





Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: TWS Earphone

Test Model: GUTWST31

Environmental Conditions

Temperature:	23.8 ° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	 Bill Zhu
Supervised by:	 Li Huan





A.1 -20dB Bandwidth

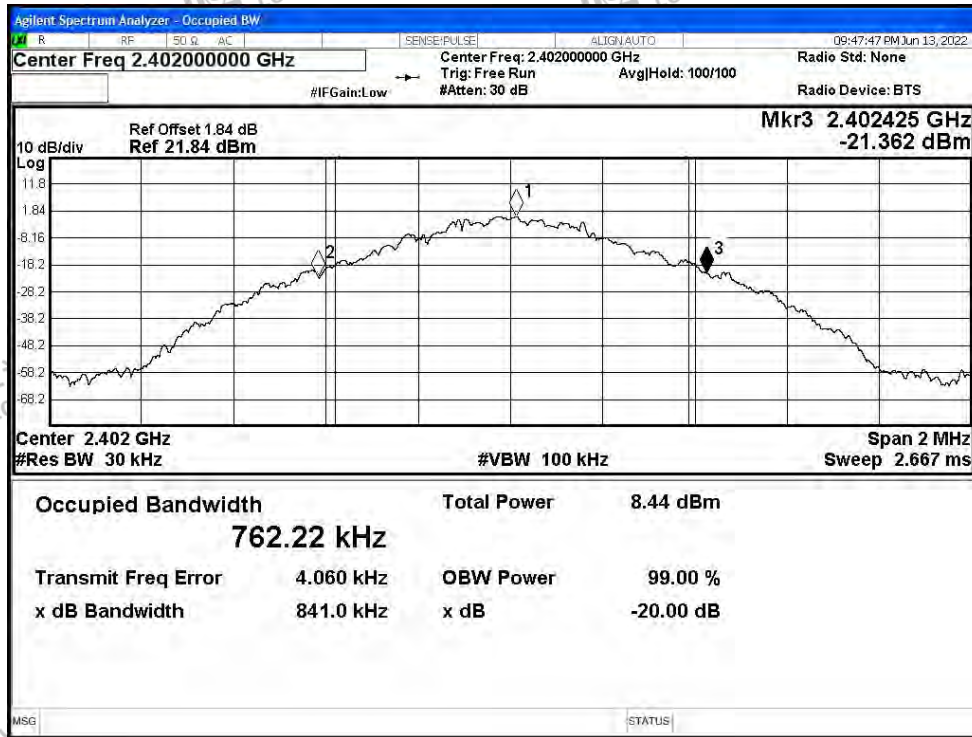
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	0.841	---	Pass
NVNT	1-DH5	2441	Ant1	0.858	---	Pass
NVNT	1-DH5	2480	Ant1	0.872	---	Pass
NVNT	2-DH5	2402	Ant1	1.262	---	Pass
NVNT	2-DH5	2441	Ant1	1.282	---	Pass
NVNT	2-DH5	2480	Ant1	1.28	---	Pass
NVNT	3-DH5	2402	Ant1	1.31	---	Pass
NVNT	3-DH5	2441	Ant1	1.295	---	Pass
NVNT	3-DH5	2480	Ant1	1.3	---	Pass



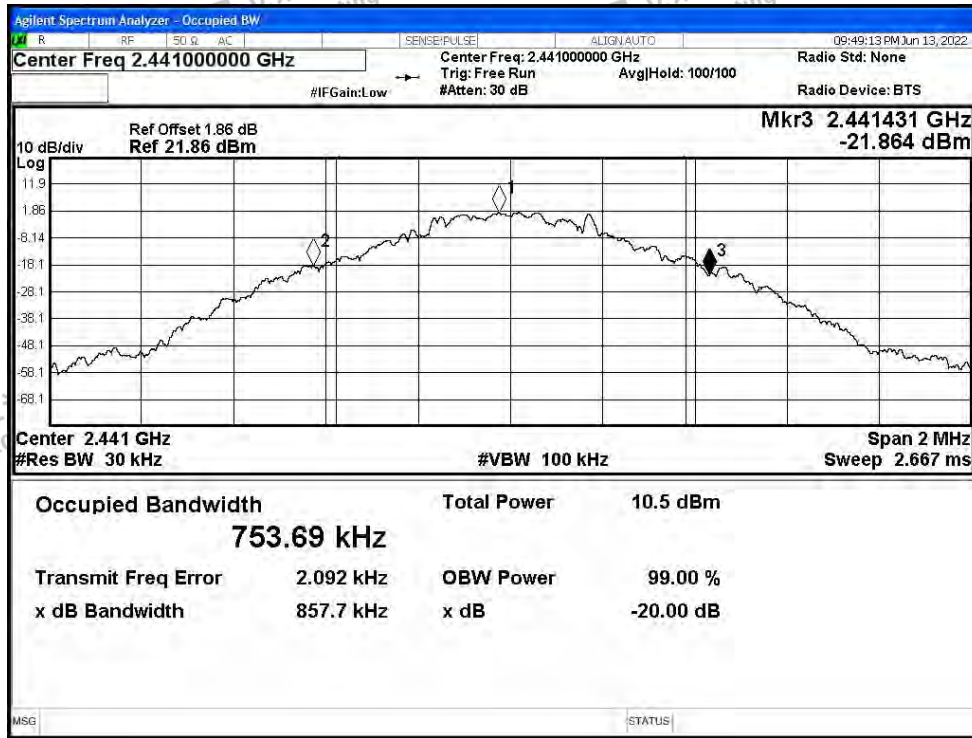


Test Graphs

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1

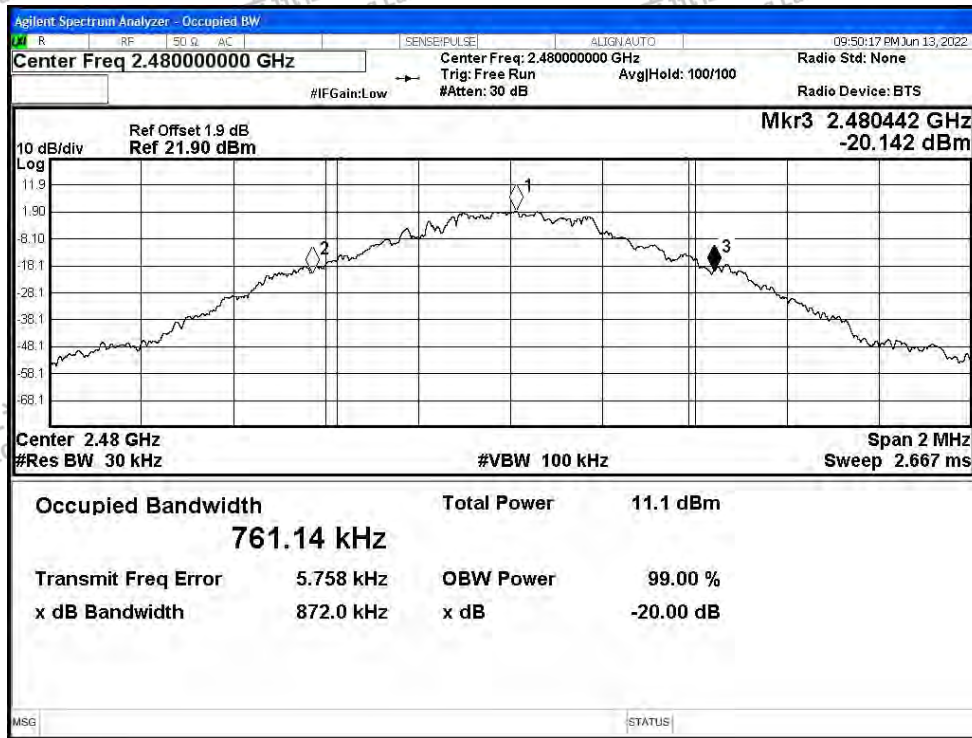


-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1





-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

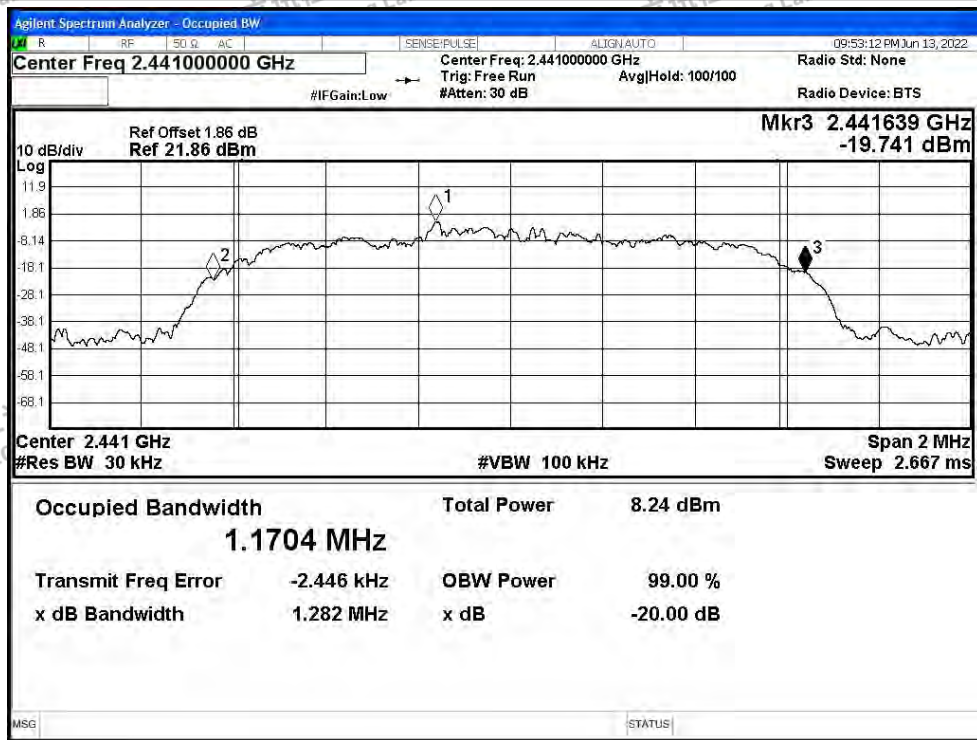


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1





-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

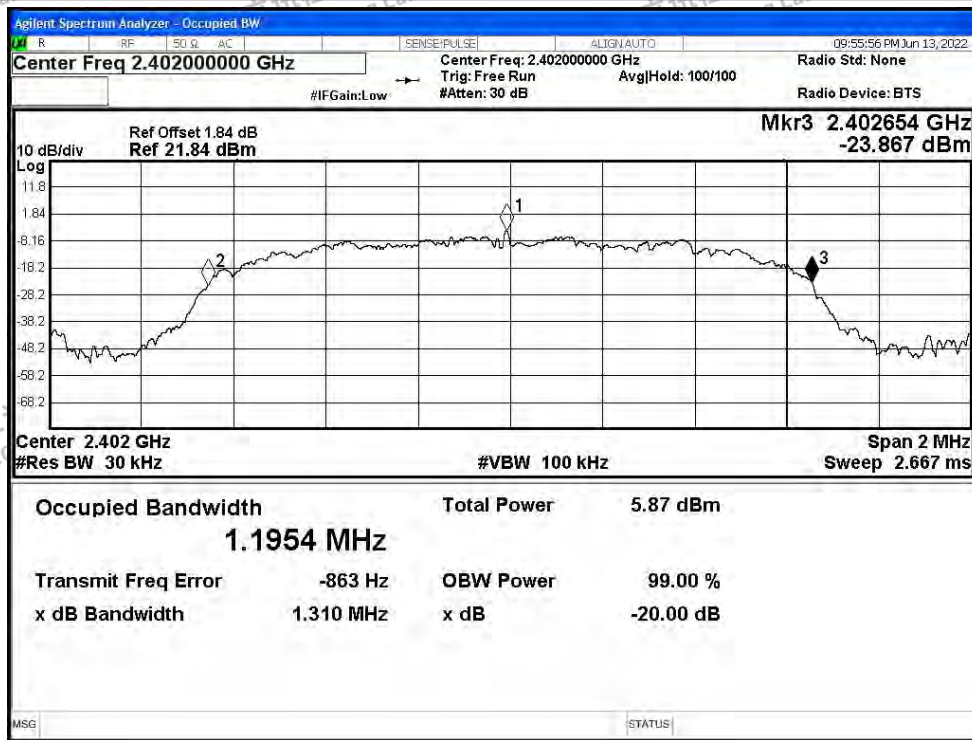


-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

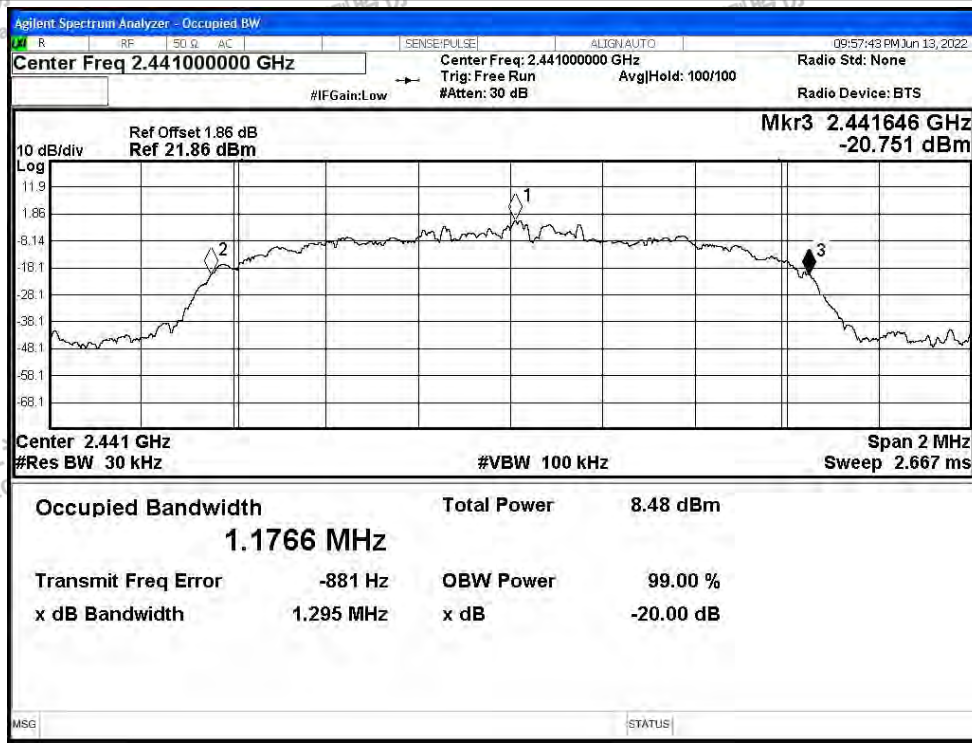




-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1





-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1





A.2 Maximum Peak Conducted Output Power

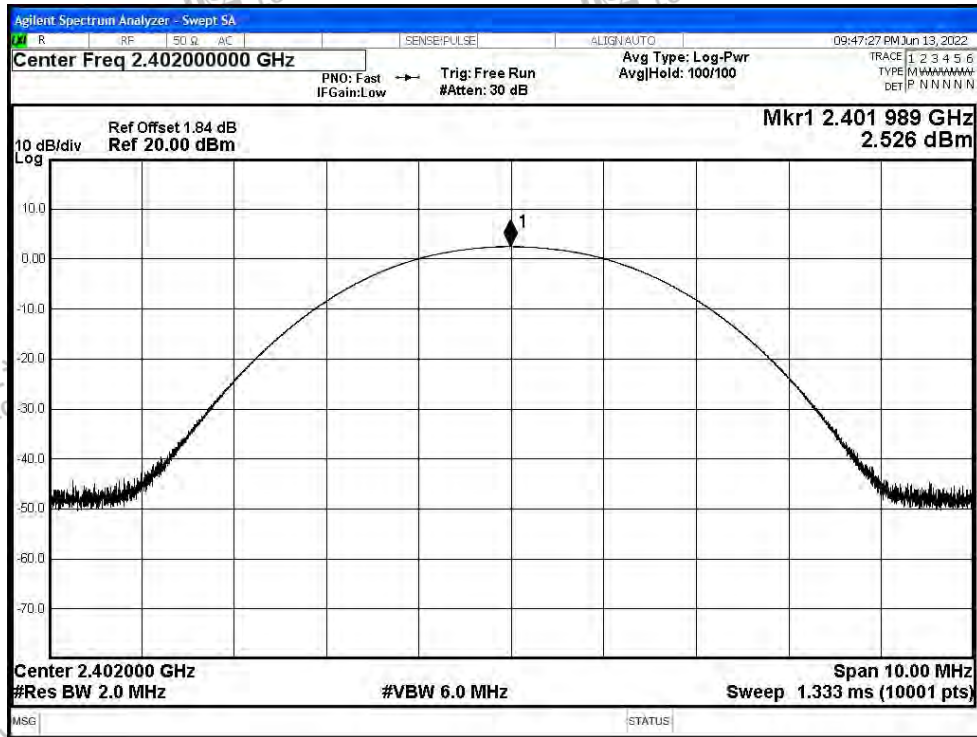
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	2.53	21	Pass
NVNT	1-DH5	2441	Ant1	4.22	21	Pass
NVNT	1-DH5	2480	Ant1	5.18	21	Pass
NVNT	2-DH5	2402	Ant1	2.19	21	Pass
NVNT	2-DH5	2441	Ant1	3.56	21	Pass
NVNT	2-DH5	2480	Ant1	4.6	21	Pass
NVNT	3-DH5	2402	Ant1	2.18	21	Pass
NVNT	3-DH5	2441	Ant1	3.58	21	Pass
NVNT	3-DH5	2480	Ant1	4.58	21	Pass



