

Report No.: ZR/2021/1004102

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FCC TEST REPORT

Application No.: ZR/2021/10041

Applicant: Honor Device Co., Ltd.

Address of Applicant Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road,

Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's

Republic of China

Manufacturer: Honor Device Co., Ltd.

Address of Manufacturer Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road,

Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's

Republic of China

EUT Description: Wireless Earphone

Model No.: T0005 (for earphone), T0005C (for charging case)

Trade Mark: **HONOR**

FCC ID: 2AYGCT0005

47 CFR FCC Part 2, Subpart J Standards:

47 CFR Part 15, Subpart C

Date of Receipt: 2021/2/7

Date of Test: 2021/2/7 to 2021/2/22

Date of Issue: 2021/4/17

Test Result: PASS *

In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Derek Yang Wireless Laboratory Manager





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Version 1

Revision Record						
Version	Chapter	Date	Modifier	Remark		
01		2021/3/8		Original		
02		2021/4/17	James Qin	1.Add test site Information 2.Update equipment list		

Authorized for issue by:	
Prepared By	Dee.Zheng
	(Dee Zheng) / Engineer
Checked By	Jan Hy
	(Jim Huang) / Reviewer



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Test Summary 2

Test Item	Test Requirement	Test Method	Result	Test Lab*
AC Power Line Conducted Emission	15.207	ANSI C63.10 (2013)	PASS	В
Conducted Peak Output Power	15.247 (b)(1)	ANSI C63.10 (2013)	PASS	А
20dB Emission Bandwidth	15.247 (a)(1)	ANSI C63.10 (2013)	PASS	А
Carrier Frequencies Separation	15.247 (a)(1)	ANSI C63.10 (2013)	PASS	А
Hopping Channel Number	15.247 (a)(1)	ANSI C63.10 (2013)	PASS	Α
Dwell Time	15.247 (a)(1)	ANSI C63.10 (2013)	PASS	Α
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 (2013)	PASS	А
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 (2013)	PASS	А
Radiated Spurious	15.247(d);	ANSI C63.10 (2013)	PASS	В
emissions	15.205/15.209	, ,		
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d); 15.205/15.209	ANSI C63.10 (2013)	PASS	В

Remark: All test were performed by Lab A and B. Parts of test items above were subcontracted to Lab B. Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. Test engineer: Dee Zheng, Swing Hu, Habit Zeng, Leah Chen, Ken Liu, Andy Yao





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General Information 3

3.1 Details of Client

Applicant:	Honor Device Co., Ltd. Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China		
Address of Applicant			
Manufacturer:	Honor Device Co., Ltd.		
Address of Manufacturer	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China		

3.2 Test Location

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057

Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086





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3.3 Test Facility

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

Lab A:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC -Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

Designation Number: CN1271.





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3.4 General Description of EUT

EUT Description:	Wireless Earphone		
Model No.:	T0005 (for earphone), T0005C (for charging case)		
Trade Mark:	HONOR		
Hardware Version:	PCB V8		
Software Version:	Otter-CT030+1.0.0.126		
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 2 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 0 to 39.		
Bluetooth version:	Bluetooth V2.1+EDR		
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)		
Modulation Type:	GFSK, π/4DQPSK, 8DPSK		
Number of Channel:	79		
Hopping Channel Type:	Adaptive Frequency Hopping systems		
Sample Type:	□ Portable Device, □ Module		
Antenna Type:	☐ External, ☑ Integrated		
Antenna Gain:	1.4dBi		

Operation Frequency of each 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



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17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

Remark:

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(CH0)	2402MHz
The Middle channel(CH39)	2441MHz
The Highest channel(CH78)	2480MHz

3.5 Test Environment

Operating Environment:				
Temperature:	25.0 °C			
Humidity:	50 % RH			
Atmospheric Pressure:	101.30 KPa			

3.6 Description of Support Units

The EUT has been tested independent unit.





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Test results and Measurement Data 4

4.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be 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

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.4dBi.



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4.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

4.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)

4.2.2 Conclusion

Standard Requirement:

The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

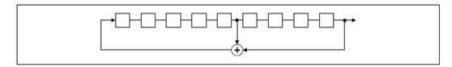
Compliance for section 15.247(a)(1):

According to Technical Specification, the pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- > Number of shift register stages: 9
- > Length of pseudo-random sequence: 29 -1 = 511 bits
- > Longest sequence of zeros: 8 (non-inverted signal)

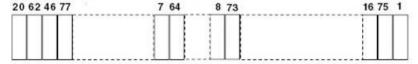
Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:





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Each frequency used equally on the average by each transmitter.

According to Technical Specification, the receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any transmitters and shift frequencies in synchronization with the transmitted signals.

Compliance for section 15.247(g):

Compliance for section 15.247(h):

According to Technical Specification, the system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the RF system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.

According to Technical specification, the 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. The 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.



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4.3 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	150kHz to 30MHz				
Limit:	Frequency range (MHz)	Limit (dBuV)			
	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 log	arithm of the frequency.			
Test Procedure:	The mains terminal coroom.	listurbance voltage test was	conducted in a shielded		
	 room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to 				



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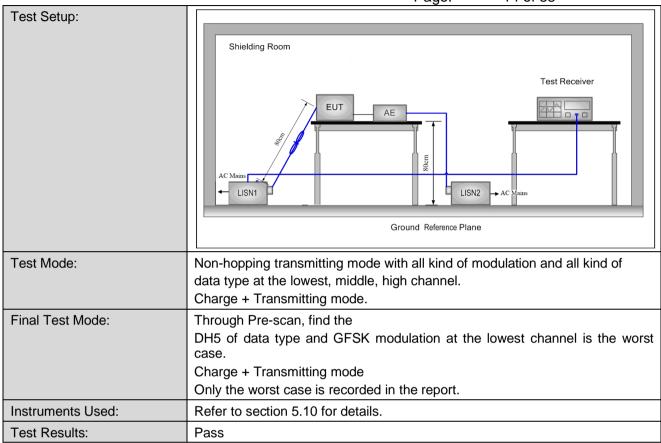
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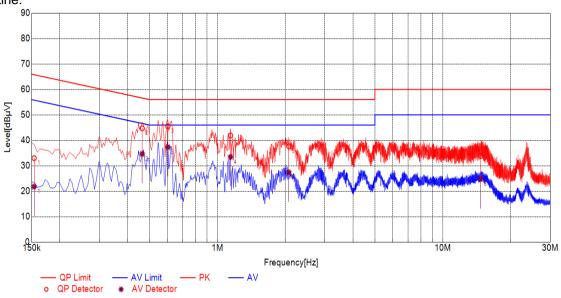
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Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



Test Graph

Final	Final Data List							
NO.	Freq. [MHz]	Factor [dB]	QP Value [dΒμV]	QP Limit [dΒμV]	QP Margin [dB]	ΑV Value [dBμV]	ΑV Limit [dBμV]	AV Margin [dB]
1	0.1539	10.10	33.03	65.79	32.76	21.80	55.79	33.99
2	0.4640	10.10	44.72	56.62	11.90	34.68	46.62	11.94
3	0.6033	10.10	45.52	56.00	10.48	37.32	46.00	8.68
4	1.1443	10.10	41.90	56.00	14.10	33.47	46.00	12.53
5	2.0738	10.10	37.67	56.00	18.33	27.41	46.00	18.59
6	14.7305	10.11	33.83	60.00	26.17	24.79	50.00	25.21



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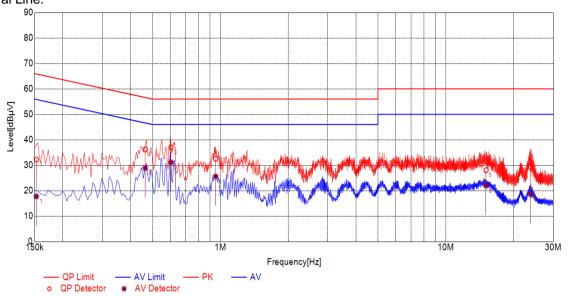
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Test Graph

Final	Final Data List							
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dΒμV]	QP Margin [dB]	ΑV Value [dBμV]	ΑV Limit [dBμV]	AV Margin [dB]
1	0.1527	10.10	32.25	65.85	33.60	17.74	55.85	38.11
2	0.4642	10.10	36.21	56.62	20.41	28.92	46.62	17.70
3	0.6039	10.10	36.96	56.00	19.04	31.11	46.00	14.89
4	0.9533	10.10	32.51	56.00	23.49	25.63	46.00	20.37
5	15.0836	10.11	28.08	60.00	31.92	21.98	50.00	28.02
6	23.7576	10.11	29.22	60.00	30.78	18.63	50.00	31.37

Remarks:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(1)			
Test Method:	ANSI C63.10:2013 Section 7.8.5			
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Test Instruments:	Refer to section 5.10 for details			
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.			
Limit:	(20.97dBm) 125mW			
Test Results:	Pass			





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4.4.1 **Test Results**

Measurement Data of Peak Power:

GFSK mode					
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	10.47	20.97	Pass		
Middle	10.70	20.97	Pass		
Highest	10.82	20.97	Pass		
	π/4DQP	SK mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	10.55	20.97	Pass		
Middle	10.77	20.97	Pass		
Highest	10.86	20.97	Pass		
	8DPSI	K mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	10.58	20.97	Pass		
Middle	10.86	20.97	Pass		
Highest	10.87	20.97	Pass		

