

FCC Appendix RF Test Data for 2.4GWIFI

Product Name: Automotive Diagnostic Tool

Test Model: VD700

Environmental Conditions

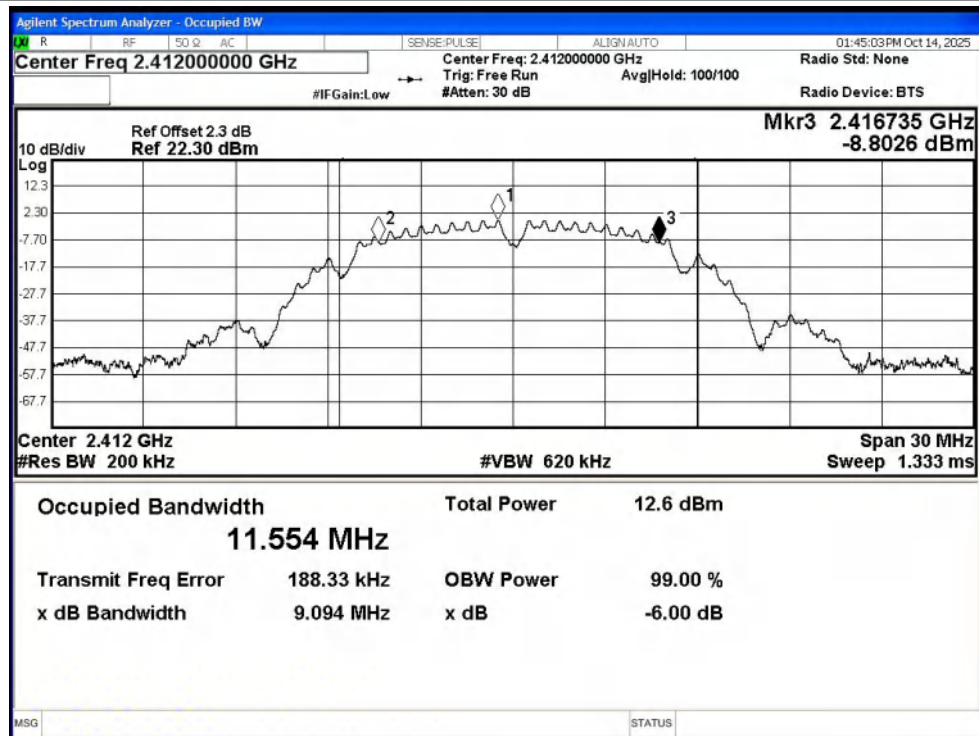
Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Zoey Cao
Supervised by:	Eric Wang

1. -6dB Bandwidth

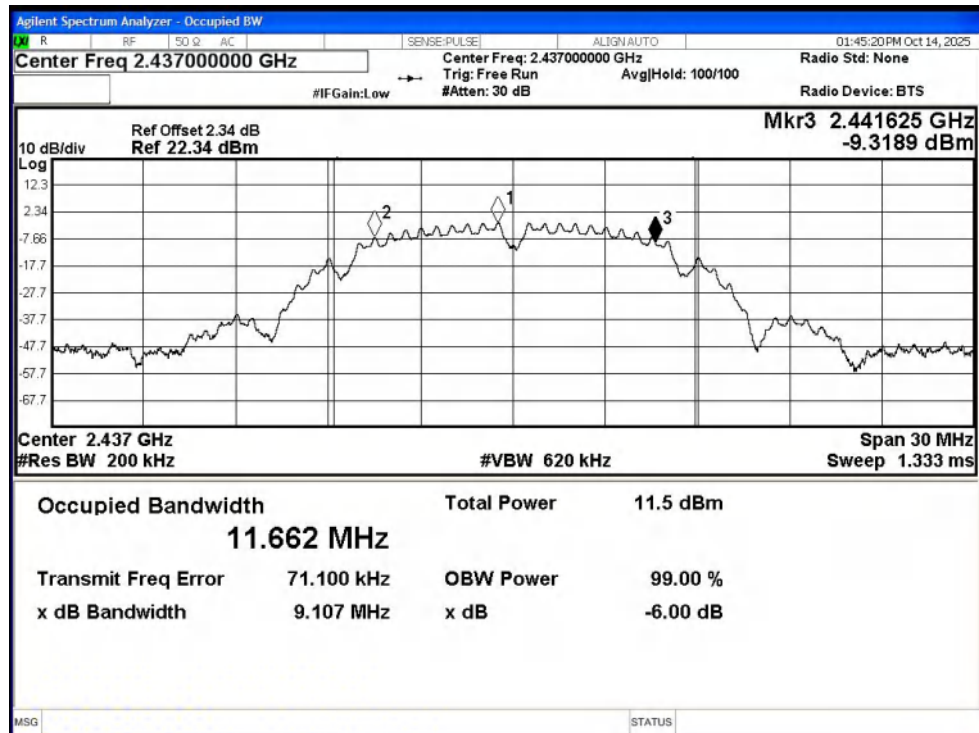
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	9.094	≥ 0.5	Pass
NVNT	b	2437	Ant1	9.107	≥ 0.5	Pass
NVNT	b	2462	Ant1	9.096	≥ 0.5	Pass
NVNT	g	2412	Ant1	16.337	≥ 0.5	Pass
NVNT	g	2437	Ant1	16.377	≥ 0.5	Pass
NVNT	g	2462	Ant1	16.306	≥ 0.5	Pass
NVNT	n20	2412	Ant1	17.321	≥ 0.5	Pass
NVNT	n20	2437	Ant1	17.515	≥ 0.5	Pass
NVNT	n20	2462	Ant1	17.304	≥ 0.5	Pass
NVNT	n40	2422	Ant1	35.861	≥ 0.5	Pass
NVNT	n40	2437	Ant1	35.672	≥ 0.5	Pass
NVNT	n40	2452	Ant1	35.807	≥ 0.5	Pass

