



FCC TEST REPORT

FCC ID: 2BAH2-N291WIFI

Product	:	Dash Cam
Model Name	:	N291 WiFi,N291,N291S
Brand	:	PAPAGO!
Report No.	:	PTC22110306504E-FC01
Sample ID	:	PTC22110306504E-01#
Prepared for		
Maction Technologies (Shanghai) ,Ltd		
18 / F, West building, no.2218, Hunan Road, Pudong New Area, Shanghai		
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 : Maction Technologies (Shanghai) ,Ltd
Address : 18 / F, West building, no.2218, Hunan Road, Pudong New Area, Shanghai
Manufacture's name : Maction Technologies (Shanghai) ,Ltd
Address : 18 / F, West building, no.2218, Hunan Road, Pudong New Area, Shanghai
Product name : Dash Cam
Model name : N291 WiFi,N291,N291S
Standards : FCC CFR47 Part 15 Section 15.247
Test procedure : ANSI C63.10:2013
Test Date : Jan. 08, 2023 to Feb.17, 2023
Date of Issue : Feb.18, 2023
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.

This report shall not be reproduced except in full, without the written approval of PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.

Test Engineer:

A handwritten signature in black ink that reads "Simon Pu".

Simon Pu / Engineer

Technical Manager:

A handwritten signature in black ink that reads "Ronnie Liu".

Ronnie Liu / Manager



Contents

Page

1 TEST RESULT CERTIFICATION	2
2 TEST SUMMARY	5
2.1 TEST SITE	5
3 GENERAL INFORMATION	6
3.1 GENERAL DESCRIPTION OF E.U.T.	6
3.2 CHANNEL LIST	7
4 EQUIPMENT DURING TEST	11
4.1 EQUIPMENTS LIST	11
4.2 MEASUREMENT UNCERTAINTY	13
4.3 DESCRIPTION OF SUPPORT UNITS	14
5 CONDUCTED EMISSION	15
5.1 E.U.T. OPERATION	15
5.2 EUT SETUP	15
5.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	16
5.4 MEASUREMENT PROCEDURE	16
5.5 CONDUCTED EMISSION LIMIT	16
5.6 MEASUREMENT DESCRIPTION	16
5.7 CONDUCTED EMISSION TEST RESULT	16
6 RADIATED SPURIOUS EMISSIONS	17
6.1 EUT OPERATION	17
6.2 TEST SETUP	18
6.3 SPECTRUM ANALYZER SETUP	19
6.4 TEST PROCEDURE	20
6.5 SUMMARY OF TEST RESULTS	21
7 CONDUCTED SPURIOUS EMISSION	27
7.1 TEST PROCEDURE	27
7.2 TEST RESULT	27
8 BAND EDGE MEASUREMENT	44
8.1 TEST PROCEDURE	44



8.2 TEST RESULT	45
9 6DB BANDWIDTH MEASUREMENT	49
9.1 TEST PROCEDURE	49
9.2 TEST RESULT	49
10 MAXIMUM PEAK OUTPUT POWER	54
10.1 TEST PROCEDURE	54
10.2 TEST RESULT	54
11 POWER SPECTRAL DENSITY	55
11.1 TEST PROCEDURE	55
11.2 TEST RESULT	55
12 ANTENNA APPLICATION	59
12.1 ANTENNA REQUIREMENT	59
12.2 RESULT	59
13 TEST SETUP	60
14 EUT PHOTOS	61



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		

2.1 Test Site

Precise Testing & Certification Co., Ltd.

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

FCC Registration Number: 790290

Designation Number: CN1219

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

CAB identifier: CN0080



3 General Information

3.1 General Description of E.U.T.

Product Name	:	Dash Cam
Model Name	:	N291 WiFi,N291,N291S
Specification	:	802.11b/g/n HT20
Operation Frequency	:	2412-2462MHz for 802.11b/g/ n(HT20)
Number of Channel	:	11 channels for 802.11b/g/ n(HT20)
Type of Modulation	:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Antenna installation	:	Fpcb Antenna
Antenna Gain	:	2dBi
Power supply	:	DC 5V 2.4A via adapter input DC 12V battery
Hardware Version	:	Q09-6_MAIN_V01_C
Software Version	:	Q09-6.C_2022.07.05.V110



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/HT40): 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.

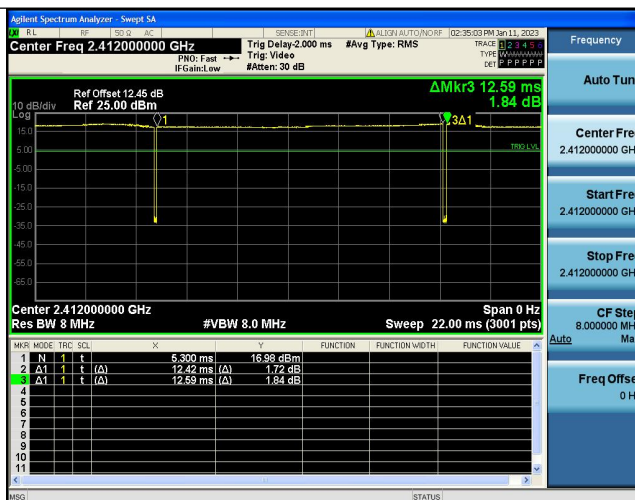
Frequency and Channel list for 802.11 b/g/n (HT20)

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		

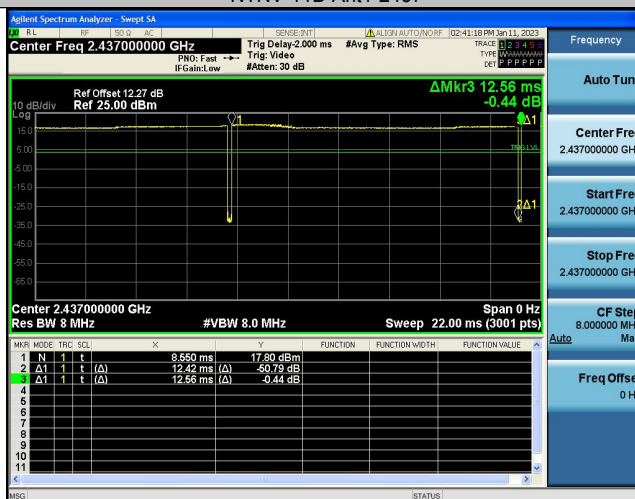
The maximum duty cycle as following table:

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	12.42	12.59	98.65	0.06
11B	Ant1	2437	12.42	12.56	98.89	0.05
11B	Ant1	2462	12.42	12.54	99.04	0.04
11G	Ant1	2412	2.06	2.19	94.06	0.27
11G	Ant1	2437	2.06	2.15	95.81	0.19
11G	Ant1	2462	2.07	2.19	94.52	0.24
11N20SISO	Ant1	2412	0.23	0.41	56.10	2.51
11N20SISO	Ant1	2437	0.23	0.50	46.00	3.37
11N20SISO	Ant1	2462	0.23	0.39	58.97	2.29

