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Test Report

Report No. : Applicant: Address of Applicant:	CQASZ20211001748E -01 MOSWS INTERNATIONAL LIMITED FLAT/RM 07 BLKB 5/F KING YIP FACTORY BUILDING 59 KING YIP STREET KWUN TONG KL
Equipment Under Test (E	UT):
Product:	Wireless bluetooth headset
All Model No.:	EW9
Test Model No.:	EW9
Brand Name:	N/A
FCC ID:	2AZ43-EW9
Standards:	47 CFR Part 15, Subpart C
Date of Receipt:	2021-10-12
Date of Test:	2021-10-12 to 2021-10-28
Date of Issue:	2021-11-17
Test Result :	PASS*

Tested By:	lewts zhou	RESTING TO
	(Lewis Zhou)	
Reviewed By:	Rook Husing	
	(Rock Huang)	* APPROVED *
Approved By:	Junios	
	(Jack ai)	

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

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.



Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20211001748E -01	Rev.01	Initial report	2021-11-17



1 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)&TCB Exclusion List (7 July 2002)	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	



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3 General Information

3.1 Client Information

Applicant:	MOSWS INTERNATIONAL LIMITED		
Address of Applicant:	FLAT/RM 07 BLKB 5/F KING YIP FACTORY BUILDING 59 KING YIP STREET KWUN TONG KL		
Manufacturer:	MOSWS INTERNATIONAL LIMITED		
Address of Manufacturer:	FLAT/RM 07 BLKB 5/F KING YIP FACTORY BUILDING 59 KING YIP STREET KWUN TONG KL		
Factory:	SHENZHEN CITY ENKOR ELECTRONICS LTD		
Address of Factory:	the 2nd&3rd floor, Building P and building Q, Shengguang Ind.park, 152#Donghuan Road, Huangpu Xinqiao street, Bao'an District, Shenzhen, China		

3.2 General Description of EUT

Product Name:	Wireless bluetooth headset
All Model No.:	EW9
Test Model No.:	EW9
Trade Mark:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	BT5.0
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 Portable Fix Location
Test Software of EUT:	Signaling fixed frequency
Antenna Type:	chip antenna
Antenna Gain:	2.25 dBi
Power Supply:	Li-ion battery: DC 3.7V, 300mAh 1.11Wh, Charge by DC 5.0V

Note:

BT does not work when EUT is charging



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



3.3 Additional Instructions

EUT Test Software Se	ttings:		
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 lo	owest frequency, the middle frequency and	I the highest frequency keep	
transmitting of the EUT.		1	
Mode	Channel	Frequency(MHz)	
	СНО	2402	
DH1/DH3/DH5	СН39	2441	
	CH78	2480	
	СНО	2402	
2DH1/2DH3/2DH5	СН39	2441	
	CH78	2480	
	СНО	2402	
3DH1/3DH3/3DH5	СН39	2441	
	CH78	2480	

Run Software:

助(日)					
用口设置			设备[COM6]打开成功	 	
AB [] COME (US	B-SERIAL CMD40)	•	reply data: 04 0E 04 01 01 FC 00		
波特车 115200			return code: 0x0 配置数据发送成功1		
教掘位 8			reply data: 04 0E 04 01 01 FC 00		
核验位 None		•	return code: 0x0		
停止位 1			配置数据发送成功)		
液 控 NeFlow					
	关闭				
BR/EIR BLE					
NULE	π				
Channel	0				
Transmit_Power	10				
Facket_Type	1-005				
Mopping	036				
Data_Types	Pa@	•			
Sec	d configuration				
			南路日志	 	-



3.4 Test Environment

Operating Environment	Operating Environment:			
Temperature:	26 °C			
Humidity:	57 % RH			
Atmospheric Pressure:	100.9mbar			
Test Mode:	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.			

3.5 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
/	/	/	/	/



3.6 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	Notes
1	Radiated Emission (Below 1GHz)	±5.12dB	(1)
2	Radiated Emission (Above 1GHz)	±4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	±3.34dB	(1)
4	Radio Frequency	3×10 ⁻⁸	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8°C	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(1)

Hereafter the best measurement capability for CQA laboratory is reported:

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



3.7 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd,

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

3.8 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

• 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

3.9 Abnormalities from Standard Conditions

None.

3.10Other Information Requested by the Customer

None.



3.11 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration 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
Preamplifier	MITEQ	AFS4-00010300-18-10P- 4	CQA-035	2021/9/10	2022/9/9
Preamplifier	MITEQ	AMF-6D-02001800-29- 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	2021/9/11	2024/9/10
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



4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement:	
responsible party shall be us antenna that uses a unique so that a broken antenna ca electrical connector is prohit	be designed to ensure that no antenna other than that furnished by the sed with the device. The use of a permanently attached antenna or of an coupling to the intentional radiator, the manufacturer may design the unit n be replaced by the user, but the use of a standard antenna jack or bited.
15.247(b) (4) requirement:	
	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

antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:



The antenna is chip antenna. The best case gain of the antenna is 2.25dBi.



4.2 Conducted Emissions

 Conducted Emissio				
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	1
	0.15-0.5	66 to 56*	56 to 46*	I
	0.5-5	56	46	1
	5-30	60	50	1
	* Decreases with the logarithm	n of the frequency.		
Test Procedure:	 The mains terminal disturbution. The EUT was connected to Impedance Stabilization Nation impedance. The power calls connected to a second LIS reference plane in the same measured. A multiple sock power cables to a single LI exceeded. The tabletop EUT was place ground reference plane. An placed on the horizontal grade on the closest points the EUT shall be 0.4 m for the grade on the closest points the EUT and associated exception of the grade on the closest points the EUT and associated exceptions the EUT and associated exceptions the EUT and all of the im ANSI C63.10: 2013 on conditional conditis and conditional conditional conditional conditional conditi	b AC power source thro etwork) which provides oles of all other units of SN 2, which was bonde in 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 olane 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 50Ω/50µH + 5Ω lin f the EUT were d to the ground or the unit being d to connect multiple of the LISN was not c table 0.8m above the rangement, the EUT v erence plane. The read d reference plane for LISNs his distance was EUT. All other units of	near was ar ne of 2.
Test Setup:	Shielding Room	AE IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Test Receiver	

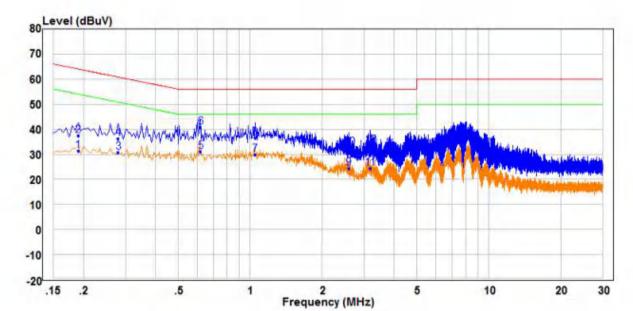


Test Mode:	Charging mode
Test Voltage:	AC 120V/60Hz
Test Results:	Pass



Measurement Data

Live line:



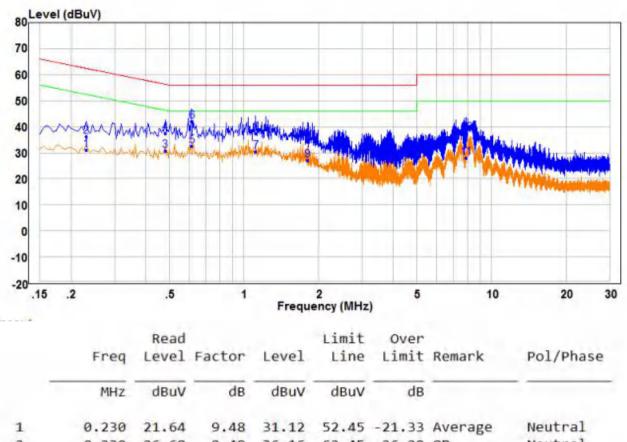
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.190	22.01	9.49	31.50	54.04	-22.54	Average	Line
2	0.190	27.83	9.49	37.32	64.04	-26.72	QP	Line
3	0.280	21.22	9.49	30.71	50.82	-20.11	Average	Line
4	0.280	26.66	9.49	36.15	60.82	-24.67	QP	Line
5 PP	0.620	21.22	9.74	30.96	46.00	-15.04	Average	Line
6 QP	0.620	30.93	9.74	40.67	56.00	-15.33	QP	Line
7	1.050	20.42	9.53	29.95	46.00	-16.05	Average	Line
8	1.050	26.91	9.53	36.44	56.00	-19.56	QP	Line
9	2.595	14.68	9.58	24.26	46.00	-21.74	Average	Line
10	2.595	22.97	9.58	32.55	56.00	-23.45	QP	Line
11	3.180	14.65	9.62	24.27	46.00	-21.73	Average	Line
12	3.180	23.97	9.62	33.59	56.00	-22.41	QP	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:



1	0.230	21.64	9.48	31.12	52.45	-21.33	Average	Neutral
2	0.230	26.68	9.48	36.16		-26.29	0	Neutral
3	0.480	21.12	9.58	30.70			Average	Neutral
4	0.480	27.88	9.58	37.46	56.34	-18.88	QP	Neutral
5 PP	0.615	22.81	9.73	32.54	46.00	-13.46	Average	Neutral
6 QP	0.615	32.17	9.73	41.90	56.00	-14.10	QP	Neutral
7	1.115	20.75	9.72	30.47	46.00	-15.53	Average	Neutral
8	1.115	27.86	9.72	37.58	56.00	-18.42	QP	Neutral
9	1.805	17.52	9.72	27.24	46.00	-18.76	Average	Neutral
10	1.805	24.70	9.72	34.42	56.00	-21.58	QP	Neutral
11	7.865	18.33	9.83	28.16	50.00	-21.84	Average	Neutral
12	7.865	27.68	9.83	37.51	60.00	-22.49	QP	Neutral

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.



4.3 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

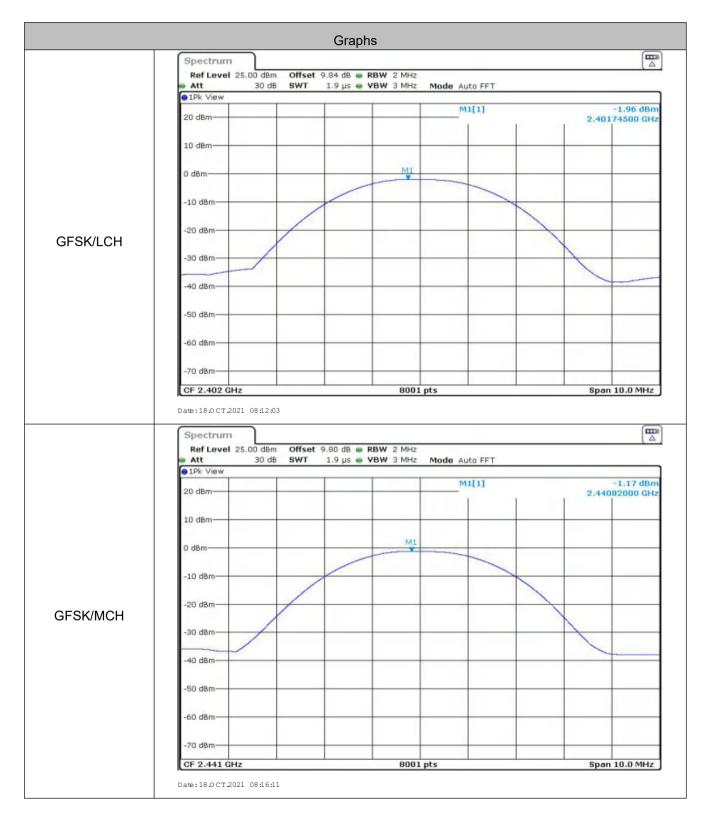


Measurement Data

	GFSK mode	e	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-1.960	21.00	Pass
Middle	-1.170	21.00	Pass
Highest	-0.150	21.00	Pass
	π/4DQPSK m	ode	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-1.370	21.00	Pass
Middle	-0.560	21.00	Pass
Highest	0.440	21.00	Pass



Test plot as follows:





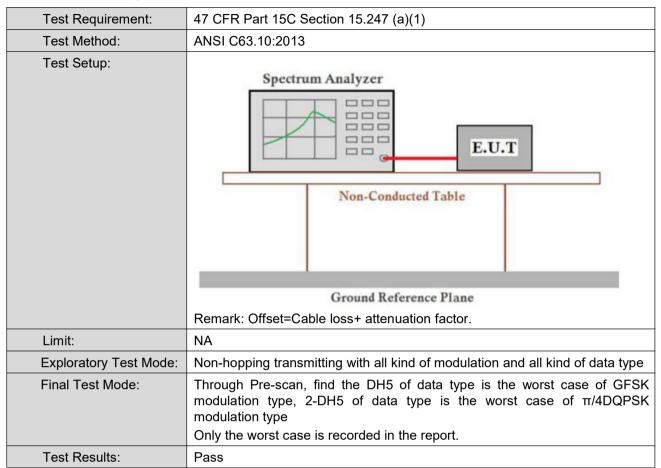
	Spectrum	
	Ref Level 25.00 dBm Offset 9.80 dB ● RBW 2 MP ● Att 30 dB SWT 1.9 μs ● VBW 3 MP	
	1Pk View 20 dBm	M1[1] -0.15 dB 2.47984500 G
	10 dBm	
	0 dBm	11
	-10 dBm	
	-20 dBm	
GFSK/HCH	-30 dBm	
	-40 dBm	
	-50 dBm	
	-60 dBm	
	-70 dBm	
	-70 dbill	
	Date: 18.0 CT 2021 08 20:32	01 pts Span 10.0 MH
	Date: 18.0 CT 2021 08 20:32 Spectrum Ref Level 25.00 dBm Offset 9.84 dB • RBW 2 MH Att 30 dB SWT 1.9 µs • VBW 3 MH	12
	Date: 18.0 CT 2021 08 20:32 Spectrum Ref Level 25.00 dBm Offset 9.84 dB • RBW 2 MH Att 30 dB SWT 1.9 µs • VBW 3 MH • 1Pk View	Iz Iz Mode Auto FFT M1[1] -1.37 dB
	Date: 18.0 CT 2021 08 20:32	iz Iz Mode Auto FFT
	Date: 18.0 CT 2021 08 20:32	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
	Date: 18.0 CT 2021 08 20:32 Spectrum Ref Level 25.00 dBm Offset 9.84 dB RBW 2 MH Att 30 dB SWT 1.9 µs VBW 3 MH 1 Pk View 20 dBm 10 dBm	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
	Date: 18.0 CT 2021 08:20:32	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
1/4DQPSK/LCH	Date: 18.0 CT 2021 08:20:32	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
1/4DQPSK/LCH	Date: 18.0 CT 2021 08.20:32	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
1/4DQPSK/LCH	Date: 18.0 CT 2021 08:20:32	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
1/4DQPSK/LCH	Date: 18.0 CT 2021 08 20:32	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ
1/4DQPSK/LCH	Date: 18.0 CT 2021 08:20:32 Spectrum Ref Level 25.00 dBm Offset 9.84 dB • RBW 2 MH • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -50 dBm	IZ IZ IZ IZ IZ IZ IZ IZ IZ IZ



	Spectrum		
	Ref Level 25.00 dBm Offset 9.80 dB RE Att 30 dB SWT 1.9 µs VE ● 1Pk View		
	20 dBm	M1[1]	-0.56 dBm 2.44060000 GHz
	10 dBm		
	0 dBm	M1	
	-10 dBm		
	-20 dBm		
τ/4DQPSK/MCH	-30 dBm		
	-40 dBm		
	-50 dBm		
	-60 dBm		
	-70 dBm		
	CF 2.441 GHz Date: 18.0 CT 2021 08:31:13 Spectrum Ref Level 25.00 dBm Offset 9.80 dB • RE	8001 pts	Span 10.0 MHz
	Date: 18.0 CT.2021 08:31:13 Spectrum Ref Level 25.00 dBm Offset 9.80 dB Att 30 dB SWT 1.9 µs VE	3W 2 MHz	
	Date: 18.0 CT.2021 08:31:13 Spectrum Ref Level 25.00 dBm Offset 9.80 dB Ref	3W 2 MHz	(🛄 0.44 dBm
	Date: 18.0 CT.2021 08:31:13 Spectrum Ref Level 25.00 dBm Offset 9.80 dB • Re • Att 30 dB SWT 1.9 μs • VE • 1Pk View	3W 2 MHz 3W 3 MHz Mode Auto FFT	(🛄 0.44 dBm
	Date: 18.0 CT 2021 08:31:13 Spectrum Ref Level 25.00 dBm Offset 9.80 dB • Re • Att 30 dB SWT 1.9 µs • VE • 1Pk View 20 dBm	3W 2 MHz 3W 3 MHz Mode Auto FFT	(🛄 0.44 dBm
	Date: 18.0 CT 2021 08:31:13 Spectrum Ref Level 25.00 dBm Offset 9.80 dB RE Att 30 dB SWT 1.9 µs VE 10 dBm 10 dBm	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	(🛄 0.44 dBm
	Date: 18.0 CT 2021 08:31:13	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	(🛄 0.44 dBm
t/4DQPSK/HCH	Date: 18.0 CT 2021 08:31:13	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	(🛄 0.44 dBm
t/4DQPSK/HCH	Date: 18.0 CT 2021 08:31:13	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	(🛄 0.44 dBm
t/4DQPSK/HCH	Date: 18.0 CT 2021 08:31:13	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	
τ/4DQPSK/HCH	Date: 18.0 CT 2021 08:31:13	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	(🛄 0.44 dBm
τ/4DQPSK/HCH	Date: 18.0 CT 2021 08:31:13	3W 2 MHz 3W 3 MHz Mode Auto FFT M1[1]	(🛄 0.44 dBm



4.4 20dB Occupy Bandwidth



Measurement Data

Test channel	20dB Occupy Bandwidth (MHz)		
rest channel	GFSK	π/4DQPSK	
Lowest	1.040	1.328	
Middle	1.042	1.326	
Highest	1.040	1.328	



Test plot as follows:





	Spectrum				
		et 9.80 dB 👄 RBW 30 kH 63.3 µs 🖷 VBW 100 kH			ĮΔ
	1Pk View	03.3 µs 🖷 VBW 100 KH	2 Mode Auto FFT		
	20 dBm		M1[1]		-23.26 dBm 2.47947600 GHz
	10 dBm		M2[1]	E 1	-3.02 dBm 2.48005600 GHz
	0 dBm		M2 Non		
	-10 dBm	- M	m		-
	-20 dBm D1 -23.018 dBm			- All	_
GFSK/HCH	-30 dBm			-	~
	-49 dBm				Y
	-50 dBm-				
	-60 dBm				
	-70 dBm CF 2.48 GHz	1001	pts		Span 2.0 MHz
	Marker				
		alue Y-value 79476 GHz -23.26 dB	Function	Function	Result
		1.04 MHz 0.01 0			(m
	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08.20:03 Spectrum Ref Level 25.00 dBm Offse Att 30 dB SWT 30 dB SWT	80056 GHz -3.02 dB 1.04 MHz 0.01 d et 9.84 dB RBW 30 kH	z		(mag)
	M2 1 2.4 D3 M1 1 2.4 Date:18.0CT.2021 08.20:03 08.20:03 08.20:03 Spectrum Ref Level 25.00 dBm Offsi	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	z		-24.59 dBm
	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT.2021 08.20:03 08 Spectrum Ref Level 25.00 dBm Offset Att 30 dB SWT 1 IPk View 1 1 1	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	z z Mode Auto FFT		-24.59 dBm 2.40133400 GHz -4.46 dBm
	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 0820:03 0820:03 Spectrum Ref Level 25.00 dBm Offse 1Pk View 20 dBm 0 8WT	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24.59 dBm 2.40133400 GHz -4.46 dBm
	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08.20:03 Spectrum Ref Level 25.00 dBm Offs. Att 30 dB SWT 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24.59 dBm 2.40133400 GHz -4.46 dBm
	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 0820:03 0820:03 0820:03 Spectrum Ref Level 25.00 dBm Offsigned and a second and and a second and and a second and a second and a sec	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24.59 dBm 2.40133400 GHz -4.46 dBm
	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 0820:03 0820:03 Spectrum Ref Level 25.00 dBm Offse Att 30 dB SWT 10 km 10 dBm 0 dBm 0 dBm 0 dBm	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24.59 dBm 2.40133400 GHz -4.46 dBm
r/4DQPSK/LCH	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08 Spectrum Ref Level 25.00 dBm Offse Att 30 dB SWT 1 0 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm -10 dBm -10 dBm -10 dBm	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24.59 dBm 2.40133400 GHz -4.46 dBm
r/4DQPSK/LCH	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08 Spectrum Ref Level 25.00 dBm Offs. Att 30 dB SWT 0 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm 0 10 dBm 10 dBm -10 dBm 0 12.4 957 dBm -30 dBm -30 dBm -50 dBm -50 dBm -50 dBm	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24,59 dBm 2,40133400 GHz -4,46 dBm 2,40183400 GHz
t/4DQPSK/LCH	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08 07 Ref Level 25.00 dBm Offsigned 07 Att 30 dB SWT 01 10 dBm 0 0 0 0 -20 dBm 01 -24.457 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 z Mode Auto FFT M1[1]		-24.59 dBm 2.40133400 GHz -4.46 dBm
1/4DQPSK/LCH	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08 07 Ref Level 25.00 dBm Offsic 4t 30 dB 90 Plk View 20 dBm 10	80056 GHz 1.04 MHz 0.01 c et 9.84 dB ● RBW 30 kH 63.3 µs ● VBW 100 kH 0.01 c 0.01 c 0.	2 2 3 3 3 3 3 3 3 3 3 3 3 3 3		-24.59 dBm 2.40133400 GHz -4.46 dBm 2.40183400 GHz
1/4DQPSK/LCH	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08 07 Ref Level 25.00 dBm Offsigned 07 Att 30 dB SWT 01 10 dBm 0 0 0 0 -20 dBm 01 -24.457 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB B RBW 30 kH	2 2 3 3 3 3 3 3 3 3 3 3 3 3 3		-24.59 dBm 2.40133400 GHz -4.46 dBm
τ/4DQPSK/LCH	M2 1 2.4 D3 M1 1 Date: 18.0 CT 2021 08.20:03 Spectrum Ref Level 25.00 dBm Offs. Att 30 dB SWT 1Pk View 20 dBm 10 dBm 10 dBm 0 0 dBm -20 dBm 01 -24 \$57 dBm -30 dBm -50 dBm -60 dBm -50 dBm -60 dBm -70 dBm CF 2.402 GHz Marker Type Ref Trc X-v.	80056 GHz -3.02 dB 1.04 MHz 0.01 c at 9.84 dB • RBW 30 kH 63.3 µs • VBW 100 kH 	2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	Function	-24.59 dBm 2.40133400 GHz -4.46 dBm 2.40183400 GHz
τ/4DQPSK/LCH	M2 1 2.4 D3 M1 1 2.4 Date: 18.0 CT 2021 08.20:03 08 07 Ref Level 25.00 dBm Offsic 41 30 dB 97 Plk View 20 dBm 10	80056 GHz -3.02 dB 1.04 MHz 0.01 c et 9.84 dB • RBW 30 kH 63.3 µs • VBW 100 kH 	2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3		-24.59 dBm 2.40133400 GHz -4.46 dBm 2.40183400 GHz



