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TEST REPORT

Application No.: ZEWM2304000552RG

Applicant: vivo Mobile Communication Co., Ltd.

Address of Applicant: No.1, vivo Road, Chang'an, Dongguan, Guangdong, China

Manufacturer: vivo Mobile Communication Co., Ltd.

Address of Manufacturer: No.1, vivo Road, Chang'an, Dongguan, Guangdong, China

EUT Description: Mobile Phone

V2249 Model No.: **Trade Mark:** vivo

FCC ID: 2AUCY-V2249

Standards: FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

Date of Receipt: 2023/05/30

Date of Test: 2023/05/31 to 2023/06/06

Date of Issue: 2023/06/09

Test Result: PASS *

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

Authorized Signature:

Ervin Li Regulatory Manager



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Version

Revision Record						
Version Chapter Date Modifier Remark						
01		2023/06/09		Original		

Prepared By	Dee . Zheng (Dee Zheng) / Test Engineer
Checked By	Daniel Wang (Daniel Wang) / Reviewer



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2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result	Test Lab ^[1]
Antenna Requirement	15.203/15.247(b)		Clause 4.1	PASS	
AC Power Line Conducted Emission	15.207	ANSI C63.10-2020 Section 6.2	Clause 4.3	PASS	В
Conducted Peak Output Power	15.247 (b)(1)	ANSI C63.10-2020 Section 11.9.1.2	Clause 4.4	PASS	Α
20dB Emission Bandwidth & 99% Occupied Bandwidth	15.247 (a)(1)	ANSI C63.10-2020 Section 6.9.2/6.9.3	Clause 4.5	For Report Purpose	A
Carrier Frequencies Separation	15.247 (a)(1)	ANSI C63.10-2020 Section 7.8.2	Clause 4.6	PASS	Α
Hopping Channel Number	15.247 (a)(1)	ANSI C63.10-2020 Section 7.8.3	Clause 4.7	PASS	Α
Dwell Time	15.247 (a)(1)	ANSI C63.10-2020 Section 7.8.4	Clause 4.8	PASS	Α
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10-2020 Section 7.8.7.2	Clause 4.9	PASS	Α
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10-2020 Section 7.8.7.1	Clause 4.10	PASS	Α
Radiated Spurious emissions	15.247(d); 15.205/15.209	ANSI C63.10-2020 Section 6.4 / 6.5 / 6.6	Clause 4.11	PASS	В
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d); 15.205/15.209	ANSI C63.10-2020 Section 6.10.5	Clause 4.12	PASS	В

Remark:

1. Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Lab B SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.





SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

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General Information 3

3.1 Details of Client

Applicant:	vivo Mobile Communication Co., Ltd.
Address of Applicant:	No.1, vivo Road, Chang'an, Dongguan, Guangdong, China
Manufacturer:	vivo Mobile Communication Co., Ltd.
Address of Manufacturer:	No.1, vivo Road, Chang'an, Dongguan, Guangdong, 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, Nanshan District, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Jerry Zeng
Lab B:	
Company:	SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Address:	1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi' an, Shaanxi China
Post code:	710086
Test engineer:	Ken Liu



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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 Branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

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.

• Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

• FCC -Designation Number: CN1336

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

Designation Number: CN1336.

Test Firm Registration Number: 787754

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.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

• FCC -Designation Number: CN1337

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing

laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410



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3.4 General Description of EUT

EUT Description:	Mobile Phone	Mobile Phone				
Model No.:	V2249	V2249				
Trade Mark:	vivo	vivo				
Hardware Version:	MP_0.1					
Software Version:	PD2281CF_EX_A_13.0.3	3.19.W30				
IMEI:	RF Conducted	IMEI1: 860407069993950 IMEI2: 860407069993943				
	RSE & AC power line	86040769998215				
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 1 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 0 to 78.					
Bluetooth version:	Bluetooth V5.0	Bluetooth V5.0				
Modulation Technique:	Frequency Hopping Spre	Frequency Hopping Spread Spectrum(FHSS)				
Modulation Type:	GFSK, π/4DQPSK, 8DPS	GFSK, π/4DQPSK, 8DPSK				
Number of Channel:	79					
Hopping Channel Type:	Adaptive Frequency Hop	ping systems				
Antenna Type:	PIFA Antenna					
	-2.7dBi (Ant22)	-2.7dBi (Ant22)				
Antenna Gain:	Note: The antenna gain are derived from the gain information report provided by the manufacturer.					
RF Cable:	2000MHz ~ 3000MHz (1.	1dB)				
Remark:						



suitability, reliability or/and integrity of the information.

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

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



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3.5 Test Environment

Environment Parameter	96~101 kPa Selected Values During Tests				
Relative Humidity	40-60 % RH Ambient				
Value	Temperature(°C) Voltage(V)				
NTNV	22~25 3.87				
D					

Remark:

NV: Normal Voltage NT: Normal Temperature

3.6 Description of Support Units

The EUT has been tested as an independent unit.



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4 Test results and Measurement Data

4.1 Antenna Requirement

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

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.

The antenna is PIFA Antenna and no consideration of replacement.

The best case gain of the antenna is -2.7dBi (Ant22). *

*Note:

The antenna gain are derived from the gain information report provided by the manufacturer. Remark:

As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.



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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 Pseudo randomly 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.

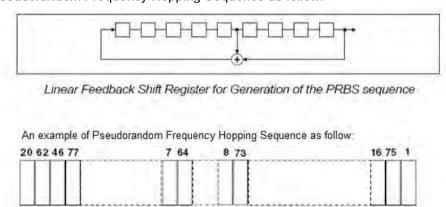
Compliance for section 15.247(a)(1):

According to Technical Specification, the pseudo random 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:



Each frequency used equally on the average by each transmitter.



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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):

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.

Compliance for section 15.247(h):

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 Sectio	n 15.207				
Test Method:	ANSI C63.10-2020 Section 6.2					
Test Frequency Range:	150kHz to 30MHz					
Receiver Setup:	RBW = 9kHz, VBW = 30)kHz				
Limit:		Limit (d	BuV)			
	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:	room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω I impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground refe 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 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 ANSI C63.10-2020 on conducted measurement.					

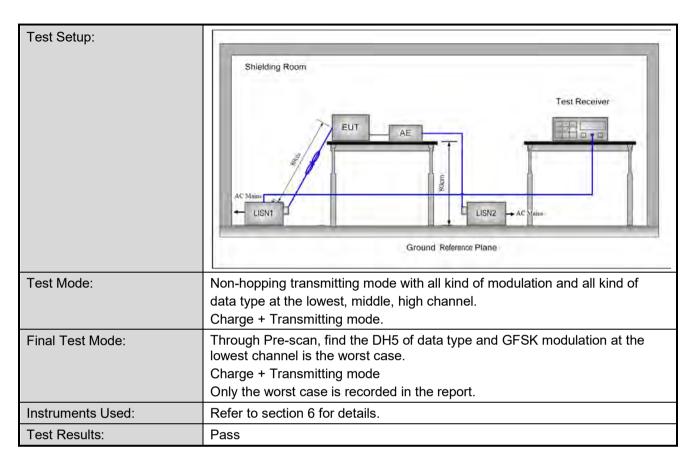




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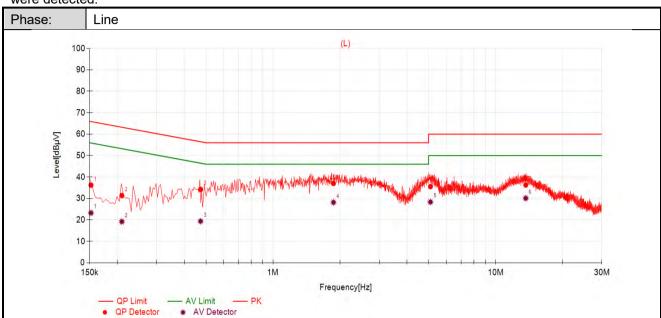
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Measurement Data

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.



Data	Data List										
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1523	9.86	26.36	36.22	65.88	29.66	13.40	23.26	55.88	32.62	PASS
2	0.2095	9.85	21.52	31.37	63.23	31.86	9.37	19.22	53.23	34.01	PASS
3	0.4732	9.88	24.35	34.23	56.46	22.23	9.51	19.39	46.46	27.07	PASS
4	1.8692	9.85	27.20	37.05	56.00	18.95	18.35	28.20	46.00	17.80	PASS
5	5.0965	9.88	25.67	35.55	60.00	24.45	18.48	28.36	50.00	21.64	PASS
6	13.6537	10.14	26.14	36.28	60.00	23.72	19.98	30.12	50.00	19.88	PASS

Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Value =Reading[dBµV] + Factor(Lisn factor[dB] + cable loss[dB]).
- 3. Margin = Limit[$dB\mu V$] Value[$dB\mu V$]

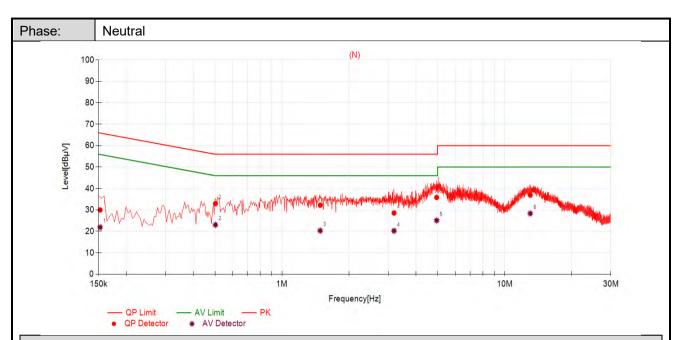




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Data	Data List										
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1525	9.77	20.21	29.98	65.86	35.88	12.15	21.92	55.86	33.94	PASS
2	0.5026	9.87	23.09	32.96	56.00	23.04	13.18	23.05	46.00	22.95	PASS
3	1.4854	9.82	22.41	32.23	56.00	23.77	10.51	20.33	46.00	25.67	PASS
4	3.1862	9.97	18.60	28.57	56.00	27.43	10.29	20.26	46.00	25.74	PASS
5	4.9507	9.97	25.87	35.84	56.00	20.16	15.12	25.09	46.00	20.91	PASS
6	13.0354	10.23	26.70	36.93	60.00	23.07	18.13	28.36	50.00	21.64	PASS

Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Value =Reading[dBµV] + Factor(Lisn factor[dB] + cable loss[dB]).
- 3. Margin = Limit[$dB\mu V$] Value[$dB\mu V$]



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4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)&15.247 (b)(1)			
Test Method:	ANSI C63.10-2020 Section 11.9.1.2			
Test Setup:	Ground Reference Plane * Test with power meter (Detector function: Peak)			
Test Instruments:	Refer to section 6 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:	0.125 watts			
Test Results:	Pass			
The detailed test data see: A	ppendix			





