



FCC TEST REPORT

FCC ID: 2BTSK-TY21

Product	:	Surveillance camera
Model Name	:	TY21
Brand	:	N/A
Report No.	:	PTC26090405402E-FC01
Prepared for		
Shenzhen Taiyue Electronics Co., LTD		
3rd Floor, Building A, Jinchangda Science and Technology Park, Shangwei Industrial Road, Guanhu Street, Longhua District, Shenzhen		
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 Taiyue Electronics Co., LTD
Address : 3rd Floor, Building A, Jinchangda Science and Technology Park,
Shangwei Industrial Road, Guanhu Street, Longhua District,
Shenzhen
Manufacture's name : Shenzhen Taiyue Electronics Co., LTD
Address : 3rd Floor, Building A, Jinchangda Science and Technology Park,
Shangwei Industrial Road, Guanhu Street, Longhua District,
Shenzhen
Product name : Surveillance camera
Model name : TY21
Standards : FCC CFR47 Part 15 Section 15.247
Test procedure : ANSI C63.10-2020
Test Date : September 10, 2026 to September 22, 2026
Date of Issue : September 22, 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 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	:	Surveillance camera
Model Name	:	TY21
Models Difference	:	N/A
Specification	:	802.11b/g/n HT20
Operating frequency	:	2412-2462MHz for 802.11b/g/ n(HT20)
Numbers of Channel	:	11 channels for 802.11b/g/ n(HT20)
Antenna Type	:	PCB Antenna
Antenna Gain	:	3 dBi
Type of Modulation	:	DSSS, OFDM
Power supply	:	Input: 5V $\overline{\text{---}}$ 1A
Hardware Version	:	N/A
Software Version	:	N/A
Test sample No.	:	PTC26090405402E-1/2, PTC26090405402E-2/2



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 (HT20): 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/n (HT20)

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 see page 57.



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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
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.

Radiated Emissions

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	Dec. 01, 2025	1 Year
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Sep. 08, 2026	1 Year
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug. 10, 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	9120D	9120D-1246	1GHz-18GHz	Dec. 01, 2025	1 Year



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Power Amplifier	ZHINAN	ZN3380C	15002	1GHz-26.5GHz	Aug. 10, 2026	1 Year
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	ESCI	101417	9KHz-3GHz	Aug. 10, 2026	1 Year
Artificial Mains Network	Rohde&Schwarz	ENV216	102453	9KHz-300MHz	Aug. 10, 2026	1 Year
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Aug. 10, 2026	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	/	9kHz-6GHz	Mar. 16,2026	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.
Adapter	A0501A	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
Class/Severity	: Class B

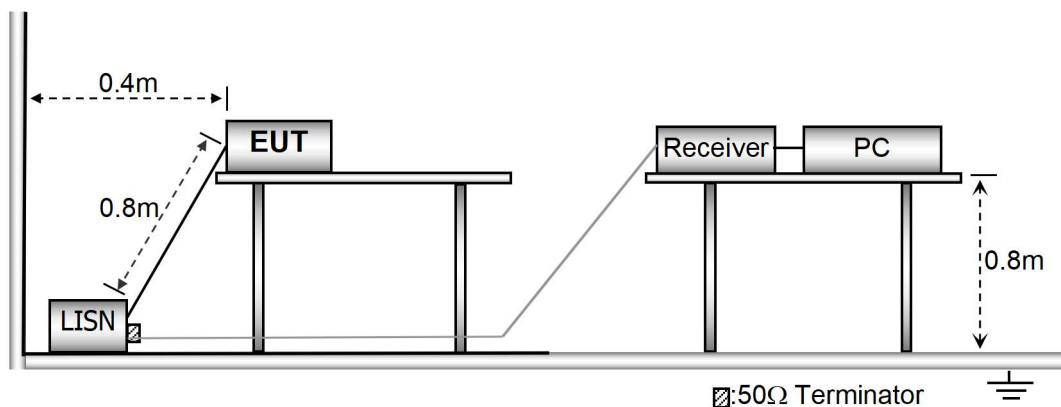
5.1E.U.T. Operation

Operating Environment :

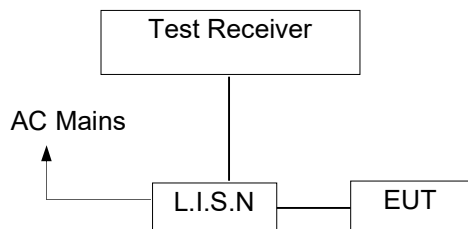
Temperature	: 25 °C
Humidity	: 60 % RH
Atmospheric Pressure	: 101.3kPa

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

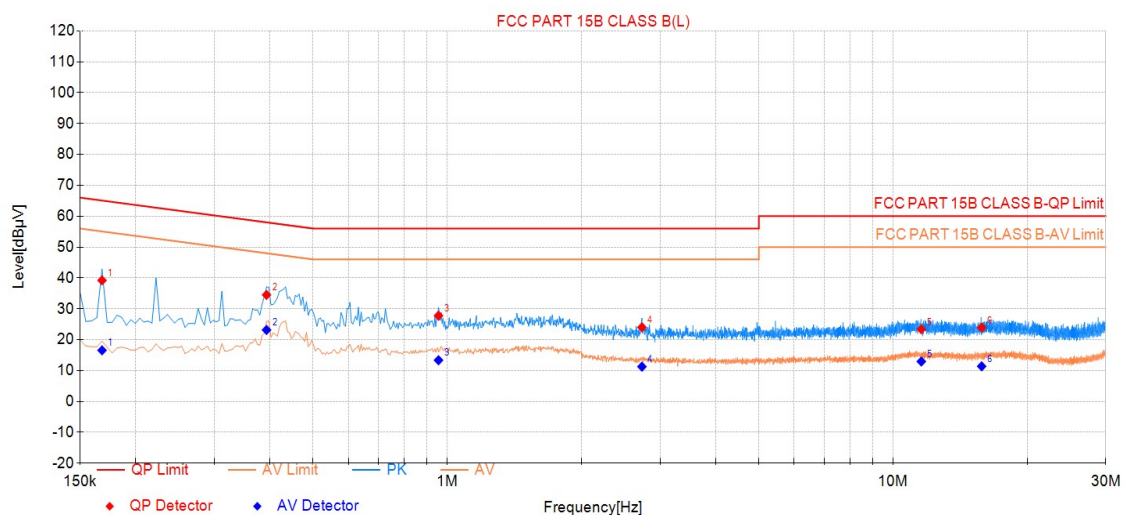
Pass.

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

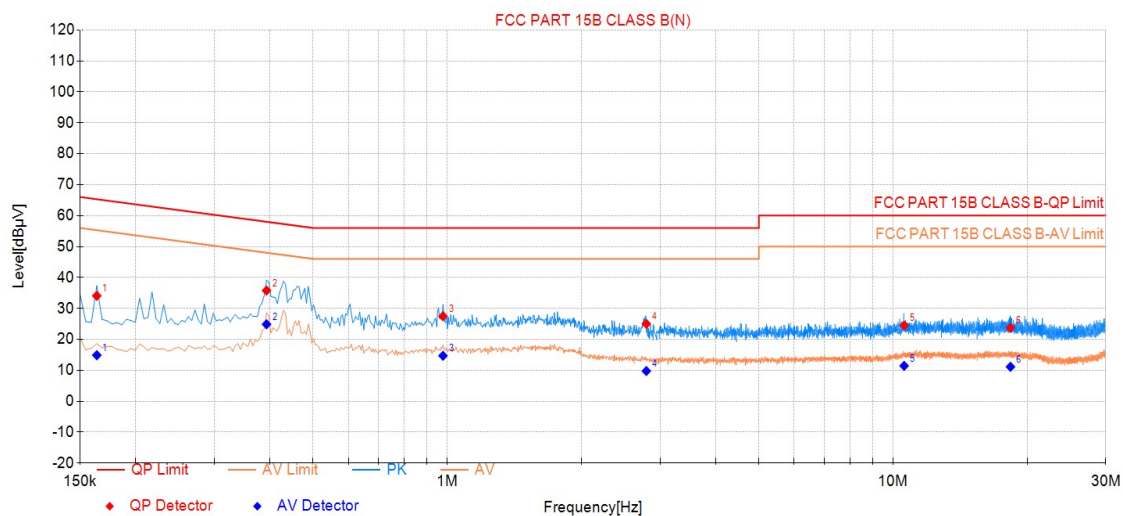


Final test data

NO.	Freq. [MHz]	Factor [dB]	QP Reading[d BμV]	QP Value	QP Limit	QP Margin	AV Reading[d BμV]	AV Value	AV Limit	AV Margin	Verdict
1	0.168	19.81	19.40	39.21	65.06	25.85	-3.24	16.57	55.06	38.49	PASS
2	0.393	19.85	14.67	34.52	58.00	23.48	3.31	23.16	48.00	24.84	PASS
3	0.956	19.83	7.94	27.77	56.00	28.23	-6.46	13.37	46.00	32.63	PASS
4	2.733	19.85	4.17	24.02	56.00	31.98	-8.57	11.28	46.00	34.72	PASS
5	11.576	19.92	3.46	23.38	60.00	36.62	-6.96	12.96	50.00	37.04	PASS
6	15.806	19.96	3.97	23.93	60.00	36.07	-8.57	11.39	50.00	38.61	PASS



Neutral-AC 120V/60Hz



Final test data

NO.	Freq. [MHz]	Factor [dB]	QP Reading[d BμV]	QP Value	QP Limit	QP Margin	AV Reading[d BμV]	AV Value	AV Limit	AV Margin	Verdict
1	0.164	19.81	14.26	34.07	65.28	31.21	-4.92	14.89	55.28	40.39	PASS
2	0.393	19.84	15.94	35.78	58.00	22.22	5.05	24.89	48.00	23.11	PASS
3	0.978	19.84	7.64	27.48	56.00	28.52	-5.13	14.71	46.00	31.29	PASS
4	2.796	19.86	5.16	25.02	56.00	30.98	-10.08	9.78	46.00	36.22	PASS
5	10.590	19.88	4.61	24.49	60.00	35.51	-8.44	11.44	50.00	38.56	PASS
6	18.344	19.97	3.77	23.74	60.00	36.26	-8.83	11.14	50.00	38.86	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