	Spectrum		
	Ref Level 25.00 dBm Offset 9.80 dB	RBW 30 kHz VBW 100 kHz Mode Auto FFT	(4
	1Pk View		
	20 dBm	M1[1]	-23.65 dBm 2.44033800 GHz
	10 dBm	M2[1]	-3.65 dBm 2.44083600 GHz
	0 dBm	142	
		A	
	-10 dBm		m
	-20 dBm23.647 dBm		103
	-30 dBm		
r/4DQPSK/MCH	40.dem		- m
	-50 dBm-		
	-60 dBm		
	and the second se		
	-70 dBm CF 2.441 GHz	1001 pts	Span 2.0 MHz
	Marker	1001 prs	apan 2.0 MH2
	Type Ref Trc X-value	-23.65 dBm	Function Result
	M1 1 2 440329 CH-		
	M1 1 2.440338 GHz M2 1 2.440836 GHz D2 M1 1 1 2.440836 GHz	-3.65 dBm	
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum	-3.65 dBm -0.29 dB	
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date:18.0CT.2021 08:30:44 Spectrum Ref Level 25.00 dBm Offset 9.80 dB •	-3.65 dBm -0.29 dB	
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Ref Level 25.00 dBm Offset 9.80 dB Att 30 dB SWT 63.3 µs	-3.65 dBm -0.29 dB	-22.81 dBm
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Ref Level 25.00 dBm Offset 9.80 dB Att 30 dB SWT 63.3 µs 1Pk View 1 1 1	-3.65 dBm -0.29 dB RBW 30 kHz VBW 30 kHz VBW 100 kHz Mode Auto FFT	-22.81 dBm 2.47933600 GHz -2.77 dBm
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Offset 9.80 dB Att 30 dB SWT 63.3 µs 1Pk View 20 dBm 10 dBm 10 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT 	-22.81 dBm 2.47933600 GHz -2.77 dBm
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 10 dBm 10 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 10 dBm 10 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 10 dBm 10 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
1/4DOPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 10 dBm 10 dBm -10 dBm M1 M1 M1	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
ſ/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Ref Level 25.00 dBm Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 10 dBm 10 dBm -10 dBm 0 dBm 0 dBm 0 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm 2.47983600 GHz
1/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB SWT 63.3 µs ● 1Pk View 20 dBm 0 0 dBm 0 10 dBm 0 0 0 0 0 -20 dBm 01 -22.768 dBm -30 dBm 0 -30 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
t/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 0	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
t/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Offset 9.80 dB Att 30 dB SWT 63.3 µs © 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm 50 dBm <td< td=""><td>-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]</td><td>-22.81 dBm 2.47933600 GHz -2.77 dBm</td></td<>	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
1/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB Offset 9.80 dB Att 30 dB SWT 63.3 µs ● 1Pk View 20 dBm 10 dBm 10 dBm -10 dBm 01 -22768 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm	-3.65 dBm -0.29 dB RBW 30 kHz YBW 100 kHz Mode Auto FFT M1[1] M2[1]	-22.81 dBm 2.47933600 GHz -2.77 dBm
1/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT.2021 08:30:44 Spectrum Offset 9.80 dB Offset 9.80 dB Att 30 dB SWT 63.3 µs • 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm 0 10 dBm 10 dBm -20 dBm D1 -22768 dBm -30 dBm -30 dBm -50 dBm -60 dBm -60 dBm -60 dBm -70 dBm -70 dBm -70 dBm	-3.65 dBm -0.29 dB • RBW 30 kHz • VBW 100 kHz Mode Auto FFT M1[1] M2[1] M2 1001 pts	-22.81 dBm 2.47933600 GHz -2.77 dBm 2.47983600 GHz
τ/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Ref Level 25.00 dBm Offset 9.80 dB Att 30 dB SWT 63.3 µs ● 1Pk View 20 dBm 0 0 dBm 10 dBm 0 0 dBm 0 -10 dBm 0 -20 dBm 0 -27.68 dBm -30 dBm 0 -50 dBm -50 dBm -50 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm 1 2.479336 GHz -79336 GHz	-3.65 dBm -0.29 dB RBW 30 kHz VBW 100 kHz Mode Auto FFT M1[1] M2[1] M2[1] M2 1001 pts Y-value Function -22.81 dBm	-22.81 dBm 2.47933600 GHz -2.77 dBm 2.47983600 GHz
t/4DQPSK/HCH	M2 1 2.440836 GHz D3 M1 1 1.326 MHz Date: 18.0 CT 2021 08:30:44 Spectrum Offset 9.80 dB Offset 9.80 dB Att 30 dB SWT 63.3 µs 0 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm 0 dBm 10 -22 768 dBm -30 dBm -30 dBm 01 -22 768 dBm -30 dBm -30 dBm -50 dBm -60 dBm -60 dBm -70 dBm -70 dBm CF 2.48 GHz Marker Type Ref Trc X-value	-3.65 dBm -0.29 dB RBW 30 kHz VBW 100 kHz Mode Auto FFT M1[1] M2[1] M2[1] M2[1] M2 M2 M2 M2 M2 M2 M2 M2 M2 M2	-22.81 dBm 2.47933600 GHz -2.77 dBm 2.47983600 GHz



4.5 Carrier Frequencies Separation

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.		
Limit:	2/3 of the 20dB bandwidth		
	Remark: the transmission power is less than 0.125W.		
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		
Test Results:	Only the worst case is recorded in the report. Pass		
	1 435		



Measurement Data

GFSK mode				
Test channel	Carrier Frequencies Separation (MHz)	Limit (MHz)	Result	
Lowest	1.005	≥0.695	Pass	
Middle	1.000	≥0.695	Pass	
Highest	1.005	≥0.695	Pass	
	π/4DQPSK m	node		
Test channel	Carrier Frequencies Separation (MHz)	Limit (MHz)	Result	
Lowest	1.000	≥0.885	Pass	
Middle	1.000	≥0.885	Pass	
Highest	1.000	≥0.885	Pass	

Mode	20dB bandwidth (MHz)	Limit (MHz)
woue	(worse case)	(Carrier Frequencies Separation)
GFSK	1.042	0.695
π/4DQPSK	1.328	0.885



Test plot as follows:





	Spectrum		
	Ref Level 25.00 dBm Offset 9.80 dB ■ RBW 10 ■ Att 30 dB SWT 18.9 μs ■ VBW 30		
	1Pk View 20 dBm	M1[1] D1[1]	-0.50 dBm 2.47915385 GHz -0.03 dB 1.00481 MHz
	10 dBm	01	
	-10 dBm		
GFSK/HCH	-20 dBm		
	-30 dBm		
	-50 dBm		
	-60 dBm		
	-70 dBm		
	01-10.170.011-	605 1	01 0 101 011
	Date: 18.0 CT 2021 08:47:18	625 pts	Stop 2.481 GHz
	N	00 kHz 00 kHz Mode Auto FFT	(m) A
	Date: 18.0 CT 2021 08:47:18 Spectrum Ref Level 25.00 dBm Offset 9.84 dB Att 30 dB SWT 18.9 μs VBW 30 1Pk View 20 dBm	00 kHz	-2.31 dBm 2.40183654 GHz -0.07 dB
	Date: 18.0 CT 2021 08:47:18 Spectrum Ref Level 25.00 dBm Offset 9.84 dB • RBW 10 Att 30 dB SWT 18.9 µs • VBW 30 1Pk View	00 kHz 00 kHz Mode Auto FFT M1[1]	-2.31 dBm 2.40183654 GHz
	Date: 18.0 CT 2021 08:47:18	00 kHz 00 kHz Mode Auto FFT M1[1] 01[1] 01[1]	-2.31 dBm 2.40183654 GHz -0.07 dB
1/4DQPSK/LCH	Spectrum Offset 9.84 dB RBW 10 Att 30 dB SWT 18.9 μs VBW 30 O 1Pk View 20 dBm 10 dBm 11 10 10 M1 10 10 M1 10 10 M1 10 10 10 M1 10 10 M1 10 10 10 10 10 10 10 10 10 10 10 10 10 10 1	00 kHz 00 kHz Mode Auto FFT M1[1] 01[1] 01[1]	-2.31 dBm 2.40183654 GHz -0.07 dB
1/4DQPSK/LCH	Date: 18.0 CT 2021 08:47:18	00 kHz 00 kHz Mode Auto FFT M1[1] 01[1] 01[1]	-2.31 dBm 2.40183654 GHz -0.07 dB
T/4DQPSK/LCH	Date: 18.0 CT 2021 08:47:18	00 kHz 00 kHz Mode Auto FFT M1[1] 01[1] 01[1]	-2.31 dBm 2.40183654 GHz -0.07 dB
τ/4DQPSK/LCH	Date: 18.0 CT 2021 08:47:18	00 kHz 00 kHz Mode Auto FFT M1[1] 01[1] 01[1]	-2.31 dBm 2.40183654 GHz -0.07 dB



	Spectrum		u ana ku-			
	Ref Level 25.00 d Att 30			Auto FFT		
	e 1Pk View 20 dBm			M1[1]	2	-1.46 dBm .44083654 GHz
	10 dBm			D1[1]		-0.09 dB 1.00000 MHz
	0 dBm-	M1		01		
		m		in	hand	~~
	-10 dBm					
/4DQPSK/MCH	-20 dBm					
	-30 dBm					
	-40 dBm					
	-50 dBm					_
	-60 dBm					_
	-70 dBm					_
			605 1		5	top 2.443 GHz
	Stort 2.44 GHz Date: 18.0 CT 2021 09:1: Spectrum Ref Level 25.00 d		625 pts			
	Date: 18.0 CT 2021 09:1: Spectrum Ref Level 25.00 d Att 30	Bm Offset 9.80 dB 🖷 RBN	✔ 100 kHz	Auto FFT		
	Date: 18.0 CT.2021 09:11 Spectrum Ref Level 25.00 d Att 30 1Pk View	Bm Offset 9.80 dB 🖷 RBN	W 100 kHz W 300 kHz Mode	Auto FFT		-0.55 dBm
	Date: 18.0 CT 2021 09:1: Spectrum Ref Level 25.00 d Att 30	Bm Offset 9.80 dB 🖷 RBN	V 100 kHz V 300 kHz Mode			-0.55 dBm 2.47883654 GHz 0.10 dB
	Date: 18.0 CT.2021 09:13 Spectrum Ref Level 25.00 d Att 30 10 dBm 10 dBm	Bm Offset 9.80 dB 🖷 RBN	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GH2 0.10 dB
	Date: 18.0 CT.2021 09:13 Spectrum Ref Level 25.00 d Att 30 1Pk View 20 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1]		-0.55 dBm 2.47883654 GH2 0.10 dB
	Date: 18.0 CT.2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GH2 0.10 dB
/4DQPSK/HCH	Date: 18.0 CT.2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GH2 0.10 dB
/4DQPSK/HCH	Date: 18.0 CT.2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GHz 0.10 dB
/4DQPSK/HCH	Date: 18.0 CT.2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GHz 0.10 dB
/4DQPSK/HCH	Date: 18.0 CT.2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GHz 0.10 dB
1/4DQPSK/HCH	Date: 18.0 CT 2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GHz 0.10 dB
1/4DQPSK/HCH	Date: 18.0 CT 2021 09:11 Spectrum Ref Level 25.00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	Bm Offset 9.80 dB ● RB1 dB SWT 18.9 µs ● VB1	V 100 kHz V 300 kHz Mode	M1[1] D1[1]		-0.55 dBm 2.47883654 GHz 0.10 dB 1.00000 MHz



4.6 Hopping Channel Number

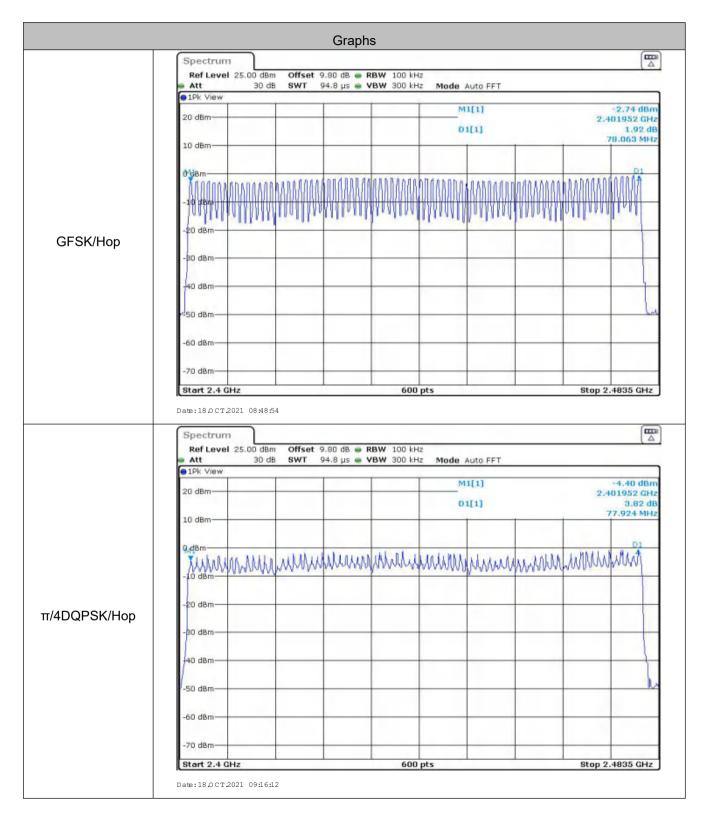
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10:2013		
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.		
Limit:	At least 15 channels		
Exploratory Test Mode:	hopping transmitting with all 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:





4.7 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

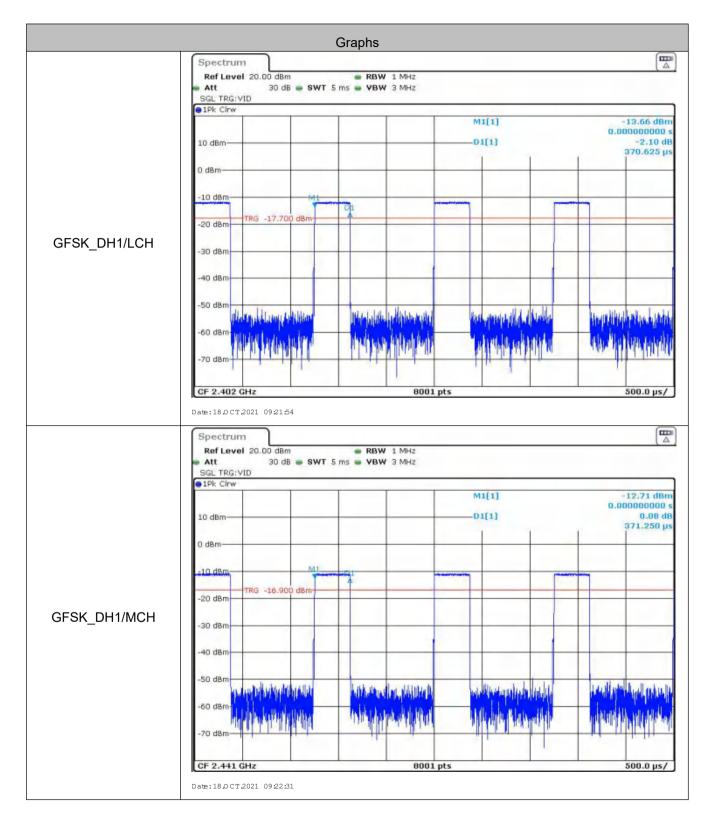
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Dwell Time[s]	Limit (second)
GFSK	DH1	LCH	0.37	0.118	≤0.4
GFSK	DH1	МСН	0.37	0.118	≤0.4
GFSK	DH1	НСН	0.37	0.118	≤0.4
π/4DQPSK	2DH1	LCH	0.38	0.122	≤0.4
π/4DQPSK	2DH1	МСН	0.38	0.122	≤0.4
π/4DQPSK	2DH1	НСН	0.38	0.122	≤0.4
GFSK	DH3	LCH	1.63	0.261	≤0.4
GFSK	DH3	MCH	1.63	0.261	≤0.4
GFSK	DH3	НСН	1.63	0.261	≤0.4
π/4DQPSK	2DH3	LCH	1.63	0.261	≤0.4
π/4DQPSK	2DH3	MCH	1.63	0.261	≤0.4
π/4DQPSK	2DH3	НСН	1.63	0.261	≤0.4
GFSK	DH5	LCH	2.87	0.306	≤0.4
GFSK	DH5	МСН	2.87	0.306	≤0.4
GFSK	DH5	НСН	2.87	0.306	≤0.4
π/4DQPSK	2DH5	LCH	2.88	0.307	≤0.4
π/4DQPSK	2DH5	МСН	2.88	0.307	≤0.4
π/4DQPSK	2DH5	НСН	2.88	0.307	≤0.4