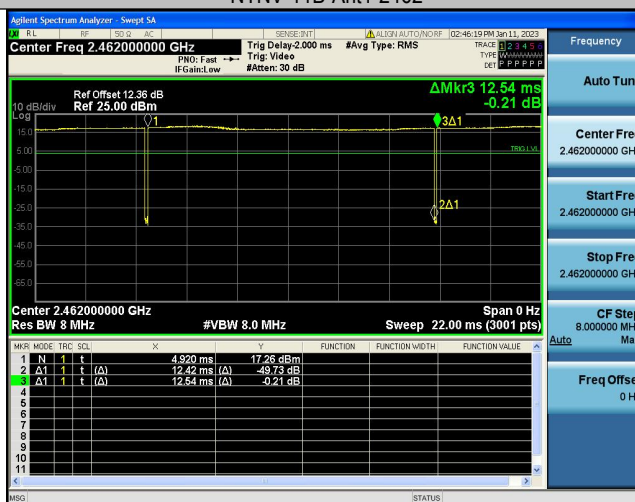
NTNV-11B-Ant1-2412



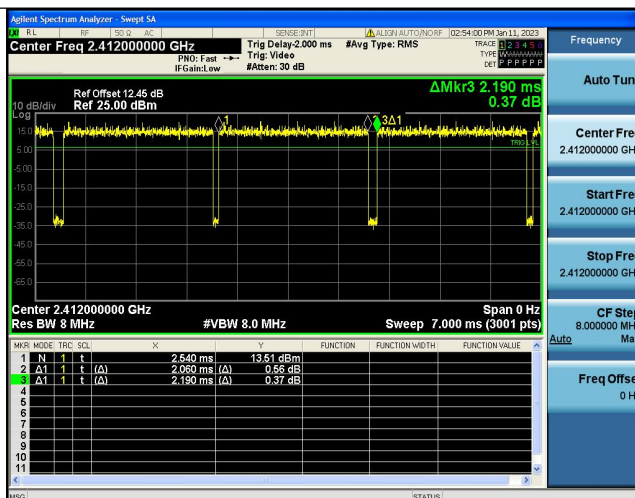
NTNV-11B-Ant1-2437



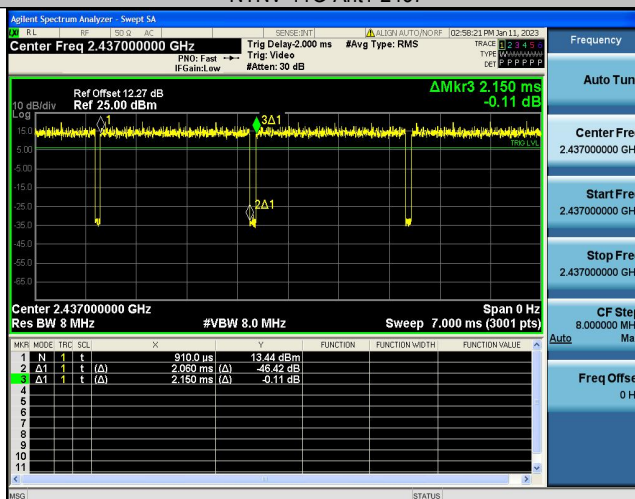
NTNV-11B-Ant1-2462



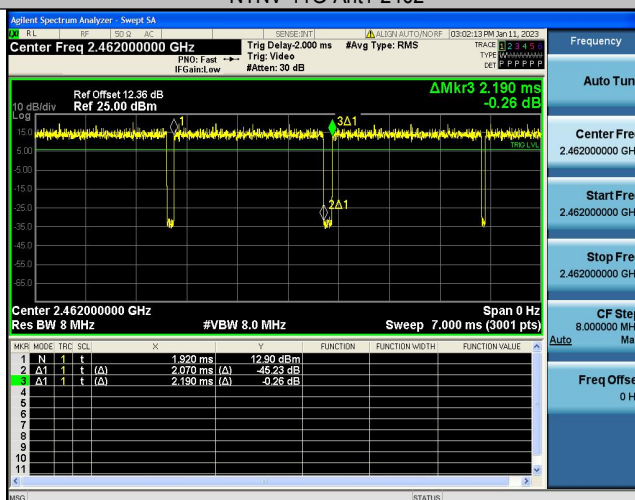
NTNV-11G-Ant1-2412



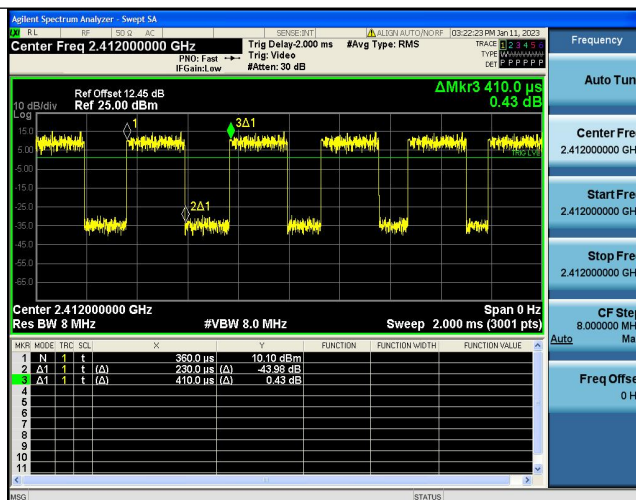
NTNV-11G-Ant1-2437



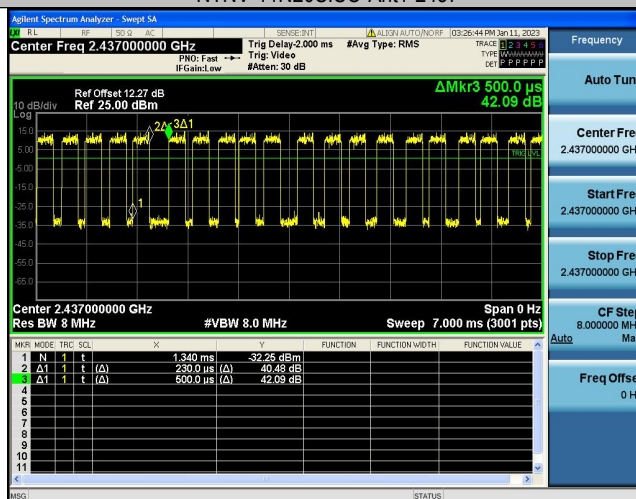
NTNV-11G-Ant1-2462



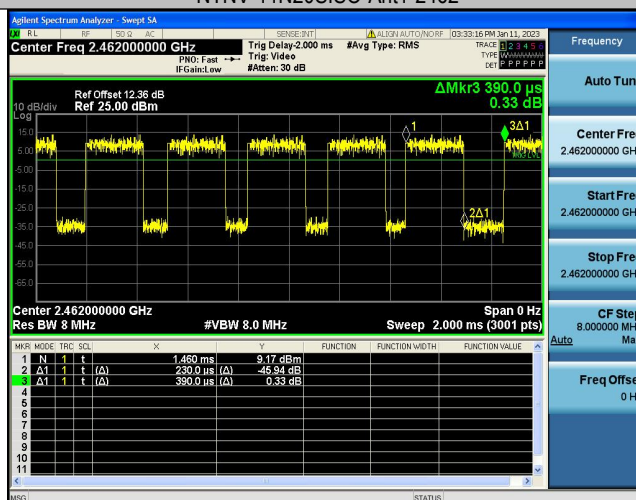
NTNV-11N20SISO-Ant1-2412



NTNV-11N20SISO-Ant1-2437



NTNV-11N20SISO-Ant1-2462





4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Aug21,2023
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug21,2023
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Aug21,2023
Scope	Tektronix	TDS3032B	B014131	300MHz BW; 2 way scope	Aug21,2023
DC power	eTOMENS	eTM-1560	--	15V 60A	Aug21,2023
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug21,2023
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug21,2023

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	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug21,2023
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug21,2023
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug21,2023
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Aug21,2023
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-26.5GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug21,2023
High NOISE AMPLIFIER	ZHINAN	ZN3380C	15002	10KHz-18GHz	Aug21,2023
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug21,2023
Spectrum Analyzer	Rohde&Schwarz	FSVR40	101003	10Hz-40GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	BBHA9170	01066	15GHZ-40GHZ	Aug21,2023
Preamplifier	SCHWARZBECK	BBV-9721	81	18GHZ-40GHZ	Aug21,2023



Report No.: PTC22110306504E-FC01

Test S/W	Tonscend	JS32-RE/4.0.0.0
----------	----------	-----------------

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	BS ENV216	102453	9KHz-300MHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Aug21,2023
Test S/W	Tonscend	JS32-CE/4.0.0.3			



4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9KHz~30MHz)	±2.54dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	



Report No.: PTC22110306504E-FC01

4.3 Description of Support Units

Equipment	Model No.	Series No.

