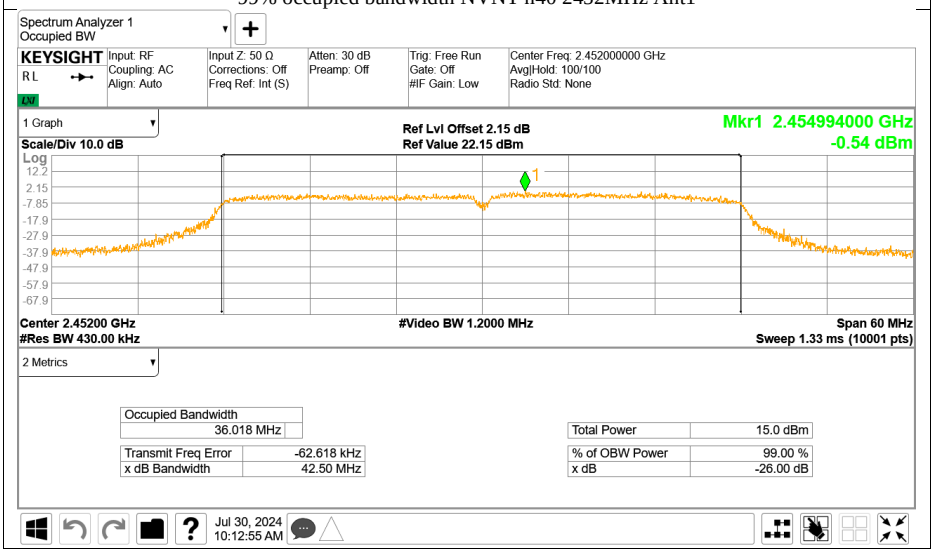
99% occupied bandwidth NVNT n40 2422MHz Ant1

99% occupied bandwidth NVNT n40 2437MHz Ant1

99% occupied bandwidth NVNT n40 2452MHz Ant1



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10.4 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. The RF output of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
4. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW≥3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
5. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
6. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm/3kHz]
≤8

Test result

802.11 b

Frequency **MHz**	Power spectral density **dBm/3kHz**	Result
Low channel 2412MHz	-7.04	Pass
Middle channel 2437MHz	-5.63	Pass
High channel 2462MHz	-5.96	Pass

802.11 g

Frequency **MHz**	Power spectral density **dBm/3kHz**	Result
Low channel 2412MHz	-14.1	Pass
Middle channel 2437MHz	-13.46	Pass
High channel 2462MHz	-12.14	Pass

802.11 n (HT20)

Frequency **MHz**	Power spectral density **dBm/3kHz**	Result
Low channel 2412MHz	-14.4	Pass
Middle channel 2437MHz	-14.32	Pass
High channel 2462MHz	-14.39	Pass

802.11 n (HT40)

Frequency **MHz**	Power spectral density **dBm/3kHz**	Result
Low channel 2422MHz	-18.47	Pass
Middle channel 2437MHz	-17.75	Pass
High channel 2452MHz	-16.84	Pass

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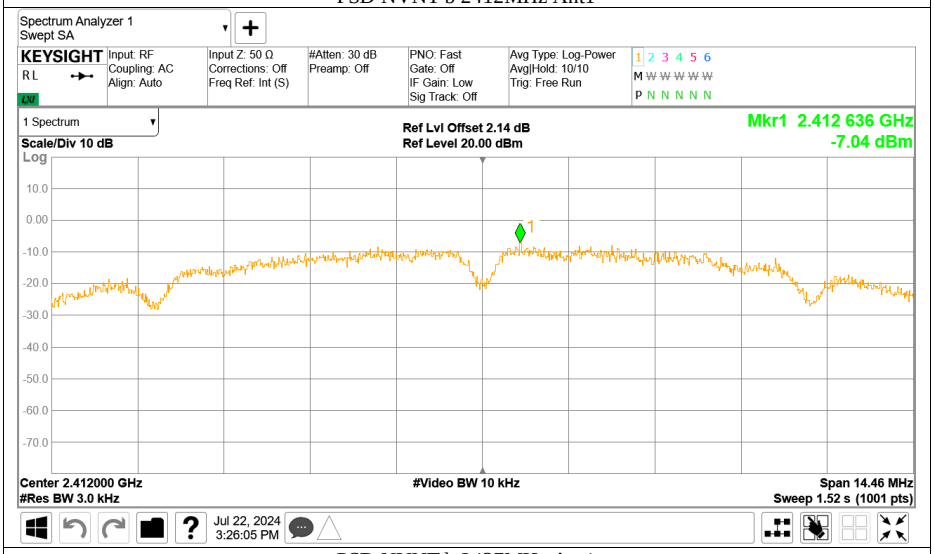
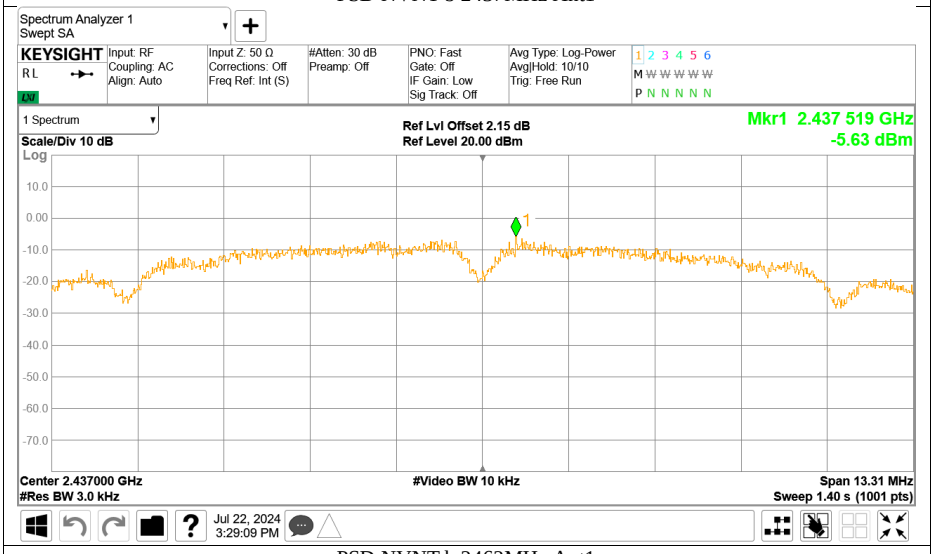
Power spectral density

Test Graphs

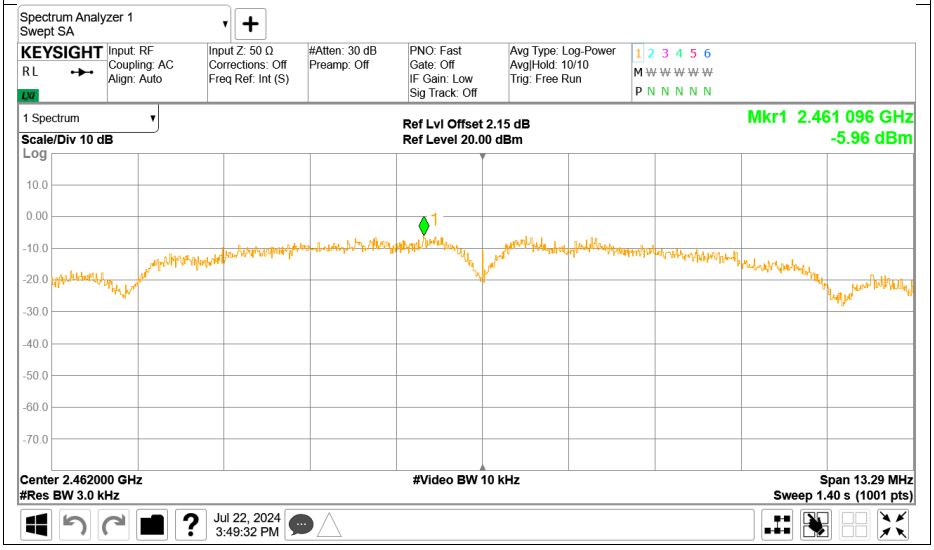
PSD NVNT b 2412MHz Ant1



PSD NVNT b 2437MHz Ant1



PSD NVNT b 2462MHz Ant1



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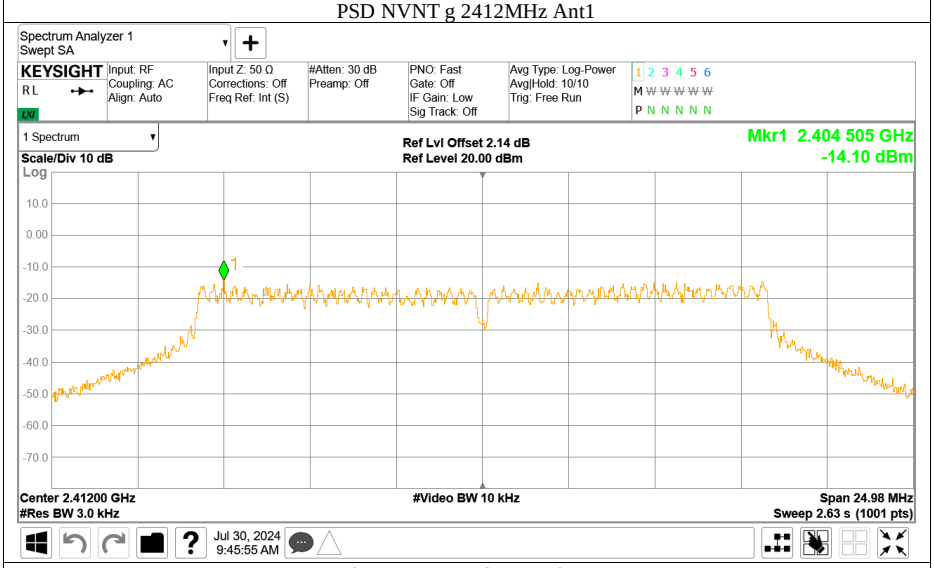
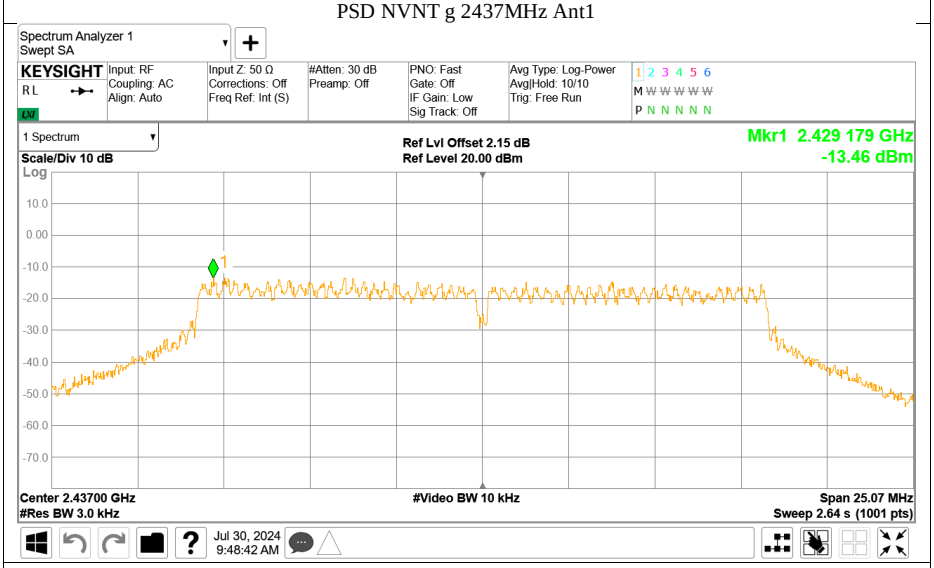
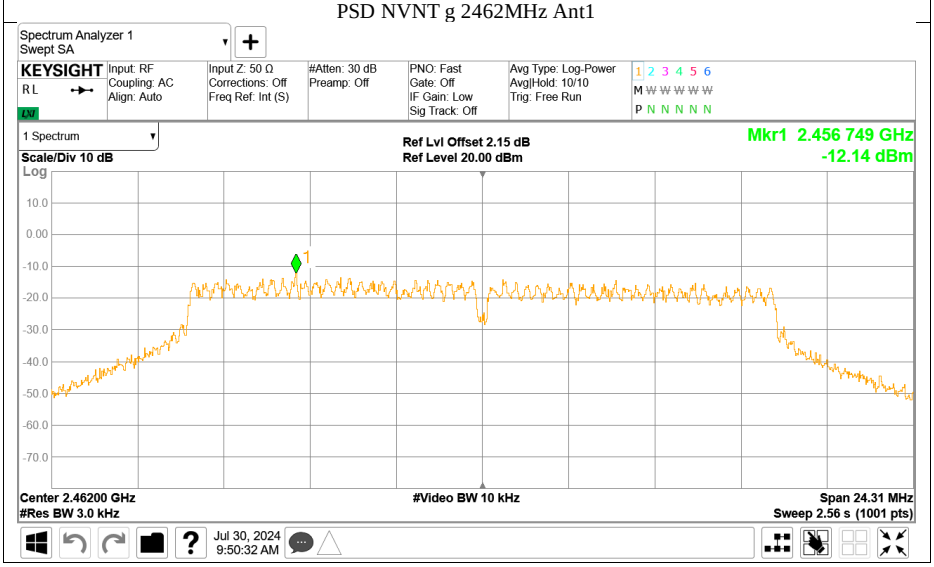
PSD NVNT g 2412MHz Ant1