Test Graphs

-6dB Bandwidth NVNT b 2412MHz Ant1



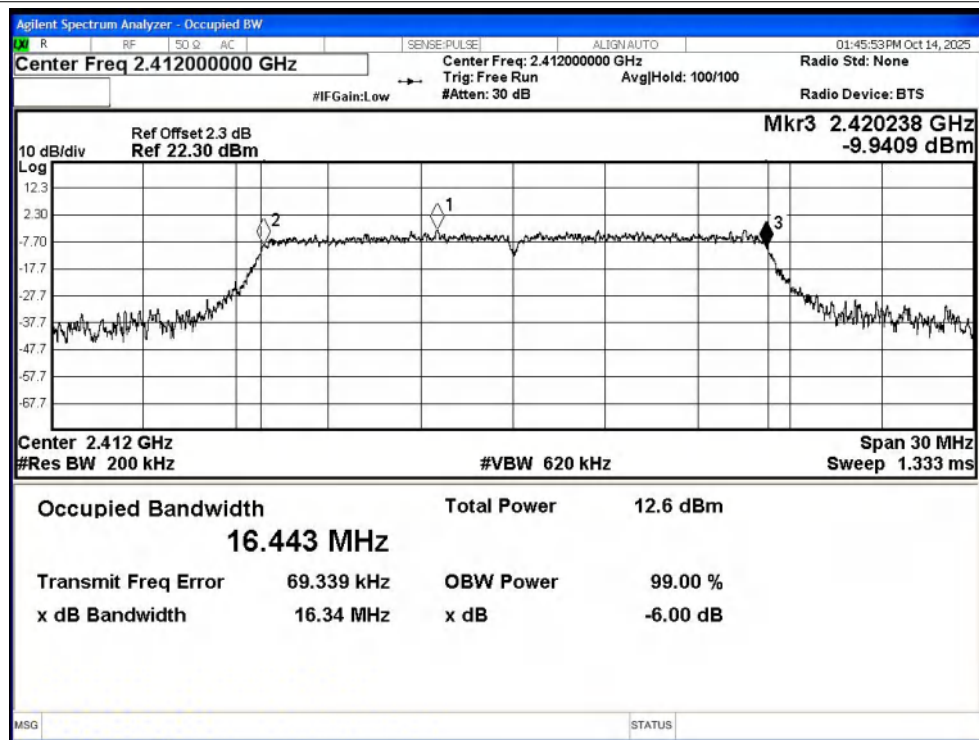
-6dB Bandwidth NVNT b 2437MHz Ant1



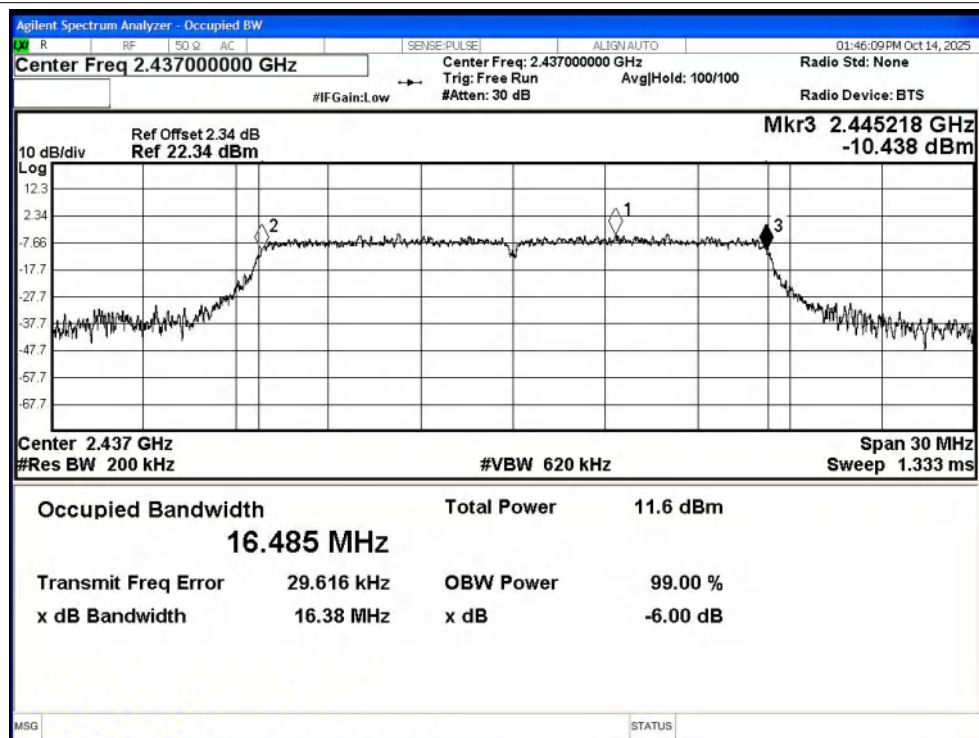
-6dB Bandwidth NVNT b 2462MHz Ant1



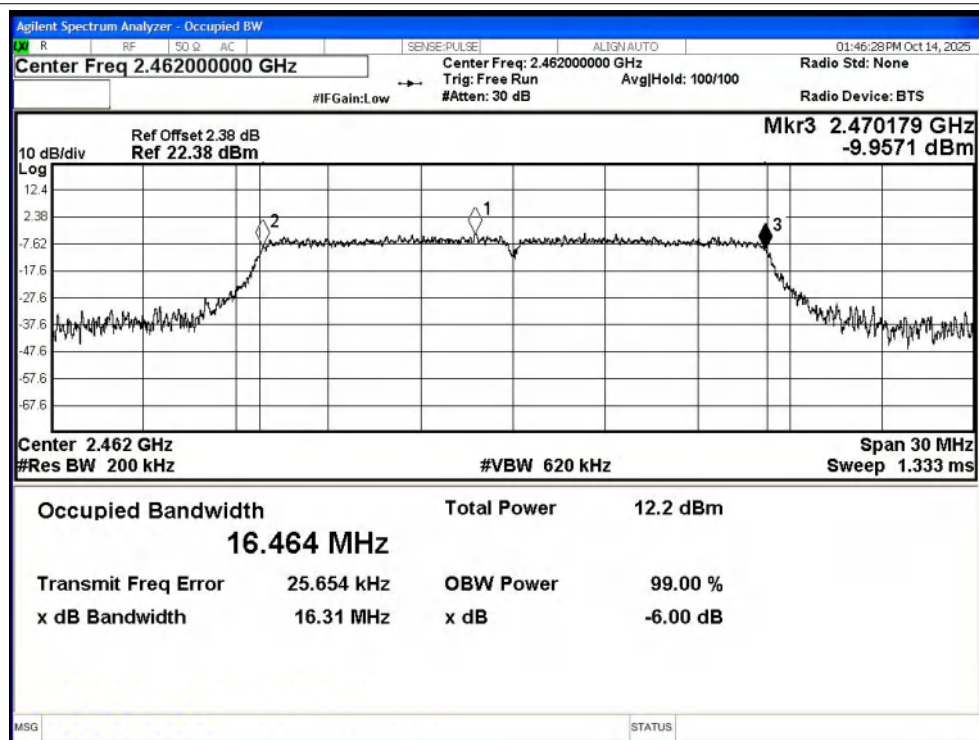
-6dB Bandwidth NVNT g 2412MHz Ant1



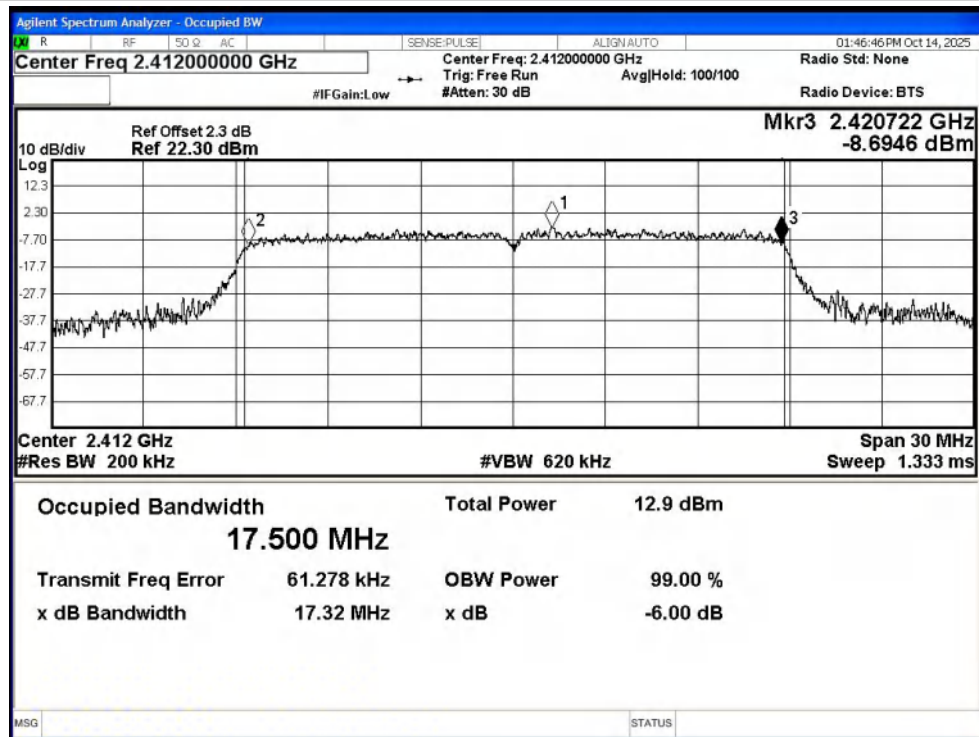
-6dB Bandwidth NVNT g 2437MHz Ant1



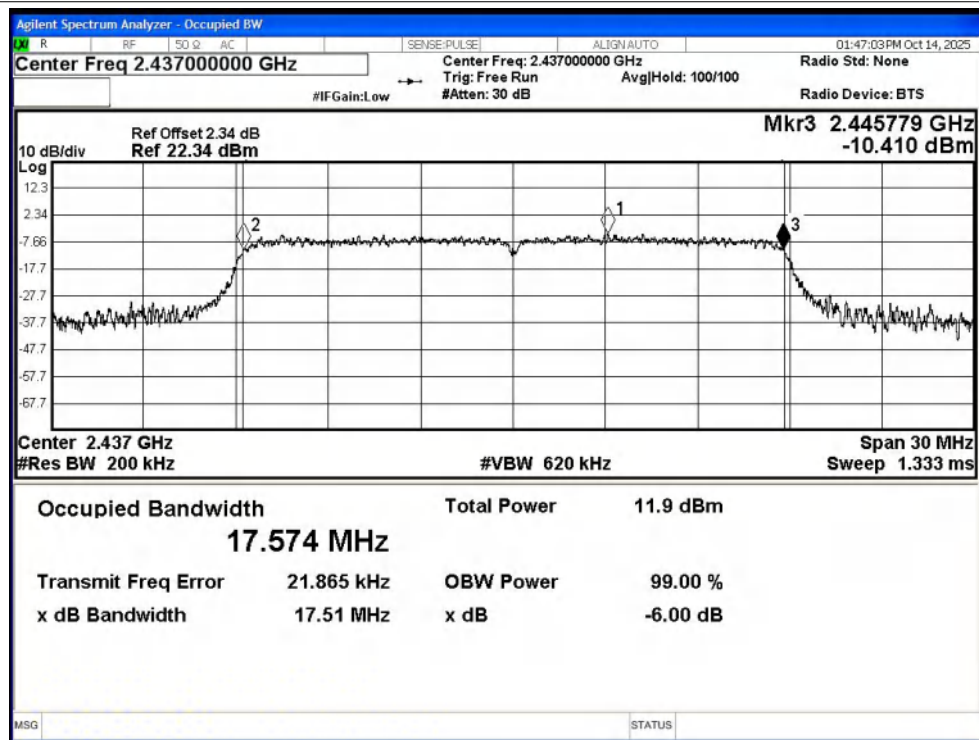
-6dB Bandwidth NVNT g 2462MHz Ant1



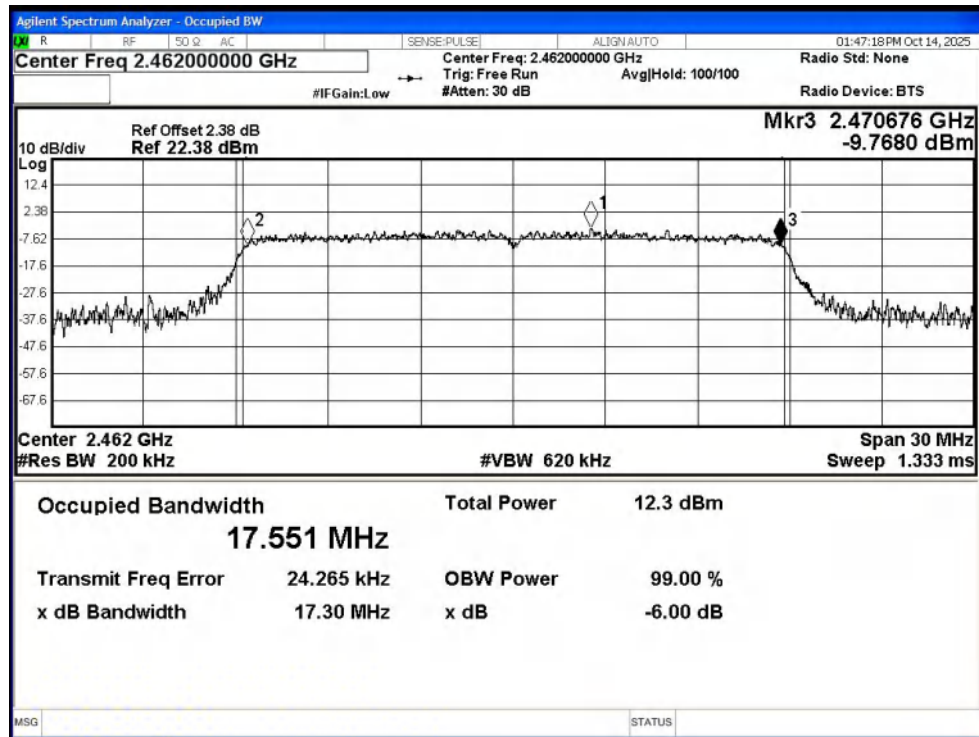
-6dB Bandwidth NVNT n20 2412MHz Ant1



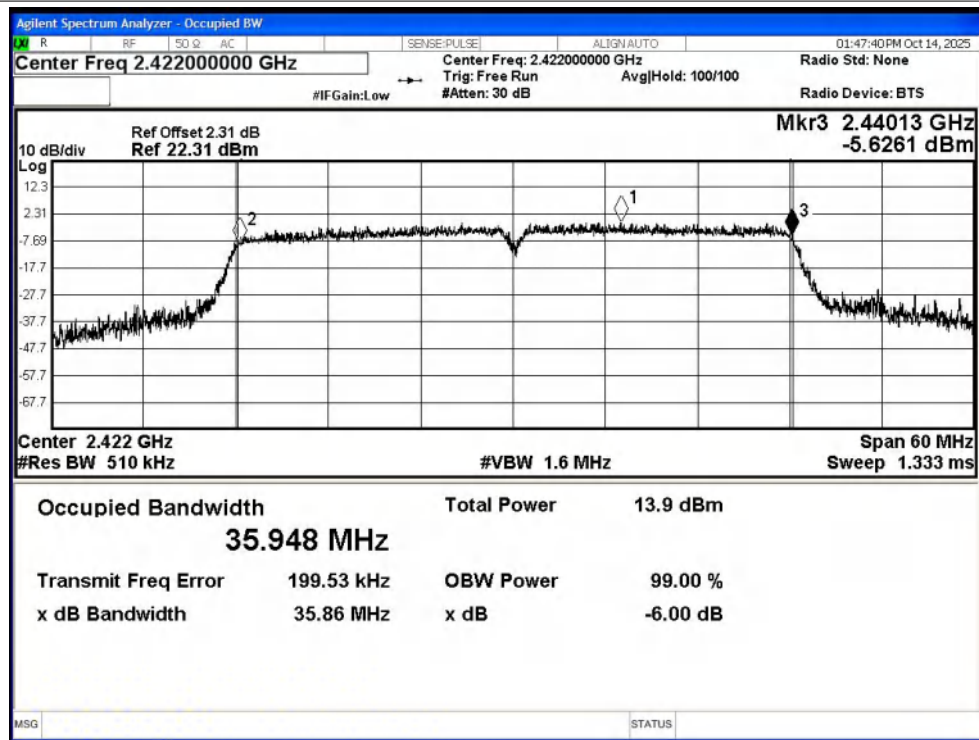
-6dB Bandwidth NVNT n20 2437MHz Ant1



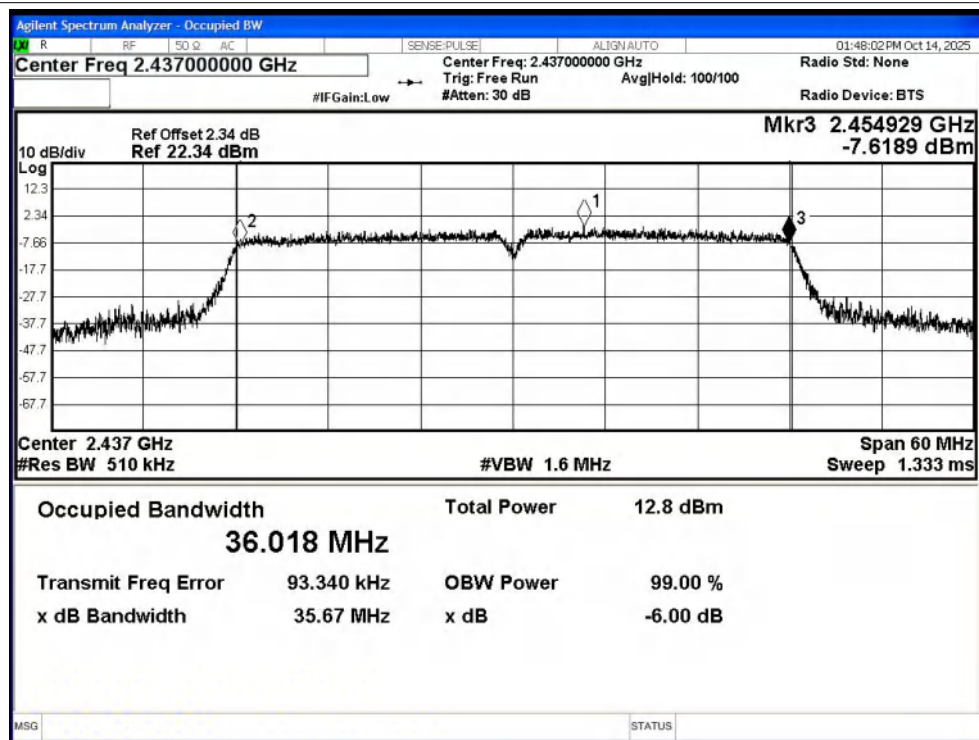
-6dB Bandwidth NVNT n20 2462MHz Ant1



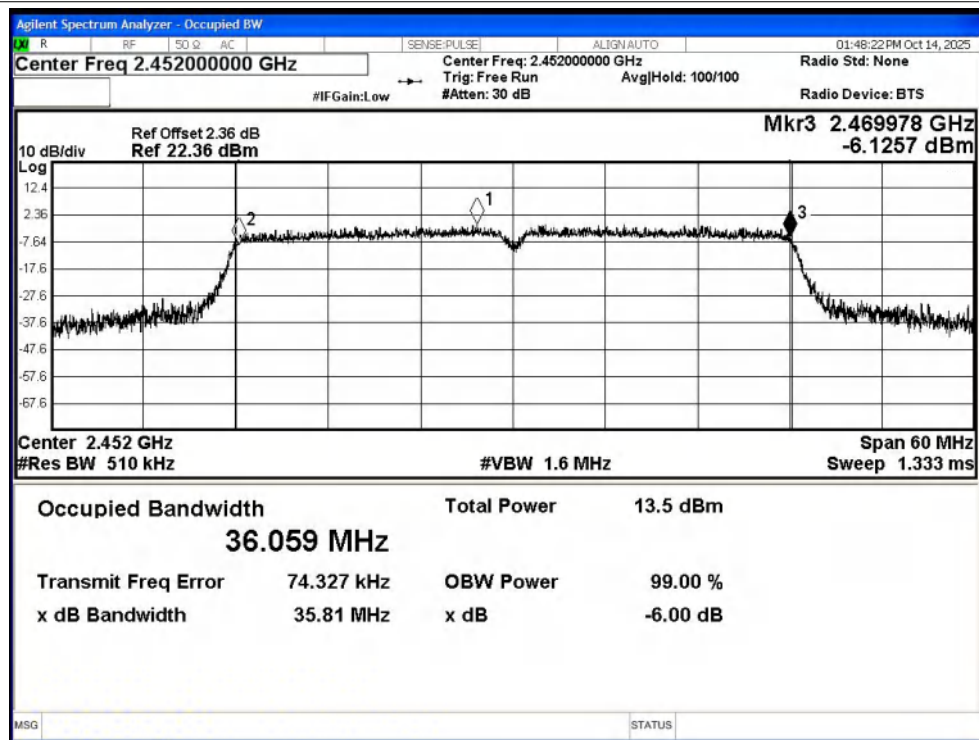
-6dB Bandwidth NVNT n40 2422MHz Ant1



-6dB Bandwidth NVNT n40 2437MHz Ant1



-6dB Bandwidth NVNT n40 2452MHz Ant1



2. Maximum Peak Conducted Output Power

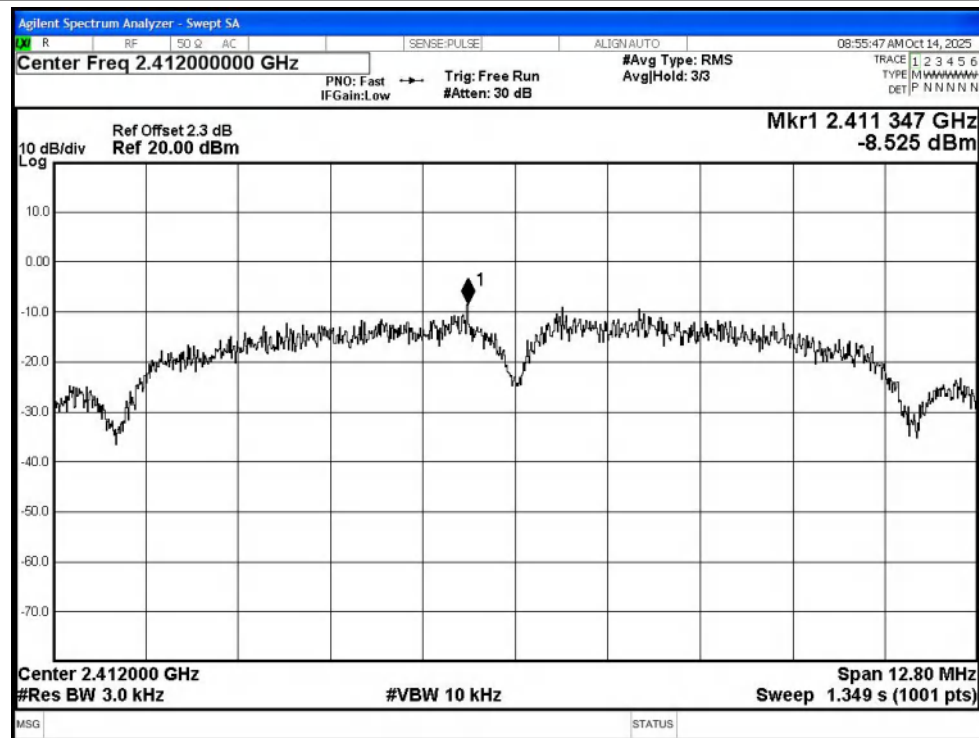
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.01	30	Pass
NVNT	b	2437	Ant1	15.56	30	Pass
NVNT	b	2462	Ant1	14.88	30	Pass
NVNT	g	2412	Ant1	14.39	30	Pass
NVNT	g	2437	Ant1	14.57	30	Pass
NVNT	g	2462	Ant1	14.3	30	Pass
NVNT	n20	2412	Ant1	13.98	30	Pass
NVNT	n20	2437	Ant1	13.05	30	Pass
NVNT	n20	2462	Ant1	13.83	30	Pass
NVNT	n40	2422	Ant1	12.44	30	Pass
NVNT	n40	2437	Ant1	12.11	30	Pass
NVNT	n40	2452	Ant1	12.47	30	Pass

3. Maximum Power Spectral Density Level

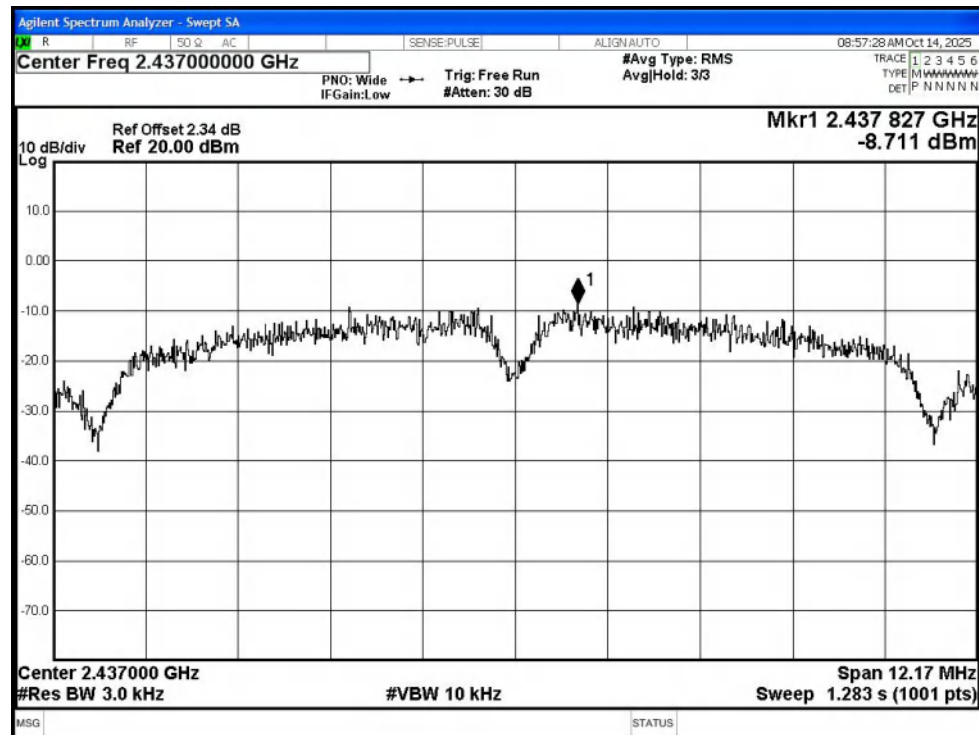
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	-8.53	8	Pass
NVNT	b	2437	Ant1	-8.71	8	Pass
NVNT	b	2462	Ant1	-8.29	8	Pass
NVNT	g	2412	Ant1	-15.93	8	Pass
NVNT	g	2437	Ant1	-16.81	8	Pass
NVNT	g	2462	Ant1	-16.39	8	Pass
NVNT	n20	2412	Ant1	-15.87	8	Pass
NVNT	n20	2437	Ant1	-17.17	8	Pass
NVNT	n20	2462	Ant1	-16.41	8	Pass
NVNT	n40	2422	Ant1	-21.2	8	Pass
NVNT	n40	2437	Ant1	-21.95	8	Pass
NVNT	n40	2452	Ant1	-20.8	8	Pass

