

RF Test Data for 2.4G WiFi (Conducted Measurements)

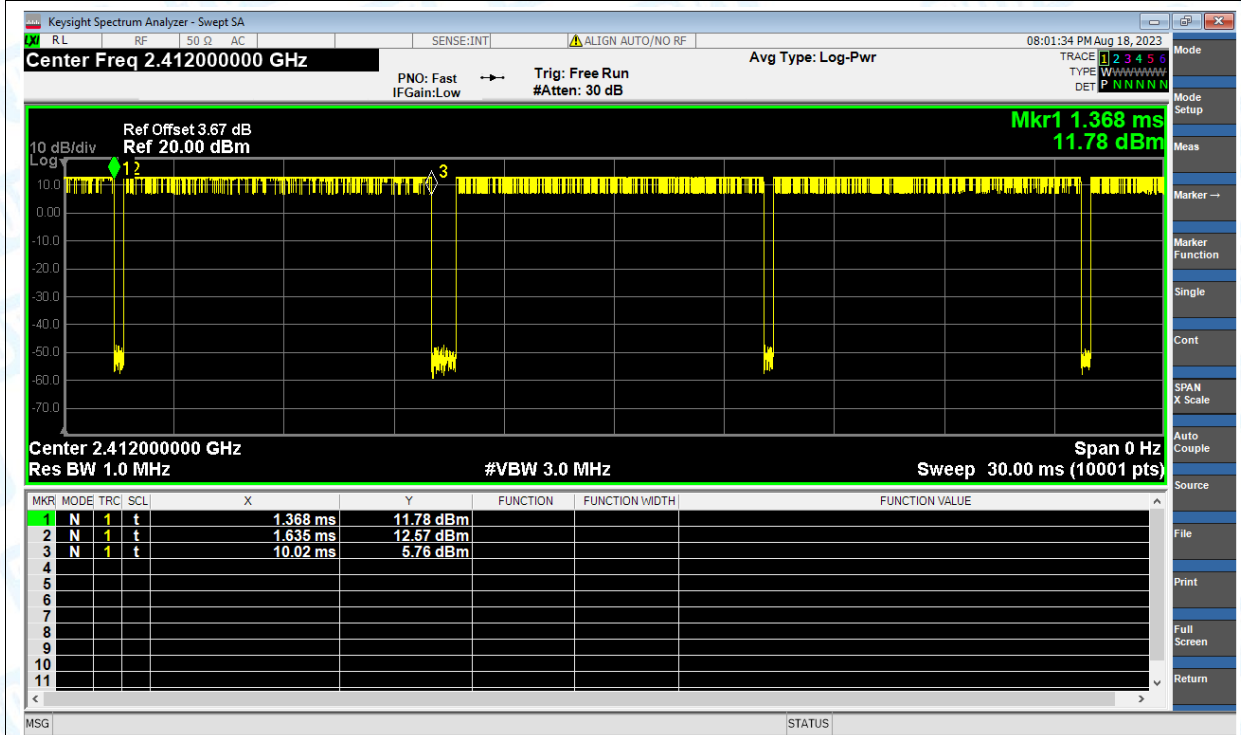
General Description of EUT	
Product Name:	Sufficient IoT Hub
Test Model:	Sufficient IoT Hub
Sample ID:	RW-C-202209-0299-4-2#
Environmental Conditions	
Temperature:	23.8°C
Relative Humidity:	48%
Test Voltage:	DC 5V
Test Engineer:	Yan Zhen Ming
Note: For a more detailed features description, please refer to the report TBR-C-202209-0299-8 The report only show the worst case data.	

1. Duty Cycle

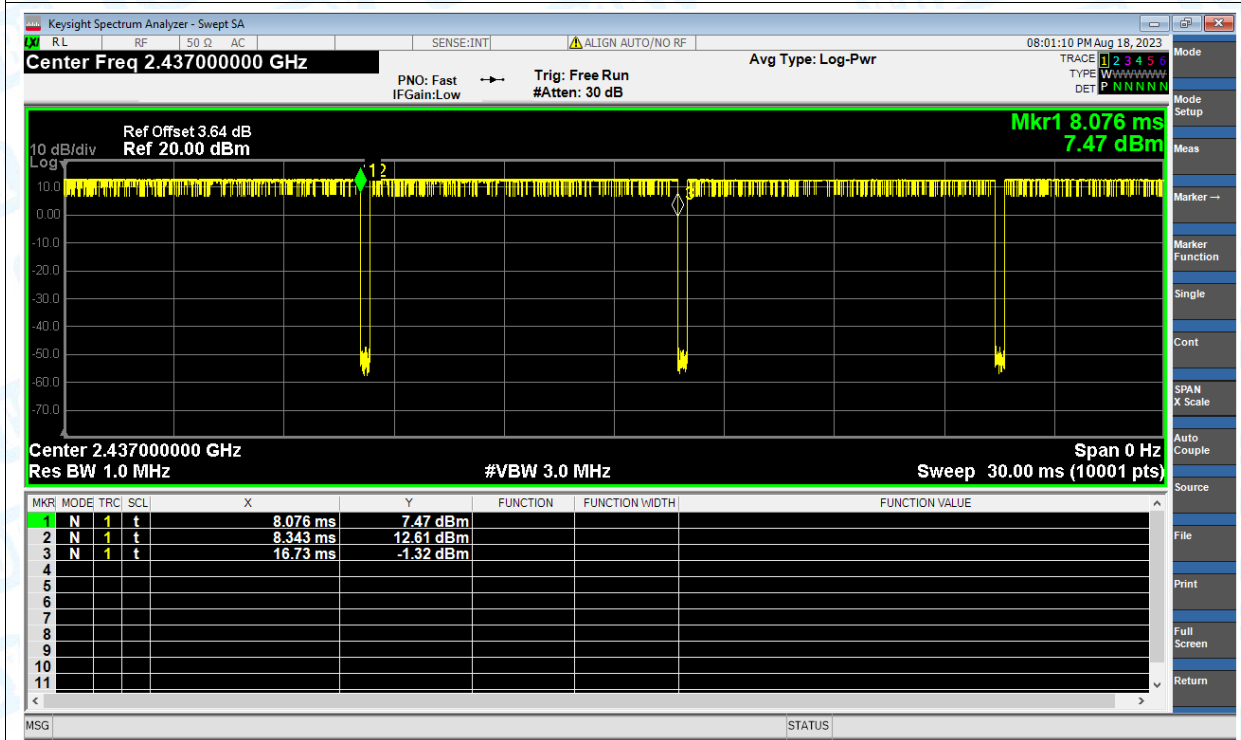
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant1	96.91	0.14	0.12
NVNT	b	2437	Ant1	96.91	0.14	0.12
NVNT	b	2462	Ant1	96.88	0.14	0.12
NVNT	g	2412	Ant1	83.46	0.79	0.73
NVNT	g	2437	Ant1	82.93	0.81	0.74
NVNT	g	2462	Ant1	83.44	0.79	0.74
NVNT	n(HT20)	2412	Ant1	94.95	0.23	0.2
NVNT	n(HT20)	2437	Ant1	94.95	0.23	0.2
NVNT	n(HT20)	2462	Ant1	94.95	0.23	0.2
NVNT	n(HT40)	2422	Ant1	51.27	2.9	3.53
NVNT	n(HT40)	2437	Ant1	44.69	3.5	3.55
NVNT	n(HT40)	2452	Ant1	51.27	2.9	3.53

Test Graphs

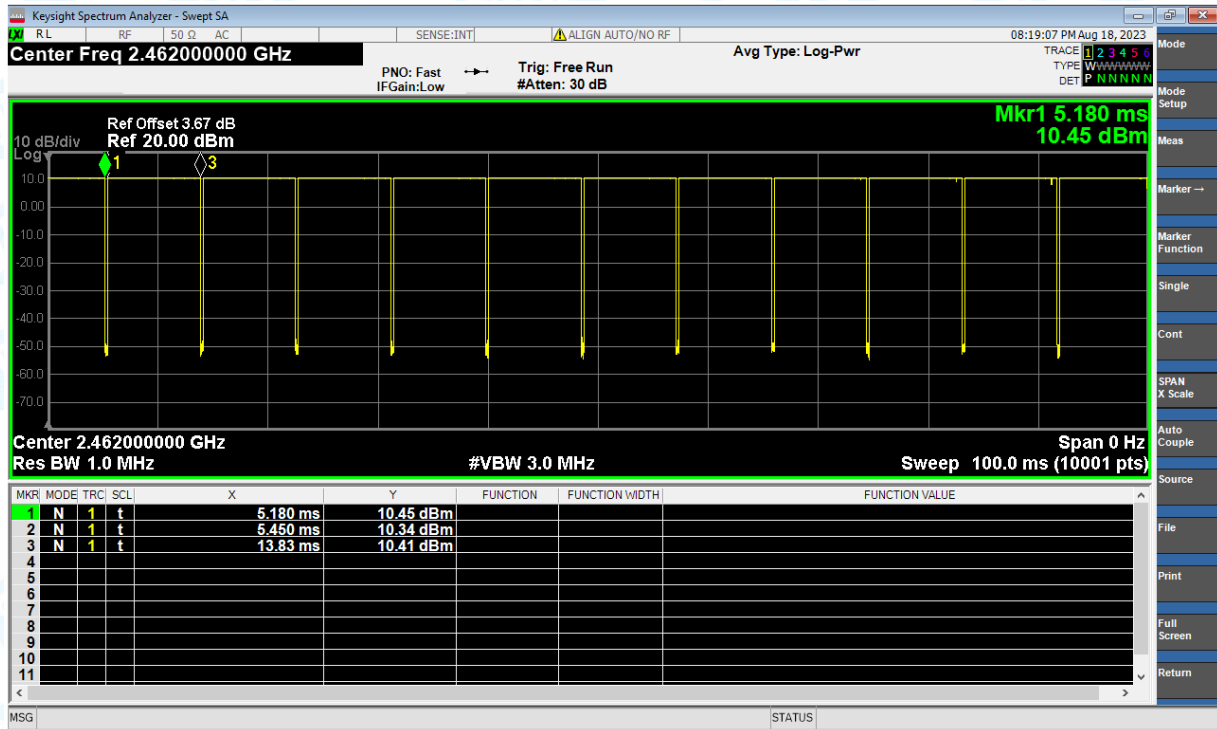
Duty Cycle NVNT b 2412MHz Ant1



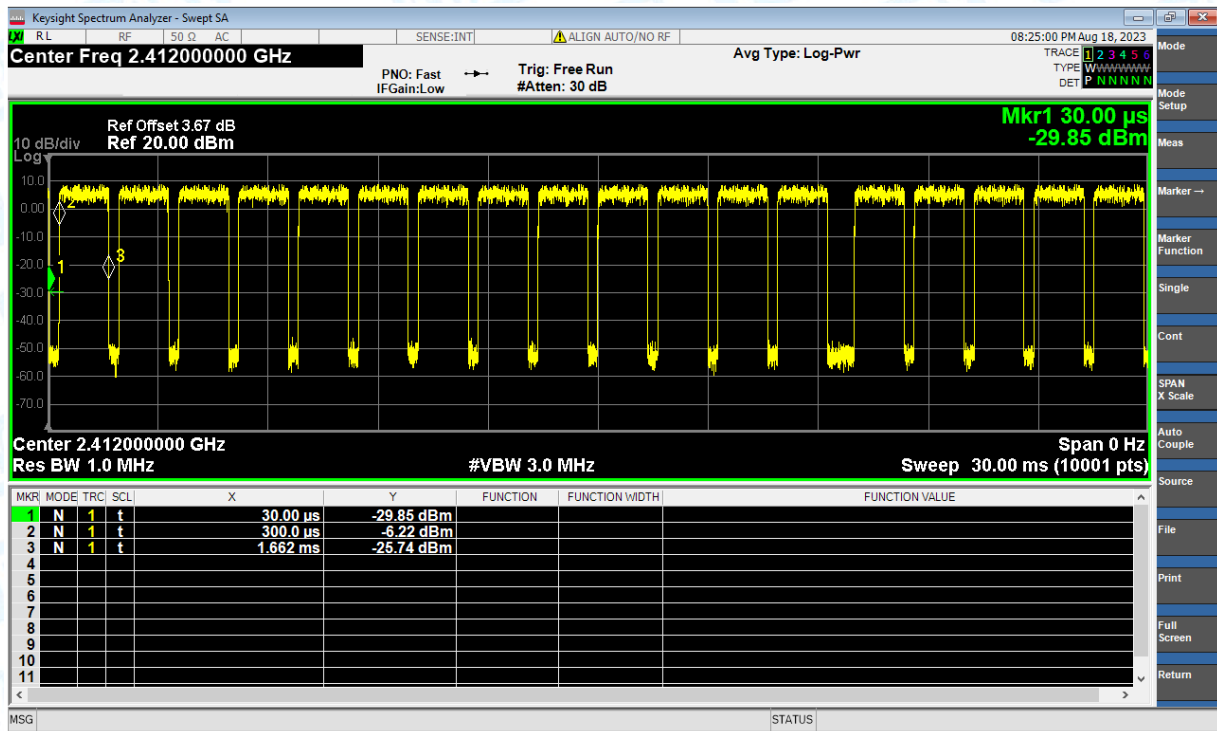
Duty Cycle NVNT b 2437MHz Ant1



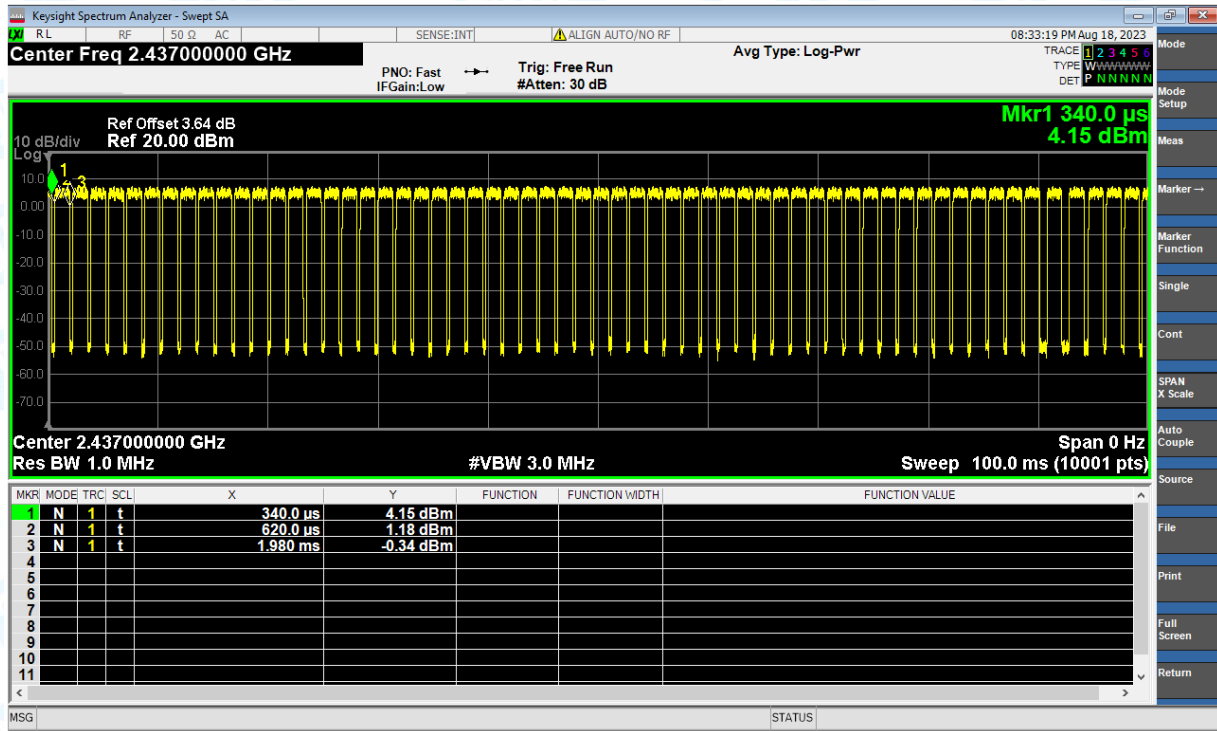
Duty Cycle NVNT b 2462MHz Ant1



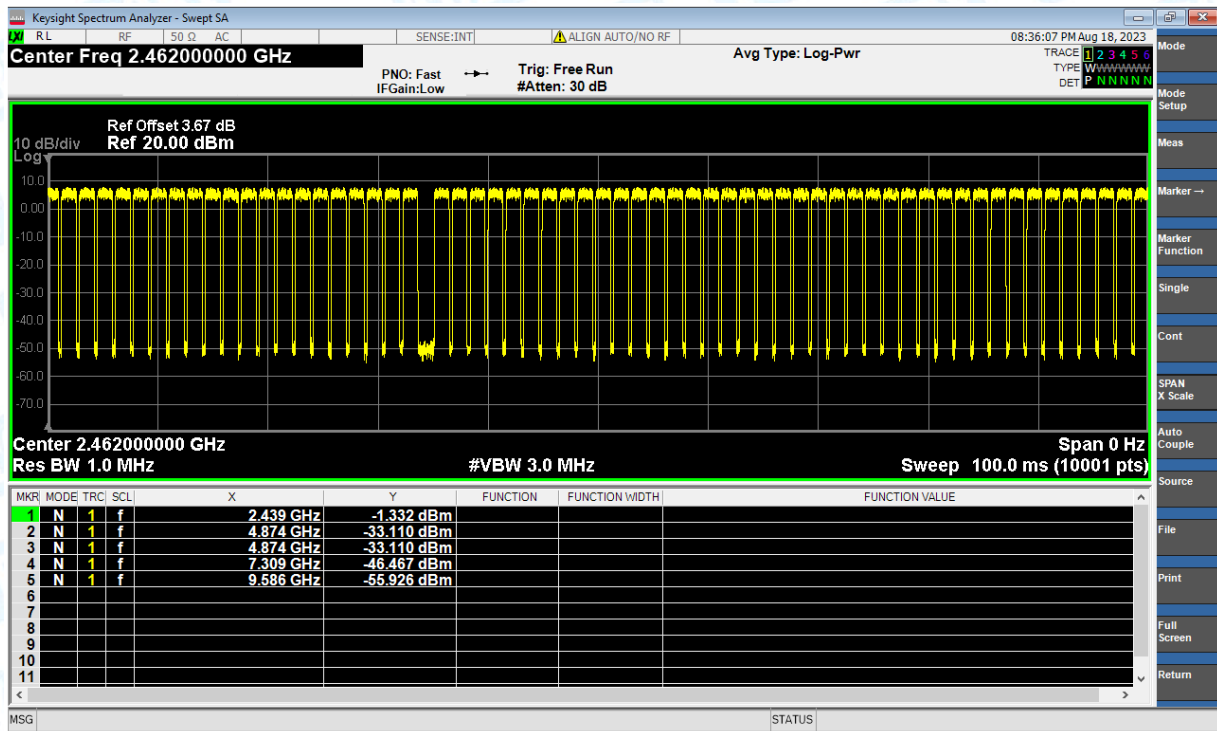
Duty Cycle NVNT g 2412MHz Ant1



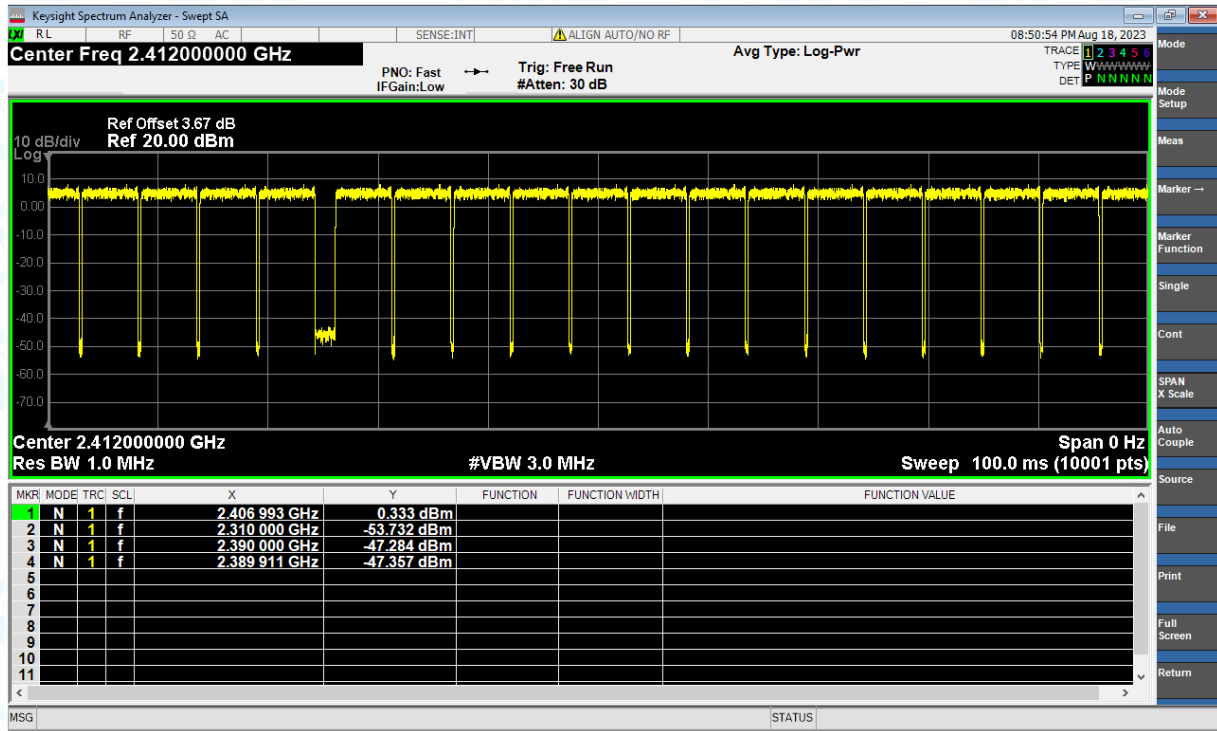
Duty Cycle NVNT g 2437MHz Ant1



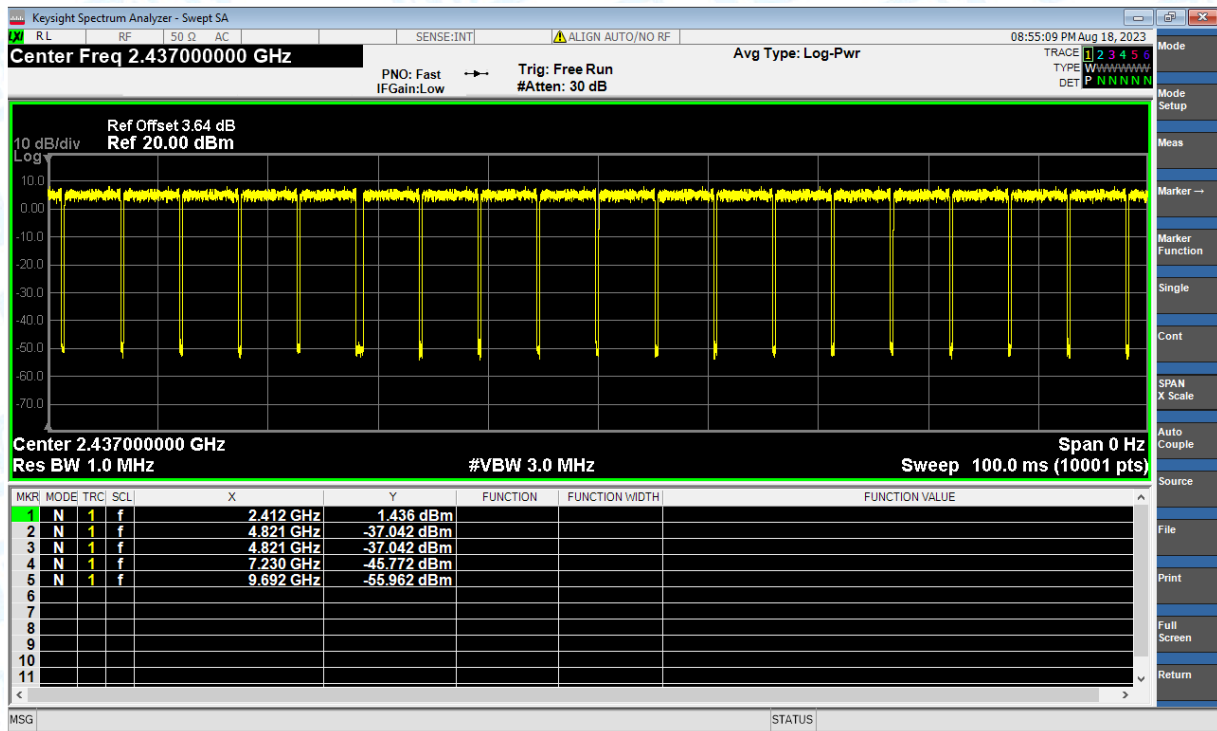
Duty Cycle NVNT g 2462MHz Ant1



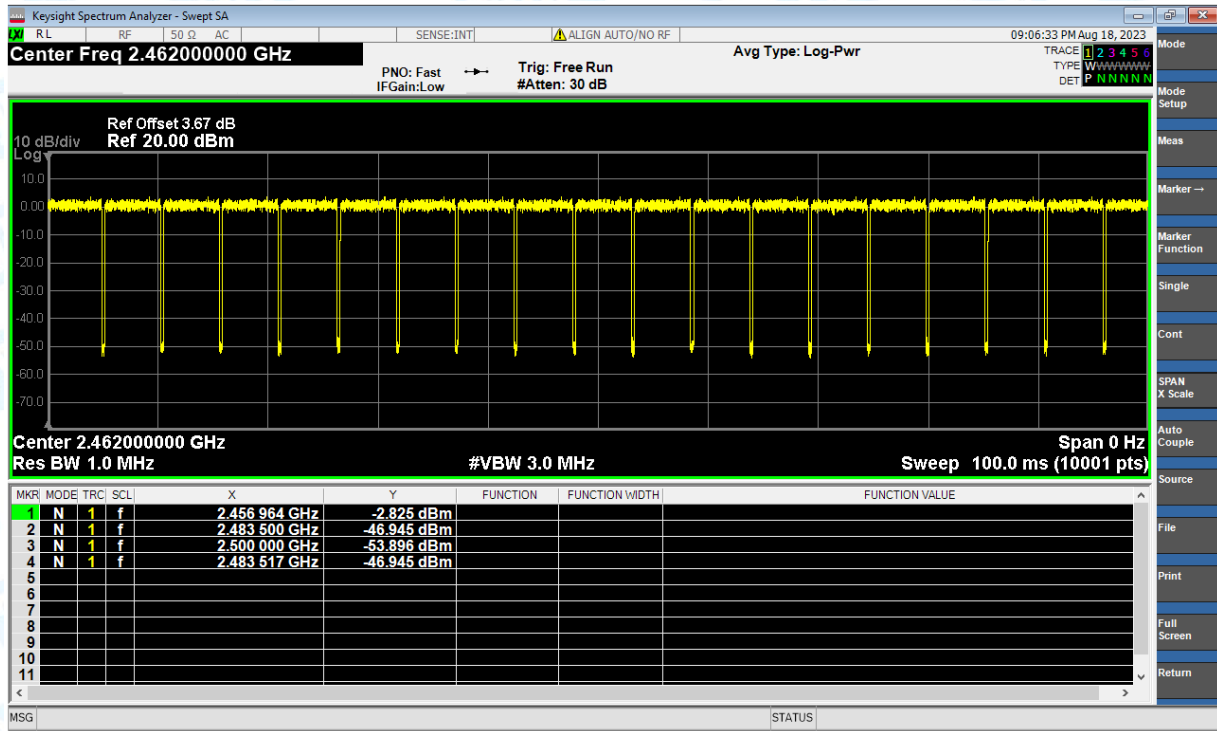
Duty Cycle NVNT n(HT20) 2412MHz Ant1



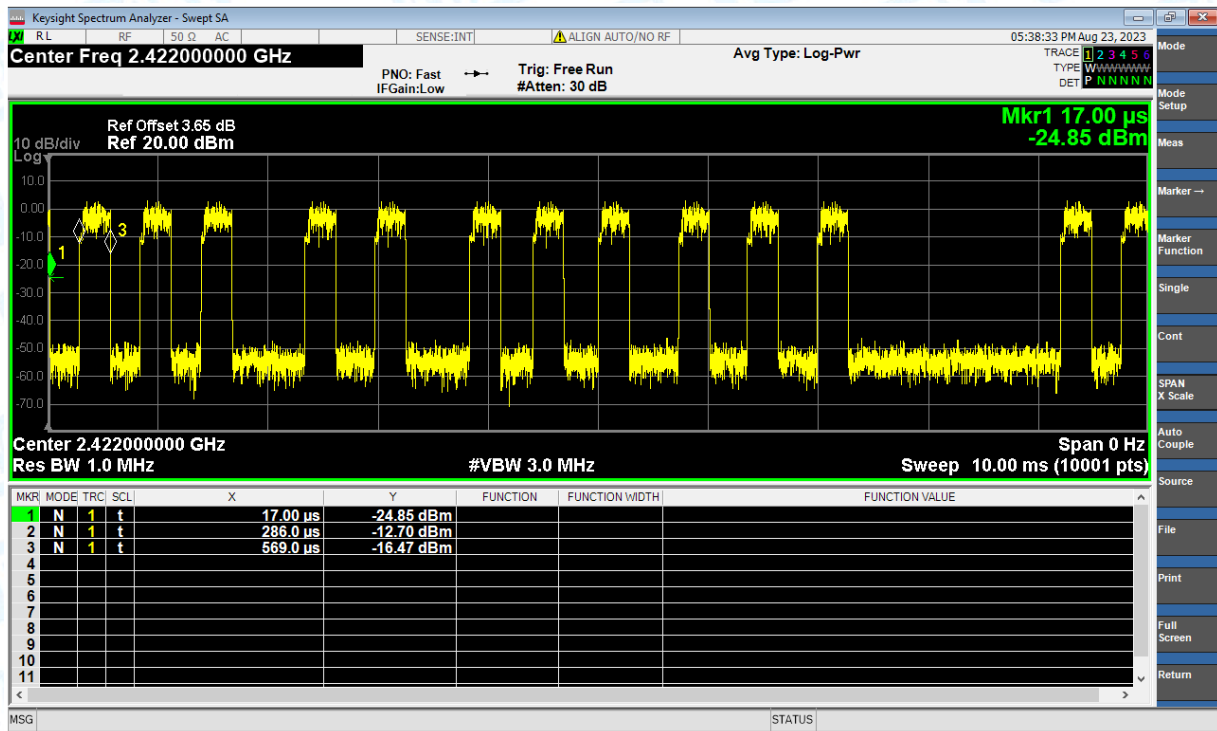
Duty Cycle NVNT n(HT20) 2437MHz Ant1



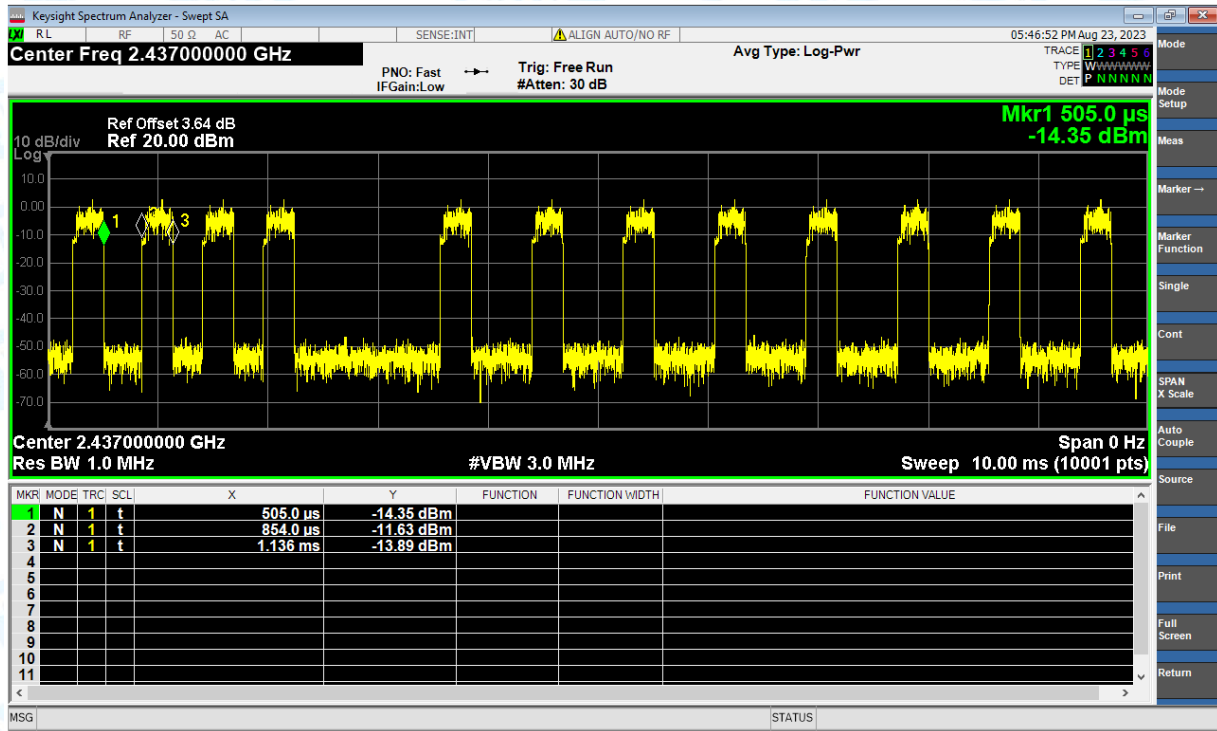
Duty Cycle NVNT n(HT20) 2462MHz Ant1



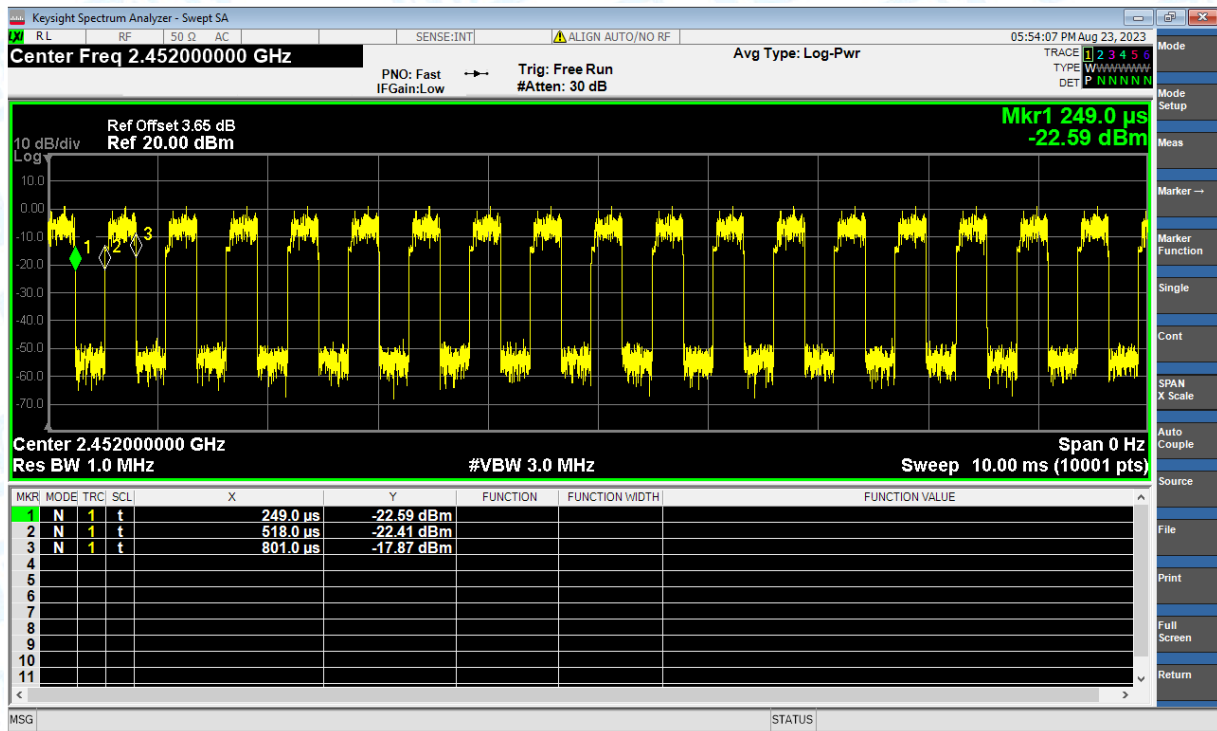
Duty Cycle NVNT n(HT40) 2422MHz Ant1



Duty Cycle NVNT n(HT40) 2437MHz Ant1



Duty Cycle NVNT n(HT40) 2452MHz Ant1



2. Maximum Conducted Output Power

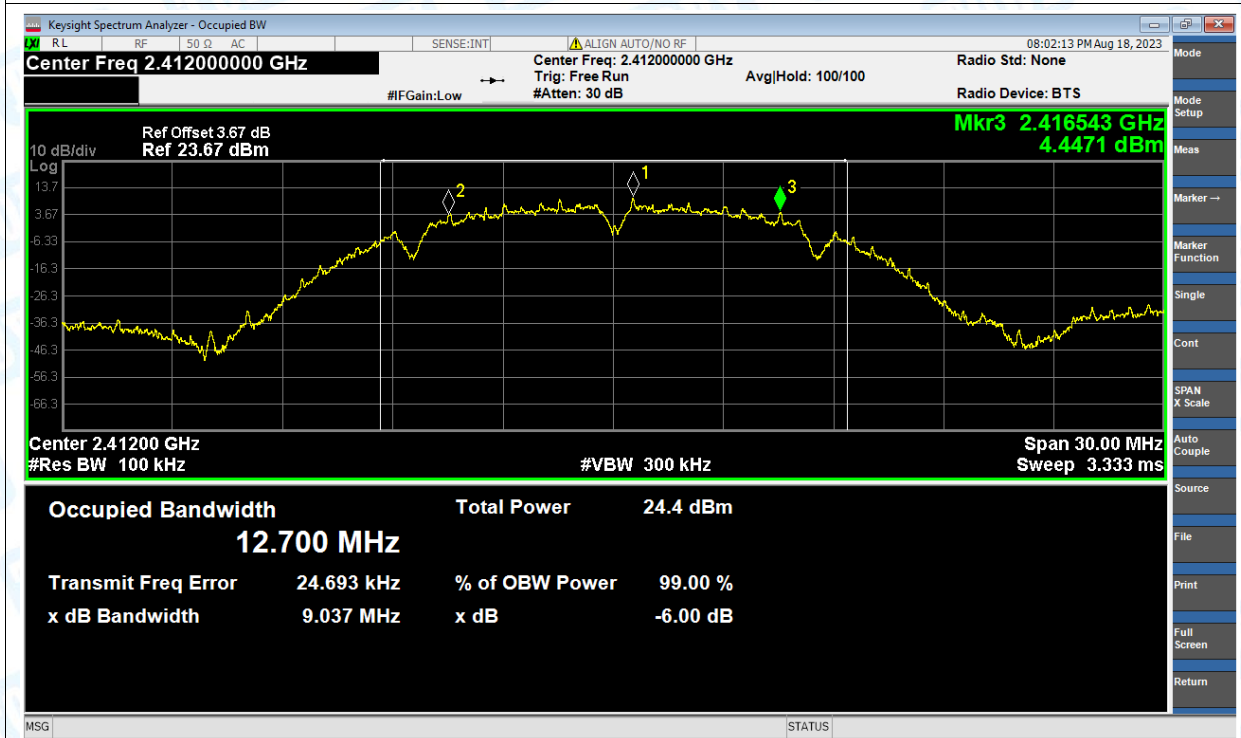
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.018	30	Pass
NVNT	b	2437	Ant1	17.910	30	Pass
NVNT	b	2462	Ant1	15.786	30	Pass
NVNT	g	2412	Ant1	12.118	30	Pass
NVNT	g	2437	Ant1	12.110	30	Pass
NVNT	g	2462	Ant1	12.125	30	Pass
NVNT	n(HT20)	2412	Ant1	12.903	30	Pass
NVNT	n(HT20)	2437	Ant1	13.358	30	Pass
NVNT	n(HT20)	2462	Ant1	13.231	30	Pass
NVNT	n(HT40)	2422	Ant1	12.845	30	Pass
NVNT	n(HT40)	2437	Ant1	13.351	30	Pass
NVNT	n(HT40)	2452	Ant1	13.213	30	Pass

