



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Formuler Z12 Pro

Test Model: Z12 Pro

Environmental Conditions

Temperature:	24.8°C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Jerry Chu
Supervised by:	Can Kun

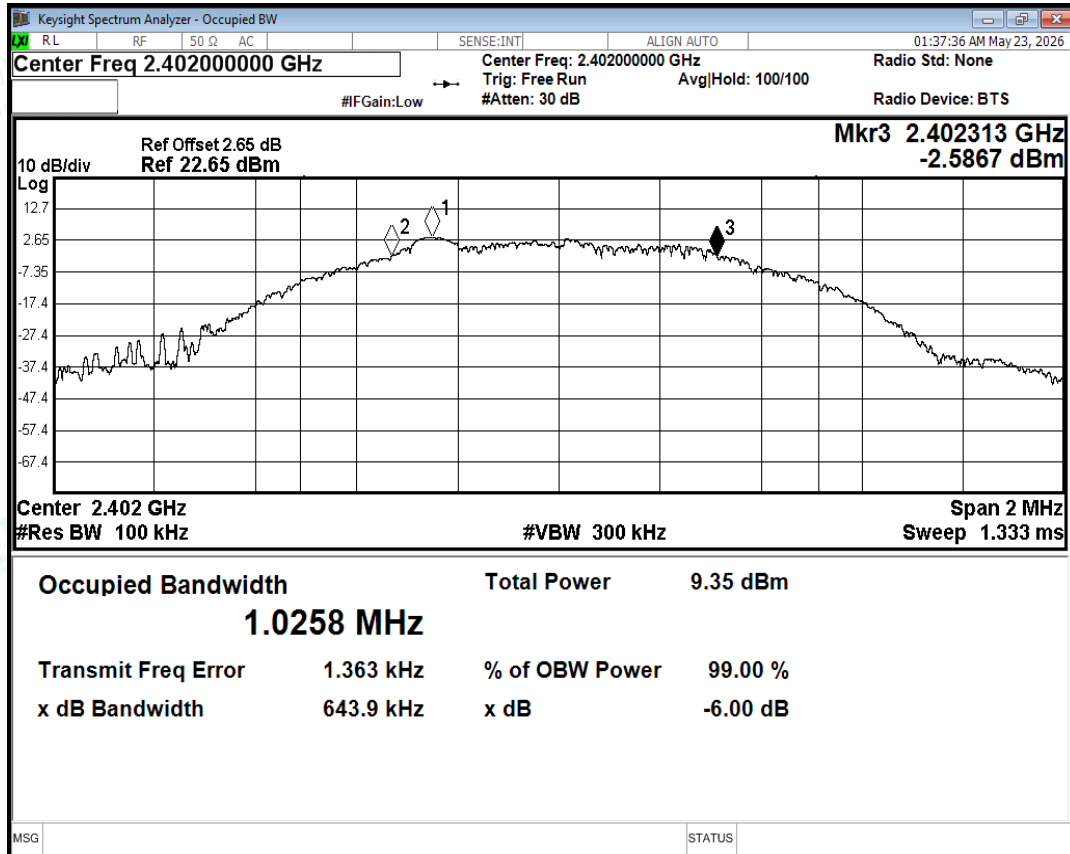




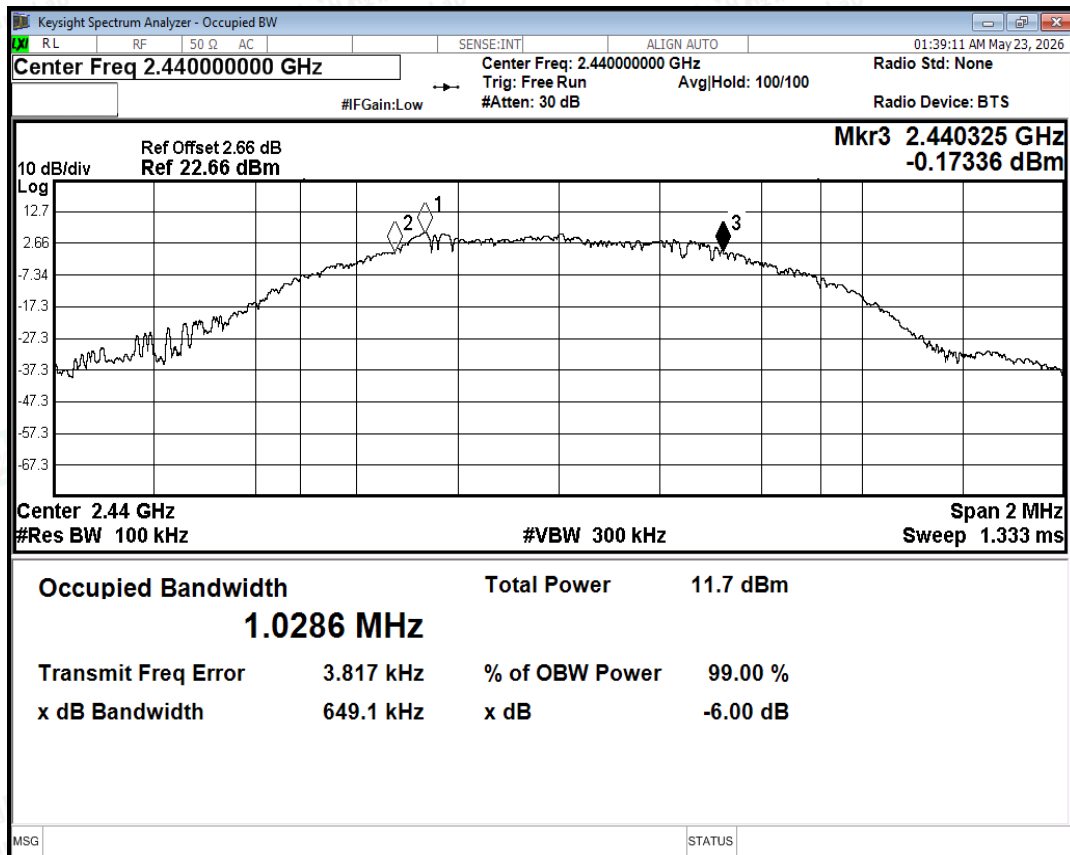
B.1 -6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant	0.6439	0.5	Pass
NVNT	BLE 1M	2440	Ant	0.6491	0.5	Pass
NVNT	BLE 1M	2480	Ant	0.6517	0.5	Pass
NVNT	BLE 2M	2402	Ant	1.133	0.5	Pass
NVNT	BLE 2M	2440	Ant	1.13	0.5	Pass
NVNT	BLE 2M	2480	Ant	1.119	0.5	Pass





-6dB Bandwidth NVNT BLE 1M 2402MHz Ant



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant

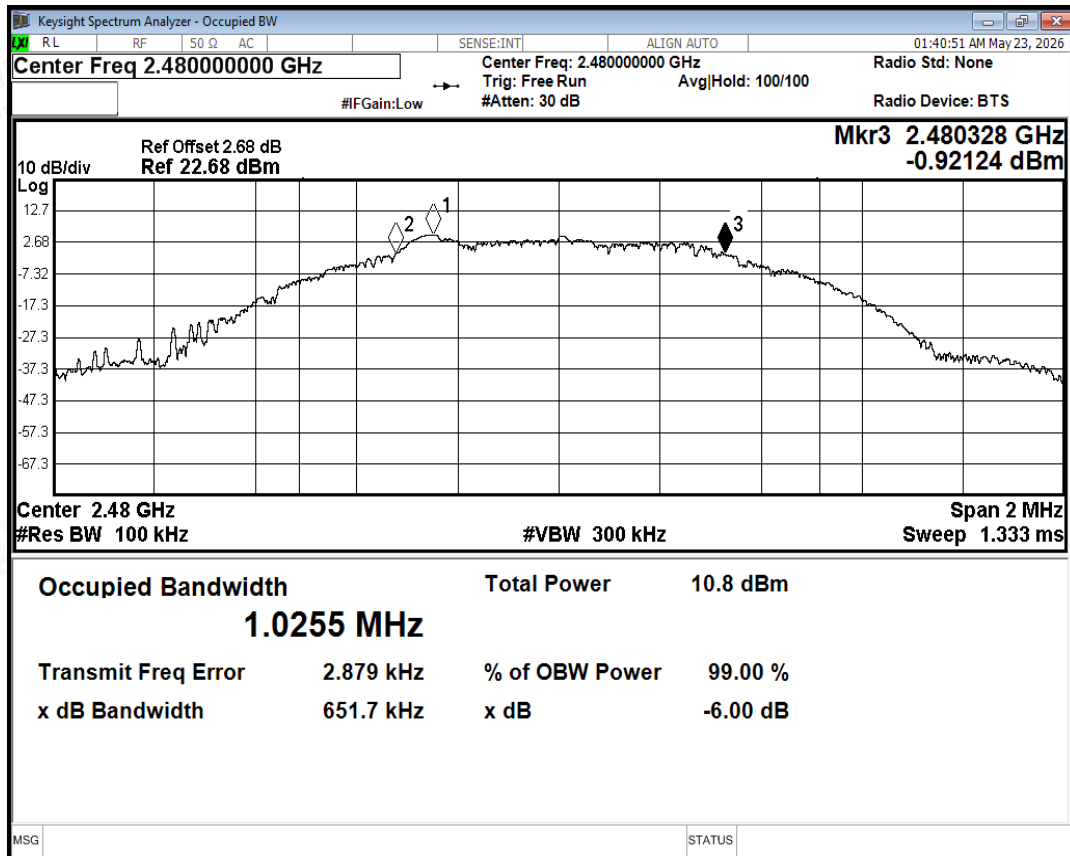


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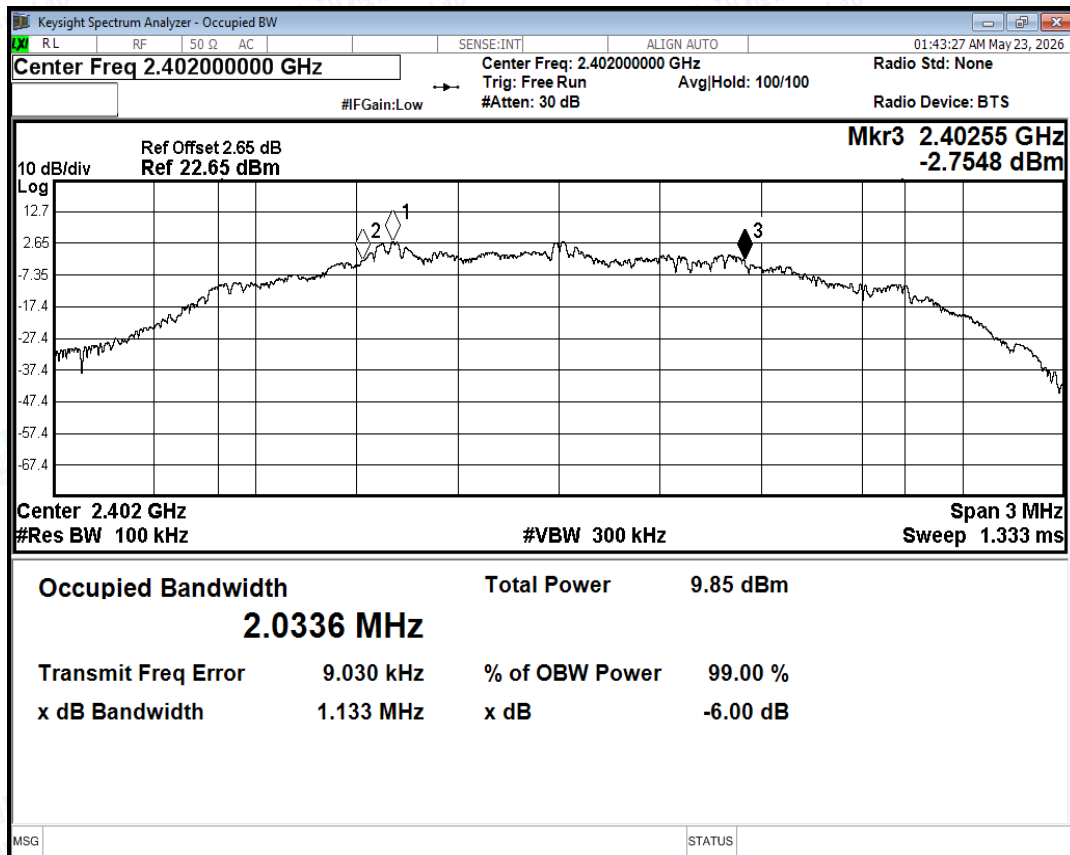
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-6dB Bandwidth NVNT BLE 1M 2480MHz Ant



-6dB Bandwidth NVNT BLE 2M 2402MHz Ant

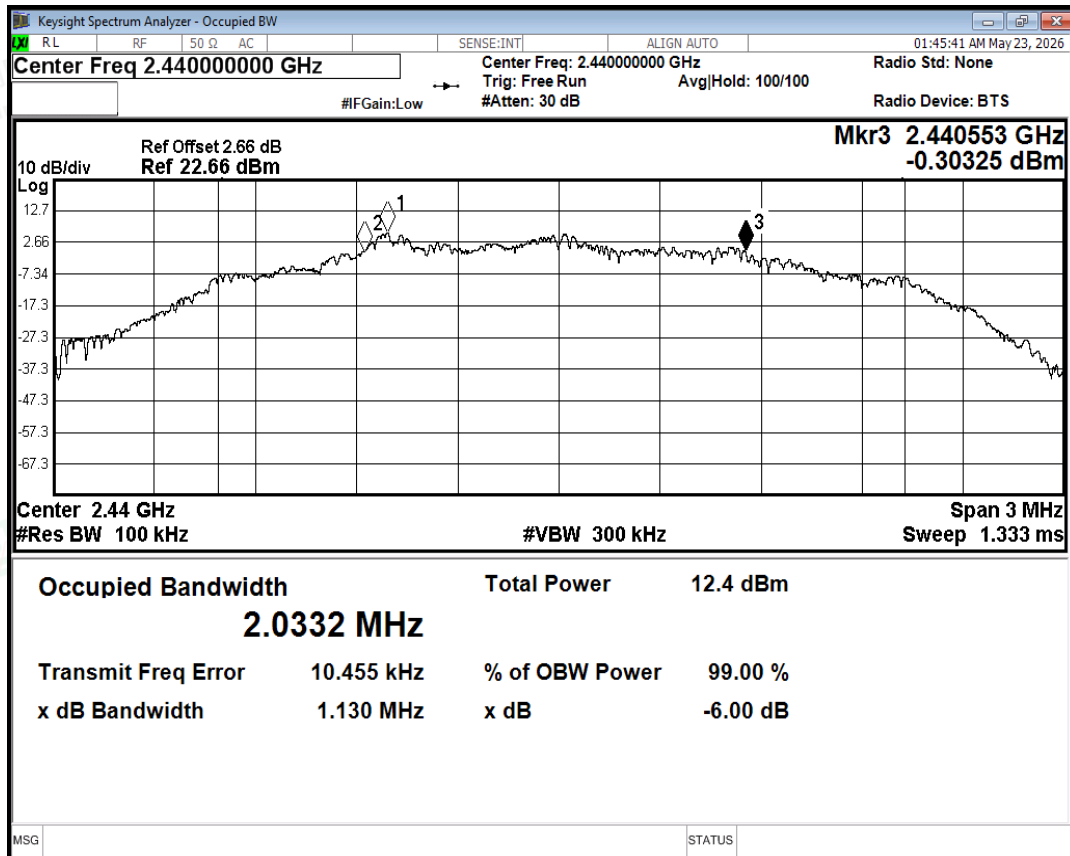


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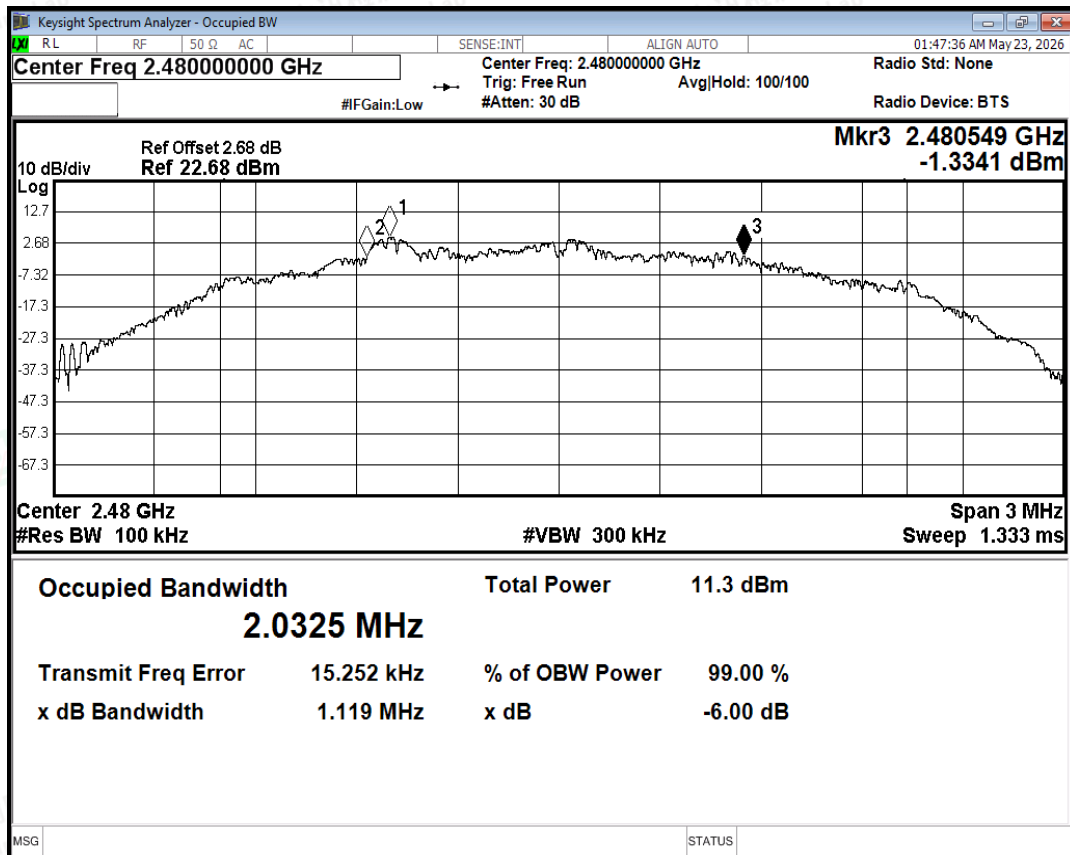
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-6dB Bandwidth NVNT BLE 2M 2440MHz Ant



