



Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart Plug and Gateway

Test Model: HUB1

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng
	<i>Nick Peng</i>
Supervised by:	Ling Zhu
	<i>Ling Zhu</i>



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B.1 -6dB Bandwidth

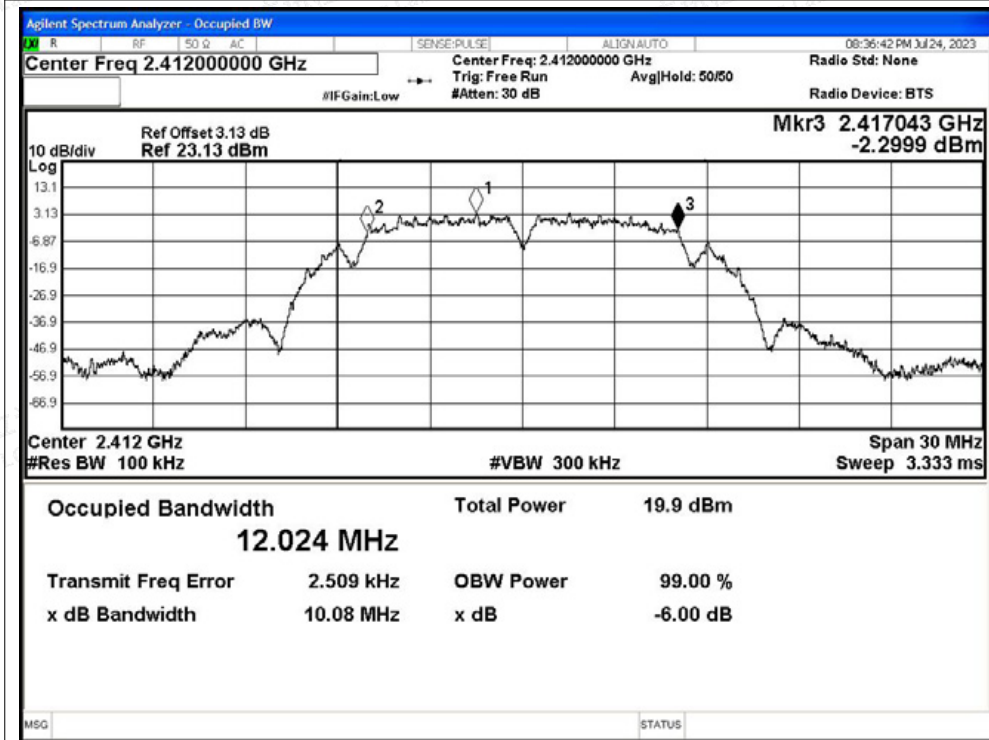
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	10.081	≥ 0.5	Pass
NVNT	b	2437	Ant1	8.685	≥ 0.5	Pass
NVNT	b	2462	Ant1	10.028	≥ 0.5	Pass
NVNT	g	2412	Ant1	16.281	≥ 0.5	Pass
NVNT	g	2437	Ant1	16.295	≥ 0.5	Pass
NVNT	g	2462	Ant1	16.09	≥ 0.5	Pass
NVNT	n20	2412	Ant1	17.127	≥ 0.5	Pass
NVNT	n20	2437	Ant1	16.867	≥ 0.5	Pass
NVNT	n20	2462	Ant1	17.538	≥ 0.5	Pass
NVNT	n40	2422	Ant1	35.221	≥ 0.5	Pass
NVNT	n40	2437	Ant1	35.19	≥ 0.5	Pass
NVNT	n40	2452	Ant1	35.833	≥ 0.5	Pass





Test Graphs

-6dB Bandwidth NVNT b 2412MHz Ant1



-6dB Bandwidth NVNT b 2437MHz Ant1



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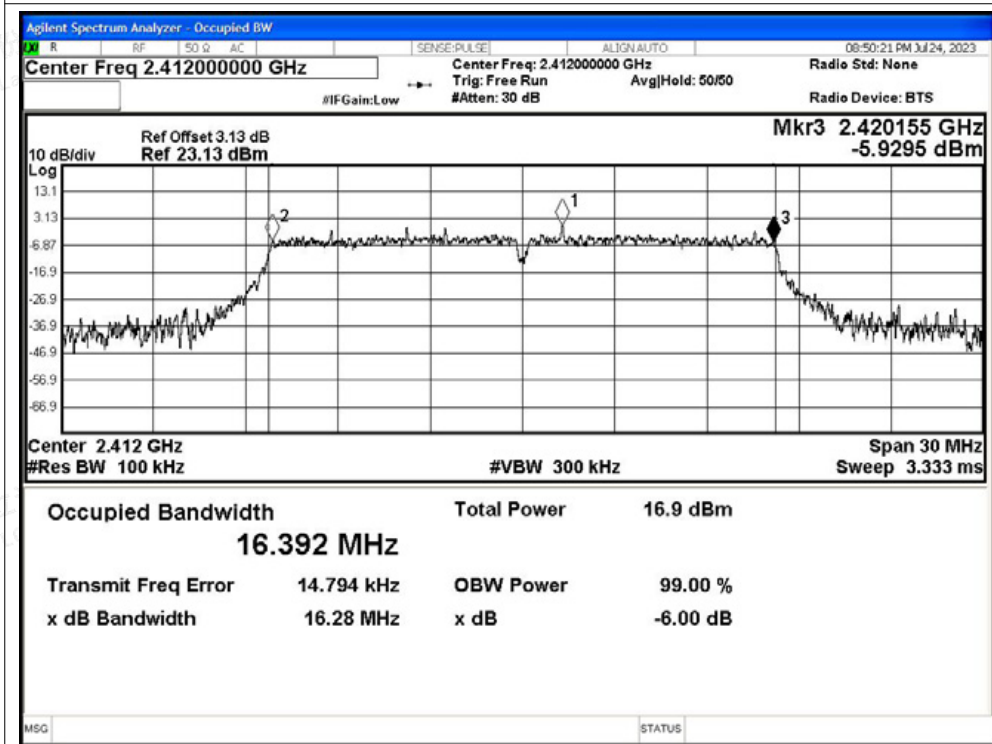
Scan code to check authenticity



-6dB Bandwidth NVNT b 2462MHz Ant1



-6dB Bandwidth NVNT g 2412MHz Ant1



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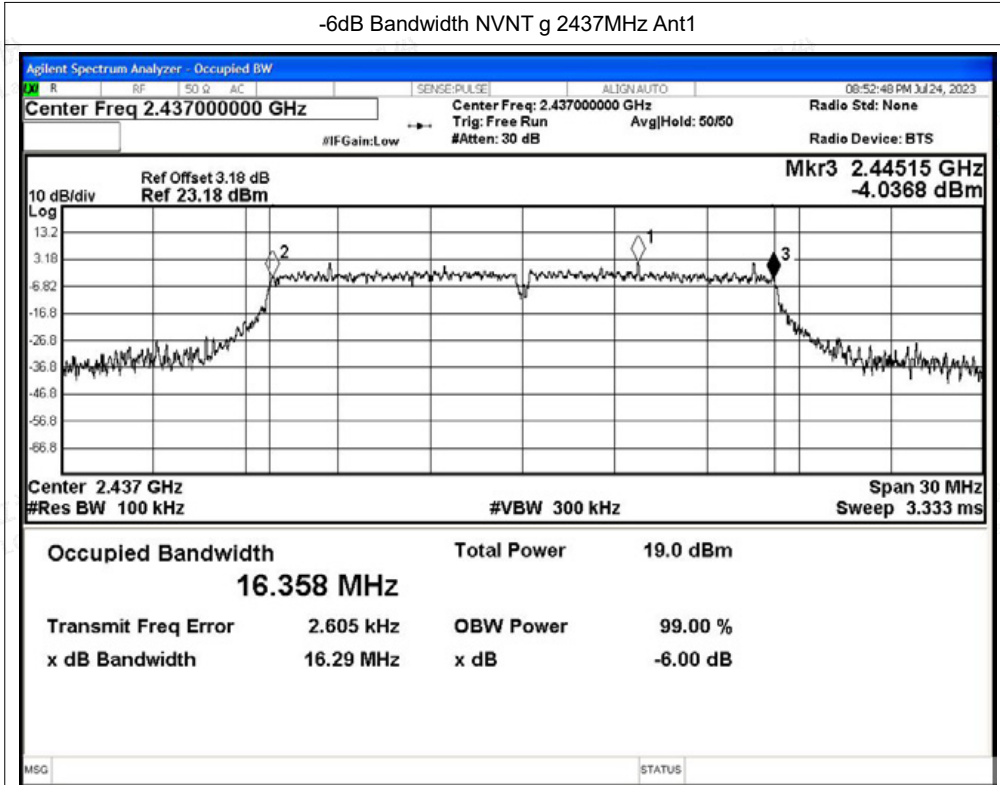
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