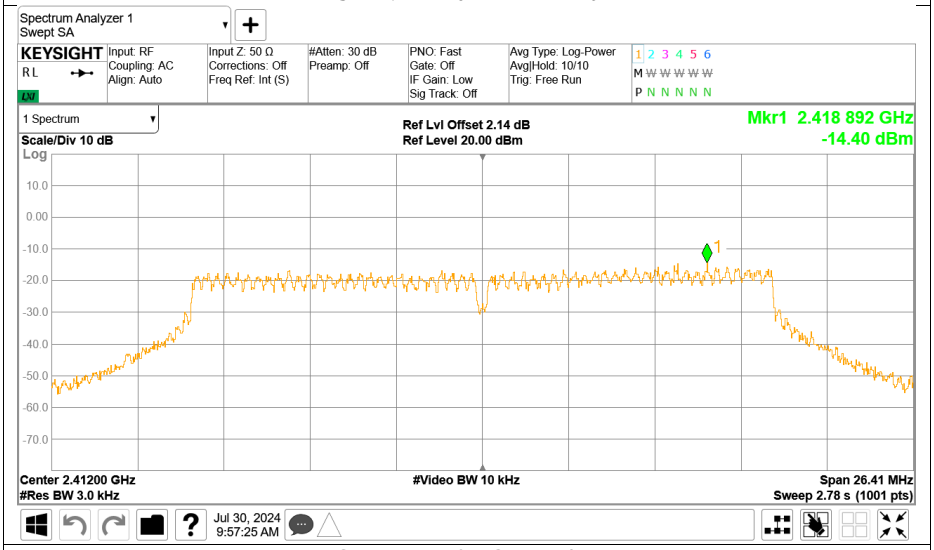
PSD NVNT g 2437MHz Ant1



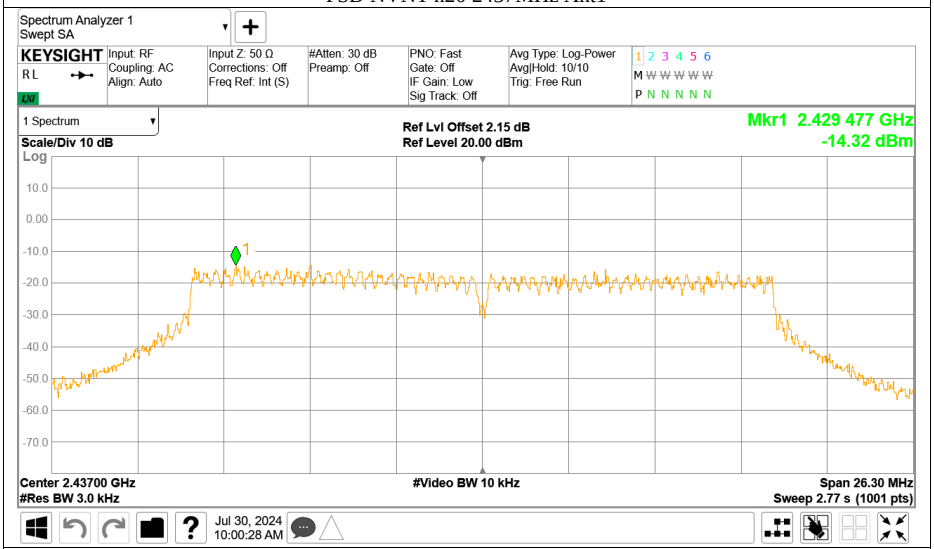
PSD NVNT g 2462MHz Ant1



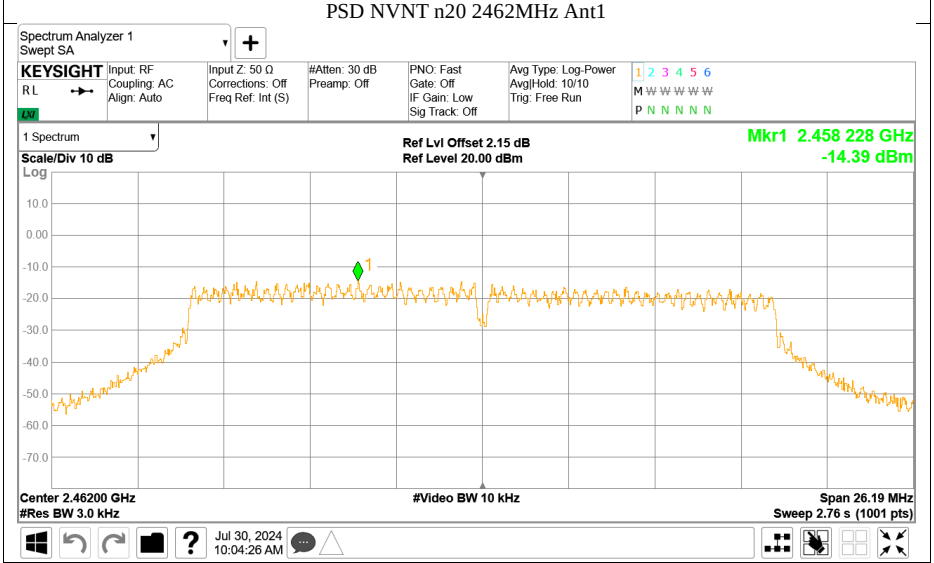
PSD NVNT n20 2412MHz Ant1



PSD NVNT n20 2437MHz Ant1



PSD NVNT n20 2462MHz Ant1



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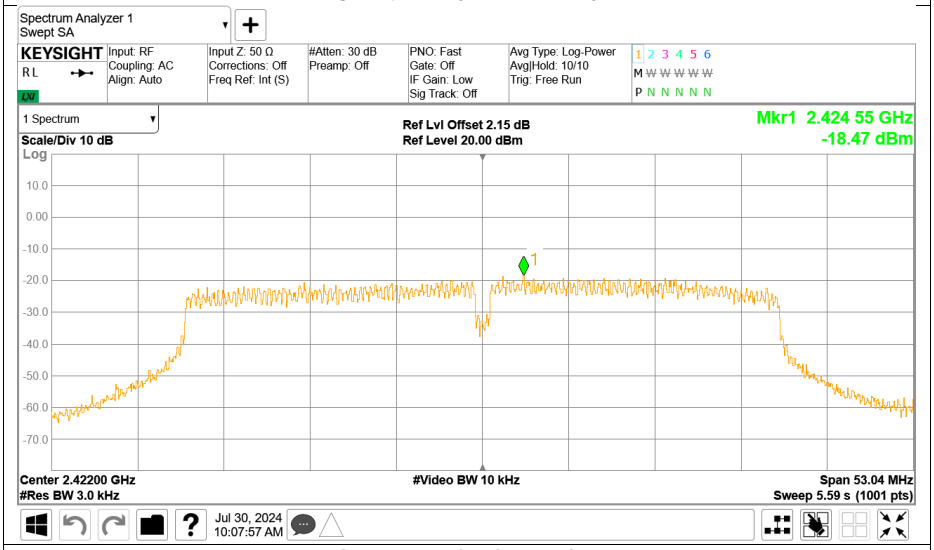
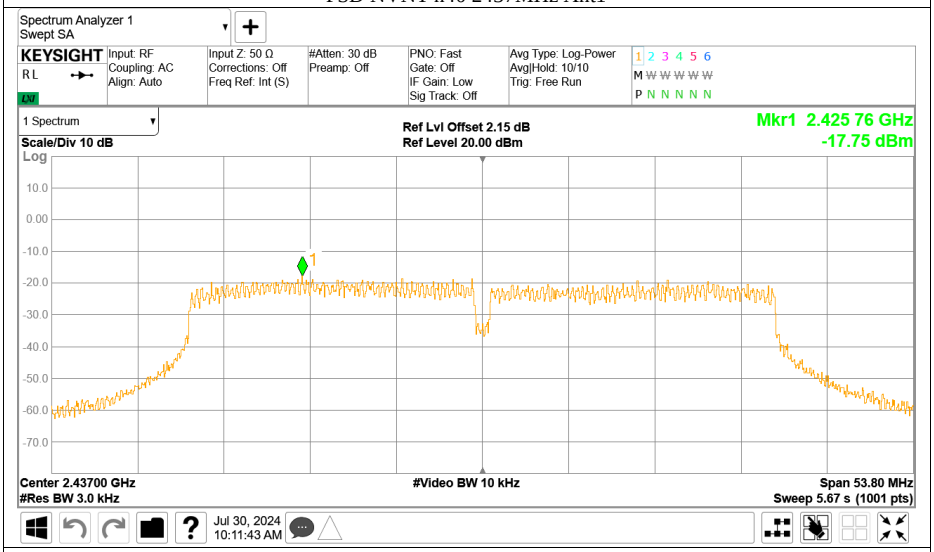
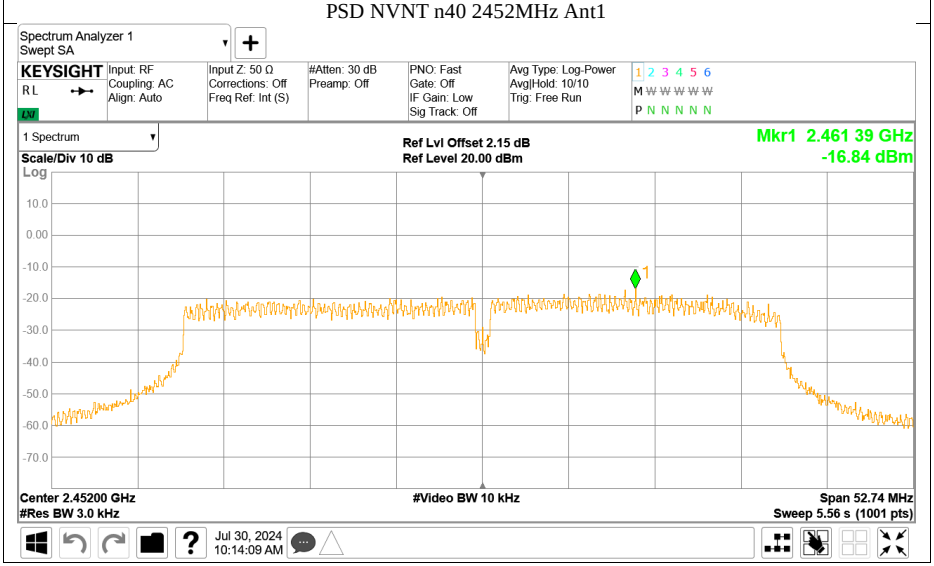
PSD NVNT n40 2422MHz Ant1



PSD NVNT n40 2437MHz Ant1



PSD NVNT n40 2452MHz Ant1



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10.5 Spurious RF conducted emissions

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
5. The level displayed must comply with the limit specified in this Section. Submit these plots.
6. Repeat above procedures until all frequencies measured were complete.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

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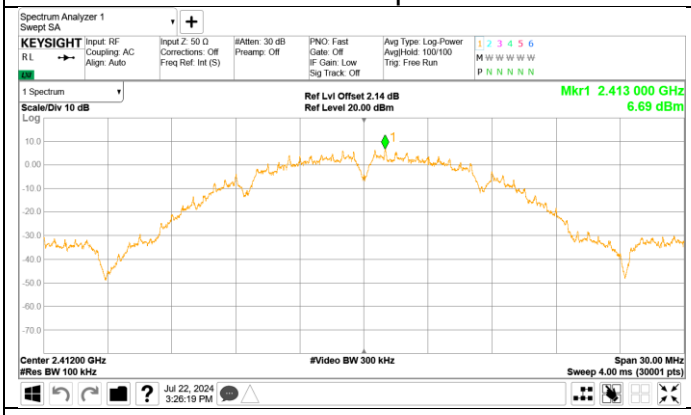
Spurious RF conducted emissions

802.11 B

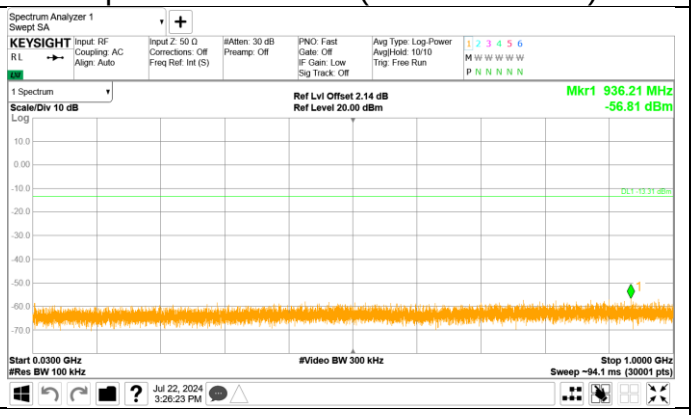
Out-of-Band Emissions

Channel 1 (2412MHz)

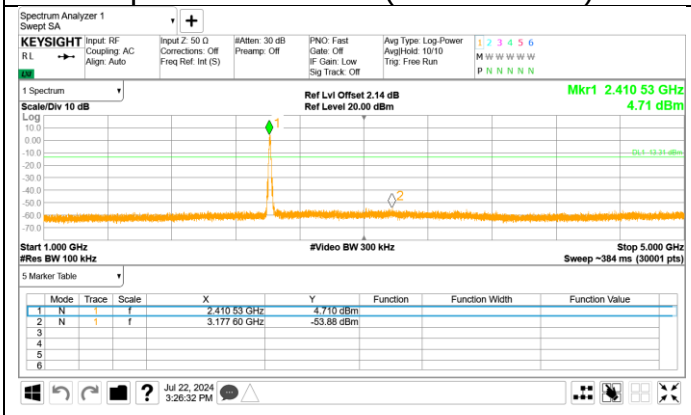
Reference point



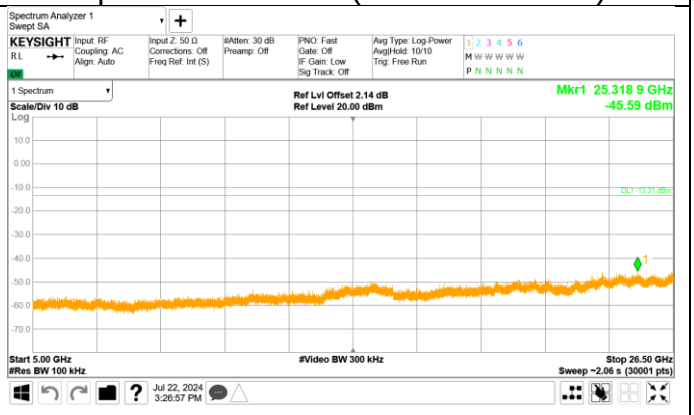
Spurious Emission (30MHz – 1GHz)



Spurious Emission (1GHz –5GHz)



Spurious Emission (5GHz –26.5GHz)



