

8. OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

8.1 APPLIED PROCEDURES/LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULT

Temperature :	26°C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC48V

Condition NVNT	Modulation	Frequency (MHz)	Conducted Power(dBm)		limit(dBm)	Result
			ANT1	ANT2		
NVNT	802.11b	2412.00	14.25	15.09	30	Pass
NVNT	802.11b	2437.00	14.13	15.04	30	Pass
NVNT	802.11b	2462.00	13.88	14.89	30	Pass
NVNT	802.11g	2412.00	16.49	16.21	30	Pass
NVNT	802.11g	2437.00	16.35	16.24	30	Pass
NVNT	802.11g	2462.00	16.14	15.98	30	Pass
NVNT	802.11n(HT20)	2412.00	16.06	16.22	30	Pass
NVNT	802.11n(HT20)	2437.00	15.88	16.32	30	Pass
NVNT	802.11n(HT20)	2462.00	16.15	15.95	30	Pass
NVNT	802.11n(HT40)	2422.00	14.01	15.17	30	Pass
NVNT	802.11n(HT40)	2437.00	14.60	15.52	30	Pass
NVNT	802.11n(HT40)	2452.00	13.21	15.77	30	Pass

Condition NVNT	Modulation	Frequency (MHz)	Conducted Power(dBm)	limit(dBm)	Result
			MIMO		
NVNT	802.11n(HT20)	2412.00	19.15	22.84	Pass
NVNT	802.11n(HT20)	2437.00	19.12	22.84	Pass
NVNT	802.11n(HT20)	2462.00	19.06	22.84	Pass
NVNT	802.11n(HT40)	2422.00	17.64	22.84	Pass
NVNT	802.11n(HT40)	2437.00	18.09	22.84	Pass
NVNT	802.11n(HT40)	2452.00	17.69	22.84	Pass

Note:

1. For MIMO with CCD technology device, The Directional Gain= Gain of individual transmit antennas (dBi) + Array gain;

Array gain = $10 \log(N_{\text{ant}})$, where N_{ant} is the number of transmit antennas.

So MIMO=30-(13.16-6)=30-7.16=22.84 dBm

9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

9.1 APPLICABLE STANDARD

in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

9.2 TEST PROCEDURE

Using the following spectrum analyzer setting:

- A) Set the RBW = 100KHz.
- B) Set the VBW = 300KHz.
- C) Sweep time = auto couple.
- D) Detector function = peak.
- E) Trace mode = max hold.
- F) Allow trace to fully stabilize.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

Test plot as follows:

ANT1

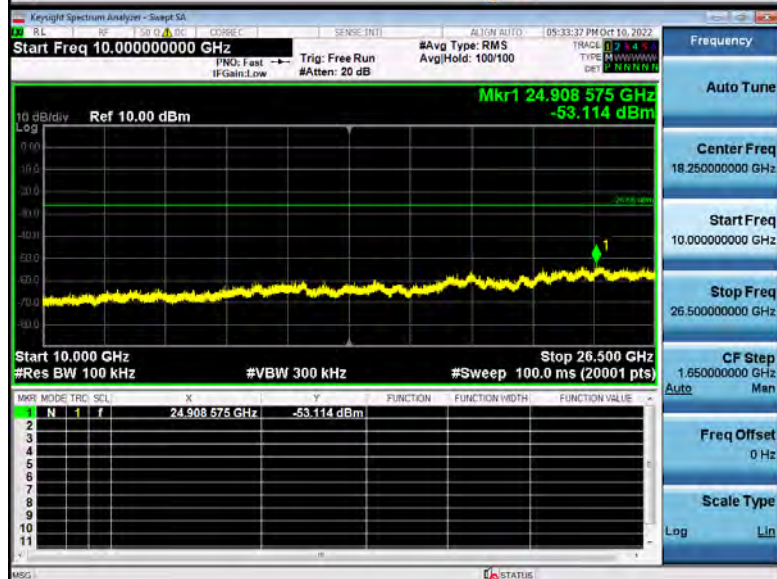
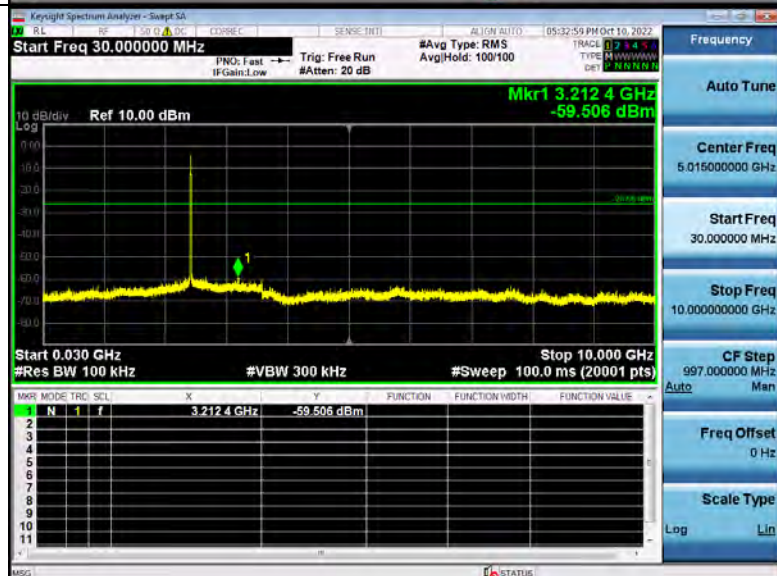
802.11b Modulation

Spurious emission

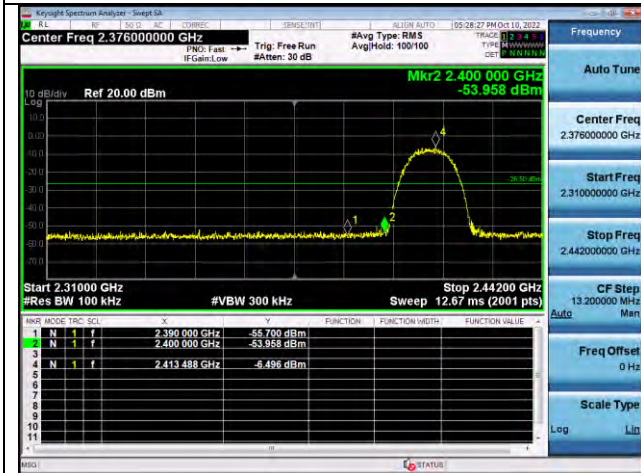
Low Channel



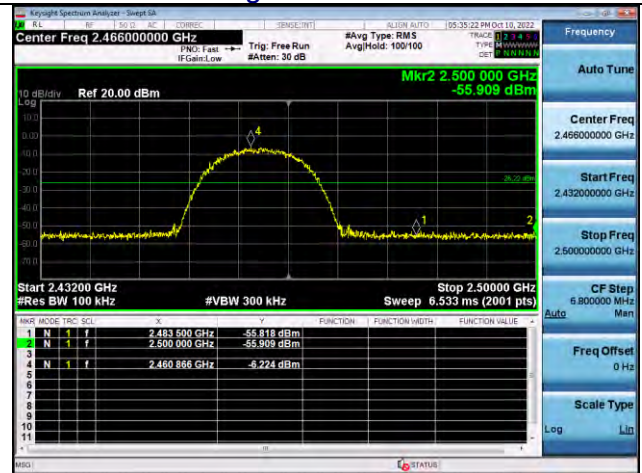
Middle Channel



Lowest Channel



Highest Channel



Left Band Edge

Right Band Edge

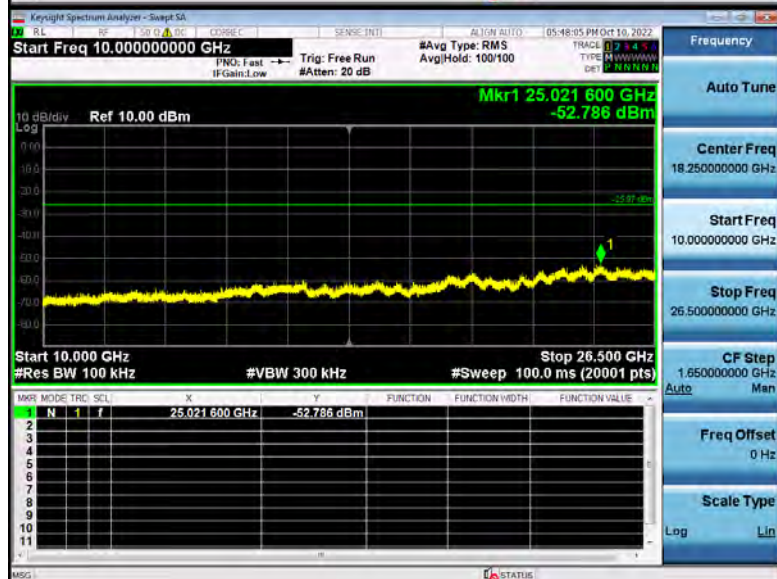
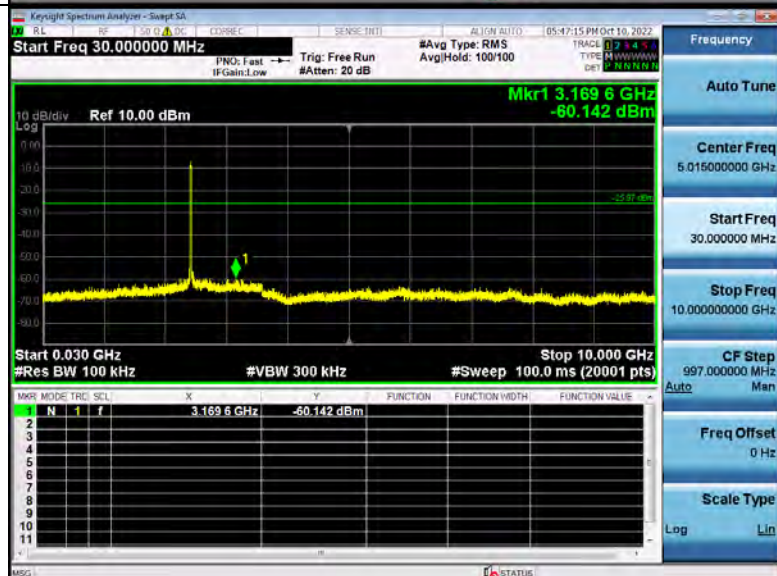
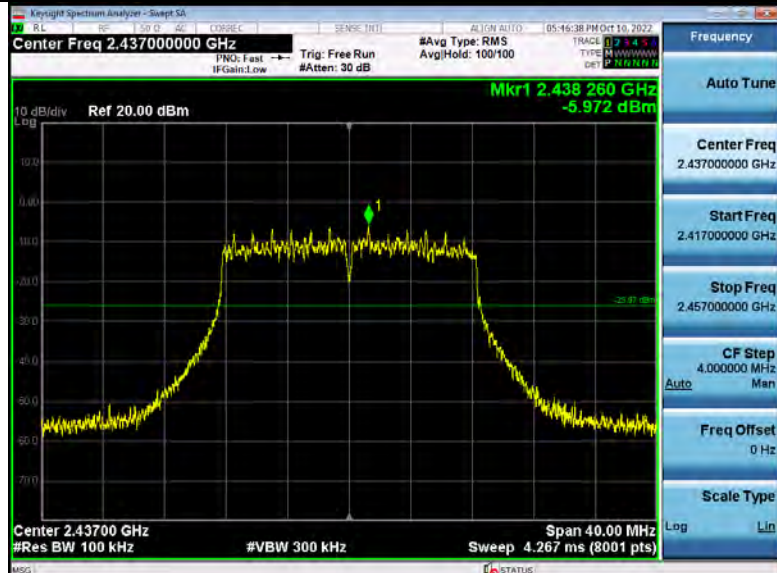
802.11g Modulation