5 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method	: ANSI C63.10: 2013
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

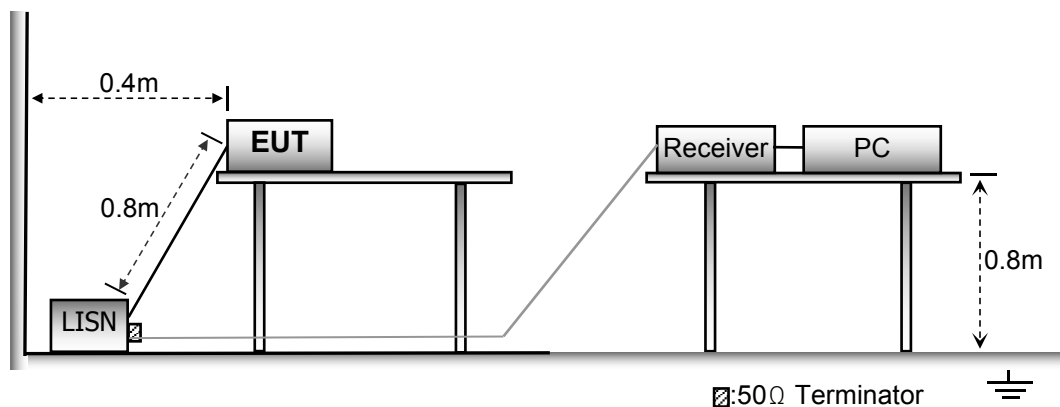
5.1 E.U.T. Operation

Operating Environment :

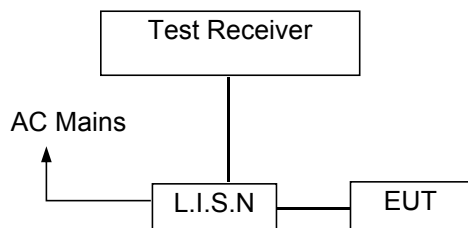
Temperature	: 23.9 °C
Humidity	: 51.4 % RH
Atmospheric Pressure	: 101.21kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



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 with AC 120V 60Hz and AC 240V 50Hz, the worst case is AC 120V 60Hz. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

N/A

As the EUT power by DC 12V battery,so it is no need tested.



6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247
 Test Method : ANSI C63.10:2013
 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	$20\log^{(500)}$

6.1 EUT Operation

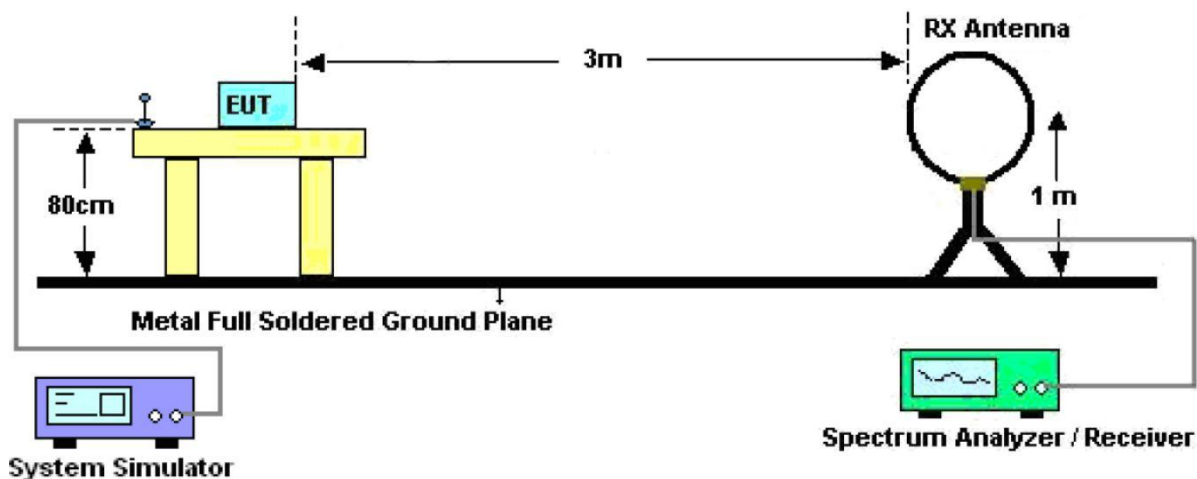
Operating Environment :

Temperature: : 24.5 °C
 Humidity: : 52 % RH
 Atmospheric Pressure: : 101.3kPa
 Test Voltage : DC 12V

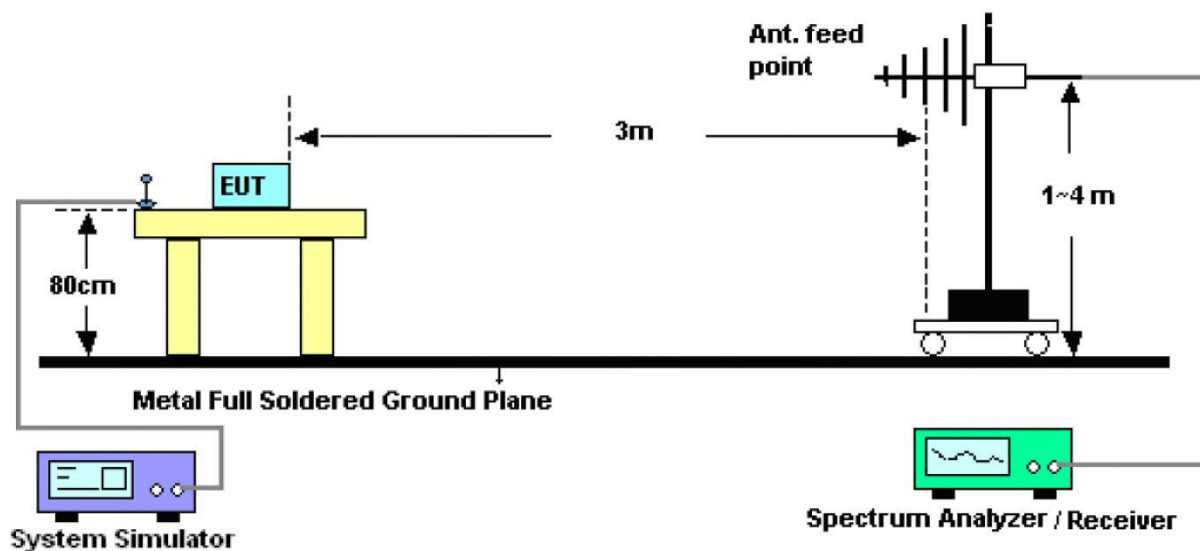
6.2 Test Setup

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

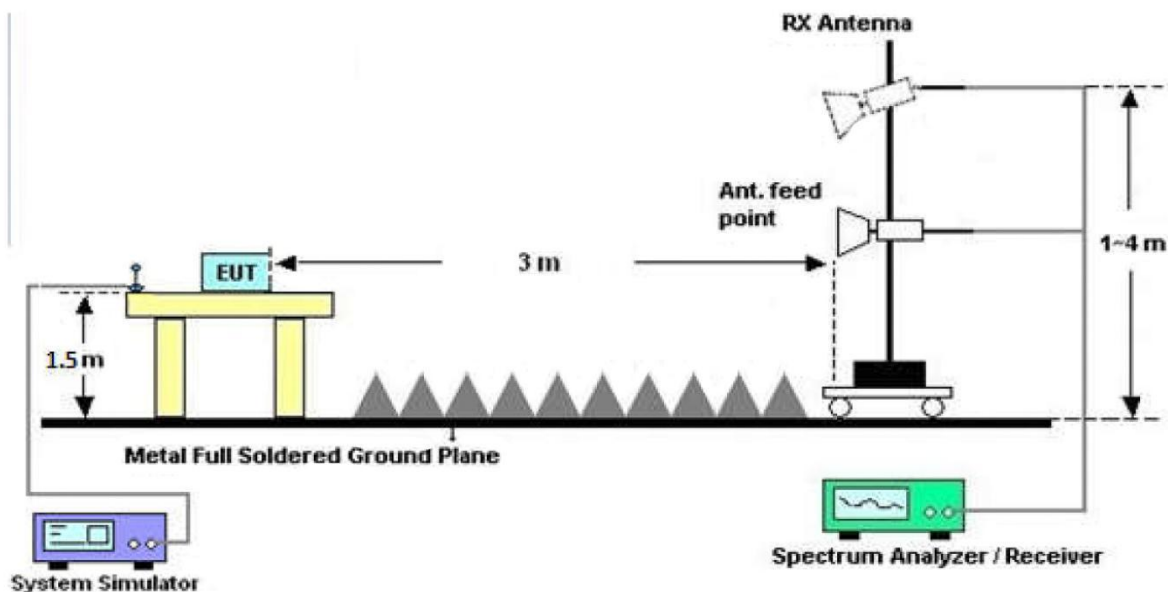
The test setup for emission measurement below 30MHz



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

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

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.

