20220801313E-01 Shenzhen RB-LINK Intelligent Technology Co., Ltd			
Address of Applicant:	Room 401, building C, Runhe Industrial Zone Huangpu, Shajing Town, Bao'an District, Shenzhen, Guangdong Province			
Equipment Under Test (E	:UT):			
Product:	A20 bluetooth headset			
Model No.:	A20, A20+, A20 Plus, A21, A21 Plus, A22, A22 Plus, TQ6			
Test Model No.:	A20			
Brand Name:	N/A			
FCC ID:	2AXI9A20			
Standards:	47 CFR Part 15, Subpart C			
Date of Receipt:	2022-08-01			
Date of Test:	2022-08-01 to 2022-08-11			
Date of Issue: Test Result :	2022-08-22 PASS*			

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

lewis 2h0u (Lewis Zhou) Tested By: K. Liao Reviewed By: (KLiao) Approved By: (Jack Ai)

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

PPROVE



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220801313E-01	Rev.01	Initial report	2022-08-22



2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(1)	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Carrier Frequencies Separation	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Hopping Channel Number	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Dwell Time	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Pseudorandom Frequency Hopping Sequence	47 CFR Part 15, Subpart C Section 15.247(b)(4)	ANSI C63.10 (2013)	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 (2013)	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 (2013)	PASS
Radiated Spurious emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 (2013)	PASS



3 Contents

Page

1 VERSION	2
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 Client Information	
4.2 GENERAL DESCRIPTION OF EUT	
4.3 Additional Instructions	
4.4 Test Environment	
4.5 DESCRIPTION OF SUPPORT UNITS	
4.6 STATEMENT OF THE MEASUREMENT UNCERTAINTY	
4.7 TEST LOCATION	
4.8 TEST FACILITY	
4.9 ABNORMALITIES FROM STANDARD CONDITIONS	
4.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER	
4.11 Equipment List	
5 TEST RESULTS AND MEASUREMENT DATA	
5.1 ANTENNA REQUIREMENT	
5.2 Conducted Emissions	
5.3 CONDUCTED PEAK OUTPUT POWER	
5.4 20DB Occupy Bandwidth	
5.5 CARRIER FREQUENCIES SEPARATION	
5.6 HOPPING CHANNEL NUMBER	
5.7 DWELL TIME	
5.8 BAND-EDGE FOR RF CONDUCTED EMISSIONS	
5.9 Spurious RF Conducted Emissions	
5.10 OTHER REQUIREMENTS FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM	
5.11 RADIATED SPURIOUS EMISSION & RESTRICTED BANDS	
5.11.1 Radiated Emission below 1GHz	
5.11.2 Transmitter Emission above 1GHz	
6 PHOTOGRAPHS - EUT TEST SETUP	64
6.1 Radiated Emission	
6.2 CONDUCTED EMISSION	65
7 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS	66



4 General Information

4.1 Client Information

Applicant:	Shenzhen RB-LINK Intelligent Technology Co., Ltd
Address of Applicant:	Room 401, building C, Runhe Industrial Zone Huangpu, Shajing Town, Bao'an District, Shenzhen, Guangdong Province
Manufacturer:	Shenzhen RB-LINK Intelligent Technology Co., Ltd
Address of Manufacturer:	Room 401, building C, Runhe Industrial Zone Huangpu, Shajing Town, Bao'an District, Shenzhen, Guangdong Province
Factory:	Shenzhen Jiteng Network Technology Co., Ltd
Address of Factory:	No.74, Yangyong Road,Yanluo street, Tangxiayong Community, Songgang, Baoan, Shenzhen, Guangdong, P.R.China

4.2 General Description of EUT

Product Name:	A20 bluetooth headset
Model No.:	A20, A20+, A20 Plus, A21, A21 Plus, A22, A22 Plus, TQ6
Test Model No.:	A20
Trade Mark:	N/A
Software Version:	RBZN-IT105-BT8926B2(A20)-20220726-6E6C4790_741B0600_C15_D
Hardware Version:	A20-IP6818-YJX-V2.1-20220718
	A20_L_V1.2_BT8926B_20220607
	A20_R_V1.2_BT8926B_20220607
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.3
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK
Transfer Rate:	1Mbps/2Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	□ Mobile
Test Software of EUT:	BT_Tool
Antenna Type:	Chip antenna
Antenna Gain:	2.67dBi
Power Supply:	earphone: 3.7V 40mAh 0.148Wh
	charging compartment: 3.7V 600mAh 2.22Wh, Charge by DC 5V for adapter

Model No.: A20+, A20 Plus, A21, A21 Plus, A22, A22 Plus, TQ6, A20

The circuit design, layout, components used and internal wiring are all the same, except for the color difference



Operation F	Operation Frequency each of channel						
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz



4.3 Additional Instructions

EUT Test Software Settings:							
Mode:	 Special software is used. Through engineering command into the engineering mode. engineering command: *#*#3646633#*#* 						
EUT Power level:	Class2 (Power level is built-in set para selected)	meters and cannot be changed and					
Use test software to set the low	vest frequency, the middle frequency and	the highest frequency keep					
transmitting of the EUT.	1						
Mode	Channel	Frequency(MHz)					
	СН0	2402					
DH1/DH3/DH5	DH1/DH3/DH5 CH39 2441						
	CH78 2480						
	CH0 2402						
2DH1/2DH3/2DH5 CH39 2441							
	CH78 2480						

Run Software:

BT_Tool			<u></u>	□ ×
COMx Baudrate				
Classic BLE				
Test Mode				
FCC Test 🔘	Remote H	BT address		
CBT Test 🔿	5555555	55555	Stoj	
RF Control				
RF Mode	TX TEST \sim	Packet Type	DH5	\sim
Hopping	OFF ~	TX Frequency	2402	~
TX Power	4 ~	RX Frequency	2402	\sim
Scenario	PRBS Pattern	n		~
LOG: FCC test LOG: [COM4] (LOG: BR/EDR 1	open, 1500000	bps		
COM4 is open		1500000bps		



4.4 Test Environment

Operating Environment	Operating Environment:			
Temperature:	25 °C			
Humidity:	54% RH			
Atmospheric Pressure:	1009mbar			
Test Mode:	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.			

4.5 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
Adapter	MI	1	1	CQA



4.6 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

No.	Item	Uncertainty
1	Radiated Emission (Below 1GHz)	5.12dB
2	Radiated Emission (Above 1GHz)	4.60dB
3	Conducted Disturbance (0.15~30MHz)	3.34dB
4	Radio Frequency	3×10 ⁻⁸
5	Duty cycle	0.6 %
6	Occupied Bandwidth	1.1%
7	RF conducted power	0.86dB
8	RF power density	0.74
9	Conducted Spurious emissions	0.86dB
10	Temperature test	0.8°C
11	Humidity test	2.0%
12	Supply voltages	0.5 %
13	Frequency Error	5.5 Hz

Hereafter the best measurement capability for CQA laboratory is reported:



4.7 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: **IC Registration No.: 22984-1**

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

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

• CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.9 Abnormalities from Standard Conditions

None.

4.10 Other Information Requested by the Customer

None.



4.11 Equipment List

			Instrument	Calibration	Calibration
Test Equipment	Manufacturer	Model No.	No.	Date	Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2021/9/10	2022/9/9
Spectrum analyzer	R&S	FSU26	CQA-038	2021/9/10	2022/9/9
		AFS4-00010300-18-10P-			
Preamplifier	MITEQ	4	CQA-035	2021/9/10	2022/9/9
		AMF-6D-02001800-29-			
Preamplifier	MITEQ	20P	CQA-036	2021/9/10	2022/9/9
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2021/9/16	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2021/9/16	2024/9/15
Horn Antenna	R&S	HF906	CQA-012	2021/9/16	2024/9/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/9/16	2024/9/15
Coaxial Cable					
(Above 1GHz)	CQA	N/A	C019	2021/9/10	2022/9/9
Coaxial Cable					
(Below 1GHz)	CQA	N/A	C020	2021/9/10	2022/9/9
Antenna Connector	CQA	RFC-01	CQA-080	2021/9/10	2022/9/9
RF					
cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2021/9/10	2022/9/9
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2021/9/10	2022/9/9
EMI Test Receiver	R&S	ESPI3	CQA-013	2021/9/10	2022/9/9
LISN	R&S	ENV216	CQA-003	2021/9/10	2022/9/9
Coaxial cable	CQA	N/A	CQA-C009	2021/9/10	2022/9/9

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



5 Test results and Measurement Data

5.1 Antenna Requirement

	-
Standard requirement:	47 CFR Part 15C 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 us	sed 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 ca	n be replaced by the user, but the use of a standard antenna jack or
electrical connector is prohit	pited.
15.247(b) (4) requirement:	
The conducted output powe	r limit specified in paragraph (b) of this section is based on the use of
antennas with directional ga	ins that do not exceed 6 dBi. Except as shown in paragraph (c) of this
section, if transmitting anten	nas of directional gain greater than 6 dBi are used, the conducted output
power from the intentional ra	adiator shall be reduced below the stated values in paragraphs (b)(1),
(b)(2), and (b)(3) of this sect	tion, as appropriate, by the amount in dB that the directional gain of the
antenna exceeds 6 dBi.	
EUT Antenna:	
The antenna is Chin anten	na The best case gain of the antenna is 2 67 dBi

The antenna is Chip antenna. The best case gain of the antenna is 2.67 dBi.





5.2 Conducted Emissions

 Conducted Emissio	5115		
Test Requirement:	47 CFR Part 15C Section 15.2	207	
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:		Limit (c	lBuV)
	Frequency range (MHz)	Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithn	n of the frequency.	
Test Procedure:	 The mains terminal disturbation of the EUT was connected to a second LIS reference plane in the same measured. A multiple sock power cables to a single Liexceeded. The tabletop EUT was place ground reference plane. An placed on the horizontal grade on the tell shall be 0.4 m for the EUT shall be 0.4 m for the EUT shall be 0.4 m for the EUT and associated ergonal to the grade on the closest points the EUT and associated ergonal to the grade on the closest points the EUT and associated ergonal and all of the in ANSI C63.10: 2013 on control on the tell shall be tell shall be the tell shall be tell shall be tell shall be the tell shall be tell shall shall be tell shall be tell shall shall shall shall	b AC power source thro etwork) which provides bles of all other units of SN 2, which was bonde he way as the LISN 1 for et outlet strip was used ISN provided the rating ced upon a non-metalling of floor-standing ar round reference plane, th a vertical ground ref from the vertical ground ref from the vertical ground blane was bonded to the 1 was placed 0.8 m fr d to a ground reference und reference plane. The of the LISN 1 and the quipment was at least of the mission, the relative terface cables must be	bugh a LISN 1 (Line a $30\Omega/50\mu$ H + 5Ω linear f the EUT were d to the ground or the unit being d to connect multiple g of the LISN was not c table 0.8m above the rangement, the EUT was erence plane. The rear d reference plane. The rear d reference plane. The e horizontal ground om the boundary of the e plane for LISNs his distance was EUT. All other units of 0.8 m from the LISN 2. re positions of
Test Setup:	Shielding Room	AE <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u> <u>B</u>	Test Receiver

