



## Appendix A

### RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: 4G Industrial Router

Test Model: F-R100

#### Environmental Conditions

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



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



### A.1 -6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant	9.505	$\geq 0.5$	Pass
NVNT	b	2437	Ant	8.052	$\geq 0.5$	Pass
NVNT	b	2462	Ant	8.102	$\geq 0.5$	Pass
NVNT	g	2412	Ant	16.258	$\geq 0.5$	Pass
NVNT	g	2437	Ant	16.185	$\geq 0.5$	Pass
NVNT	g	2462	Ant	16.339	$\geq 0.5$	Pass
NVNT	n20	2412	Ant	13.523	$\geq 0.5$	Pass
NVNT	n20	2437	Ant	14.052	$\geq 0.5$	Pass
NVNT	n20	2462	Ant	13.734	$\geq 0.5$	Pass
NVNT	n40	2422	Ant	35.067	$\geq 0.5$	Pass
NVNT	n40	2437	Ant	33.702	$\geq 0.5$	Pass
NVNT	n40	2452	Ant	35.114	$\geq 0.5$	Pass

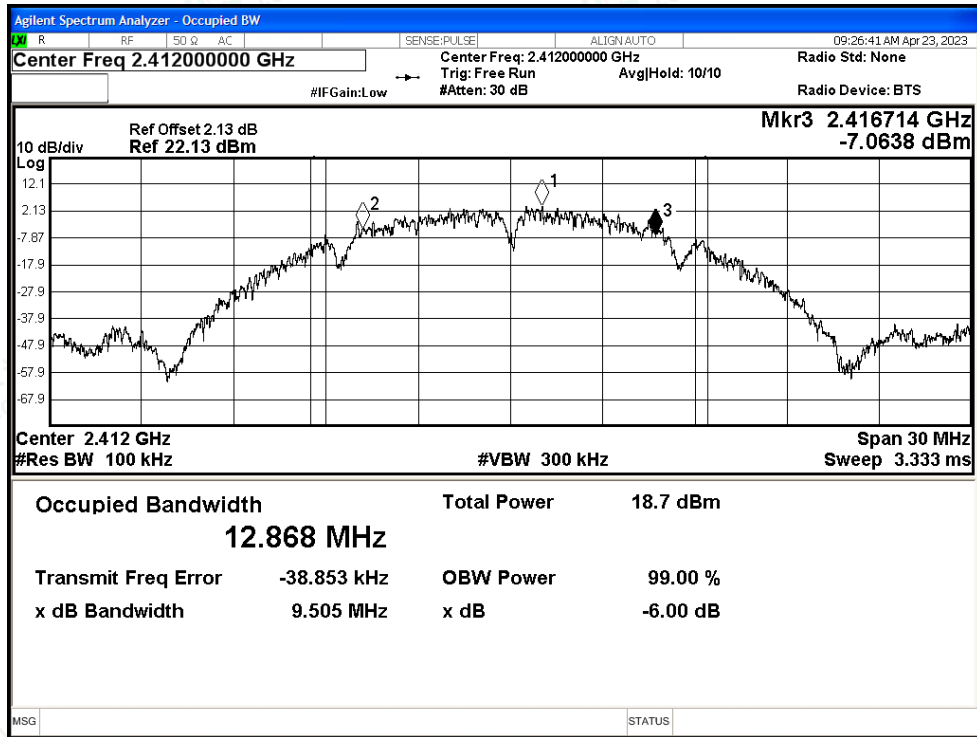


Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
Scan code to check authenticity

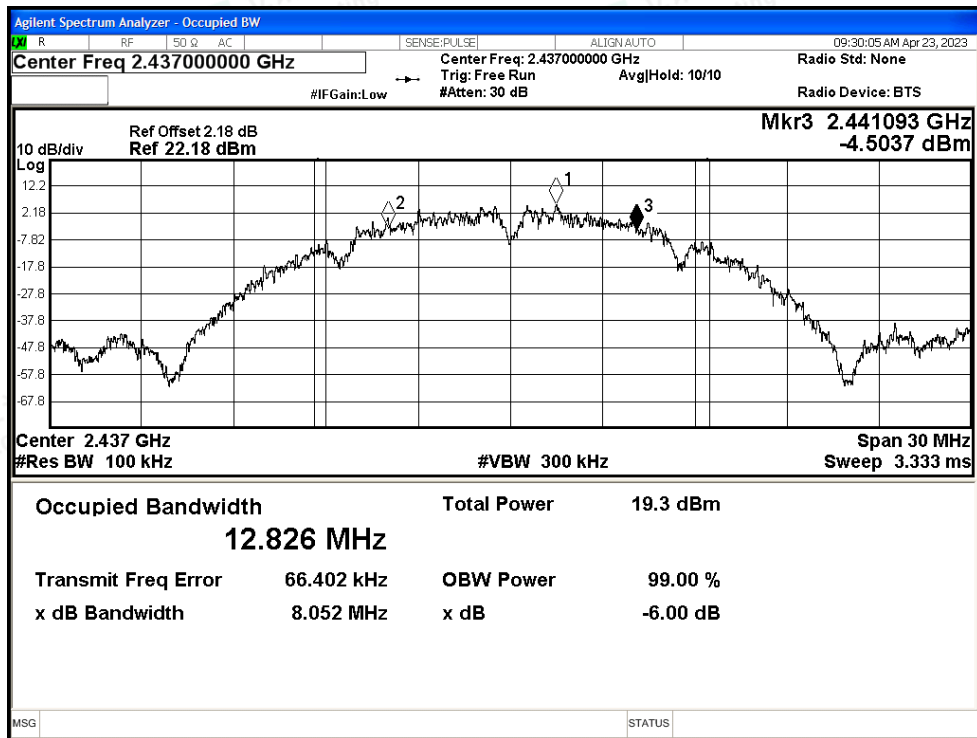


Test Graphs

-6dB Bandwidth NVNT b 2412MHz Ant

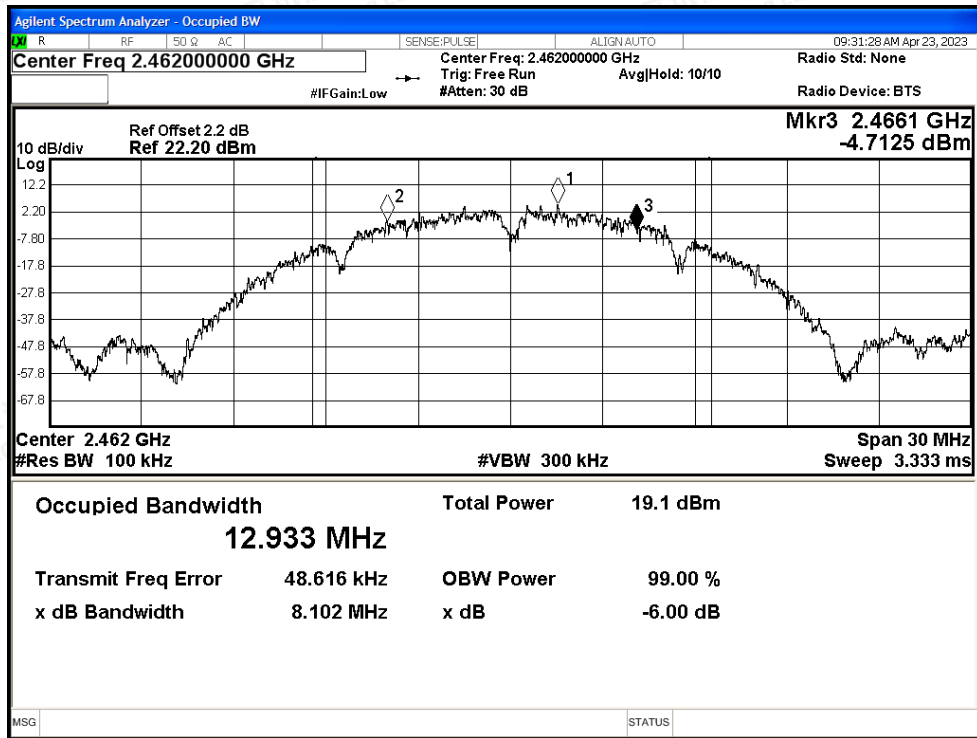


-6dB Bandwidth NVNT b 2437MHz Ant

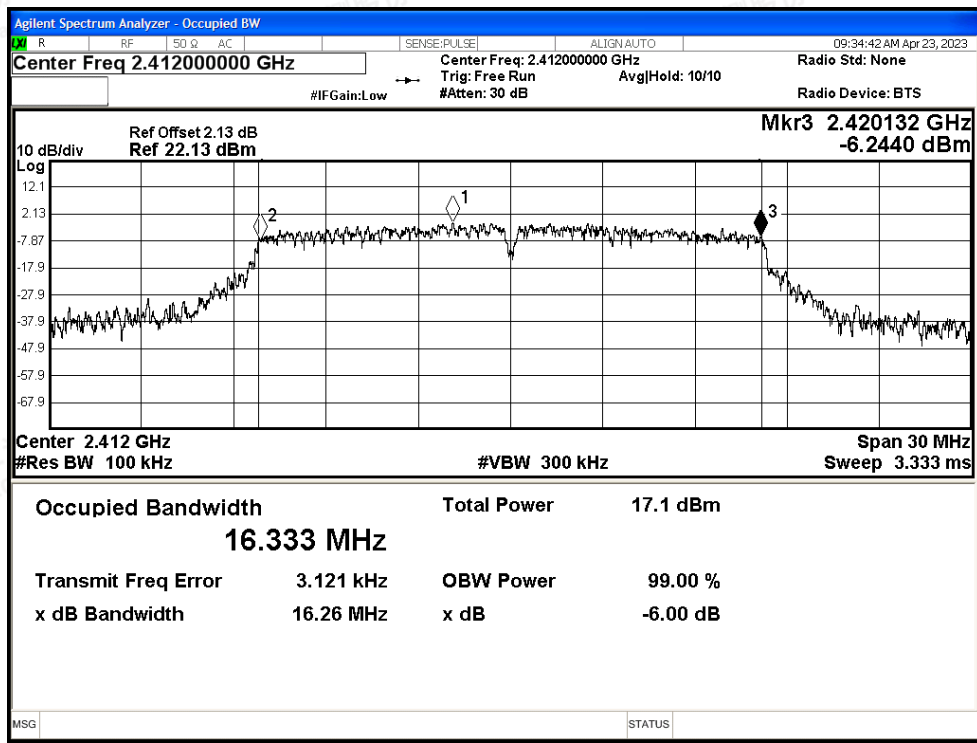




-6dB Bandwidth NVNT b 2462MHz Ant

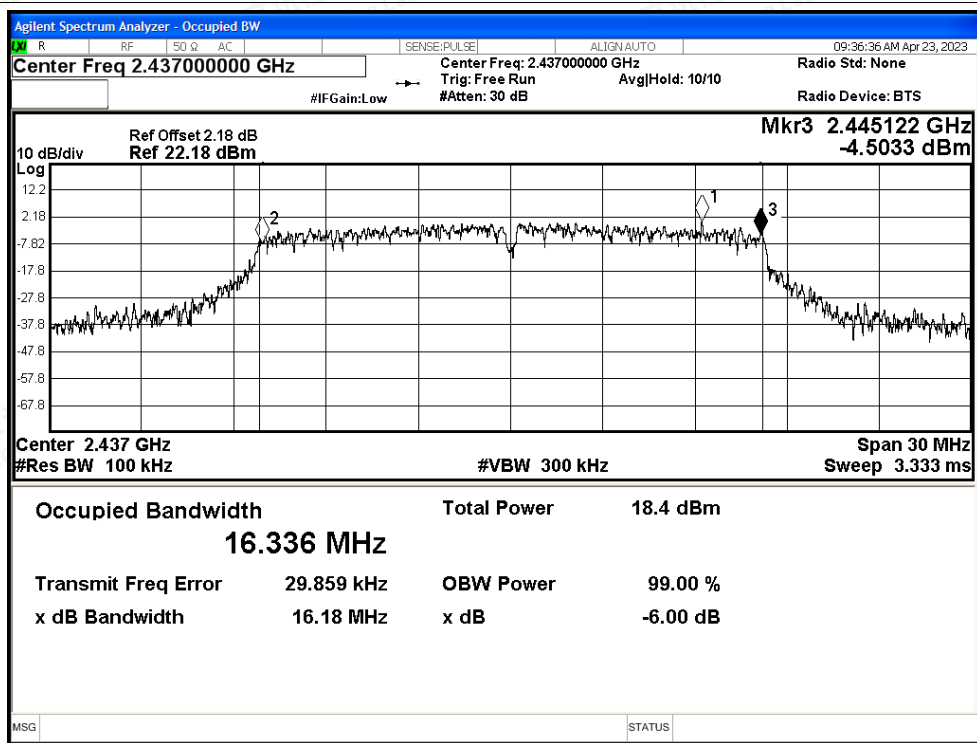


-6dB Bandwidth NVNT g 2412MHz Ant

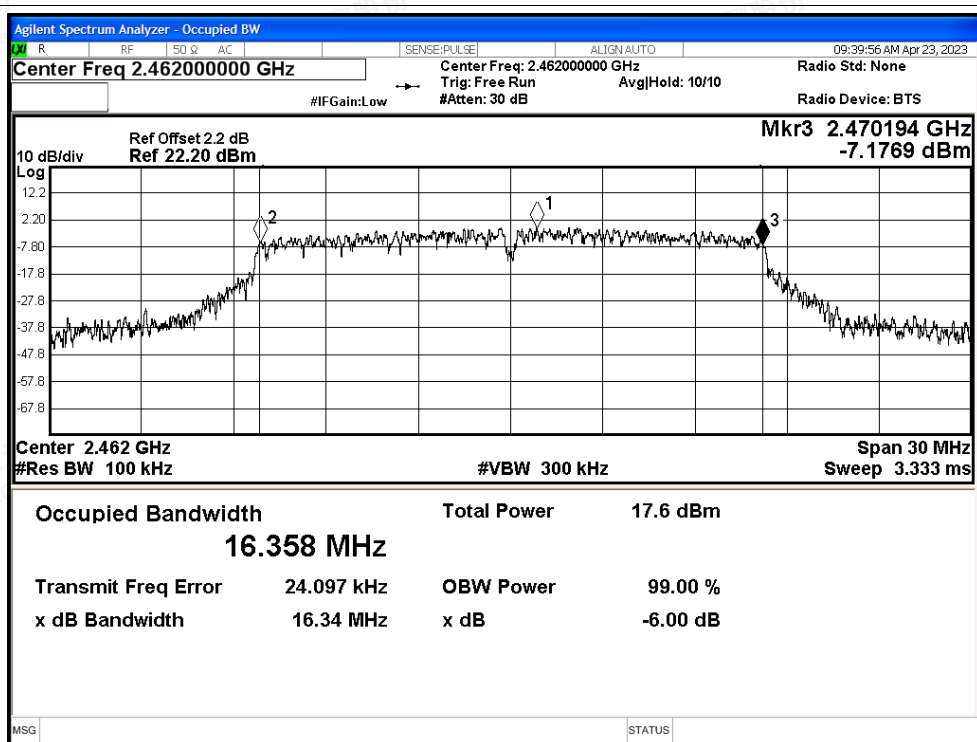




-6dB Bandwidth NVNT g 2437MHz Ant

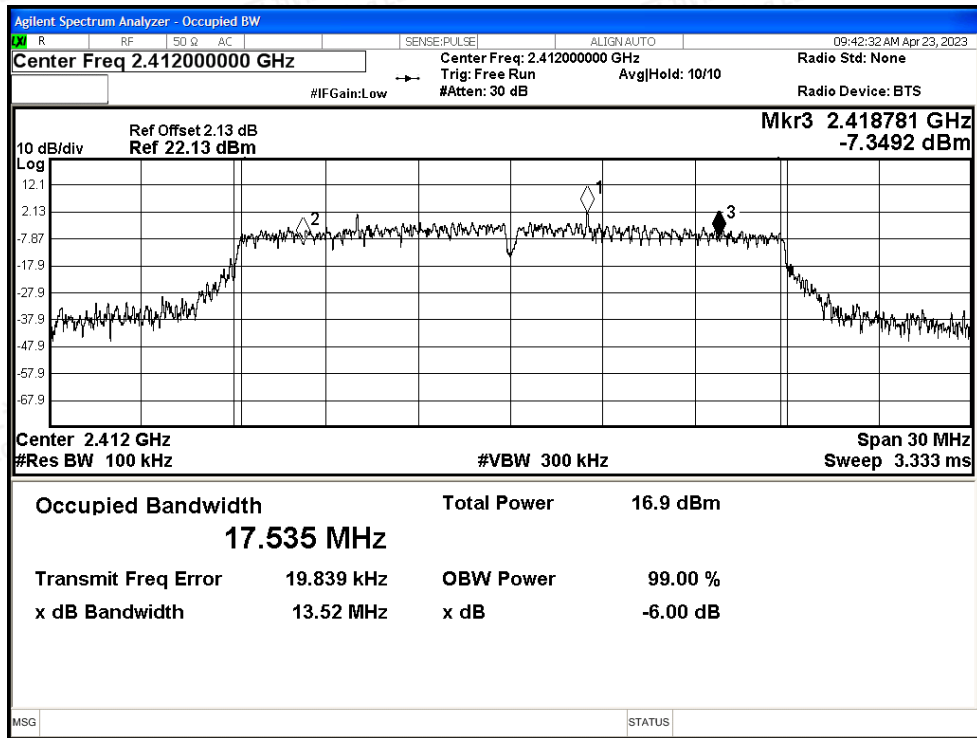


-6dB Bandwidth NVNT g 2462MHz Ant

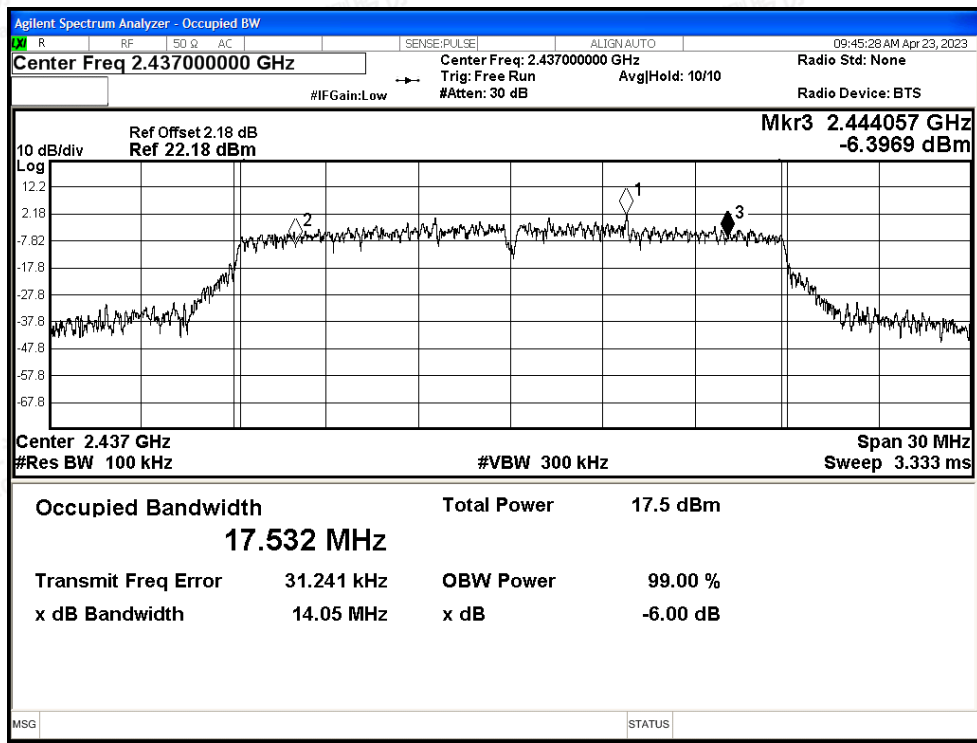




-6dB Bandwidth NVNT n20 2412MHz Ant

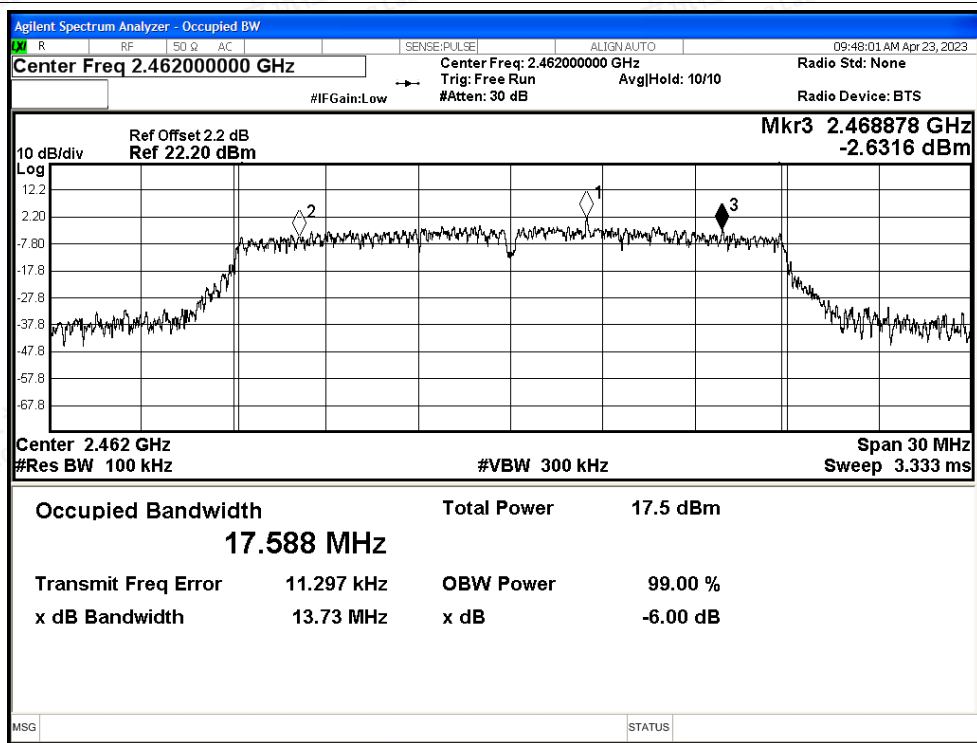


-6dB Bandwidth NVNT n20 2437MHz Ant

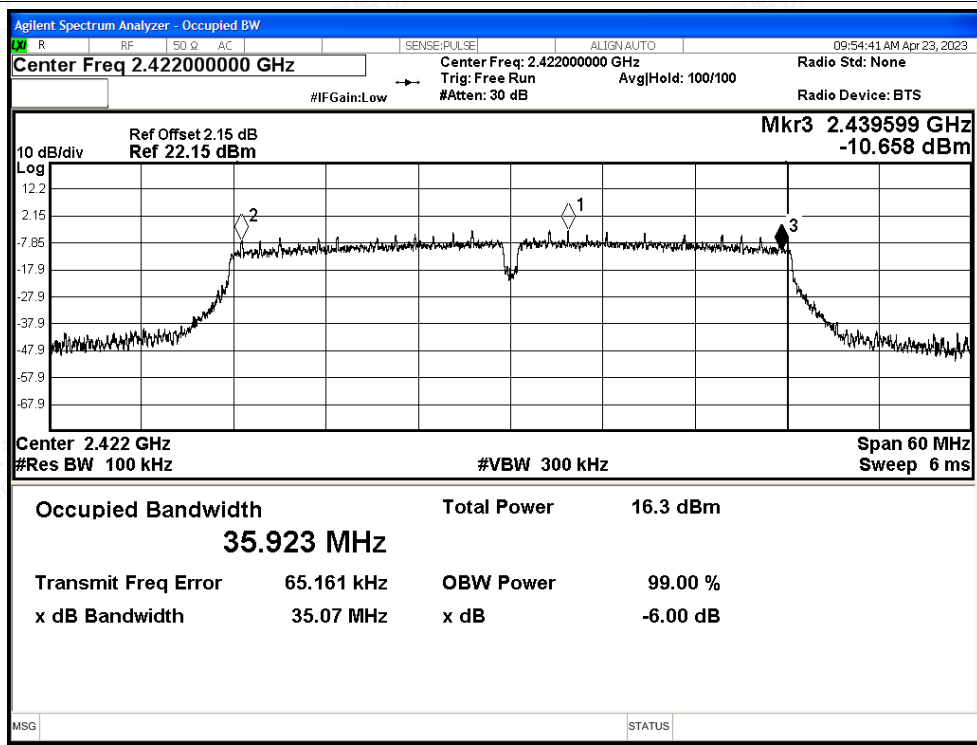




-6dB Bandwidth NVNT n20 2462MHz Ant

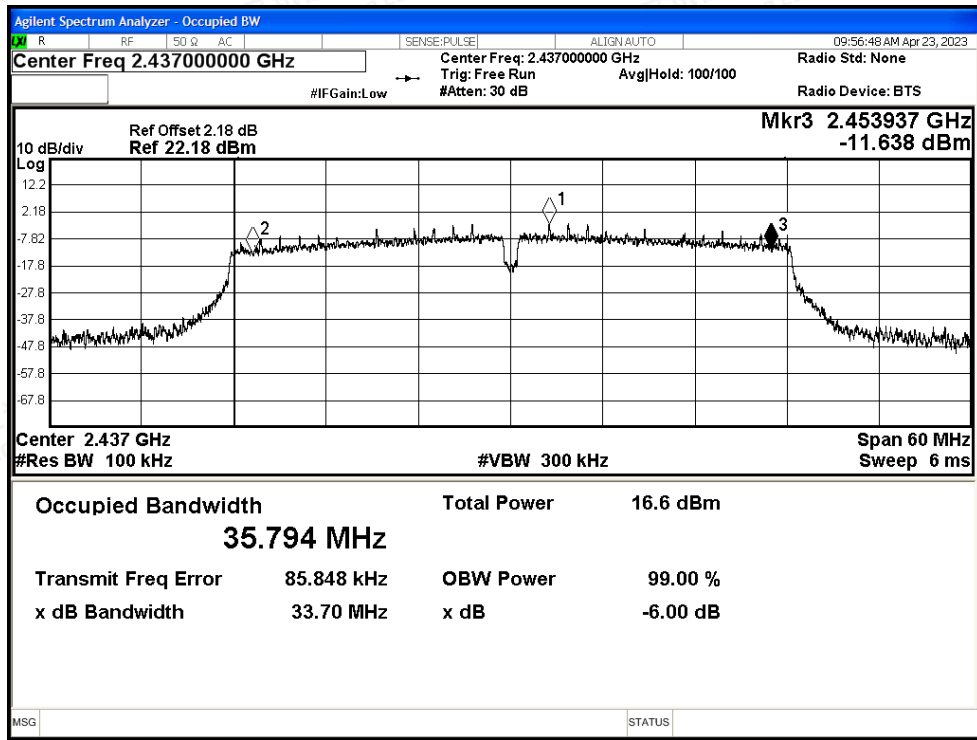


-6dB Bandwidth NVNT n40 2422MHz Ant

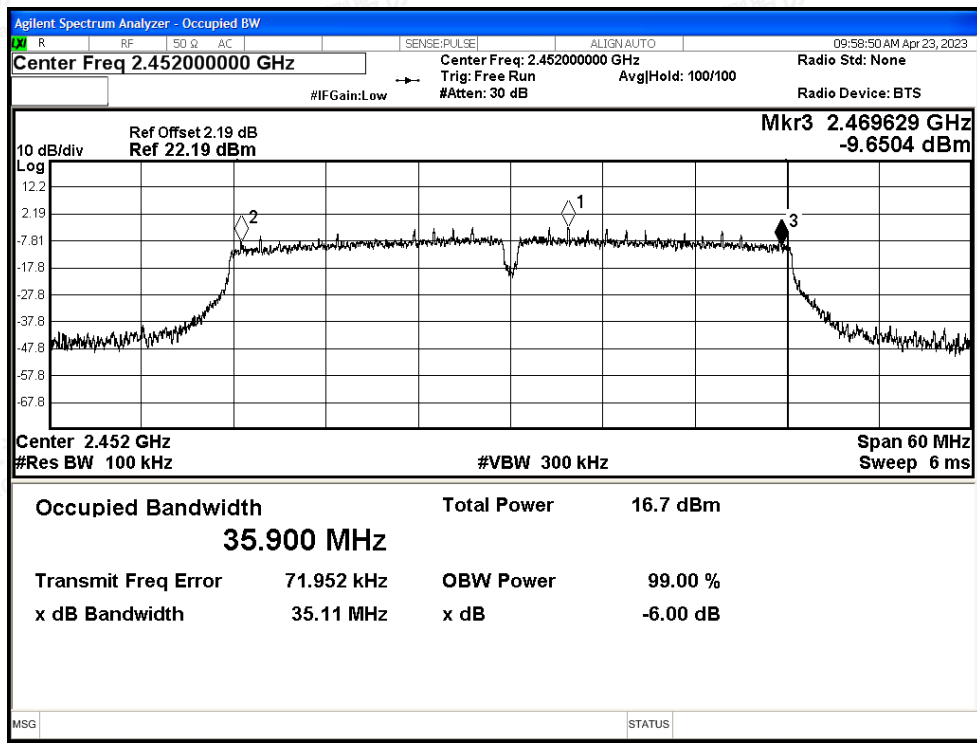




-6dB Bandwidth NVNT n40 2437MHz Ant



-6dB Bandwidth NVNT n40 2452MHz Ant







## A.2 Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant	15.15	30	Pass
NVNT	b	2437	Ant	15.70	30	Pass
NVNT	b	2462	Ant	15.68	30	Pass
NVNT	g	2412	Ant	15.70	30	Pass
NVNT	g	2437	Ant	15.97	30	Pass
NVNT	g	2462	Ant	16.42	30	Pass
NVNT	n20	2412	Ant	15.50	30	Pass
NVNT	n20	2437	Ant	16.00	30	Pass
NVNT	n20	2462	Ant	15.73	30	Pass
NVNT	n40	2422	Ant	14.76	30	Pass
NVNT	n40	2437	Ant	15.06	30	Pass
NVNT	n40	2452	Ant	15.17	30	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



