Appendix A

RF Test Data for 900MHz (Conducted Measurement)

Product Name: BDE Ultra-Low Power & Long-Range Wi-Fi HaLow Module

Test Model: BDE-HWF7394N-US

Environmental Conditions

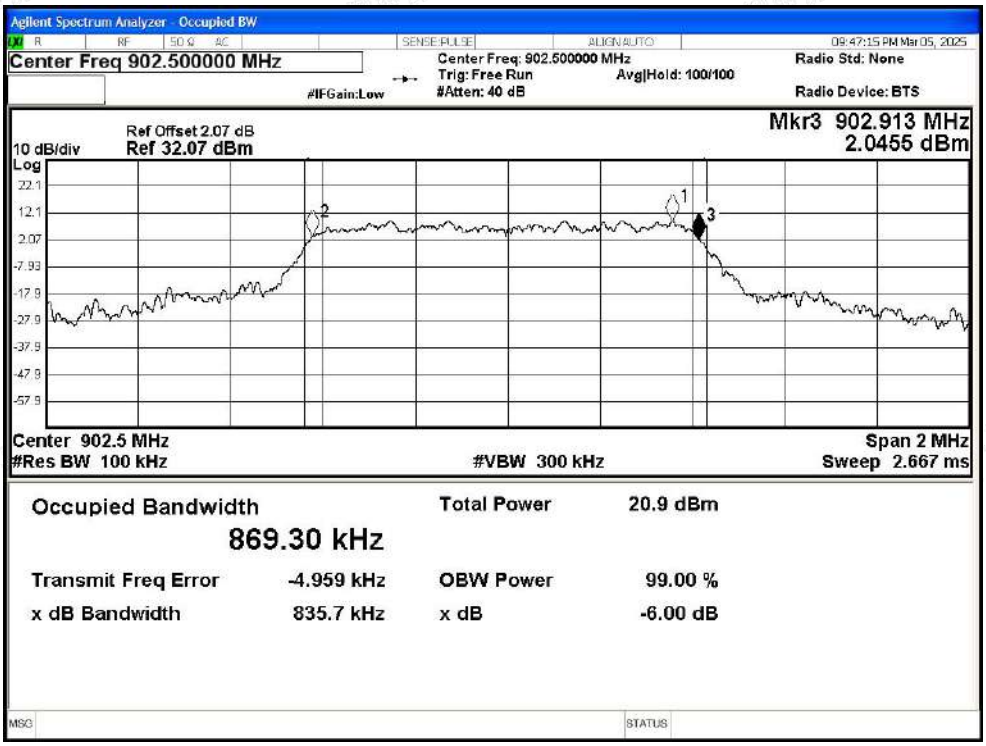
Temperature:	23.5° C
Relative Humidity:	52.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Jose Zhu
Supervised by:	Nick Peng

A.1 -6dB Bandwidth

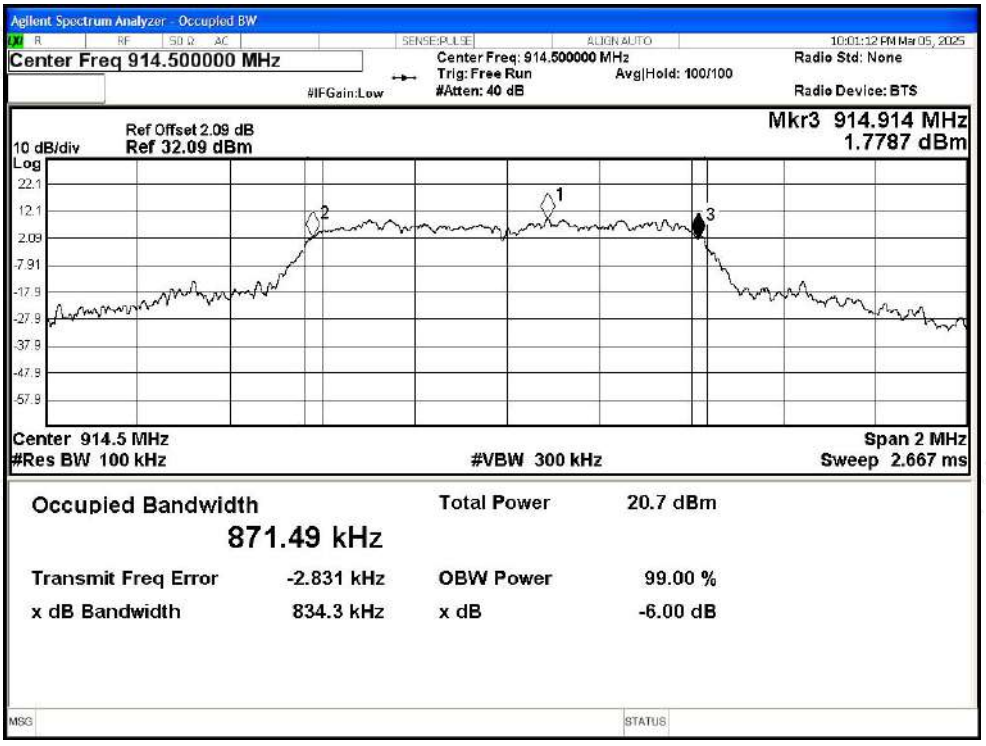
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	11ah 1M	902.5	Ant1	0.836	>=0.5	Pass
NVNT	11ah 1M	914.5	Ant1	0.834	>=0.5	Pass
NVNT	11ah 1M	927.5	Ant1	0.839	>=0.5	Pass
NVNT	11ah 2M	903	Ant1	1.768	>=0.5	Pass
NVNT	11ah 2M	913	Ant1	1.763	>=0.5	Pass
NVNT	11ah 2M	927	Ant1	1.762	>=0.5	Pass
NVNT	11ah 4M	906	Ant1	3.605	>=0.5	Pass
NVNT	11ah 4M	914	Ant1	3.613	>=0.5	Pass
NVNT	11ah 4M	926	Ant1	3.614	>=0.5	Pass

