



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Handheld tire tread detection equipment

Test Model: TTM313

Environmental Conditions

Temperature:	23.8°C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Luo
Supervised by:	Nick Peng



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B.1 -6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.691	≥ 0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.702	≥ 0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.699	≥ 0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.097	≥ 0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.088	≥ 0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.096	≥ 0.5	Pass

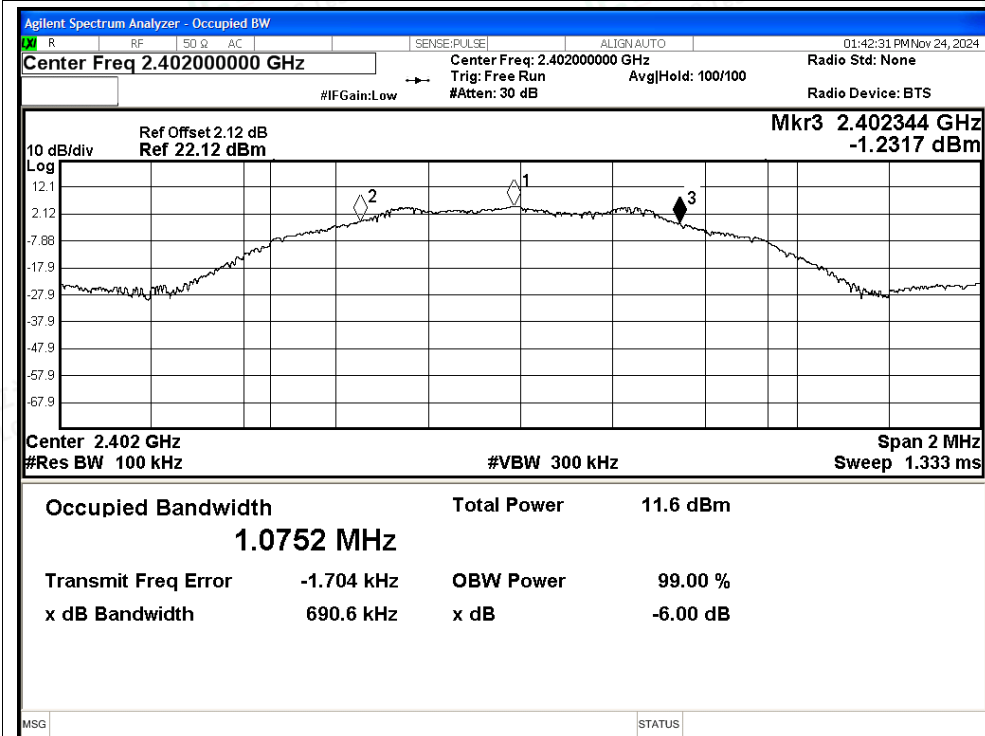


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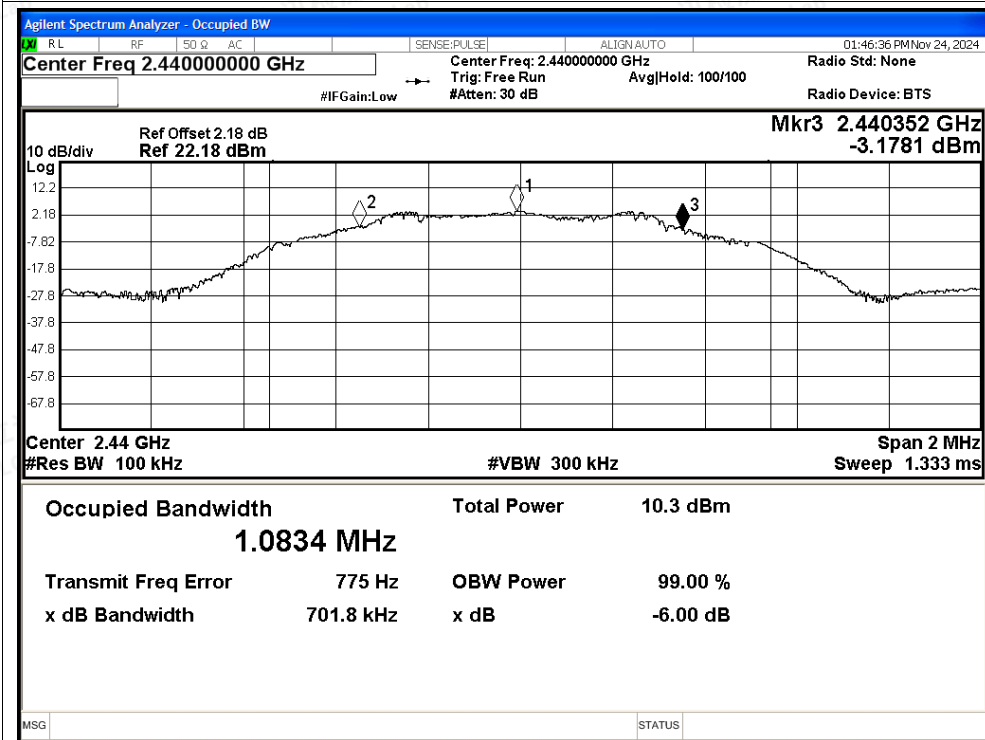


Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



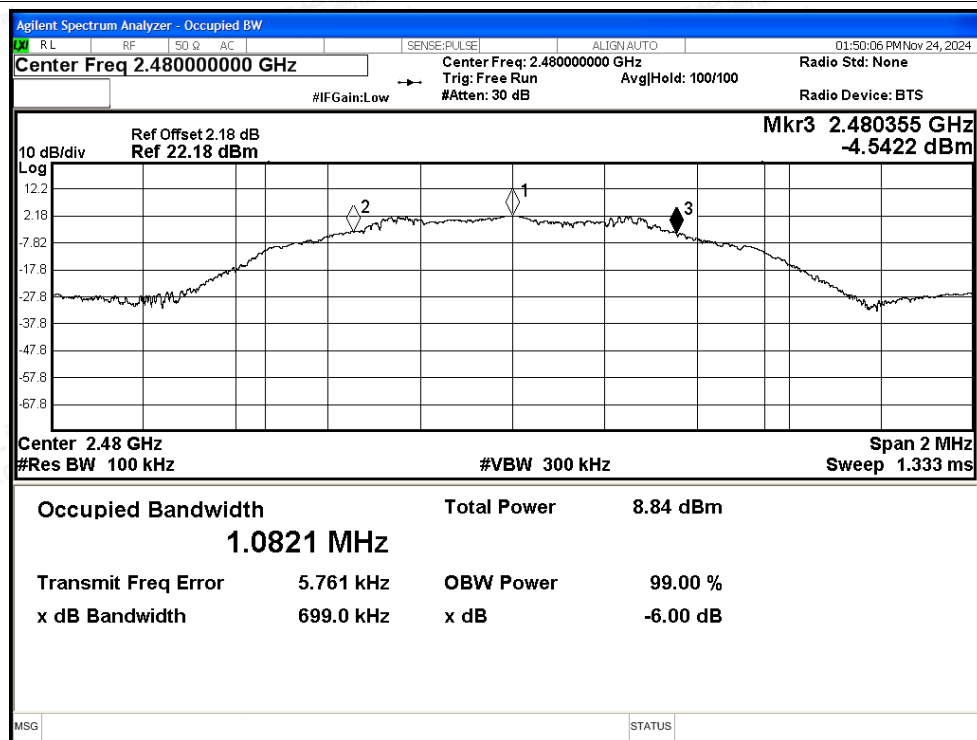
-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



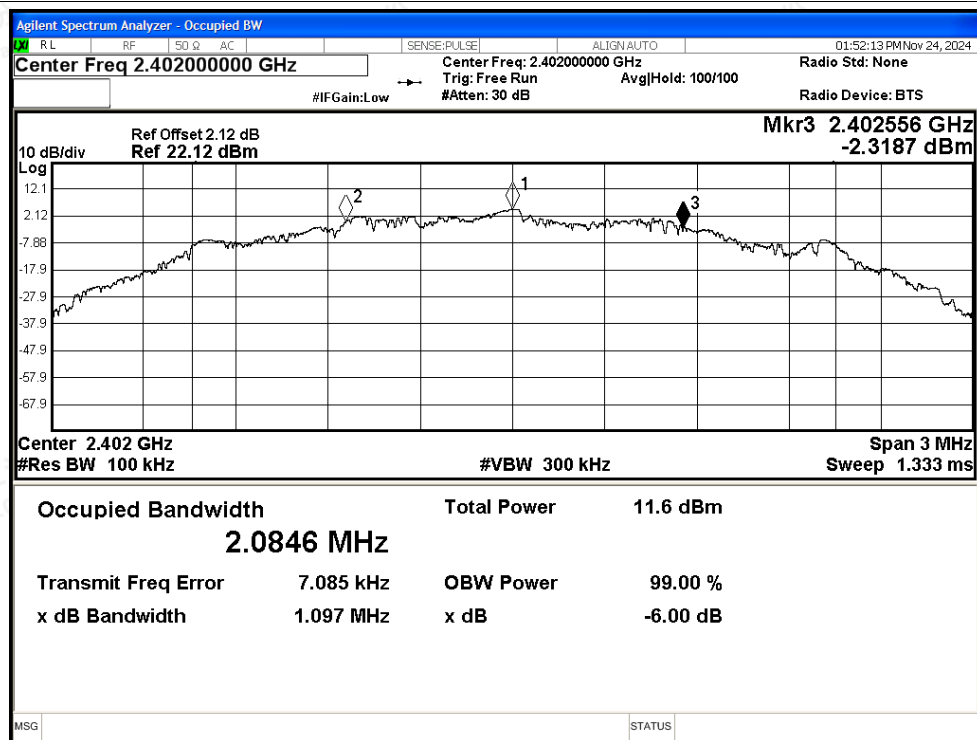
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-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1

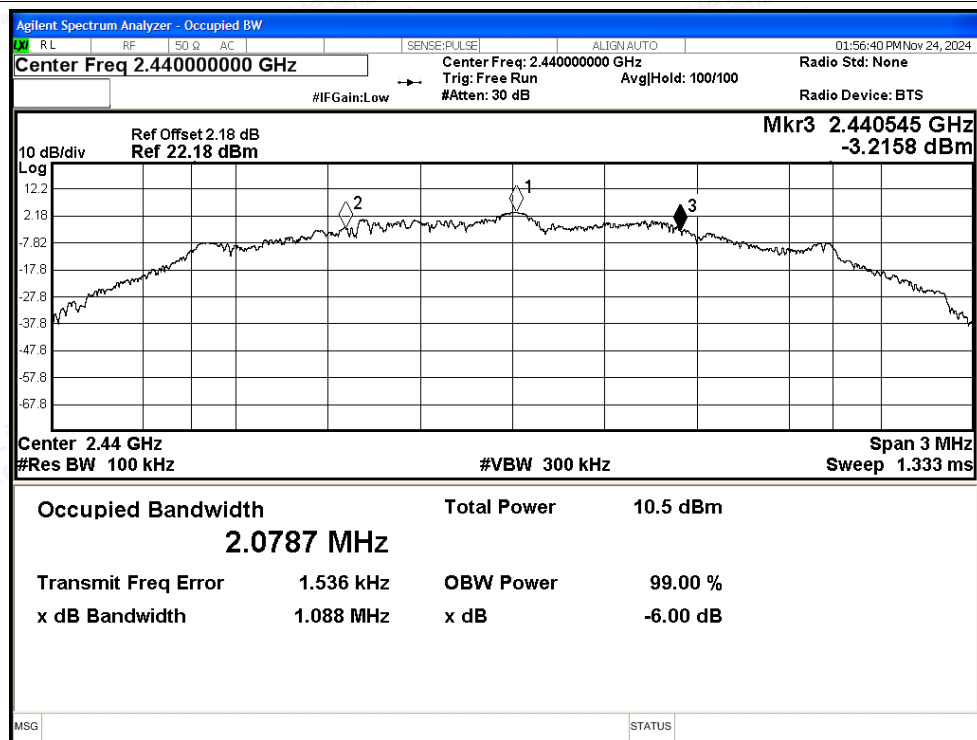


-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1

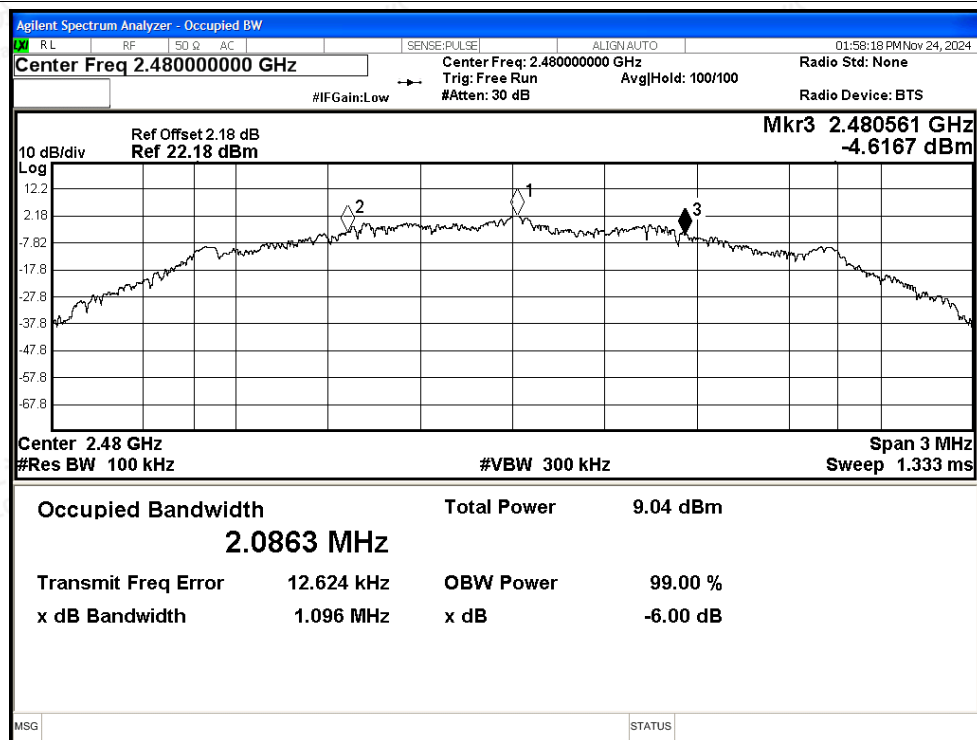




-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1



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B.2 Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	5.65	30	Pass
NVNT	BLE 1M	2440	Ant1	4.39	30	Pass
NVNT	BLE 1M	2480	Ant1	2.94	30	Pass
NVNT	BLE 2M	2402	Ant1	5.63	30	Pass
NVNT	BLE 2M	2440	Ant1	4.45	30	Pass
NVNT	BLE 2M	2480	Ant1	3.09	30	Pass