Test Graphs

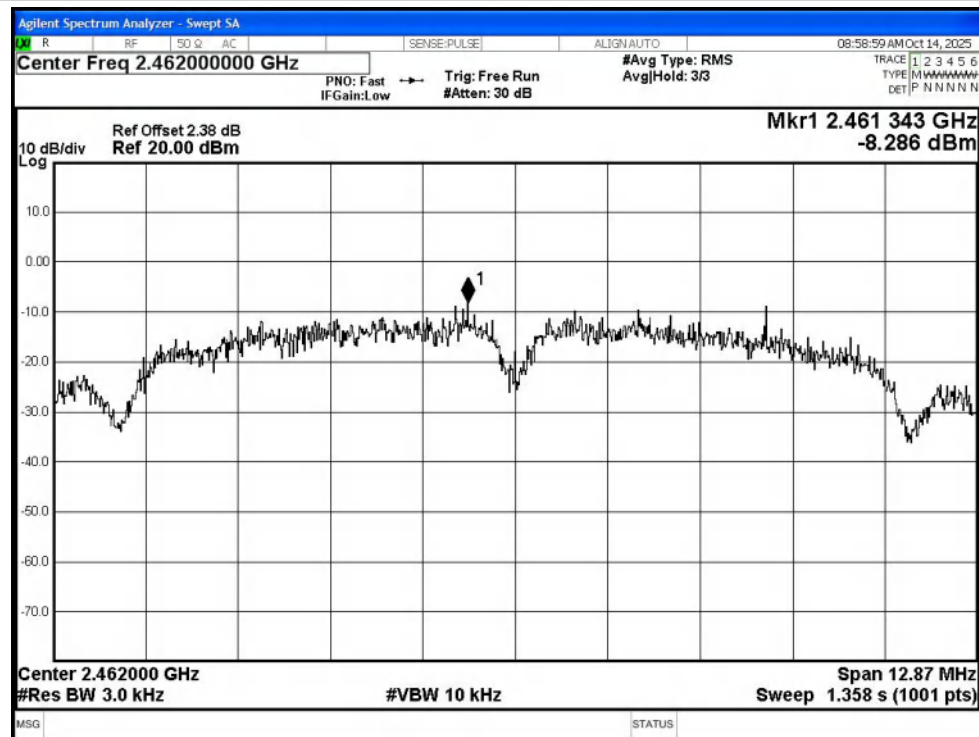
PSD NVNT b 2412MHz Ant1



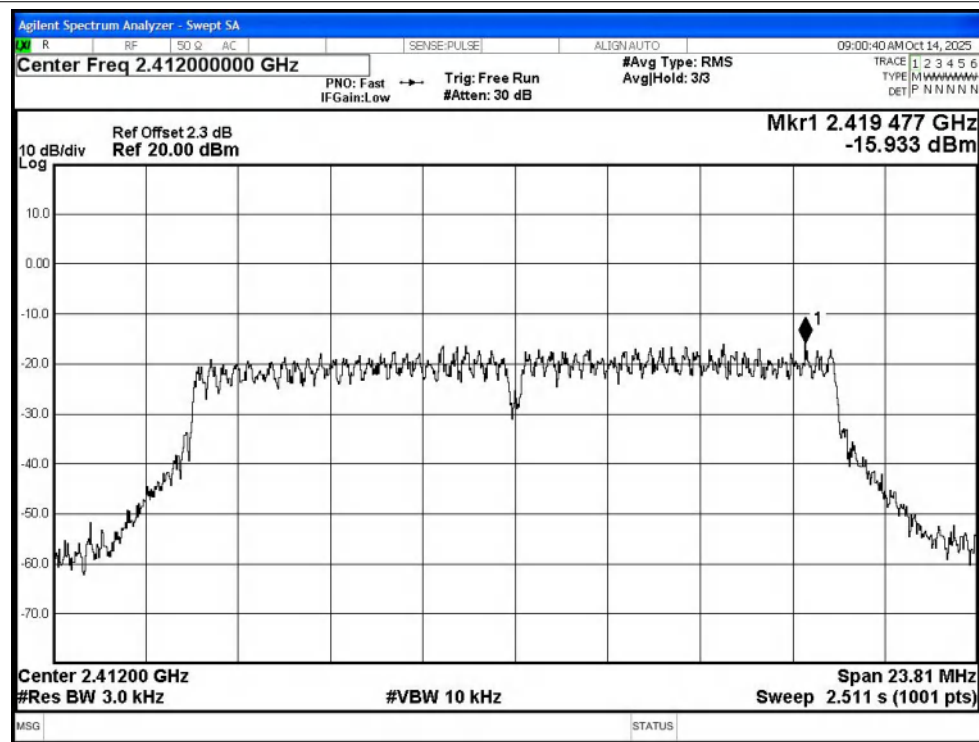
PSD NVNT b 2437MHz Ant1



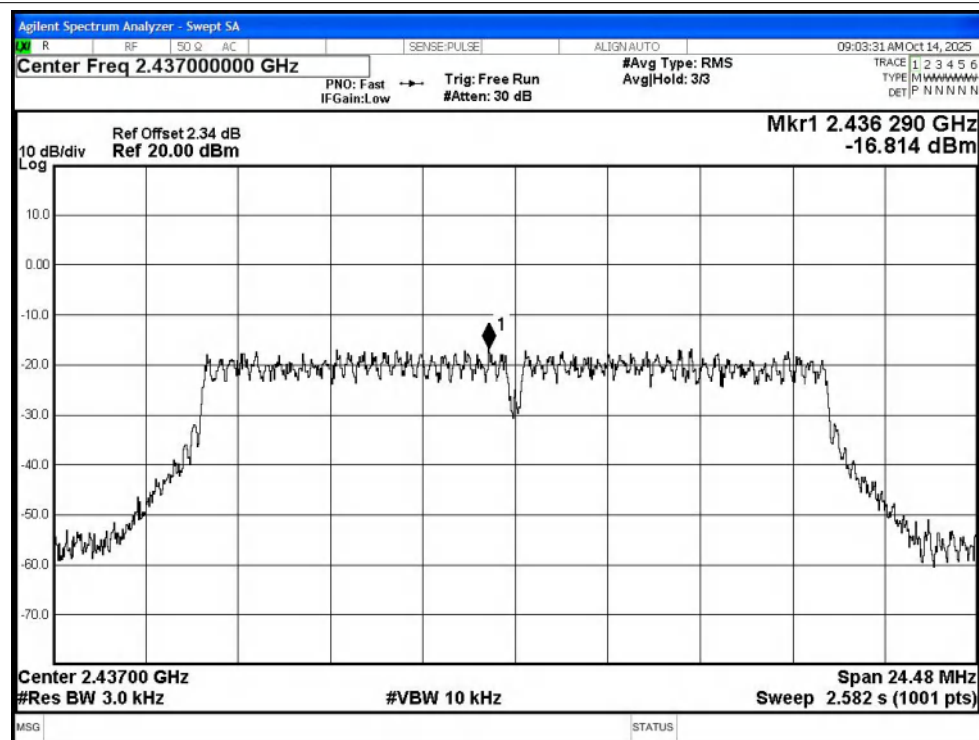
PSD NVNT b 2462MHz Ant1



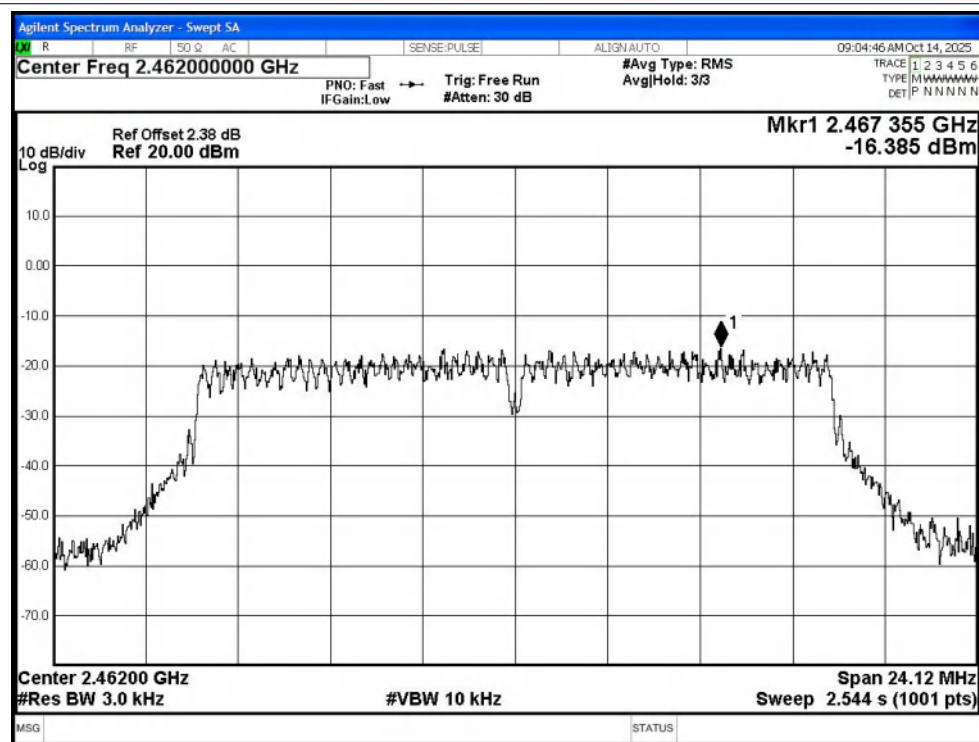
PSD NVNT g 2412MHz Ant1



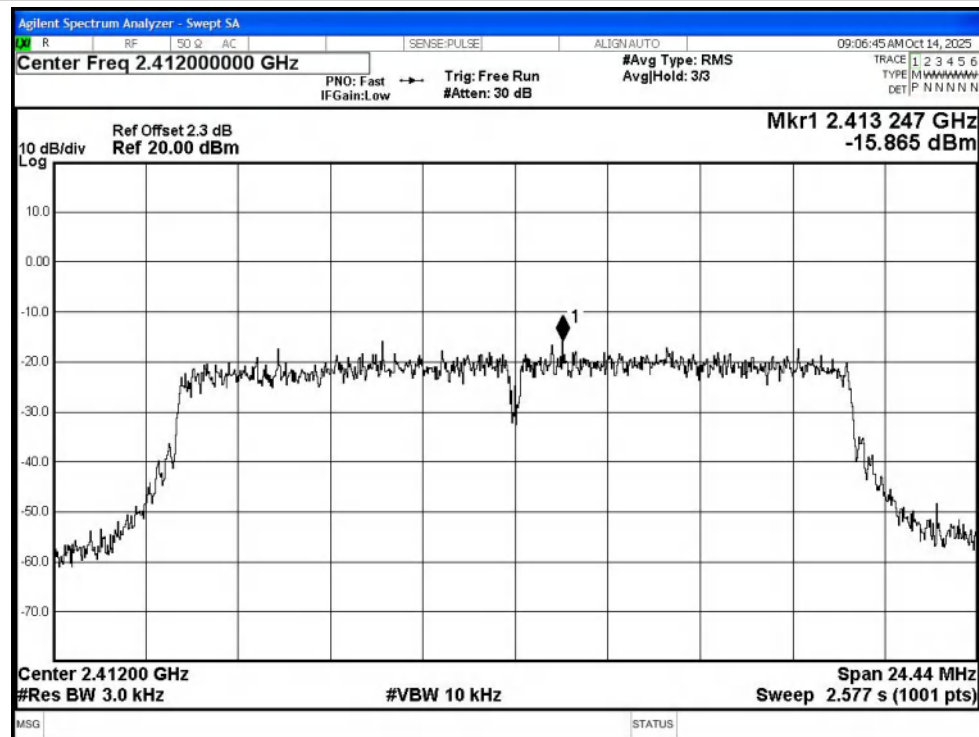
PSD NVNT g 2437MHz Ant1



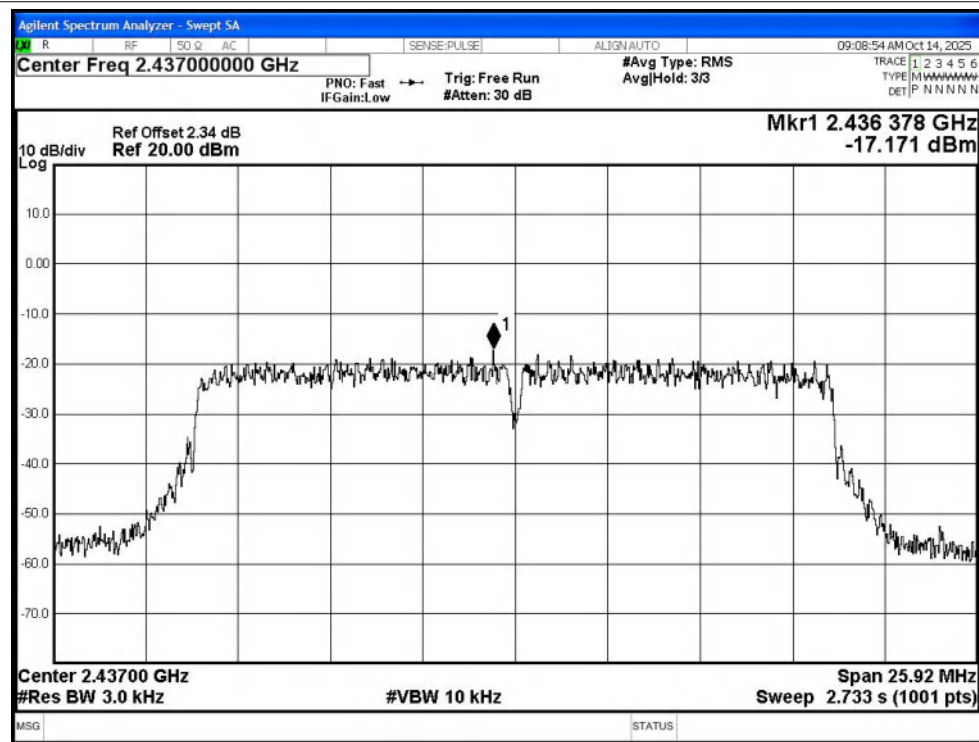
PSD NVNT g 2462MHz Ant1



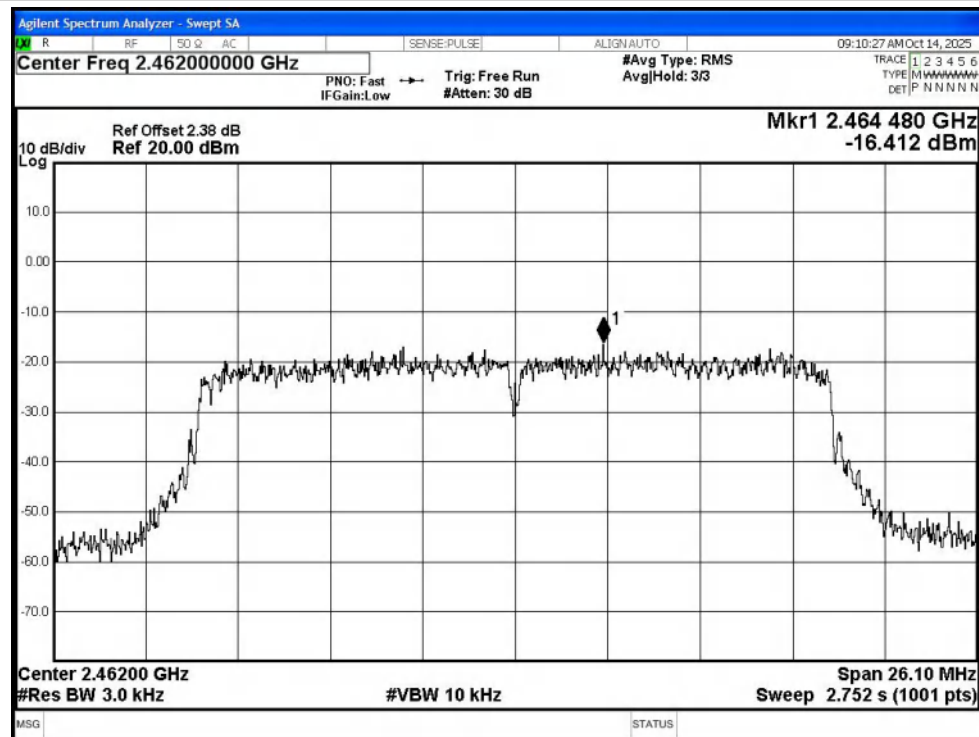
PSD NVNT n20 2412MHz Ant1



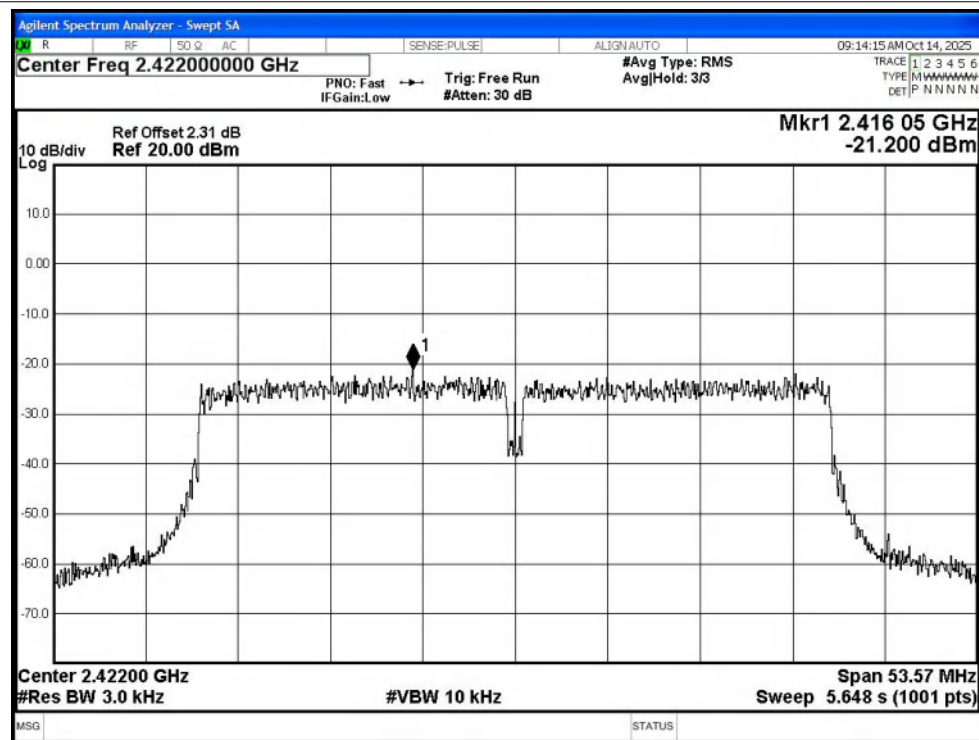
PSD NVNT n20 2437MHz Ant1



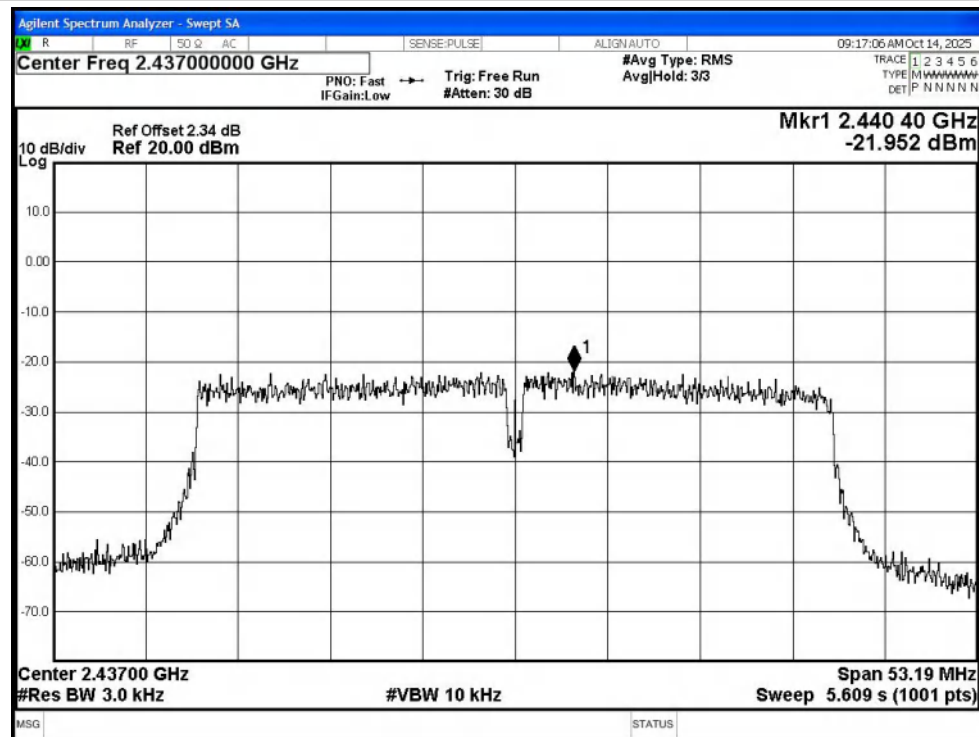
PSD NVNT n20 2462MHz Ant1



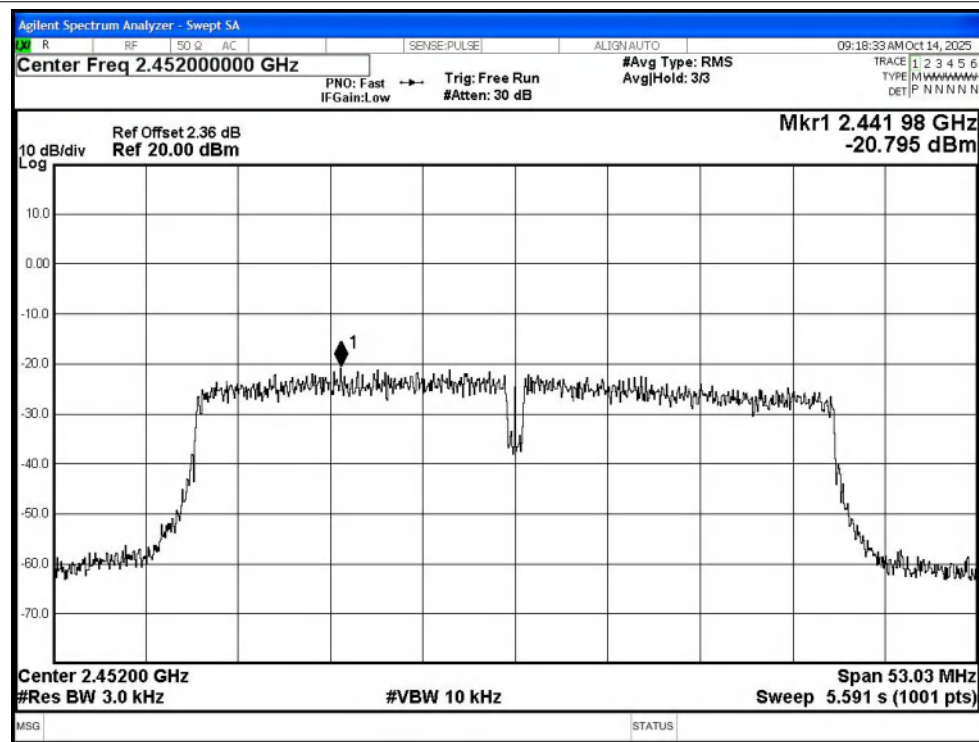
PSD NVNT n40 2422MHz Ant1



PSD NVNT n40 2437MHz Ant1



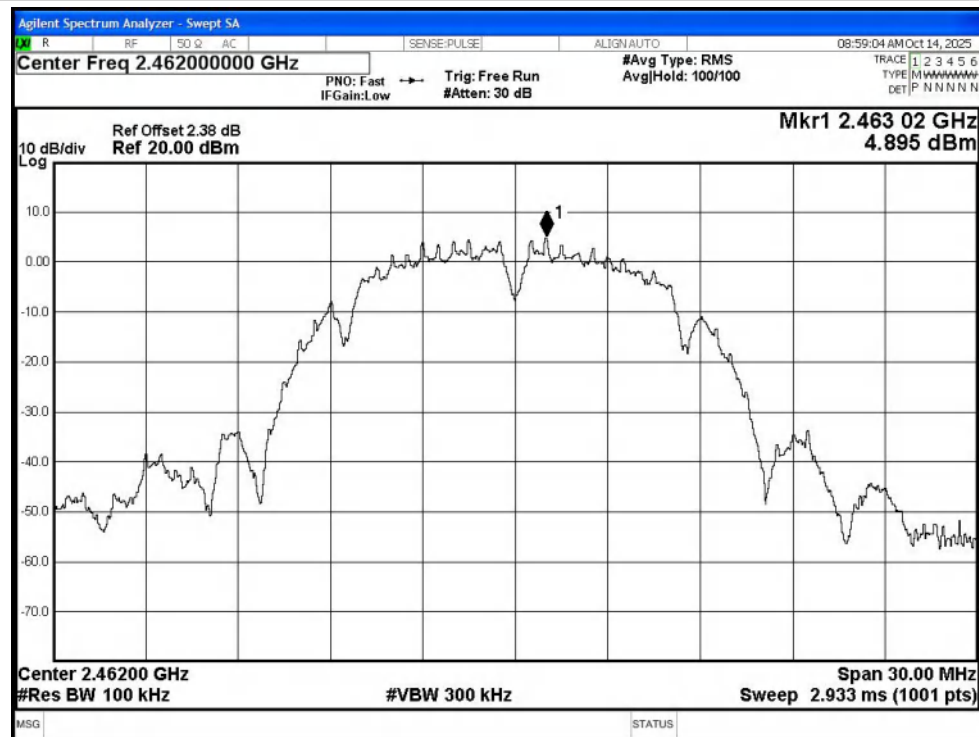
PSD NVNT n40 2452MHz Ant1



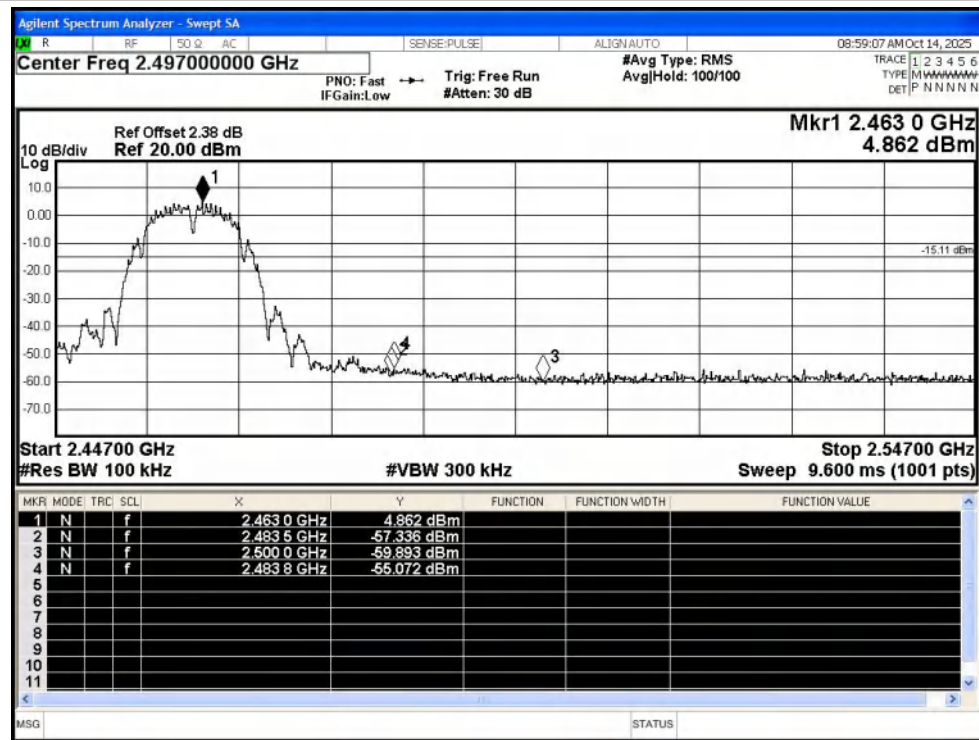
4. Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-51.35	-20	Pass
NVNT	b	2462	Ant1	-59.97	-20	Pass
NVNT	g	2412	Ant1	-34.28	-20	Pass
NVNT	g	2462	Ant1	-42.09	-20	Pass
NVNT	n20	2412	Ant1	-30.81	-20	Pass
NVNT	n20	2462	Ant1	-38.09	-20	Pass
NVNT	n40	2422	Ant1	-32.53	-20	Pass
NVNT	n40	2452	Ant1	-40.3	-20	Pass

