

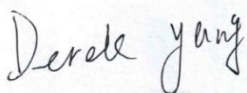
FCC TEST REPORT

Application No.: ZR/2020/B0036
Applicant: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Applicant: NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City , Guangdong, China
Manufacturer: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Manufacturer: NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City , Guangdong, China
EUT Description: Mobile Phone
Model No.: CPH2173
Trade Mark: OPPO
FCC ID: R9C-CPH2173
Standards: 47 CFR FCC Part 2, Subpart J
 47 CFR Part 15, Subpart C
Date of Receipt: 2020/11/19
Date of Test: 2020/11/19 to 2020/12/31
Date of Issue: 2021/4/15

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		2021/1/4		Original
02		2021/4/15	Stephen liang	1.Add test site Information 2.Modify data conversion error of antenna height 3.Update equipment list

*This report supersedes our previous report ZR/2020/B003603, issued on 2021-01-04, which is hereby deemed null and void.

Authorized for issue by:		
Prepared By		 (Stephen liang) / Engineer
Checked By		 (David Chen) /Reviewer



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2 Test Summary

Test Item	Test Requirement	Test Method	Test Result	Result	Test Lab*
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Clause 4.2	PASS	B
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.3	PASS	A
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.4	PASS	A
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.5	PASS	A
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.6	PASS	A
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS	A
Radiated Spurious Emissions	15.205/15.209	ANSI C63.10 2013	Clause 4.8	PASS	B
Restricted bands around fundamental frequency (Radiated Emission)	15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS	B

Remark :

All test were performed by Lab A and B.

Parts of test items above were subcontracted to Lab B.

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

Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.



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3 General Information

3.1 Details of Client

Applicant:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Applicant	NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City , Guangdong,China
Manufacturer:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Manufacturer	NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan City , Guangdong,China

3.2 Test Location

Lab A:

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

Lab B:

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



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3.3 Test Facility

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

Lab A:

• A2LA (Certificate No. 3816.01)

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

• VCCI

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

• FCC –Designation Number: CN1178

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

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

• Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

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

• FCC –Designation Number: CN1271



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3.4 General Description of EUT

EUT Description:	Mobile Phone
Model No.:	CPH2173
Trade Mark:	OPPO
Hardware Version:	11
Software Version:	ColorOS V11.2
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 2 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 0 to 39.
Bluetooth version:	Bluetooth V5.2 LE
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	☒ Portable Device, ☐ Module
Antenna Type:	☐ External, ☒ Integrated
Antenna Gain:	-3.5dBi
Power Supply	☒ AC/DC Adapter; ☐ Battery ☐ PoE;; ☐ Other:

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



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

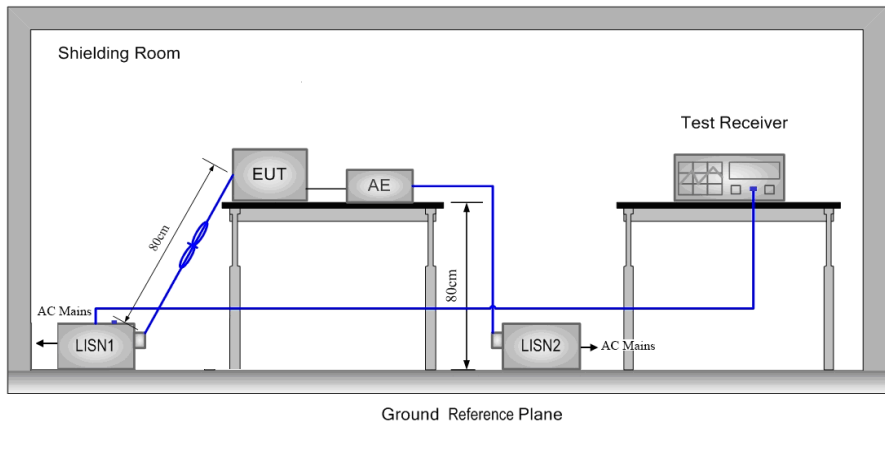
Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -3.5dBi.	



4.2 AC Power Line Conducted Emissions

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



Test Setup:	
Test Mode:	Transmitting with GFSK modulation. Charge +Transmitting mode.
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

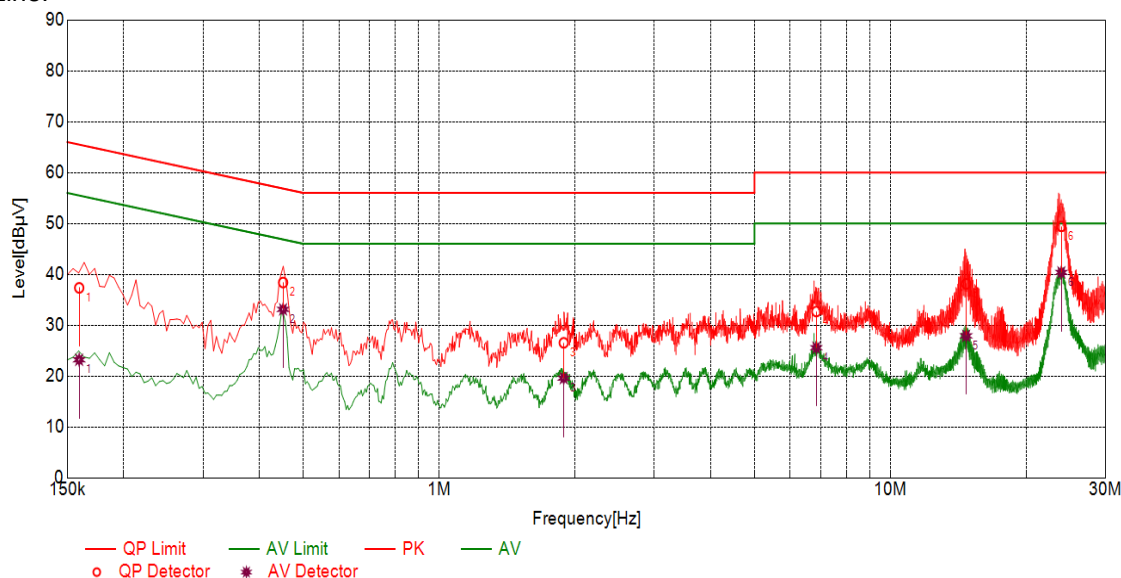


Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Type
1	0.1594	10.10	37.34	65.49	28.15	23.20	55.49	32.29	L
2	0.4512	10.10	38.39	56.85	18.46	33.11	46.85	13.74	L
3	1.8889	10.10	26.54	56.00	29.46	19.60	46.00	26.40	L
4	6.8523	10.10	32.69	60.00	27.31	25.58	50.00	24.42	L
5	14.7220	10.11	38.13	60.00	21.87	27.91	50.00	22.09	L
6	23.9307	10.11	49.44	60.00	10.56	40.37	50.00	9.63	L

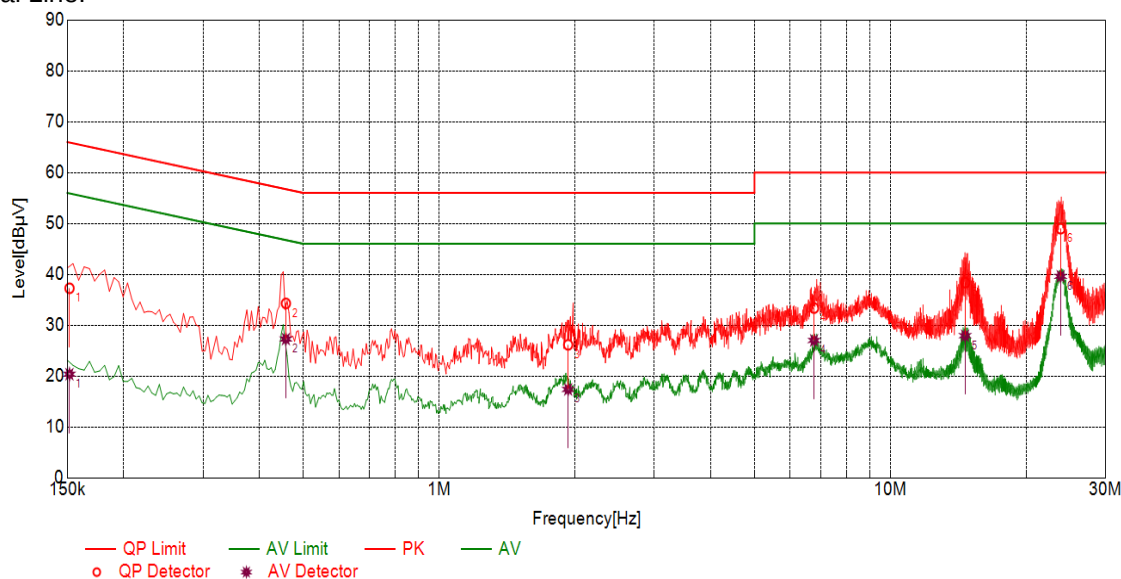


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Neutral Line:



Test Graph

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Type
1	0.1517	10.10	37.26	65.90	28.64	20.37	55.90	35.53	N
2	0.4577	10.10	34.28	56.73	22.45	27.28	46.73	19.45	N
3	1.9320	10.10	26.14	56.00	29.86	17.38	46.00	28.62	N
4	6.7759	10.10	33.37	60.00	26.63	27.01	50.00	22.99	N
5	14.6434	10.11	38.38	60.00	21.62	27.94	50.00	22.06	N
6	23.8421	10.11	48.98	60.00	11.02	39.61	50.00	10.39	N

Remarks:

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



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Shenzhen Branch

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4.3 Duty Cycle

4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
BLE_1M	CH0, CH19, CH39	61.67
BLE_2M	CH0, CH19, CH39	32.41



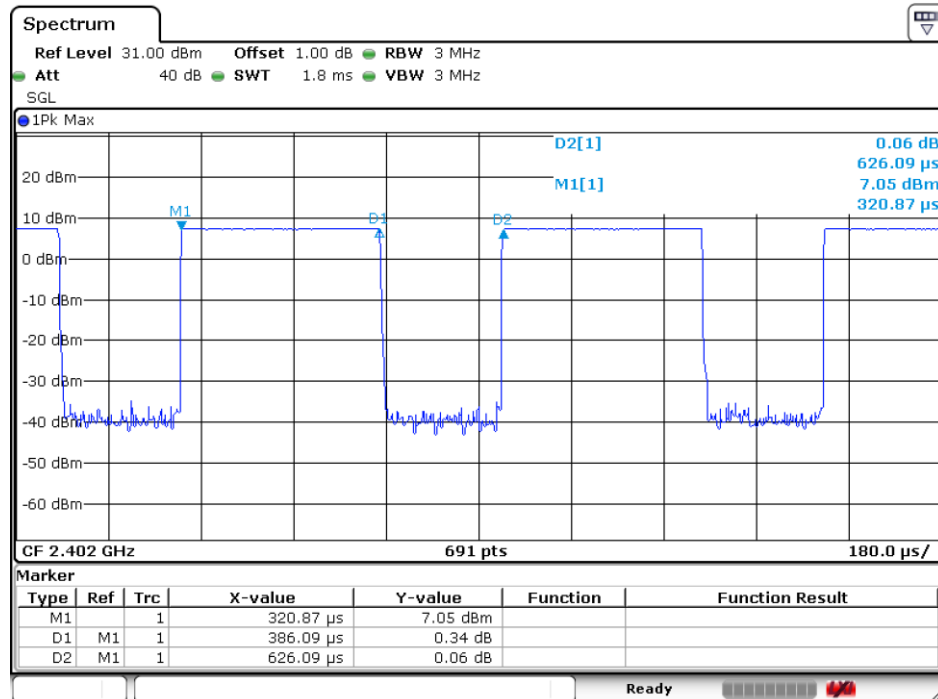
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4.3.2 Test Plots

4.3.2.1 ANT1

4.3.2.1.1 BLE 1M



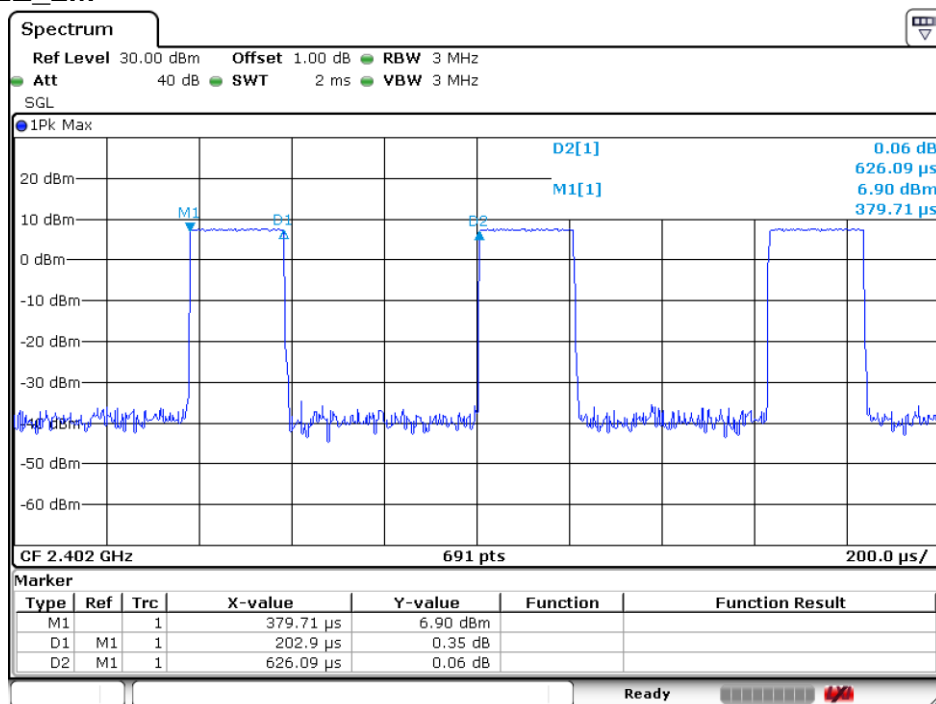
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4.3.2.1.2 BLE_2M



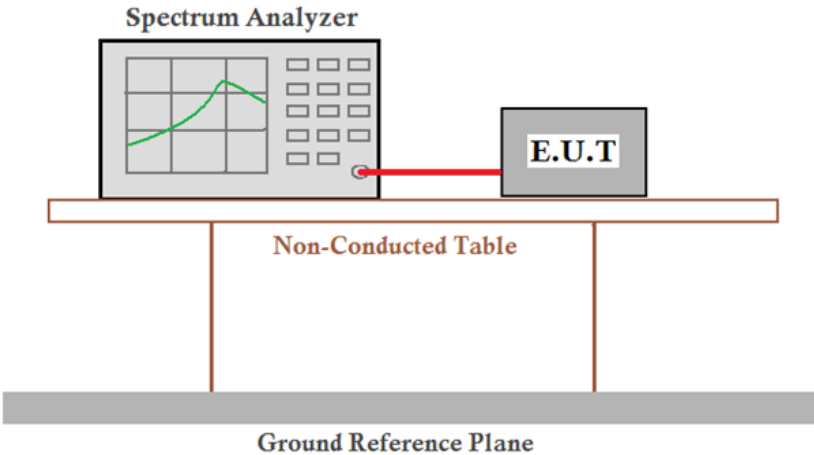
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4.4 Conducted Output Power

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 5.10 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	30dBm
Test Results:	Pass

4.4.1 Test Results

Measurement Data of Peak Power:

GFSK_1M mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	7.63	30.00	Pass
Middle	7.71	30.00	Pass
Highest	7.46	30.00	Pass

GFSK_2M mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	7.62	30.00	Pass
Middle	7.75	30.00	Pass
Highest	7.53	30.00	Pass

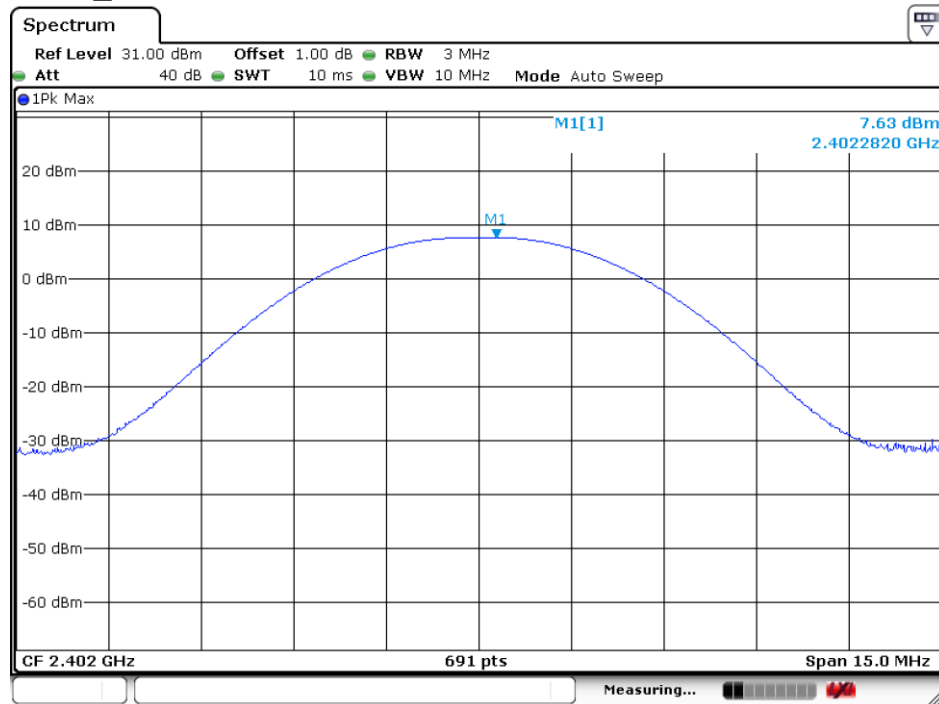


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4.4.2 Test Plots

4.4.2.1 GFSK 1M_Lowest Channel



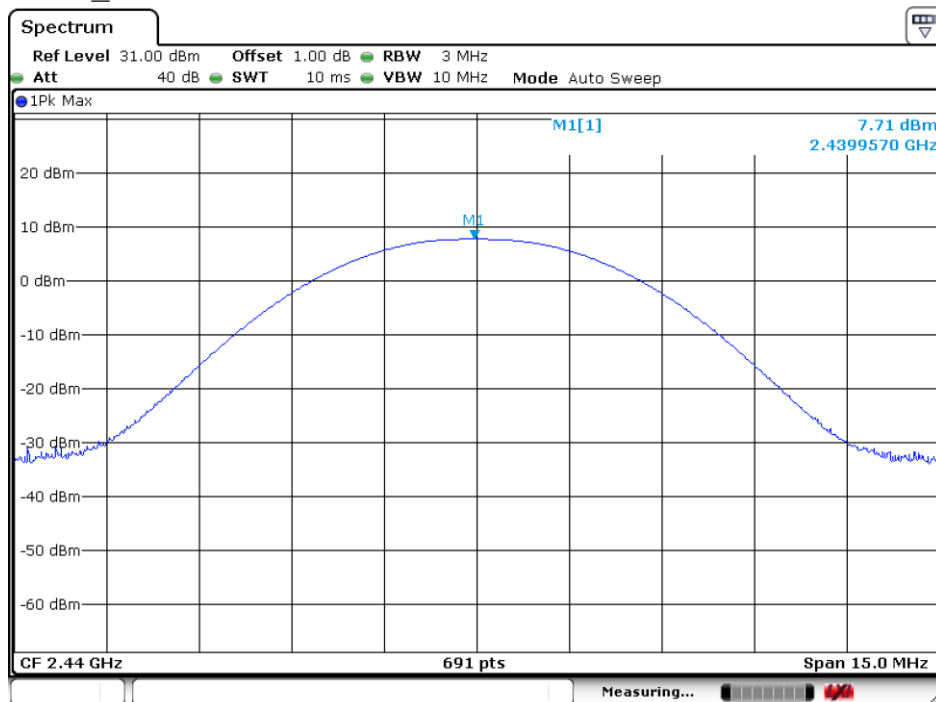
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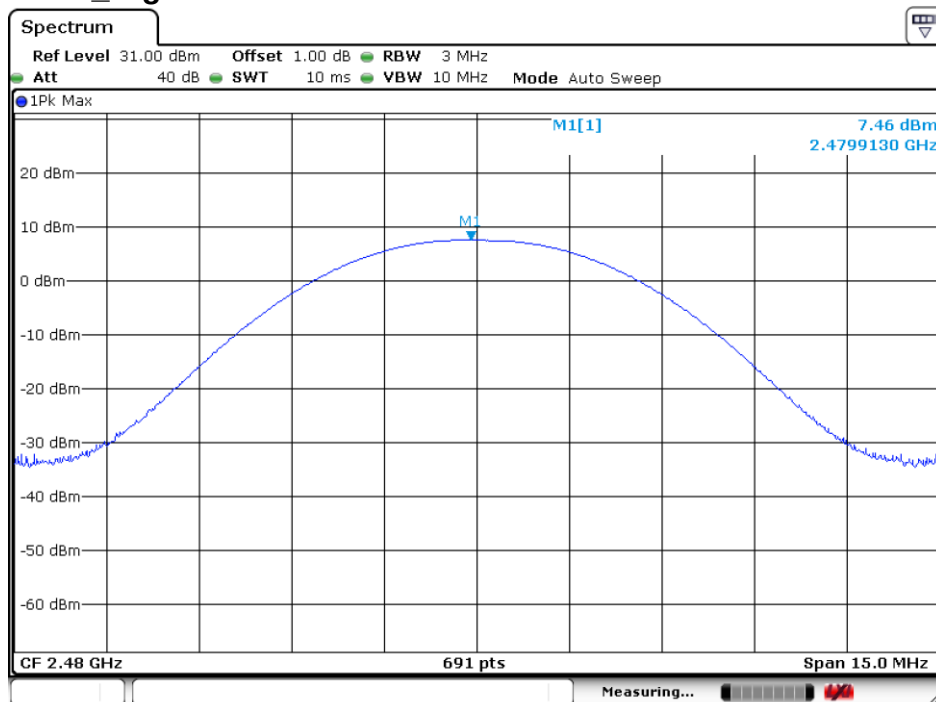
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4.4.2.2GFSK 1M_Middle Channel