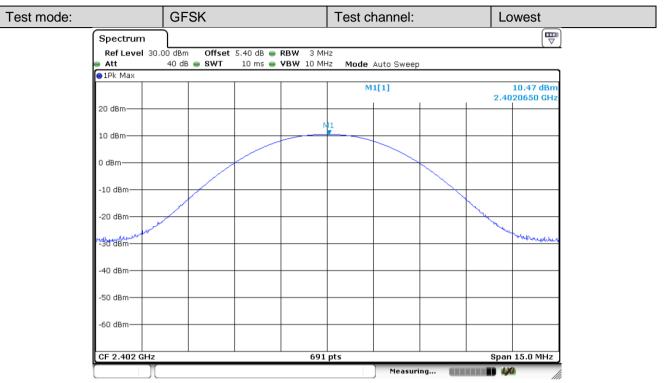




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4.4.2 **Test Plots**



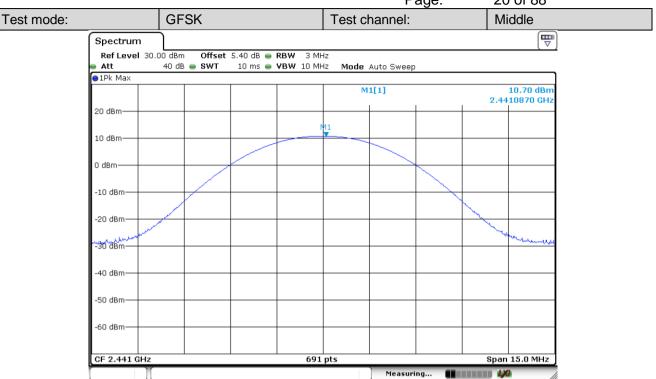
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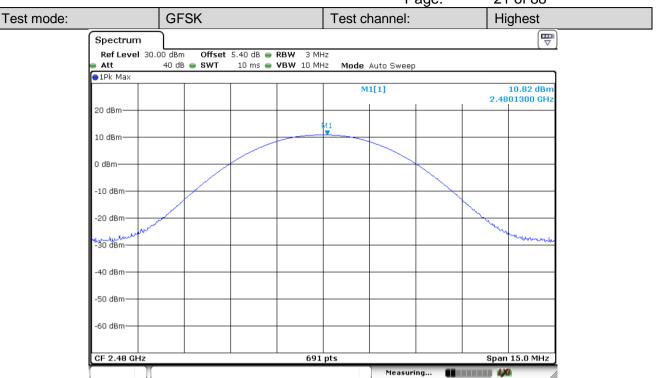
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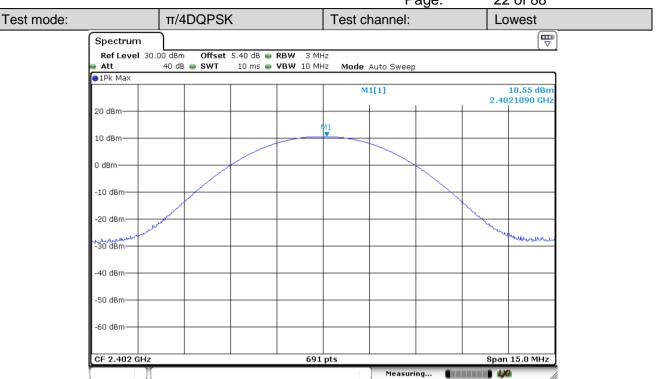
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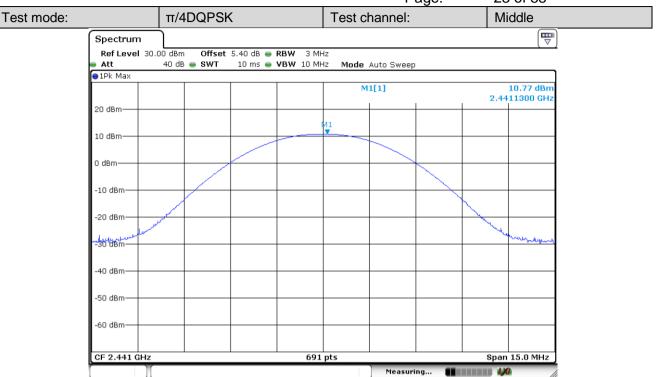
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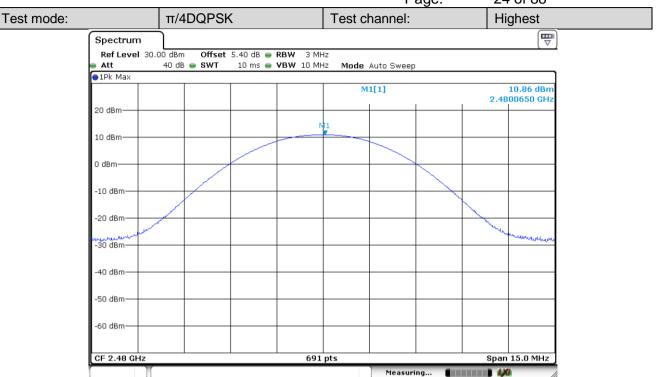
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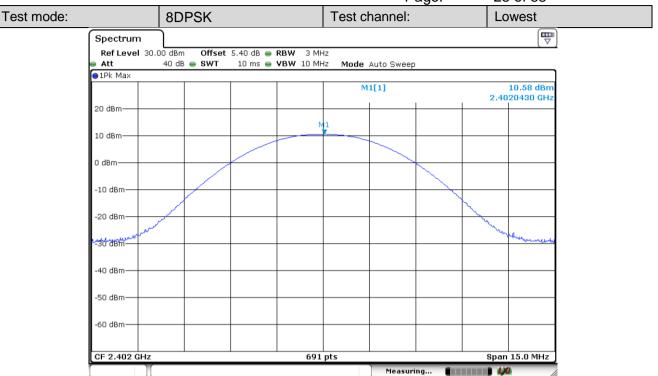
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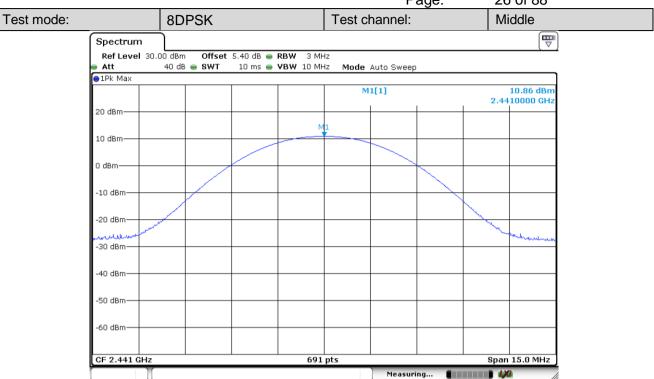
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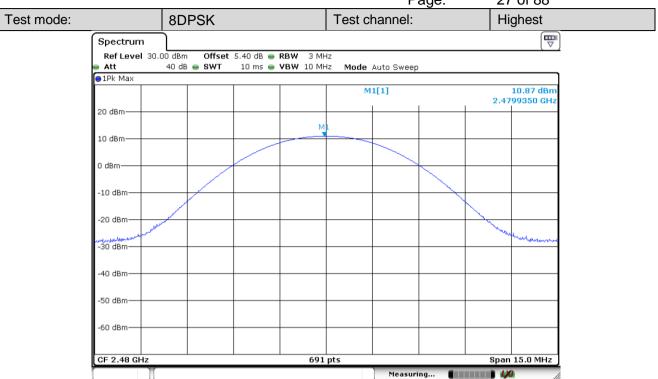
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4.5 20dB Emission Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)			
Test Method:	ANSI C63.10:2013 Section 7.8.7			
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Instruments Used:	Refer to section 5.10 for details			
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.			
Limit:	NA			
Test Results:	Pass			





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4.5.1 **Test Results**

Mode	Test Channel	20dB Emission Bandwidth (KHz)	Result
	Lowest	946.5	Pass
GFSK	Middle	946.5	Pass
	Highest	950.8	Pass
	Lowest	1228.7	Pass
π/4DQPSK	Middle	1233.0	Pass
	Highest	1233.0	Pass
	Lowest	1211.3	Pass
8DPSK	Middle	1211.3	Pass
	Highest	1211.3	Pass