3. -6dB Bandwidth

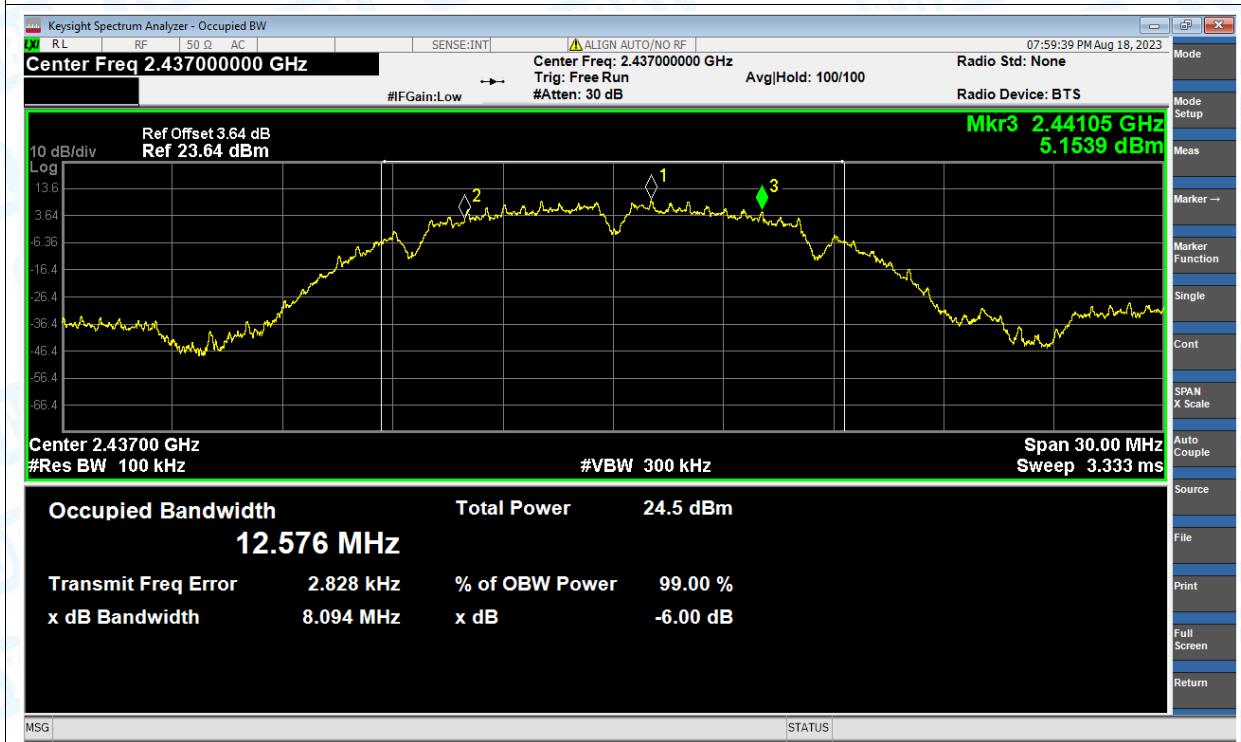
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	9.04	0.5	Pass
NVNT	b	2437	Ant1	8.09	0.5	Pass
NVNT	b	2462	Ant1	9.00	0.5	Pass
NVNT	g	2412	Ant1	16.35	0.5	Pass
NVNT	g	2437	Ant1	16.38	0.5	Pass
NVNT	g	2462	Ant1	16.43	0.5	Pass
NVNT	n(HT20)	2412	Ant1	17.57	0.5	Pass
NVNT	n(HT20)	2437	Ant1	17.62	0.5	Pass
NVNT	n(HT20)	2462	Ant1	17.57	0.5	Pass
NVNT	n(HT40)	2422	Ant1	35.95	0.5	Pass
NVNT	n(HT40)	2437	Ant1	36.21	0.5	Pass
NVNT	n(HT40)	2452	Ant1	36.33	0.5	Pass

Test Graphs

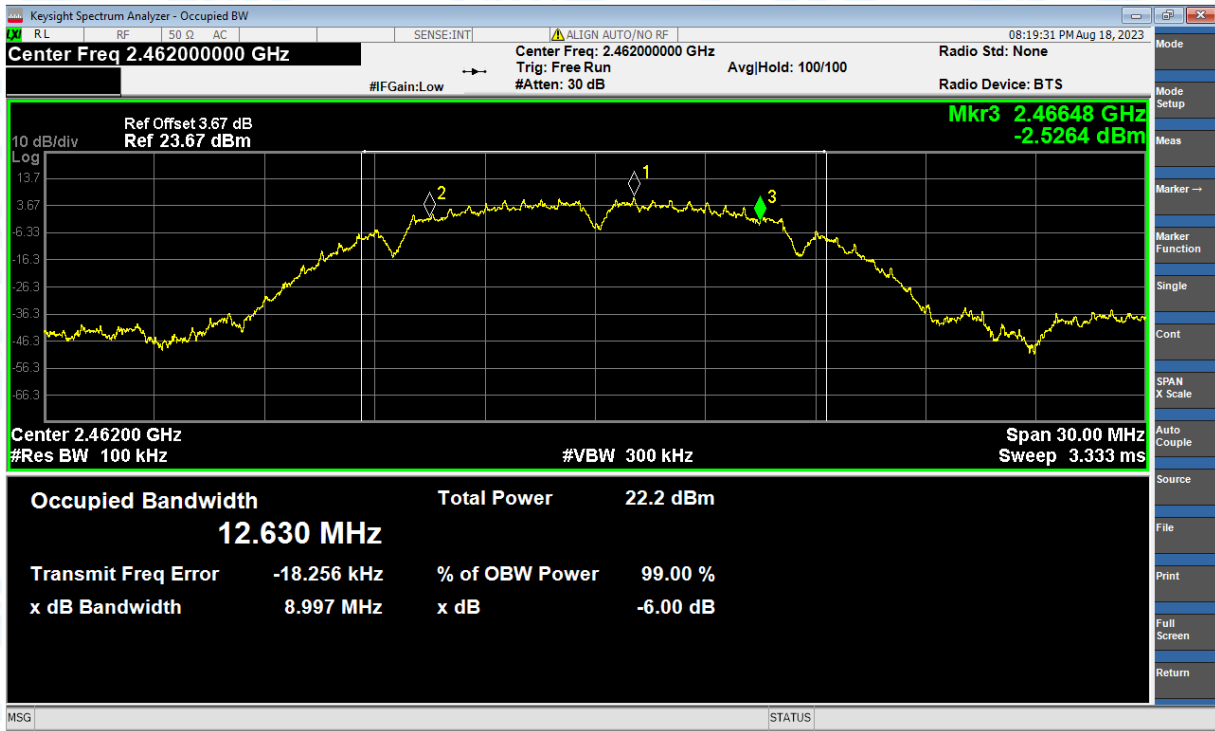
-6dB Bandwidth NVNT b 2412MHz Ant1



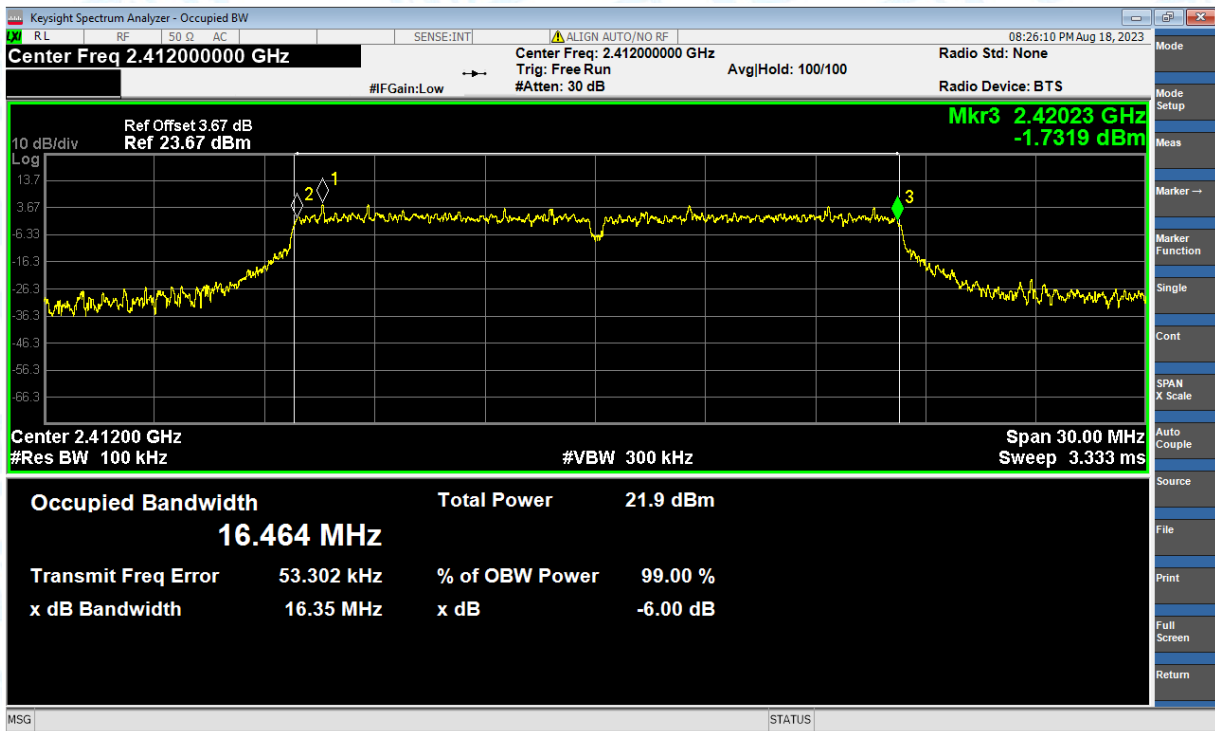
-6dB Bandwidth NVNT b 2437MHz Ant1



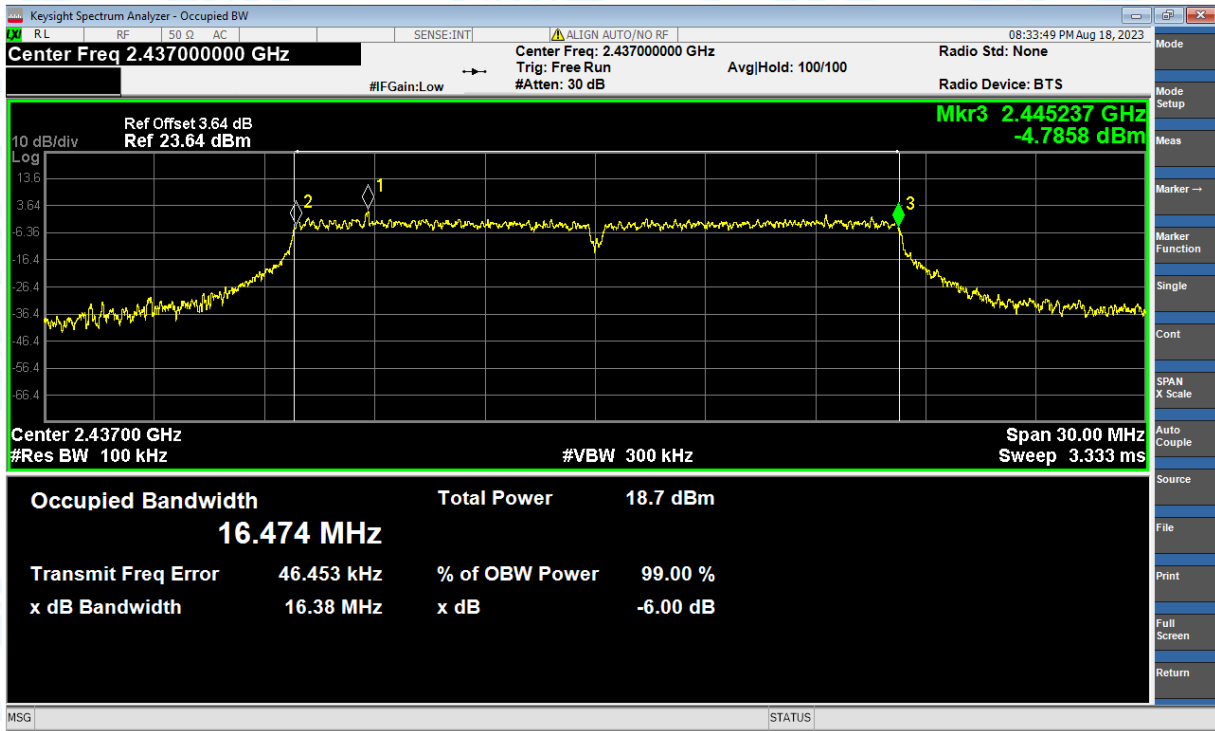
-6dB Bandwidth NVNT b 2462MHz Ant1



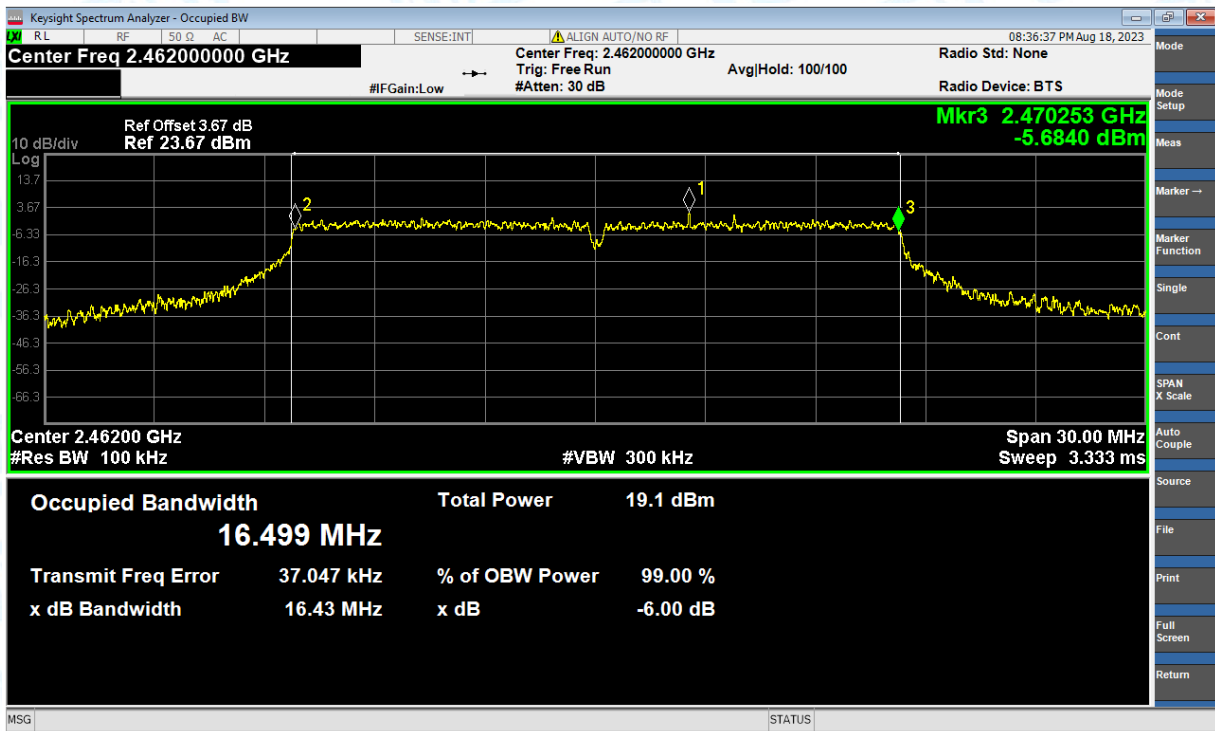
-6dB Bandwidth NVNT g 2412MHz Ant1



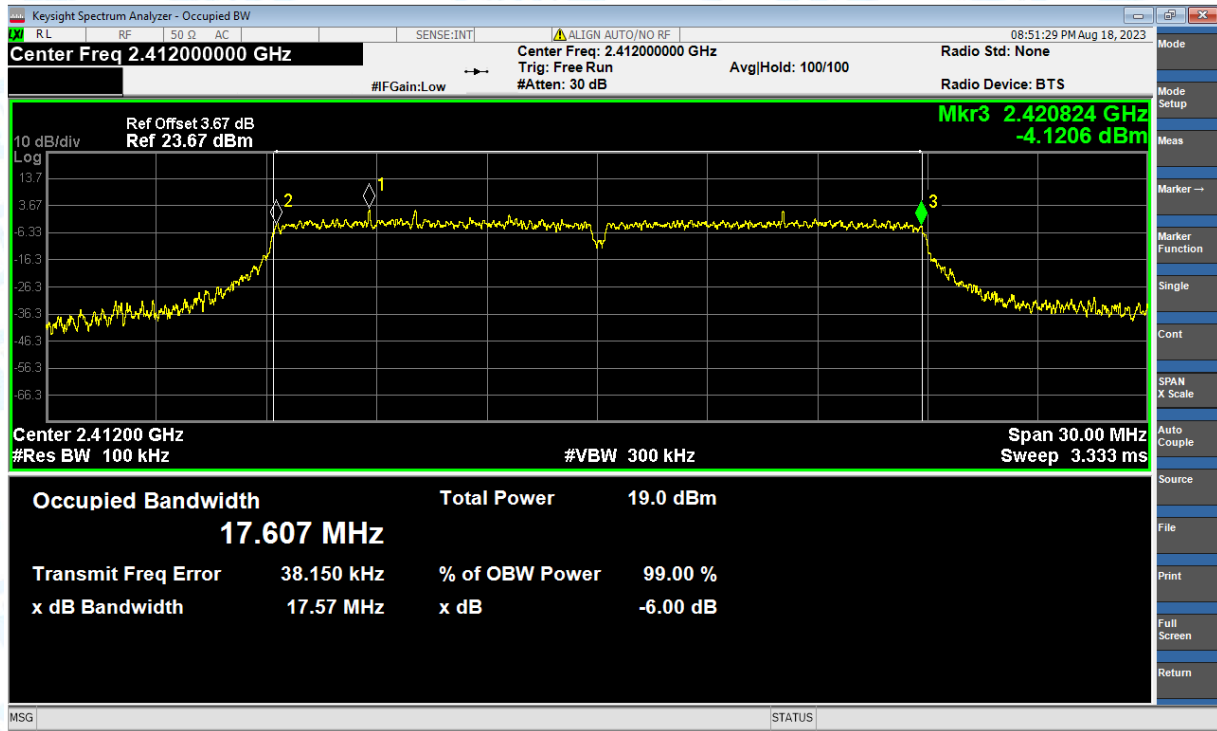
-6dB Bandwidth NVNT g 2437MHz Ant1



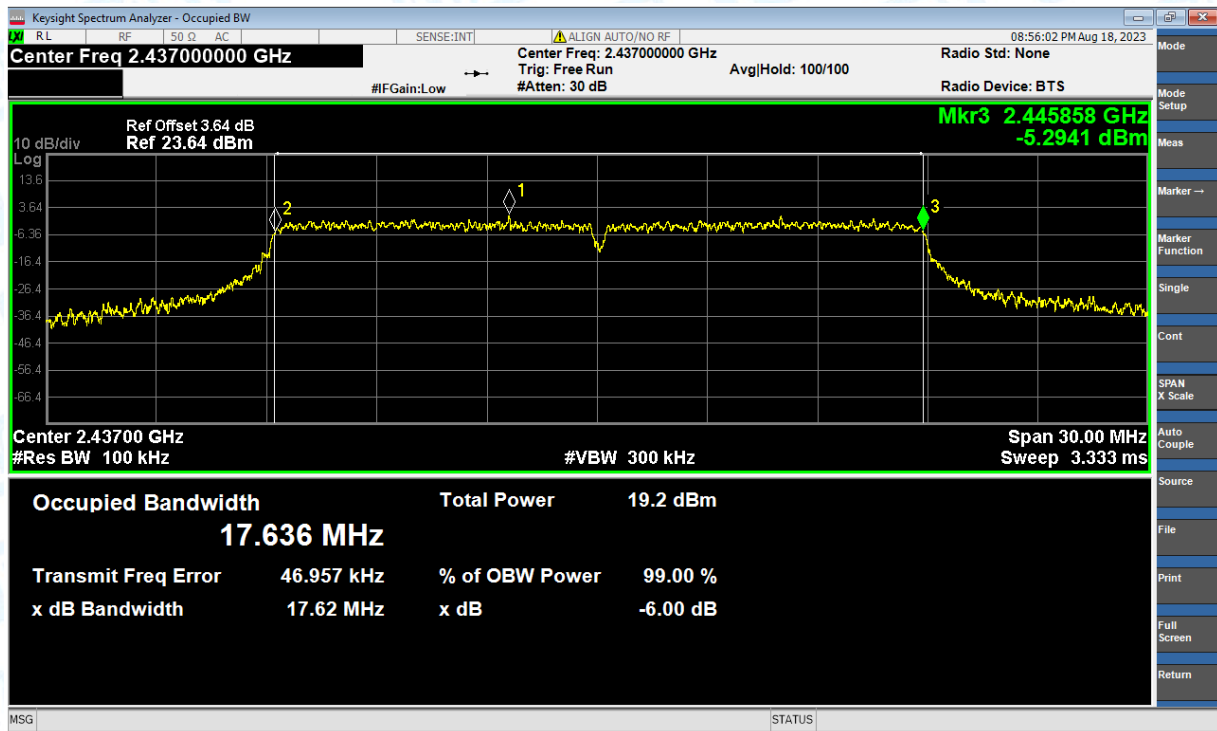
-6dB Bandwidth NVNT g 2462MHz Ant1



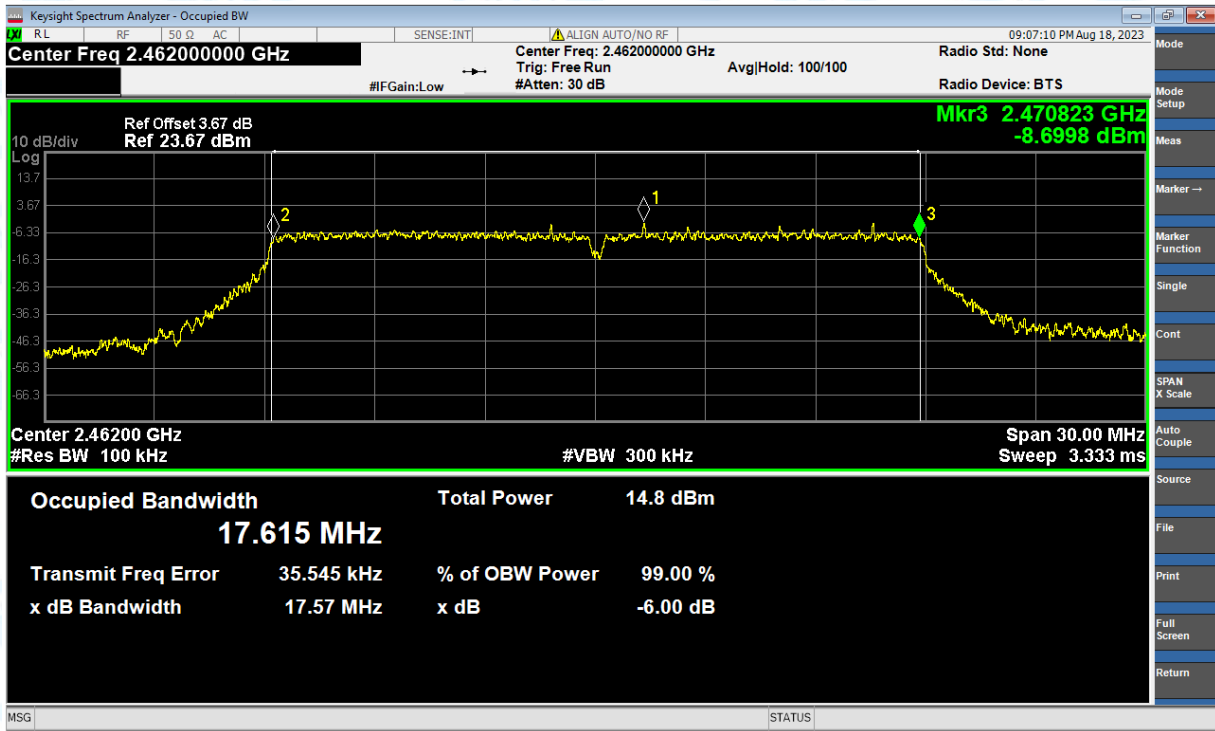
-6dB Bandwidth NVNT n(HT20) 2412MHz Ant1



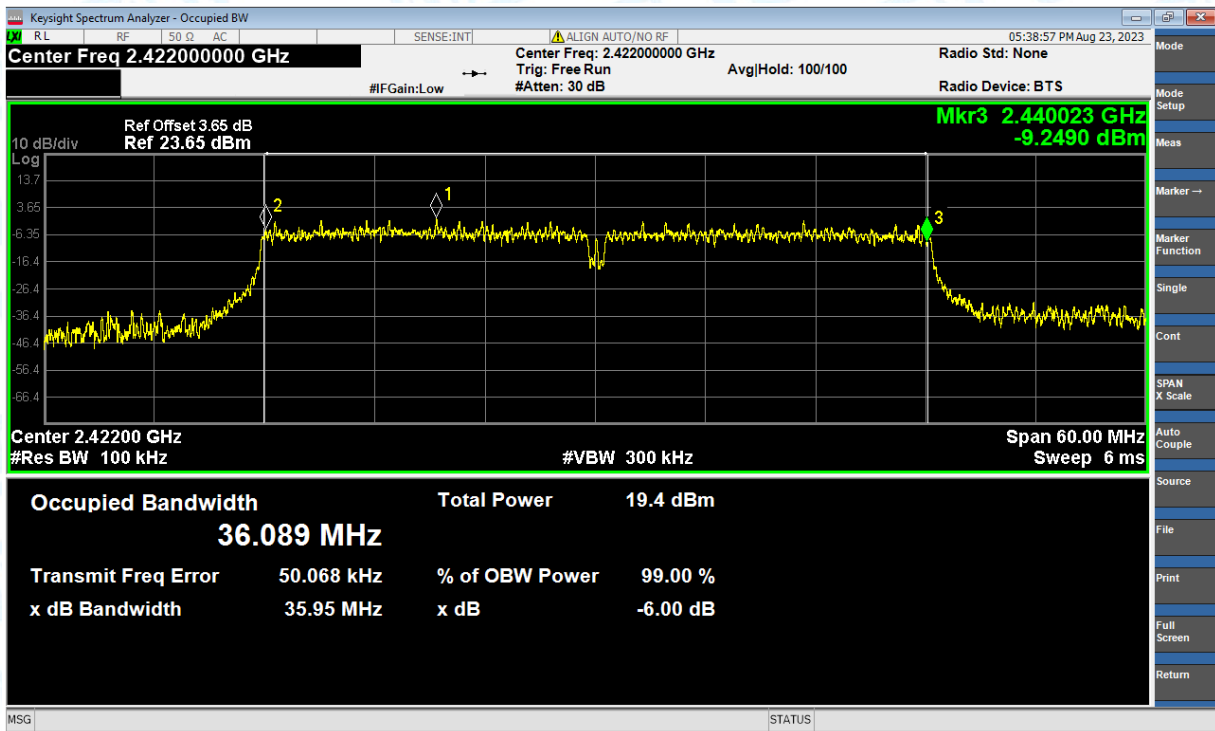
-6dB Bandwidth NVNT n(HT20) 2437MHz Ant1



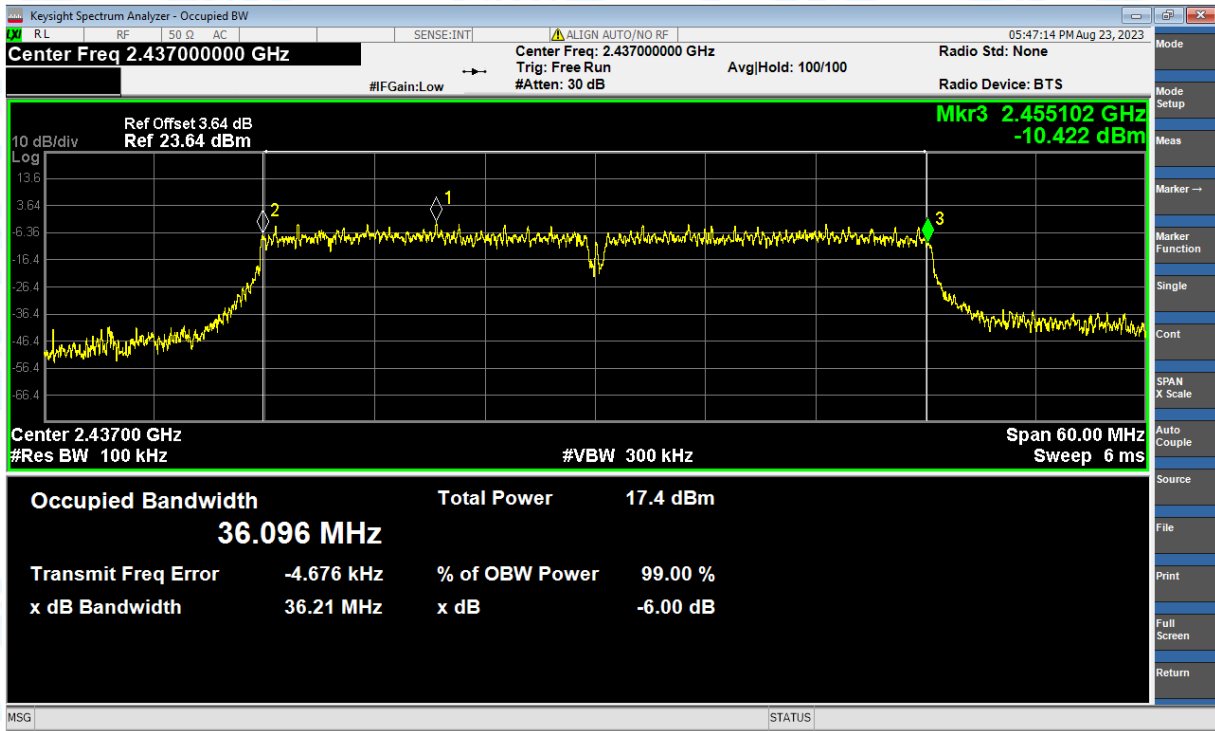
-6dB Bandwidth NVNT n(HT20) 2462MHz Ant1



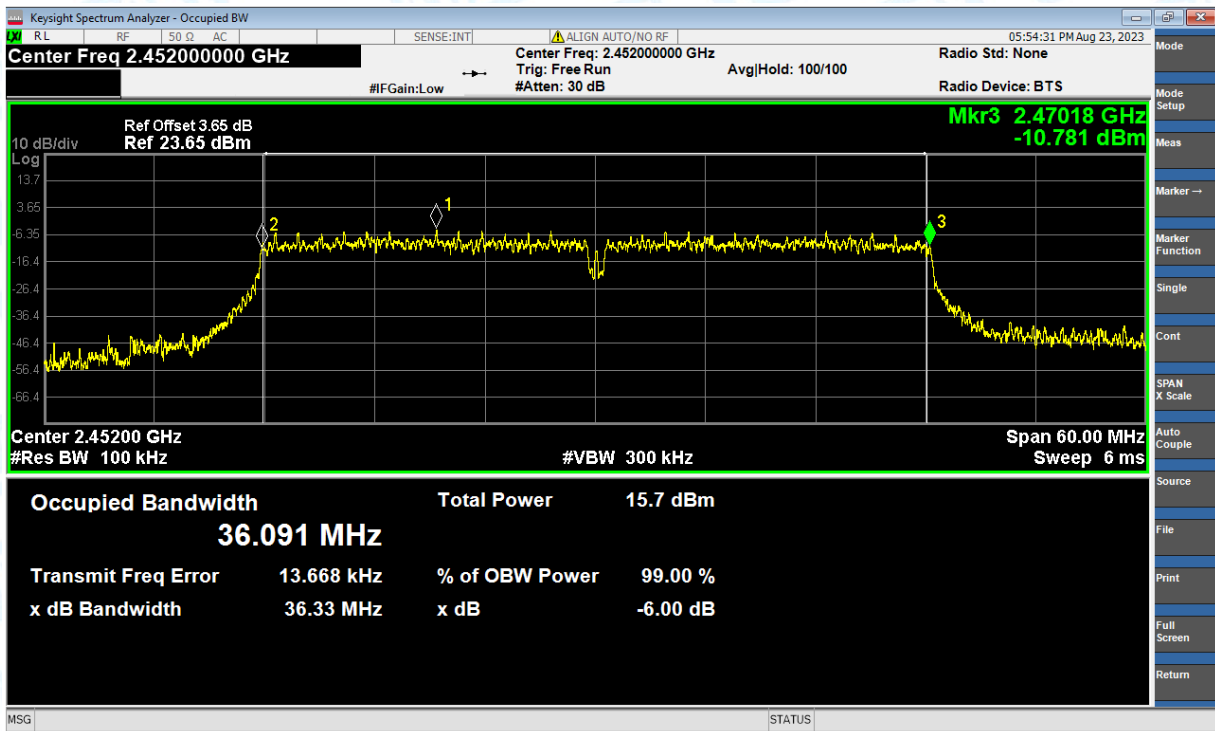
-6dB Bandwidth NVNT n(HT40) 2422MHz Ant1



