



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: BLUETOOTH SPEAKER

Test Model: MPD102XB(Thunder 10)

Environmental Conditions

Temperature:	23.8°C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Paddi Chen
Supervised by:	Nick Peng





A.1 -20dB Bandwidth

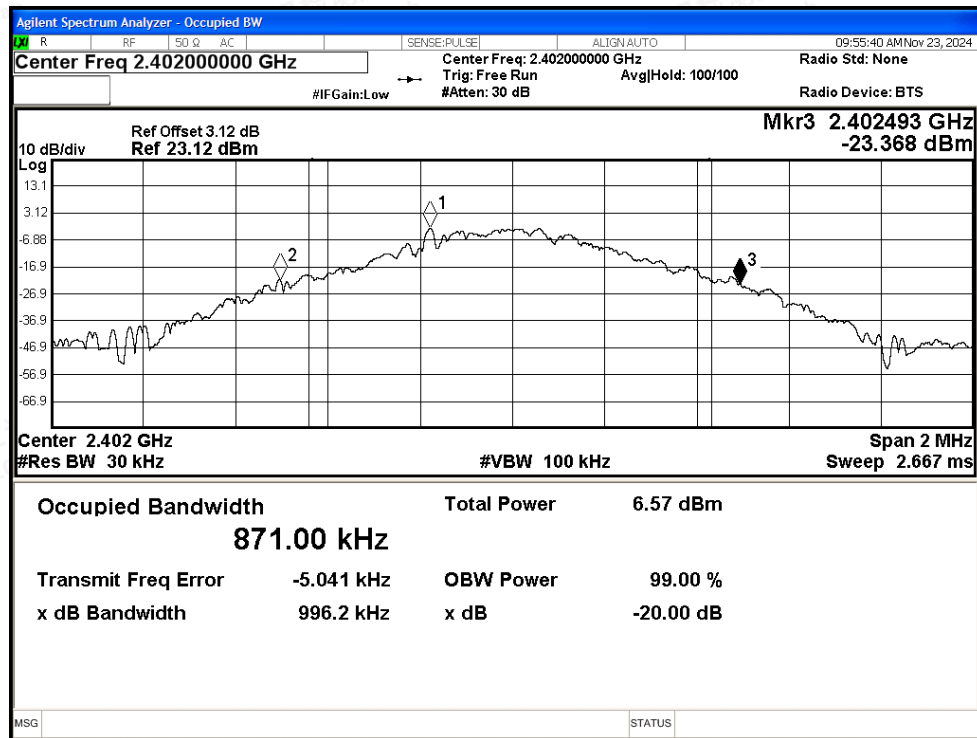
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	0.996	N/A	Pass
NVNT	1-DH5	2441	Ant1	1.012	N/A	Pass
NVNT	1-DH5	2480	Ant1	0.946	N/A	Pass
NVNT	2-DH5	2402	Ant1	1.285	N/A	Pass
NVNT	2-DH5	2441	Ant1	1.325	N/A	Pass
NVNT	2-DH5	2480	Ant1	1.289	N/A	Pass
NVNT	3-DH5	2402	Ant1	1.309	N/A	Pass
NVNT	3-DH5	2441	Ant1	1.293	N/A	Pass
NVNT	3-DH5	2480	Ant1	1.289	N/A	Pass



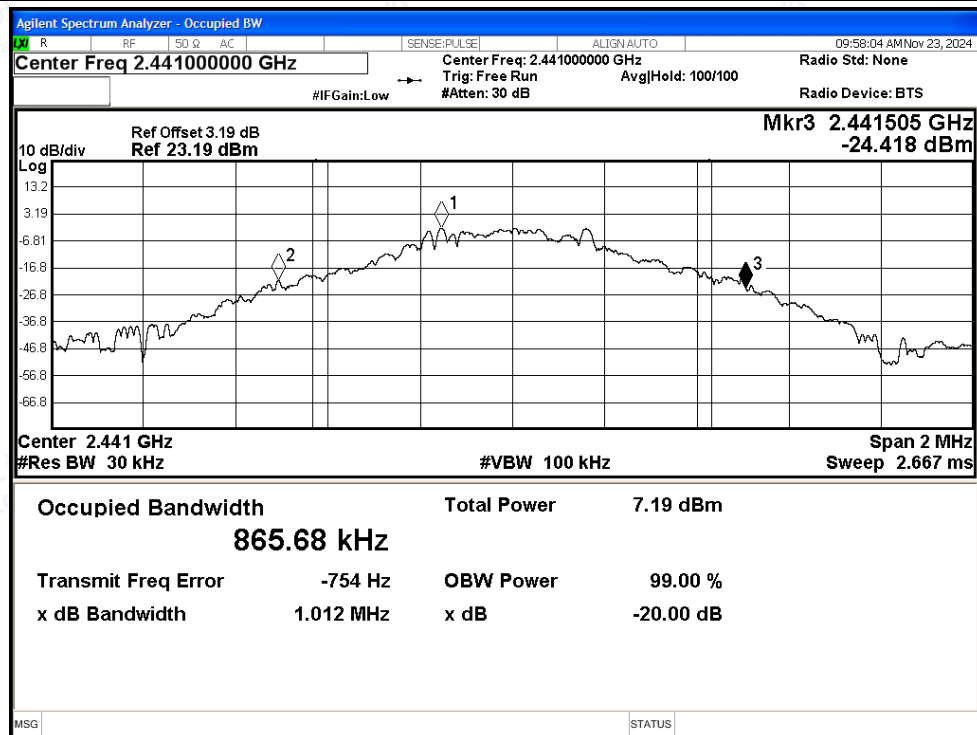


Test Graphs

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1

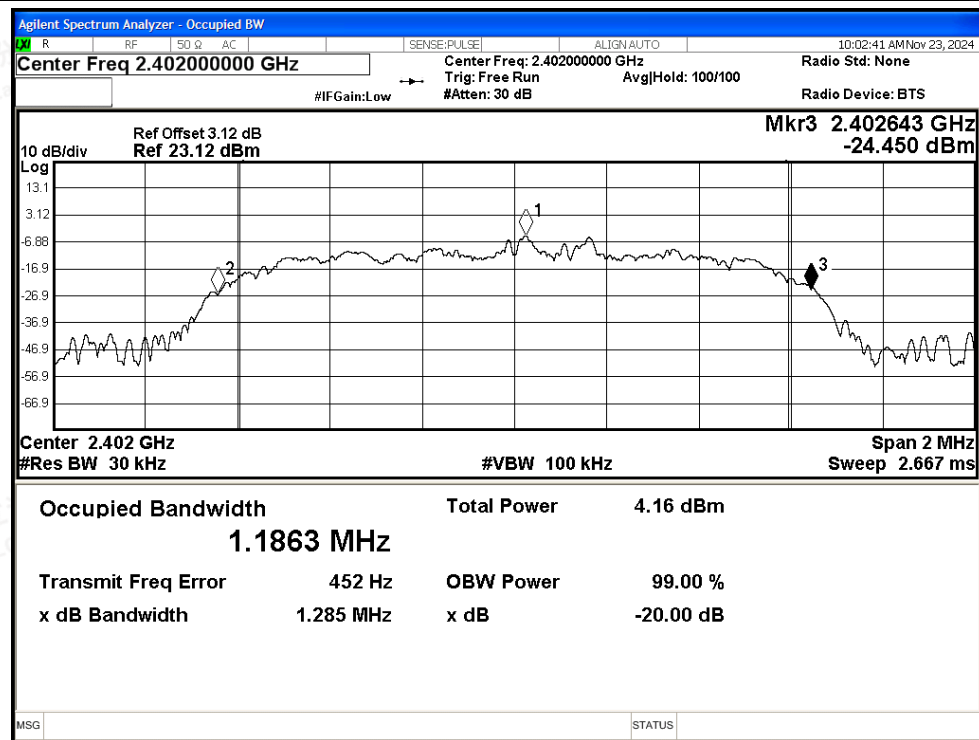




-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

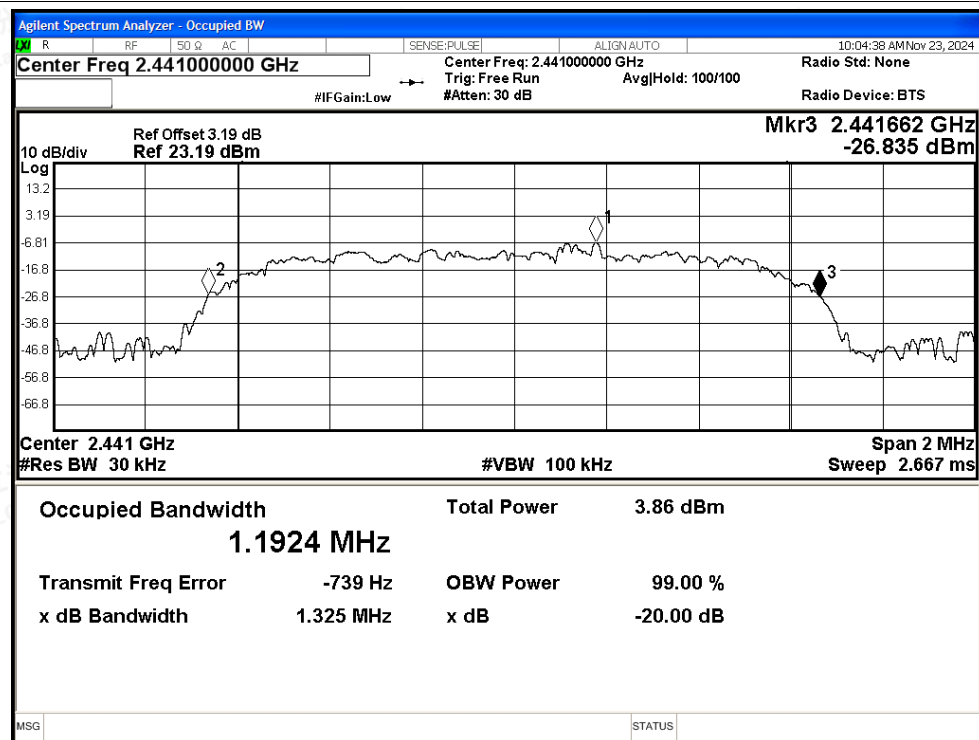


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1

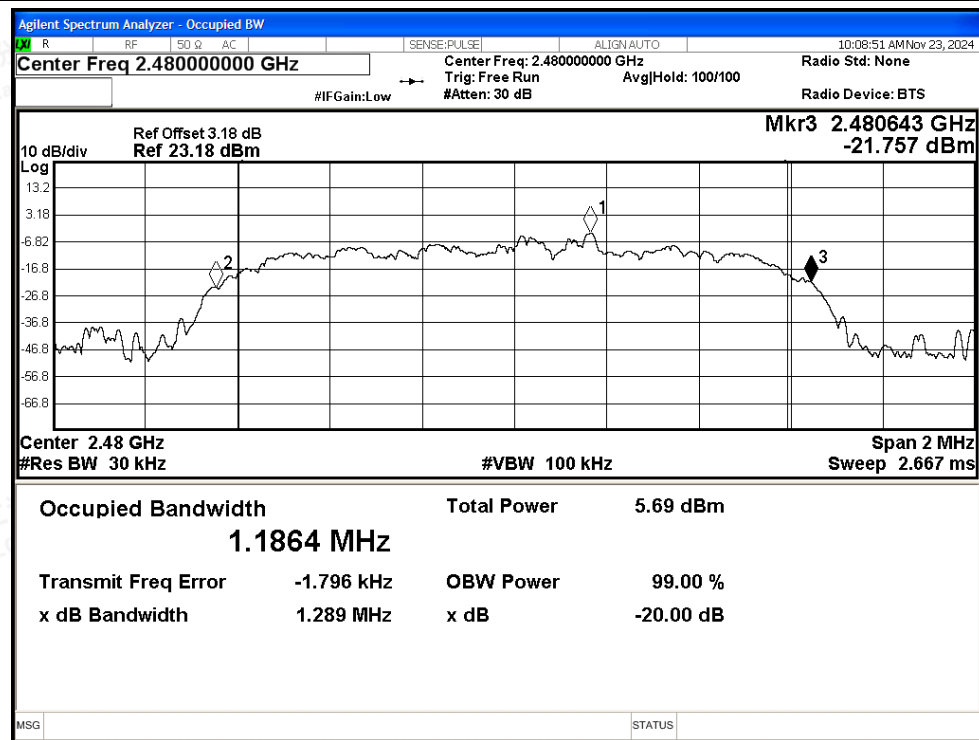




-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

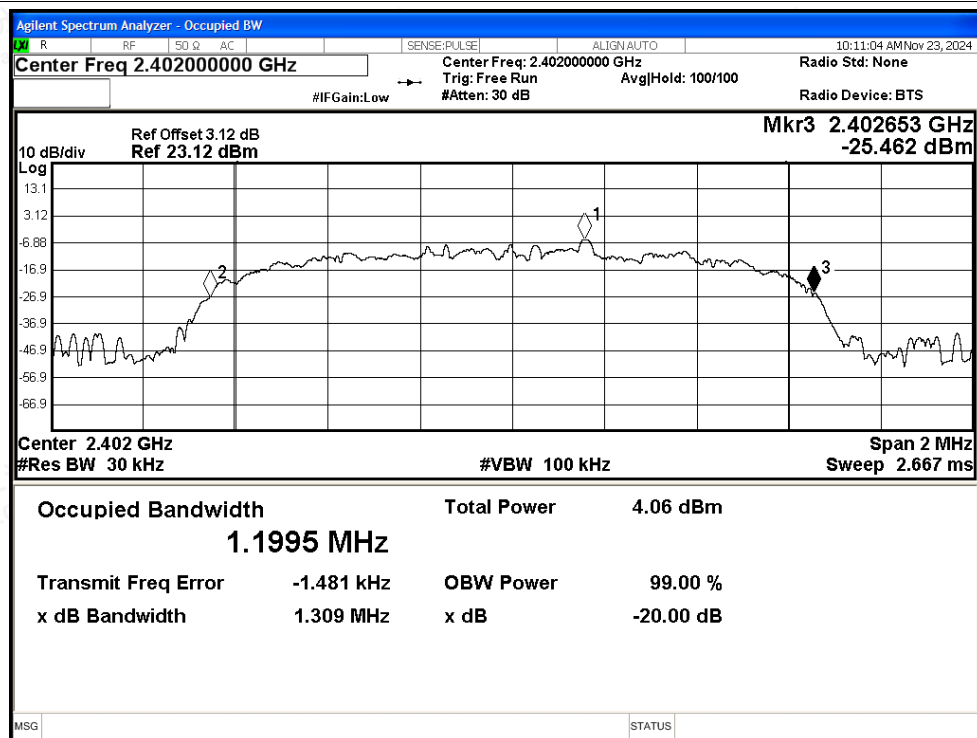


-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

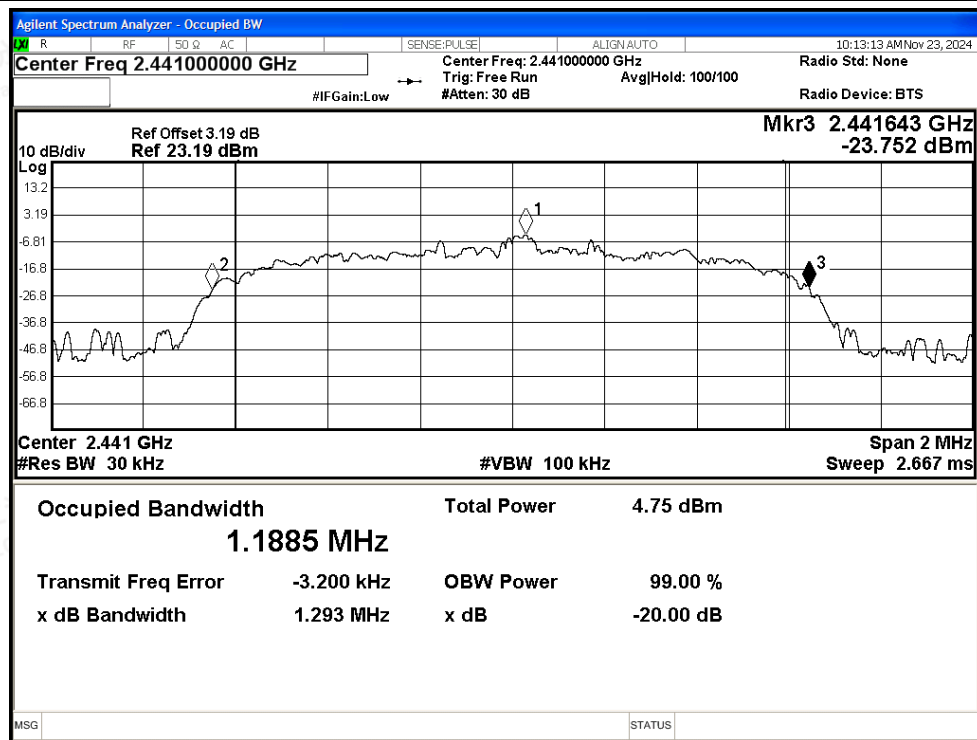


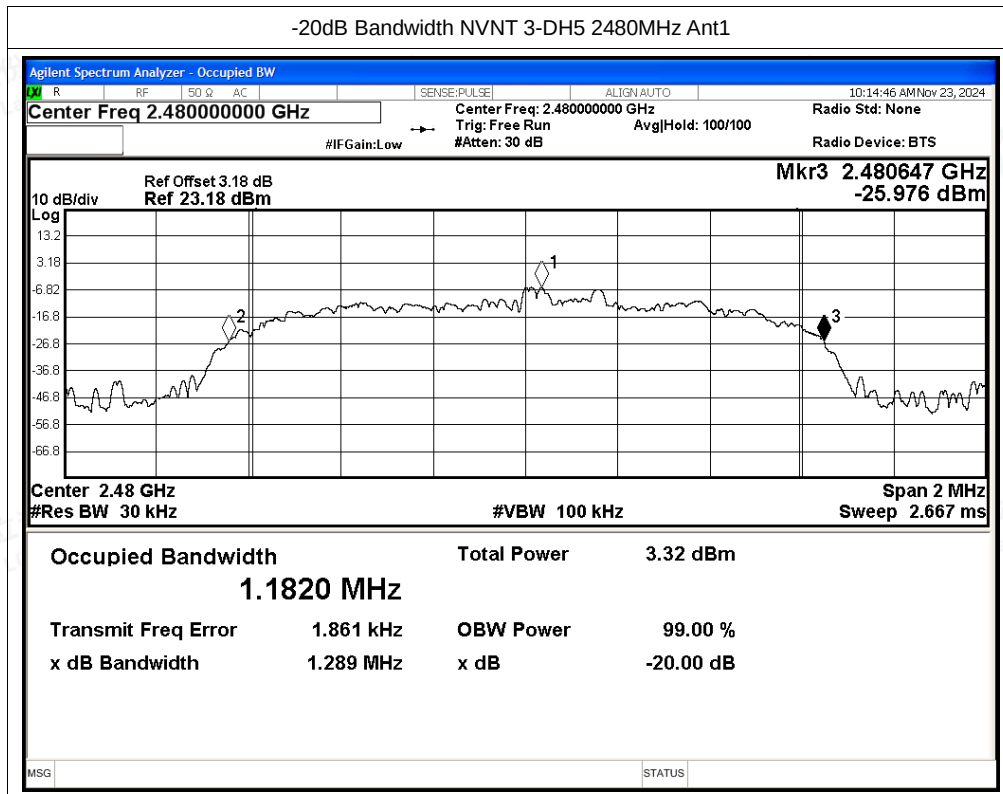


-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1







A.2 Maximum Peak Conducted Output Power

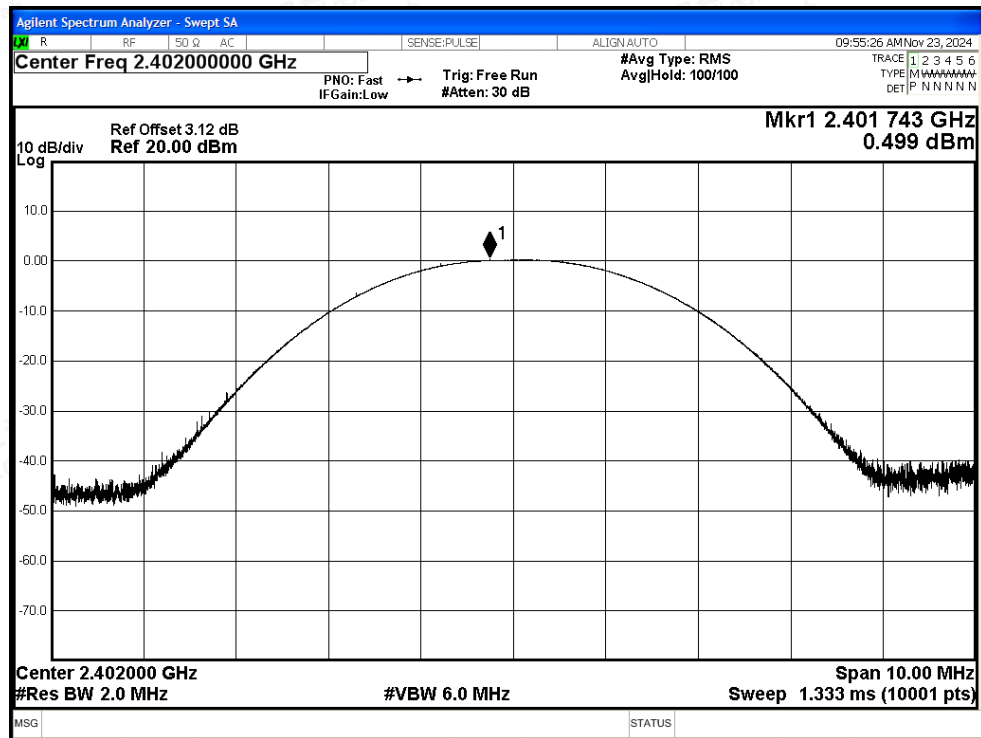
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	0.5	21	Pass
NVNT	1-DH5	2441	Ant1	0.74	21	Pass
NVNT	1-DH5	2480	Ant1	-0.81	21	Pass
NVNT	2-DH5	2402	Ant1	-0.27	21	Pass
NVNT	2-DH5	2441	Ant1	0.04	21	Pass
NVNT	2-DH5	2480	Ant1	1.28	21	Pass
NVNT	3-DH5	2402	Ant1	0.12	21	Pass
NVNT	3-DH5	2441	Ant1	0.44	21	Pass
NVNT	3-DH5	2480	Ant1	-0.79	21	Pass