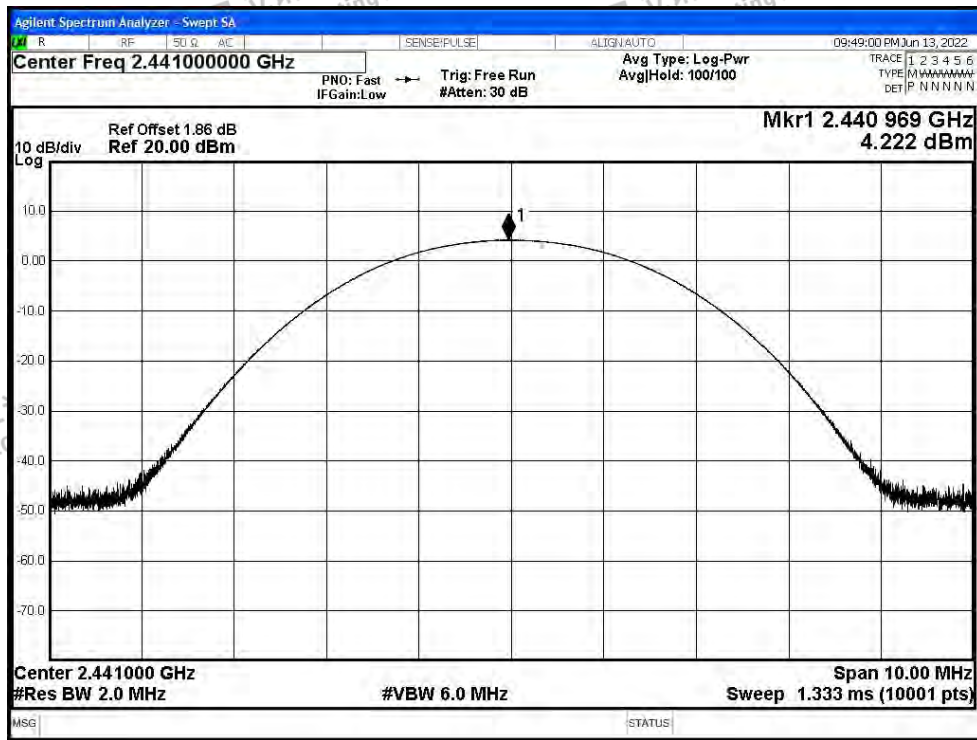


Test Graphs

Power NVNT 1-DH5 2402MHz Ant1

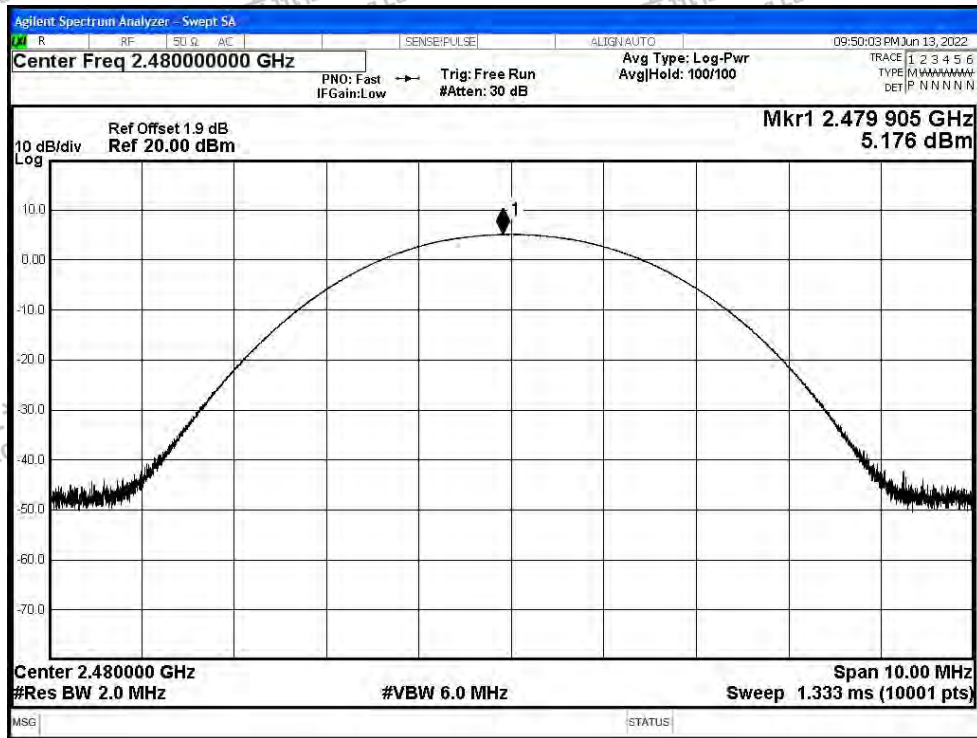


Power NVNT 1-DH5 2441MHz Ant1

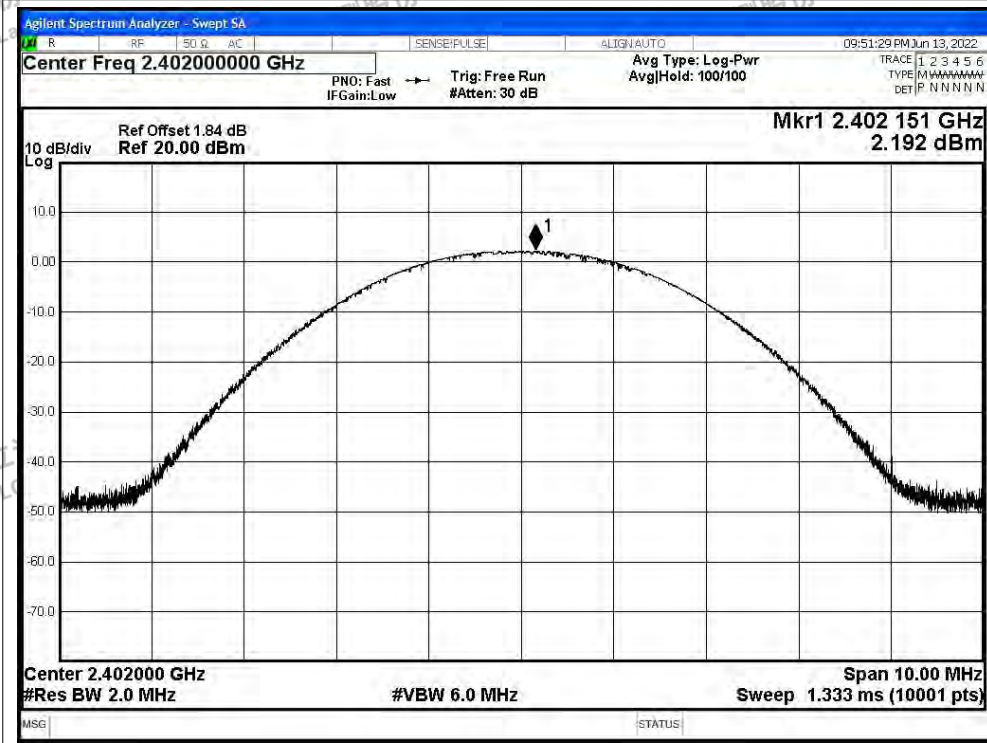




Power NVNT 1-DH5 2480MHz Ant1

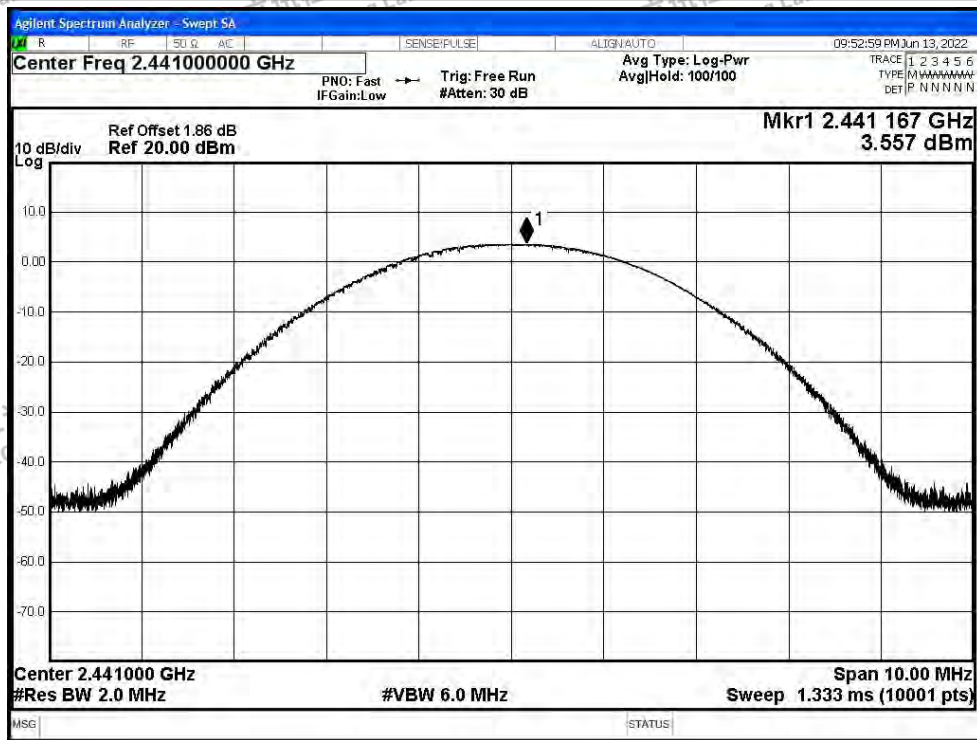


Power NVNT 2-DH5 2402MHz Ant1

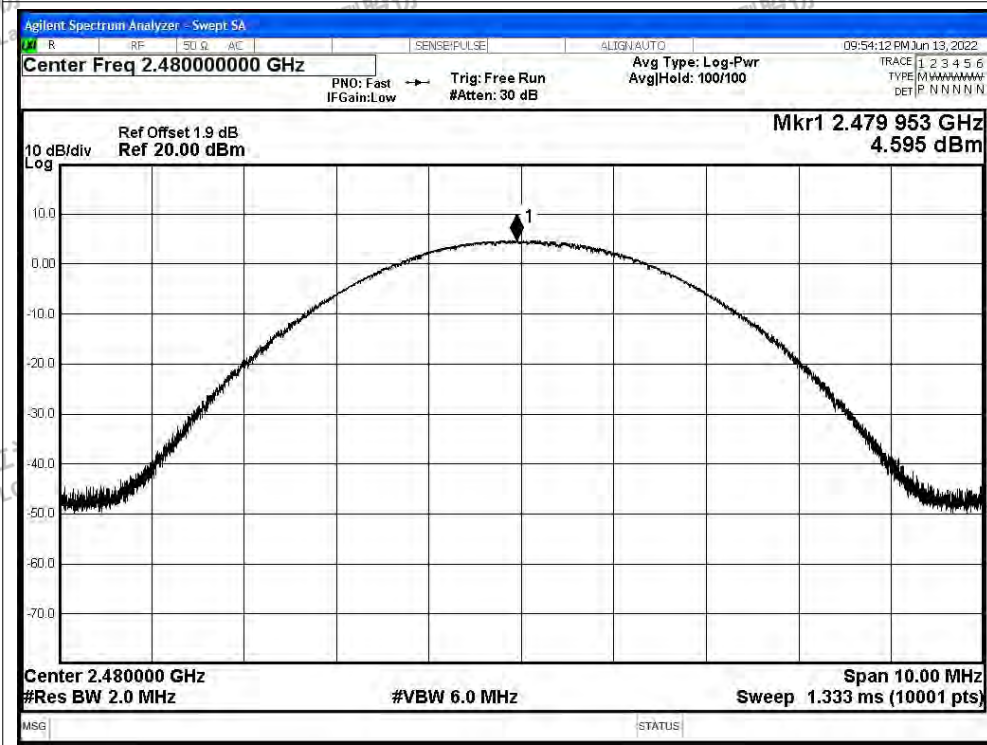




Power NVNT 2-DH5 2441MHz Ant1

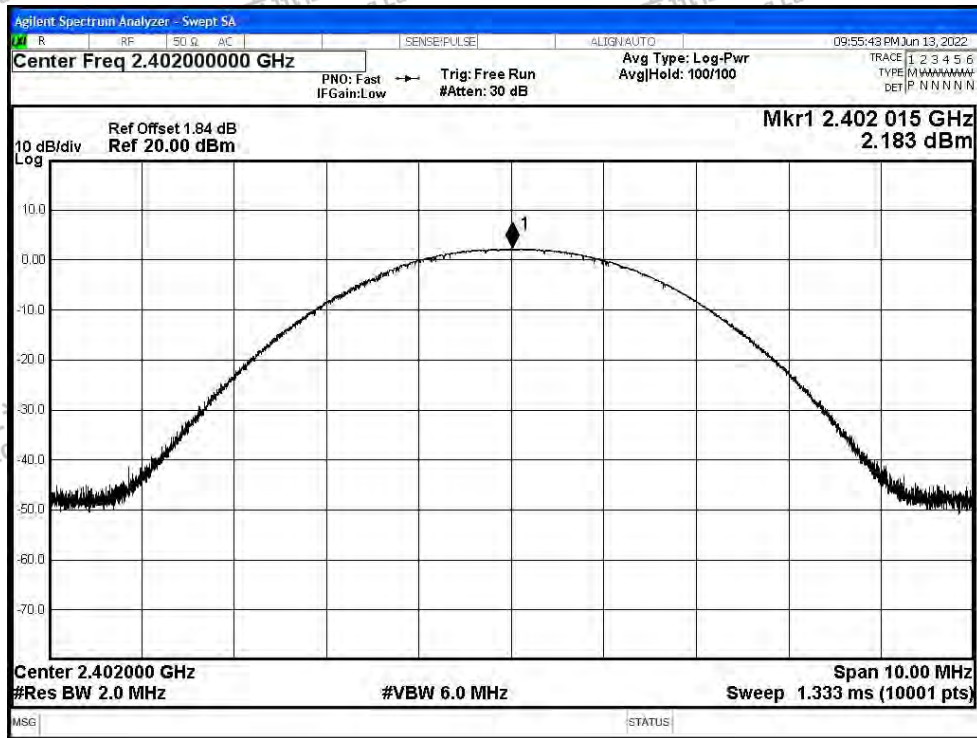


Power NVNT 2-DH5 2480MHz Ant1

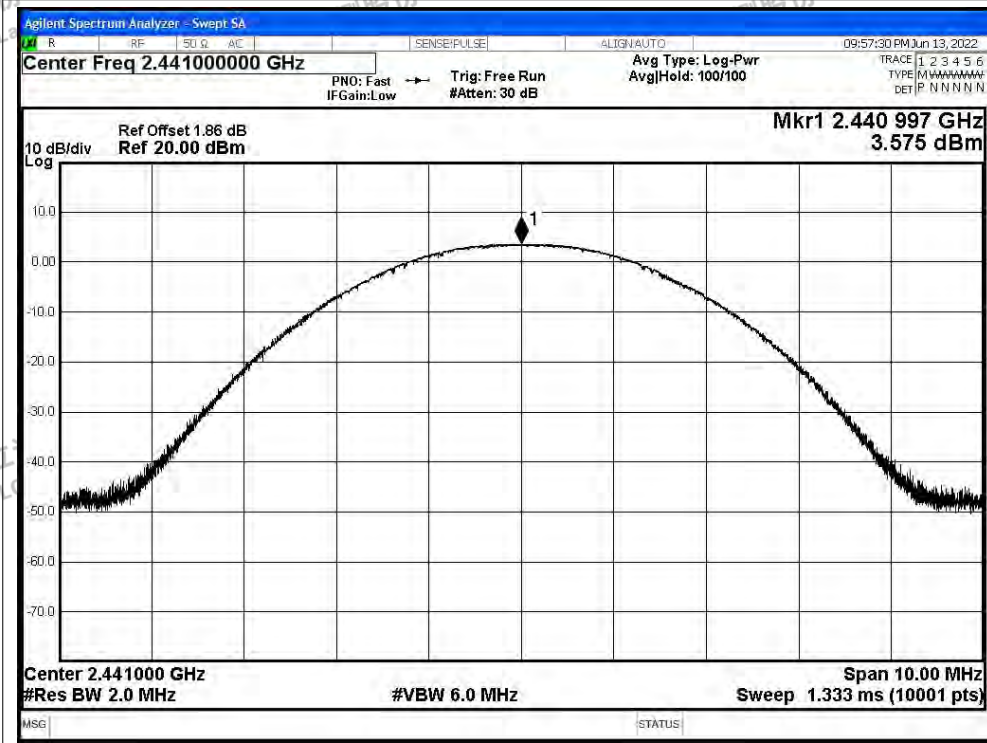




Power NVNT 3-DH5 2402MHz Ant1

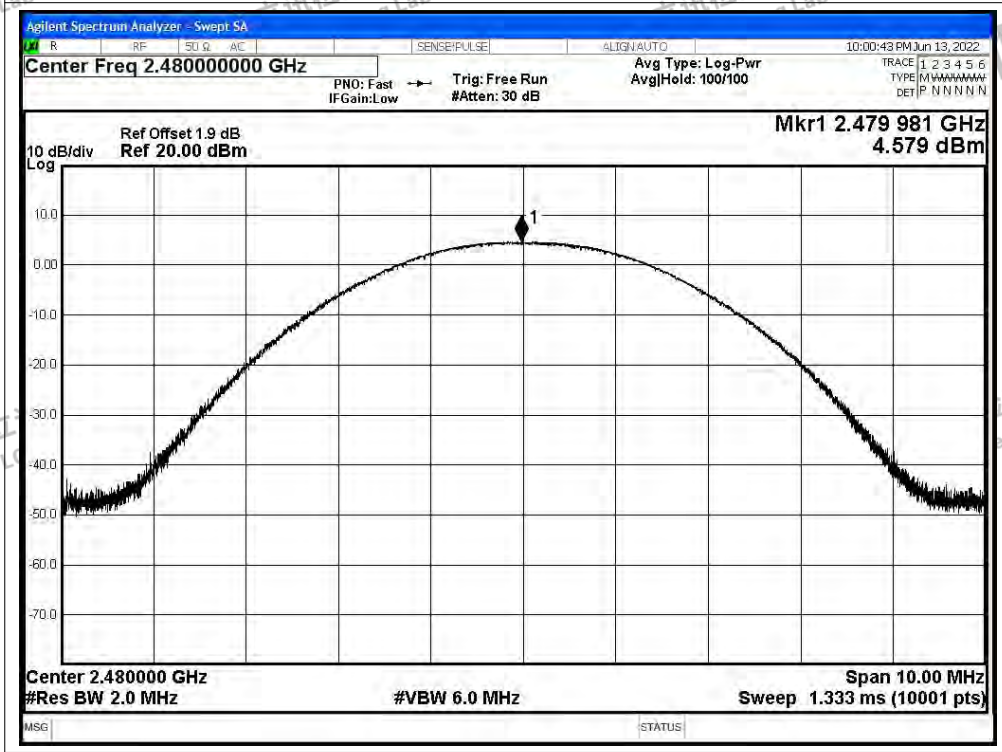


Power NVNT 3-DH5 2441MHz Ant1





Power NVNT 3-DH5 2480MHz Ant1



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A.3 Carrier Frequencies Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2402.012	2403.01	0.998	0.561	Pass
NVNT	2-DH5	Ant1	2402.026	2402.948	0.922	0.841	Pass
NVNT	3-DH5	Ant1	2402.018	2403.158	1.14	0.873	Pass

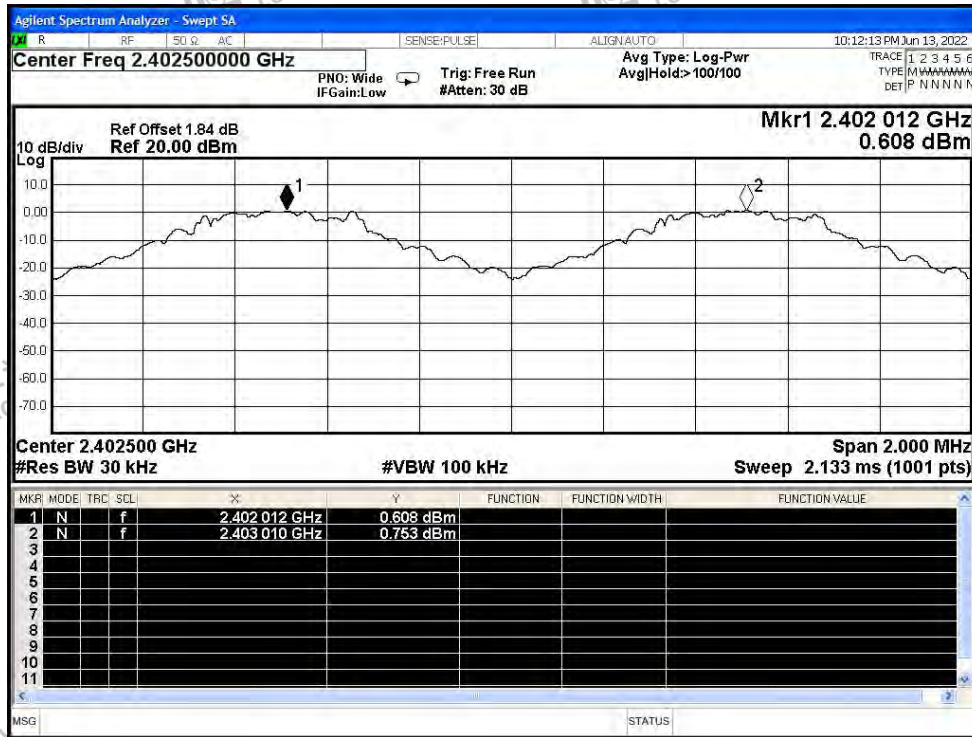


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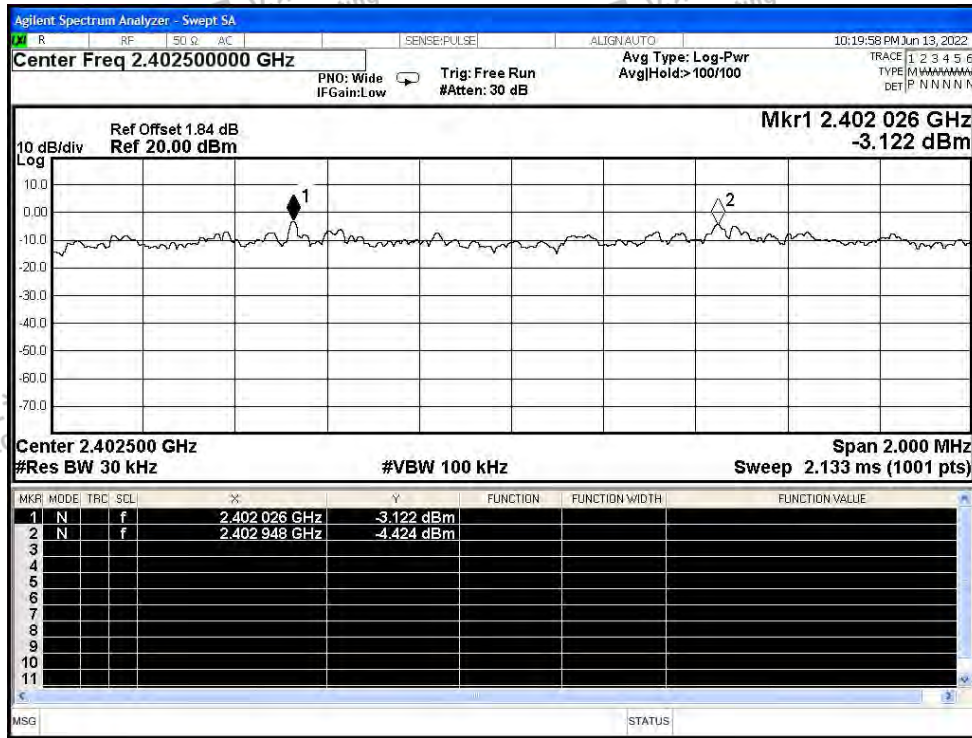


Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1

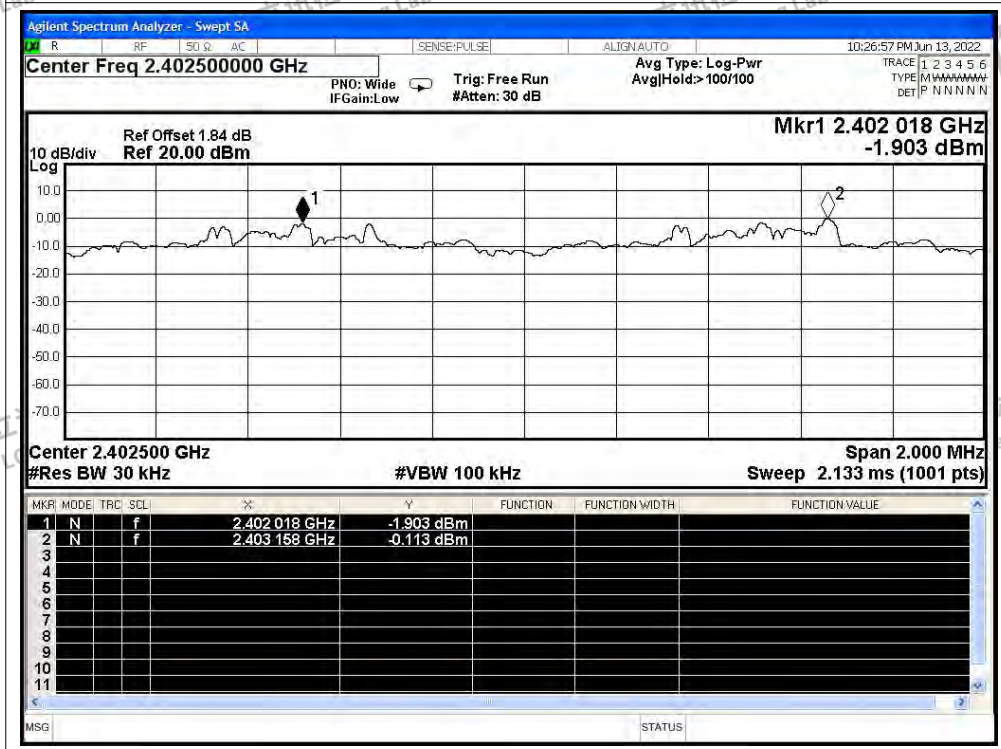


CFS NVNT 2-DH5 2402MHz Ant1





CFS NVNT 3-DH5 2402MHz Ant1



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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	2.881	325.553	113	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.882	265.144	92	31600	400	Pass
NVNT	1-DH5	2480	Ant1	2.882	285.318	99	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.885	268.305	93	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.884	294.168	102	31600	400	Pass
NVNT	2-DH5	2480	Ant1	2.884	288.4	100	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.887	297.361	103	31600	400	Pass
NVNT	3-DH5	2441	Ant1	2.887	323.344	112	31600	400	Pass
NVNT	3-DH5	2480	Ant1	2.887	274.265	95	31600	400	Pass

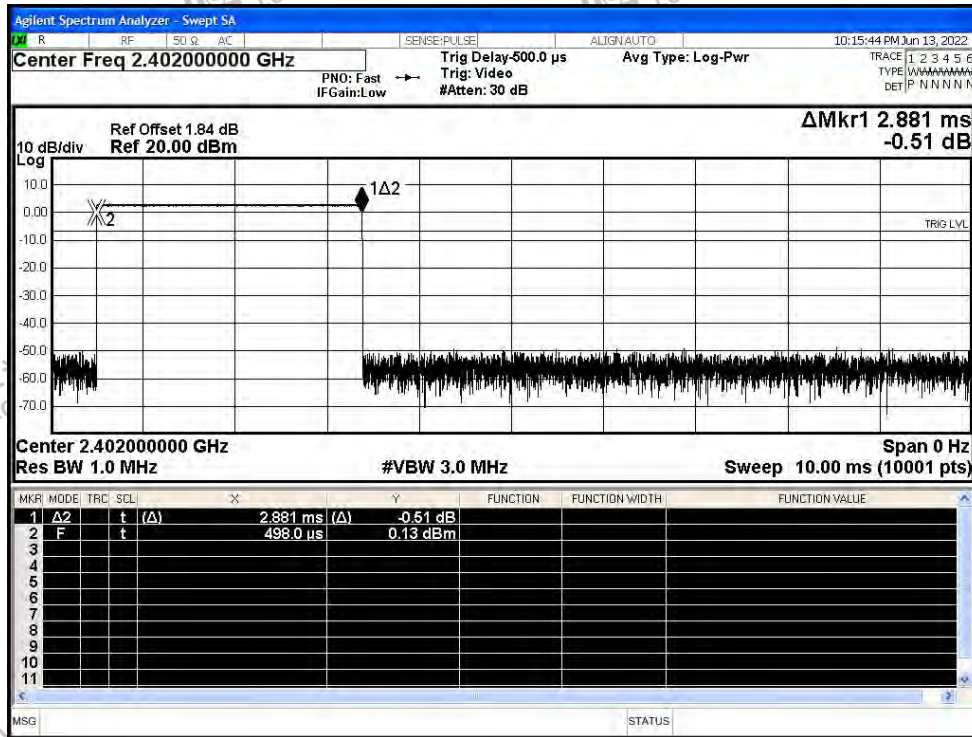


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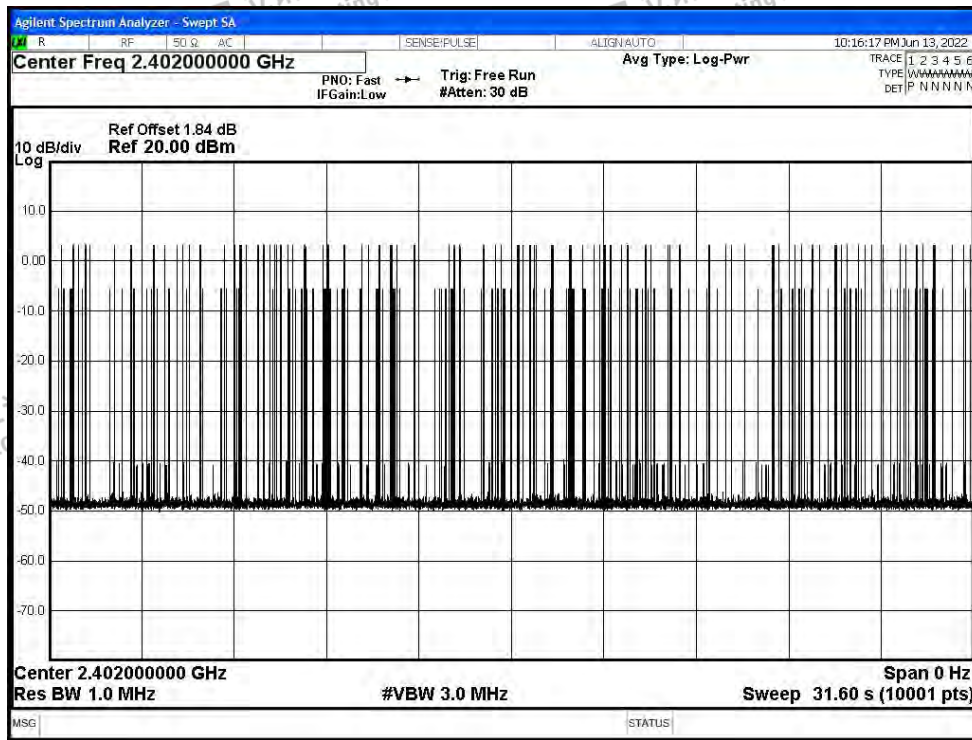