-6dB Bandwidth NVNT n(HT40) 2437MHz Ant1



-6dB Bandwidth NVNT n(HT40) 2452MHz Ant1

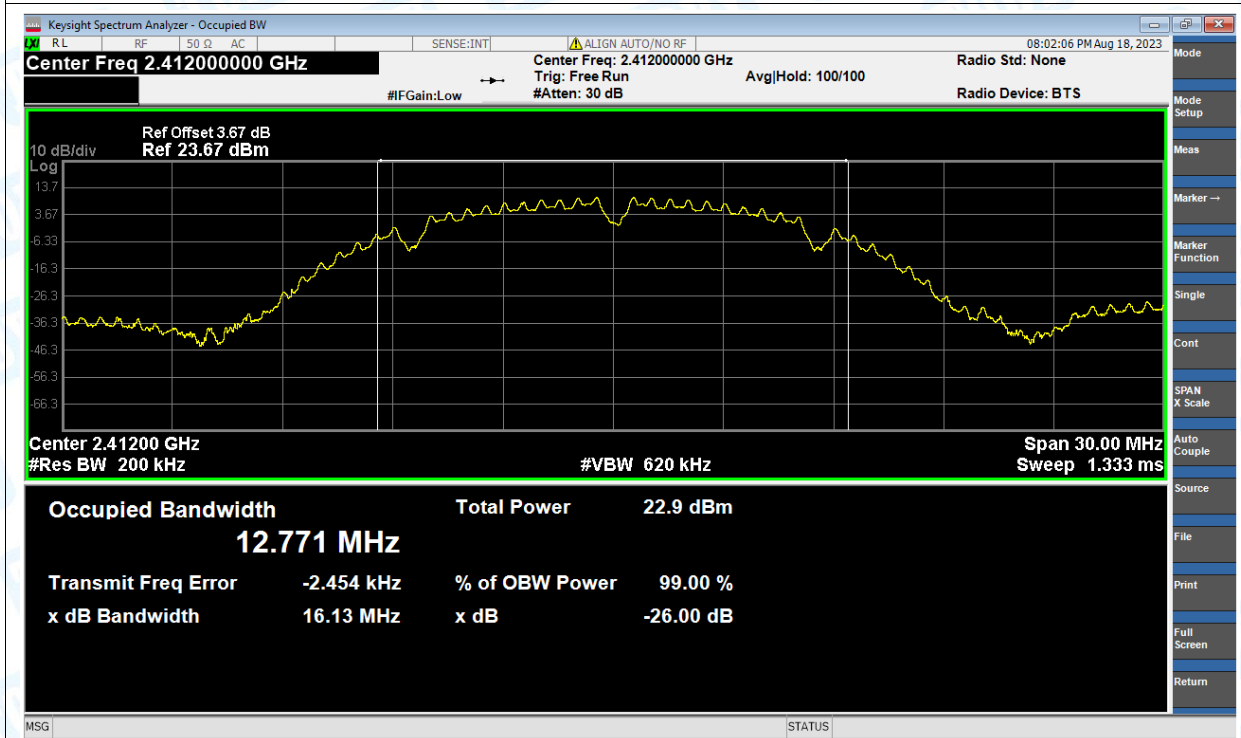


4. Occupied Channel Bandwidth

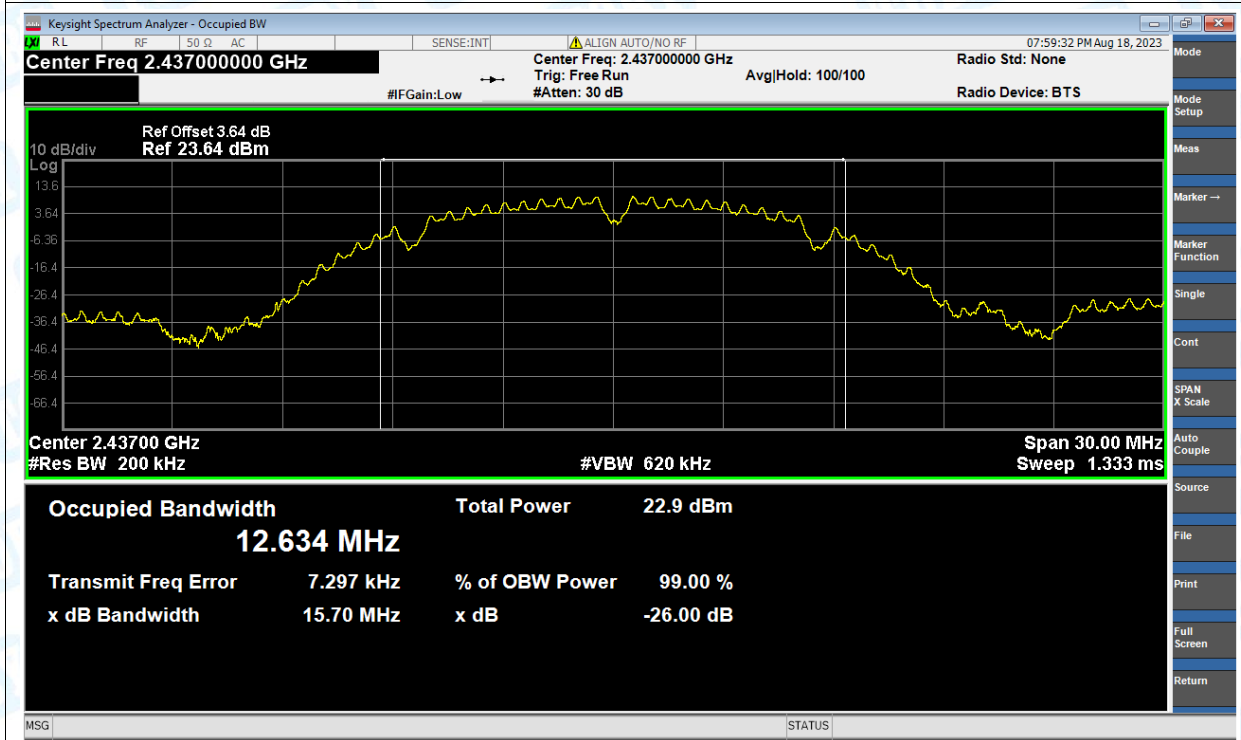
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	12.771
NVNT	b	2437	Ant1	12.634
NVNT	b	2462	Ant1	12.626
NVNT	g	2412	Ant1	16.567
NVNT	g	2437	Ant1	16.603
NVNT	g	2462	Ant1	16.605
NVNT	n(HT20)	2412	Ant1	17.660
NVNT	n(HT20)	2437	Ant1	17.683
NVNT	n(HT20)	2462	Ant1	17.665
NVNT	n(HT40)	2422	Ant1	36.178
NVNT	n(HT40)	2437	Ant1	36.214
NVNT	n(HT40)	2452	Ant1	36.142

Test Graphs

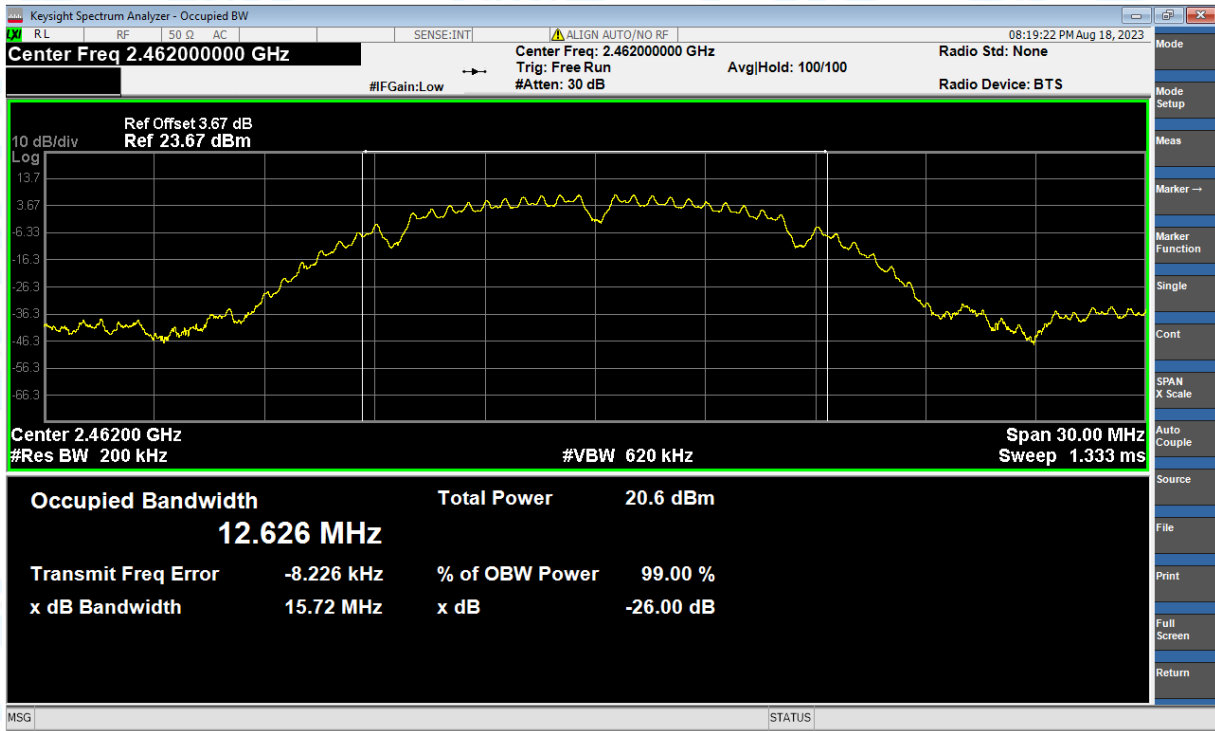
OBW NVNT b 2412MHz Ant1



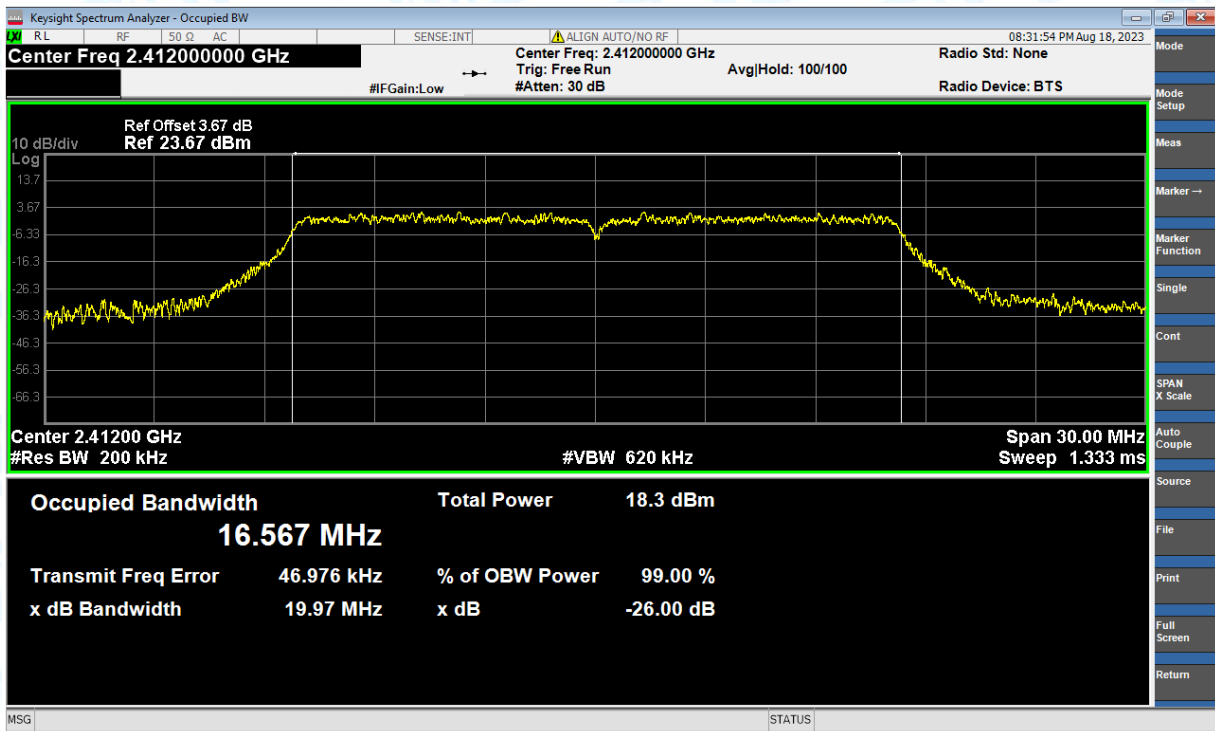
OBW NVNT b 2437MHz Ant1



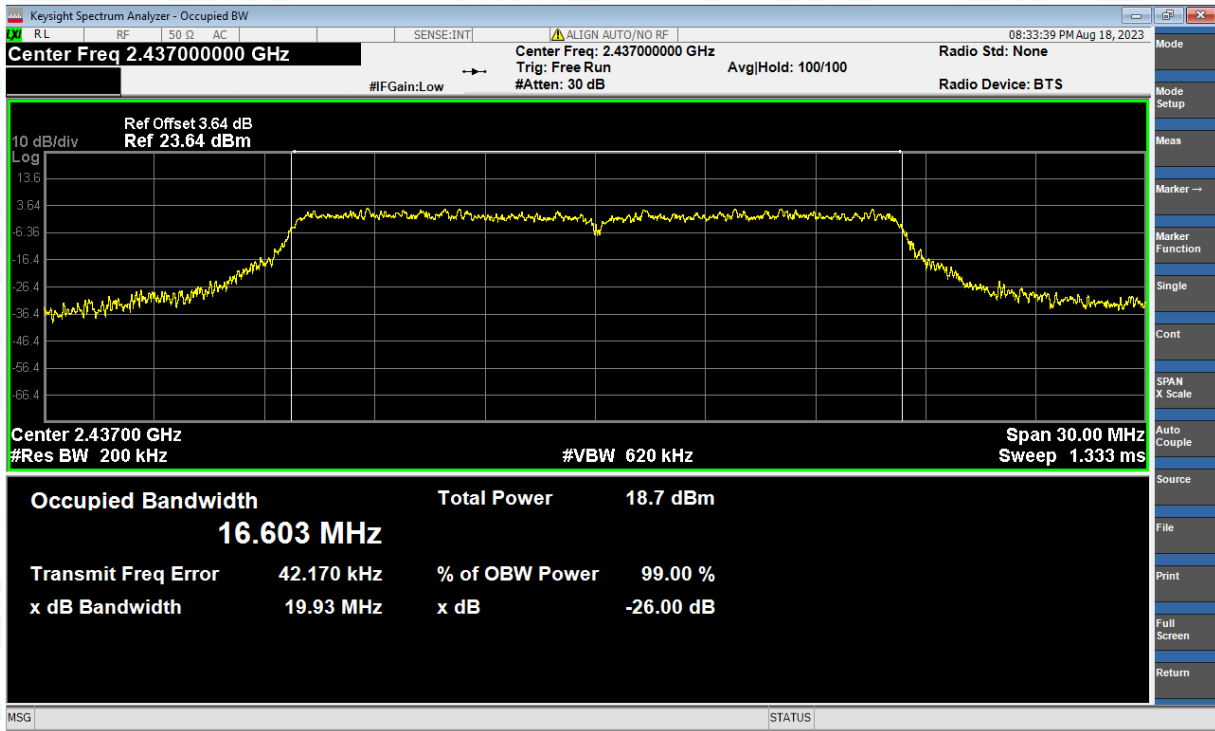
OBW NVNT b 2462MHz Ant1



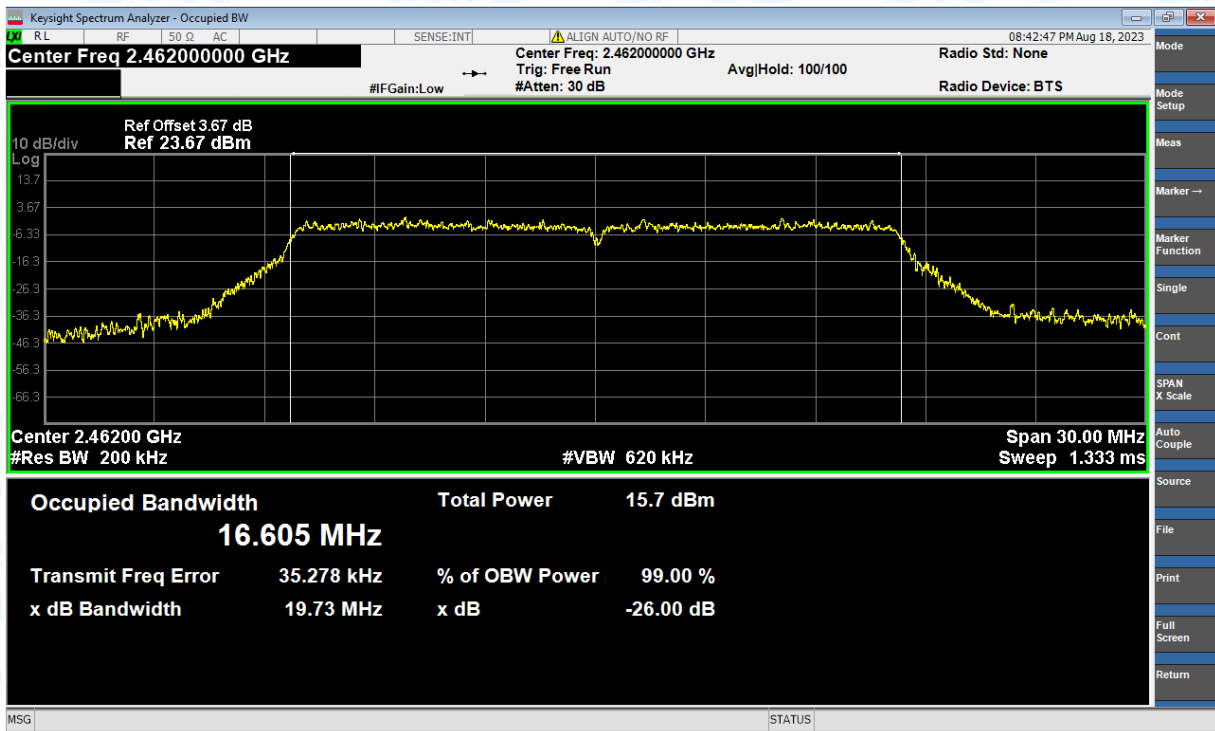
OBW NVNT g 2412MHz Ant1



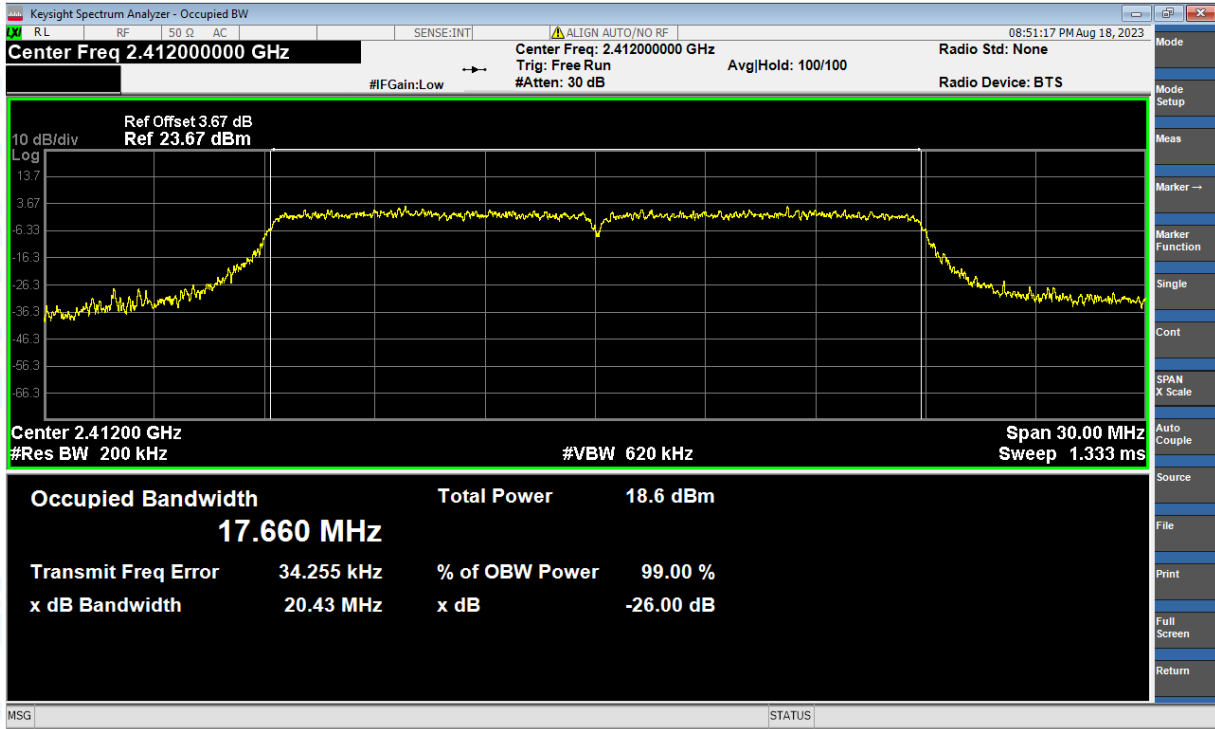
OBW NVNT g 2437MHz Ant1



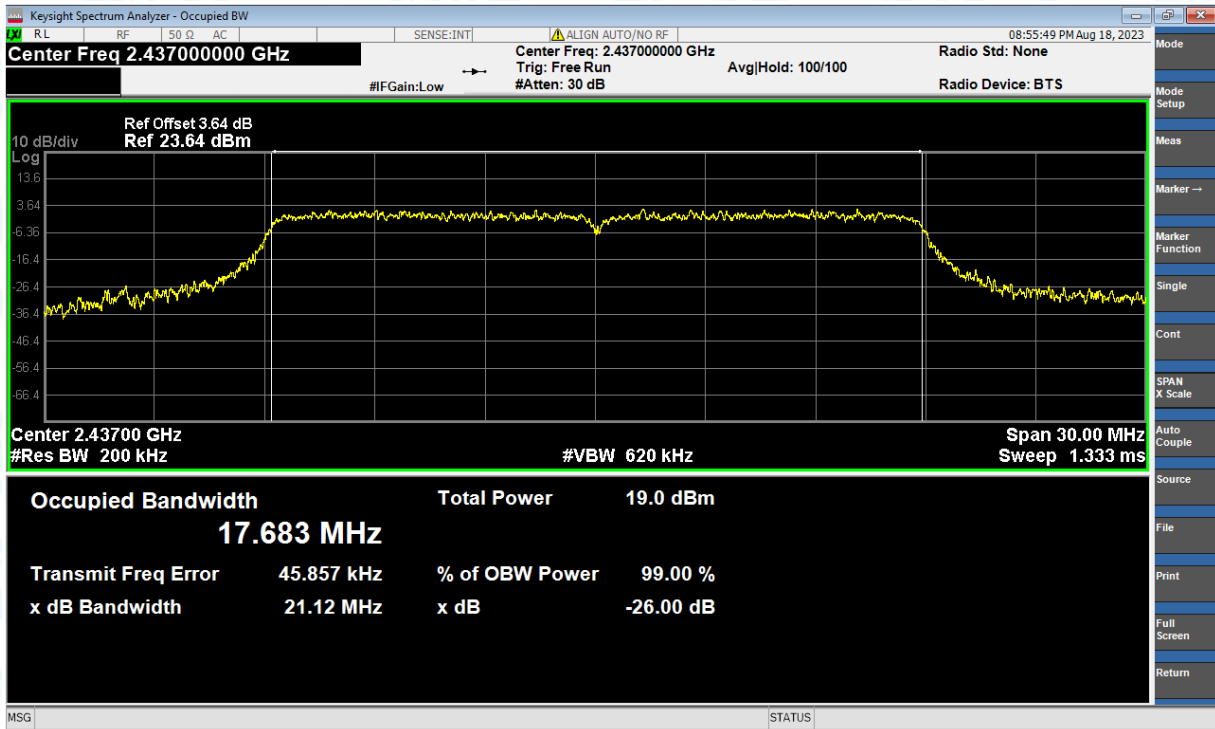
OBW NVNT g 2462MHz Ant1



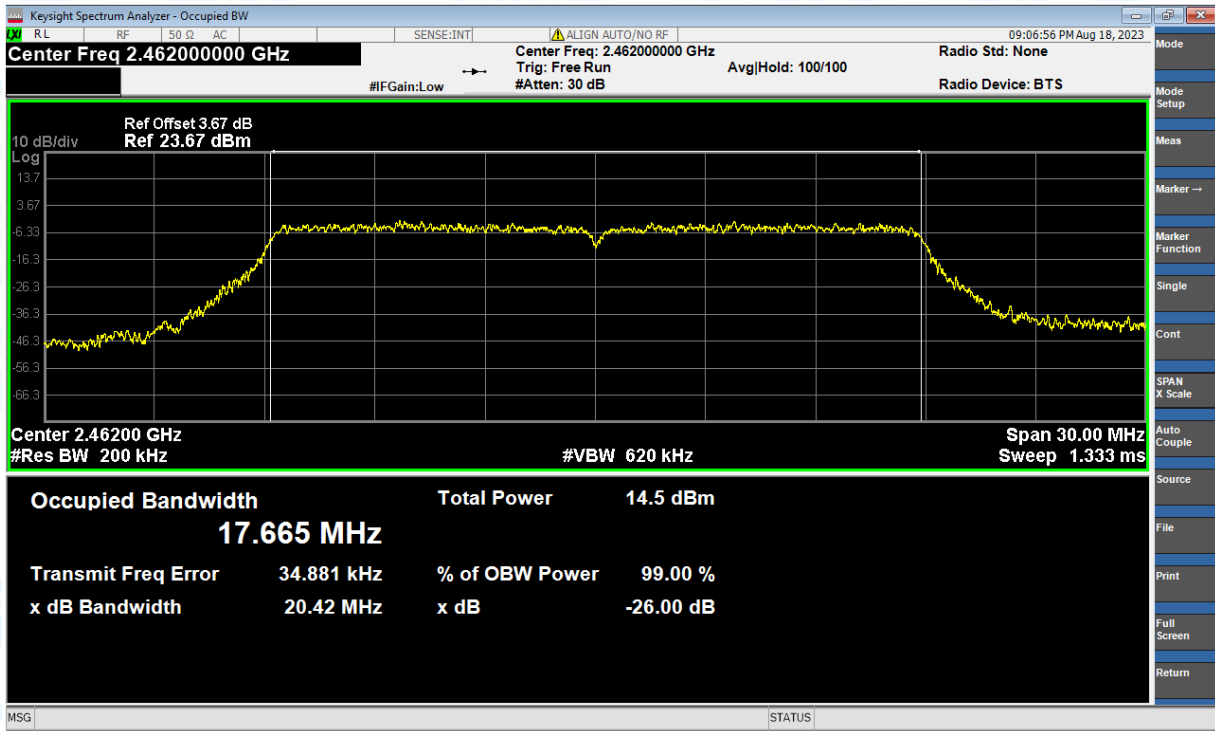
OBW NVNT n(HT20) 2412MHz Ant1



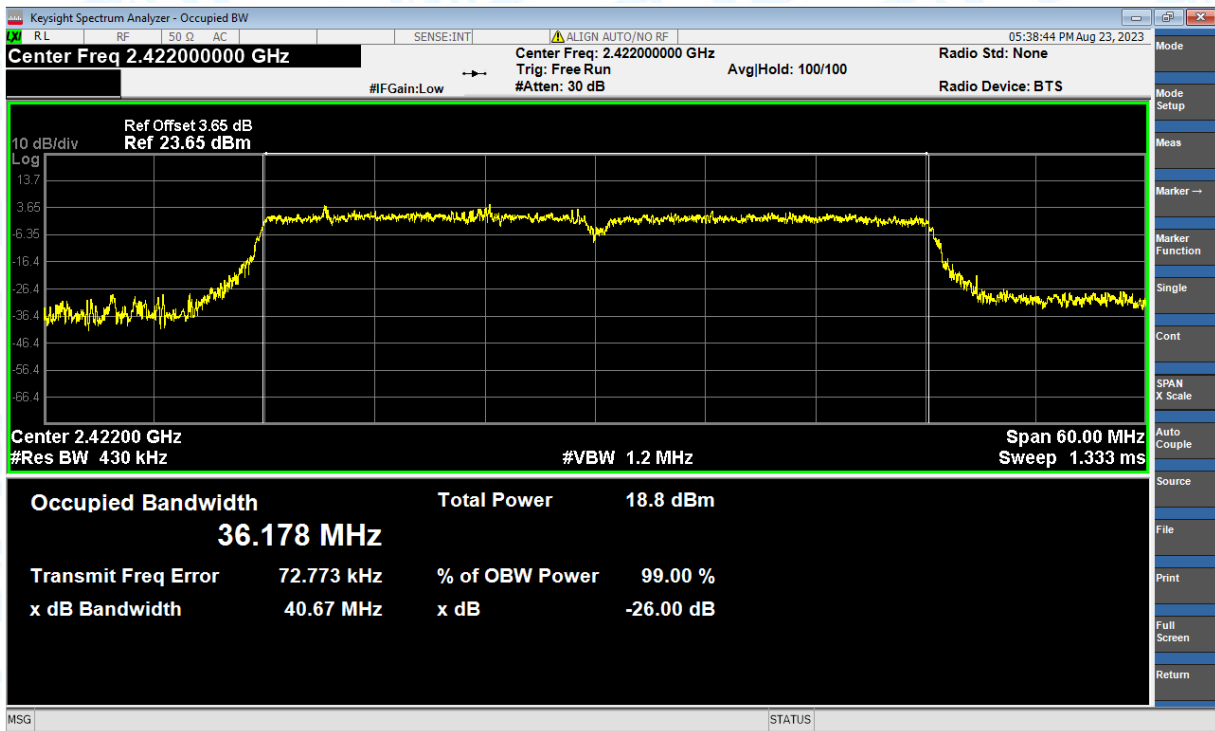
OBW NVNT n(HT20) 2437MHz Ant1



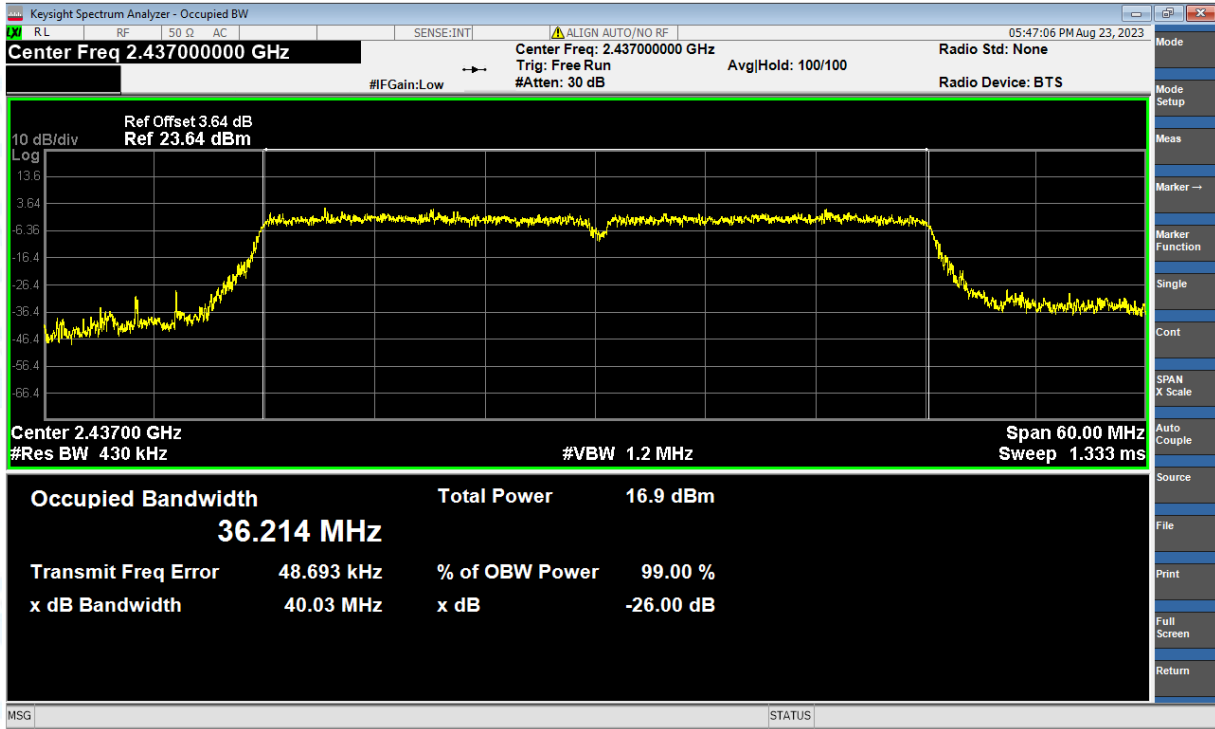
OBW NVNT n(HT20) 2462MHz Ant1



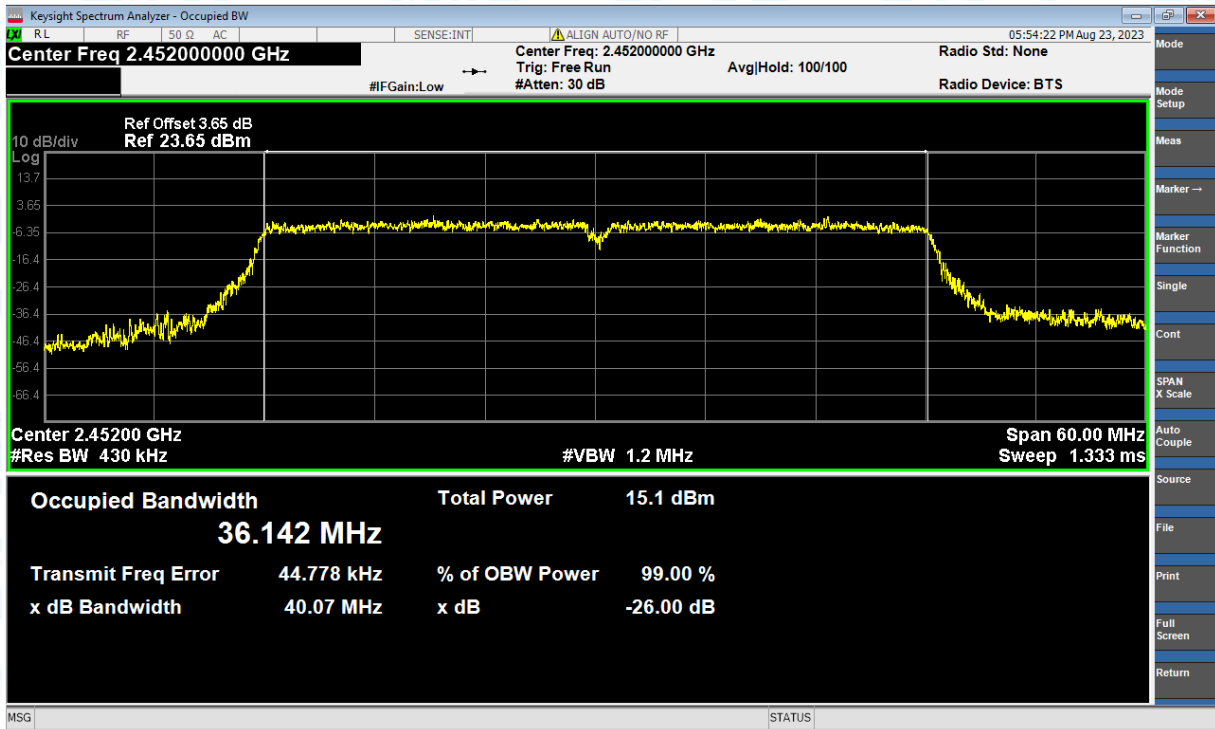
OBW NVNT n(HT40) 2422MHz Ant1



OBW NVNT n(HT40) 2437MHz Ant1



OBW NVNT n(HT40) 2452MHz Ant1

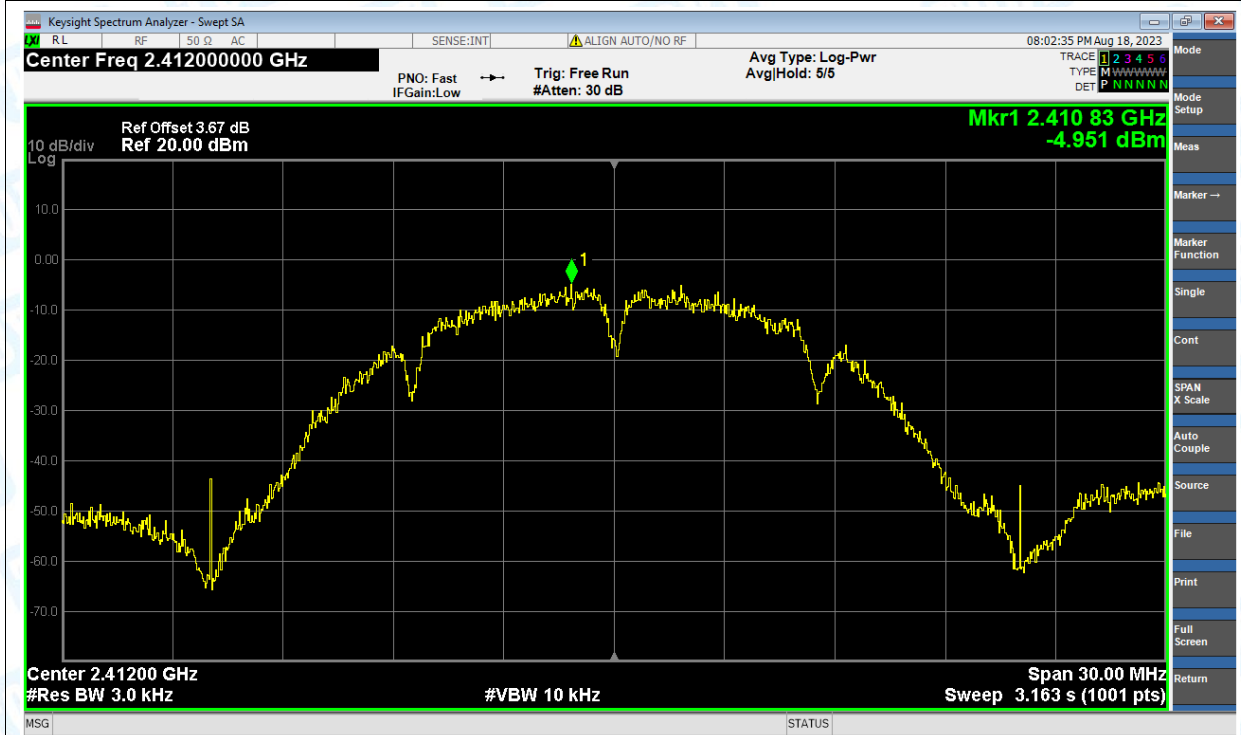


5. Maximum Power Spectral Density Level

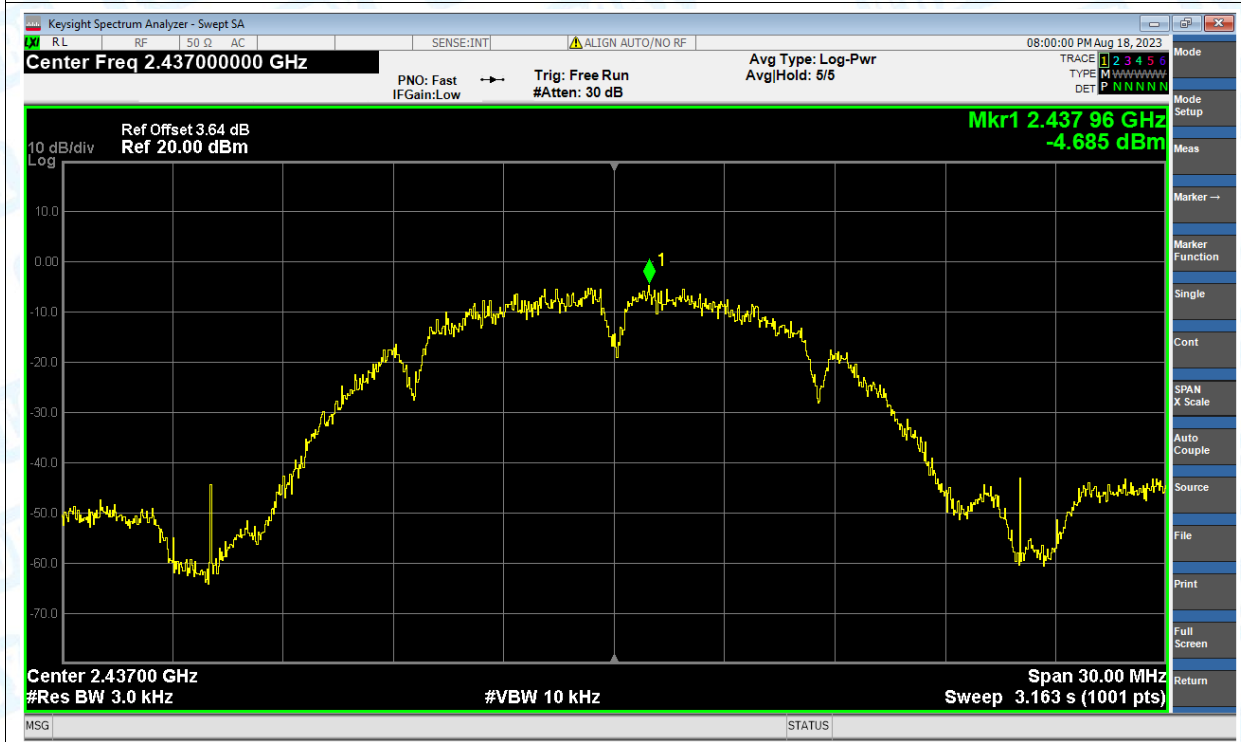
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	-4.951	8	Pass
NVNT	b	2437	Ant1	-4.685	8	Pass
NVNT	b	2462	Ant1	-6.098	8	Pass
NVNT	g	2412	Ant1	-13.010	8	Pass
NVNT	g	2437	Ant1	-12.148	8	Pass
NVNT	g	2462	Ant1	-14.537	8	Pass
NVNT	n(HT20)	2412	Ant1	-12.784	8	Pass
NVNT	n(HT20)	2437	Ant1	-11.622	8	Pass
NVNT	n(HT20)	2462	Ant1	-16.870	8	Pass
NVNT	n(HT40)	2422	Ant1	-12.318	8	Pass
NVNT	n(HT40)	2437	Ant1	-13.506	8	Pass
NVNT	n(HT40)	2452	Ant1	-16.177	8	Pass