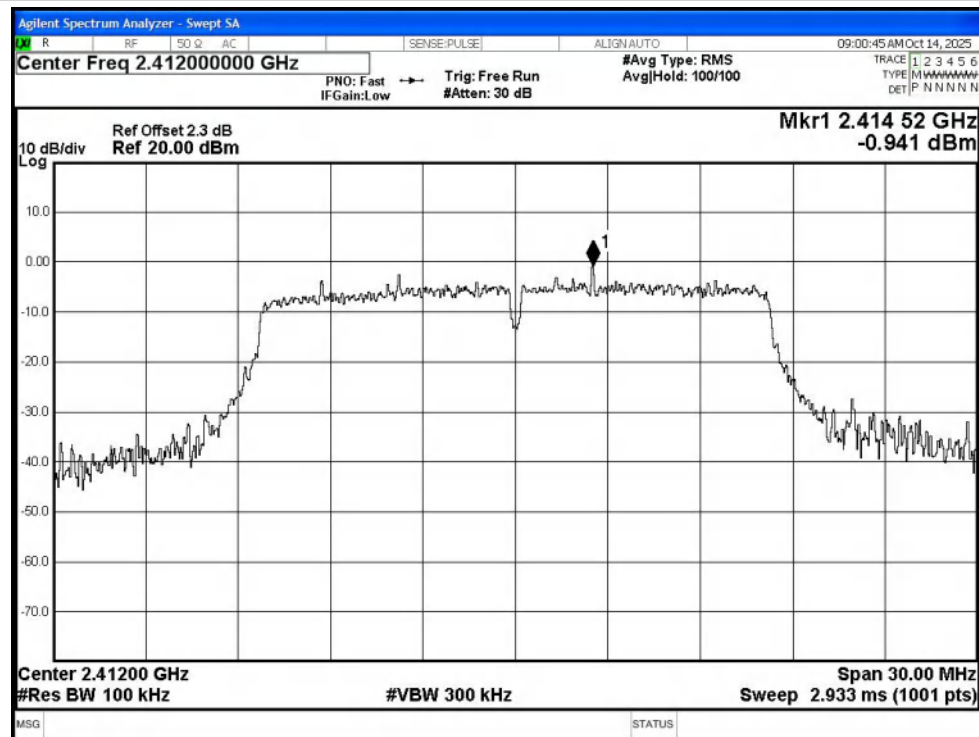
Band Edge NVNT b 2462MHz Ant1 Ref



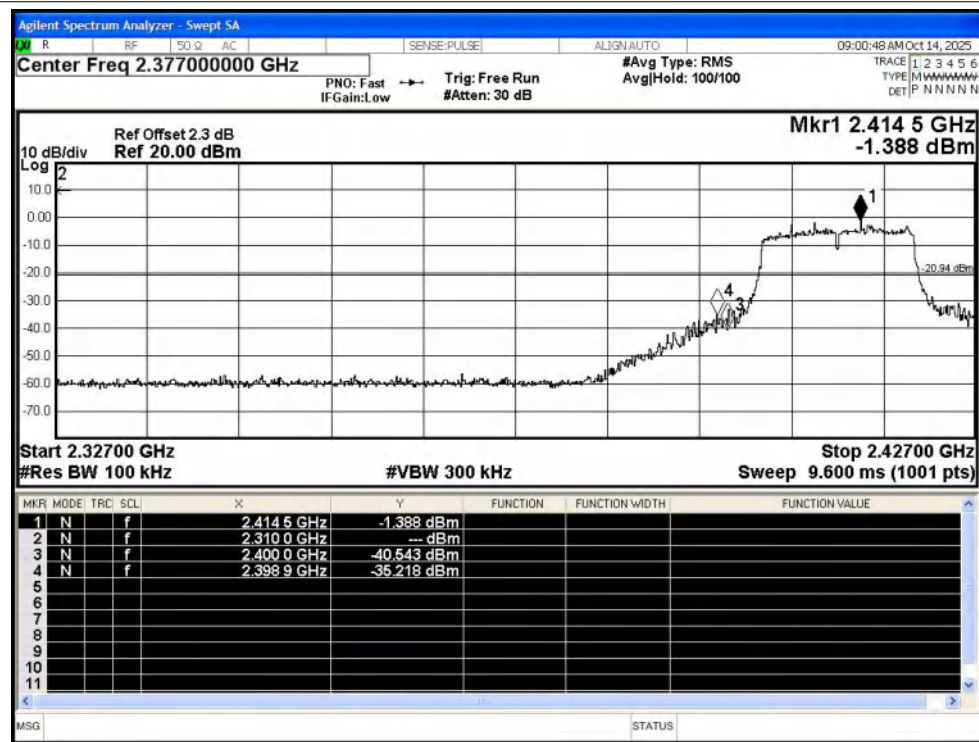
Band Edge NVNT b 2462MHz Ant1 Emission



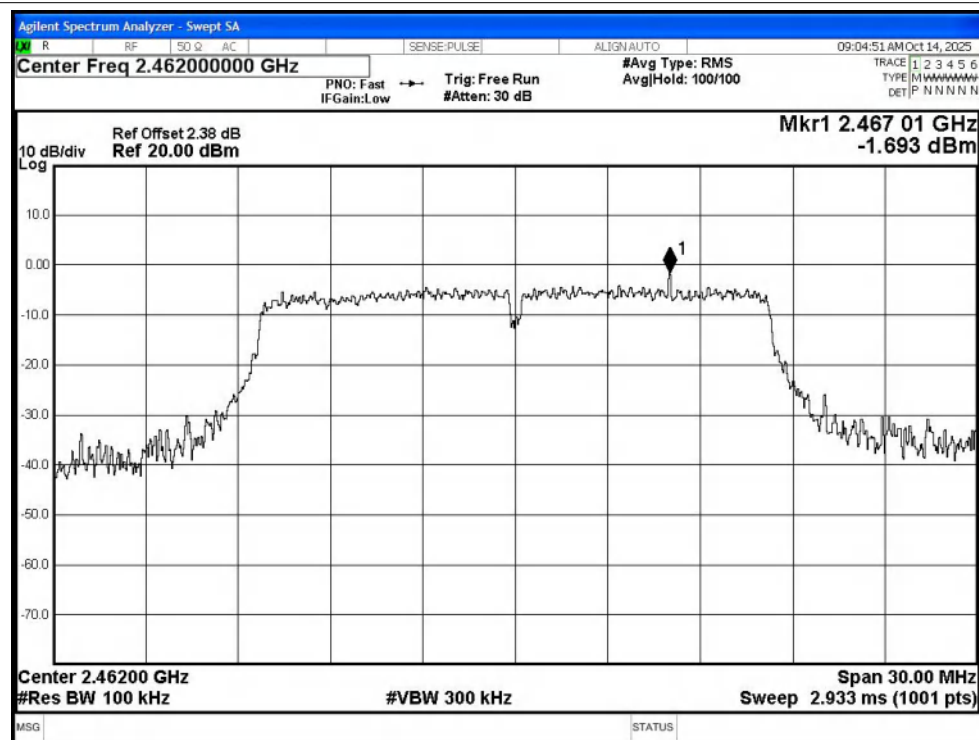
Band Edge NVNT g 2412MHz Ant1 Ref



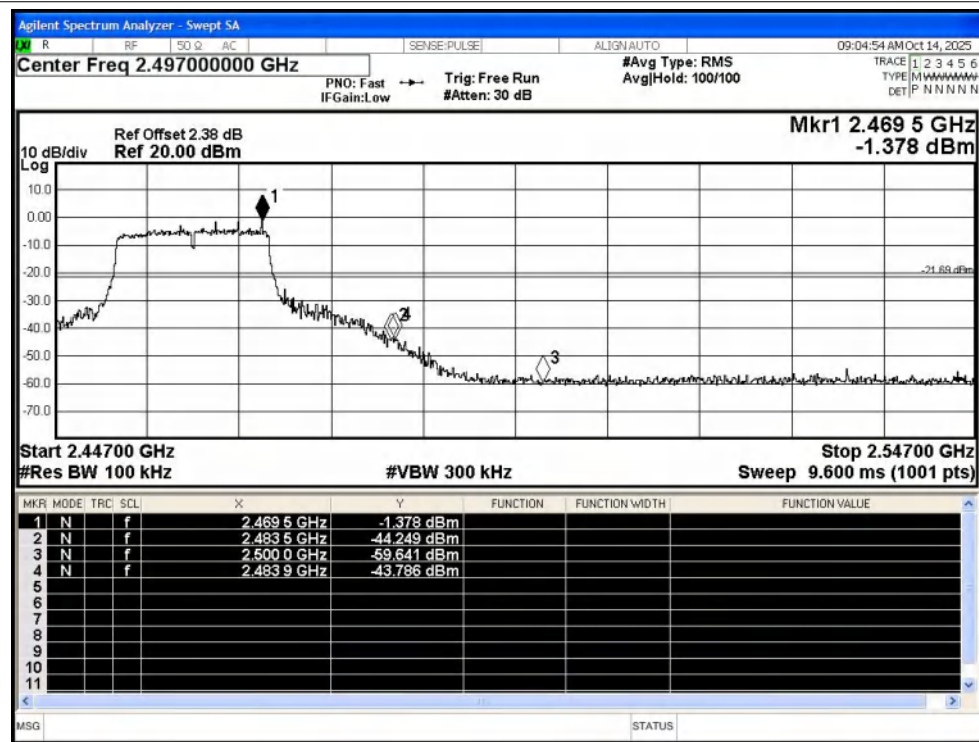
Band Edge NVNT g 2412MHz Ant1 Emission



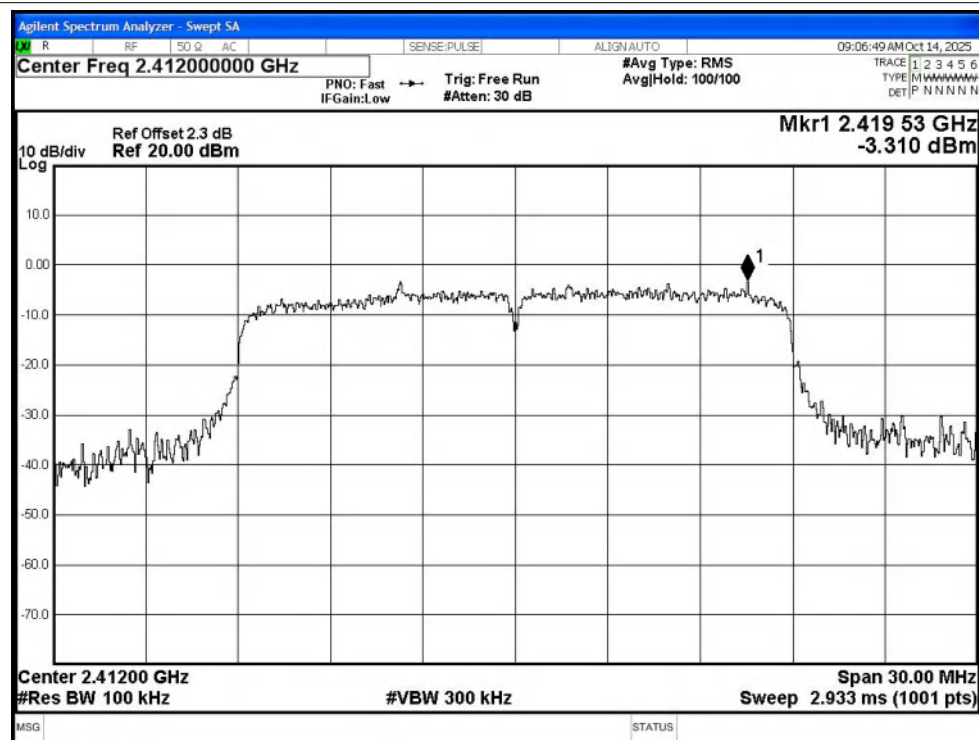
Band Edge NVNT g 2462MHz Ant1 Ref



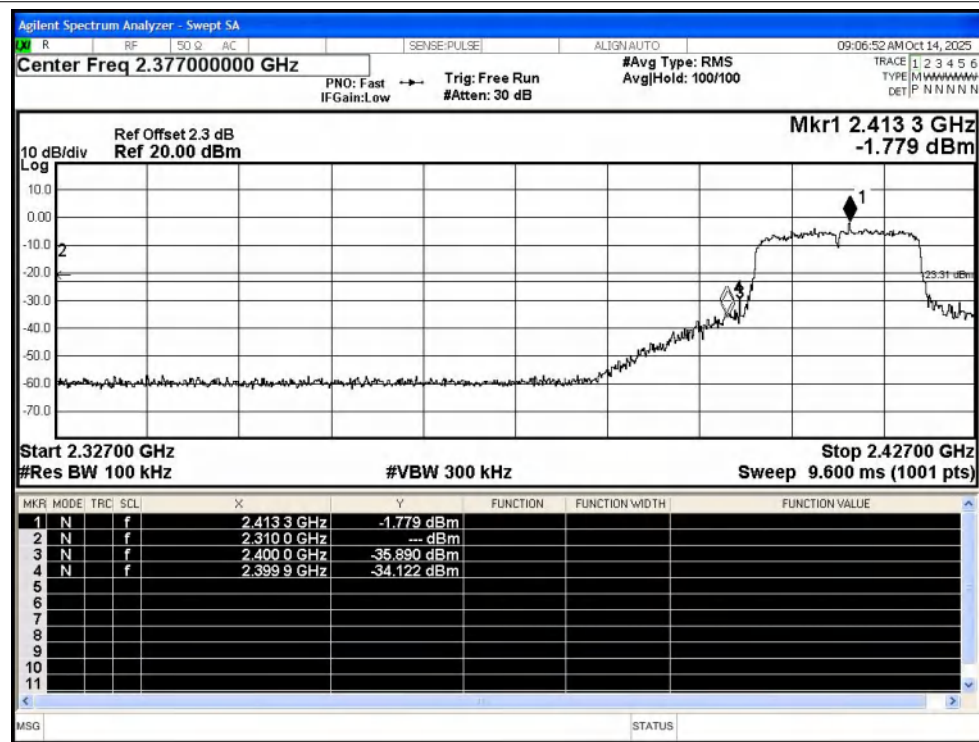
Band Edge NVNT g 2462MHz Ant1 Emission



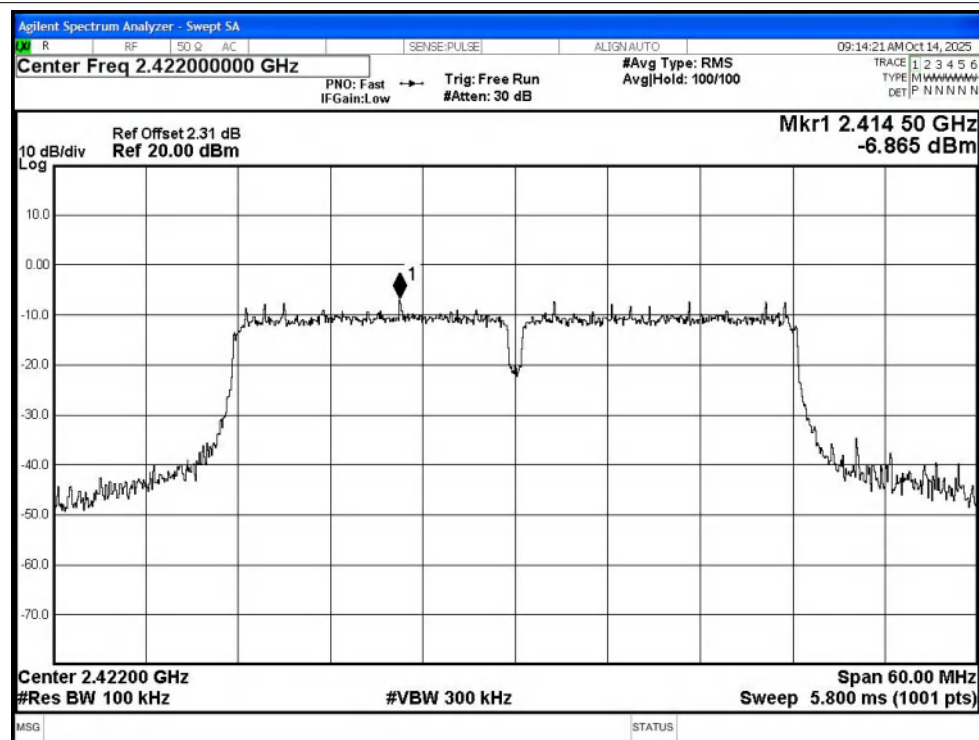
Band Edge NVNT n20 2412MHz Ant1 Ref



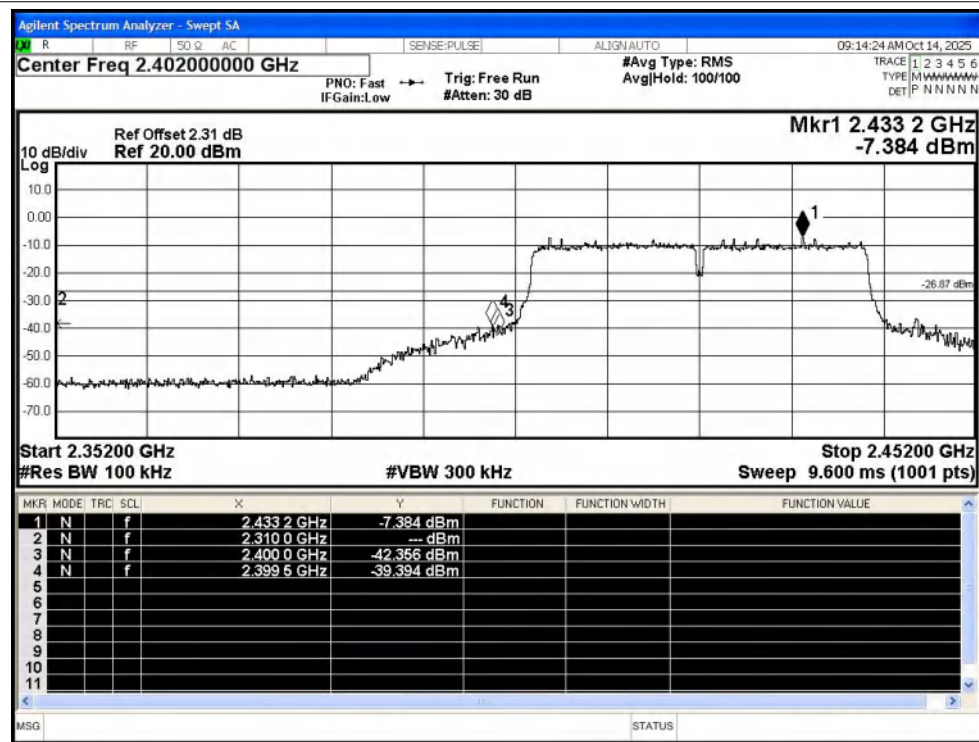
Band Edge NVNT n20 2412MHz Ant1 Emission



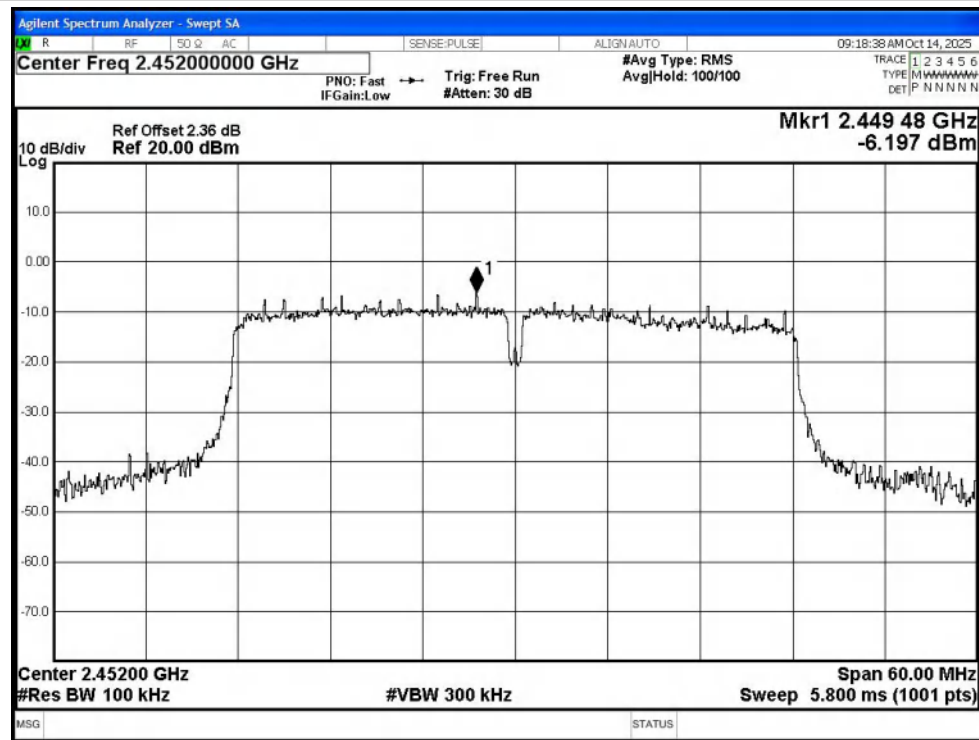
Band Edge NVNT n40 2422MHz Ant1 Ref



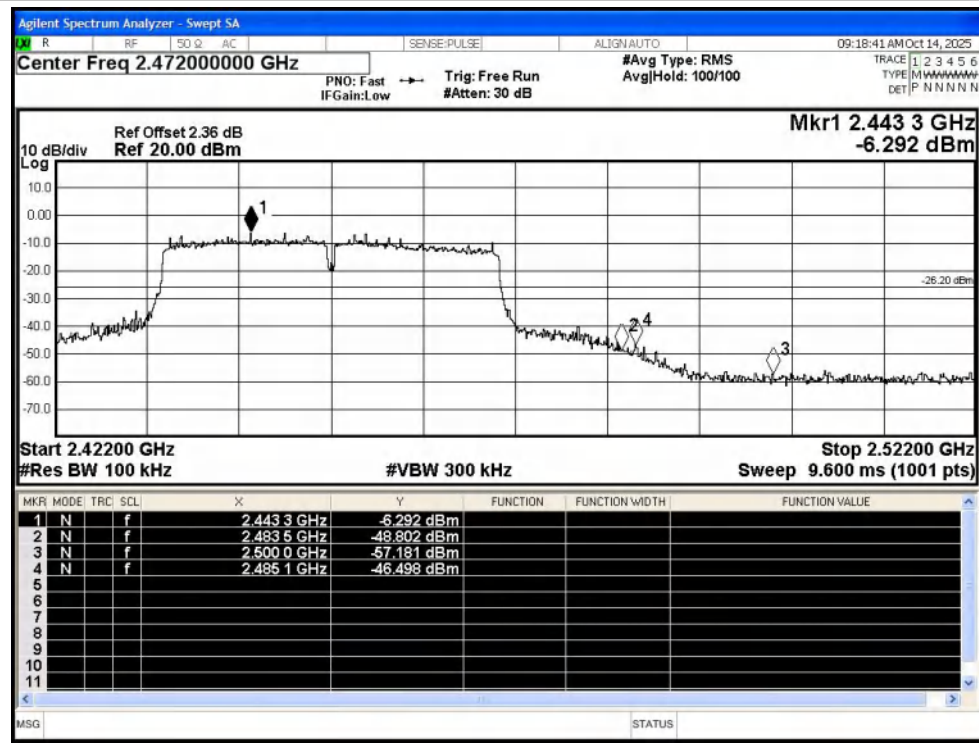
