

Report No.: ZR/2019/A000302-01
Rev.: 01
Page: 1 of 108

TEST REPORT

Application No.: ZR/2019/A0003
Applicant: Sony Mobile Communications INC
Address of Applicant: 4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan
Manufacturer: Sony Mobile Communications INC
Address of Manufacturer: 4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan
EUT Description: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n, GPS and NFC
Model No.: PM-1291-BV
Trade Mark: Sony
FCC ID: PY7-50352P
Standards: FCC 47 CFR Part 2, Subpart J
 FCC 47 CFR Part 15, Subpart C
Date of Receipt: 2019/10/15
Date of Test: 2019/10/15 to 2019/10/29
 2021/12/20 to 2022/1/10(For Tianjin Dongdian Testing Service Co., Ltd.)
Date of Issue: 2022/5/7

Test Result :	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Jim Huang



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1 Version

<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2022/4/29		Original
02		2022/5/7		Add Note On Section2

Prepared By	 <hr/> (Wick Feng) / Test Supervisor
Checked By	 <hr/> (Daniel Wang) / Reviewer

This report supersedes our previous report **ZR/2019/A000304**, issued on **2019-10-29**, which is hereby deemed null and void.



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2 Test Summary

Test Item	FCC Rules 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 (2013)	Clause 4.3	PASS	B
Conducted Peak Output Power	15.247 (b)(1)	ANSI C63.10 (2013)	Clause 4.4	PASS	B
20dB Emission Bandwidth& 99% Occupied Bandwidth	15.247 (a)(1)	ANSI C63.10 (2013)	Clause 4.5	Reporting only	A
Carrier Frequencies Separation	15.247 (a)(1)	ANSI C63.10 (2013)	Clause 4.6	PASS	A
Hopping Channel Number	15.247 (a)(1)	ANSI C63.10 (2013)	Clause 4.7	PASS	A
Dwell Time	15.247 (a)(1)	ANSI C63.10 (2013)	Clause 4.8	PASS	A
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 (2013)	Clause 4.9	PASS	A
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 (2013)	Clause 4.10	PASS	A
Radiated Spurious emissions	15.247(d); 15.205/15.209	ANSI C63.10 (2013)	Clause 4.11	PASS	B
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d); 15.205/15.209	ANSI C63.10 (2013)	Clause 4.12	PASS	B

Note^[1]:

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

Lab B Tianjin Dongdian Testing Service Co., Ltd.

Test data from lab A is from the original version of this report with measurements made from 2019/10/15 to 2019/10/29. The measurement data for Radiated Emissions, Restricted bands and AC Power line Conducted Emissions is from lab B and was taken from 2021/12/20 to 2022/1/10. This report also includes power verification measurements performed at lab B (refer to section 4.4) to confirm that devices tested at lab B were operating within the expected range of output powers. Refer to section 2 for full details.



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3 General Information

3.1 Details of Client

Applicant:	Sony Mobile Communications INC
Address of Applicant:	4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan
Manufacturer:	Sony Mobile Communications INC
Address of Manufacturer:	4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

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
Test engineer:	Adam Liang
Lab B:	
Company:	Tianjin Dongdian Testing Service Co., Ltd
Address:	Building D-1, No. 19, Weisi Road, Microelectronics Industrial Park, Development Area, Tianjin, China.
Tel:	+86-22-58038033
E-mail:	ddt@dgddt.com, http://www.ddttest.com
Test engineer:	Sunny Zhang



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3.3 Test Facility

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

Lab A:
<ul style="list-style-type: none"> • 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. • 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:
<p>Tianjin Dongdian Testing Service Co., Ltd.</p> <p>Address: Building D-1, No. 19, Weisi Road, Microelectronics Industrial Park Development Area, Tianjin, China., 300385</p> <p>Tel: +86-22-58038033, http://www.ddttest.com, Email: ddt@dgddt.com</p> <p>NVLAP (National Voluntary Laboratory Accreditation Program) CODE: 500036-0</p> <p>CNAS (China National Accreditation Service for Conformity Assessment) CODE: L13402</p> <p>FCC Designation Number: CN5004; FCC Test Firm Registration Number: 368676</p> <p>ISED (Innovation, Science and Economic Development Canada) Company Number: 27768</p> <p>Conformity Assessment Body Identifier: CN0125</p> <p>VCCI Facility Registration Number: C-20089, T-20093, R-20125, G-20122</p>



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3.4 General Description of EUT

EUT Description:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n, GPS and NFC		
Model No.:	PM-1291-BV		
Trade Mark:	Sony		
Hardware Version:	A		
Software Version:	0.96		
Operation Frequency:	2400MHz~2483.5MHz $f_c = 2402 \text{ MHz} + N * 1 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 78.		
Bluetooth version:	Bluetooth V2.0/3.0		
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)		
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK		
Number of Channel:	79		
Hopping Channel Type:	Adaptive Frequency Hopping systems		
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated		
Antenna Gain*:	<input checked="" type="checkbox"/> Provided by client		
	-2.33dBi		
RF Cable*:	<input checked="" type="checkbox"/> Provided by client		
	0.5dB(0.6~1GHz)	0.8dB(1.4~2GHz)	1.0dB(2.1~2.7GHz)
	1.5dB(3~4GHz)	1.8dB(4.4~6GHz)	
<p>Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.</p> <p>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.</p>			



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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		

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



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3.5 Test Environment

Environment Parameter	86-106 kPa Selected Values During Tests	
Relative Humidity	25-75 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	21-25	3.8
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(c)
<p>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.</p> <p>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.</p>	
<p>The antenna is integrated and no consideration of replacement.</p> <p>The best case gain of the antenna is -2.33dBi.</p>	



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

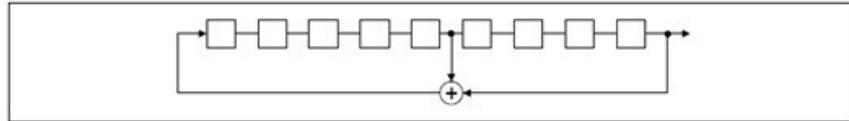
> Length of pseudo-random sequence: $2^9 - 1 = 511$ bits

> Longest sequence of zeros: 8 (non-inverted signal)

Linear Feedback Shift Register for Generation of the PRBS sequence

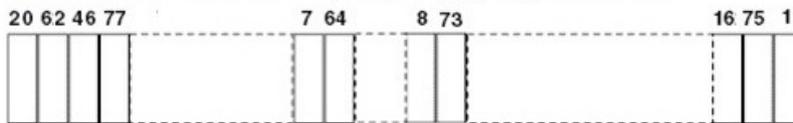
An example of Pseudorandom Frequency Hopping Sequence as follow:





Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



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):

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.



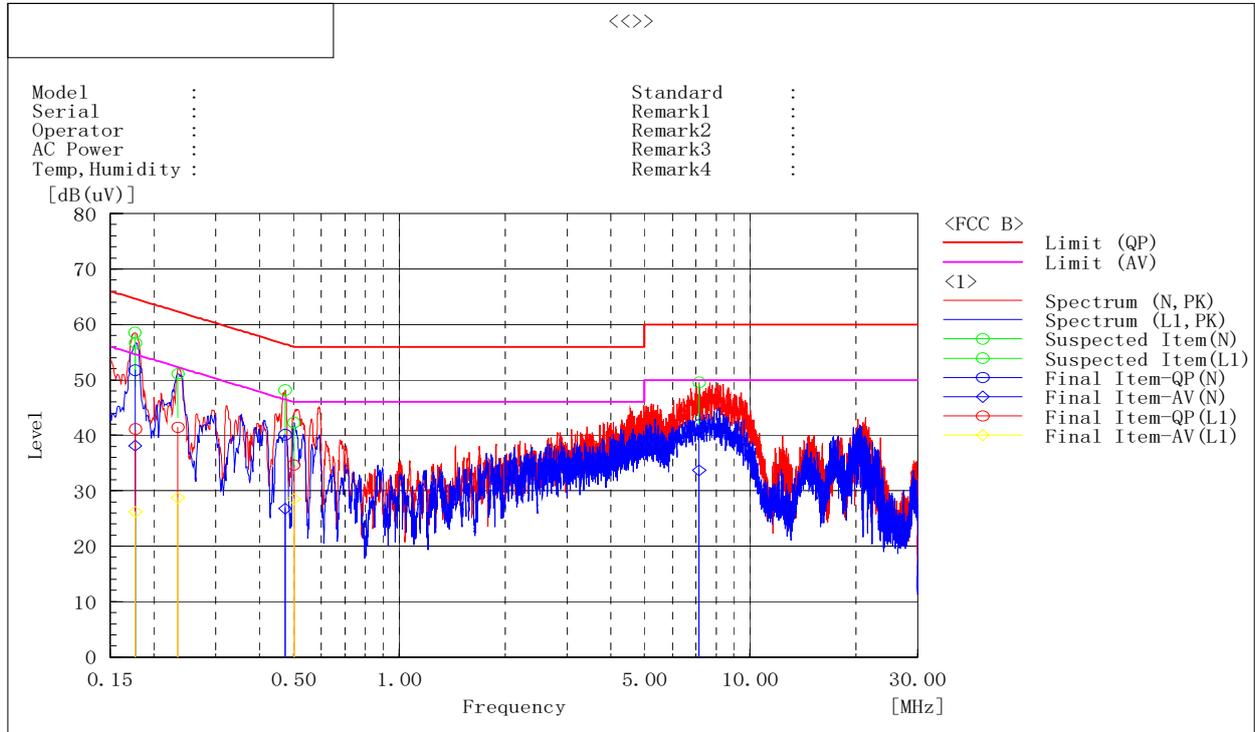
4.3 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		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 logarithm of the frequency.			
Test Procedure:	<p>The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.</p> <p>Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.</p> <p>All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.</p> <p>All support equipment power received from a second LISN.</p> <p>Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.</p> <p>The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.</p> <p>During the above scans, the emissions were maximized by cable manipulation.</p> <p>The test mode(s) described in clause 2.4 were scanned during the preliminary test.</p> <p>After the preliminary scan, we found the test mode producing the highest emission level.</p> <p>The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.</p> <p>EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.</p> <p>A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.</p> <p>Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.</p> <p>The test data of the worst-case condition(s) was recorded.</p> <p>The bandwidth of test receiver is set at 9 kHz.</p>		



<p>Test Setup:</p>	
<p>Test Mode:</p>	<p>Non-hopping transmitting mode with all kind of modulation and all kind of data type at the lowest, middle, high channel. Charge + Transmitting mode.</p>
<p>Final Test Mode:</p>	<p>Through Pre-scan, find the DH5 of data type and GFSK modulation at the lowest channel is the worst case. Charge + Transmitting mode Only the worst case is recorded in the report.</p>
<p>Instruments Used:</p>	<p>Refer to section 6 for details.</p>
<p>Test Results:</p>	<p>Pass</p>
<p>Note:</p>	<p>Note1: All emissions not reported below are too low against the prescribed limits. Note2: “-----” means Peak detection; “-----” means Average detection. Note3: According the pre-test, the worst case is transmitting and charging mode.</p>





Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17683	42.1	28.5	9.7	51.8	38.2	64.6	54.6	12.8	16.4
2	0.47356	30.4	17.1	9.7	40.1	26.8	56.5	46.5	16.4	19.7
3	7.15728	31.9	23.8	9.9	41.8	33.7	60.0	50.0	18.2	16.3

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17742	31.4	16.5	9.7	41.1	26.2	64.6	54.6	23.5	28.4
2	0.2343	31.8	19.0	9.7	41.5	28.7	62.3	52.3	20.8	23.6
3	0.50147	25.0	18.8	9.7	34.7	28.5	56.0	46.0	21.3	17.5

Note1) Level (Quasi-Peak and/or C/Average) = Meter Reading + Factor

Note2) Line = Polarity of input power (Live or Neutral)

N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity,

Note3) Factor = LISN Insertion Loss + Cable Loss

Note4) Margin = Limit – Level (Quasi-Peak and/or C/Average)

Note5) C/Average : Abbreviation of CISPR Average



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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:	
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 $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Limit:	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
Test procedure:	Connect each EUT's antenna output to power sensor by RF cable and attenuator. Measure the PK output power of each antenna port by power sensor.
Re-Test statement:	The EUT is operating at the same power level with the original testing of SGS-CSTC Standards Technical Services, Co., Ltd. Shenzhen Branch.
Test Results:	Pass



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Test results:

Remark

	The Original Reports	Re-Test Reports
File name:	test report BLE	DDT-B21122006-1E03
Test location:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch	Tianjin Dongdian Testing Service Co., Ltd.

Power

Mode	Test Channel	The Original Reports Level [dBm]	Re-Test Reports Level [dBm]	Power level
BLE_1M	Lowest	-3.416	-3.25	Default
	Middle	-2.159	-2.09	Default
	Highest	-2.663	-2.72	Default
BLE_2M	Lowest	-3.505	-2.63	Default
	Middle	-2.205	-2.14	Default
	Highest	-2.698	-2.77	Default



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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 C63.10:2013 Section 6.9.2 and 6.9.3
Test Setup:	
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 $\pi/4$ DQPSK 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: Appendix	



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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:	
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 $\pi/4$ DQPSK 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: Appendix	



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4.7 Hopping Channel Number

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 Section 7.8.3
Test Setup:	
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: Appendix	



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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:	
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: Appendix	



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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:	
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 $\pi/4$ DQPSK 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: Appendix	



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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:	
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 $\pi/4$ DQPSK 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: Appendix	



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Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

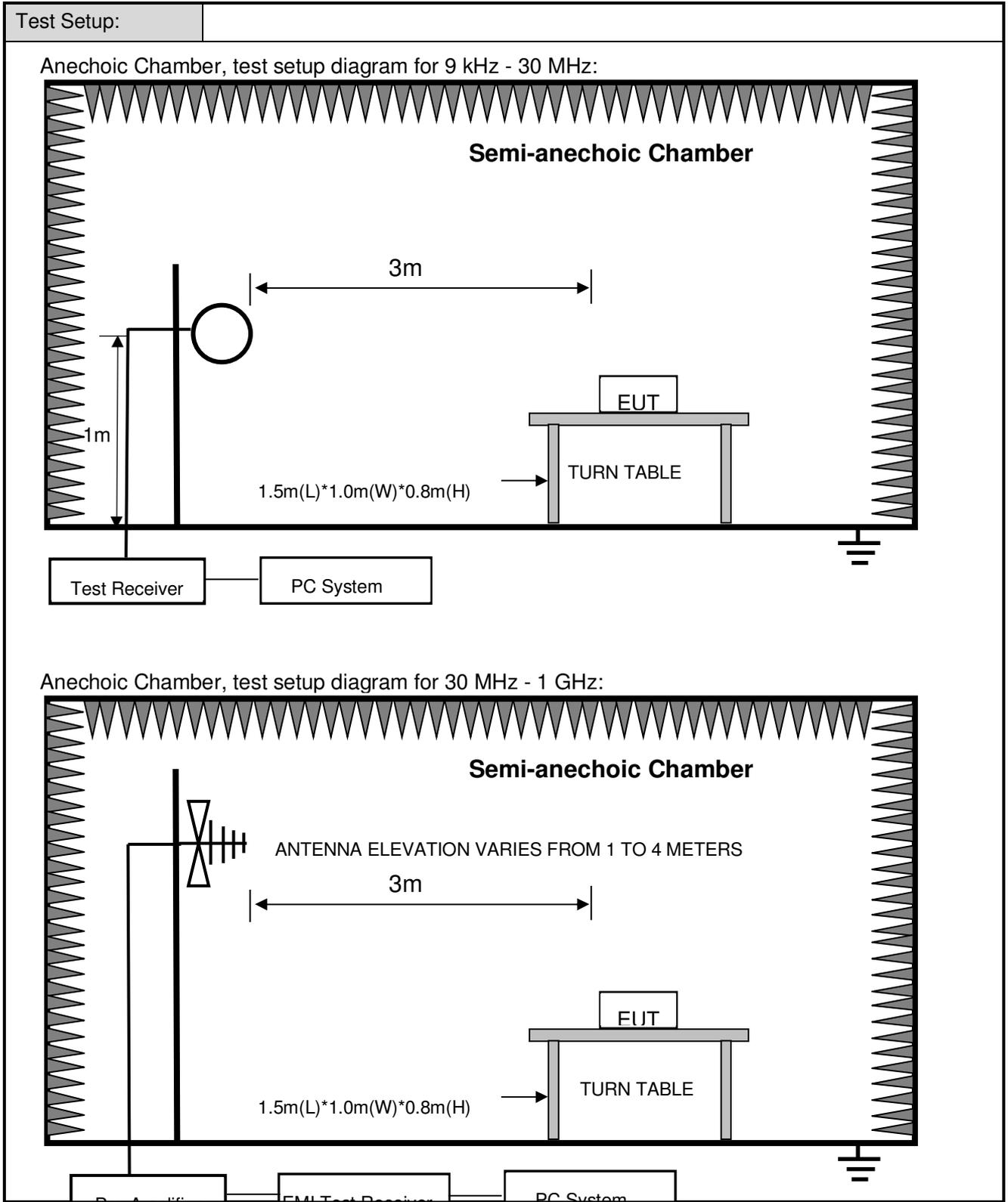
$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m)$$

(3) Limit for this EUT

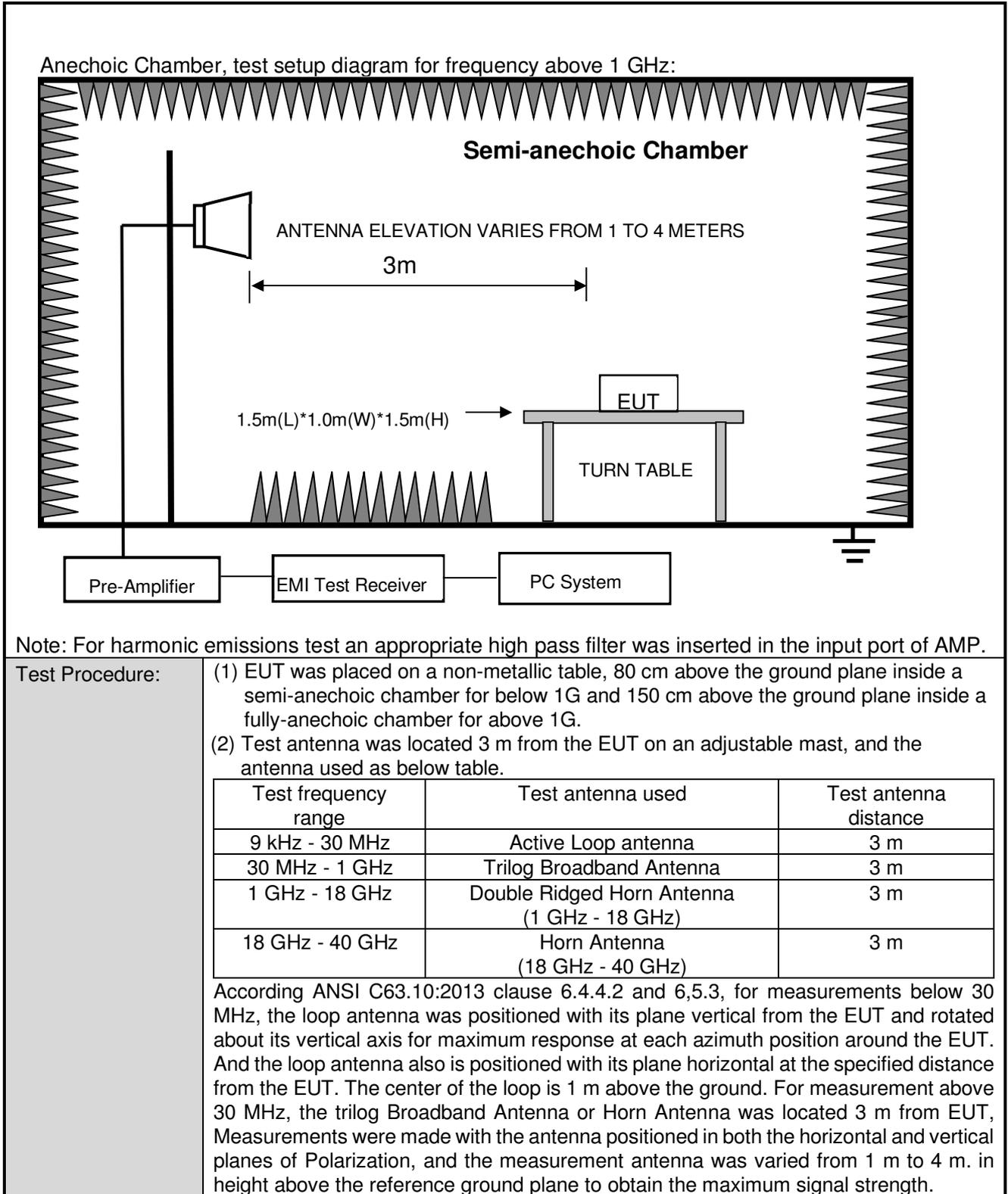
All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits.



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	<p>(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:</p> <p>(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)</p> <p>(b) Change work frequency or channel of device if practicable.</p> <p>(c) Change modulation type of device if practicable.</p> <p>(d) Change power supply range from 85% to 115% of the rated supply voltage</p> <p>(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.</p> <p>Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18 GHz to 25 GHz, so below final test was performed with frequency range from 9 kHz to 18 GHz.</p> <p>(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.</p> <p>(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.</p> <p>(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.</p> <table border="1" data-bbox="571 1238 1313 1375"> <thead> <tr> <th>Frequency band</th> <th>RBW</th> </tr> </thead> <tbody> <tr> <td>9 kHz - 150 kHz</td> <td>200 Hz</td> </tr> <tr> <td>150 kHz - 30 MHz</td> <td>9 kHz</td> </tr> <tr> <td>30 MHz - 1 GHz</td> <td>120 kHz</td> </tr> </tbody> </table> <p>(7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; According ANSI C63.10:2013 clause 4.1.4.2.2 procedure for average measure.</p> <p>(8) X axis, Y axis, Z axis are tested, and worse setup X axis is reported.</p>	Frequency band	RBW	9 kHz - 150 kHz	200 Hz	150 kHz - 30 MHz	9 kHz	30 MHz - 1 GHz	120 kHz
Frequency band	RBW								
9 kHz - 150 kHz	200 Hz								
150 kHz - 30 MHz	9 kHz								
30 MHz - 1 GHz	120 kHz								
<p>Exploratory Test Mode:</p>	<p>Non-hopping transmitting mode with all kind of modulation and all kind of data type Charge + Transmitting mode.</p>								
<p>Final Test Mode:</p>	<p>Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case. 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.</p>								
<p>Instruments Used:</p>	<p>Refer to section 6 for details</p>								
<p>Test Results:</p>	<p>Pass</p>								



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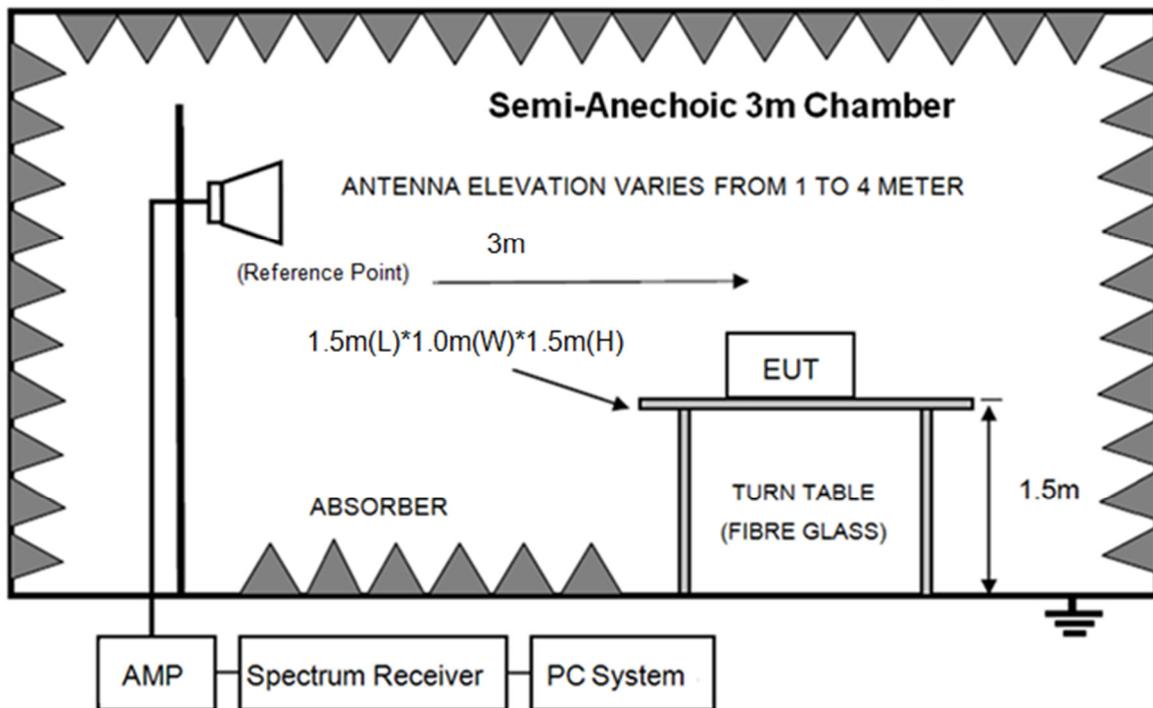
Note:	<p>All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limits.</p> <p>Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.</p> <p>Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in DH5 transmitting and charging mode.</p> <p>Note3: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.</p>
The detailed test data see: Appendix	



