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

Test Report

Report No. :	CQASZ20211001737E-02
Applicant:	Avantronics Limited
Address of Applicant:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen
Equipment Under Test (E	UT):
Product:	Avantree Ace 130
Model No.:	BTHS-TWS130
Test Model No.:	BTHS-TWS130
Brand Name:	Avantree
FCC ID:	WJ5-BTHS-TWS130
Standards:	47 CFR Part 15, Subpart C
Date of Receipt:	2021-10-08
Date of Test:	2021-10-08 to 2022-01-11
Date of Issue:	2022-01-25
Test Result :	PASS*

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

Tested By:	lewis zhou	TETIMO
	(Lewis Zhou)	ALL DO
Reviewed By:	Kook Musig	日生夏海
	(Rock Huang) 了	APPROV
Approved By:	faces	-
	(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.



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20211001737E-02	Rev.01	Initial report	2022-01-25



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)&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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4 General Information

4.1 Client Information

Applicant:	Avantronics Limited		
Address of Applicant:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen		
Manufacturer:	Avantronics Limited		
Address of Manufacturer:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen		
Factory:	Avantronics Limited		
Address of Factory:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen		

4.2 General Description of EUT

Product Name:	Avantree Ace 130
Model No.:	BTHS-TWS130
Test Model No.:	BTHS-TWS130
Trade Mark:	Avantree
Software Version:	V3.01
Hardware Version:	1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	□ Mobile
Test Software of EUT:	BlueTest3
Antenna Type:	Chip antenna
Antenna Gain:	2.2dBi
Power Supply:	earphone: 3.7V 60mAh 0.222Wh
	charging compartment: 3.7V 580mAh 0.96Wh, Charge by DC 5V for adapter



Operation F	- requency 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 parameters and cannot be changed and selected)		
Use test software to set the l	owest frequency, the middle frequency and	the highest frequency keep	
transmitting of the EUT.		1	
Mode	Channel	Frequency(MHz)	
	СН0	2402	
DH1/DH3/DH5	CH39	2441	
	CH78	2480	
	СН0	2402	
2DH1/2DH3/2DH5	CH39	2441	
	CH78	2480	
	СНО	2402	
3DH1/3DH3/3DH5	СН39	2441	
	CH78	2480	

Run Software:

CW TX	Test Arguments -		
CONTINUOUS TX	Channel (0-78)	78	Close
PACKET TX PACKET RX	Power (0-9)	9	Help
QHS RF TEST STOP	Туре	BREDR 1-PR9 🔻	Execute
POWER TABLE GET POWER TABLE SET	Pattern bits (1-	2	1
ENABLE DUT MODE	Pattern (hex)	00000001	Reset
Test Results Save to file Br C:\Vsers\Administrat	rowse for f	Display : @ Standard neTest3\testapplog.txt	← BER
☐ Save to file Br C:\Users\Administrat	or\AppData\Local\QTIL\Blv = 2402MHz		C BER
Save to file Br C:\Vsers\Administrat Channel frequency = CONTINUOUS TX succe channel frequency =	cor\AppData\Local\QTIL\Blv = 2402MHa >ssful = 2441MHz		C BER
Save to file Br C:\Vsers\Administrat Channel frequency = CONTINUOUS TX succe Channel frequency = CONTINUOUS TX succe Channel frequency =	or \AppData\Local \QTIL\Blue = 2402MHz = 2401MHz = 2441MHz = 2441MHz = 2441MHz		C BER
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Continuous TX succes Continuous TX succes	cor\AppData\Local\QTTL\Blv = 2402MHz = 2441MHz essful = 2441MHz essful = 2441MHz essful = 2400MHz = 2400MHz = 2400MHz = 2400MHz = 2400MHz		C BER



4.4 Test 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	HUAWEI	HW-0502000C01	/	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)
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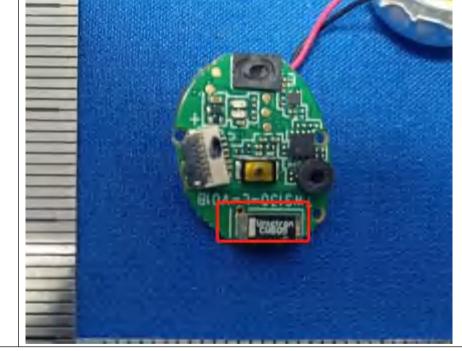
15.203 requirement:

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

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of 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 2.2 dBi.





5.2 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	
	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 distur- room. The EUT was connected to Impedance Stabilization N- impedance. The power cal connected to a second LIS reference plane in the sam measured. A multiple sock power cables to a single LI exceeded. The tabletop EUT was place ground reference plane. An placed on the horizontal gr The test was performed wi of the EUT shall be 0.4 m for vertical ground reference plane. The LISN unit under test and bonded mounted on top of the group between the closest points the EUT and associated ed In order to find the maximum equipment and all of the in ANSI C63.10: 2013 on con 	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 plane was bonded to the 1 was placed 0.8 m fro to a ground reference und reference plane. The of the LISN 1 and the quipment was at least 0 im emission, the relative terface cables must be	bugh a LISN 1 (Line a $50\Omega/50\mu$ H + 5Ω line 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 we erence plane. The rear d reference plane. The rear d reference plane. The e horizontal ground om the boundary of the plane for LISNs his distance was EUT. All other units of 0.8 m from the LISN 2. re positions of	ear e vas
Test Setup:	Shielding Room	AE UISN2 + AC Ma Ground Reference Plane	Test Receiver	

Shenzhen Huaxia Testing Technology Co., Ltd.

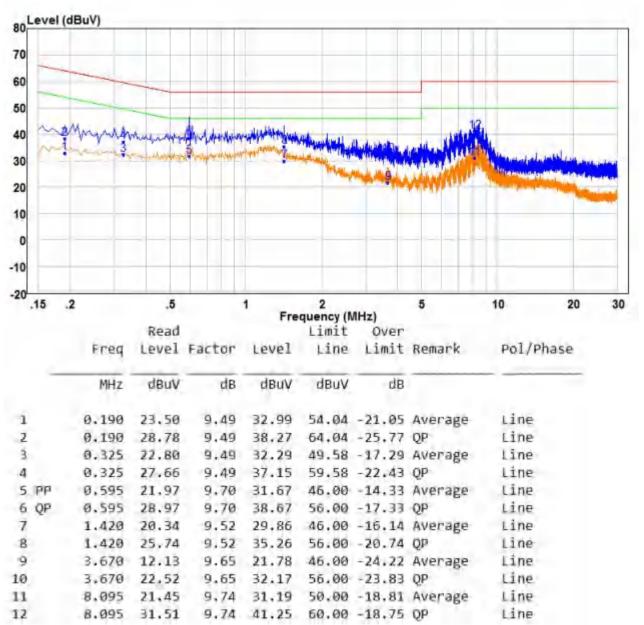


Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of
	data type at the lowest, middle, high channel.
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation at the lowest channel is the worst case.
	Only the worst case is recorded in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



Measurement Data

Live line:



Remark:

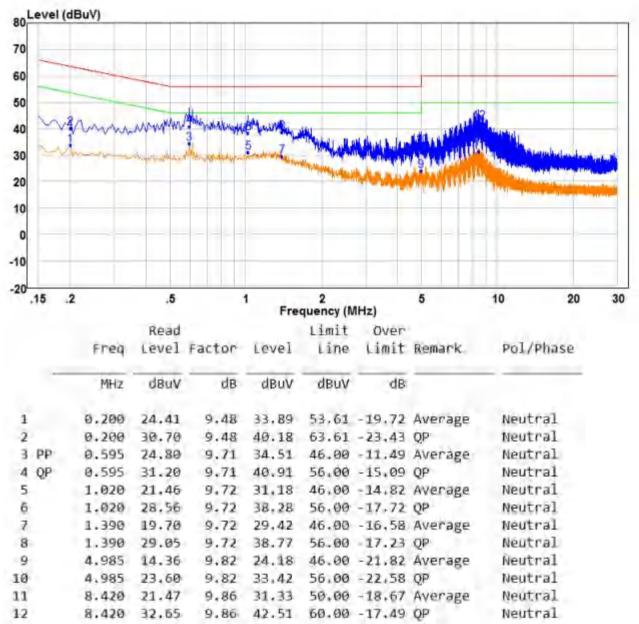
1. The following Quasi-Peak and Average measurements were performed on the EUT:

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, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

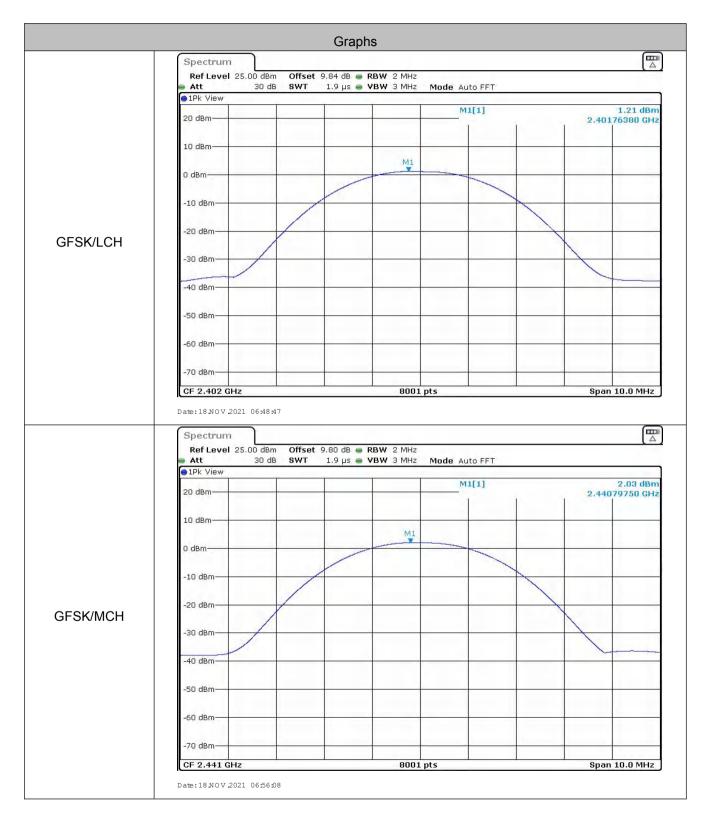


Measurement Data

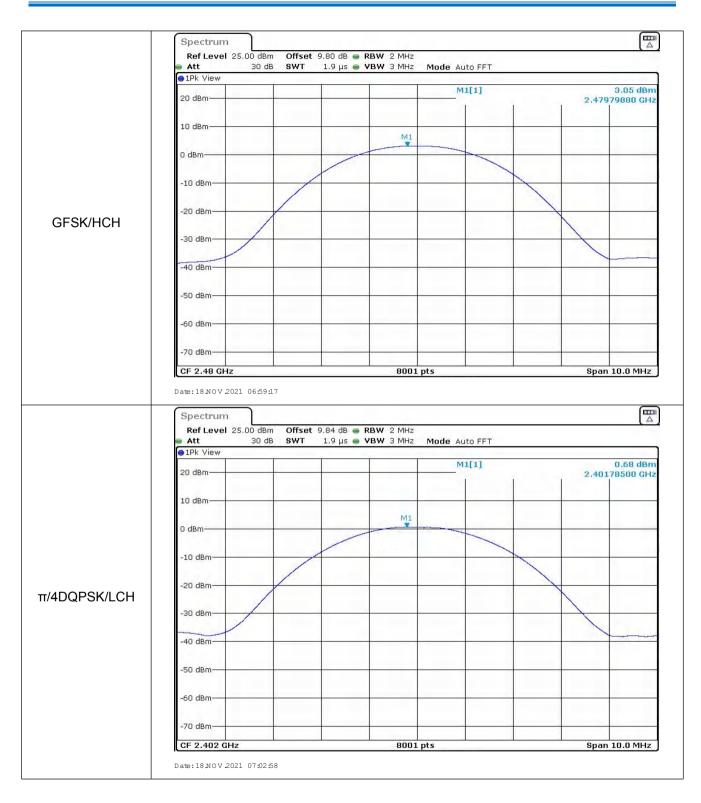
	GFSK mode	9	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	1.210	21.00	Pass
Middle	2.030	21.00	Pass
Highest	3.050	21.00	Pass
	π/4DQPSK m	ode	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	0.680	21.00	Pass
Middle	1.470	21.00	Pass
Highest	2.520	21.00	Pass
	8DPSK mod	le	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	0.820	21.00	Pass
Middle	1.780	21.00	Pass
Highest	2.920	21.00	Pass



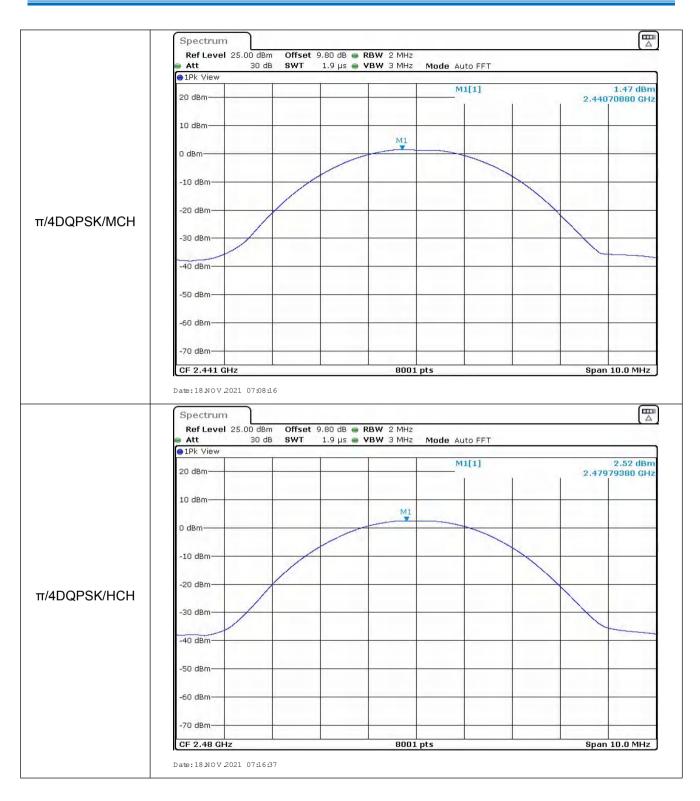
Test plot as follows:







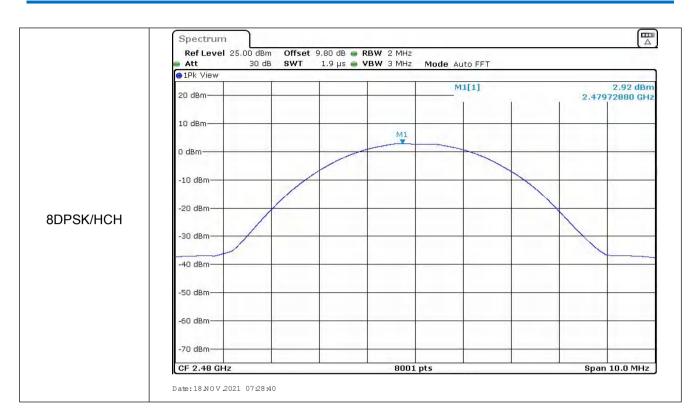






	Ref Level 25.00 d		4 dB 👄 RBW 2 MHz	Mada 1		
	e Att 30	dB SWT 1	.9 µs 🖷 VBW 3 MHz	Mode Auto FFT		
	20 dBm-			M1[1]		0.82 dBn 2.40190250 GH
	10 dBm					
	0 dBm		MI		_	
	-10 dBm					
	-20 dBm					
8DPSK/LCH	-30 dBm					
	-40 dBm					
	-50 dBm		-		-	
	-60 dBm					
	-70 dBm					
	CF 2.402 GHz	-	8001	nts		Span 10.0 MHz
	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25.00 d		10 dB e RBW 2 MHz			
	Date: 18.NOV 2021 07:2 Spectrum Ref Level 25.00 d	Bm Offset 9.8		Mode Auto FFT		
	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25.00 d Att 30	Bm Offset 9.8	0 dB e RBW 2 MHz		1 1	1.78 dBn
	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25.00 d Att 30 9 1Pk View	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		
	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25.00 d Att 30 PIPk View 20 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25:00 d Att 30 PIPk View 20 dBm 10 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
8DPSK/MCH	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25:00 d Att 30 IPk View 20 dBm 10 dBm 0 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
8DPSK/MCH	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25:00 d Att 30 1Pk View 20 dBm 10 dBm -10 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
8DPSK/MCH	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25:00 d Att 30 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
8DPSK/MCH	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25:00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
8DPSK/MCH	Date: 18 NOV 2021 07:2 Spectrum Ref Level 25:00 d Att 30 • 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm	Bm Offset 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn
8DPSK/MCH	Date: 18 NOV 2021 07:2 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 9.8	ю dB — RBW 2 MHz 9 µs — VBW 3 MHz	Mode Auto FFT		1.78 dBn







5.4 20dB Occupy Bandwidth

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:	NA
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, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