Band Edge NVNT n40 2422MHz Ant1 Emission



Band Edge NVNT n40 2452MHz Ant1 Ref



Band Edge NVNT n40 2452MHz Ant1 Emission



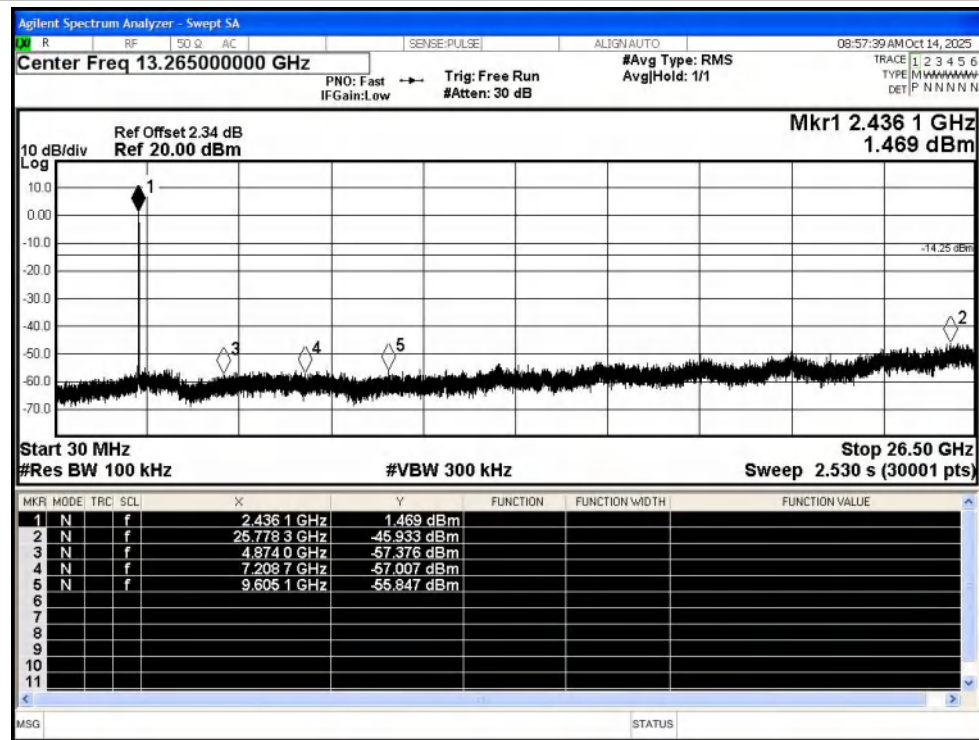
5. Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-49.96	-20	Pass
NVNT	b	2437	Ant1	-51.68	-20	Pass
NVNT	b	2462	Ant1	-50.14	-20	Pass
NVNT	g	2412	Ant1	-45.29	-20	Pass
NVNT	g	2437	Ant1	-44.06	-20	Pass
NVNT	g	2462	Ant1	-44.31	-20	Pass
NVNT	n20	2412	Ant1	-42.94	-20	Pass
NVNT	n20	2437	Ant1	-42.75	-20	Pass
NVNT	n20	2462	Ant1	-43.61	-20	Pass
NVNT	n40	2422	Ant1	-39.13	-20	Pass
NVNT	n40	2437	Ant1	-38.33	-20	Pass
NVNT	n40	2452	Ant1	-40.13	-20	Pass

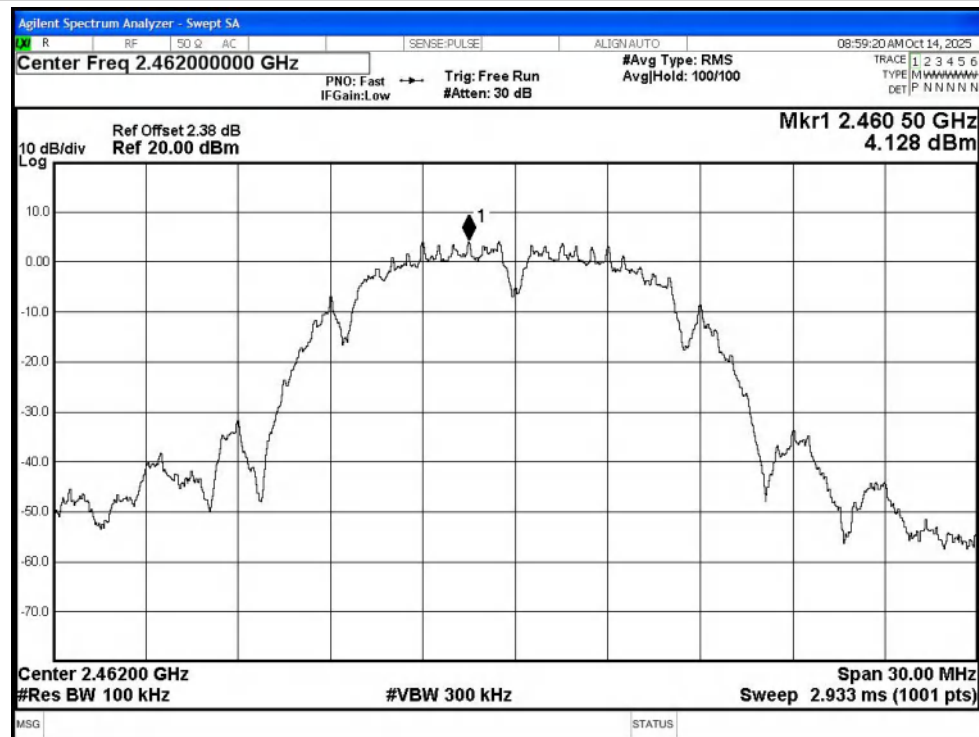
Tx. Spurious NVNT b 2437MHz Ant1 Ref



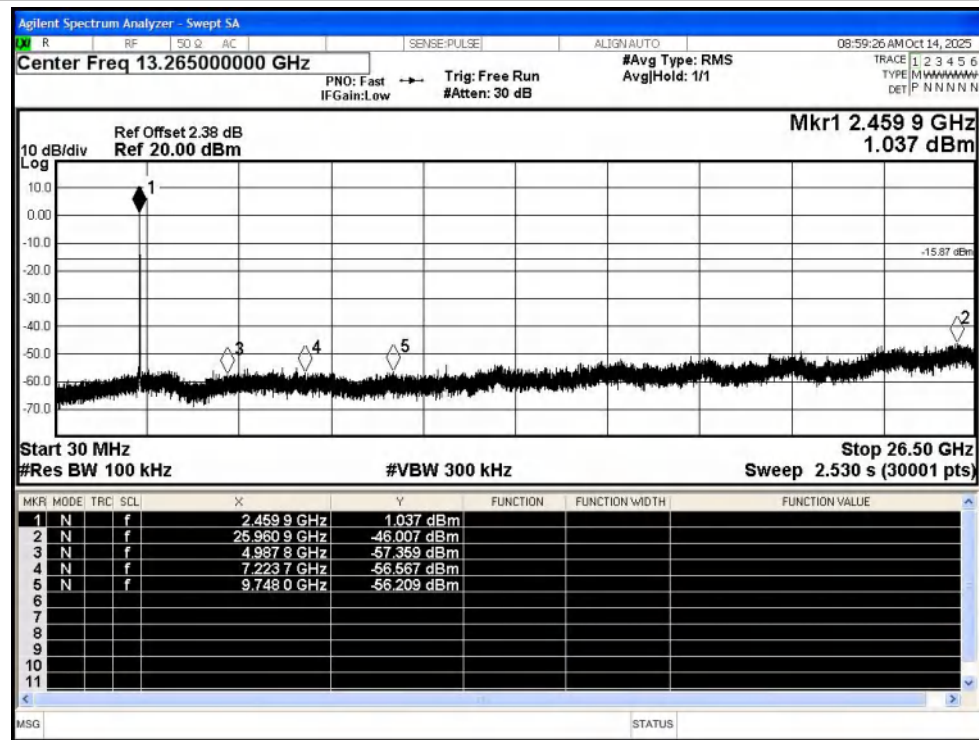
Tx. Spurious NVNT b 2437MHz Ant1 Emission