Spurious emission

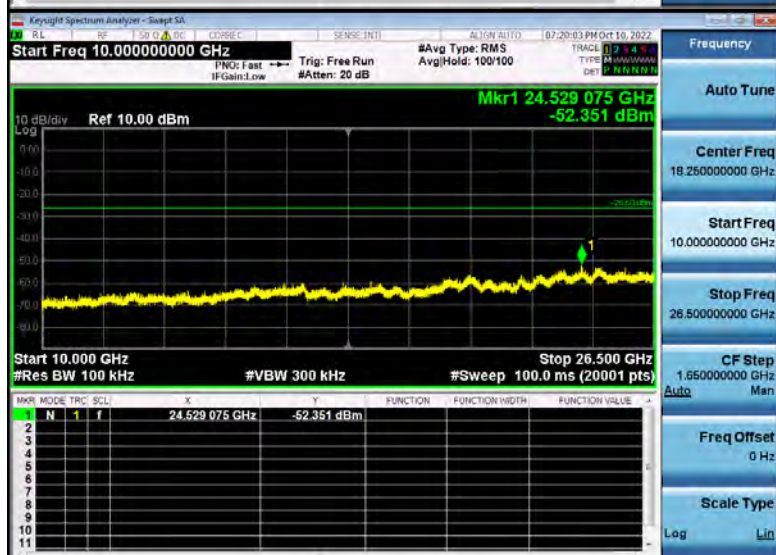
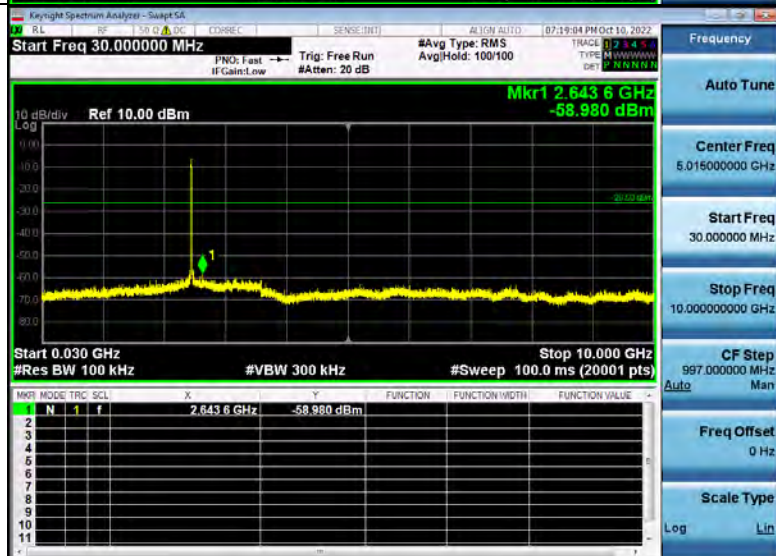
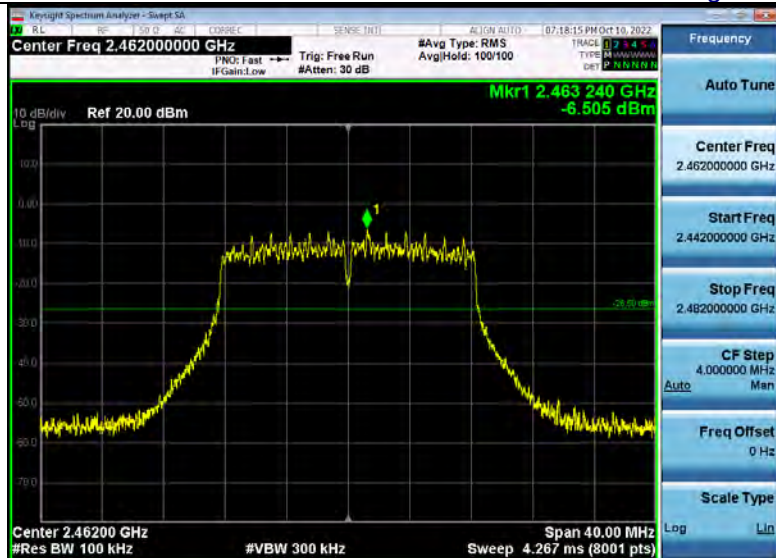
Low Channel



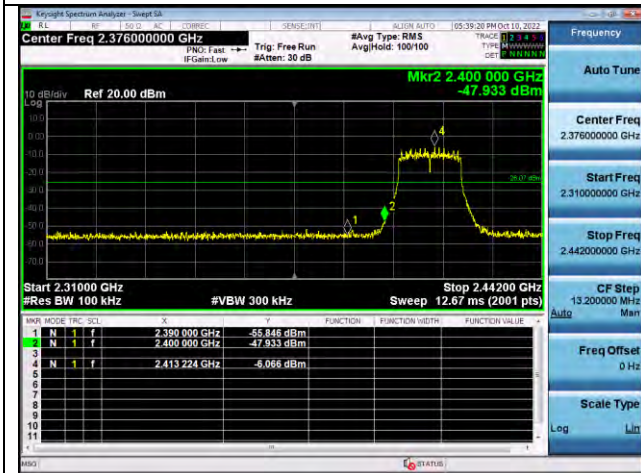
Middle Channel



High Channel

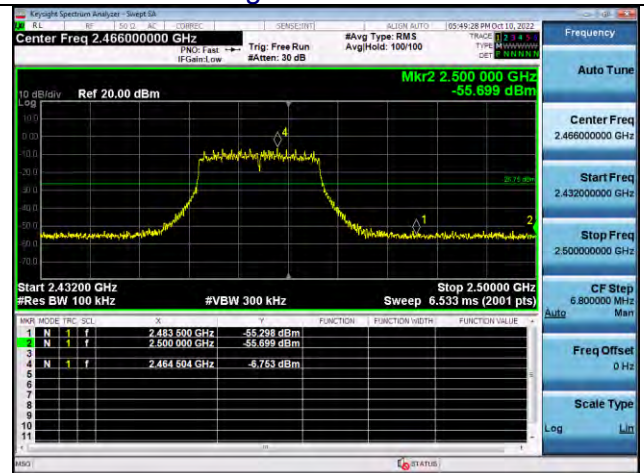


Lowest Channel



Left Band Edge

Highest Channel

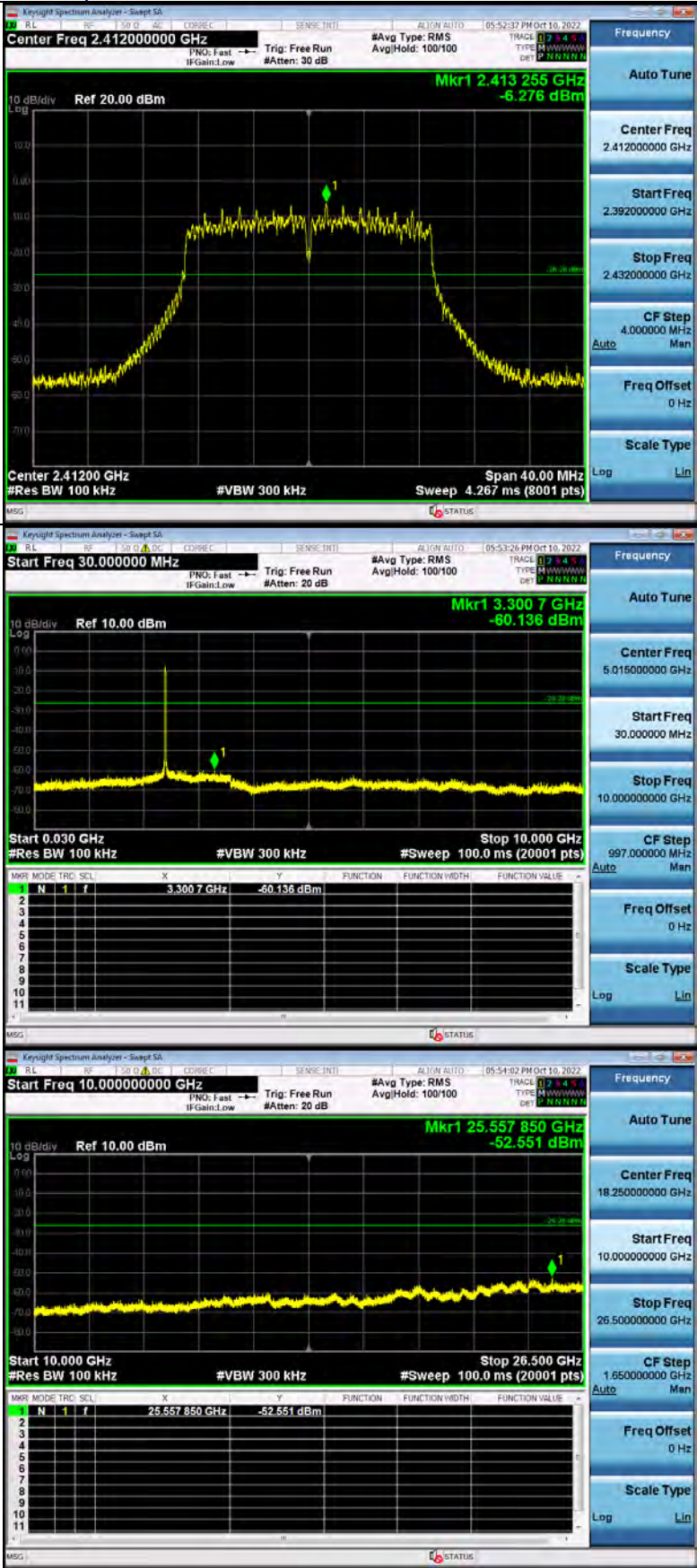


Right Band Edge

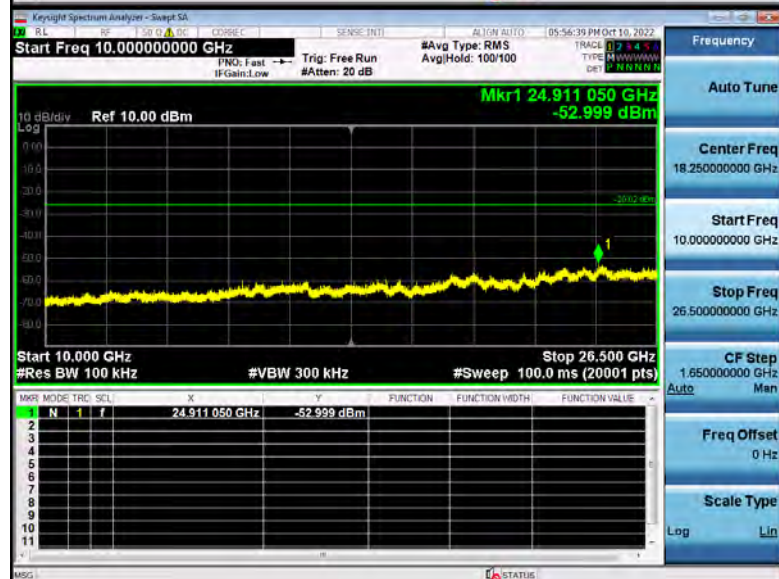
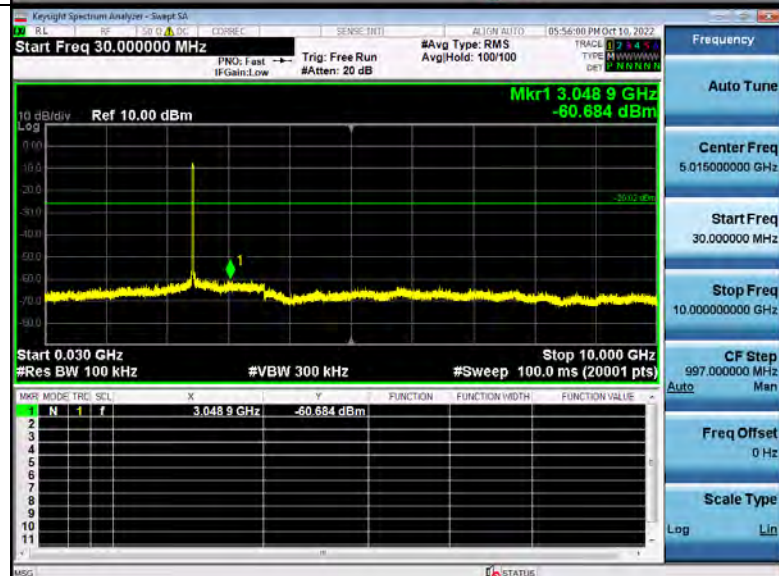
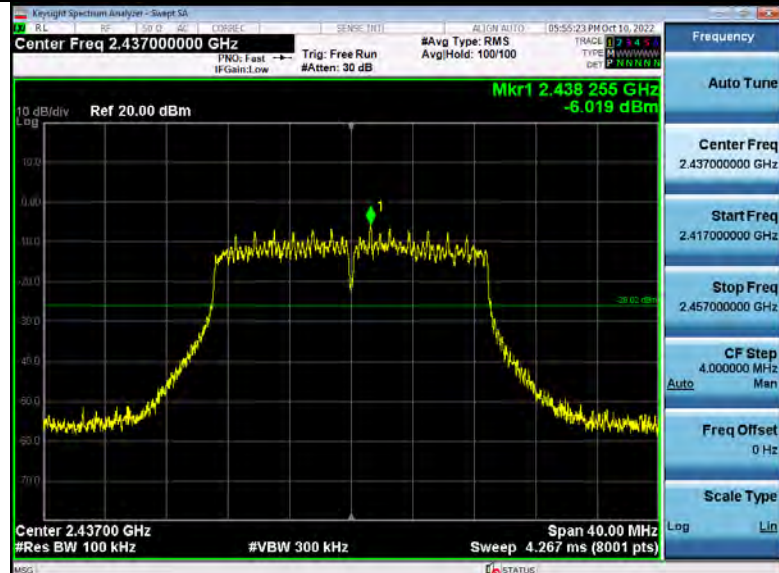
802.11n20 Modulation