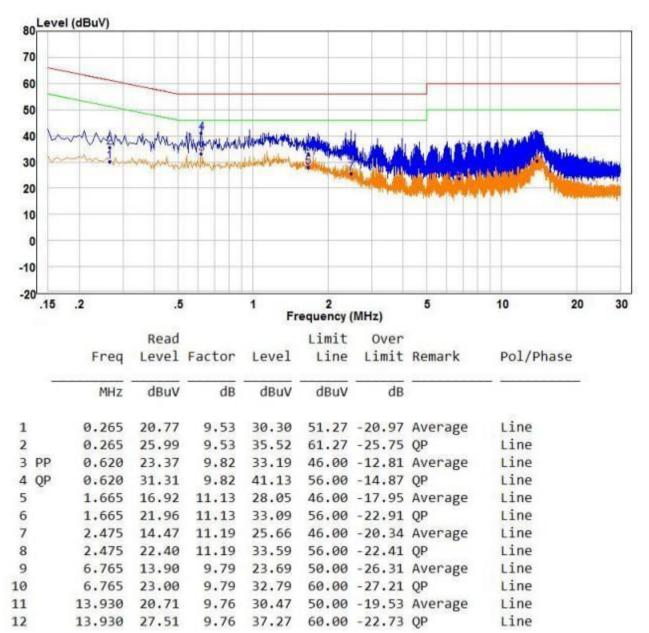


Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of
	data type at the lowest, middle, high channel.
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation at the lowest channel is the worst case. Only the worst case is recorded in the report.
Test Voltage:	AC 120V/60Hz
Test Results:	Pass



Measurement Data

Live line:

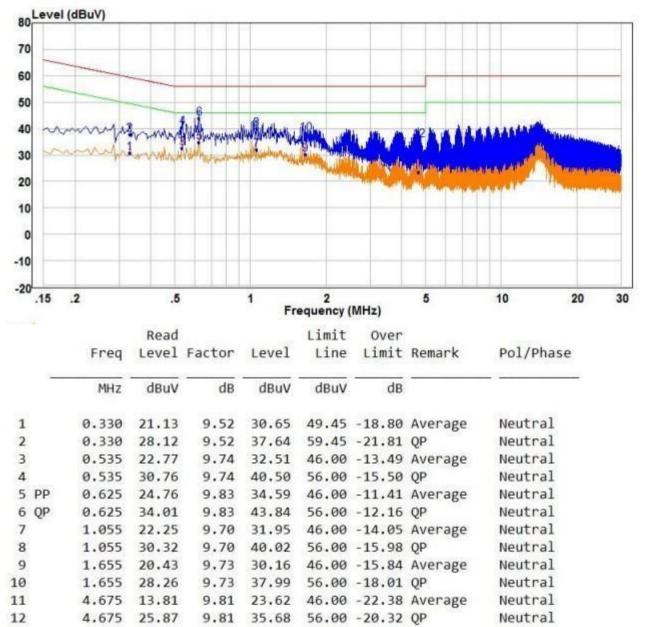


Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



Neutral line:



Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



5.3 Conducted Peak Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table
	Ground Reference Plane
	Remark: Offset=Cable loss+ attenuation factor.
Limit:	21dBm
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

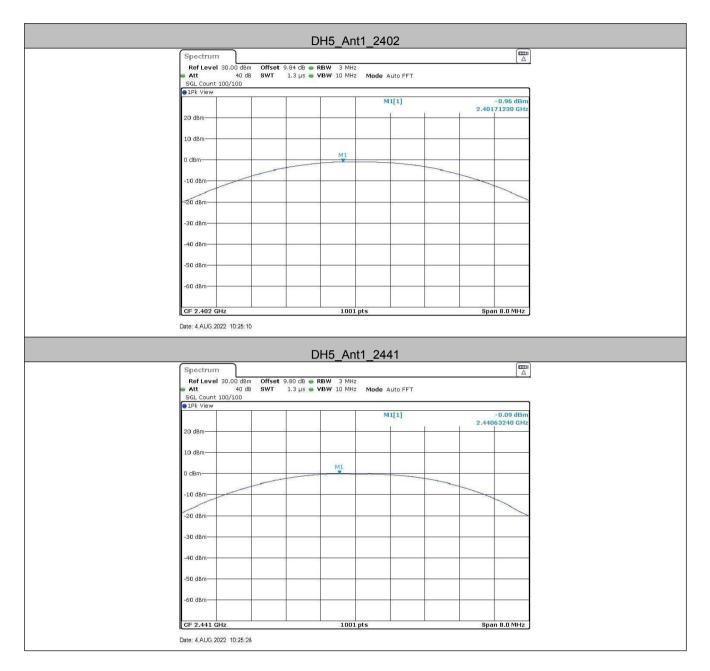


Measurement Data

	GFSK mode	e	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-0.96	21.00	Pass
Middle	-0.09	21.00	Pass
Highest	-0.16	21.00	Pass
	π/4DQPSK me	ode	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-0.51	21.00	Pass
Middle	0.17	21.00	Pass
Highest	0.11	21.00	Pass



Test plot as follows:





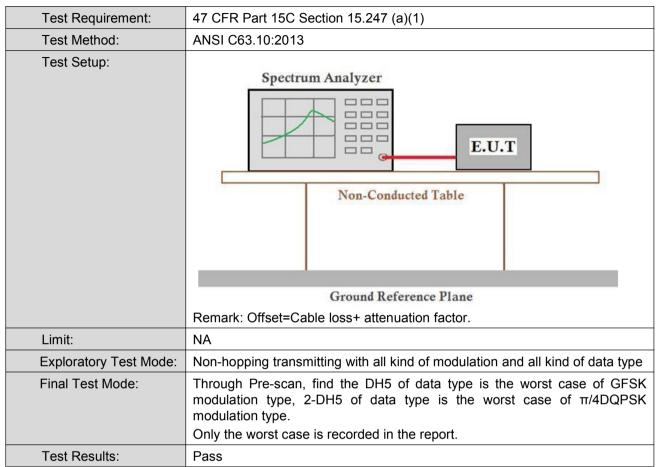
	DH5_Ant1_2480		
Spectrum			
 Att 40 dB SWT 1.3 μ: SGL Count 100/100 	B B RBW 3 MHz S VBW 10 MHz Mode Auto FFT		
● 1Pk View	M1[1]	-0.16 dBm	
20 dBm		2.47980820 GHz	
10 dBm			
0 dBm	MI		
-10 dBm			
20 dBm			
-30 dBm			
-40 dBm			
-50 dBm			
-60 dBm			
CF 2.48 GHz	1001 pts	Span 8.0 MHz	
Date: 4.AUG.2022 10:25:47	NA CONTRACTOR		
	2DH5 Ant1 2402		
Spectrum	2DH5_Ant1_2402		
Ref Level 30.00 dBm Offset 9.84 db Att 40 dB SWT 1.3 μ SGL Count 100/100 SWT 1.3 μ	2DH5_Ant1_2402		
RefLevel 30.00 dBm Offset 9.84 di Att 40 dB SWT 1.3 µ	B ● RBW 3 MHz	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 db Att 40 dB SWT 1.3 μ SGL Count 100/100 SWT 1.3 μ	3 ● RBW 3 MHz s ● VBW 10 MHz Mode Auto FFT		
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View	3 ● RBW 3 MHz s ● VBW 10 MHz Mode Auto FFT	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 Intervention Intervention Intervention IPk View Intervention Intervention Intervention Intervention 20 dBm Intervention Intervention Intervention Intervention	3 ● RBW 3 MHz s ● VBW 10 MHz Mode Auto FFT	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 920 dBm 10 dBm 10 dBm	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 91Pk View 91Pk View 20 dBm 10 dBm 90 dBm 90 dBm 91Pk View	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 920 dBm 10 dBm 10 dBm 10 dBm -10 dBm -10 dBm -10 dBm -10 dBm -10 dBm	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 91Pk View 91Pk View 20 dBm 0 dBm 90 dBm 910 dBm 910 dBm 10 dBm 91 dBm 910 dBm 910 dBm 910 dBm 20 dBm 91 dBm 910 dBm 910 dBm 910 dBm	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 9 9 20 dBm 0 0 9 10 dBm 0 0 9 -10 dBm -30 dBm -30 dBm -30 dBm	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 dl Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 91Pk View 91Pk View 20 dBm 10 dBm 910 dBm 910 dBm 910 dBm 10 dBm 910 dBm 910 dBm 910 dBm 910 dBm -10 dBm 910 dBm 910 dBm 910 dBm 910 dBm -40 dBm -40 dBm 910 dBm 910 dBm 910 dBm 910 dBm	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	
Ref Level 30.00 dBm Offset 9.84 di Att 40 db SWT 1.3 µ SGL Count 100/100 91Pk View 9 9 20 dBm 10 dBm 10 dBm 10 dBm 10 dBm 0 dBm 10 dBm 10 dBm -10 dBm -30 dBm -30 dBm -30 dBm -30 dBm -30 dBm -30 dBm -30 dBm	B RBW 3 MH2 s VBW 10 MH2 Mode Auto FFT M1[1]	-0.51 dBm	



	2[DH5_Ant1_2	2441			
Spectrum Ref Level 30.00 dBm						
Att 40 dB SGL Count 100/100		VBW 10 MHz Mod	e Auto FFT			
●1Pk View			M1[1]	2.4413	0.17 dBm 9160 GHz	
20 dBm						
10 dBm		MI				
0 dBm						
-20 dBm						
-30 dBm		10 0				
-40 dBm		8		-		
-50 dBm						
-60 dBm		s				
CF 2.441 GHz		1001 pts		Span	8.0 MHz	
 Date: 4.AUG.2022 10:26:46						
	2[DH5_Ant1_2	2480			
Spectrum Ref Level 30.00 dBm Att 40 dB		RBW 3 MHz				
Ref Level 30.00 dBm	Offset 9.80 dB 👄	RBW 3 MHz	e Auto FFT			
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100	Offset 9.80 dB 👄	RBW 3 MHz		2.4798	(∭) 0.11 dBm 2420 GHz	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 PIPk View	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 1Pk View 20 dBm	Offset 9.80 dB 👄	RBW 3 MHz	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 PIPk View 20 dBm 10 dBm	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 PIPk View 20 dBm 10 dBm -10 dBm -20 dBm	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 9 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -20 dBm -30 dBm	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 P1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -30 dBm -40 dBm	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Court 100/100 9 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm -50 dBm	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	
Ref Level 30.00 dBm Att 40 dB SGL Count 100/100 P1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -30 dBm -40 dBm	Offset 9.80 dB 👄	RBW 3 MHz VBW 10 MHz Mod	e Auto FFT	2.4798	0.11 dBm	



5.4 20dB Occupy Bandwidth

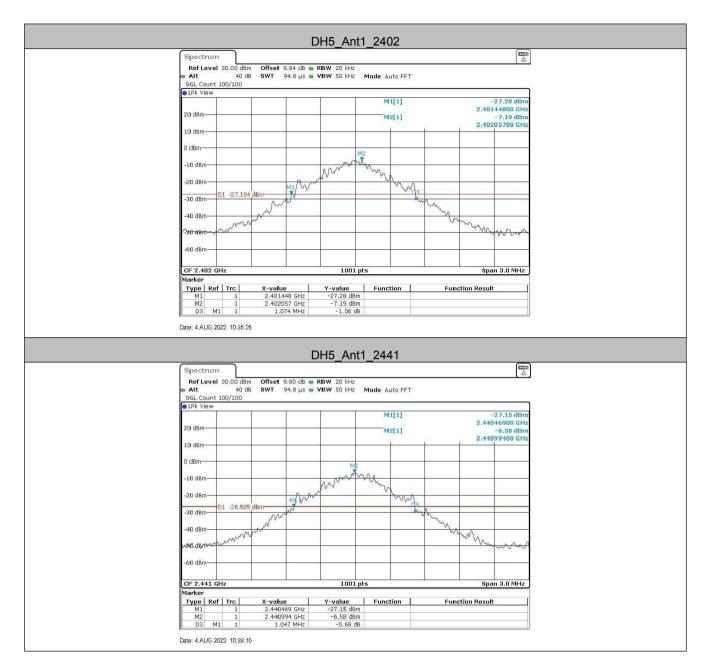


Measurement Data

Test channel	20dB Occupy B	andwidth (MHz)
rest channel	GFSK	π/4DQPSK
Lowest	1.074	1.344
Middle	1.047	1.371
Highest	1.044	1.350