Test Graphs

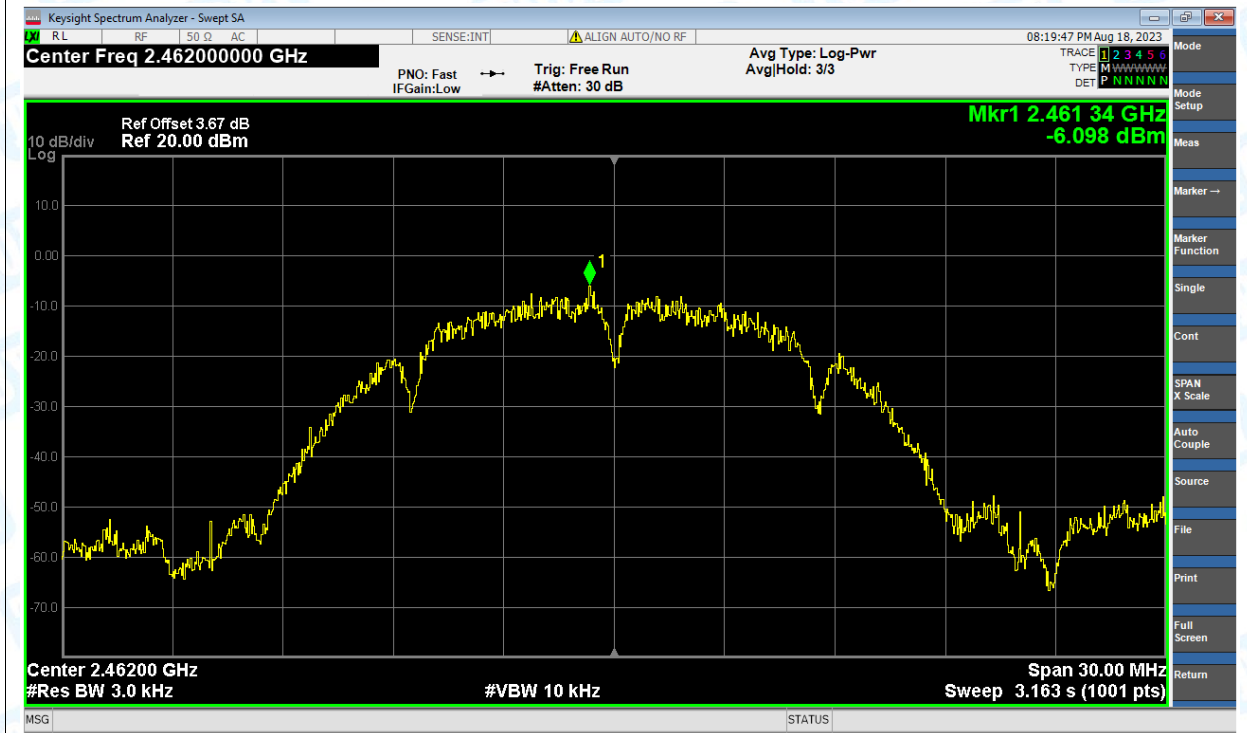
PSD NVNT b 2412MHz Ant1



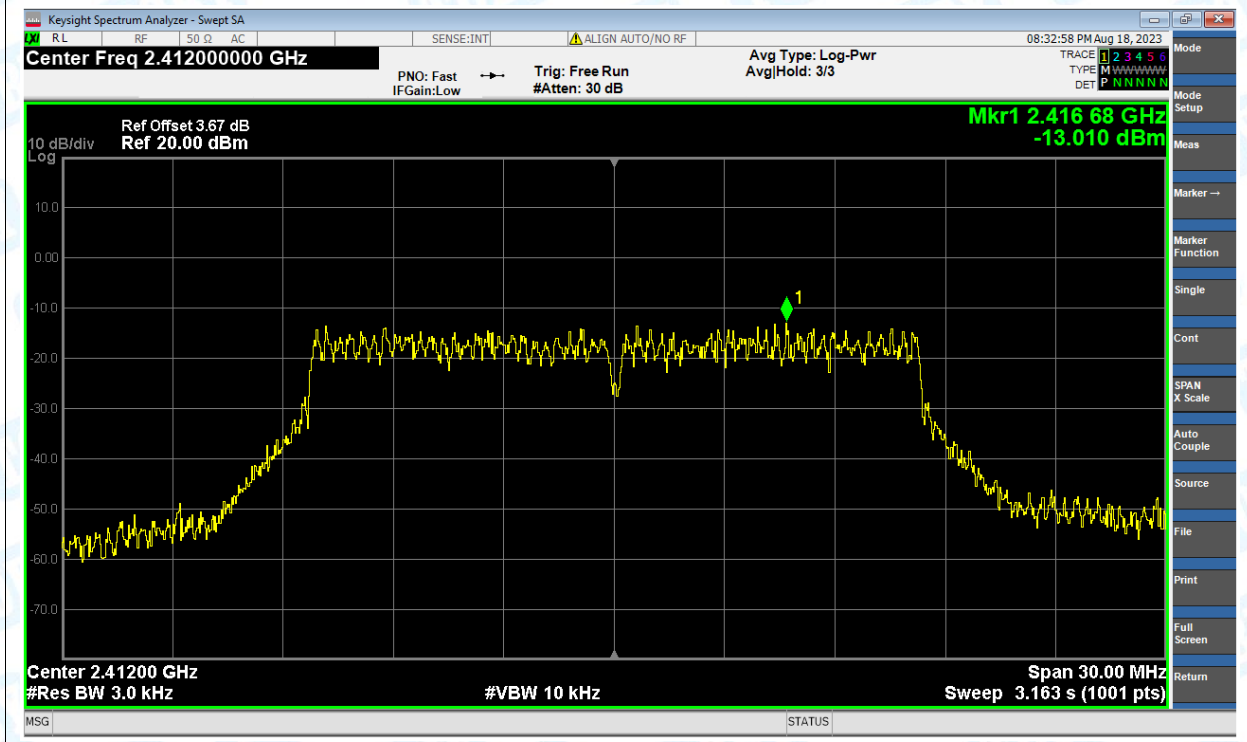
PSD NVNT b 2437MHz Ant1



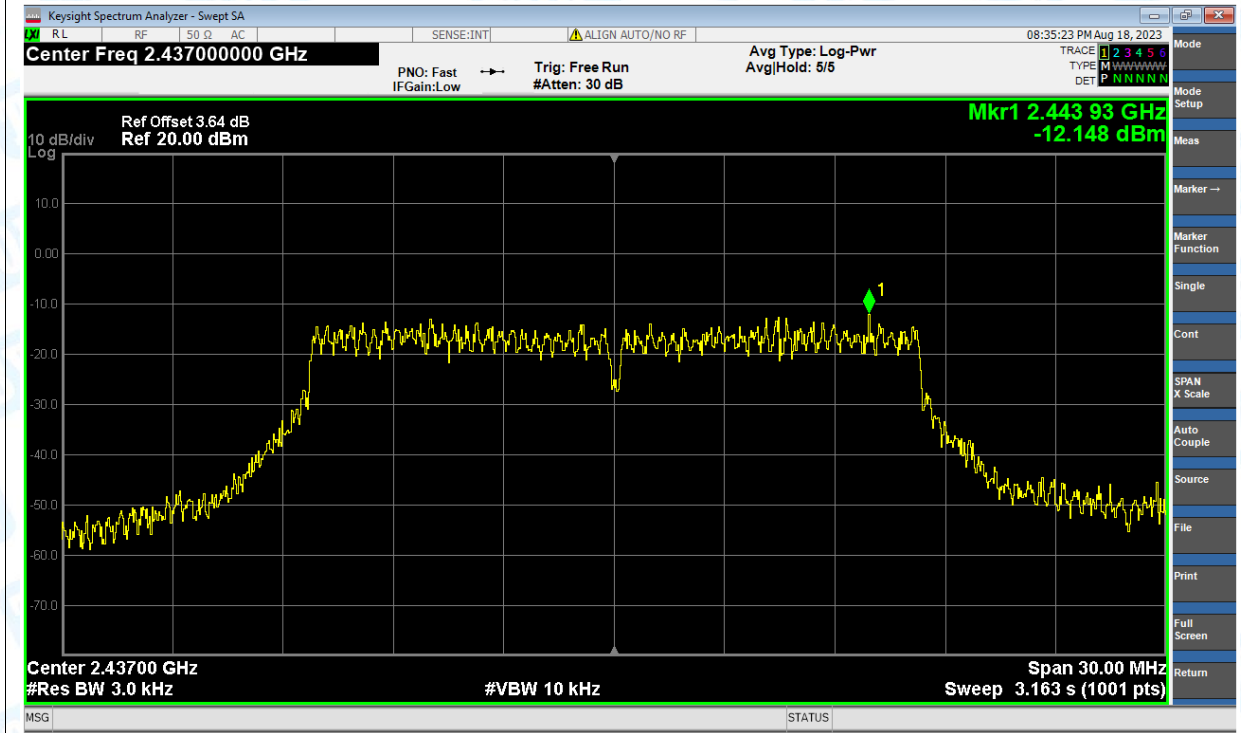
PSD NVNT b 2462MHz Ant1



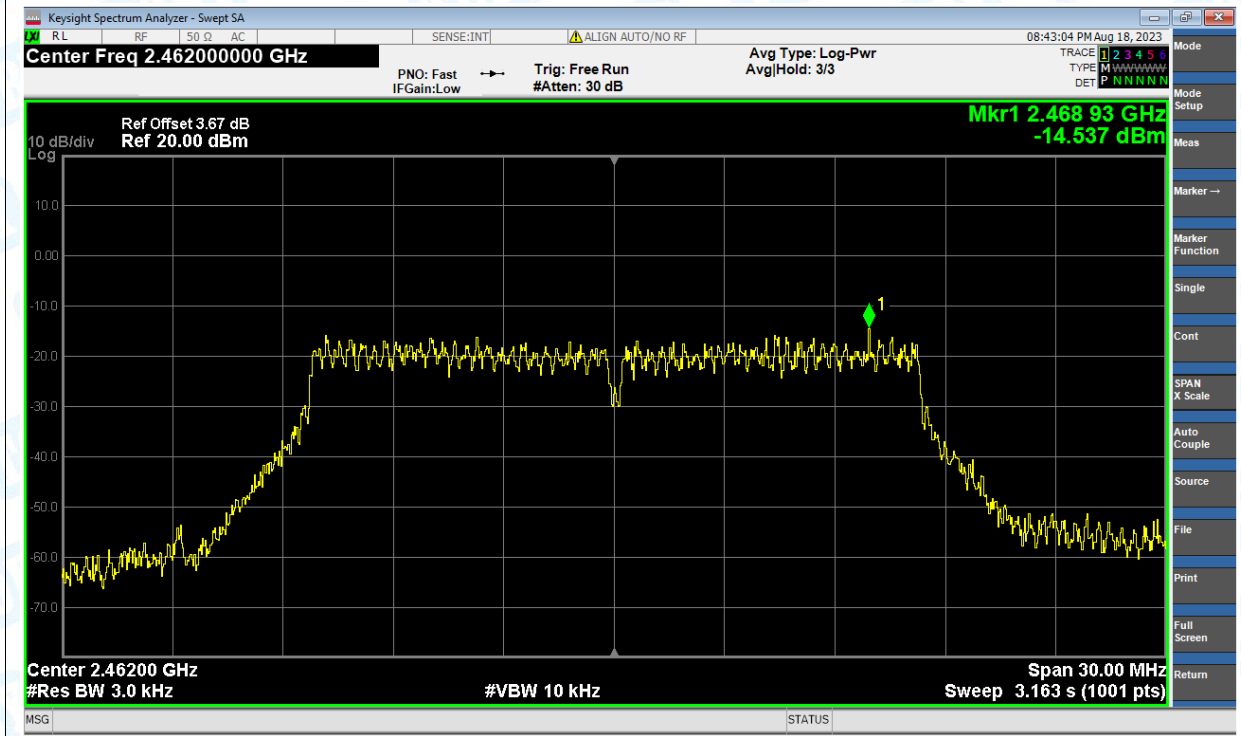
PSD NVNT g 2412MHz Ant1



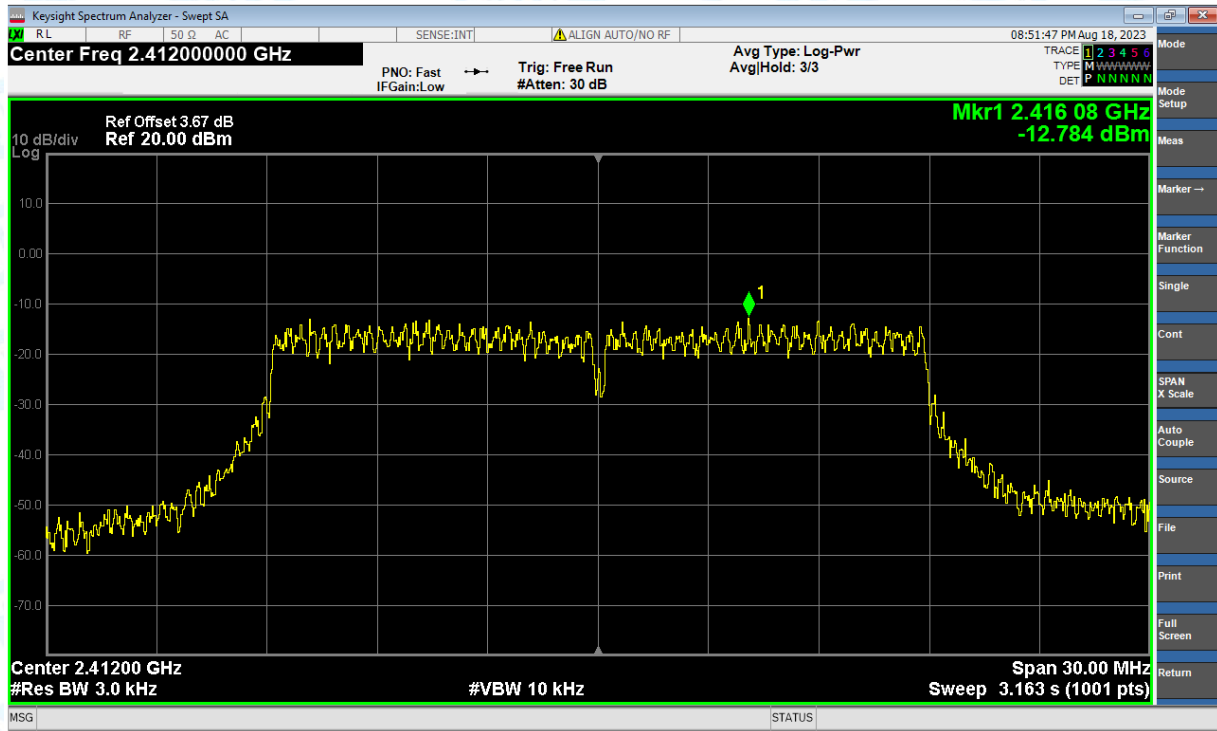
PSD NVNT g 2437MHz Ant1



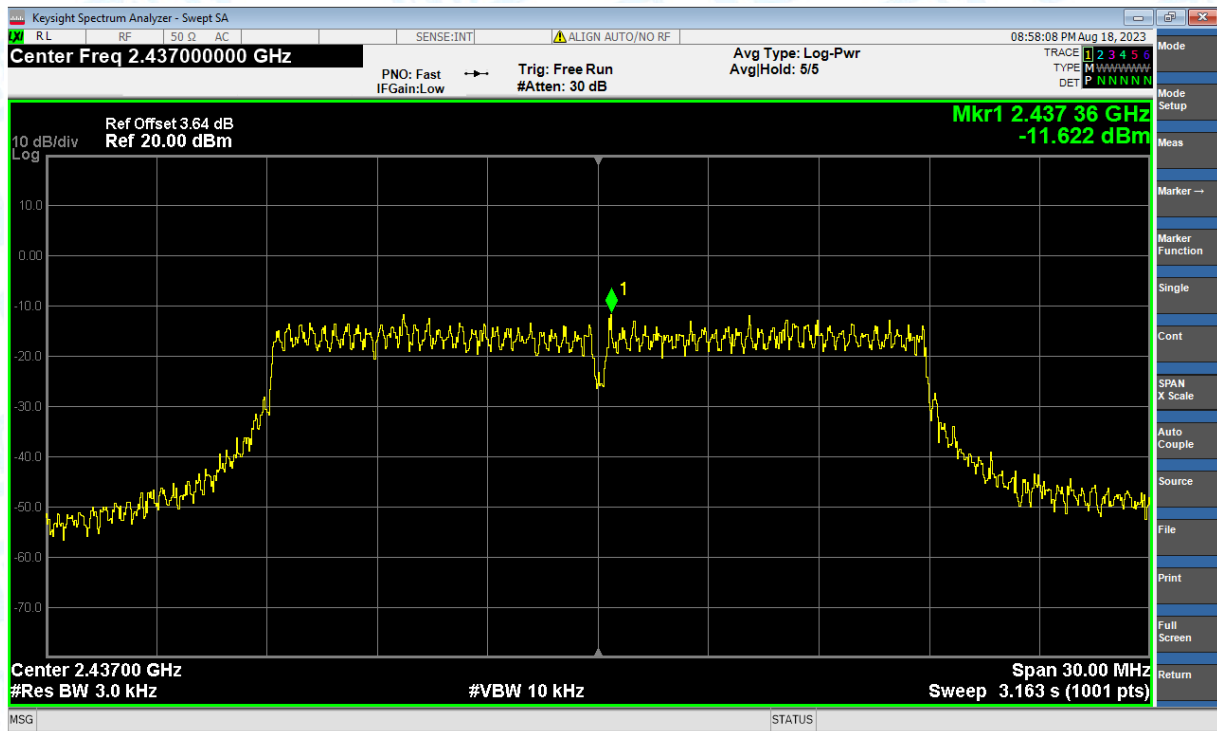
PSD NVNT g 2462MHz Ant1



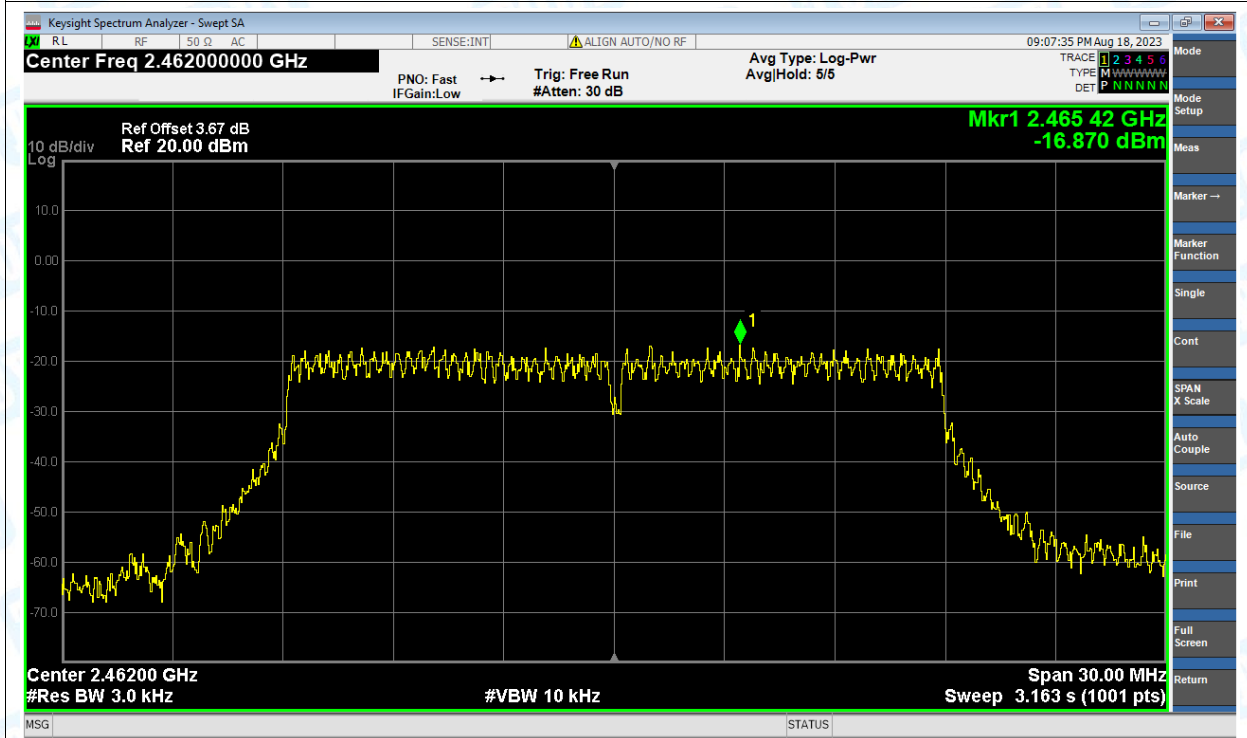
PSD NVNT n(HT20) 2412MHz Ant1



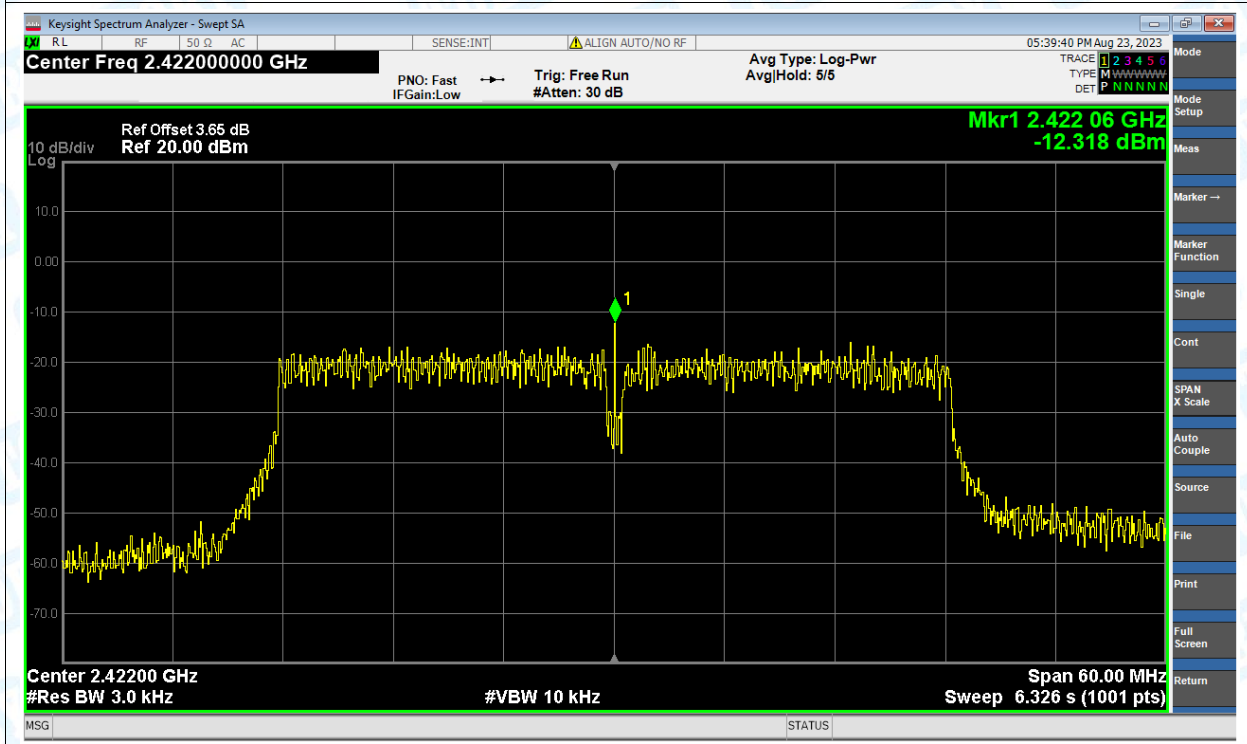
PSD NVNT n(HT20) 2437MHz Ant1



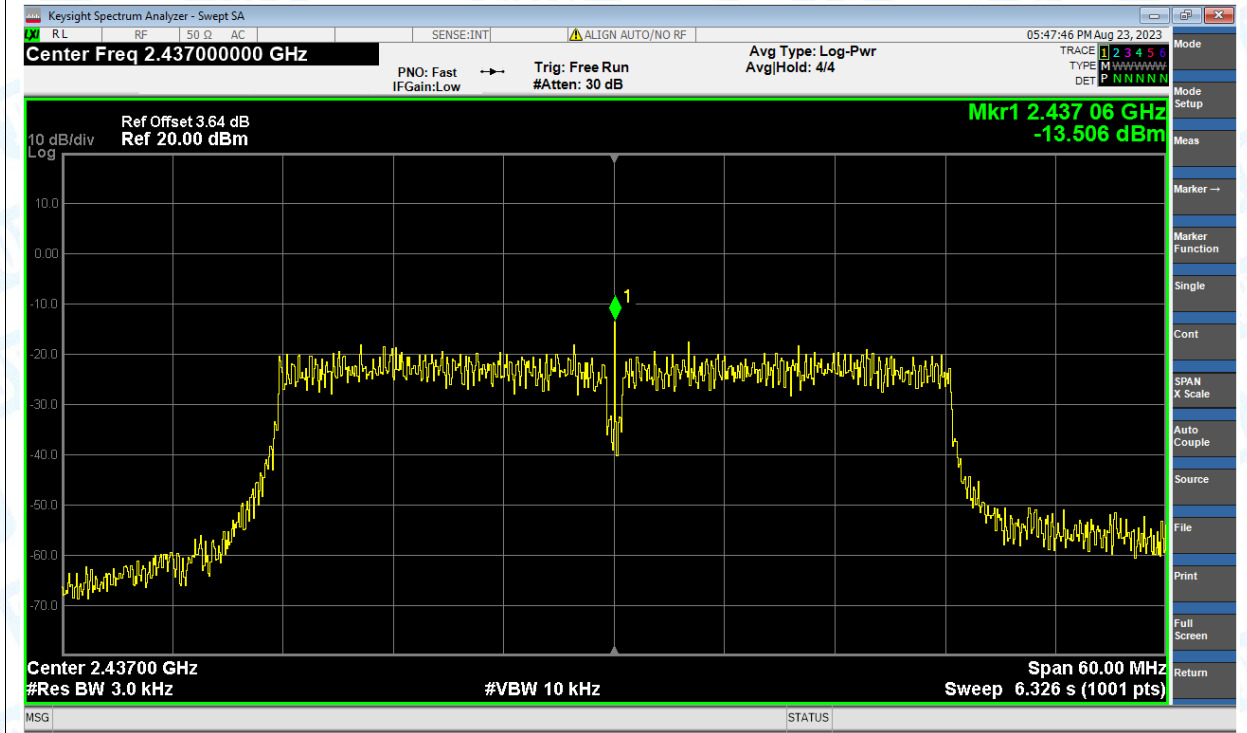
PSD NVNT n(HT20) 2462MHz Ant1



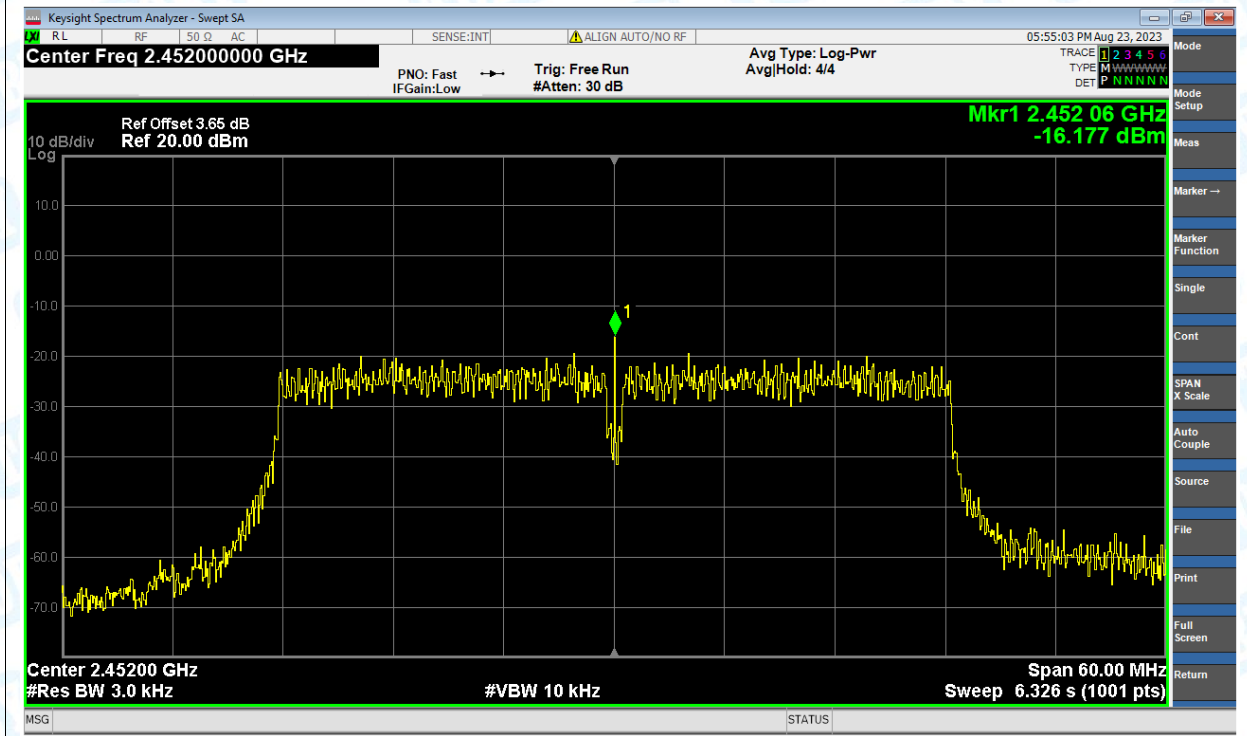
PSD NVNT n(HT40) 2422MHz Ant1



PSD NVNT n(HT40) 2437MHz Ant1



PSD NVNT n(HT40) 2452MHz Ant1

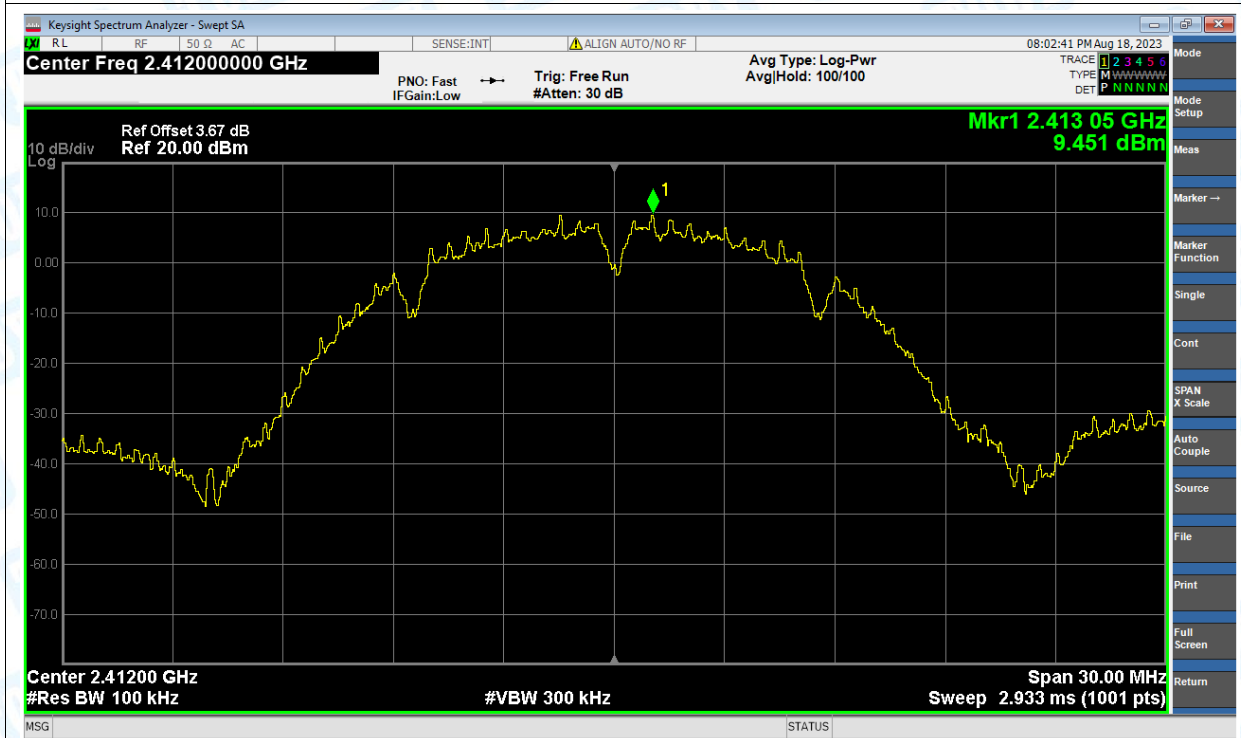


6. Band Edge

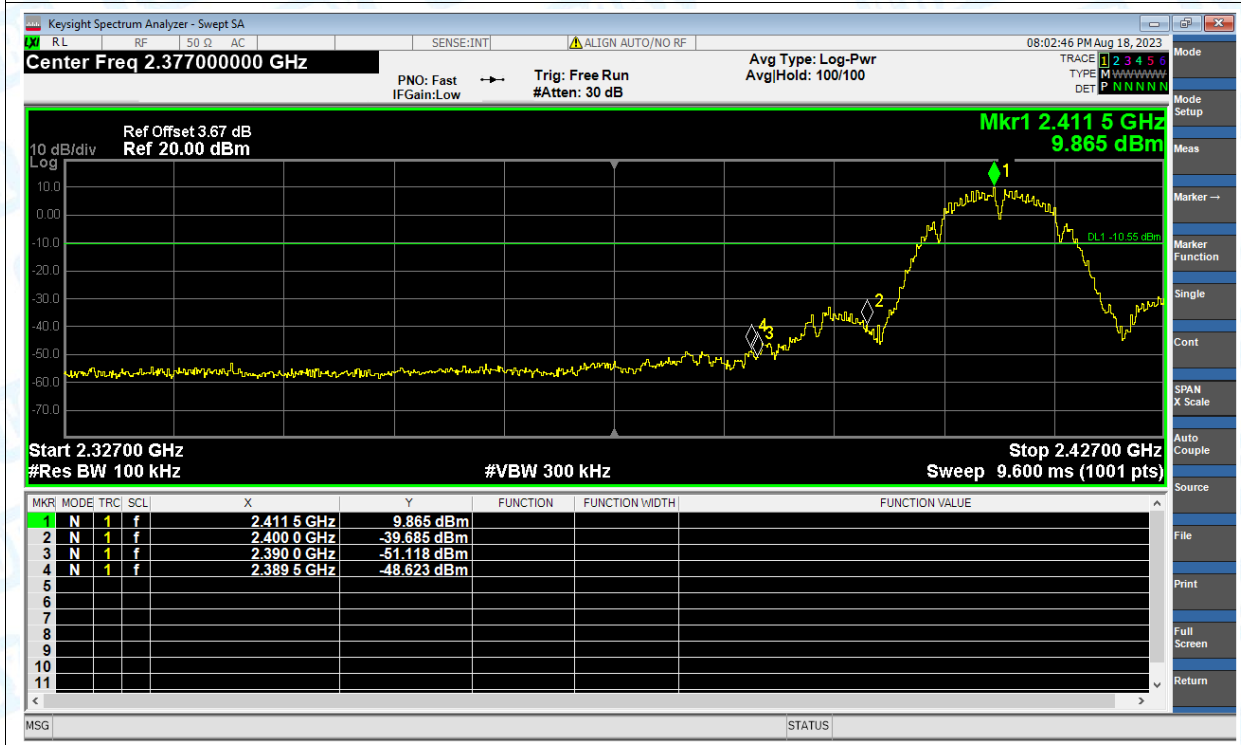
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-58.07	-20	Pass
NVNT	b	2462	Ant1	-58.60	-20	Pass
NVNT	g	2412	Ant1	-43.71	-20	Pass
NVNT	g	2462	Ant1	-42.04	-20	Pass
NVNT	n(HT20)	2412	Ant1	-42.94	-20	Pass
NVNT	n(HT20)	2462	Ant1	-43.81	-20	Pass
NVNT	n(HT40)	2422	Ant1	-37.50	-20	Pass
NVNT	n(HT40)	2452	Ant1	-35.98	-20	Pass