Spurious emission

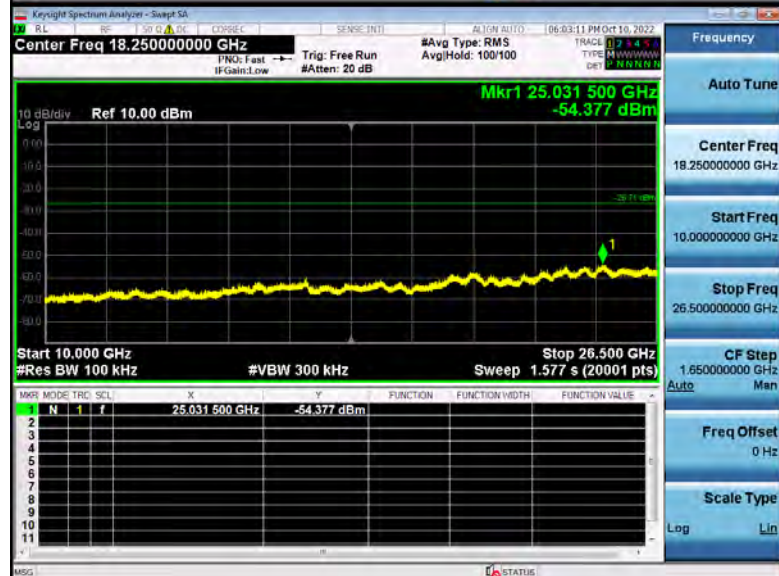
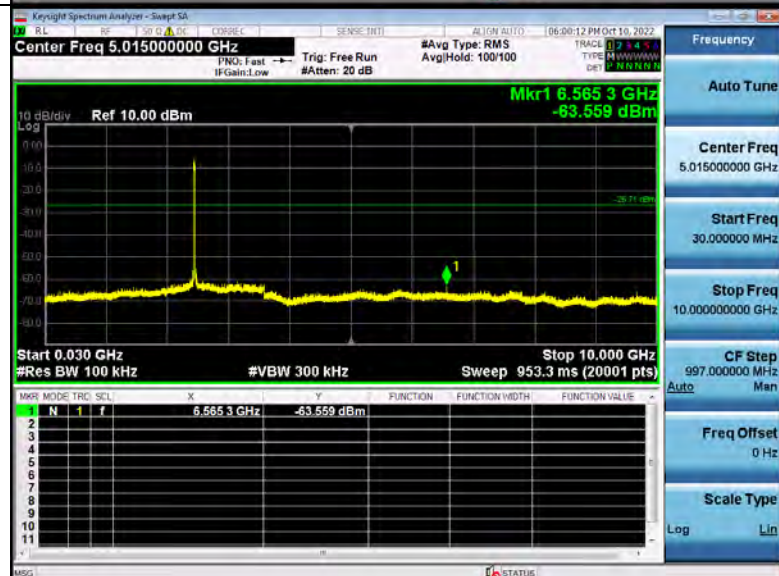
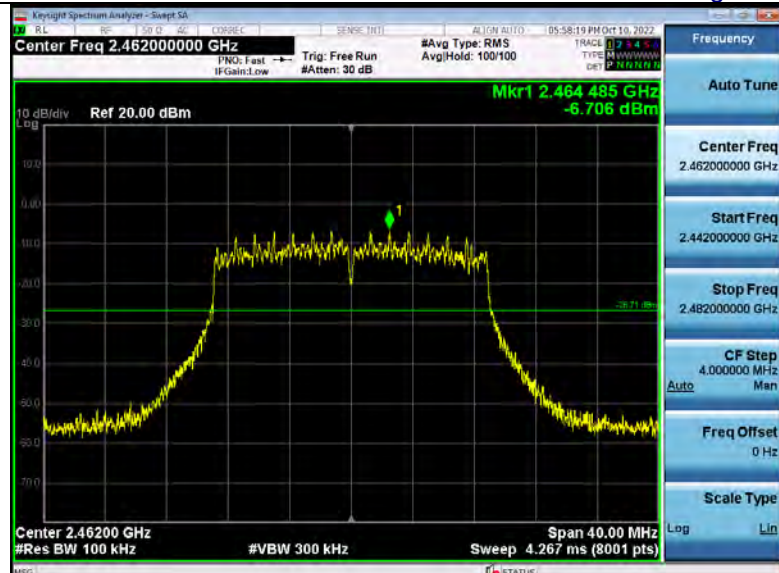
Low Channel



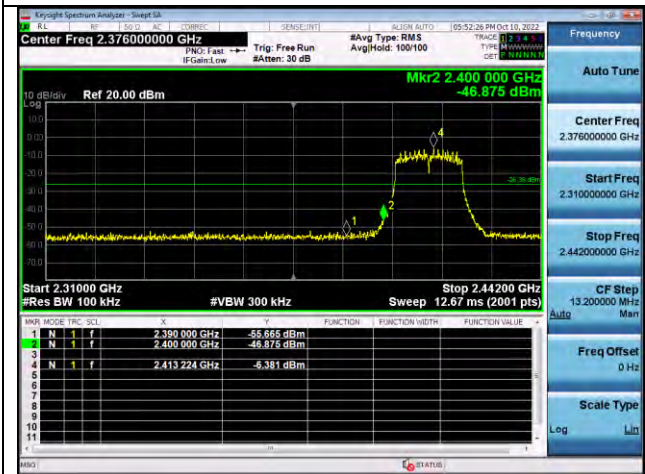
Middle Channel



High Channel

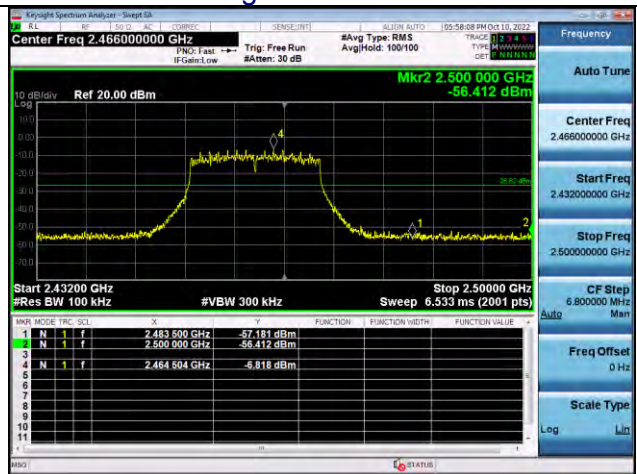


Lowest Channel



Left Band Edge

Highest Channel

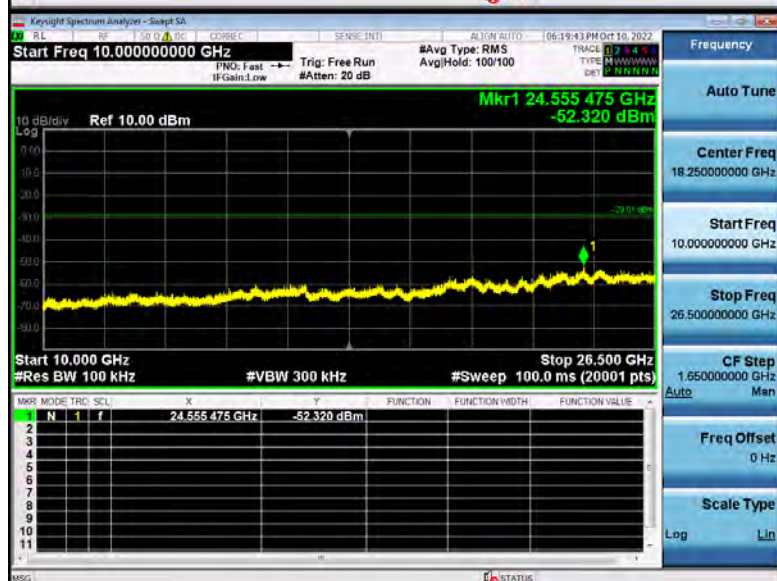
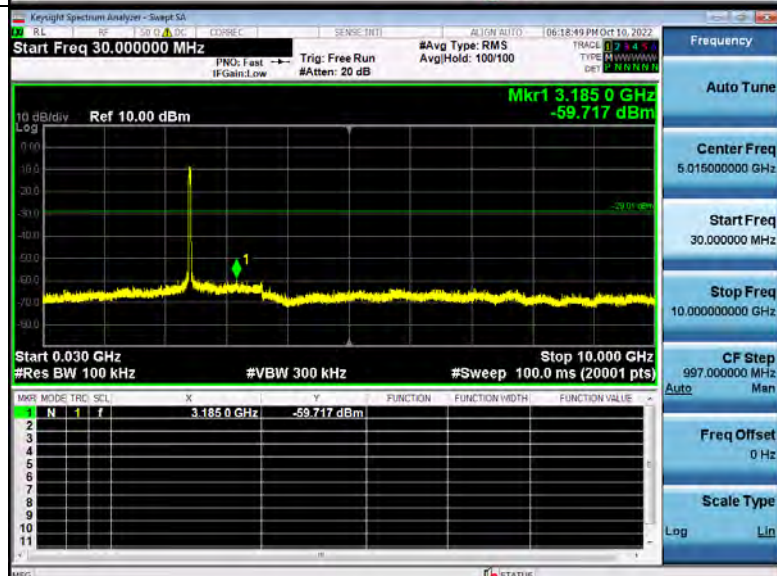
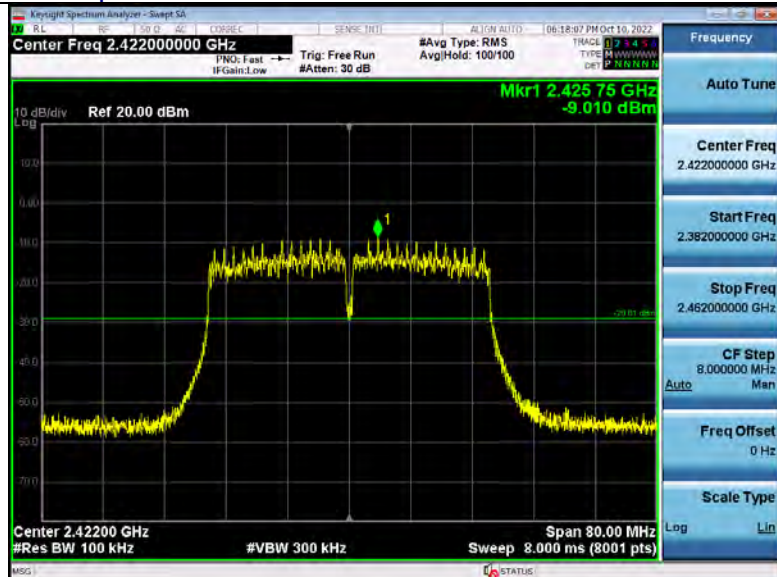