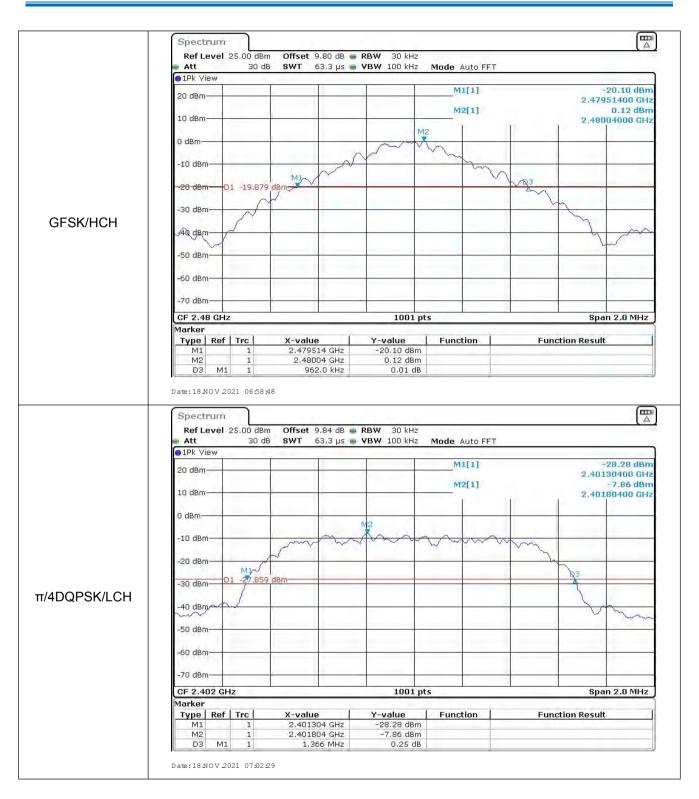
Test shannel	20	0dB Occupy Bandwidth (MH	z)
Test channel	GFSK	π/4DQPSK	8DPSK
Lowest	0.976	1.366	1.356
Middle	0.962	1.366	1.354
Highest	0.962	1.364	1.352



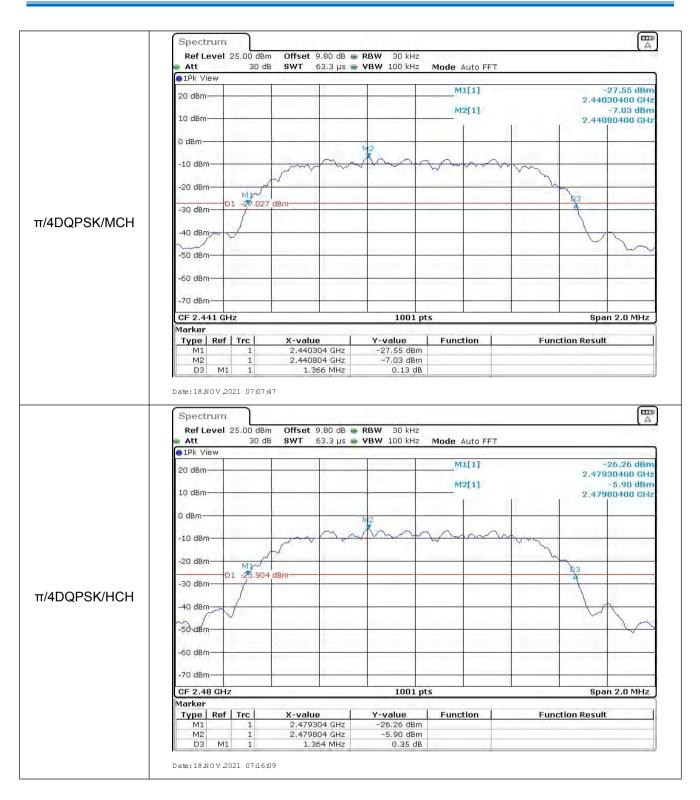
Test plot as follows:









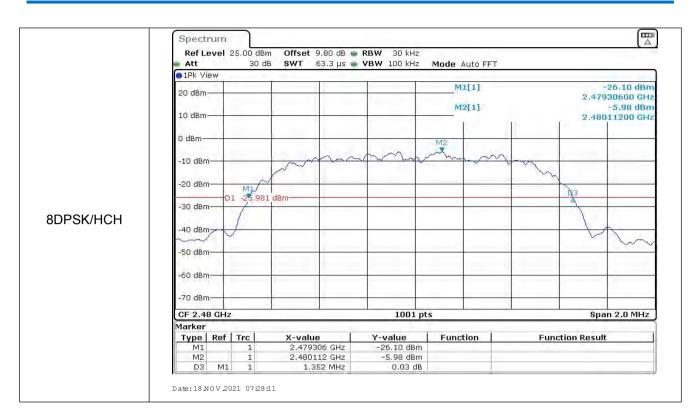






	e Att	25.00 dBm 30 dB		s 画 VBW 100 kHz	Mode Auto FF	т		
	●1Pk View				M1[1]			28.52 dBr
	20 dBm				ant til			30400 GH
	10 dBm				M2[1]		2 401	-7.95 dBr 93200 GH
	10 00.00				ľ	Ť	2.401	95200 GH
	0 dBm			140		_		-
	-10 dBm			M2	~			
	-to abiii		~~~~~	and a mo		, have		
	-20 dBm	\sim				~		
	-30 dBm	M1./ D1 -27.950	dBm-				<u>b</u> 3	
PSK/LCH	-su ubiii	1					1	
	-40 dBm					-		-
	\sim							~~~
	-50 dBm							
	-60 dBm							
	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1							
	-70 dBm						-	
	CF 2.402 G	Hz		1001 pt	5		Spa	n 2.0 MHz
	Marker Type Ref	Tre	X-value	Y-value	Function	Fun	ction Result	_
	M1	1	2.401304 GH	z -28.52 dBm	. anotion	. un		
	M2 D3 M3	1 1 1	2,401932 GH: 1.356 MH:					
	Date: 18 NOV 2							2
	Spectrum Ref Level Att	_	n Offset 9.80 di	B ● RBW 30 kHz s ● VBW 100 kHz	Mode Auto FF	т		
	Spectrum Ref Level	25.00 dBm	n Offset 9.80 di			т		27 11 dBr
	Spectrum Ref Level Att	25.00 dBm	n Offset 9.80 di		M1[1]	т		27.11 dBr 30600 GH
	Spectrum Ref Level Att 1Pk View 20 dBm	25.00 dBm	n Offset 9.80 di			т	2.440	27.11 dBr 30600 GH -7.07 dBr
	Spectrum Ref Level Att IPk View	25.00 dBm	n Offset 9.80 di		M1[1]	т	2.440	27.11 dBr 30600 GH -7.07 dBr
	Spectrum Ref Level Att 1Pk View 20 dBm	25.00 dBm	n Offset 9.80 di		M1[1] M2[1]	т	2.440	27.11 dBr 30600 GH
	Spectrum Ref Level Att IPk View 20 dBm 10 dBm 0 dBm	25.00 dBm	n Offset 9.80 di		M1[1]		2.440	27.11 dBr 30600 GH -7.07 dBr
	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm	25.00 dBm	n Offset 9.80 di		M1[1] M2[1]		2.440	27.11 dBr 30600 GH -7.07 dBr
	Spectrum Ref Level Att IPk View 20 dBm 10 dBm 0 dBm	25.00 dBm 30 dE	n Offset 9.80 di		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	25.00 dBm	n Offset 9.80 dl		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
2SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
°SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
PSK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
°SK/MCH	Spectrum Ref Level Att IPk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
°SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]	T	2.440	27.11 dBr 30600 GH -7.07 dBr
°SK/MCH	Spectrum Ref Level Att P1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -50 dBm -60 dBm	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]		2.440	27.11 dBr 30600 GH -7.07 dBr
'SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	25.00 dBm 30 dE	n Offset 9.80 dl	s • VBW 100 kHz	M1[1] M2[1]		2.440	27.11 dBr 30600 GH -7.07 dBr
SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.441 G	25.00 dBm 30 dE	n Offset 9.80 dl		M1[1] M2[1]		2.440	27.11 dBr 30600 GH -7.07 dBr
°SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm CF 2.441 G	25.00 dBm 30 dE	b Offset 9.80 dl	s • VBW 100 kHz	M1[1] M2[1] 		2.440 2.441	27.11 dBr 30600 GH -7.07 dBr 11400 GH
SK/MCH	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.441 G	25.00 dBm 30 dE	n Offset 9.80 dl	s • VBW 100 kHz	M1[1] M2[1]		2.440	27.11 dBr 30600 GH -7.07 dBr 11400 GH







5.5 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, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass



Measurement Data

	GFSK mod	le	
Test channel	Carrier Frequencies Separation (MHz)	Limit (MHz)	Result
Lowest	1.000	≥0.651	Pass
Middle	1.005	≥0.651	Pass
Highest	1.332	≥0.651	Pass
	π/4DQPSK m	node	
Test channel	Carrier Frequencies Separation (MHz)	Limit (MHz)	Result
Lowest	1.000	≥0.651	Pass
Middle	1.005	≥0.651	Pass
Highest	1.332	≥0.651	Pass
	8DPSK mo	de	
Test channel	Carrier Frequencies Separation (MHz)	Limit (MHz)	Result
Lowest	1.005	≥0.904	Pass
Middle	1.005	≥0.904	Pass
Highest	1.005	≥0.904	Pass

Mode	20dB bandwidth (MHz) (worse case)	Limit (MHz) (Carrier Frequencies Separation)
GFSK	0.976	0.651
π/4DQPSK	1.366	0.911
8DPSK	1.356	0.904



Test plot as follows:

			Graphs			
	Spectrum Ref Level 25.0		9.84 dB 👄 RBW 10 18.9 µs 👄 VBW 30		TO FET	
	Pk View	SUUB SWI	10.9 µs 🖷 ¥BW 30	JU KHZ MODE AU		
	1453			M1[1]	0.95 dBm
	20 dBm			D1[1	u .	2.40214904 GHz -0.12 dB
	10 dBm					1.00000 MHz
			M1			
	0 dBm	-		-	D1	p
		1-		E E		
	-10 dBm					
				Y		
GFSK/LCH	-20 dBm					
0.0.0	-30 dBm					
	_ /					
	-40 dBm					
	-50 dBm-					
	-60 dBm					
	-00 0611-					
	-70 dBm					
	70 0011					
	Start 2.401 GHz			625 pts		Stop 2.404 GHz
	Start 2.401 GHz	07:33:56 0 dBm Offset	9.80 dB • RBW 10	DO kHz		Stop 2.404 GHz
	Start 2.401 GHz	07:33:56 0 dBm Offset	9.80 dB ● RBW 10 18.9 µs ● VBW 30	DO kHz	to FFT	
	Start 2.401 GHz Date: 18 NOV 2021 (Spectrum Ref Level 25.0 Att	07:33:56 0 dBm Offset		DO kHz		1.76 dBm
	Start 2.401 GHz Date: 18 NOV 2021 (Spectrum Ref Level 25.0 Att 1Pk View	07:33:56 0 dBm Offset		00 kHz 10 kHz Mode Aut	1]	1.76 dBm 2.44114904 GHz 0.06 dB
	Start 2.401 GHz Date: 18 NOV 2021 (Spectrum Ref Level 25.0 Att 1Pk View	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1]	1.76 dBm 2.44114904 GHz
	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm	07:33:56 0 dBm Offset		00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
	Start 2.401 GHz Date: 18 NOV 2021 (Spectrum Ref Level 25.0 Att 1Pk View 20 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1]	1.76 dBm 2.44114904 GHz 0.06 dB
	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 O Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm -10 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att Dtrive 20 dBm 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att Dtrive 20 dBm 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
GFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB
ЭFSK/MCH	Start 2.401 GHz Date: 18 NOV 2021 0 Spectrum Ref Level 25.0 Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -50 dBm	07:33:56 0 dBm Offset	18.9 μs • VBW 30	00 kHz 00 kHz Mode Aut	1] 1] D1	1.76 dBm 2.44114904 GHz 0.06 dB





			9.80 dB 💿 RBW 100 kH 18.9 µs 💿 VBW 300 kH				
	● 1Pk View 20 dBm			M1[1]		2 478	2.67 dBm 82211 GHz
	10 dBm			D1[1]			0.29 dB 33173 MHz
		M1			D1		
	0 dBm				1		
	-10 dBm					~	
GFSK/HCH	-20 dBm					1	
	-30 dBm						1-
	-40 dBm						5
	-50 dBm						
	-60 dBm				-		-
	-70 dBm						
	Start 2.478 GHz		625	pts		Stop 2	2.481 GHz
	Date: 18.NOV 2021 0 Spectrum Ref Level 25.00) dBm Offset	9.84 dB 🖷 RBW 100 kH	z			
	Date: 18.NOV 2021 0 Spectrum Ref Level 25.00) dBm Offset		z z Mode Auto FFT			
	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 1Pk View 20 dBm) dBm Offset	9.84 dB 🖷 RBW 100 kH	z		2.402	-2.08 dBm 14904 GHz -0.13 dB
	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 10 dBm) dBm Offset	9.84 dB ● RBW 100 kH 18.9 µs ● VBW 300 kH	z Z Mode Auto FFT M1[1]		2.402	-2.08 dBm 14904 GHz -0.13 dB
	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 0 dBm) dBm Offset	9.84 dB 🖷 RBW 100 kH	z Z Mode Auto FFT M1[1]	81	2.402	-2.08 dBm 14904 GHz -0.13 dB
	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 10 dBm) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	z Z Mode Auto FFT M1[1]	81	2.402	-2.08 dBm 14904 GHz -0.13 dB 00000 MHz
7/4DQPSK/LCH	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 10 dBm -10 dBm -20 dBm) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	z Z Mode Auto FFT M1[1]	81	2.402	-2.08 dBm 14904 GHz -0.13 dB
1/4DQPSK/LCH	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 10 dBm -10 dBm) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	z Z Mode Auto FFT M1[1]	01	2.402	-2.08 dBm 14904 GHz -0.13 dB
:/4DQPSK/LCH	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 10 dBm -10 dBm -20 dBm) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	z Z Mode Auto FFT M1[1]	01	2.402	-2.08 dBm 14904 GHz -0.13 dB
/4DQPSK/LCH	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	z Z Mode Auto FFT M1[1]		2.402	-2.08 dBm 14904 GHz -0.13 dB
1/4DQPSK/LCH	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att Date: 18 NOV 2021 0) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	z Z Mode Auto FFT M1[1]		2.402	-2.08 dBm 14904 GHz -0.13 dB
1/4DQPSK/LCH	Date: 18 NOV 2021 0 Spectrum Ref Level 25.00 Att Date: 18 NOV 2021 0 Att Date: 18 NOV 2021 0 Att Call of the second se) dBm Offset	9.84 dB • RBW 100 kH 18.9 µs • VBW 300 kH	Z Mode Auto FFT		2.402	-2.08 dBm 14904 GHz -0.13 dB





	Att 1Pk View	5.00 dBm 30 dB		.8.9 μs 💿 VB'	W 100 kH W 300 kH		Auto FFT	_		_
	20 dBm						1[1] 1[1]		2.44	-1.13 dBn L14904 GH: -0.07 dE
	10 dBm	-						1	1	.00000 MH:
			~~	M1	~		~~~~	01		~
	-10 dBm							-		
1DQPSK/MCH	-20 dBm	-								
	-30 dBm		-							
	-40 dBm						_			
	-50 dBm									
	-60 dBm				-					
	-70 dBm									
	Start 2.44 GH	17			625	pts			Stop	2.443 GHz
	Date: 18 NOV 202 Spectrum Ref Level 23	21 07:45:45	Offset 9	9.80 dB 🖷 RB1	W 100 kH					
	Date: 18 NOV 202	21 07:45:45	Offset 9	1.80 dB ● RB ¹ 18.9 µs ● VB	W 100 kH	z Mode /	Auto FFT			
	Date: 18 NOV 202 Spectrum Ref Level 24	21 07:45:45	Offset 9		W 100 kH	z Mode /	Auto FFT 1[1] 1[1]			-0.12 dBn 914904 GH 0.05 df
	Date: 18 NOV 202 Spectrum Ref Level 29 Att 1Pk View	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]			-0.12 dBn 914904 GH 0.05 df
	Date: 18 NOV 202 Spectrum Ref Level 23 Att IPK View 20 dBm	21 07:45:45	Offset 9		W 100 kH	z Mode /	1[1]	D1		-0.12 dBn 914904 GH 0.05 di
	Date: 18 NOV 202 Spectrum Ref Level 23 Att 10 dBm 10 dBm -10 dBm	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]	01		-0.12 dBn 914904 GH 0.05 di
4DQPSK/HCH	Date: 18 NOV 202 Spectrum Ref Level 23 Att 10 dBm 10 dBm -10 dBm -20 dBm	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]	01		-0.12 dBn 914904 GH 0.05 df
4DQPSK/HCH	Date: 18 NOV 202 Spectrum Ref Level 23 Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]	D1		-0.12 dBn 914904 GH 0.05 df
4DQPSK/HCH	Date: 18 NOV 202 Spectrum Ref Level 23 Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]	D1		-0.12 dBn 914904 GH 0.05 di
4DQPSK/HCH	Date: 18 NOV 202 Spectrum Ref Level 23 Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]			-0.12 dBn 914904 GH 0.05 di
4DQPSK/HCH	Date: 18 NOV 202 Spectrum Ref Level 23 Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	21 07:45:45	Offset 9	.8.9 µs 💿 VB	W 100 kH	z Mode /	1[1]			





