



FCC TEST REPORT

FCC ID: 2BXO3-Q3

Product	:	Smart Projector
Model Name	:	Q3
Brand	:	N/A
Report No.	:	PTC26071615302E-FC03
Prepared for		
Shenzhen World Winner Technology Co., Ltd		
3rd Floor, Building 2, No. 107 Fuqian Road, Longhua District, Shenzhen City, Guangdong Province		
Prepared by		
Precise Testing & Certification Co., Ltd.		
Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China		



1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen World Winner Technology Co., Ltd
Address : 3rd Floor, Building 2, No. 107 Fuqian Road, Longhua District,
Shenzhen City, Guangdong Province
Manufacture's name : Shenzhen World Winner Technology Co., Ltd
Address : 3rd Floor, Building 2, No. 107 Fuqian Road, Longhua District,
Shenzhen City, Guangdong Province
Product name : Smart Projector
Model name : Q3
Standards : FCC CFR47 Part 15 Section 15.247
Test procedure : ANSI C63.10-2020
Test Date : Jul. 21, 2026 to Aug. 24, 2026
Date of Issue : Aug. 24, 2026
Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Engineer:

A handwritten signature in black ink, appearing to read 'Jack Zhou'.

Jack Zhou / Engineer

Technical Manager:

A handwritten signature in black ink, appearing to read 'Simon Pu'.

Simon Pu / Manager



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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious Emission	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A: Not Applicable		



3 General Information

3.1 General Description of E.U.T.

Product Name	:	Smart Projector
Model Name	:	Q3
Specification	:	802.11b/g/n HT20/HT40/ax20/ax40
Operating frequency	:	2412-2462MHz for 802.11b/g/ n(HT20)/ax20 2422-2452MHz for 802.11 n(HT40)/ax40
Numbers of Channel	:	11 channels for 802.11b/g/ n(HT20) /ax20 7 channels for 802.11n(HT40) /ax40
Antenna Type	:	FPC Antenna
Antenna Gain	:	1.55 dBi
Type of Modulation	:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n; OFDM with BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM for 802.11ax
Power supply	:	Input: AC 100-240V DC30V/1.05A 12V/1A
Hardware Version	:	N/A
Software Version	:	N/A
Test sample No.	:	PTC26071615302E-1/2, PTC26071615302E-2/2
Resource Unit	:	Full RU



3.2 Channel List

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11b: 1 Mbps; 802.11g: 6 Mbps; 802.11n 20: MCS0; 802.11n 40: MCS0; 802.11ax20: MCS0; 802.11ax20: MCS0) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for 802.11 b/g/n20/n40/ax20/ax40

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

The maximum duty cycle as following table:

Test Mode	Duty Cycle(%)
802.11b	100%
802.11g	100%
802.11n20/ax20	100%
802.11n40/ax40	100%



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3.3 Test Site

Precise Testing & Certification Co., Ltd

Address: Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

FCC Designation Number: CN1219



4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Last Calibration	Calibration Interval
MXG Signal Analyzer	Agilent	N9020A	SER MY5111038	10Hz-26.5GHz	Aug. 10, 2026	1 Year
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug. 10, 2026	1 Year
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug. 10, 2026	1 Year
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug. 10, 2026	1 Year
DC power Supply	Agilent	E3642A	MY52420017	0-8V,5A/0-20,2.5A	Aug. 10, 2026	1 Year
6dB Attenuation	/	DC-3GHz	/	0.09MHz-3GHz	Aug. 10, 2026	1 Year
Test S/W	Tonscend	JS1120-3	/	/	/	/

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Last Calibration	Calibration Interval
EMI Test Receiver	Rohde&Schwarz	ESPI7	101671	9KHz-7GHz	Aug. 10, 2026	1 Year
Loop Antenna	Schwarzbeck	FMZB 1519	192	9 KHz -30MHz	Nov. 28, 2025	1 Year
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Sep. 10, 2025	1 Year
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	9KHz-1GHz	Mar. 21, 2026	1 Year
Cable	IMRO	AK-9515E(9m)	Cable-L	9KHz-3GHz	Aug. 10, 2026	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV40	6625-01-588-5515	9KHz-40GHz	Aug. 10, 2026	1 Year
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1246	1GHz-18GHz	Dec. 12, 2025	1 Year
Power Amplifier	ZHINAN	ZN3380C	15002	1GHz-26.5GHz	Aug. 10, 2026	1 Year



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Horn Antenna	SCHWARZBECK	BBHA 9170	9170-1066	15GHz-40GHz	Jun. 06, 2026	1 Year
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Jun. 04, 2026	1 Year
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug. 10, 2026	1 Year
RF Cable	R&S	R204	R21X	1GHz-40GHz	Aug. 10, 2026	1 Year
Test S/W	Tonscend	TS+	/	/	/	/

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Date	Calibration Interval
EMI Test Receiver	Rohde&Schwarz	ESCI3	101417	9KHz-3GHz	Aug. 10, 2026	1 Year
Artificial Mains Network	Rohde&Schwarz	ENV216	102453	9KHz-300MHz	Oct. 30, 2025	1 Year
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Oct. 30, 2025	1 Year
Limiter	R&S	ESH3-Z2	0357.8810.54-102808-NB	0Hz-30MHz	Aug. 10, 2026	1 Year
RF Switch	DIAMOND ANTENNA	CX-210	/	0.09MHz-6GHz	Mar. 21,2026	1 Year
Test S/W	Tonscend	JS32-CE	/	/	/	/



4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(9kHz~30MHz)	$\pm 3.15\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$



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4.3Description of Support Units

Equipment	Model No.	Series No.
N/A	N/A	N/A

5 Conducted Emission

Test Requirement: : FCC CFR 47 Part 15 Section 15.207

Test Method : ANSI C63.10: 2020

Test Result : PASS

Frequency Range : 150kHz to 30MHz

5.1E.U.T. Operation

Operating Environment :

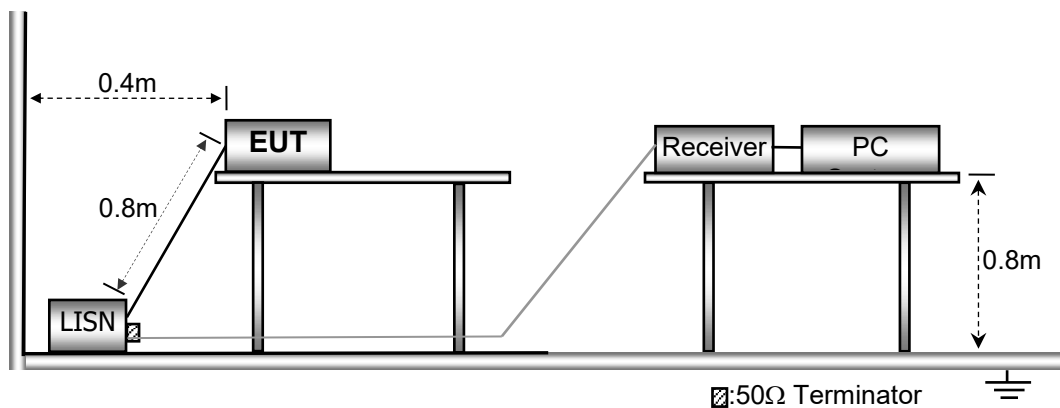
Temperature : 23.9 °C

Humidity : 51.4 % RH

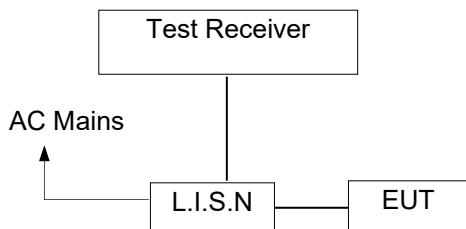
Atmospheric Pressure : 101.21kPa

5.2EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

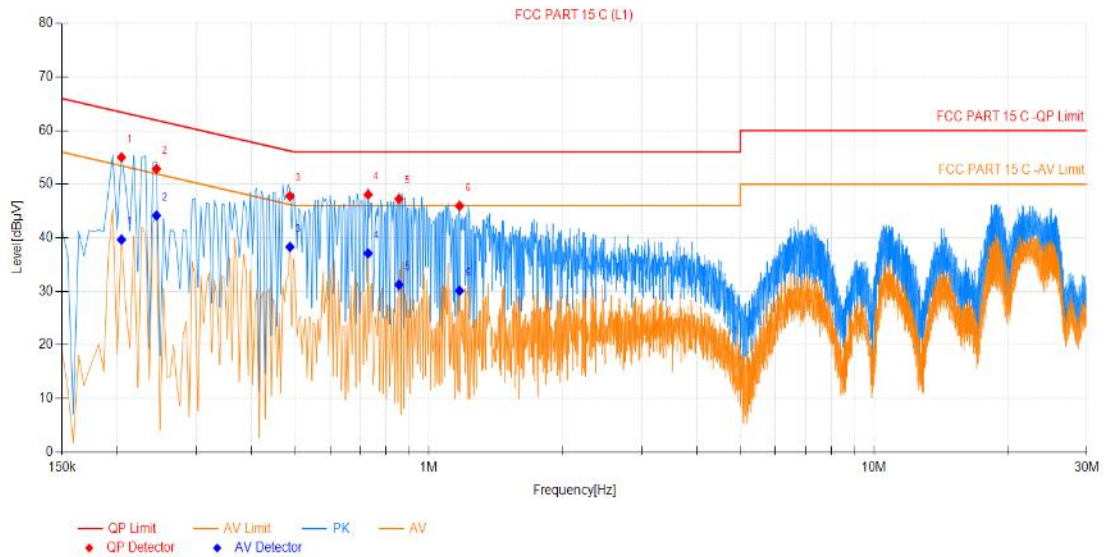
Pass.

During the test, the 120Vac/60Hz and 240Vac/60Hz power supplies were scanned in advance, and it was found that (120Vac/60Hz, TX 802.11b Low Channel) was a poor mode, and the report only reflected the poor mode.

Please refer to the following pages.



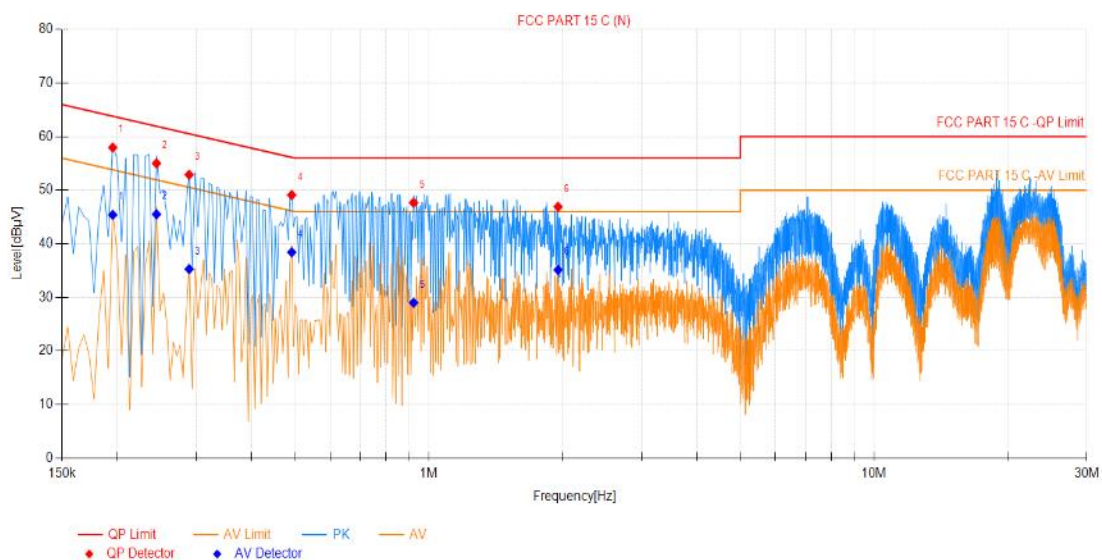
Line- AC 120V/60Hz



Final Data List

NO.	Freq. [MHz]	QP Reading	Factor [dB]	QP Value	QP Limit	QP Margin	AV Reading	AV Value	AV Limit	AV Margin	Verdict
1	0.204	35.62	19.40	55.02	63.45	8.43	20.26	39.66	53.45	13.79	PASS
2	0.245	33.38	19.48	52.86	61.94	9.08	24.68	44.16	51.94	7.78	PASS
3	0.488	28.33	19.43	47.76	56.21	8.45	18.87	38.30	46.21	7.91	PASS
4	0.731	28.63	19.43	48.06	56.00	7.94	17.68	37.11	46.00	8.89	PASS
5	0.857	27.83	19.43	47.26	56.00	8.74	11.81	31.24	46.00	14.76	PASS
6	1.172	26.45	19.50	45.95	56.00	10.05	10.62	30.12	46.00	15.88	PASS

Neutral-AC 120V/60Hz



Final Data List

NO.	Freq. [MHz]	QP Reading	Factor [dB]	QP Value	QP Limit	QP Margin	AV Reading	AV Value	AV Limit	AV Margin	Verdict
1	0.195	38.56	19.40	57.96	63.82	5.86	26.00	45.40	53.82	8.42	PASS
2	0.245	35.61	19.40	55.01	61.94	6.93	26.11	45.51	51.94	6.43	PASS
3	0.290	33.49	19.40	52.89	60.54	7.65	15.88	35.28	50.54	15.26	PASS
4	0.492	29.69	19.41	49.10	56.13	7.03	19.01	38.42	46.13	7.71	PASS
5	0.924	28.26	19.42	47.68	56.00	8.32	9.58	29.00	46.00	17.00	PASS
6	1.950	27.47	19.44	46.91	56.00	9.09	15.70	35.14	46.00	10.86	PASS

Note: QP Margin[dB]= QP Limit[dBμV]- QP Value[dBμV], AV Margin[dB]= AV Limit[dBμV]- AV Value[dBμV].