Right Band Edge

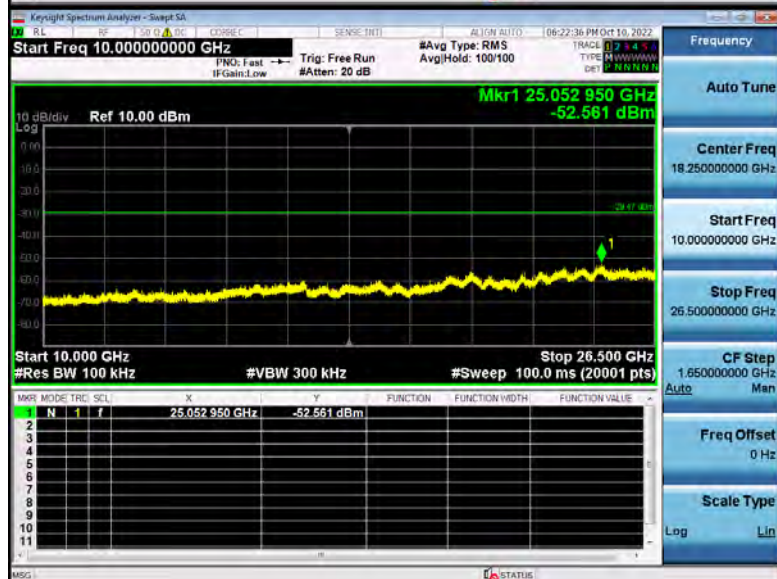
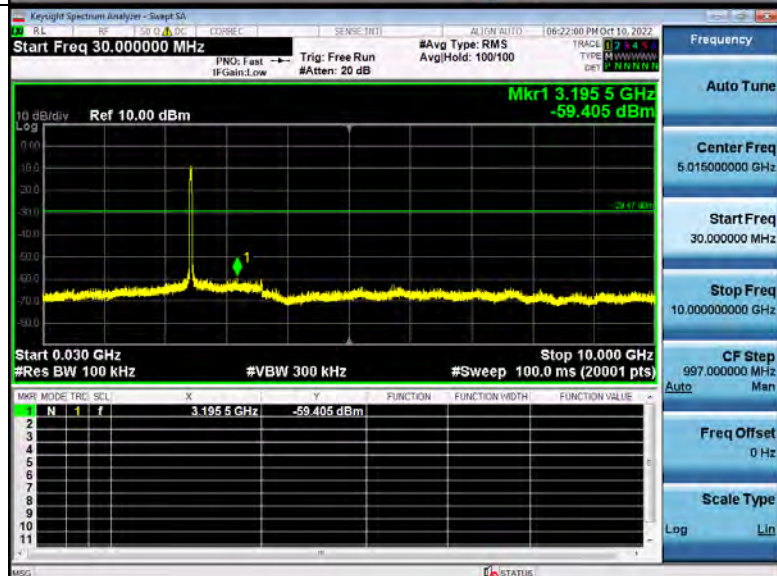
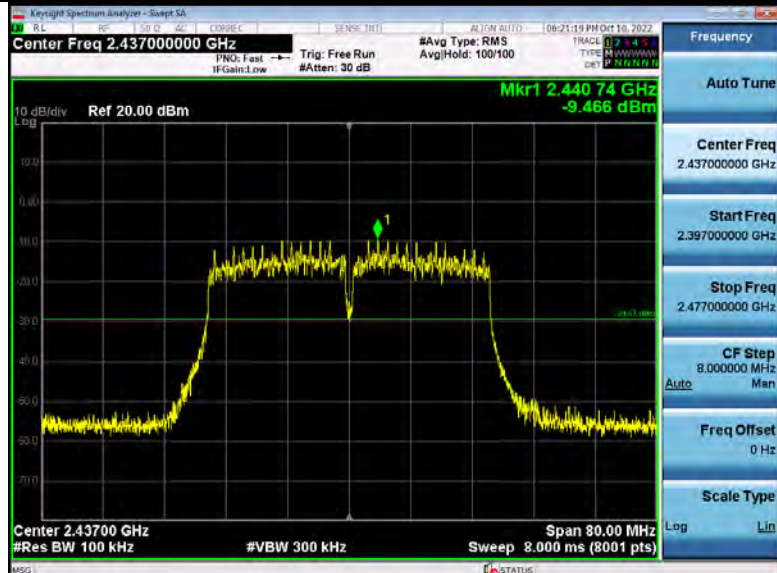
802.11n40 Modulation

Spurious emission

Low Channel



Middle Channel



Keysight Spectrum Analyzer - Sweep SA

RF 1.50 GHz CORREC SERVIC INT ALON AUTO 06:21:18 PM Oct 10, 2022

Center Freq 2.45200000 GHz #Avg Type: RMS #Res BW 100 kHz

TRAC 1 7 1 4 5 TYPE M W W W W W DEF 2 1 5 1 5 1 5 1 5

PN0: Fast Trig: Free Run IF Gain: Low #Atten: 30 dB

10 dB/div Ref 20.00 dBm

Mkr1 2.455 73 GHz -10.030 dBm

Center Freq 2.45200000 GHz

Start Freq 2.41200000 GHz

Stop Freq 2.49200000 GHz

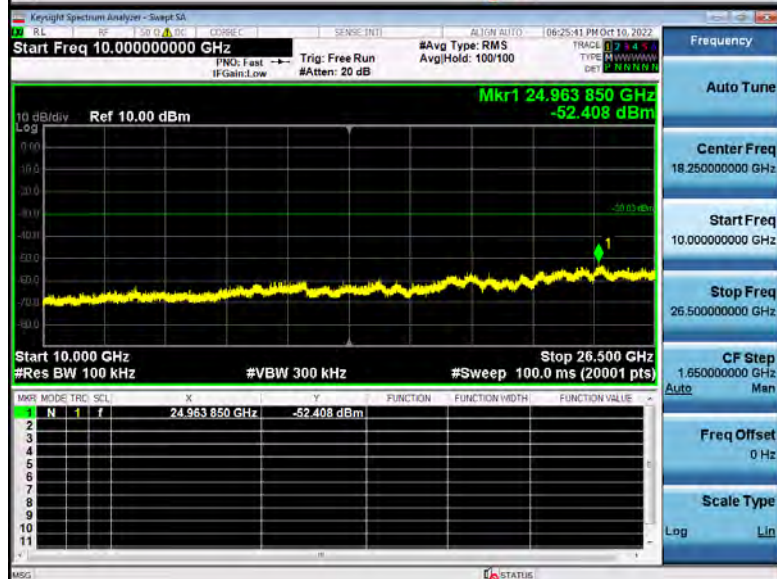
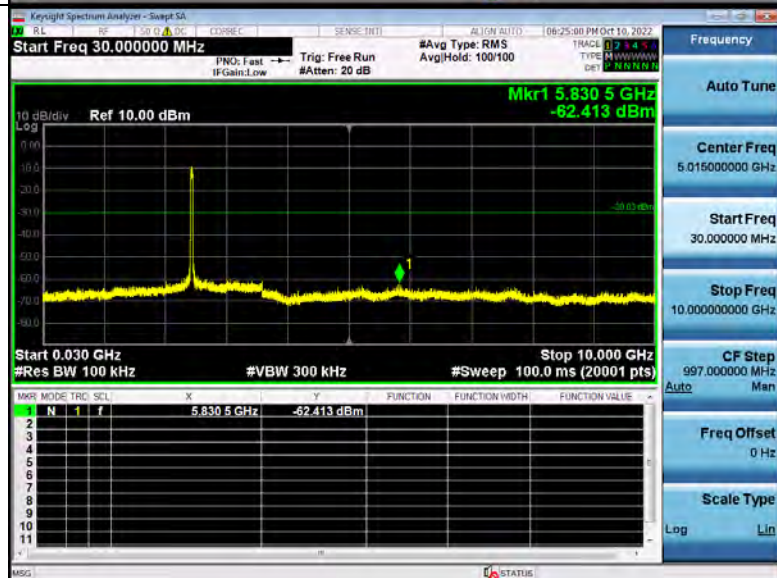
CF Step 8.000000 MHz

Freq Offset 0 Hz

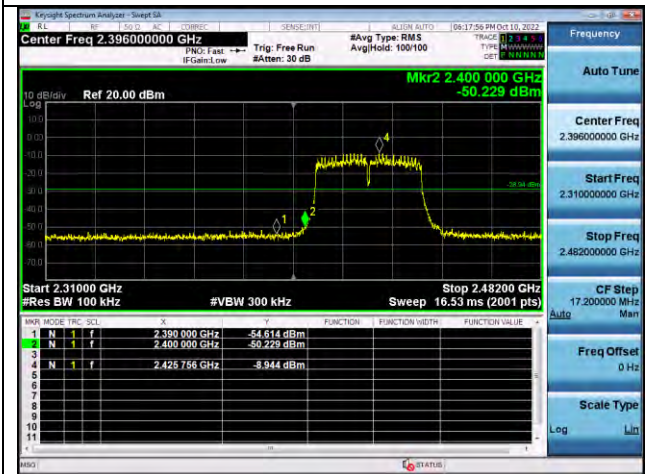
Scale Type Log

Span 80.00 MHz

Sweep 8.000 ms (8001 pts)