### A.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant	-8.44	8	Pass
NVNT	b	2437	Ant	-8.25	8	Pass
NVNT	b	2462	Ant	-6.96	8	Pass
NVNT	g	2412	Ant	-12.6	8	Pass
NVNT	g	2437	Ant	-11.6	8	Pass
NVNT	g	2462	Ant	-8.36	8	Pass
NVNT	n20	2412	Ant	-12.57	8	Pass
NVNT	n20	2437	Ant	-10.99	8	Pass
NVNT	n20	2462	Ant	-14.42	8	Pass
NVNT	n40	2422	Ant	-17.65	8	Pass
NVNT	n40	2437	Ant	-16.02	8	Pass
NVNT	n40	2452	Ant	-16.8	8	Pass

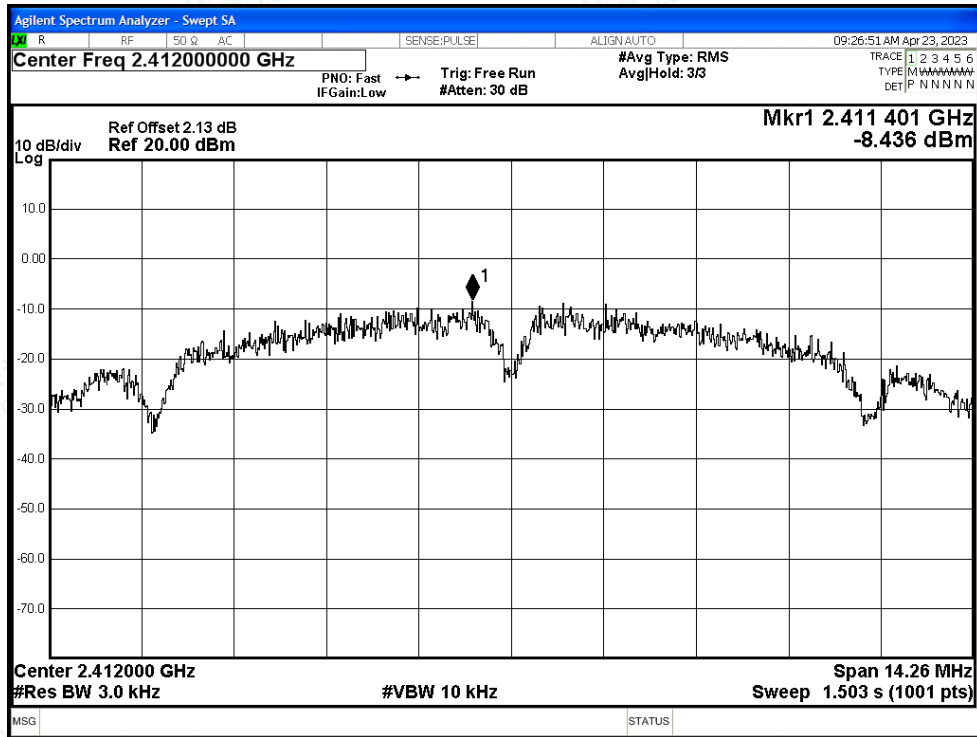


Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
Scan code to check authenticity

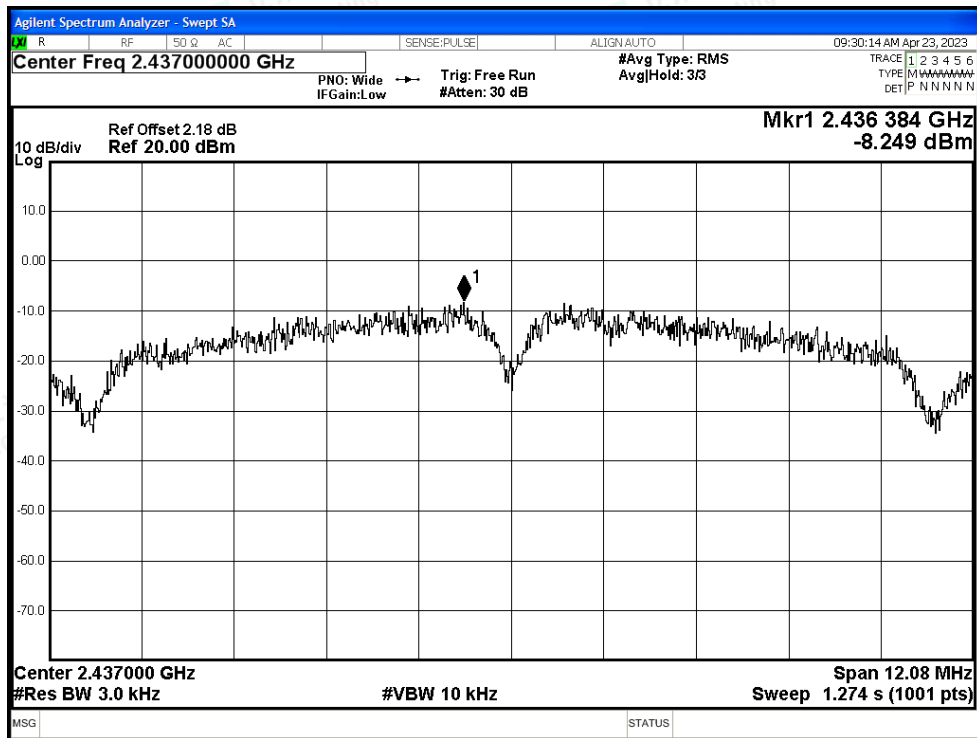


Test Graphs

PSD NVNT b 2412MHz Ant

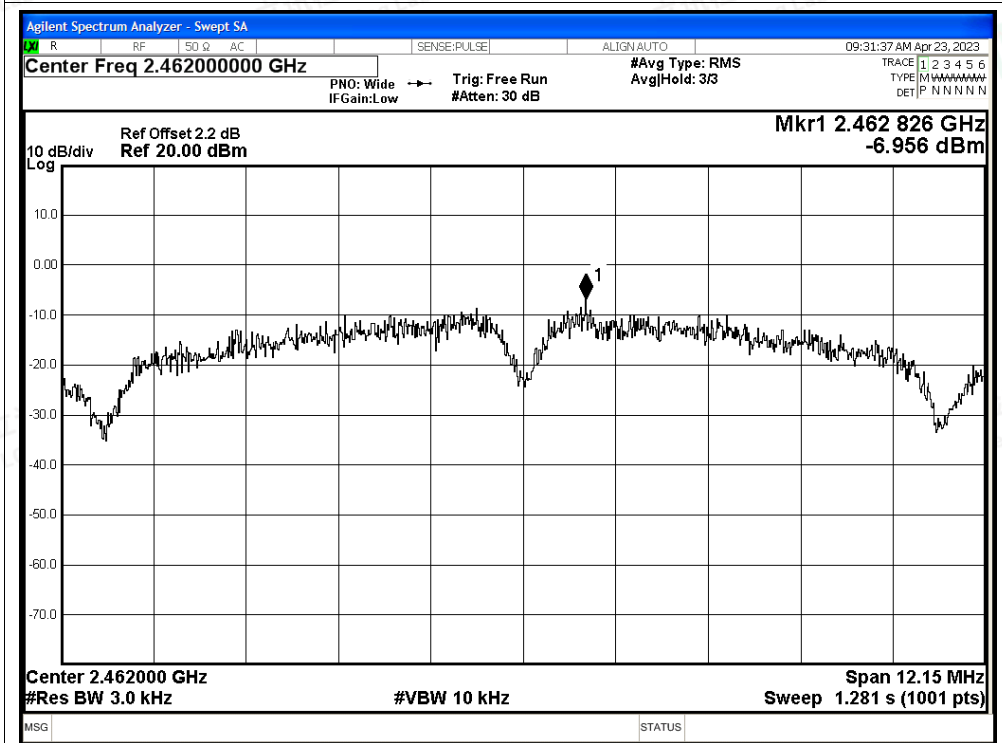


PSD NVNT b 2437MHz Ant

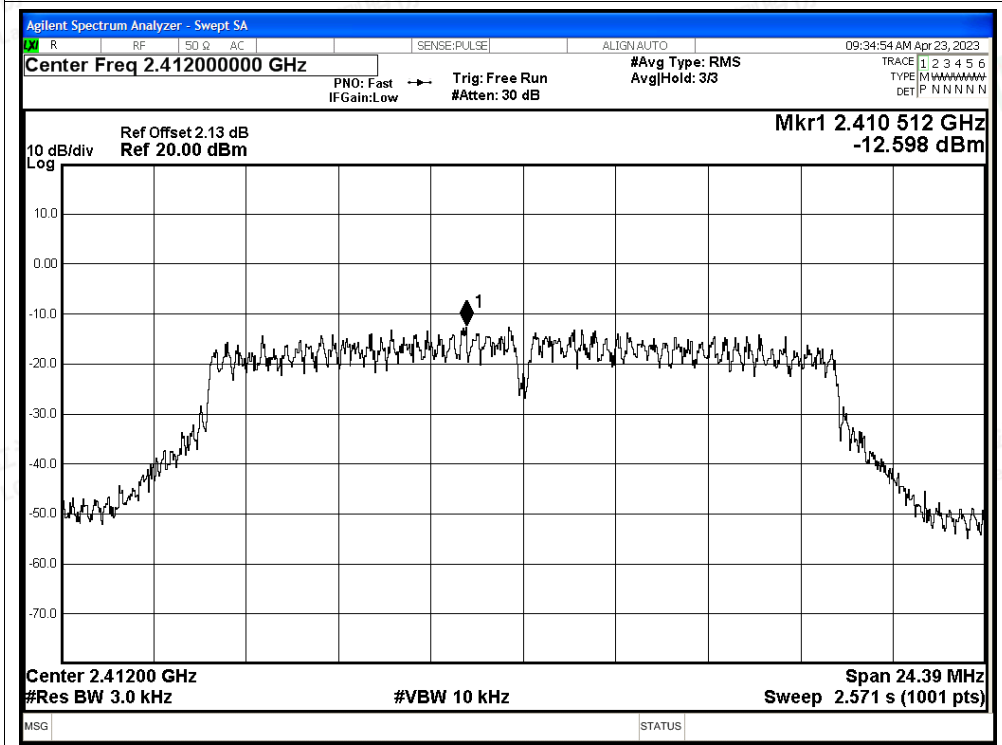




PSD NVNT b 2462MHz Ant

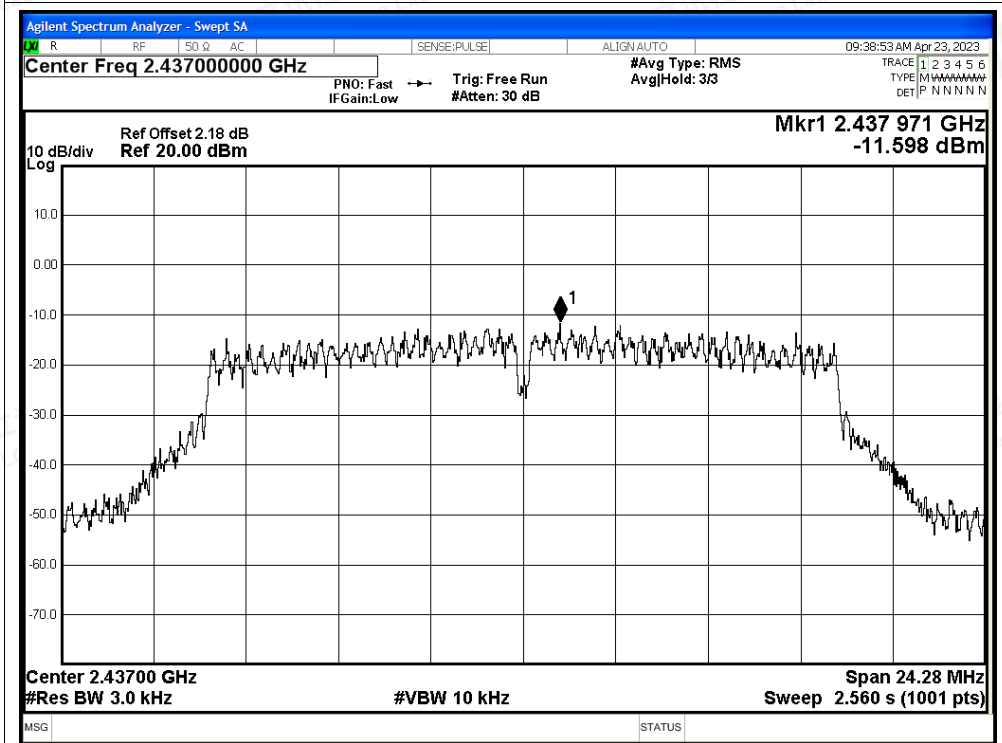


PSD NVNT g 2412MHz Ant

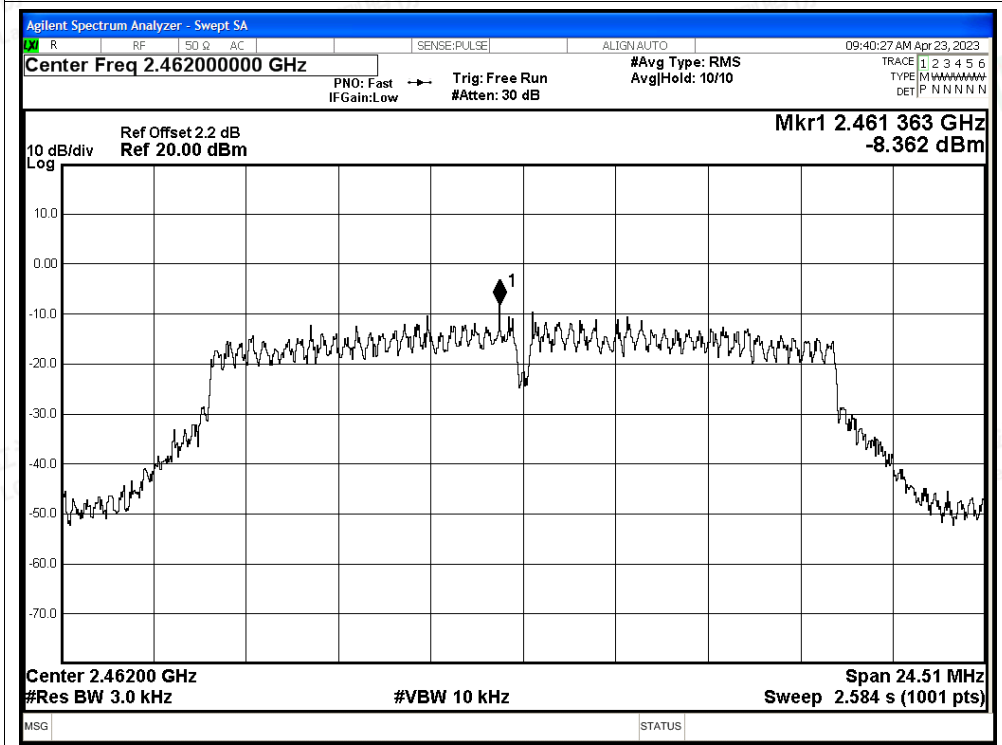


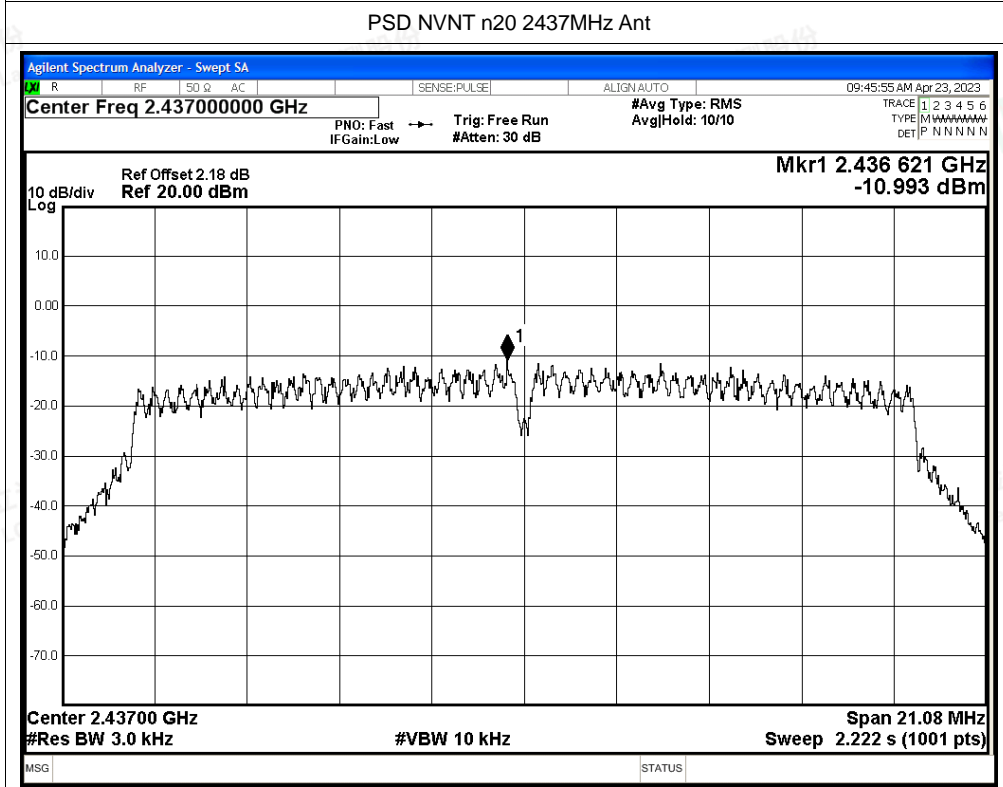
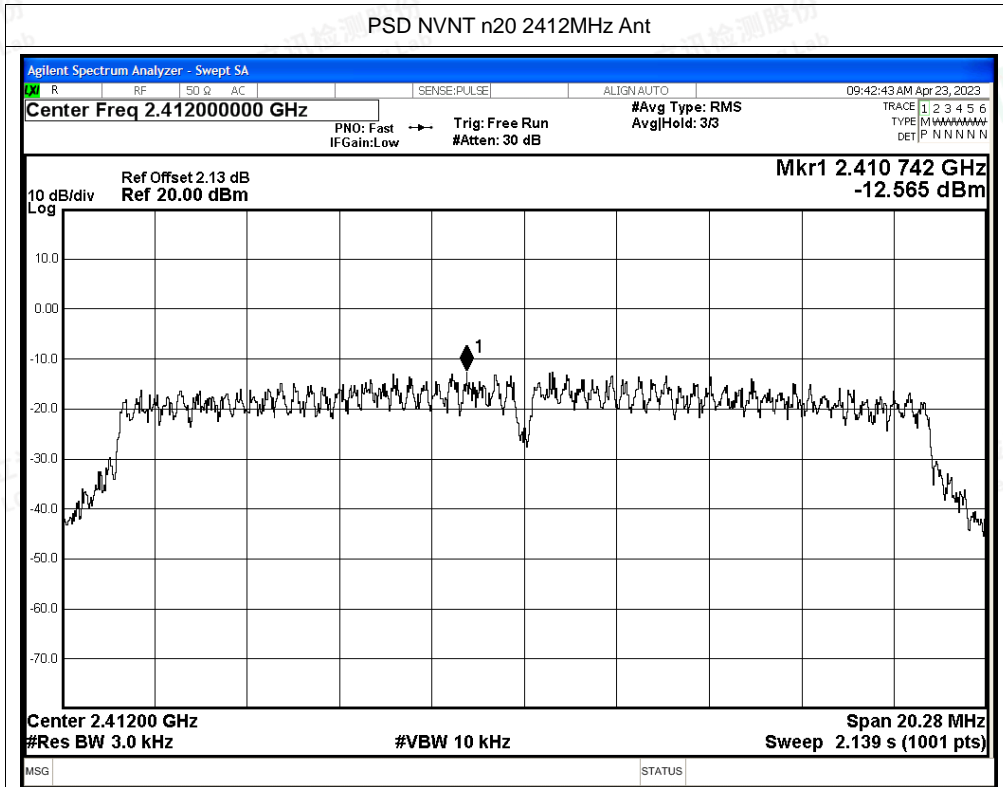


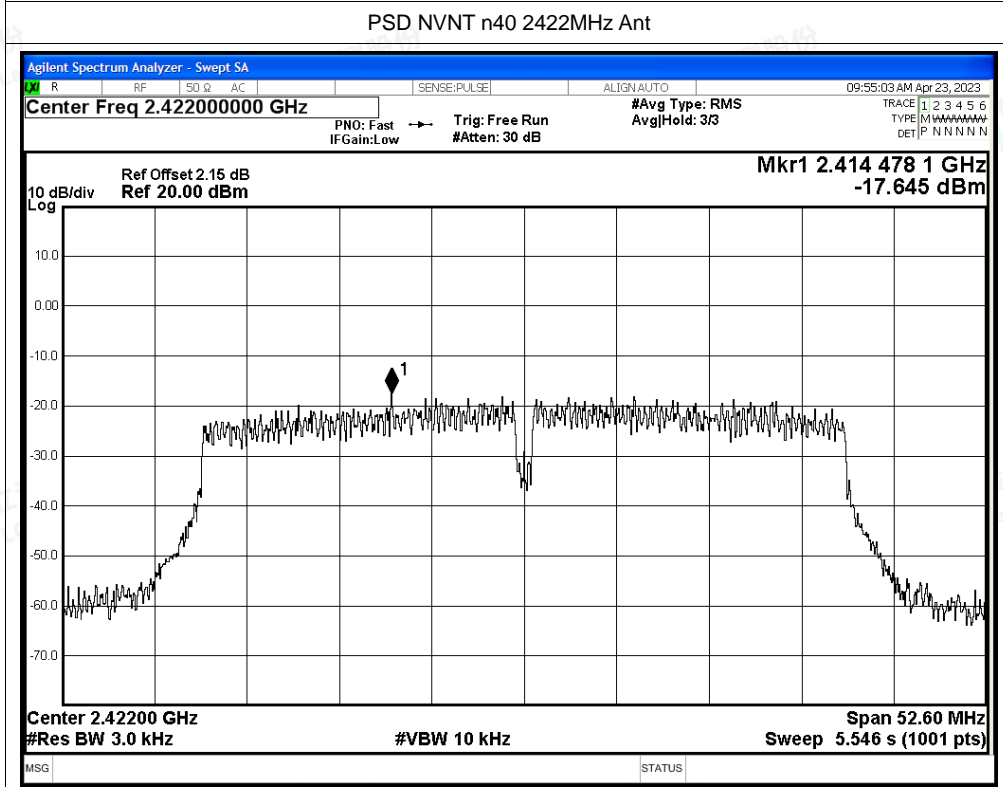
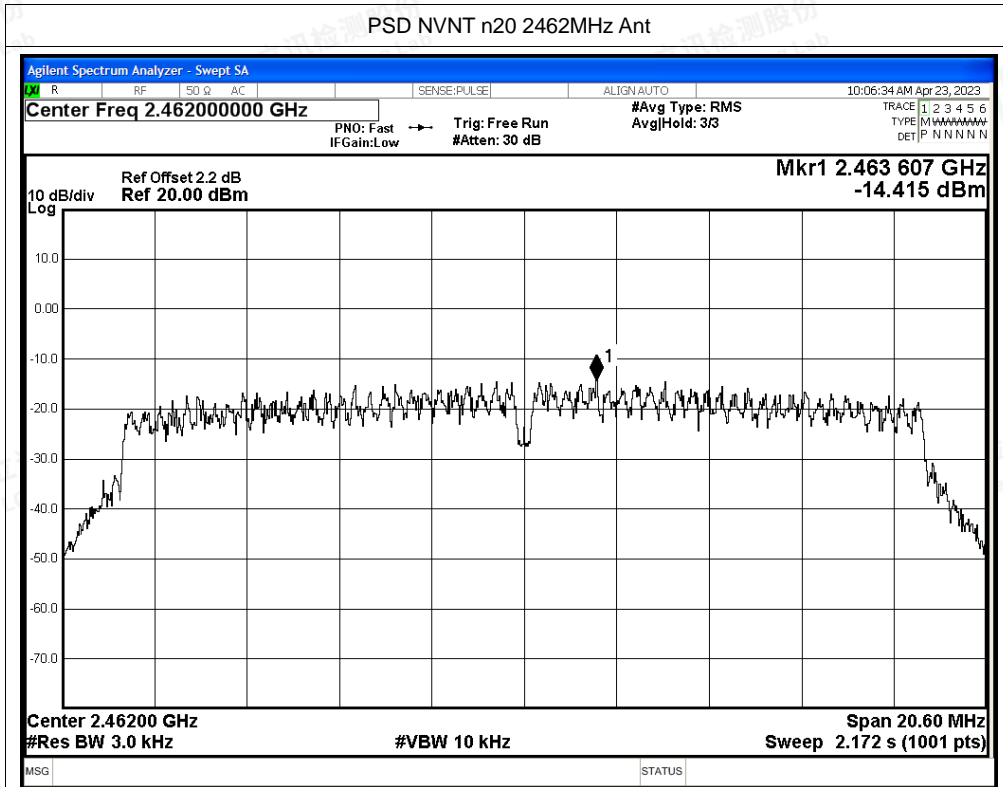
PSD NVNT g 2437MHz Ant

