

Report No.: SEWM2305000166RG06
 Rev.: 01
 Page: 1 of 830

TEST REPORT

Application No.: SEWM2305000166RG
Applicant: vivo Mobile Communication Co., Ltd.
Address of Applicant: No.1, vivo Road, Chang'an, Dongguan,Guangdong,China
Manufacturer: vivo Mobile Communication Co., Ltd.
Address of Manufacturer: No.1, vivo Road, Chang'an, Dongguan,Guangdong,China
EUT Description: Mobile Phone
Model No.: V2250
Trade Mark: vivo
FCC ID: 2AUCY-V2250
Standards: FCC 47 CFR Part 2, Subpart J
 FCC 47 CFR Part 15, Subpart E
Date of Receipt: 2023/05/12
Date of Test: 2023/05/23 to 2023/06/05
Date of Issue: 2023/06/05

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:


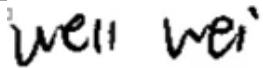
Panta Sun
 Wireless Laboratory Manager



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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/06/05		Original

Prepared By		 <hr/> (Ives Cheng) / Test Engineer
Checked By		 <hr/> (Well Wei) / Reviewer



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2 Test Summary

Test Item	Band ^[1]	FCC rules No.	Test Requirements	Test Result	Result
Antenna Requirement	--	15.203/15.407(a)	--	Clause 4.1	PASS
26dB Emission Bandwidth	Band I	15.407(a)(1)	No limit.	Clause 4.5	For Report Purpose
	Band II-A	15.407(a)(2)			
	Band II-C	15.407(a)(2)			
6dB Emission Bandwidth	Band III	15.407(e)	≥ 500 kHz.	Clause 4.6	PASS
99% Occupied Bandwidth	Band I	KDB 789033 D02§ D	No limit.	Clause 4.7	For Report Purpose
	Band II-A				
	Band II-C				
	Band III				
Duty Cycle	Band I Band II-A Band II-C Band III	--	No limit.	Clause 4.3	For Report Purpose
Maximum Conducted Output Power	Band I	15.407(a)(iv)	< 250mW	Clause 4.4	PASS
	Band II-A	15.407(a)(2)	<MIN{250mW, 11dBm+ 10*lg(EBW)}		
	Band II-C				
	Band III	15.407(a)(3)	< 1W		
Maximum Power Spectral Density	Band I	15.407(a)(iv)	<11dBm/MHz	Clause 4.8	PASS
	Band II-A	15.407(a)(2)	<11dBm/MHz		
	Band II-C				
	Band III	15.407(a)(3)	<30dBm/500KHz		
Radiated Spurious Emissions	Band I	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).	Clause 4.9	PASS
	Band II-A	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).		PASS
	Band II-C	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).		PASS
	Band III	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP) F≥1GHz & out-restricted:(PK)		PASS



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			All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. F≥1GHz & in-restricted: §15.209 limit (AV&PK).		
Restricted bands around fundamental frequency	Band I Band II-A Band II-C Band III	15.407(b) 15.205/15.209	---	Clause 4.10	PASS
AC Power Line Conducted Emissions	Band I Band II-A Band II-C Band III	15.207	---	Clause 4.2	PASS
Dynamic Frequency Selection	Band II-A Band II-C	15.407	Channel Move Time:10 Seconds	Clause 4.11	PASS
Frequency Stability	Band I Band II-A Band II-C Band III	15.407(g)	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual	N/A	N/A
<p>Note 1: Band I: 5150-5250MHz Band II-A: 5250-5350MHz Band II-C: 5470-5725MHz Band III: 5725-5850MHz</p>					



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Contents

1	Version	2
2	Test Summary	3
3	General Information	6
3.1	Details of Client	6
3.2	Test Location	6
3.3	Test Facility	6
3.4	General Description of EUT	7
3.5	Test Environment and Mode	10
3.6	Description of Support Units	10
3.7	Worst-case configuration and mode	10
4	Test results and Measurement Data	11
4.1	Antenna Requirement	11
4.2	AC Power Line Conducted Emissions	13
4.3	Duty Cycle	17
4.4	Conducted Output Power	18
4.5	26dB Emission Bandwidth	19
4.6	6dB Emission Bandwidth	20
4.7	99% Occupied Bandwidth	21
4.8	Power Spectral Density	22
4.9	Radiated Spurious Emissions	23
4.10	Restricted bands around fundamental frequency	25
4.11	Dynamic Frequency Selection	27
4.11.1	DFS Overview	27
4.11.2	DFS Detection Thresholds	28
4.11.3	RADAR TEST WAVEFORMS	29
4.11.4	Response Requirements	31
5	Measurement Uncertainty (95% confidence levels, k=2)	32
6	Equipment List	33
7	Photographs - Setup Photos	35



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3 General Information

3.1 Details of Client

Applicant:	vivo Mobile Communication Co., Ltd.
Address of Applicant:	No.1, vivo Road, Chang'an, Dongguan,Guangdong,China
Manufacturer:	vivo Mobile Communication Co., Ltd.
Address of Manufacturer:	No.1, vivo Road, Chang'an, Dongguan,Guangdong,China

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Ives Cheng, Tizzy Song

3.3 Test Facility

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

<ul style="list-style-type: none"> • A2LA (Certificate No. 6336.01) SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01. • Innovation, Science and Economic Development Canada SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory. CAB identifier: CN0120. IC#: 27594. • FCC –Designation Number: CN1312 SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory. Designation Number: CN1312. Test Firm Registration Number: 717327
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3.4 General Description of EUT

EUT Description:	Mobile Phone	
Model No.:	V2250	
Trade Mark:	vivo	
Hardware Version:	MP_0.1	
Software Version:	PD2283F_EX_A_13.0.6.14.W30	
IMEI:	RF Conducted	866242060182863
	RSE & AC power line	868007060199631
WLAN Mode Supported:	802.11a:	20 MHz channel bandwidth
	802.11n:	20 MHz / 40 MHz channel bandwidth
	802.11ac:	20 MHz / 40 MHz / 80 MHz / 160 MHz channel bandwidth
	802.11ax:	20 MHz / 40 MHz / 80 MHz / 160 MHz channel bandwidth
Operation Frequency:	5150MHz to 5250MHz 5250MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz	
Modulation Type:	802.11a:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11ac:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
	802.11ax:	OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Channel Spacing:	20MHz:	802.11a/n(HT20)/ac(VHT20)/ax(HE20)
	40MHz:	802.11n(HT40)/ac(VHT40)/ax(HE40)
	80MHz:	802.11ac(VHT80)/ax(HE80)
	160MHz:	802.11ac(VHT160)/ax(HE160)
Antenna Type:	IFA Antenna	
Antenna Gain:	5150MHz to 5250MHz: -2.05dBi(Ant22); -4.1dBi(Ant24); 5250MHz to 5350MHz: -0.81dBi(Ant22); -2.52dBi(Ant24); 5470MHz to 5725MHz: 0.2dBi(Ant22); -1.21dBi(Ant24); 5725MHz to 5850MHz: 0.41dBi(Ant22); -0.85dBi(Ant24);	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
Smart System:	<input checked="" type="checkbox"/> SISO	802.11a/n/ac/ax
	<input checked="" type="checkbox"/> MIMO	802.11n/ac/ax: 2Tx & 2Rx
	<input checked="" type="checkbox"/> Diversity	802.11a: 2Tx & 2Rx
TPC Function:	<input type="checkbox"/> Support, <input checked="" type="checkbox"/> Not Support	



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DFS Function:	<input type="checkbox"/> Master	<input checked="" type="checkbox"/> Slave without radar detection
	<input type="checkbox"/> Slave with radar detection	
RF Cable:	1.5dB	
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.		

Remark: In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:		
Frequency range over which device operates	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

For UNII Band I:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5180
	The Middle channel	5200
	The Highest channel	5240
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac/ax 80MHz	The Middle channel	5210

For UNII Band II-A:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5260
	The Middle channel	5280
	The Highest channel	5320
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac/ax 80MHz	The Middle channel	5290
IEEE 802.11ac/ax 160MHz	The Middle channel	5250



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For UNII Band II-C:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5510
	The Middle channel	5550
	The Highest channel	5670
IEEE 802.11ac/ax 80MHz	The Middle channel	5530

For UNII Band III:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5825
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac/ax 80MHz	The Middle channel	5775

Frequency Band	Channel	Freq.(MHz)	Channel	Freq.(MHz)
Straddle Channel	144 ^[1]	5720	142 ^[2]	5710
	138 ^[3]	5690		

Note:

1. The above Frequency and Channel were 802.11a, 802.11n HT20, 802.11ac VHT20 and 802.11ax HE20.
2. The above Frequency and Channel were 802.11n HT40, 802.11ac VHT40 and 802.11ax HE40.
3. The above Frequency and Channel were 802.11ac VHT80 and 802.11ax HE80.



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3.5 Test Environment and Mode

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	3.91
Remark: NV: Normal Voltage NT: Normal Temperature		

3.6 Description of Support Units

Description	Manufacturer	Model No.
Router	ASUS	GT-AXE11000 (FCC ID MSQ-RTAXJF00)

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	CDD/MIMO - Data Rate
802.11a	6 Mbps	12 Mbps
802.11n (HT 20)	MCS0 (6.5 Mbps)	MCS0 (13 Mbps)
802.11n (HT 40)	MCS0 (13.5 Mbps)	MCS0 (27 Mbps)
802.11ac (VHT 20)	MCS0 (6.5 Mbps)	MCS0 (13 Mbps)
802.11ac (VHT 40)	MCS0 (13.5 Mbps)	MCS0 (27 Mbps)
802.11ac (VHT 80)	MCS0 (29.3 Mbps)	MCS0 (58.5 Mbps)
802.11ac (VHT 160)	MCS0 (58.5 Mbps)	MCS0 (117 Mbps)
802.11ax (HE 20)	MCS0 (8 Mbps)	MCS0 (16 Mbps)
802.11ax (HE 40)	MCS0 (16 Mbps)	MCS0 (32 Mbps)
802.11ax (HE 80)	MCS0 (34 Mbps)	MCS0 (68 Mbps)
802.11ax (HE 160)	MCS0 (68 Mbps)	MCS0 (136 Mbps)



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4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15 Section 15.203
<p>The antenna is IFA Antenna and no consideration of replacement. The best case gain of the antenna is 5150MHz to 5250MHz: -2.05dBi(Ant22); -4.1dBi(Ant24);* 5250MHz to 5350MHz: -0.81dBi(Ant22); -2.52dBi(Ant24);* 5470MHz to 5725MHz: 0.2dBi(Ant22); -1.21dBi(Ant24);* 5725MHz to 5850MHz: 0.41dBi(Ant22); -0.85dBi(Ant24);*</p> <p><i>*Note:</i> <i>The antenna gain are derived from the gain information report provided by the manufacturer.</i></p> <p><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></p>	



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Cyclic Delay Diversity (CDD) System:

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,
 $Array\ Gain = 10 \log(N_{ANT}/N_{SS}=1) \text{ dB}$.
- For power measurements on IEEE 802.11 devices:
 $Array\ Gain = 0 \text{ dB}$ (i.e., no array gain) for $N_{ANT} \leq 4$;

For power, the directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The Power and PSD limit should be modified if the directional gain of eut is over 6dbi.

The EUT supports CDD System.

Unequal antenna gain:

Operation Frequency	ANT Gain22 (dBi)	ANT Gain24 (dBi)	Directional gain For Power (dBi)	Directional gain For PSD (dBi)	Power Limit Reduction (dBm)	PSD Limit Reduction (dBm)
5150MHz to 5250MHz	-2.05	-4.1	-2.05	0.00	0	0
5250MHz to 5350MHz	-0.81	-2.52	-0.81	1.39	0	0
5470MHz to 5725MHz	0.2	-1.21	0.2	2.54	0	0
5725MHz to 5850MHz	0.41	-0.85	0.41	2.81	0	0

5150MHz to 5250MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

5250MHz to 5350MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

5470MHz to 5725MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

5725MHz to 5850MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0



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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15 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:	<ol style="list-style-type: none"> 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 C63.10-2020 on conducted measurement. 		



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



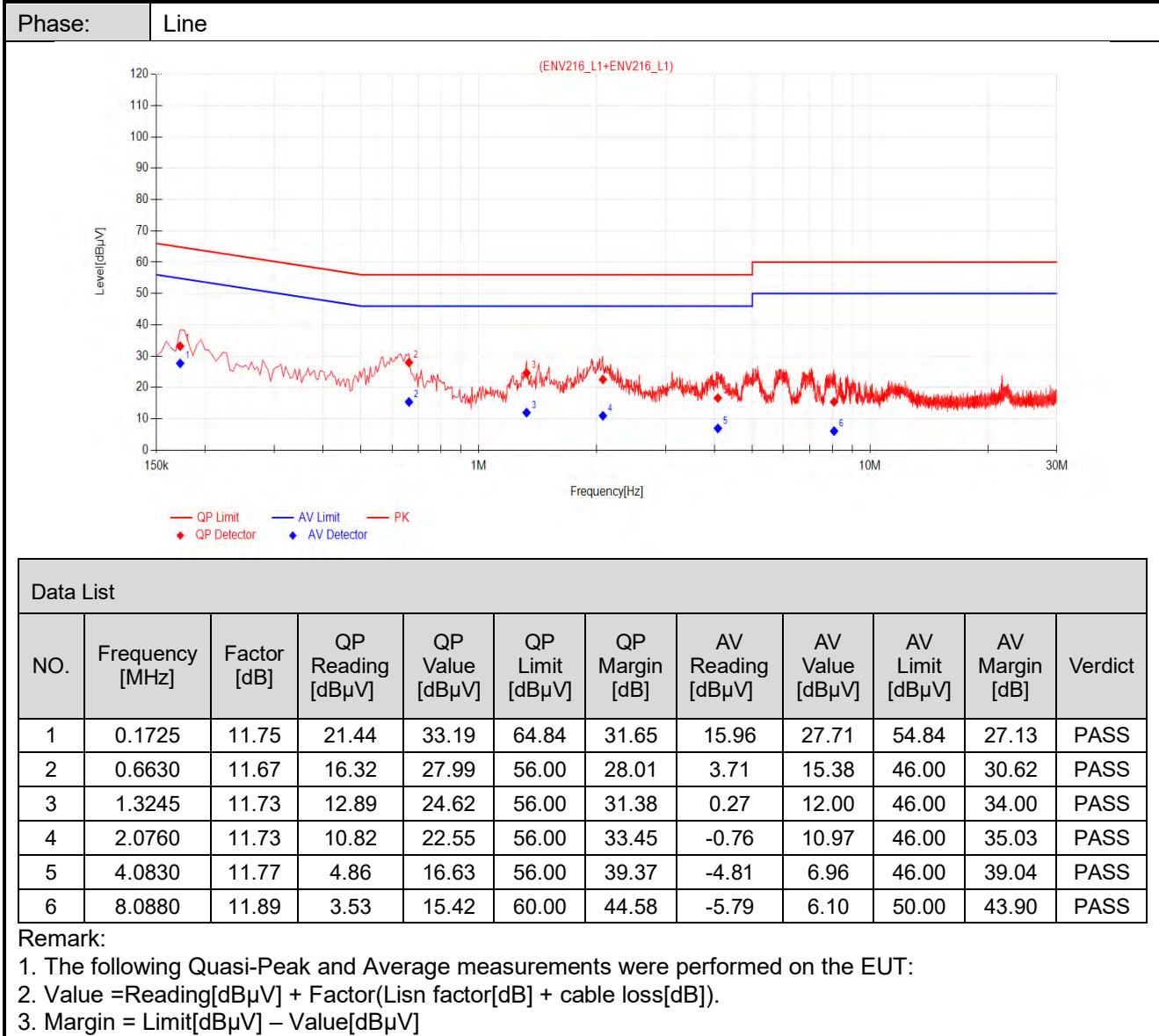
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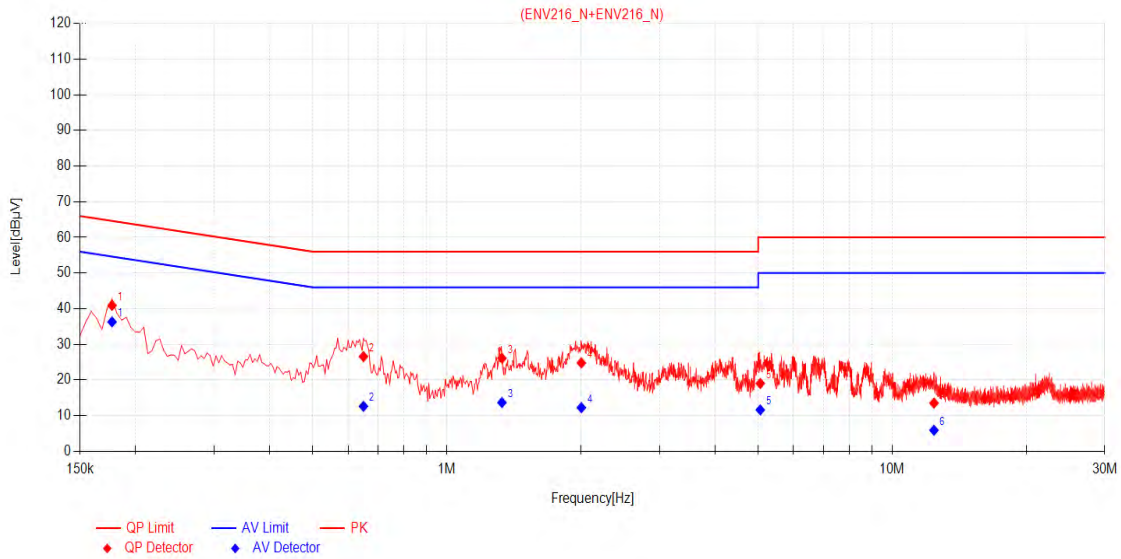
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Measurement Data

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.