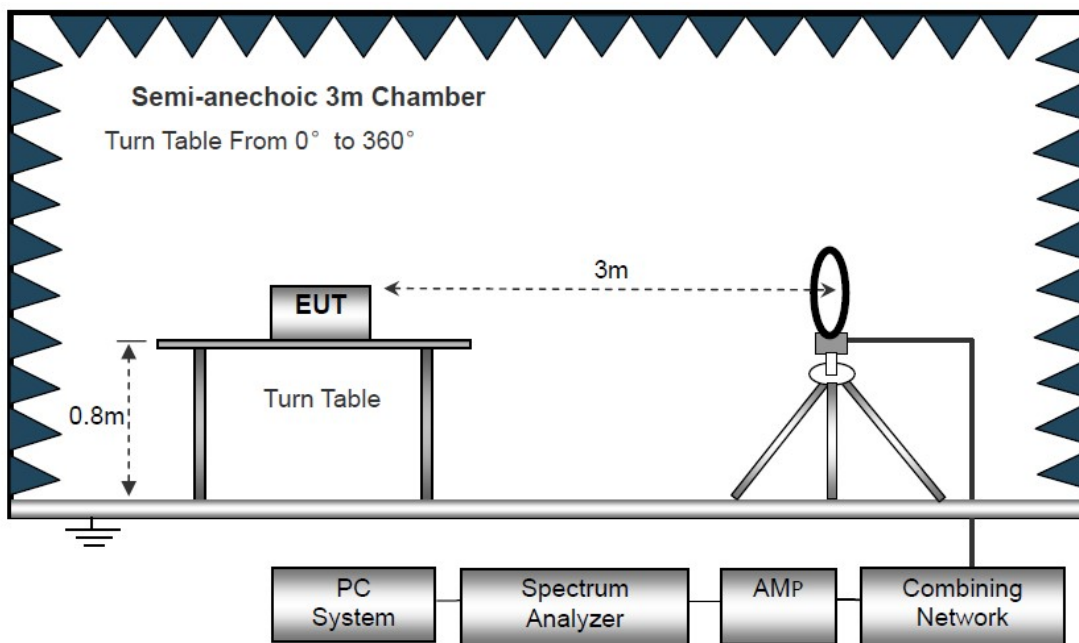
Operating Environment :

Temperature: : 21.8 °C
 Humidity: : 58 % RH
 Atmospheric Pressure: : 101.2kPa
 Test Voltage : AC 120V 60Hz

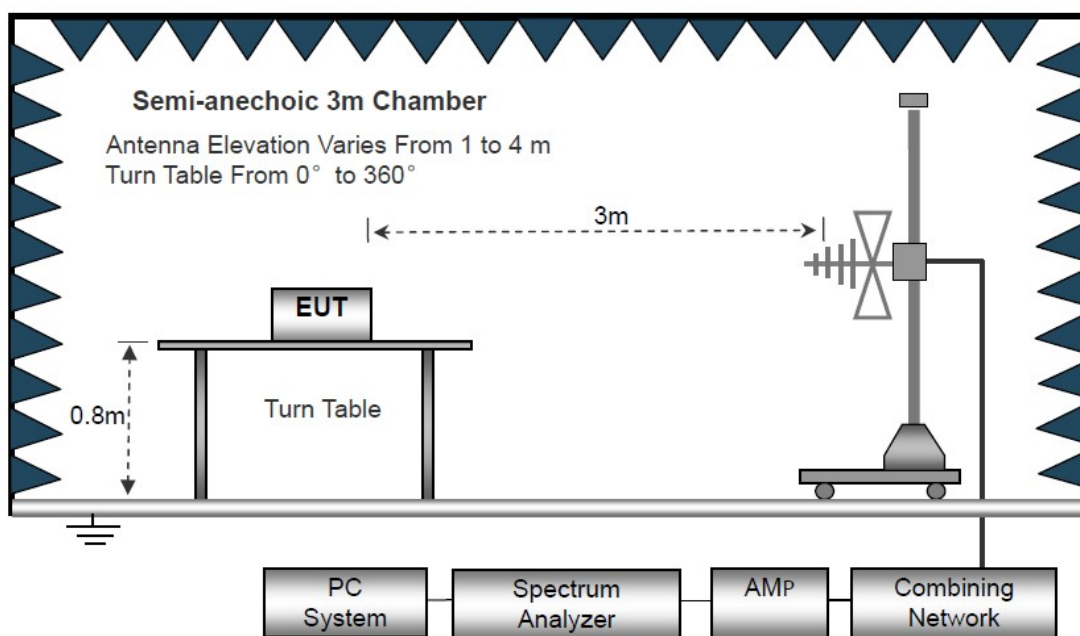
6.2 Test Setup

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

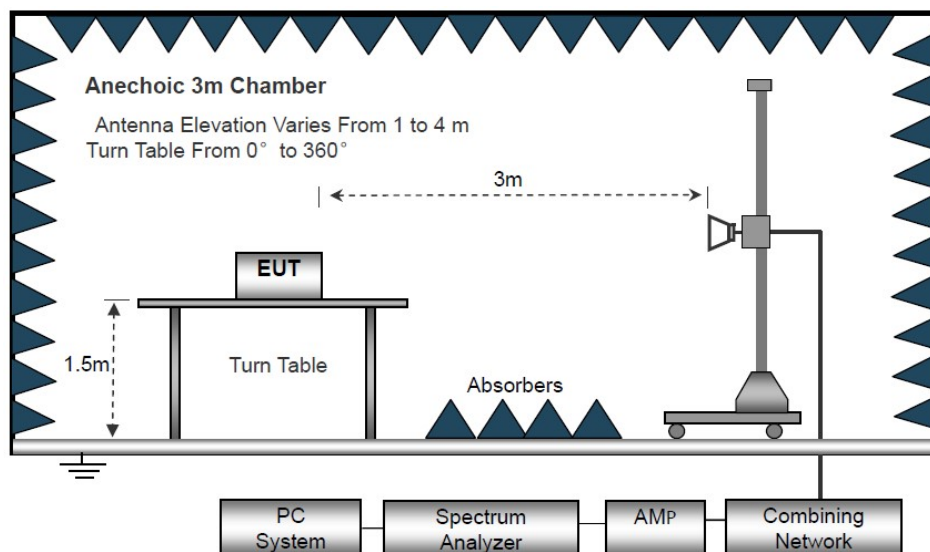
The test setup for emission measurement below 30MHz



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

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	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);

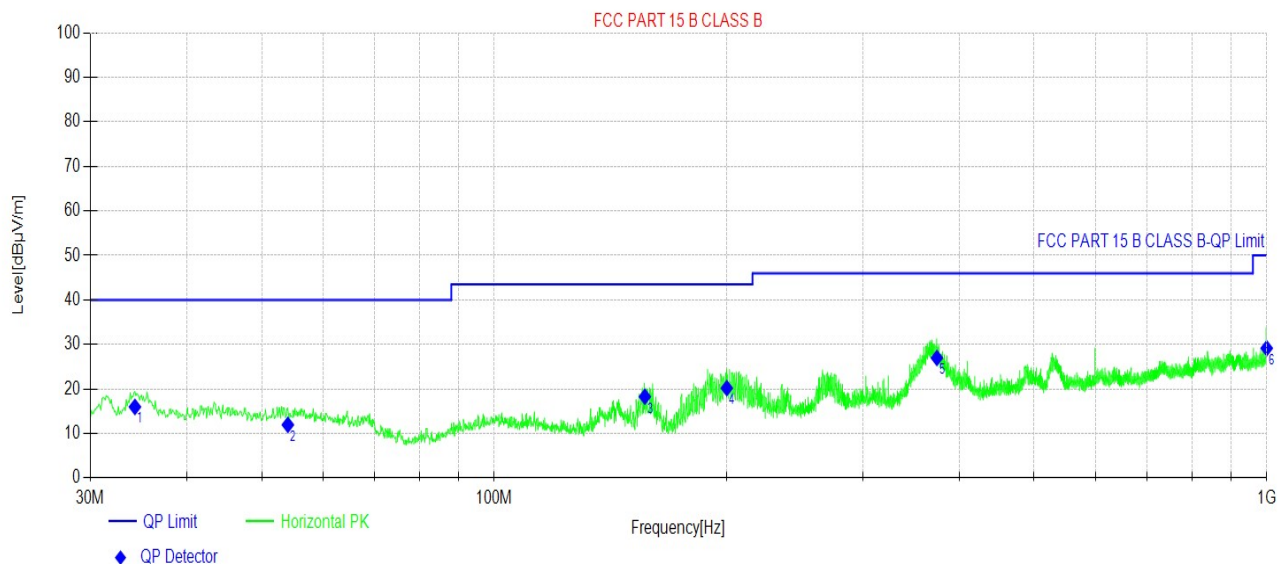
Limit line = Specific limits (dBuV) + distance extrapolation factor.