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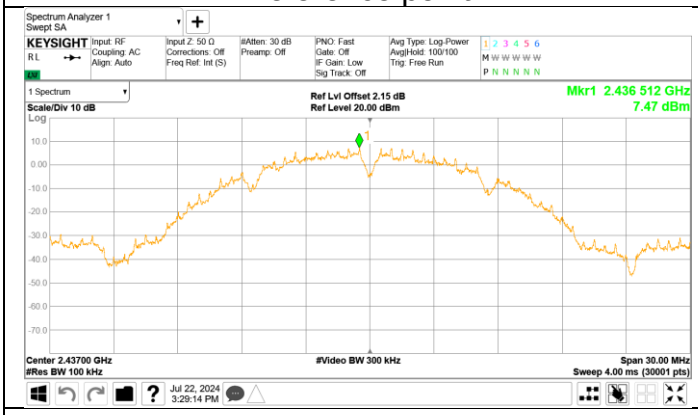
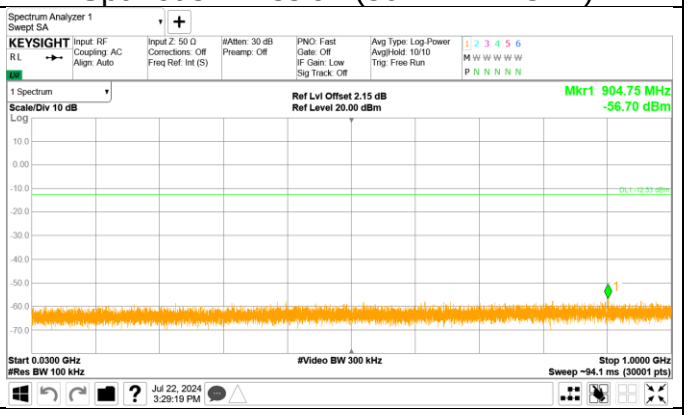
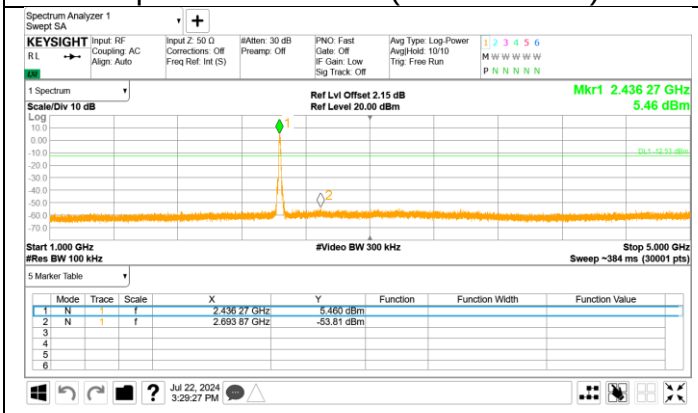
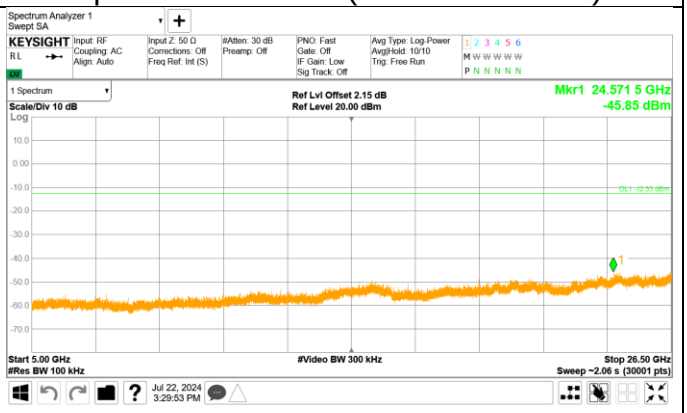
Out-of-Band Emissions	
Channel 6 (2437MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

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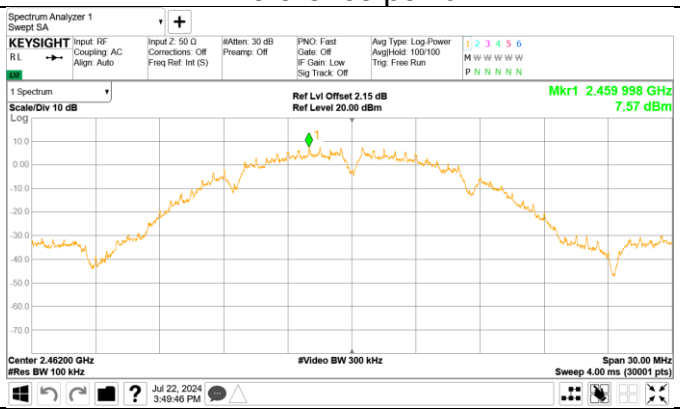
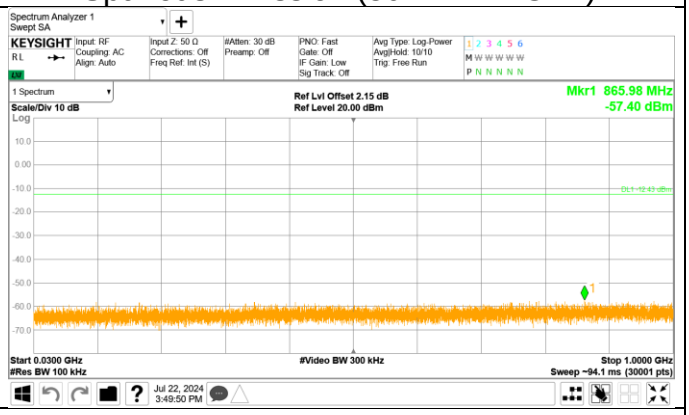
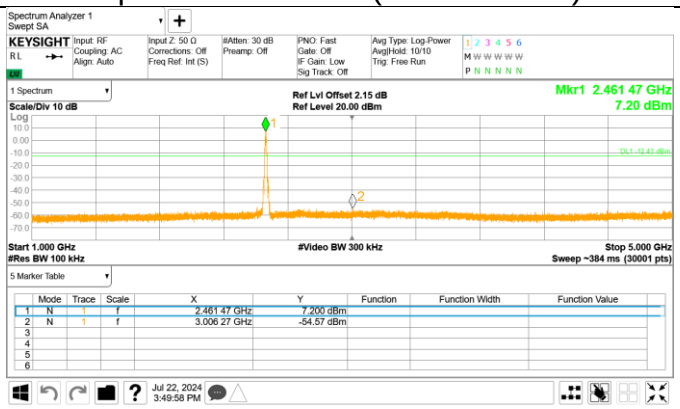
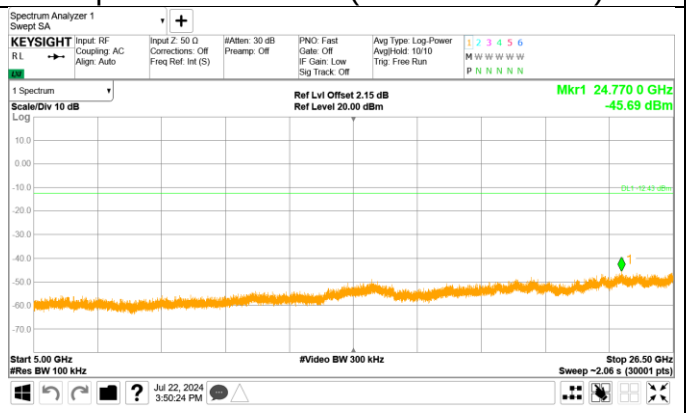
Out-of-Band Emissions	
Channel 11 (2462MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

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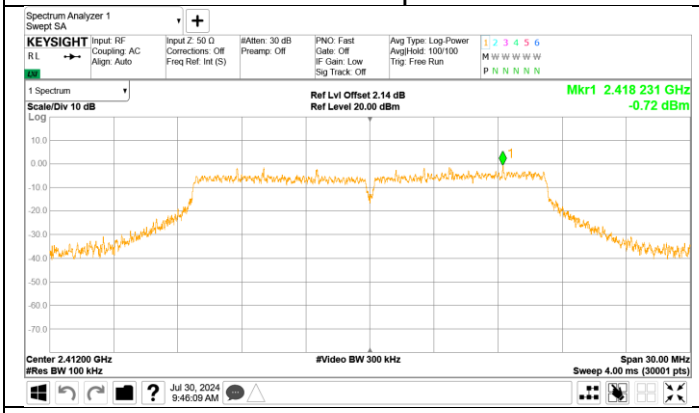
802.11 G

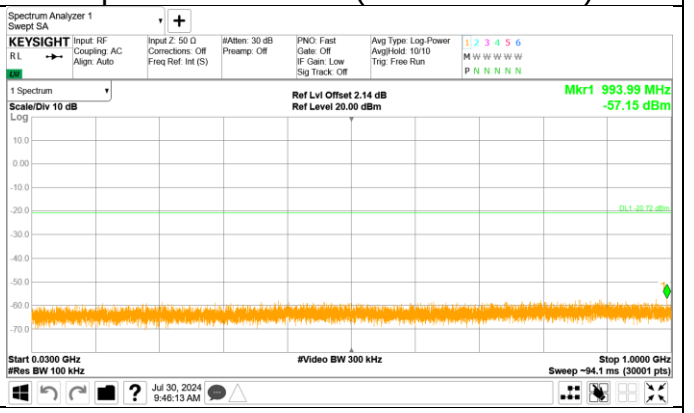
Out-of-Band Emissions

Channel 1 (2412MHz)

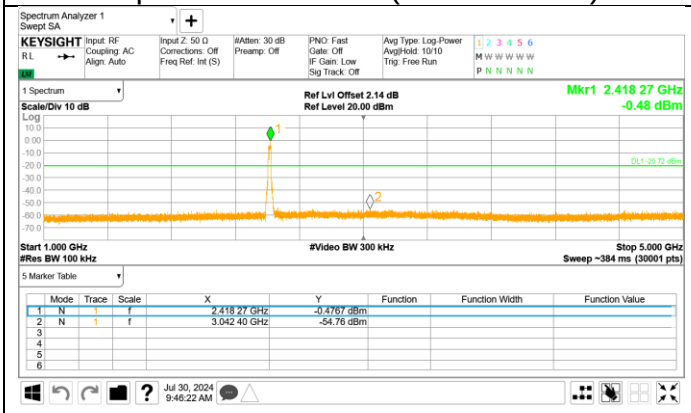
Reference point



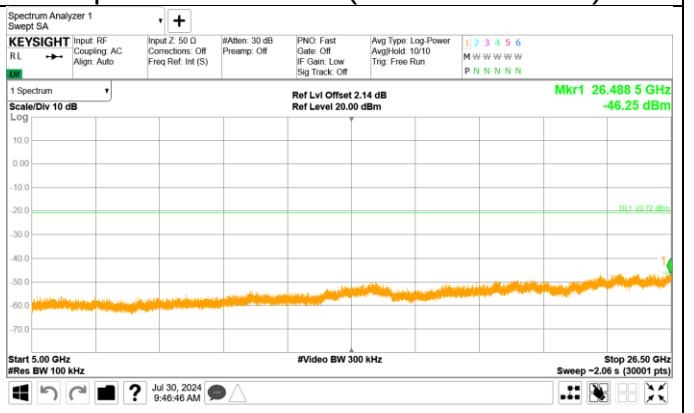
Spurious Emission (30MHz – 1GHz)

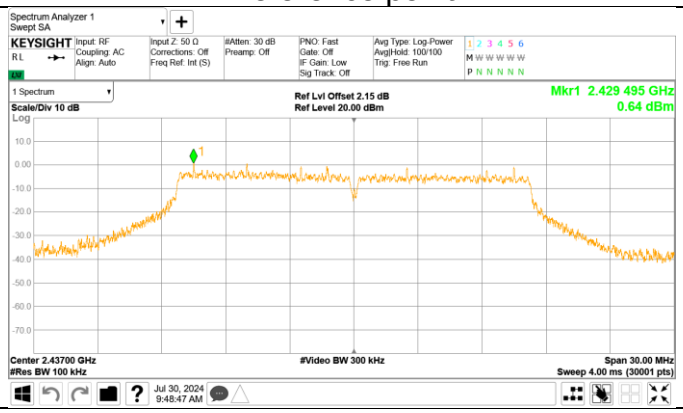
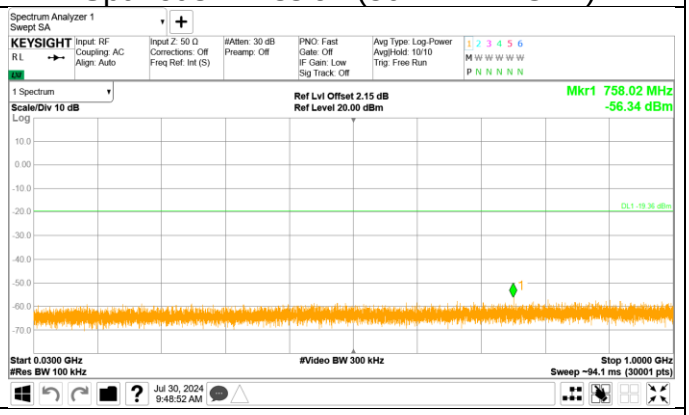
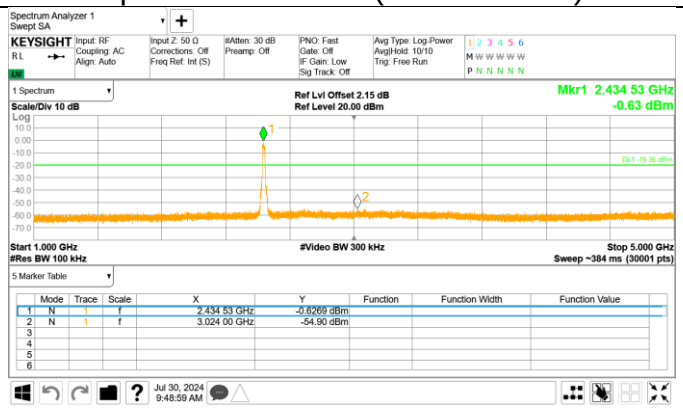
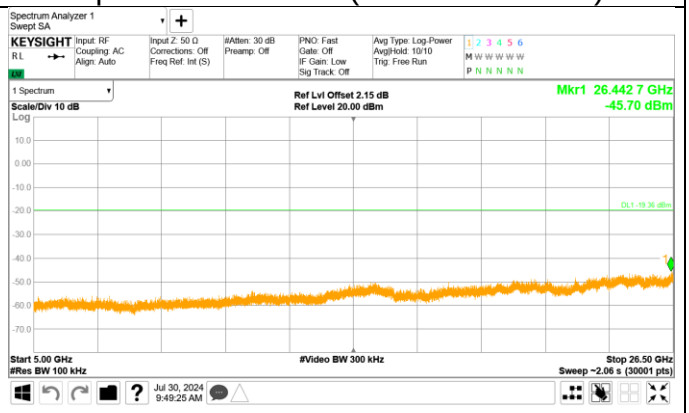