Remark:

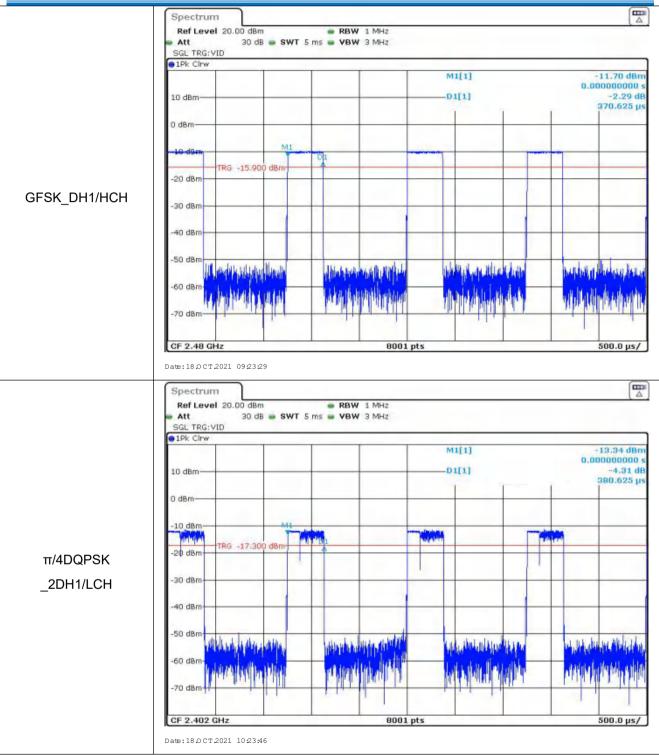
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s DH1/2DH1 Dwell time = Burst Width(ms)*(1600/ (2*79))*31.6 DH3/2DH3 Dwell time = Burst Width (ms)*(1600/ (4*79))*31.6 DH5/2DH5 Dwell time = Burst Width (ms)*(1600/ (6*79))*31.6



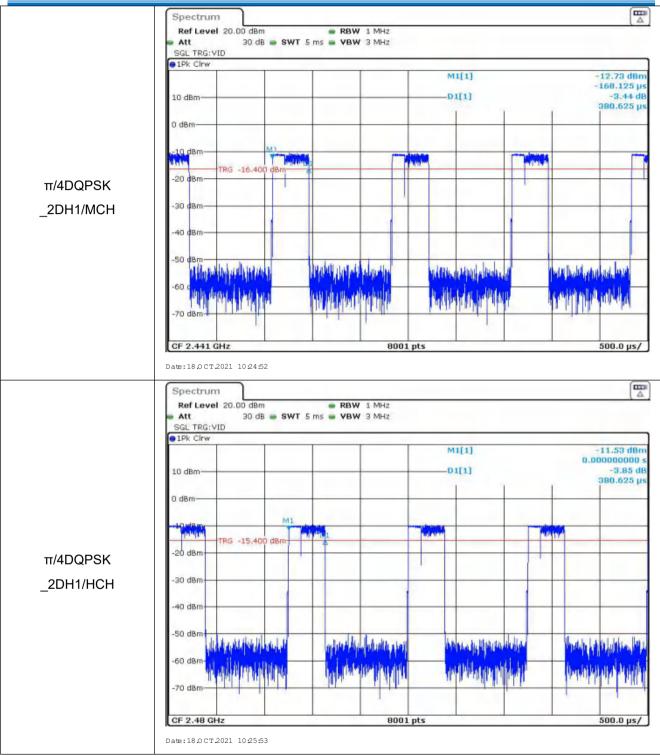
Test plot as follows:











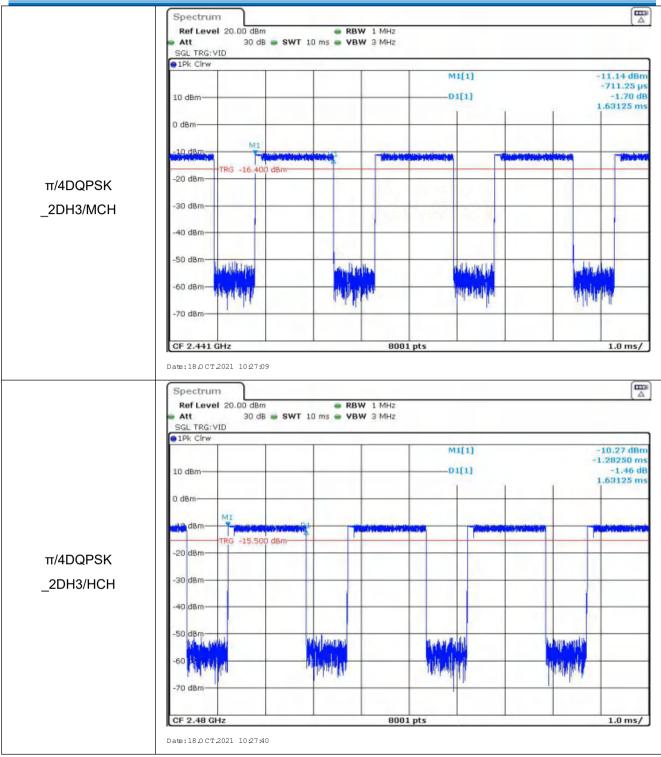


	Spectrum)			
	Ref Level 20.0		🖷 RBW 1 MHz		
	SGL TRG:VID	30 dB 👄 SWT 10 ms	S VBW 3 MHz		
	• 1Pk Clrw				
				M1[1]	-12.07 dBm 0.00000000 s
	10 dBm			D1[1]	-0.28 dB
				TIT	1.62625 ms
	0 dBm				
	-10 dBm	MI			
			1		
	-20 dBm	-17.800 dBm			
GFSK_DH3/LCH	-30 dBm				
	-30 dbm				
	-40 dBm				
	-50 dBm	La Martin	of the bar half	IL ALLA DI	dund. Milde
	-60 dBm-		Lutitur day	in dation	ui l hand
			Ja. de maid	Loughly build	Addined of
	-70 dBm				
	CF 2.402 GHz		8001 pts		1.0 ms/
)			_
	Spectrum				
	Ref Level 20.0		🖷 RBW 1 MHz		
		00 dBm 30 dB 🖶 SWT 10 ms			
	Ref Level 20.0			20151	
	Ref Level 20.0 Att SGL TRG:VID			M1[1]	-11.23 dBm 0.00000000 s
	Ref Level 20.0 Att SGL TRG:VID			M1[1] —D1[1]	-11.23 dBm 0.0000000 s -0.17 dB
	Ref Level 20.0 Att SGL TRG:VID 1Pk Clrw 10 dBm				-11.23 dBm 0.00000000 s -0.17 dB
	Ref Level 20.0 Att SGL TRG:VID 1Pk Cirw	30 dB 👄 SWT 10 ms			-11.23 dBm 0.00000000 s -0.17 dB 1.62625 ms
	Ref Level 20.0 Att SGL TRG:VID 1Pk Clrw 10 dBm				-11.23 dBm 0.00000000 s -0.17 dB
	Ref Level 20.0 Att SGL TRG:VID 1Pk Cirw 10 dBm 0 dBm -10 dBm TRG	30 dB 👄 SWT 10 ms			-11.23 dBm 0.00000000 s -0.17 dB
	Ref Level 20.0 Att SGL TRG:VID 1Pk Cinw 10 dBm 0 dBm -10 dBm	30 dB • SWT 10 ms			-11.23 dBm 0.00000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG:VID 1Pk Cirw 10 dBm 0 dBm -10 dBm TRG	30 dB • SWT 10 ms			-11.23 dBm 0.00000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	30 dB • SWT 10 ms			-11.23 dBm 0.00000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm TRG	30 dB • SWT 10 ms			-11.23 dBm 0.00000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB • SWT 10 ms	P1		-11.23 dBm 0.00000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	30 dB • SWT 10 ms			-11.23 dBm 0.00000000 -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB • SWT 10 ms	P1		-11.23 dBm 0.00000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	30 dB • SWT 10 ms	P1		-11.23 dBm 0.00000000 -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB • SWT 10 ms	P1		-11.23 dBm 0.0000000 s -0.17 dB
GFSK_DH3/MCH	Ref Level 20.0 Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	30 dB • SWT 10 ms	P1		-11.23 dBm 0.0000000 s -0.17 dB



	Spectrum			
	Ref Level 20.00 dBm	RBW 1 MHz		[4
	SGL TRG: VID	T 10 ms 🖶 VBW 3 MHz		
	• 1Pk Clrw		M1[1]	-10.19 dBm
	10.0			1.25 µs -0.30 dB
	10 dBm		01[1]	1.62625 ms
	0 dBm			
	M1	D1		
	TRG -16.000 dBm	A		
	-20 dBm			
GFSK_DH3/HCH	-30 dBm			
	-40 dBm			
	-50 dBm			
	the set of	A Mapped Mar	15 M (marks)	Withthe
	-60 dBm		P M AN	ALC: NOT A PARTY
	-70 dBm	1, 1, 2, 2	. 11	
	CF 2.48 GHz	8001 pts		1.0 ms/
	Date:18.0CT.2021 09:42:33			
	Spectrum			
	Ref Level 20.00 dBm Att 30 dB = SW1	 RBW 1 MHz T 10 ms VBW 3 MHz 		
	SGL TRG: VID			
	• 1Pk Clrw		M1[1]	-12.00 dBm
	10 dBm			-256.25 µs
			-D1[1]	-1.60 dB
			-D1[1]	
	0 dBm			-1.60 dB 1.63125 ms
	0 d8m -10 d8m -10 d8m -17 d8m -17.300 d8m	Hereford Hereford Hereford		
π/4DQPSK	0 dBm			1.63125 ms
	0 d8m -10 d8m -10 d8m -17 d8m -17.300 d8m			1.63125 ms
π/4DQPSK _2DH3/LCH	0 dBm -10 dBm -20 dBm -30 dBm			1.63125 ms
	0 dBm -10 dBm -20 dBm -20 dBm -20 dBm			1.63125 ms
	0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm			1.63125 ms
	0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm			1.63125 ms
	0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm			1.63125 ms
	0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm			1.63125 ms
	0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -60 dBm -60 dBm -60 dBm -60 dBm -60 dBm -60 dBm -10 d	8001 pts		1.63125 ms