Test plot as follows:







	DUE Anti 2490		
	DH5_Ant1_2480		
Spectrum Ref Level 30.00 dBm Offset 9.80	dB 🖷 RBW 20 kHz		
Att 40 dB SWT 94.8	μs • VBW 50 kHz Mode Auto FFT		
SGL Count 100/100 9 1Pk View			
ACK YIGW	M1[1]	-27.31 dBm	
20 dBm	M2[1]	2.47946900 GHz -6.71 dBm	
		2.48004800 GHz	
10 dBm			
0 dBm	M2		
-10 dBm	month.		
	a manana hay		
-20 dBm D1 -26.714 dBm 01	man man of		
-30 dBm	- Mym	Mar Marganer Mar	
-30 dBm20,714 dBm		When a	
		" When and a she and	
~\$@'88ma-a/V		C. C	
-60 dBm			
	1001 mtc	Sman () () Milita	
CF 2.48 GHz Marker	1001 pts	Span 3.0 MHz	
Type Ref Trc X-value	Y-value Function	Function Result	
M1 1 2.479469 M2 1 2.480048	GHz -27.31 dBm GHz -6.71 dBm		
D3 M1 1 1.044 M			
Date: 4.AUG.2022 10:40:47			
	2DH5_Ant1_2402	(IIII) (A)	
RefLevel 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8		[^{IIII}]	
Ref Level 30.00 dBm Offset 9.84	dB ● RBW 20 kHz µs ● VBW 50 kHz Mode Auto FFT		
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 Image: Count 100/100 Image: Count 100/100 Image: Count 100/100	dB 🖷 RBW 20 kHz	-28.23 dBm 2.40132500 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100	dB ● RBW 20 kHz µs ● VBW 50 kHz Mode Auto FFT	-28.23 dBm 2.40132500 GHz -7.59 dBm	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 Image: Count 100/100 Image: Count 100/100 Image: Count 100/100	dB ● RBW 20 kHz µs ● VBW 50 kHz Mode Auto FFT M1[1]	-28.23 dBm 2.40132500 GHz	
RefLevel 30.00 dBm Offset 9.84 Att 40 dB SGL Count 100/100 SGL Count 100/100 1Pk View 20 dBm 20 dBm	dB ● RBW 20 kHz µs ● VBW 50 kHz Mode Auto FFT M1[1] M2[1]	-28.23 dBm 2.40132500 GHz -7.59 dBm	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SGL Count 100/100 SGL Count 100/100 1Pk View 20 dBm 10 dBm 10 dBm 0 dBm	dB RBW 20 kHz µs VBW 50 kHz Made Auto FFT M1[1] M2[1]	-28.23 dBm 2.40132500 GHz -7.59 dBm	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SGL Count 100/100 SGL Count 100/100 1Pk View 20 dBm 10 dBm 10 dBm 0 dBm	dB RBW 20 kHz µs VBW 50 kHz Made Auto FFT M1[1] M2[1]	-28.23 dBm 2.40132500 GHz -7.59 dBm	
Ref Level 30.00 dbm Offset 9.84 Att 40 db SWT 94.8 SGL Count 100/100 ID0/100 IPk View 20 dbm 10 dbm 0 dbm -10 dbm	dB • RBW 20 kHz µs • VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M2 M2 M2 M2 M2 M2 M2 M2 M2	-28.23 dBm 2.40132500 GHz -7.59 dBm	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm - - 10 dBm - 10 dBm -10 dBm - - 0 dBm - 10 dBm	dB RBW 20 kHz µs VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dbm Offset 9.84 Att 40 db SWT 94.8 SGL Count 100/100 IPk View 20 dbm 10 dbm 0 dbm -10 dbm -20 dbm -30 dbm 01 -27.588 dbm	dB RBW 20 kHz ys VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 ● 1Pk View 20 dBm 10 dBm -20 dBm -10 dBm -20 dBm -30 dBm -40 dBm	dB RBW 20 kHz ys VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 1Pk View 20 dBm 10 dBm 0 0 dBm -10 dBm - - -20 dBm - - -30 dBm 01 -27,588 dBm -	dB RBW 20 kHz ys VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm -20 dBm 10 dBm -30 dBm 10 -27.588 dBm -40 dBm -30 dBm	dB RBW 20 kHz ys VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 ● 1Pk View 20 dBm 10 dBm -20 dBm -10 dBm -20 dBm -30 dBm -40 dBm	dB RBW 20 kHz ys VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm -20 dBm 10 dBm -30 dBm 10 -27.588 dBm -40 dBm -30 dBm	dB RBW 20 kHz µs VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M4 M4	-28.23 dBm 2.40132500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30,00 dbm Offset 9,84 Att 40 db SWT 94.8 SGL Count 100/100 IPk View 20 20 dbm 10 dbm 10 10 dbm 0 0 -20 dbm	d8 • RBW 20 kHz µs • VBW 50 kHz Mode Auto FFT M1[1] M2[1] M2 M2 M2 M2 M2 M2 M2 M2 M2 M2	-28.23 dBm 2.40122500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dbs Offset 9.84 Att 40 db SWT 94.8 SGL Count 100/100 ● IPk View 20 dbm 10 d	dB RBW 20 kHz µs VBW 50 kHz M1[1] M2[1] M2 1001 pts	-28.23 dBm 2.40182500 GHz -7.59 dBm 2.40182900 GHz	
Ref Level 30.00 dBm Offset 9.84 Att 40 dB SWT 94.8 SGL Count 100/100 918 View 20 dBm 10 dBm 10 dBm 10 dBm -20 dBm 10 dBm -30 dBm 10 dBm -60 dBm -60 dBm -60 dBm -60 dBm -60 dBm -60 dBm -11 version -70 version	dB RBW 20 kHz µs VBW 50 kHz M1[1] M2[1] M2 1001 pts	-28.23 dBm 2.40122500 GHz -7.59 dBm 2.40182900 GHz	

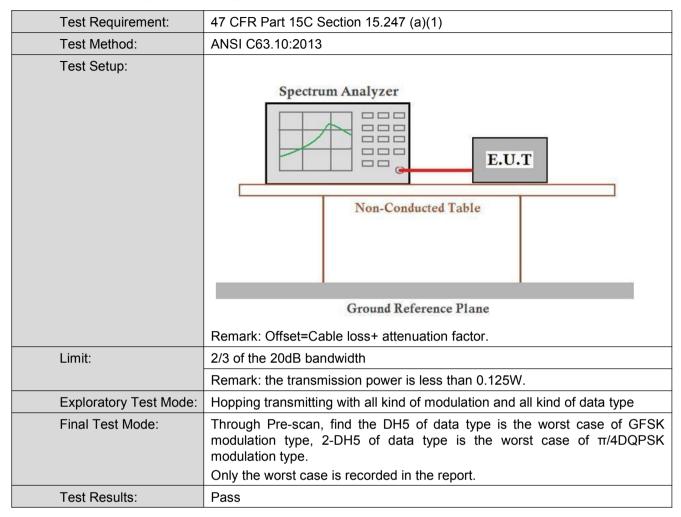




			20F	15_Ant1	_2441			~
Spectrur	a	- "						(
👄 Att	el 30.00 dBm 40 dB	Offset 9.80 SWT 94.8	1 dB 👄 RBW 3 µs 👄 VBV	/ 20 kHz / 50 kHz M	lode Auto FFT			
SGL Count	t 100/100							
TLK AIGM					M1[1]			-28.01 d
20 dBm				15			2.4	4031900 0
					M2[1]		2.4	-7.41 di 4098800 C
10 dBm								
0 dBm								_
				MP				
-10 dBm			mm	Marine	mon			
-20 dBm			N~~ P~	1 1		hyp3 hyhn	-	-
-30 dBm	D1 -27.410 dt	Bm M1/				Mos	-	-
-30 ubiii		m				Why	Ch D	
-40 dBm	www.				8	-	The	Ma
V50 dBm-								a porto
-se ubiii								
-60 dBm							-	
CF 2.441 Marker	GHz			1001 pts	~		S	pan 3.0 MH
Type Re	ef Trc	X-value	Y	-value	Function	Fun	ction Resu	ult
M1 M2	1	2.440319	GHz -	28.01 dBm				
	1	2.440988 0	aHZ	-7.41 dBm				
	41 1	1.371 N	4Hz					
	41 1	1.371 M	ИНZ	0.56 dB				
D3 N	41 1	1.371 M			_2480			
D3 M Date: 4.AUG (Spectrur	11 1 2022 10:46:20		2DH	0.56 dB	_2480			
Date: 4.AUG. Spectrur Ref Leve	41 1 2022 10:46:20 m s0.00 dBm	Offset 9.80	2DH	0.56 dB				[
Date: 4.AUG.; Date: 4.AUG.; Spectrur Ref Leve Att	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB	_2480			(
Date: 4.AUG. Spectrur Ref Leve	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB	Iode Auto FFT			
Date: 4.AUG.2	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB			2.4	-26.24 d
Date: 4.AUG.2	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB	Iode Auto FFT			-26.24 d 7932500 C -6.11 d
Date: 4.AUG. Spectrur Ref Leve Att SGL Count Plk View 20 dBm-	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB	Iode Auto FFT M1[1]			-26.24 di 7932500 di
Date: 4.AUG. Spectrur Ref Leve Att SGL Count 1Pk View 20 dBm- 10 dBm-	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB	Iode Auto FFT M1[1]			-26.24 d 7932500 C -6.11 d
Date: 4.AUG. Spectrur Ref Leve Att SGL Count Plk View 20 dBm-	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80	2DH	0.56 dB	Iode Auto FFT M1[1]			-26.24 d 7932500 C -6.11 d
Date: 4.AUG. Spectrur Ref Leve Att SGL Count 1Pk View 20 dBm- 10 dBm-	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80 SWT 94.6	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]			-26.24 d 7932500 C -6.11 d
D3 N Date: 4 AUG , Spectrur Ref Leve Att SGL Count • 1Pk View 20 dBm- 10 dBm- -10 dBm-	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80 SWT 94.6	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]			-26.24 d 7932500 C -6.11 d
D3 N Date: 4 AUG. Spectrur Ref Leve Att SGL Count SGL Count SGL Count O dBm- D dBm- D dBm-	41 1 2 2022 10:46:20	Offset 9.80 SWT 94.8	2DH	0.56 dB	M1[1] M2[1]			-26.24 d 7932500 C -6.11 d
D3 N Date: 4 AUG ; Spectrur Ref Leve Att SGL Count 10 dBm- 10 dBm- -10 dBm- -20 dBm-	11 1 2022 10:46:20 n el 30.00 dBm 40 dB	Offset 9.80 SWT 94.6	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]	V WQ3	2.4	-26.24 d 7932500 C -6.11 d 8000000 C
D3 N Date: 4 AUG : Spectrur Ref Leve Att SGL Count 10 dBm -10 dBm -20 dBm -30 dBm	41 1 2022 10:46:20 2022 10:46:20 30.00 dBm 40 dB 100/100 	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]	V WQ3	2.4	-26.24 d 7932500 C -6.11 d 8000000 C
D3 N Date: 4 AUG ; S Ref Leve Att SGL Count SGL Count • 1Pk View O dBm 10 dBm O dBm -10 dBm -30 dBm -40 dBm -40 dBm	41 1 2 2022 10:46:20	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]	V WQ3	2.4	-26.24 d 7932500 C -6.11 d 8000000 C
D3 N Date: 4 AUG : Spectrur Ref Leve Att SGL Count 10 dBm -10 dBm -20 dBm -30 dBm	41 1 2022 10:46:20 2022 10:46:20 30.00 dBm 40 dB 100/100 	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]	V WQ3	2.4	-26.24 d 7932500 C -6.11 d 8000000 C
D3 N Date: 4 AUG. Ref Leve Att SGL Count D dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	41 1 2022 10:46:20 2022 10:46:20 30.00 dBm 40 dB 100/100 	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]	V WQ3	2.4	-26.24 d 7932500 C -6.11 d
D3 N Date: 4 AUG .: Spectrur Ref Leve Att SGL Count O dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -30 dBm	41 1 2022 10:46:20 2022 10:46:20 30.00 dBm 40 dB 100/100 	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	M1[1] M2[1]	V WQ3	2.4	-26.24 d 7932500 C -6.11 d 8000000 C
D3 N Date: 4.AUG.; SGL Count Ref Leve Att SGL Count 1Pk View 20 dBm 10 dBm 10 dBm -0 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -60 dBm	11 1 2022 10:46:20 30.00 dBm 40 dB 100/100 01 -26,113 df	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	MI[1] MI[1] M2[1]	V WQ3	2.41	-26.24 dl 7932500 C -6.11 dl 8000000 C
D3 N Date: 4.AUG; S Spectrur Ref Leve Att SGL Count SGL Count 10 dBm 10 dBm 0 dBm -10 dBm - -20 dBm - -30 dBm - -40 dBm - -50 dBm - -60 dBm CF 2.48 G	11 1 2022 10:46:20 30.00 dBm 40 dB 100/100 01 -26,113 df	Offset 9.80 SWT 94.8	2DH dB • RBW µs • VBV	0.56 dB	MI[1] MI[1] M2[1]	V WQ3	2.41	-26.24 d 7932500 C -6.11 d 8000000 C
D3 N Date: 4 AUG .: Spectrur Ref Leve Att SGL Count O dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm	11 1 2022 10:46:20 2022 10:46:20	Offset 9.80 SWT 94.8	2DH	0.56 dB	MI[1] MI[1] M2[1]		2,44	-26.24 dl 7932500 c -6.11 dl 8000000 c
D3 N Date: 4.AUG; S Spectrur Ref Leve Att SGL Count SGL Count 10 dBm 10 dBm 0 dBm -10 dBm - -20 dBm - -30 dBm - -40 dBm - -50 dBm - -60 dBm CF 2.48 G	11 1 2022 10:46:20 2022 10:46:20	Offset 9.80 SWT 94.6	2DH	0.56 dB	MI[1] MI[1] M2[1]		2.41	-26.24 dl 7932500 c -6.11 dl 8000000 c



