

Report No.: XEWM2305000230RG02

Rev.: 01

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TEST REPORT

Application No.: XEWM2305000230RG

Applicant: Quectel Wireless Solutions Co., Ltd.

Address of Applicant: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

Manufacturer: Quectel Wireless Solutions Co., Ltd.

Address of Manufacturer: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

EUT Description: Wi-Fi & Bluetooth Module

Model No.: FLM140D

Trade Mark: Quectel

FCC ID: XMR2023FLM140D

Standards: FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C

Date of Receipt: 2023/05/16

Date of Test: 2023/05/20 to 2023/06/12

Date of Issue: 2023/06/26

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:



Peter Tan
Regulatory Technical Manager



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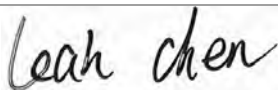
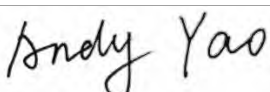
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/06/26		Original

Prepared By	 (Leah Chen) / Test Engineer
Checked By	 (Andy Yao) / Reviewer



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2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result
Antenna Requirement	15.203/15.247(b)	--	Clause 4.1	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10-2020 Section 6.2	Clause 4.2	PASS
Duty Cycle	--	--	Clause 4.3	For Report Purpose
Conducted Output Power	15.247 (b)(3)	ANSI C63.10-2020 Section 11.9.1.2	Clause 4.4	PASS
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10-2020 Section 11.8 Option 2 / 6.9.3	Clause 4.5	PASS
Power Spectral Density	15.247 (e)	ANSI C63.10-2020 Section 11.10.2	Clause 4.6	PASS
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10-2020 Section 11.11	Clause 4.7	PASS
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10-2020 Section 11.11	Clause 4.8	PASS
Radiated Spurious Emissions	15.247(d);15.205/15.209	ANSI C63.10-2020 Section 11.12	Clause 4.9	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d);15.205/15.209	ANSI C63.10-2020 Section 11.12	Clause 4.10	PASS



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3 General Information

3.1 Details of Client

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Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Address:	1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Qiang Zhang, Ken Liu

3.3 Test Facility

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

• **A2LA (Certificate No. 4854.01)**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4854.01.

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

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

CAB identifier: CN0095.

IC#: 25613.

• **FCC –Designation Number: CN1337**

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

Designation Number: CN1337.

Test Firm Registration Number: 917410



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3.4 General Description of EUT

EUT Description:	Wi-Fi & Bluetooth Module		
Model No.:	FLM140D		
Trade Mark:	Quectel		
Hardware Version:	R1.0		
Software Version:	FLM140DAAR01A01		
SN:	RF Conducted	E1823C139000005	
	RSE & AC power line	E1823EC5A000001	
Operation Frequency:	802.11b/g/n(HT20):		2412MHz to 2462MHz
Modulation Type:	802.11b:	DSSS (DBPSK, DQPSK, CCK)	
	802.11g/n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)	
Number of Channels:	802.11b/g/n(HT20): 11		
Channel Spacing:	5MHz		
Smart System:	☒ SISO	802.11b/g/n	
	☐ MIMO	CDD: 802.11b/g/n/VHT/ax: Tx & Rx	
		STBC: 802.11n/VHT/ax: Tx & Rx	
		TXBF: 802.11n/VHT/ax: Tx & Rx	
	☐ Diversity	802.11b/g : Tx & Rx	
Antenna Type:	PCB Antenna		
Antenna Gain:	-1.85dBi(Ant0);		
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.		
RF Cable:	1.2dB		
Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.			



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Operation Frequency of each channel (802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		
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 for 802.11 b/g/n (HT20)					
The Lowest channel		2412MHz					
The Middle channel		2437MHz					
The Highest channel		2462MHz					



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3.5 Test Environment and Mode

Environment Parameter	96~101 kPa Selected Values During Tests	
Relative Humidity	40-60 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~25	3.3
Remark: NV: Normal Voltage NT: Normal Temperature		

3.6 Description of Support Units

Description	Manufacturer	Model No.
Mother board	QUECTEL	FLM140D-TE-B
Remark: all above the information of table are provided by client.		

3.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

Modulation Type	SISO - Data Rate	MIMO - Data Rate
802.11b	1 Mbps	/
802.11g	6 Mbps	/
802.11n (HT 20)	MCS0 (6.5 Mbps)	/



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4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(b)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The antenna is PCB Antenna and no consideration of replacement. The best case gain of the antenna is -1.85dBi(Ant0).* <i>*Note:</i> <i>The antenna gain are derived from the gain information report provided by the manufacturer.</i> <i>Remark:</i> <i>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</i>	



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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10-2020 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	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. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10-2020 on conducted measurement.		



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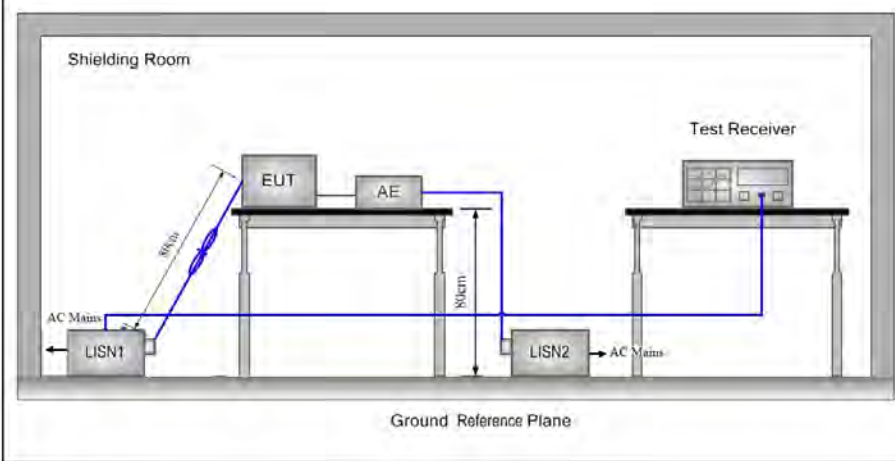
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Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass

Report No.: XEWM2305000230RG02

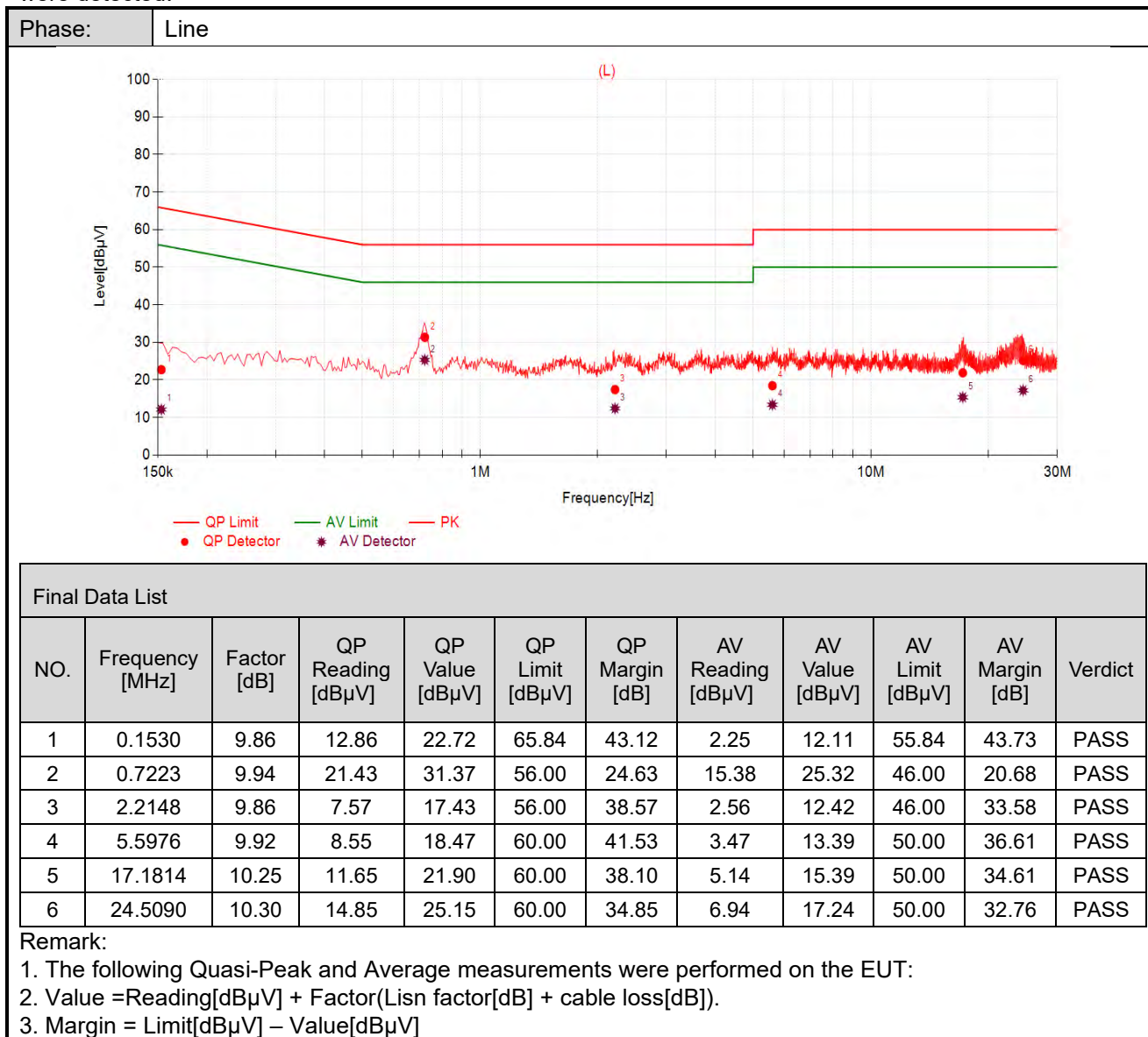
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Measurement Data

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

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



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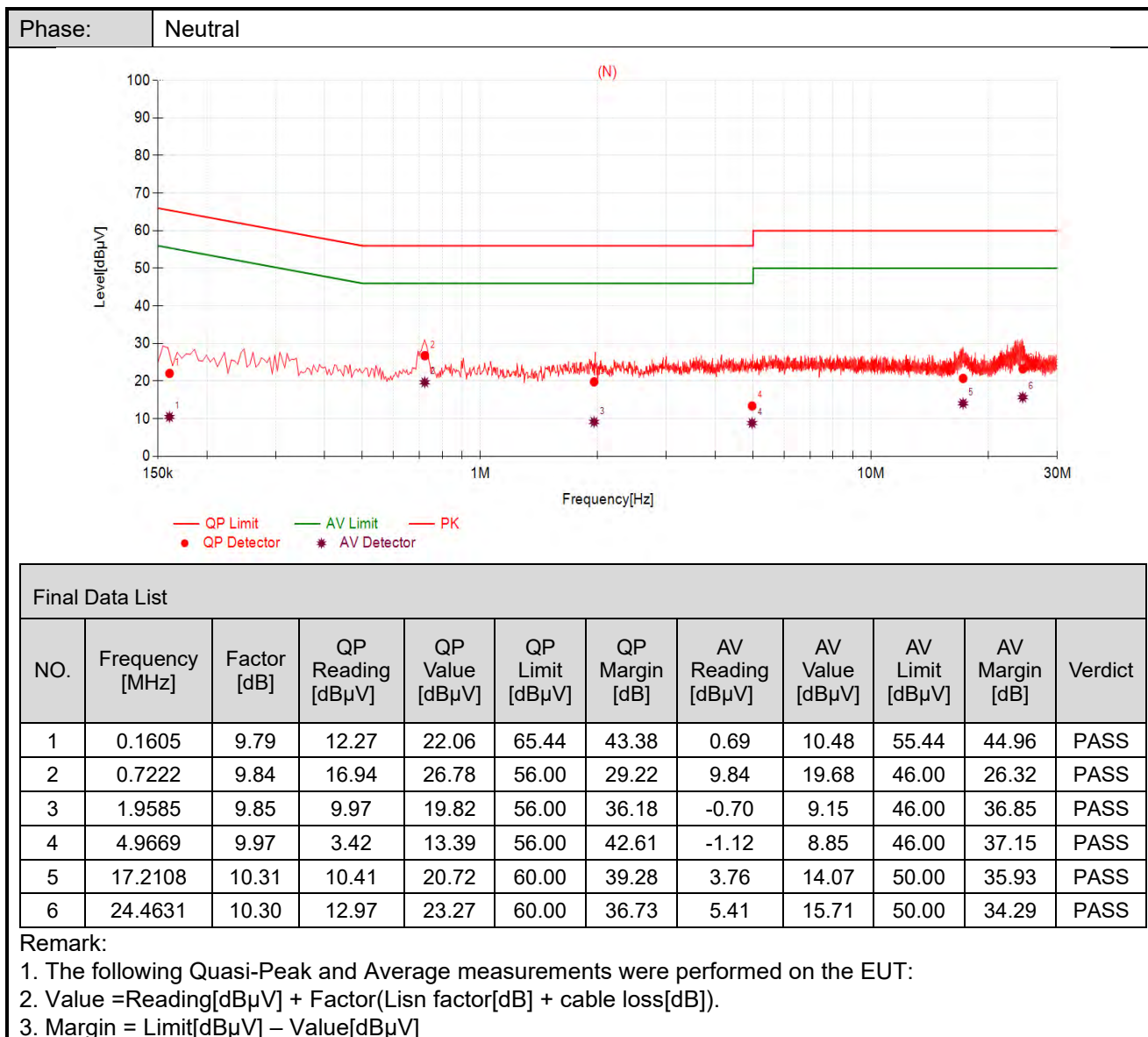
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4.3 Duty Cycle

The detailed test data see: **Appendix**



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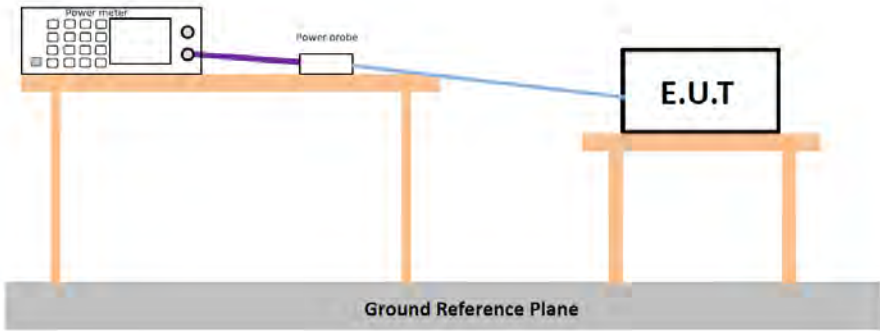
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4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10-2020 Section 11.9.1.2
Test Setup:	 * Test with power meter (Detector function: Peak)
Test Instruments:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	30dBm
Test Results:	Pass
The detailed test data see: Appendix	

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

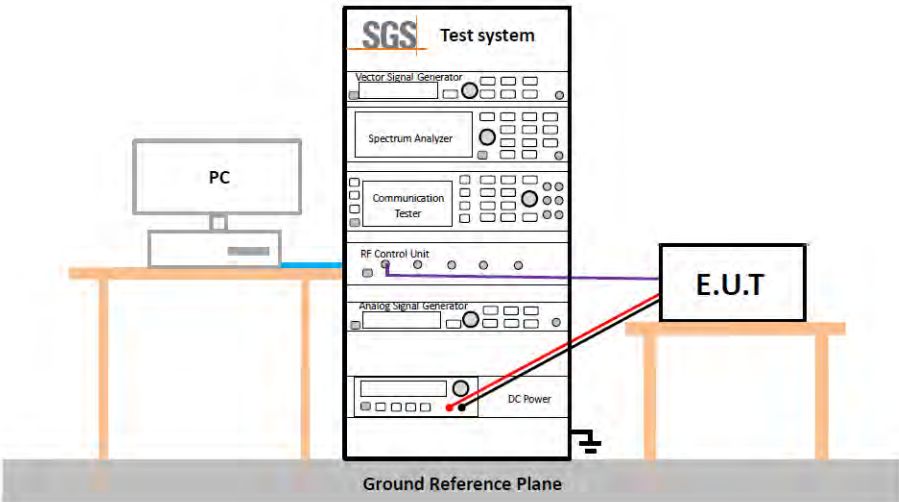
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10-2020 Section 11.8 Option 2 / 6.9.3
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	≥ 500 kHz
Test Results:	Pass
The detailed test data see: Appendix	

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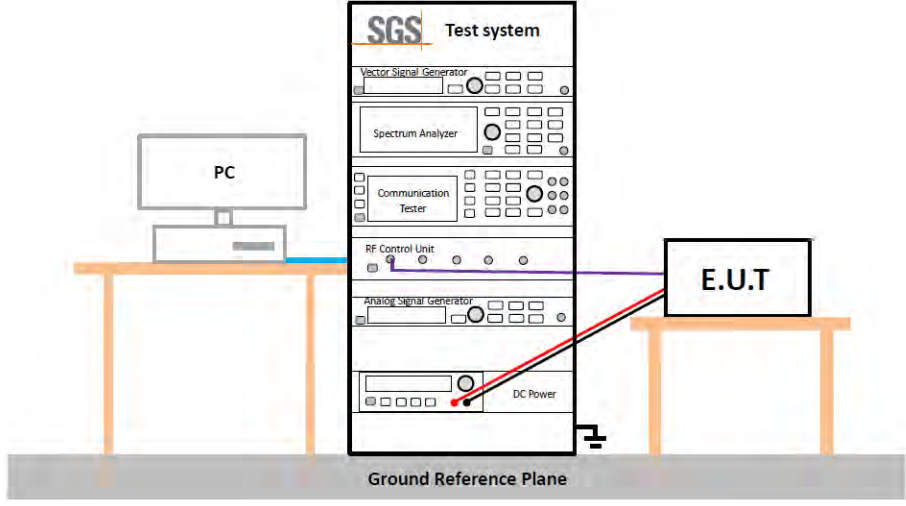
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4.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10-2020 Section 11.10.2
Test Setup:	
Test Instruments:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	$\leq 8.00\text{dBm}/3\text{kHz}$
Test Results:	Pass
The detailed test data see: Appendix	

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4.7 Band-edge for RF Conducted Emissions

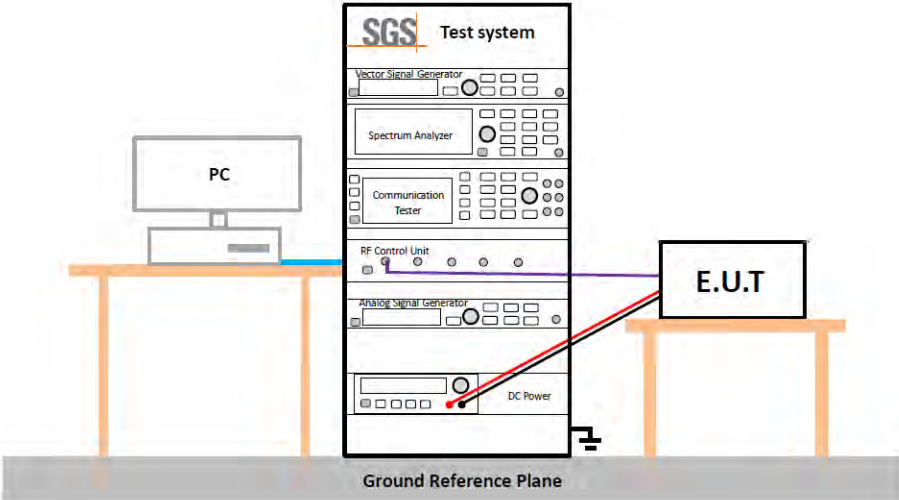
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass
The detailed test data see: Appendix	

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4.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass
The detailed test data see: Appendix	

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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Test Frequency:	9kHz ~ 25GHz				
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
Limit:	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	3MHz	Peak
	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:

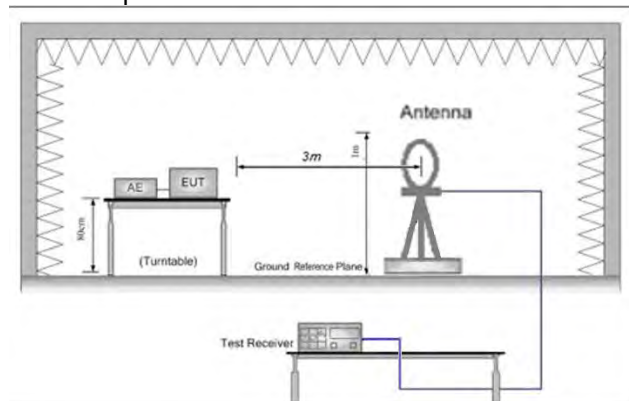


Figure 1. Below 30MHz

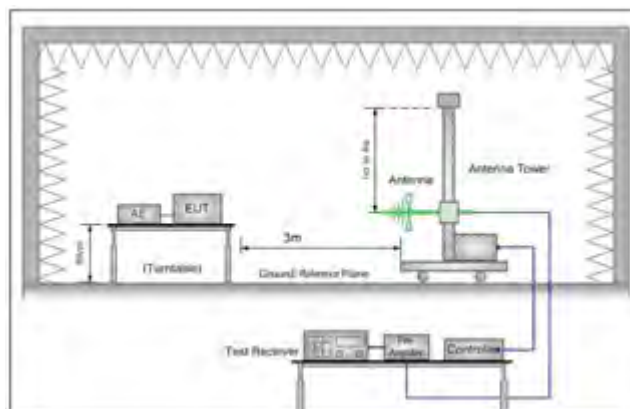


Figure 2. 30MHz to 1GHz

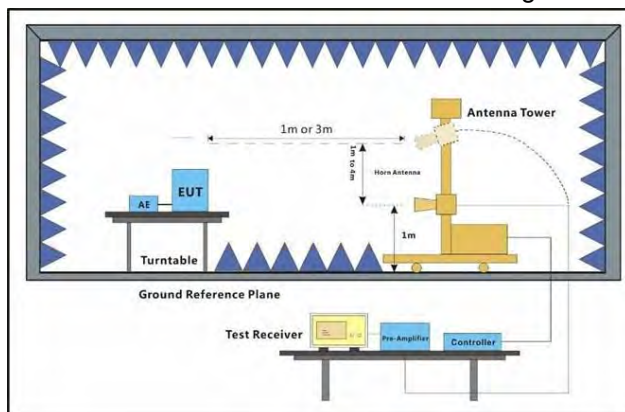


Figure 3. Above 1 GHz

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 (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test

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	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. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Test the EUT in the lowest channel, the middle channel ,the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete. j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed. l. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \log(3/1) = 9.54 \text{ dB}$.
Test Configuration:	Measurements below 30MHz • RBW = 10 kHz • VBW = 30 kHz • Detector = Peak & Average & Quasi-peak • Trace mode = max hold Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW $\geq 3 \text{ MHz}$ • 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 $\geq 1/T$, 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 all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.