6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247
 Test Method : ANSI C63.10-2020
 Test Result : PASS
 Measurement Distance : 3m
 Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1EUT Operation

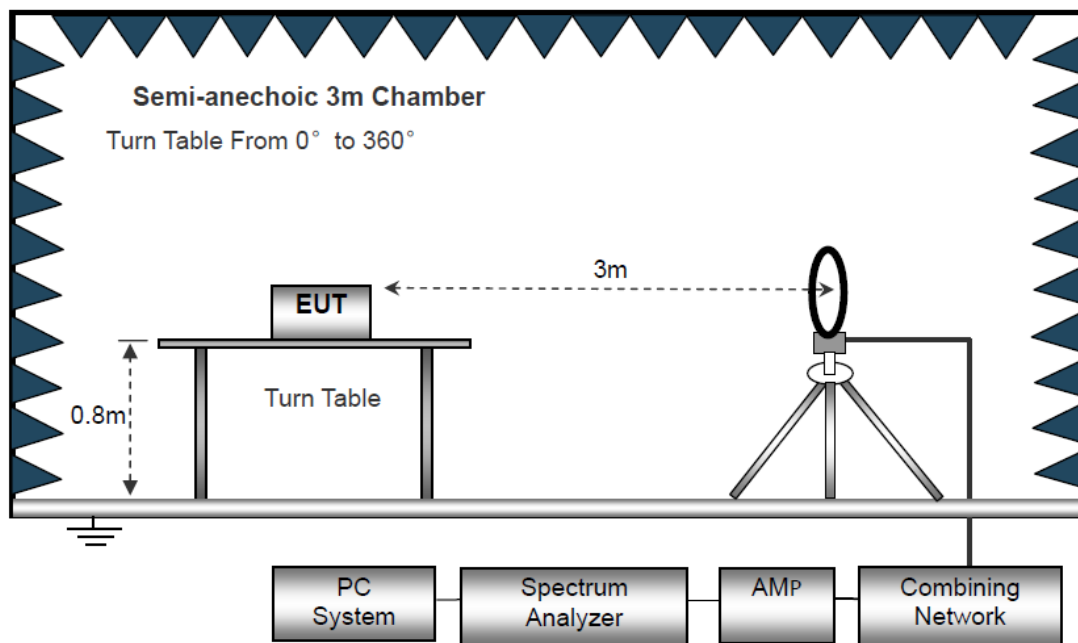
Operating Environment :

Temperature: : 24.5 °C
 Humidity: : 52 % RH
 Atmospheric Pressure: : 101.3kPa
 Test Voltage : AC 120V 60Hz

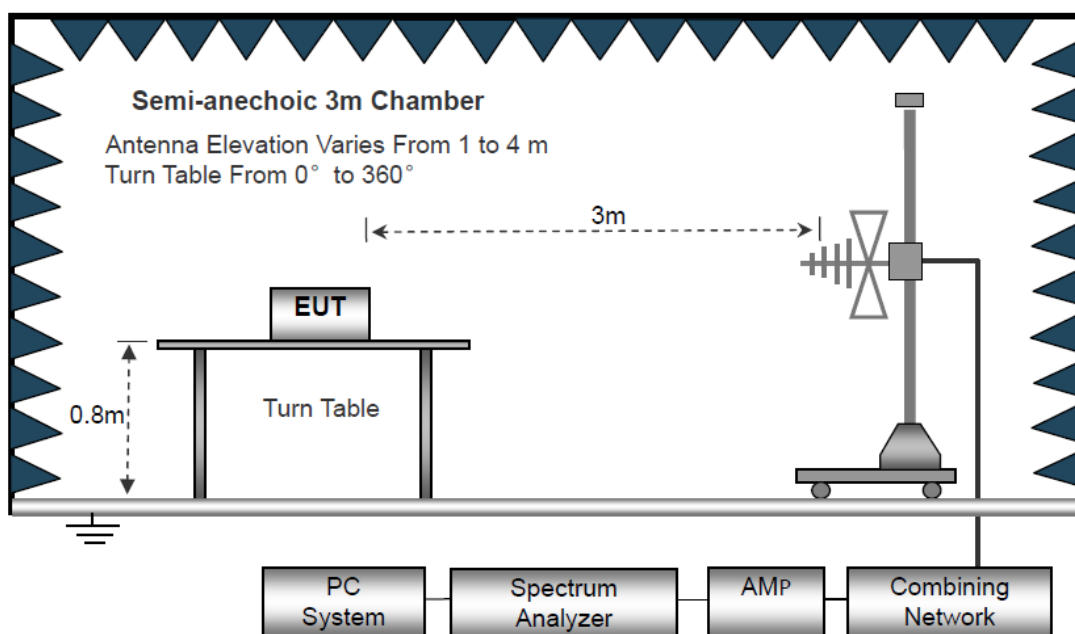
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

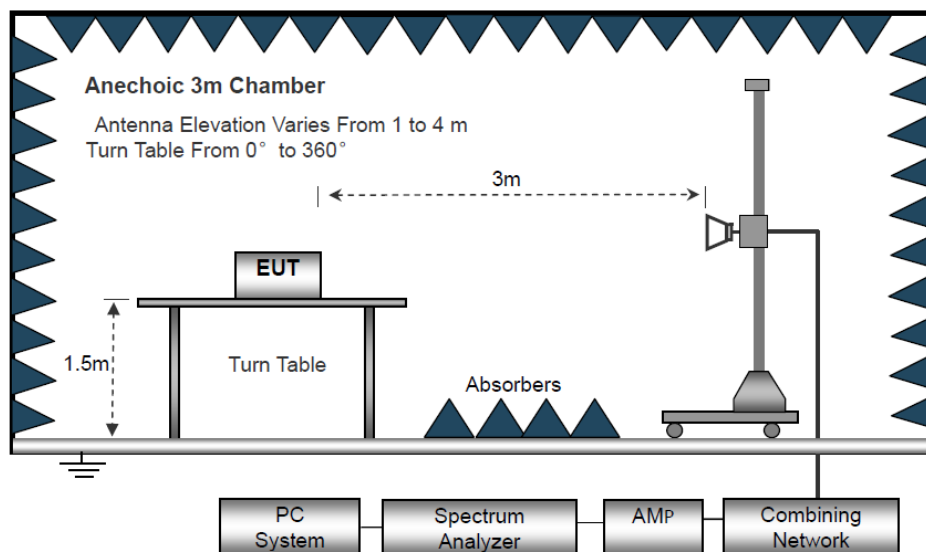
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

Receiver Setup	Frequency	Detector	RBW	VBW	Remark
	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value



6.4 Test Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room



6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance} / \text{test distance})$ (dB);

Limit line = Specific limits (dBuV) + distance extrapolation factor.

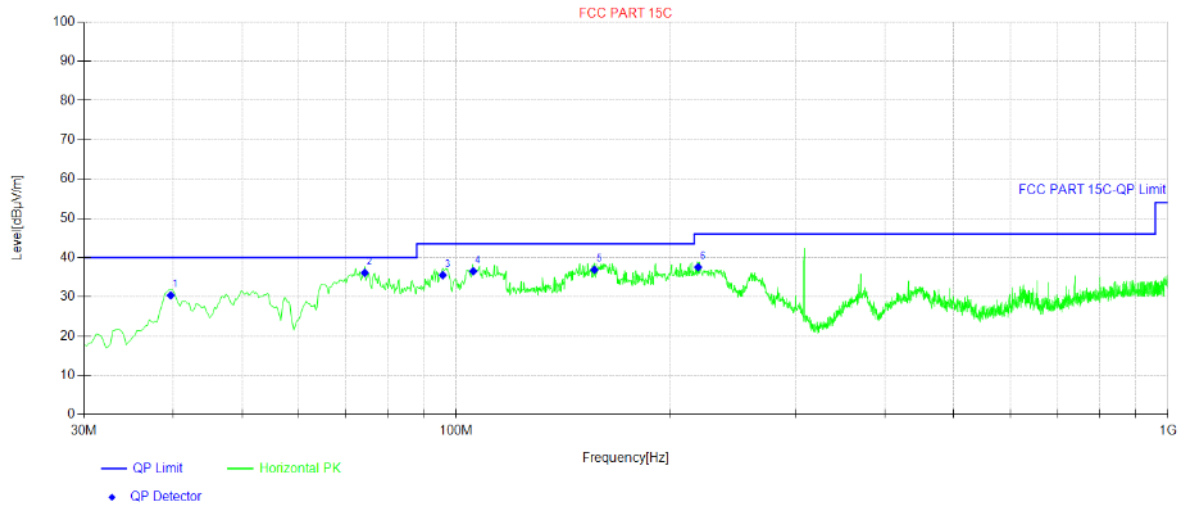
Test Frequency: 30MHz ~ 1GHz

All the modulation modes were tested the data of the worst mode (TX 802.11b Low Channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:



Antenna Polarization: Horizontal

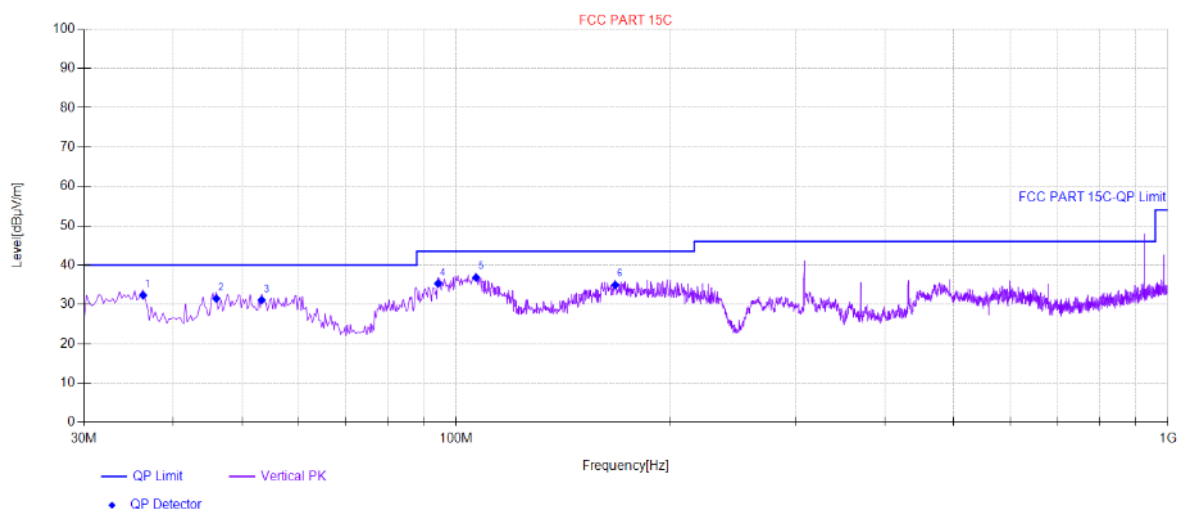


Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity	Verdict
1	39.70	40.19	-9.82	30.37	40.00	9.63	Horizontal	PASS
2	74.38	49.82	-13.70	36.12	40.00	3.88	Horizontal	PASS
3	95.72	49.15	-13.62	35.53	43.50	7.97	Horizontal	PASS
4	105.66	47.95	-11.42	36.53	43.50	6.97	Horizontal	PASS
5	156.34	44.73	-7.84	36.89	43.50	6.61	Horizontal	PASS
6	218.67	47.25	-9.70	37.55	46.00	8.45	Horizontal	PASS

Remark: 1. QP Value= QP Reading+ Factor;
 2. QP Margin= QP Limit- QP Value;
 3. Factor= ANT Factor+ Cable Loss -AMP Factor.



Antenna Polarization: Vertical



Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity	Verdict
1	36.31	42.43	-10.11	32.32	40.00	7.68	Vertical	PASS
2	46.01	41.12	-9.63	31.49	40.00	8.51	Vertical	PASS
3	53.28	41.26	-10.15	31.11	40.00	8.89	Vertical	PASS
4	94.26	49.3	-13.99	35.31	43.50	8.19	Vertical	PASS
5	106.63	48.1	-11.27	36.83	43.50	6.67	Vertical	PASS
6	167.26	43.02	-8.07	34.95	43.50	8.55	Vertical	PASS

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor



Test Frequency: From 1GHz to 18GHz

Worst case 802.11b

Test Mode: 2412					Test channel: Lowest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4824	45.94	32.35	4.12	28.44	53.97	74	-20.03	V
7236	38.92	36.08	6.3	27.74	53.56	74	-20.44	V
9648	35.27	38.25	7.91	24.65	56.78	74	-17.22	V
4824	42.77	32.35	4.12	28.44	50.80	74	-23.20	H
7236	37.83	36.08	6.3	27.74	52.47	74	-21.53	H
9648	34.31	38.25	7.91	24.65	55.82	74	-18.18	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4824	30.70	32.35	4.12	28.44	38.73	54	-15.27	V
7236	23.48	36.08	6.3	27.74	38.12	54	-15.88	V
9648	21.17	38.25	7.91	24.65	42.68	54	-11.32	V
4824	30.79	32.35	4.12	28.44	38.82	54	-15.18	H
7236	25.59	36.08	6.3	27.74	40.23	54	-13.77	H
9648	21.78	38.25	7.91	24.65	43.29	54	-10.71	H



Worst case 802.11b

Test Mode: 2437					Test channel: Middle			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4874	46.62	32.35	4.12	28.44	54.65	74	-19.35	V
7311	38.76	36.08	6.3	27.74	53.40	74	-20.60	V
9748	35.35	38.25	7.91	24.65	56.86	74	-17.14	V
4874	43.04	32.35	4.12	28.44	51.07	74	-22.93	H
7311	37.40	36.08	6.3	27.74	52.04	74	-21.96	H
9748	33.77	38.25	7.91	24.65	55.28	74	-18.72	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4874	30.67	32.35	4.12	28.44	38.70	54	-15.30	V
7311	24.73	36.08	6.3	27.74	39.37	54	-14.63	V
9748	21.27	38.25	7.91	24.65	42.78	54	-11.22	V
4874	30.52	32.35	4.12	28.44	38.55	54	-15.45	H
7311	24.36	36.08	6.3	27.74	39.00	54	-15.00	H
9748	20.67	38.25	7.91	24.65	42.18	54	-11.82	H



Worst case 802.11b

Test Mode: 2462					Test channel: High			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4924	45.74	32.41	4.14	28.42	53.87	74	-20.13	V
7386	38.94	36.15	6.36	27.68	53.77	74	-20.23	V
9848	35.25	38.35	7.97	24.33	57.24	74	-16.76	V
4924	43.89	32.41	4.14	28.42	52.02	74	-21.98	H
7386	38.88	36.15	6.36	27.68	53.71	74	-20.29	H
9848	35.21	38.35	7.97	24.33	57.20	74	-16.80	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4924	32.12	32.41	4.14	28.42	40.25	54	-13.75	V
7386	25.10	36.15	6.36	27.68	39.93	54	-14.07	V
9848	20.91	38.35	7.97	24.33	42.90	54	-11.10	V
4924	31.04	32.41	4.14	28.42	39.17	54	-14.83	H
7386	24.51	36.15	6.36	27.68	39.34	54	-14.66	H
9848	21.53	38.35	7.97	24.33	43.52	54	-10.48	H

Note:

1. The testing has been conformed to $10 \times 2462 \text{ MHz} = 24620 \text{ MHz}$.
2. All other emissions more than 30dB below the limit.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
Margin=Emission Level-Limit
4. X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz



2.4G WiFi (802.11b/g/n) mode have been tested, and the worst result(802.11b) was report as below
 Test Mode: Worst case 802.11b Low Channel 2412MHz

Test Mode: 802.11b Low Channel 2412MHz									Test Value
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over (dB)	Polarity H/V	
2310	48.60	28.67	6.72	37.26	46.73	74	-27.27	H	Peak
2390	60.63	28.08	6.81	37.12	58.40	74	-15.60	H	
2310	47.36	28.67	6.72	37.26	45.49	74	-28.51	V	
2390	55.75	28.08	6.81	37.12	53.52	74	-20.48	V	
2310	40.88	28.67	6.72	37.26	39.01	54	-14.99	H	Average
2390	44.37	28.08	6.81	37.12	42.14	54	-11.86	H	
2310	39.22	28.67	6.72	37.26	37.35	54	-16.65	V	
2390	44.60	28.08	6.81	37.12	42.37	54	-11.63	V	

Test Mode: Worst case 802.11b High Channel 2462MHz

Test Mode: 802.11b High Channel 2462MHz									Test Value
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over (dB)	Polarity H/V	
2483.5	60.62	27.38	6.15	36.29	57.86	74	-16.14	H	Peak
2500	48.65	27.43	6.68	36.79	45.97	74	-28.03	H	
2483.5	60.25	27.38	6.15	36.29	57.49	74	-16.51	V	
2500	48.20	27.43	6.68	36.79	45.52	74	-28.48	V	
2483.5	42.64	27.38	6.15	36.29	39.88	54	-14.12	H	Average
2500	39.96	27.43	6.68	36.79	37.28	54	-16.72	H	
2483.5	43.71	27.38	6.15	36.29	40.95	54	-13.05	V	
2500	40.47	27.43	6.68	36.79	37.79	54	-16.21	V	

Test Frequency: From 18GHz to 25GHz

The measurements were more than 20dB below the limit and not reported.