Test Graphs

Dwell-NVNT 1-DH5 2402MHz Ant1 One Burst

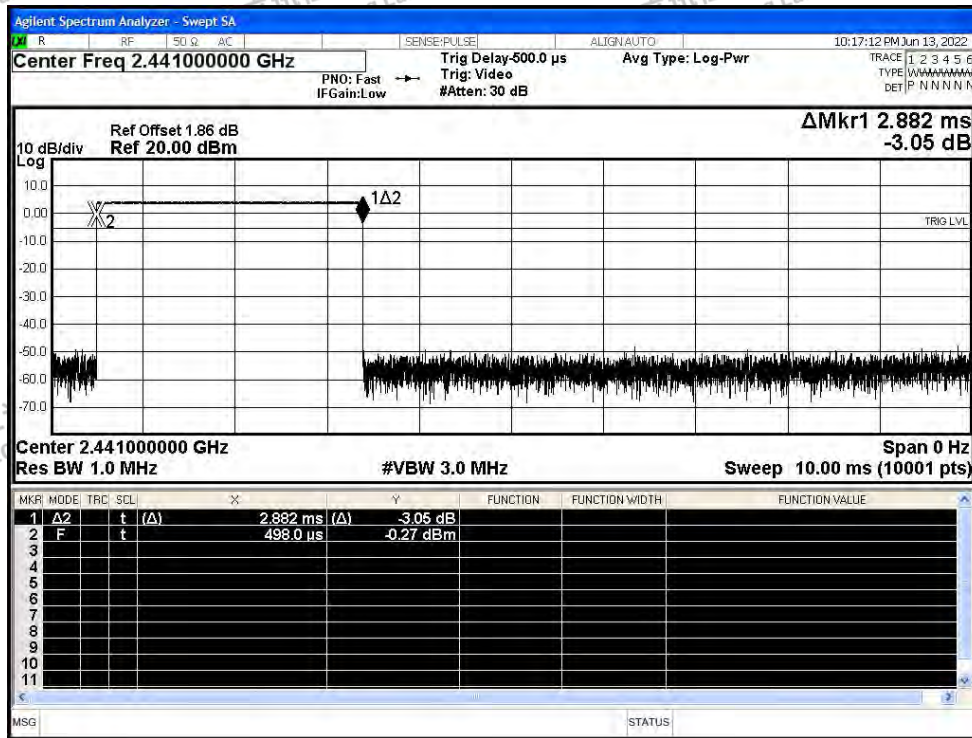


Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated

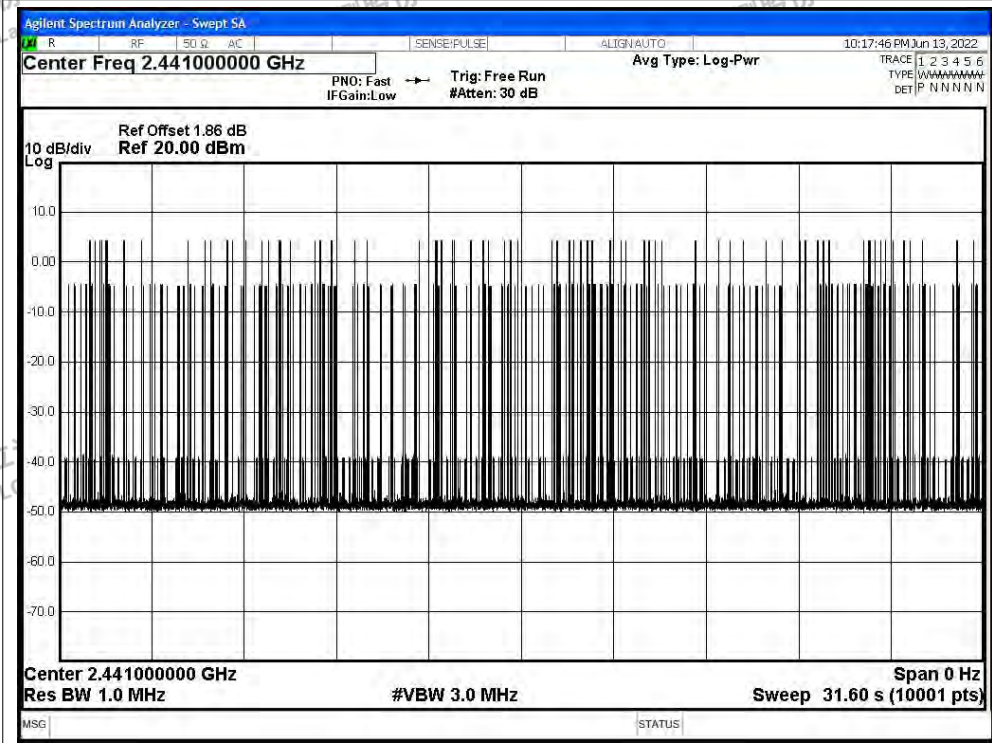




Dwell NVNT 1-DH5 2441MHz Ant1 One Burst

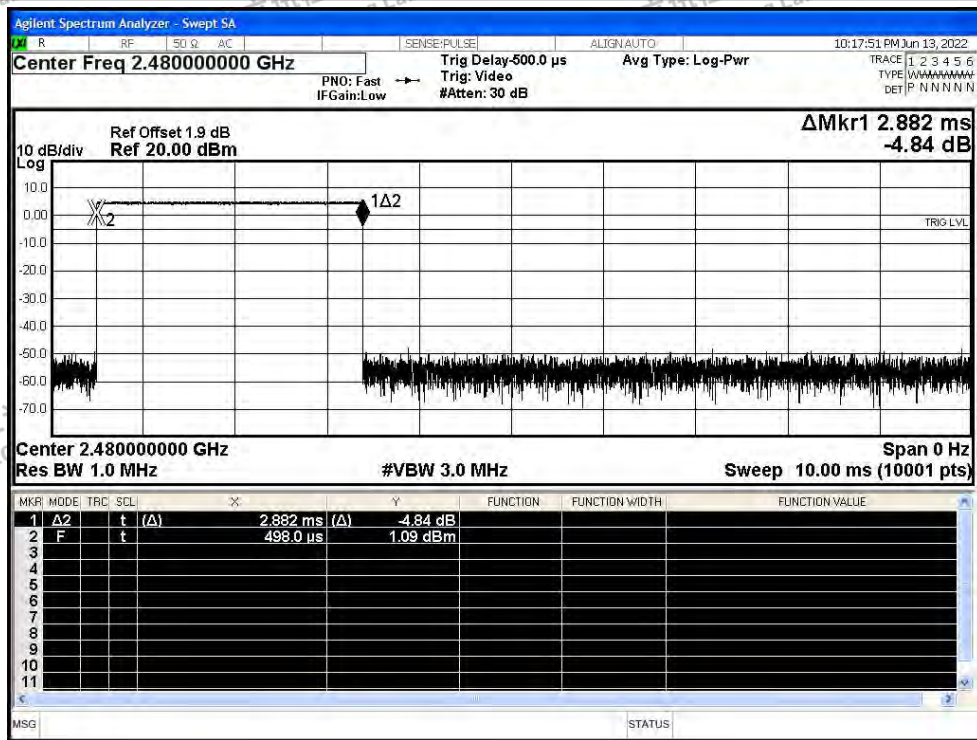


Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated

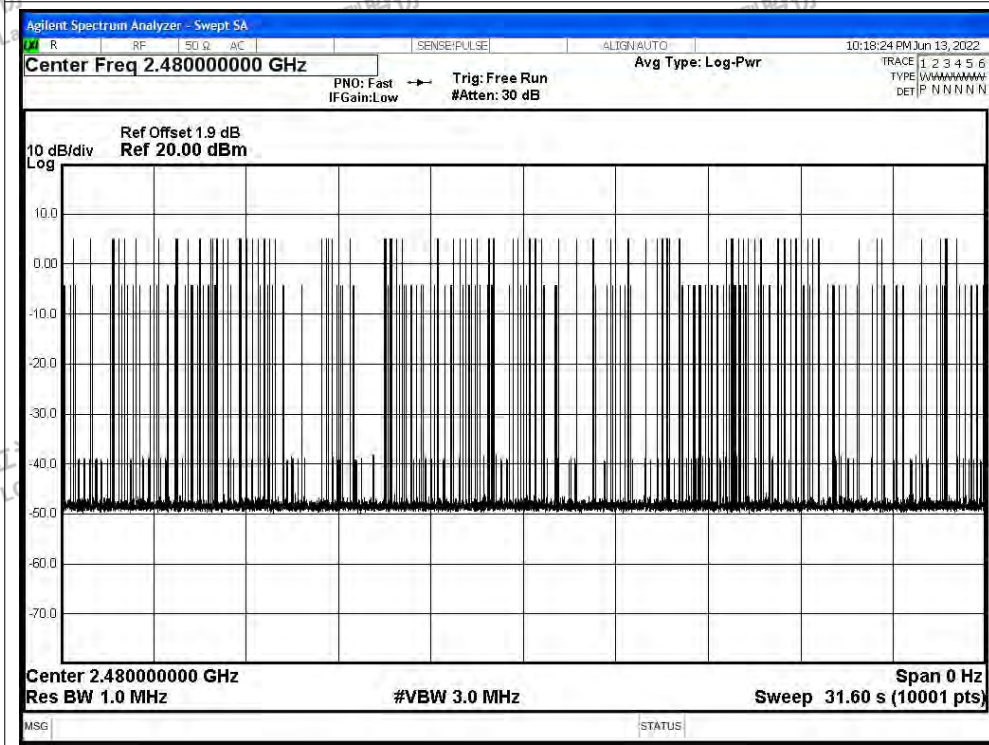




Dwell NVNT 1-DH5 2480MHz Ant1 One Burst

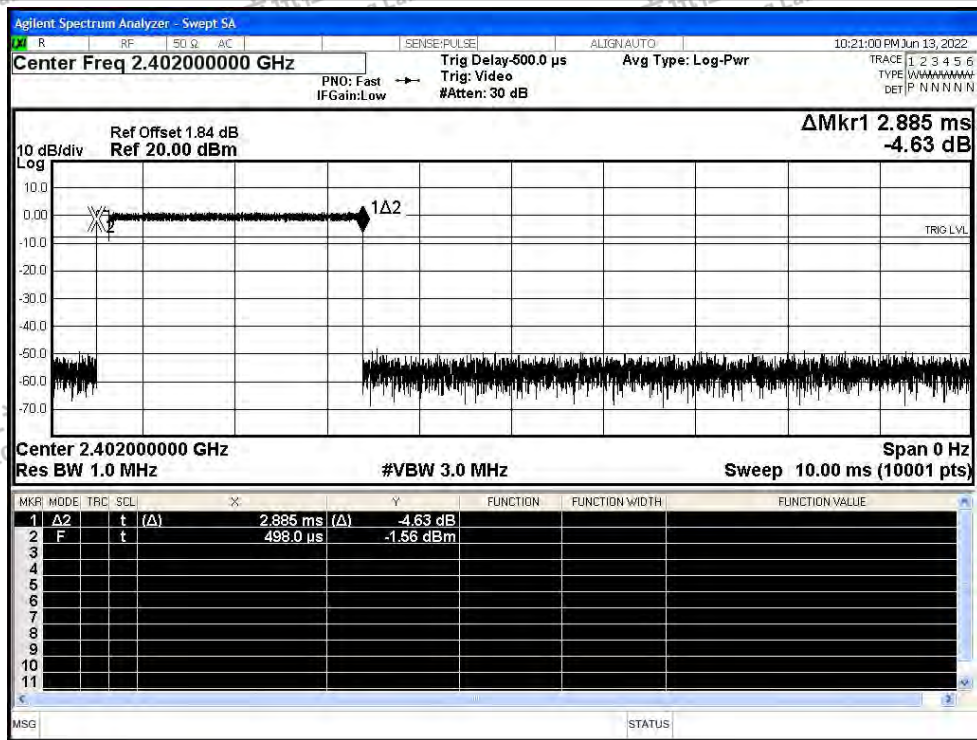


Dwell NVNT 1-DH5 2480MHz Ant1 Accumulated

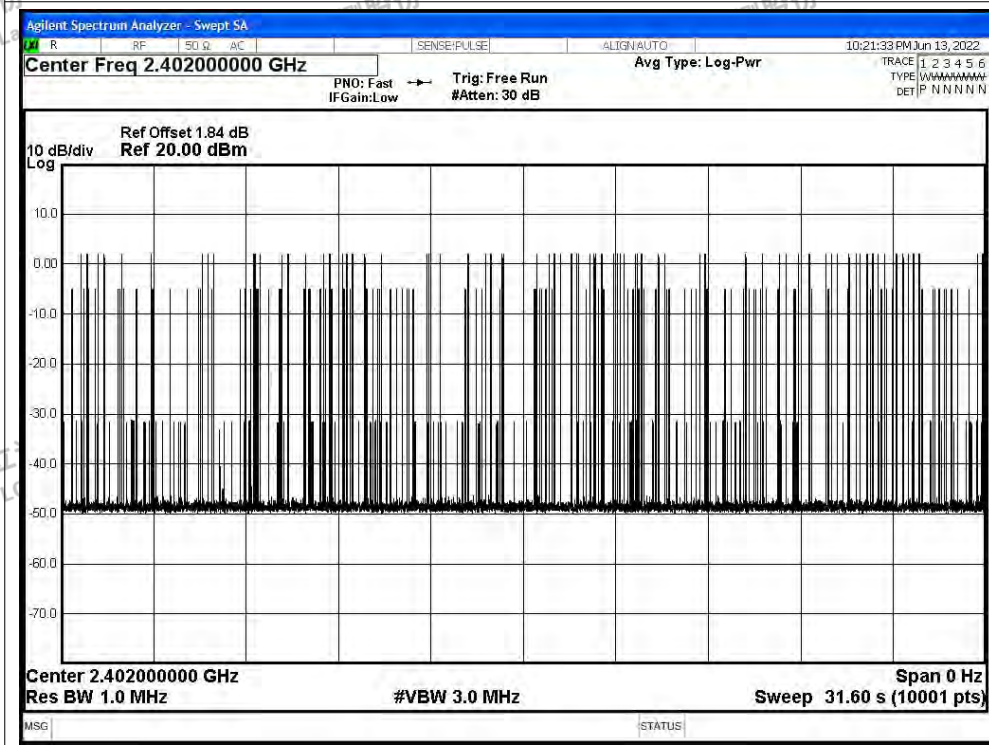




Dwell NVNT 2-DH5 2402MHz Ant1 One Burst

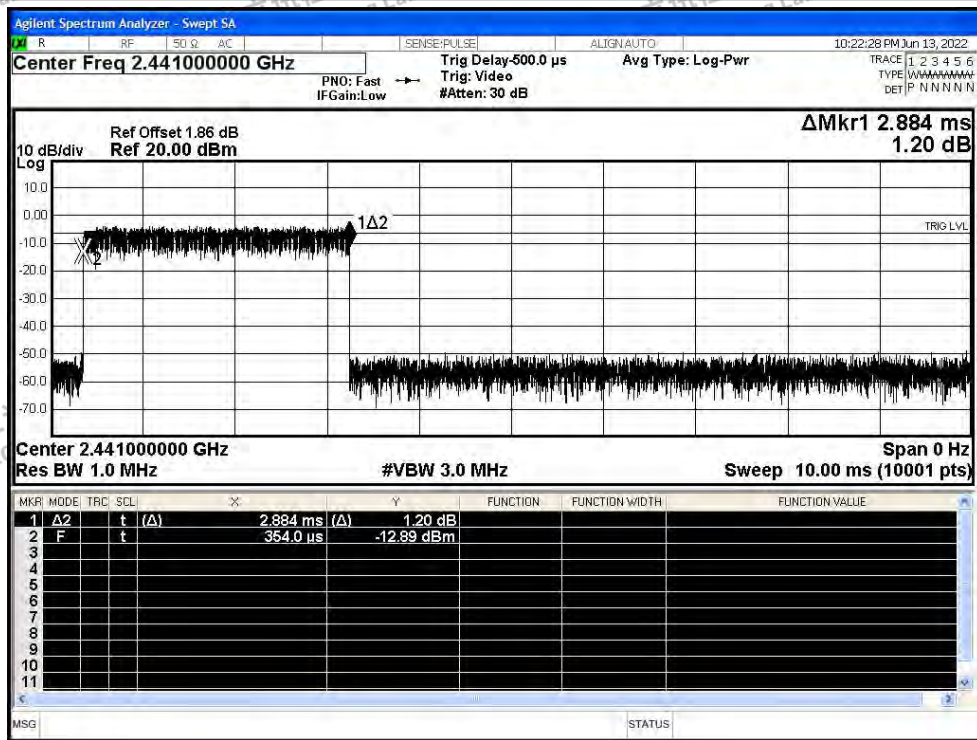


Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated

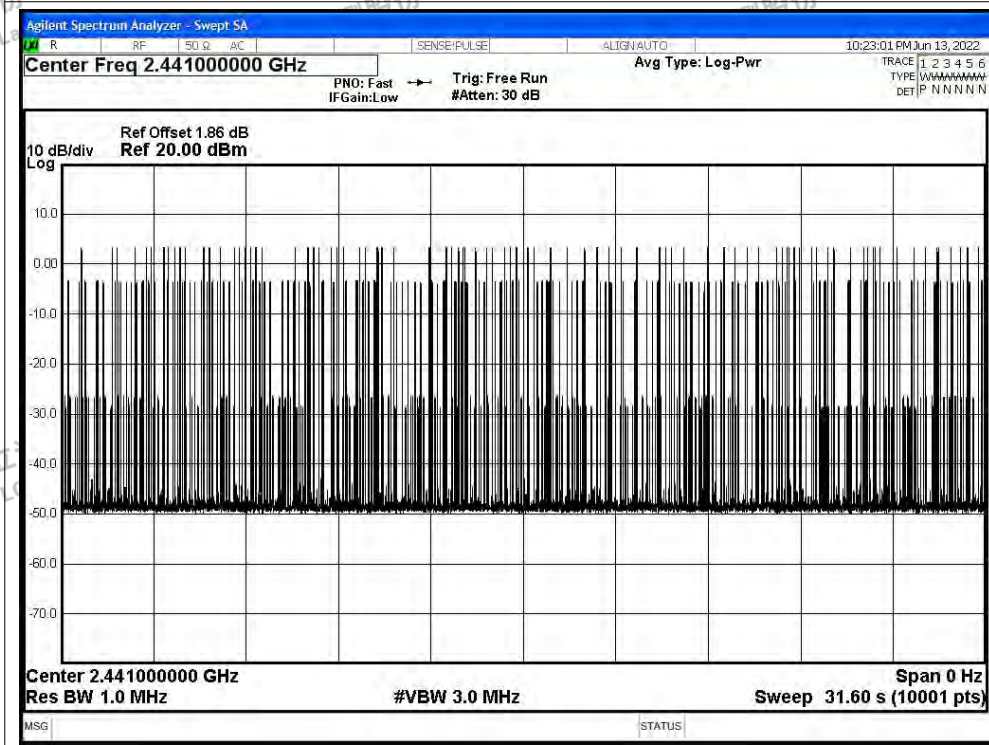




Dwell NVNT 2-DH5 2441MHz Ant1 One Burst

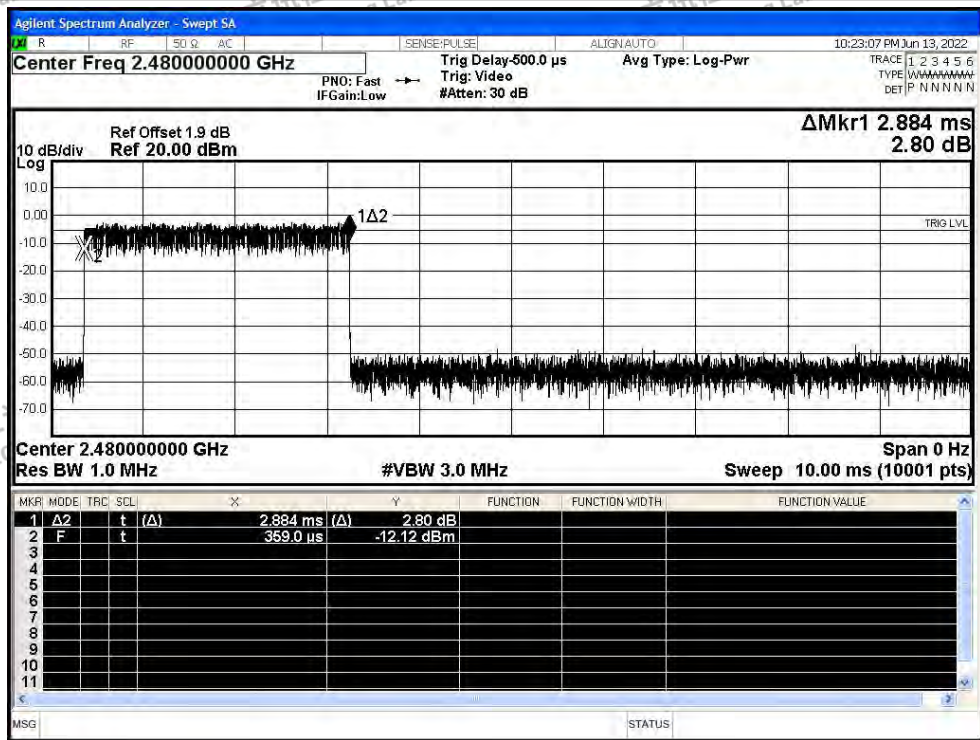


Dwell NVNT 2-DH5 2441MHz Ant1 Accumulated

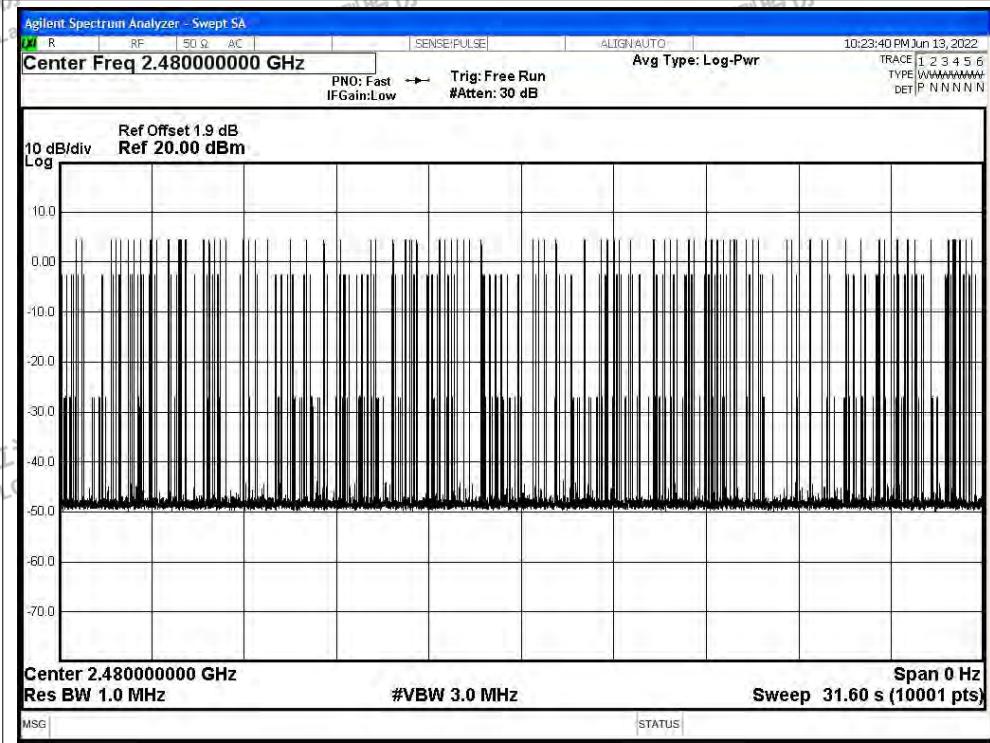




Dwell NVNT 2-DH5 2480MHz Ant1 One Burst

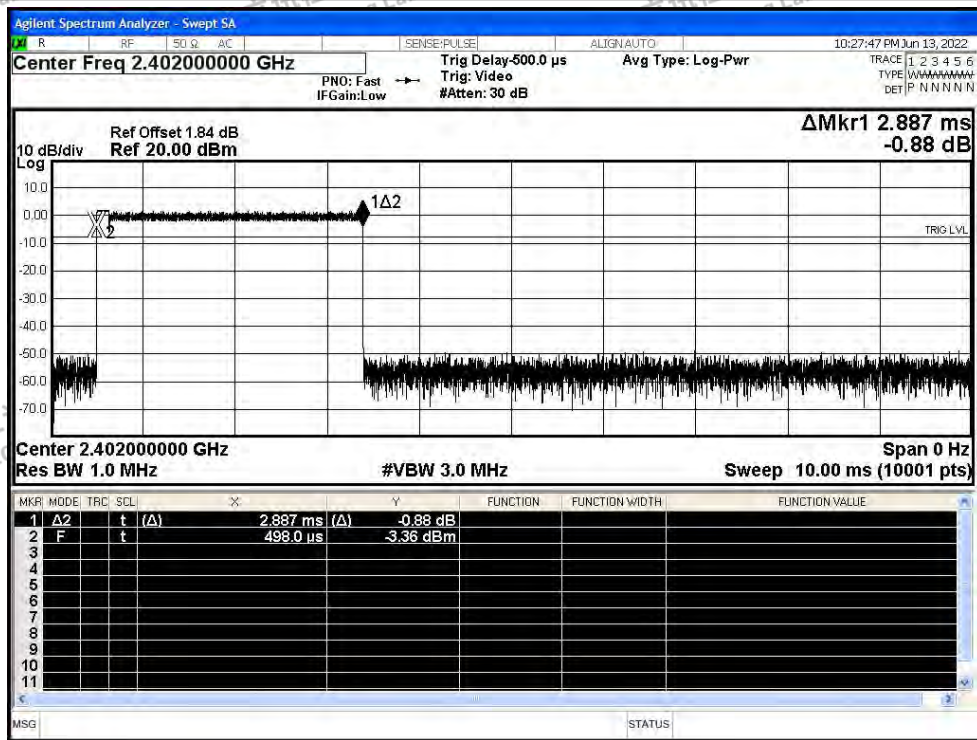


Dwell NVNT 2-DH5 2480MHz Ant1 Accumulated

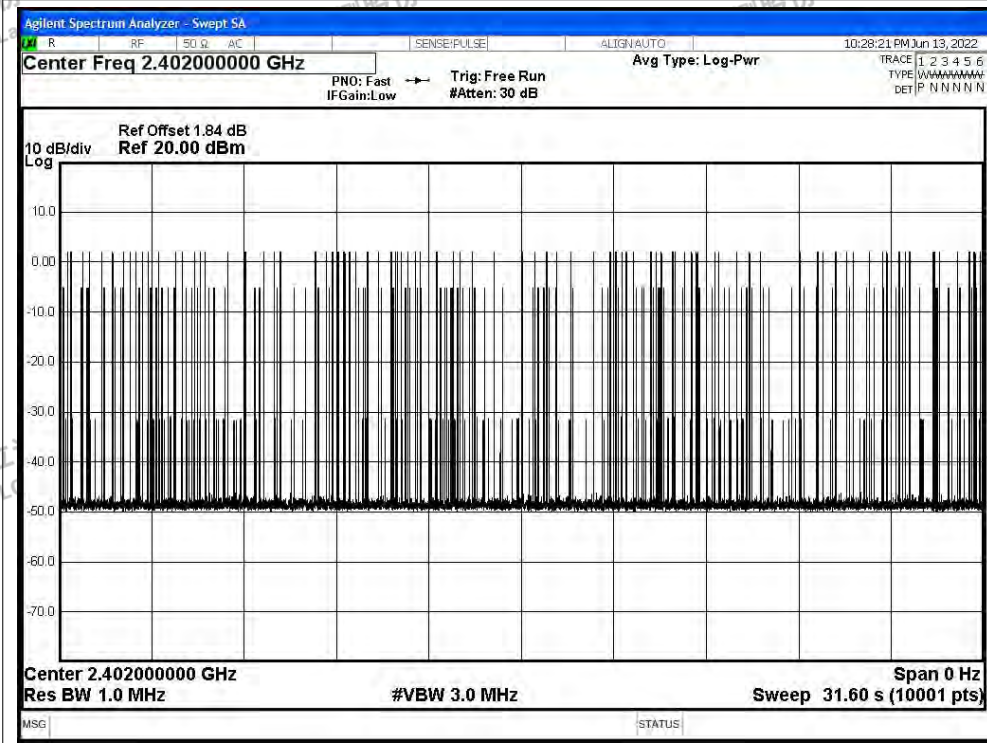




Dwell NVNT 3-DH5 2402MHz Ant1 One Burst

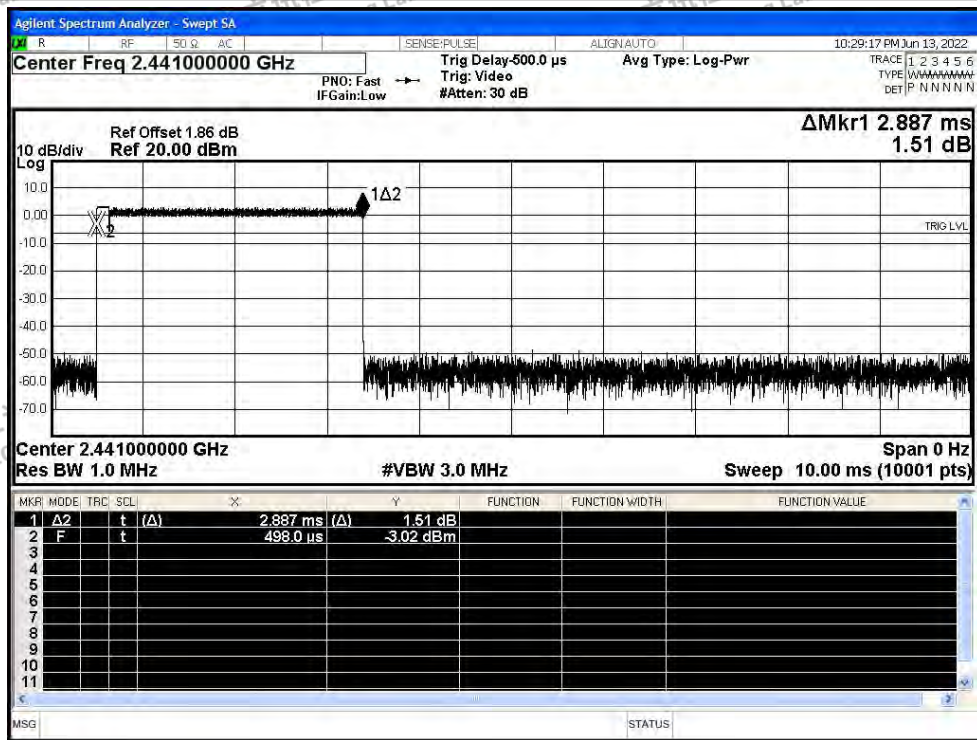


Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated

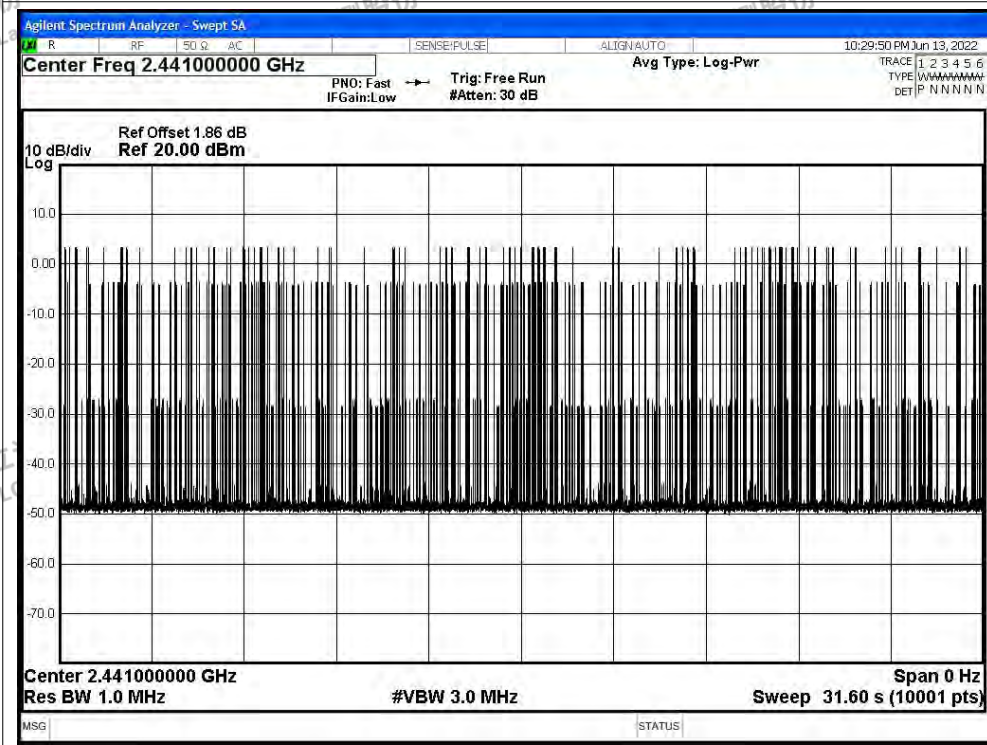