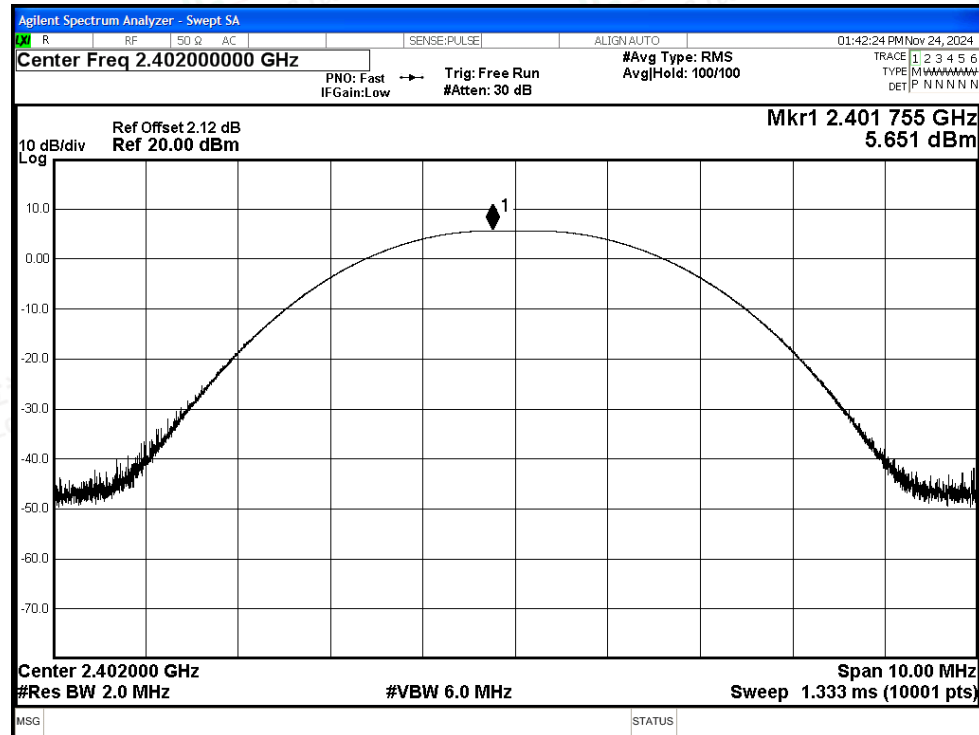


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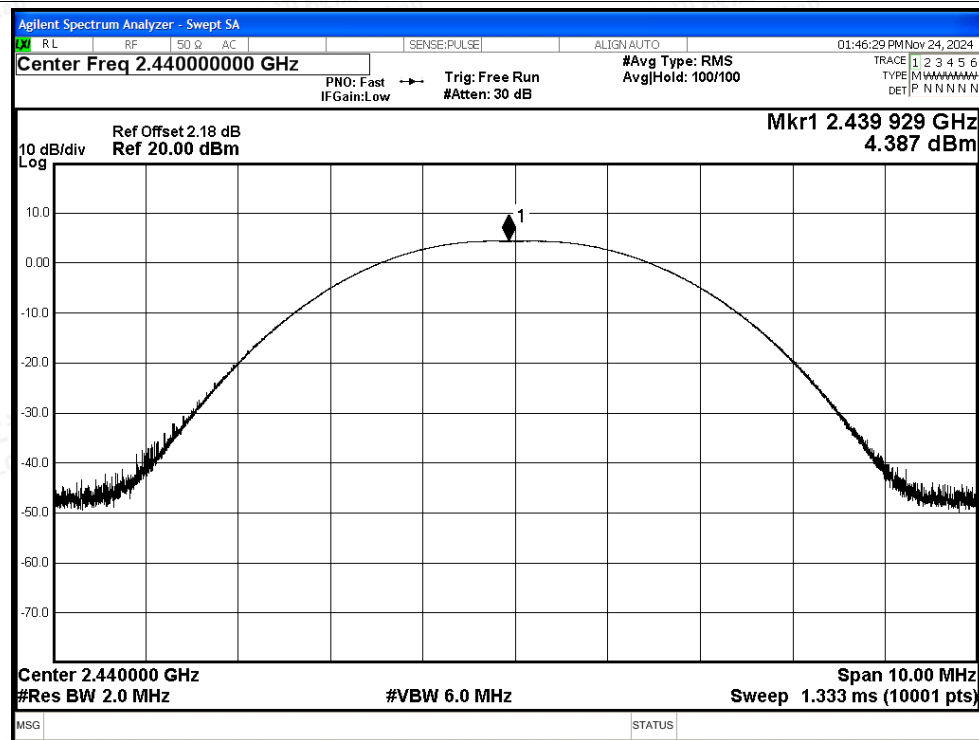


Test Graphs

Power NVNT BLE 1M 2402MHz Ant1

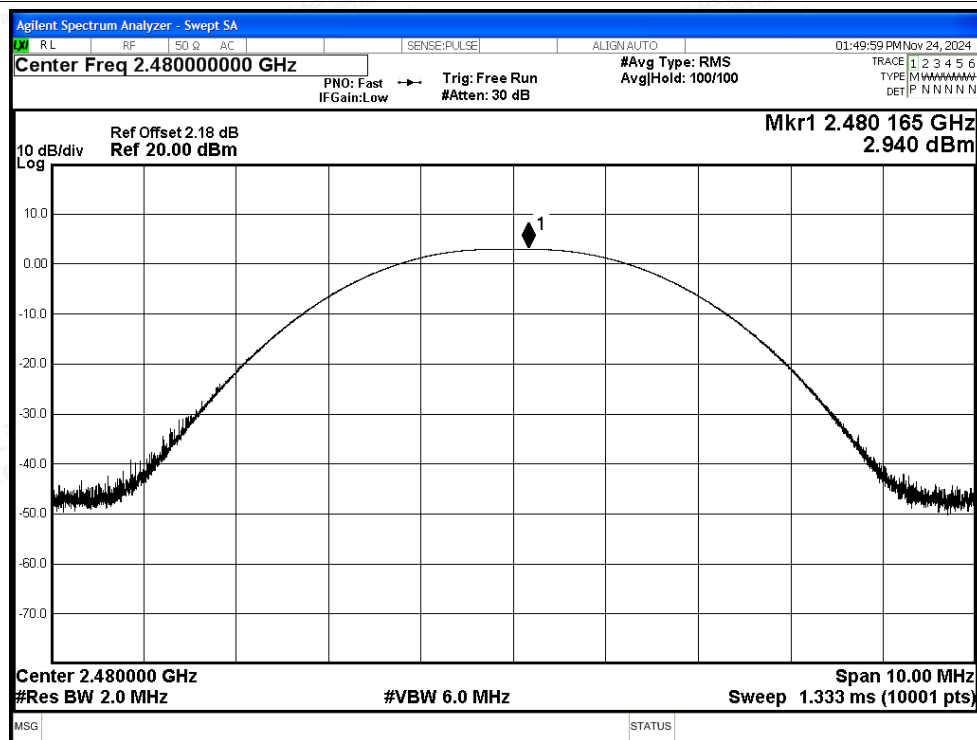


Power NVNT BLE 1M 2440MHz Ant1

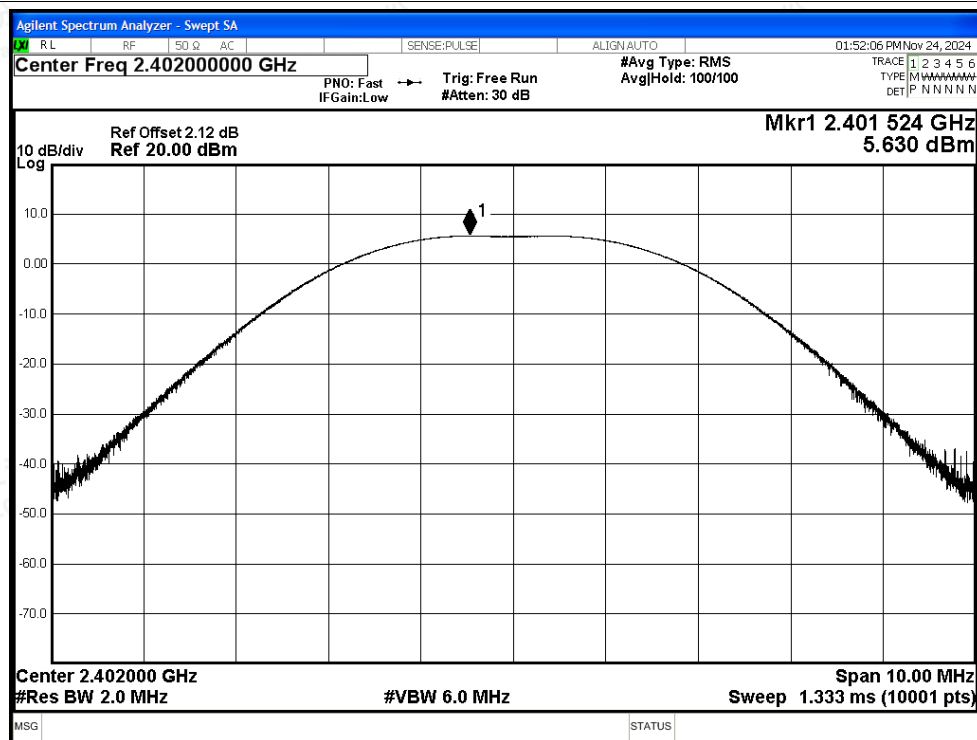


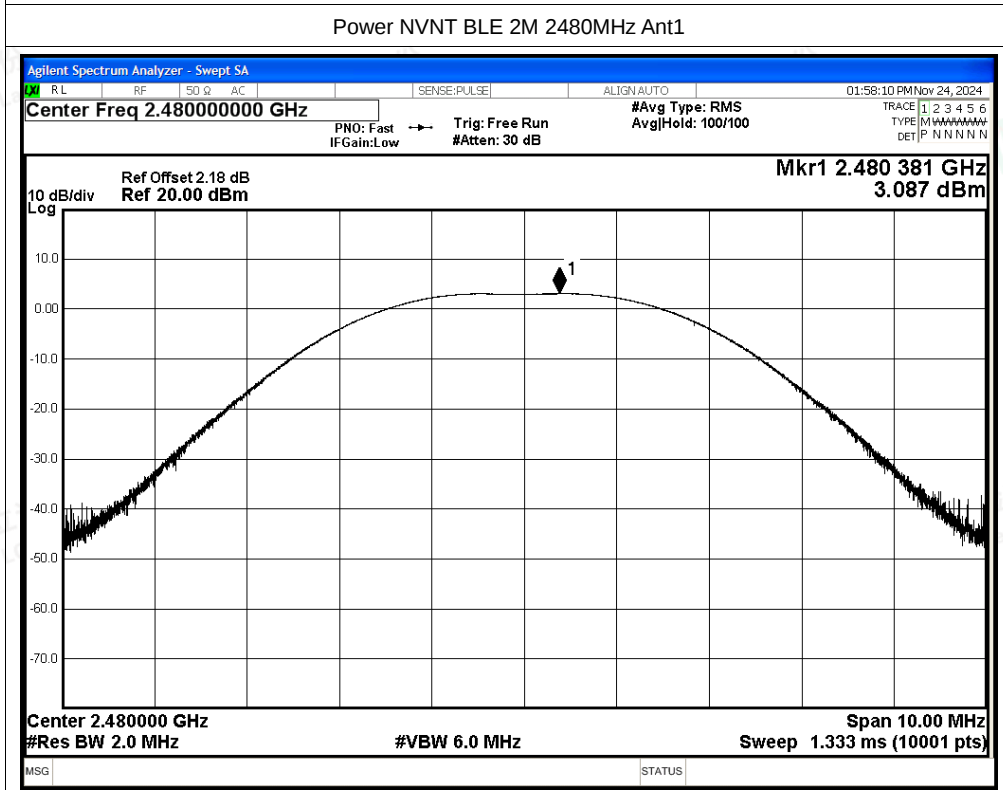
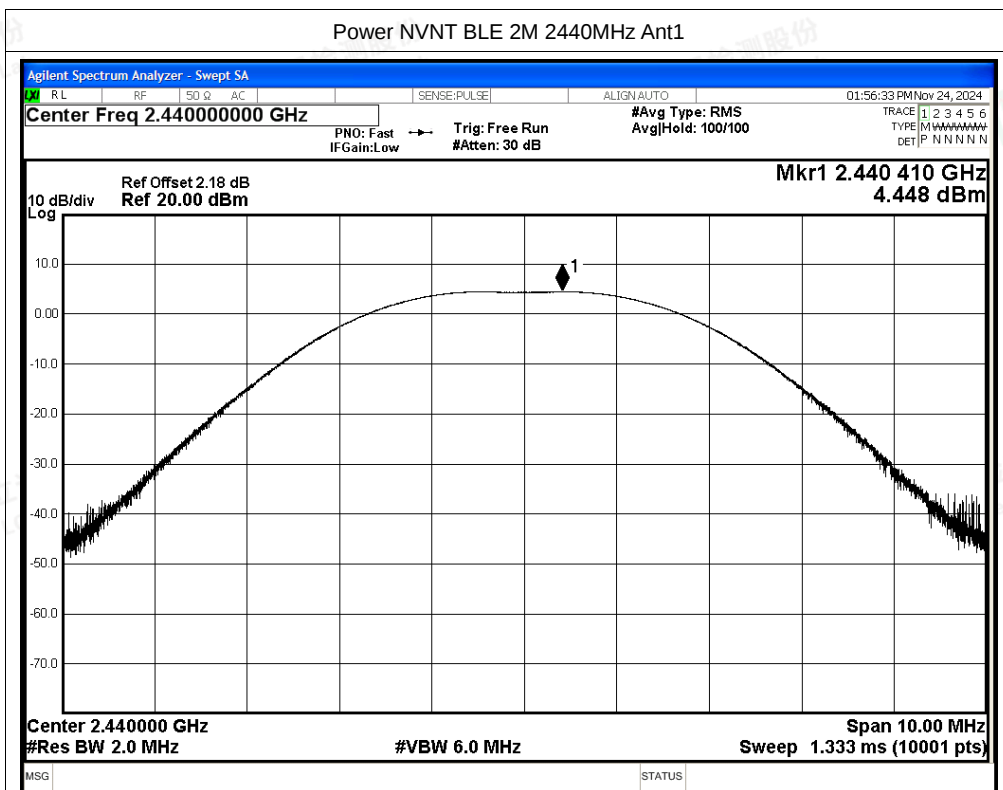


Power NVNT BLE 1M 2480MHz Ant1



Power NVNT BLE 2M 2402MHz Ant1







B.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-8.85	8	Pass
NVNT	BLE 1M	2440	Ant1	-10.02	8	Pass
NVNT	BLE 1M	2480	Ant1	-11.46	8	Pass
NVNT	BLE 2M	2402	Ant1	-11.52	8	Pass
NVNT	BLE 2M	2440	Ant1	-12.77	8	Pass
NVNT	BLE 2M	2480	Ant1	-14	8	Pass