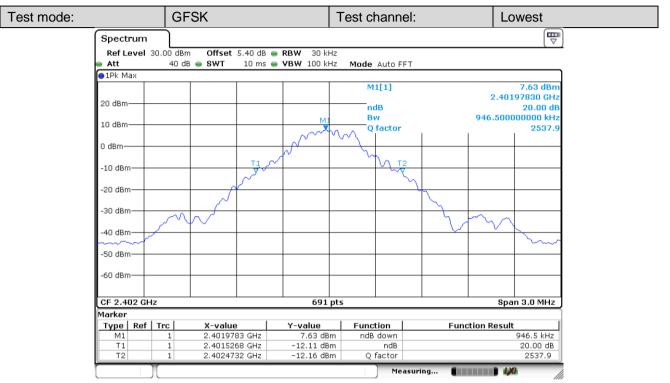




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4.5.2 **Test Plots**



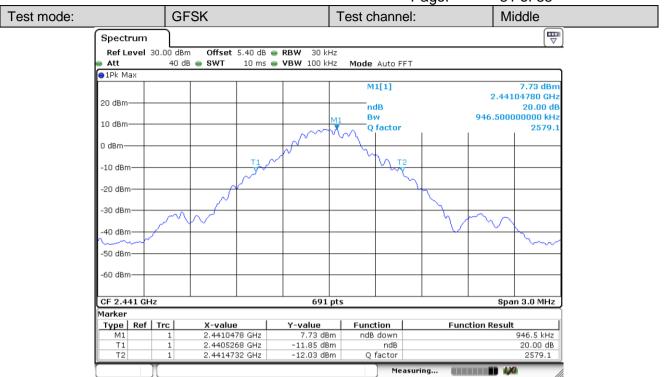
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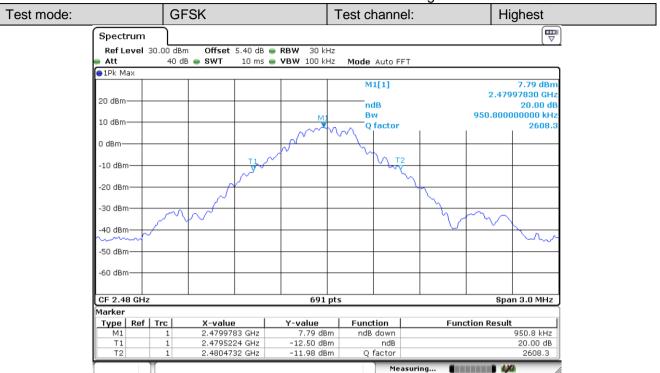
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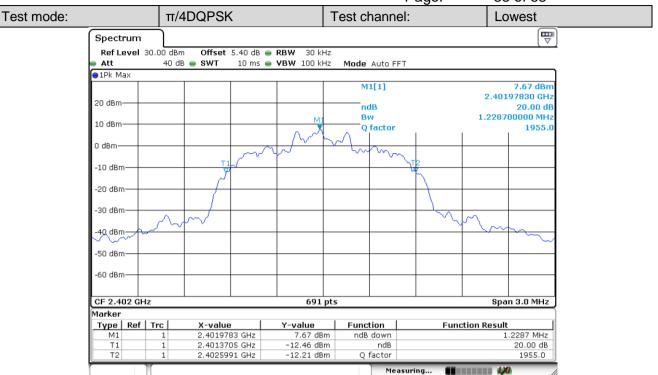
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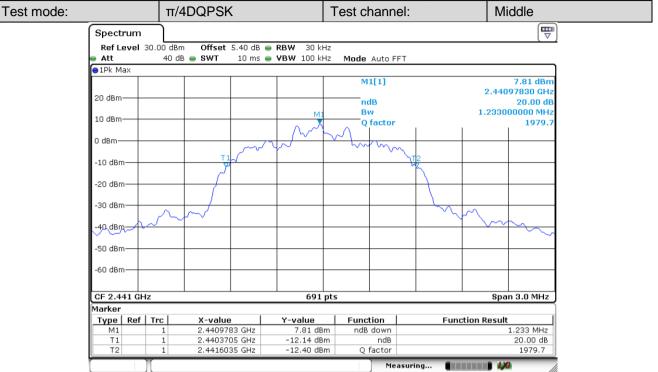
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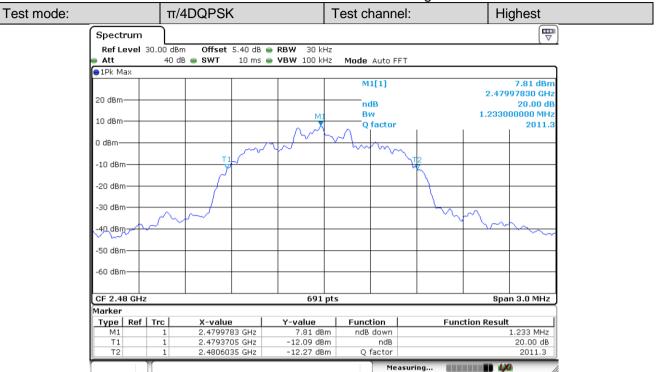
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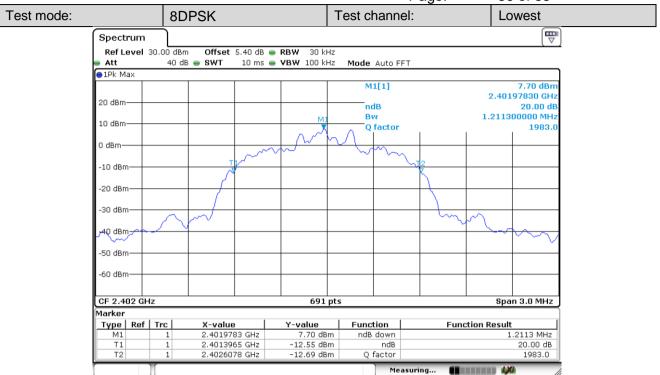
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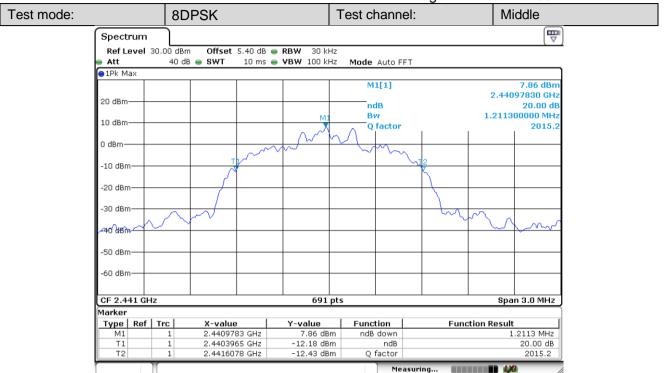
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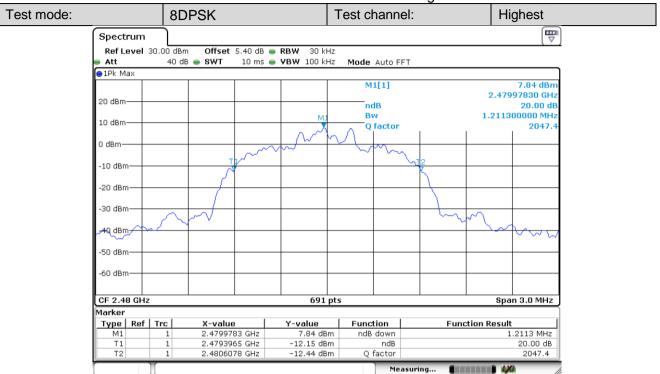
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4.6 Carrier Frequencies Separationy

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)				
Test Method:	ANSI C63.10:2013 Section 7.8.2				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Test Instruments:	Refer to section 5.10 for details				
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.				
Limit:	2/3 of the 20dB bandwidth				
	Remark: the transmission power is less than 0.125W.				
Test Results:	Pass				





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4.6.1 **Test Results**

GFSK mode							
Test channel	Carrier Frequencies Separation (kHz) Limit (kHz)						
Middle	1029	633.9	PASS				
	π/4DQPSK mode						
Test channel	Carrier Frequencies Separation (kHz) Limit (kHz)		Result				
Middle	1020	822.0	PASS				
	8DPSF	C mode					
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result				
Middle	1007	807.5	PASS				

Remark: According to section 4.5.

Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	950.8	633.9
π/4DQPSK	1233.0	822.0
8DPSK	1211.3	807.5

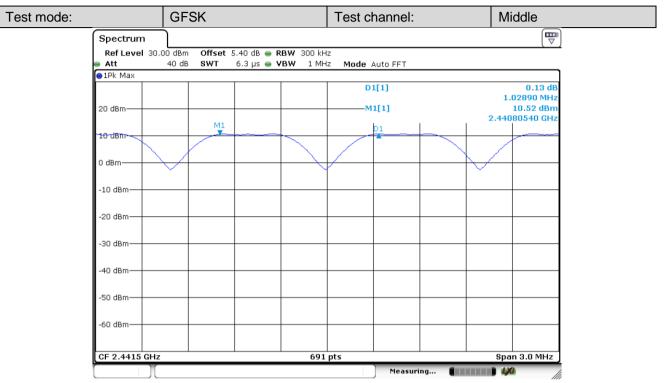




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4.6.2 **Test Plots**



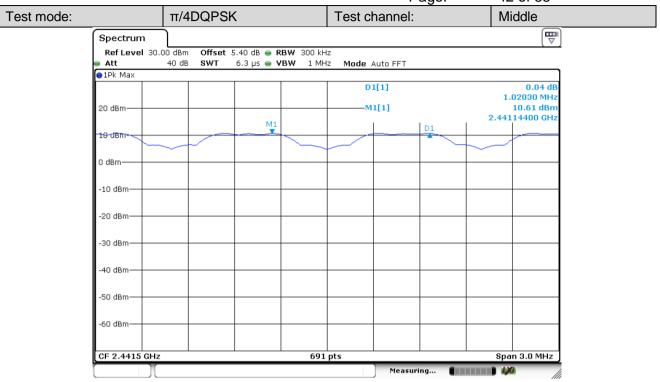
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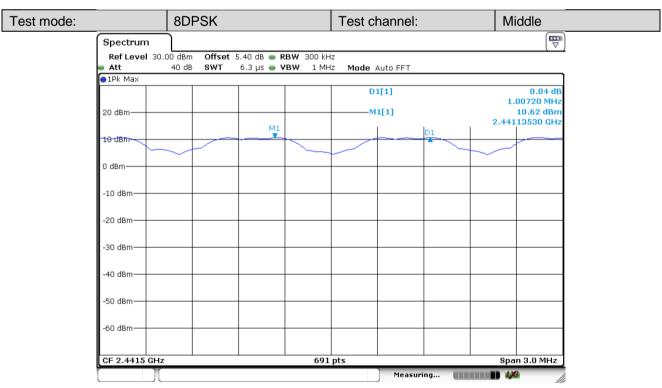


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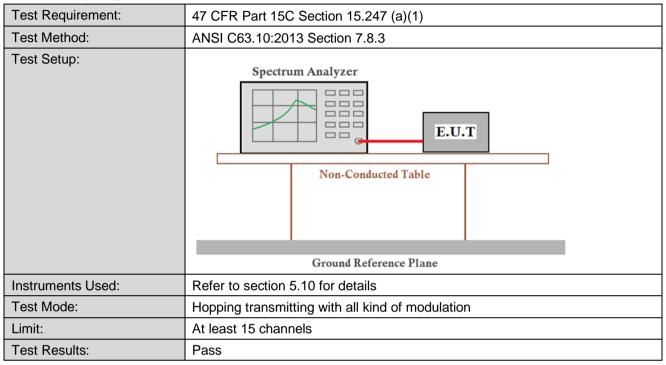
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4.7 Hopping Channel Number