7 Conducted Spurious Emission

Test Requirement : FCC CFR47 Part 15 Section 15.247
Test Method : ANSI C63.10-2020
Test Limit : Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.1 Test Result

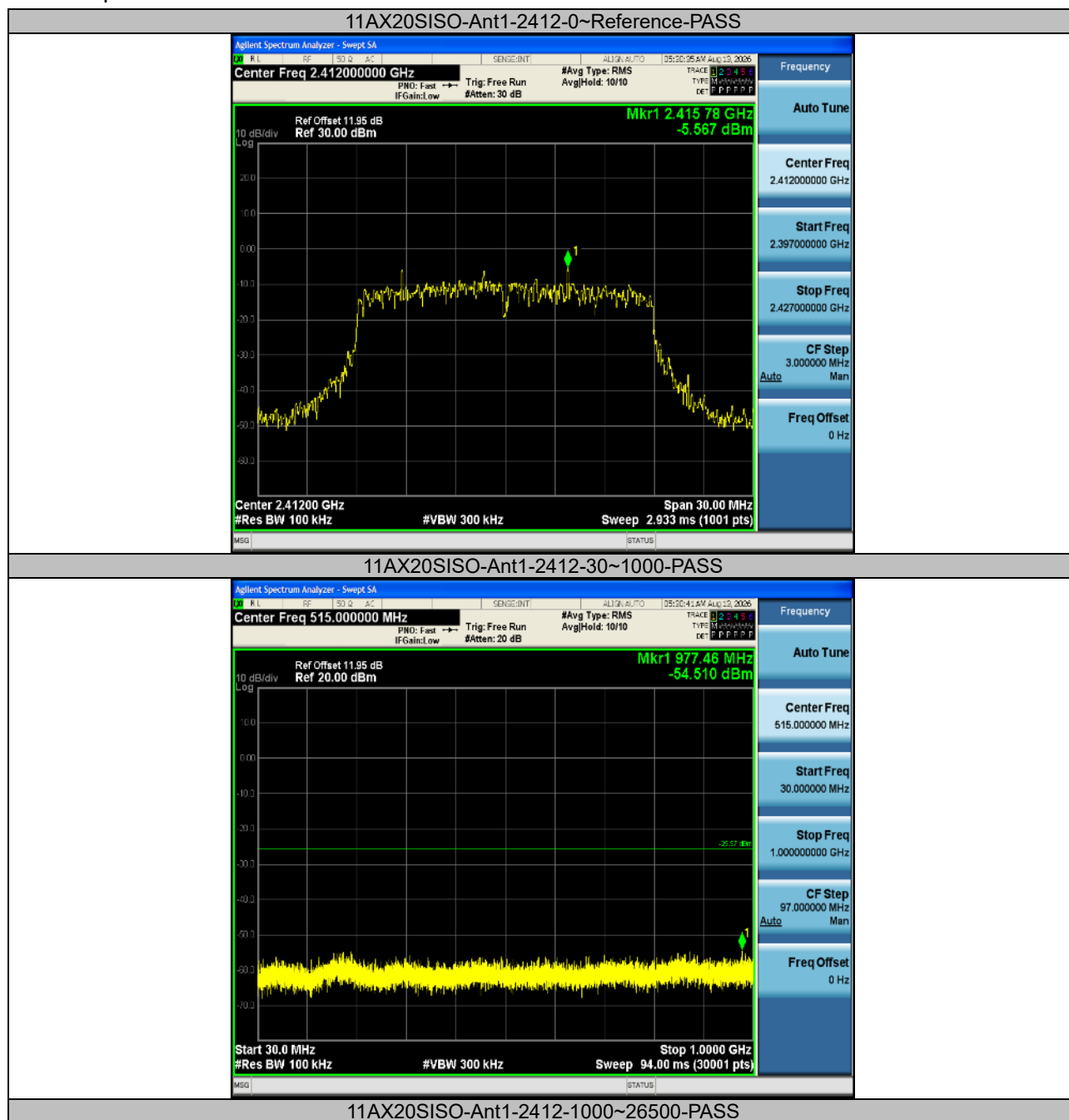
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11AX20SISO	Ant1	2412	0~Reference	-5.57	-5.57	---	PASS
11AX20SISO	Ant1	2412	30~1000	-5.57	-54.51	≤-25.57	PASS
11AX20SISO	Ant1	2412	1000~26500	-5.57	-42.27	≤-25.57	PASS
11AX20SISO	Ant1	2437	0~Reference	-9.05	-9.05	---	PASS
11AX20SISO	Ant1	2437	30~1000	-9.05	-54.92	≤-29.05	PASS
11AX20SISO	Ant1	2437	1000~26500	-9.05	-42.59	≤-29.05	PASS
11AX20SISO	Ant1	2462	0~Reference	-8.31	-8.31	---	PASS
11AX20SISO	Ant1	2462	30~1000	-8.31	-54.23	≤-28.31	PASS
11AX20SISO	Ant1	2462	1000~26500	-8.31	-42.33	≤-28.31	PASS
11AX40SISO	Ant1	2422	0~Reference	-8.51	-8.51	---	PASS
11AX40SISO	Ant1	2422	30~1000	-8.51	-54.69	≤-28.51	PASS
11AX40SISO	Ant1	2422	1000~26500	-8.51	-42.81	≤-28.51	PASS
11AX40SISO	Ant1	2437	0~Reference	-11.78	-11.78	---	PASS
11AX40SISO	Ant1	2437	30~1000	-11.78	-54.55	≤-31.78	PASS
11AX40SISO	Ant1	2437	1000~26500	-11.78	-42.39	≤-31.78	PASS
11AX40SISO	Ant1	2452	0~Reference	-11.39	-11.39	---	PASS
11AX40SISO	Ant1	2452	30~1000	-11.39	-54.29	≤-31.39	PASS
11AX40SISO	Ant1	2452	1000~26500	-11.39	-42.35	≤-31.39	PASS
11B	Ant1	2412	0~Reference	-0.84	-0.84	---	PASS
11B	Ant1	2412	30~1000	-0.84	-54.25	≤-20.84	PASS
11B	Ant1	2412	1000~26500	-0.84	-42.34	≤-20.84	PASS
11B	Ant1	2437	0~Reference	-1.85	-1.85	---	PASS
11B	Ant1	2437	30~1000	-1.85	-53.87	≤-21.85	PASS
11B	Ant1	2437	1000~26500	-1.85	-42.74	≤-21.85	PASS
11B	Ant1	2462	0~Reference	-1.60	-1.60	---	PASS
11B	Ant1	2462	30~1000	-1.60	-54.47	≤-21.6	PASS
11B	Ant1	2462	1000~26500	-1.60	-41.88	≤-21.6	PASS
11G	Ant1	2412	0~Reference	-4.62	-4.62	---	PASS
11G	Ant1	2412	30~1000	-4.62	-54.52	≤-24.62	PASS
11G	Ant1	2412	1000~26500	-4.62	-41.6	≤-24.62	PASS
11G	Ant1	2437	0~Reference	-8.49	-8.49	---	PASS
11G	Ant1	2437	30~1000	-8.49	-55.02	≤-28.49	PASS
11G	Ant1	2437	1000~26500	-8.49	-42.33	≤-28.49	PASS

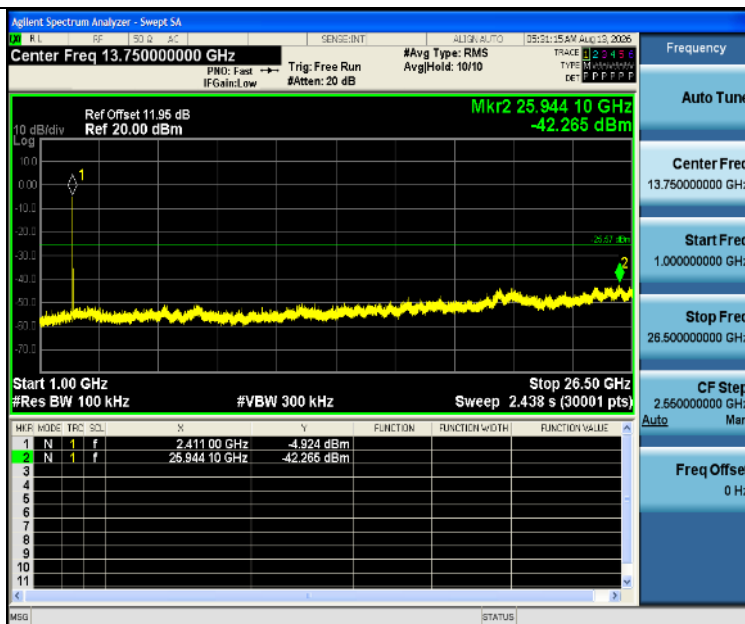


11G	Ant1	2462	0~Reference	-7.67	-7.67	---	PASS
11G	Ant1	2462	30~1000	-7.67	-54.64	≤ -27.67	PASS
11G	Ant1	2462	1000~26500	-7.67	-42.69	≤ -27.67	PASS
11N20SISO	Ant1	2412	0~Reference	-5.00	-5.00	---	PASS
11N20SISO	Ant1	2412	30~1000	-5.00	-54.31	≤ -25	PASS
11N20SISO	Ant1	2412	1000~26500	-5.00	-41.93	≤ -25	PASS
11N20SISO	Ant1	2437	0~Reference	-7.02	-7.02	---	PASS
11N20SISO	Ant1	2437	30~1000	-7.02	-55.21	≤ -27.02	PASS
11N20SISO	Ant1	2437	1000~26500	-7.02	-42.87	≤ -27.02	PASS
11N20SISO	Ant1	2462	0~Reference	-7.99	-7.99	---	PASS
11N20SISO	Ant1	2462	30~1000	-7.99	-53.73	≤ -27.99	PASS
11N20SISO	Ant1	2462	1000~26500	-7.99	-42.78	≤ -27.99	PASS
11N40SISO	Ant1	2422	0~Reference	-10.02	-10.02	---	PASS
11N40SISO	Ant1	2422	30~1000	-10.02	-54.2	≤ -30.02	PASS
11N40SISO	Ant1	2422	1000~26500	-10.02	-42.92	≤ -30.02	PASS
11N40SISO	Ant1	2437	0~Reference	-9.44	-9.44	---	PASS
11N40SISO	Ant1	2437	30~1000	-9.44	-55.15	≤ -29.44	PASS
11N40SISO	Ant1	2437	1000~26500	-9.44	-42.55	≤ -29.44	PASS
11N40SISO	Ant1	2452	0~Reference	-9.22	-9.22	---	PASS
11N40SISO	Ant1	2452	30~1000	-9.22	-55.1	≤ -29.22	PASS
11N40SISO	Ant1	2452	1000~26500	-9.22	-42.94	≤ -29.22	PASS

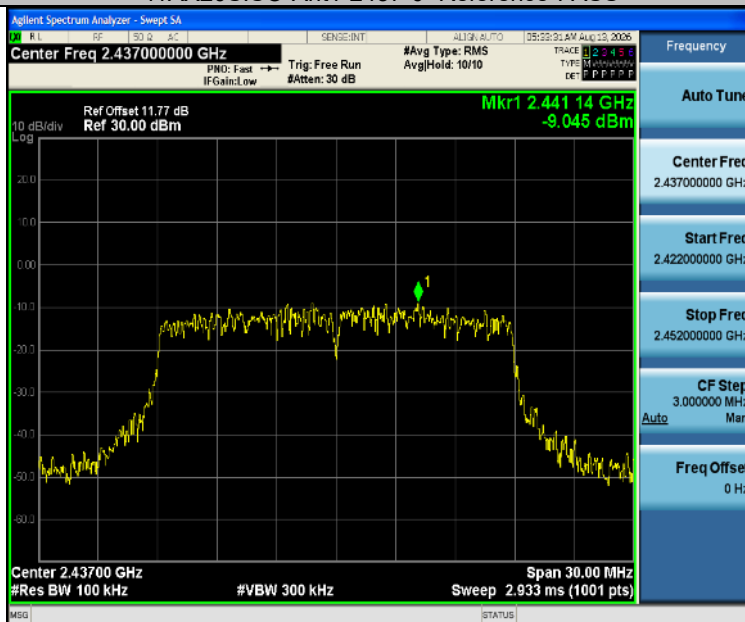


Test Graphs:

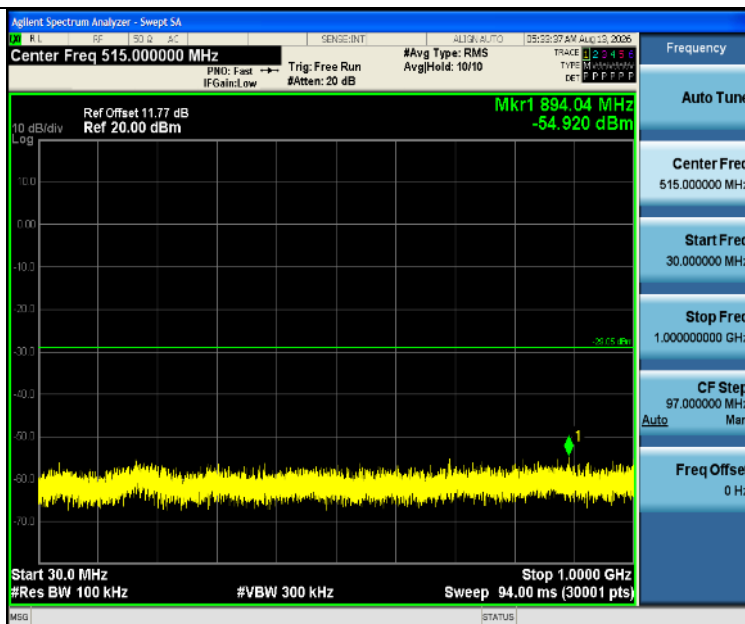




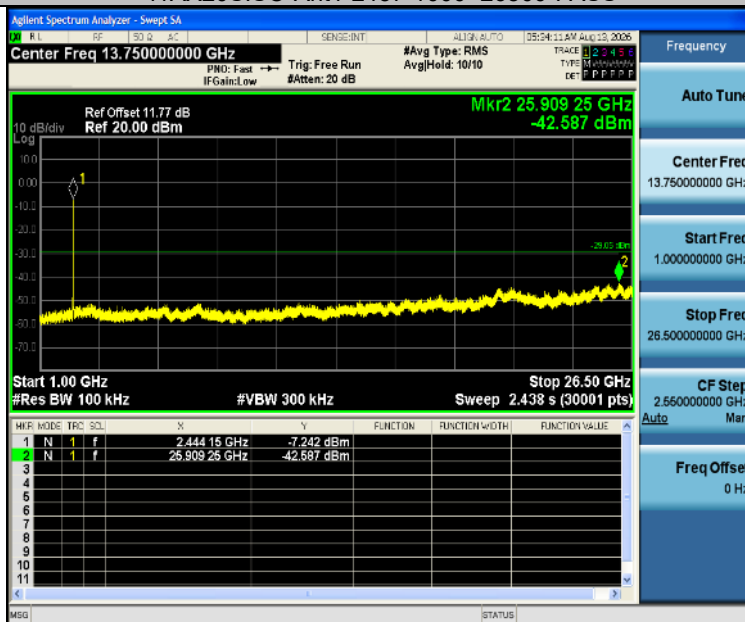
11AX20SISO-Ant1-2437-0~Reference-PASS



11AX20SISO-Ant1-2437-30~1000-PASS



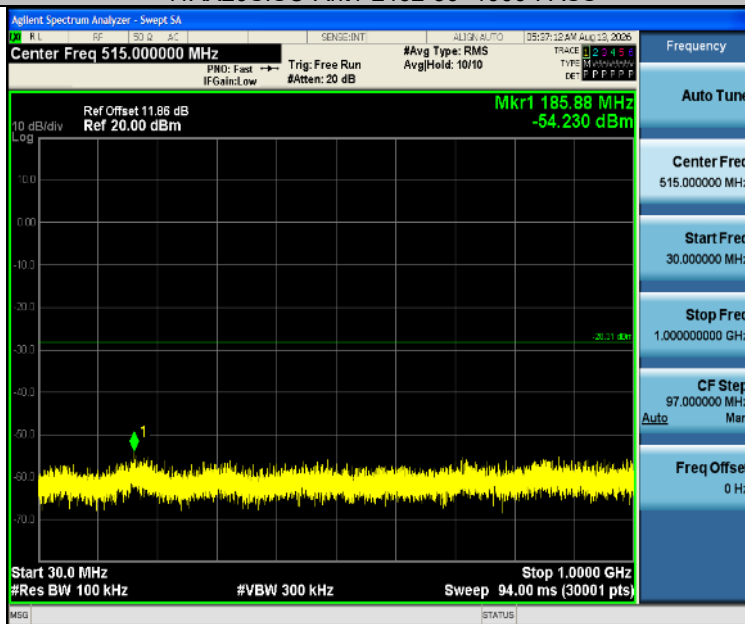
11AX20SISO-Ant1-2437-1000~26500-PASS



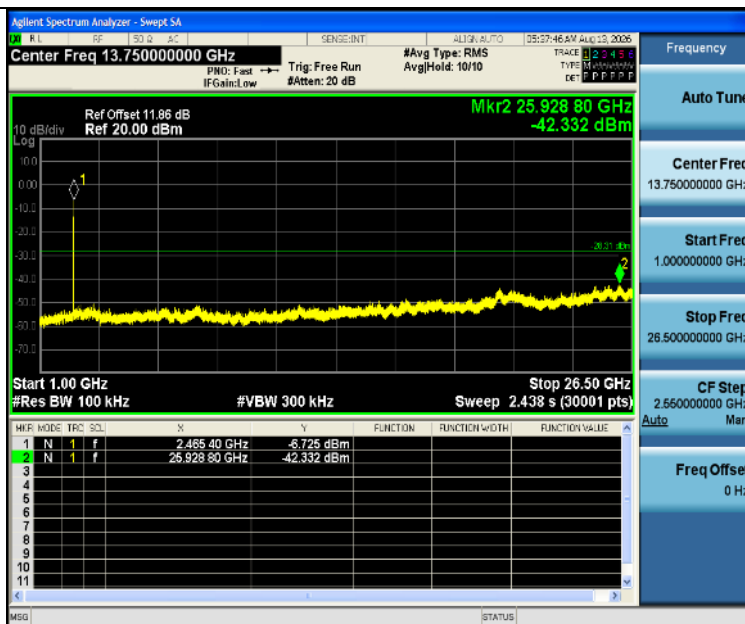
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11AX20SISO-Ant1-2462-30~1000-PASS