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

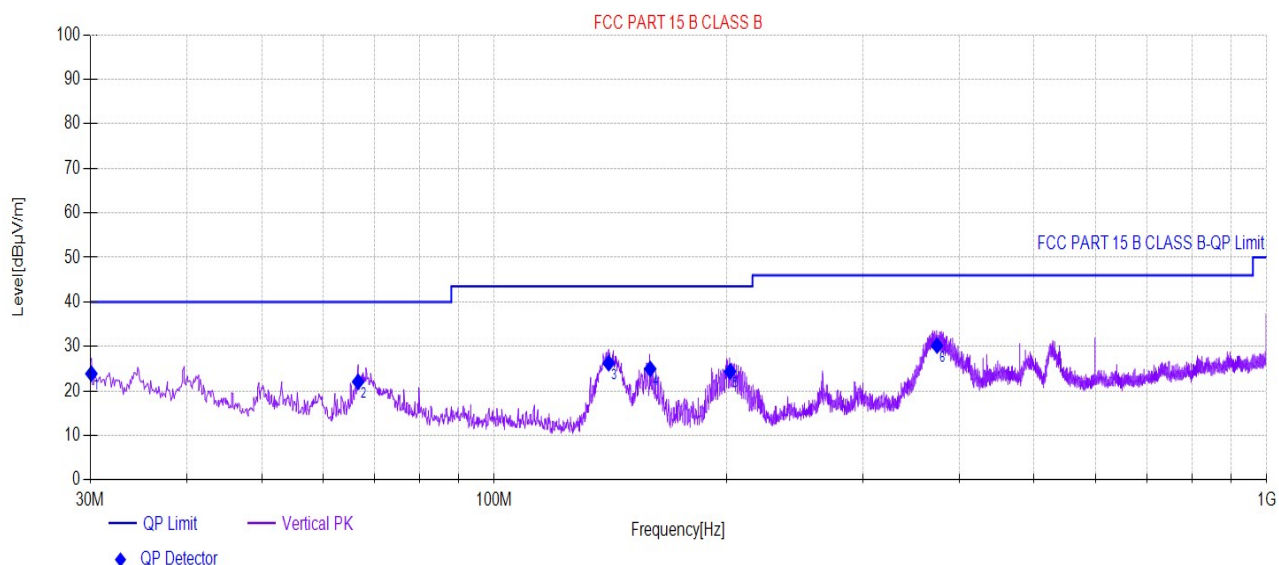


Final Test Data

NO.	Freq. [MHz]	QP Reading[dBμV/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Factor [dB]	Height [cm]	Angle [°]	Polarity	Result
1	34.27	42.25	15.98	40.00	24.02	-26.27	100	351	Horizontal	PASS
2	54.06	35.09	11.95	40.00	28.05	-23.14	100	64	Horizontal	PASS
3	156.69	45.73	18.27	43.50	25.23	-27.46	100	256	Horizontal	PASS
4	200.06	45.02	20.19	43.50	23.31	-24.83	100	73	Horizontal	PASS
5	374.19	46.86	26.97	46.00	19.03	-19.89	100	204	Horizontal	PASS
6	1000.0	38.29	29.16	50.00	20.84	-9.13	100	256	Horizontal	PASS



Antenna Polarization: Vertical



Final Test Data

NO.	Freq. [MHz]	QP Reading[dBμV/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Factor [dB]	Height [cm]	Angle [°]	Polarity	Result
1	30.10	50.41	23.89	40.00	16.11	-26.52	100	182	Vertical	PASS
2	66.67	47.88	22.07	40.00	17.93	-25.81	100	243	Vertical	PASS
3	140.69	54.79	26.24	43.50	17.26	-28.55	100	164	Vertical	PASS
4	159.22	52.1	24.97	43.50	18.53	-27.13	100	281	Vertical	PASS
5	202.00	49.49	24.37	43.50	19.13	-25.12	100	15	Vertical	PASS
6	374.38	50.05	30.19	46.00	15.81	-19.86	100	217	Vertical	PASS

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



Test Frequency: From 1GHz to 18GHz

2.4G Wi-Fi (802.11b/g/n) mode have been tested, and the worst result(802.11b) was report as below:
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	49.46	32.35	4.12	28.44	57.49	74	-16.51	V
7236	39.56	36.08	6.3	27.74	54.20	74	-19.80	V
9648	38.78	38.25	7.91	24.65	60.29	74	-13.71	V
4824	48.86	32.35	4.12	28.44	56.89	74	-17.11	H
7236	39.61	36.08	6.3	27.74	54.25	74	-19.75	H
9648	33.35	38.25	7.91	24.65	54.86	74	-19.14	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	35.90	32.35	4.12	28.44	43.93	54	-10.07	V
7236	23.27	36.08	6.3	27.74	37.91	54	-16.09	V
9648	19.36	38.25	7.91	24.65	40.87	54	-13.13	V
4824	30.92	32.35	4.12	28.44	38.95	54	-15.05	H
7236	22.09	36.08	6.3	27.74	36.73	54	-17.27	H
9648	21.36	38.25	7.91	24.65	42.87	54	-11.13	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	48.83	32.35	4.12	28.44	56.86	74	-17.14	V
7311	37.79	36.08	6.3	27.74	52.43	74	-21.57	V
9748	32.70	38.25	7.91	24.65	54.21	74	-19.79	V
4874	53.90	32.35	4.12	28.44	61.93	74	-12.07	H
7311	36.42	36.08	6.3	27.74	51.06	74	-22.94	H
9748	33.13	38.25	7.91	24.65	54.64	74	-19.36	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	32.30	32.35	4.12	28.44	40.33	54	-13.67	V
7311	24.89	36.08	6.3	27.74	39.53	54	-14.47	V
9748	20.93	38.25	7.91	24.65	42.44	54	-11.56	V
4874	31.83	32.35	4.12	28.44	39.86	54	-14.14	H
7311	25.44	36.08	6.3	27.74	40.08	54	-13.92	H
9748	21.75	38.25	7.91	24.65	43.26	54	-10.74	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	52.36	32.41	4.14	28.42	60.49	74	-13.51	V
7386	36.58	36.15	6.36	27.68	51.41	74	-22.59	V
9848	34.55	38.35	7.97	24.33	56.54	74	-17.46	V
4924	46.63	32.41	4.14	28.42	54.76	74	-19.24	H
7386	35.05	36.15	6.36	27.68	49.88	74	-24.12	H
9848	34.17	38.35	7.97	24.33	56.16	74	-17.84	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	29.63	32.41	4.14	28.42	37.76	54	-16.24	V
7386	26.51	36.15	6.36	27.68	41.34	54	-12.66	V
9848	21.27	38.35	7.97	24.33	43.26	54	-10.74	V
4924	31.46	32.41	4.14	28.42	39.59	54	-14.41	H
7386	21.95	36.15	6.36	27.68	36.78	54	-17.22	H
9848	19.45	38.35	7.97	24.33	41.44	54	-12.56	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(802.11g) was report as below
 Test Mode: Worst case 802.11g Low Channel 2412MHz

Test Mode: 802.11g 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	
2390	46.94	28.67	6.72	37.26	45.07	74	-28.93	H	Peak
2400	60.05	28.08	6.81	37.12	57.82	74	-16.18	H	
2390	44.31	28.67	6.72	37.26	42.44	74	-31.56	V	
2400	52.96	28.08	6.81	37.12	50.73	74	-23.27	V	
2390	39.29	28.67	6.72	37.26	37.42	54	-16.58	H	Average
2400	45.17	28.08	6.81	37.12	42.94	54	-11.06	H	
2390	40.09	28.67	6.72	37.26	38.22	54	-15.78	V	
2400	46.77	28.08	6.81	37.12	44.54	54	-9.46	V	

Test Mode: Worst case 802.11g High Channel 2462MHz

Test Mode: 802.11g 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	62.99	27.38	6.15	36.29	60.23	74	-13.77	H	Peak
2500	49.05	27.43	6.68	36.79	46.37	74	-27.63	H	
2483.5	56.97	27.38	6.15	36.29	54.21	74	-19.79	V	
2500	47.50	27.43	6.68	36.79	44.82	74	-29.18	V	
2483.5	44.59	27.38	6.15	36.29	41.83	54	-12.17	H	Average
2500	40.71	27.43	6.68	36.79	38.03	54	-15.97	H	
2483.5	40.82	27.38	6.15	36.29	38.06	54	-15.94	V	
2500	38.97	27.43	6.68	36.79	36.29	54	-17.71	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 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.

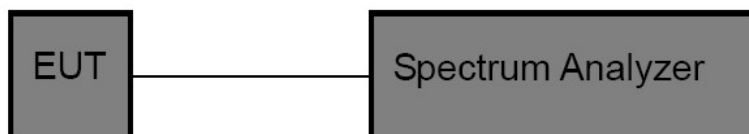
f) Trace mode = max-hold.

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.

7.2 Test Setup



7.3 Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	0~Reference	3.80	3.80	---	PASS
11B	Ant1	2412	30~1000	3.80	-56.5	≤ -26.2	PASS
11B	Ant1	2412	1000~26500	3.80	-30.95	≤ -26.2	PASS
11B	Ant1	2437	0~Reference	3.20	3.20	---	PASS
11B	Ant1	2437	30~1000	3.20	-56.35	≤ -26.8	PASS
11B	Ant1	2437	1000~26500	3.20	-29.77	≤ -26.8	PASS
11B	Ant1	2462	0~Reference	3.34	3.34	---	PASS
11B	Ant1	2462	30~1000	3.34	-56.03	≤ -26.66	PASS
11B	Ant1	2462	1000~26500	3.34	-28.29	≤ -26.66	PASS
11G	Ant1	2412	0~Reference	-0.38	-0.38	---	PASS
11G	Ant1	2412	30~1000	-0.38	-56.08	≤ -30.38	PASS
11G	Ant1	2412	1000~26500	-0.38	-37.92	≤ -30.38	PASS
11G	Ant1	2437	0~Reference	0.37	0.37	---	PASS
11G	Ant1	2437	30~1000	0.37	-55.94	≤ -29.63	PASS
11G	Ant1	2437	1000~26500	0.37	-39.02	≤ -29.63	PASS
11G	Ant1	2462	0~Reference	0.95	0.95	---	PASS
11G	Ant1	2462	30~1000	0.95	-54.86	≤ -29.05	PASS
11G	Ant1	2462	1000~26500	0.95	-36.11	≤ -29.05	PASS
11N20SISO	Ant1	2412	0~Reference	1.19	1.19	---	PASS