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4.5 20dB Emission Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10-2020 Section 6.9.2 and 6.9.3		
Test Setup:	PC Spectrum Analyzer O O O O O O O O O		
Instruments Used:	Refer to section 6 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		
The detailed test data see: A	ppendix		



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4.6 Carrier Frequencies Separation

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10-2020 Section 7.8.2		
Test Setup:	SGS Test system Vector Signal Generator Spectrum Analyzer Communication Tester RF Control Unit Control Unit		
Test Instruments:	Refer to section 6 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		
The detailed test data see: A	ppendix		



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4.7 Hopping Channel Number

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10-2020 Section 7.8.3		
Test Setup:	SGS Test system Vector Signal Generator Spectrum Analyzer Communication Tester RF Control Unit DC Rower Ground Reference Plane		
Instruments Used:	Refer to section 6 for details		
Test Mode:	Hopping transmitting with all kind of modulation		
Limit:	At least 15 channels		
Test Results:	Pass		
The detailed test data see: A	ppendix		



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4.8 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10-2020 Section 7.8.4		
Test Setup:	PC Spectrum Analyzer O O O O O O O O O		
Instruments Used: Refer to section 6 for details			
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.		
Limit:	0.4 Second		
Test Results:	Pass		
The detailed test data see: A	ppendix		



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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 C63.10-2020 Section 7.8.7.2		
Test Setup:	PC Spectrum Analyzer O O O O O O O O O		
Instruments Used:	Refer to section 6 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		
The detailed test data see: A	ppendix		



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4.10 Spurious RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)		
Test Method:	ANSI C63.10-2020 Section 7.8.7.1		
Test Setup:	PC Spectrum Analyzer O O O O O O O O O		
Instruments Used:	Refer to section 6 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		
The detailed test data see: A	ppendix		



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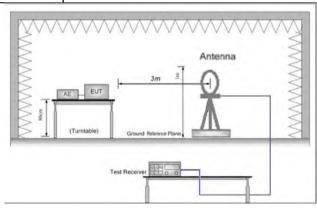
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4.11 Radiated Spurious Emissions

	•				
Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020 Section 6.4 / 6.5 / 6.6				
Test Site:	Measurement Distance: 3	m (Semi-Anechoic	Chamber)		
Test Frequency:	9kHz ~ 25GHz				
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 Qua		Quasi-peak	3	
	88MHz-216MHz 150 43.5 Quasi-pe		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
	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 level radiated by the device.				it

Test Setup:



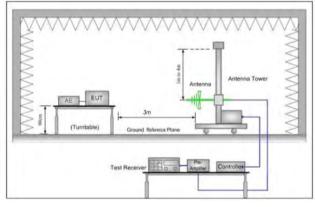


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz



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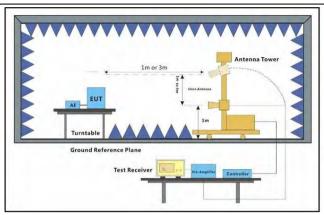


Figure 3. Above 1 GHz

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 (Distance from antenna to EUT is 1m for measurements >18GHz).
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified f. Bandwidth with Maximum Hold Mode.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.
- The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported
- The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.
- At a measurement distance of 1 meter the limit line was increased by 20*LOG(3/1) = 9.54 dB.

Test Configuration:

Measurements below 30MHz

- RBW = 10 kHz
- VBW = 30 kHz
- Detector = Peak & Average & Quasi-peak
- Trace mode = max hold



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	Measurements Below 1000MHz
	• RBW = 120 kHz
	• VBW = 300 kHz
	Detector = Quasi-peak
	Trace mode = max hold
	Peak Measurements Above 1000 MHz
	• RBW = 1 MHz
	• VBW ≥ 3 MHz
	Detector = Peak
	Sweep time = auto
	Trace mode = max hold
	Average Measurements Above 1000MHz
	Use duty cycle correction factor method per 15.35(c).
	Duty cycle = On time / 100 milliseconds
	On time = $N_1*L_1 + N_2*L_2+N_{N-1}*L_{N-1} + N_N*L_N$
	Where N_1 is number of type 1 pulese, L_1 is length of type 1 pulses, etc.
	Average Value = Peak Value +20*log(Duty cycle).
Familian dama Tarib	Non-hopping transmitting mode with all kind of modulation and all kind of
Exploratory Test Mode:	data type
wode.	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
The detailed test data	a see: Appendix



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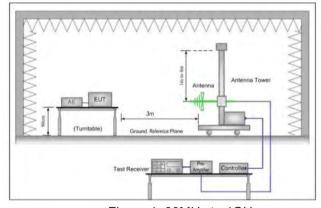
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4.12 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020 Section 6.10.5				
Test Site:	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		
	Above 1GHz	54.0	Average Value		
	Above IGHZ	74.0	Peak Value		

Test Setup:



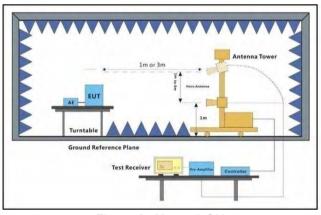


Figure 1. 30MHz to 1GHz

Figure 2. 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.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



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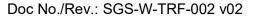
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	 g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest 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.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW ≥ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz Use duty cycle correction factor method per 15.35(c). Duty cycle = On time / 100 milliseconds On time = N₁*L₁ + N₂*L₂+N _{N-1} *L _{N-1} + N _N *L _N Where N₁ is number of type 1 pulese, L₁ is length of type 1 pulses, etc. Average Value = Peak Value +20*log(Duty cycle).
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
The detailed test data see	: Appendix





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Measurement Uncertainty (95% confidence levels, k=2) 5

Lab A				
No.	Item	Measurement Uncertainty		
1	Radio Frequency	± 9.84Hz		
2 Duty cycle		± 0.185%		
3	Occupied Bandwidth	± 0.20%		
4	RF conducted power	± 0.42dB		
5	RF power density	± 1.97dB		
6	Conducted Spurious emissions	± 0.42dB		

Remark:

The Ulab (lab Uncertainty) is less than Ucispr/ETSI (CISPR/ETSI Uncertainty), so the test results - compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

Lab B					
No.	Item Measurement Uncertainty				
1	Conduction Emission ± 3.0dB (150kHz to 30MHz)				
		± 4.6dB (9kHz to 30MHz)			
		± 4.9dB (30MHz to 1GHz)			
2	Radiated Emission	± 4.9dB (1GHz to 6GHz)			
		± 4.7dB (6GHz to 18GHz)			
		± 5.26dB (Above 18GHz)			

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cispr/ETSI} (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.





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Equipment List

C Equipment List							
Lab A							
RF Test System							
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)		
Spectrum Analyzer	Keysight	N9020A	SZ-WRG-M-002	2022/11/18	2023/11/17		
Signal Generator	Keysight	N5181A	SZ-WRG-M-005	2022/11/18	2023/11/17		
DC power supply	Tonscend	TS0806- 4ADC	SZ-WRG-A-007	NCR	NCR		
RF Control Unit	Tonscend	JS0806-2	SZ-WRG-M-008	2022/11/18	2023/11/17		
Radio Communication Tester	Rohde & Schwarz	CMW270	SZ-WRG-M-009	2023/02/16	2024/02/15		
Radio Communication Tester	Rohde & Schwarz	CMW-Z800A	SZ-WRG-M-010	NCR	NCR		
Signal Generator	Rohde & Schwarz	SMM100A	SZ-WRG-M-011	2023/02/22	2024/02/21		
Test Software	Tonscend	JS1120 V3.2.22	N/A	NCR	NCR		
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	SZ-WRG-M-077	2022/07/06	2023/07/05		
Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-012	2023/02/16	2024/02/15		

Lab B CE Test System						
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)	
Shielding Room	Brilliant-emc	N/A	XAW04-03-01	N/A	N/A	
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07	
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2022/06/30	2023/06/29	
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17	
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-07-01	NCR	NCR	
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15	
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-02	2022/06/30	2023/06/29	



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Lab B RSE Test System						
Test Equipment	Cal. date	Cal.Due date				
	Manufacturer	Model No.	No.	(yyyy/mm/dd)	(yyyy/mm/dd)	
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2021/09/09	2024/09/08	
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2023/02/16	2024/02/15	
Spectrum Analyzer	ROHDE &SCHWARZ	FSV3044	XAW01-13-05	2023/05/15	2024/05/14	
Test receiver	ROHDE &SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07	
Receiving antenna (30MHz- 3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/07/28	2024/07/27	
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/07/28	2024/07/27	
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/07/23	2024/07/22	
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	TAP9K3G32	XAW01-41-01	2023/05/15	2024/05/14	
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2022/09/14	2023/09/13	
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2022/09/14	2023/09/13	
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2022/09/14	2023/09/13	
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17	
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15	
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR	
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2022/05/26	2024/05/25	



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Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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Appendix



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20dB Emission Bandwidth **Test Result**

TestMode	Antenna	Frequency[MHz]	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Verdict
DH5	Ant22	2402	0.86	2401.55	2402.41	
		2441	0.86	2440.55	2441.41	
		2480	0.87	2479.55	2480.41	
	Ant22	2402	1.26	2401.37	2402.63	For Poport
2DH5		2441	1.26	2440.37	2441.63	For Report Purpose
		2480	1.26	2479.37	2480.63	Pulpose
3DH5	Ant22	2402	1.26	2401.36	2402.62	
		2441	1.26	2440.36	2441.62	
		2480	1.26	2479.36	2480.62	



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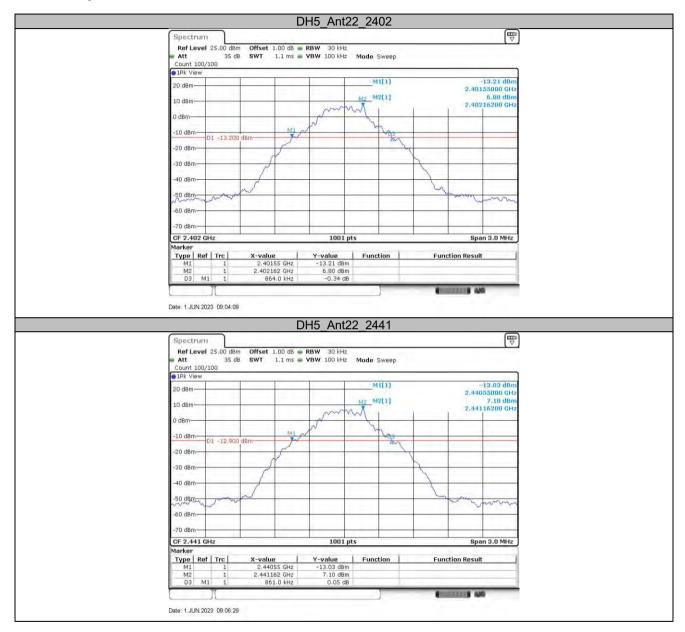