Test Graphs

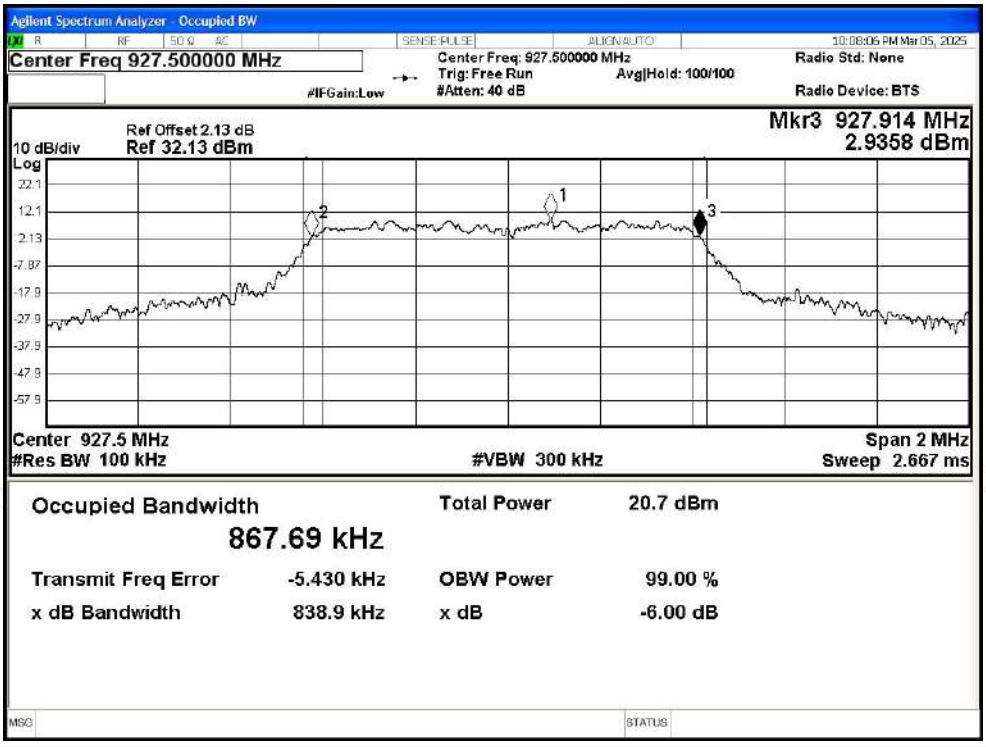
-6dB Bandwidth NVNT 802.11ah 1M 902.5MHz Ant1



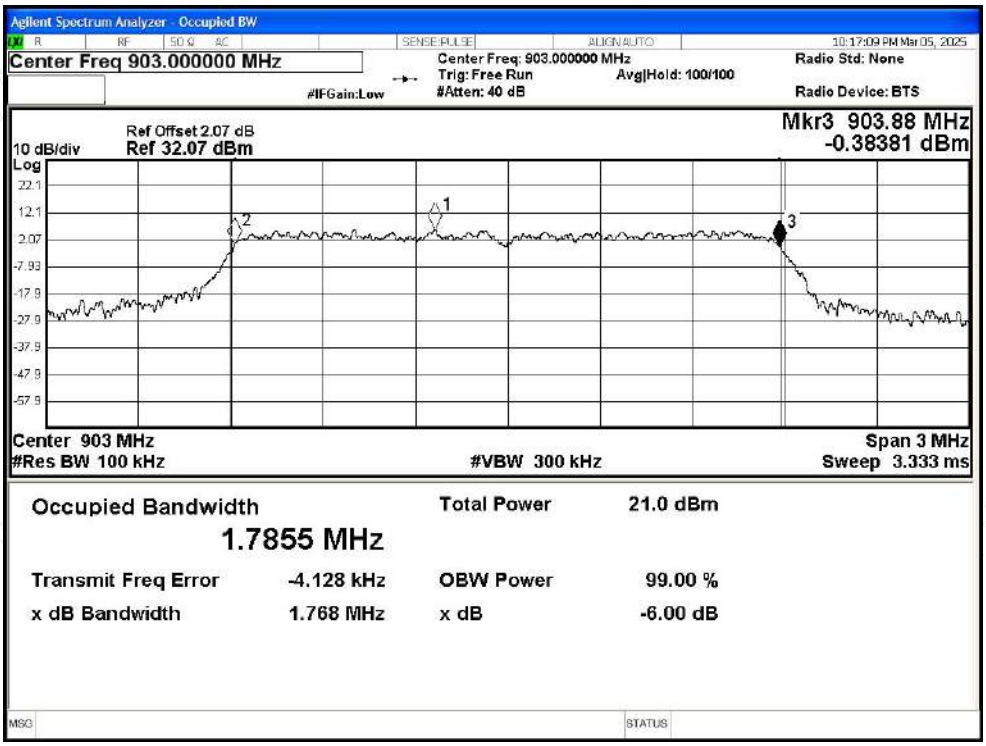
-6dB Bandwidth NVNT 802.11ah 1M 914.5MHz Ant1



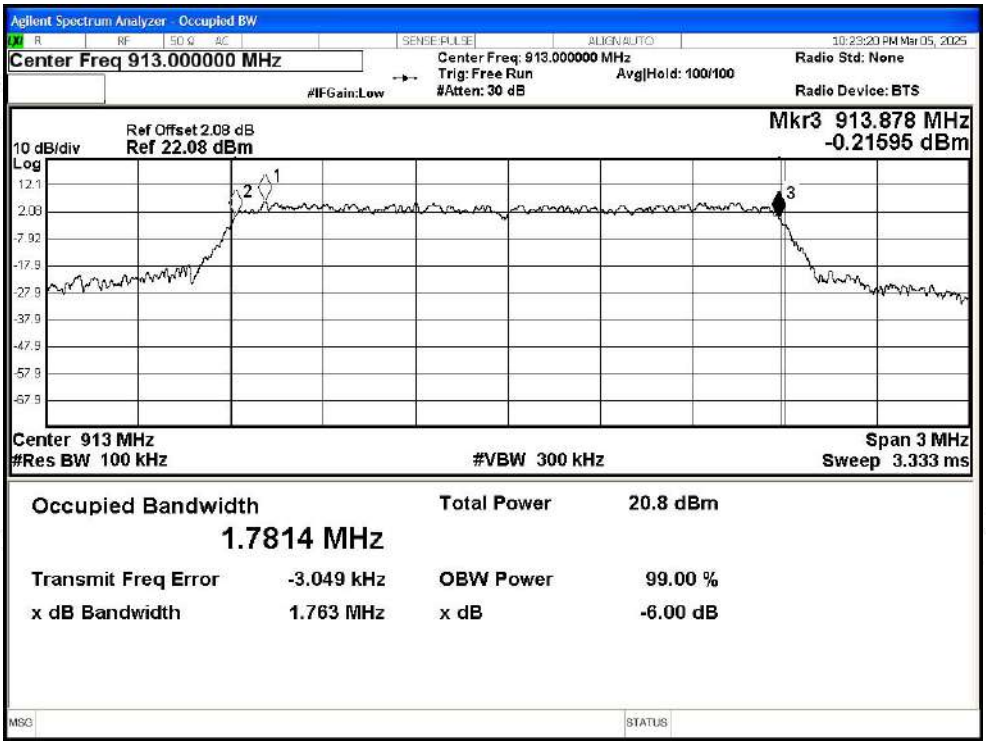
-6dB Bandwidth NVNT 802.11ah 1M 927.5MHz Ant1