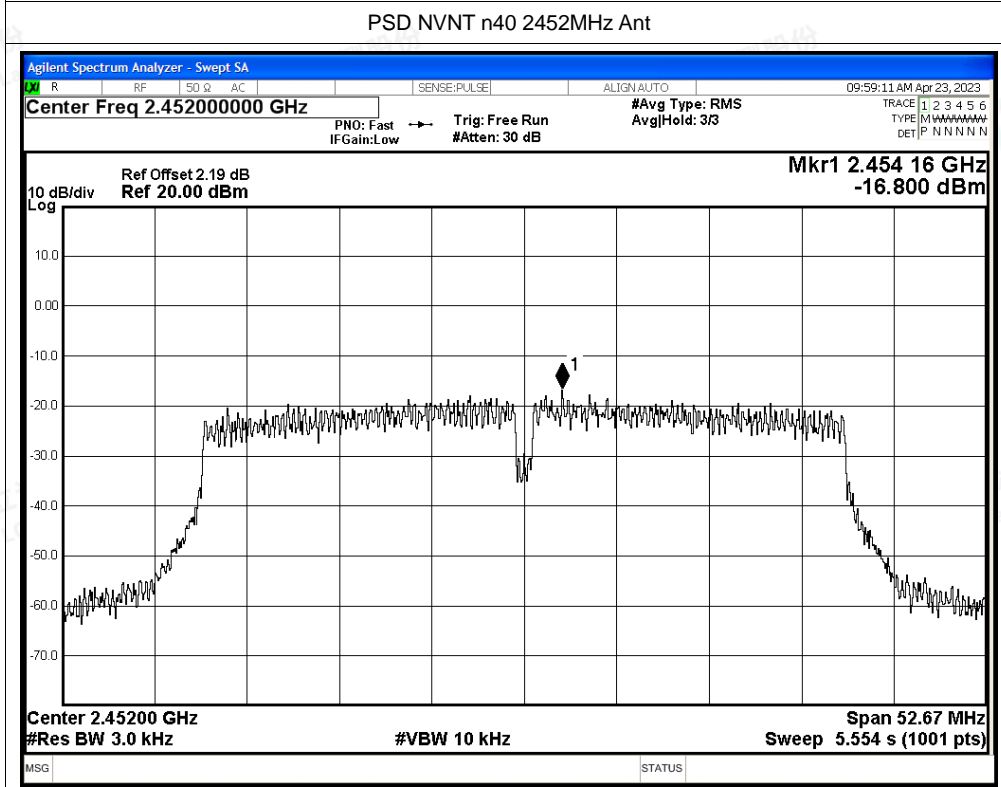
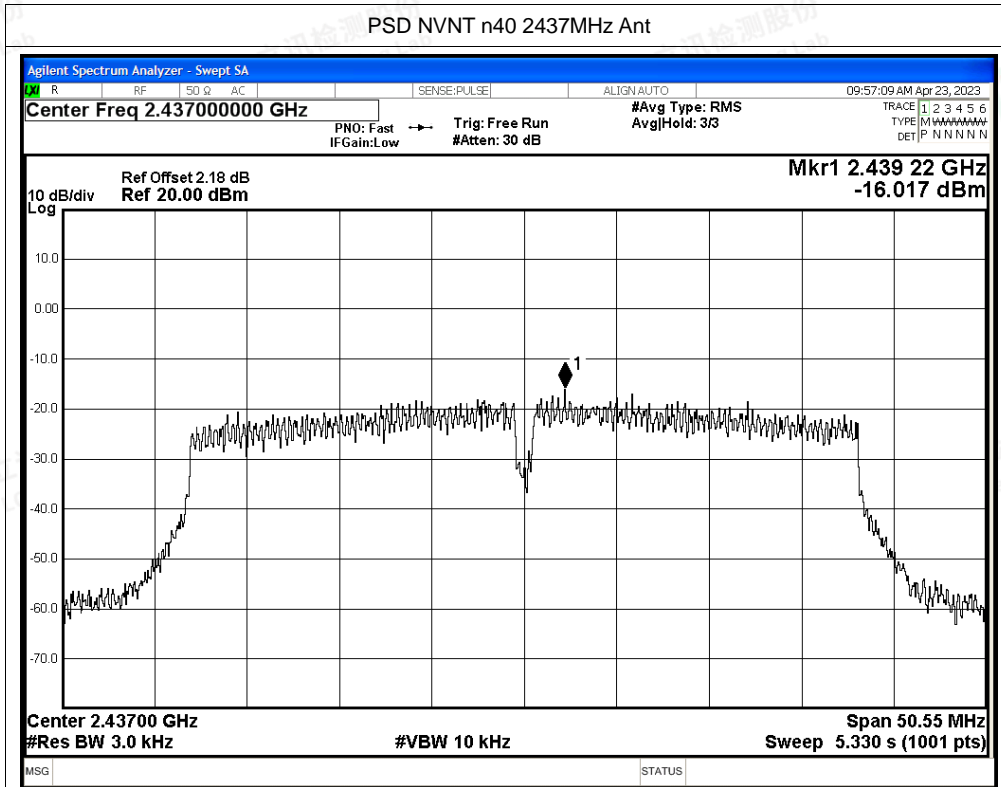


PSD NVNT g 2462MHz Ant













### A.4 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant	-45.84	-20	Pass
NVNT	b	2462	Ant	-60.04	-20	Pass
NVNT	g	2412	Ant	-33.21	-20	Pass
NVNT	g	2462	Ant	-49.97	-20	Pass
NVNT	n20	2412	Ant	-33.97	-20	Pass
NVNT	n20	2462	Ant	-49.2	-20	Pass
NVNT	n40	2422	Ant	-36.24	-20	Pass
NVNT	n40	2452	Ant	-39.89	-20	Pass

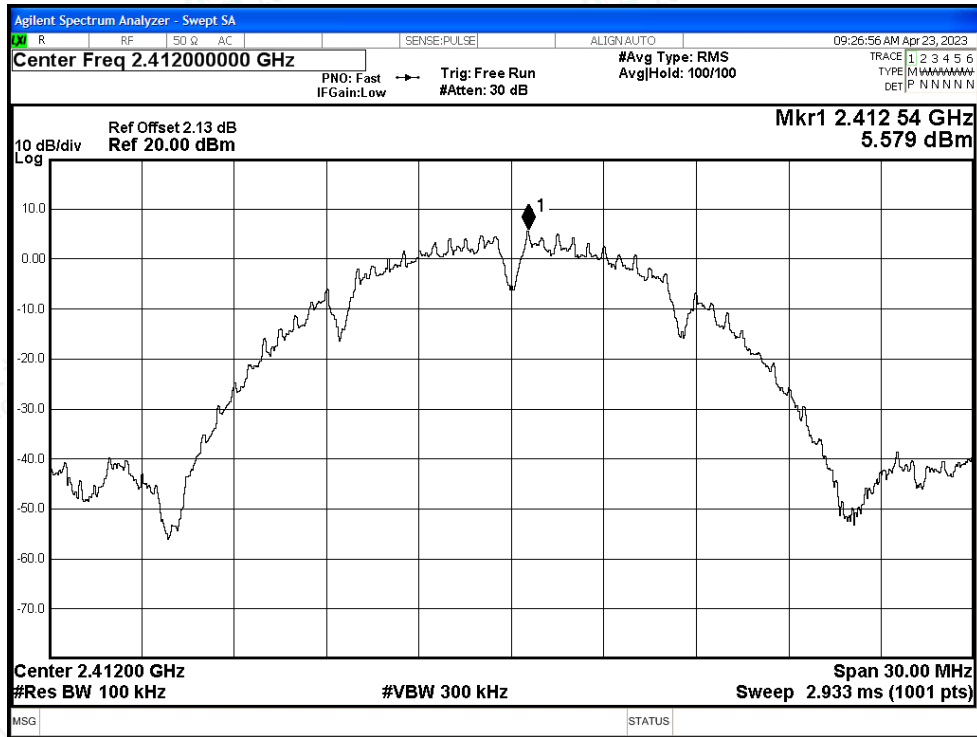


Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
Scan code to check authenticity

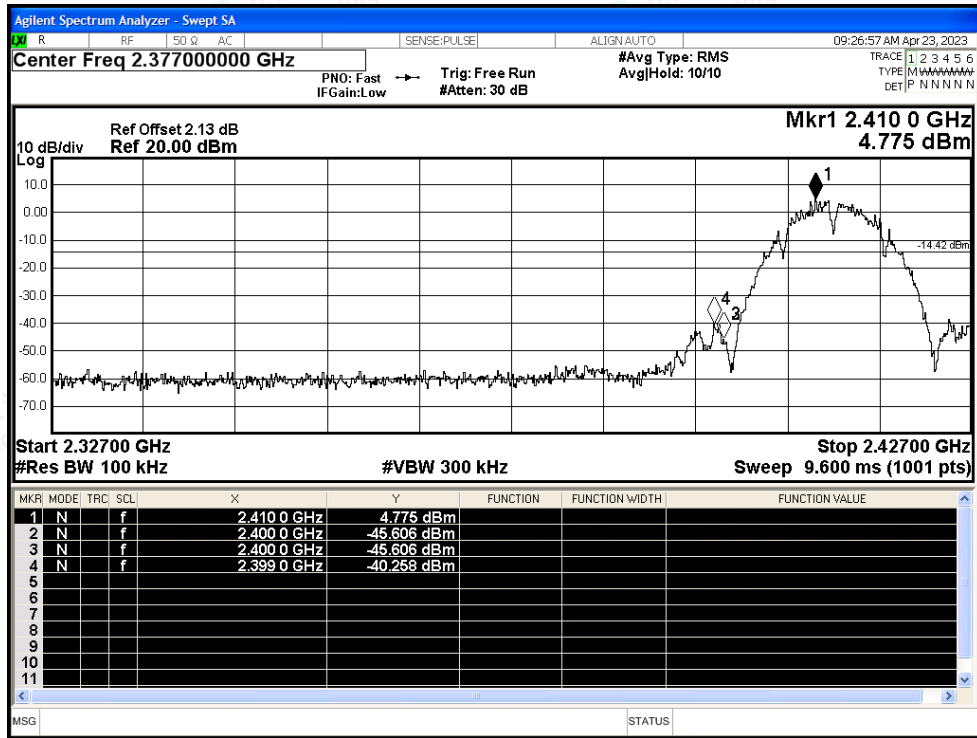


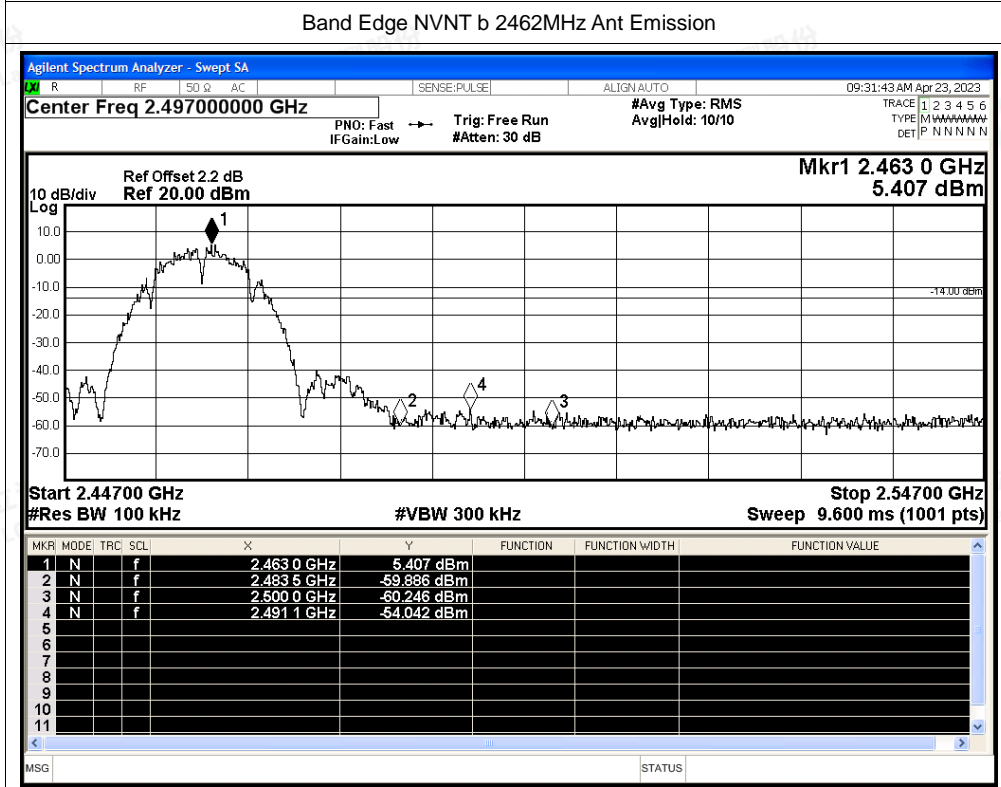
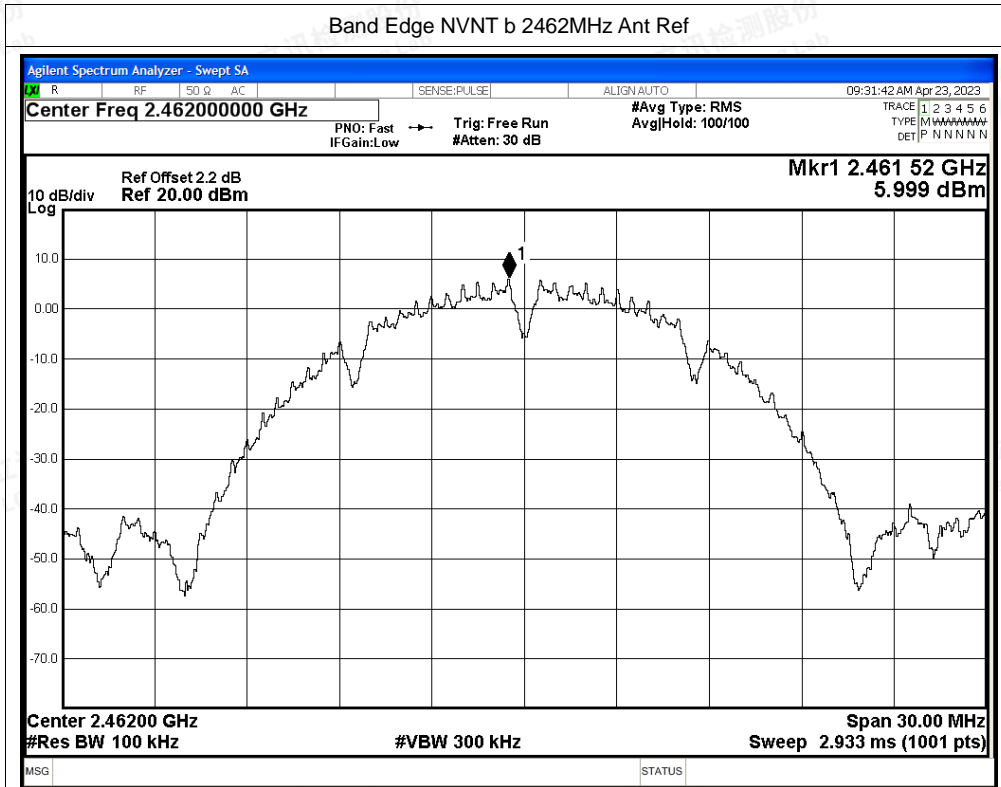
Test Graphs