Dwell NVNT 3-DH5 2441MHz Ant1 One Burst

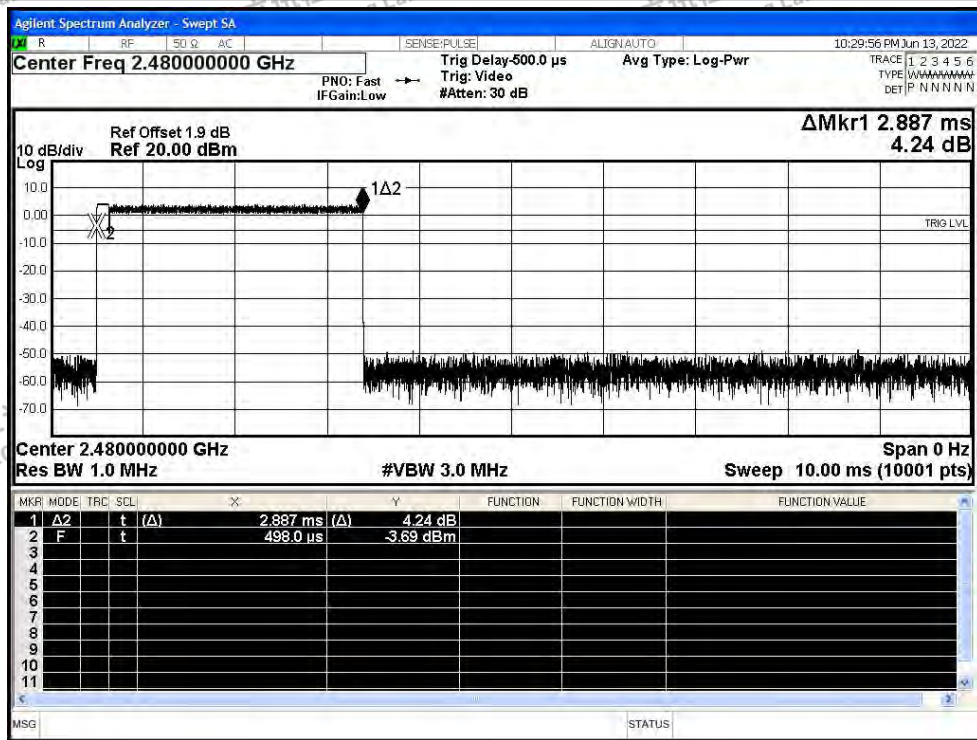


Dwell NVNT 3-DH5 2441MHz Ant1 Accumulated

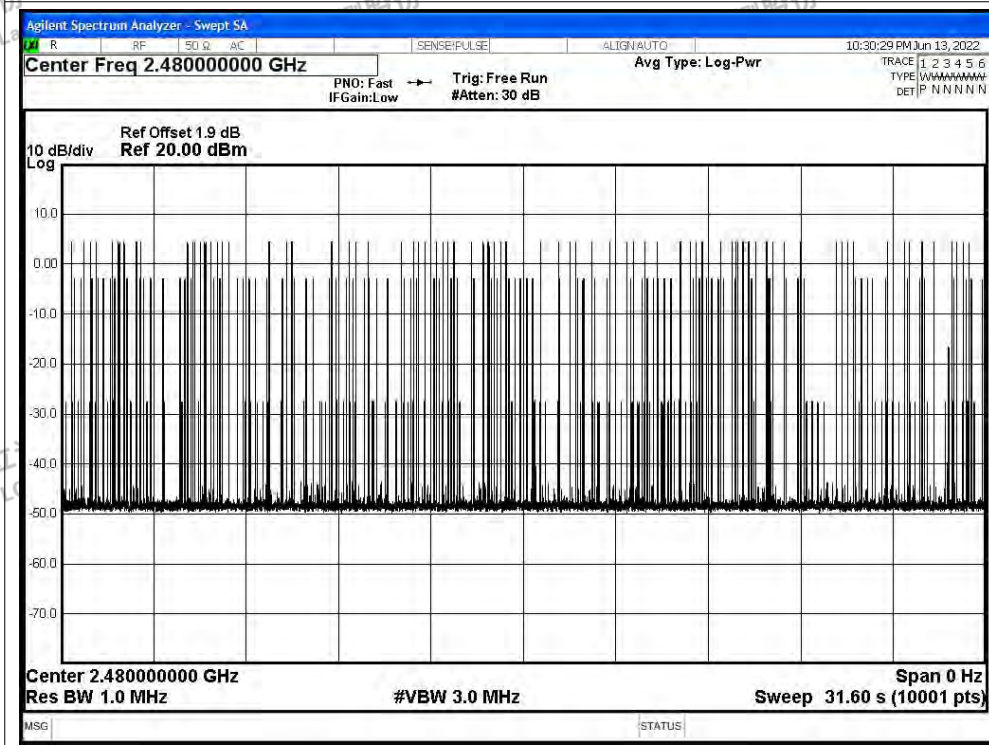




Dwell NVNT 3-DH5 2480MHz Ant1 One Burst



Dwell NVNT 3-DH5 2480MHz 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

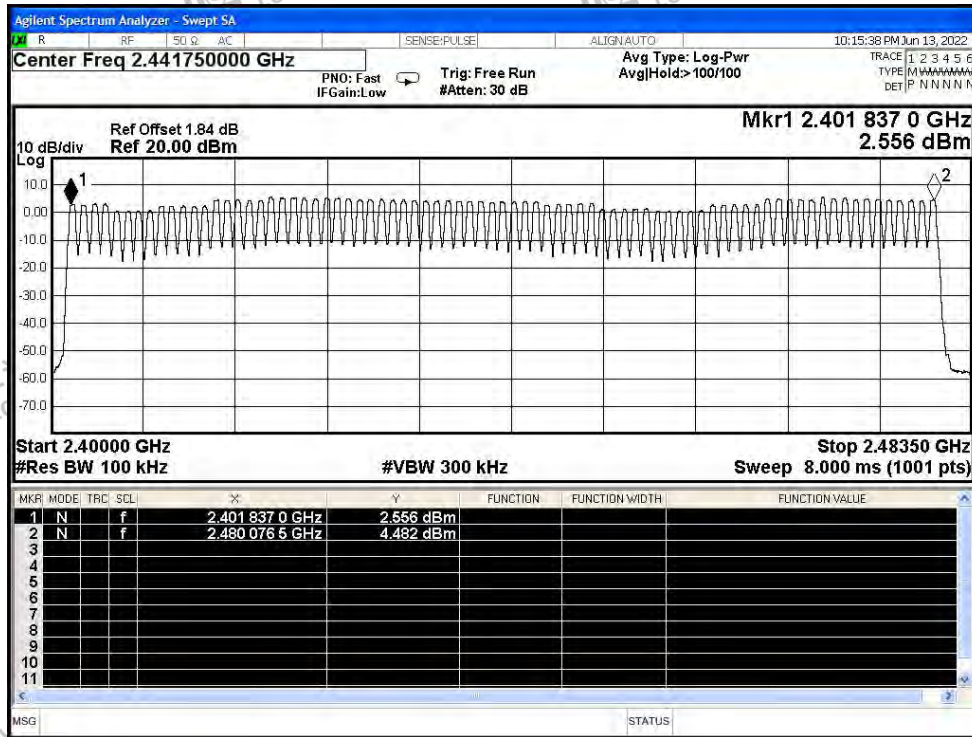


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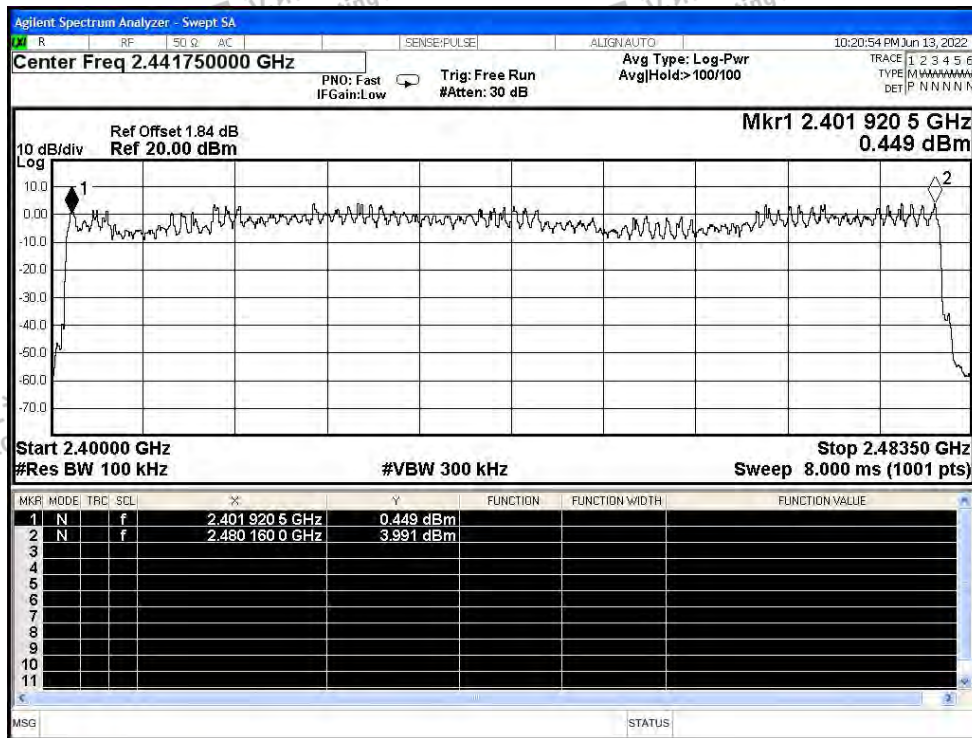


Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1

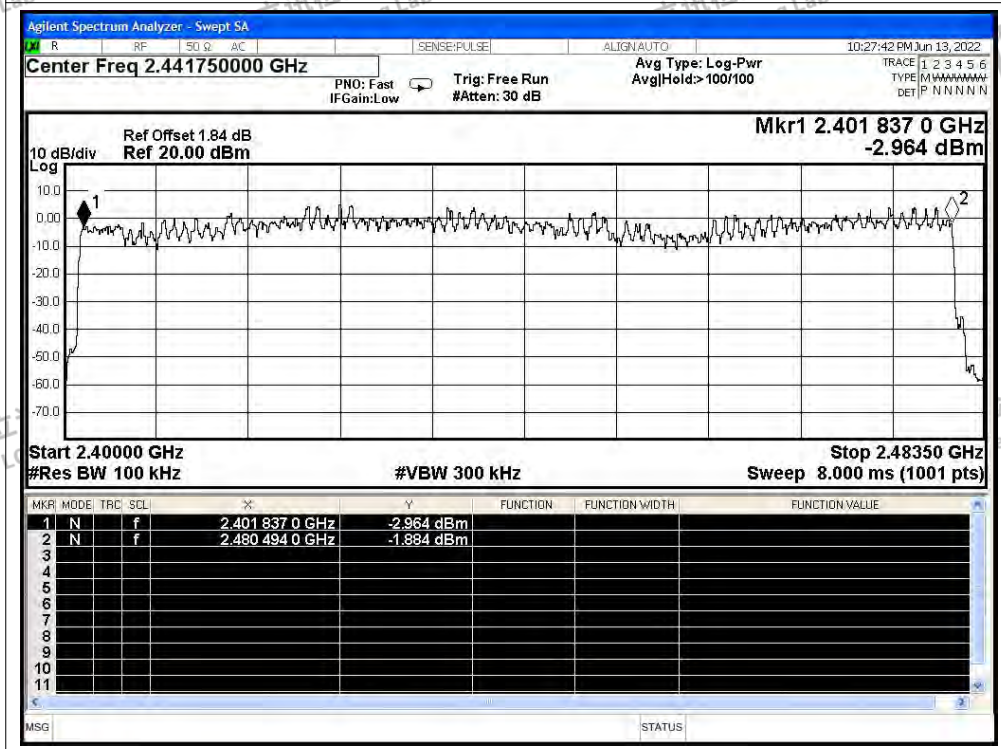


Hopping No. NVNT 2-DH5 2402MHz Ant1





Hopping No. NVNT 3-DH5 2402MHz Ant1





A.6 Band Edge

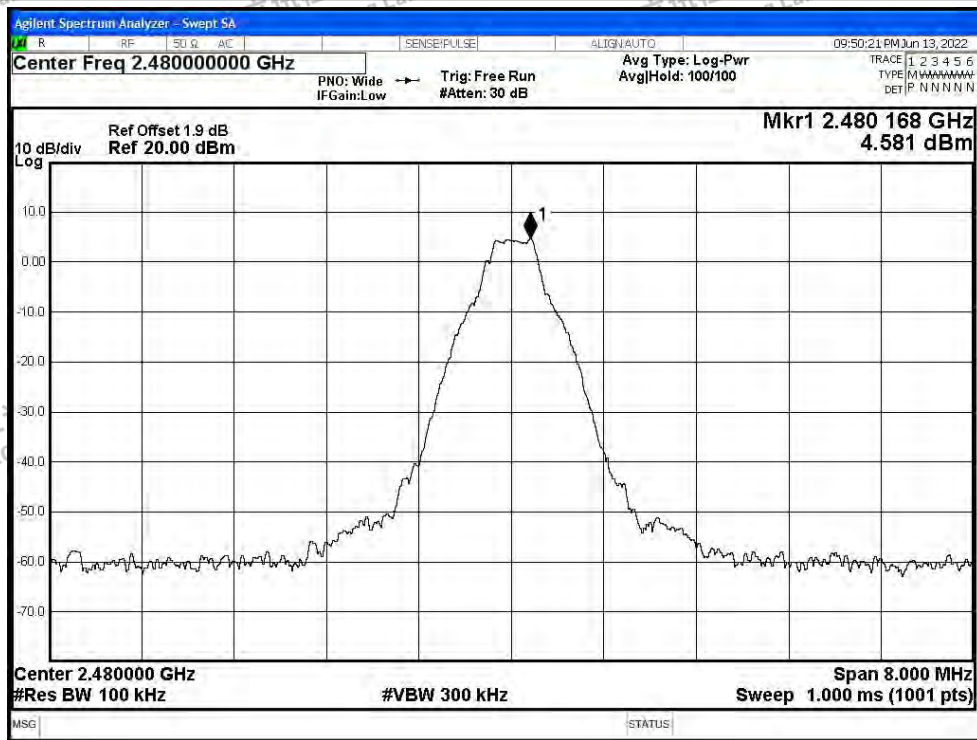
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-59.41	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-61.38	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-57.58	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-61.9	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-58.21	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-60.72	-20	Pass



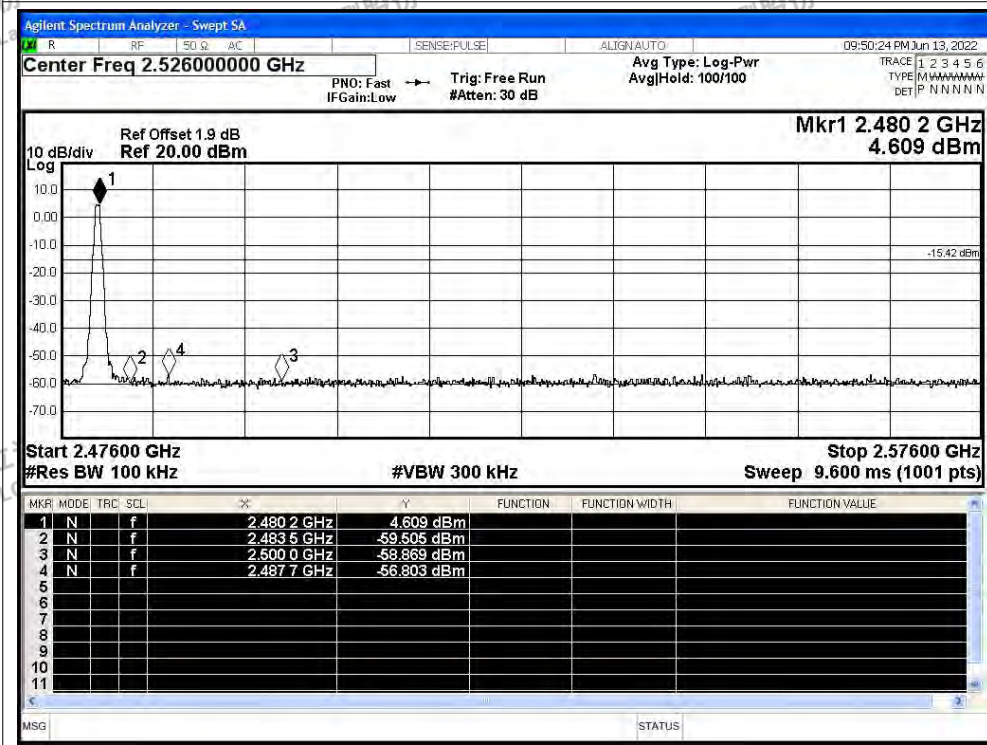
Shenzhen LCS Compliance Testing Laboratory Ltd.
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Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref