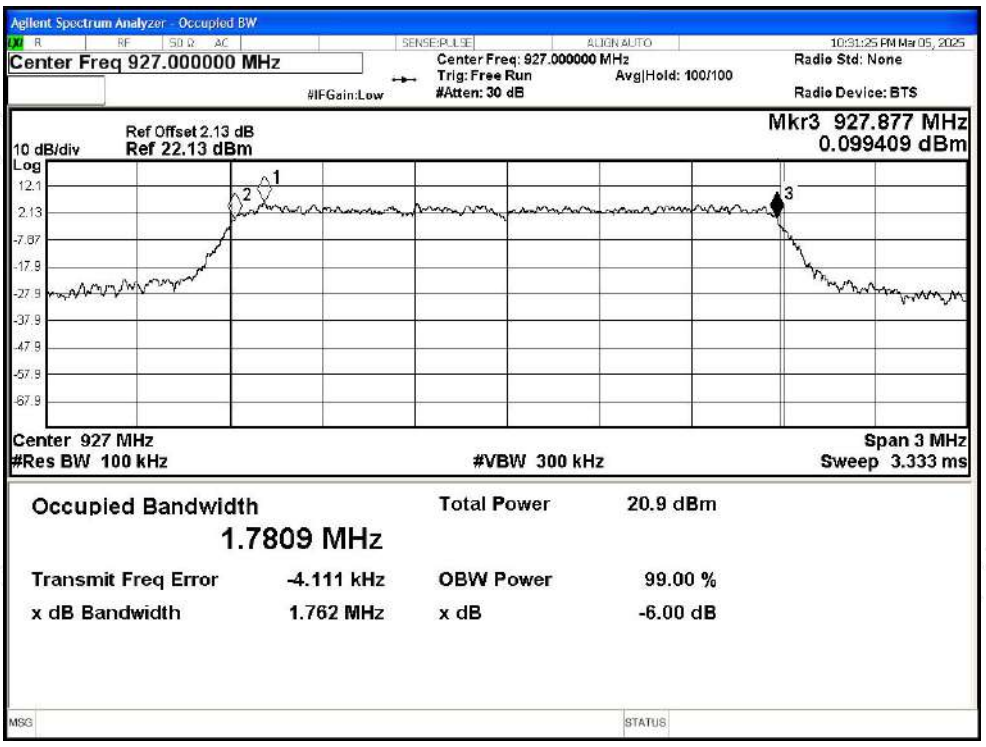
-6dB Bandwidth NVNT 802.11ah 2M 903MHz Ant1



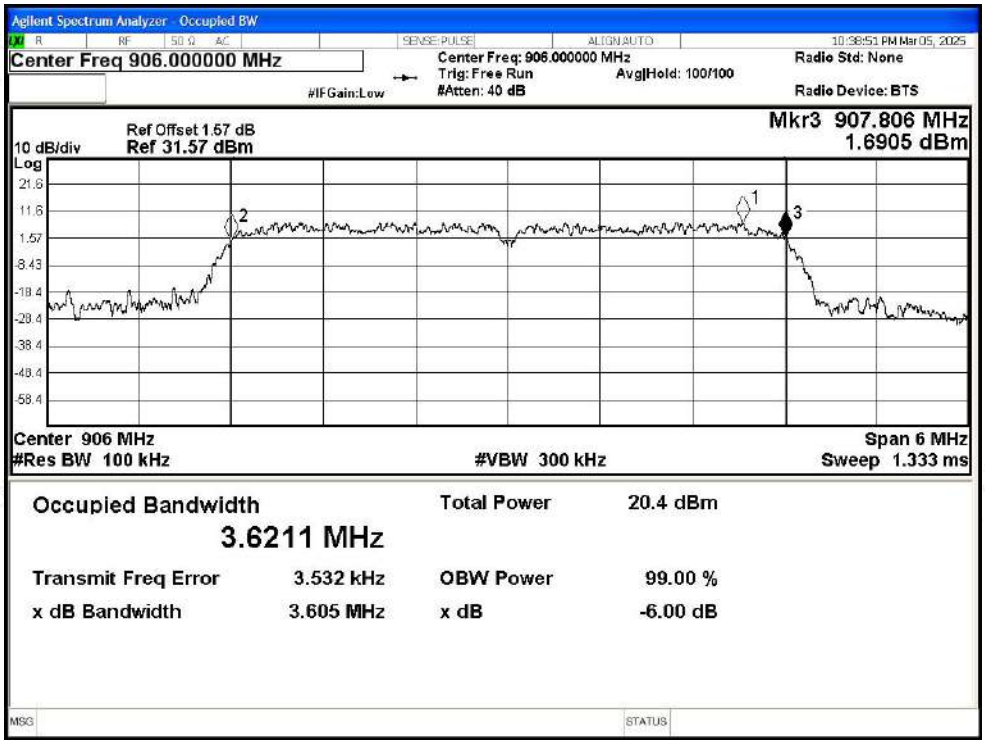
-6dB Bandwidth NVNT 802.11ah 2M 913MHz Ant1



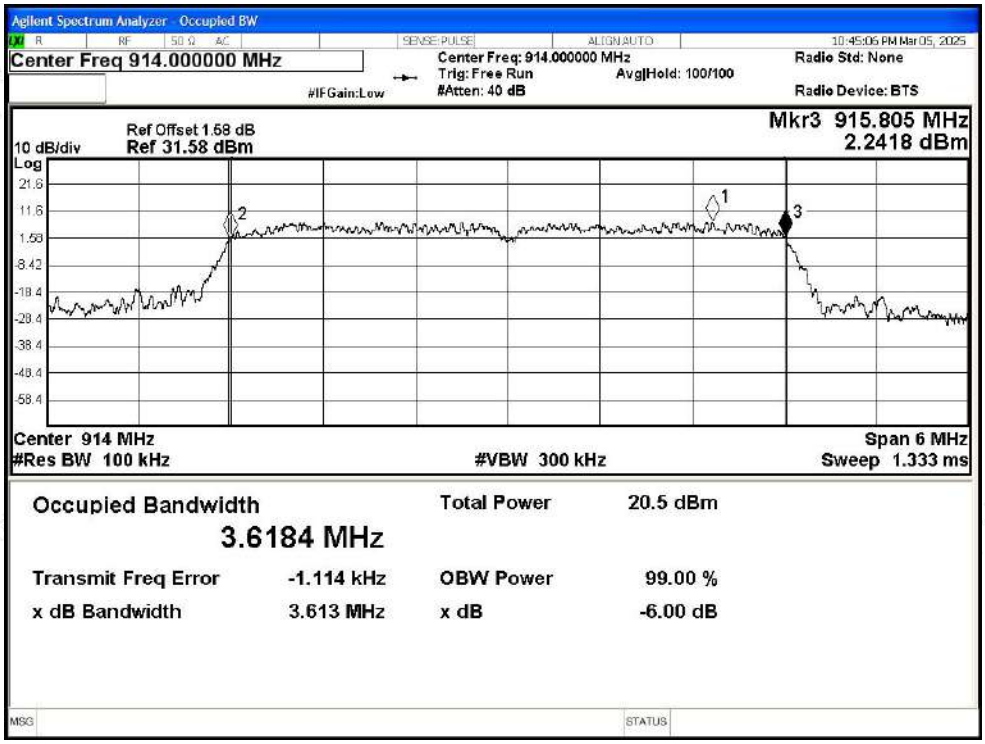
-6dB Bandwidth NVNT 802.11ah 2M 927MHz Ant1