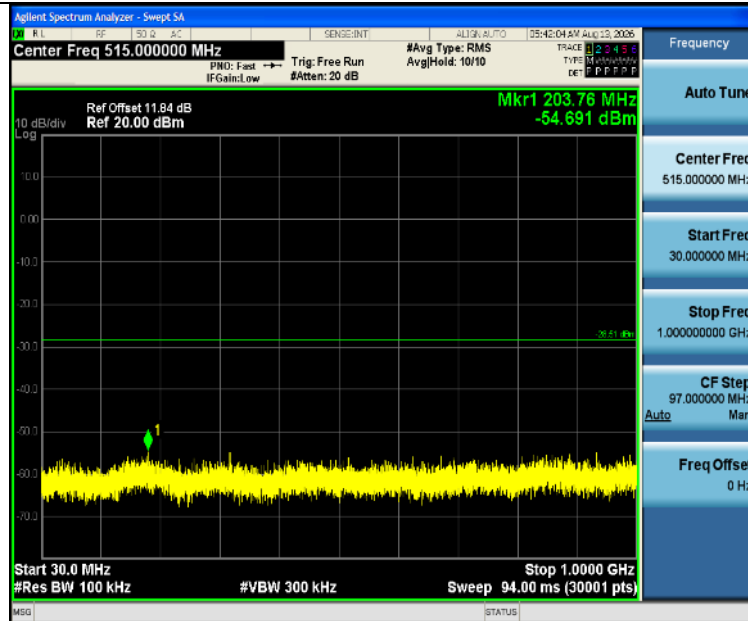
11AX20SISO-Ant1-2462-1000~26500-PASS



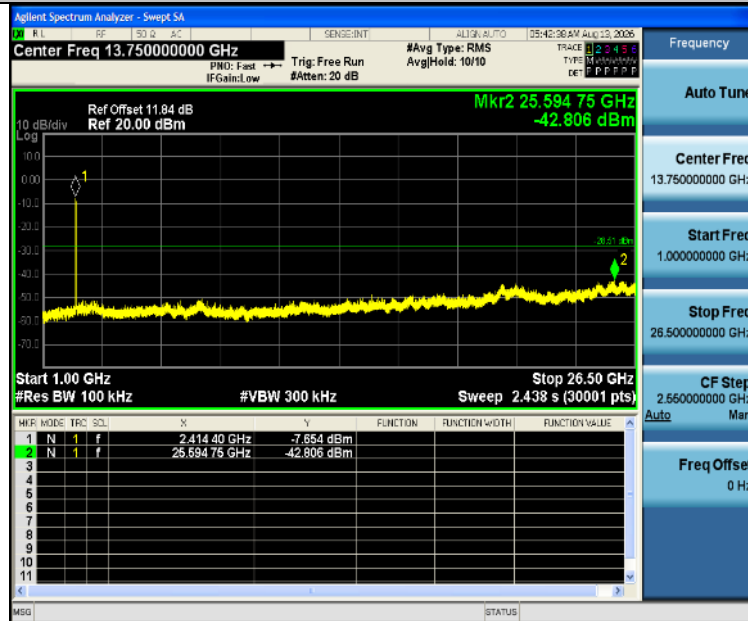
11AX40SISO-Ant1-2422-0~Reference-PASS



11AX40SISO-Ant1-2422-30~1000-PASS



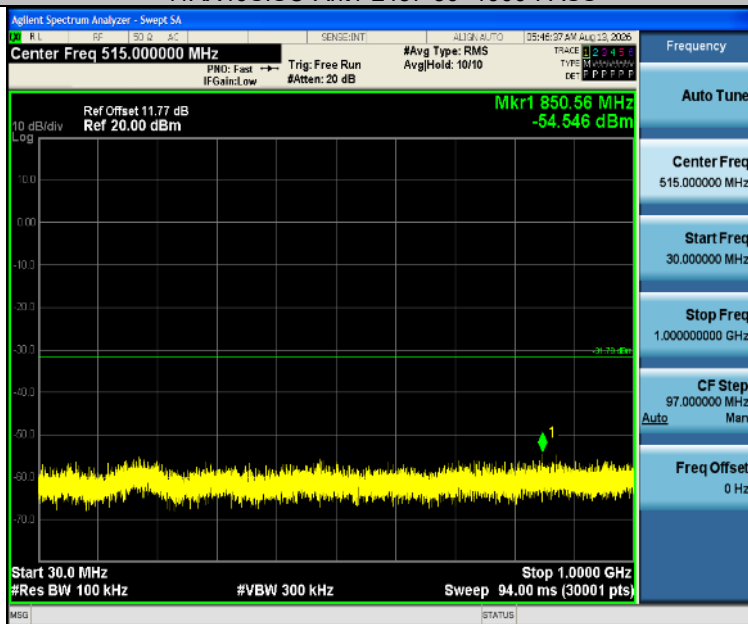
11AX40SISO-Ant1-2422-1000~26500-PASS



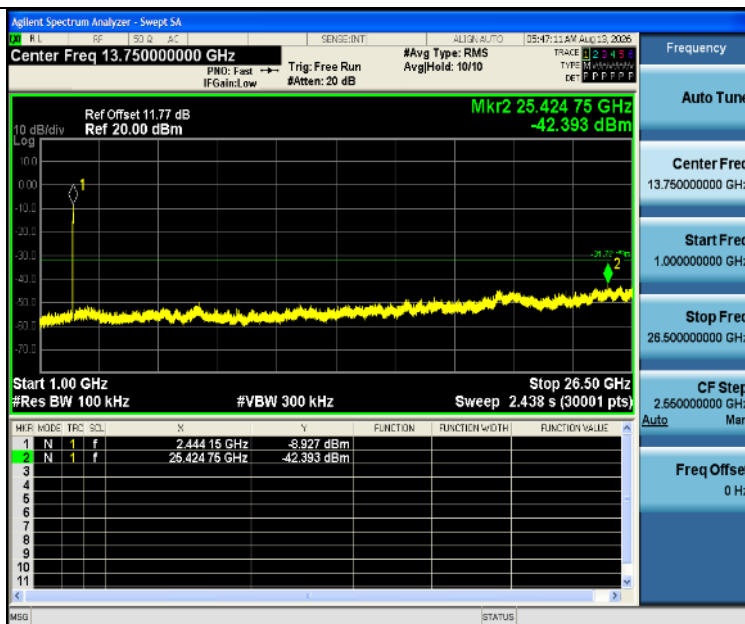
11AX40SISO-Ant1-2437-0~Reference-PASS



11AX40SISO-Ant1-2437-30~1000-PASS



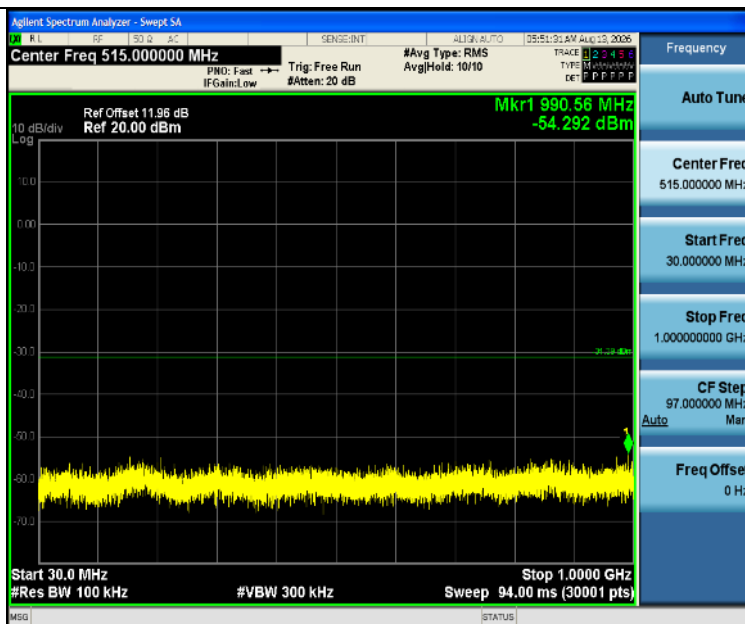
11AX40SISO-Ant1-2437-1000~26500-PASS



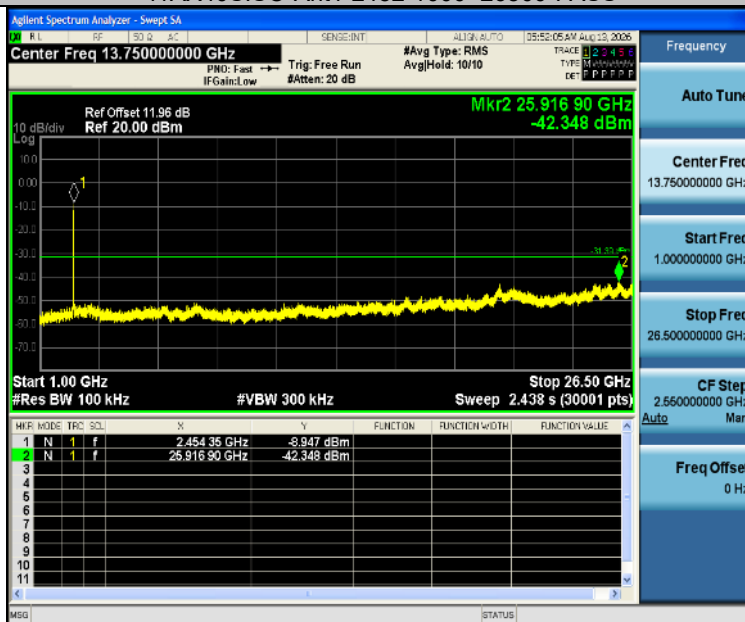
11AX40SISO-Ant1-2452-0~Reference-PASS



11AX40SISO-Ant1-2452-30~1000-PASS



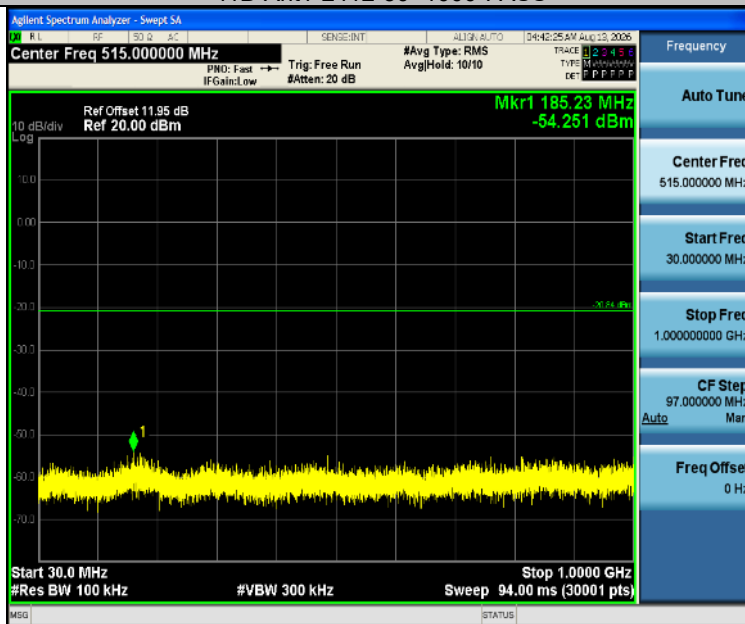
11AX40SISO-Ant1-2452-1000~26500-PASS



11B-Ant1-2412-0~Reference-PASS



11B-Ant1-2412-30~1000-PASS



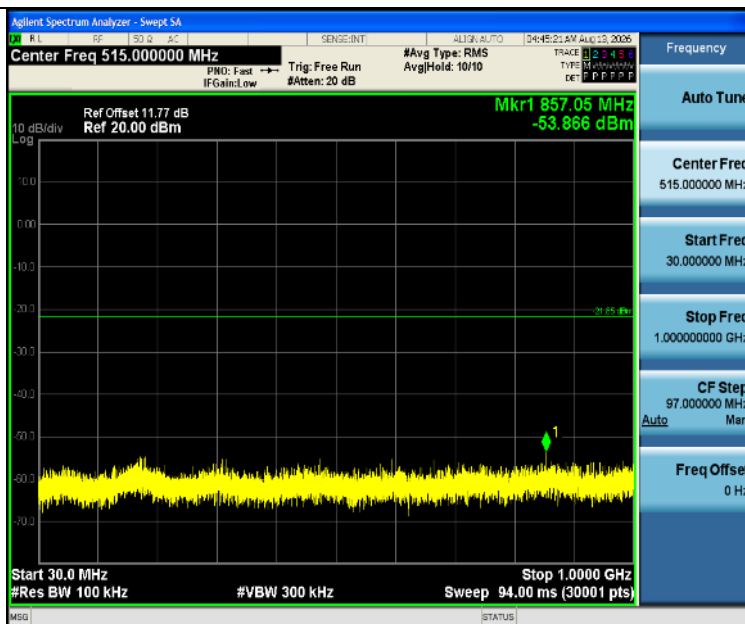
11B-Ant1-2412-1000~26500-PASS



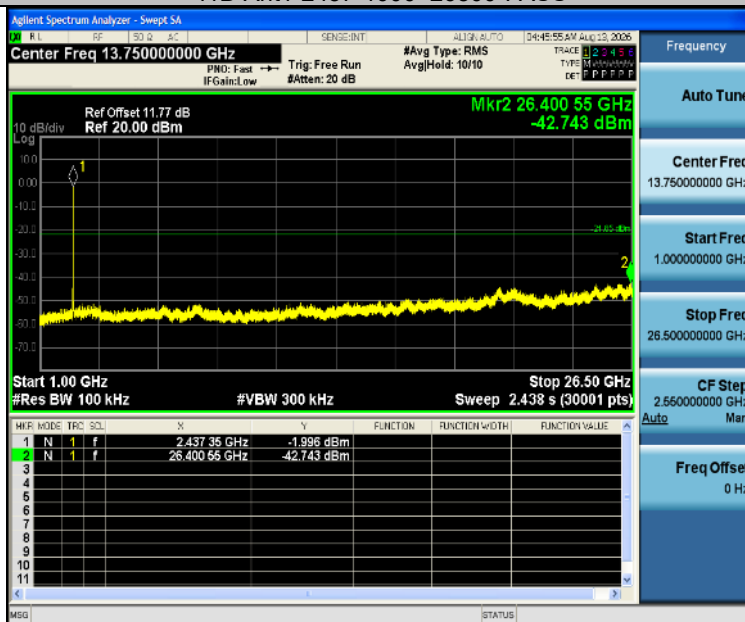
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11B-Ant1-2437-30~1000-PASS



