

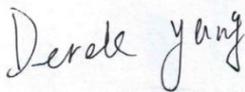
FCC TEST REPORT

Application No.: AR/2021/10008
Applicant: Xiaomi Communications Co., Ltd.
Address of Applicant #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer: Xiaomi Communications Co., Ltd.
Address of Manufacturer #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
EUT Description: Mobile Phone
Model No.: M2103K19G / M2103K19PG
Trade Mark: Redmi / POCO
FCC ID: 2AFZZK19G
Standards: 47 CFR Part 15, Subpart C
Date of Receipt: 2021/2/8
Date of Test: 2021/2/8 to 2021/3/17
Date of Issue: 2021/3/18

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:



Derek Yang
 Wireless Laboratory Manager



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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-03-18		Original

Authorized for issue by:			
Prepared By		 _____ (Dee Zheng) / Engineer	
Checked By		 _____ (Daniel Wang) / Reviewer	



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2 Test Summary

Test Item	Test Requirement	Test Method	Test Result	Result
Duty Cycle	--	--	Clause 4.2	PASS
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.3	PASS
DTS (6 dB) Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.4	PASS
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.5	PASS
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.6	PASS
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS

Note: The differences between M2103K19G (K19) and M2103K19PG (K19P) are as below:

Model name	Brand Name	rear cover
M2103K19G	Redmi	The material is the same, drawing is different, laser engraving is different
M2103K19PG	POCO	

Except listings above, the others are all the same as previous version.

Based on the above differences, the main test only performs M2103K19G



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3 General Information

3.1 Details of Client

Applicant:	Xiaomi Communications Co., Ltd.
Address of Applicant	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer:	Xiaomi Communications Co., Ltd.
Address of Manufacturer	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

3.2 Test Location

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



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3.3 Test Facility

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

• **A2LA (Certificate No. 3816.01)**

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

• **VCCI**

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

• **FCC –Designation Number: CN1178**

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

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

• **Innovation, Science and Economic Development Canada**

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

CAB identifier: CN0006.

IC#: 4620C.



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3.4 General Description of EUT

EUT Description:	Mobile Phone
Model No.:	M2103K19G / M2103K19PG
Trade Mark:	Redmi / POCO
Hardware Version:	P2
Software Version:	MIUI 12
Operation Frequency:	2400MHz~2483.5MHz $f_c = 2402 \text{ MHz} + N * 2 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 39.
Bluetooth version:	Bluetooth V5.1
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	PIFA Antenna
Antenna Gain:	-1.3dBi

Operation Frequency of each channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz



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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(CH19)	2440MHz
The Highest channel(CH39)	2480MHz

3.5 Test Environment

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

3.6 Description of Support Units

The EUT has been tested independent unit.



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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 on the main PCB and no consideration of replacement. The best case gain of the antenna is -1.3dBi.</p>	



4.2 Duty Cycle

4.2.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]	T(ms)	1/T(kHz)	VBW(kHz)
BLE_1M	CH0, CH19, CH39	84.56	2.12	0.47	1
BLE_2M	CH0, CH19, CH39	56.68	1.06	0.94	1

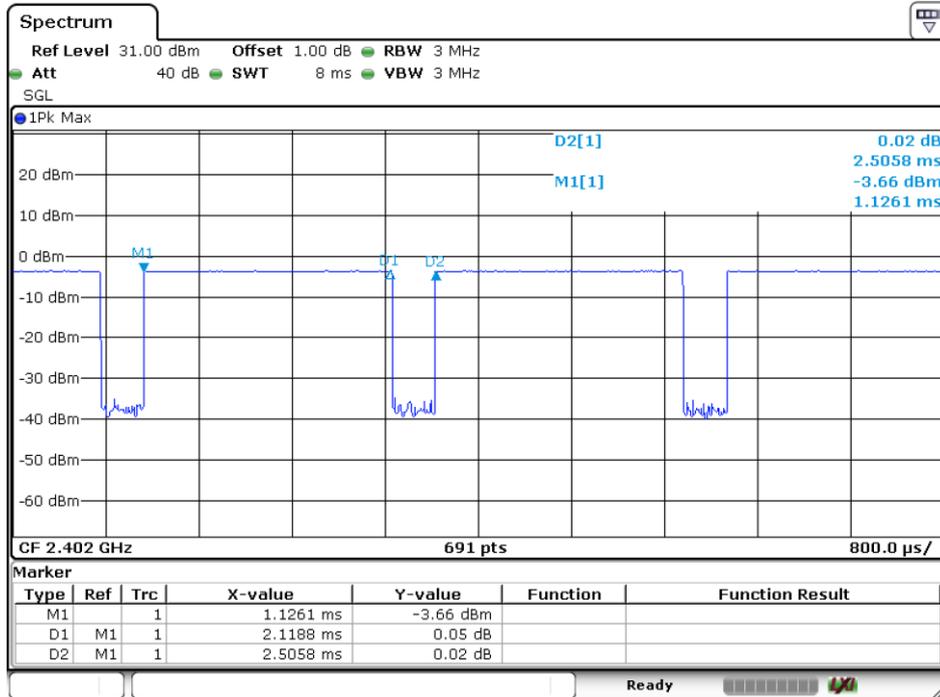


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4.2.2 Test Plots

4.2.2.1 ANT1

4.2.2.1.1 BLE_1M



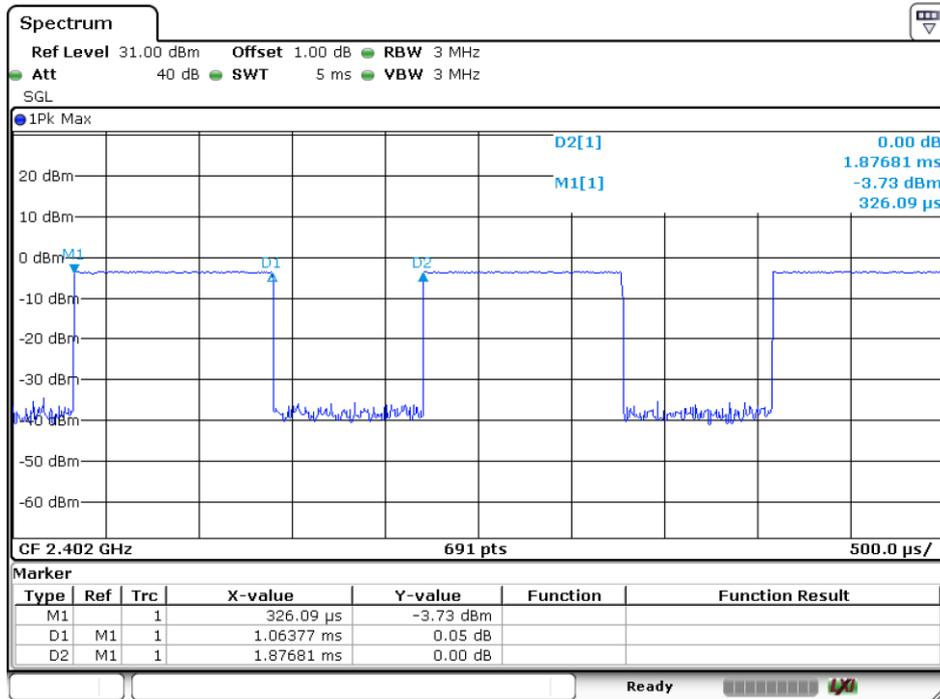
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4.2.2.1.2 BLE_2M

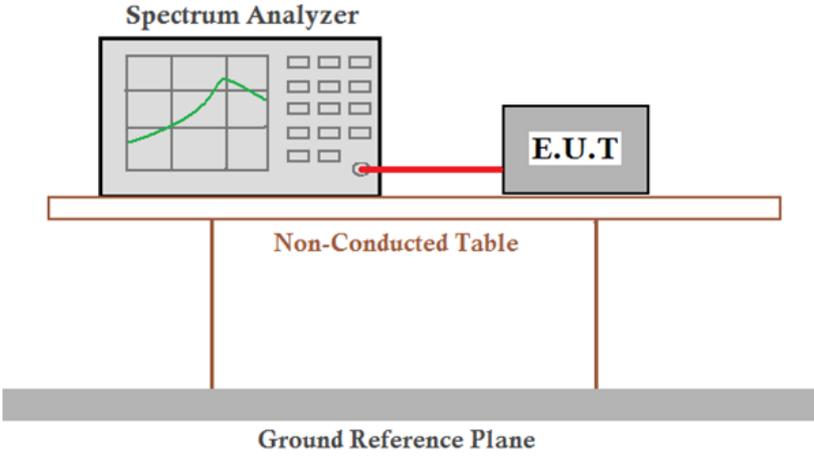


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4.3 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section 11.9.1.1
Test Setup:	
Test Instruments:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	30dBm
Test Results:	Pass



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4.3.1 Test Results

Measurement Data of Peak Power:

GFSK_1M mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-2.18	30.00	Pass
Middle	-1.02	30.00	Pass
Highest	-1.37	30.00	Pass