5.5 Carrier Frequencies Separation





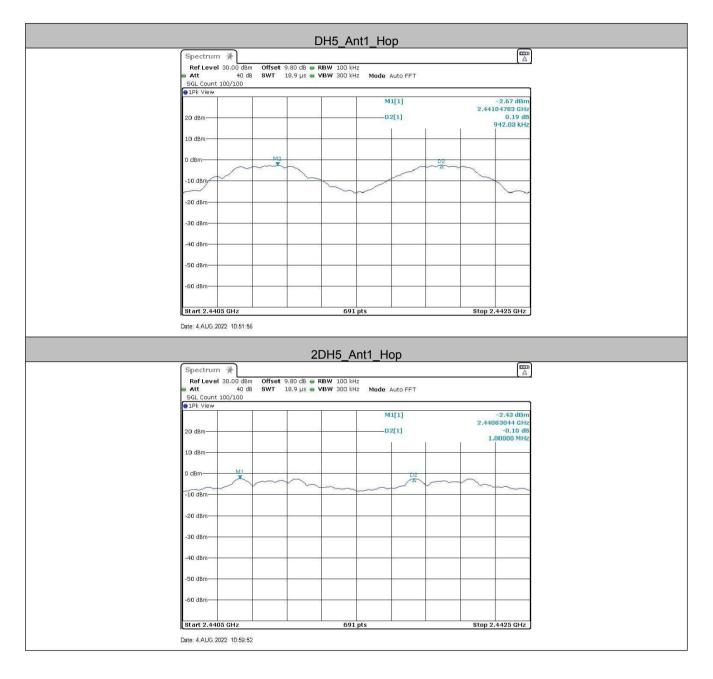
Measurement Data

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Нор	0.942	≥0.716	PASS
2DH5	Ant1	Нор	1	≥0.914	PASS

Mode	20dB bandwidth (MHz)	Limit (MHz)		
woue	(worse case)	(Carrier Frequencies Separation)		
GFSK	1.074	0.716		
π/4DQPSK	1.371	0.914		



Test plot as follows:





5.6 Hopping Channel Number

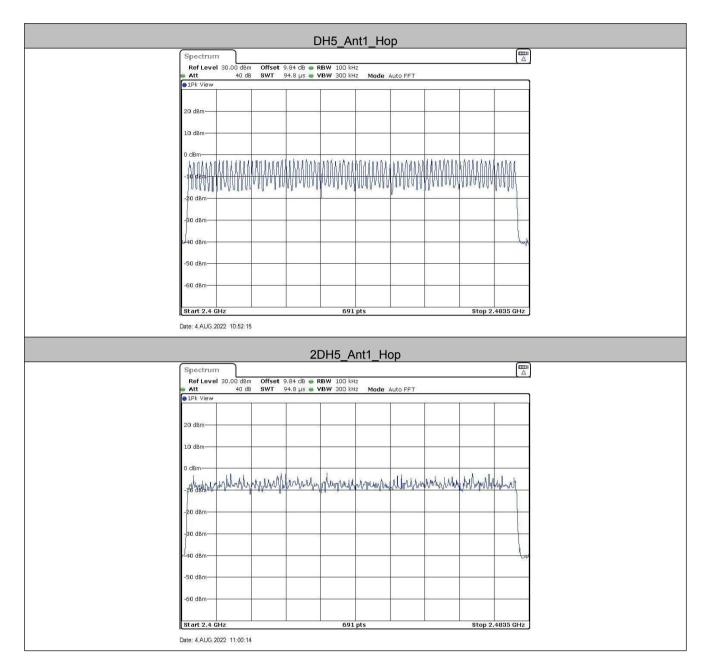
Test Requirement:	47 CEP Dart 15C Section 15 247 (a)(1)
· ·	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.
Limit:	At least 15 channels
Exploratory Test Mode:	hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

Mode	Hopping channel numbers	Limit
GFSK	79	≥15
π/4DQPSK	79	≥15



Test plot as follows:





5.7 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table
	Ground Reference Plane
	Remark: Offset=Cable loss+ attenuation factor.
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Limit:	0.4 Second
Test Results:	Pass



Measurement Data

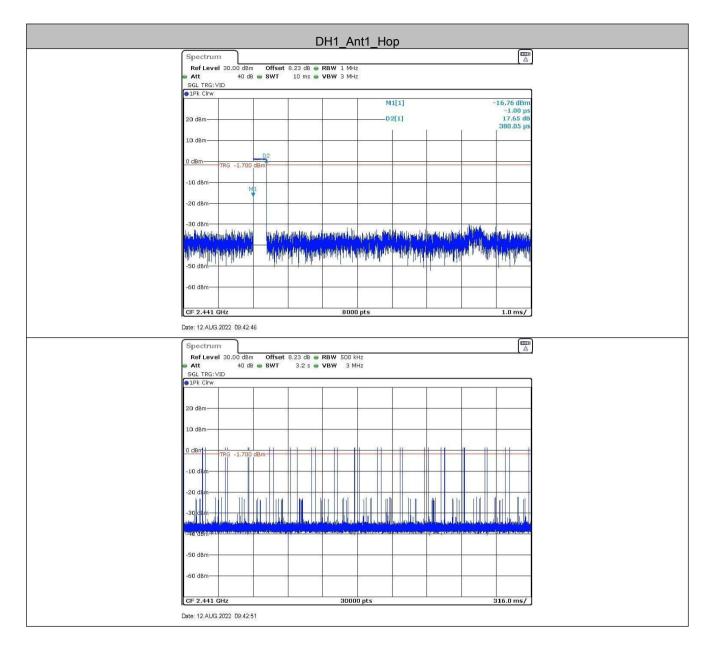
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Нор	0.38	320	0.122	≤0.4	PASS
DH3	Ant1	Нор	1.63	150	0.244	≤0.4	PASS
DH5	Ant1	Нор	2.87	140	0.402	≤0.4	FAIL
2DH1	Ant1	Нор	0.39	320	0.124	≤0.4	PASS
2DH3	Ant1	Нор	1.63	150	0.245	≤0.4	PASS
2DH5	Ant1	Нор	2.87	110	0.316	≤0.4	PASS

Remark:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s



Test plot as follows:





	DH3_Ant1_Hop	
Spectrum		
RefLevel 30.00 dBm Offset Att 40 dB SWT	8.23 dB RBW 1 MHz 10 ms VBW 3 MHz	
SGL TRG: VID		
●1Pk Cirw	M1[1]	-6.13 dBm
20 dBm	D2[1]	-1.00 μs 7.04 dB
		1.62770 ms
10 dBm	D2	
0 dBm		
-10 dBm		
-20 dBm		
-30 dBm		
the weight of the state of the	phatelese and a state of the sector transfer and a state of the the state of the sector of the secto	the subsystems of public of the state of the
	ען אין דער איז	Allen and a standard and a state of the stat
-50 dBm ¹		
-60 dBm		
CF 2.441 GHz	8000 pts	1.0 ms/
Date: 12.AUG.2022 09:43:13		
Spectrum		
	3.2 s SVBW 3 MHz	
SGL TRG: VID]
20 dBm		
10 dBm		
	10 A 10 A 10	100 T 10 T
0 dBm		
-10 dBm		
-20 dBm		
-30 dBm	a particular reflect a logoromia an a state of the design of the state of the state	and the second second second second
17.150 gBMs and a second se	an faller film an a faller and a faller and a statement for you from the statement of the statement of the state	v Biller several la secolarity several de sev
-50 dBm		
-50 dbit-		
-60 dBm		
CF 2.441 GHz	30000 pts	316.0 ms/
GF 2.441 GHZ Date: 12.AUG;2022 03:43:18	auuuu hcz	310.0 ms/ J
Late, 12,AUG,2022, 03,43,18		

