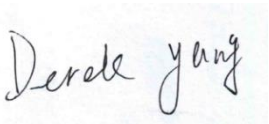
FCC TEST REPORT

Application No.:	HR/2020/C0004
Applicant:	Honor Device Co., Ltd.
Address of Applicant	Shum Yip Sky Park, No. 8089, Hongli West Road, Shenzhen, Guangdong, China
Manufacturer:	Honor Device Co., Ltd.
Address of Manufacturer	Shum Yip Sky Park, No. 8089, Hongli West Road, Shenzhen, Guangdong, China
EUT Description:	Smart Watch
Model No.:	KAN-B39
FCC ID:	2AYGCKAN-B39
Trade Mark:	HONOR
Standards:	47 CFR FCC Part 2, Subpart J 47 CFR Part 15, Subpart C
Date of Receipt:	2020/12/12
Date of Test:	2020/12/12 to 2020/12/24
Date of Issue:	2021/4/28
Test Result :	**PASS ***

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

Authorized Signature:



Derek Yang
Wireless Laboratory Manager

1 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2020-12-24		Original
02		2021-2-22		Comment Revised
03		2021/4/28	Kevin.Lan	1.Add test site Information 2.Modify data conversion error of antenna height 3.Update equipment list

*This report supersedes our previous report HR/2020/C000403, issued on 2020/2/22, which is hereby deemed null and void.

Authorized for issue by:		
Prepared By		Kevin. Lan **(Kevin.Lan) /Engineer**
Checked By		David Chen **(David Chen) /Reviewer**

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.

Contents

3 General Information

3.1 Details of Client

Applicant:	Honor Device Co., Ltd.
Address of Applicant	Shum Yip Sky Park, No. 8089, Hongli West Road, Shenzhen, Guangdong, China
Manufacturer:	Honor Device Co., Ltd.
Address of Manufacturer	Shum Yip Sky Park, No. 8089, Hongli West Road, Shenzhen, 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

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

3.4 General Description of EUT

EUT Description:	Smart Watch
Model No.:	KAN-B39
Trade Mark:	HONOR
Hardware Version:	Ajc8ac
Software Version:	10.1.2.52SP1
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 V5.1 LE
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	☒ Portable Device, ☐Module
Antenna Type:	☐ External, ☒ Integrated
Antenna Gain:	-5.2dBi
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.

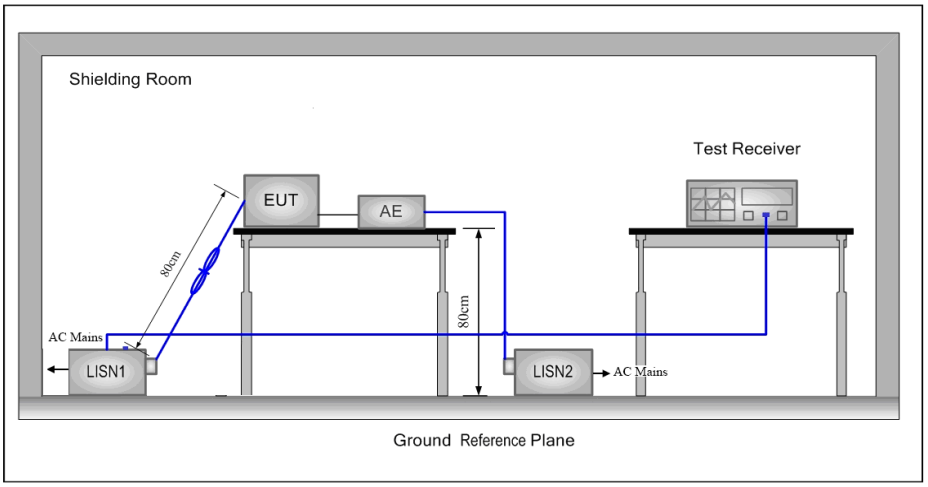
4 Test results and Measurement Data

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 -5.2dBi.	

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.		

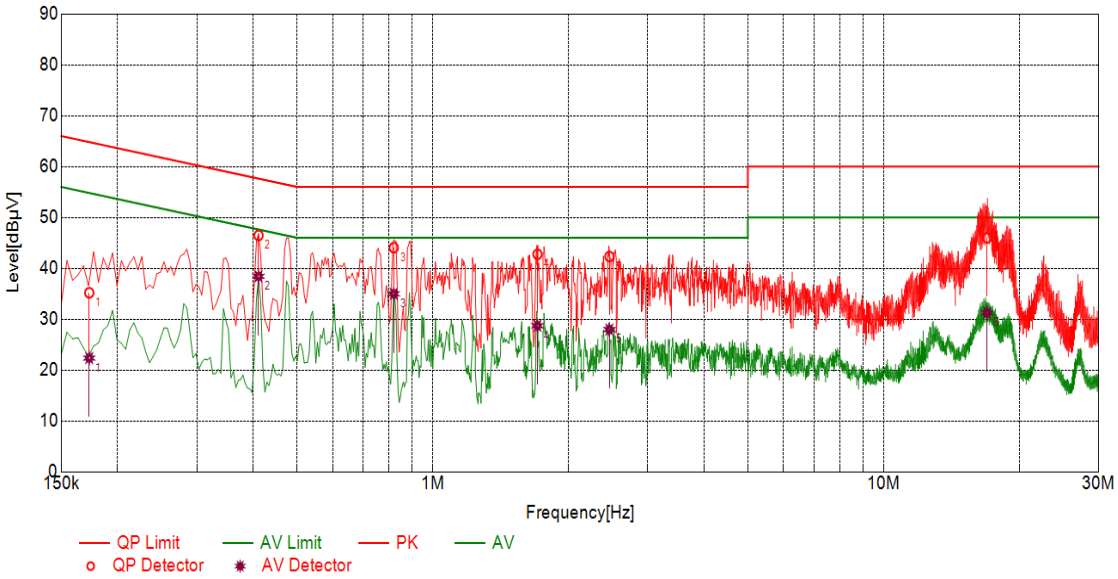
Test Setup:	
Test Mode:	Transmitting with GFSK modulation. Charge +Transmitting mode.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass

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.

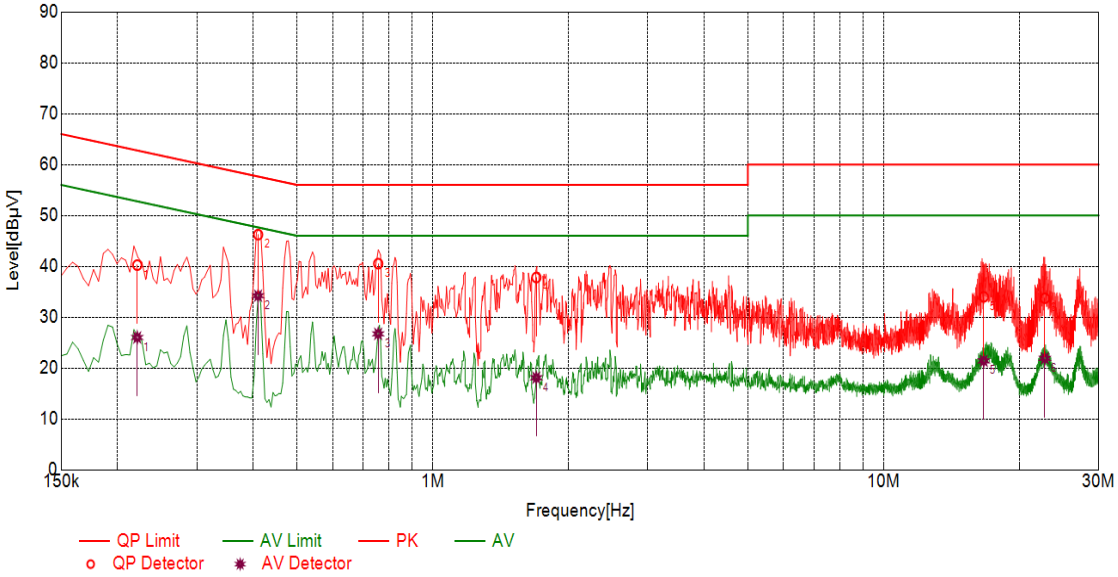
Live Line:



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	0.1731	10.10	35.19	64.81	29.62	22.36	54.81	32.45	L
2	0.4109	10.10	46.46	57.63	11.17	38.42	47.63	9.21	L
3	0.8197	10.10	44.06	56.00	11.94	34.99	46.00	11.01	L
4	1.7074	10.10	42.76	56.00	13.24	28.71	46.00	17.29	L
5	2.4650	10.10	42.32	56.00	13.68	27.96	46.00	18.04	L
6	16.9583	10.11	46.00	60.00	14.00	31.26	50.00	18.74	L

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	0.2212	10.10	40.24	62.77	22.53	26.01	52.77	26.76	N
2	0.4100	10.10	46.24	57.65	11.41	34.22	47.65	13.43	N
3	0.7571	10.10	40.53	56.00	15.47	26.73	46.00	19.27	N
4	1.6977	10.10	37.81	56.00	18.19	18.10	46.00	27.90	N
5	16.6788	10.11	34.02	60.00	25.98	21.42	50.00	28.58	N
6	22.7842	10.11	33.73	60.00	26.27	21.91	50.00	28.09	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.
3. Factor = LISN Factor + Cable Loss

4.3 Duty Cycle

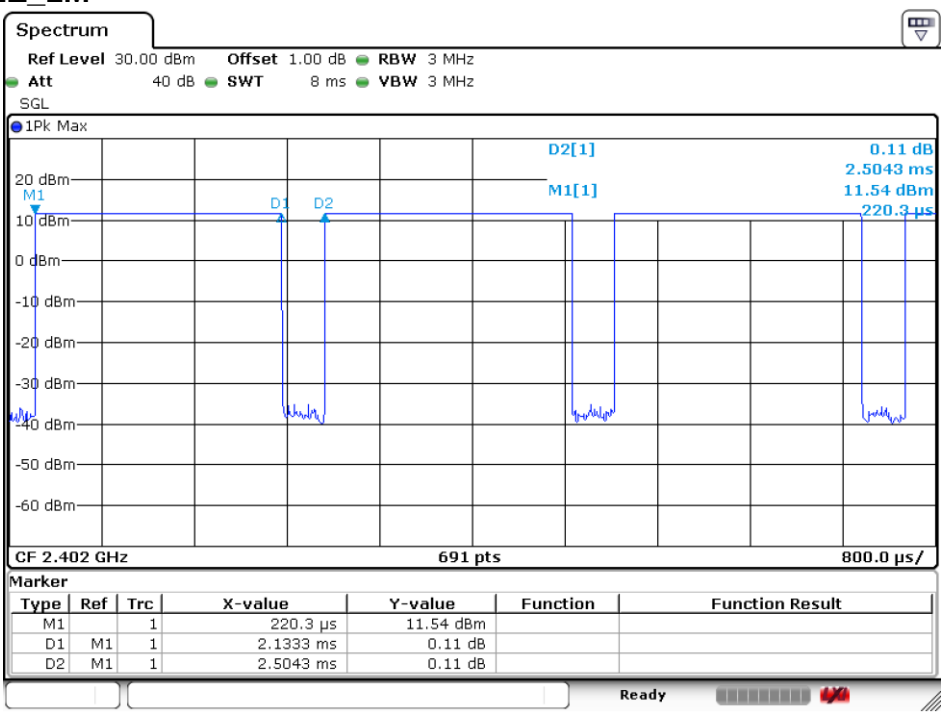
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
BLE_1M	CH0, CH19, CH39	85.19
BLE_2M	CH0, CH19, CH39	56.88

4.3.2 Test Plots

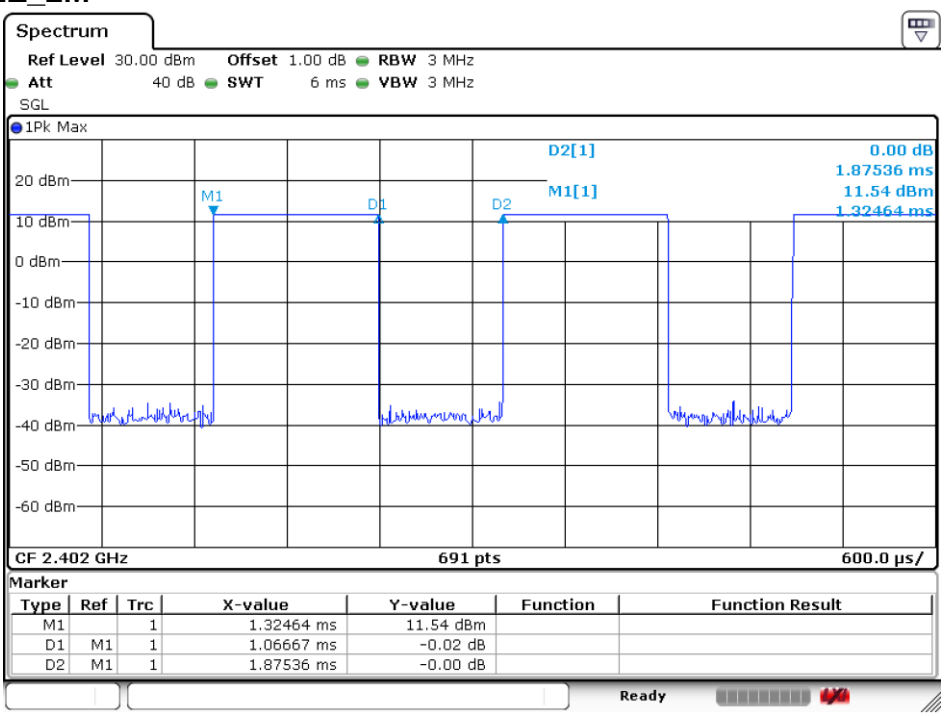
4.3.2.1 ANT1

4.3.2.1.1 BLE_1M



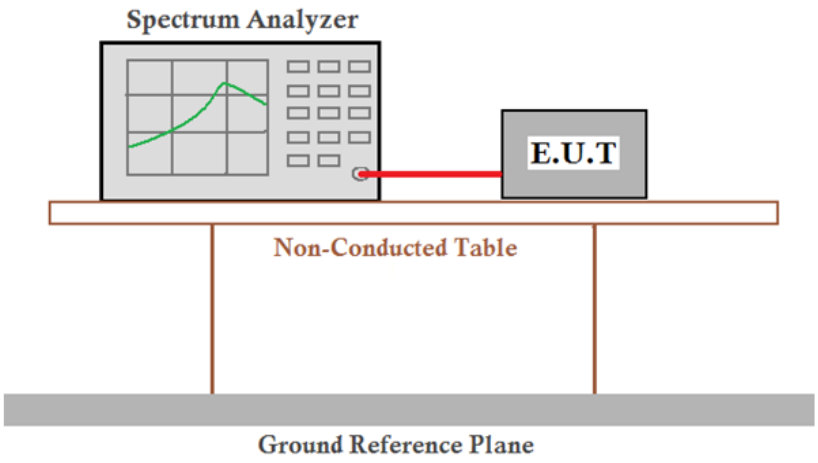
Date: 16.DEC.2020 10:31:57

4.3.2.1.2 BLE_2M



Date: 16.DEC.2020 10:57:00

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

4.4.1 Test Results

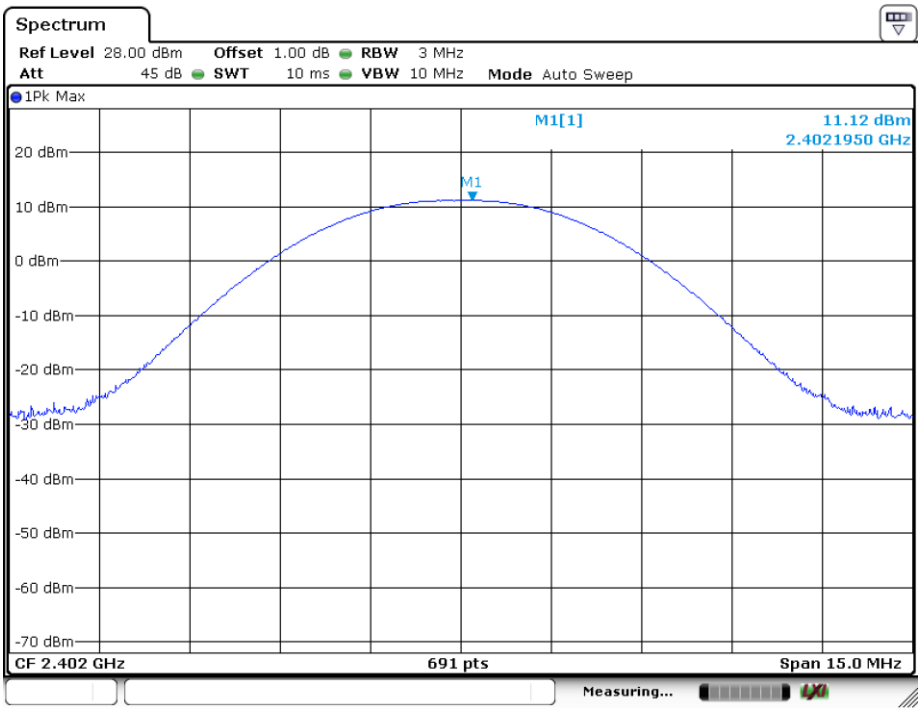
Measurement Data of Peak Power:

GFSK_1M mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	11.12	30.00	Pass
Middle	11.23	30.00	Pass
Highest	11.20	30.00	Pass

GFSK_2M mode			
Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	11.18	30.00	Pass
Middle	11.27	30.00	Pass
Highest	11.21	30.00	Pass