4.7.1 **Test Results**

Mode	Hopping channel numbers	Limit
GFSK	79	≥15
π/4DQPSK	79	≥15
8DPSK	79	≥15



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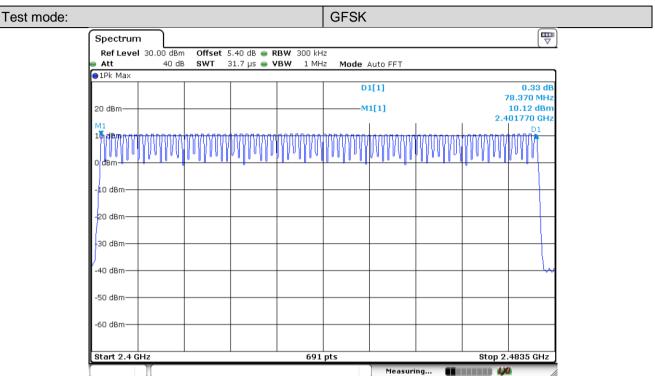
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4.7.2 **Test Plots**



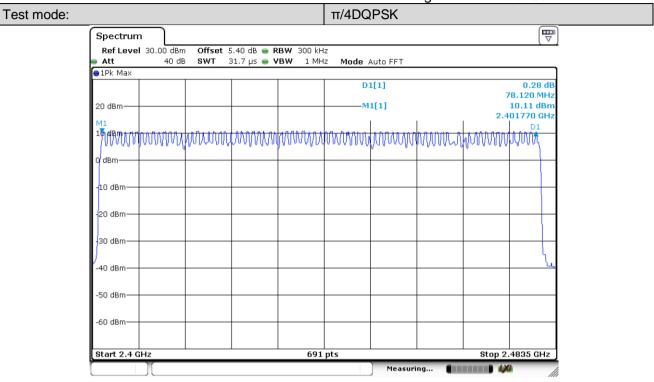
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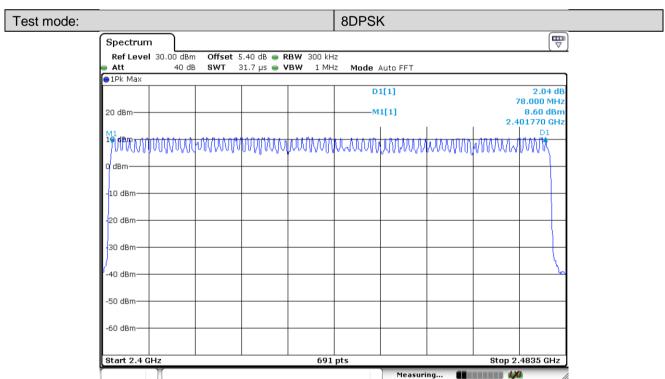


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4.8 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)			
Test Method:	ANSI C63.10:2013 Section 7.8.4			
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Instruments Used:	Refer to section 5.10 for details			
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.			
Limit:	0.4 Second			
Test Results:	Pass			





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4.8.1 **Test Results**

Operation Modes	On time (ms) on one channel
DH1	0.403
DH3	1.669
DH5	2.920
2-DH1	0.412
2-DH3	1.682
2-DH5	2.935
3-DH1	0.412
3-DH2	1.669
3-DH5	2.928

Bluetooth Time of Occupancy Calculation

Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600 hops/s, since 1x/EDR modes use 5 transmit and 1 receive slot, for a total of 6 slots, the Bluetooth transmitter is actually hopping at a rate of 1600/6=266.67 hops/slot

400ms x 79 Channel = 31.6 s (Time of Occupancy Limit)

Worst case BT has 266.67 hops/second (for 1x/EDR modes with 2-DH5 operation)

266.67 hops/second/79 channels=3.38 hops/second (# of hops/second on one channel)

3.38 hops/second/channel*31.6seconds=106.67 hops (#hops over a 31.6 second period)

106.67 hops *2.935 ms/channel =313.08 ms(worst case dwell time for one channel in 1x/EDR

modes)

With AFH, the number of channels is reduced to a minimum of 20 channels and the channel hopping rate is reduced by 50% to 800hops/s, AFH mode also uses 6 slots so the Bluetooth transmitter hops at a rate of 800/6=133.3 hops/s/slot

400ms x 20 Channel = 8 s (Time of Occupancy Limit)

Worst case BT has 133.3 hops/second/slot (for AFH mode with 2-DH5 operation)

133.3 hops/second/20 channels=6.67 hops/second (#hops/second on one channel)

6.67 hops/second *8seconds=53.34 hops (#hops over a 8 seconds period)

53.34 hops x2.935 ms/channel=156.6 ms(worst case dwell time for one channel in AFH mode)

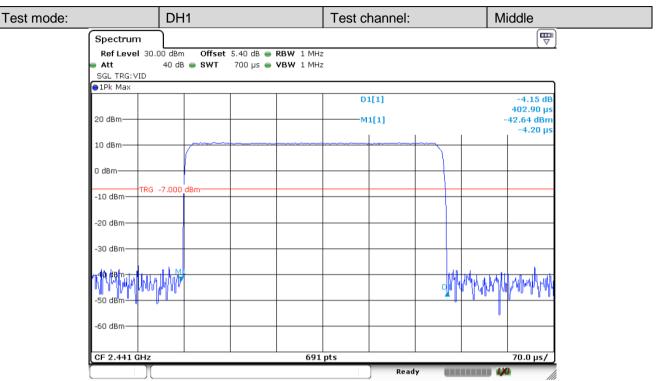




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4.8.2 **Test Plots**



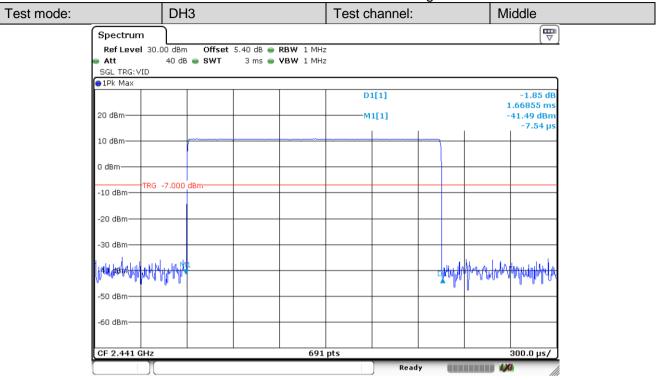
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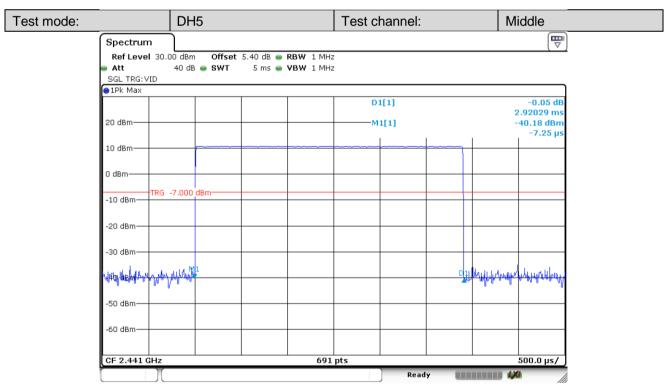


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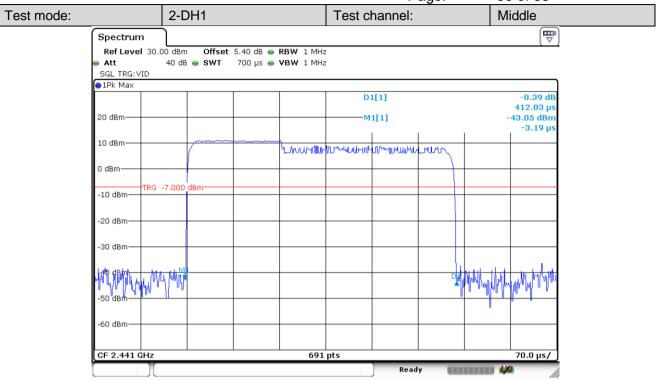
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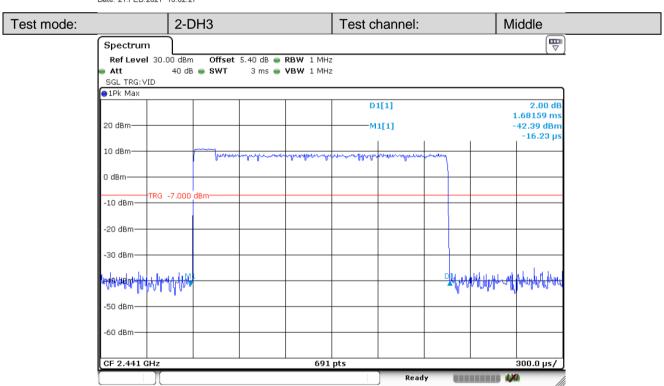


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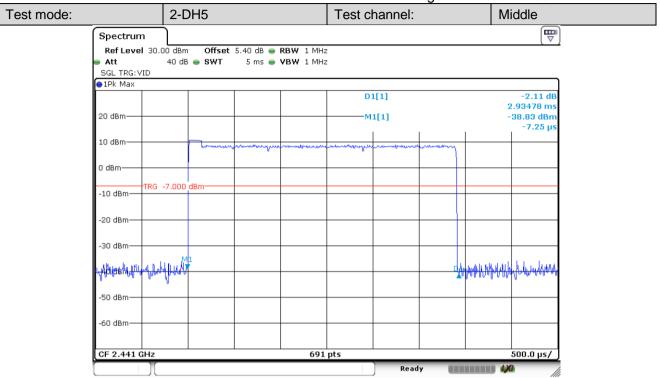
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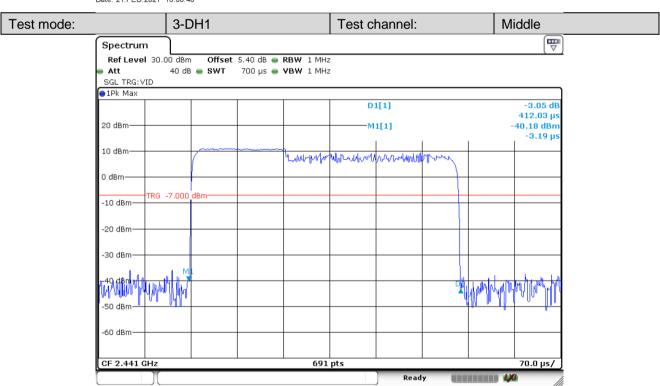