Band Edge NVNT b 2412MHz Ant Ref



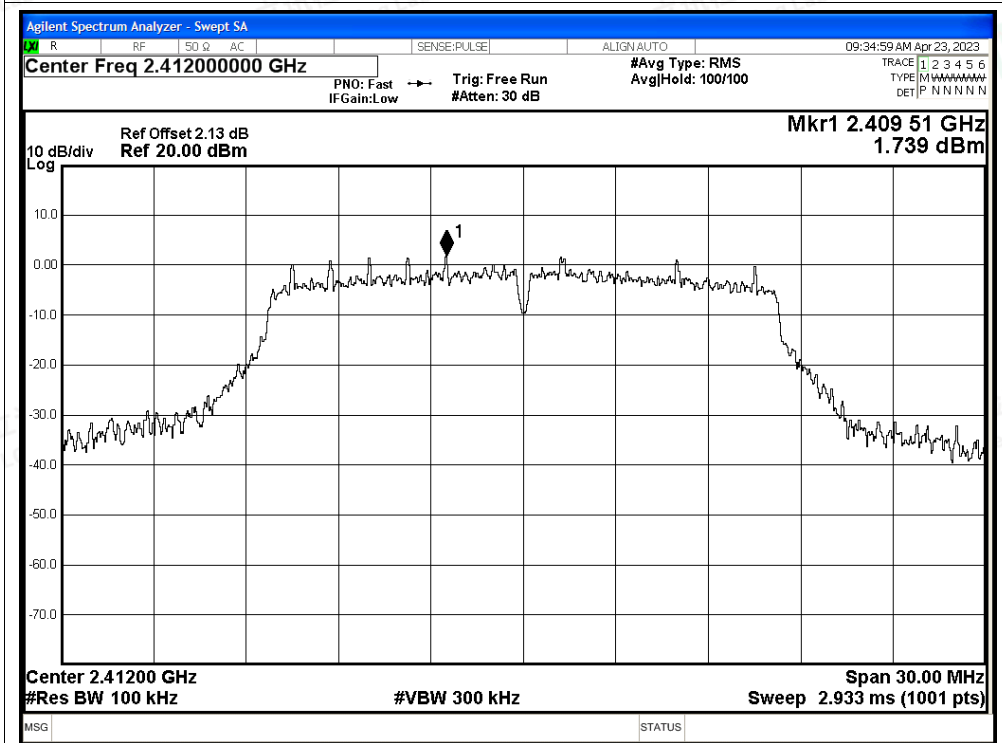
Band Edge NVNT b 2412MHz Ant Emission



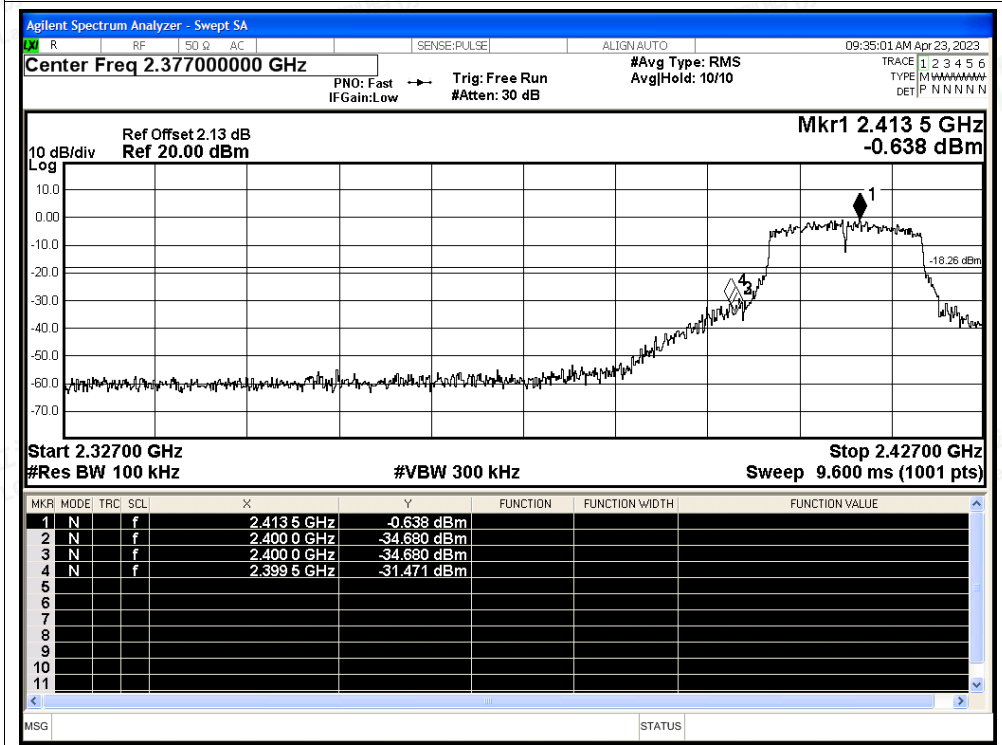




Band Edge NVNT g 2412MHz Ant Ref

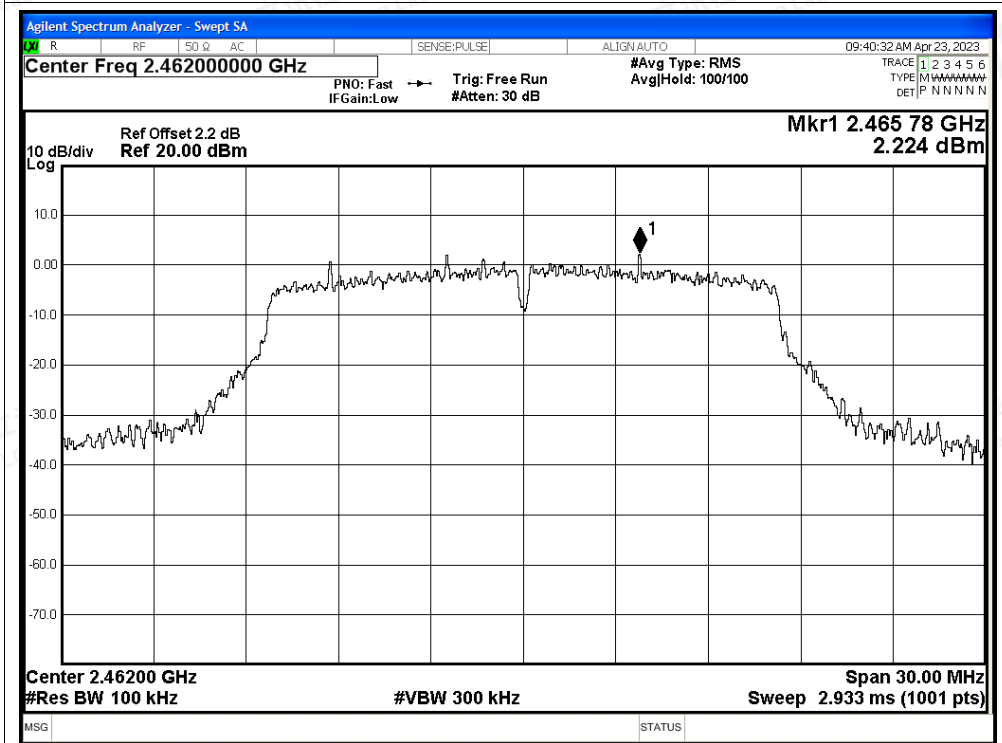


Band Edge NVNT g 2412MHz Ant Emission

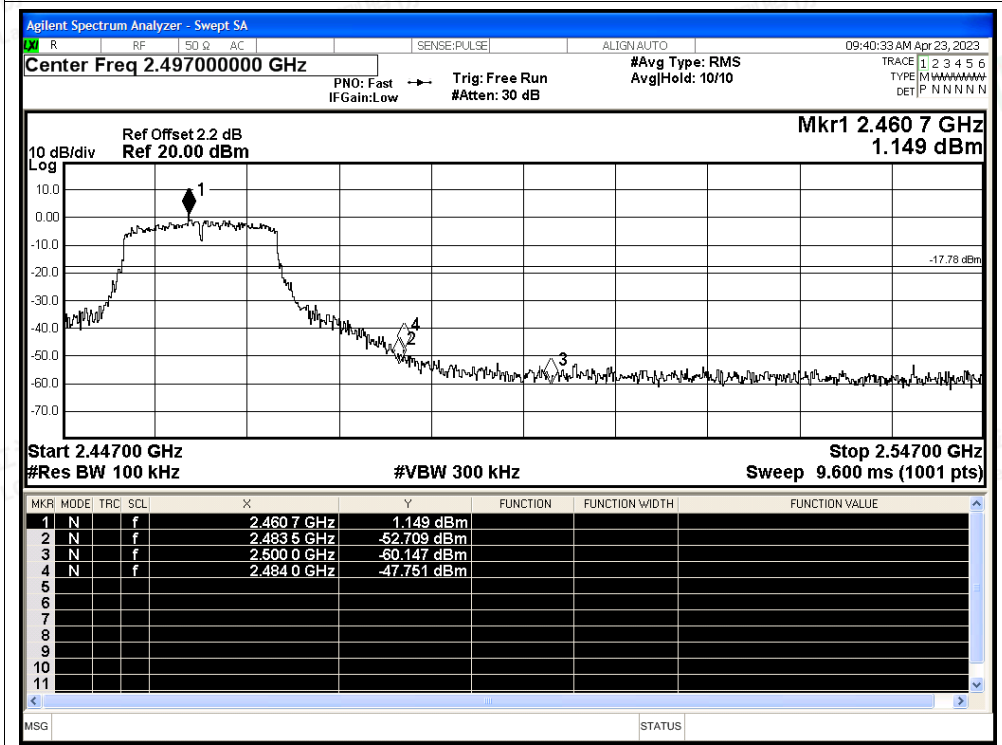




Band Edge NVNT g 2462MHz Ant Ref

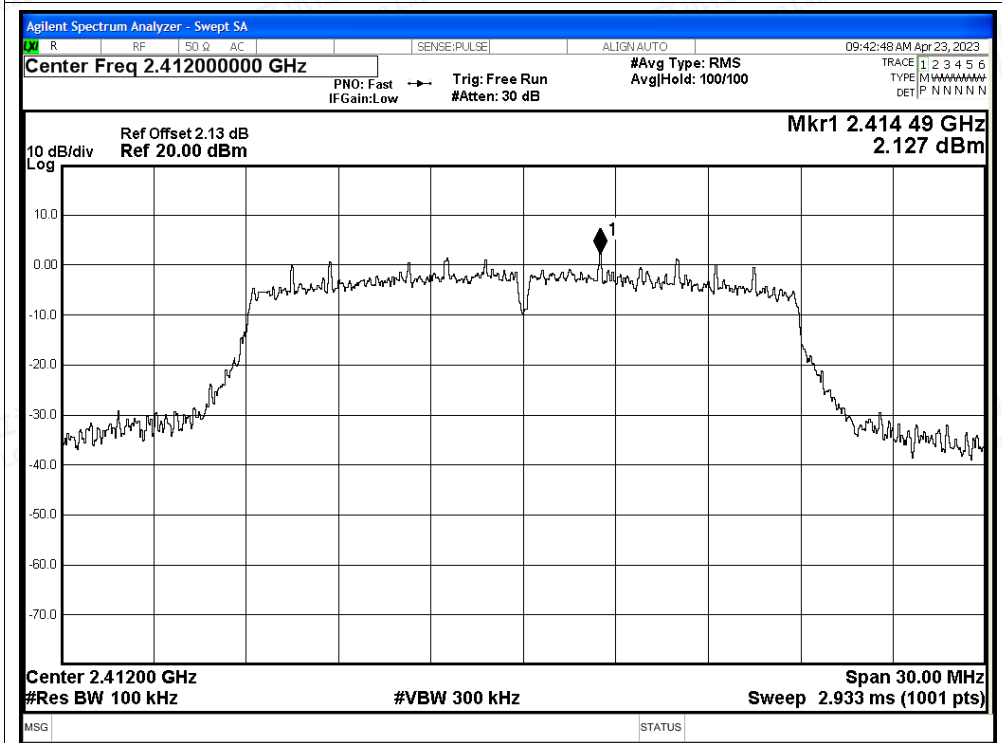


Band Edge NVNT g 2462MHz Ant Emission

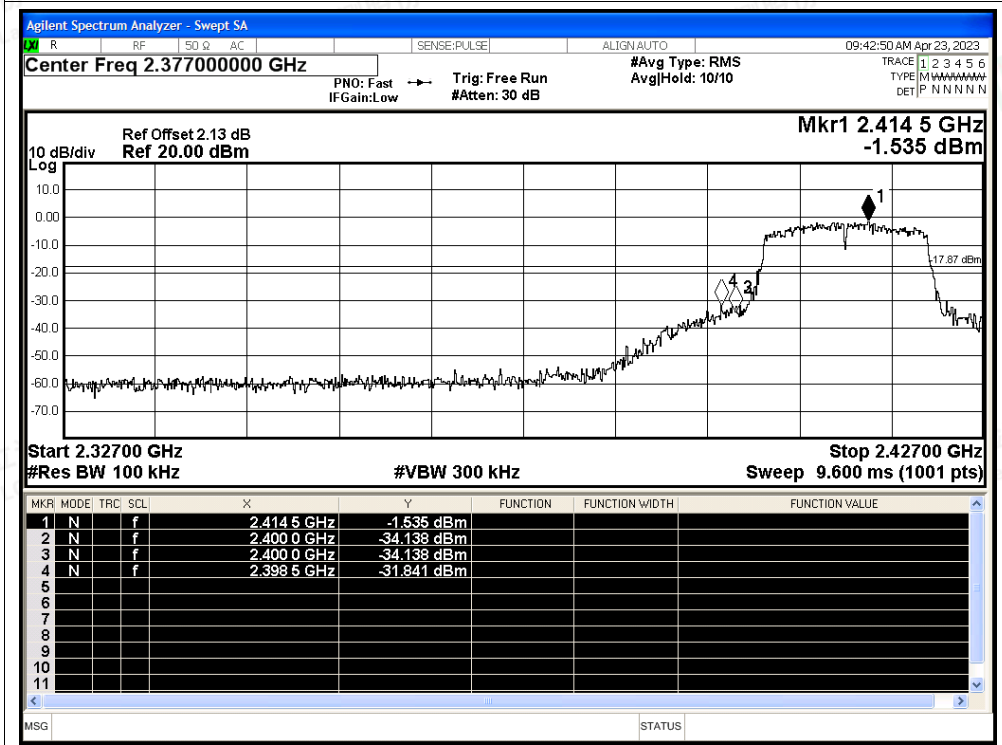




Band Edge NVNT n20 2412MHz Ant Ref

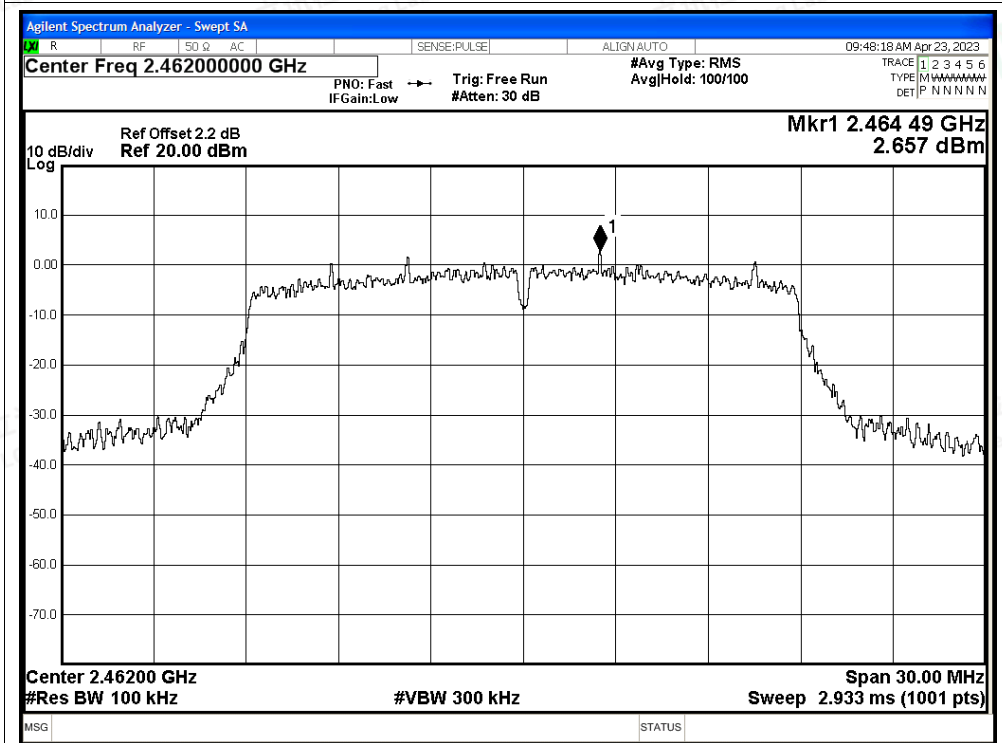


Band Edge NVNT n20 2412MHz Ant Emission

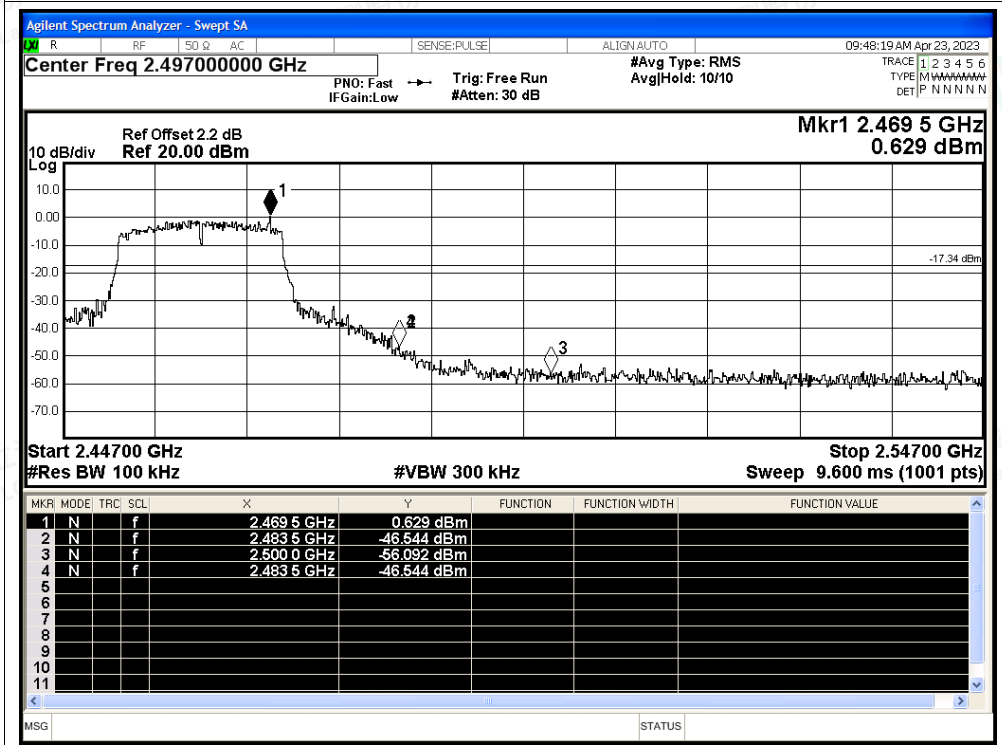




Band Edge NVNT n20 2462MHz Ant Ref

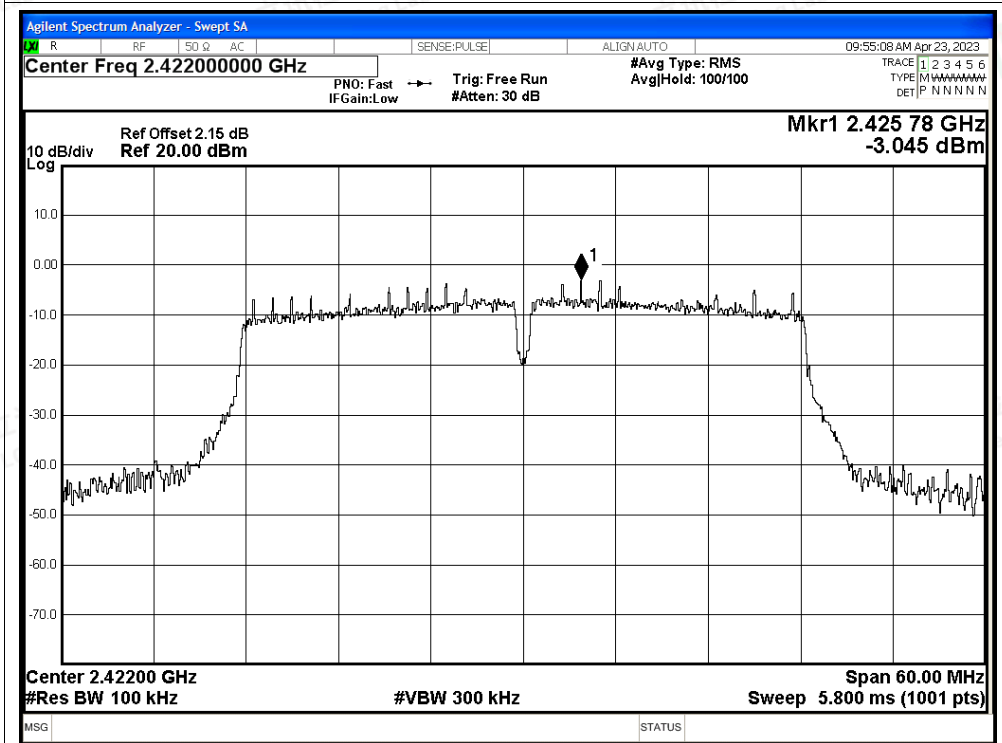


Band Edge NVNT n20 2462MHz Ant Emission

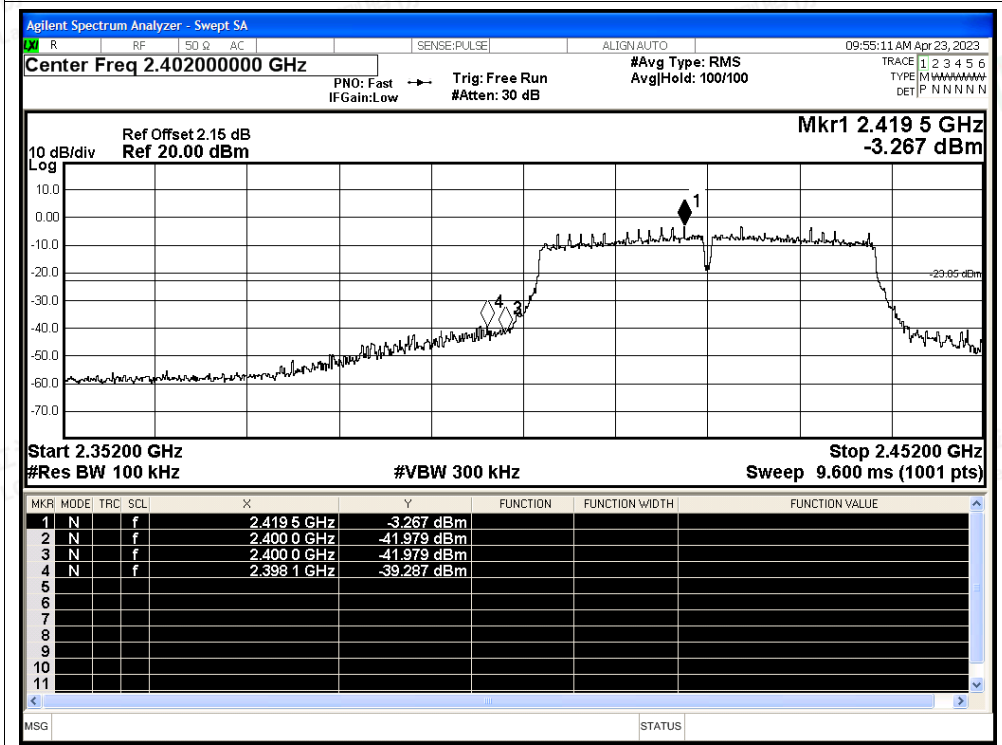




Band Edge NVNT n40 2422MHz Ant Ref



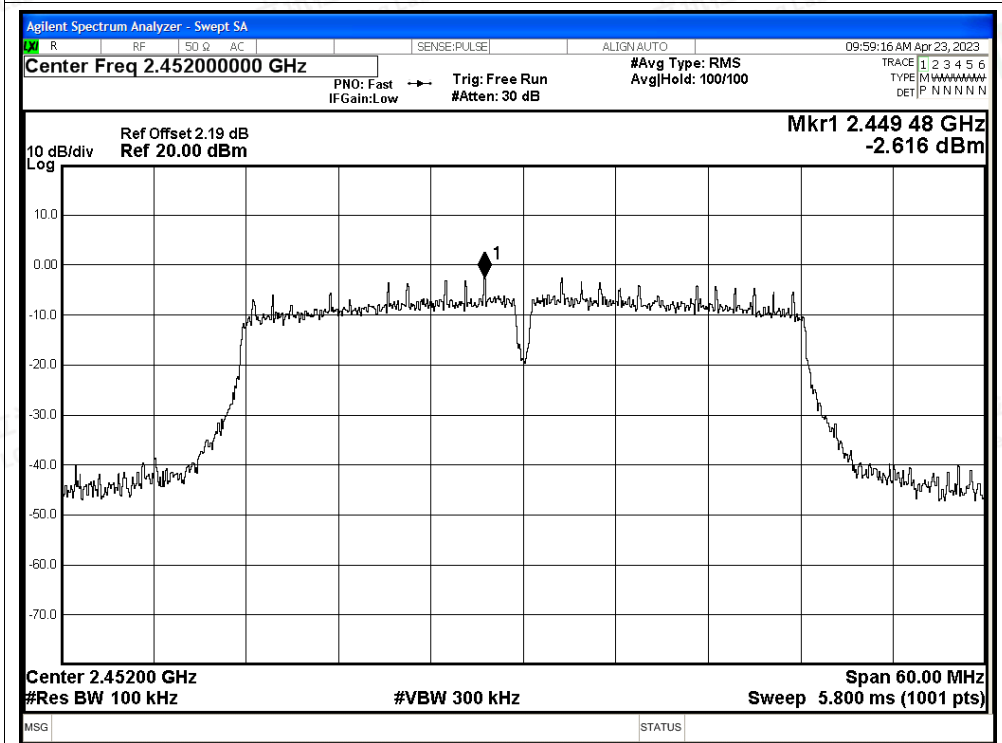
Band Edge NVNT n40 2422MHz Ant Emission



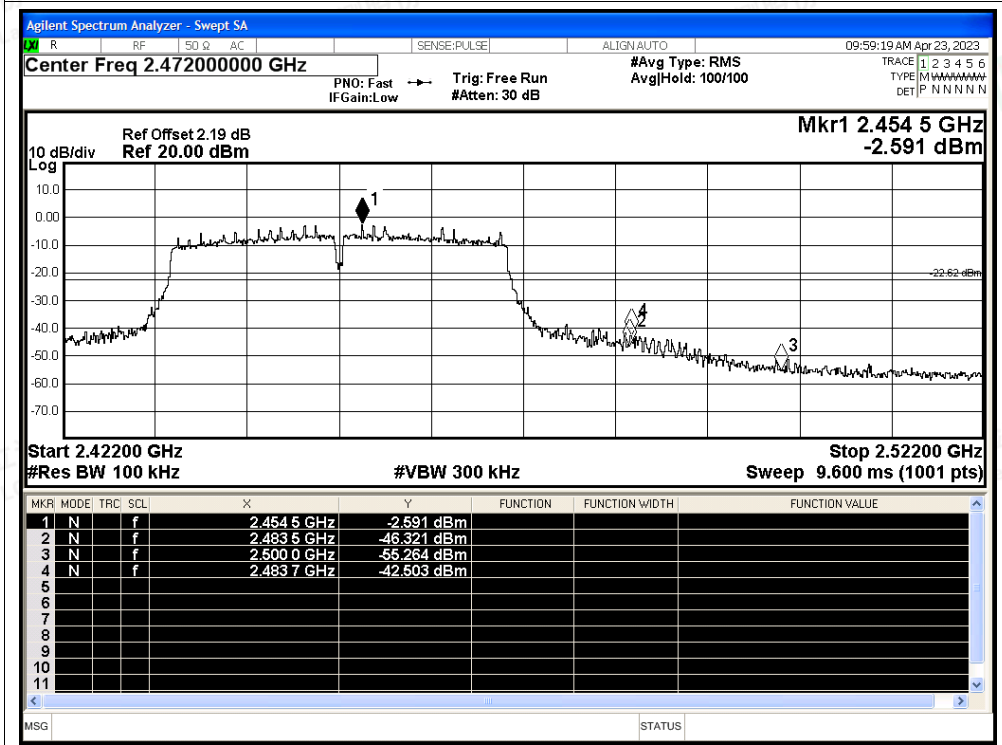




Band Edge NVNT n40 2452MHz Ant Ref



Band Edge NVNT n40 2452MHz Ant Emission





## A.5 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant	-50.05	-20	Pass
NVNT	b	2437	Ant	-50.78	-20	Pass
NVNT	b	2462	Ant	-51.02	-20	Pass
NVNT	g	2412	Ant	-47.11	-20	Pass
NVNT	g	2437	Ant	-48.68	-20	Pass
NVNT	g	2462	Ant	-48.63	-20	Pass
NVNT	n20	2412	Ant	-48.55	-20	Pass
NVNT	n20	2437	Ant	-49.75	-20	Pass
NVNT	n20	2462	Ant	-48.12	-20	Pass
NVNT	n40	2422	Ant	-42.59	-20	Pass
NVNT	n40	2437	Ant	-42.6	-20	Pass
NVNT	n40	2452	Ant	-42.27	-20	Pass

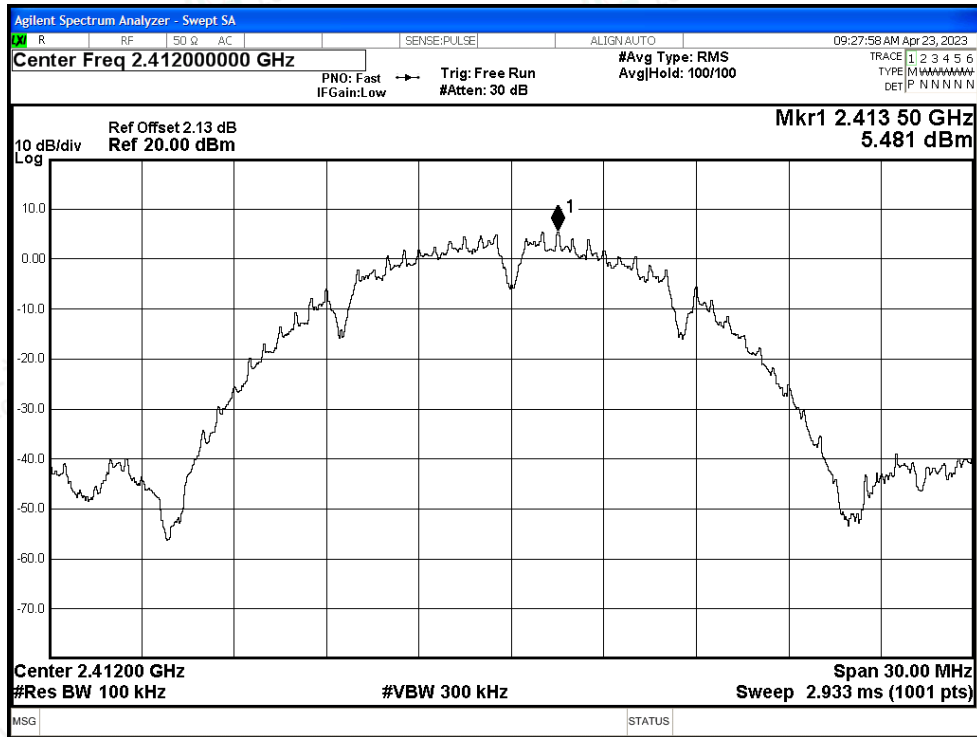


Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
Scan code to check authenticity