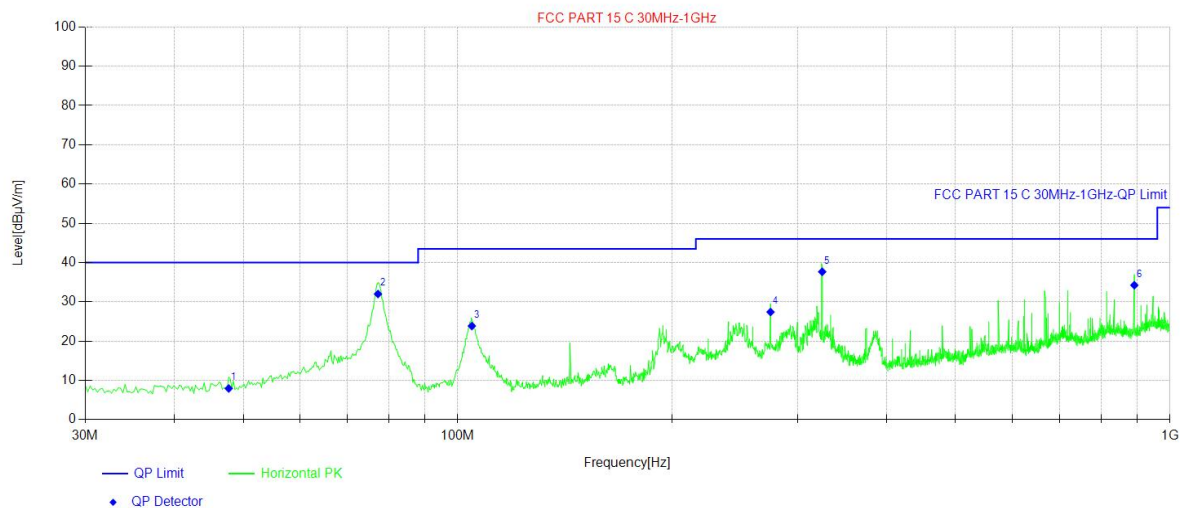
Test Frequency: 30MHz ~ 1GHz

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

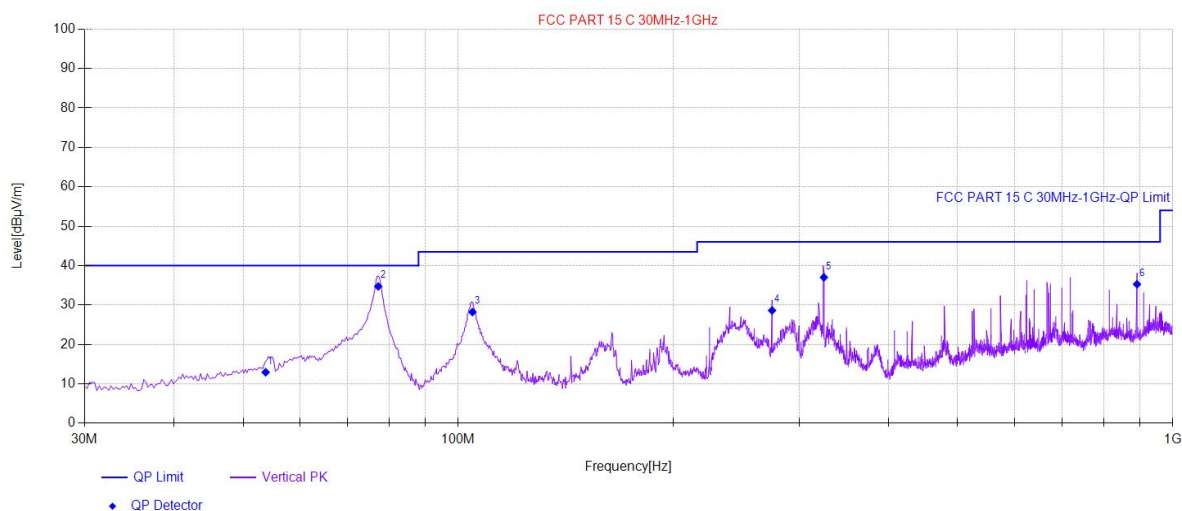


Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	47.70	25.61	-17.66	7.95	40.00	32.05	Horizontal
2	77.29	52.93	-20.93	32.00	40.00	8.00	Horizontal
3	104.69	42.85	-18.99	23.86	43.50	19.64	Horizontal
4	274.93	43.64	-16.22	27.42	46.00	18.58	Horizontal
5	324.88	52.39	-14.72	37.67	46.00	8.33	Horizontal
6	891.12	37.39	-3.15	34.24	46.00	11.76	Horizontal

Remark:Emission Level=Reading+Cable Loss+ANT Factor-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
1	53.77	30.79	-17.84	12.95	40.00	27.05	Vertical
2	77.29	55.65	-20.93	34.72	40.00	5.28	Vertical
3	104.69	47.22	-18.99	28.23	43.50	15.27	Vertical
4	274.93	44.84	-16.22	28.62	46.00	17.38	Vertical
5	324.88	51.74	-14.72	37.02	46.00	8.98	Vertical
6	891.12	38.42	-3.15	35.27	46.00	10.73	Vertical

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



Test Frequency: From 1GHz to 25GHz

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.
4824.00	40.73	32.29	4.10	28.45	48.67	74.00	-25.33	V
7236.00	34.50	35.99	6.22	27.83	48.88	74.00	-25.12	V
9648.00	32.91	38.11	7.83	25.10	53.75	74.00	-20.25	V
4824.00	39.33	32.29	4.10	28.45	47.27	74.00	-26.73	H
7236.00	34.21	35.99	6.22	27.83	48.59	74.00	-25.41	H
9648.00	32.48	38.11	7.83	25.10	53.32	74.00	-20.68	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.
4824.00	29.78	32.29	4.10	28.45	37.72	54.00	-16.28	V
7236.00	23.35	35.99	6.22	27.83	37.73	54.00	-16.27	V
9648.00	23.25	38.11	7.83	25.10	44.09	54.00	-9.91	V
4824.00	28.85	32.29	4.10	28.45	36.79	54.00	-17.21	H
7236.00	22.79	35.99	6.22	27.83	37.17	54.00	-16.83	H
9648.00	22.22	38.11	7.83	25.10	43.06	54.00	-10.94	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.
4874.00	39.71	32.35	4.12	28.44	47.74	74.00	-26.26	V
7311.00	34.52	36.08	6.30	27.74	49.16	74.00	-24.84	V
9748.00	33.90	38.25	7.91	24.65	55.41	74.00	-18.59	V
4874.00	40.14	32.35	4.12	28.44	48.17	74.00	-25.83	H
7311.00	33.13	36.08	6.30	27.74	47.77	74.00	-26.23	H
9748.00	33.77	38.25	7.91	24.65	55.28	74.00	-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.
4874.00	30.54	32.35	4.12	28.44	38.57	54.00	-15.43	V
7311.00	22.83	36.08	6.30	27.74	37.47	54.00	-16.53	V
9748.00	23.14	38.25	7.91	24.65	44.65	54.00	-9.35	V
4874.00	30.23	32.35	4.12	28.44	38.26	54.00	-15.74	H
7311.00	22.21	36.08	6.30	27.74	36.85	54.00	-17.15	H
9748.00	23.48	38.25	7.91	24.65	44.99	54.00	-9.01	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.
4924.00	45.51	32.41	4.14	28.42	53.64	74.00	-20.36	V
7386.00	35.36	36.15	6.36	27.68	50.19	74.00	-23.81	V
9848.00	37.31	38.35	7.97	24.33	59.30	74.00	-14.70	V
4924.00	44.72	32.41	4.14	28.42	52.85	74.00	-21.15	H
7386.00	34.21	36.15	6.36	27.68	49.04	74.00	-24.96	H
9848.00	33.46	38.35	7.97	24.33	55.45	74.00	-18.55	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.
4924.00	36.37	32.41	4.14	28.42	44.50	54.00	-9.50	V
7386.00	25.26	36.15	6.36	27.68	40.09	54.00	-13.91	V
9848.00	25.80	38.35	7.97	24.33	47.79	54.00	-6.21	V
4924.00	35.05	32.41	4.14	28.42	43.18	54.00	-10.82	H
7386.00	23.59	36.15	6.36	27.68	38.42	54.00	-15.58	H
9848.00	22.71	38.35	7.97	24.33	44.70	54.00	-9.30	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.