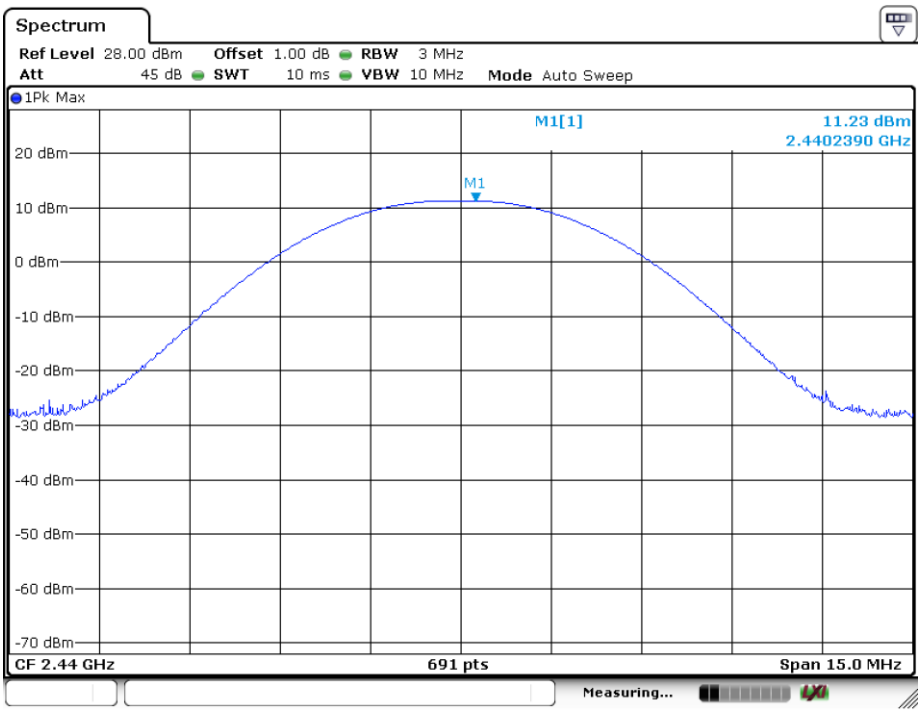
4.4.2 Test Plots

4.4.2.1 GFSK 1M_Lowest Channel



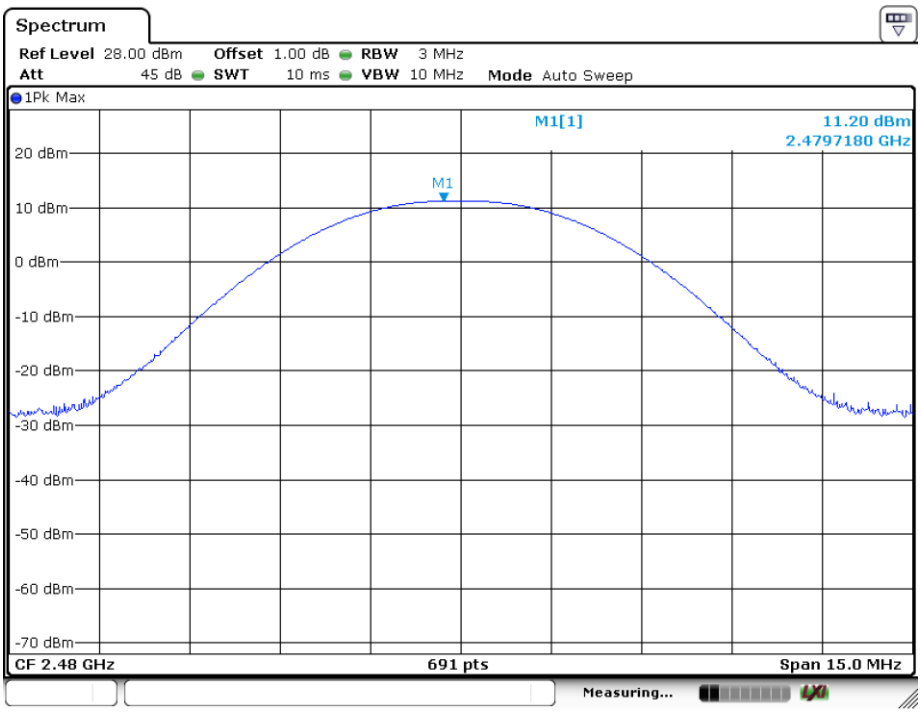
Date: 24.DEC.2020 09:21:28

4.4.2.2 GFSK 1M_Middle Channel



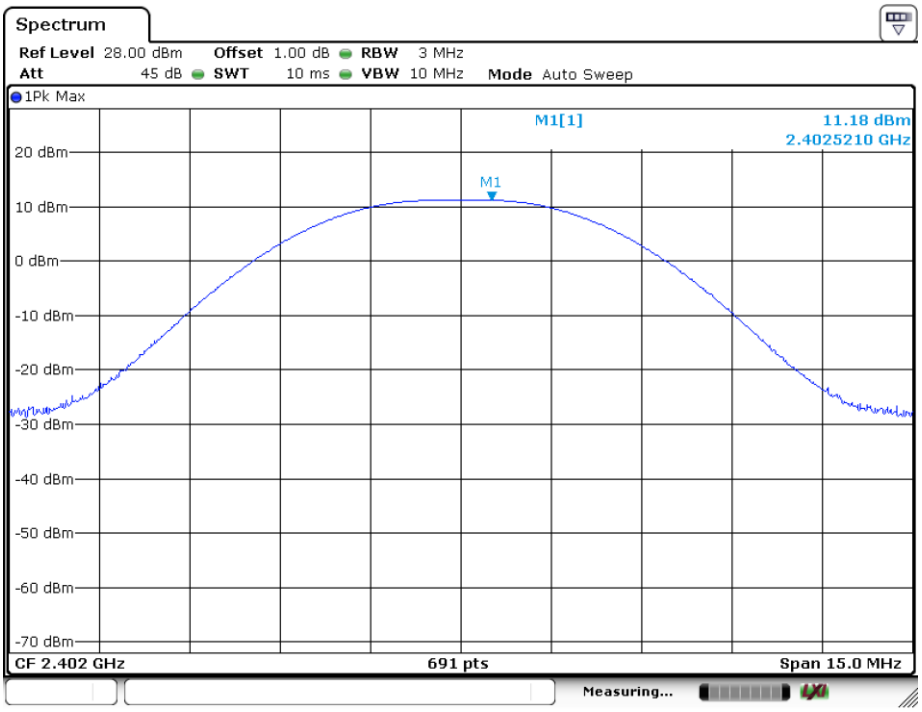
Date: 24.DEC.2020 09:21:13

4.4.2.3 GFSK 1M_Highest Channel



Date: 24.DEC.2020 09:20:32

4.4.2.4 GFSK 2M_Lowest Channel



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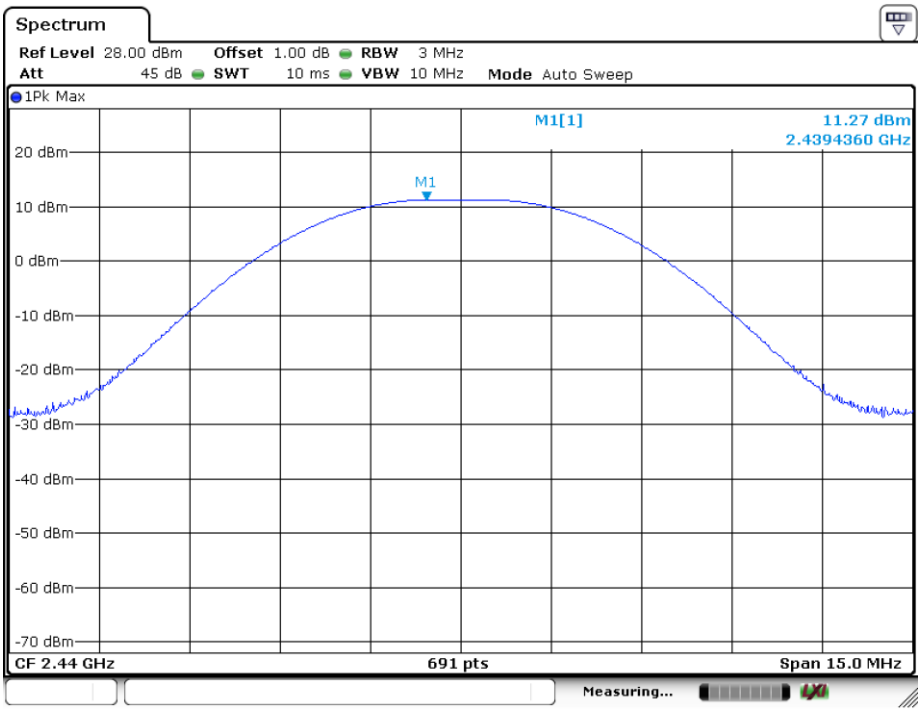
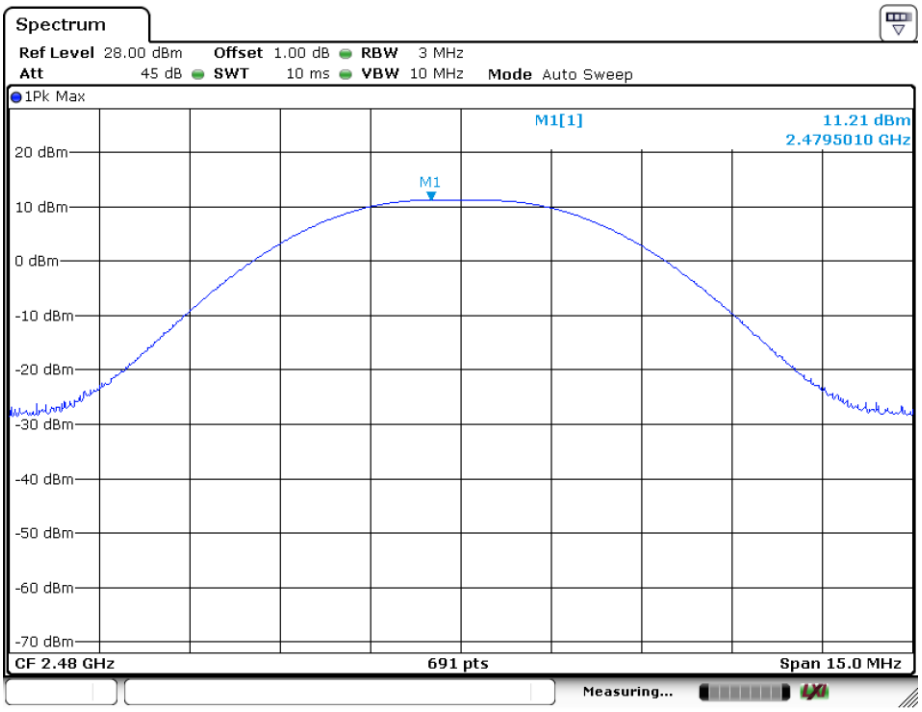
4.4.2.5 GFSK 2M_Middle Channel



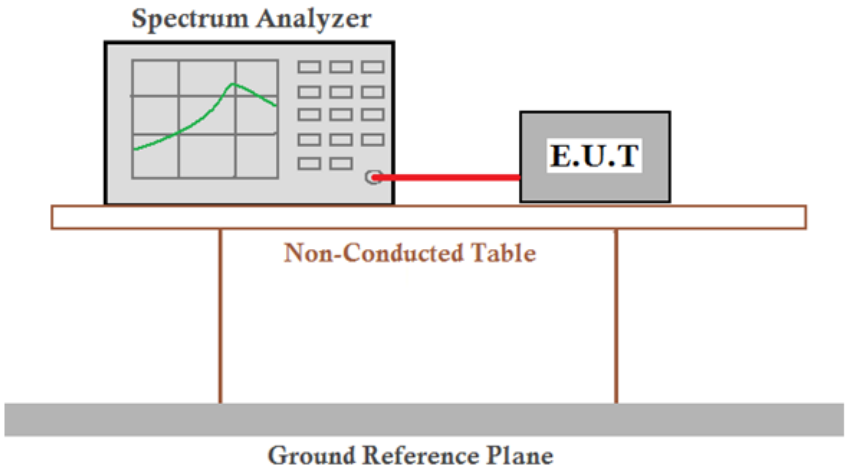
Date: 24.DEC.2020 09:25:05

4.4.2.6 GFSK 2M_Highest Channel



Date: 24.DEC.2020 09:25:53

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 6 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	≥ 500 kHz
Test Results:	Pass

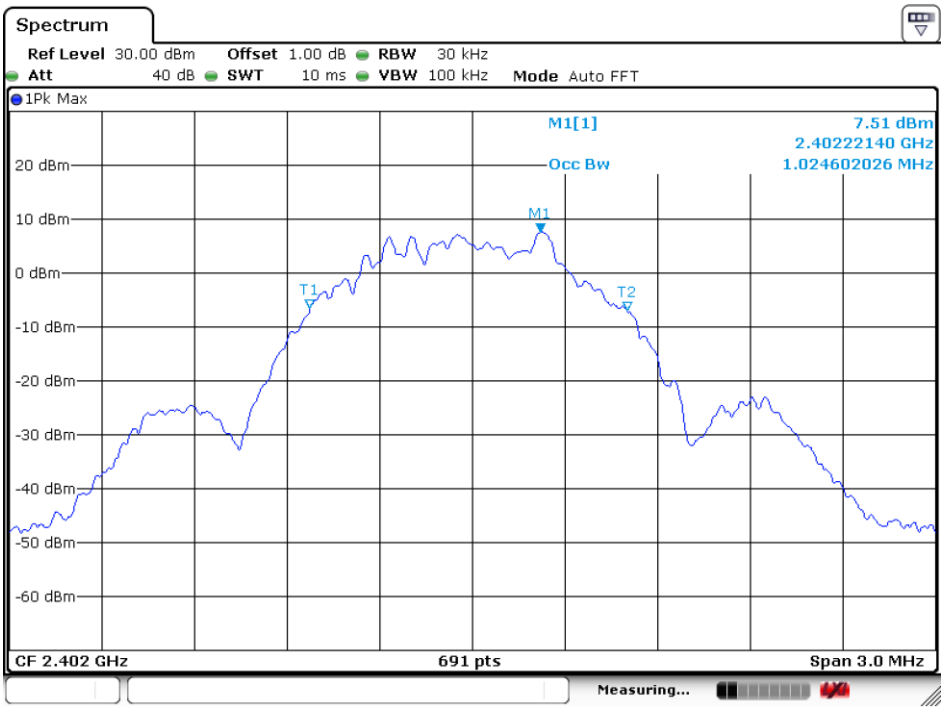
4.5.1 Test Results

Mode	Test Channel	99% Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK_1M	Lowest	1.02	0.67	≥500	Pass
	Middle	1.02	0.67	≥500	Pass
	Highest	1.03	0.67	≥500	Pass

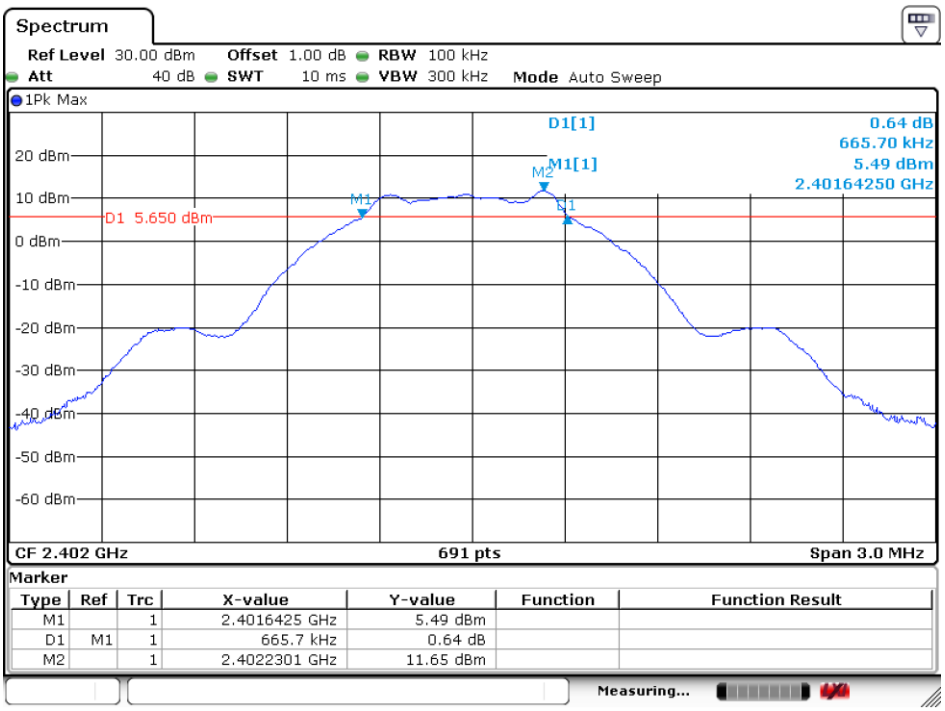
Mode	Test Channel	99% Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK_2M	Lowest	2.05	1.24	≥500	Pass
	Middle	2.05	1.25	≥500	Pass
	Highest	2.05	1.24	≥500	Pass

4.5.2 Test Plots

4.5.2.1 GFSK 1M_Lowest Channel



Date: 16.DEC.2020 10:30:01



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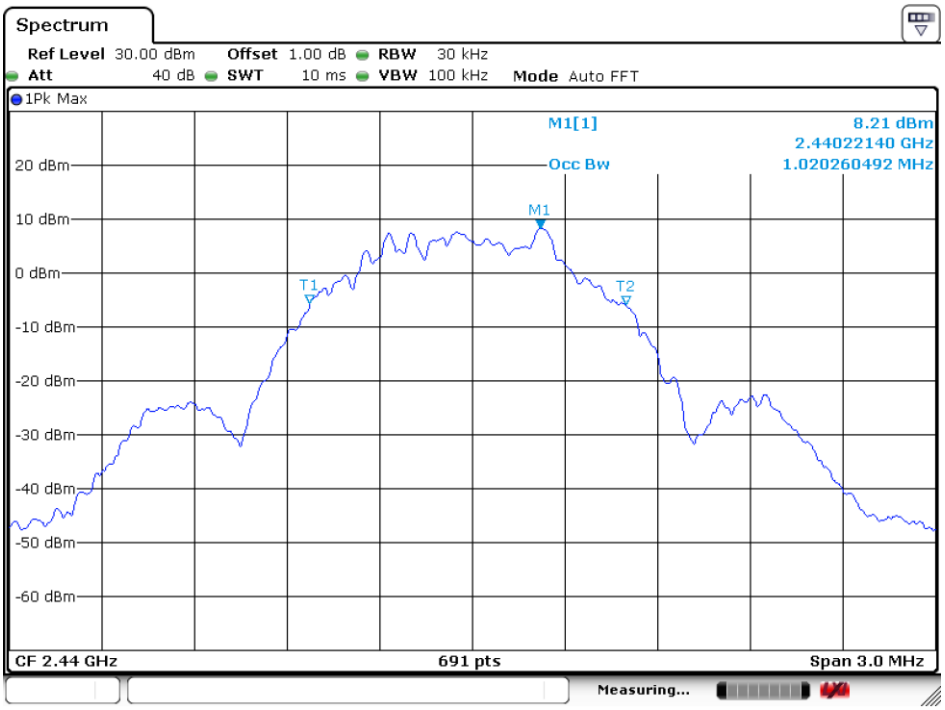
4.5.2.2 GFSK 1M_Middle Channel



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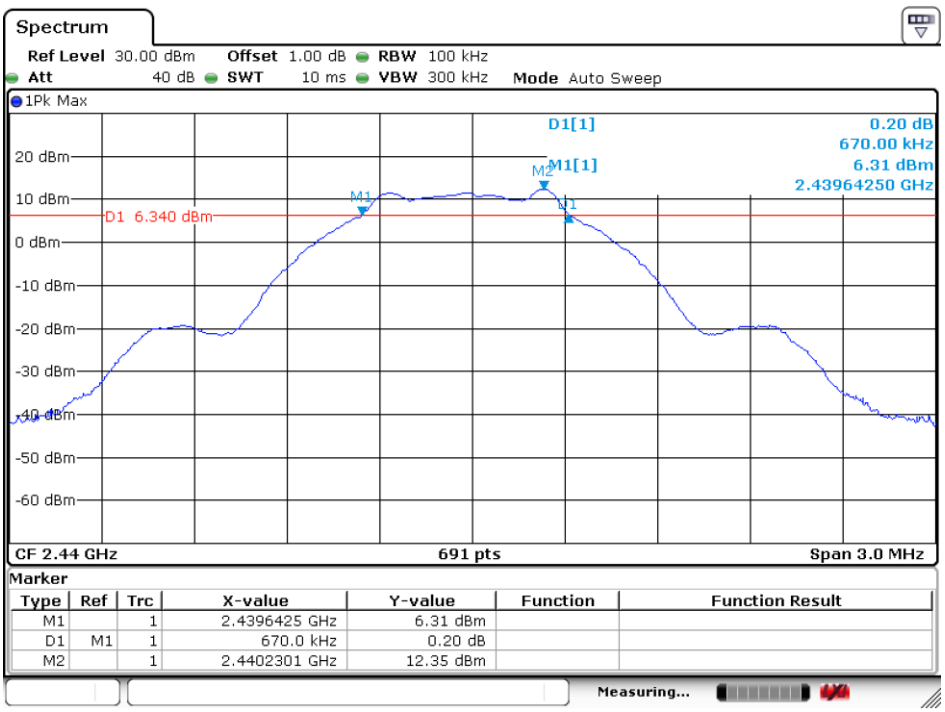