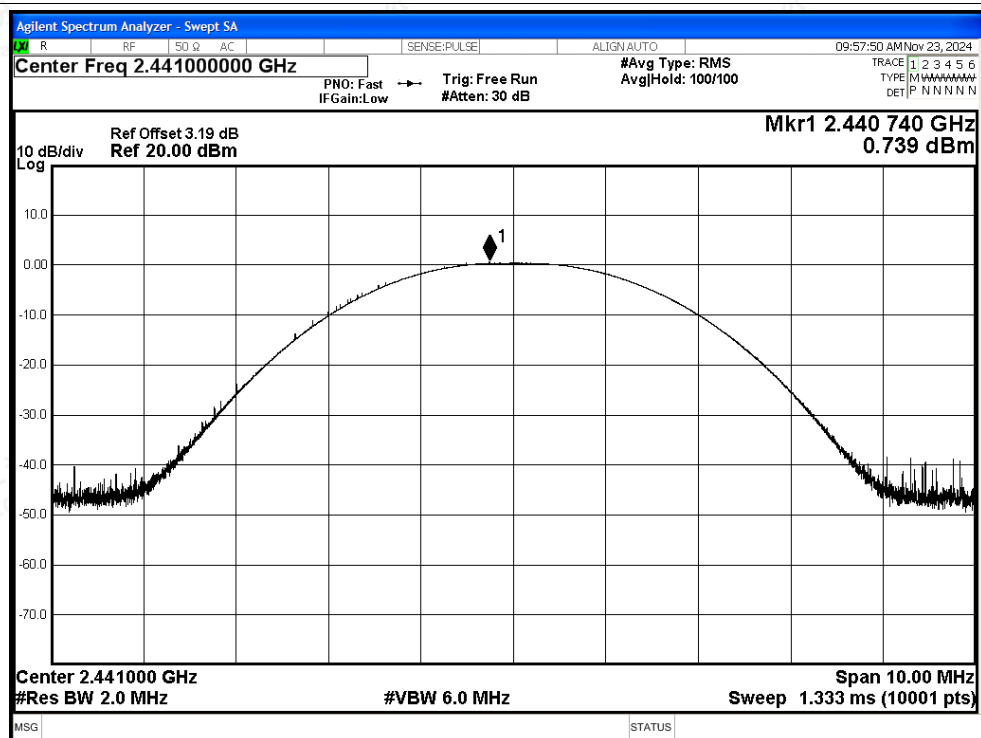


Test Graphs

Power NVNT 1-DH5 2402MHz Ant1

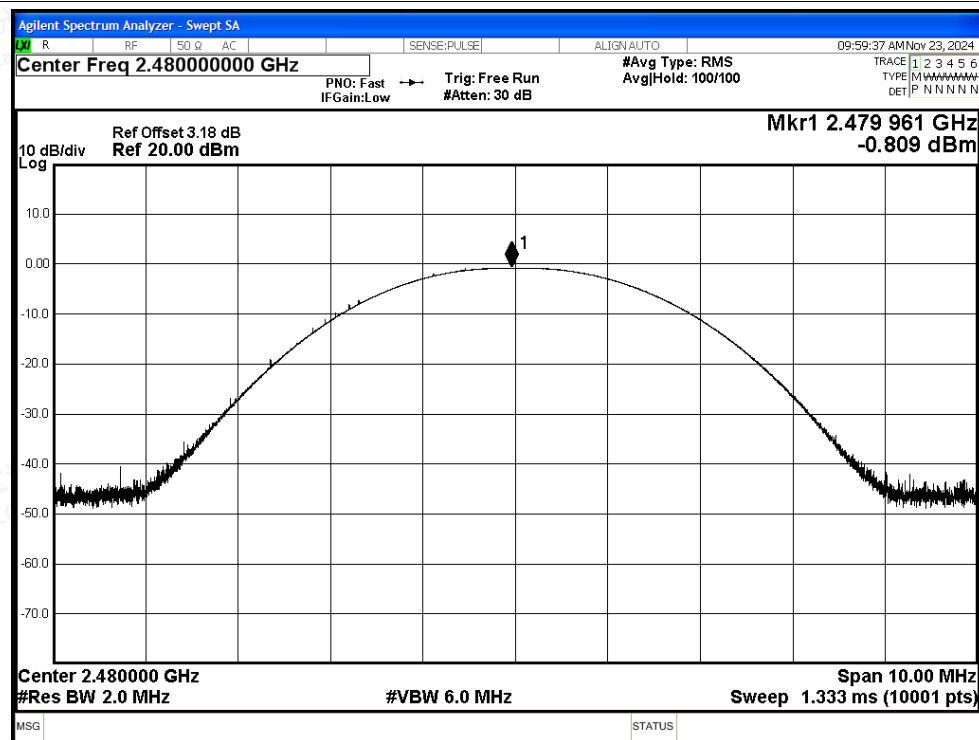


Power NVNT 1-DH5 2441MHz Ant1

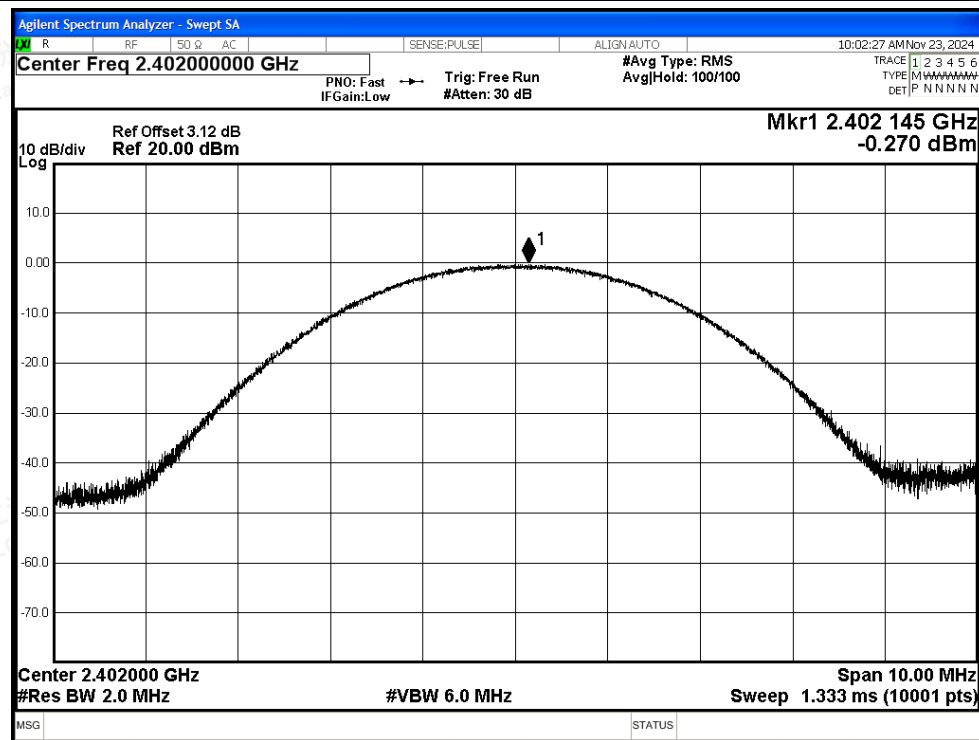




Power NVNT 1-DH5 2480MHz Ant1

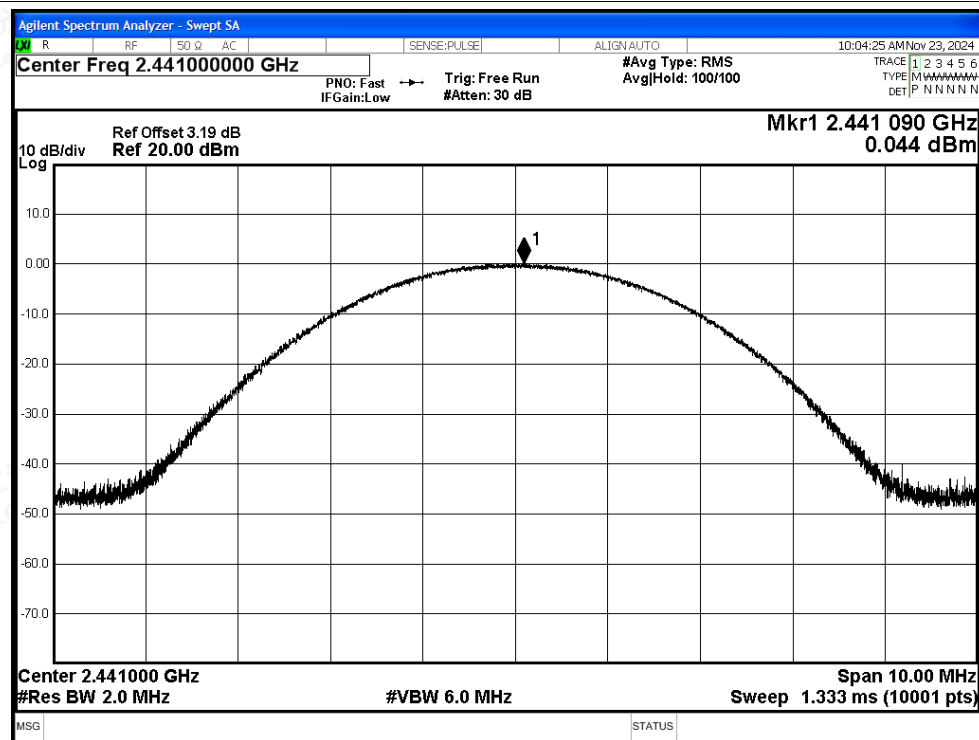


Power NVNT 2-DH5 2402MHz Ant1

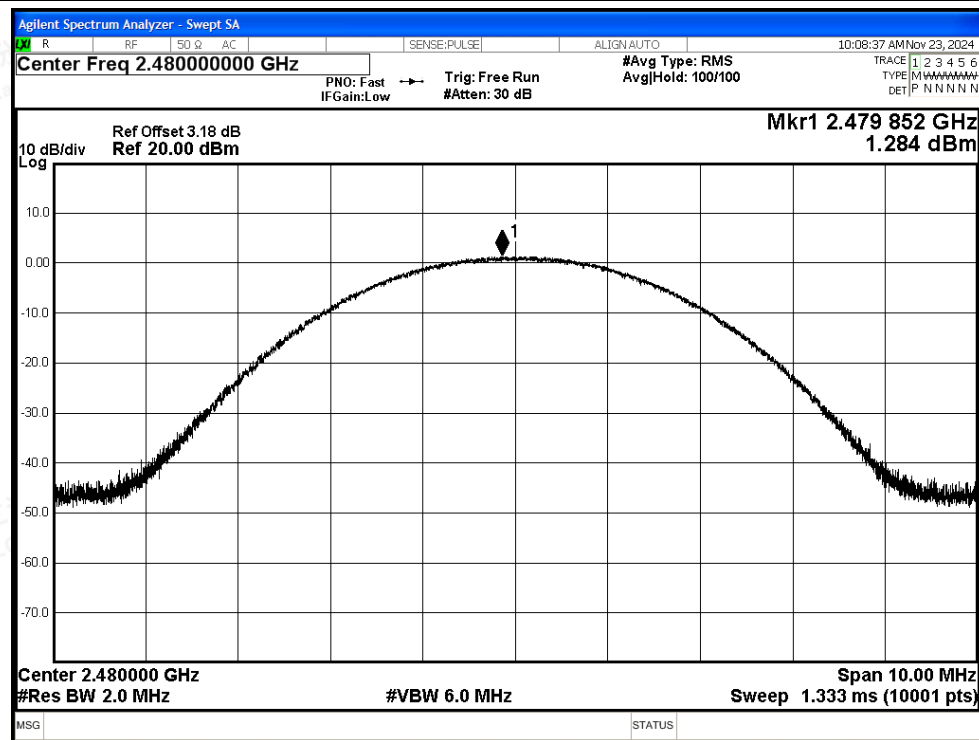




Power NVNT 2-DH5 2441MHz Ant1

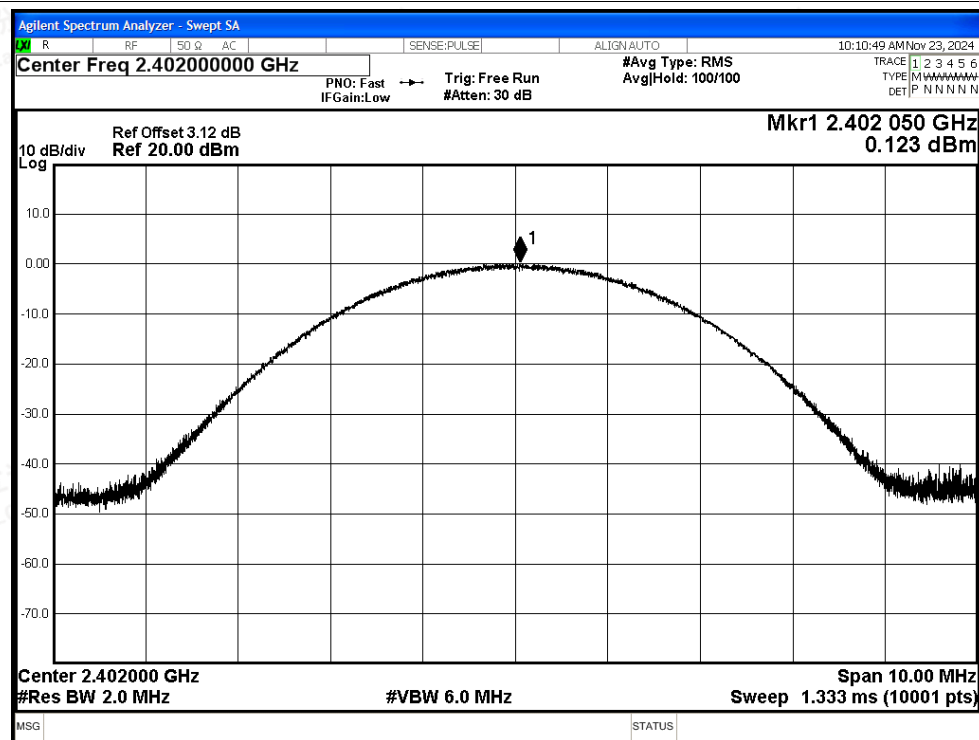


Power NVNT 2-DH5 2480MHz Ant1

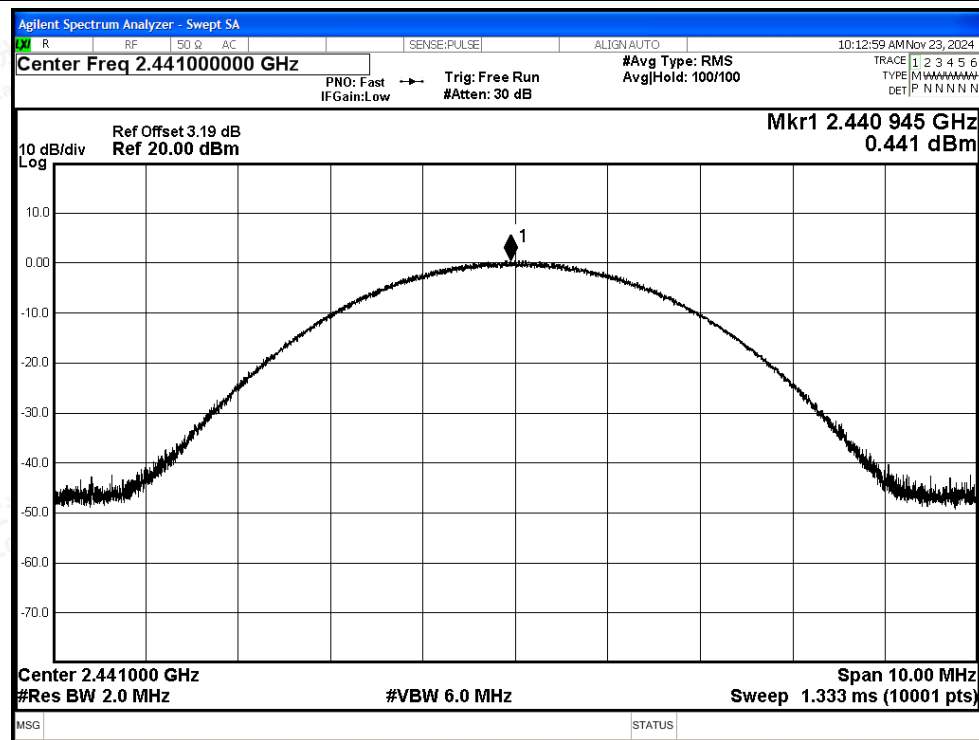


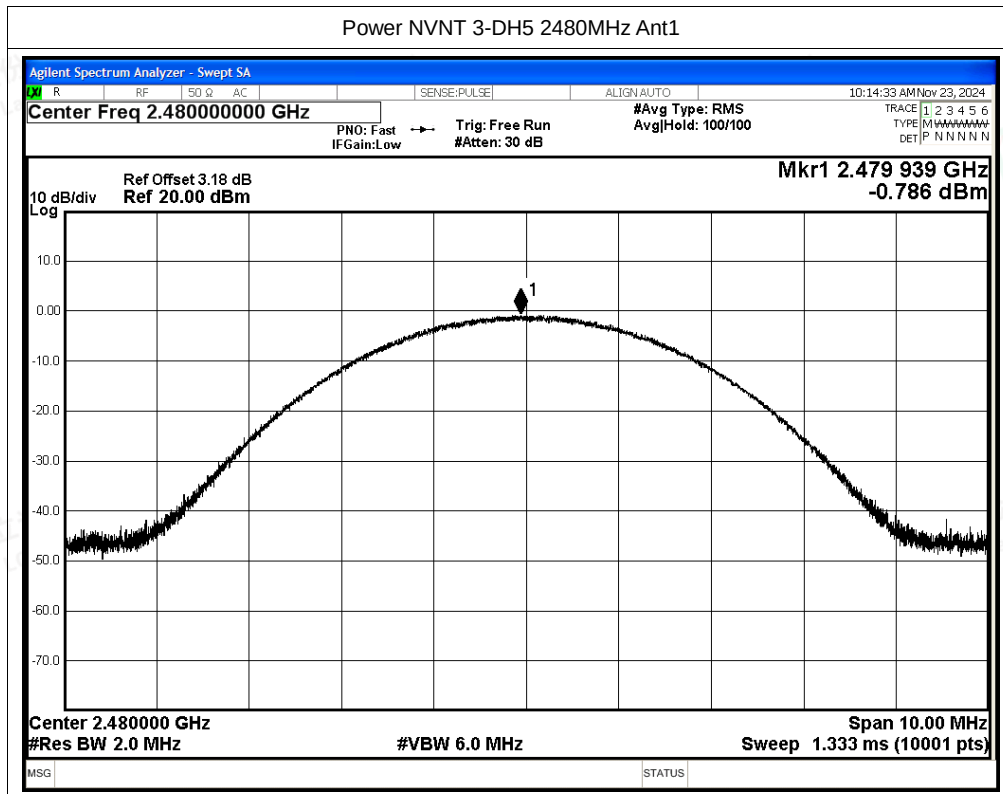


Power NVNT 3-DH5 2402MHz Ant1



Power NVNT 3-DH5 2441MHz Ant1







A.3 Carrier Frequencies Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2401.824	2402.822	0.998	0.675	Pass
NVNT	2-DH5	Ant1	2402.03	2402.998	0.968	0.883	Pass
NVNT	3-DH5	Ant1	2402.026	2403.008	0.982	0.873	Pass

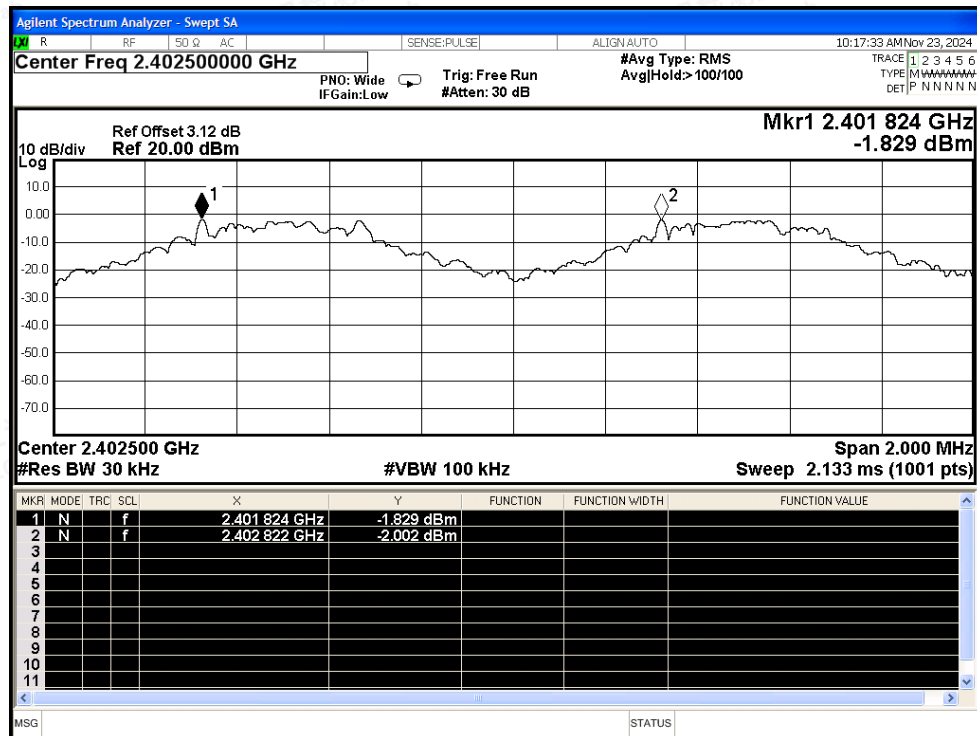


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Baoan District, Shenzhen, 518000, China
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity

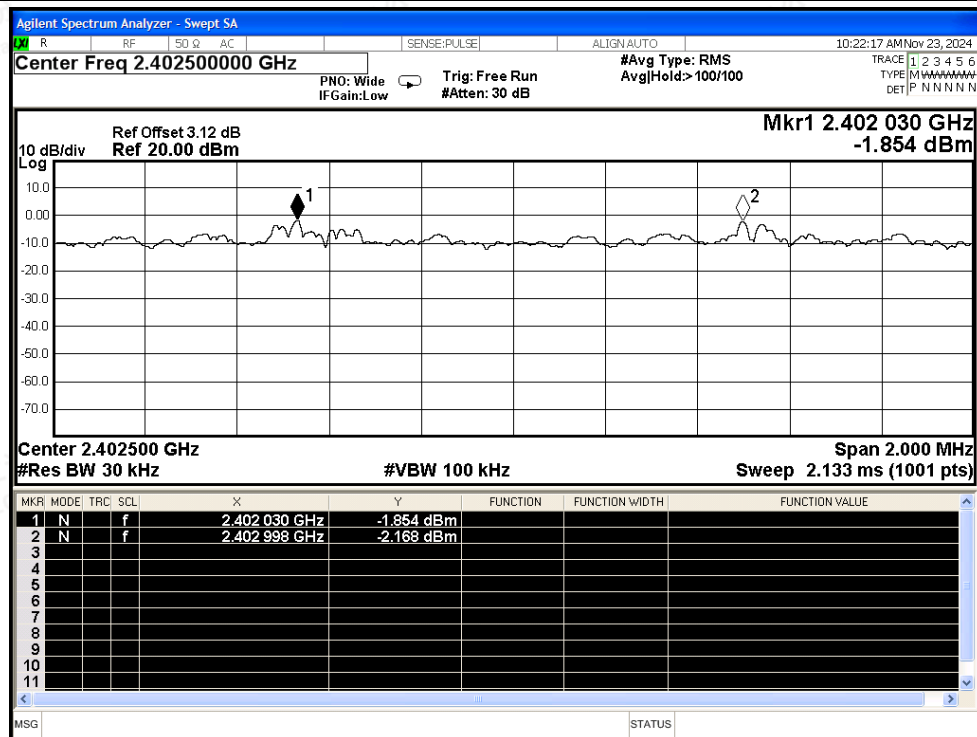


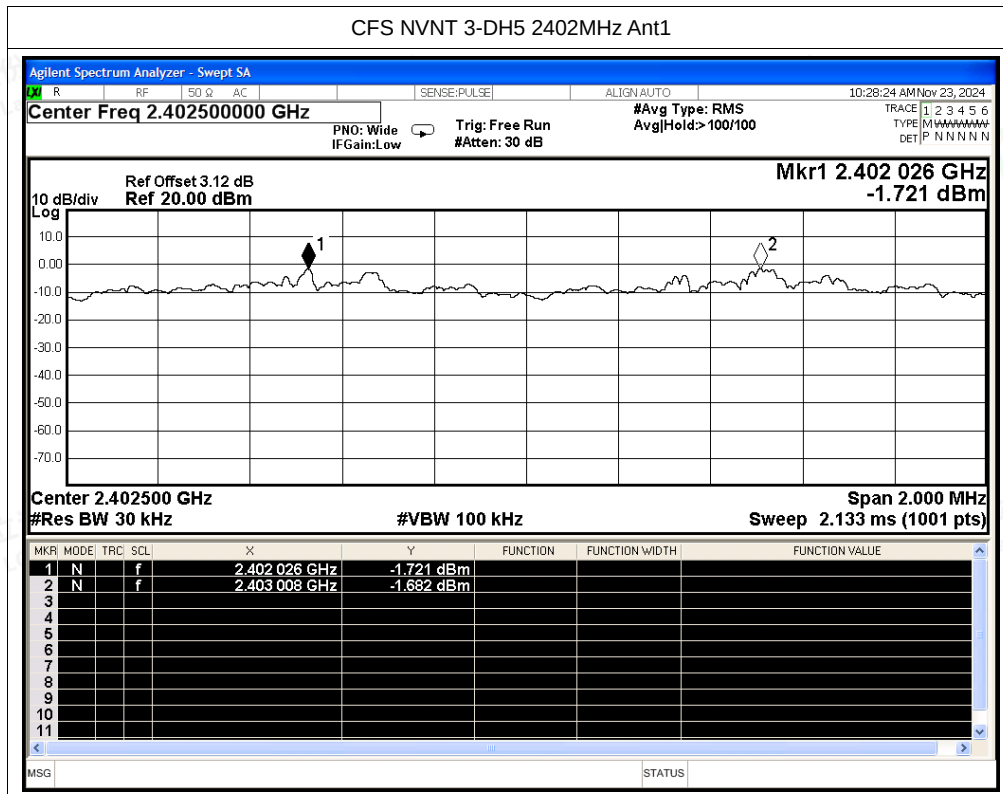
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1



CFS NVNT 2-DH5 2402MHz Ant1







A.4 Dwell Time

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant1	2.91	282.27	97	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.898	275.31	95	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.898	370.944	128	31600	400	Pass