-6dB Bandwidth NVNT BLE 2M 2480MHz Ant



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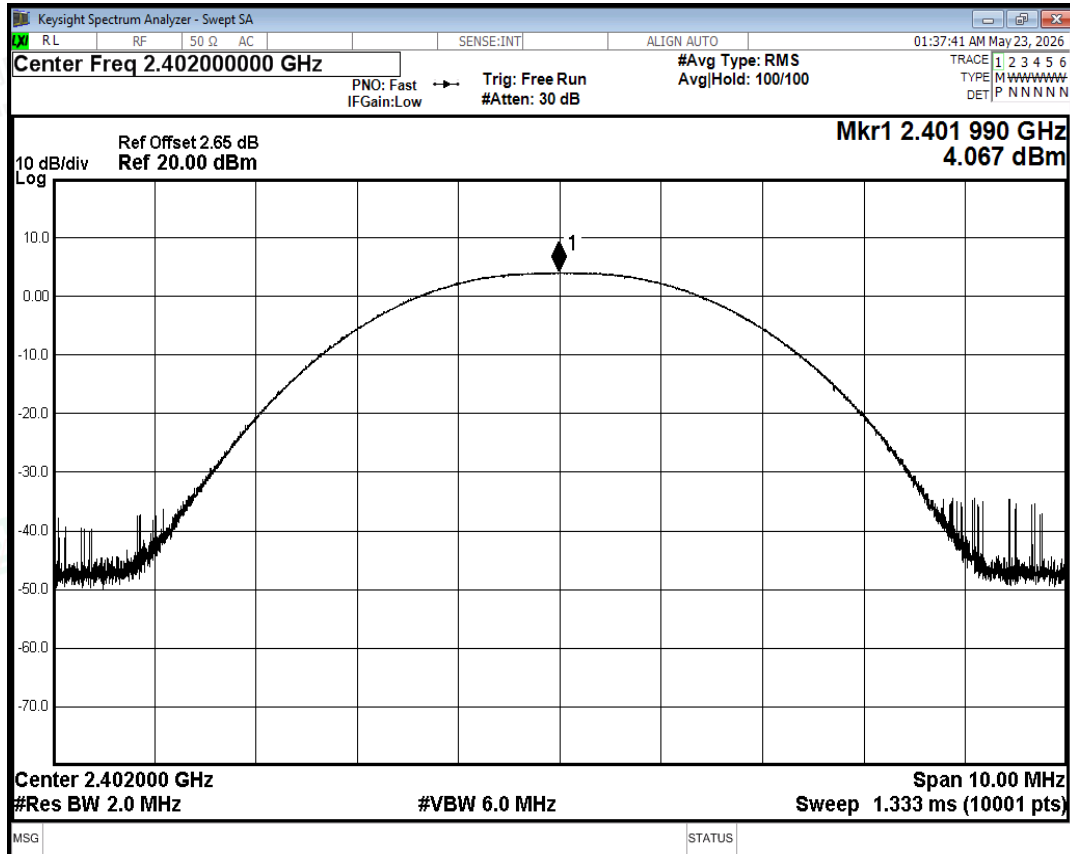
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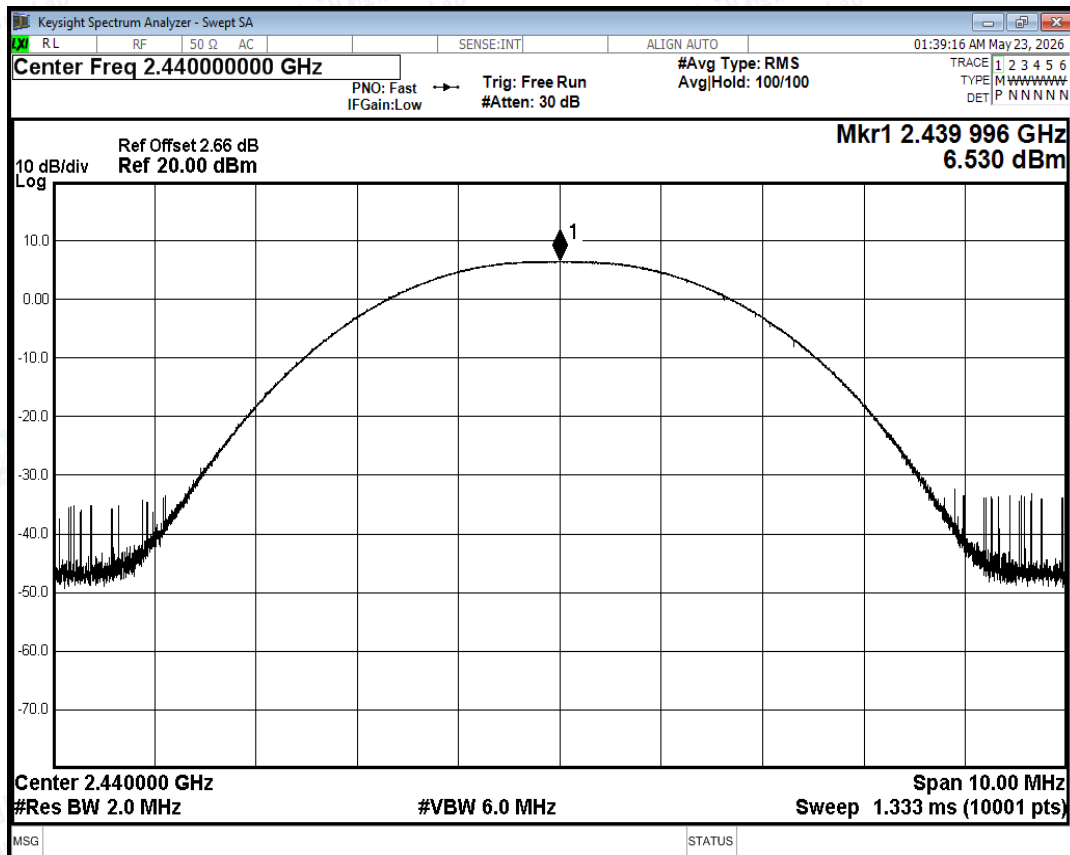
B.2 Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant	4.07	30	Pass
NVNT	BLE 1M	2440	Ant	6.53	30	Pass
NVNT	BLE 1M	2480	Ant	5.46	30	Pass
NVNT	BLE 2M	2402	Ant	4.03	30	Pass
NVNT	BLE 2M	2440	Ant	6.41	30	Pass
NVNT	BLE 2M	2480	Ant	5.28	30	Pass