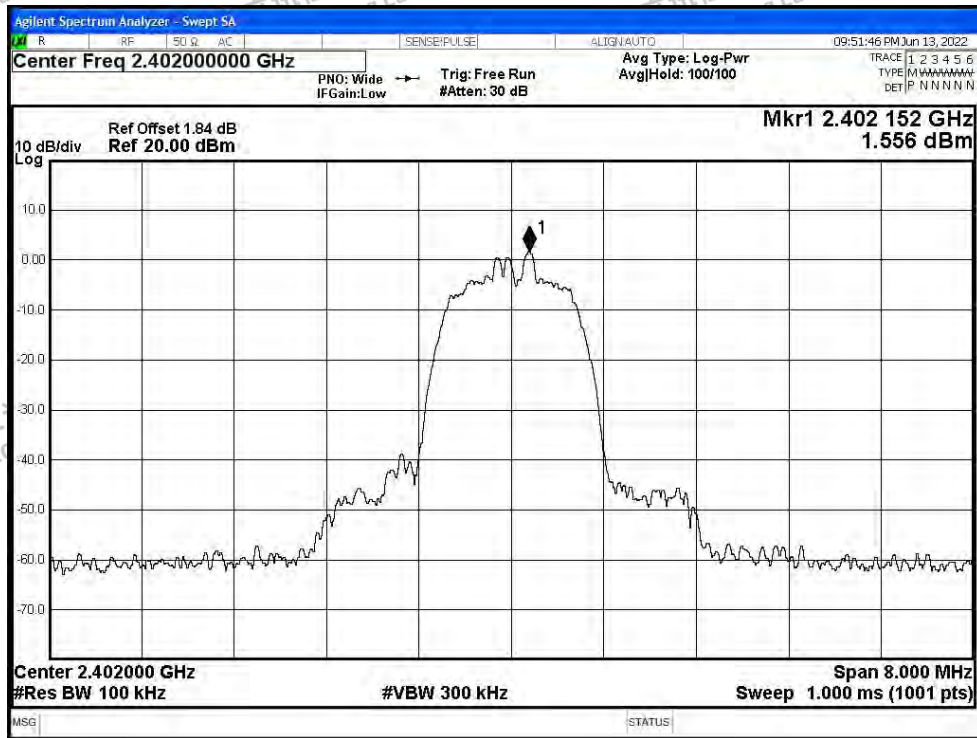


Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission

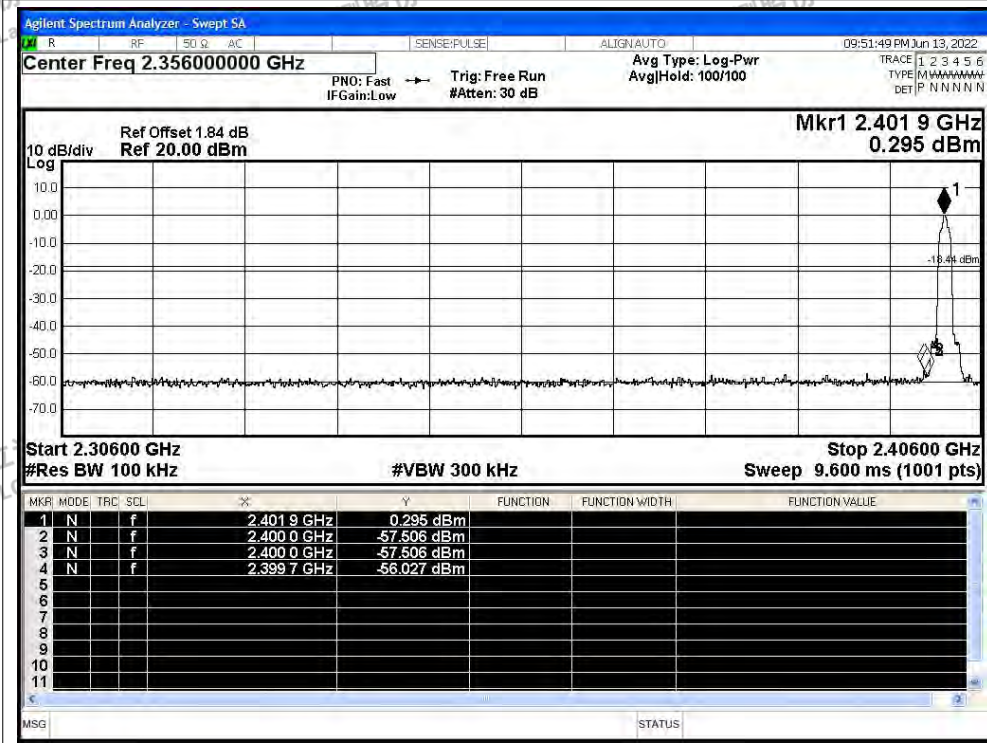




Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Ref



Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Emission

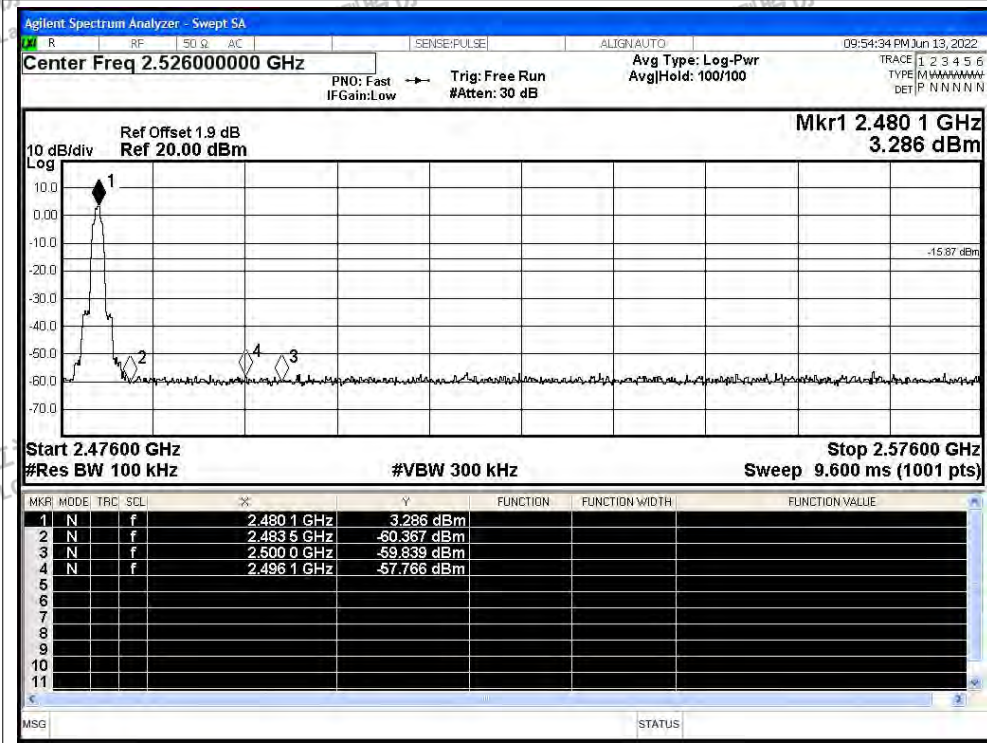




Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Ref

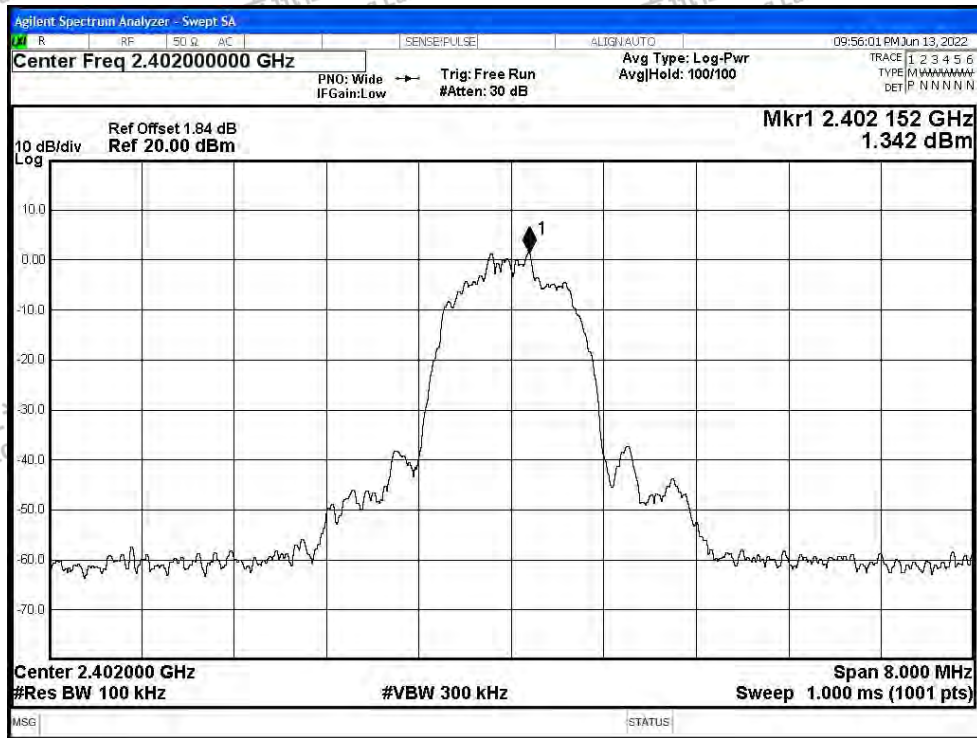


Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Emission

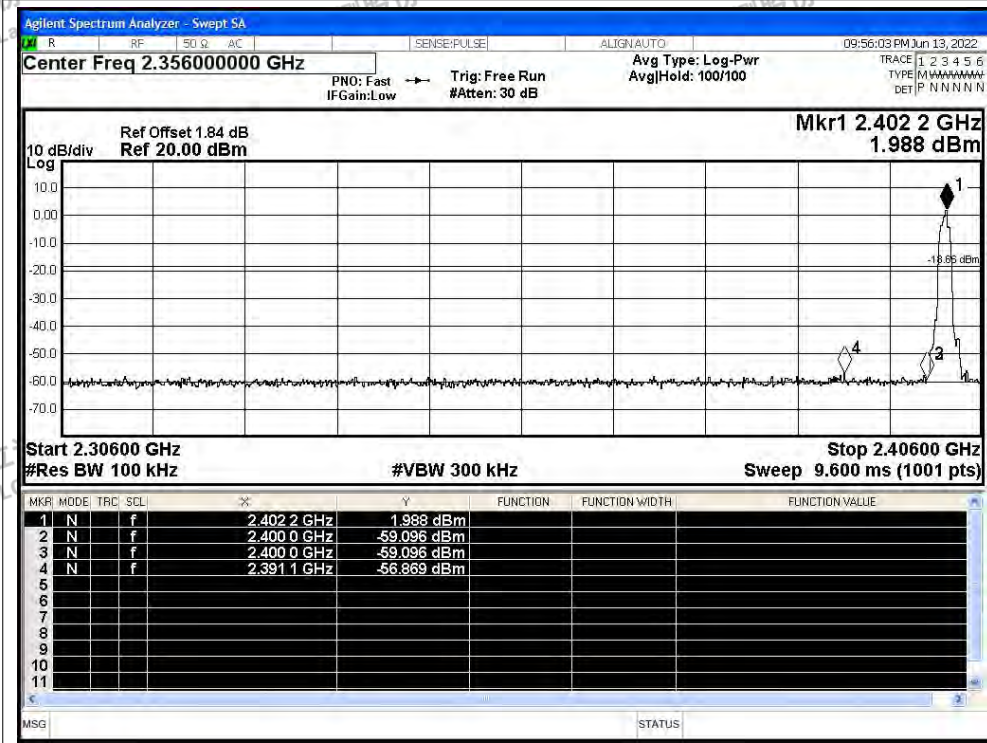




Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Ref



Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission

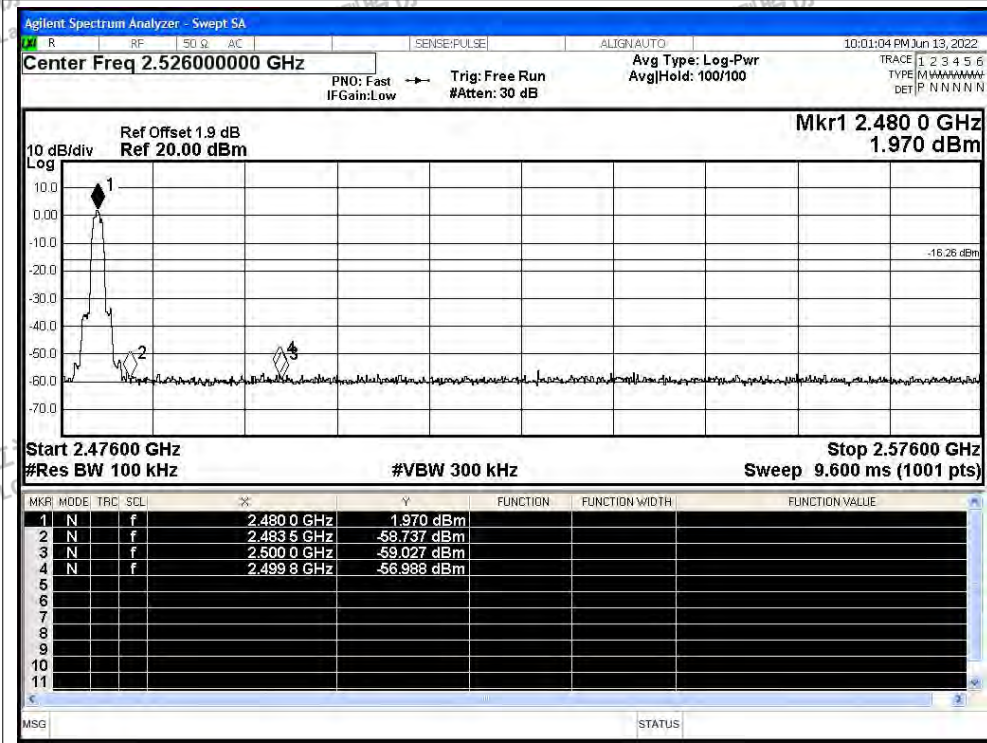




Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 3-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	-59.11	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-60.86	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-58.74	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-58.43	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-57.2	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-60.58	-20	Pass



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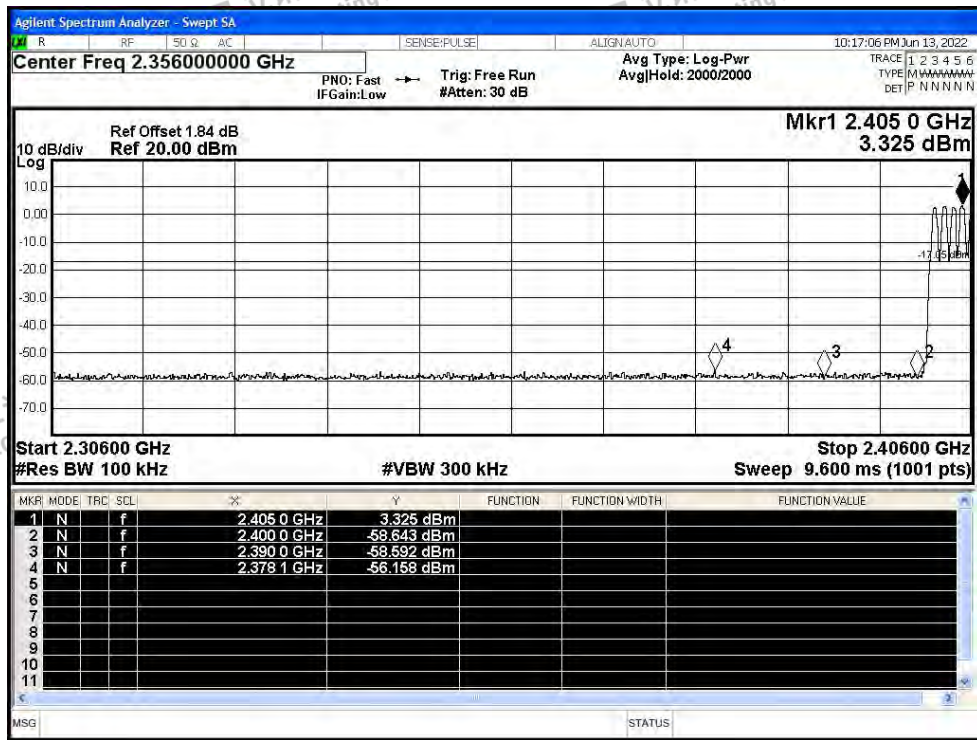