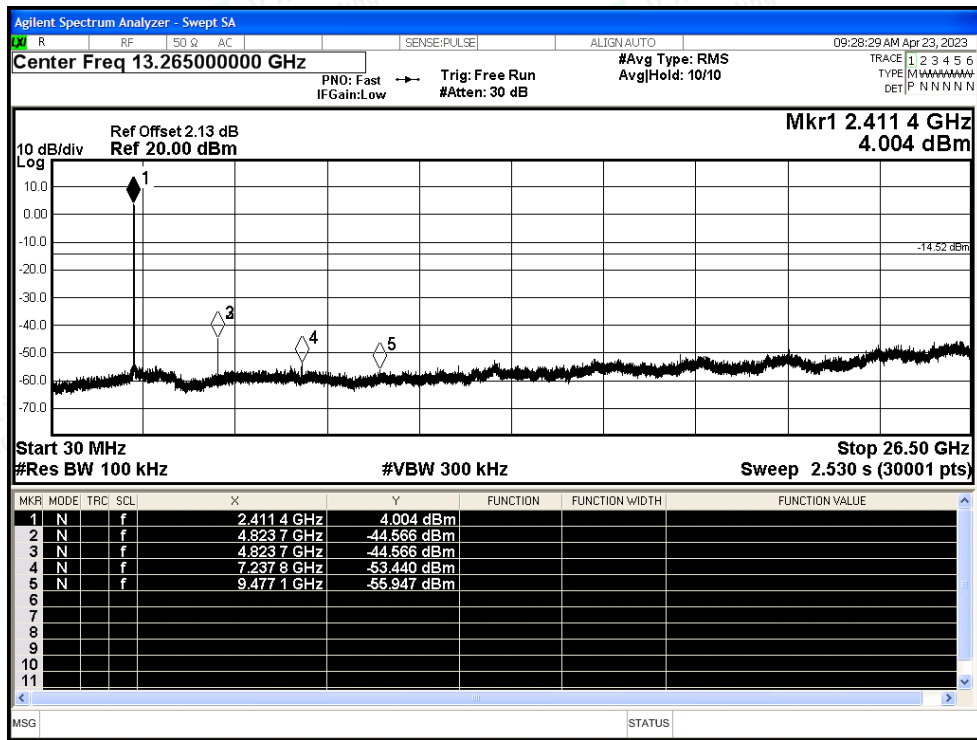


Test Graphs

Tx. Spurious NVNT b 2412MHz Ant Ref

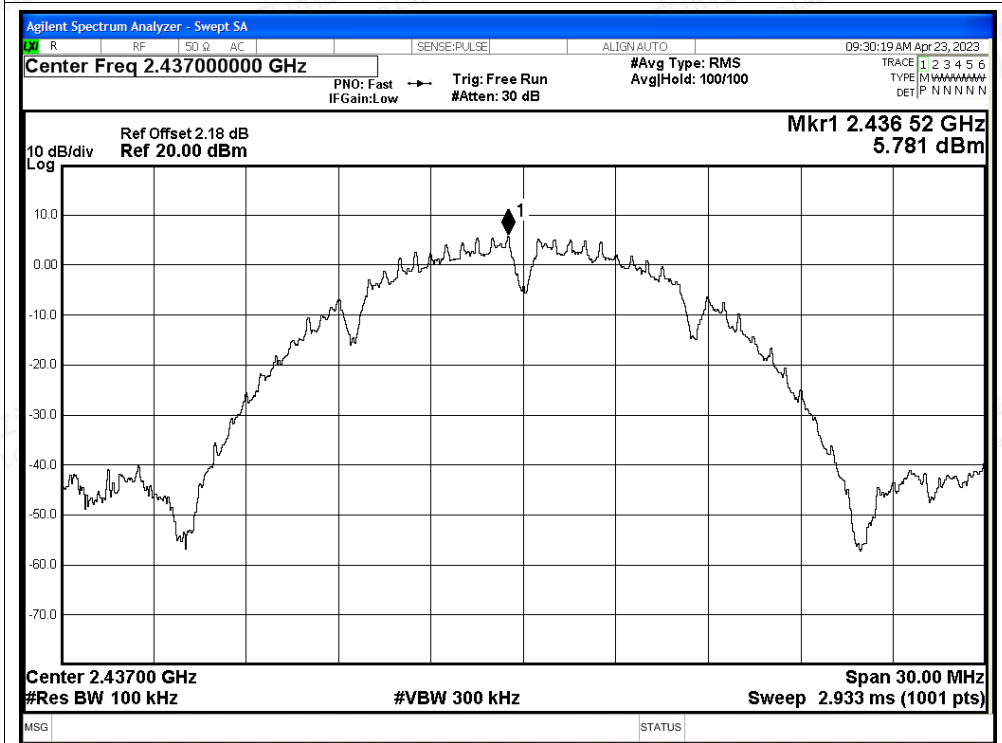


Tx. Spurious NVNT b 2412MHz Ant Emission

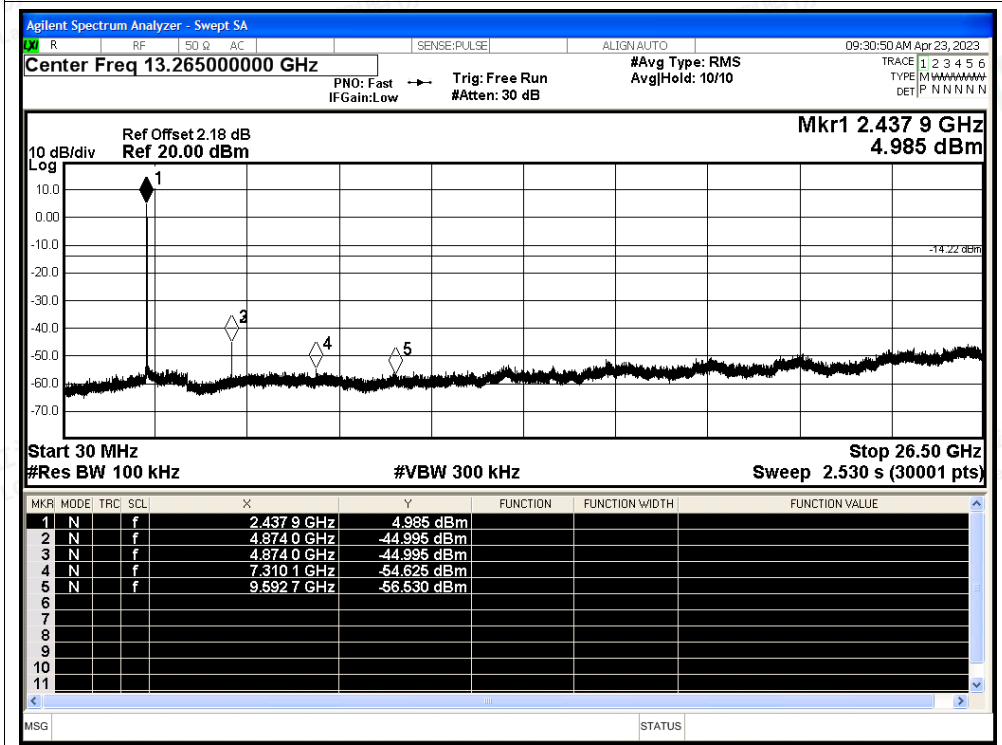




Tx. Spurious NVNT b 2437MHz Ant Ref

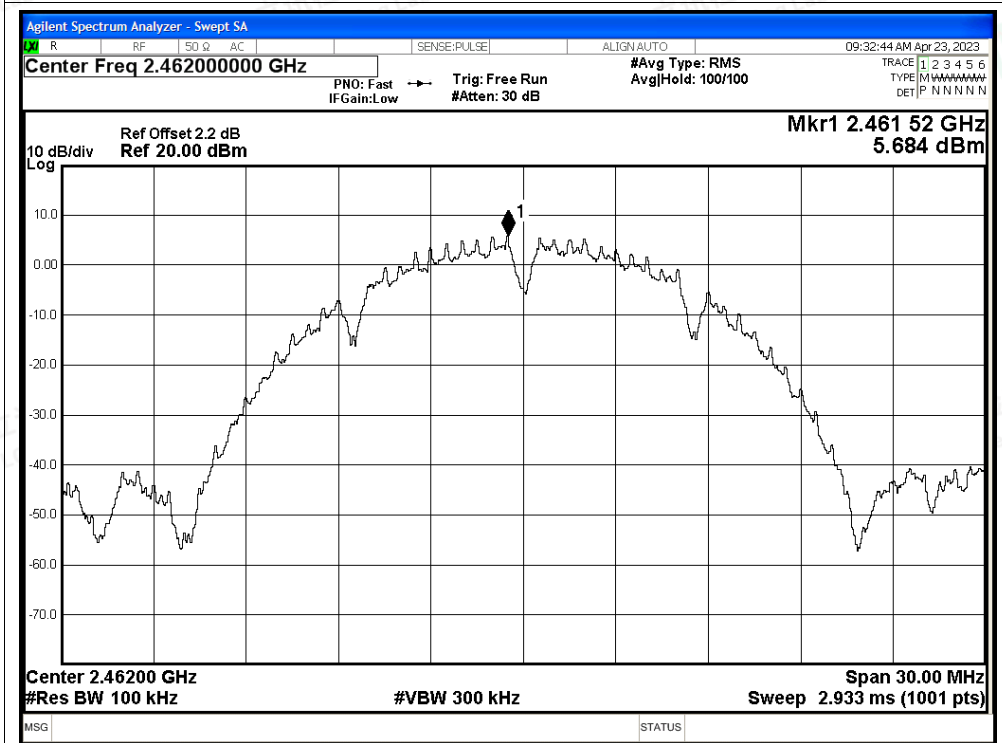


Tx. Spurious NVNT b 2437MHz Ant Emission

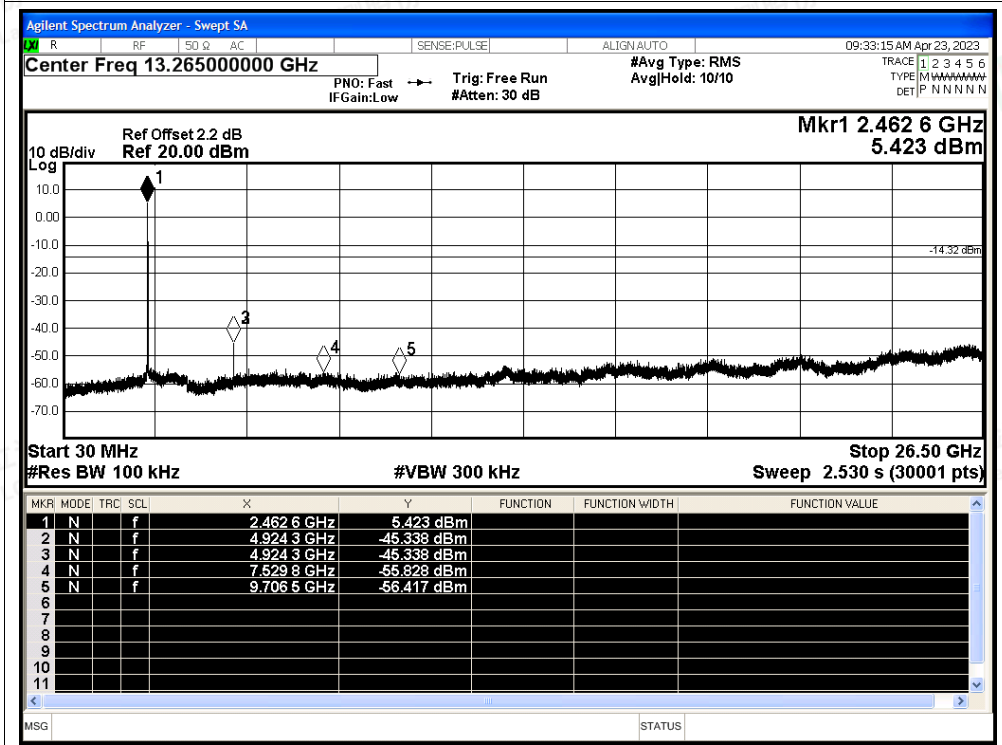




Tx. Spurious NVNT b 2462MHz Ant Ref

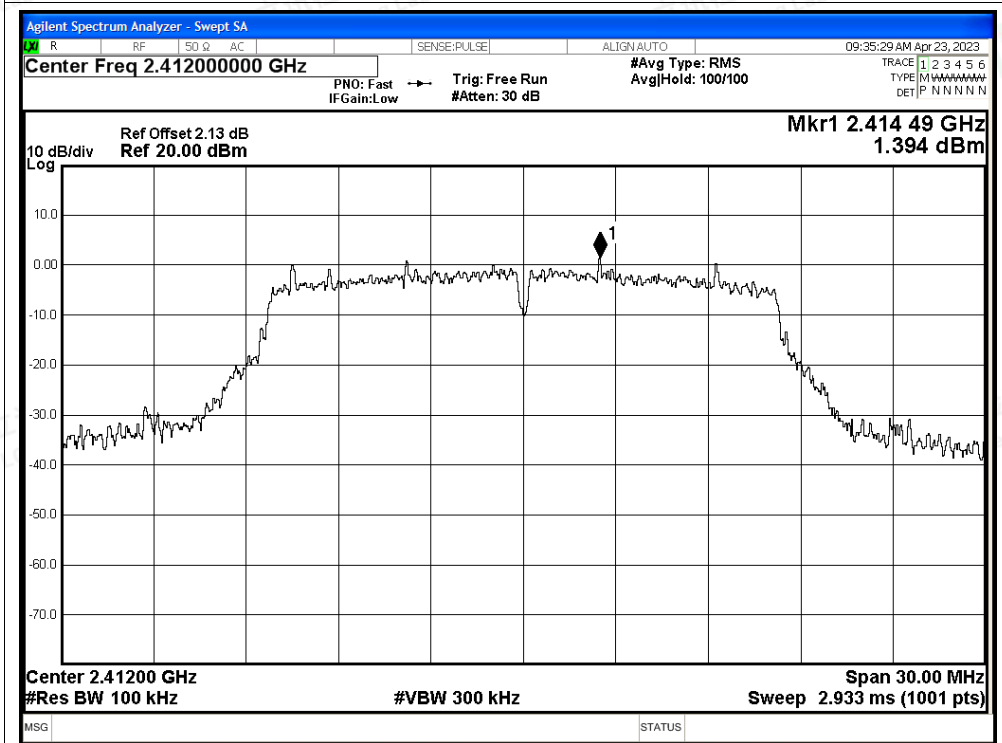


Tx. Spurious NVNT b 2462MHz Ant Emission

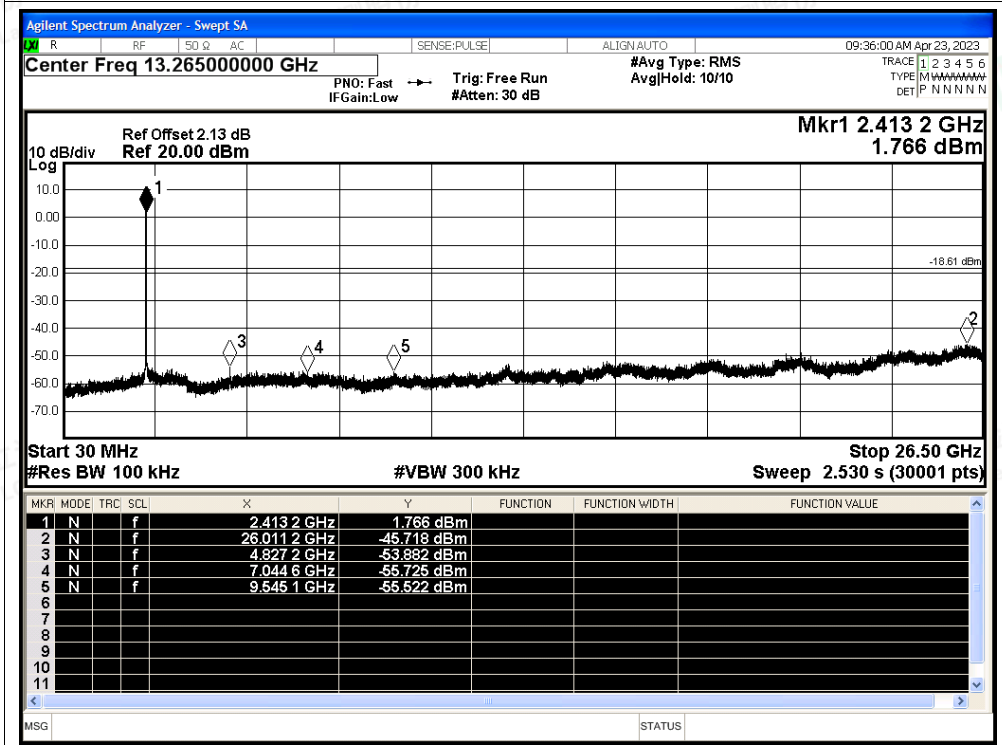




Tx. Spurious NVNT g 2412MHz Ant Ref

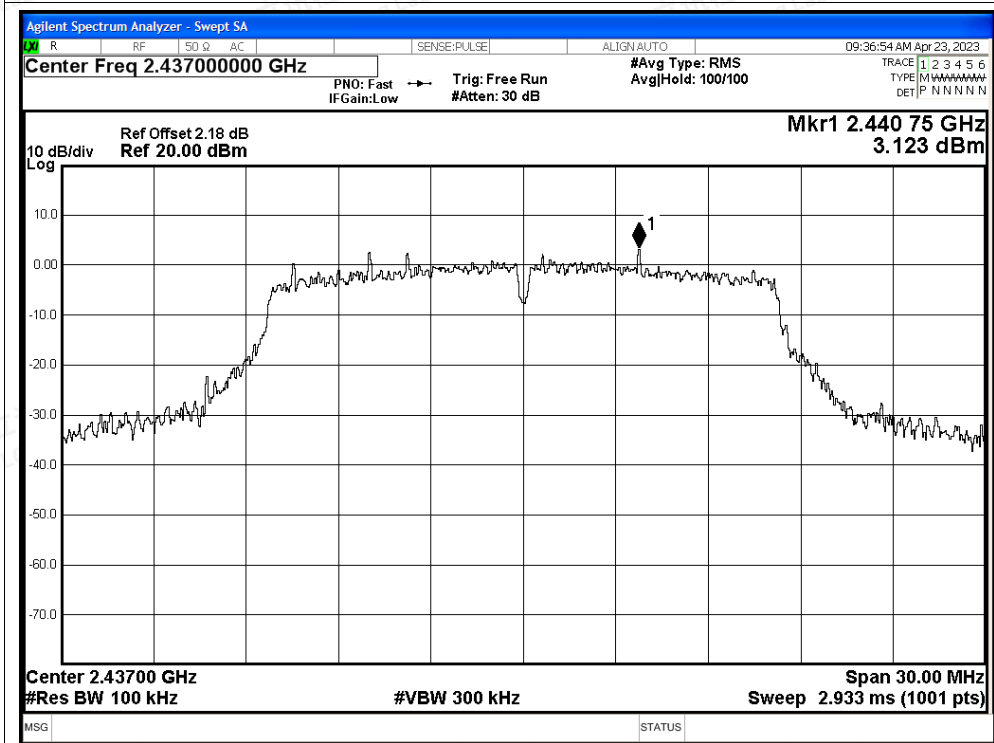


Tx. Spurious NVNT g 2412MHz Ant Emission

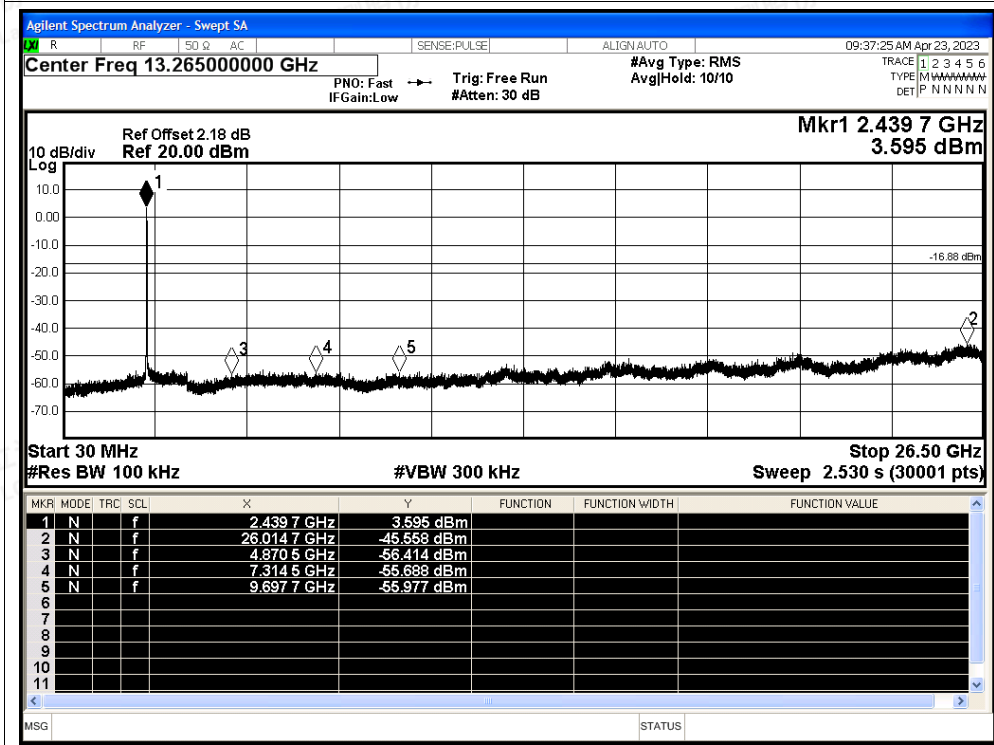




Tx. Spurious NVNT g 2437MHz Ant Ref

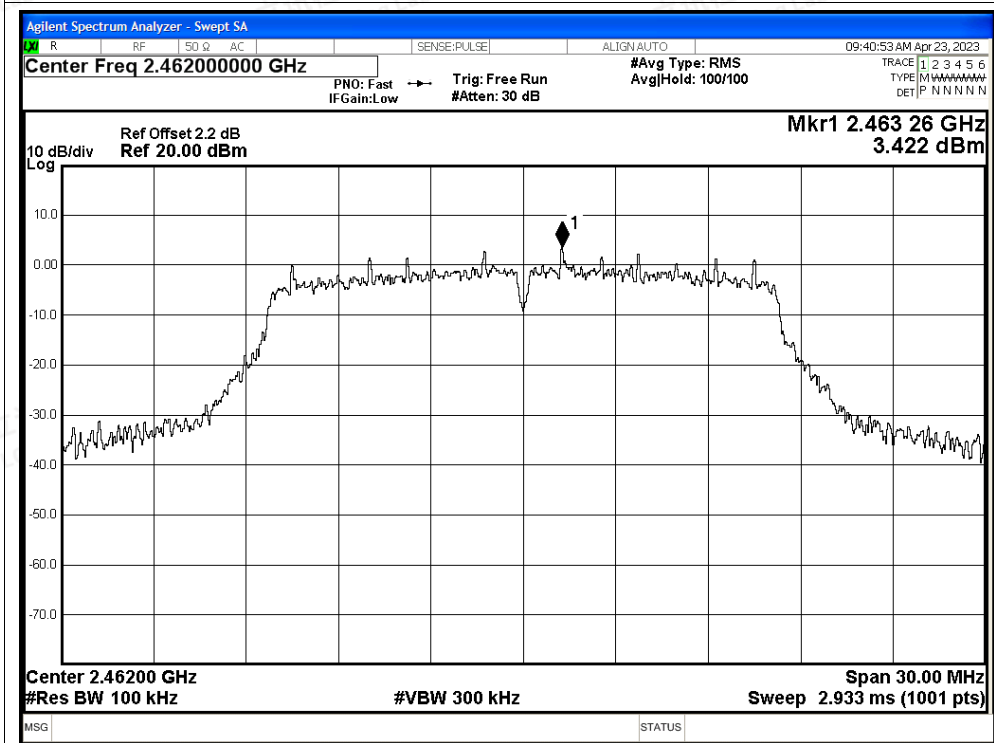


Tx. Spurious NVNT g 2437MHz Ant Emission

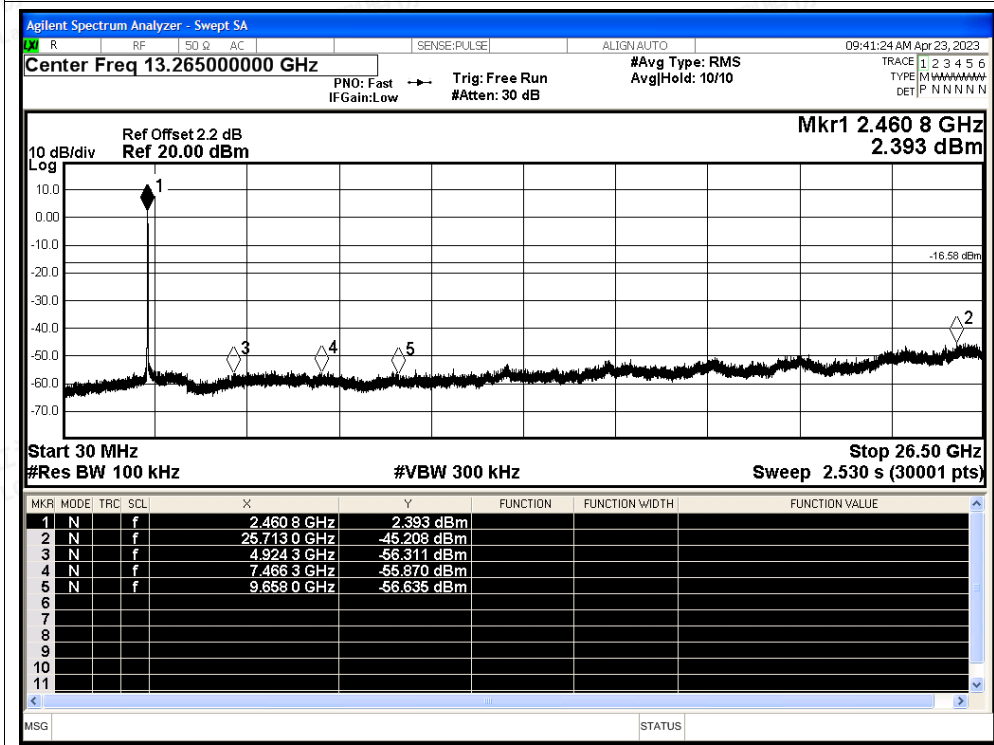




Tx. Spurious NVNT g 2462MHz Ant Ref



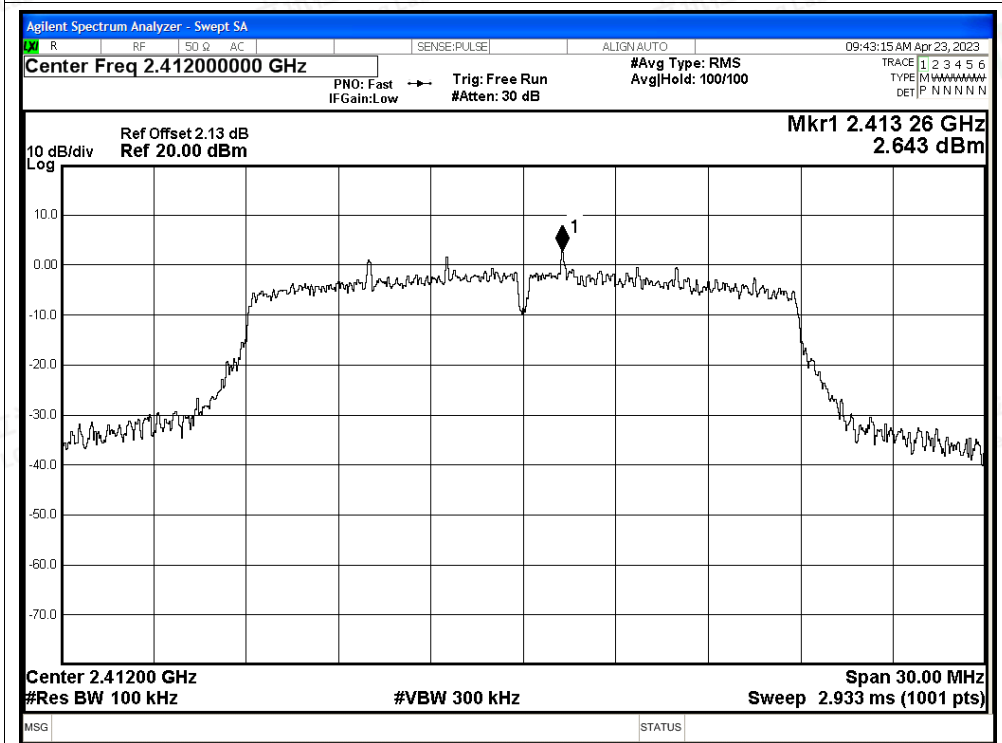
Tx. Spurious NVNT g 2462MHz Ant Emission