Phase:	Neutral
--------	---------



Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1770	11.73	29.21	40.94	64.63	23.69	24.57	36.30	54.63	18.33	PASS
2	0.6495	11.65	14.91	26.56	56.00	29.44	0.97	12.62	46.00	33.38	PASS
3	1.3290	11.73	14.35	26.08	56.00	29.92	1.95	13.68	46.00	32.32	PASS
4	2.0040	11.73	13.07	24.80	56.00	31.20	0.51	12.24	46.00	33.76	PASS
5	5.0550	11.81	7.23	19.04	60.00	40.96	-0.19	11.62	50.00	38.38	PASS
6	12.4080	11.89	1.65	13.54	60.00	46.46	-5.98	5.91	50.00	44.09	PASS

Remark:

- The following Quasi-Peak and Average measurements were performed on the EUT:
- Value = Reading[dBµV] + Factor(Lin factor[dB] + cable loss[dB]).
- Margin = Limit[dBµV] – Value[dBµV]



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Report No.: SEWM2305000166RG06
Rev.: 01
Page: 17 of 830

4.3 Duty Cycle

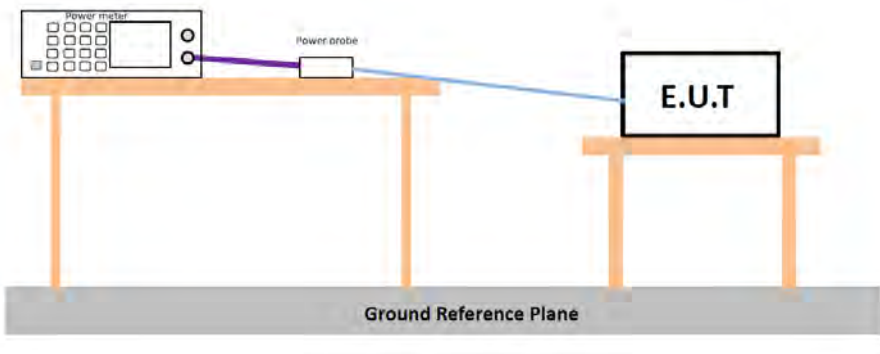
The detailed test data see: **Appendix**



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4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15 Section 15.407(a)(iv)	
Test Method:	ANSI C63.10-2020 Section 12.4.3.2	
Test Setup:	 <p>* Test with power meter (Detector function: Average) Method PM-G is measurement using a gated RF average power meter. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.</p>	
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:	Frequency Band	Limit
	5150-5250MHz	Not exceed 250mW(24dBm)
	5250-5350MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5470-5725MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5725-5850MHz	Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz	
Test Results:	Pass	
The detailed test data see: Appendix		



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4.5 26dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a), KDB 789033 D02& C
Test Method:	ANSI C63.10-2020 Section 12.5.2
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:	No restriction limits
Test Results:	Pass
The detailed test data see: Appendix	



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4.6 6dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(e)	
Test Method:	ANSI C63.10-2020 Section 12.5.1	
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:	Frequency Band	Limit
	5725-5850MHz	At least 500kHz
Test Results:	Pass	
The detailed test data see: Appendix		



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4.7 99% Occupied Bandwidth

Test Requirement:	KDB 789033 D02§ D
Test Method:	ANSI C63.10-2020 Section 12.5.3
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:	No restriction limits
Test Results:	Pass
The detailed test data see: Appendix	



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4.8 Power Spectral Density

Test Requirement:	47 CFR Part 15 Section 15.407(a)(iv)	
Test Method:	ANSI C63.10-2020 Section 12.6 KDB 789033 D02 v02r01, Section F.	
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:	Frequency Band	Limit
	5150-5250MHz	The power spectral density less than 11dBm/1MHz
	5250-5350MHz	The power spectral density less than 11dBm/1MHz
	5470-5725MHz	The power spectral density less than 11dBm/1MHz
	5725-5850MHz	The power spectral density less than <30dBm/500KHz
Test Results:	Pass	
The detailed test data see: Appendix		



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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15 Section 15.205/15.209/15.407(b)
Test Method:	ANSI C63.10-2020 Section 6.4 / 6.5 / 6.6
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)
Test frequency:	9kHz ~ 40GHz(or 10 Harmonic)

Test Setup:

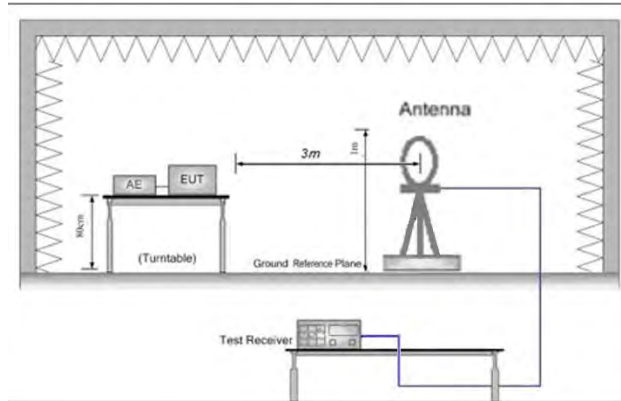


Figure 1. 9kHz to 30MHz

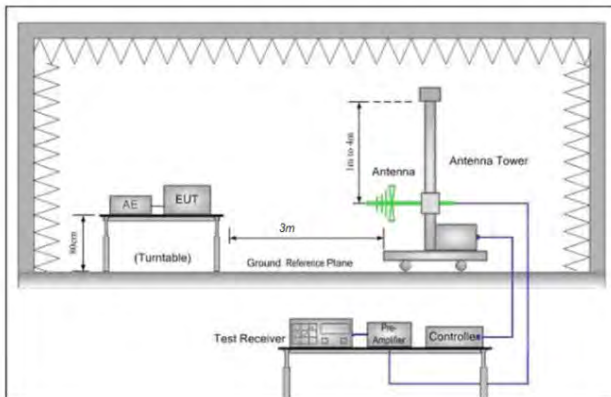


Figure 1. 30MHz to 1GHz

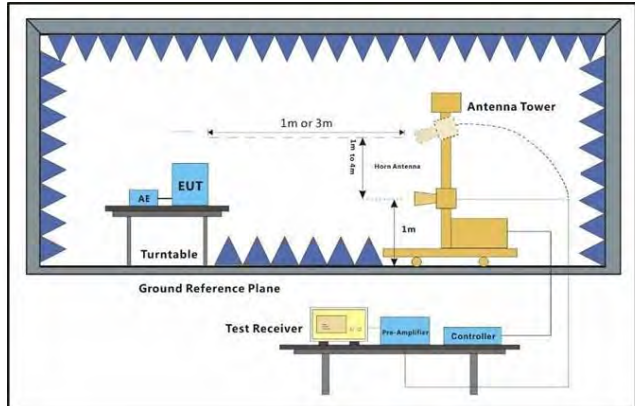


Figure 2. Above 1 GHz

Test Procedure:

- For below 1GHz test, 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 test, 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.



	<p>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.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. Test the EUT in the outermost channels.</p> <p>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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>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</p> <p>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.</p> <p>l. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54 \text{ dB}$.</p>
<p>Test Configuration:</p>	<p>Measurements below 30MHz</p> <ul style="list-style-type: none"> • RBW = 10 kHz • VBW = 30 kHz • Detector = Peak & Average & Quasi-peak • Trace mode = max hold <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW $\geq 3 \text{ MHz}$ • Detector = Peak • Sweep time = auto • Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW = 10Hz, 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.
<p>Exploratory Test Mode:</p>	<p>Transmitting with all kind of modulations, data rates.</p>
<p>Final Test Mode:</p>	<p>Refer to section 3.7 for details.</p>
<p>Instruments Used:</p>	<p>Refer to section 6 for details.</p>
<p>Test Results:</p>	<p>Pass</p>
<p>The detailed test data see: Appendix</p>	



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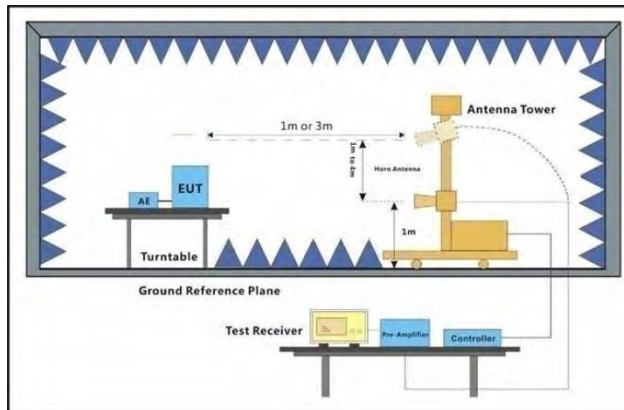
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4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15 Section 15.205/15.209/15.407(b)		
Test Method:	ANSI C63.10-2020 Section 12.7		
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:



Test Procedure:

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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
- Test the EUT in the outermost channels.
- The radiation measurements are performed in X, Y, Z axis positioning for



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	Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW ≥ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW = 10Hz, 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.
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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4.11 Dynamic Frequency Selection

4.11.1 DFS Overview

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required
Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	Any single BW mode	Not required
<p>Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.</p>		



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4.11.2 DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.
Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.



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4.11.3 RADAR TEST WAVEFORMS

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{ \begin{matrix} \left(\frac{1}{360} \right) \cdot \\ \left(\frac{19 \cdot 10^6}{PRI_{\mu sec}} \right) \end{matrix} \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					



Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate $(82.9\% + 60\% + 90\% + 88\%)/4 = 80.2\%$			



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Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

4.11.4 Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

The detailed test data see: **Appendix**



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

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.54dB
2	RF power density, conducted	±1.03dB
3	Spurious emissions, conducted	±0.54dB
4	Radio Frequency	±1.0 %
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	±1.0 %
7	Conduction Emission	± 2.90dB (150kHz to 30MHz)
8	Radiated Emission	± 3.13dB (9k to 30MHz)
		± 4.88dB (30M to 1GHz)
		± 4.75dB (1GHz to 18GHz)
		± 4.77dB (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 Equipment					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2023/02/06	2024/02/05
Measurement Software	Tonscend	JS1120-3 Test System V3.1.55	SUWI-02-09-09	NCR	NCR
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2023/05/11	2024/05/10
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-05	2023/02/06	2024/02/05
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2023/02/06	2024/02/05
Power meter	Anritsu	ML2495A	SUWI-01-31-01	2022/11/23	2023/11/22
Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	2022/11/23	2023/11/22
MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	2023/02/06	2024/02/05
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2023/02/06	2024/02/05
Signal Generator	ROHDE&SCHWARZ	SMM100A	SUWI-01-07-04	2023/02/22	2024/02/21
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-05	2022/11/23	2023/11/22

Conduction Test Equipment					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-03-01	2021/05/08	2024/05/07
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2023/02/08	2024/02/07
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2023/02/06	2024/02/05
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2023/02/07	2024/02/06
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-03	2023/02/08	2024/02/07
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-04	2023/02/08	2024/02/07
Measurement Software	Tonscend	JS32-CE V4.0.0.2	SUWI-02-09-05	NCR	NCR



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RSE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	2021/11/25	2024/11/24
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-13	2023/02/07	2024/02/06
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2023/05/11	2024/05/10
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-06	2022/11/23	2023/11/22
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2023/02/08	2024/02/07
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9168	SUWI-01-11-04	2021/12/05	2023/12/04
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	2021/12/05	2023/12/04
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2023/05/12	2024/05/11
Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
Amplifier	Tonscend	TAP9K3G32	SUWI-01-14-06	2022/11/23	2023/11/22
Amplifier	Tonscend	TAP01018050	SUWI-01-14-04	2022/11/23	2023/11/22
Amplifier	Tonscend	TAP30M7G30	SUWI-01-14-05	2022/11/23	2023/11/22
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-09-04	NCR	NCR



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Report No.: SEWM2305000166RG06
Rev.: 01
Page: 35 of 830

7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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Report No.: SEWM2305000166RG06

Rev.: 01

Page: 36 of 830

Appendix



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**Emission Bandwidth
Test Result**

TestMode	Antenna	Frequency[MHz]	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Verdict
11a-CDD	Ant22	5180	18.480	5170.600	5189.080	For Report Purpose
	Ant24	5180	18.960	5170.520	5189.480	
	Ant22	5200	19.400	5189.840	5209.240	
	Ant24	5200	18.960	5190.520	5209.480	
	Ant22	5240	18.400	5230.720	5249.120	
	Ant24	5240	19.440	5229.960	5249.400	
	Ant22	5260	18.680	5251.000	5269.680	
	Ant24	5260	19.640	5250.560	5270.200	
	Ant22	5280	18.240	5270.760	5289.000	
	Ant24	5280	18.600	5270.640	5289.240	
	Ant22	5320	19.040	5310.240	5329.280	
	Ant24	5320	18.560	5310.840	5329.400	
	Ant22	5500	18.520	5490.760	5509.280	
	Ant24	5500	21.240	5489.680	5510.920	
	Ant22	5580	19.000	5570.680	5589.680	
	Ant24	5580	18.840	5570.480	5589.320	
	Ant22	5700	18.800	5690.440	5709.240	
	Ant24	5700	18.920	5690.560	5709.480	
	Ant22	5720	19.360	5709.840	5729.200	
	Ant24	5720	20.480	5709.720	5730.200	
	Ant22	5720 UNII-2C	15.16	5709.840	5725	
	Ant24	5720 UNII-2C	15.28	5709.720	5725	
	Ant22	5720 UNII-3	4.2	5725	5729.200	
	Ant24	5720 UNII-3	5.2	5725	5730.200	
	Ant22	5745	21.640	5734.320	5755.960	
	Ant24	5745	19.120	5735.360	5754.480	
	Ant22	5785	18.640	5775.560	5794.200	
	Ant24	5785	19.720	5775.400	5795.120	
Ant22	5825	18.560	5815.760	5834.320		
Ant24	5825	23.440	5815.080	5838.520		
11n20MIMO	Ant22	5180	20.280	5169.760	5190.040	
	Ant24	5180	19.880	5170.080	5189.960	
	Ant22	5200	21.760	5189.160	5210.920	
	Ant24	5200	20.640	5189.920	5210.560	
	Ant22	5240	19.560	5230.240	5249.800	
	Ant24	5240	19.680	5230.160	5249.840	
	Ant22	5260	19.960	5250.080	5270.040	
	Ant24	5260	20.160	5250.120	5270.280	
	Ant22	5280	19.800	5270.000	5289.800	
	Ant24	5280	19.640	5270.080	5289.720	
	Ant22	5320	19.640	5310.160	5329.800	
	Ant24	5320	20.320	5309.920	5330.240	
	Ant22	5500	20.600	5489.800	5510.400	
	Ant24	5500	20.080	5490.040	5510.120	
	Ant22	5580	20.160	5569.720	5589.880	
	Ant24	5580	20.200	5569.880	5590.080	
	Ant22	5700	19.800	5690.040	5709.840	
	Ant24	5700	19.680	5690.000	5709.680	
	Ant22	5720	19.560	5710.200	5729.760	
	Ant24	5720	20.000	5709.960	5729.960	
Ant22	5720 UNII-2C	14.80	5710.200	5725		