Test Graphs

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

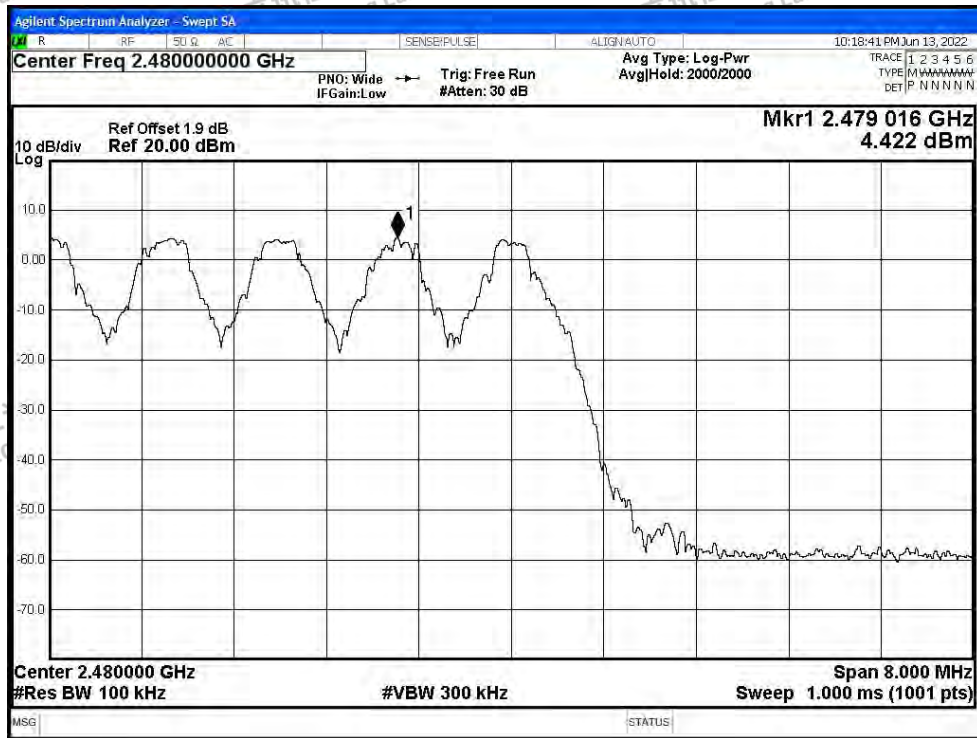


Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission

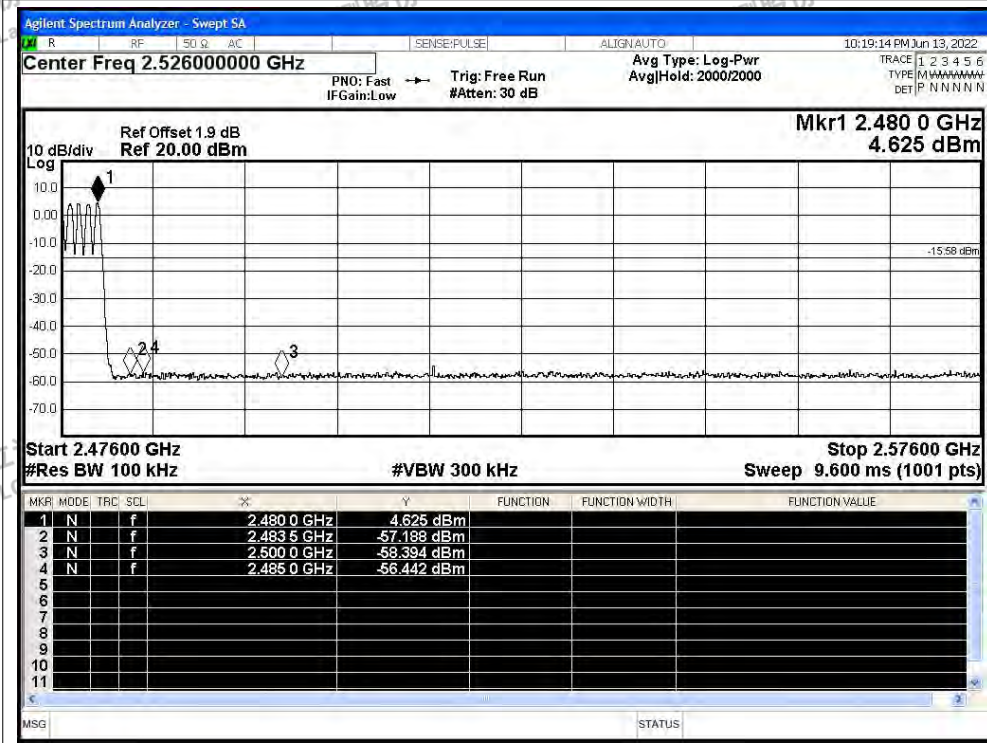




Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission

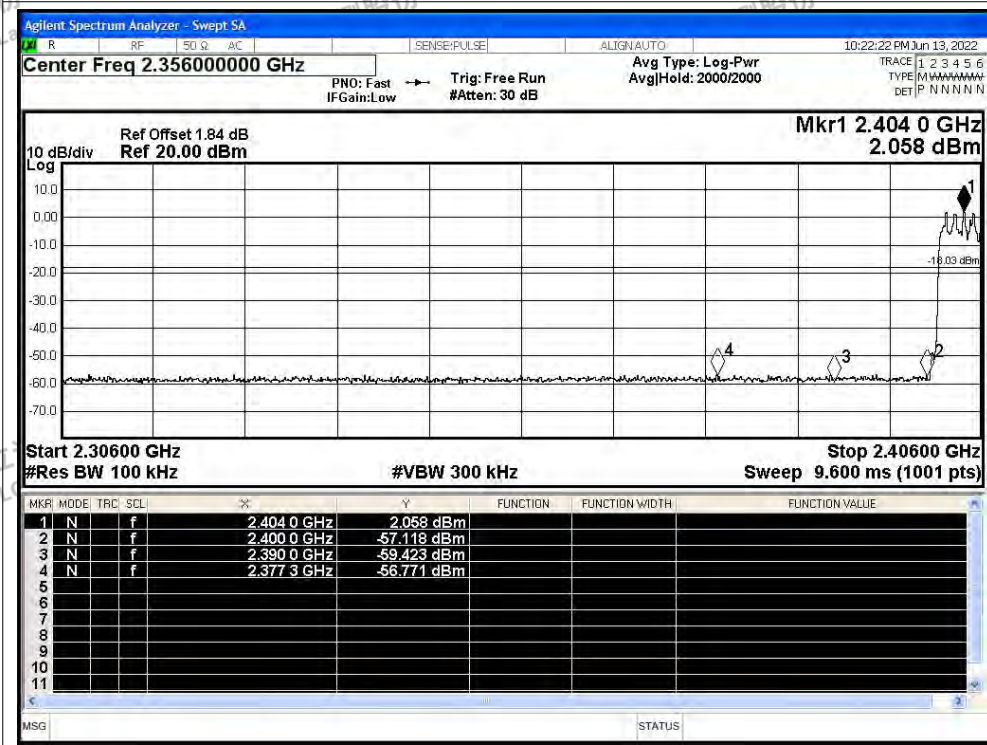




Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission

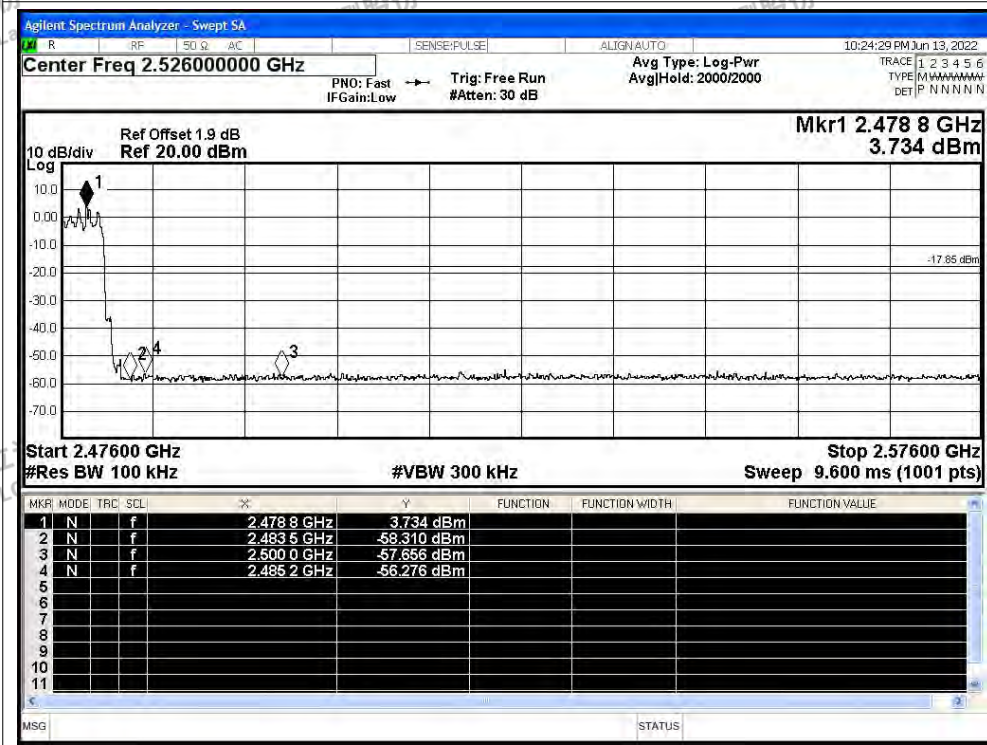




Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Ref

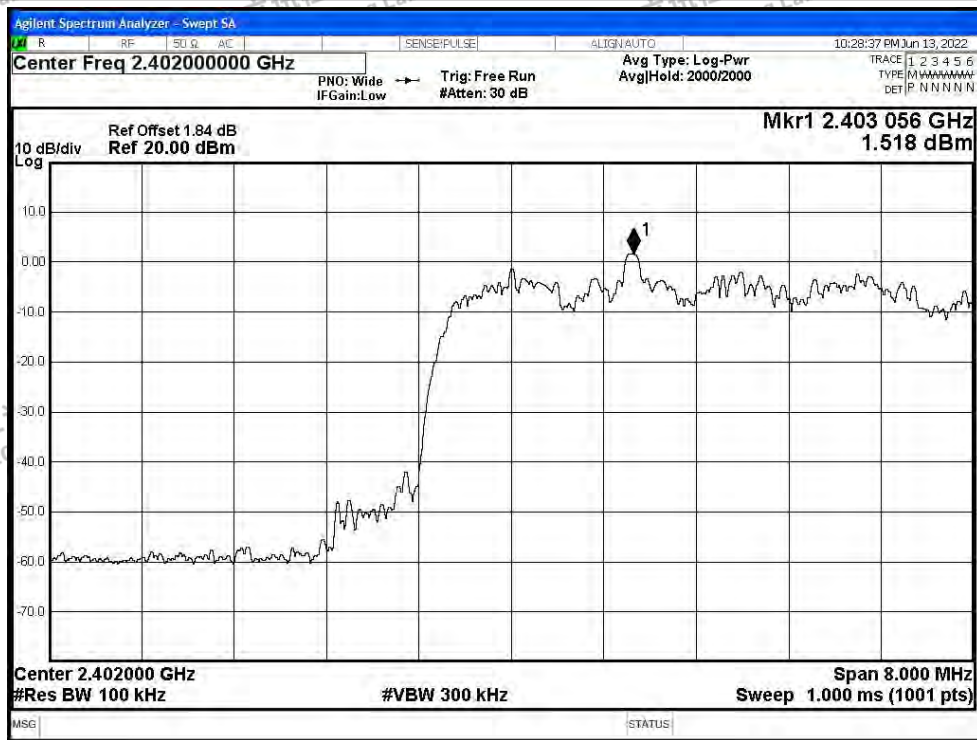


Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Emission

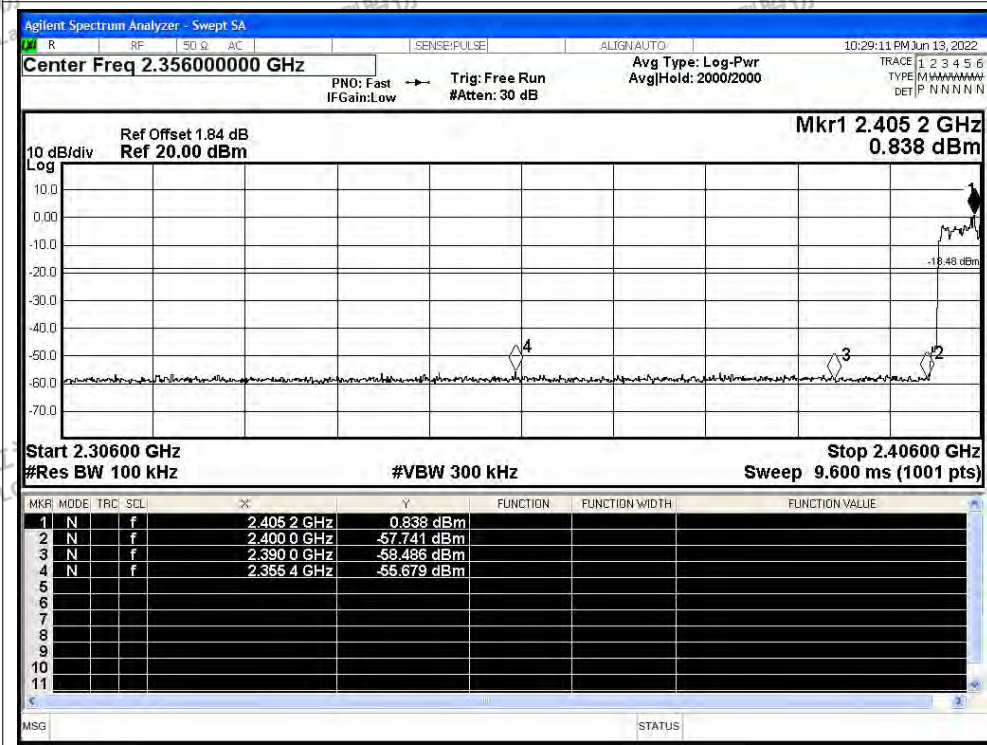




Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Ref

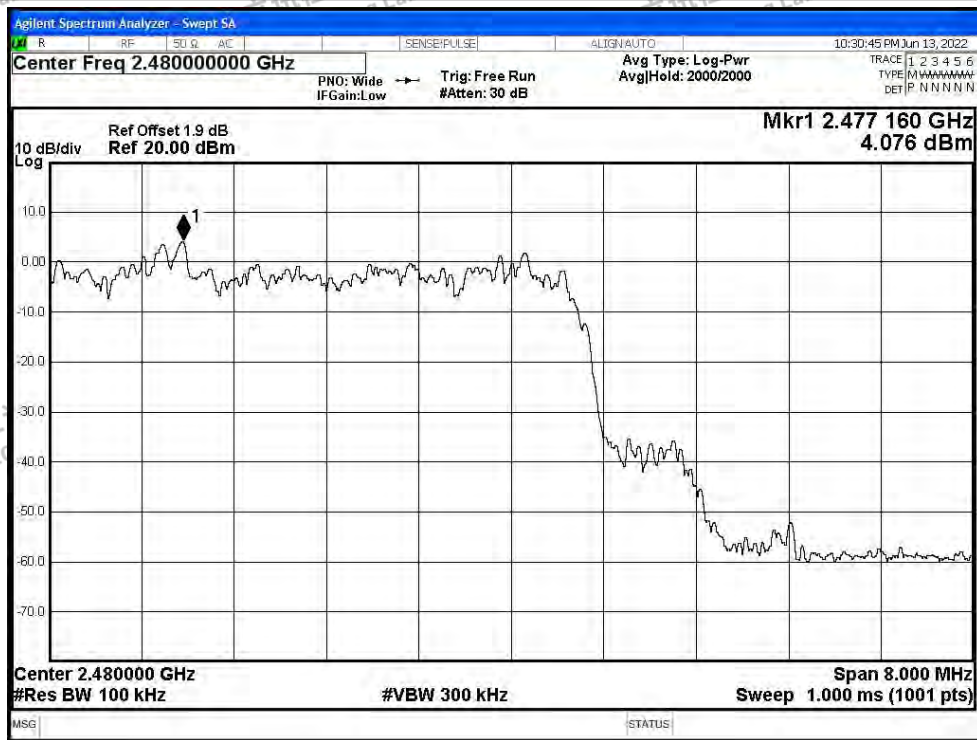


Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission

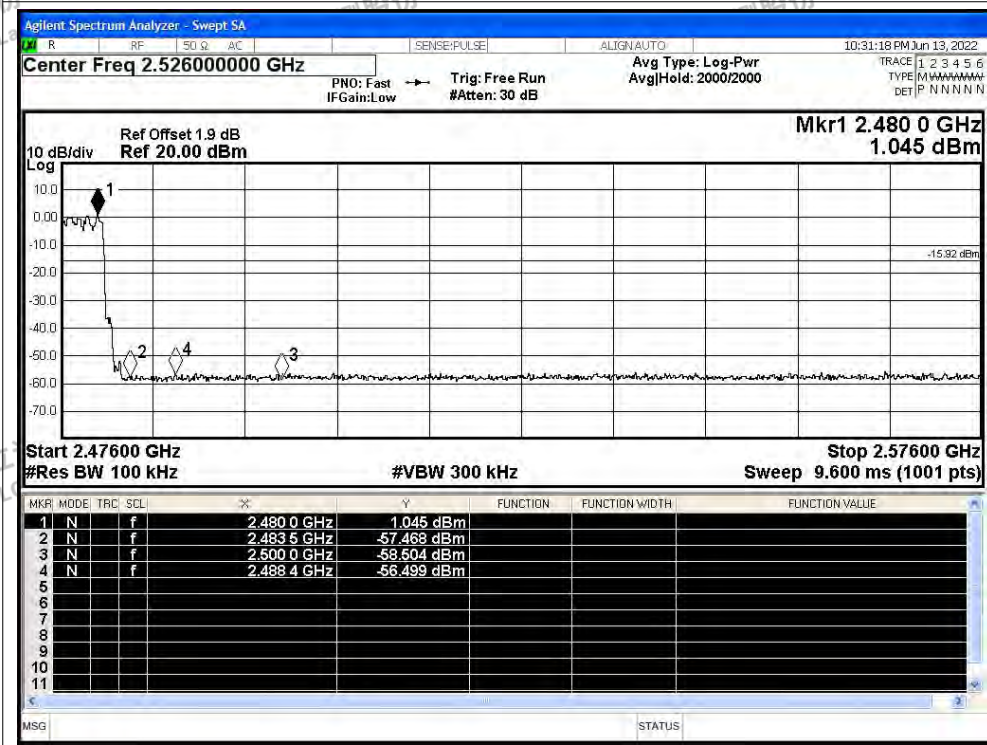




Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2480MHz 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	-58.73	-20	Pass
NVNT	1-DH5	2441	Ant1	-59.74	-20	Pass
NVNT	1-DH5	2480	Ant1	-60.63	-20	Pass
NVNT	2-DH5	2402	Ant1	-58.07	-20	Pass
NVNT	2-DH5	2441	Ant1	-59.01	-20	Pass
NVNT	2-DH5	2480	Ant1	-60.57	-20	Pass
NVNT	3-DH5	2402	Ant1	-56.68	-20	Pass
NVNT	3-DH5	2441	Ant1	-59.33	-20	Pass
NVNT	3-DH5	2480	Ant1	-60.33	-20	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

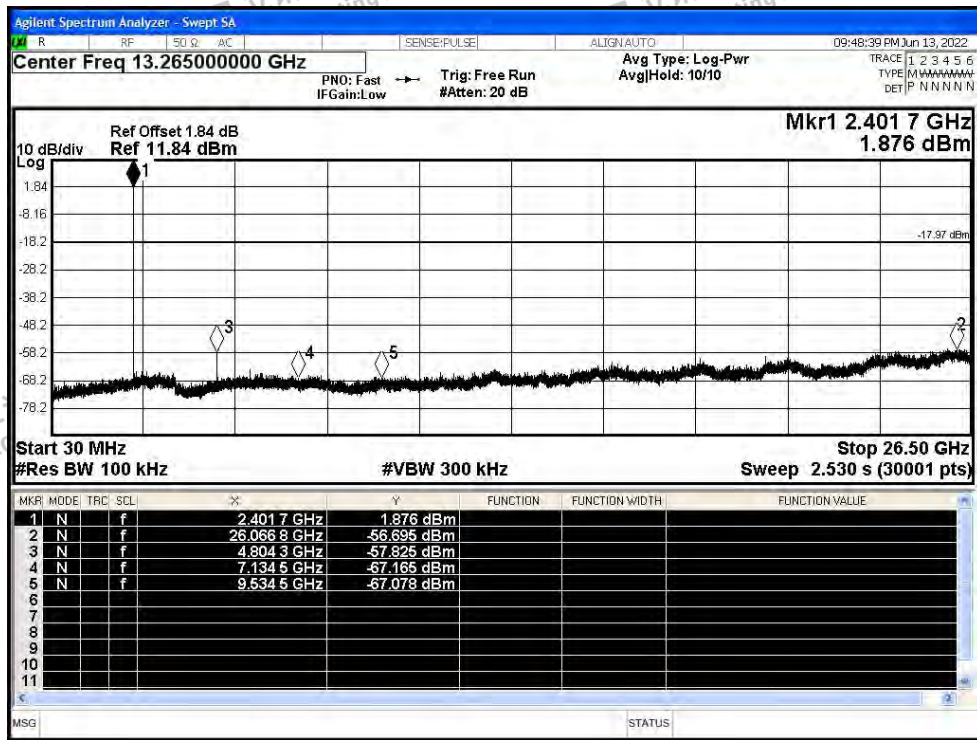


Test Graphs

Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref

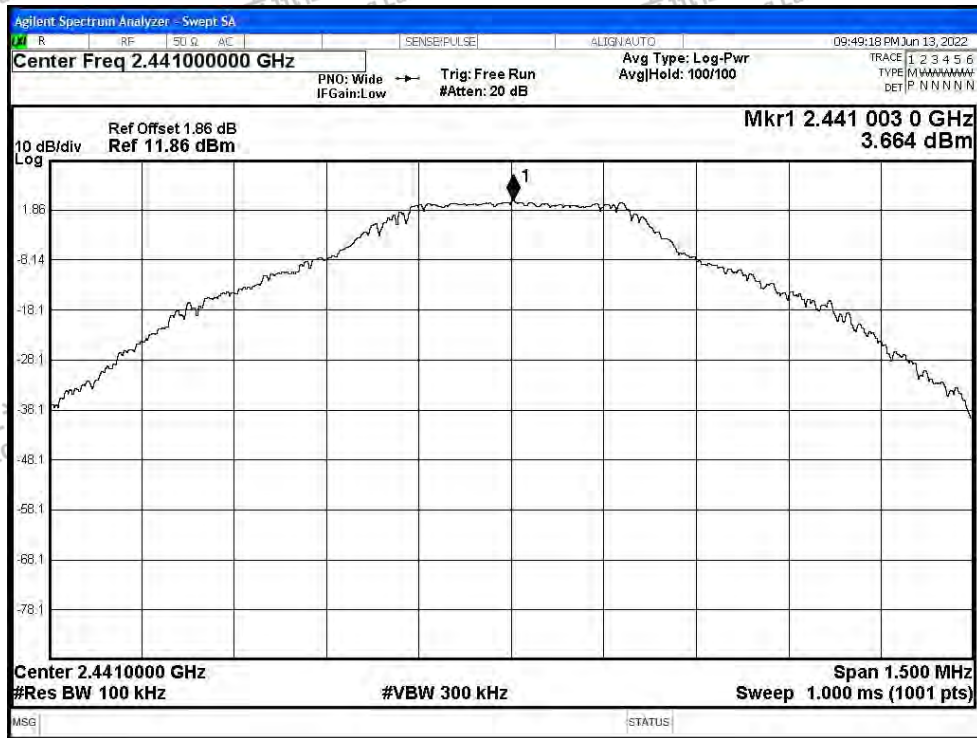


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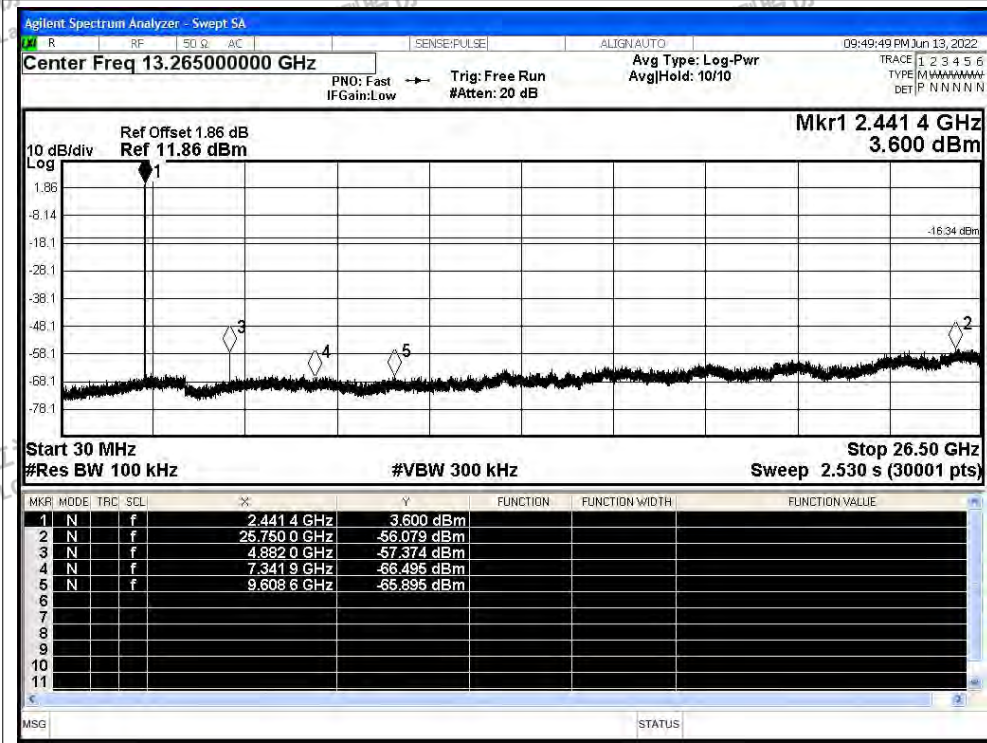




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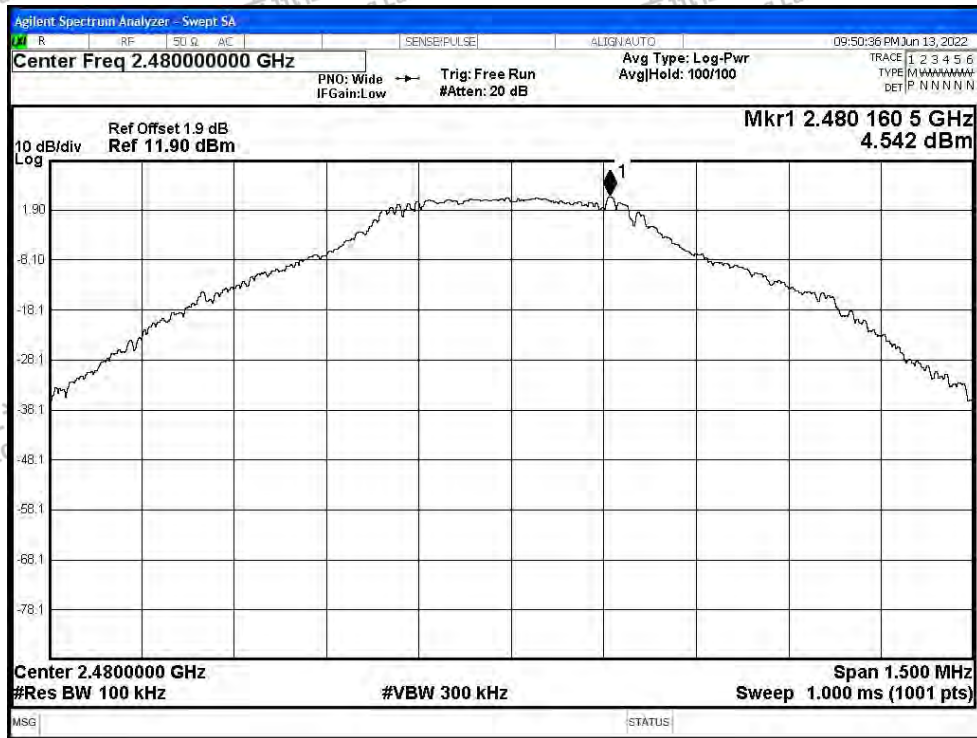


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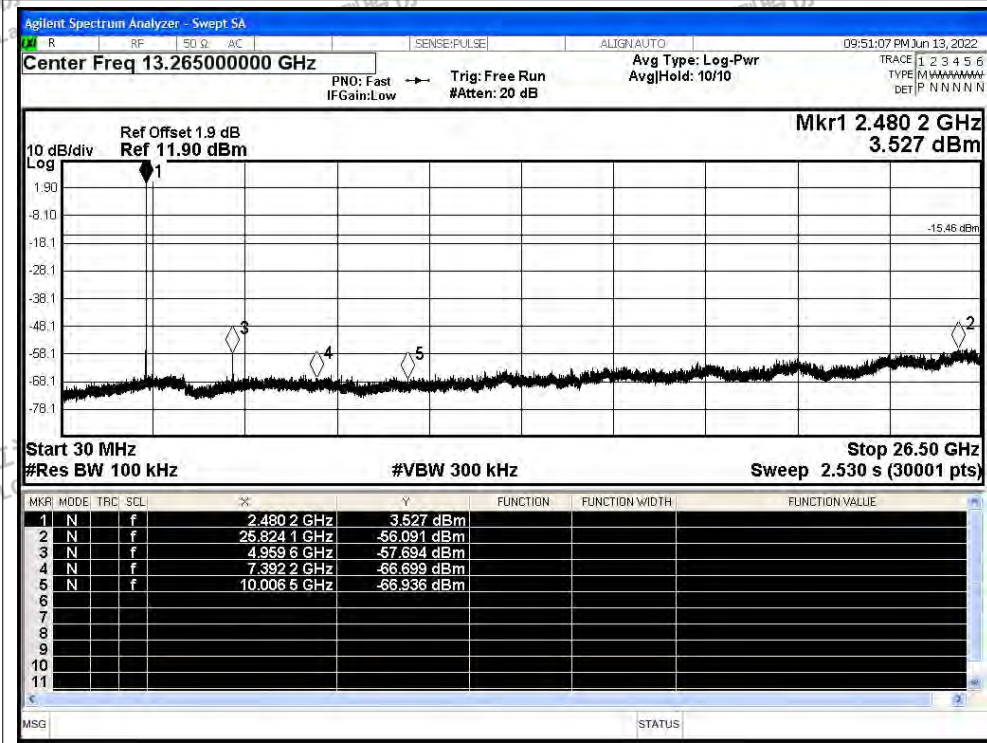




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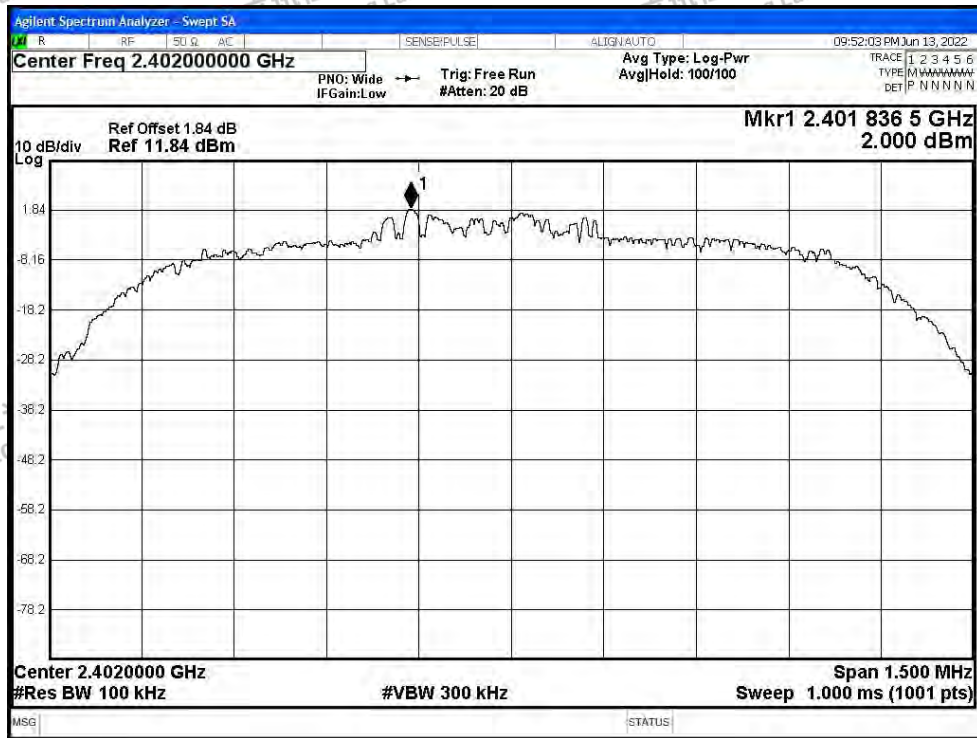


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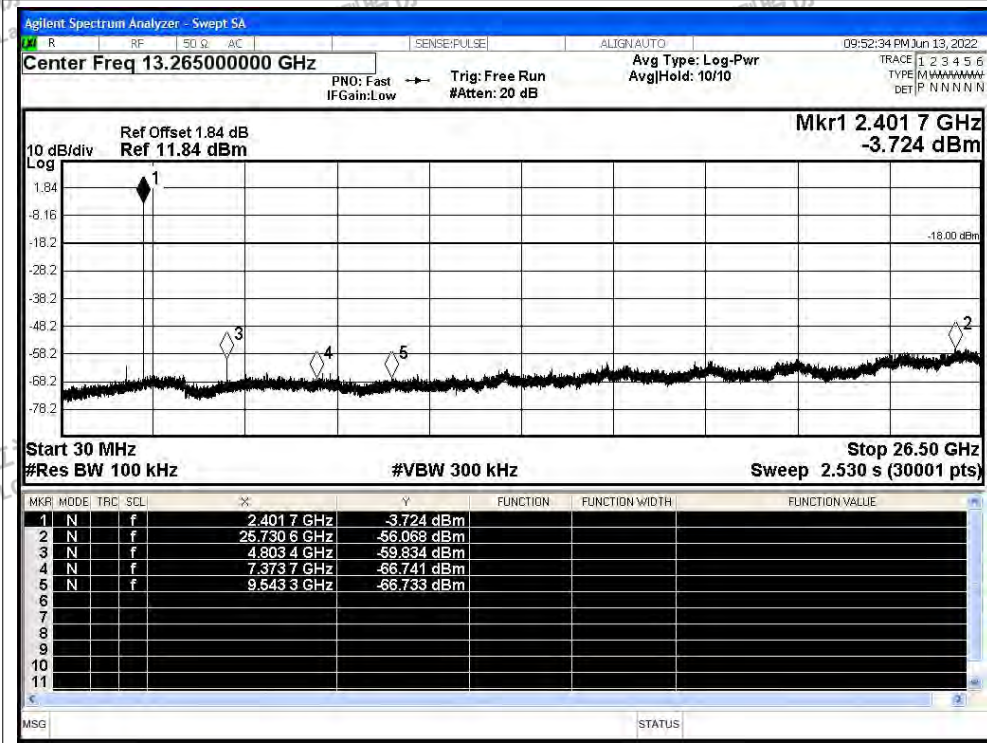