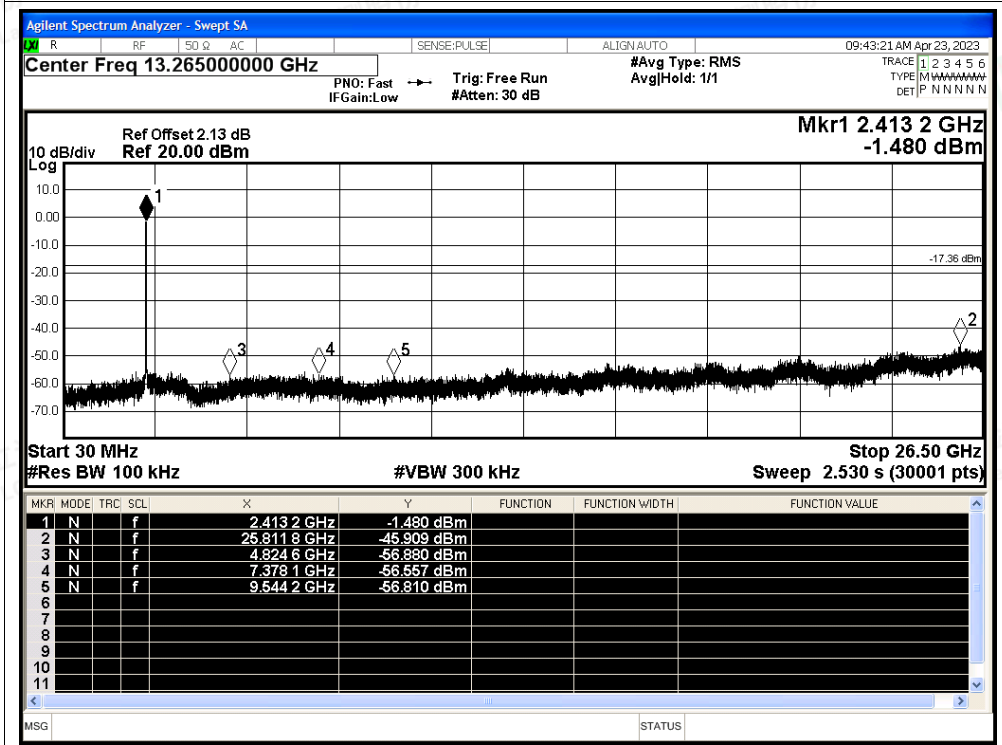




Tx. Spurious NVNT n20 2412MHz Ant Ref

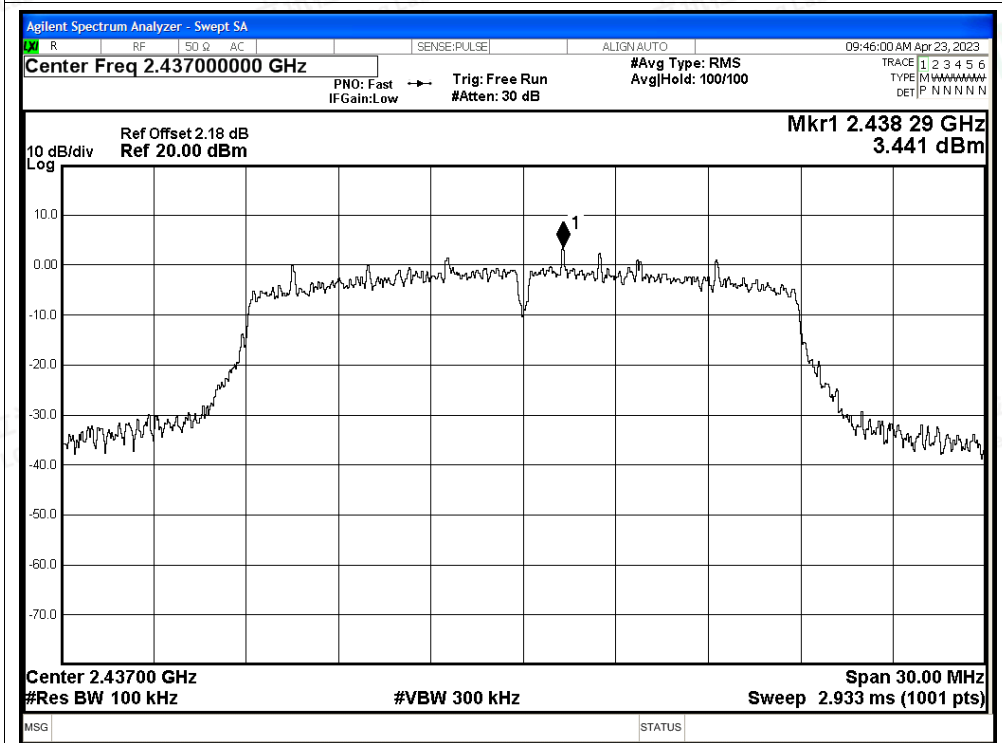


Tx. Spurious NVNT n20 2412MHz Ant Emission

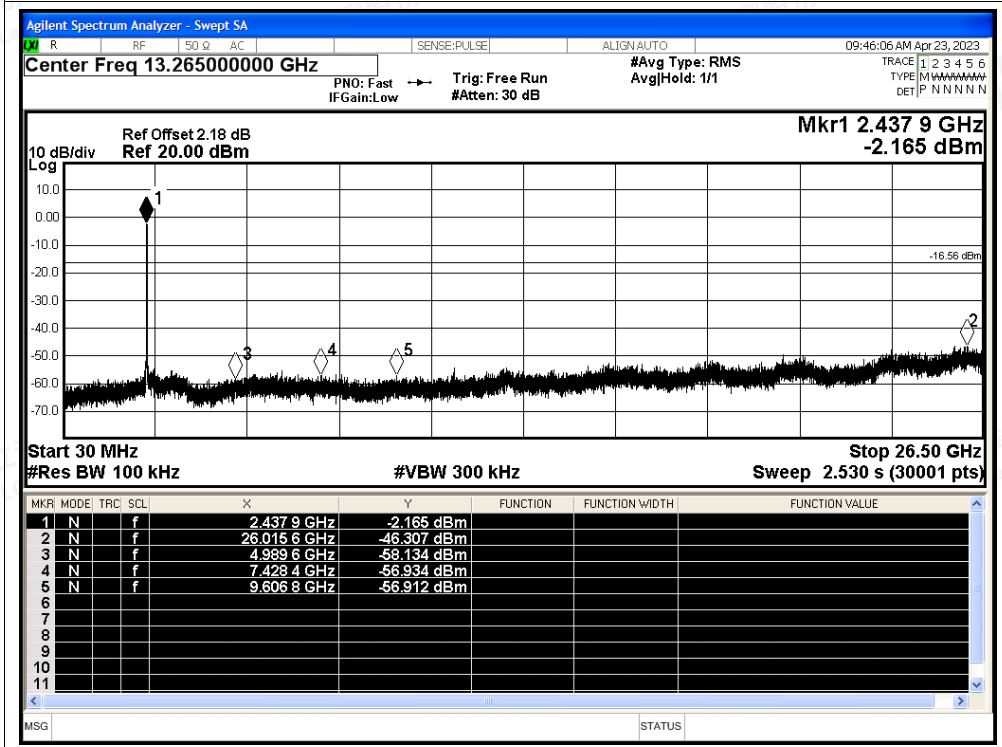




Tx. Spurious NVNT n20 2437MHz Ant Ref

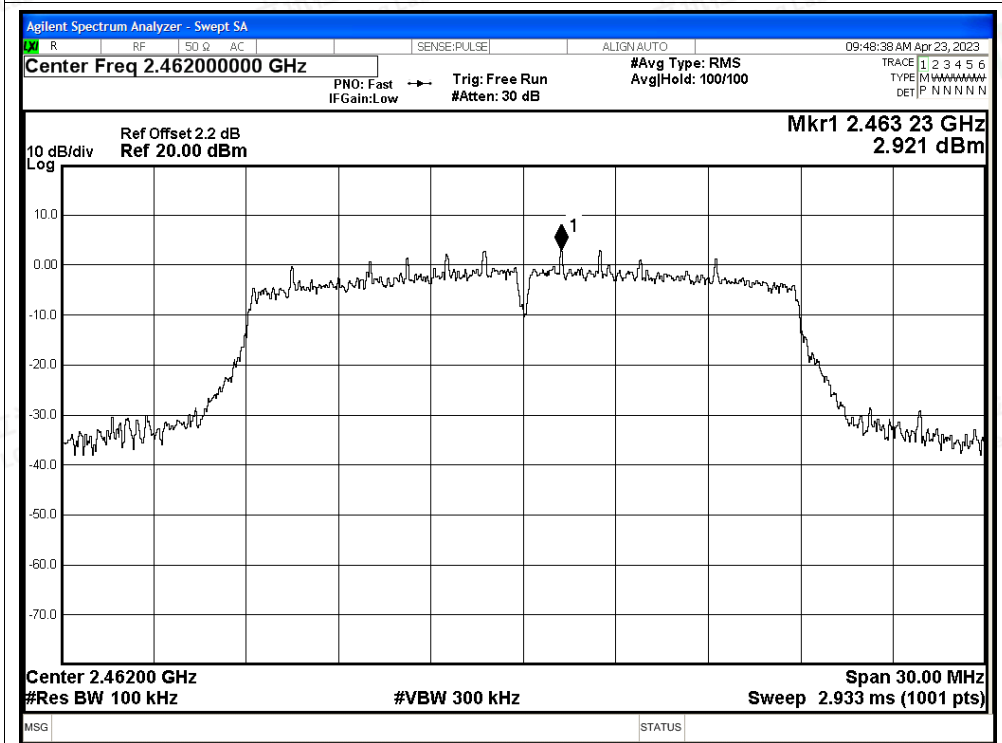


Tx. Spurious NVNT n20 2437MHz Ant Emission

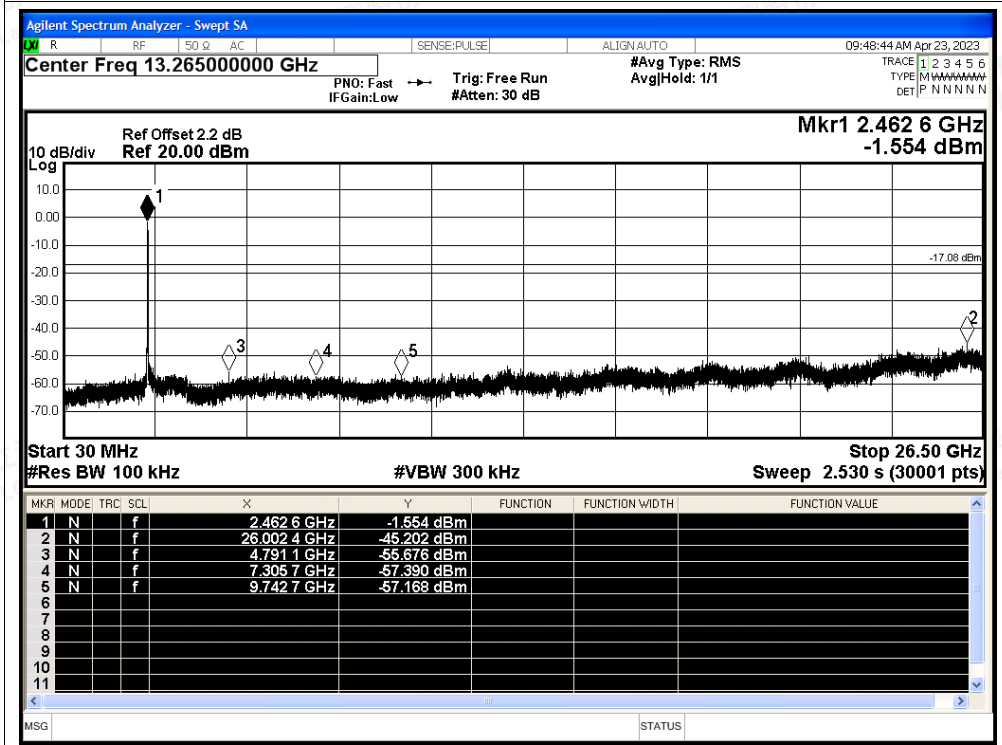




Tx. Spurious NVNT n20 2462MHz Ant Ref

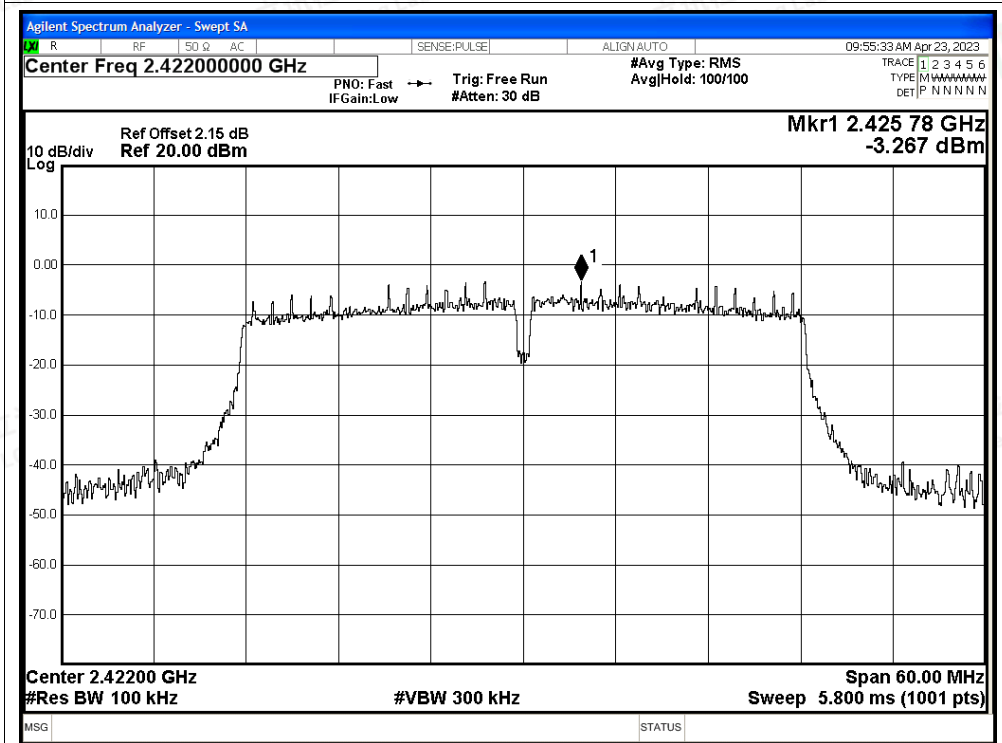


Tx. Spurious NVNT n20 2462MHz Ant Emission

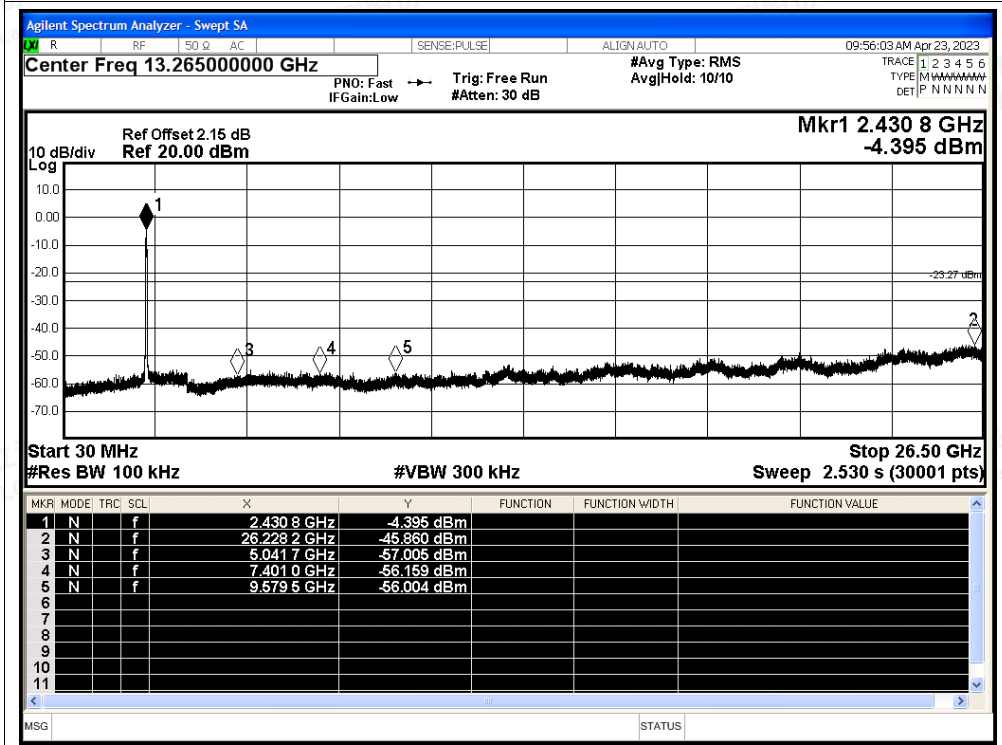




Tx. Spurious NVNT n40 2422MHz Ant Ref

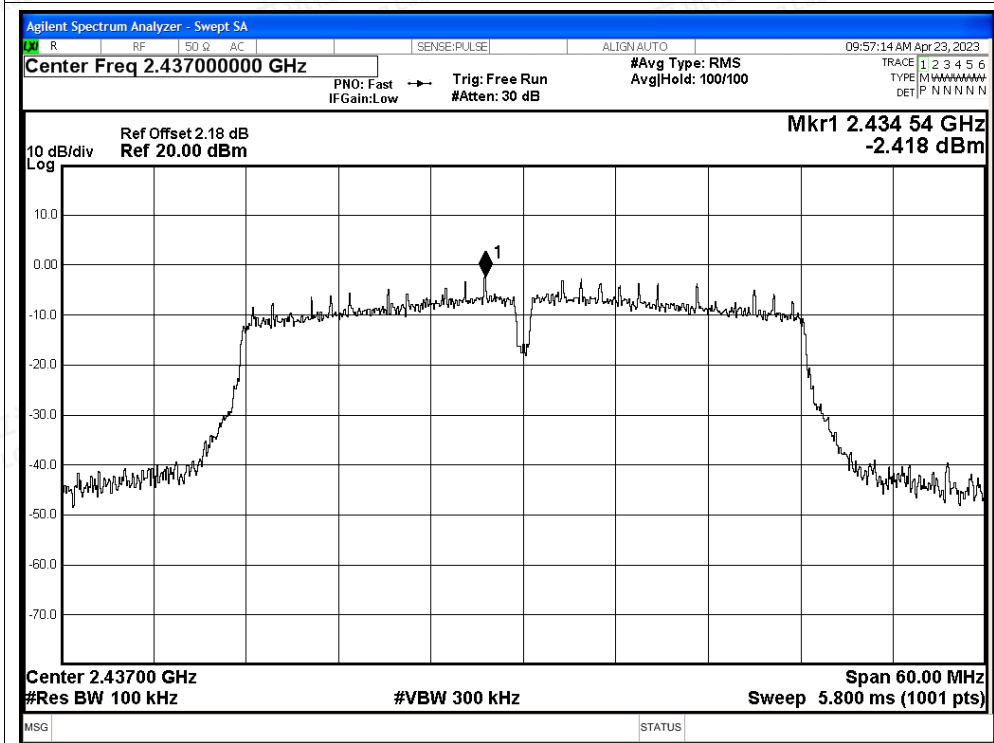


Tx. Spurious NVNT n40 2422MHz Ant Emission

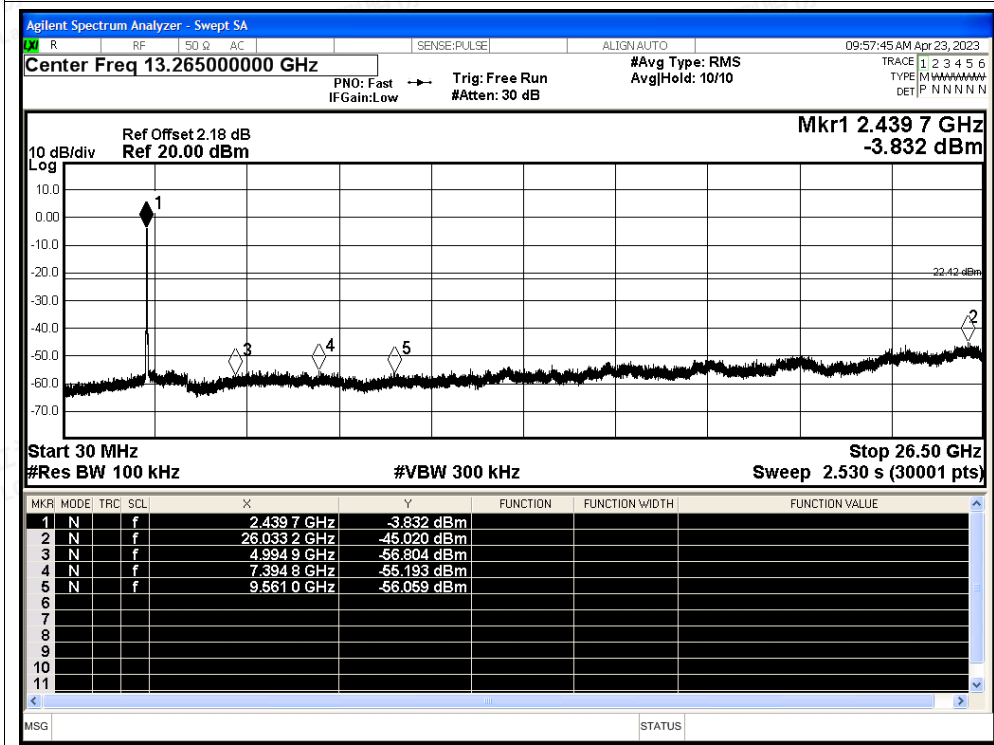




Tx. Spurious NVNT n40 2437MHz Ant Ref

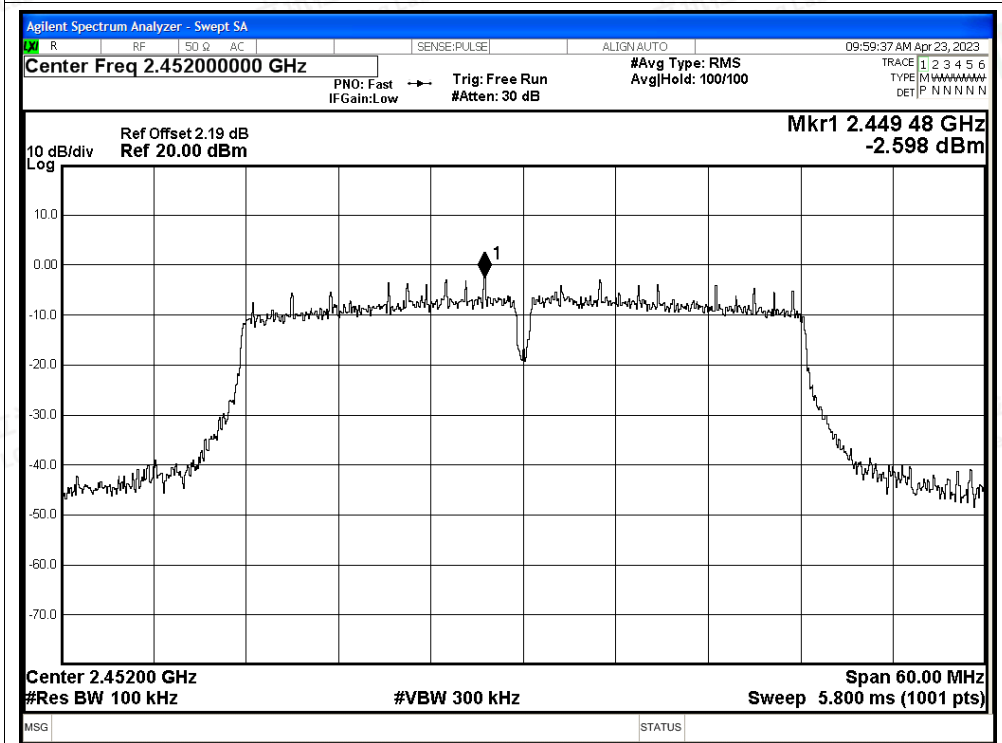


Tx. Spurious NVNT n40 2437MHz Ant Emission

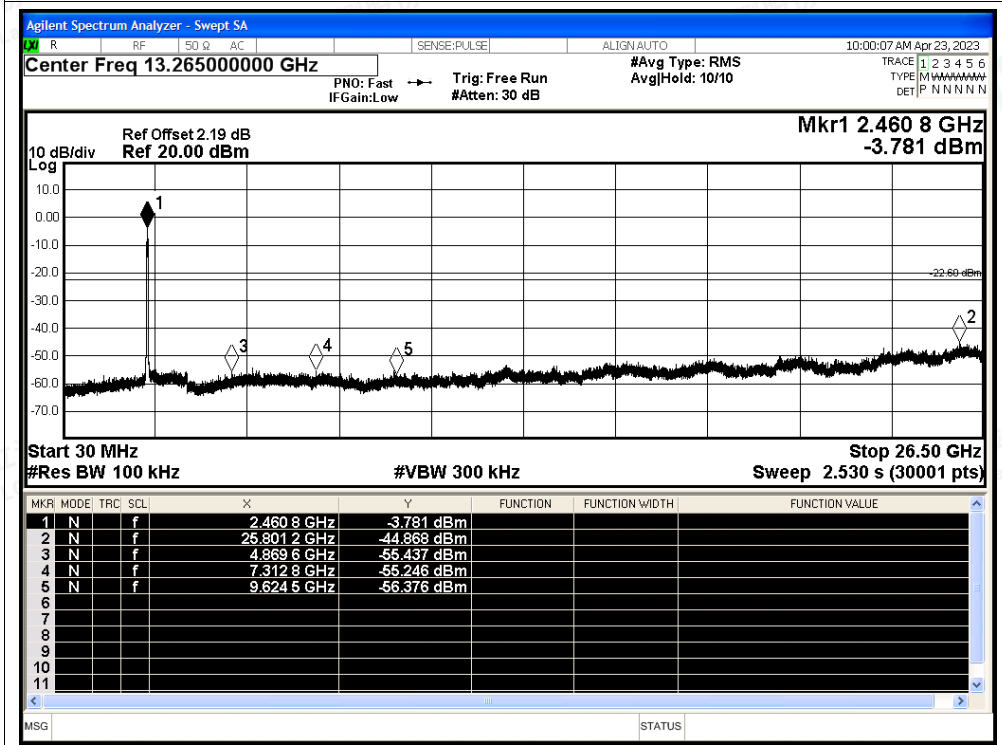




Tx. Spurious NVNT n40 2452MHz Ant Ref



Tx. Spurious NVNT n40 2452MHz Ant Emission





### A.6 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant	99.55	0	0.12
NVNT	b	2437	Ant	99.57	0	0.12
NVNT	b	2462	Ant	99.57	0	0.12
NVNT	g	2412	Ant	96.8	0.14	0.72
NVNT	g	2437	Ant	96.94	0.13	0.72
NVNT	g	2462	Ant	96.94	0.13	0.72
NVNT	n20	2412	Ant	96.73	0.14	0.77
NVNT	n20	2437	Ant	96.73	0.14	0.77
NVNT	n20	2462	Ant	96.73	0.14	0.77
NVNT	n40	2422	Ant	93.64	0.29	1.54
NVNT	n40	2437	Ant	93.64	0.29	1.54
NVNT	n40	2452	Ant	93.64	0.29	1.54

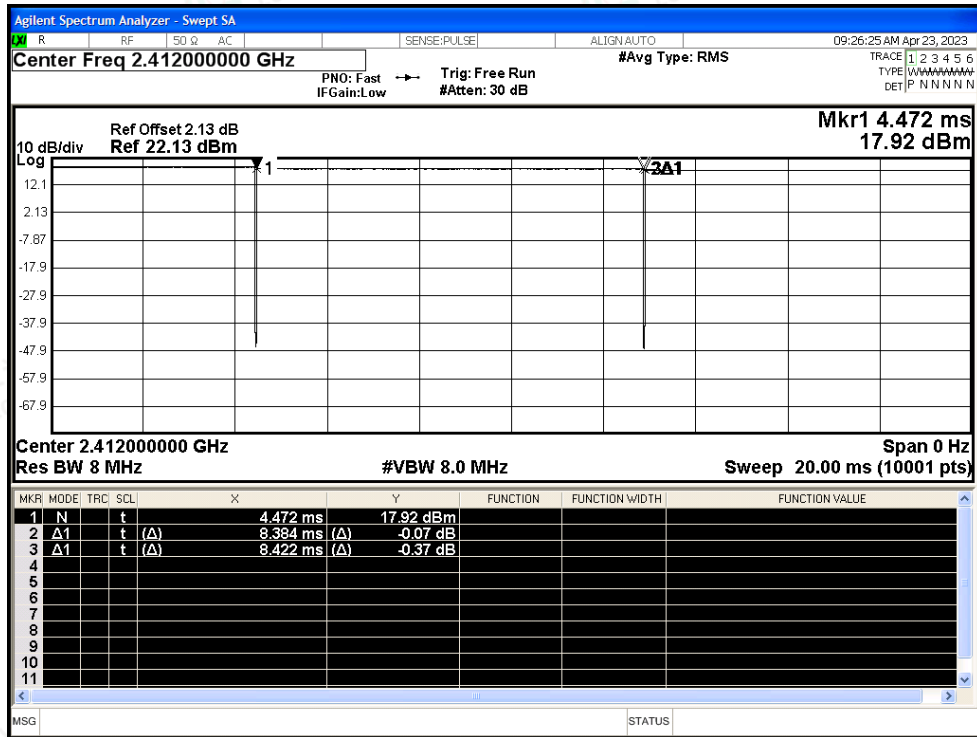


Shenzhen LCS Compliance Testing Laboratory Ltd.  
 Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China  
 Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
 Scan code to check authenticity