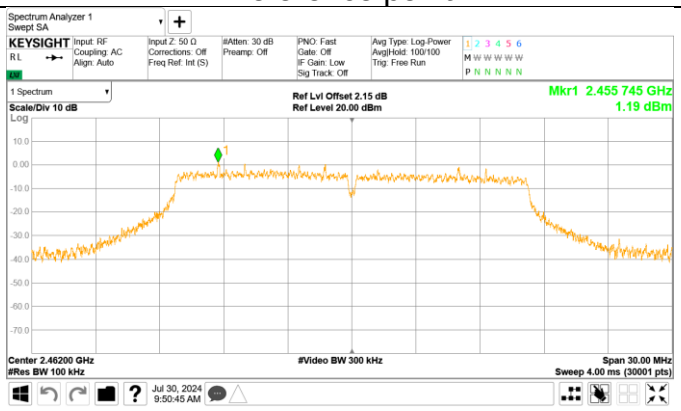
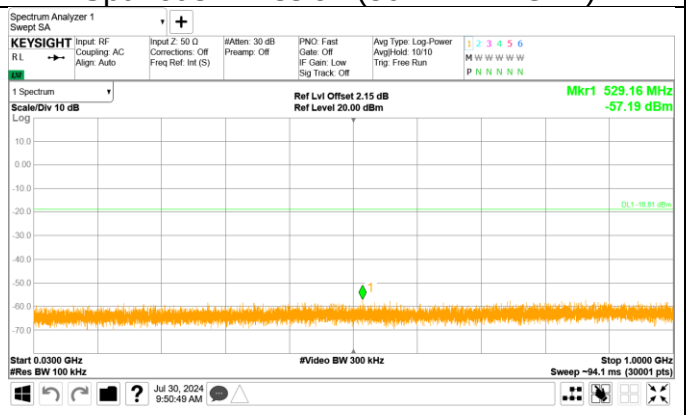
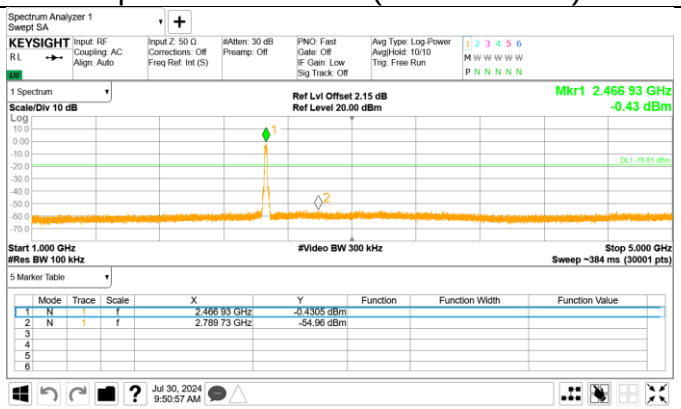
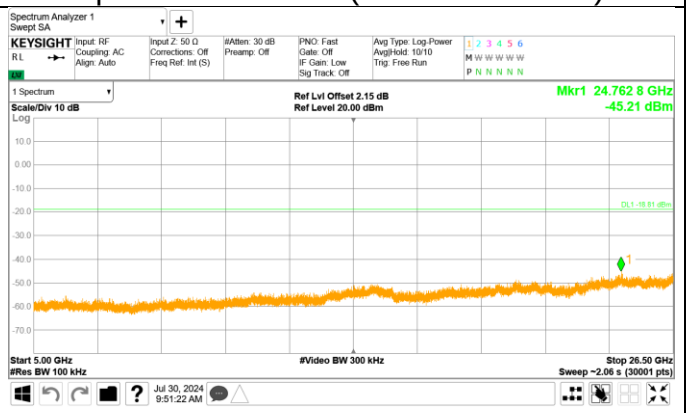
Spurious Emission (1GHz –5GHz)



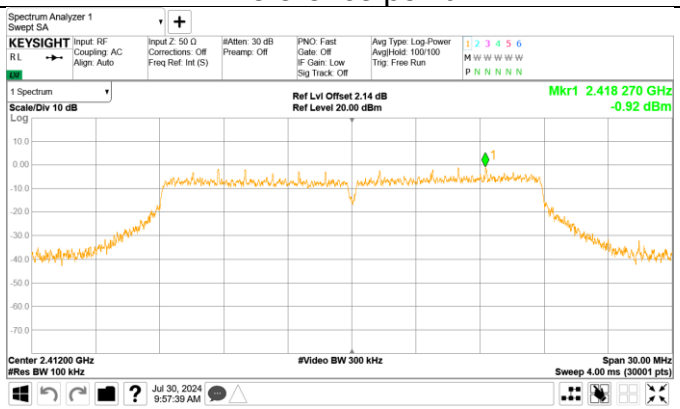
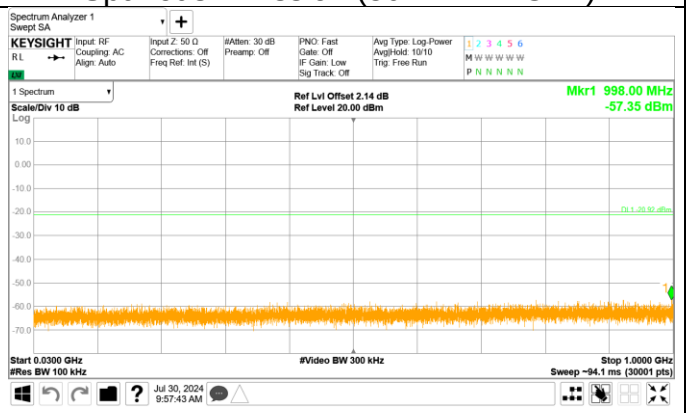
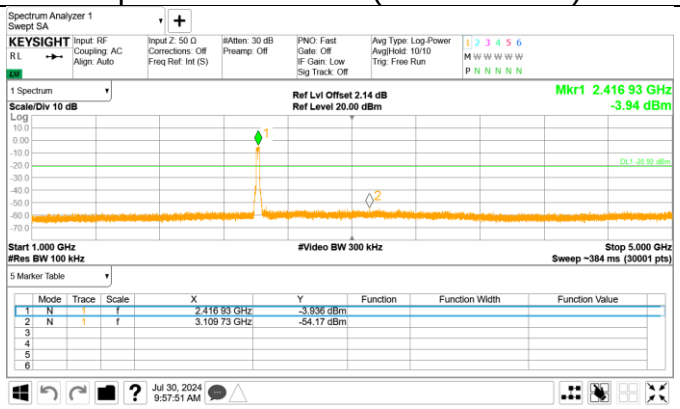
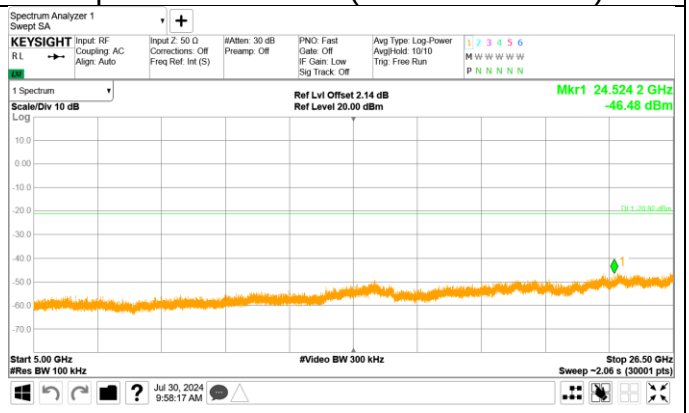
Spurious Emission (5GHz –26.5GHz)



Out-of-Band Emissions	
Channel 6 (2437MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

Out-of-Band Emissions	
Channel 11 (2462MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

802.11 N HT20

Out-of-Band Emissions	
Channel 1 (2412MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

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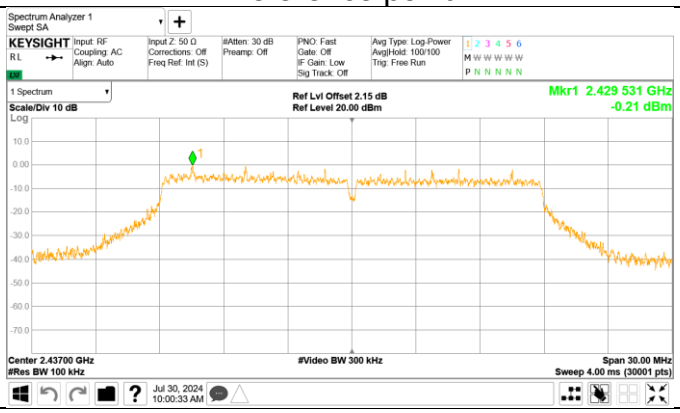
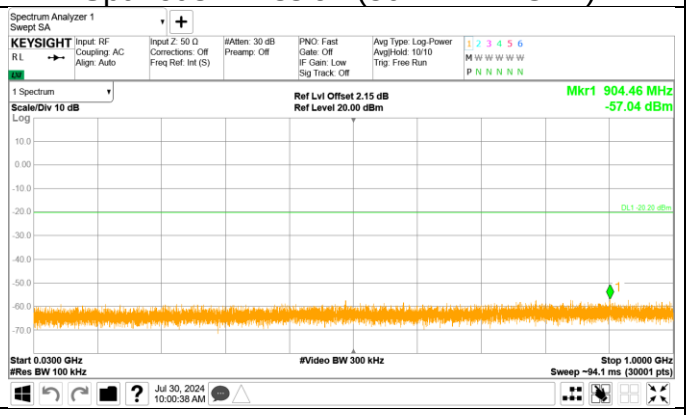
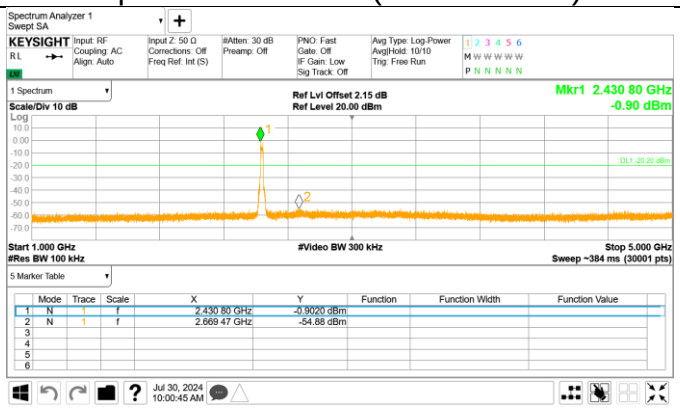
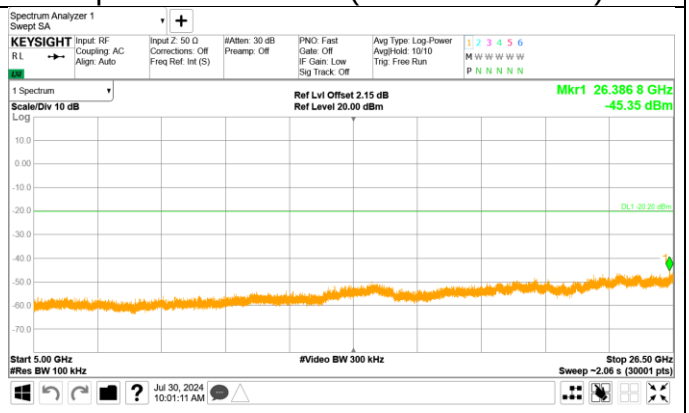
Out-of-Band Emissions	
Channel 6 (2437MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