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Test Results:	Pass
The detailed test data see: Appendix	



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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 C63.10-2020 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:

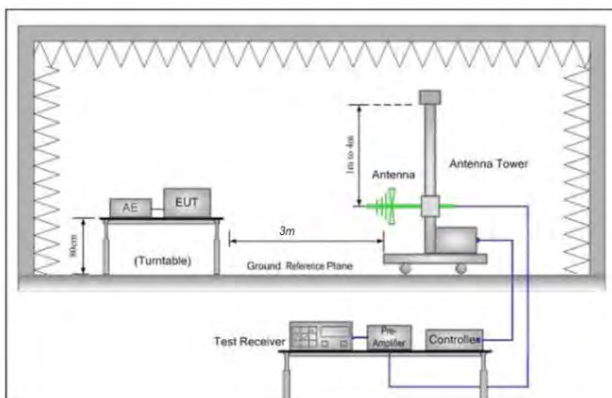


Figure 1. 30MHz to 1GHz

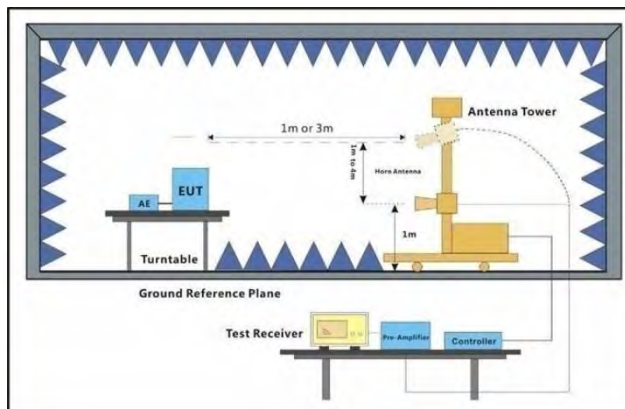


Figure 2. Above 1 GHz

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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.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW ≥ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • 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 all kind of modulations, data rates. Charge + Transmitting mode.



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Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: Appendix	



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

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$ GHz
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 0.2\%$
4	RF conducted power	± 0.21 dB
5	RF power density	± 2.84 dB
6	Conducted Spurious emissions	± 0.75 dB
7	Conduction Emission	± 3.0 dB (150kHz to 30MHz)
8	Radiated Emission	± 4.6 dB (9kHz to 30MHz)
		± 4.9 dB (30MHz to 1GHz)
		± 4.9 dB (1GHz to 6GHz)
		± 4.7 dB (6GHz to 18GHz)
		± 5.26 dB (Above 18GHz)

Remark:

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

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



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6 Equipment List

RF Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
MXA signal analyzer	Agilent	N9020A	XAW01-06-07	2023/02/16	2024/02/15
Measurement Software	Tonscend	JS1120-3 (3.2.18)	XAW02-14-01	NCR	NCR
RF control unit	Tonscend	JS0806-2	XAW03-37-01	NCR	NCR
Power Meter	Anritsu	ML2495A	XAW01-25-03	2022/09/14	2023/09/13
Power Supply	Agilent	66311B	XAW01-17-01	2023/02/16	2024/02/15
Temperature and humidity meter	MingGao	T809	XAW01-01-16	2022/09/18	2023/09/17

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



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RSE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/d d)	Cal.Due date (yyyy/mm/d d)
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2021/09/09	2024/09/08
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2023/02/16	2024/02/15
Spectrum Analyzer	ROHDE &SCHWARZ	FSV3044	XAW01-13-05	2022/05/24	2023/05/23
				2023/05/15	2024/05/14
Test receiver	ROHDE &SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/07/28	2024/07/27
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/07/28	2024/07/27
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/07/23	2024/07/22
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP9K3G32	XAW01-41-01	2022/05/24	2023/05/23
				2023/05/15	2024/05/14
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2022/09/14	2023/09/13
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2022/09/14	2023/09/13
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2022/09/14	2023/09/13
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2022/05/26	2024/05/25



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7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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Appendix



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DTS Bandwidth Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11b	Ant0	2412	9.080	2406.960	2416.040	0.5	PASS
		2437	7.800	2432.240	2440.040	0.5	PASS
		2462	8.680	2457.320	2466.000	0.5	PASS
11g	Ant0	2412	16.440	2403.800	2420.240	0.5	PASS
		2437	17.040	2428.360	2445.400	0.5	PASS
		2462	17.000	2453.800	2470.800	0.5	PASS
11n20SISO	Ant0	2412	18.000	2403.080	2421.080	0.5	PASS
		2437	16.400	2428.520	2444.920	0.5	PASS
		2462	17.320	2453.560	2470.880	0.5	PASS



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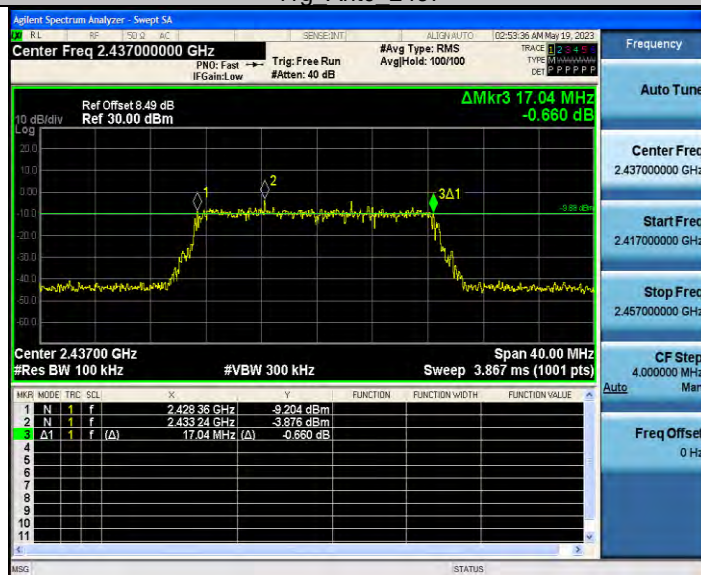
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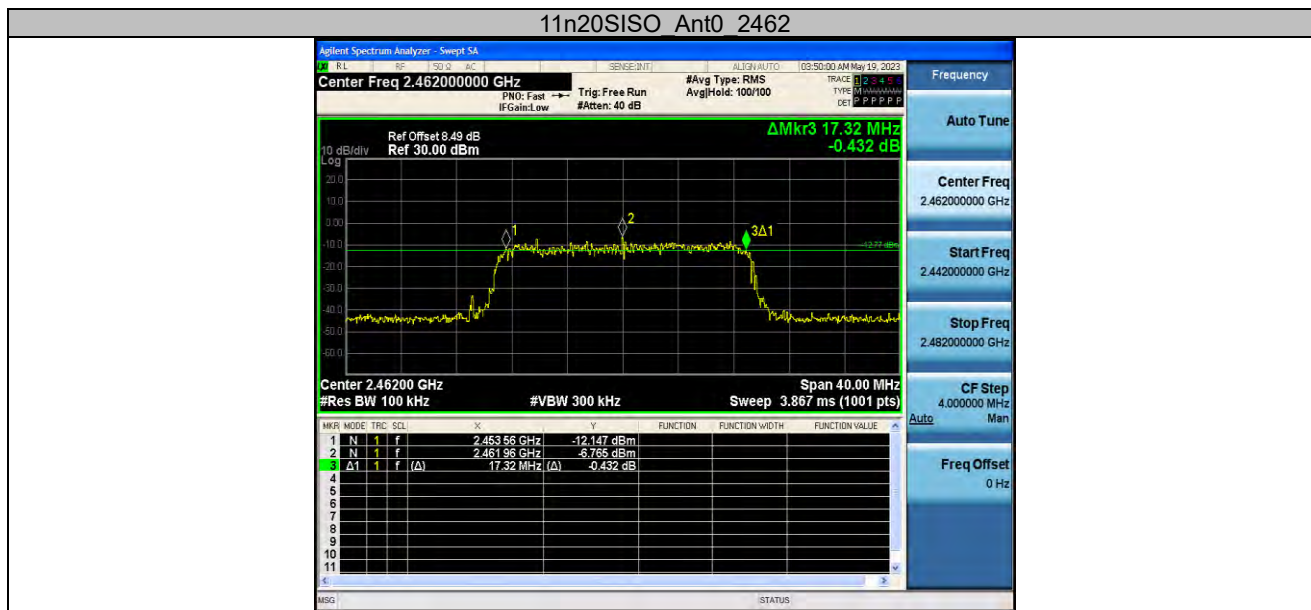
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Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
11b	Ant0	2412	14.001	2404.4529	2418.4539	For Report Purpose
		2437	13.810	2429.3514	2443.1614	
		2462	13.920	2454.5041	2468.4241	
11g	Ant0	2412	17.611	2403.0942	2420.7052	
		2437	17.171	2428.4185	2445.5895	
		2462	17.316	2453.3979	2470.7139	
11n20SISO	Ant0	2412	18.053	2403.0041	2421.0571	
		2437	18.137	2427.7887	2445.9257	
		2462	18.258	2453.1360	2471.3940	



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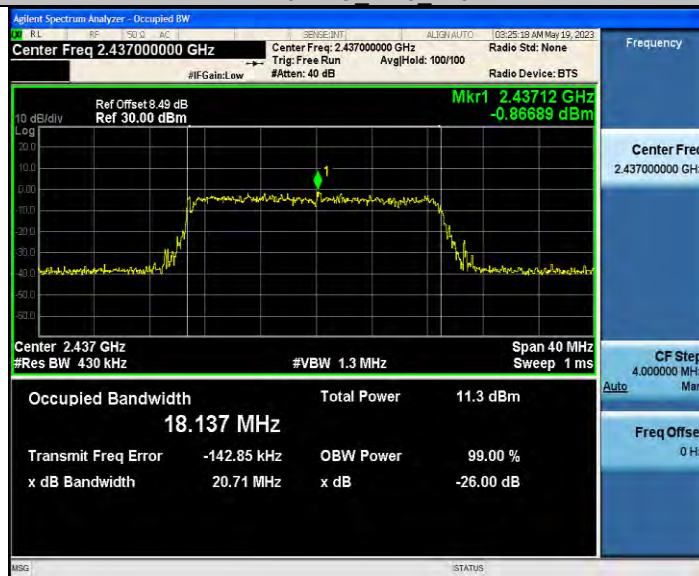
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11n20SISO Ant0 2412



11n20SISO Ant0 2437



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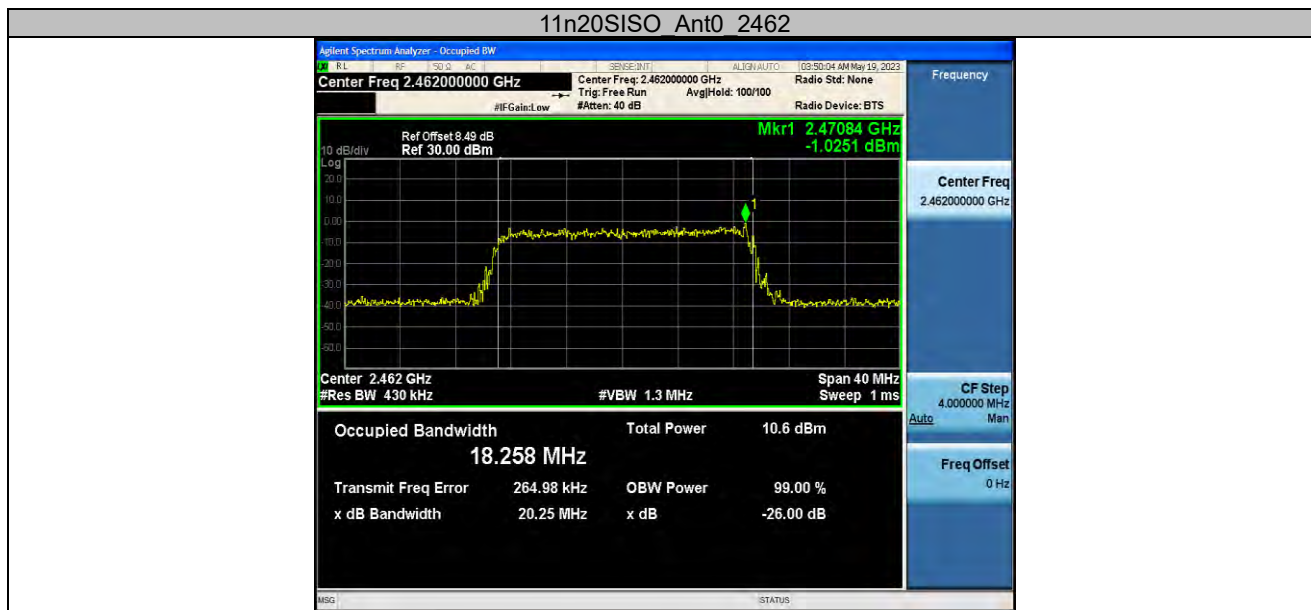
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Maximum conducted output power Test Result Peak

TestMode	Antenna	Frequency[MHz]	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11b	Ant0	2412	15.77	≤30.00	PASS
		2437	15.98	≤30.00	PASS
		2462	15.21	≤30.00	PASS
11g	Ant0	2412	15.42	≤30.00	PASS
		2437	15.37	≤30.00	PASS
		2462	14.85	≤30.00	PASS
11n20SISO	Ant0	2412	14.43	≤30.00	PASS
		2437	14.49	≤30.00	PASS
		2462	13.85	≤30.00	PASS



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Maximum power spectral density

Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11b	Ant0	2412	-9.75	≤8.00	PASS
		2437	-8.99	≤8.00	PASS
		2462	-9.93	≤8.00	PASS
11g	Ant0	2412	-17.16	≤8.00	PASS
		2437	-17.31	≤8.00	PASS
		2462	-17.3	≤8.00	PASS
11n20SISO	Ant0	2412	-18.55	≤8.00	PASS
		2437	-18.4	≤8.00	PASS
		2462	-18.7	≤8.00	PASS



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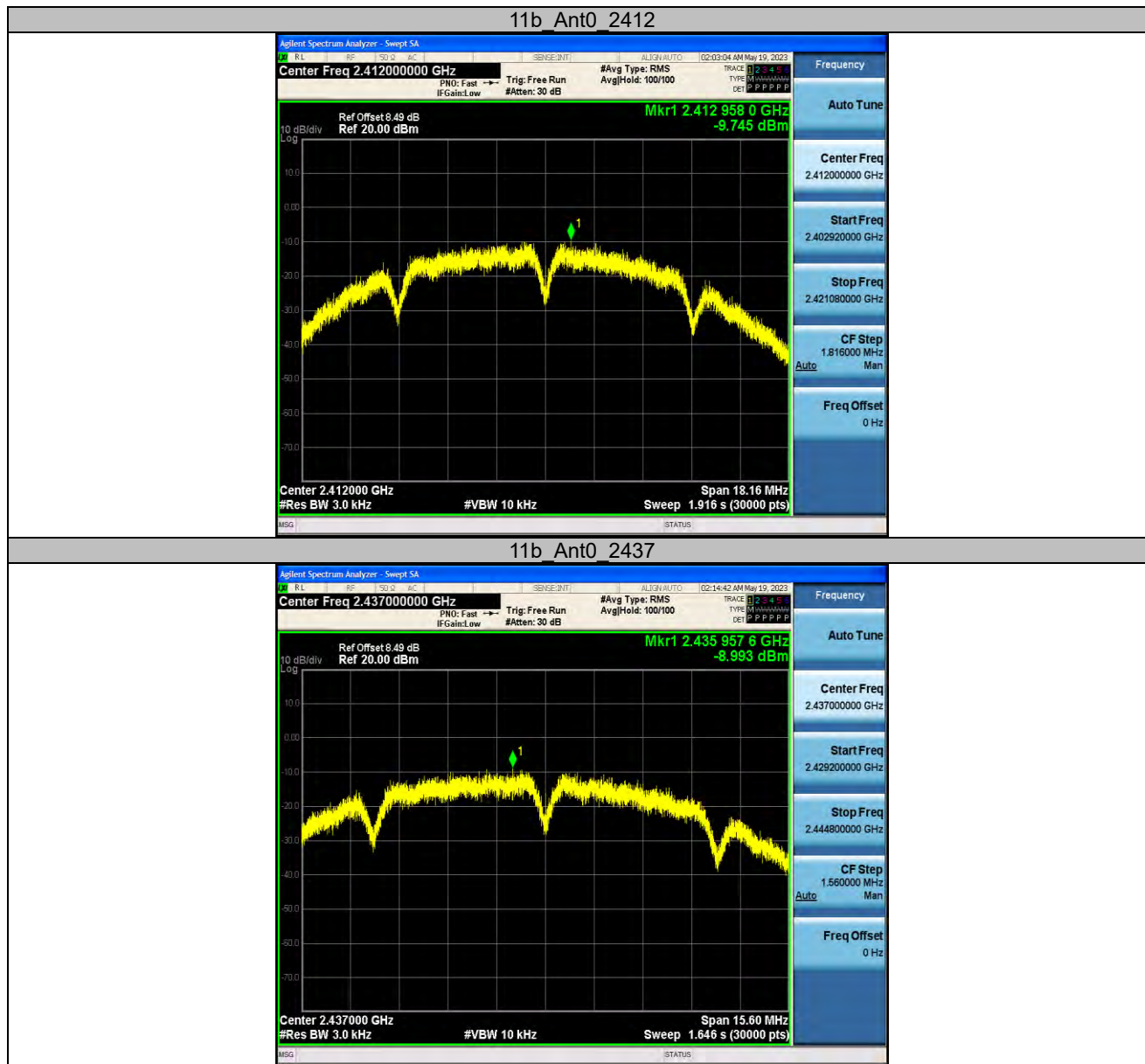
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Test Graphs



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11b Ant0 2462



11g Ant0 2412



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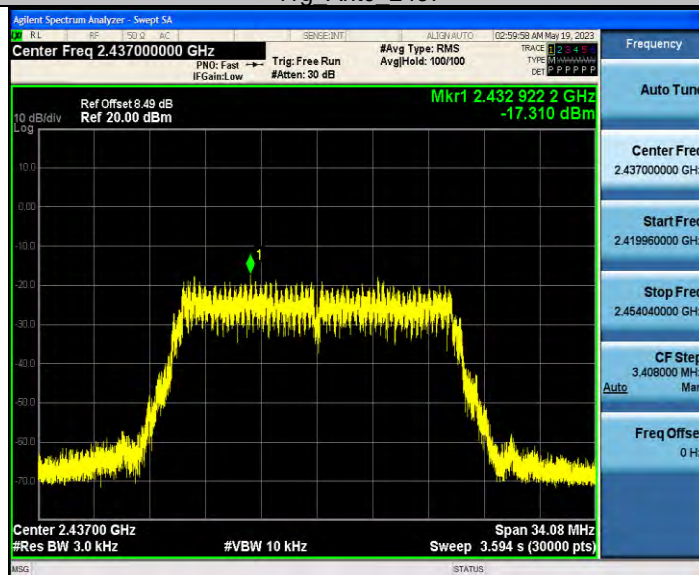
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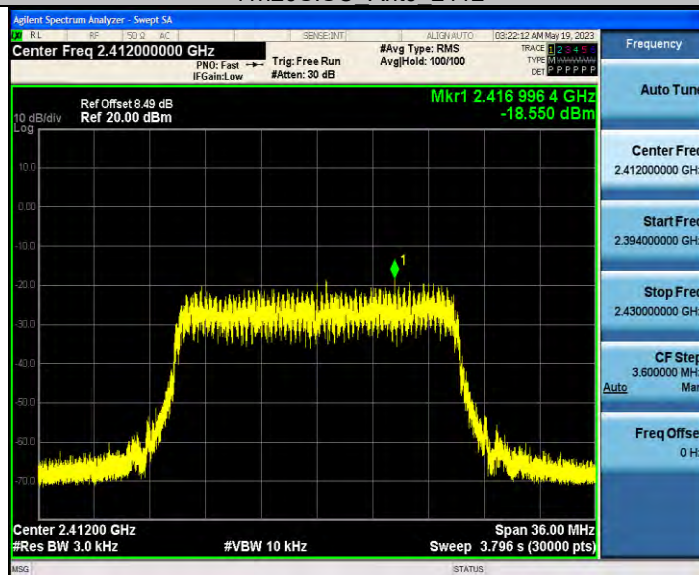
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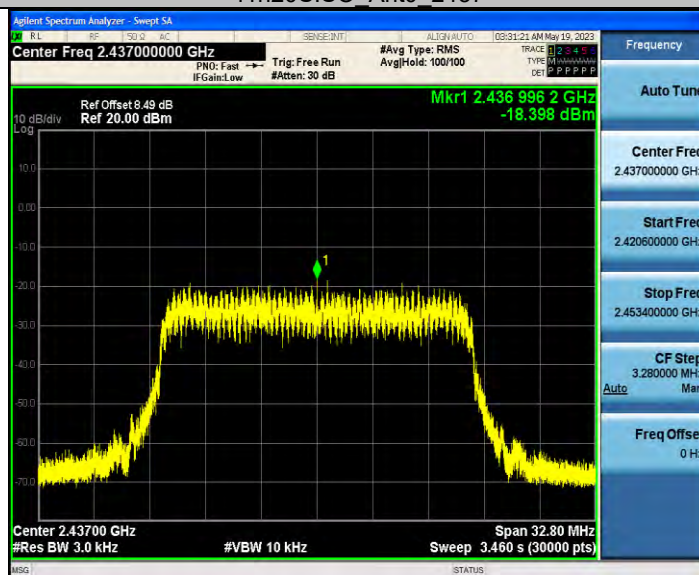
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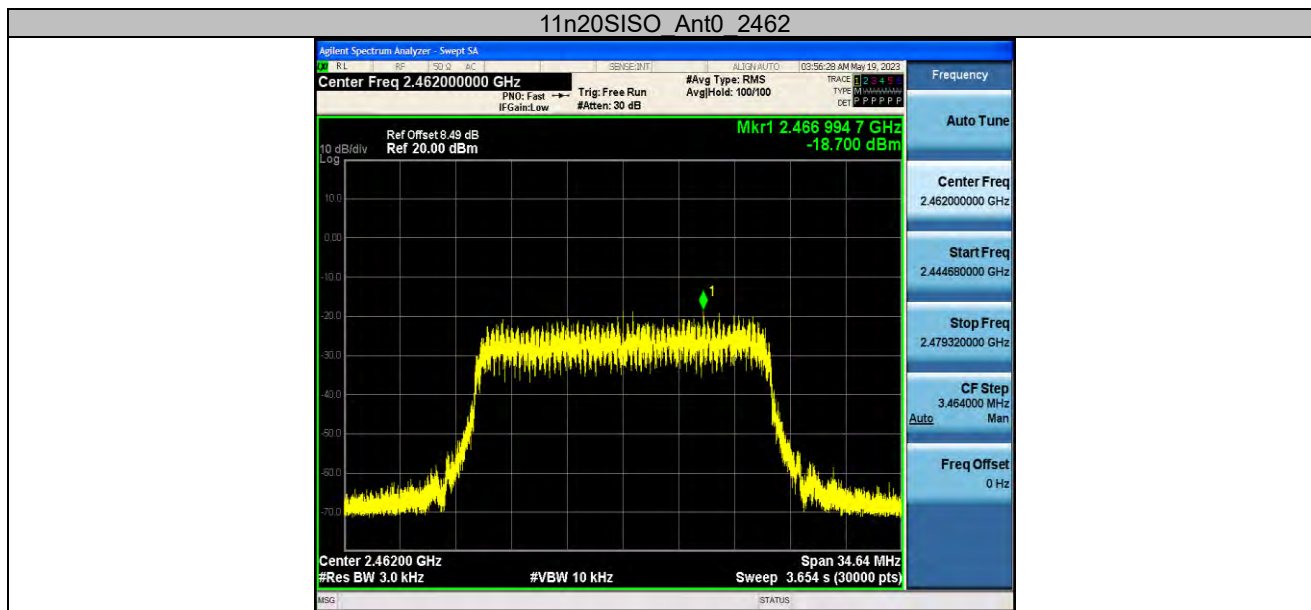
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Band edge measurements