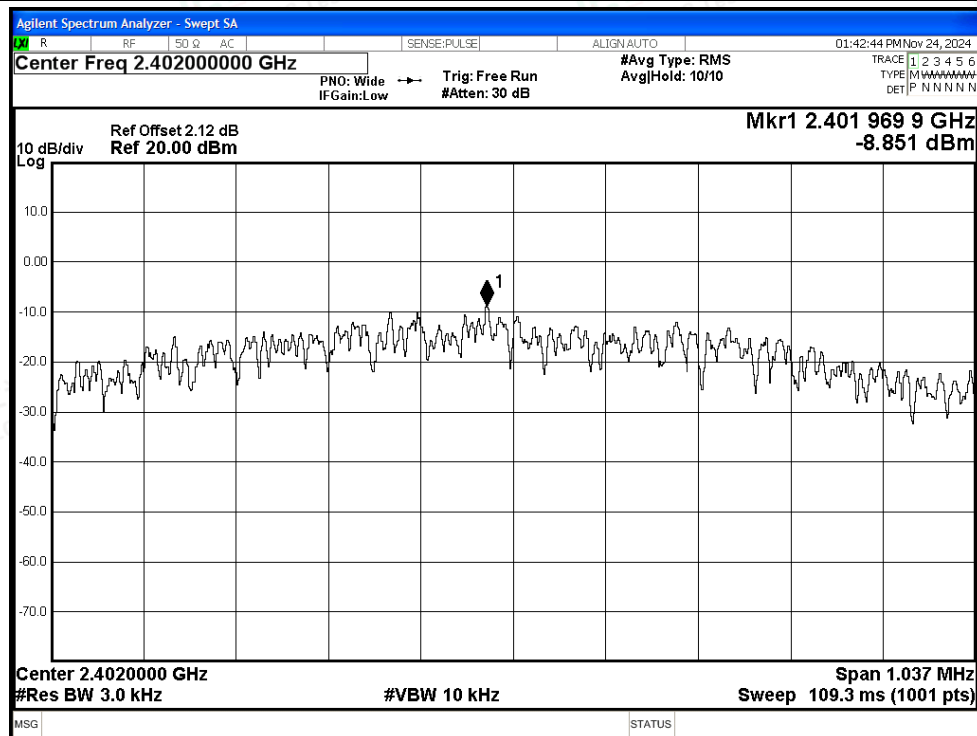


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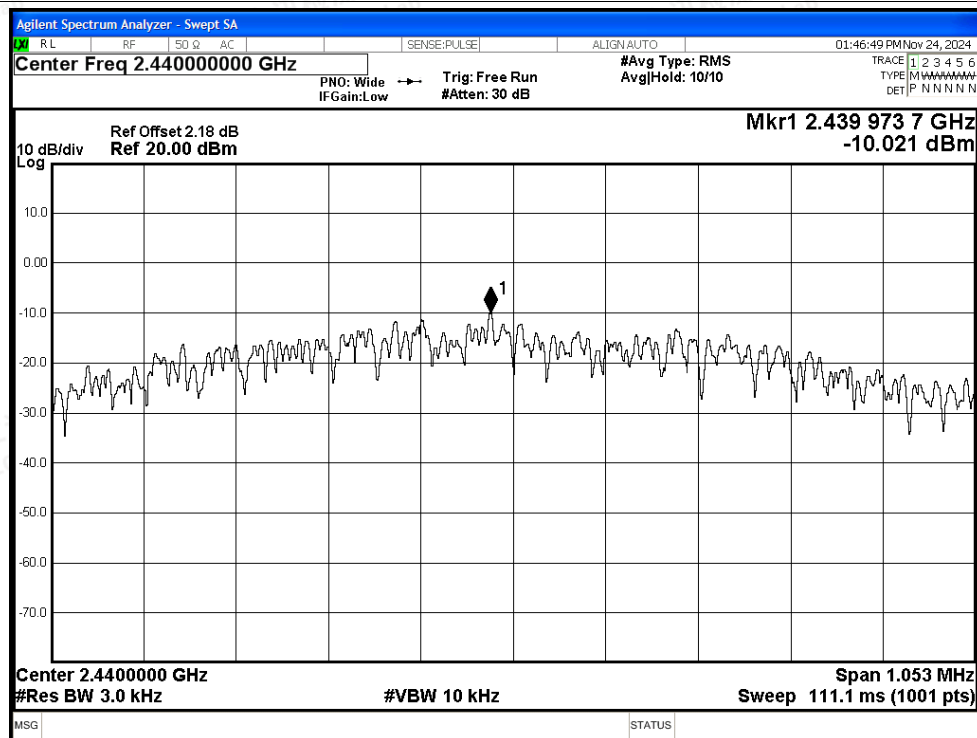


Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1

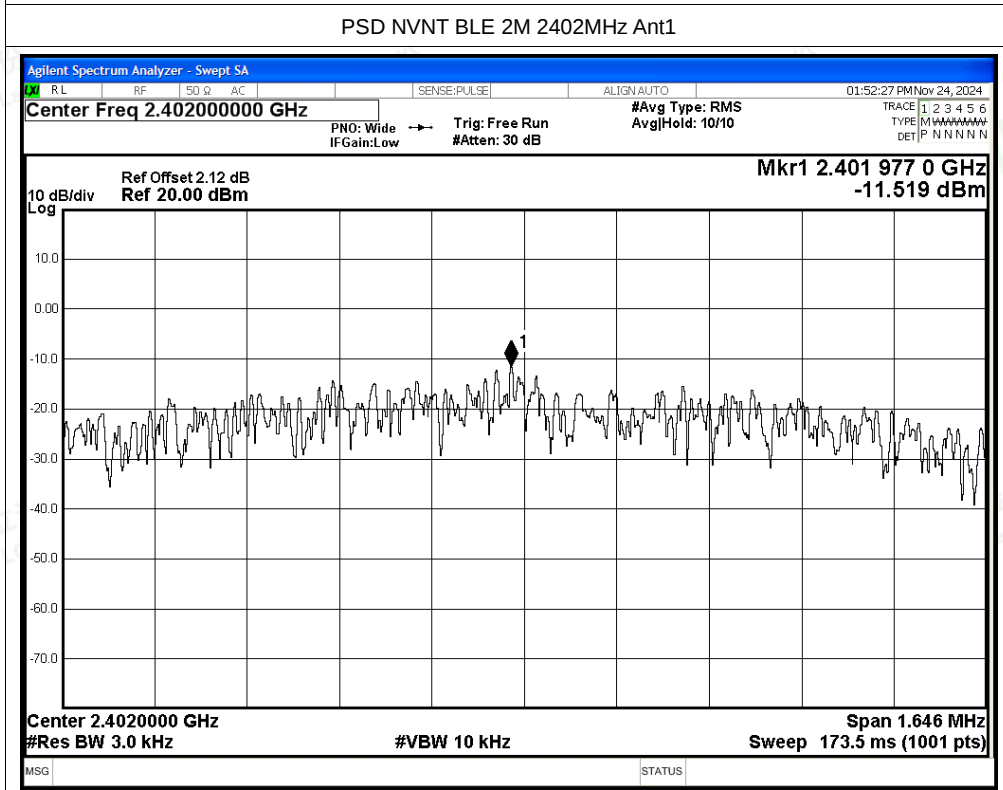
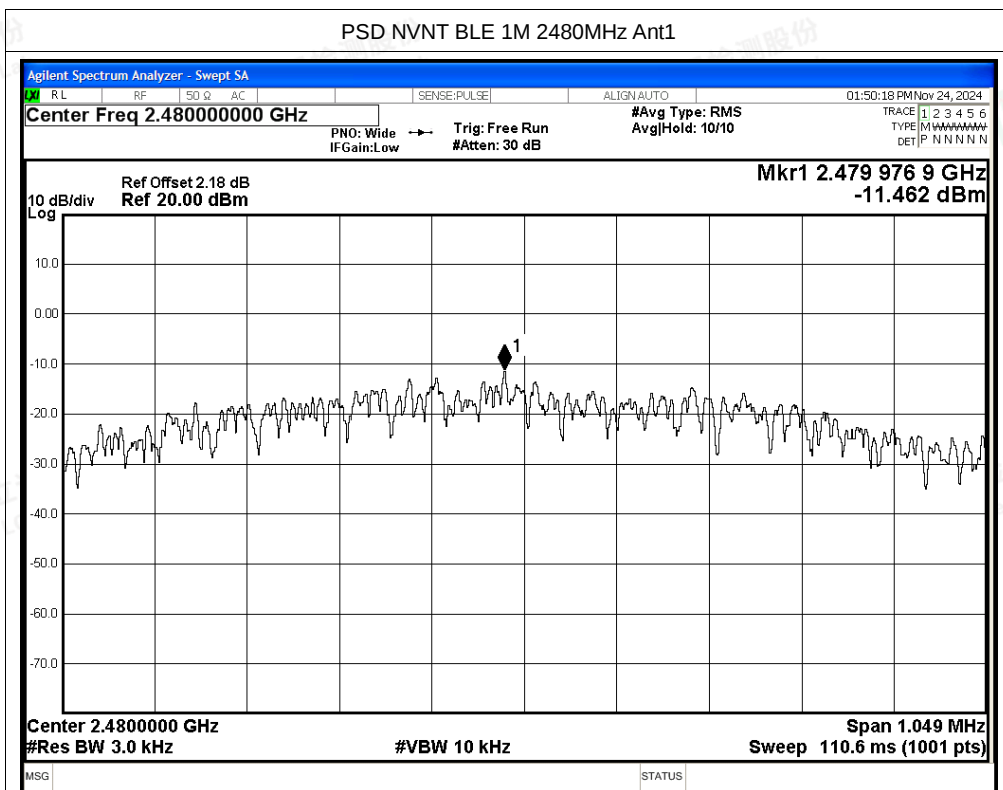


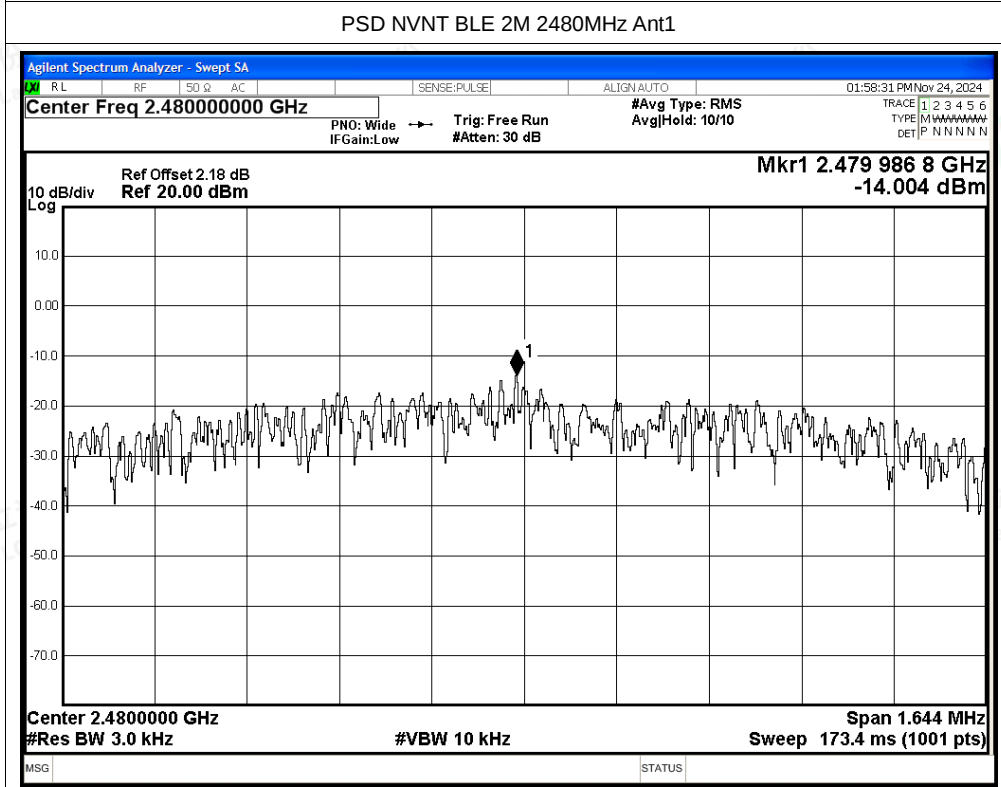
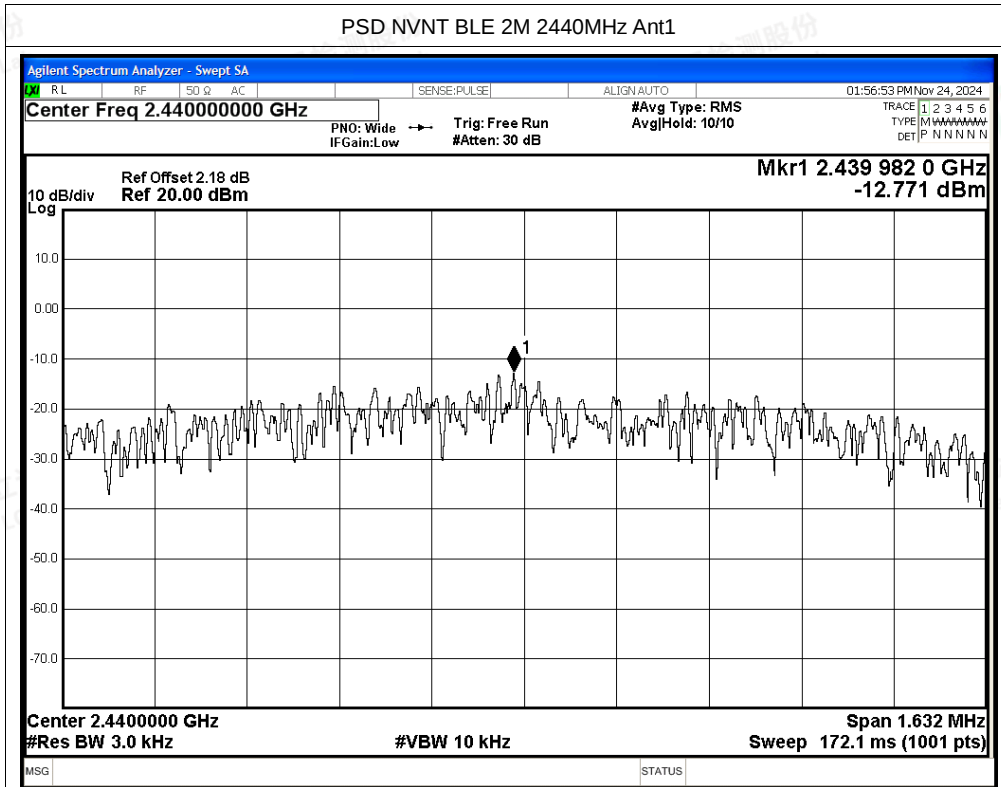
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B.4 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-56.18	-20	Pass
NVNT	BLE 1M	2480	Ant1	-58.39	-20	Pass
NVNT	BLE 2M	2402	Ant1	-30.15	-20	Pass
NVNT	BLE 2M	2480	Ant1	-58.54	-20	Pass