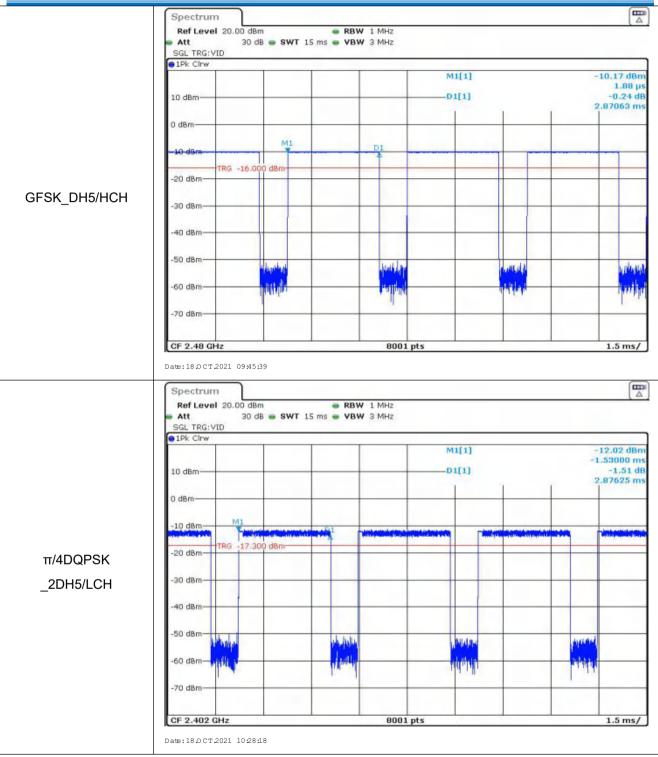




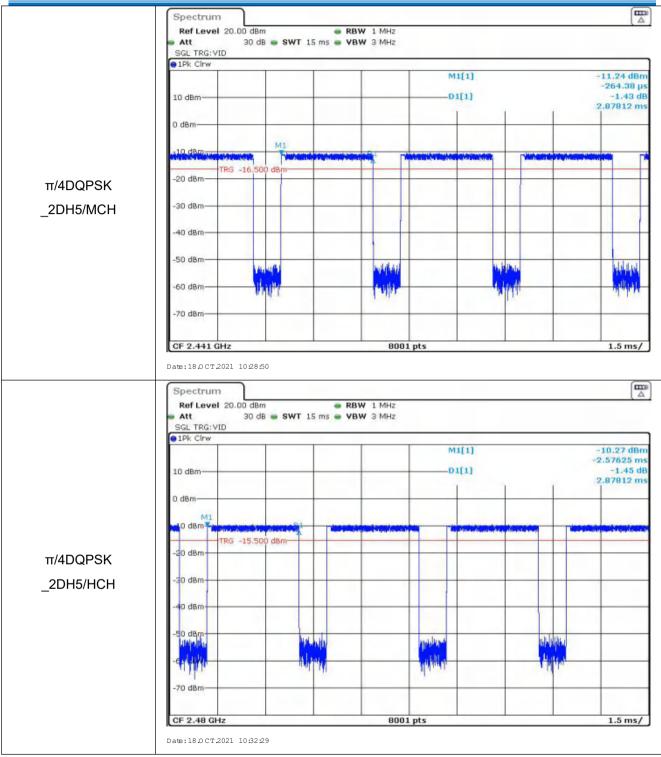


	Spectrum	7				
	Ref Level 20.		RBW 1 MHz			(A
	SGL TRG: VID	30 dB 👄 SWT 15 ms	WBW 3 MHz			
	• 1Pk Clrw					
				M1[1]		-12.09 dBm 1.88 µs
	10 dBm			D1[1]		-0.07 dB 2.87250 ms
	0 dBm				1 1	2.07200 113
	O GBII					
	-10 d8m-	M1				
	-20 dBm-TRG	-17.900 d8m				
	-20 dbm					
GFSK_DH5/LCH	-30 dBm					
	-40 dBm					
	-40 0811					
	-50 dBm	and a state	the sec b		al attai	1
	50 day	AND ALL	all may		the first	1 Martine
	-60 dBm	100	bitalis		In the second	Indute
	-70 dBm					
	CF 2.402 GHz	1	8001 pts		-	1.5 ms/
	Date: 18.0 CT 2021	1				(m A
	Spectrum Ref Level 20. Att SGL TRG:VID	1	• RBW 1 MHz • VBW 3 MHz			
	Spectrum Ref Level 20.	00 dBm		M1[1]		-11.22 dBm
	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw	00 dBm				-11.22 dBn 0.00000000 :
	Spectrum Ref Level 20. Att SGL TRG:VID	00 dBm		M1[1] 01[1]		-11.22 dBn 0.00000000 -0.05 dB
	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw	00 dBm				-11.22 dBn 0.00000000 -0.05 dB
	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm	00 dBm				-11.22 dBn 0.00000000 -0.05 dB
	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Cirw 10 dBm 0 dBm -10 dBm	00 dBm 30 dB SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Cirw 10 dBm 0 dBm -10 dBm	00 dBm 30 dB - SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm	00 dBm 30 dB SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm	00 dBm 30 dB SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm	00 dBm 30 dB SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	00 dBm 30 dB • SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	00 dBm 30 dB SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dB
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	00 dBm 30 dB SWT 15 ms 	DI			-11.22 dBn 0.00000000 -0.05 dt 2.87438 m
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	00 dBm 30 dB • SWT 15 ms	• VBW 3 MHz			-11.22 dBn 0.00000000 -0.05 dE 2.87438 ms
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm	00 dBm 30 dB SWT 15 ms 	DI			-11.22 dBm 0.00000000 s -0.05 dE 2.87438 ms
GFSK_DH5/MCH	Spectrum Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	00 dBm 30 dB SWT 15 ms 	DI	D1[1]		-11.22 dBm 0.00000000 s -0.05 dE 2.87438 ms











4.8 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



Mode	Test Channel	Frequency [MHz]	Frequency Hopping	Emission Level [dBm]	Limit [dBm]	Result
			Off	-50.310	-22.32	PASS
GFSK	LCH	2400	On	-50.160	-21.37	PASS
			Off	-53.120	-20.44	PASS
GFSK	HCH	2483.5	On	-51.250	-20.82	PASS
			Off	-50.810	-22.25	PASS
π/4DQPSK	LCH	2400	On	-49.700	-21.17	PASS
			Off	-52.880	-20.45	PASS
π/4DQPSK	HCH	2483.5	On	-51.180	-20.68	PASS



Test plot as follows:

					Graph	S						
	Spectr	um										
		vel 25.				RBW 100 kH						
	Att 1Pk Vie	3W	30 dB	SWT	151.7 µs 🖷	VBW 300 kH	1z Mod	e Auto F	FT			
	20 dBm-	-	-					M1[1]				-2.32 dBm
								M2[1]				21550 GHz 50.31 dBm
	10 dBm-							1	.1	O	2.40	00000 GHz
	0 dBm-	-							M	1		
	-10 dBm	-	_		-	-			_			
	-20 dBm	-			-	-		_	_			-
	an dam		-22.320	dBm						-		
	-30 dBm											
GFSK/LCH/No Hop	-40 dBm	-			M5			42				
	LEOL delm	-	-	and the second starting	and a starter	and and provident	-	and a series	MAC	which provide	Martin Martin	Wend
	-60 dBm	_	_				_					
	-70 dBm											
	Start 2.					8001	nts				Ston	2.441 GHz
	Marker	51 GH2		_		0001	pes				Stop	2.441 0/12
	Type M1	Ref T	1	X-value 2.4021	e 55 GHz	-2.32 dB		ction		Func	tion Result	t
	M2		1	2	2.4 GHz	-50.31 dB	m					
	M3 M4		1		39 GHz 31 GHz	-50.11 dB			-			
	M5		1	2.35213		-47.82 dB						
	Date: 18.0	um										
	Spectr Ref Le Att	um vel 25		Offset		RBW 100 kH		e Auto F	FT			
	Spectr Ref Le Att	um vel 25	.00 dBm	Offset			lz Mod		FT			(Δ
	Spectr Ref Le Att	um vel 25	.00 dBm	Offset			lz Mod	M1[1]	FT			-1.37 dBn 28880 GH2
	Spectr Ref Le Att	um vel 25	.00 dBm	Offset			lz Mod		FT			-1.37 dBn 28880 GH: 50.16 dBn
	Spectr Ref Le Att 1Pk Vie 20 dBm-	um vel 25	.00 dBm	Offset			lz Mod	M1[1]	FT			-1.37 dBn 28880 GH: 50.16 dBn
	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm-	evel 25.	.00 dBm	Offset			lz Mod	M1[1]	FT	WARANA		-1.37 dBn 28880 GH: 50.16 dBn
	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- 0 dBm- -10 dBm	evel 25.	.00 dBm	Offset			lz Mod	M1[1]	FT			-1.37 dBn 28880 GH: 50.16 dBn
	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm-	evel 25.	.00 dBm	Offset SWT			lz Mod	M1[1]	FT			-1.37 dBn 28880 GH: 50.16 dBn
	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- 0 dBm- -10 dBm	evel 25.	00 dBm 30 dB	Offset SWT			lz Mod	M1[1]	FT			-1.37 dBm 28880 GHz 50.16 dBm
GESK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm	2001 25.	00 dBm 30 dB	Offset SWT			lz Mod	M1[1]	FT			-1.37 dBm 28880 GHz 50.16 dBm
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm	25.	00 dBm 30 dB	Offset SWT			lz Mod	M1[1]	FT			-1.37 dBm 28880 GHz 50.16 dBm
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm	D1	00 dBm 30 dB	dBm			lz Mod	M1[1]	FT			-1.37 dBm 28880 GHz 50.16 dBm
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm	D1	00 dBm 30 dB	dBm			lz Mod	M1[1]	FT			-1.37 dBm 28880 GHz 50.16 dBm
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm	D1	-21.370	dBm		• VBW 300 kH	tz Mod	M1[1]	FT M2			-1.37 dBm 22880 GH2 50.16 dBm 00000 GH2 \$11
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm	D1	-21.370	dBm			tz Mod	M1[1]	FT			-1.37 dBm 28880 GHz 50.16 dBm
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -59 dBm -60 dBm -70 dBm Stort 2. Marker Type	25. 3W D1	-21.370	dBm X-value	e	• VBW 300 kH	tz Mod	M1[1]	FT	TTT DATA TA		-1.37 dBm 28880 GH2 50.16 dBm 911
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm 4 -60 dBm -70 dBm Start 2.	25. 3W D1	-21.370	dBm	151.7 µs	• VBW 300 kH	pts	M1[1] M2[1] M3 M3	MŻ	TTT DATA TA	2.4	-1.37 dBm 28880 GHz 50.16 dBm 911
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -30 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm Start 2. Marker Type M1 M2 M3	2000 25.	-21.370	dBm X-value 2.428	e 188 GHz 39 GHz	600 Y-value -1.37 dB -50.16 dB -49.34 dB	iz Mod	M1[1] M2[1] M3 M3	FT Ma	TTT DATA TA	2.4	28880 GH2 50.16 dBm 00000 GH2 11
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm Stort 2. Marker Type M1 M2	2000 25.	-21.370	dBm X-value 2,428 2, 2, 2,	e 888 GHz 2.4 GHz	• VBW 300 kH	pts	M1[1] M2[1] M3 M3	FT M2	TTT DATA TA	2.4	-1.37 dBm 28880 GH2 50.16 dBm 911



	Spectrun	11						
		el 25.00 dBr 30 d		RBW 100 kHz VBW 300 kHz	Mode Auto FFT			(=
	• 1Pk View	-		1 1				4 dBm
	20 dBm				M1[1] M2[1]		2.4801554	a GHz 2 dBm
	10 0011			MI	1	1 1	2,4835000	IU GHZ
	0 dBm							
	-10 dBm-							
	-20 dBm							
	au upin	D1 -20.440	dBm					
	-30 dBm							
GFSK/HCH/No Hop	-40 dBm			11		-		
	Hotomanha		contra marchaline march	ment more		M4 #13	monthine-placeterineterior	-
			And Manager and Address of the		and the second sec			
	-60 dBm							
	-70 dBm					-		-
	CF 2.4835	GHz		8001 pt	s		Span 60.0	MHz
	Marker Type Re	fTrc	X-value	Y-value	Function	Fund	tion Result	
	M1 M2	1	2.4801554 GHz 2.4835 GHz	-0.44 dBm -53.12 dBm				_
	M3	1	2.5 GHz	-51.21 dBm				
	M4	1	2.49928 GHz	-48.16 dBm				
	Date:18.0CT	.2021 08:21:	01					
		_	01					Ē
	Spectrur	_		RBW 100 kHz				
	Spectrum Ref Leve	"	n Offset 9.80 dB	RBW 100 kHz VBW 300 kHz	Mode Auto FFT			
	Spectrum Ref Leve Att 1Pk View	n 1 25.00 dBr	n Offset 9.80 dB		Mode Auto FFT			2 dBn
	Spectrum Ref Leve	n 1 25.00 dBr	n Offset 9.80 dB		M1[1]		2.479950	2 dBn
	Spectrum Ref Leve Att 1Pk View	n 1 25.00 dBr	n Offset 9.80 dB	VBW 300 kHz				2 dBn IO GHI 5 dBn
	Spectrum Ref Leve Att 1Pk View 20 dBm-	n 1 25.00 dBr	n Offset 9.80 dB		M1[1]	1	2.479950	2 dBn 10 GH 5 dBn
	Spectrum Ref Leve Att 1Pk View 20 dBm- 10 dBm-	n 1 25.00 dBr	n Offset 9.80 dB	M1	M1[1]	1	2.479950	2 dBn 10 GH 5 dBn
	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm	n 1 25.00 dBr	n Offset 9.80 dB	VBW 300 kHz	M1[1]		2.479950	2 dBn IO GHI 5 dBn
	Spectrum Ref Leve Att 1Pk View 20 dBm- 10 dBm-	n 1 25.00 dBr	n Offset 9.80 dB swr 75.8 μs	M1	M1[1]		2.479950	2 dBn IO GH: 5 dBn
	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm	n 1 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1]		2.479950	2 dBn IO GH: 5 dBn
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm	n 1 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]		2.479950	2 dBn IO GH: 5 dBn
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm	n 1 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]	M3	2.479950	2 dBn IO GH2 5 dBn
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm	n 1 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]	Ma	2.479950	2 dBn IO GHI 5 dBn
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm	n 1 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]	M3	2.479950	2 dBm IO GH2 5 dBm
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm	n 1 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]	M3	2.479950	5 dBm
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	n 25.00 dBr 30 d	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]	Ma	2.479950	2 dBm 0 GH; 5 dBn 0 GH;
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 0 dBm 0 dBm -20 dBm -30 dBm -40 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.4835 Marker	n 25.00 dBr 30 dl	n Offset 9.80 dB 8 SWT 75.8 µs	000 pts	M1[1] M2[1]	-accon ver	2.479950 -51.21 2.483500	2 dBm 0 GH; 5 dBn 0 GH;
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 0 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -70 dBm CF 2.4835	n 25.00 dBr 30 dl	n Offset 9.80 dB swr 75.8 μs	M1	M1[1] M2[1]	-accon ver	2.479950 -51.21 2.483500	2 dBm 0 GHz 5 dBm 0 GHz
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm CF 2.4835 Marker Type M1 M2	n 25.00 dBr 30 dl 0 d	а Offset 9.80 dB 3 SWT 75.8 µs	VBW 300 kHz	M1[1] M2[1]	-accon ver	2.479950 -51.21 2.483500	2 dBm 0 GHz 5 dBm 0 GHz
GFSK/HCH/Hop	Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -70 dBm	n 25.00 dBr 30 d 0 1 0 1 -20.820 0 1 -20.820	n Offset 9.80 dB 3 SWT 75.8 µs =	WBW 300 kHz M1 M1 M1 600 pts Y-value -0.82 dBm	M1[1] M2[1]	-accon ver	2.479950 -51.21 2.483500	2 dBm 0 GH; 5 dBn 0 GH;