Test Graphs

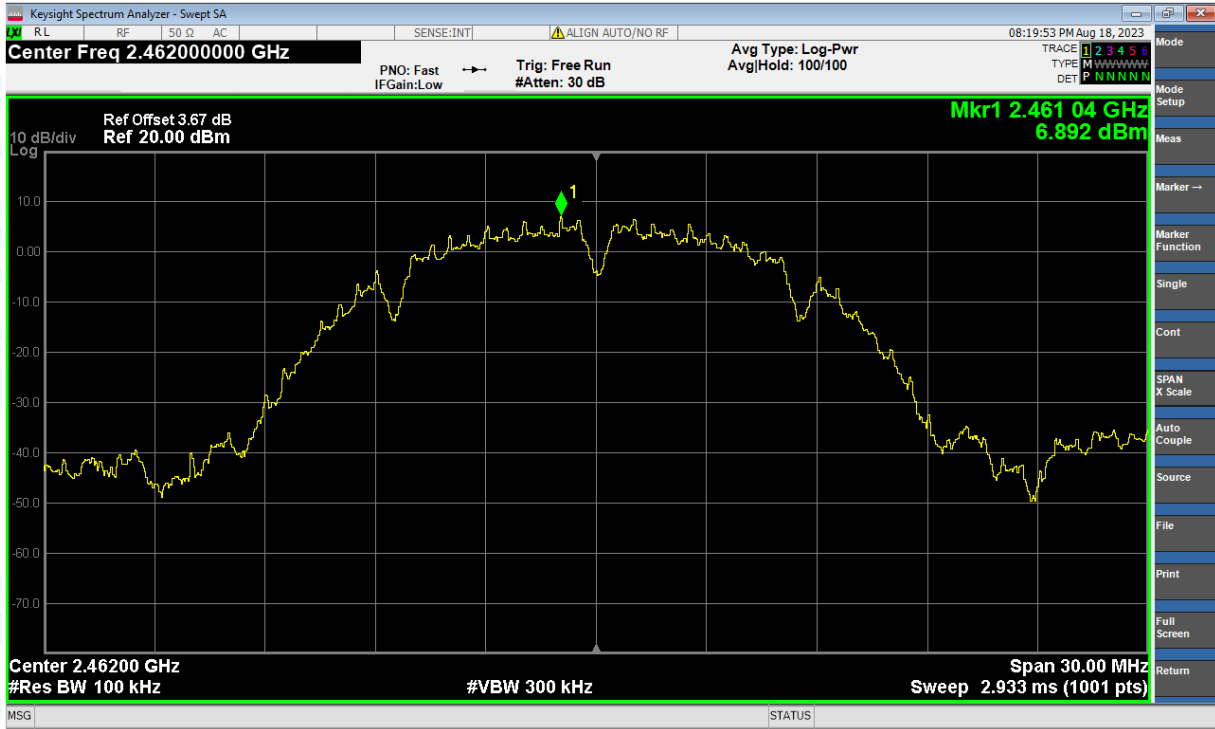
Band Edge NVNT b 2412MHz Ant1 Ref



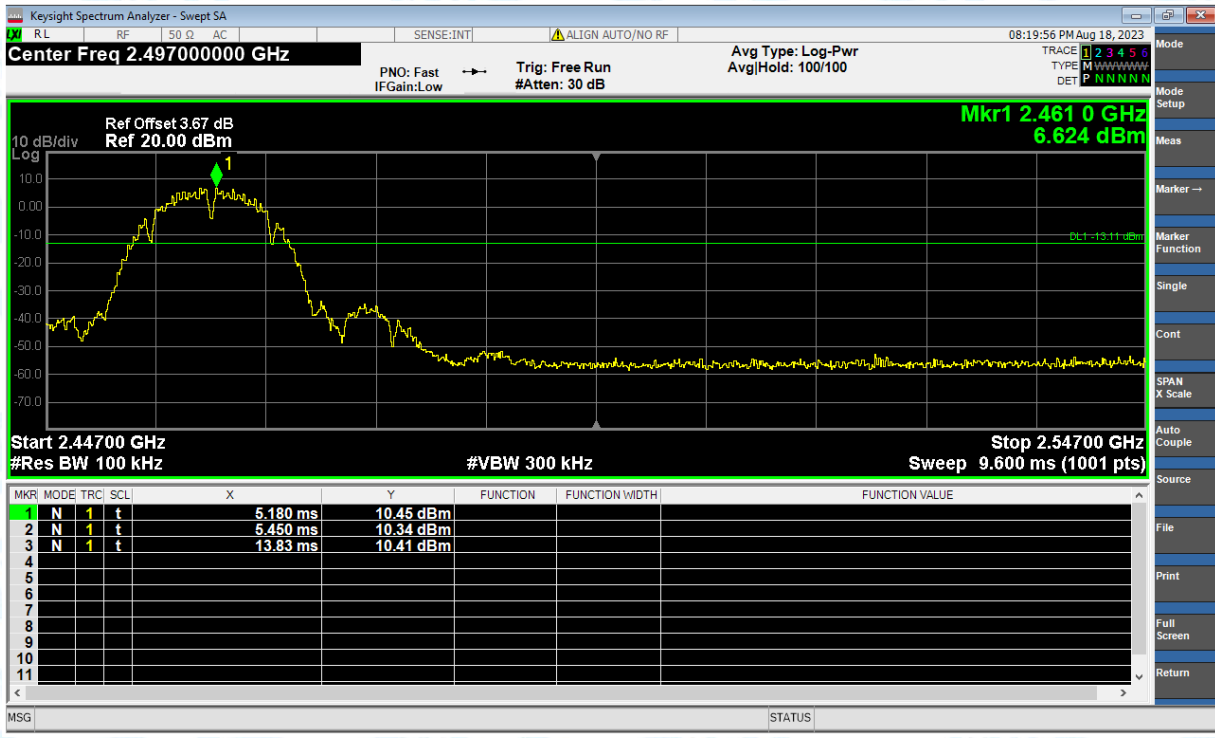
Band Edge NVNT b 2412MHz Ant1 Emission



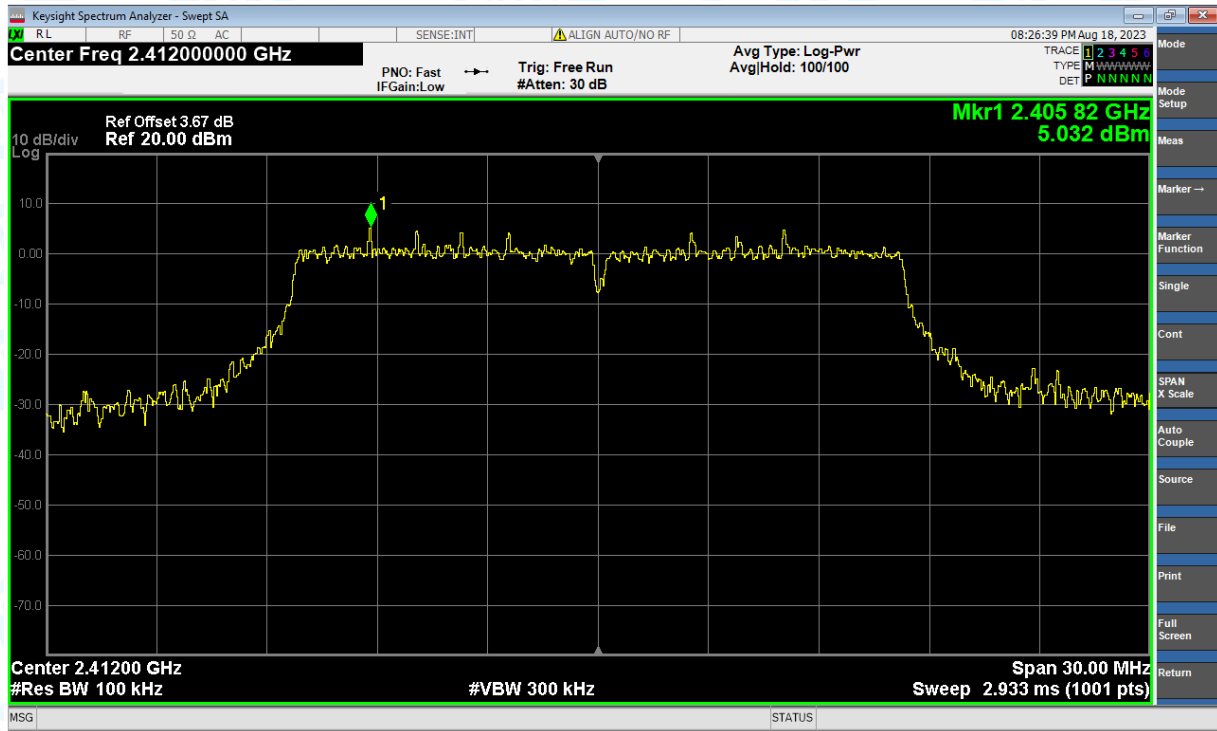
Band Edge NVNT b 2462MHz Ant1 Ref



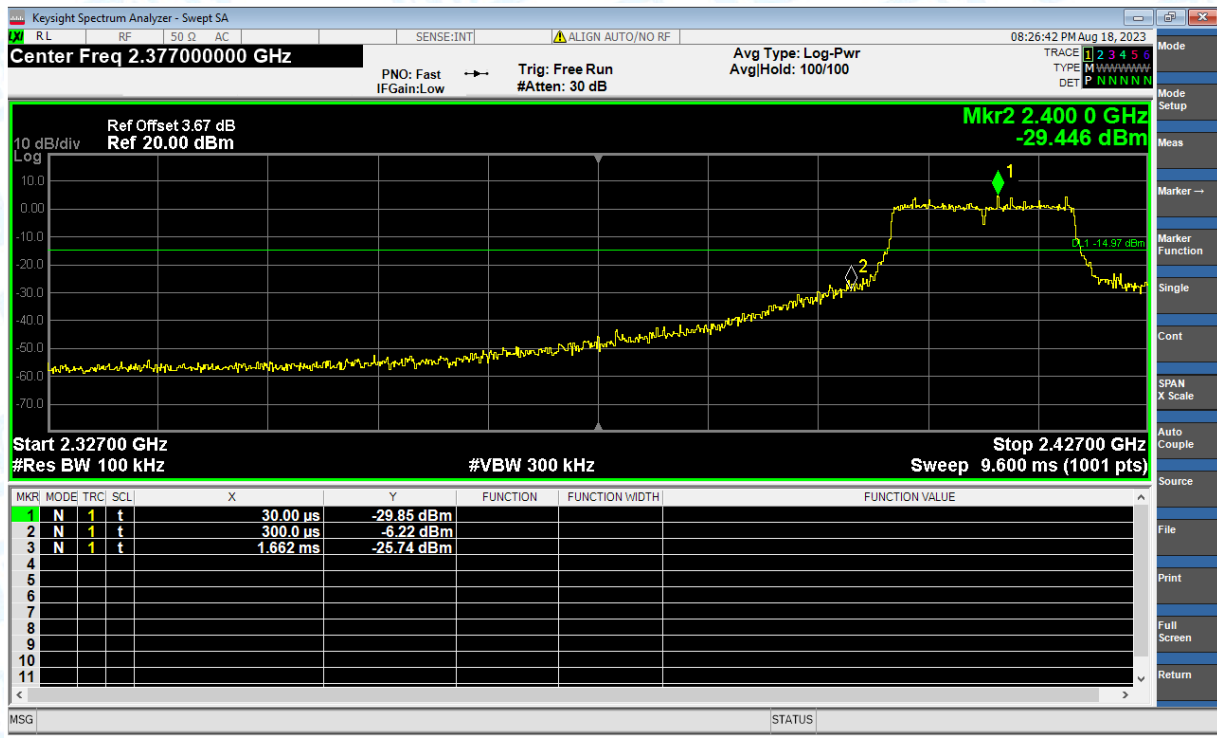
Band Edge NVNT b 2462MHz Ant1 Emission



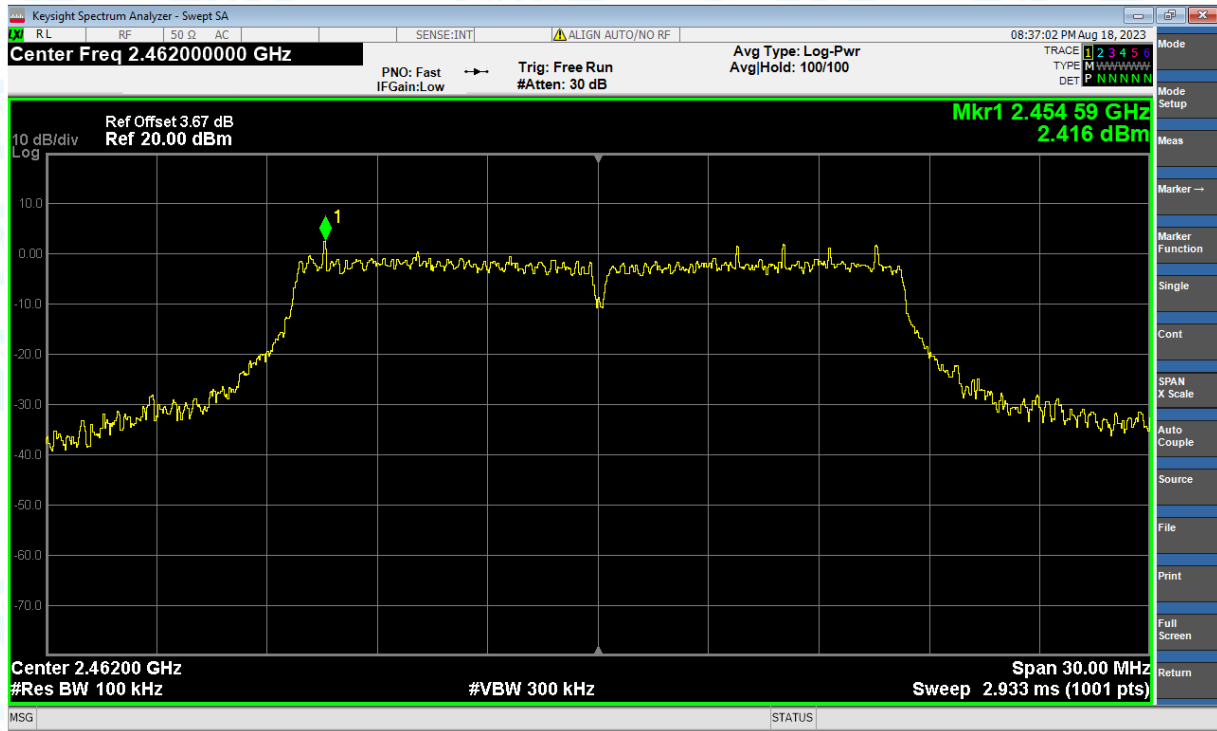
Band Edge NVNT g 2412MHz Ant1 Ref



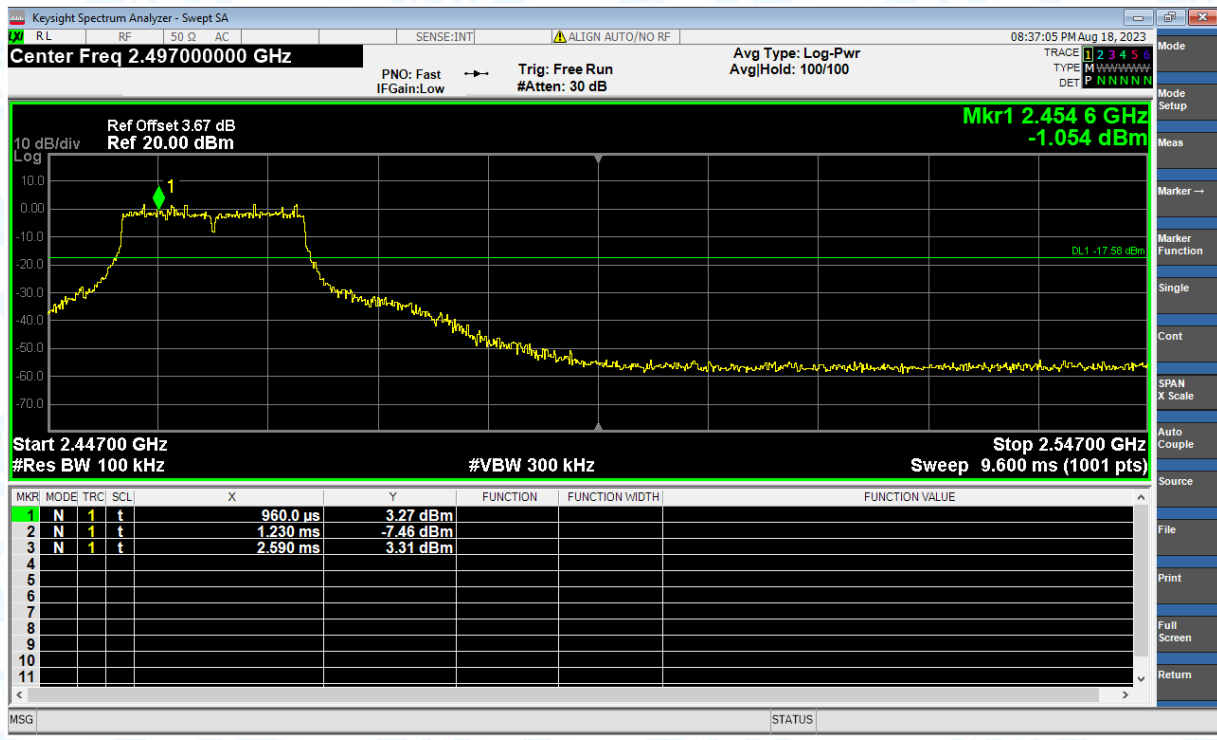
Band Edge NVNT g 2412MHz Ant1 Emission

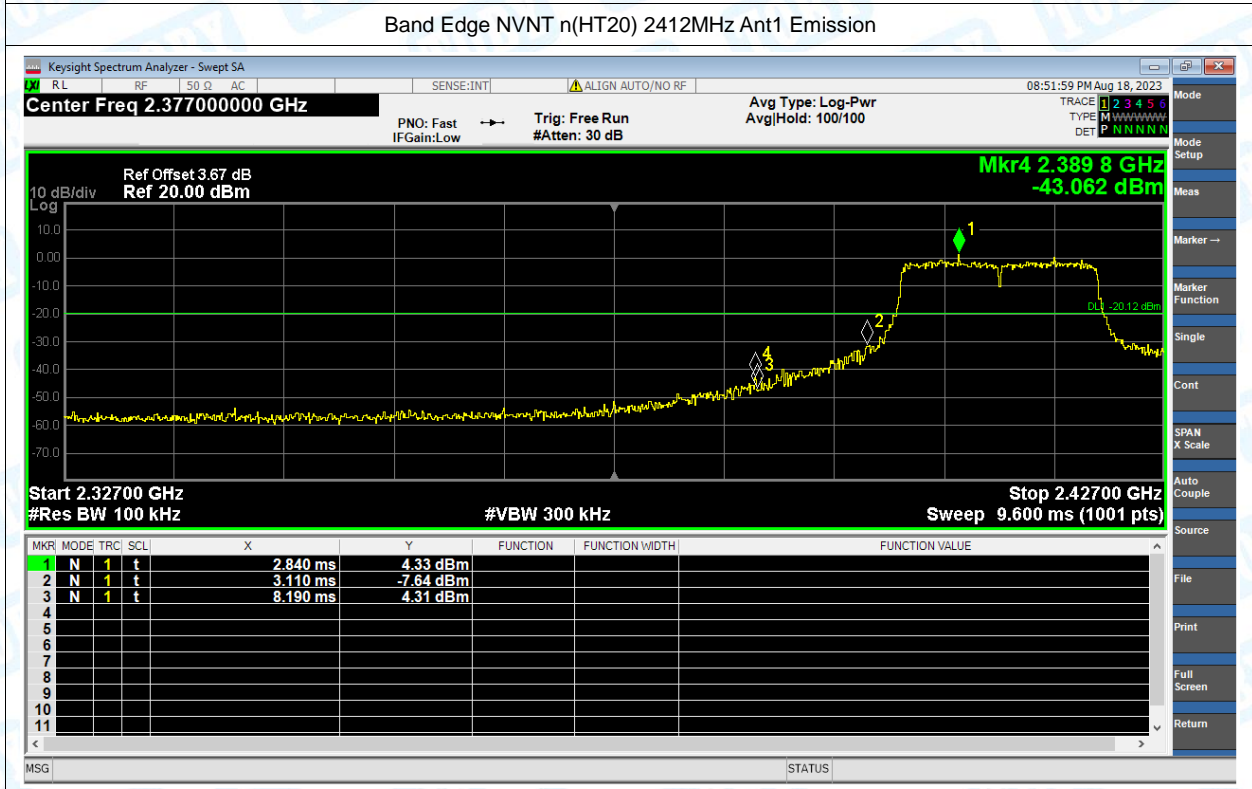
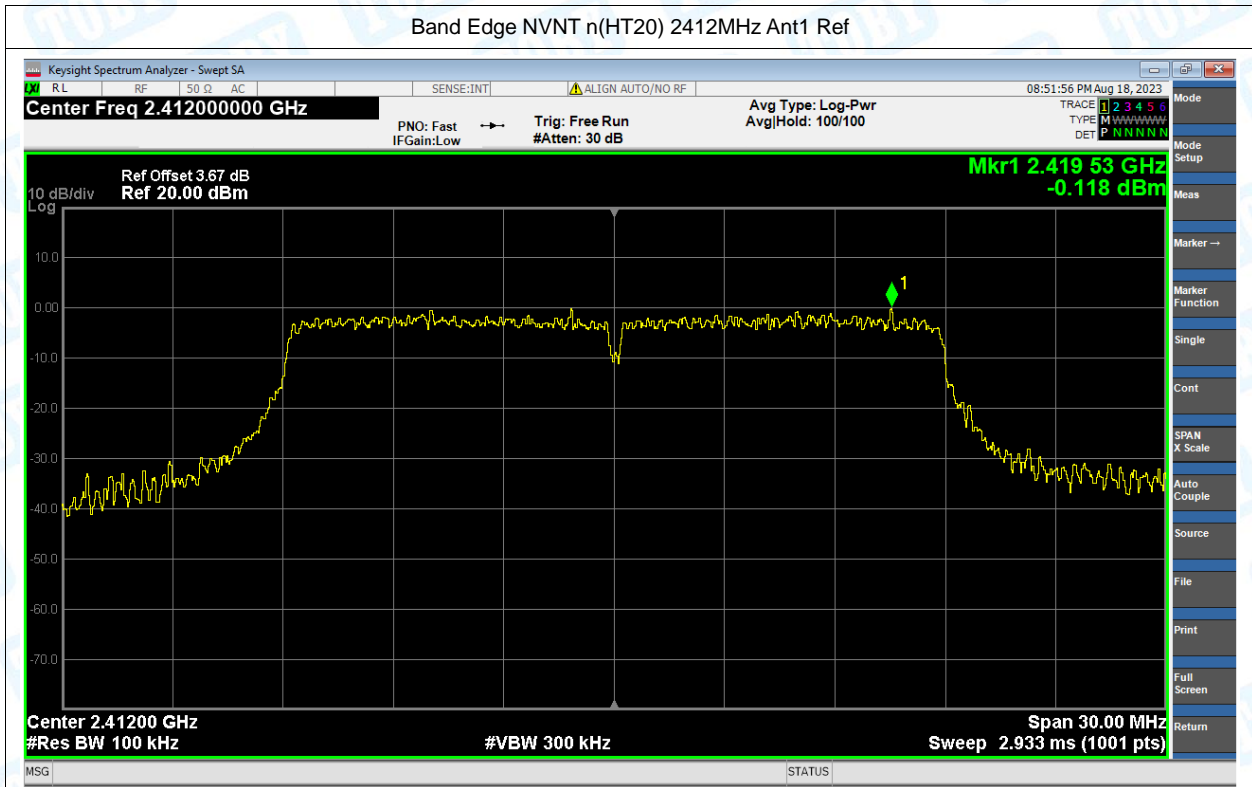


Band Edge NVNT g 2462MHz Ant1 Ref

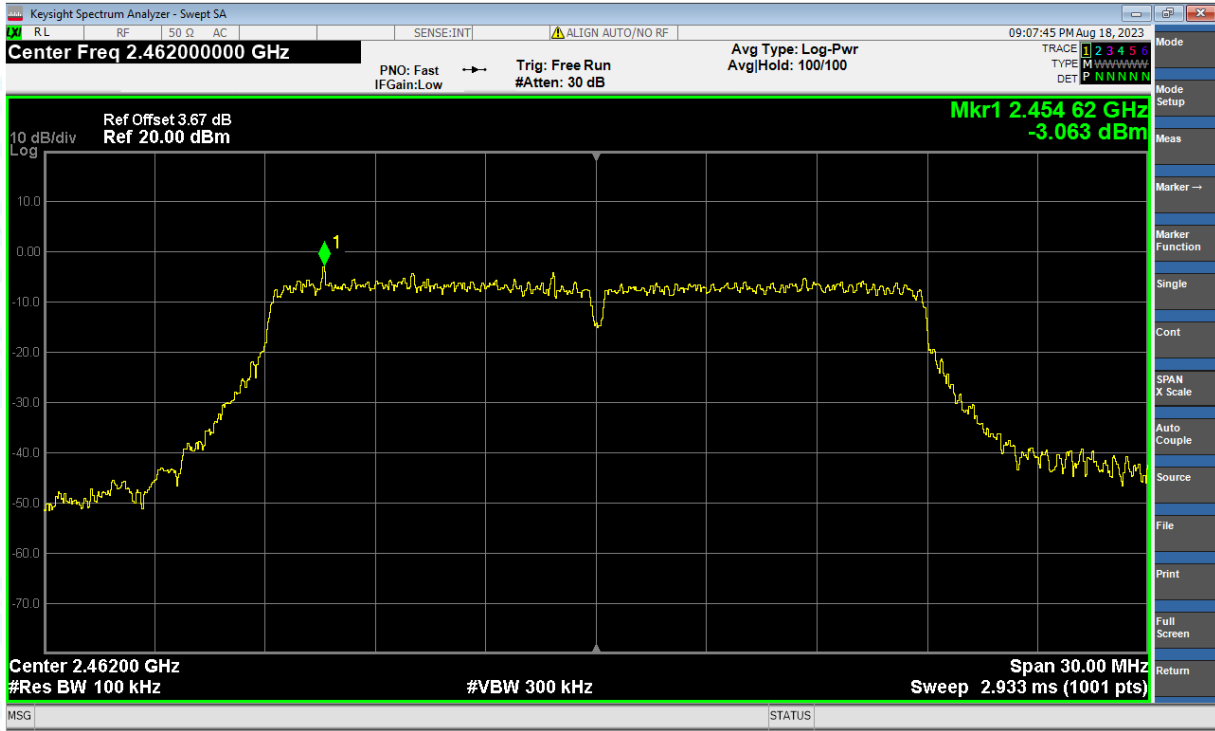


Band Edge NVNT g 2462MHz Ant1 Emission

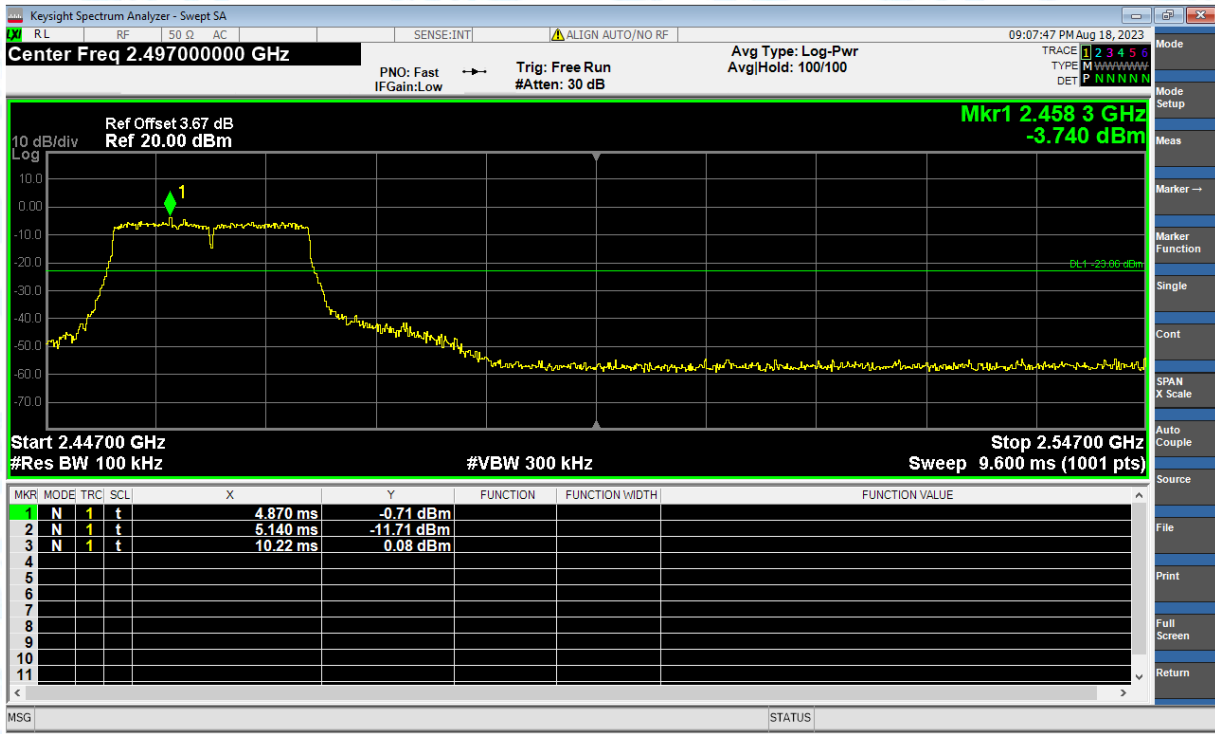


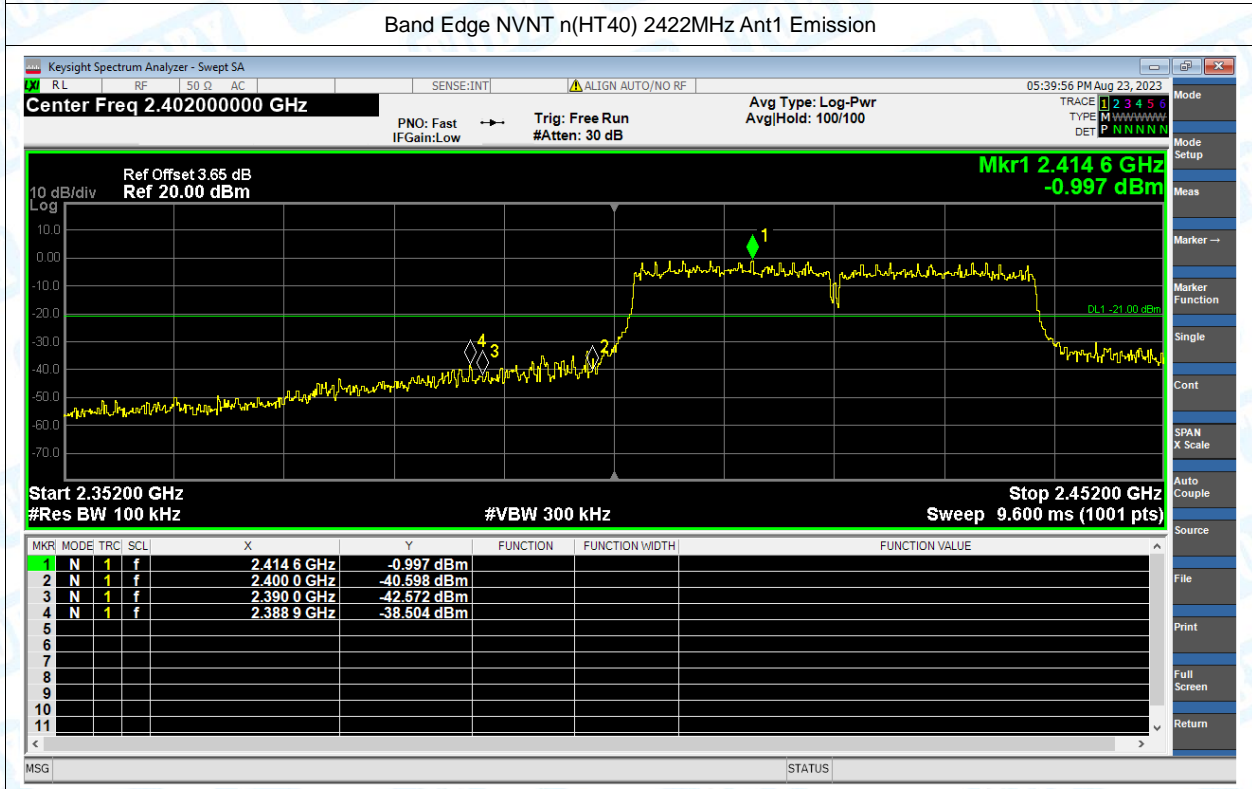
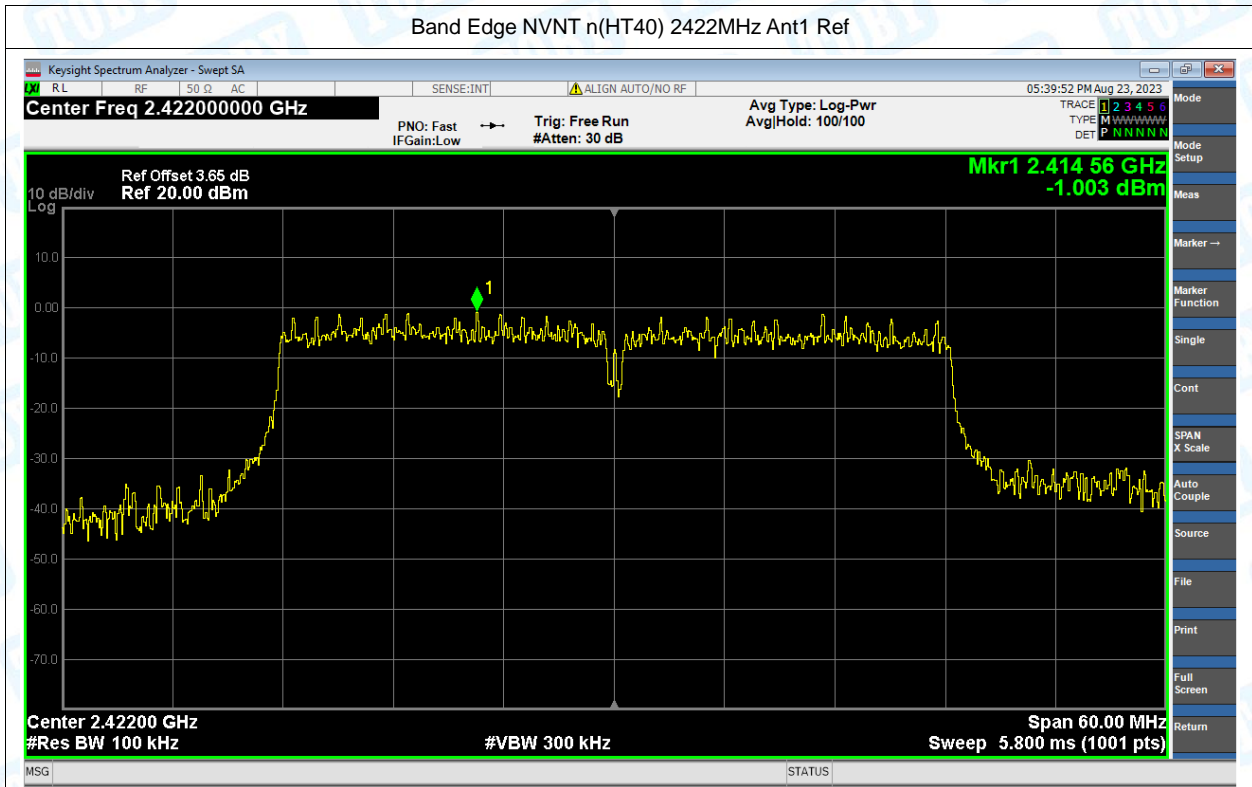