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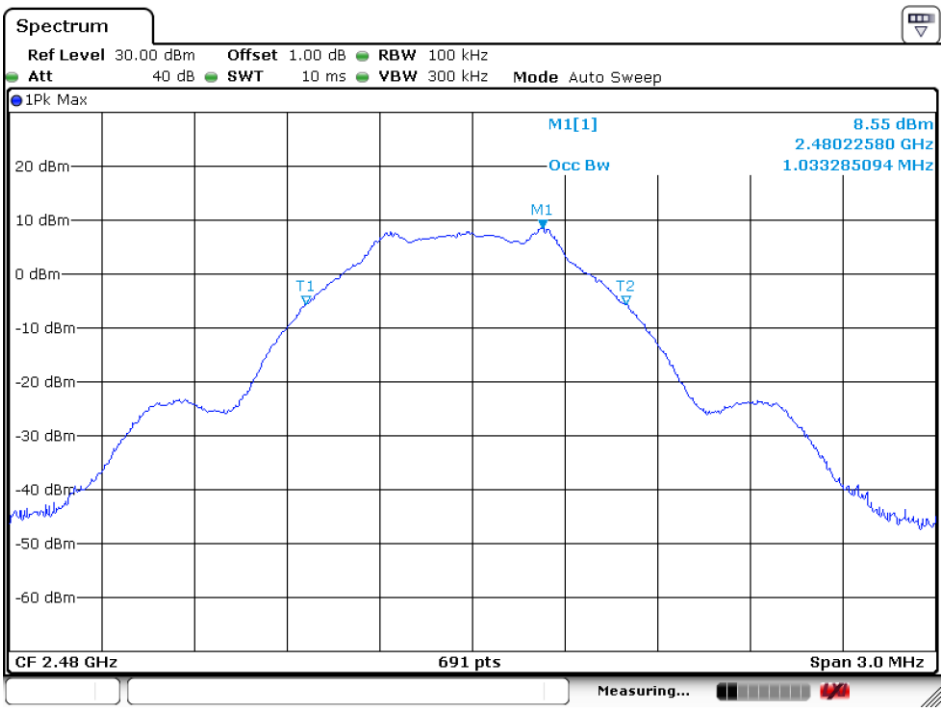
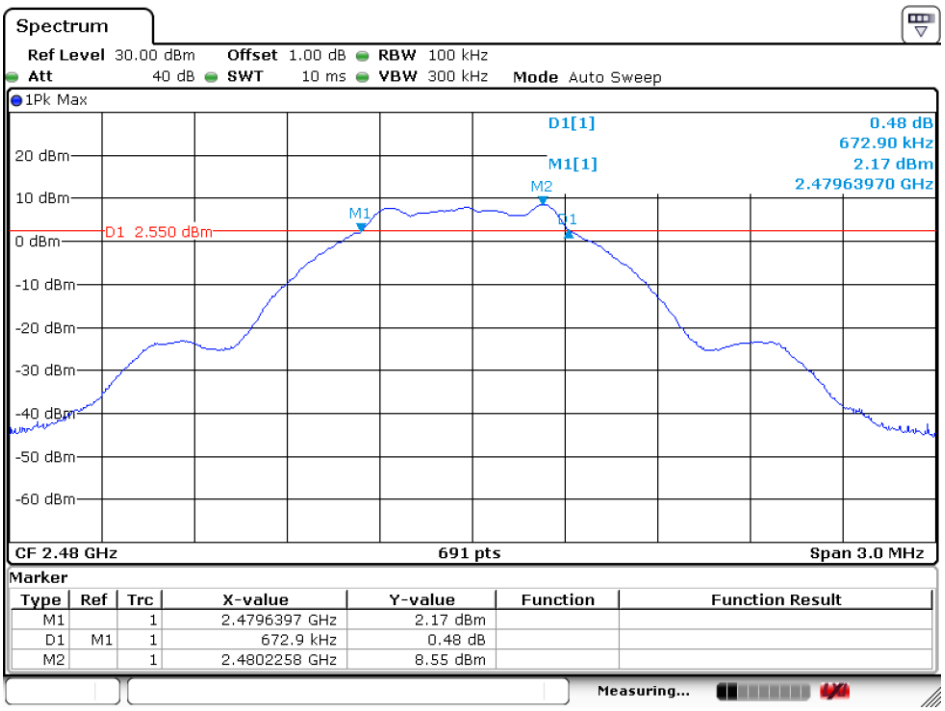
4.5.2.3 GFSK 1M_Highest Channel



Date: 16.DEC.2020 10:35:58

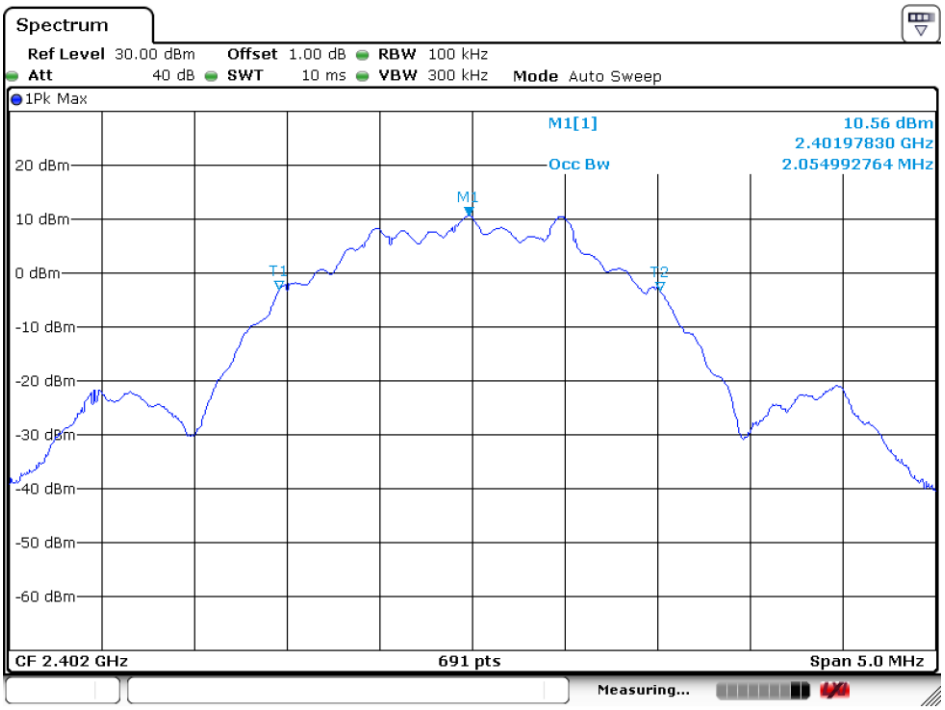


Marker

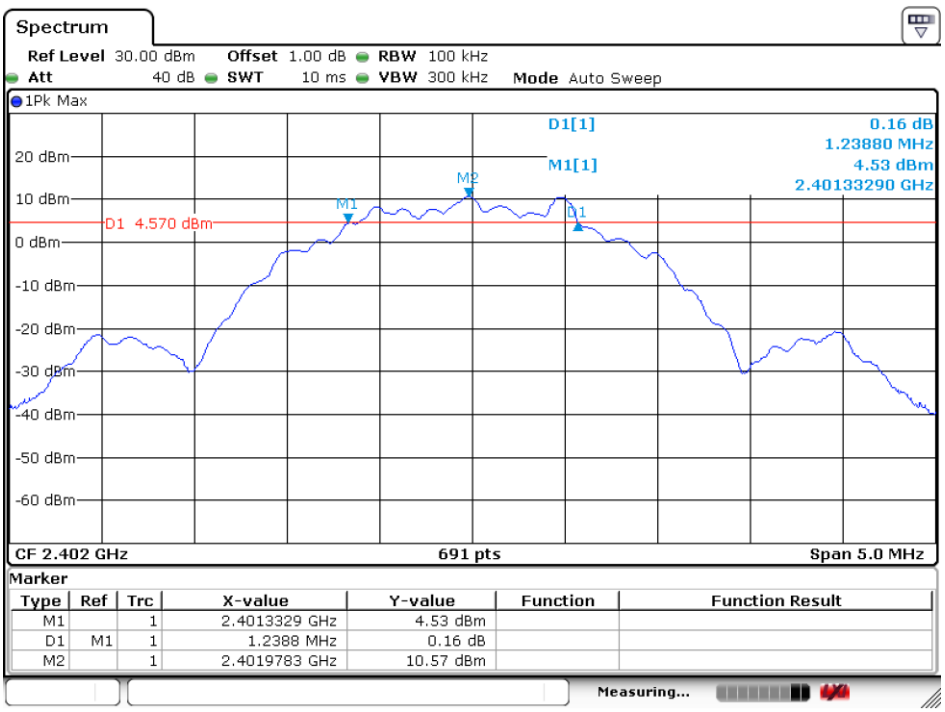
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4796397 GHz	2.17 dBm		
D1	M1	1	672.9 kHz	0.48 dB		
M2		1	2.4802258 GHz	8.55 dBm		

Date: 16.DEC.2020 10:35:50

4.5.2.4 GFSK 2M_Lowest Channel



Date: 16.DEC.2020 10:55:35

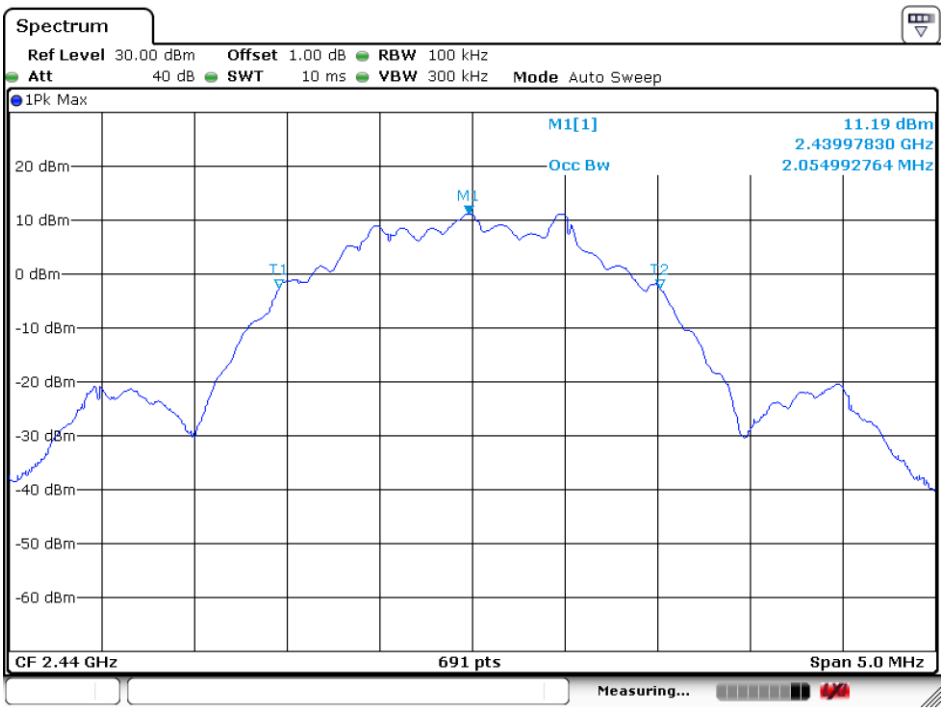


Marker

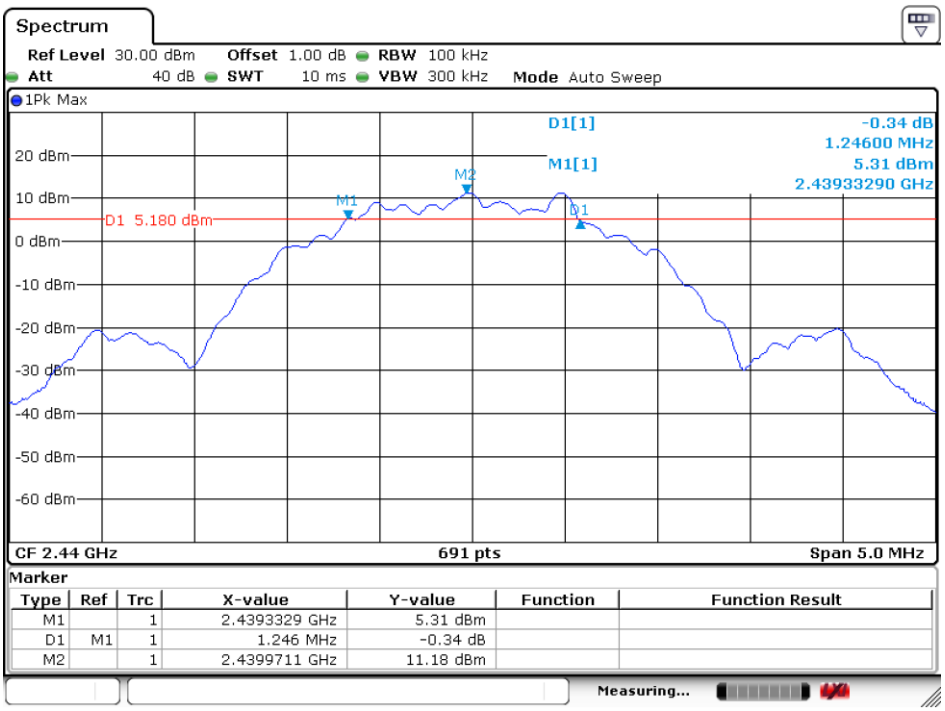
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4013329 GHz	4.53 dBm		
D1	M1	1	1.2388 MHz	0.16 dB		
M2		1	2.4019783 GHz	10.57 dBm		

Date: 16.DEC.2020 10:55:56

4.5.2.5 GFSK 2M_Middle Channel



Date: 16.DEC.2020 10:58:01

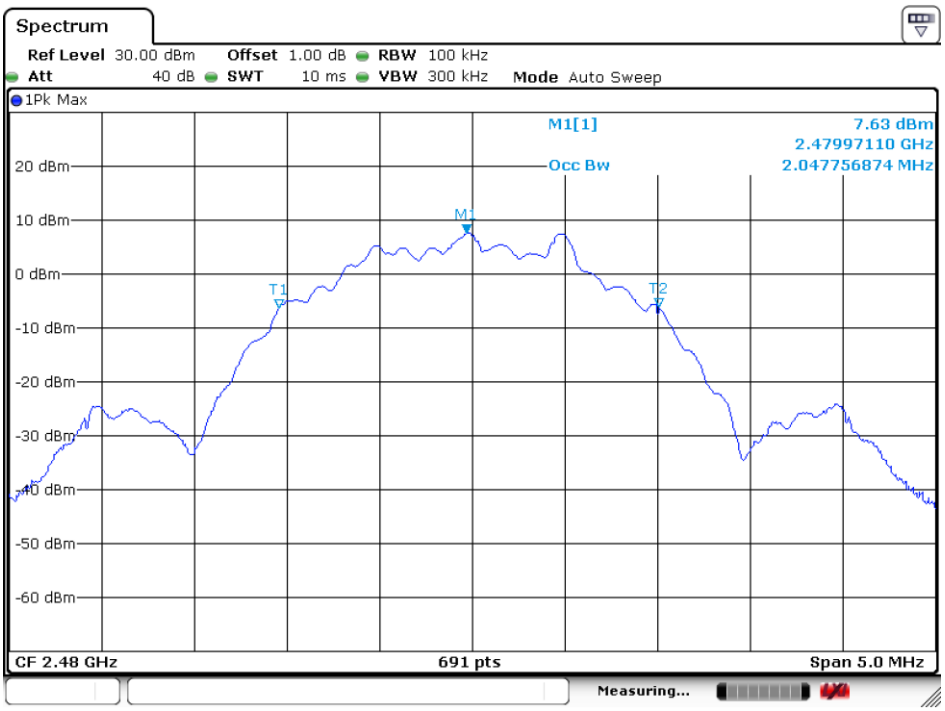


Marker

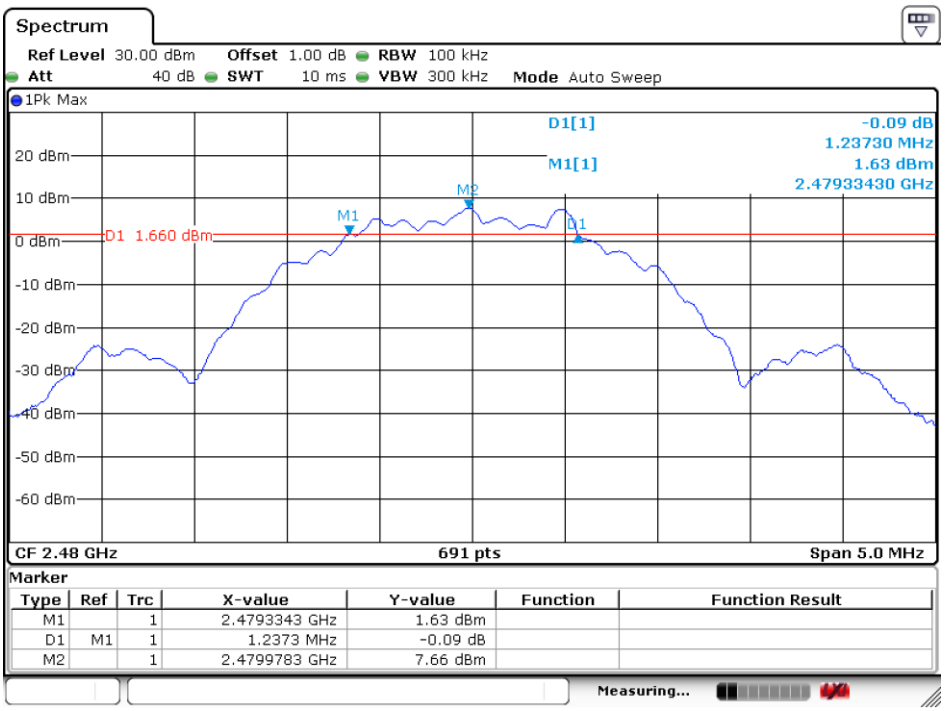
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4393329 GHz	5.31 dBm		
D1	M1	1	1.246 MHz	-0.34 dB		
M2		1	2.4399711 GHz	11.18 dBm		

Date: 16.DEC.2020 10:58:31

4.5.2.6 GFSK 2M_Highest Channel



Date: 16.DEC.2020 10:59:14



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4793343 GHz	1.63 dBm		
D1	M1	1	1.2373 MHz	-0.09 dB		
M2		1	2.4799783 GHz	7.66 dBm		

Date: 16.DEC.2020 10:59:04

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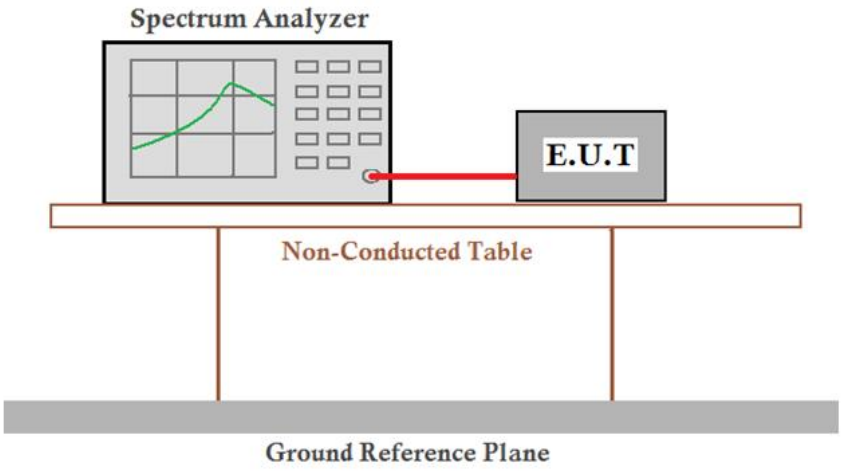
4.6 Power Spectral Density

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

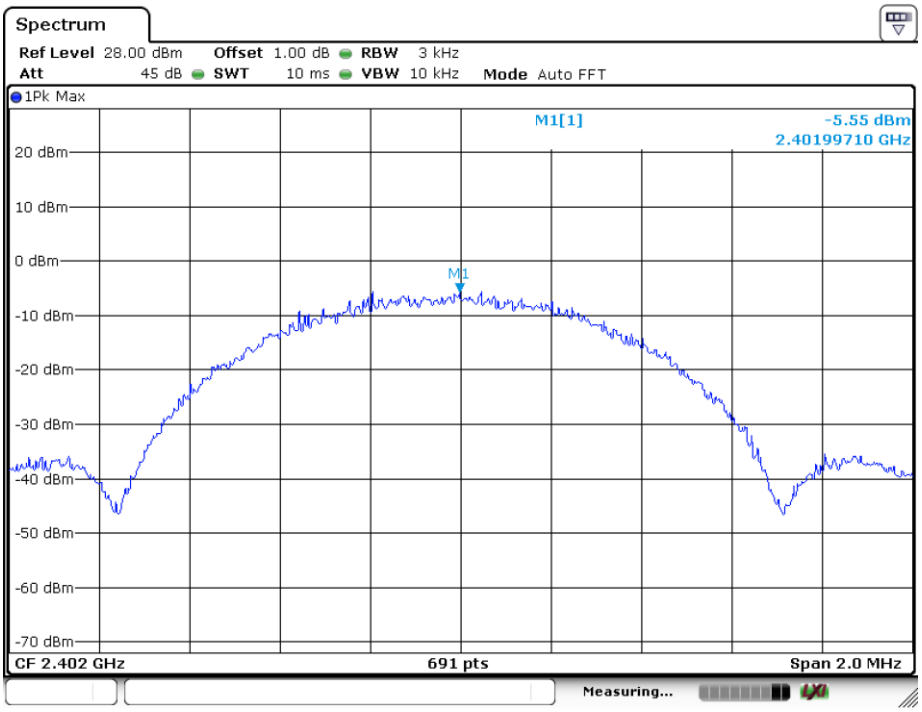
4.6.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
GFSK_1M	Lowest	-5.55	≤8.00	Pass
	Middle	-5.46	≤8.00	Pass
	Highest	-5.44	≤8.00	Pass