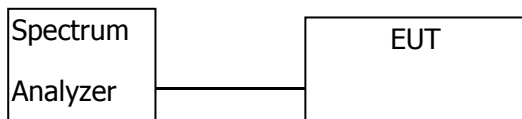


7 Conducted Spurious Emission

Test Requirement : FCC CFR47 Part 15 Section 15.247
 Test Method : ANSI C63.10:2013
 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

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
3. Set up:

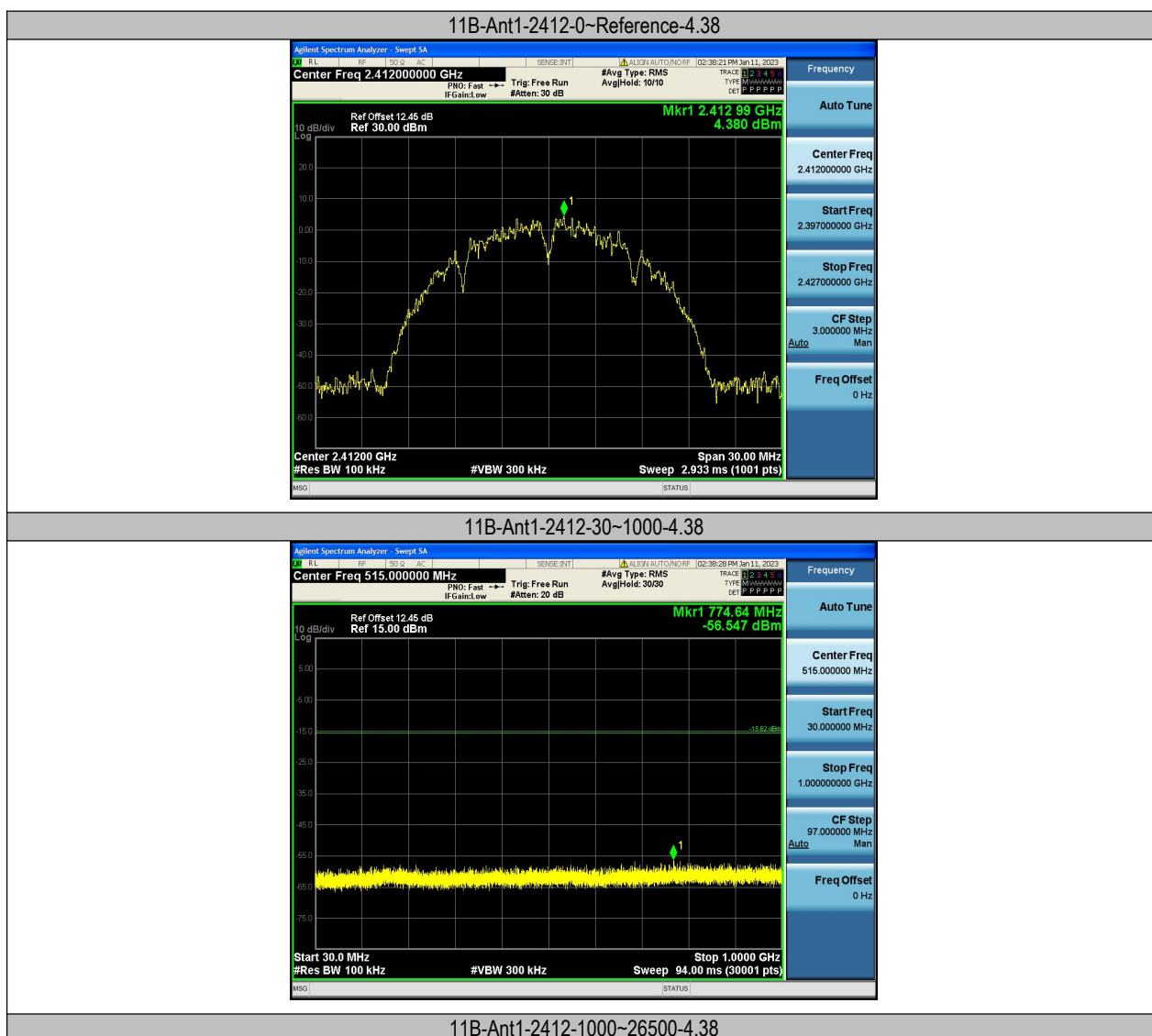


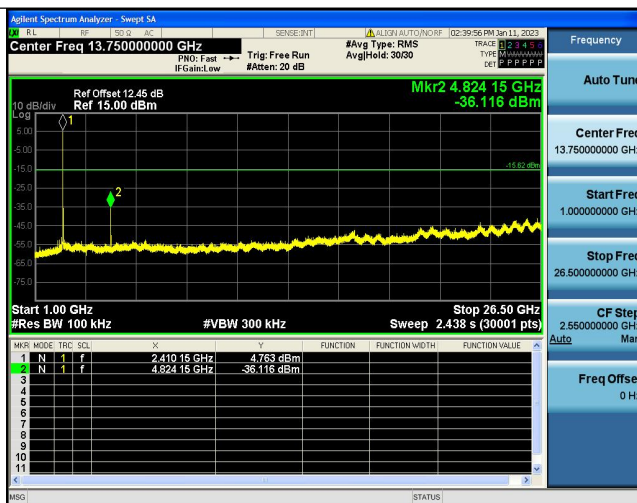
7.2 Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	0~Reference	4.38	4.38	---	PASS
11B	Ant1	2412	30~1000	4.38	-56.55	≤-15.62	PASS
11B	Ant1	2412	1000~26500	4.38	-36.12	≤-15.62	PASS
11B	Ant1	2437	0~Reference	3.37	3.37	---	PASS
11B	Ant1	2437	30~1000	3.37	-56.47	≤-16.63	PASS
11B	Ant1	2437	1000~26500	3.37	-37.3	≤-16.63	PASS
11B	Ant1	2462	0~Reference	3.97	3.97	---	PASS
11B	Ant1	2462	30~1000	3.97	-56.74	≤-16.03	PASS
11B	Ant1	2462	1000~26500	3.97	-35.4	≤-16.03	PASS
11G	Ant1	2412	0~Reference	0.26	0.26	---	PASS
11G	Ant1	2412	30~1000	0.26	-56.33	≤-19.74	PASS
11G	Ant1	2412	1000~26500	0.26	-41.41	≤-19.74	PASS
11G	Ant1	2437	0~Reference	-2.60	-2.60	---	PASS
11G	Ant1	2437	30~1000	-2.60	-56.79	≤-22.6	PASS
11G	Ant1	2437	1000~26500	-2.60	-42.03	≤-22.6	PASS
11G	Ant1	2462	0~Reference	-3.22	-3.22	---	PASS
11G	Ant1	2462	30~1000	-3.22	-55.8	≤-23.22	PASS
11G	Ant1	2462	1000~26500	-3.22	-41.01	≤-23.22	PASS



11N20SISO	Ant1	2412	0~Reference	-2.29	-2.29	---	PASS
11N20SISO	Ant1	2412	30~1000	-2.29	-57.01	≤ -22.29	PASS
11N20SISO	Ant1	2412	1000~26500	-2.29	-41.08	≤ -22.29	PASS
11N20SISO	Ant1	2437	0~Reference	-3.00	-3.00	---	PASS
11N20SISO	Ant1	2437	30~1000	-3.00	-54.66	≤ -23	PASS
11N20SISO	Ant1	2437	1000~26500	-3.00	-41.56	≤ -23	PASS
11N20SISO	Ant1	2462	0~Reference	-3.35	-3.35	---	PASS
11N20SISO	Ant1	2462	30~1000	-3.35	-56.82	≤ -23.35	PASS
11N20SISO	Ant1	2462	1000~26500	-3.35	-40.3	≤ -23.35	PASS