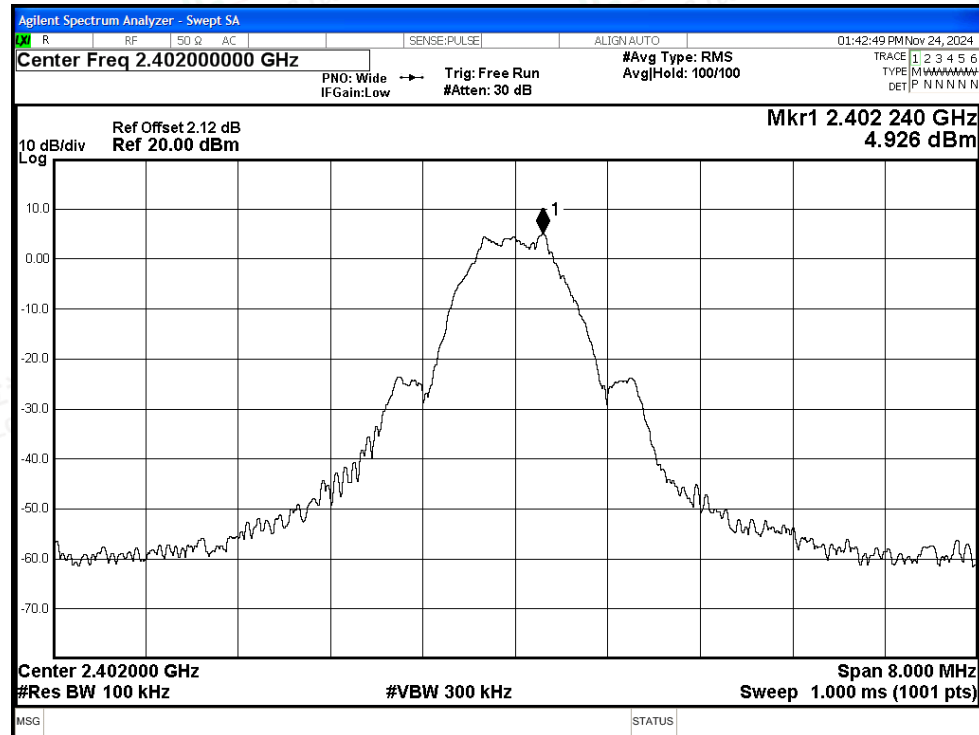


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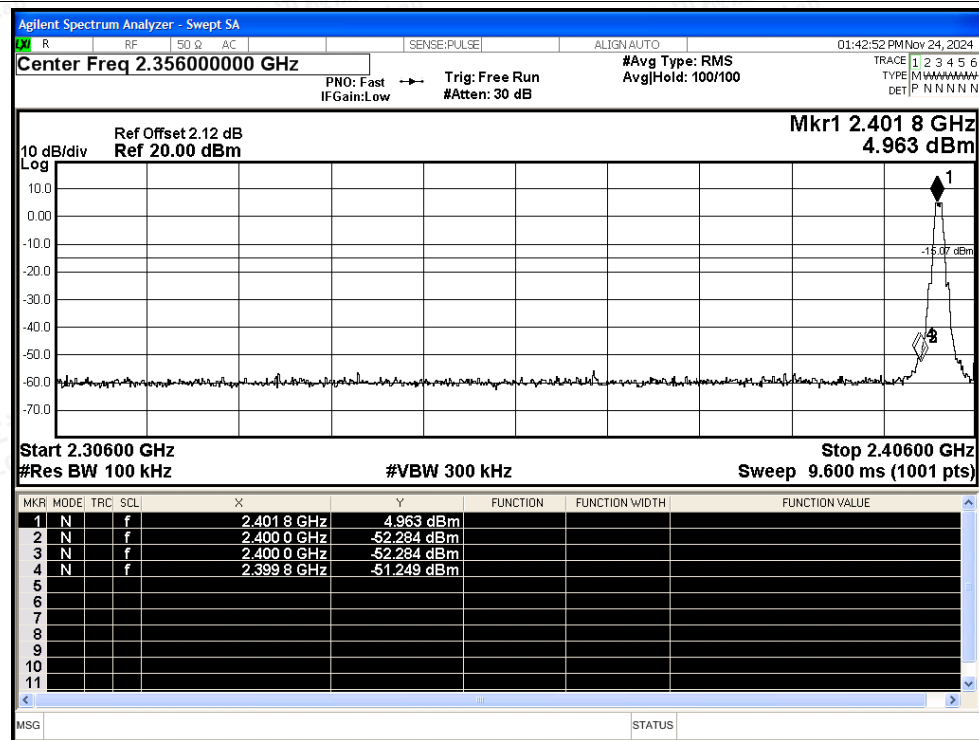


Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



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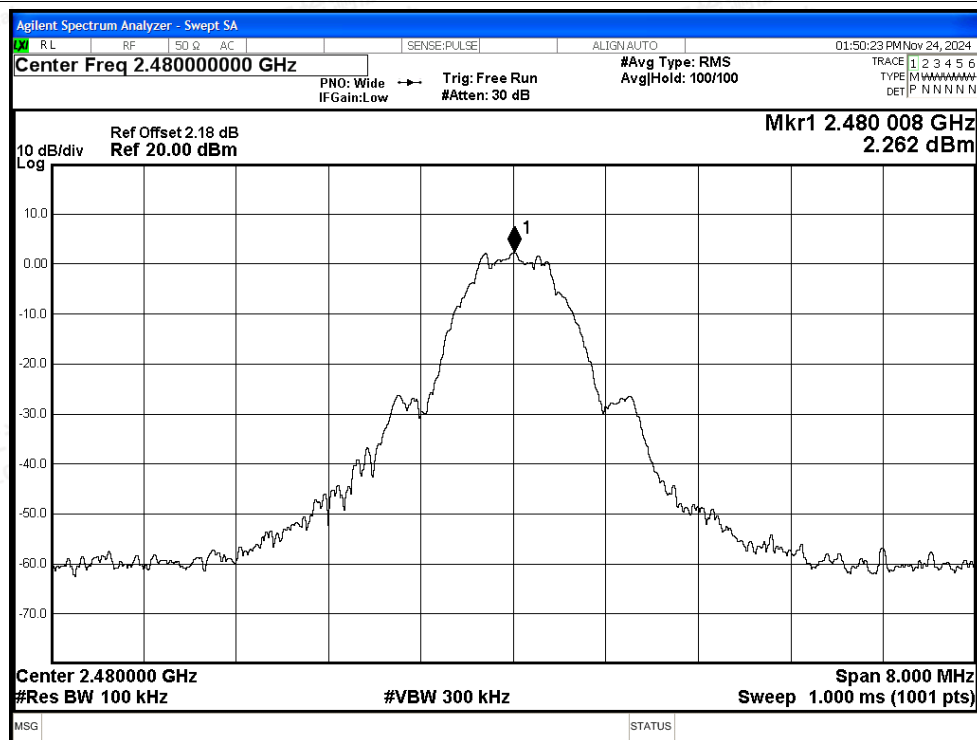
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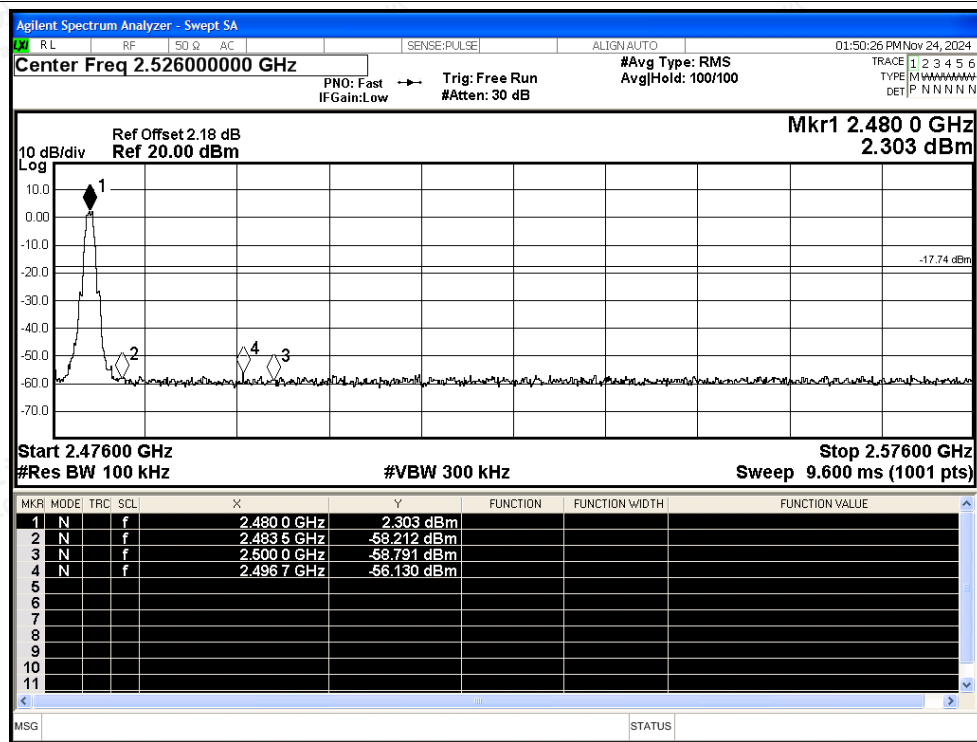
Scan code to check authenticity



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



Band Edge NVNT BLE 1M 2480MHz Ant1 Emission

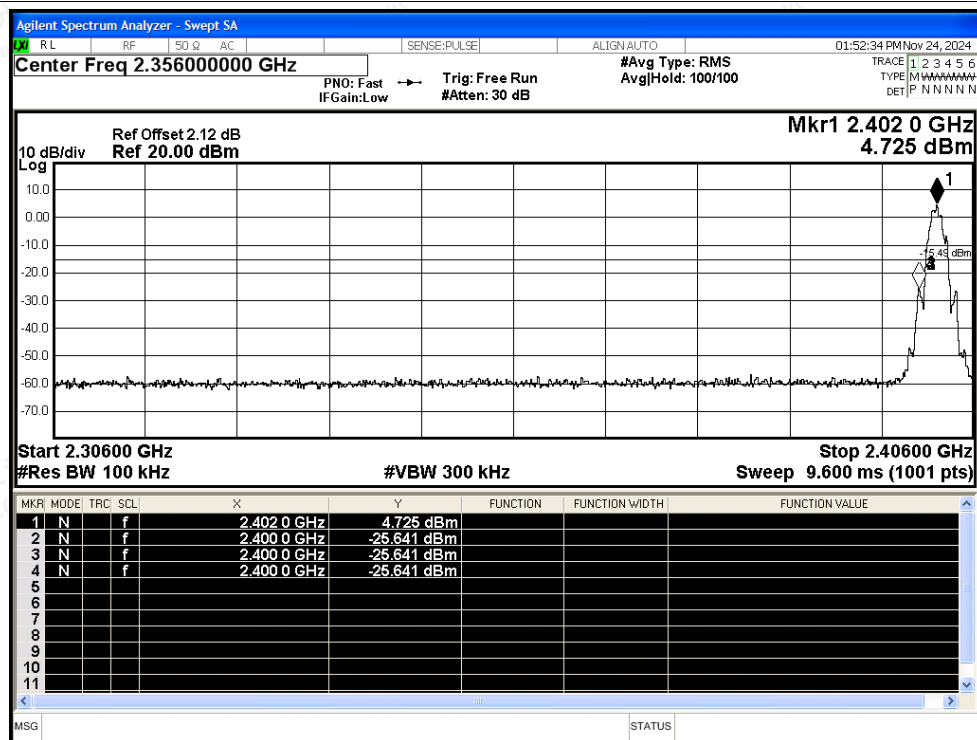




Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



Band Edge NVNT BLE 2M 2402MHz Ant1 Emission



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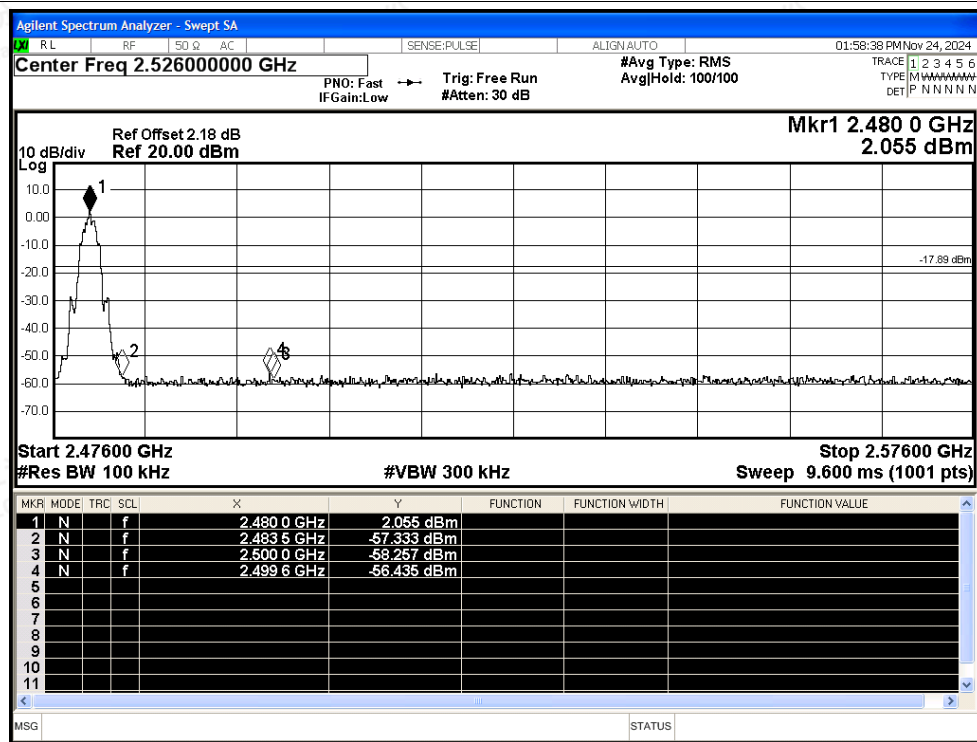
Scan code to check authenticity



Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



Band Edge NVNT BLE 2M 2480MHz Ant1 Emission



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B.5 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-59.76	-20	Pass
NVNT	BLE 1M	2440	Ant1	-58.67	-20	Pass
NVNT	BLE 1M	2480	Ant1	-55.99	-20	Pass
NVNT	BLE 2M	2402	Ant1	-59.81	-20	Pass
NVNT	BLE 2M	2440	Ant1	-59.07	-20	Pass
NVNT	BLE 2M	2480	Ant1	-50.18	-20	Pass