Band Edge NVNT n(HT20) 2462MHz Ant1 Ref

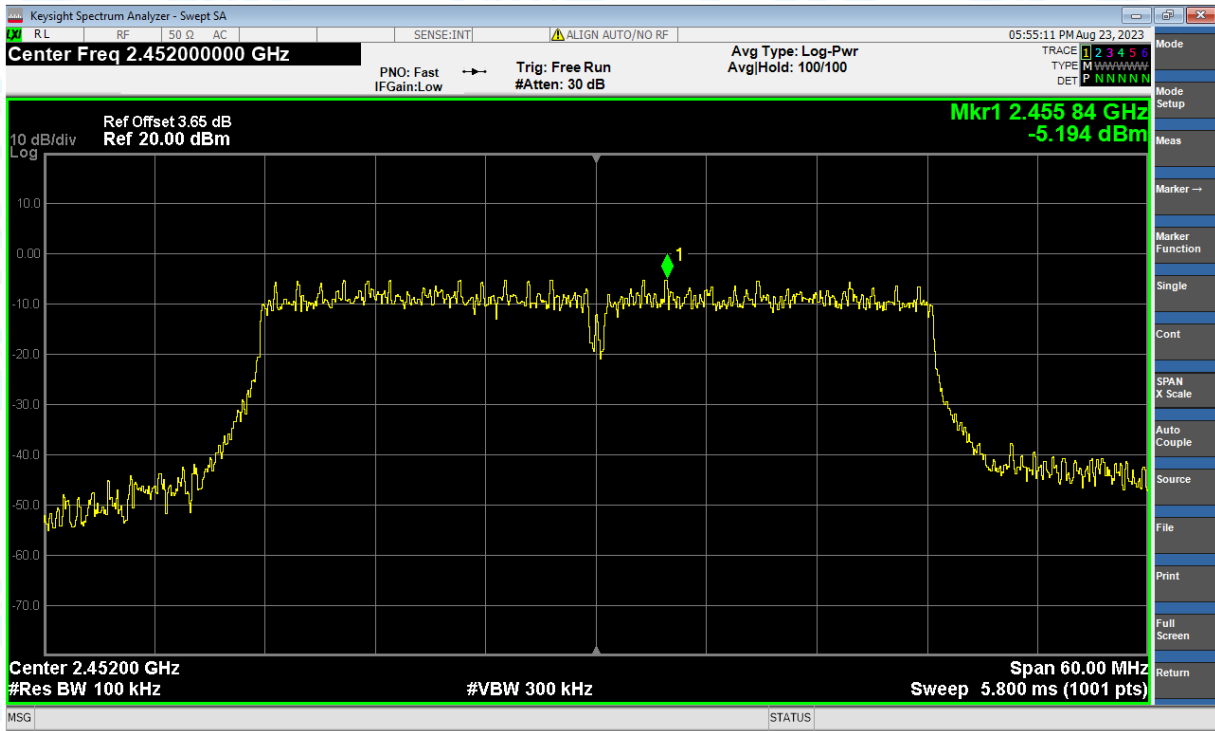


Band Edge NVNT n(HT20) 2462MHz Ant1 Emission





Band Edge NVNT n(HT40) 2452MHz Ant1 Ref



Band Edge NVNT n(HT40) 2452MHz Ant1 Emission

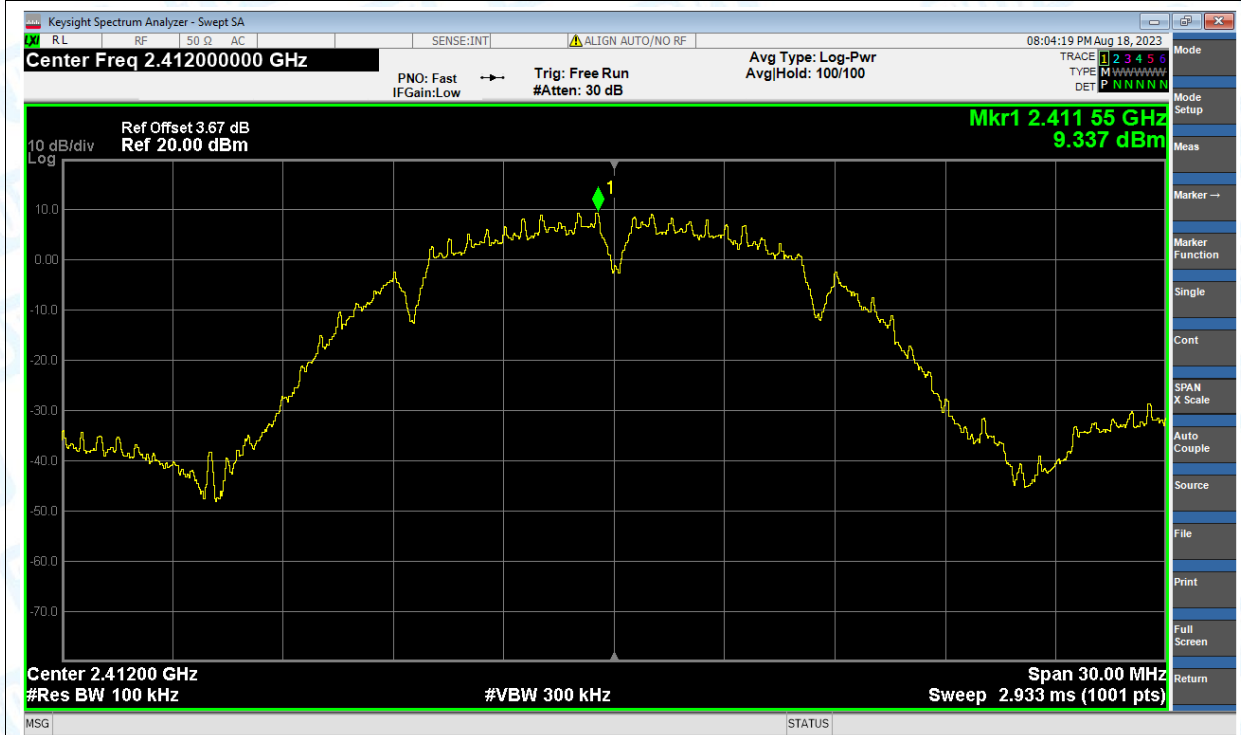


7. Conducted RF Spurious Emission

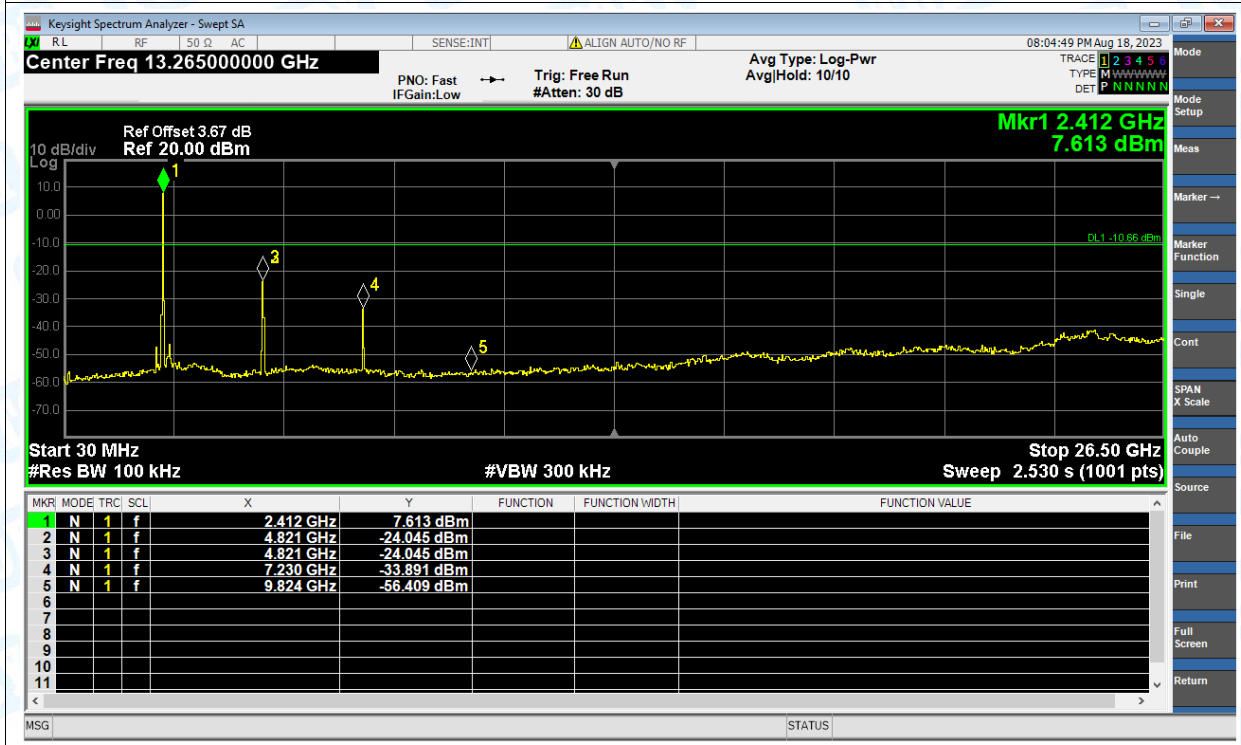
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-33.38	-20	Pass
NVNT	b	2437	Ant1	-30.87	-20	Pass
NVNT	b	2462	Ant1	-30.26	-20	Pass
NVNT	g	2412	Ant1	-40.08	-20	Pass
NVNT	g	2437	Ant1	-34.61	-20	Pass
NVNT	g	2462	Ant1	-37.28	-20	Pass
NVNT	n(HT20)	2412	Ant1	-38.11	-20	Pass
NVNT	n(HT20)	2437	Ant1	-38.16	-20	Pass
NVNT	n(HT20)	2462	Ant1	-38.73	-20	Pass
NVNT	n(HT40)	2422	Ant1	-32.32	-20	Pass
NVNT	n(HT40)	2437	Ant1	-36.70	-20	Pass
NVNT	n(HT40)	2452	Ant1	-36.22	-20	Pass

Test Graphs

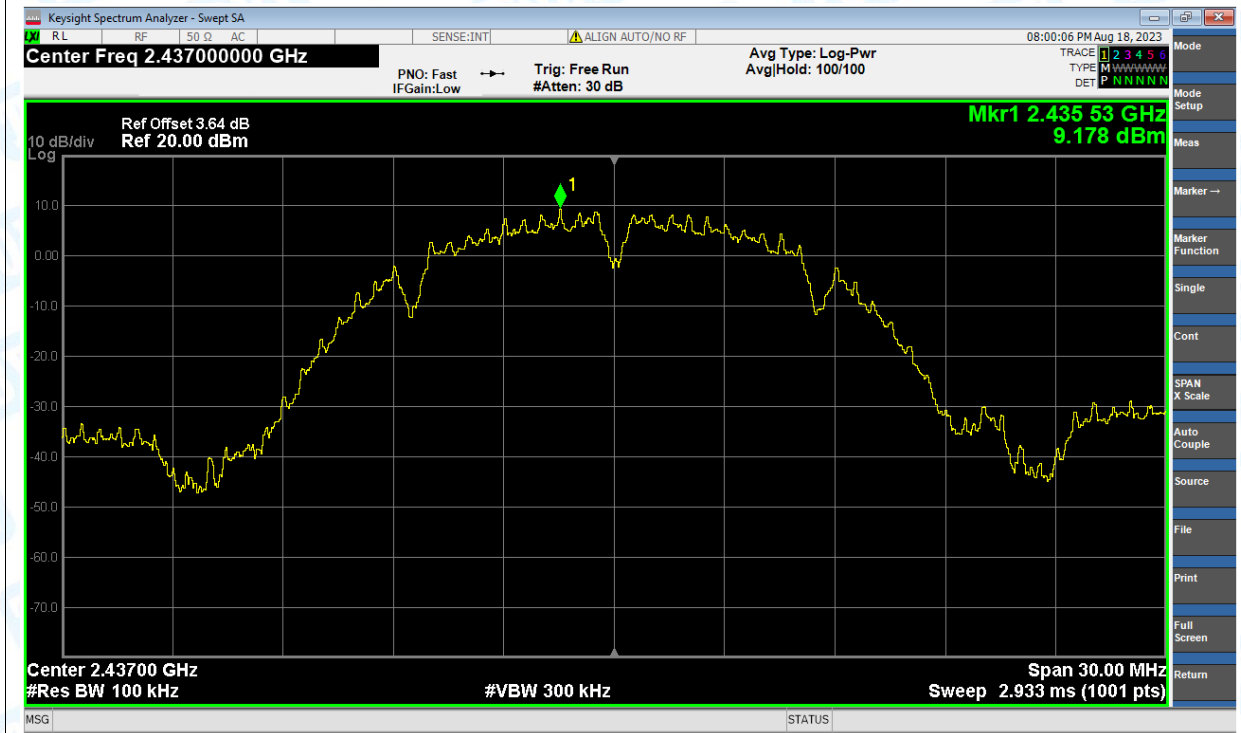
Tx. Spurious NVNT b 2412MHz Ant1 Ref



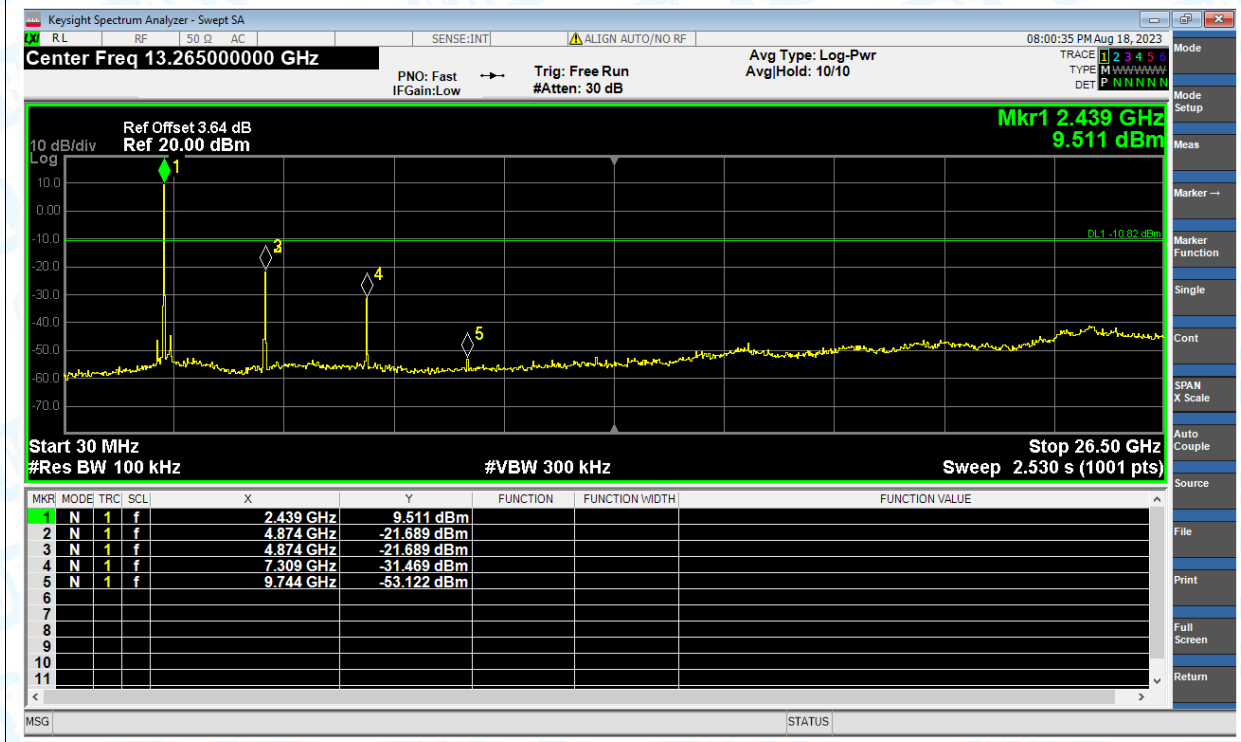
Tx. Spurious NVNT b 2412MHz Ant1 Emission



Tx. Spurious NVNT b 2437MHz Ant1 Ref



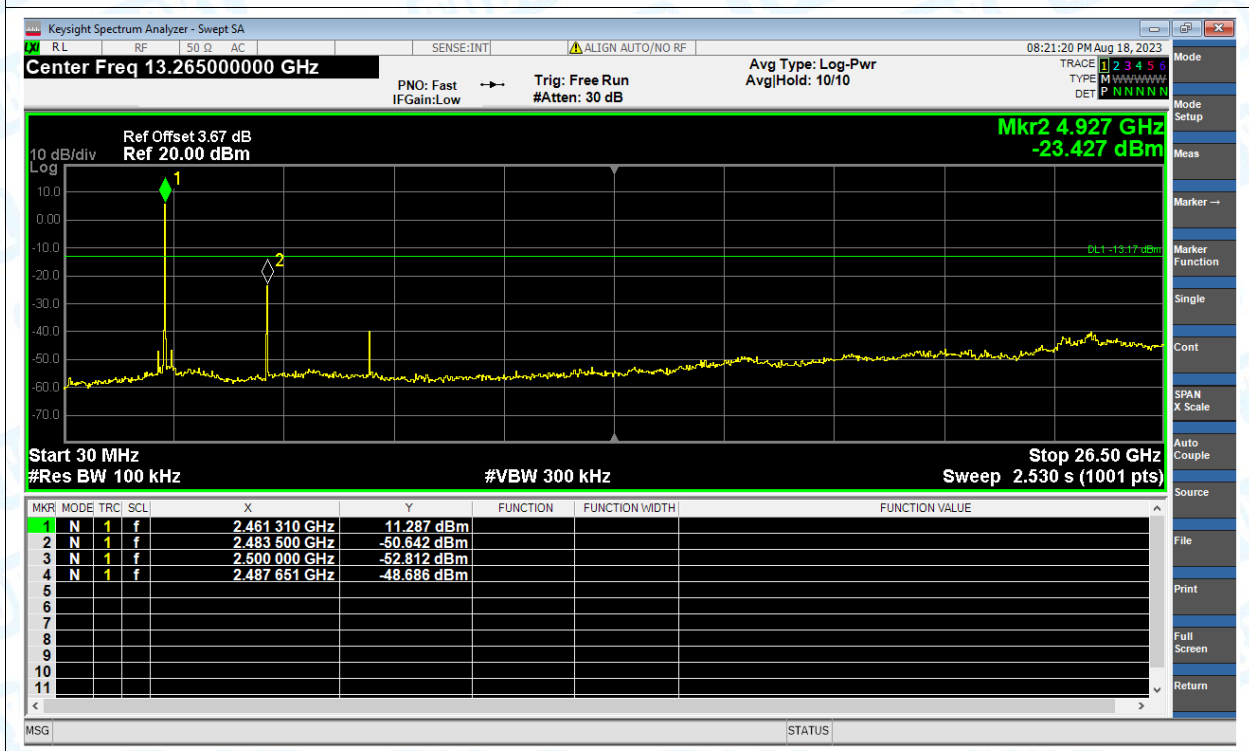
Tx. Spurious NVNT b 2437MHz Ant1 Emission



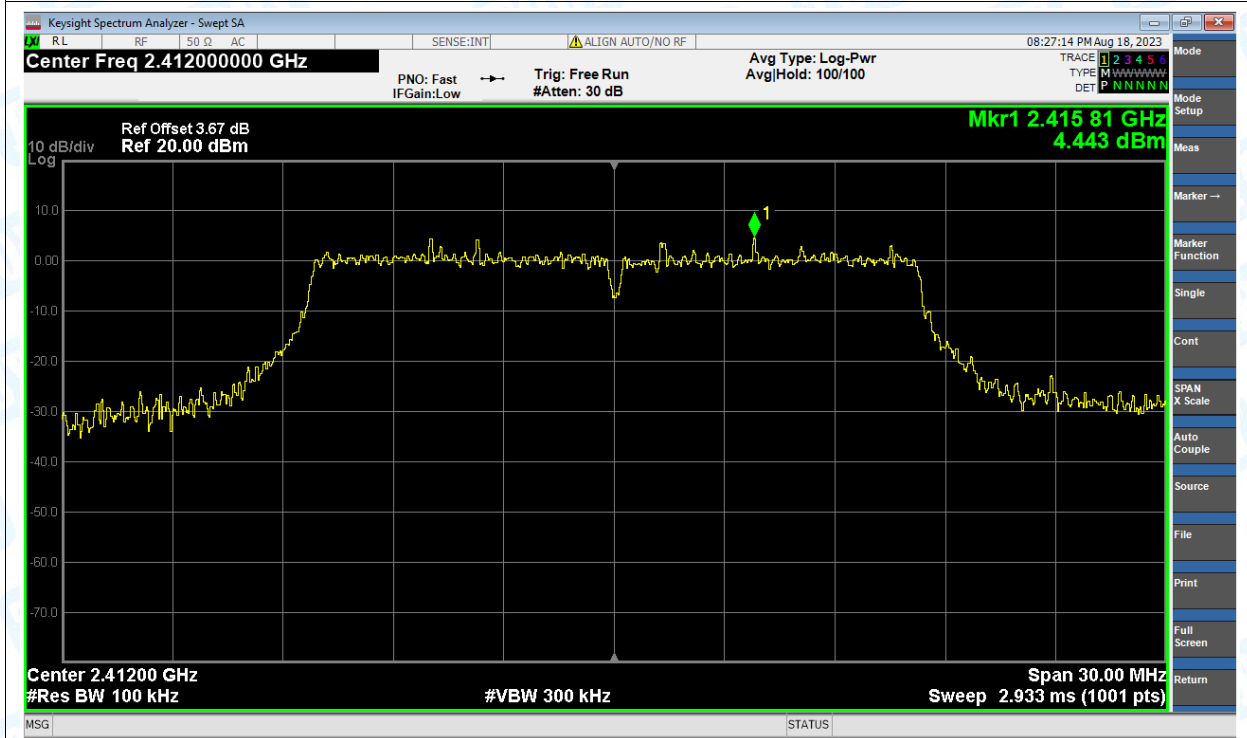
Tx. Spurious NVNT b 2462MHz Ant1 Ref



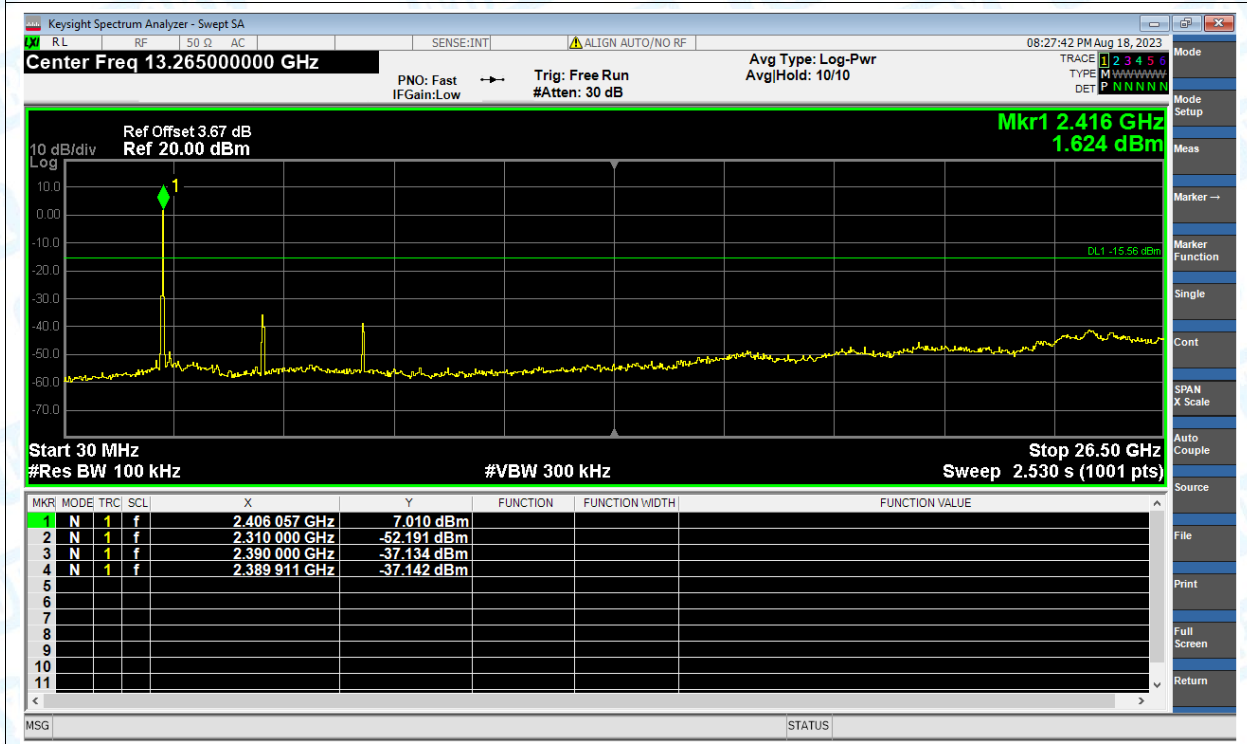
Tx. Spurious NVNT b 2462MHz Ant1 Emission



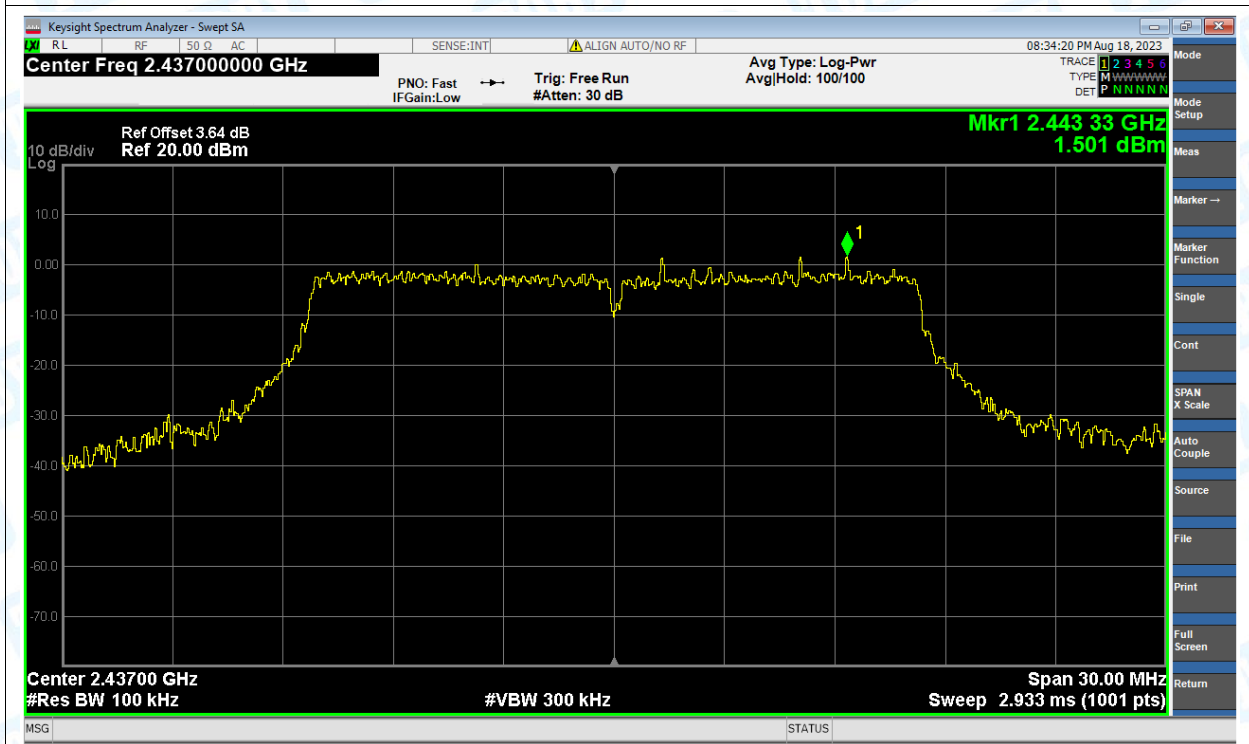
Tx. Spurious NVNT g 2412MHz Ant1 Ref



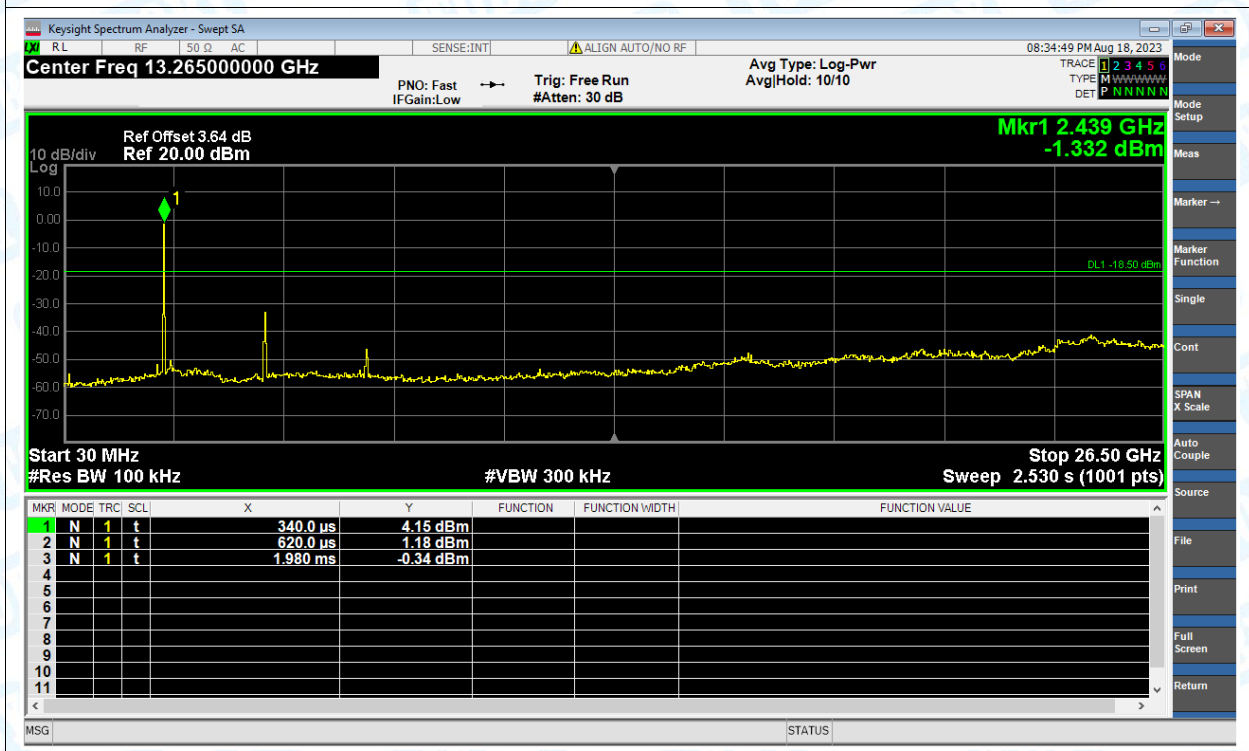
Tx. Spurious NVNT g 2412MHz Ant1 Emission



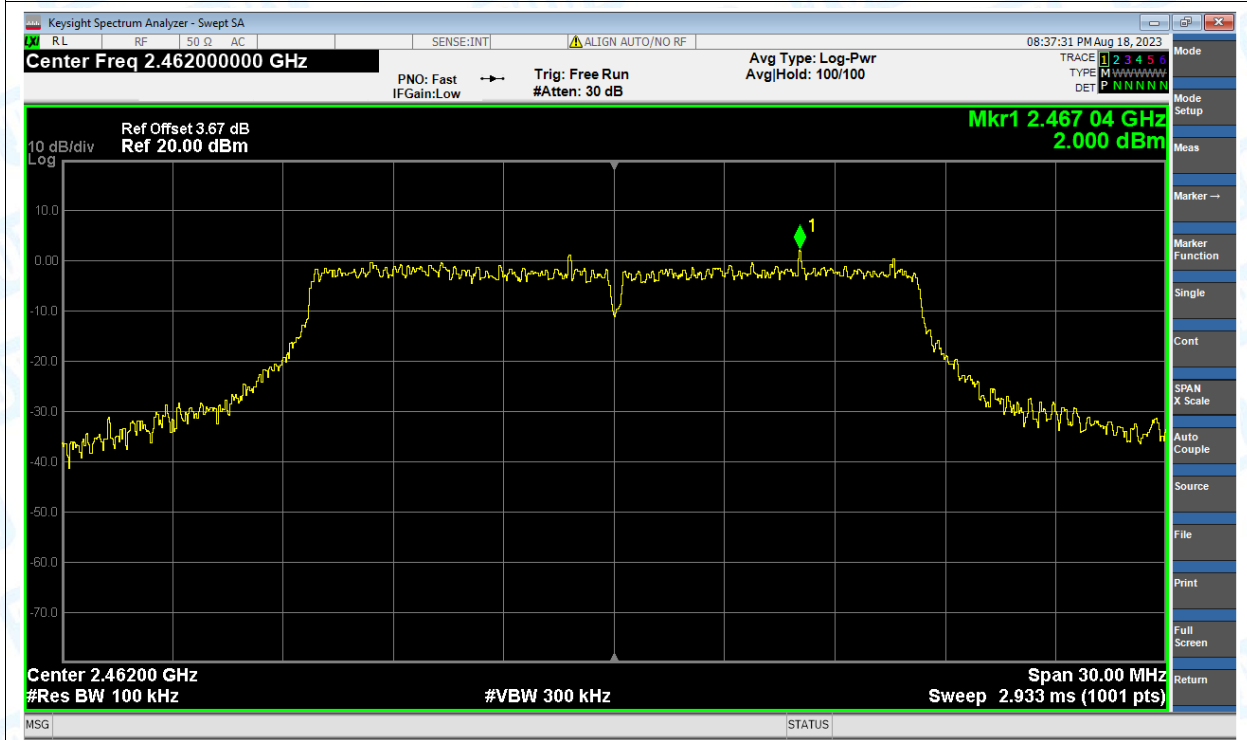
Tx. Spurious NVNT g 2437MHz Ant1 Ref



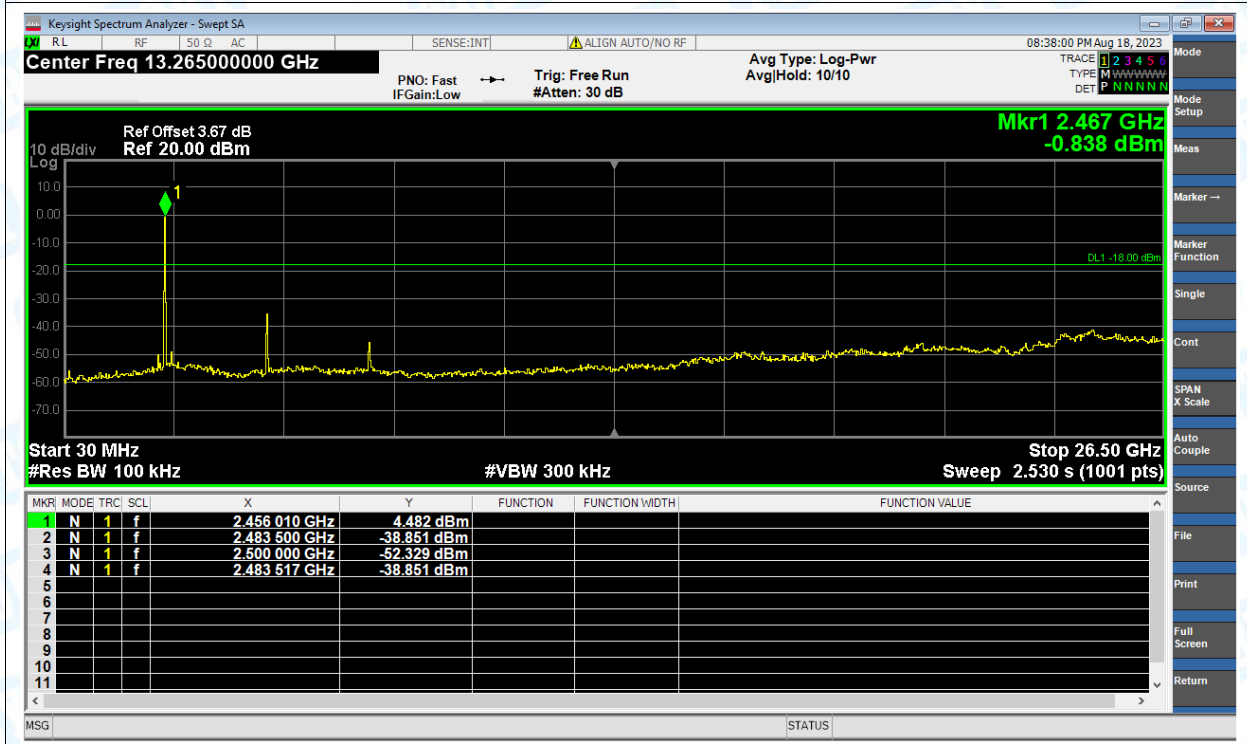
Tx. Spurious NVNT g 2437MHz Ant1 Emission