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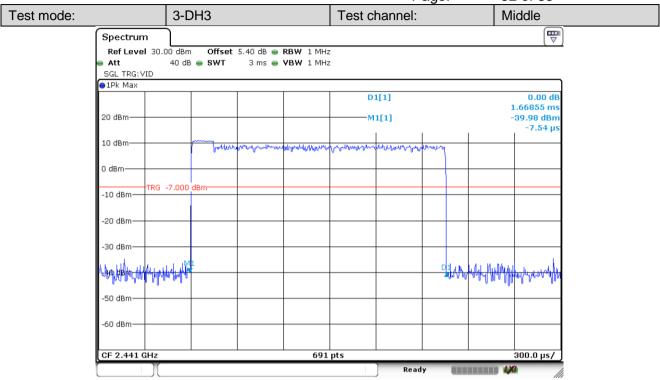
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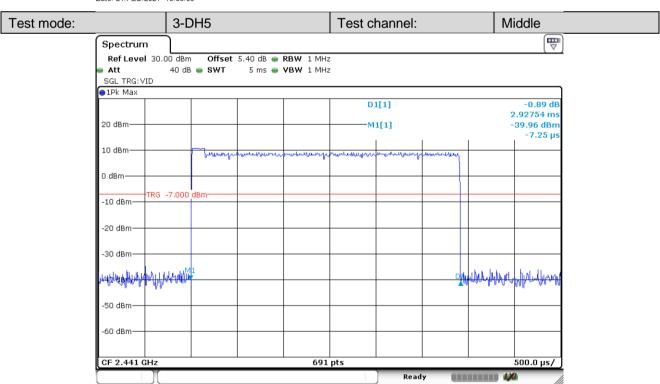


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4.9 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)				
Test Method:	ANSI C63.10:2013 Section 7.8.6				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Instruments Used:	Refer to section 5.10 for details				
Exploratory Test Mode:	Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type.				
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π/4DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.				
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.				
Test Results:	Pass				

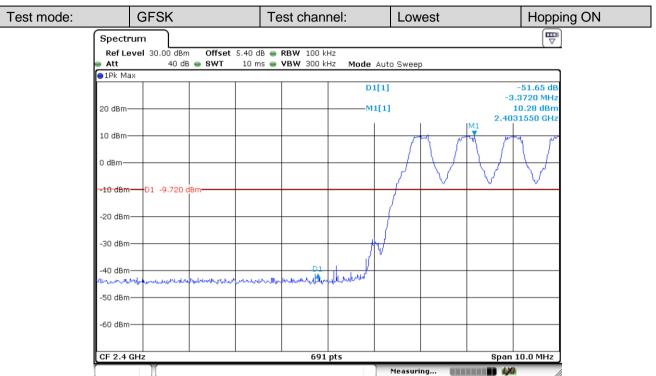




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4.9.1 **Test Plots**



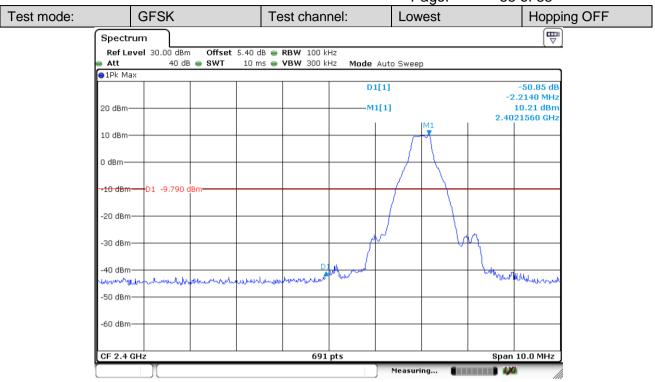
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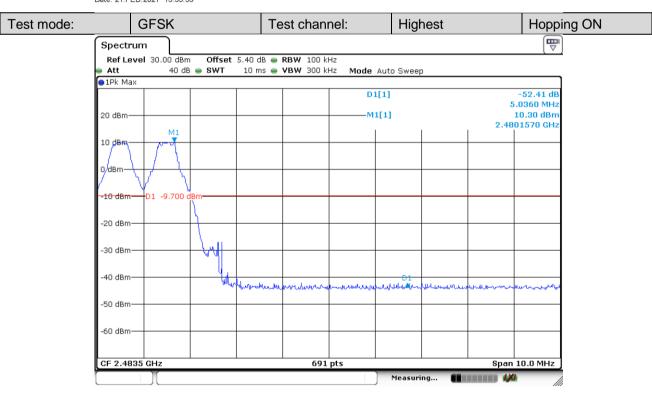


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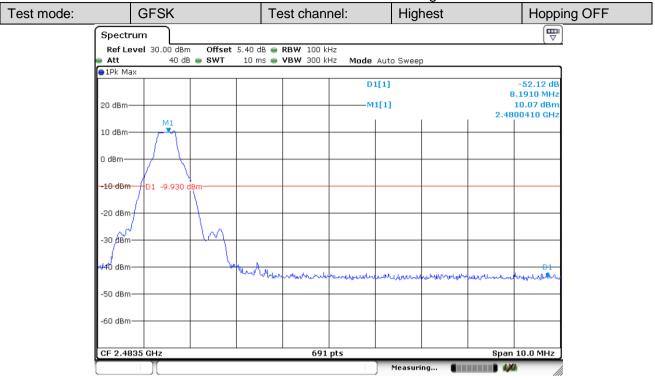
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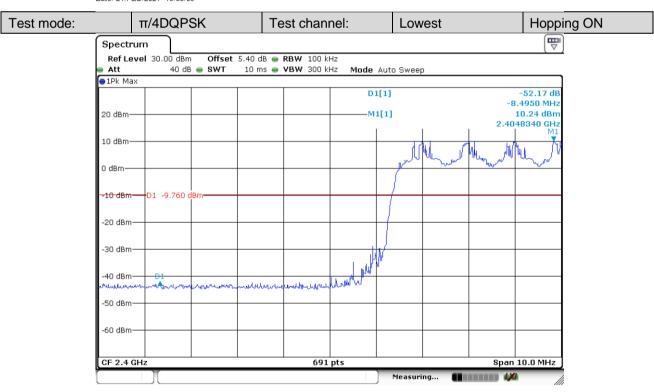


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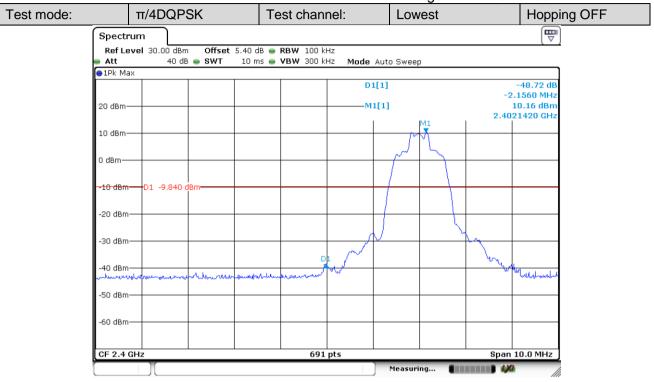
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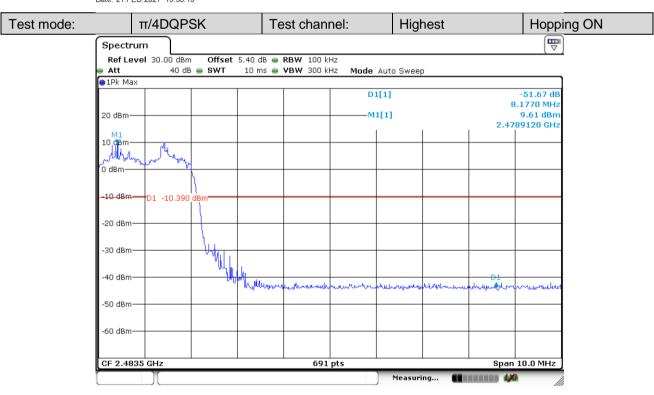


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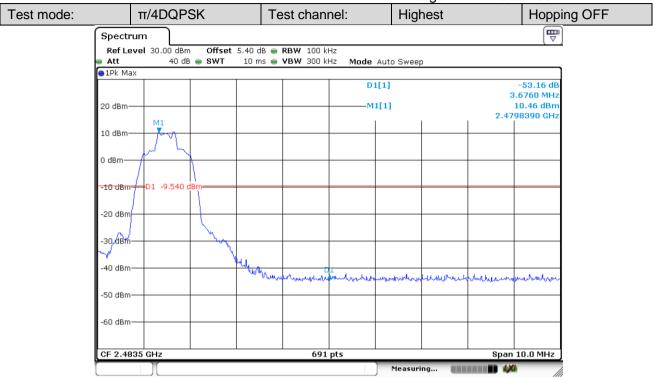
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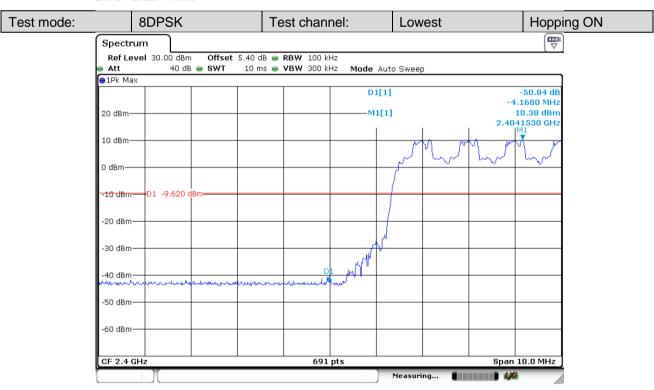