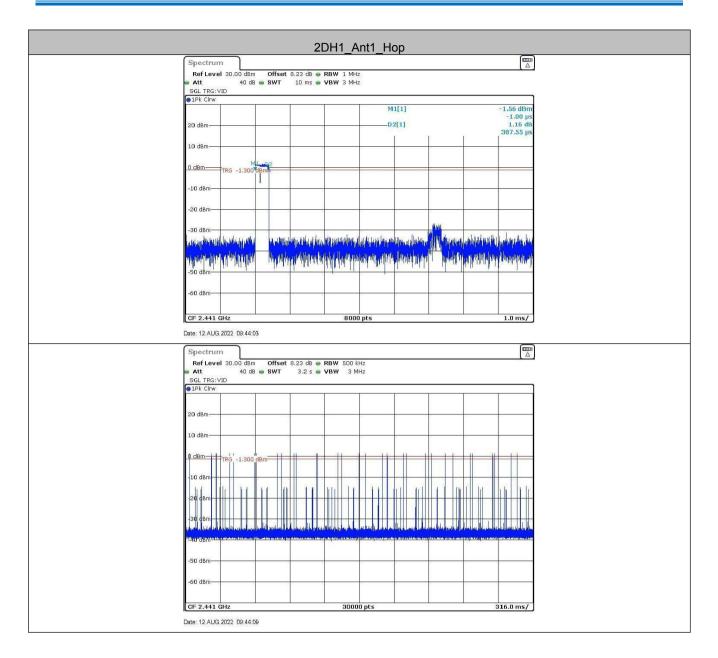




)H5_Ant1_Hop		
Ref Level 30.00 dBm Offset 8.23 dB	PBW 1 MHz		2
Att 40 dB SWT 10 ms 10 ms			
SGL TRG: VID 1Pk Clrw			
	M1[1]	-12.02 dBm -1.00 µs	m
20 dBm-	D2[1]	12.81 dE 2.86911 ms	IB
10 dBm	n 8	2.00911113	13
	D2		
0 dBm TRG -1.800 dBm			-
-10 dBm			
-20 dBm			-
-30 dBm			-
Mar Start by a base by a base manually bar	Herbitation and the coloradist.	and a set to be the second set of the second set of the second second second second second second second second	6
halla philat ar easain bh'airt as tea	pport of the second		bk
-50 dBm		an an hattid hat.	
-60 dBm			
CF 2.441 GHz	8000 pts	1.0 ms/	
Date: 12.AUG.2022 09:42:10	100		
Spectrum			
Ref Level 30,00 dBm Offset 8,23 dB	RBW 500 kHz		2
Att 40 dB SWT 3.2 s SGL TRG: VID	VBW 3 MHz		
IPk Clrw			
20 dBm-			-
10 dBm			_
	× × ×		
0 dBm TRG -1.800 dBm			1
-10 dBm			
-10 d8m			
			_
	1 fiven e-longer () for the second state		
-20 dBm			
-20 dBm -30 dBm 100, bbl to Budit to dbm (Laborator) to the base of the south of th			
-20 dBm -30 dBm U, skie duly, k dwn (alse w y graspinovan) U, skie duly, k dwn (alse w y graspinovan)			
-20 dBm -30 dBm 100, bbl to Budit to dbm (Laborator) to the base of the south of th	Allitera enlangular, langu tijar organisti allitera enlangular, langu tijar organisti muna pata de servitegen organisti allitera enlangu a		











			2	DH3_A	nt1_H	ор			
Spectru Ref Lev	m el 30.00 dBm	Offset	3.23 dB 👄	RBW 1 MH	z				
Att SGL TRG	40 dE	SWT							
IPk Cirw				1					
					514	1[1]			-1.13 dBm -1.00 μs
20 dBm—		~			D	2[1]		1	0.61 dB
10 dBm	_				~				
0.40	N	Lippanterroom	Paule D2						
_0 dBm	TRG -1.300	dBm	the state of the s						
-10 dBm—		90 20		-	-				
-20 dBm-									
-30 dBm-	deal at the cateolo		1114	al Later Later Later	u Linsolad.	duce of all the	uu	Alta settles.	a kulasta a muu
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-50 dBm-	all a sull dated		1 11	a dissert and	an she and . Ha	للتداما للعلمه أأ	an abilitant an	باله بيناهير البالي	in the second
-50 0811-		81			1.12			1	
-60 dBm-				-		8	8		
CF 2.441	GHZ 3.2022 09:44:2			800) pts				1.0 ms/
	_	9							
Spectru	m el 30.00 dBm	Offect	2 2 2 de 👄	RBW 500	·U7				
👄 Att	40 dE	SWT							
SGL TRG 1Pk Clrw									
20 dBm		20		<	20	-			1
10 dBm									
						-			
<u>.0 dBm</u>	TRG -1.300	dBm							
-10 dBm-			8				5		1 1
	3 SA		1 L	1 1	11	T.	11 11		1
-20 dBm-									
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-30 dBm 1983 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 -		11.1 benerig for the s	iller de den ju		Alasali lata taulu Hasari				
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-30 dBm- -50 dBm- -50 dBm-					g taan ku taa ku ku 19 may 200 min Qulan				
-30 dBm- -50 dBm- -50 dBm- -60 dBm-				3000	elosali na terde inapro-revision 0 pts				216.0 ms/





2D		
	H5_Ant1_Hop	
Spectrum Ref Level 30.00 dBm Offset 8.23 dB ● RE	3W 1 MHz	
Att 40 dB SWT 10 ms VE SGL TRG: VID		
IPK Cirw		
	M1[1]	-2.10 dBm -1.00 μs
20 dBm	D2[1]	1.61 dB 2.87286 ms
10 dBm		
Mill and Million and Million and Million	mark in mD2	
0 dBm TRG -1.400 Bm TRG -1.400 Bm	and a second s	
-10 dBm		
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-30 dBm	al a trint, able datable da a dare daar	n that the distance in the date of the second
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-50 dBm	A threads a contract for the first of the state of the state.	in the second state of the second s
50 dbm		
-60 dBm		
CF 2.441 GHz	8000 pts	1.0 ms/
Date: 12.AUG.2022 09:43:39	0000 prs	1.0 ms/ j
Spectrum Ref Level 30.00 dBm Offset 8.23 dB • RE	3W 500 kHz	
Att 40 dB SWT 3.2 s VE		
●1Pk Cirw		
20 dBm		
10 dBm		
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2 HBm TRG -1,400 dBm		
-10 dBm		
-10 dBm		
-1D dBm		
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-1D dBm -22 dBm -30 dBm -10 u biological and a biological biologic		
-1D dBm		
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-1D dBm -2D dBm -3D dBm -3D dBm -3D dBm -3C dBm -50 dBm -60 dBm		
-1D dBm -2d dBm -3D dBm -1U lyster frank ut best hithy statistic sector in the statistic Avoid Structure and statistic sector in the statistic -50 dBm	wains to dealed an article and the stability of the stabi	316.0 ms/



5.8 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)				
Test Method:	ANSI C63.10:2013				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=cable loss+ attenuation factor.				
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.				
Exploratory Test Mode:	Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type				
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.				
Test Results:	Pass				



Shenzhen Huaxia Testing Technology Co., Ltd.

Report No.: CQASZ20220801313E-01

Measurement Data

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
		Low	2402	-2.90	-48.44	≤-22.9	PASS
		High	2480	-2.53	-47.66	≤-22.53	PASS
DH5	DH5 Ant1	Low	Hop_2402	-3.84	-49.01	≤-23.84	PASS
		High	Hop_2480	-1.86	-48.04	≤-21.86	PASS
		Low	2402	-2.99	-49.01	≤-22.99	PASS
		High	2480	-3.51	-47.89	≤-23.51	PASS
2DH5	Ant1	Low	Hop_2402	-6.40	-48.84	≤-26.4	PASS
		High	Hop_2480	-3.32	-48.5	≤-23.32	PASS



Test plot as follows:

		DH5_Ant	1_Low_2402			
Spectr	um					
		: 9.84 dB 👄 RBW 100			(-)	
Att	30 dB SWT unt 300/300	75.8 µs 🖷 VBW 300	0 kHz Mode Auto FFT			
1Pk Vie						
			M1[1]		2.90 dBm 0150 GHz	
10 dBm-			M2[1]		1.04 dBm	
0 dBm					ODD GHZ	
					Ĩ.	
-10 dBm						
-20 dBm	D1 -22.900 dBm					
-30 dBm	percent construction of the second					
-40 dBm				M4		
. 65 9.480	munneman	mummumm	mounterman	- Marthan way way	- Bar	
-60 dBm	287					
-70 dBm						
Start 2.	35 GHz		591 pts	Ston 2	405 GHz	
Marker						
Type M1	Ref Trc X-val 1 2.40:		le Function	Function Result		
M2	1	2.4 GHz -51.04	4 dBm			
M3 M4		2.39 GHz -51.9 8551 GHz -48.4	7 dBm			
			r dom [
Date: 4.AU	G.2022 10:35:47					
			1_High_2480			
			1_11g11_2400			
Spectr			- 70			
e Att		9.80 dB 👄 RBW 100 94.8 µs 👄 VBW 300) KHZ) KHZ Mode Auto FFT			
	unt 300/300	storate entry storate return	a. 2007 Y.C. 2000 TOTAL STREET & ALAR STREET			
●1Pk Vie	W		M1[1]	-	2.53 dBm	
10 dBm-				2.48	0010 GHz	
2000 00-000	M1		M2[1]		1.15 dBm 3500 GHz	
0 dBm—	X	- A				
-10 dBm-						
-20 dBm						
	D1 -22.530 dBm					
-30 dBm						
-40 dBm-			M4			
1.15Q.148.00	M2 M2	M3 unally a	Manalan	and the second		
CO-S/DARA		AN INCOMENTAL CONTRACTOR	and a surface and the second	and many many when we want	and and	
-60 dBm						
-60 dBm -70 dBm						
-70 dBm						
-70 dBm Start 2.			591 pts		.55 GHz	
-70 dBm Start 2. Marker	47 GHz		591 pts	Stop 2		
-70 dBm Start 2. Marker Type M1	47 GHz Ref Trc X-val 1 2.44	ue Y-valu 3001 GHz -2.53	591 pts IE Function 3 dBm			
-70 dBm Start 2. Marker Type M1 M2 M3	47 GHz Ref Trc X-val 1 2.41 1 2.	ue Y-volu 3001 GHz -2.5: 4835 GHz -51.13 2.5 GHz -51.9	591 pts E Function 3 dBm C dBm C dBm	Stop 2		
-70 dBm Start 2: Marker Type M1 M2	47 GHz Ref Trc X-val 1 2.41 1 2.	ue Y-valu 3001 GHz -2.5 4835 GHz -51.11	591 pts E Function 3 dBm C dBm C dBm	Stop 2		