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	Ant24	5720 UNII-2C	15.04	5709.960	5725
	Ant22	5720 UNII-3	4.76	5725	5729.760
	Ant24	5720 UNII-3	4.96	5725	5729.960
	Ant22	5745	21.760	5733.960	5755.720
	Ant24	5745	19.960	5735.040	5755.000
	Ant22	5785	19.920	5775.000	5794.920
	Ant24	5785	20.320	5774.920	5795.240
	Ant22	5825	21.680	5815.040	5836.720
	Ant24	5825	20.080	5815.040	5835.120
11n40MIMO	Ant22	5190	39.120	5170.240	5209.360
	Ant24	5190	39.200	5170.240	5209.440
	Ant22	5230	39.200	5210.560	5249.760
	Ant24	5230	38.880	5210.560	5249.440
	Ant22	5270	38.560	5250.640	5289.200
	Ant24	5270	38.640	5250.640	5289.280
	Ant22	5310	39.120	5290.240	5329.360
	Ant24	5310	39.360	5290.240	5329.600
	Ant22	5510	38.960	5490.560	5529.520
	Ant24	5510	39.520	5490.160	5529.680
	Ant22	5550	38.960	5530.560	5569.520
	Ant24	5550	38.960	5530.480	5569.440
	Ant22	5670	39.440	5650.480	5689.920
	Ant24	5670	39.360	5650.240	5689.600
	Ant22	5710	38.800	5690.480	5729.280
	Ant24	5710	39.520	5690.240	5729.760
	Ant22	5710 UNII-2C	34.52	5690.480	5725
	Ant24	5710 UNII-2C	34.76	5690.240	5725
	Ant22	5710 UNII-3	4.28	5725	5729.280
	Ant24	5710 UNII-3	4.76	5725	5729.760
	Ant22	5755	65.200	5725.160	5790.360
	Ant24	5755	39.520	5735.320	5774.840
	Ant22	5795	38.800	5775.800	5814.600
	Ant24	5795	39.200	5775.320	5814.520
11ac20MIMO	Ant22	5180	20.040	5169.800	5189.840
	Ant24	5180	19.920	5170.200	5190.120
	Ant22	5200	22.280	5188.280	5210.560
	Ant24	5200	20.200	5189.840	5210.040
	Ant22	5240	19.680	5230.120	5249.800
	Ant24	5240	19.800	5230.040	5249.840
	Ant22	5260	19.880	5250.120	5270.000
	Ant24	5260	19.800	5250.280	5270.080
	Ant22	5280	19.800	5270.000	5289.800
	Ant24	5280	19.800	5269.960	5289.760
	Ant22	5320	19.680	5310.080	5329.760
	Ant24	5320	19.760	5310.080	5329.840
	Ant22	5500	22.040	5488.200	5510.240
	Ant24	5500	20.200	5490.000	5510.200
	Ant22	5580	19.840	5570.040	5589.880
	Ant24	5580	20.680	5569.480	5590.160
	Ant22	5700	19.840	5689.960	5709.800
	Ant24	5700	19.520	5690.240	5709.760
	Ant22	5720	20.560	5709.760	5730.320
	Ant24	5720	20.200	5709.880	5730.080
	Ant22	5720 UNII-2C	15.24	5709.760	5725
	Ant24	5720 UNII-2C	15.12	5709.880	5725
	Ant22	5720 UNII-3	5.32	5725	5730.320
	Ant24	5720 UNII-3	5.08	5725	5730.080



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	Ant22	5745	21.120	5734.280	5755.400	
	Ant24	5745	19.680	5735.480	5755.160	
	Ant22	5785	20.040	5775.000	5795.040	
	Ant24	5785	19.720	5775.280	5795.000	
	Ant22	5825	22.320	5814.720	5837.040	
	Ant24	5825	20.640	5815.000	5835.640	
11ac40MIMO	Ant22	5190	39.440	5169.920	5209.360	
	Ant24	5190	39.040	5170.400	5209.440	
	Ant22	5230	39.440	5210.400	5249.840	
	Ant24	5230	38.960	5210.640	5249.600	
	Ant22	5270	38.960	5250.480	5289.440	
	Ant24	5270	38.800	5250.720	5289.520	
	Ant22	5310	39.120	5290.400	5329.520	
	Ant24	5310	39.200	5290.320	5329.520	
	Ant22	5510	38.800	5490.640	5529.440	
	Ant24	5510	38.800	5490.480	5529.280	
	Ant22	5550	38.880	5530.560	5569.440	
	Ant24	5550	39.120	5530.240	5569.360	
	Ant22	5670	39.440	5650.320	5689.760	
	Ant24	5670	39.200	5650.320	5689.520	
	Ant22	5710	39.440	5690.080	5729.520	
	Ant24	5710	39.200	5690.320	5729.520	
	Ant22	5710 UNII-2C	34.92	5690.080	5725	
	Ant24	5710 UNII-2C	34.68	5690.320	5725	
	Ant22	5710 UNII-3	4.52	5725	5729.520	
	Ant24	5710 UNII-3	4.52	5725	5729.520	
	Ant22	5755	39.600	5735.000	5774.600	
	Ant24	5755	39.360	5735.480	5774.840	
	Ant22	5795	38.720	5775.720	5814.440	
	Ant24	5795	39.120	5775.400	5814.520	
	11ac80MIMO	Ant22	5210	80.800	5169.840	5250.640
		Ant24	5210	80.640	5169.680	5250.320
		Ant22	5290	80.960	5249.680	5330.640
		Ant24	5290	80.640	5250.160	5330.800
Ant22		5530	80.640	5489.680	5570.320	
Ant24		5530	80.000	5490.000	5570.000	
Ant22		5690	80.320	5649.520	5729.840	
Ant24		5690	80.320	5650.000	5730.320	
Ant22		5690 UNII-2C	75.48	5649.520	5725	
Ant24		5690 UNII-2C	75	5650.000	5725	
Ant22		5690 UNII-3	4.84	5725	5729.840	
Ant24		5690 UNII-3	5.32	5725	5730.320	
Ant22	5775	85.280	5731.640	5816.920		
Ant24	5775	80.000	5735.000	5815.000		
11ac160MIMO	Ant22	5250	163.200	5169.040	5332.240	
	Ant24	5250	162.560	5169.040	5331.600	
11ax20MIMO	Ant22	5180	20.360	5169.800	5190.160	
	Ant24	5180	20.360	5169.880	5190.240	
	Ant22	5200	20.720	5189.440	5210.160	
	Ant24	5200	20.400	5189.960	5210.360	
	Ant22	5240	20.480	5229.720	5250.200	
	Ant24	5240	20.320	5229.840	5250.160	
	Ant22	5260	20.720	5249.600	5270.320	
	Ant24	5260	20.400	5249.920	5270.320	
	Ant22	5280	20.240	5269.880	5290.120	
	Ant24	5280	20.160	5269.880	5290.040	
Ant22	5320	20.720	5309.480	5330.200		



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	Ant24	5320	20.280	5309.840	5330.120
	Ant22	5500	20.520	5489.920	5510.440
	Ant24	5500	20.600	5489.600	5510.200
	Ant22	5580	20.320	5569.800	5590.120
	Ant24	5580	20.560	5569.720	5590.280
	Ant22	5700	20.320	5689.840	5710.160
	Ant24	5700	20.400	5689.720	5710.120
	Ant22	5720	20.600	5709.600	5730.200
	Ant24	5720	20.560	5709.760	5730.320
	Ant22	5720 UNII-2C	15.4	5709.600	5725
	Ant24	5720 UNII-2C	15.24	5709.760	5725
	Ant22	5720 UNII-3	5.2	5725	5730.200
	Ant24	5720 UNII-3	5.32	5725	5730.320
	Ant22	5745	22.360	5733.160	5755.520
	Ant24	5745	20.120	5734.960	5755.080
	Ant22	5785	20.440	5774.760	5795.200
	Ant24	5785	20.400	5774.880	5795.280
	Ant22	5825	21.240	5814.440	5835.680
	Ant24	5825	21.440	5814.840	5836.280
11ax40MIMO	Ant22	5190	39.840	5170.080	5209.920
	Ant24	5190	39.920	5170.000	5209.920
	Ant22	5230	39.680	5210.240	5249.920
	Ant24	5230	39.760	5210.160	5249.920
	Ant22	5270	40.000	5250.080	5290.080
	Ant24	5270	40.000	5250.080	5290.080
	Ant22	5310	39.680	5290.080	5329.760
	Ant24	5310	40.080	5290.080	5330.160
	Ant22	5510	39.600	5490.320	5529.920
	Ant24	5510	39.520	5490.160	5529.680
	Ant22	5550	39.760	5530.080	5569.840
	Ant24	5550	39.840	5530.080	5569.920
	Ant22	5670	39.680	5650.240	5689.920
	Ant24	5670	39.760	5650.080	5689.840
	Ant22	5710	40.000	5689.760	5729.760
	Ant24	5710	40.000	5690.000	5730.000
	Ant22	5710 UNII-2C	35.24	5689.760	5725
	Ant24	5710 UNII-2C	35	5690.000	5725
	Ant22	5710 UNII-3	4.76	5725	5729.760
	Ant24	5710 UNII-3	5	5725	5730.000
11ax80MIMO	Ant22	5755	39.840	5735.240	5775.080
	Ant24	5755	39.760	5735.080	5774.840
	Ant22	5795	39.520	5775.240	5814.760
	Ant24	5795	39.760	5775.160	5814.920
	Ant22	5210	80.960	5169.520	5250.480
	Ant24	5210	80.480	5169.840	5250.320
	Ant22	5290	81.120	5249.520	5330.640
	Ant24	5290	80.960	5249.520	5330.480
	Ant22	5530	81.280	5489.200	5570.480
	Ant24	5530	80.960	5489.520	5570.480
	Ant22	5690	81.280	5649.200	5730.480
	Ant24	5690	80.960	5649.520	5730.480
	Ant22	5690 UNII-2C	75.8	5649.200	5725
	Ant24	5690 UNII-2C	75.48	5649.520	5725
Ant22	5690 UNII-3	5.48	5725	5730.480	
Ant24	5690 UNII-3	5.48	5725	5730.480	
Ant22	5775	81.280	5734.680	5815.960	
Ant24	5775	80.800	5734.680	5815.480	



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Report No.: SEWM2305000166RG06

Rev.: 01

Page: 41 of 830

11ax160MIMO	Ant22	5250	163.200	5168.720	5331.920
	Ant24	5250	163.520	5168.720	5332.240



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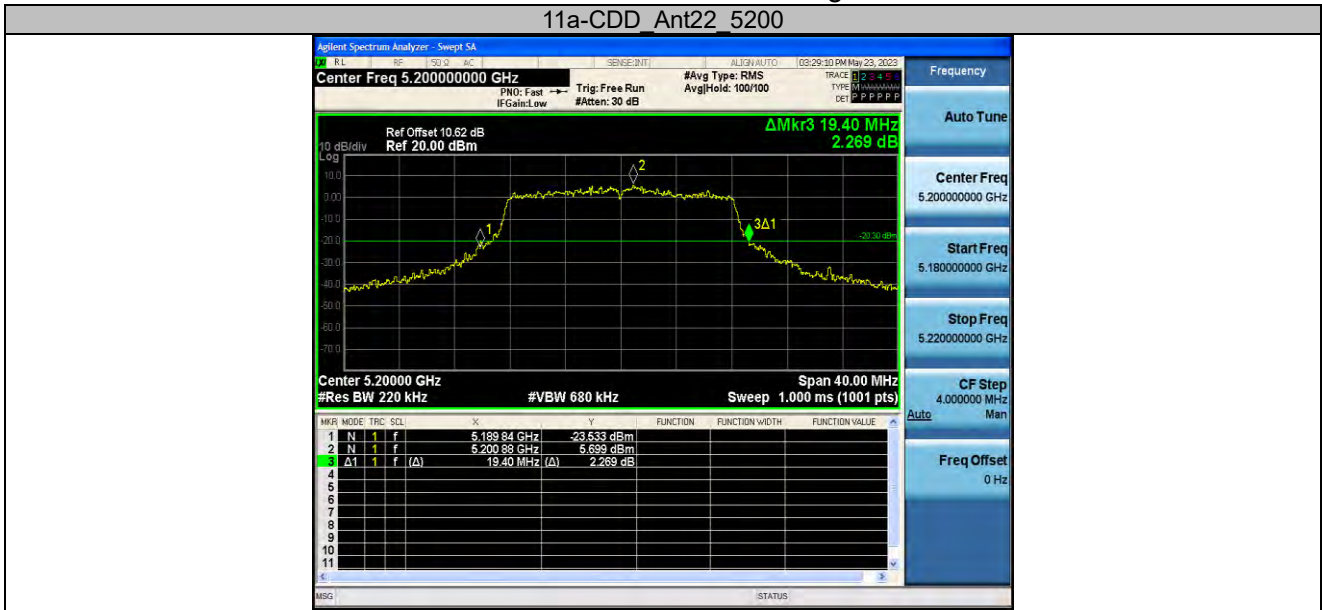
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Test Graphs