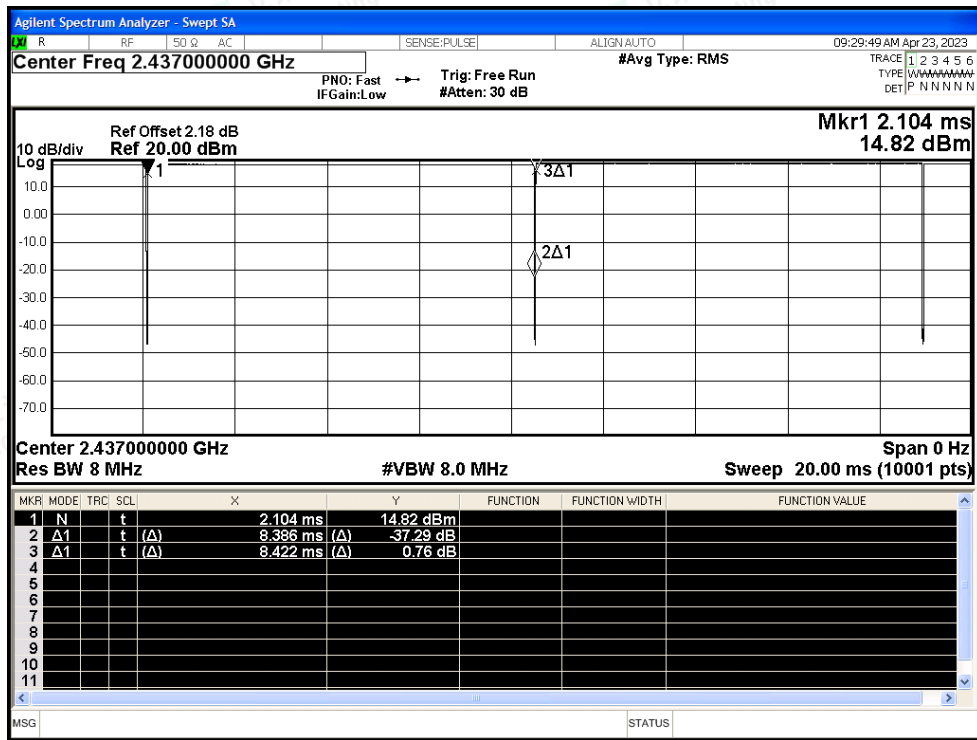


Test Graphs

Duty Cycle NVNT b 2412MHz Ant



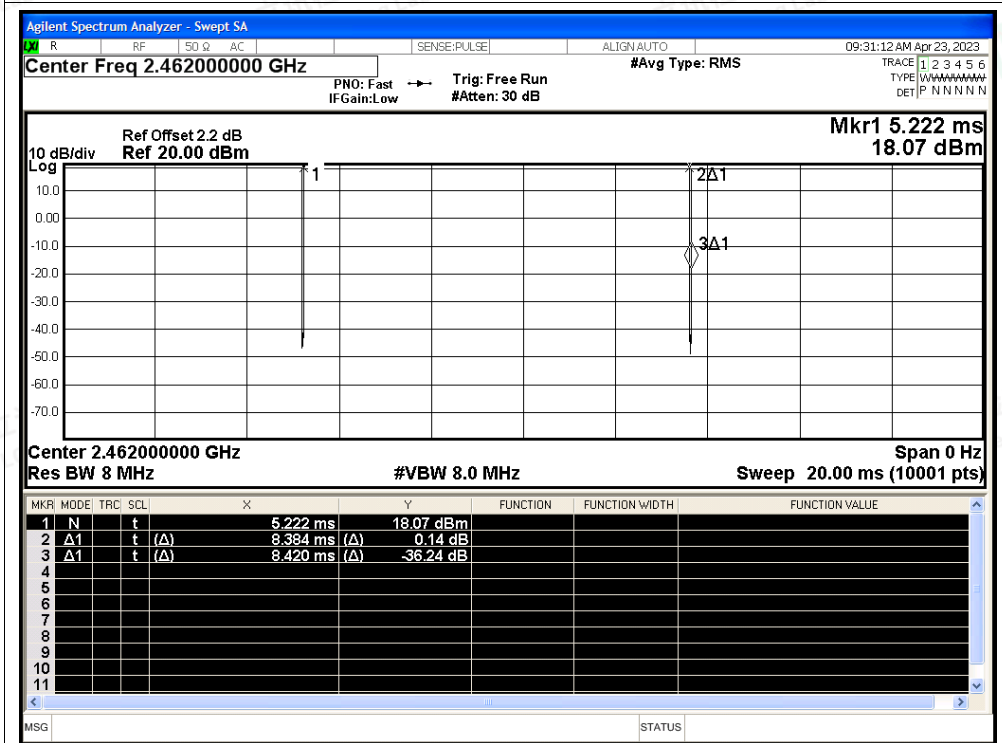
Duty Cycle NVNT b 2437MHz Ant



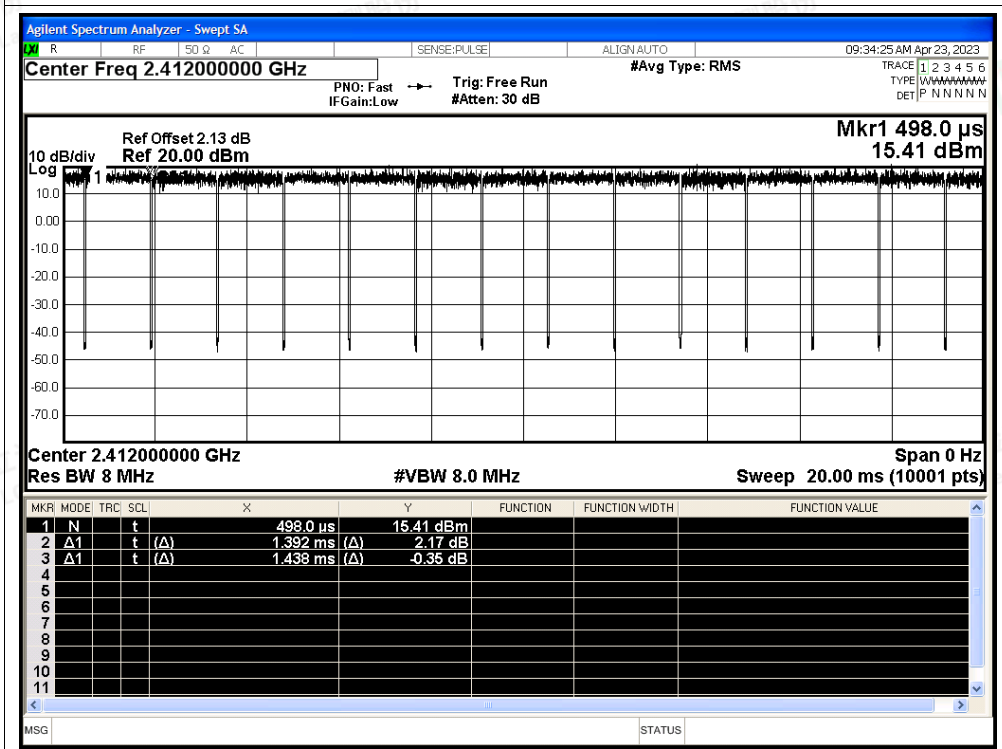




Duty Cycle NVNT b 2462MHz Ant

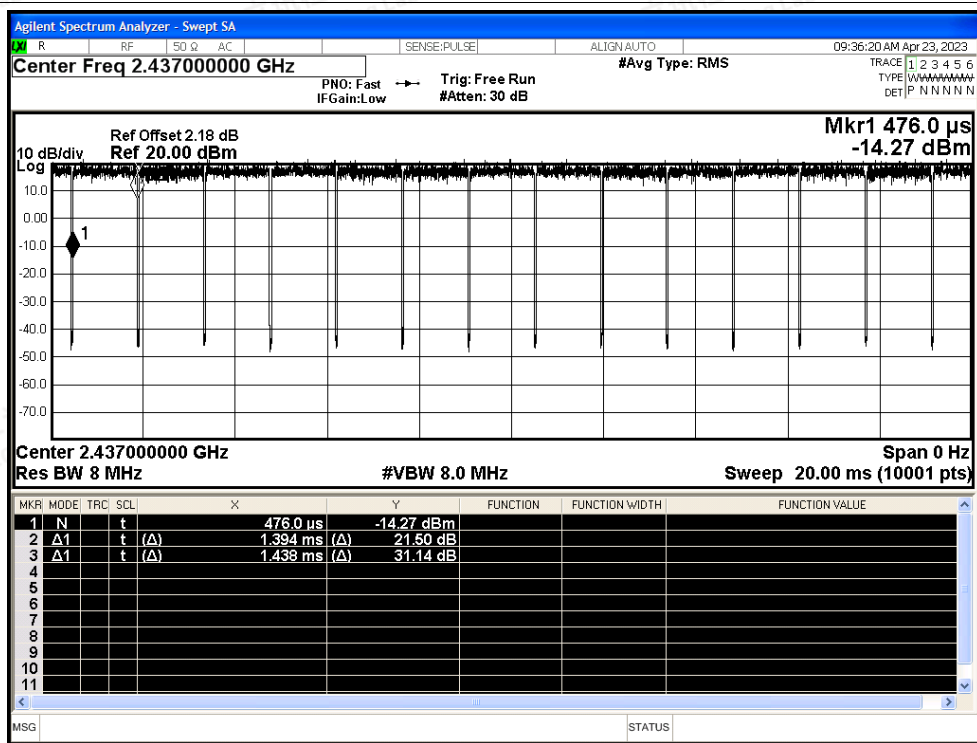


Duty Cycle NVNT g 2412MHz Ant

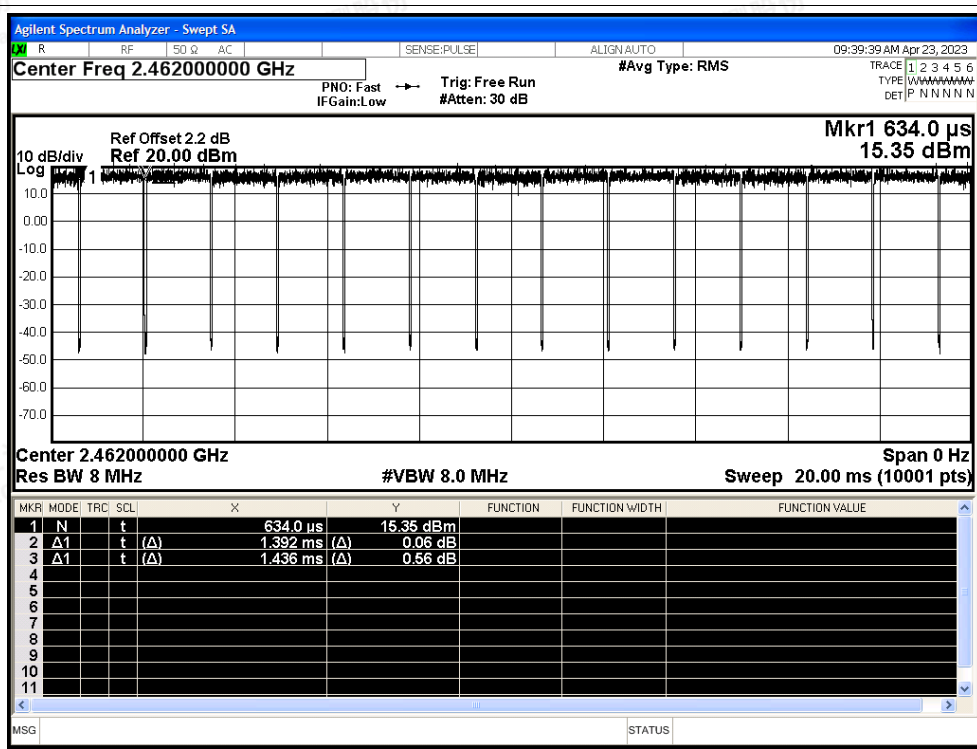


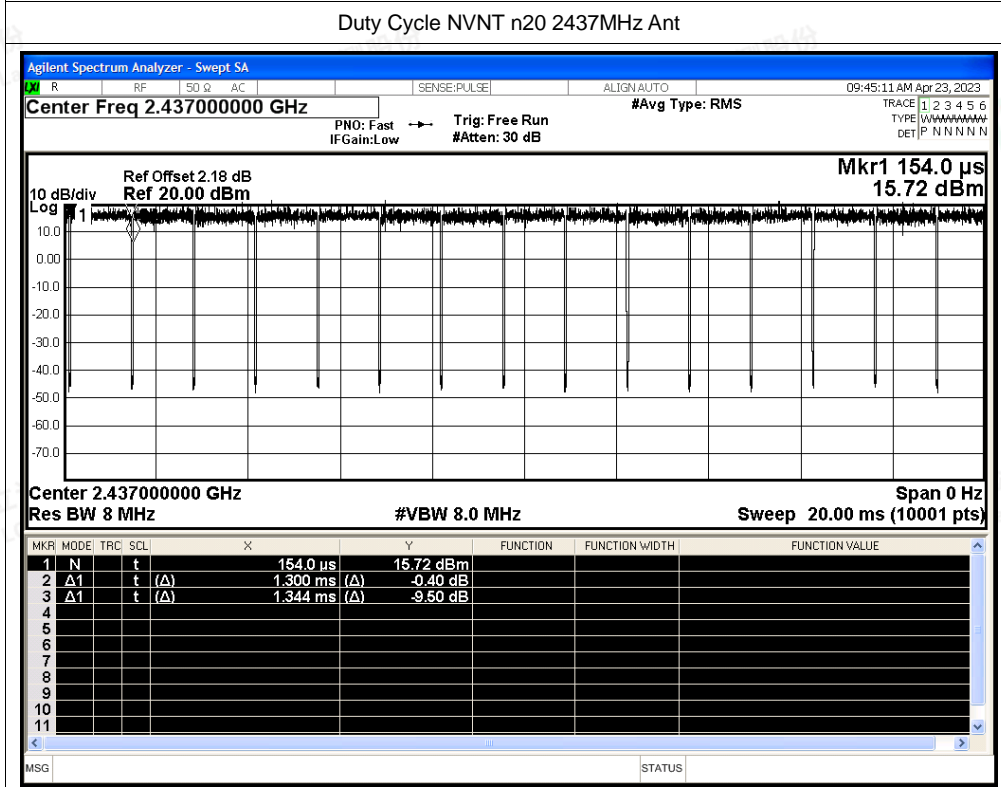
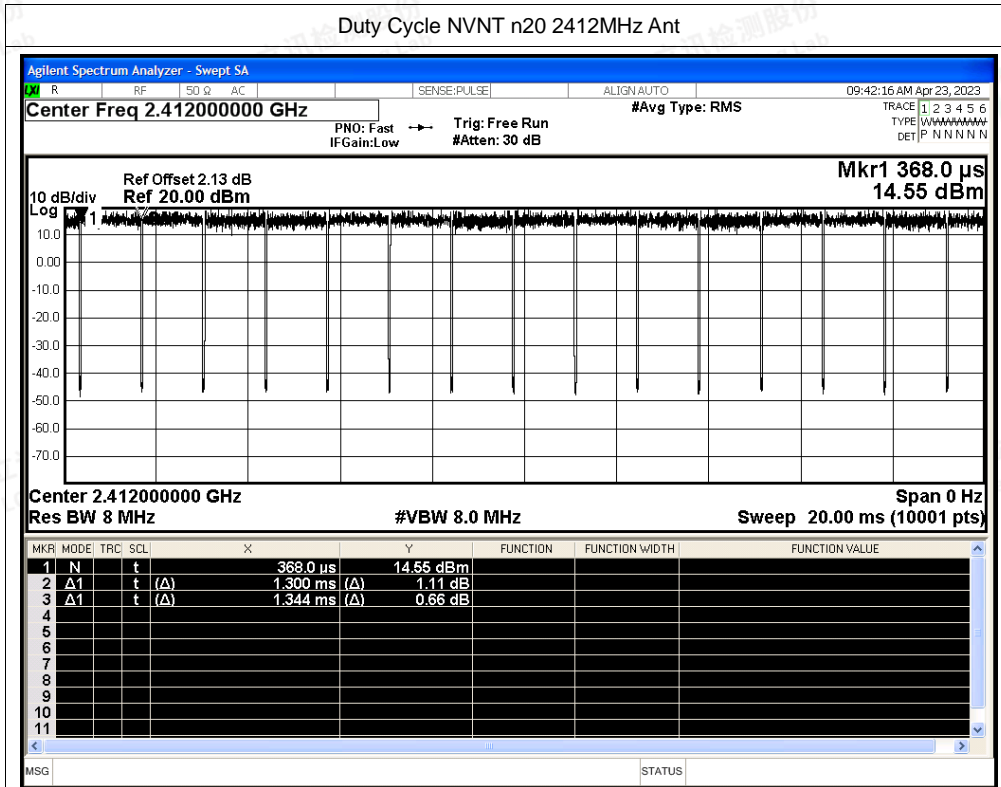


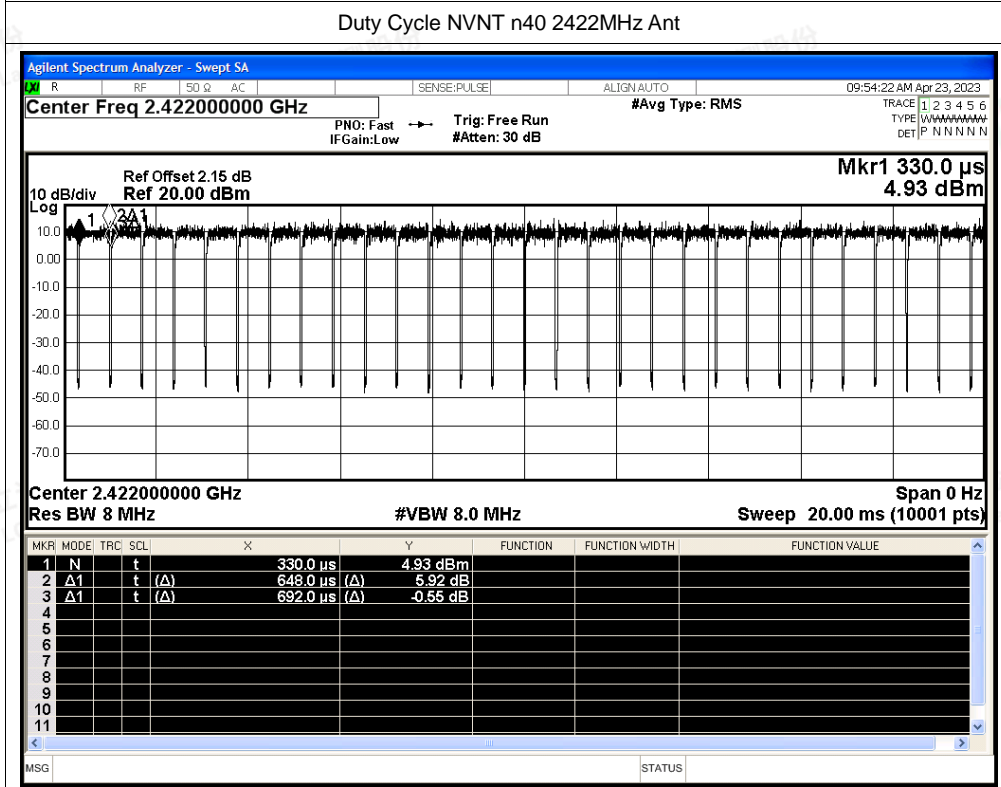
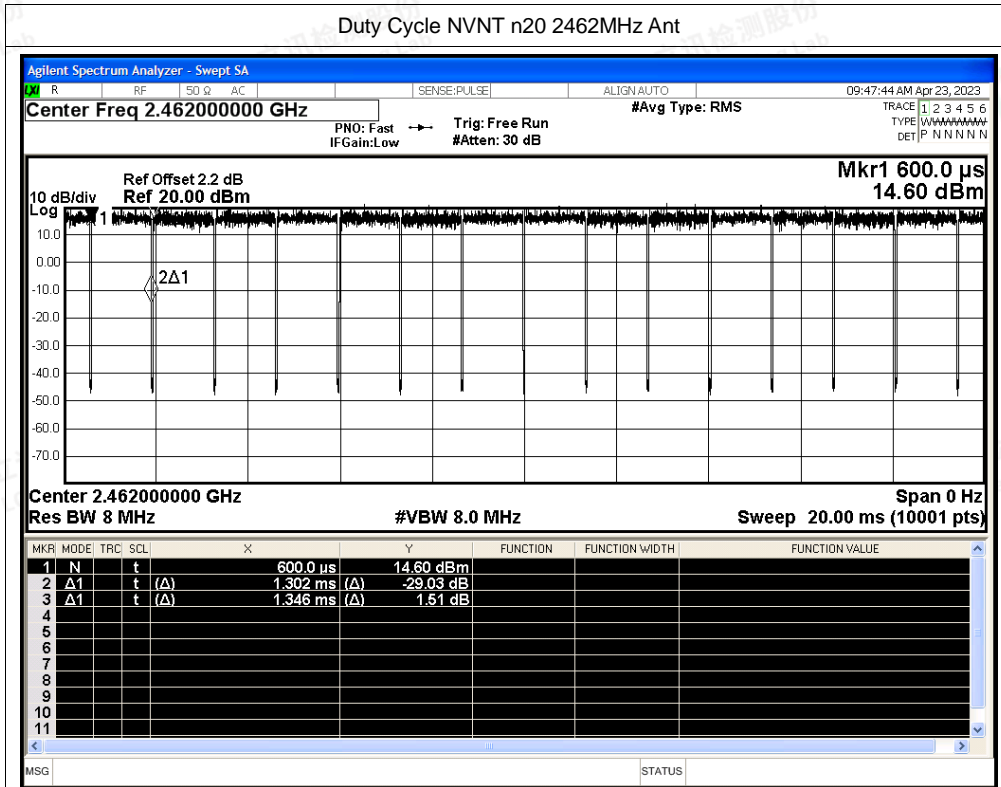
Duty Cycle NVNT g 2437MHz Ant

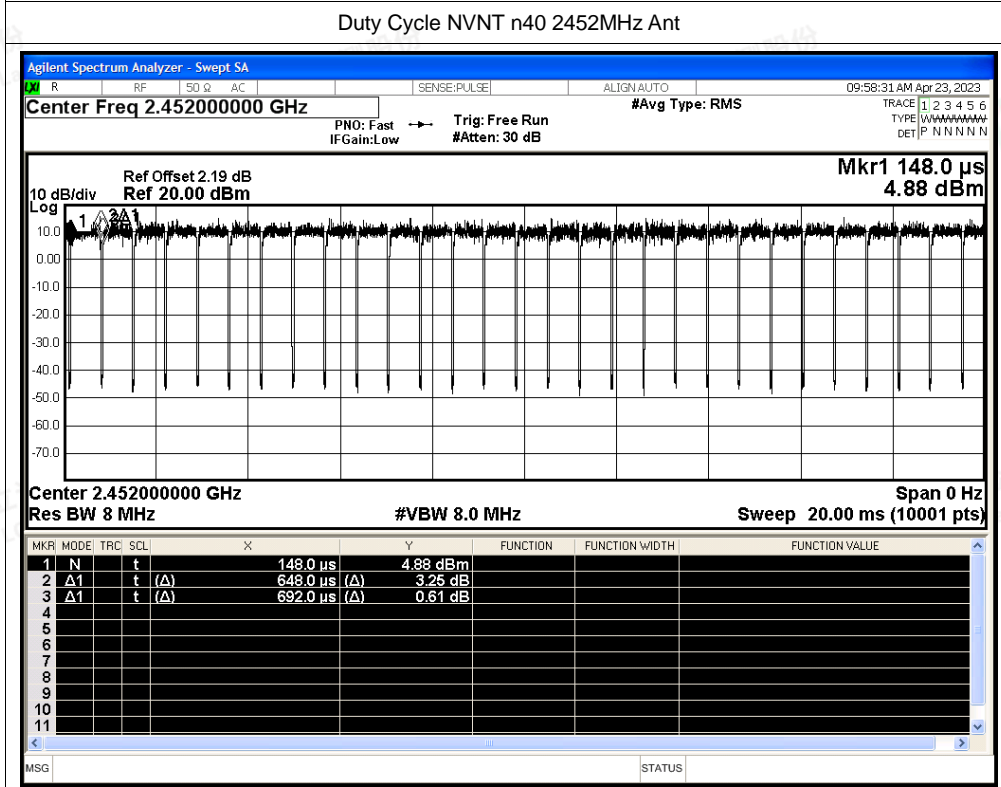
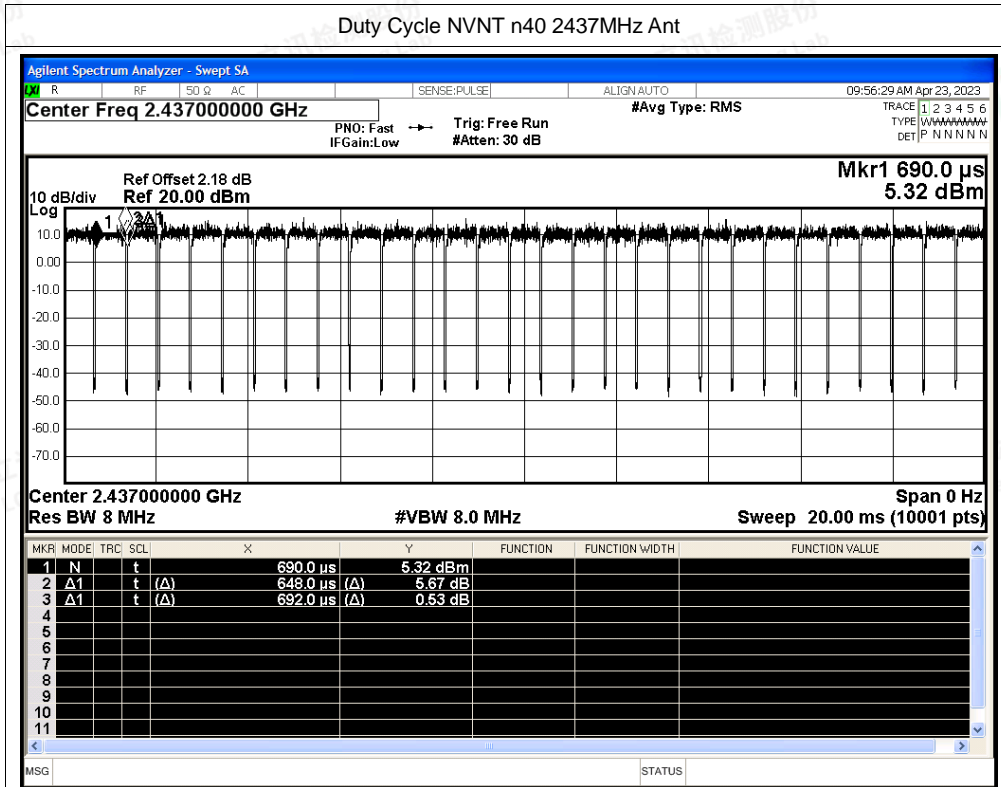


Duty Cycle NVNT g 2462MHz Ant











## A.7 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	Ant	2310	-49.48	5.5	51.28	Peak	74	Pass
NVNT	b	2412	Ant	2310	-59.89	5.5	40.87	Average	54	Pass
NVNT	b	2412	Ant	2383.827	-45.1	5.5	55.66	Peak	74	Pass
NVNT	b	2412	Ant	2383.827	-55.28	5.5	45.48	Average	54	Pass
NVNT	b	2412	Ant	2390	-48.34	5.5	52.42	Peak	74	Pass
NVNT	b	2412	Ant	2390	-58.18	5.5	42.58	Average	54	Pass
NVNT	b	2462	Ant	2483.5	-47.1	5.5	53.66	Peak	74	Pass
NVNT	b	2462	Ant	2483.5	-56.49	5.5	44.27	Average	54	Pass
NVNT	b	2462	Ant	2489.559	-43.96	5.5	56.80	Peak	74	Pass
NVNT	b	2462	Ant	2487.969	-55.22	5.5	45.54	Average	54	Pass
NVNT	b	2462	Ant	2500	-46.73	5.5	54.03	Peak	74	Pass
NVNT	b	2462	Ant	2500	-56.89	5.5	43.87	Average	54	Pass
NVNT	g	2412	Ant	2310	-50.66	5.5	50.10	Peak	74	Pass
NVNT	g	2412	Ant	2310	-59.21	5.5	41.55	Average	54	Pass
NVNT	g	2412	Ant	2389.56	-38.25	5.5	62.51	Peak	74	Pass
NVNT	g	2412	Ant	2389.911	-50.84	5.5	49.92	Average	54	Pass
NVNT	g	2412	Ant	2390	-38.73	5.5	62.03	Peak	74	Pass
NVNT	g	2412	Ant	2390	-50.89	5.5	49.87	Average	54	Pass
NVNT	g	2462	Ant	2483.5	-38.37	5.5	62.39	Peak	74	Pass
NVNT	g	2462	Ant	2483.5	-49.86	5.5	50.90	Average	54	Pass
NVNT	g	2462	Ant	2483.994	-34.86	5.5	65.90	Peak	74	Pass
NVNT	g	2462	Ant	2483.517	-49.86	5.5	50.90	Average	54	Pass
NVNT	g	2462	Ant	2500	-45.76	5.5	55.00	Peak	74	Pass
NVNT	g	2462	Ant	2500	-55.14	5.5	45.62	Average	54	Pass
NVNT	n20	2412	Ant	2310	-48.85	5.5	51.91	Peak	74	Pass
NVNT	n20	2412	Ant	2310	-59.06	5.5	41.70	Average	54	Pass
NVNT	n20	2412	Ant	2389.443	-34.6	5.5	66.16	Peak	74	Pass
NVNT	n20	2412	Ant	2389.911	-48.95	5.5	51.81	Average	54	Pass
NVNT	n20	2412	Ant	2390	-32.03	5.5	68.73	Peak	74	Pass
NVNT	n20	2412	Ant	2390	-48.71	5.5	52.05	Average	54	Pass
NVNT	n20	2462	Ant	2483.5	-33.42	5.5	67.34	Peak	74	Pass
NVNT	n20	2462	Ant	2483.5	-48.27	5.5	52.49	Average	54	Pass
NVNT	n20	2462	Ant	2483.517	-33.42	5.5	67.34	Peak	74	Pass
NVNT	n20	2462	Ant	2483.517	-48.27	5.5	52.49	Average	54	Pass
NVNT	n20	2462	Ant	2500	-45.55	5.5	55.21	Peak	74	Pass
NVNT	n20	2462	Ant	2500	-54.99	5.5	45.77	Average	54	Pass
NVNT	n40	2422	Ant	2310	-51.38	5.5	49.38	Peak	74	Pass





NVNT	n40	2422	Ant	2310	-59.22	5.5	41.54	Average	54	Pass
NVNT	n40	2422	Ant	2389.946	-32.69	5.5	68.07	Peak	74	Pass
NVNT	n40	2422	Ant	2389.662	-49.53	5.5	51.23	Average	54	Pass
NVNT	n40	2422	Ant	2390	-32.69	5.5	68.07	Peak	74	Pass
NVNT	n40	2422	Ant	2390	-49.6	5.5	51.16	Average	54	Pass
NVNT	n40	2452	Ant	2483.5	-36.68	5.5	64.08	Peak	74	Pass
NVNT	n40	2452	Ant	2483.5	-50.11	5.5	50.65	Average	54	Pass
NVNT	n40	2452	Ant	2483.776	-31.88	5.5	68.88	Peak	74	Pass
NVNT	n40	2452	Ant	2483.62	-50.03	5.5	50.73	Average	54	Pass
NVNT	n40	2452	Ant	2500	-47.73	5.5	53.03	Peak	74	Pass
NVNT	n40	2452	Ant	2500	-55.58	5.5	45.18	Average	54	Pass

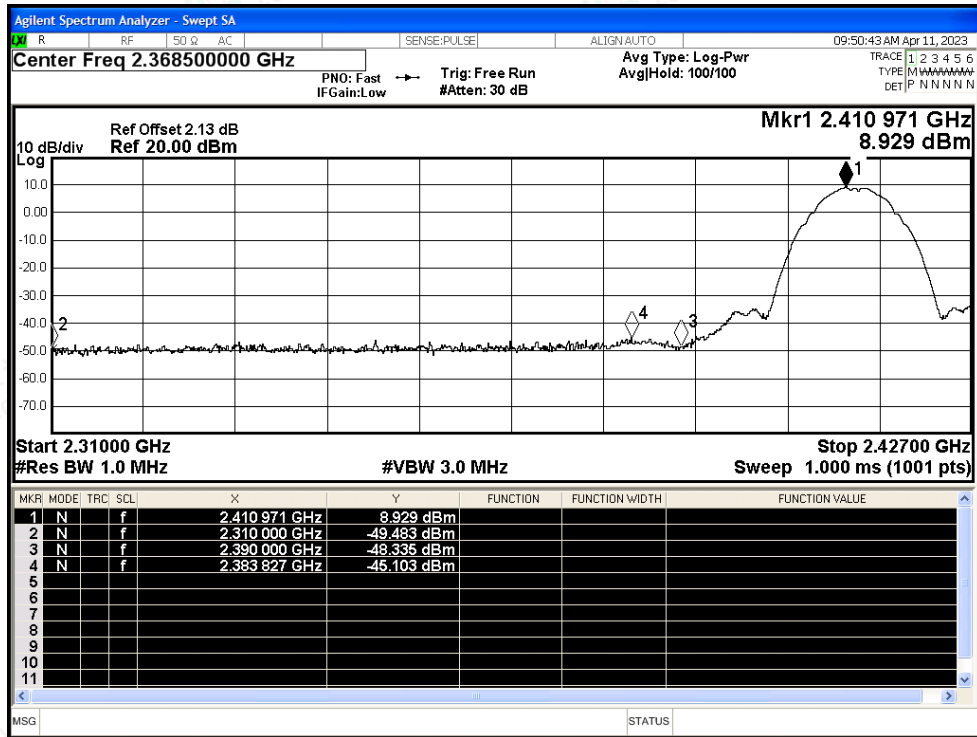


Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
Scan code to check authenticity

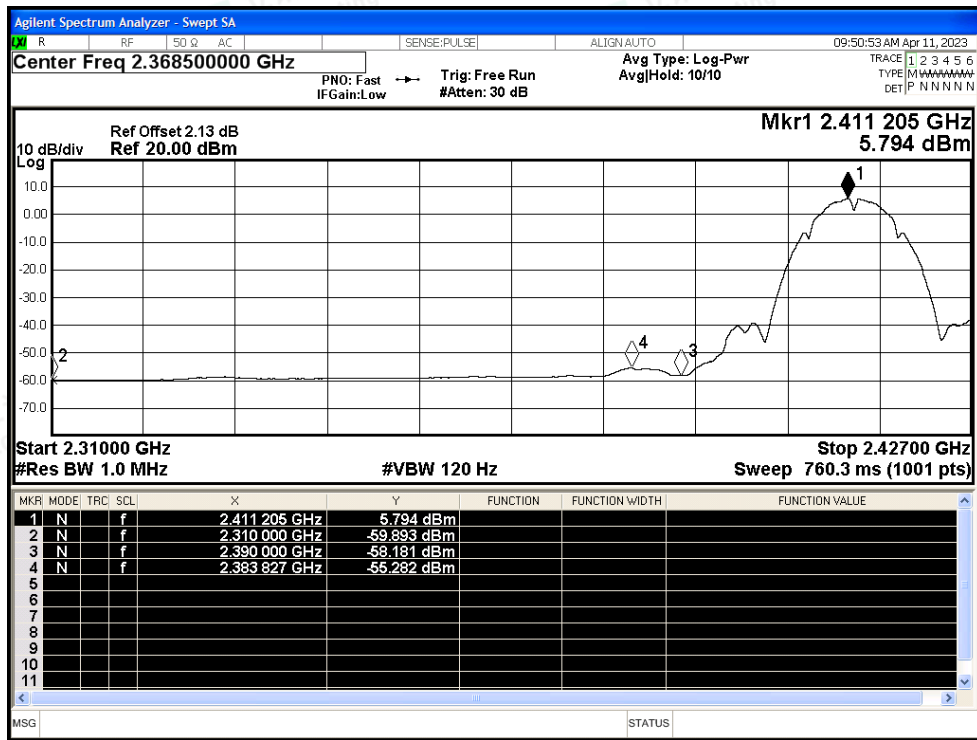


Test Graphs

Restrict Band NVNT b 2412MHz Ant Peak



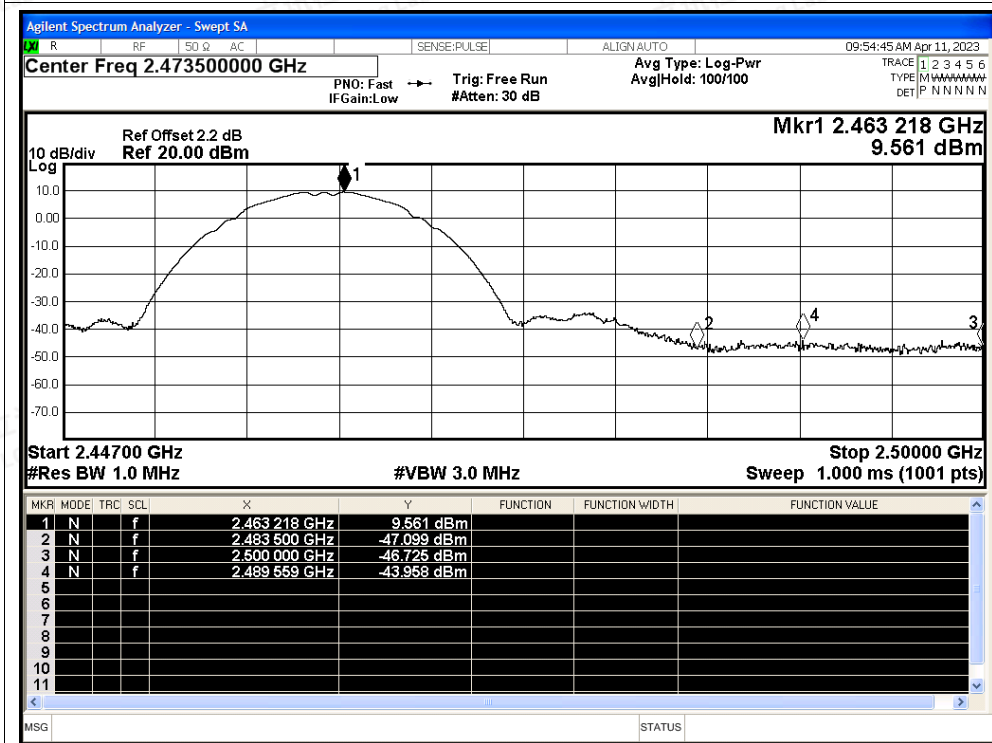
Restrict Band NVNT b 2412MHz Ant Average