	Spectrun	ı)								
	Att	25.00 dBm 30 dB			RBW 100 kHz VBW 300 kHz		Auto FFT			
	 1Pk View 20 dBm— 	-	-			M1	[1]		2.40	-2.25 dBm 18440 GHz
	10 dBm					M2		1	-	50.81 dBm 00000 GHz
	0 dBm							1		
	-10 d8m-									
	-30 dBm	D1 -22.250	dBm							
п/4DQPSK/LCH/No Hop	-40 dBm		MS			M	13 M			
Пор	-60 dBm-	manuting	and and		-	Annahim artist	- Monthly Mart	print angeling	and the second	
	-70 dBm									
	Start 2.31 Marker	GHz			8001 p	ts			Stop :	2.441 GHz
	Type Re M1 M2	f Trc 1	X-value 2.4018-		Y-value -2.25 dBm -50.81 dBm	Functi	on	Fund	ction Result	
	M3 M4 M5	1	2.	39 GHz 31 GHz	-49.98 dBm -51.39 dBm -47.91 dBm					
	Date:18.0CT.	2021 08:24:5	5							
	Spectrun									
	Att 1Pk View	25.00 dBm 30 dB			RBW 100 kHz VBW 300 kHz	Mode A	Auto FFT			
	20 dBm-	_	-			M1	[1]		2.4	-1.17 dBm 33900 GHz
	10 dBm					M2	[1]		-	49.70 dBm 00000 GHz
	0 dBm						-	b	mound	MINUM
	-10 dBm									
	-20 dBm	01 -21.170	dBm							
/4DQPSK/LCH/Hop	-40 dBm			MS		_				
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· · · · · · ·	W-sordemain	and any solution of the second state								
	-60 dBm	n kanyat di disan disi								
		GHz			600 pt	5			Stop	2.441 GHz
	-60 dBm -70 dBm Start 2.31 Marker Type Re	f Trc	X-value		Y-value	Functi	on	Fun	Stop :	
· · ·	-60 dBm		2.43 2 2.1	9 39 GHz 4 GHz 39 GHz 31 GHz		Functi	on	Fund		



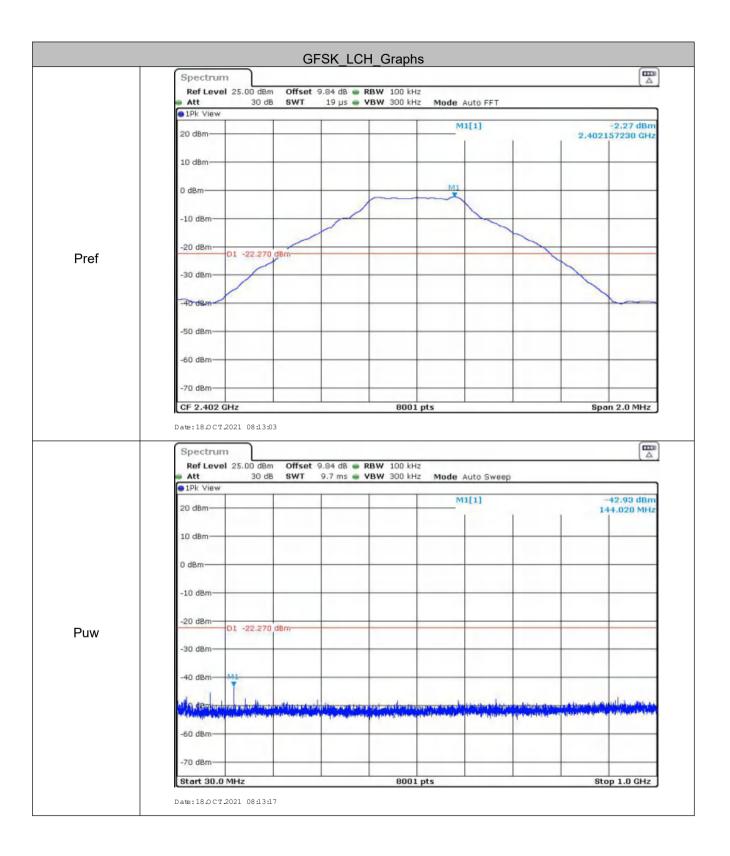
	Spectru	m]					m
		el 25.00 dBr		RBW 100 kHz			
	Att 1Pk View	30 d	B SWT 75.8 µs	VBW 300 kHz	Mode Auto Fi	FT	
	20 dBm				M1[1]		-0.45 dBm
					M2[1]		2.47984050 GHz -52.88 dBm
	10 dBm-			M1	1	1 1	2,48350000 GHz
	0 dBm			X			
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	-20 dBm-	D1 -20.45	1 dBm				
		D1 -10.101					
π/4DQPSK/HCH/No	-30 dBm-						
Нор	-40 dBm-				M4		
inop	MEDIOROM	-	And an and the states	mind here	warmer hander	M3	www.Waladele.molourieurge.gh.gh.gh.gh.gh.gh.gh.gh.gh.gh.gh.gh.gh.
	-60 dBm-		<u> </u>			-	
	-70 dBm-	5 CH2		8001 pt			Span 60.0 MHz
	Marker	o anz		0001 p	3		apan oolo mnz
	Type R M1	ef Trc	X-value 2.4798405 GHz	-0.45 dBm	Function	Fund	ction Result
	M2 M3	1	2.4835 GHz 2.5 GHz	-52.88 dBm -50.51 dBm			
		-	2.0 GHZ				
	M4	1	2.49016 GHz	-47.76 dBm			
	M4 Date:18.0C	I.2021 08:39:		-47.76 dBm			(77)
	M4 Date:18.0C?	m	02				(mm A
	M4 Date: 18.0 C? Spectru Ref Lev Att	r.2021 08:39: m el 25.00 dBr 30 d	02 m Offset 9.80 dB		Mode Auto Fi	FT	
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View	r.2021 08:39: m el 25.00 dBr 30 d	02 m Offset 9.80 dB	RBW 100 kHz		FT	
	M4 Date: 18.0 C? Spectru Ref Lev Att	r.2021 08:39: m el 25.00 dBr 30 d	02 m Offset 9.80 dB	RBW 100 kHz	M1[1]	FT	-0.68 dBm 2.4768500 GHz
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm-	m el 25.00 dBr 30 d	02 m Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz		FT	-0.68 dBm
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm-	m el 25.00 dBr 30 d	02 m Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz	M1[1]	FT	-0.68 dBm 2.4769500 GHz -51.18 dBm
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm-	m el 25.00 dBr 30 d	02 m Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz	M1[1]	FT	-0.68 dBm 2.4769500 GHz -51.18 dBm
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- 0 dBm- 0 dBm-	m el 25.00 dBr 30 d	02 m Offset 9.80 dB	• RBW 100 kHz • VBW 300 kHz	M1[1]	FT	-0.68 dBm 2.4769500 GHz -51.18 dBm
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm-	m el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz	M1[1]	FT	-0.68 dBm 2.4769500 GHz -51.18 dBm
	M4 Date: 18.0 C? Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- 0 dBm- 0 dBm-	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz	M1[1]	FT	-0.68 dBm 2.4769500 GHz -51.18 dBm
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm -10 dBm -20 dBm	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz	M1[1]		-0.68 dBm 2.4769500 GHz -51.18 dBm
τ/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	• RBW 100 kHz • VBW 300 kHz	M1[1] M2[1]	M4 545	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	RBW 100 kHz VBW 300 kHz	M1[1] M2[1]		-0.68 dBm 2.4769500 GHz -51.18 dBm
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	RBW 100 kHz VBW 300 kHz	M1[1] M2[1]	M4 545	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	RBW 100 kHz VBW 300 kHz	M1[1] M2[1]	M4 545	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm -70 dBm GF 2.483	r.2021 08:39: el 25.00 dBr 30 d	n Offset 9.80 dB B SWT 75.8 µs	RBW 100 kHz VBW 300 kHz	M1[1] M2[1]	M4 545	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm 0 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -60 dBm -70 dBm -	r.2021 08:39: el 25.00 del 30 d D1 -20.681 5 GHz ef Trc	02 m Offset 9.80 dB B SWT 75.8 µs 0 dBm	• RBW 100 kHz • VBW 300 kHz • 100 kH	M1[1] M2[1]	M4 M3	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz
π/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm 0 dBm -20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -50 dBm -60 dBm -70 dBm -70 dBm	D1 -20.681	02 m Offset 9.80 dB B SWT 75.8 µs 0 dBm 0 dBm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	• RBW 100 kHz • VBW 300 kHz M1 	M1[1] M2[1] 	M4 M3	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz
т/4DQPSK/HCH/Hop	M4 Date: 18.0 C? Spectru Ref Lev Att 10 dBm 10 dBm 0 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm -70 dBm Marker Type R M1	E 25.00 dBr 30 d D1 -20.681	02 m Offset 9.80 dB B SWT 75.8 µs 0 dBm	RBW 100 kHz VBW 300 kHz	M1[1] M2[1] 	M4 M3	-0.68 dBm 2.4769500 GHz -51.18 dBm 2.4835000 GHz



4.9 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 $\pi/4DQPSK$ modulation type
Test Results:	Pass



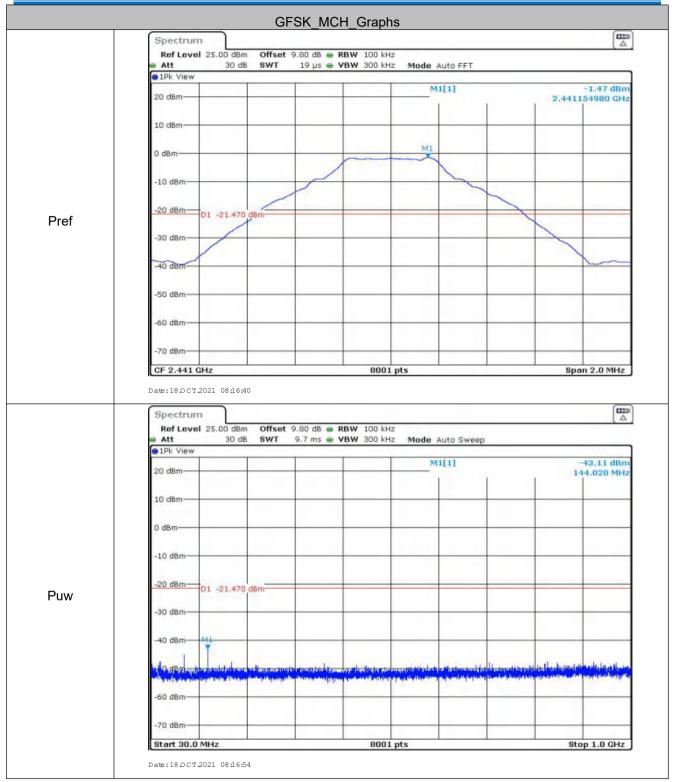




	30 dB	SWT	110 ms 🖷 🕻	VBW 300 kH	z Mode	Auto Swee	2		
●1Pk View	1		1	-		11[1]			-3.82
20 dBm-	-	-		-	/'	11[+]		2	.4016
					N	12[1]			-43,77
10 dBm-	-						1	6	.2910
0 dBm			_			_			
o dom	T								
10.10									
-10 dBm-									
and and and and									
-20 dBm-	D1 -22.270	dBm							-
-30 dBm-			-	-				-	-
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-70 dBm-						-			-
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Spectrue Ref Leve	m el 25.00 dBm 30 dE			RBW 100 kH VBW 300 kH		Auto Swee	0		
Spectrue Ref Leve	m el 25.00 dBm 30 dE				z Mode		2	_	-44 45
Spectrue Ref Leve	m el 25.00 dBm 30 dE				z Mode	Auto Sweej	2		
Spectrui Ref Leve Att 1Pk View	m el 25.00 dBm 30 dE				z Mode				
Spectrum Ref Leve Att 1Pk View 20 dBm-	m el 25.00 dBm 30 dE				z Mode				
Spectrui Ref Levi Att 1Pk View	m el 25.00 dBm 30 dE				z Mode				
Spectrum Ref Leve Att 1Pk View 20 dBm- 10 dBm-	m el 25.00 dBm 30 dE				z Mode				
Spectrum Ref Leve Att 1Pk View 20 dBm-	m el 25.00 dBm 30 dE				z Mode				
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Spectrum Ref Levi Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -60 dBm	m	SWT			z Mode				