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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: 2013
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)
Limit:	All restriction band should comply with 15.209, other emission should be at least 20 dB below the fundamental.
Test Setup:	



Test Procedure:	Same with clause 10.3 except change investigated frequency range from 2310 MHz to 2410 MHz and 2475 MHz to 2550 MHz. Remark: All restriction band have been tested, and only the worst case is shown in report.
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



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Test Results:	Pass
Note:	hopping on and hopping off mode all have been test, hopping off mode is worse and reported only.
The detailed test data see: Appendix	



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

Lab A:

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB

Lab B:

Test Item	Uncertainty
Uncertainty for Radiation Emission Test (30 MHz - 1 GHz)	2.72 dB (Antenna Polarize: V)
	2.72 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission Test (1 GHz - 40 GHz)	2.74 dB (1 - 6 GHz)
	2.72 dB (6 GHz - 18 GHz)
	3.54 dB (18 GHz - 26 GHz)
	4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power Line Conduction Emission Test	3.40 dB (150 kHz - 30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	



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6 Equipment List

Lab A:

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	2019/4/9	2020/4/8
Signal Analyzer	Agilent	N9020A	W025-01	2019/6/25	2020/6/24
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2019/7/14	2020/7/13
Humidity/ Temperature Indicator	MingGao	TH101B	W006-05	2019/6/27	2020/6/26



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Lab B:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (MWRftest system)					
Microwave Signal Generator	R&S	SMF100A	101396	2021/05/25	1 Year
MXG Vector Signal Generator	Agilent	N5182A	MY50143288	2021/03/08	1 Year
EMI Test Receiver	R&S	ESU26	100243	2021/03/03	1 Year
Wideband Radio Communication Tester	R&S	CMW500	158800	2021/05/14	1 Year
Power Detector	MWRftest	MW100-PSB	MW201203008	2021/03/31	1 Year
DC Power Supply	inSTEK	PSP-2010	EH131319	2021/02/27	1 Year
Test Software	MWRftest	MTS8310	V03	N/A	N/A
Radiated Emission -10m EMI Chamber					
EXA Signal Analyzer	Keysight	N9010A	MY53281492	2021/03/31	1 Year
Active Loop Antenna	R&S	HFH2-Z2	100269	2021/05/08	1 Year
Double-Ridged Guide Horn Antenna	ETS-LINDGREN	3115	00102808	2021/03/16	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	2021/04/21	1 Year
Broadband Horn Antenna	TESEQ	BHA 9118	31754	2021/10/12	1 Year
Low noise amplifier	MITEQ	TPA0118-36	0914	2021/02/03	1 Year
EMI Test Receiver	R&S	ESCI	101024	2021/03/03	1 Year
EMI Test Receiver	R&S	ESCI	101030	2021/05/15	1 Year
Bilog Antenna	TESEQ	CBL6112D	29068	2020/10/12	2 Year
Bilog Antenna	TESEQ	CBL6112D	29069	2020/10/12	2 Year
Amplifier	Sonoma	310N	300913	2021/03/03	1 Year
Amplifier	Sonoma	310N	300914	2021/03/03	1 Year
Ant Mast	Innco	MA4000	N/A	N/A	N/A
Ant Mast	Innco	MA4000	N/A	N/A	N/A
Mast Controller	Innco	CO2000	N/A	N/A	N/A
Mast Controller	Innco	CO2000	N/A	N/A	N/A
RF Selector 4CH	TOYO	NS4904N	Selector1	N/A	N/A
RF Selector 4CH	TOYO	NS4904N	Selector2	N/A	N/A
Test software	TOYO	EP5/RSE	Ver 1.9.1	N/A	N/A
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
Test Receiver	R&S	ESCI	101397	2021/03/03	1 Year
LISN	R&S	ENV216	101122	2021/03/31	1 Year
Test software	TOYO	EP5/CE	V 5.4.40	N/A	N/A



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7 Photographs – Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.





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Appendix



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20dB Emission Bandwidth & 99% Occupied Bandwidth

Test Results

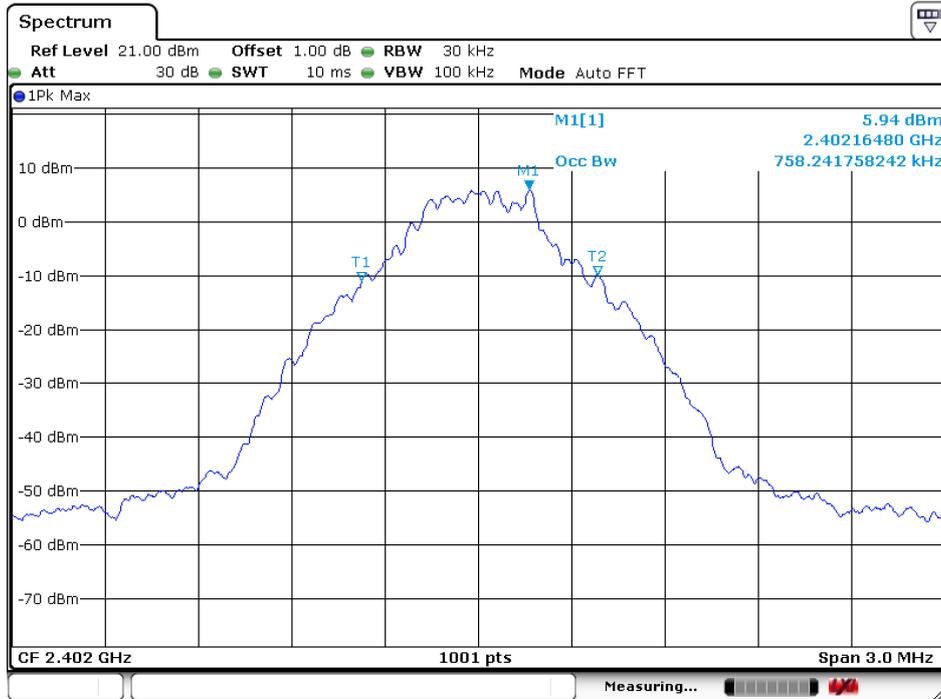
Mode	Test Channel	99% Occupied Bandwidth (KHz)	20dB Emission Bandwidth (KHz)	Result
GFSK	Lowest	758.2	815.2	Pass
	Middle	755.2	812.2	Pass
	Highest	755.2	815.2	Pass
π/4DQPSK	Lowest	1144.9	1255.7	Pass
	Middle	1141.9	1258.7	Pass
	Highest	1144.9	1252.7	Pass
8DPSK	Lowest	1144.9	1252.7	Pass
	Middle	1147.9	1216.8	Pass
	Highest	1144.9	1252.7	Pass



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Test plots

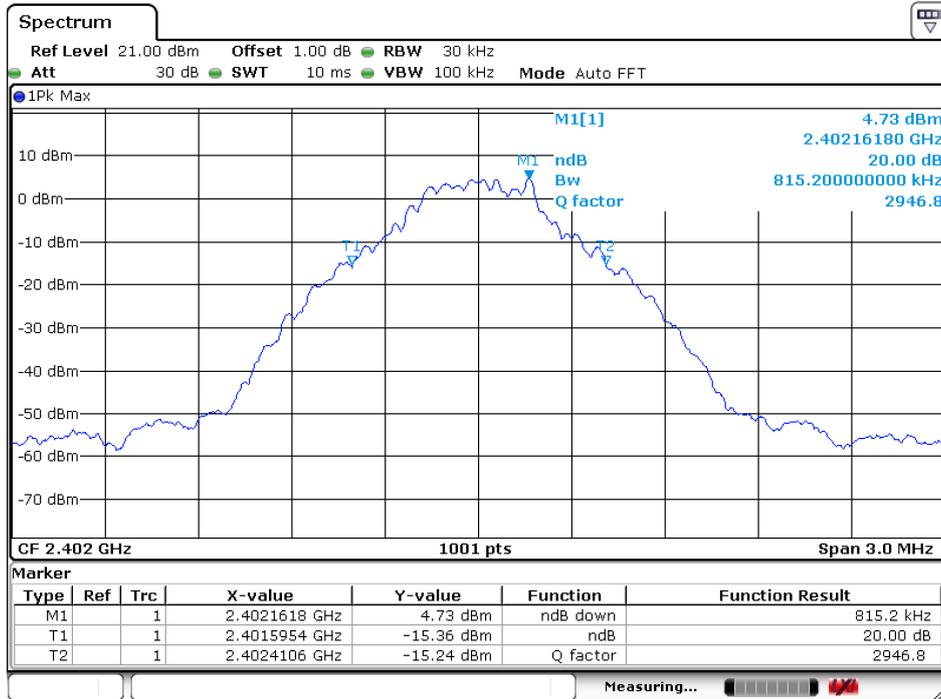
GFSK _Lowest Channel



Date: 23.OCT.2019 02:46:00



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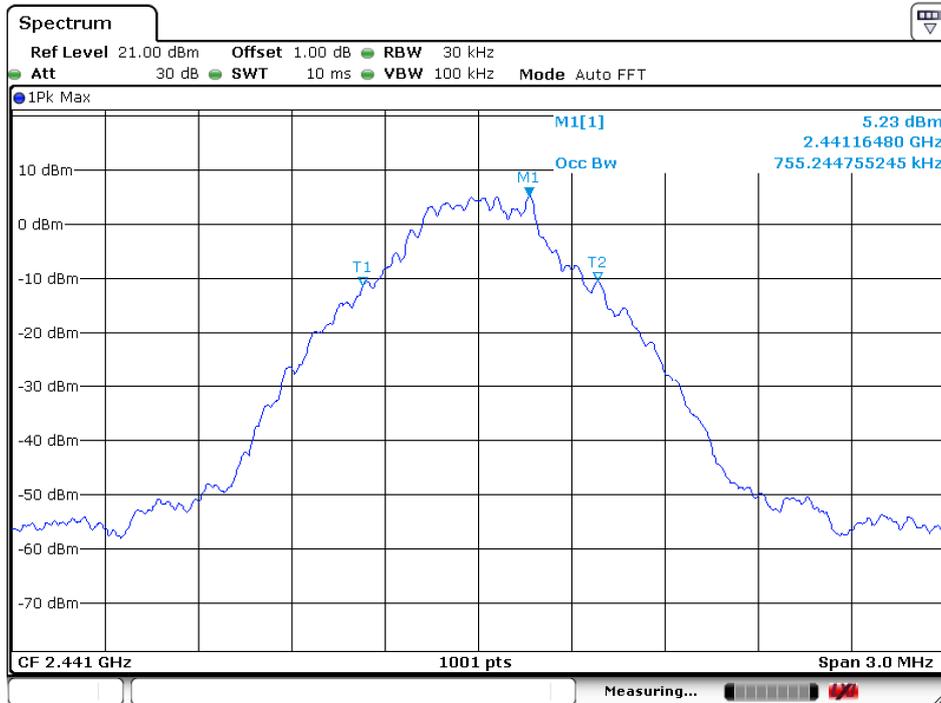


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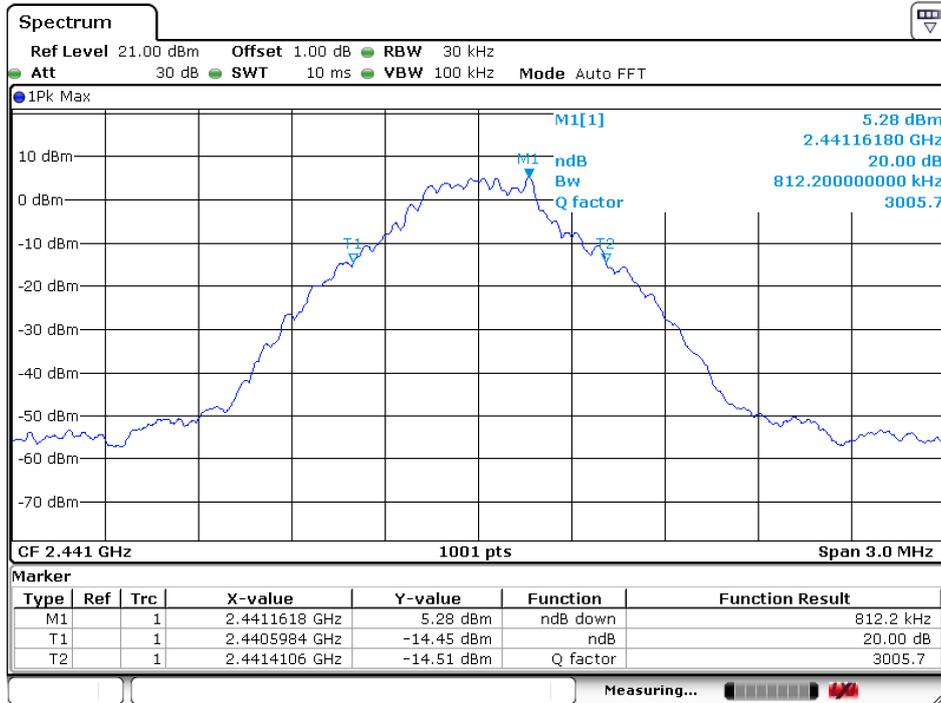
GFSK _Middle Channel



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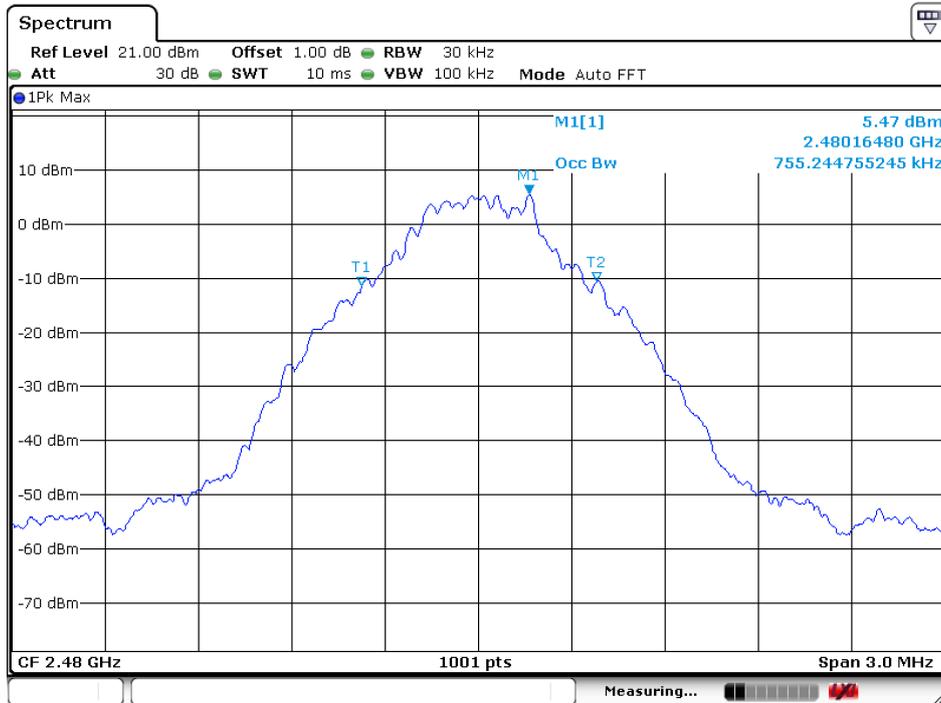
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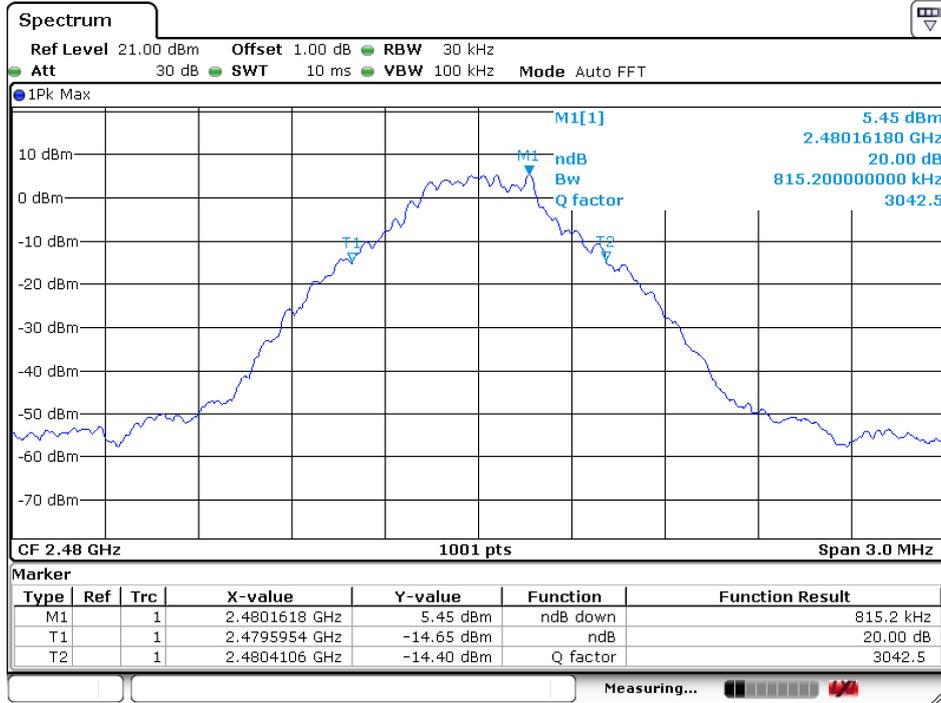
GFSK_Highest Channel



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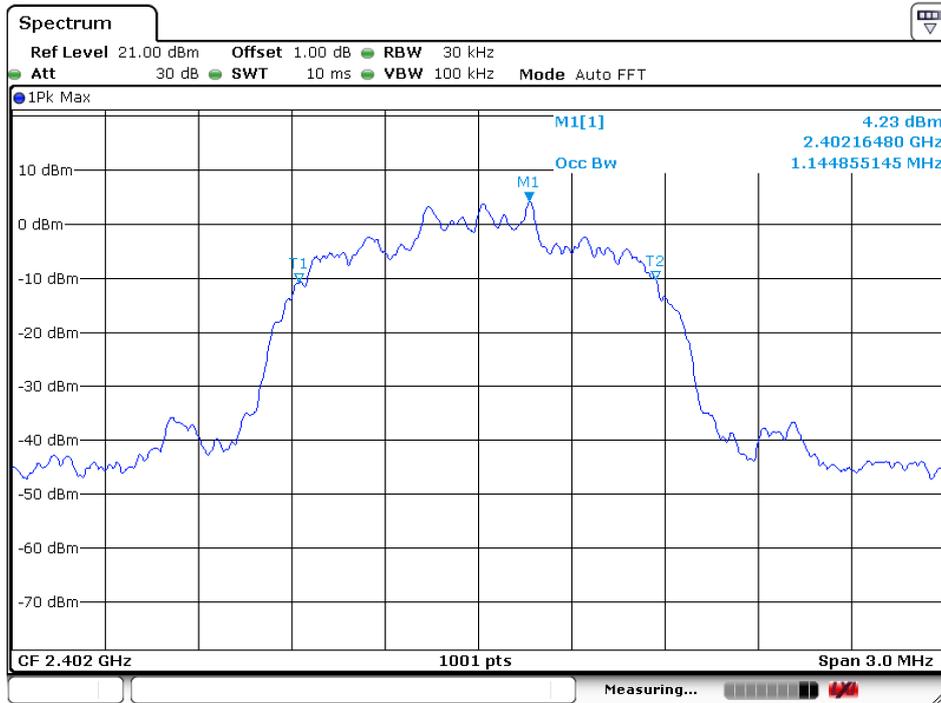


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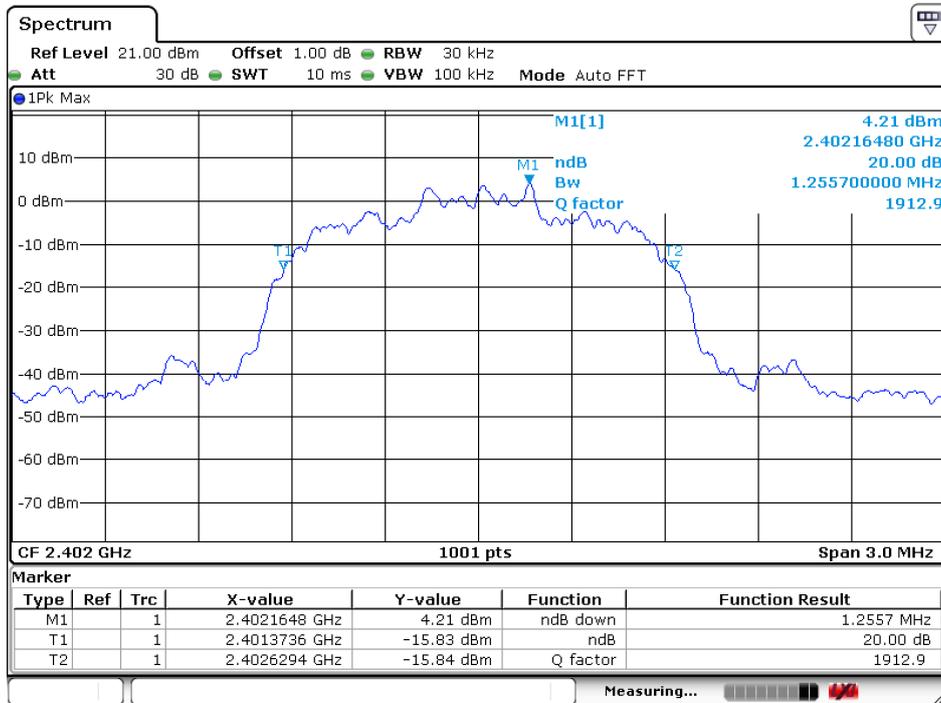


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π /4DQPSK Lowest Channel



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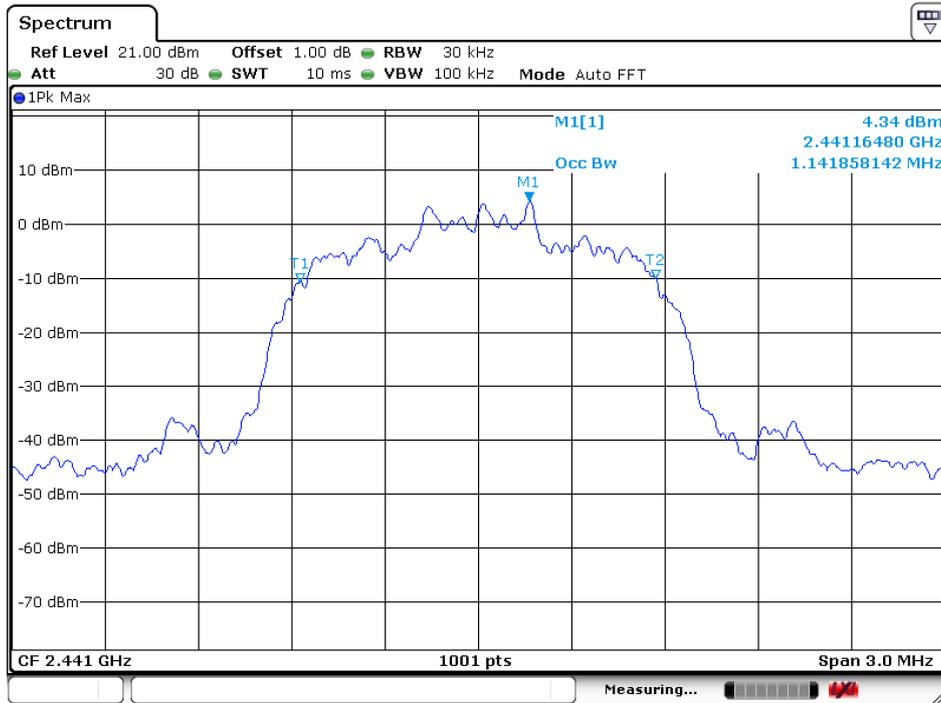