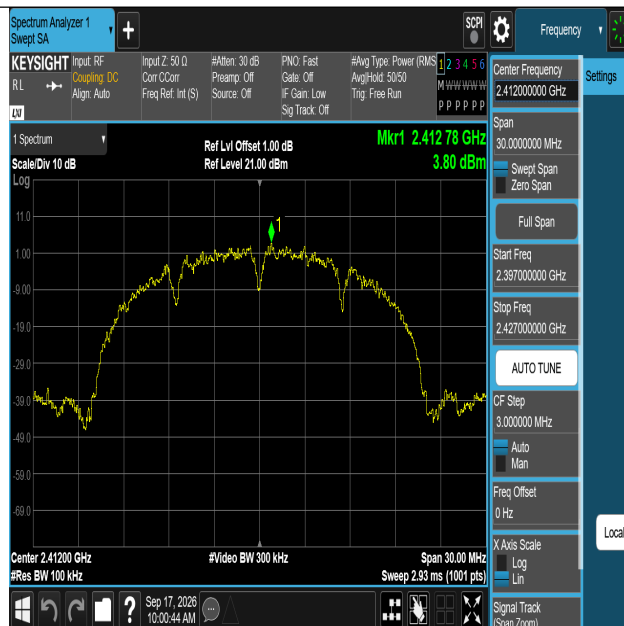


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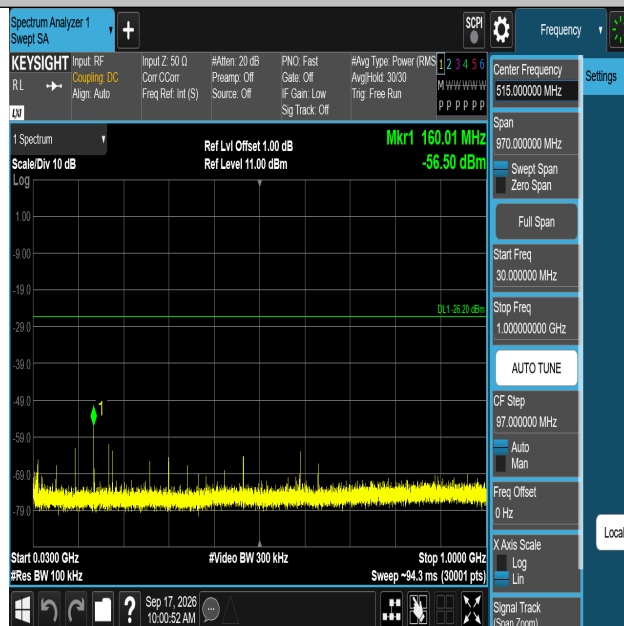
11N20SISO	Ant1	2412	30~1000	1.19	-56.02	≤ -28.81	PASS
11N20SISO	Ant1	2412	1000~26500	1.19	-37.06	≤ -28.81	PASS
11N20SISO	Ant1	2437	0~Reference	1.54	1.54	---	PASS
11N20SISO	Ant1	2437	30~1000	1.54	-56.02	≤ -28.46	PASS
11N20SISO	Ant1	2437	1000~26500	1.54	-37.13	≤ -28.46	PASS
11N20SISO	Ant1	2462	0~Reference	2.47	2.47	---	PASS
11N20SISO	Ant1	2462	30~1000	2.47	-56.14	≤ -27.53	PASS
11N20SISO	Ant1	2462	1000~26500	2.47	-34.25	≤ -27.53	PASS



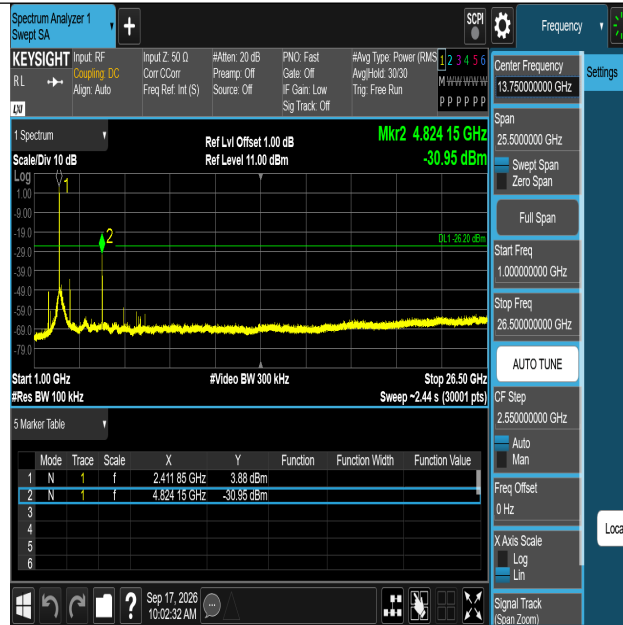
Test Graphs:



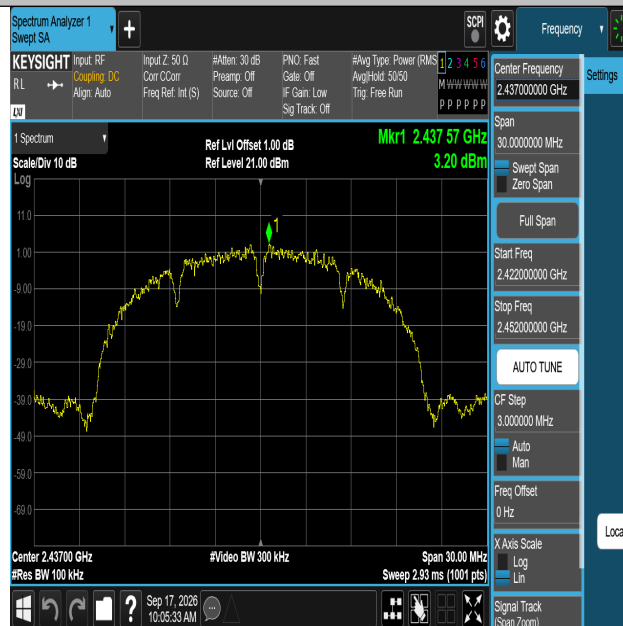
11B-Ant1-2412-0~Reference-PASS



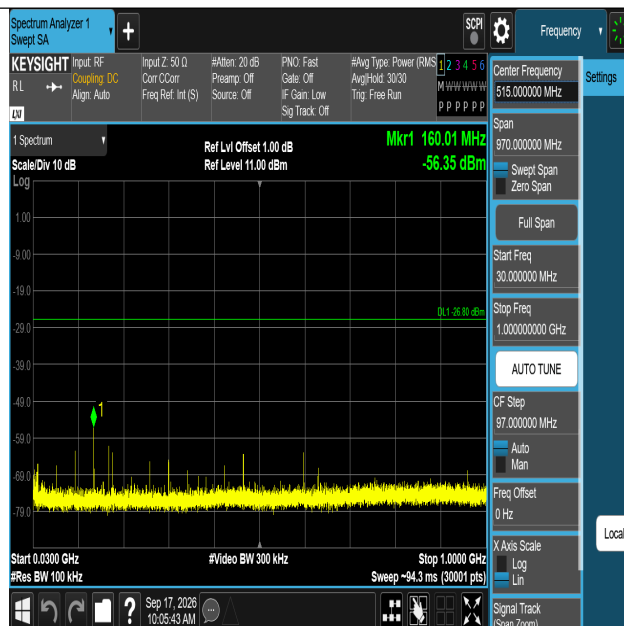
11B-Ant1-2412-30~1000-PASS



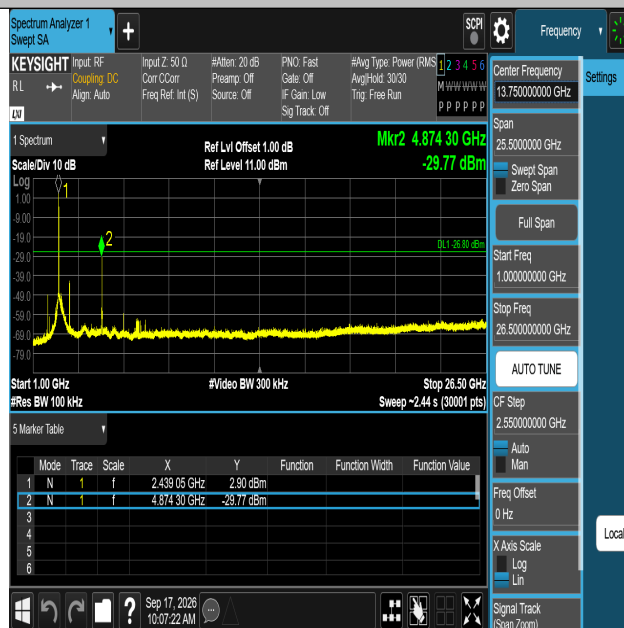
11B-Ant1-2412-1000~26500-PASS



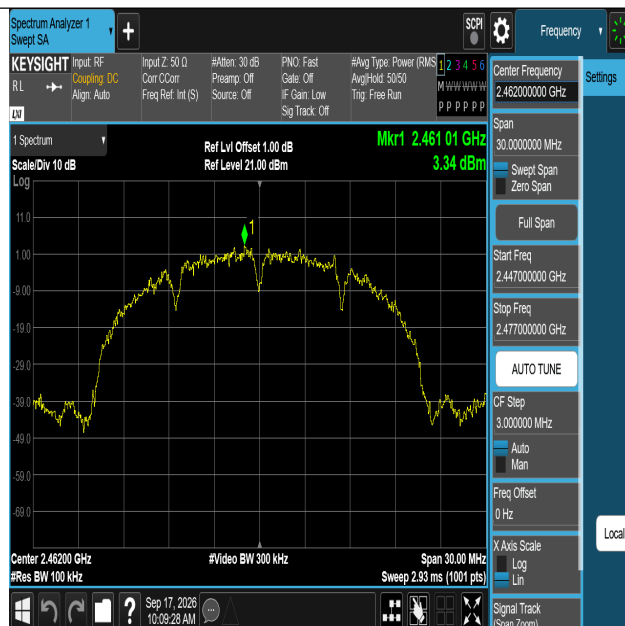
11B-Ant1-2437-0~Reference-PASS



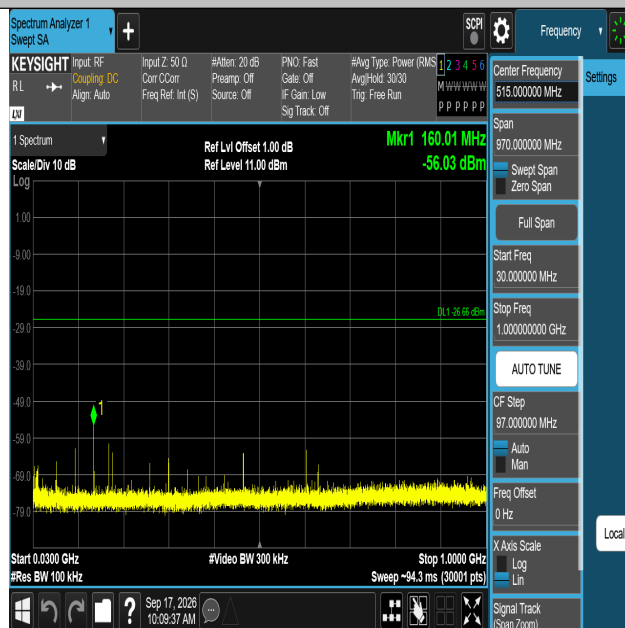
11B-Ant1-2437-30~1000-PASS



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



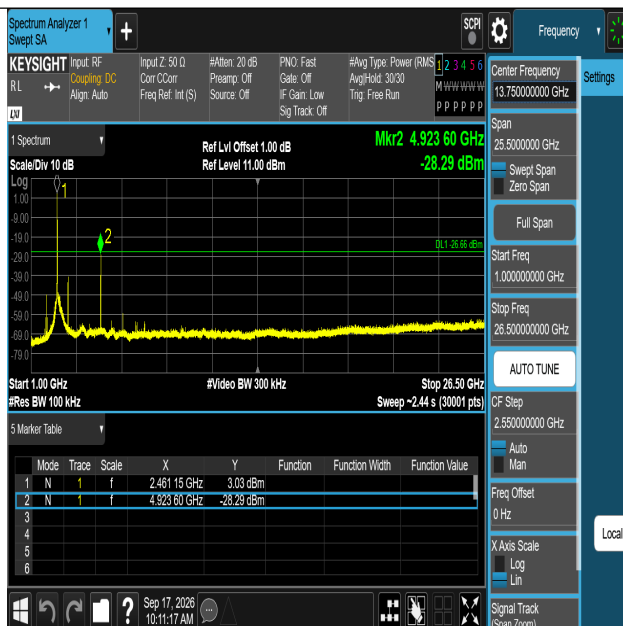
11B-Ant1-2462-0~Reference-PASS



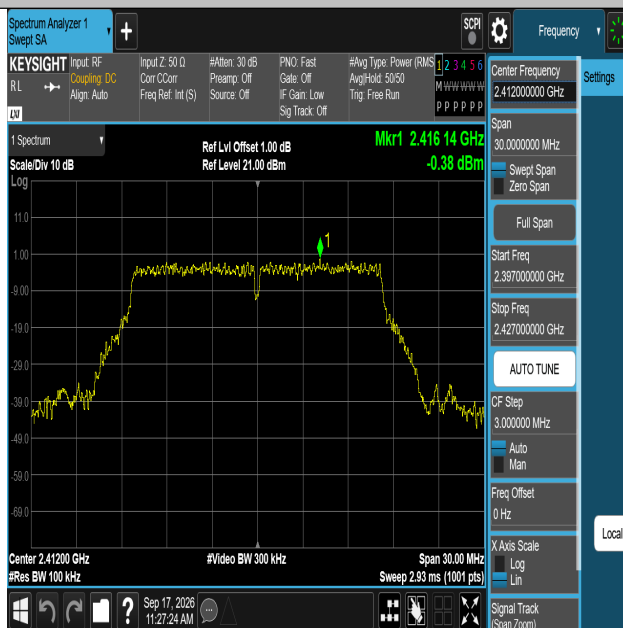
11B-Ant1-2462-30~1000-PASS



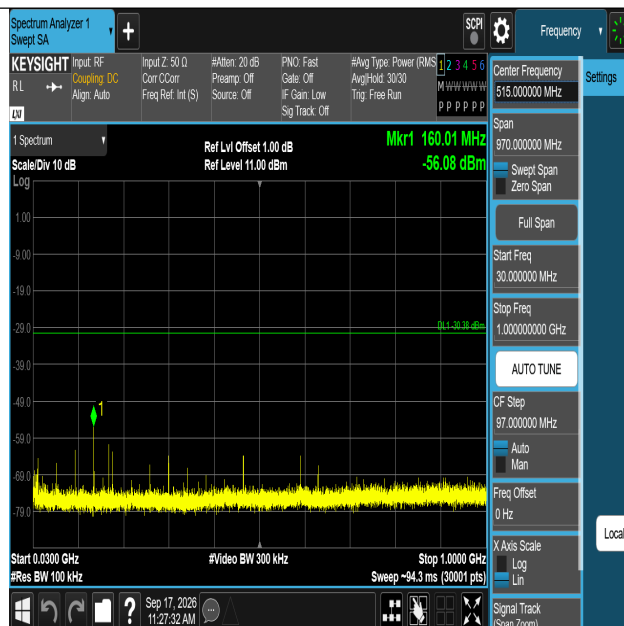
Report No.: PTC26090405402E-FC01



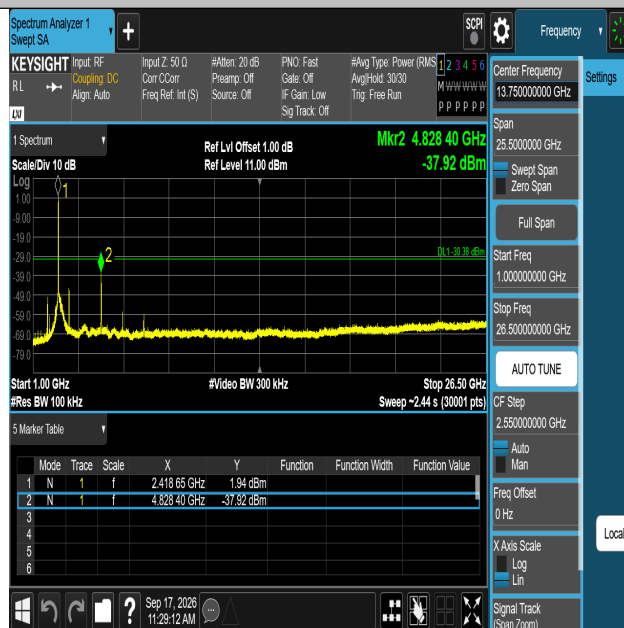
11B-Ant1-2462-1000~26500-PASS



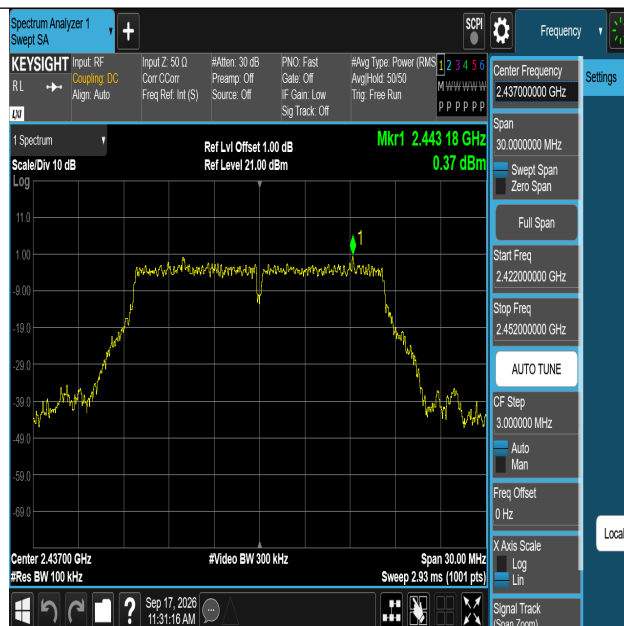
11G-Ant1-2412-0~Reference-PASS



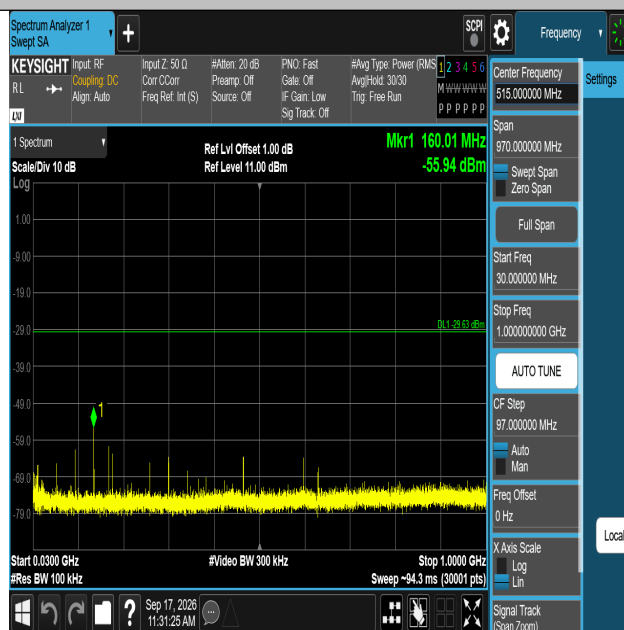
11G-Ant1-2412-30~1000-PASS



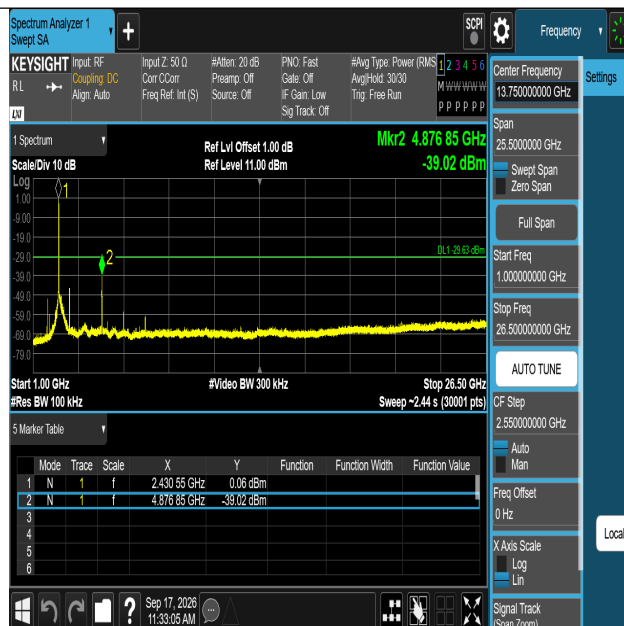