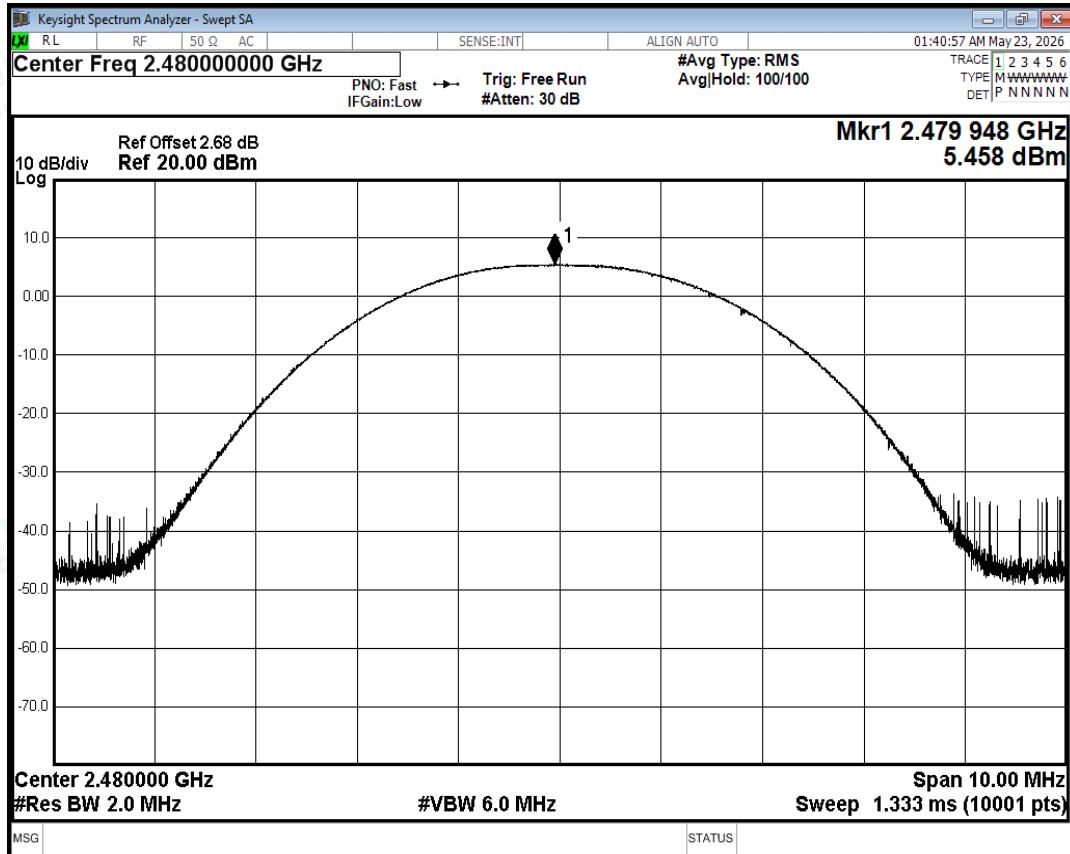


Peak Power NVNT BLE 1M 2402MHz Ant

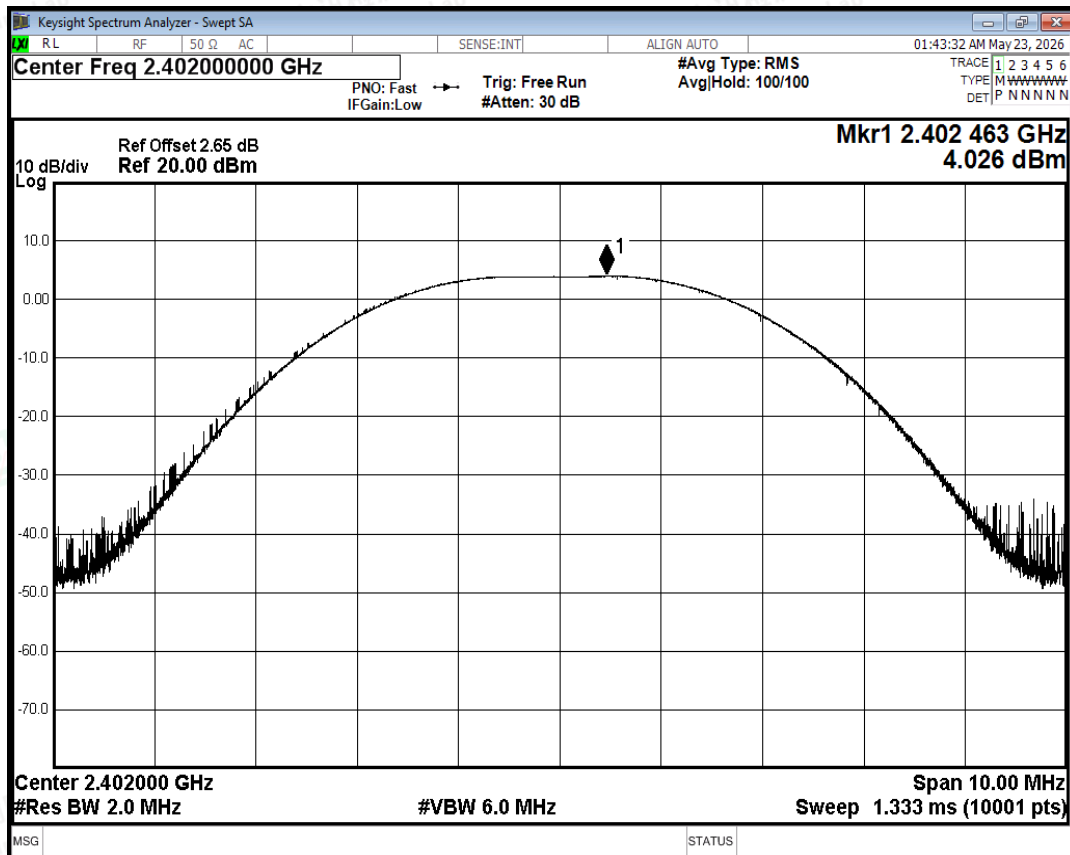


Peak Power NVNT BLE 1M 2440MHz Ant



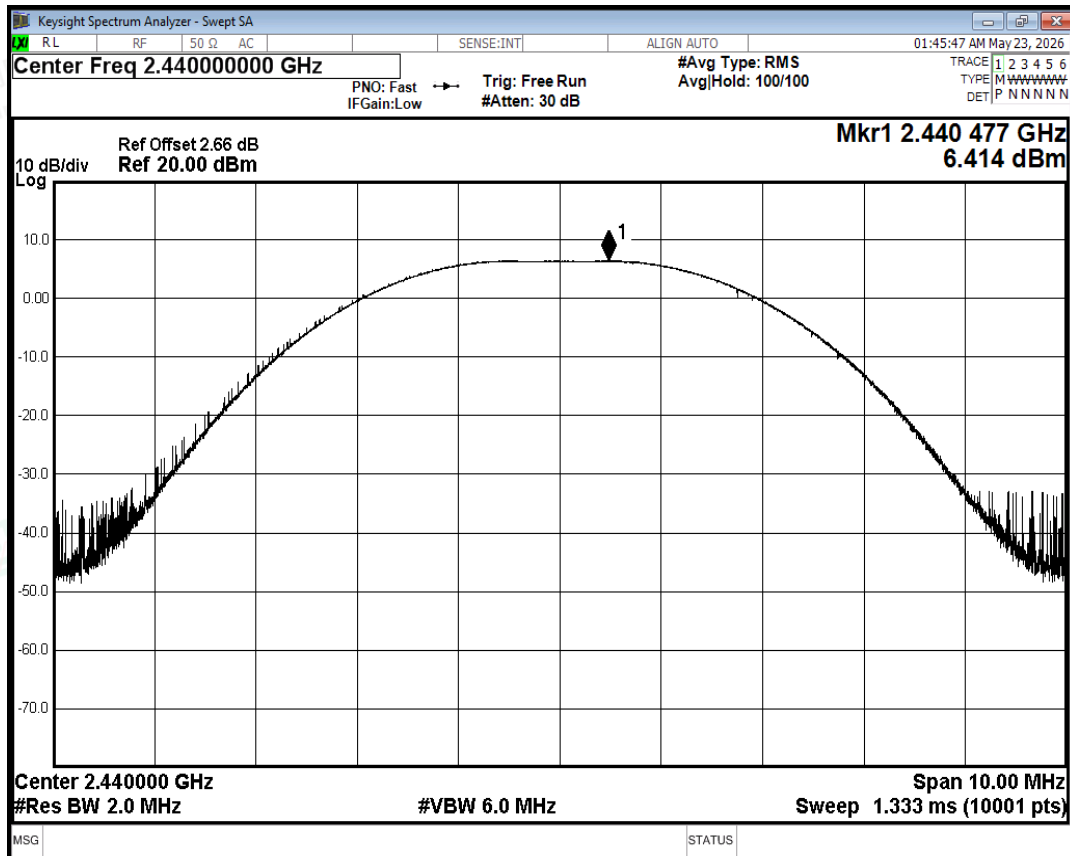


Peak Power NVNT BLE 1M 2480MHz Ant

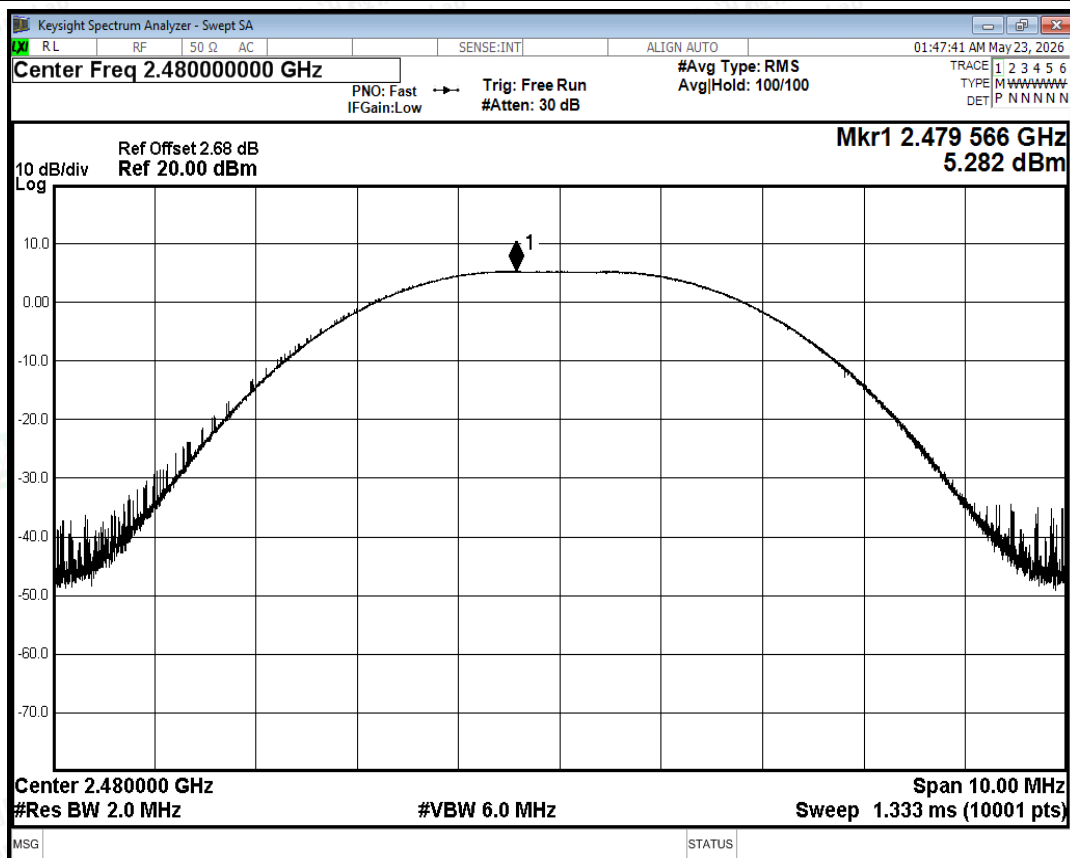


Peak Power NVNT BLE 2M 2402MHz Ant





Peak Power NVNT BLE 2M 2440MHz Ant



Peak Power NVNT BLE 2M 2480MHz Ant

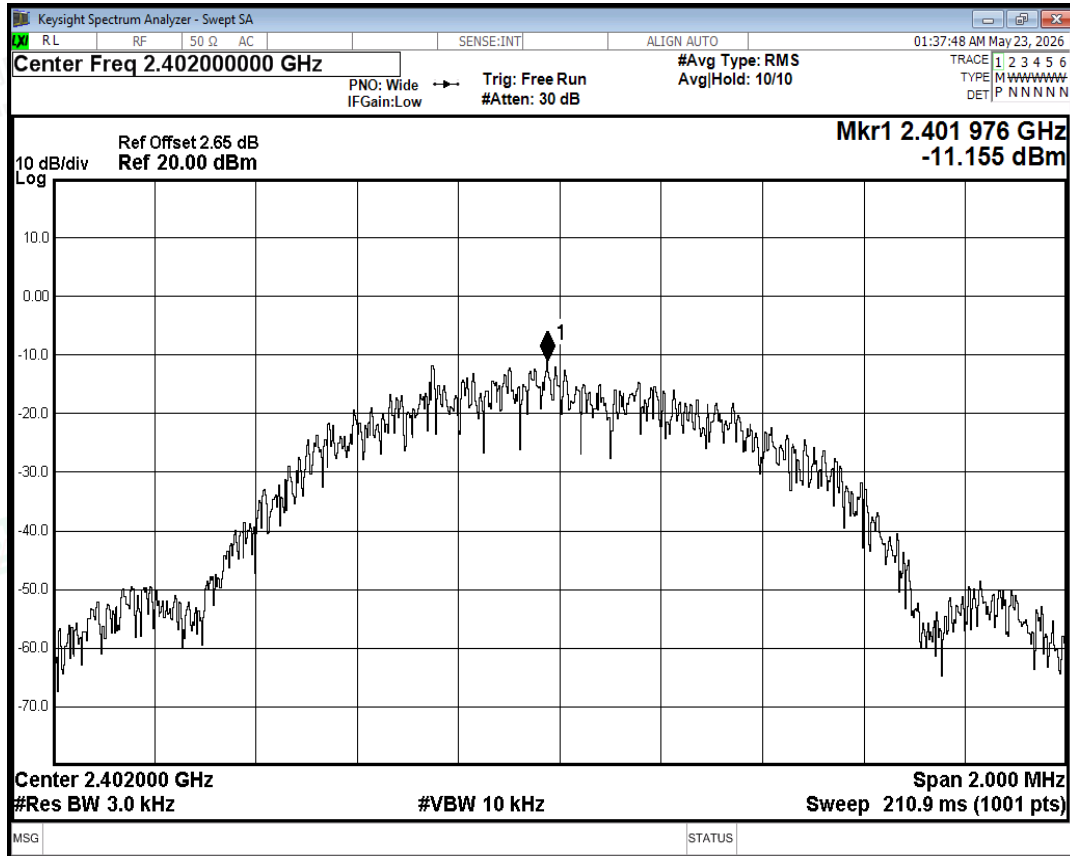




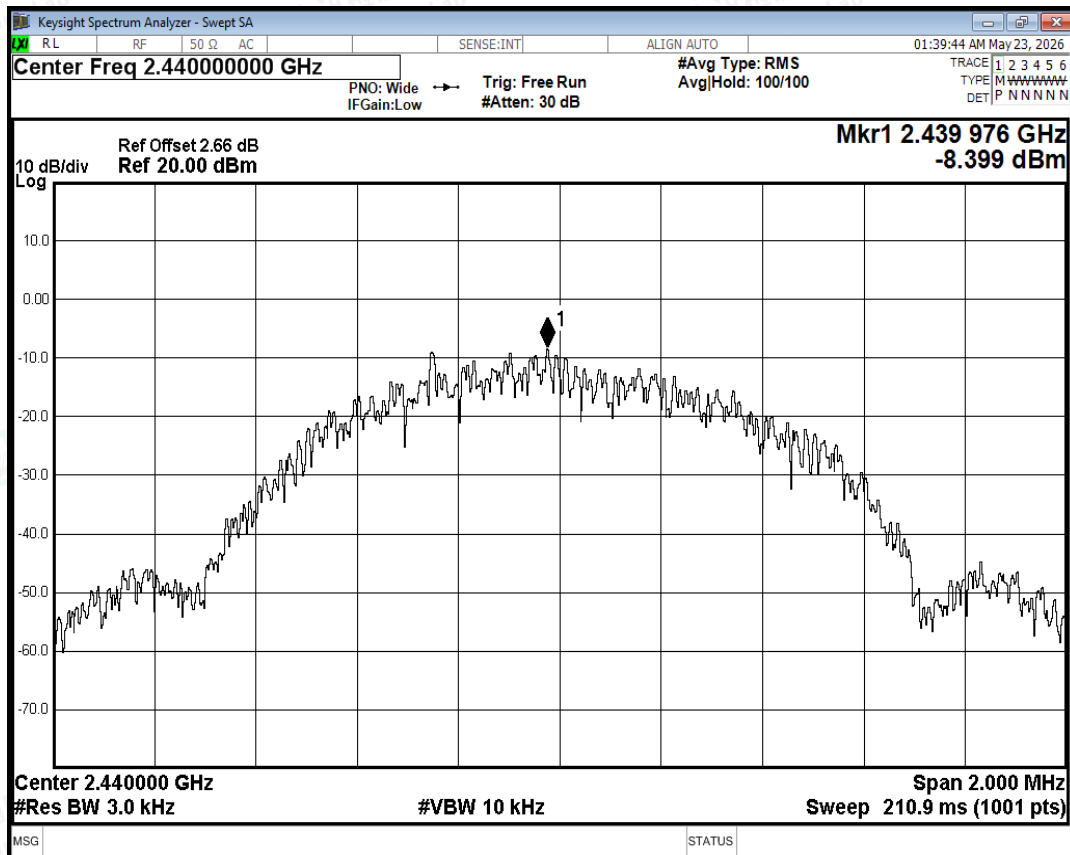
B.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant	-11.16	8	Pass
NVNT	BLE 1M	2440	Ant	-8.4	8	Pass
NVNT	BLE 1M	2480	Ant	-9.66	8	Pass
NVNT	BLE 2M	2402	Ant	-13.6	8	Pass
NVNT	BLE 2M	2440	Ant	-11.48	8	Pass
NVNT	BLE 2M	2480	Ant	-13.16	8	Pass





PSD NVNT BLE 1M 2402MHz Ant



PSD NVNT BLE 1M 2440MHz Ant

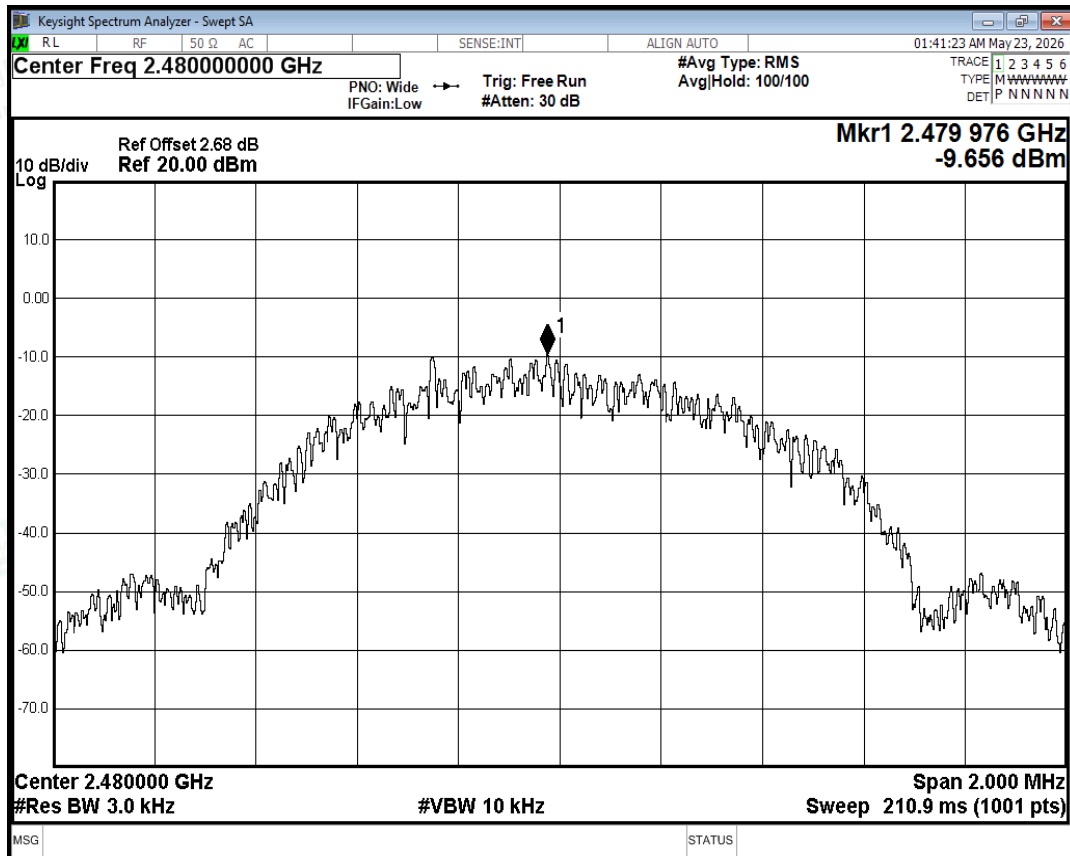


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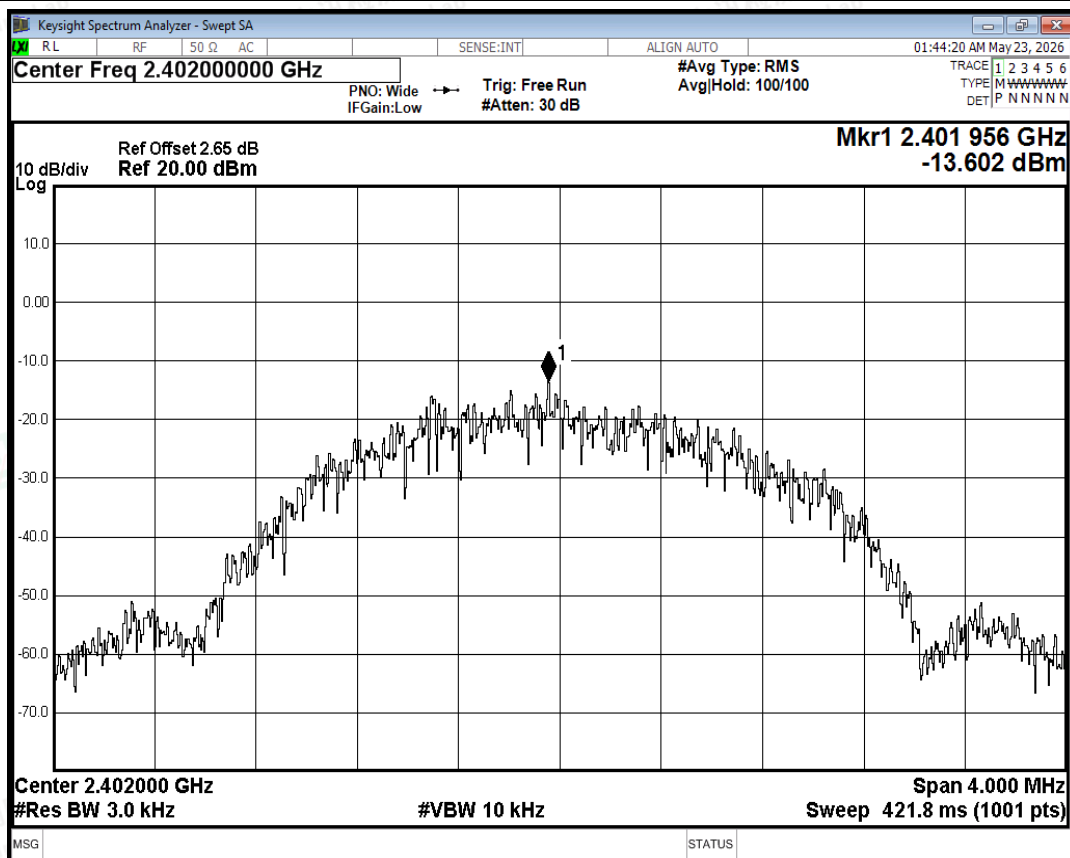
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PSD NVNT BLE 1M 2480MHz Ant



PSD NVNT BLE 2M 2402MHz Ant

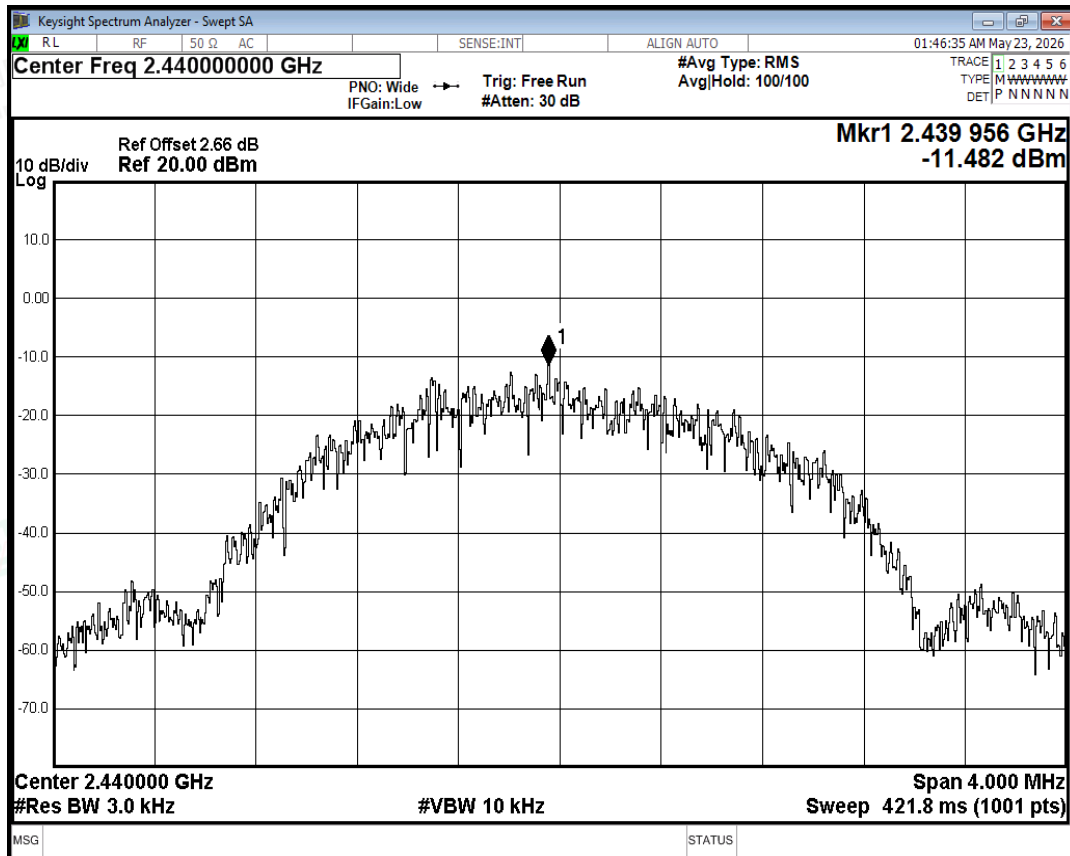


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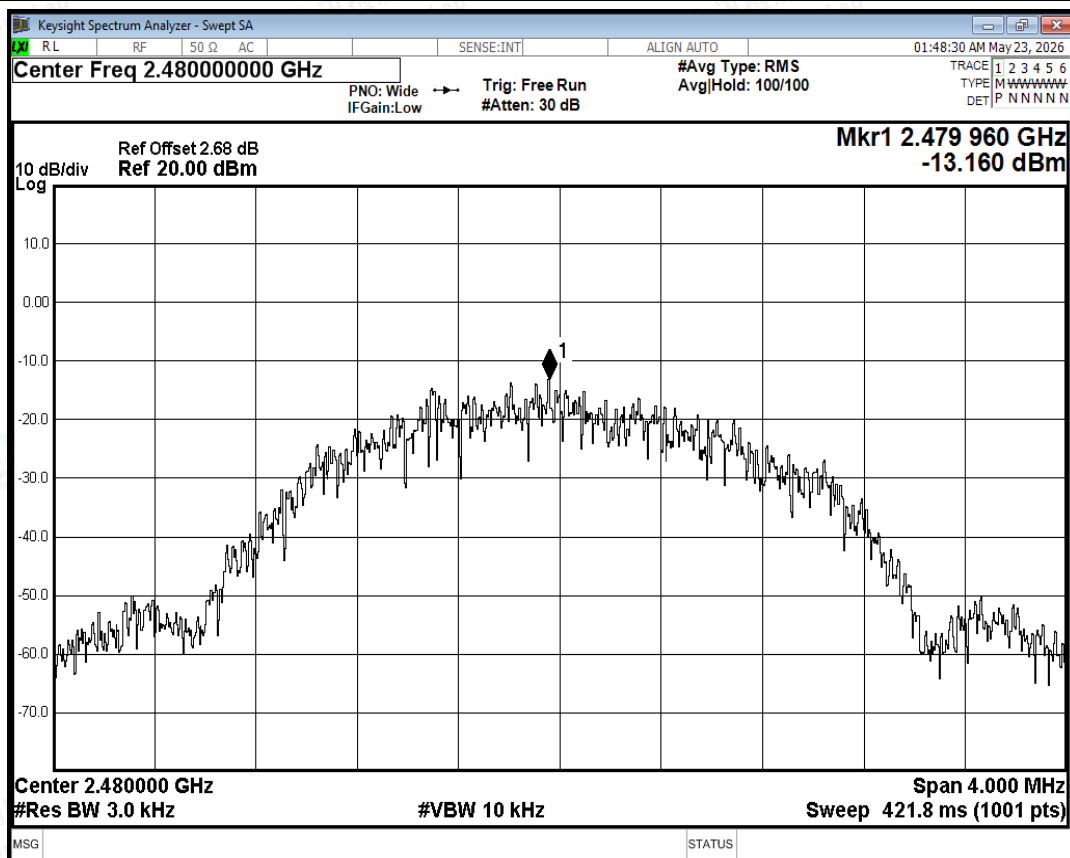
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PSD NVNT BLE 2M 2440MHz Ant



PSD NVNT BLE 2M 2480MHz Ant

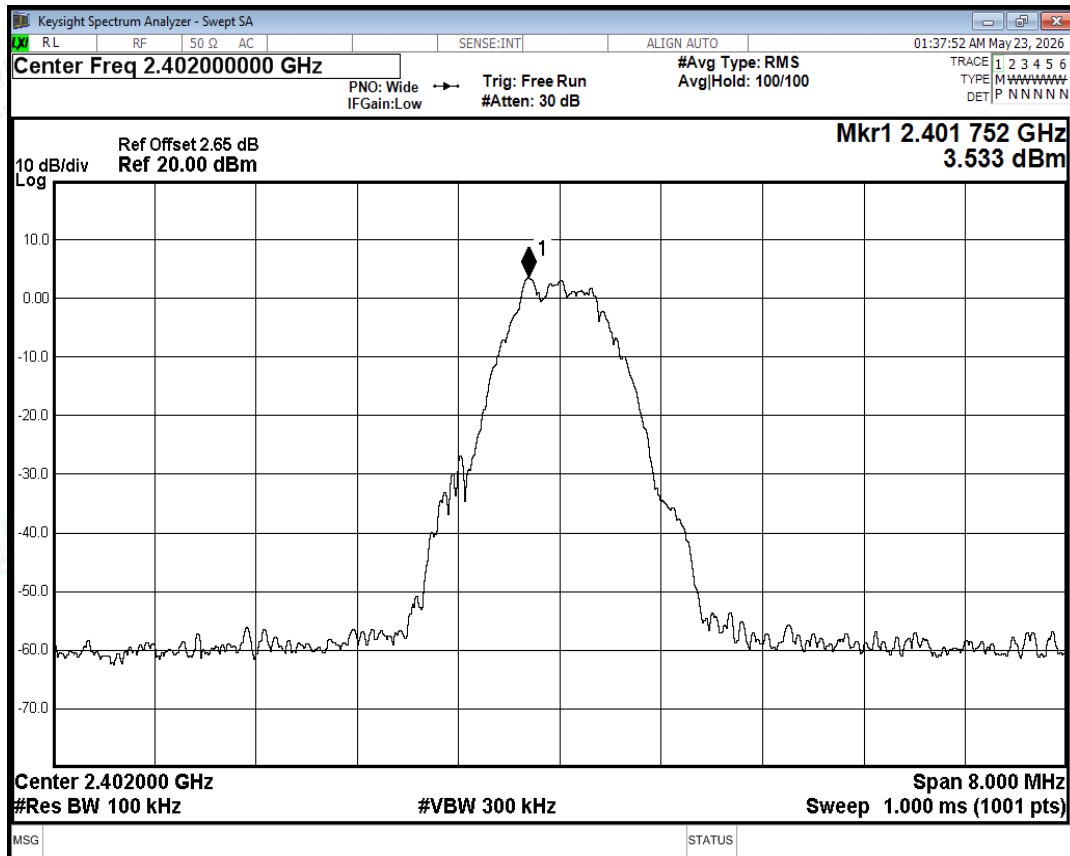




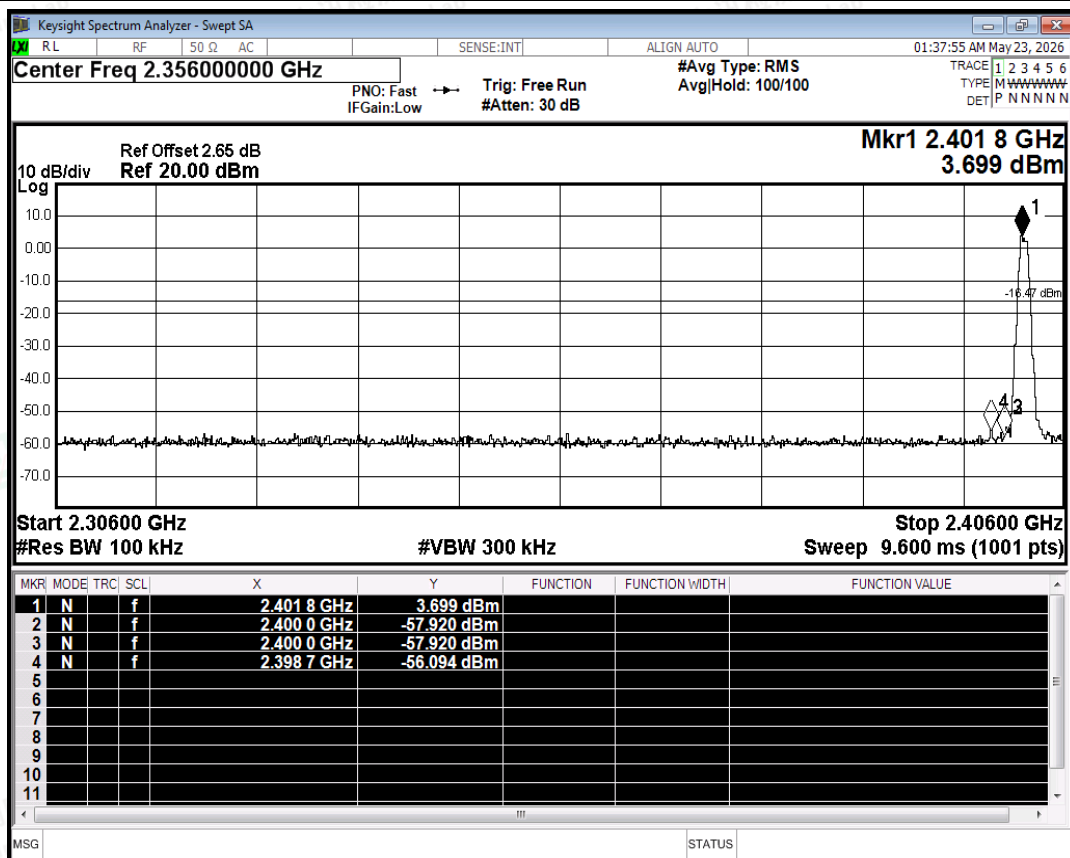
B.4 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant	-59.62	-20	Pass
NVNT	BLE 1M	2480	Ant	-60.73	-20	Pass
NVNT	BLE 2M	2402	Ant	-45.42	-20	Pass
NVNT	BLE 2M	2480	Ant	-58.17	-20	Pass