		DH	5_Ant1_Lov	v Hop 2402	2		
Spec	rum			_			
100 Land 100	evel 20.00 dBm	n Offset 9.84 d	dB 🖷 RBW 100 kHz				
🖷 Att	30 dE	3 SWT 75.8	us 🖷 VBW 300 kHz	Mode Auto FFT			
SGL C	ount 300/300						
UTH V				M1[1]	-	3.84 dBm	
10 dBn					2.402	9700 GHz	
2002 124002	8			M2[1]		1.10 dBm 0000 GHz	
0 dBm-	-		2		2.400	V. V.	
-10 dB	0					1 A A	
10 40						1 NIV	
-20 dB	01 22 940	dBm				V V V	
-30 dB	D1 -23.840	Shall					
-40 dB	0	M4					
~50 dB.	0		a national de	an alter a shirt after a star	MB	2	
		mannender	~ when the hold of the	a con a sugar and a	water warmen	1.4	
-60 dB	n						
-70 dB	n						
Start :	2.35 GHz		691 pt	s	Stop 2.	.405 GHz	
Marker		11. 20 and 20					
Type	Ref Trc 1	X-value 2.40297 GH	Y-value +z -3.84 dBm	Function	Function Result		
M2	1	2.4 GH	Hz -51.10 dBm				
M3	1	2.39 GH	Hz -53.09 dBm				
M4	1	2.3625942 GH	Hz -49.01 dBm				
	(÷)						
	UG.2022 10:50:27			· · · · ·			
Date: 4.4 Spec Ref I	UG.2022 10:50:27	7 DH:	5_Ant1_Hig)		
Date: 4.P Spec Ref I	UG.2022 10:50:27	7 DH:)		
Date: 4.P Spec Ref I	UG.2022 10:50:23 rum evel 20.00 dBm 30 dE 300/300	7 DH:	dB 🖷 RBW 100 kHz	Mode Auto FFT			
Date: 4,4	UG.2022 10:50:23 rum evel 20.00 dBm 30 dE 300/300	7 DH:	dB 🖷 RBW 100 kHz			1.86 dBm	
Date: 4,4	UG,2022 10:50:27 rum evel 20.00 dBm 30 dE 300/300	7 DH:	dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]	- 2.47	1.86 dBm 2030 GHz	
Date: 4 A Spec Ref Att Count O den 10 den	UG,2022 10:50:27 rum evel 20.00 dBm 30 dE 300/300	7 DH:	dB 🖷 RBW 100 kHz	Mode Auto FFT		1.86 dBm	
Date: 4.4 Spect Ref 1 • Att Count • LPK v • 10 dBm • 0 dBm • 1 M h	UG 2022 10.50.27	7 DH:	dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4.4 Spect Ref 1 • Att Count • LPK v • 10 dBm • 0 dBm • 1 M h	UG 2022 10.50.27	7 DH:	dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4.4 Spect Ref I • Att Count • IPk v 10 dBn • Javy B	UG 2022 10.50.27	7 DH: 1 Offset 9.80 (3 SWT 94.8 (dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4.4 Spect Ref 1 • Att Count • LPK v • 10 dBm • 0 dBm • 1 M h	UG 2022 10.50.27	7 DH: 1 Offset 9.80 (3 SWT 94.8 (dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4.4 Spect Ref I • Att Count • IPk v 10 dBn • Javy B	UG 2022 10.50.27	7 DH: 1 Offset 9.80 (3 SWT 94.8 (dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4 A Spec: Ref Att Count I dan S dan -20 da -30 da	UG 2022 10:50:27	7 DH: 1 Offset 9.80 (3 SWT 94.8 (dB 🖷 RBW 100 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4 A Spect Ref I • Att Count • IPk v 10 dBn • Jem Jem	UG 2022 10.50.27	7 DH: Offset 9.80 (3 SWT 94.8 (B RBW 100 kHz s VBW 300 kHz	Mode Auto FFT M1[1]		1.86 dBm 2030 GHz 0.47 dBm	
Date: 4 A Spec: Ref Att Count I dan S dan -20 da -30 da	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (dB • RBW 100 kHz Js • VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1]	2.47	1.86 dBm 2030 GHz 0.47 dBm	
Date: 4.4 Spect ■ Att Count ■ IPK V 10 dBn -20 dB -30 dB -40 dB -50 dB	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (B RBW 100 kHz s VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1]	2.47	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spect ■ Att Count ■ IPK v 10 dBn -20 dB -30 dB -40 dB	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (B RBW 100 kHz s VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1]	2.47	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spect ■ Att Count ■ IPK V 10 dBn -20 dB -30 dB -40 dB -50 dB	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (B RBW 100 kHz s VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1]	2.47	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spec: • Att • Att • Cont • LPK v • 10 dBm • JW v • 20 dB • -50 dB -50 dB	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (B RBW 100 kHz s VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1]	2.47	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spect Ref ■ Att Count ■ IPk v 10 den 0 den -20 db -30 db -50 db -50 db -50 db -50 db -50 db	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (B RBW 100 kHz s VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1] M2[1]	2.47 -5 2.48	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spect ■ Att Count ■ IPK V 10 dBn -20 dB -30 dB -50 dB -50 dB -50 dB -50 dB -50 dB -50 dB -50 dB -50 dB	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (dB ● RBW 100 kHz Js ● VBW 300 kHz	Mode Auto FFT M1[1] M2[1] M2[1] M2[1] S	2.47 -5 2.48	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spec: Ref att Count ■ IPk v 10 den 0 den -20 de -30 de -50 de -50 de -70 de Start : Type	UG 2022 10:50:27	7 DH: Offset 9.80 (3 SWT 94.8 (B • RBW 100 kHz s • VBW 300 kHz 	Mode Auto FFT M1[1] M2[1]	2.47 -5 2.48	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4. Spect ■ Att Count ■ In dian d'item- → O dian -20	UG 2022 10:50:27	7 DH: 0 Offset 9.80 (3 SWT 94.8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B • RBW 100 kHz s • VBW 300 kHz WBW 300 kHz M3 M4 M3 KM4 M4 M3 KM4 M4 M4 M4 M4 M4 M4 M4 M4 M4	Mode Auto FFT M1[1] M2[1]	2.47 -5 2.48	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spect ■ Att Count ■ LPK \ 10 dBn -20 dB -20 dB -30 dB -40 dB -50 dB -50 dB -70 dB	UG 2022 10:50:27	7 DH: 0 Offset 9.80 (3 SWT 94.8) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B RBW 100 kHz s VBW 300 kHz WW 300 kHz M3 M4 M3 M4 12 -1.86 dBm -1.86 dBm -1.86 dBm -1.82 dBm -2.03 dBm	Mode Auto FFT M1[1] M2[1]	2.47 -5 2.48	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	
Date: 4.4 Spec: Ref att Count ■ IPK 10 den 0 den -20 db -30 db -30 db -50 db -50 db -70 db Start Type Market	UG 2022 10:50:27	7 DH: Offset 9.80 SWT 94.8 dBm dBm X-volue 2.47203 Gf 2.4835 Gf	B RBW 100 kHz s VBW 300 kHz WW 300 kHz M3 M4 M3 M4 12 -1.86 dBm -1.86 dBm -1.86 dBm -1.82 dBm -2.03 dBm	Mode Auto FFT M1[1] M2[1]	2.47 -5 2.48	1.86 dBm 2030 GHz 0.47 dBm 3500 GHz	



2DH5 Ant1 Low 2402	
Spectrum	
Ref Level 20,00 dBm Offset 9,84 dB RBW 100 kHz Att 30 dB SWT 75.8 µs VBW 300 kHz	
SGL Count 300/300	
●1Pk View M1[1] -2.99 dBm	
10 dBm	
0 dBm	
K K K K K K K K K K K K K K K K K K K	
-10 dBm	
-20 dBm 01 -22.990 dBm 01 -22.990 dBm	
-30 dBm	
-40 dBm	
22,4BM - mulanew water marker of the more and marker of the marker of th	
-60 dBm	
-70 dBm	
Start 2.35 GHz 691 pts Stop 2.405 GHz	
Marker Type Ref Trc X-value Function Function Result	
M1 1 2.401856 GHz -2.99 d8m M2 1 2.4 GHz -48.40 d8m	
M3 1 2.39 GHz -50.92 dBm M4 1 2.3790145 GHz -49.01 dBm	
Date: 4 AUG 2022 10:43:48	
Spectrum Continuity Ref Level 20.00 dBm Offset 9.80 dB RBW 100 kHz Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT	
SGL Count 300/300	
M1[1] -3.51 dBm	
10 dBm	
10 dBm	
10 08m M2[1] -49.90 dBm	
M1 M2[1] -49.90 dBm 0 dBm 2.483500 GHz -49.90 dBm -10 dBm -10 dBm -10 dBm -10 dBm	
M1 M2[1] -49.90 dBm 0 dBm 2.483500 GHz -10 dBm -10 dBm -20 dBm 01 -23.510 dBm	
M1 M2[1] -49.90 dBm 0 dBm 2.483500 GHz -10 dBm	
10 dBm M2[1] -49.90 dBm 0 dBm 2.483500 GHz -10 dBm -10 dBm -20 dBm -10 dBm -30 dBm -10 dBm -40 dBm -10 dBm	
10 dBm M2[1] -49.90 dBm 0 dBm 2.489500 GHz -10 dBm - -20 dBm - -30 dBm - -40 dBm -	
10 dBm M2[1] -49.90 dBm 0 dBm 2.483500 GHz -10 dBm -10 dBm -20 dBm -10 dBm -30 dBm -10 dBm -40 dBm -10 dBm	
10 dBm M1 -49.90 dBm 0 dBm M1 2.483500 GHz -10 dBm -10 dBm -10 dBm -30 dBm 01 -23.510 dBm -23.510 dBm -40 dBm M2 M4 -40 dBm M2 M4 -40 dBm M2 M4	
10 dBm M1 -49.90 dBm 0 dBm 2.483500 GHz -10 dBm 2.483500 GHz -20 dBm	
10 dBm M2[1] -49.90 dBm 0 dBm 2.483500 GHz -10 dBm 2.483500 GHz -20 dBm -1.23.510 dBm -30 dBm -1.23.510 dBm -40 dBm -1.23.510 dBm -30 dBm -1.23.510 dBm -30 dBm -1.23.510 dBm -30 dBm -1.23.510 dBm -70 dBm -1.23.510 dBm -60 dBm -1.23.510 dBm -70 dBm -1.23.510 dBm -70 dBm -1.23.510 dBm -70 dBm -1.23.510 dBm	
10 dBm M1 -49.90 dBm 0 dBm 2.483500 GHz -10 dBm 2.483500 GHz -20 dBm -123.510 dBm -30 dBm -123.510 dBm -40 dBm -123.510 dBm -40 dBm -123.510 dBm -30 dBm -123.510 dBm -40 dBm -123.510 dBm -50 dBm -123.510 dBm -70 dBm -123.510 dBm	
10 dBm M1 -49.90 dBm 0 dBm M1 2.489500 GHz -10 dBm -10 dBm -10 dBm -20 dBm 01 -23.510 dBm -23.510 dBm -30 dBm M2 M3 -40 dBm M2 -30 dBm M2	
10 dBm M1 -49.90 dBm 0 dBm M1 2.493500 GHz -10 dBm -10 dBm -10 dBm -20 dBm 01 -23.510 dBm -23.510 dBm -30 dBm -10 dBm -10 dBm -30 dBm -10 dBm -10 dBm -40 dBm -10 dBm -10 dBm -30 dBm -10 dBm -10 dBm -40 dBm -10 dBm -10 dBm -40 dBm -10 dBm -10 dBm -50 dBm -10 dBm -10 dBm -70 dBm -10 dBm -10 dBm	
10 dBm M1 -49.90 dBm 0 dBm M1 2.489500 GHz -10 dBm 2.489500 GHz -20 dBm -1.23.510 dBm -30 dBm -1.23.510 dBm -40 dBm -1.23.510 dBm -40 dBm -1.23.510 dBm -40 dBm -1.23.510 dBm -30 dBm -1.23.510 dBm -40 dBm -1.23.510 dBm -50 dBm -1.23.510 dBm -70 dBm -1.23.510 dBm	