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Test Graphs





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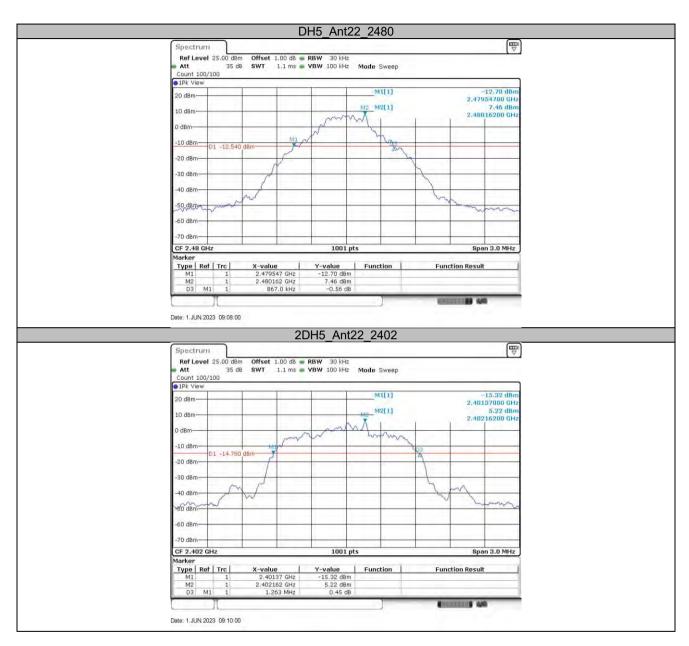
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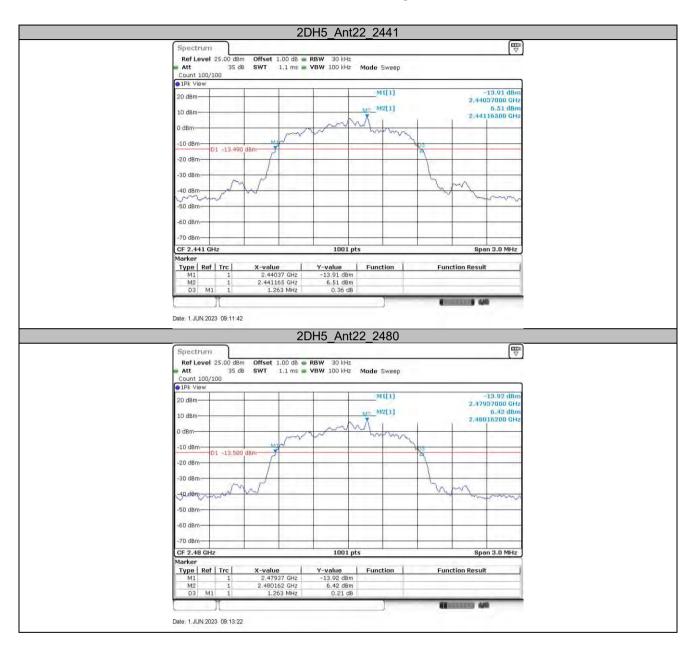
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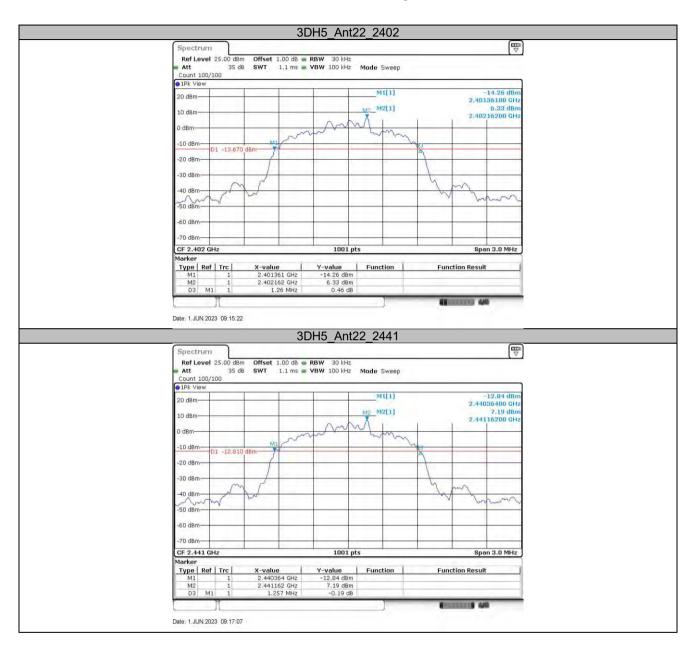




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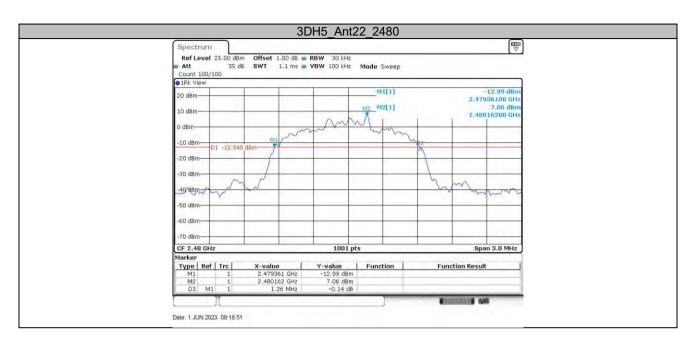




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Occupied Channel Bandwidth Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict	
DH5	Ant22	2402	0.758	2401.6254	2402.3836		
		2441	0.755	2440.6254	2441.3806		
		2480	0.758	2479.6224	2480.3806		
2DH5	Ant22	2402	1.148	2401.4216	2402.5694	For Donort	
		Ant22	2441	1.148	2440.4216	2441.5694	For Report
		2480	1.151	2479.4186	2480.5694	Purpose	
3DH5	Ant22		2402	1.148	2401.4276	2402.5754	
		2441	1.145	2440.4276	2441.5724		
		2480	1.148	2479.4246	2480.5724		



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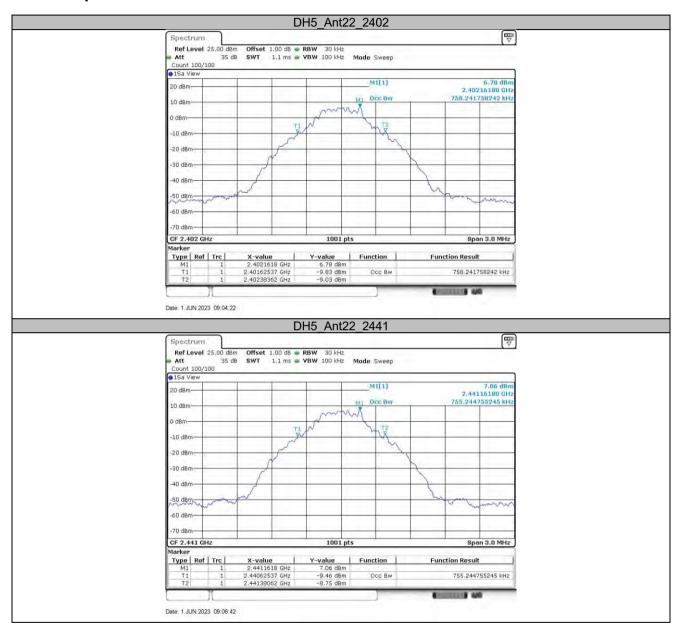


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Test Graphs



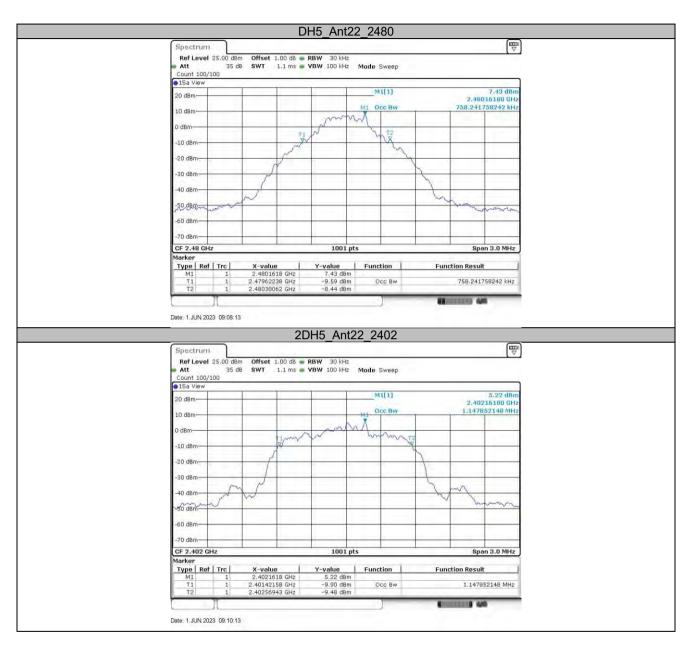




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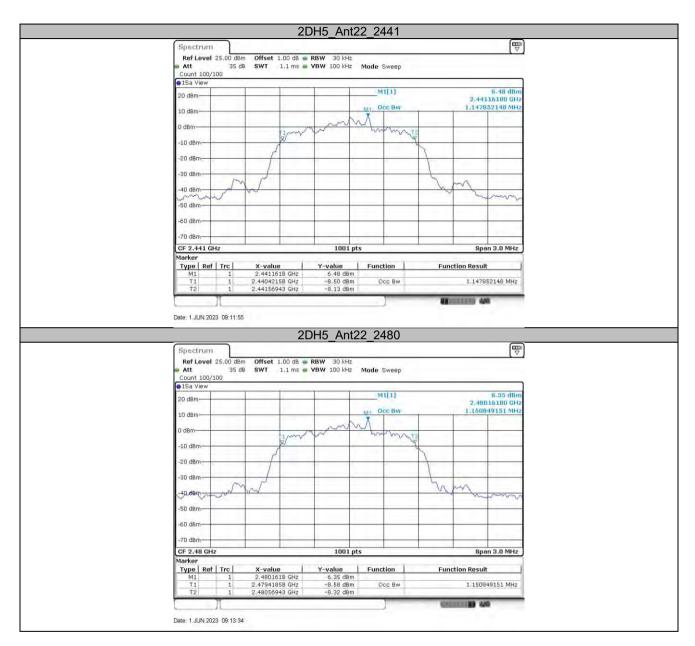
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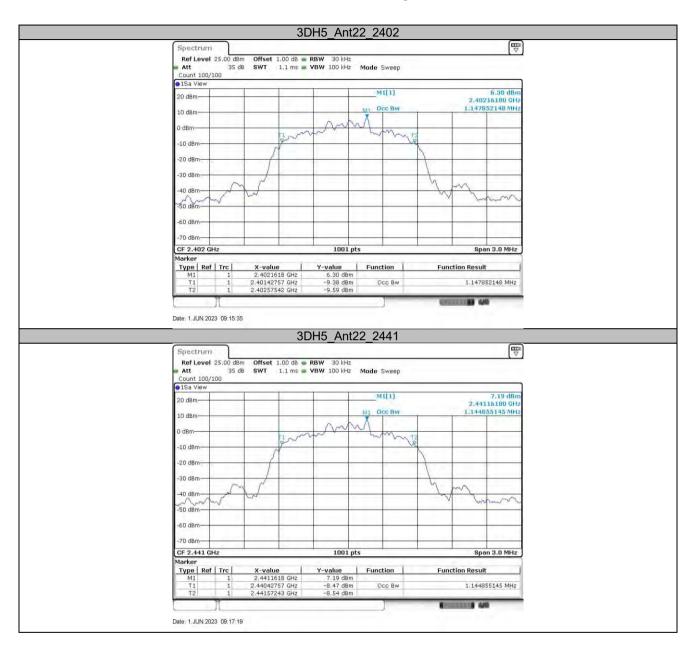