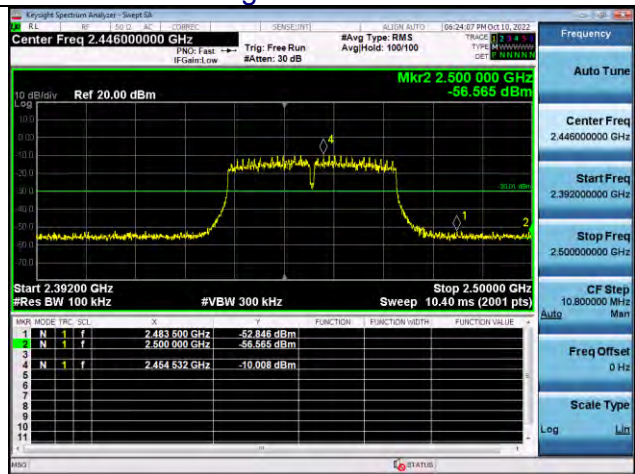


Lowest Channel



Left Band Edge

Highest Channel



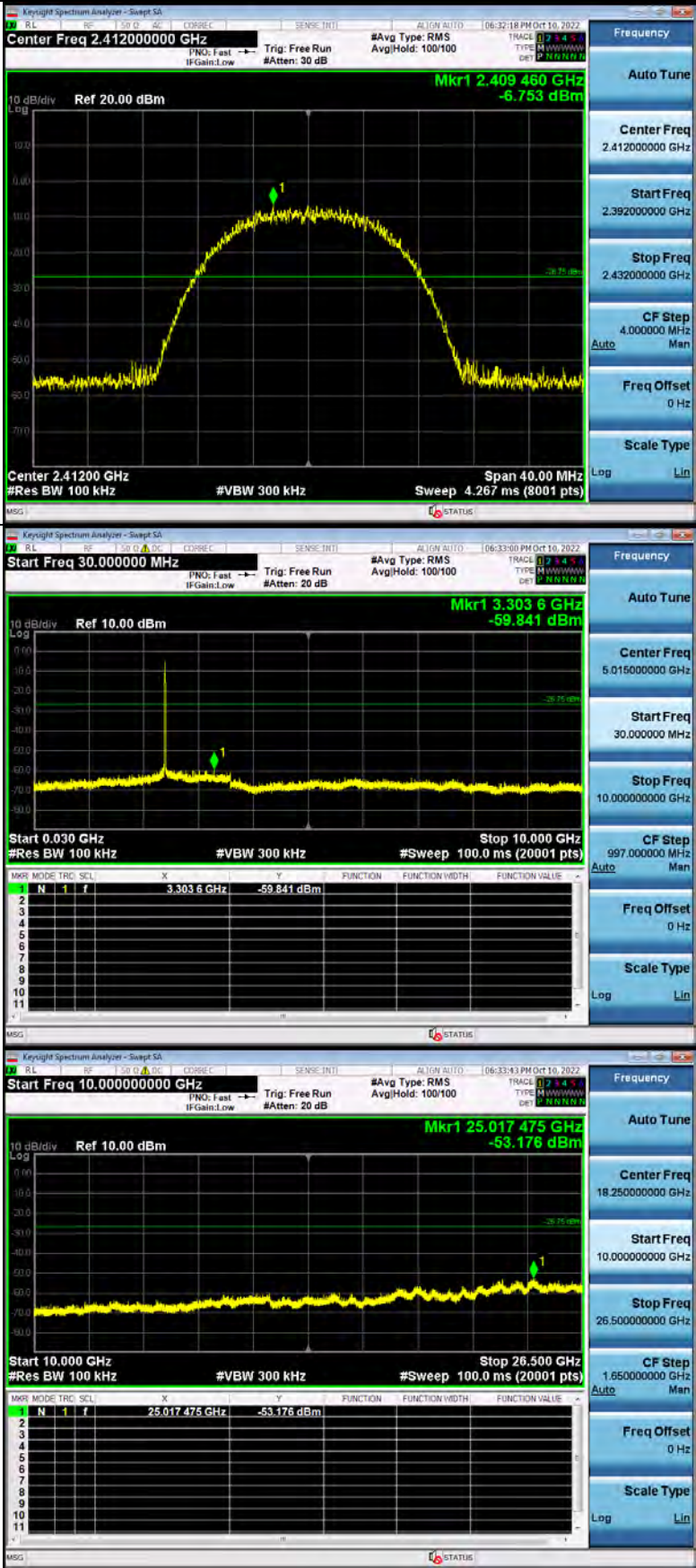
Right Band Edge

ANT2

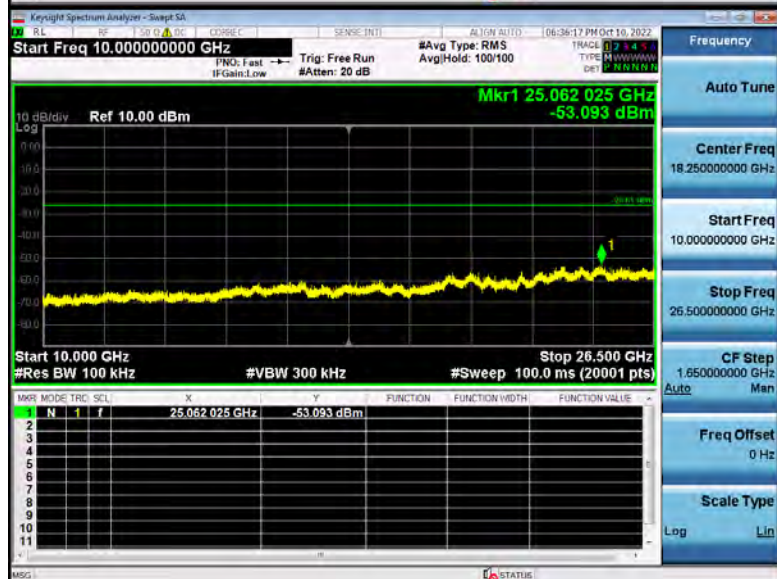
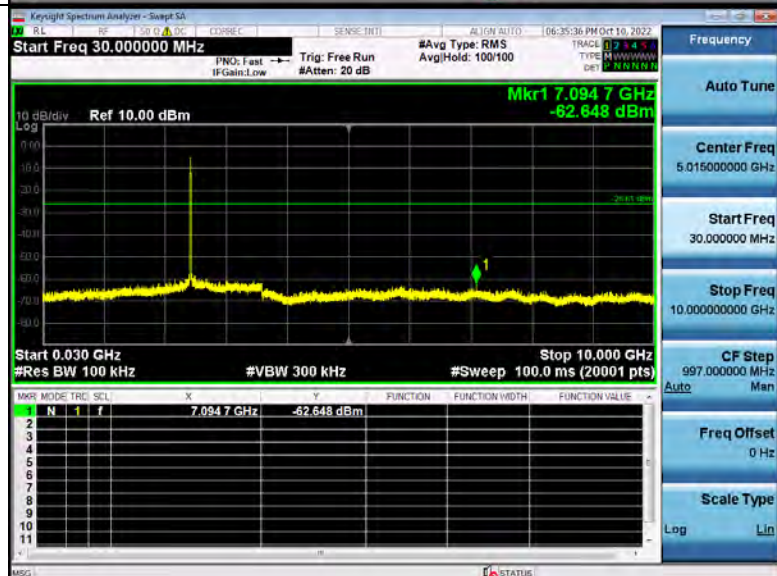
802.11b Modulation

Spurious emission

Low Channel



Middle Channel



Keysight Spectrum Analyzer - Sweep 5A

ALN AUTO 06:37:37 PM Oct 10, 2022

Center Freq 2.46200000 GHz

#Avg Type: RMS Avg/Hold: 100/100

TRAC1 1 1 4 1 1
TYPE M W W W W W W
DET M A V G

PN1: Fast Trig: Free Run
IF Gain: Low #Atten: 30 dB

10 dBm/div Ref 20.00 dBm

Mkr1 2.459 500 GHz
-6.273 dBm

Center Freq 2.46200000 GHz

Start Freq 2.44200000 GHz

Stop Freq 2.48200000 GHz

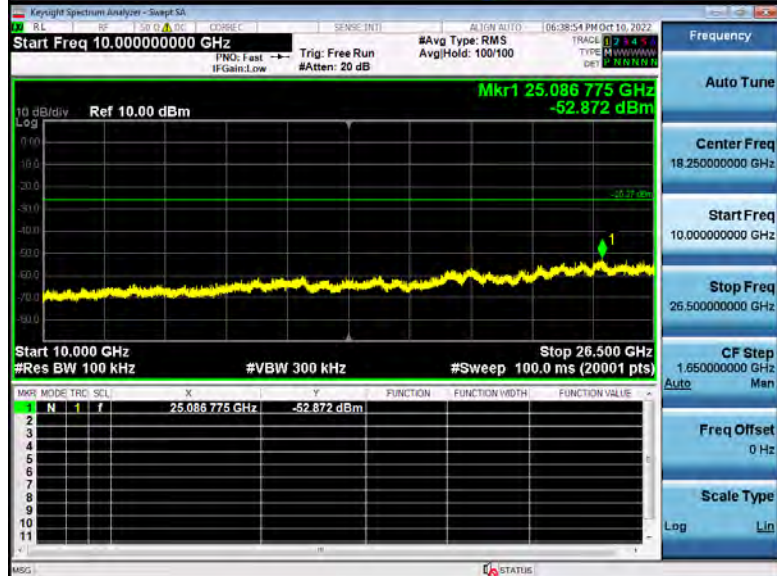
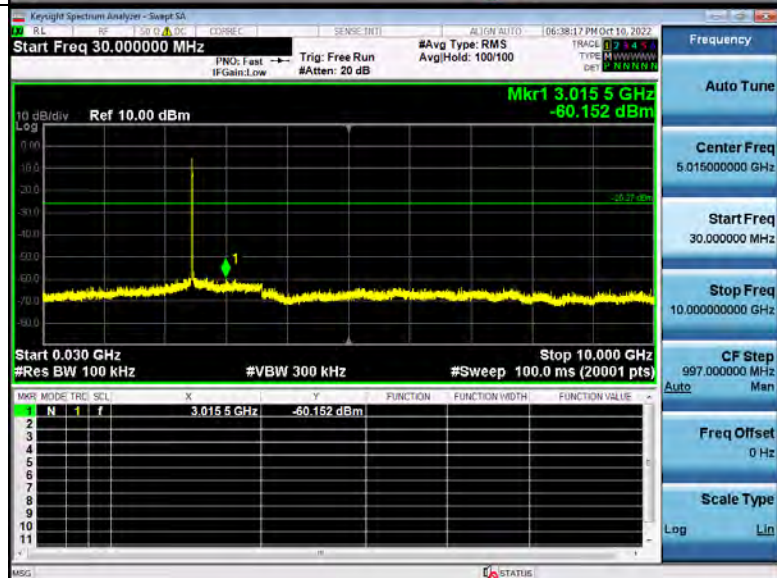
CF Step 4.000000 MHz

Auto Man

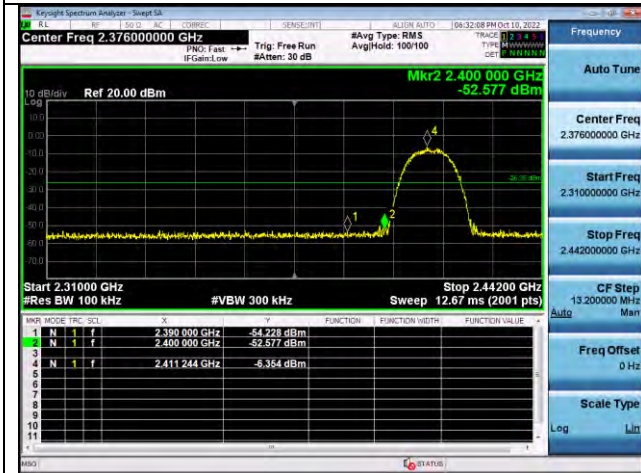
Freq Offset 0 Hz

Scale Type Log Lin

Center 2.46200 GHz Span 40.00 MHz
#Res BW 100 kHz Sweep 4.267 ms (8001 pts)
#VBW 300 kHz

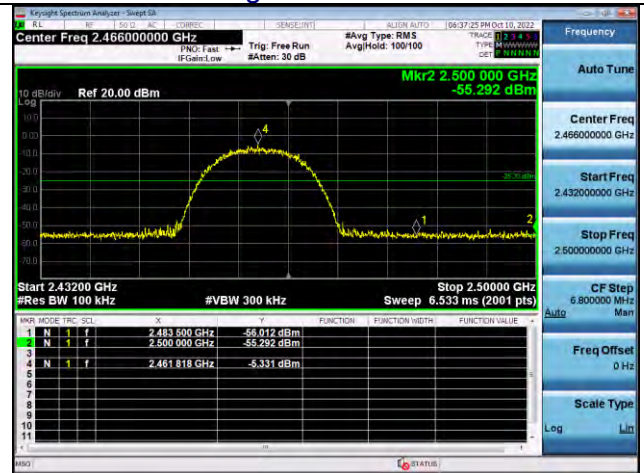


Lowest Channel



Left Band Edge

Highest Channel



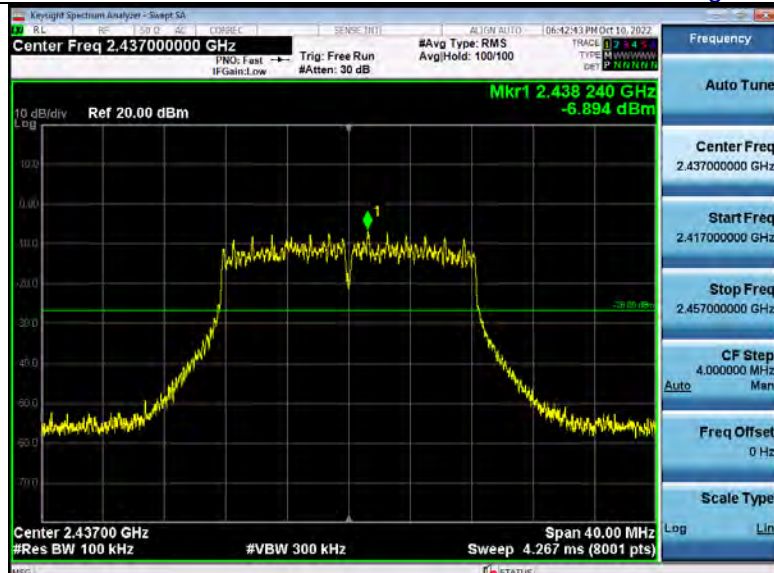
Right Band Edge

802.11g Modulation

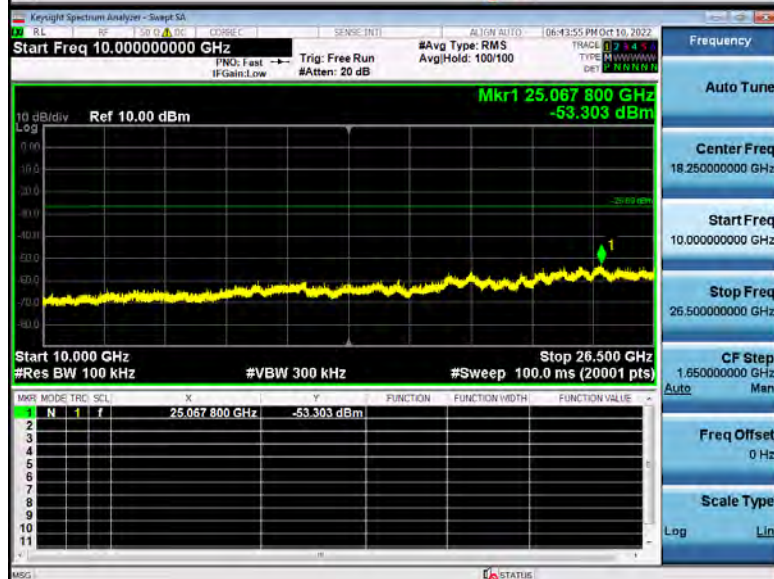
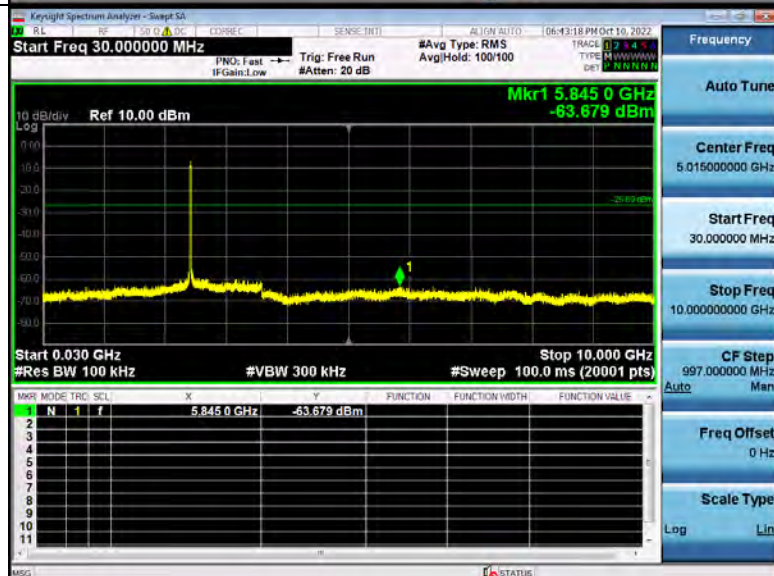
Spurious emission