	Ref Level 25.00 da Att 30			de Auto FFT		
	●1Pk View		1			
	20 dBm		-	M1[1]	2.402	-1.93 dBm 214904 GHz
				D1[1]		-0.08 dB .00481 MHz
	10 dBm				1.	.00101 0012
	1000	MI				
	0 dBm	Land				
	-10 dBm	The Transfer				
	-20 dBm			-		
8DPSK/LCH						
	-30 dBm					
	-40 dBm					_
	-50 dBm					-
	-60 dBm					
	-70 dBm-					
	Allerter					
	Start 2.401 GHz	4 :08	625 pts		300	2.404 GHz
	Date: 18 NOV 2021 07:5-				асор	
	Date: 18 NOV 2021 07:5- Spectrum Ref Level 25.00 df Att 30	3m Offset 9.80 dB 🕳 1		de Auto FFT		
	Date: 18 NOV 2021 07:5- Spectrum Ref Level 25.00 df Att 30 9 1Pk View	3m Offset 9.80 dB 🕳 1	RBW 100 kHz	de Auto FFT M1[1]		-1.10 dBm
	Date: 18 NOV 2021 07:5- Spectrum Ref Level 25.00 df Att 30	3m Offset 9.80 dB 🕳 1	RBW 100 kHz	M1[1]		-1.10 dBm 114904 GHz
	Date: 18 NOV 2021 07:5- Spectrum Ref Level 25.00 di Att 30 1Pk View 20 dBm	3m Offset 9.80 dB 🕳 1	RBW 100 kHz		2.441	-1.10 dBm
	Date: 18 NOV 2021 07:5- Spectrum Ref Level 25.00 df Att 30 9 1Pk View	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
	Date: 18 NOV 2021 07:5- Spectrum Ref Level 25.00 di Att 30 1Pk View 20 dBm	3m Offset 9.80 dB 🕳 1	RBW 100 kHz VBW 300 kHz Mor	M1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
	Date: 18 NOV 2021 07:54 Spectrum Ref Level 25.00 di Att 30 1Pk View 20 dBm 10 dBm 0 dBm	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54 Spectrum Ref Level 25.00 di Att 30 1Pk View 20 dBm 10 dBm 0 dBm	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
8DPSK/MCH	Date: 18 NOV 2021 07:54 Spectrum Ref Level 25.00 dd Att 30 P 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB
3DPSK/MCH	Date: 18 NOV 2021 07:54 Spectrum Ref Level 25.00 dd Att 30 P 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	Bm Offset 9.80 dB ● 1 dB SWT 18.9 μs ● 1	RBW 100 kHz VBW 300 kHz Mor	M1[1] D1[1]	2.441	-1.10 dBm 114904 GHz 0.03 dB





	● Att 30 dB SWT 18.4	0 dB 🖷 RBW 100 kHz 9 µs 🖷 VBW 300 kHz – Mode Auto FFT	
	1Pk View 20 dBm 10 dBm	M1[1] D1[1]	0.03 dB/ 2.47914904 GF 0.13 d 1.00481 MF
	0 dBm		
DPSK/HCH	-20 dBm		
	-30 dBm		
	-50 dBm		
	-70 dBm	625 pts	Stop 2.481 GH:



5.6 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, 3-DH5 of data type is the worst case of 8DPSK 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
8DPSK	79	≥15



Test plot as follows:

		Graphs		
		Dffset 9.80 dB 🖷 RBW 100 kHz GWT 94.8 µs 🖷 VBW 300 kHz		
	10 dBm		M1[1] D1[1]	0,24 dBm 2.401952 GHz 2.04 dB 78.203 MHz
	М1 0 Яврании и и и и и и и и и и и и и и и и и и			
GFSK/Hop	-80 dBm			l la co
	-60 dBm -70 dBm Start 2.4 GHz Date:18 NOV 2021 07:38:44	600	pts	Stop 2.4835 GHz
		Dffset 9.80 dB 👄 RBW 100 kHz SWT 94.8 µs 👄 VBW 300 kHz		
	1Pk View 20 dBm 10 dBm		M1[1]	-2.57 dBm 2.401812 GHz -0.21 dB 78.482 MHz
	O'dem MyMMMWWWWWW -10 dem	mannan	Munnununun	In Munharity
π/4DQPSK/Hop	Manufamiliand	Munhanghandh	Mmmmmmmmmmm	UNIVUNIVUS
π/4DQPSK/Hop	-10 dBm			





	Ref Level 25.00 dB Att 30 d		'BW 300 kHz Mode Auto FFT	
	●1Pk View			
	20 dBm		M1[1]	-2.84 dB 2.401952 GF 1.68 c
	10 dBm			78.063 MF
	₫⁄₫Bm	the second se		Later dida
	MMMMmmm	Annahanan	daway way and a second shall	manufanna
	-10 dBm			
	-20 dBm			
BDPSK/Hop	-30 dBm			
	W			
	-40 dBm			
	-50 dBm			
	-60 dBm			
	-70 dBm			
	Start 2.4 GHz		600 pts	Stop 2.4835 GH



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

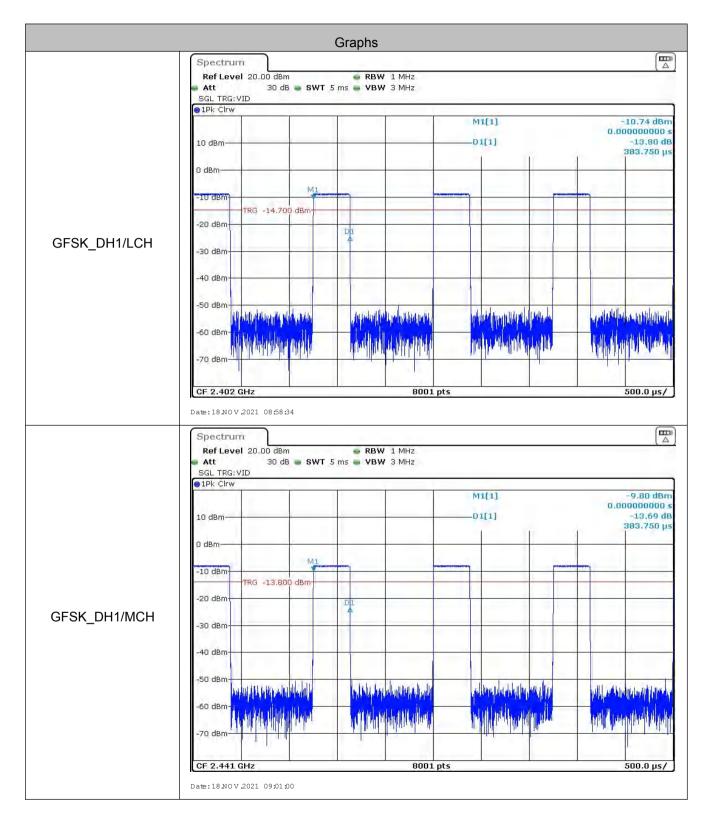
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Dwell Time[s]	Limit (second)
GFSK	DH1	LCH	0.38	0.122	≤0.4
GFSK	DH1	MCH	0.38	0.122	≤0.4
GFSK	DH1	НСН	0.38	0.122	≤0.4
π/4DQPSK	2DH1	LCH	0.39	0.125	≤0.4
π/4DQPSK	2DH1	MCH	0.39	0.125	≤0.4
π/4DQPSK	2DH1	НСН	0.39	0.125	≤0.4
8DPSK	3DH1	LCH	0.39	0.125	≤0.4
8DPSK	3DH1	МСН	0.39	0.125	≤0.4
8DPSK	3DH1	НСН	0.39	0.125	≤0.4
GFSK	DH3	LCH	1.64	0.262	≤0.4
GFSK	DH3	МСН	1.64	0.262	≤0.4
GFSK	DH3	НСН	1.64	0.262	≤0.4
π/4DQPSK	2DH3	LCH	1.64	0.262	≤0.4
π/4DQPSK	2DH3	МСН	1.64	0.262	≤0.4
π/4DQPSK	2DH3	НСН	1.64	0.262	≤0.4
8DPSK	3DH3	LCH	1.64	0.262	≤0.4
8DPSK	3DH3	МСН	1.64	0.262	≤0.4
8DPSK	3DH3	НСН	1.64	0.262	≤0.4
GFSK	DH5	LCH	2.89	0.308	≤0.4
GFSK	DH5	МСН	2.88	0.307	≤0.4
GFSK	DH5	НСН	2.89	0.308	≤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
8DPSK	3DH5	LCH	2.89	0.308	≤0.4
8DPSK	3DH5	МСН	2.89	0.308	≤0.4
8DPSK	3DH5	НСН	2.89	0.308	≤0.4

Remark:

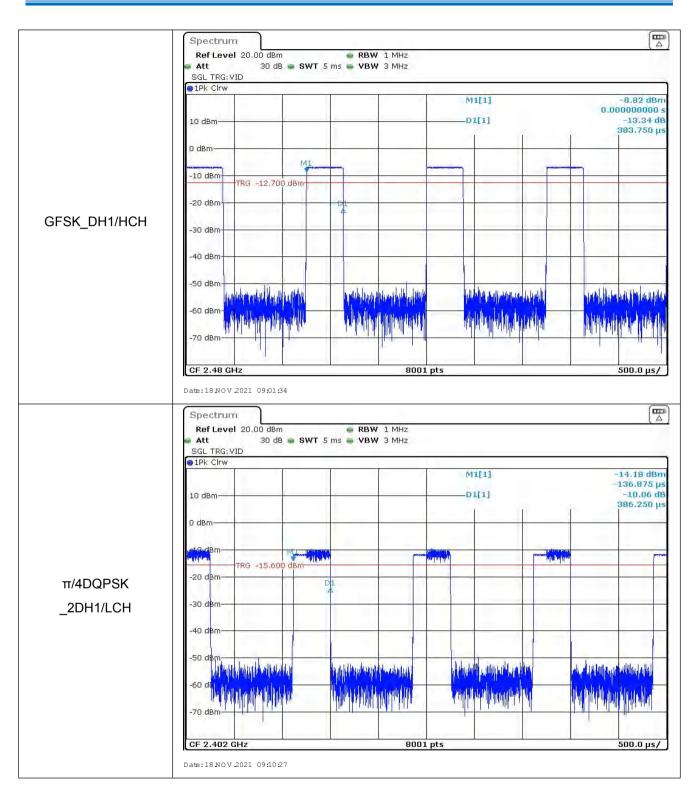
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s DH1/2DH1/3DH1 Dwell time = Burst Width(ms)*[1600/ (2*79)]*31.6 DH3/2DH3/3DH3 Dwell time = Burst Width (ms)*[1600/ (4*79)]*31.6 DH5/2DH5/3DH5 Dwell time = Burst Width (ms)*[1600/ (6*79)]*31.6



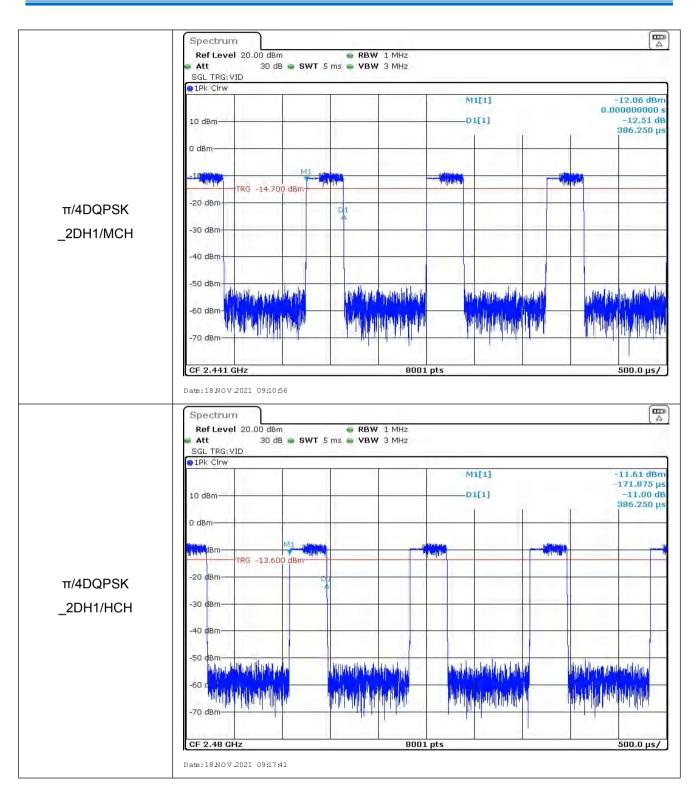
Test plot as follows:



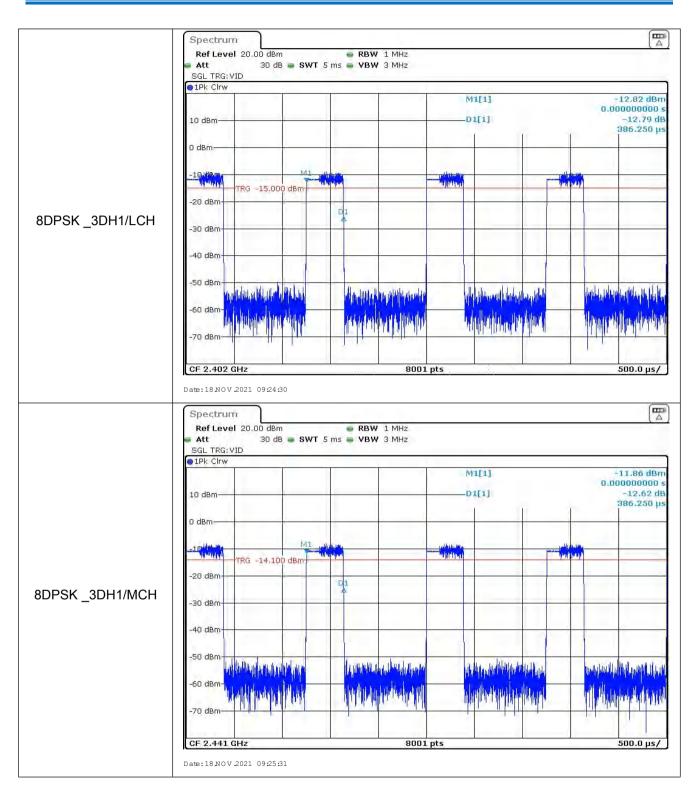




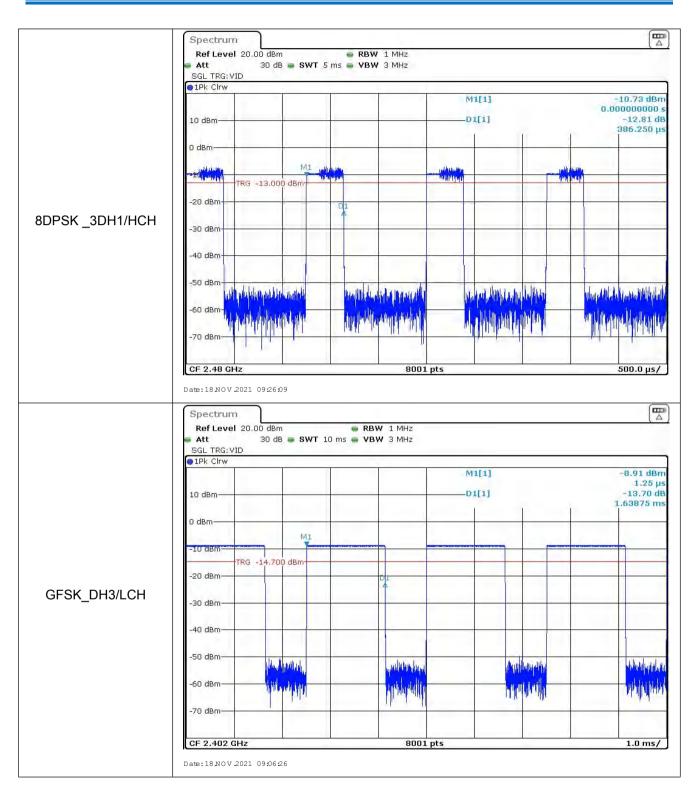








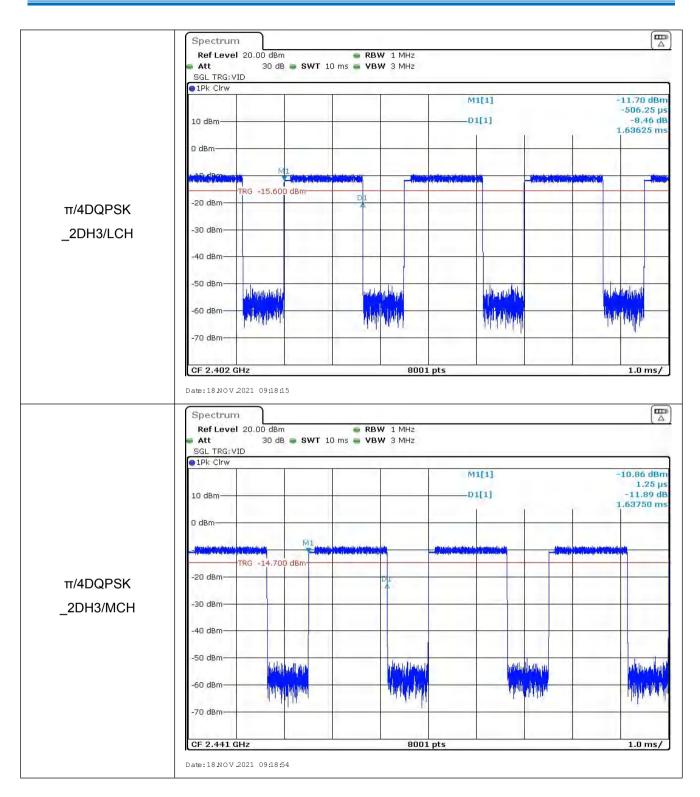




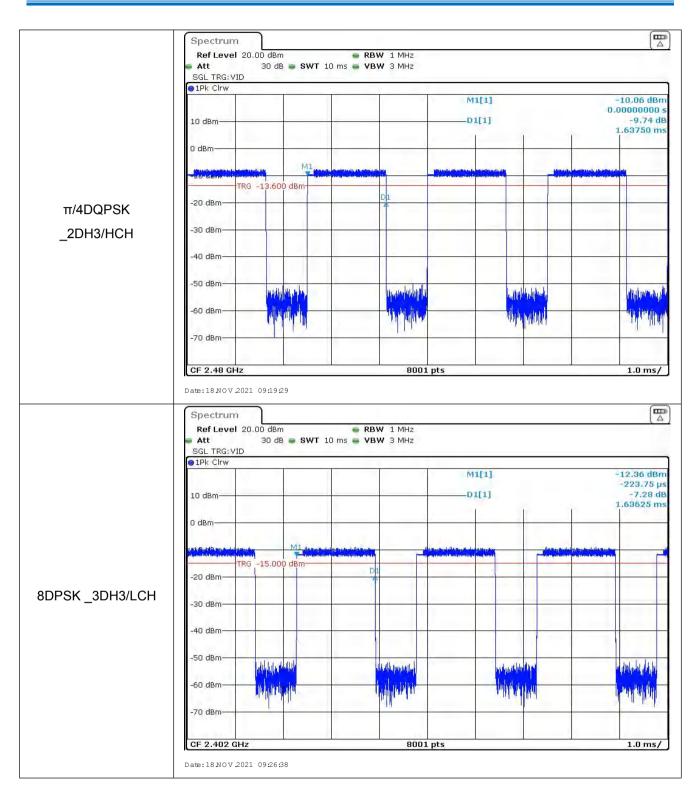


	Spectrum				
	Ref Level		🖷 RBW 1 MHz		
	SGL TRG: VII	30 dB 🥃 SWT 10 ms	🖶 VBW 3 MHz		
	● 1Pk Clrw	,			
				M1[1]	-8.03 dB
	10000			DITI	1.25 -14.09 c
	10 dBm			D1[1]	1.63875 n
	0 dBm				
	o dom	M1			
	-10 dBm				
		RG -13.900 dBm			
	-20 dBm		Di		
GFSK_DH3/MCH			1		
	-30 dBm				
	-40 dBm				
	-50 dBm				
	-50 dBm-	and the station and	الالساري الالطي	ing which which said the	A link off
	-60 dBm		and the second sec		
			PPP TUNK	ALT A ALTAN	
	-70 dBm	11 1 x			
	CF 2.441 GH	17	8001 pts		1.0 ms
	Ci 2.771 di	12	0001 pts		1.0 113
		021 09:08:00			
	Spectrum Ref Level Att SGL TRG:VII	20.00 dBm 30 dB swT 10 ms	 RBW 1 MHz VBW 3 MHz 		
	Spectrum Ref Level	20.00 dBm 30 dB swT 10 ms	e VBW 3 MHz	M1[1]	[.
	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw	20.00 dBm 30 dB swT 10 ms	• VBW 3 MHz	M1[1]	-6.94 dB 1.25
	Spectrum Ref Level Att SGL TRG:VII	20.00 dBm 30 dB swT 10 ms	• VBW 3 MHz	M1[1] D1[1]	-6.94 dB 1.25 -9.41 d
	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm	20.00 dBm 30 dB swT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw	20.00 dBm 30 dB swT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
	Spectrum Ref Level Att SGL TRG: VIII 1Pk Clrw 10 dBm 0 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
	Spectrum Ref Level Att SGL TRG: VIII 1Pk Clrw 10 dBm 0 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
	Spectrum Ref Level Att SGL TRG: VIII 1Pk Clrw 10 dBm 0 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GESK DH3/HCH	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm 0 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm 0 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm 0 dBm -10 dBm T-20 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	20.00 dBm 30 dB SWT 10 ms	• VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG:VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	20.00 dBm 30 dB SWT 10 ms	© VBW 3 MHz		-6.94 dB 1.25 -9.41 (1.63750 n
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG: VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm	20.00 dBm 30 dB SWT 10 ms	VBW 3 MHz		-6.94 dB 1.25 -9.41 d
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG: VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	20.00 dBm 30 dB SWT 10 ms	VBW 3 MHz		-6.94 dB 1.25 -9.41 (1.63750 n
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG: VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	20.00 dBm 30 dB SWT 10 ms	© VBW 3 MHz		-6.94 dB 1.25 -9.41 d 1.63750 r
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG: VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm	20.00 dBm 30 dB SWT 10 ms	VBW 3 MHz		-6.94 dB 1.25 -9.41 (1.63750 n
GFSK_DH3/HCH	Spectrum Ref Level Att SGL TRG: VII 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	20.00 dBm 30 dB SWT 10 ms	VBW 3 MHz		-6.94 dB 1.25 -9.41 (1.63750 n

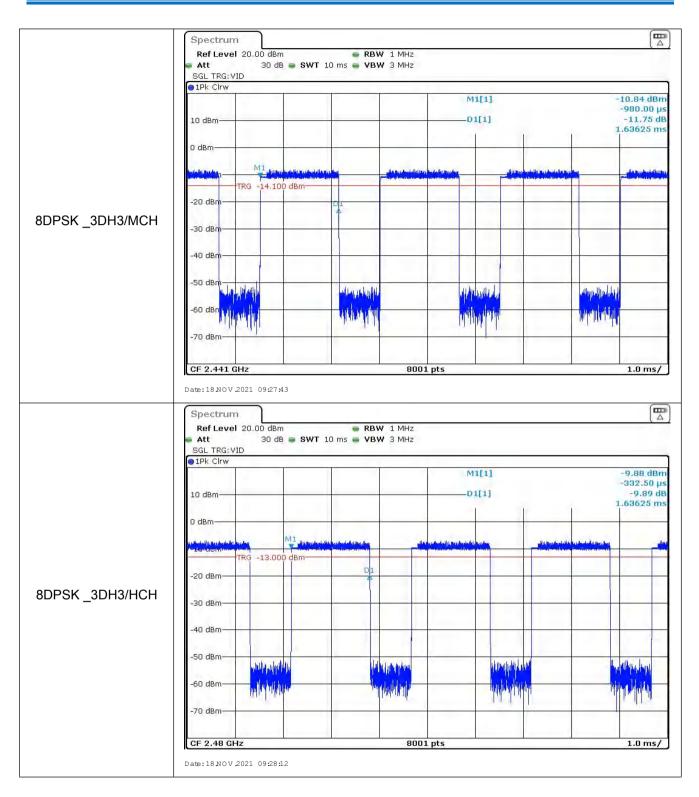








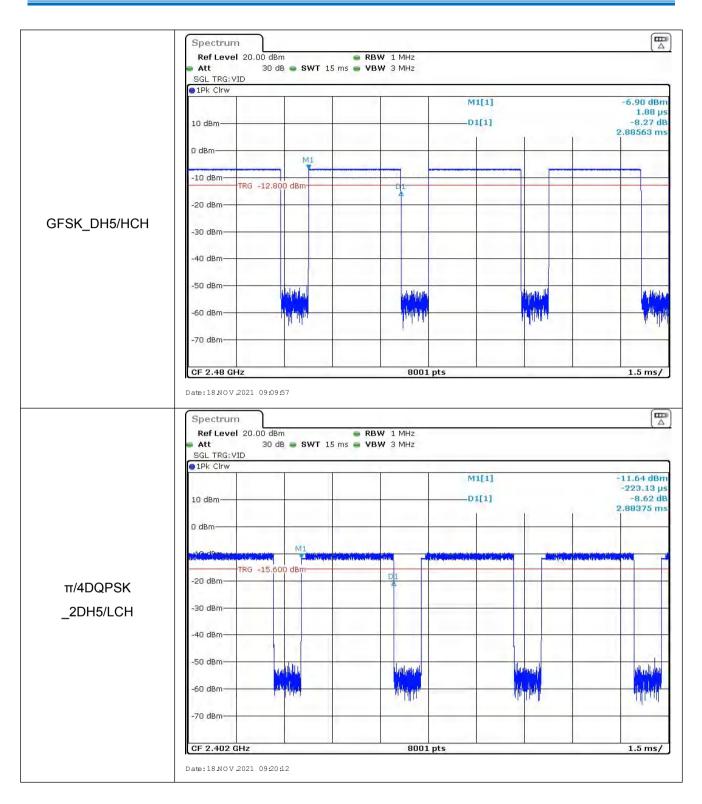




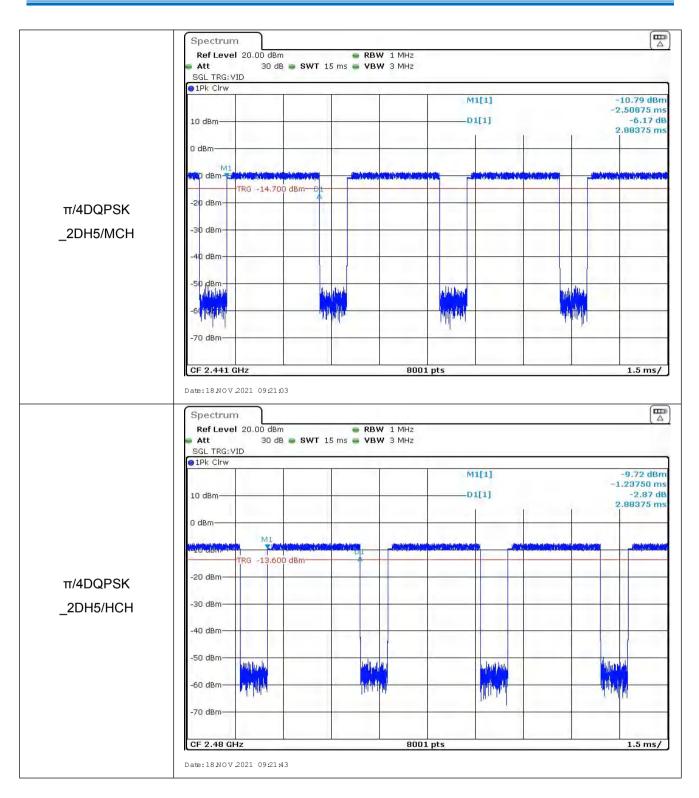


	Spectrum Ref Level 20.	00 d8m	RBW 1 MHz		
	Att	30 dB 👄 SWT 15 ms			
	SGL TRG: VID				
	●1Pk Clrw			11[1]	-8.91 dB
				11[1]	1.88
	10 dBm		D	1[1]	-7.92 (
				1 1 1	2.88563 n
	0 dBm				
		M1			Sector Sector
	-10 dBm				
		-14.800 dBm	4		
	-20 dBm				
GFSK_DH5/LCH	-30 dBm				
	-50 dbiii				
	-40 dBm				
	-50 dBm				
		(molding)	A HALL HA	Mahata -	and the second
	-60 dBm		and a second		
				1 1 1	*1.
	-70 dBm				
	CF 2.402 GHz		8001 pts		1.5 ms
	Date:18.NOV 2021	09:08:59			
		_			C
	Spectrum				
	Spectrum Ref Level 20.	.00 dBm	RBW 1 MHz		
	Ref Level 20. Att	.00 dBm 30 dB SWT 15 ms			
	Ref Level 20. Att SGL TRG: VID				
	Ref Level 20. Att		■ VBW 3 MHz	11[1]	
	Ref Level 20. Att SGL TRG:VID 1Pk Clrw		• VBW 3 MHz		-7.99 dB 1.88
	Ref Level 20. Att SGL TRG: VID		• VBW 3 MHz	n1[1] 01[1]	-7.99 dB 1.88 -4.09 d
	Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm		• VBW 3 MHz		-7.99 dB 1.88 -4.09 (
	Ref Level 20. Att SGL TRG:VID 1Pk Clrw		• VBW 3 MHz		-7.99 dB 1.88 -4.09 (
	Ref Level 20. Att SGL TRG:VID 1Pk Clrw 10 dBm	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 (
	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 d
	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 (
	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm -10 dBm TRG	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 d
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm -10 dBm TRG	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 d 2.88375 m
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm -10 dBm TRG -20 dBm	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 d
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm -10 dBm TRG -20 dBm	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 d
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB SWT 15 ms	• VBW 3 MHz		-7.99 dB 1.88 -4.09 d
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm -10 dBm -20 dBm -30 dBm	30 dB SWT 15 ms	VBW 3 MHz		-7.99 dB 1.88 -4.09 c 2.88375 m
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB SWT 15 ms	VBW 3 MHz		-7.99 dB 1.88 -4.09 d
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB SWT 15 ms	VBW 3 MHz		-7.99 dB 1.88 -4.09 c 2.88375 m
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	30 dB SWT 15 ms	VBW 3 MHz		-7.99 dB 1.88 -4.09 c 2.88375 m
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	30 dB SWT 15 ms	VBW 3 MHz		-7.99 dB 1.88 -4.09 d 2.88375 r
GFSK_DH5/MCH	Ref Level 20. Att SGL TRG: VID 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	30 dB SWT 15 ms	VBW 3 MHz		-7.99 dB 1.88 -4.09 d 2.88375 r

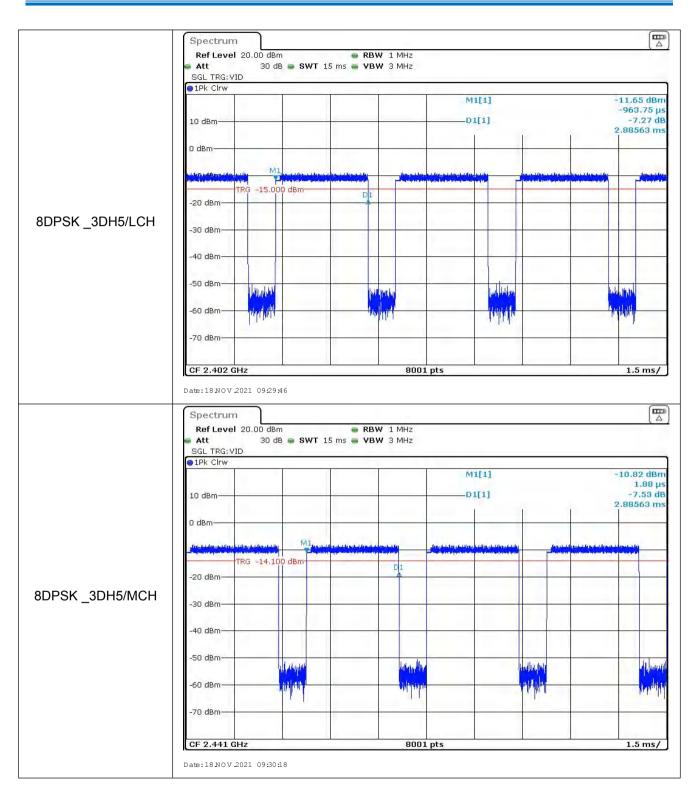




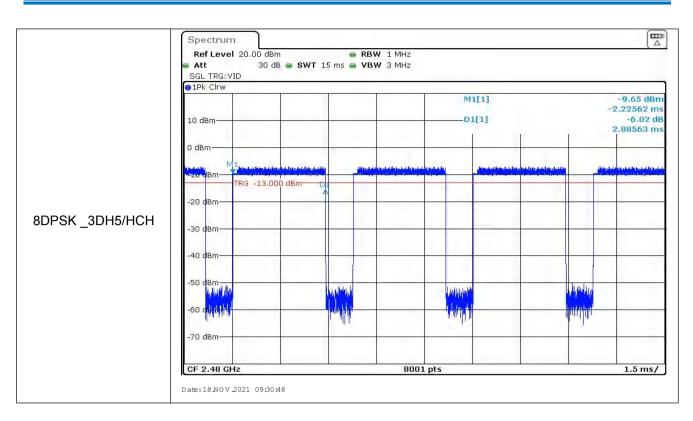














5.8 Band-edge for RF Conducted Emissions

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 $\pi/4DQPSK$ modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass



Measurement Data

Mode	Test Channel	Frequency [MHz]	Frequency Hopping	Emission Level [dBm]	Limit [dBm]	Result
			Off	-50.490	-19.54	PASS
GFSK	LCH	2400	On	-50.040	-17.73	PASS
			Off	-53.160	-17.62	PASS
GFSK	HCH	2483.5	On	-51.430	-17.66	PASS
			Off	-50.440	-23.66	PASS
π/4DQPSK	LCH	2400	On	-50.320	-21.59	PASS
			Off	-53.210	-21.63	PASS
π/4DQPSK	HCH	2483.5	On	-51.320	-20.6	PASS
			Off	-50.570	-23.71	PASS
8DPSK	LCH	2400	On	-50.030	-20.68	PASS
			Off	-53.100	-21.72	PASS
8DPSK	HCH	2483.5	On	-51.630	-20.38	PASS



Test plot as follows:

					Graph	ns						
	Spectr	um		1.0								
	Ref Le	evel	25.00 dt 30			RBW 100 kH		Auto F				
	1Pk Vie	BW	30		тэт., µз	VBW 300 kH	14 IMUUR	auto r	FI			-
	20 dBm-	-	_	-			r	11[1]			2,40	0,46 dBm 21390 GHz
	10 dBm-	+	-				P	12[1]		1		50,49 dBm 00000 GHz
	0 dBm—	+	-	1				-	_	-	-	
	-10 dBm	-	_	-				-	_		_	
	20 dBm	D	1 -19.54	10 dBm						·		
	-30 dBm			0								
GFSK/LCH/No Hop	-40 dBm				M5			100	T.a.S			
	A Budgind		al many ma	op for long what	-	Manager and Manager	new and the second second	M3	Ma	Marin marine	-	Angles and a start
	-60 dBm		0									
	-70 dBm										_	
	Start 2		Hz			8001	pts				Stop :	2.441 GHz
	Marker		1					direction and	_			
	Type M1	Ref	Trc 1	X-valı 2.402	139 GHz	Y-value 0.46 dBi		ction		Func	tion Result	
	M2 M3	_	1		2.4 GHz 2.39 GHz	-50.49 dBi -50.66 dBi						
	M4	_	1	2	2.31 GHz	-51.66 dBi -47.57 dBi	m					
	M5		1	2.3490	708 GHz							
	Date:18.N	0 V .2	021 06:4	9:17								
	Spectr	um	021 06:4 25.00 df 30	3m Offset	9.84 dB	RBW 100 kH	łz	e Auto F	FT			
	Spectr Ref Le	um evel	25.00 dt	3m Offset	9.84 dB		Hz Hz Mode	e Auto F	-FT			
	Spectr Ref Le Att	um evel	25.00 dt	3m Offset	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	FT			2.27 dBn 30190 GH:
	Spectr Ref Le Att 1Pk Vie	um evel	25.00 dt	3m Offset	9.84 dB	RBW 100 kH	łz łz Mode		FT			2.27 dBn 30190 GH; 50.04 dBn
	Spectr Ref Le Att 1Pk Vie 20 dBm-	um evel	25.00 dt	3m Offset	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	T	1860 1 8 - 51 11 111		2.27 dBn 30190 GH; 50.04 dBn
	Spectr Ref Le Att 1Pk Viz 20 dBm- 10 dBm-	ew	25.00 dt	3m Offset	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	T			2.27 dBn 30190 GH; 50.04 dBn
	Spectr Ref Le Att IPk Vie 20 dBm- 10 dBm- 0 dBm- -10 dBm	sw	25.00 df 30	Bm Offset dB SWT	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	FT			2.27 dBn 30190 GH; 50.04 dBn
	Spectr Ref Le Att 1Pk Viz 20 dBm- 10 dBm-	sw	25.00 dt	Bm Offset dB SWT	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	TT			2.27 dBn 30190 GH; 50.04 dBn
	Spectr Ref Le Att IPk Vie 20 dBm- 10 dBm- 0 dBm- -10 dBm	evel	25.00 df 30	Bm Offset dB SWT	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	FT			2.27 dBn 30190 GH; 50.04 dBn
GESK/I CH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 0 dBm- -10 dBm -20 dBm	evel	25.00 df 30	Bm Offset dB SWT	9.84 dB	RBW 100 kH	łz łz Mode	11[1]	FT			2.27 dBn 30190 GH; 50.04 dBn
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 0 dBm- -10 dBm -20 dBm -30 dBm -40 dBm	eum evel	25.00 df 30	Bm Offset dB SWT	9.84 dB 151.7 µs	RBW 100 kH	łz łz Mode	11[1]	FT			2.27 dBn 30190 GH; 50.04 dBn
GFSK/LCH/Hop	Spectr Ref Le Att 1Pk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm	D CompA	25.00 df 30	Am Offset BWT	9.84 dB 151.7 µs	RBW 100 kH	łz łz Mode	41[1]				2.27 dBn 30190 GH; 50.04 dBn
GFSK/LCH/Hop	Spectr Ref Le Att IPk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm 4 *50 dBm	BW	25.00 df 30	Am Offset BWT	9.84 dB 151.7 µs	RBW 100 kH	łz łz Mode	41[1]				2.27 dBm 30190 GHz 50.04 dBm
GFSK/LCH/Hop	Spectr Ref Le Att IPk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -60 dBm		25.00 di 30	Am Offset BWT	9.84 dB 151.7 µs	RBW 100 kH	12 12 Mode	41[1]			2.4	2.27 dBn 30190 GHz 50.04 dBn 9900 GHz
GFSK/LCH/Hop	Spectr Ref Le Att IPk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm 4 *50 dBm		25.00 di 30	Am Offset BWT	9.84 dB 151.7 µs	RBW 100 kH	12 12 Mode	41[1]			2.4	2.27 dBm 30190 GHz 50.04 dBm
GFSK/LCH/Hop	Spectr Ref Le Att PIPk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -60 dBm -70 dBm Start 2. Marker Type	D	25.00 df 30 01 -17.73	Am Offset BWT SWT SWT SWT SWT SWT SWT SWT S	9.84 dB 151.7 µs	RBW 100 kH VBW 300 kH	12 12 Mode 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	41[1]		Func	2.4	2.27 dBm 30190 GHz 50.04 dBm 9900 GHz
GFSK/LCH/Hop	Spectr Ref Le Att PIPk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -40 dBm 4 50 dBm -60 dBm -70 dBm Start 2. Marker	D	25.00 dt 30	Am Offset BWT BWT BWT BWT BWT BWT BWT BWT	9.84 dB	RBW 100 kH VBW 300 kH 	12 12 12 10 10 10 10 10 10 10 10 10 10 10 10 10	M3		Func	2.4	2.27 dBm 30190 GHz 50.04 dBm 9900 GHz
GFSK/LCH/Hop	Spectr Ref Le Att IPk Vie 20 dBm- 10 dBm- -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm 4 50 dBm -70 dBm Start 2. Marker Type M1	D	25.00 di 30 1 -17.73	Am Offset BWT AWT AWT AWT AWT AWT AWT AWT AWT AWT A	9.84 dB 151.7 µs	RBW 100 kH VBW 300 kH VBW 30	الا الا الا الا الا الا الا الا	M3		Func	2.4	





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GFSK/HCH/No Hop	5.0 1005									
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	CF 2.4835 GH	z			8001 pt	S			Span	60.0 MHz
	Marker Type Ref 1	Tec	X-value	Y-val	100	Function	1	Functio	on Result	
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	M2	1	2.4835 GH		16 dBm					
	M3 M4	1	2.5 GH 2.48497 GH		52 dBm 51 dBm					
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	the second second	5.00 dBr 30 dI		• • RBW 10 • • VBW 30		Mode Auto	FFT			
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	Ref Level 29 Att					M1[1]	FT			2,34 dBm 00500 GHz
	Ref Level 25 Att 1Pk View			5 • VBW 30		-	FT		-1	2,34 dBm 00500 GHz 51.43 dBm
	Ref Level 23 Att 1Pk View 20 dBm					M1[1]	-FT		-1	2,34 dBm 00500 GHz
	Ref Level 23 Att 1Pk View 20 dBm			5 • VBW 30		M1[1]	-FT		-1	2,34 dBm 00500 GHz 51.43 dBm
	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm			5 • VBW 30		M1[1]	FFT		-1	2,34 dBm 00500 GHz 51,43 dBm
	Ref Level 29 Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm	30 di	B SWT 75.8 L	5 • VBW 30		M1[1]	-FT		-1	2,34 dBm 00500 GHz 51,43 dBm
	Ref Level 29 Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm		B SWT 75.8 L	5 • VBW 30		M1[1]	-FT		-1	2,34 dBm 00500 GHz 51,43 dBm
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	Ref Level 29 Att 1Pk View 20 dBm 10 dBm 10 dBm 10 dBm	30 di	B SWT 75.8 L	5 • VBW 30		M1[1]	FT		-1	2,34 dBm 00500 GHz 51.43 dBm
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	30 di	B SWT 75.8 L	5 • VBW 30		M1[1]	FT		-1	2,34 dBm 00500 GHz 51.43 dBm
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm 10 dBm -20 dBm D1	30 di	B SWT 75.8 L	5 • VBW 30	DO KHZ	M1[1] M2[1]	FFT	M3	-1	2,34 dBm 00500 GHz 51.43 dBm
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	30 di	B SWT 75.8 L	5 • VBW 30		M1[1] M2[1]	FFT	M3	-1	2,34 dBm 00500 GHz 51,43 dBm
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm	30 di	B SWT 75.8 L	5 • VBW 30	DO KHZ	M1[1] M2[1]		M3	-1	2,34 dBm 00500 GHz 51,43 dBm
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GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -50 dBm -60 dBm	30 di	B SWT 75.8 L	5 • VBW 30	DO KHZ	M1[1] M2[1]	eren och sody	M3	-1	2,34 dBm 00500 GHz 51,43 dBm
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -50 dBm -50 dBm -70 dBm	30 dl	B SWT 75.8 L	5 • VBW 30	No kHz	M1[1]	econsels dady	M3	2.48 2.48	2.34 dBm 00500 GHz 51.43 dBm 35000 GHz
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 10 dBm -110 dBm -20 dBm -30 dBm -40 dBm -50 dBm -70 dBm CF 2.4835 GH	30 dl	B SWT 75.8 L	5 • VBW 30	DO KHZ	M1[1]	econstant dady	M3	2.48 2.48	2,34 dBm 00500 GHz 51,43 dBm
GFSK/HCH/Hop	Ref Level 25 Att 1Pk View 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.4835 GH	30 dl	B SWT 75.8 L		00 kHz	M1[1] 	EFT		2.48 14.01/40-mm	2,34 dBm 00500 GHz 51,43 dBm 35000 GHz
GFSK/HCH/Hop	Ref Level 25 Att • 1Pk View 20 dBm 10 dBm 10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm CF 2.4835 GH Marker Type Ref	30 dl	B SWT 75.8 µ	M1 M1 M2 Y-val 2.:	00 kHz	M1[1]	enconstrain Andy		2.48 2.48	2,34 dBm 00500 GHz 51,43 dBm 35000 GHz
GFSK/HCH/Hop	Ref Level 25 Att 11Pk View 20 dBm 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -70 dBm CF 2.4835 GH Marker Type M1 M2	30 dl	B SWT 75.8 L	M1 M1 V-val 2. -51.	00 kHz	M1[1] 	encontrate dady		2.48 14.01/40-mm	2,34 dBm 00500 GHz 51,43 dBm 35000 GHz
GFSK/HCH/Hop	Ref Level 25 Att • 1Pk View 20 dBm 10 dBm 10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm CF 2.4835 GH Marker Type Ref	30 dl	B SWT 75.8 µ	M1 M1 M2 VBW 30 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	00 kHz	M1[1] 	encent fields dady		2.48 14.01/40-mm	2.34 dBm 00500 GHz 51.43 dBm 35000 GHz



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	20 dBm		-			MI	1]		2.40	-3.66 dBm 20080 GHz
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π/4DQPSK/LCH/No	-40 dBm		TVA	15	-		(1		
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	-60 dBm								a rand ordered	
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	Start 2.31 C Marker	iHZ			8001 pt	s			stop	2.441 GHz
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	M1	1	2.4020		-3.66 dBm	Functio	0	Full	Luon Result	
	M2	1		2.4 GHz	-50.44 dBm					
	M3	1		39 GHz	-52.19 dBm	6				
	M4	1		31 GHz	-51.53 dBm					
	M5	1	2.34902		-47.32 dBm					
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	Spectrum Ref Level Att		n Offset		RBW 100 kHz VBW 300 kHz	Mode A	uto FFT			
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	Spectrum Ref Level Att 1Pk View 20 dBm	25.00 dBm	n Offset				1]			(A
	Spectrum Ref Level Att 1Pk View	25.00 dBm	n Offset			M1[1]		2.4	-1,59 dBm 25830 GHz
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τ/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	25.00 dBm 30 dE	n Offset 3 SWT :			M1[1] 1]	hubbur	2.4 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz
т/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	25.00 dBm 30 dE	n Offset 3 SWT :	151.7 μs		M1[1]	huruhulnye	2.4 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz
т/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm	25.00 dBm 30 dE	n Offset 3 SWT :	151.7 μs		M1[1]	hubbling	2.4 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz
r/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm	25.00 dBm 30 dE	n Offset 3 SWT :	151.7 μs	VBW 300 kHz	M1[M2[1]	Mutuhelnye	2.4 Mi whywwyw	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz wWWWwym
r/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm Stort 2.31 C	25.00 dBm 30 dE	n Offset 3 SWT :	151.7 μs		M1[M2[1]	munulun	2.4 Mi whywwyw	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz
τ/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm Start 2.31 C Marker	25.00 dBm 30 db	dBm	151.7 μs	VBW 300 kHz	M1[M2[[] [] []		2.4 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz 00000 GHz 00000 GHz 2.441 GHz
τ/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm Start 2.31 C Marker Type Ref	25.00 dBm 30 dB 30 dL 30 dL 30 dL 31 -21.590	dBm	151.7 μs	VBW 300 kHz	M1[M2[[] [] []		2.4 Mi whywwyw	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz 00000 GHz 00000 GHz 2.441 GHz
τ/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -50 dBm -70 dBm Start 2.31 C Marker Type Ref M1	25.00 dBm 30 dE 30 dE	dBm	151.7 μs	VBW 300 kHz	M1[M2[[] [] []		2.4 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz 00000 GHz 00000 GHz 2.441 GHz
τ/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm Start 2.31 C Marker Type M1 M2	25.00 dBm 30 dE	dBm	151.7 μs	VBW 300 kHz	M1[M2[[] [] []		2.4 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz 00000 GHz 00000 GHz 2.441 GHz
τ/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -70 dBm Start 2.31 C Marker Type Ref M1 M2 M3 M3	25.00 dBm 30 dE 20 1 -21.590	dBm X-value 2.425 2.	151.7 μs	VBW 300 kHz	M1[M2[[] [] []		2.4 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz 00000 GHz 00000 GHz 2.441 GHz
π/4DQPSK/LCH/Hop	Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm Start 2.31 C Marker Type M1 M2	25.00 dBm 30 dE	dBm	151.7 μs	VBW 300 kHz	M1[M2[[] [] []		2.4 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	-1.59 dBm 25830 GHz 50.32 dBm 00000 GHz 00000 GHz 00000 GHz 2.441 GHz



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	Ref Lev Att	/el 25.00 d 30			RBW 100 kHz VBW 300 kHz	Mode Au	to FFT			
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	0 dBm		-		MI		_			
	-10 dBm—			_	A	_	_			
	20 dBm—	D1 -21.6	30 dBm				_			
π/4DQPSK/HCH/No	-30 dBm—			_						
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	-60 dBm—						11			-
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	M1	Ref Trc	X-value 2.480012	29 GHz	-1.63 dBm	Functio		Func	tion Result	
	M2 M3	1		S GHz	-53.21 dBm -49.60 dBm		_			
	M4	1	2.492012	.5 GHz 25 GHz	-48.37 dBm					
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	Spectru Ref Lev Att	um vel 25.00 d 30	IBm Offset 9		RBW 100 kHz VBW 300 kHz	Mode Au	to FFT			
	Spectru Ref Lev	um vel 25.00 d 30	IBm Offset 9			Mode Au				-0.60 dBm
	Spectru Ref Lev Att 1Pk Viev 20 dBm—	um vel 25.00 d 30	IBm Offset 9				1]		2.47	-0.60 dBm 61500 GHz 51.32 dBm
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	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -10 dBm-	лт vel 25.00 с зо м	IBm Offset 9 dB SWT 7	5.8 µs 🖷	VBW 300 kHz	M1[1]		2.47	-0.60 dBm 61500 GHz 51.32 dBm
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -10 dBm- -20 dBm-	лт vel 25.00 с зо м	IBm Offset 9 dB SWT 7	5.8 µs 🖷	VBW 300 kHz	M1[1]		2.47	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- 0 dBm- -20 dBm- -30 dBm-	лт vel 25.00 с зо м	IBm Offset 9 dB SWT 7	5.8 µs 🖷	VBW 300 kHz	M1[1]	Ma	2.47	-0.60 dBm 61500 GHz 51.32 dBm
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -20 dBm- -30 dBm- -40 dBm-	лт vel 25.00 с зо м	IBm Offset 9 dB SWT 7	5.8 µs 🖷	VBW 300 kHz	M1[M2[1]		2.47	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -20 dBm- -30 dBm- -30 dBm- -50 dBm-	лт vel 25.00 с зо м	IBm Offset 9 dB SWT 7	5.8 µs 🖷	VBW 300 kHz	M1[M2[1]		2.47	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- 0 dBm- -20 dBm- -30 dBm- -50 dBm- -50 dBm-	201 -20.6	IBm Offset 9 dB SWT 7	5.8 µs 🖷	VBW 300 kHz	M1[1]		2.47 2.48	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -20 dBm- -30 dBm- -30 dBm- -40 dBm- -50 dBm- -70 dBm- -70 dBm-	201 -20.6	IBm Offset 9 dB SWT 7 AMAMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	5.8 µs •	VBW 300 kHz	M1[1] 1]	balance - server	2.47 2.48	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz M4 M4 M4 60.0 MHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -20 dBm- -30 dBm- -30 dBm- -40 dBm- -50 dBm- -70 dBm- CF 2.4833 Marker Type F	201 -20.6 30 201 -20.6 31 201 -20.6 35 GHz Ref Trc	IBm Offset 9 dB SWT 7	5.8 µs • м:	VBW 300 kHz	M1[M2[1] 1]	balance - server	2.47 2.48	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz M4 M4 M4 60.0 MHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -20 dBm- -20 dBm- -30 dBm- -40 dBm- -50 dBm- -70 dBm- CF 2.483 Marker Type R M1 M2	201 -20.6 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	IBm Offset 9 dB SWT 7	5.8 µs • м:	VBW 300 kHz	M1[M2[1] 1]	balance - server	2.47 2.48	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz M4 M4 M4 60.0 MHz
π/4DQPSK/HCH/Hop	Spectru Ref Lev Att 1Pk View 20 dBm- 10 dBm- 0 dBm- -20 dBm- -20 dBm- -30 dBm- -50 dBm- -50 dBm- -70 dBm- CF 2.483 Marker Type R M1	201 -20.6	IBm Offset 9 dB SWT 7 000 dBm 000 dBm 000 dBm 2.4761 2.483	5.8 µs М: Д. М. Д. М. С. GHZ 5. GHZ	VBW 300 kHz	M1[M2[1] 1]	balance - server	2.47 2.48	-0.60 dBm 61500 GHz 51.32 dBm 35000 GHz M4 M4 M4 60.0 MHz