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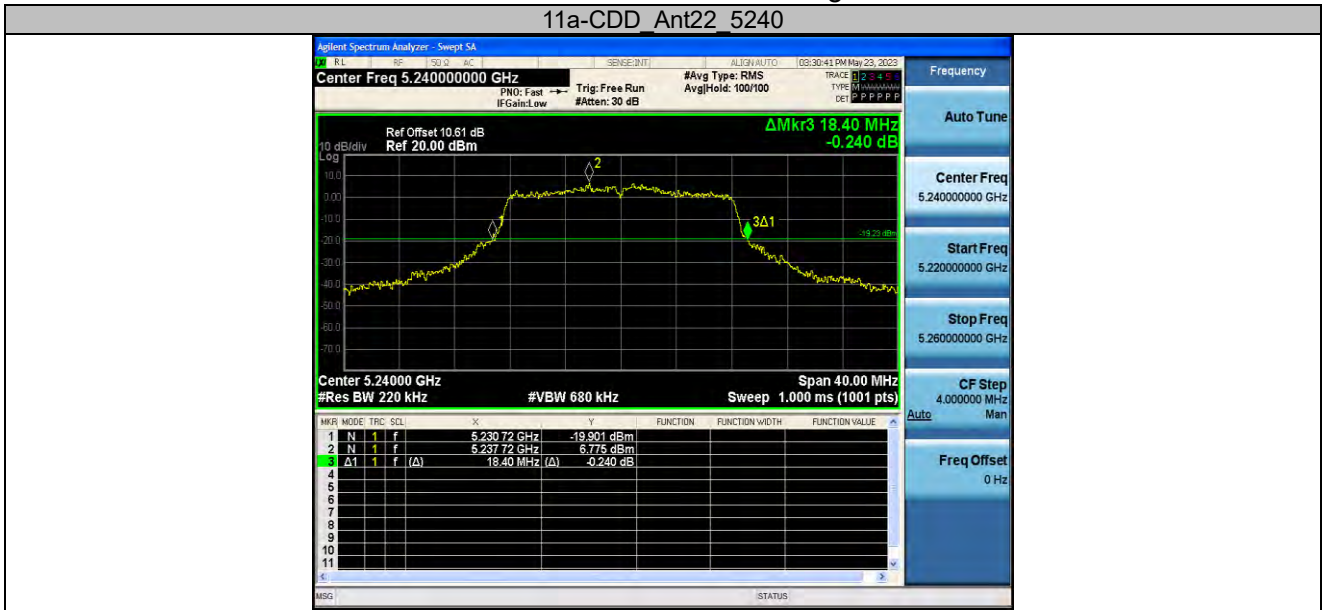
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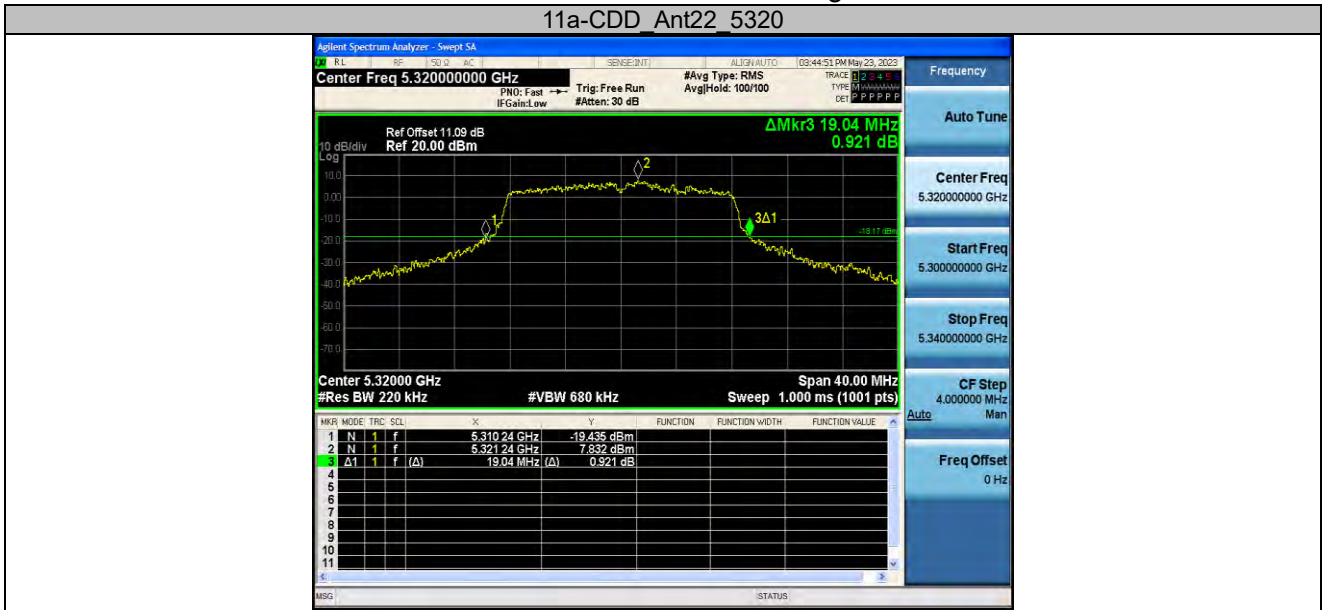
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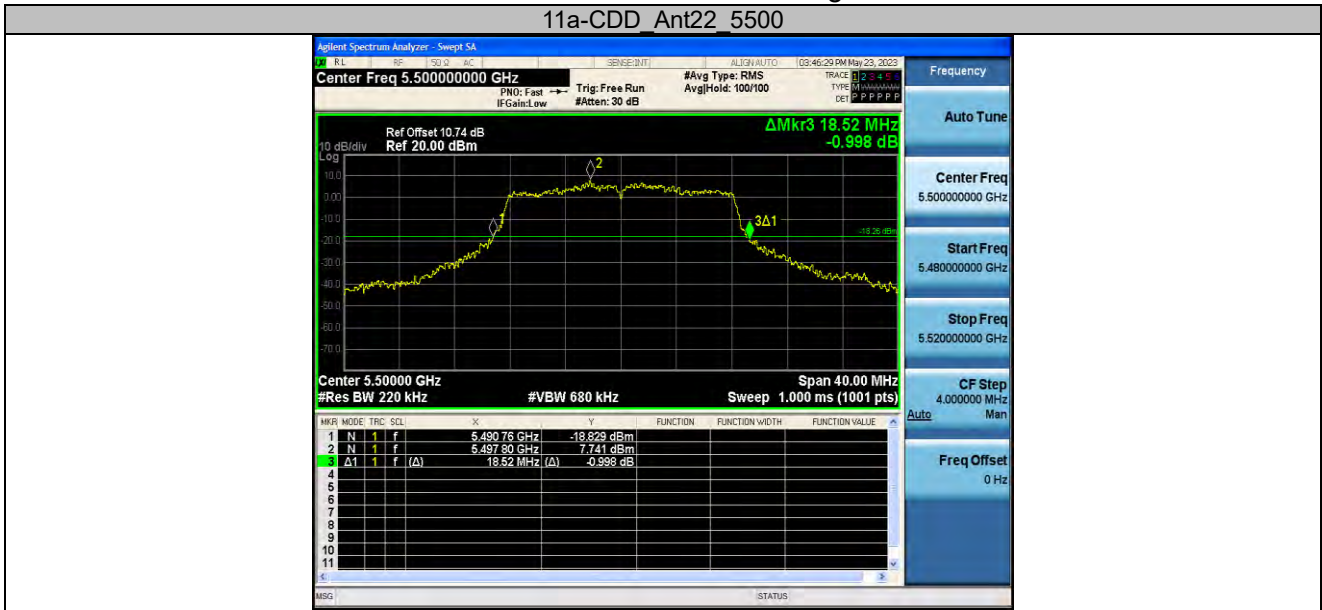
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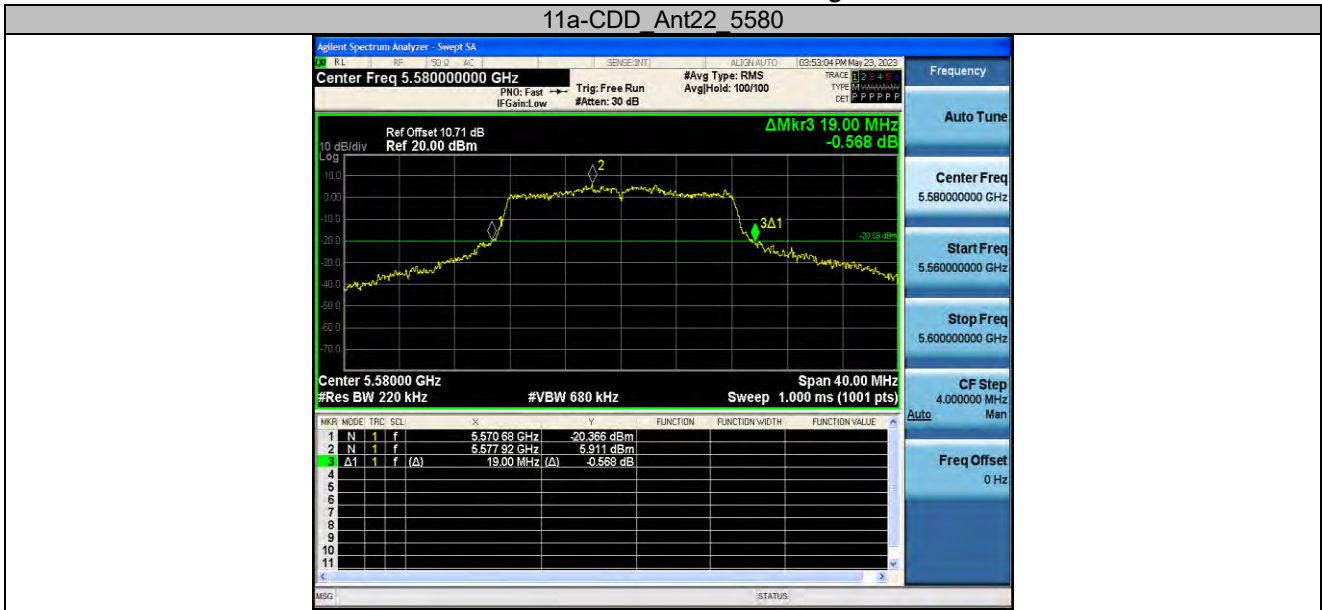
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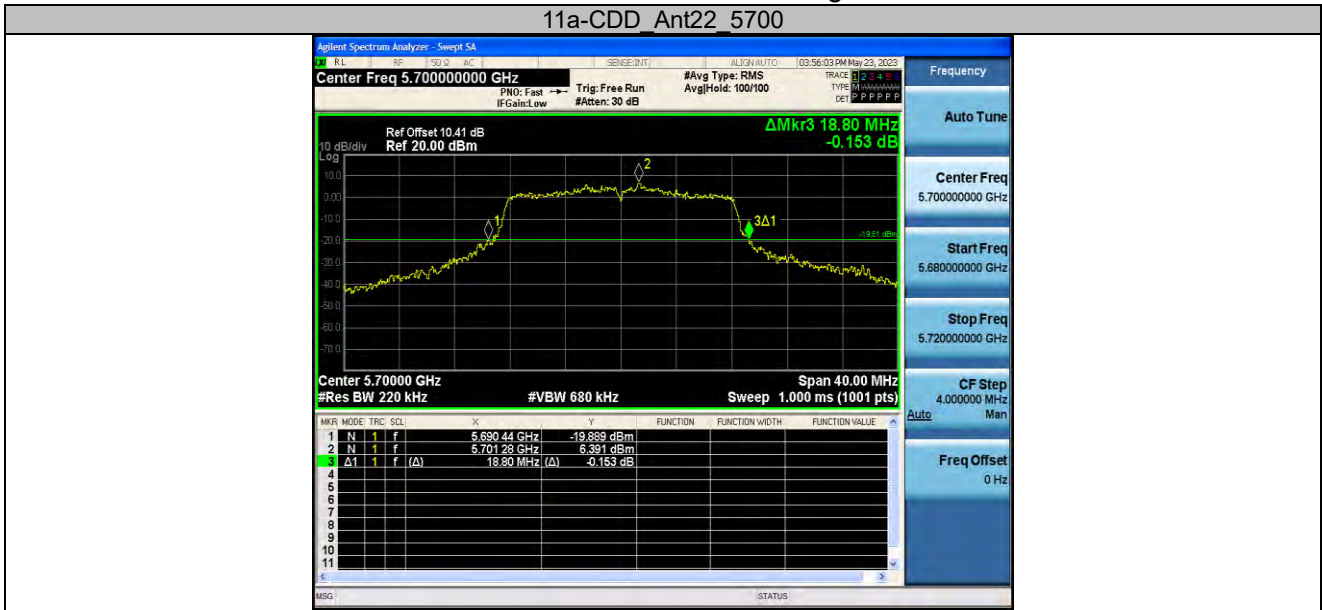
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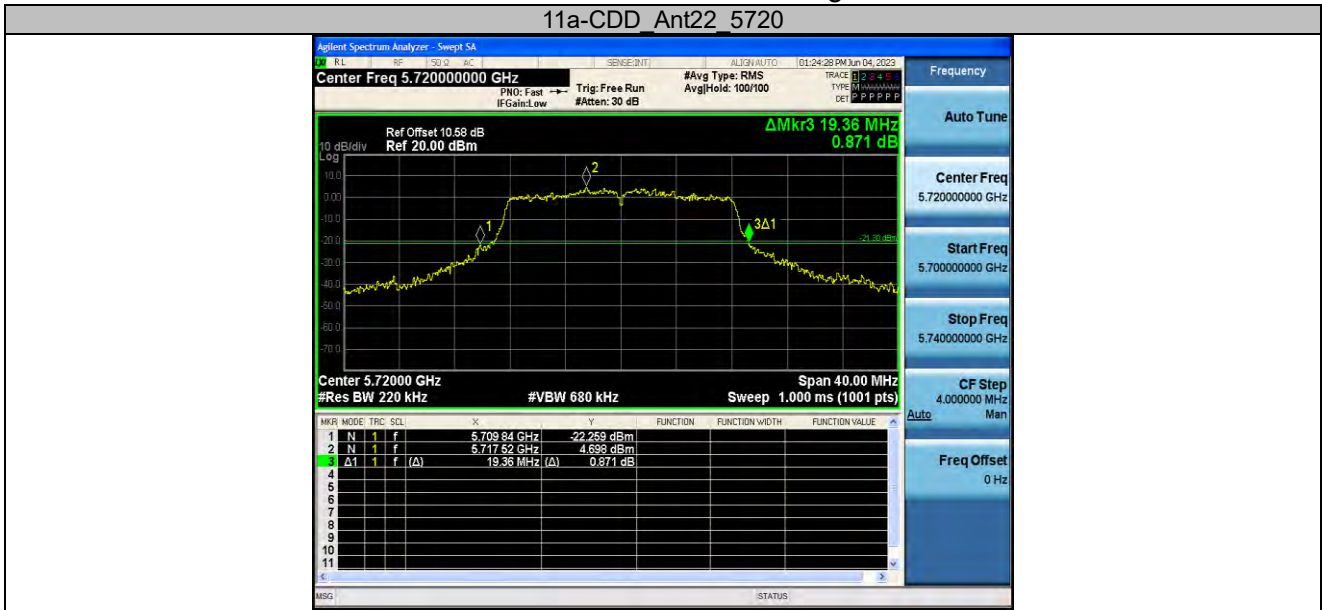
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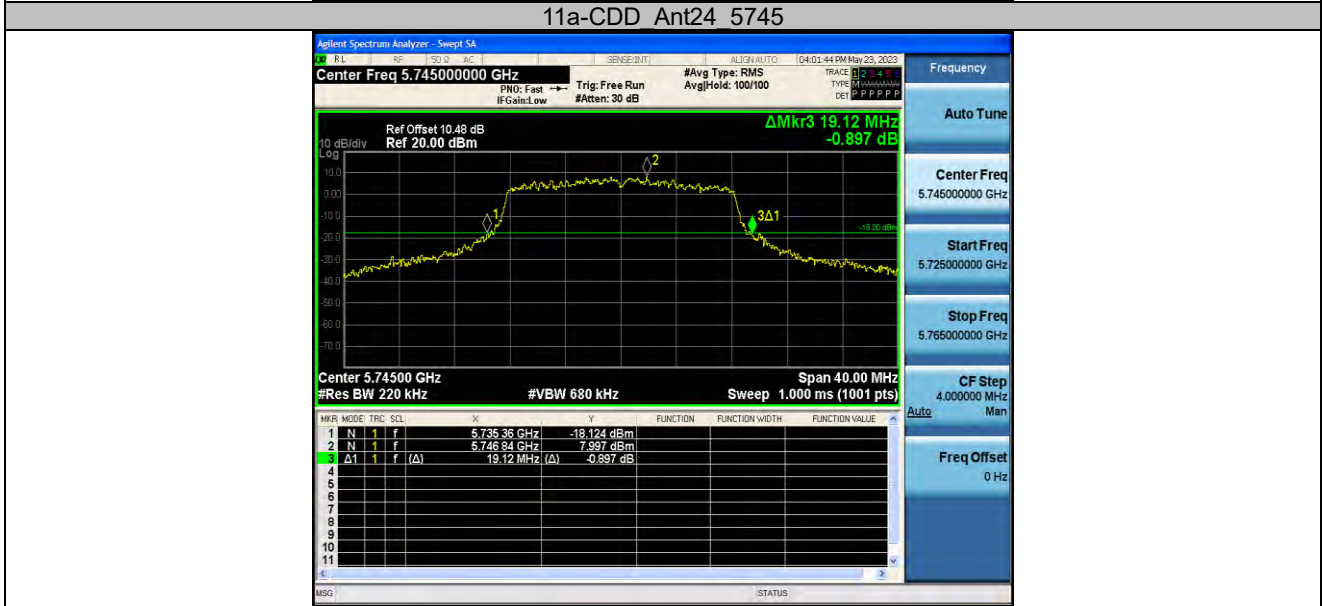
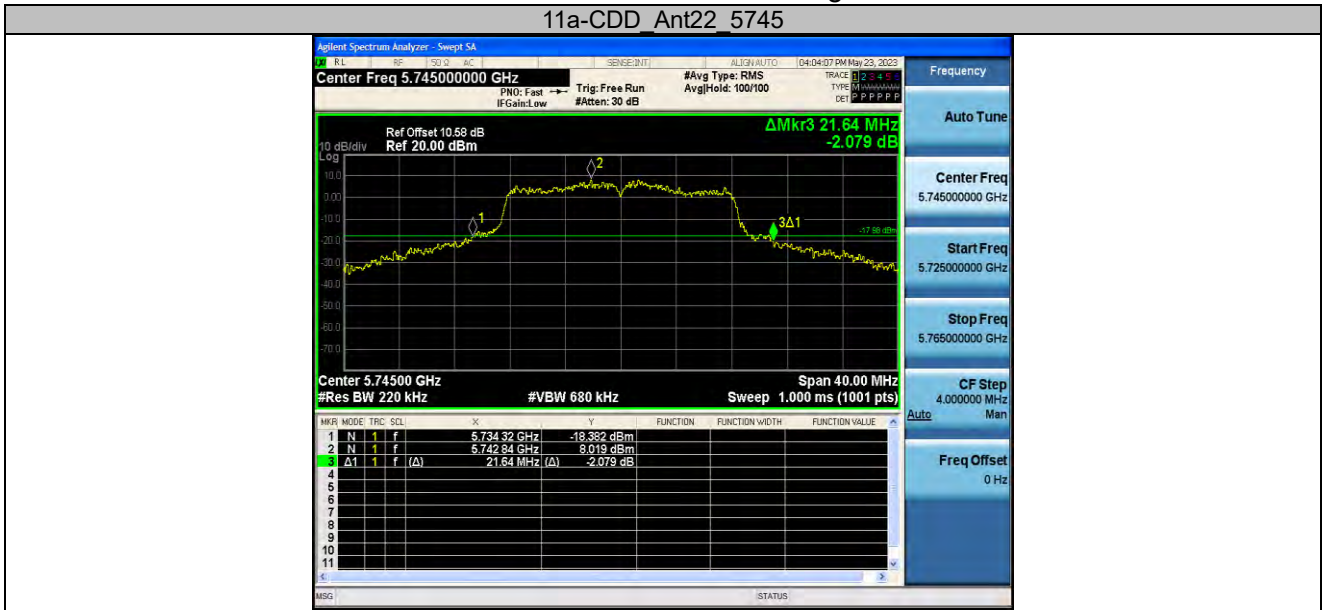
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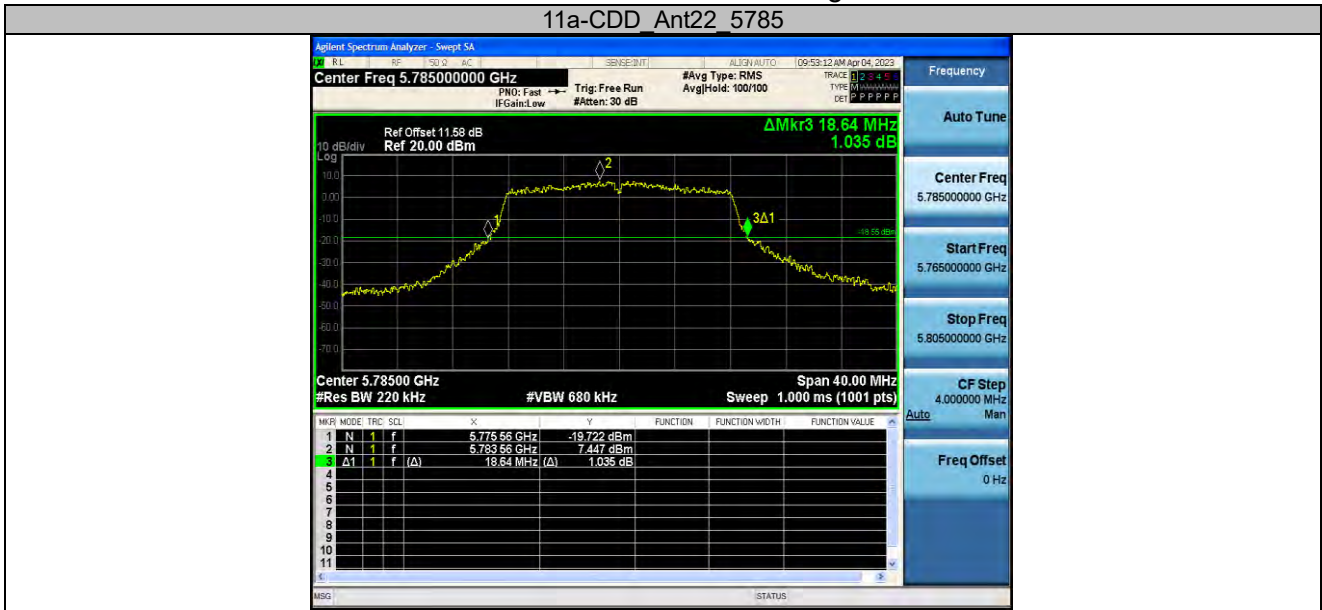