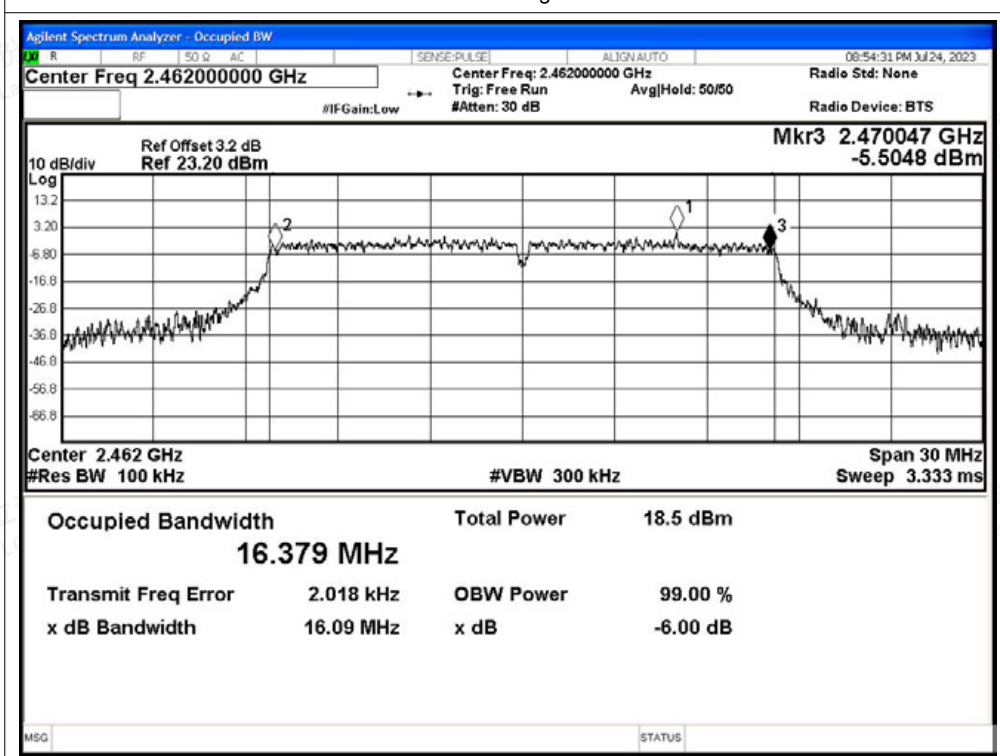
Scan code to check authenticity



-6dB Bandwidth NVNT g 2437MHz Ant1

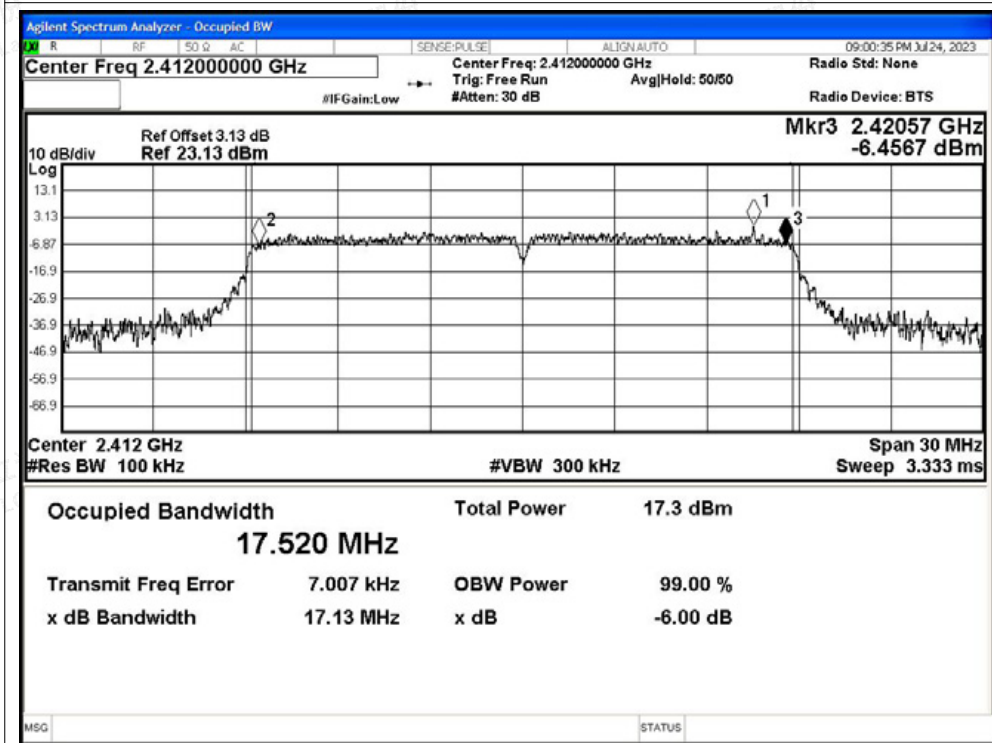


-6dB Bandwidth NVNT g 2462MHz Ant1

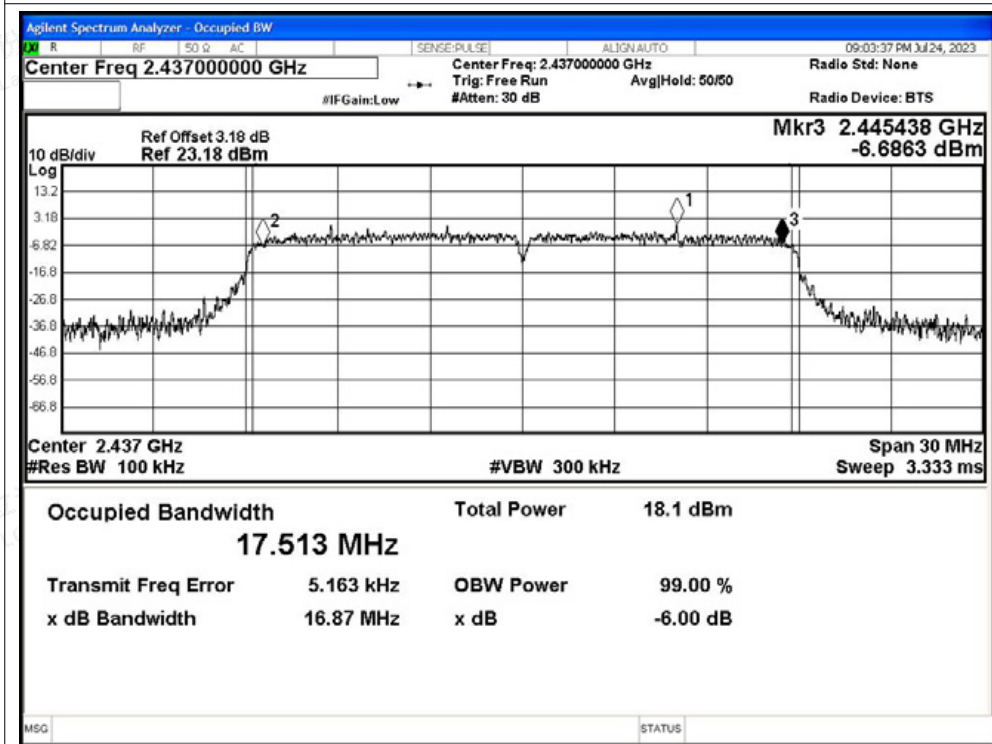




-6dB Bandwidth NVNT n20 2412MHz Ant1

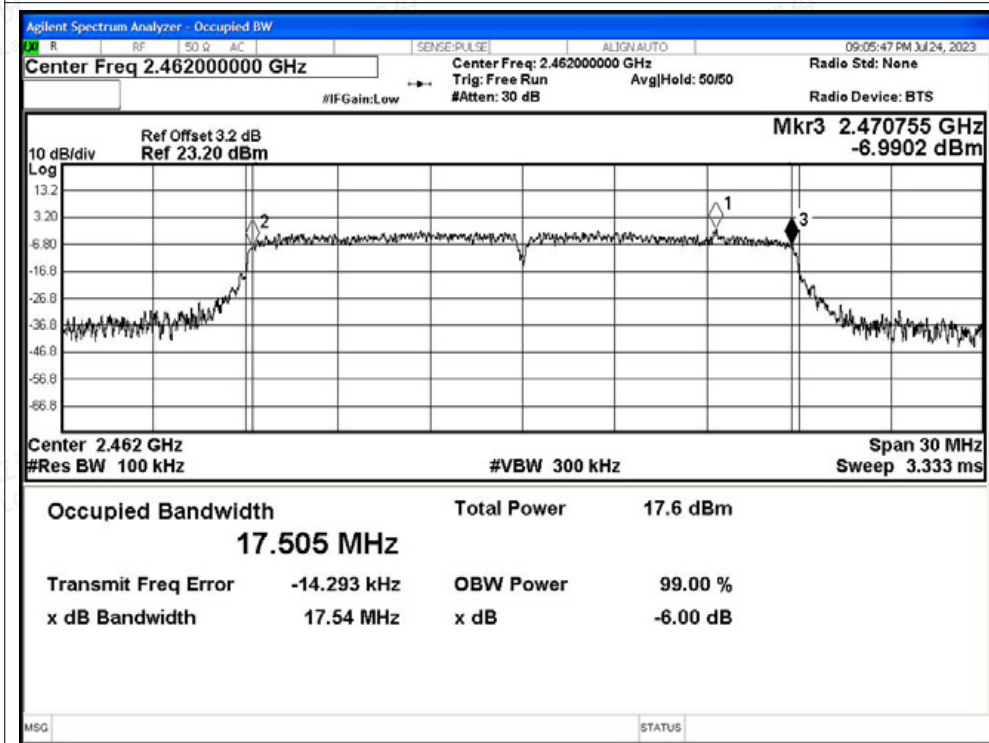


-6dB Bandwidth NVNT n20 2437MHz Ant1

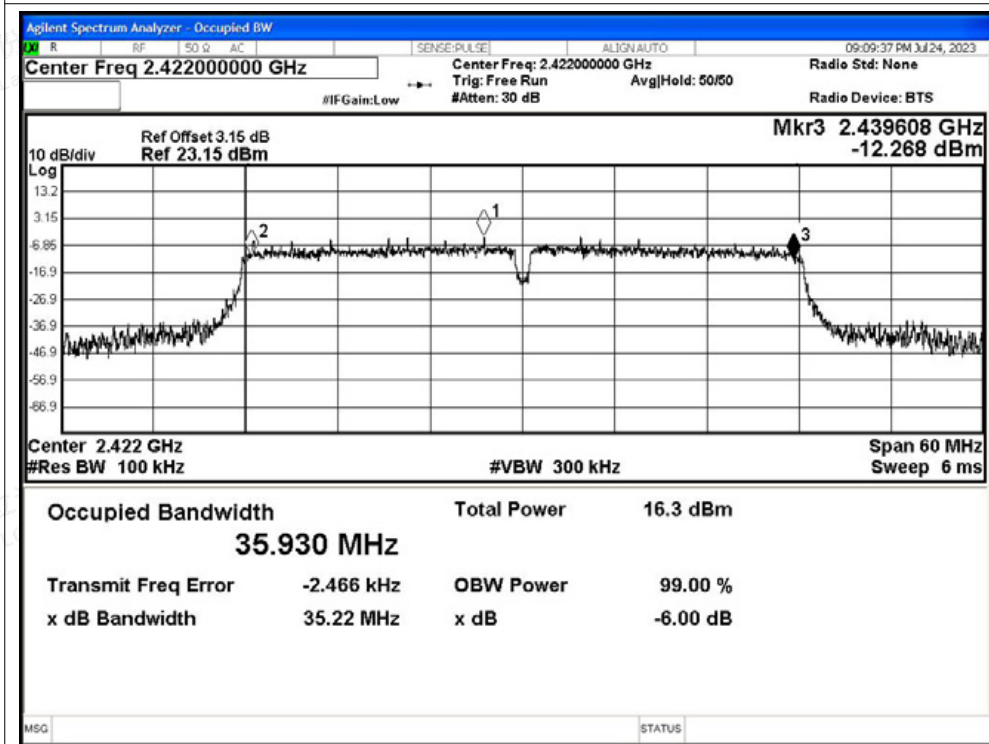




-6dB Bandwidth NVNT n20 2462MHz Ant1



-6dB Bandwidth NVNT n40 2422MHz Ant1



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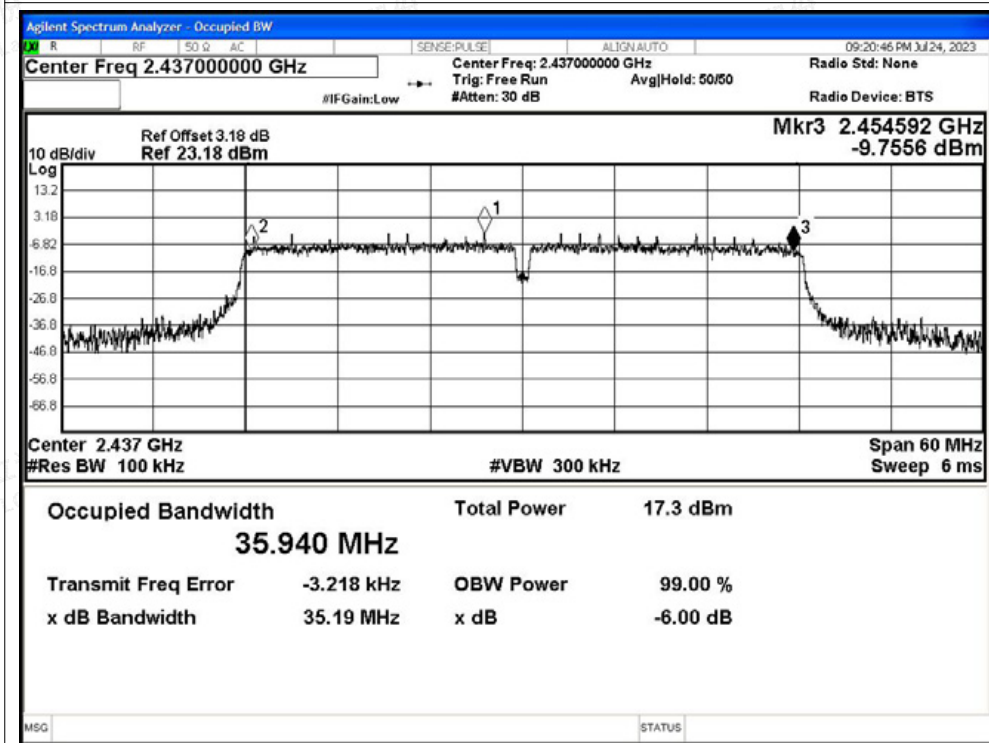
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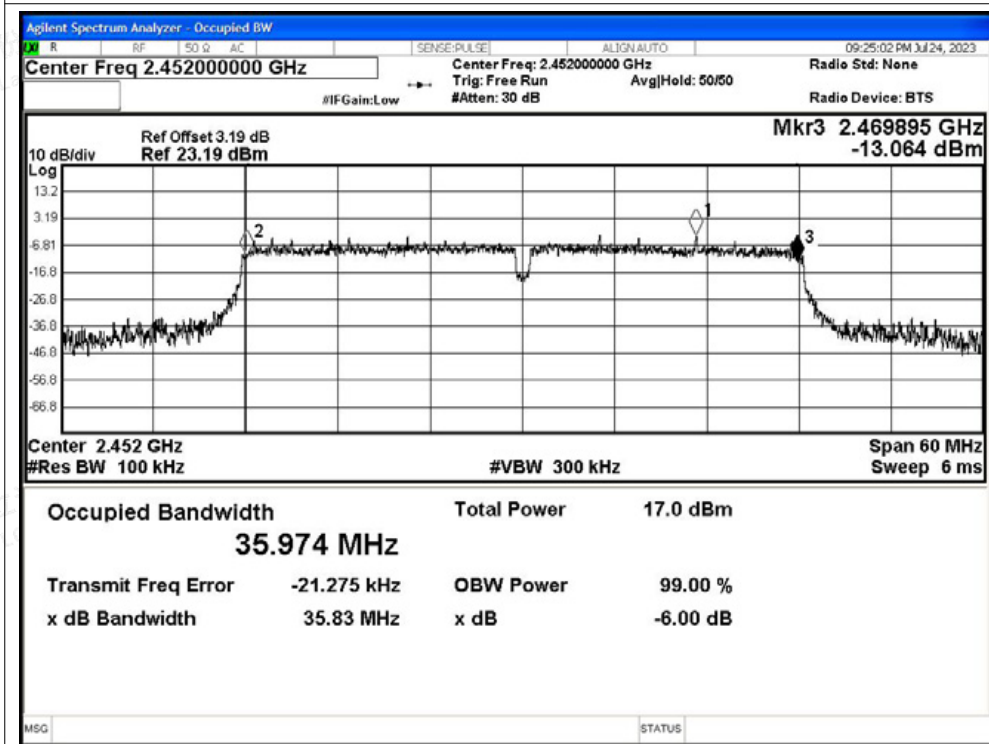
Scan code to check authenticity



-6dB Bandwidth NVNT n40 2437MHz Ant1



-6dB Bandwidth NVNT n40 2452MHz Ant1





B.2 Occupied Channel Bandwidth

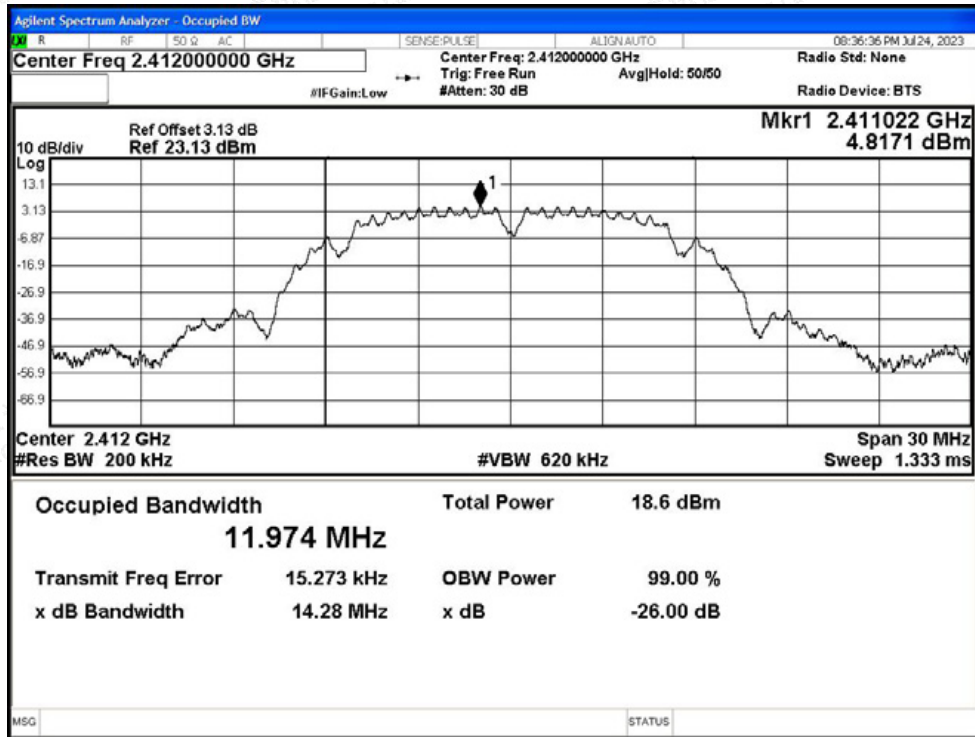
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	11.974
NVNT	b	2437	Ant1	11.972
NVNT	b	2462	Ant1	11.99
NVNT	g	2412	Ant1	16.417
NVNT	g	2437	Ant1	16.448
NVNT	g	2462	Ant1	16.44
NVNT	n20	2412	Ant1	17.534
NVNT	n20	2437	Ant1	17.521
NVNT	n20	2462	Ant1	17.512
NVNT	n40	2422	Ant1	36.057
NVNT	n40	2437	Ant1	36.057
NVNT	n40	2452	Ant1	36.151



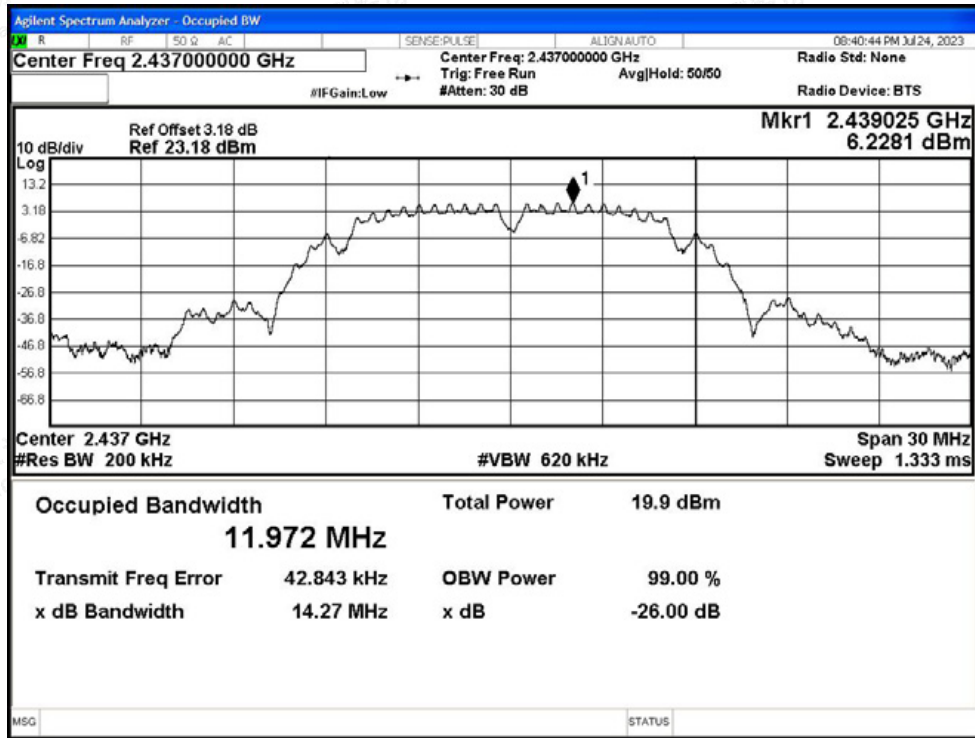


Test Graphs

OBW NVNT b 2412MHz Ant1



OBW NVNT b 2437MHz Ant1



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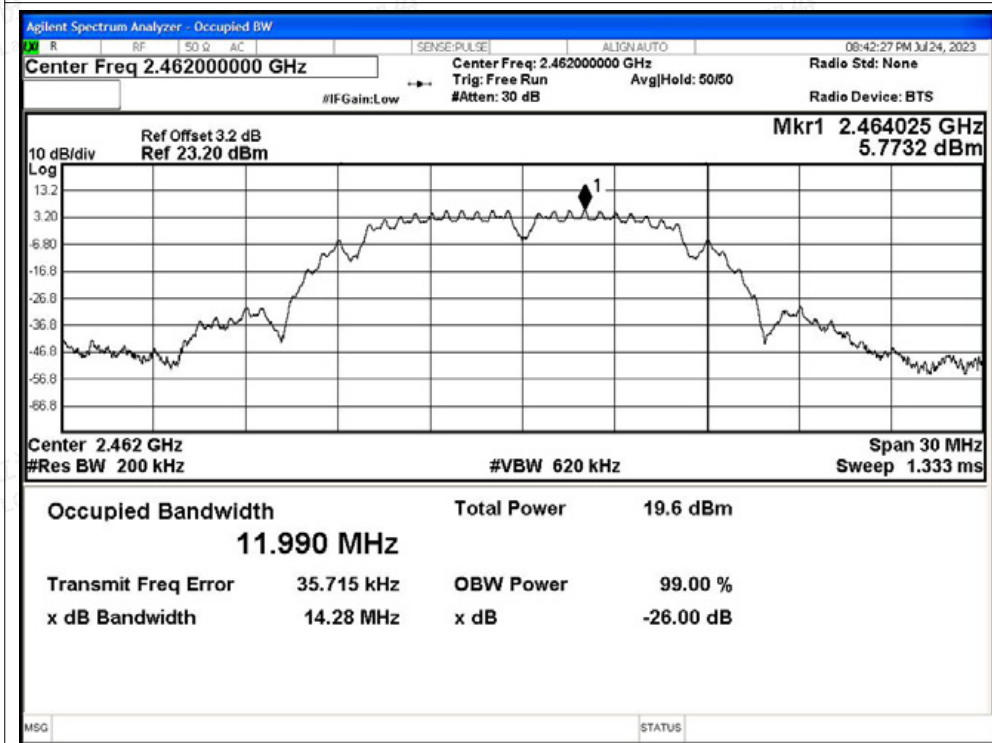
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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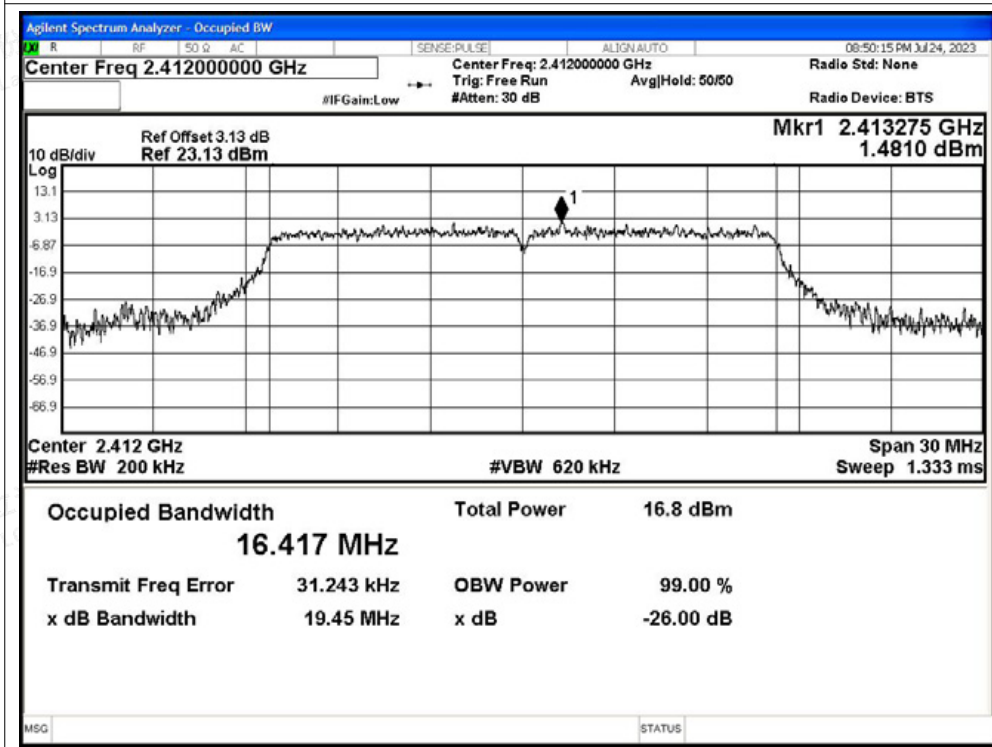
Scan code to check authenticity