	Spectrum									
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						M1[1]	_			-3,71 dBm
	20 dBm									19420 GHz
	10 dBm	-		-		M2[1]				50.57 dBm 00000 GHz
	0 dBm-						4	1		
	-10 dBm	_						ĥ		
	-20 dBm	01 -23.710	dBm-							
	-30 dBm	-			-		-			
BDPSK/LCH/No Hop	-40 dBm		M5	-				4		
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	-60 dBm						-			
	-70 dBm			_		_	_	-		č
	Start 2.31 0	20.0			8001 pt	-			Ptop	2.441 GHz
					8001 pt	s			stop .	2,441 GHZ
	Marker	1 min 1	M	- 1	Vicelas 1		-	ena		
	Type Ref M1	1	X-value 2.40194		Y-value -3.71 dBm	Function		Fun	ction Result	
	M2 M2	1		4 GHz	-50.57 dBm					
	M3	1		9 GHz	-52.28 dBm					
	M4	1	2.3	1 GHz	-50.60 dBm					
					47 54 40.00					
	M5 Date: 18 NOV 2 Spectrum				-47.51 dBm					
	Date:18.NOV.2	.021 07:20:	59 n Offset 9	9.84 dB	-47.51 dBm RBW 100 kHz VBW 300 kHz	Mode Aut	D FFT			(III) A
	Date: 18 NOV 2 Spectrum Ref Level Att	021 07:20:	59 n Offset 9	9.84 dB	RBW 100 kHz	Mode Aut				-0.68 dBn
	Date: 18 NOV 2 Spectrum Ref Level Att 1Pk View 20 dBm	021 07:20:	59 n Offset 9	9.84 dB	RBW 100 kHz				2,4	-0.68 dBr 37180 GH 50.03 dBr
	Date: 18 NOV 2 Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm	021 07:20:	59 n Offset 9	9.84 dB	RBW 100 kHz	M1[1]			2.4	-0.68 dBn 37180 GH 50.03 dBn 00000 GH M1
	Date: 18 NOV 2 Spectrum Ref Level Att 1Pk View 20 dBm	021 07:20:	59 n Offset 9	9.84 dB	RBW 100 kHz	M1[1]		Limmedida	2.4	-0.68 dBr 37180 GH 50.03 dBr 00000 GH M1
	Date: 18 NOV 2 Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm	021 07:20:	59 n Offset 9	9.84 dB	RBW 100 kHz	M1[1]		L.Mongel All	2,4	-0.68 dBr 37180 GH 50.03 dBr 00000 GH M1
	Date: 18 NOV 2 Spectrum Ref Level Att 10 dBm 10 dBm -10 dBm	021 07:20:	59 n Offset 9 B SWT 1.	9.84 dB	RBW 100 kHz	M1[1]		&mundal	2.4	-0.68 dBr 37180 GH 50.03 dBr 00000 GH M1
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8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm 4	25.00 dBn 30 df	59 n Offset 9 B SWT 1.	9.84 dB 51.7 μs	RBW 100 kHz VBW 300 kHz	M1[1]		emundar	2.4	-0.68 dBn 37180 GH 50.03 dBn 00000 GH M1
8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 10 dBm 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	25.00 dBn 30 df	59 n Offset 9 B SWT 1.	9.84 dB	RBW 100 kHz VBW 300 kHz	M1[1]		Lanne Meder	2.4	-0.68 dBn 37180 GH 50.03 dBn 00000 GH M1
8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 1Pk View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -60 dBm	25.00 dBn 30 df	59 n Offset 9 B SWT 1.	9.84 dB 51.7 μs	RBW 100 kHz VBW 300 kHz	M1[1]		L.M. M. M. Marker	2.4	-0.68 dBn 37180 GH 50.03 dBn 00000 GH M1
8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 10 dBm 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -40 dBm -70 dBm	021 0720: 25.00 dBn 30 df	59 n Offset 9 B SWT 1.	9.84 dB 51.7 μs	RBW 100 kHz VBW 300 kHz	M1[1]		a man Mart	2.4 2.4 Awhamym	-0.68 dBr 37180 GH 50.03 dBr 00000 GH M1 WWWWWW
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8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 10 HR View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -70 dBm -70 dBm -70 dBm -70 dBm Ref Level -70 dBm -70 dBm Ref Level Ref Level -70 dBm Ref Level -70 dBm Ref Level -70 dBm -70 dB	021 0720: 25.00 dBn 30 df	59 B SWT 1. D dBm M5 Swing Trans	9.84 dB 51.7 μs	RBW 100 kHz VBW 300 kHz	M1[1]	M		2.4 2.4 Awhamym	-0.68 dBr 37180 GH 50.03 dBr 00000 GH M1 MM/W/M
8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 10 HPK View 20 dBm 10 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -40 dBm -70 dBm -70 dBm Start 2.31 C Marker M1	021 0720: 25.00 dBn 30 df 01 -20.680 01 -20.	59 m Offset 9 B SWT 1. dBm dBm M5 Autor M5 Autor	9.84 dB 51.7 µs	RBW 100 kHz VBW 300 kHz	M1[1]	M		2.4 2.4 hwhanhyph	-0.68 dBr 37180 GH 50.03 dBr 00000 GH M1 MM/W/M
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8DPSK/LCH/Hop	Date: 18 NOV 2 Spectrum Ref Level Att 10 k View 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -60 dBm -70 dBm Start 2.31 C Marker Type Ref M1 M2	021 0720: 25.00 dBn 30 df 01 -20.680 01 -20.680 01 -20.680 01 -20.680 01 -20.680	59 m Offset 9 B SWT 1. B SWT 1. C C C C C C C C C C C C C C C C C C C	9.84 dB 51.7 µs	RBW 100 kHz VBW 300 kHz	M1[1] M2[1]	M		2.4 2.4 hwhampyrth Stop :	-0.68 dBn 37180 GH 50.03 dBn 00000 GH M1 MMWMM





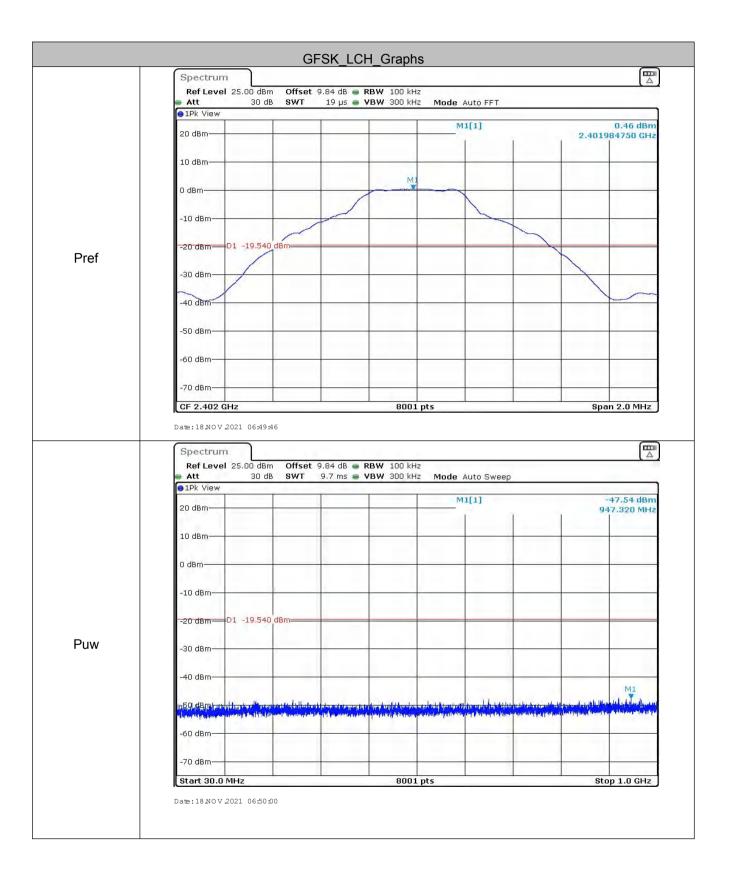
	Spect		L	- P		<u> </u>	1.1					
	Ref L	.evel 25.	.00 dB 30 c		9.80 dB 🖷 75.8 µs 🖷			Mode Au	uto FFT			
	●1Pk Vi	iew		T	1	1	-	MI	[1]			-1.72 dBm
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	-30 dBn			-	-							
	-40 dBn											
3DPSK/HCH/No Hop					1.00	1	100			M3		M4
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	-60 dBn	0				-			-			-
	-70 dBn	n				-		-				-
		835 GHz					8001 pt	s			Span	60.0 MHz
	Marker Type	Ref T	rc	X-valu	ie	Y-va	lue	Functi	on	Functi	on Result	
	M1 M2		1		804 GHz 835 GHz		72 dBm 10 dBm					
	M3		1		2.5 GHz	-51.	33 dBm					
	M4	NOV .2021	1 07:29	2.5112:	275 GHz	-48.	20 0011					
	M4	NOV.2021			275 GHz	-48.	20 0011	1				
	M4 Date: 18 M Spect Ref L	NOV 2021 Frum .evel 25.	07:29	:09 m Offset	275 GHz 9.80 dB 🖷 75.8 µs 🖷	RBW 1	00 kHz	Mode At	uto FFT			∏ ∆
	M4 Date:181 Spect Ref Li Att 1Pk Vi	nov 2021 rum evel 25. iew	07:29	:09 m Offset	9.80 dB 🖝	RBW 1	00 kHz	Mode Al				-0.38 dBm
	M4 Date:182 Spect Ref L • Att • 1Pk Vi 20 dBm	nov 2021 rum evel 25.	07:29	:09 m Offset	9.80 dB 🖝	RBW 1	00 kHz	M1	[1]		2.47	
	M4 Date:181 Spect Ref Li Att 1Pk Vi	nov 2021 rum evel 25.	07:29	:09 m Offset	9.80 dB 🖝	RBW 1 VBW 3	00 kHz		[1]		2.47	-0.38 dBm 38500 GHz
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	M4 Date: 181 Spect Ref L Att 0 1Pk Vi 20 dBm 10 dBm	rum rum iew i	07:29 00 dB 30 c	:09 m Offset	9.8D dB 75.8 µs	RBW 1 VBW 3	00 kHz	M1	[1]		2.47	-0.38 dBm 38500 GHz 51.63 dBm
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8DPSK/HCH/Hop	M4 Date: 181 Spect Ref L Att 1Pk Vi 20 dBm 10 dBm 0 dBm- -10 dBm -20 dBm	NOV 2021 rum evel 25. iew /////// n n D 1 n D 1 n	07:29 00 dB 30 c	:09 m Offset B SWT	9.8D dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz	M1 	[1]	M3	2.471 	-0.38 dBm 38500 GHz 51.63 dBm
8DPSK/HCH/Hop	M4 Date:181 Spect Att IPk Vi 20 dBm 10 dBm -20 dBm -30 dBn	NOV 2021 rum evel 25. iew ydur n n n n n	07:29 00 dB 30 c	:09 m Offset B SWT	9.8D dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz	M1	[1]	Ma	2,471	-0.38 dBm 38500 GHz 51.63 dBm
8DPSK/HCH/Hop	M4 Date: 181 Spect Ref L 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	NOV 2021 rum evel 25. iew //	07:29 00 dB 30 c	:09 m Offset B SWT	9.8D dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz	M1 	[1]	Ma	2.471 	-0.38 dBm 38500 GHz 51.63 dBm
8DPSK/HCH/Hop	M4 Date:181 Ref L Att DPk Vi 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -30 dBm	NOV 2021 rum evel 25. iew v/u/v/v n n n n n n	07:29 00 dB 30 c	:09 m Offset B SWT	9.8D dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz	M1 	[1]	M3	2.471 	-0.38 dBm 38500 GHz 51.63 dBm
8DPSK/HCH/Hop	M4 Date:181 Spect Att IPK Vi 20 dBm 0 dBm -20 dBm -20 dBm -30 dBm -30 dBm -30 dBm -30 dBm -70 dBm -70 dBm CF 2.4	Nov 2021 rum evel 25. iew 	07.29 0.00 dB 30 c	:09 m Offset B SWT	9.8D dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz	M1 M2	[1]	Ma	2.47 2.48 M4	-0.38 dBm 38500 GHz 51.63 dBm
8DPSK/HCH/Hop	M4 Date: 181 Spect Ref L 10 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -30 dBm -50 dBm -50 dBm -60 dBm -70 dBm	Nov 2021 rum evel 25. iew 	07.29 0.00 dB 30 c	:09 m Offset B SWT	9.80 dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz	M1 M2	[1]	and a started	2.47 2.48 M4	-0.38 dBm 38500 GHz 51.63 dBm 35000 GHz
8DPSK/HCH/Hop	M4 Date:181 Spect Ref L Att PPK Vi 20 dBm 10 dBm 0 dBm -20 dBm -30 dBm -30 dBm -30 dBm -30 dBm -30 dBm -70 dBm -70 dBm CF 2.44 Marker Type M1	NOV 2021	07.29 0.00 dB 30 c -20.38	:09 m Offset B SWT	9.80 dB 75.8 µs	RBW 1 VBW 3	00 kHz 00 kHz 600 pt	M1 	[1]	and a started	2.47 2.48 M4 7	-0.38 dBm 38500 GHz 51.63 dBm 35000 GHz
8DPSK/HCH/Hop	M4 Date:181 Pate:181	NOV 2021	07.29 0.00 dB 30 c	:09 m Offset B SWT A how have a b b b b b b b b b b b b b b b b b b b	9.80 dB 75.8 µs	RBW 1 VBW 3 M1 M1 V-Va -0.	00 kHz 00 kHz	M1 	[1]	and a started	2.47 2.48 M4 7	-0.38 dBm 38500 GHz 51.63 dBm 35000 GHz



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, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Test Results:	Pass