11G-Ant1-2412-1000~26500-PASS



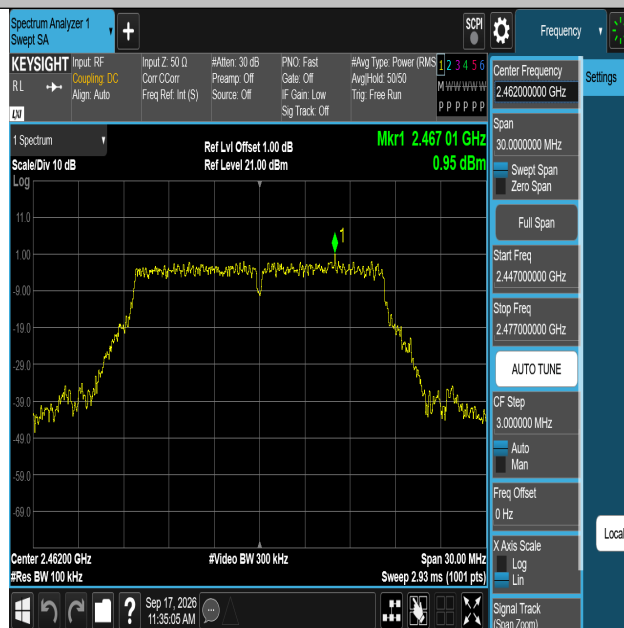
11G-Ant1-2437-0~Reference-PASS



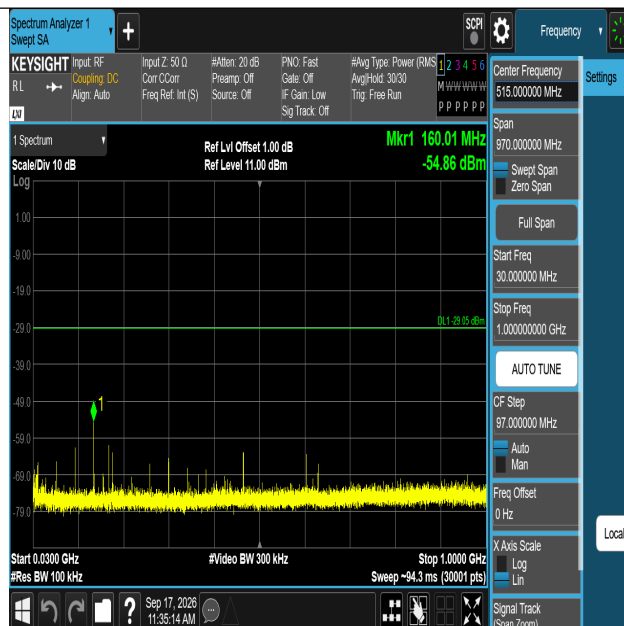
11G-Ant1-2437-30~1000-PASS



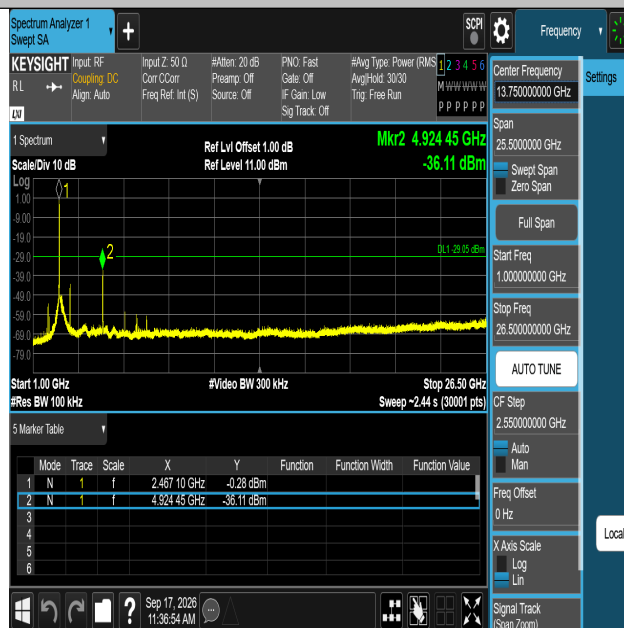
11G-Ant1-2437-1000~26500-PASS



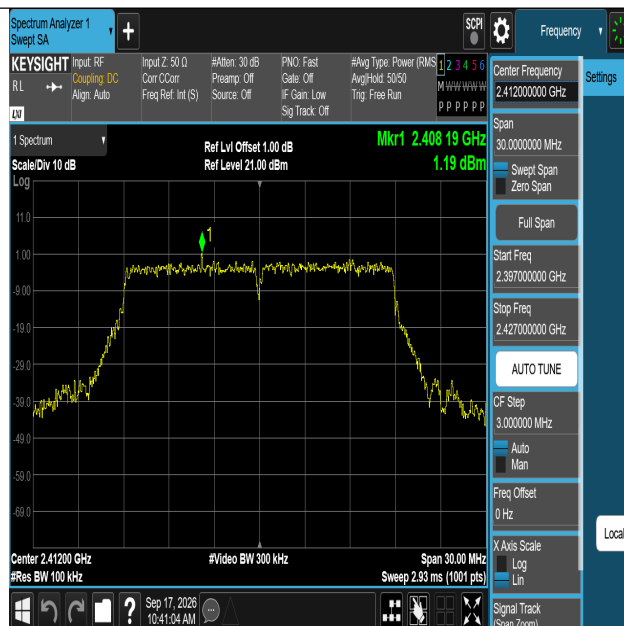
11G-Ant1-2462-0~Reference-PASS



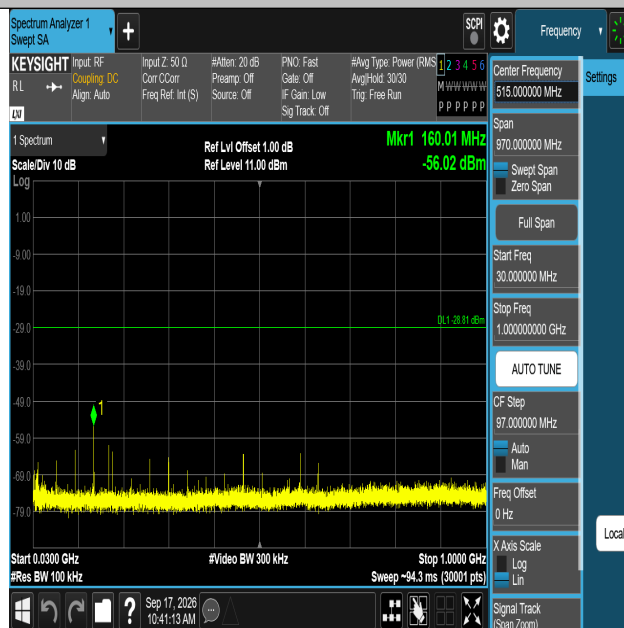
11G-Ant1-2462-30~1000-PASS



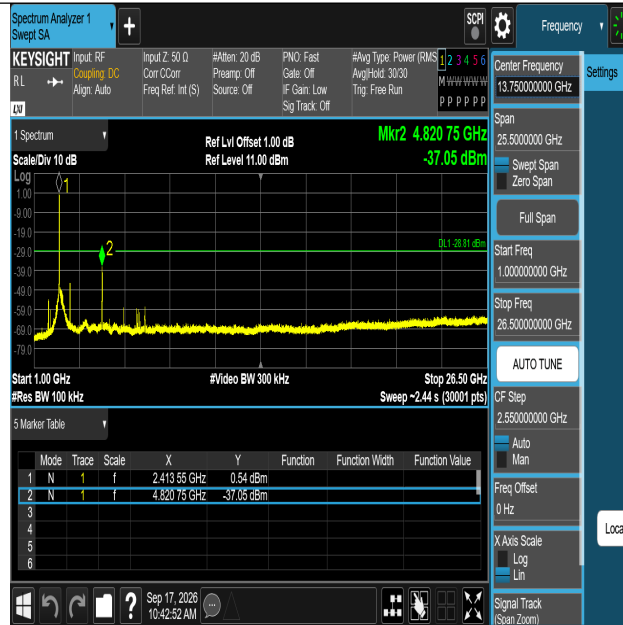
11G-Ant1-2462-1000~26500-PASS



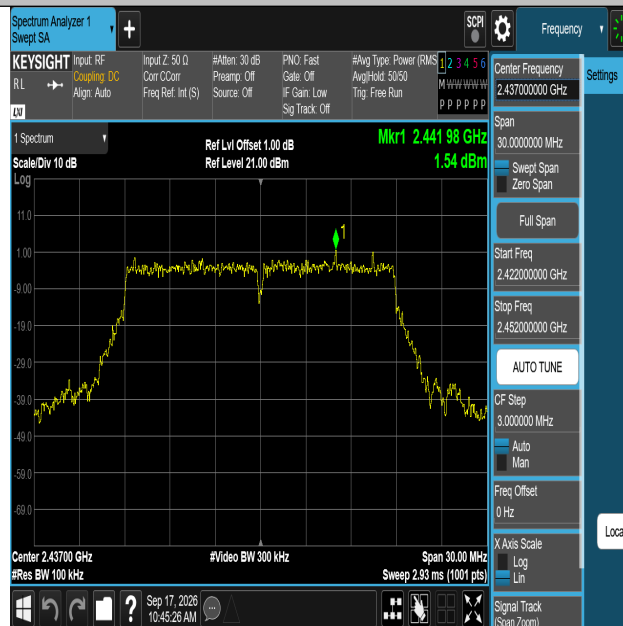
11N20SISO-Ant1-2412-0~Reference-PASS



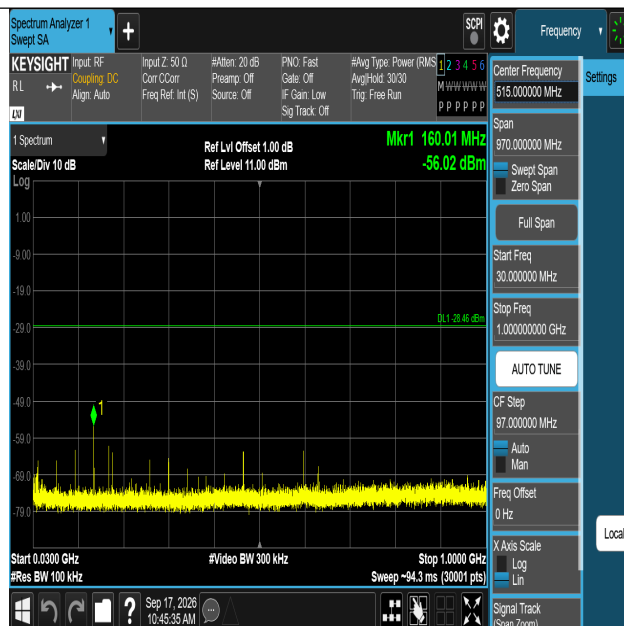
11N20SISO-Ant1-2412-30~1000-PASS



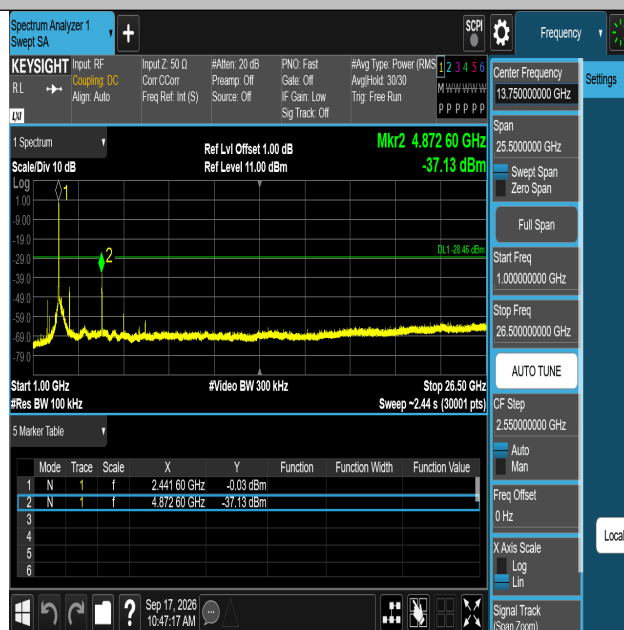
11N20SISO-Ant1-2412-1000~26500-PASS



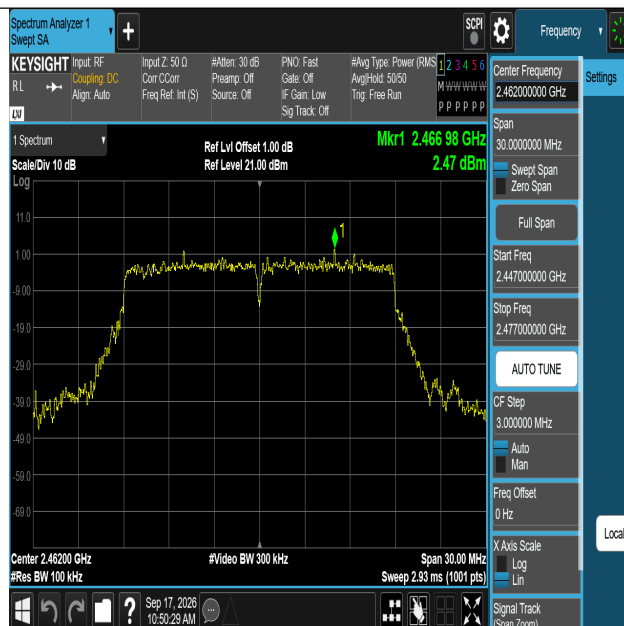
11N20SISO-Ant1-2437-0~Reference-PASS



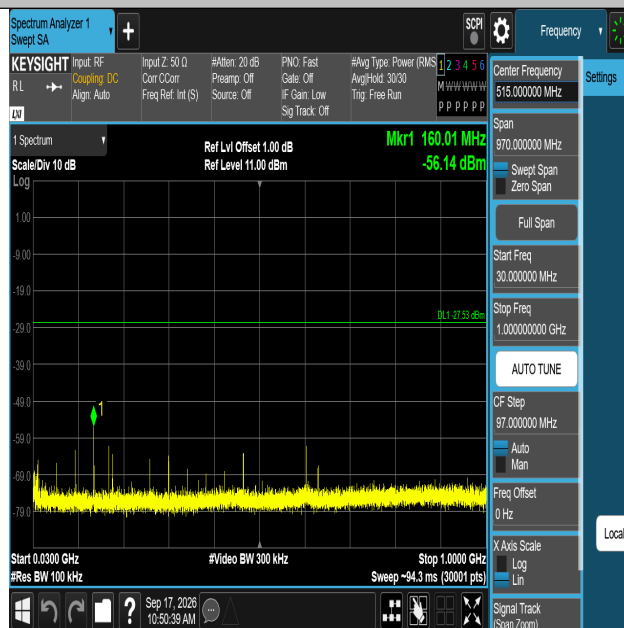
11N20SISO-Ant1-2437-30~1000-PASS