OBW NVNT b 2462MHz Ant1



OBW NVNT g 2412MHz Ant1



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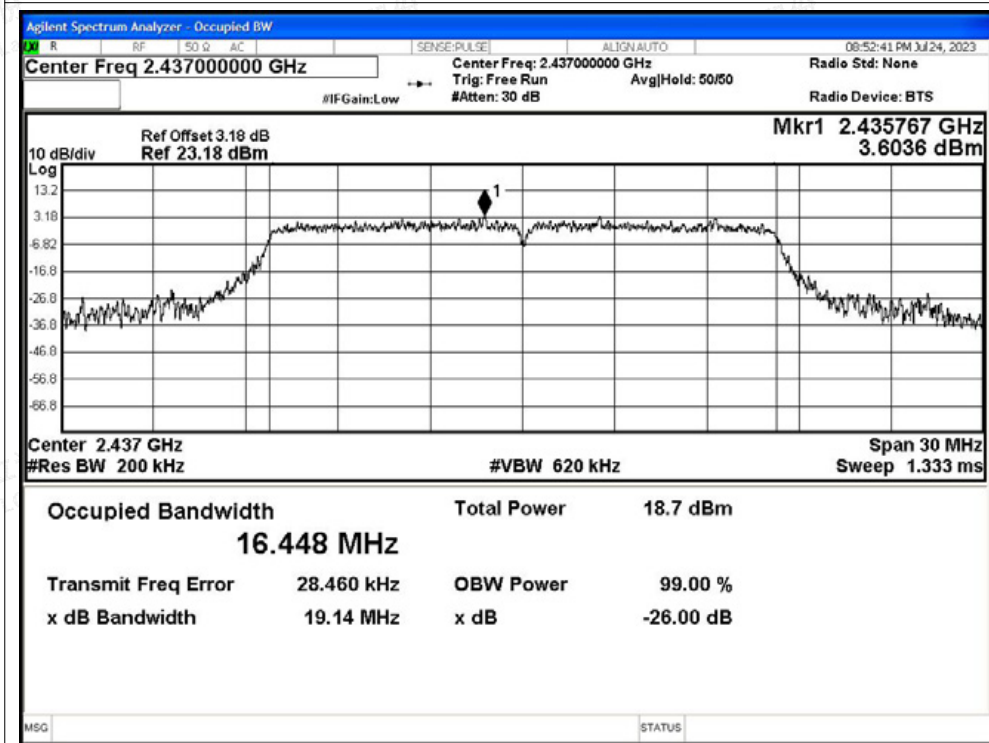
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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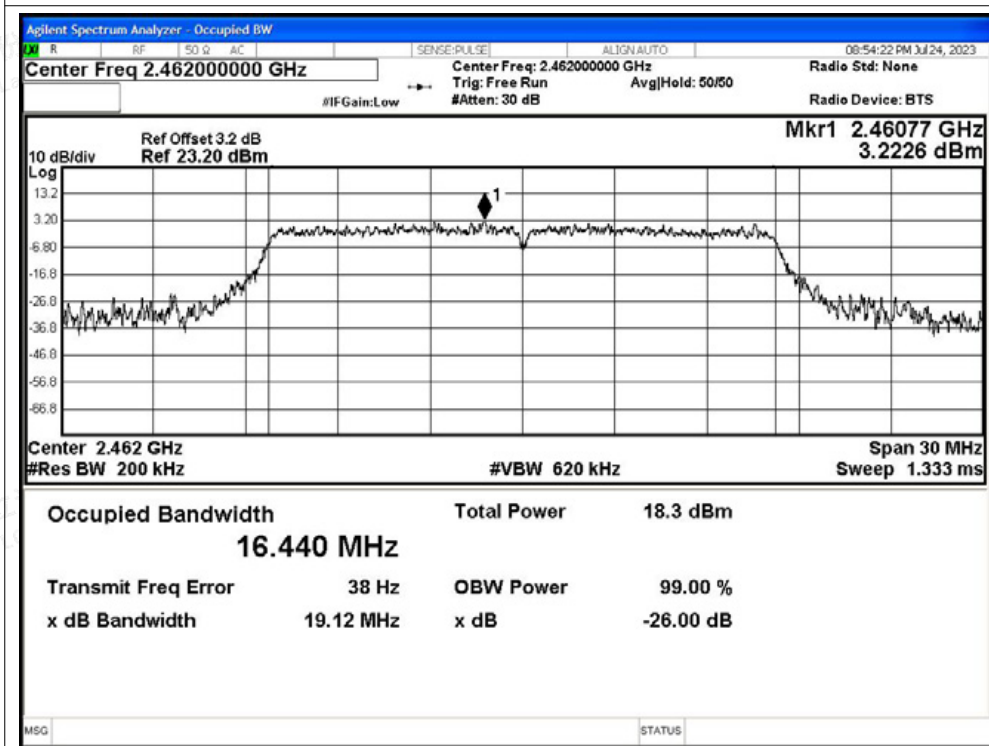
Scan code to check authenticity