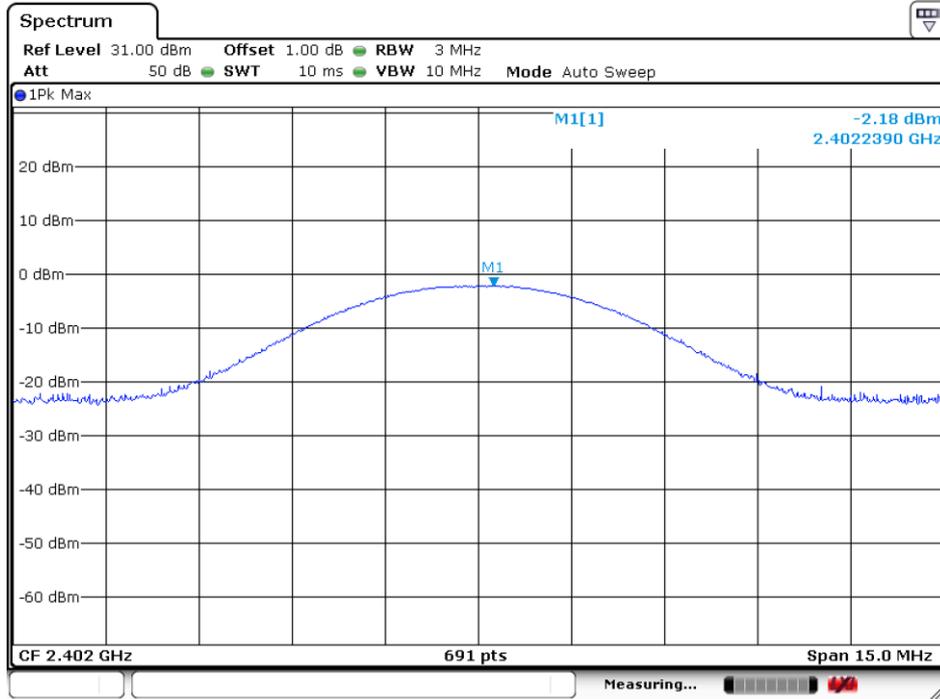
GFSK_2M mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-2.27	30.00	Pass
Middle	-1.02	30.00	Pass
Highest	-1.31	30.00	Pass



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4.3.2 Test Plots

4.3.2.1 GFSK 1M_Lowest Channel



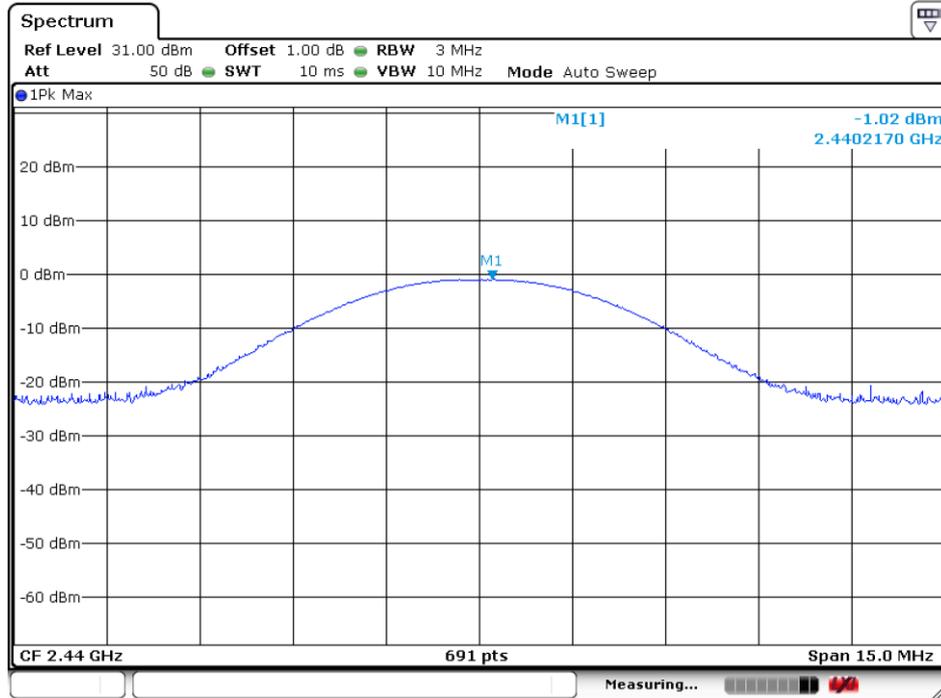
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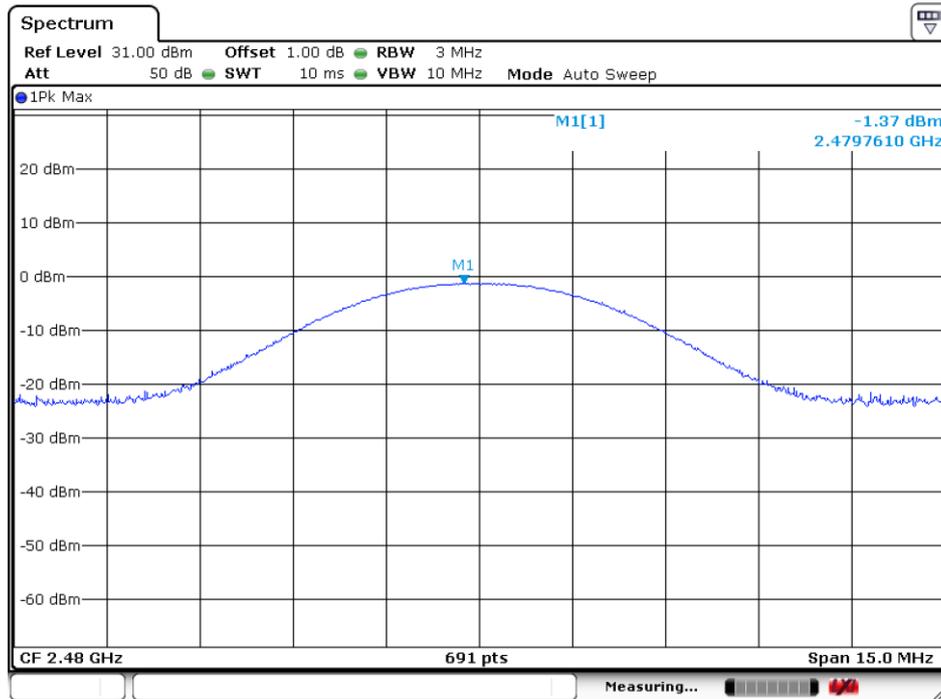
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4.3.2.2 GFSK 1M_Middle Channel



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4.3.2.3 GFSK 1M_Highest Channel