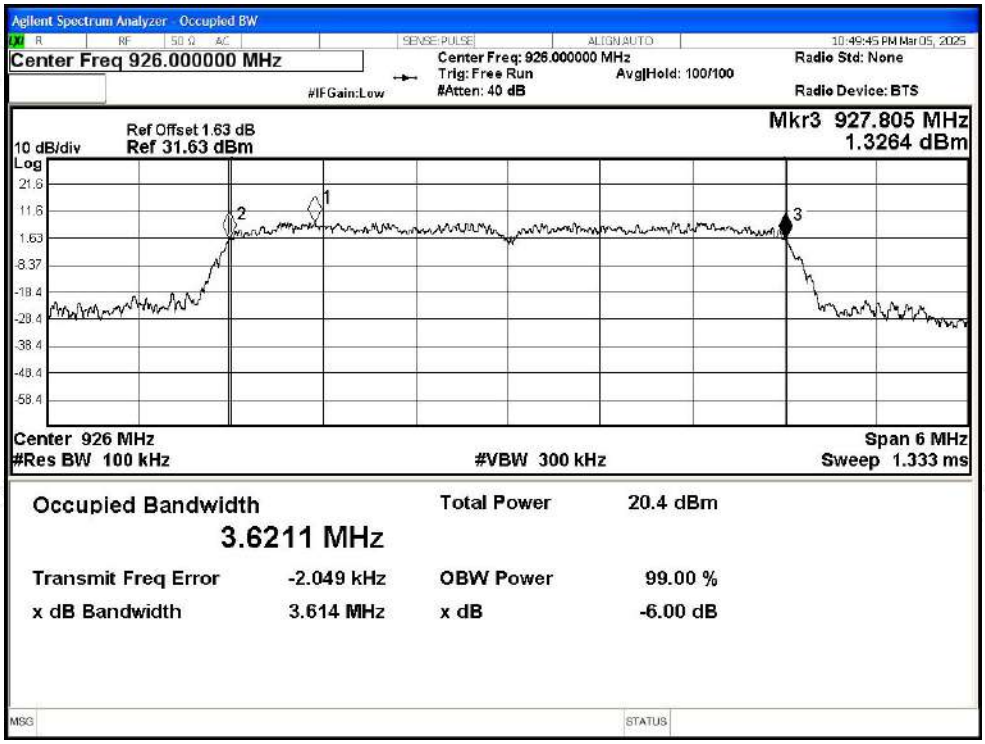
-6dB Bandwidth NVNT 802.11ah 4M 906MHz Ant1