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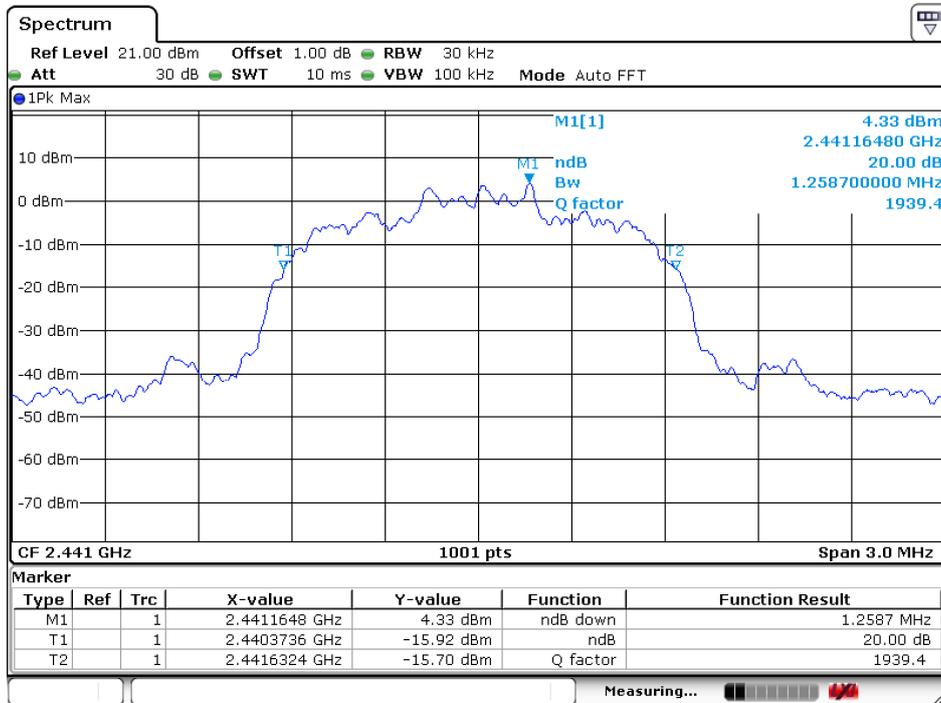
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π /4DQPSK Middle Channel



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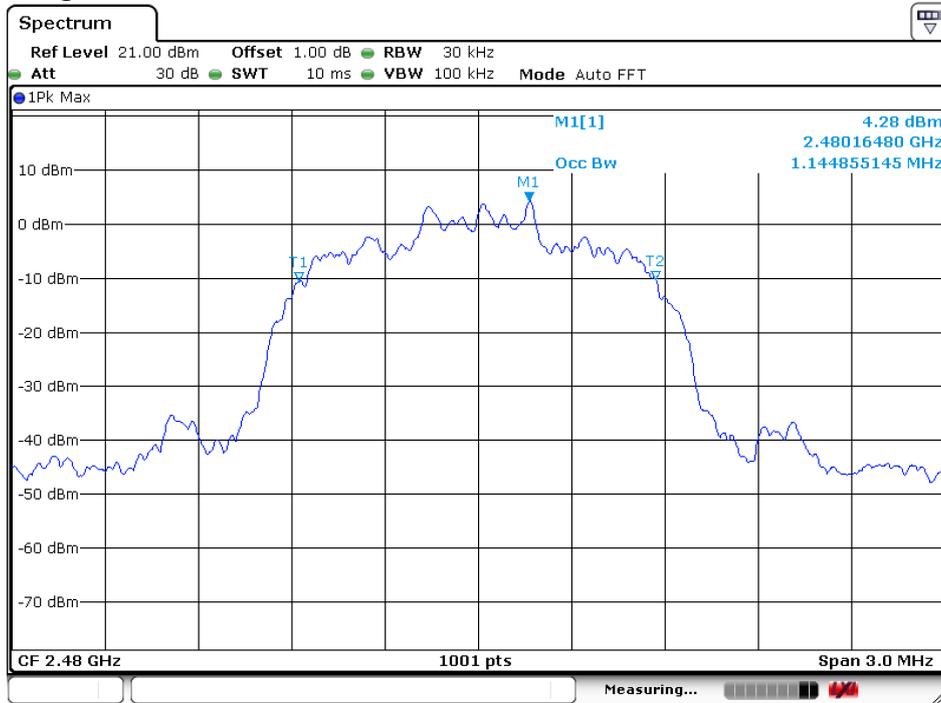


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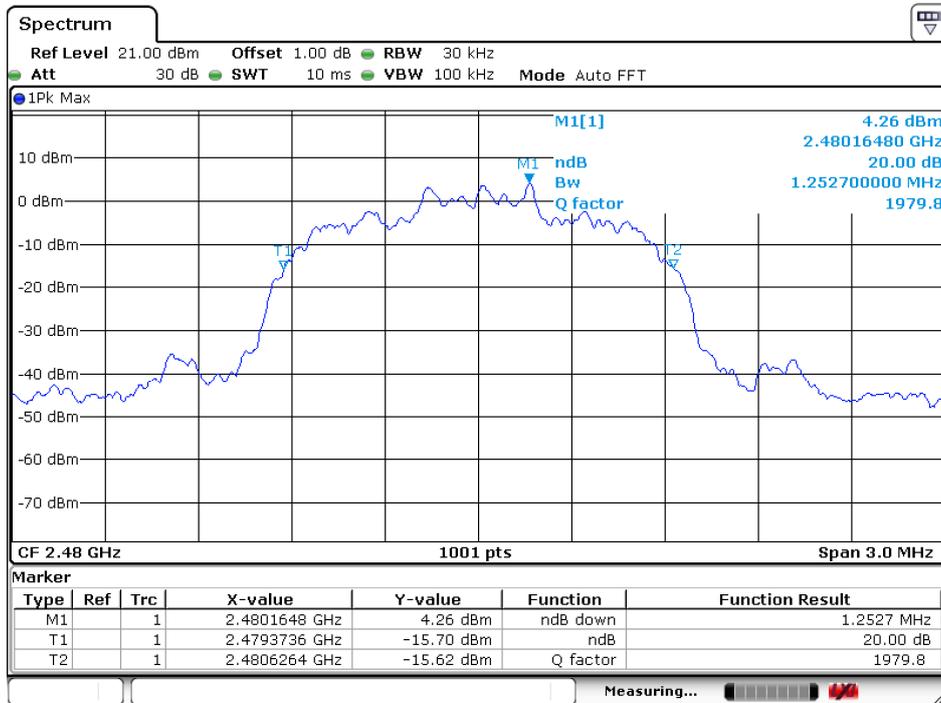


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π /4DQPSK Highest Channel



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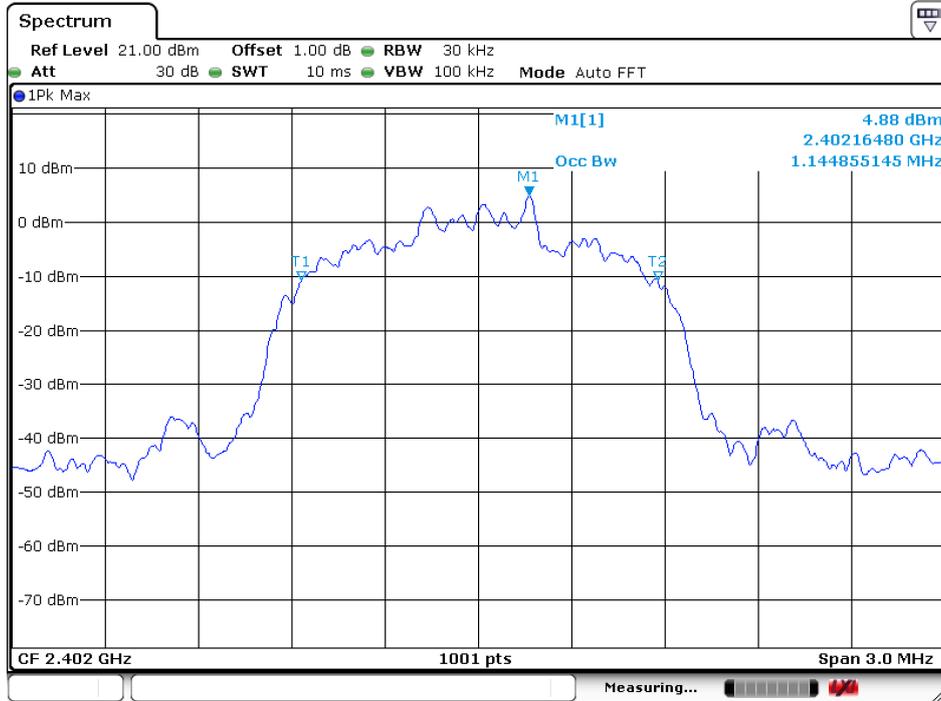


Date: 23.OCT.2019 02:55:01

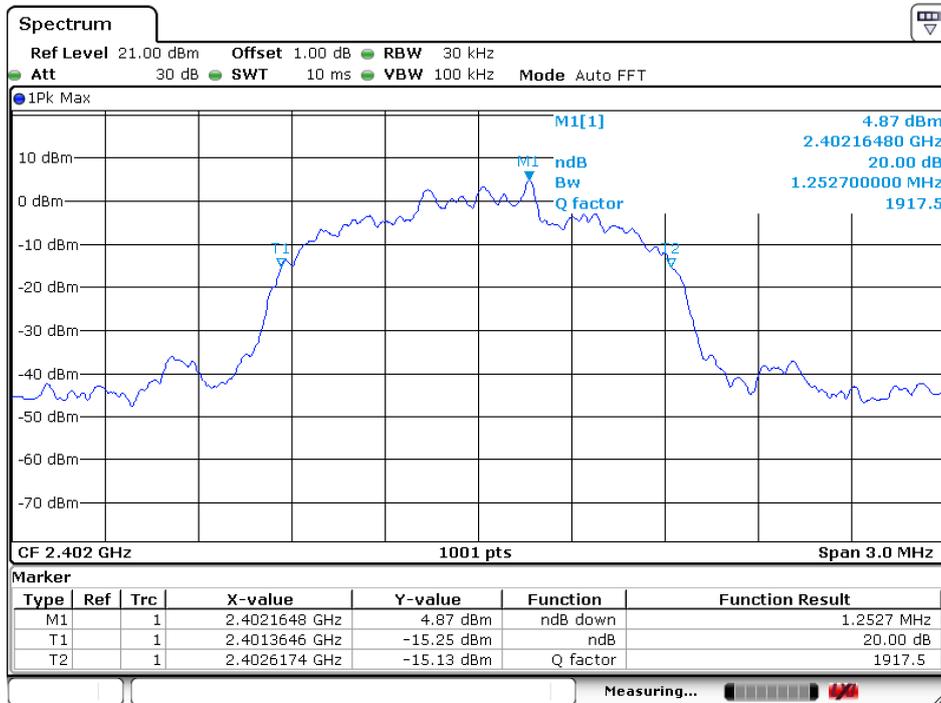


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8DPSK_Lowest Channel



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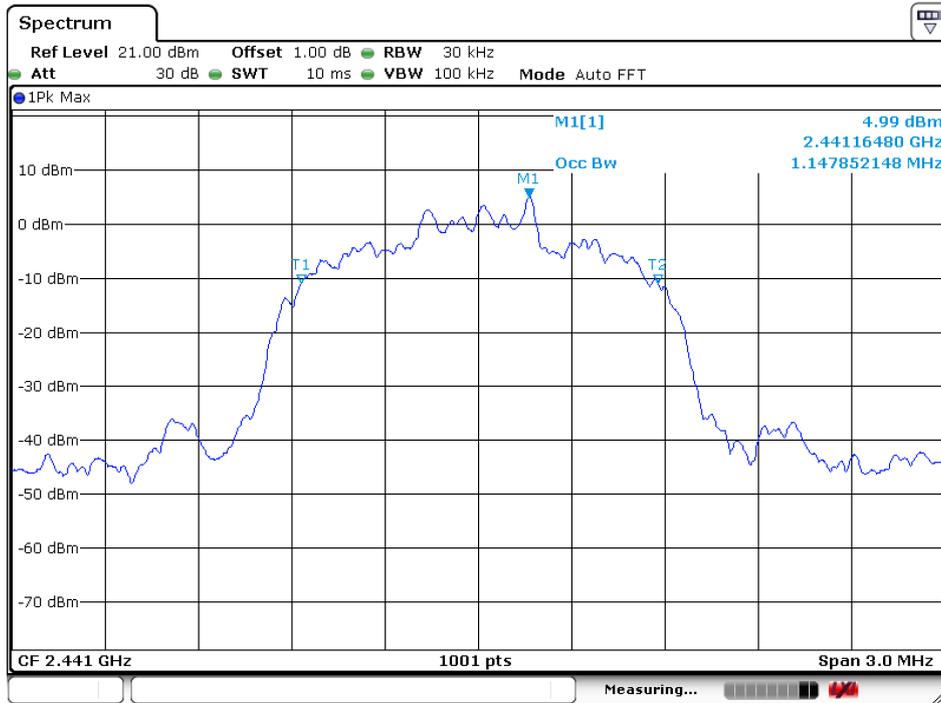


Date: 23.OCT.2019 02:53:56

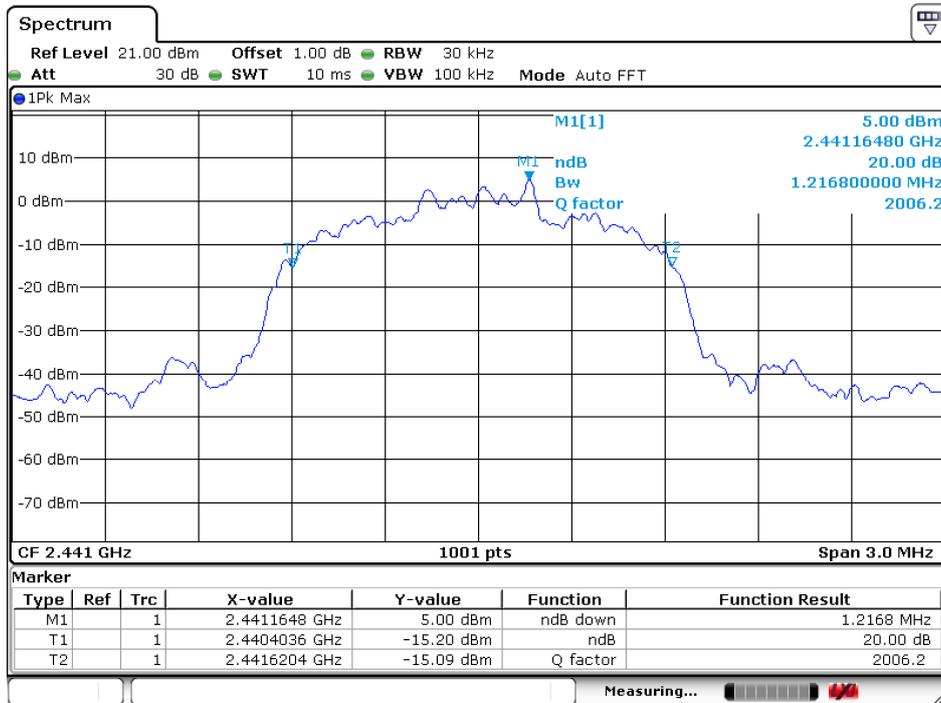


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8DPSK_Middle Channel



Date: 23.OCT.2019 02:49:32

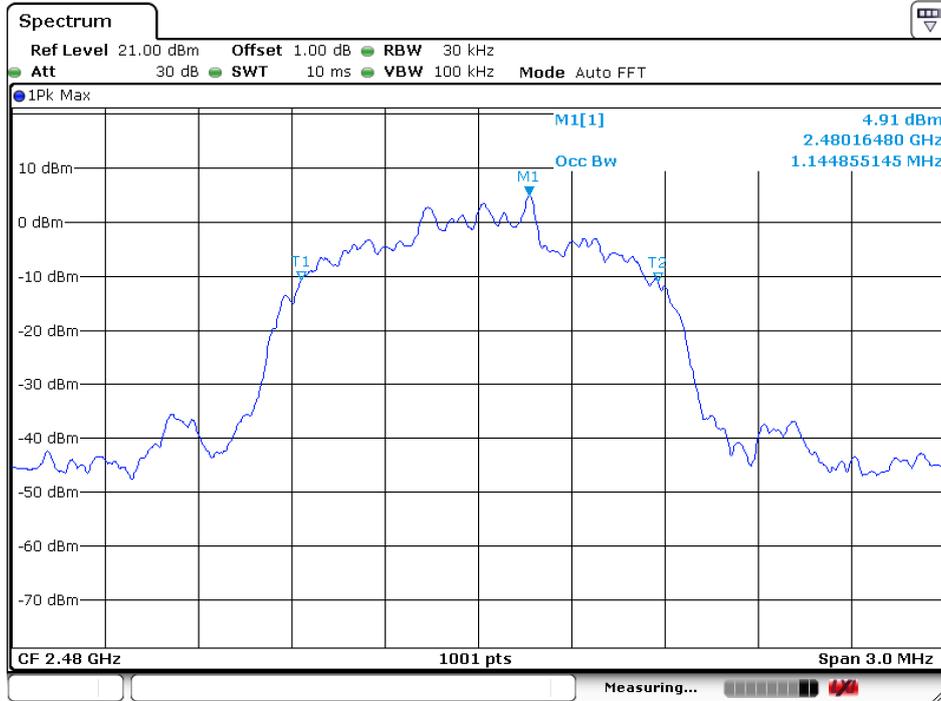


Date: 23.OCT.2019 02:53:40

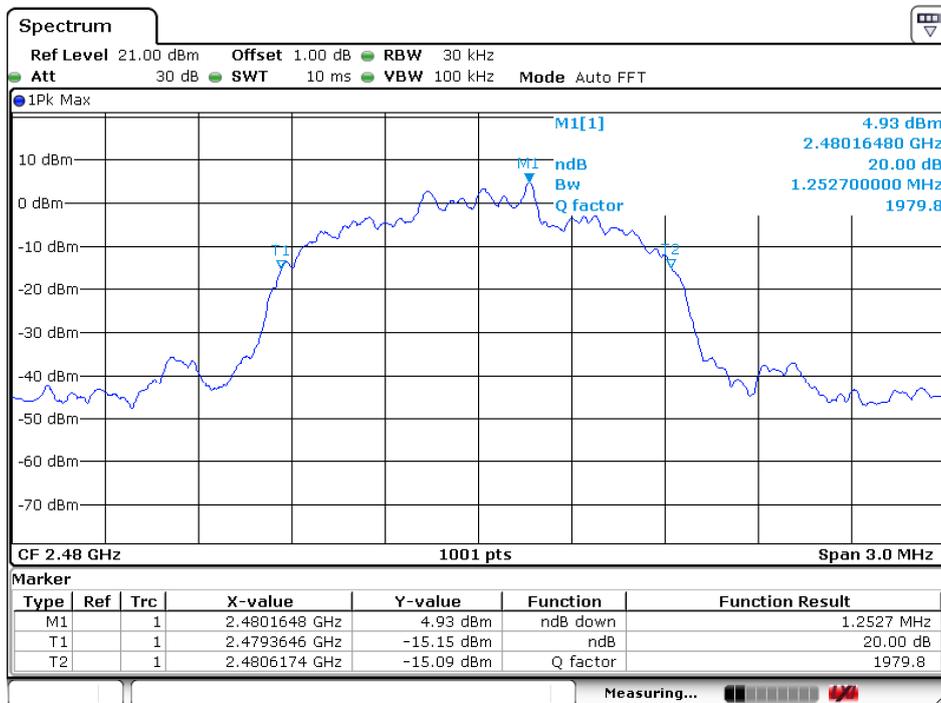


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8DPSK_Highest Channel



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Date: 23.OCT.2019 02:52:26



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Carrier Frequencies Separation

Test Results

GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Middle	998	543.5	Pass
π/4DQPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Middle	1001	839.1	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Middle	1001	835.1	Pass

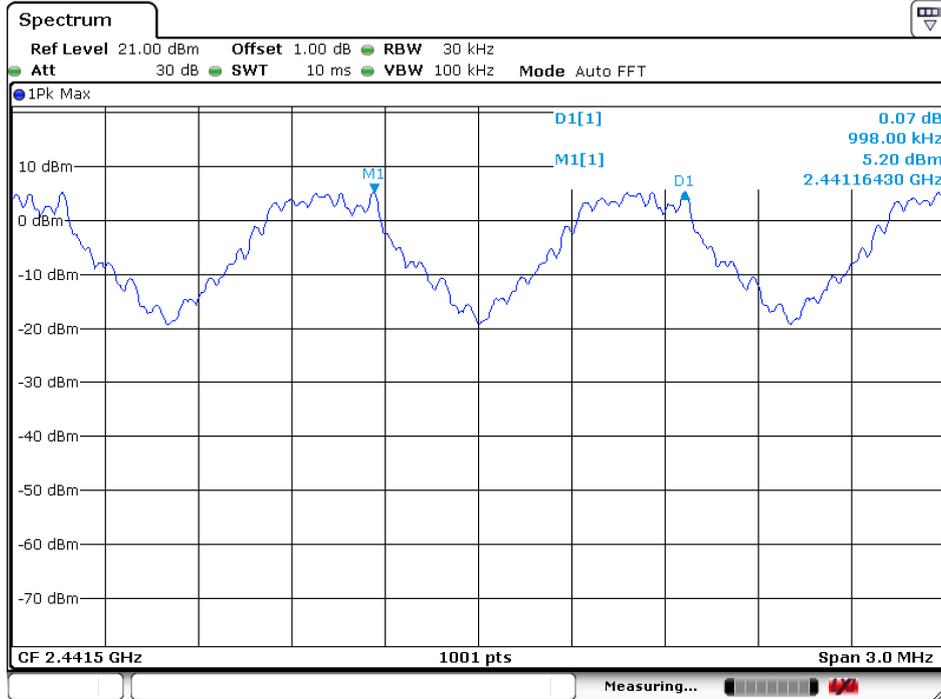
Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	815.2	543.5
π/4DQPSK	1258.7	839.1
8DPSK	1252.7	835.1



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Test plots:

Test mode:	GFSK	Test channel:	Middle
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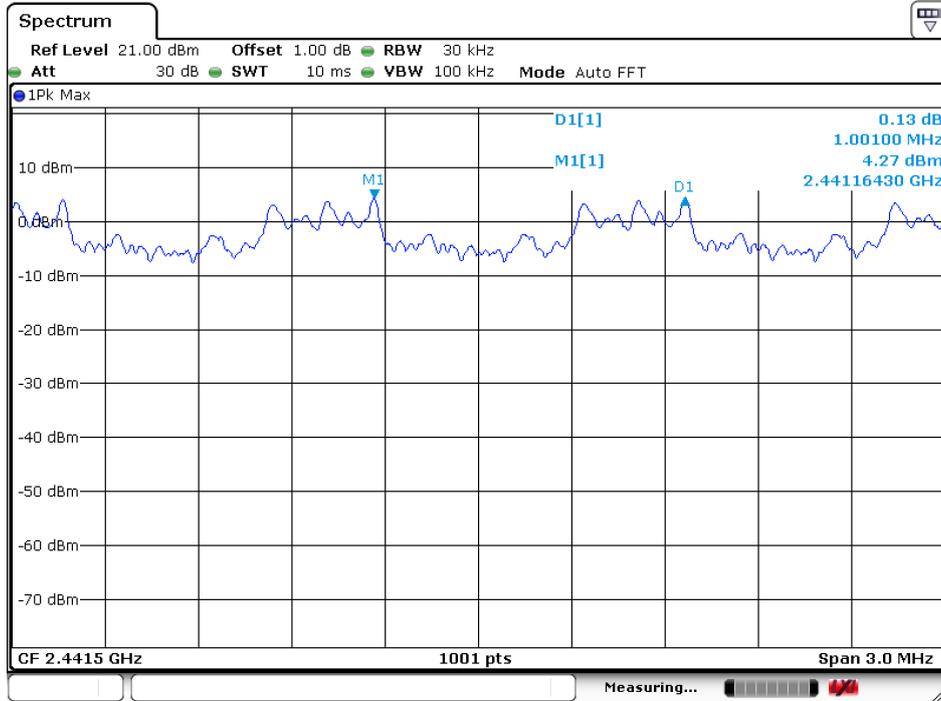