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
GFSK_2M	Lowest	-8.29	≤8.00	Pass
	Middle	-8.17	≤8.00	Pass
	Highest	-8.22	≤8.00	Pass

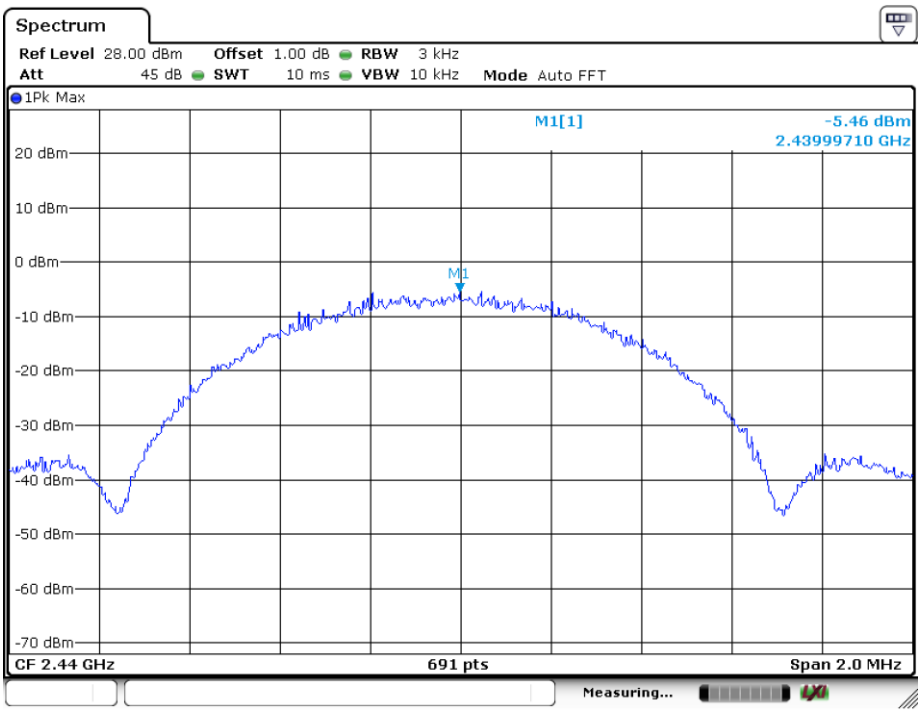
4.6.2 Test Plots

4.6.2.1 GFSK 1M_Lowest Channel



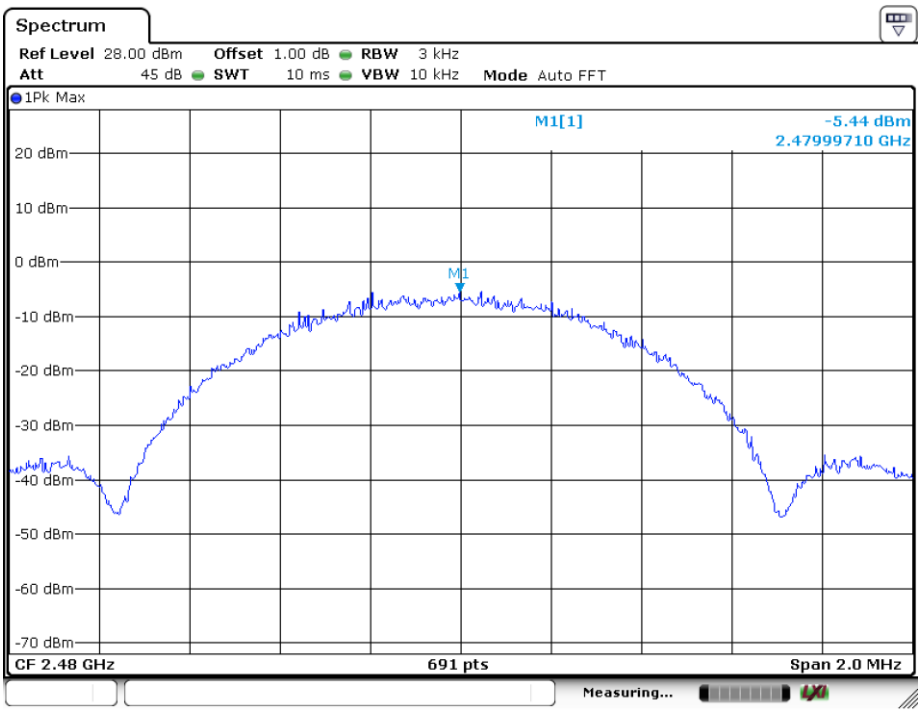
Date: 24.DEC.2020 09:21:39

4.6.2.2 GFSK 1M_Middle Channel



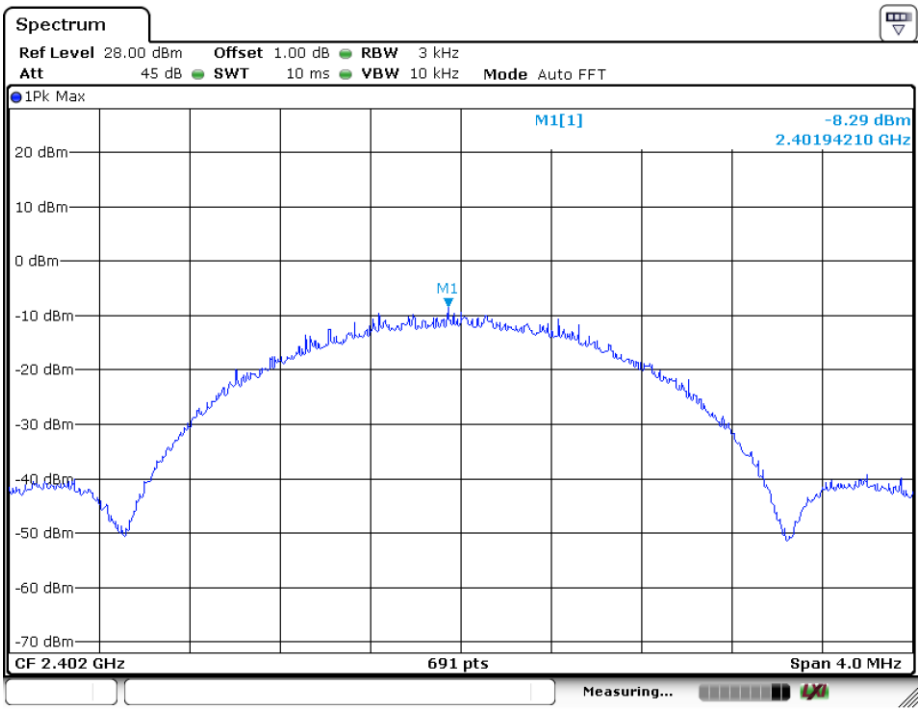
Date: 24.DEC.2020 09:21:00

4.6.2.3 GFSK 1M_Highest Channel



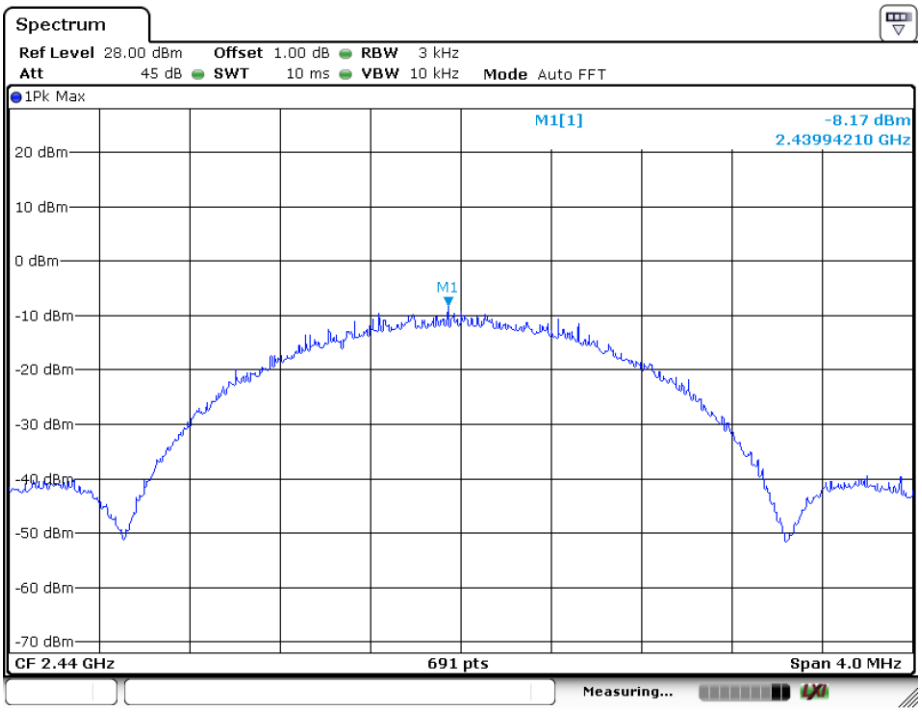
Date: 24.DEC.2020 09:20:43

4.6.2.4 GFSK 2M_Lowest Channel



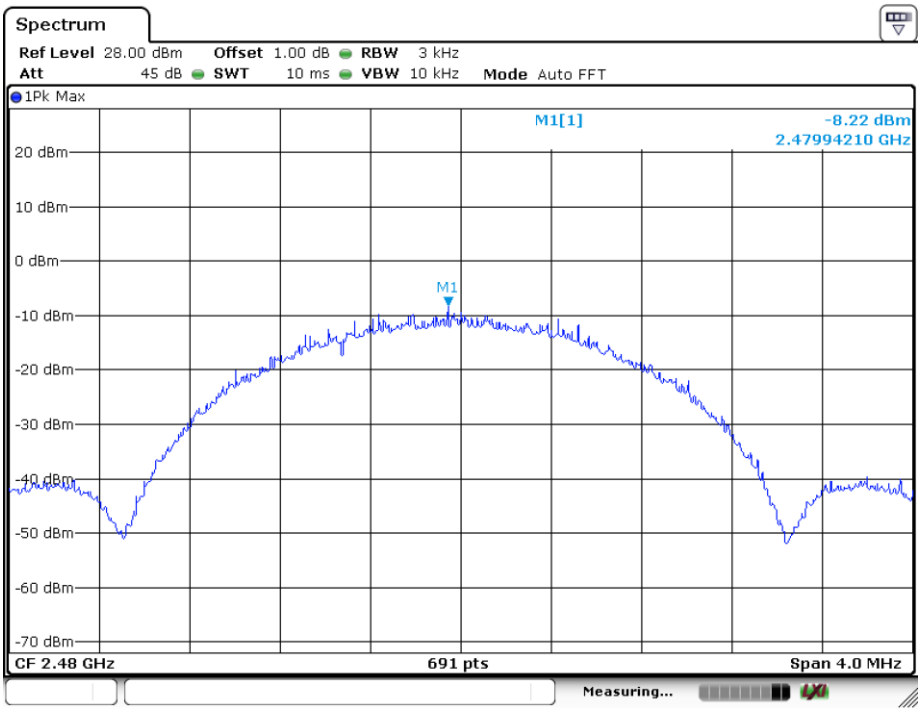
Date: 24.DEC.2020 09:24:33

4.6.2.5 GFSK 2M_Middle Channel

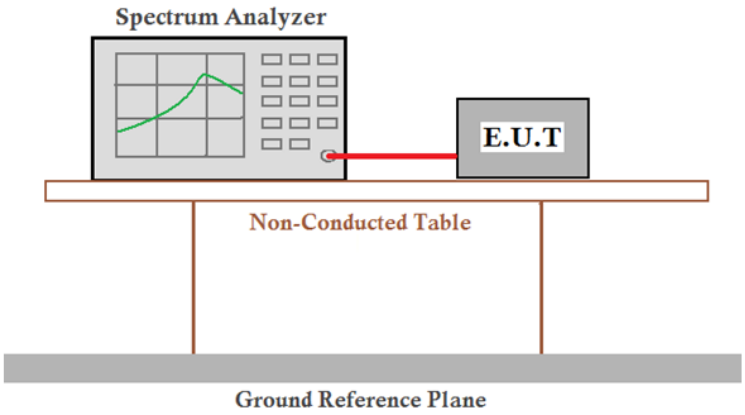


Date: 24.DEC.2020 09:25:18

4.6.2.6 GFSK 2M_Highest Channel

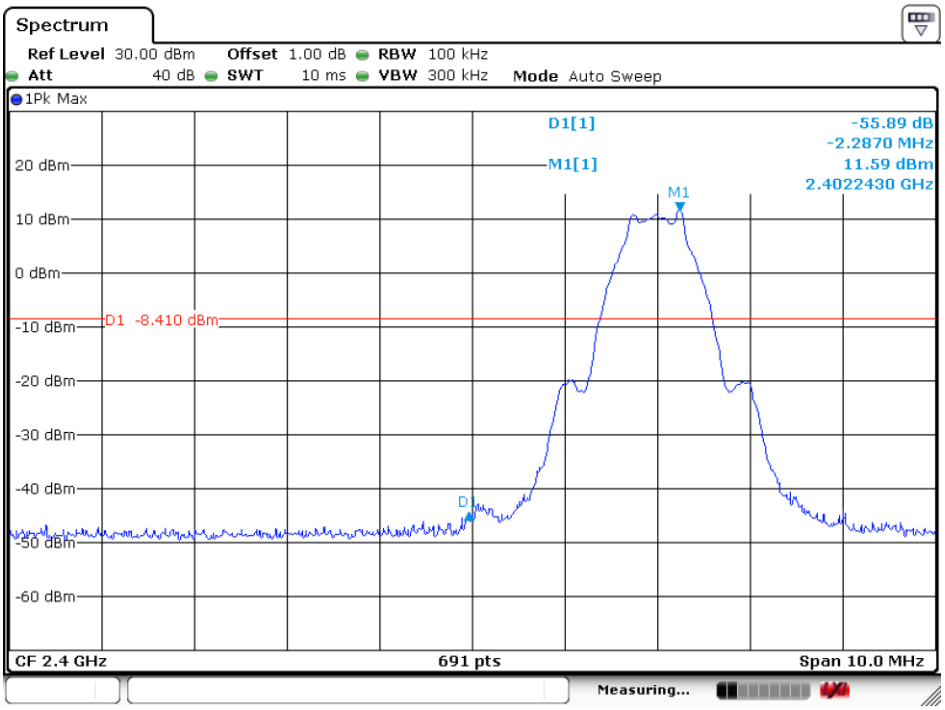


4.7 Band-edge for RF Conducted Emissions

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 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