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4.4.2.3GFSK 1M_Highest Channel



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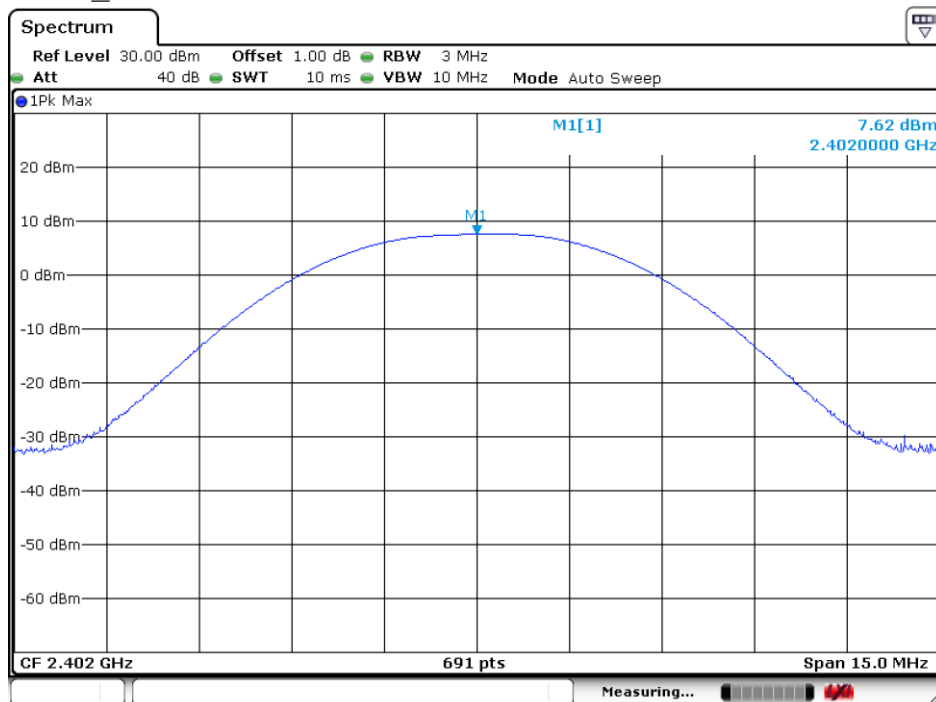
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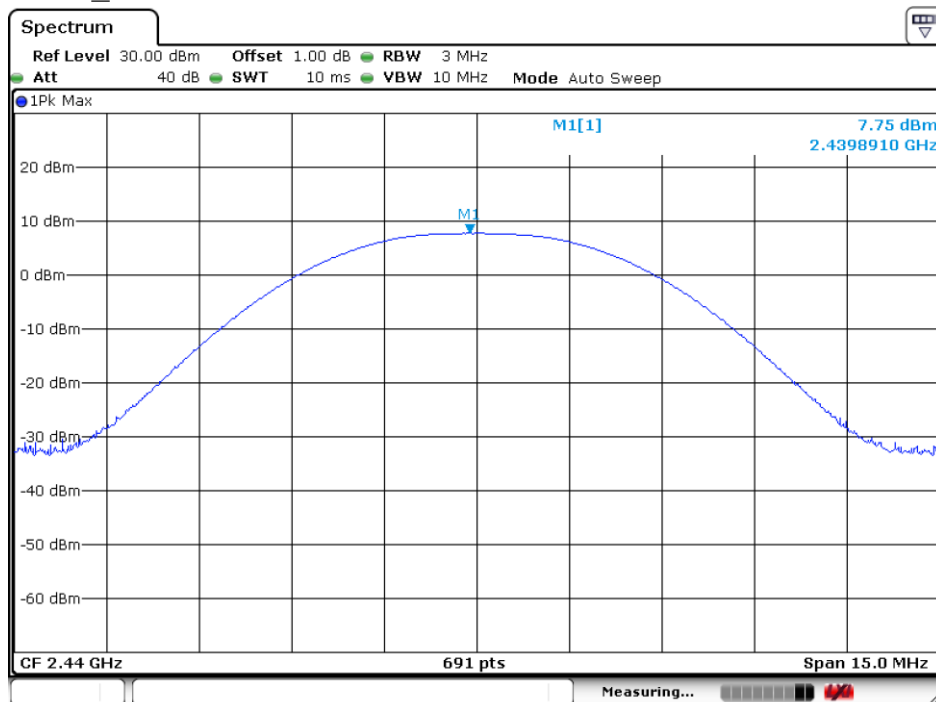
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4.4.2.4 GFSK 2M_Lowest Channel



Date: 7.DEC.2020 14:36:25

4.4.2.5 GFSK 2M_Middle Channel



Date: 7.DEC.2020 14:39:08



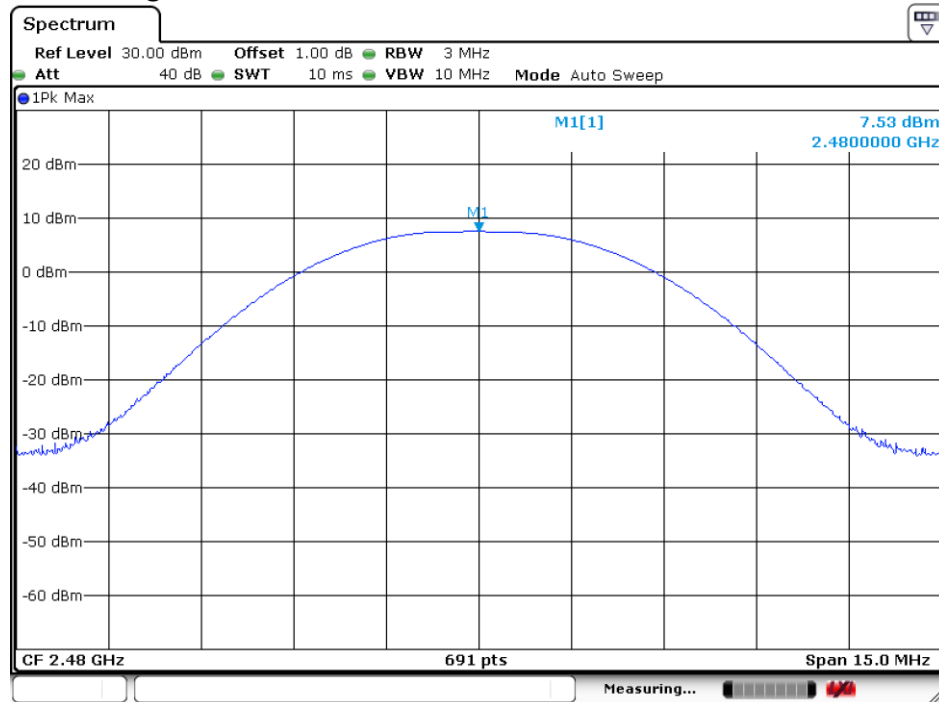
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4.4.2.6 GFSK 2M_Highest Channel



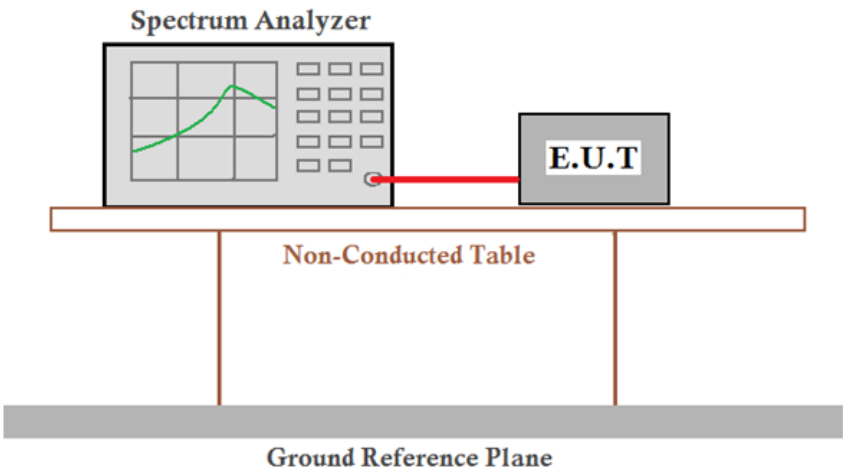
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4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8 Option 2
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	≥ 500 kHz
Test Results:	Pass

4.5.1 Test Results

Mode	Test Channel	99% Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK_1M	Lowest	1.02	0.68	≥500	Pass
	Middle	1.02	0.69	≥500	Pass
	Highest	1.02	0.69	≥500	Pass

Mode	Test Channel	99% Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK_2M	Lowest	2.03	1.17	≥500	Pass
	Middle	2.03	1.17	≥500	Pass
	Highest	2.03	1.16	≥500	Pass

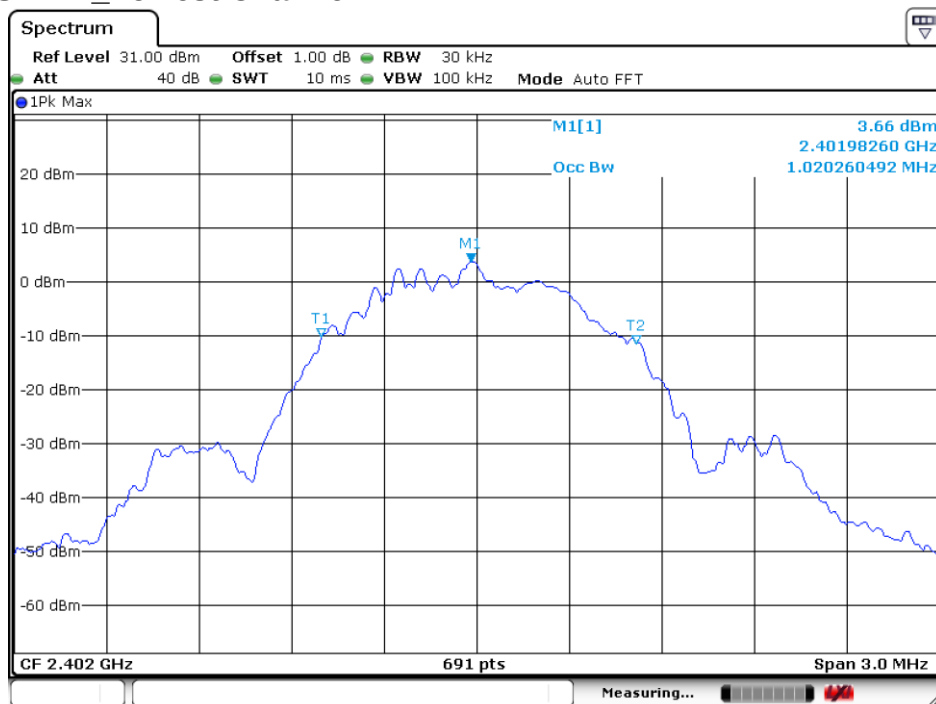


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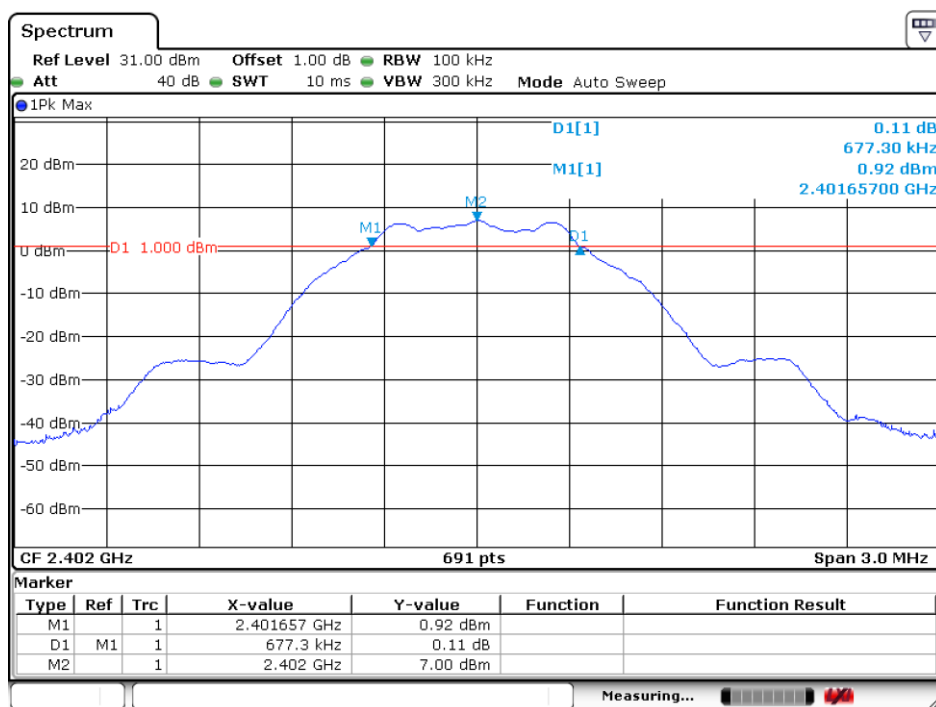
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4.5.2 Test Plots

4.5.2.1 GFSK 1M_Lowest Channel



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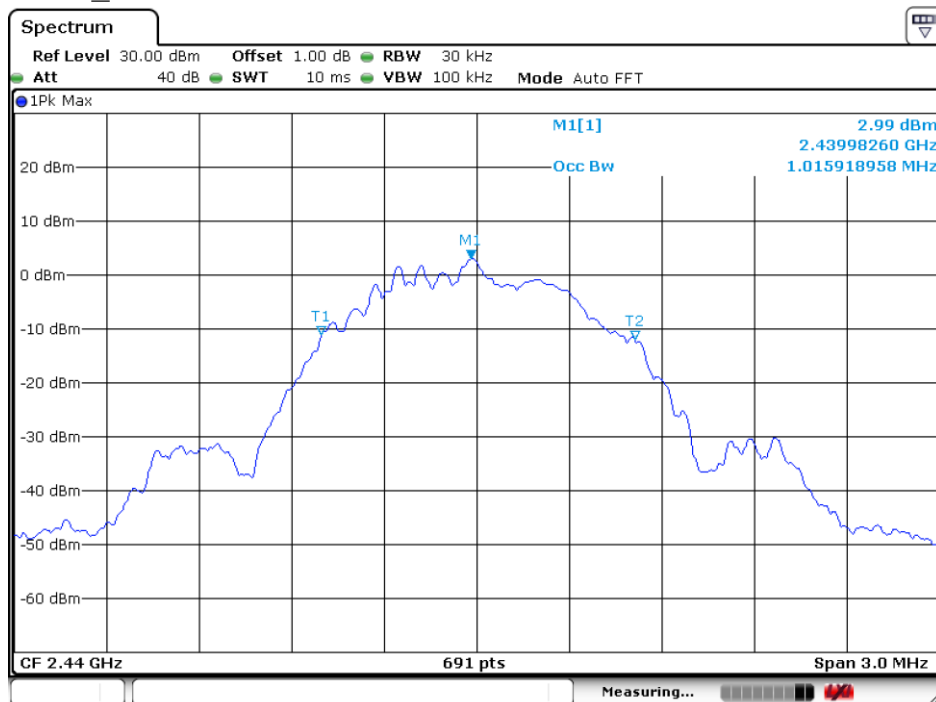
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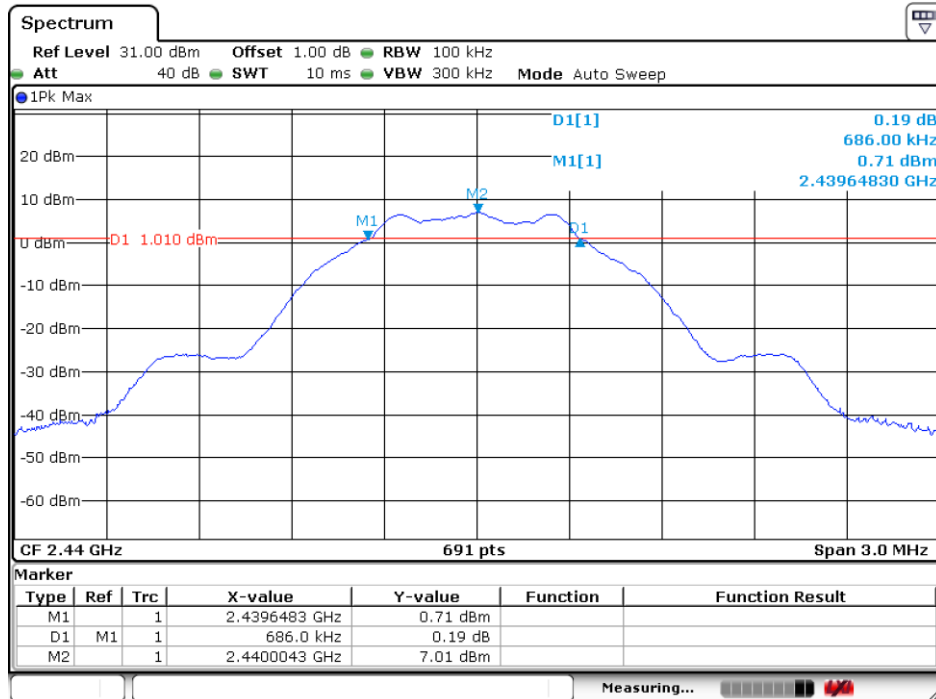
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4.5.2.2GFSK 1M_Middle Channel