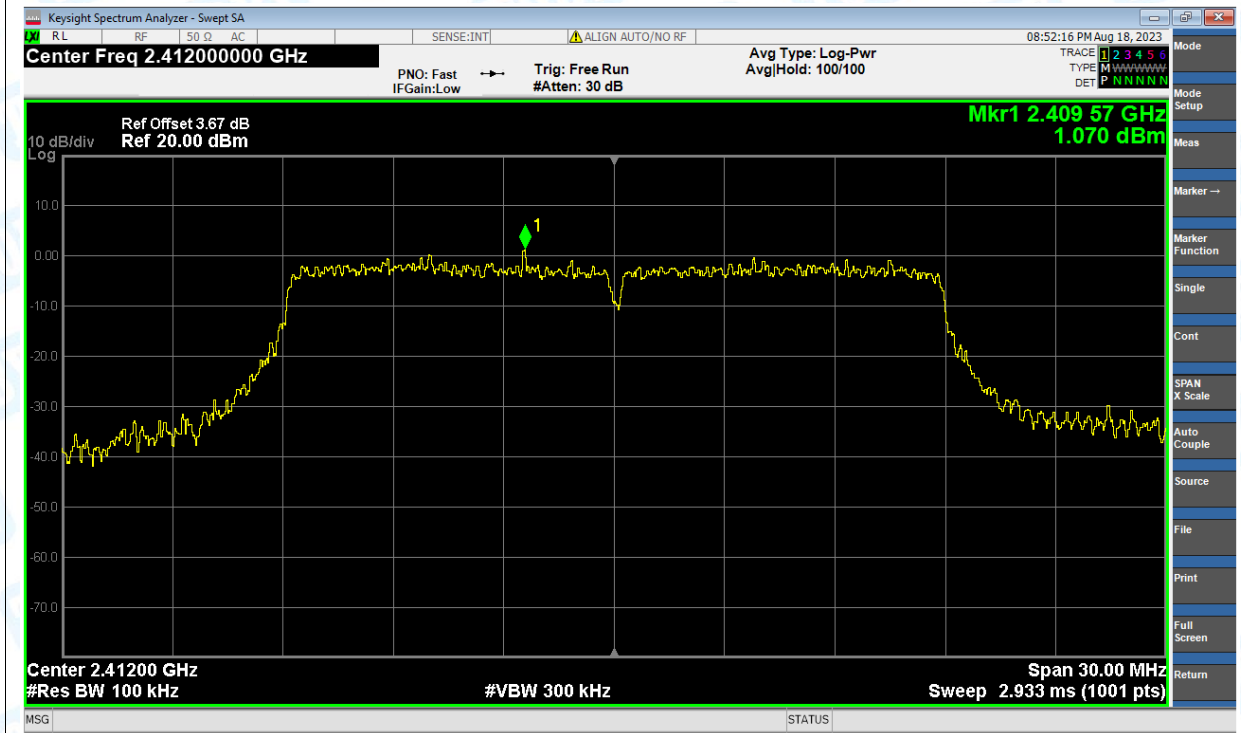
Tx. Spurious NVNT g 2462MHz Ant1 Ref



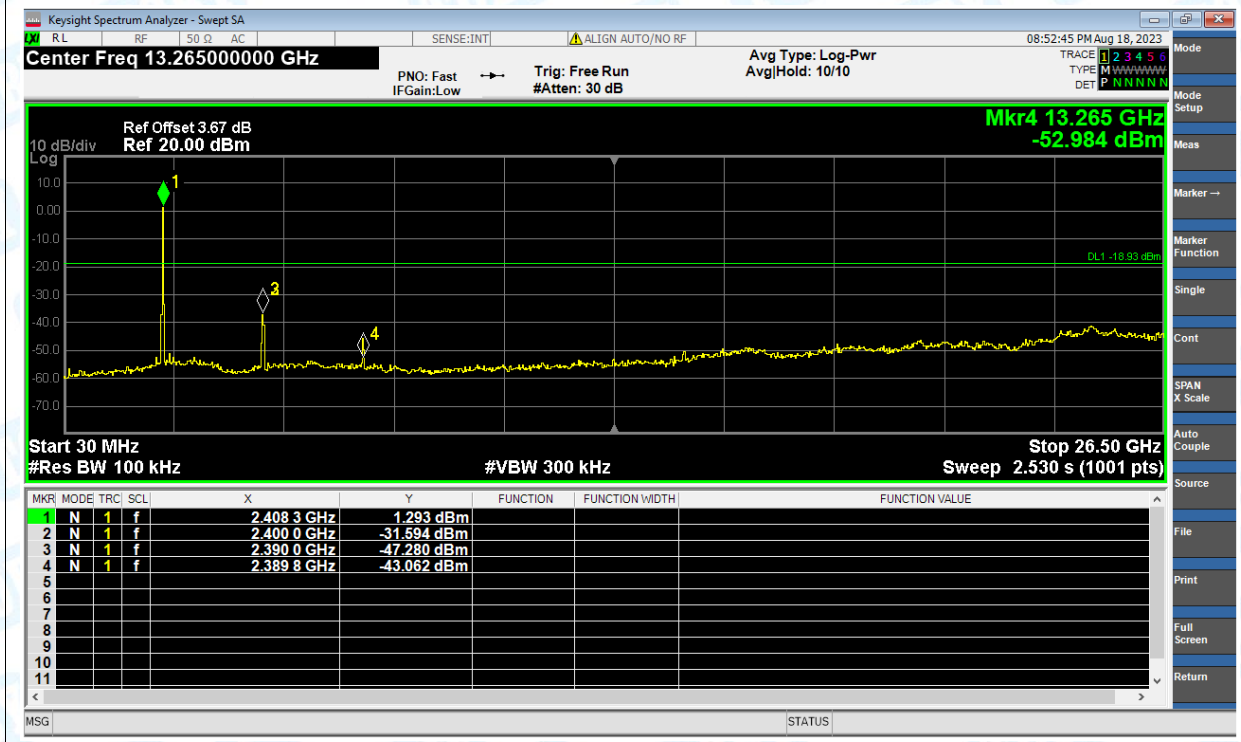
Tx. Spurious NVNT g 2462MHz Ant1 Emission



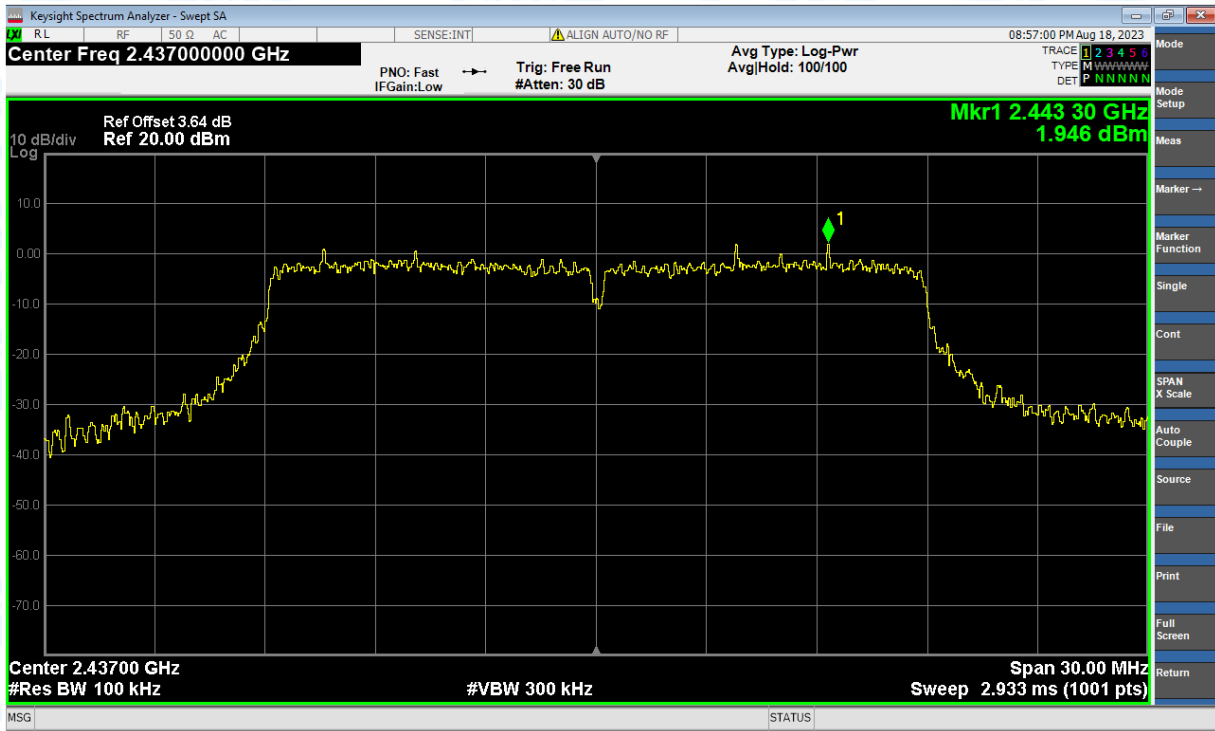
Tx. Spurious NVNT n(HT20) 2412MHz Ant1 Ref



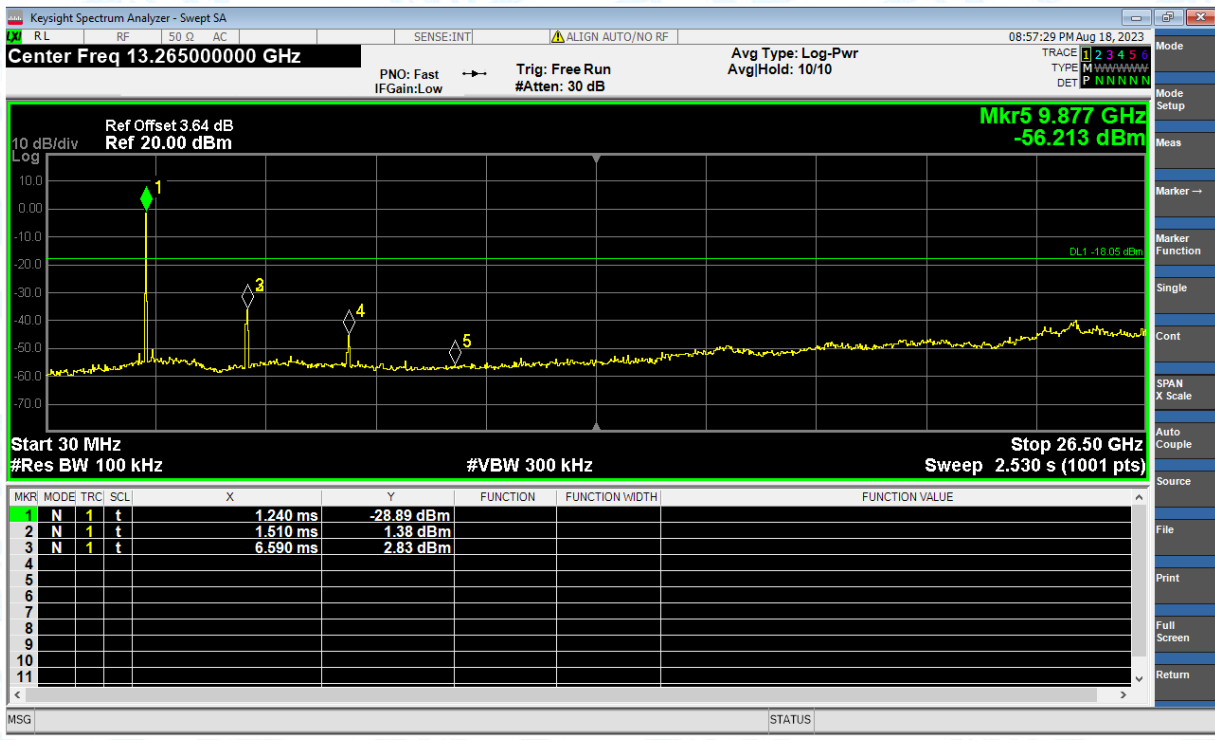
Tx. Spurious NVNT n(HT20) 2412MHz Ant1 Emission



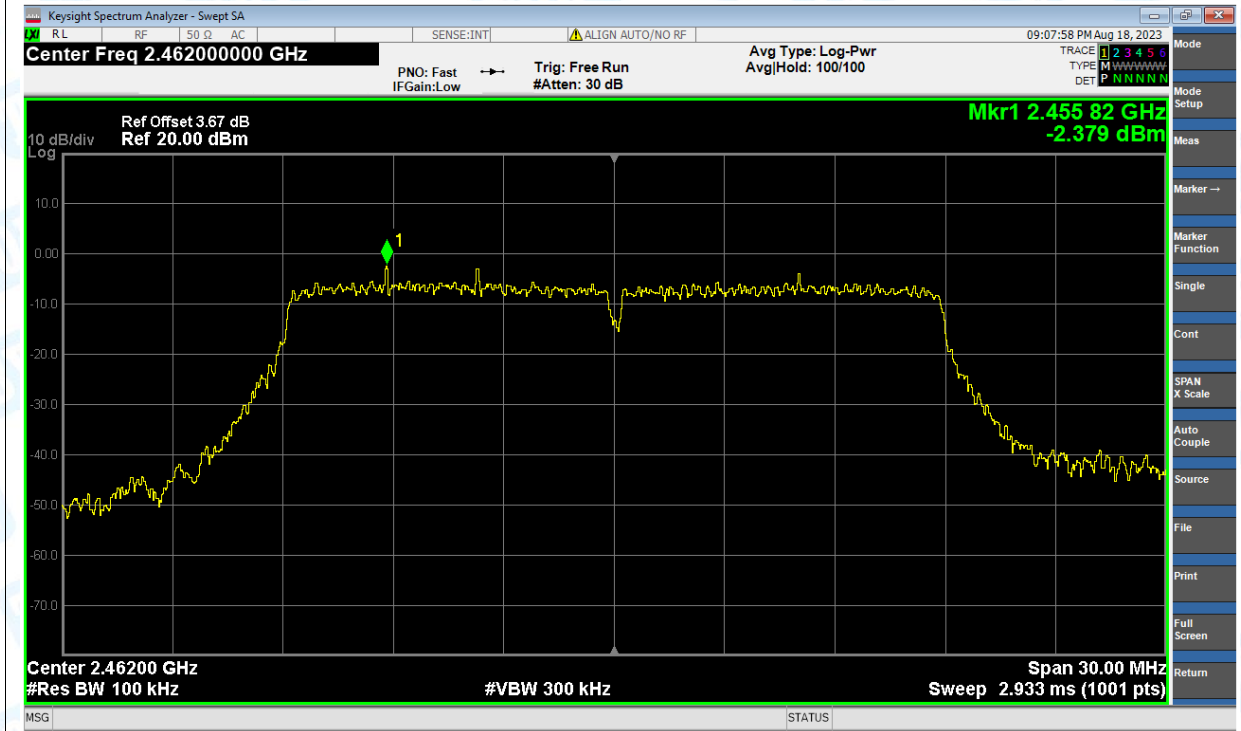
Tx. Spurious NVNT n(HT20) 2437MHz Ant1 Ref



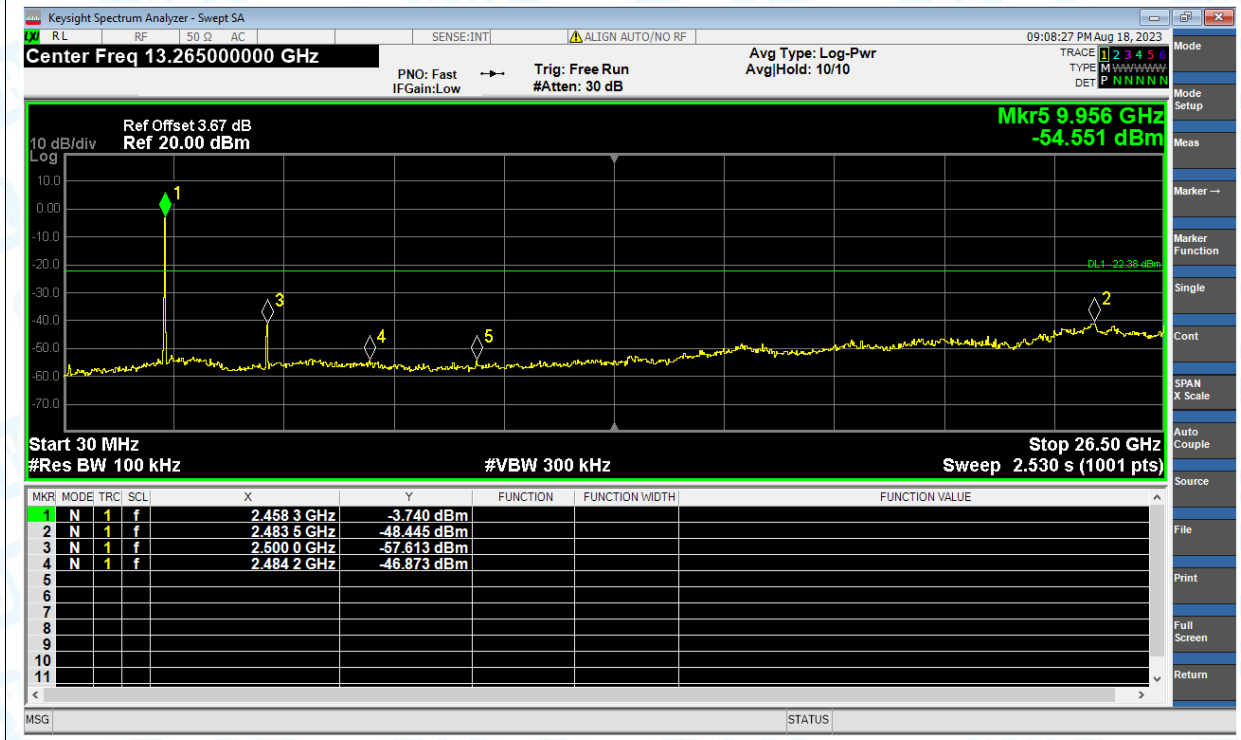
Tx. Spurious NVNT n(HT20) 2437MHz Ant1 Emission



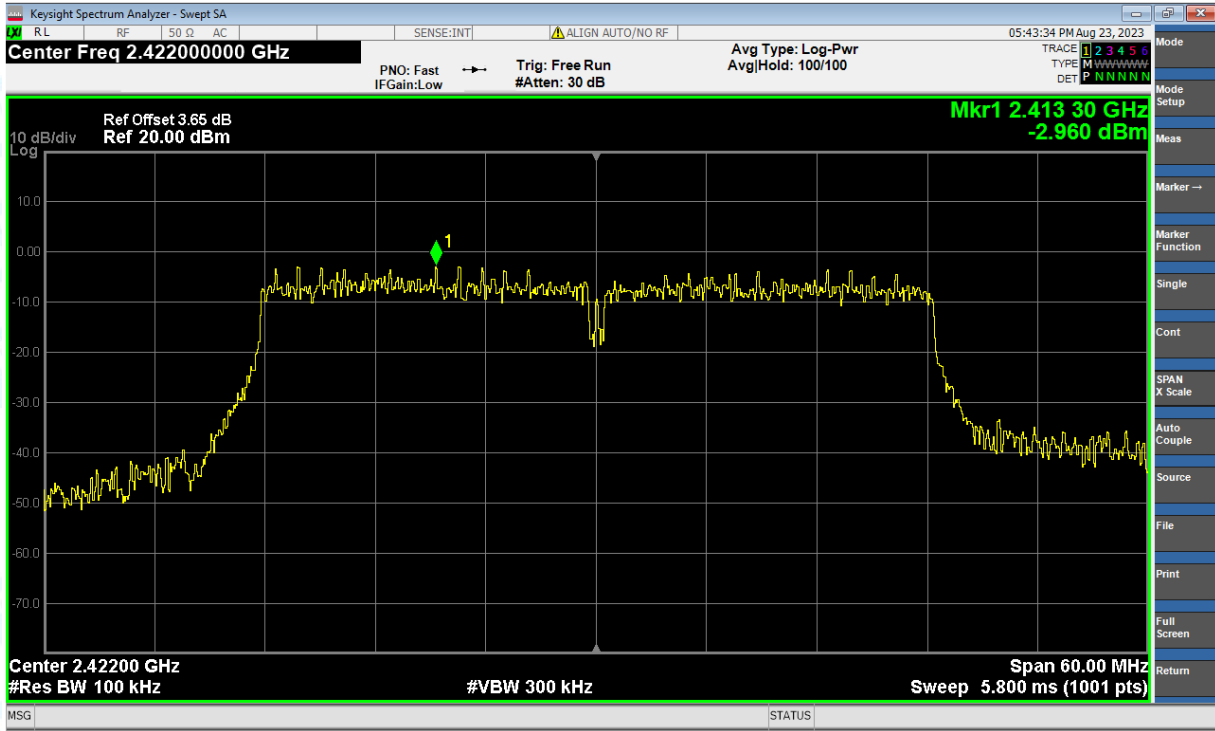
Tx. Spurious NVNT n(HT20) 2462MHz Ant1 Ref



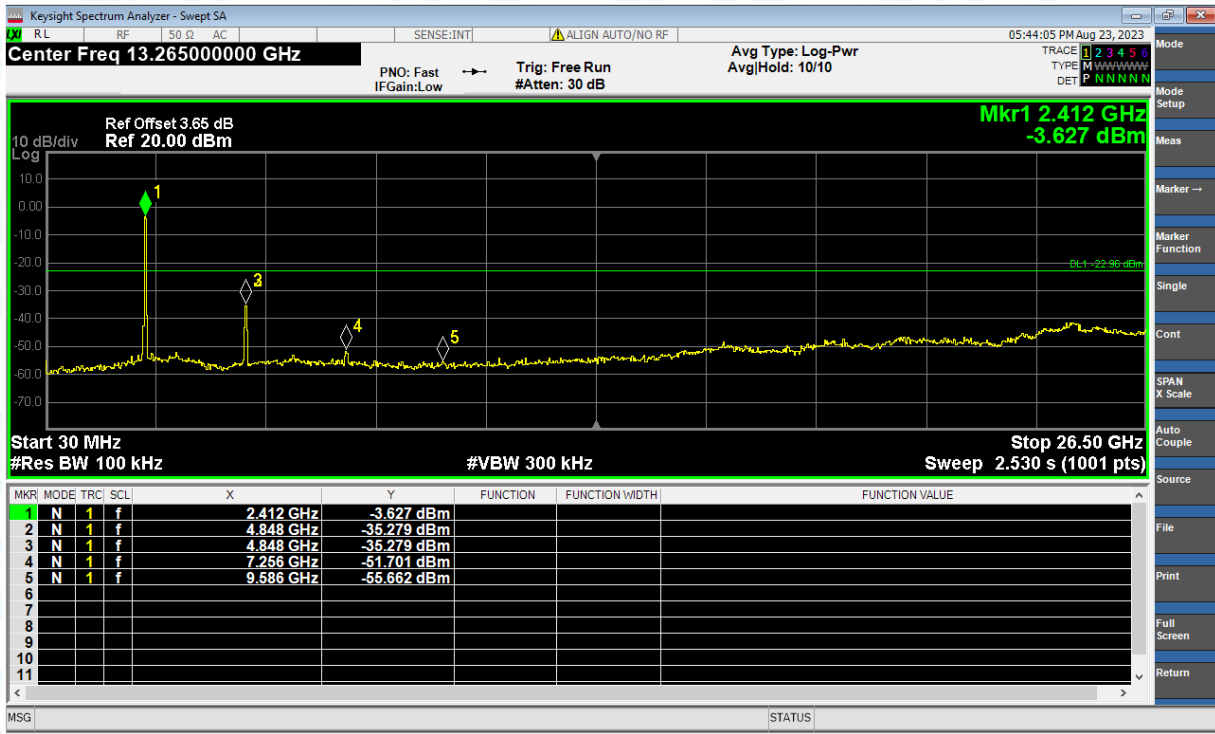
Tx. Spurious NVNT n(HT20) 2462MHz Ant1 Emission



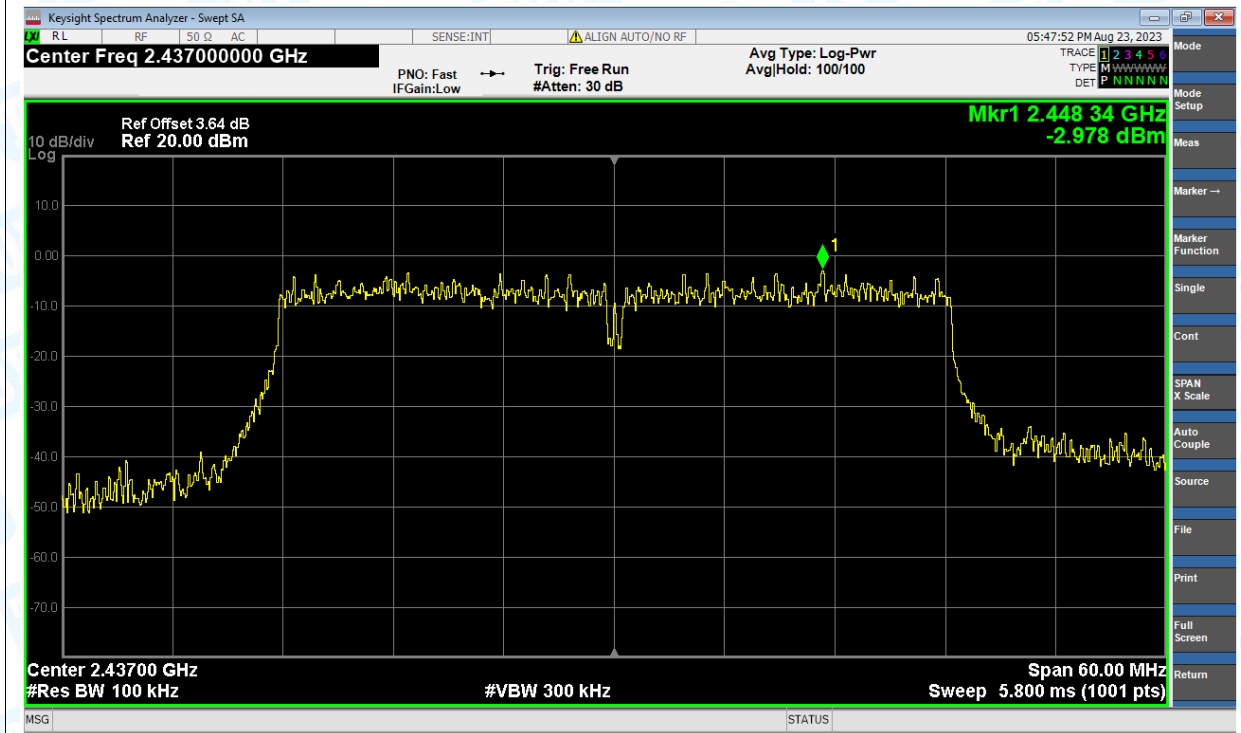
Tx. Spurious NVNT n(HT40) 2422MHz Ant1 Ref



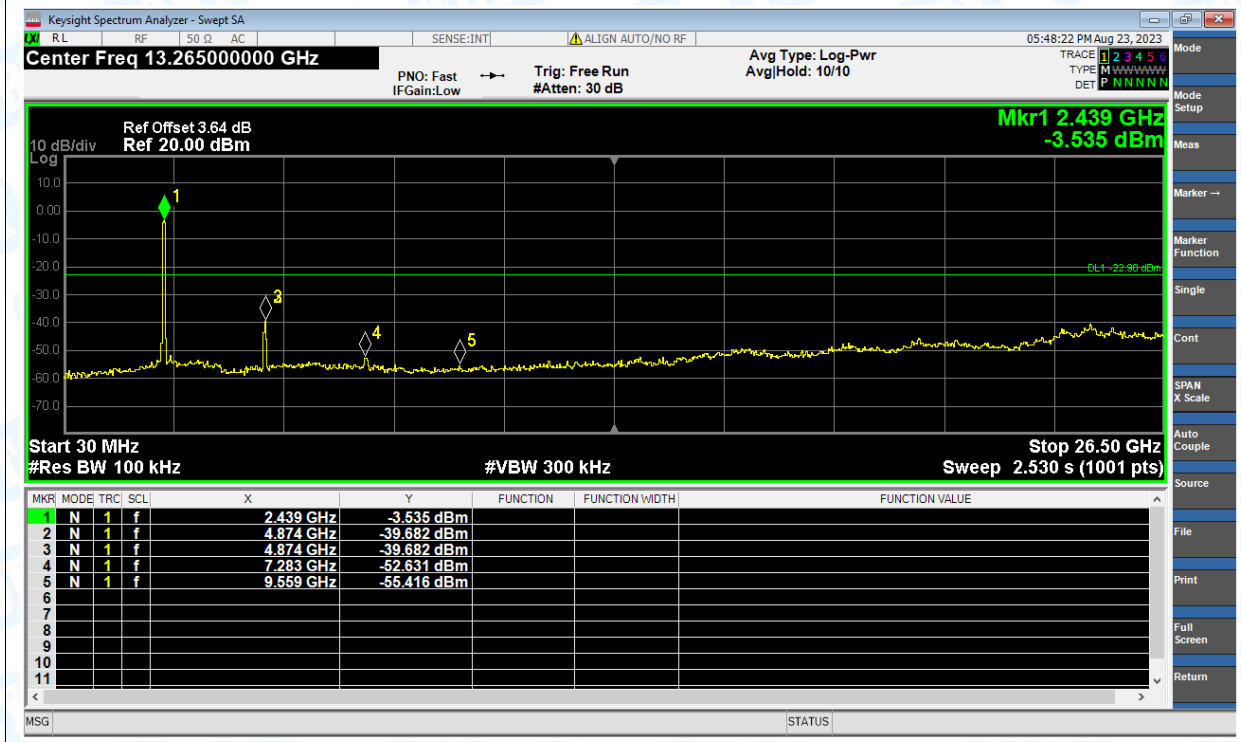
Tx. Spurious NVNT n(HT40) 2422MHz Ant1 Emission



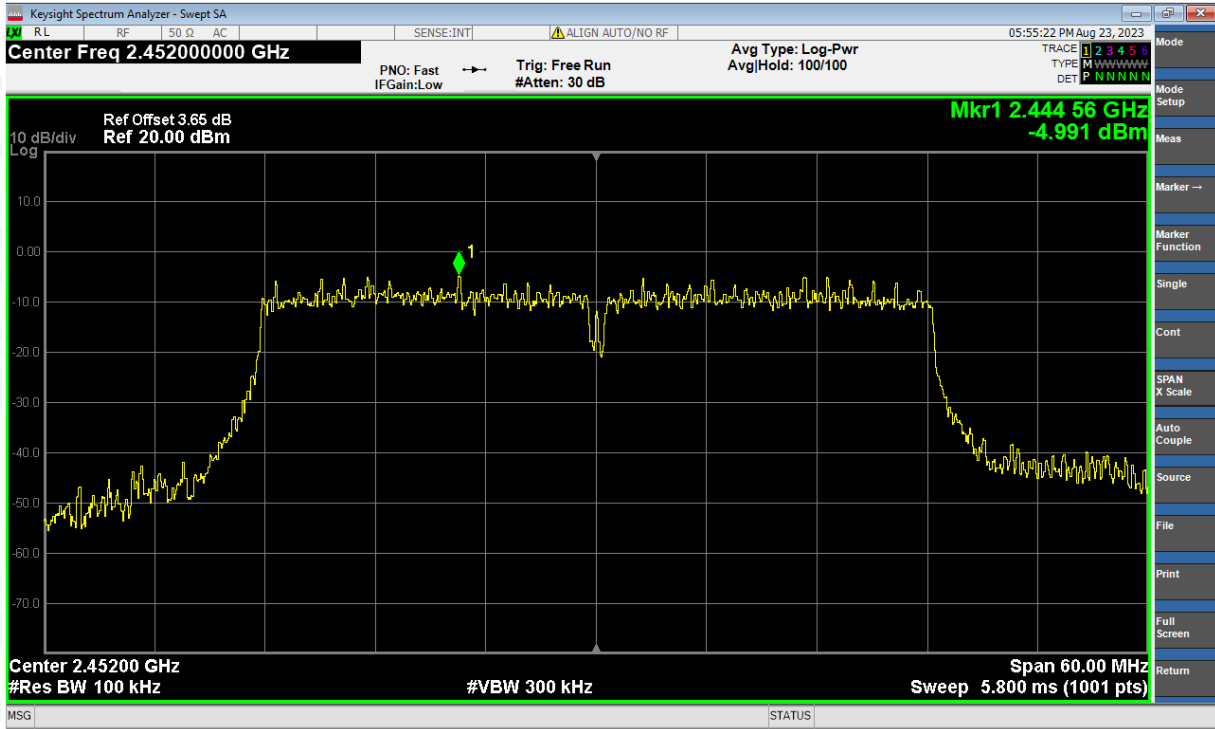
Tx. Spurious NVNT n(HT40) 2437MHz Ant1 Ref



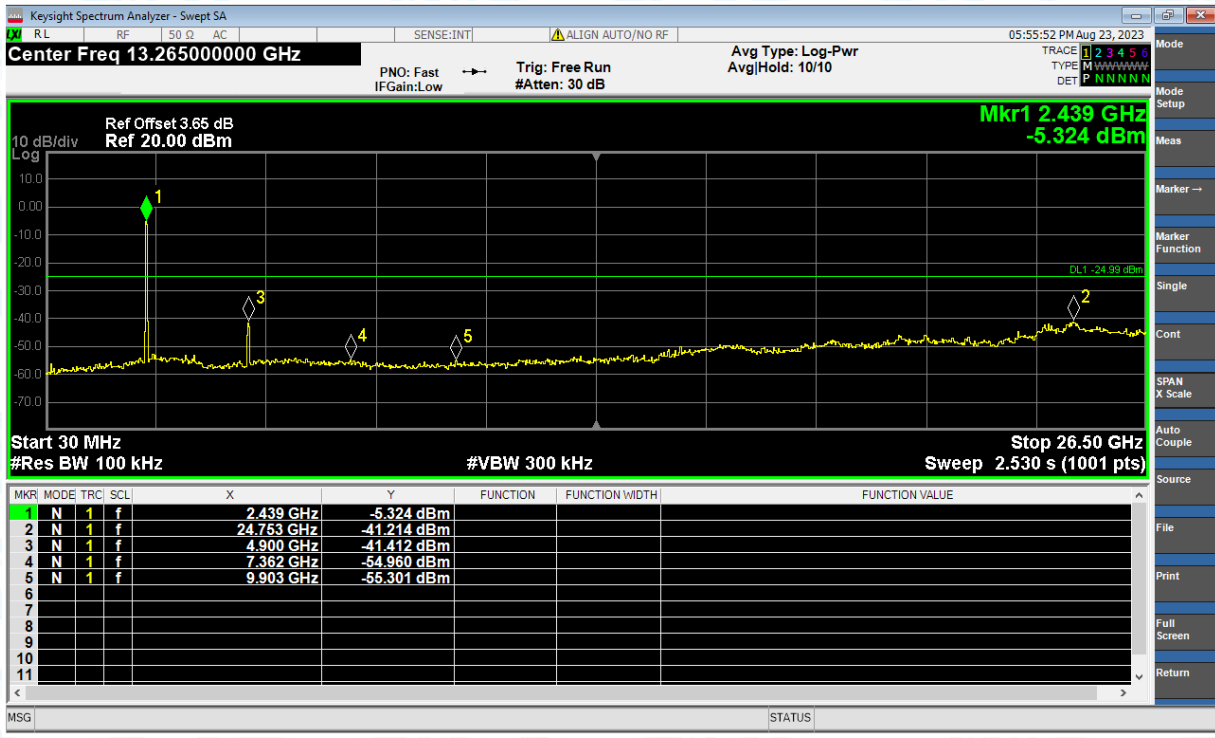
Tx. Spurious NVNT n(HT40) 2437MHz Ant1 Emission