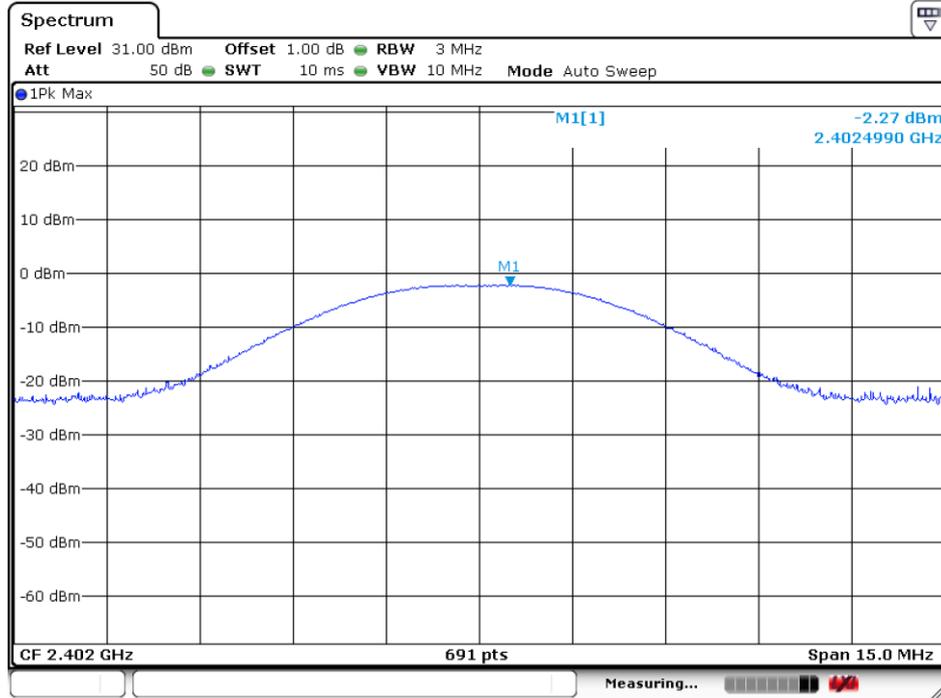


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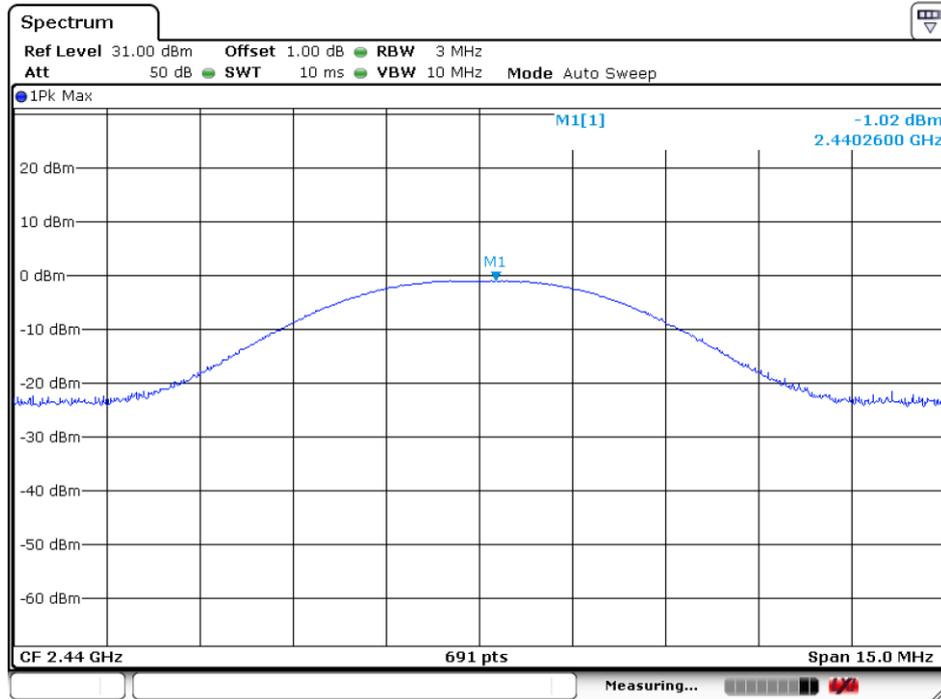
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4.3.2.4 GFSK 2M_Lowest Channel



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4.3.2.5 GFSK 2M_Middle Channel

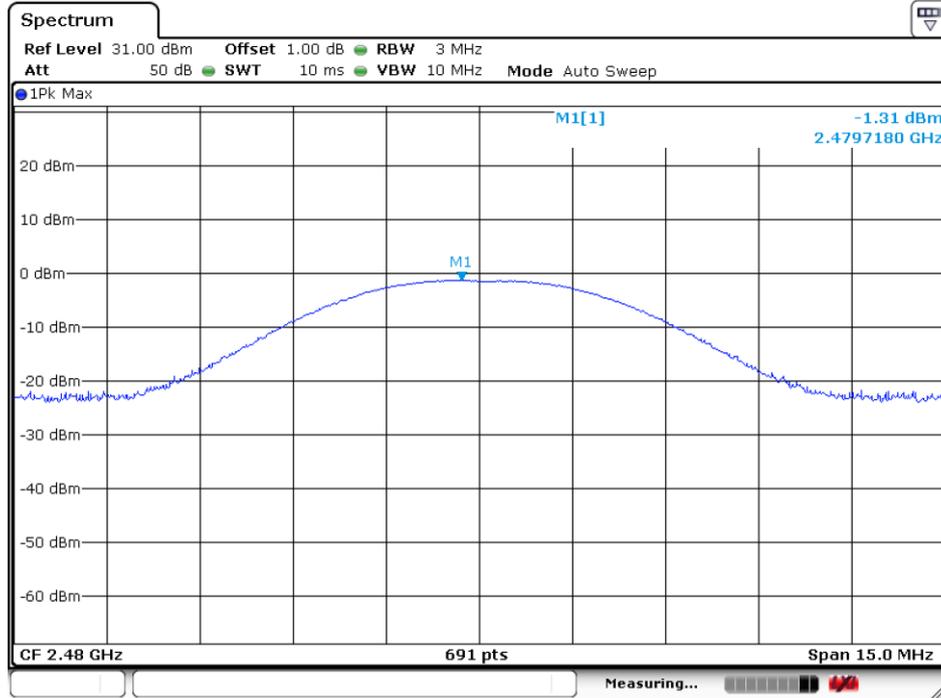


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4.3.2.6 GFSK 2M_Highest Channel



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4.4 DTS (6 dB) Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8 Option 2
Test Setup:	<p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	≥ 500 kHz
Test Results:	Pass

4.4.1 Test Results

Mode	Test Channel	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK_1M	Lowest	0.67	≥500	Pass
	Middle	0.68	≥500	Pass
	Highest	0.69	≥500	Pass

Mode	Test Channel	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK_2M	Lowest	1.23	≥500	Pass
	Middle	1.23	≥500	Pass
	Highest	1.23	≥500	Pass

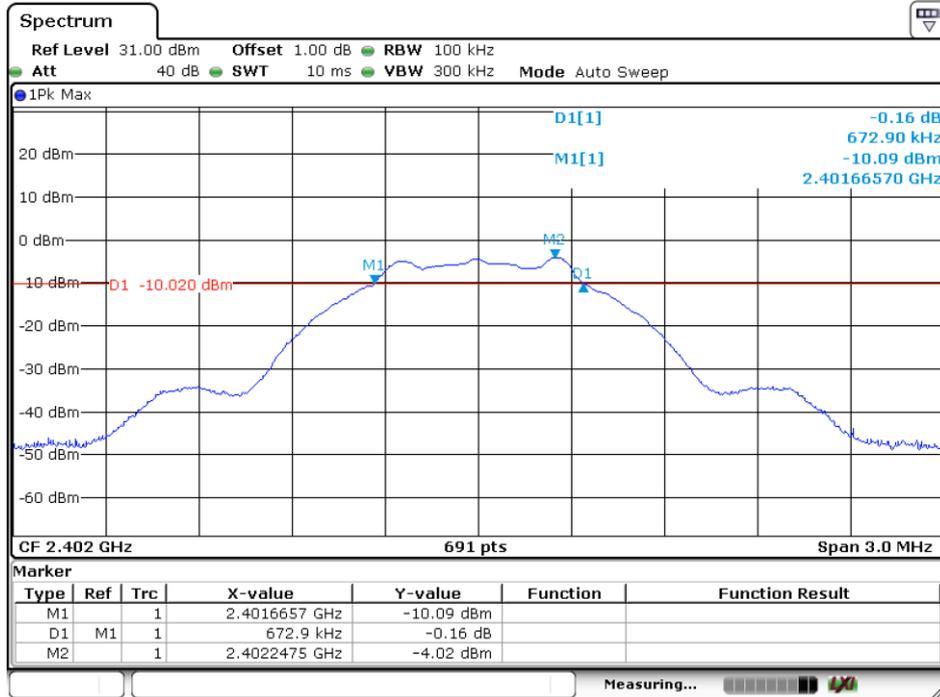


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4.4.2 Test Plots

4.4.2.1 GFSK 1M_Lowest Channel

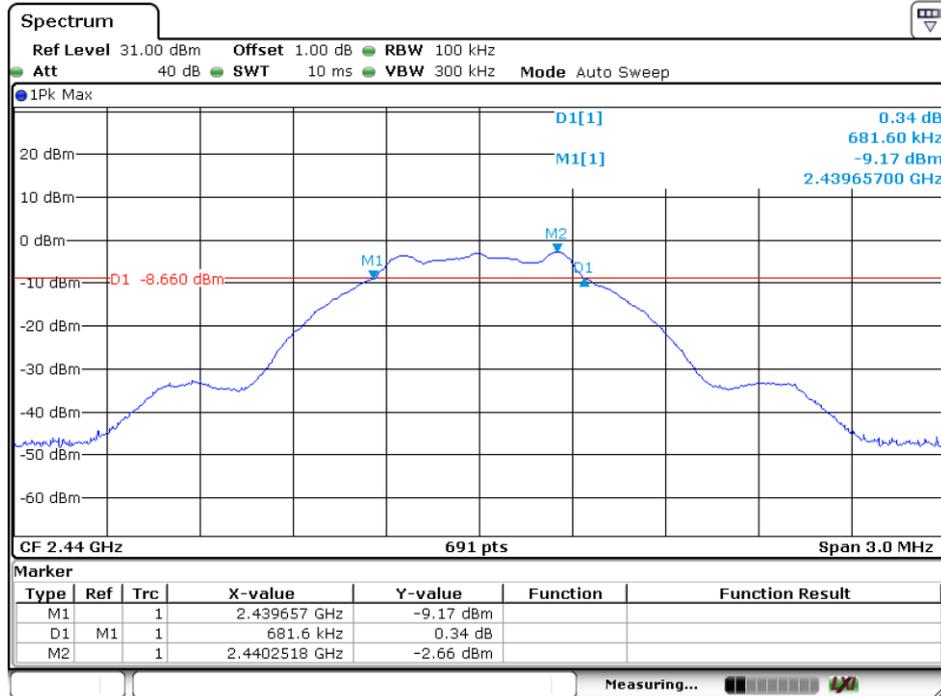


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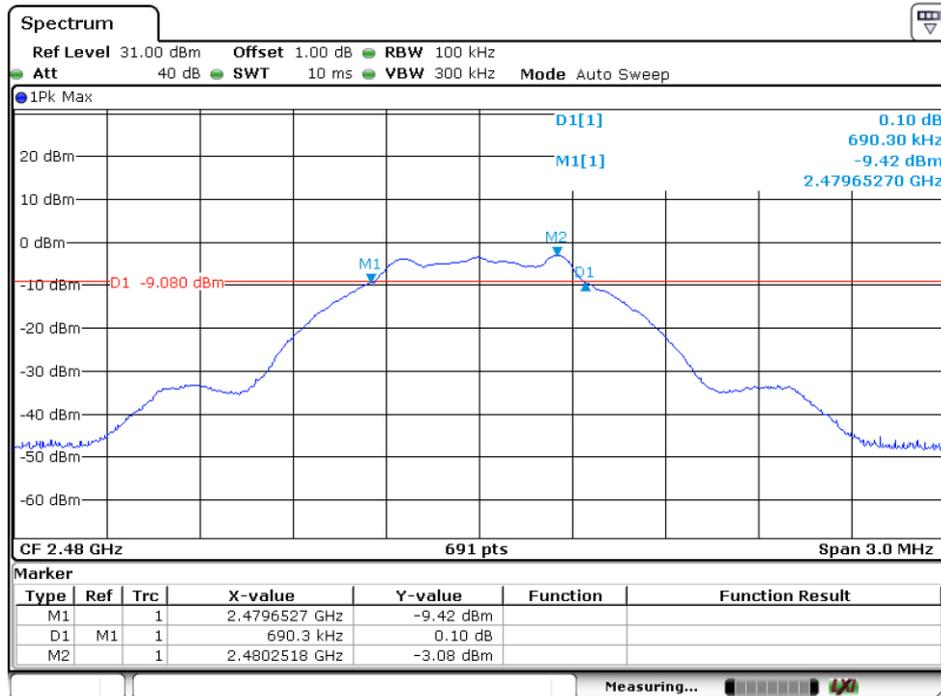
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4.4.2.2 GFSK 1M_Middle Channel