Band Edge NVNT BLE 1M 2402MHz Ant Ref



Band Edge NVNT BLE 1M 2402MHz Ant Emission

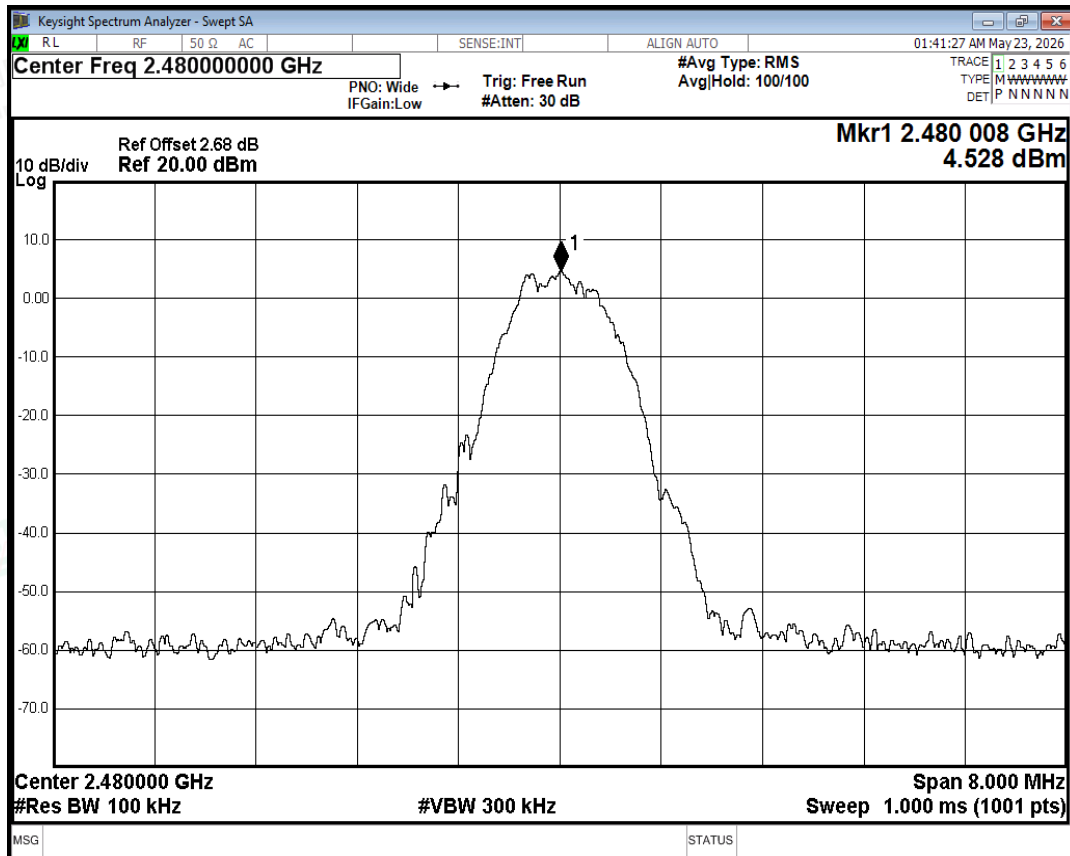


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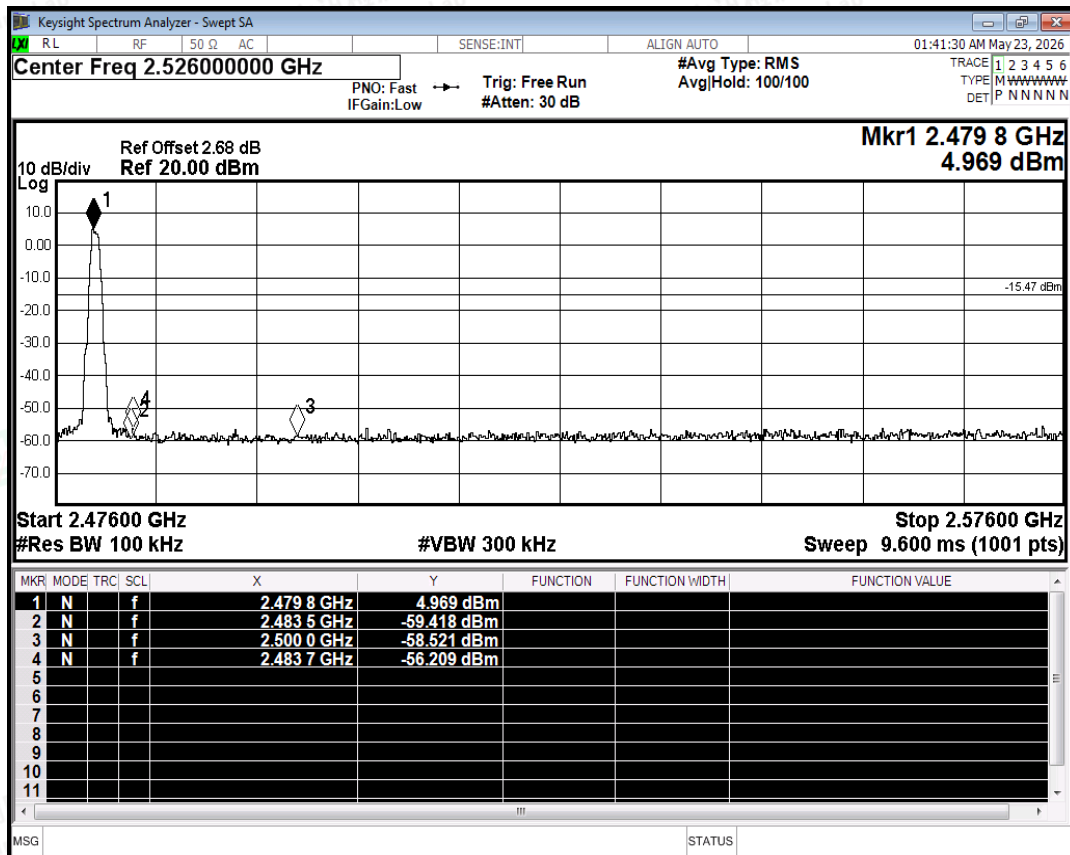
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Band Edge NVNT BLE 1M 2480MHz Ant Ref



Band Edge NVNT BLE 1M 2480MHz Ant Emission

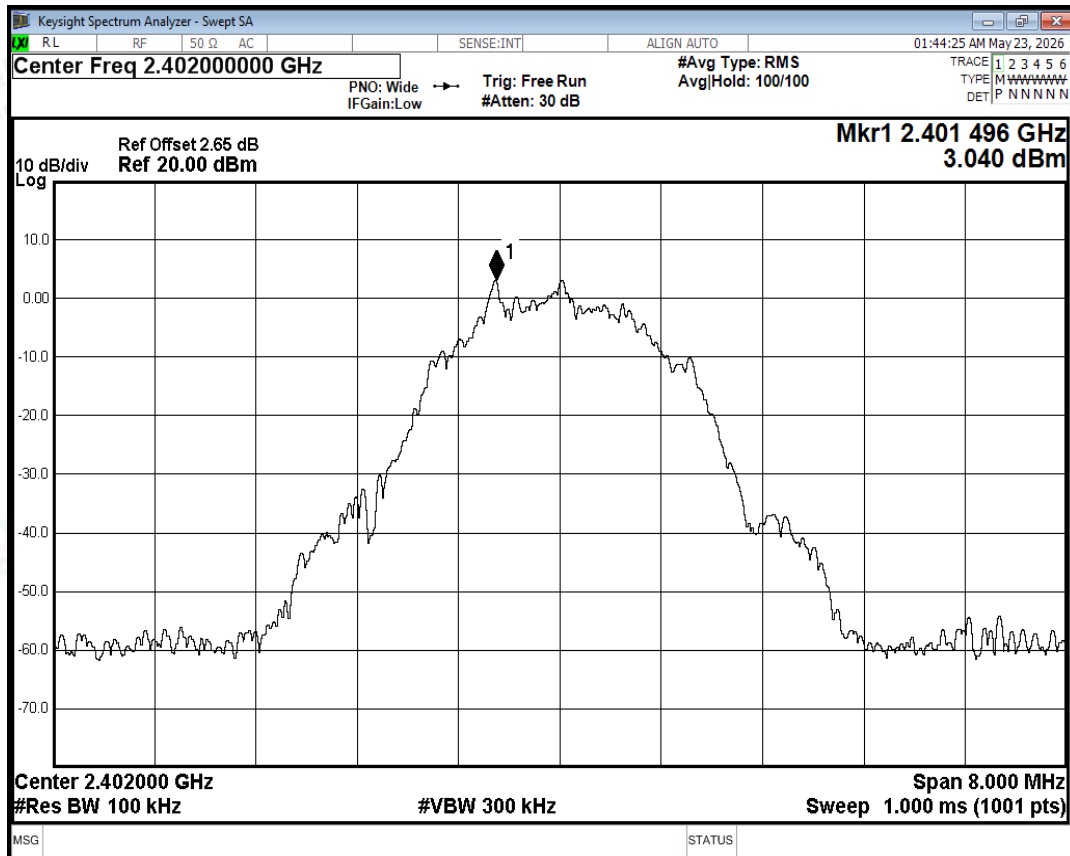


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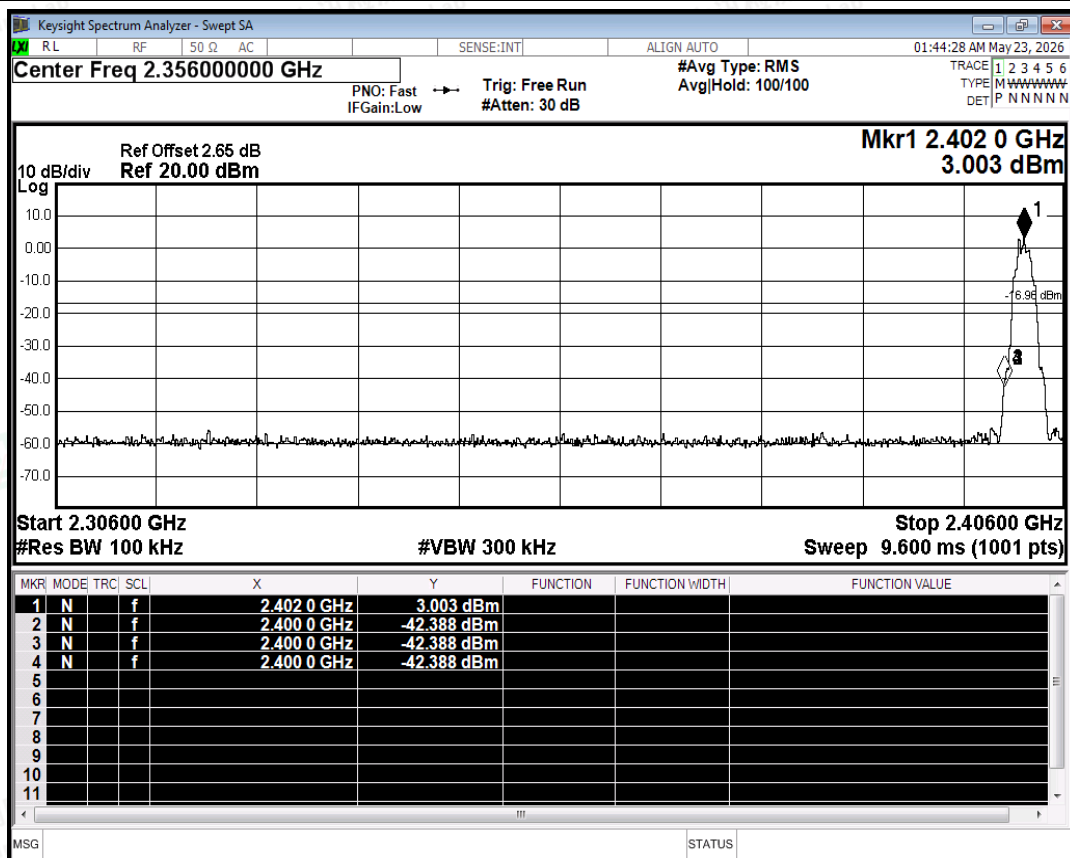
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Band Edge NVNT BLE 2M 2402MHz Ant Ref



Band Edge NVNT BLE 2M 2402MHz Ant Emission

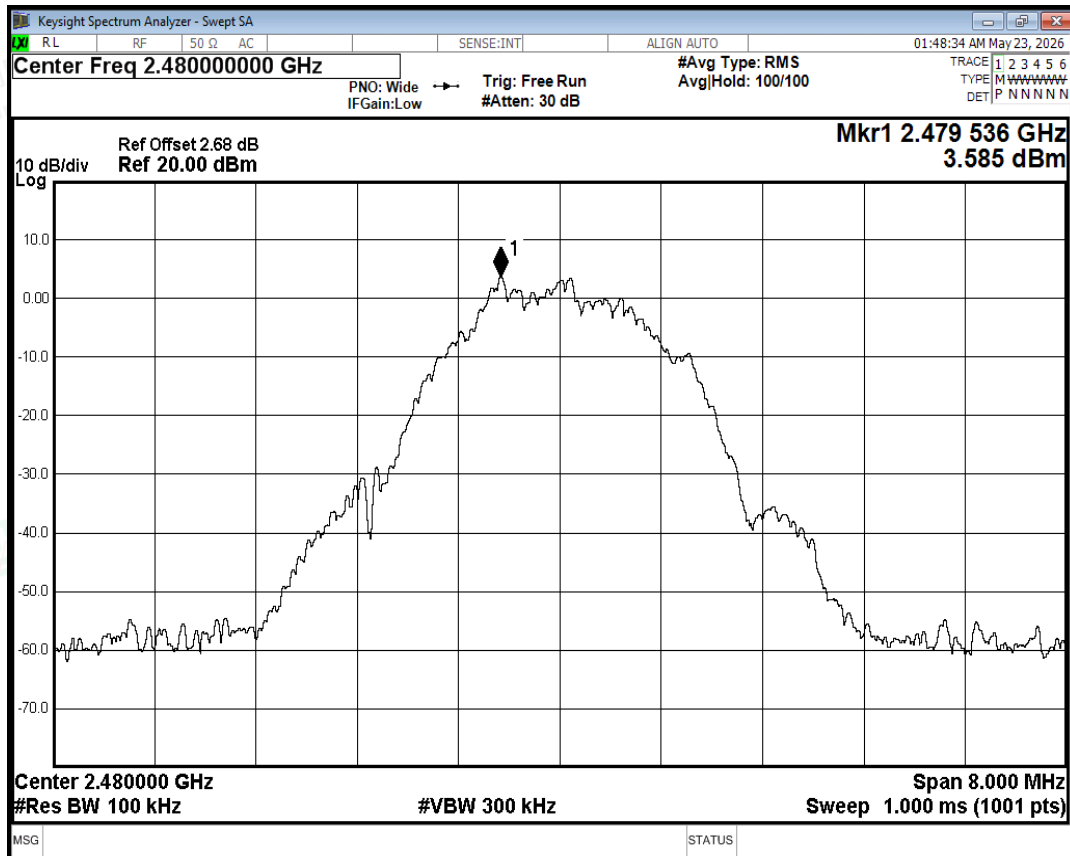


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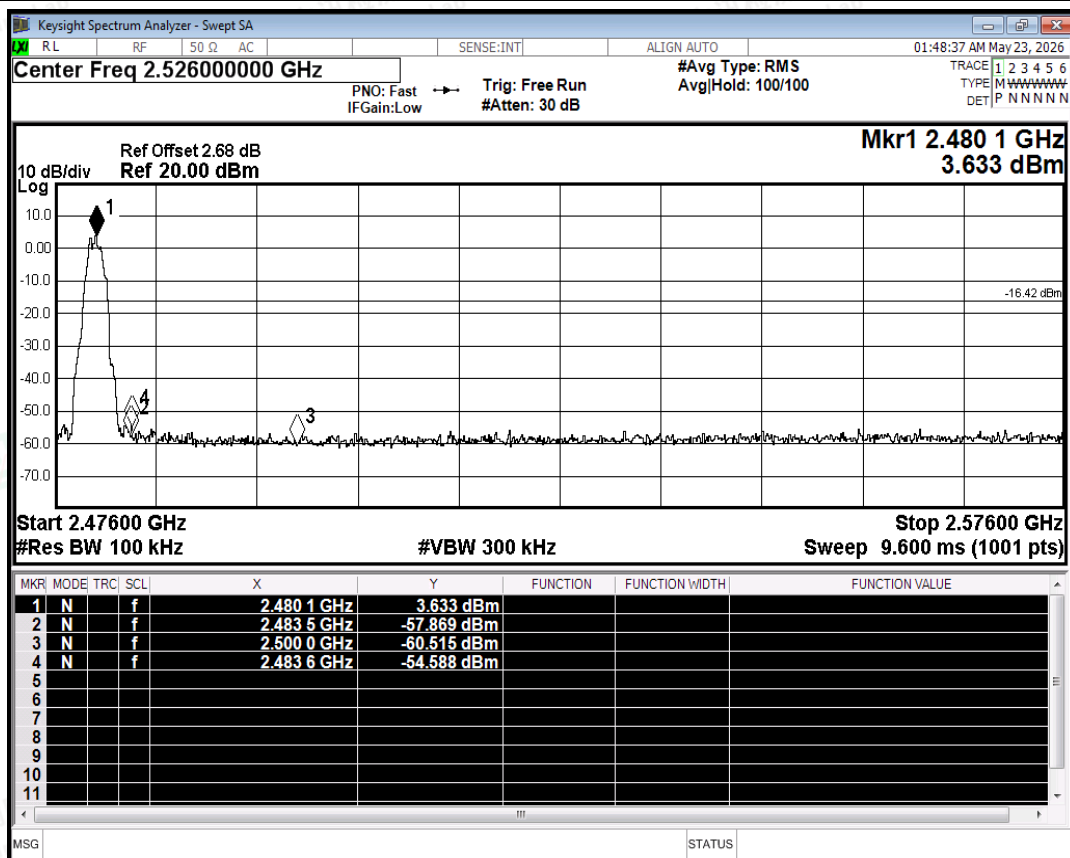
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Band Edge NVNT BLE 2M 2480MHz Ant Ref