Test Result

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11b	Ant0	Low	2412	3.85	-37.15	≤-16.15	PASS
		High	2462	3.70	-50.21	≤-16.3	PASS
11g	Ant0	Low	2412	-5.32	-46.95	≤-25.32	PASS
		High	2462	-7.04	-50.17	≤-27.04	PASS
11n20SISO	Ant0	Low	2412	-5.71	-45.97	≤-25.71	PASS
		High	2462	-5.78	-51.05	≤-25.78	PASS



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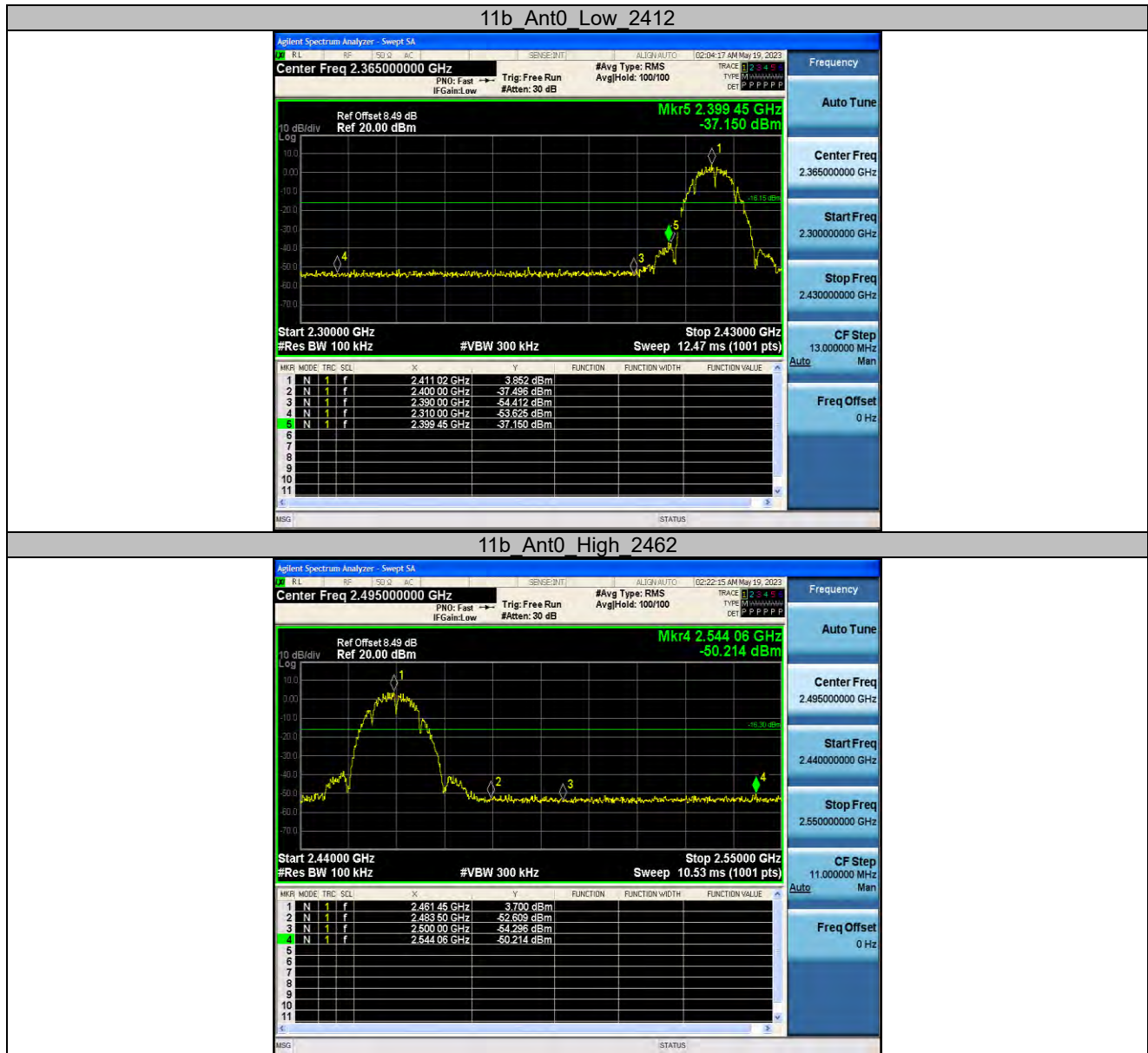
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Test Graphs



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11g Ant0 Low 2412



11g Ant0 High 2462



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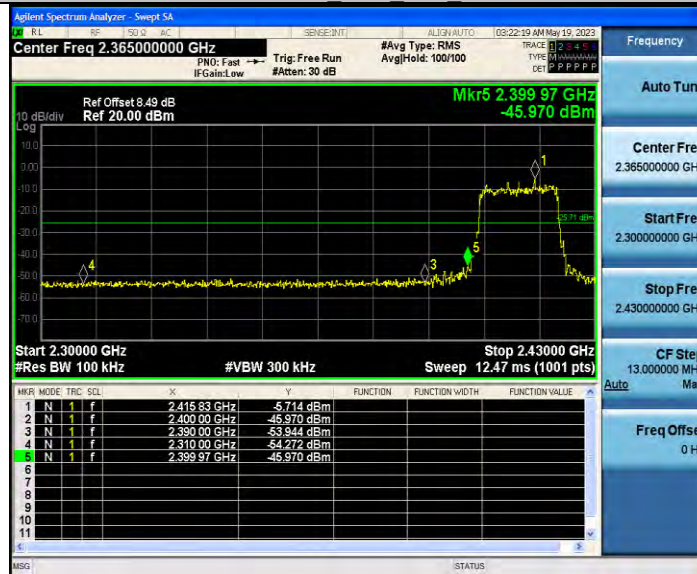
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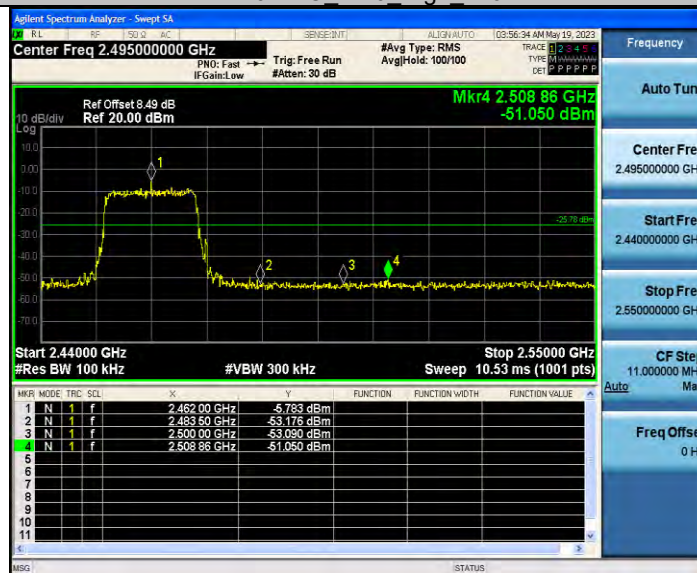
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11n20SISO Ant0 Low 2412



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Conducted Spurious Emission Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11b	Ant0	2412	Reference	1.01	1.01	---	PASS
			30~1000	1.01	-60.32	≤-18.99	PASS
			1000~26500	1.01	-46.13	≤-18.99	PASS
		2437	Reference	4.19	4.19	---	PASS
			30~1000	4.19	-60.03	≤-15.81	PASS
			1000~26500	4.19	-46.55	≤-15.81	PASS
		2462	Reference	3.01	3.01	---	PASS
			30~1000	3.01	-61.41	≤-16.99	PASS
			1000~26500	3.01	-46.72	≤-16.99	PASS
11g	Ant0	2412	Reference	-6.62	-6.62	---	PASS
			30~1000	-6.62	-61.34	≤-26.62	PASS
			1000~26500	-6.62	-46.31	≤-26.62	PASS
		2437	Reference	-6.42	-6.42	---	PASS
			30~1000	-6.42	-61.3	≤-26.42	PASS
			1000~26500	-6.42	-46.29	≤-26.42	PASS
		2462	Reference	-5.27	-5.27	---	PASS
			30~1000	-5.27	-60.88	≤-25.27	PASS
			1000~26500	-5.27	-45.73	≤-25.27	PASS
11n20SISO	Ant0	2412	Reference	-8.85	-8.85	---	PASS
			30~1000	-8.85	-61.45	≤-28.85	PASS
			1000~26500	-8.85	-46.38	≤-28.85	PASS
		2437	Reference	-12.74	-12.74	---	PASS
			30~1000	-12.74	-61.35	≤-32.74	PASS
			1000~26500	-12.74	-46.37	≤-32.74	PASS
		2462	Reference	-9.24	-9.24	---	PASS
			30~1000	-9.24	-61.03	≤-29.24	PASS
			1000~26500	-9.24	-46.04	≤-29.24	PASS



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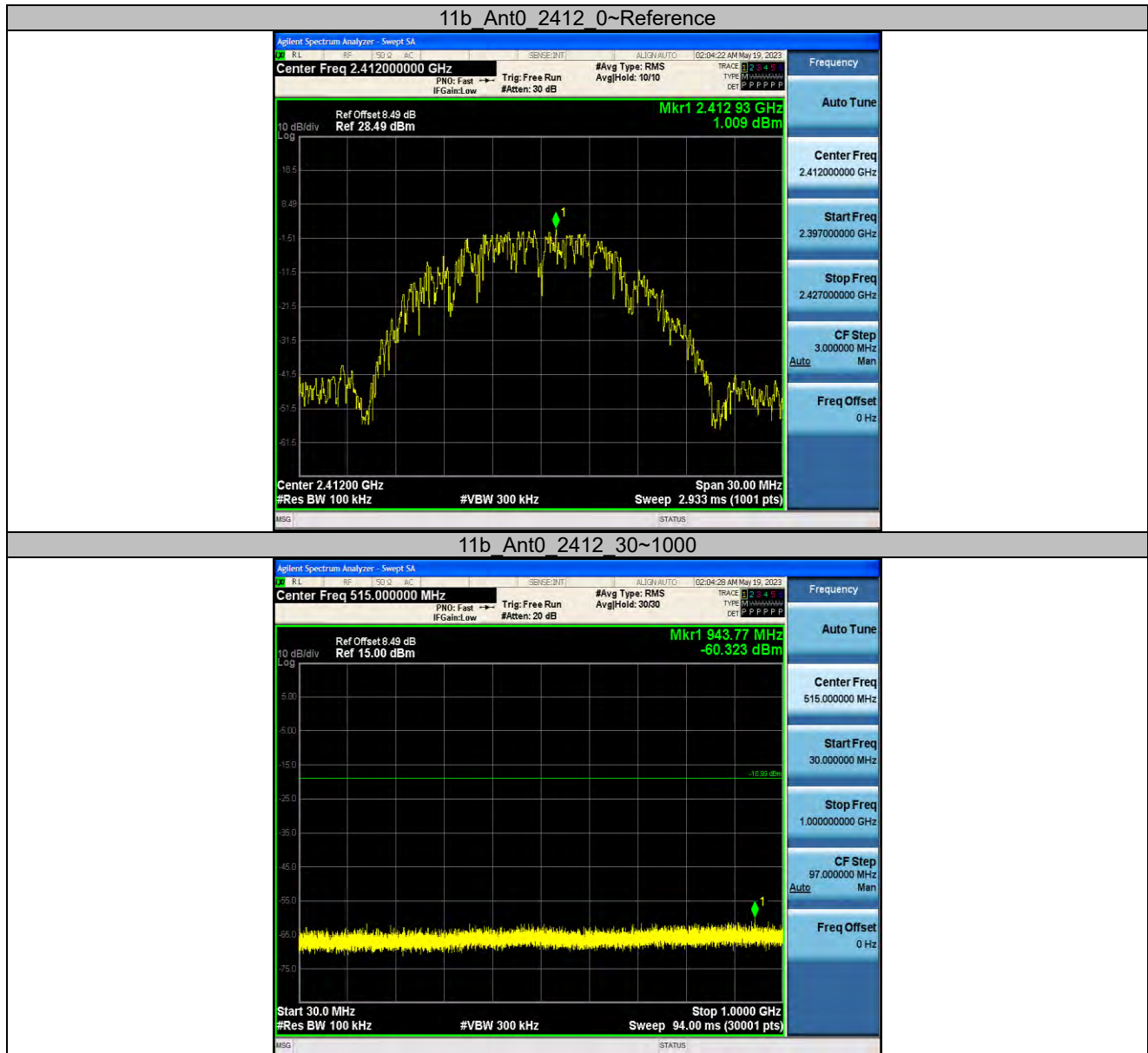
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Test Graphs



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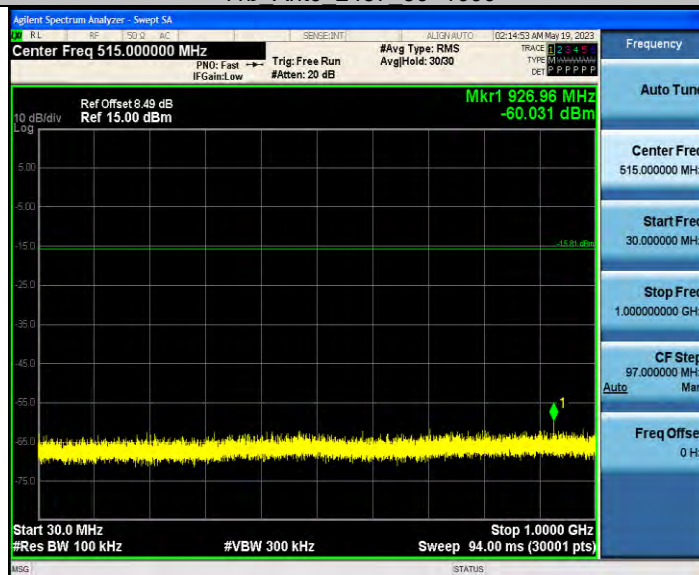
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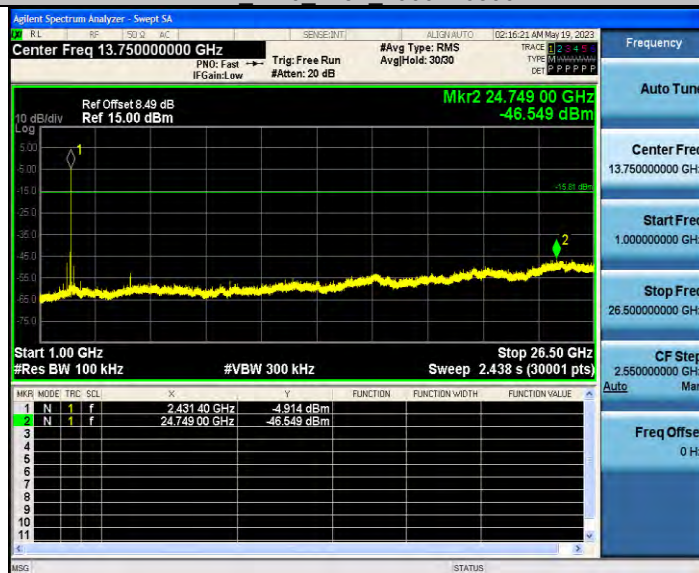
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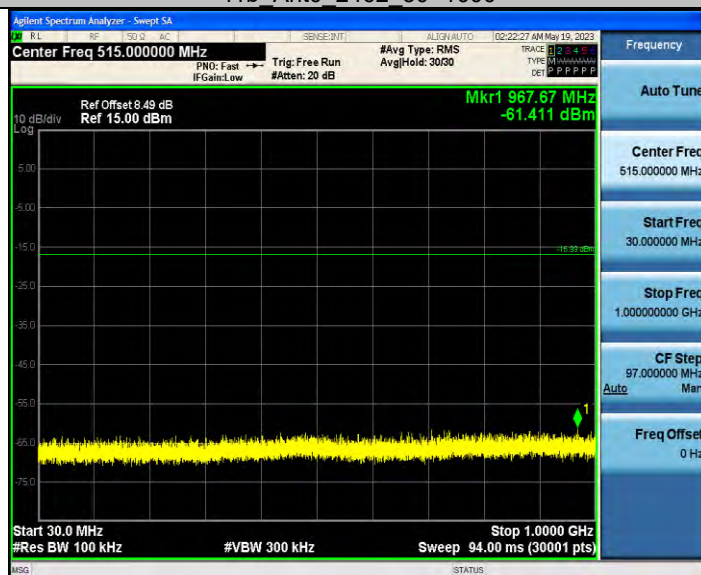
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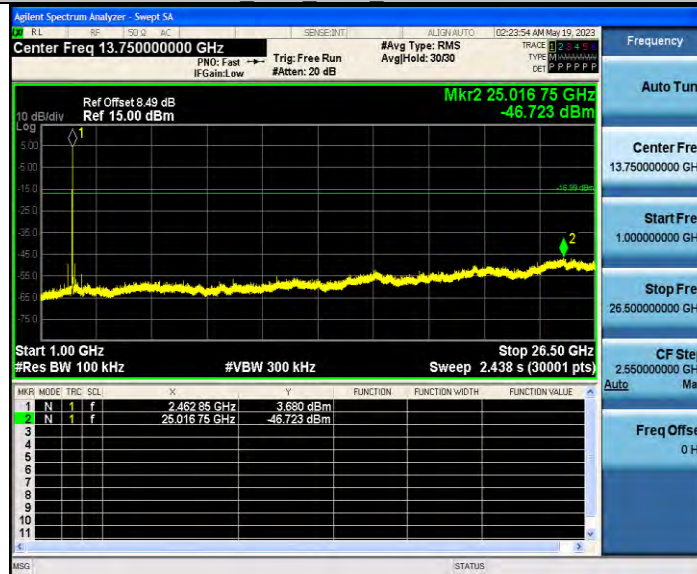
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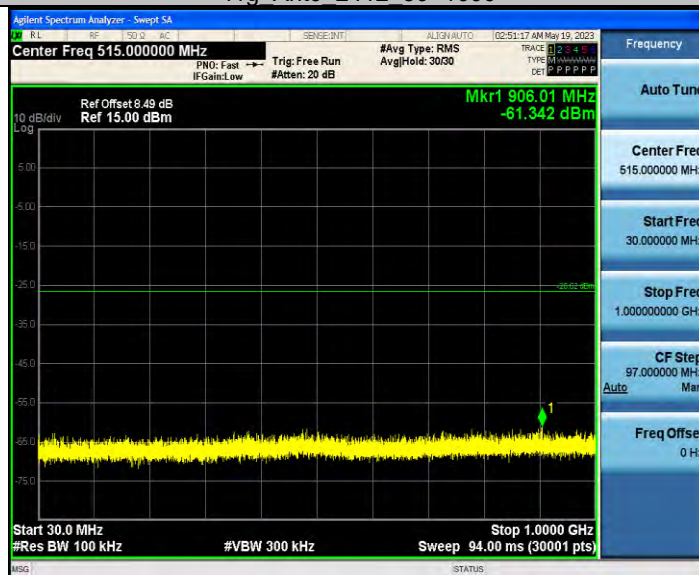