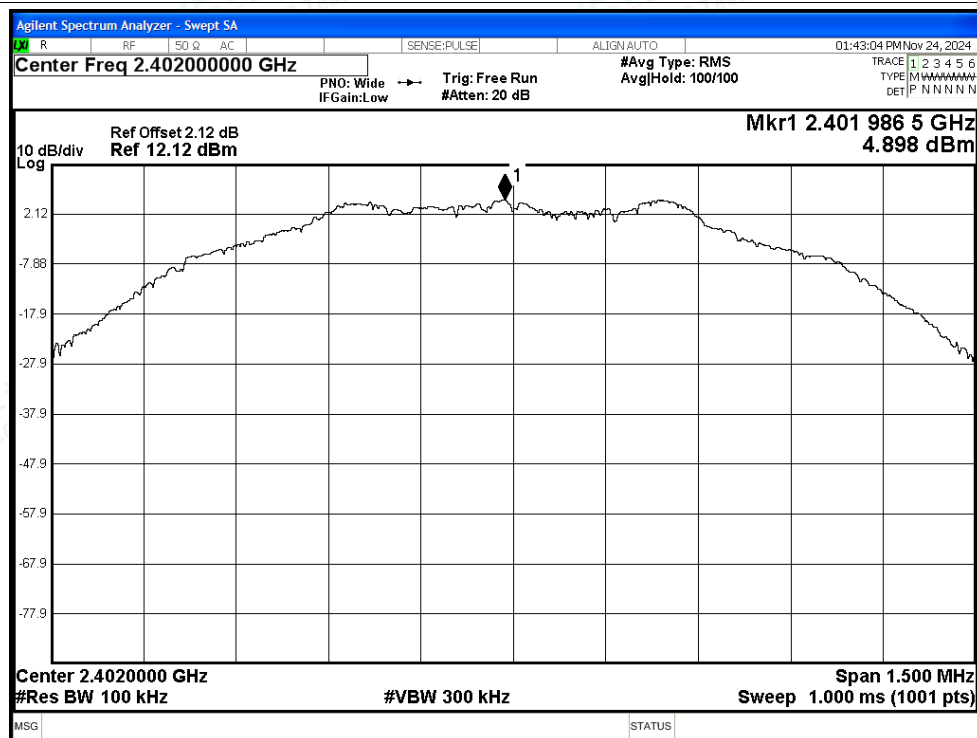


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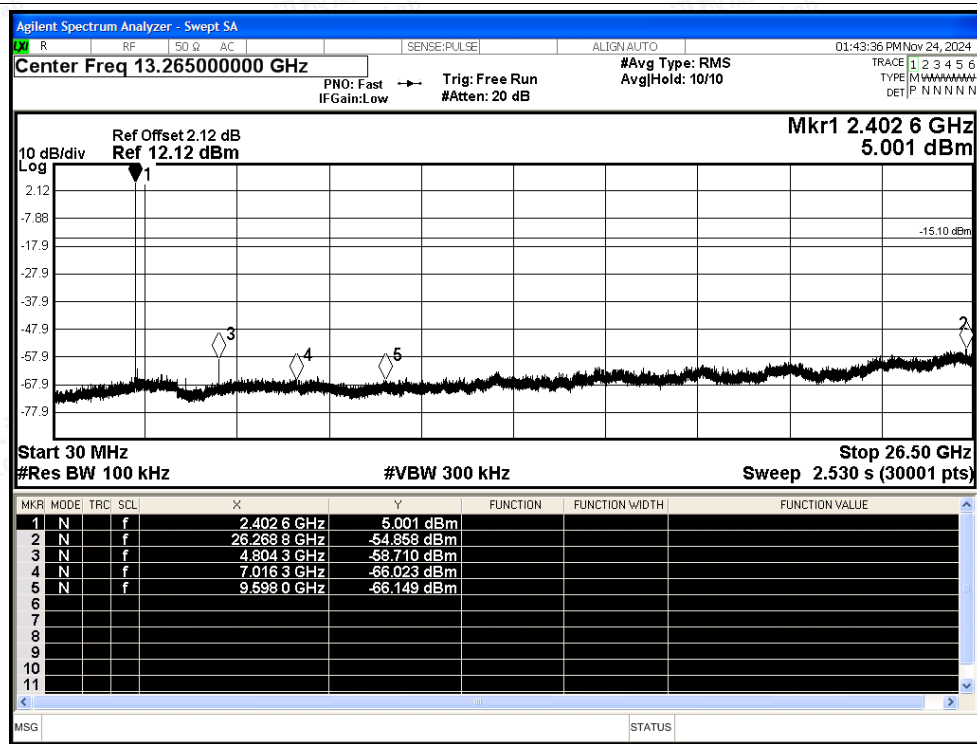


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



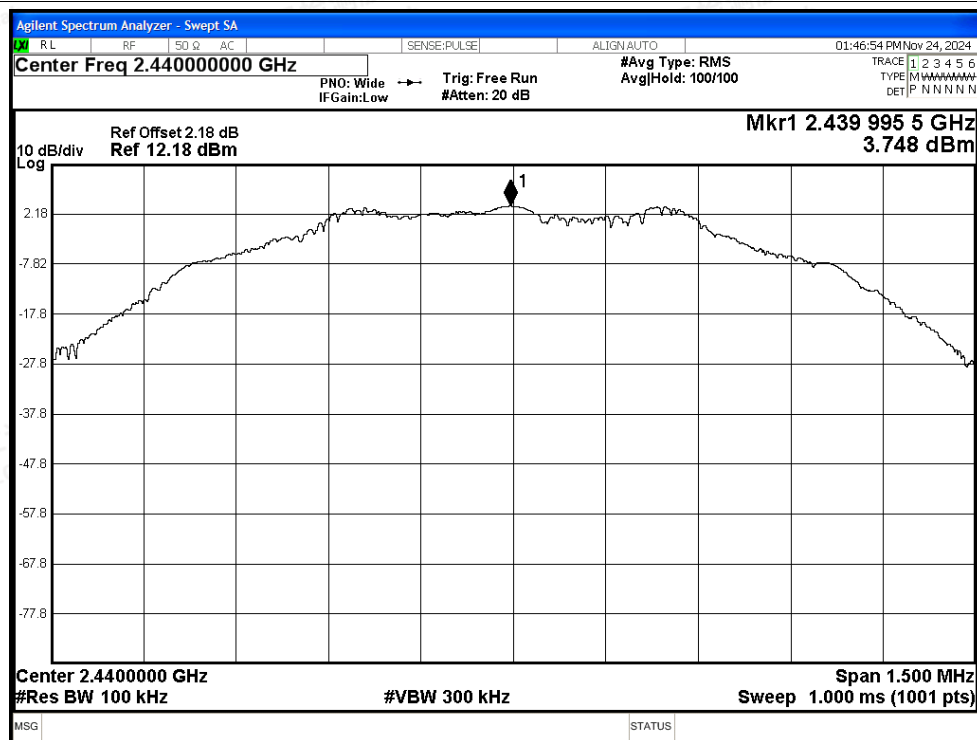
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



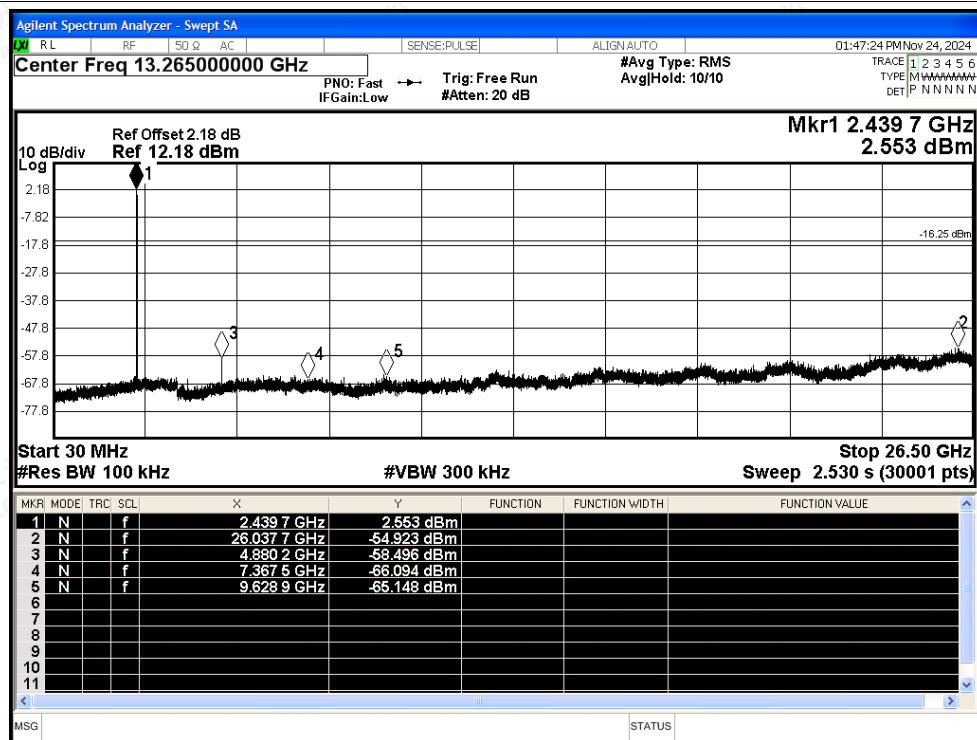
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Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



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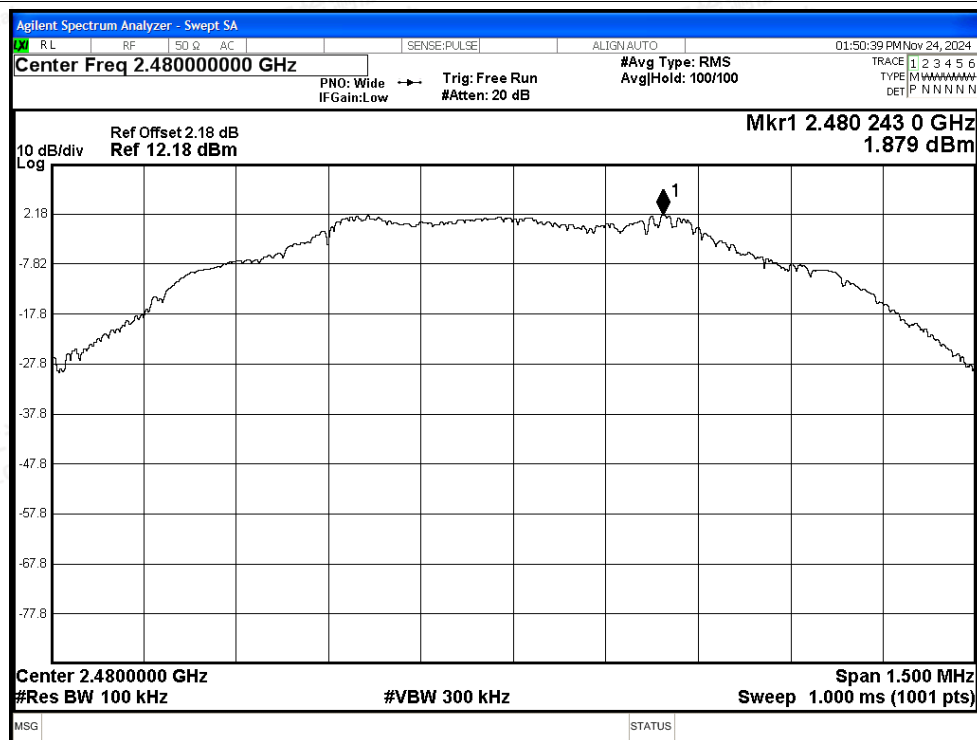
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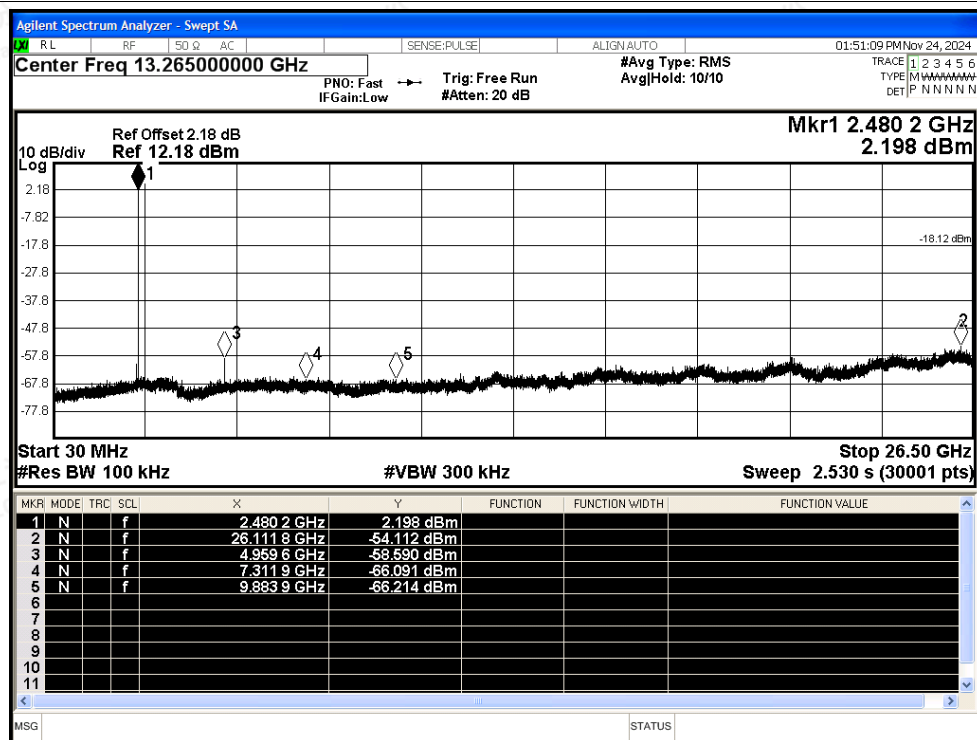
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Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