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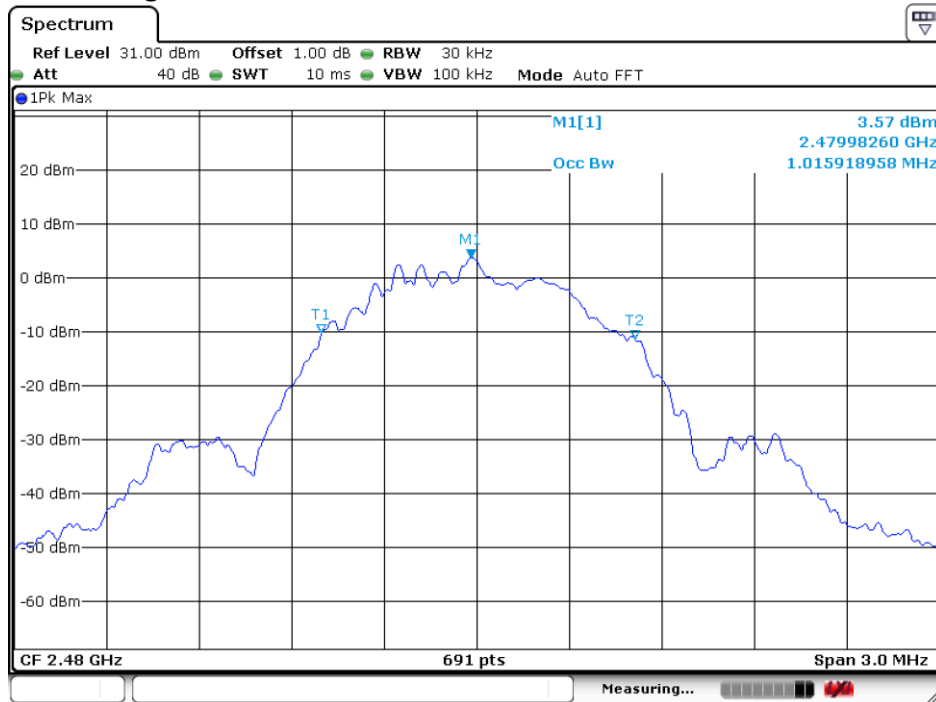
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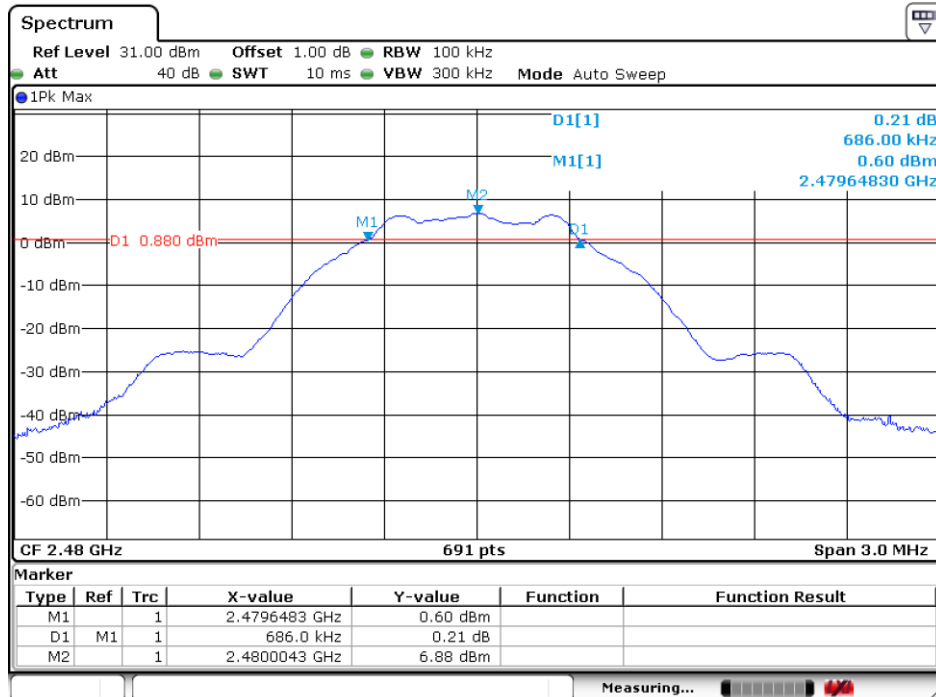
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4.5.2.3 GFSK 1M_Highest Channel



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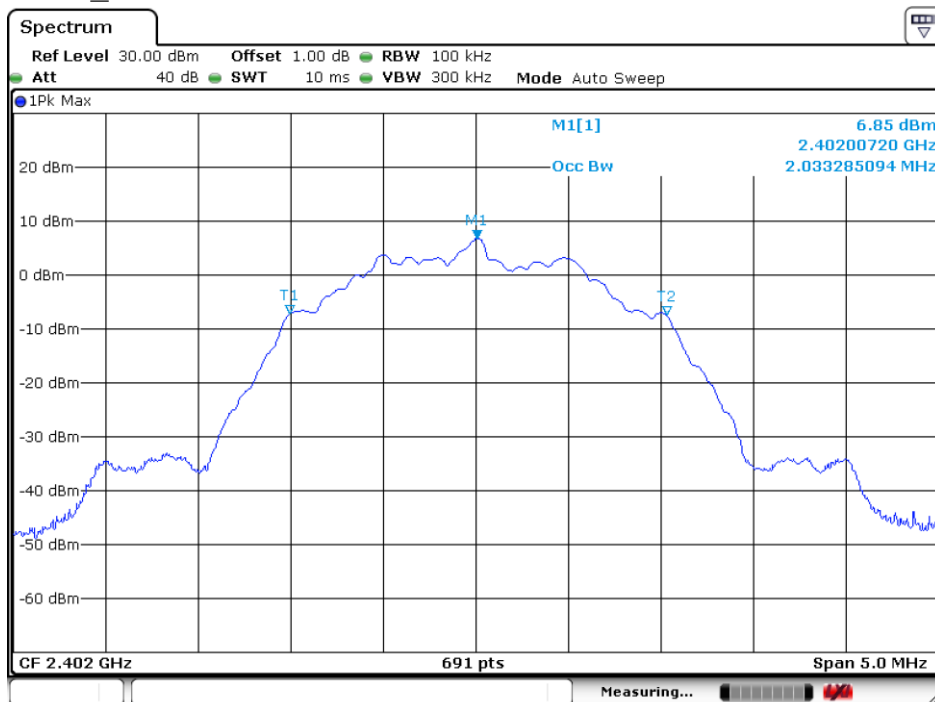
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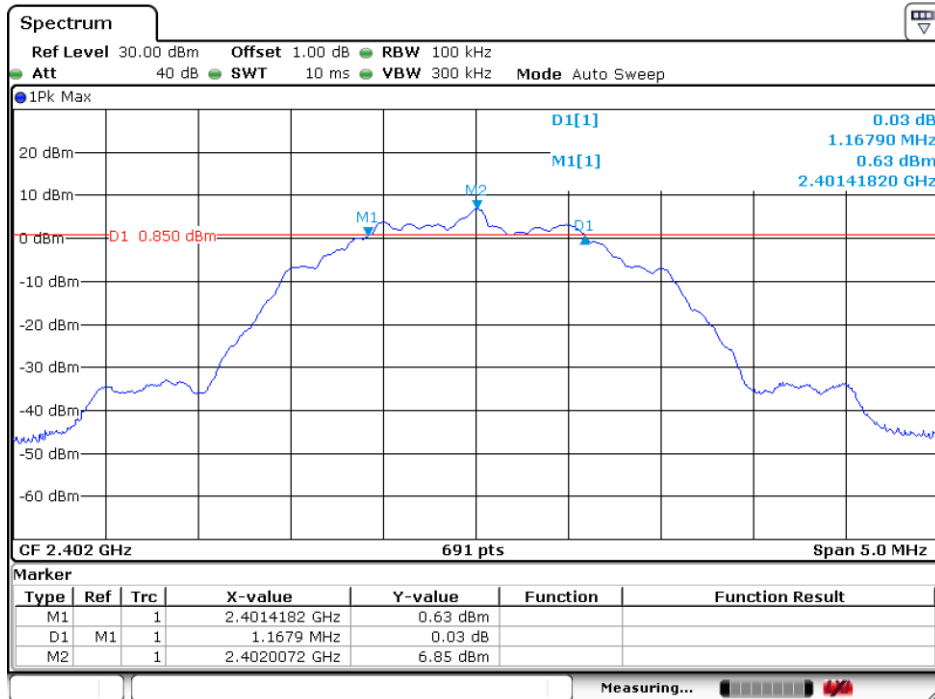
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4.5.2.4GFSK 2M_Lowest Channel



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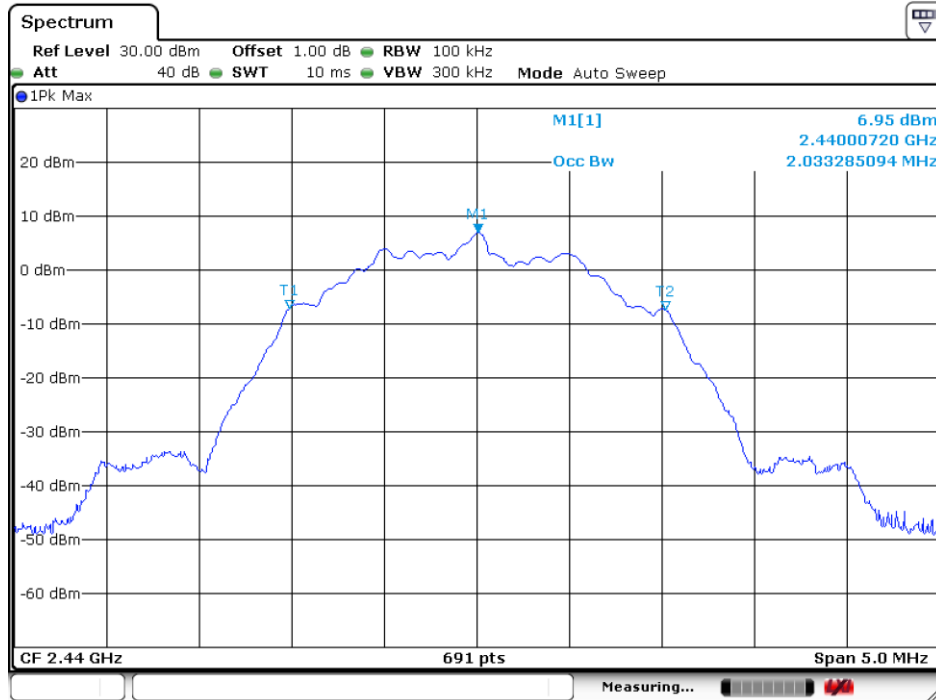


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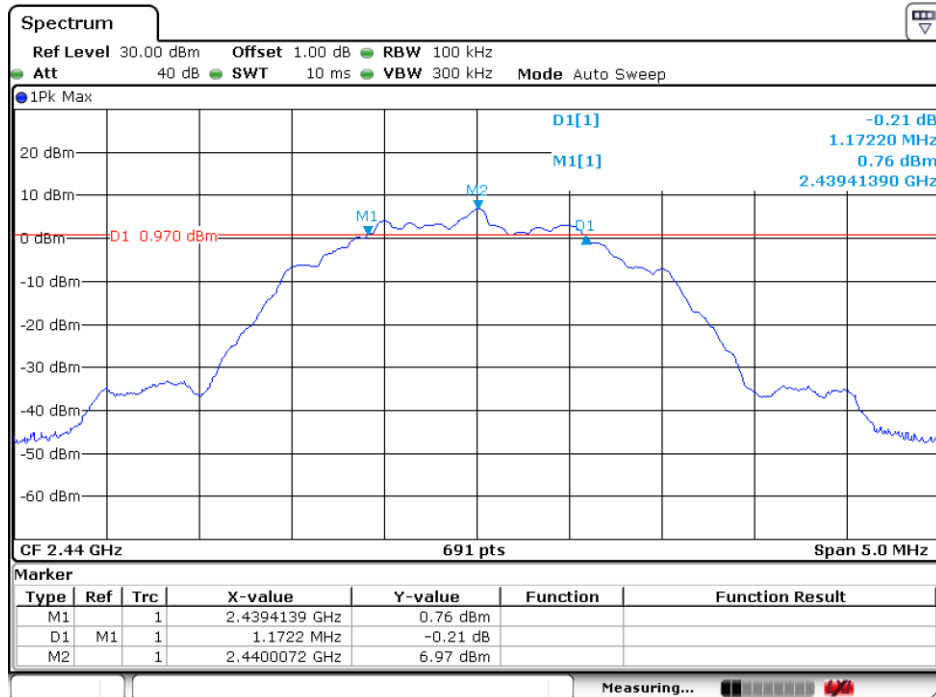


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4.5.2.5GFSK 2M_Middle Channel



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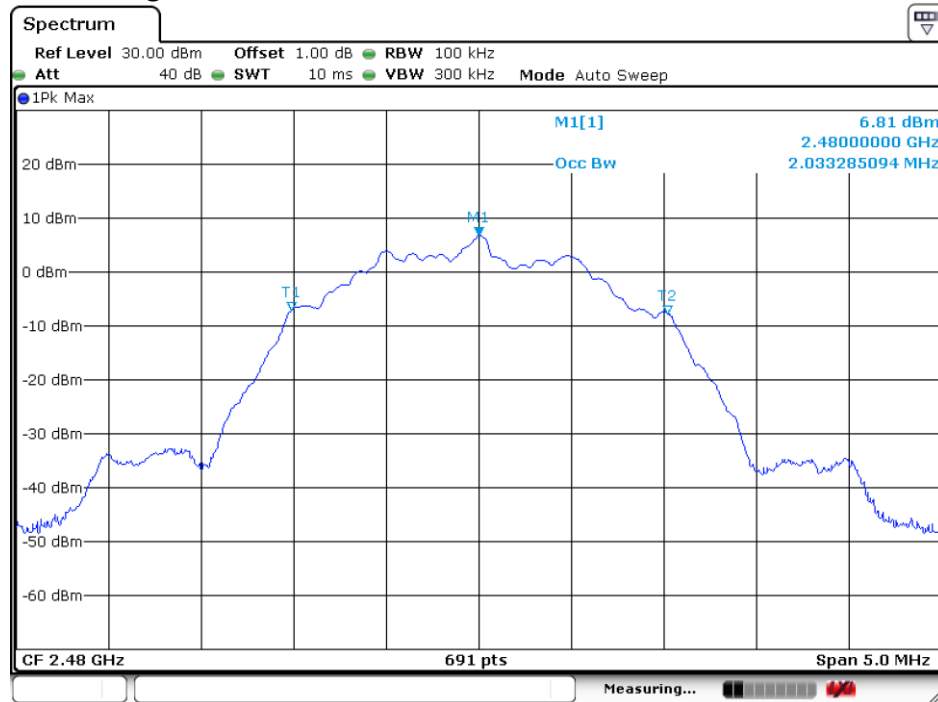
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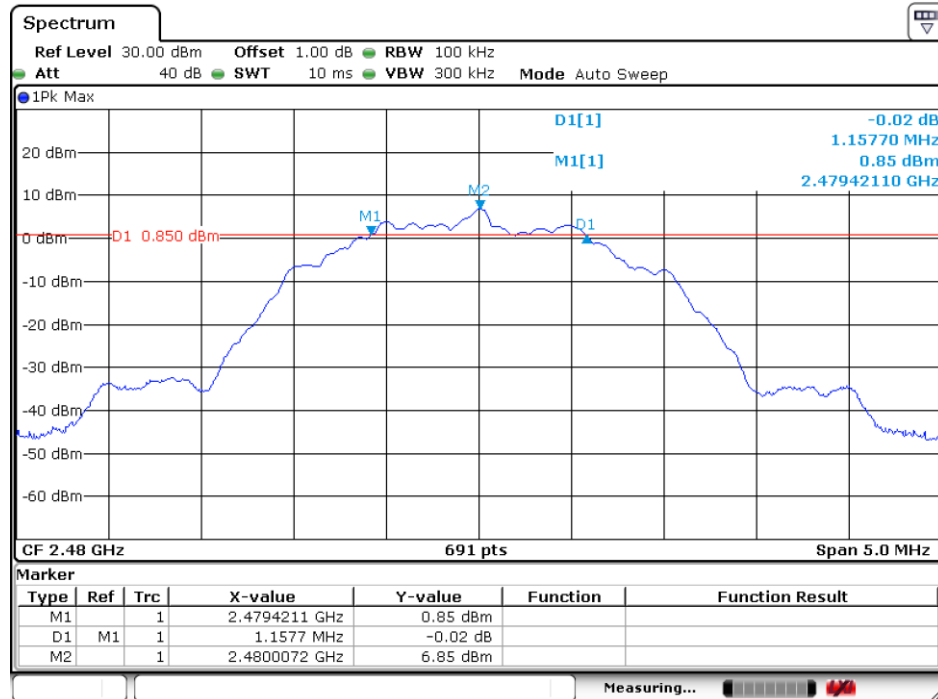
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4.5.2.6 GFSK 2M_Highest Channel



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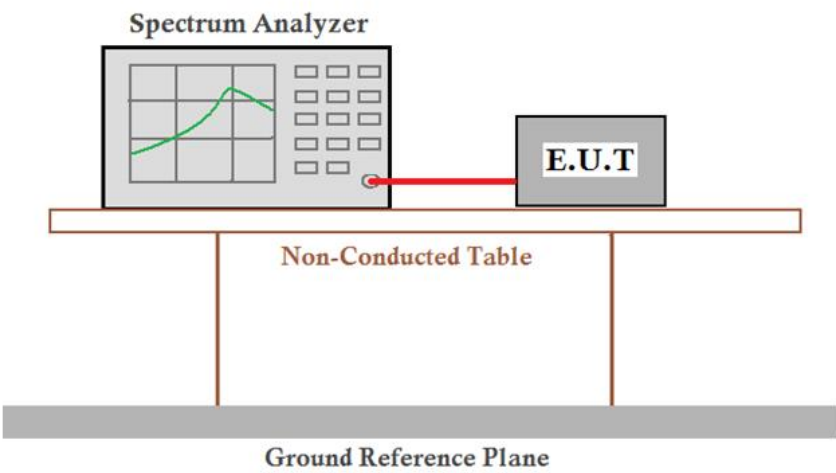
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4.6 Power Spectral Density

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 5.10 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass

4.6.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
GFSK_1M	Lowest	-7.49	≤8.00	Pass
	Middle	-7.46	≤8.00	Pass
	Highest	-7.59	≤8.00	Pass

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
GFSK_2M	Lowest	-10.58	≤8.00	Pass
	Middle	-10.43	≤8.00	Pass
	Highest	-10.52	≤8.00	Pass