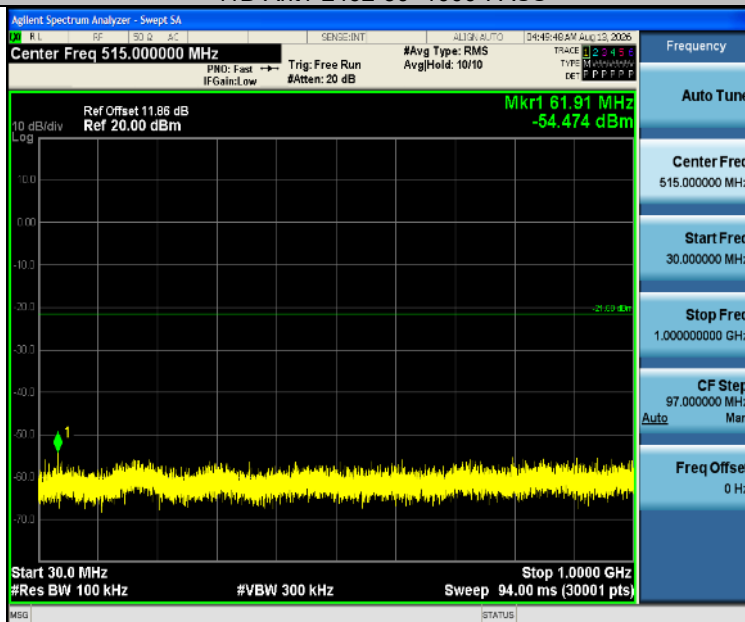
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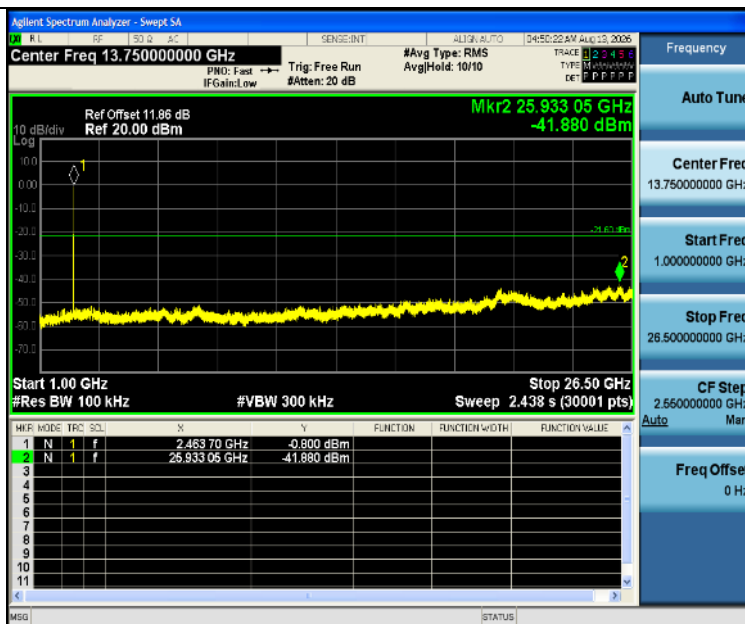
11B-Ant1-2462-0~Reference-PASS