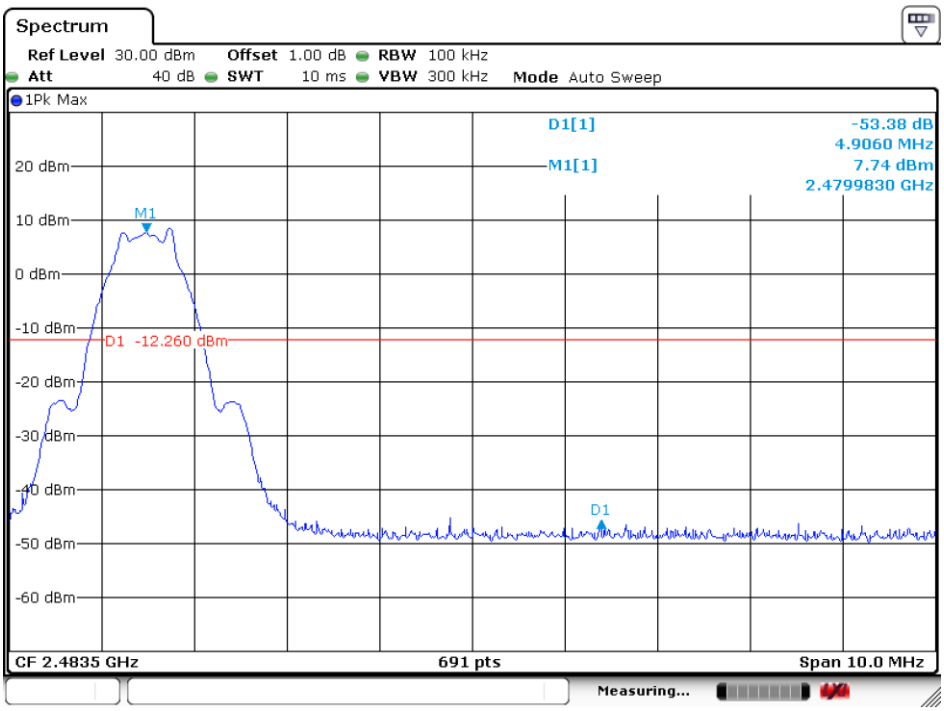
4.7.1 Test Plots

4.7.1.1 GFSK 1M_Lowest Channel



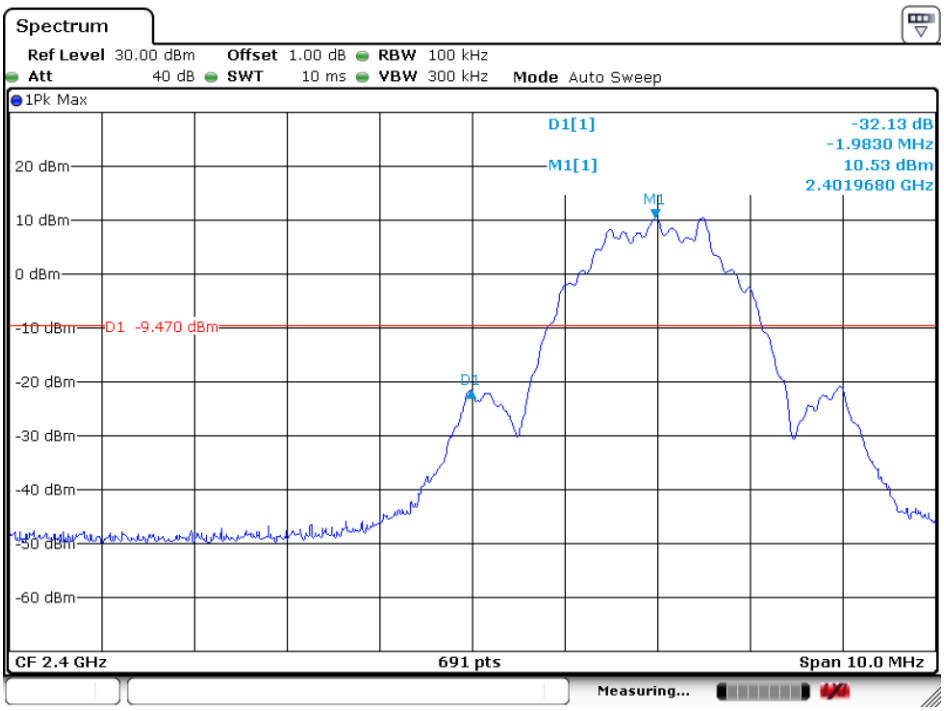
Date: 16.DEC.2020 10:31:18

4.7.1.2 GFSK 1M_Highest Channel



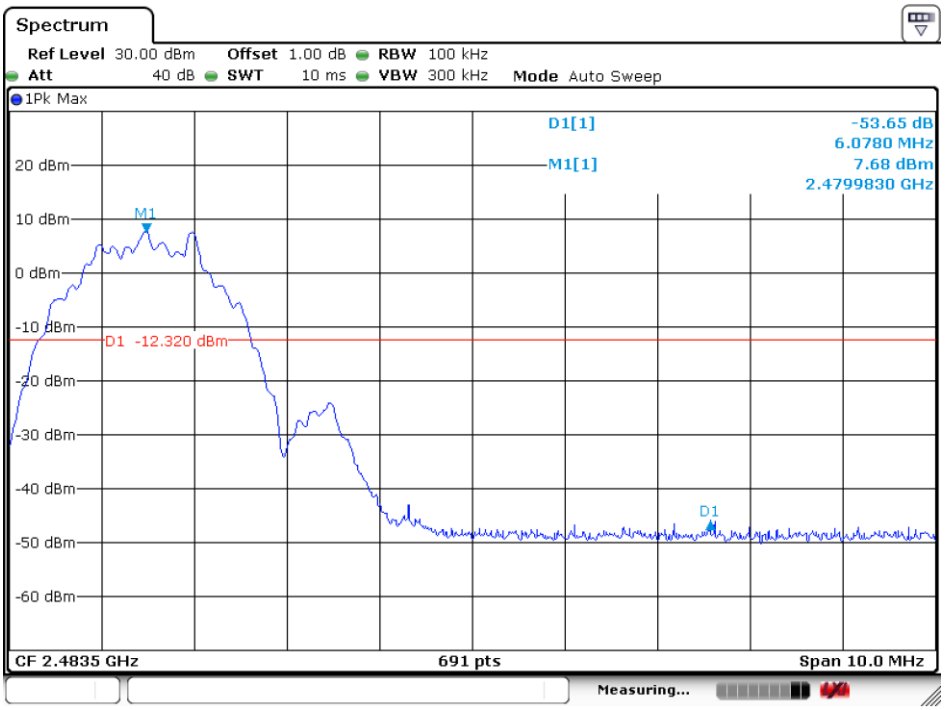
Date: 16.DEC.2020 10:44:32

4.7.1.3 GFSK 2M_Lowest Channel



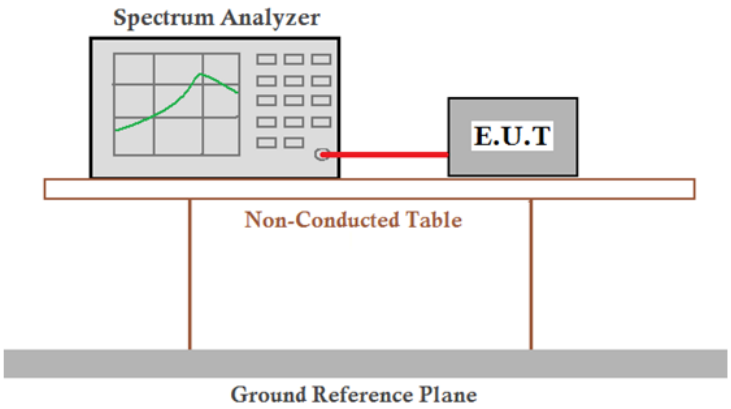
Date: 16.DEC.2020 10:56:20

4.7.1.4 GFSK 2M_Highest Channel



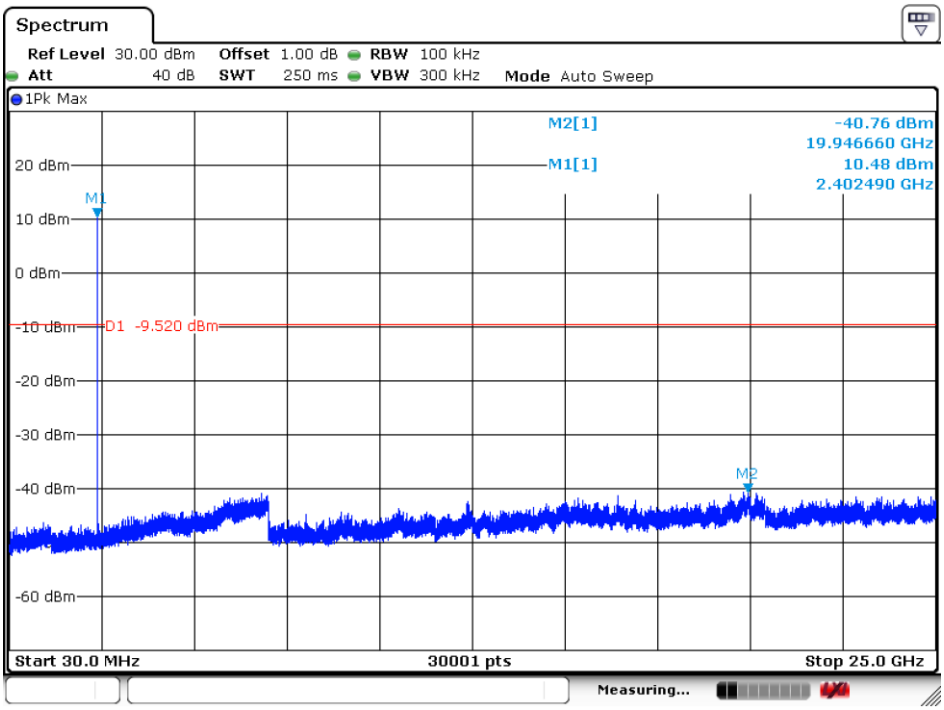
Date: 16.DEC.2020 11:00:20

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 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

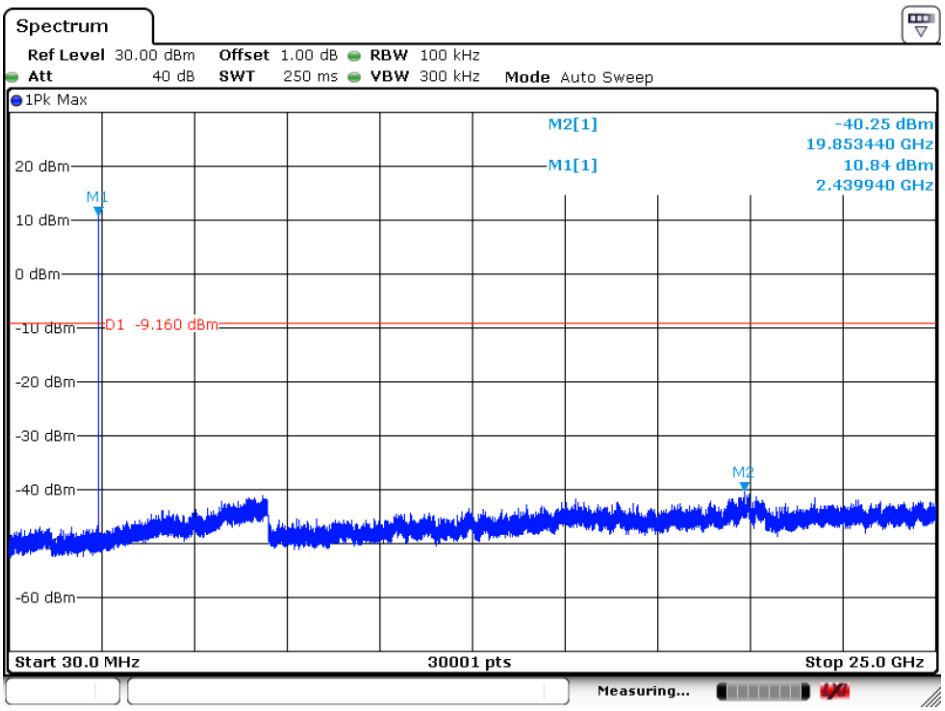
4.8.1 Test Plots

4.8.1.1 GFSK 1M_Lowest Channel



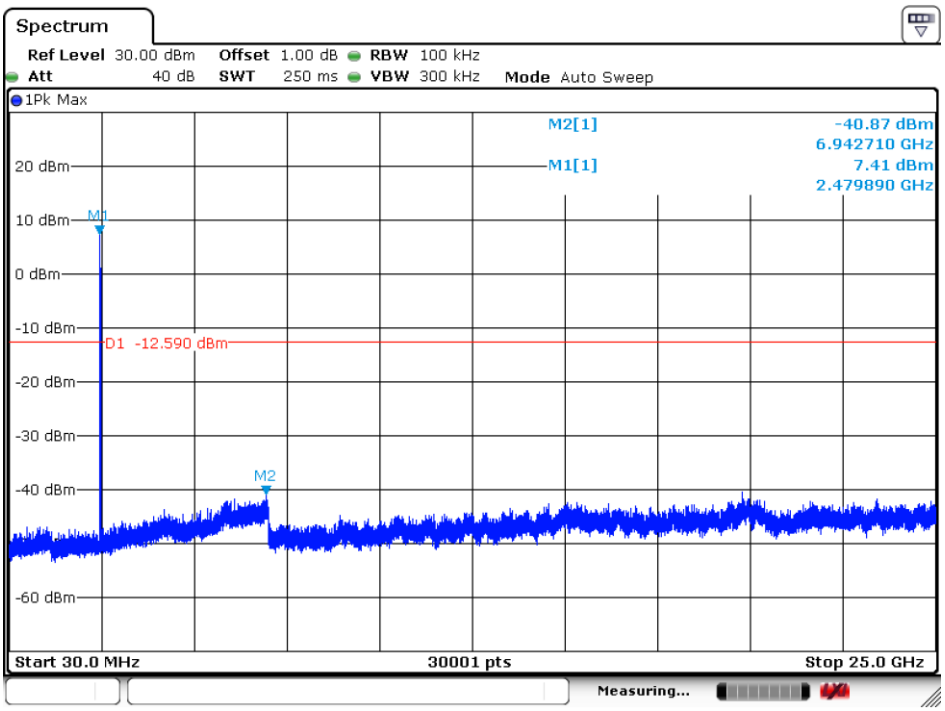
Date: 17.DEC.2020 11:48:54

4.8.1.2 GFSK 1M_Middle Channel



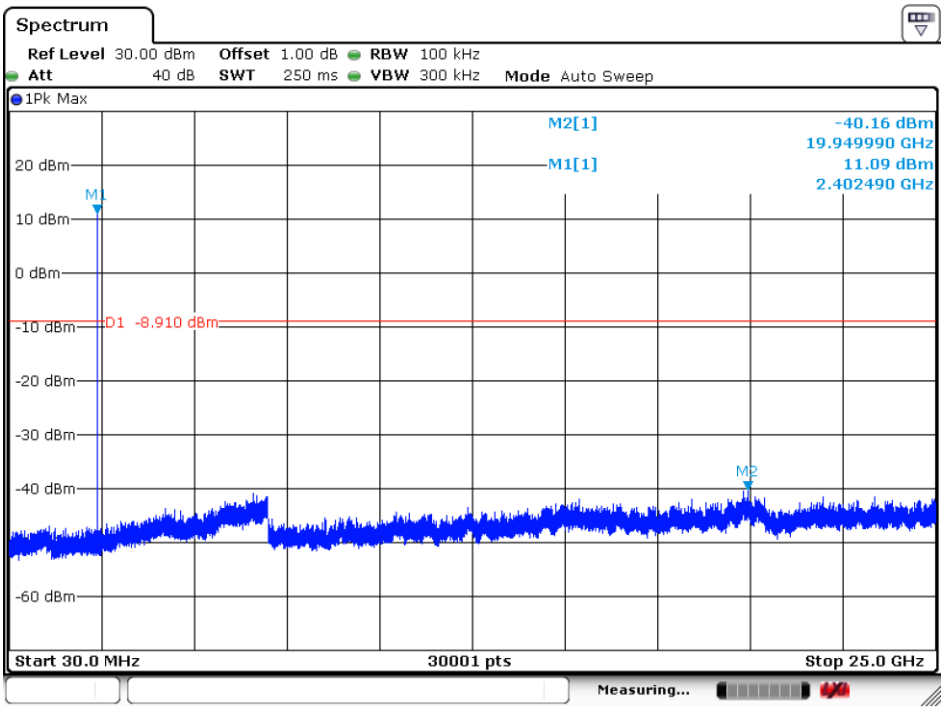
Date: 17.DEC.2020 11:50:31

4.8.1.3 GFSK 1M_Highest Channel



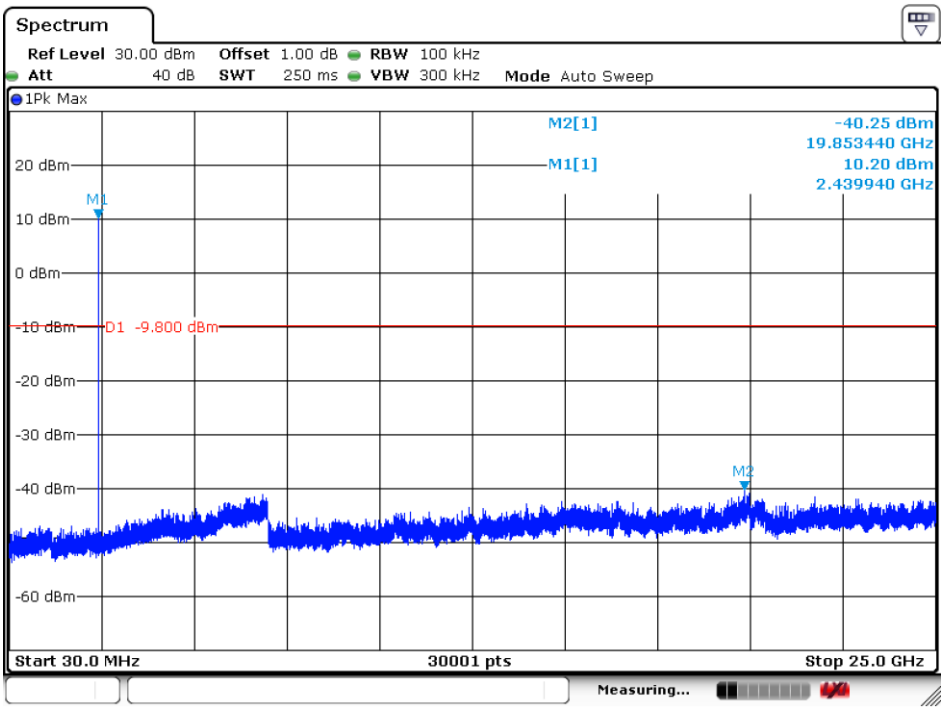
Date: 17.DEC.2020 11:51:11

4.8.1.4 GFSK 2M_Lowest Channel



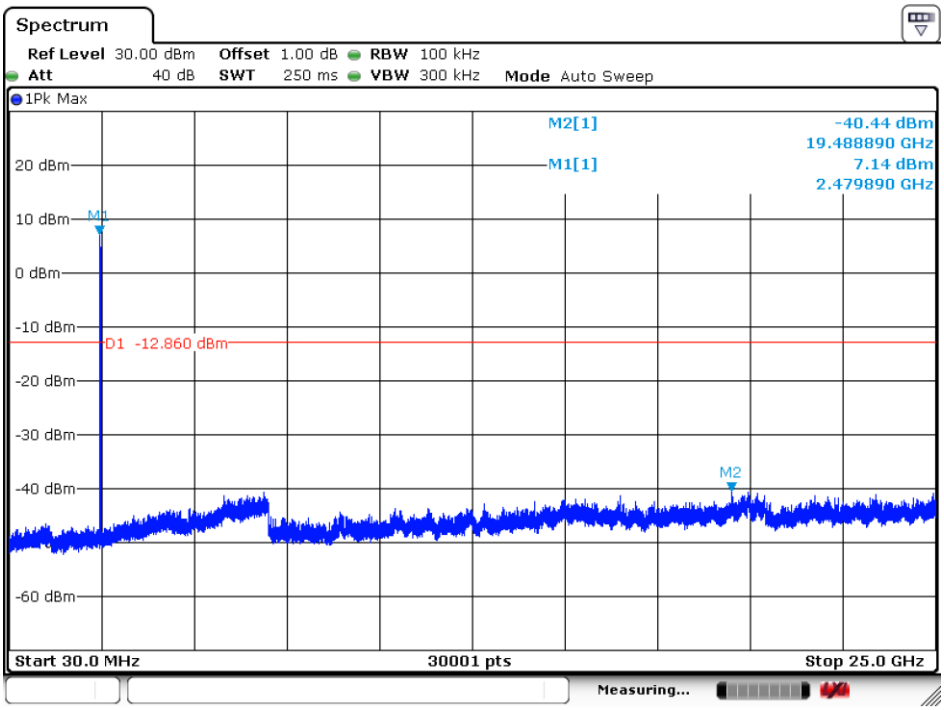
Date: 17.DEC.2020 11:49:32

4.8.1.5 GFSK 2M_Middle Channel



Date: 17.DEC.2020 11:50:13

4.8.1.6 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.

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	120kHz	300kHz	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.				

Test Setup:	

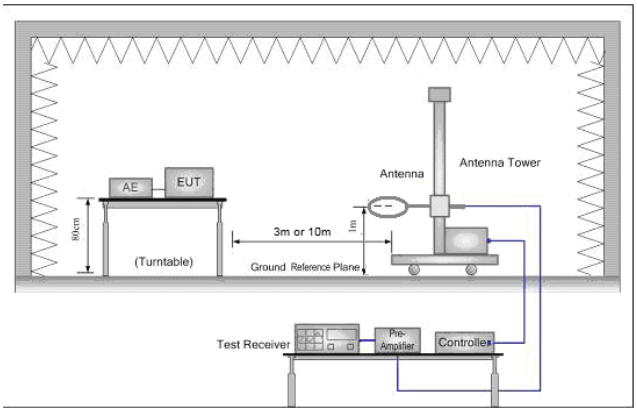


Figure 1. Below 30MHz

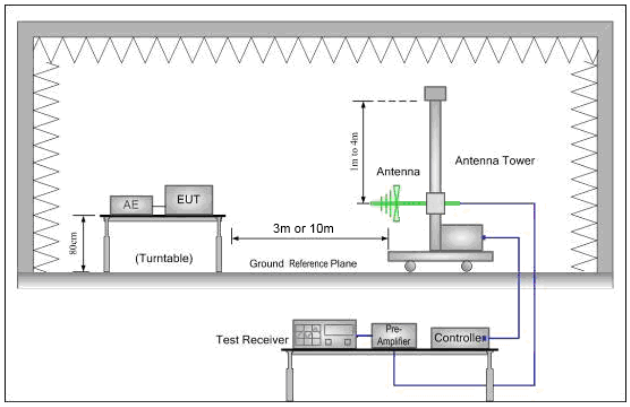


Figure 2. 30MHz to 1GHz

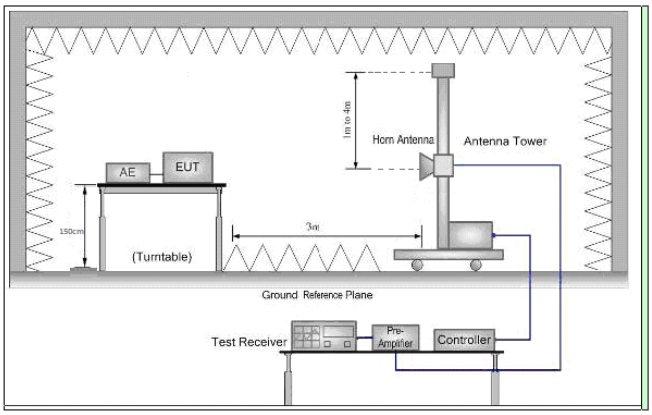
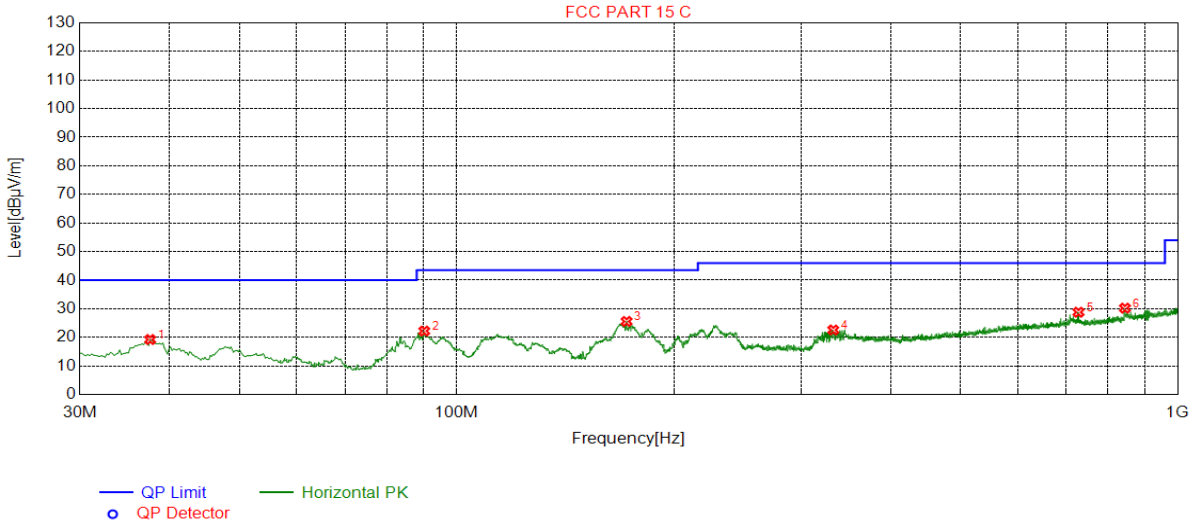