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Test mode:	$\pi/4$ DQPSK	Test channel:	Middle
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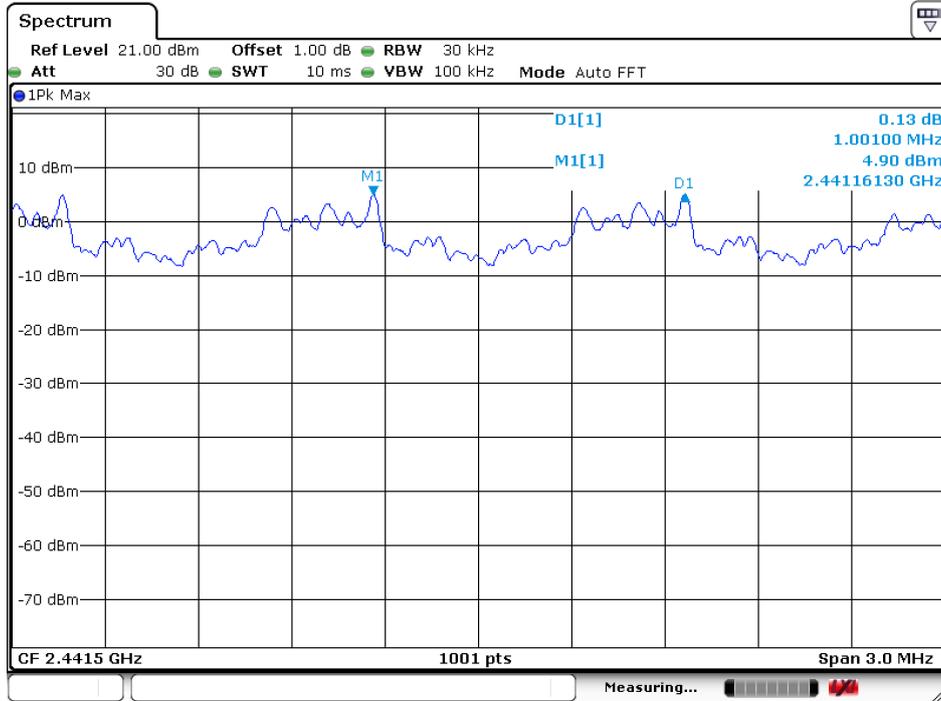


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Test mode:	8DPSK	Test channel:	Middle
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Hopping Channel Number

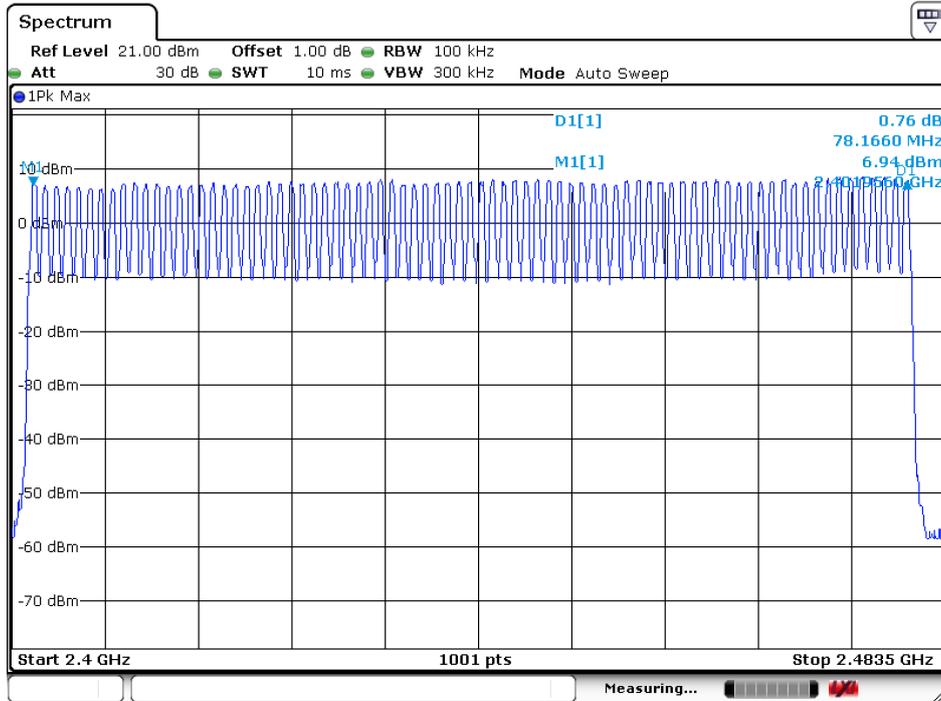
Test Results

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



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Test plots
GFSK

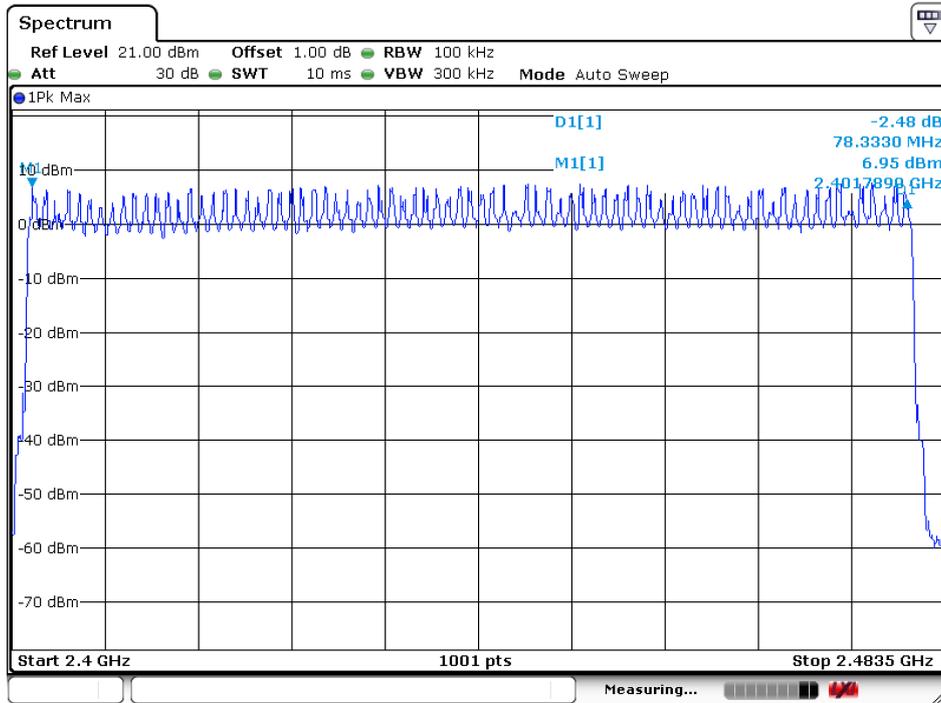


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$\pi/4$ DQPSK

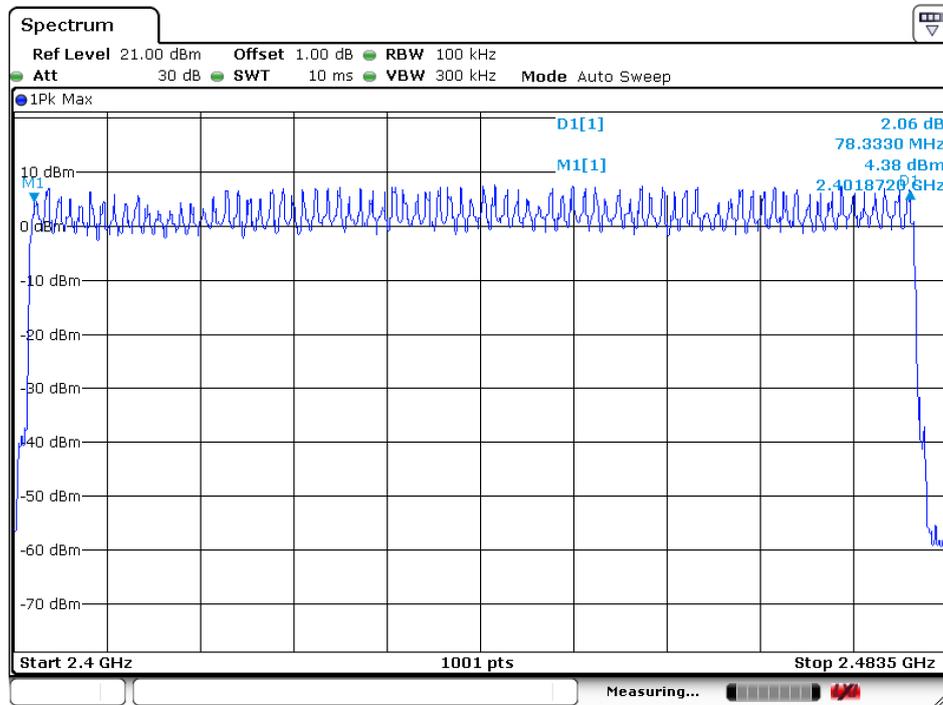


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8DPSK



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Dwell Time

Test Results

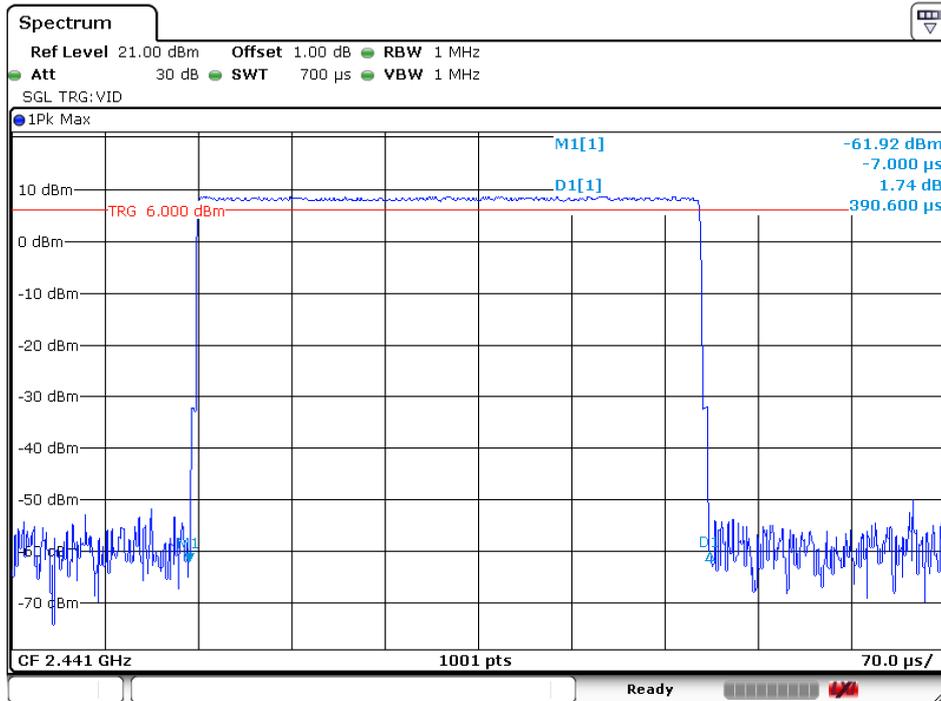
Operation Modes	On time (ms) on one channel
DH1	0.391
DH3	1.655
DH5	2.898
2-DH1	0.397
2-DH3	1.655
2-DH5	2.903
3-DH1	0.398
3-DH3	1.658
3-DH5	2.903