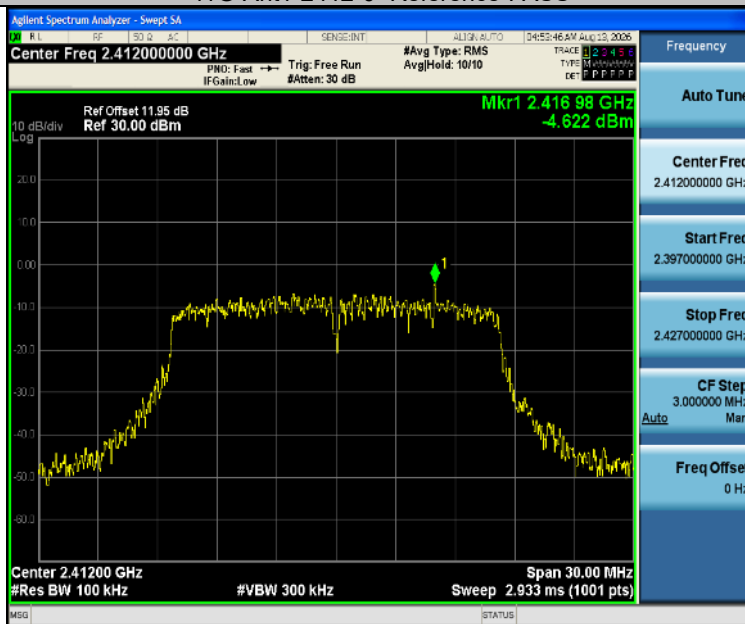
11B-Ant1-2462-30~1000-PASS



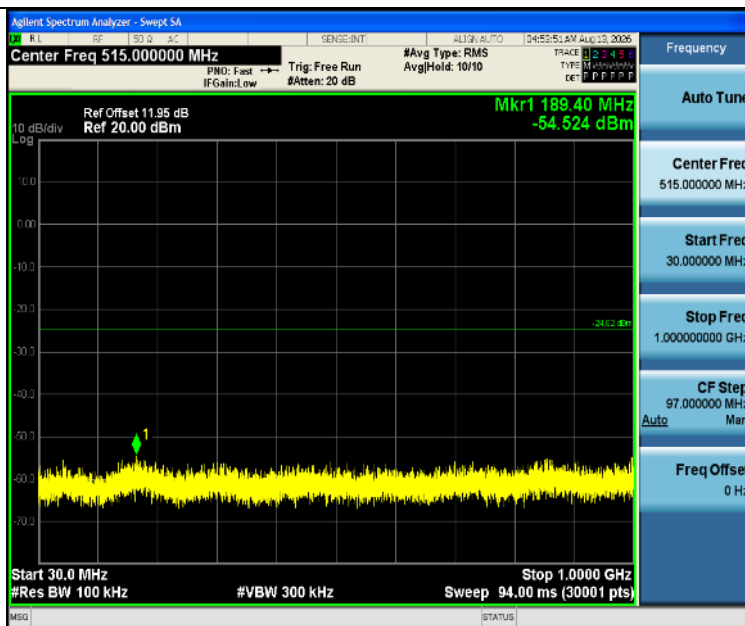
11B-Ant1-2462-1000~26500-PASS



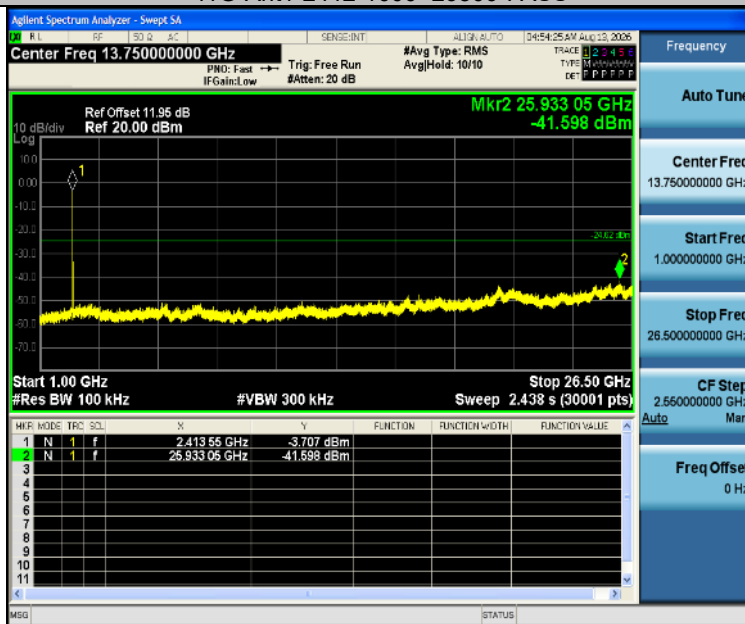
11G-Ant1-2412-0~Reference-PASS



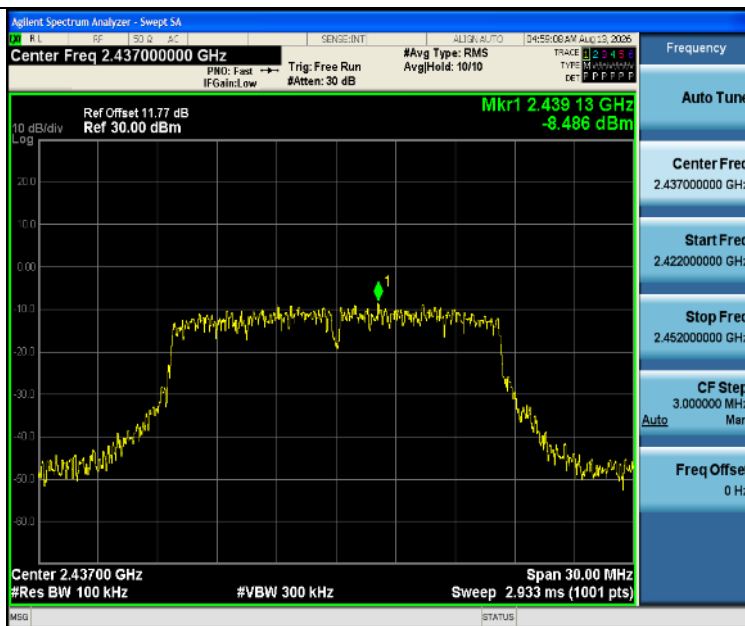
11G-Ant1-2412-30~1000-PASS



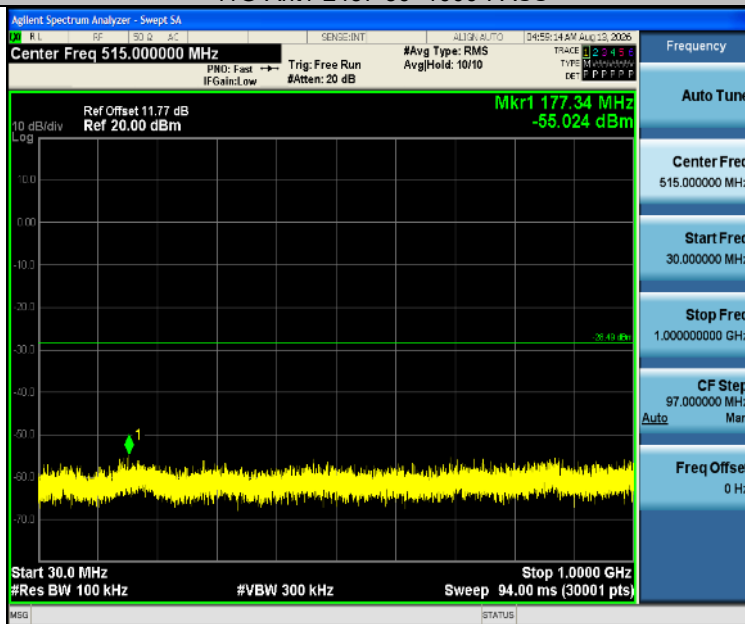
11G-Ant1-2412-1000~26500-PASS



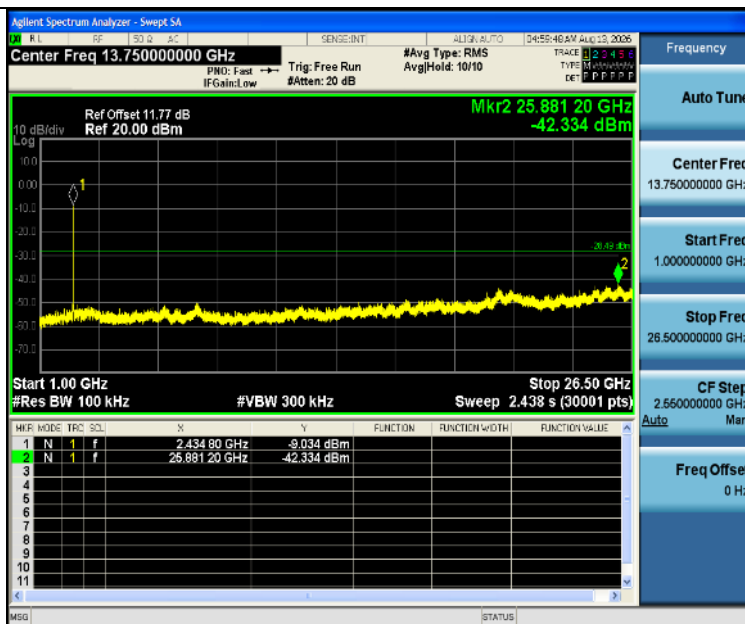
11G-Ant1-2437-0~Reference-PASS



11G-Ant1-2437-30~1000-PASS



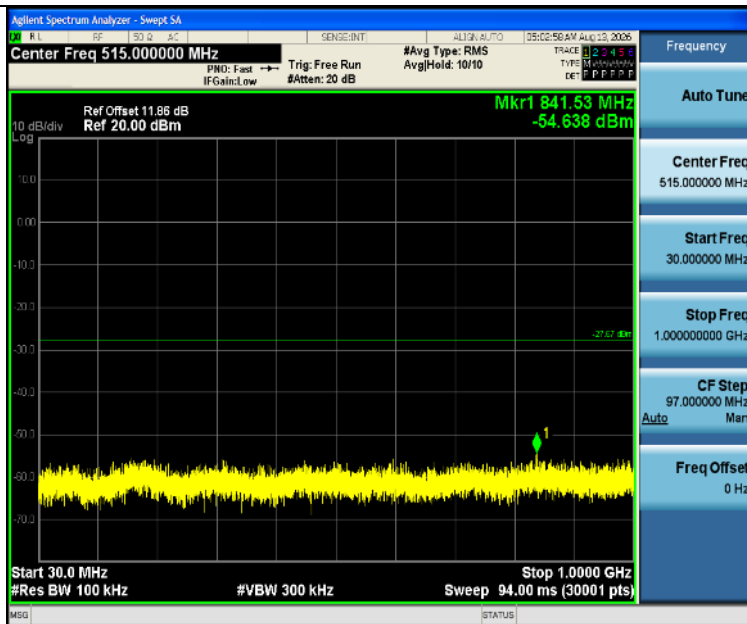
11G-Ant1-2437-1000~26500-PASS



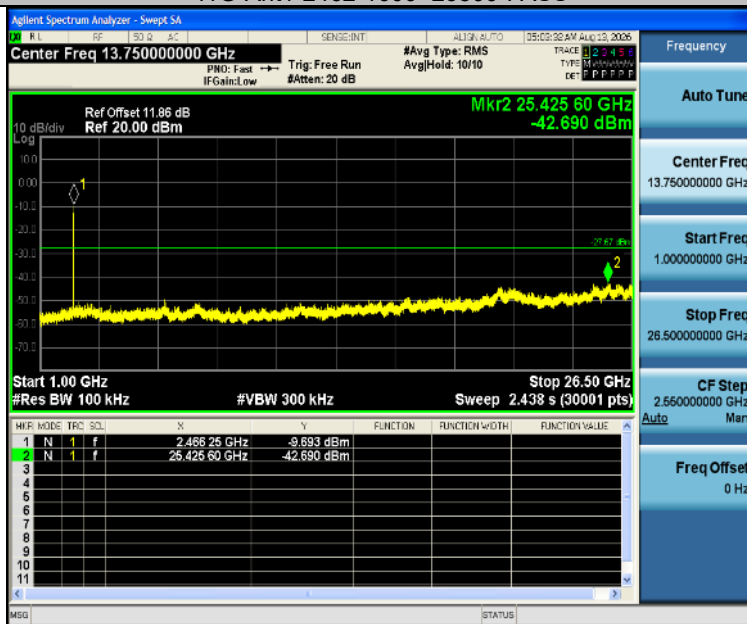
11G-Ant1-2462-0~Reference-PASS



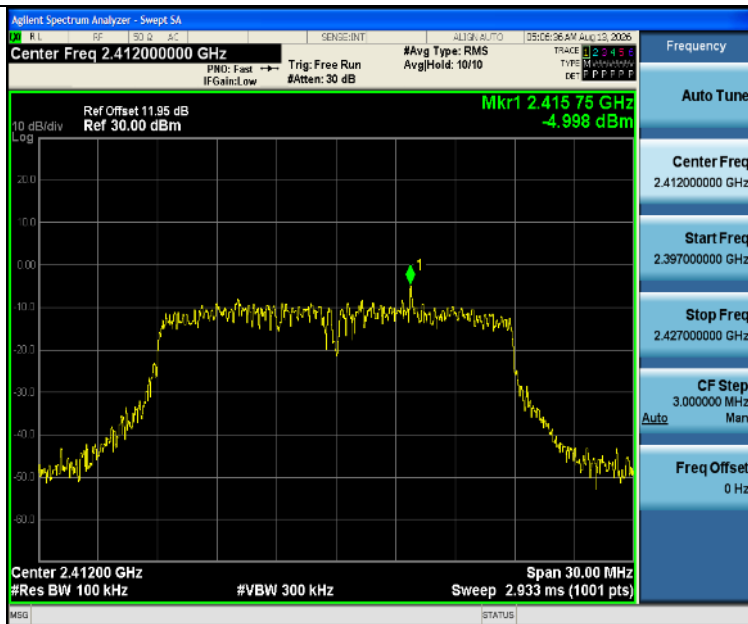
11G-Ant1-2462-30~1000-PASS



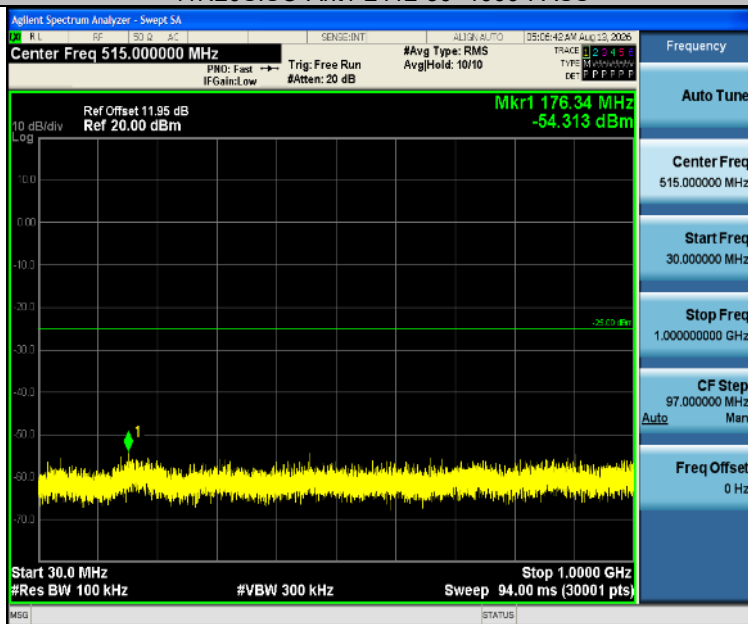
11G-Ant1-2462-1000~26500-PASS



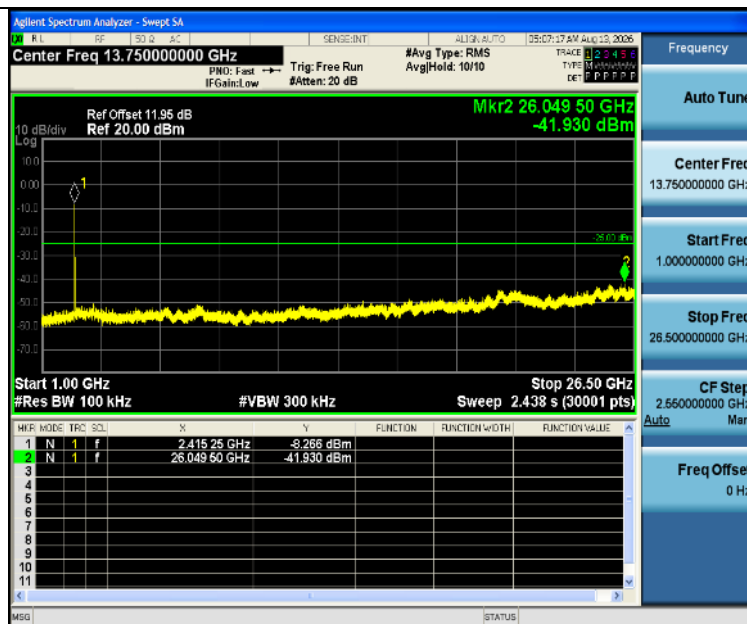
11N20SISO-Ant1-2412-0~Reference-PASS



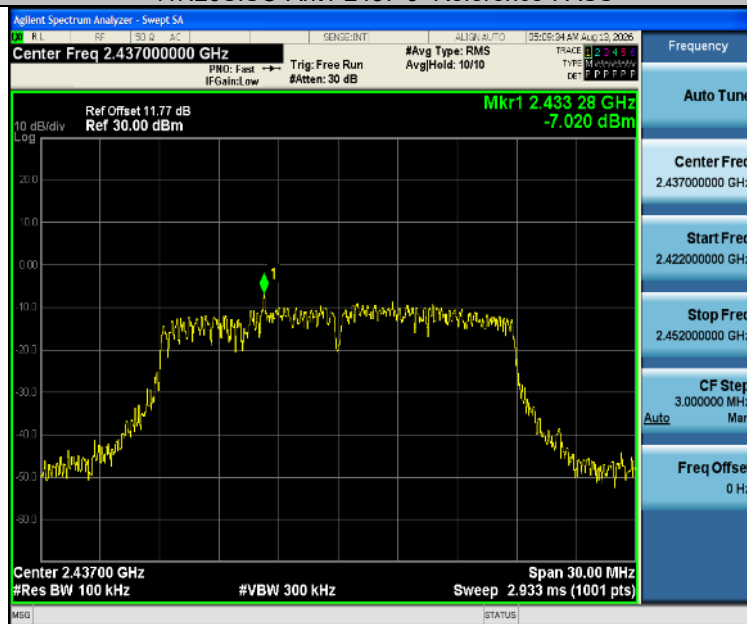
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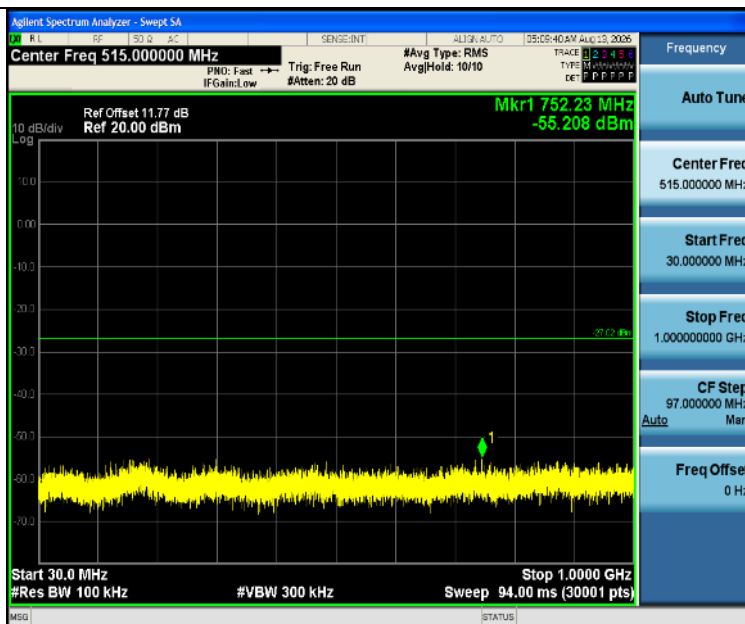
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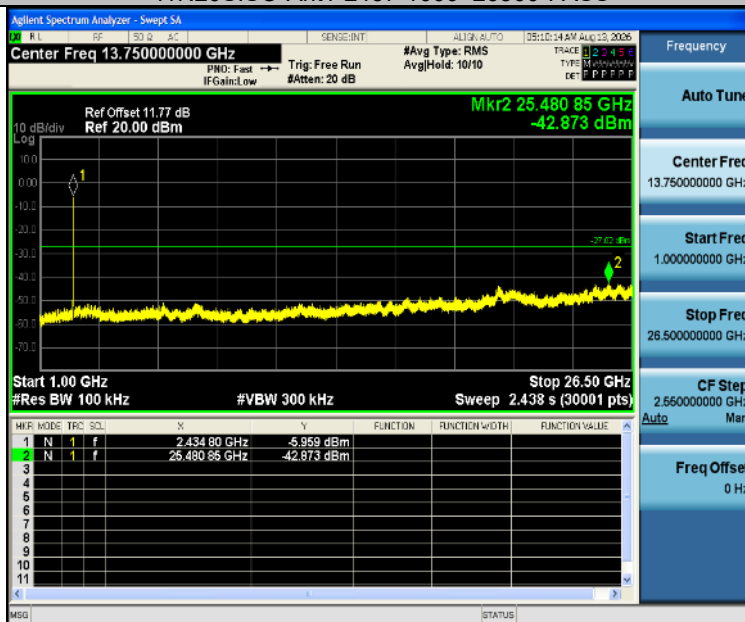
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11N20SISO-Ant1-2437-30~1000-PASS



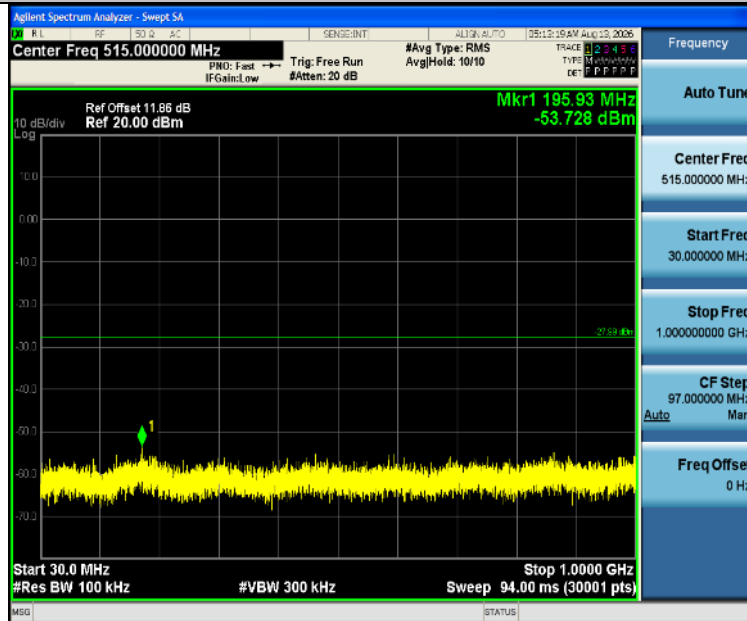
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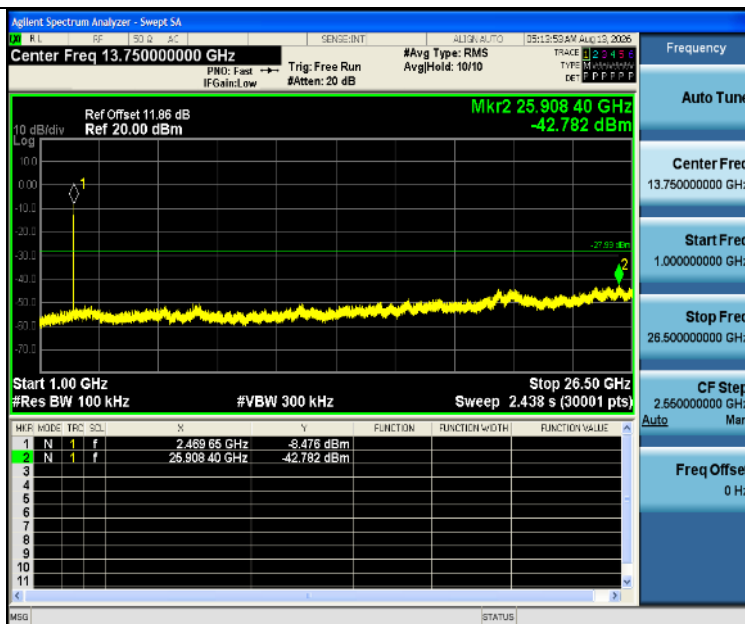
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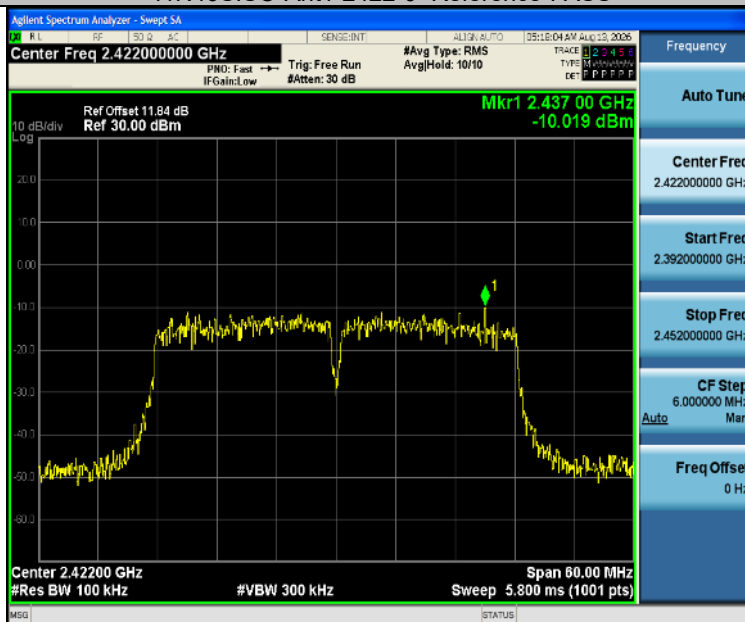
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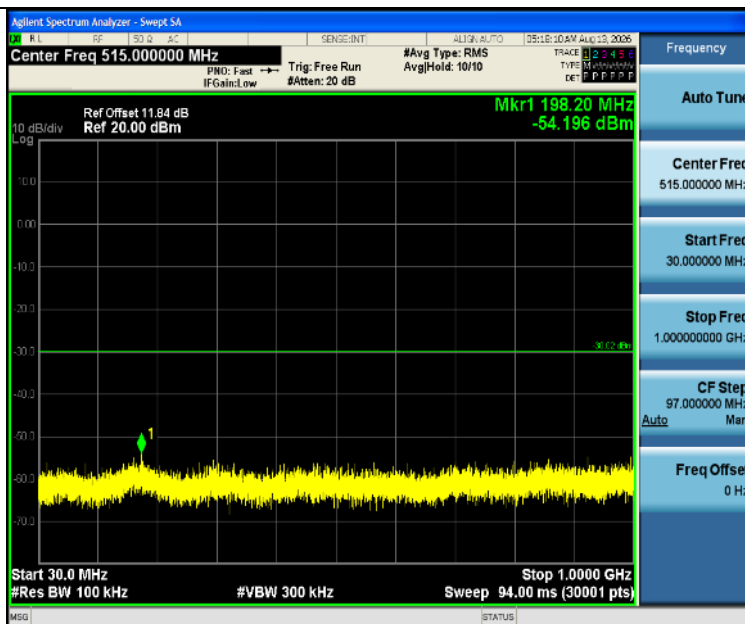
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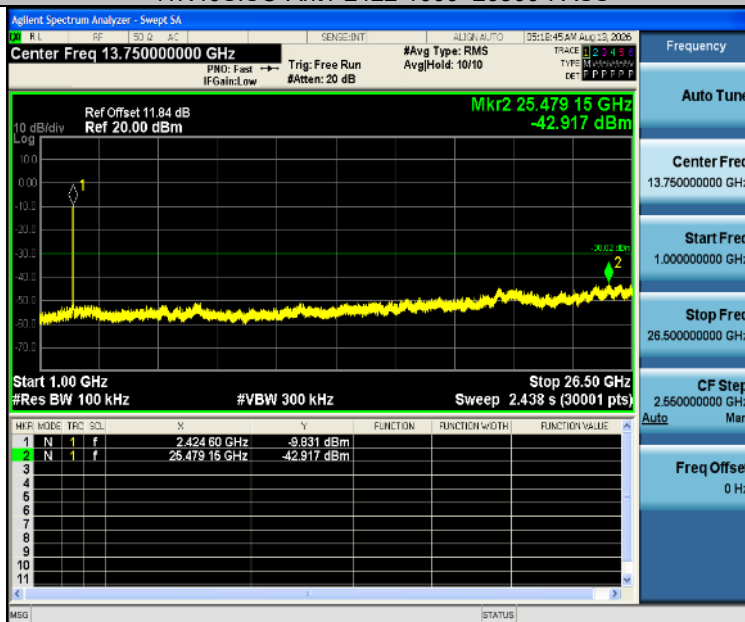
11N40SISO-Ant1-2422-0~Reference-PASS