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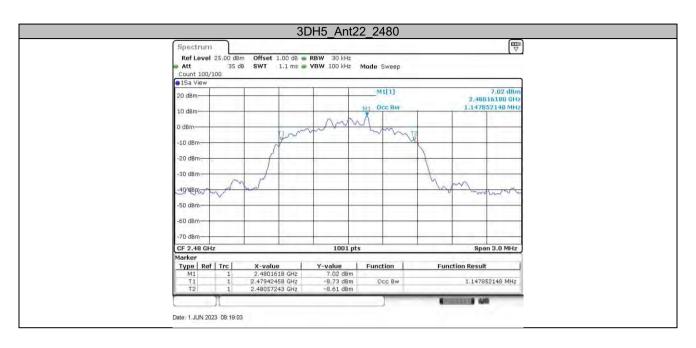
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Maximum conducted output power Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
		2402	9.58	≤20.97	PASS
DH5	Ant22	2441	9.79	≤20.97	PASS
		2480	10.38	≤20.97	PASS
2DH5	Ant22	2402	8.88	≤20.97	PASS
		2441	9.63	≤20.97	PASS
		2480	10.16	≤20.97	PASS
3DH5		2402	8.4	≤20.97	PASS
	Ant22	2441	9.63	≤20.97	PASS
		2480	9.74	≤20.97	PASS



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Carrier frequency separation Test Result

TestMode	Antenna	Hop/No-Hop	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant22	Нор	1.006	≥0.870	PASS
2DH5	Ant22	Нор	1.003	≥0.840	PASS
3DH5	Ant22	Нор	1.012	≥0.840	PASS



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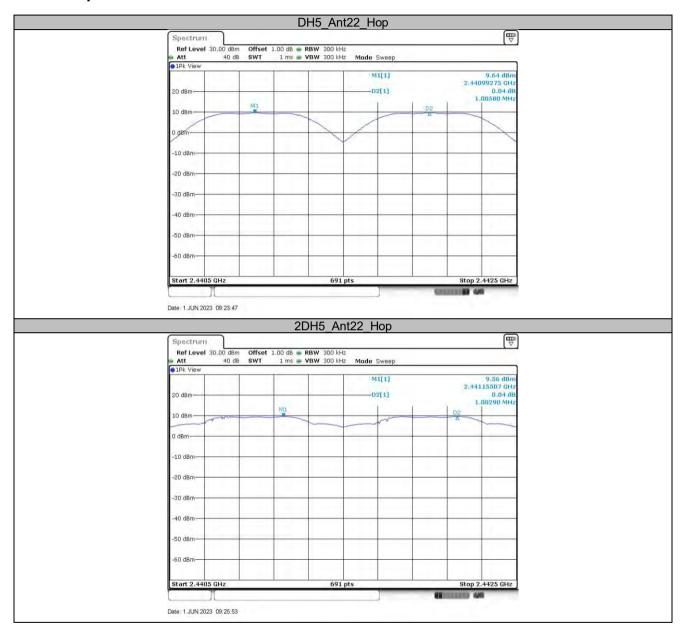


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Test Graphs





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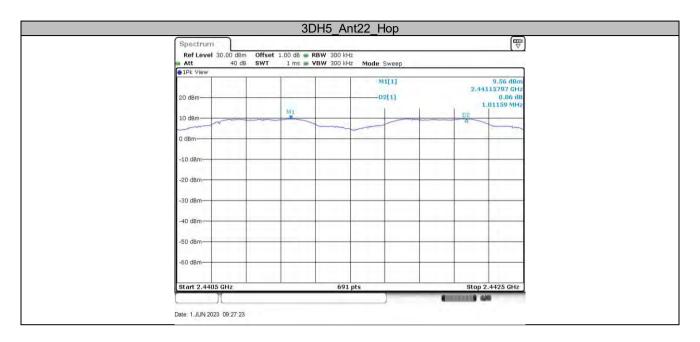
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Time of occupancy **Test Result**

TestMode	Antenna	Hop/No- Hop	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant22	Нор	0.360	320	0.115	≤0.4	PASS
DH3	Ant22	Нор	1.610	160	0.258	≤0.4	PASS
DH5	Ant22	Нор	2.870	106.67	0.306	≤0.4	PASS
2DH1	Ant22	Нор	0.370	320	0.118	≤0.4	PASS
2DH3	Ant22	Нор	1.620	160	0.259	≤0.4	PASS
2DH5	Ant22	Нор	2.860	106.67	0.305	≤0.4	PASS
3DH1	Ant22	Нор	0.370	320	0.118	≤0.4	PASS
3DH3	Ant22	Нор	1.620	160	0.259	≤0.4	PASS
3DH5	Ant22	Нор	2.870	106.67	0.306	≤0.4	PASS



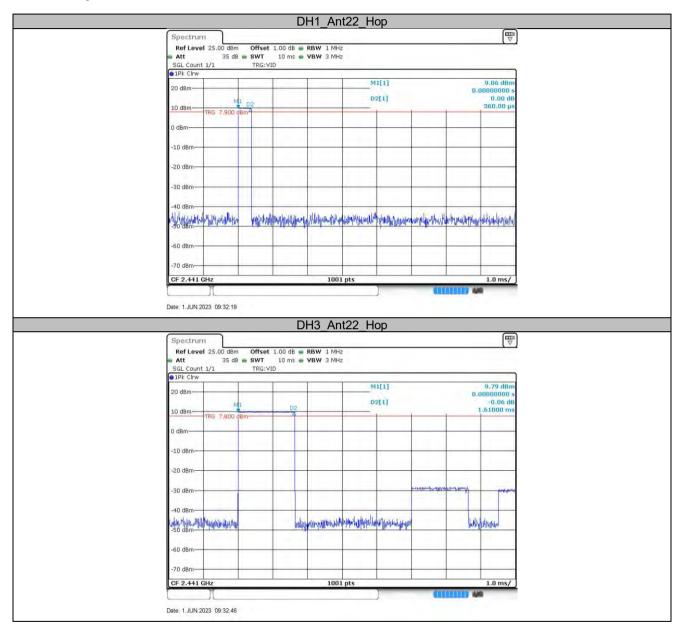


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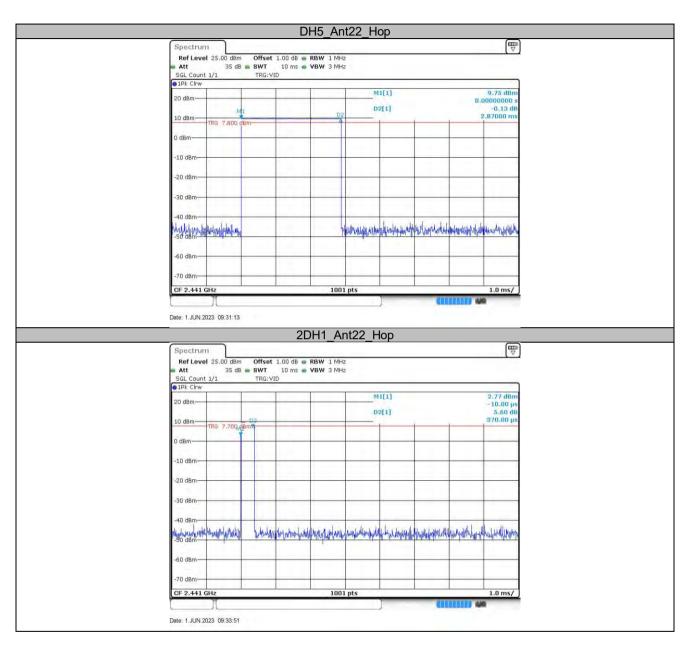




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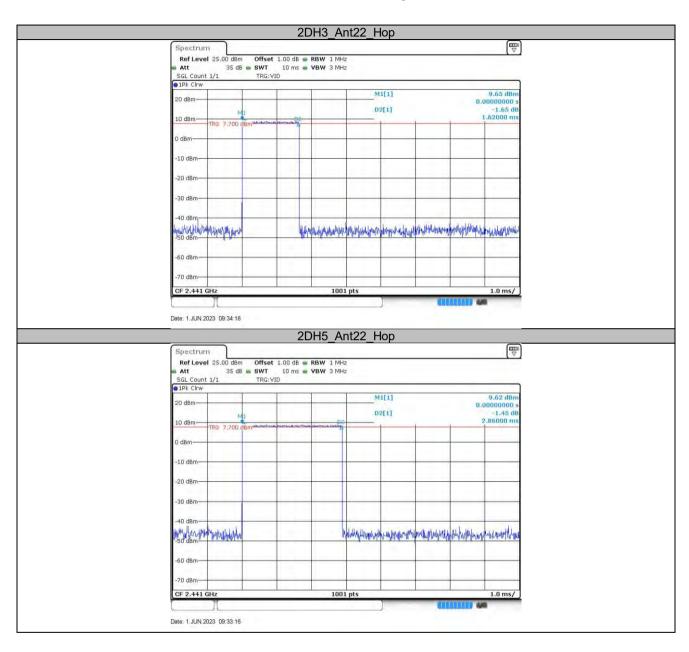
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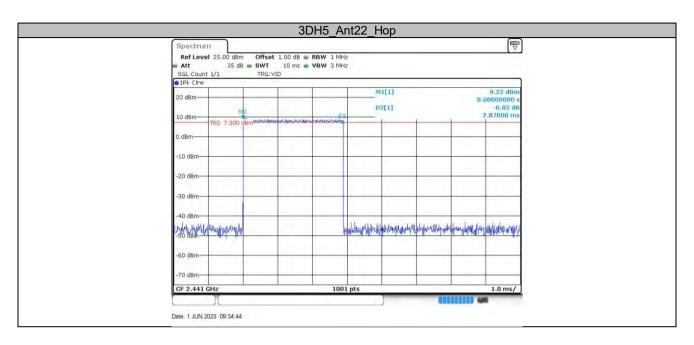




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Number of hopping channels **Test Result**

TestMode	Antenna	Hop/No-Hop	Result[Num]	Limit[Num]	Verdict
DH5	Ant22	Нор	79	≥15	PASS
2DH5	Ant22	Нор	79	≥15	PASS
3DH5	Ant22	Нор	79	≥15	PASS