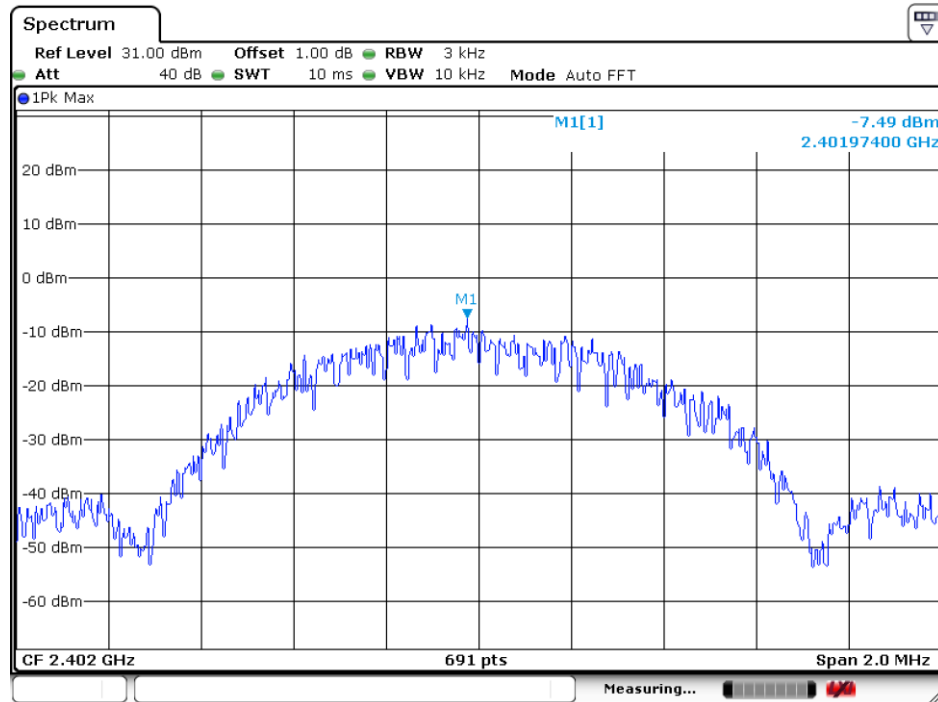


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4.6.2 Test Plots

4.6.2.1 GFSK 1M_Lowest Channel



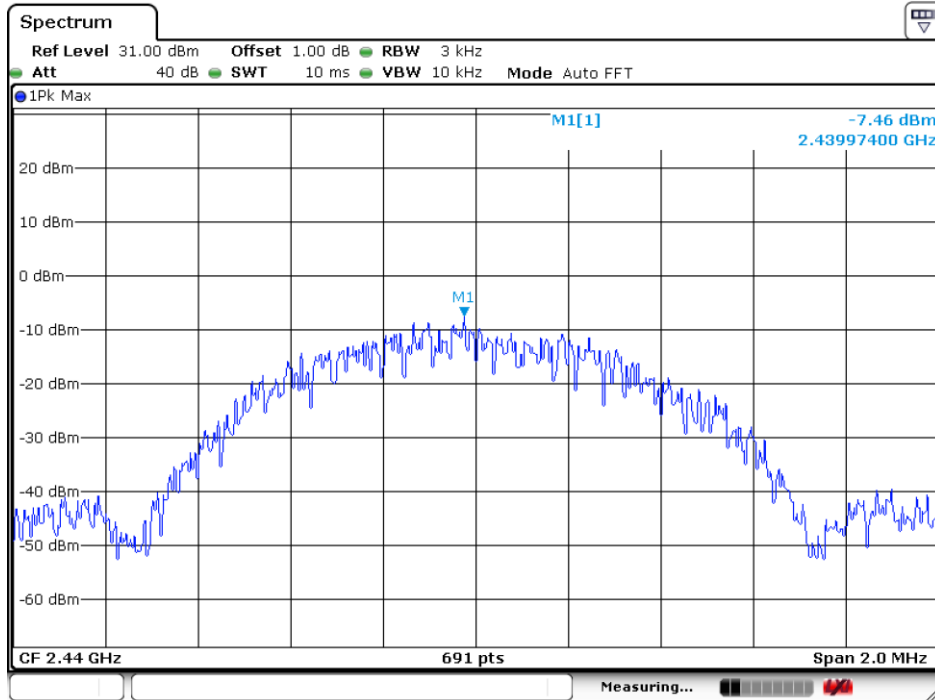
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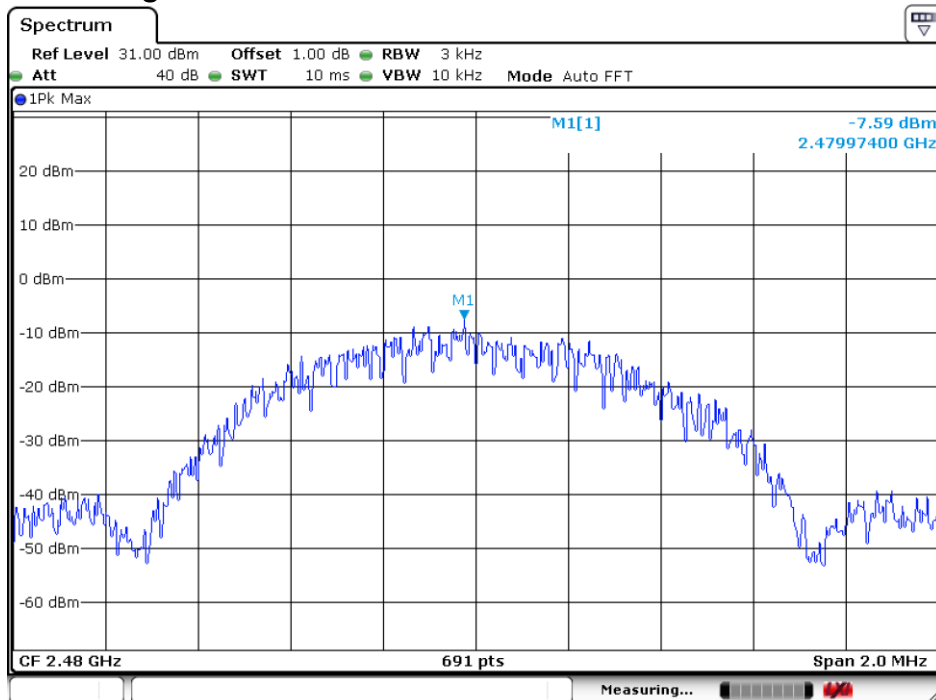
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4.6.2.2 GFSK 1M_Middle Channel



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4.6.2.3 GFSK 1M_Highest Channel



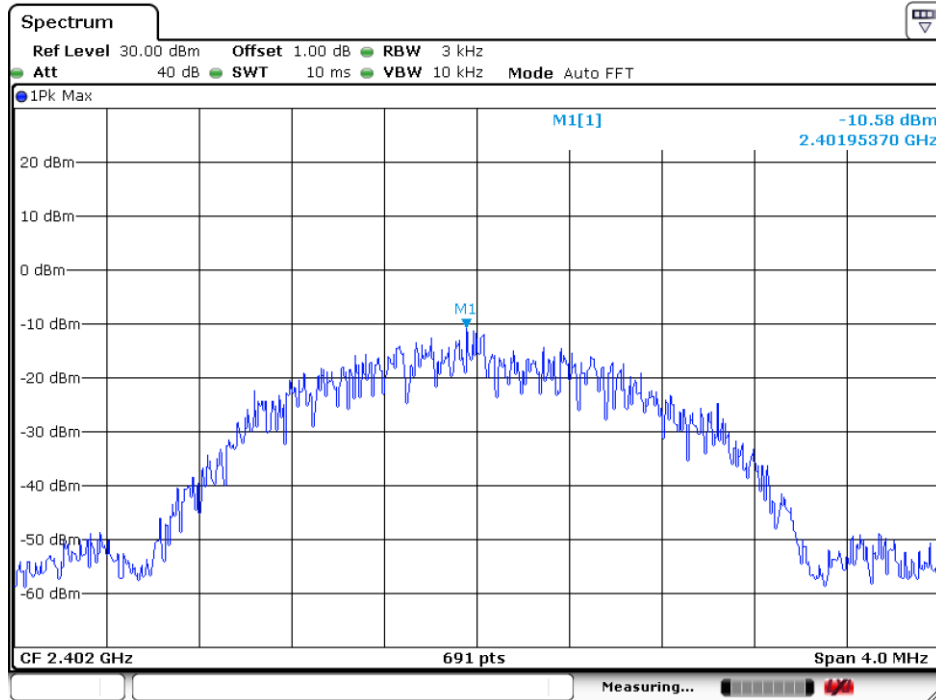
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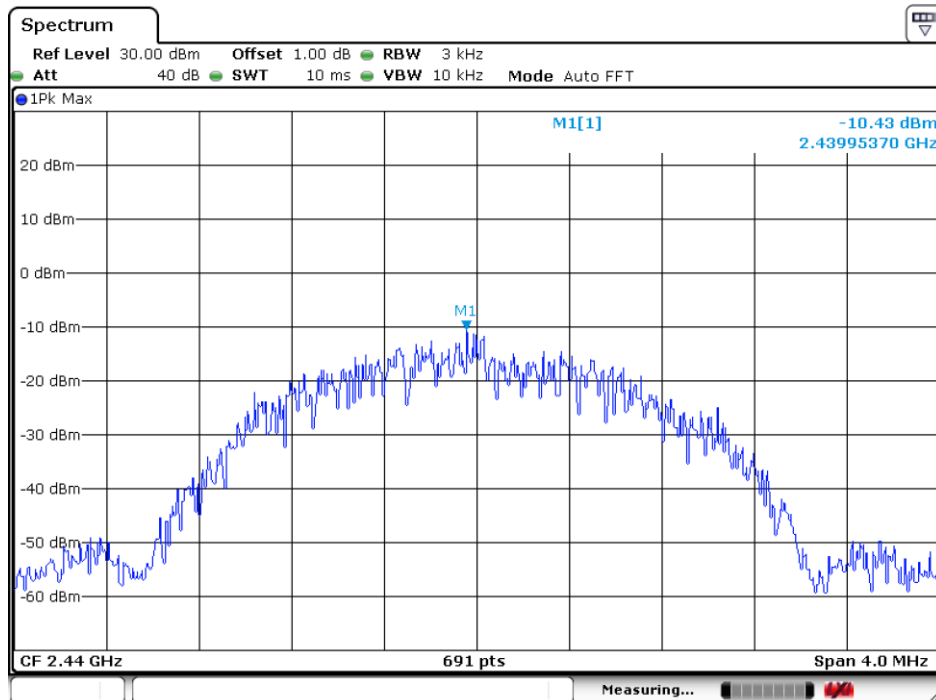
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4.6.2.4GFSK 2M_Lowest Channel



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4.6.2.5GFSK 2M_Middle Channel

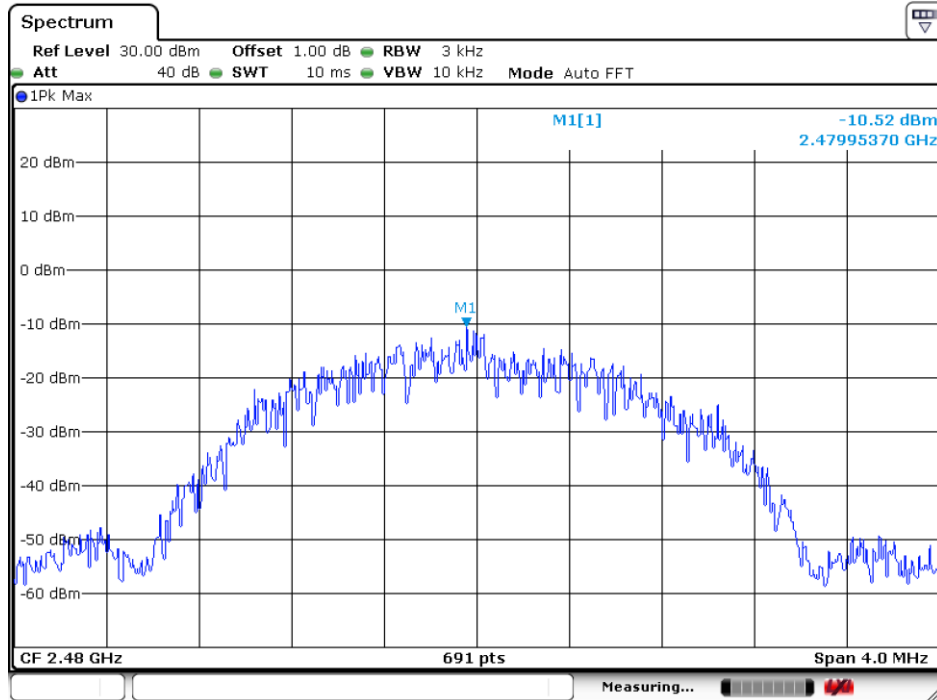


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4.6.2.6 GFSK 2M_Highest Channel



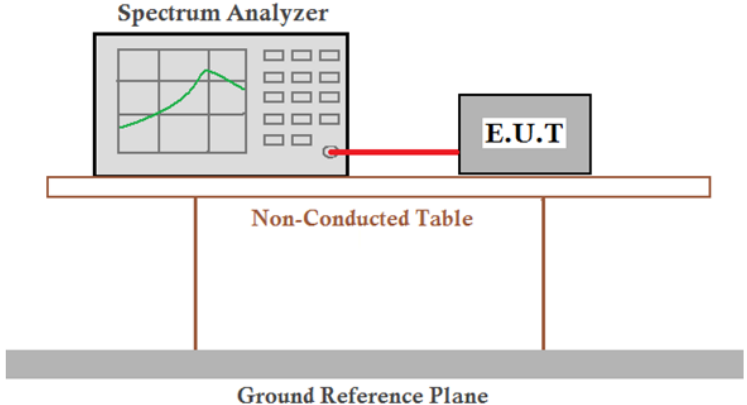
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4.7 Band-edge for RF Conducted Emissions

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 5.10 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

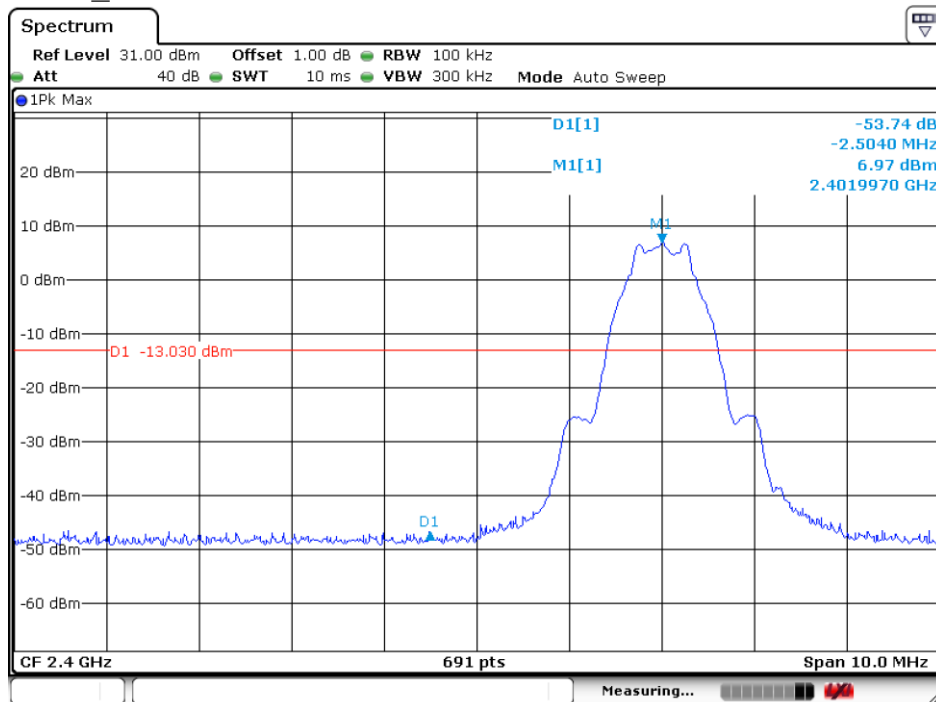


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4.7.1 Test Plots

4.7.1.1 GFSK 1M_Lowest Channel



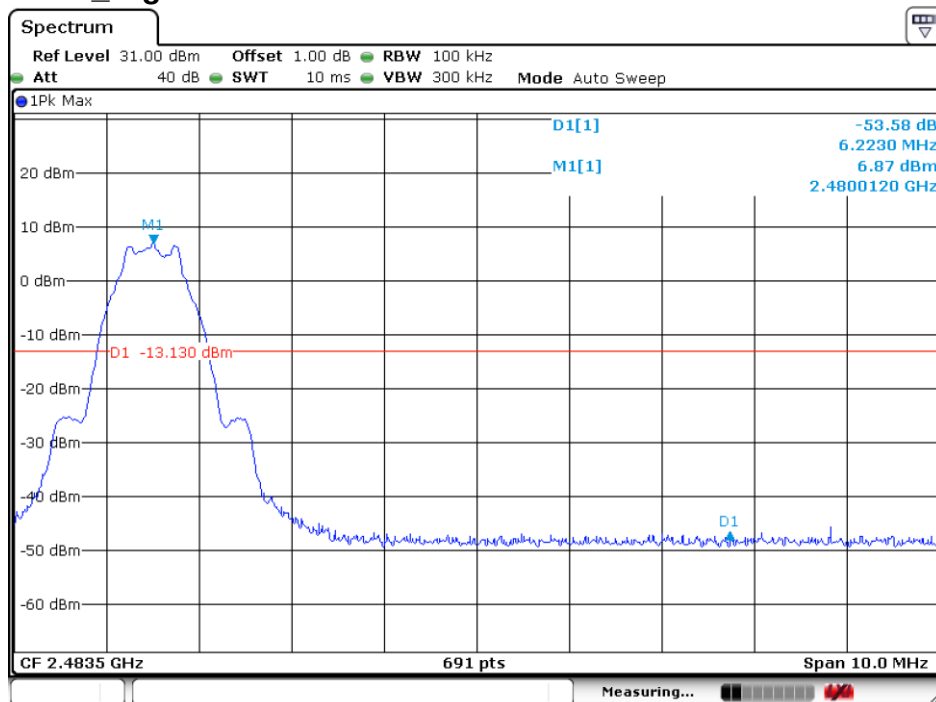
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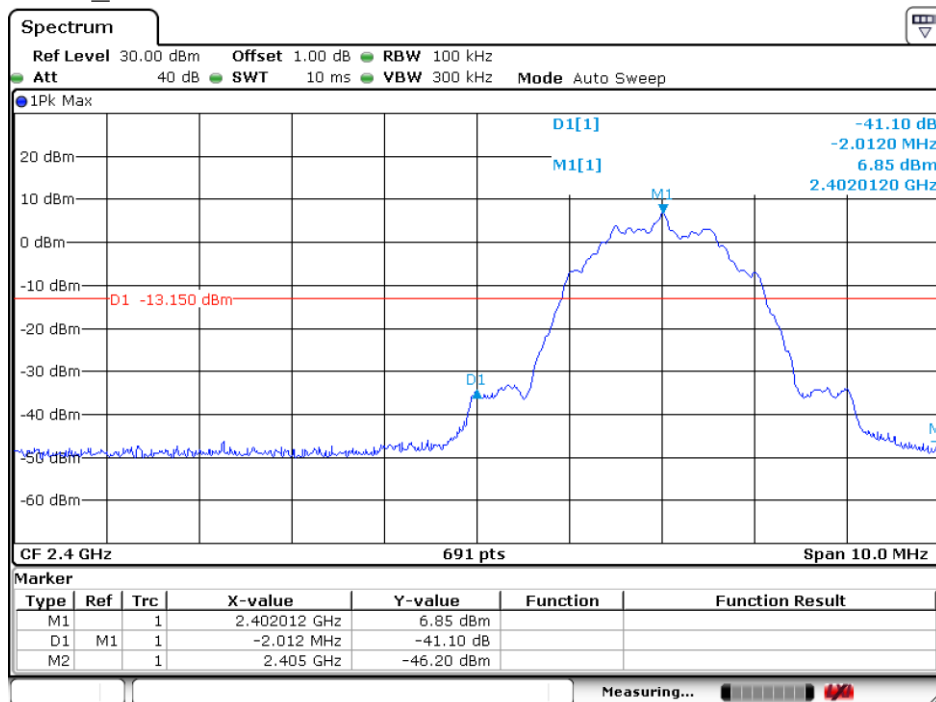
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4.7.1.2 GFSK 1M_Highest Channel



Date: 7.DEC.2020 10:48:56

4.7.1.3 GFSK 2M_Lowest Channel

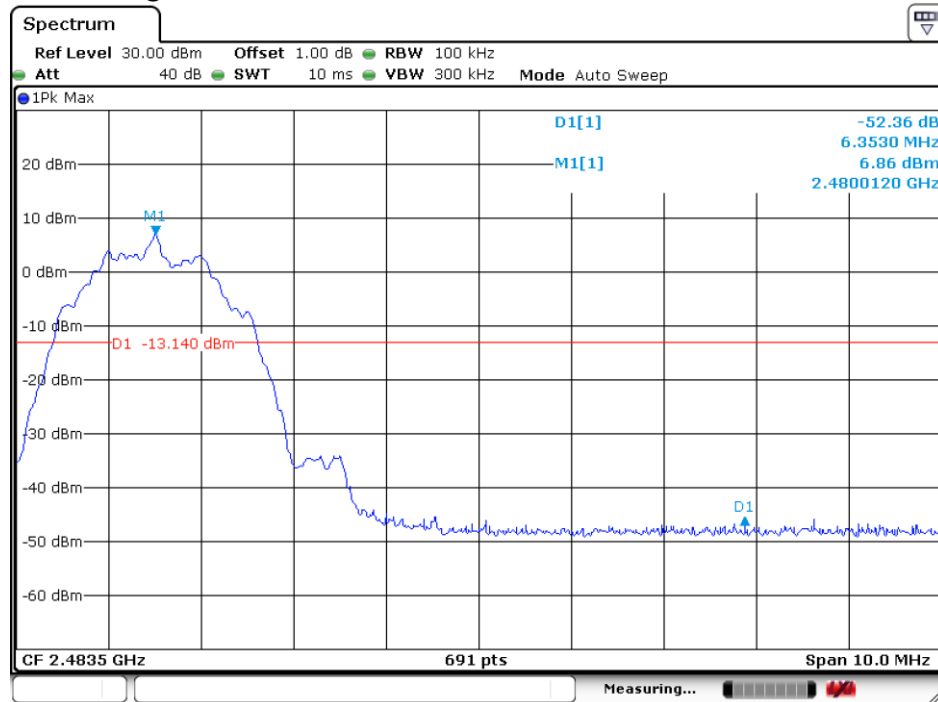


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4.7.1.4GFSK 2M_Highest Channel