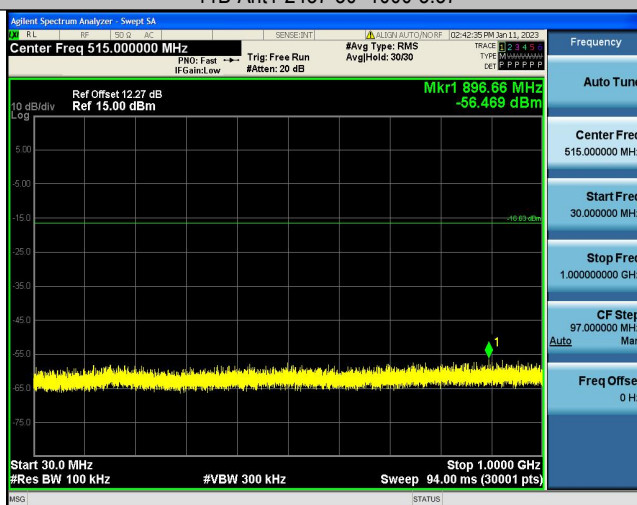




11B-Ant1-2437-0~Reference-3.37

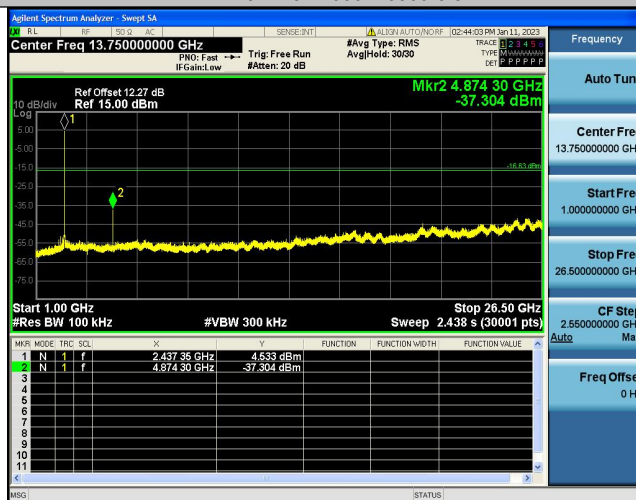


11B-Ant1-2437-30~1000-3.37





11B-Ant1-2437-1000~26500-3.37



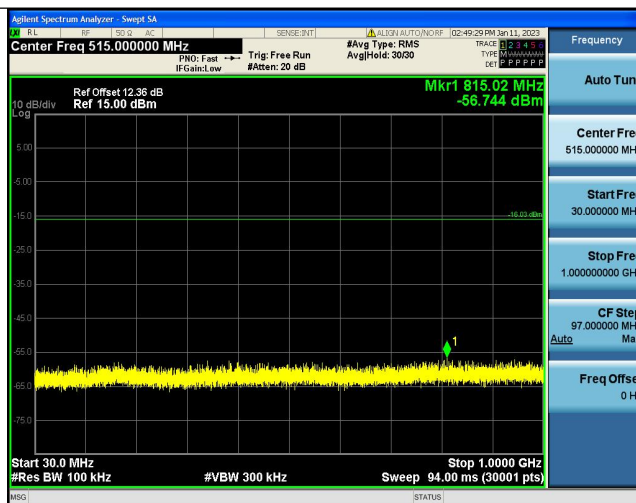
11B-Ant1-2462-0~Reference-3.97



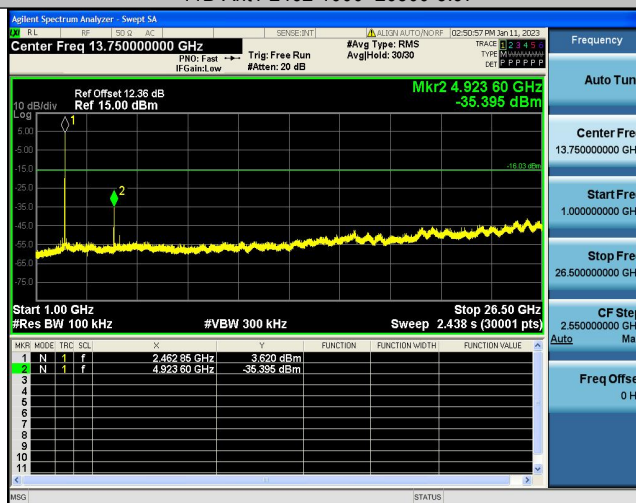
11B-Ant1-2462-30~1000-3.97



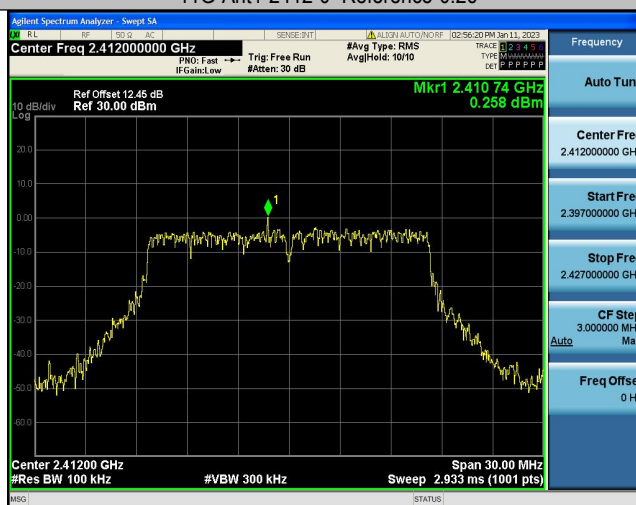
Report No.: PTC22110306504E-FC01



11B-Ant1-2462-1000~26500-3.97

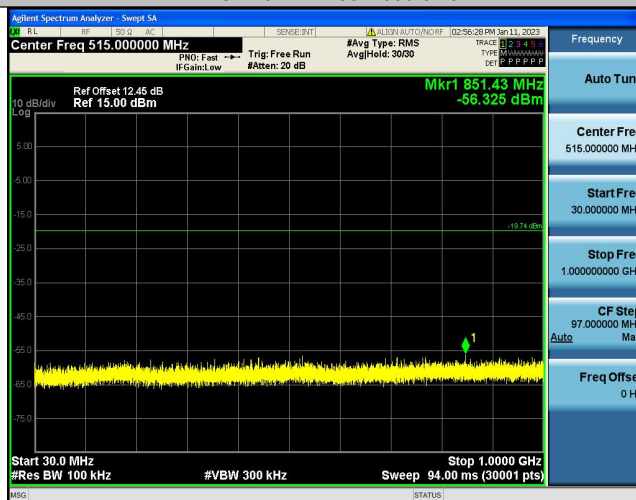


11G-Ant1-2412-0~Reference-0.26

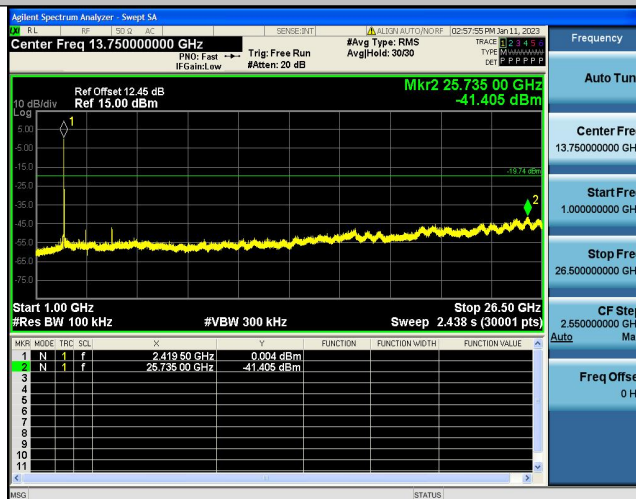




11G-Ant1-2412-30~1000-0.26



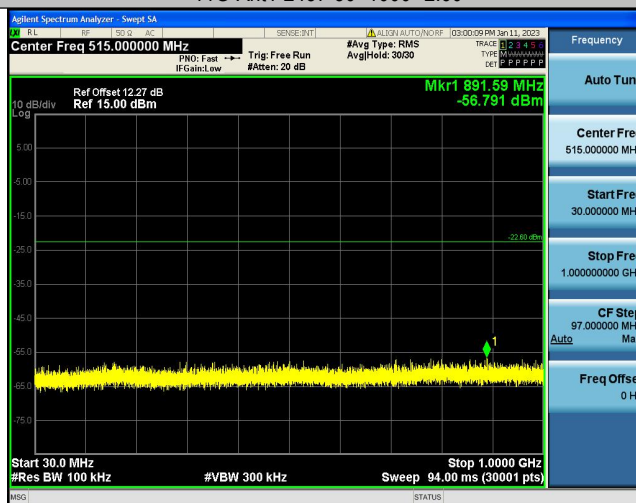
11G-Ant1-2412-1000~26500-0.26



11G-Ant1-2437-0~Reference--2.60



11G-Ant1-2437-30~1000~2.60



11G-Ant1-2437-1000~26500~2.60

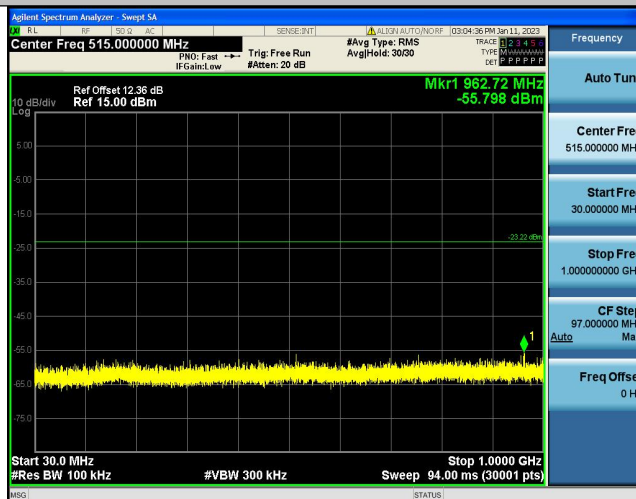




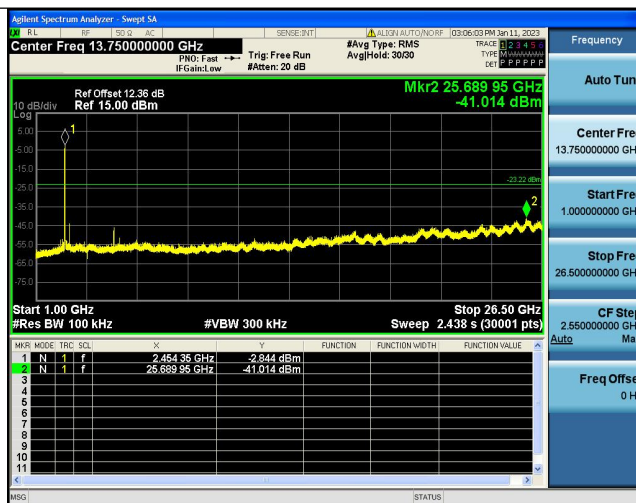
11G-Ant1-2462-0~Reference--3.22



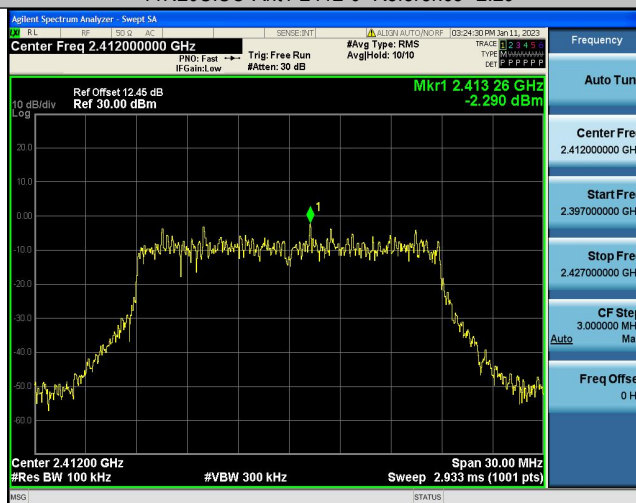
11G-Ant1-2462-30~1000--3.22



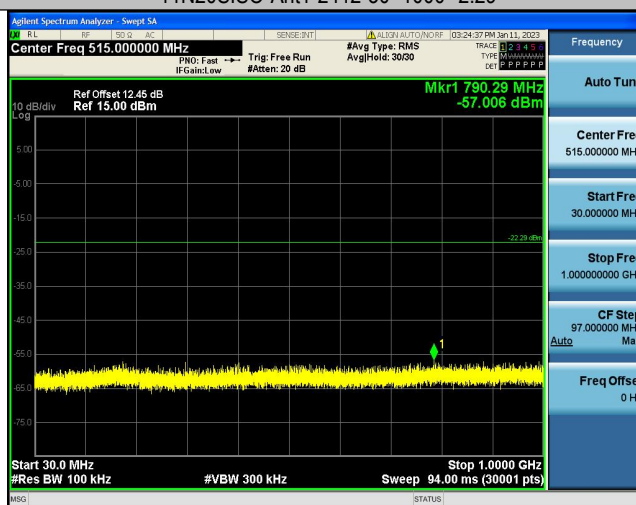
11G-Ant1-2462-1000~26500--3.22



11N20SISO-Ant1-2412-0~Reference-2.29

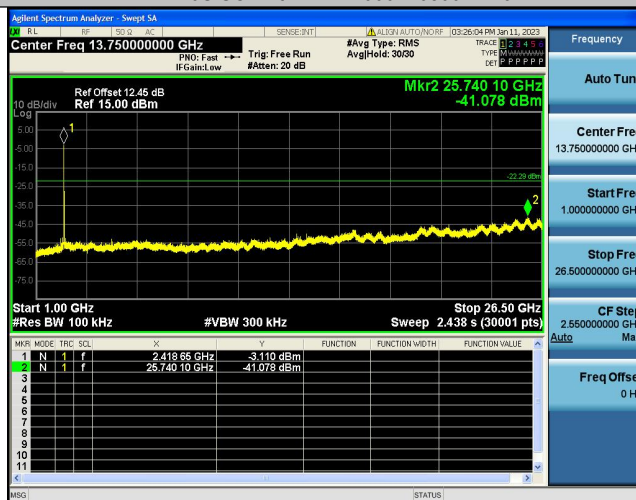


11N20SISO-Ant1-2412-30~1000-2.29

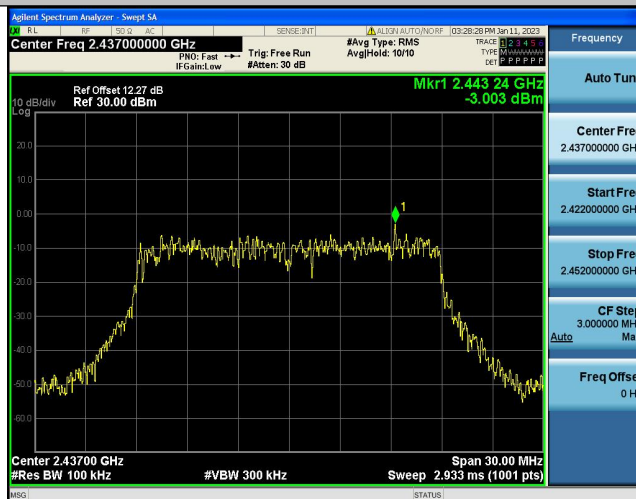




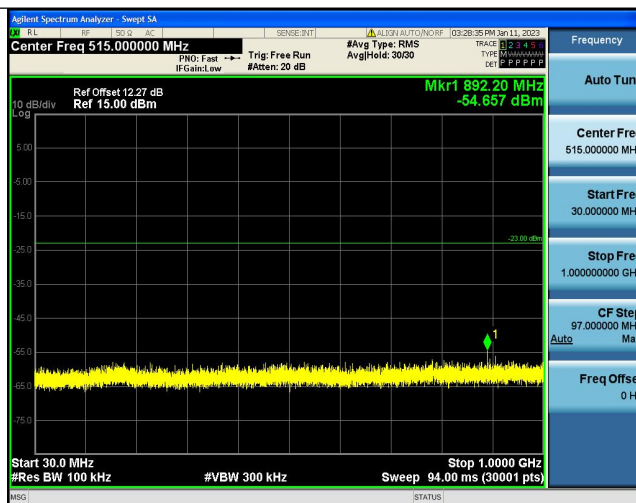
11N20SISO-Ant1-2412-1000~26500--2.29



11N20SISO-Ant1-2437-0~Reference--3.00



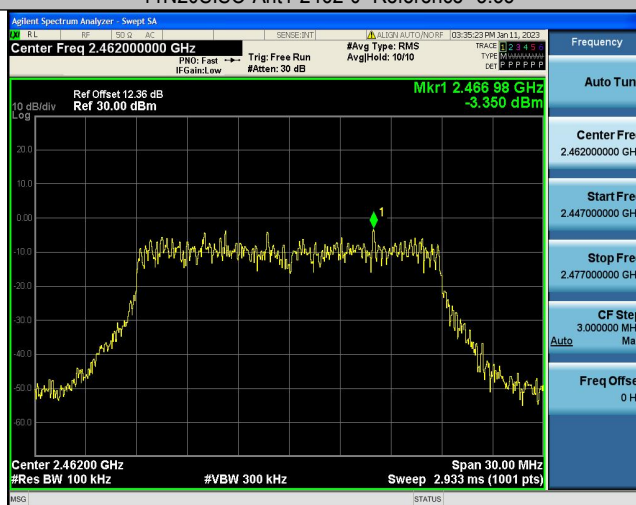
11N20SISO-Ant1-2437-30~1000--3.00