-6dB Bandwidth NVNT 802.11ah 4M 914MHz Ant1



-6dB Bandwidth NVNT 802.11ah 4M 926MHz Ant1

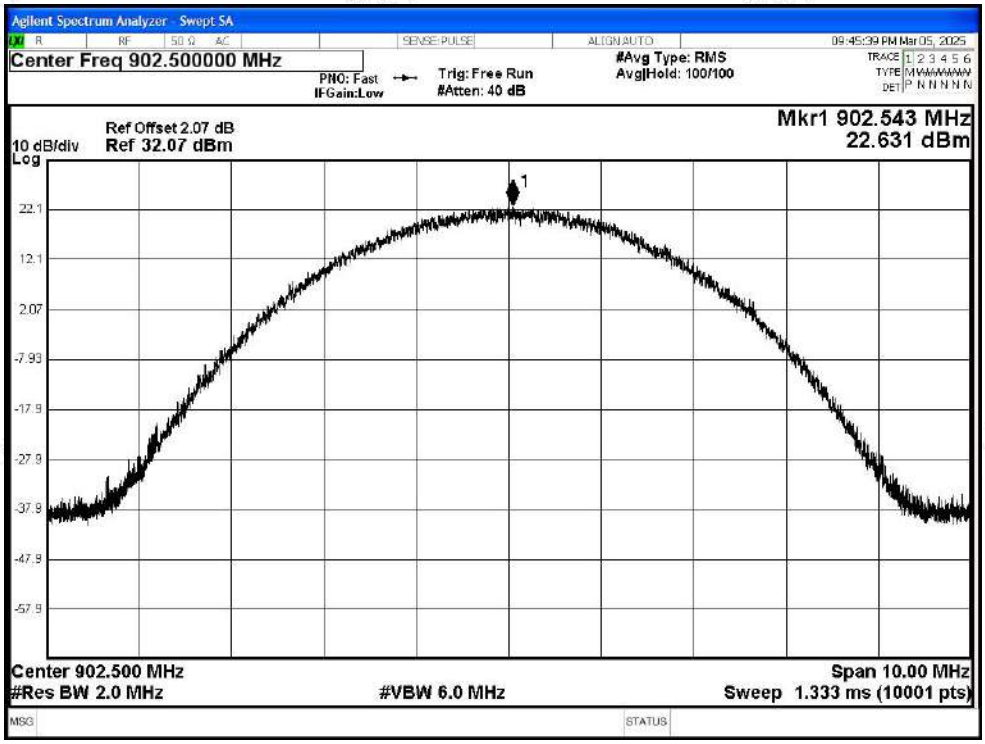


A.2 Maximum Peak Conducted Output Power

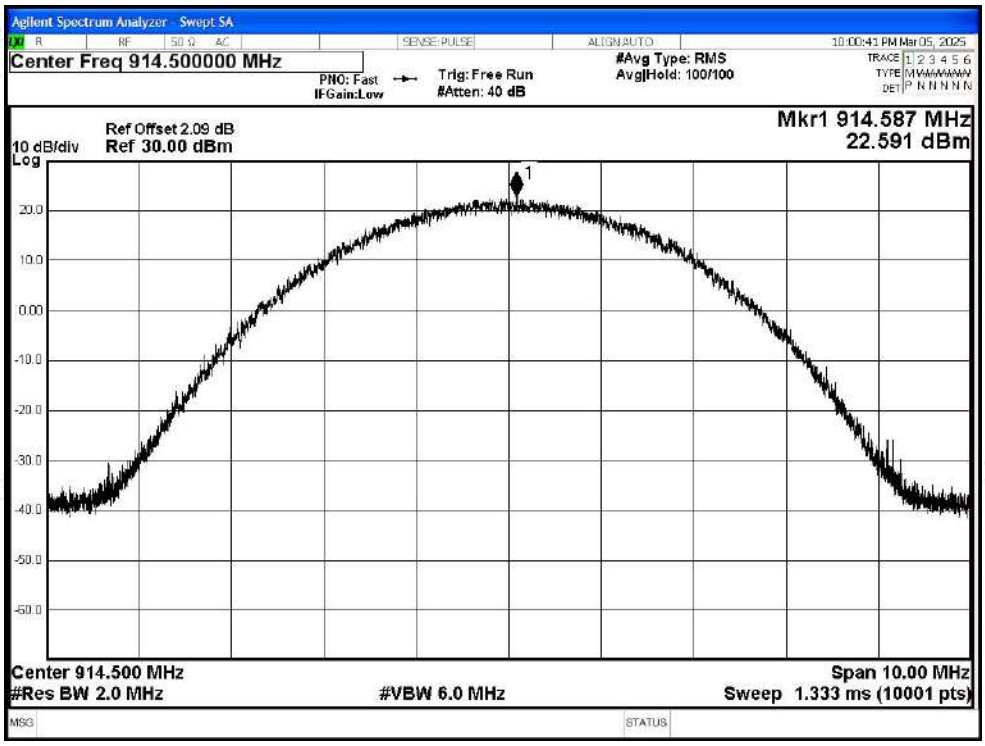
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	11ah 1M	902.5	Ant1	22.63	30	Pass
NVNT	11ah 1M	914.5	Ant1	22.59	30	Pass
NVNT	11ah 1M	927.5	Ant1	22.64	30	Pass
NVNT	11ah 2M	903	Ant1	23.29	30	Pass
NVNT	11ah 2M	913	Ant1	23.07	30	Pass
NVNT	11ah 2M	927	Ant1	23.22	30	Pass
NVNT	11ah 4M	906	Ant1	21.07	30	Pass
NVNT	11ah 4M	914	Ant1	21.05	30	Pass
NVNT	11ah 4M	926	Ant1	21.06	30	Pass