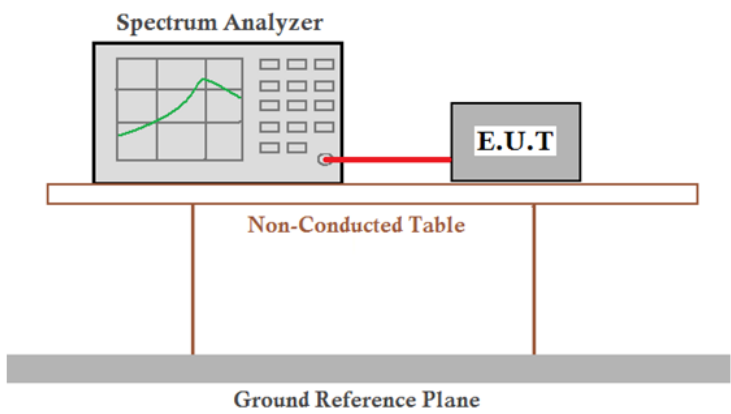
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4.8 RF Conducted Spurious Emissions

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 5.10 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

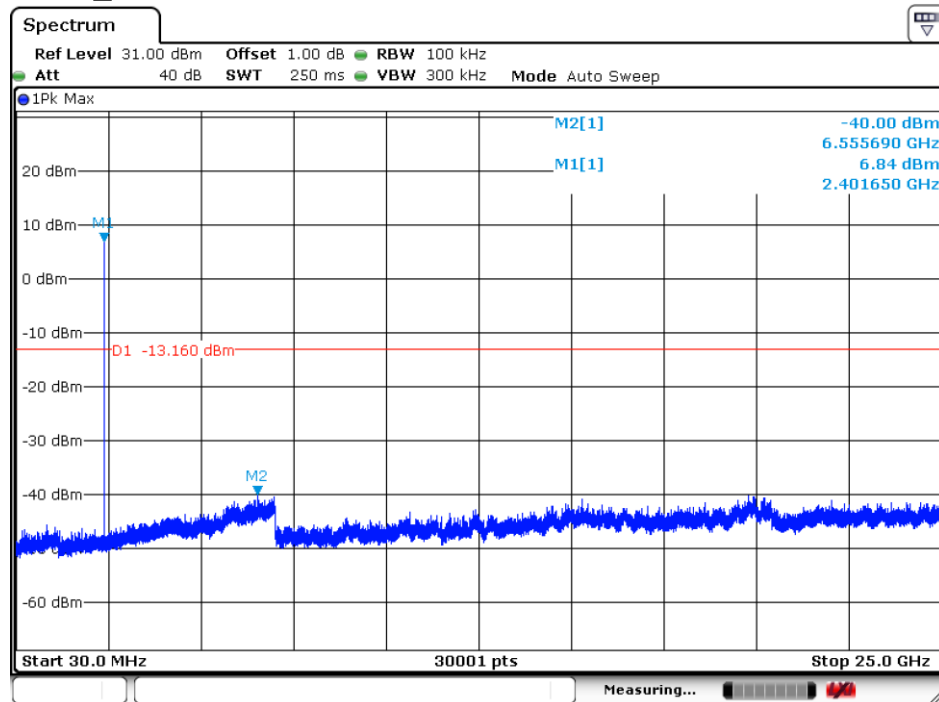


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4.8.1 Test Plots

4.8.1.1 GFSK 1M_Lowest Channel



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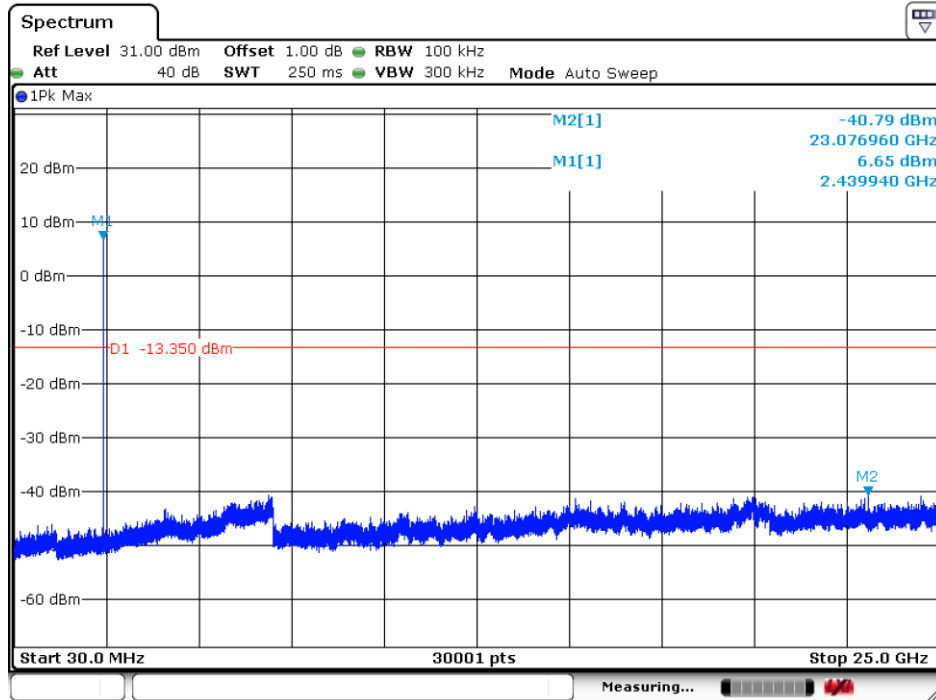
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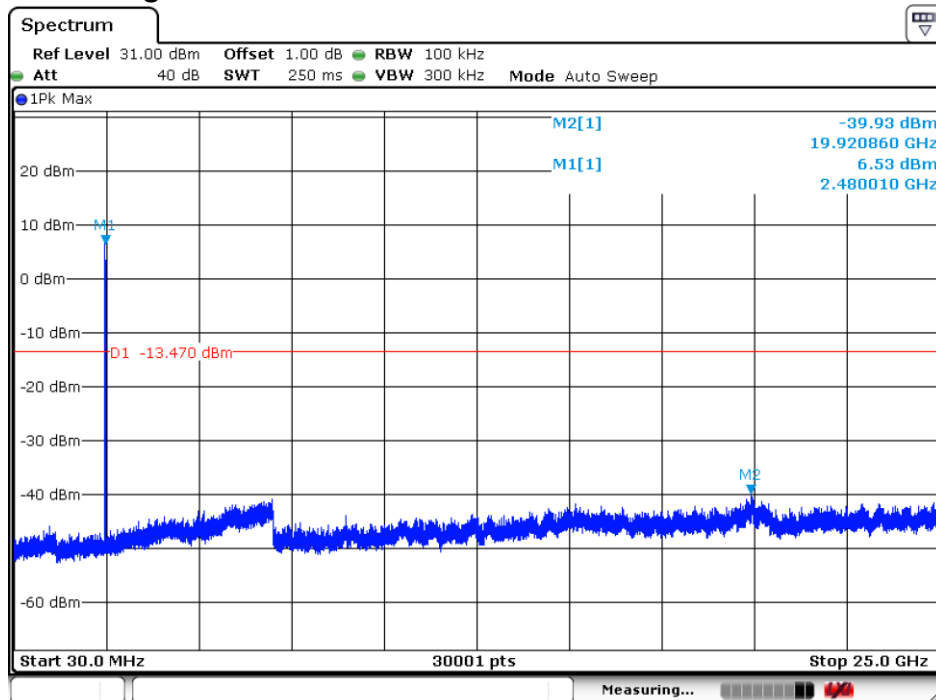
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4.8.1.2 GFSK 1M_Middle Channel



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4.8.1.3 GFSK 1M_Highest Channel

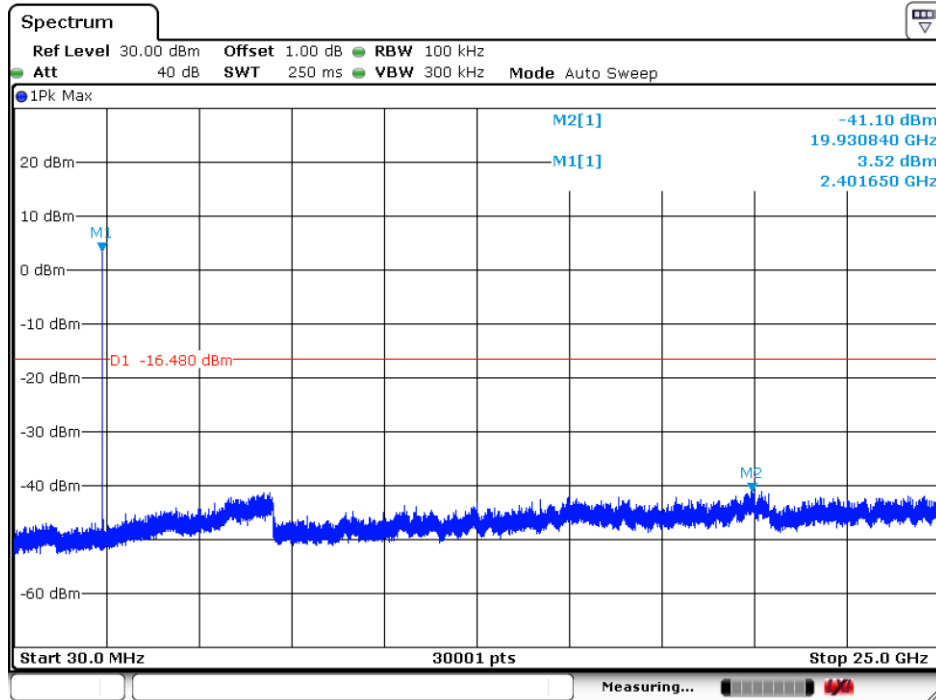


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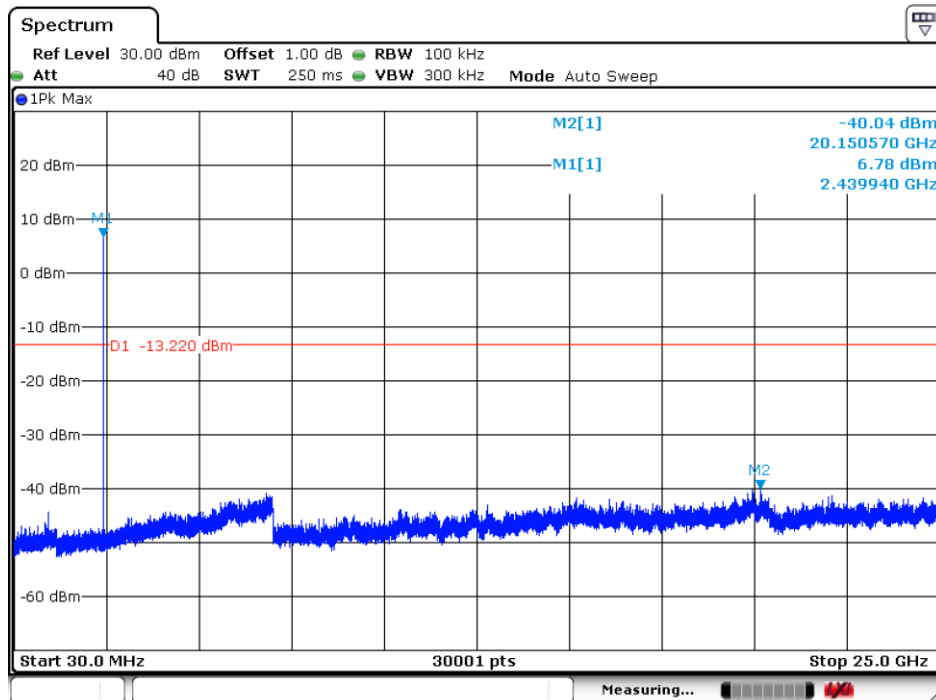
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4.8.1.4 GFSK 2M_Lowest Channel



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4.8.1.5 GFSK 2M_Middle Channel



Date: 7.DEC.2020 14:52:11

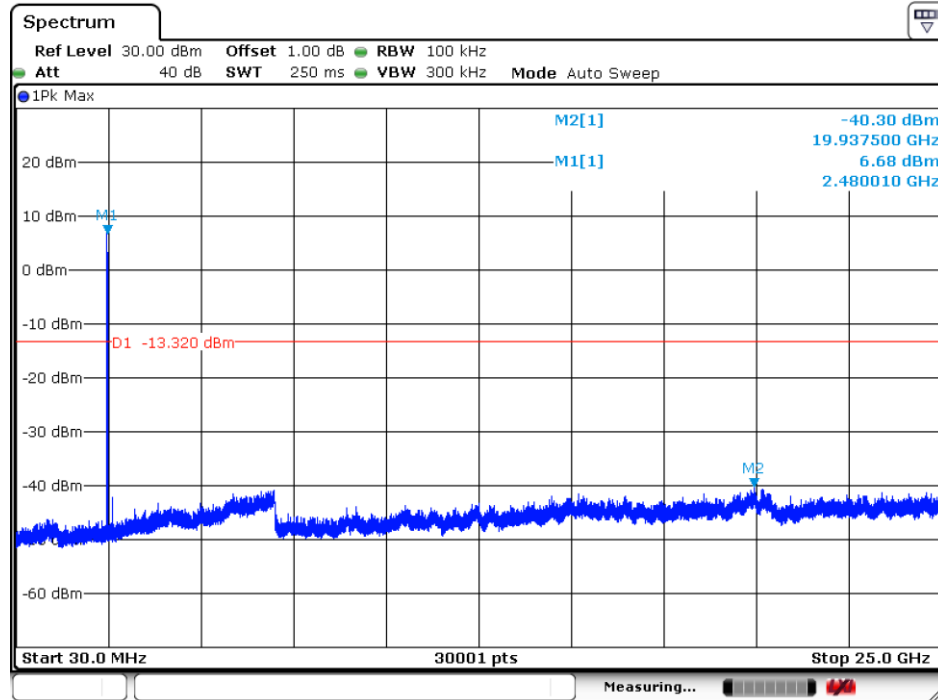


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4.8.1.6 GFSK 2M_Highest Channel



Date: 7.DEC.2020 14:51:10

Remark:

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



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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100kHz	30kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				



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Test Setup:

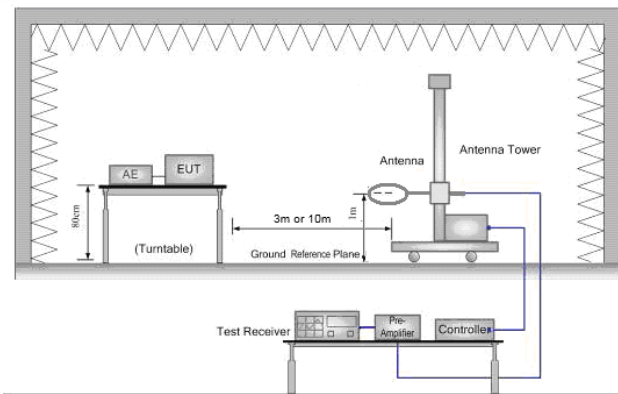


Figure 1. Below 30MHz

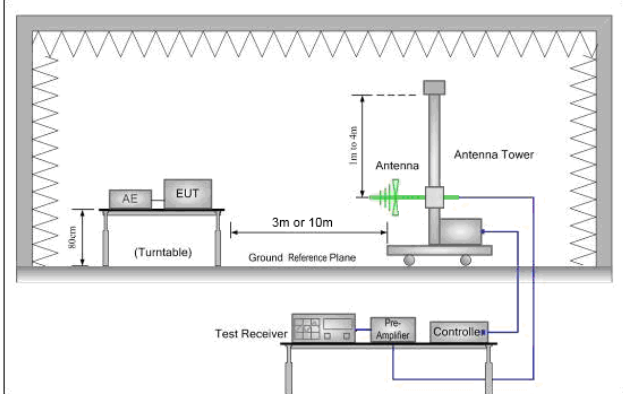


Figure 2. 30MHz to 1GHz

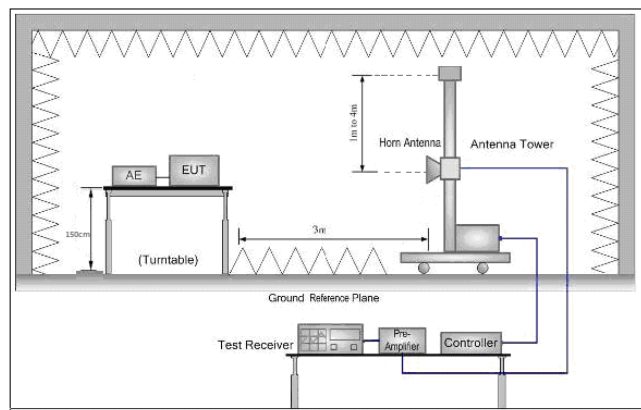


Figure 3. Above 1 GHz

Test Procedure:

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



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	Duty cycle = On time/100 milliseconds On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$ Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + $20 * \log(\text{Duty cycle})$ f. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. h. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. i. Test the EUT in the lowest channel, the middle channel, the Highest channel. j. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. k. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with GFSK modulation. Charge + Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation. Pretest the EUT at Charge + Transmitting mode, For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



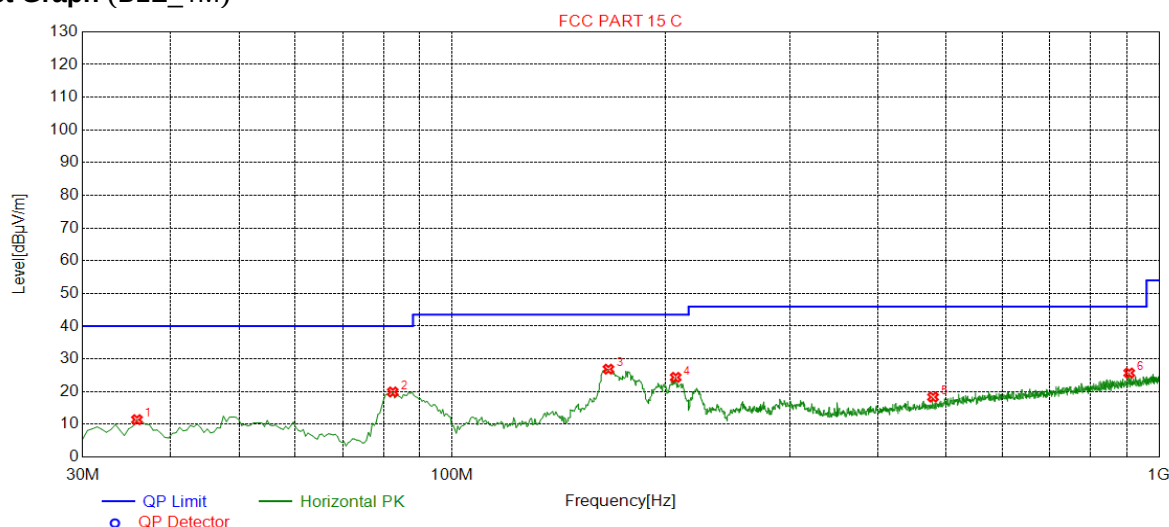
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4.9.1 Radiated Emission below 1GHz