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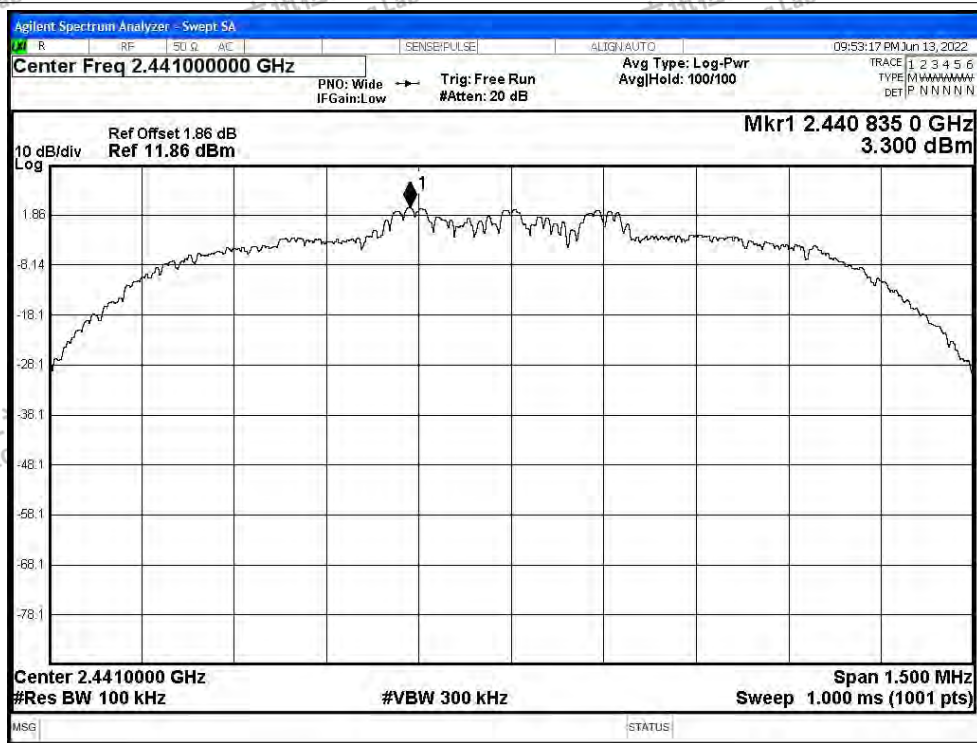


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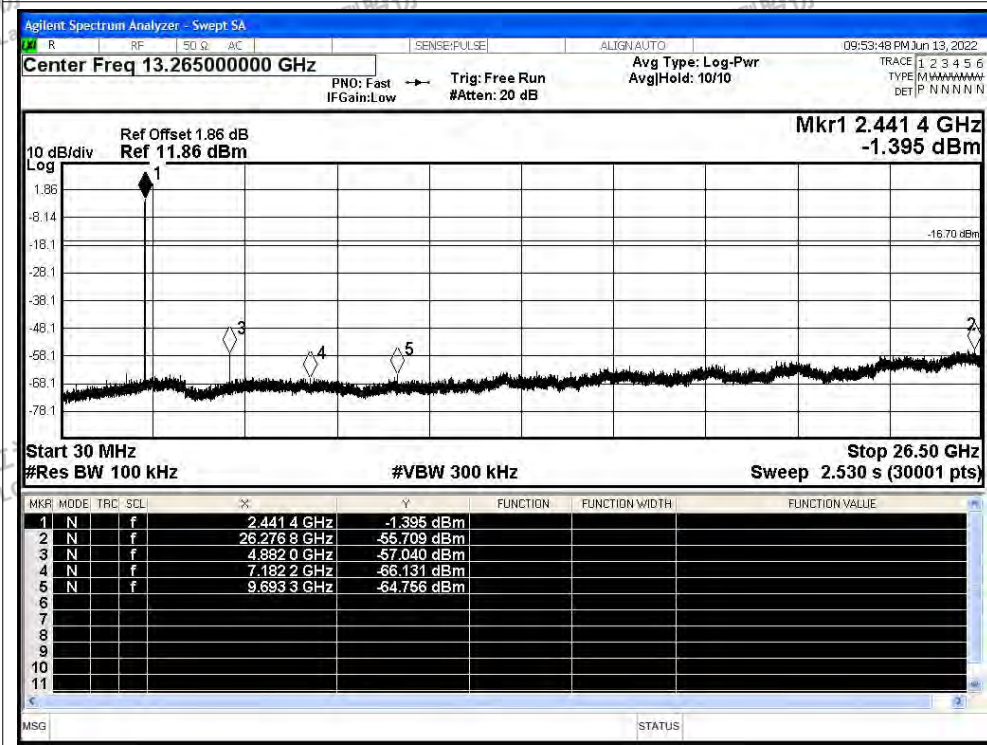




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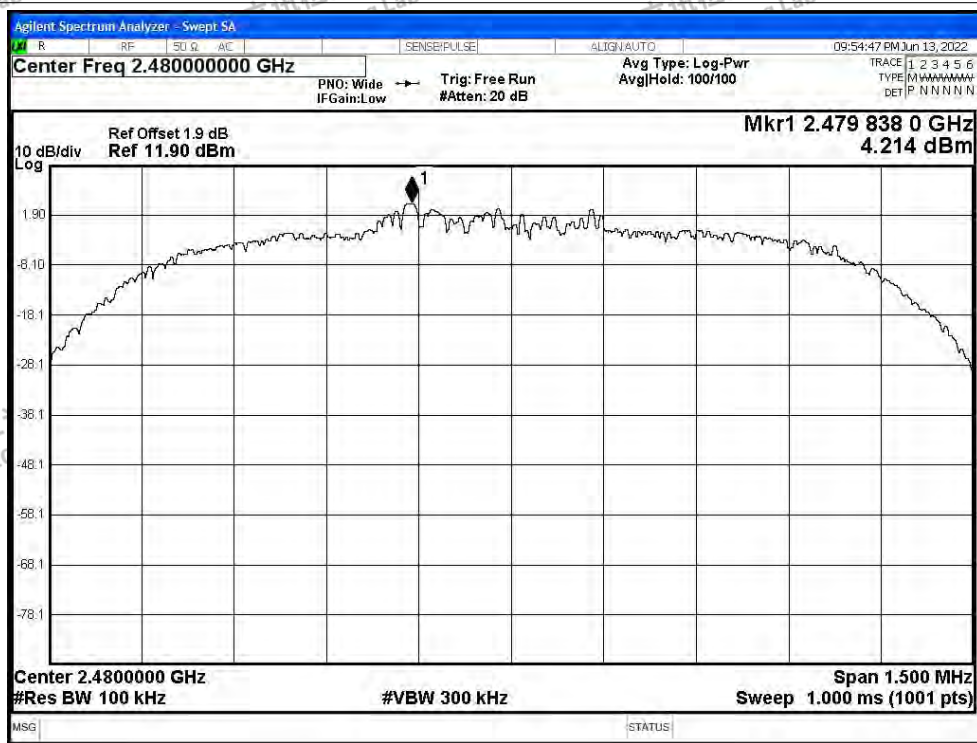


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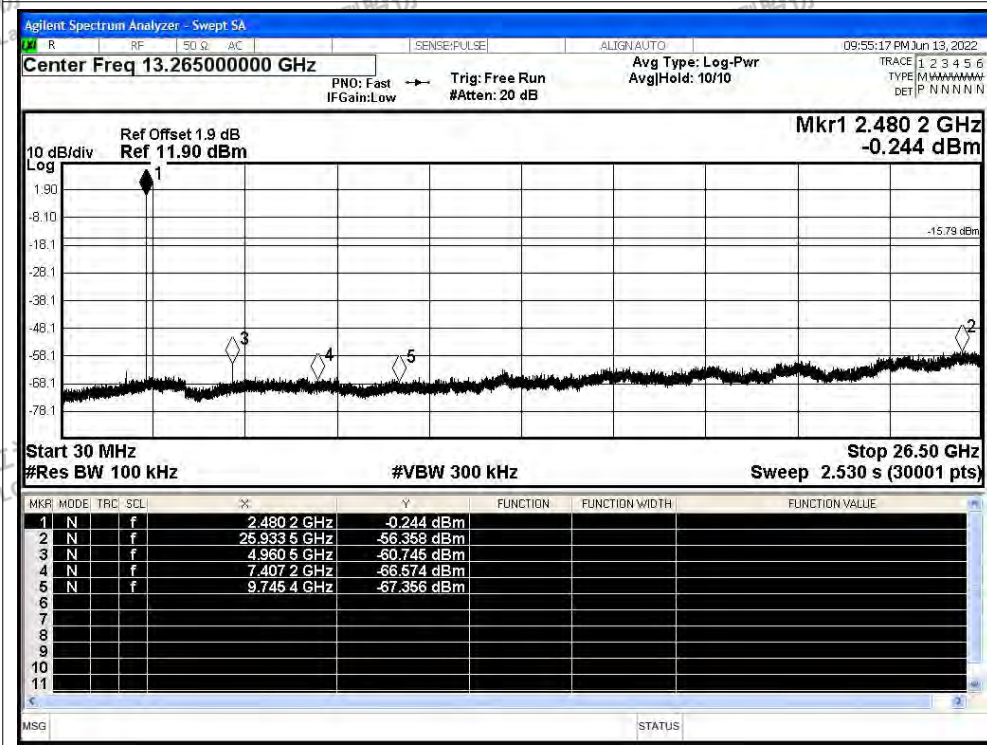




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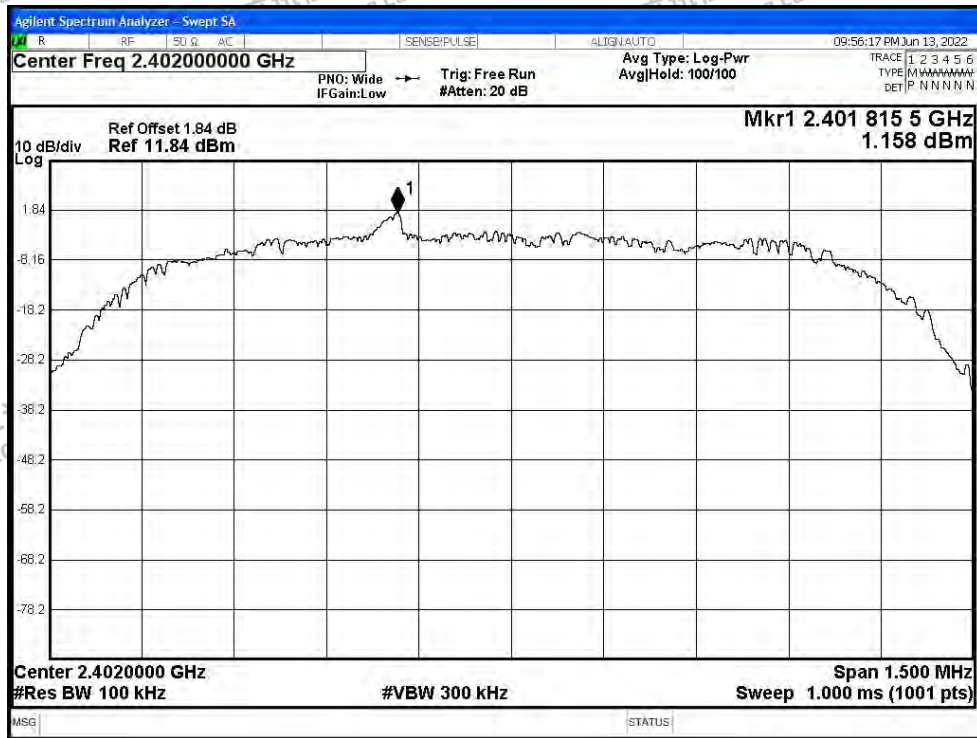


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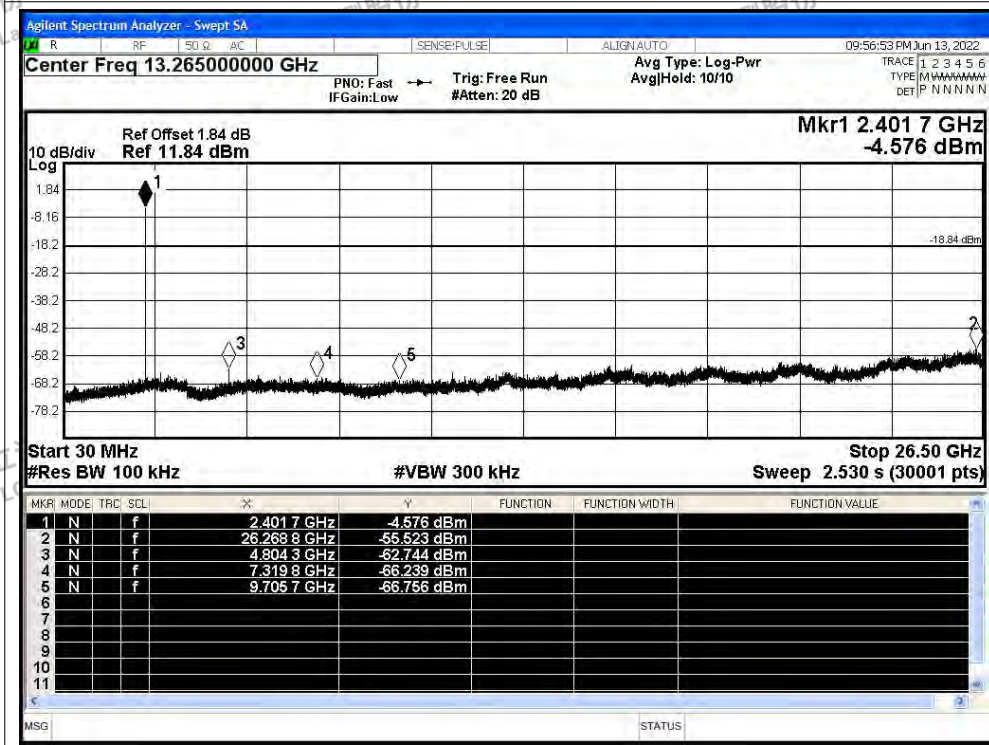




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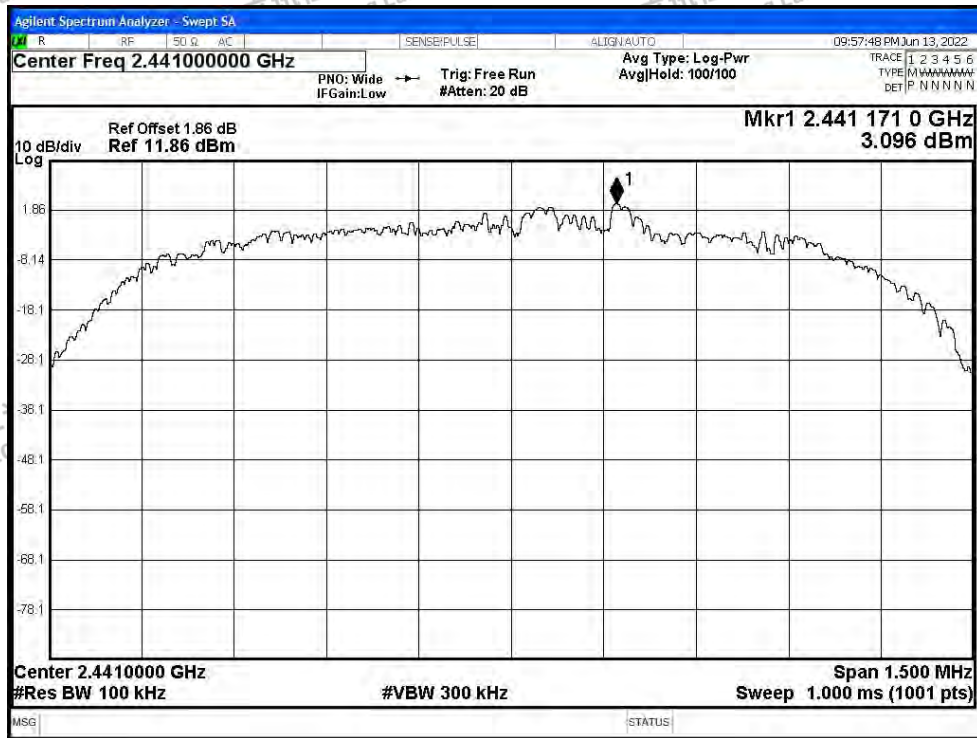


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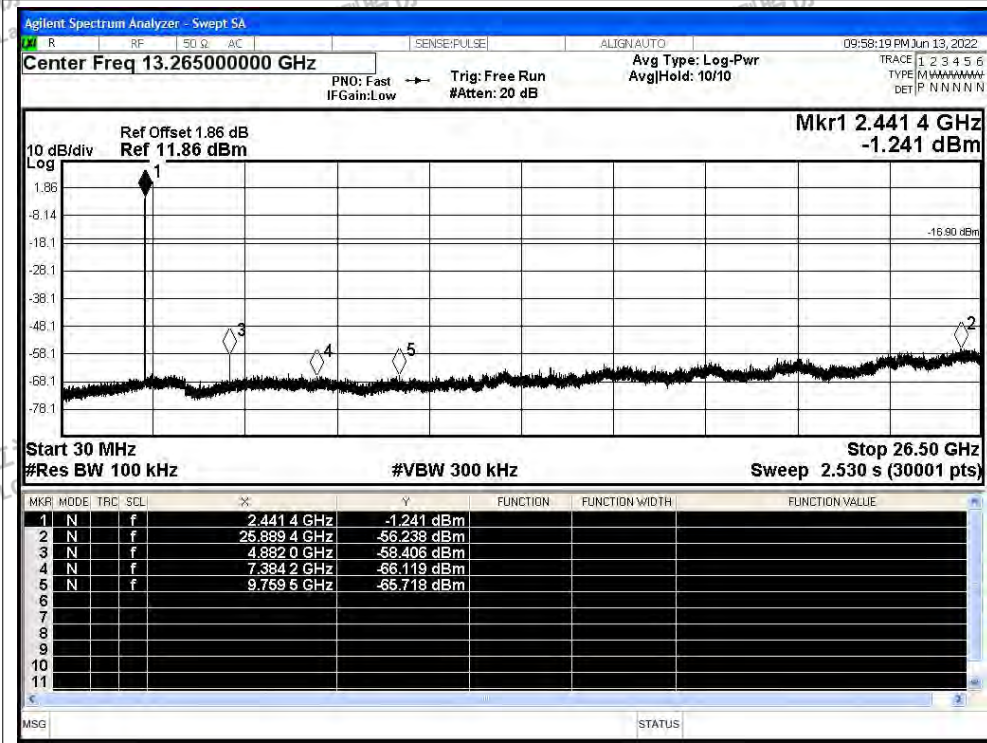




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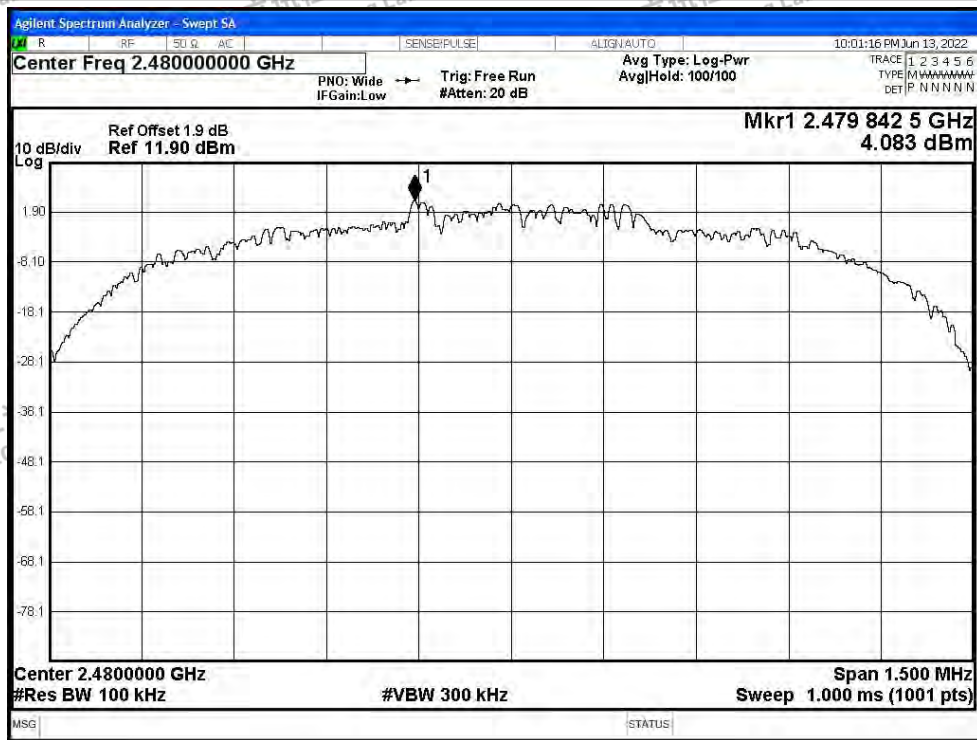


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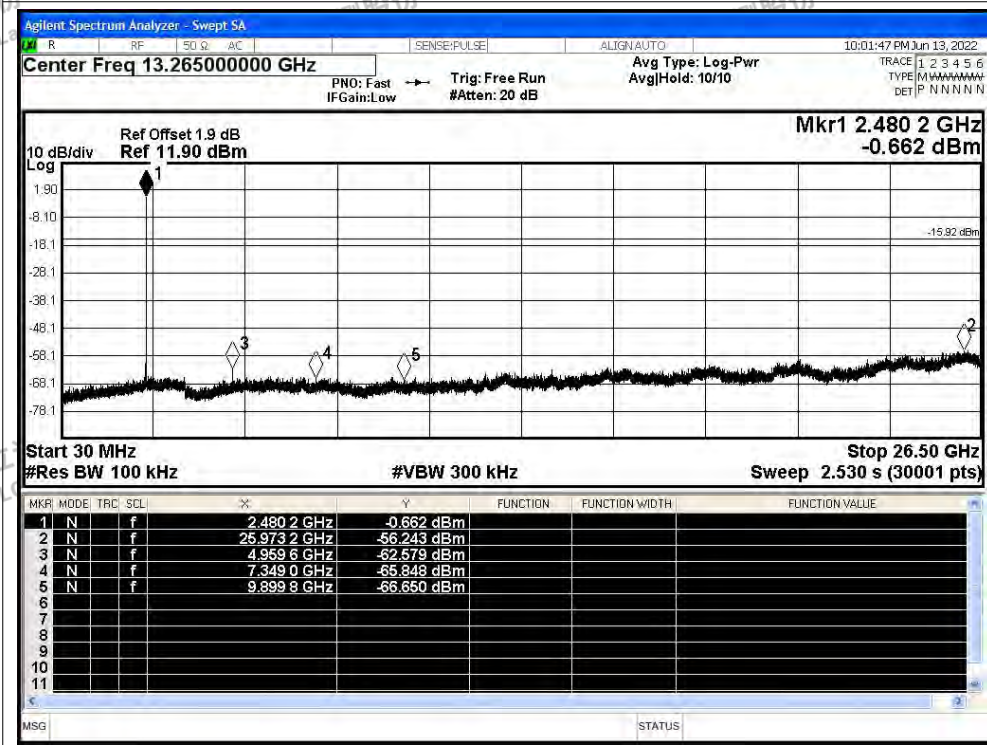




Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission





A.8 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-51.23	3.0	47.00	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-60.71	3.0	37.52	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2353.392	-47.85	3.0	50.38	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2378.064	-60.2	3.0	38.03	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-50.74	3.0	47.49	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-60.43	3.0	37.80	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-49.86	3.0	48.37	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-59.4	3.0	38.83	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2488.672	-47.47	3.0	50.76	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.68	-59.32	3.0	38.91	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-49.89	3.0	48.34	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-59.99	3.0	38.24	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-50.73	3.0	47.50	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-60.82	3.0	37.41	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2366.064	-48.21	3.0	50.02	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2387.28	-60.15	3.0	38.08	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-50.78	3.0	47.45	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-60.43	3.0	37.80	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-50.26	3.0	47.97	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-59.01	3.0	39.22	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.656	-46.93	3.0	51.30	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.512	-59.01	3.0	39.22	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-50.73	3.0	47.50	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-60.09	3.0	38.14	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-49.74	3.0	48.49	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-60.77	3.0	37.46	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2354.736	-47.72	3.0	50.51	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2384.976	-60.12	3.0	38.11	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-49.47	3.0	48.76	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-60.38	3.0	37.85	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-48.91	3.0	49.32	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-59.08	3.0	39.15	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2486.92	-47.19	3.0	51.04	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.512	-59.08	3.0	39.15	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-49.96	3.0	48.27	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-60.12	3.0	38.11	Average	54	Pass