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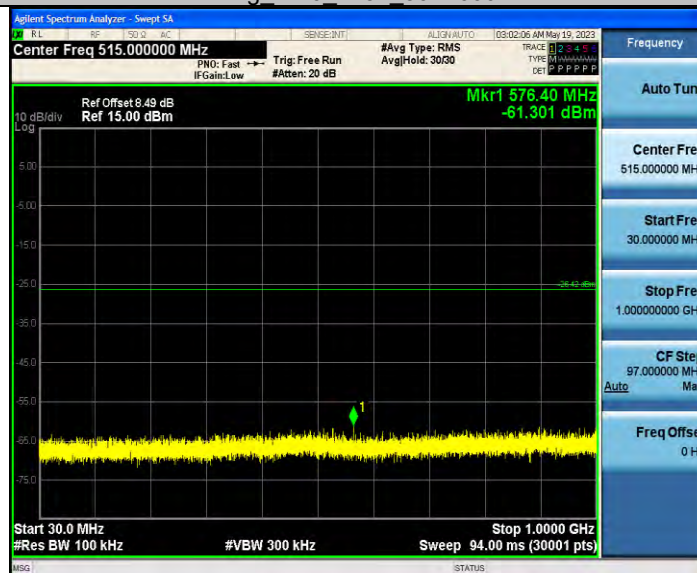
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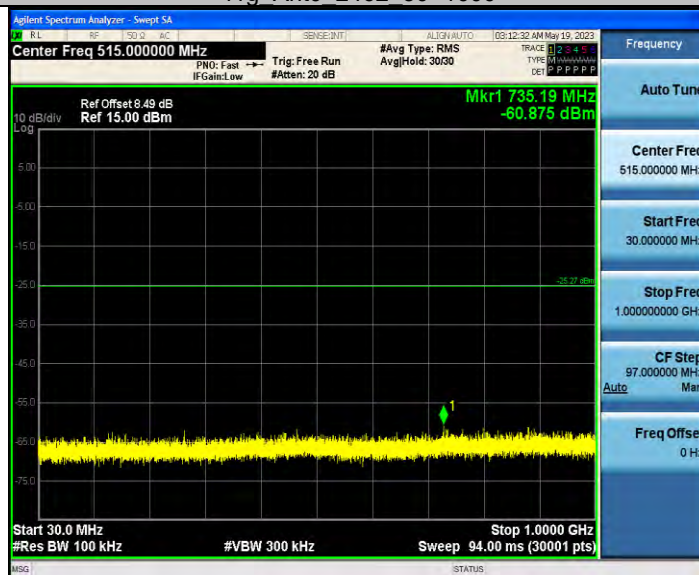
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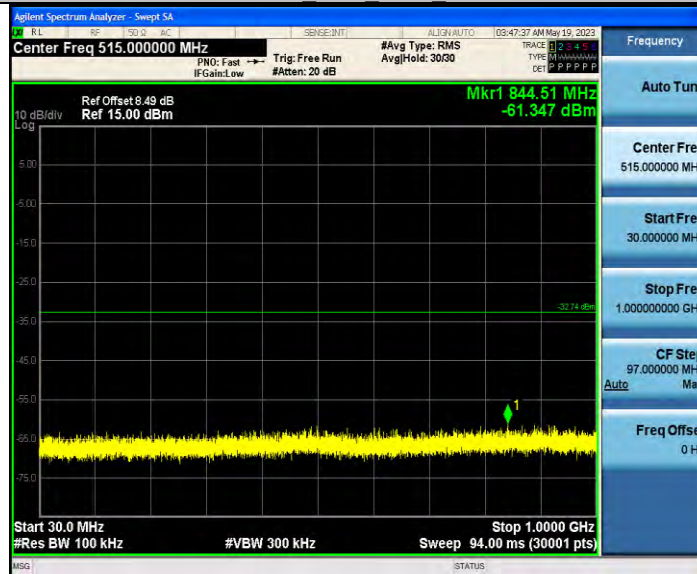
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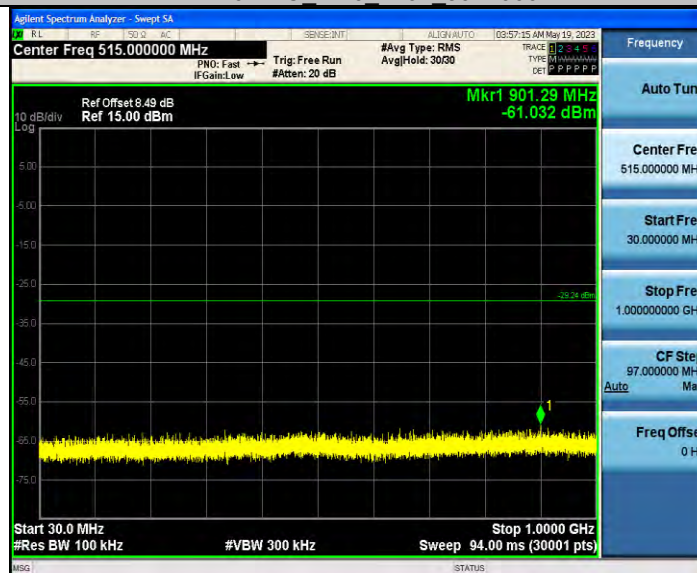
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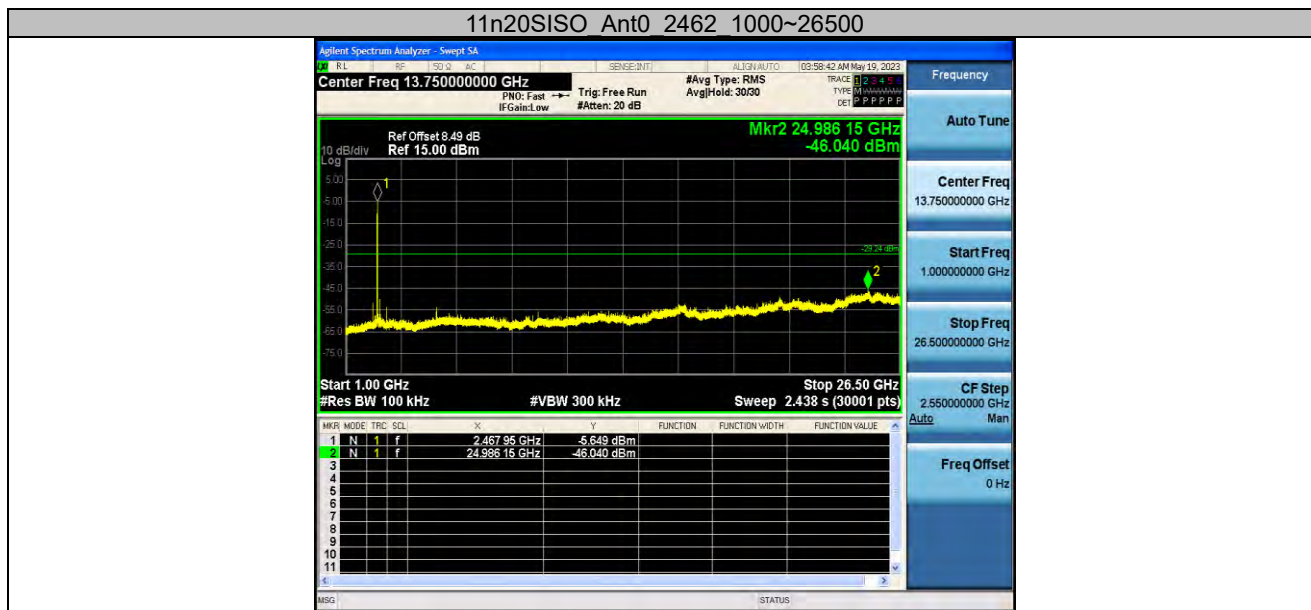
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Duty Cycle Test Result

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11b	Ant0	2412	8.37	43.33	19.32	7.14
		2437	8.40	43.37	19.37	7.13
		2462	8.40	43.37	19.37	7.13
11g	Ant0	2412	1.39	13.98	9.94	10.03
		2437	1.39	13.98	9.94	10.03
		2462	1.39	13.98	9.94	10.03
11n20SISO	Ant0	2412	1.30	13.06	9.95	10.02
		2437	1.30	13.06	9.95	10.02
		2462	1.30	13.06	9.95	10.02

Note:

Radiated Emission Average VBW = 1 / T

TestMode	T[ms]	Period[ms]	Duty Cycle[%]	1/T[kHz]	VBW Setting
11b	8.37	43.33	19.32	0.11947	0.12KHz
11g	1.39	13.98	9.94	0.71942	0.82KHz
11n20SISO	1.3	13.06	9.95	0.76923	0.82KHz



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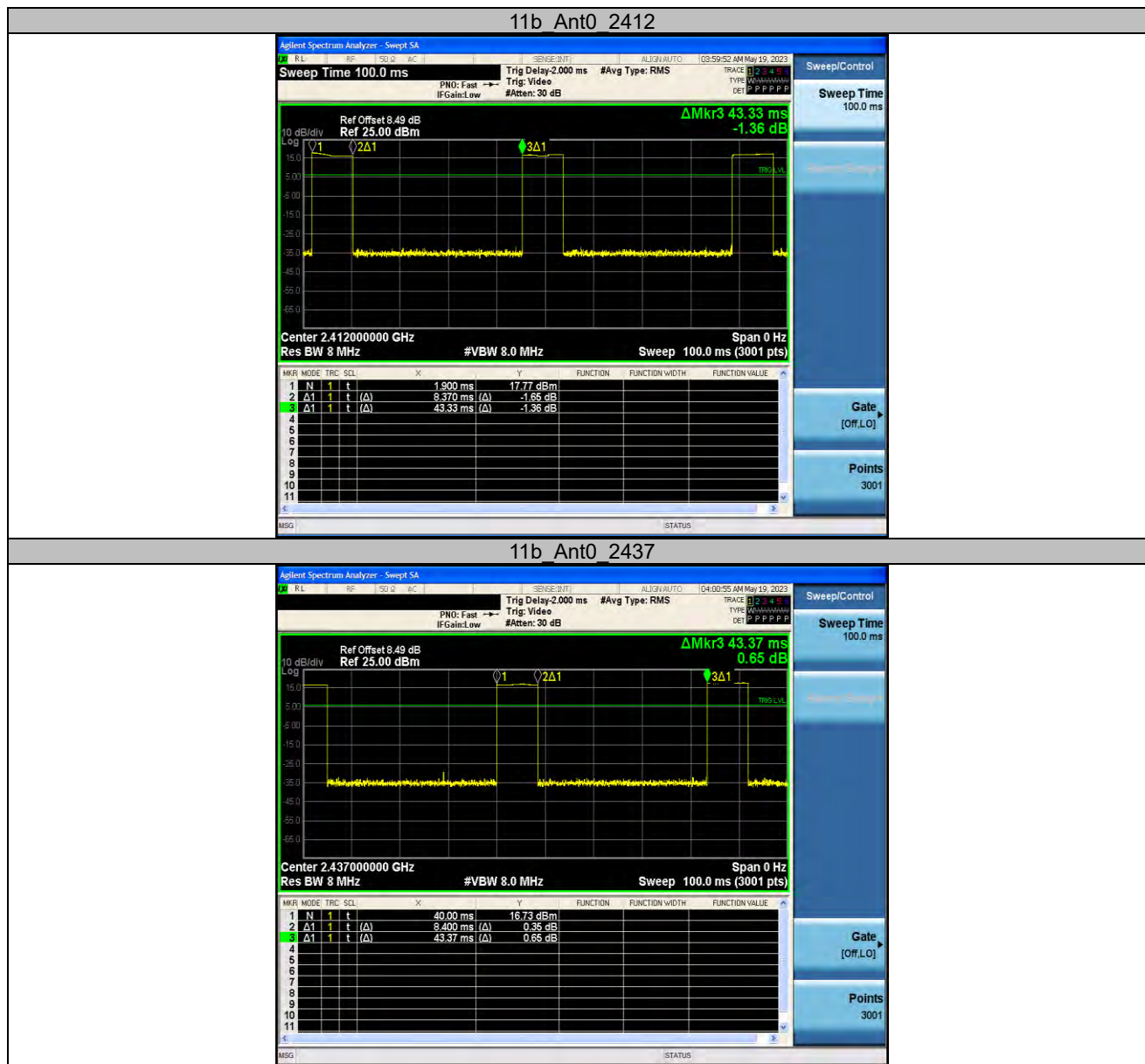
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Test Graphs



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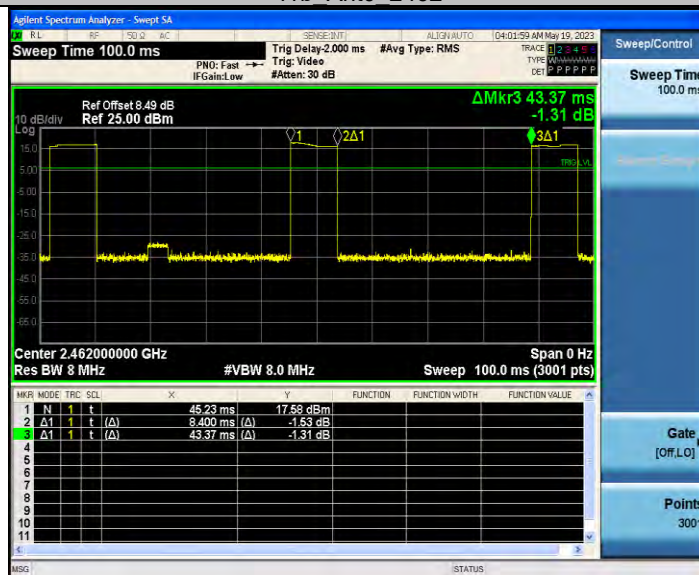
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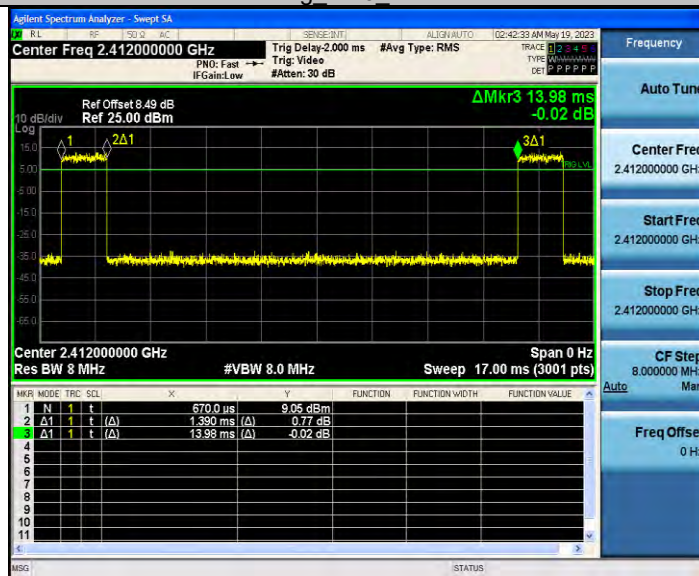
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11b Ant0 2462



11g Ant0 2412



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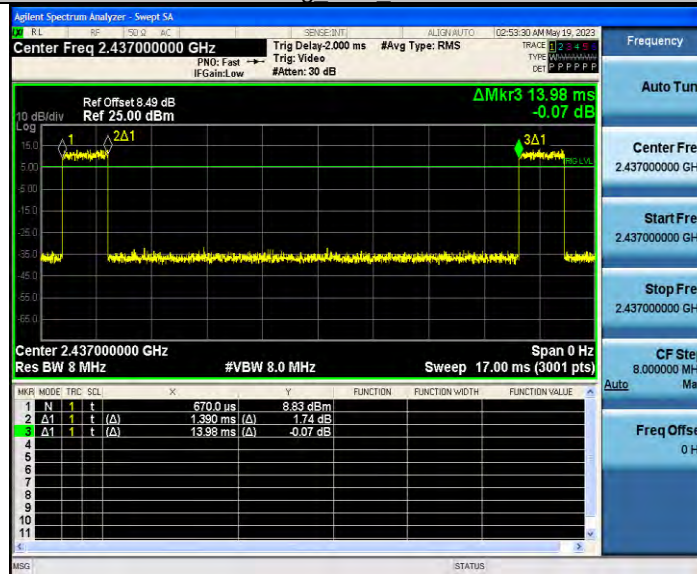
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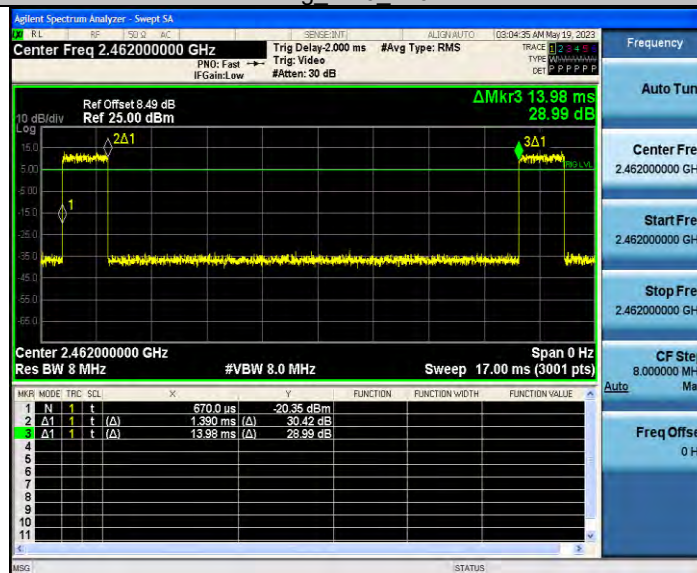
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11g Ant0 2437



11g Ant0 2462



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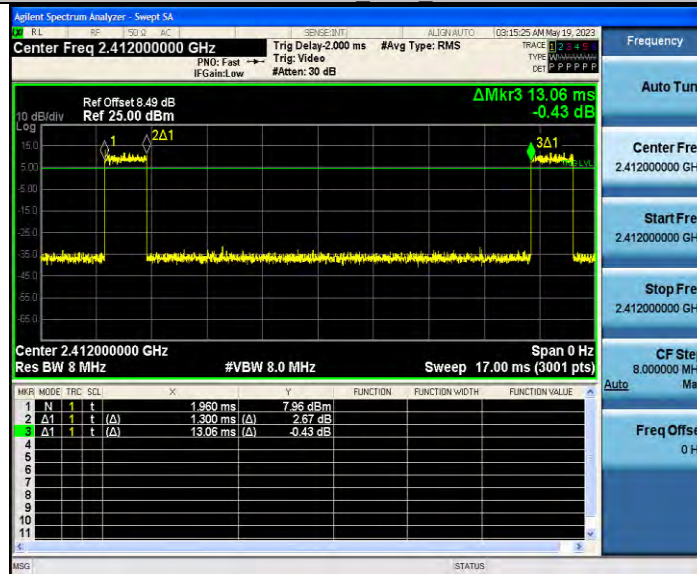
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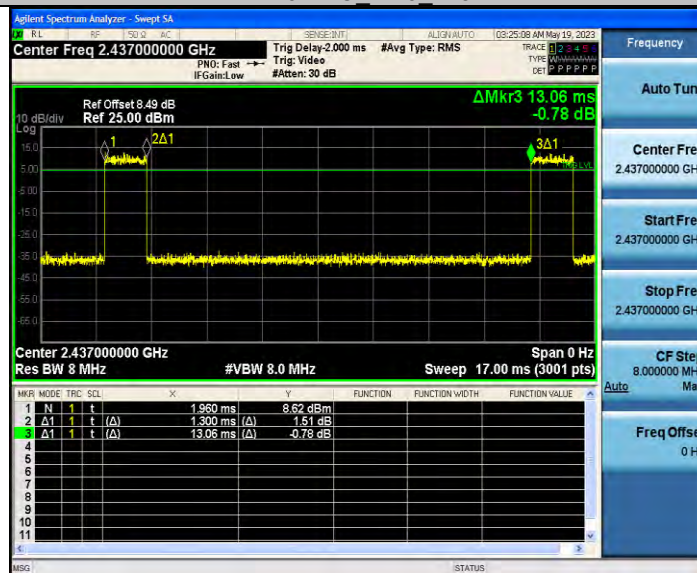
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11n20SISO Ant0 2412



11n20SISO Ant0 2437



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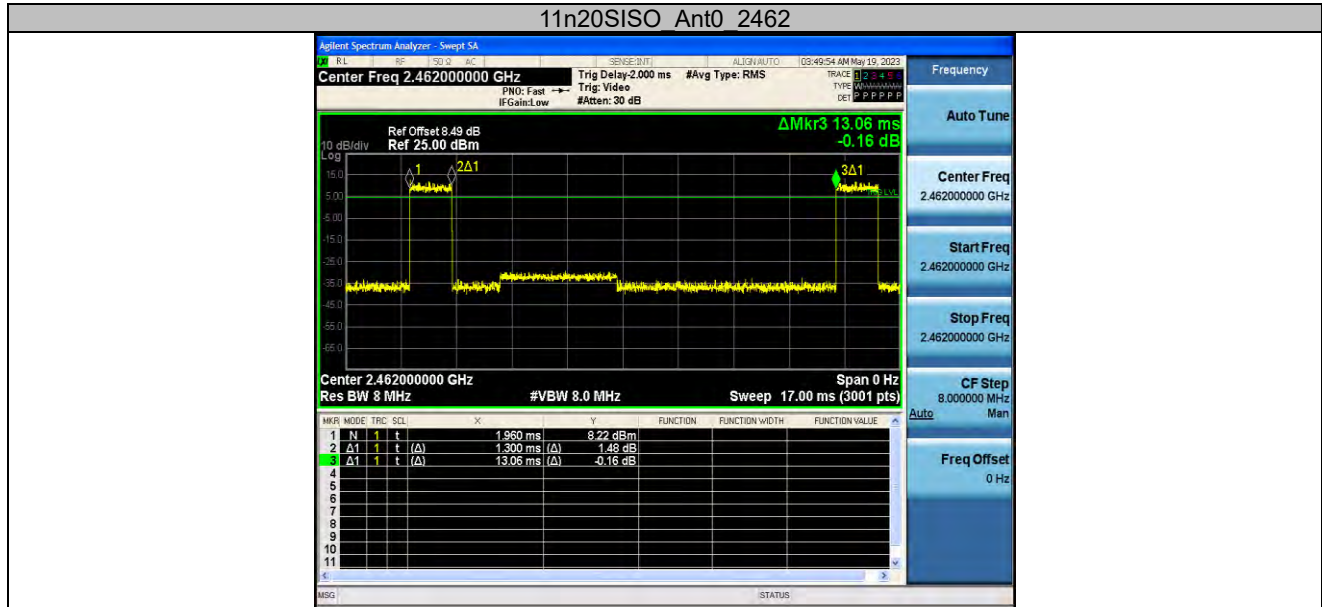
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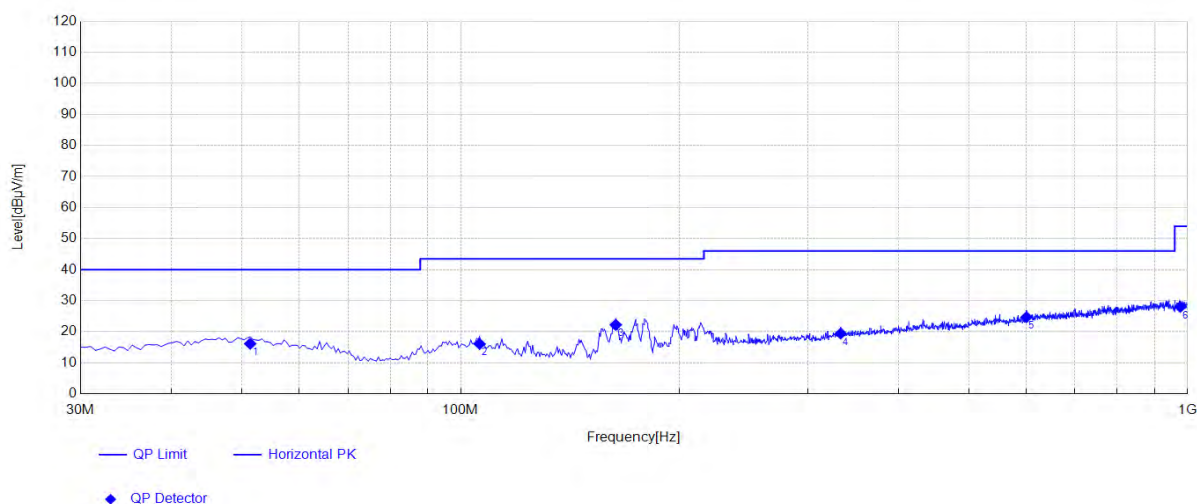
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Radiated Spurious Emissions