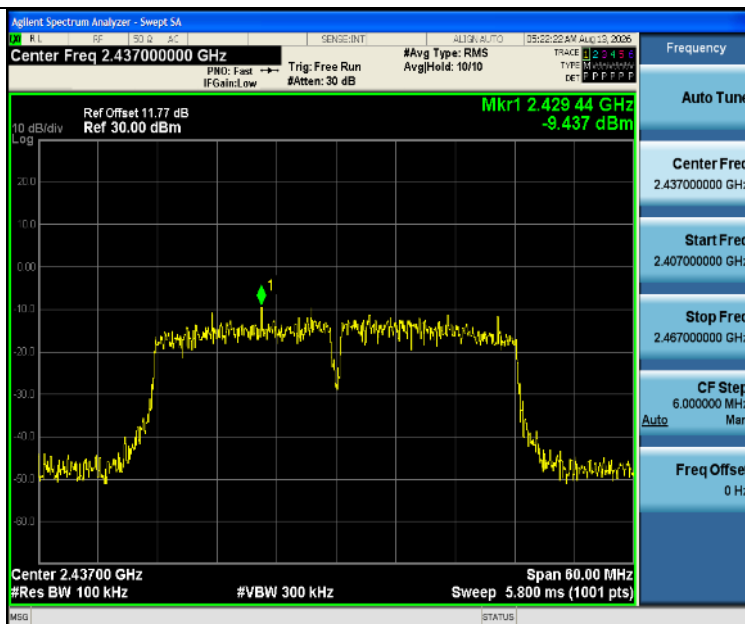
11N40SISO-Ant1-2422-30~1000-PASS



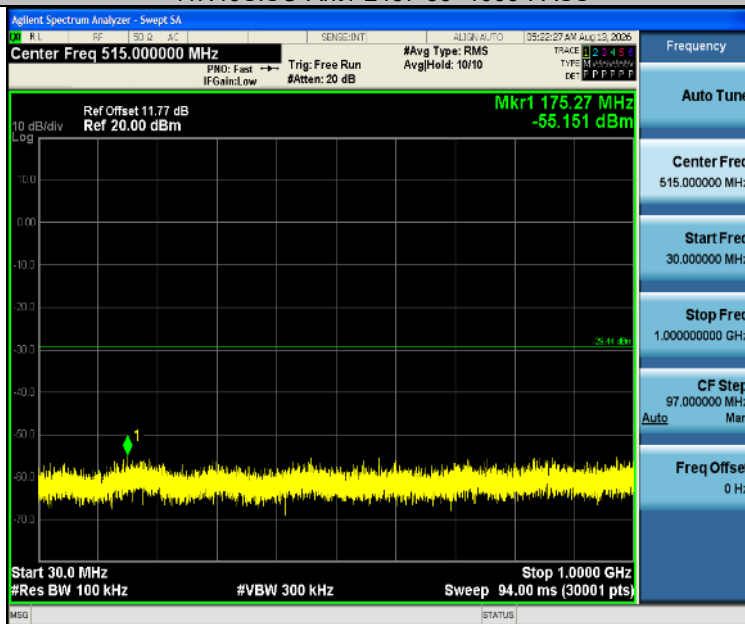
11N40SISO-Ant1-2422-1000~26500-PASS



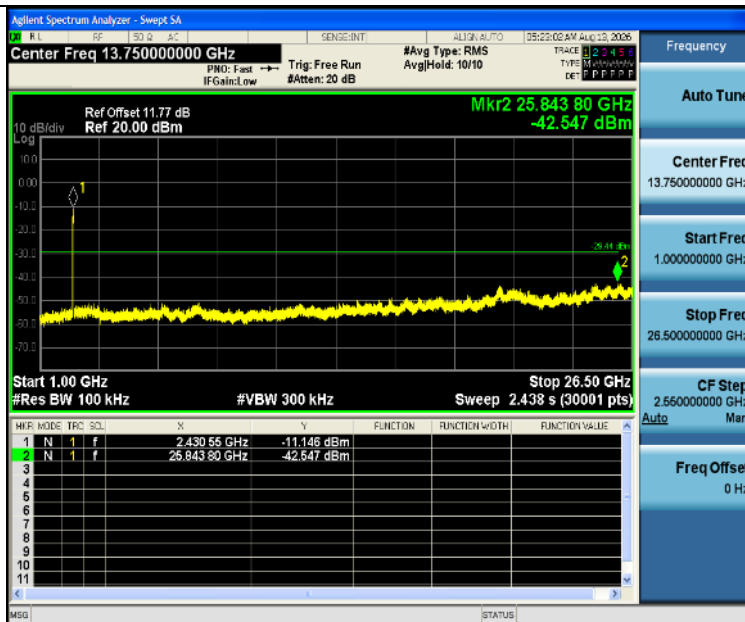
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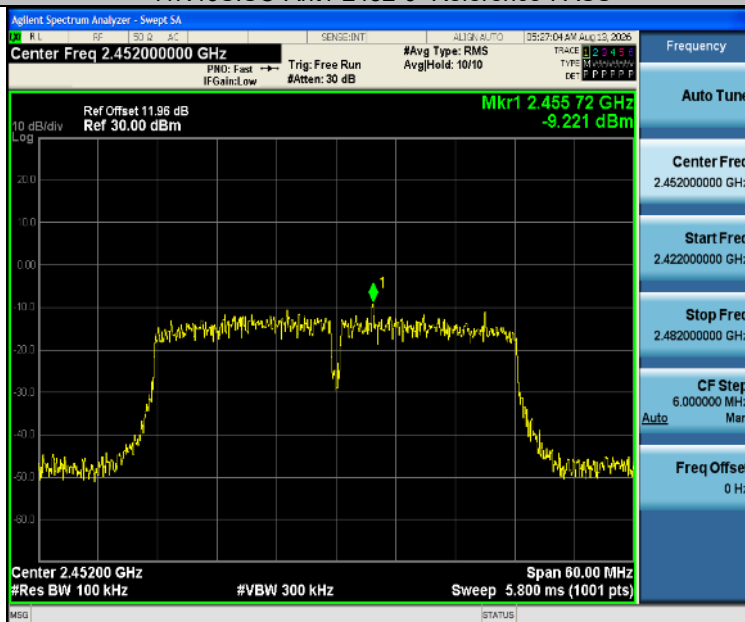
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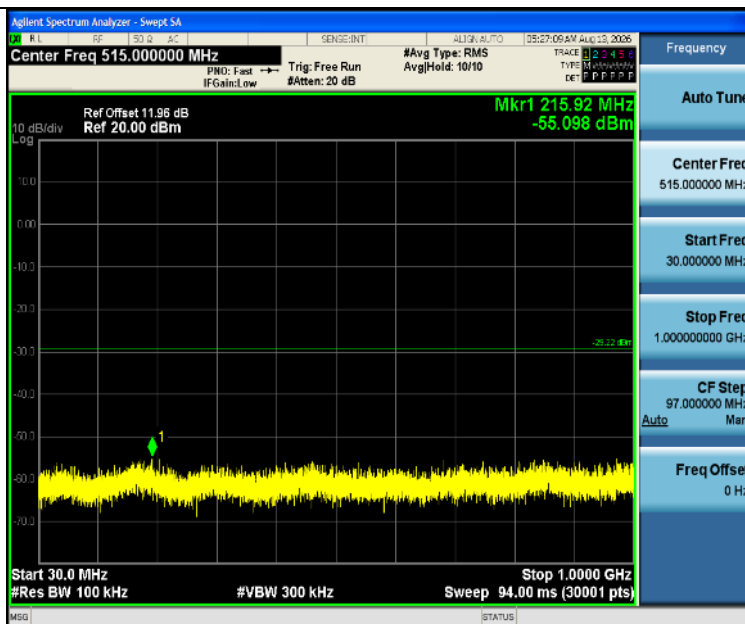
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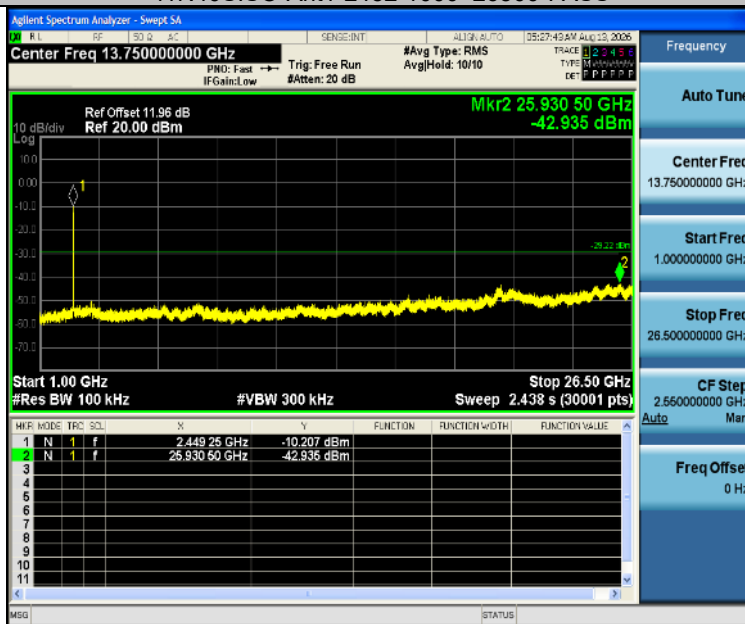
11N40SISO-Ant1-2452-0~Reference-PASS



11N40SISO-Ant1-2452-30~1000-PASS



11N40SISO-Ant1-2452-1000~26500-PASS



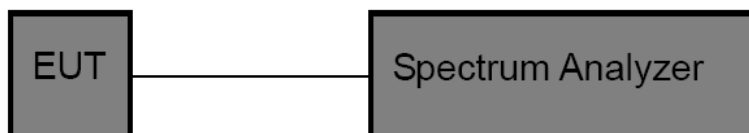
8 Band Edge Measurement

Test Requirement	:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	:	ANSI C63.10-2020
Test Limit	:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

8.1Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

8.2Test Setup

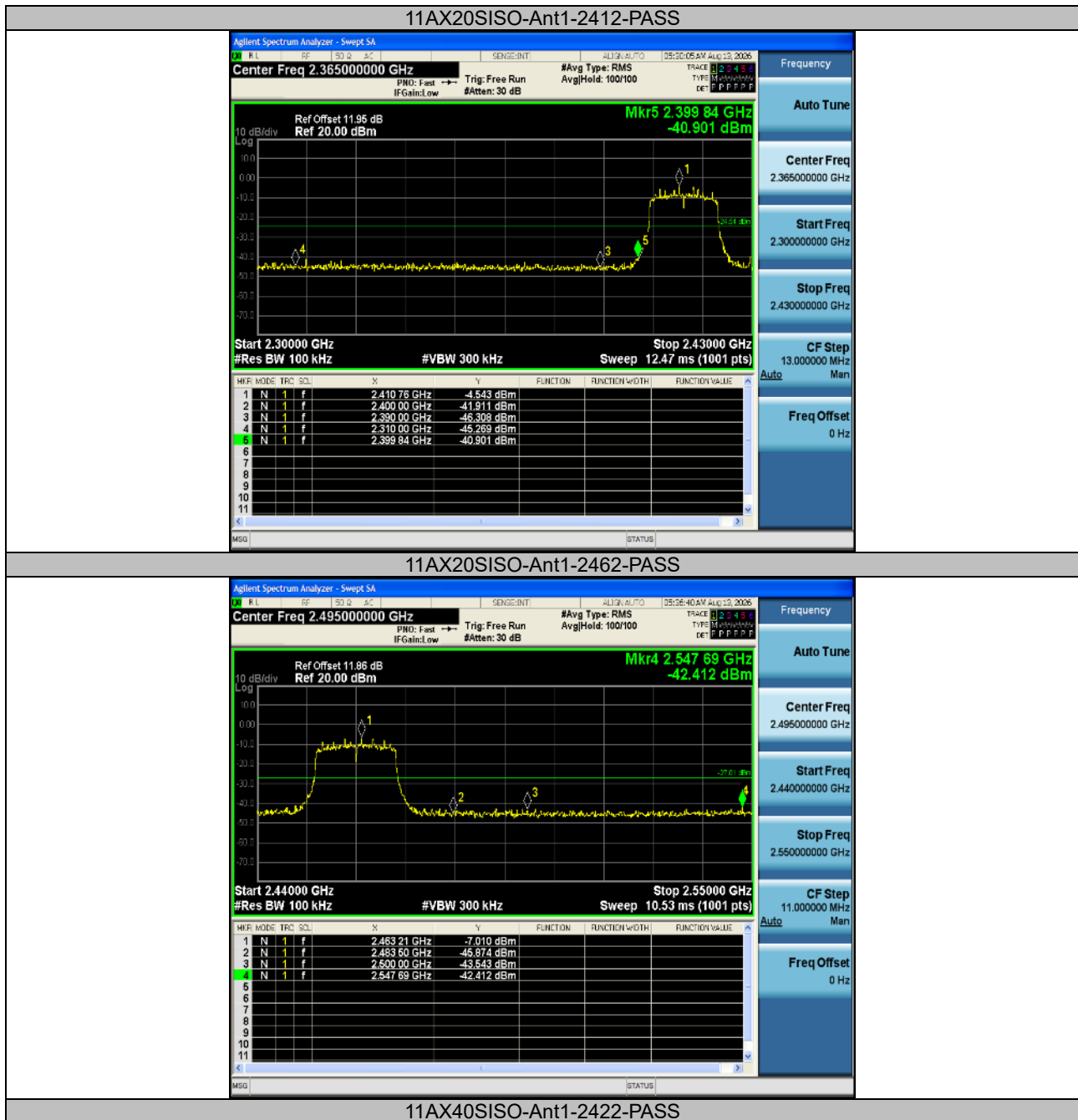


8.3Test Result

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11AX20SISO	Ant1	Low	2412	-4.54	-40.9	≤-24.54	PASS
11AX20SISO	Ant1	High	2462	-7.01	-42.41	≤-27.01	PASS
11AX40SISO	Ant1	Low	2422	-7.96	-42.7	≤-27.96	PASS
11AX40SISO	Ant1	High	2452	-8.10	-40.67	≤-28.1	PASS
11B	Ant1	Low	2412	0.55	-41.17	≤-19.45	PASS
11B	Ant1	High	2462	-0.33	-41.65	≤-20.33	PASS
11G	Ant1	Low	2412	-3.04	-41.26	≤-23.04	PASS
11G	Ant1	High	2462	-6.03	-42.69	≤-26.03	PASS
11N20SISO	Ant1	Low	2412	-4.16	-41.51	≤-24.16	PASS
11N20SISO	Ant1	High	2462	-6.29	-42.22	≤-26.29	PASS
11N40SISO	Ant1	Low	2422	-7.62	-42.49	≤-27.62	PASS
11N40SISO	Ant1	High	2452	-7.43	-41.82	≤-27.43	PASS

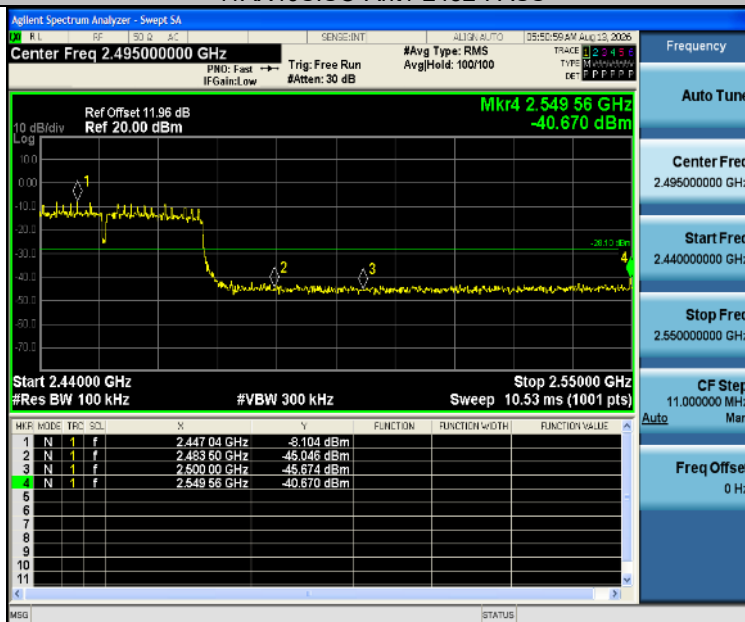


Test Graphs:

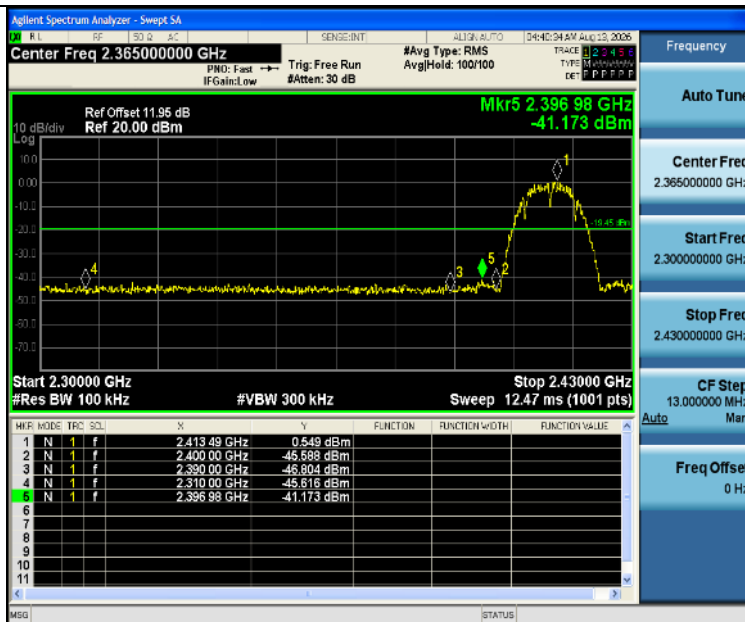




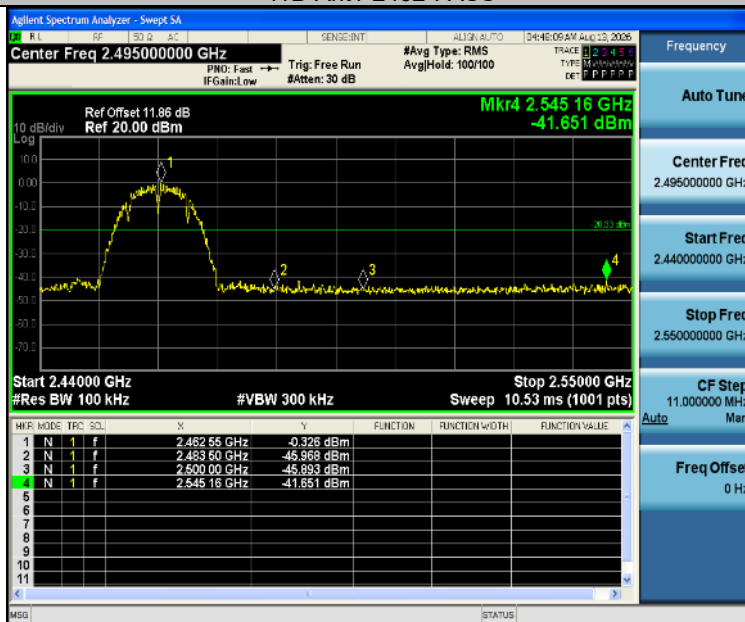
11AX40SISO-Ant1-2452-PASS



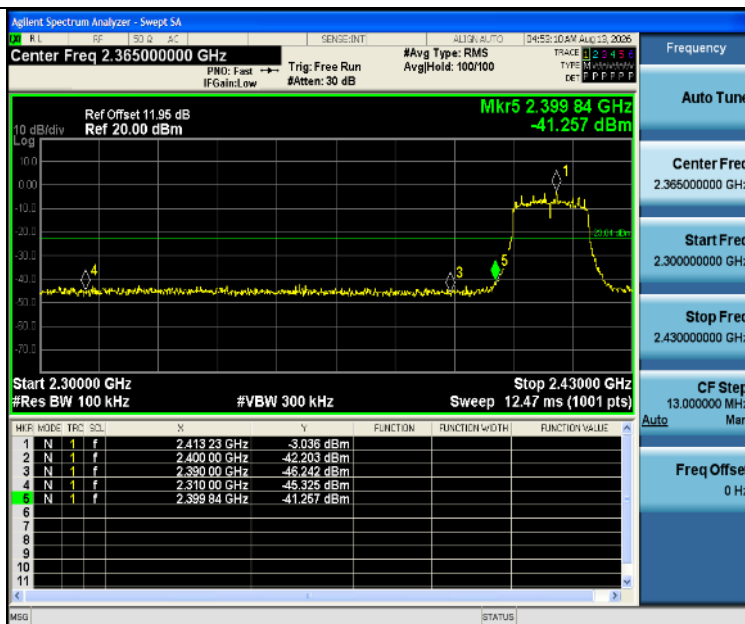
11B-Ant1-2412-PASS



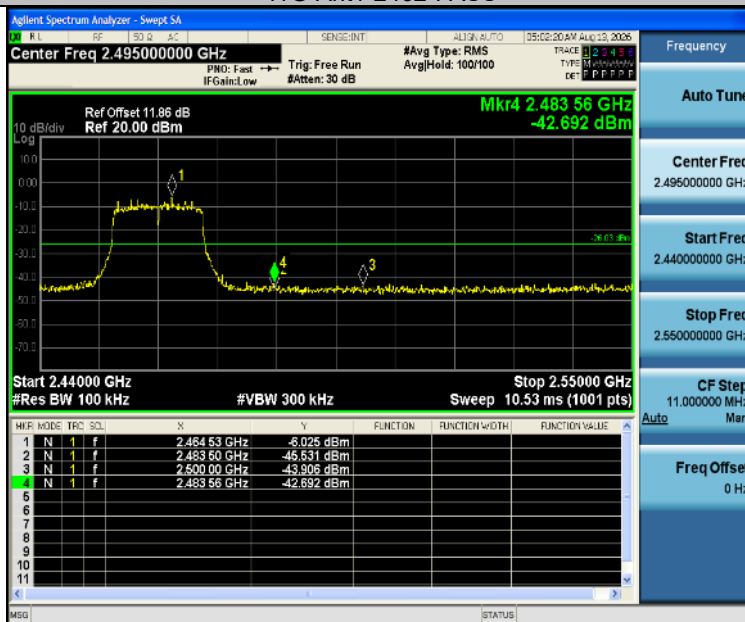
11B-Ant1-2462-PASS



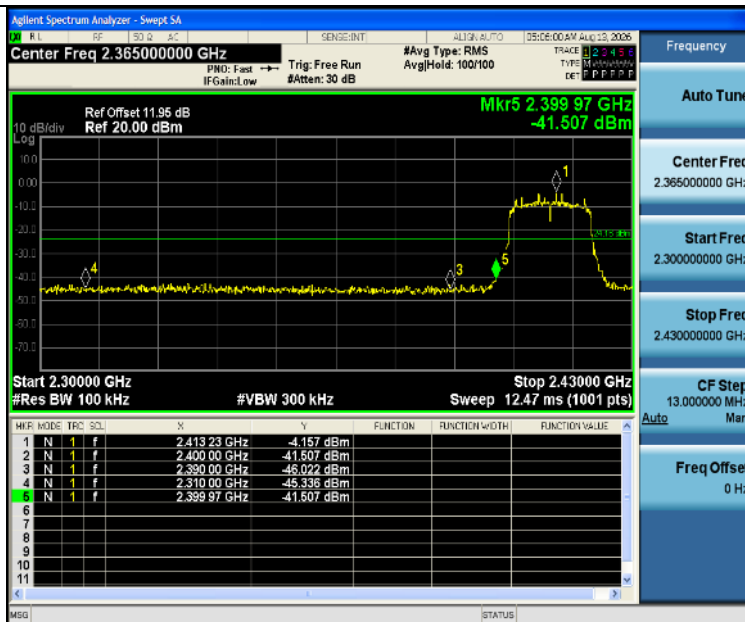
11G-Ant1-2412-PASS



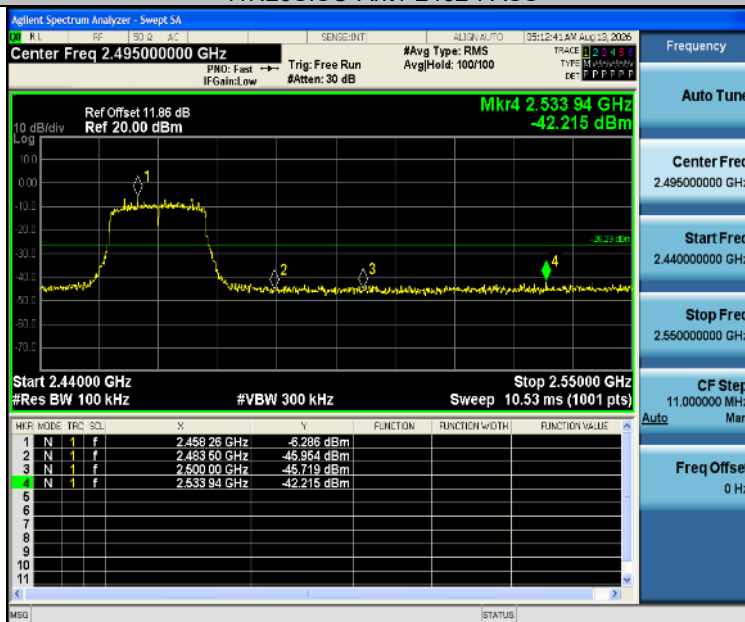
11G-Ant1-2462-PASS



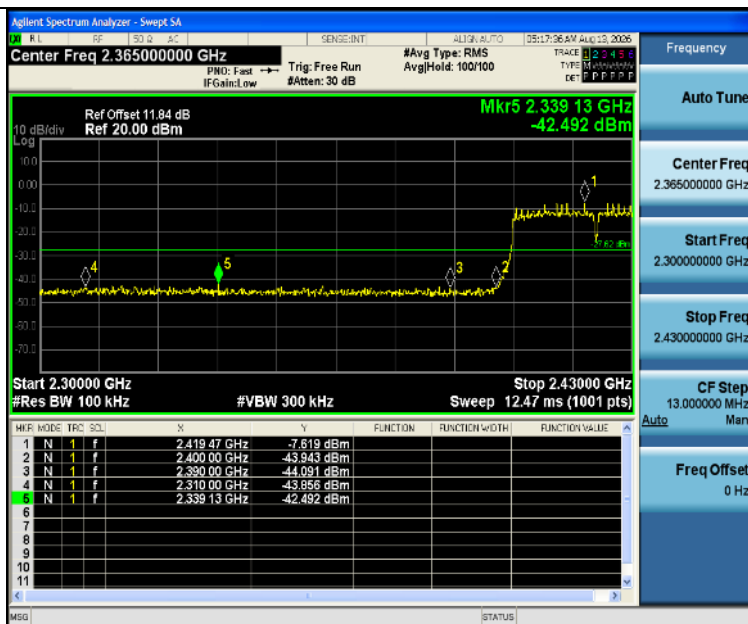
11N20SISO-Ant1-2412-PASS



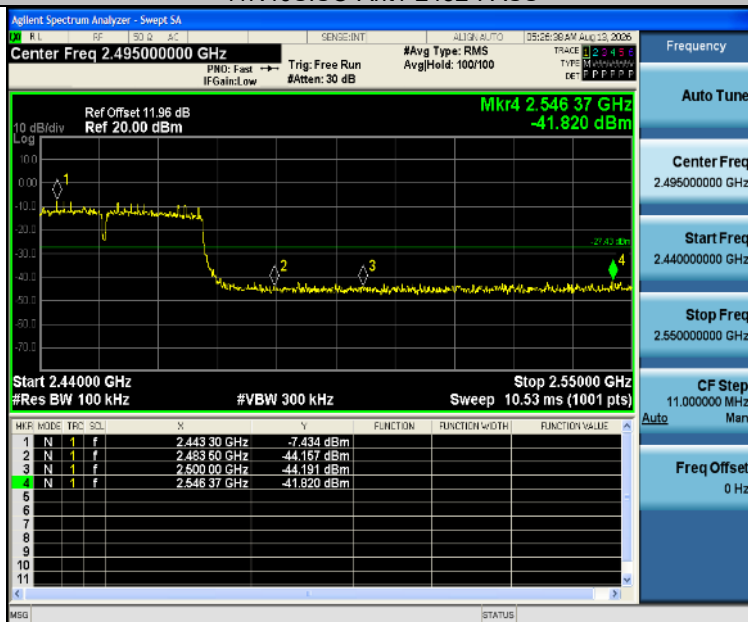
11N20SISO-Ant1-2462-PASS



11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2452-PASS





9 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10-2020

Test Limit : Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

9.1 Test Procedure

Reference Level:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum; Set to the maximum power setting and enable the EUT transmit continuously.
2. Establish a reference level by using the following procedure:
 - a) Set instrument center frequency to DTS channel center frequency.
 - b) Set the span to ≥ 1.5 times the DTS bandwidth.
 - c) Set the RBW = 100 kHz.
 - d) Set the VBW $\geq [3 \times \text{RBW}]$.
 - e) Detector = peak.
 - f) Sweep time = No faster than coupled (auto) time.
 - g) Trace mode = max-hold.
 - h) Allow trace to fully stabilize.
 - i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level

Spurious Emissions Measurement:

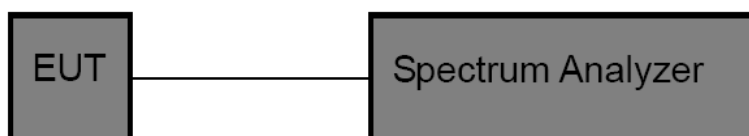
Establish an emission level by using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured. Note that the frequency range might need to be divided into multiple frequency ranges to retain frequency resolution.

NOTE—the number of points can also be increased for large spans to retain frequency resolution

- b) Set the RBW = 100 kHz.
 - c) Set the VBW $\geq [3 \times \text{RBW}]$.
 - d) Detector = peak.
 - e) Sweep time = No faster than coupled (auto) time.
 - f) Trace mode = max-hold.
 - g) Allow trace to fully stabilize.
 - h) Use the peak marker function to determine the maximum amplitude level.
- Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

9.2 Test Setup



9.3 Test Procedure

6dB Bandwidth:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, the automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz,

VBW $\geq 3 \times$ RBW, and peak detector with maximum hold) is implemented by the instrumentation function.

When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

11.8.1 Option 1

The steps for the first option are as follows:

Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. Set the VBW $\geq [3 \times$ RBW]. Detector = peak. Trace mode = max-hold. Sweep = No faster than coupled (auto) time. Allow the trace to stabilize. Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-6 dB down amplitude”. If a marker is below this “-6 dB down amplitude” value, then it shall be as close as possible to this value

Occupied bandwidth:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1% to 5% of the OBW, VBW = approximately three times the RBW.

9.4 Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11AX20SISO	Ant1	2412	15.400	2404.120	2419.520	0.5	PASS
11AX20SISO	Ant1	2437	15.880	2429.480	2445.360	0.5	PASS
11AX20SISO	Ant1	2462	17.040	2453.480	2470.520	0.5	PASS
11AX40SISO	Ant1	2422	35.120	2404.400	2439.520	0.5	PASS
11AX40SISO	Ant1	2437	34.960	2419.560	2454.520	0.5	PASS
11AX40SISO	Ant1	2452	34.960	2434.560	2469.520	0.5	PASS
11B	Ant1	2412	10.080	2406.960	2417.040	0.5	PASS
11B	Ant1	2437	10.040	2432.000	2442.040	0.5	PASS
11B	Ant1	2462	10.080	2456.960	2467.040	0.5	PASS
11G	Ant1	2412	16.000	2403.880	2419.880	0.5	PASS
11G	Ant1	2437	15.720	2429.120	2444.840	0.5	PASS
11G	Ant1	2462	16.280	2453.880	2470.160	0.5	PASS
11N20SISO	Ant1	2412	16.920	2403.480	2420.400	0.5	PASS
11N20SISO	Ant1	2437	15.680	2429.440	2445.120	0.5	PASS



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11N20SISO	Ant1	2462	16.000	2453.880	2469.880	0.5	PASS
11N40SISO	Ant1	2422	35.440	2404.080	2439.520	0.5	PASS
11N40SISO	Ant1	2437	35.440	2419.080	2454.520	0.5	PASS
11N40SISO	Ant1	2452	35.040	2434.480	2469.520	0.5	PASS