Band Edge NVNT BLE 2M 2480MHz Ant Emission



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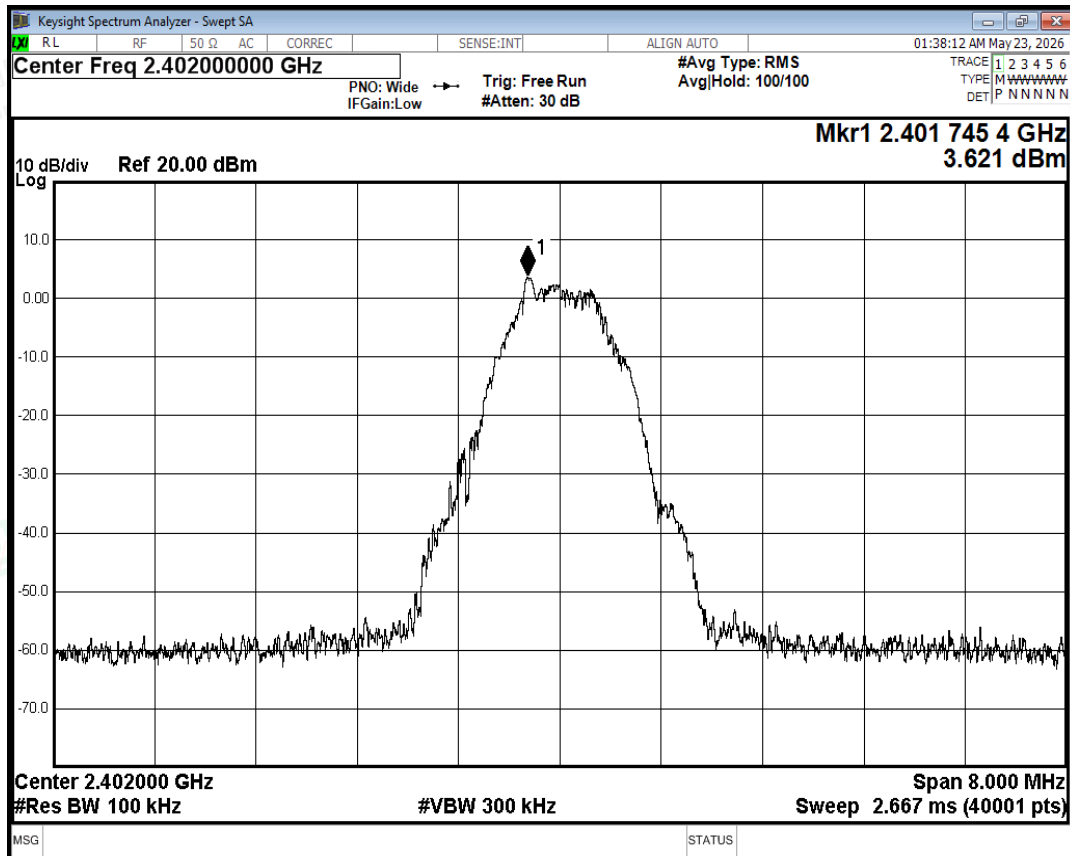


B.5 Conducted RF Spurious Emission

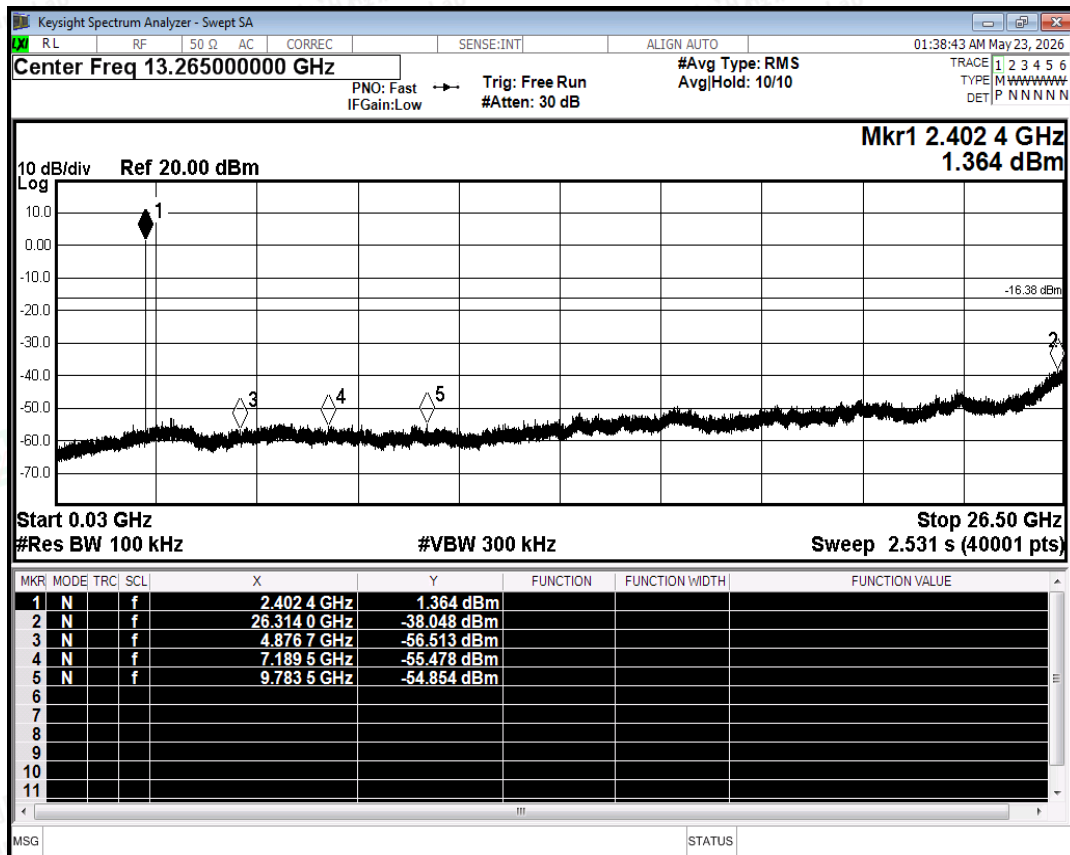
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant	-41.66	-20	Pass
NVNT	BLE 1M	2440	Ant	-42.78	-20	Pass
NVNT	BLE 1M	2480	Ant	-42.84	-20	Pass
NVNT	BLE 2M	2402	Ant	-50.01	-20	Pass
NVNT	BLE 2M	2440	Ant	-52	-20	Pass
NVNT	BLE 2M	2480	Ant	-50.8	-20	Pass

Note: input compensation coefficient (dB)= Cable Loss (dB) + Attenuator attenuation value (dB)





Tx. Spurious NVNT BLE 1M 2402MHz Ant Ref



Tx. Spurious NVNT BLE 1M 2402MHz Ant Emission

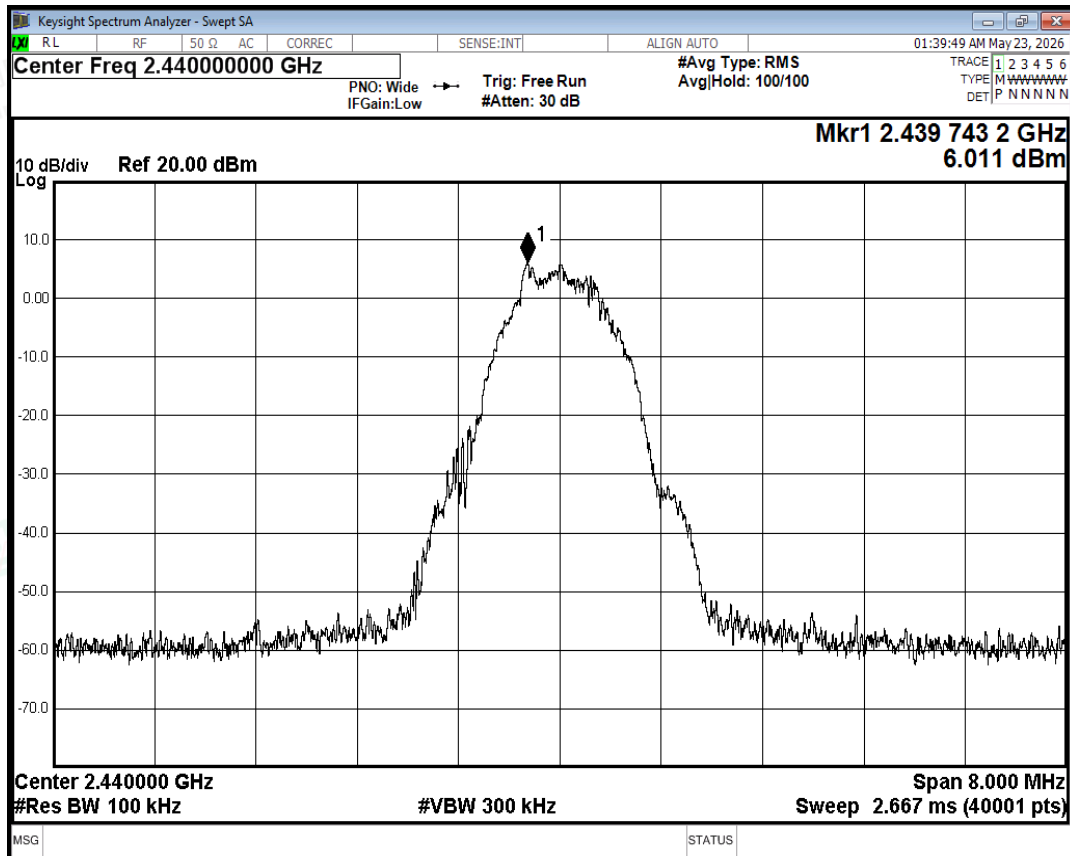


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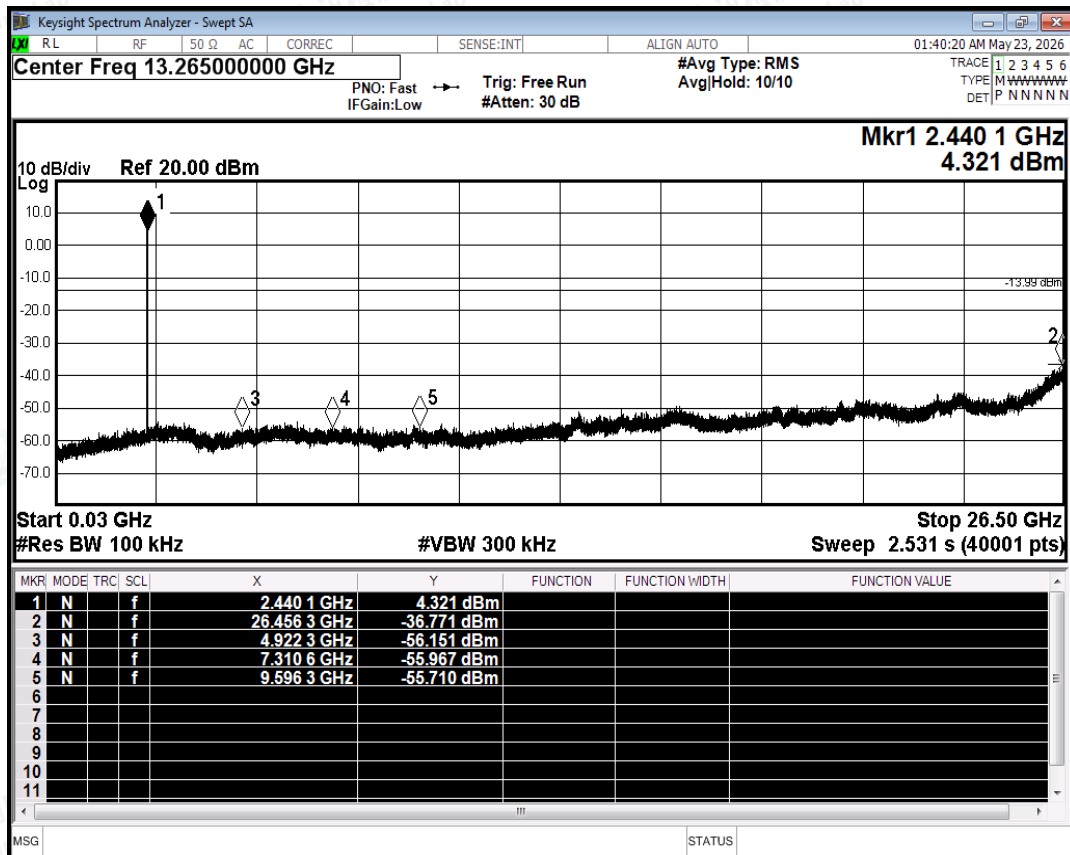
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Tx. Spurious NVNT BLE 1M 2440MHz Ant Ref



Tx. Spurious NVNT BLE 1M 2440MHz Ant Emission

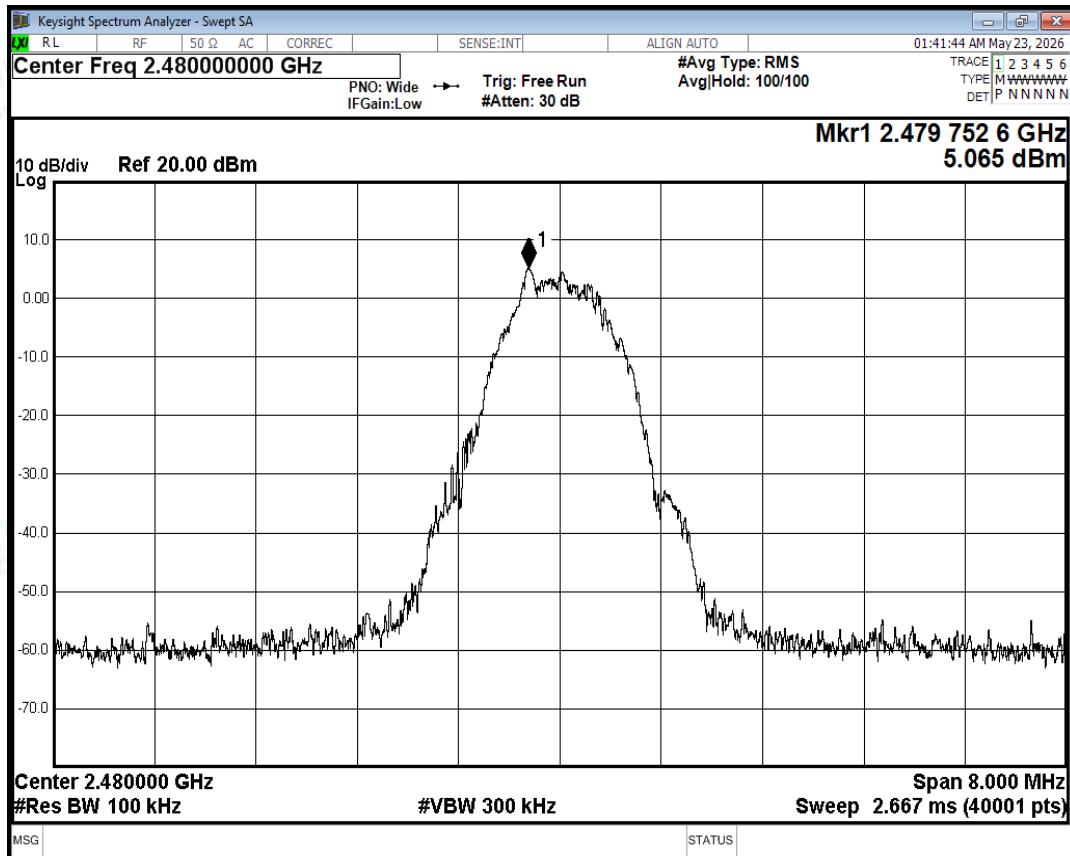


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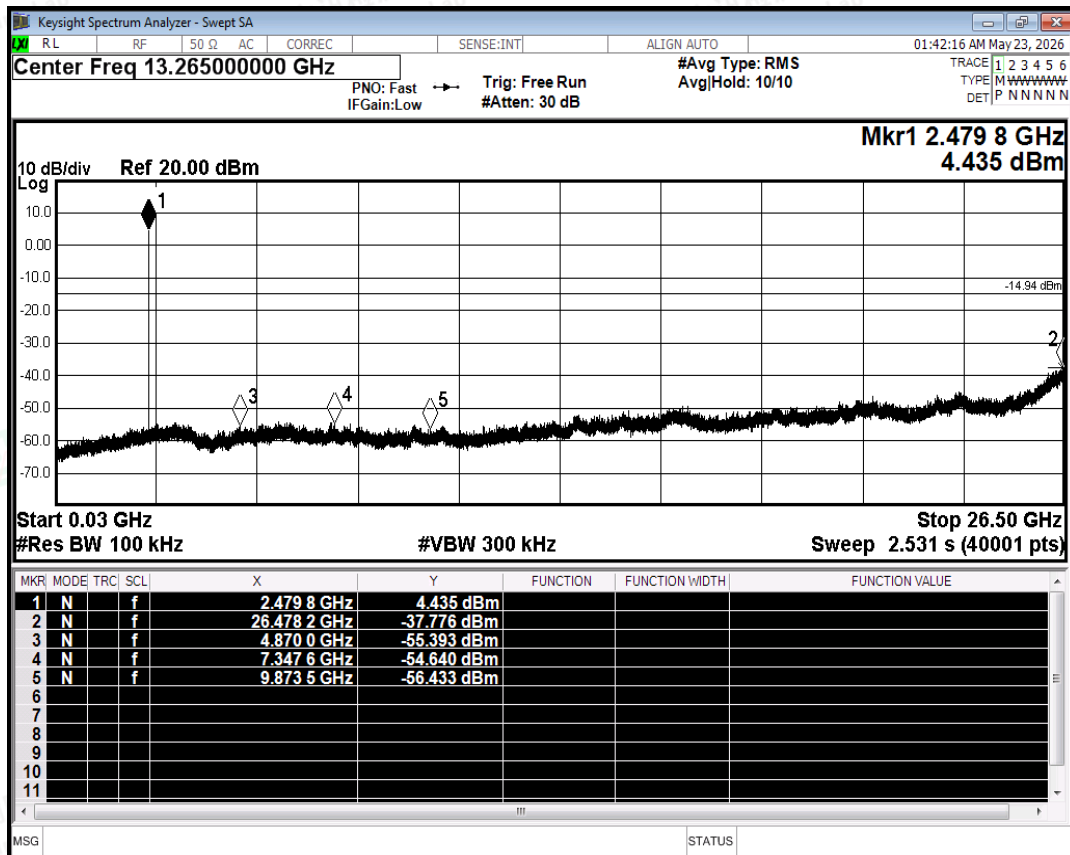
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Tx. Spurious NVNT BLE 1M 2480MHz Ant Ref



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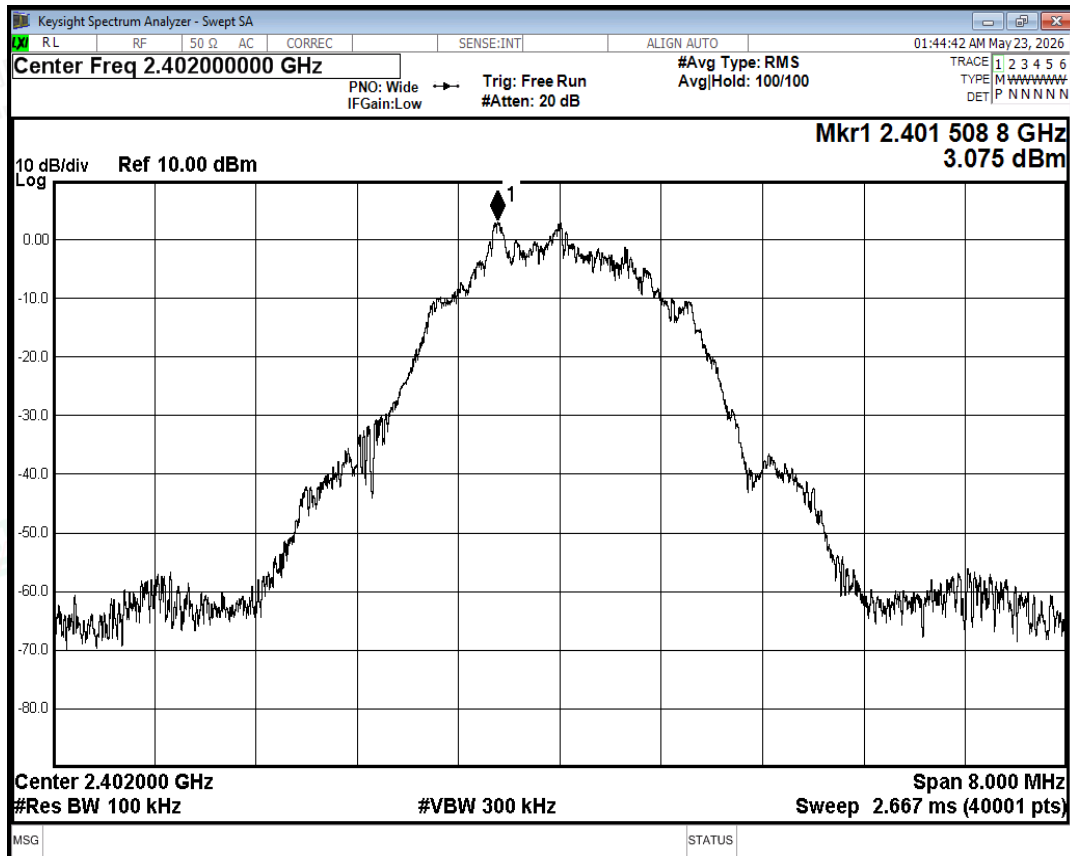