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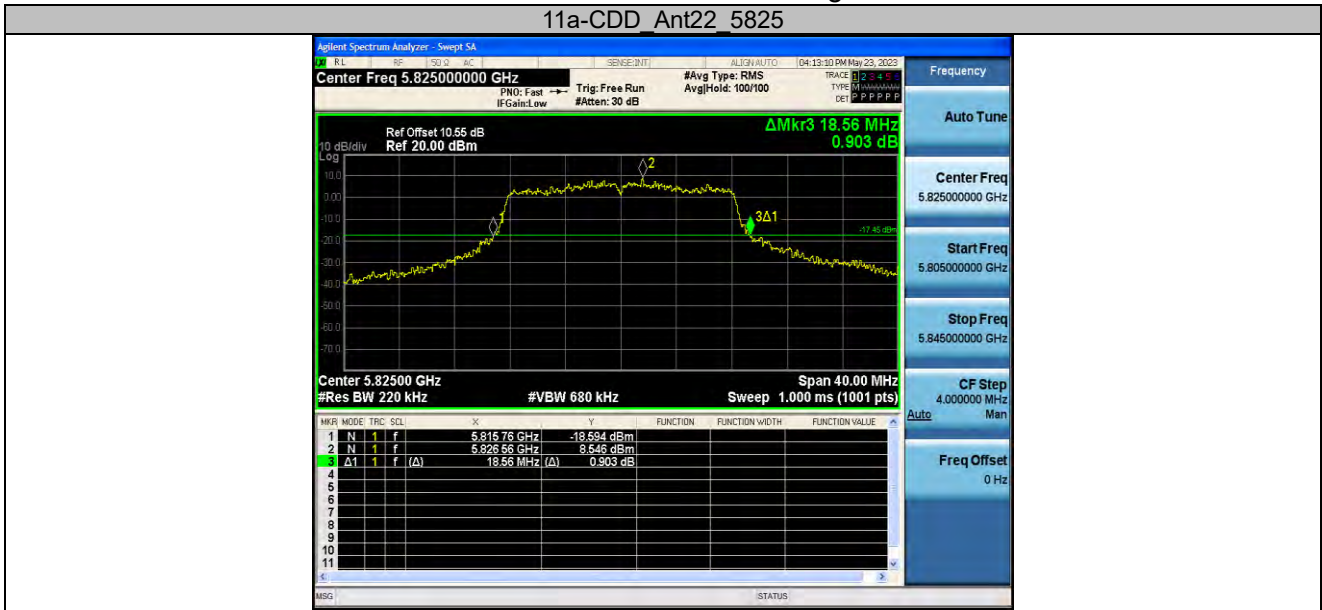
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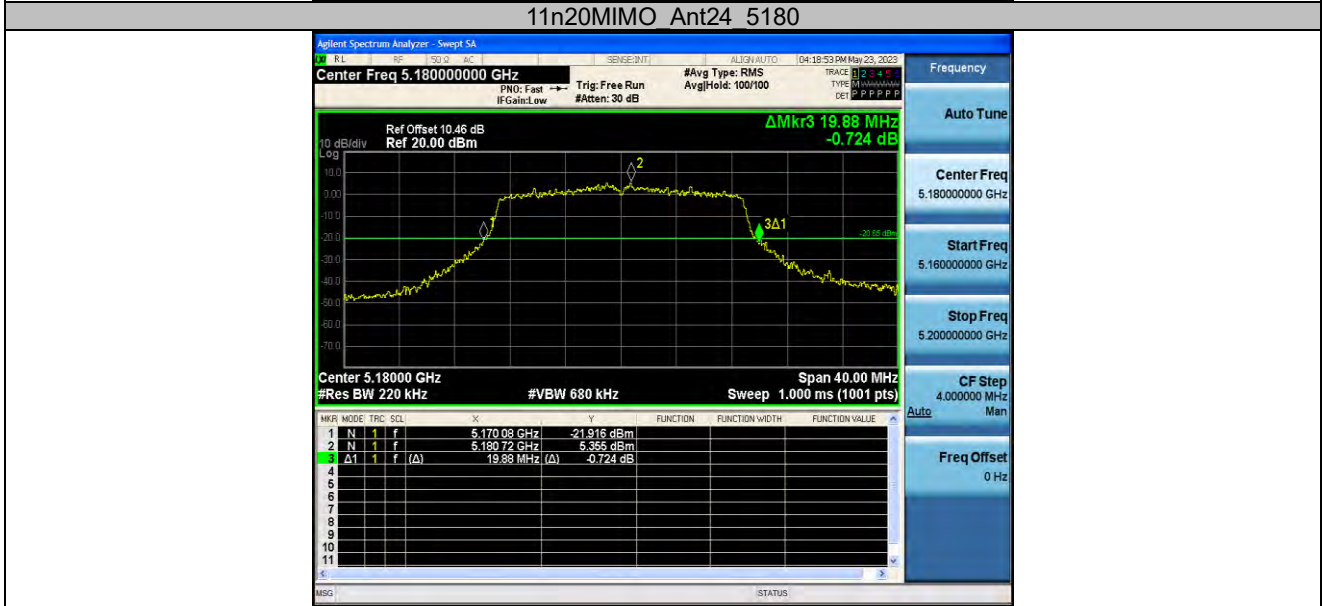
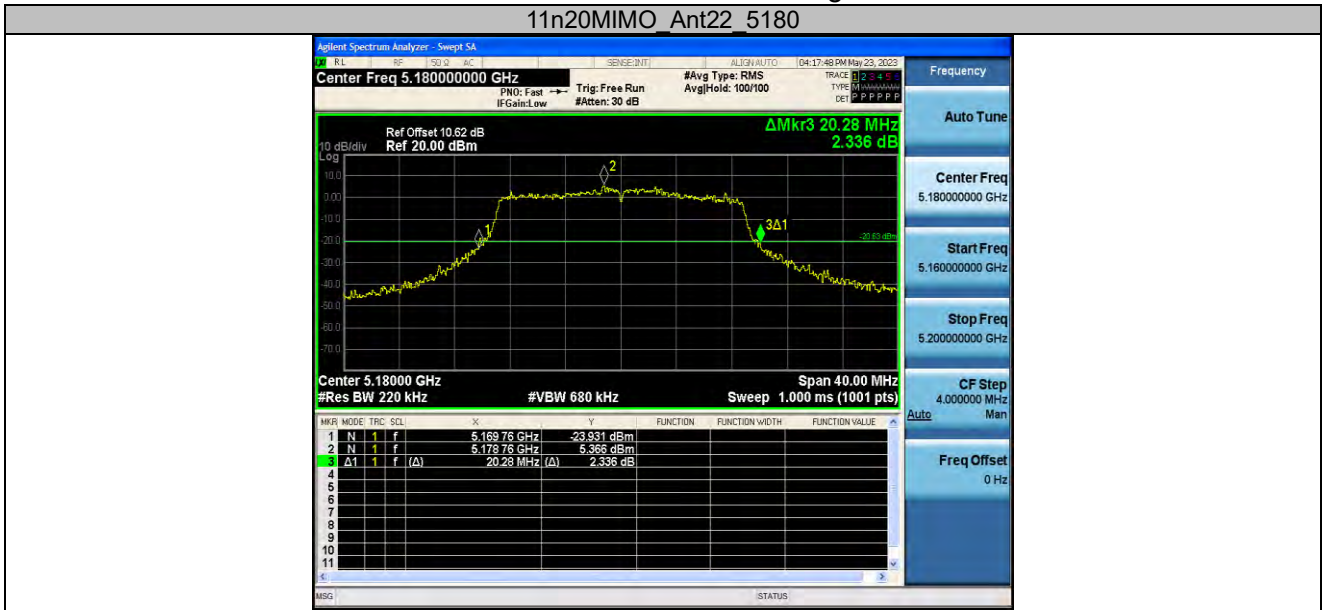
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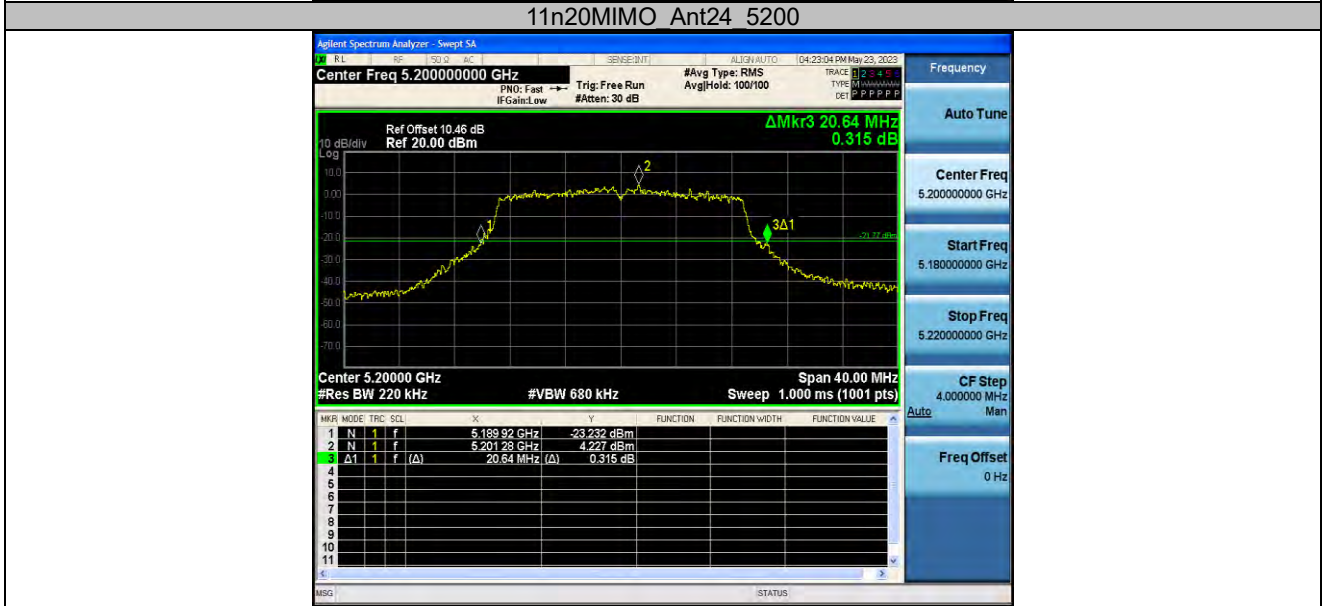
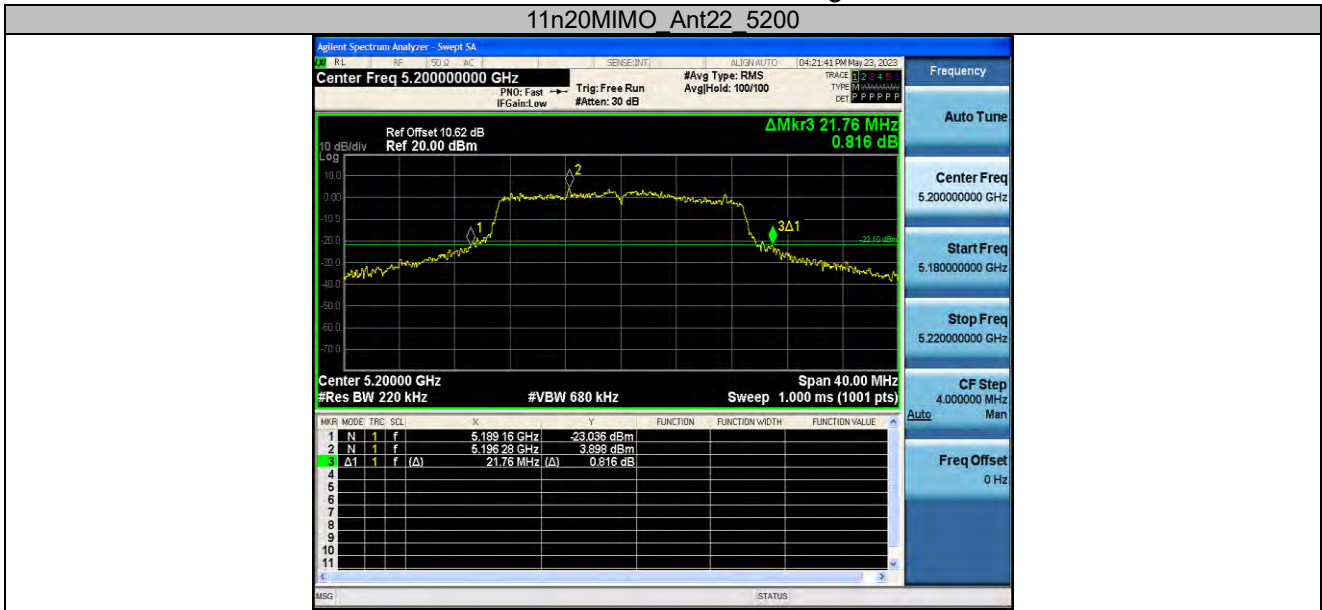
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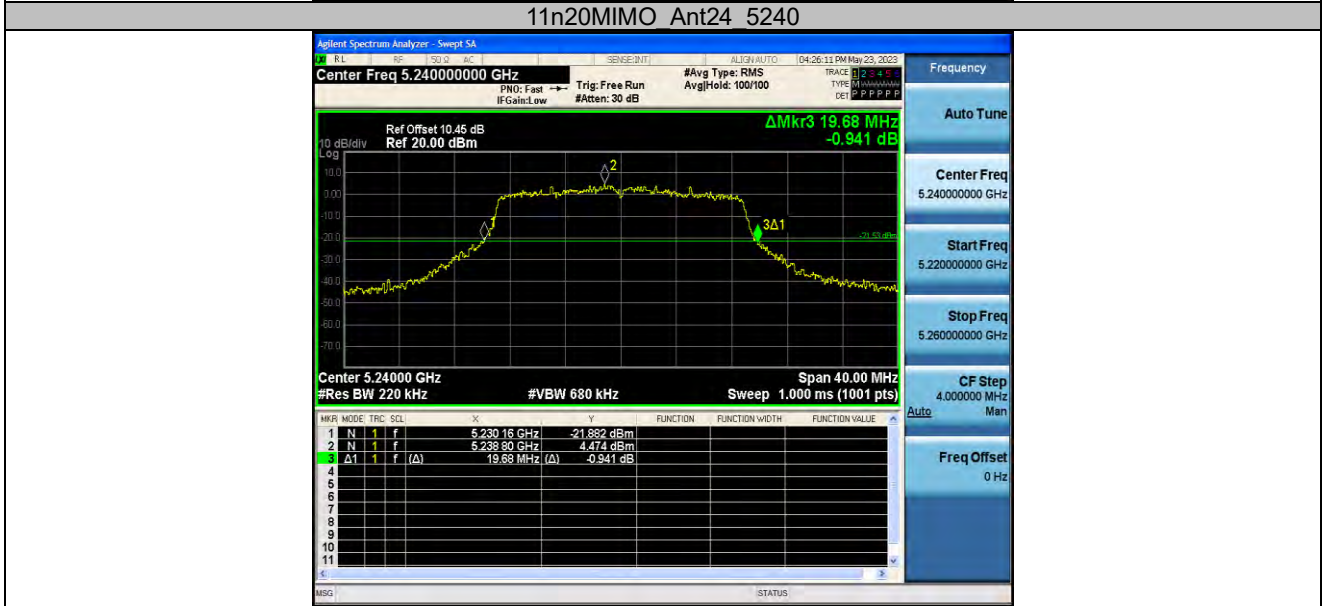
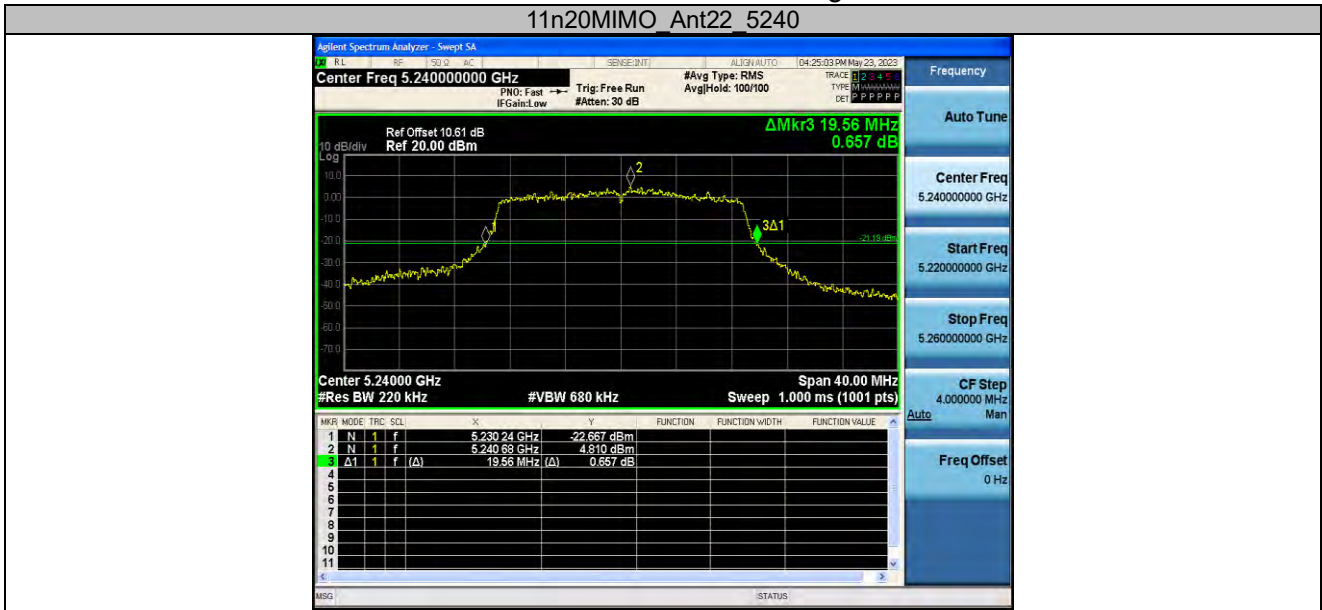
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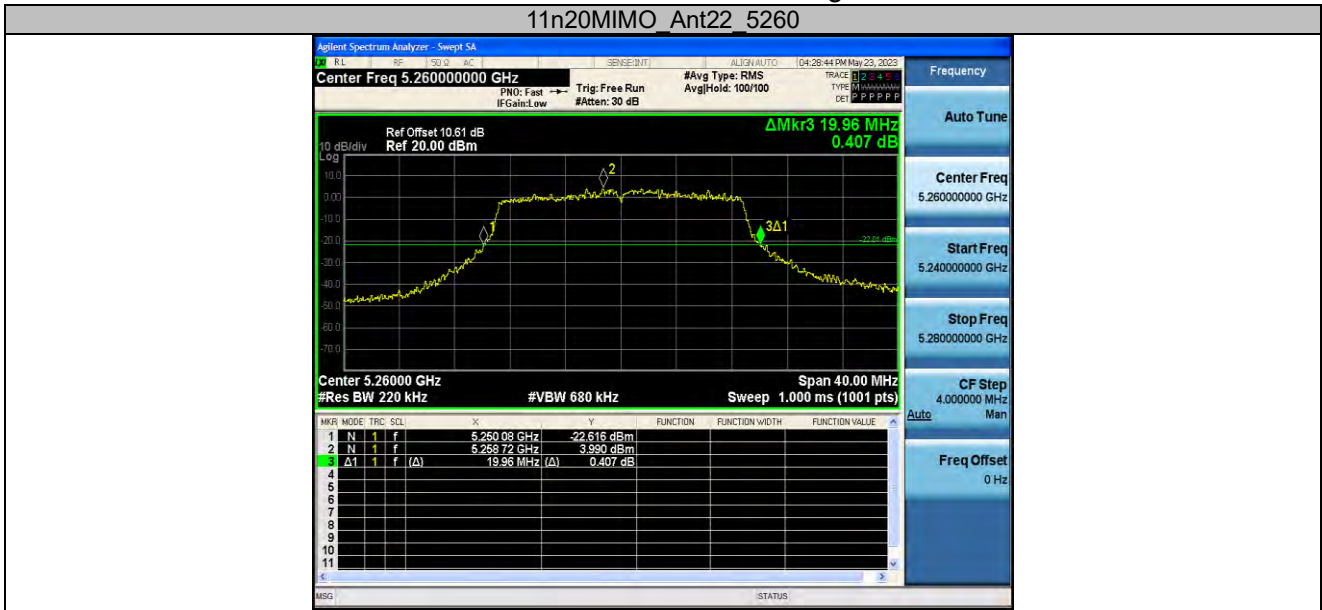
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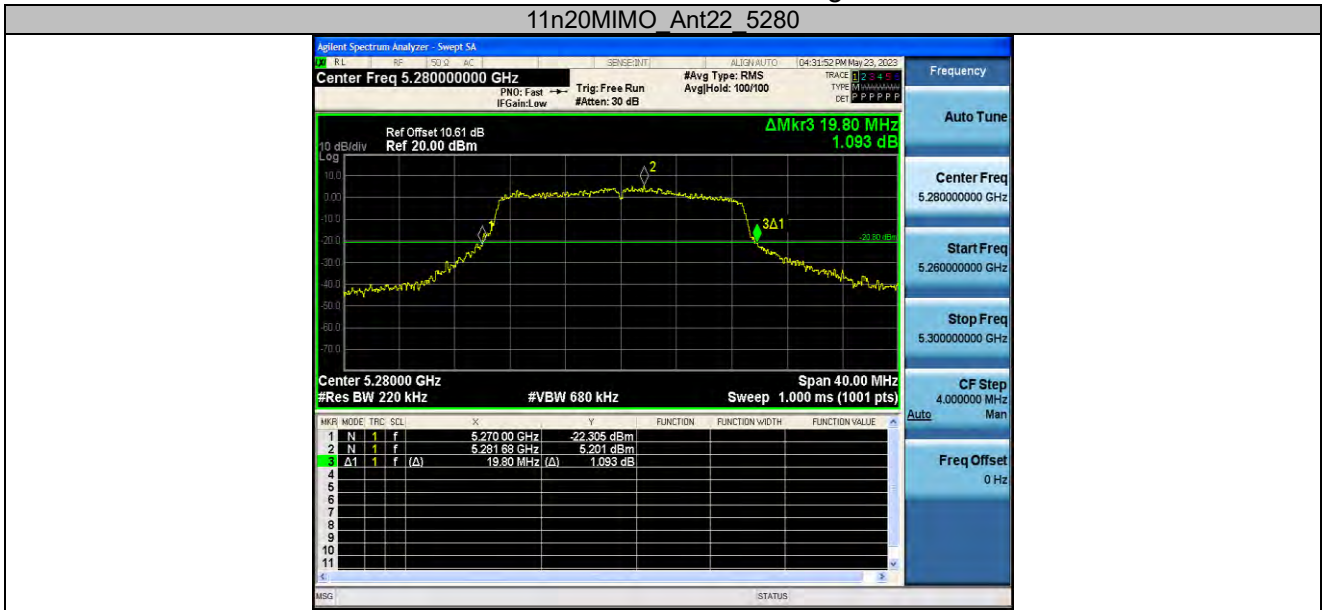
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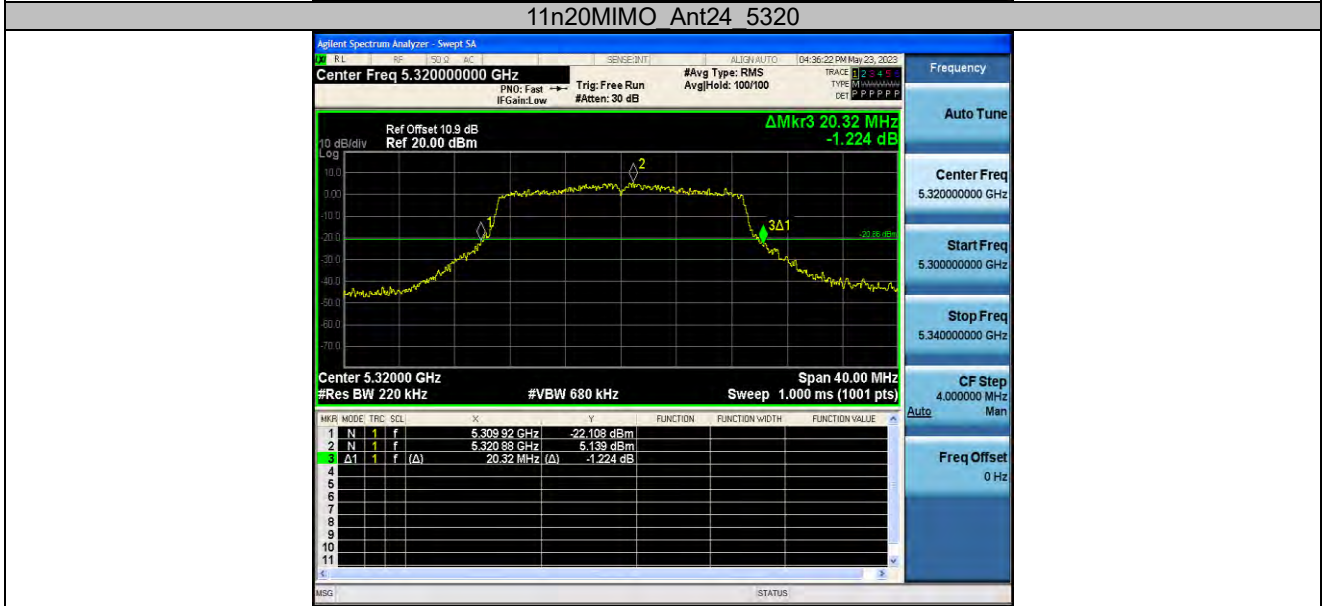
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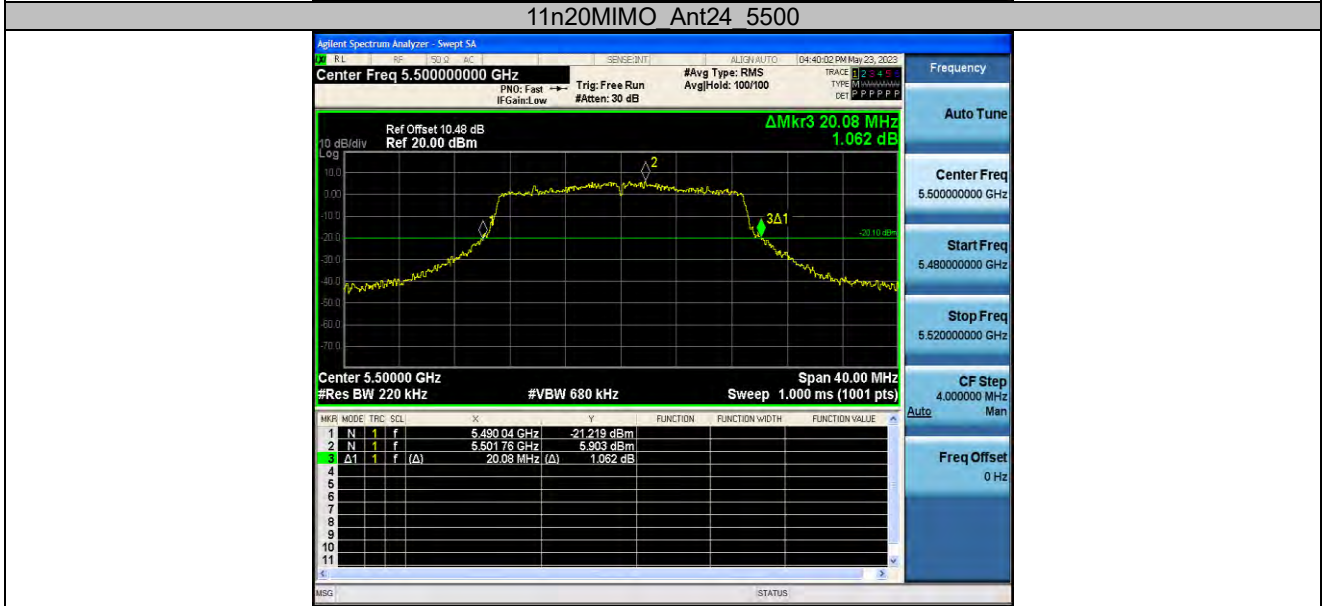