Figure 3. Above 1 GHz

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

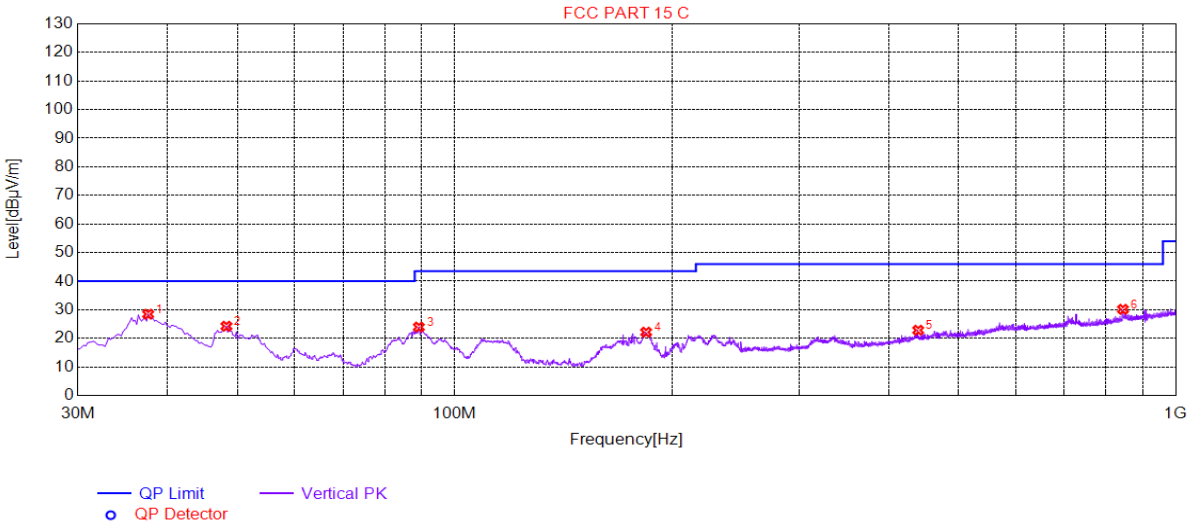
	Duty cycle = On time/100 milliseconds On time = N 1 *L 1 +N 2 *L 2 +...+N n-1 *LN n-1 +N n *L n Where N 1 is number of type 1 pulses, L 1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + 20*log(Duty cycle) f. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. h. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. i. Test the EUT in the lowest channel, the middle channel ,the Highest channel. j. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. k. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	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 6 for details
Test Results:	Pass

4.9.1 Transmitter Emission below 1GHz



Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	37.5675	48.40	-29.13	19.27	40.00	20.73	232	234	PK	Horizontal
2	90.1520	55.92	-33.69	22.23	43.50	21.27	177	262	PK	Horizontal
3	172.0364	59.49	-33.89	25.60	43.50	17.90	234	219	PK	Horizontal
4	332.8946	49.94	-27.33	22.61	46.00	23.39	206	84	PK	Horizontal
5	728.5397	47.65	-18.84	28.81	46.00	17.19	227	196	PK	Horizontal
6	844.9630	47.21	-16.97	30.24	46.00	15.76	128	132	PK	Horizontal



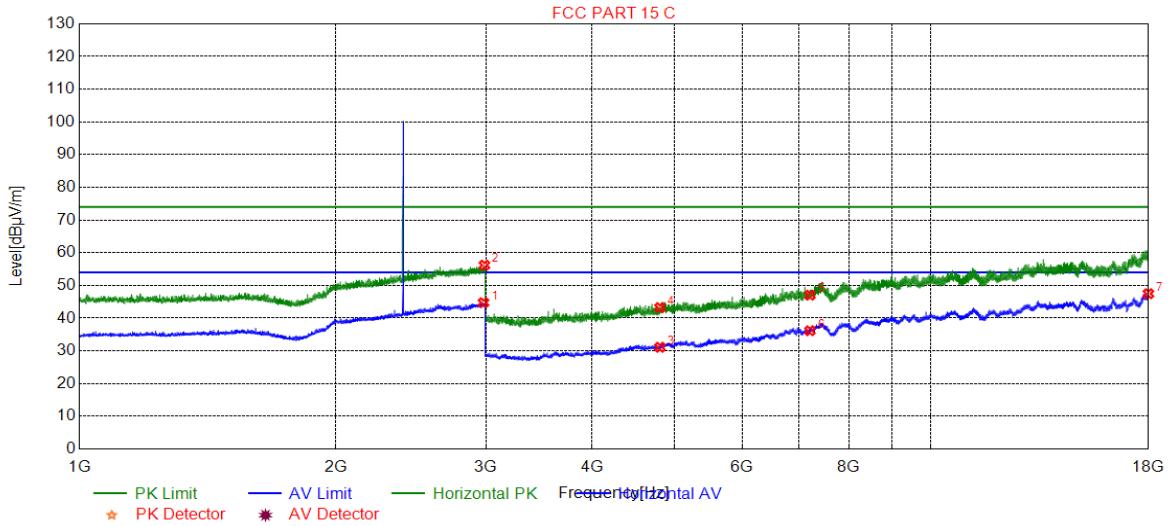
Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	37.5675	57.61	-29.13	28.48	40.00	11.52	273	14	PK	Vertical
2	48.2396	54.64	-30.38	24.26	40.00	15.74	297	350	PK	Vertical
3	89.1818	57.89	-33.91	23.98	43.50	19.52	187	100	PK	Vertical
4	184.2609	55.03	-32.85	22.18	43.50	21.32	189	25	PK	Vertical
5	439.4219	47.43	-24.56	22.87	46.00	23.13	201	298	PK	Vertical
6	844.9630	47.15	-16.97	30.18	46.00	15.82	288	110	PK	Vertical

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
Factor = Antenna Factor + Cable Factor + Preamplifier Factor

4.9.2 Transmitter Emission above 1GHz
4.9.3 BLE_1M_Channel 0

Test Graph

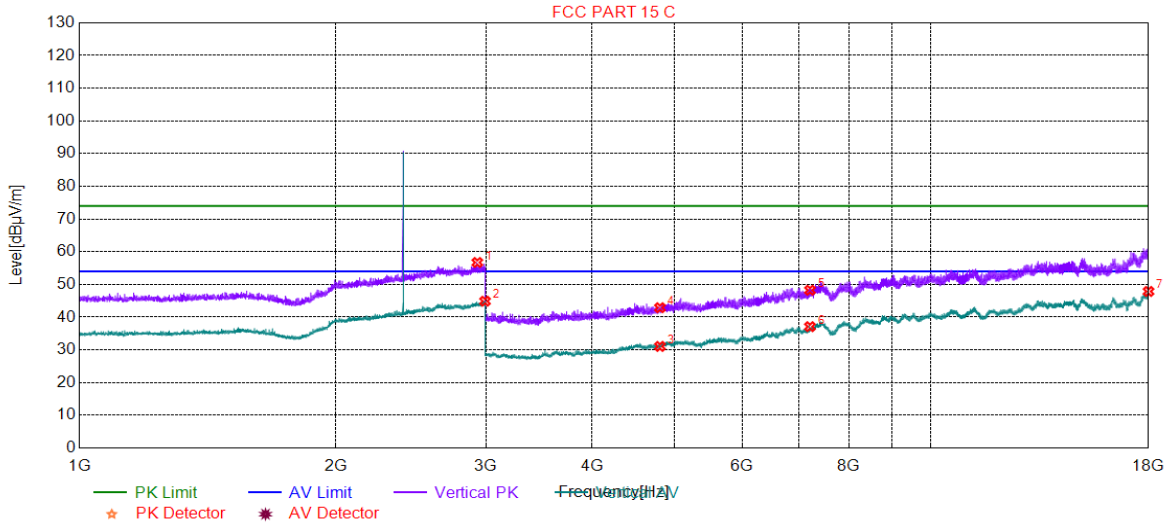


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2981.4954	34.12	10.62	44.74	54.00	9.26	246	123	AV	Horizontal
2	2988.4971	45.64	10.58	56.22	74.00	17.78	135	311	PK	Horizontal
3	4804.0000	48.29	-17.18	31.11	54.00	22.89	240	14	AV	Horizontal
4	4804.0000	60.44	-17.18	43.26	74.00	30.74	172	304	PK	Horizontal
5	7206.0000	56.53	-9.48	47.05	74.00	26.95	226	185	PK	Horizontal
6	7206.0000	45.65	-9.48	36.17	54.00	17.83	161	30	AV	Horizontal
7	17991.7496	44.72	2.77	47.49	54.00	6.51	216	322	AV	Horizontal

4.9.4 BLE_1M_Channel 0

Test Graph



Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2931.9830	46.05	10.68	56.73	74.00	17.27	264	253	PK	Vertical
2	2993.4984	34.23	10.66	44.89	54.00	9.11	177	154	AV	Vertical
3	4804.0000	48.25	-17.18	31.07	54.00	22.93	289	227	AV	Vertical
4	4804.0000	60.08	-17.18	42.90	74.00	31.10	235	193	PK	Vertical
5	7206.0000	57.73	-9.48	48.25	74.00	25.75	177	6	PK	Vertical
6	7206.0000	46.59	-9.48	37.11	54.00	16.89	239	346	AV	Vertical
7	17998.4999	45.07	2.81	47.88	54.00	6.12	246	176	AV	Vertical

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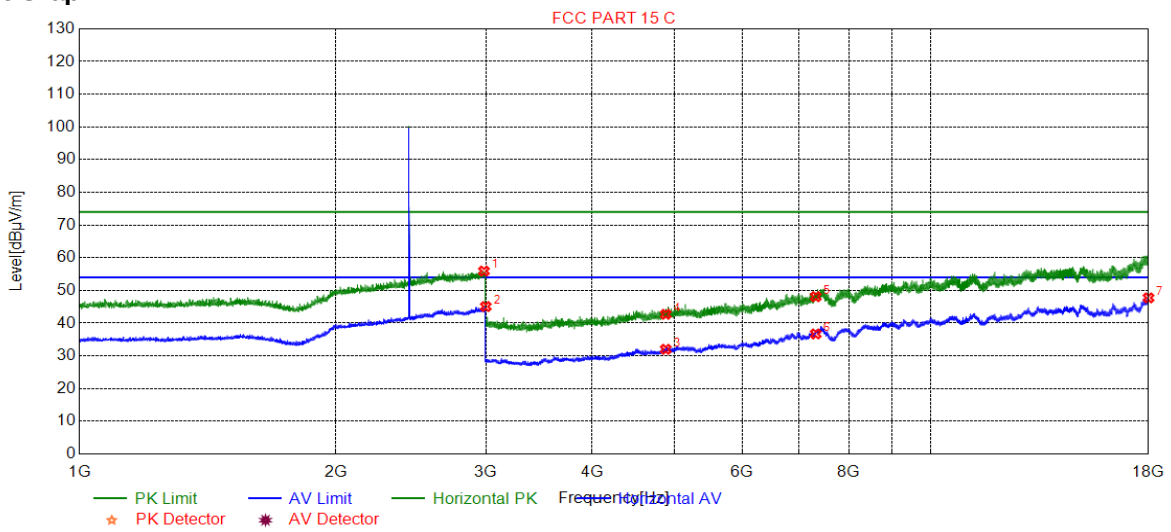
4.9.5 BLE_1M_Channel 19

Test Graph

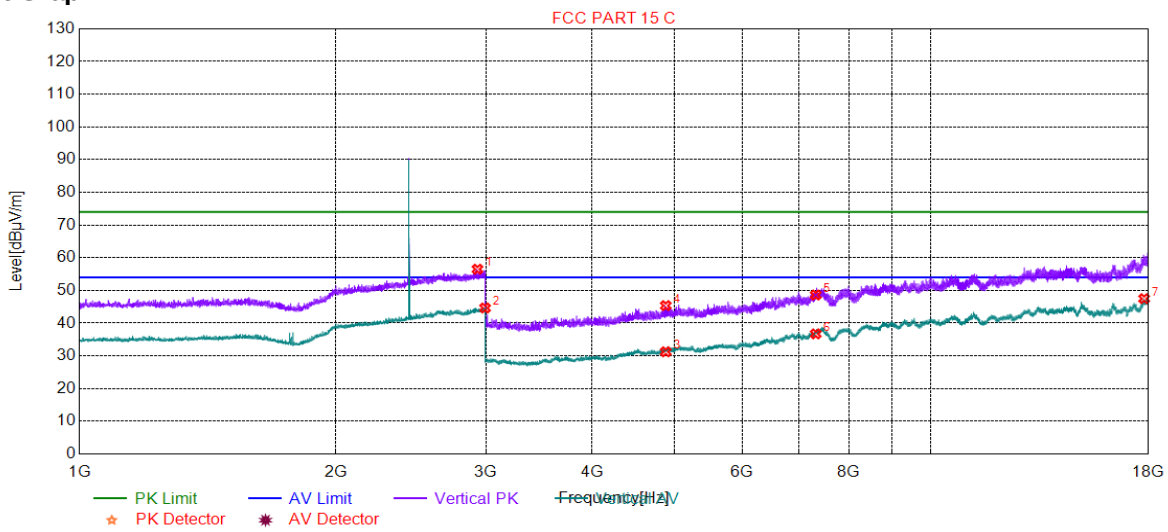


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2984.9962	45.33	10.60	55.93	74.00	18.07	123	201	PK	Horizontal
2	3000.0000	34.30	10.78	45.08	54.00	8.92	237	222	AV	Horizontal
3	4880.0000	48.83	-16.81	32.02	54.00	21.98	109	30	AV	Horizontal
4	4880.0000	59.53	-16.81	42.72	74.00	31.28	189	30	PK	Horizontal
5	7320.0000	57.39	-9.28	48.11	74.00	25.89	201	287	PK	Horizontal
6	7320.0000	45.99	-9.28	36.71	54.00	17.29	143	150	AV	Horizontal
7	17998.4999	44.93	2.81	47.74	54.00	6.26	181	304	AV	Horizontal

4.9.6 BLE_1M_Channel 19

Test Graph

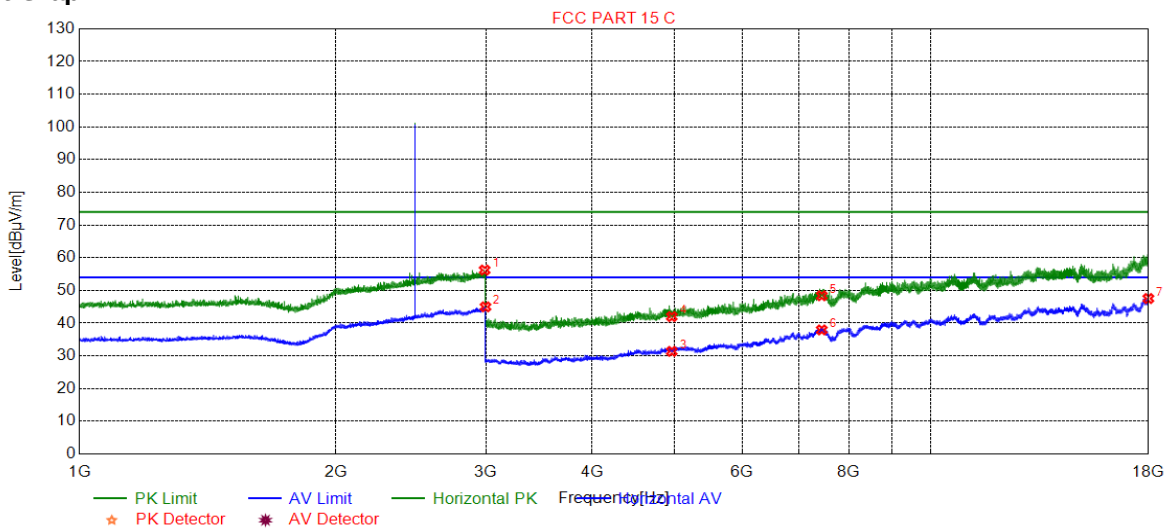


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2932.9832	45.85	10.66	56.51	74.00	17.49	151	9	PK	Vertical
2	2993.9985	33.98	10.67	44.65	54.00	9.35	164	206	AV	Vertical
3	4880.0000	48.07	-16.81	31.26	54.00	22.74	181	346	AV	Vertical
4	4880.0000	62.19	-16.81	45.38	74.00	28.62	228	227	PK	Vertical
5	7320.0000	57.90	-9.28	48.62	74.00	25.38	262	5	PK	Vertical
6	7320.0000	46.02	-9.28	36.74	54.00	17.26	274	244	AV	Vertical
7	17785.4893	45.05	2.45	47.50	54.00	6.50	179	312	AV	Vertical

4.9.7 BLE_1M_Channel 39

Test Graph

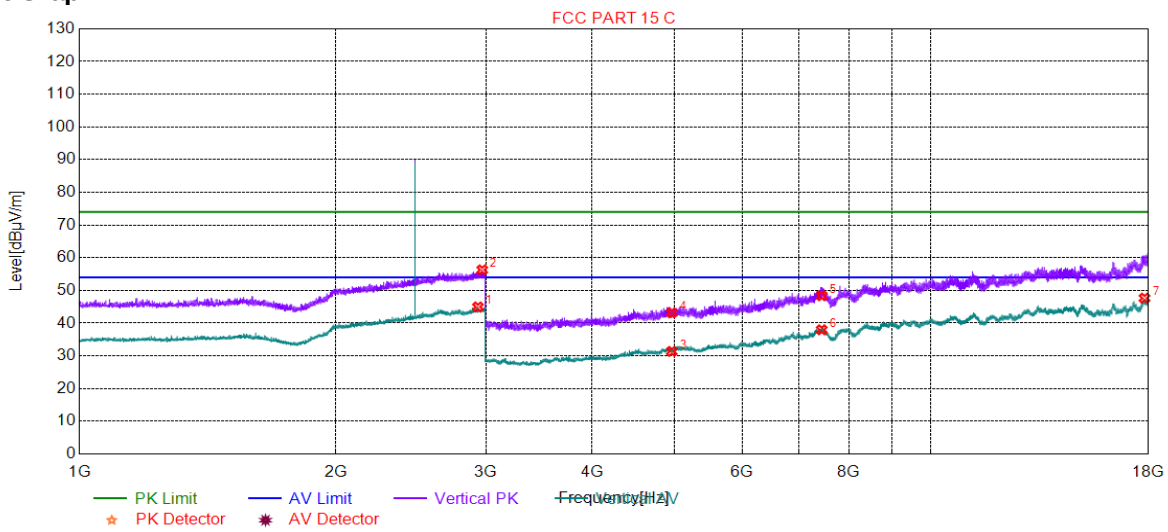


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2990.4976	45.66	10.58	56.24	74.00	17.76	244	159	PK	Horizontal
2	2997.4994	34.25	10.74	44.99	54.00	9.01	137	284	AV	Horizontal
3	4960.0000	47.66	-16.28	31.38	54.00	22.62	155	83	AV	Horizontal
4	4960.0000	58.29	-16.28	42.01	74.00	31.99	193	237	PK	Horizontal
5	7440.0000	57.22	-8.83	48.39	74.00	25.61	110	152	PK	Horizontal
6	7440.0000	46.77	-8.83	37.94	54.00	16.06	177	220	AV	Horizontal
7	17991.7496	44.77	2.77	47.54	54.00	6.46	118	237	AV	Horizontal