Radiated emission below 1GHz

Worst case Mode: 802.11b_Channel 11

Final Data List

NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	51.3507	13.94	-27.74	29.96	16.16	40.00	23.84	263	221	Horizontal
2	106.1831	11.86	-27.12	31.33	16.07	43.50	27.43	224	19	Horizontal
3	163.4417	8.61	-26.43	40.04	22.22	43.50	21.28	189	195	Horizontal
4	333.2766	14.17	-25.81	31.09	19.45	46.00	26.55	219	113	Horizontal
5	600.1601	19.10	-24.88	30.47	24.69	46.00	21.31	263	89	Horizontal
6	976.7084	22.17	-23.46	29.31	28.02	54.00	25.98	189	4	Horizontal



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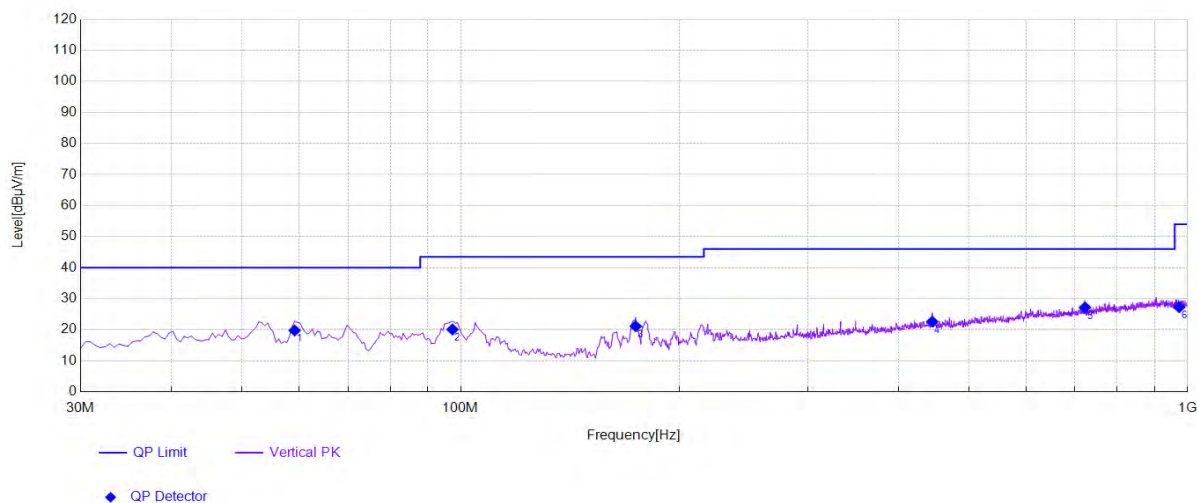
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Final Data List										
NO.	Freq. [MHz]	AF[dB/m]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	59.1146	12.49	-27.95	35.24	19.78	40.00	20.22	266	245	Vertical
2	97.4487	11.36	-27.25	35.98	20.09	43.50	23.41	345	104	Vertical
3	174.1171	9.28	-26.49	38.35	21.14	43.50	22.36	196	243	Vertical
4	445.3677	16.12	-25.26	31.77	22.63	46.00	23.37	127	333	Vertical
5	722.4412	19.70	-24.44	31.93	27.19	46.00	18.81	196	279	Vertical
6	973.7969	22.18	-23.43	28.53	27.28	54.00	26.72	302	48	Vertical

Remark:

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

Value = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

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

Margin = Limit(dBμV/m) – Value(dBμV/m)

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



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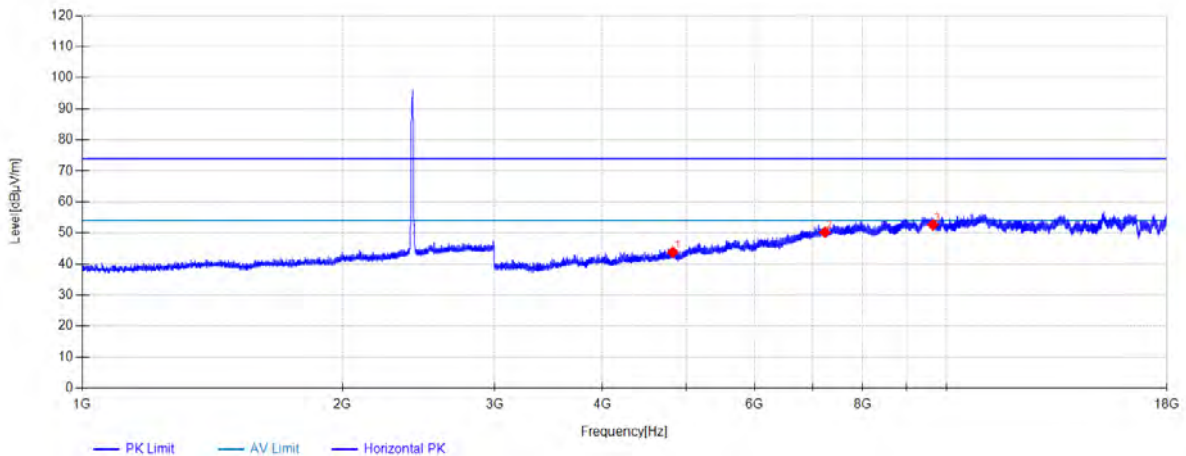
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Transmitter emission Above 1GHz

802.11b_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824	56.06	30.70	-42.93	43.83	74.00	30.17	122	350	Horizontal
2	7236	52.61	36.38	-38.77	50.22	74.00	23.78	234	225	Horizontal
3	9648	50.51	38.09	-35.97	52.63	74.00	21.37	345	62	Horizontal



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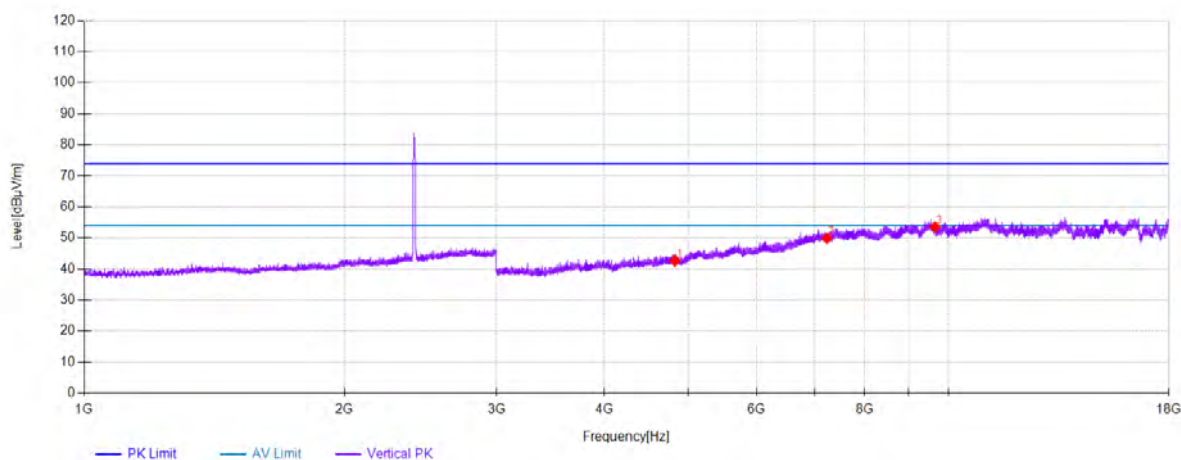
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802.11b_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824	54.95	30.70	-42.93	42.72	74.00	31.28	225	0	Vertical
2	7236	52.31	36.38	-38.77	49.92	74.00	24.08	348	321	Vertical
3	9648	51.43	38.09	-35.97	53.55	74.00	20.45	228	101	Vertical



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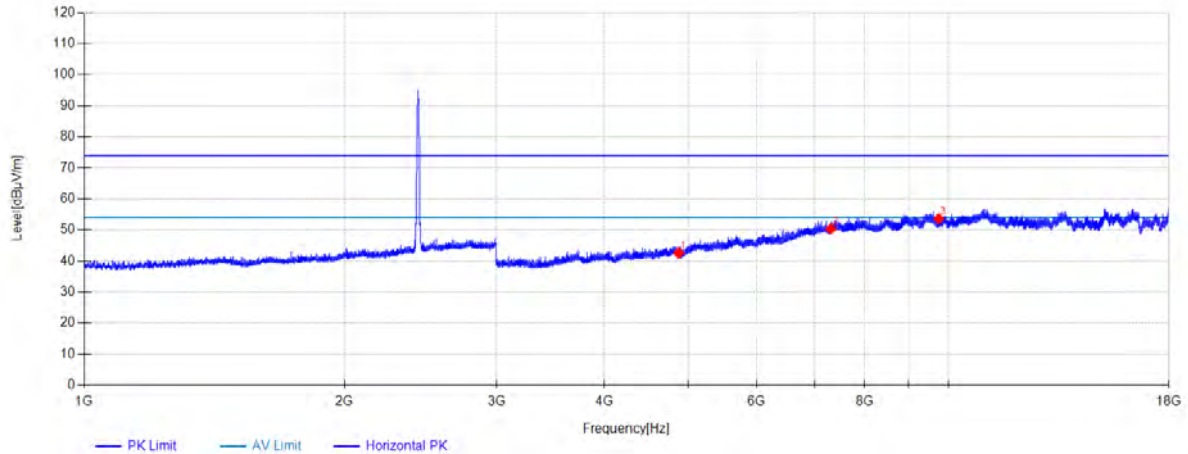
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802.11b_Channel 6



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874	54.76	30.75	-42.90	42.61	74.00	31.39	235	65	Horizontal
2	7311	52.79	36.42	-38.81	50.40	74.00	23.60	247	235	Horizontal
3	9748	51.41	38.30	-36.04	53.67	74.00	20.33	224	96	Horizontal



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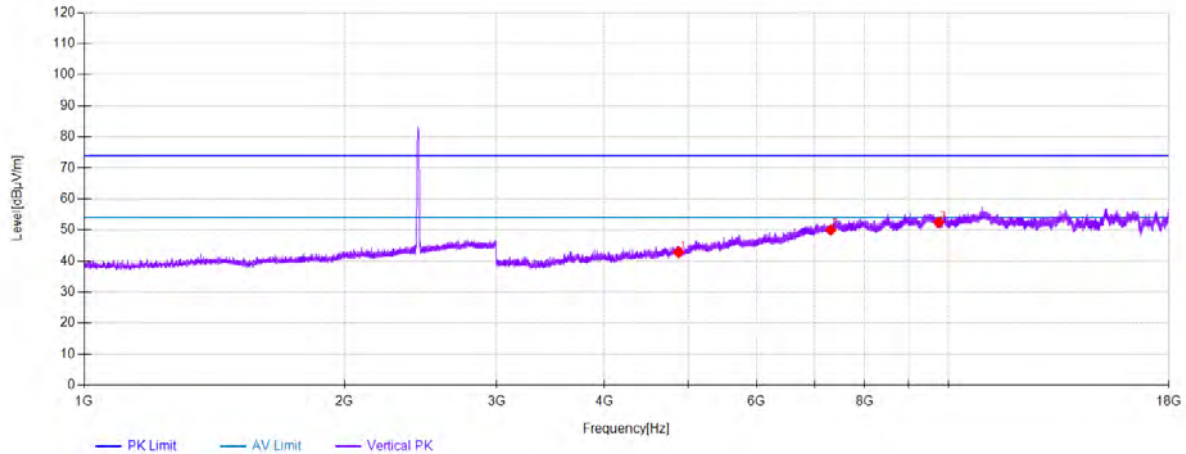
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874	55.00	30.75	-42.90	42.85	74.00	31.15	233	102	Vertical
2	7311	52.39	36.42	-38.81	50.00	74.00	24.00	296	217	Vertical
3	9748	50.19	38.30	-36.04	52.45	74.00	21.55	379	0	Vertical



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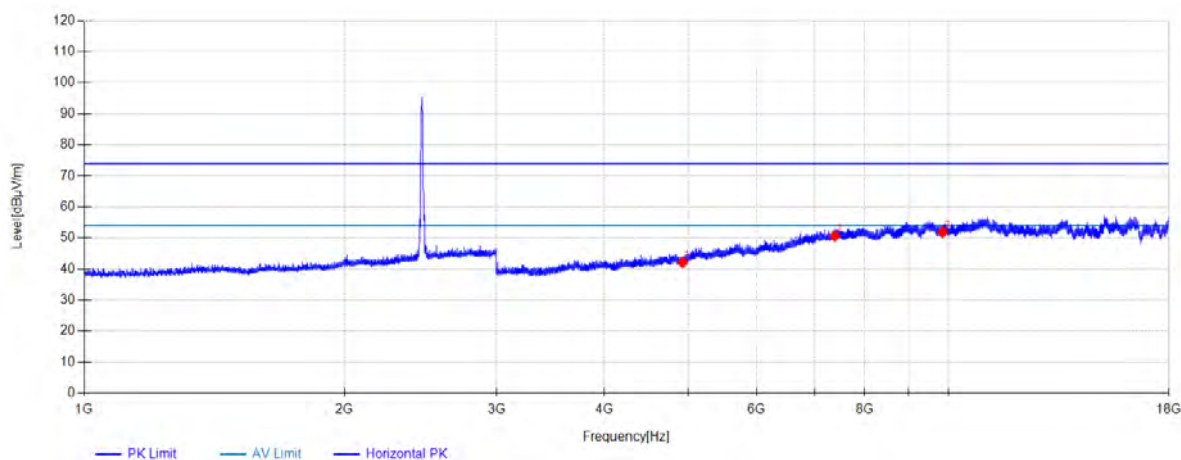
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4924	54.06	30.95	-42.84	42.17	74.00	31.83	223	92	Horizontal
2	7386	52.36	36.64	-38.36	50.64	74.00	23.36	178	330	Horizontal
3	9848	49.05	38.21	-35.36	51.90	74.00	22.10	256	73	Horizontal



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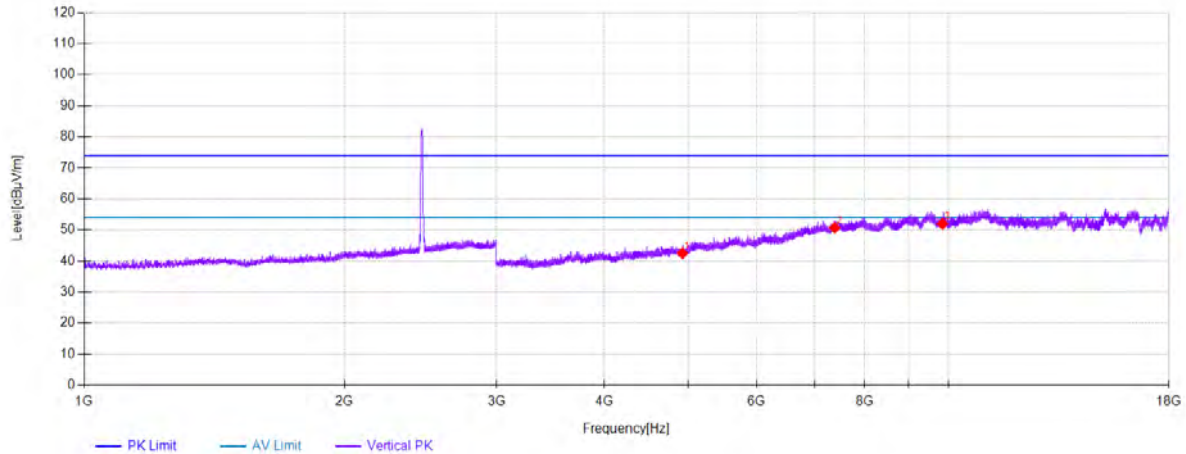
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Final Data List										
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1	4924	54.42	30.95	-42.84	42.53	74.00	31.47	274	225	Vertical
2	7386	52.46	36.64	-38.36	50.74	74.00	23.26	333	302	Vertical
3	9848	49.17	38.21	-35.36	52.02	74.00	21.98	210	24	Vertical



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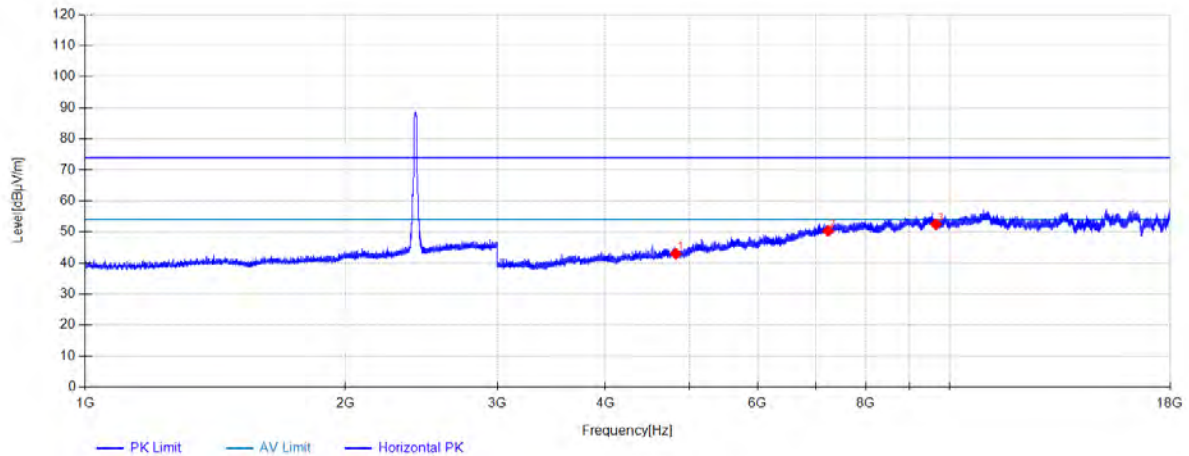
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802.11g_Channel 1



Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824	55.22	30.70	-42.93	42.99	74.00	31.01	175	154	Horizontal
2	7236	52.71	36.38	-38.77	50.32	74.00	23.68	241	231	Horizontal
3	9648	50.36	38.09	-35.97	52.48	74.00	21.52	236	106	Horizontal



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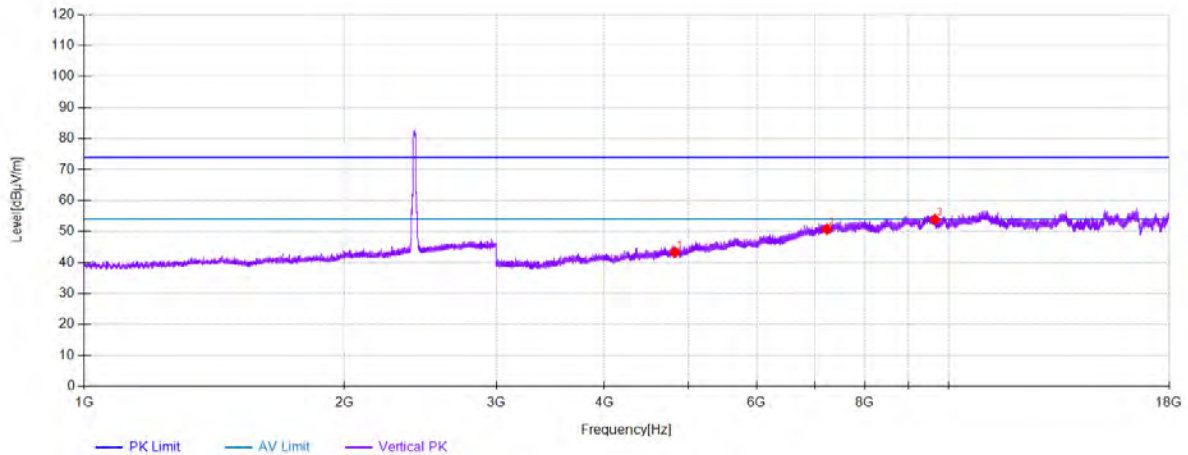
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824	55.54	30.70	-42.93	43.31	74.00	30.69	279	347	Vertical
2	7236	53.13	36.38	-38.77	50.74	74.00	23.26	267	29	Vertical
3	9648	51.77	38.09	-35.97	53.89	74.00	20.11	348	39	Vertical



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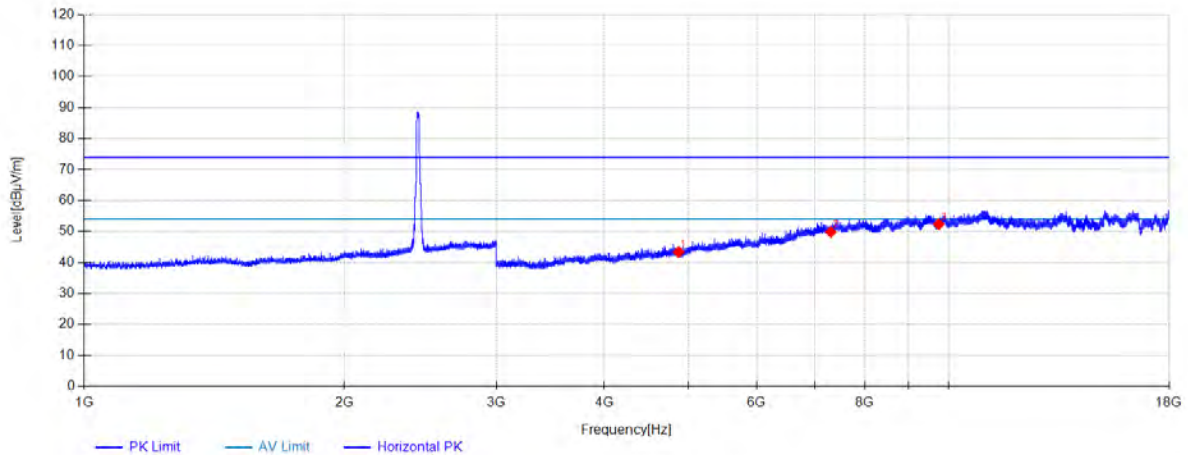
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Final Data List										
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1	4874	55.54	30.75	-42.90	43.39	74.00	30.61	157	193	Horizontal
2	7311	52.23	36.42	-38.81	49.84	74.00	24.16	263	339	Horizontal
3	9748	50.11	38.30	-36.04	52.37	74.00	21.63	247	69	Horizontal