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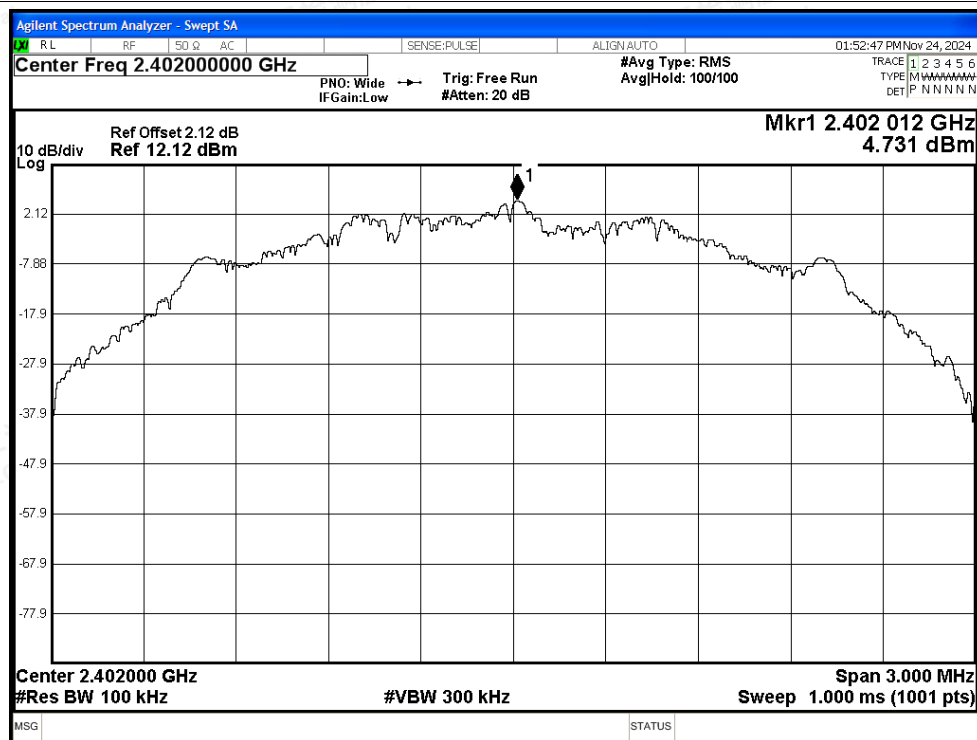
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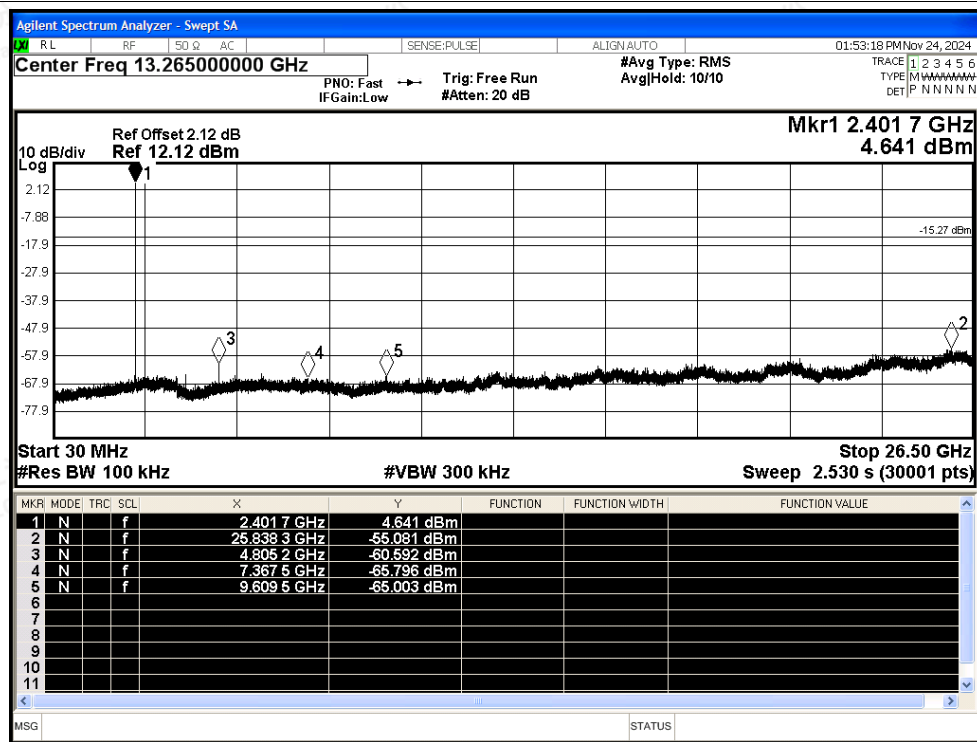
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Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref

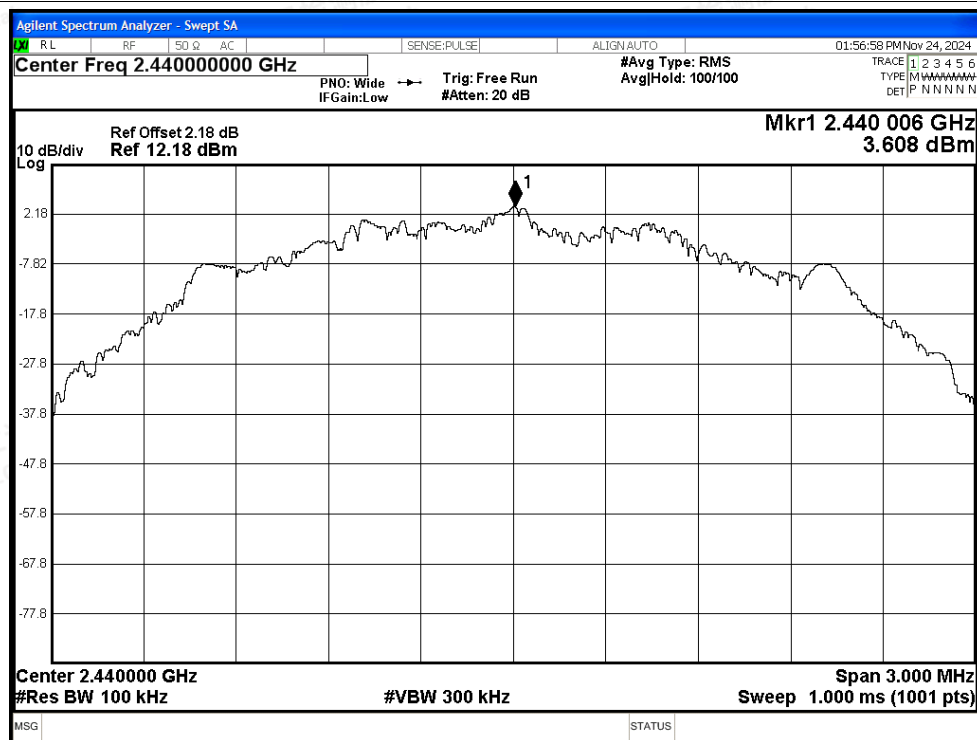


Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission

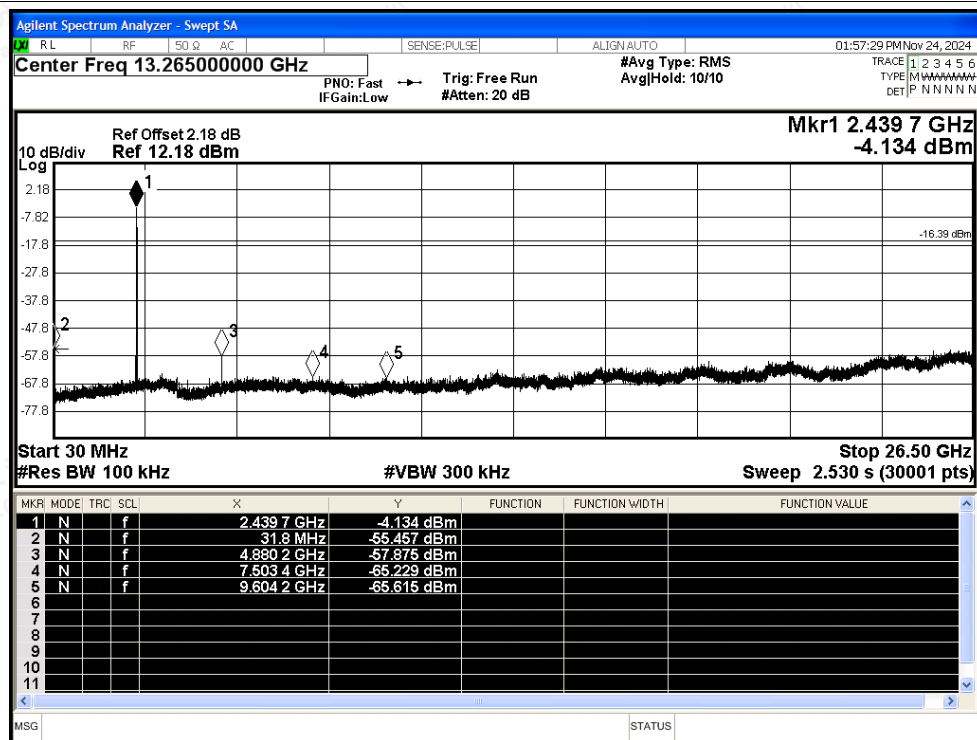




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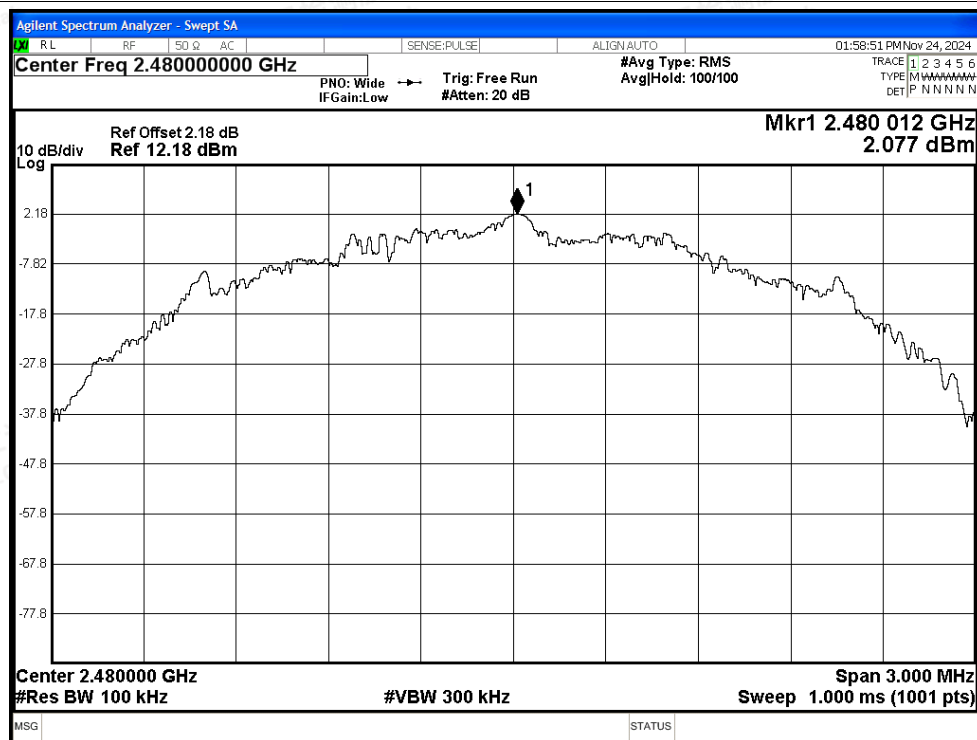


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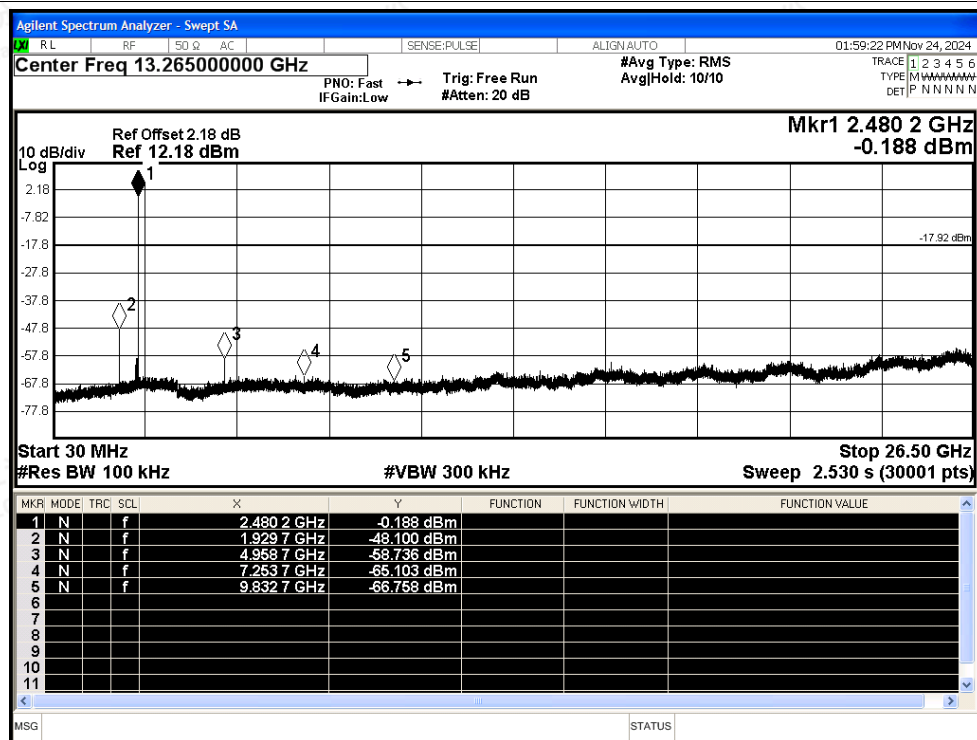




Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission



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B.6 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	63.37	1.98	2.56
NVNT	BLE 1M	2440	Ant1	63.27	1.99	2.56
NVNT	BLE 1M	2480	Ant1	63.17	1.99	2.56
NVNT	BLE 2M	2402	Ant1	33.17	4.79	4.85
NVNT	BLE 2M	2440	Ant1	33.17	4.79	4.85
NVNT	BLE 2M	2480	Ant1	33.33	4.77	4.83

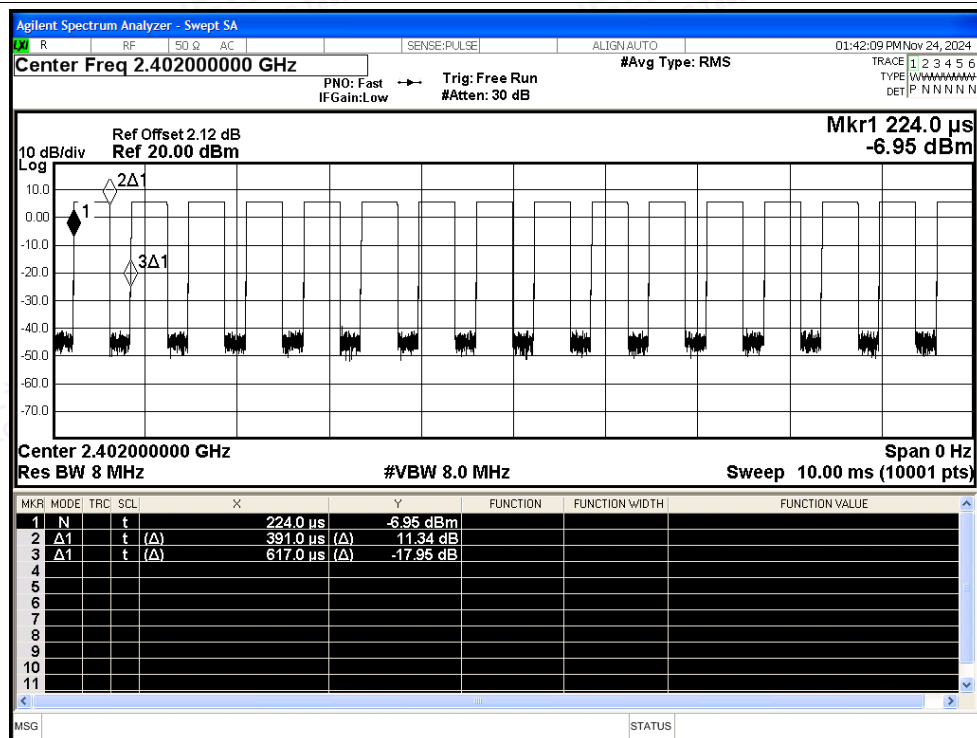


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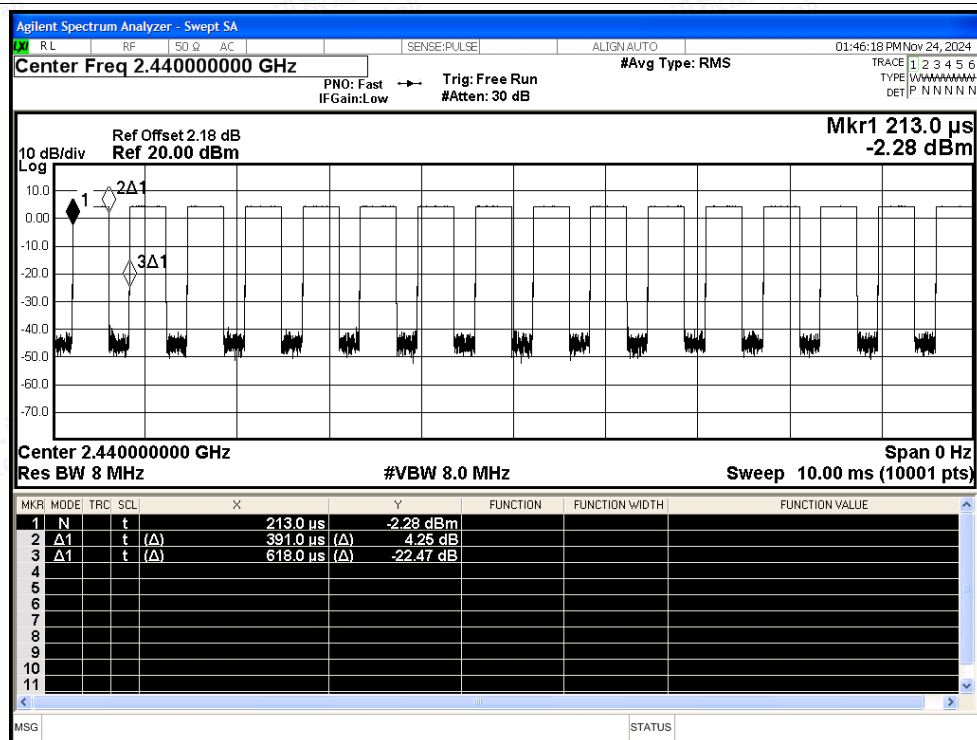


Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1



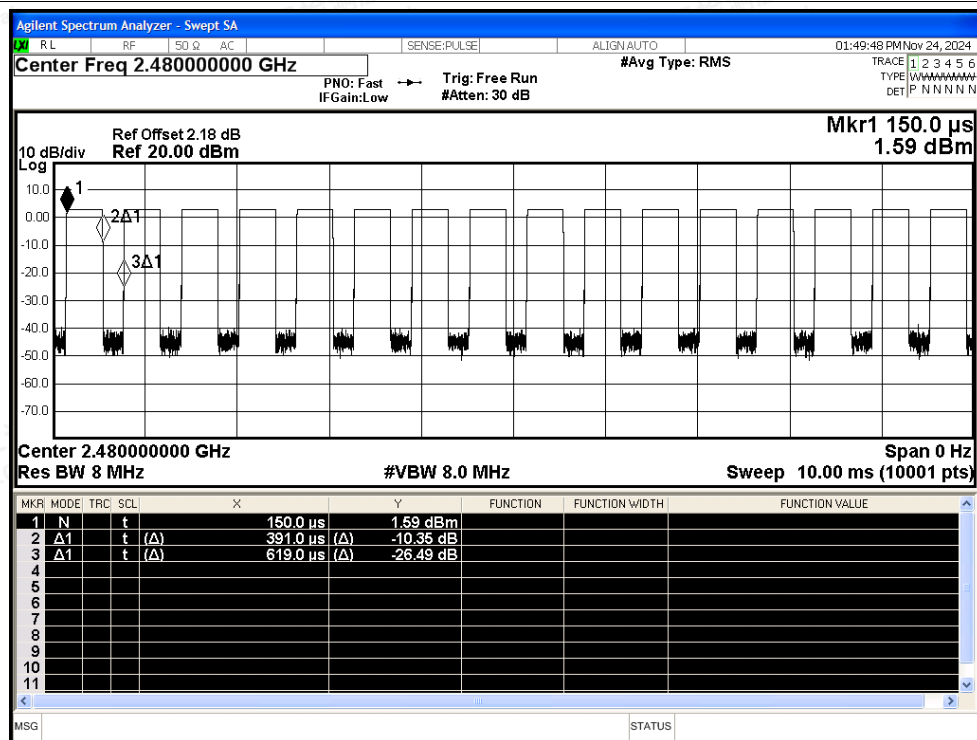
Duty Cycle NVNT BLE 1M 2440MHz Ant1



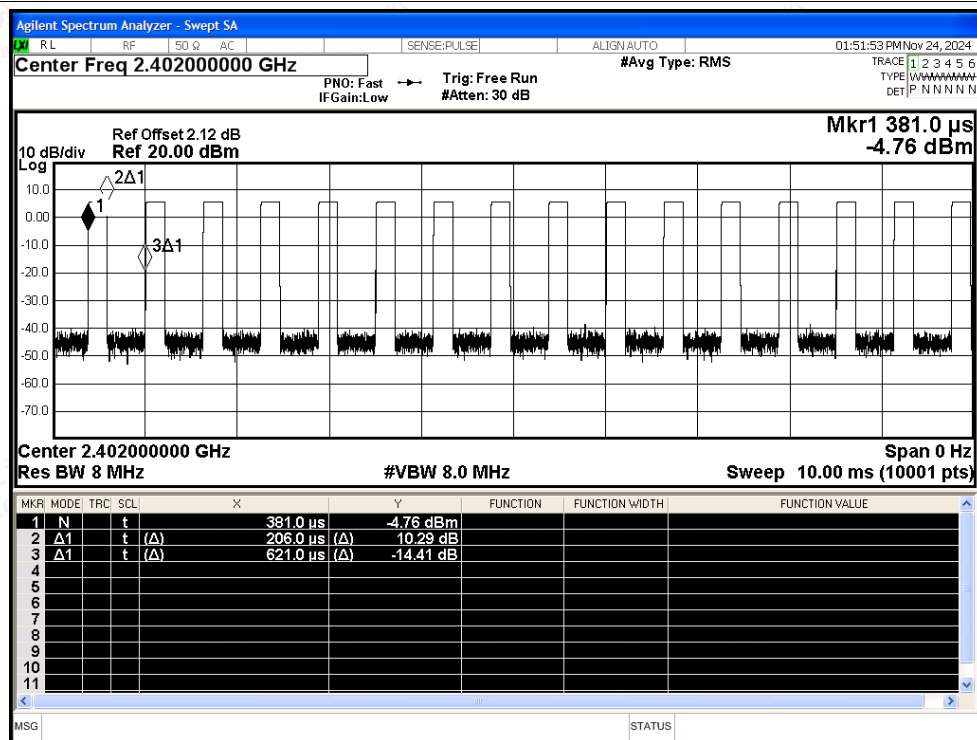
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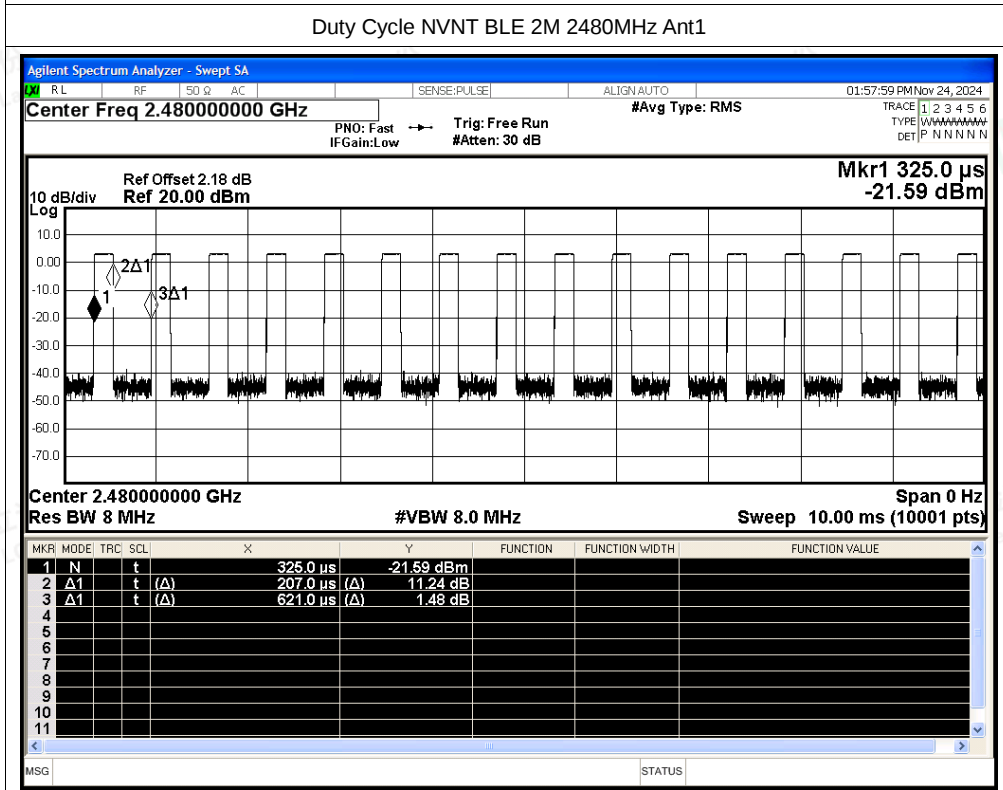
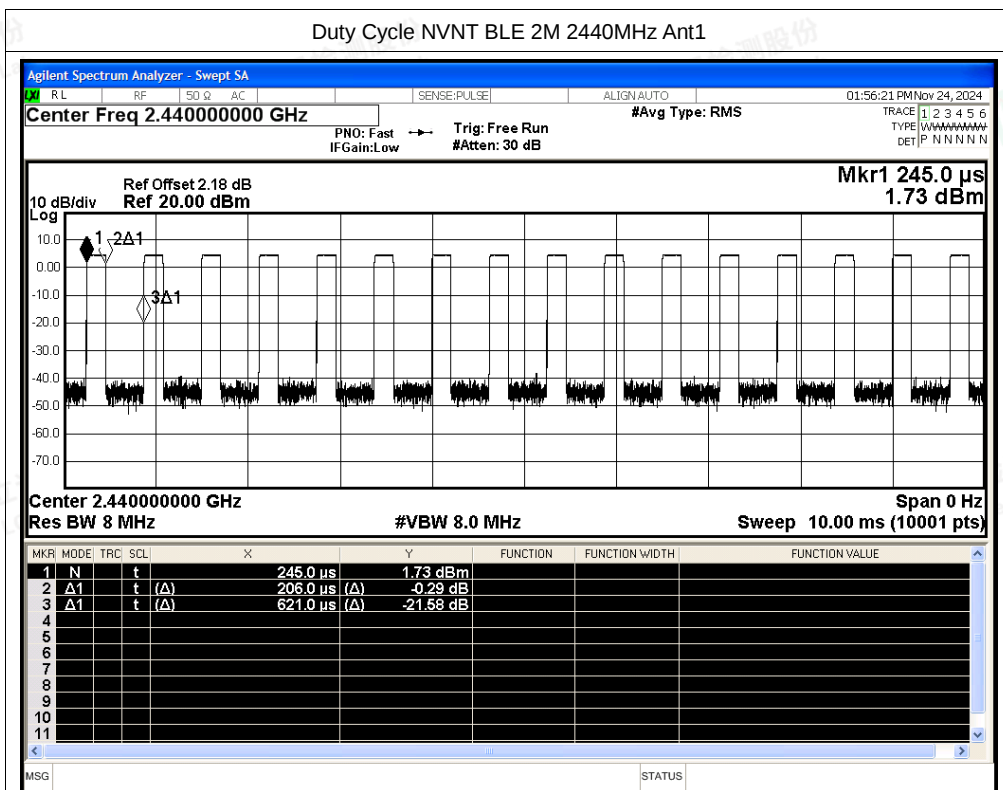


Duty Cycle NVNT BLE 1M 2480MHz Ant1



Duty Cycle NVNT BLE 2M 2402MHz Ant1







B.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	BLE 1M	2402	Ant1	2310	-50.04	2.21	-	47.43	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-58.36	2.21	1.98	41.09	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2374.8	-47.18	2.21	-	50.29	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2383.056	-57.56	2.21	1.98	41.89	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-50.03	2.21	-	47.44	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-58.08	2.21	1.98	41.37	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-49.11	2.21	-	48.36	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-57.43	2.21	1.99	42.03	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2496.688	-45.54	2.21	-	51.93	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.656	-56.81	2.21	1.99	42.65	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-48.49	2.21	-	48.98	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.35	2.21	1.99	41.11	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2310	-51.92	2.21	-	45.55	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2310	-58.47	2.21	4.79	43.79	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2328.336	-46.51	2.21	-	50.96	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2373.744	-57.49	2.21	4.79	44.77	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2390	-50.85	2.21	-	46.62	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2390	-58.07	2.21	4.79	44.19	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2483.5	-45.17	2.21	-	52.30	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2483.5	-55.69	2.21	4.77	46.55	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2483.656	-41.31	2.21	-	56.16	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2483.56	-55.06	2.21	4.77	47.18	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2500	-49	2.21	-	48.47	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2500	-58.35	2.21	4.77	43.89	Average	54	Pass

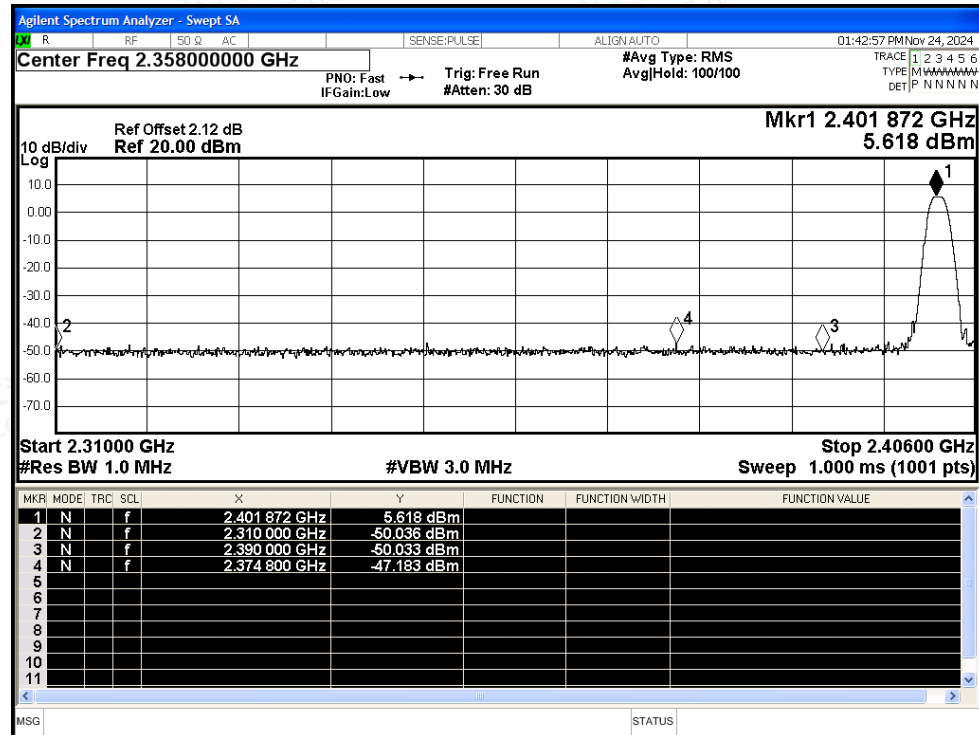


Shenzhen LCS Compliance Testing Laboratory Ltd.
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street,
Baoan District, Shenzhen, 518000, China
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity