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4.4.2.3 GFSK 1M_Highest Channel



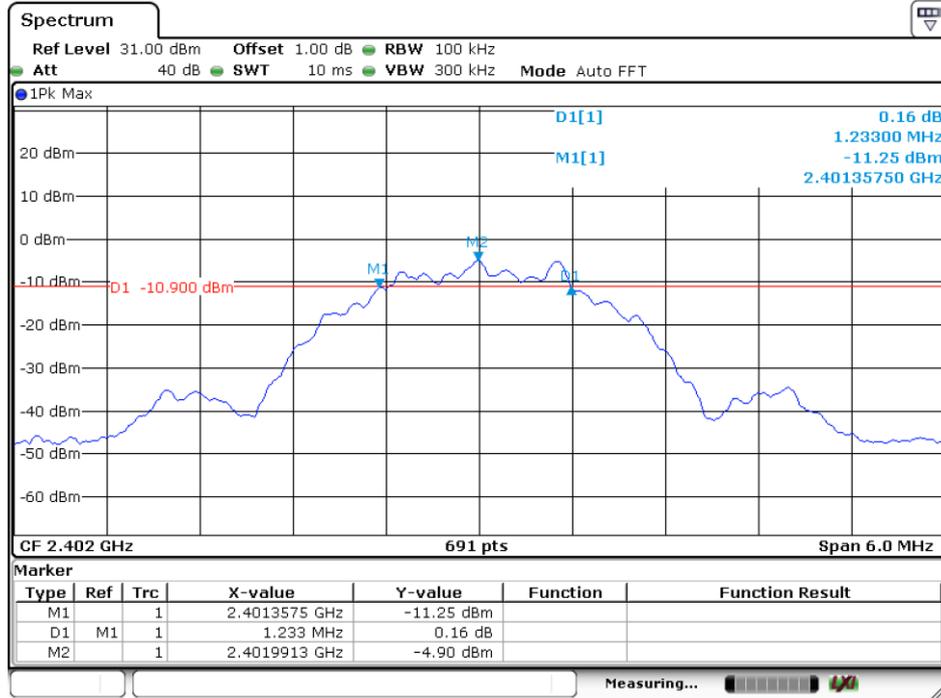
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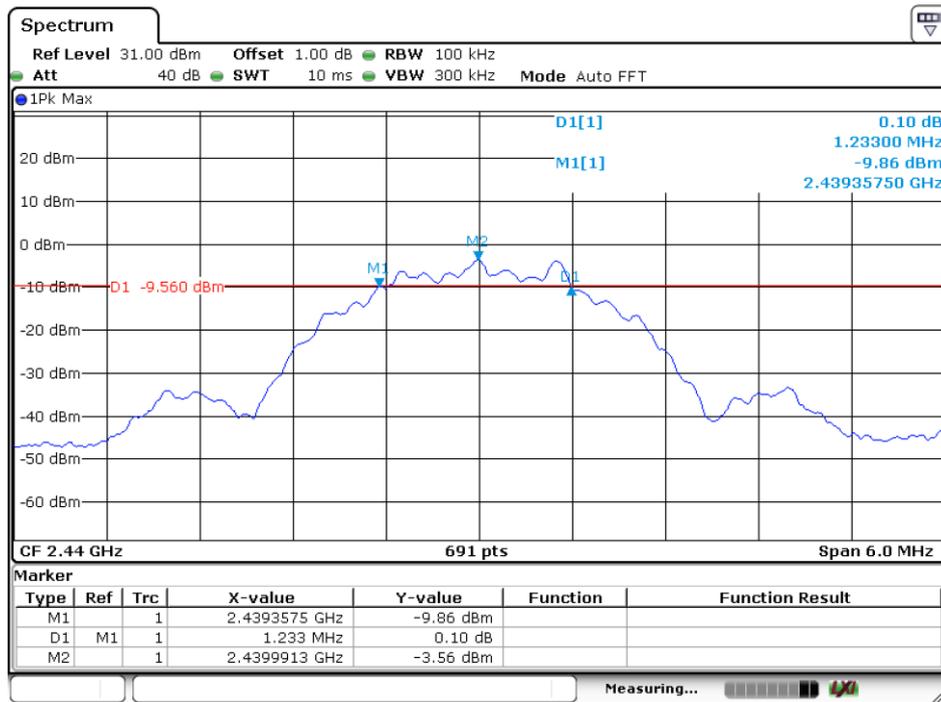
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4.4.2.4 GFSK 2M_Lowest Channel



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4.4.2.5 GFSK 2M_Middle Channel

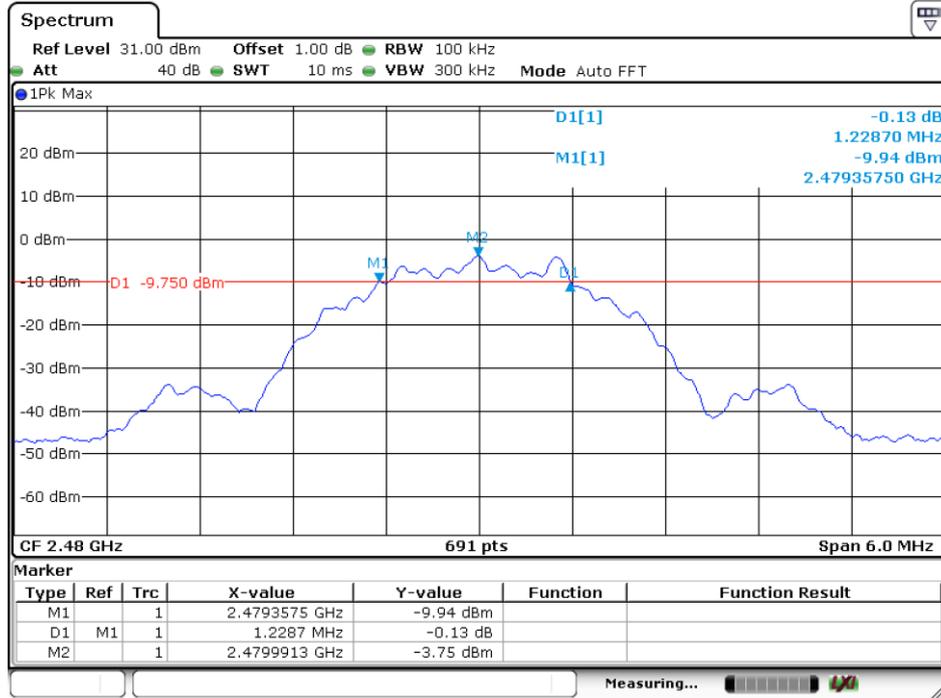


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4.4.2.6 GFSK 2M_Highest Channel



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4.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	
Test Instruments:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass

4.5.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
GFSK_1M	Lowest	-19.91	≤8.00	Pass
	Middle	-18.56	≤8.00	Pass
	Highest	-18.94	≤8.00	Pass