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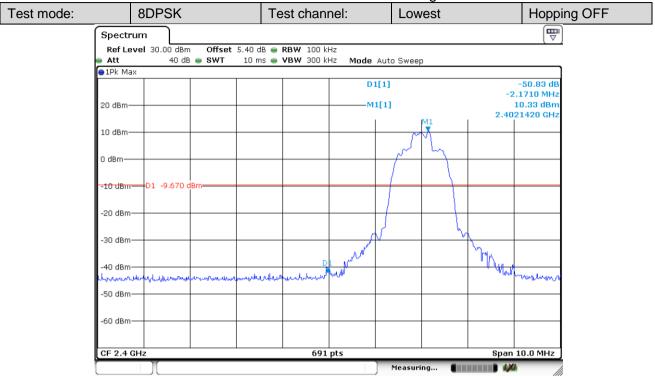
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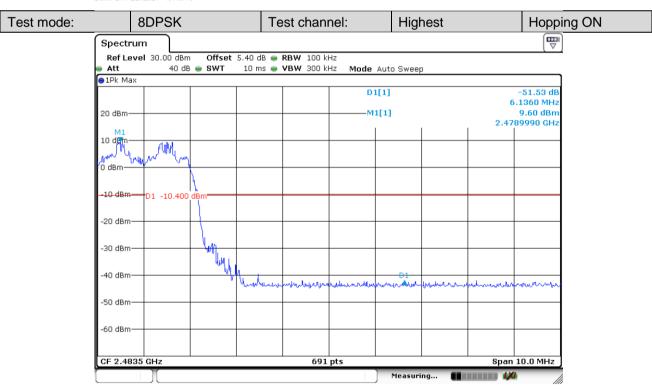


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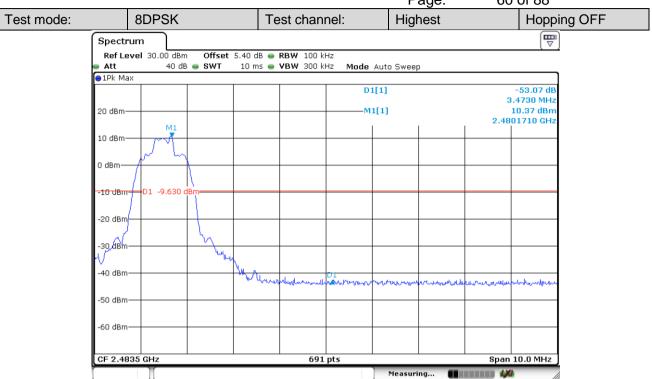
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4.10 Spurious RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)				
Test Method:	ANSI C63.10:2013 Section 7.8.8				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Instruments Used:	Refer to section 5.10 for details				
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.				
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.				
Test Results:	Pass				

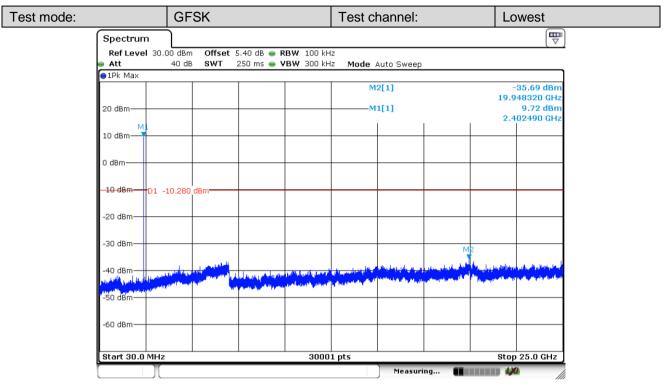




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Test Plots 4.10.1



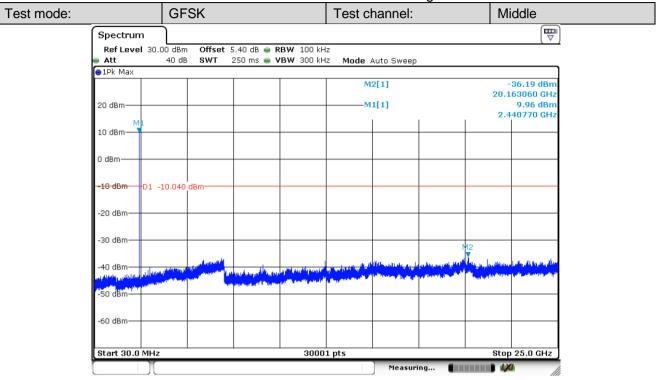
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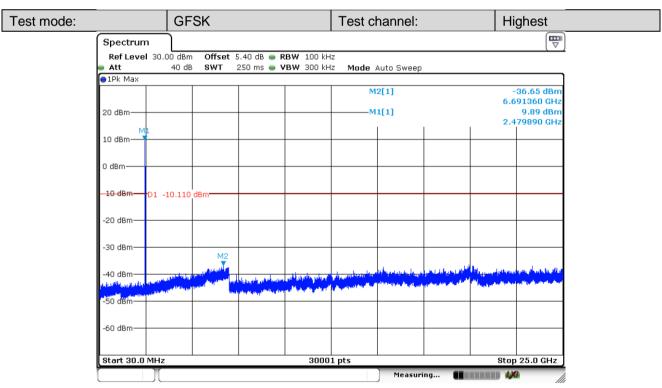


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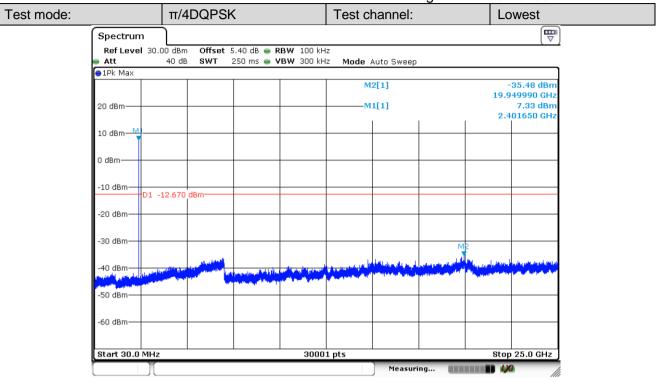
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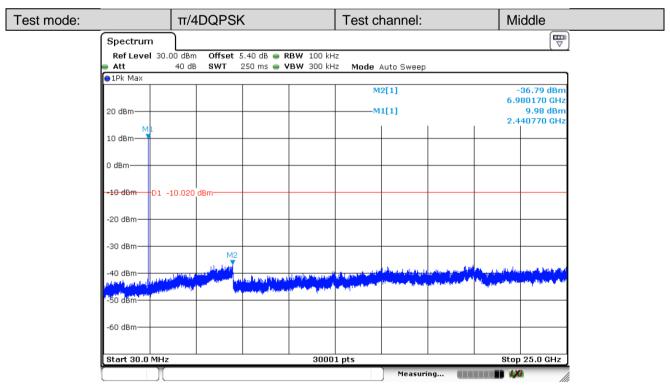


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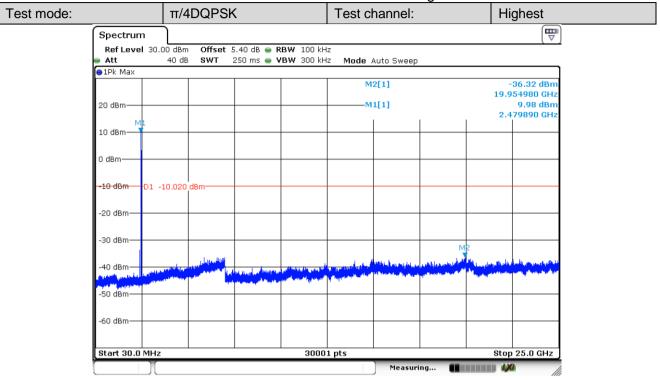
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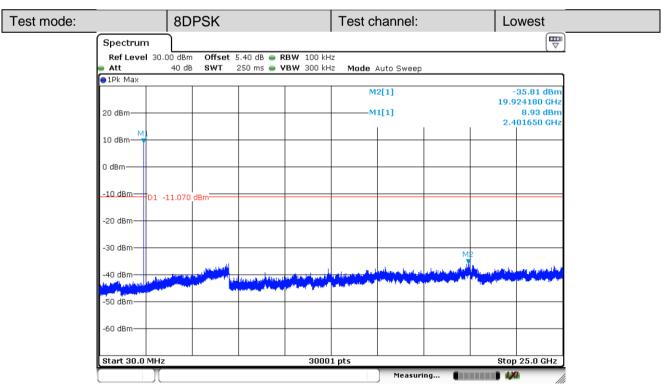


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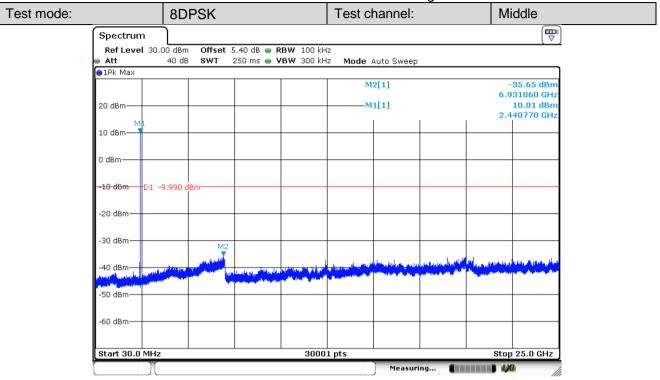
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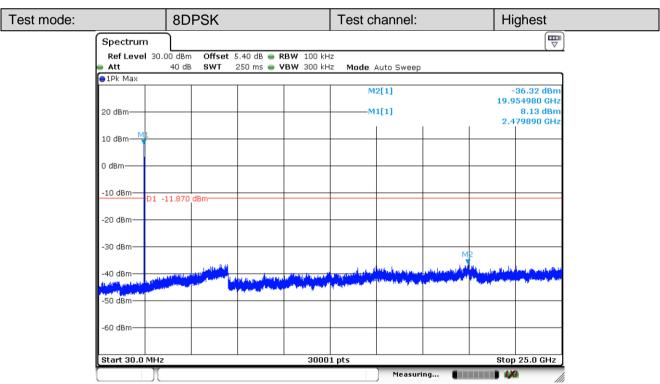


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Date: 21.FEB.2021 15:11:07



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Remark:

Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.