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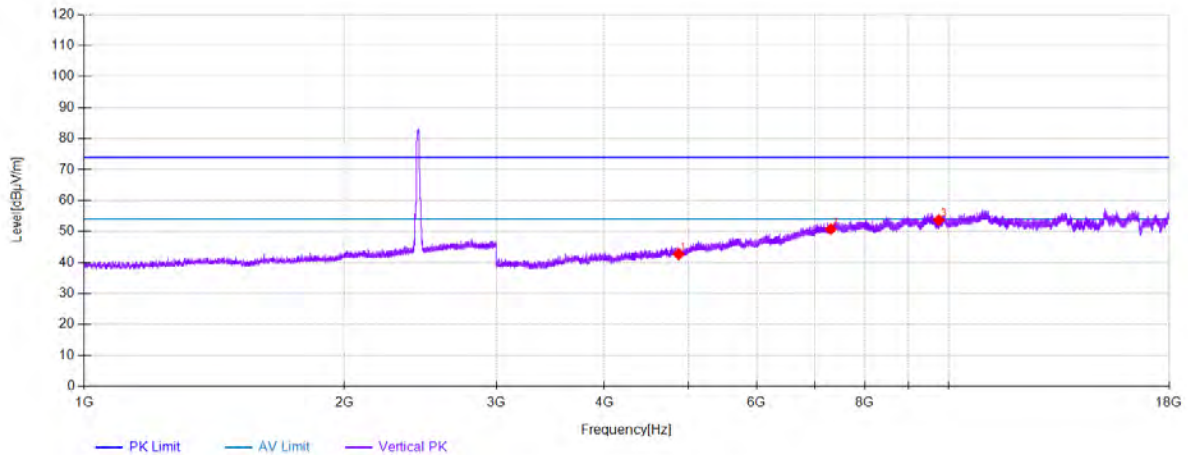
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1	4874	54.84	30.75	-42.90	42.69	74.00	31.31	274	136	Vertical
2	7311	53.16	36.42	-38.81	50.77	74.00	23.23	352	29	Vertical
3	9748	51.48	38.30	-36.04	53.74	74.00	20.26	348	358	Vertical



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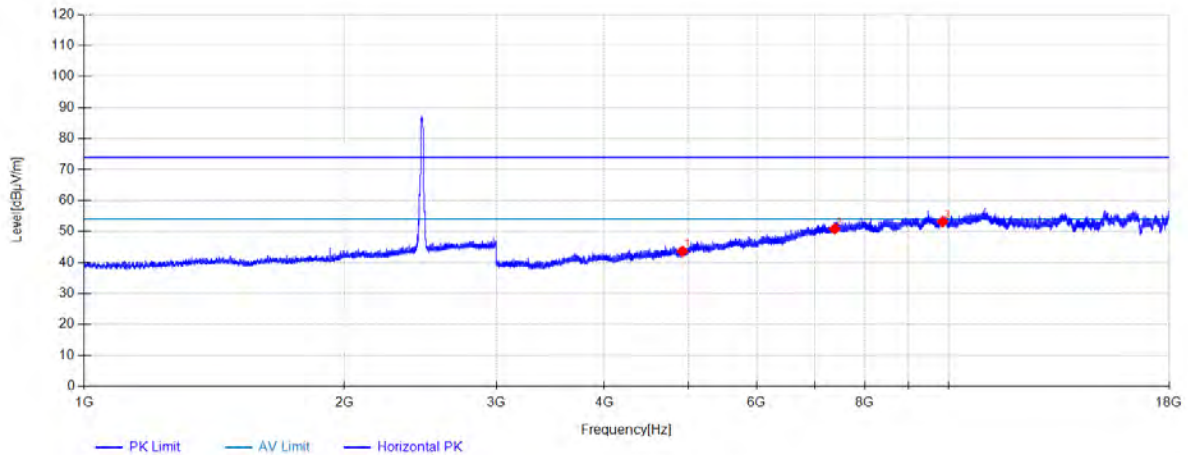
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1	4924	55.56	30.95	-42.84	43.67	74.00	30.33	227	174	Horizontal
2	7386	52.57	36.64	-38.36	50.85	74.00	23.15	165	339	Horizontal
3	9848	50.30	38.21	-35.36	53.15	74.00	20.85	248	2	Horizontal



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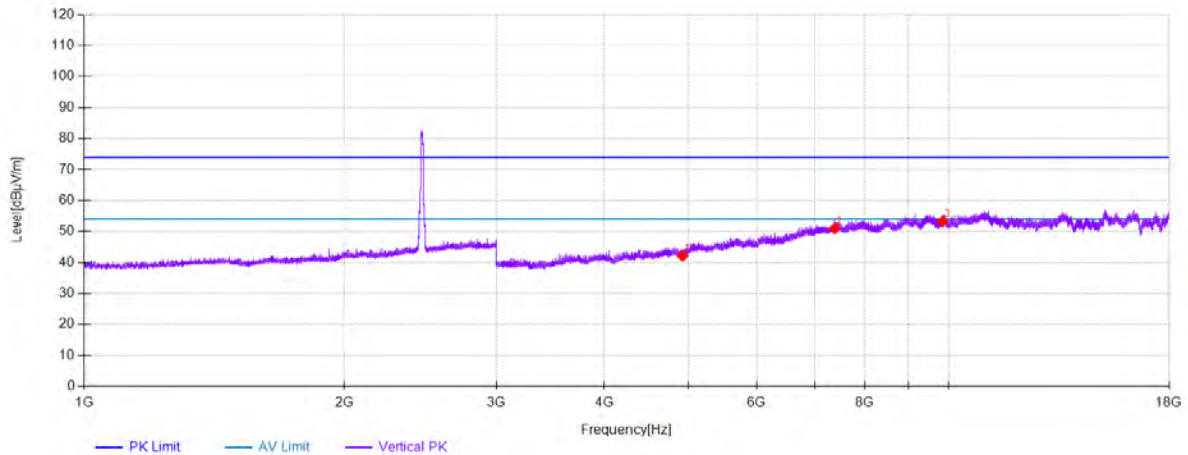
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1	4924	54.06	30.95	-42.84	42.17	74.00	31.83	268	68	Vertical
2	7386	52.63	36.64	-38.36	50.91	74.00	23.09	354	98	Vertical
3	9848	50.47	38.21	-35.36	53.32	74.00	20.68	227	2	Vertical



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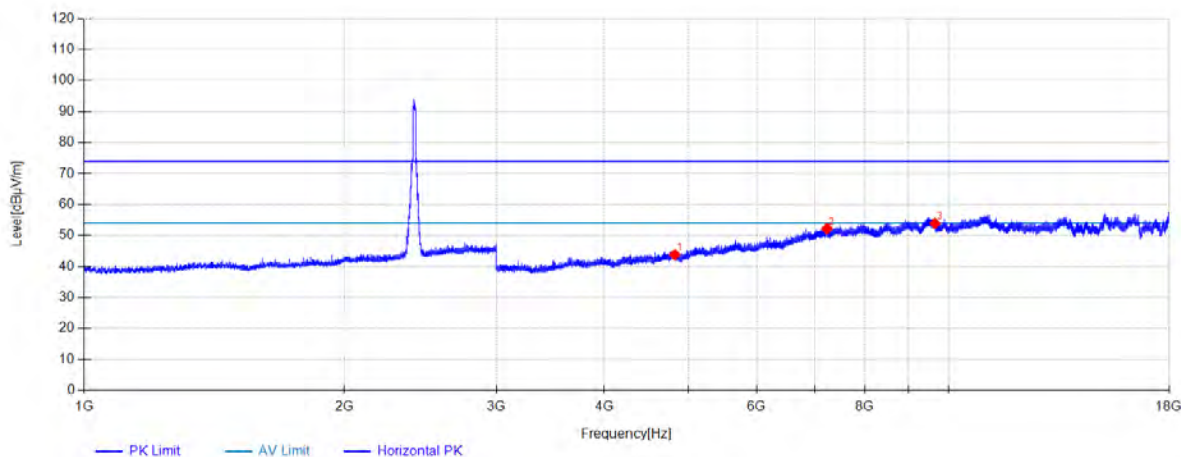
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802.11n20_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824	56.04	30.70	-42.93	43.81	74.00	30.19	274	225	Horizontal
2	7236	54.59	36.38	-38.77	52.20	74.00	21.80	236	138	Horizontal
3	9648	51.78	38.09	-35.97	53.90	74.00	20.10	265	223	Horizontal



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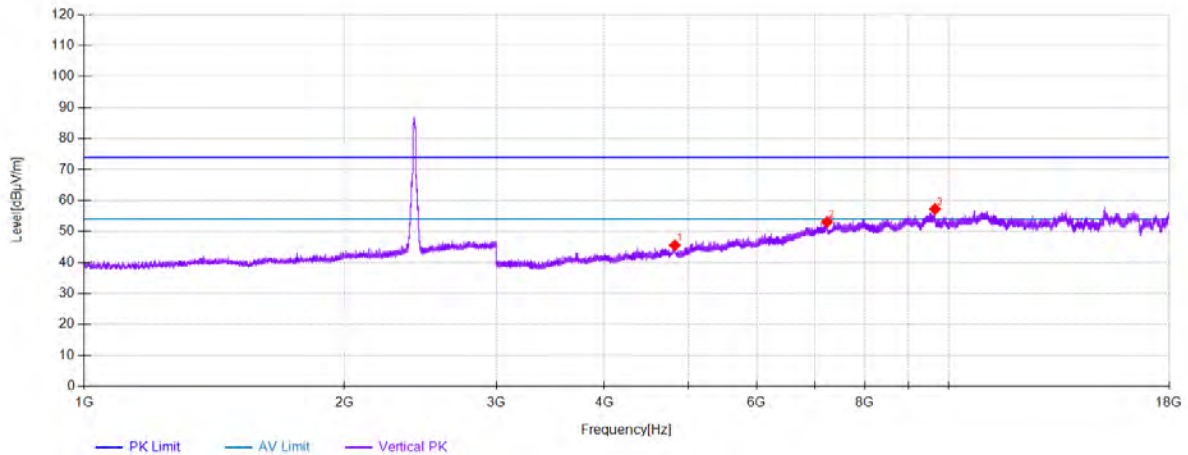
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802.11n20_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824	57.78	30.70	-42.93	45.55	74.00	28.45	236	71	Vertical
2	7236	55.50	36.38	-38.77	53.11	74.00	20.89	279	71	Vertical
3	9648	55.09	38.09	-35.97	57.21	74.00	16.79	265	42	Vertical



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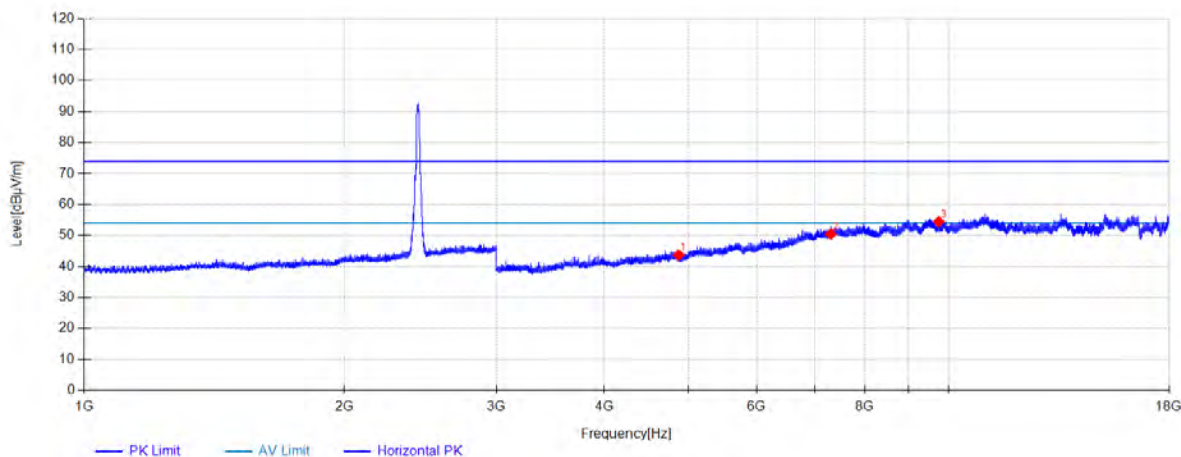
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802.11n20_Channel 6



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874	55.88	30.75	-42.90	43.73	74.00	30.27	274	202	Horizontal
2	7311	52.86	36.42	-38.81	50.47	74.00	23.53	196	183	Horizontal
3	9748	52.20	38.30	-36.04	54.46	74.00	19.54	263	78	Horizontal



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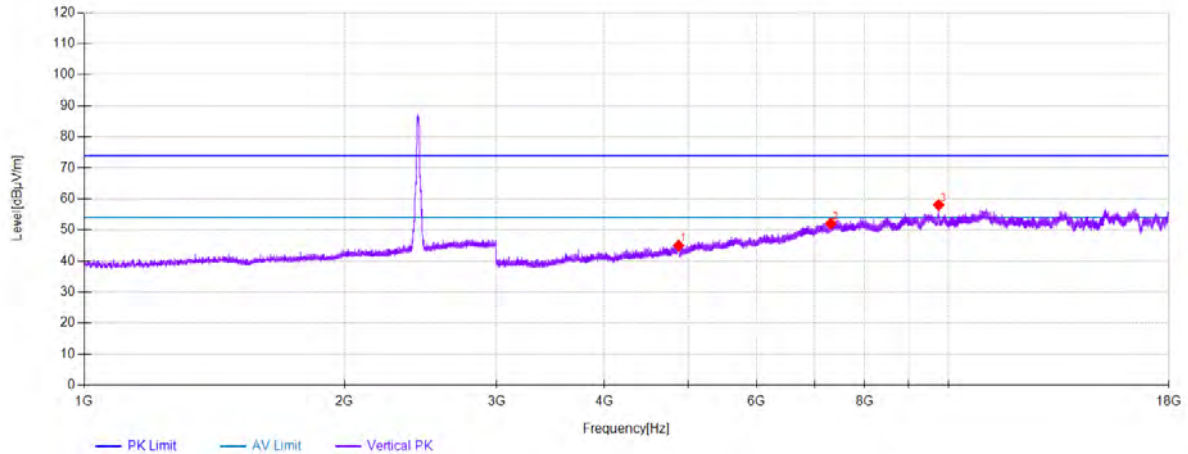
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802.11n20_Channel 6



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874	57.16	30.75	-42.90	45.01	74.00	28.99	352	87	Vertical
2	7311	54.47	36.42	-38.81	52.08	74.00	21.92	348	288	Vertical
3	9745.4698	55.83	38.29	-36.06	58.06	74.00	15.94	336	269	Vertical



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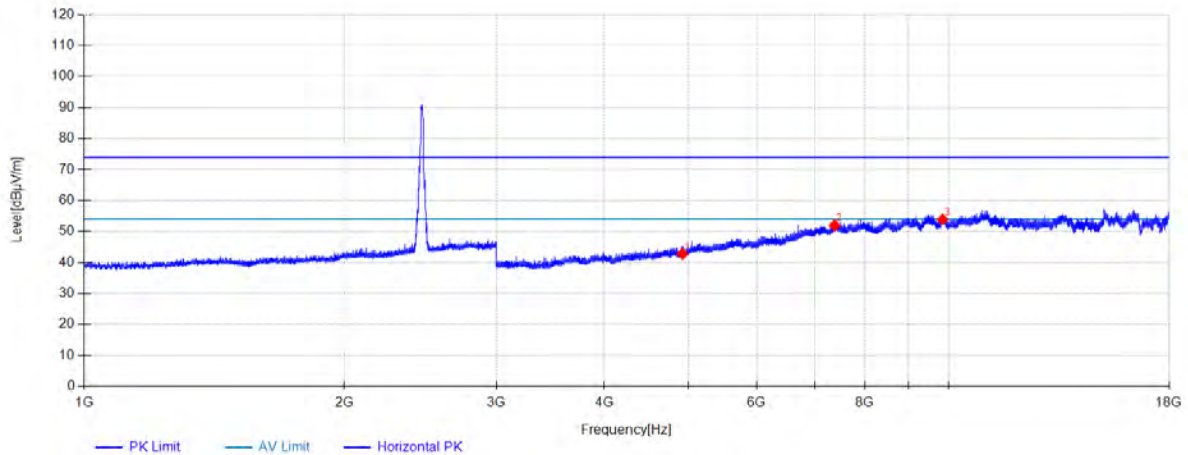
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802.11n20_Channel 11



Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4924	54.71	30.95	-42.84	42.82	74.00	31.18	152	134	Horizontal
2	7386	53.68	36.64	-38.36	51.96	74.00	22.04	236	144	Horizontal
3	9848	51.05	38.21	-35.36	53.90	74.00	20.10	274	106	Horizontal

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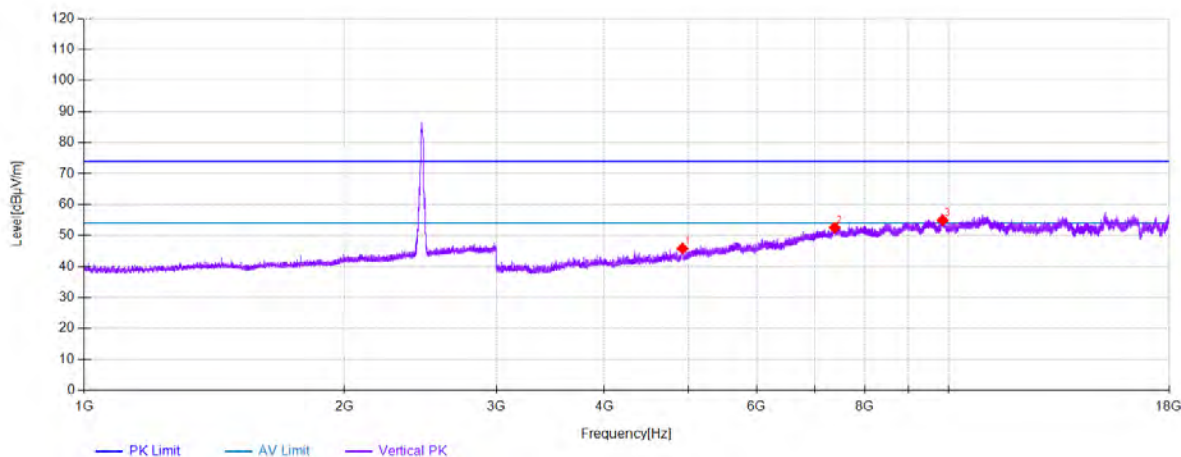
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802.11n20_Channel 11



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4924	57.71	30.95	-42.84	45.82	74.00	28.18	198	77	Vertical
2	7386	54.28	36.64	-38.36	52.56	74.00	21.44	225	270	Vertical
3	9848	52.12	38.21	-35.36	54.97	74.00	19.03	279	270	Vertical

Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:
Level = Reading(dBμV) + AF(dB/m) + Factor(dB):
AF = Antenna Factor(dB/m)
Factor = Cable Factor(dB) - Preamplifier gain(dB)
Margin = Limit(dBμV/m) – Level(dBμV/m)
- All channels have been tested, but only the worst case data displayed in this report.
- Both peak and average measured complies with the limit line, so test result is "PASS"



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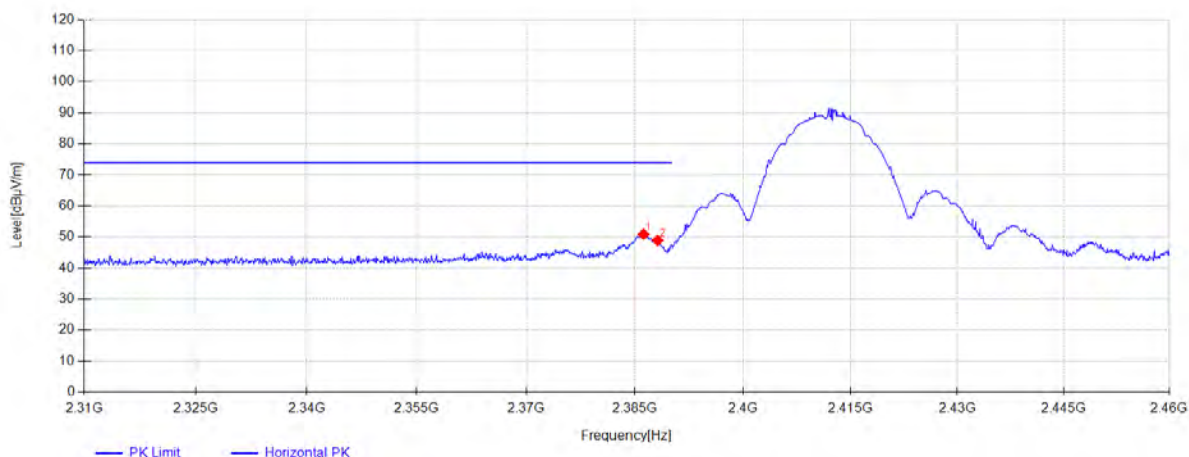
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Restricted bands around fundamental frequency 802.11b_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2386.1631	46.45	27.46	-23.02	50.89	74.00	23.11	174	47	Horizontal
2	2388.1141	44.48	27.45	-23.02	48.91	74.00	25.09	174	47	Horizontal



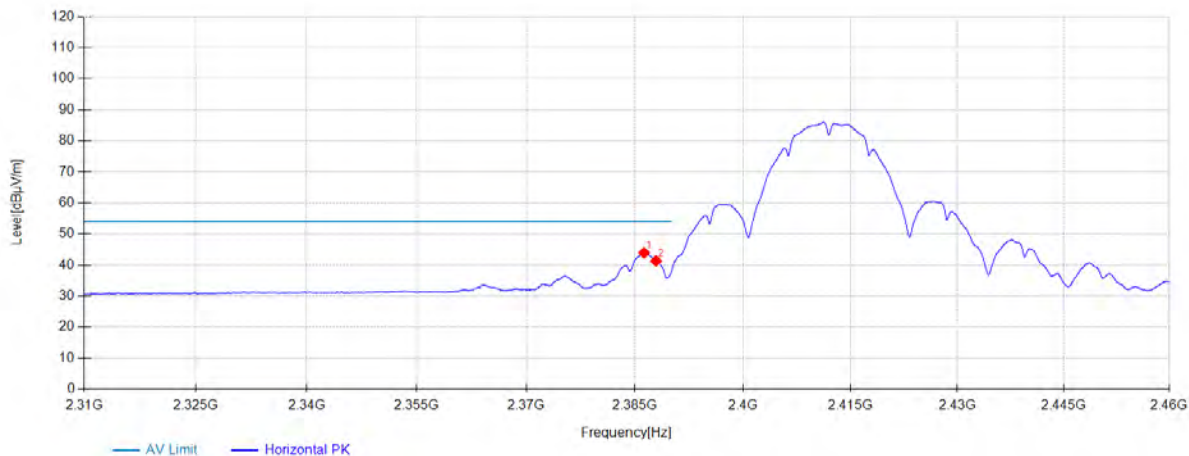
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802.11b_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2386.2381	39.49	27.46	-23.02	43.93	54.00	10.07	174	47	Horizontal
2	2387.8889	36.92	27.45	-23.02	41.35	54.00	12.65	174	47	Horizontal