4.9.8 BLE_1M_Channel 39

Test Graph

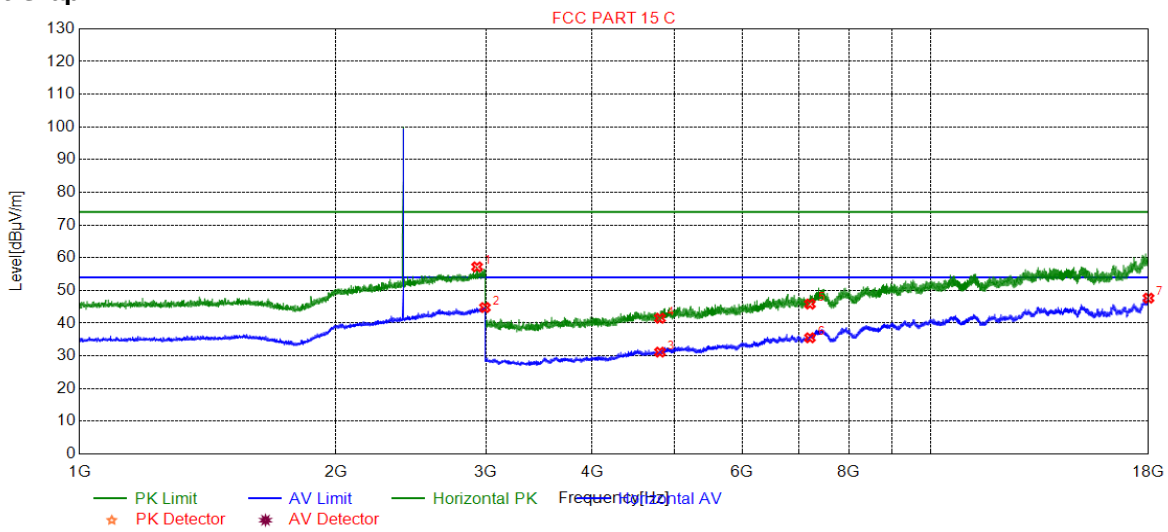


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2936.9842	34.41	10.57	44.98	54.00	9.02	154	294	AV	Vertical
2	2970.9927	45.68	10.63	56.31	74.00	17.69	271	336	PK	Vertical
3	4960.0000	47.66	-16.28	31.38	54.00	22.62	291	106	AV	Vertical
4	4960.0000	59.45	-16.28	43.17	74.00	30.83	206	312	PK	Vertical
5	7440.0000	57.22	-8.83	48.39	74.00	25.61	272	20	PK	Vertical
6	7440.0000	46.81	-8.83	37.98	54.00	16.02	276	20	AV	Vertical
7	17804.2402	45.22	2.43	47.65	54.00	6.35	181	106	AV	Vertical

4.9.9 BLE-2.0_Channel 0

Test Graph

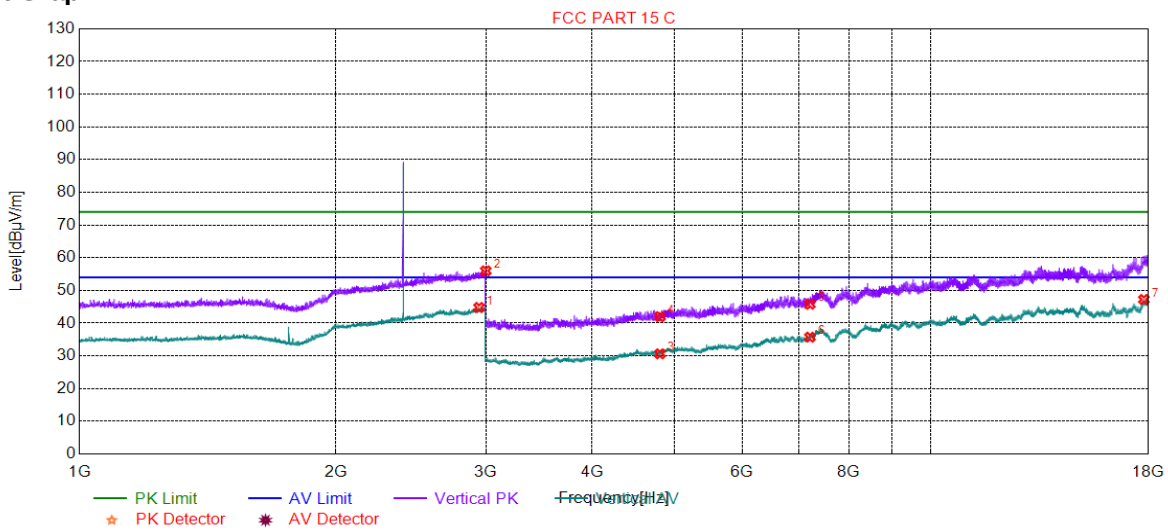


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2929.9825	46.50	10.72	57.22	74.00	16.78	237	175	PK	Horizontal
2	2992.9983	34.15	10.64	44.79	54.00	9.21	116	29	AV	Horizontal
3	4804.0000	48.34	-17.18	31.16	54.00	22.84	219	286	AV	Horizontal
4	4804.0000	58.70	-17.18	41.52	74.00	32.48	204	337	PK	Horizontal
5	7206.0000	55.33	-9.48	45.85	74.00	28.15	107	183	PK	Horizontal
6	7206.0000	45.02	-9.48	35.54	54.00	18.46	161	218	AV	Horizontal
7	17997.7499	44.85	2.81	47.66	54.00	6.34	147	183	AV	Horizontal

4.9.10 BLE-2.0_Channel 0

Test Graph

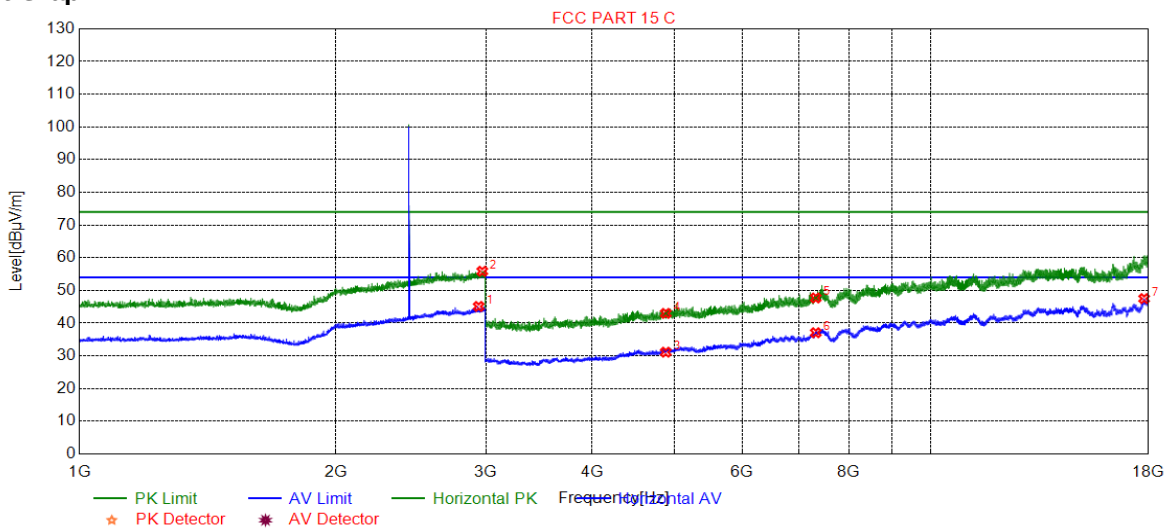


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2945.4864	34.17	10.64	44.81	54.00	9.19	268	253	AV	Vertical
2	2999.4999	45.24	10.77	56.01	74.00	17.99	282	13	PK	Vertical
3	4804.0000	47.82	-17.18	30.64	54.00	23.36	255	261	AV	Vertical
4	4804.0000	59.17	-17.18	41.99	74.00	32.01	179	109	PK	Vertical
5	7206.0000	55.28	-9.48	45.80	74.00	28.20	173	211	PK	Vertical
6	7206.0000	45.22	-9.48	35.74	54.00	18.26	170	329	AV	Vertical
7	17772.7386	44.79	2.46	47.25	54.00	6.75	282	92	AV	Vertical

4.9.11 BLE-2.0_Channel 19

Test Graph

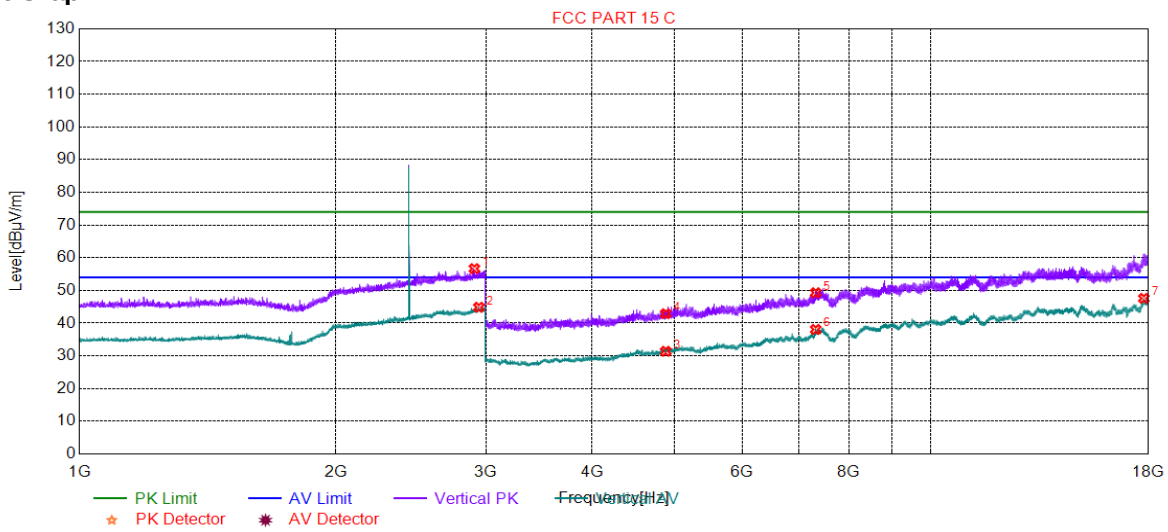


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2942.4856	34.55	10.57	45.12	54.00	8.88	117	239	AV	Horizontal
2	2971.4929	45.25	10.62	55.87	74.00	18.13	209	239	PK	Horizontal
3	4880.0000	47.95	-16.81	31.14	54.00	22.86	166	99	AV	Horizontal
4	4880.0000	59.81	-16.81	43.00	74.00	31.00	149	273	PK	Horizontal
5	7320.0000	57.00	-9.28	47.72	74.00	26.28	115	273	PK	Horizontal
6	7320.0000	46.37	-9.28	37.09	54.00	16.91	151	30	AV	Horizontal
7	17784.7392	45.06	2.45	47.51	54.00	6.49	159	82	AV	Horizontal

4.9.12 BLE-2.0_Channel 19

Test Graph

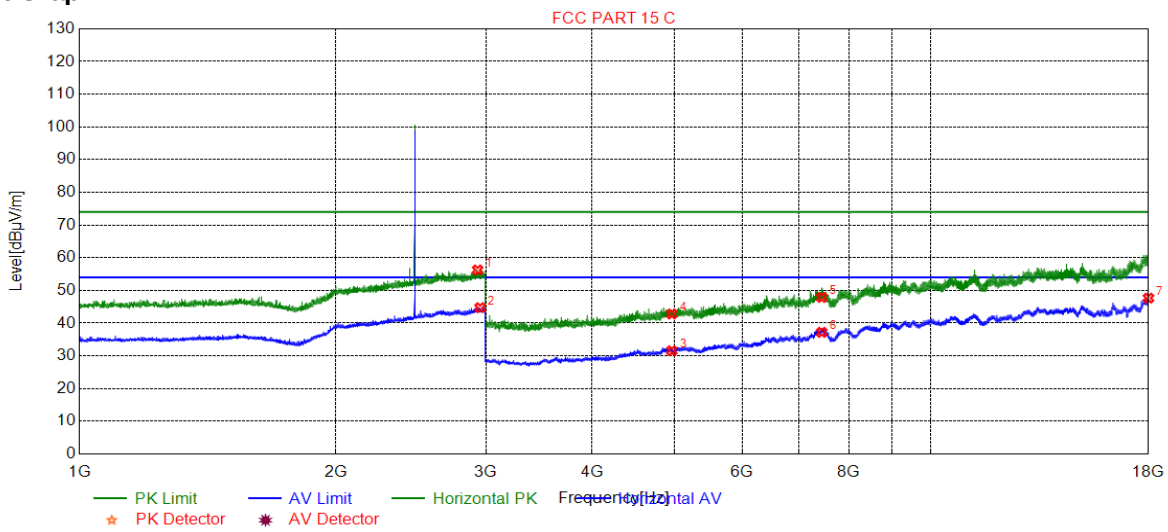


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2908.9772	46.18	10.50	56.68	74.00	17.32	151	294	PK	Vertical
2	2944.4861	34.24	10.63	44.87	54.00	9.13	192	127	AV	Vertical
3	4880.0000	48.22	-16.81	31.41	54.00	22.59	237	262	AV	Vertical
4	4880.0000	59.72	-16.81	42.91	74.00	31.09	205	228	PK	Vertical
5	7320.0000	58.60	-9.28	49.32	74.00	24.68	182	211	PK	Vertical
6	7320.0000	47.37	-9.28	38.09	54.00	15.91	205	8	AV	Vertical
7	17771.9886	45.13	2.46	47.59	54.00	6.41	244	211	AV	Vertical

4.9.13 BLE-2.0_Channel 39

Test Graph

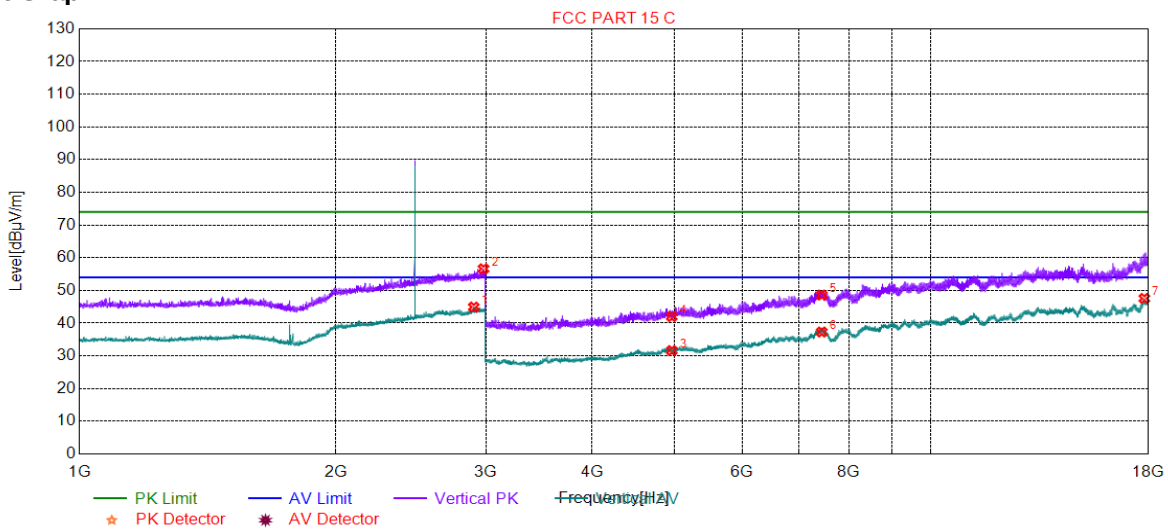


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2934.4836	45.65	10.63	56.28	74.00	17.72	111	50	PK	Horizontal
2	2954.4886	34.02	10.73	44.75	54.00	9.25	160	29	AV	Horizontal
3	4960.0000	47.85	-16.28	31.57	54.00	22.43	148	149	AV	Horizontal
4	4960.0000	59.09	-16.28	42.81	74.00	31.19	169	14	PK	Horizontal
5	7440.0000	56.72	-8.83	47.89	74.00	26.11	185	302	PK	Horizontal
6	7440.0000	46.04	-8.83	37.21	54.00	16.79	130	268	AV	Horizontal
7	17996.2498	44.88	2.80	47.68	54.00	6.32	214	234	AV	Horizontal

4.9.14 BLE-2.0_Channel 39

Test Graph



Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2903.9760	34.54	10.40	44.94	54.00	9.06	164	104	AV	Vertical
2	2981.4954	46.01	10.62	56.63	74.00	17.37	292	51	PK	Vertical
3	4960.0000	47.91	-16.28	31.63	54.00	22.37	272	296	AV	Vertical
4	4960.0000	58.31	-16.28	42.03	74.00	31.97	247	313	PK	Vertical
5	7440.0000	57.45	-8.83	48.62	74.00	25.38	183	296	PK	Vertical
6	7440.0000	46.13	-8.83	37.30	54.00	16.70	156	262	AV	Vertical
7	17796.7398	45.13	2.45	47.58	54.00	6.42	161	211	AV	Vertical

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor + Preamplifier Factor
Factor = Antenna Factor + Cable Factor + Preamplifier Factor
2) Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.
4) All Modes have been tested, but only the worst case data displayed in this report.

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:			

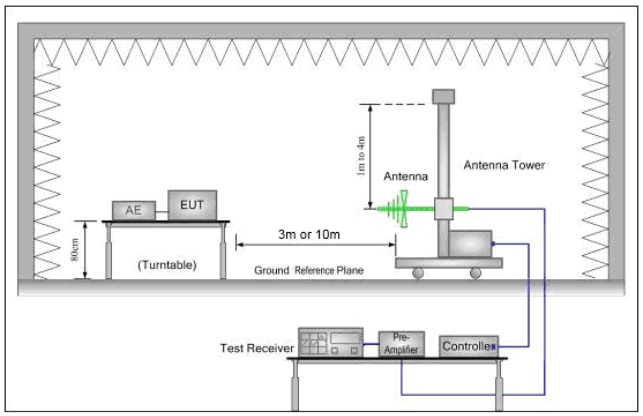


Figure 1. 30MHz to 1GHz

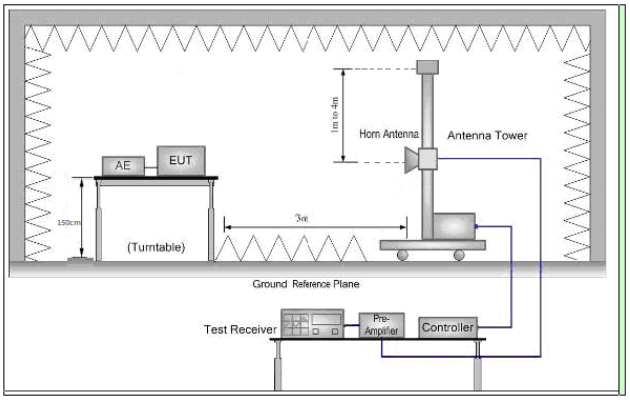


Figure 2. Above 1 GHz

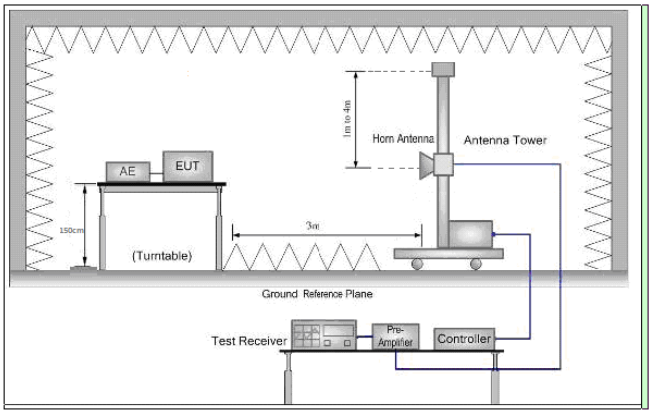
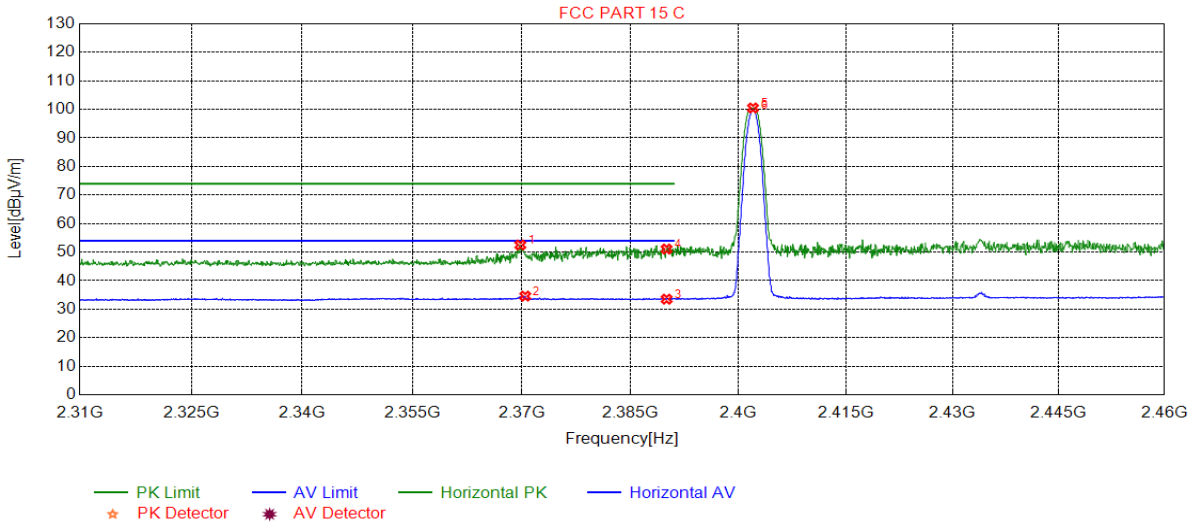