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4.11 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10 :2013 Section 11.12						
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)						
Receiver Setup:	Frequency Detector RBW VBW						
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak		
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average		
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak		
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average		
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak		
	Above 4CLI-	Peak	1MHz	3MHz	Peak		
	Above 1GHz Peak 1MHz			10Hz	Average		
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)		
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300		
	0.490MHz-1.705MHz	24000/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		
	Average	3					
Remark: 15.35(b),Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.							



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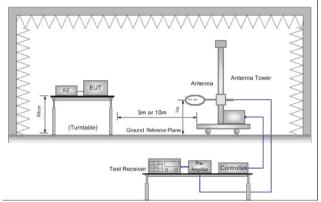
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Test Setup:



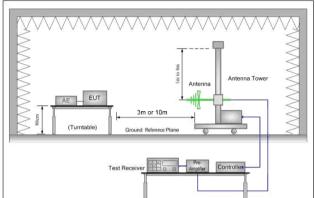


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

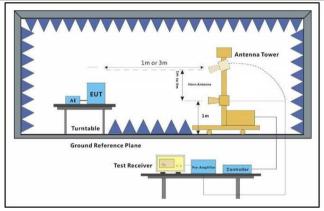


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- Use the following spectrum analyzer settings:
 - Span shall wide enough to fully capture the emission being (1) measured;
 - Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz; (2) VBW ≥ RBW; Sweep = auto;
 - Detector function = peak; Trace = max hold for peak
 - For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds



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	. age. 100.00
	On time = N 1 *L 1 +N 2 *L 2 ++N n-1 *LN n-1 +N n *L n
	Where N 1 is number of type 1 pulses, L 1 is length of type 1 pulses, etc.
	Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
	f. 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.
	g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	h. 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.
	 i. Test the EUT in the lowest channel, the middle channel ,the Highest channel. j. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.
	k. 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 Charge + Transmitting mode.
	Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case.
Final Test Mode:	Pretest the EUT at Charge + Transmitting mode
	For below 1GHz part, through pre-scan, the worst case is the lowest channel.
	Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
Remark:	The Emission Test data were reused from the report no:XZR/2021/1004102
	8





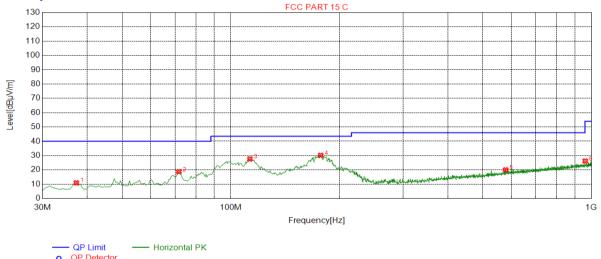
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4.11.1 Radiated emission below 1GHz

4.11.1.1 Charge + Transmitting

Test Graph



Suspected List

Suspe	ected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.2786	10.94	-32.03	40.00	29.06	115	267	Horizontal
2	71.7309	18.73	-34.46	40.00	21.27	169	60	Horizontal
3	112.976	27.61	-32.16	43.50	15.89	185	242	Horizontal
4	177.513	30.18	-33.08	43.50	13.32	113	208	Horizontal
5	578.324	20.02	-20.67	46.00	25.98	218	233	Horizontal
6	961.665	26.20	-14.33	54.00	27.80	155	192	Horizontal

Final Data List

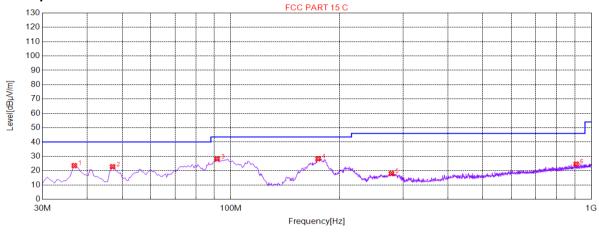




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Test Graph



QP Limit QP Detector Vertical PK

Suspected List

Suspe	Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.7934	23.52	-32.19	40.00	16.48	161	251	Vertical
2	46.9835	22.78	-30.20	40.00	17.22	207	358	Vertical
3	91.6258	28.21	-33.15	43.50	15.29	195	68	Vertical
4	174.602	28.29	-33.29	43.50	15.21	203	334	Vertical
5	278.929	18.00	-28.42	46.00	28.00	273	337	Vertical
6	907.803	24.63	-15.11	46.00	21.37	277	148	Vertical

Final Data List



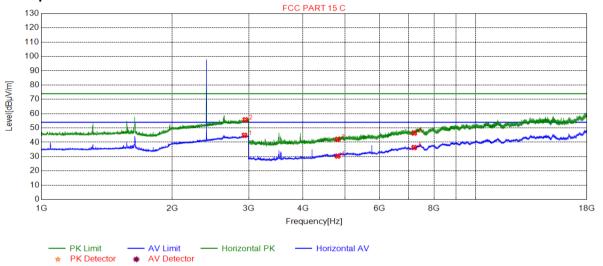


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4.11.2 Transmitter Emission above 1GHz **GFSK Channel 0 RIGHT**

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2931.98	44.86	10.68	54.00	9.14	249	292	Horizontal				
2	2945.48	55.70	10.64	74.00	18.30	193	125	Horizontal				
3	4804.00	42.07	-17.18	74.00	31.93	150	92	Horizontal				
4	4804.00	30.35	-17.18	54.00	23.65	230	40	Horizontal				
5	7206.00	36.32	-9.48	54.00	17.68	211	343	Horizontal				
6	7206.00	46.44	-9.48	74.00	27.56	183	40	Horizontal				

Final Data List



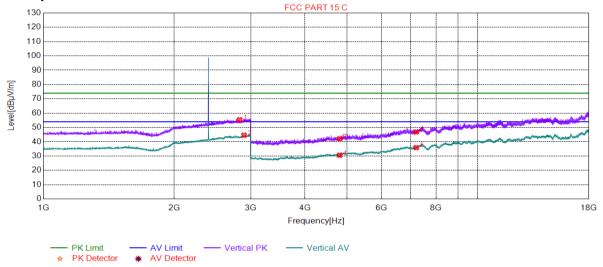


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4.11.2.2 **GFSK Channel 0 RIGHT**

Test Graph



Suspected List

<u> </u>	dopotica Elec										
Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2828.45	55.37	9.98	74.00	18.63	275	80	Vertical			
2	2894.47	44.58	10.42	54.00	9.42	279	263	Vertical			
3	4804.00	42.10	-17.18	74.00	31.90	157	102	Vertical			
4	4804.00	30.60	-17.18	54.00	23.40	166	82	Vertical			
5	7206.00	35.89	-9.48	54.00	18.11	254	200	Vertical			
6	7206.00	46.83	-9.48	74.00	27.17	281	324	Vertical			

Final Data List



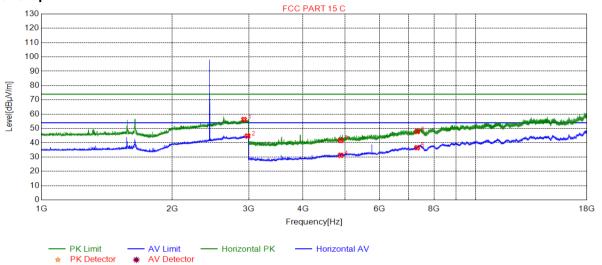


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4.11.2.3 **GFSK Channel 39 RIGHT**

Test Graph



Suspected List

<u> </u>	dopotica Elec										
Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2924.98	56.21	10.66	74.00	17.79	241	112	Horizontal			
2	2981.49	44.70	10.62	54.00	9.30	165	26	Horizontal			
3	4882.00	41.66	-16.80	74.00	32.34	238	53	Horizontal			
4	4882.00	31.23	-16.80	54.00	22.77	149	277	Horizontal			
5	7323.00	36.55	-9.27	54.00	17.45	233	346	Horizontal			
6	7323.00	47.85	-9.27	74.00	26.15	175	191	Horizontal			

Final Data List



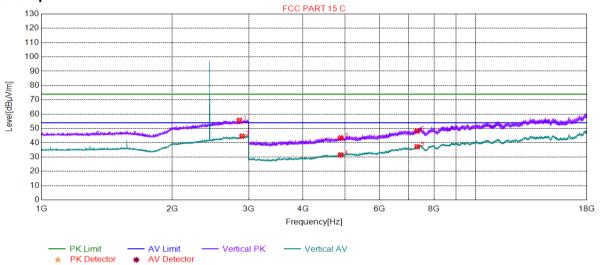


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4.11.2.4 **GFSK Channel 39 RIGHT**

Test Graph



Suspected List

<u> </u>	dopeoted List												
Susp	Suspected List												
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity					
1	2854.46	55.71	10.21	74.00	18.29	207	239	Vertical					
2	2895.47	44.60	10.42	54.00	9.40	150	138	Vertical					
3	4882.00	43.41	-16.80	74.00	30.59	192	204	Vertical					
4	4882.00	31.53	-16.80	54.00	22.47	262	186	Vertical					
5	7323.00	37.25	-9.27	54.00	16.75	199	134	Vertical					
6	7323.00	48.12	-9.27	74.00	25.88	293	100	Vertical					