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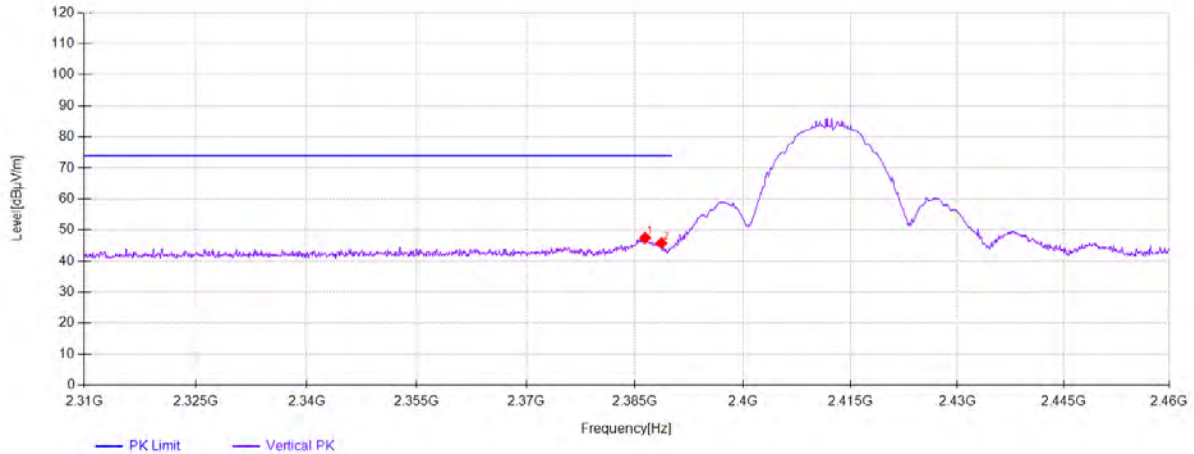
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802.11b_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2386.3882	43.03	27.45	-23.02	47.46	74.00	26.54	252	217	Vertical
2	2388.6393	41.35	27.45	-23.02	45.78	74.00	28.22	252	217	Vertical



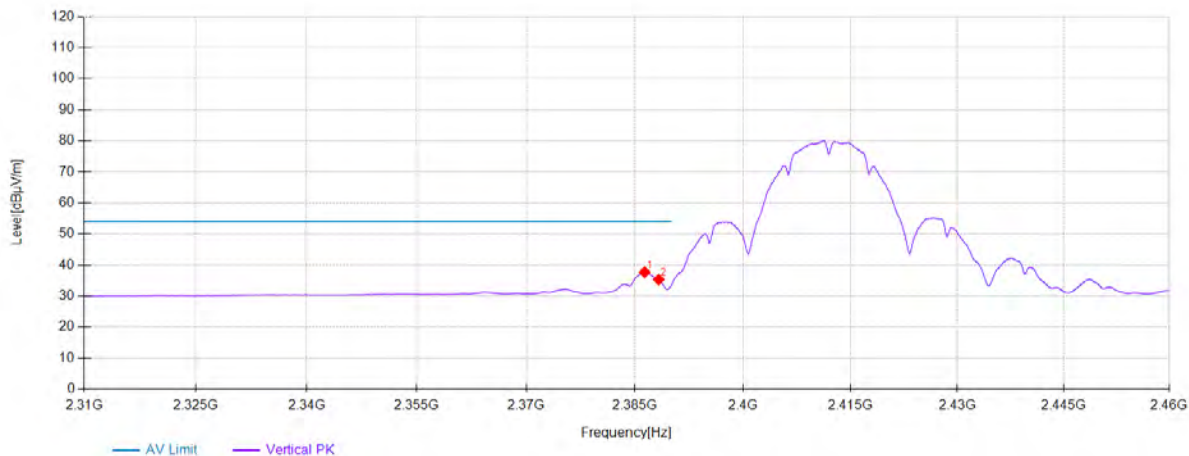
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802.11b_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2386.3132	33.29	27.45	-23.02	37.72	54.00	16.28	252	217	Vertical
2	2388.2641	30.90	27.45	-23.02	35.33	54.00	18.67	252	217	Vertical



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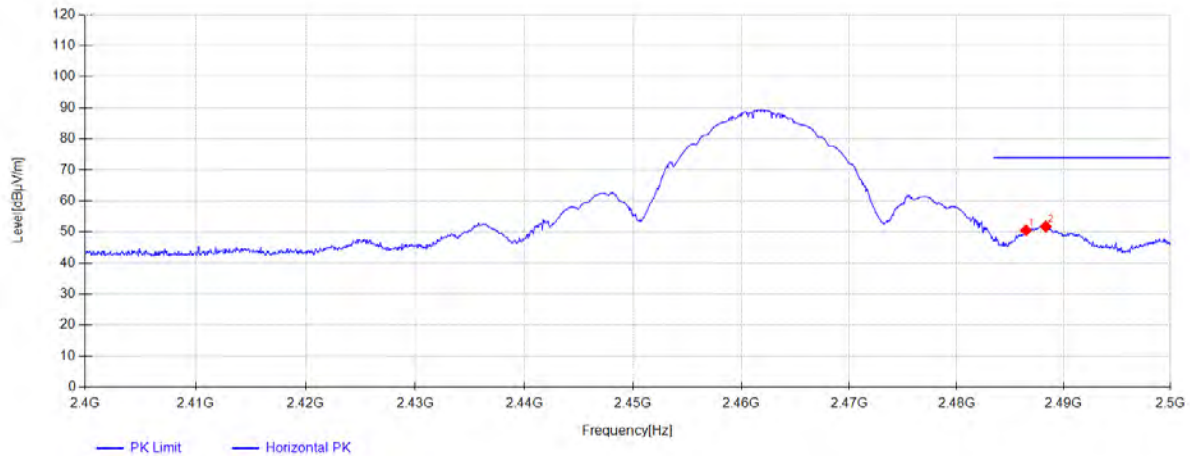
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802.11b_Channel 11



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2486.4932	45.94	27.75	-23.12	50.57	74.00	23.43	168	54	Horizontal
2	2488.3442	47.17	27.75	-23.12	51.80	74.00	22.20	168	54	Horizontal



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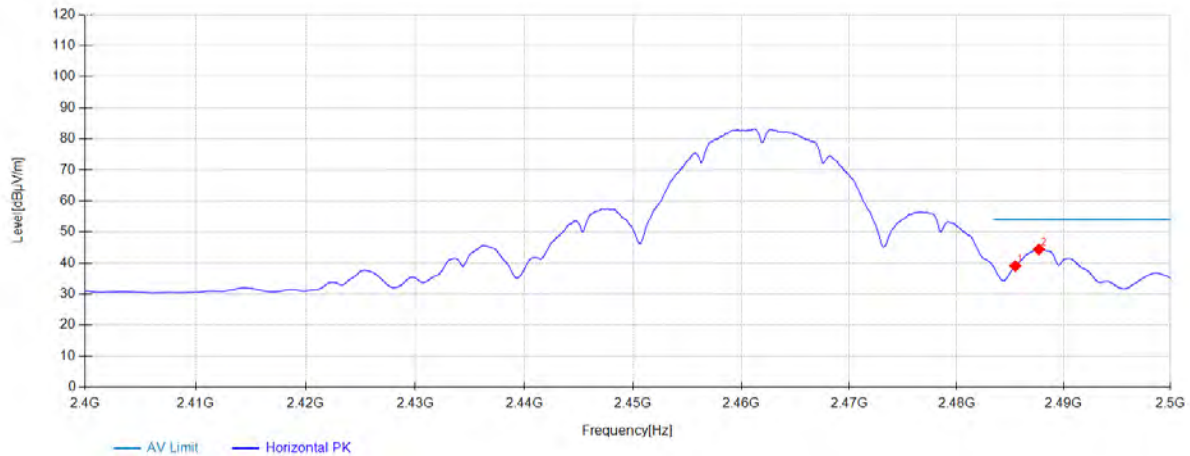
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802.11b_Channel 11



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2485.4927	34.46	27.74	-23.12	39.08	54.00	14.92	168	54	Horizontal
2	2487.6938	39.79	27.75	-23.12	44.42	54.00	9.58	168	54	Horizontal



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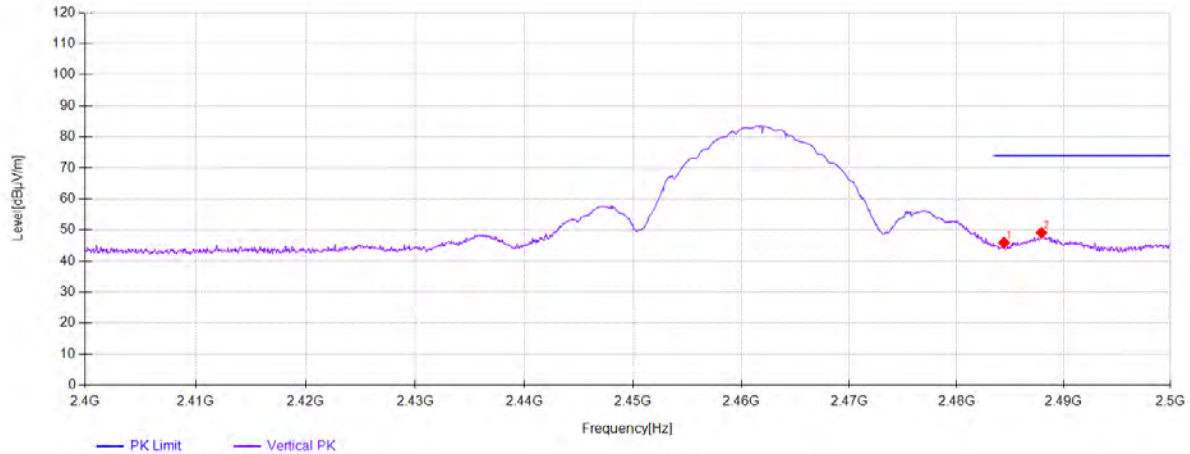
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2484.4422	41.33	27.74	-23.12	45.95	74.00	28.05	275	219	Vertical
2	2487.944	44.49	27.75	-23.12	49.12	74.00	24.88	275	219	Vertical



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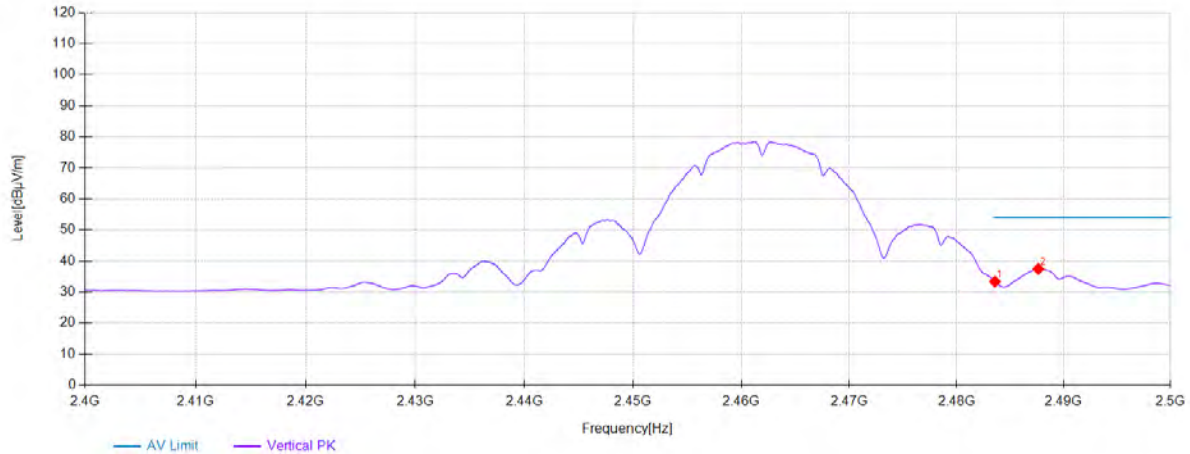
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Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.5918	28.77	27.73	-23.12	33.38	54.00	20.62	275	219	Vertical
2	2487.6438	32.82	27.75	-23.12	37.45	54.00	16.55	275	219	Vertical



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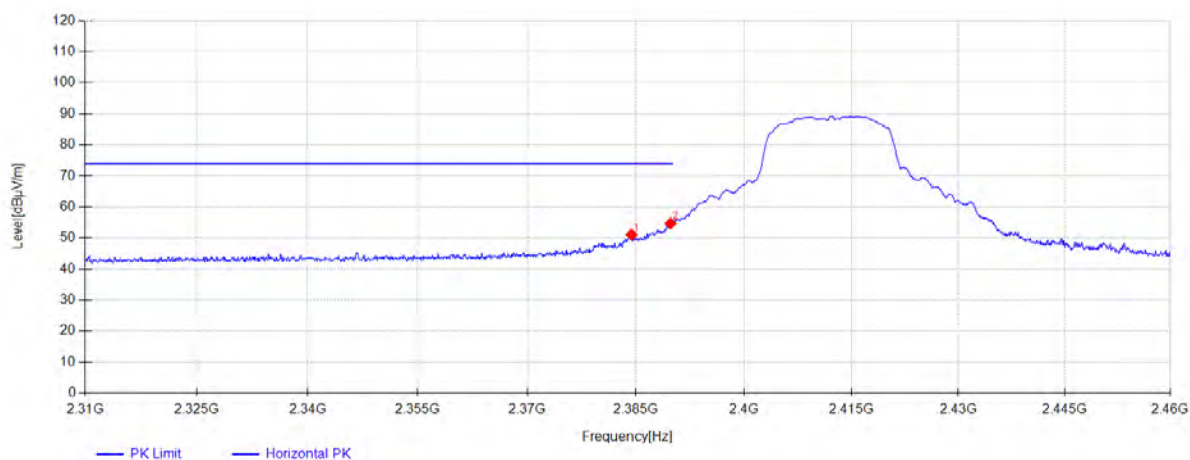
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2384.3622	46.67	27.46	-23.03	51.10	74.00	22.90	105	67	Horizontal
2	2389.7649	50.27	27.44	-23.02	54.69	74.00	19.31	105	67	Horizontal



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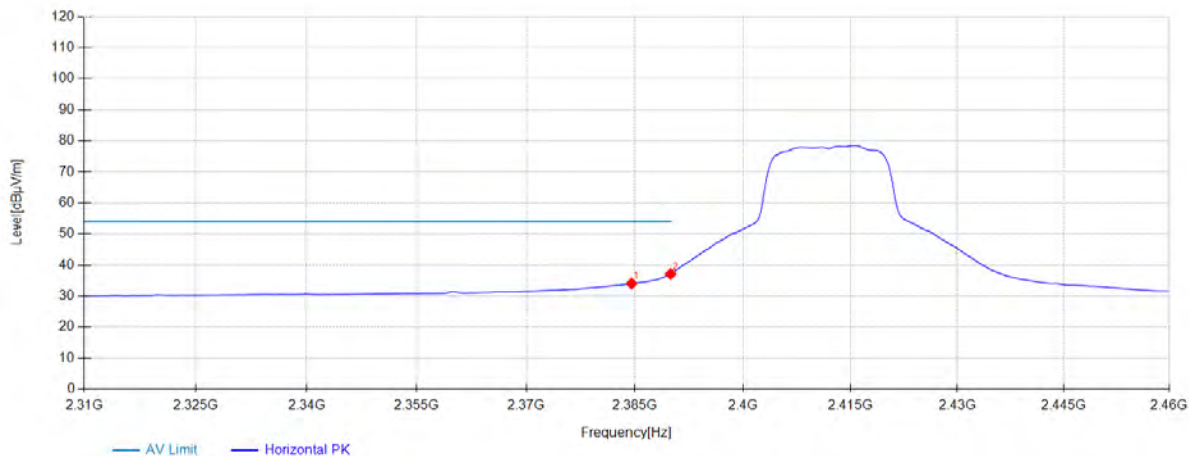
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NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2384.5123	29.60	27.46	-23.02	34.04	54.00	19.96	105	67	Horizontal
2	2389.915	32.70	27.44	-23.02	37.12	54.00	16.88	105	67	Horizontal

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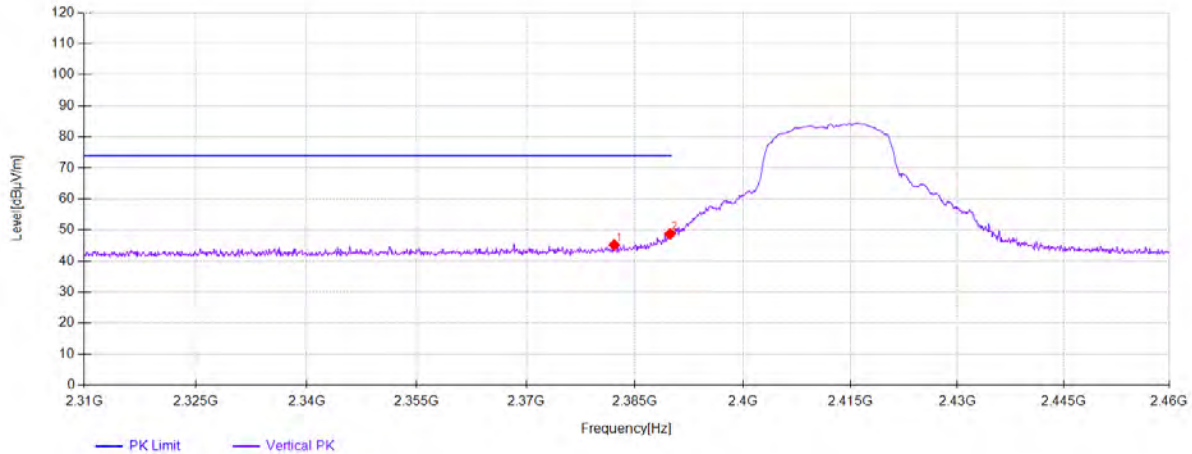
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2382.1111	40.76	27.47	-23.03	45.20	74.00	28.80	252	220	Vertical
2	2389.8399	44.33	27.44	-23.02	48.75	74.00	25.25	252	220	Vertical



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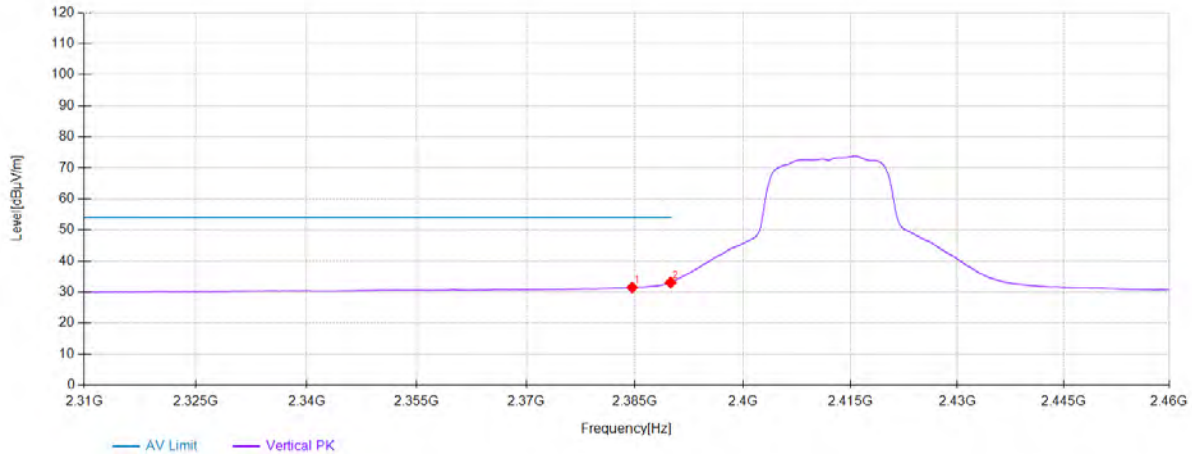
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2384.5873	27.04	27.46	-23.02	31.48	54.00	22.52	252	220	Vertical
2	2389.915	28.67	27.44	-23.02	33.09	54.00	20.91	252	220	Vertical



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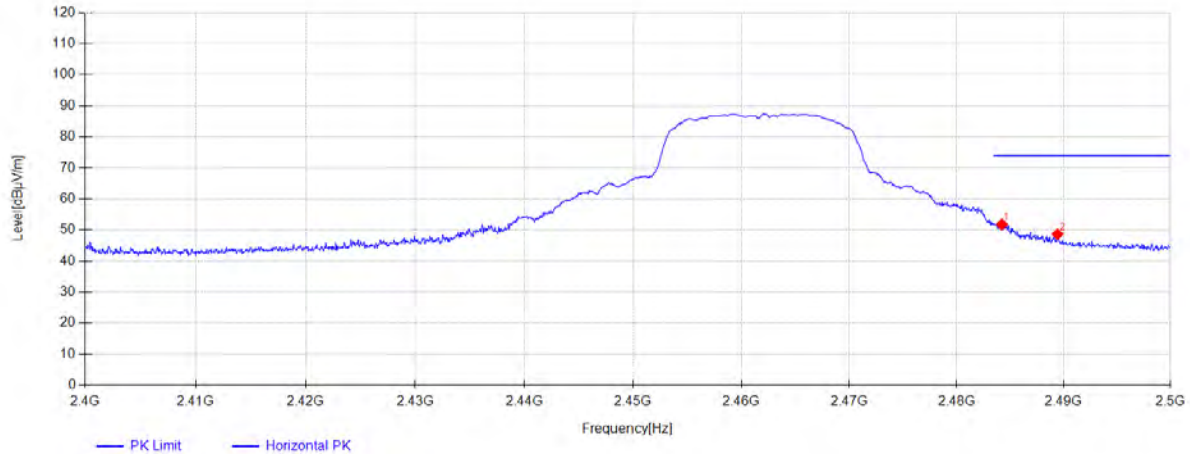
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802.11g_Channel 11