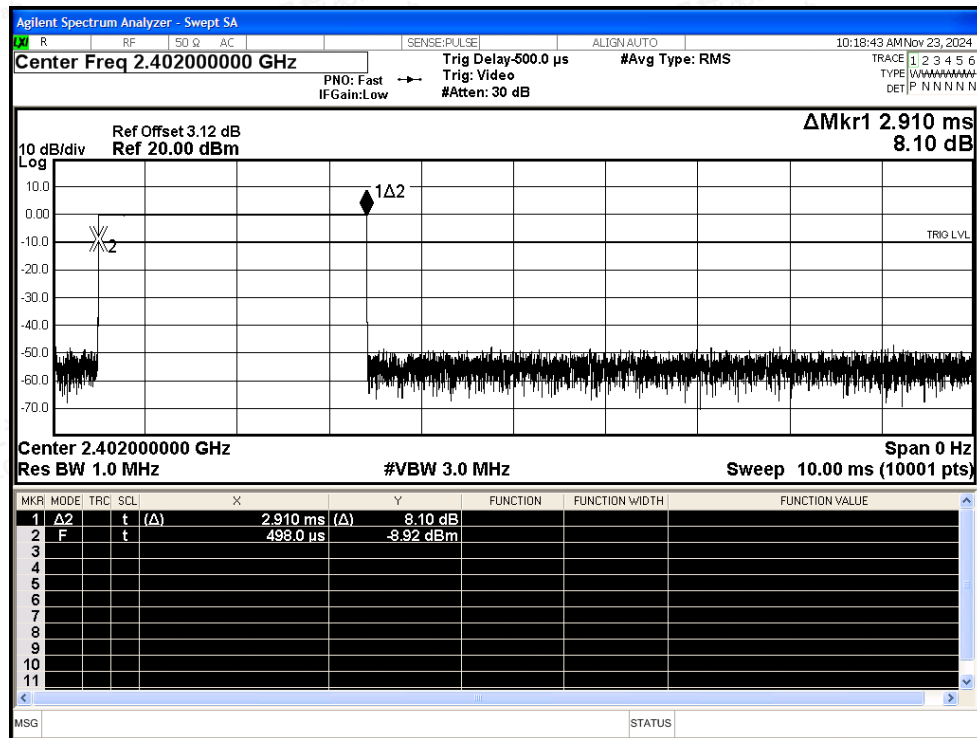


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Scan code to check authenticity

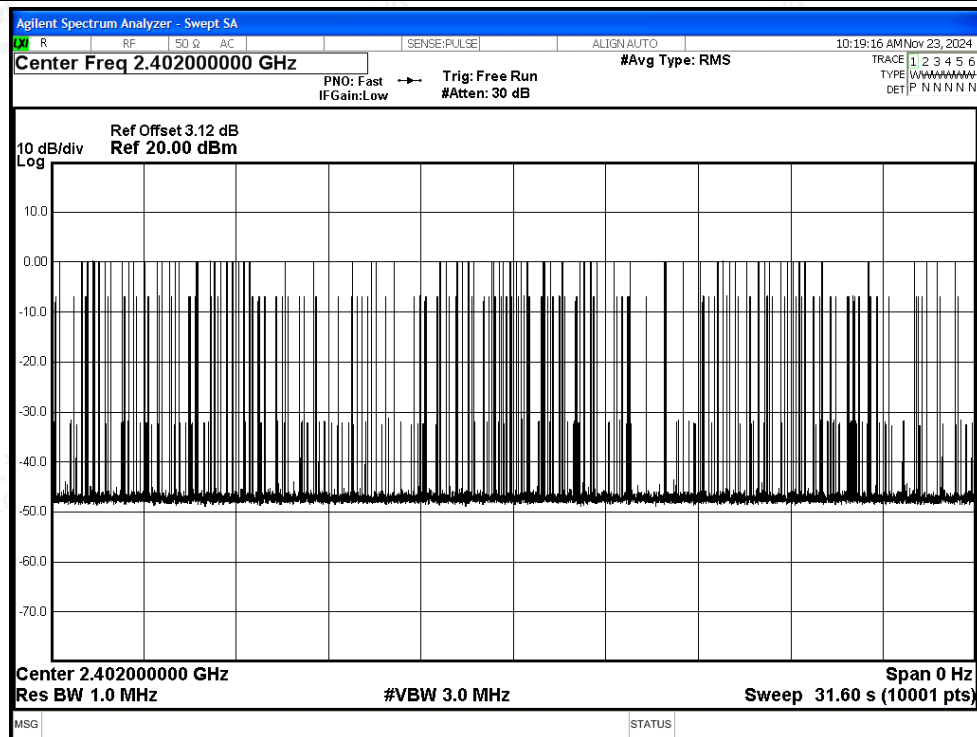


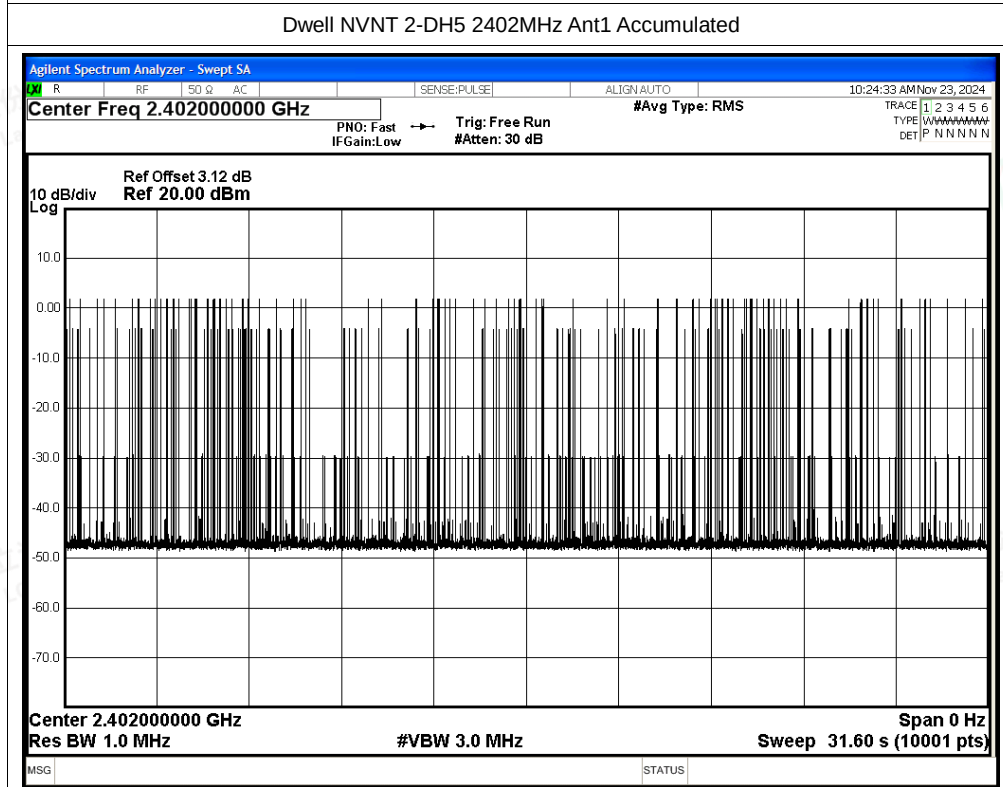
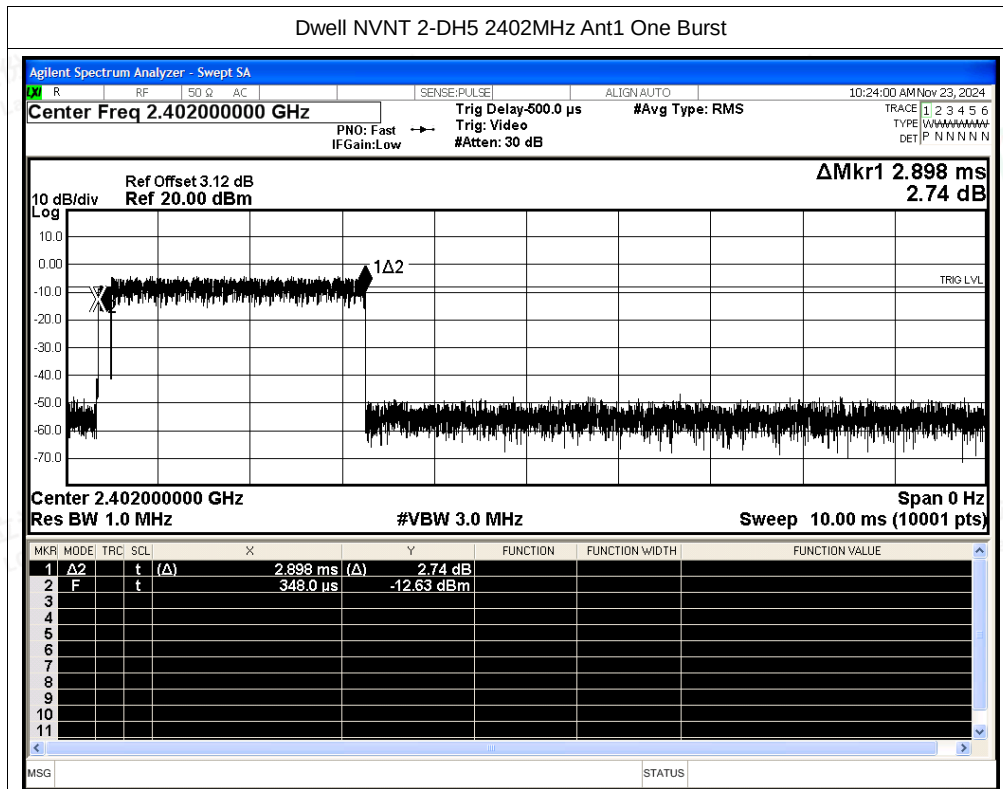
Test Graphs

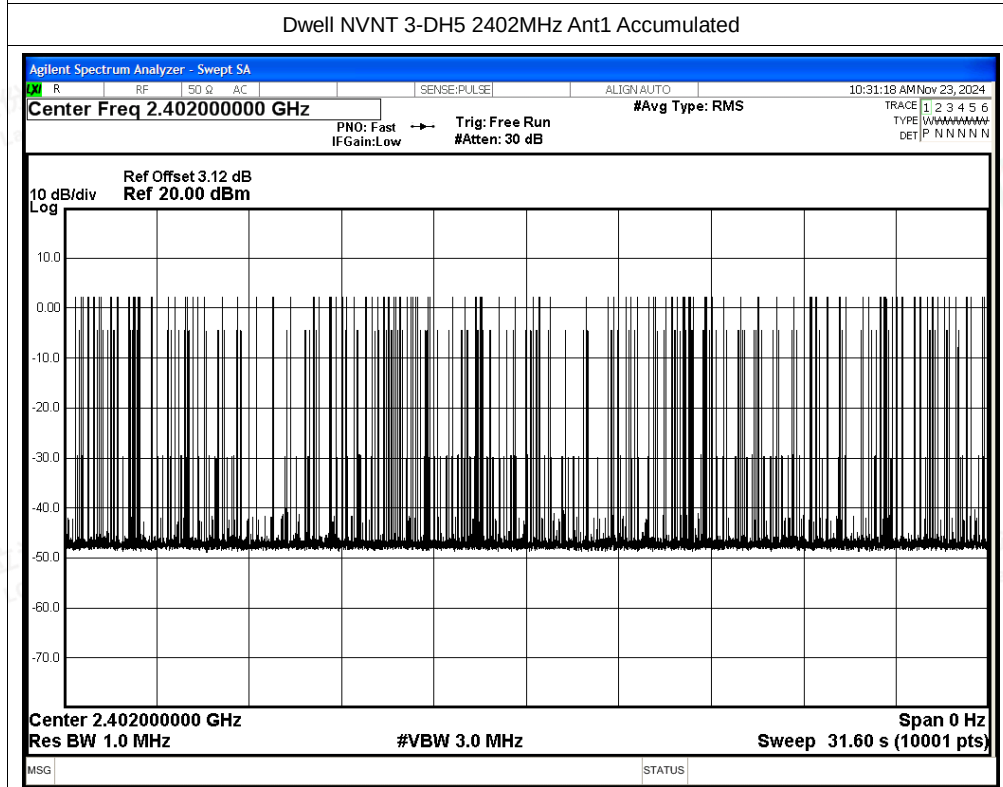
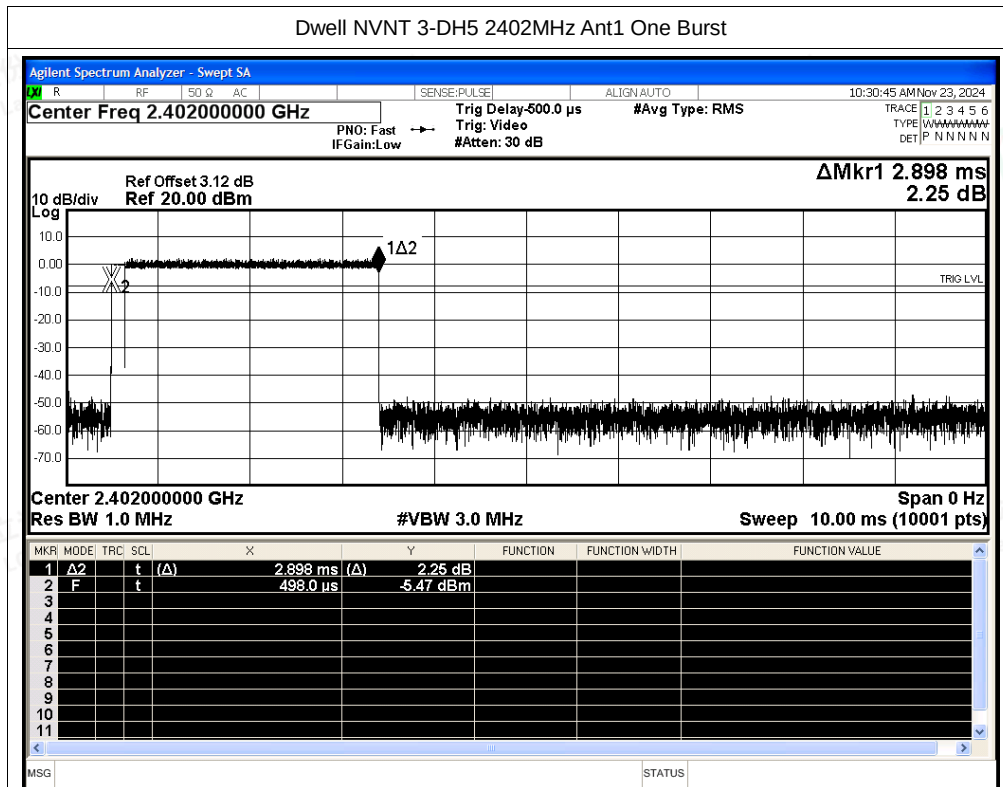
Dwell NVNT 1-DH5 2402MHz Ant1 One Burst



Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated









A.5 Number of Hopping Channel

Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass
NVNT	3-DH5	Ant1	79	15	Pass

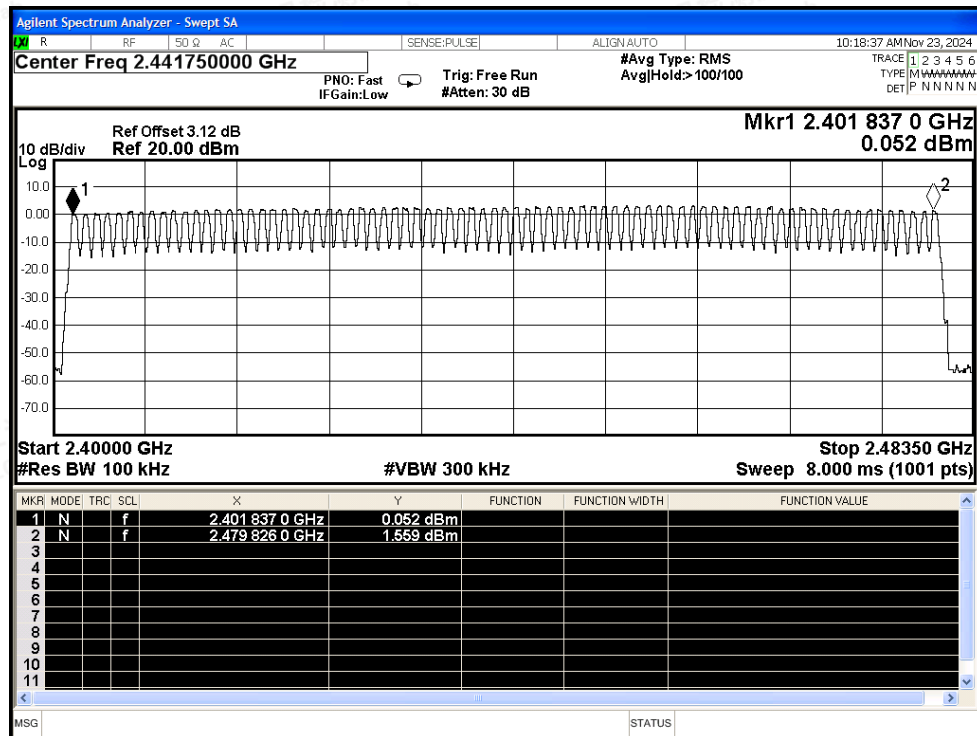


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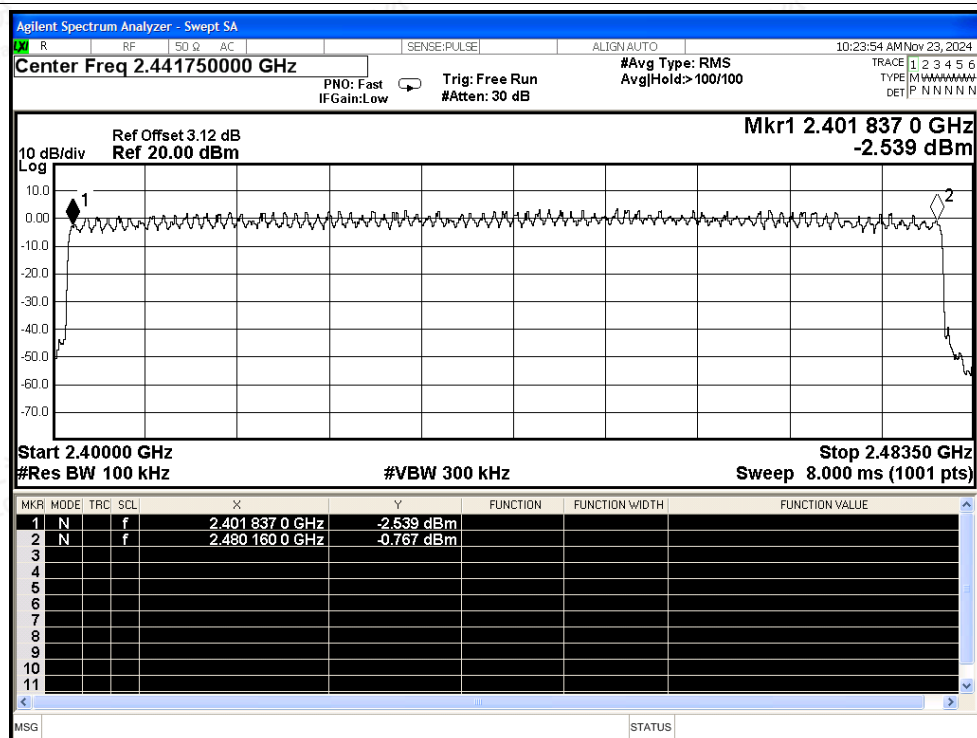


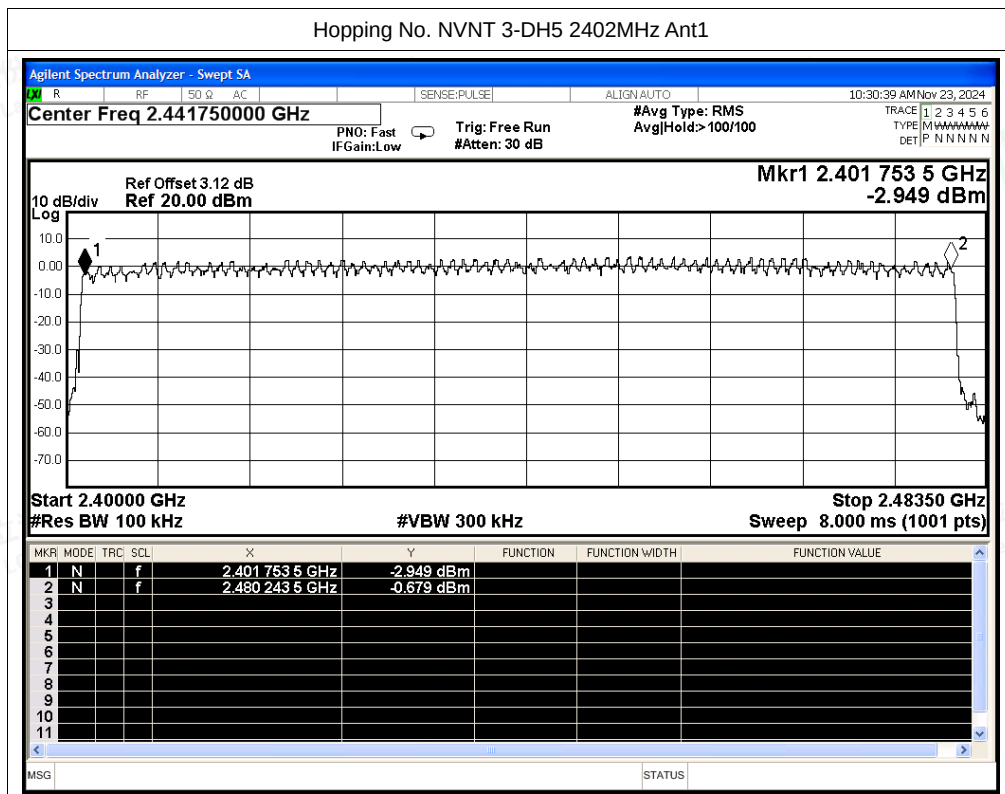
Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1



Hopping No. NVNT 2-DH5 2402MHz Ant1







A.6 Band Edge

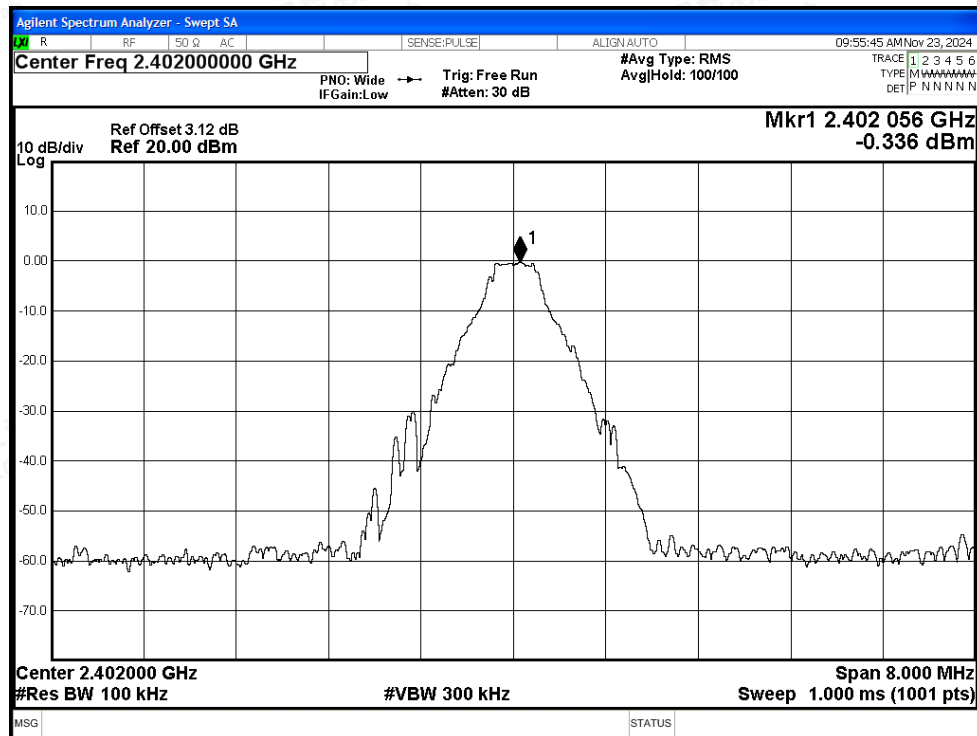
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-55.43	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-55.25	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-49.34	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-53.02	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-51.29	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-50.14	-20	Pass