OBW NVNT g 2437MHz Ant1

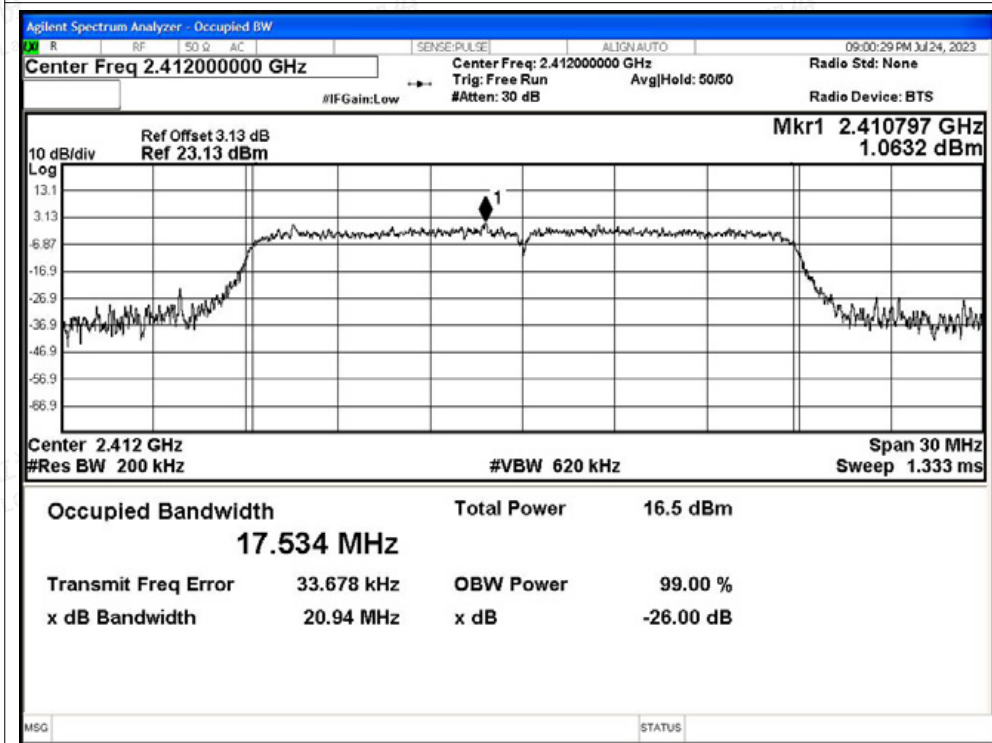


OBW NVNT g 2462MHz Ant1

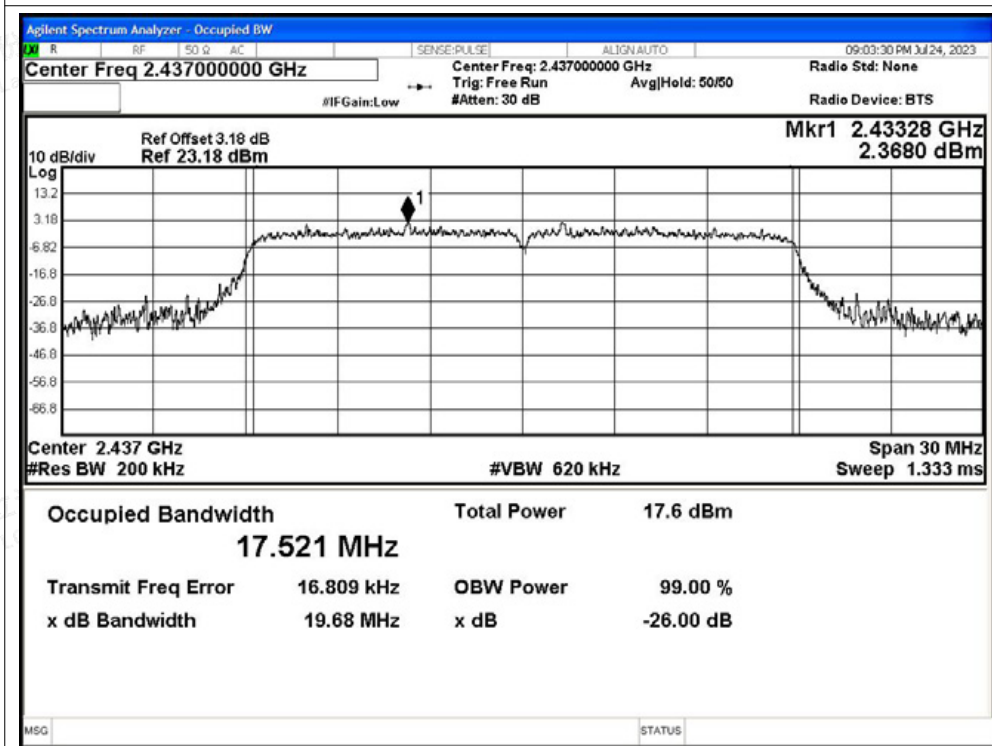




OBW NVNT n20 2412MHz Ant1

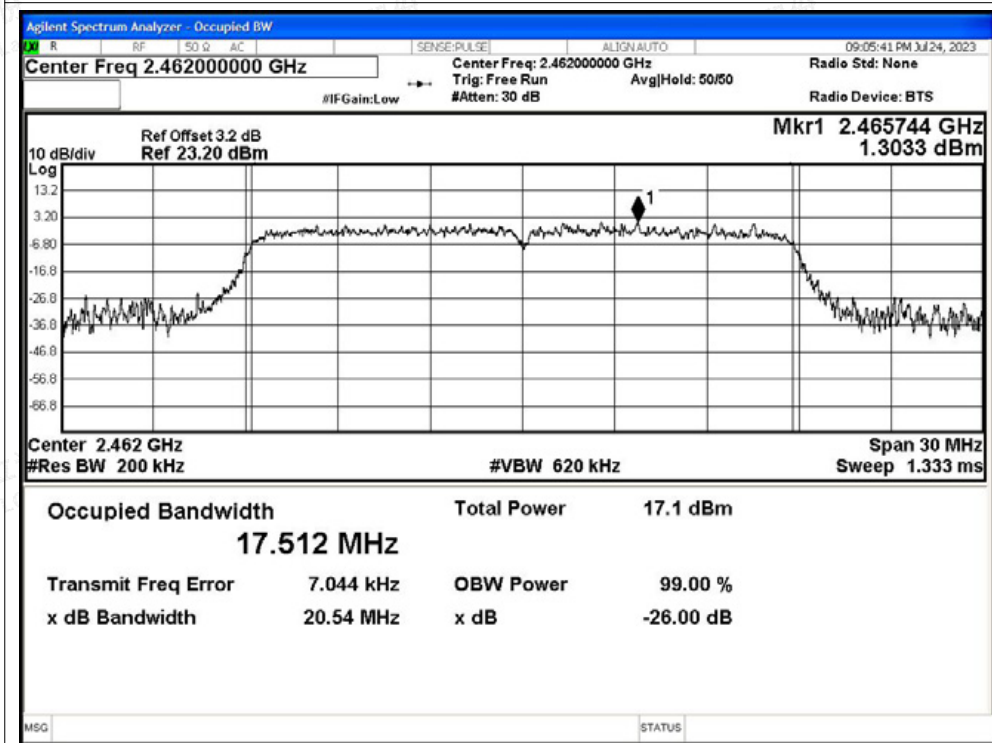


OBW NVNT n20 2437MHz Ant1

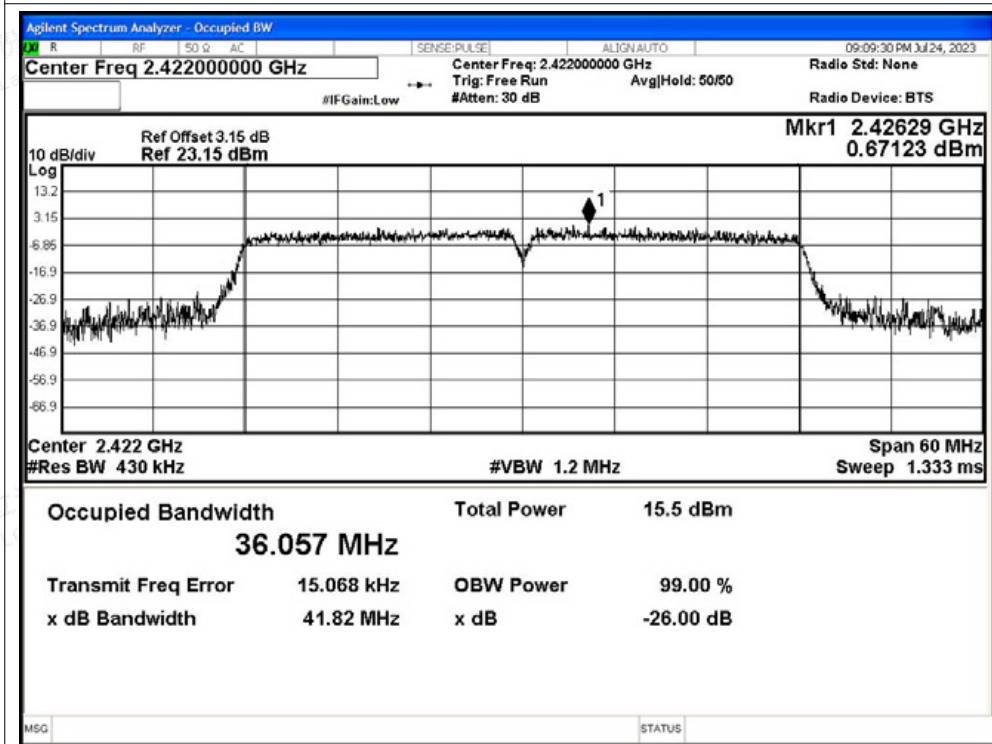




OBW NVNT n20 2462MHz Ant1

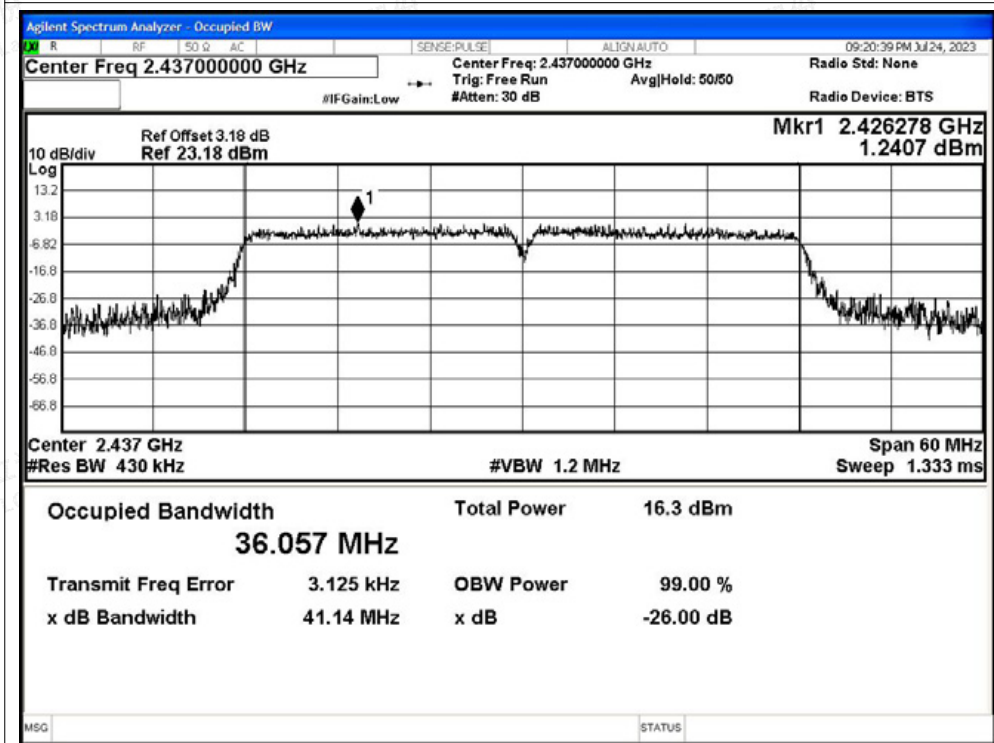


OBW NVNT n40 2422MHz Ant1

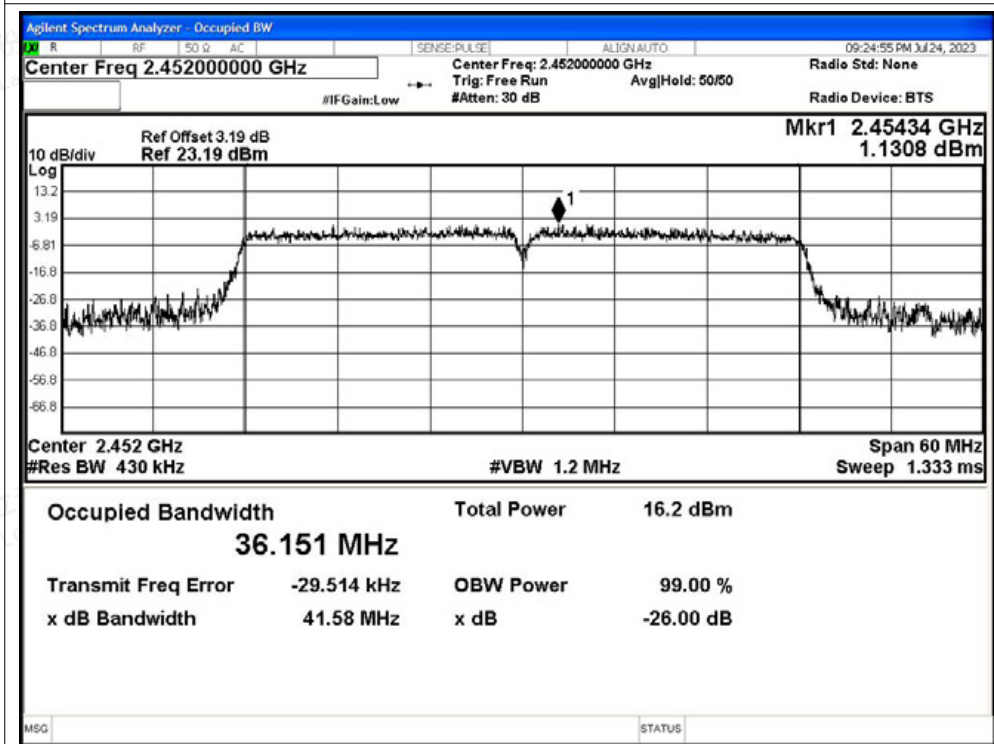




OBW NVNT n40 2437MHz Ant1



OBW NVNT n40 2452MHz Ant1



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B.3 Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.09	30	Pass
NVNT	b	2437	Ant1	16.6	30	Pass
NVNT	b	2462	Ant1	15.84	30	Pass
NVNT	g	2412	Ant1	14.48	30	Pass
NVNT	g	2437	Ant1	15.34	30	Pass
NVNT	g	2462	Ant1	14.78	30	Pass
NVNT	n20	2412	Ant1	14.46	30	Pass
NVNT	n20	2437	Ant1	15.31	30	Pass
NVNT	n20	2462	Ant1	14.83	30	Pass
NVNT	n40	2422	Ant1	13.13	30	Pass
NVNT	n40	2437	Ant1	13.93	30	Pass
NVNT	n40	2452	Ant1	13.86	30	Pass

EIRP

Condition	Mode	Frequency (MHz)	Antenna	Maximum Peak Output Power [dBm]	Antenna Gain	Report EIRP Power(dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.09	3.59	18.68	36	Pass
NVNT	b	2437	Ant1	16.6	3.59	20.19	36	Pass
NVNT	b	2462	Ant1	15.84	3.59	19.43	36	Pass
NVNT	g	2412	Ant1	14.48	3.59	18.07	36	Pass
NVNT	g	2437	Ant1	15.34	3.59	18.93	36	Pass
NVNT	g	2462	Ant1	14.78	3.59	18.37	36	Pass
NVNT	n20	2412	Ant1	14.46	3.59	18.05	36	Pass
NVNT	n20	2437	Ant1	15.31	3.59	18.9	36	Pass
NVNT	n20	2462	Ant1	14.83	3.59	18.42	36	Pass
NVNT	n40	2422	Ant1	13.13	3.59	16.72	36	Pass
NVNT	n40	2437	Ant1	13.93	3.59	17.52	36	Pass
NVNT	n40	2452	Ant1	13.86	3.59	17.45	36	Pass





B.4 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	-9.54	8	Pass
NVNT	b	2437	Ant1	-8.59	8	Pass
NVNT	b	2462	Ant1	-9.11	8	Pass
NVNT	g	2412	Ant1	-14.36	8	Pass
NVNT	g	2437	Ant1	-14.05	8	Pass
NVNT	g	2462	Ant1	-13.93	8	Pass
NVNT	n20	2412	Ant1	-14.28	8	Pass
NVNT	n20	2437	Ant1	-13.76	8	Pass
NVNT	n20	2462	Ant1	-15.85	8	Pass
NVNT	n40	2422	Ant1	-18.97	8	Pass
NVNT	n40	2437	Ant1	-16.86	8	Pass
NVNT	n40	2452	Ant1	-17.9	8	Pass

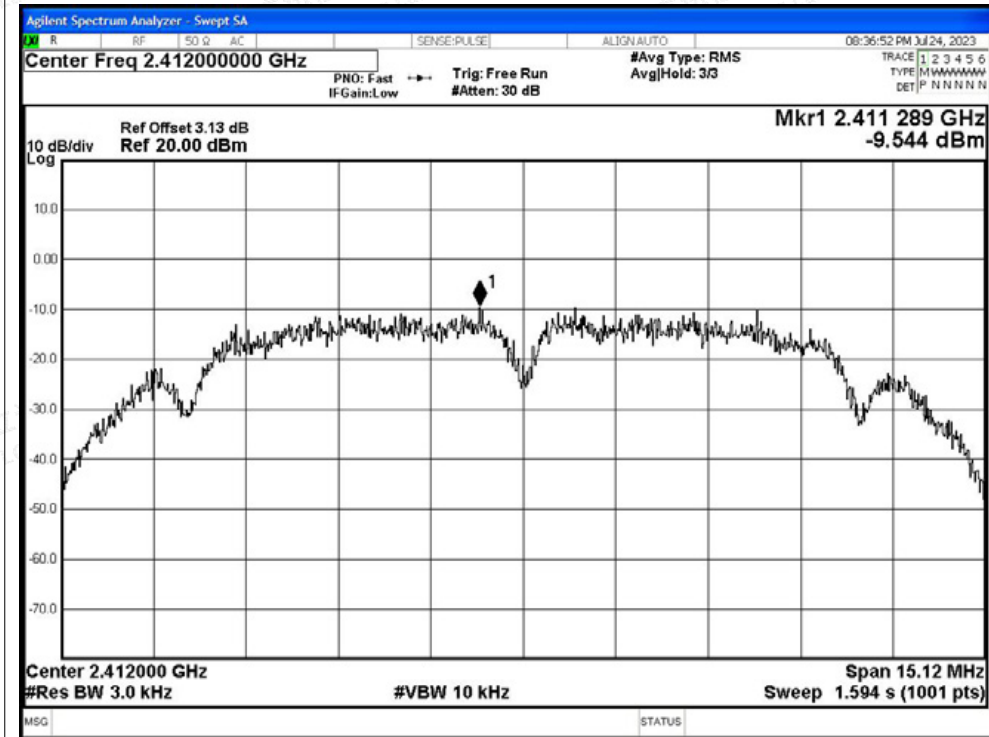


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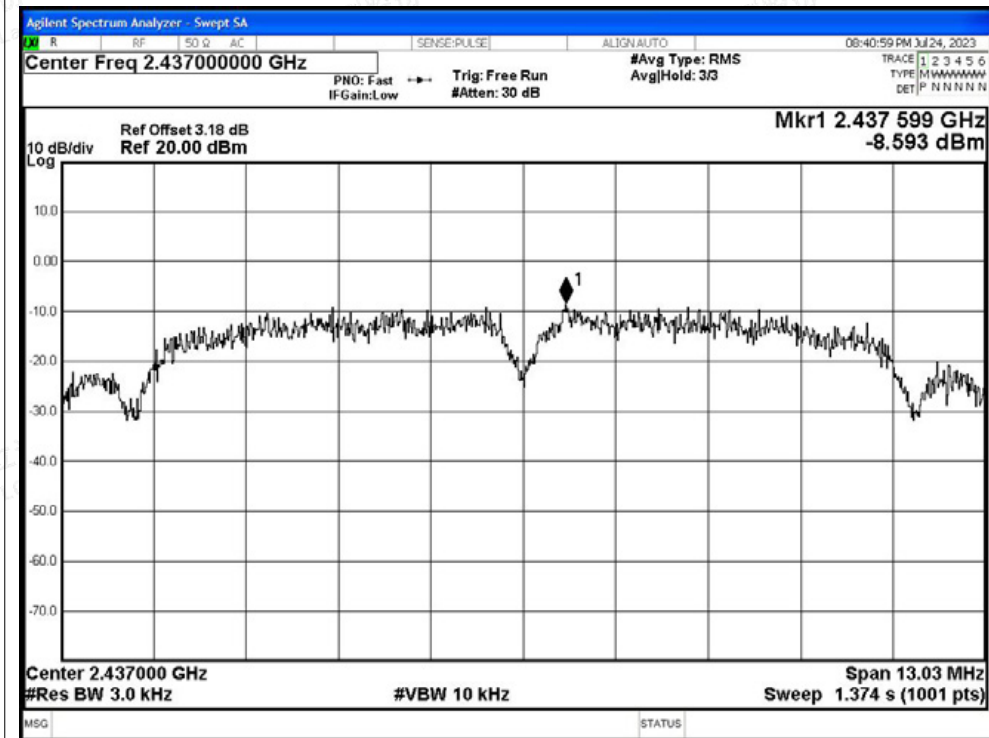