Low Channel

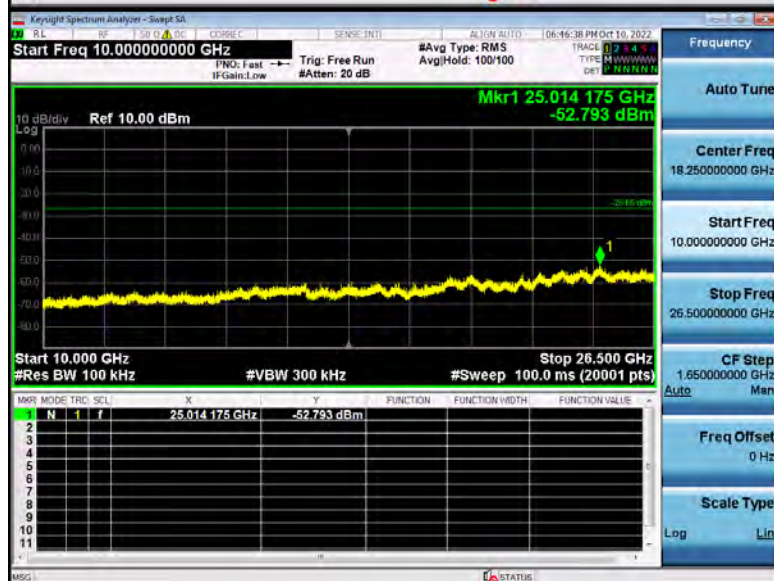
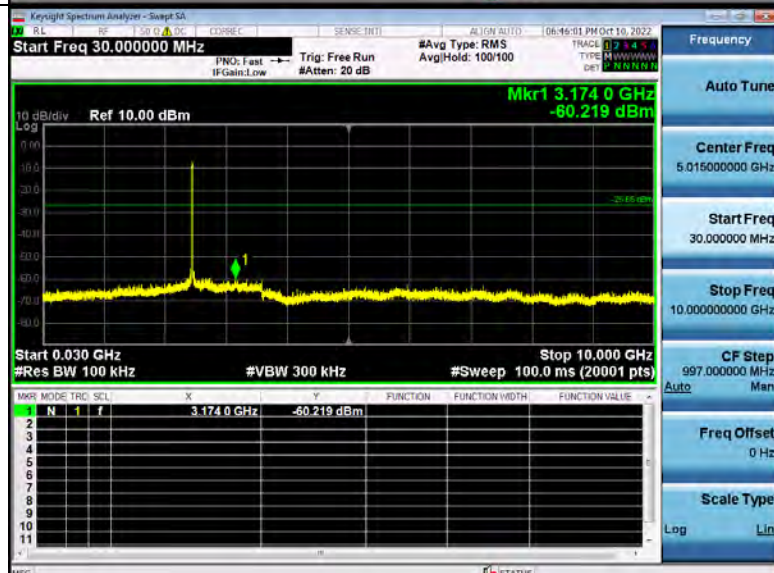
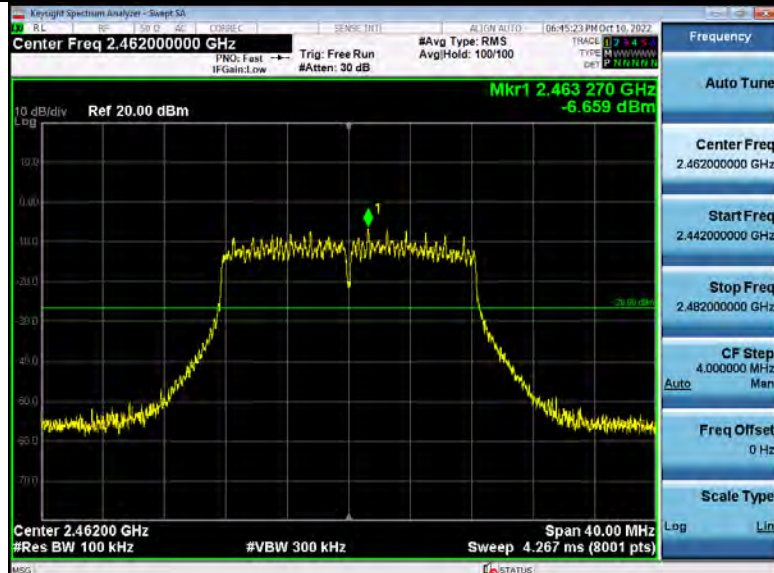




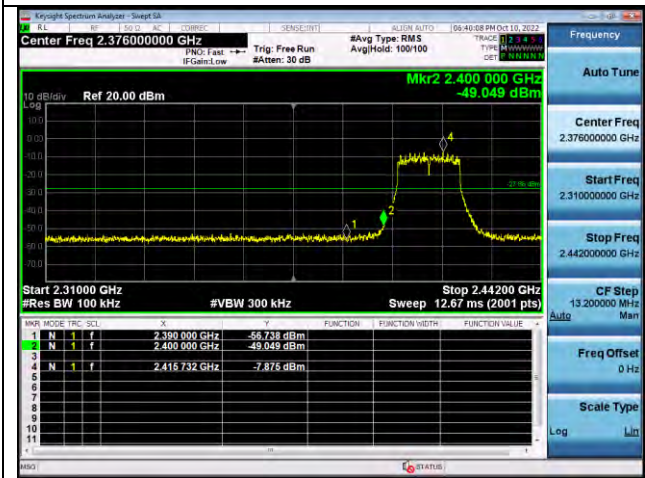
Middle Channel



High Channel

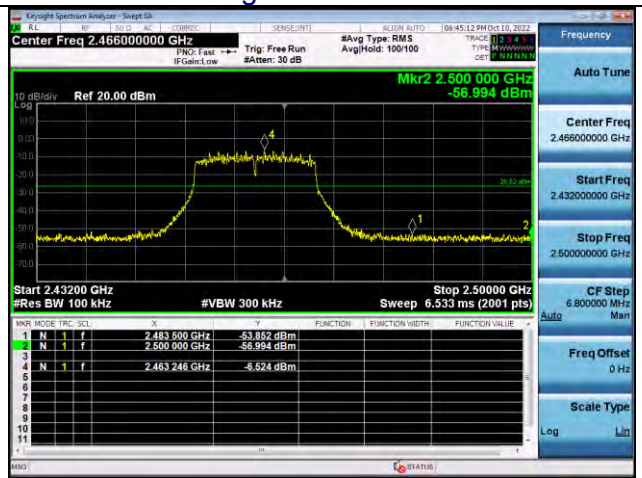


Lowest Channel



Left Band Edge

Highest Channel



Right Band Edge

802.11n20 Modulation

Spurious emission

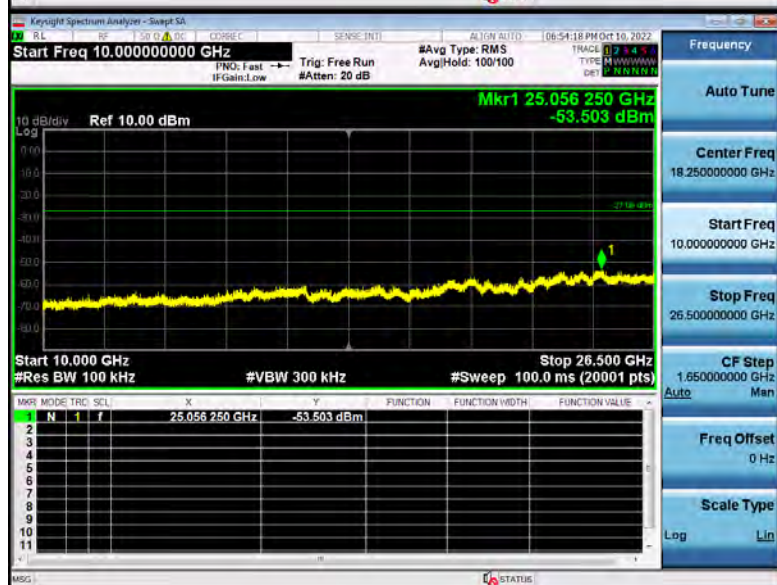
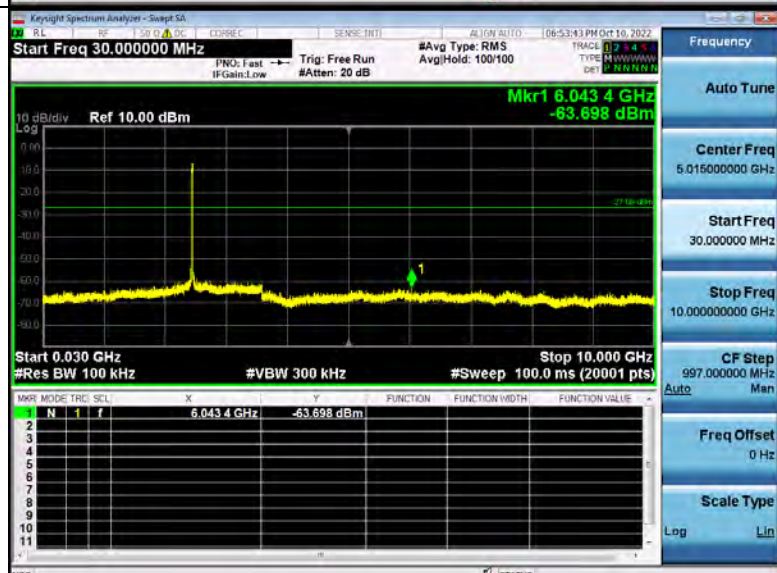
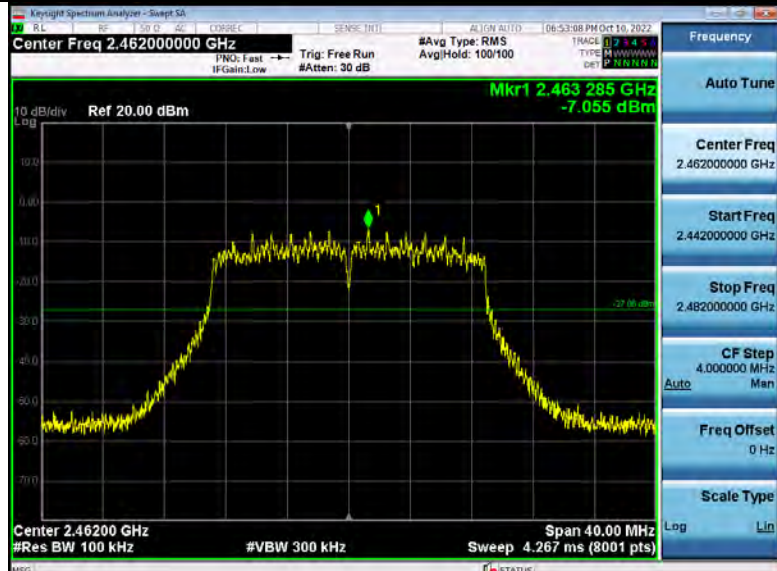
Low Channel