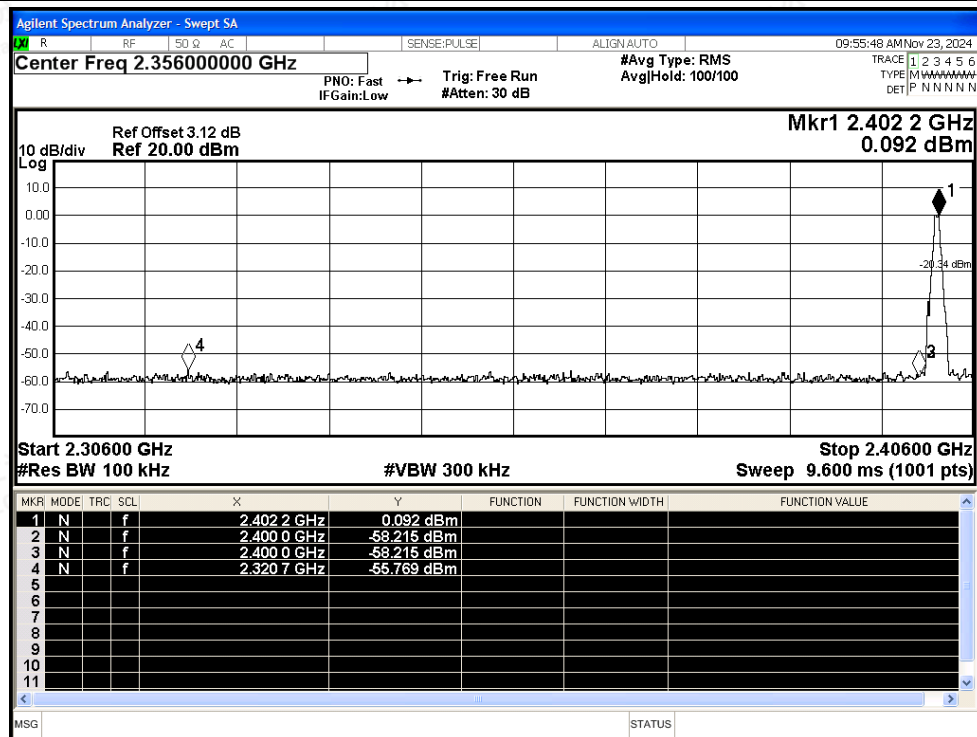


Test Graphs

Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Ref

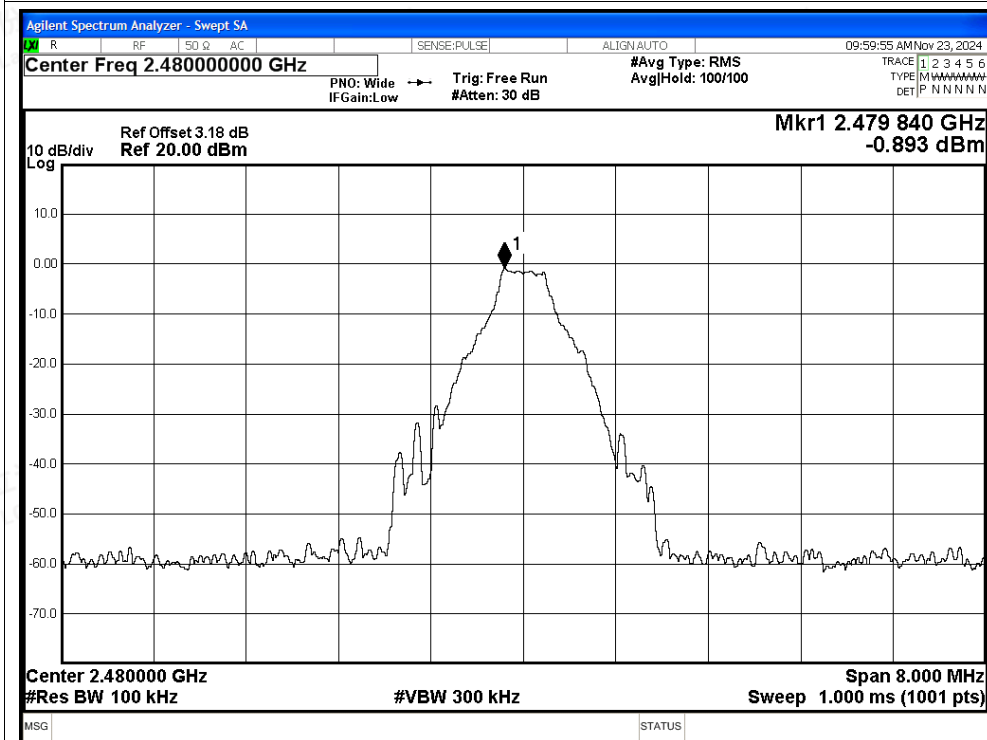


Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission

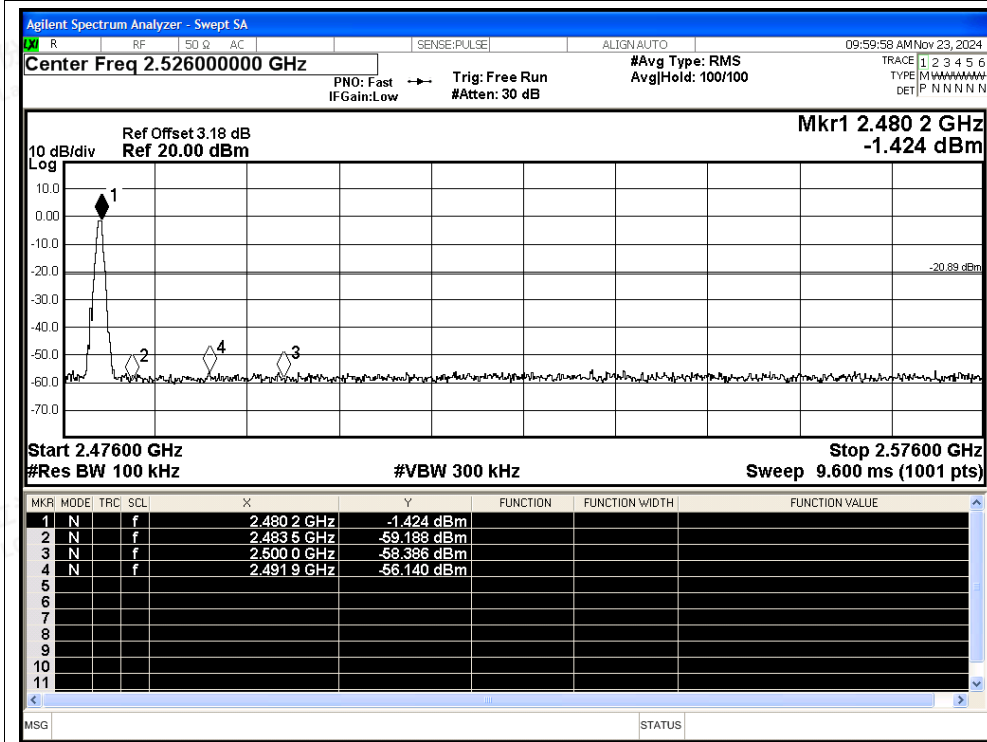


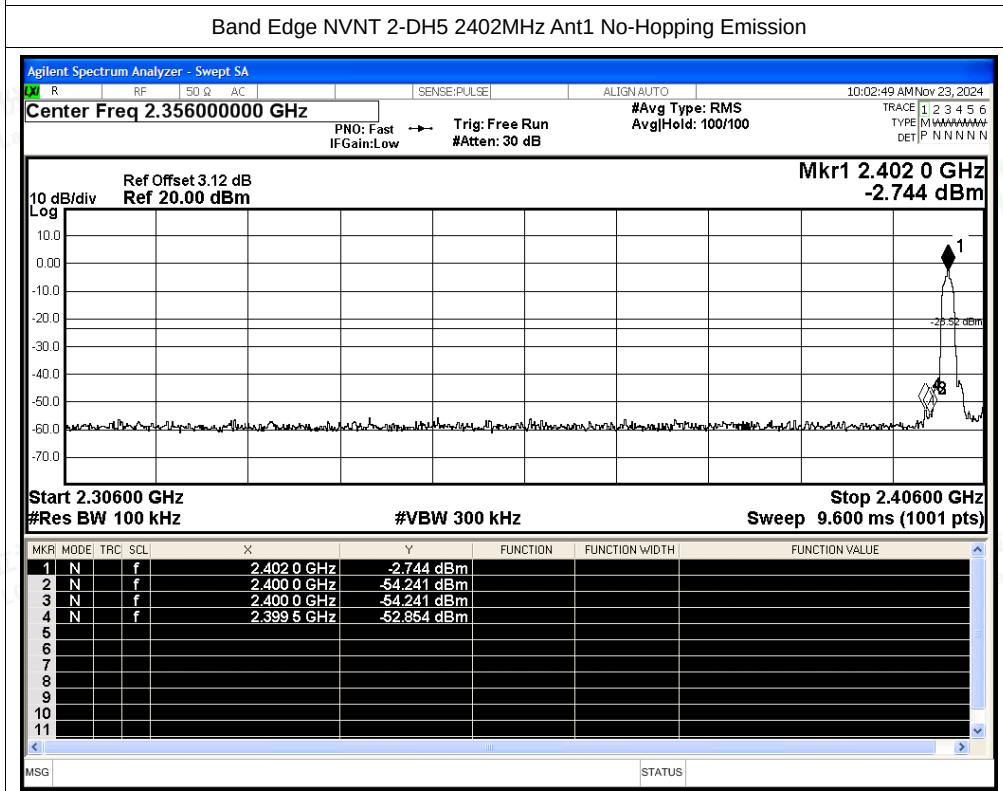
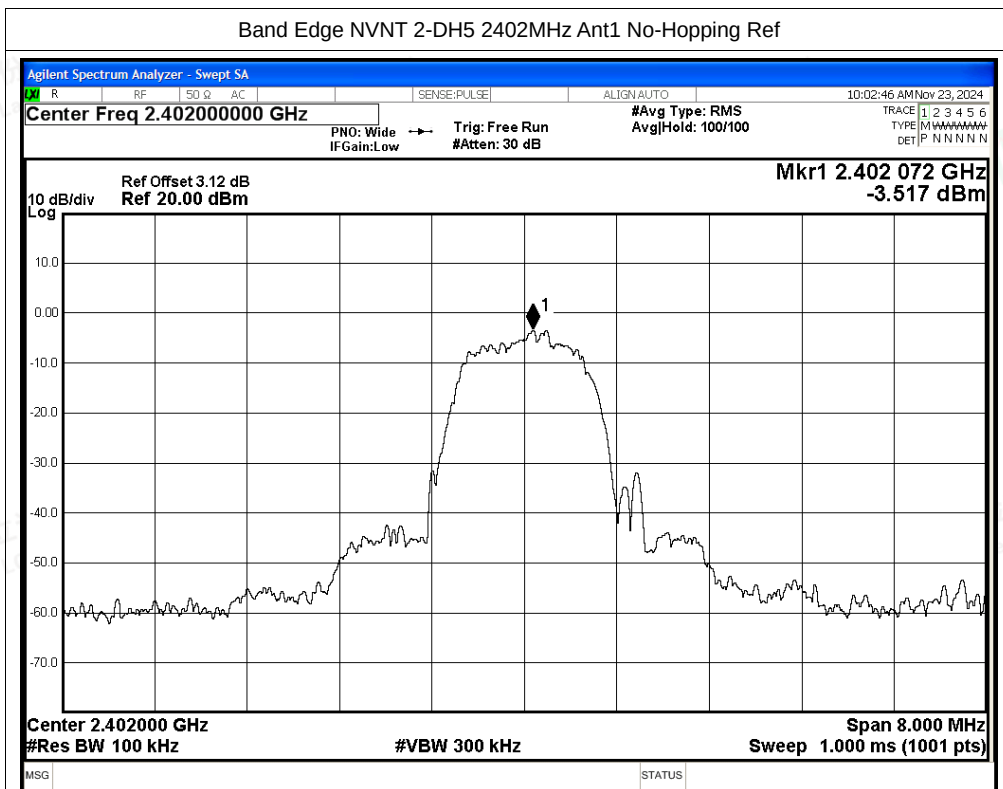


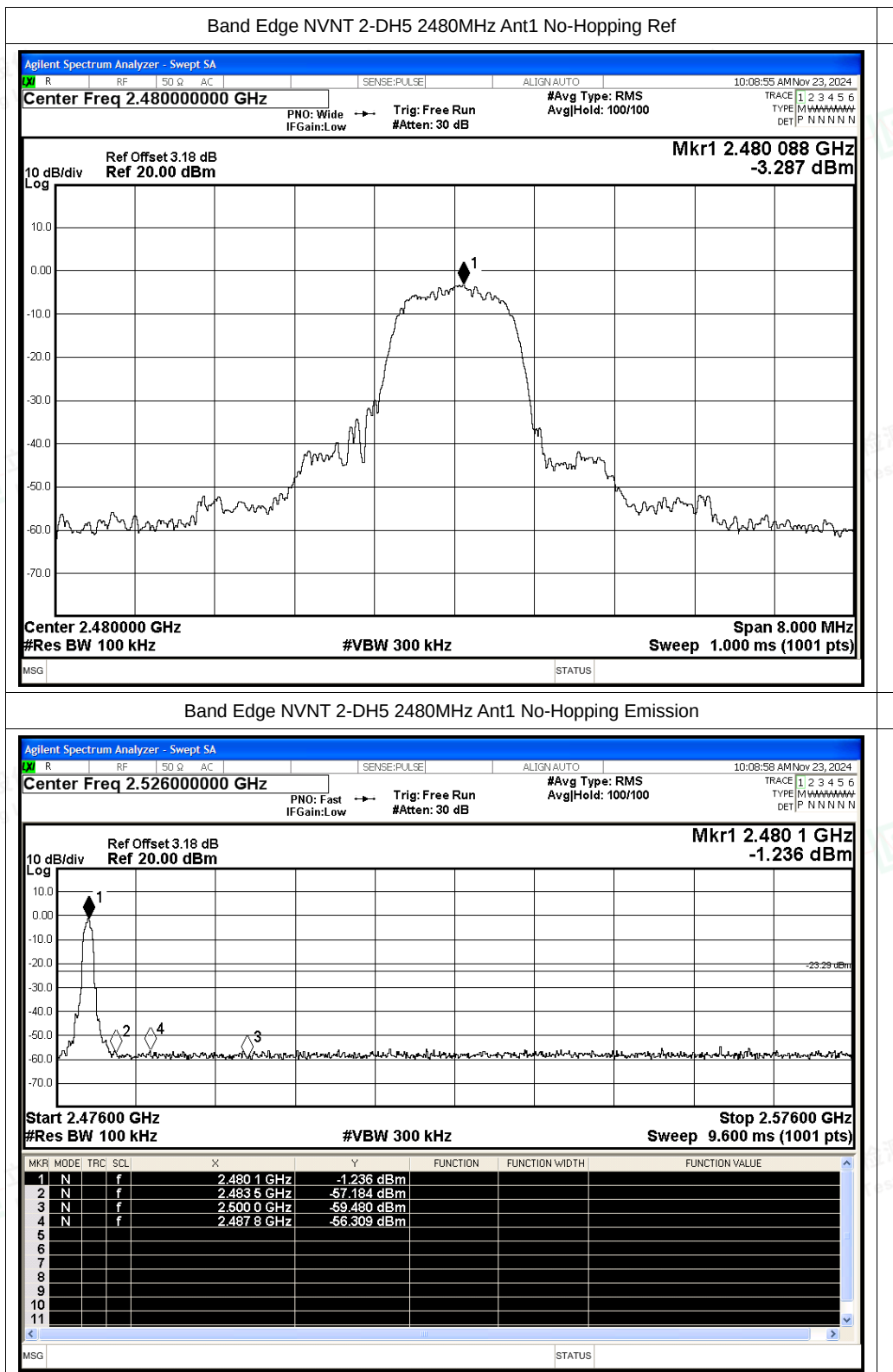
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref

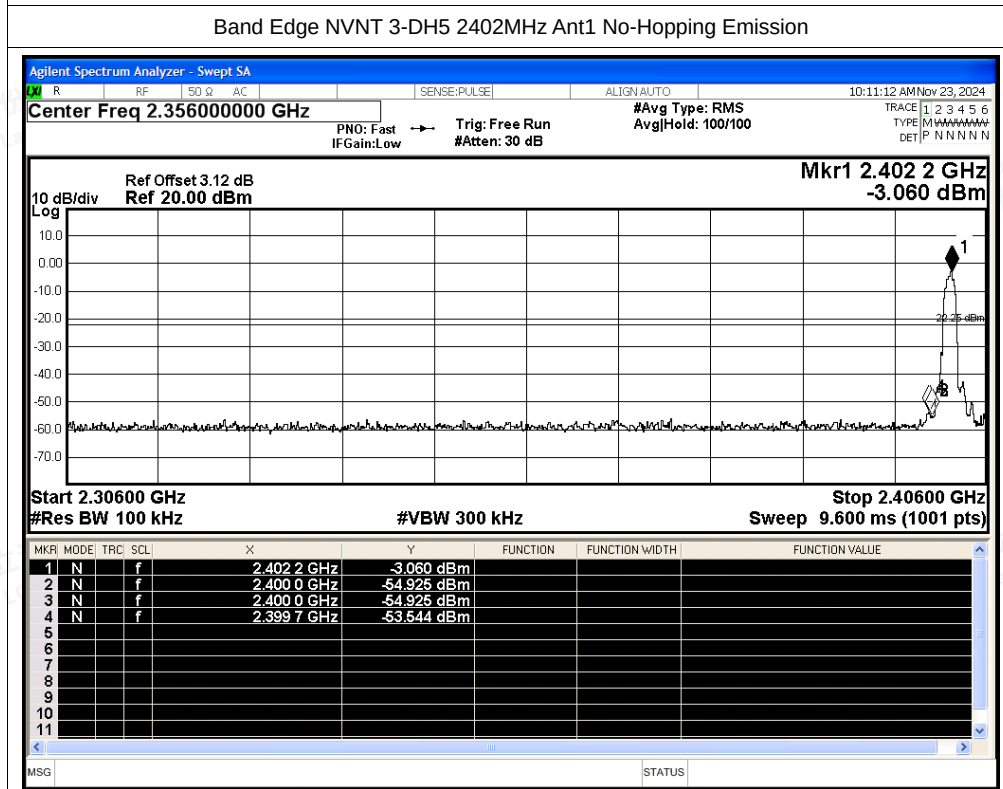
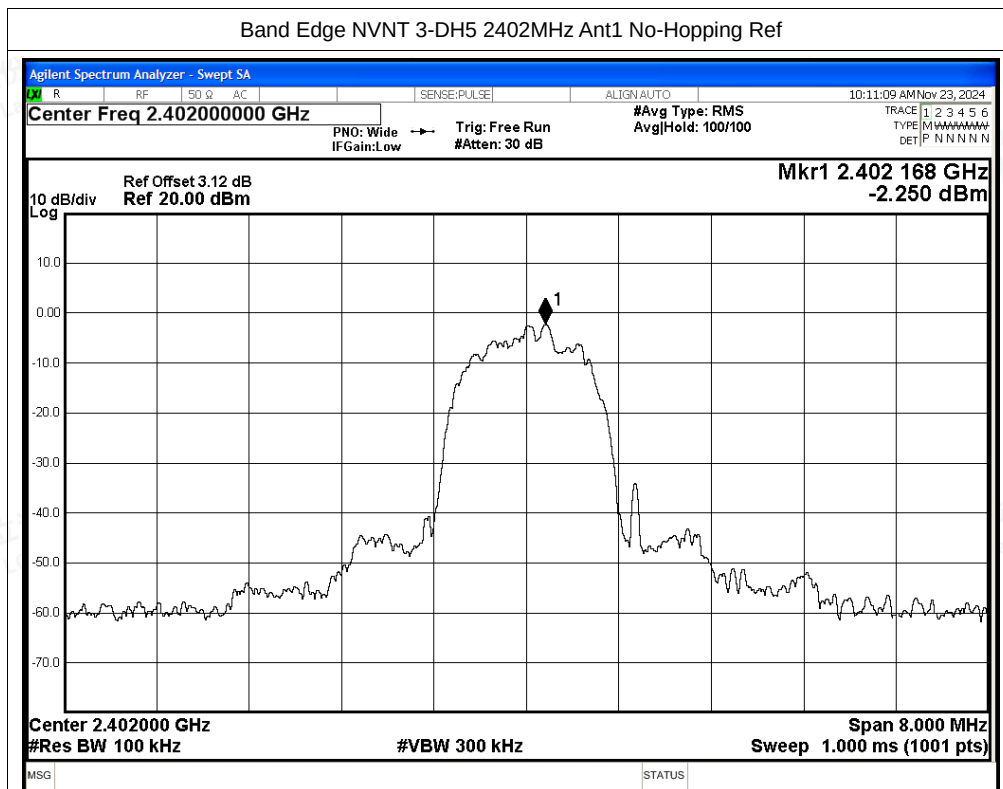


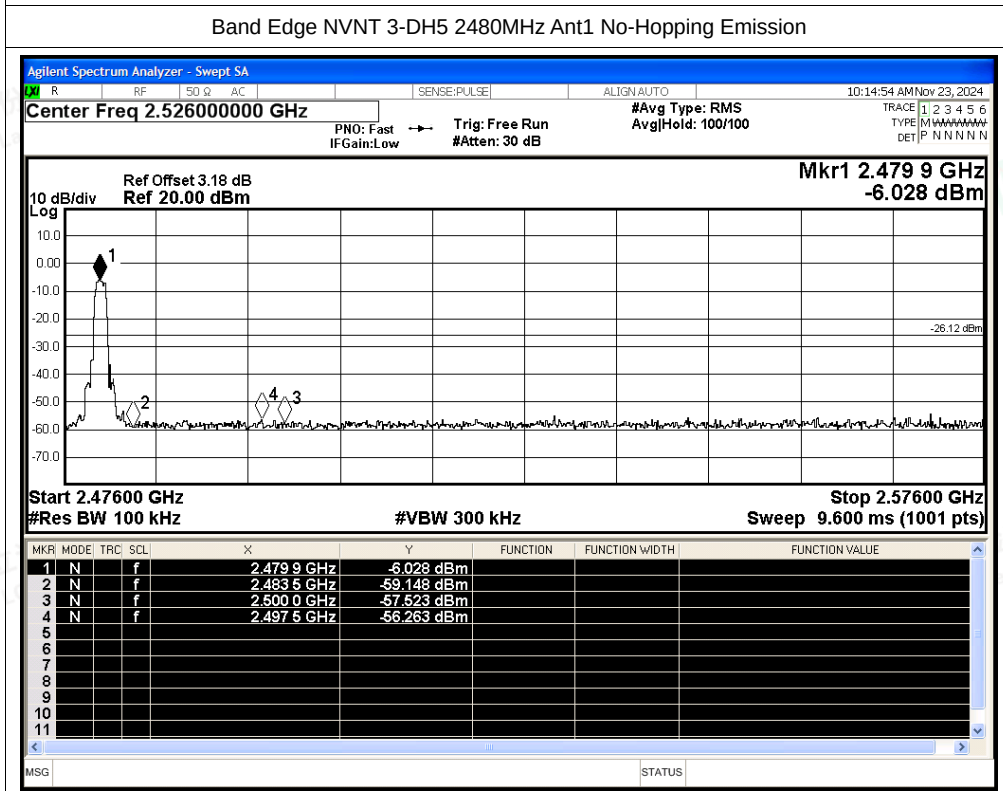
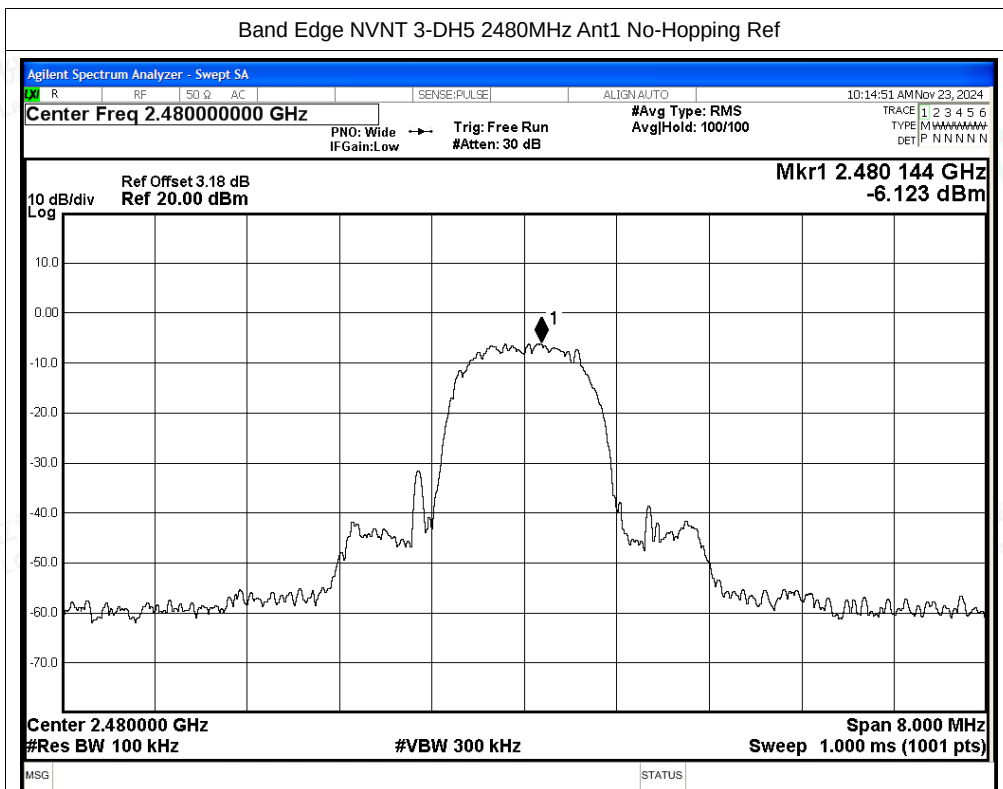
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission













(Hopping)

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-55.4	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-54.19	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-54.49	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-54.11	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-54.89	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-55.55	-20	Pass



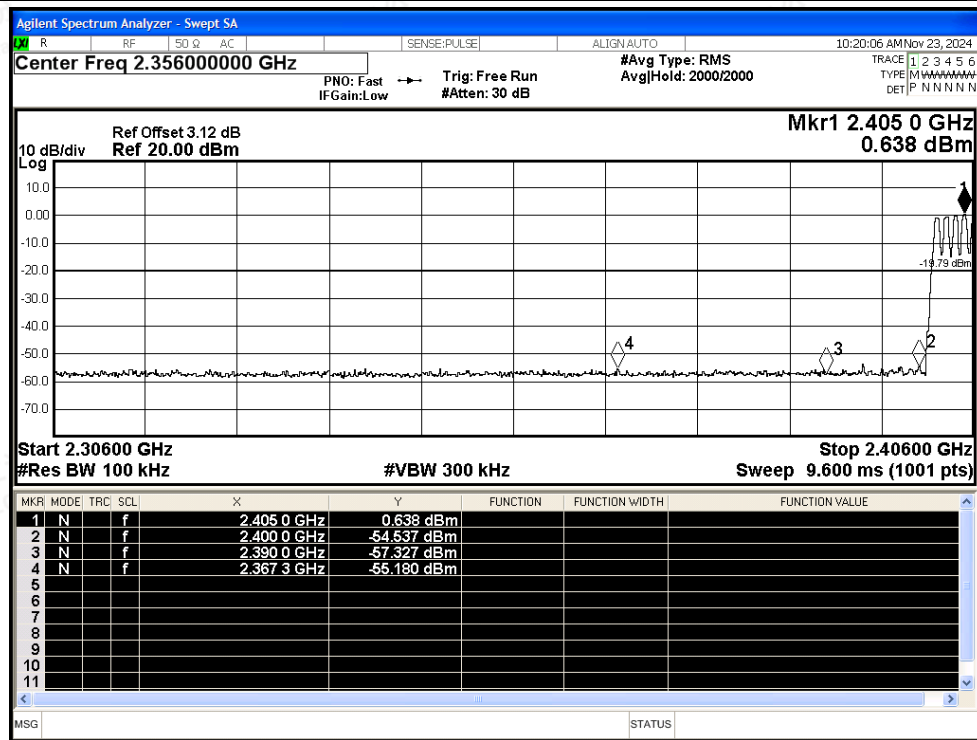


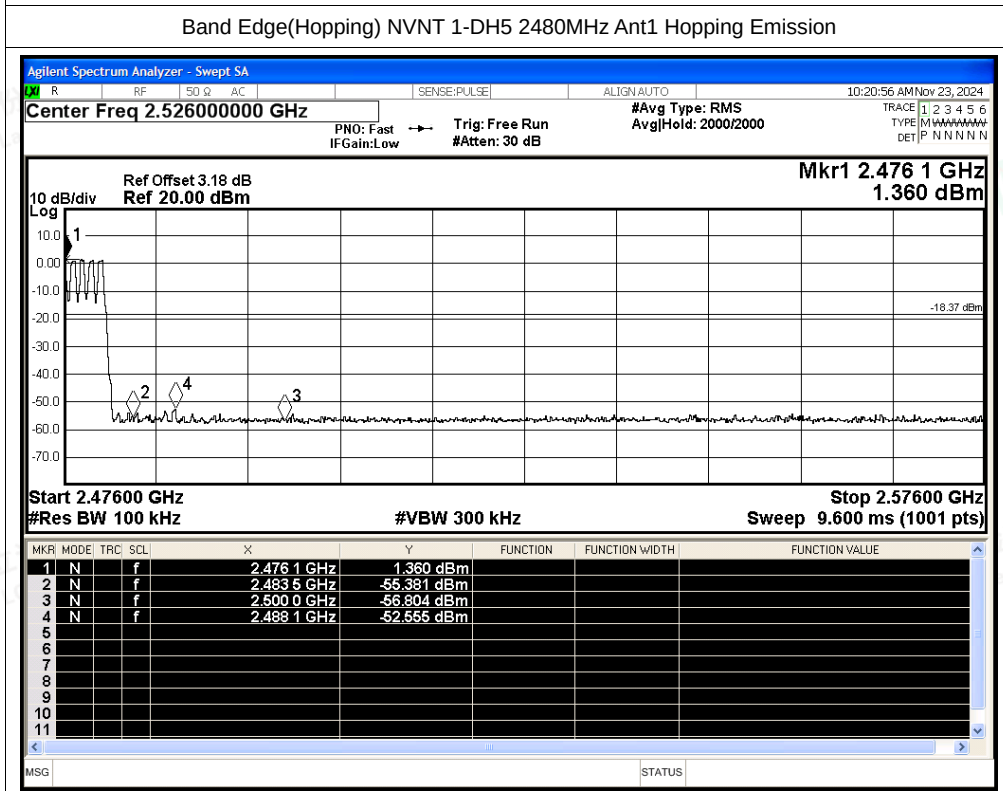
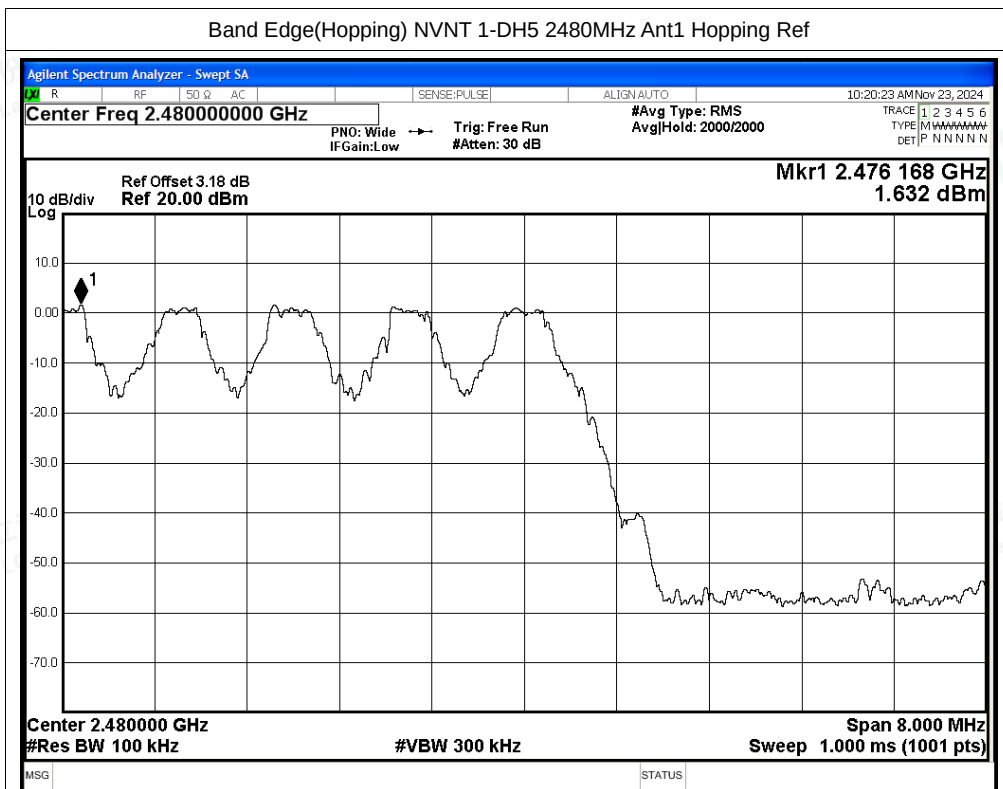
Test Graphs

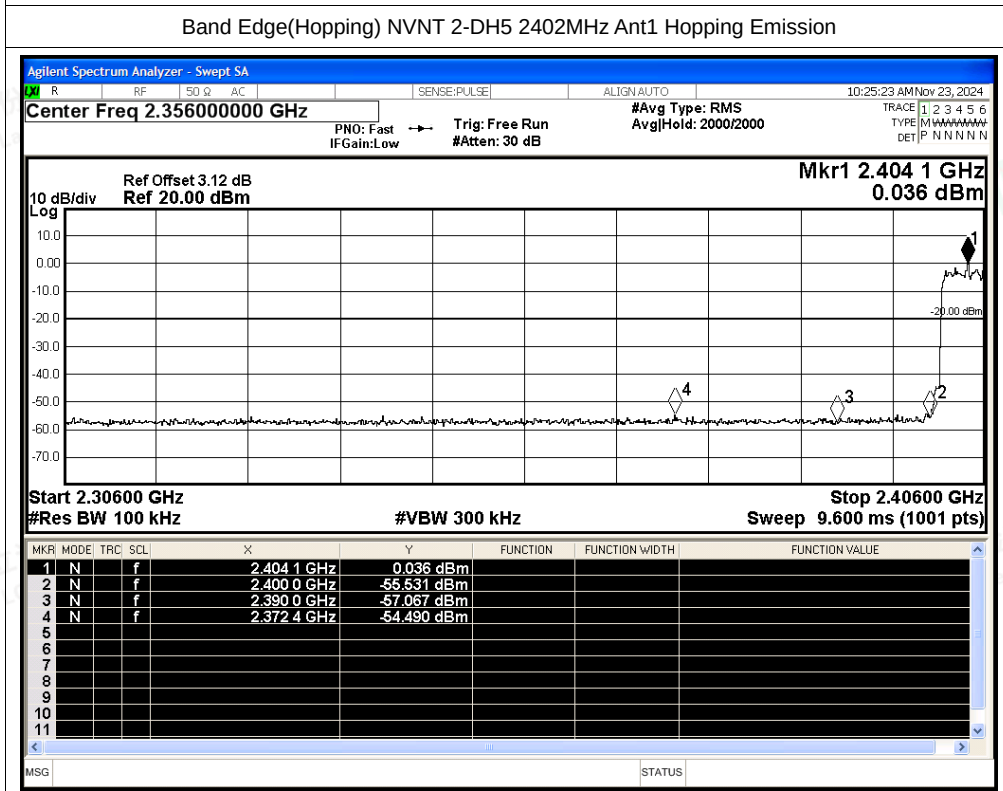
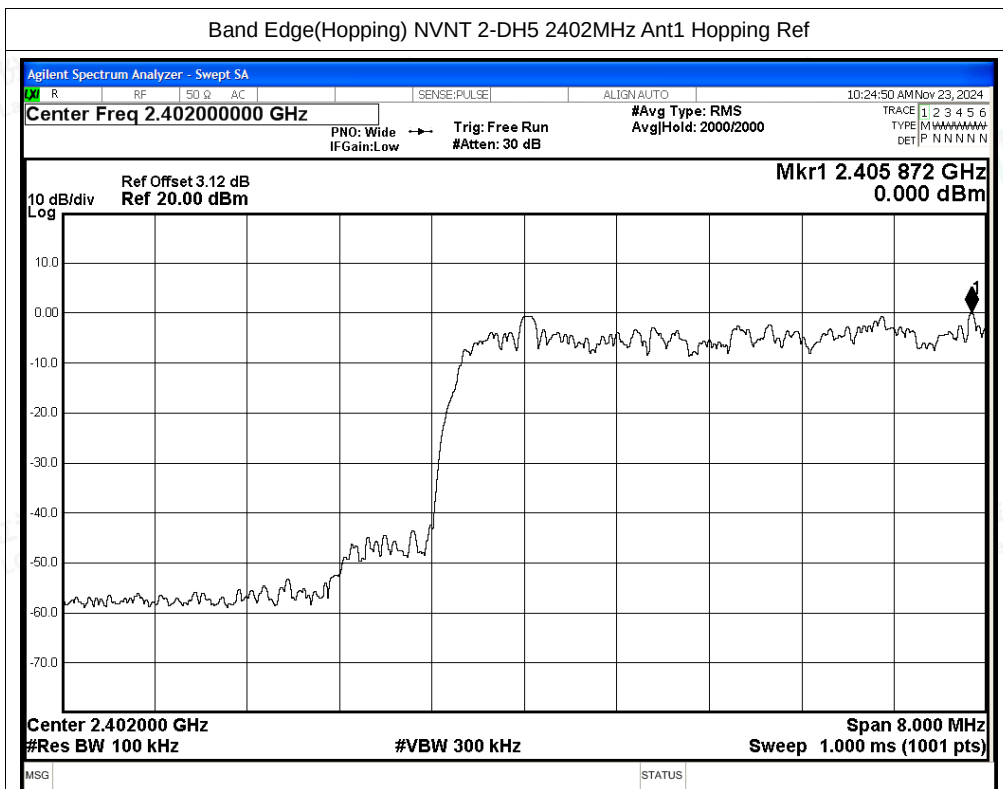
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref

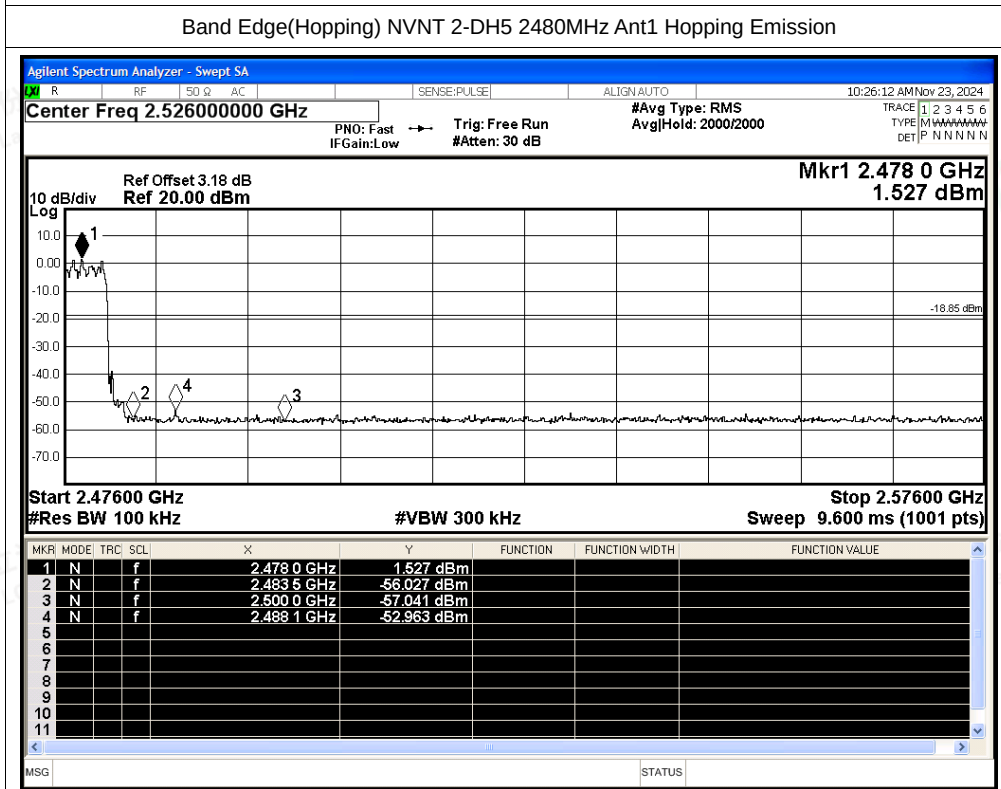
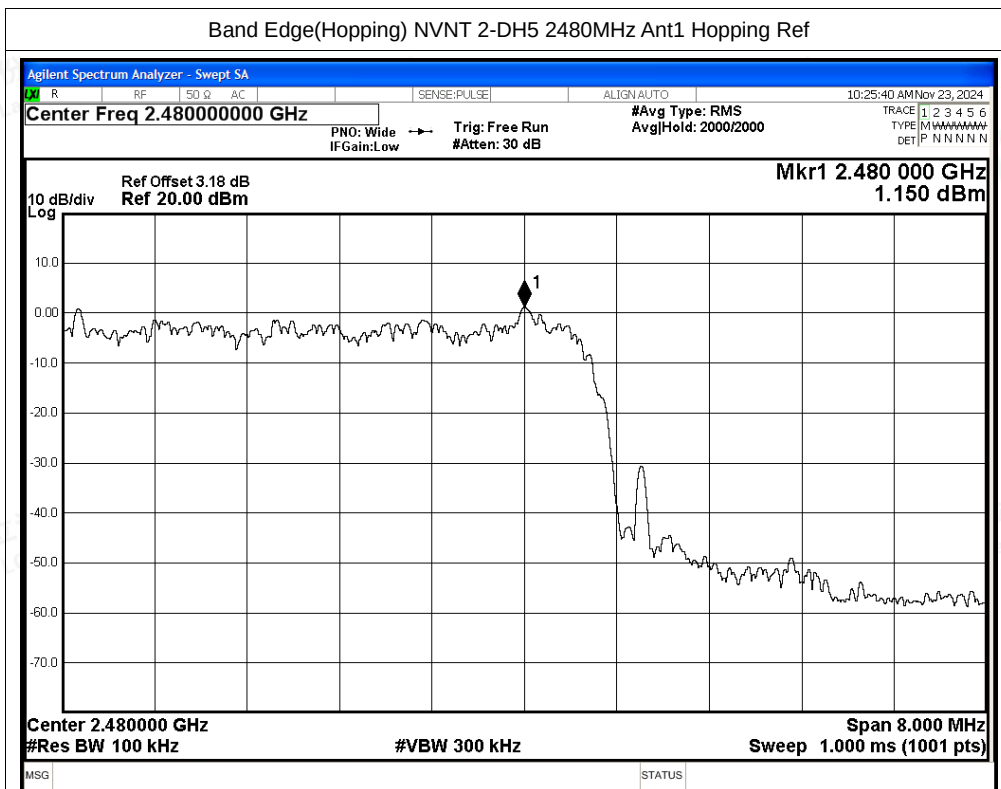


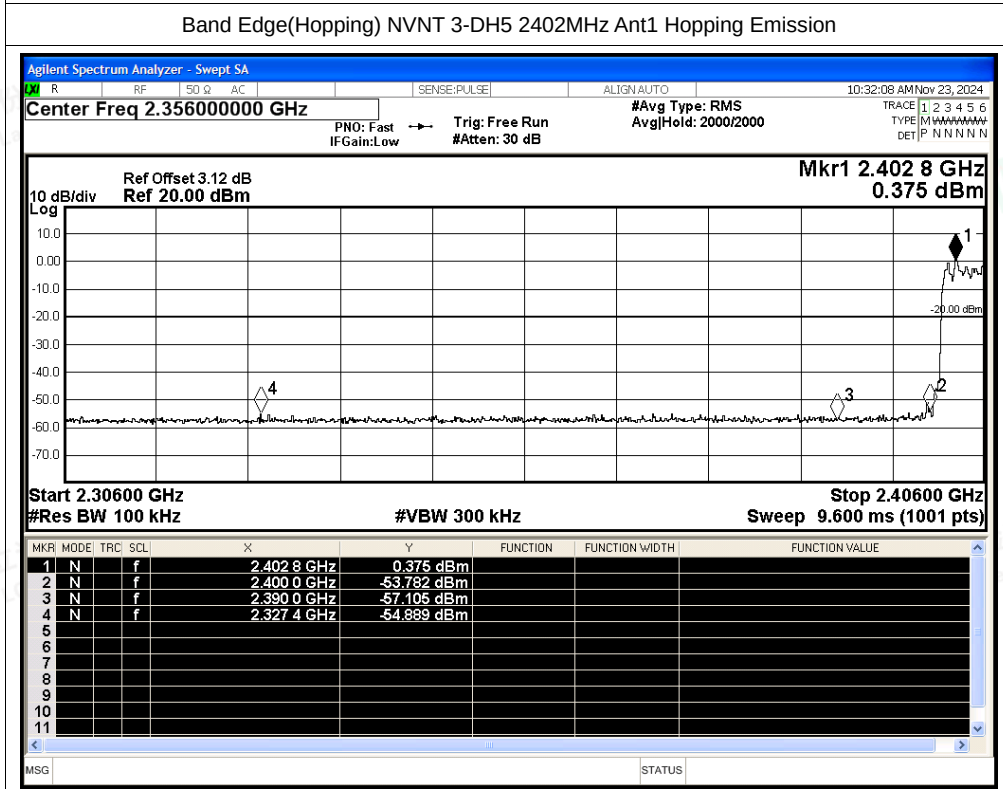
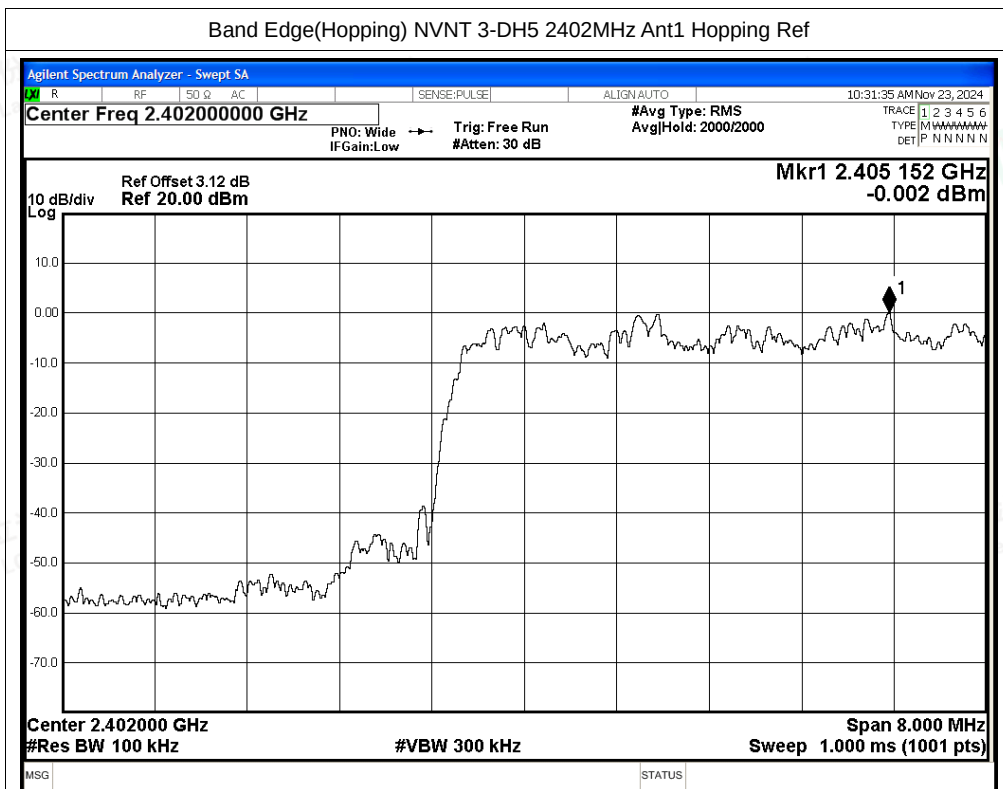
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission

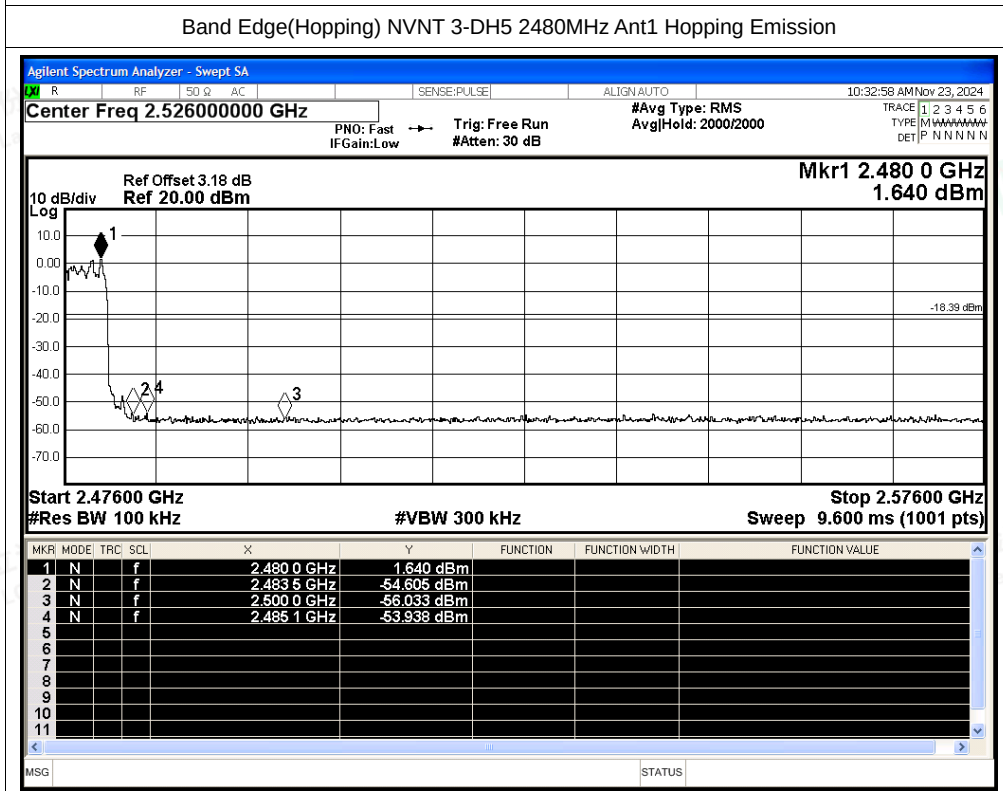
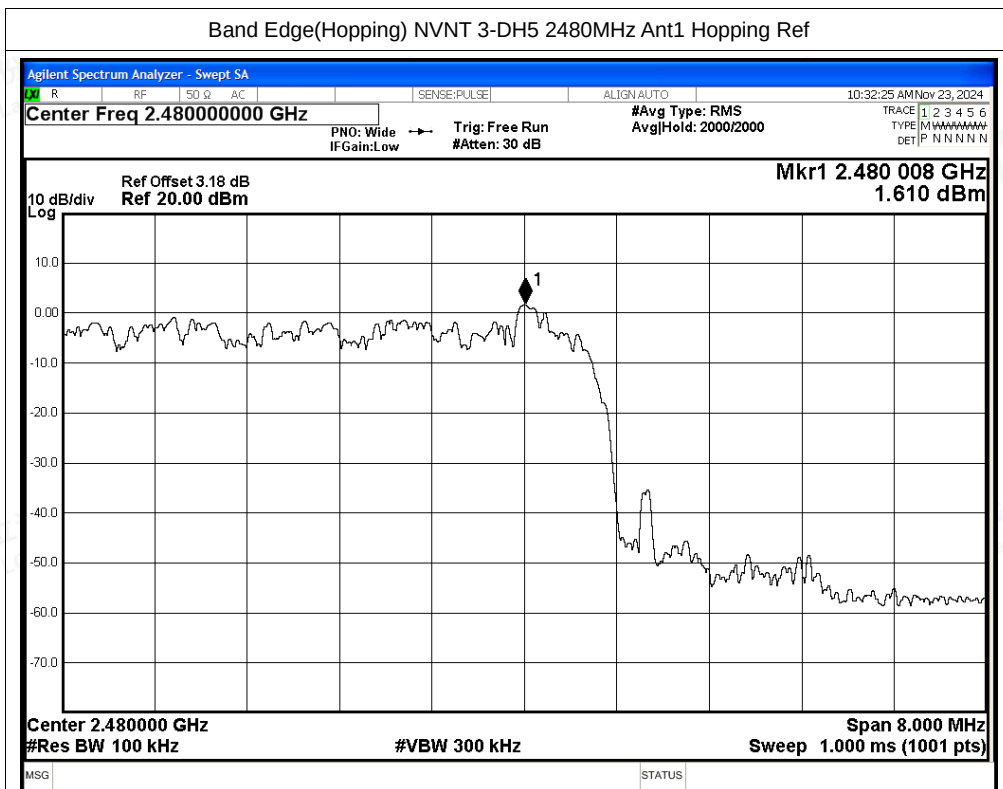














A.7 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	-54.09	-20	Pass
NVNT	1-DH5	2441	Ant1	-54.72	-20	Pass
NVNT	1-DH5	2480	Ant1	-53.32	-20	Pass
NVNT	2-DH5	2402	Ant1	-51.52	-20	Pass
NVNT	2-DH5	2441	Ant1	-51.42	-20	Pass
NVNT	2-DH5	2480	Ant1	-53.39	-20	Pass
NVNT	3-DH5	2402	Ant1	-51.31	-20	Pass
NVNT	3-DH5	2441	Ant1	-52.61	-20	Pass
NVNT	3-DH5	2480	Ant1	-50.96	-20	Pass



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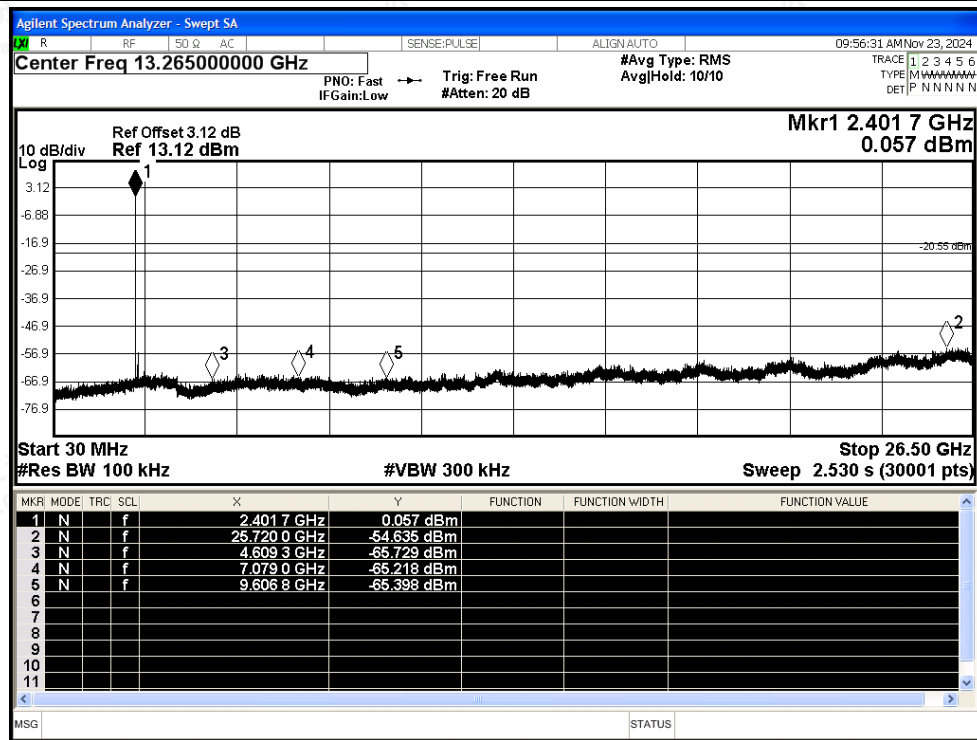