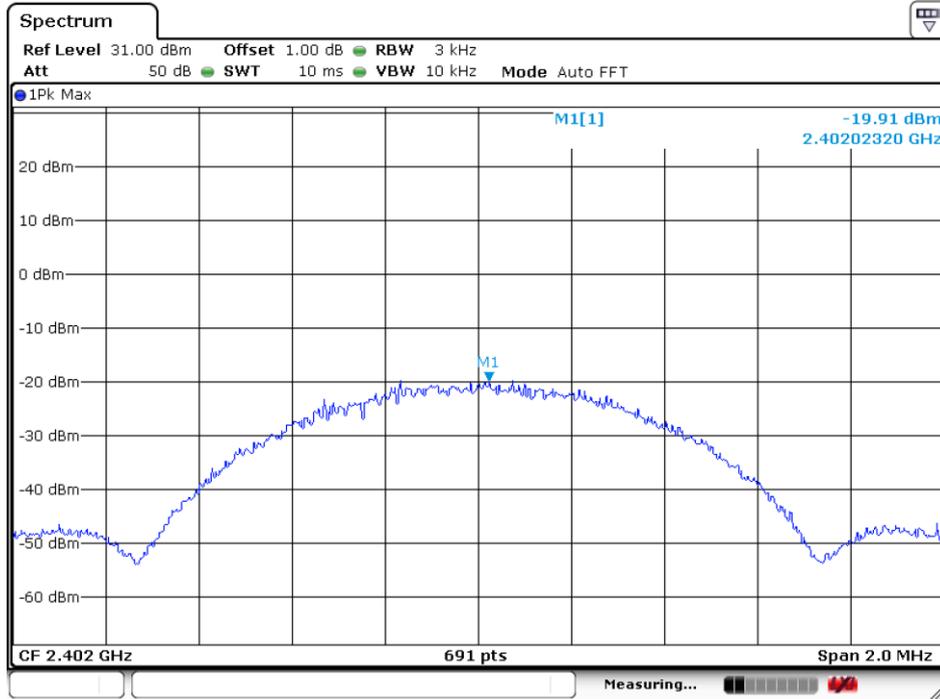
Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
GFSK_2M	Lowest	-21.82	≤8.00	Pass
	Middle	-20.57	≤8.00	Pass
	Highest	-20.95	≤8.00	Pass



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4.5.2 Test Plots

4.5.2.1 GFSK 1M_Lowest Channel

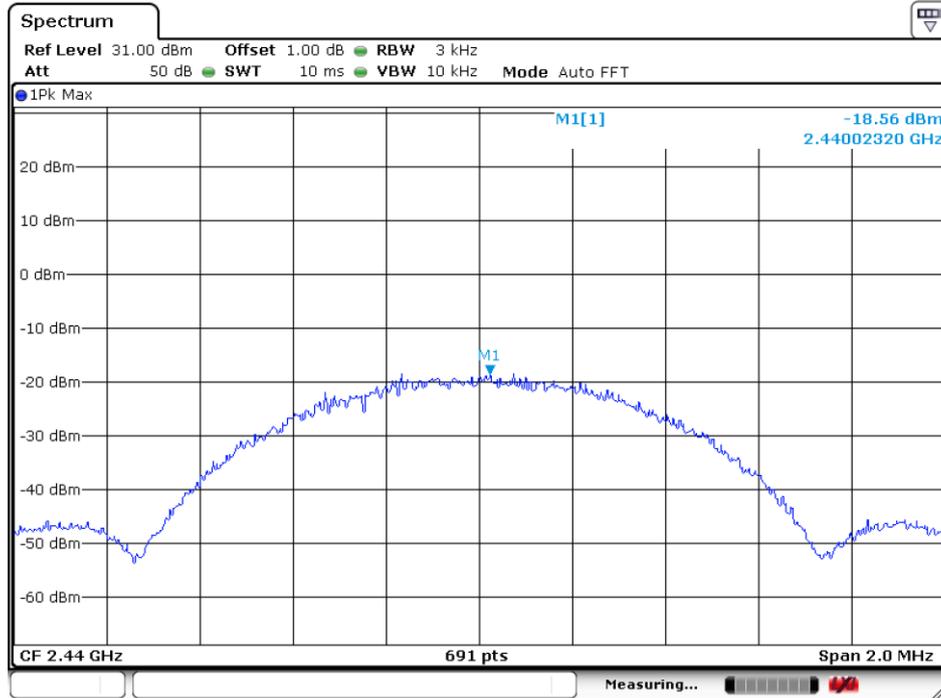


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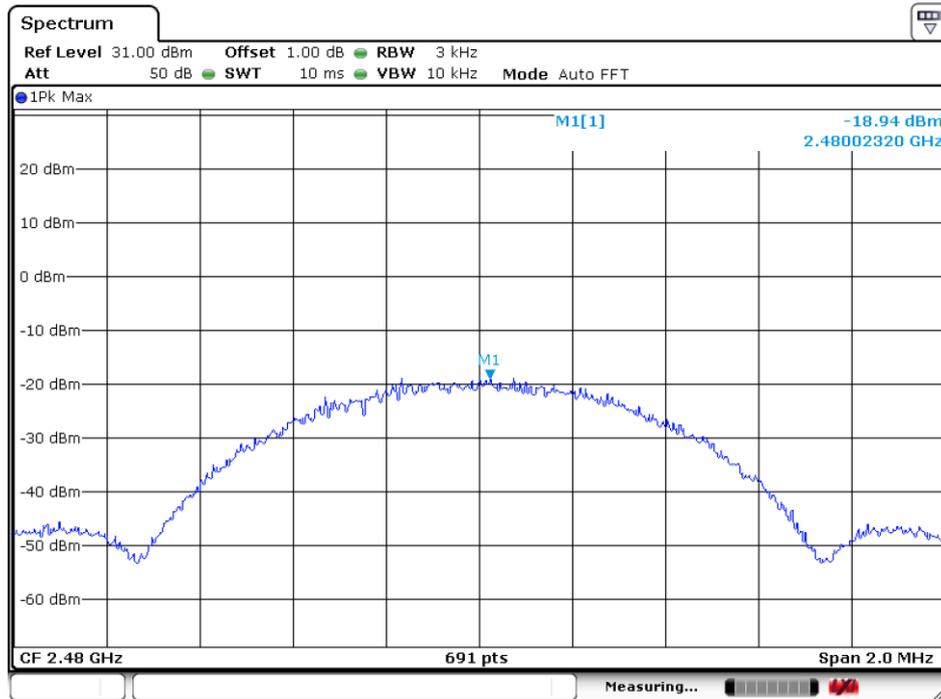
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4.5.2.2 GFSK 1M_Middle Channel



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4.5.2.3 GFSK 1M_Highest Channel



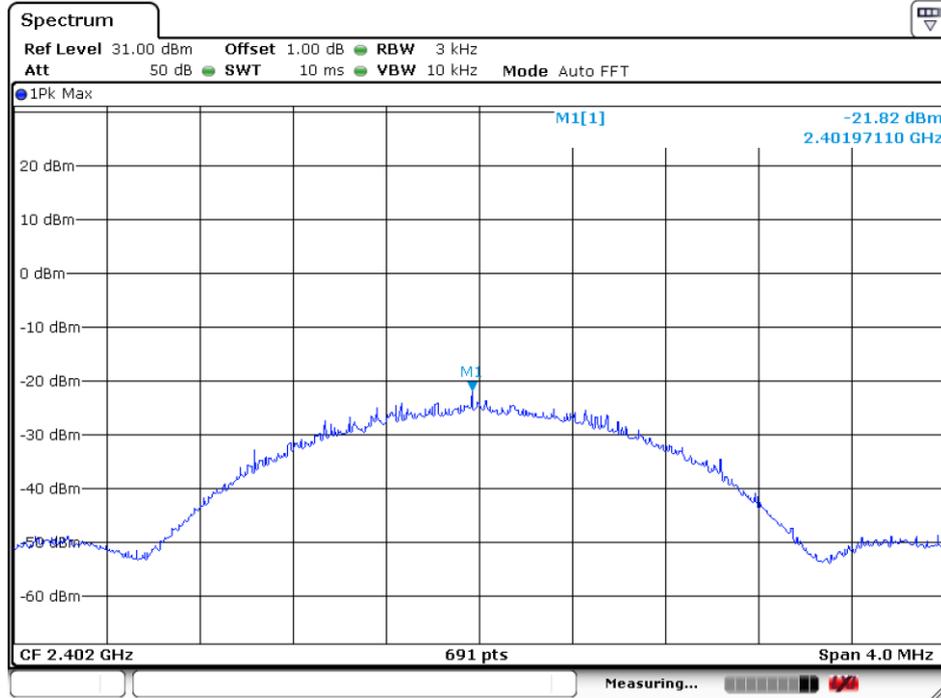
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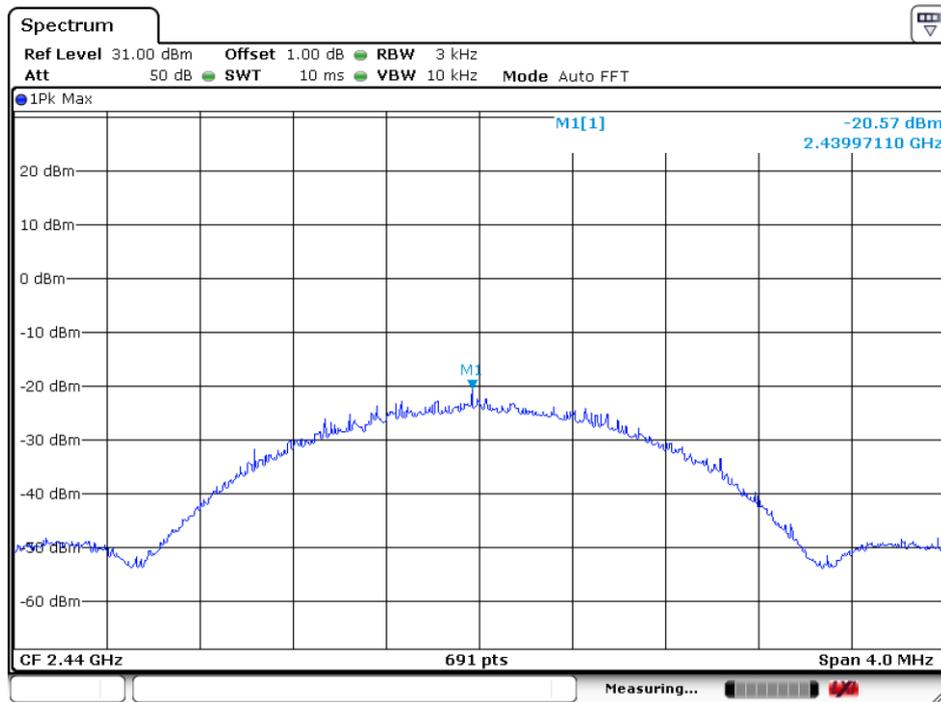
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4.5.2.4 GFSK 2M_Lowest Channel