Test Graphs

PSD NVNT b 2412MHz Ant1

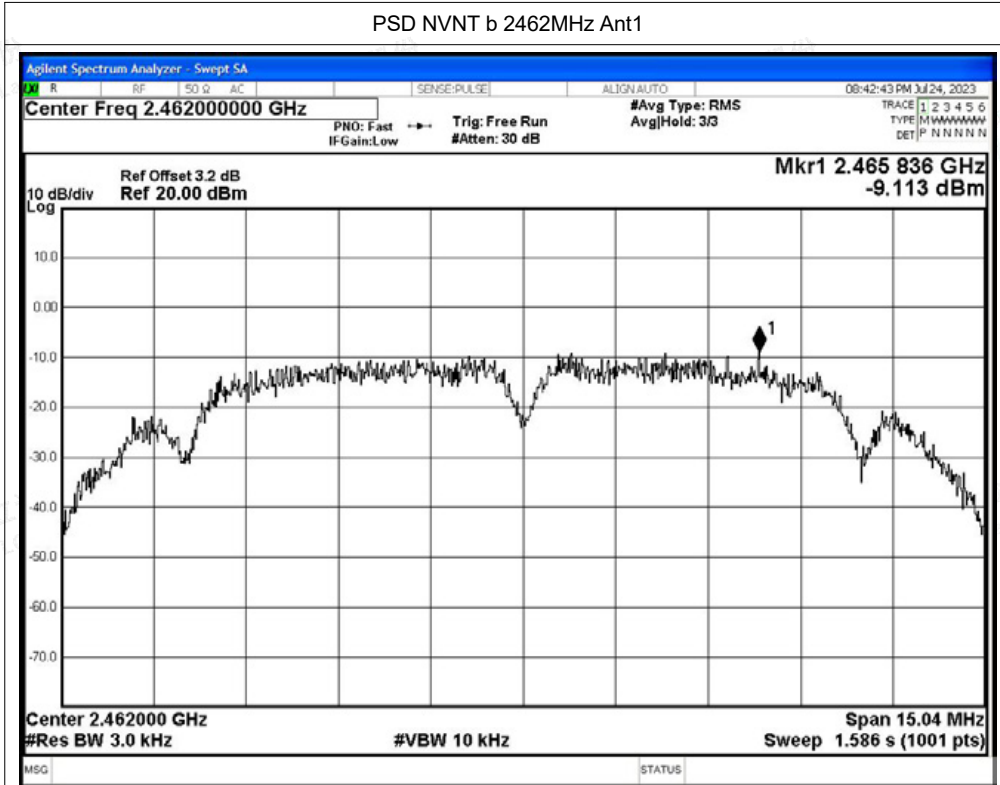


PSD NVNT b 2437MHz Ant1

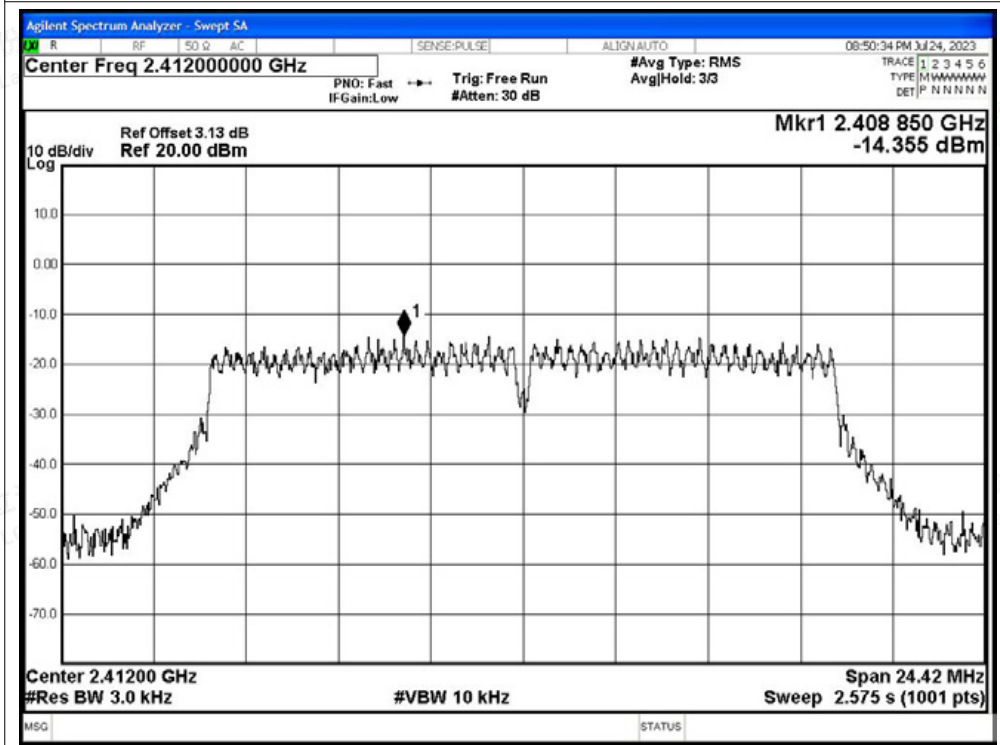




PSD NVNT b 2462MHz Ant1

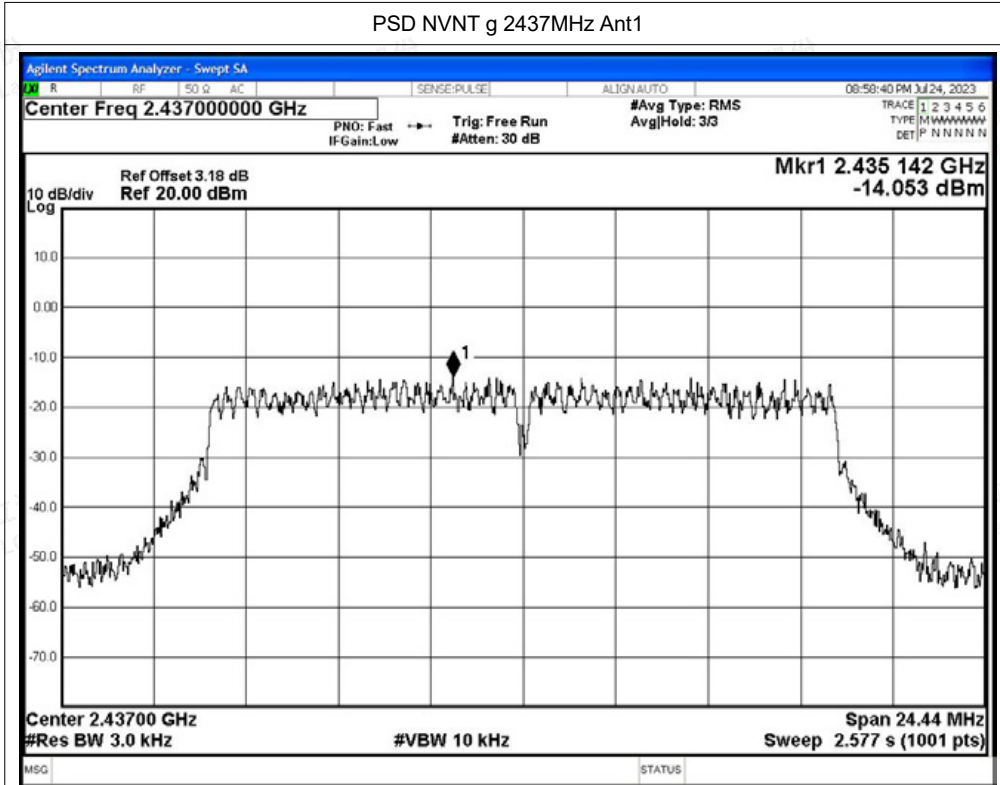


PSD NVNT g 2412MHz Ant1

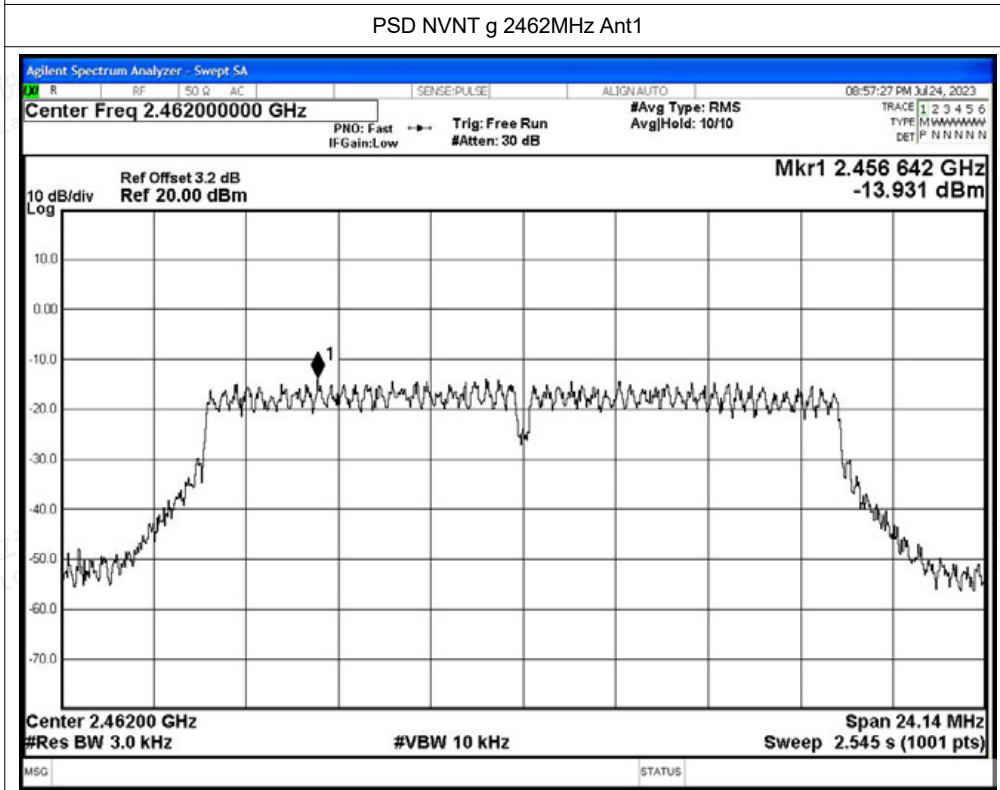


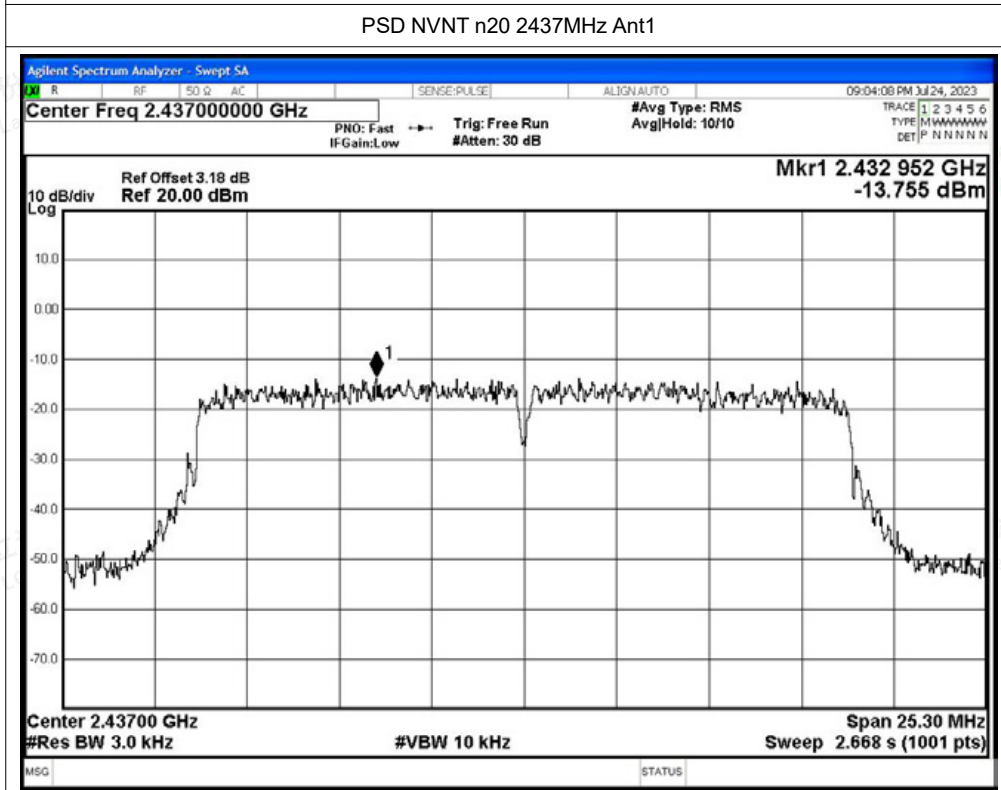
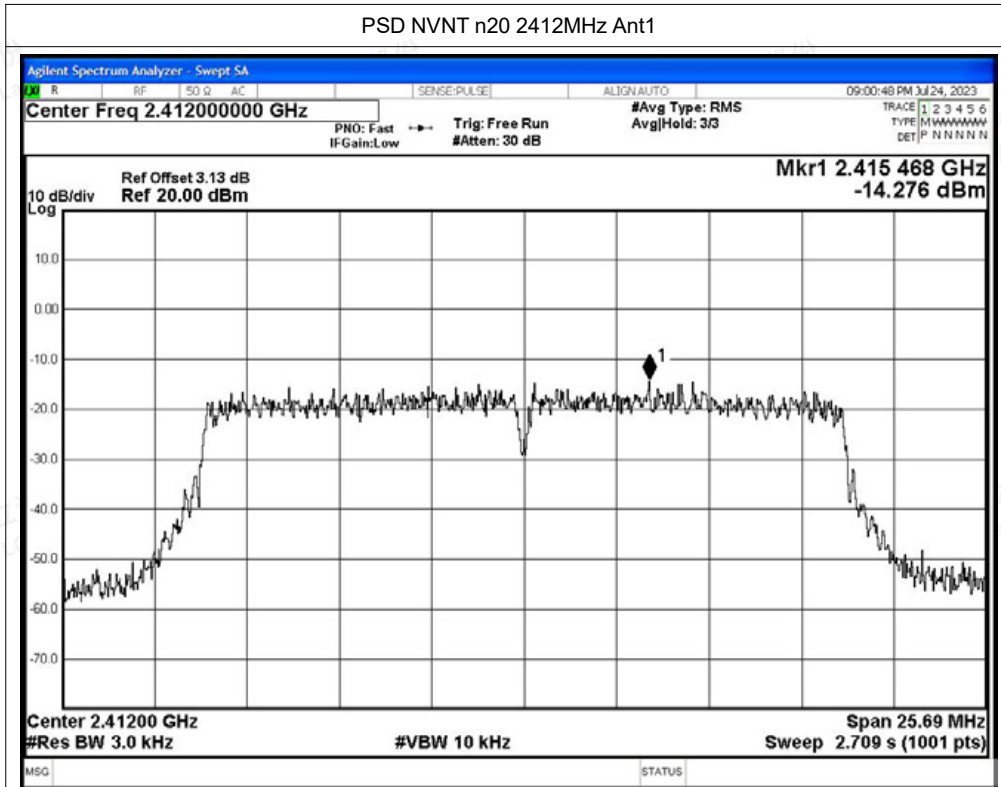