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Test plots

DH1 _ Middle Channel

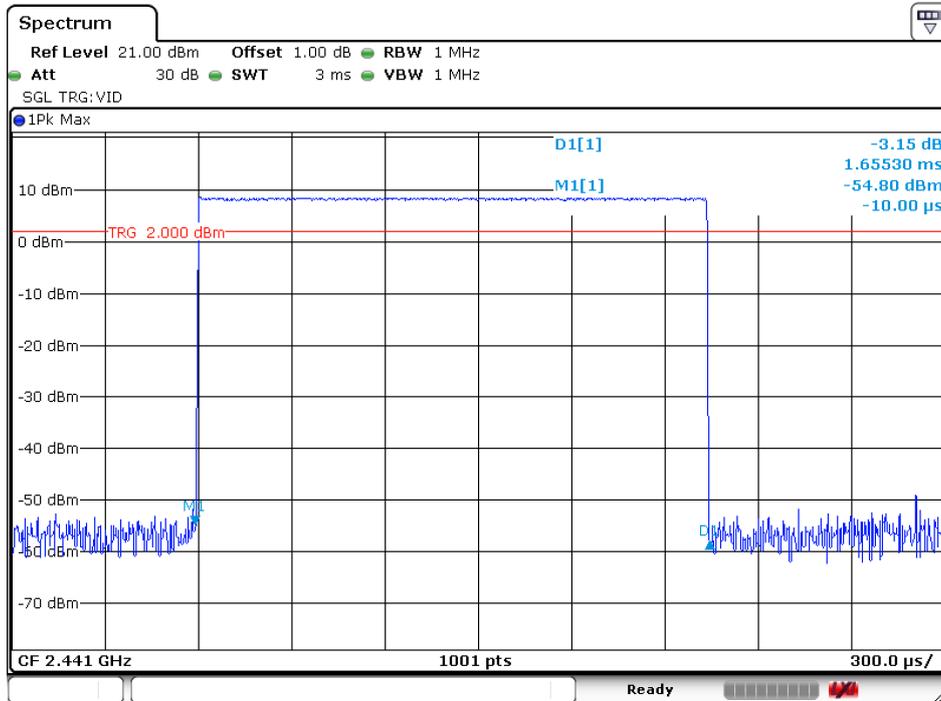


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DH3 _ Middle Channel

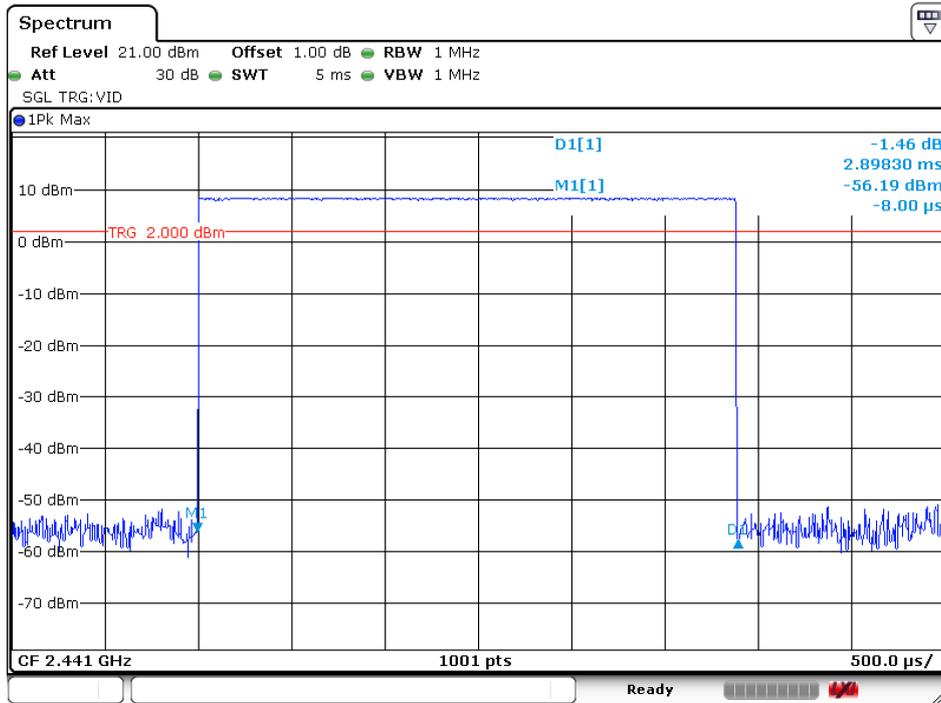


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DH5 _ Middle Channel

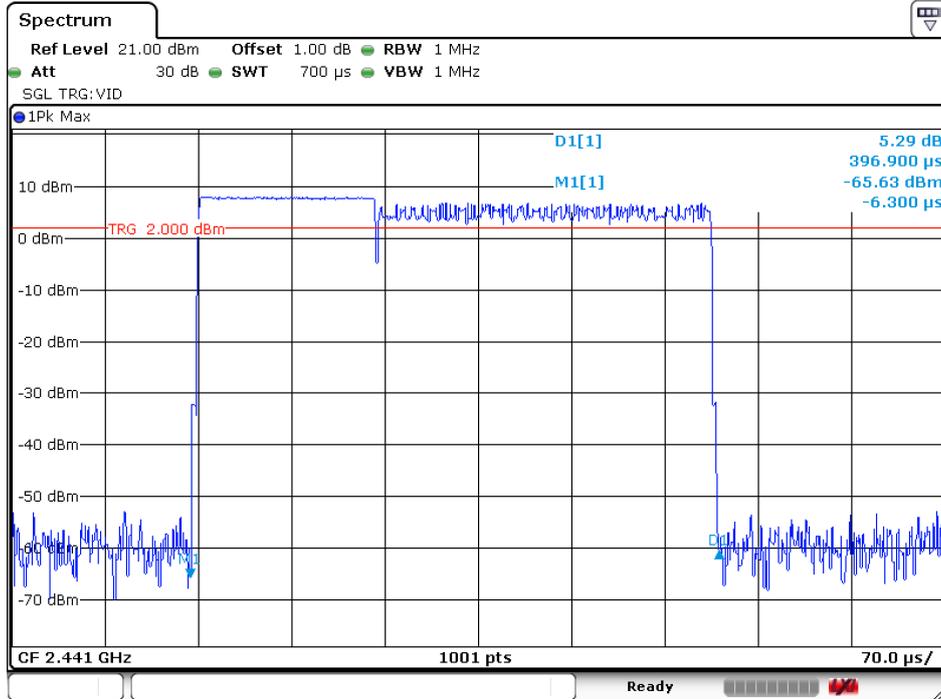


Date: 23.OCT.2019 05:50:17

2DH1 _ Middle Channel

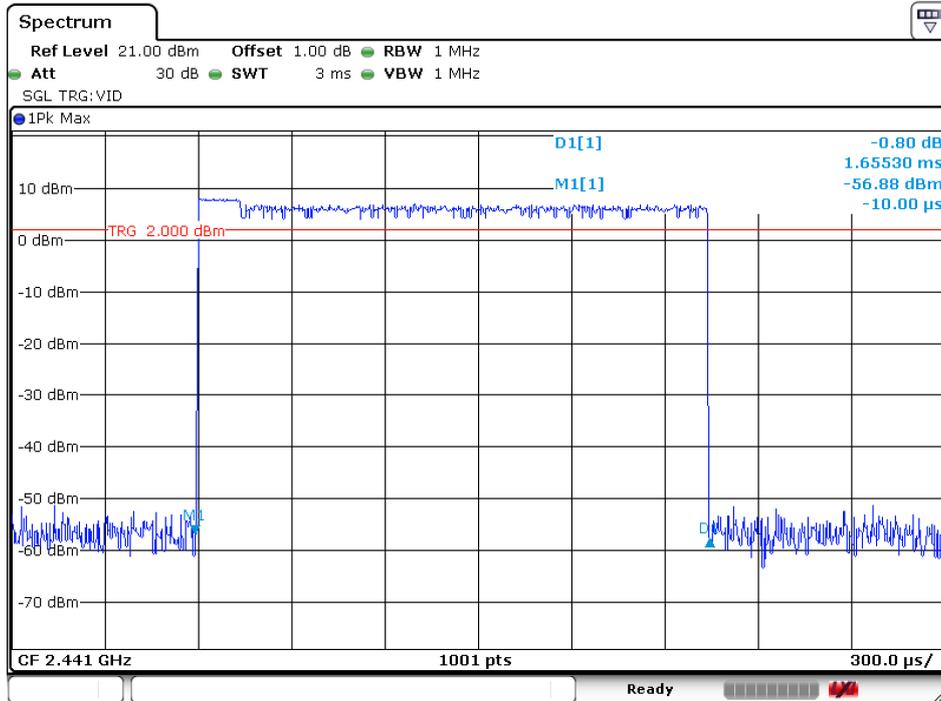


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2DH3 _ Middle Channel

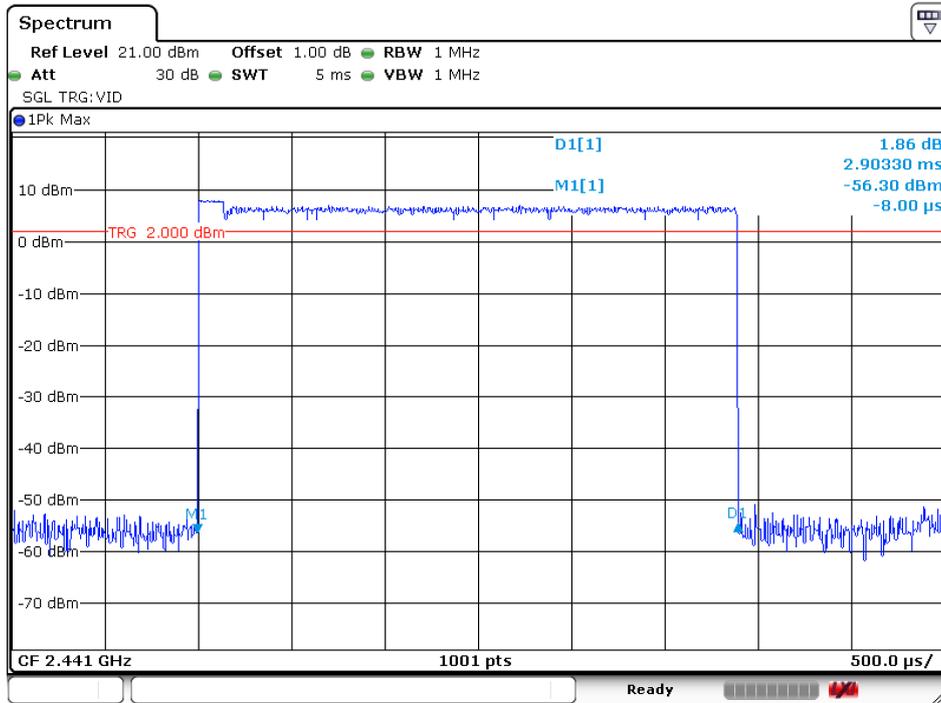


Date: 23.OCT.2019 05:49:14



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2DH5 _ Middle Channel

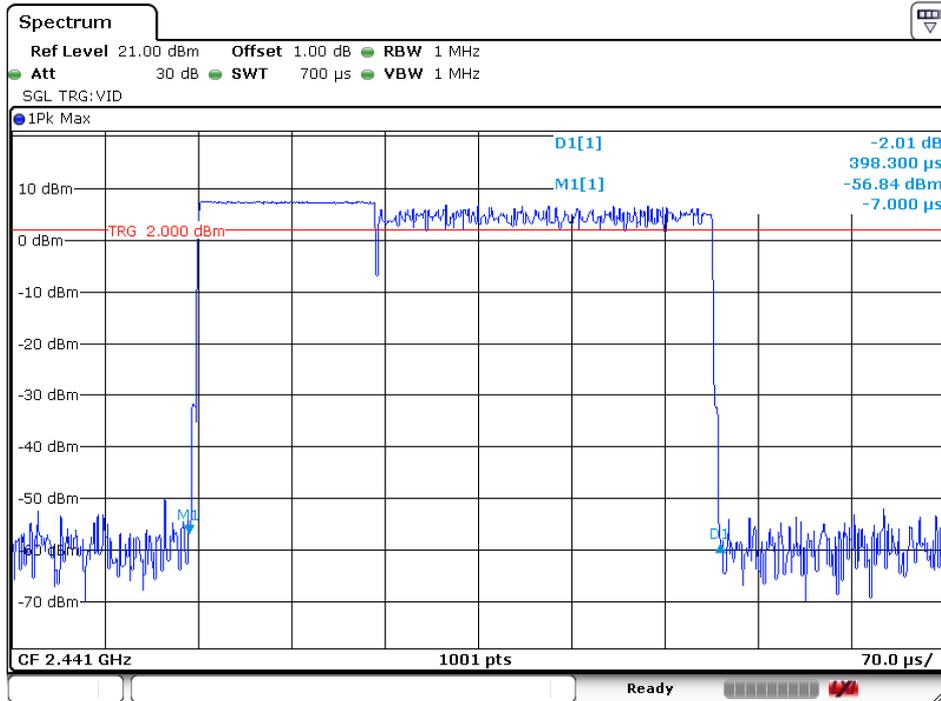


Date: 23.OCT.2019 05:50:38

3DH1 _ Middle Channel

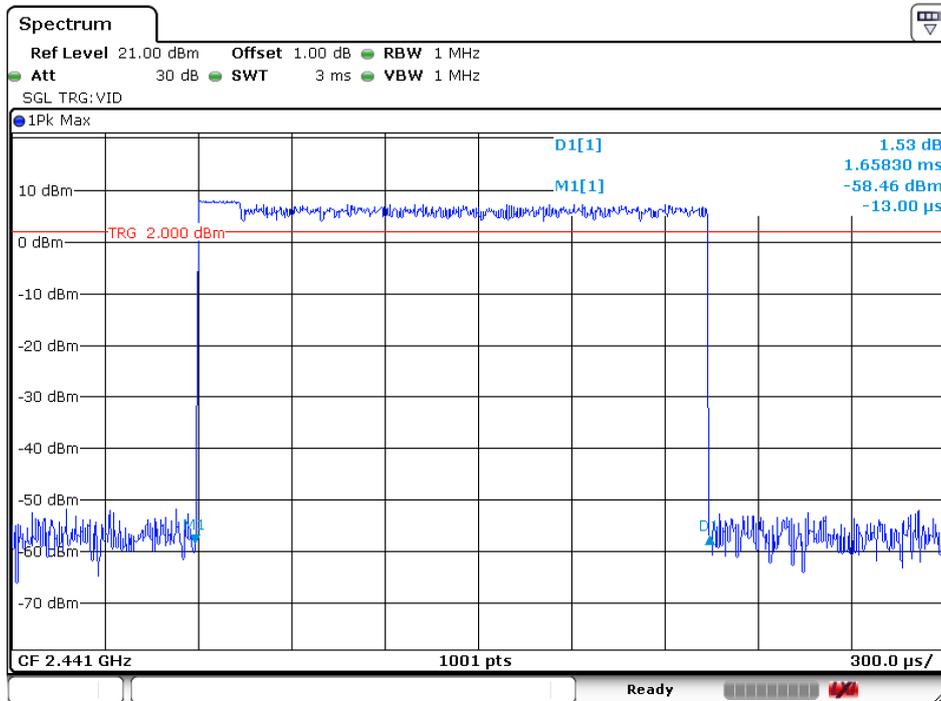


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Date: 23.OCT.2019 05:46:49

3DH3 _ Middle Channel



Date: 23.OCT.2019 05:49:37

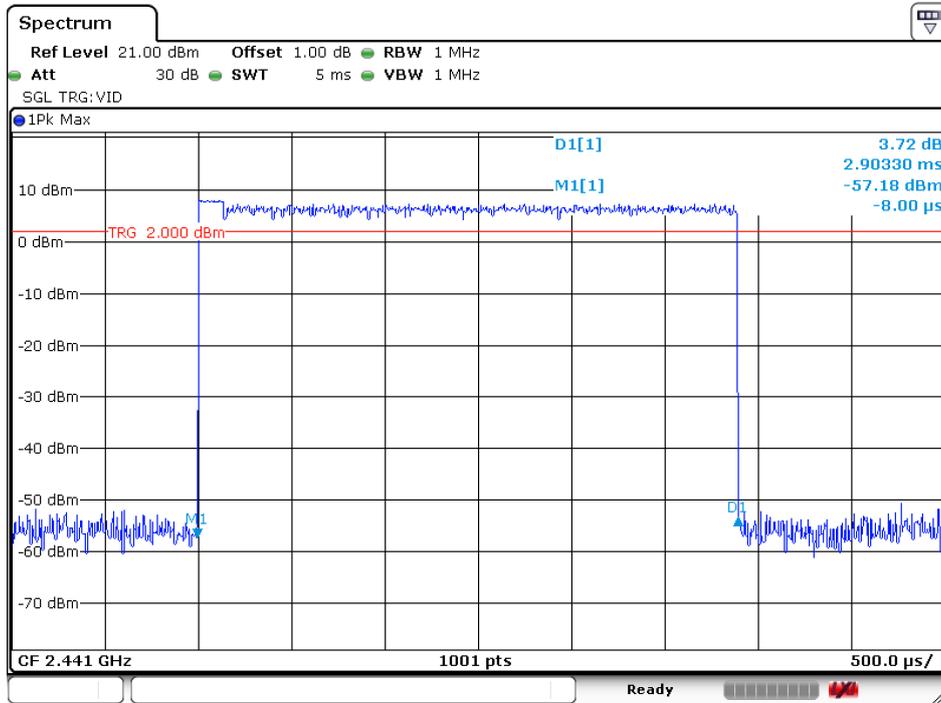


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3DH5 _ Middle Channel



Date: 23.OCT.2019 05:50:58



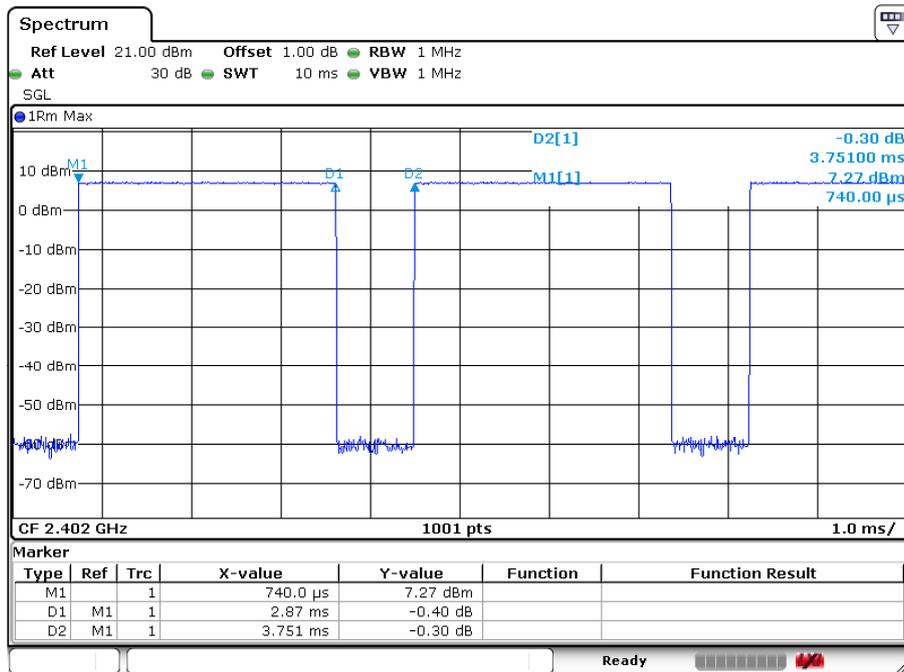
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Duty Cycle

Test Results

Operation Modes	Duty Cycle
DH5	76.51
2-DH5	75.98
3-DH5	76.58

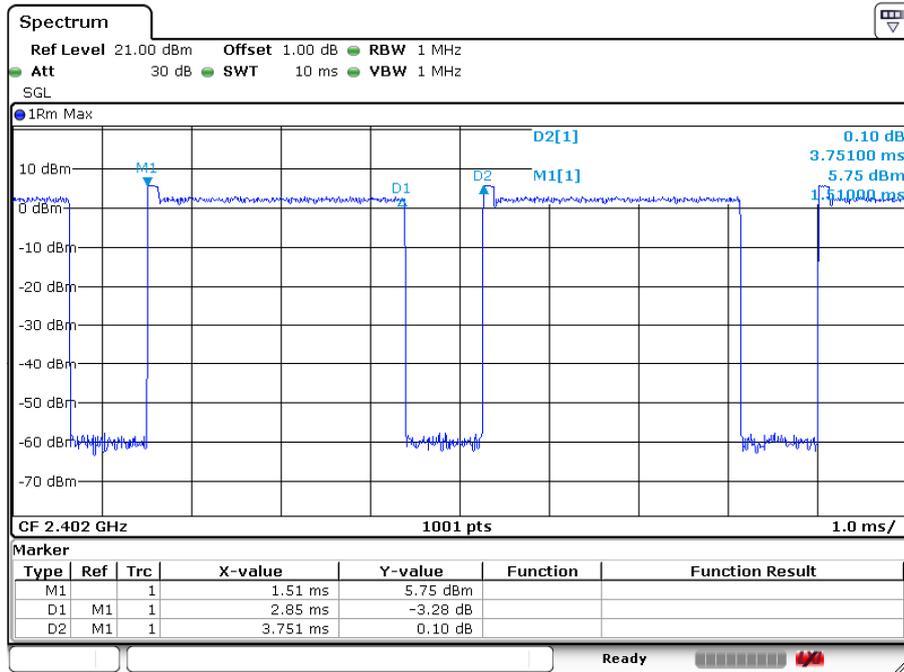
DH5



Date: 23.OCT.2019 02:31:15

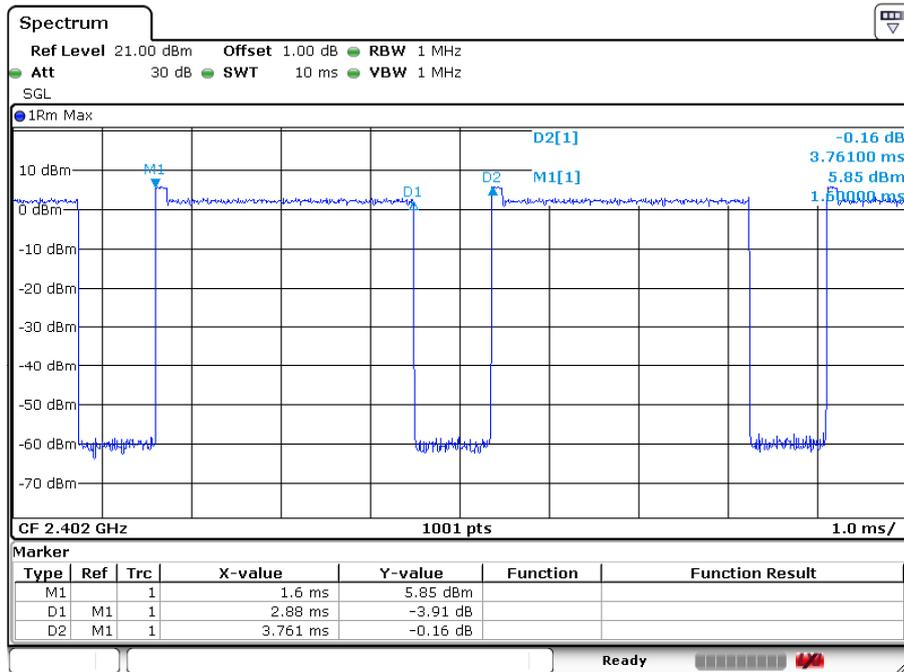


2DH5



Date: 23.OCT.2019 02:32:05

3DH5



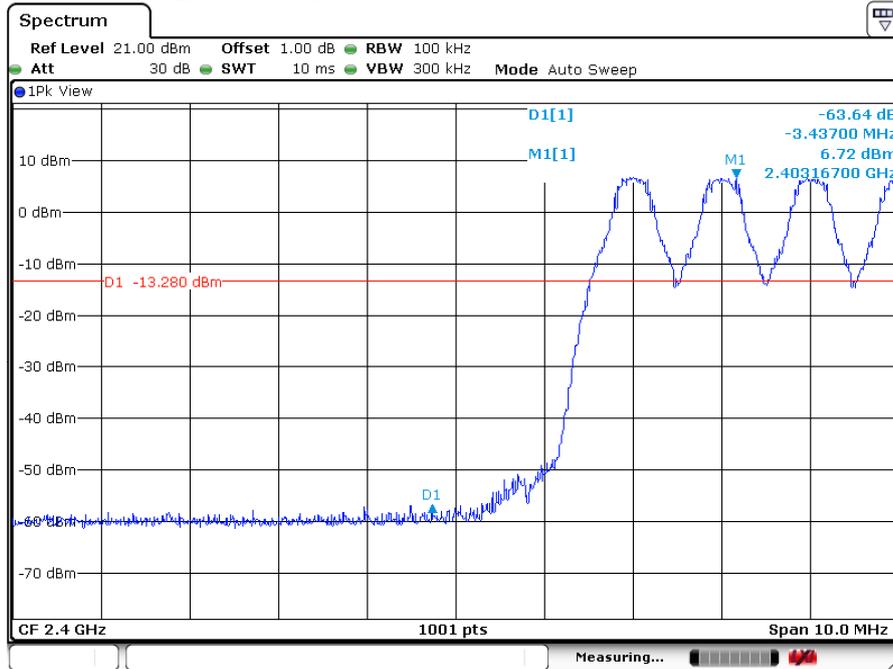
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Band-edge for RF Conducted Emissions

Test plots

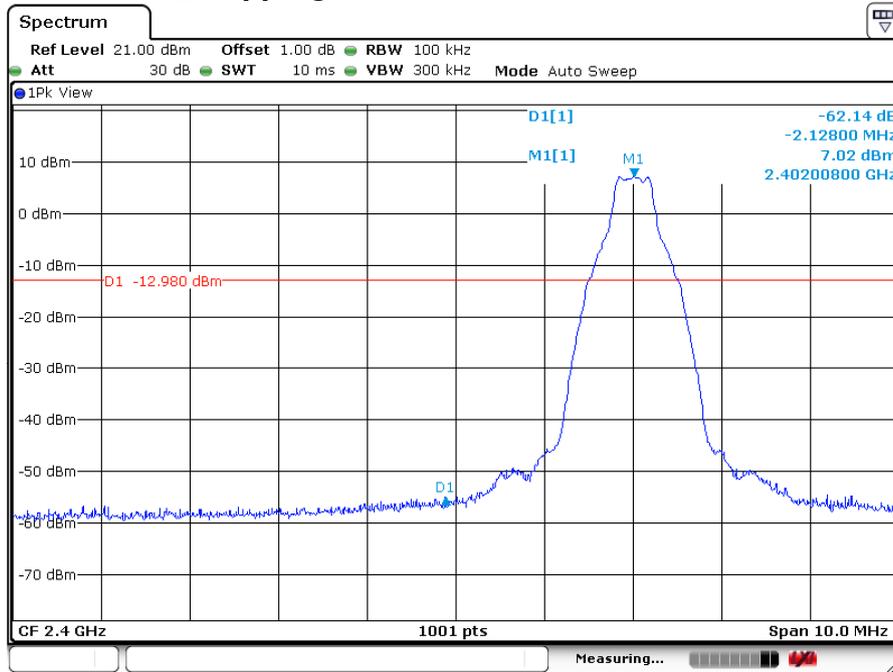
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Date: 23.OCT.2019 03:11:07



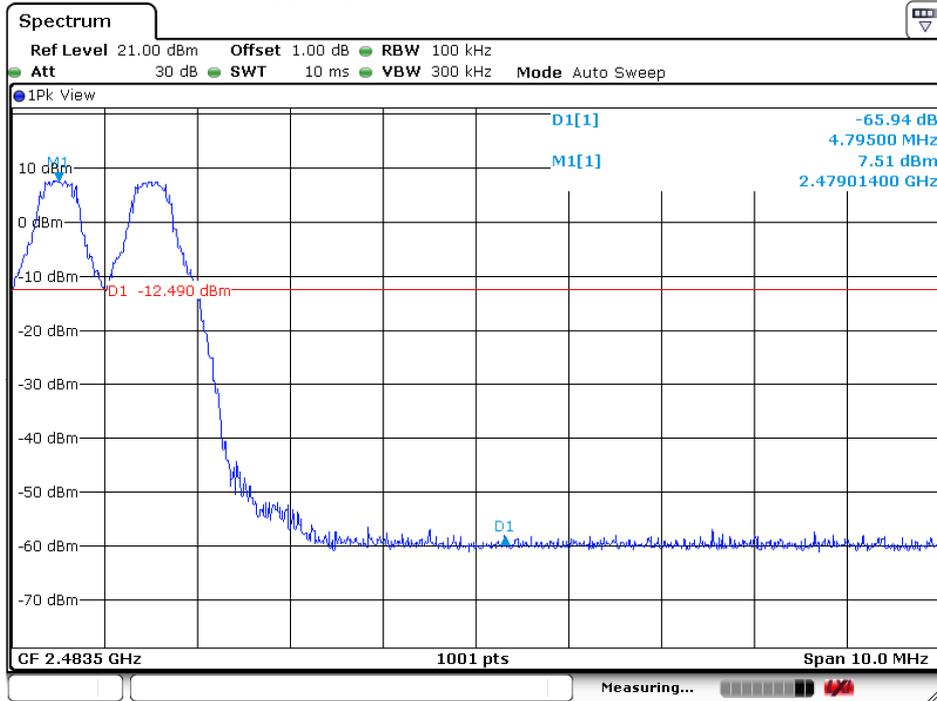
GFSK _Lowest Channel_ Hopping OFF



Date: 23.OCT.2019 03:13:57



GFSK_Highest Channel_Hopping ON



Date: 23.OCT.2019 03:24:30

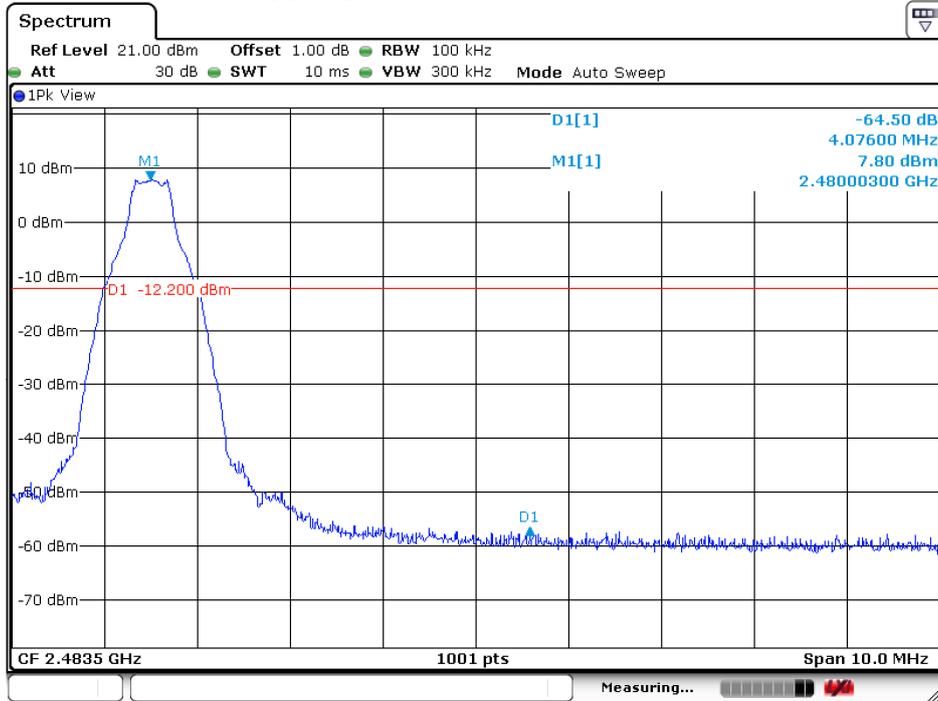


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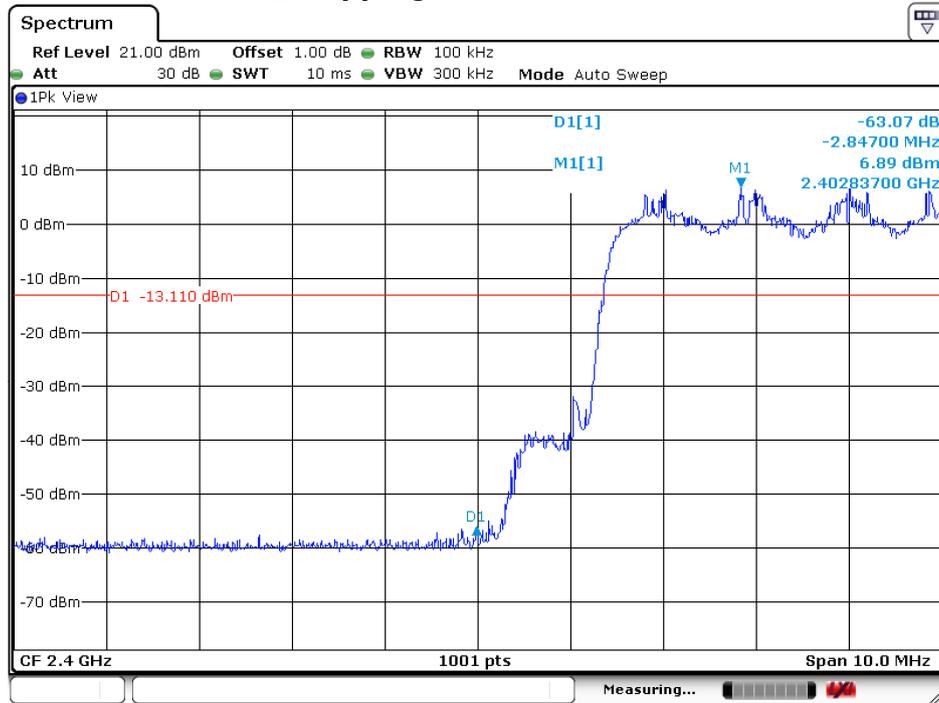
GFSK _Highest Channel_ Hopping OFF



Date: 23.OCT.2019 03:42:23



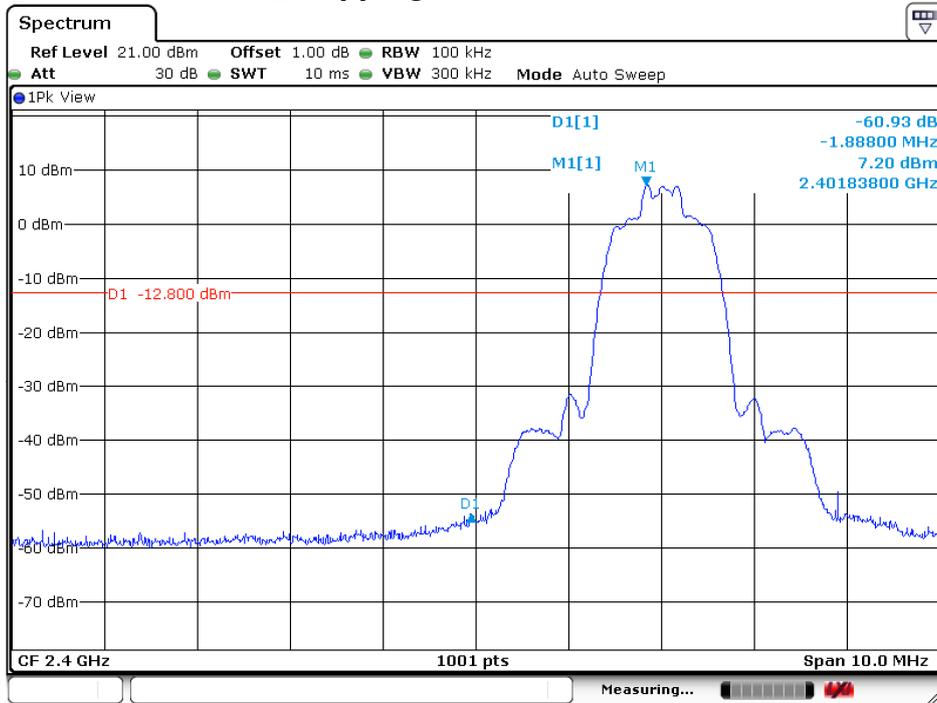
$\pi/4$ QPSK Lowest Channel_ Hopping ON



Date: 23.OCT.2019 03:20:19



$\pi/4$ QPSK Lowest Channel_ Hopping OFF



Date: 23.OCT.2019 03:16:05

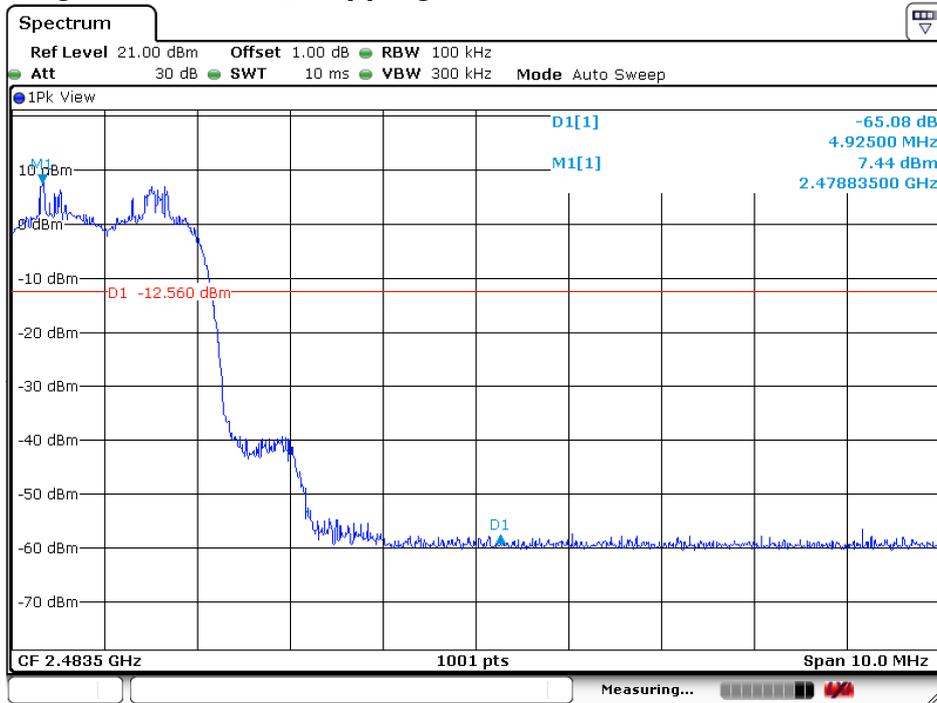


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$\pi/4$ QPSK_Highest Channel_Hopping ON