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4.5.2.5 GFSK 2M_Middle Channel



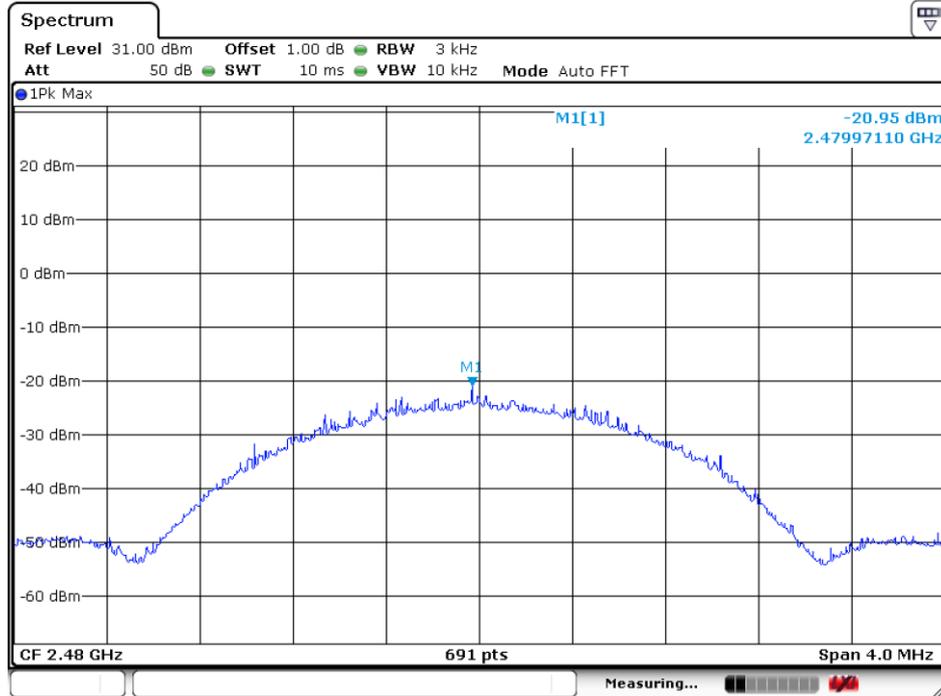
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4.5.2.6 GFSK 2M_Highest Channel



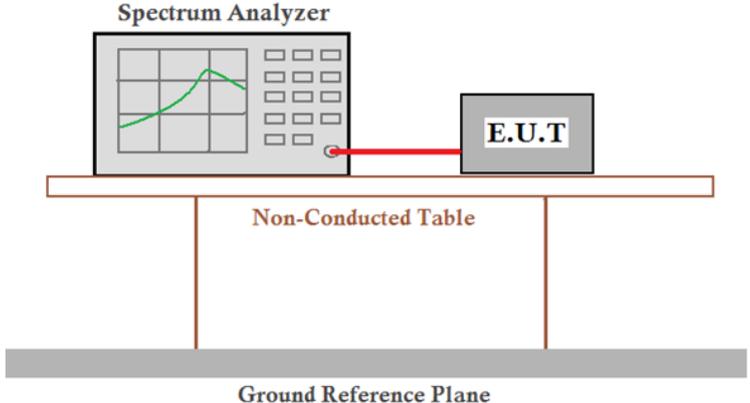
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4.6 Band-edge for RF Conducted Emissions

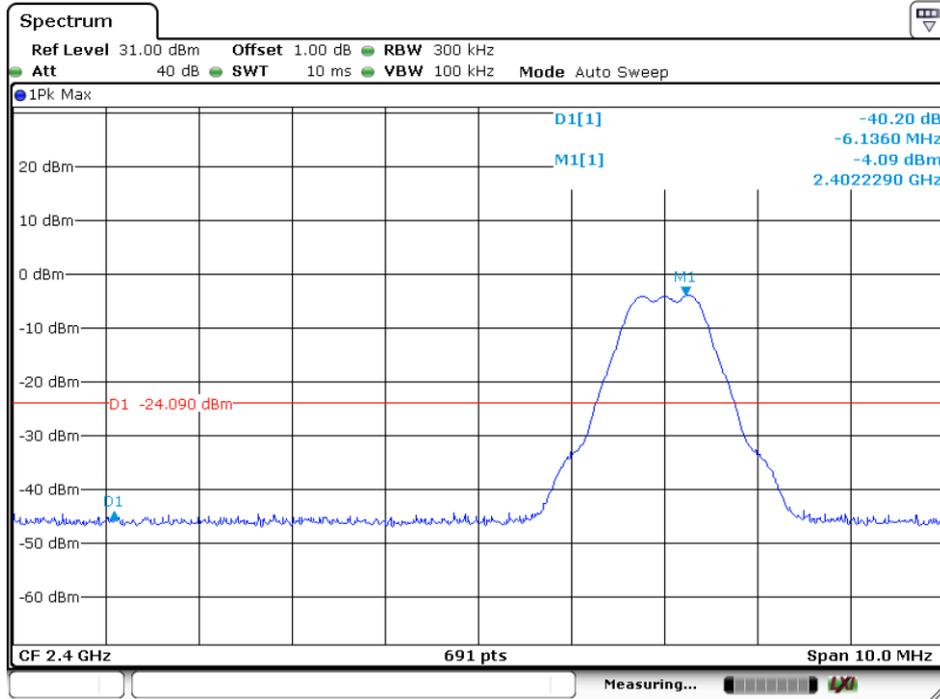
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass



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4.6.1 Test Plots

4.6.1.1 GFSK 1M_Lowest Channel



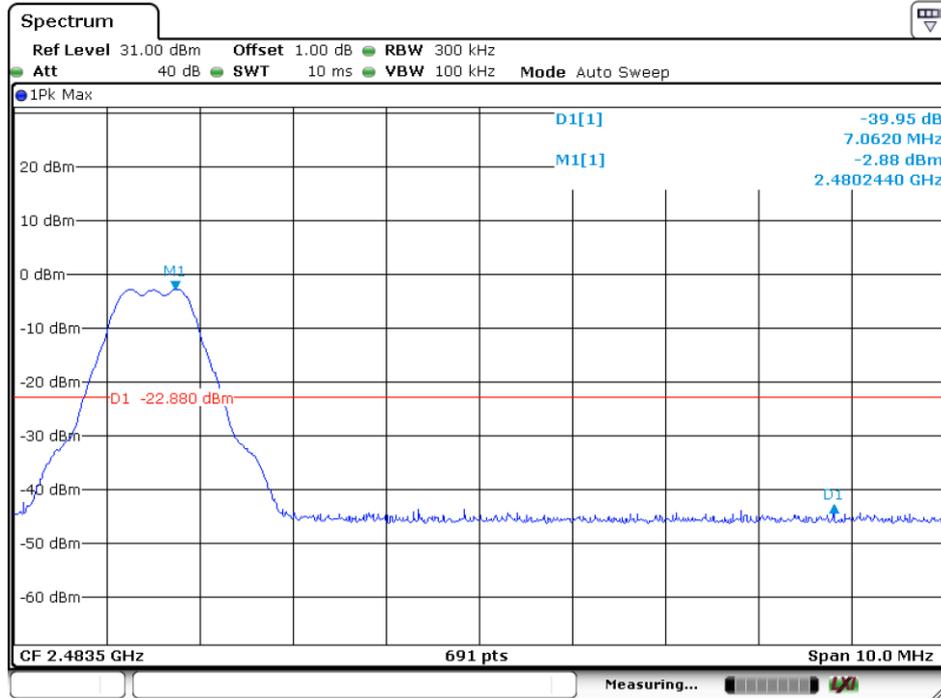
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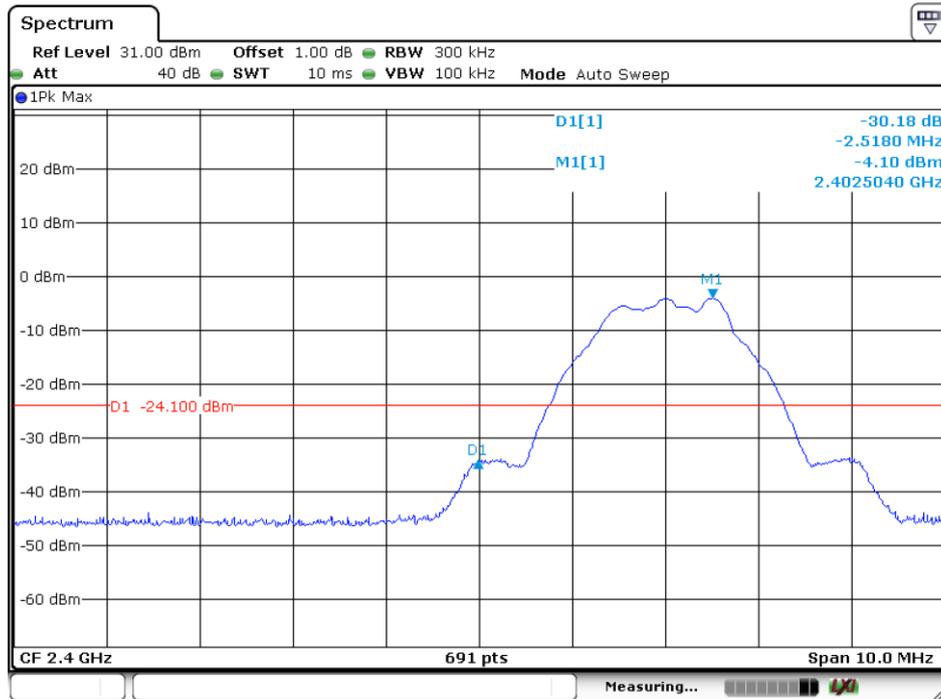
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4.6.1.2 GFSK 1M_Highest Channel