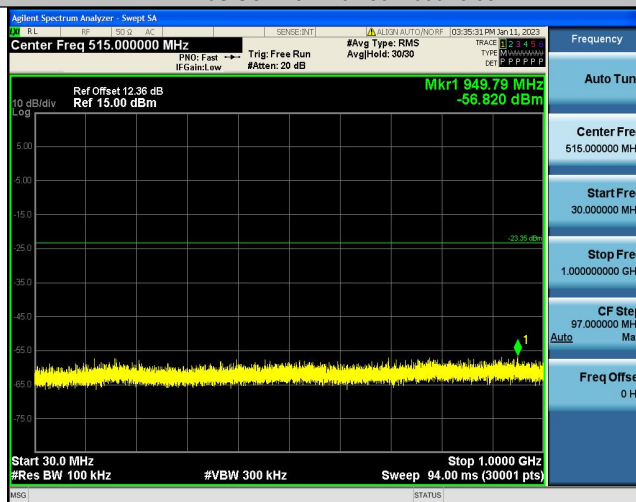
11N20SISO-Ant1-2437-1000~26500~3.00



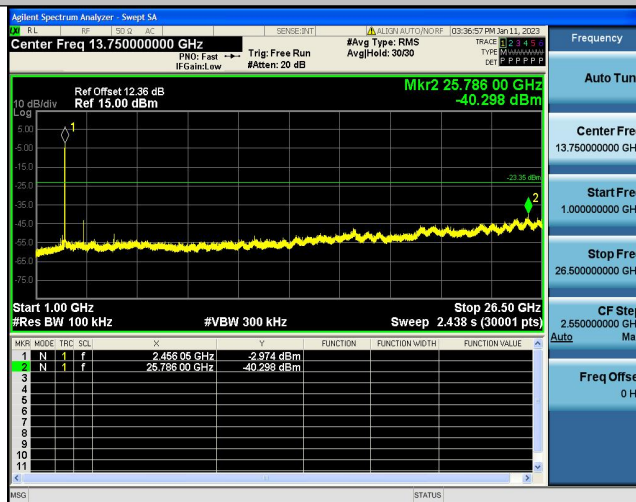
11N20SISO-Ant1-2462-0~Reference--3.35



11N20SISO-Ant1-2462-30~1000--3.35



11N20SISO-Ant1-2462-1000~26500--3.35



Emissions in Restricted Bands

TestMod e	Antenn a	ChNam e	Frequen cy[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	Peak	2390.000	-34.86	≤-21.20	60.34	≤74	PASS
11B	Ant1	Low	2412	Peak	2310.000	-35.1	≤-21.20	60.10	≤74	PASS
11B	Ant1	Low	2412	Peak	2389.180	-33.04	≤-21.20	62.16	≤74	PASS
11B	Ant1	Low	2412	AV	2390.000	-43.46	≤-41.20	51.74	≤54	PASS
11B	Ant1	Low	2412	AV	2310.000	-43.93	≤-41.20	51.27	≤54	PASS
11B	Ant1	Low	2412	AV	2352.130	-43.07	≤-41.20	52.13	≤54	PASS
11B	Ant1	High	2462	Peak	2483.500	-38.86	≤-21.20	56.34	≤74	PASS



11B	Ant1	High	2462	Peak	2500.000	-36.17	≤-21.20	59.03	≤74	PASS
11B	Ant1	High	2462	Peak	2490.600	-34.78	≤-21.20	60.42	≤74	PASS
11B	Ant1	High	2462	AV	2483.500	-43.19	≤-41.20	52.01	≤54	PASS
11B	Ant1	High	2462	AV	2500.000	-43.4	≤-41.20	51.80	≤54	PASS
11B	Ant1	High	2462	AV	2486.200	-43.18	≤-41.20	52.02	≤54	PASS
11G	Ant1	Low	2412	Peak	2390.000	-39.07	≤-21.20	56.13	≤74	PASS
11G	Ant1	Low	2412	Peak	2310.000	-40.18	≤-21.20	55.02	≤74	PASS
11G	Ant1	Low	2412	Peak	2341.860	-34.96	≤-21.20	60.24	≤74	PASS
11G	Ant1	Low	2412	AV	2390.000	-42.67	≤-41.20	52.53	≤54	PASS
11G	Ant1	Low	2412	AV	2310.000	-43.55	≤-41.20	51.65	≤54	PASS