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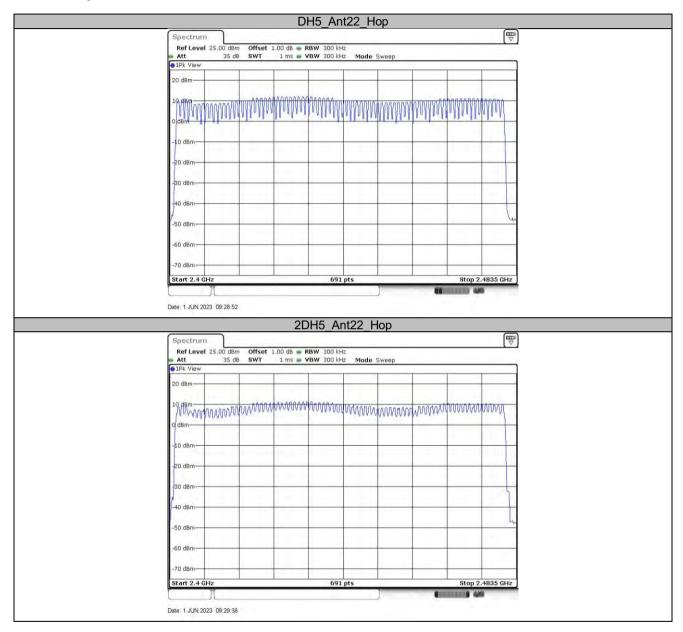


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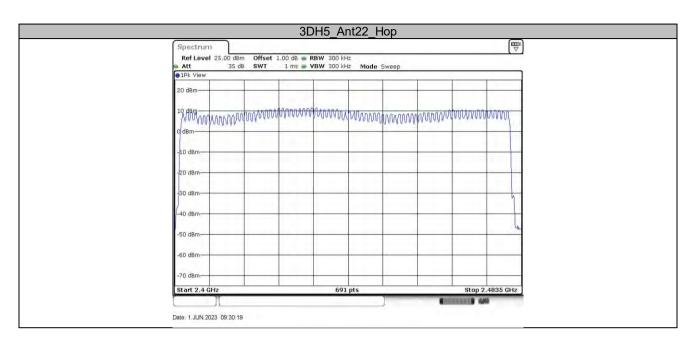




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Band edge measurements **Test Graphs**





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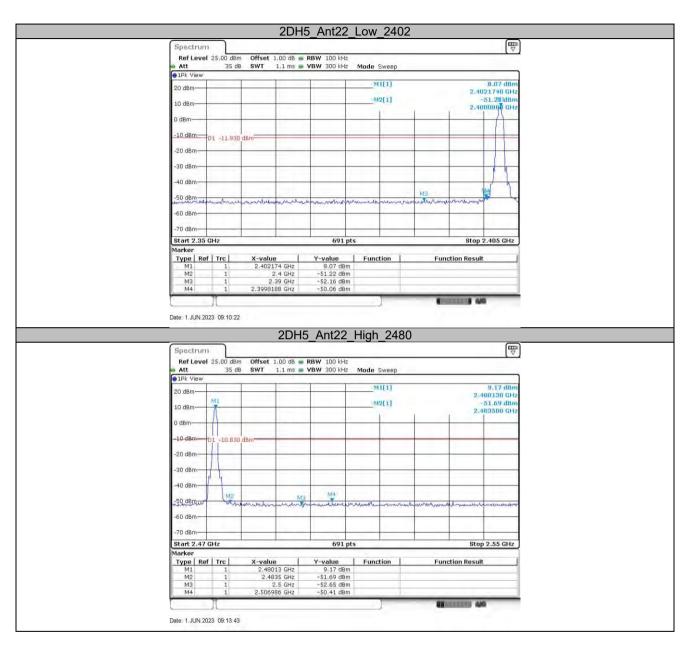
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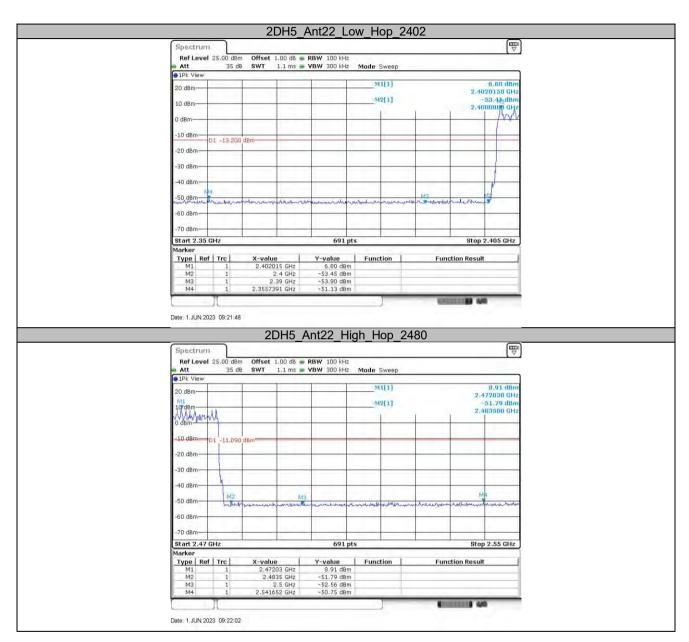




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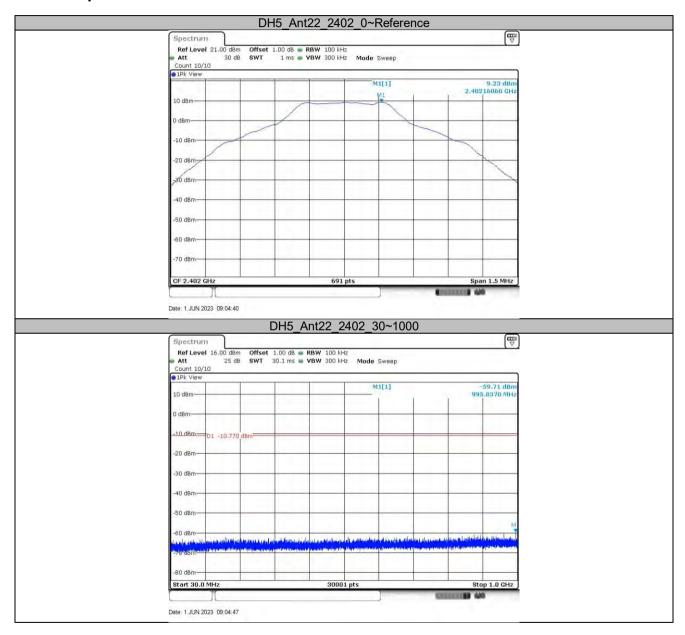


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Conducted Spurious Emission Test Graphs





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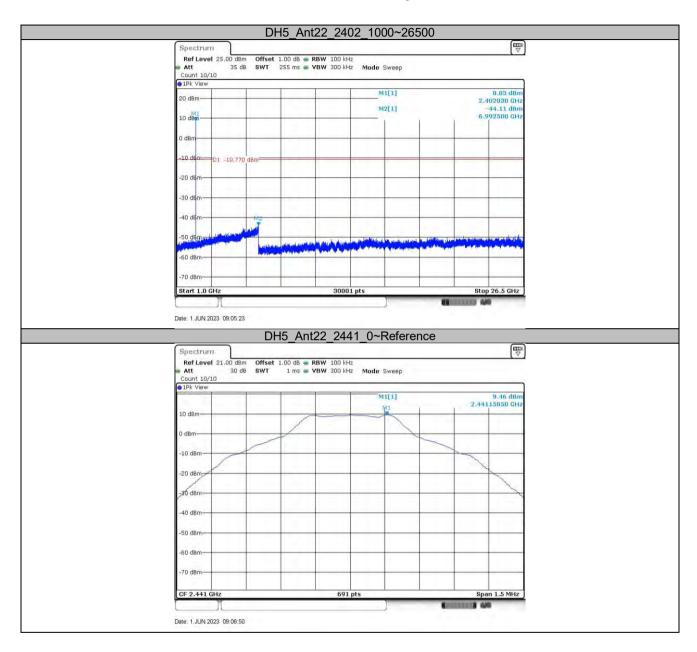
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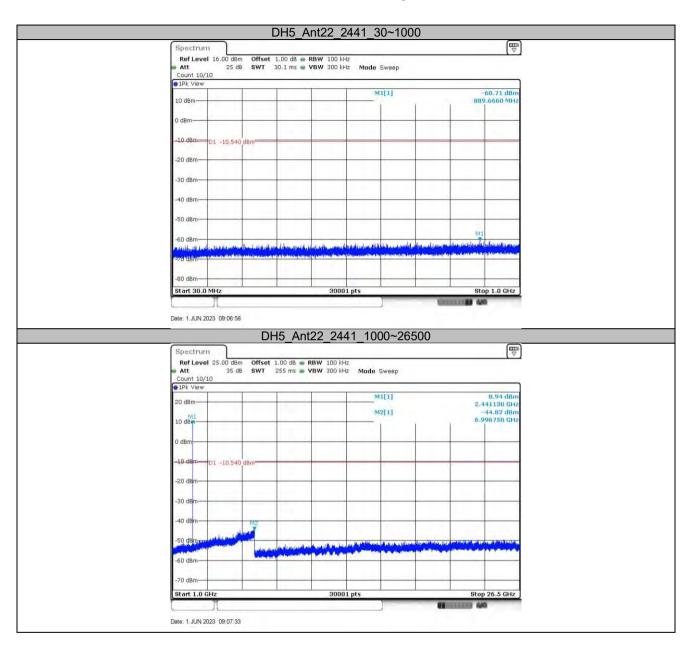
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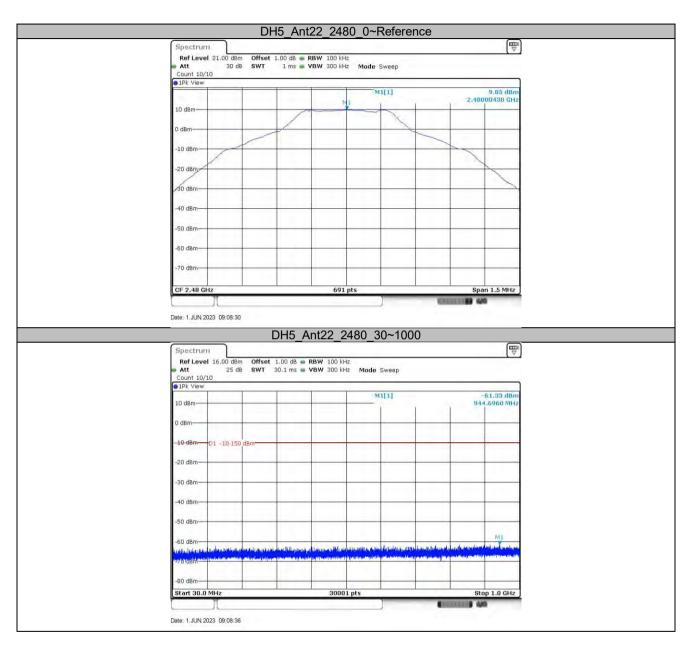
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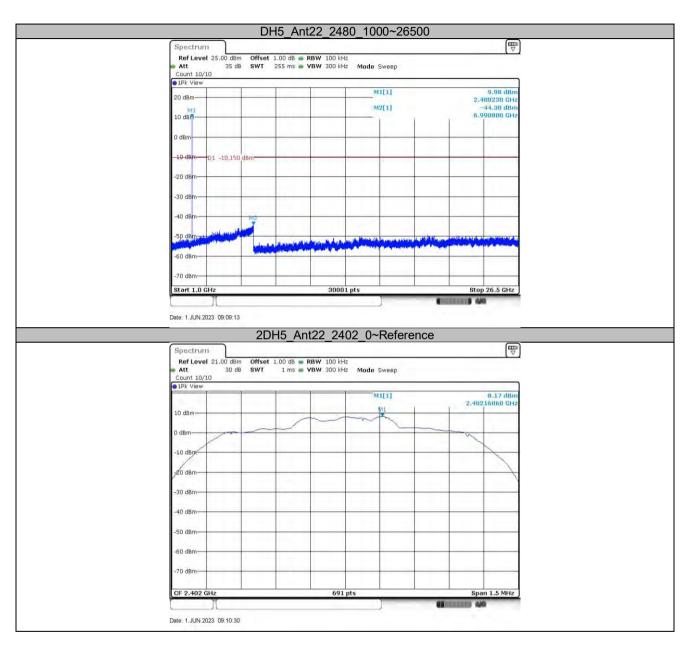