	25.00 dBm 30 dB			 RBW 100 k VBW 300 k 		Auto Sweep			
• 1Pk View									
20 dBm					P	41[1]			-2.15
20 abm-						42[1]			-43.91
						uz[1]			5.2772
10 dBm			-		-				1
0 dBm	M1			-			-		+
-10 dBm-			-	-		-	-		-
-20 dBm-			_	_	_	_			-
-20 00111	D1 -21.470	dBm							-
						_			
-30 dBm									
-40 dBm			-	M2					-
		2.2.1	I.	La Canterna	A HERE				
-50 dBm wit	te da bask hite	a the state	A PARTY OF A	and the state of the section	and a state of the	the state of the state	addition in post	And Barrie	Huller
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-/u ubiii-									
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	25.00 dBm			RBW 100 k					
Ref Leve Att				RBW 100 k VBW 300 k		Auto Sweep			
Ref Leve Att	25.00 dBm				Hz Mode		i		40.15
Ref Leve	25.00 dBm				Hz Mode	Auto Sweep			-43.15
Ref Leve Att 1Pk View	25.00 dBm				Hz Mode		1		
Ref Leve Att 1Pk View 20 dBm	25.00 dBm				Hz Mode				
Ref Leve Att 1Pk View	25.00 dBm				Hz Mode				
Ref Leve Att 1Pk View 20 dBm- 10 dBm-	25.00 dBm				Hz Mode				
Ref Leve Att 1Pk View 20 dBm	25.00 dBm				Hz Mode				
Ref Leve Att 1Pk View 20 dBm- 10 dBm- 0 dBm-	25.00 dBm				Hz Mode				
Ref Leve Att 1Pk View 20 dBm- 10 dBm-	25.00 dBm				Hz Mode				
Ref Leve Att 1Pk View 20 dBm- 10 dBm- 0 dBm-	25.00 dBm				Hz Mode				-43.15 9.97210
Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm	1 25.00 dBm 30 dB	SWT			Hz Mode				
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Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm	1 25.00 dBm 30 dB	SWT			Hz Mode				
Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm	1 25.00 dBm 30 dB	SWT			Hz Mode				
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Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 25.00 dBm 30 dB	SWT			Hz Mode				
Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 25.00 dBm 30 dB	SWT			Hz Mode				
Ref Leve Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm	01 -21.470	SWT		• VBW 300 k	Hz Mode			15	





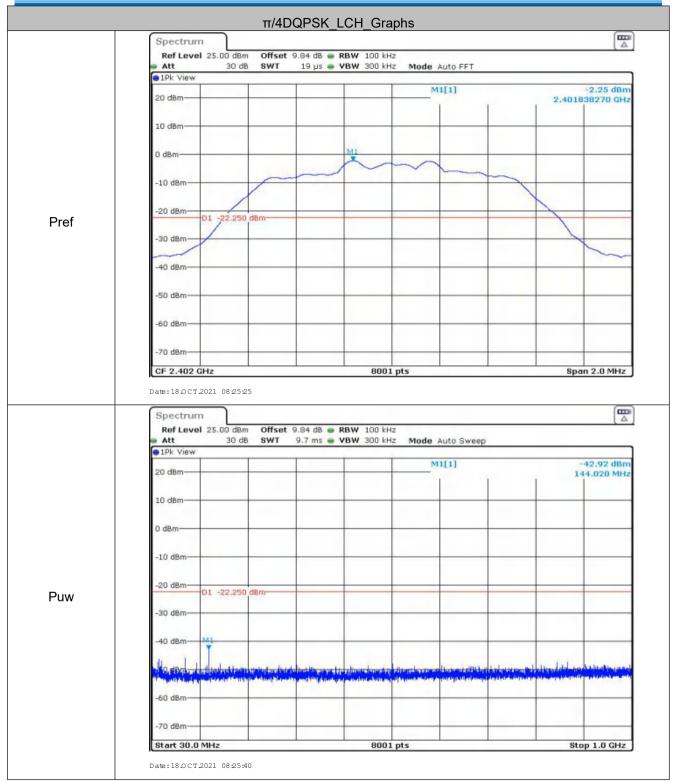
	Ref Level 25.0		0 dB 👄 RBW 100 kH 9 µs 👄 VBW 300 kH		auto EET		
	1Pk View	30 GD 3441 1	500 Ki	12 Moue /			
				M	1[1]		-0.43 dBm
	20 dBm-				1	2.480	0157480 GHz
	10 dBm						
				M1			
	0 dBm						
	-10 dBm-		~		~		
	-10 000						
	-20-d8m-01 -2	0.430 dBm					-
Pref	01 -2	0.430 000					
	-30 dBm				-		-
	-40 dBm						
	-50 dBm						-
	-60 dBm						-
	-70 dBm			-			-
	CF 2.48 GHz		800	1 pts		S	an 2.0 MHz
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	Spectrum Ref Level 25.0 Att 1Pk View	0 dBm Offset 9.8		Hz Hz Mode /	auto Sweep		-43.88 dBm
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	30 dE	SWT	110 ms 🖷	VBW 300 kH	z Mode	Auto Swee	р		
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-70 dBm-				-			-		-
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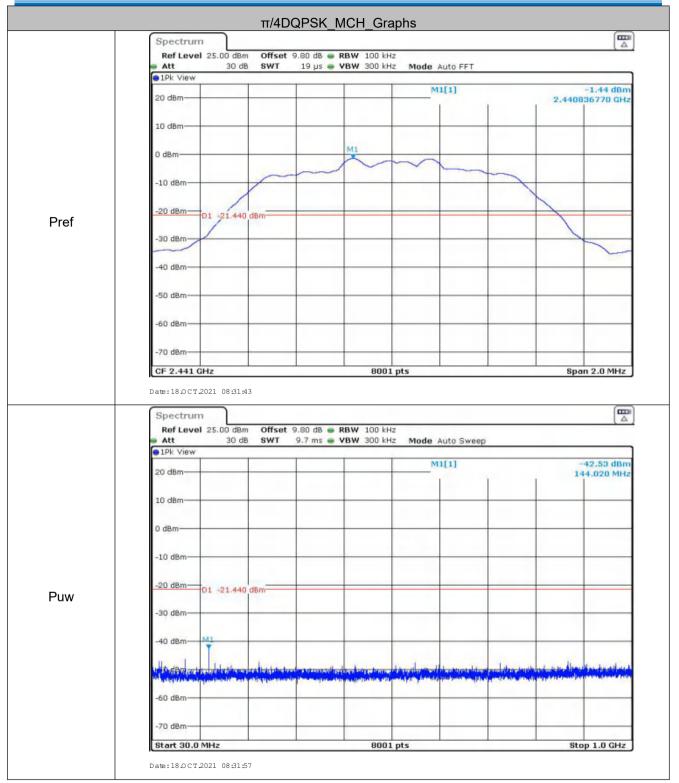




1Pk View	30 dB	SWT 110 m	ns 🖷 VBW 300 k	HIDDE A	uto sweep		
				M1	[1]		-3.21
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				MZ	[1]		6.8616
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0 dBm-	M1					_	-
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-70 dBm-							-
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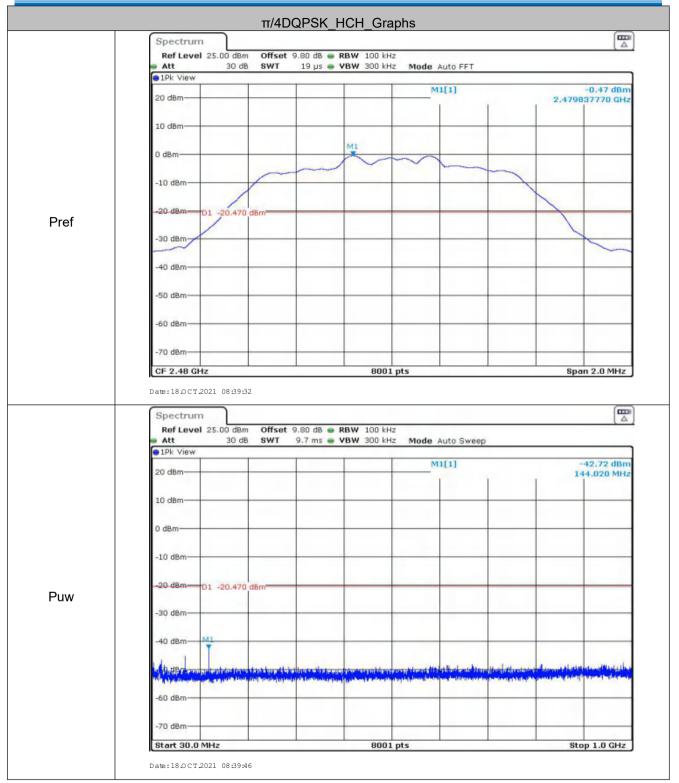




1Pk View	w							7.04
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Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm- -60 dBm-	01 -21.440	SWT 1			Mode Aut			19.99320









Report No.: CQASZ20211001748E -01

20 dBm M1[1] -4.9 20 dBm M2[1] -44.3 10 dBm 6.1232 0 dBm M1 -10 dBm 0 -20 dBm D1 -20.470 dBm -30 dBm M2 -40 dBm M2 -50 dBm M2 -30 dBm M2 -40 dBm M2 -50 dBm M2 -20 dBm M2 -30 dBm M2 -40 dBm M2 -50 dBm M2 -60 dBm M2 -70 dBm M2 <th>1Pk View</th> <th>30 dE</th> <th>SWT</th> <th>110 ms 🖷 VE</th> <th>W JUU KH</th> <th>2 Mode A</th> <th>uto Sweep</th> <th></th> <th></th> <th></th>	1Pk View	30 dE	SWT	110 ms 🖷 VE	W JUU KH	2 Mode A	uto Sweep			
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-60 dBm	Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- -10 dBm- -20 dBm-	el 25.00 dBm 30 dE	3 SWT	9.80 dB • RE	W 100 kH	z Mode A				
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-70 dBm	Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	el 25.00 dBm 30 dE	3 SWT	9.80 dB • RE 130 ms • VE	W 100 kH	z Mode A			19	
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Start 12.0 GHz 8001 pts Stor 25.0	Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm-	el 25.00 dBm 30 dE	3 SWT	9.80 dB • RE 130 ms • VE	W 100 kH	z Mode A			19	
	Spectru Ref Lev Att 10 kView 20 dBm	el 25.00 dBm 30 dE	3 SWT	9.80 dB • RE 130 ms • VE	W 100 kH	z Mode A			19	

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.



4.10Other requirements Frequency Hopping Spread Spectrum System

•	
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1), (h) requirement:
rate from a Pseudorandom on the average by each tran	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 s of their corresponding transmitters and shall shift frequencies in asmitted signals.
channels during each transr receiver, must be designed transmitter be presented wit employing short transmissio	spectrum systems are not required to employ all available hopping nission. However, the system, consisting of both the transmitter and the to comply with all of the regulations in this section should the h a continuous data (or information) stream. In addition, a system n bursts must comply with the definition of a frequency hopping system missions over the minimum number of hopping channels specified in
the system to recognize oth independently chooses and The coordination of frequen	ence within a frequency hopping spread spectrum system that permits er users within the spectrum band so that it individually and adapts its hopsets to avoid hopping on occupied channels is permitted. cy hopping systems in any other manner for the express purpose of ccupancy of individual hopping frequencies by multiple transmitters is
Compliance for section 15	.247(a)(1)
stage shift register whose 5t outputs are added in a modu	alo-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 ages: 9 sequence: $2^9 - 1 = 511$ bits
Linear Foodback S	hift Register for Generation of the PRBS sequence
An example of Pseudorando	m Frequency Hopping Sequence as follow: 7 64 8 73 16 75 1
According to Bluetooth Cor bandwidths that match the	y on the average by each transmitter. e Specification, Bluetooth receivers are designed to have input and IF hopping channel bandwidths of any Bluetooth transmitters and shift on with the transmitted signals.
Compliance for section 15	.247(g)
pseudorandom hopping free	re Specification, the Bluetooth system transmits the packet with the quency 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.