Test Graphs

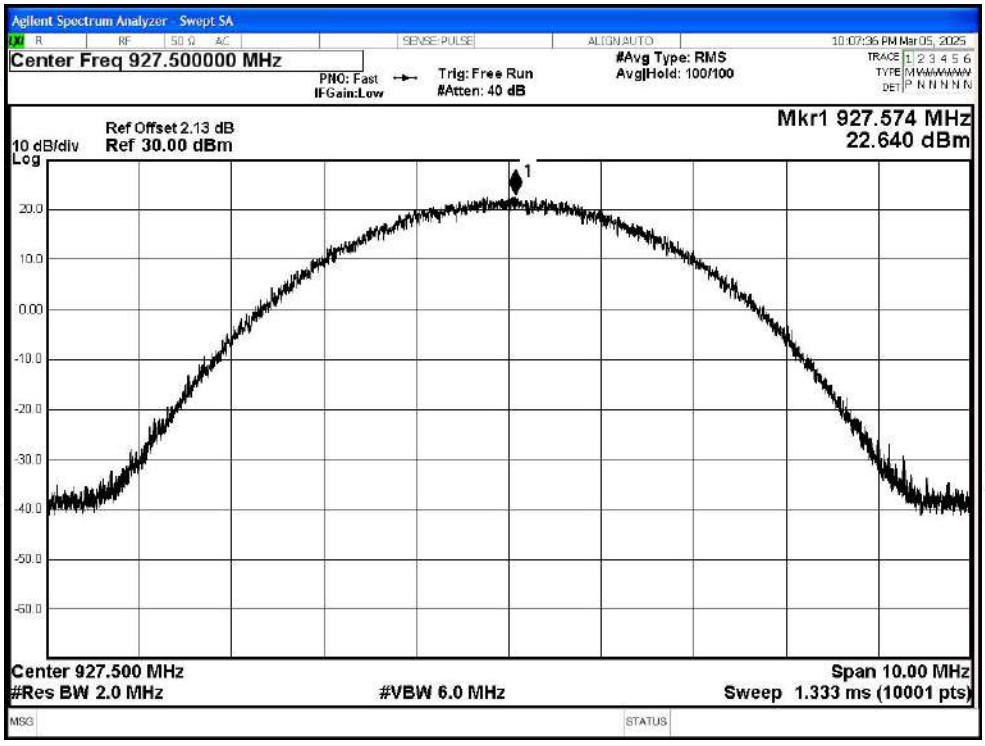
Power NVNT 802.11ah 1M 902.5MHz Ant1



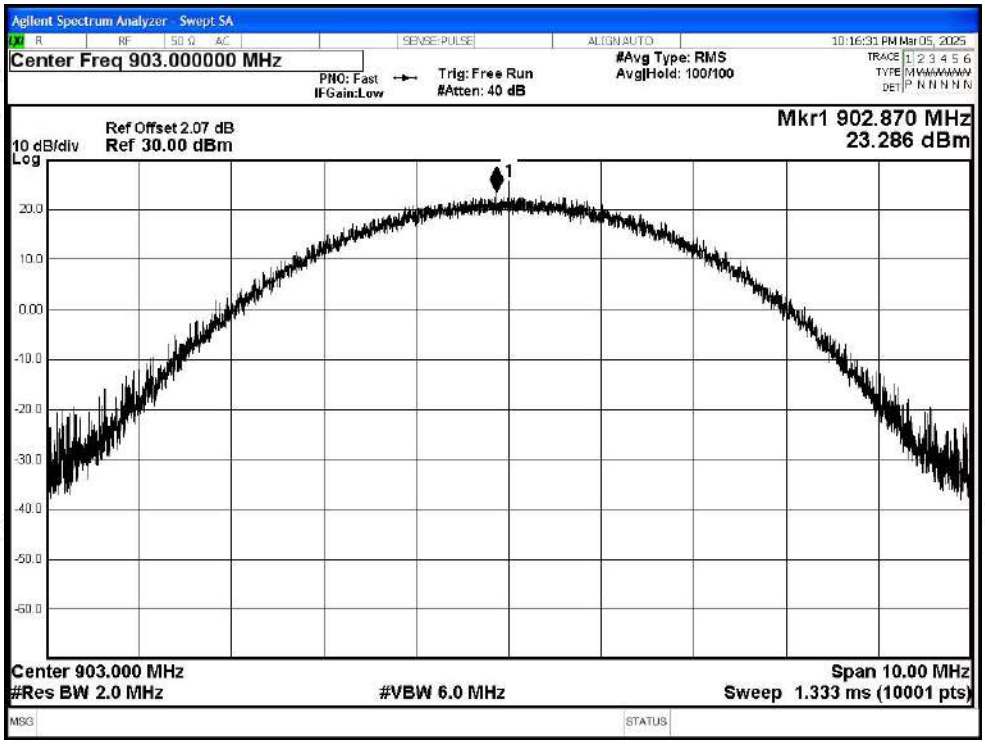
Power NVNT 802.11ah 1M 914.5MHz Ant1



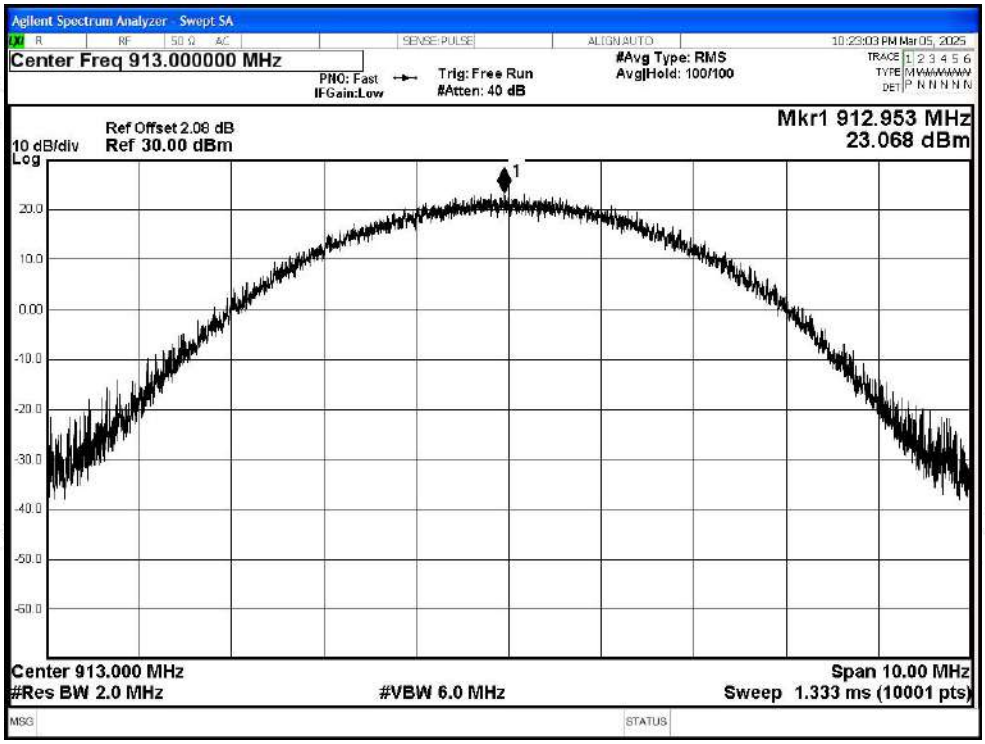
Power NVNT 802.11ah 1M 927.5MHz Ant1



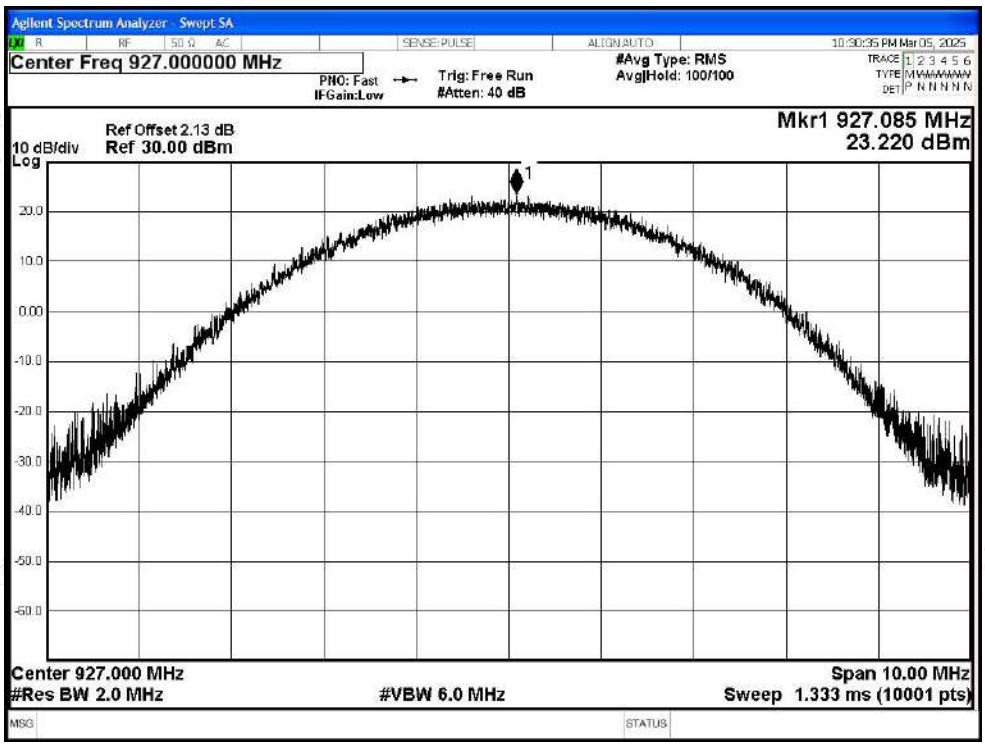
Power NVNT 802.11ah 2M 903MHz Ant1



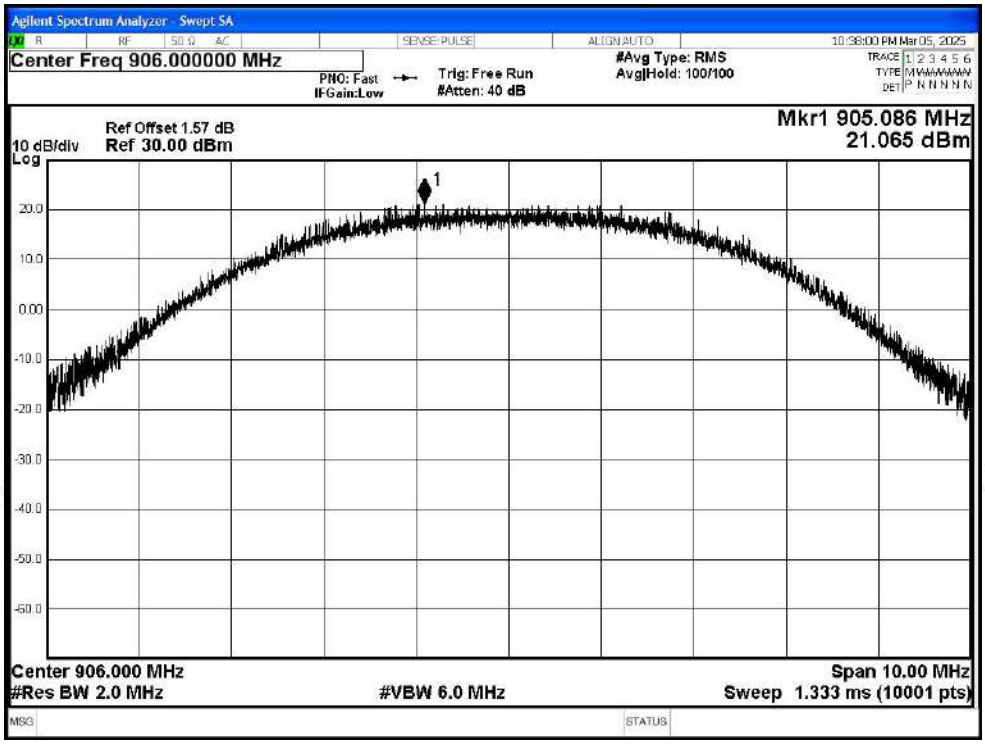
Power NVNT 802.11ah 2M 913MHz Ant1