PSD NVNT g 2437MHz Ant1



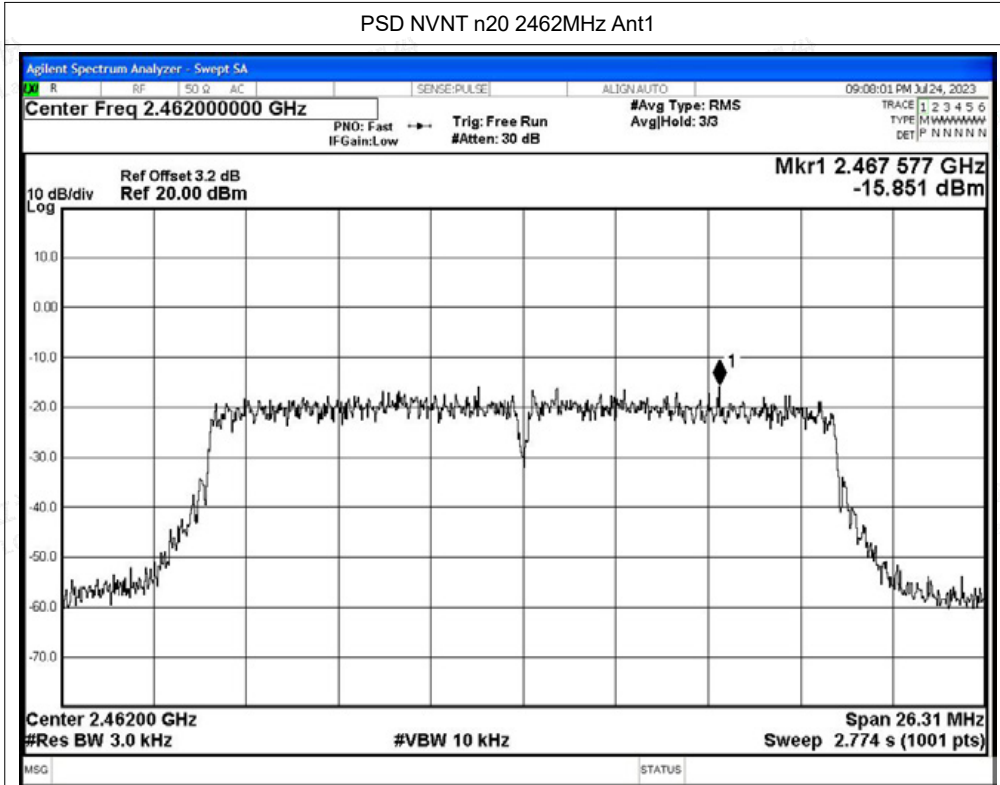
PSD NVNT g 2462MHz Ant1



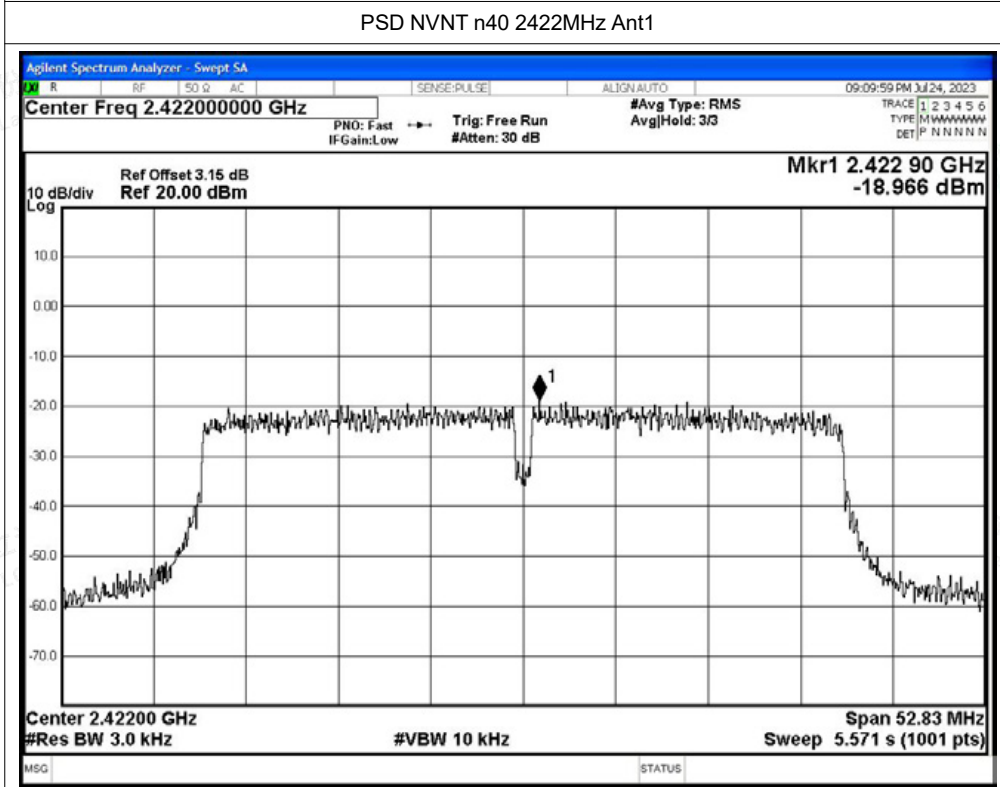




PSD NVNT n20 2462MHz Ant1

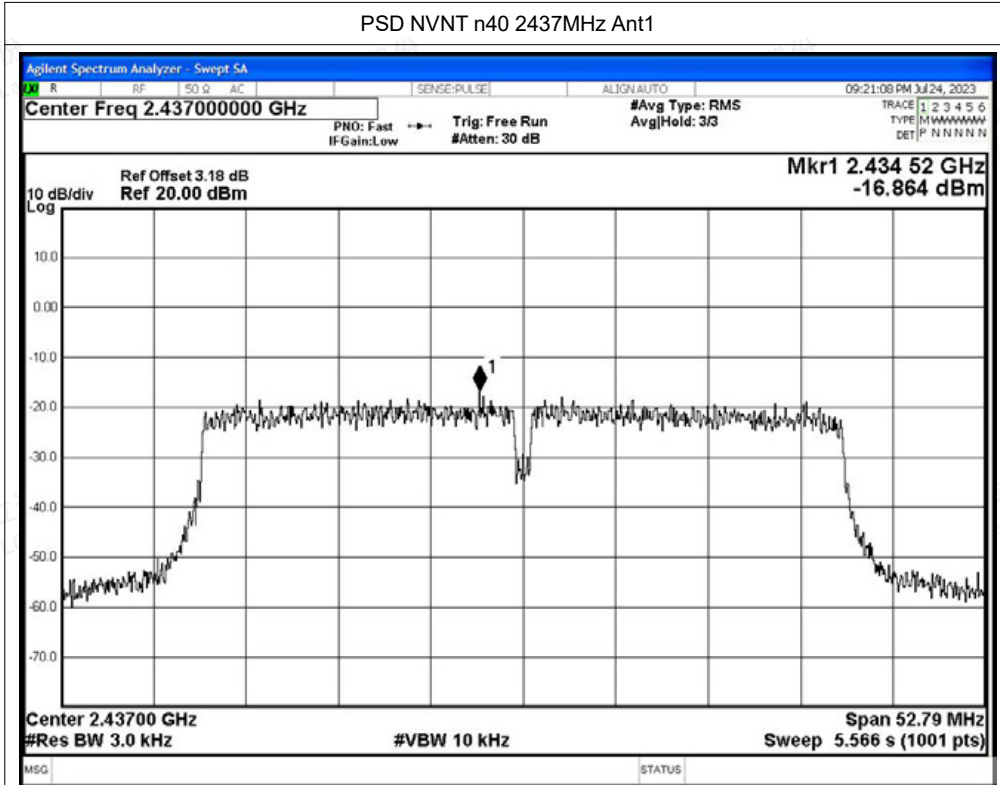


PSD NVNT n40 2422MHz Ant1

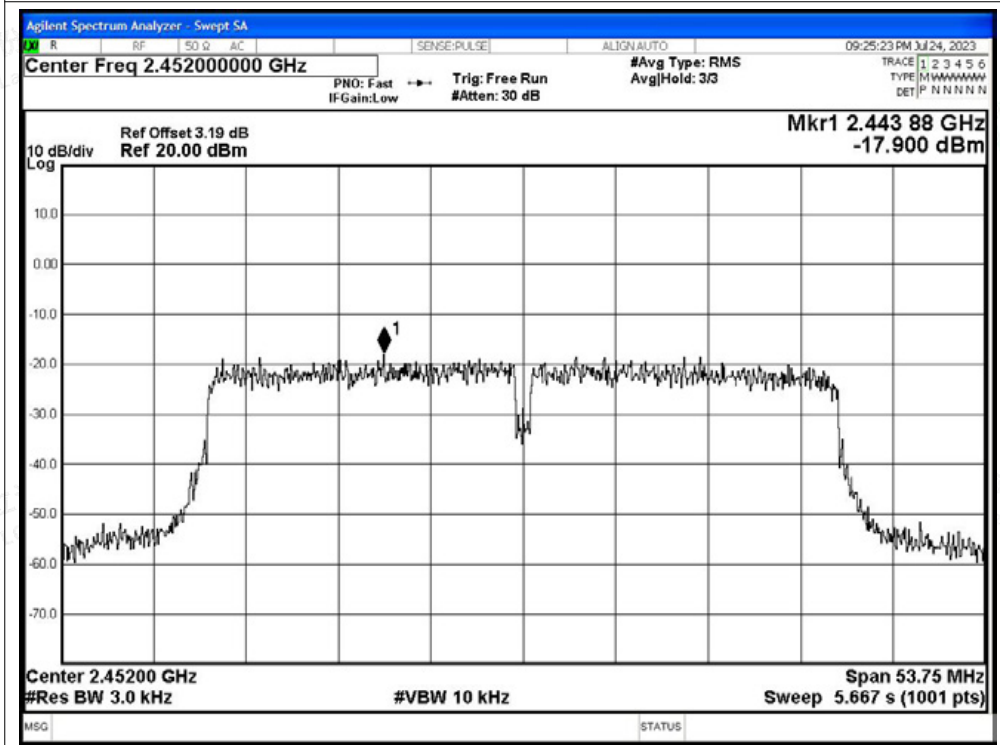




PSD NVNT n40 2437MHz Ant1



PSD NVNT n40 2452MHz Ant1





B.5 Band Edge

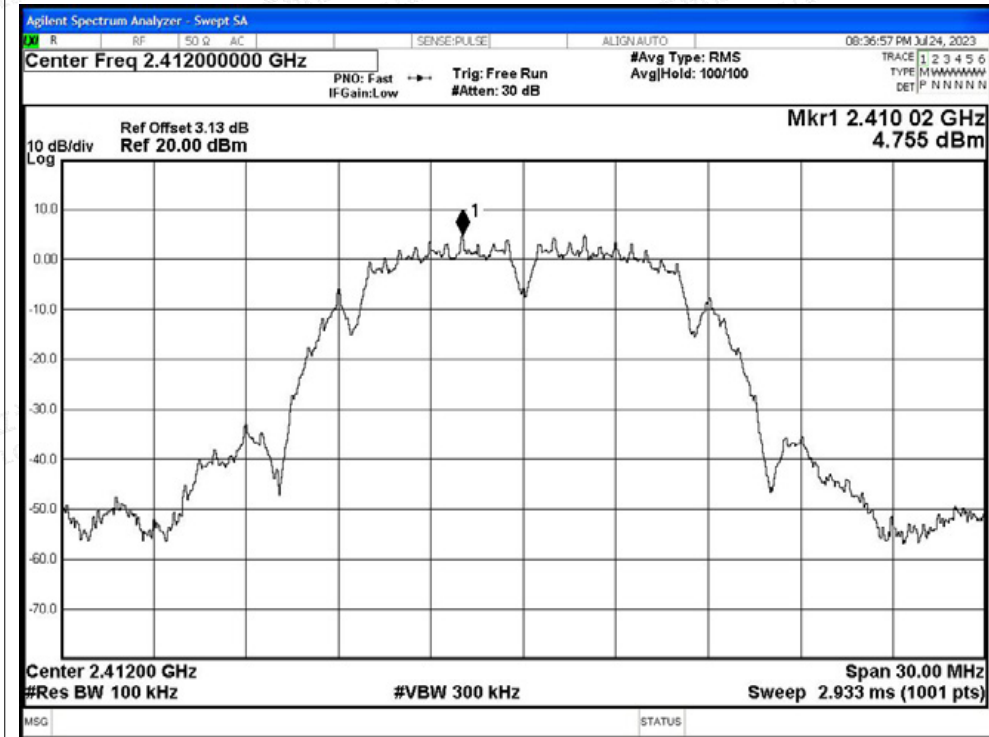
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-51.76	-20	Pass
NVNT	b	2462	Ant1	-55.19	-20	Pass
NVNT	g	2412	Ant1	-37.06	-20	Pass
NVNT	g	2462	Ant1	-50.19	-20	Pass
NVNT	n20	2412	Ant1	-33.62	-20	Pass
NVNT	n20	2462	Ant1	-47.22	-20	Pass
NVNT	n40	2422	Ant1	-31.69	-20	Pass
NVNT	n40	2452	Ant1	-38.93	-20	Pass



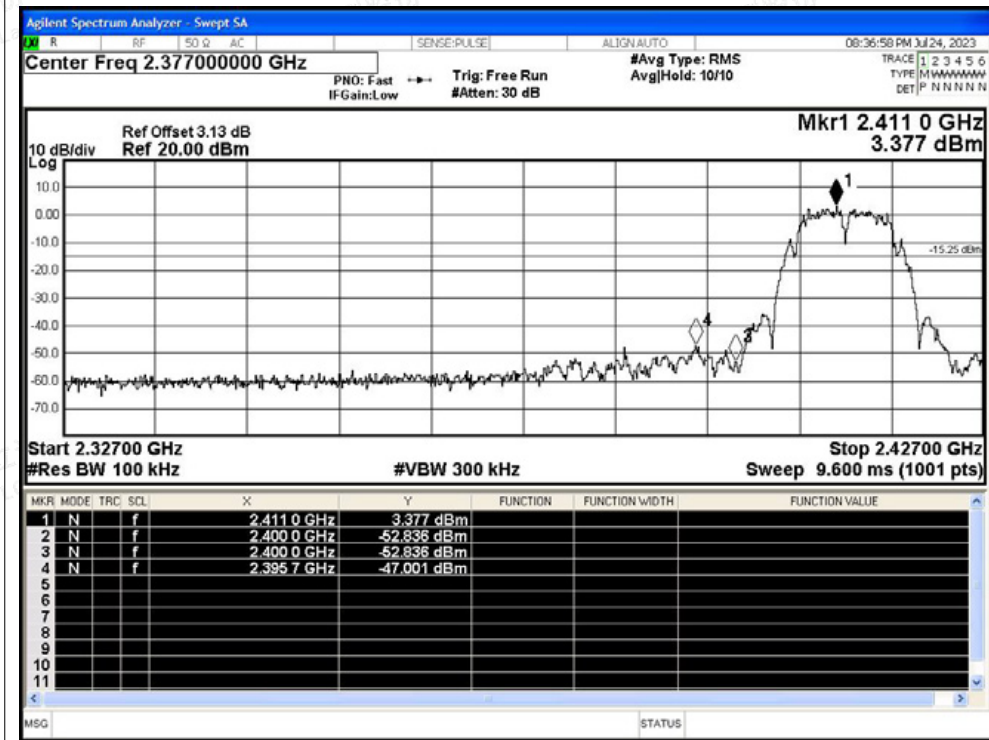


Test Graphs

Band Edge NVNT b 2412MHz Ant1 Ref

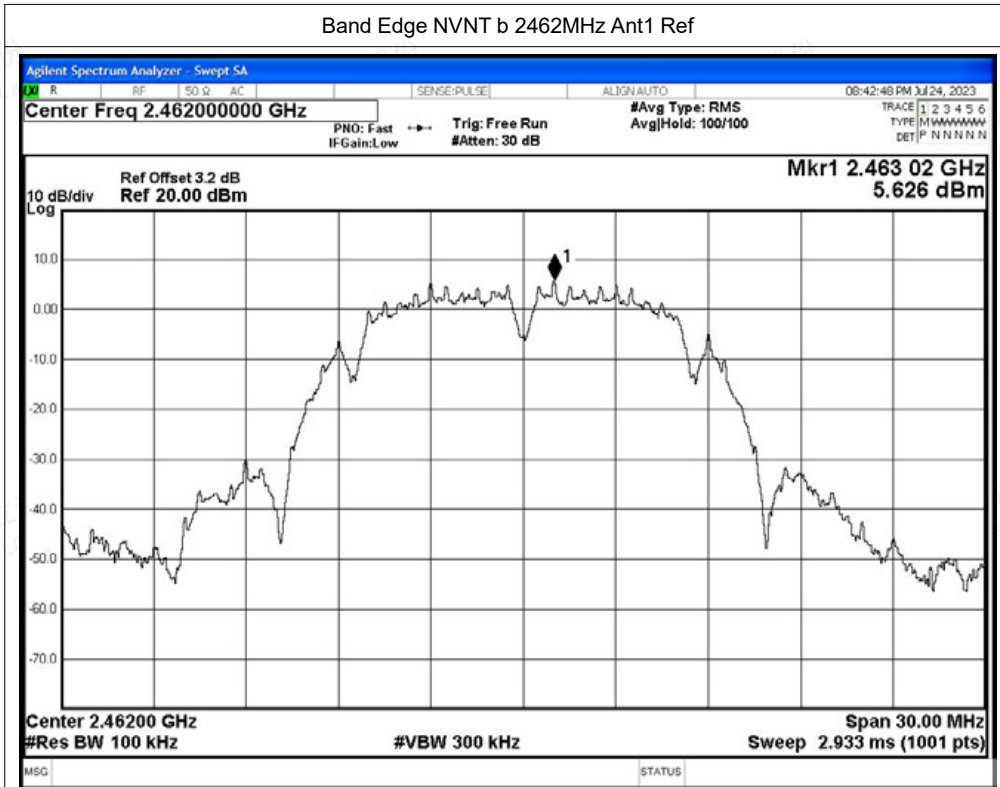


Band Edge NVNT b 2412MHz Ant1 Emission

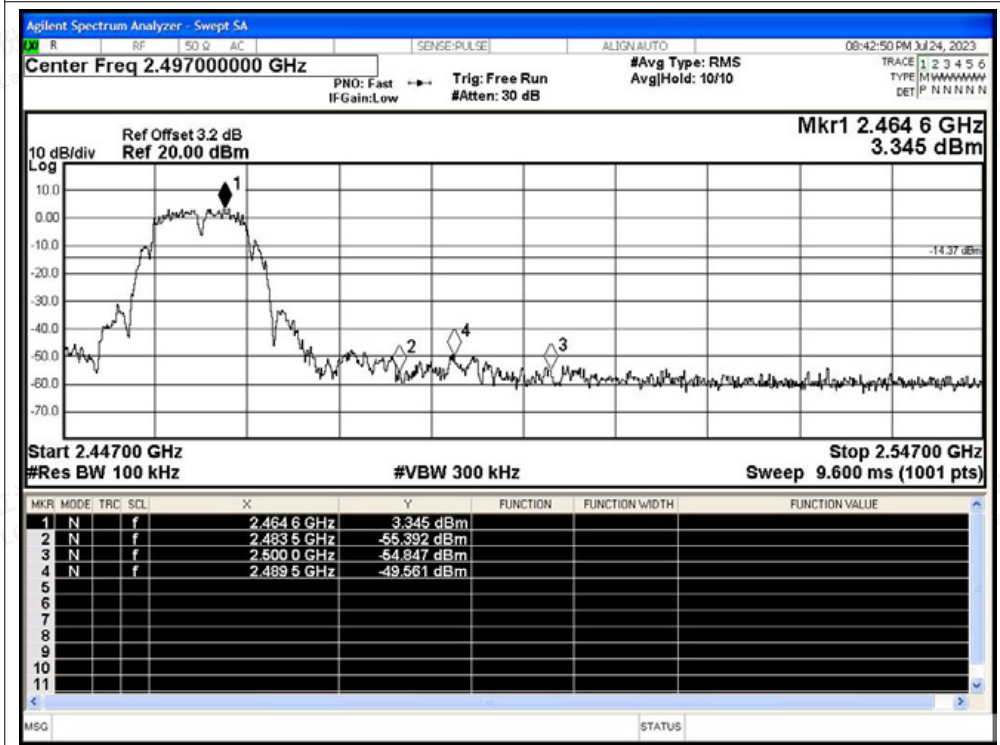




Band Edge NVNT b 2462MHz Ant1 Ref



Band Edge NVNT b 2462MHz Ant1 Emission



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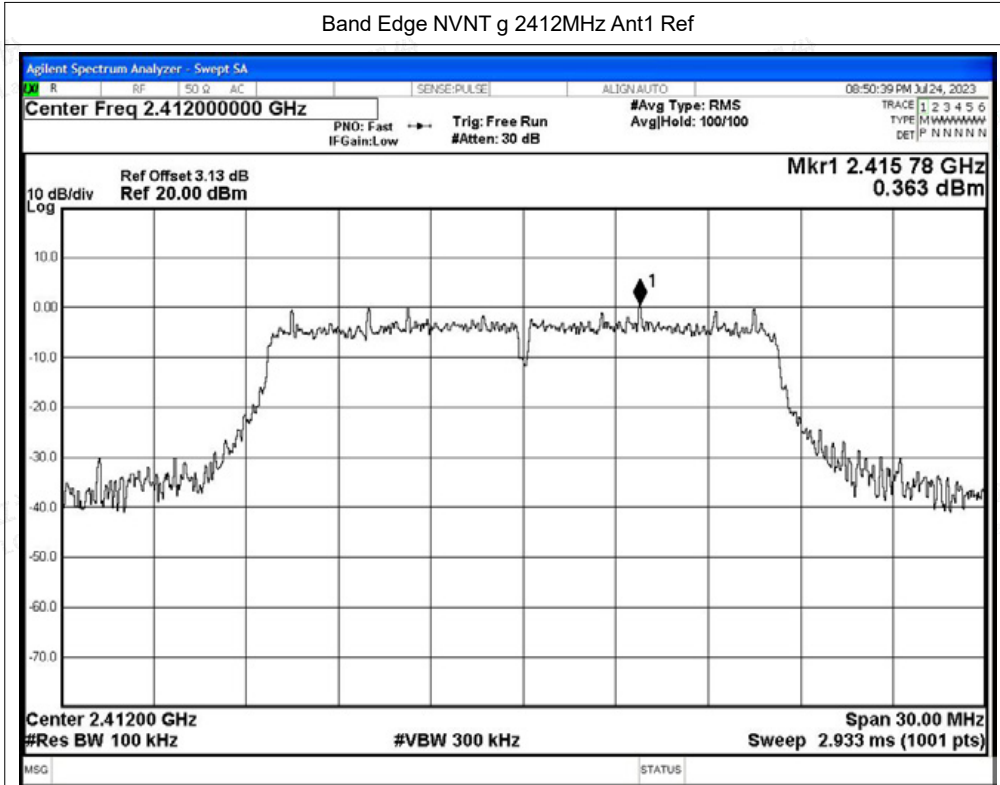
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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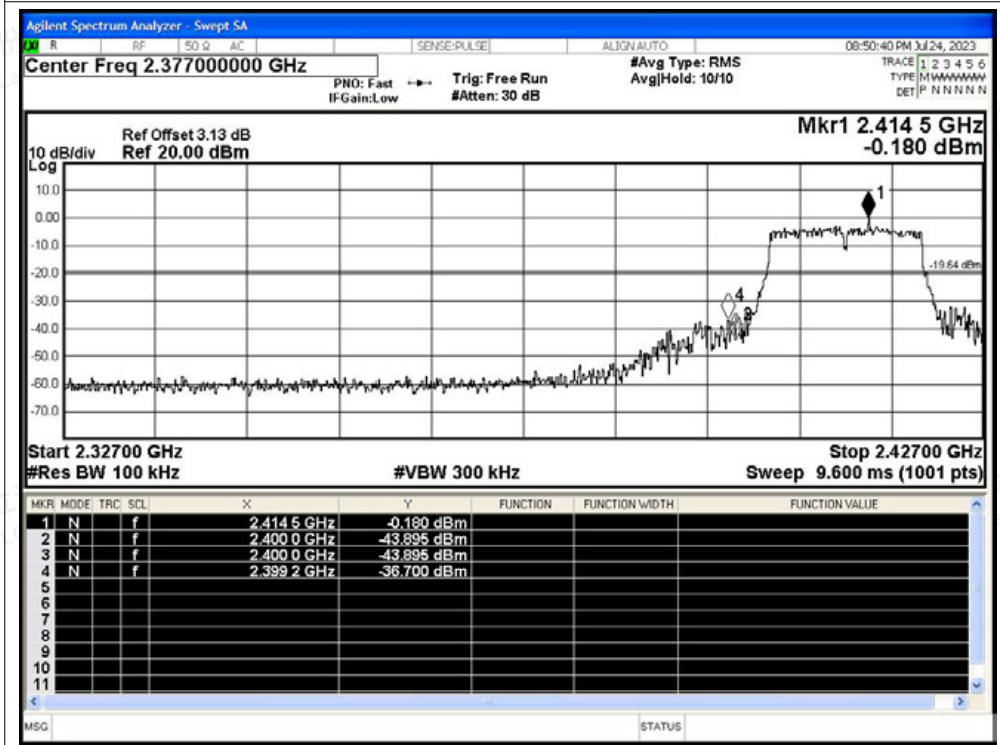
Scan code to check authenticity