Date: 23.OCT.2019 03:21:59

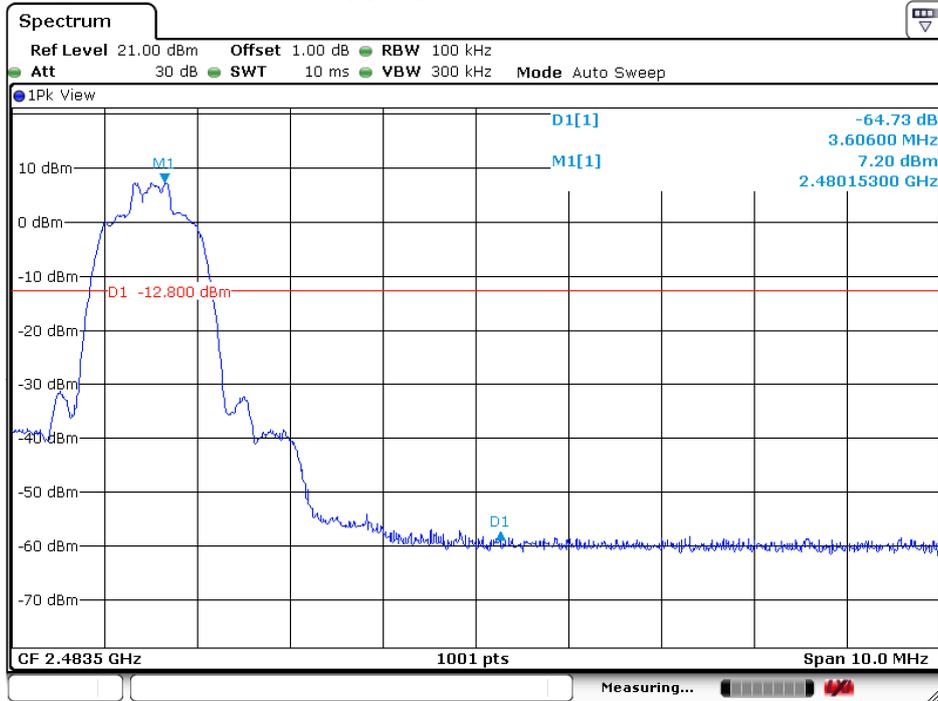


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$\pi/4$ QPSK Highest Channel_Hopping OFF



Date: 23.OCT.2019 03:43:02

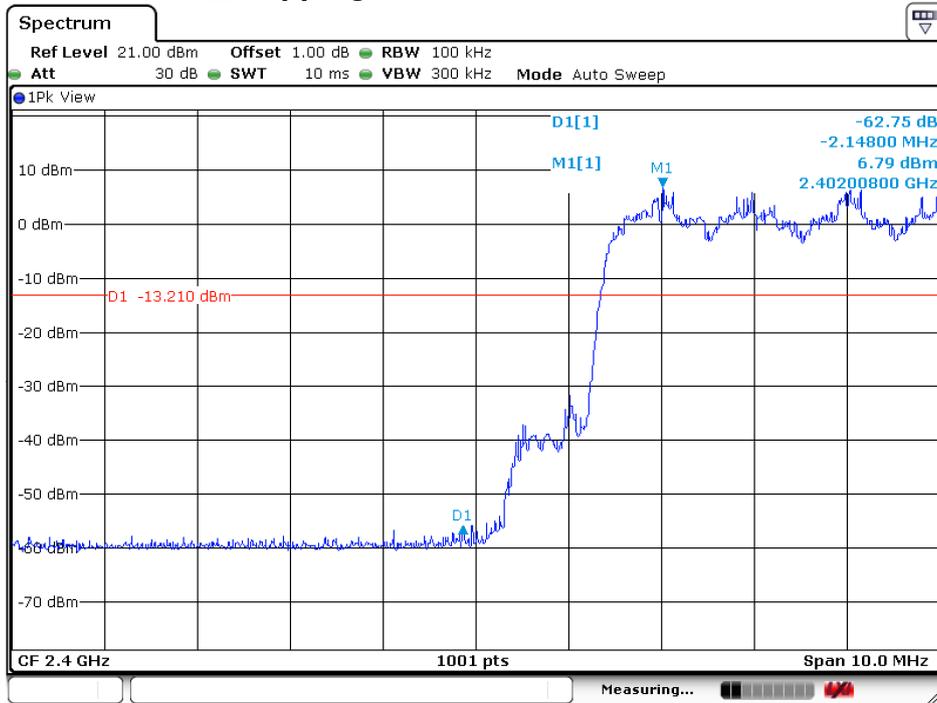


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8DPSK _Lowest Channel_ Hopping ON



Date: 23.OCT.2019 03:18:50

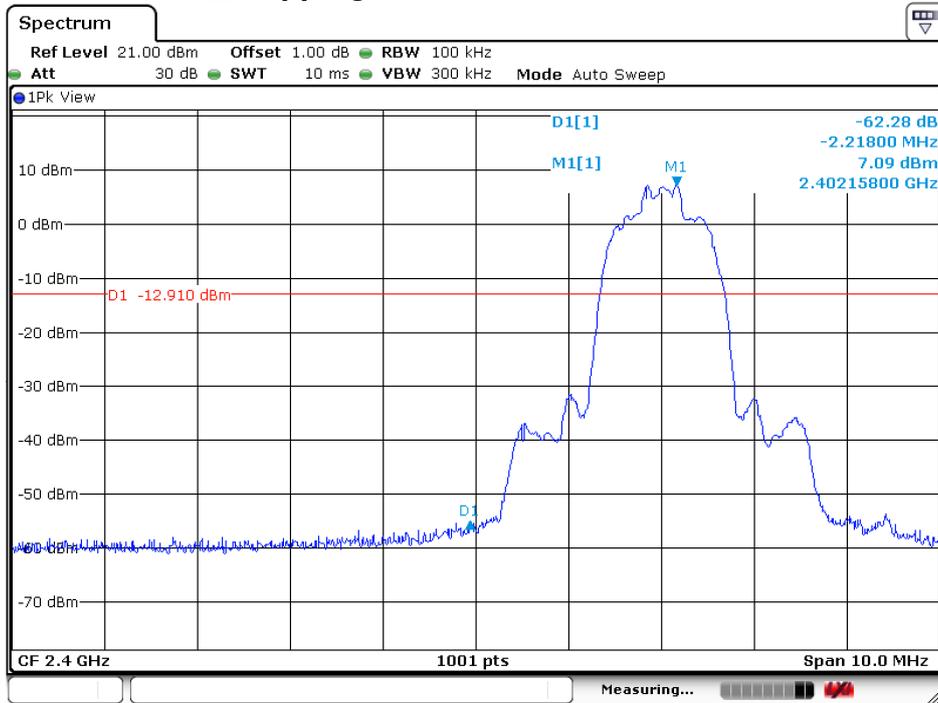


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Date: 23.OCT.2019 03:17:26

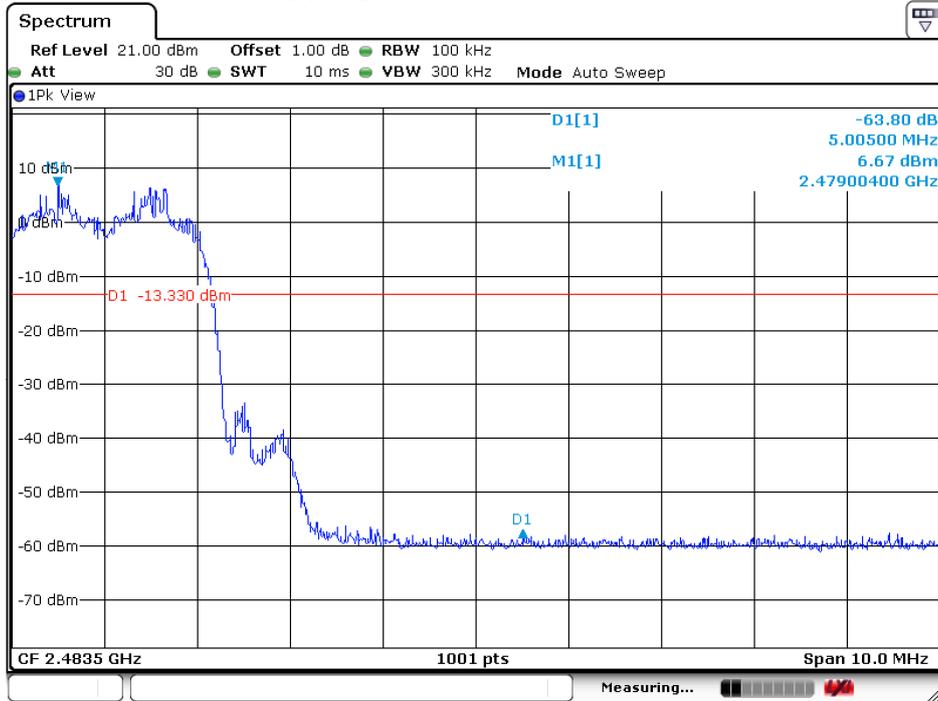


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Date: 23.OCT.2019 03:23:33

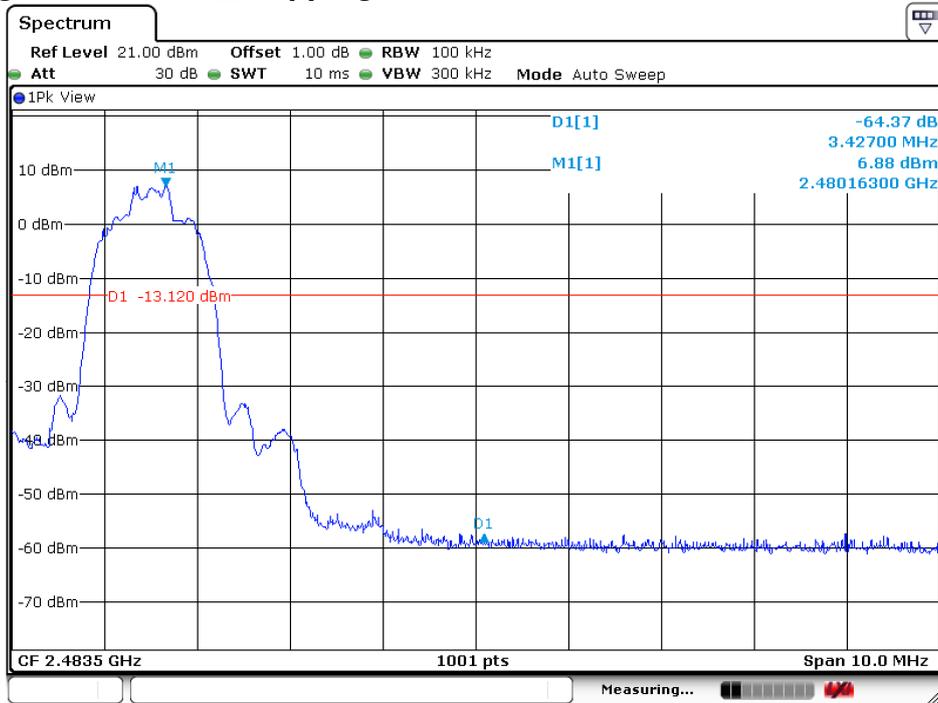


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8DPSK_Highest Channel_Hopping OFF



Date: 23.OCT.2019 03:43:47



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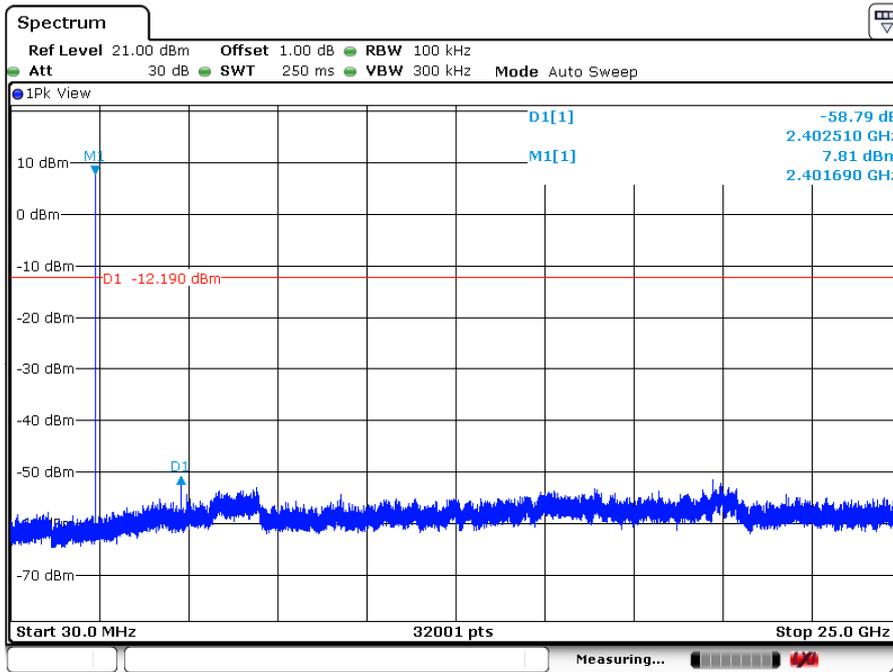
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Spurious RF Conducted Emissions

Test plots

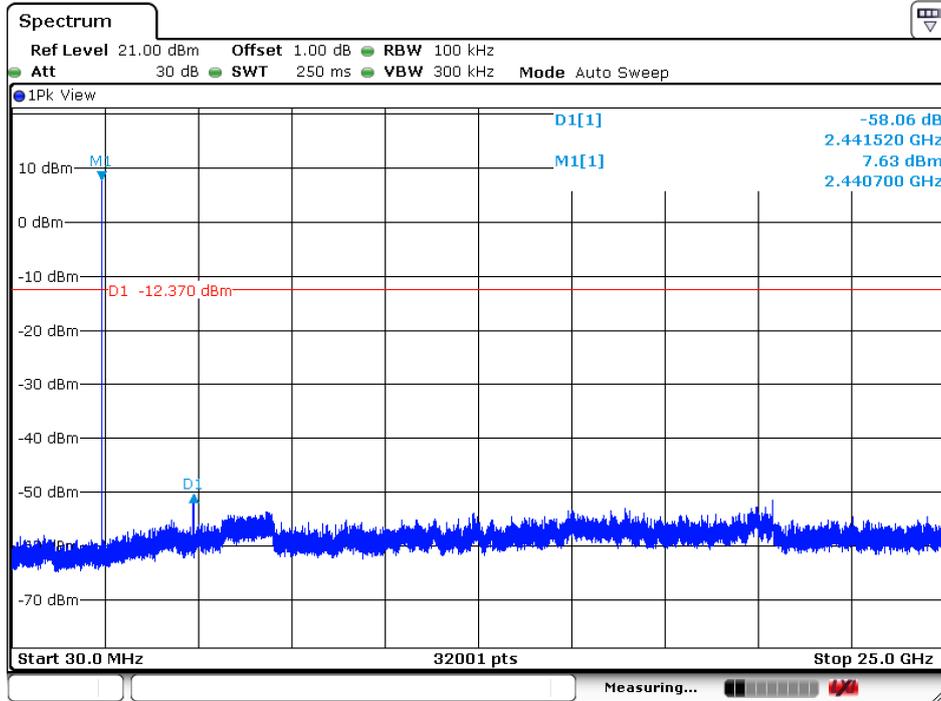
GFSK_Lowest Channel



Date: 23.OCT.2019 05:42:55



GFSK _Middle Channel



Date: 23.OCT.2019 05:42:01

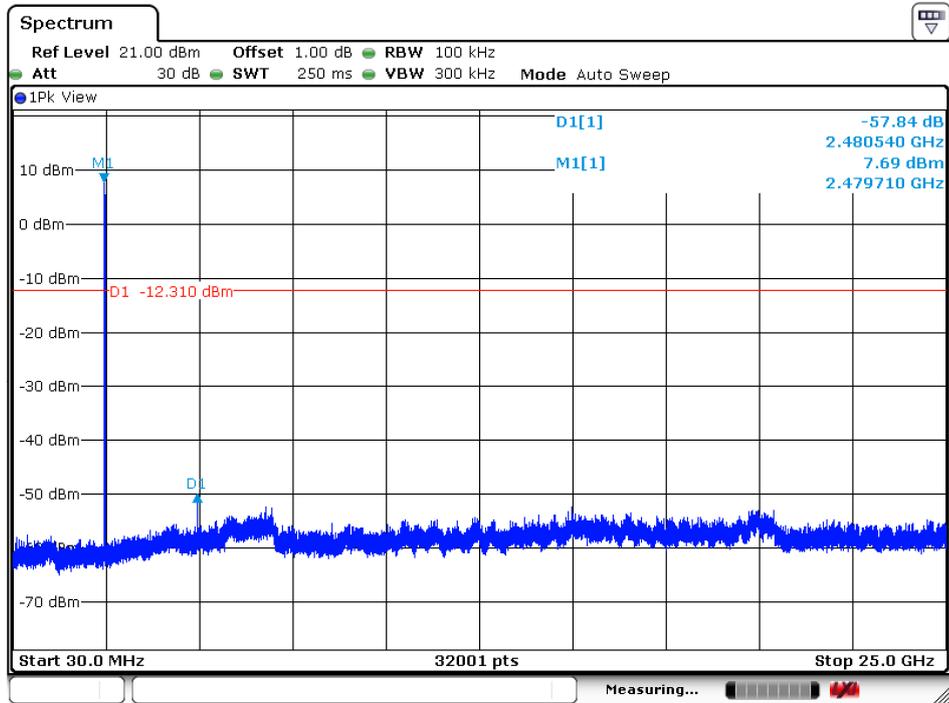


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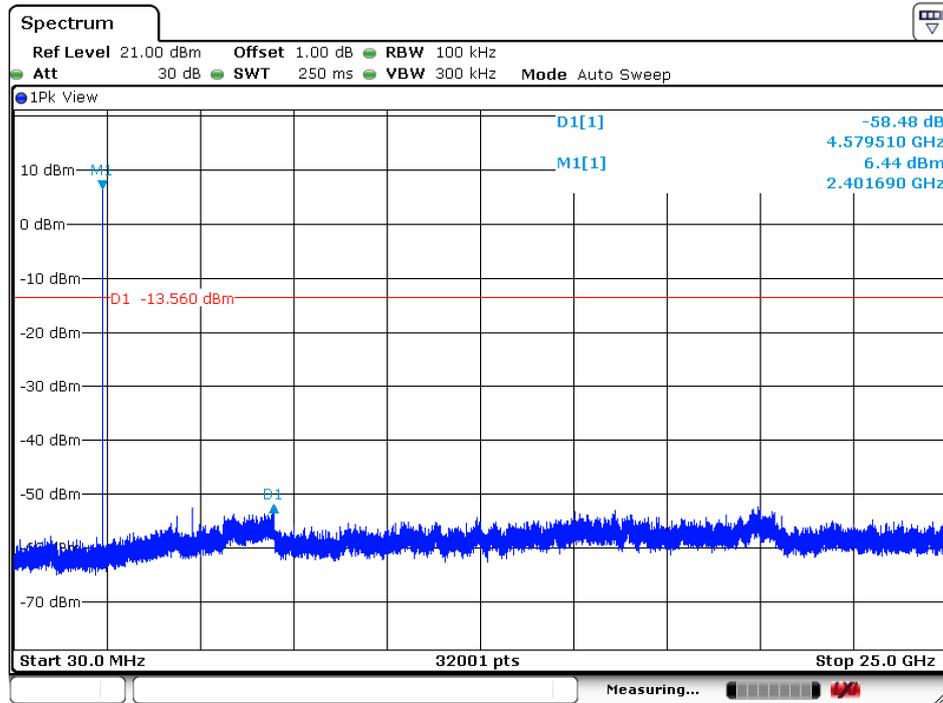
GFSK_Highest Channel



Date: 23.OCT.2019 05:41:23



π /4QPSK Lowest Channel



Date: 23.OCT.2019 05:37:55

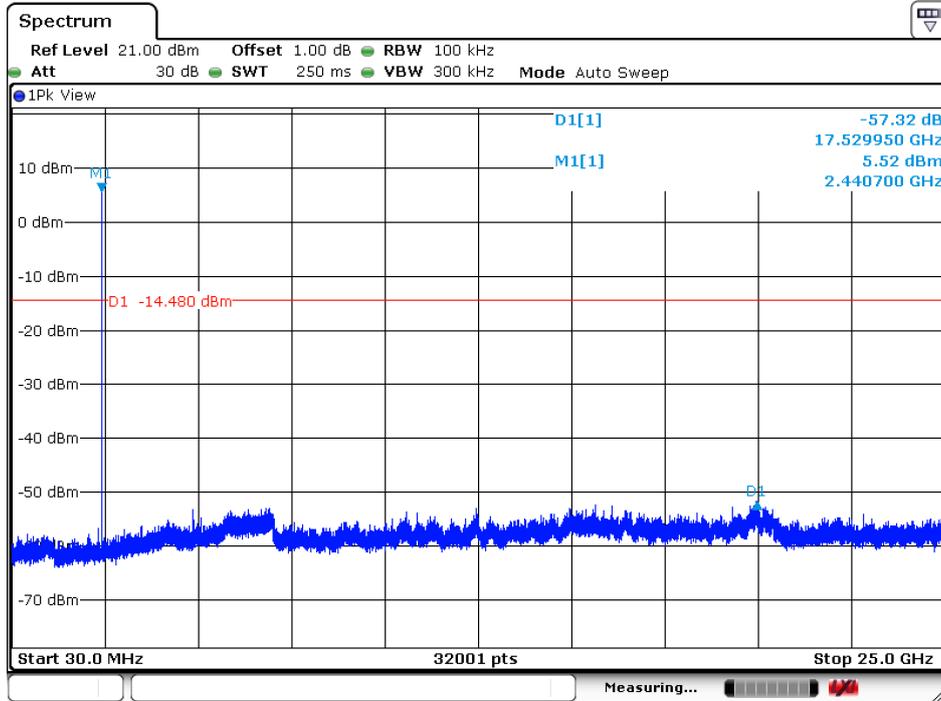


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π /4QPSK Middle Channel



Date: 23.OCT.2019 05:38:57

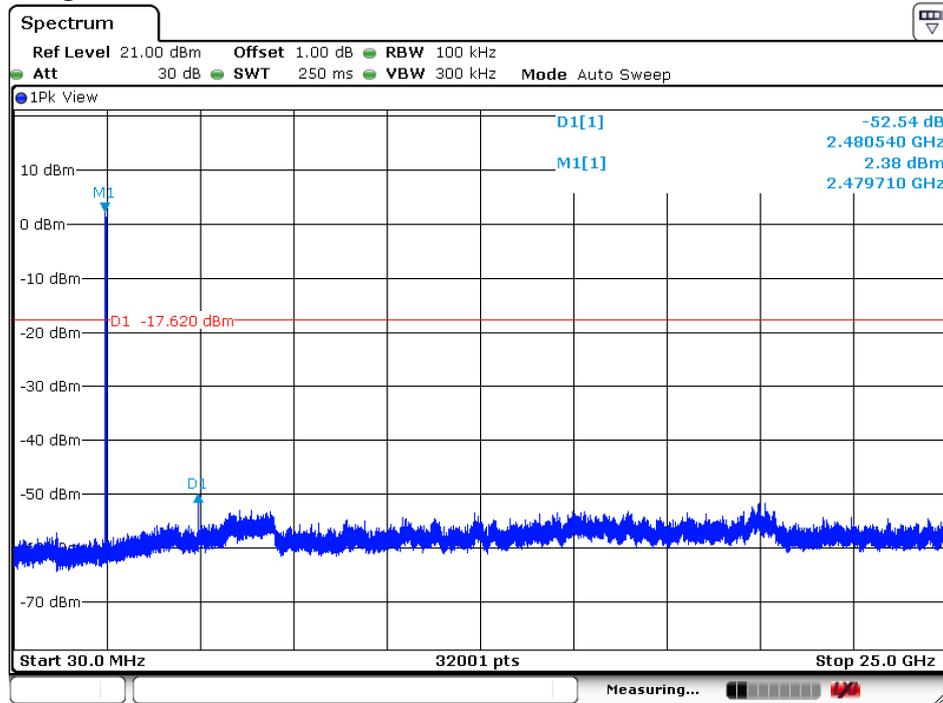


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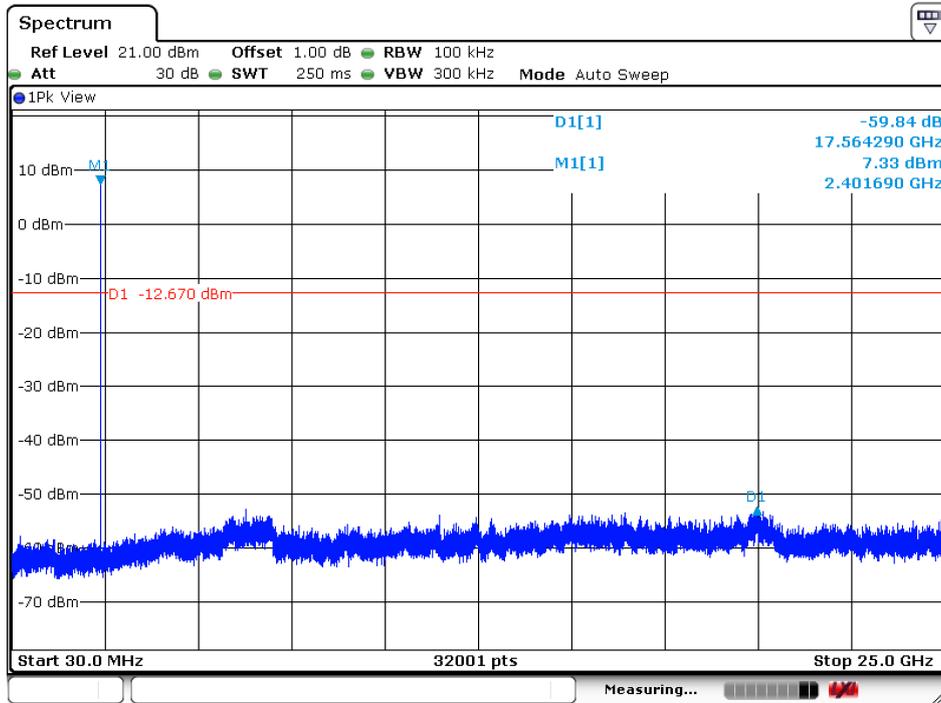
π /4DQPSK Highest Channel