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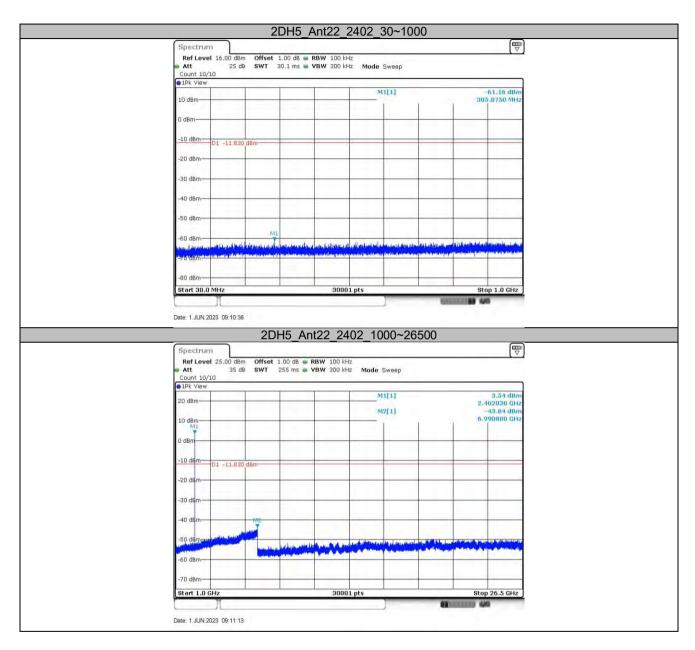




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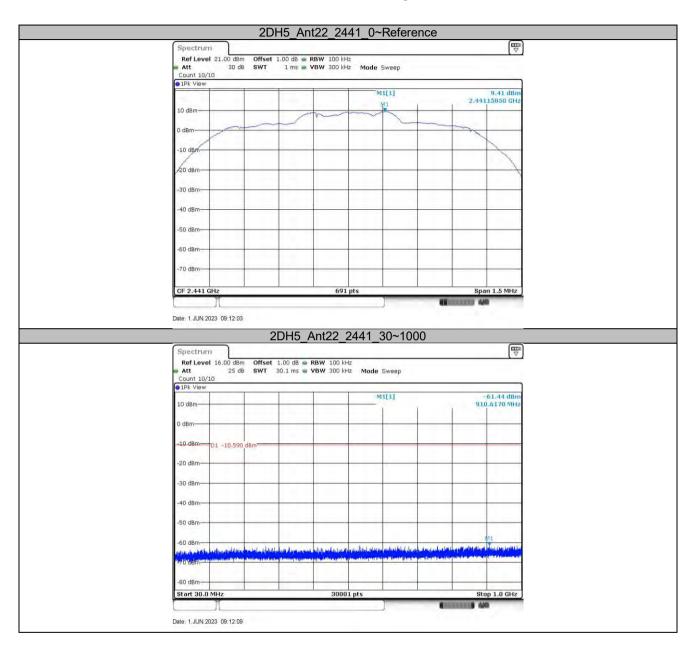




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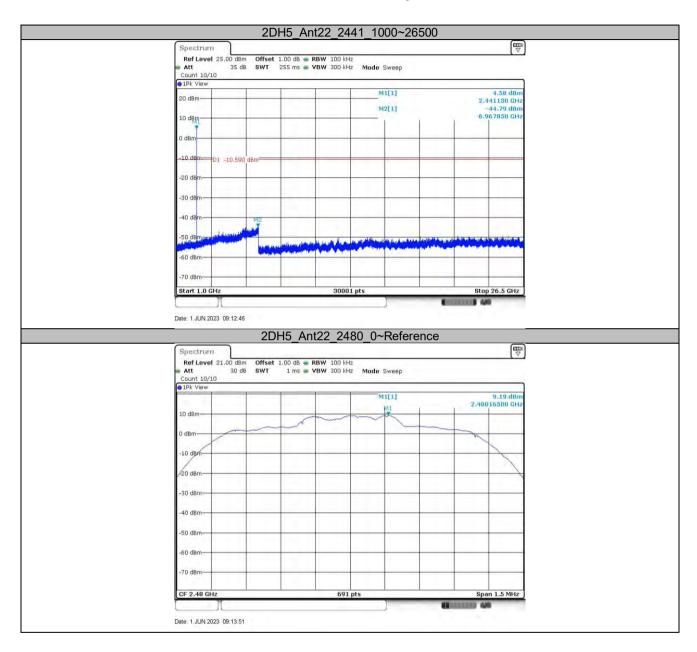
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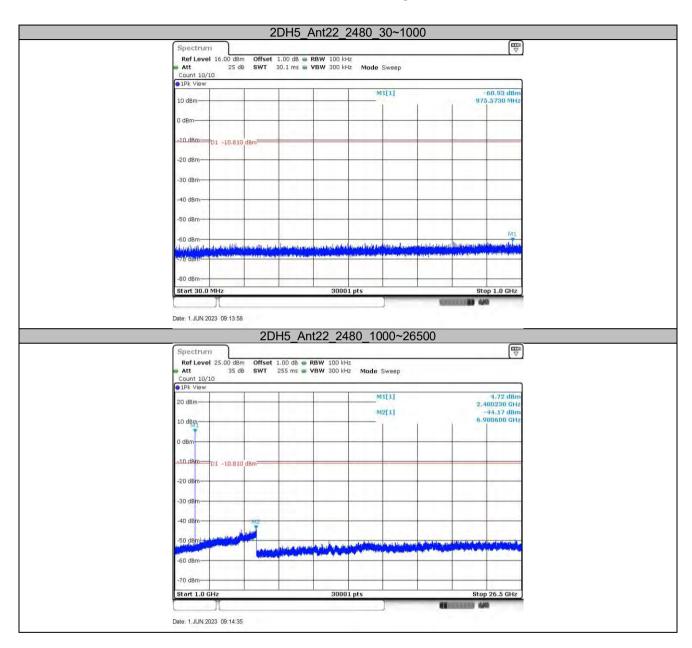




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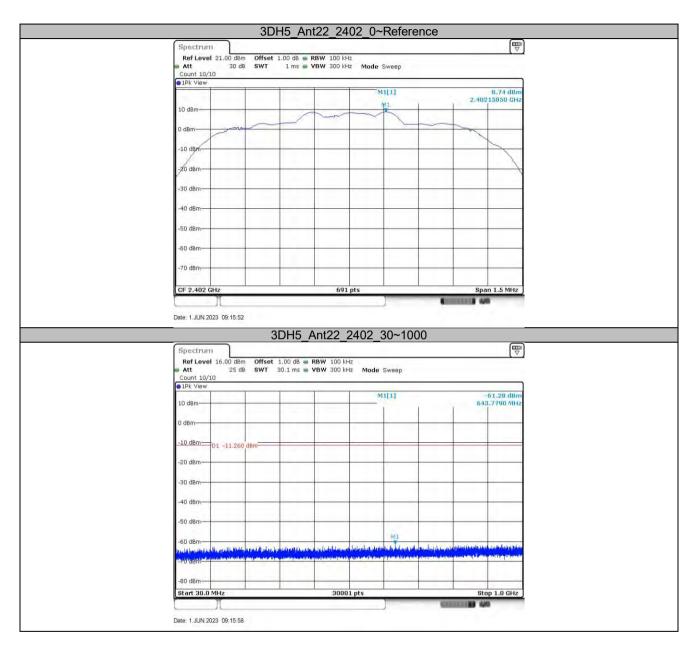




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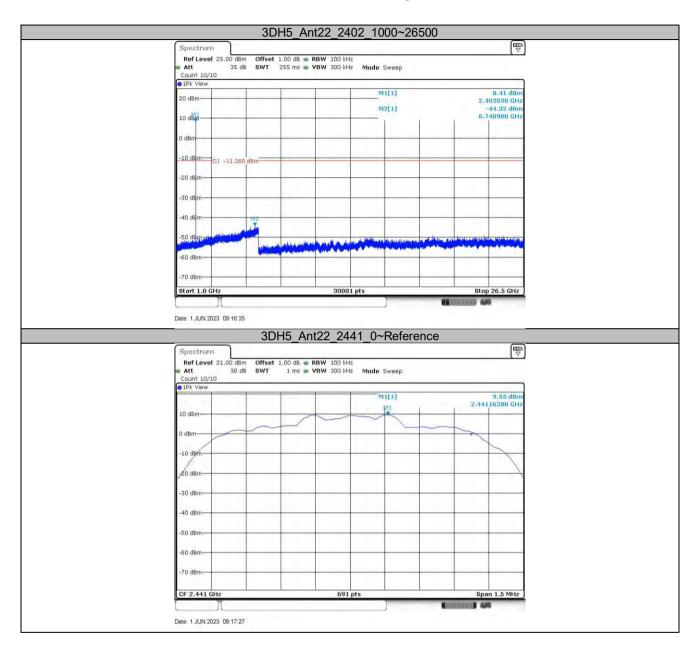