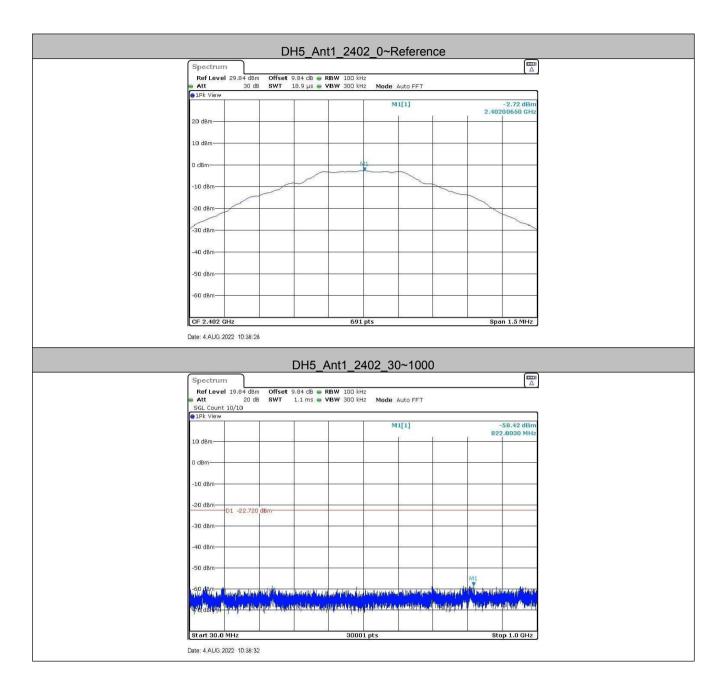
2DH5_Ant1_Low_Hop_2402		
Spectrum		
Ref Level 20.00 dBm Offset 9.84 dB 🖷 RBW 100 kHz		
Att 30 dB SWT 75.8 µs VBW 300 kHz Mode Auto FFT SGL Count 300/300		
IPk View		
M1[1] -6.40 dBm 2.4023340 GHz		
10 dBm M2[1] -50,90 dBm 2,4000000 GHz		
0 dBm M1		
-10 dBm		
-20 dBm		
-20 ubin D1 -26,400 dBm		
-30 dBm		
-40 dBm		
N50 d9m		
189. All and a second and the second		
-60 dBm-		
-70 dBm		
Start 2.35 GHz 691 pts Stop 2.405 GHz		
Start 2.35 GHz 691 pts Stop 2.405 GHz Marker		
Type Ref Trc X-value Y-value Function Function Result		
M2 1 2.4 GHz -50.90 dBm		
M3 1 2.39 GHz -51.53 dBm		
M4 1 2.383558 GHz -48.84 dBm Date: 4.AUG, 2022 10.56:47		
M4 1 2.383558 GHz -48.84 dBm		
M4 1 2.383558 GHz -48.84 dBm Date: 4 AUG.2022 10:56:47 2DH5_Ant1_High_Hop_2480		
M4 1 2.383558 GHz -48.84 dBm Date: 4.AUG 2022 10.56:47 2DH5_Ant1_High_Hop_2480 Spectrum Ref Level 20.00 dBm Offset 9.60 dB RBW 100 kHz		
M4 1 2.383558 GHz -48.84 dBm Date: 4 AUG.2022 10 56:47 2DH5_Ant1_High_Hop_2480 Spectrum Ref Level 20.00 dBm Offset 9.80 dB RBW 100 kHz Att 30 dB SBW 100 kHz Att 30 dB SW 100 kHz		
M4 1 2.383558 GHz -48.84 dBm Date: 4 AUG 2022 10:56:47 2DH5_Ant1_High_Hop_2480 Spectrum Ref Level 20.00 dBm Offset 9.60 dB ® RBW 100 kHz Att 30 dB SWT 94.8 µs ® VBW 300 kHz Mode Auto FFT GL Count 300/3000 IPK View		
M4 1 2.383558 GHz -48.84 dBm Date: 4 AUG 2022 10:56:47 2DH5_Ant1_High_Hop_2480 Colspan="2" Ref Level 20.00 dBm Offset 9.60 dB RBW 100 kHz Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT SGL Count 300/300 IPIk View M1[1] -9.32 dBm		
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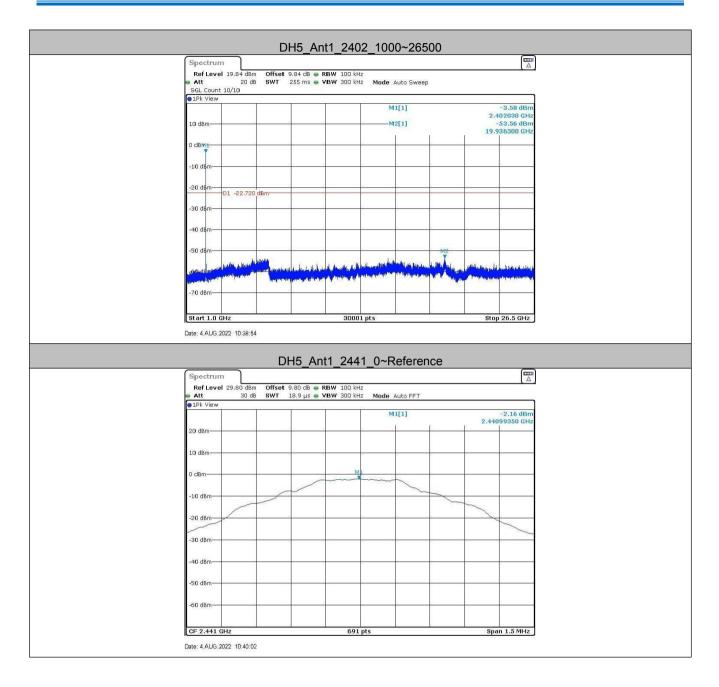
5.9 Spurious RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
	Remark: Offset=cable loss+ attenuation factor.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type.
Test Results:	Pass