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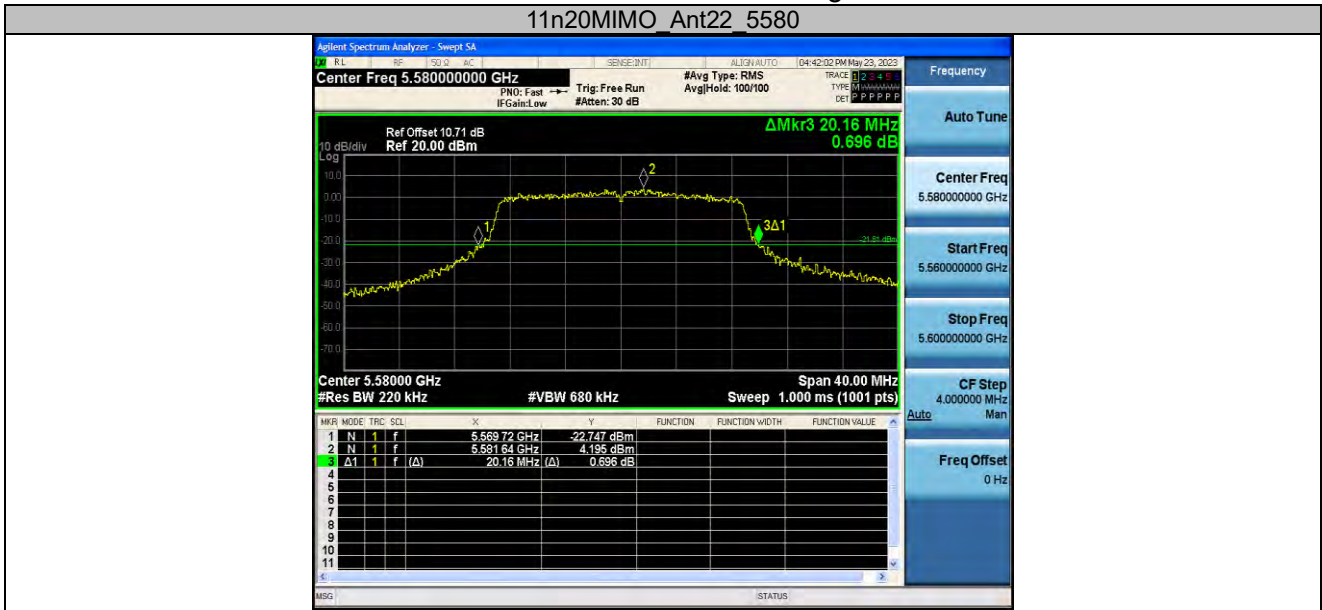
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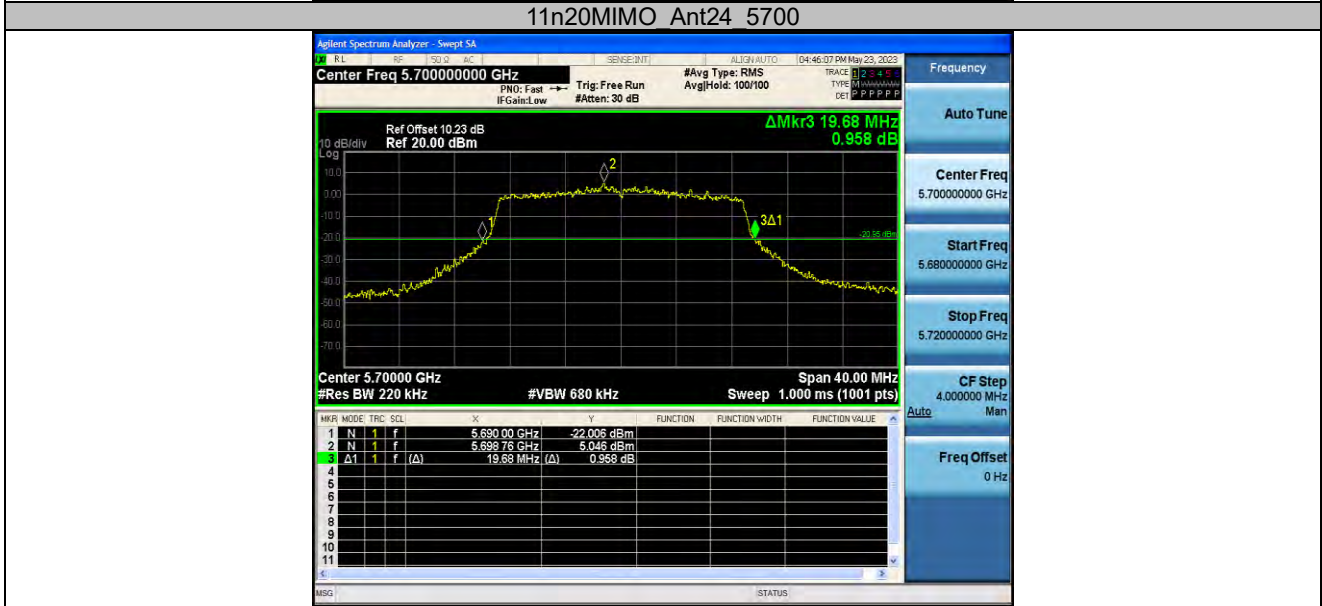
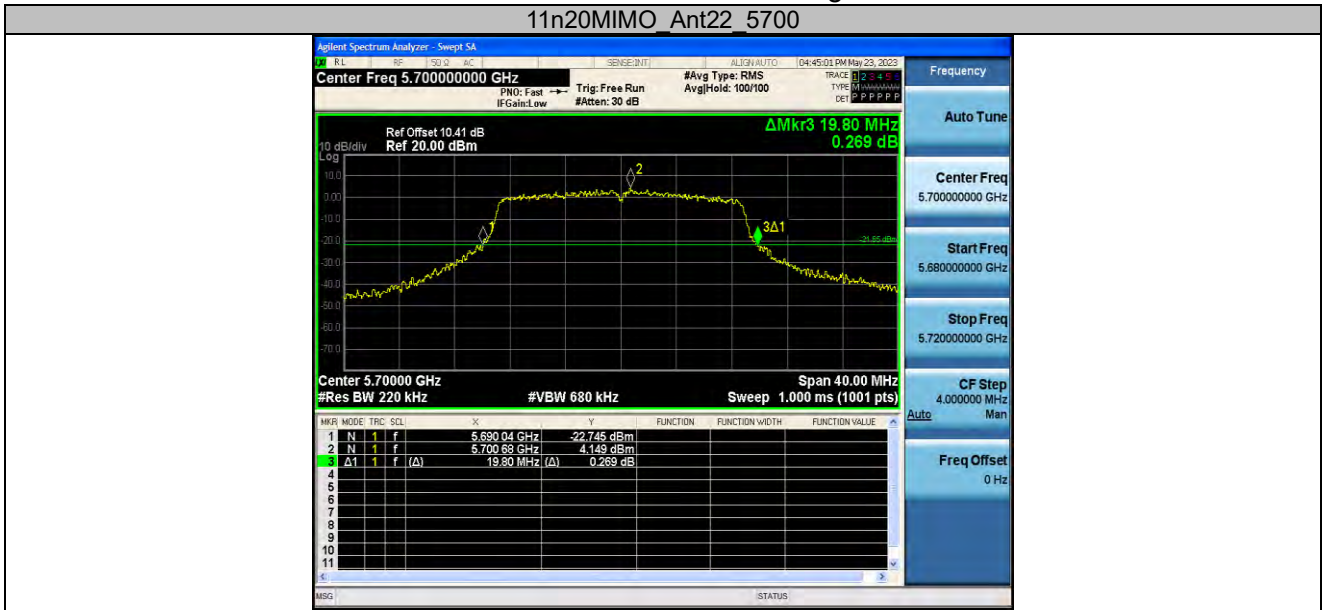
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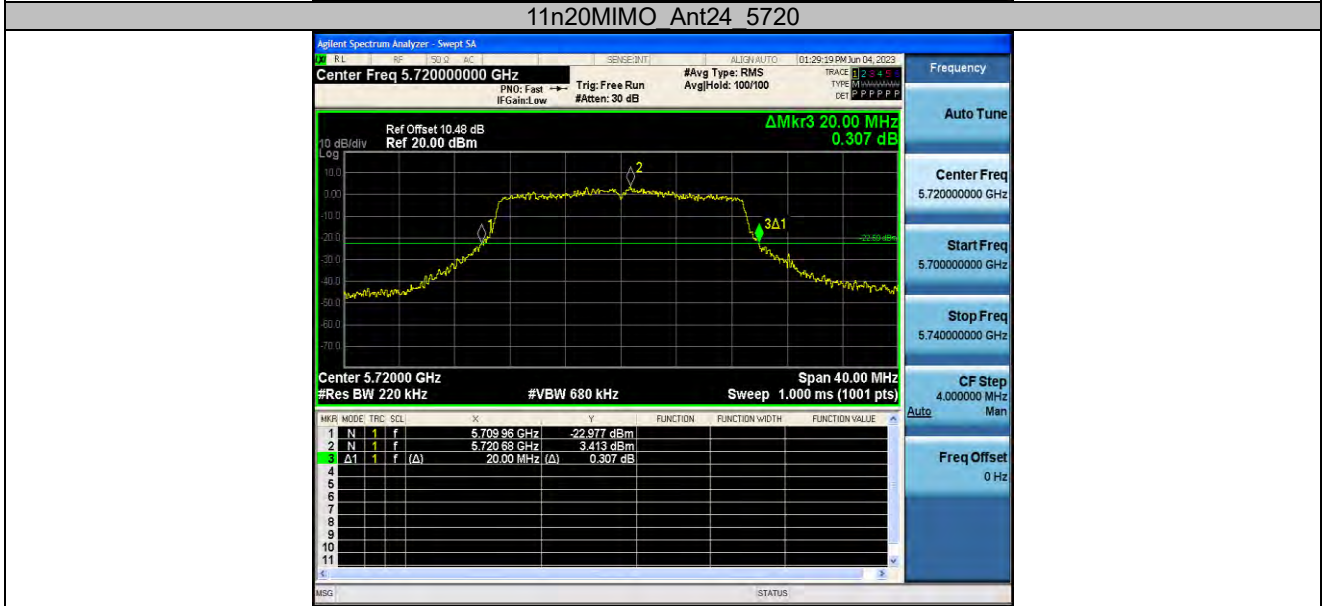
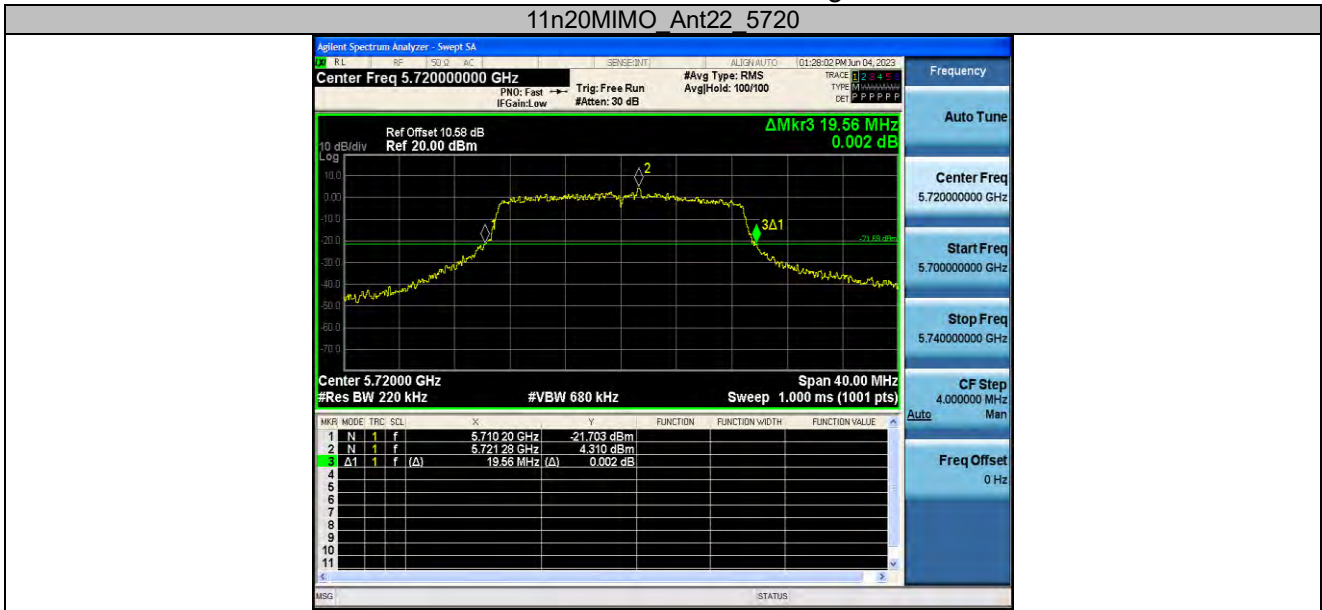
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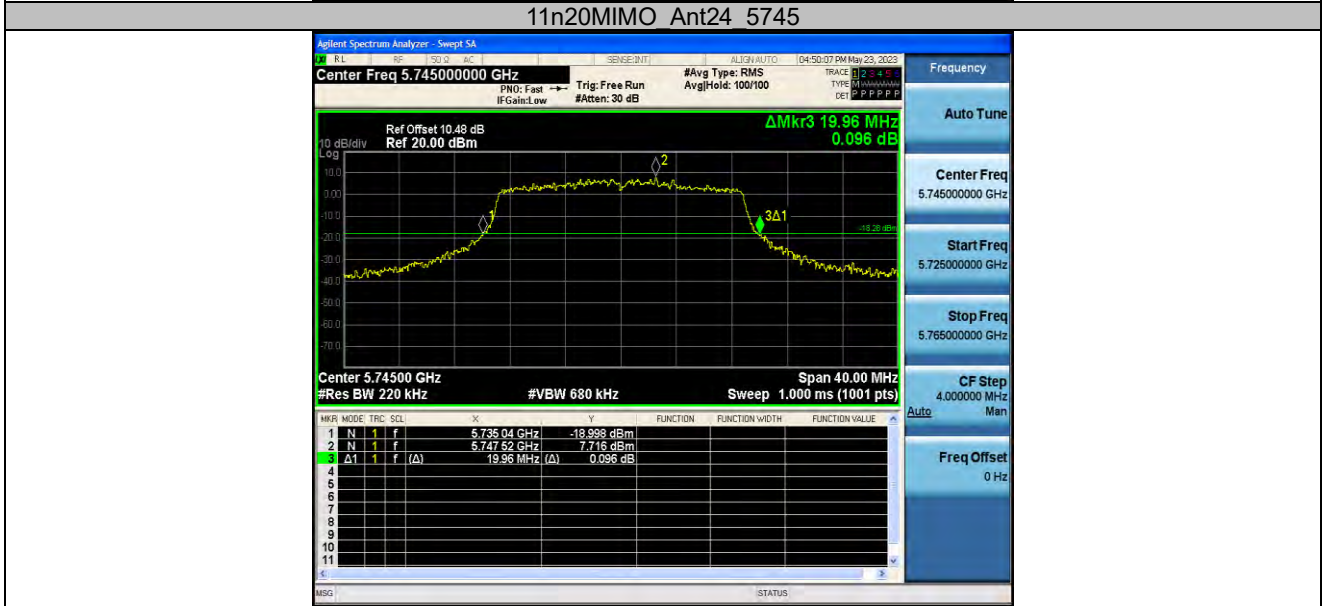
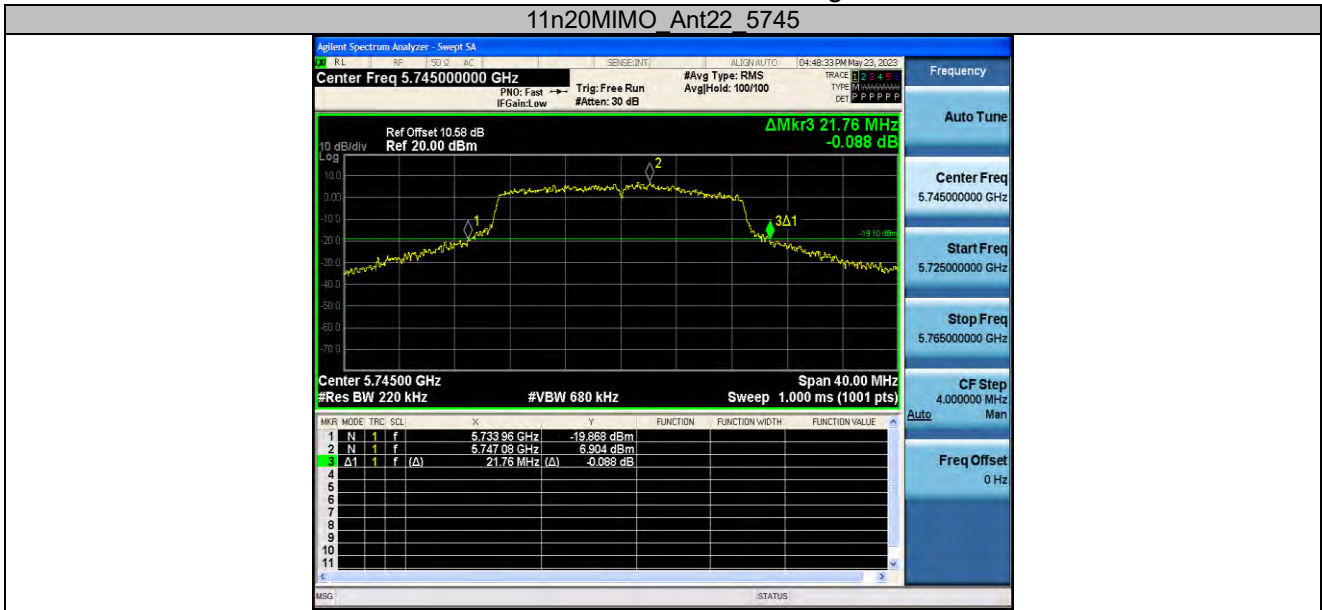
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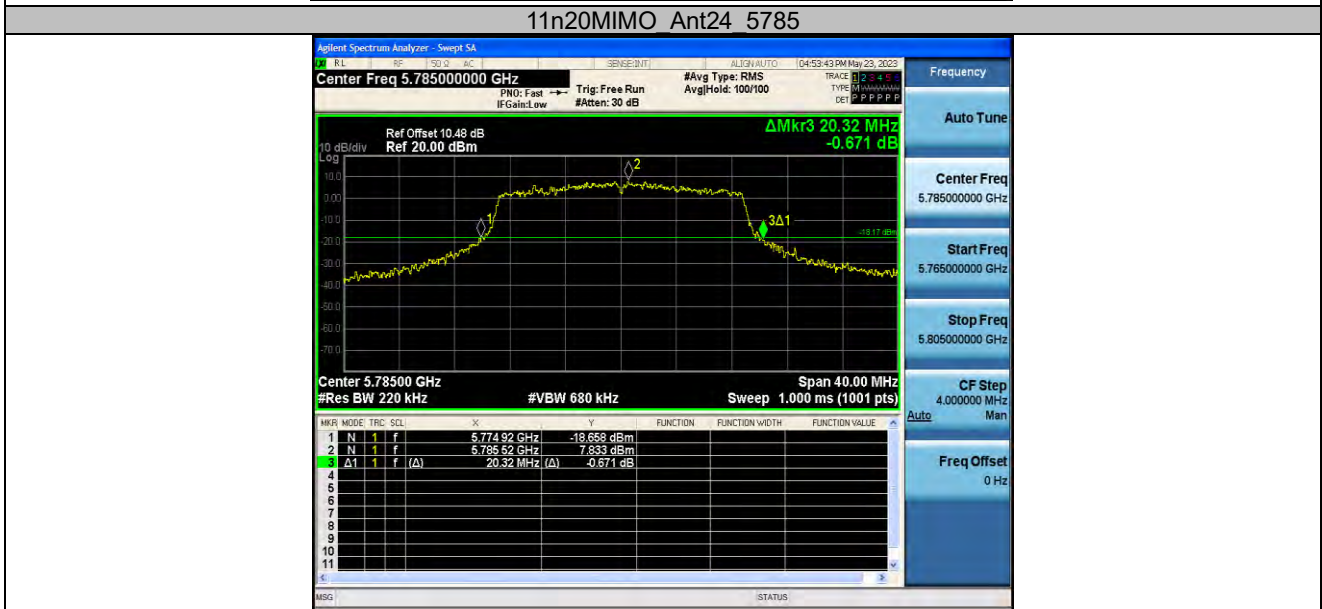
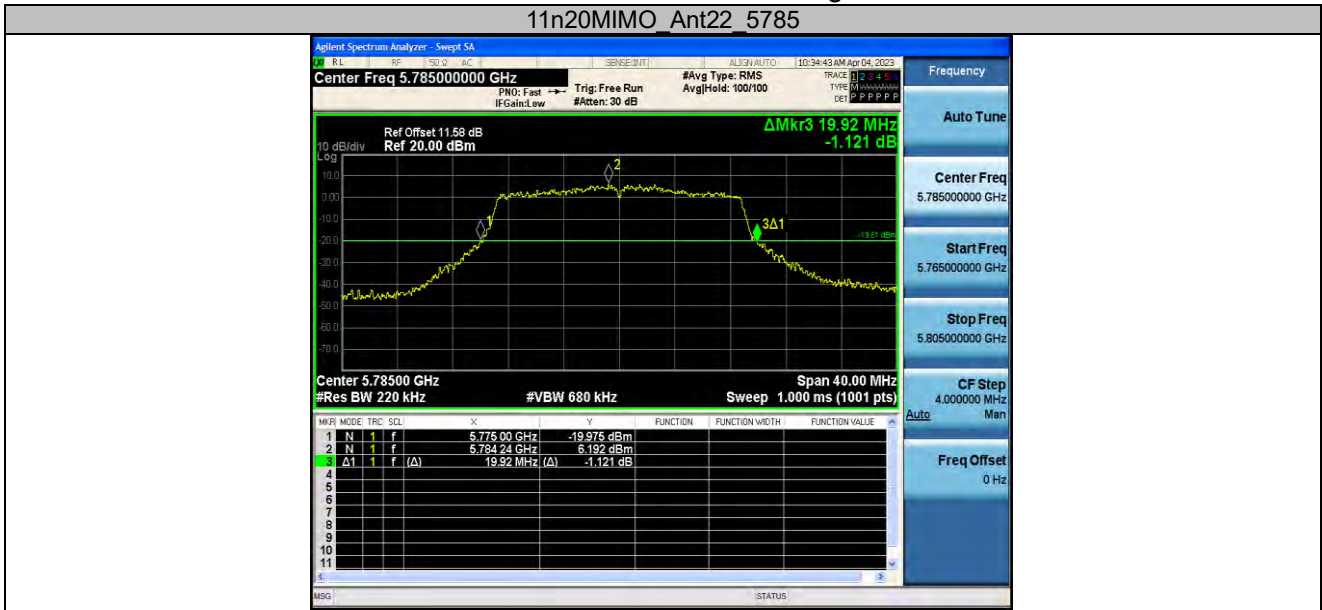
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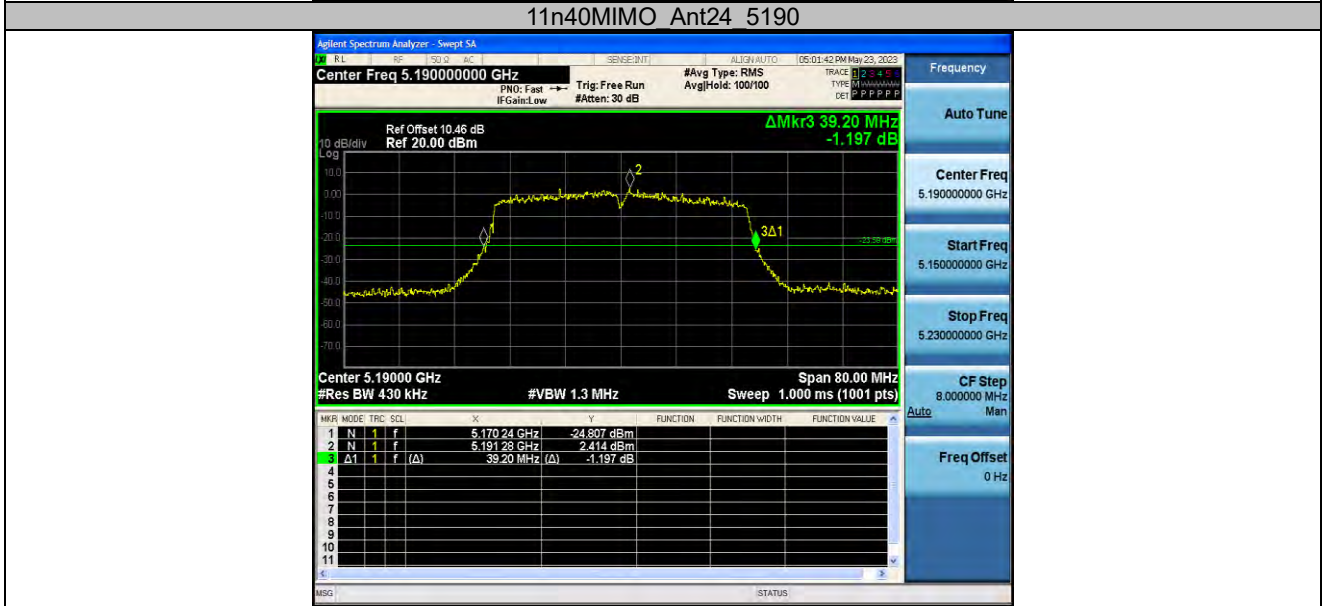
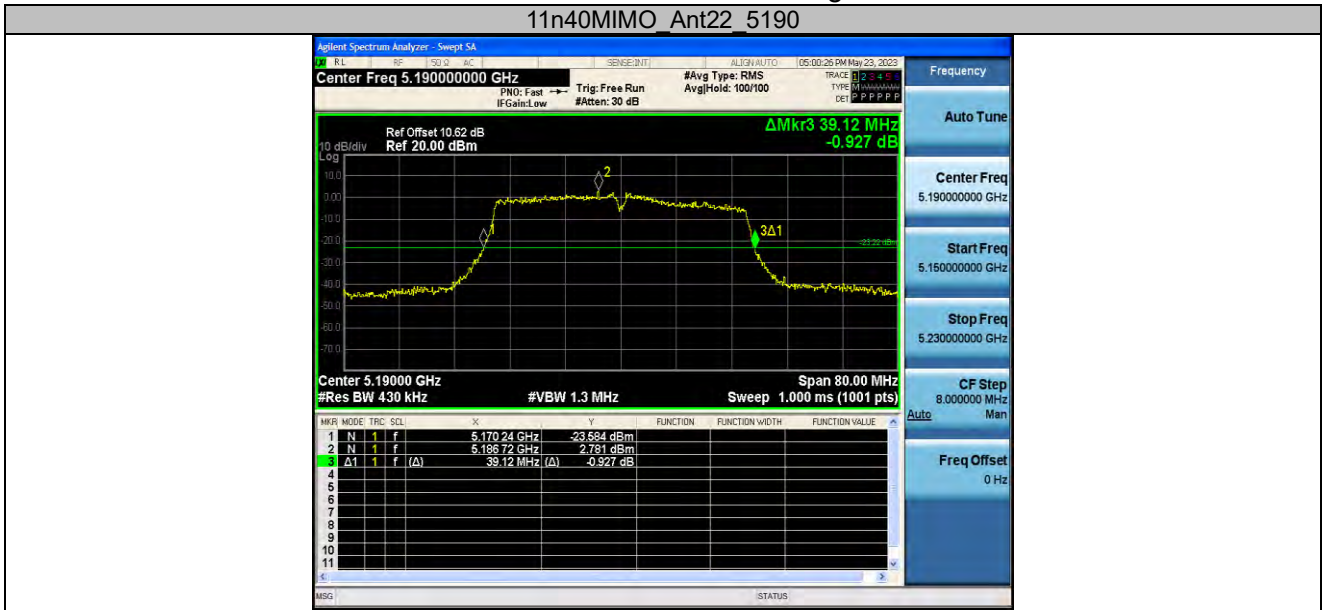