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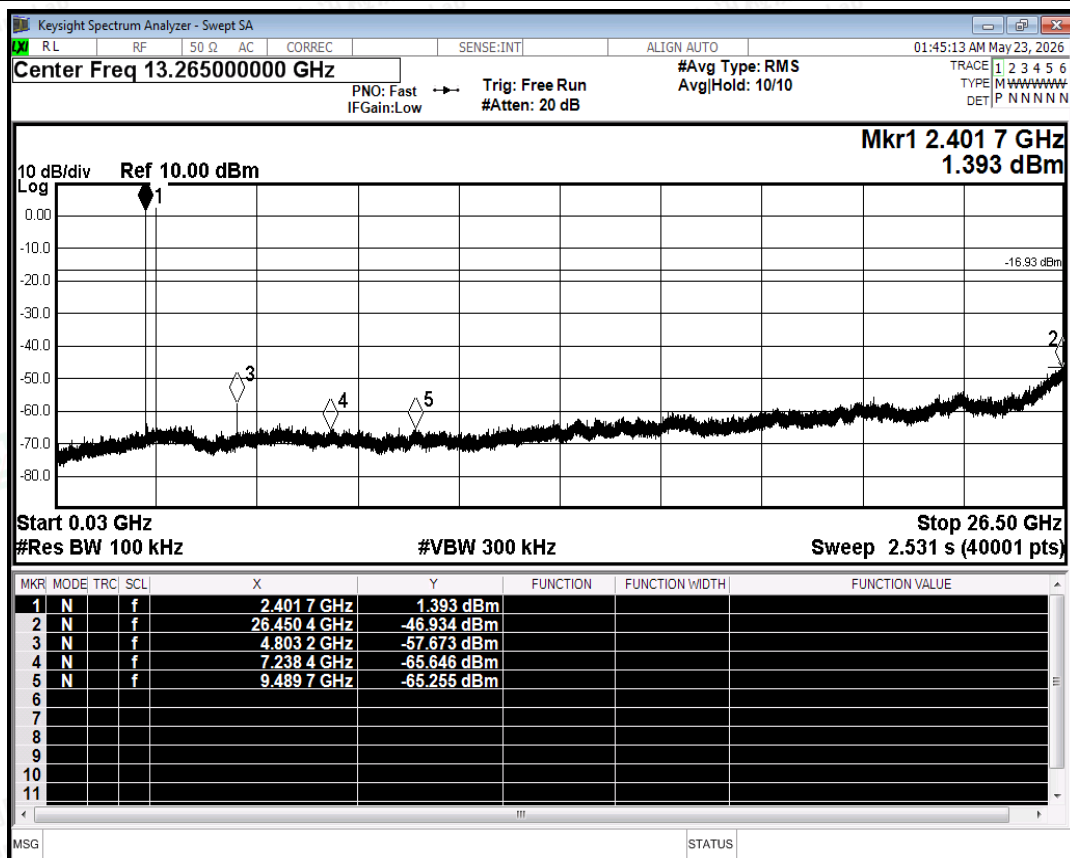
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Tx. Spurious NVNT BLE 2M 2402MHz Ant Emission

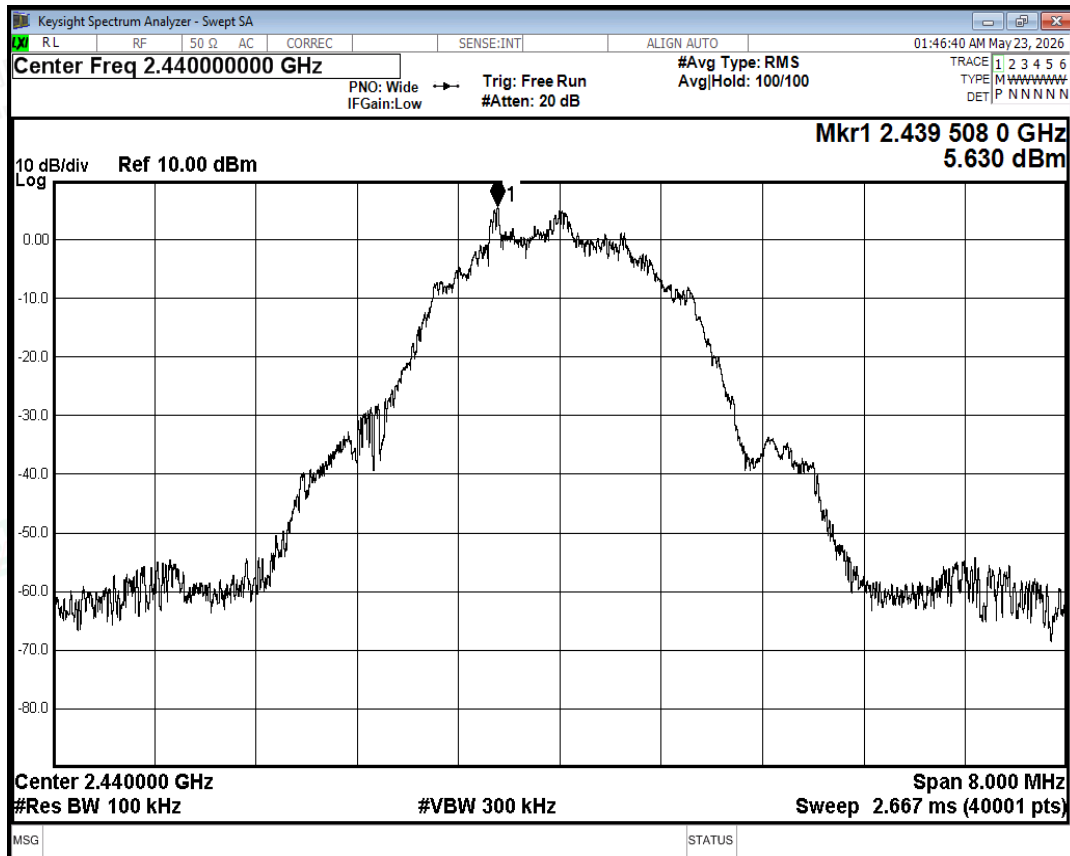


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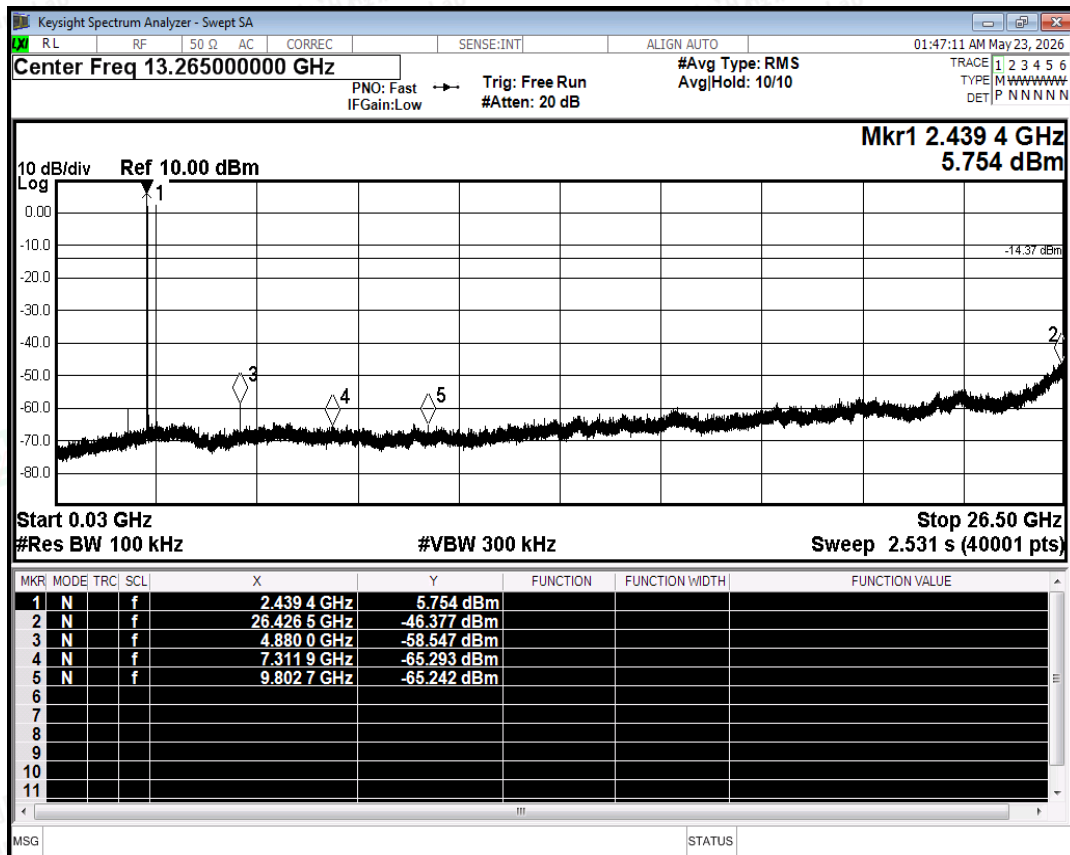
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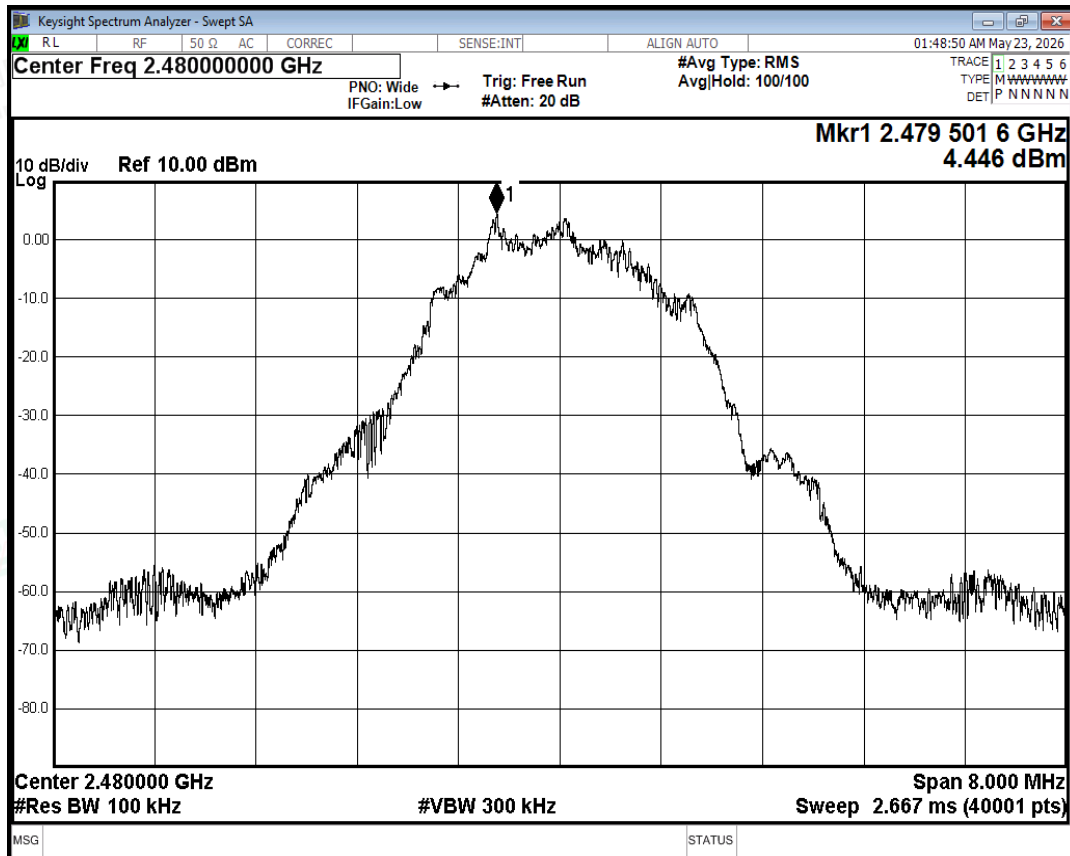


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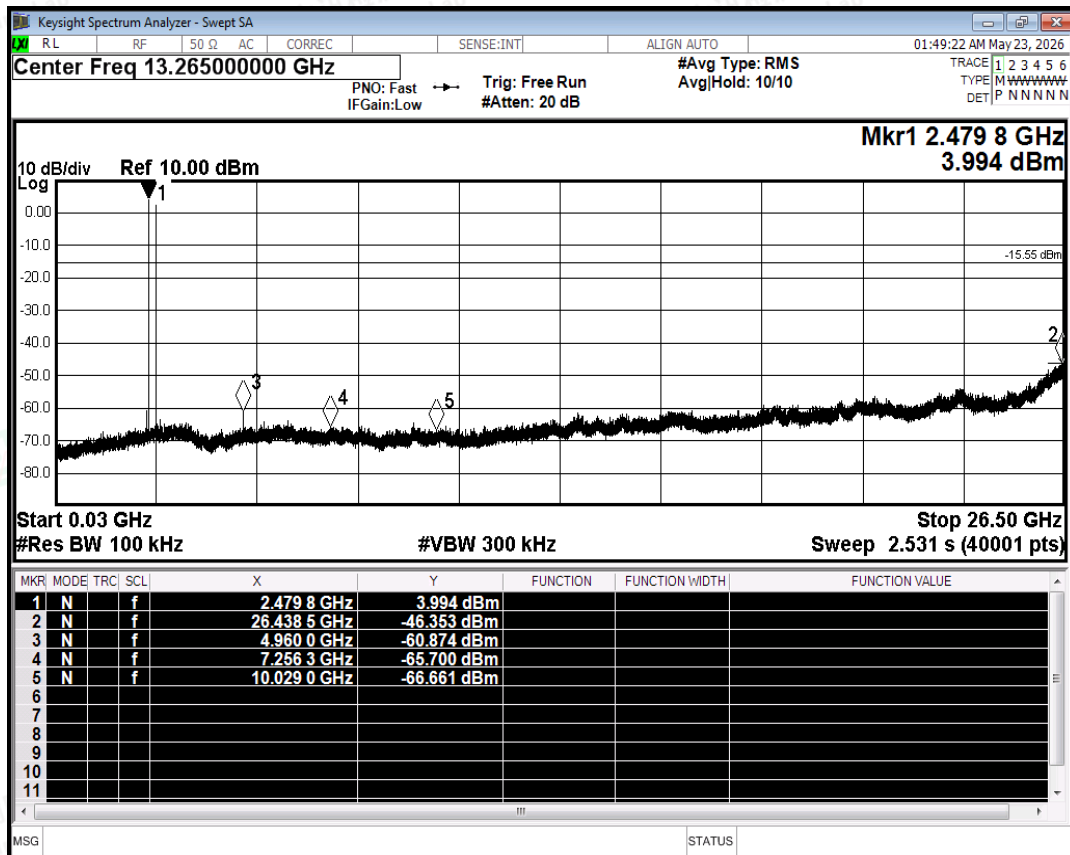
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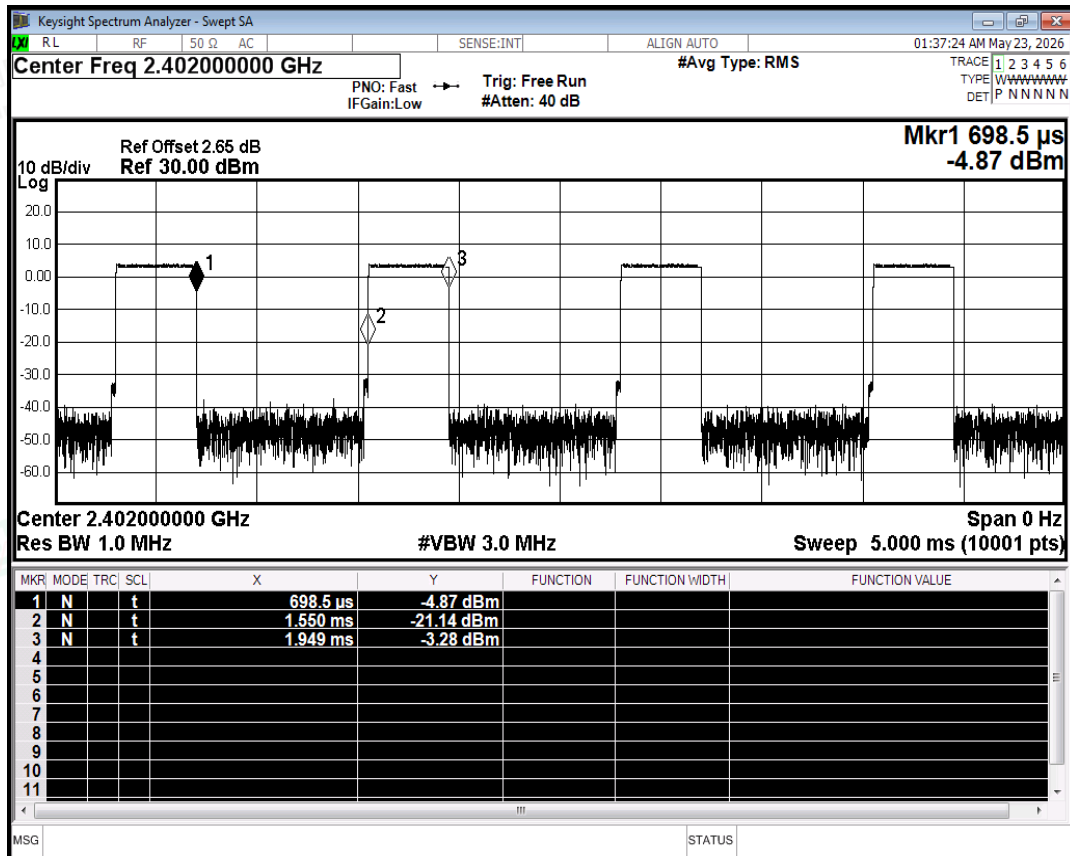
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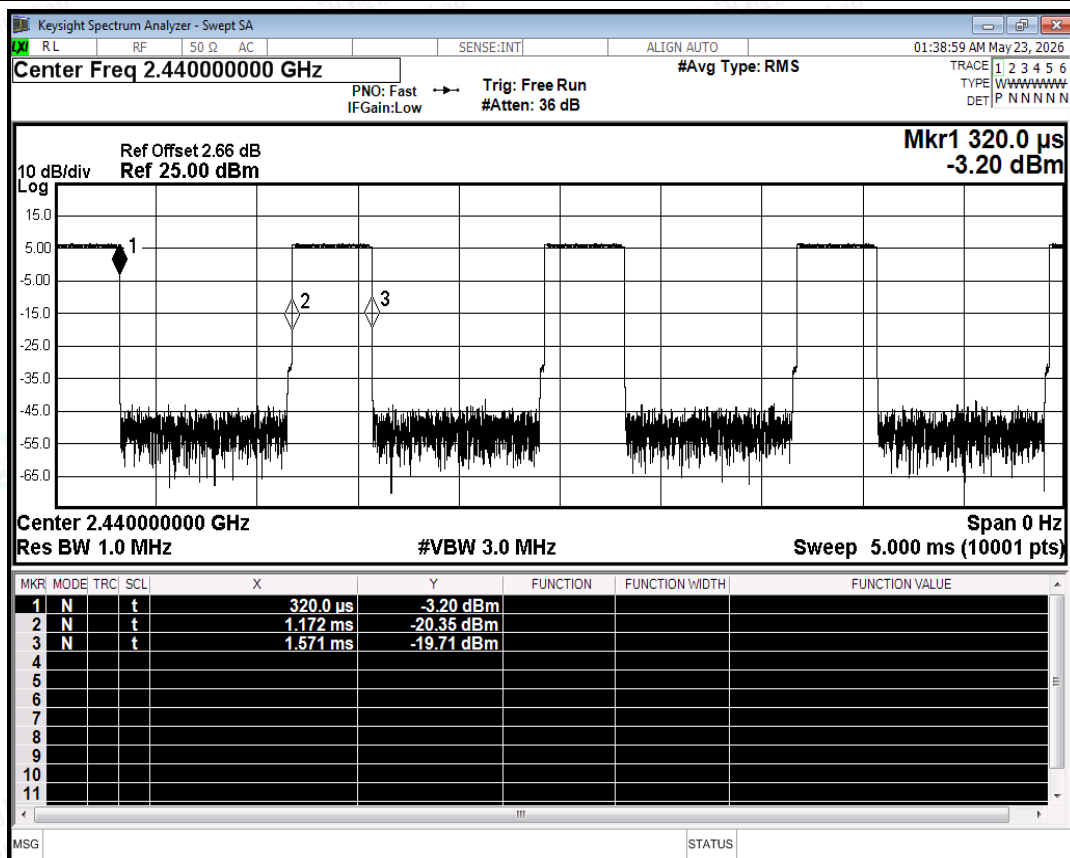
B.6 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant	31.88	4.96	2.51
NVNT	BLE 1M	2440	Ant	31.91	4.96	2.51
NVNT	BLE 1M	2480	Ant	31.88	4.96	2.51
NVNT	BLE 2M	2402	Ant	32.64	4.86	4.9
NVNT	BLE 2M	2440	Ant	32.64	4.86	4.9
NVNT	BLE 2M	2480	Ant	32.69	4.86	4.89