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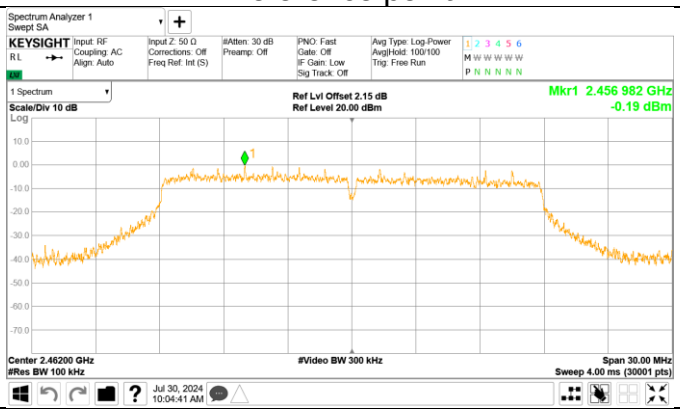
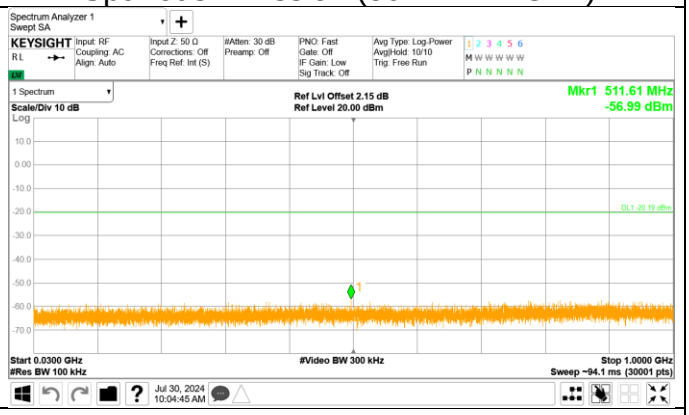
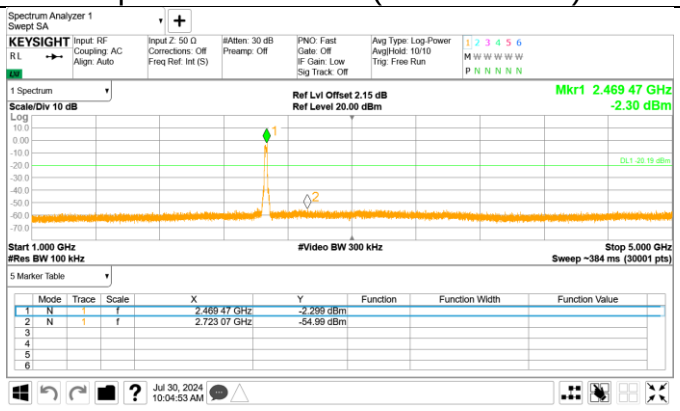
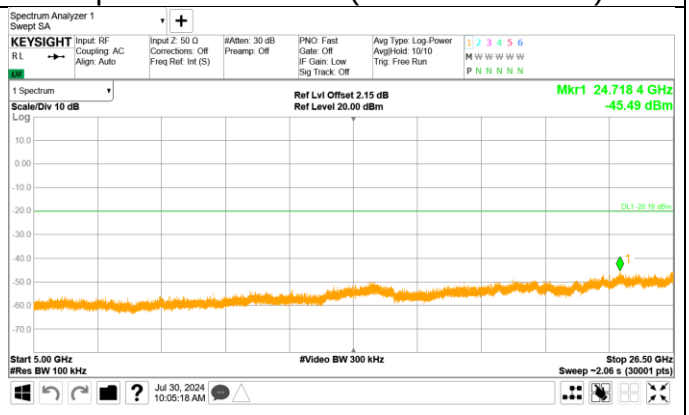
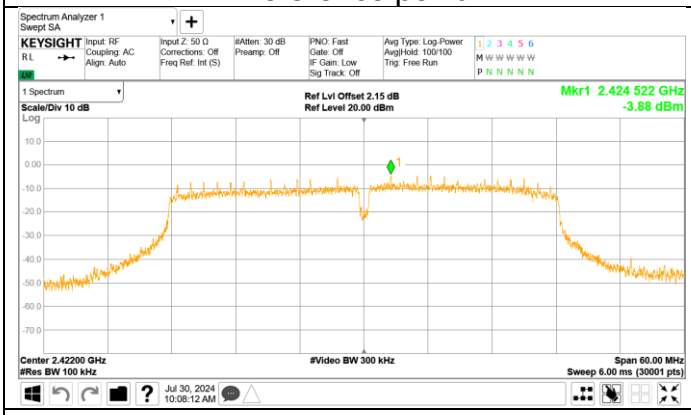
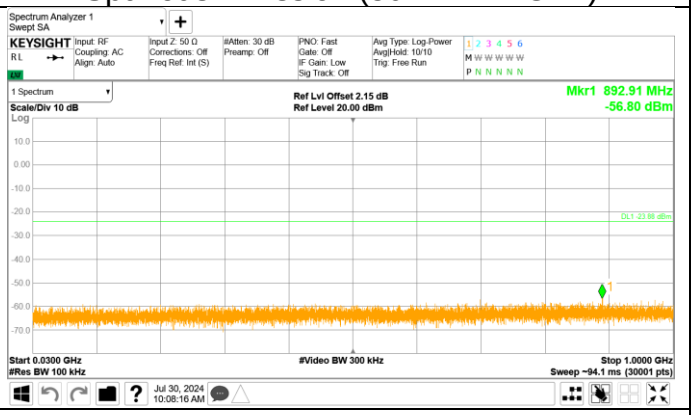
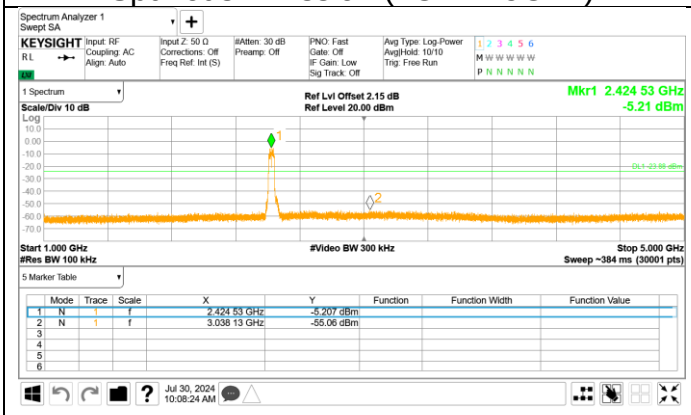
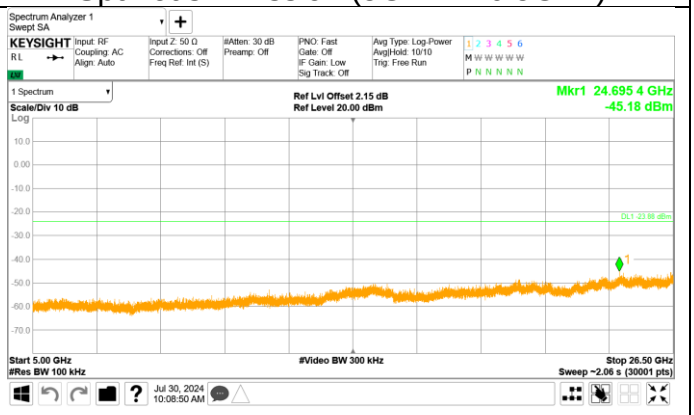
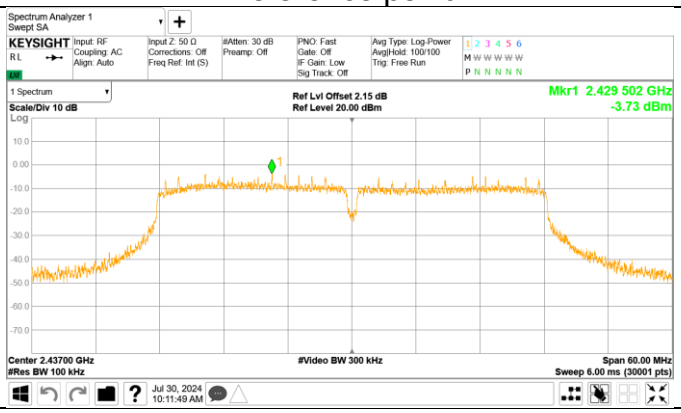
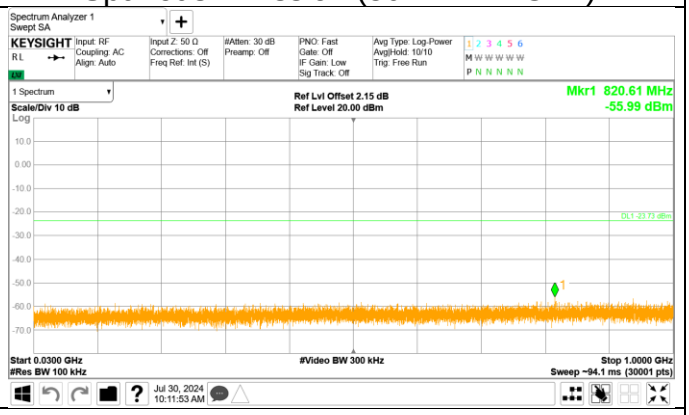
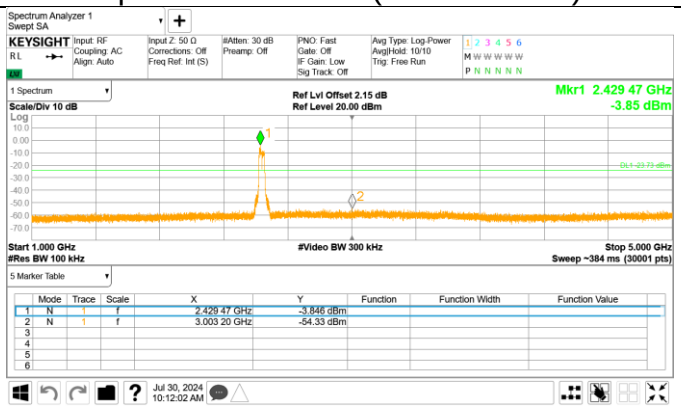
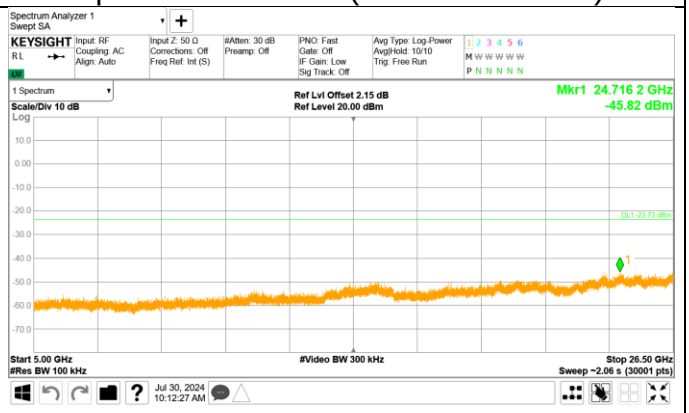
Out-of-Band Emissions	
Channel 11 (2462MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

802.11 N HT40

Out-of-Band Emissions	
Channel 3 (2422MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

Out-of-Band Emissions	
Channel 6 (2437MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

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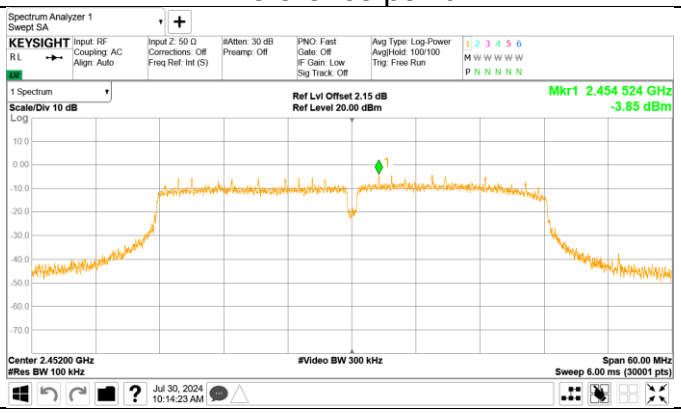
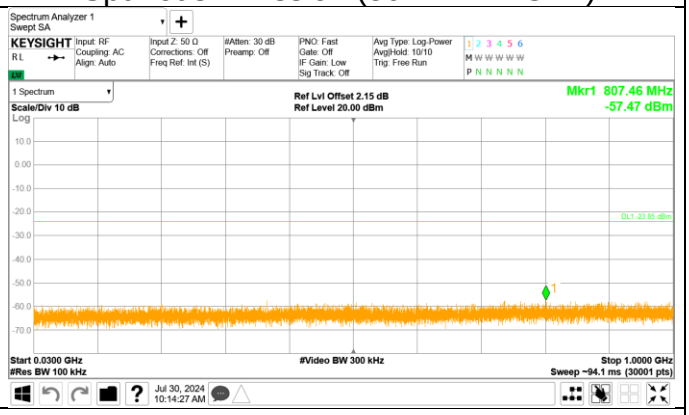
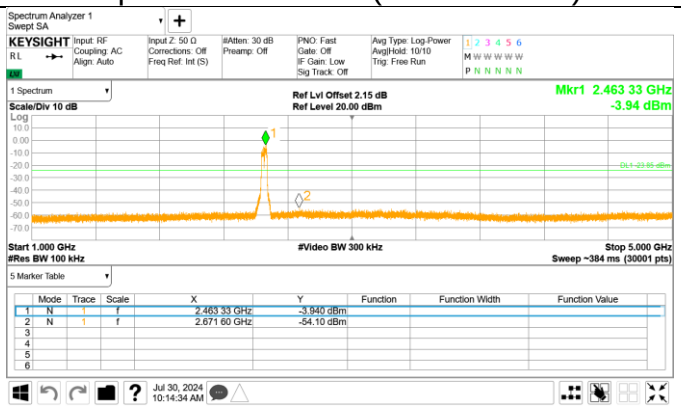
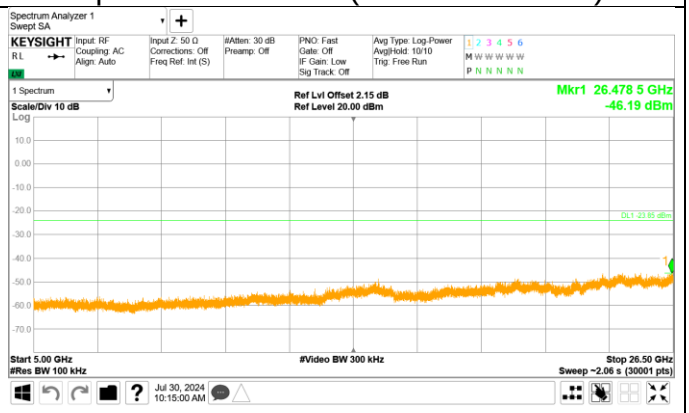
Out-of-Band Emissions	
Channel 9 (2452MHz)	
Reference point	Spurious Emission (30MHz – 1GHz)
	
Spurious Emission (1GHz –5GHz)	Spurious Emission (5GHz –26.5GHz)
	

10.6 Band edge

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 100 kHz, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize, use the peak and delta measurement to record the result.
5. The level displayed must comply with the limit specified in this Section.
6. Repeat above procedures until all frequencies measured were complete and submit all the plots.

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that 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 § 15.247(b)(3), the attenuation required shall be 30 dB instead of 20 dB.