Date: 23.OCT.2019 05:39:57



8DPSK_Lowest Channel



Date: 23.OCT.2019 05:37:07

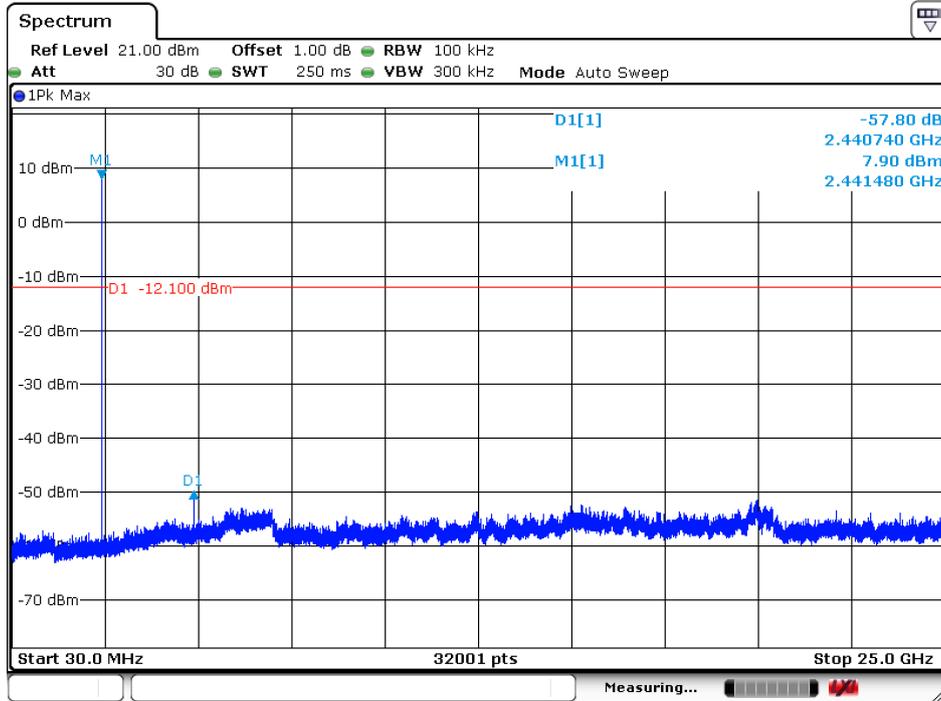


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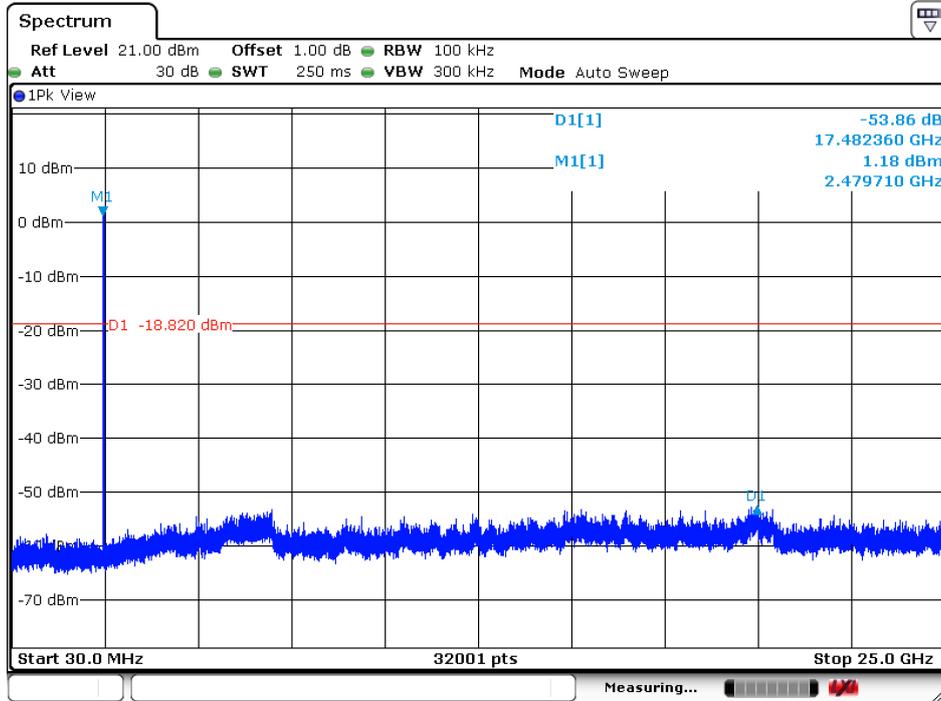
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Date: 23.OCT.2019 05:36:11



8DPSK_Highest Channel



Date: 23.OCT.2019 05:28:54

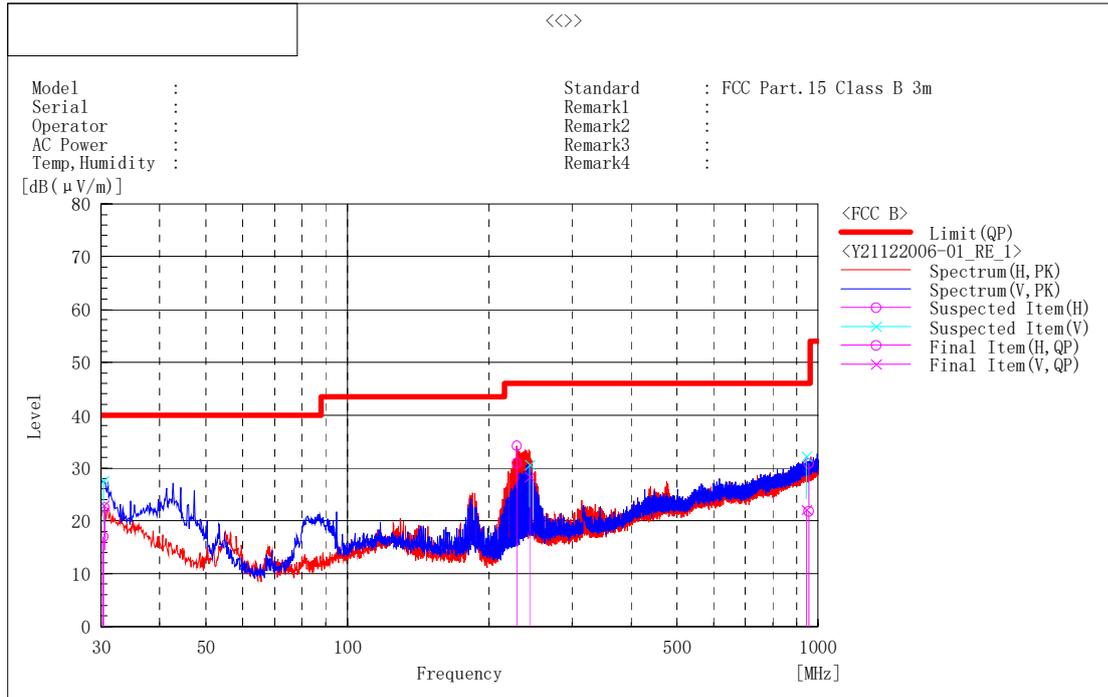
Remark:

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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Radiated Spurious Emissions
Radiated Emission test (below 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading [dB (µV)]	c. f [dB(1/m)]	Result [dB (µV/m)]	Limit [dB (µV/m)]	Margin [dB]	Height [cm]	Angle [°]	System	Remark
1	30.338	H	22.0	-5.0	17.0	40.0	23.0	392.0	163.0	1	
2	229.257	H	42.7	-11.7	31.0	46.0	15.0	106.0	29.1	1	
3	954.065	H	17.3	4.5	21.8	46.0	24.2	336.0	2.7	1	
4	30.451	V	26.9	-4.0	22.9	40.0	17.1	100.0	351.7	2	
5	243.987	V	37.4	-9.1	28.3	46.0	17.7	103.0	225.1	2	
6	944.869	V	17.1	5.0	22.1	46.0	23.9	400.0	93.9	2	



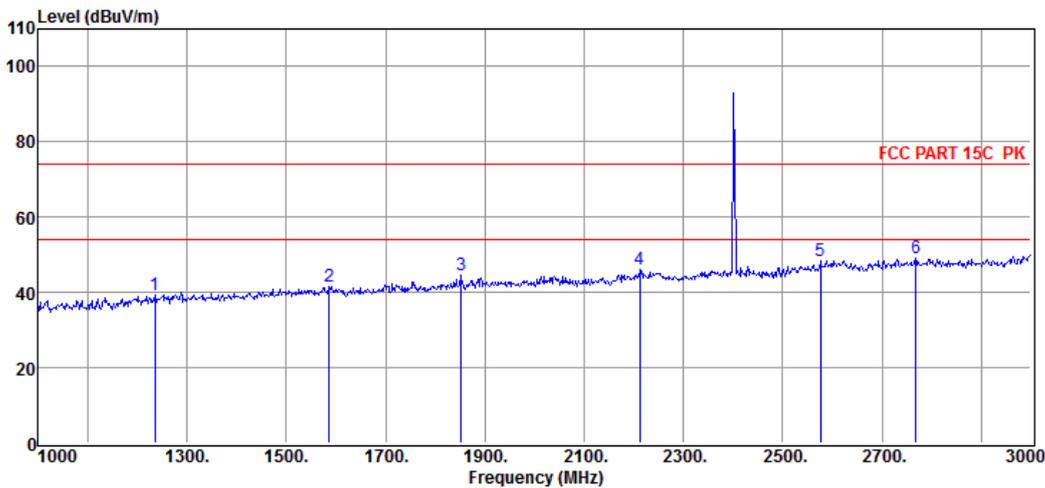
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Radiated Emission Test Result

Radiated Emission test (1 GHz – 3 GHz)

Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2402

Data: 159



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/ m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	1236.00	-4.89	39.48	74.00	-34.52	182	190	Peak	VERTICAL
2	1586.00	-2.33	41.73	74.00	-32.27	184	25	Peak	VERTICAL
3	1852.00	-0.32	44.46	74.00	-29.54	177	291	Peak	VERTICAL
4	2212.00	2.37	46.24	74.00	-27.76	184	123	Peak	VERTICAL
5	2576.00	5.37	48.51	74.00	-25.49	186	318	Peak	VERTICAL
6	2768.00	6.55	49.17	74.00	-24.83	179	345	Peak	VERTICAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

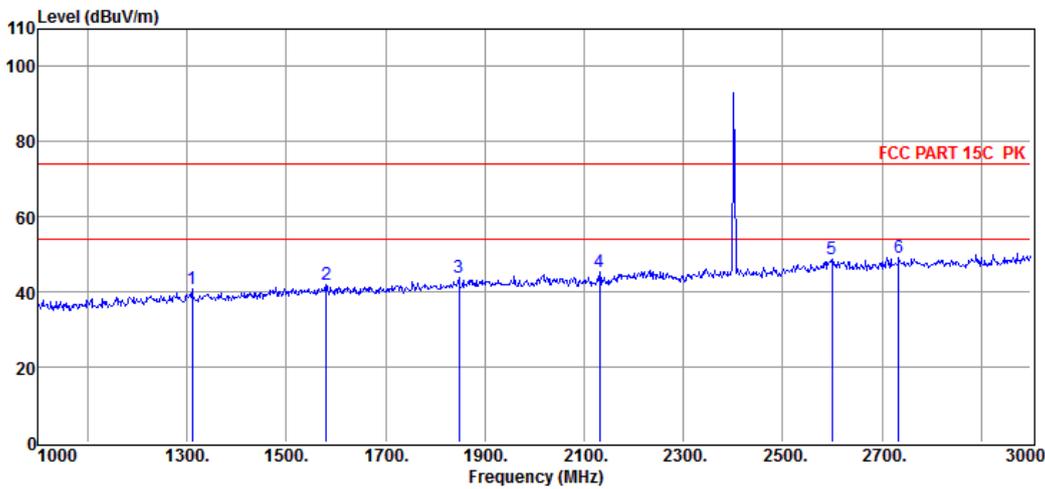


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4. Margin = Result Level – Limit.

Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2402

Data: 160



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	1310.00	-4.62	40.73	74.00	-33.27	156	123	Peak	HORIZONTAL
2	1580.00	-2.35	42.05	74.00	-31.95	154	88	Peak	HORIZONTAL
3	1848.00	-0.36	43.85	74.00	-30.15	160	245	Peak	HORIZONTAL
4	2132.00	0.92	45.26	74.00	-28.74	166	226	Peak	HORIZONTAL
5	2600.00	5.91	48.71	74.00	-25.29	163	316	Peak	HORIZONTAL
6	2734.00	6.42	49.27	74.00	-24.73	190	25	Peak	HORIZONTAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.



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 Rev.: 01
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4. Margin = Result Level – Limit.



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Test Site : 10m Chamber

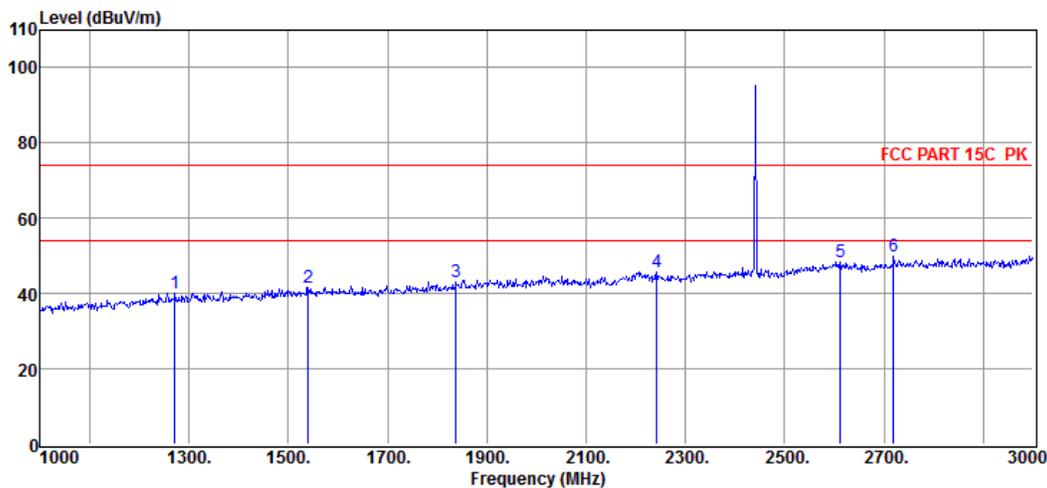
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2441

Data: 161



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	1272.00	-4.71	40.18	74.00	-33.82	190	202	Peak	HORIZONTAL
2	1540.00	-2.56	41.66	74.00	-32.34	189	353	Peak	HORIZONTAL
3	1838.00	-0.52	43.26	74.00	-30.74	177	86	Peak	HORIZONTAL
4	2242.00	2.37	45.81	74.00	-28.19	162	267	Peak	HORIZONTAL
5	2612.00	5.76	48.36	74.00	-25.64	171	71	Peak	HORIZONTAL
6	2720.00	6.21	49.80	74.00	-24.20	153	205	Peak	HORIZONTAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.



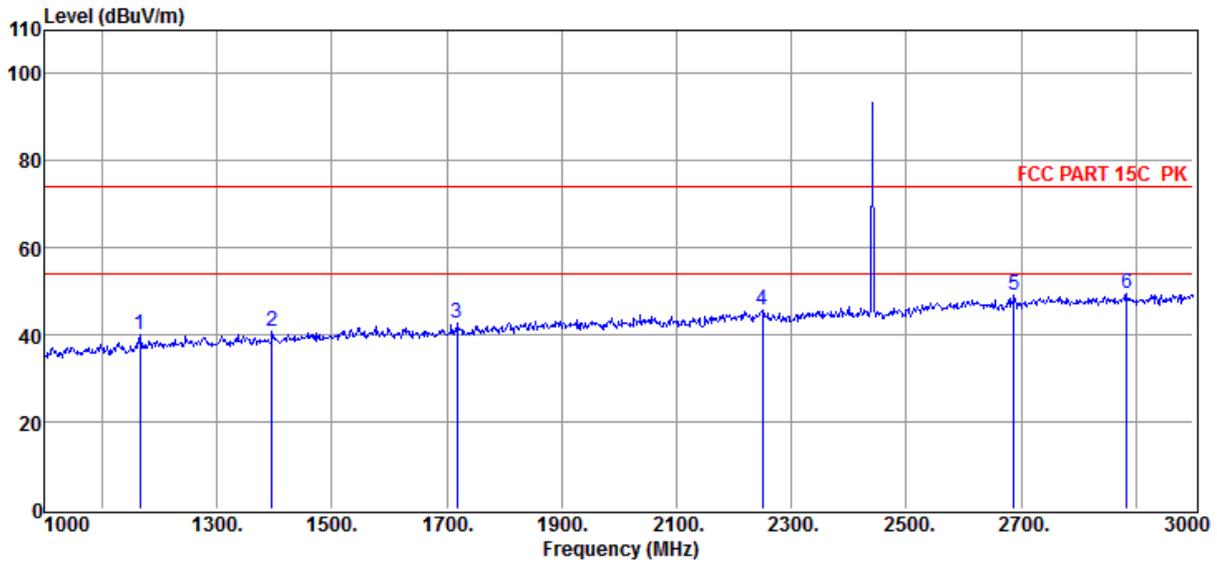
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4. Margin = Result Level – Limit.

Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n, GPS and NFC **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2441

Data: 162



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	1166.00	-6.00	40.14	74.00	-33.86	189	276	Peak	VERTICAL
2	1396.00	-4.12	40.87	74.00	-33.13	170	48	Peak	VERTICAL
3	1718.00	-1.78	42.73	74.00	-31.27	159	62	Peak	VERTICAL
4	2250.00	2.37	45.87	74.00	-28.13	165	17	Peak	VERTICAL
5	2688.00	5.76	49.21	74.00	-24.79	159	1	Peak	VERTICAL
6	2884.00	6.90	49.53	74.00	-24.47	181	203	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.



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3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

Test Site : 10m Chamber

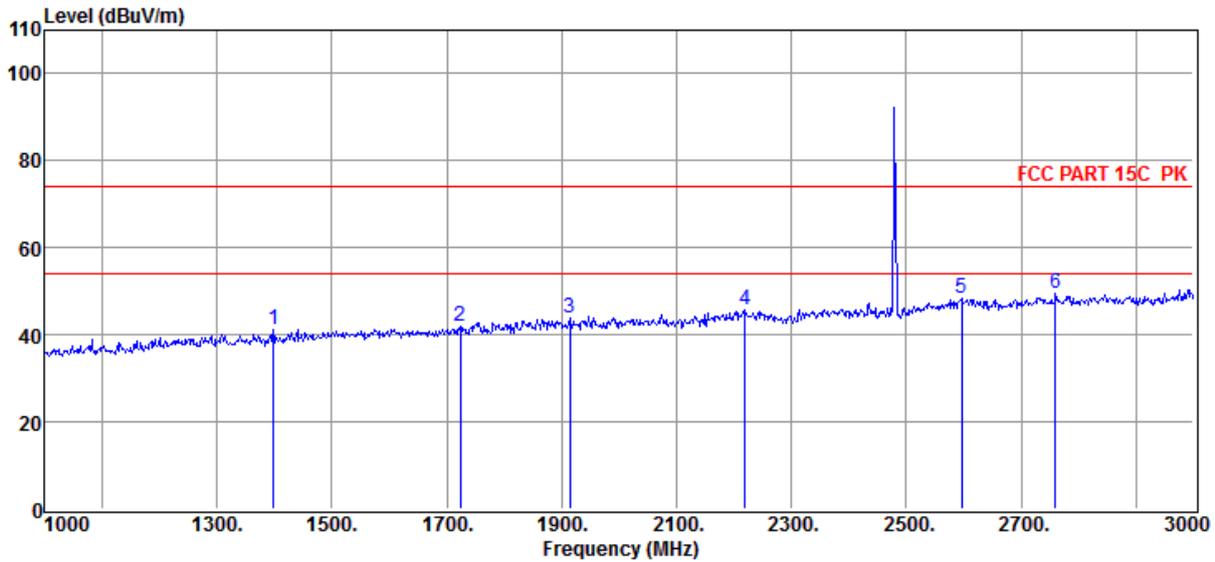
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT,
 DTS/UNII a/b/g/n, GPS and NFC **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2480

Data: 163



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	1398.00	-4.11	41.28	74.00	-32.72	171	90	Peak	VERTICAL
2	1724.00	-1.72	41.94	74.00	-32.06	150	133	Peak	VERTICAL
3	1914.00	0.04	43.75	74.00	-30.25	188	2	Peak	VERTICAL
4	2220.00	2.37	45.77	74.00	-28.23	172	19	Peak	VERTICAL
5	2596.00	5.82	48.35	74.00	-25.65	166	69	Peak	VERTICAL
6	2760.00	6.60	49.58	74.00	-24.42	160	257	Peak	VERTICAL



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- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

Test Site : 10m Chamber

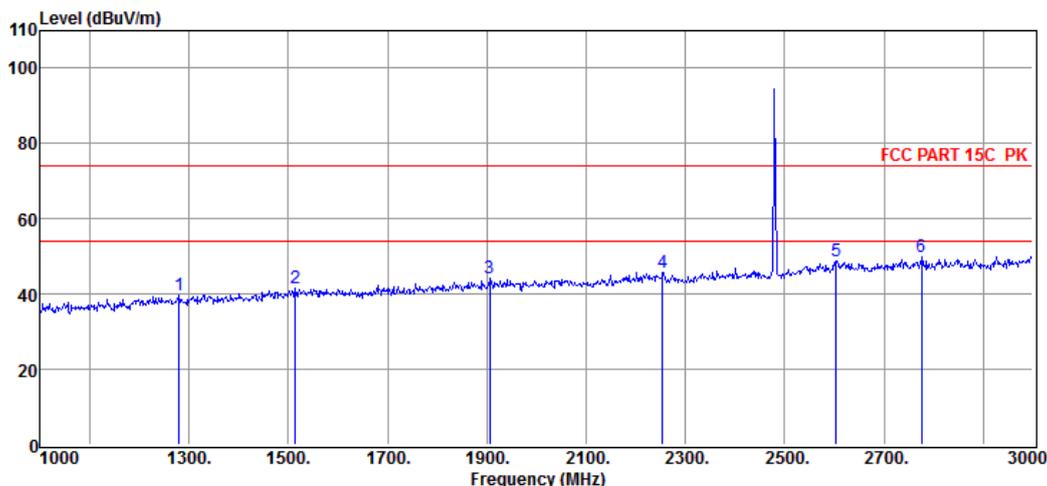
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2480

Data: 164



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	1280.00	-4.70	39.83	74.00	-34.17	185	317	Peak	HORIZONTAL
2	1514.00	-2.82	41.40	74.00	-32.60	167	186	Peak	HORIZONTAL
3	1906.00	-0.03	44.21	74.00	-29.79	180	18	Peak	HORIZONTAL
4	2254.00	2.34	45.82	74.00	-28.18	178	69	Peak	HORIZONTAL
5	2604.00	5.86	48.76	74.00	-25.24	169	240	Peak	HORIZONTAL
6	2776.00	6.51	49.84	74.00	-24.16	154	285	Peak	HORIZONTAL