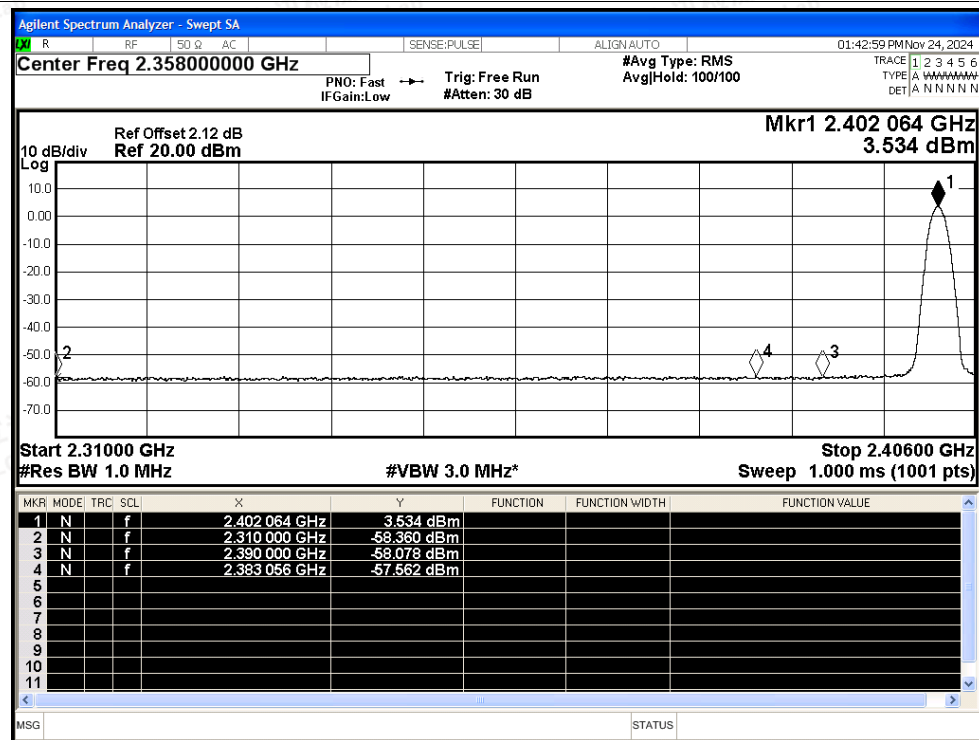


Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak

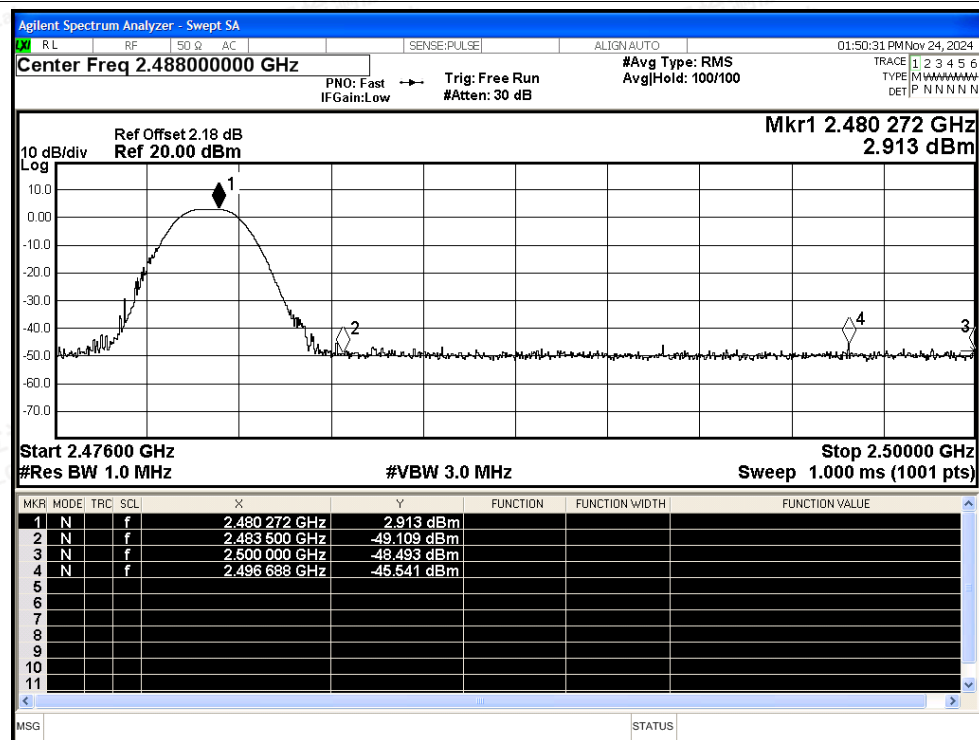


Restrict Band NVNT BLE 1M 2402MHz Ant1 Average

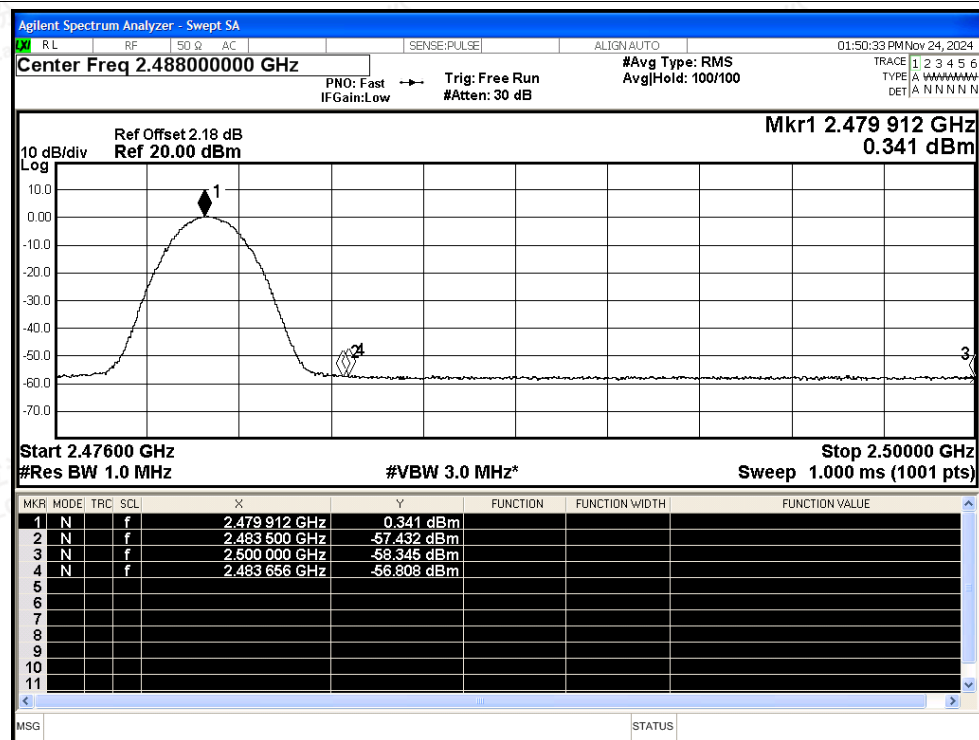




Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak

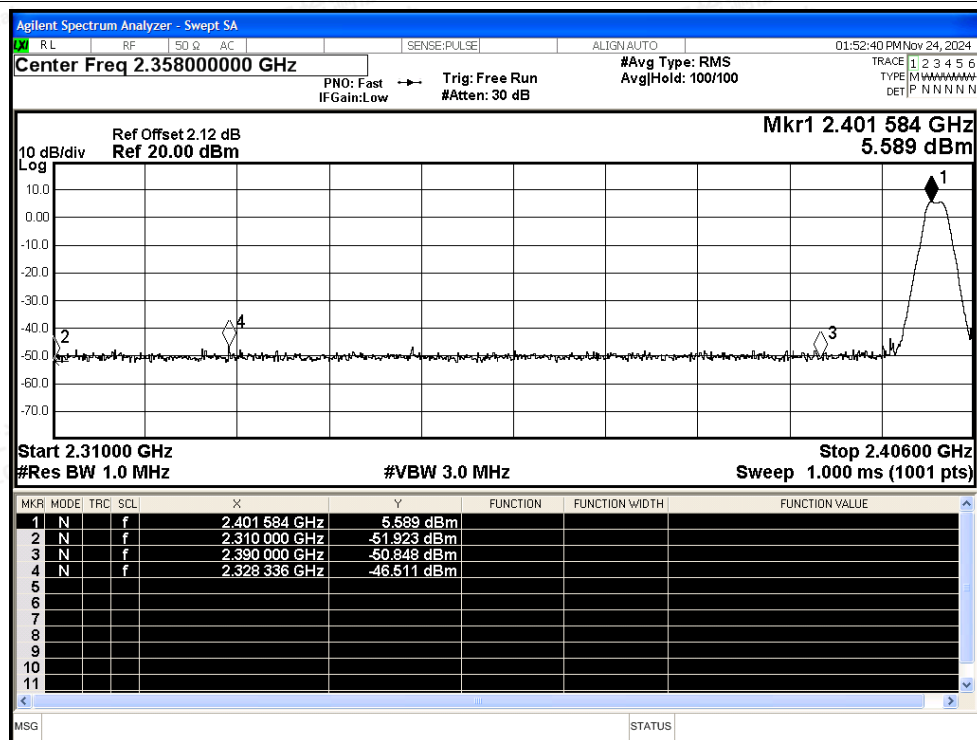


Restrict Band NVNT BLE 1M 2480MHz Ant1 Average

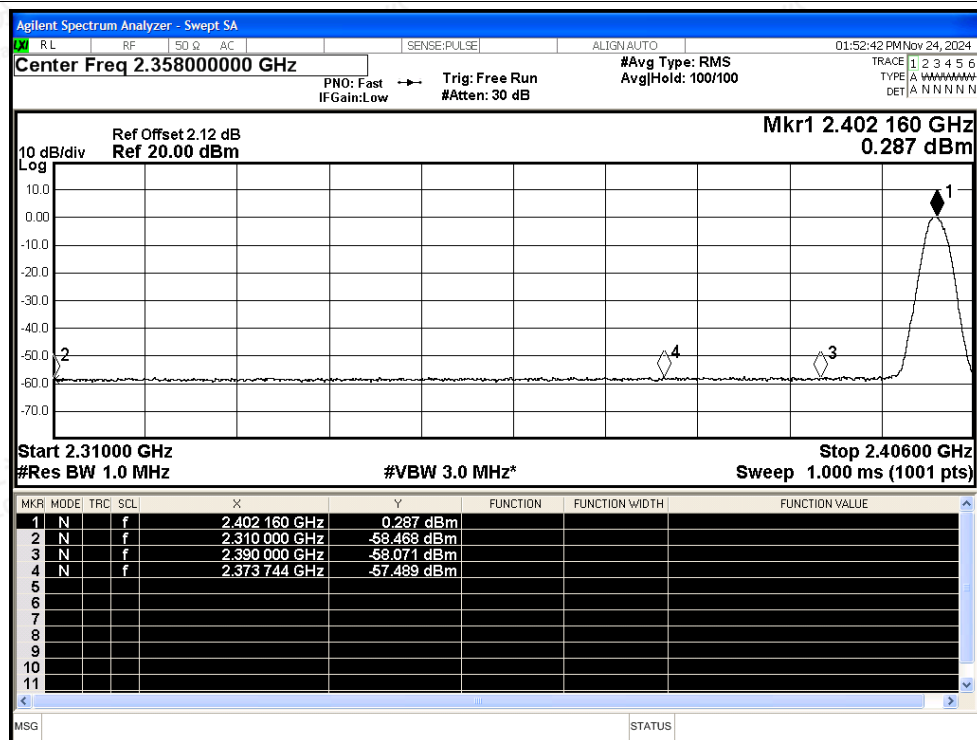




Restrict Band NVNT BLE 2M 2402MHz Ant1 Peak

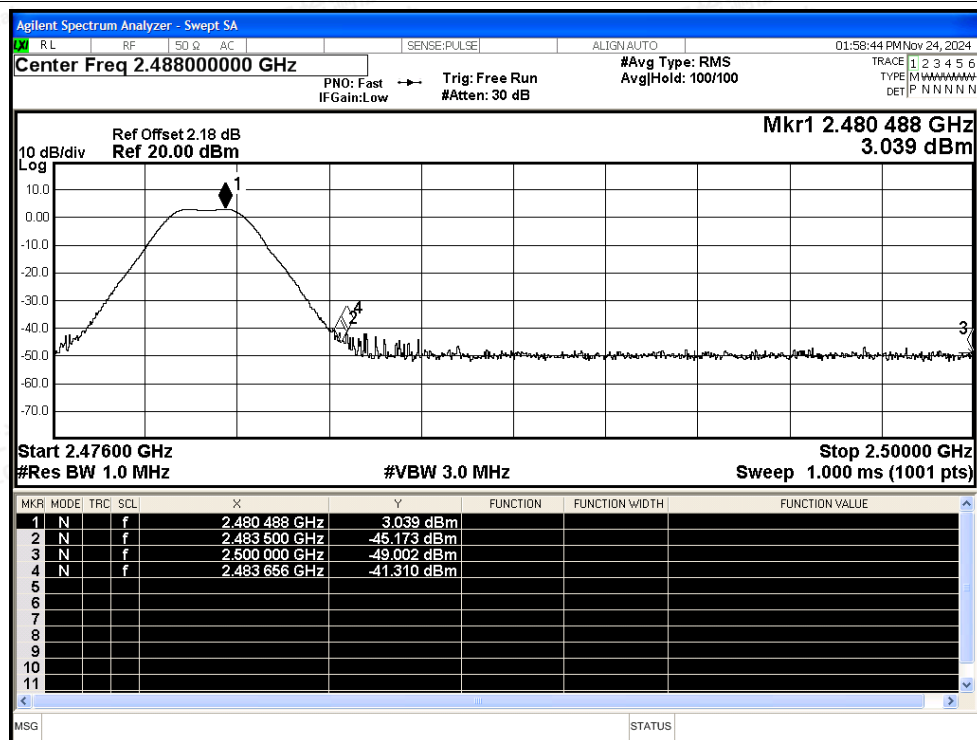


Restrict Band NVNT BLE 2M 2402MHz Ant1 Average





Restrict Band NVNT BLE 2M 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2M 2480MHz Ant1 Average