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2484.2421	47.17	27.74	-23.12	51.79	74.00	22.21	102	46	Horizontal
2	2489.4447	44.03	27.76	-23.13	48.66	74.00	25.34	102	46	Horizontal



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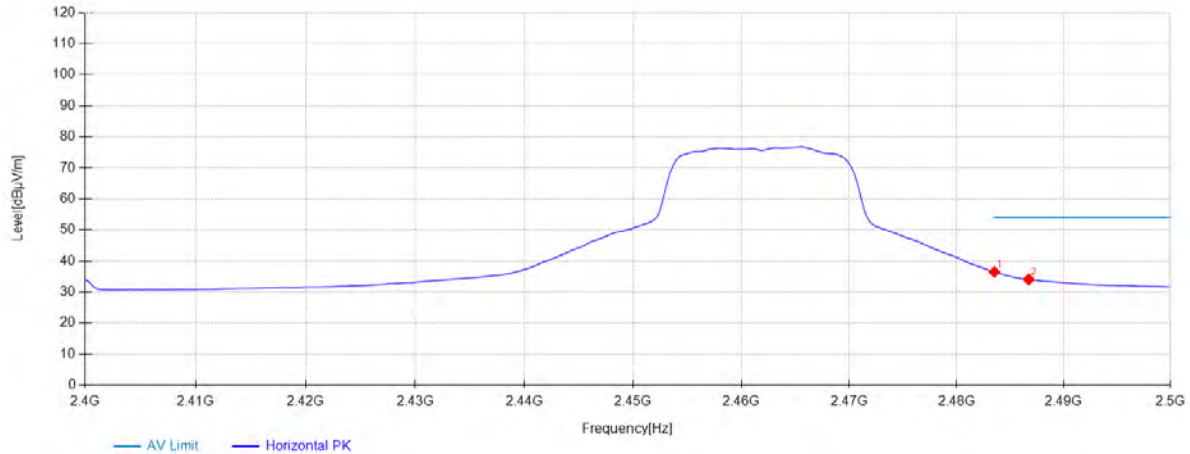
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.5418	31.88	27.73	-23.12	36.49	54.00	17.51	102	46	Horizontal
2	2486.7434	29.45	27.75	-23.12	34.08	54.00	19.92	102	46	Horizontal



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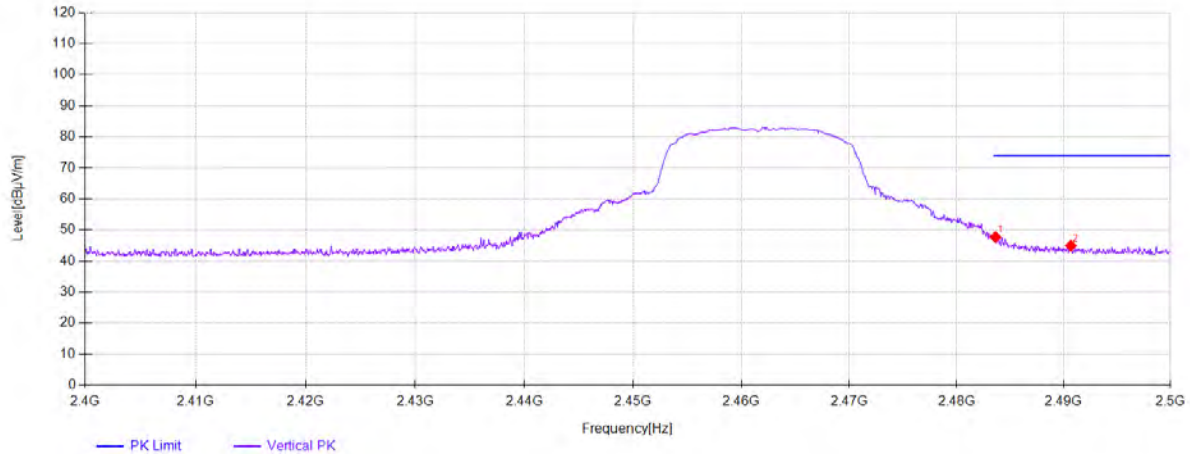
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1	2483.6418	43.09	27.73	-23.12	47.70	74.00	26.30	277	233	Vertical
2	2490.6953	40.31	27.76	-23.13	44.94	74.00	29.06	277	233	Vertical



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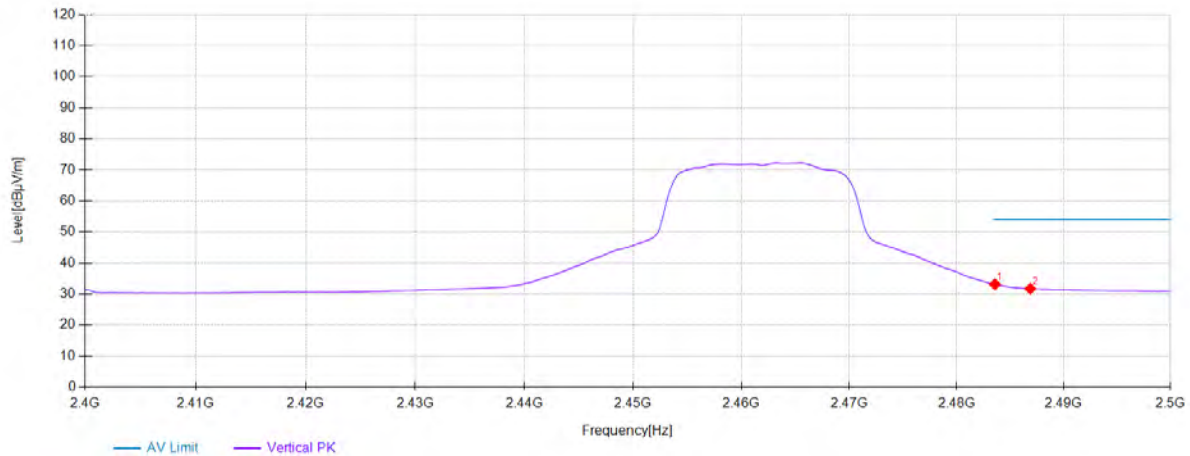
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802.11g_Channel 11



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.5918	28.56	27.73	-23.12	33.17	54.00	20.83	277	233	Vertical
2	2486.8934	27.11	27.75	-23.12	31.74	54.00	22.26	277	233	Vertical



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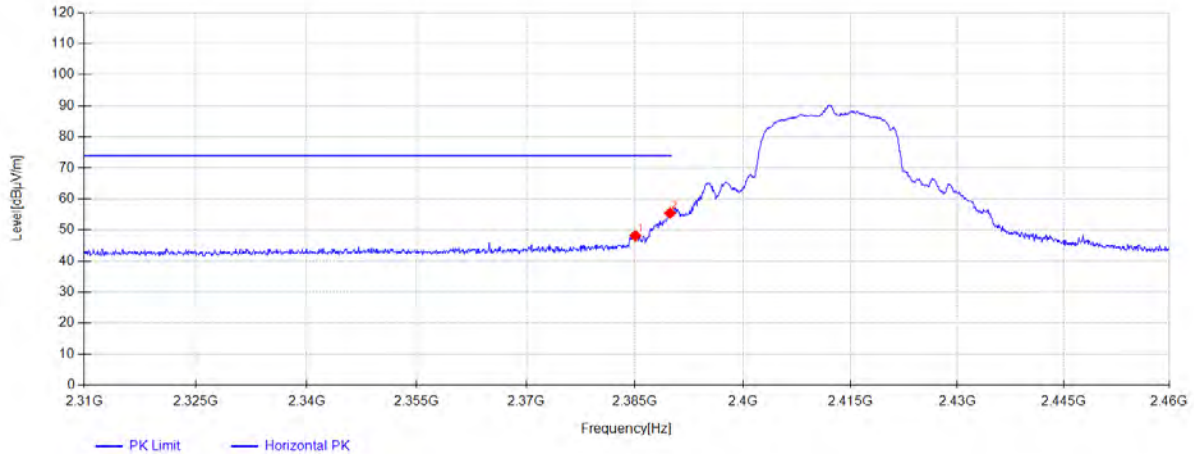
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802.11n20_Channel 1



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2385.0375	43.72	27.46	-23.02	48.16	74.00	25.84	105	73	Horizontal
2	2389.8399	51.01	27.44	-23.02	55.43	74.00	18.57	105	73	Horizontal



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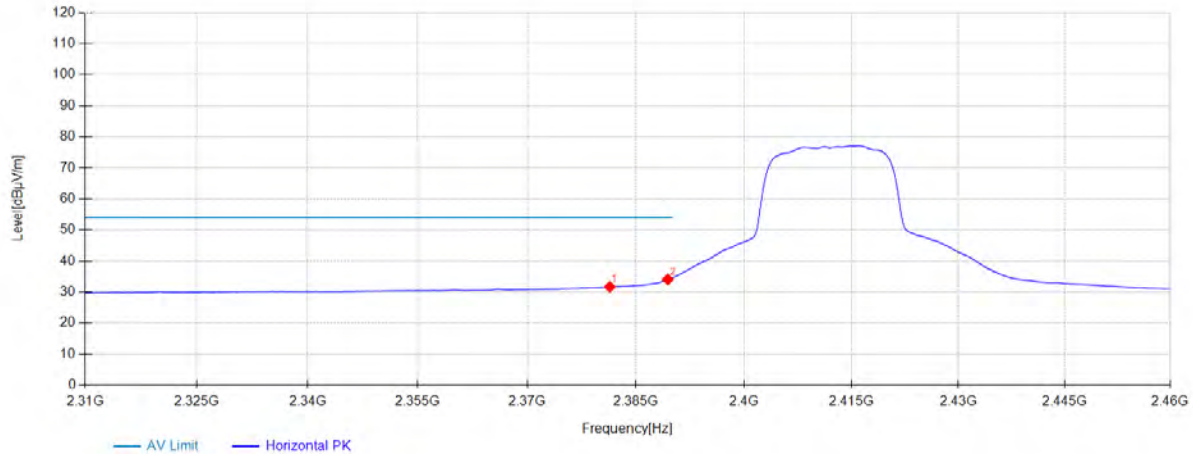
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Final Data List

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1	2381.3607	27.24	27.47	-23.03	31.68	54.00	22.32	105	73	Horizontal
2	2389.3897	29.67	27.44	-23.02	34.09	54.00	19.91	105	73	Horizontal



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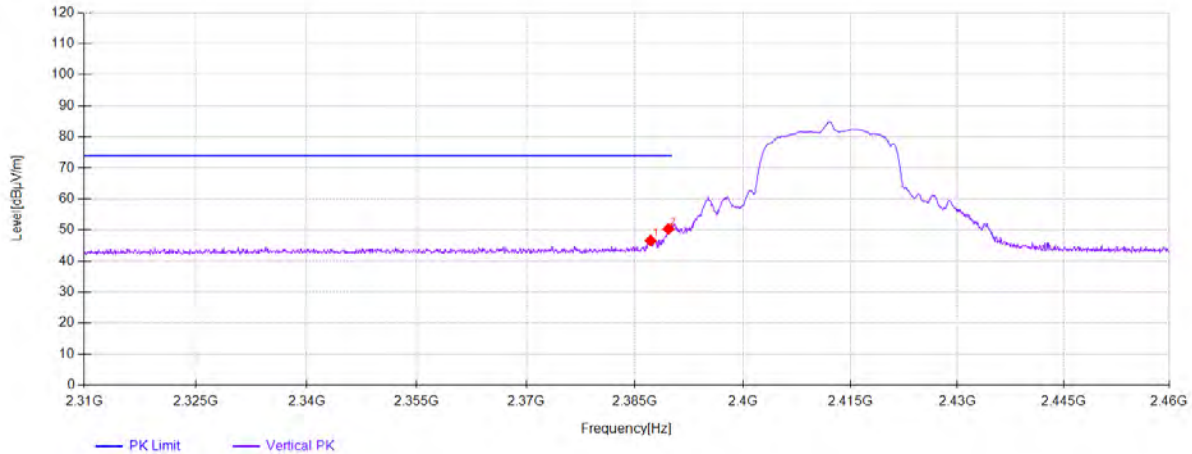
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2387.1386	42.17	27.45	-23.02	46.60	74.00	27.40	398	121	Vertical
2	2389.6148	45.90	27.44	-23.02	50.32	74.00	23.68	398	121	Vertical



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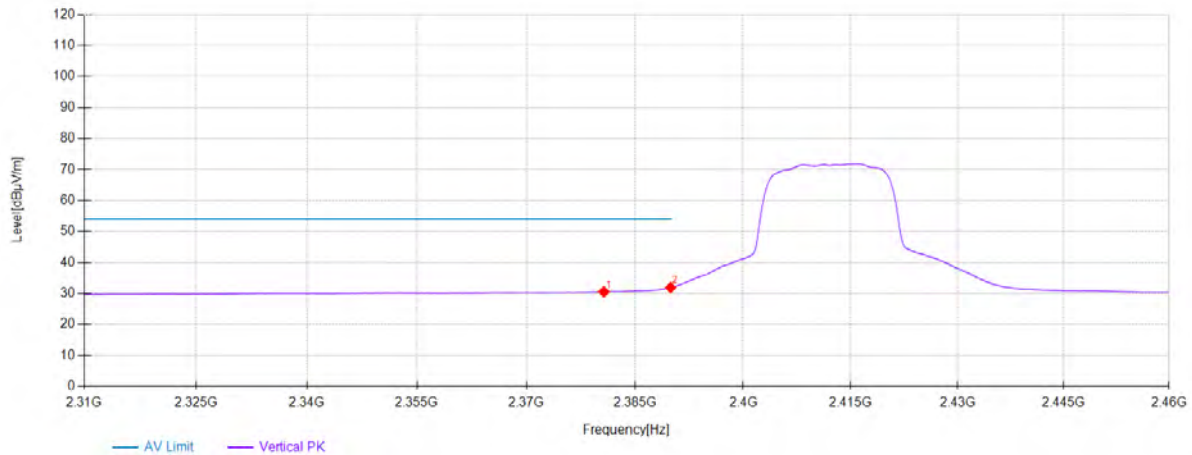
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Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2380.6853	26.10	27.48	-23.03	30.55	54.00	23.45	398	121	Vertical
2	2389.915	27.48	27.44	-23.02	31.90	54.00	22.10	398	121	Vertical

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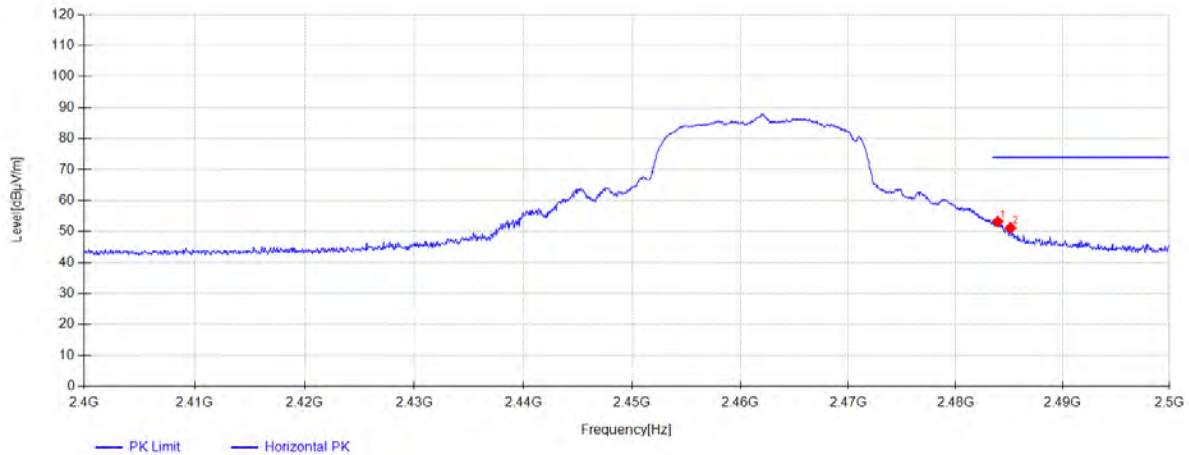
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Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.942	48.60	27.74	-23.12	53.22	74.00	20.78	105	72	Horizontal
2	2485.1426	46.57	27.74	-23.12	51.19	74.00	22.81	105	72	Horizontal



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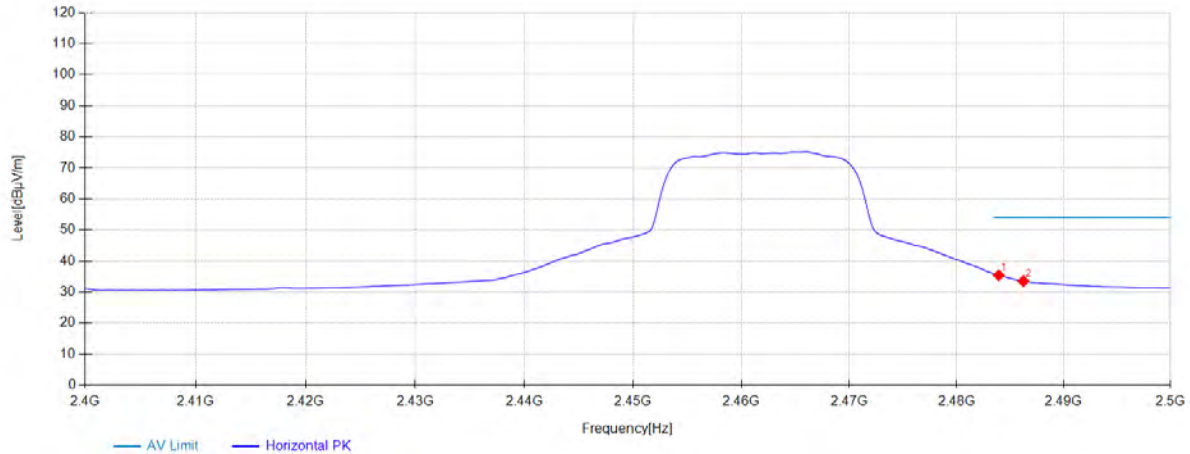
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.942	30.83	27.74	-23.12	35.45	54.00	18.55	105	72	Horizontal
2	2486.2431	28.92	27.74	-23.12	33.54	54.00	20.46	105	72	Horizontal



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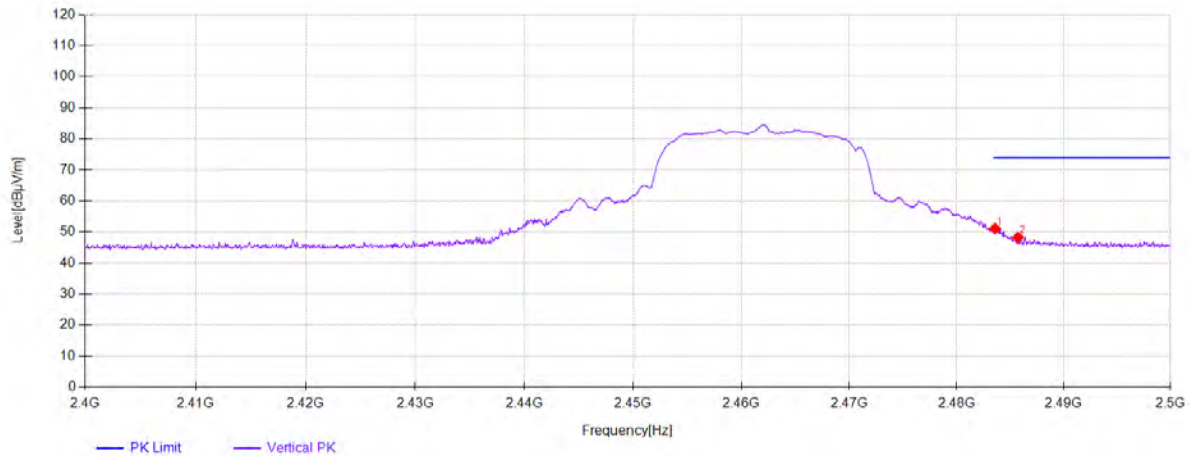
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF[dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2483.5918	46.48	27.73	-23.12	51.09	74.00	24.91	385	119	Vertical
2	2485.7429	43.67	27.74	-23.12	48.29	74.00	27.71	385	119	Vertical



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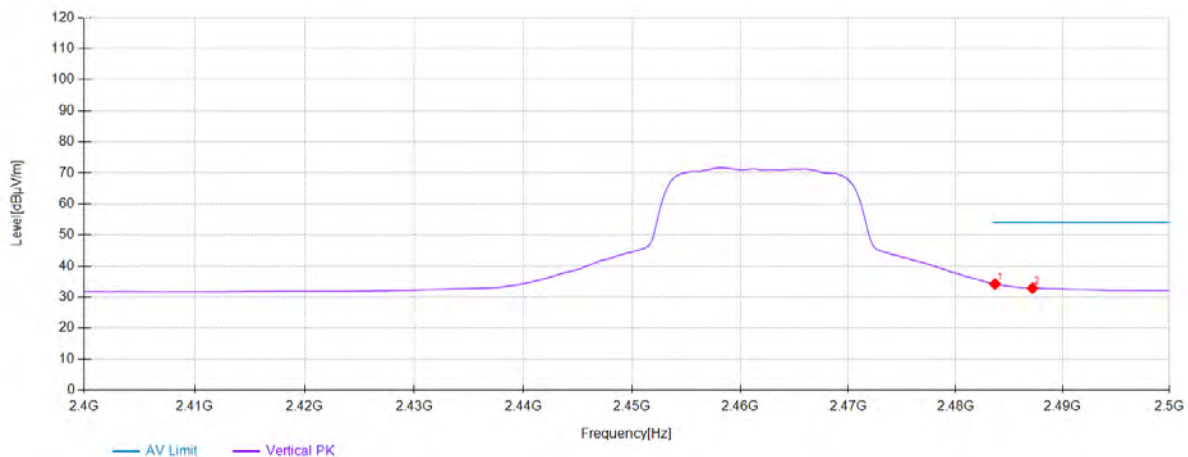
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1	2483.6918	29.58	27.73	-23.12	34.19	54.00	19.81	385	119	Vertical
2	2487.1936	28.23	27.75	-23.12	32.86	54.00	21.14	385	119	Vertical

Remark:

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

Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

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

Margin = Limit(dBμV/m) – Level(dBμV/m)

- 2) Both peak and average measured complies with the limit line, so test result is "PASS"

---End of Report---



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