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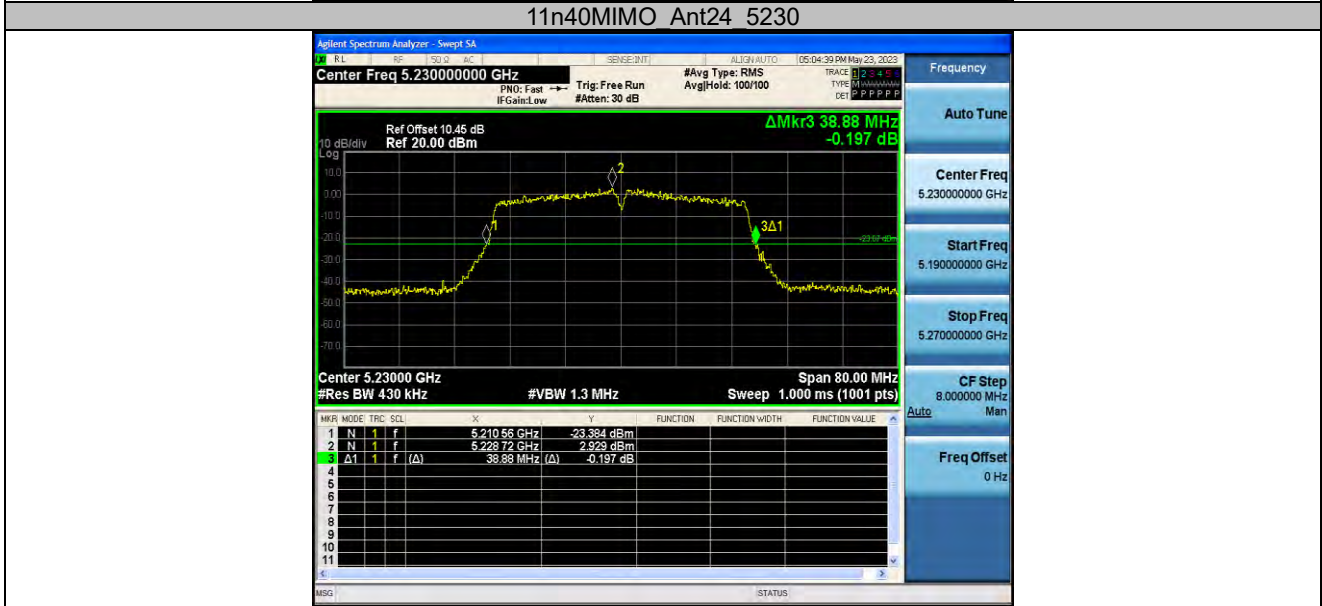
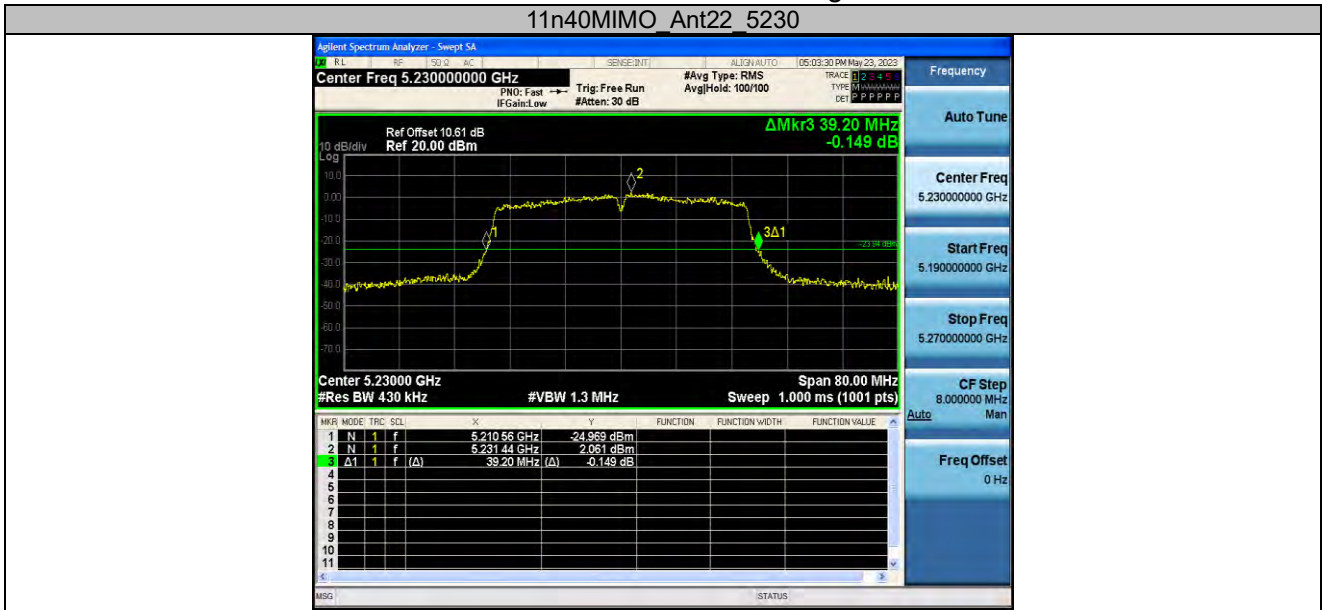