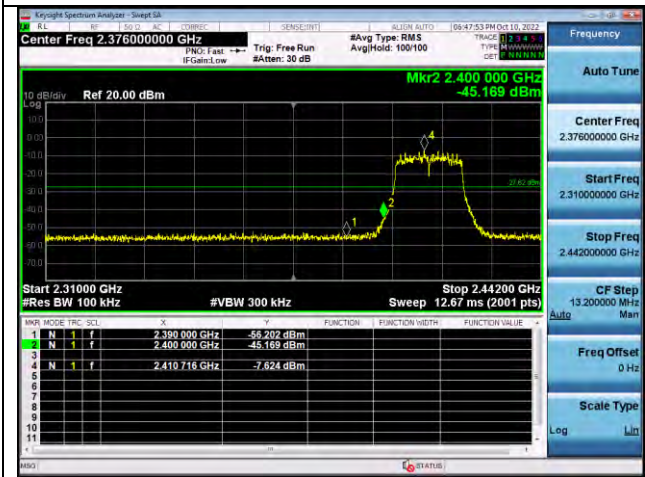
Middle Channel



High Channel

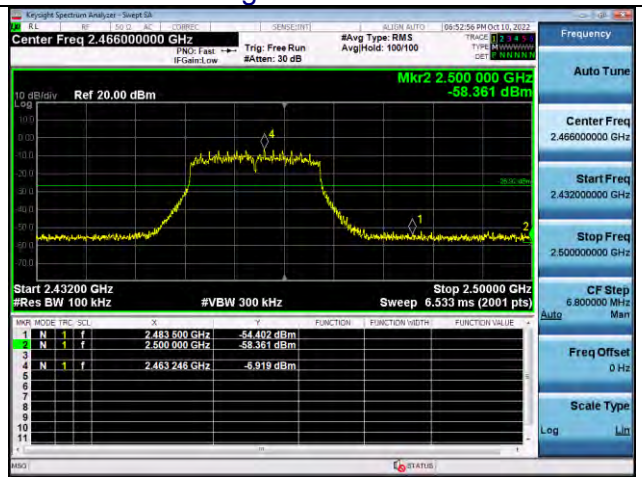


Lowest Channel



Left Band Edge

Highest Channel

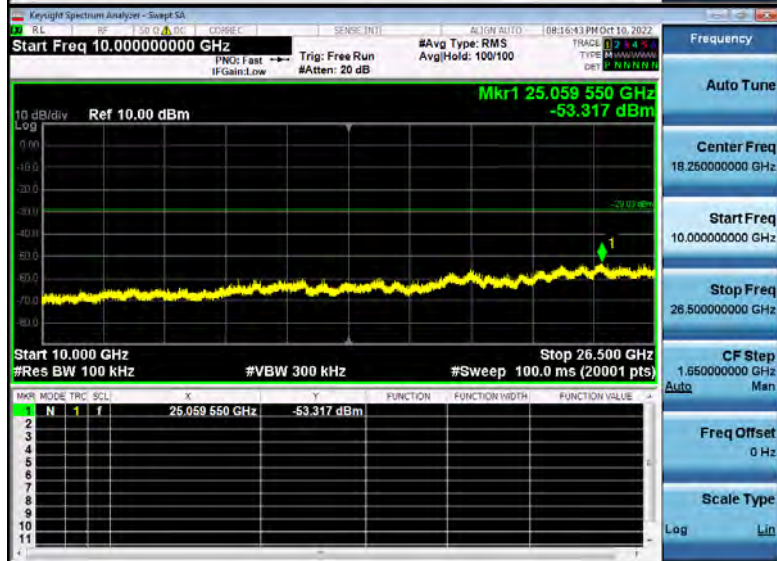
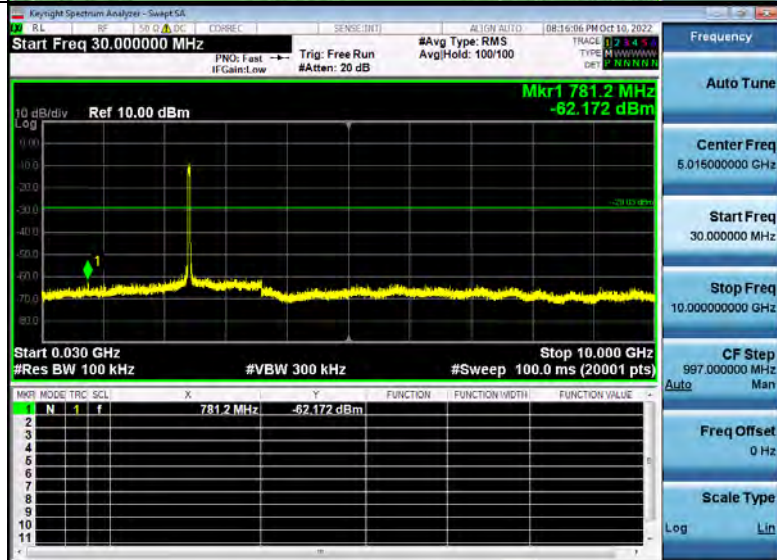
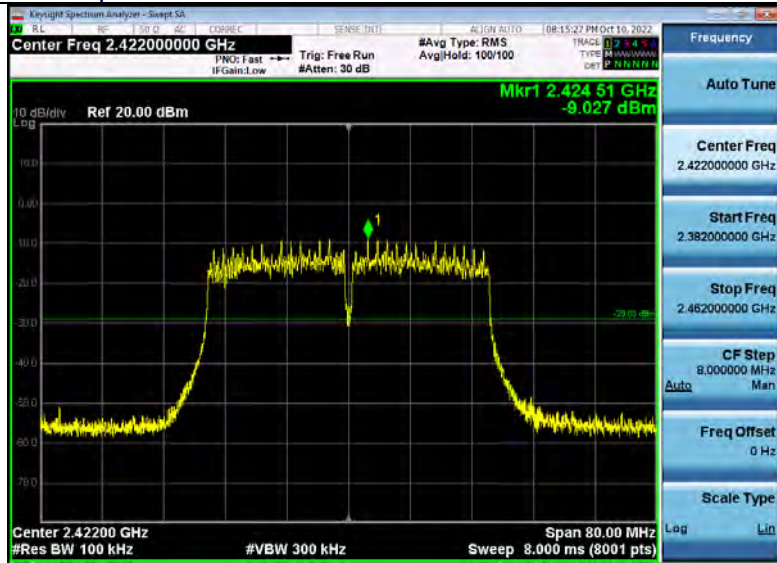


Right Band Edge

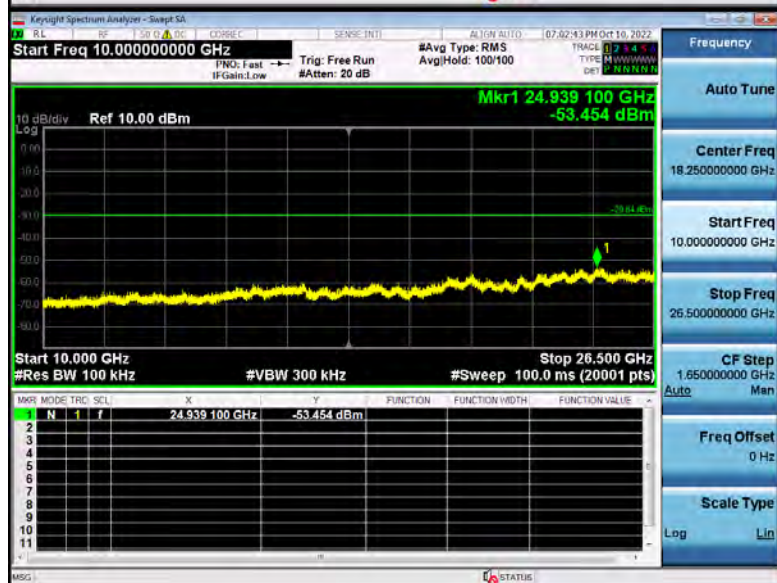
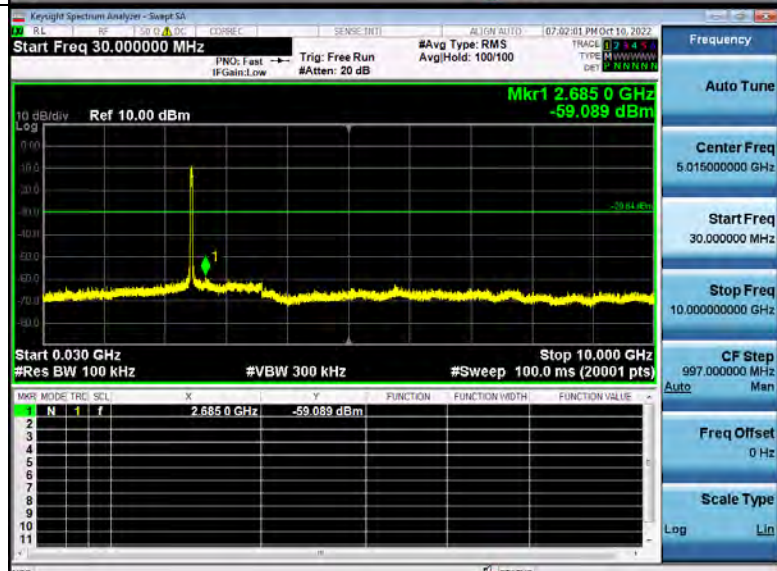
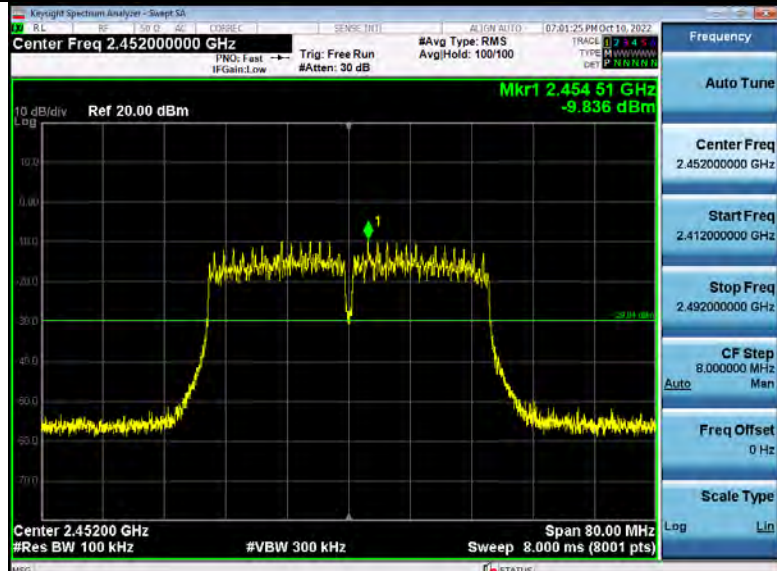
802.11n40 Modulation