4.9.1.1 Charge + Transmitting

Test Graph (BLE_1M)



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8229	11.43	40.00	28.57	246	253	Horizontal
2	82.4062	19.89	40.00	20.11	239	85	Horizontal
3	166.3532	26.86	43.50	16.64	107	228	Horizontal
4	207.1136	24.36	43.50	19.14	149	228	Horizontal
5	478.8494	18.34	46.00	27.66	108	266	Horizontal
6	907.3187	25.69	46.00	20.31	104	161	Horizontal

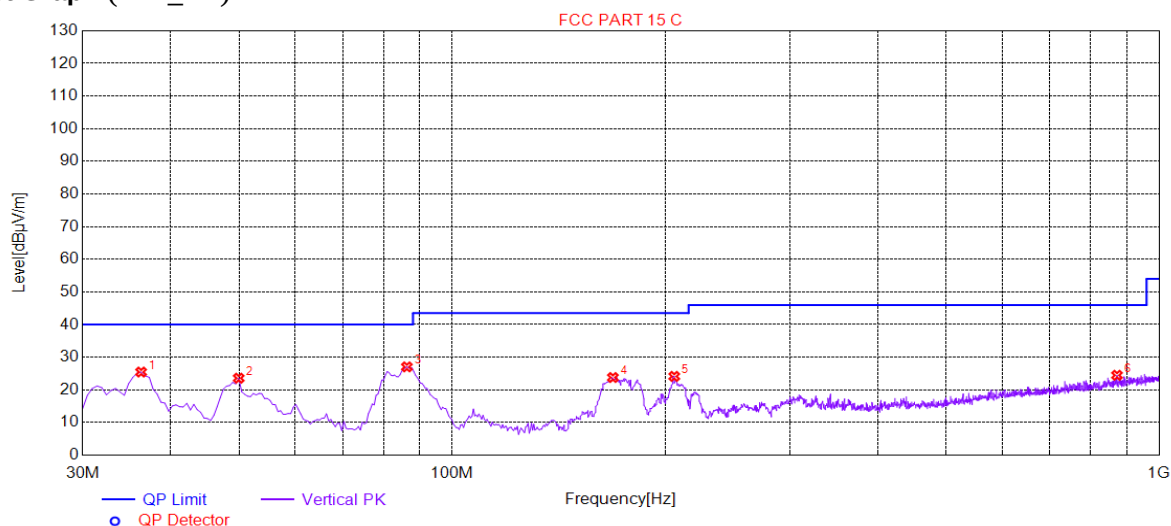
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Test Graph (BLE_1M)



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.3082	25.47	40.00	14.53	296	72	Vertical
2	49.8949	23.59	40.00	16.41	171	2	Vertical
3	86.2881	27.05	40.00	12.95	267	246	Vertical
4	168.7794	23.80	43.50	19.70	159	344	Vertical
5	206.1431	24.14	43.50	19.36	202	322	Vertical
6	871.8959	24.48	46.00	21.52	183	344	Vertical

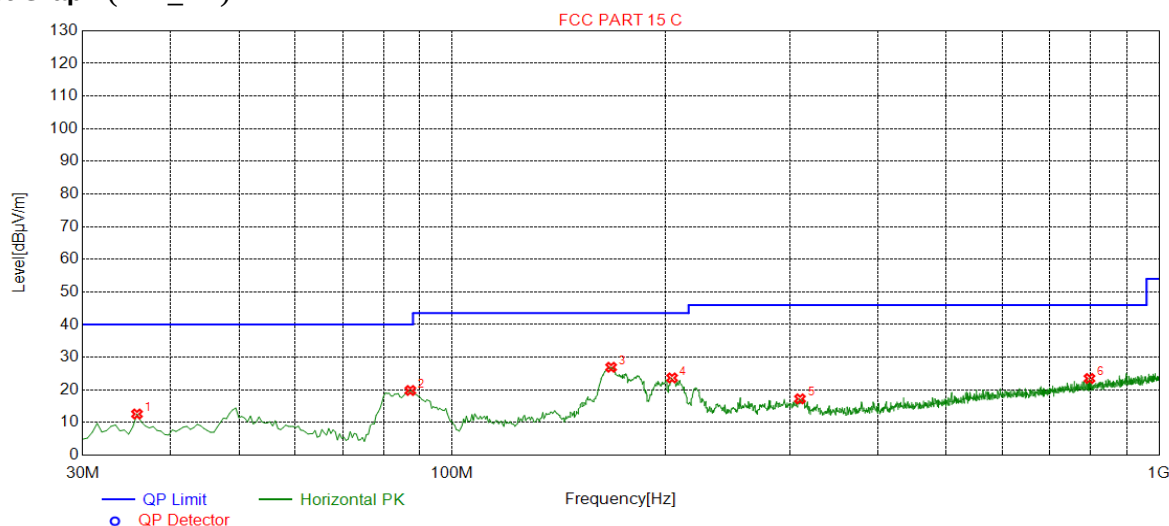
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Test Graph (BLE_2M)



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8229	12.62	40.00	27.38	213	284	Horizontal
2	87.2586	19.81	40.00	20.19	109	94	Horizontal
3	167.8089	26.94	43.50	16.56	242	218	Horizontal
4	204.6873	23.67	43.50	19.83	230	224	Horizontal
5	310.4702	17.26	46.00	28.74	183	104	Horizontal
6	797.1686	23.49	46.00	22.51	161	313	Horizontal

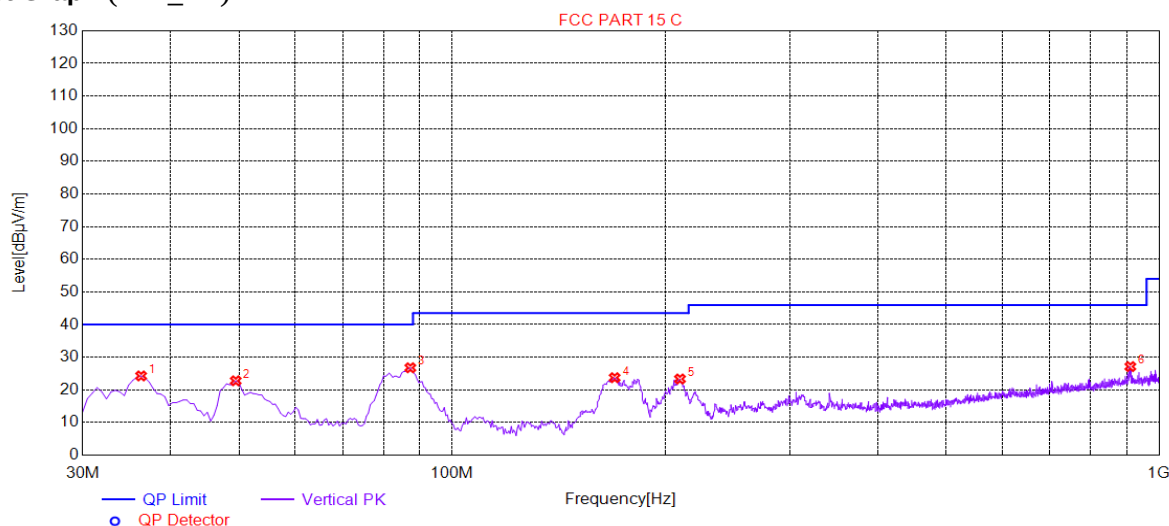
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Test Graph (BLE_2M)



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.3082	24.28	40.00	15.72	219	344	Vertical
2	49.4097	22.79	40.00	17.21	227	329	Vertical
3	87.2586	26.78	40.00	13.22	232	98	Vertical
4	169.7499	23.74	43.50	19.76	262	344	Vertical
5	210.0250	23.34	43.50	20.16	229	326	Vertical
6	910.7154	27.14	46.00	18.86	153	10	Vertical

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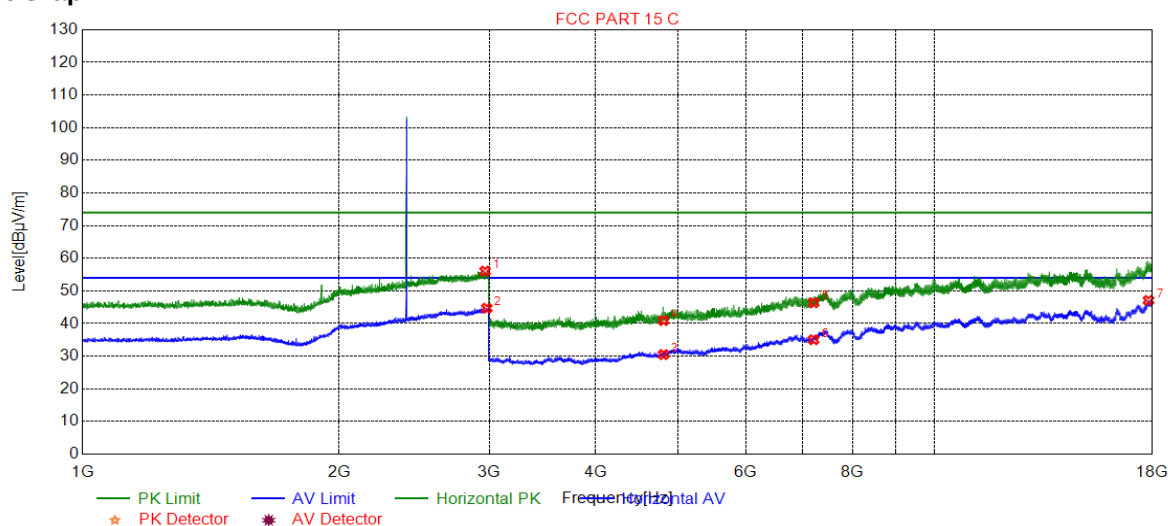
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4.9.2 Transmitter Emission above 1GHz

4.9.2.1 BLE-1M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2966.491	56.08	74.00	17.92	241	354	Horizontal
2	2980.995	44.71	54.00	9.29	106	56	Horizontal
3	4804.000	30.52	54.00	23.48	245	23	Horizontal
4	4804.000	40.94	74.00	33.06	168	330	Horizontal
5	7206.000	46.38	74.00	27.62	222	330	Horizontal
6	7206.000	35.06	54.00	18.94	209	6	Horizontal
7	17807.99	47.11	54.00	6.89	195	194	Horizontal

Final Data List

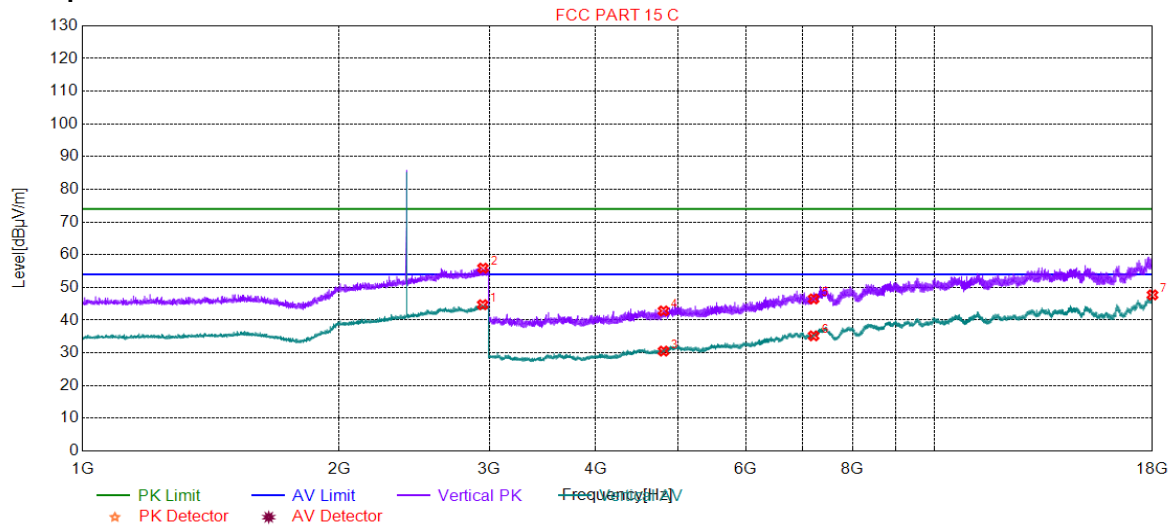


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4.9.2.2 BLE-1M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2947.486	44.74	54.00	9.26	189	81	Vertical
2	2949.987	55.93	74.00	18.07	279	330	Vertical
3	4804.000	30.55	54.00	23.45	160	224	Vertical
4	4804.000	42.83	74.00	31.17	173	190	Vertical
5	7206.000	46.50	74.00	27.50	202	173	Vertical
6	7206.000	35.21	54.00	18.79	200	139	Vertical
7	18000.00	47.73	54.00	6.27	241	71	Vertical

Final Data List

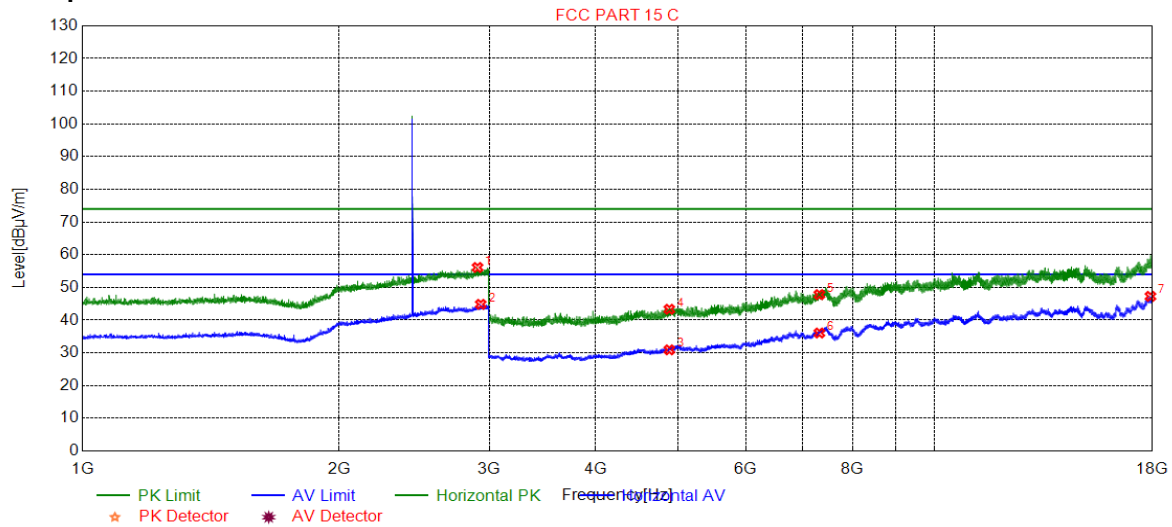


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4.9.2.3 BLE-1M_Channel 19

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2906.476	56.12	74.00	17.88	157	312	Horizontal
2	2931.983	44.86	54.00	9.14	203	113	Horizontal
3	4880.000	30.94	54.00	23.06	164	346	Horizontal
4	4880.000	43.35	74.00	30.65	236	109	Horizontal
5	7320.000	47.82	74.00	26.18	142	8	Horizontal
6	7320.000	36.08	54.00	17.92	139	296	Horizontal
7	17900.99	47.29	54.00	6.71	117	312	Horizontal

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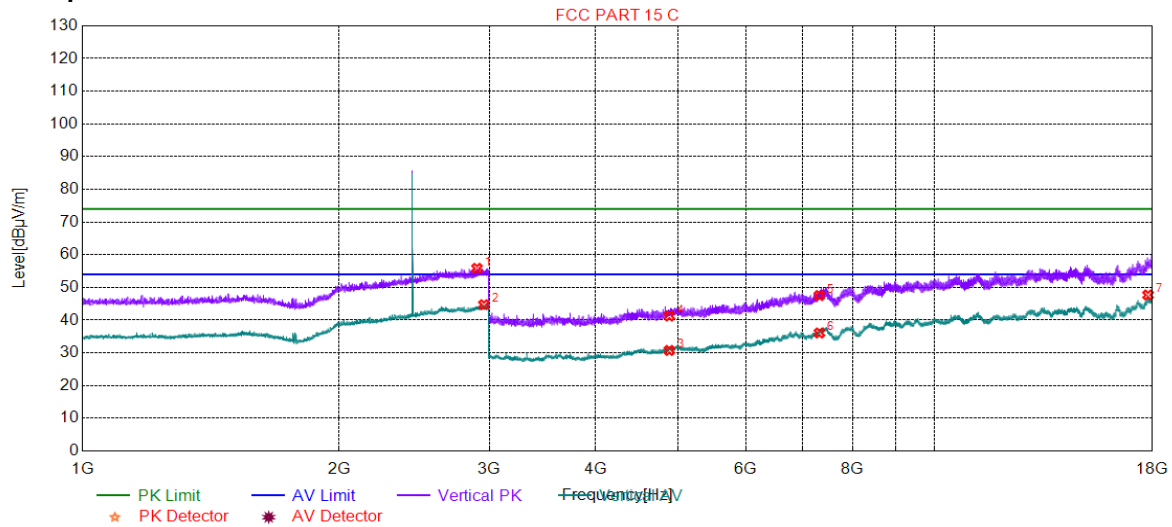
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4.9.2.4 BLE-1M_Channel 19

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2902.475	55.87	74.00	18.13	179	143	Vertical
2	2956.989	44.75	54.00	9.25	222	128	Vertical
3	4880.000	30.76	54.00	23.24	168	14	Vertical
4	4880.000	41.28	74.00	32.72	176	352	Vertical
5	7320.000	47.54	74.00	26.46	235	48	Vertical
6	7320.000	36.09	54.00	17.91	267	64	Vertical
7	17785.48	47.71	54.00	6.29	258	82	Vertical

Final Data List

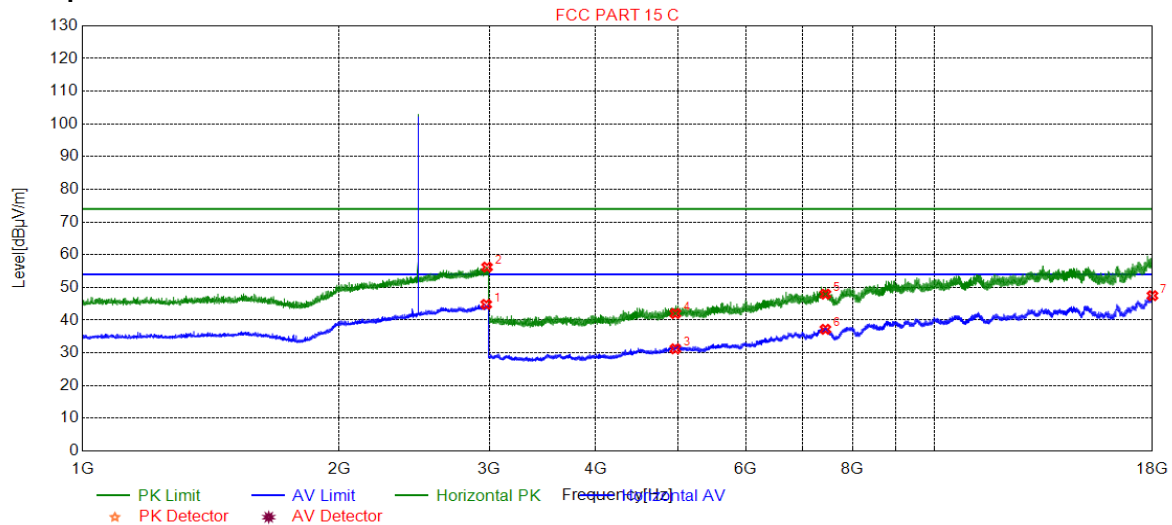


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4.9.2.5 BLE-1M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2975.994	44.84	54.00	9.16	236	329	Horizontal
2	2982.495	56.23	74.00	17.77	178	129	Horizontal
3	4960.000	31.25	54.00	22.75	179	228	Horizontal
4	4960.000	42.04	74.00	31.96	149	23	Horizontal
5	7440.000	47.96	74.00	26.04	244	346	Horizontal
6	7440.000	37.21	54.00	16.79	242	58	Horizontal
7	17996.99	47.50	54.00	6.50	216	244	Horizontal