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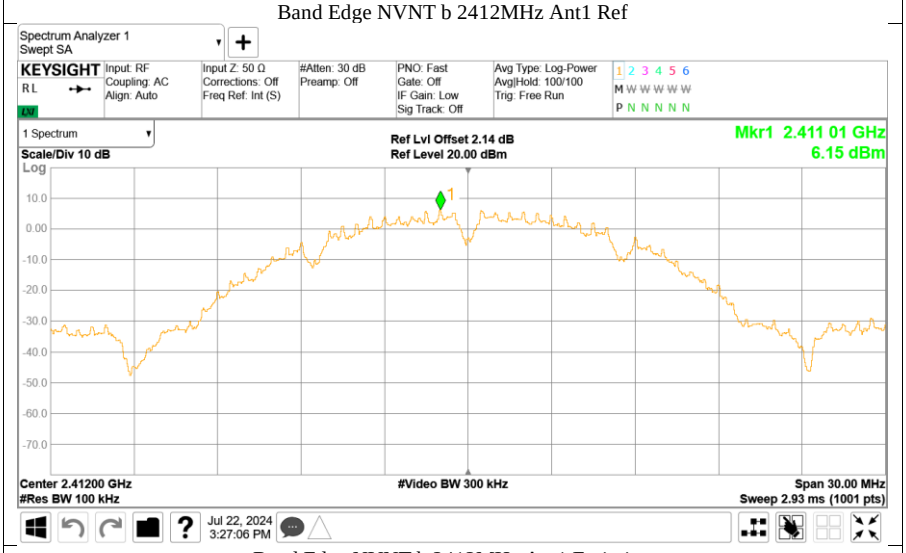
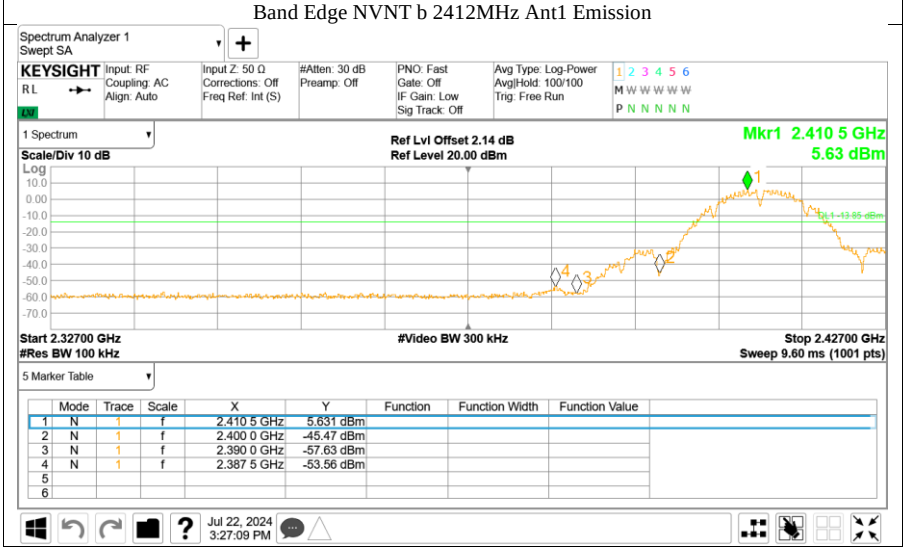
Test result

Test Graphs
Band Edge NVNT b 2412MHz Ant1 Ref



Band Edge NVNT b 2412MHz Ant1 Emission



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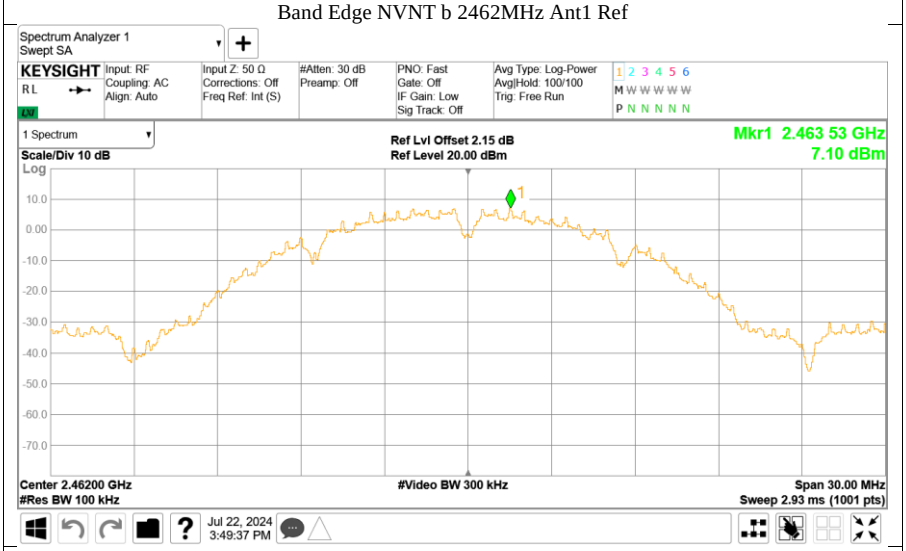
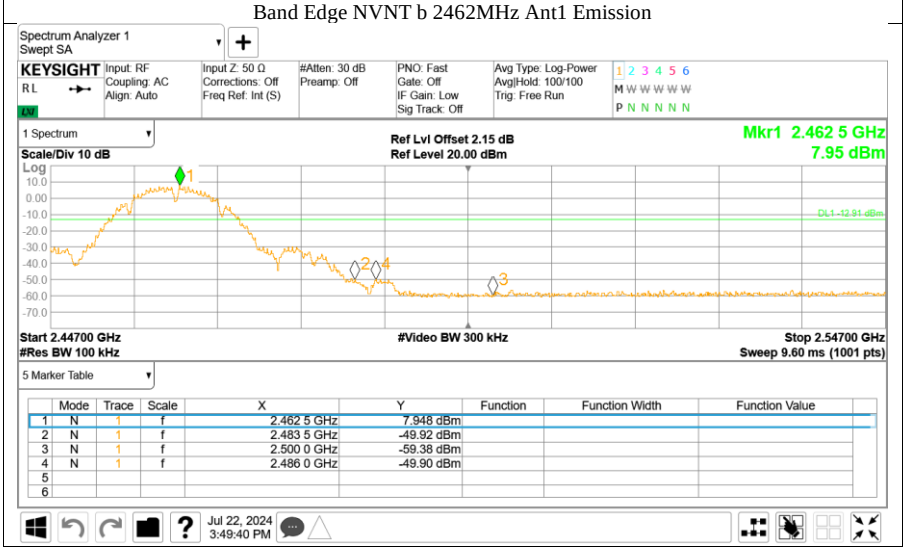
Band Edge NVNT b 2462MHz Ant1 Ref



Band Edge NVNT b 2462MHz Ant1 Emission



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.462 5 GHz	7.948 dBm			
2	N	1	f	2.483 5 GHz	-49.92 dBm			
3	N	1	f	2.500 0 GHz	-59.38 dBm			
4	N	1	f	2.486 0 GHz	-49.90 dBm			
5								
6								

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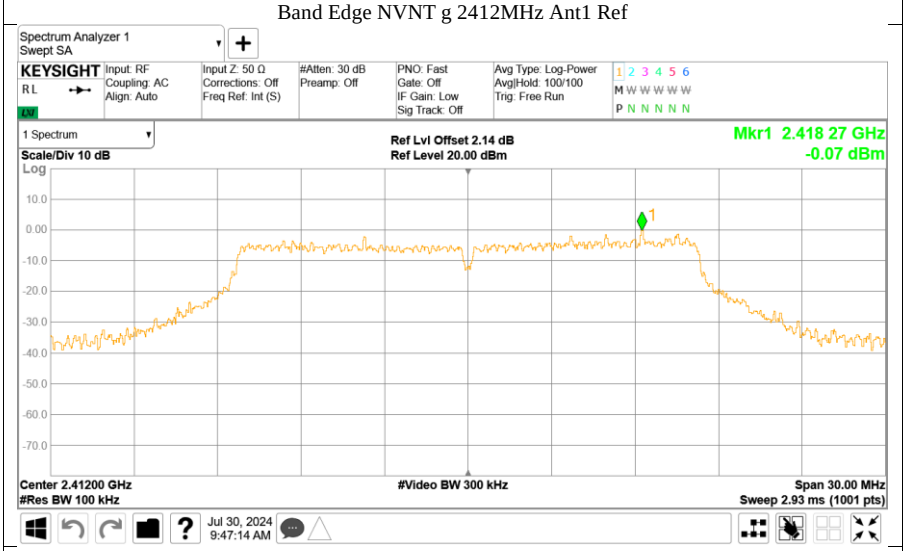
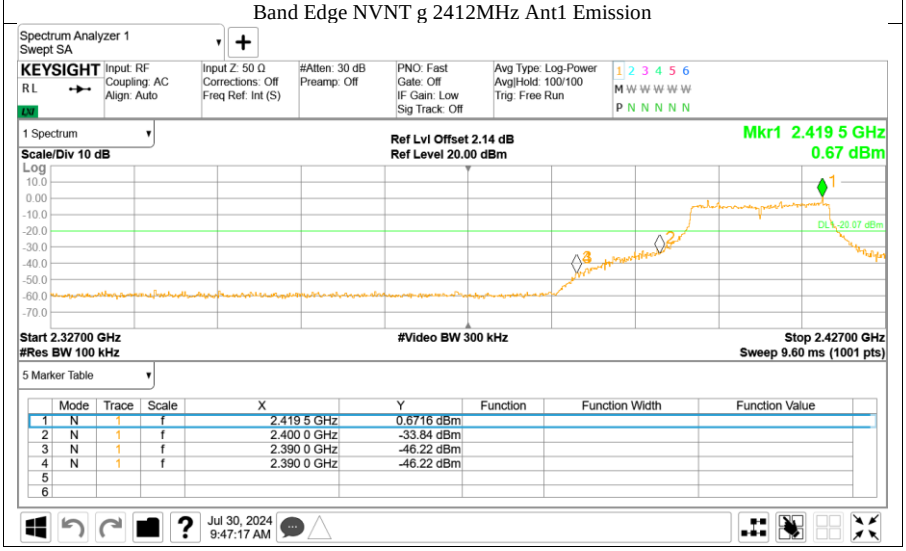
Band Edge NVNT g 2412MHz Ant1 Ref



Band Edge NVNT g 2412MHz Ant1 Emission



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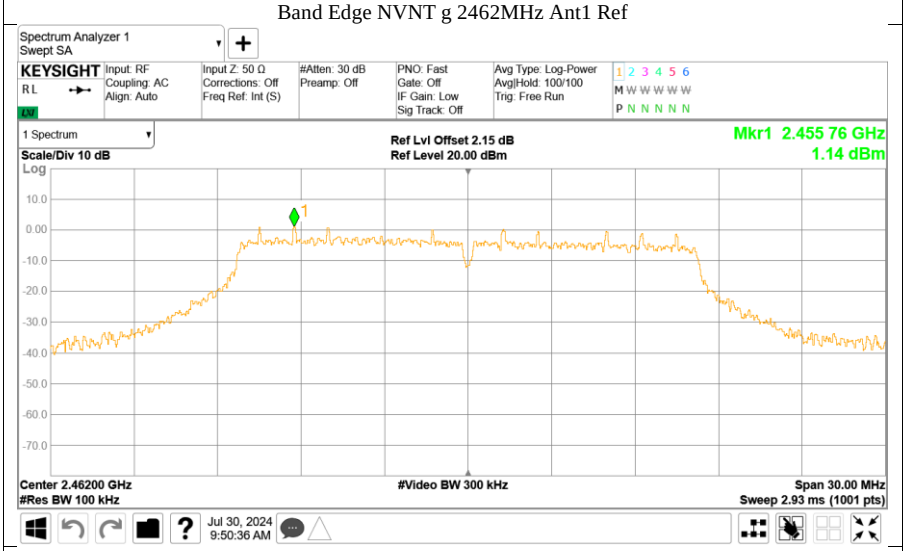
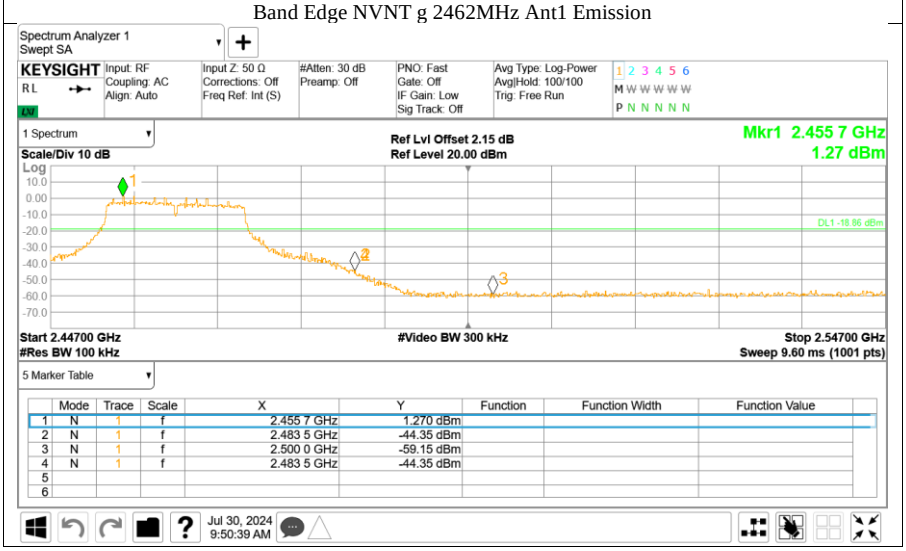
Band Edge NVNT g 2462MHz Ant1 Ref



Band Edge NVNT g 2462MHz Ant1 Emission



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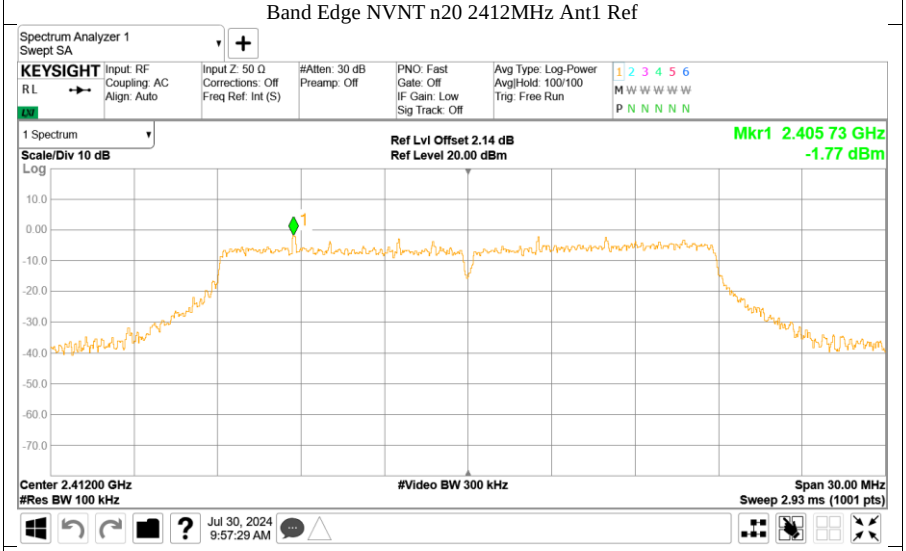
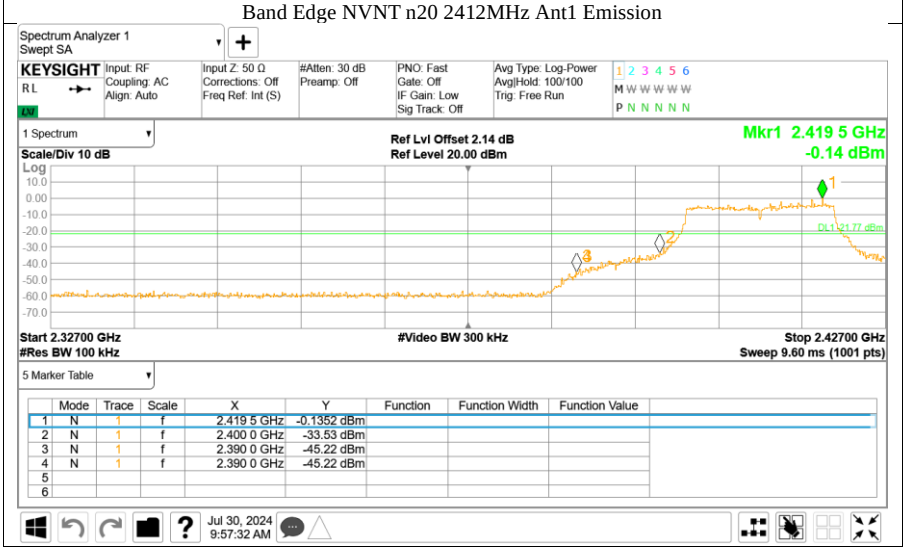
Band Edge NVNT n20 2412MHz Ant1 Ref