Test Graphs

Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref

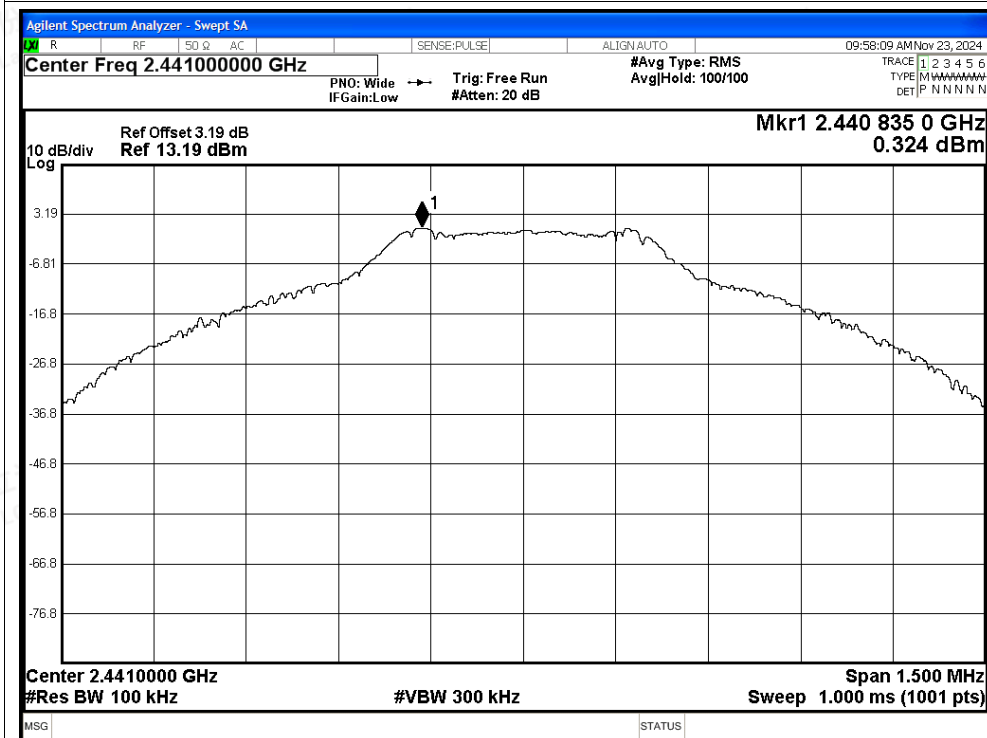


Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission

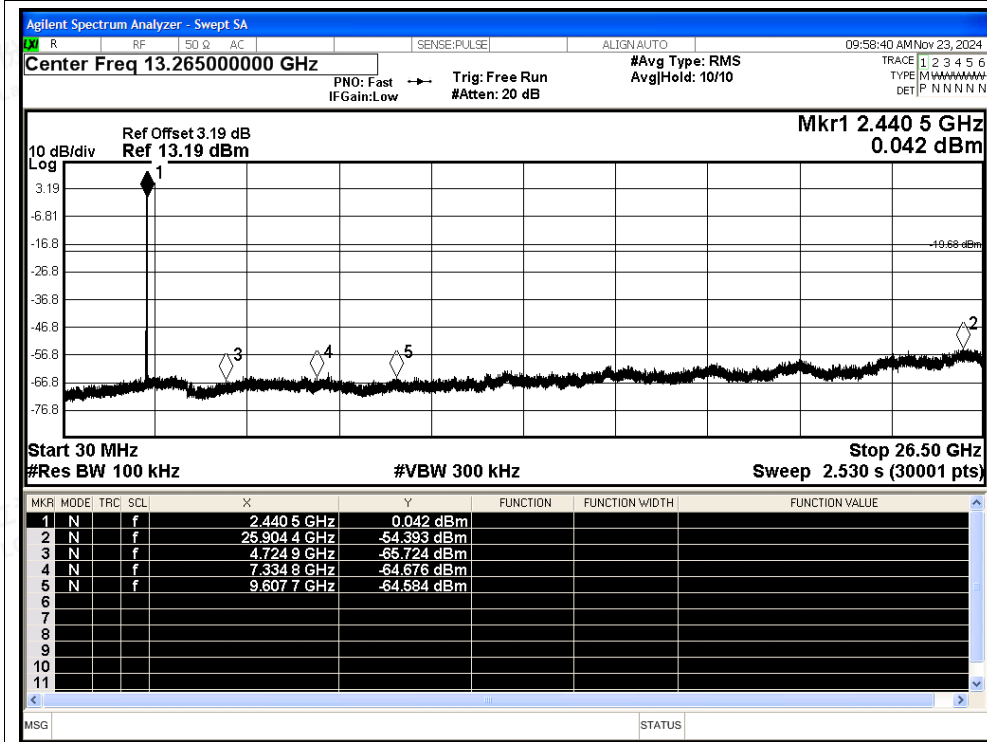




Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Ref

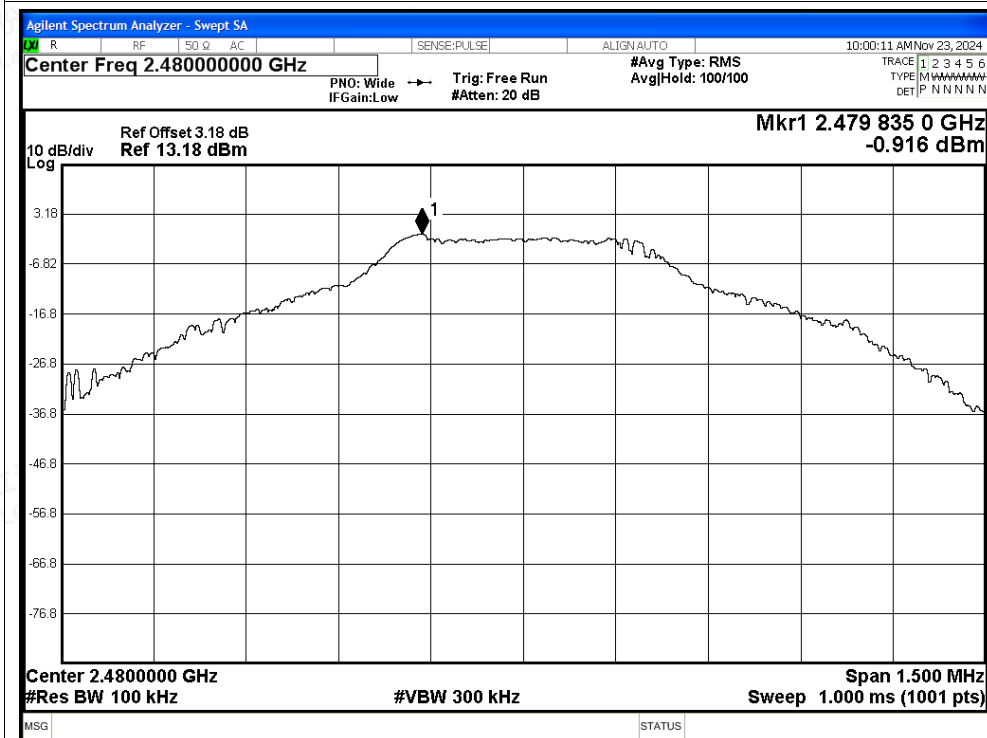


Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Emission

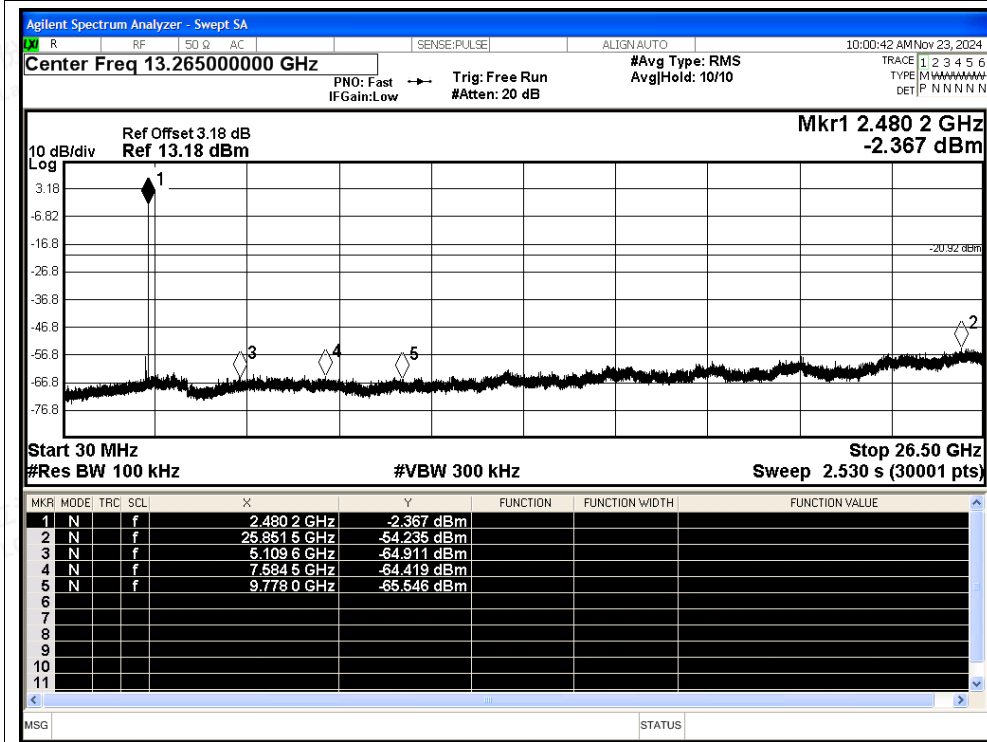




Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref

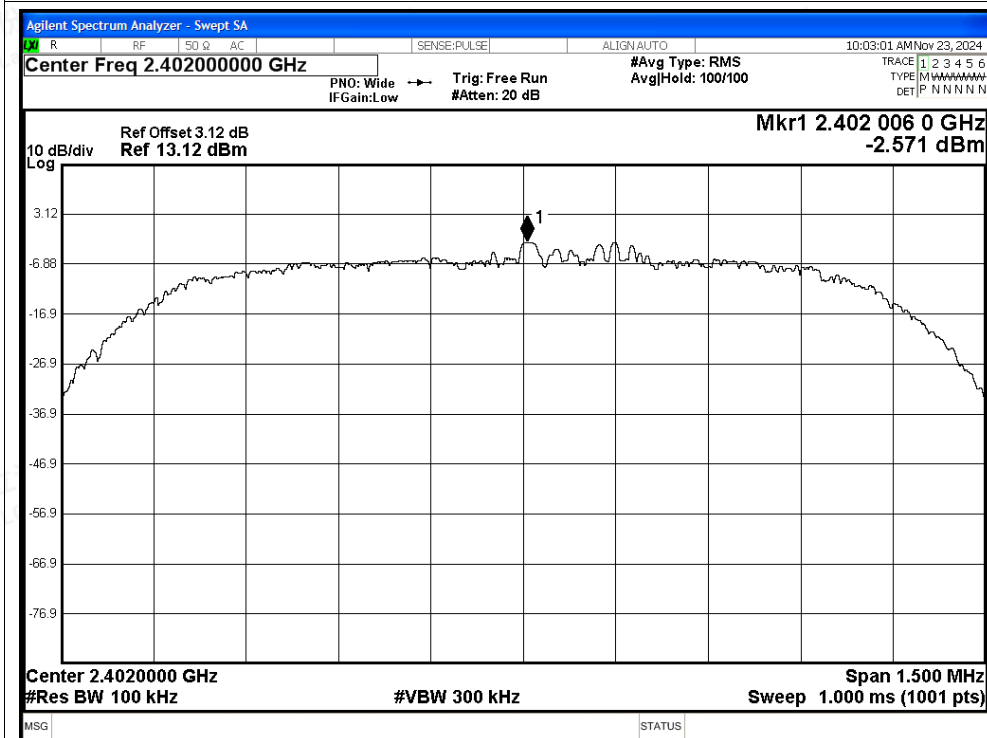


Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission

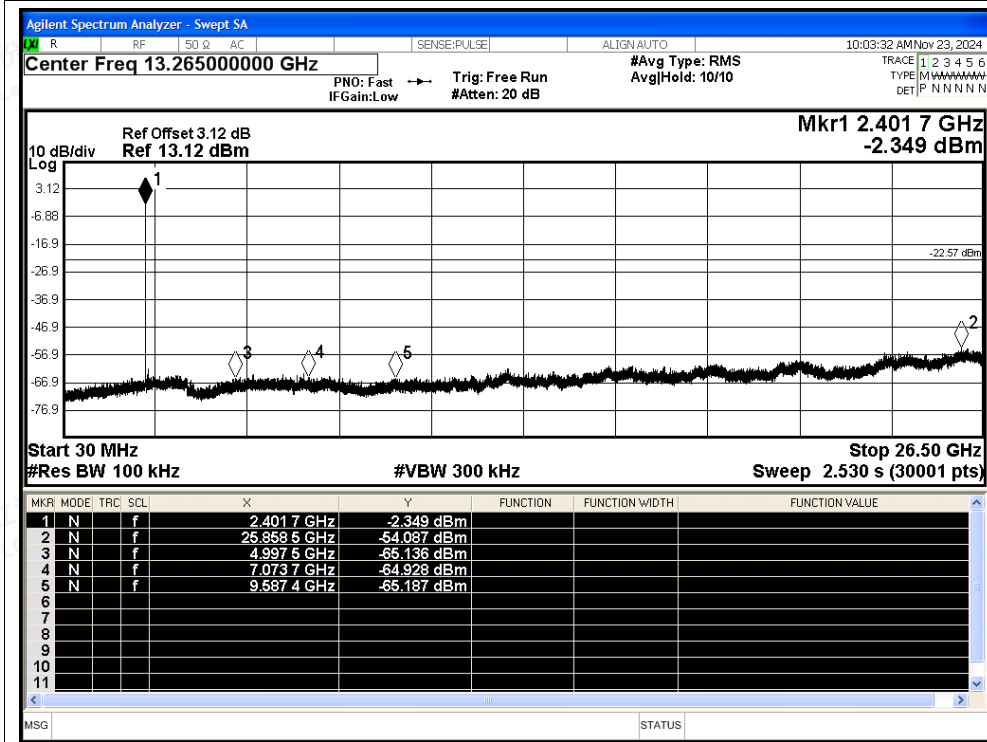




Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Ref

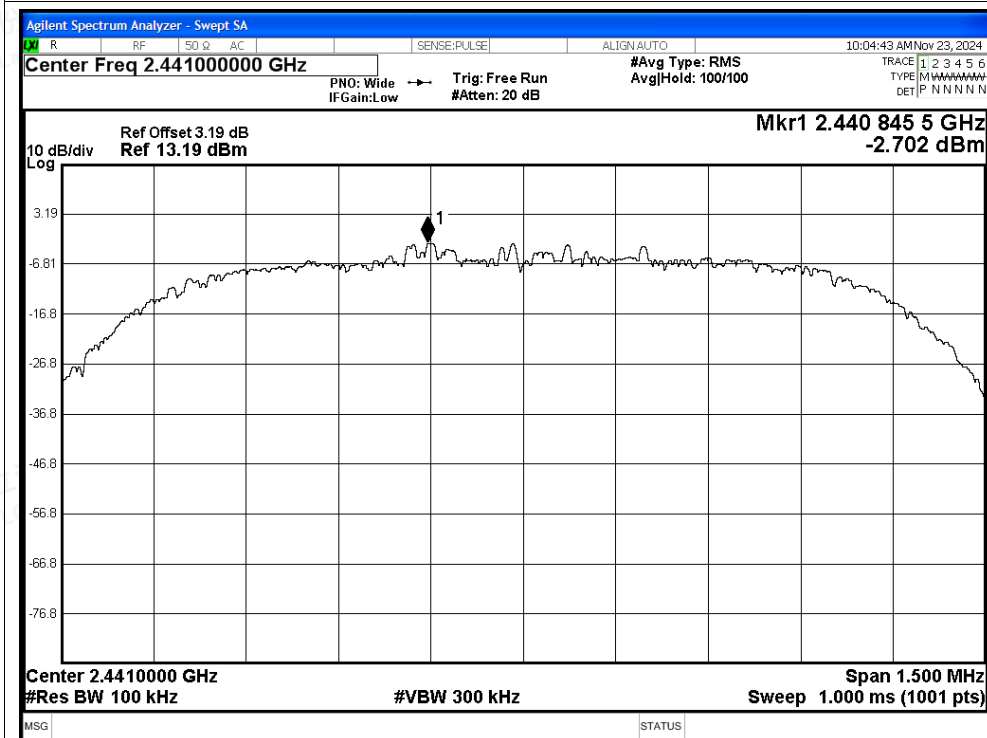


Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Emission

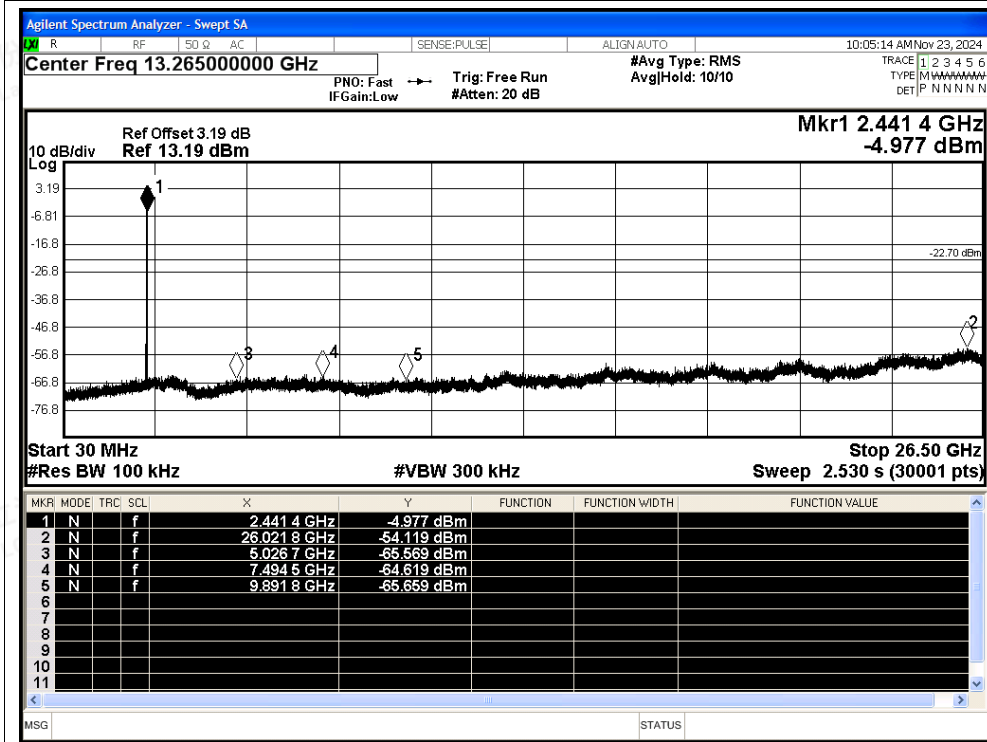




Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Ref

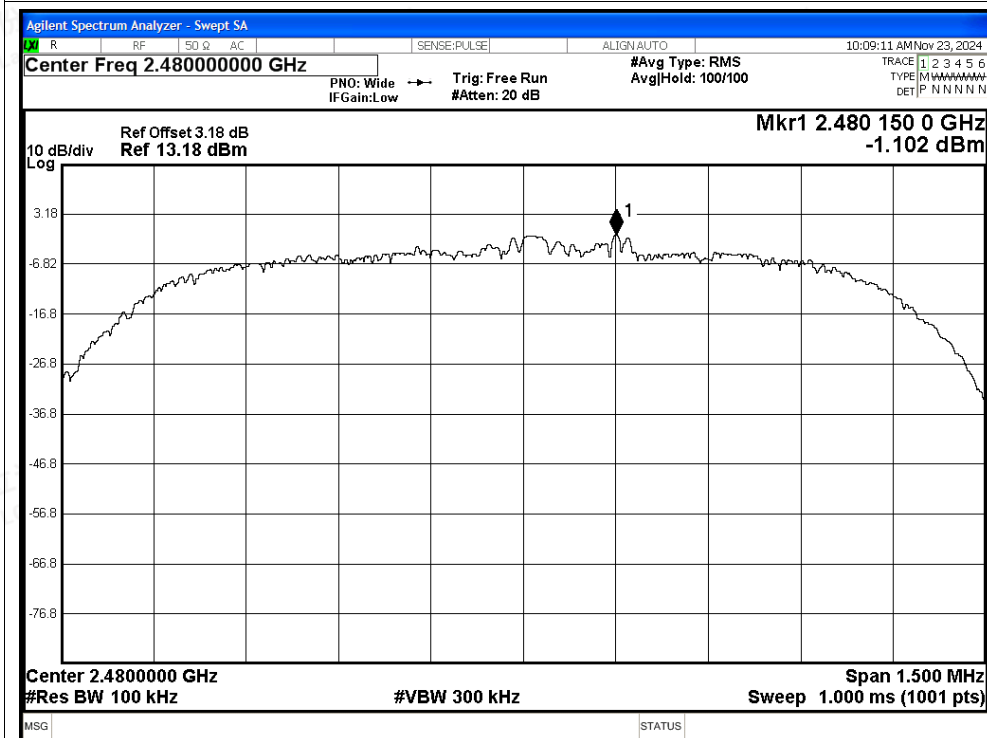


Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Emission

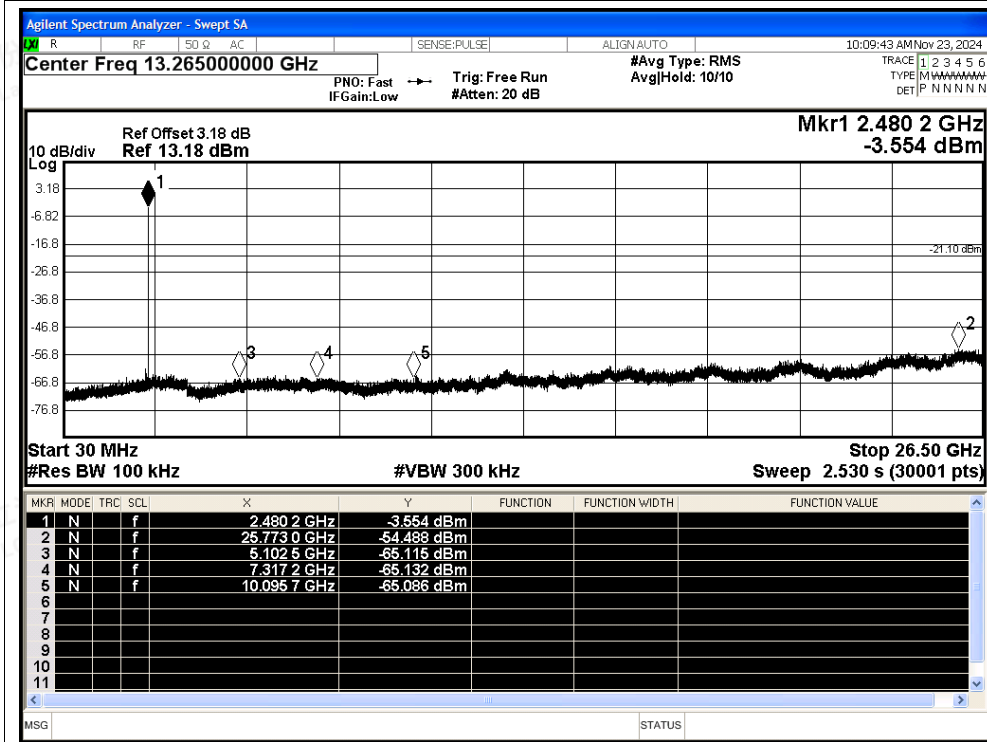




Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Ref

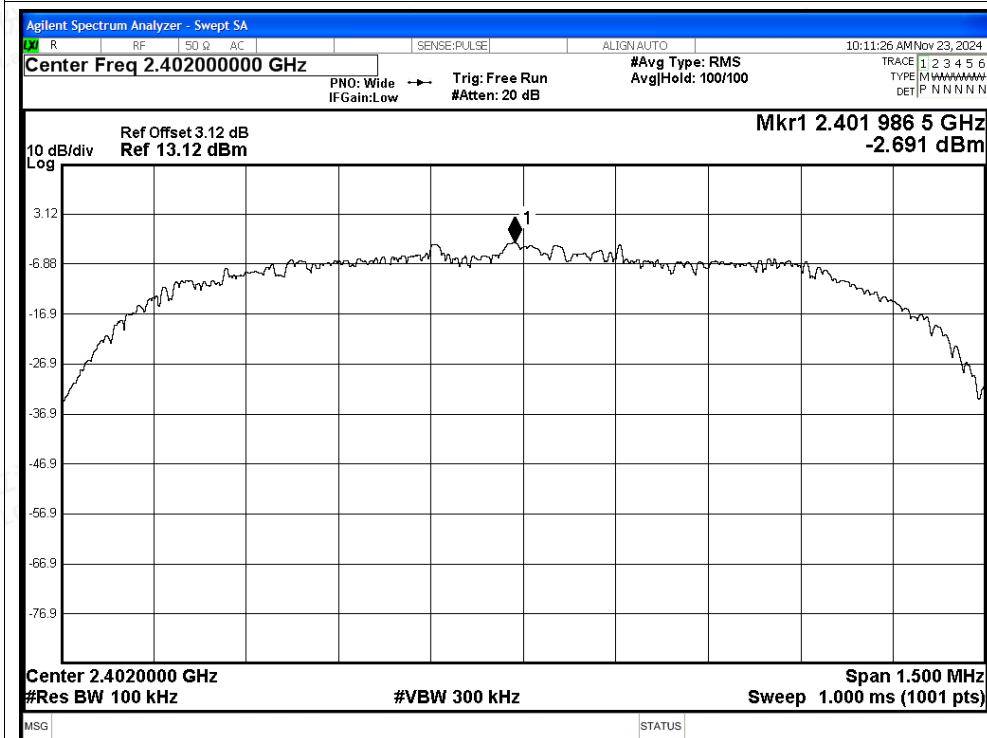


Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Emission

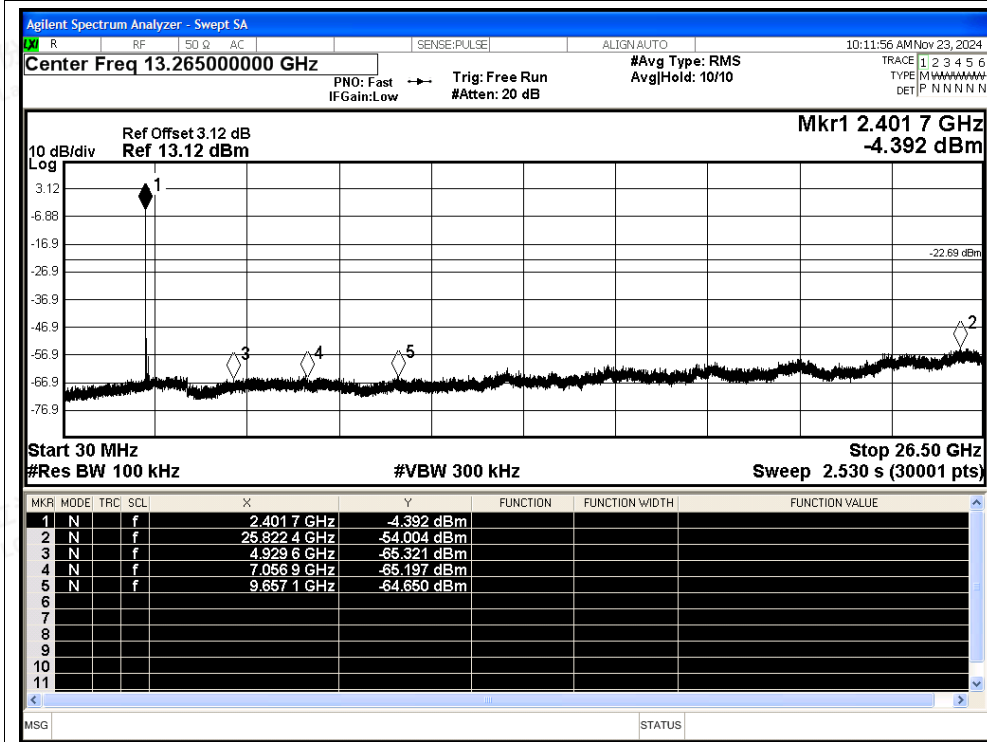




Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Ref

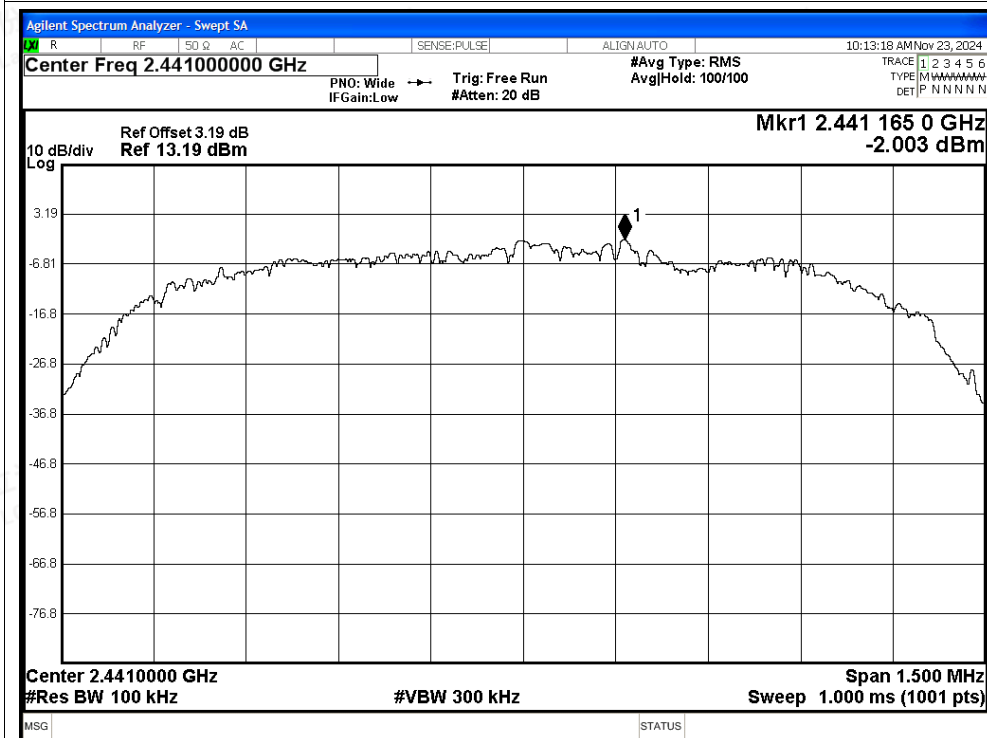


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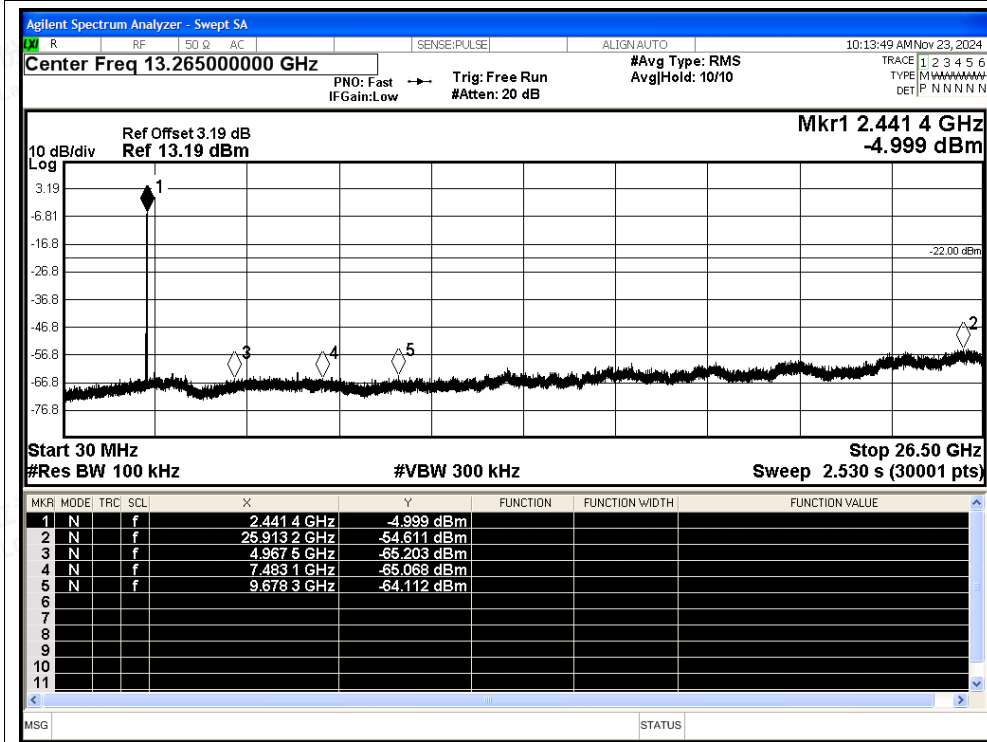




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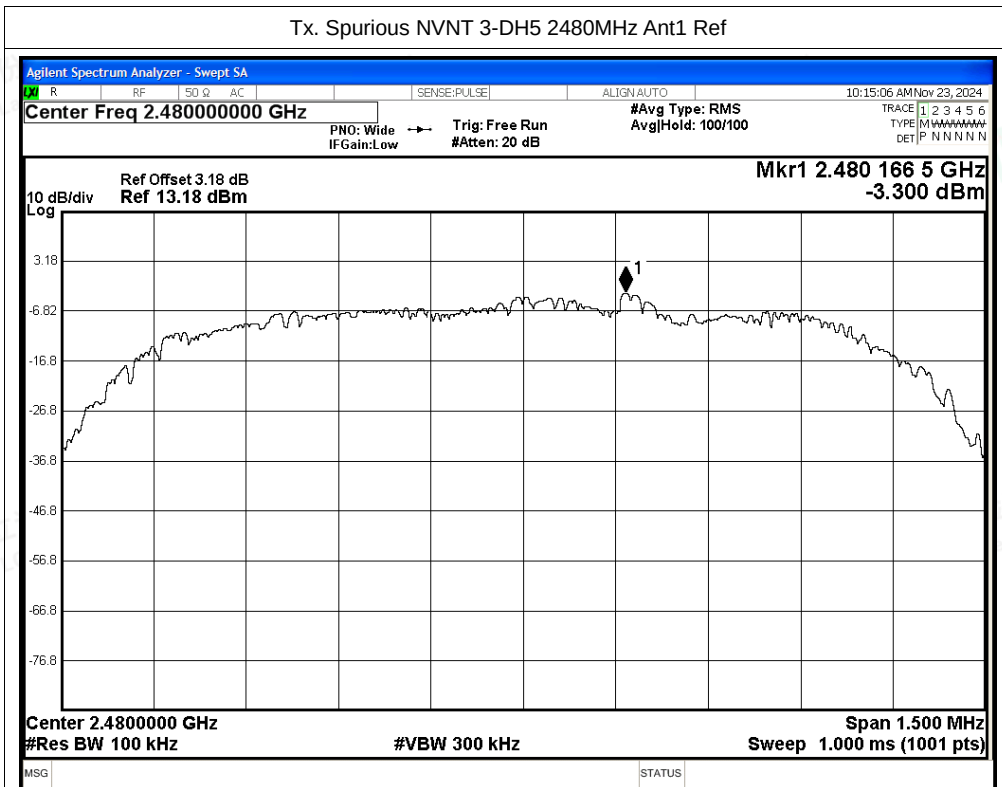


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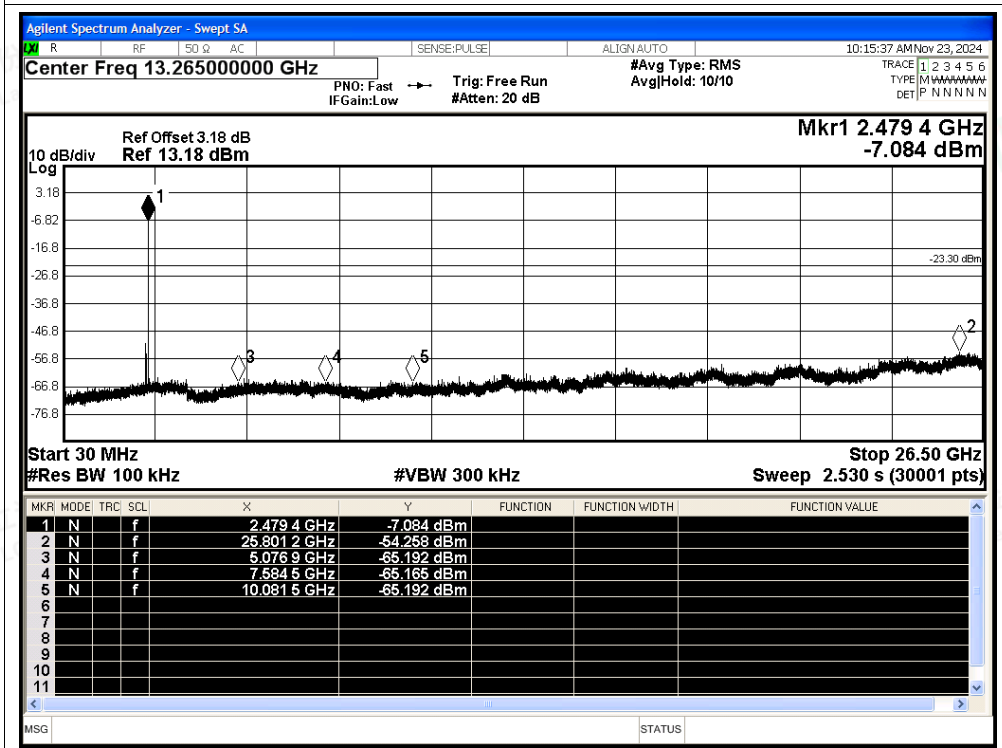




Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission





A.8 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant1	77.63	1.1	0.34
NVNT	1-DH5	2441	Ant1	77.6	1.1	0.34
NVNT	1-DH5	2480	Ant1	77.63	1.1	0.34
NVNT	2-DH5	2402	Ant1	77.33	1.12	0.34
NVNT	2-DH5	2441	Ant1	77.28	1.12	0.35
NVNT	2-DH5	2480	Ant1	77.33	1.12	0.34
NVNT	3-DH5	2402	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2441	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2480	Ant1	77.28	1.12	0.35

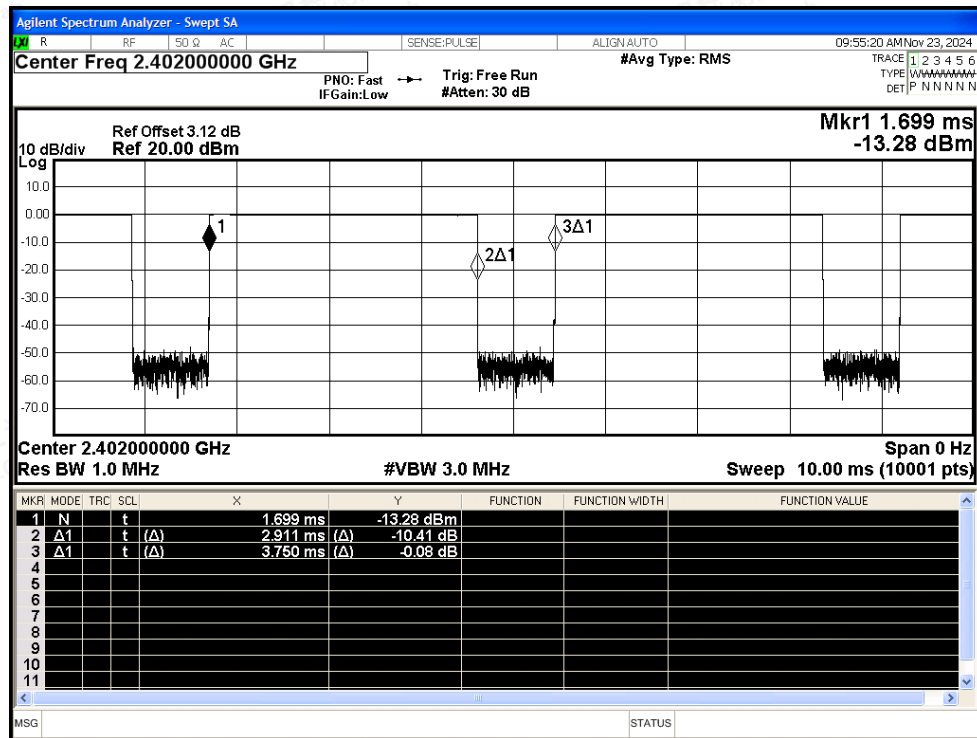


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Baoan District, Shenzhen, 518000, China
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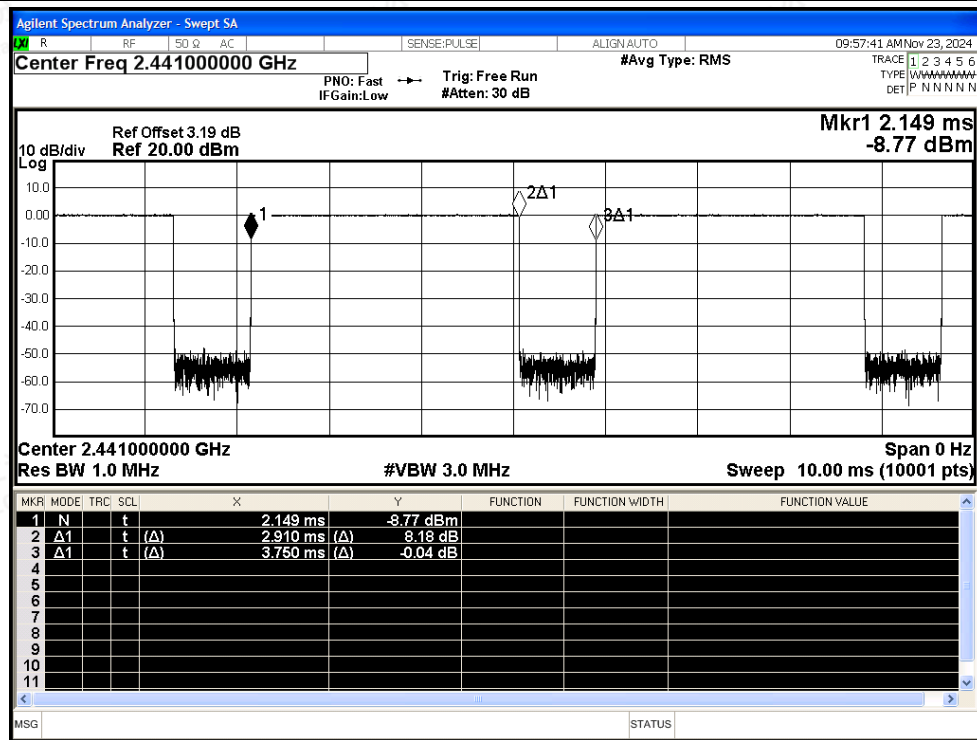