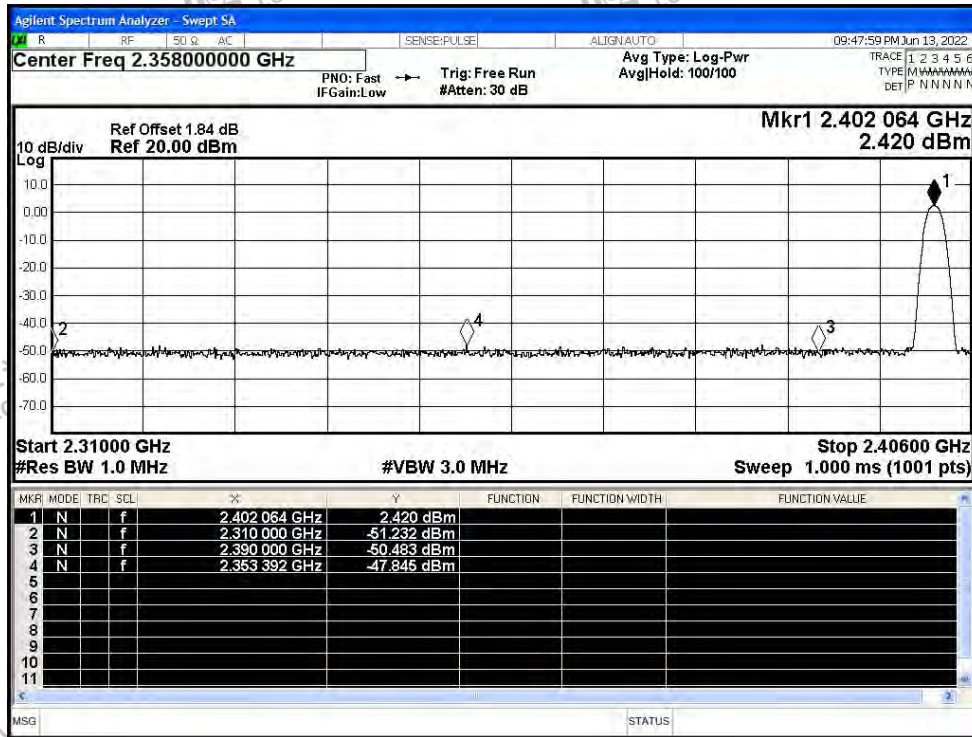


Shenzhen LCS Compliance Testing Laboratory Ltd.
 Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
 Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
 Scan code to check authenticity

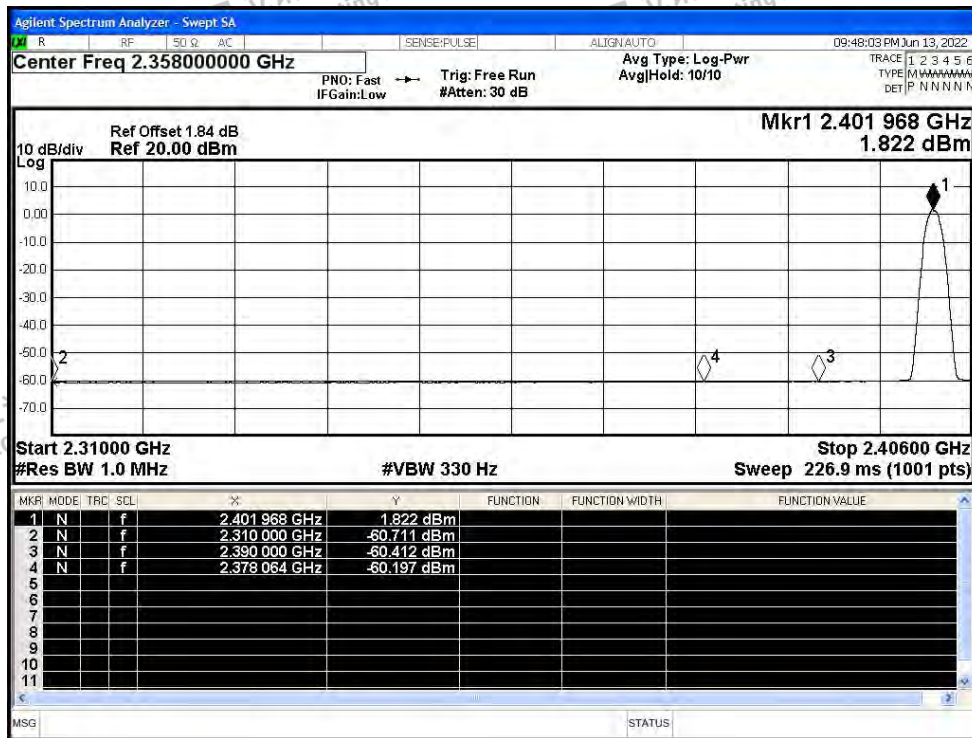


Test Graphs

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

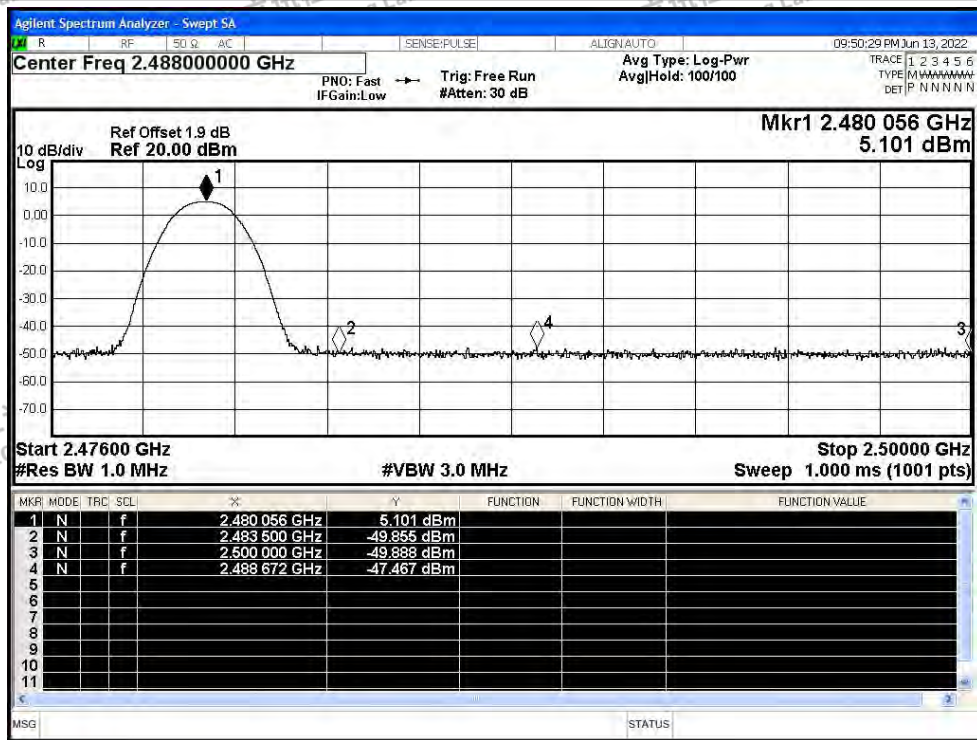


Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average

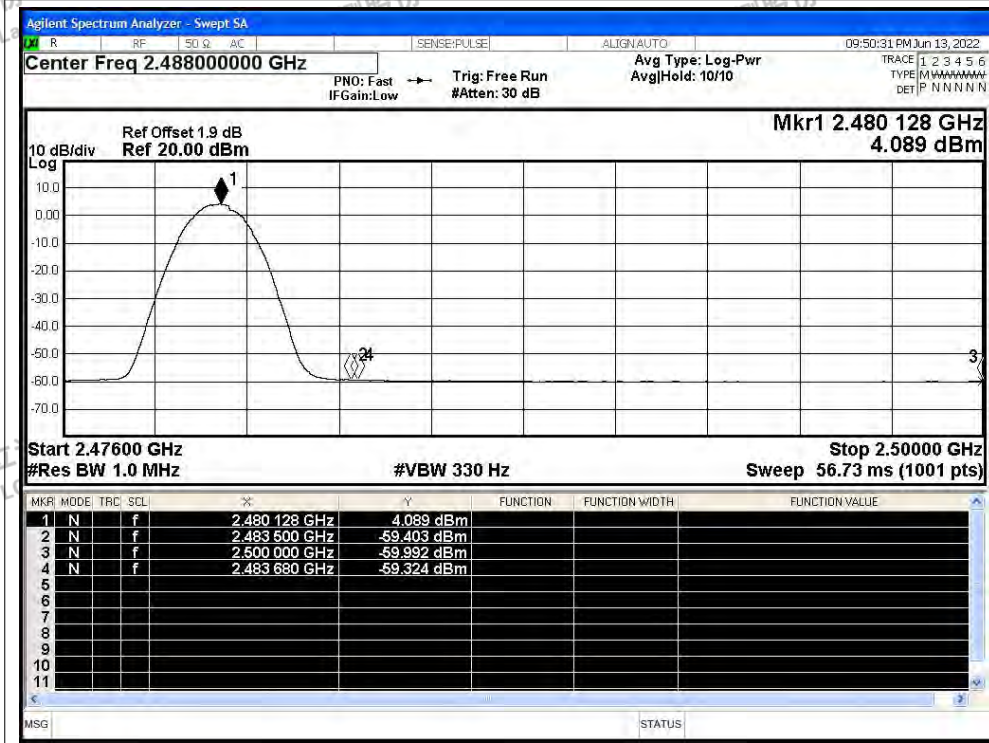




Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Peak

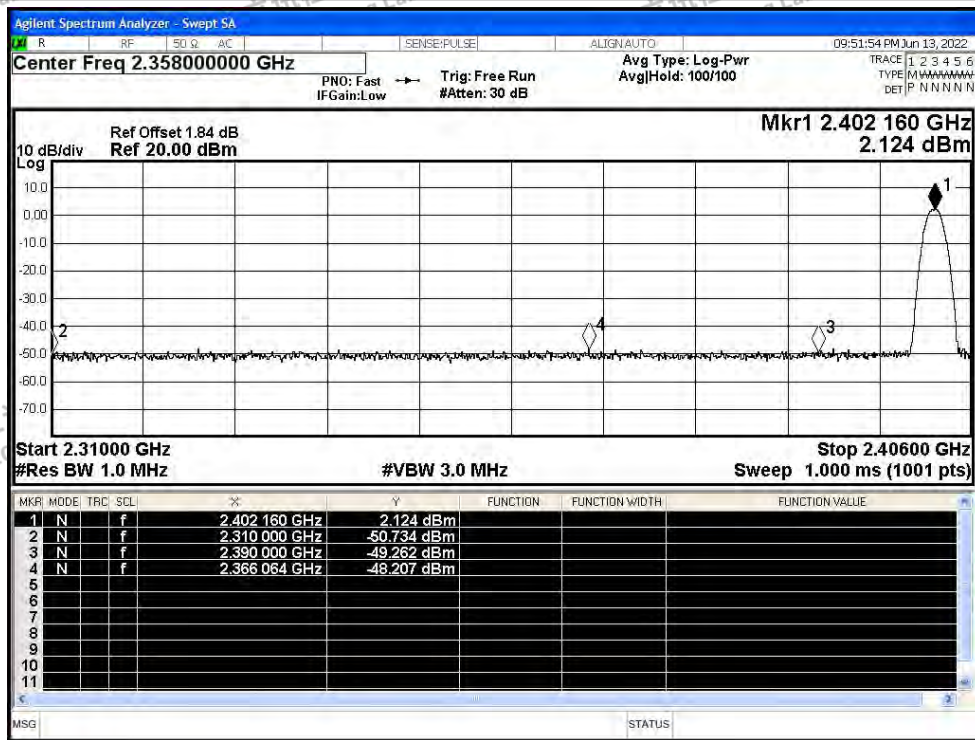


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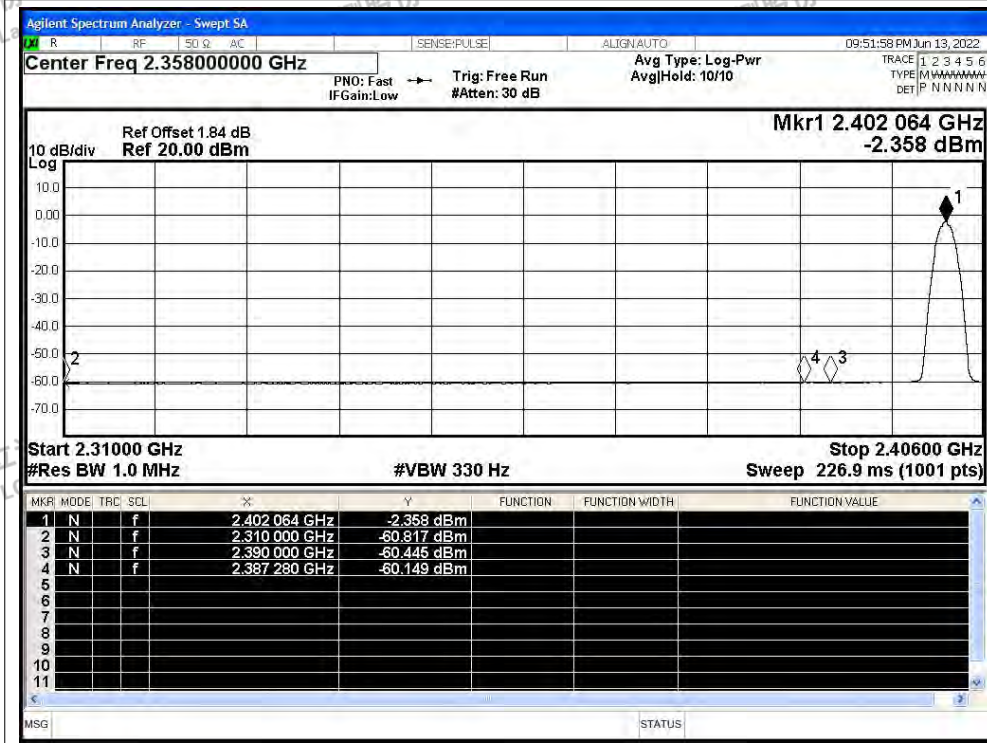




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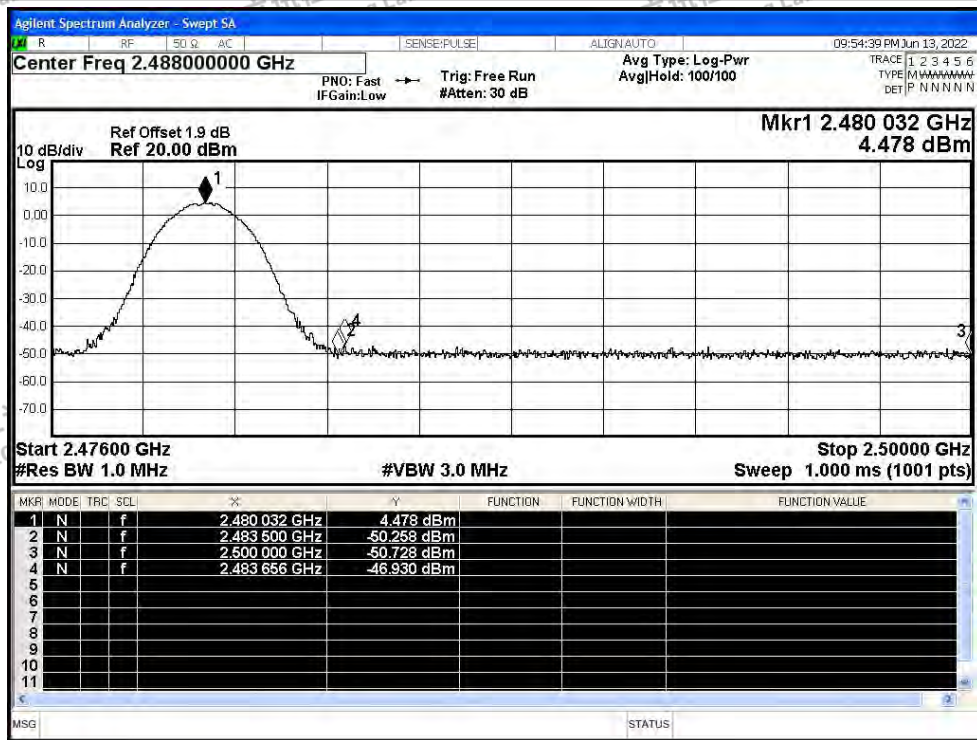


Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Average

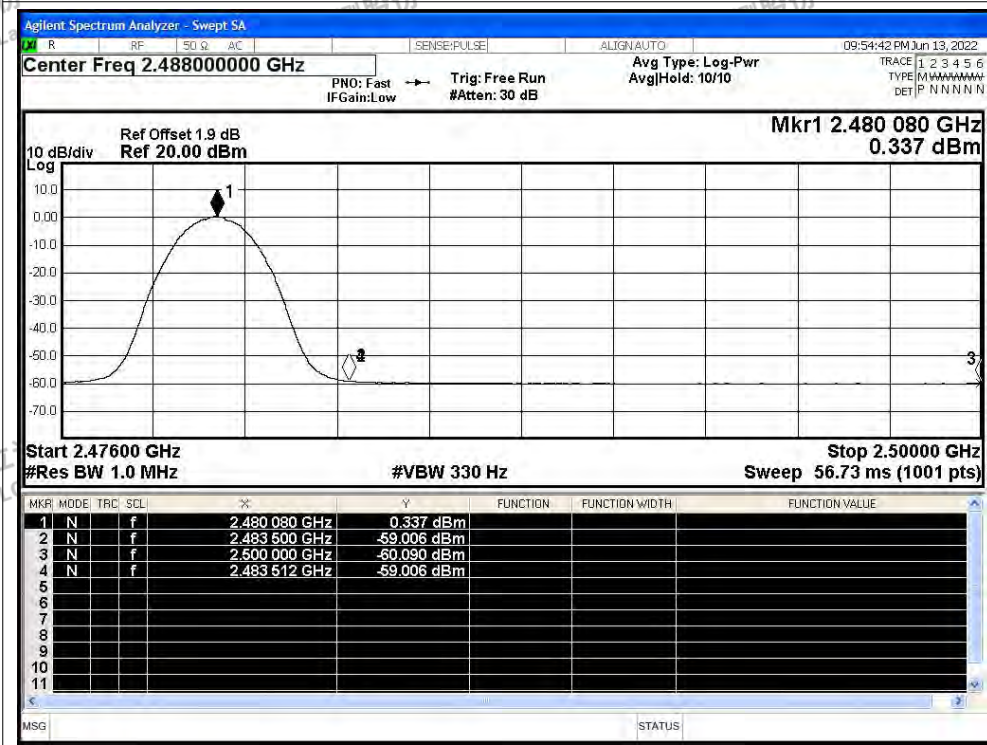




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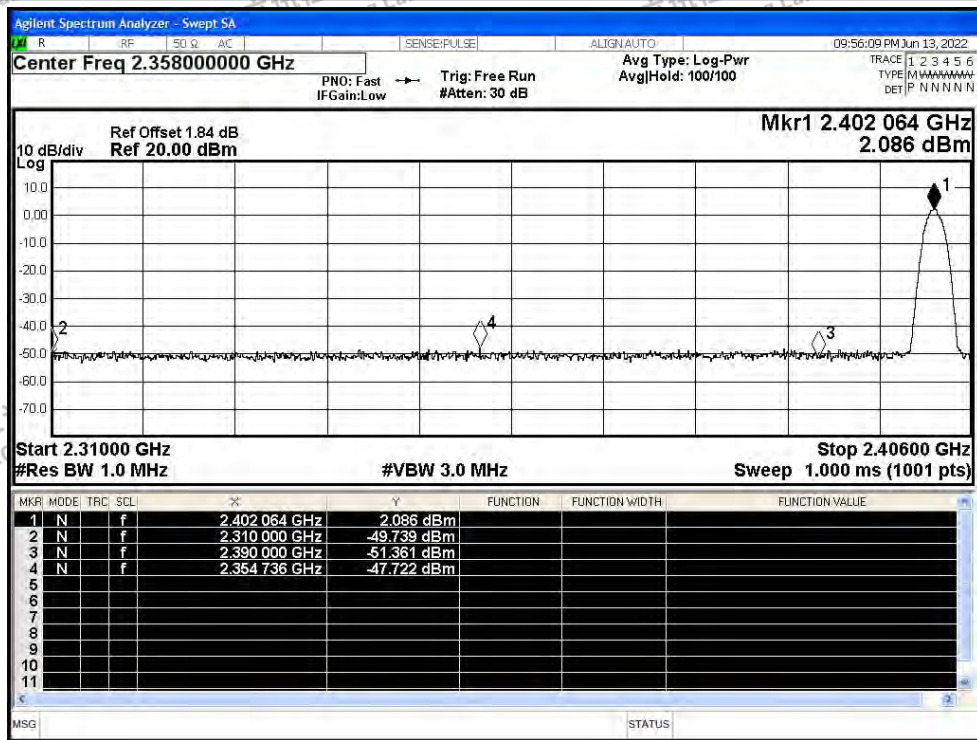


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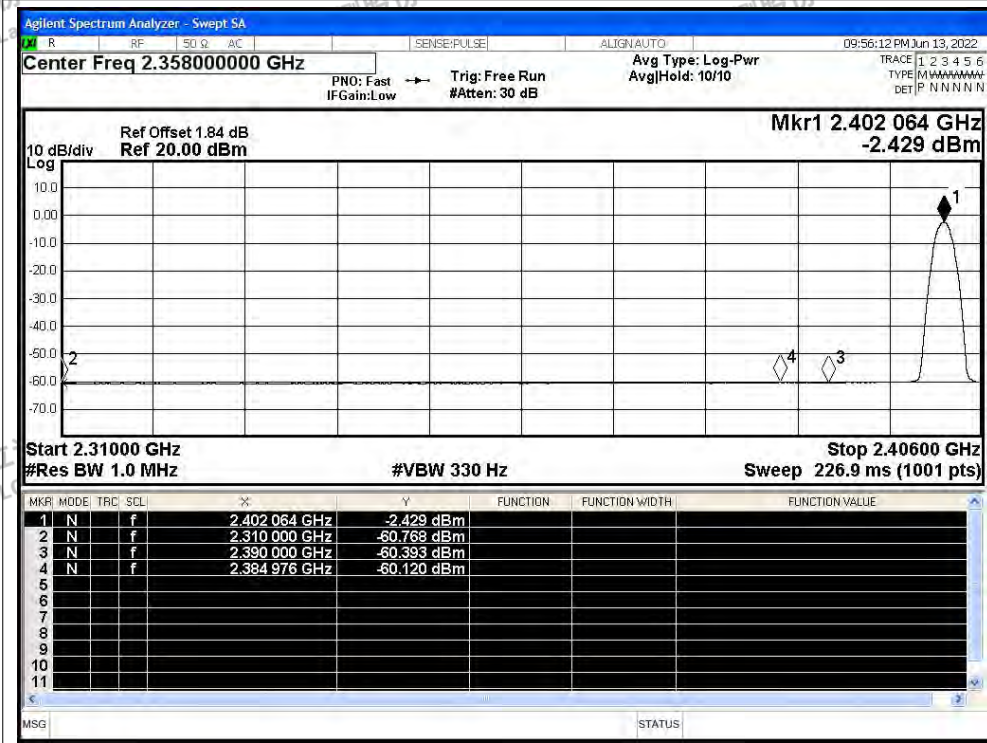




Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Peak

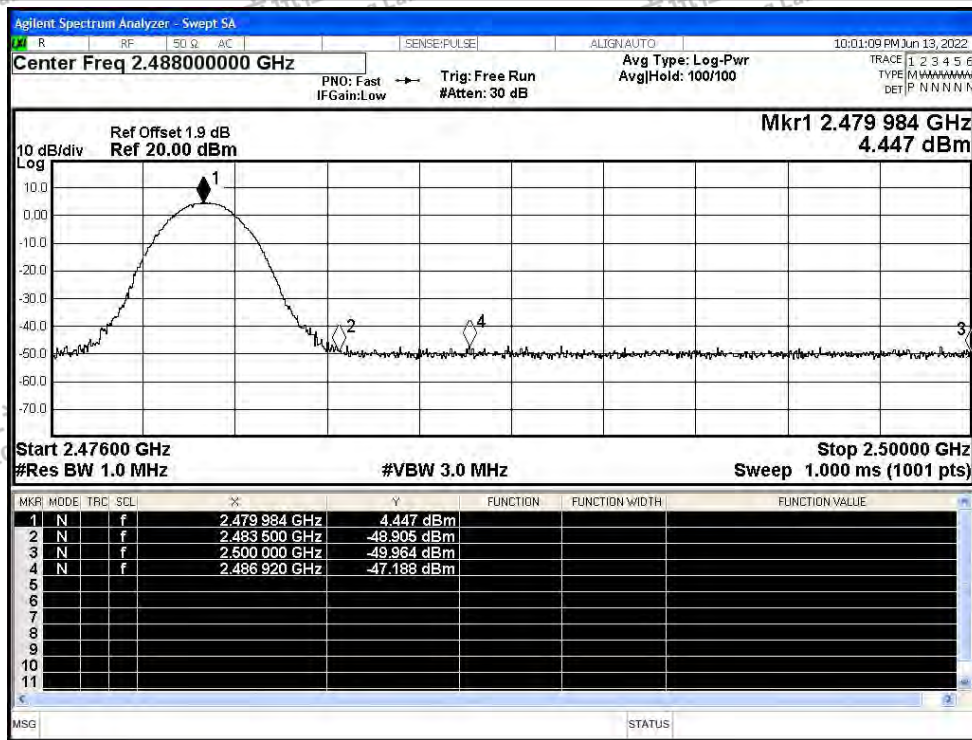


Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Average





Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Peak



Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Average