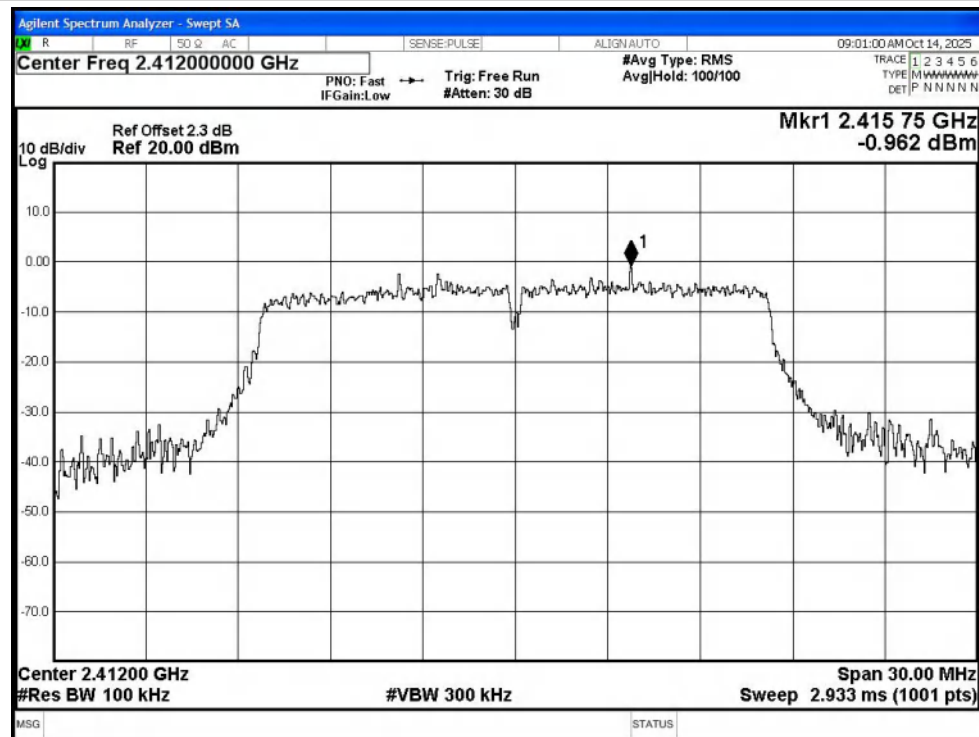
Tx. Spurious NVNT b 2462MHz Ant1 Ref



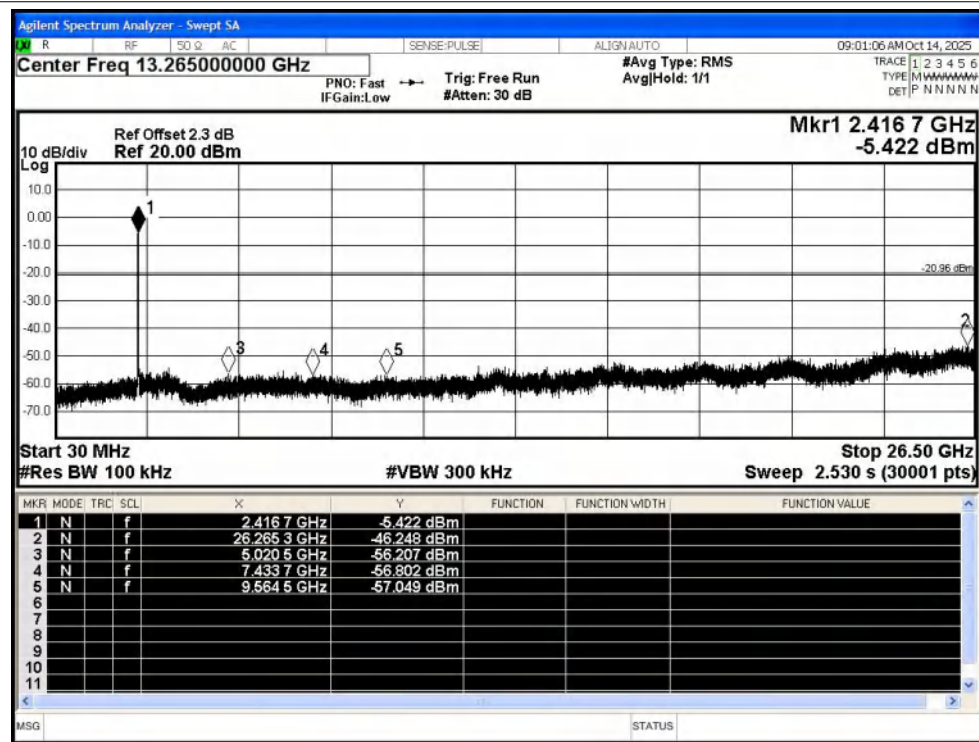
Tx. Spurious NVNT b 2462MHz Ant1 Emission



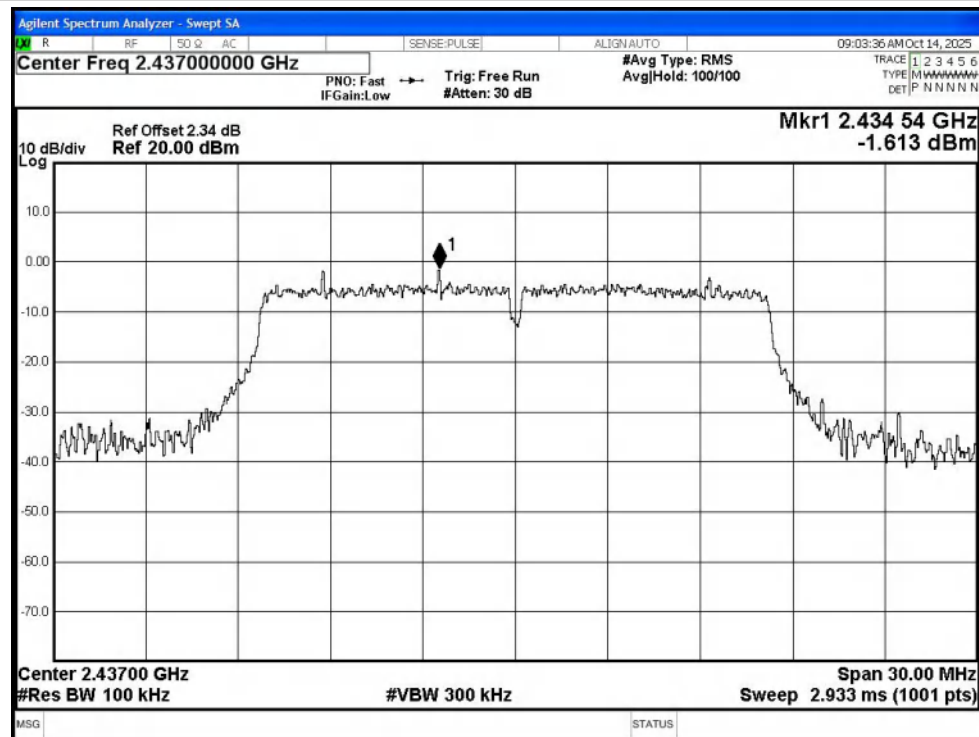
Tx. Spurious NVNT g 2412MHz Ant1 Ref



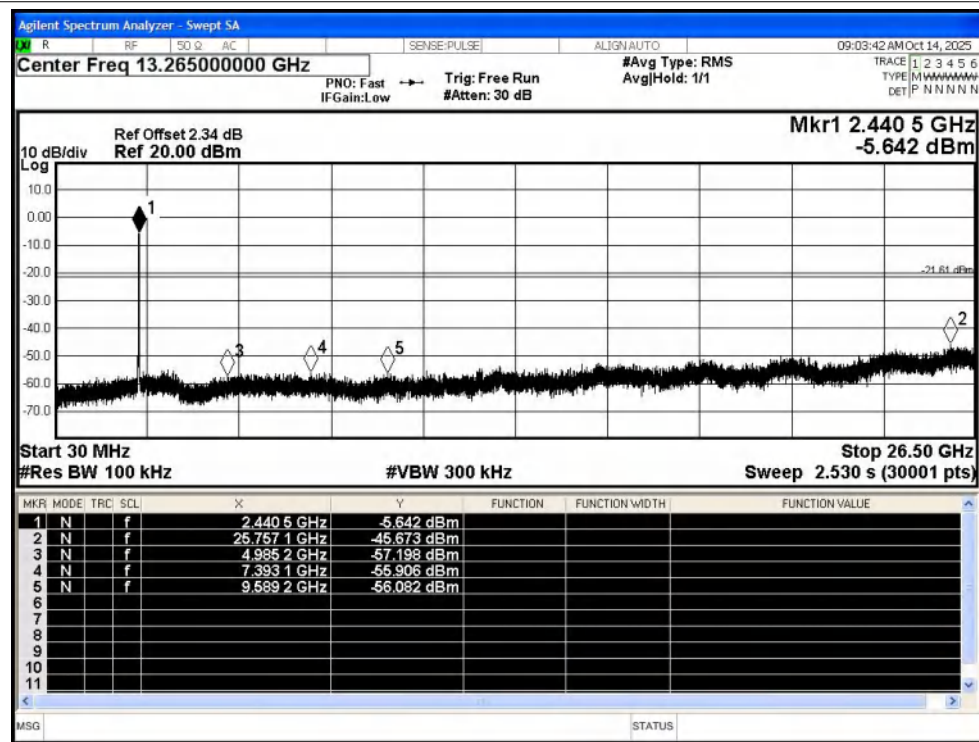
Tx. Spurious NVNT g 2412MHz Ant1 Emission

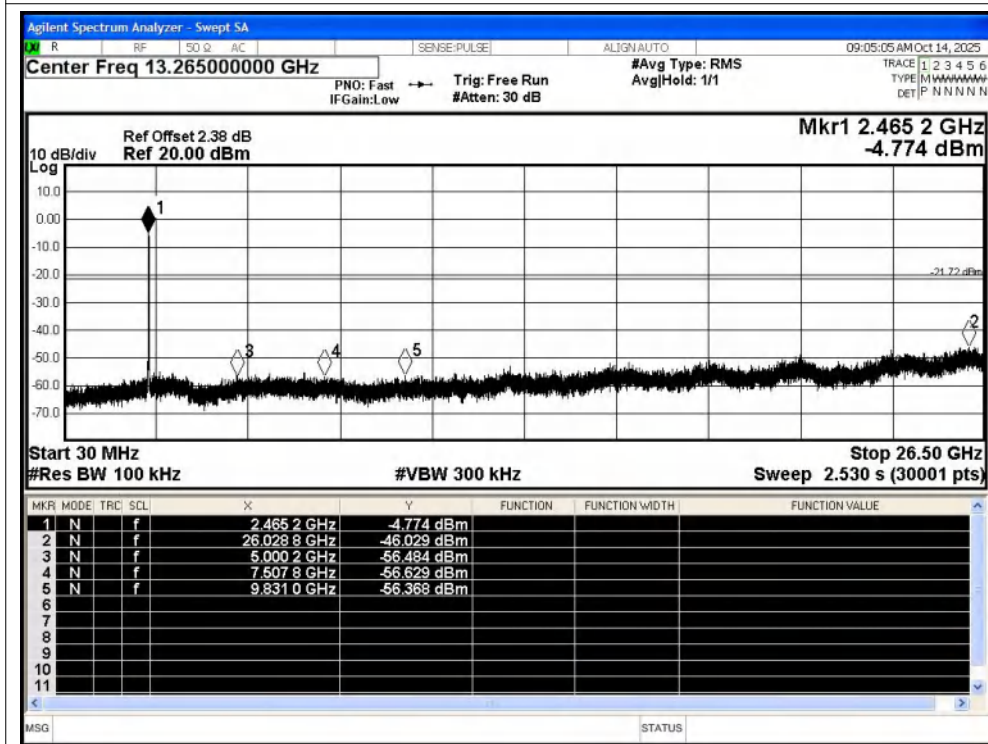
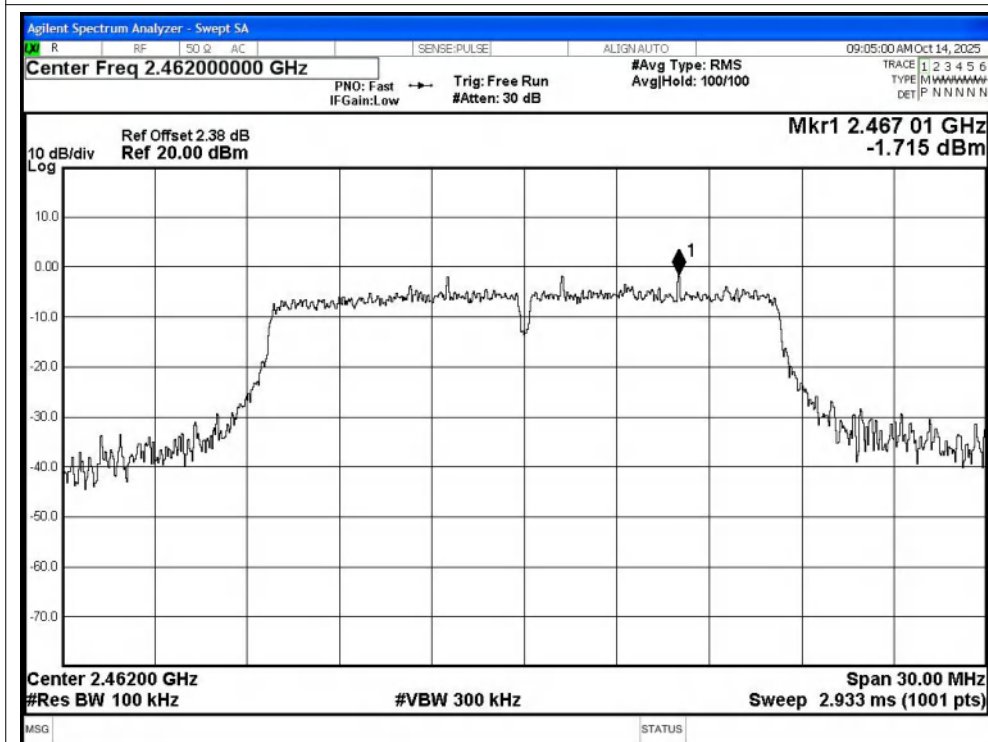