Band Edge NVNT n20 2412MHz Ant1 Emission



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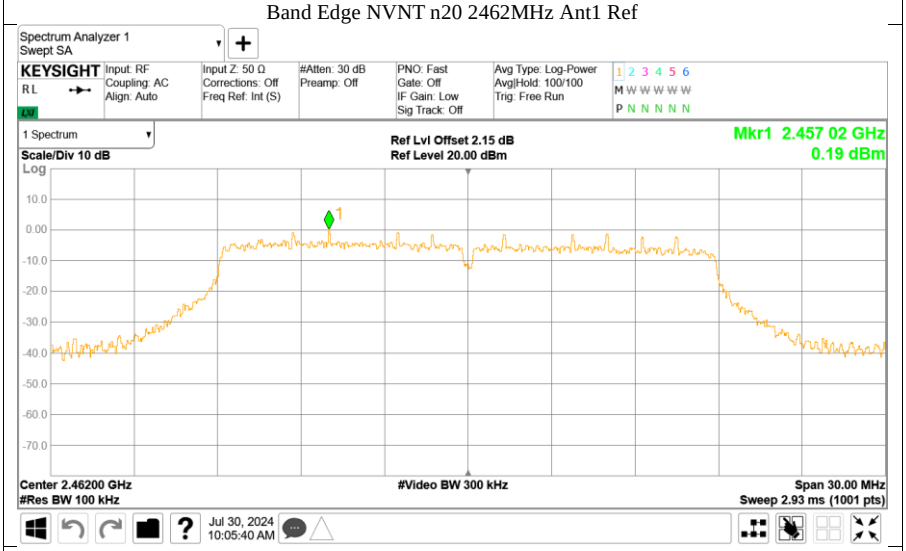
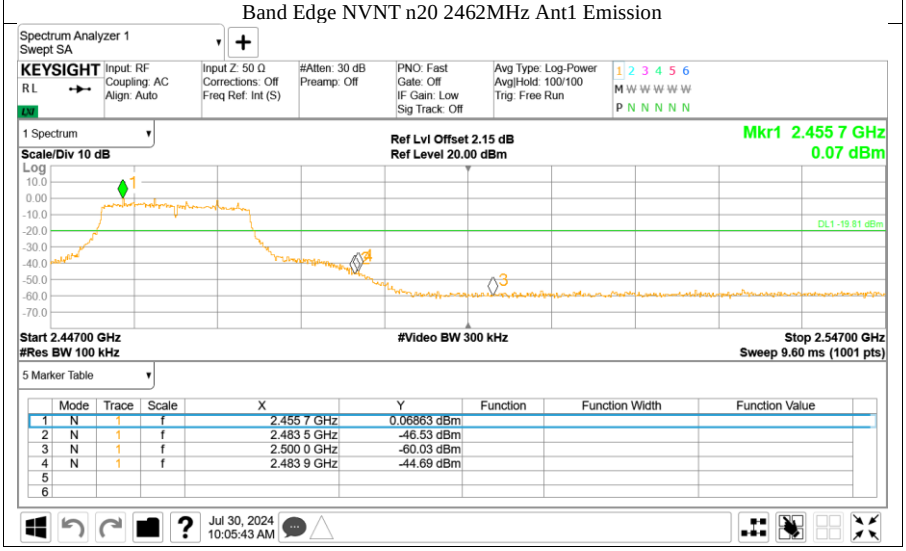
Band Edge NVNT n20 2462MHz Ant1 Ref



Band Edge NVNT n20 2462MHz Ant1 Emission



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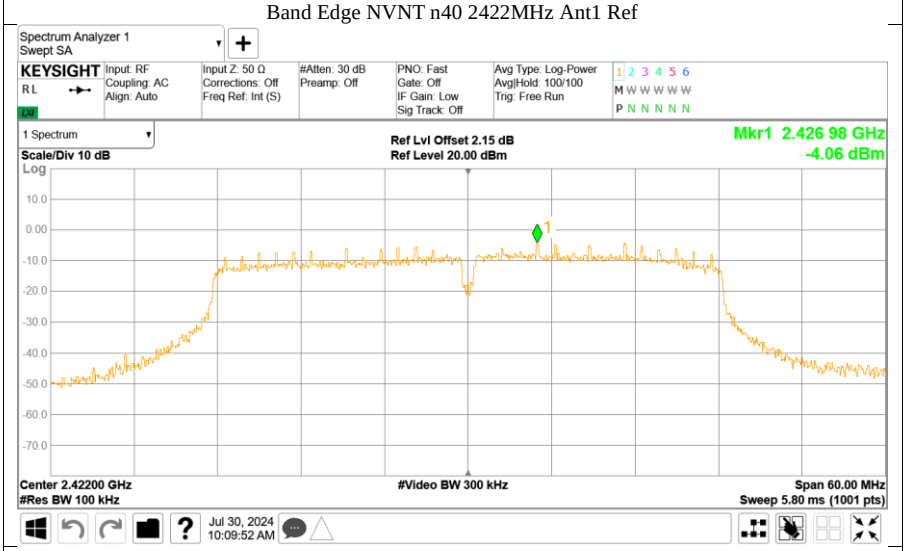
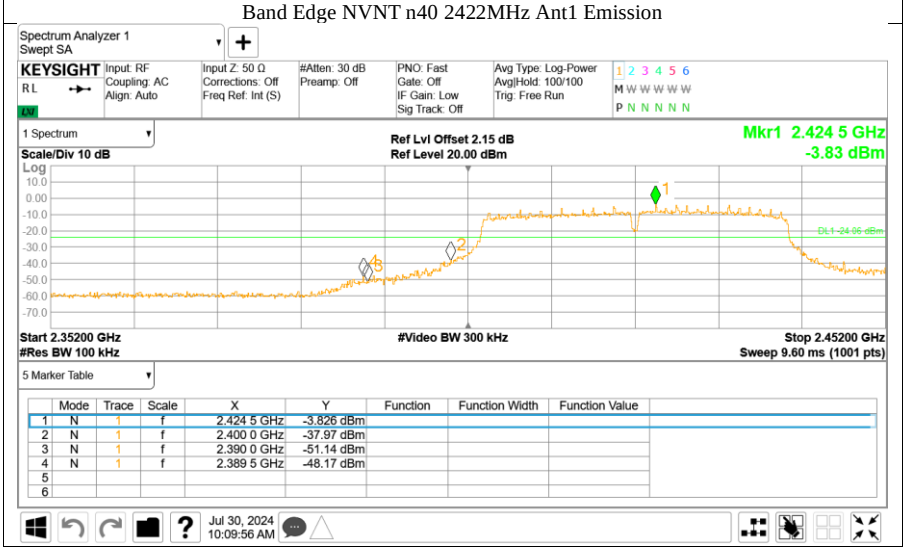
Band Edge NVNT n40 2422MHz Ant1 Ref



Band Edge NVNT n40 2422MHz Ant1 Emission



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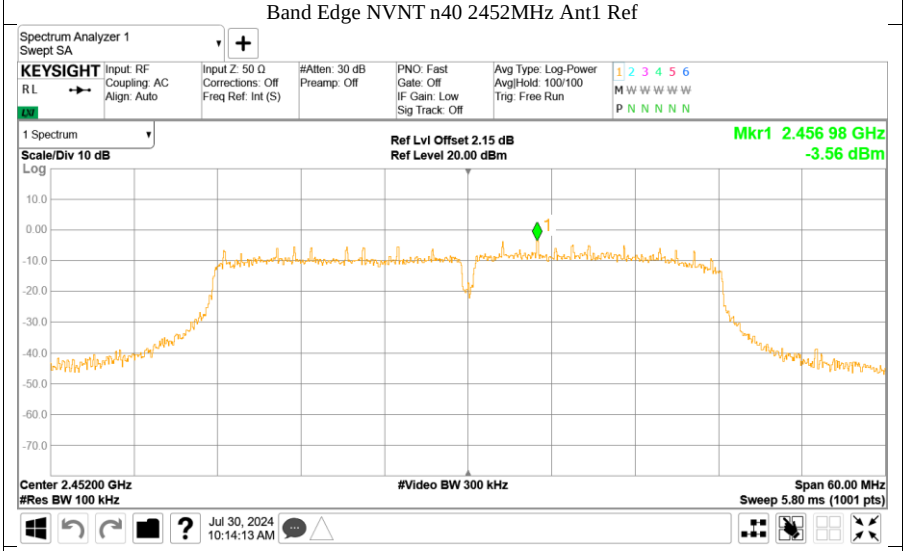
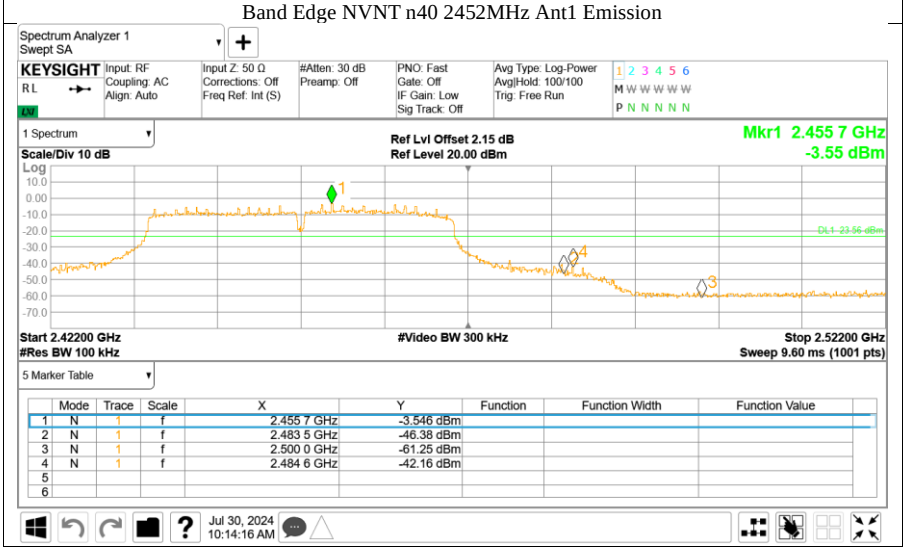
Band Edge NVNT n40 2452MHz Ant1 Ref



Band Edge NVNT n40 2452MHz Ant1 Emission



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10.7 Spurious radiated emissions for transmitter

Test Method

1. The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. Use the following spectrum analyzer settings According to C63.10

   1) Procedure for Unwanted Emissions Measurements Below 1000 MHz

   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 100 kHz to 120kHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

   2) For Peak unwanted emissions Above 1GHz:

   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 1MHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

   Procedures for average unwanted emissions measurements above 1GHz

   a) RBW = 1MHz.
   b) VBW \ [3 × RBW].
   c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
   d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
   e) Sweep time = auto.
   f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
   g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
   1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

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2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission (AV) at frequency above 1GHz.

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that 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 § 15.247(b)(3), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength 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).

Frequency MHz	Field Strength μV/m	Field Strength dBμV/m	Detector	Measurement distance meters
0.009-0.490	2400/F(kHz)	48.5-13.8	AV	300
0.490-1.705	24000/F(kHz)	33.8-23.0	QP	30
1.705-30	30	29.5	QP	30
30-88	100	40	QP	3
88-216	150	43.5	QP	3
216-960	200	46	QP	3
960-1000	500	54	QP	3
Above 1000	500	54	AV	3
Above 1000	5000	74	PK	3

Note 1: Limit 3m(dBμV/m)=Limit 300m(dBμV/m)+40Log(300m/3m) (Below 30MHz)
Note 2: Limit 3m(dBμV/m)=Limit 30m(dBμV/m)+40Log(30m/3m) (Below 30MHz)

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Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.
Data of measurement within frequency range 9kHz-30MHz and 18-25GHz is the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so test data does not present in this report.