11G	Ant1	Low	2412	AV	2352.000	-42.57	≤-41.20	52.63	≤54	PASS
11G	Ant1	High	2462	Peak	2483.500	-36.91	≤-21.20	58.29	≤74	PASS
11G	Ant1	High	2462	Peak	2500.000	-38.45	≤-21.20	56.75	≤74	PASS
11G	Ant1	High	2462	Peak	2490.270	-34.1	≤-21.20	61.10	≤74	PASS
11G	Ant1	High	2462	AV	2483.500	-41.88	≤-41.20	53.32	≤54	PASS
11G	Ant1	High	2462	AV	2500.000	-42.96	≤-41.20	52.24	≤54	PASS
11G	Ant1	High	2462	AV	2483.560	-41.84	≤-41.20	53.36	≤54	PASS
11N20SIS O	Ant1	Low	2412	Peak	2390.000	-35.61	≤-21.20	59.59	≤74	PASS
11N20SIS O	Ant1	Low	2412	Peak	2310.000	-40.07	≤-21.20	55.13	≤74	PASS
11N20SIS O	Ant1	Low	2412	Peak	2339.650	-34.53	≤-21.20	60.67	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2390.000	-42.19	≤-41.20	53.01	≤54	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-42.55	≤-41.20	52.65	≤54	PASS
11N20SIS O	Ant1	Low	2412	AV	2352.260	-41.74	≤-41.20	53.46	≤54	PASS
11N20SIS O	Ant1	High	2462	Peak	2483.500	-36.97	≤-21.20	58.23	≤74	PASS
11N20SIS O	Ant1	High	2462	Peak	2500.000	-36.57	≤-21.20	58.63	≤74	PASS
11N20SIS O	Ant1	High	2462	Peak	2489.940	-34.55	≤-21.20	60.65	≤74	PASS
11N20SIS O	Ant1	High	2462	AV	2483.500	-41.87	≤-41.20	53.33	≤54	PASS
11N20SIS O	Ant1	High	2462	AV	2500.000	-42.22	≤-41.20	52.98	≤54	PASS
11N20SIS O	Ant1	High	2462	AV	2483.670	-41.69	≤-41.20	53.51	≤54	PASS

Note:

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

11B-Ant1-Low-2412-Peak-2390.000