Duty Cycle NVNT BLE 1M 2402MHz Ant



Duty Cycle NVNT BLE 1M 2440MHz Ant

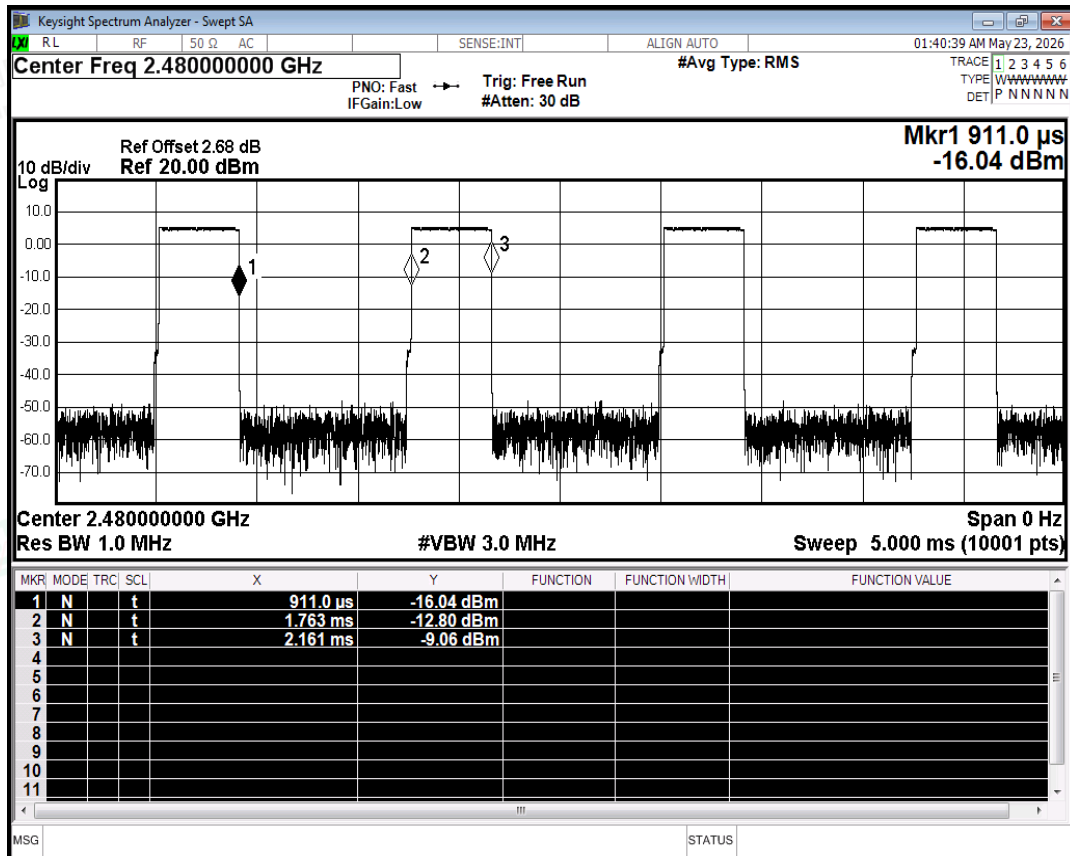


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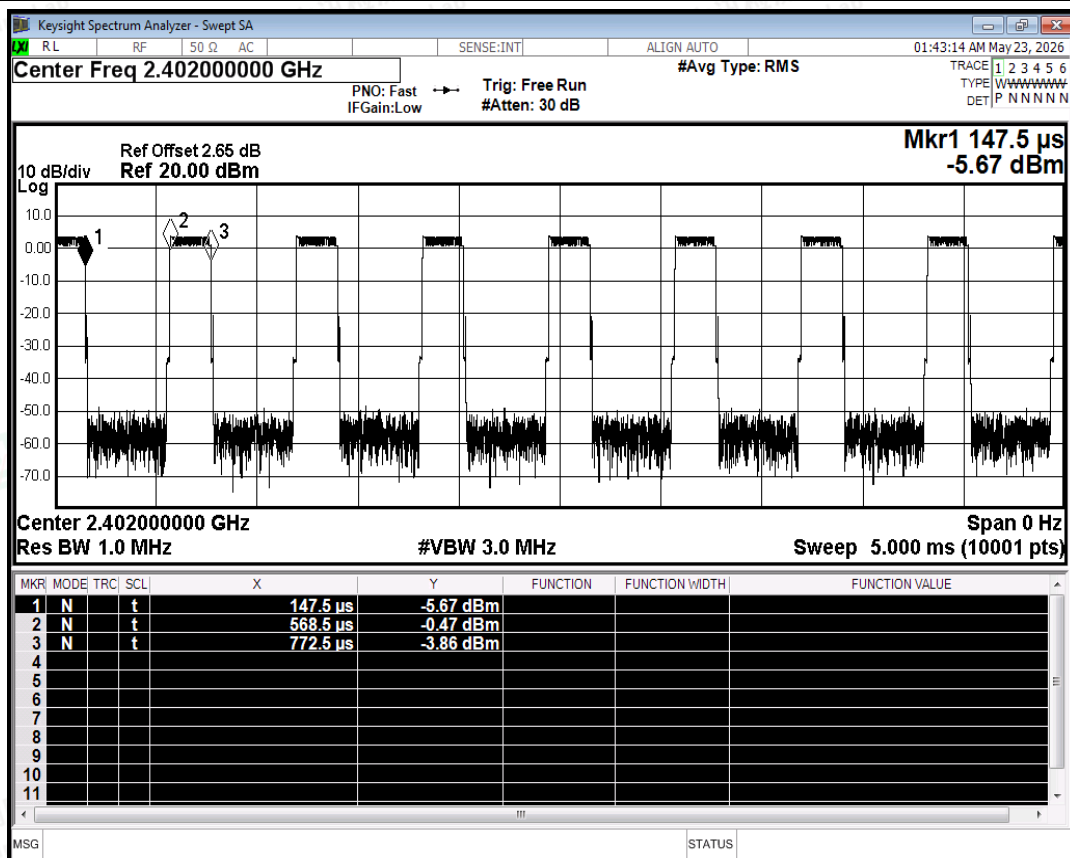
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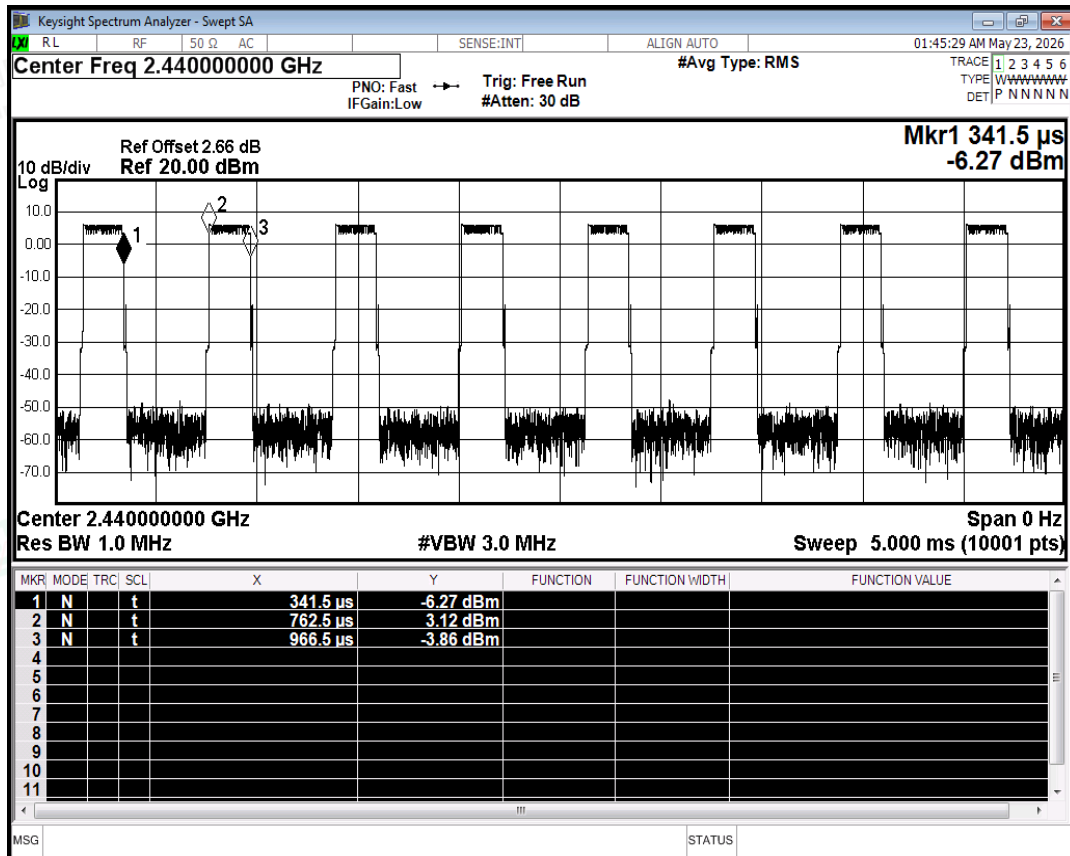


Duty Cycle NVNT BLE 1M 2480MHz Ant

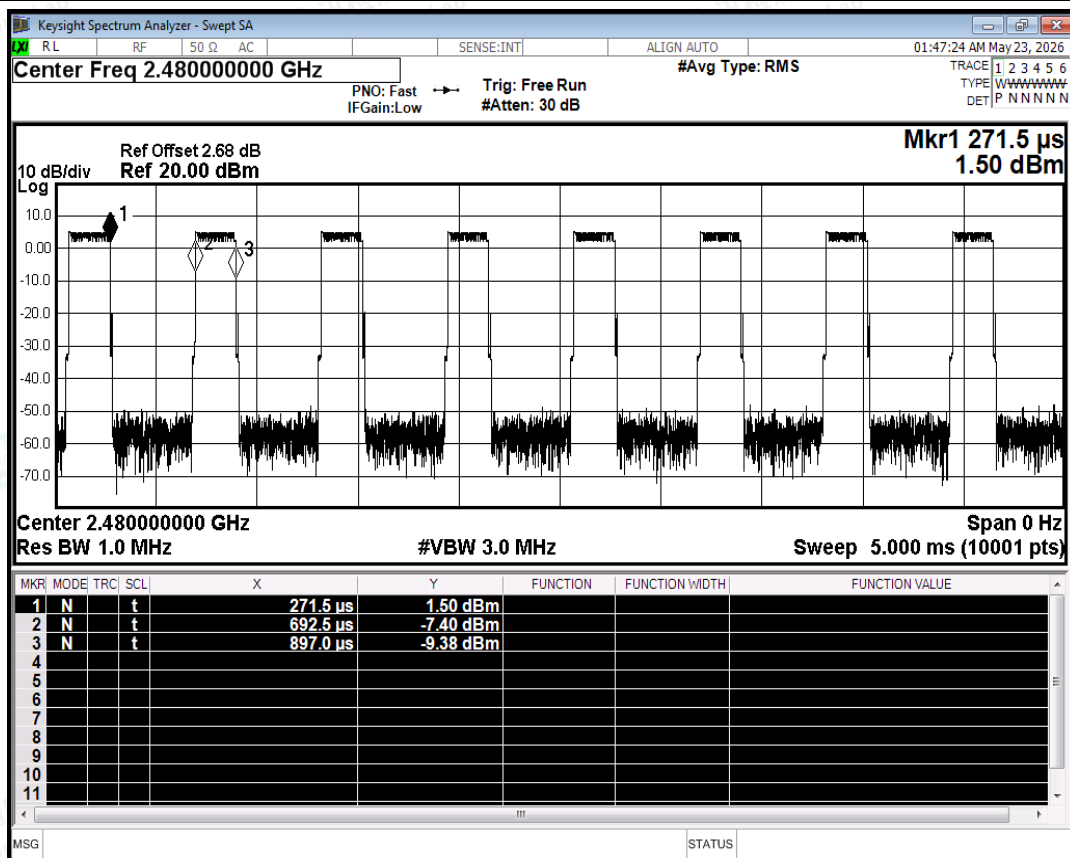


Duty Cycle NVNT BLE 2M 2402MHz Ant





Duty Cycle NVNT BLE 2M 2440MHz Ant



Duty Cycle NVNT BLE 2M 2480MHz Ant





B.7 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant	2310	-48.75	2	48.51	Peak	74	Pass
NVNT	BLE 1M	2402	Ant	2310	-56.41	2	40.85	Average	54	Pass
NVNT	BLE 1M	2402	Ant	2344.272	-46.06	2	51.2	Peak	74	Pass
NVNT	BLE 1M	2402	Ant	2334.288	-56.07	2	41.19	Average	54	Pass
NVNT	BLE 1M	2402	Ant	2390	-48.01	2	49.25	Peak	74	Pass
NVNT	BLE 1M	2402	Ant	2390	-56.56	2	40.7	Average	54	Pass
NVNT	BLE 1M	2480	Ant	2483.5	-46.68	2	50.58	Peak	74	Pass
NVNT	BLE 1M	2480	Ant	2483.5	-52.11	2	45.15	Average	54	Pass
NVNT	BLE 1M	2480	Ant	2483.92	-40.09	2	57.17	Peak	74	Pass
NVNT	BLE 1M	2480	Ant	2483.512	-52.11	2	45.15	Average	54	Pass
NVNT	BLE 1M	2480	Ant	2500	-49.5	2	47.76	Peak	74	Pass
NVNT	BLE 1M	2480	Ant	2500	-56.48	2	40.78	Average	54	Pass
NVNT	BLE 2M	2402	Ant	2310	-50.25	2	47.01	Peak	74	Pass
NVNT	BLE 2M	2402	Ant	2310	-56.27	2	40.99	Average	54	Pass
NVNT	BLE 2M	2402	Ant	2383.152	-47.07	2	50.19	Peak	74	Pass
NVNT	BLE 2M	2402	Ant	2352.144	-55.42	2	41.84	Average	54	Pass
NVNT	BLE 2M	2402	Ant	2390	-48.1	2	49.16	Peak	74	Pass
NVNT	BLE 2M	2402	Ant	2390	-56.51	2	40.75	Average	54	Pass
NVNT	BLE 2M	2480	Ant	2483.5	-46.48	2	50.78	Peak	74	Pass
NVNT	BLE 2M	2480	Ant	2483.5	-50.36	2	46.9	Average	54	Pass
NVNT	BLE 2M	2480	Ant	2486.896	-40.16	2	57.1	Peak	74	Pass
NVNT	BLE 2M	2480	Ant	2483.512	-50.36	2	46.9	Average	54	Pass
NVNT	BLE 2M	2480	Ant	2500	-49.45	2	47.81	Peak	74	Pass
NVNT	BLE 2M	2480	Ant	2500	-56.23	2	41.03	Average	54	Pass

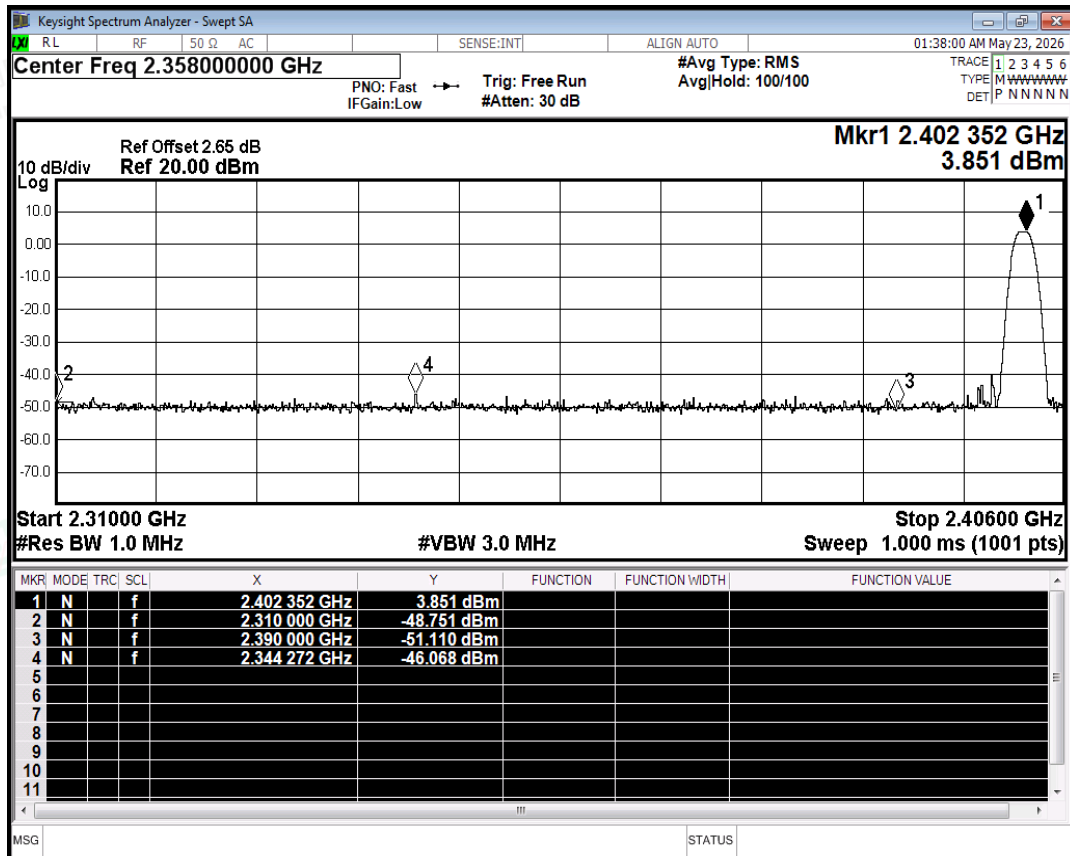


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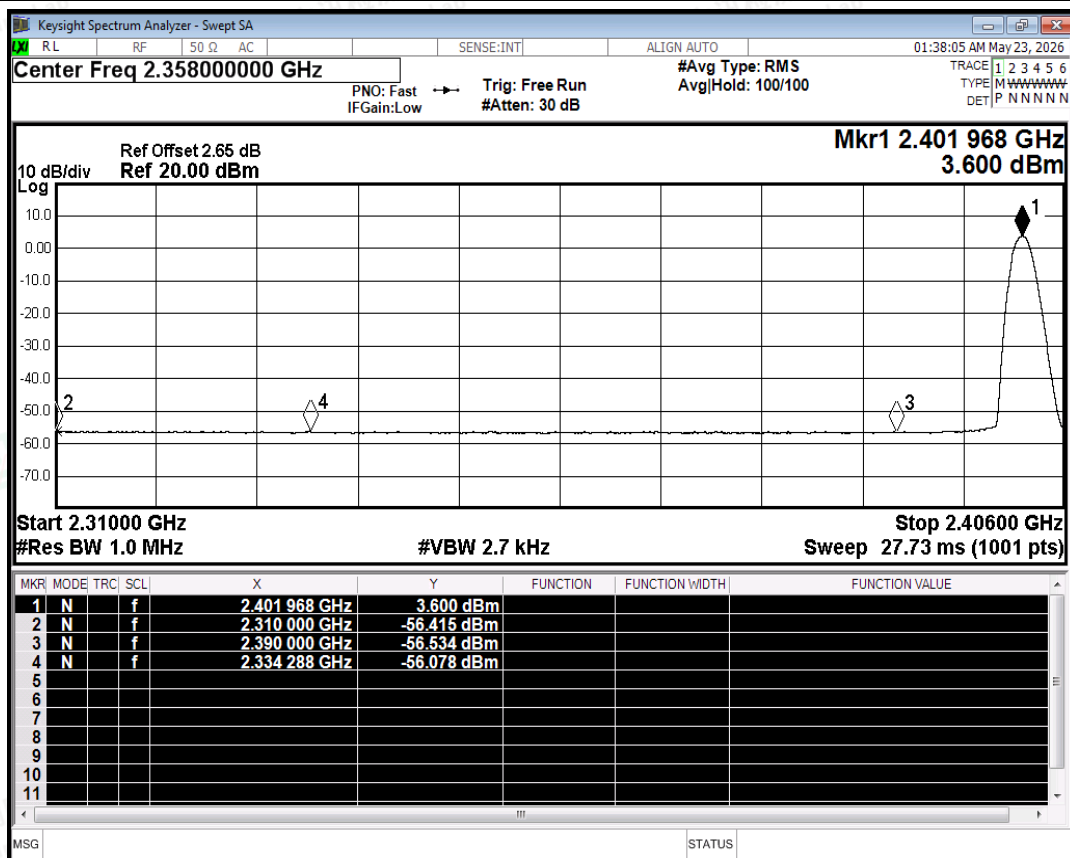
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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Restrict Band NVNT BLE 1M 2402MHz Ant Peak