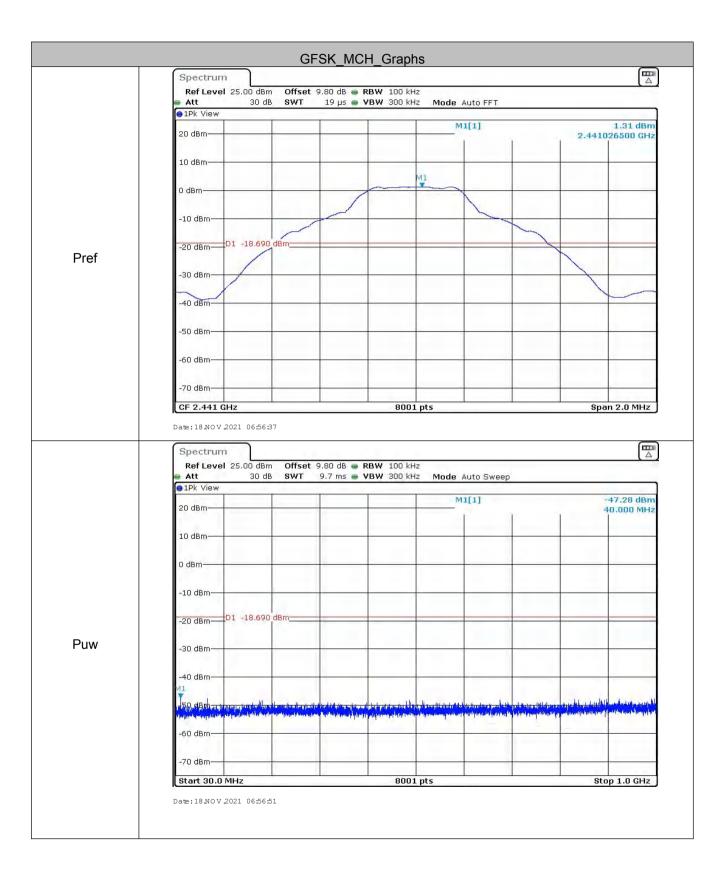






●1Pk View		
20 dBm	M1[1]	0.5
	M2[1]	-43.9
10 dBm		6.9056
MI		
0 dBm		
-10 dBm		
-20 dBm-D1 -19.540 dBm		
-30 dBm-		
-40 dBm	IVI2	
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Interface and the state of the second state of		and a loss of a loss of a loss of the loss of a loss of the loss o
-60 dBm		
-70 dBm		
Start 1.0 GHz	8001 pts	Stop 12.0
	9.84 dB • RBW 100 kHz 130 ms • VBW 300 kHz Mode Auto S	weep
Spectrum Ref Level 25.00 dBm Offset 9		weep
Spectrum Ref Level 25.00 dBm Offset 9 Att 30 dB SWT 1Pk View		-44.1
Spectrum Ref Level 25.00 dBm Offset 9 Att 30 dB SWT	130 ms 🖶 VBW 300 kHz Mode Auto S	-44.1
Spectrum Ref Level 25.00 dBm Offset 9 Att 30 dB SWT 1Pk View 20 dBm	130 ms 🖶 VBW 300 kHz Mode Auto S	-44.1
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Spectrum Offset Att 30 dB SwT IPk View 20 dBm 10 dBm 10 dBm	130 ms 🖶 VBW 300 kHz Mode Auto S	-44.1
Spectrum Offset Att 30 dB SwT 1Pk View 20 dBm 10 dBm 10 dBm	130 ms • VBW 300 kHz Mode Auto S	-44.1
Spectrum Offset 9 Att 30 dB SwT IPk View 20 dBm 20 dBm 10 dBm 0 dBm 10 dBm -10 dBm -10 dBm -19.540 dBm -30 dBm -19.540 dBm -30 dBm	130 ms • VBW 300 kHz Mode Auto S	weep 44.1) 15.7557
Spectrum Offset 9 Att 30 dB SwT IPk View 20 dBm 20 dBm 10 dBm 0 dBm 10 dBm -10 dBm -10 dBm -19.540 dBm -30 dBm -19.540 dBm -30 dBm	130 ms • VBW 300 kHz Mode Auto S	-44.1
Spectrum Offset 9 Att 30 dB SwT IPk View 20 dBm 9 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm -10 dBm	130 ms • VBW 300 kHz Mode Auto S	-44.1
Spectrum Offset 9 Att 30 dB SwT IPk View 20 dBm 20 dBm 10 dBm 0 dBm 10 dBm -10 dBm -10 dBm -19.540 dBm -30 dBm -19.540 dBm -30 dBm	130 ms • VBW 300 kHz Mode Auto S	-44.1
Spectrum Offset 9 Att 30 dB SwT IPk View 20 dBm 9 20 dBm 9 9 10 dBm 9 9 -10 dBm 9 9 -30 dBm 9 9 -40 dBm 9 9 -60 dBm 10 10	130 ms • VBW 300 kHz Mode Auto S	-44.1
Spectrum Offset 9 Att 30 dB SwT IPk View 20 dBm 9 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm -10 dBm	130 ms • VBW 300 kHz Mode Auto S	-44.1

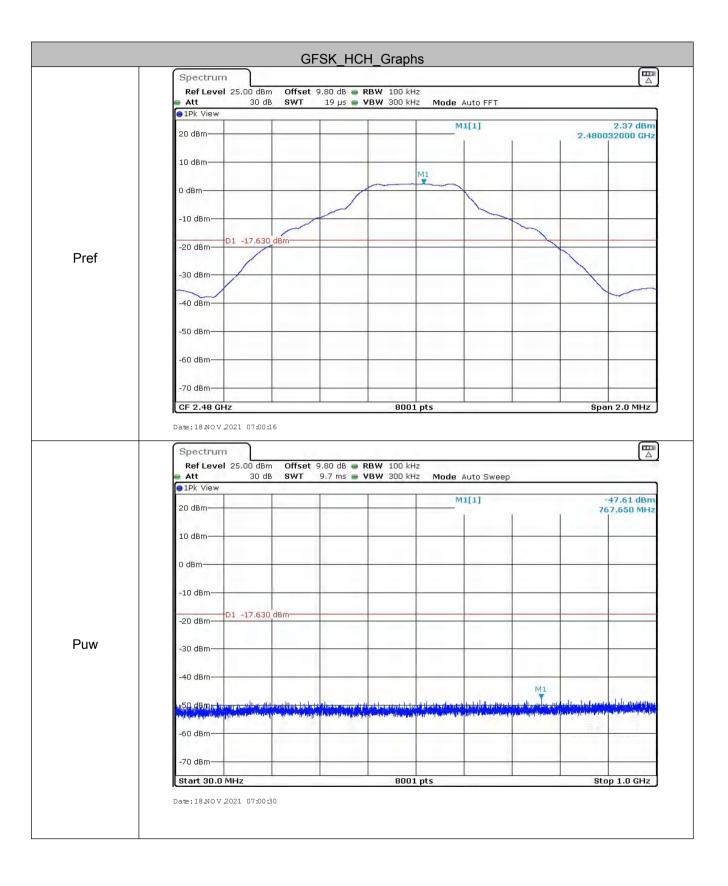






●1Pk Viev					P	M1[1]			1.55 0
20 dBm—						12[1]			.44150 -44.16 (
10 dBm—									.78325
10 0.5.11	M1								
0 dBm	T	-							
-10 dBm-		-				-			
	D1 -18.690	dRes							
-20 dBm-									
-30 dBm-				L					
-30 übm-									
-40 dBm-					M2	/			_
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Personal Condition	distantion of the state	Lesth Les			office of	AN AND SALAR AND	r lanke bestille and	a subscription	Abline allow a
-60 dBm-		-							
1									
-70 dBm-									-
Start 1.0	GHz							Pto	p 12.0 G
Spectru	V.2021 06:57:0	Offset	9.80 dB 👄 R 130 ms 🖷 V		z	Auto Swee	p	310	p 12.0 C
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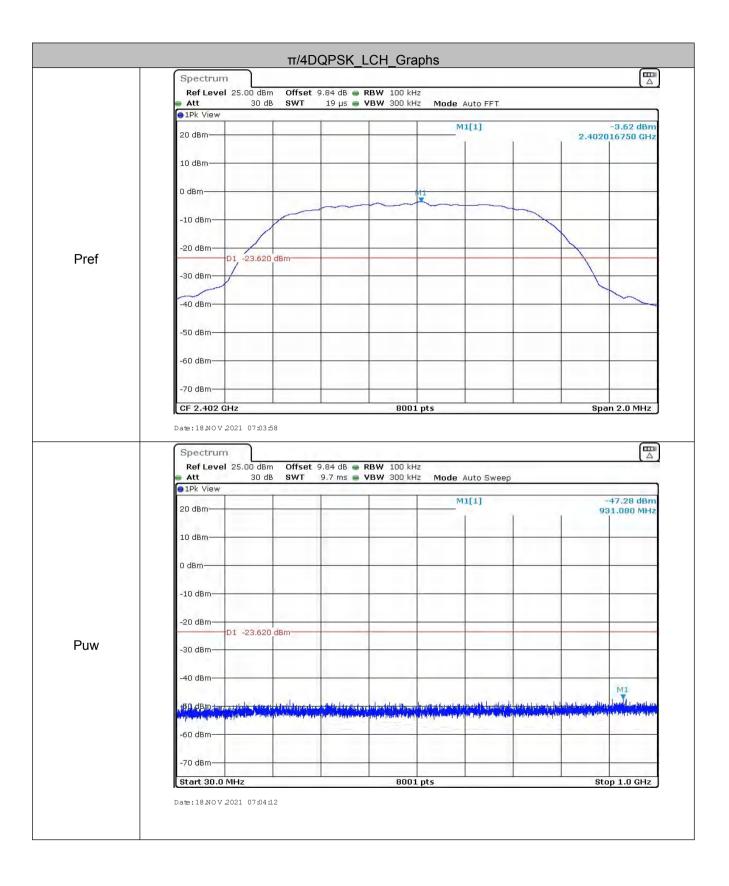






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Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm-	im vel 25.00 d 30	lBm Offset					
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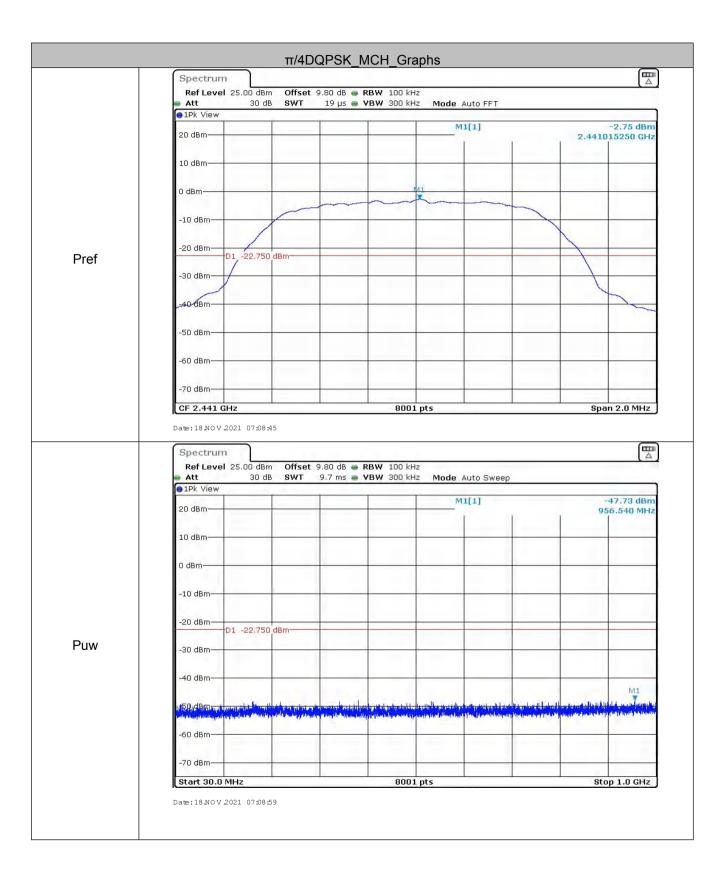






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Spectru Ref Lee Att	vv.2021 07:04: um vel 25.00 dBn 30 dl	n Offset 9		₩ 100 kHz	Mode A				-44.46 d
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Spectru Ref Lev Att 1Pk Vie 20 dBm- 10 dBm-	vv.2021 07:04: um vel 25.00 dBn 30 dl	n Offset 9		₩ 100 kHz	Mode A				-44.46 d
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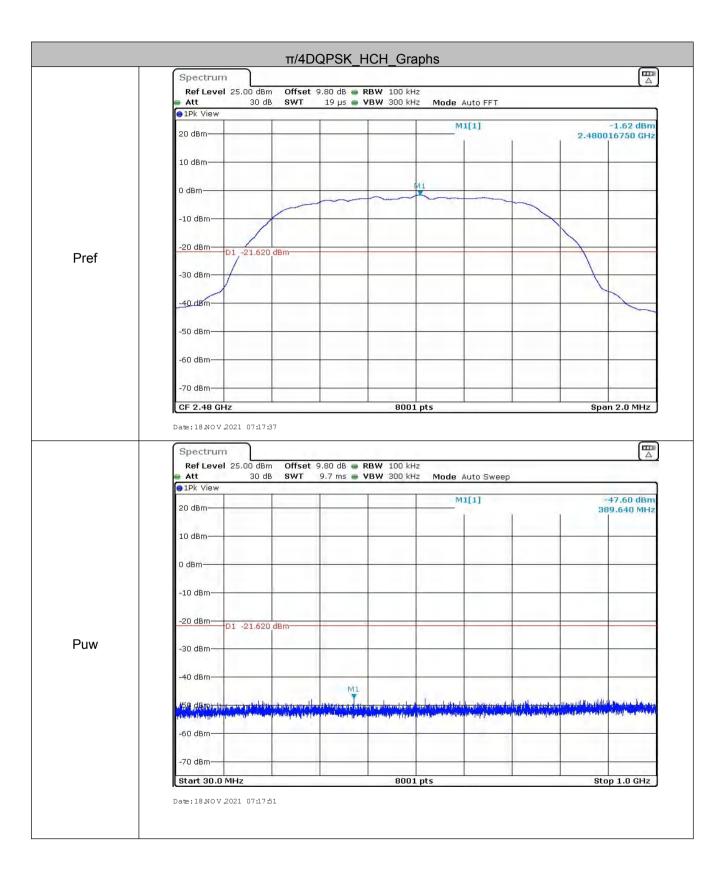






●1Pk View	1 1	444543	
20 dBm		M1[1]	-5.93 dE 2.44010 G
		M2[1]	-43.53 dt
10 dBm			6.69388 G
0 dBm			
M1			
-10 dBm			
-20 dBm-D1 -22.750 dBm			
-30 dBm			
-40 dBm-	M2		
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-70 dBm			
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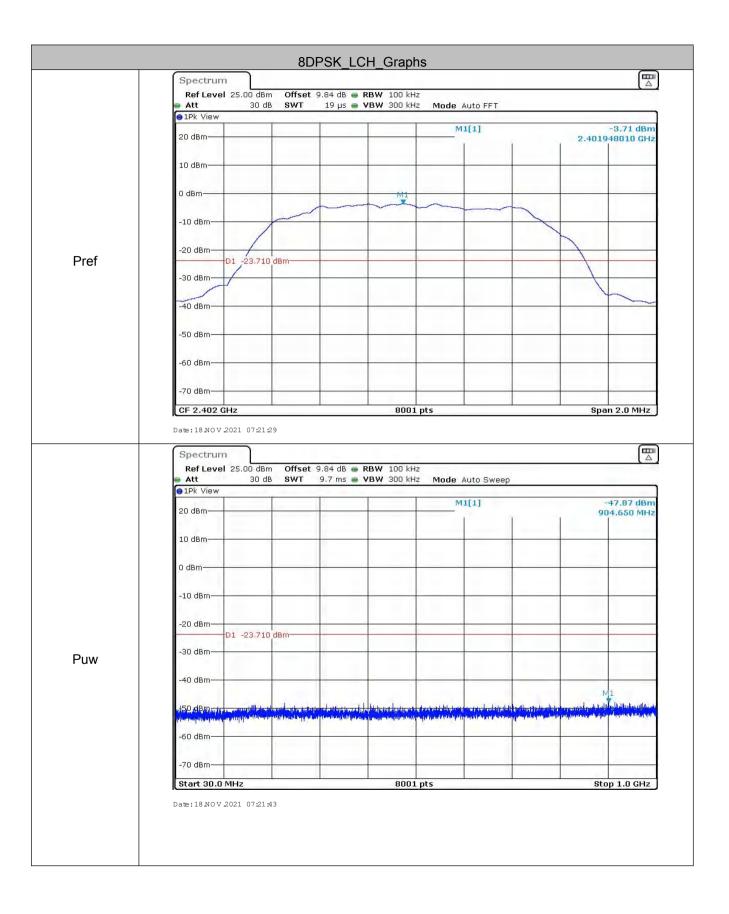






●1Pk View		1	1 1	M11[1]			-2.66 dE
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Spectrum Ref Leve Att 1Pk View	2021 07:18:04		RBW 100 kHz	Mode Auto S	weep		14.34 di
Spectrun Ref Leve Att 1Pk View 20 dBm- 10 dBm-	2021 07:18:04		RBW 100 kHz	Mode Auto S	weep		14.34 di
Spectrun Ref Leve Att 1Pk View 20 dBm-	2021 07:18:04		RBW 100 kHz	Mode Auto S	weep		14.34 di
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Spectrum Ref Leve Att 1Pk View 20 dBm 10 dBm -10 dBm -10 dBm	2021 07:18:04	SWT 130 ms	RBW 100 kHz	Mode Auto S	weep		14.34 di
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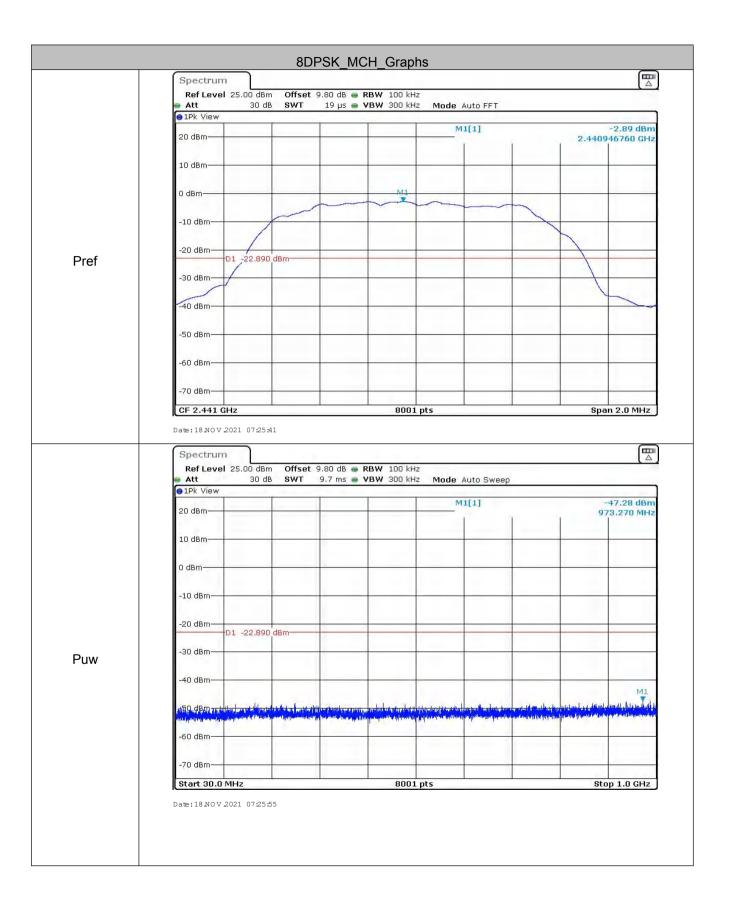