Final Data List

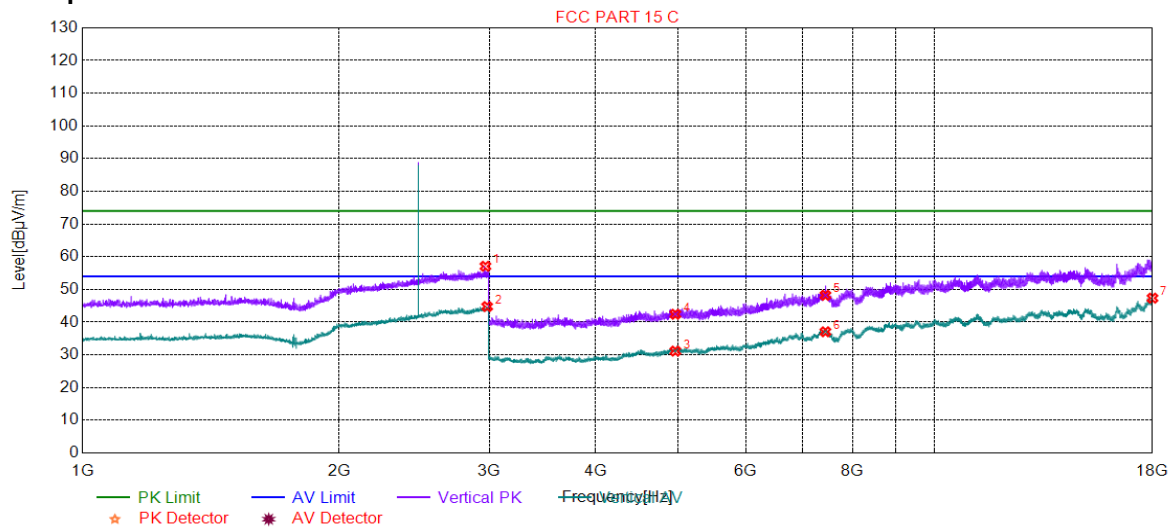


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4.9.2.6 BLE-1M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2969.492	57.10	74.00	16.90	289	242	Vertical
2	2983.495	44.77	54.00	9.23	262	211	Vertical
3	4960.000	31.17	54.00	22.83	253	354	Vertical
4	4960.000	42.43	74.00	31.57	180	252	Vertical
5	7440.000	48.23	74.00	25.77	204	201	Vertical
6	7440.000	37.07	54.00	16.93	155	82	Vertical
7	18000.00	47.36	54.00	6.64	152	252	Vertical

Final Data List

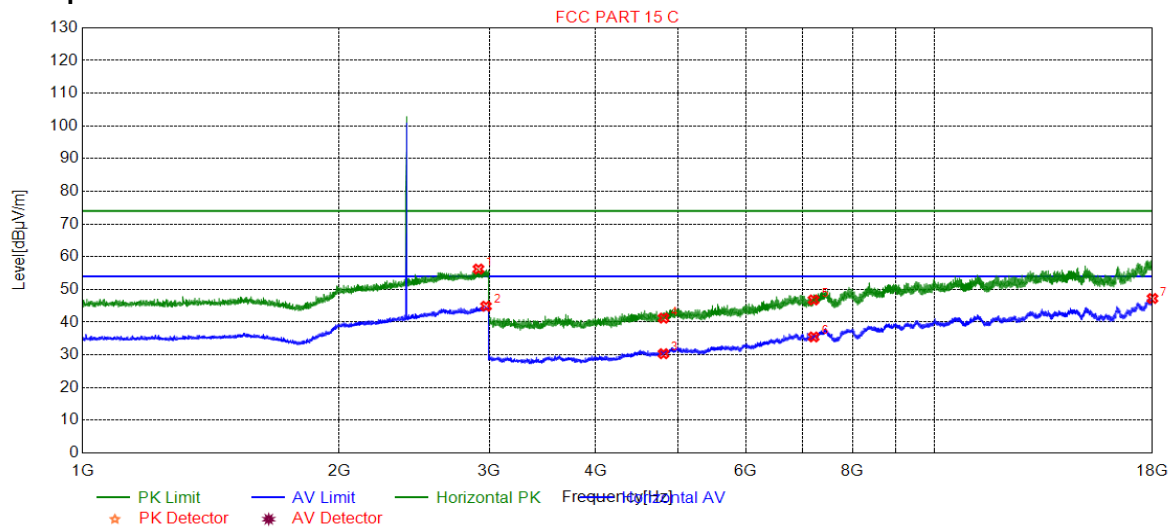


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4.9.2.7 BLE-2M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2913.978	56.25	74.00	17.75	156	97	Horizontal
2	2973.993	44.89	54.00	9.11	244	206	Horizontal
3	4804.000	30.37	54.00	23.63	191	92	Horizontal
4	4804.000	41.25	74.00	32.75	156	92	Horizontal
5	7206.000	46.81	74.00	27.19	223	58	Horizontal
6	7206.000	35.49	54.00	18.51	187	126	Horizontal
7	17998.49	47.25	54.00	6.75	124	143	Horizontal

Final Data List

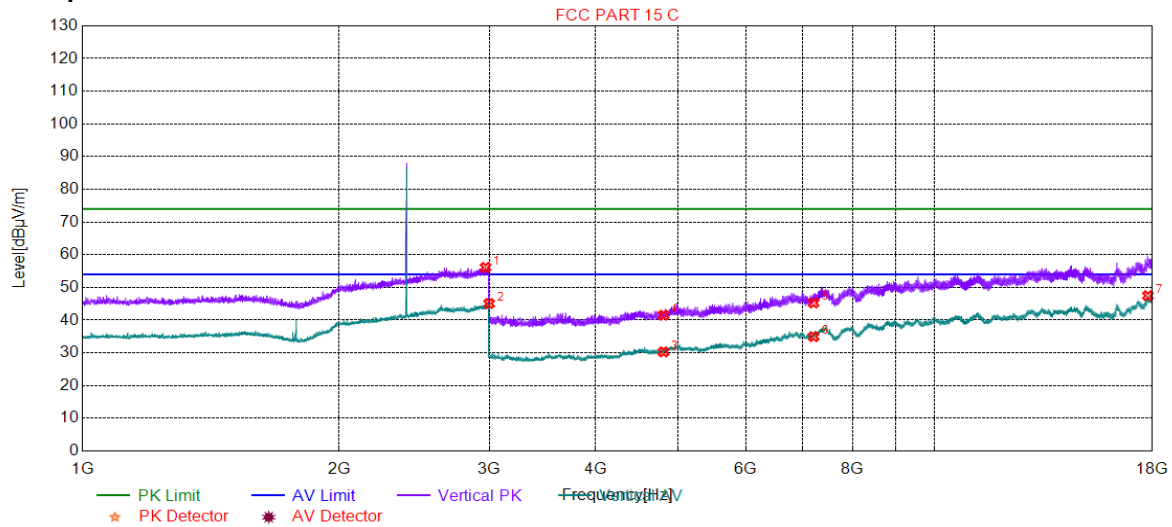


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4.9.2.8 BLE-2M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2970.492	56.15	74.00	17.85	293	128	Vertical
2	2999.499	45.10	54.00	8.90	180	289	Vertical
3	4804.000	30.31	54.00	23.69	242	150	Vertical
4	4804.000	41.53	74.00	32.47	270	150	Vertical
5	7206.000	45.28	74.00	28.72	285	30	Vertical
6	7206.000	34.97	54.00	19.03	293	14	Vertical
7	17777.98	47.48	54.00	6.52	270	167	Vertical

Final Data List

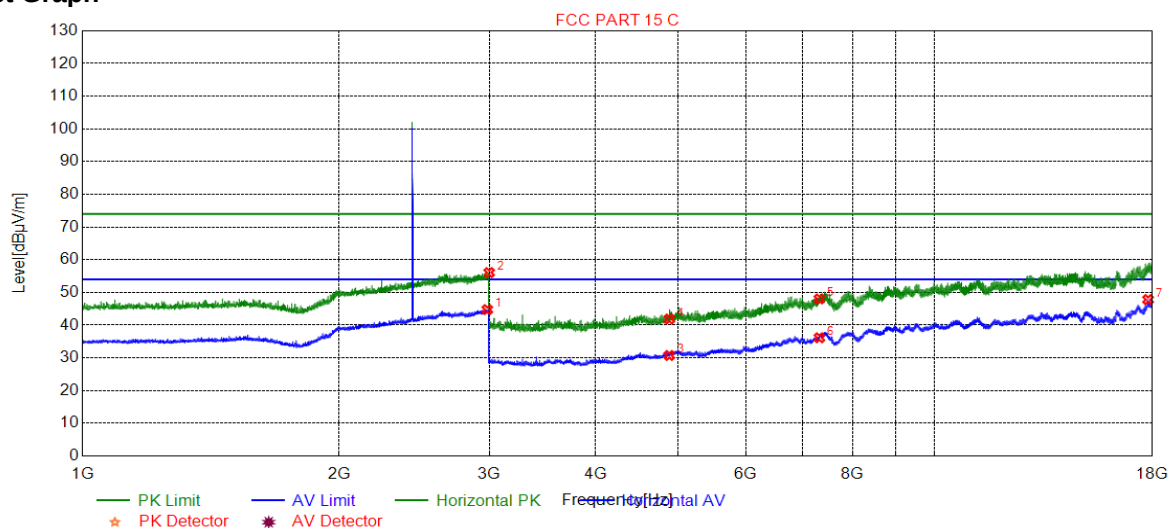


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4.9.2.9 BLE-2M_Channel 19

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2984.496	44.77	54.00	9.23	173	353	Horizontal
2	2999.499	56.10	74.00	17.90	133	343	Horizontal
3	4880.000	30.75	54.00	23.25	199	346	Horizontal
4	4880.000	41.89	74.00	32.11	197	159	Horizontal
5	7320.000	48.04	74.00	25.96	231	329	Horizontal
6	7320.000	36.16	54.00	17.84	138	210	Horizontal
7	17785.48	47.84	54.00	6.16	156	58	Horizontal

Final Data List

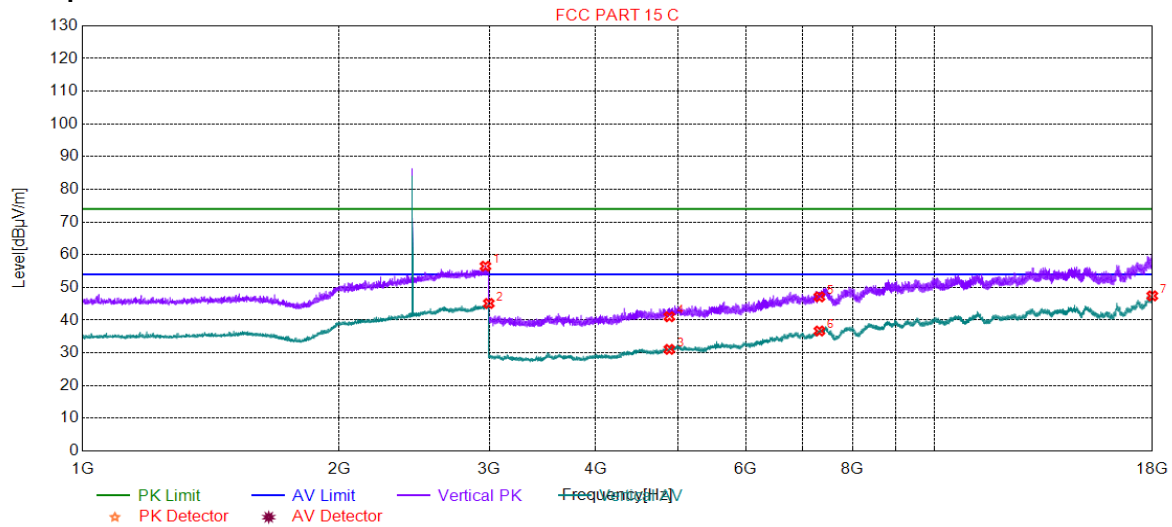


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4.9.2.10 BLE-2M_Channel 19

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2969.992	56.51	74.00	17.49	202	278	Vertical
2	2996.499	45.12	54.00	8.88	174	272	Vertical
3	4880.000	31.09	54.00	22.91	180	209	Vertical
4	4880.000	41.06	74.00	32.94	248	31	Vertical
5	7320.000	47.14	74.00	26.86	273	99	Vertical
6	7320.000	36.70	54.00	17.30	266	136	Vertical
7	17987.99	47.44	54.00	6.56	224	82	Vertical

Final Data List

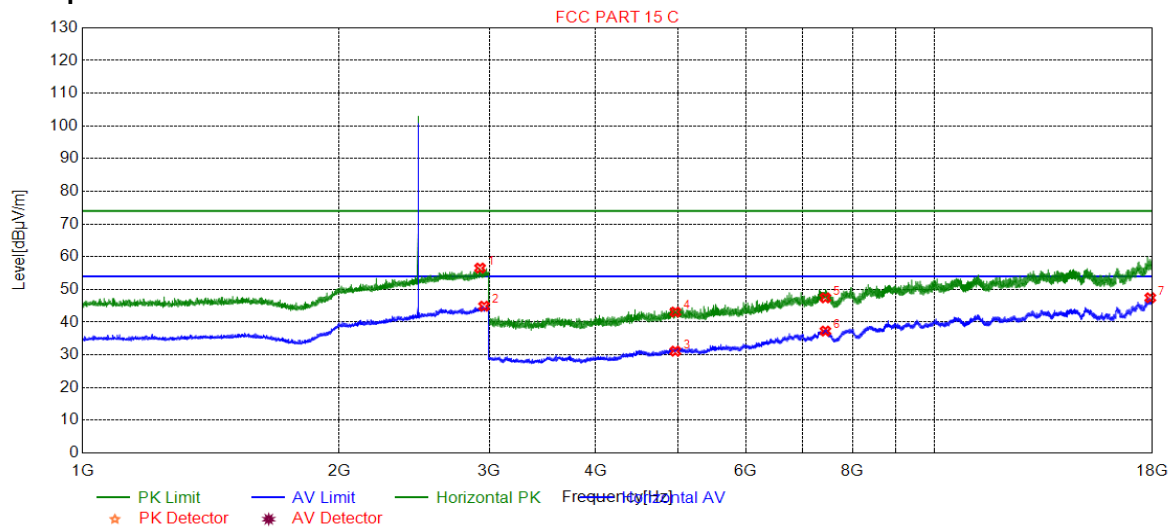


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4.9.2.11 BLE-2M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2926.481	56.55	74.00	17.45	140	136	Horizontal
2	2958.489	44.89	54.00	9.11	154	231	Horizontal
3	4960.000	31.15	54.00	22.85	178	329	Horizontal
4	4960.000	43.11	74.00	30.89	236	153	Horizontal
5	7440.000	47.45	74.00	26.55	223	240	Horizontal
6	7440.000	37.29	54.00	16.71	214	222	Horizontal
7	17891.24	47.46	54.00	6.54	123	296	Horizontal

Final Data List

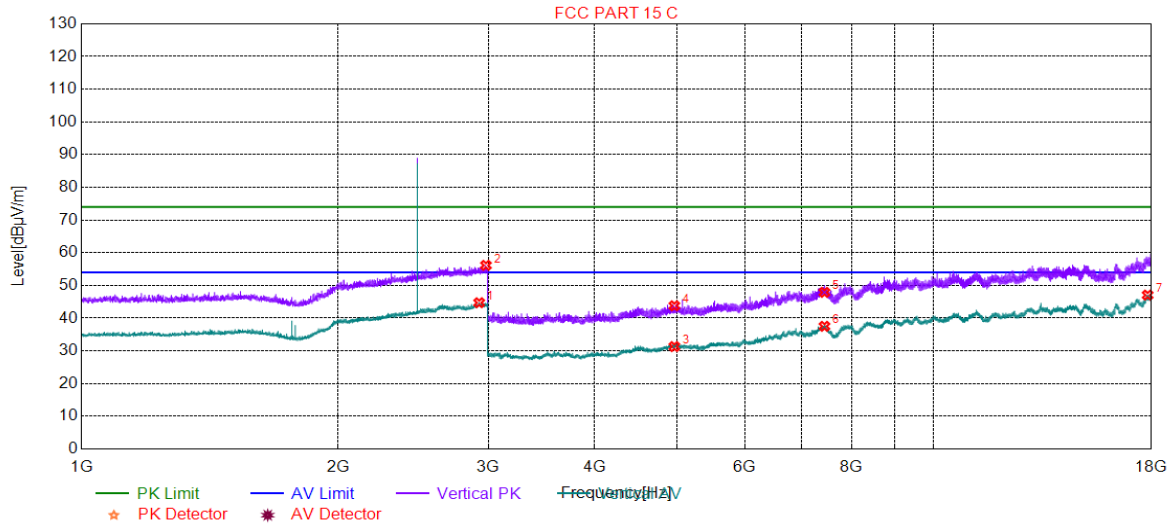


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4.9.2.12 BLE-2M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2927.481	44.73	54.00	9.27	187	142	Vertical
2	2981.495	56.17	74.00	17.83	178	163	Vertical
3	4960.000	31.32	54.00	22.68	212	14	Vertical
4	4960.000	43.80	74.00	30.20	193	30	Vertical
5	7440.000	47.90	74.00	26.10	160	250	Vertical
6	7440.000	37.52	54.00	16.48	295	132	Vertical
7	17813.24	47.07	54.00	6.93	287	352	Vertical

Final Data List

Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 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.
- As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.
- All Modes have been tested, but only the worst case data displayed in this report.