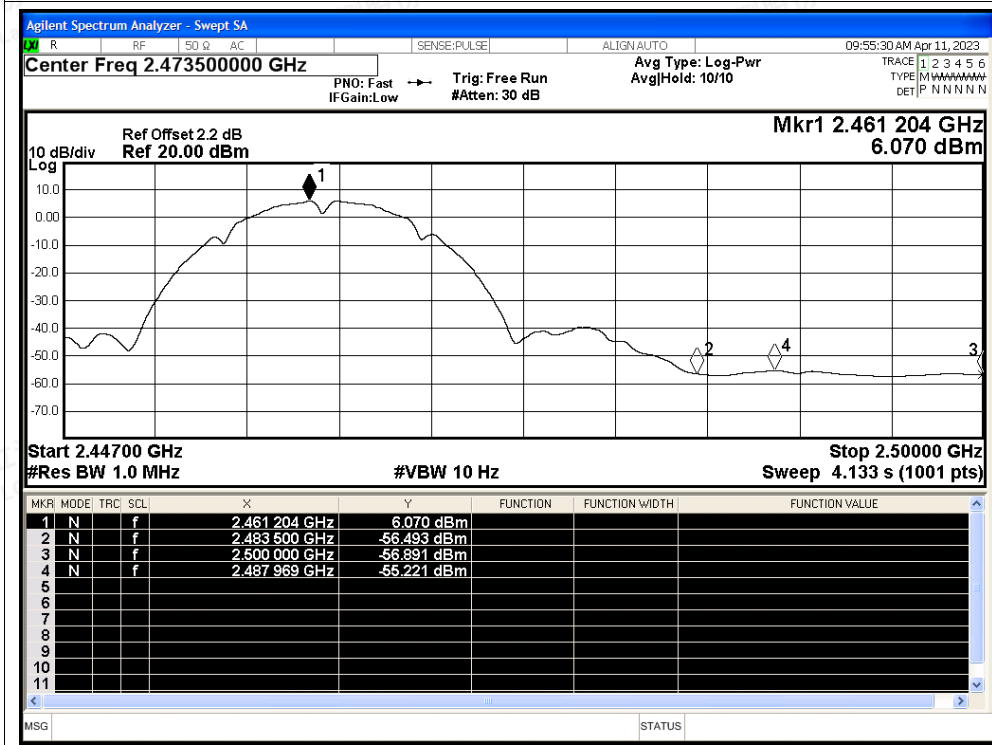




Restrict Band NVNT b 2462MHz Ant Peak

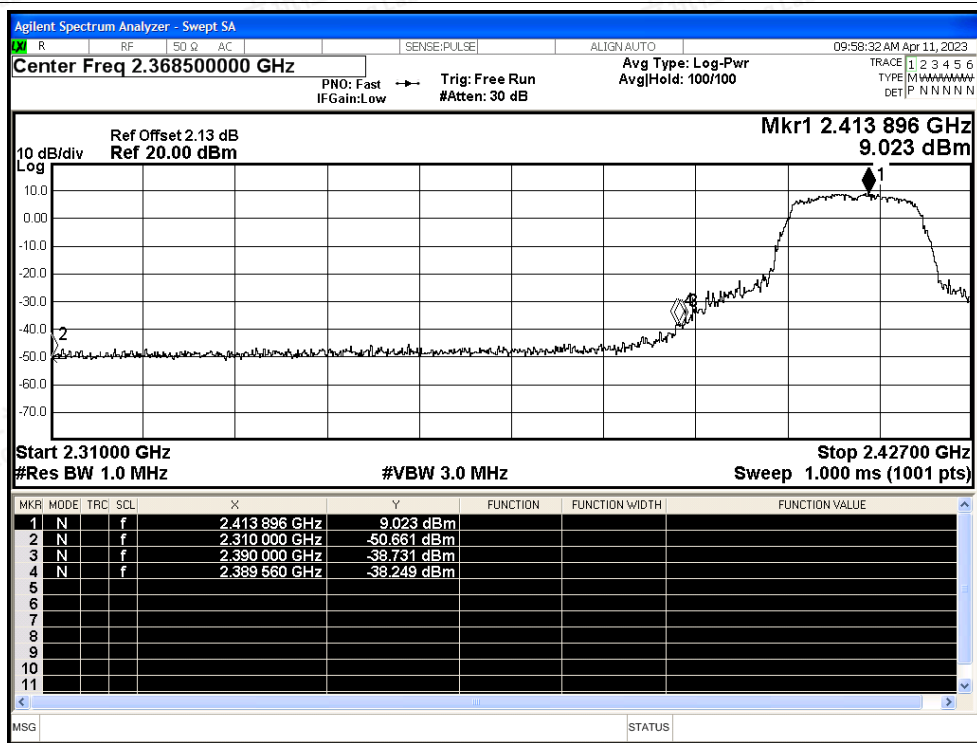


Restrict Band NVNT b 2462MHz Ant Average

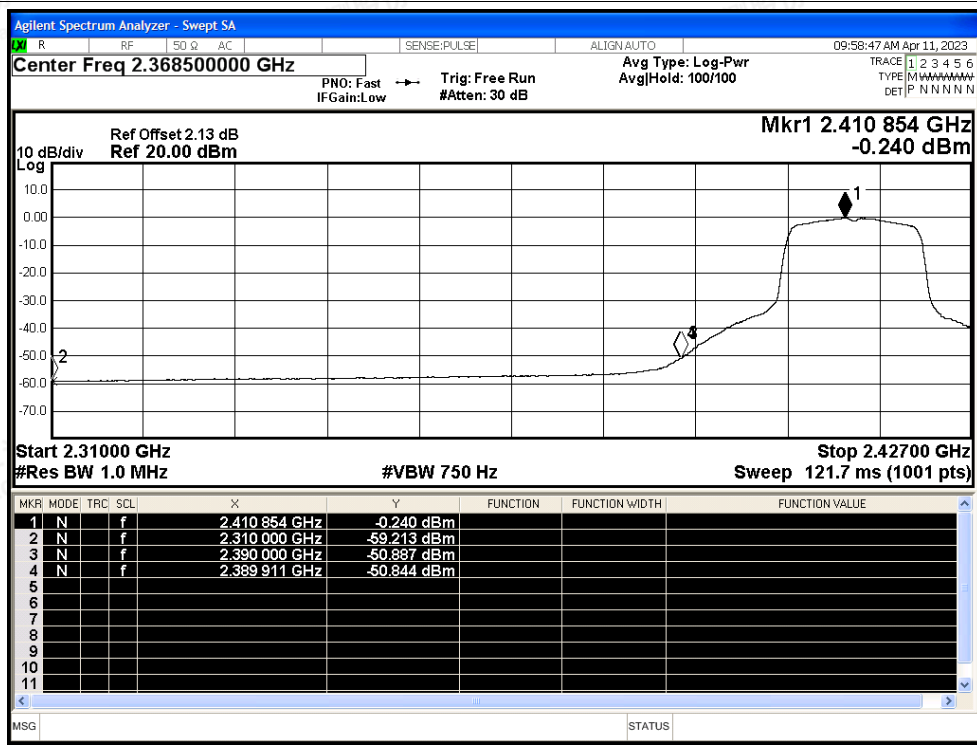




Restrict Band NVNT g 2412MHz Ant Peak

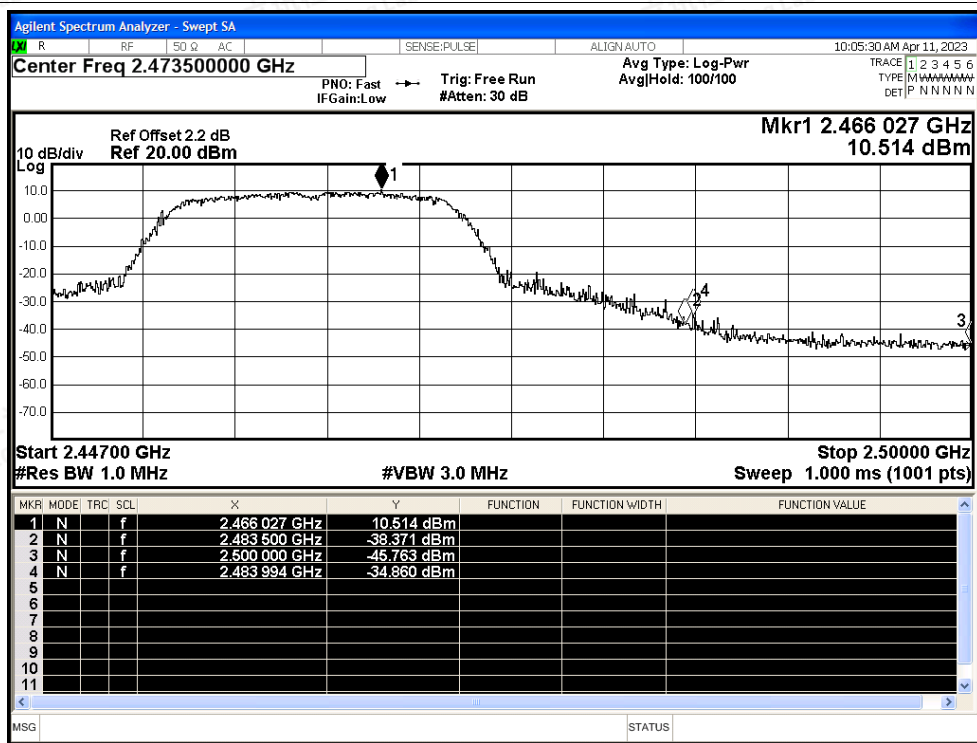


Restrict Band NVNT g 2412MHz Ant Average

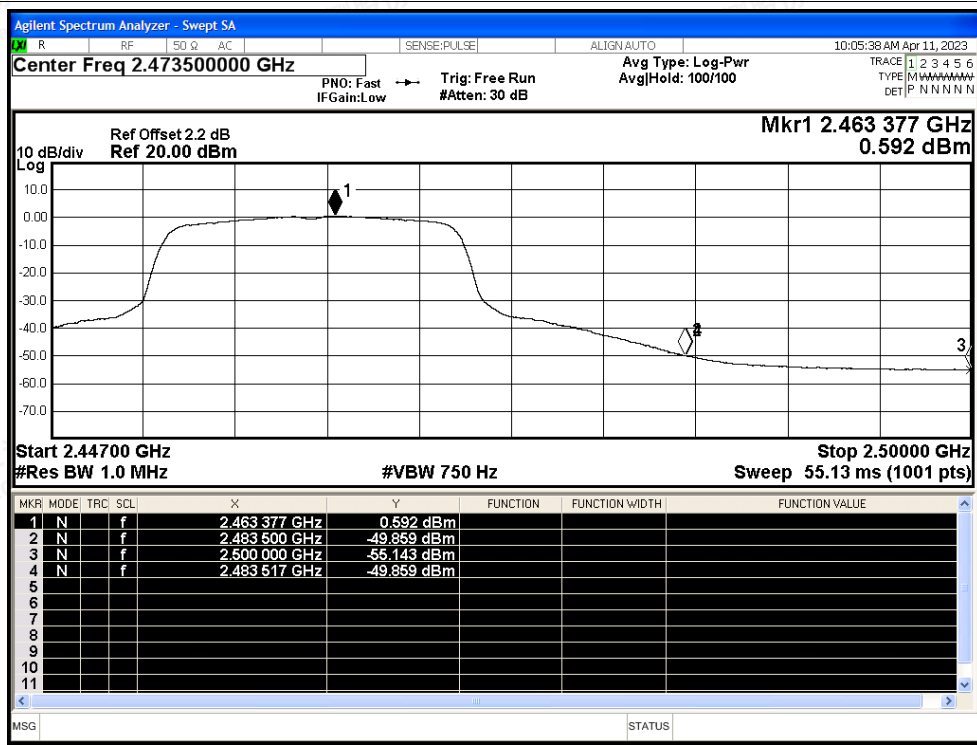




Restrict Band NVNT g 2462MHz Ant Peak

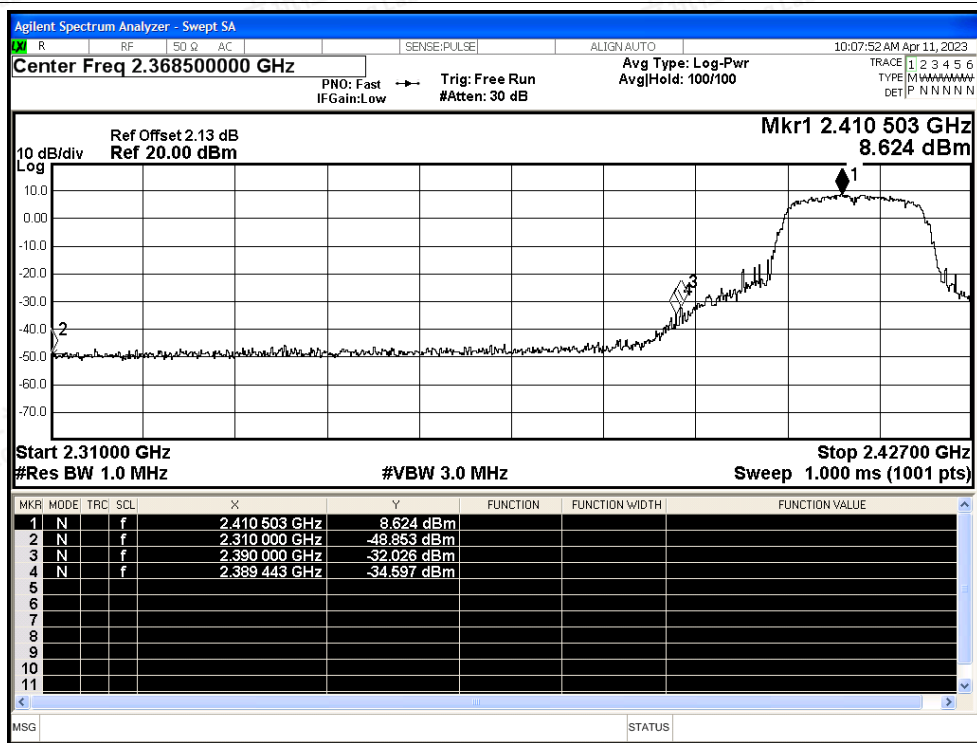


Restrict Band NVNT g 2462MHz Ant Average

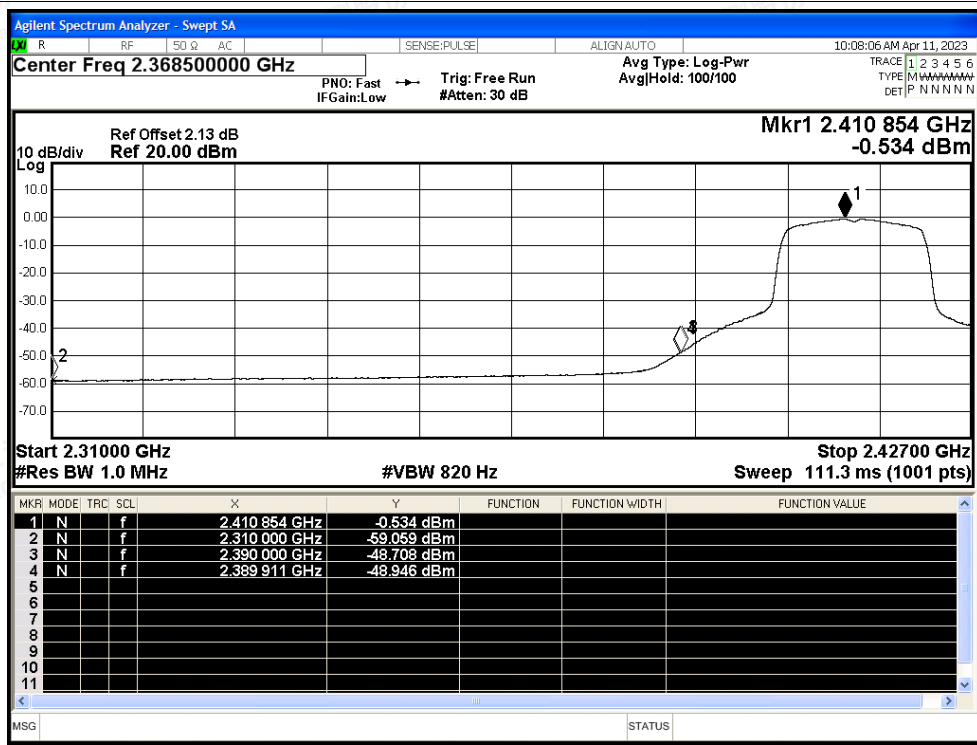


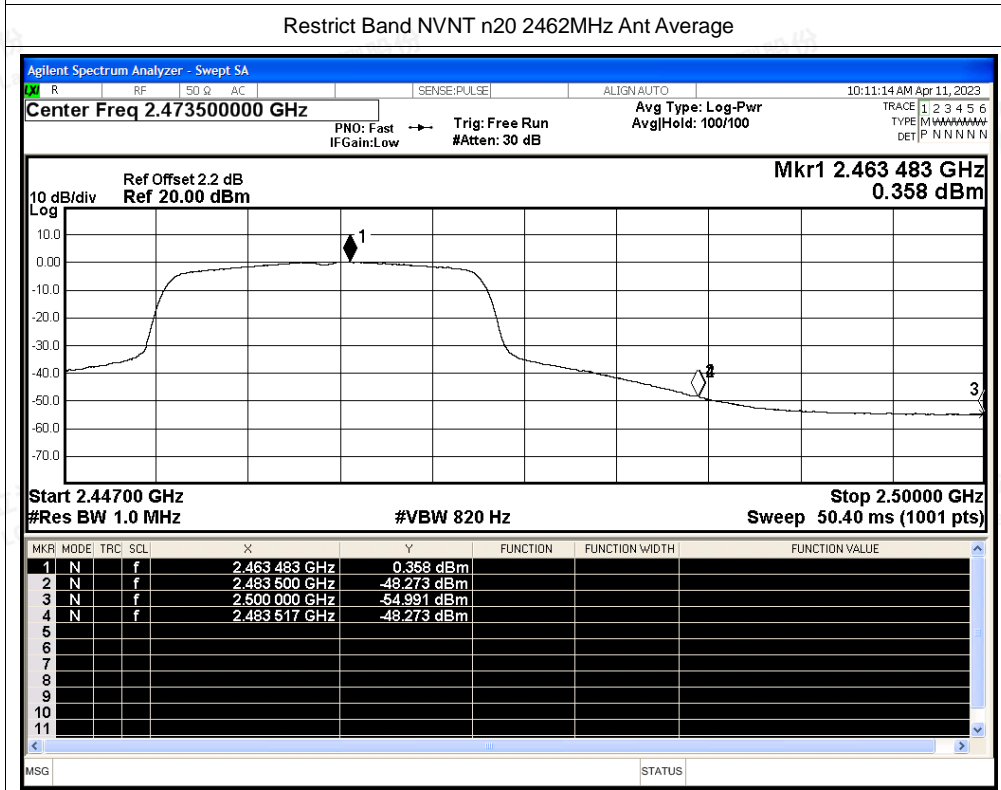
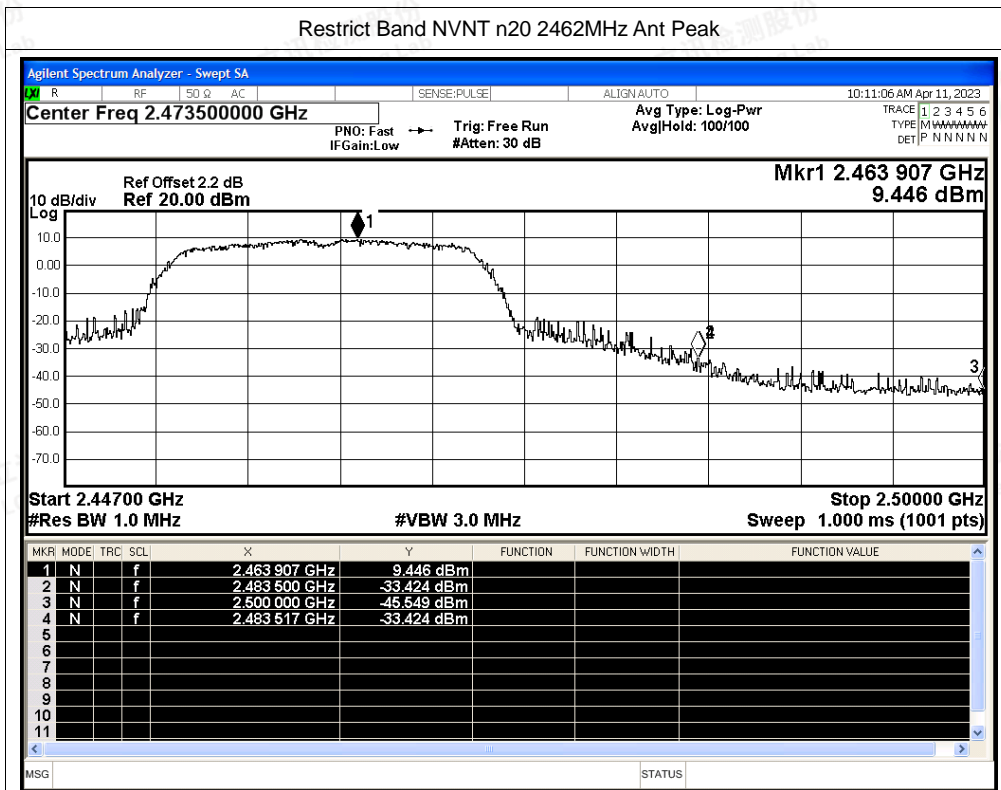


Restrict Band NVNT n20 2412MHz Ant Peak



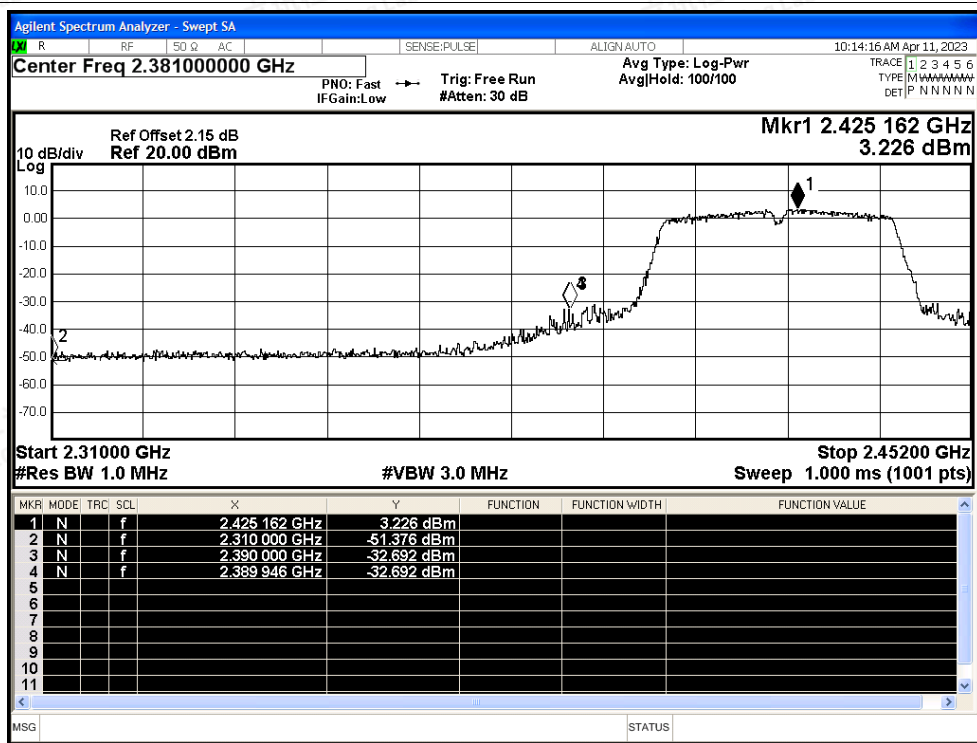
Restrict Band NVNT n20 2412MHz Ant Average



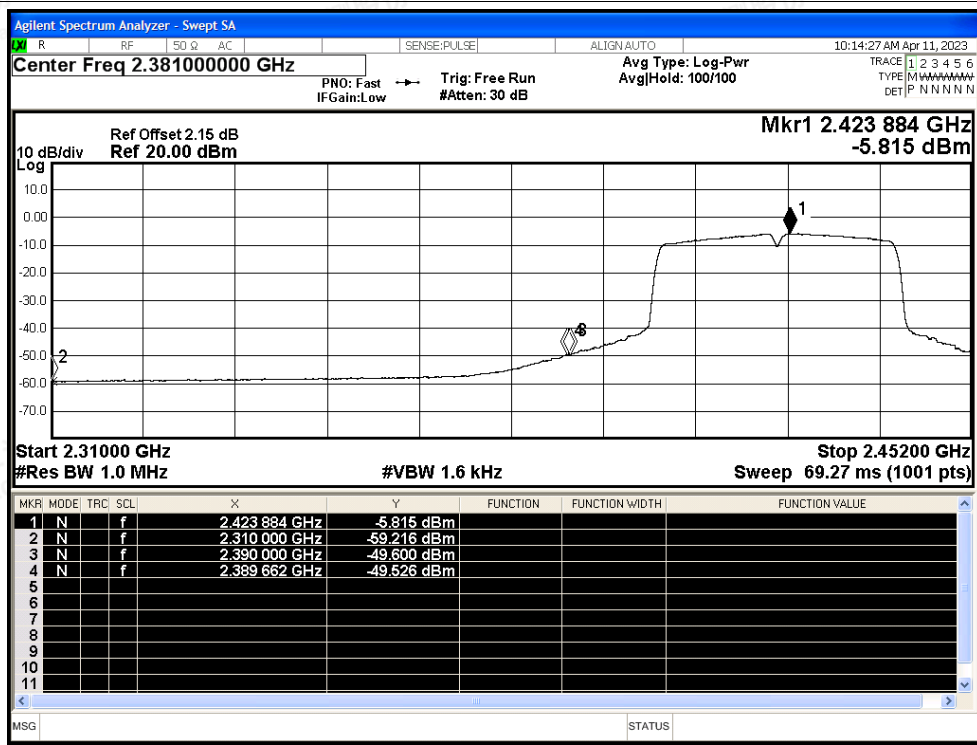




Restrict Band NVNT n40 2422MHz Ant Peak

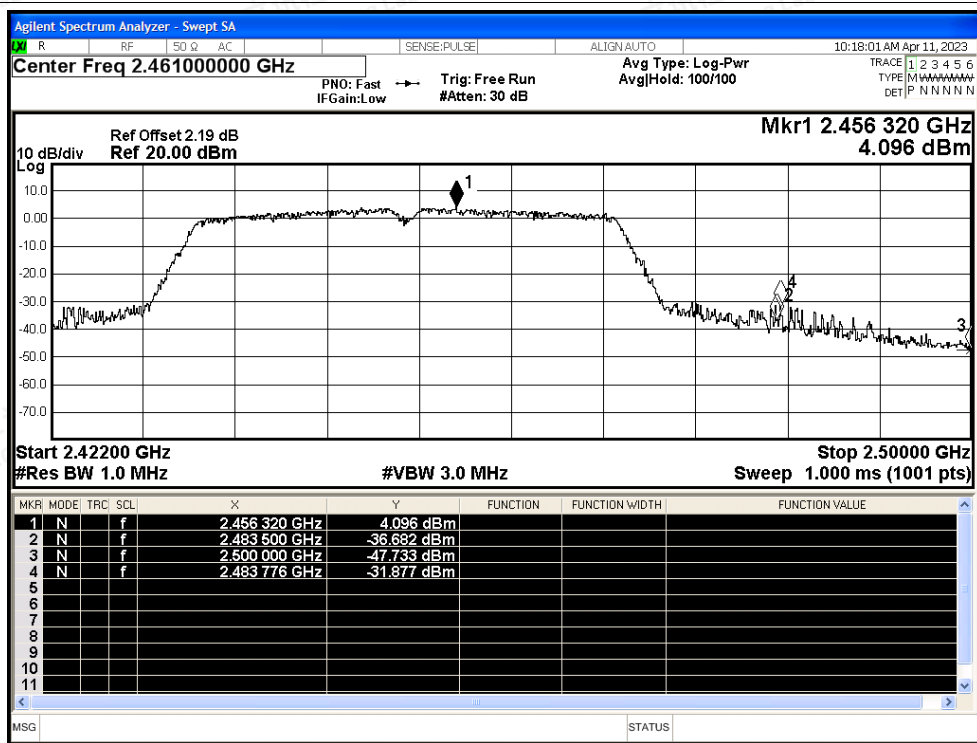


Restrict Band NVNT n40 2422MHz Ant Average





Restrict Band NVNT n40 2452MHz Ant Peak



Restrict Band NVNT n40 2452MHz Ant Average