⊖1Pk Vie	**	1			M1[1]			-4.41 d
20 dBm-		1			-			40160
					M2[1]			43.86 d
10 dBm-		-					-	
0 dBm-	M1							
10.10								
-10 dBm-							1	1
-20 dBm-							1	6
- LO GDIII	D1 -23.710	dBm			_		A	
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-70 dBm-								-
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Spectr Ref Le	um vel 25.00 dBm 30 dB	Offset 9		100 kHz		0		
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Spectro Ref Le Att 1Pk Vie 20 dBm-	um vel 25.00 dBm 30 dB	Offset 9		100 kHz				44.25 d
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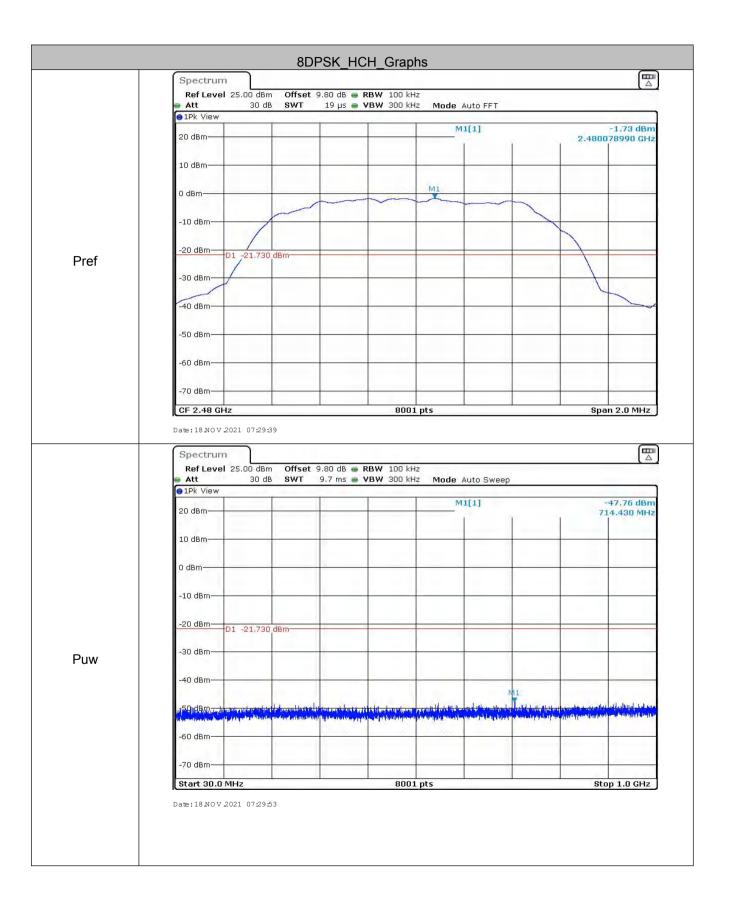






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Spectru Ref Lev Att	um vel 25.00 dBn 30 dB	n Offset	9.80 dB 👄 Rf 130 ms 👄 VI	BW 100 kHz) Sweep	(
Spectru Ref Lev Att	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz			 -44.91 d
Spectru Ref Lev Att	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz	Mode Auto		 -44.91 d
Spectru Ref Lev Att 1Pk Viet 20 dBm-	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz	Mode Auto		-44.91 d
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Spectru Ref Lev 1Pk View 20 dBm-	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Viev 20 dBm-	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Vier 20 dBm- 10 dBm- 0 dBm-	um vel 25.00 dBn 30 dB	n Offset		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Vier 20 dBm- 10 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -10 dBm- -20 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -10 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Vier 20 dBm- 10 dBm- -10 dBm- -20 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att 1Pk Viev 20 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	um	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
Spectru Ref Lev Att IPk Viet 20 dBm- 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm-	Um 30 dB 30 dB W D1 -22.890	n Offset B SWT		BW 100 kHz	Mode Auto		-44.91 d
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Date: 18.NO ¹ Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -10 dBm-	7 2021 07:30:0 m el 25.00 dBm 30 dB	Offset SWT		RBW 100 kH	z z Mode				44.48 dB
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Date: 18 NO 1 Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	7 2021 07:30:0 m el 25.00 dBm 30 dB	Offset SWT	130 ms • 1	RBW 100 kH	Z Mode			16	44.48 dB
Date: 18.NO ¹ Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	7 2021 07:30:0 m el 25.00 dBm 30 dB	Offset SWT	130 ms • 1	RBW 100 kH	z z Mode			16	44.48 dB
Date: 18 NO 1 Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	7 2021 07:30:0 m el 25.00 dBm 30 dB	Offset SWT	130 ms • 1	RBW 100 kH	Z Mode			16	(E 44.48 dB
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Date: 18 NO 1 Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm-	7 2021 07:30:0 m el 25.00 dBm 30 dB	Offset SWT	130 ms • 1	RBW 100 kH	Z Mode			16	(E 44.48 dB
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Date: 18 NO 1 Spectru Ref Lev Att 10 dBm- 10 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm-	7 2021 07:30:0 m el 25.00 dBm 30 dB	Offset SWT	130 ms • 1	RBW 100 kH	Z Mode			16	44.48 dB

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

•	equency hopping opread opectrum bystem
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 in 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 othe independently chooses and The coordination of frequence	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 occupancy of individual hopping frequencies by multiple transmitters is
Compliance for section 15	.247(a)(1)
-	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 Feedback S	hift Register for Generation of the PRBS sequence
	om Frequency Hopping Sequence as follow: 7 64 8 73 16 75 1
Each frequency used equally	y on the average by each transmitter.
According to Bluetooth Cor bandwidths that match the	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.

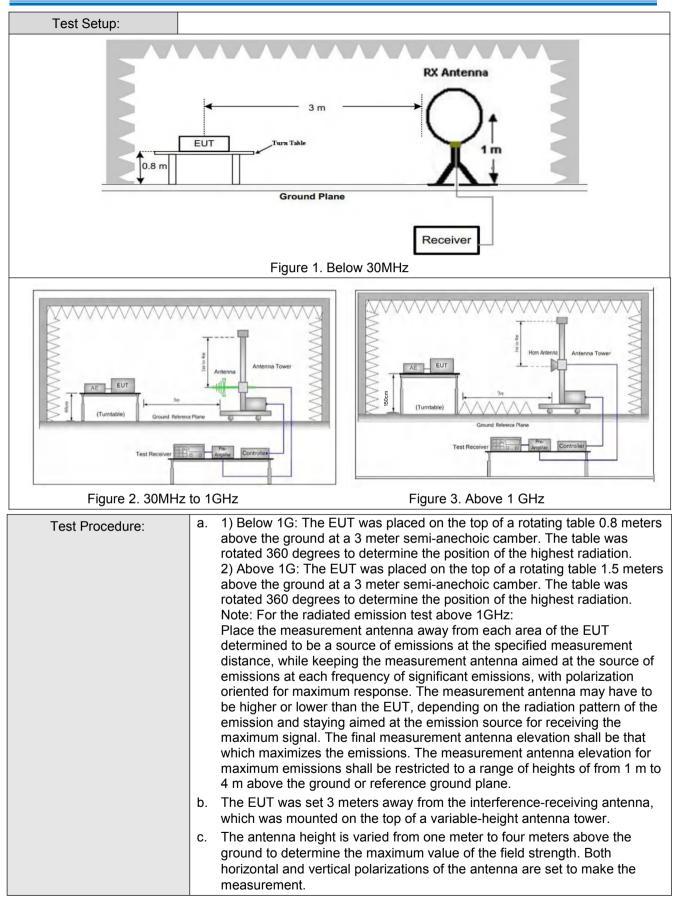


5.11 Radiated Spurious Emission & Restricted bands

Test Requirement:	47 CFR Part 15C Section	on 1	5.209 and 15.2	205			
Test Method:	ANSI C63.10: 2013						
Test Site:	Measurement Distance	: 3m	n (Semi-Anech	oic Cham	ber)		
Receiver Setup:	Frequency		Detector	RBW	VBW	Remark]
	0.009MHz-0.090MH	Peak	10kHz	z 30kHz	Peak]	
	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 kH	lz 300kHz	Peak	
	Above 1GHz		Peak	1MHz	: 3MHz	Peak	
	Above ronz		Peak	1MHz	: 10Hz	Average	
Limit:	Frequency		eld strength crovolt/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	





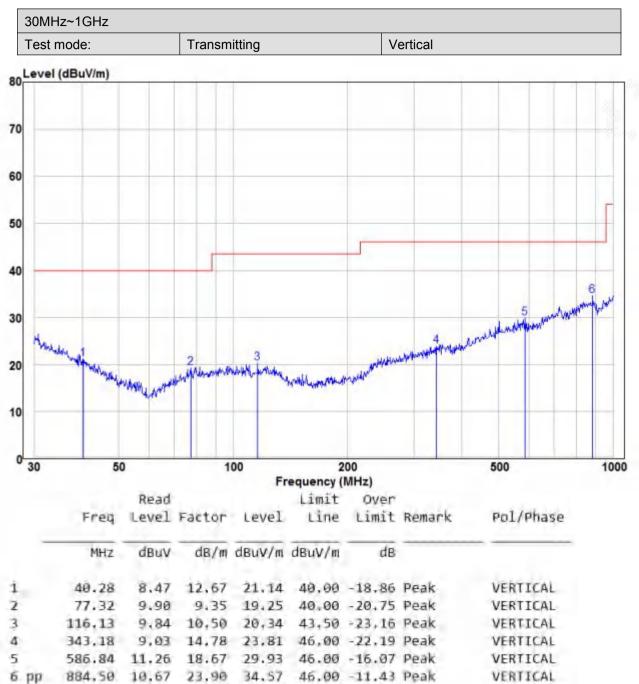




	 d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum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

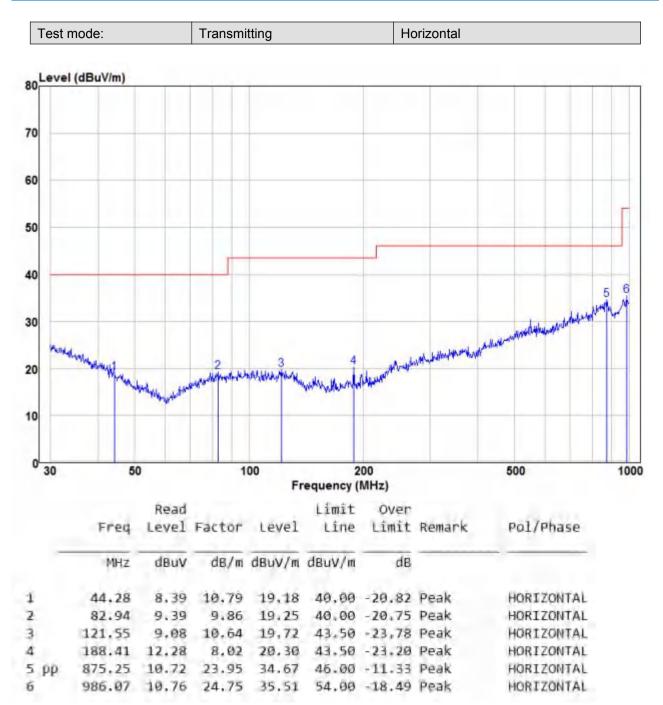
Factor= Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.







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.



5.11.2 Transmitter Emission above 1GHz

Worse case	mode:	GFSK(DH5)		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	55.79	-9.2	46.59	74	-27.41	Peak	н
2400	54.33	-9.39	44.94	74	-29.06	Peak	Н
4804	51.77	-4.33	47.44	74	-26.56	Peak	Н
7206	48.81	1.01	49.82	74	-24.18	Peak	Н
2390	53.40	-9.2	44.20	74	-29.80	Peak	V
2400	54.62	-9.39	45.23	74	-28.77	Peak	V
4804	54.21	-4.33	49.88	74	-24.12	Peak	V
7206	49.91	1.01	50.92	74	-23.08	Peak	V

Worse case	Vorse case mode:		GFSK(DH5)		Test channel:		
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4882	51.09	-4.11	46.98	74	-27.02	peak	Н
7323	48.95	1.51	50.46	74	-23.54	peak	Н
4882	53.92	-4.11	49.81	74	-24.19	peak	V
7323	50.10	1.51	51.61	74	-22.39	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	56.17	-9.29	46.88	74	-27.12	Peak	н
4960	52.80	-4.04	48.76	74	-25.24	Peak	Н
7440	48.78	1.57	50.35	74	-23.65	Peak	Н
2483.5	53.29	-9.29	44.00	74	-30.00	Peak	v
4960	50.30	-4.04	46.26	74	-27.74	Peak	V
7440	49.51	1.57	51.08	74	-22.92	Peak	V



Worse case	mode:	π /4DQPS	K (2DH5)	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	55.01	-9.2	45.81	74	-28.19	Peak	н
2400	54.73	-9.39	45.34	74	-28.66	Peak	Н
4804	51.29	-4.33	46.96	74	-27.04	Peak	Н
7206	49.01	1.01	50.02	74	-23.98	Peak	Н
2390	55.05	-9.2	45.85	74	-28.15	Peak	V
2400	54.42	-9.39	45.03	74	-28.97	Peak	V
4804	53.29	-4.33	48.96	74	-25.04	Peak	V
7206	48.98	1.01	49.99	74	-24.01	Peak	V

Worse case mode:		π /4DQPSK (2DH5)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4882	51.14	-4.11	47.03	74	-26.97	peak	Н
7323	49.47	1.51	50.98	74	-23.02	peak	Н
4882	54.19	-4.11	50.08	74	-23.92	peak	V
7323	49.38	1.51	50.89	74	-23.11	peak	V

Worse case mode:		π /4DQPSK (2DH5)		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	55.22	-9.29	45.93	74	-28.07	Peak	н
4960	50.70	-4.04	46.66	74	-27.34	Peak	Н
7440	49.61	1.57	51.18	74	-22.82	Peak	Н
2483.5	53.84	-9.29	44.55	74	-29.45	Peak	v
4960	50.25	-4.04	46.21	74	-27.79	Peak	V
7440	48.60	1.57	50.17	74	-23.83	Peak	V



Worse case mode:		8DPSK (3DH5)		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	55.31	-9.2	46.11	74	-27.89	Peak	н
2400	54.26	-9.39	44.87	74	-29.13	Peak	Н
4804	53.51	-4.33	49.18	74	-24.82	Peak	Н
7206	51.18	1.01	52.19	74	-21.81	Peak	Н
2390	55.69	-9.2	46.49	74	-27.51	Peak	v
2400	57.01	-9.39	47.62	74	-26.38	Peak	V
4804	53.49	-4.33	49.16	74	-24.84	Peak	V
7206	50.82	1.01	51.83	74	-22.17	Peak	V

Worse case mode:		8DPSK (3DH5)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4882	52.62	-4.11	48.51	74	-25.49	peak	Н
7323	50.00	1.51	51.51	74	-22.49	peak	Н
4882	51.81	-4.11	47.70	74	-26.30	peak	V
7323	49.29	1.51	50.80	74	-23.20	peak	V

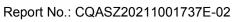
Worse case mode:		8DPSK (3DH5)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2483.5	55.54	-9.29	46.25	74	-27.75	Peak	Н
4960	51.60	-4.04	47.56	74	-26.44	Peak	Н
7440	50.29	1.57	51.86	74	-22.14	Peak	Н
2483.5	55.04	-9.29	45.75	74	-28.25	Peak	v
4960	49.64	-4.04	45.60	74	-28.40	Peak	V
7440	49.41	1.57	50.98	74	-23.02	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.

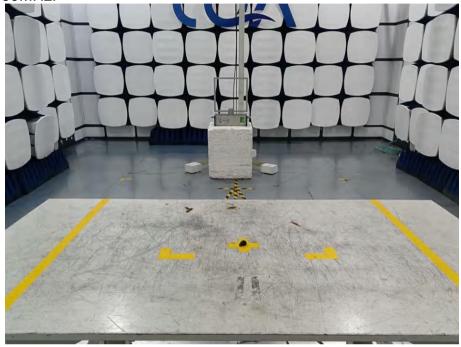




6 Photographs - EUT Test Setup

6.1 Radiated Emission

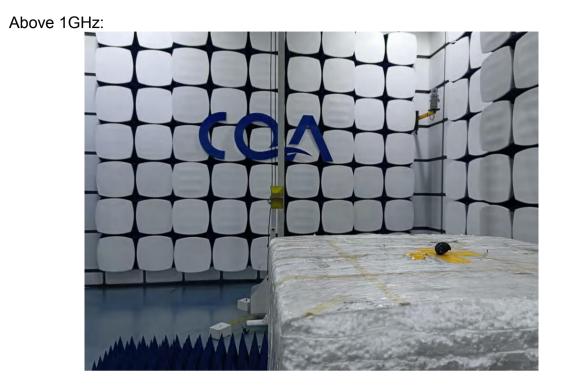
9KHz~30MHz:



30MHz~1GHz:







6.2 Conducted Emission





7 Photographs - EUT Constructional Details

Refer to Photographs - EUT Constructional Details OF EUT for CQASZ20211001737E-01.

*** END OF REPORT ***