11N20SISO-Ant1-2437-1000~26500-PASS



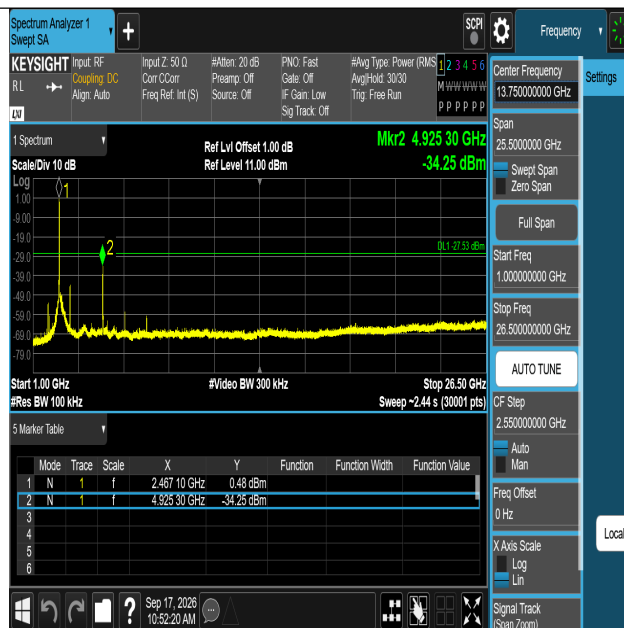
11N20SISO-Ant1-2462-0~Reference-PASS



11N20SISO-Ant1-2462-30~1000-PASS



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11N20SISO-Ant1-2462-1000~26500-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)).

8.1 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.

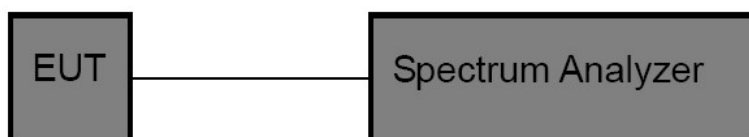
f) Trace mode = max-hold.

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.

8.2 Test Setup

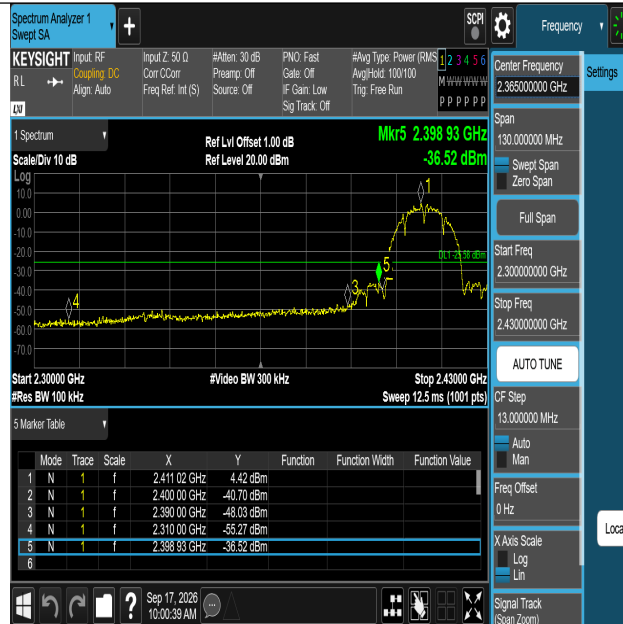


8.3 Test Result

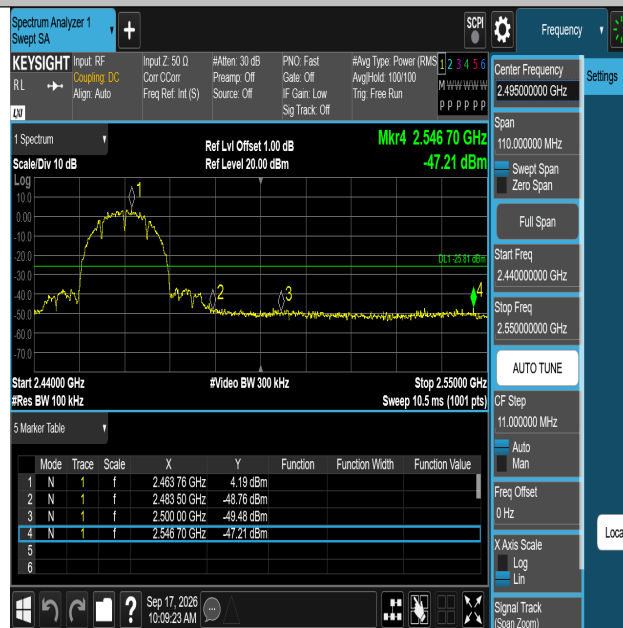
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.43	-36.52	≤ -25.58	PASS
11B	Ant1	High	2462	4.19	-47.21	≤ -25.81	PASS
11G	Ant1	Low	2412	1.26	-34.87	≤ -28.74	PASS
11G	Ant1	High	2462	1.36	-45.36	≤ -28.64	PASS
11N20SISO	Ant1	Low	2412	2.77	-33.45	≤ -27.23	PASS
11N20SISO	Ant1	High	2462	2.56	-43.37	≤ -27.44	PASS