Spurious emission

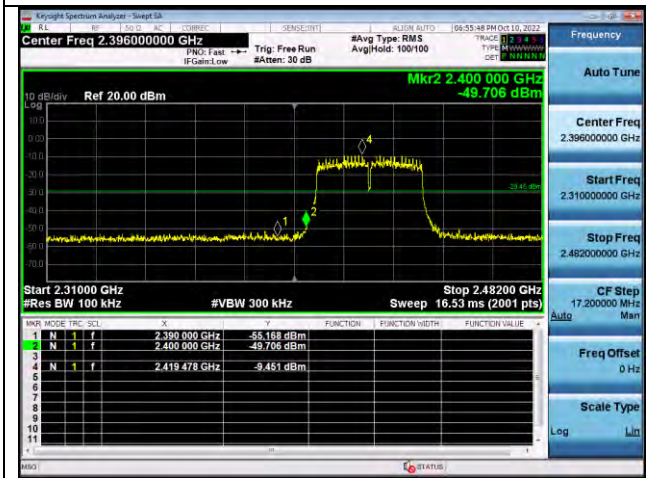
Low Channel



High Channel

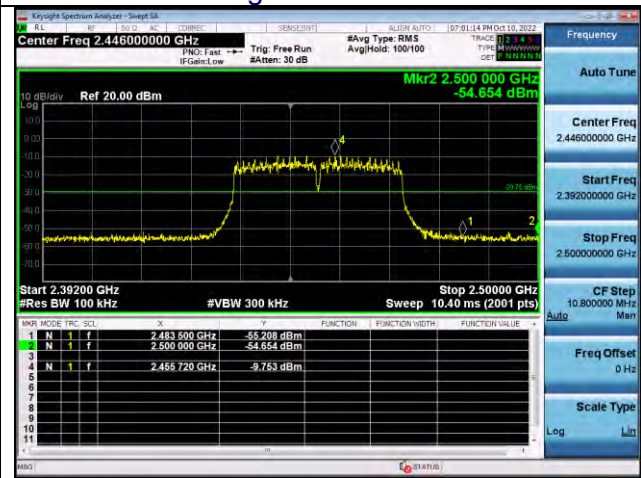


Lowest Channel



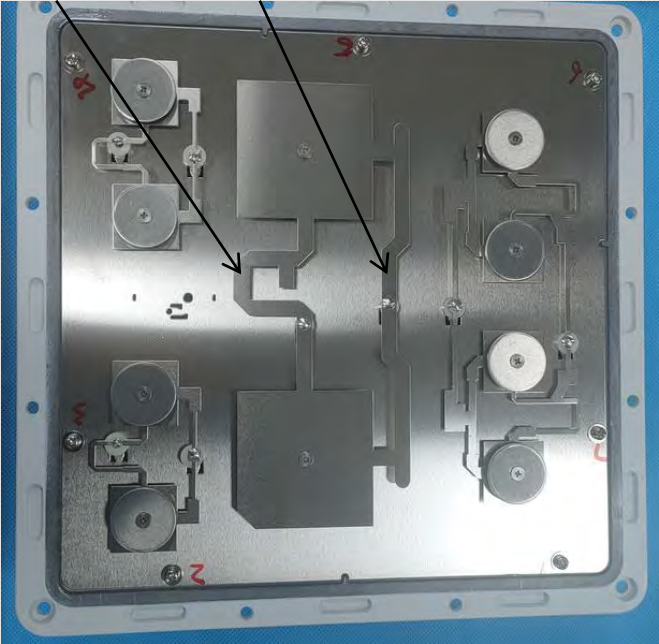
Left Band Edge

Highest Channel

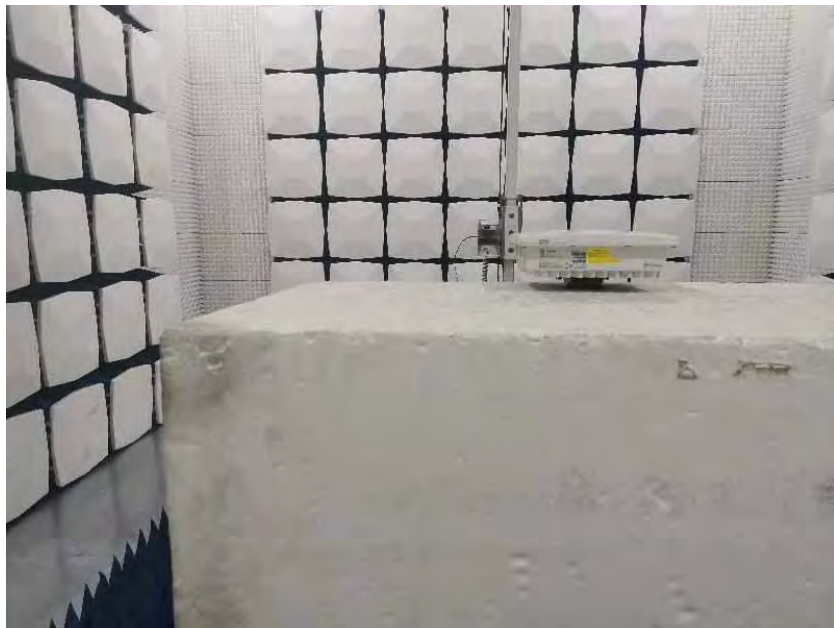


Right Band Edge

10. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. Refer to statement below for compliance. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed. Antenna Connected Construction The antenna used in this product are omni antenna, and the best case gain of the antenna is antenna port 1: 10.13dBi and Antenna port 2: 10.15 dBi EUT Antenna: 2.4G ANT1 2.4G ANT2 	

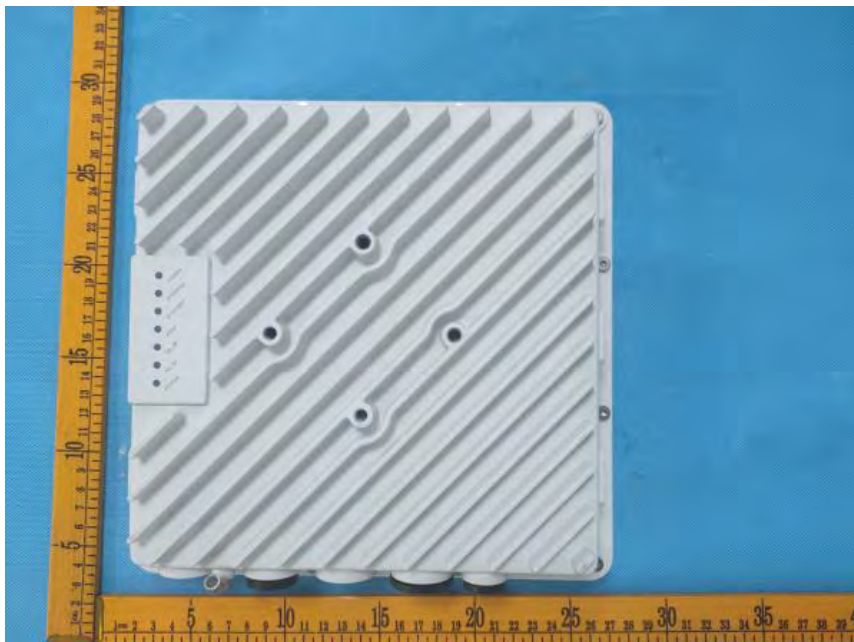
11. TEST SETUP PHOTO





12. EUT CONSTRUCTIONAL DETAILS

External photos

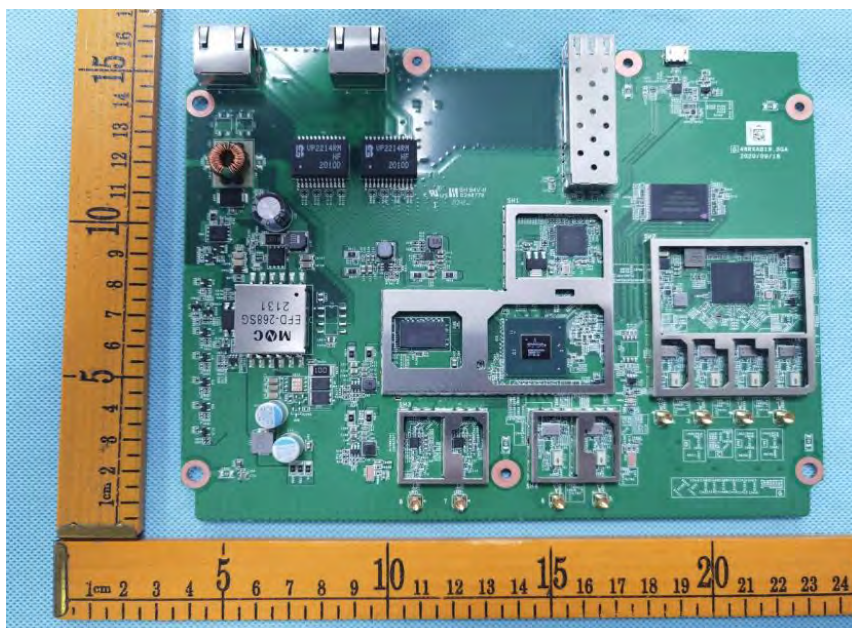
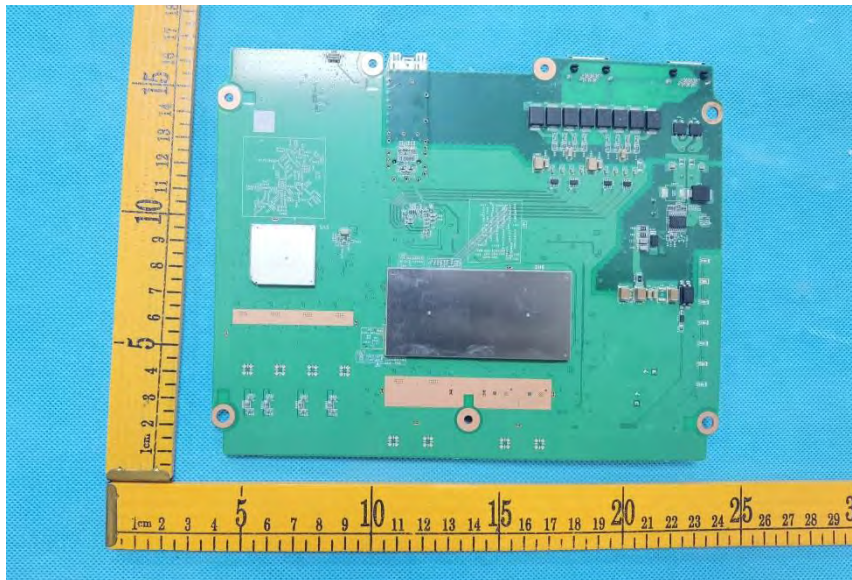
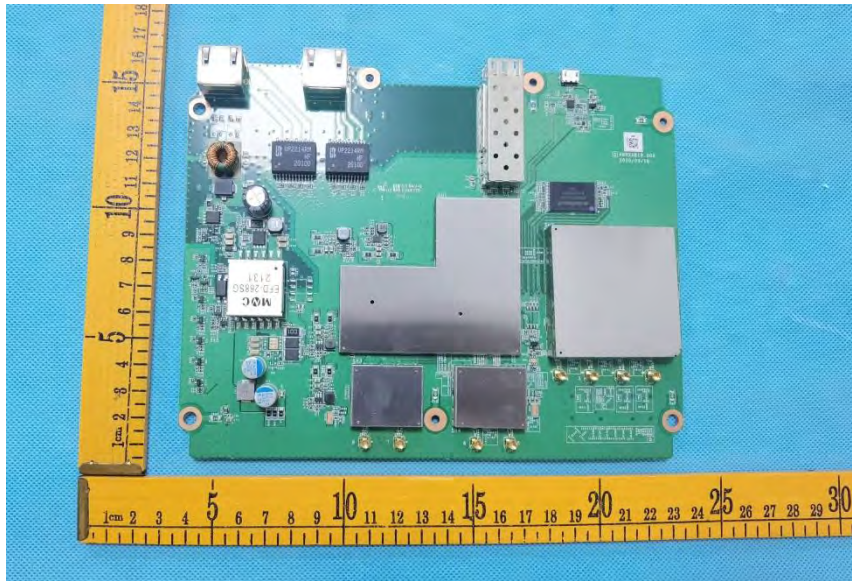


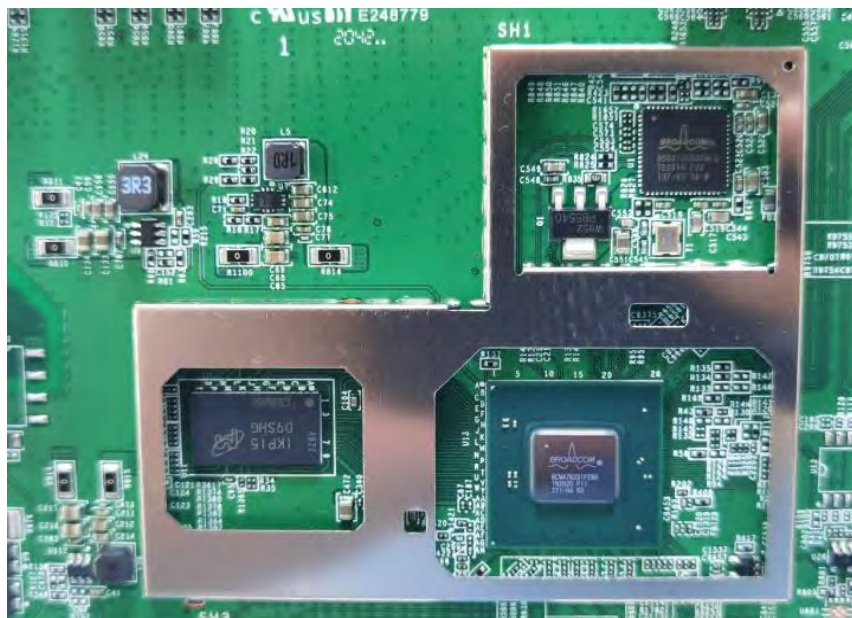


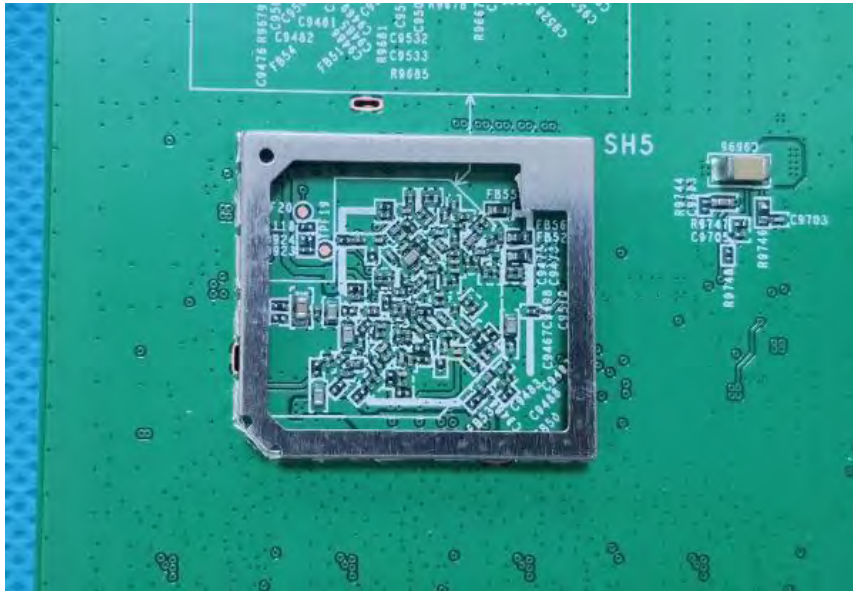


Internal photos









***** END OF REPORT *****