Pre-scan with three orthogonal axis and worst case as X axis listed below table

Test mode:2.4G_802.11b_2412MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4823.94	44.10	74.00	29.90	PK	Hor
2388.37	44.53	74.00	29.47	PK	Hor
4823.41	43.45	74.00	30.55	PK	Ver
2387.78	48.87	74.00	25.13	PK	Ver

Test mode:2.4G_802.11b_2437MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4873.88	43.60	74.00	30.40	PK	Hor
4873.88	42.63	74.00	31.37	PK	Ver

Test mode:2.4G_802.11b_2462MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
2483.50	55.68	74.00	18.32	PK	Ver
2483.50	50.40	54.00	3.60	AV	Ver
2483.66	51.12	74.00	22.88	PK	Hor
4923.28	41.46	74.00	32.54	PK	Hor
4923.81	42.22	74.00	31.78	PK	Ver

Test mode:2.4G_802.11g_2412MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
2389.79	64.28	74.00	9.72	PK	Ver
2389.79	46.80	54.00	7.20	AV	Ver
2389.81	58.63	74.00	15.37	PK	Hor
2389.81	43.80	54.00	10.20	AV	Hor
4822.88	42.01	74.00	31.99	PK	Hor
4825.00	41.44	74.00	32.56	PK	Ver

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Test mode:2.4G_802.11g_2437MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4873.88	41.22	74.00	32.78	PK	Hor
4874.41	41.40	74.00	32.60	PK	Ver

Test mode:2.4G_802.11g_2462MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
2483.56	66.63	74.00	7.37	PK	Ver
2483.56	52.40	54.00	1.60	AV	Ver
2483.51	62.57	74.00	11.43	PK	Hor
2483.51	47.90	54.00	6.10	AV	Hor
4924.88	42.56	74.00	31.44	PK	Ver
4924.88	41.03	74.00	32.97	PK	Hor

Test mode:2.4G_802.11n20_2412MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4824.47	41.43	74.00	32.57	PK	Ver
4824.47	41.33	54.00	12.67	AV	Ver
2390.00	59.67	74.00	14.33	PK	Hor
2390.00	44.20	54.00	9.80	AV	Hor
2389.49	63.70	74.00	10.30	PK	Ver
2389.49	47.70	74.00	26.30	PK	Hor

Test mode:2.4G_802.11n20_2437MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4873.88	41.15	74.00	32.85	PK	Hor
4873.88	40.91	74.00	33.09	PK	Ver

Test mode:2.4G_802.11n20_2462MHz					
Frequency MHz	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4923.28	41.43	74.00	32.57	PK	Hor
4923.28	40.44	74.00	33.56	PK	Ver
2483.59	65.37	74.00	8.63	PK	Hor
2483.59	48.30	54.00	5.70	AV	Hor
2483.53	69.38	74.00	4.62	PK	Ver
2483.53	52.70	54.00	1.30	AV	Ver

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Test mode:2.4G_802.11n40_2422MHz					
Frequency MHz	**Measure Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Detector**	**Polarization**
2389.51	59.04	74.00	14.96	PK	Ver
2389.51	47.00	54.00	7.00	AV	Ver
2389.53	57.01	74.00	16.99	PK	Hor
2389.53	43.50	54.00	10.50	AV	Hor
4824.47	41.33	74.00	32.67	PK	Ver
4824.47	41.43	74.00	32.57	PK	Hor

Test mode:2.4G_802.11n40_2437MHz					
Frequency MHz	**Measure Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Detector**	**Polarization**
4873.88	40.91	74.00	33.09	PK	Ver
4873.88	41.15	74.00	32.85	PK	Hor

Test mode:2.4G_802.11n40_2452MHz					
Frequency MHz	**Measure Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Detector**	**Polarization**
2483.55	62.92	74.00	11.08	PK	Ver
2483.55	53.60	54.00	0.40	AV	Ver
2483.53	60.67	74.00	13.33	PK	Hor
2483.53	49.20	54.00	4.80	AV	Hor
4923.28	40.44	74.00	33.56	PK	Ver
4923.28	41.43	74.00	32.57	PK	Hor

Remark:
(1) Emission level= Original Receiver Reading + Correct Factor
(2) Correct Factor = Antenna Factor + Cable Loss -Amplifier gain
(3) Margin = limit – Corrected Reading

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The worst case of Radiated Emission below 1GHz: X axis transmitting TX at 2437MHz (802.11n HT40)

30-1000MHz Radiated Emission

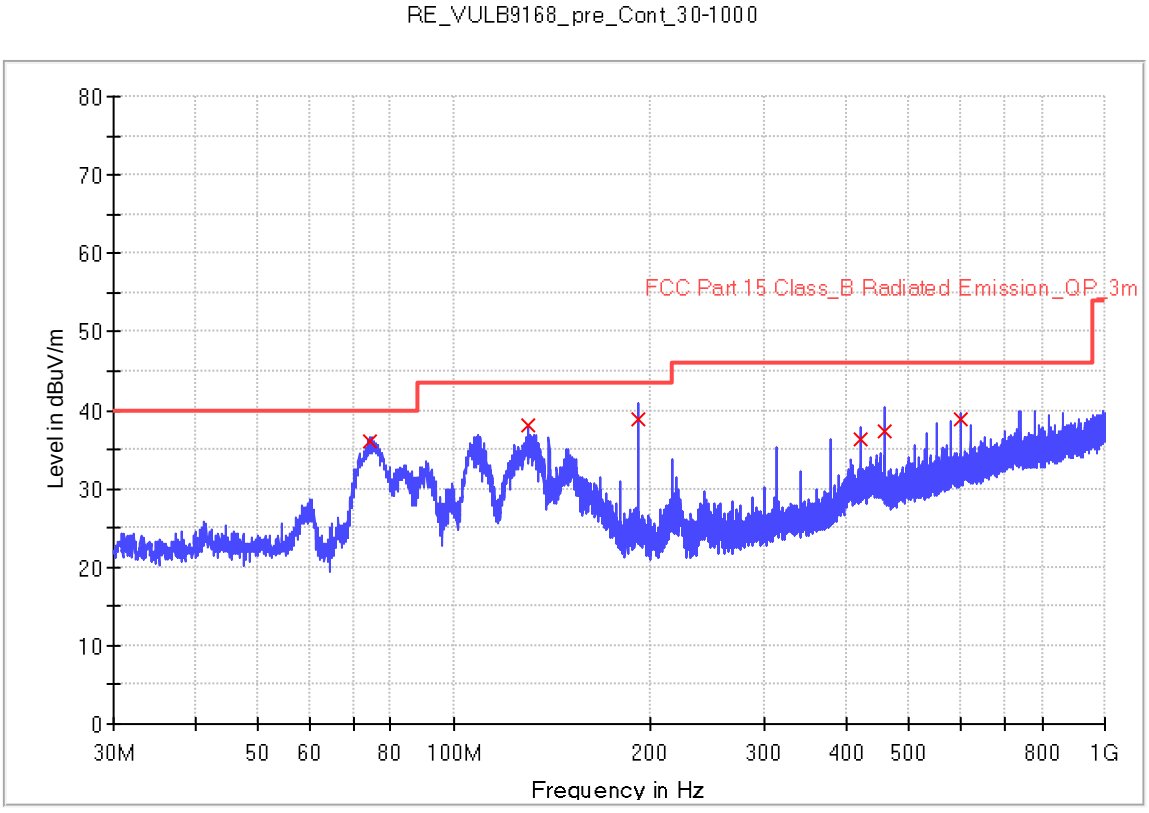
EUT Information

EUT Name:	Acoustic Thermal Imager
Model:	Fotric V0MiX
Client:	FOTRIC INC
Op Cond:	Power on, TX_2437MHz at 802.11n HT40, AC120V/60Hz
Operator:	Chengjie GUO
Test Spec:	FCC Part 15.209(a)
Comment:	Horizontal
Sample No:	SHA-832647-2

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup:	RE_VULB9168
Receiver:	[ESR 3]
Level Unit:	dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB



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Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)
74.120000	36.1	1000.0	120.000	134.0	H	116.0	17.8	3.9
130.400000	38.0	1000.0	120.000	223.0	H	138.0	19.3	5.5
192.000000	39.0	1000.0	120.000	113.0	H	154.0	18.3	4.5
420.000000	36.3	1000.0	120.000	221.0	H	169.0	24.7	9.7
460.000000	37.3	1000.0	120.000	111.0	H	159.0	25.8	8.7
600.040000	38.9	1000.0	120.000	116.0	H	178.0	29.1	7.1

(continuation of the "Limit and Margin" table from column 16 ...)

Frequency (MHz)	Limit - QPK (dBuV/m)	Comment
74.120000	40.0	
130.400000	43.5	
192.000000	43.5	
420.000000	46.0	
460.000000	46.0	
600.040000	46.0	

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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30-1000MHz Radiated Emission

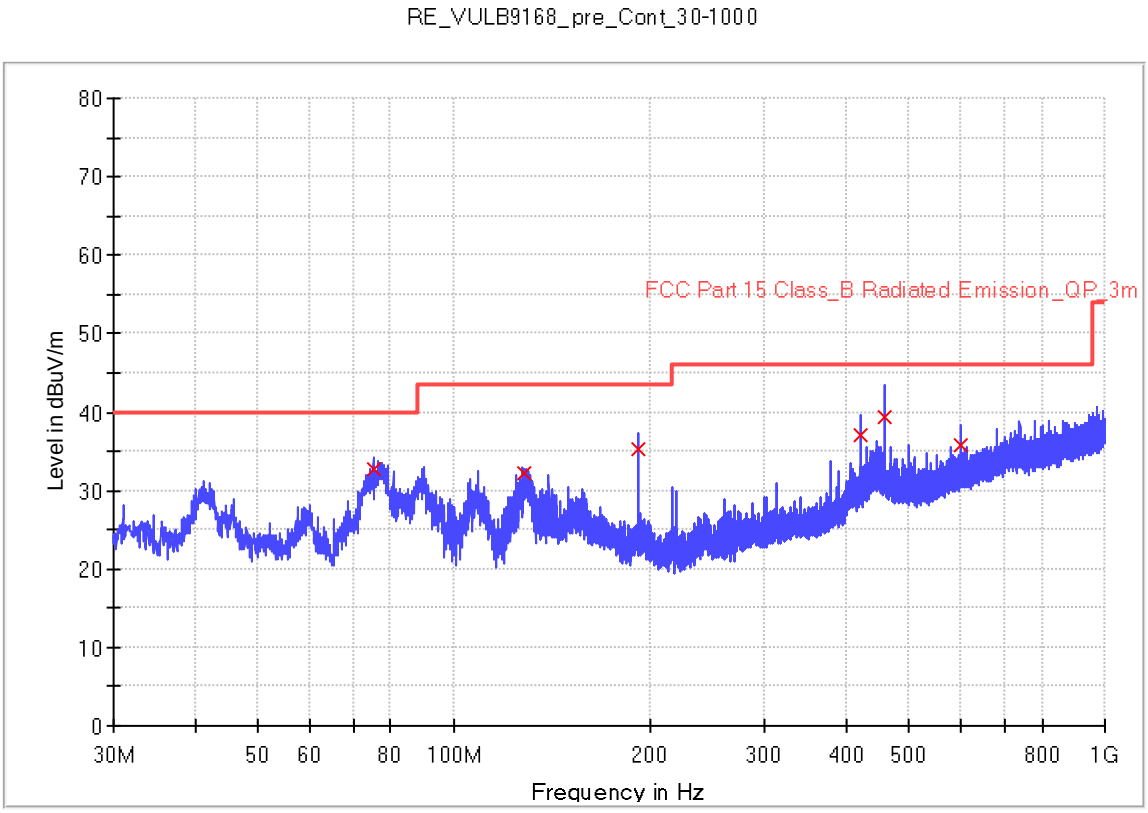
EUT Information

EUT Name:	Acoustic Thermal Imager
Model:	Fotric V0MiX
Client:	FOTRIC INC
Op Cond:	Power on, TX_2437MHz at 802.11n HT40, AC120V/60Hz
Operator:	Chengjie GUO
Test Spec:	FCC Part 15.209(a)
Comment:	Vertical
Sample No:	SHA-832647-2

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup:	RE_VULB9168
Receiver:	[ESR 3]
Level Unit:	dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB



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Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)
75.120000	32.7	1000.0	120.000	135.0	V	106.0	17.6	7.3
128.360000	32.3	1000.0	120.000	125.0	V	138.0	19.0	11.2
191.960000	35.2	1000.0	120.000	119.0	V	162.0	18.3	8.3
420.000000	37.2	1000.0	120.000	245.0	V	195.0	24.7	8.8
460.000000	39.4	1000.0	120.000	260.0	V	206.0	25.8	6.6
600.040000	35.8	1000.0	120.000	281.0	V	223.0	29.1	10.2

(continuation of the "Limit and Margin" table from column 16 ...)

Frequency (MHz)	Limit - QPK (dBuV/m)	Comment
75.120000	40.0	
128.360000	43.5	
191.960000	43.5	
420.000000	46.0	
460.000000	46.0	
600.040000	46.0	

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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11 Test Equipment List

List of Test Instruments
Test Site1

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
C	Signal spectrum analyzer	Agilent	N9020B	MY59050168	2024-2-19	2025-2-18
	Wideband power sensor	Rohde & Schwarz	NRP-Z81	105903	2024-2-19	2025-2-18
	10dB Attenuator	Aeroflex Weinschel	CG-4689	93459	2024-2-19	2025-2-18
RE	EMI Test Receiver	Rohde & Schwarz	ESR3	101906	2023-8-1	2024-7-31
	EMI Test Receiver	Rohde & Schwarz	ESR3	101906	2024-8-1	2025-7-31
	Signal Analyzer	Rohde & Schwarz	FSV40	101091	2023-8-1	2024-7-31
	Signal Analyzer	Rohde & Schwarz	FSV40	101091	2024-8-1	2025-7-31
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	961	2021-9-23	2024-9-22
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	961	2024-8-30	2025-8-29
	Horn Antenna	Rohde & Schwarz	HF907	102393	2024-4-14	2027-4-13
	Pre-amplifier	Shenzhen HzEMC	HPA-081843	HYPA23026	2024-4-16	2025-4-15
	Loop antenna	Rohde & Schwarz	HFH2-Z2	100443	2024-6-26	2025-6-25
	DOUBLE-RIDGED WAVEGUIDE HORN WITH PRE-AMPLIFIER (18 GHZ - 40 GHZ)	ETS-Lindgren	3116C	00246076	2023-7-7	2026-7-6
	3m Semi-anechoic chamber	TDK	9X6X6	----	2024-5-8	2027-5-7
CE	EMI Test Receiver	Rohde & Schwarz	ESR3	101907	2023-8-1	2024-7-31
	EMI Test Receiver	Rohde & Schwarz	ESR3	101907	2024-8-1	2025-7-31
	LISN	Rohde & Schwarz	ENV216	101924	2023-8-1	2024-7-31
	LISN	Rohde & Schwarz	ENV216	101924	2024-8-1	2025-7-31

Measurement Software Information			
Test Item	Software	Manufacturer	Version
C	MTS 8310	MWRFtest	3.0.0.0
	Power Viewer	Rohde & Schwarz	V 11.0
RE	EMC 32	Rohde & Schwarz	V10.50.40
CE	EMC 32	Rohde & Schwarz	V9.15.03

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth and 99% Occupied Bandwidth
- Power spectral density
- Spurious RF conducted emissions
- Band edge

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12 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Items	Extended Uncertainty
Conducted Disturbance at Mains Terminals	150kHz to 30MHz, LISN, 3.16dB
Radiated Disturbance	30MHz to 1GHz, 5.03dB (Horizontal) 5.12dB (Vertical) 1GHz to 18GHz, 5.49dB 18GHz to 40GHz, 5.63dB
Carrier power conducted measurement	50MHz~18GHz, 1.238dB
Spurious Emission Conducted Measurement	9kHz ~40GHz, 1.224dB

Measurement Uncertainty Decision Rule:

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2023, clause 4.3.3.

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13 Photographs of Test Set-ups

Refer to the < Test Setup photos >.

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14 Photographs of EUT

Refer to the < External Photos > & < Internal Photos >.

----------End of Test Report----------

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