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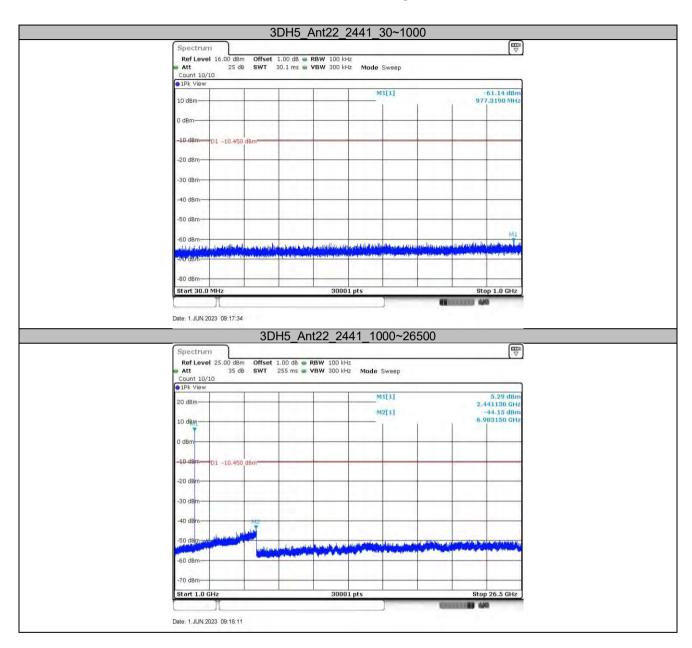
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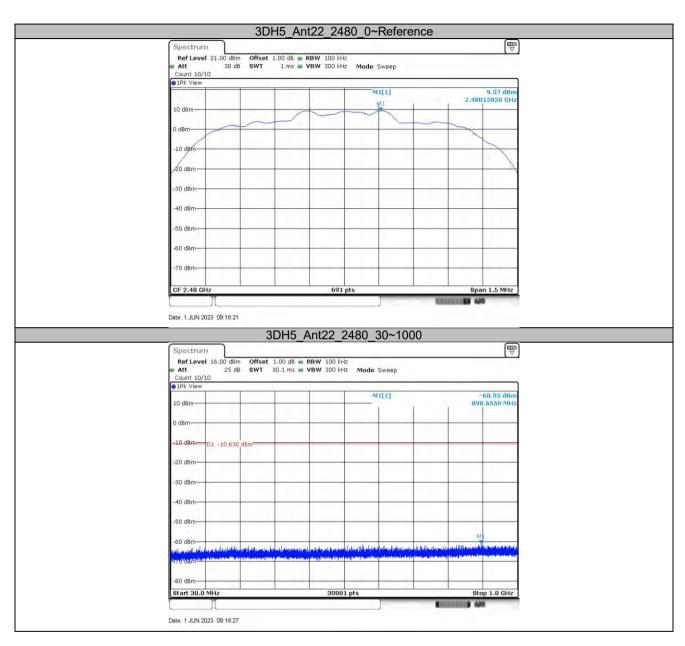
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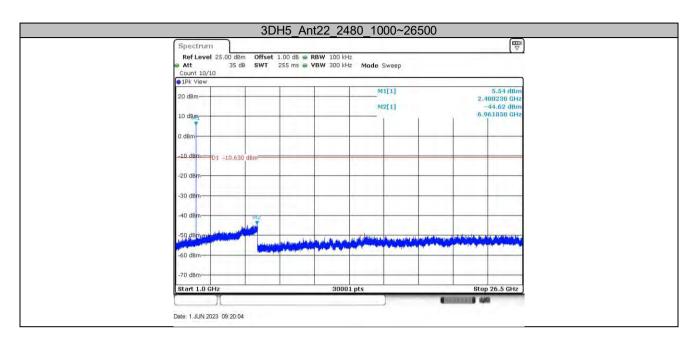
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Duty Cycle Test Result

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant22	2402	2.88	3.75	76.80	1.15
2DH5	Ant22	2402	2.89	3.75	77.07	1.13
3DH5	Ant22	2402	2.89	3.75	77.07	1.13



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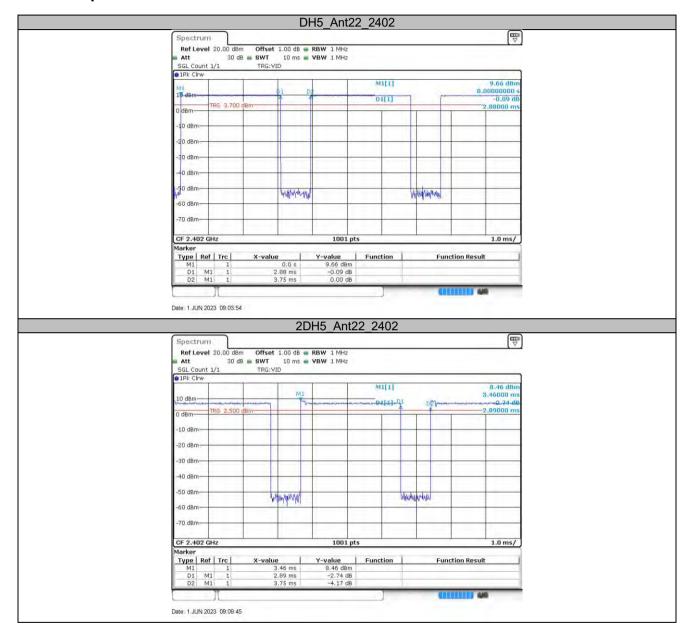


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Test Graphs



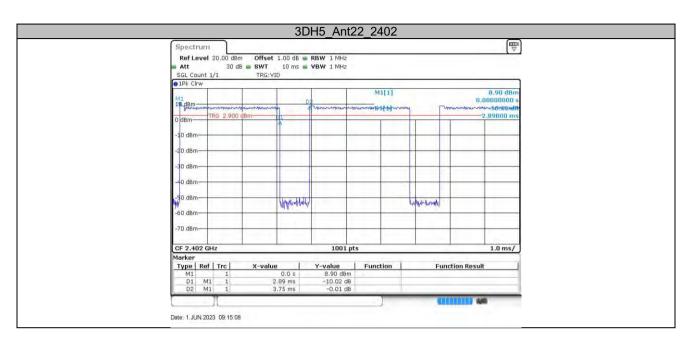




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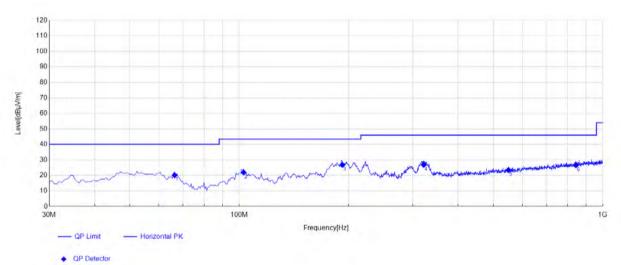
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Radiated Spurious Emissions

Radiated emission below 1GHz

Worst case Mode: GFSK_Channel 0



Data L	-ist									
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading[dBµV]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	66.3932	11.43	-27.57	36.26	20.12	40.00	19.88	318	174	Horizontal
2	102.7864	11.72	-27.12	37.28	21.88	43.50	21.62	245	103	Horizontal
3	192.071	10.47	-26.62	42.95	26.80	43.50	16.70	384	252	Horizontal
4	321.6308	13.53	-25.71	39.05	26.87	46.00	19.13	154	231	Horizontal
5	550.1801	18.00	-24.87	30.36	23.49	46.00	22.51	226	109	Horizontal
6	843.2666	21.37	-24.00	29.22	26.59	46.00	19.41	201	339	Horizontal

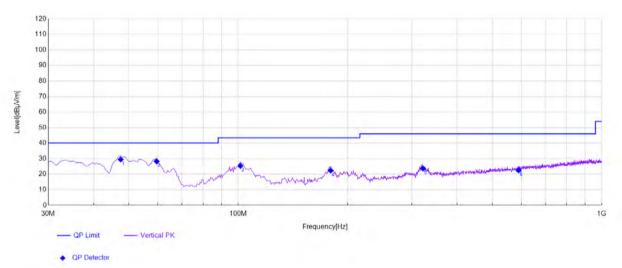




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Data L	-ist									
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading[dBμV]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	47.4687	14.07	-27.77	43.21	29.51	40.00	10.49	325	5	Vertical
2	59.5998	12.44	-27.96	43.83	28.31	40.00	11.69	195	287	Vertical
3	101.3307	11.73	-27.12	40.78	25.39	43.50	18.11	319	89	Vertical
4	179.4547	9.09	-26.45	39.71	22.35	43.50	21.15	260	293	Vertical
5	322.1161	13.54	-25.72	35.92	23.74	46.00	22.26	221	29	Vertical
6	590.4552	18.46	-24.44	28.42	22.44	46.00	23.56	263	161	Vertical

Remark:

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

Value = Reading($dB\mu V$) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit($dB\mu V/m$) – Value($dB\mu V/m$)

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



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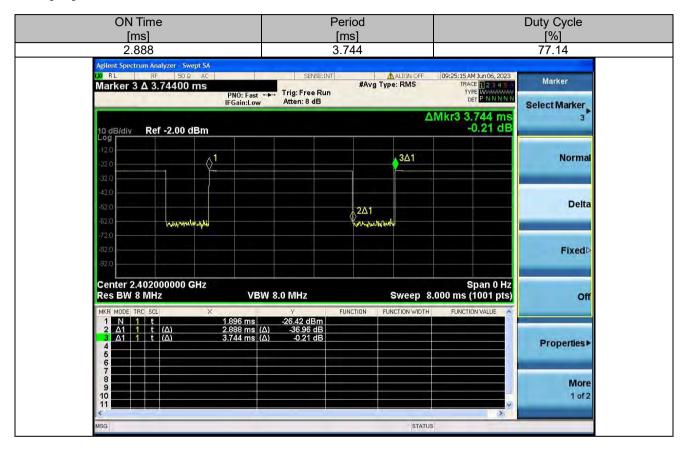


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Transmitter emission Above 1GHz Duty cycle



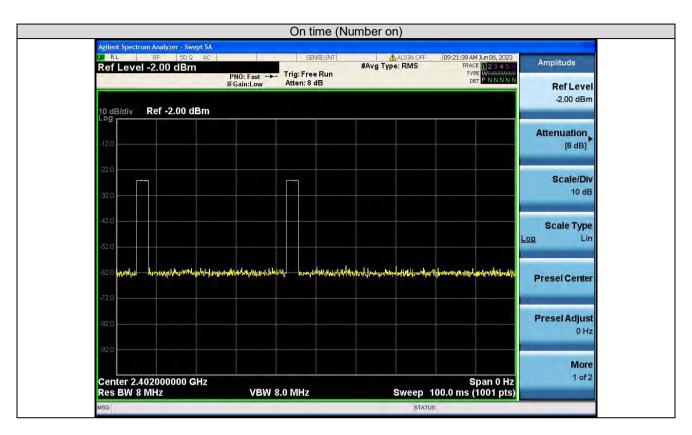




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Note:

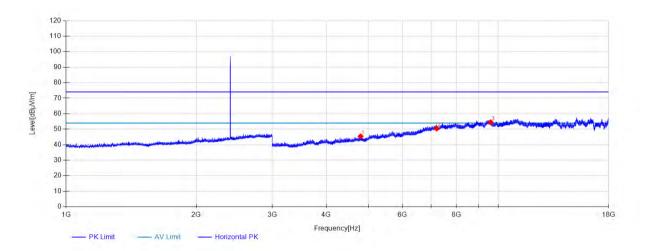
- Duty cycle = on time / 100 ms = 2 * 2.888 / 100 = 5.776%
- Duty cycle Correction factor = 20*log (Duty cycle) = -24.77dB



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GFSK Channel 0



Data	List					Data List											
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity							
1	4804	57.60	30.78	-42.95	45.43	74.00	28.57	243	344	Horizontal							
2	4804	-	-	•	20.66	54.00	33.34	-	1	-							
3	7206	52.59	36.56	-38.71	50.44	74.00	23.56	125	286	Horizontal							
4	7206	-	-	•	25.67	54.00	28.33	-	1	-							
5	9608	52.32	37.85	-35.70	54.47	74.00	19.53	315	78	Horizontal							
6	9608	•	-		29.70	54.00	24.30	ı	-	-							

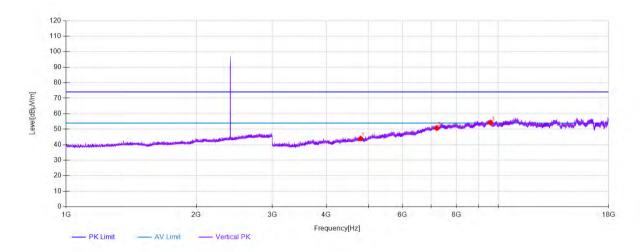




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GFSK Channel 0



Data	Data List											
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	4804	56.15	30.78	-42.95	43.98	74.00	30.02	231	127	Vertical		
2	4804	-	-	-	19.21	54.00	34.79	-	-	-		
3	7206	52.81	36.56	-38.71	50.66	74.00	23.34	286	244	Vertical		
4	7206	-	-	-	28.89	54.00	28.11	-	-	-		
5	9608	52.05	37.85	-35.70	54.20	74.00	19.80	153	233	Vertical		
6	9608	-	-	-	29.43	54.00	24.57	-	1	-		



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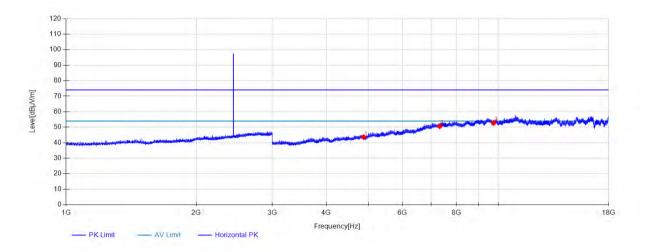


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GFSK Channel 39



Data	Data List											
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	4882	55.72	30.79	-42.89	43.62	74.00	30.38	354	320	Horizontal		
2	4882	-	-	-	18.85	54.00	35.15	-	-	-		
3	7323	52.92	36.45	-38.74	50.63	74.00	23.37	265	204	Horizontal		
4	7323	-	-	-	25.86	54.00	28.14	-	-	-		
5	9764	50.36	38.36	-35.95	52.77	74.00	21.23	315	242	Horizontal		
6	9764	-	-	1	28.00	54.00	26.00	-	1	-		



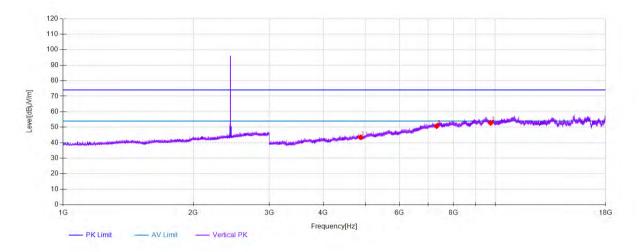


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GFSK Channel 39



Data	Data List											
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	4882	55.60	30.79	-42.89	43.50	74.00	30.50	360	146	Vertical		
2	4882	-	-	-	18.73	54.00	35.27	-	-	-		
3	7323	52.98	36.45	-38.74	50.69	74.00	23.31	288	155	Vertical		
4	7323	-	-	-	25.92	54.00	28.08	-	-	-		
5	9764	50.36	38.36	-35.95	52.77	74.00	21.23	236	107	Vertical		
6	9764	-	-	-	28.00	54.00	26.00	-	1	-		



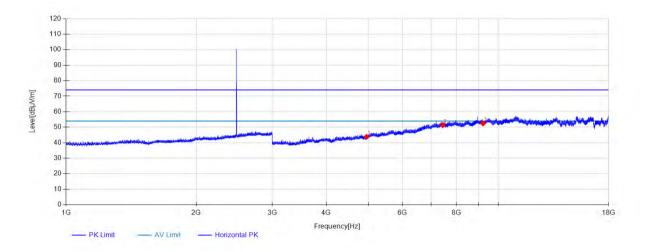
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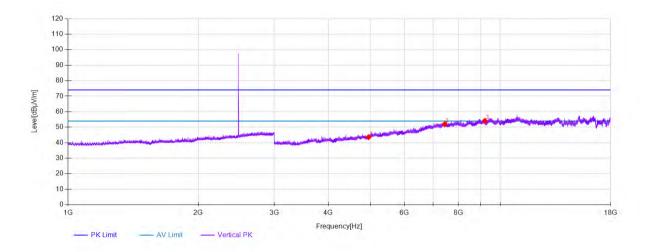
Data	Data List											
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	4960	55.53	31.04	-42.78	43.79	74.00	30.21	224	340	Horizontal		
2	4960	-	-	-	19.02	54.00	34.98	-	-	-		
3	7440	52.79	36.78	-38.28	51.29	74.00	22.71	315	146	Horizontal		
4	7440	-	-	-	26.52	54.00	27.48	-	-	-		
5	9220	51.00	37.50	-36.04	52.46	74.00	21.54	278	165	Horizontal		
6	9220	-	-	1	27.69	54.00	26.31	-	1	-		



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Data	List									
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4960	55.32	31.04	-42.78	43.58	74.00	30.42	286	328	Vertical
2	4960	-	-	-	18.81	54.00	35.19	-	-	-
3	7440	53.42	36.78	-38.28	51.92	74.00	22.08	364	164	Vertical
4	7440	-	-	-	37.15	54.00	26.85	-	-	-
5	9220	52.68	37.50	-36.04	54.14	74.00	19.86	231	223	Vertical
6	9220	-	-	-	29.37	54.00	24.63	-	-	-

Remark:

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

Level = Reading($dB\mu V$) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit($dB\mu V/m$) – Level($dB\mu V/m$)

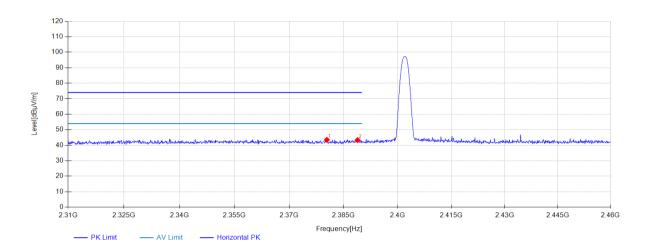
2) All channels have been tested, but only the worst case data displayed in this report.



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Restricted bands around fundamental frequency **GFSK_Channel 0**



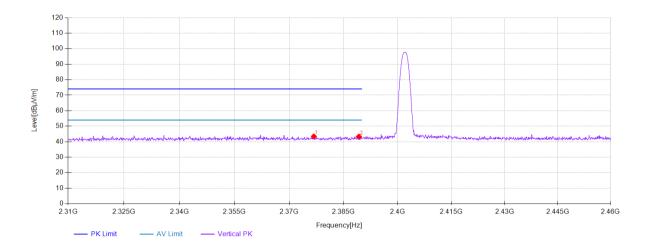
Data	Data List											
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2380.3852	39.02	27.48	-23.03	43.47	74.00	30.53	127	145	Horizontal		
2	2380.3852	-	-	-	18.70	54.00	35.30	-	-	-		
3	2388.8644	38.87	27.44	-23.02	43.29	74.00	30.71	127	145	Horizontal		
4	2388.8644	-	-	-	18.52	54.00	35.48	-	-	-		



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GFSK Channel 0



Data	List									
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2376.7834	39.00	27.49	-23.04	43.45	74.00	30.55	324	178	Vertical
2	2376.7834	-	-	-	18.68	54.00	35.32	-	-	-
3	2389.2396	38.88	27.44	-23.02	43.30	74.00	30.70	324	178	Vertical
4	2389.2396	-	-	-	18.53	54.00	35.47	-	-	-



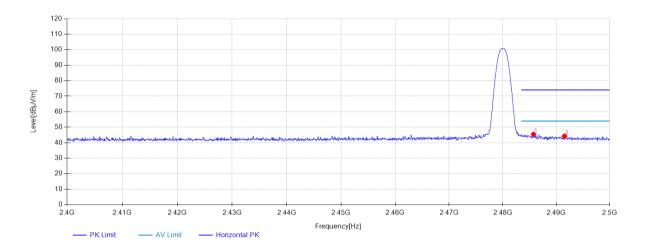
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Data	List									
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2485.7429	40.81	27.74	-23.12	45.43	74.00	28.57	136	63	Horizontal
2	2485.7429	-	-	-	20.66	54.00	33.34	-	-	-
3	2491.5458	39.54	27.77	-23.13	44.18	74.00	29.82	136	63	Horizontal
4	2491.5458	-	-	-	19.41	54.00	34.59	-	-	-



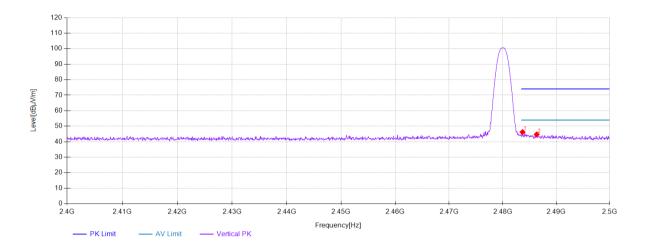
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Data List										
NO.	Frequency [MHz]	Reading [dBµV]	AF[dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.6918	41.62	27.73	-23.12	46.23	74.00	27.77	387	170	Vertical
2	2483.6918	-	-	-	21.46	54.00	32.54	-	-	-
3	2486.3432	40.07	27.75	-23.12	44.70	74.00	29.30	387	170	Vertical
4	2486.3432	-	-	-	19.93	54.00	34.07	-	-	-

Remark:

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

Level = Reading($dB\mu V$) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit($dB\mu V/m$) – Level($dB\mu V/m$)

---End of Report---



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