Figure 3. Above 1 GHz

Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was 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.
Test Configuration:	Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW ≥ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10 Hz, when duty cycle is no less than 98 percent. • VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
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 6 for details
Test Results:	Pass

4.10.1 Test plots
4.10.2 BLE_1M_Channel 0

Test Graph

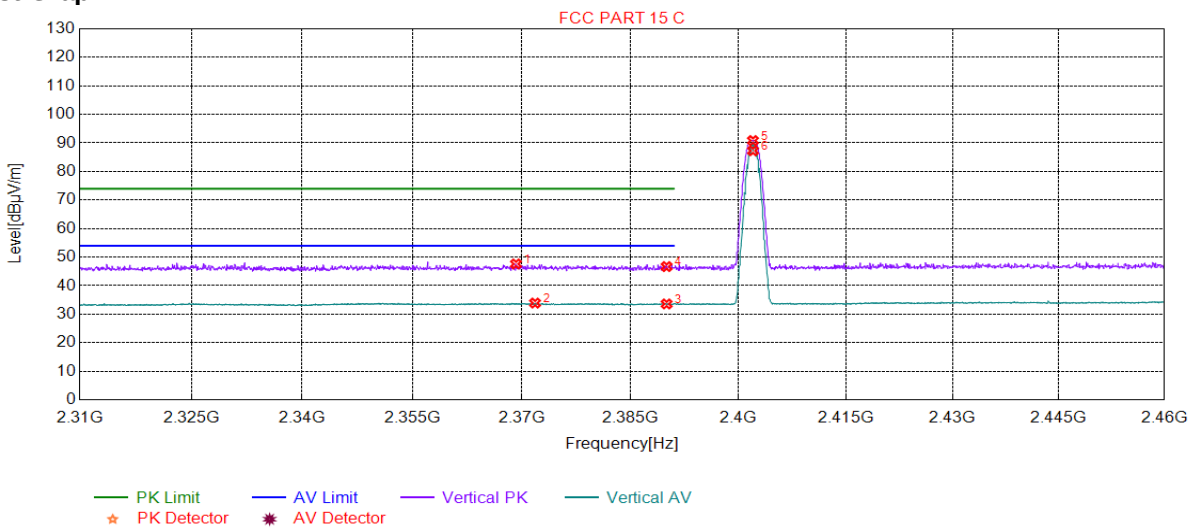


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2369.8049	44.43	8.09	52.52	74.00	21.48	124	293	PK	Horizontal
2	2370.4802	26.52	8.07	34.59	54.00	19.41	147	64	AV	Horizontal
3	2390.0000	25.55	7.98	33.53	54.00	20.47	160	235	AV	Horizontal
4	2390.0000	43.11	7.98	51.09	74.00	22.91	164	60	PK	Horizontal
5	2402.0000	92.45	8.06	100.51	0.00	-100.51	157	83	PK	Horizontal
6	2402.0000	91.69	8.06	99.75	0.00	-99.75	189	60	AV	Horizontal

4.10.3 BLE_1M_Channel 0

Test Graph

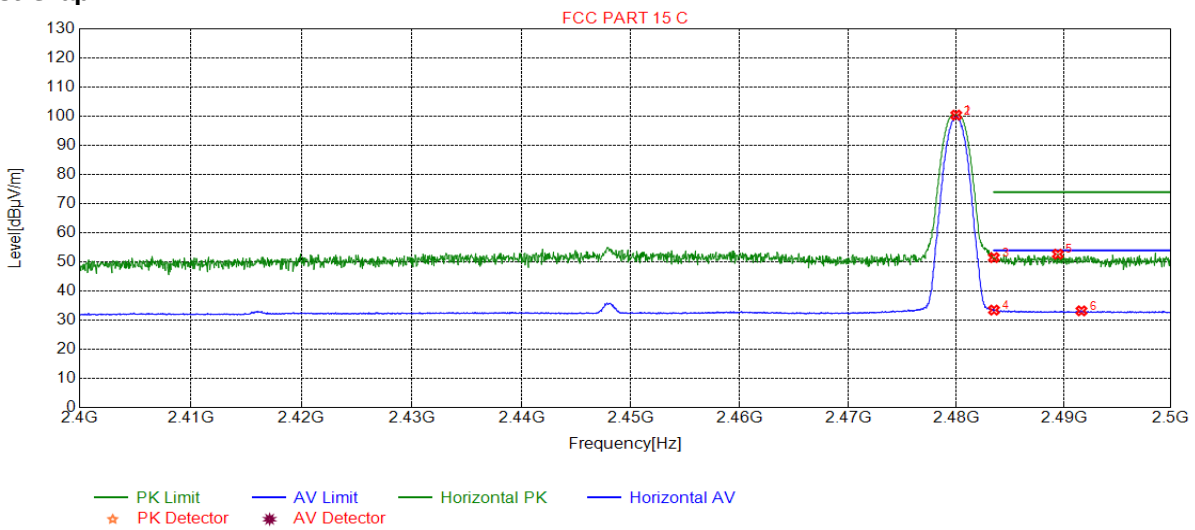


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2369.2046	39.54	8.08	47.62	74.00	26.38	151	204	PK	Vertical
2	2371.8309	25.87	8.04	33.91	54.00	20.09	195	273	AV	Vertical
3	2390.0000	25.63	7.98	33.61	54.00	20.39	211	288	AV	Vertical
4	2390.0000	38.72	7.98	46.70	74.00	27.30	151	280	PK	Vertical
5	2402.0000	82.78	8.06	90.84	0.00	-90.84	254	254	PK	Vertical
6	2402.0000	79.22	8.06	87.28	0.00	-87.28	271	269	AV	Vertical

4.10.4 BLE_1M_Channel 39

Test Graph



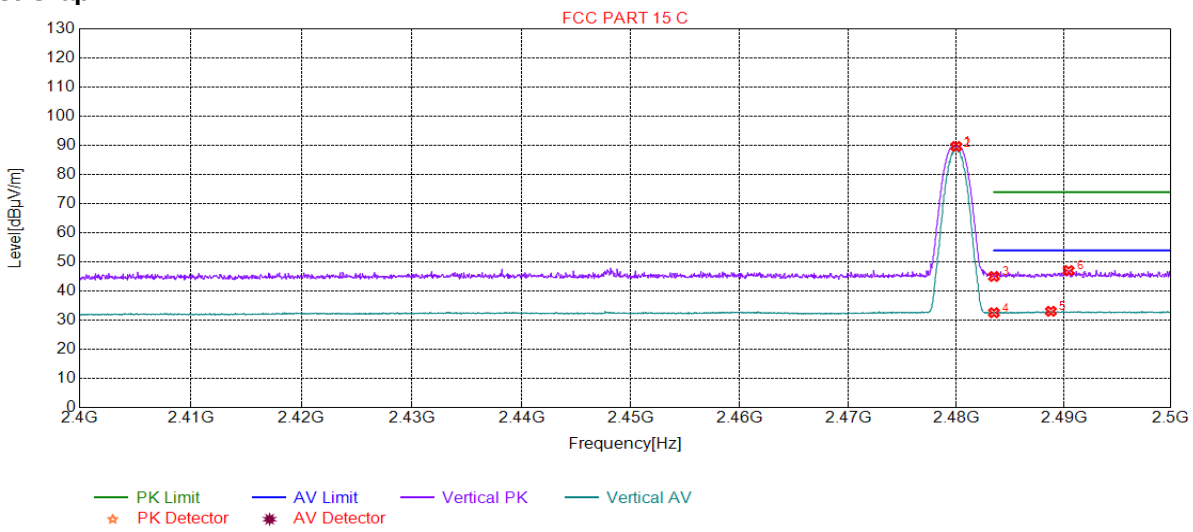
Suspected List

Suspected List

NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2480.0000	91.86	8.54	100.40	0.00	-100.40	248	58	PK	Horizontal
2	2480.0000	91.41	8.54	99.95	0.00	-99.95	170	65	AV	Horizontal
3	2483.5000	43.02	8.50	51.52	74.00	22.48	180	91	PK	Horizontal
4	2483.5000	25.01	8.50	33.51	54.00	20.49	139	73	AV	Horizontal
5	2489.4447	44.10	8.61	52.71	74.00	21.29	211	73	PK	Horizontal
6	2491.6458	24.64	8.61	33.25	54.00	20.75	203	293	AV	Horizontal

4.10.5 BLE_1M_Channel 39

Test Graph

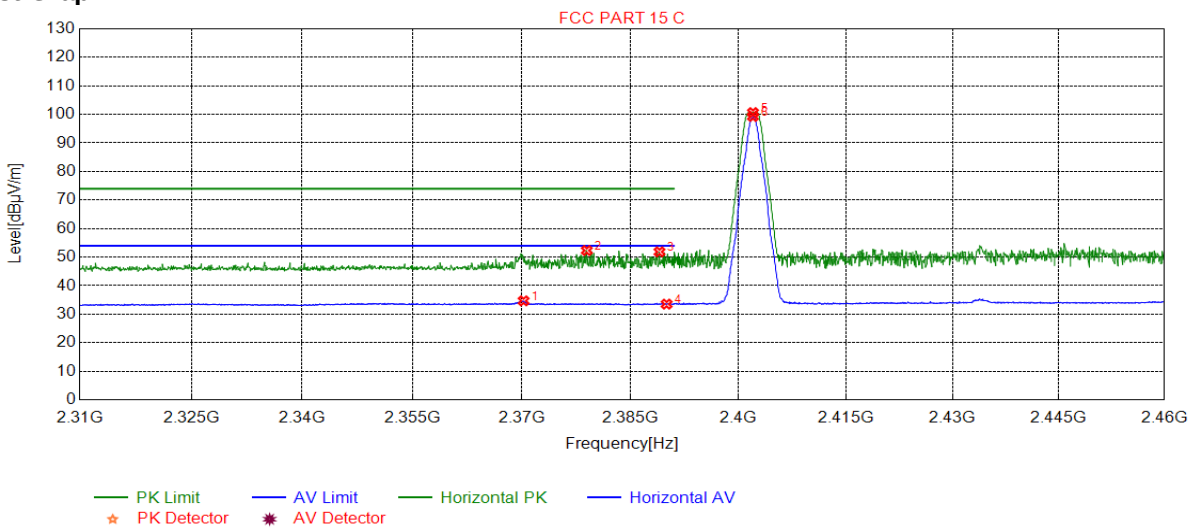


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2480.0000	81.10	8.54	89.64	0.00	-89.64	185	275	PK	Vertical
2	2480.0000	80.68	8.54	89.22	0.00	-89.22	179	275	AV	Vertical
3	2483.5000	36.54	8.50	45.04	74.00	28.96	281	210	PK	Vertical
4	2483.5000	24.11	8.50	32.61	54.00	21.39	278	301	AV	Vertical
5	2488.7944	24.51	8.59	33.10	54.00	20.90	231	256	AV	Vertical
6	2490.4452	38.45	8.62	47.07	74.00	26.93	167	59	PK	Vertical

4.10.6 BLE_2M_Channel 0

Test Graph

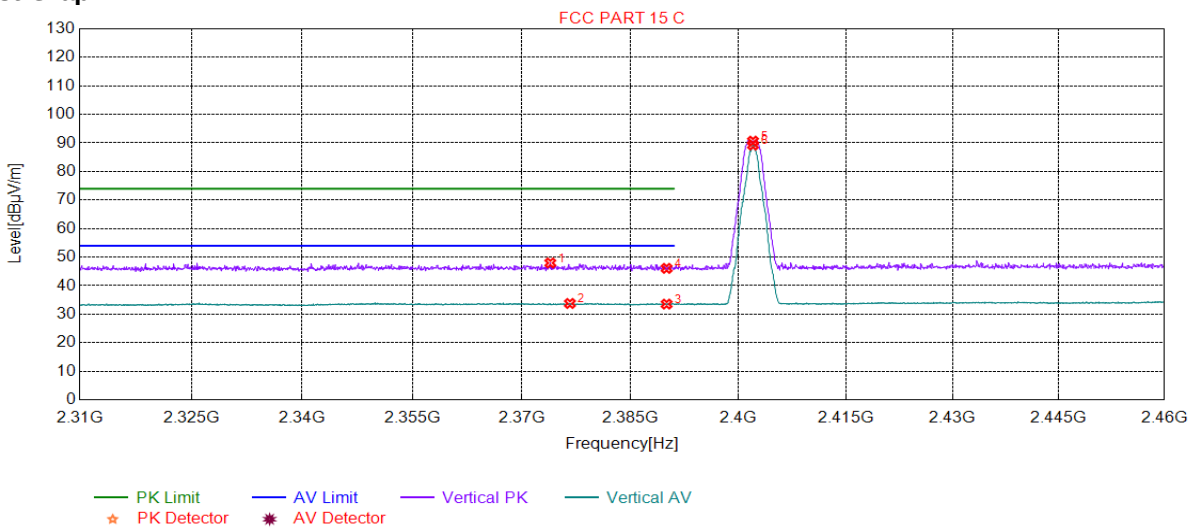


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2370.2551	26.61	8.08	34.69	54.00	19.31	103	72	AV	Horizontal
2	2378.9595	44.34	7.99	52.33	74.00	21.67	204	91	PK	Horizontal
3	2389.0145	43.91	7.95	51.86	74.00	22.14	213	95	PK	Horizontal
4	2390.0000	25.57	7.98	33.55	54.00	20.45	101	156	AV	Horizontal
5	2402.0000	92.58	8.06	100.64	0.00	-100.64	137	91	PK	Horizontal
6	2402.0000	91.23	8.06	99.29	0.00	-99.29	143	95	AV	Horizontal

4.10.7 BLE_2M_Channel 0

Test Graph

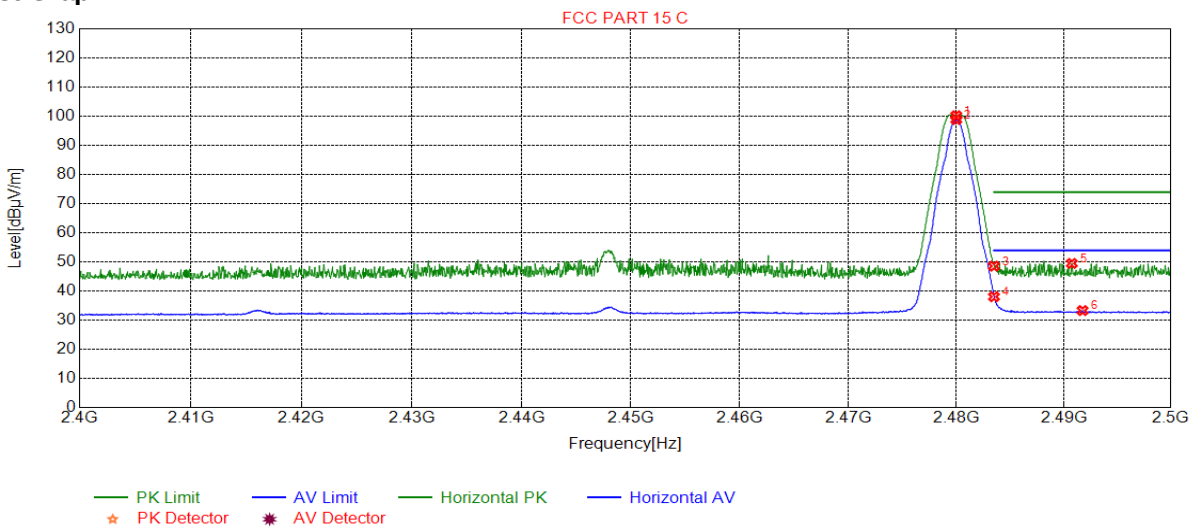


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2373.9320	39.99	7.97	47.96	74.00	26.04	265	52	PK	Vertical
2	2376.6333	25.82	7.96	33.78	54.00	20.22	213	346	AV	Vertical
3	2390.0000	25.58	7.98	33.56	54.00	20.44	157	36	AV	Vertical
4	2390.0000	38.09	7.98	46.07	74.00	27.93	254	316	PK	Vertical
5	2402.0000	82.58	8.06	90.64	0.00	-90.64	273	251	PK	Vertical
6	2402.0000	81.22	8.06	89.28	0.00	-89.28	259	255	AV	Vertical

4.10.8 BLE_2M_Channel 39

Test Graph

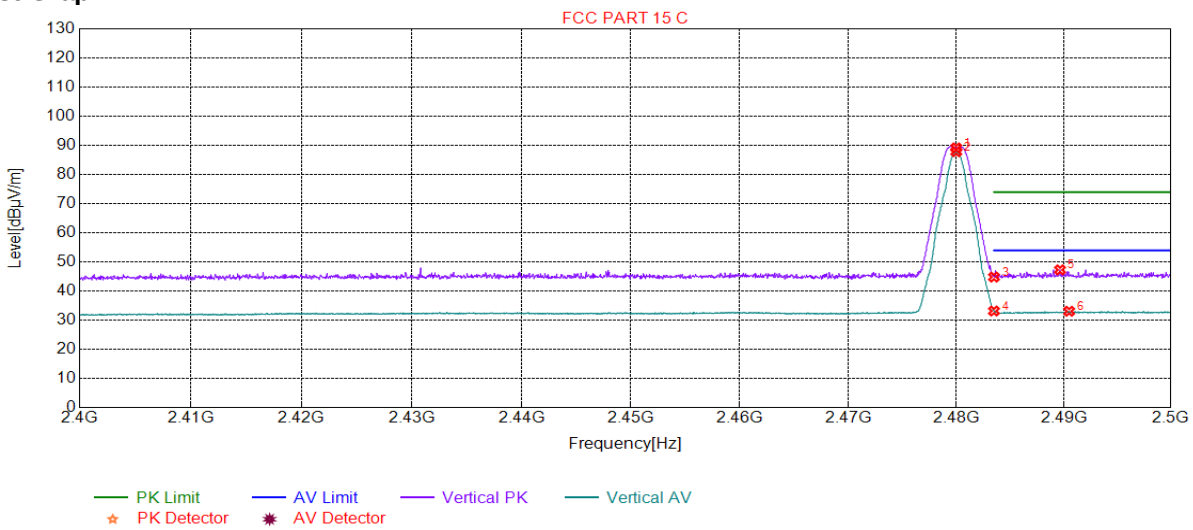


Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2480.0000	91.64	8.54	100.18	0.00	-100.18	163	324	PK	Horizontal
2	2480.0000	90.35	8.54	98.89	0.00	-98.89	120	324	AV	Horizontal
3	2483.5000	40.08	8.50	48.58	74.00	25.42	178	335	PK	Horizontal
4	2483.5000	29.59	8.50	38.09	54.00	15.91	169	300	AV	Horizontal
5	2490.7454	40.90	8.62	49.52	74.00	24.48	225	320	PK	Horizontal
6	2491.7459	24.74	8.61	33.35	54.00	20.65	130	71	AV	Horizontal

4.10.9 BLE_2M_Channel 39

Test Graph



Suspected List

Suspected List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity
1	2480.0000	80.61	8.54	89.15	0.00	-89.15	269	303	PK	Vertical
2	2480.0000	79.31	8.54	87.85	0.00	-87.85	175	303	AV	Vertical
3	2483.5000	36.34	8.50	44.84	74.00	29.16	222	303	PK	Vertical
4	2483.5000	24.70	8.50	33.20	54.00	20.80	270	307	AV	Vertical
5	2489.6448	38.71	8.61	47.32	74.00	26.68	227	197	PK	Vertical
6	2490.4952	24.50	8.62	33.12	54.00	20.88	252	334	AV	Vertical

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
Factor = Antenna Factor + Cable Factor + Preamplifier Factor
All Modes have been tested, but only the worst case data displayed in this report.

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
4	Temperature test	±1°C
5	Humidity test	±3%
6	DC and low frequency voltages	±0.5%

Lab B:

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)

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	XAW01-08-05	2020-04-12	2021-04-11
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR

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 HR/2020/C0004.

The End

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