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4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

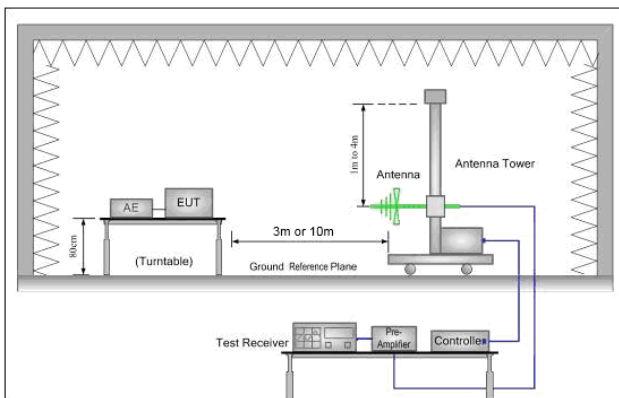


Figure 1. 30MHz to 1GHz

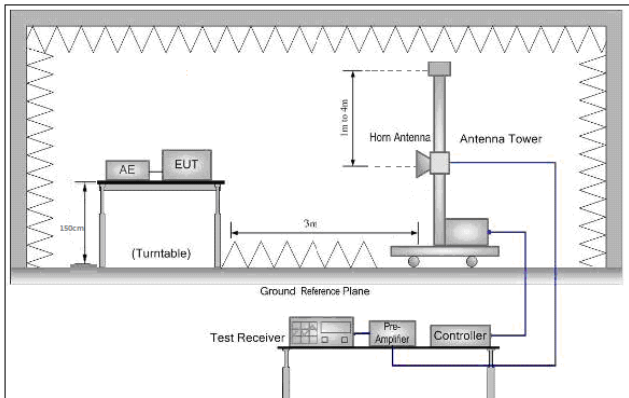


Figure 2. Above 1 GHz



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Report No.: ZR/2020/B003603-01

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Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel h. Test the EUT in the lowest channel , the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with GFSK modulation. Charge + Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation. Pretest the EUT at Charge + Transmitting mode. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



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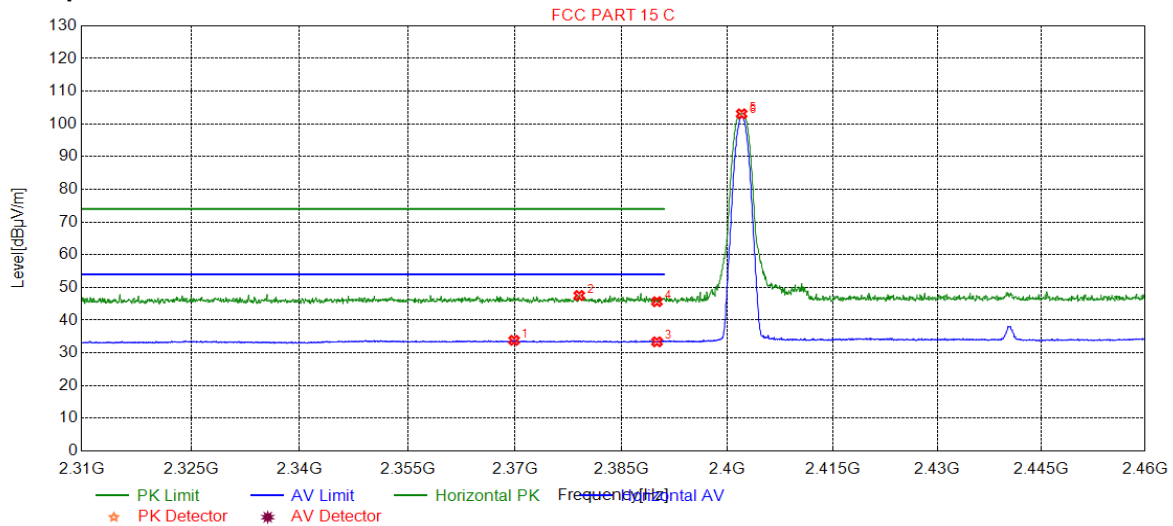
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4.10.1 Test Plots

4.10.1.1 BLE-1M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2369.879	33.84	54.00	20.16	111	295	Horizontal
2	2379.034	47.55	74.00	26.45	120	314	Horizontal
3	2390.000	33.39	54.00	20.61	112	252	Horizontal
4	2390.000	45.67	74.00	28.33	136	102	Horizontal
5	2402.000	103.10	0.00	-103.10	109	56	Horizontal
6	2402.000	102.47	0.00	-102.47	146	56	Horizontal

Final Data List

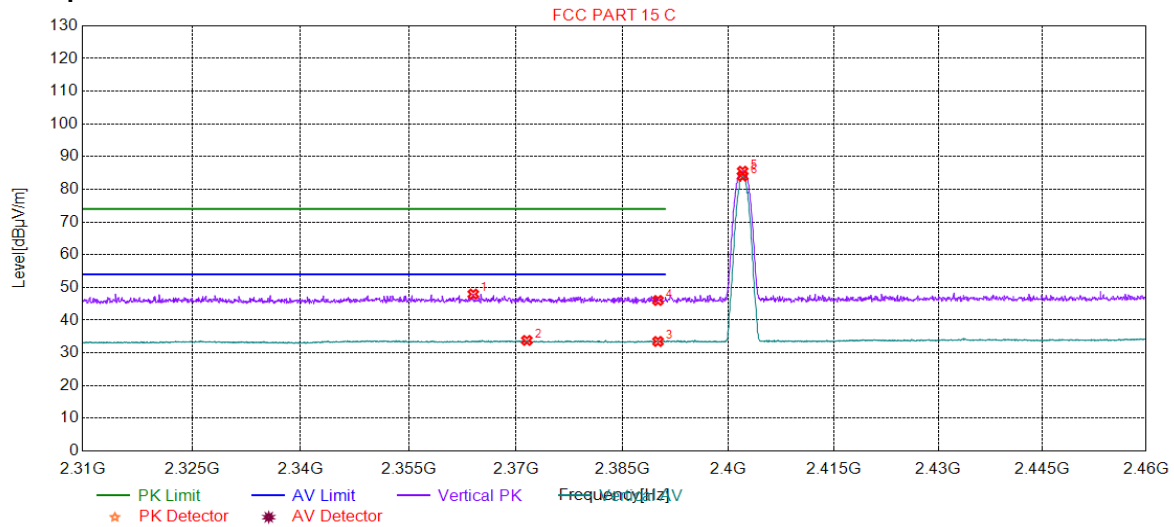


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4.10.1.2 BLE-1M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2364.027	47.97	74.00	26.03	187	297	Vertical
2	2371.530	33.82	54.00	20.18	185	308	Vertical
3	2390.000	33.50	54.00	20.50	188	308	Vertical
4	2390.000	46.04	74.00	27.96	204	332	Vertical
5	2402.000	85.56	0.00	-85.56	259	324	Vertical
6	2402.000	84.06	0.00	-84.06	214	157	Vertical

Final Data List

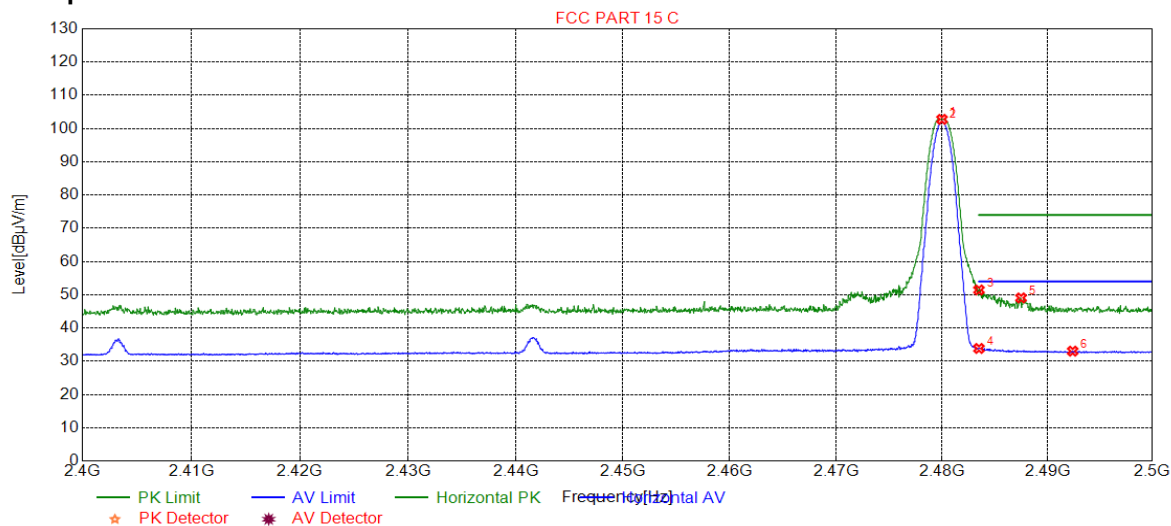


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4.10.1.3 BLE-1M_Channel 39

Test Graph



Suspected List

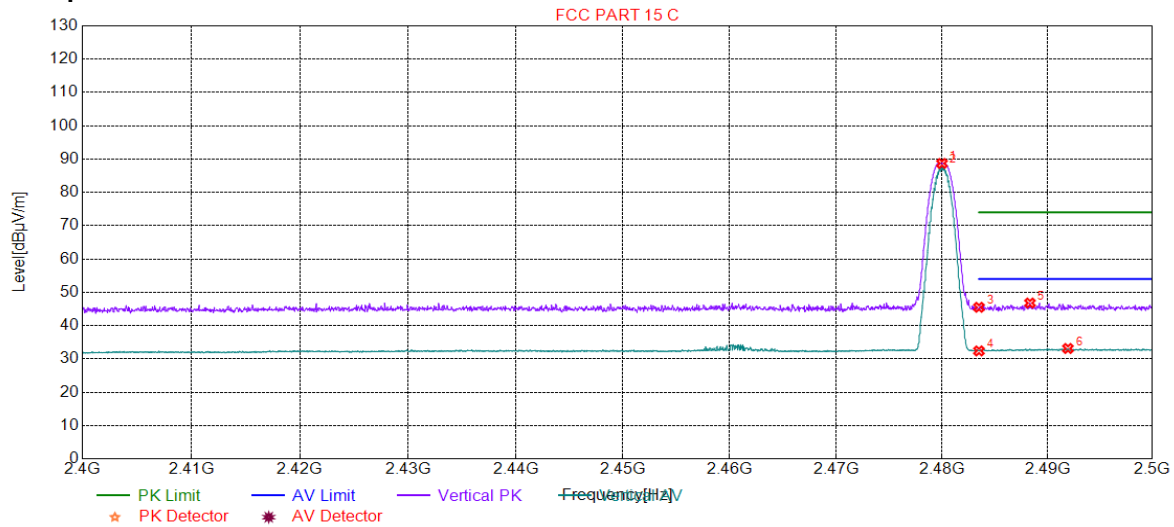
Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2480.000	102.77	0.00	-102.77	163	75	Horizontal
2	2480.000	102.17	0.00	-102.17	175	75	Horizontal
3	2483.500	51.46	74.00	22.54	194	64	Horizontal
4	2483.500	33.88	54.00	20.12	105	68	Horizontal
5	2487.493	49.07	74.00	24.93	200	98	Horizontal
6	2492.396	33.07	54.00	20.93	214	60	Horizontal

Final Data List



4.10.1.4 BLE-1M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2480.000	88.69	0.00	-88.69	155	308	Vertical
2	2480.000	88.09	0.00	-88.09	251	308	Vertical
3	2483.500	45.52	74.00	28.48	255	53	Vertical
4	2483.500	32.43	54.00	21.57	288	177	Vertical
5	2488.344	46.80	74.00	27.20	197	33	Vertical
6	2491.946	33.16	54.00	20.84	190	346	Vertical

Final Data List



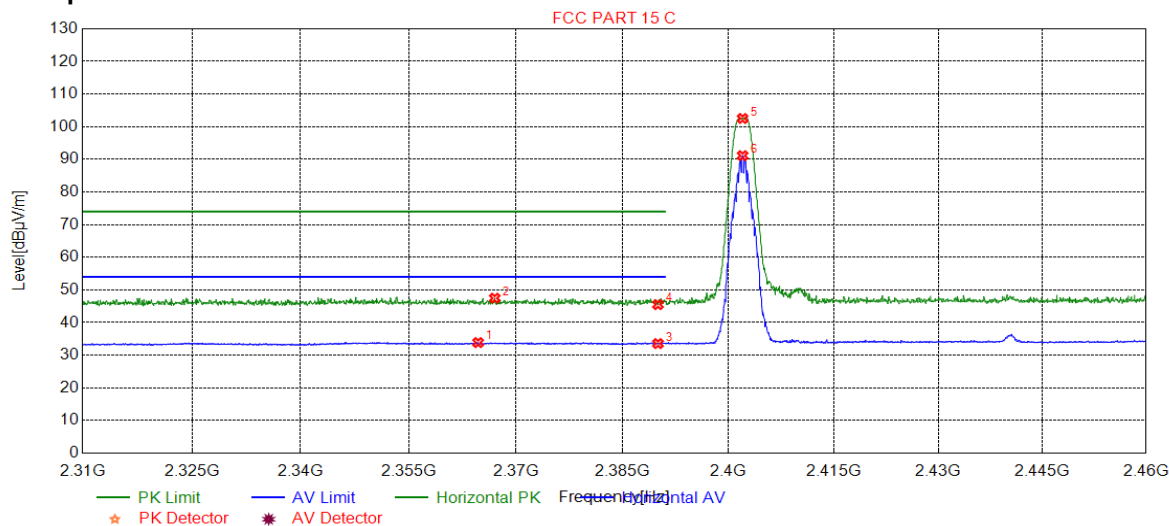
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4.10.1.5 BLE-2M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2364.702	33.88	54.00	20.12	166	199	Horizontal
2	2367.028	47.48	74.00	26.52	188	172	Horizontal
3	2390.000	33.57	54.00	20.43	189	222	Horizontal
4	2390.000	45.52	74.00	28.48	104	349	Horizontal
5	2402.000	102.52	0.00	-102.52	176	79	Horizontal
6	2402.000	91.14	0.00	-91.14	186	71	Horizontal

Final Data List

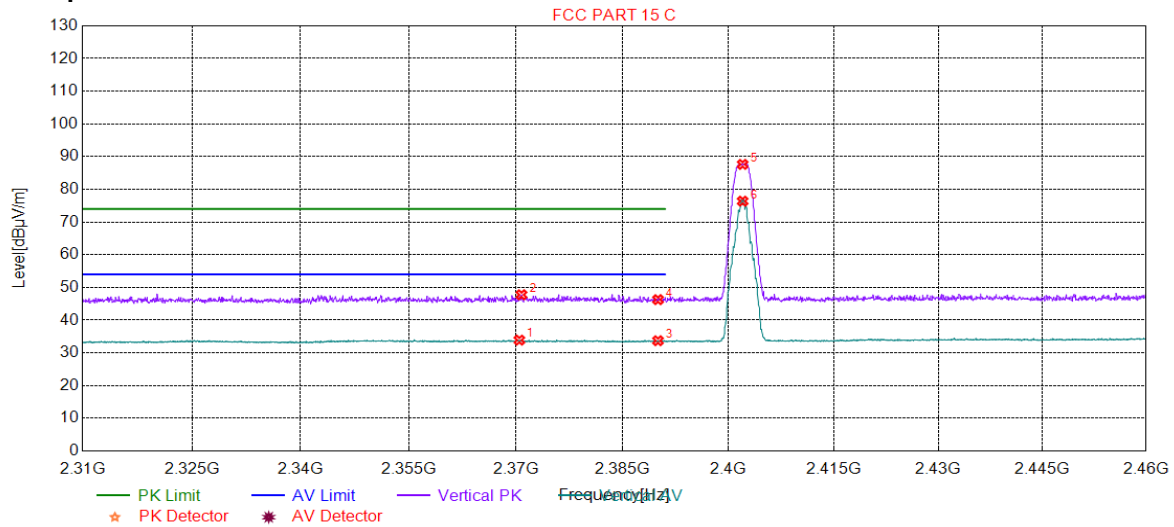


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4.10.1.6 BLE-2M_Channel 0

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2370.480	33.92	54.00	20.08	221	153	Vertical
2	2370.780	47.78	74.00	26.22	289	106	Vertical
3	2390.000	33.73	54.00	20.27	283	133	Vertical
4	2390.000	46.29	74.00	27.71	262	300	Vertical
5	2402.000	87.64	0.00	-87.64	160	335	Vertical
6	2402.000	76.39	0.00	-76.39	275	195	Vertical

Final Data List

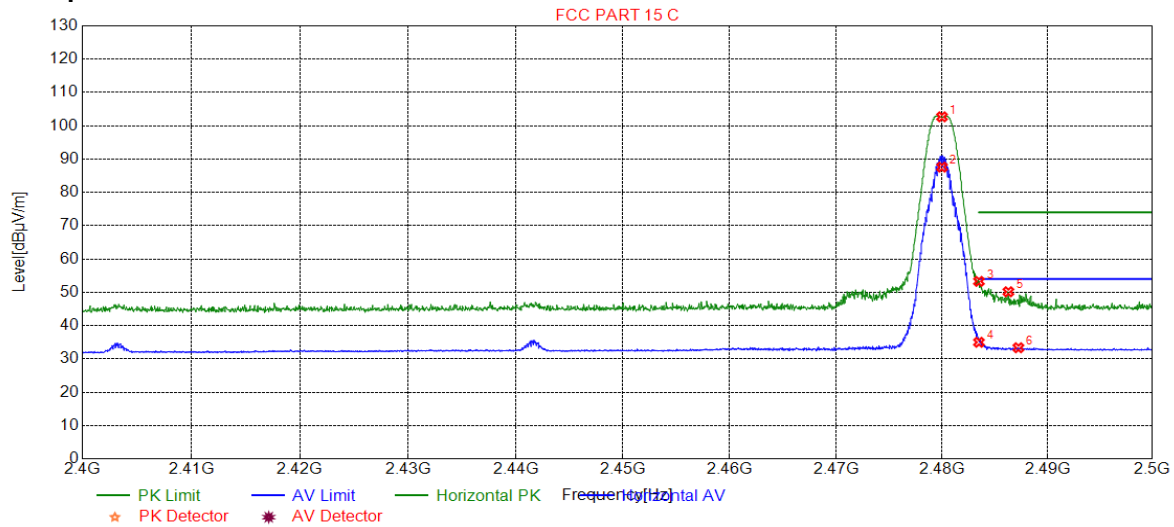


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4.10.1.7 BLE-2M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2480.000	102.69	0.00	-102.69	204	83	Horizontal
2	2480.000	87.59	0.00	-87.59	205	229	Horizontal
3	2483.500	53.30	74.00	20.70	201	83	Horizontal
4	2483.500	35.02	54.00	18.98	183	131	Horizontal
5	2486.293	50.18	74.00	23.82	122	99	Horizontal
6	2487.243	33.38	54.00	20.62	137	87	Horizontal

Final Data List



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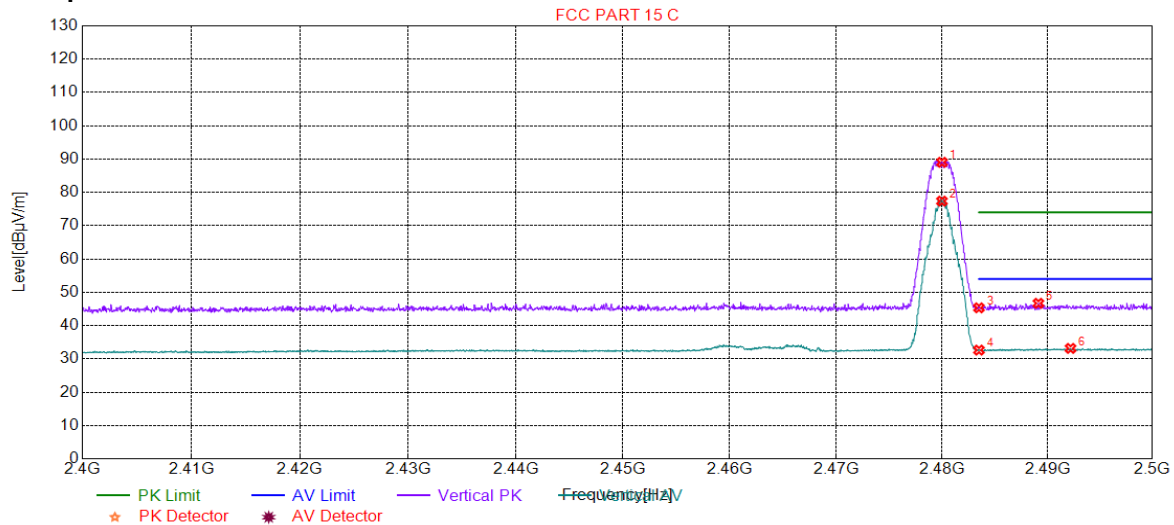
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4.10.1.8 BLE-2M_Channel 39

Test Graph



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2480.000	89.04	0.00	-89.04	291	201	Vertical
2	2480.000	77.38	0.00	-77.38	253	4	Vertical
3	2483.500	45.36	74.00	28.64	249	263	Vertical
4	2483.500	32.67	54.00	21.33	223	320	Vertical
5	2489.144	46.72	74.00	27.28	191	93	Vertical
6	2492.196	33.19	54.00	20.81	197	217	Vertical

Final Data List

Remark:

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

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



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

Lab A:

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	$\pm 0.75\text{dB}$
2	RF power density, conducted	$\pm 2.84\text{dB}$
3	Spurious emissions, conducted	$\pm 0.75\text{dB}$
4	Temperature test	$\pm 1^\circ\text{C}$
5	Humidity test	$\pm 3\%$
6	DC and low frequency voltages	$\pm 0.5\%$

Lab B:

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.8\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 6GHz)
		$\pm 4.5\text{dB}$ (6GHz to 18GHz)
		$\pm 5.02\text{dB}$ (Above 18GHz)



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6 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No	Cal. date (yyyy-mm-dd)	Cal.Duedate (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	2020/1/3	2021/1/2
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

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
				2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR



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



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7 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of Set-Up for ZR/2020/B0036.

The End



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