Band Edge NVNT g 2412MHz Ant1 Ref



Band Edge NVNT g 2412MHz Ant1 Emission



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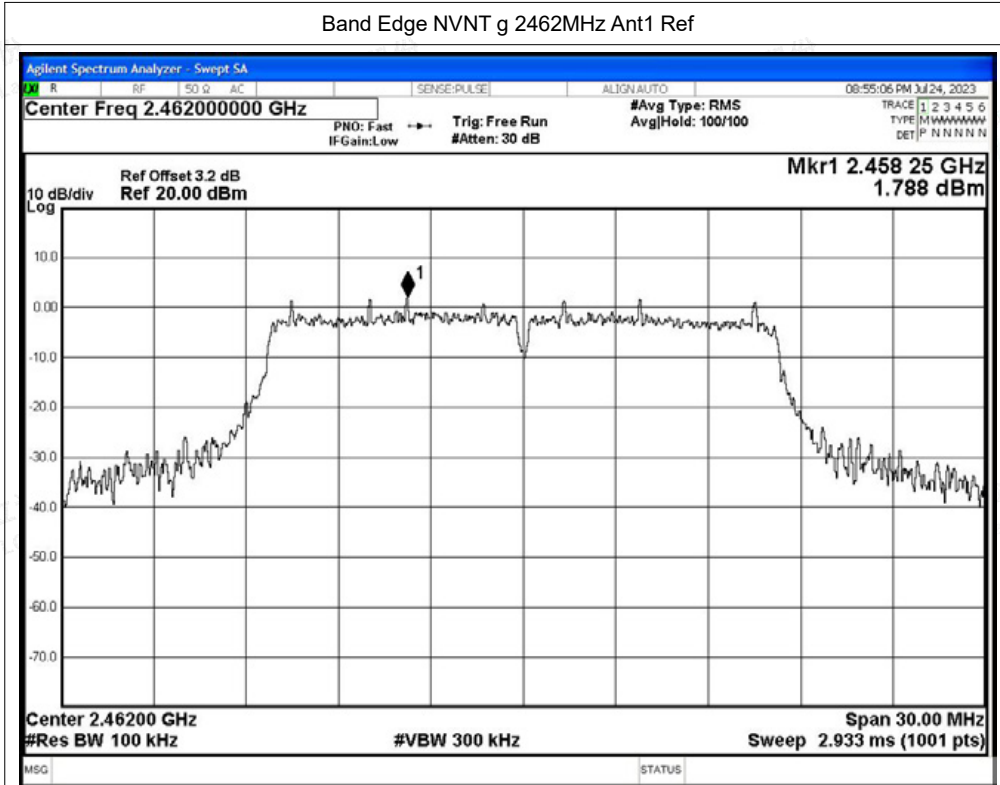
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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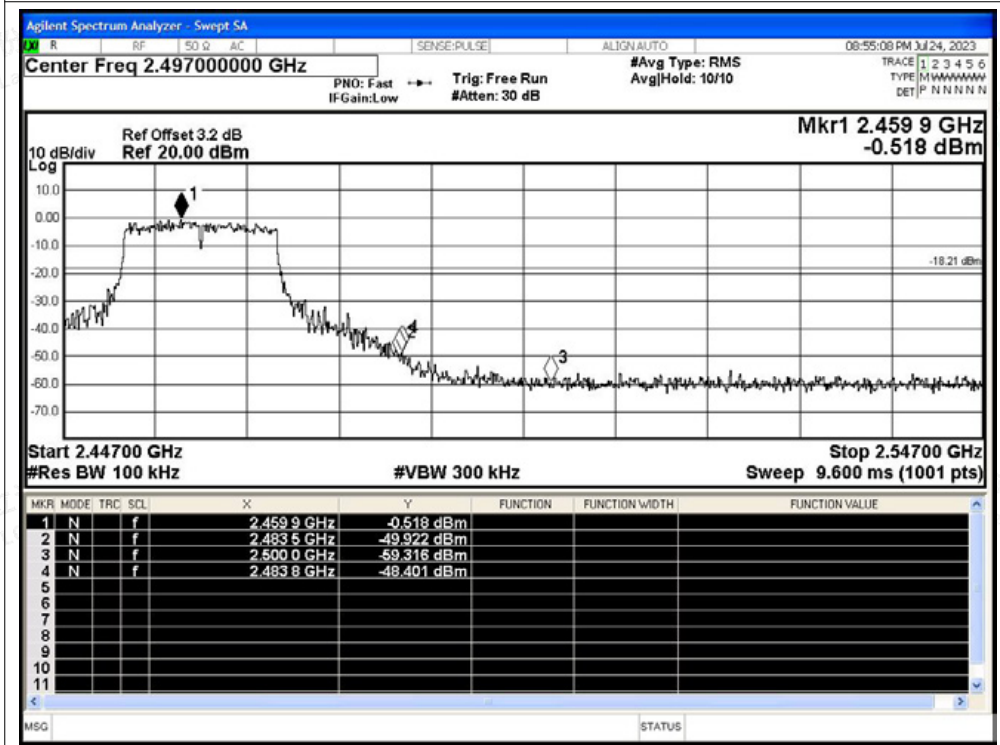
Scan code to check authenticity



Band Edge NVNT g 2462MHz Ant1 Ref



Band Edge NVNT g 2462MHz Ant1 Emission



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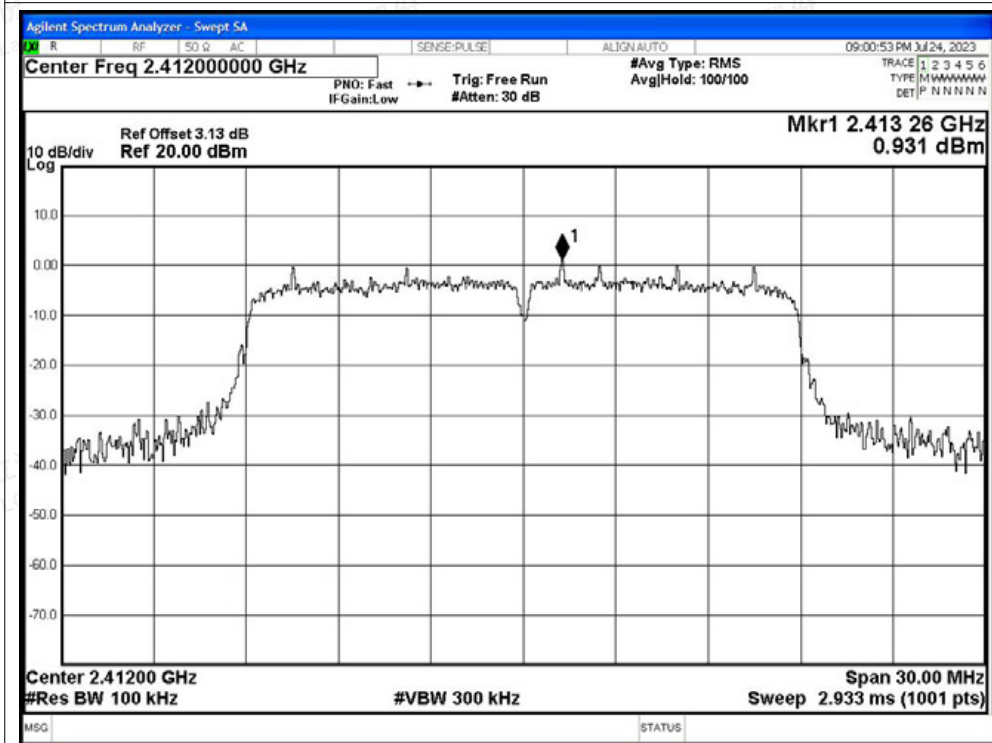
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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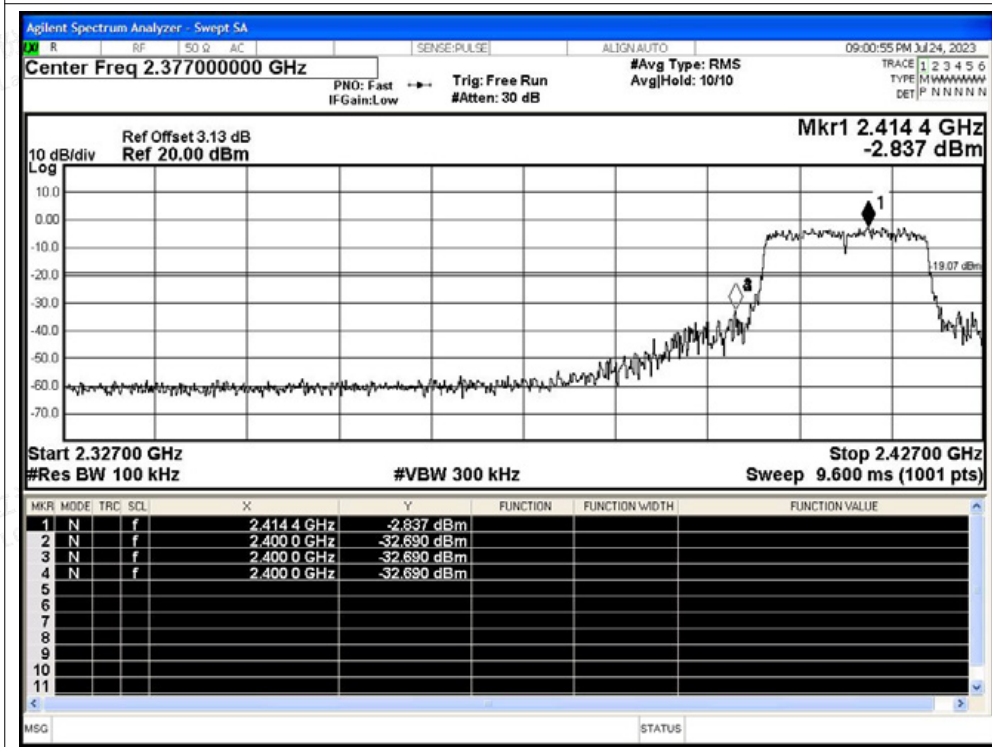
Scan code to check authenticity