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4.6.1.3 GFSK 2M_Lowest Channel

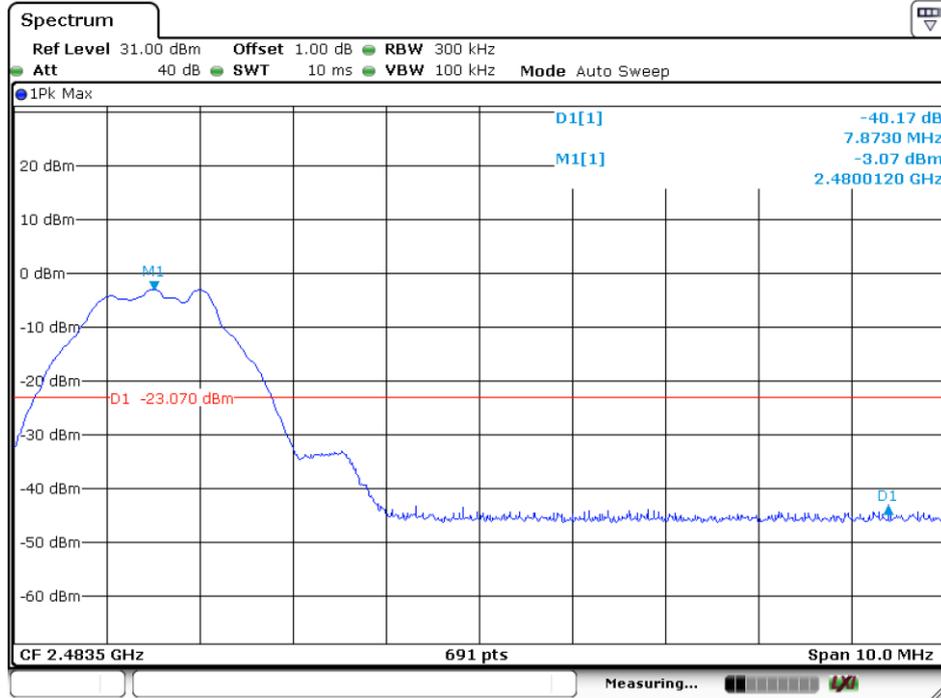


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4.6.1.4 GFSK 2M_Highest Channel



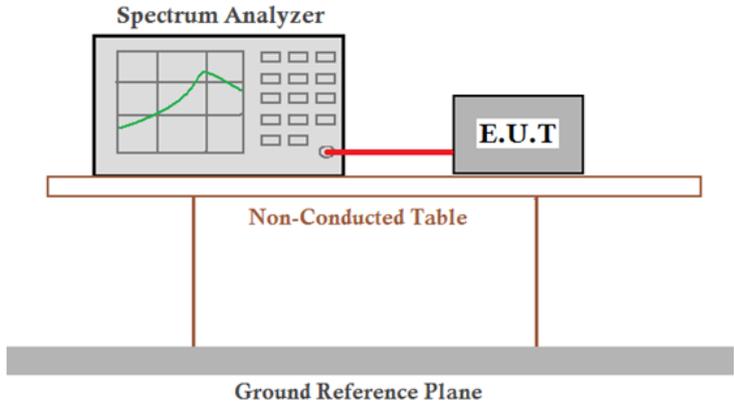
Date: 1.MAR 2021 20:04:09



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4.7 RF Conducted Spurious Emissions

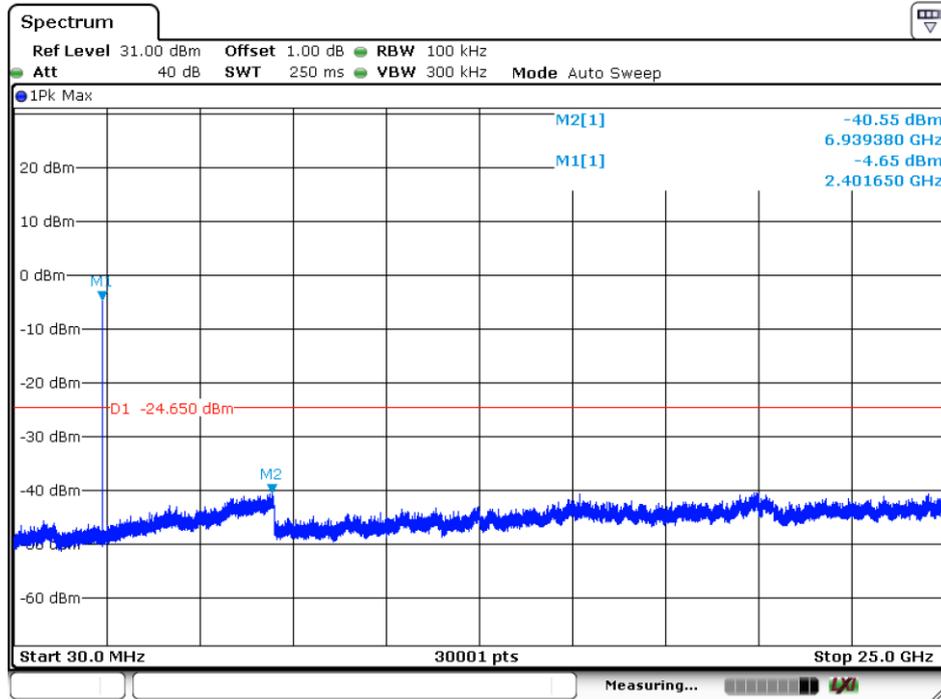
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass



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4.7.1 Test Plots

4.7.1.1 GFSK 1M_Lowest Channel



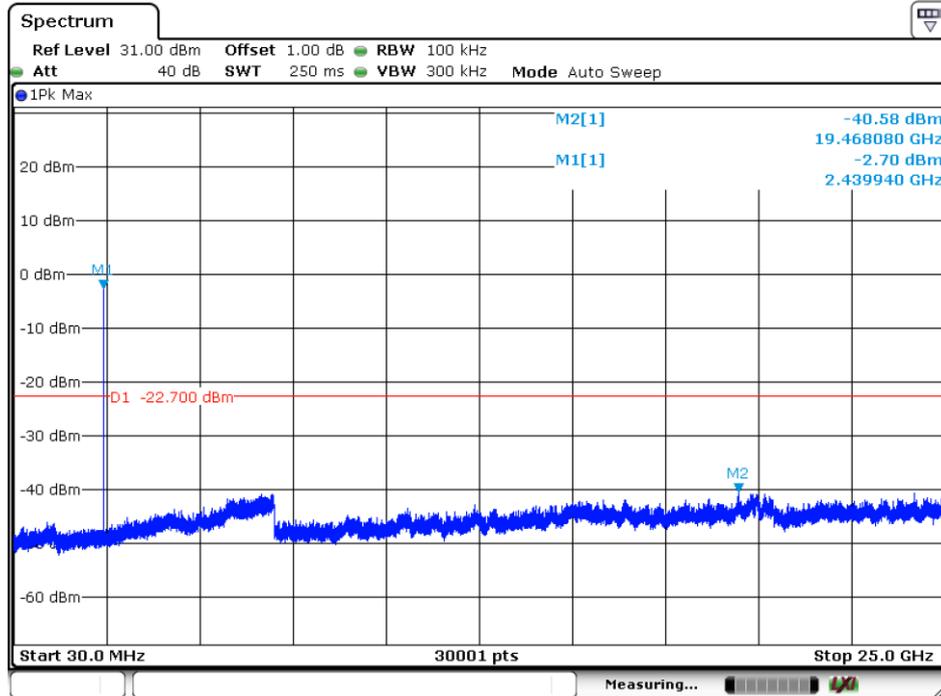
Date: 1.MAR.2021 20:11:45



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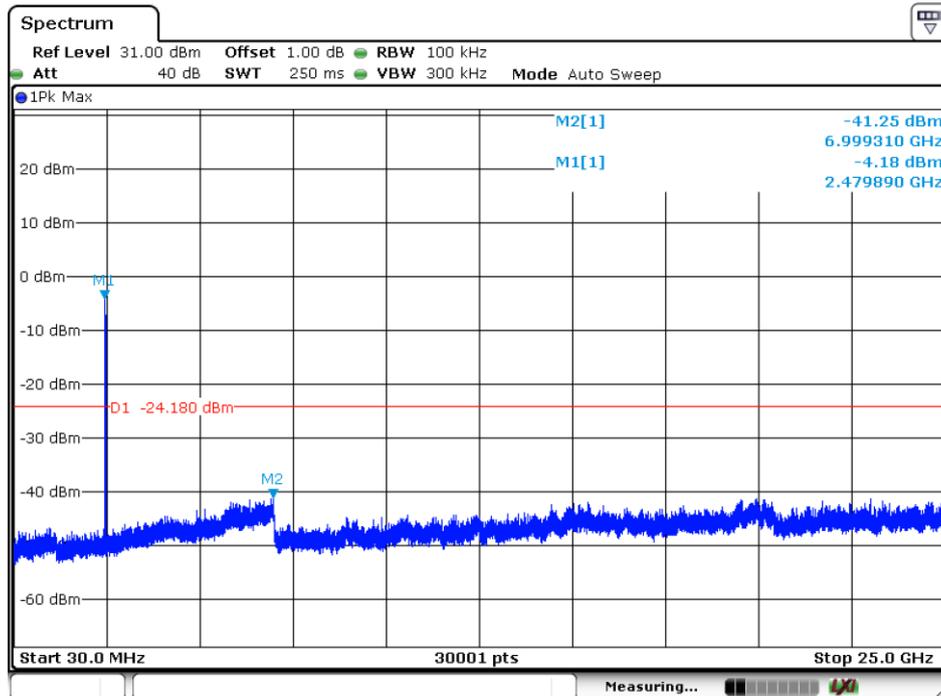
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4.7.1.2 GFSK 1M_Middle Channel



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4.7.1.3 GFSK 1M_Highest Channel



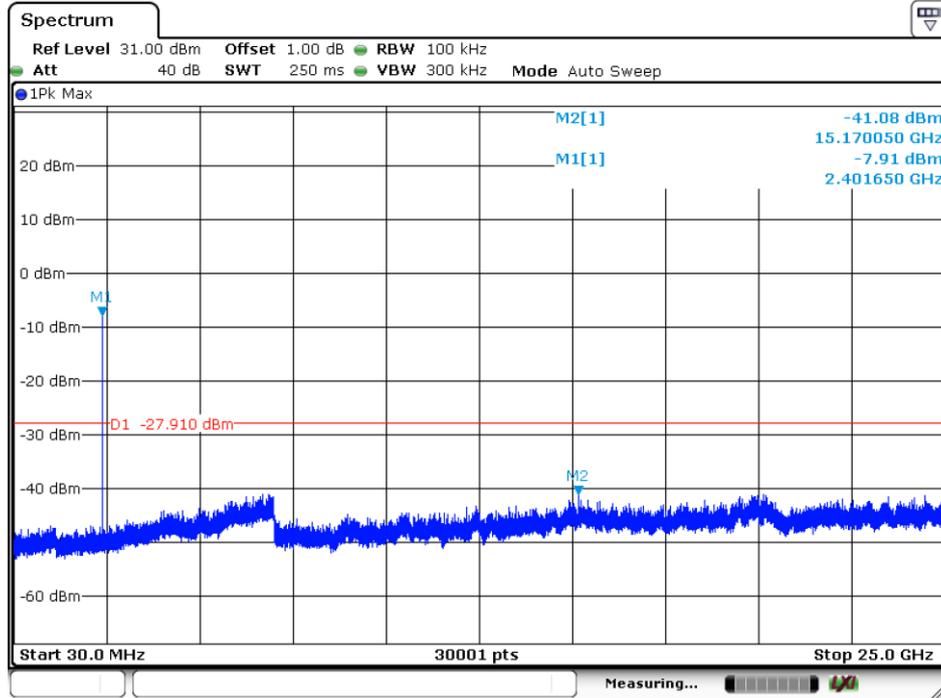
Date: 1.MAR.2021 20:14:31



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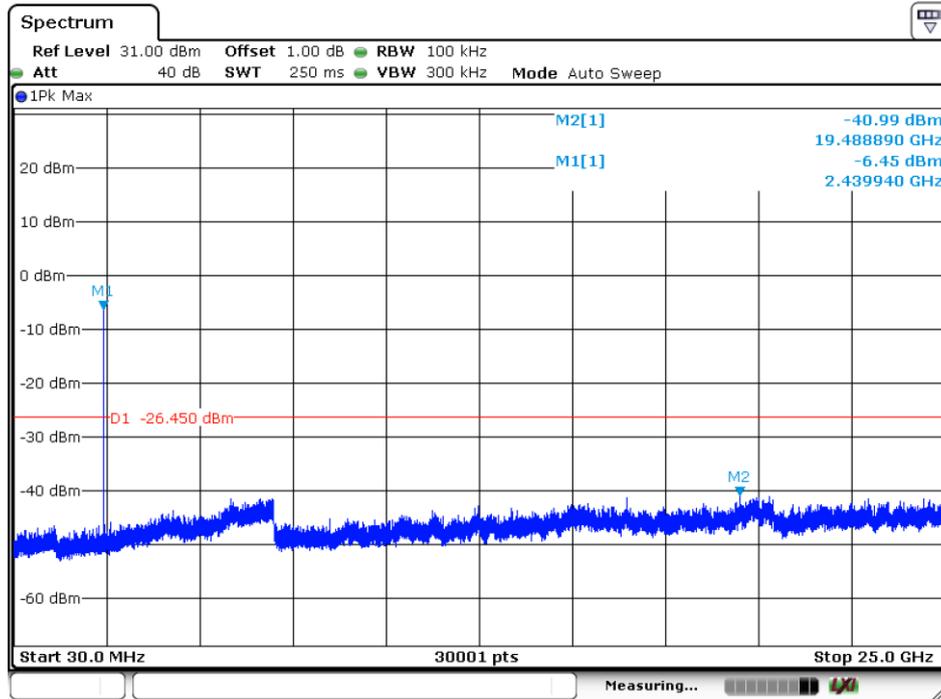
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4.7.1.4 GFSK 2M_Lowest Channel



Date: 1.MAR 2021 20:16:39

4.7.1.5 GFSK 2M_Middle Channel

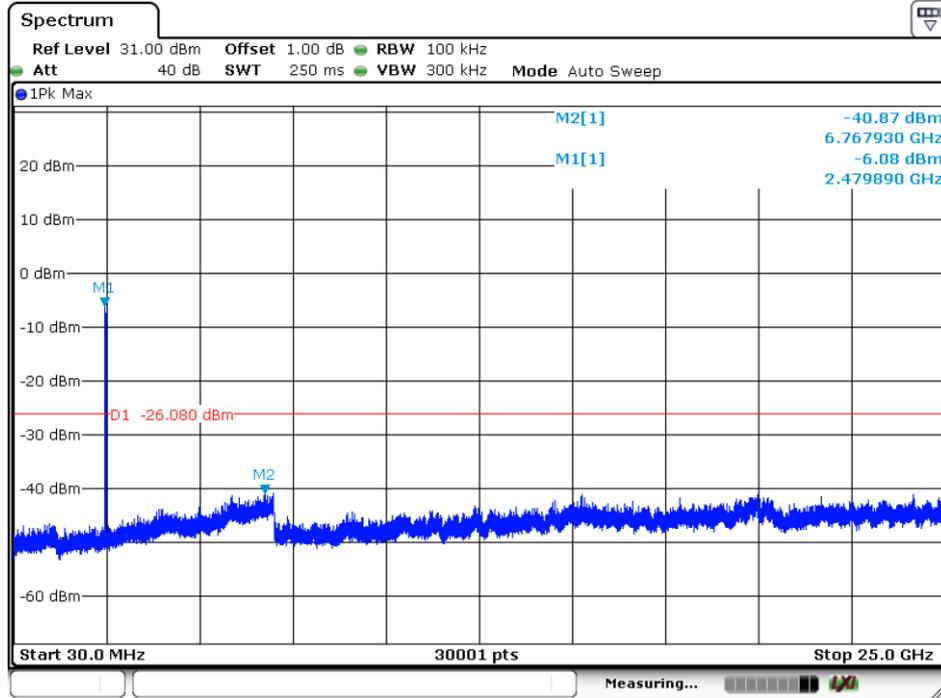


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4.7.1.6 GFSK 2M_Highest Channel



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

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB
4	Temperature test	±1°C
5	Humidity test	±3%
6	DC and low frequency voltages	±0.5%



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6 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No	Cal. date	Cal.Duedate
				(yyyy-mm-dd)	(yyyy-mm-dd)
DC Power Supply	Agilent Technologie Inc	66311B	W009-09	2020/7/15	2021/7/15
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2021/1/3	2022/1/2
Coaxial Cable	SGS	N/A	SEM031-01	2020/6/12	2021/6/11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020/7/14	2021/7/14
Temperature Chamber	GIANT FORCE	ICT-150-40-CP AR	W027-03	2020/10/27	2021/10/27
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020/7/14	2021/7/14

The End



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