Restrict Band NVNT BLE 1M 2402MHz Ant Average

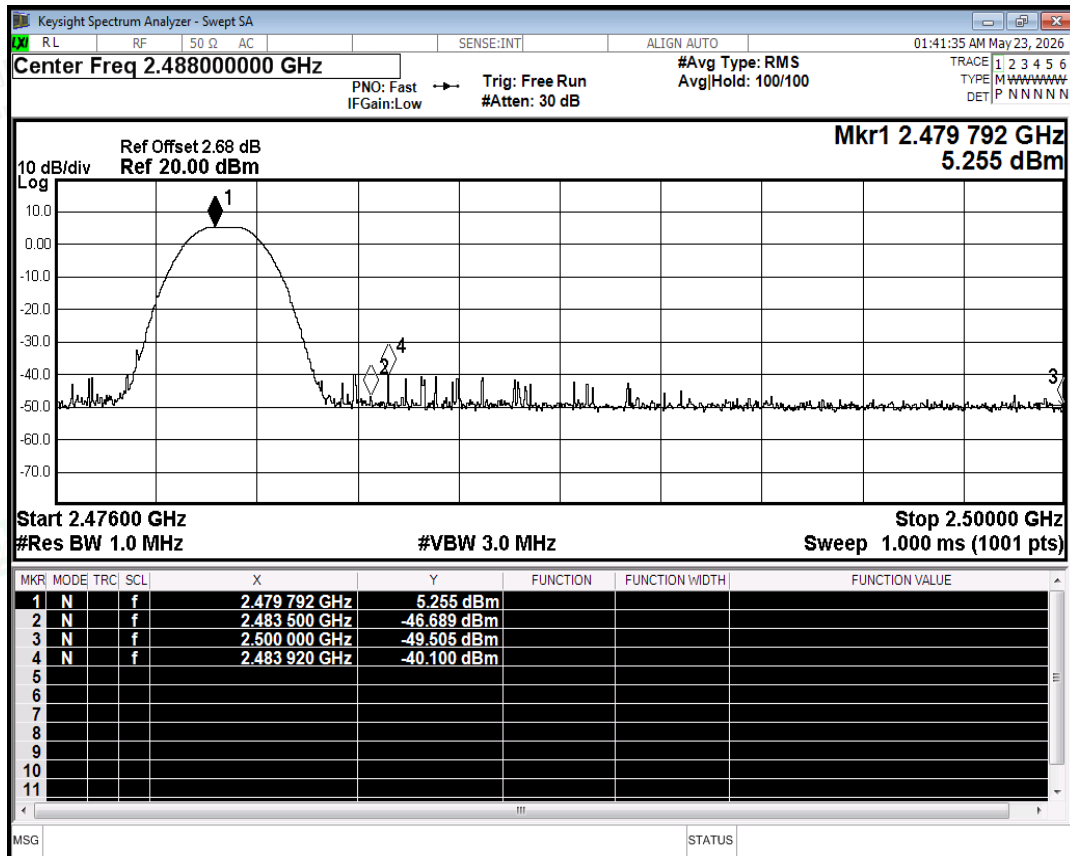


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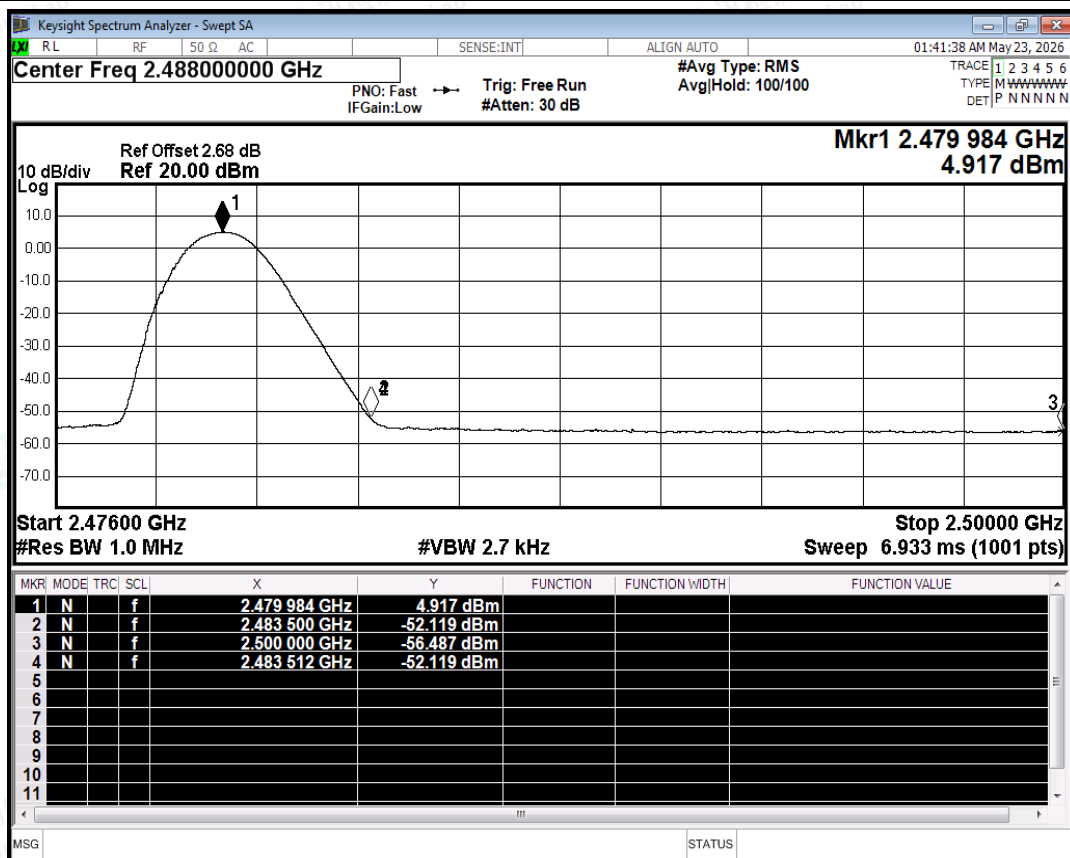
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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Restrict Band NVNT BLE 1M 2480MHz Ant Peak



Restrict Band NVNT BLE 1M 2480MHz Ant Average

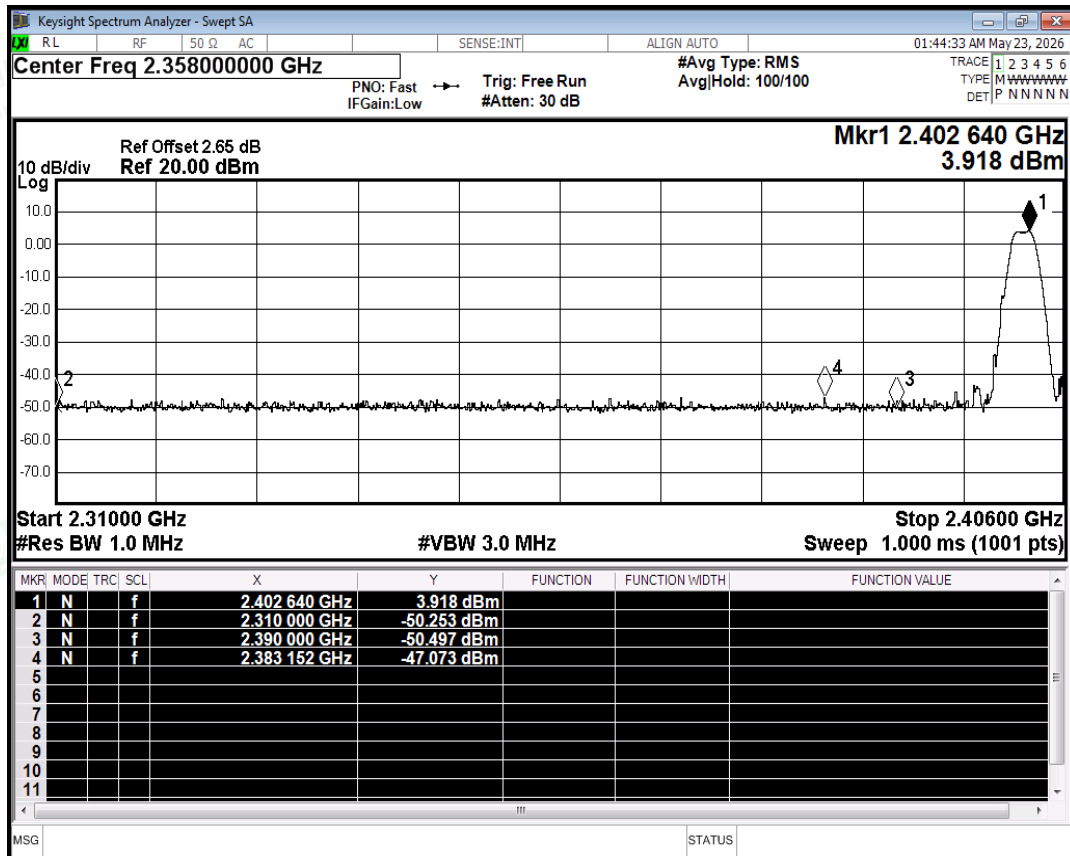


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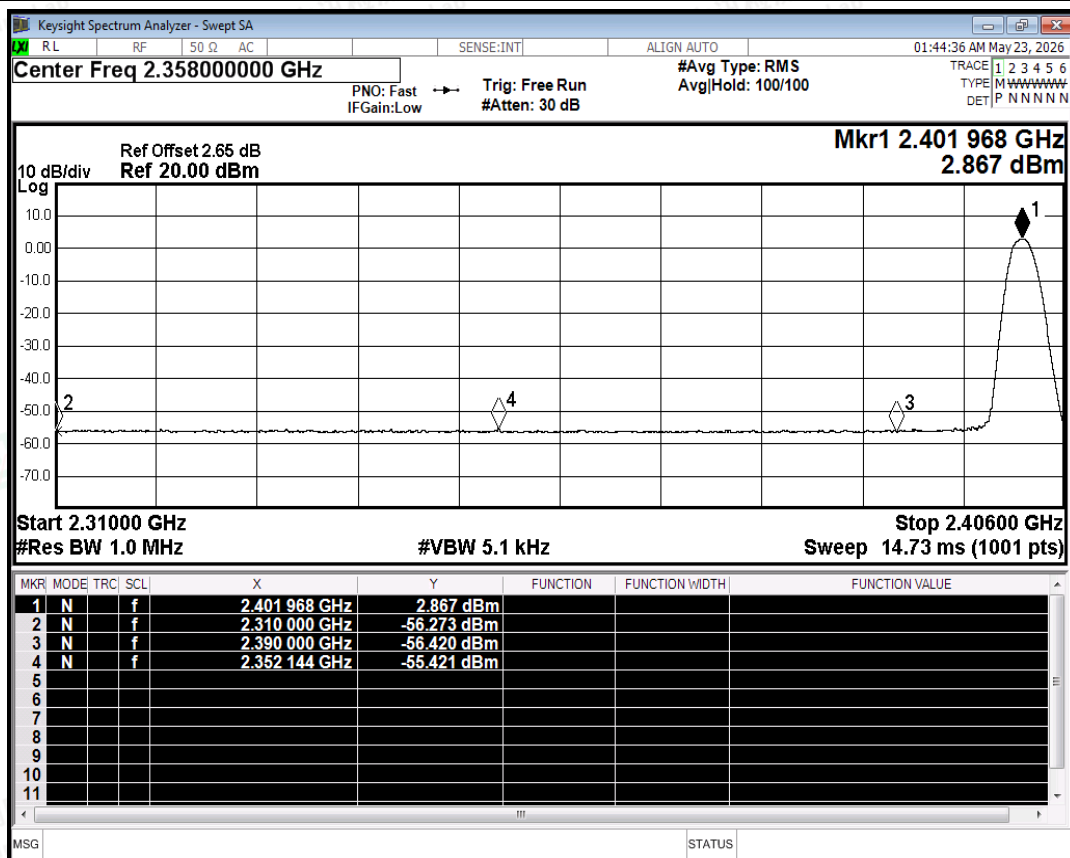
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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Restrict Band NVNT BLE 2M 2402MHz Ant Peak



Restrict Band NVNT BLE 2M 2402MHz Ant Average

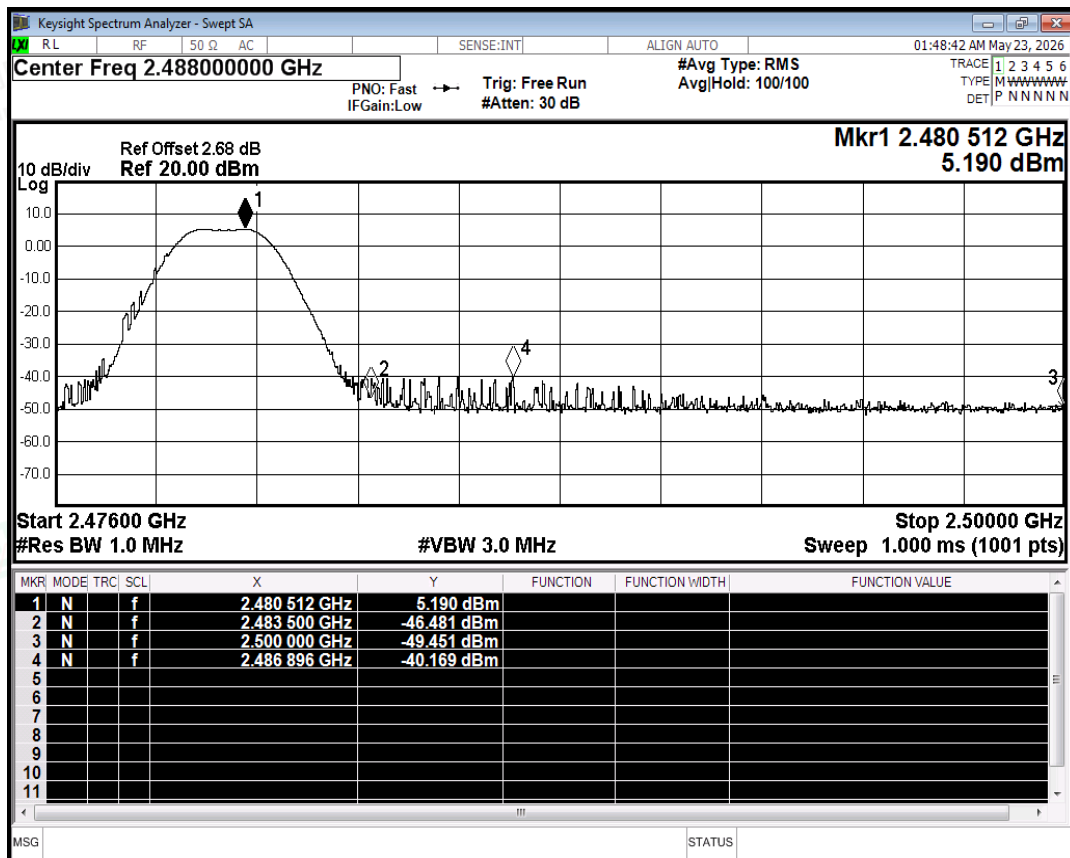


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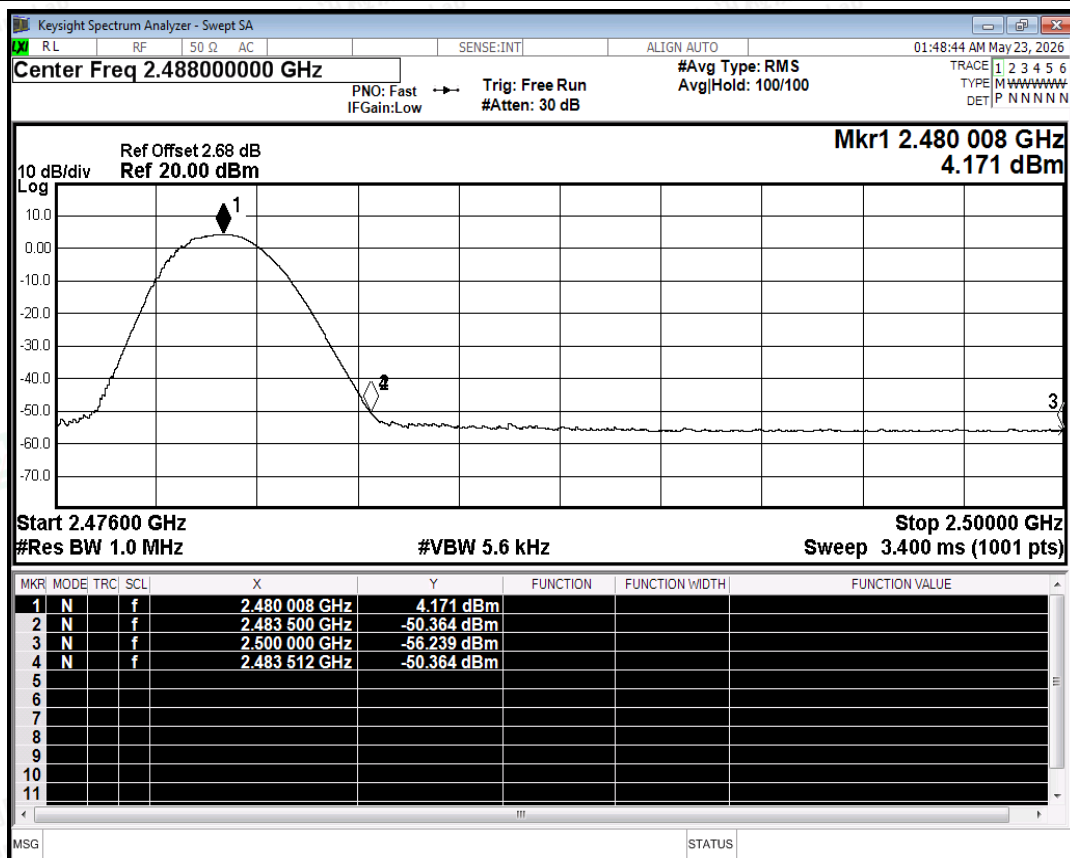
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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Restrict Band NVNT BLE 2M 2480MHz Ant Peak



Restrict Band NVNT BLE 2M 2480MHz Ant Average



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