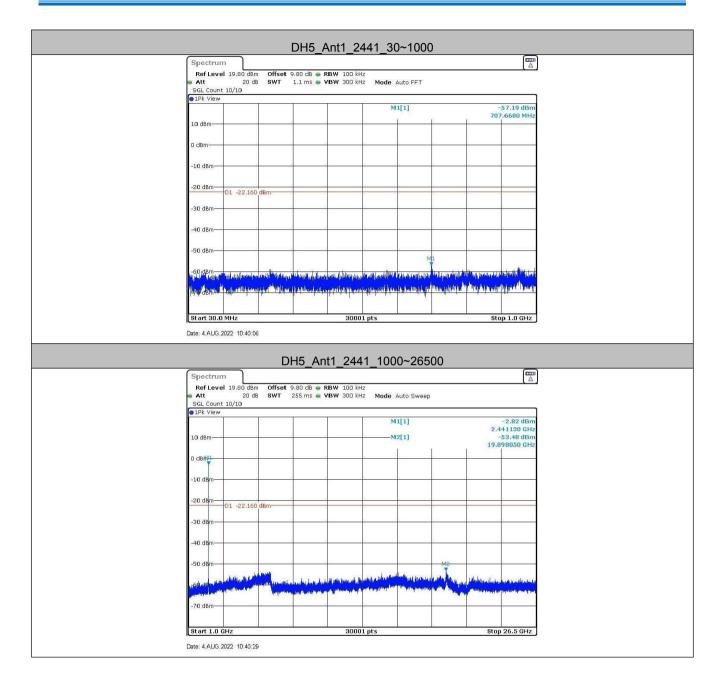




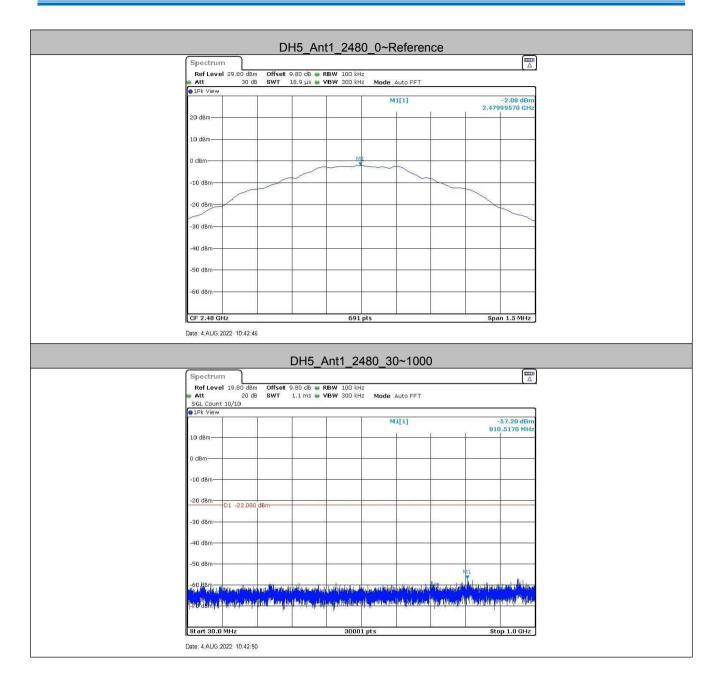




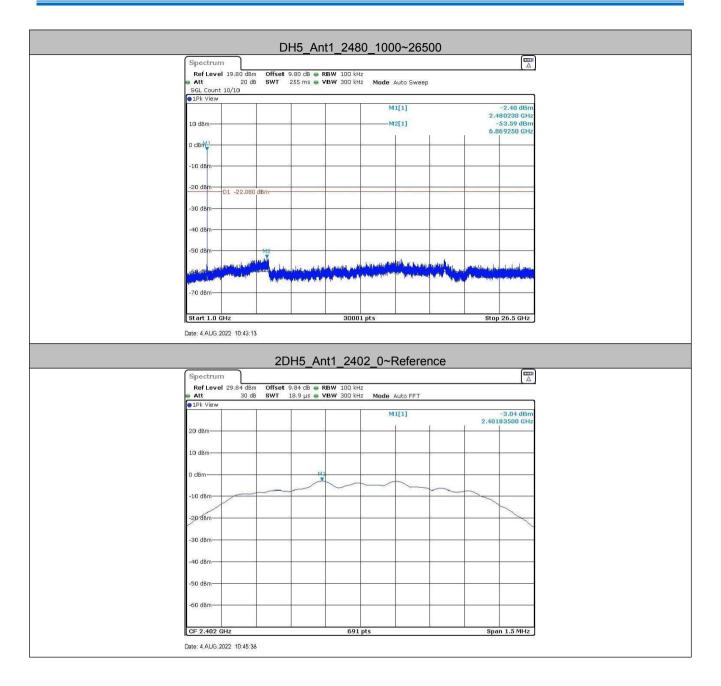




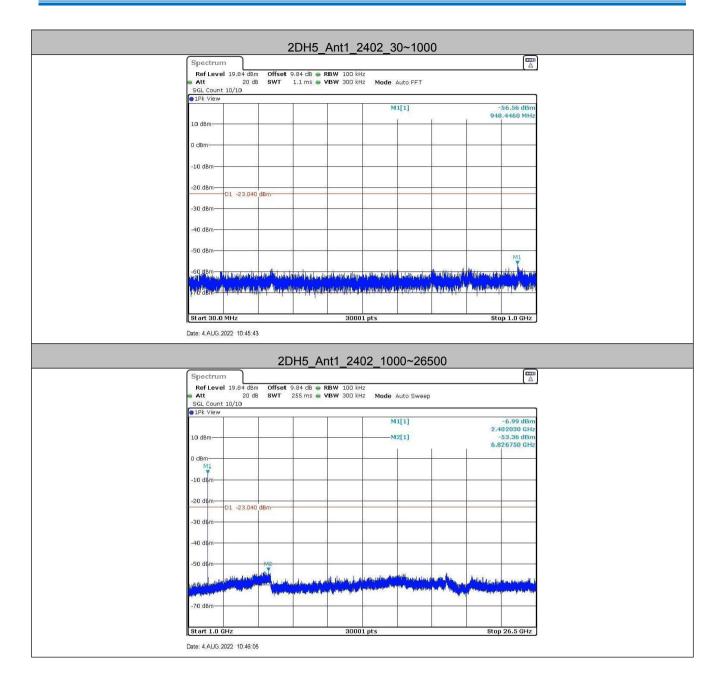




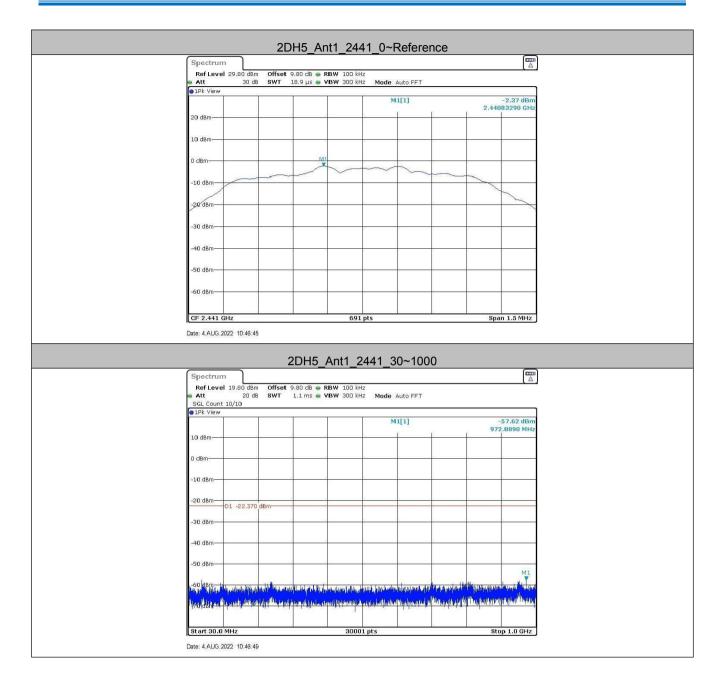




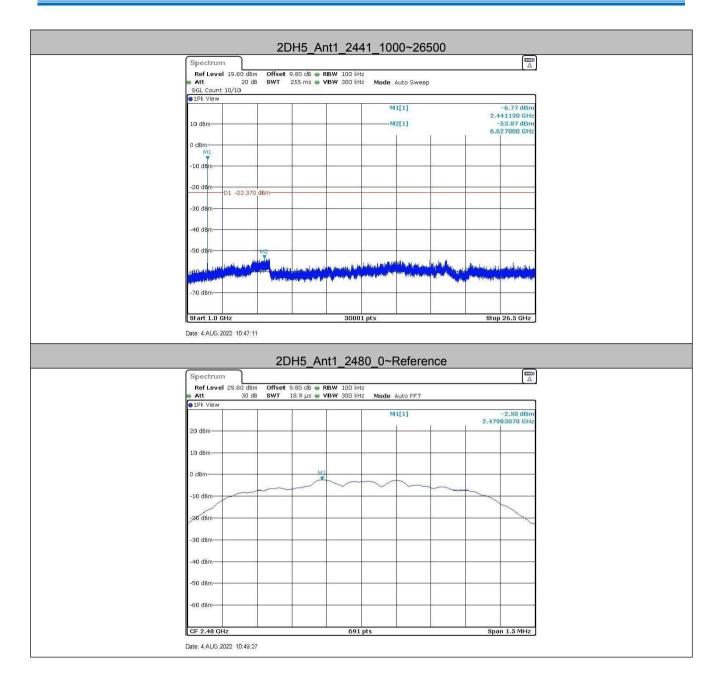




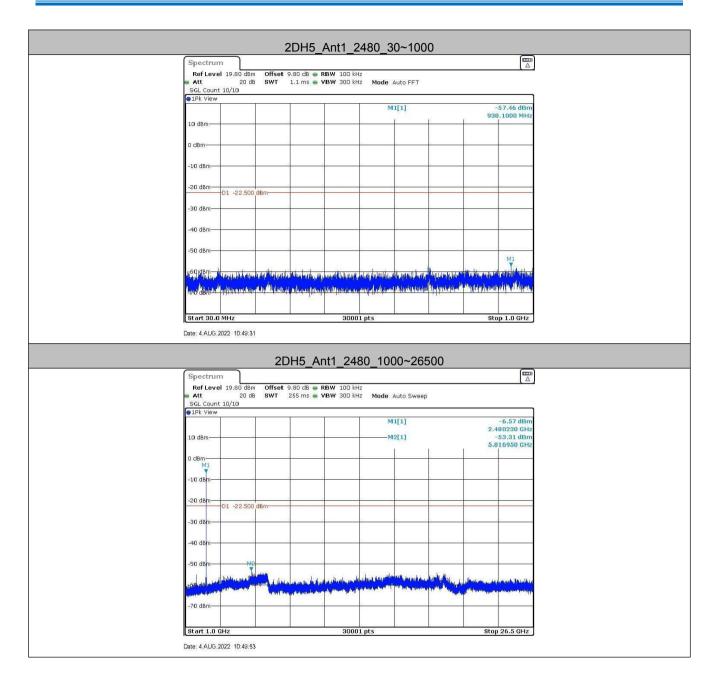












Remark:

Pre test 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.



5.10Other requirements Frequency Hopping Spread Spectrum System

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1), (h) requirement:					
rate from a Pseudorandom o on the average by each trans	nnel frequencies that are selected at the system hopping ordered list of hopping frequencies. Each frequency must be used equally smitter. The system receivers shall have input bandwidths that match the of their corresponding transmitters and shall shift frequencies in smitted signals.					
Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.						
The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.						
Compliance for section 15.	247(a)(1)					
stage shift register whose 5th outputs are added in a modu	lo-two addition stage. And the result is fed back to the input of the first with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized ges: 9 sequence: 2 ⁹ -1 = 511 bits					
	hift Register for Generation of the PRBS sequence m Frequency Hopping Sequence as follow: 7 64 8 73 16 75 1					
According to Bluetooth Cord bandwidths that match the	Each frequency used equally on the average by each transmitter. According to Bluetooth Core Specification, Bluetooth receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any Bluetooth transmitters and shift frequencies in synchronization with the transmitted signals.					
Compliance for section 15.	247(g)					
pseudorandom hopping freq	re Specification, the Bluetooth system transmits the packet with the uency with a continuous data and the short burst transmission from the ansmitted under the frequency hopping system with the pseudorandom					



Compliance for section 15.247(h)

According to Bluetooth Core specification, the Bluetooth system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels.

According to the Bluetooth Core specification, the Bluetooth system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.

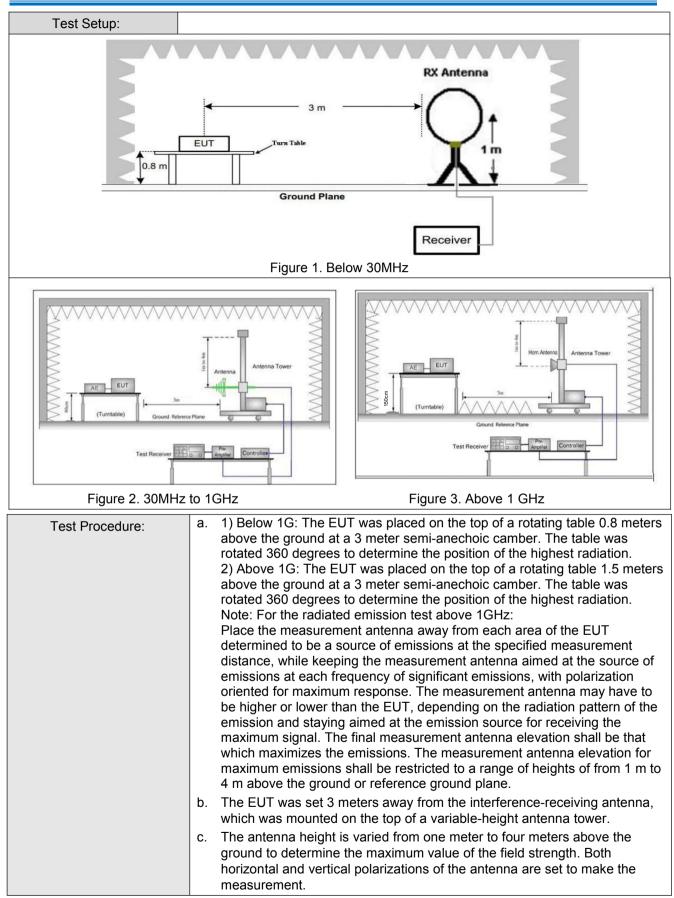


5.11 Radiated Spurious Emission & Restricted bands

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10: 2013	ANSI C63.10: 2013					
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)						
Receiver Setup:	Frequency Detector RBW VBW Remark						
	0.009MHz-0.090MH	z	Peak	10kHz	z 30kHz	Peak	1
	0.009MHz-0.090MH	z	Average	10kHz	z 30kHz	Average	
	0.090MHz-0.110MH	z	Quasi-peak	10kHz	z 30kHz	Quasi-peak	
	0.110MHz-0.490MH	z	Peak	10kHz	z 30kHz	Peak	
	0.110MHz-0.490MH	z	Average	10kHz	z 30kHz	Average	
	0.490MHz -30MHz		Quasi-peak	10kHz	z 30kHz	Quasi-peak	
	30MHz-1GHz		Peak	100 k⊢	lz 300kHz	Peak	
	Above 1GHz		Peak	1MHz	: 3MHz	Peak	
			Peak	1MHz	: 10Hz	Average	
Limit:	Frequency	Field strength (microvolt/meter)		Limit (dBuV/m)	Remark	Measureme distance (n	
	0.009MHz-0.490MHz	2	400/F(kHz)	-	-	300	
	0.490MHz-1.705MHz	24	1000/F(kHz)	-	-	30	
	1.705MHz-30MHz		30 -		-	30	
	30MHz-88MHz		100	40.0	Quasi-peak	3	
	88MHz-216MHz		150	43.5	Quasi-peak	3	
	216MHz-960MHz		200	46.0	Quasi-peak	3	
	960MHz-1GHz		500	54.0	Quasi-peak	3	
	Above 1GHz		500	54.0	Average	3	
	Note: 15.35(b), Unless emissions is 20dE applicable to the e peak emission lev	3 ab equi	ove the maxim	ium perm est. This p	itted average	emission limit	





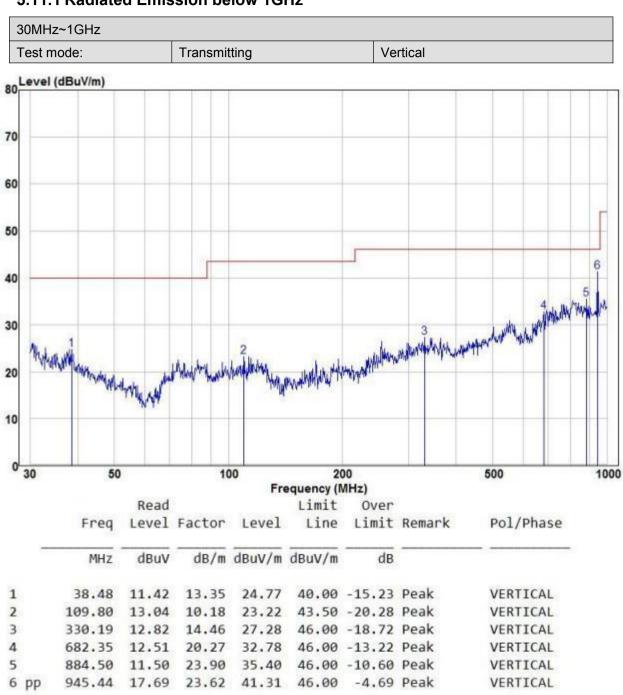




	 d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2441MHz),the Highest channel (2480MHz) h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type Transmitting mode
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case. Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Transmitting mode which it is worse case For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass



5.11.1 Radiated Emission below 1GHz



Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.