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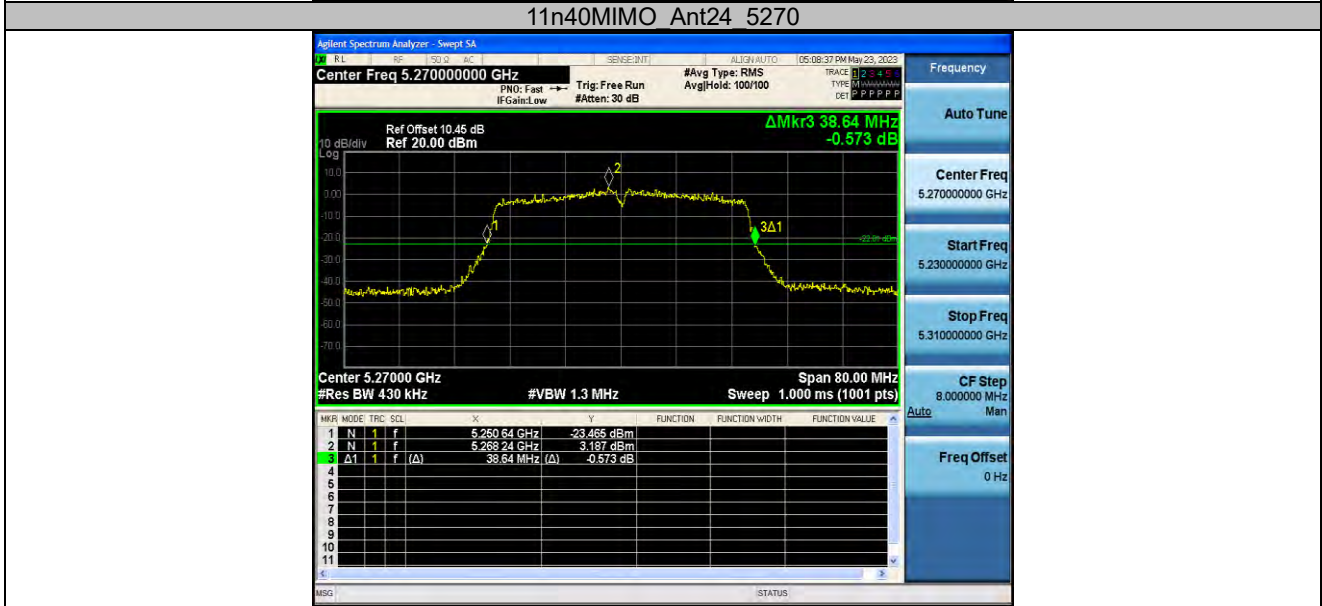
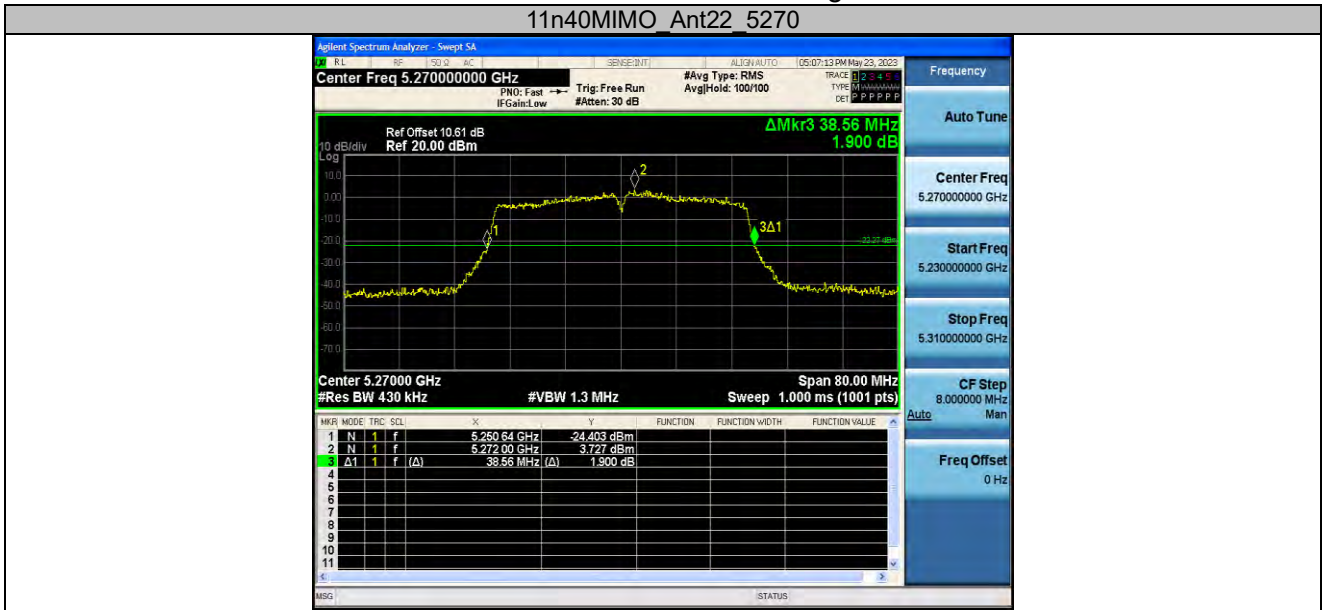
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