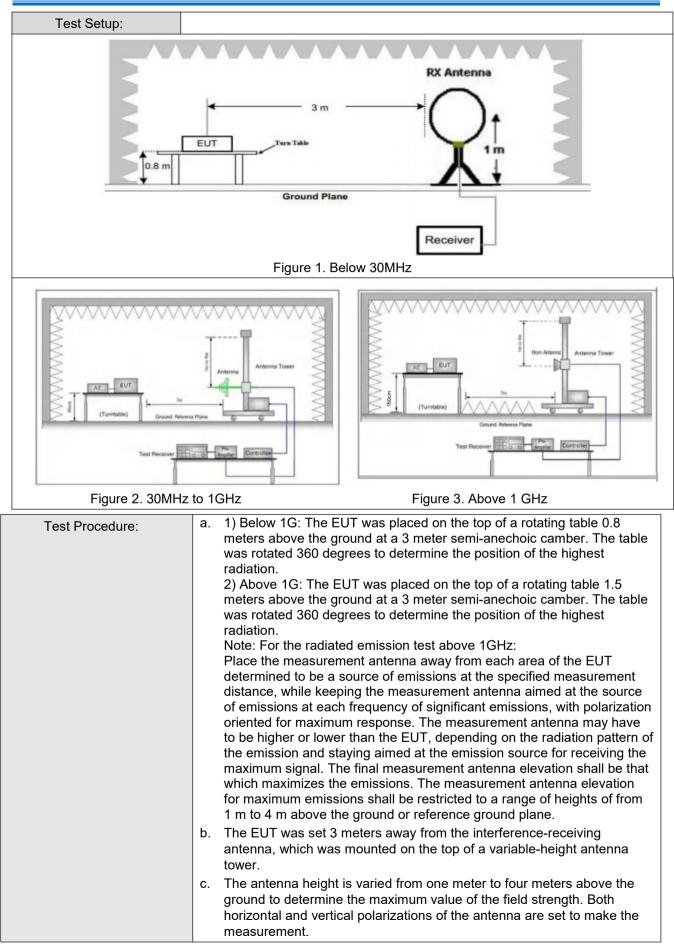


4.11 Radiated Spurious Emission & Restricted bands

Test Requirement:	47 CFR Part 15C Secti	on 1	5.209 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	1		
	0.090MHz-0.110MH	z	Quasi-peak	10kHz	z 30kHz	Quasi-peak	1		
	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		eld strength crovolt/meter)	Limit (dBuV/m)	Remark	Measureme distance (m			
	0.009MHz-0.490MHz	2	400/F(kHz)	-	-	300			
	0.490MHz-1.705MHz	24	4000/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 peak emission lev	3 ab equi	ove the maxin pment under t	num perm est. This p	itted average	emission limit			







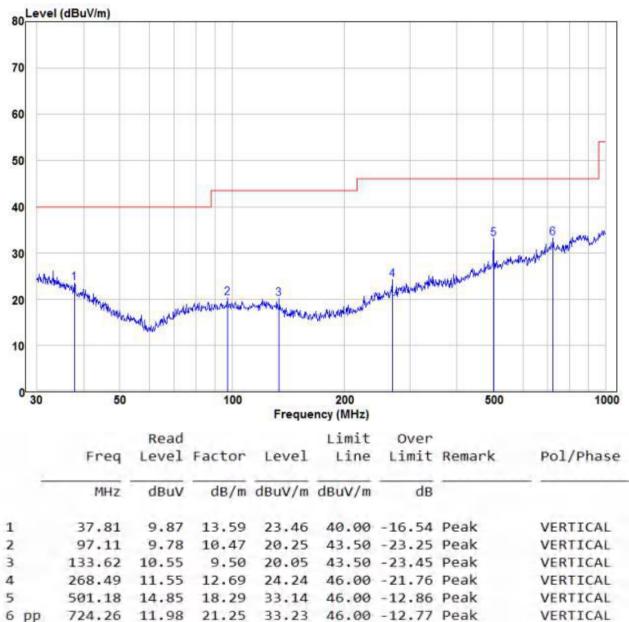


	 d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum 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, Charging 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 Charging 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



4.11.1 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:

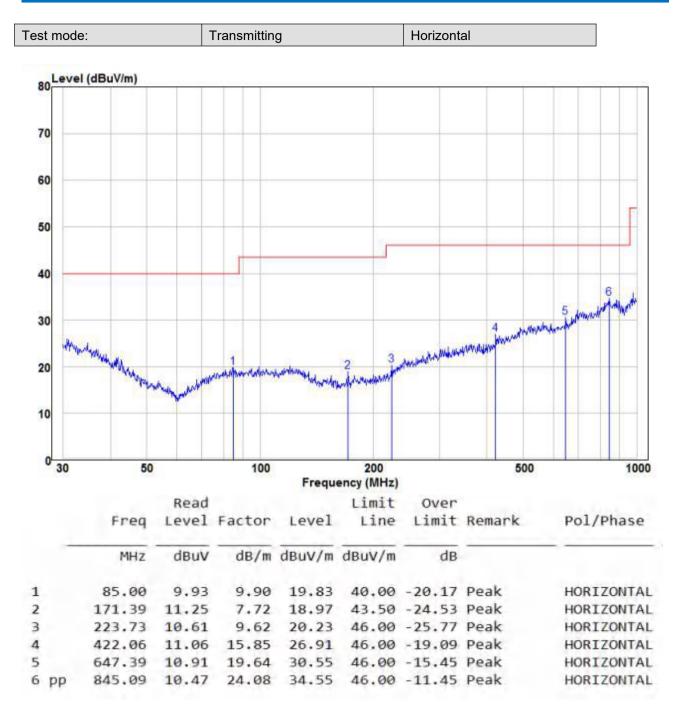
Factor= Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.







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.



4.11.2 Transmitter Emission above 1GHz

Worse case	mode:	GFSK(DH	5)	Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2390	55.11	-9.2	45.91	74	-28.09	Peak	н
2400	56.04	-9.39	46.65	74	-27.35	Peak	Н
4804	53.99	-4.33	49.66	74	-24.34	Peak	Н
7206	50.29	1.01	51.30	74	-22.70	Peak	Н
2390	55.84	-9.2	46.64	74	-27.36	Peak	v
2400	55.58	-9.39	46.19	74	-27.81	Peak	V
4804	54.13	-4.33	49.80	74	-24.20	Peak	V
7206	49.50	1.01	50.51	74	-23.49	Peak	V

Worse case	mode:	GFSK(DH	5)	Test chann	el:	Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4882	51.43	-4.11	47.32	74	-26.68	peak	Н
7323	49.18	1.51	50.69	74	-23.31	peak	Н
4882	51.70	-4.11	47.59	74	-26.41	peak	V
7323	50.33	1.51	51.84	74	-22.16	peak	V

Worse case	mode:	GFSK(DH	5)	Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2483.5	54.54	-9.29	45.25	74	-28.75	Peak	н
4960	51.29	-4.04	47.25	74	-26.75	Peak	Н
7440	50.28	1.57	51.85	74	-22.15	Peak	Н
2483.5	53.26	-9.29	43.97	74	-30.03	Peak	v
4960	48.88	-4.04	44.84	74	-29.16	Peak	V
7440	48.93	1.57	50.50	74	-23.50	Peak	V

Remark:

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

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

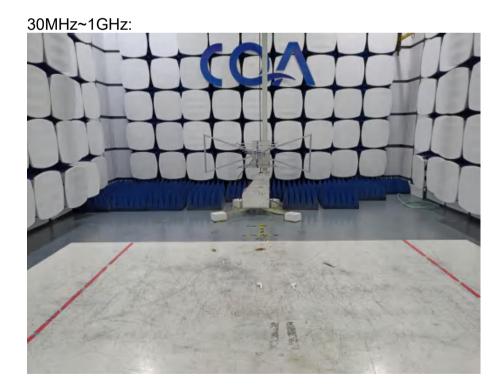


5 Photographs - EUT Test Setup

5.1 Radiated Emission

9KHz~30MHz:









5.2 Conducted Emission

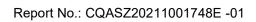




6 Photographs - EUT Constructional Details







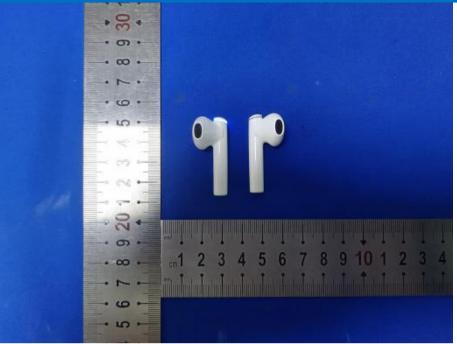






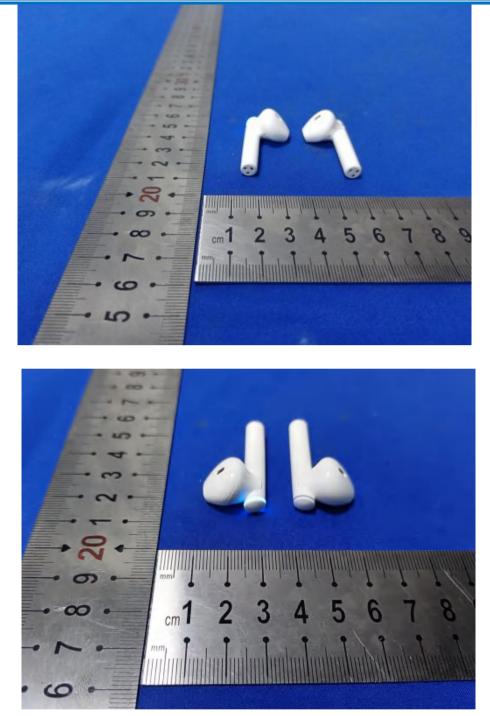


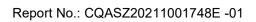




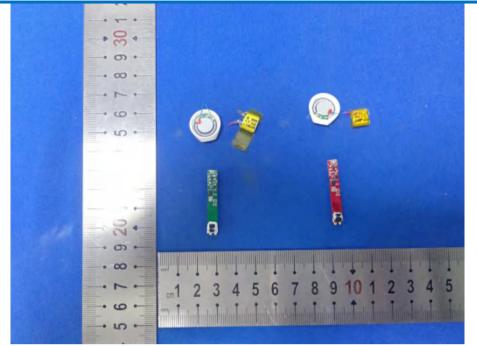


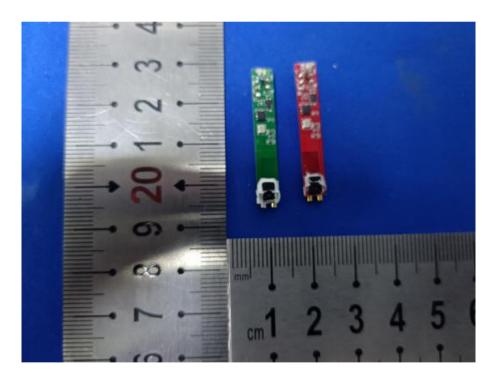


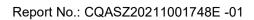




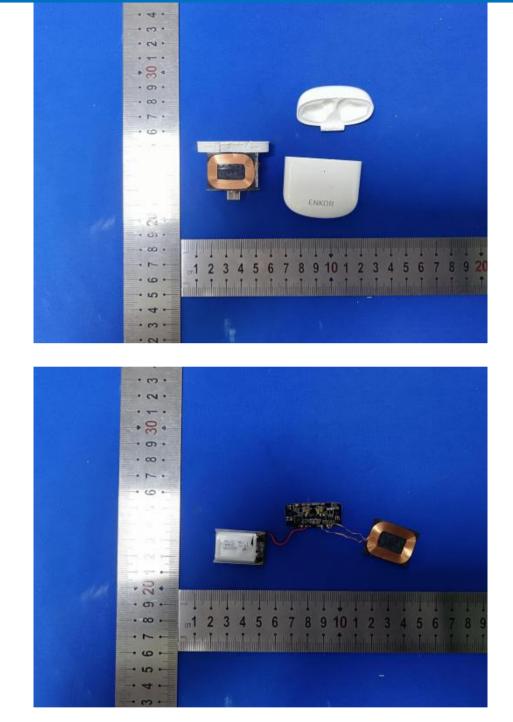




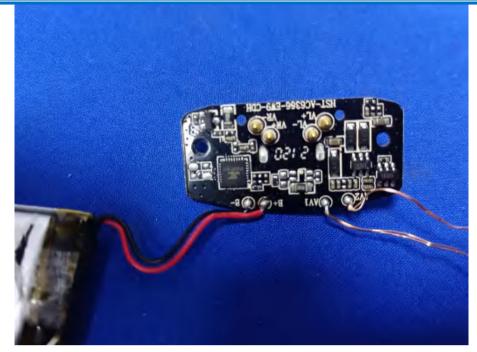


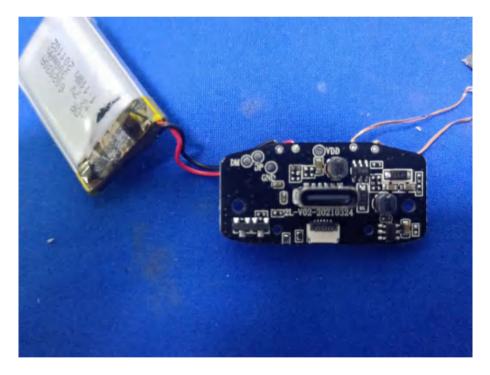














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