Test Graphs

Duty Cycle NVNT 1-DH5 2402MHz Ant1

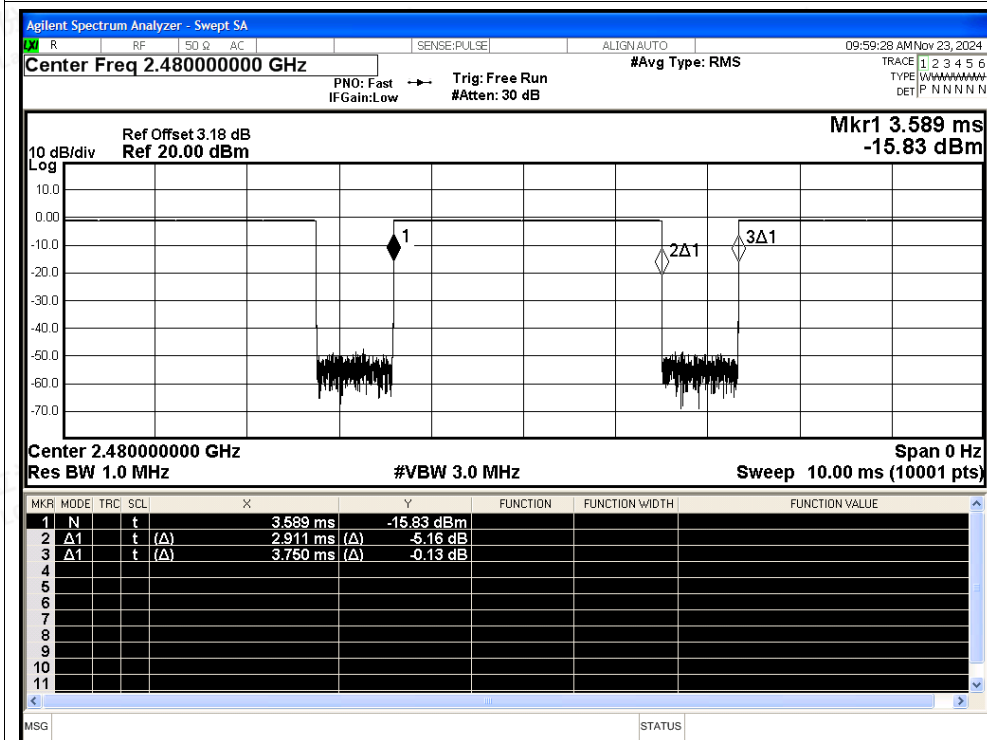


Duty Cycle NVNT 1-DH5 2441MHz Ant1

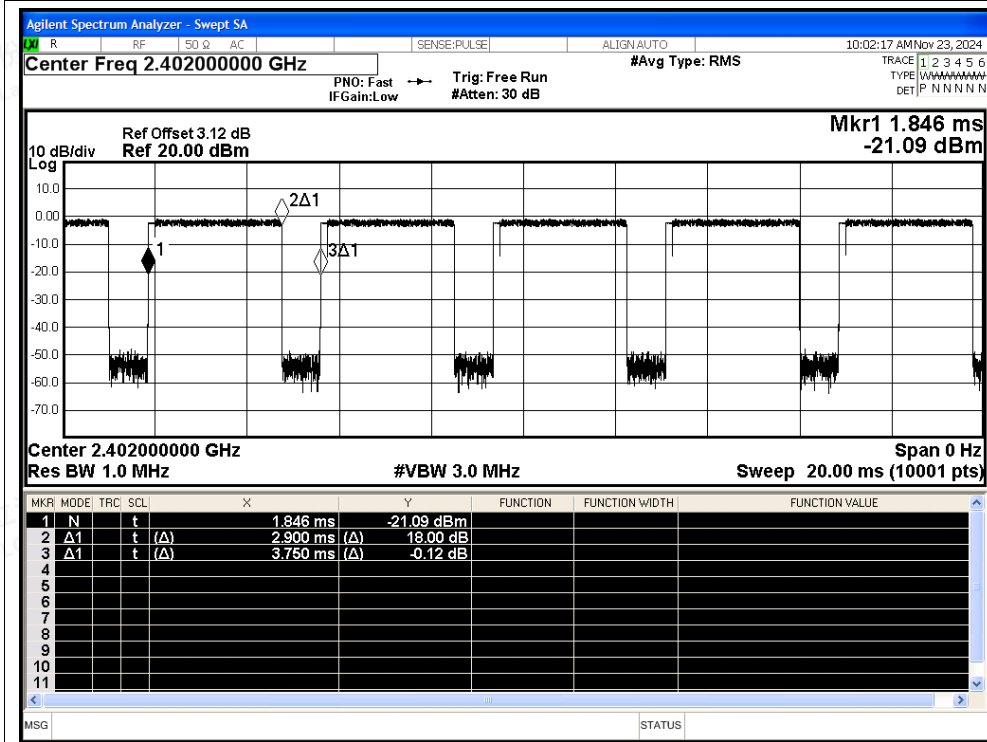




Duty Cycle NVNT 1-DH5 2480MHz Ant1

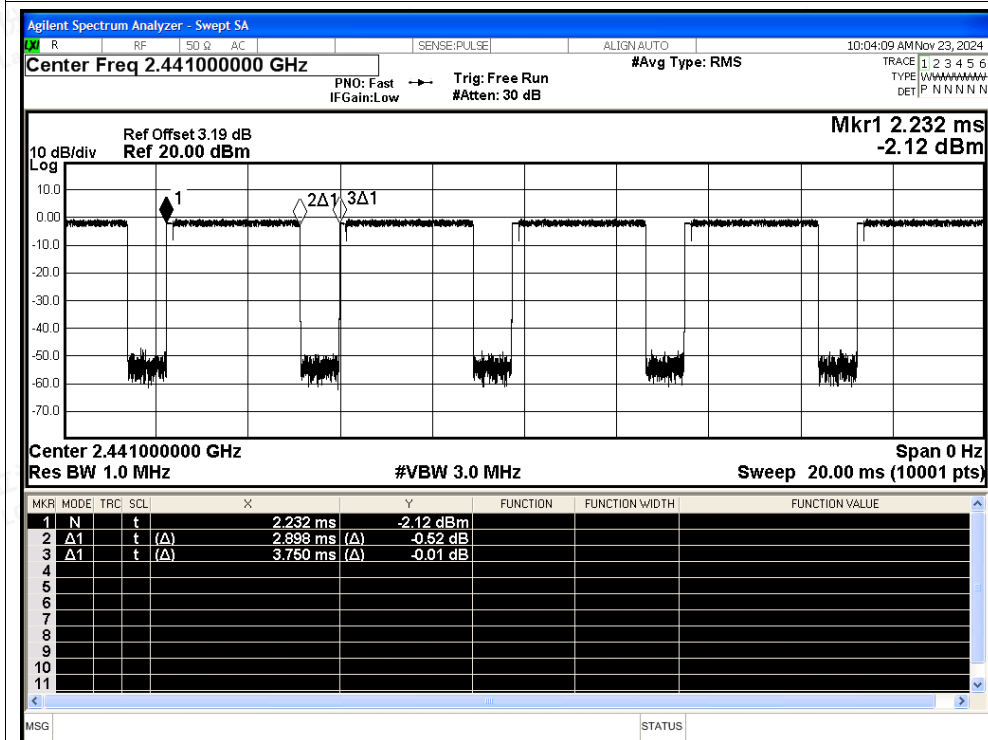


Duty Cycle NVNT 2-DH5 2402MHz Ant1

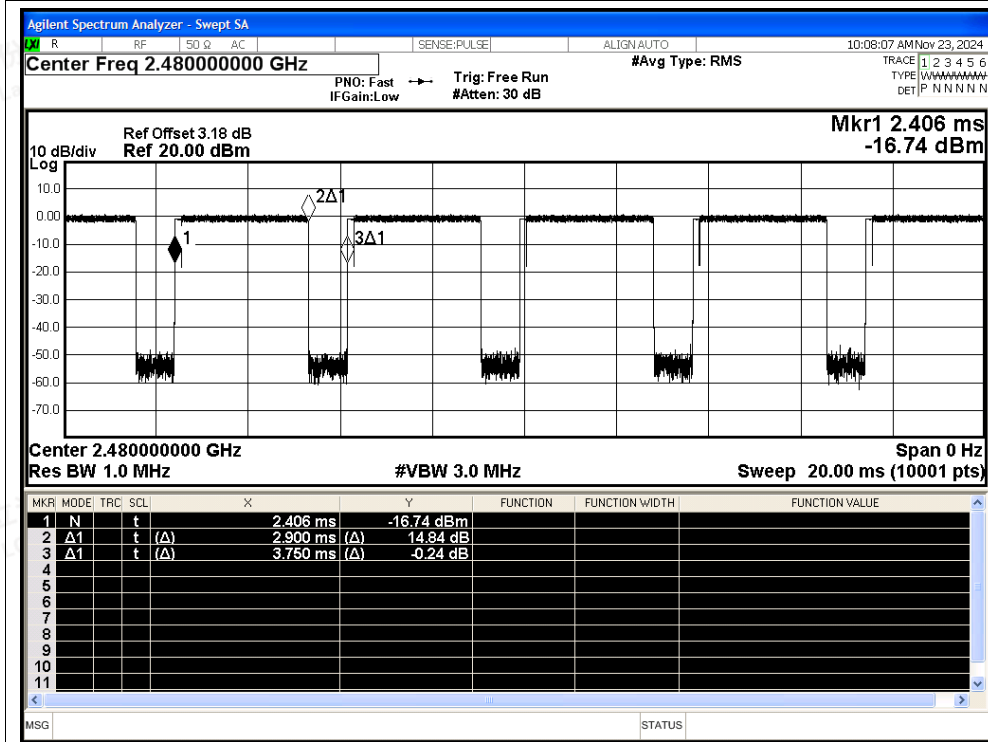




Duty Cycle NVNT 2-DH5 2441MHz Ant1

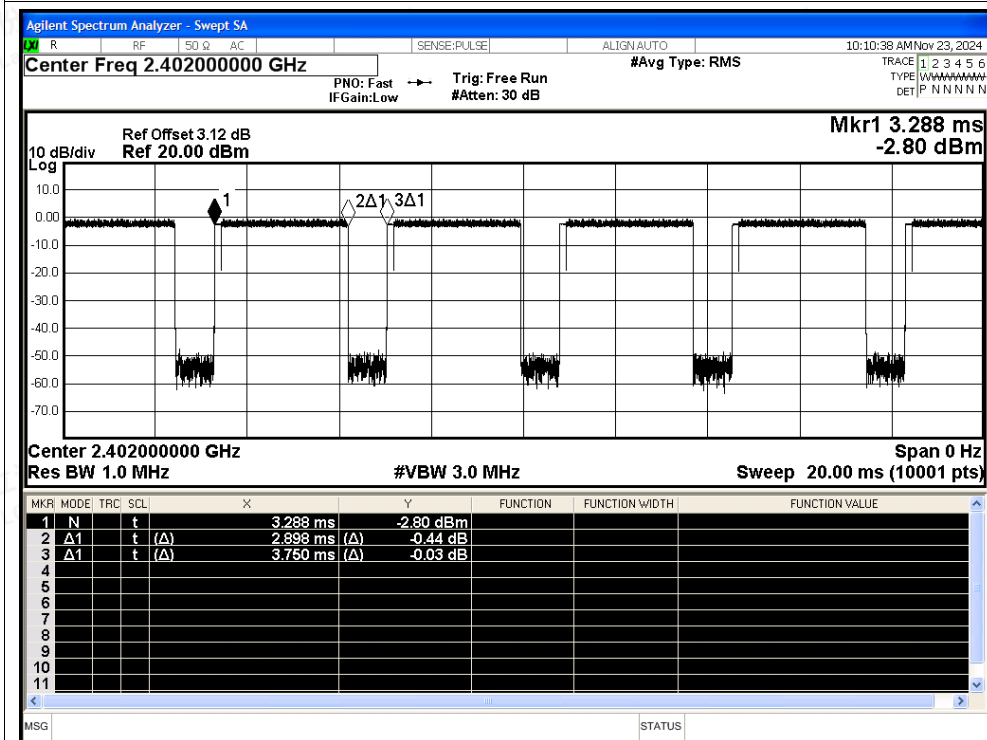


Duty Cycle NVNT 2-DH5 2480MHz Ant1

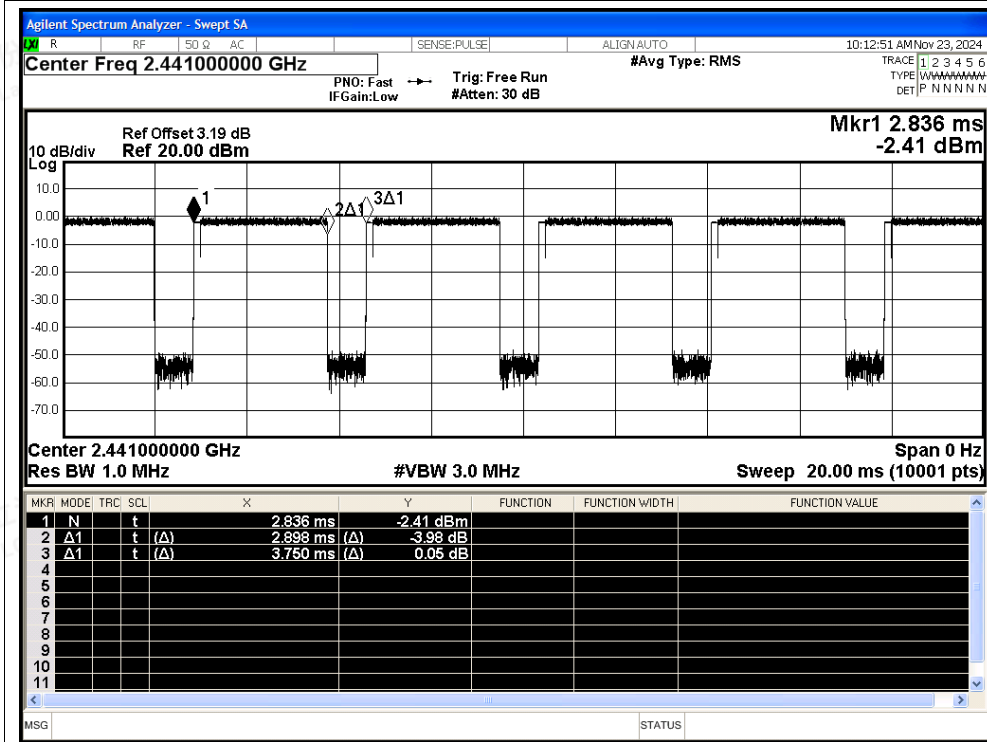


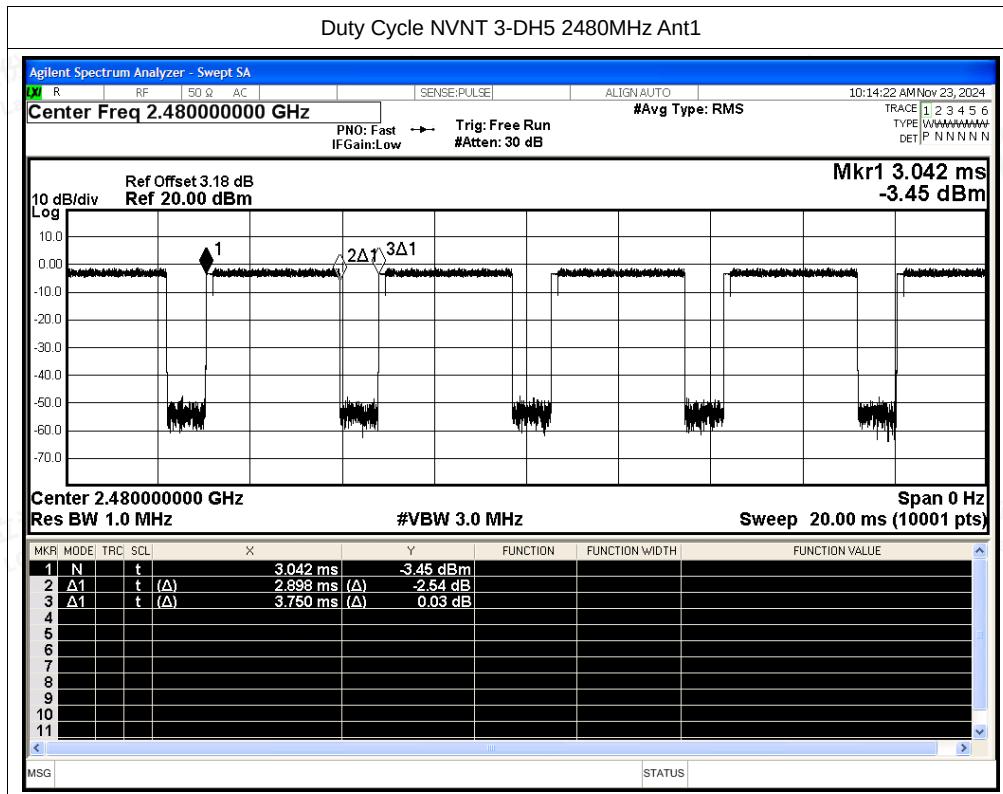


Duty Cycle NVNT 3-DH5 2402MHz Ant1



Duty Cycle NVNT 3-DH5 2441MHz Ant1







A.7 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-50.12	2	-	47.14	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-57.5	2	1.1	40.86	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2350.8	-46.83	2	-	50.43	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2374.992	-56.64	2	1.1	41.72	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-49.57	2	-	47.69	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-57.21	2	1.1	41.15	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-49.88	2	-	47.38	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-57.33	2	1.1	41.03	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2496.808	-45.4	2	-	51.86	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2484.688	-56.01	2	1.1	42.35	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-50.14	2	-	47.12	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-57.27	2	1.1	41.09	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-49.82	2	-	47.44	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-57.68	2	1.12	40.7	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2370.672	-46.01	2	-	51.25	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2372.688	-56.59	2	1.12	41.79	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-50.25	2	-	47.01	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-57.47	2	1.12	40.91	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-49.28	2	-	47.98	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-56.98	2	1.12	41.4	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2496.472	-45.02	2	-	52.24	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2499.808	-56.08	2	1.12	42.3	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-48.15	2	-	49.11	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-57.24	2	1.12	41.14	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-49.87	2	-	47.39	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-57.48	2	1.12	40.9	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2361.552	-46.46	2	-	50.8	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2371.056	-56.53	2	1.12	41.85	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-49.36	2	-	47.9	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-57.14	2	1.12	41.24	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-49.58	2	-	47.68	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-56.98	2	1.12	41.4	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2488.264	-45.83	2	-	51.43	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2488.648	-55.95	2	1.12	42.43	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-48.04	2	-	49.22	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-56.63	2	1.12	41.75	Average	54	Pass

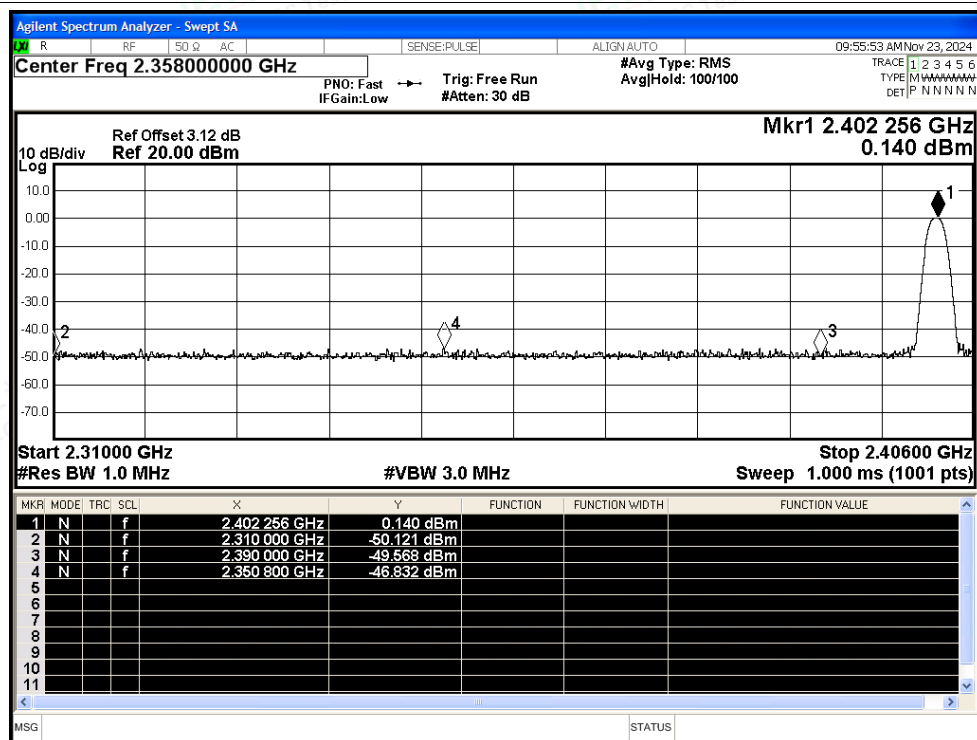


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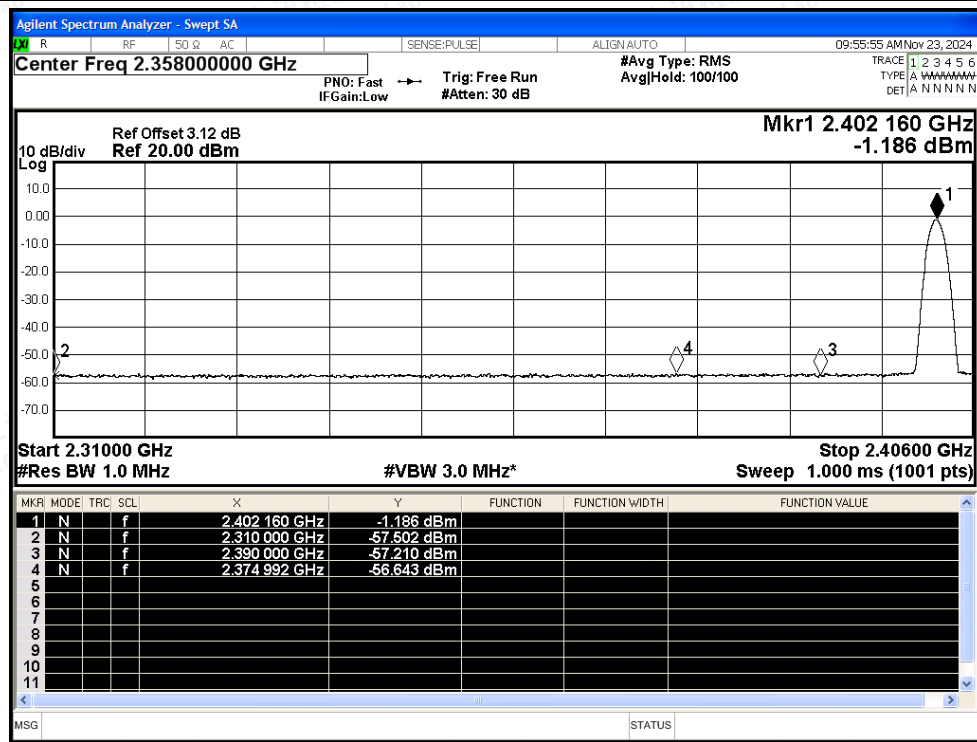


Test Graphs

Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Peak



Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average



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