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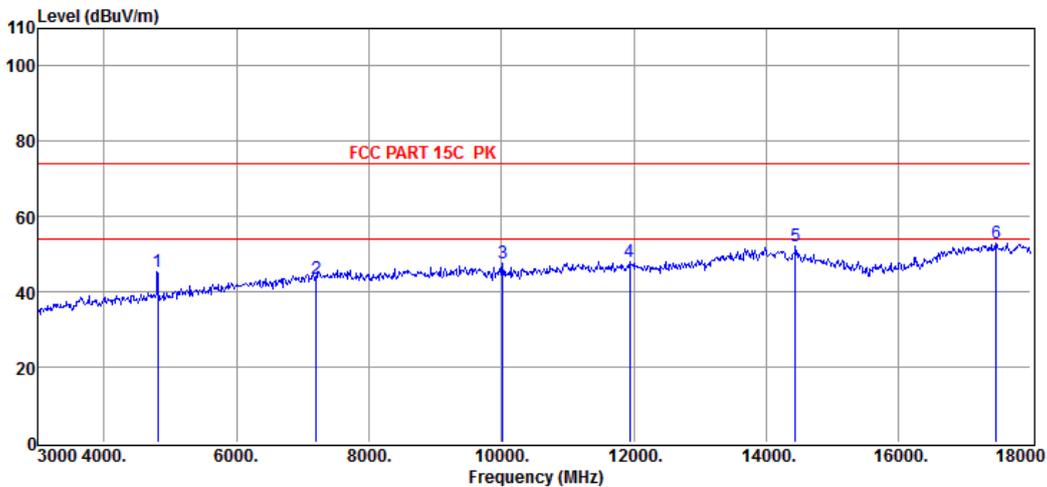
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- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

Radiated Emission test (3 GHz – 18 GHz)

Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2402

Data: 165



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	4804.00	0.78	45.34	74.00	-28.66	180	198	Peak	HORIZONTAL
2	7206.00	5.72	43.62	74.00	-30.38	183	337	Peak	HORIZONTAL
3	10020.00	8.11	47.54	74.00	-26.46	154	10	Peak	HORIZONTAL
4	11940.00	9.93	47.92	74.00	-26.08	181	360	Peak	HORIZONTAL
5	14445.00	13.39	52.06	74.00	-21.94	150	91	Peak	HORIZONTAL



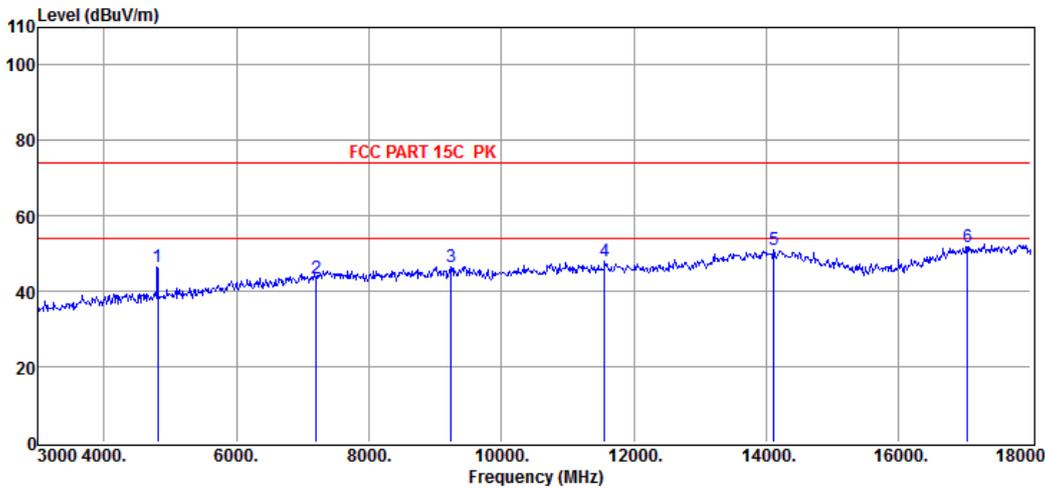
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6	17475.00	15.60	52.88	74.00	-21.12	159	244	Peak	HORIZONTAL
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- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2402

Data: 166



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	4804.00	0.78	46.68	74.00	-27.32	173	117	Peak	VERTICAL
2	7206.00	5.72	43.56	74.00	-30.44	165	18	Peak	VERTICAL
3	9240.00	7.43	46.62	74.00	-27.38	185	276	Peak	VERTICAL
4	11565.00	10.07	47.83	74.00	-26.17	164	87	Peak	VERTICAL



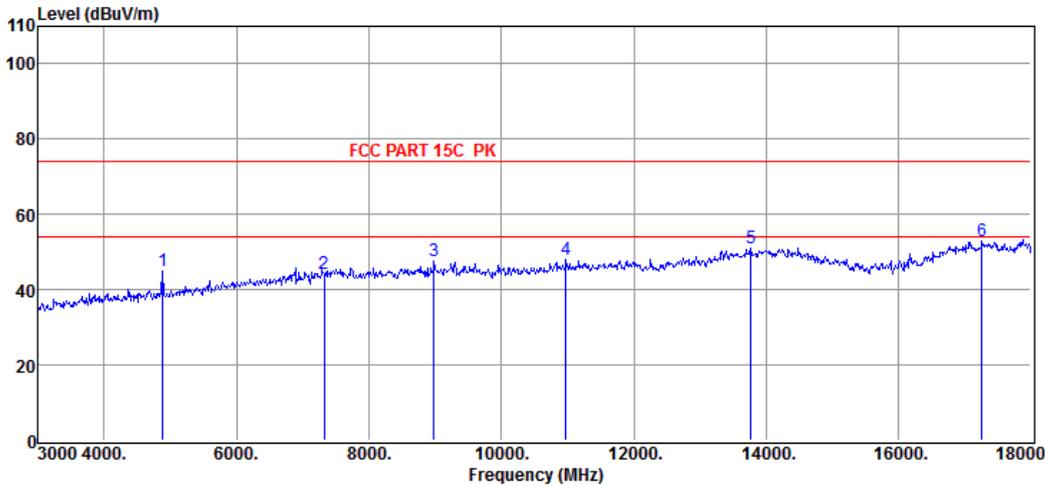
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5	14115.00	13.22	50.85	74.00	-23.15	180	127	Peak	VERTICAL
6	17040.00	16.02	51.83	74.00	-22.17	156	52	Peak	VERTICAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2441

Data: 167



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	4882.00	0.92	45.05	74.00	-28.95	187	118	Peak	VERTICAL
2	7323.00	6.41	44.20	74.00	-29.80	160	90	Peak	VERTICAL
3	8985.00	7.07	47.58	74.00	-26.42	177	167	Peak	VERTICAL



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4	10980.00	9.78	48.04	74.00	-25.96	181	81	Peak	VERTICAL
5	13770.00	11.98	51.05	74.00	-22.95	166	105	Peak	VERTICAL
6	17265.00	15.73	52.88	74.00	-21.12	163	59	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Test Site : 10m Chamber

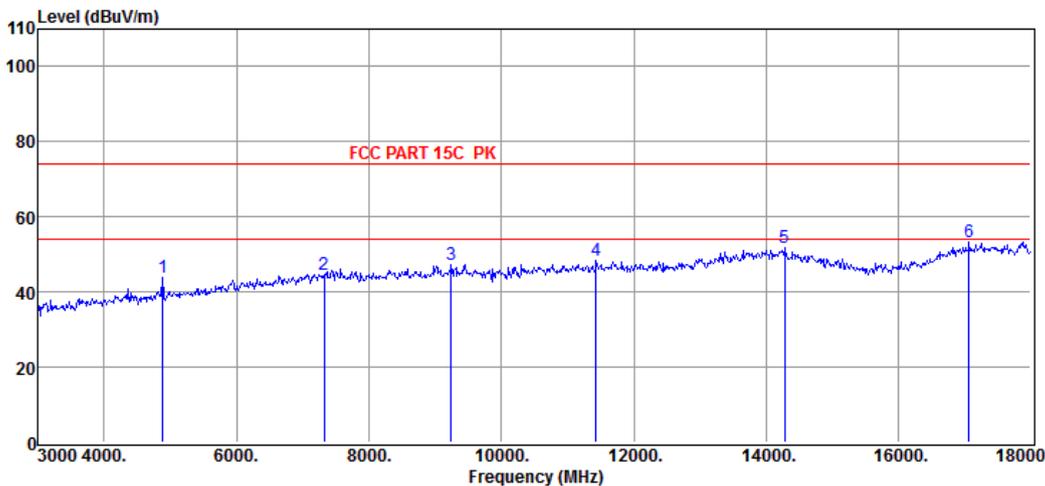
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2441

Data: 168



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	4882.00	0.92	43.71	74.00	-30.29	188	44	Peak	HORIZONTAL
2	7323.00	6.41	44.55	74.00	-29.45	171	288	Peak	HORIZONTAL



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3	9240.00	7.43	47.34	74.00	-26.66	158	152	Peak	HORIZONTAL
4	11430.00	10.07	48.34	74.00	-25.66	151	13	Peak	HORIZONTAL
5	14280.00	13.10	51.78	74.00	-22.22	166	112	Peak	HORIZONTAL
6	17070.00	15.79	53.45	74.00	-20.55	169	359	Peak	HORIZONTAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

Test Site : 10m Chamber

Test Date : 01-10-2022

Tested By : Sunny

EUT : GSM/WCDMA/LTE Phone with BT,
 DTS/UNII a/b/g/n, GPS and NFC

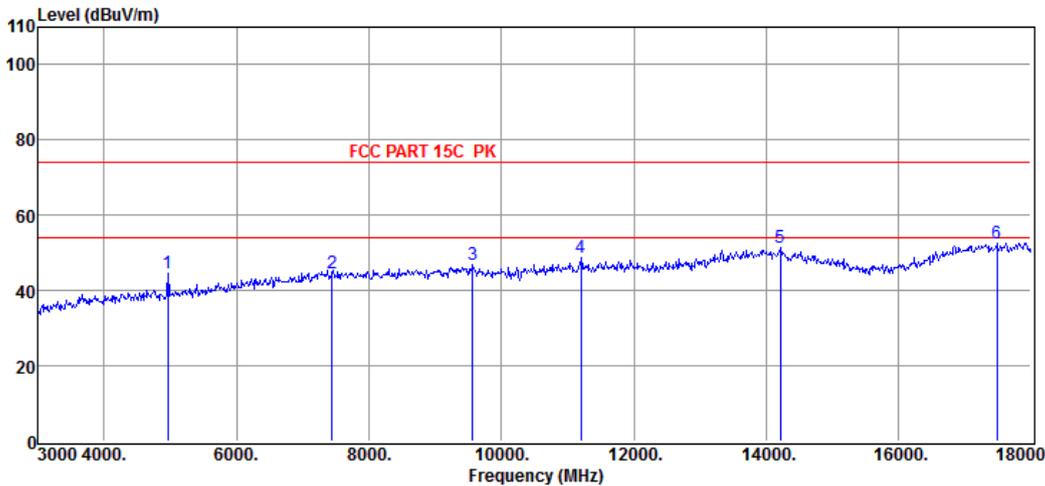
Model Number : XQ-AD52

Power Supply : Battery

Test Mode : Tx mode

Memo : DH5 2480

Data: 169



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/ m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	4960.00	1.19	44.61	74.00	-29.39	180	110	Peak	HORIZONTAL
2	7440.00	6.43	44.66	74.00	-29.34	168	102	Peak	HORIZONTAL



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3	9570.00	7.99	47.01	74.00	-26.99	167	264	Peak	HORIZONTAL
4	11205.00	10.38	48.74	74.00	-25.26	178	321	Peak	HORIZONTAL
5	14220.00	13.82	51.24	74.00	-22.76	160	357	Peak	HORIZONTAL
6	17490.00	15.60	52.68	74.00	-21.32	160	306	Peak	HORIZONTAL

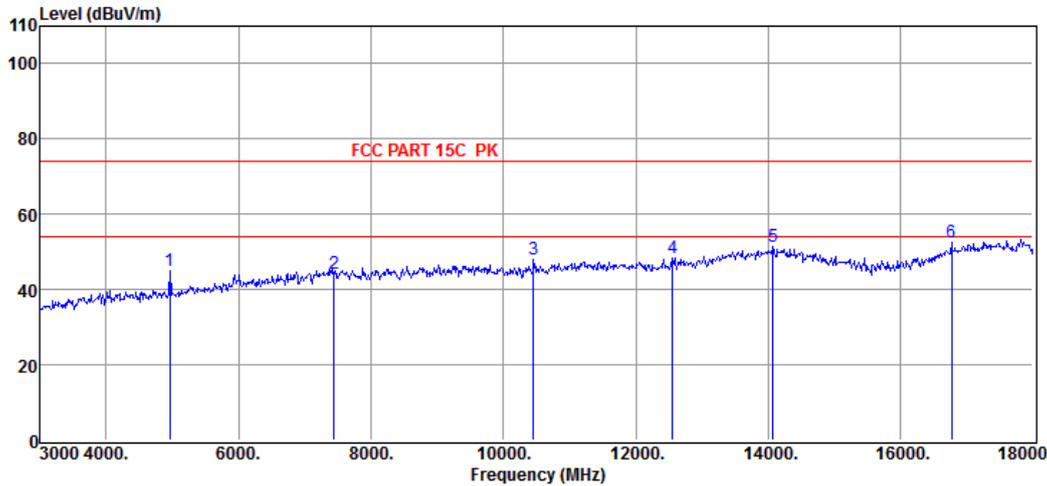
- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.



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Test Site : 10m Chamber
Test Date : 01-10-2022 **Tested By** : Sunny
EUT : GSM/WCDMA/LTE Phone with BT, **Model Number** : XQ-AD52
Power Supply : Battery **Test Mode** : Tx mode
Memo : DH5 2480

Data: 170



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	4960.00	1.19	44.85	74.00	-29.15	162	21	Peak	VERTICAL
2	7440.00	6.43	44.30	74.00	-29.70	156	234	Peak	VERTICAL
3	10455.00	8.89	48.01	74.00	-25.99	172	264	Peak	VERTICAL
4	12555.00	9.52	48.35	74.00	-25.65	153	75	Peak	VERTICAL
5	14070.00	13.05	51.48	74.00	-22.52	159	241	Peak	VERTICAL
6	16770.00	15.08	52.63	74.00	-21.37	190	222	Peak	VERTICAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.



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4. Margin = Result Level – Limit.

Restricted bands around fundamental frequency

Test Site : 10m Chamber

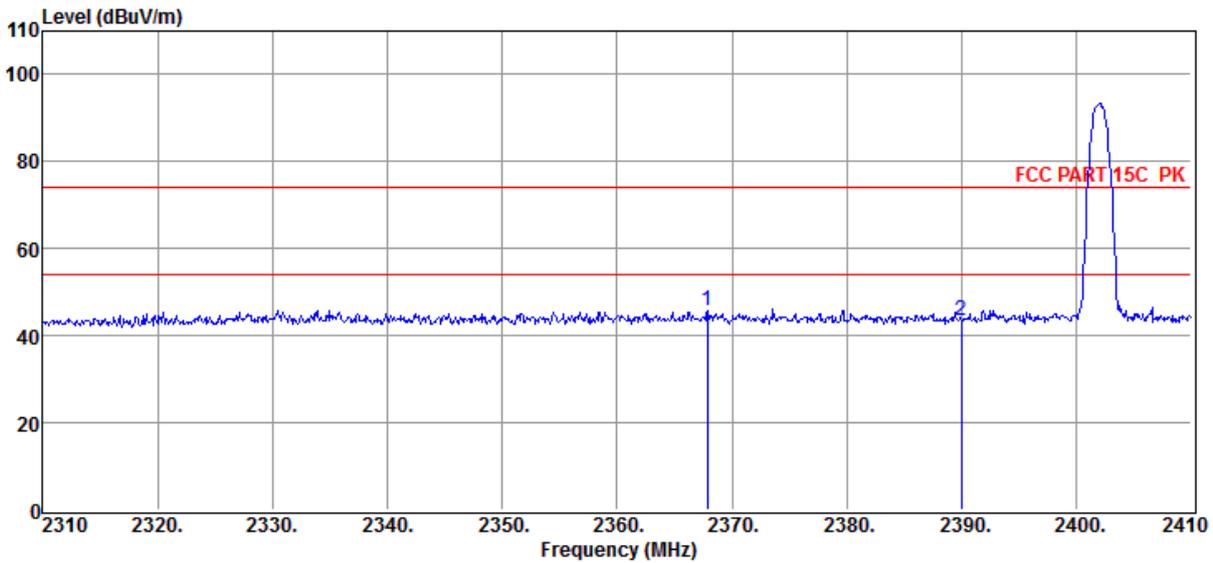
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT,
 DTS/UNII a/b/g/n, GPS and NFC **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2402

Data: 155



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/ m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	2367.90	3.24	45.61	74.00	-28.39	176	329	Peak	VERTICAL
2	2390.00	3.30	43.62	74.00	-30.38	174	300	Peak	VERTICAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.



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4. Margin = Result Level – Limit.



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Test Site : 10m Chamber

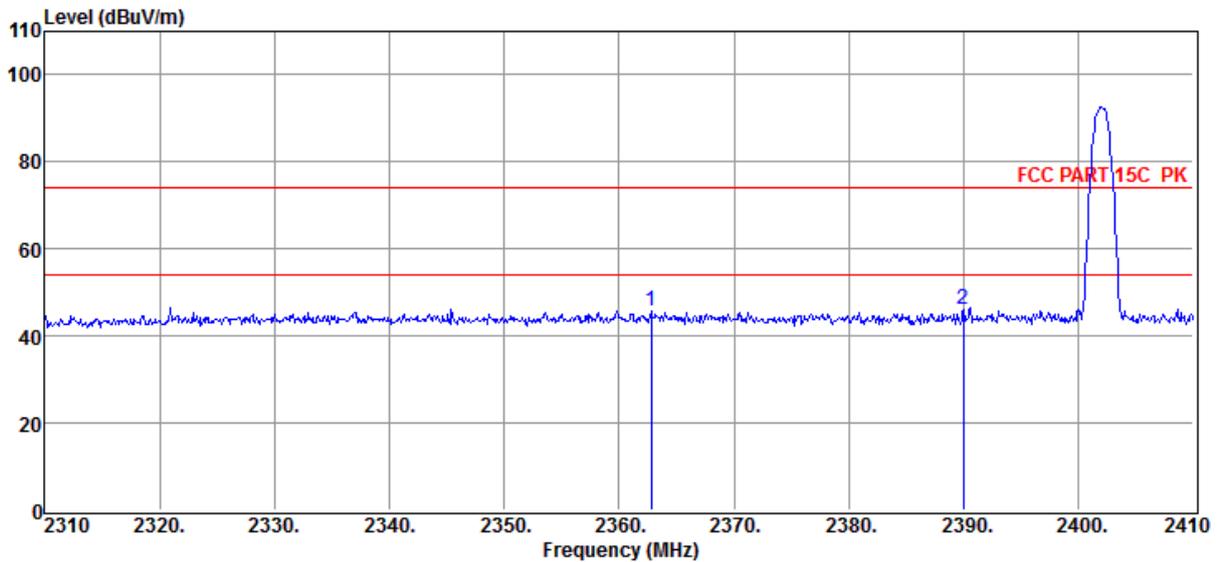
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT,
 DTS/UNII a/b/g/n, GPS and NFC **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2402

Data: 156



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/ m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	2362.80	3.23	45.88	74.00	-28.12	171	4	Peak	HORIZONTAL
2	2390.00	3.30	45.99	74.00	-28.01	181	68	Peak	HORIZONTAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.



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Test Site : 10m Chamber

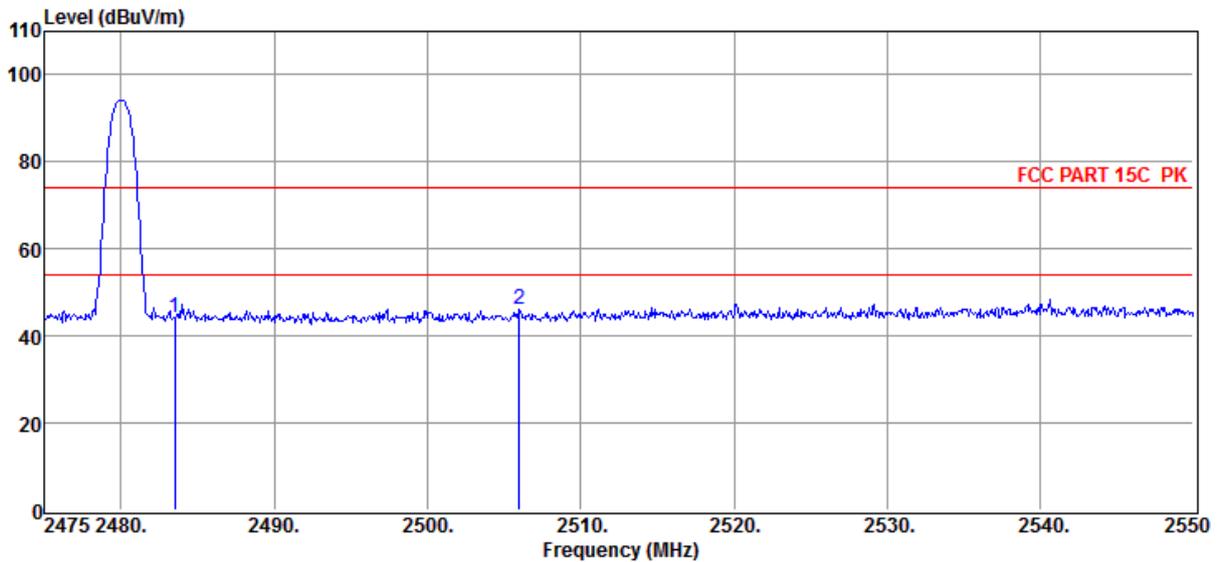
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT,
 DTS/UNII a/b/g/n, GPS and NFC **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2480

Data: 157



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/ m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	2483.50	3.52	44.23	74.00	-29.77	172	186	Peak	HORIZONTAL
2	2505.98	3.78	45.96	74.00	-28.04	167	150	Peak	HORIZONTAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.



Test Site : 10m Chamber

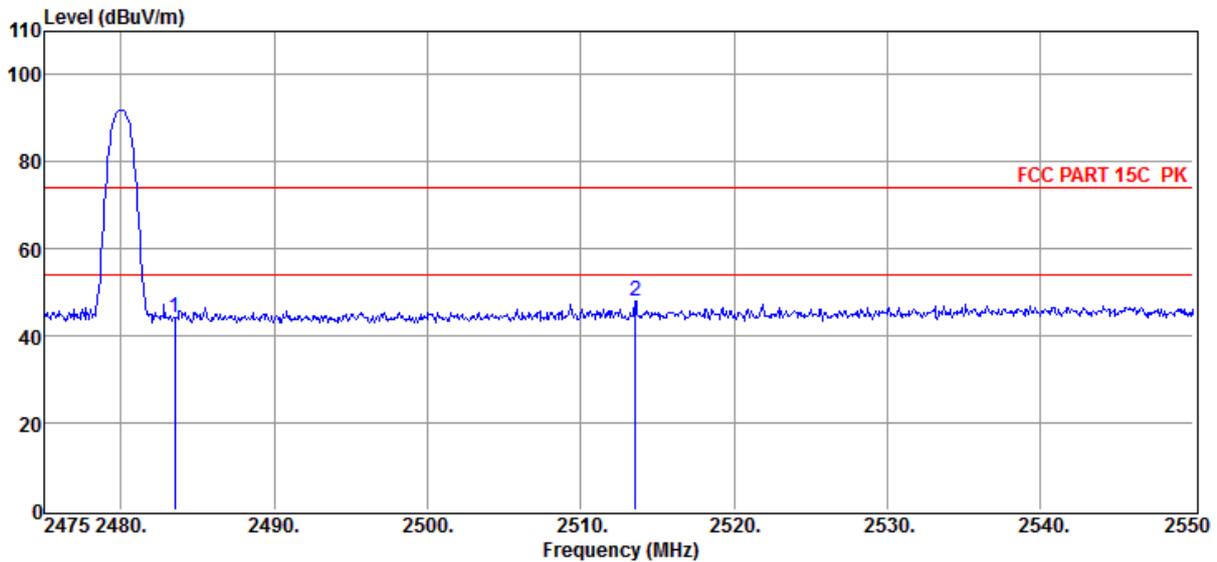
Test Date : 01-10-2022 **Tested By** : Sunny

EUT : GSM/WCDMA/LTE Phone with BT,
 DTS/UNII a/b/g/n, GPS and NFC **Model Number** : XQ-AD52

Power Supply : Battery **Test Mode** : Tx mode

Memo : DH5 2480

Data: 158



Item (Mark)	Freq. (MHz)	Factor (dB)	Result Level (dBμV/m)	Limit Line (dBμV/ m)	Over Limit (dB)	Height (cm)	Angle (deg)	Detector	Polarization
1	2483.50	3.52	44.14	74.00	-29.86	165	238	Peak	VERTICAL
2	2513.55	3.95	48.09	74.00	-25.91	170	290	Peak	VERTICAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
 4. Margin = Result Level – Limit.

The End



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