Final Data List



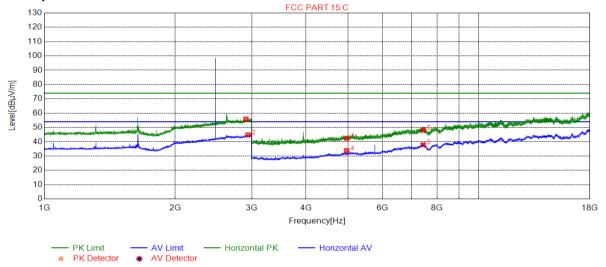


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4.11.2.5 **GFSK Channel 78 RIGHT**

Test Graph



Suspected List

<u> </u>	dopeoted Elst											
Susp	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2908.47	55.85	10.48	74.00	18.15	225	320	Horizontal				
2	2942.48	44.75	10.57	54.00	9.25	175	315	Horizontal				
3	4960.00	42.38	-16.28	74.00	31.62	126	209	Horizontal				
4	4960.00	33.84	-16.28	54.00	20.16	156	295	Horizontal				
5	7440.00	37.86	-8.83	54.00	16.14	206	175	Horizontal				
6	7440.00	48.05	-8.83	74.00	25.95	202	19	Horizontal				

Final Data List



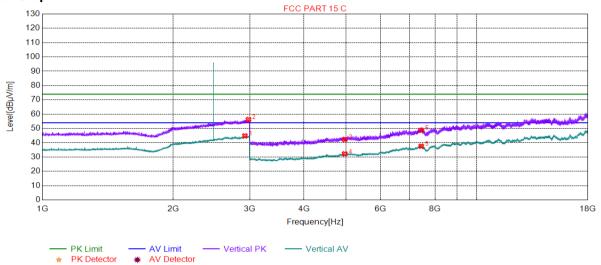


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4.11.2.6 **GFSK Channel 78 RIGHT**

Test Graph



Suspected List

<u> </u>	tou Liot											
Susp	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2923.98	44.78	10.61	54.00	9.22	185	134	Vertical				
2	2979.99	56.22	10.63	74.00	17.78	196	34	Vertical				
3	4960.00	42.31	-16.28	74.00	31.69	207	134	Vertical				
4	4960.00	32.24	-16.28	54.00	21.76	223	169	Vertical				
5	7440.00	37.58	-8.83	54.00	16.42	228	65	Vertical				
6	7440.00	48.69	-8.83	74.00	25.31	206	169	Vertical				

Final Data List

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 between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3) 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.
- 4) All Modes have been tested, but only the worst case data displayed in this report.



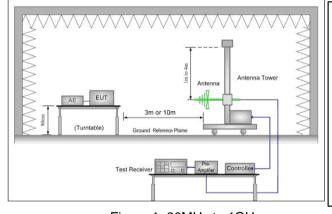


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4.12 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15	5.209 and 15.205										
Test Method:	ANSI C63.10: 2013	NSI C63.10: 2013										
Test Site:	Measurement Distance: 3m	Measurement Distance: 3m (Semi-Anechoic Chamber)										
Limit:	Frequency	Limit (dBuV/m)	Remark									
	30MHz-88MHz	40.0	Quasi-peak									
	88MHz-216MHz	43.5	Quasi-peak									
	216MHz-960MHz	46.0	Quasi-peak									
	960MHz-1GHz	54.0	Quasi-peak									
	Abovo 1CHz	54.0	Average Value									
	Above IGHZ	Above 1GHz 74.0 Peak Value										
Test Setup:												



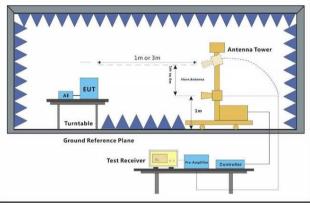


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz





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Test Procedure:	 a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was turned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted band closest.
	 bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel h. Test the EUT in the lowest channel, the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. j. 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 Charge + 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 Charge + Transmitting mode, Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
Remark:	The Emission Test data were reused from the report no:XZR/2021/1004102





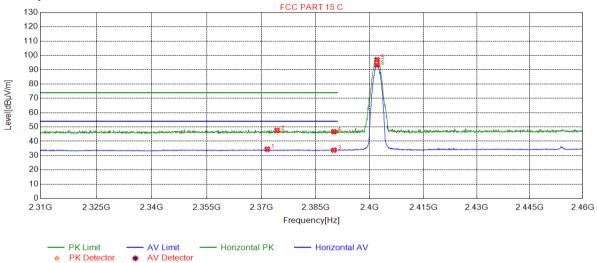
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Test Plots 4.12.1

4.12.1.1 **GFSK_Channel 0 RIGHT**

Test Graph



Suspected List

Susp	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2371.60	34.48	8.04	54.00	19.52	148	258	Horizontal				
2	2374.30	47.64	7.96	74.00	26.36	239	85	Horizontal				
3	2390.00	33.84	7.98	54.00	20.16	197	44	Horizontal				
4	2390.00	46.68	7.98	74.00	27.32	120	227	Horizontal				
5	2402.00	97.04	8.06	0.00	-97.04	130	135	Horizontal				
6	2402.00	93.21	8.06	0.00	-93.21	202	173	Horizontal				

Final Data List



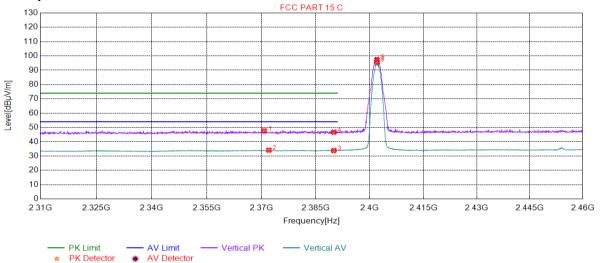


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4.12.1.2 **GFSK Channel 0 RIGHT**

Test Graph



Suspected List

<u> </u>	dopotion Elot										
Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2370.78	47.62	8.07	74.00	26.38	236	148	Vertical			
2	2372.05	34.13	8.03	54.00	19.87	165	18	Vertical			
3	2390.00	33.84	7.98	54.00	20.16	151	38	Vertical			
4	2390.00	46.72	7.98	74.00	27.28	294	236	Vertical			
5	2402.00	97.46	8.06	0.00	-97.46	188	34	Vertical			
6	2402.00	95.69	8.06	0.00	-95.69	261	7	Vertical			

Final Data List



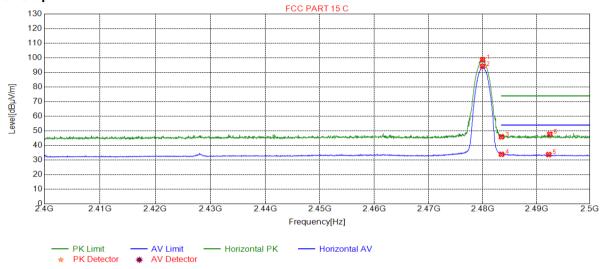


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4.12.1.3 **GFSK Channel 78 RIGHT**

Test Graph



Suspected List

Juspeo	dispected List												
Susp	Suspected List												
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity					
1	2480.00	98.81	8.54	0.00	-98.81	210	137	Horizontal					
2	2480.00	94.22	8.54	0.00	-94.22	193	118	Horizontal					
3	2483.50	45.90	8.50	74.00	28.10	228	137	Horizontal					
4	2483.50	33.98	8.50	54.00	20.02	110	145	Horizontal					
5	2492.29	33.80	8.61	54.00	20.20	182	265	Horizontal					
6	2492.49	47.74	8.60	74.00	26.26	180	265	Horizontal					

Final Data List



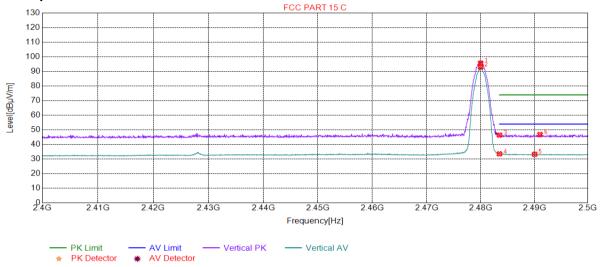


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4.12.1.4 **GFSK Channel 78 RIGHT**

Test Graph



Suspected List

<u> </u>	dopeoted List												
Susp	Suspected List												
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity					
1	2480.00	95.71	8.54	0.00	-95.71	264	14	Vertical					
2	2480.00	92.99	8.54	0.00	-92.99	242	59	Vertical					
3	2483.50	46.42	8.50	74.00	27.58	293	288	Vertical					
4	2483.50	33.62	8.50	54.00	20.38	219	360	Vertical					
5	2490.04	33.30	8.62	54.00	20.70	213	48	Vertical					
6	2491.04	46.84	8.61	74.00	27.16	225	359	Vertical					

Final Data List

Remark:

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 All Modes have been tested, but only the worst case data displayed in this report.





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Measurement Uncertainty (95% confidence levels, k=2)

Lab A:

No.	Item	Measurement Uncertainty		
1	Total RF power, conducted	±0.41dB		
2	RF power density, conducted	±1.96dB		
3	Spurious emissions, conducted	±0.41dB		
4	Radio Frequency	±7.10 x 10 ⁻⁸		
5	Duty Cycle	±0.49%		
6	Occupied Bandwidth	±0.2%		

Lab B:

No.	Item	Measurement Uncertainty		
1	Conduction Emission ± 3.0dB (150kHz to 3			
		± 4.8dB (Below 1GHz)		
2	Radiated Emission	± 4.8dB (1GHz to 6GHz)		
		± 4.5dB (6GHz to 18GHz)		
		± 5.02dB (Above 18GHz)		





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Equipment List

		RF conducted			
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2020/4/16	2021/4/15
DC Power Supply	Rohde & Schwarz	HMP2020	W009-08	2020/7/15	2021/7/15
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020/7/14	2021/7/13
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2020/4/21	2021/4/20

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR





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RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR



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7 **Photographs - EUT Constructional Details**

Refer to Appendix A DTS_DSS Setup Photos.

The End