Tx. Spurious NVNT n(HT40) 2452MHz Ant1 Ref



Tx. Spurious NVNT n(HT40) 2452MHz Ant1 Emission



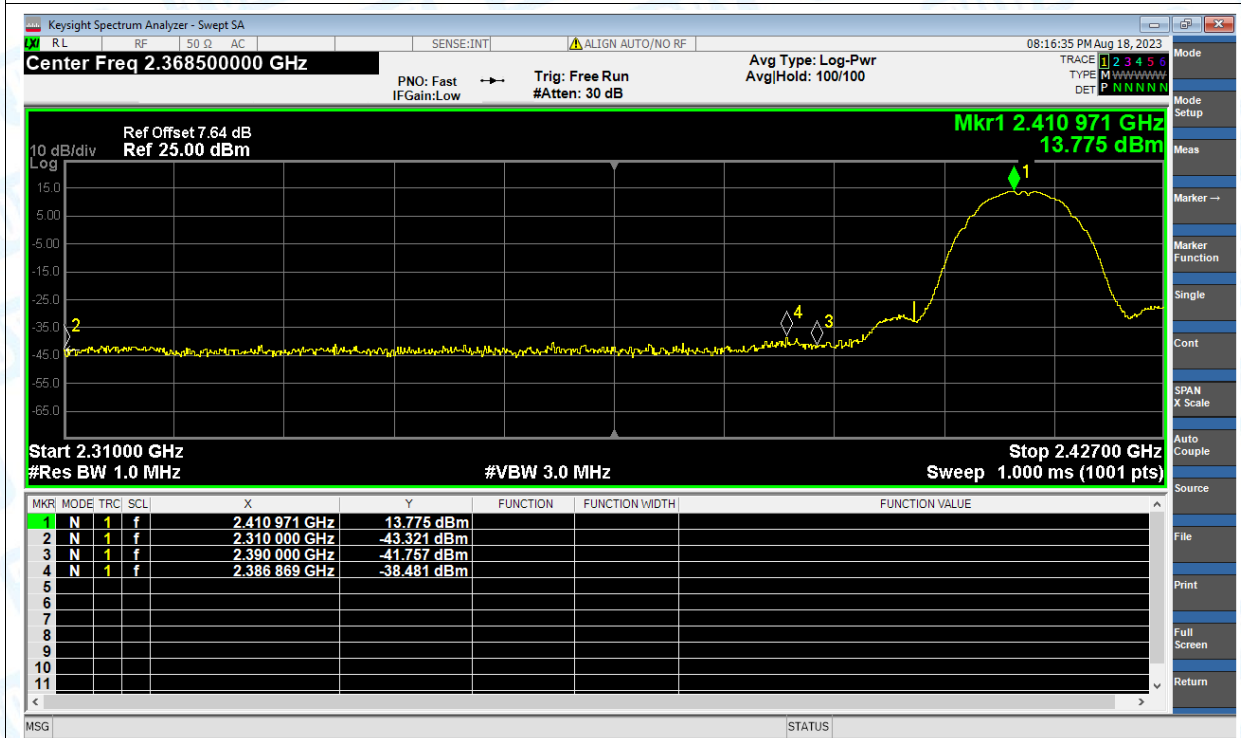
8. Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	b	2412	Ant1	2310	-43.32	3.97	55.91	Peak	74	Pass
NVNT	b	2412	Ant1	2310	-53.63	3.97	45.6	Average	54	Pass
NVNT	b	2412	Ant1	2386.869	-38.48	3.97	60.75	Peak	74	Pass
NVNT	b	2412	Ant1	2387.337	-48.78	3.97	50.45	Average	54	Pass
NVNT	b	2412	Ant1	2390	-41.76	3.97	57.47	Peak	74	Pass
NVNT	b	2412	Ant1	2390	-50.82	3.97	48.41	Average	54	Pass
NVNT	b	2462	Ant1	2483.5	-41.43	3.97	57.8	Peak	74	Pass
NVNT	b	2462	Ant1	2483.5	-50.64	3.97	48.59	Average	54	Pass
NVNT	b	2462	Ant1	2488.393	-38.62	3.97	60.61	Peak	74	Pass
NVNT	b	2462	Ant1	2487.651	-48.69	3.97	50.54	Average	54	Pass
NVNT	b	2462	Ant1	2500	-42.89	3.97	56.34	Peak	74	Pass
NVNT	b	2462	Ant1	2500	-52.81	3.97	46.42	Average	54	Pass
NVNT	g	2412	Ant1	2310	-46.74	3.97	52.49	Peak	74	Pass
NVNT	g	2412	Ant1	2310	-55.81	3.97	43.42	Average	54	Pass
NVNT	g	2412	Ant1	2389.56	-29.4	3.97	69.83	Peak	74	Pass
NVNT	g	2412	Ant1	2389.911	-47.11	3.97	52.12	Average	54	Pass
NVNT	g	2412	Ant1	2390	-32	3.97	67.23	Peak	74	Pass
NVNT	g	2412	Ant1	2390	-47.06	3.97	52.17	Average	54	Pass
NVNT	g	2462	Ant1	2483.5	-30.95	3.97	68.28	Peak	74	Pass
NVNT	g	2462	Ant1	2483.5	-45.83	3.97	53.4	Average	54	Pass
NVNT	g	2462	Ant1	2483.676	-30.9	3.97	68.33	Peak	74	Pass
NVNT	g	2462	Ant1	2483.517	-45.83	3.97	53.4	Average	54	Pass
NVNT	g	2462	Ant1	2500	-43.7	3.97	55.53	Peak	74	Pass
NVNT	g	2462	Ant1	2500	-53.27	3.97	45.96	Average	54	Pass
NVNT	n(HT20)	2412	Ant1	2310	-44.26	3.97	54.97	Peak	74	Pass
NVNT	n(HT20)	2412	Ant1	2310	-53.73	3.97	45.5	Average	54	Pass
NVNT	n(HT20)	2412	Ant1	2389.911	-28.73	3.97	70.5	Peak	74	Pass
NVNT	n(HT20)	2412	Ant1	2389.911	-47.36	3.97	51.87	Average	54	Pass
NVNT	n(HT20)	2412	Ant1	2390	-28.81	3.97	70.42	Peak	74	Pass
NVNT	n(HT20)	2412	Ant1	2390	-47.28	3.97	51.95	Average	54	Pass
NVNT	n(HT20)	2462	Ant1	2483.5	-31.12	3.97	68.11	Peak	74	Pass
NVNT	n(HT20)	2462	Ant1	2483.5	-46.95	3.97	52.28	Average	54	Pass
NVNT	n(HT20)	2462	Ant1	2483.835	-29.77	3.97	69.46	Peak	74	Pass
NVNT	n(HT20)	2462	Ant1	2483.517	-46.95	3.97	52.28	Average	54	Pass
NVNT	n(HT20)	2462	Ant1	2500	-43.37	3.97	55.86	Peak	74	Pass
NVNT	n(HT20)	2462	Ant1	2500	-53.9	3.97	45.33	Average	54	Pass
NVNT	n(HT40)	2422	Ant1	2310	-42.58	3.97	56.65	Peak	74	Pass
NVNT	n(HT40)	2422	Ant1	2310	-52.56	3.97	46.67	Average	54	Pass
NVNT	n(HT40)	2422	Ant1	2385.828	-30.45	3.97	68.78	Peak	74	Pass
NVNT	n(HT40)	2422	Ant1	2388.81	-45.96	3.97	53.27	Average	54	Pass
NVNT	n(HT40)	2422	Ant1	2390	-29.92	3.97	69.31	Peak	74	Pass
NVNT	n(HT40)	2422	Ant1	2390	-46.3	3.97	52.93	Average	54	Pass

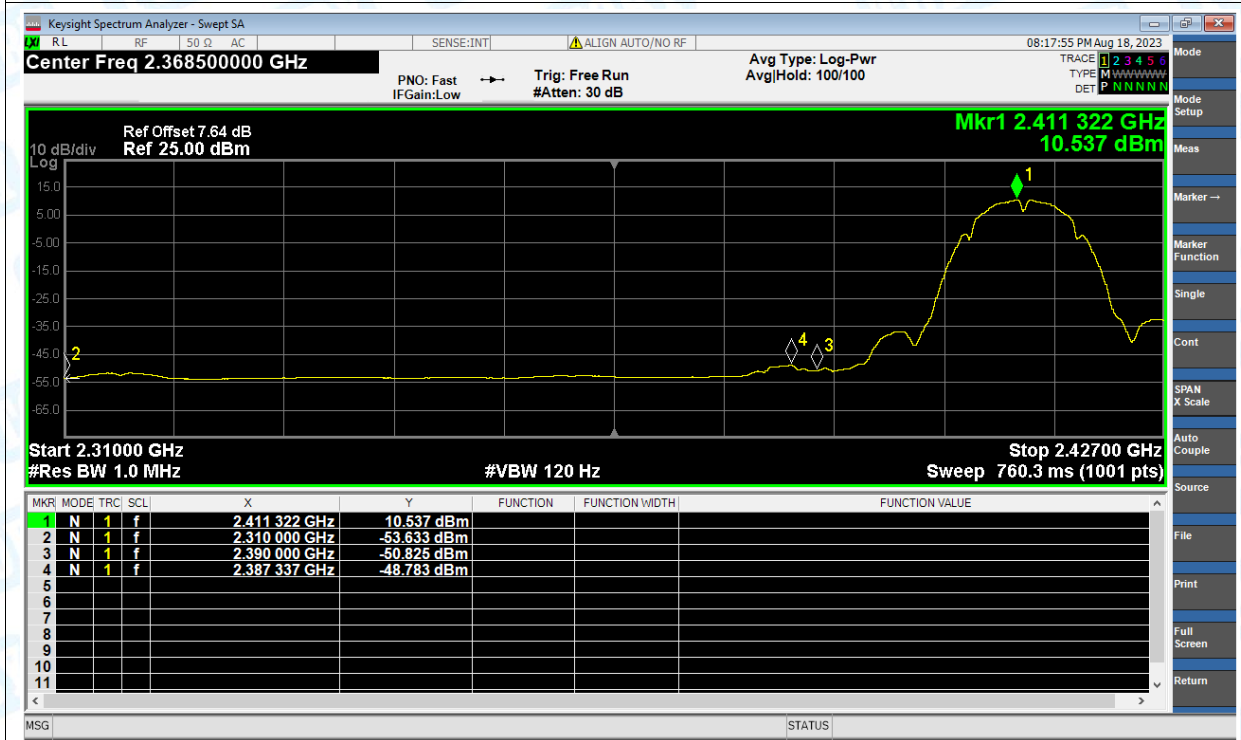
NVNT	n(HT40)	2452	Ant1	2483.5	-37.38	3.97	61.85	Peak	74	Pass
NVNT	n(HT40)	2452	Ant1	2483.5	-50.34	3.97	48.89	Average	54	Pass
NVNT	n(HT40)	2452	Ant1	2483.854	-26.82	3.97	72.41	Peak	74	Pass
NVNT	n(HT40)	2452	Ant1	2483.542	-50.34	3.97	48.89	Average	54	Pass
NVNT	n(HT40)	2452	Ant1	2500	-44.31	3.97	54.92	Peak	74	Pass
NVNT	n(HT40)	2452	Ant1	2500	-53.84	3.97	45.39	Average	54	Pass

Test Graphs

Restrict Band NVNT b 2412MHz Ant1 Peak



Restrict Band NVNT b 2412MHz Ant1 Average



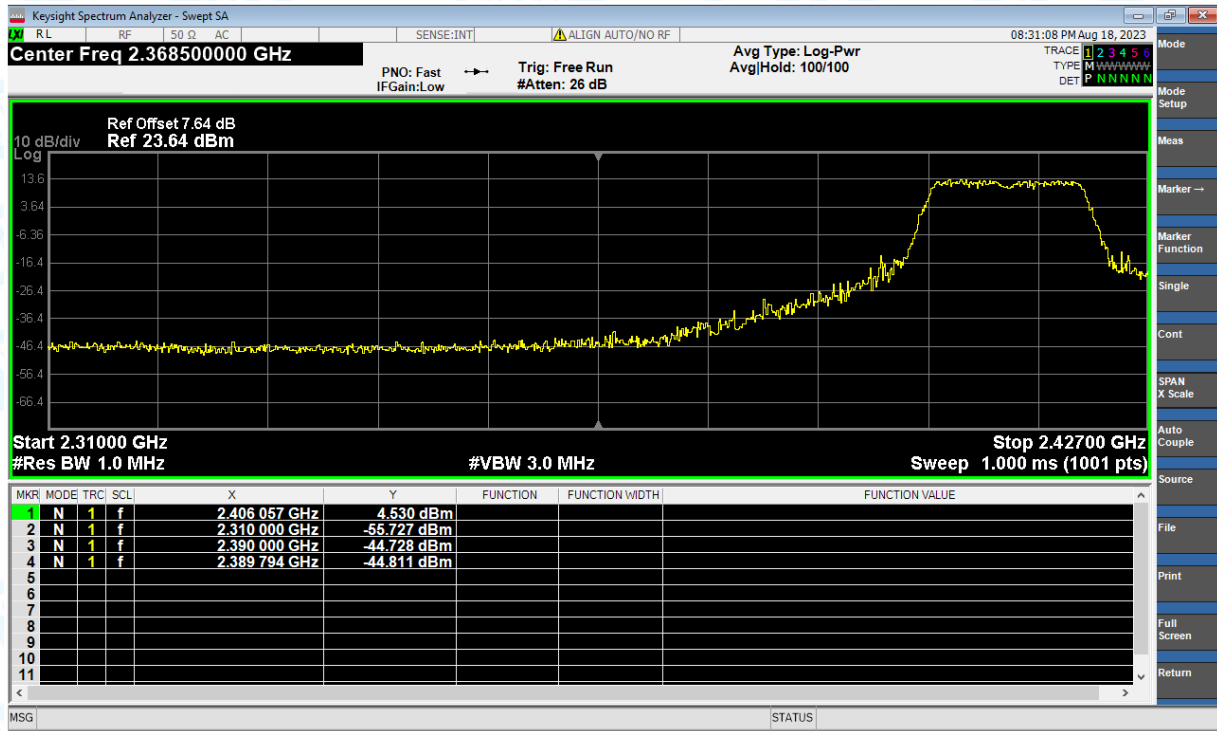
Restrict Band NVNT b 2462MHz Ant1 Peak



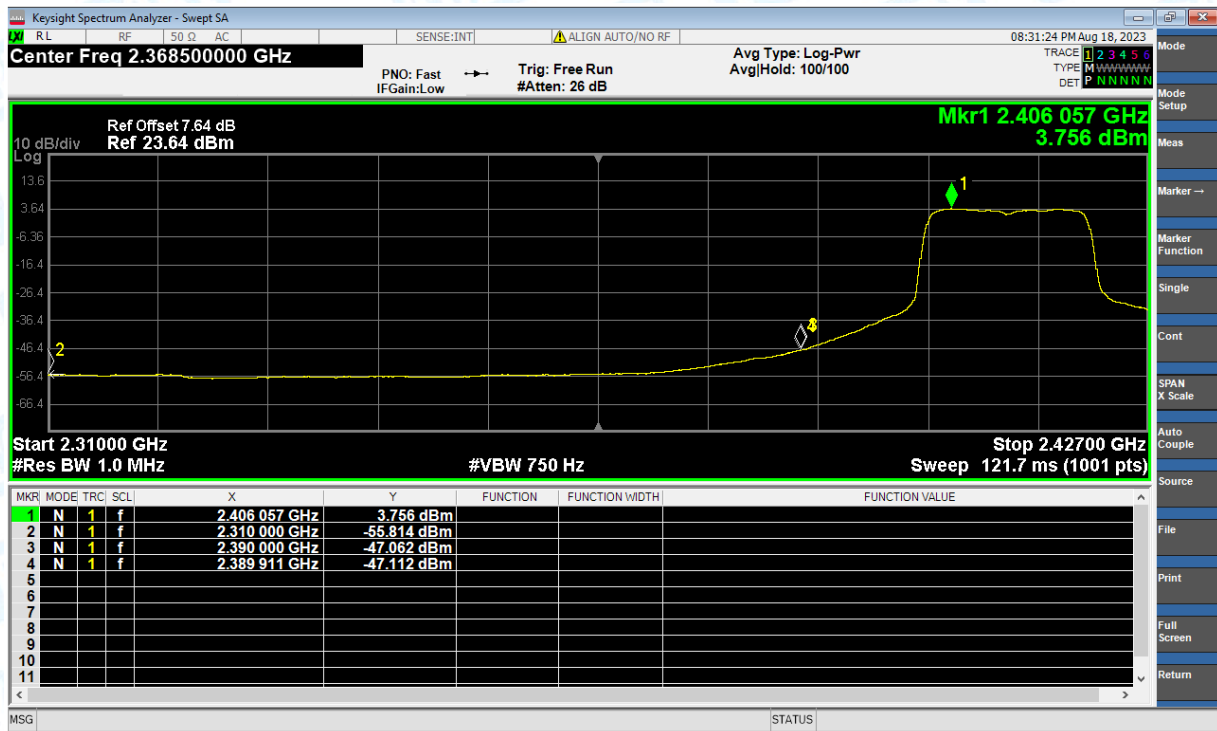
Restrict Band NVNT b 2462MHz Ant1 Average



Restrict Band NVNT g 2412MHz Ant1 Peak



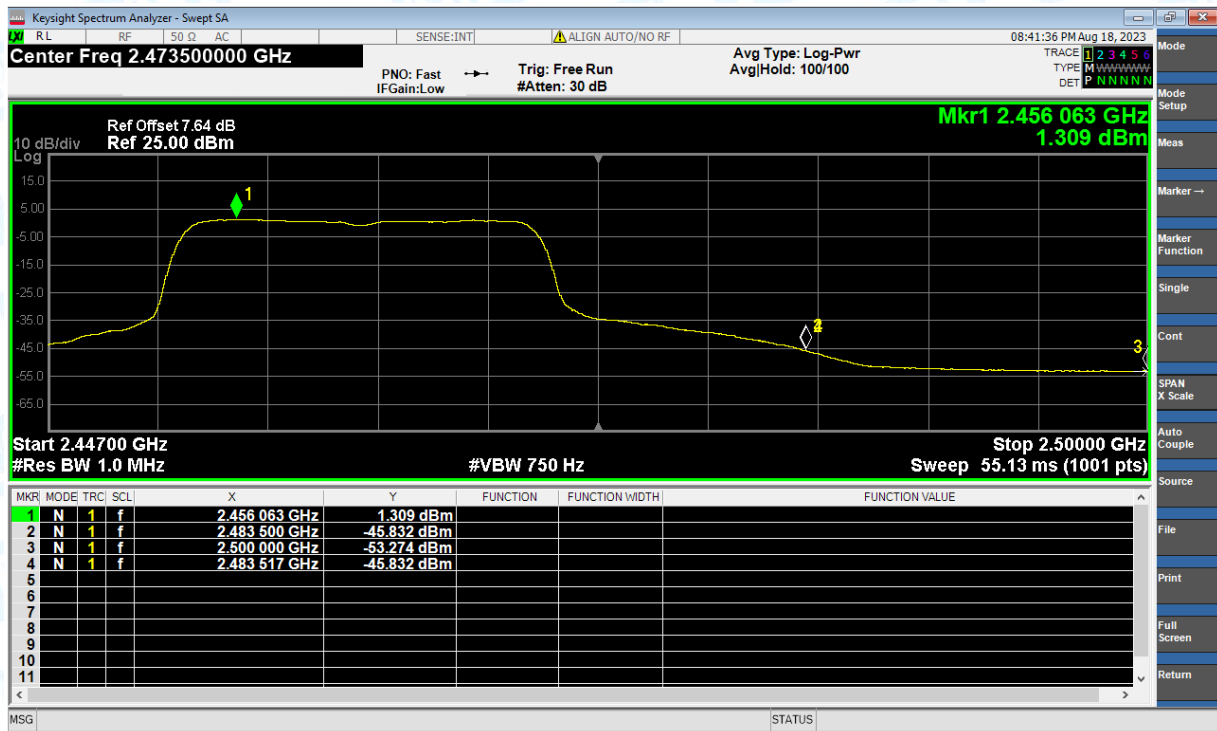
Restrict Band NVNT g 2412MHz Ant1 Average



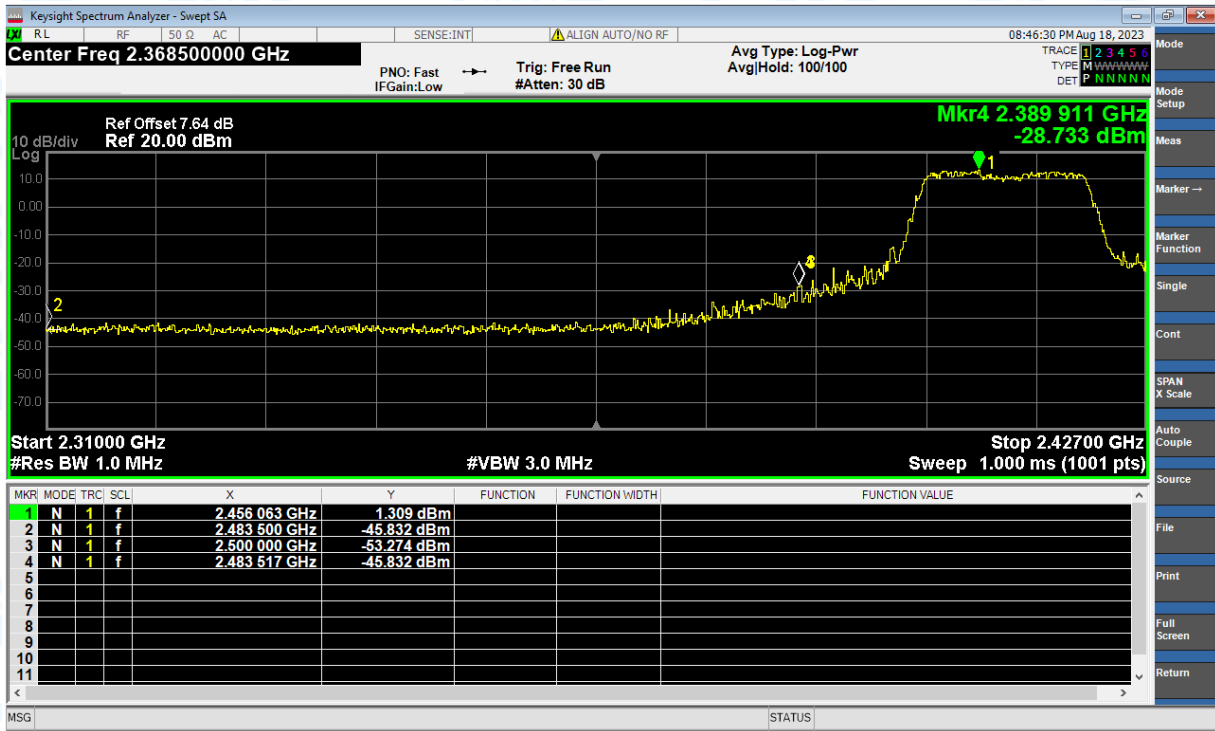
Restrict Band NVNT g 2462MHz Ant1 Peak



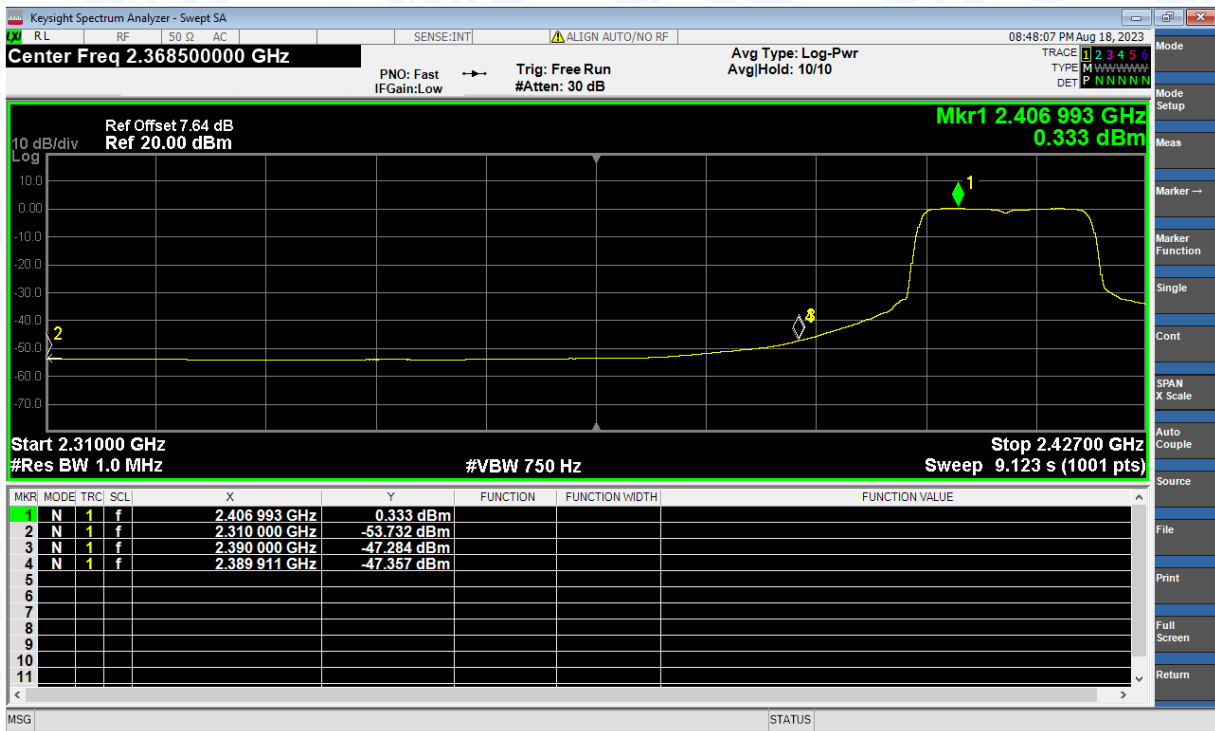
Restrict Band NVNT g 2462MHz Ant1 Average



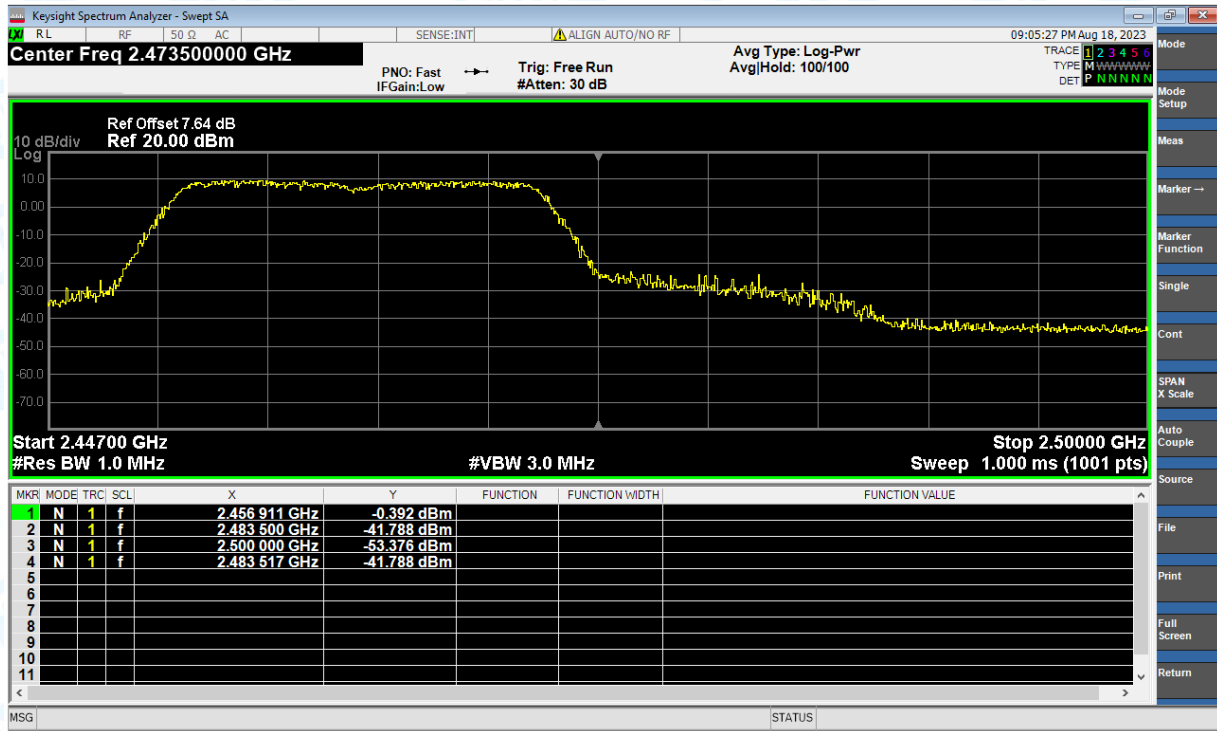
Restrict Band NVNT n(HT20) 2412MHz Ant1 Peak



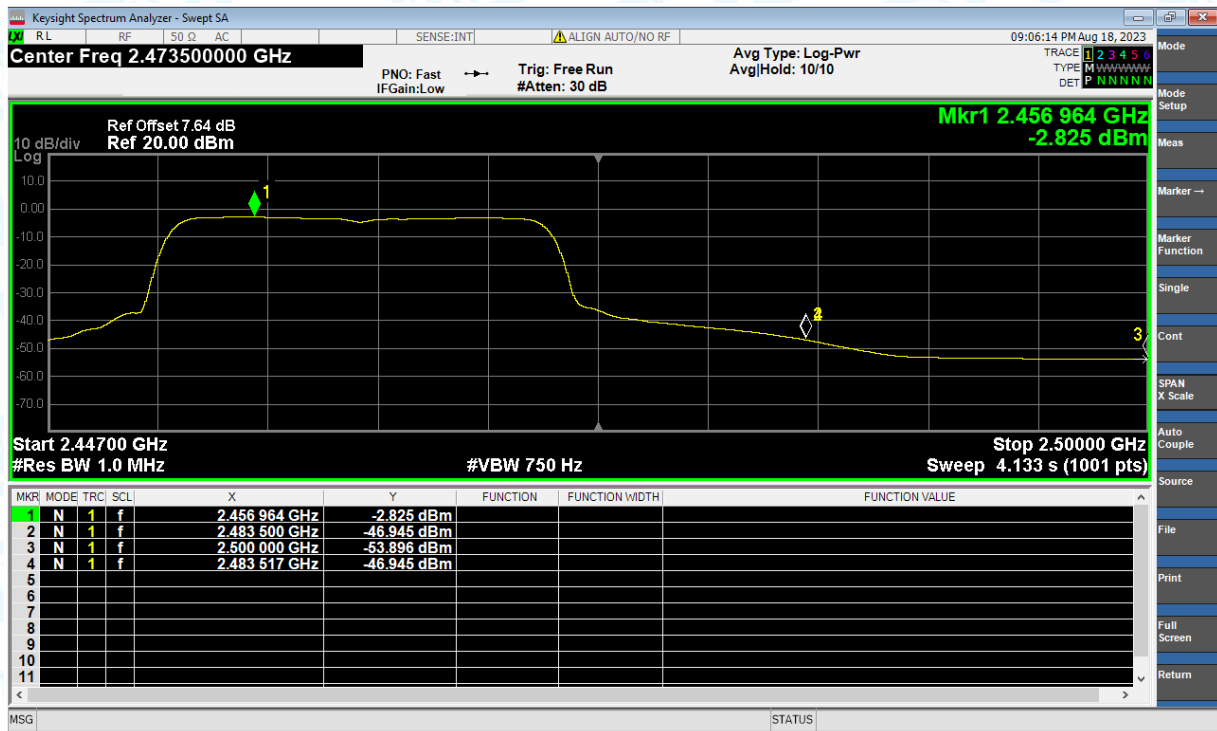
Restrict Band NVNT n(HT20) 2412MHz Ant1 Average



Restrict Band NVNT n(HT20) 2462MHz Ant1 Peak



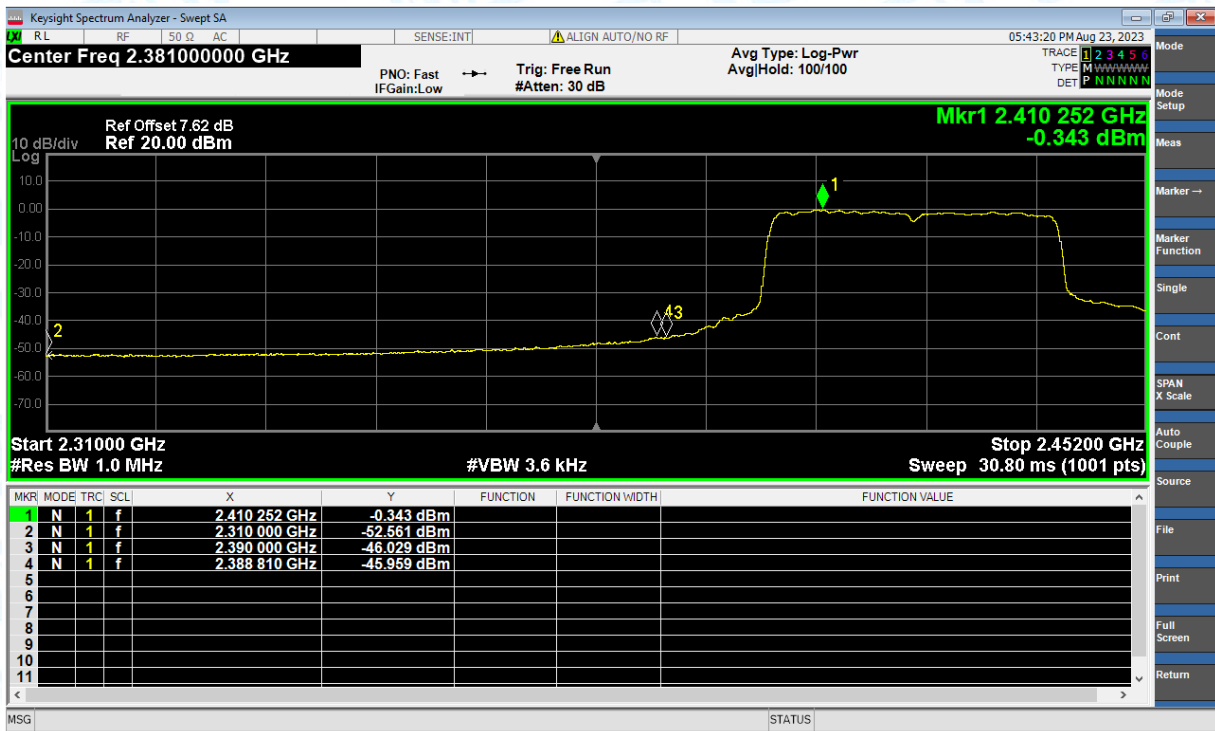
Restrict Band NVNT n(HT20) 2462MHz Ant1 Average

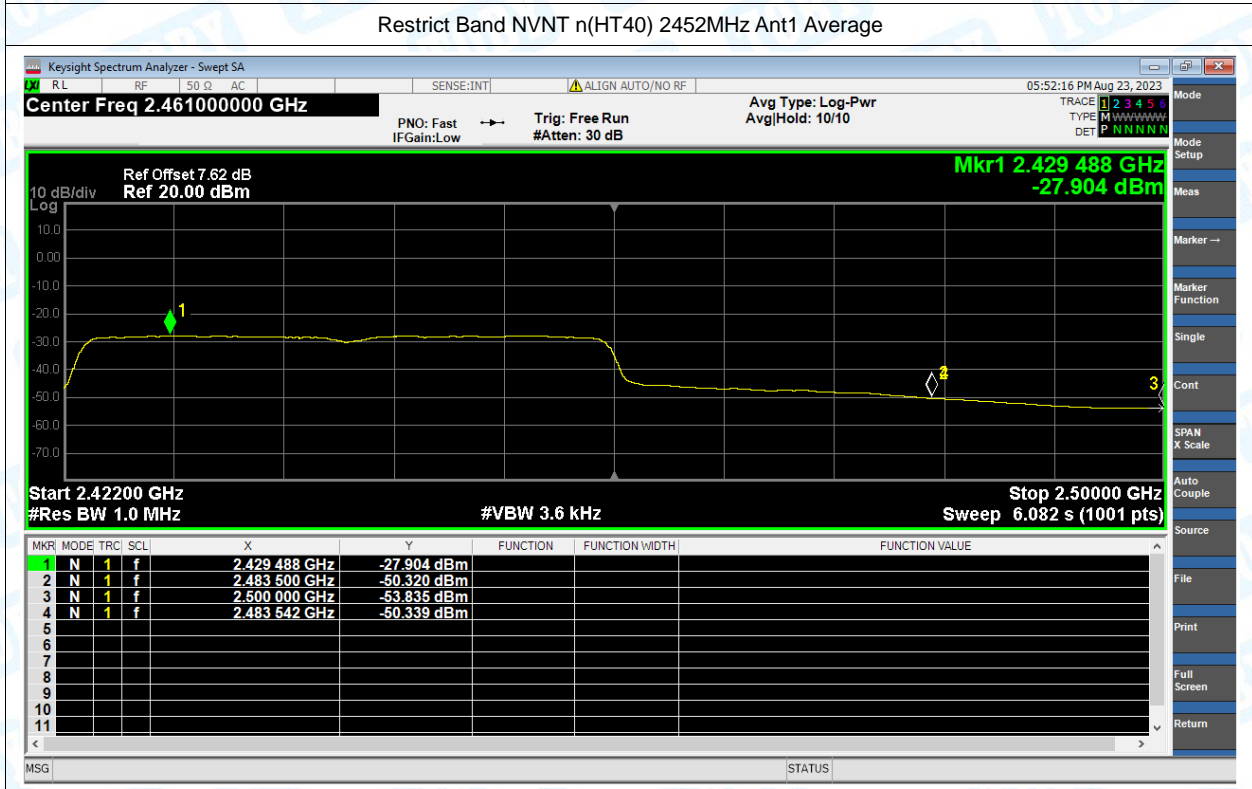
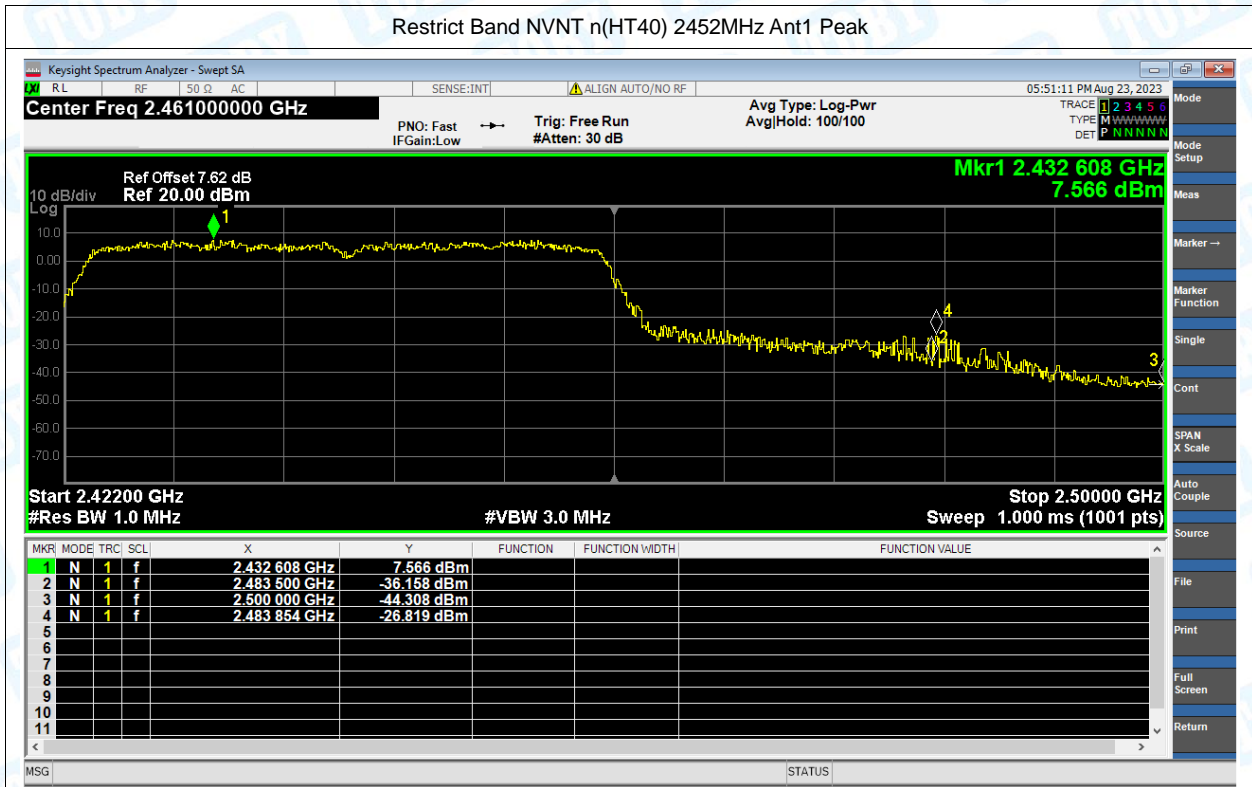


Restrict Band NVNT n(HT40) 2422MHz Ant1 Peak



Restrict Band NVNT n(HT40) 2422MHz Ant1 Average





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