Tx. Spurious NVNT g 2437MHz Ant1 Ref

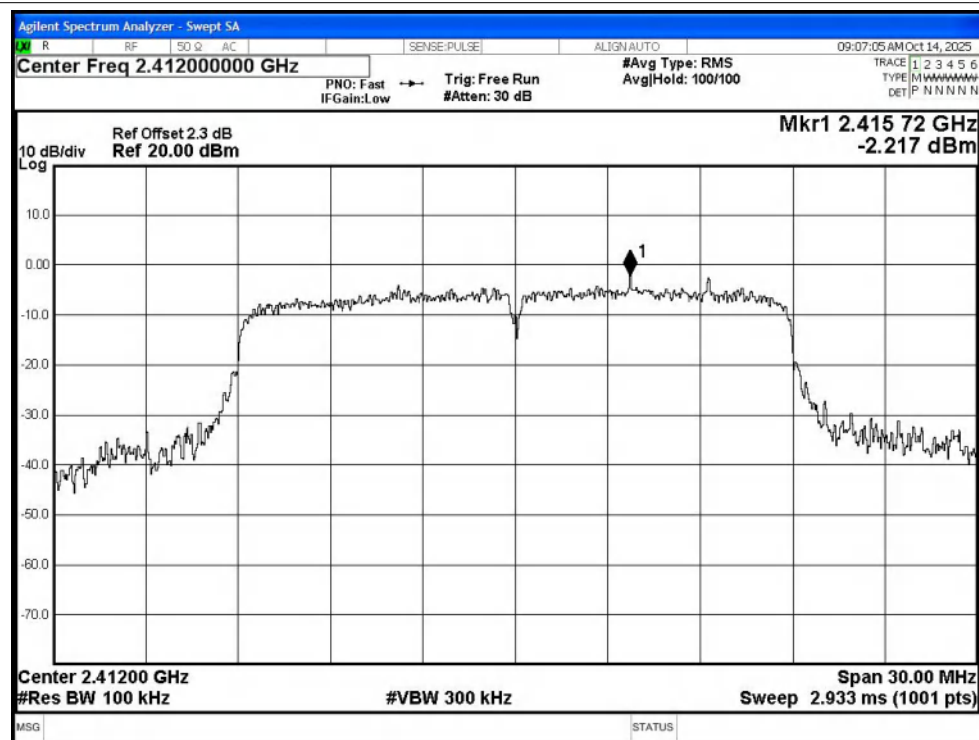


Tx. Spurious NVNT g 2437MHz Ant1 Emission

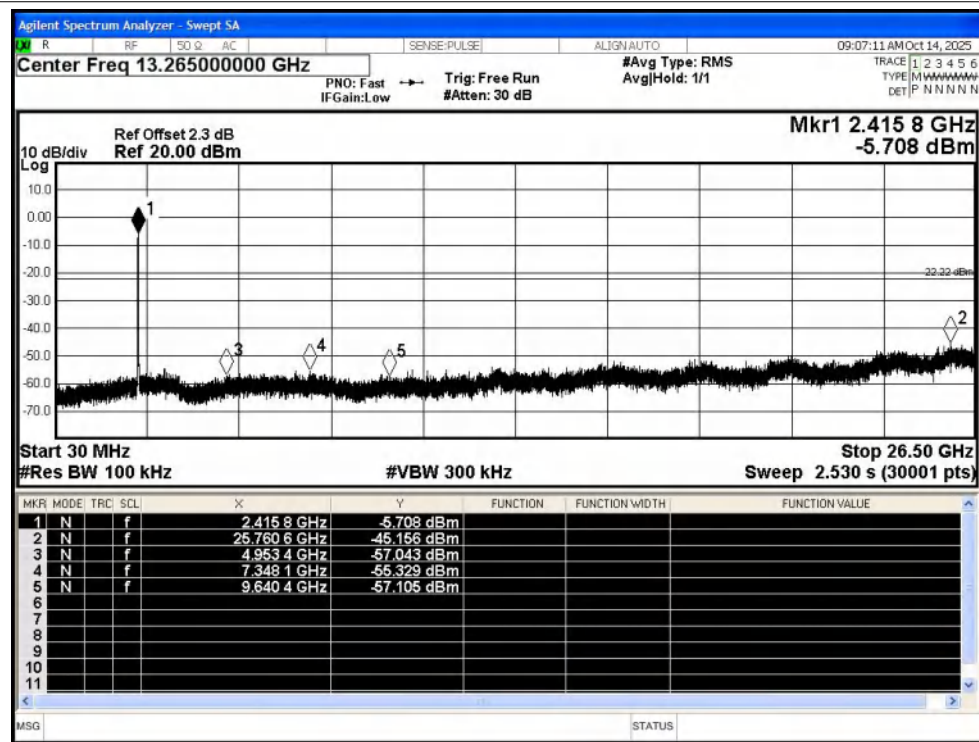




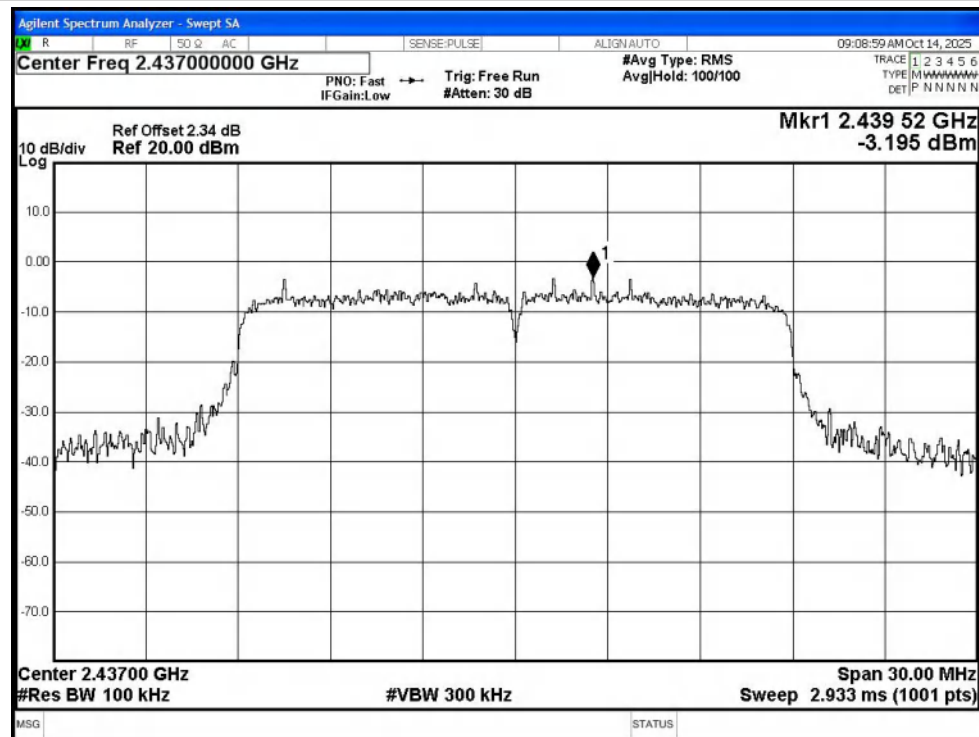
Tx. Spurious NVNT n20 2412MHz Ant1 Ref



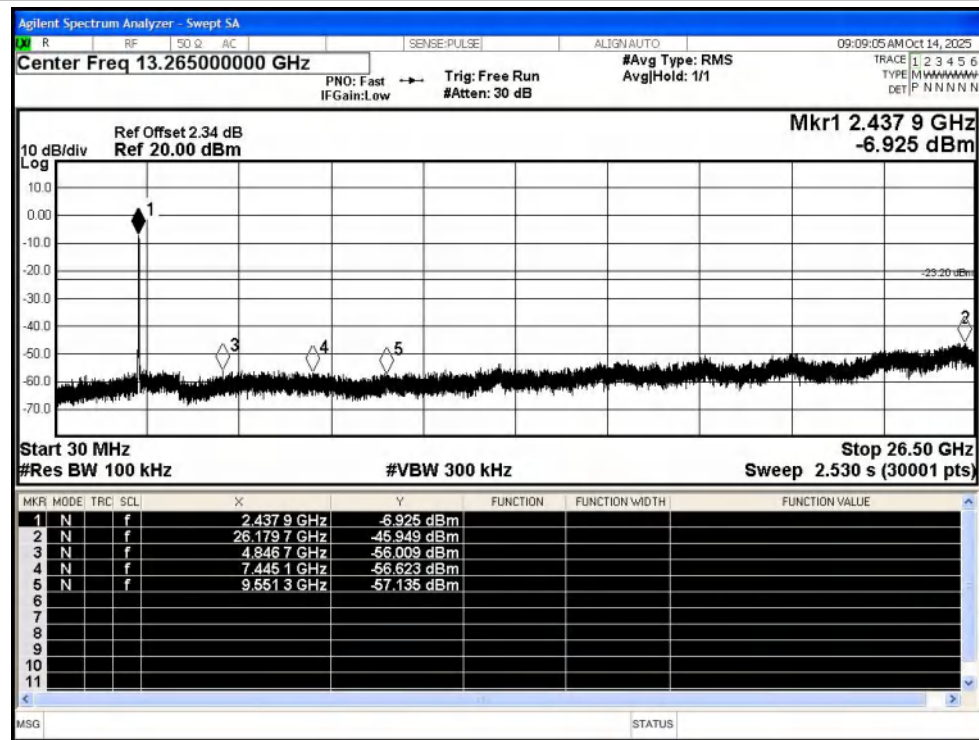
Tx. Spurious NVNT n20 2412MHz Ant1 Emission



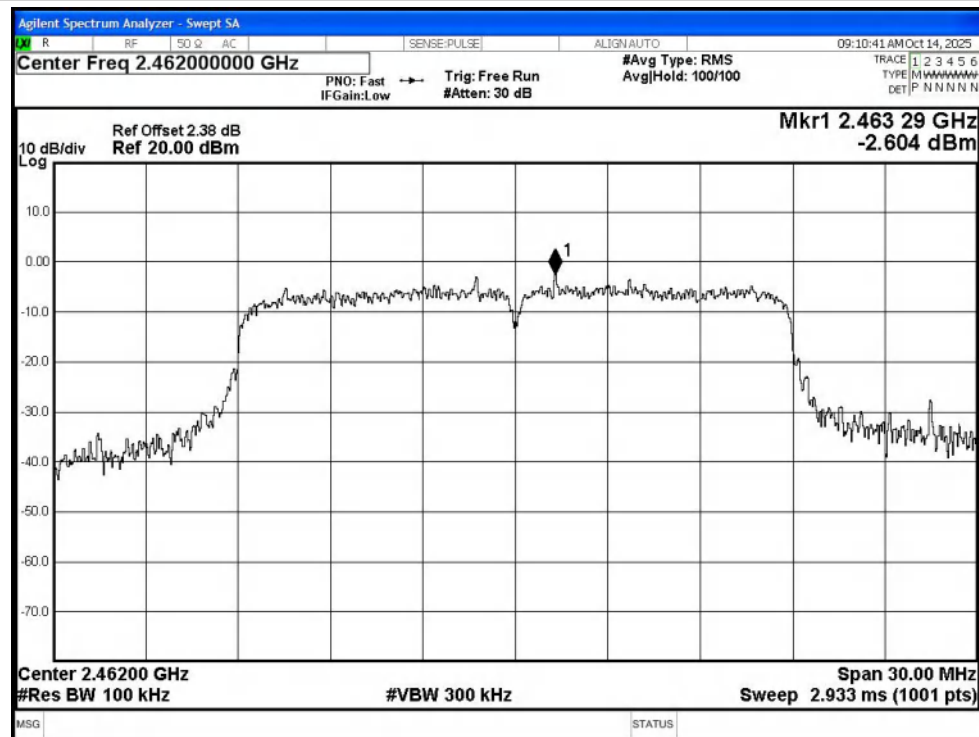
Tx. Spurious NVNT n20 2437MHz Ant1 Ref



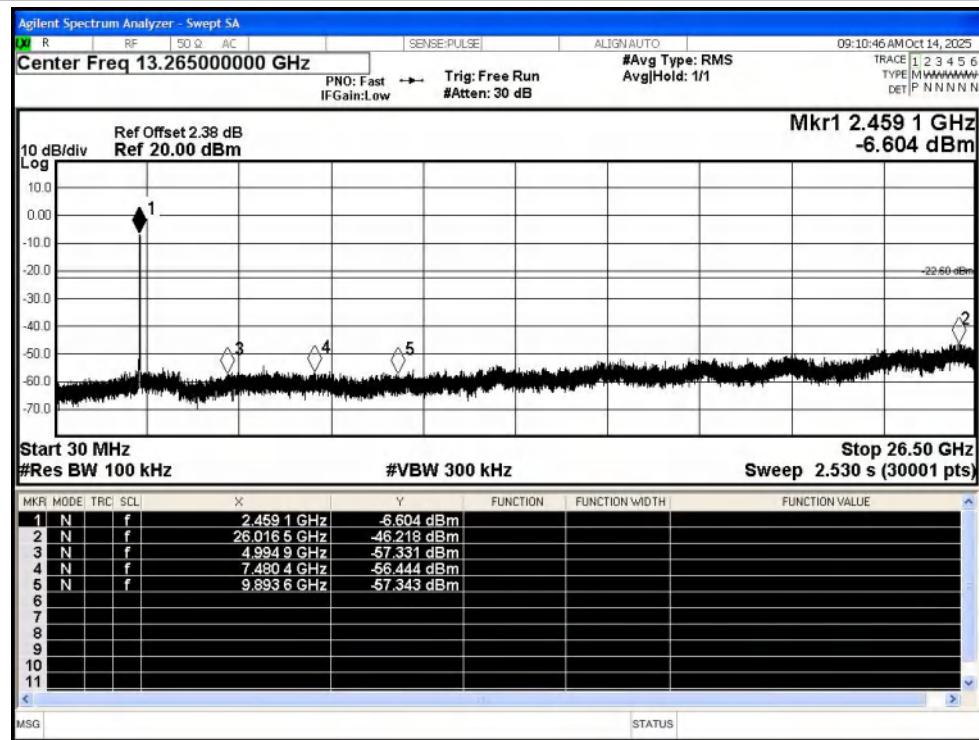
Tx. Spurious NVNT n20 2437MHz Ant1 Emission



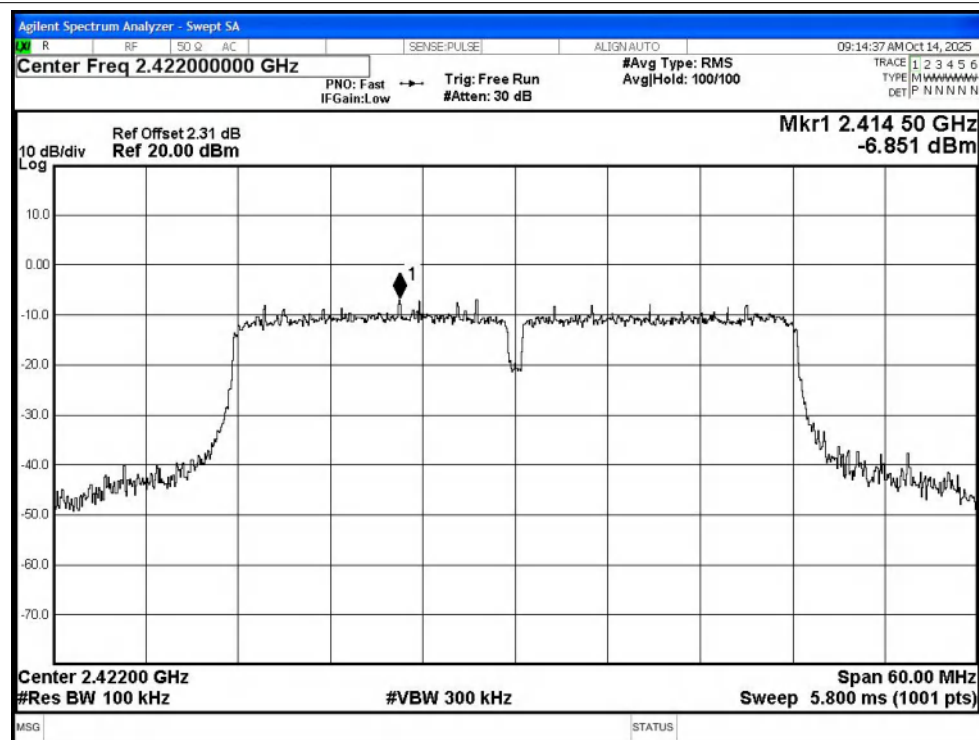
Tx. Spurious NVNT n20 2462MHz Ant1 Ref



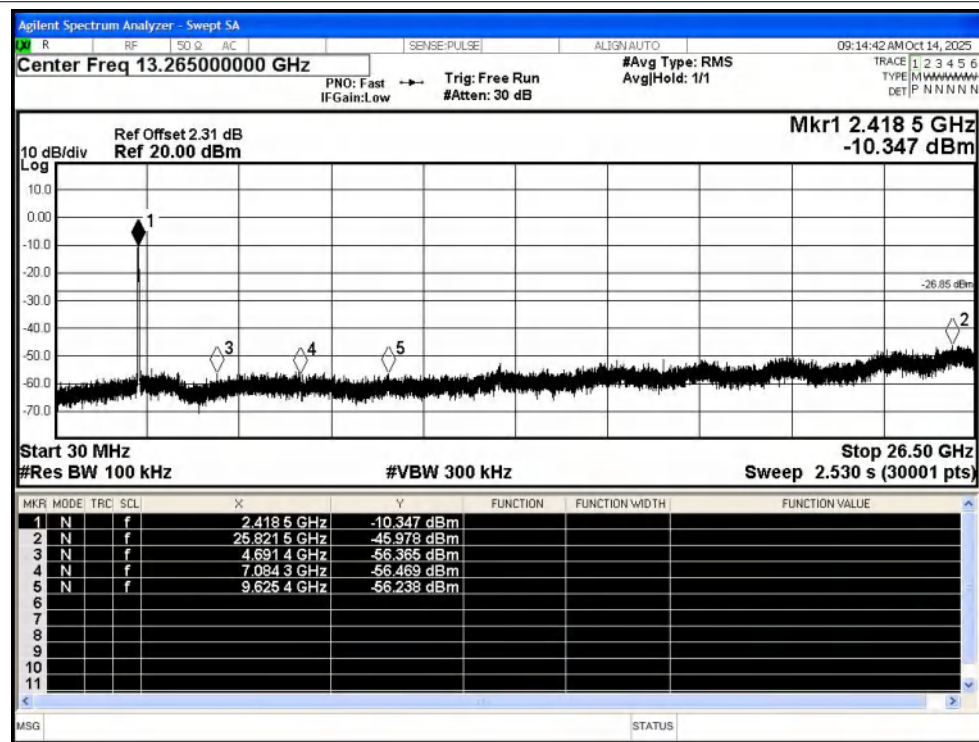
Tx. Spurious NVNT n20 2462MHz Ant1 Emission