Band Edge NVNT n20 2412MHz Ant1 Ref

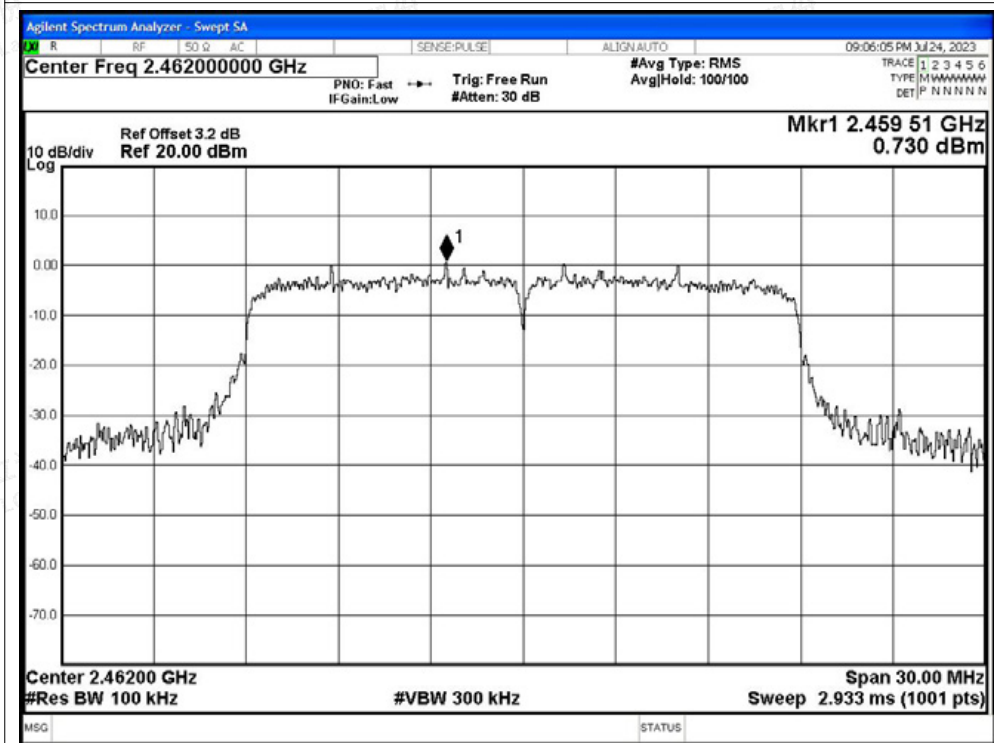


Band Edge NVNT n20 2412MHz Ant1 Emission

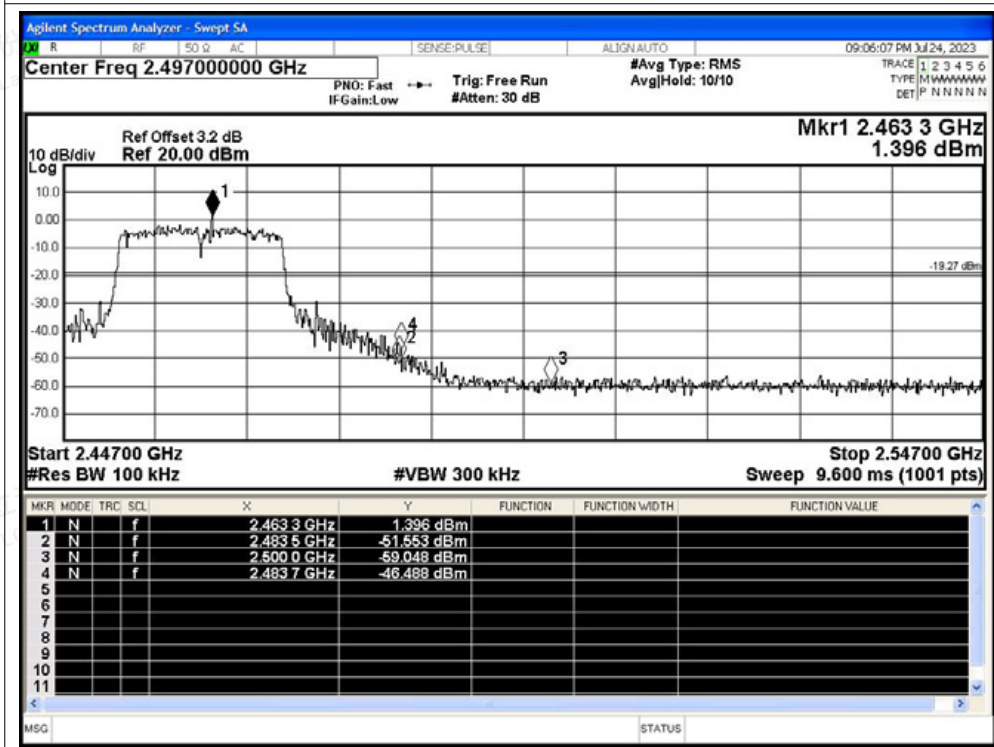




Band Edge NVNT n20 2462MHz Ant1 Ref

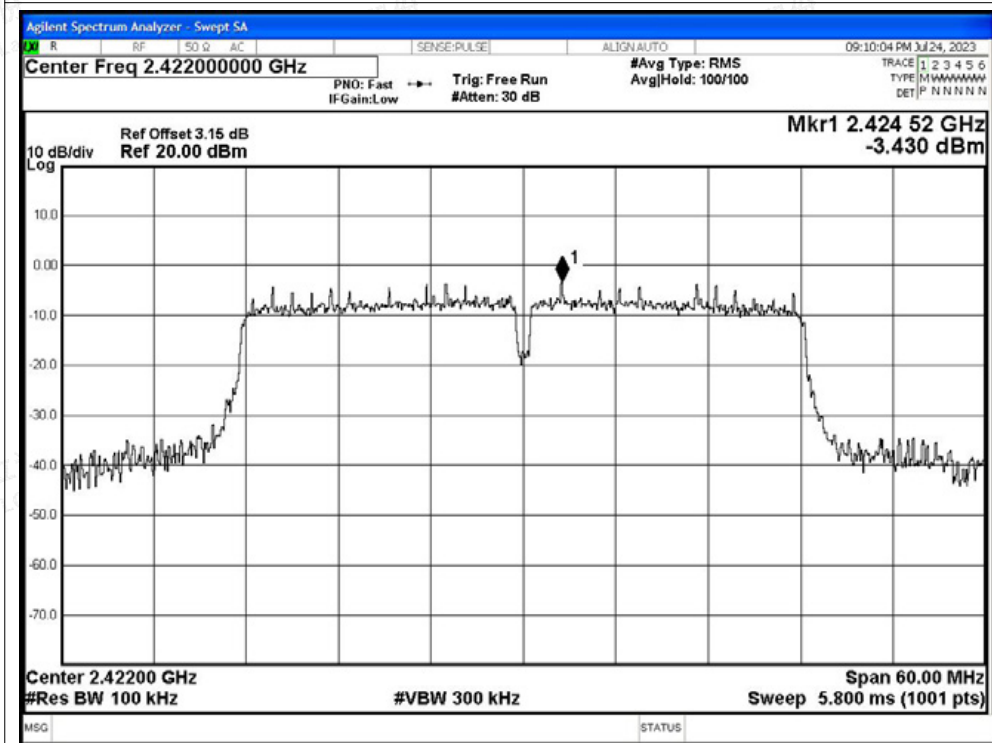


Band Edge NVNT n20 2462MHz Ant1 Emission

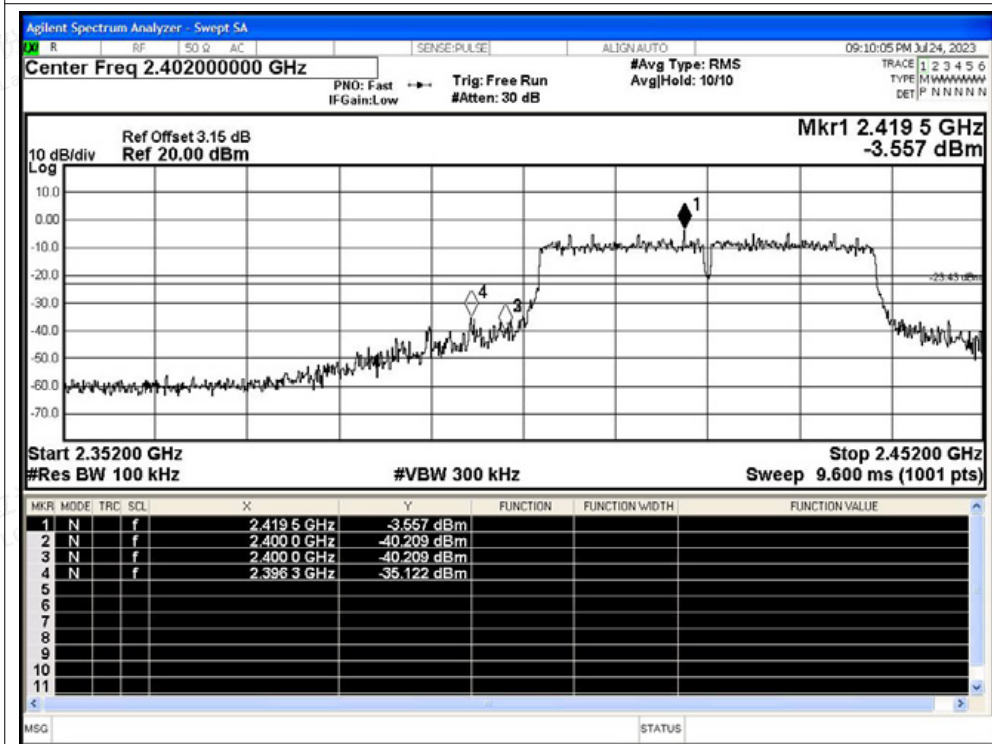




Band Edge NVNT n40 2422MHz Ant1 Ref

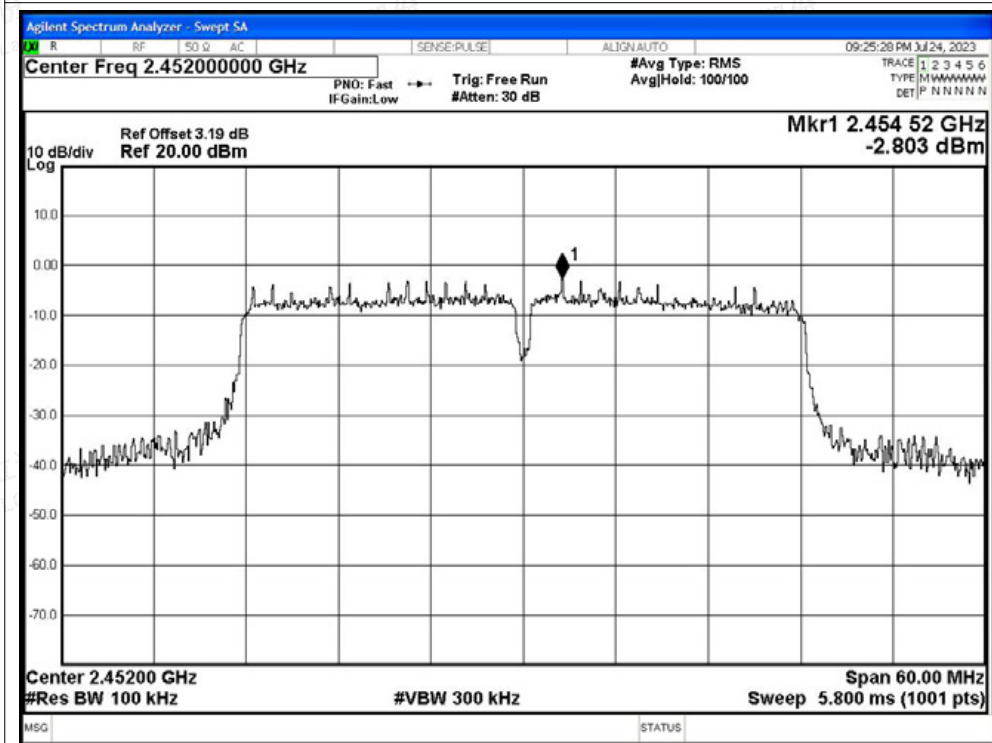


Band Edge NVNT n40 2422MHz Ant1 Emission

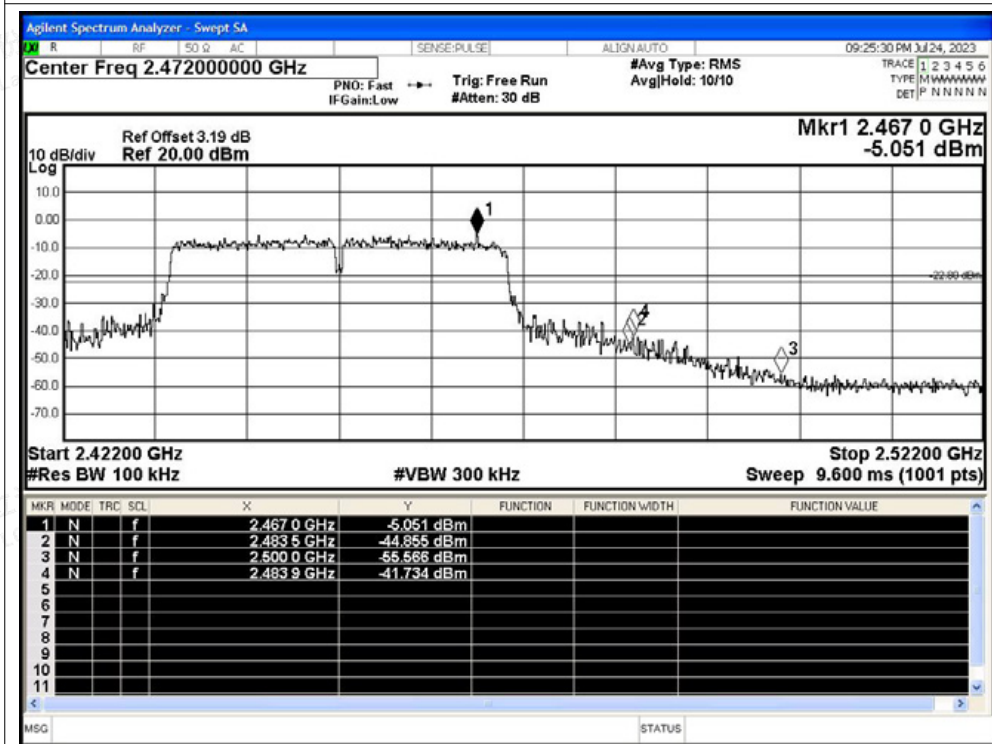




Band Edge NVNT n40 2452MHz Ant1 Ref



Band Edge NVNT n40 2452MHz Ant1 Emission



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B.6 Conducted RF Spurious Emission

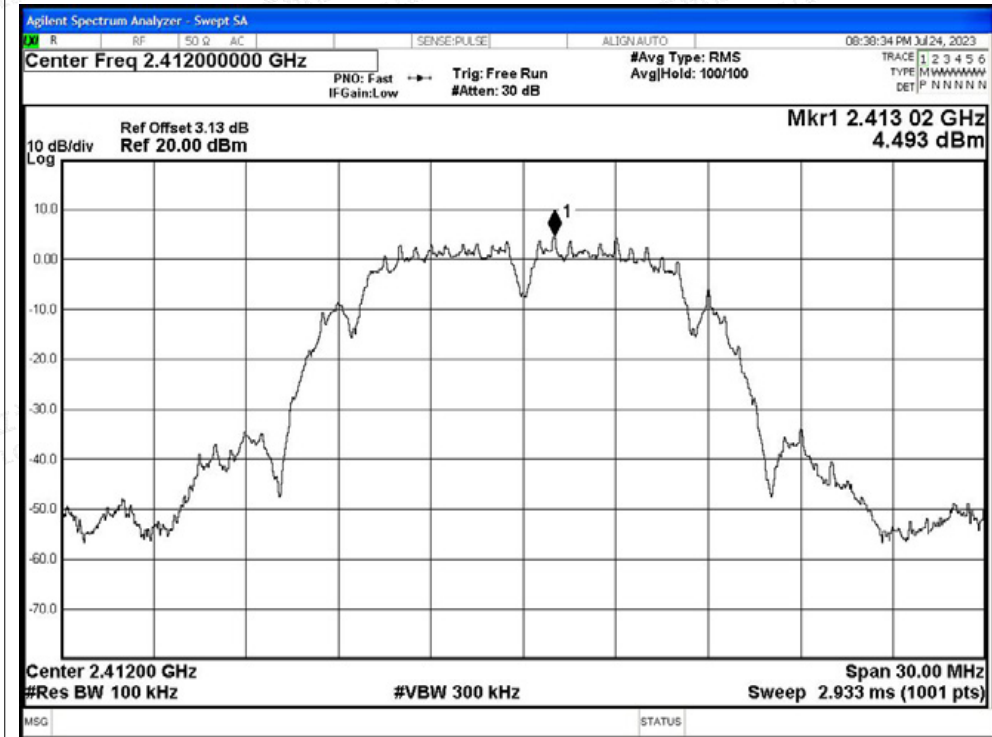
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-48.81	-20	Pass
NVNT	b	2437	Ant1	-49.68	-20	Pass
NVNT	b	2462	Ant1	-50.15	-20	Pass
NVNT	g	2412	Ant1	-44.91	-20	Pass
NVNT	g	2437	Ant1	-46.78	-20	Pass
NVNT	g	2462	Ant1	-46.47	-20	Pass
NVNT	n20	2412	Ant1	-44.87	-20	Pass
NVNT	n20	2437	Ant1	-46.98	-20	Pass
NVNT	n20	2462	Ant1	-45.75	-20	Pass
NVNT	n40	2422	Ant1	-41.61	-20	Pass
NVNT	n40	2437	Ant1	-41.46	-20	Pass
NVNT	n40	2452	Ant1	-41.11	-20	Pass



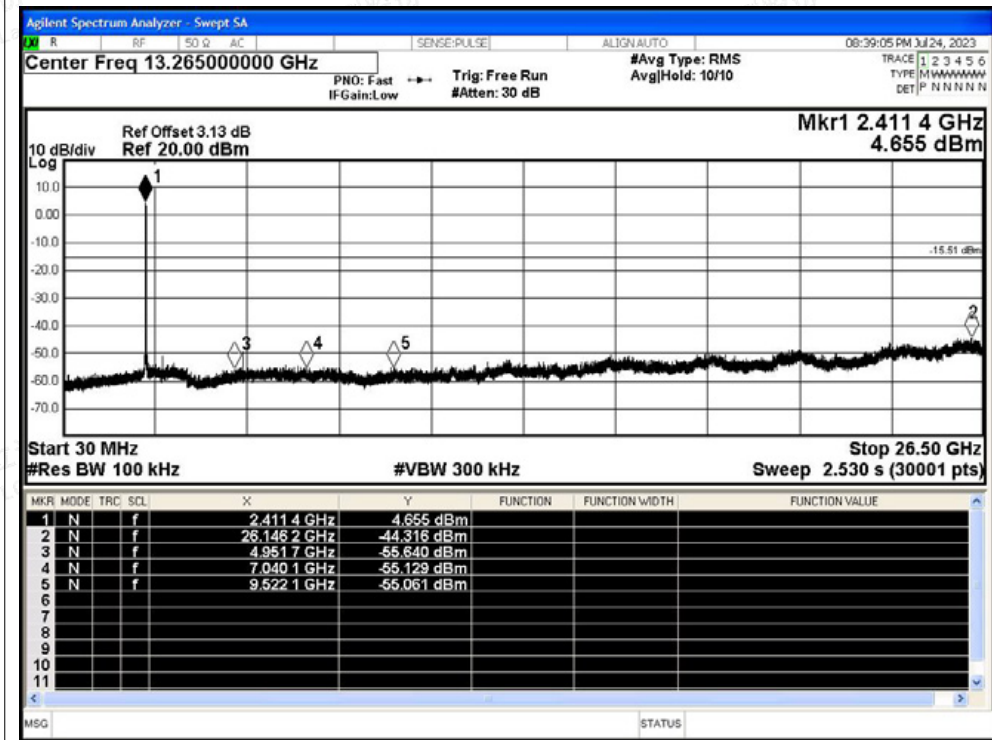


Test Graphs

Tx. Spurious NVNT b 2412MHz Ant1 Ref



Tx. Spurious NVNT b 2412MHz Ant1 Emission



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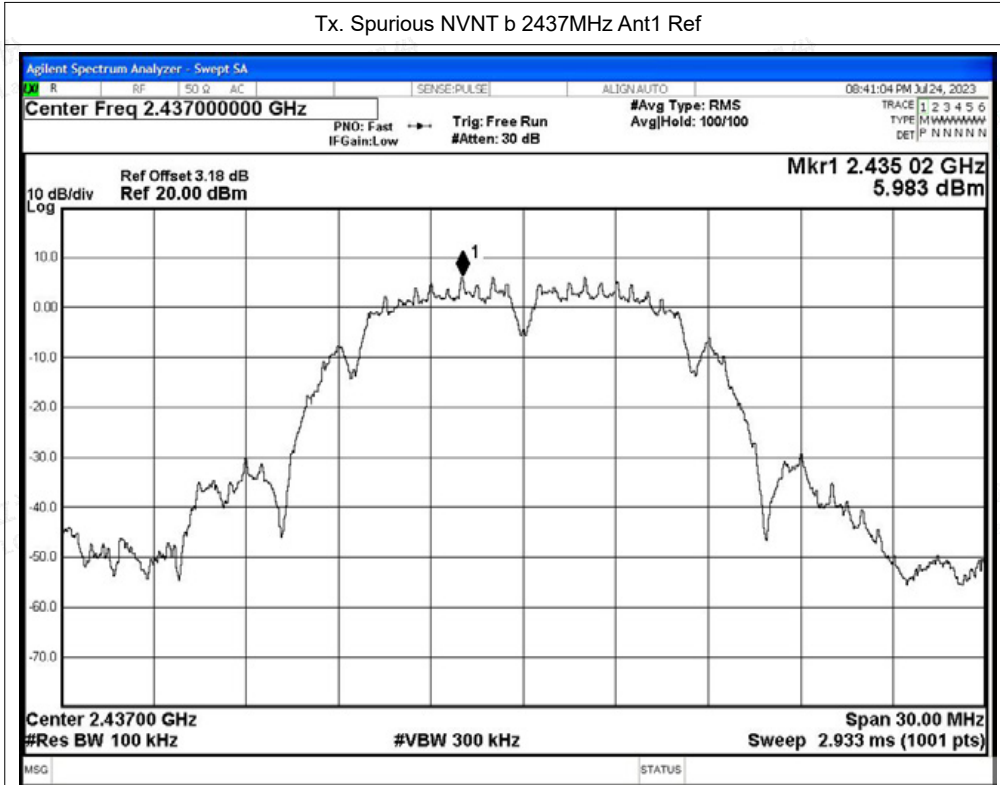
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

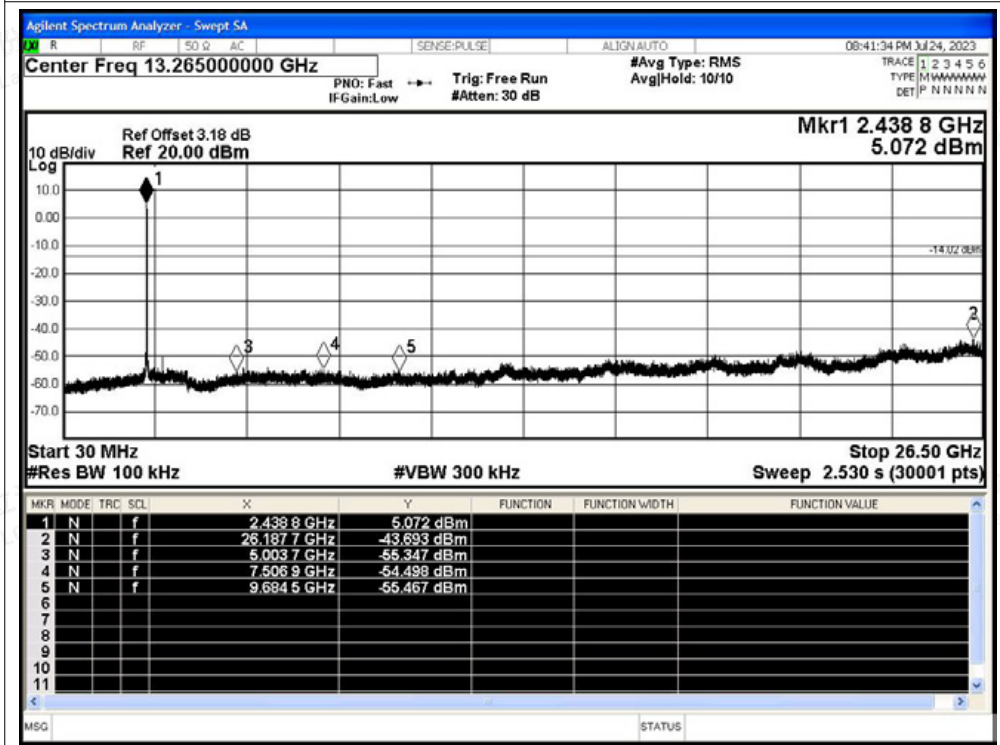
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Tx. Spurious NVNT b 2437MHz Ant1 Ref



Tx. Spurious NVNT b 2437MHz Ant1 Emission



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