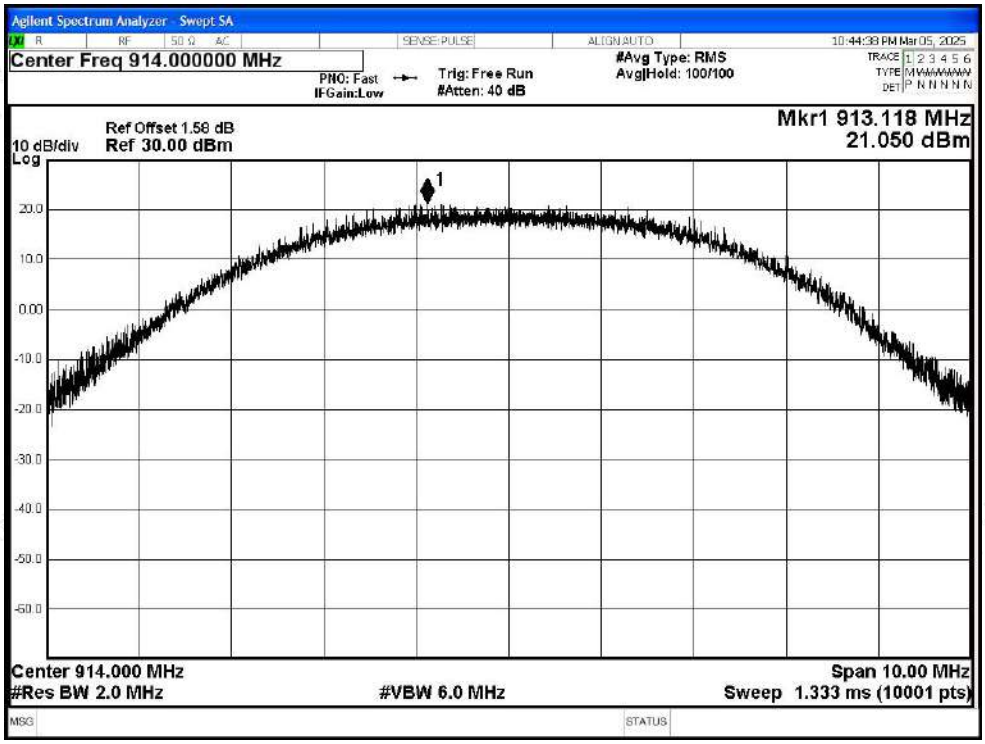
Power NVNT 802.11ah 2M 927MHz Ant1



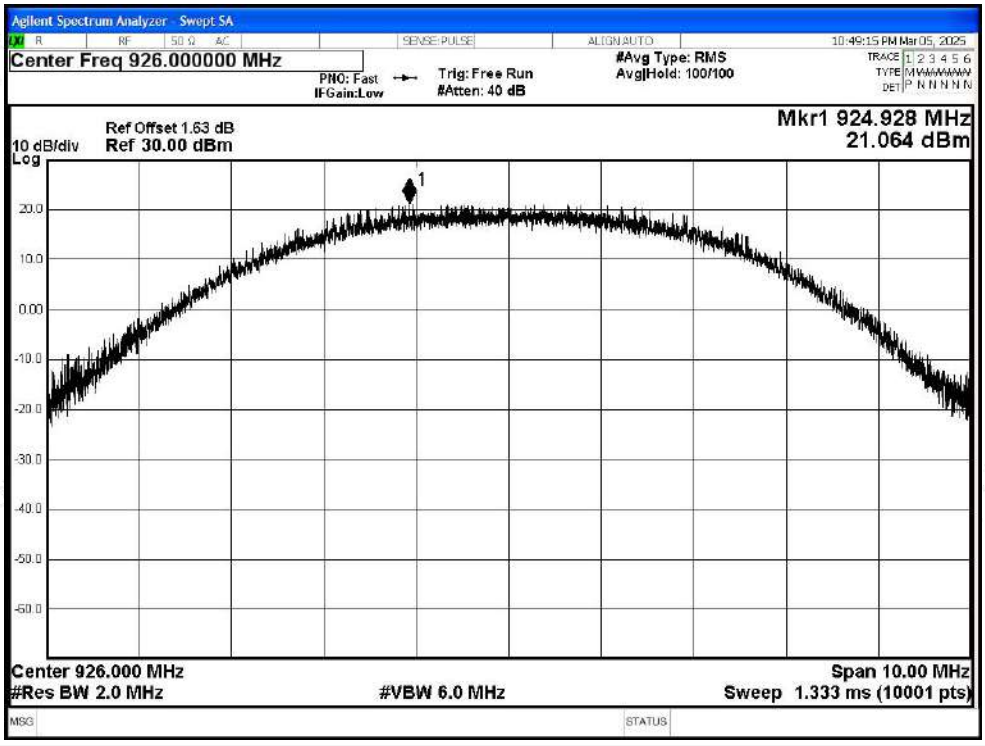
Power NVNT 802.11ah 4M 906MHz Ant1



Power NVNT 802.11ah 4M 914MHz Ant1



Power NVNT 802.11ah 4M 926MHz Ant1

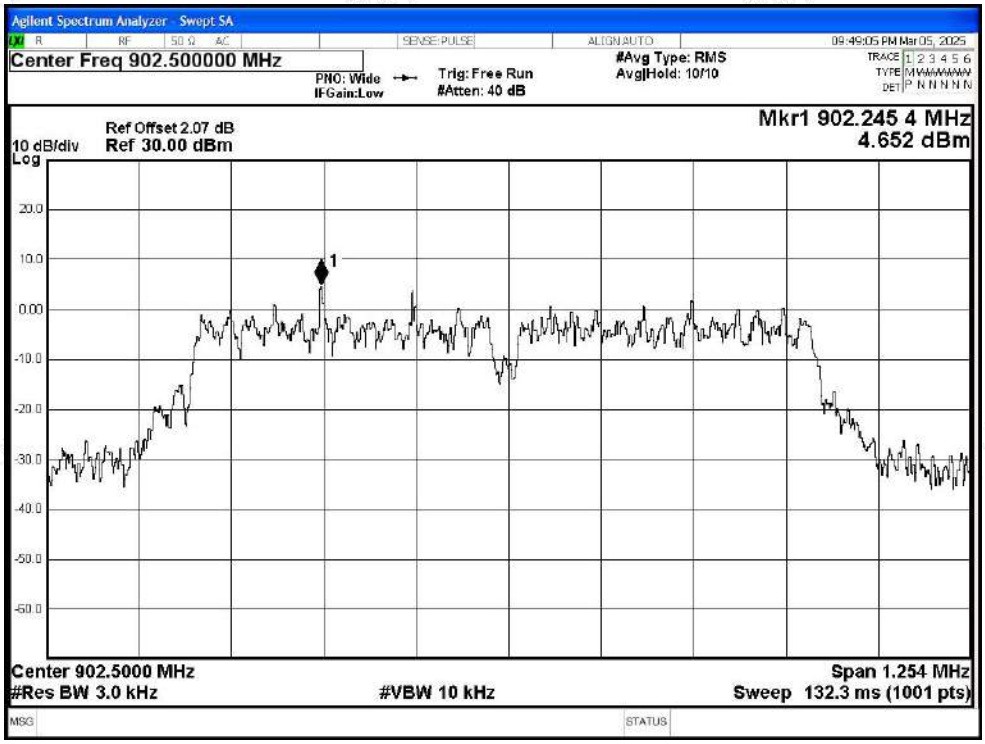


A.3 Maximum Power Spectral Density Level

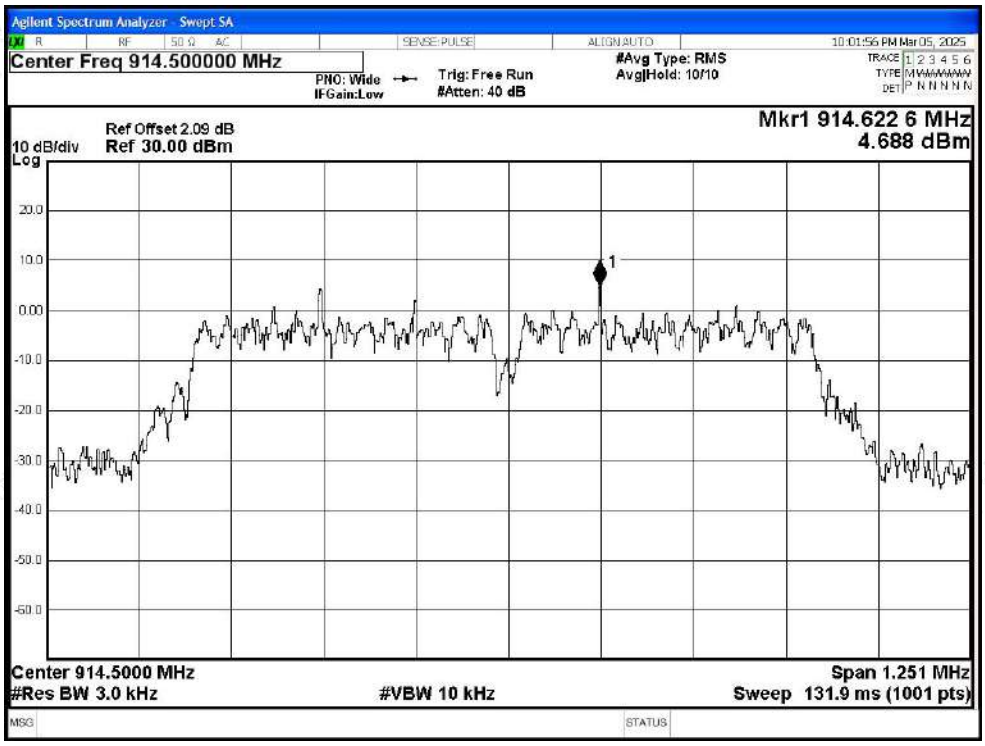
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	11ah 1M	902.5	Ant1	4.65	8	Pass