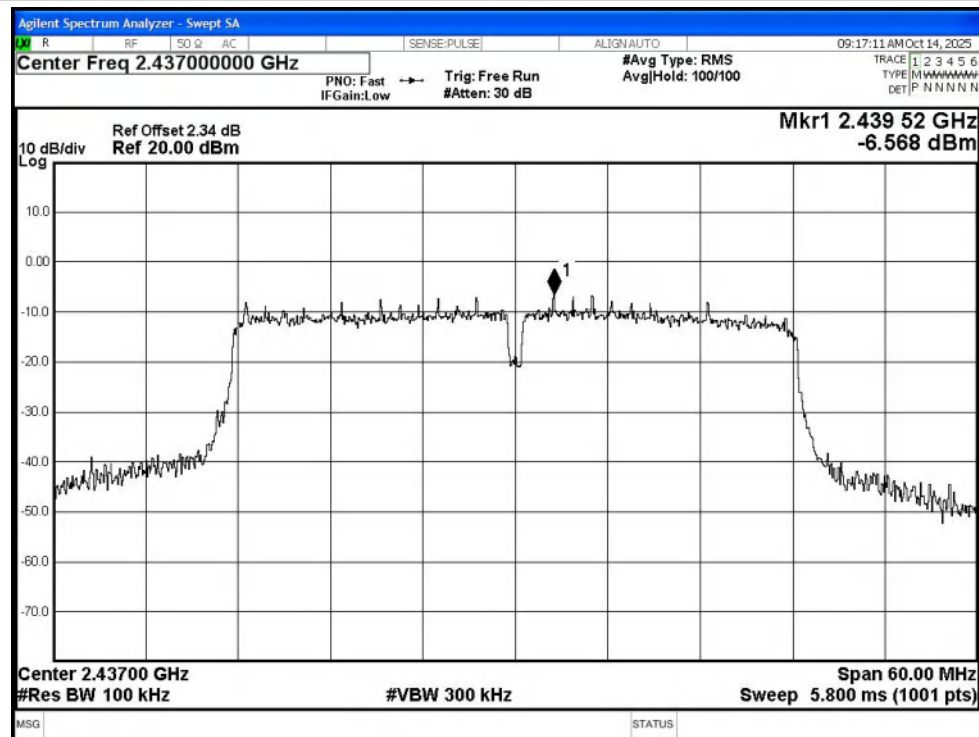
Tx. Spurious NVNT n40 2422MHz Ant1 Ref



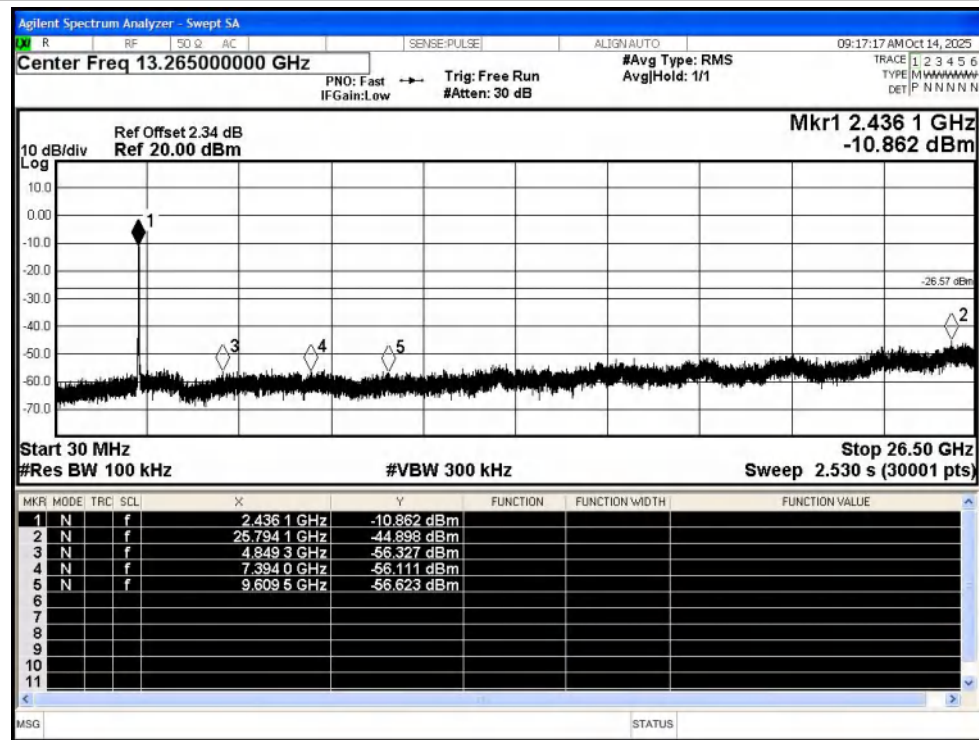
Tx. Spurious NVNT n40 2422MHz Ant1 Emission



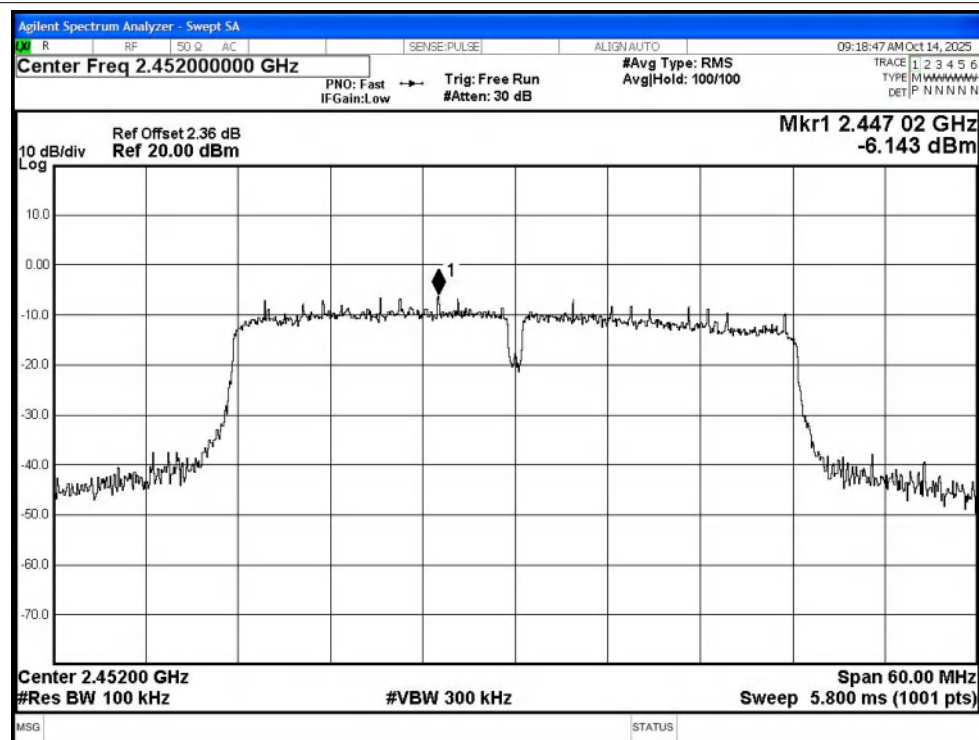
Tx. Spurious NVNT n40 2437MHz Ant1 Ref



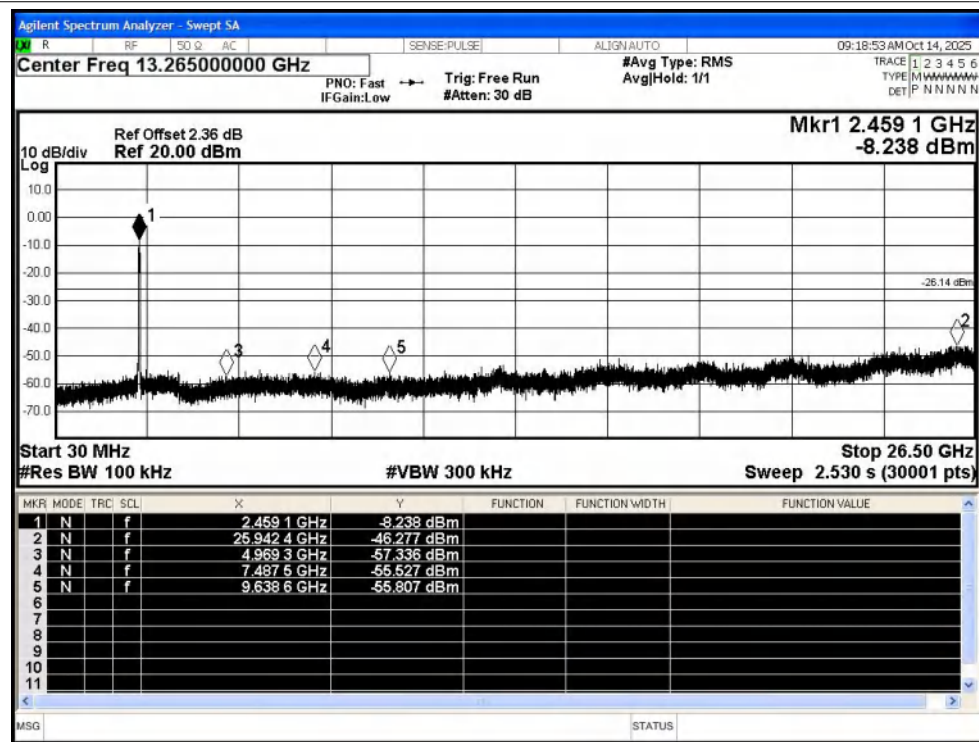
Tx. Spurious NVNT n40 2437MHz Ant1 Emission



Tx. Spurious NVNT n40 2452MHz Ant1 Ref

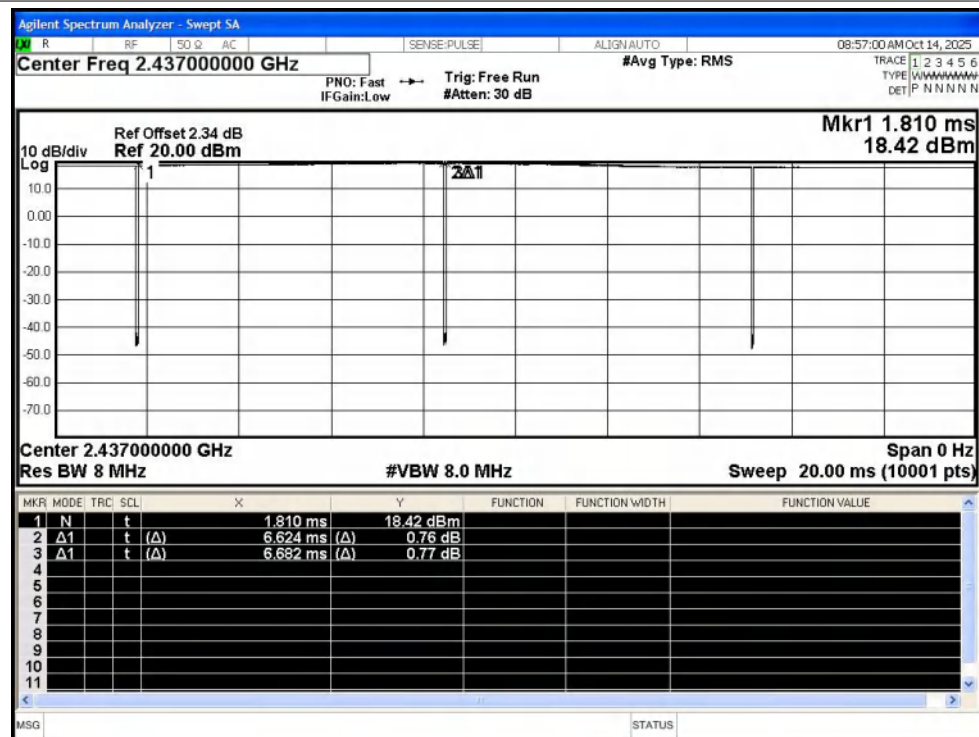


Tx. Spurious NVNT n40 2452MHz Ant1 Emission



6. Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant1	99.16	0	0.15
NVNT	b	2437	Ant1	99.13	0	0.15
NVNT	b	2462	Ant1	99.13	0	0.15
NVNT	g	2412	Ant1	97.75	0.1	0.37
NVNT	g	2437	Ant1	97.75	0.1	0.37
NVNT	g	2462	Ant1	97.75	0.1	0.37
NVNT	n20	2412	Ant1	97.33	0.12	0.44
NVNT	n20	2437	Ant1	97.33	0.12	0.44
NVNT	n20	2462	Ant1	97.25	0.12	0.44
NVNT	n40	2422	Ant1	94.71	0.24	0.9
NVNT	n40	2437	Ant1	94.7	0.24	0.9
NVNT	n40	2452	Ant1	94.71	0.24	0.9



[illegible][illegible]

[illegible]

Duty Cycle NVNT n20 2437MHz Ant1

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.437000000 GHz

Ref Offset 2.34 dB
Ref 20.00 dBm

Mkr1 1.492 ms
8.96 dBm

Center 2.437000000 GHz
Res BW 8 MHz

#VBW 8.0 MHz

Sweep 20.00 ms (10001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	t		1.492 ms	8.96 dBm			
2	Δ1	t	(Δ)	2.262 ms	-1.14 dB			
3	Δ1	t	(Δ)	2.324 ms	0.43 dB			

[illegible][illegible]

7. Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	b	2412	Ant1	2310	-50.46	3.27	-	48.07	Peak	74	Pass
NVNT	b	2412	Ant1	2310	-58.29	3.27	0	40.24	Average	54	Pass
NVNT	b	2412	Ant1	2389.677	-46.19	3.27	-	52.34	Peak	74	Pass
NVNT	b	2412	Ant1	2388.273	-55.6	3.27	0	42.93	Average	54	Pass
NVNT	b	2412	Ant1	2390	-48.17	3.27	-	50.36	Peak	74	Pass
NVNT	b	2412	Ant1	2390	-56.38	3.27	0	42.15	Average	54	Pass
NVNT	b	2462	Ant1	2483.5	-47.01	3.27	-	51.52	Peak	74	Pass
NVNT	b	2462	Ant1	2483.5	-54.93	3.27	0	43.60	Average	54	Pass
NVNT	b	2462	Ant1	2485.584	-42.52	3.27	-	56.01	Peak	74	Pass
NVNT	b	2462	Ant1	2484.471	-54.31	3.27	0	44.22	Average	54	Pass
NVNT	b	2462	Ant1	2500	-49.96	3.27	-	48.57	Peak	74	Pass
NVNT	b	2462	Ant1	2500	-57.94	3.27	0	40.59	Average	54	Pass
NVNT	g	2412	Ant1	2310	-49.92	3.27	-	48.61	Peak	74	Pass
NVNT	g	2412	Ant1	2310	-58.4	3.27	0.1	40.23	Average	54	Pass
NVNT	g	2412	Ant1	2389.092	-34.85	3.27	-	63.68	Peak	74	Pass
NVNT	g	2412	Ant1	2389.794	-53.07	3.27	0.1	45.56	Average	54	Pass
NVNT	g	2412	Ant1	2390	-38.09	3.27	-	60.44	Peak	74	Pass
NVNT	g	2412	Ant1	2390	-53.02	3.27	0.1	45.61	Average	54	Pass
NVNT	g	2462	Ant1	2483.5	-37.29	3.27	-	61.24	Peak	74	Pass
NVNT	g	2462	Ant1	2483.5	-53.22	3.27	0.1	45.41	Average	54	Pass
NVNT	g	2462	Ant1	2484.471	-34.53	3.27	-	64.00	Peak	74	Pass
NVNT	g	2462	Ant1	2483.517	-53.22	3.27	0.1	45.41	Average	54	Pass
NVNT	g	2462	Ant1	2500	-48.88	3.27	-	49.65	Peak	74	Pass
NVNT	g	2462	Ant1	2500	-57.78	3.27	0.1	40.85	Average	54	Pass
NVNT	n20	2412	Ant1	2310	-51.2	3.27	-	47.33	Peak	74	Pass
NVNT	n20	2412	Ant1	2310	-58.19	3.27	0.12	40.46	Average	54	Pass
NVNT	n20	2412	Ant1	2389.794	-36.66	3.27	-	61.87	Peak	74	Pass
NVNT	n20	2412	Ant1	2389.794	-51.37	3.27	0.12	47.28	Average	54	Pass
NVNT	n20	2412	Ant1	2390	-36.22	3.27	-	62.31	Peak	74	Pass
NVNT	n20	2412	Ant1	2390	-52.17	3.27	0.12	46.48	Average	54	Pass
NVNT	n20	2462	Ant1	2483.5	-34.48	3.27	-	64.05	Peak	74	Pass
NVNT	n20	2462	Ant1	2483.5	-50.32	3.27	0.12	48.33	Average	54	Pass
NVNT	n20	2462	Ant1	2483.888	-33.76	3.27	-	64.77	Peak	74	Pass
NVNT	n20	2462	Ant1	2483.517	-50.32	3.27	0.12	48.33	Average	54	Pass
NVNT	n20	2462	Ant1	2500	-48.53	3.27	-	50.00	Peak	74	Pass
NVNT	n20	2462	Ant1	2500	-58.02	3.27	0.12	40.63	Average	54	Pass
NVNT	n40	2422	Ant1	2310	-48.98	3.27	-	49.55	Peak	74	Pass
NVNT	n40	2422	Ant1	2310	-58.25	3.27	0.24	40.52	Average	54	Pass
NVNT	n40	2422	Ant1	2388.668	-32.97	3.27	-	65.56	Peak	74	Pass

NVNT	n40	2422	Ant1	2389.946	-50.24	3.27	0.24	48.53	Average	54	Pass
NVNT	n40	2422	Ant1	2390	-38.08	3.27	-	60.45	Peak	74	Pass
NVNT	n40	2422	Ant1	2390	-50.24	3.27	0.24	48.53	Average	54	Pass
NVNT	n40	2452	Ant1	2483.5	-39.37	3.27	-	59.16	Peak	74	Pass
NVNT	n40	2452	Ant1	2483.5	-50.49	3.27	0.24	48.28	Average	54	Pass
NVNT	n40	2452	Ant1	2483.776	-35.8	3.27	-	62.73	Peak	74	Pass
NVNT	n40	2452	Ant1	2484.166	-51.27	3.27	0.24	47.50	Average	54	Pass
NVNT	n40	2452	Ant1	2500	-49.81	3.27	-	48.72	Peak	74	Pass
NVNT	n40	2452	Ant1	2500	-57.58	3.27	0.24	41.19	Average	54	Pass

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.368500000 GHz

PNO: Fast IFGain: Low Trig: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHold: 100/100

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Ref Offset 2.3 dB Ref 20.00 dBm

Mkr1 2.415 534 GHz 7.205 dBm

Start 2.31000 GHz #Res BW 1.0 MHz Stop 2.42700 GHz Sweep 1.000 ms (1001 pts)

#VBW 3.0 MHz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.415 534 GHz	7.205 dBm			
2	N		f	2.310 000 GHz	-49.918 dBm			
3	N		f	2.390 000 GHz	-38.085 dBm			
4	N		f	2.389 092 GHz	-34.855 dBm			

[illegible]

[illegible][illegible]

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.461000000 GHz

Ref Offset 2.36 dB
Ref 20.00 dBm

Mkr 1 2.440 252 GHz
-1.297 dBm

Start 2.42200 GHz
#Res BW 1.0 MHz

Stop 2.50000 GHz
Sweep 1.000 ms (1001 pts)

#VBW 3.0 MHz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.440 252 GHz	-1.297 dBm			
2	N		f	2.483 500 GHz	-39.373 dBm			
3	N		f	2.500 000 GHz	-49.808 dBm			
4	N		f	2.483 776 GHz	-35.798 dBm			

[illegible]