Test Graphs:



11B-Ant1-2412-PASS



11B-Ant1-2462-PASS



11G-Ant1-2412-PASS



11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2462-PASS



9 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

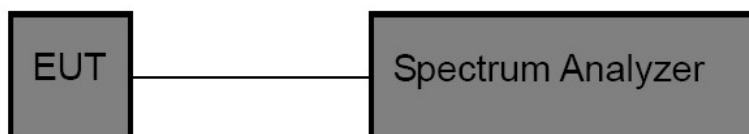
Test Method : ANSI C63.10-2020

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

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 = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz; Set the $\text{VBW} \geq [3 \times \text{RBW}]$; Detector = peak; Trace mode = max-hold; Sweep = No faster than coupled (auto) time.

9.2 Test Setup



9.3 Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	11.280	2406.880	2418.160	0.5	PASS
11B	Ant1	2437	11.280	2432.040	2443.320	0.5	PASS
11B	Ant1	2462	11.080	2456.960	2468.040	0.5	PASS
11G	Ant1	2412	16.480	2403.800	2420.280	0.5	PASS
11G	Ant1	2437	16.440	2428.800	2445.240	0.5	PASS
11G	Ant1	2462	16.480	2453.800	2470.280	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
11N20SISO	Ant1	2437	17.640	2428.200	2445.840	0.5	PASS
11N20SISO	Ant1	2462	17.640	2453.200	2470.840	0.5	PASS



Test Graphs:



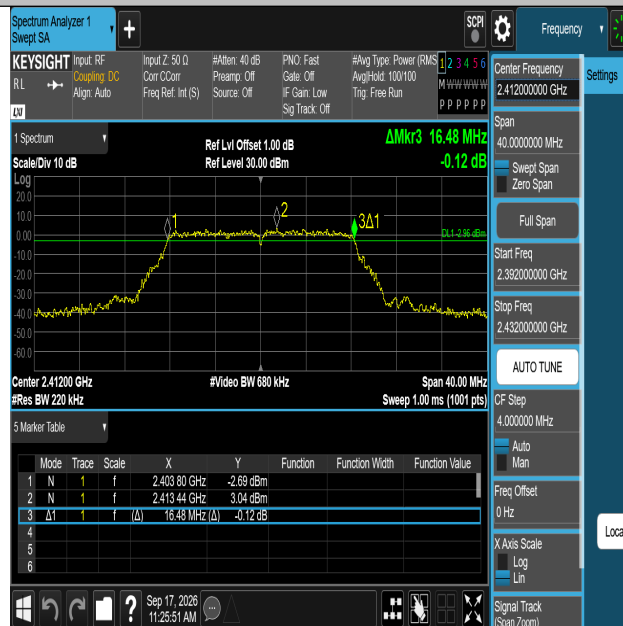
11B-Ant1-2412-PASS



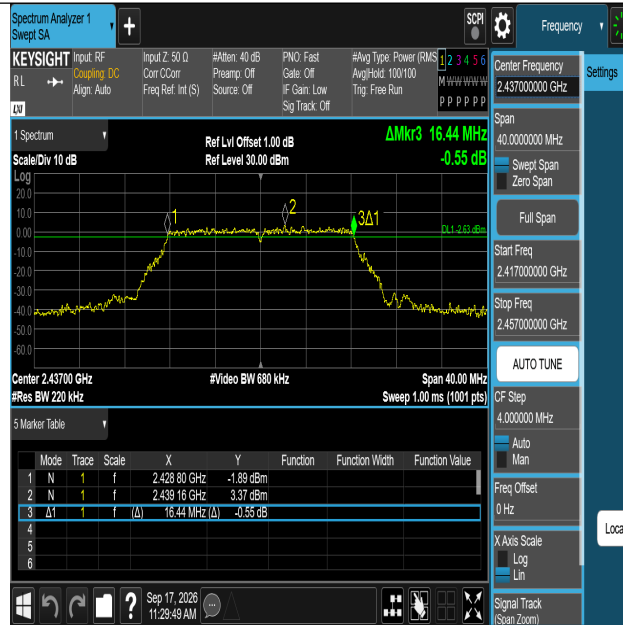
11B-Ant1-2437-PASS



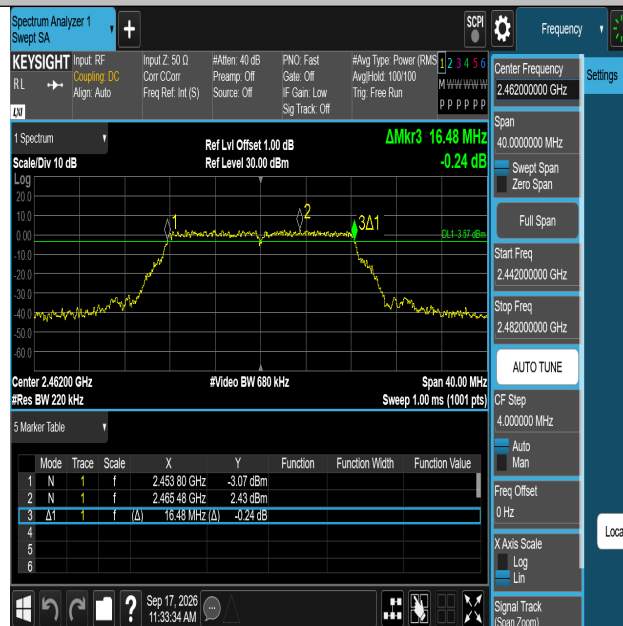
11B-Ant1-2462-PASS



11G-Ant1-2412-PASS



11G-Ant1-2437-PASS



11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2437-PASS



Report No.: PTC26090405402E-FC01



11N20SISO-Ant1-2462-PASS



10 Maximum conducted output power

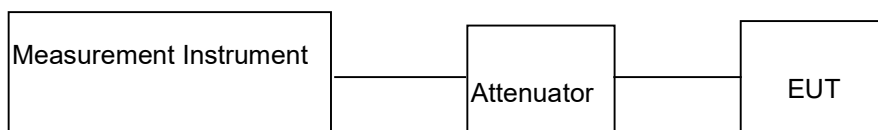
Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10-2020
Test Limit	:	Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

10.1 Test Procedure

According to ANSI C63.10-2020 clause 11.9.2.2.4 Method AVGSA-2 Method AVGSA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

- a) Measure the duty cycle D of the transmitter output signal as described in 11.6.
- b) Set span to >1.5 times the OBW.
- c) Set RBW = 1% to 5% of the OBW, but do not exceed 1 MHz.
- d) Set VBW $\geq [3 \times \text{RBW}]$.
- e) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- f) Sweep time = auto.
- g) Detector = Power averaging (rms), if available. Otherwise, use the sample detector mode.
- h) Do not use sweep triggering. Allow the sweep to “free run.”
- i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 until trace is stabilized so that the average accurately represents the true average over the ON and OFF periods of the transmitter.
- j) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band-power measurement function with band limits set equal to the OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
1. k) Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ if the duty cycle is 25%.

10.2 Test Setup





10.3 Test Result

Test Mode	Antenna	Frequency[MHz]	Set Power	Average power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	NA	13.20	74.91	1.25	14.45	≤30.00	PASS
11B	Ant1	2437	NA	12.06	74.91	1.25	13.31	≤30.00	PASS
11B	Ant1	2462	NA	12.69	74.91	1.25	13.94	≤30.00	PASS
11G	Ant1	2412	NA	10.29	49.63	3.04	13.33	≤30.00	PASS
11G	Ant1	2437	NA	10.41	49.63	3.04	13.45	≤30.00	PASS
11G	Ant1	2462	NA	11.17	49.63	3.04	14.21	≤30.00	PASS
11N20SISO	Ant1	2412	NA	11.53	45.60	3.41	14.94	≤30.00	PASS
11N20SISO	Ant1	2437	NA	11.38	45.60	3.41	14.79	≤30.00	PASS
11N20SISO	Ant1	2462	NA	10.28	45.60	3.41	13.69	≤30.00	PASS

Duty Cycle:

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	6.09	8.13	74.91	1.25
11B	Ant1	2437	6.09	8.13	74.91	1.25
11B	Ant1	2462	6.09	8.13	74.91	1.25
11G	Ant1	2412	2.01	4.05	49.63	3.04
11G	Ant1	2437	2.01	4.05	49.63	3.04
11G	Ant1	2462	2.01	4.05	49.63	3.04
11N20SISO	Ant1	2412	1.71	3.75	45.60	3.41
11N20SISO	Ant1	2437	1.71	3.75	45.60	3.41
11N20SISO	Ant1	2462	1.71	3.75	45.60	3.41



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NTNV-11B-Ant1-2412



NTNV-11B-Ant1-2437