NVNT	11ah 1M	914.5	Ant1	4.69	8	Pass
NVNT	11ah 1M	927.5	Ant1	4.82	8	Pass
NVNT	11ah 2M	903	Ant1	-1.42	8	Pass
NVNT	11ah 2M	913	Ant1	-1.02	8	Pass
NVNT	11ah 2M	927	Ant1	-1.58	8	Pass
NVNT	11ah 4M	906	Ant1	-4.39	8	Pass
NVNT	11ah 4M	914	Ant1	-4.86	8	Pass
NVNT	11ah 4M	926	Ant1	-5.1	8	Pass

Test Graphs

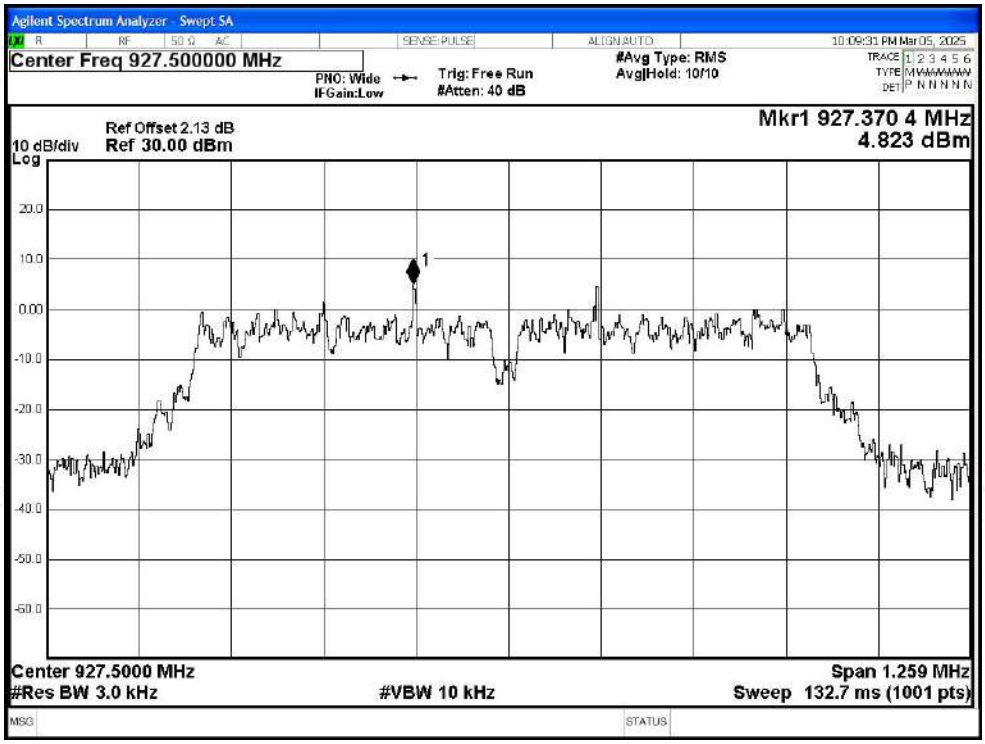
PSD NVNT 802.11ah 1M 902.5MHz Ant1



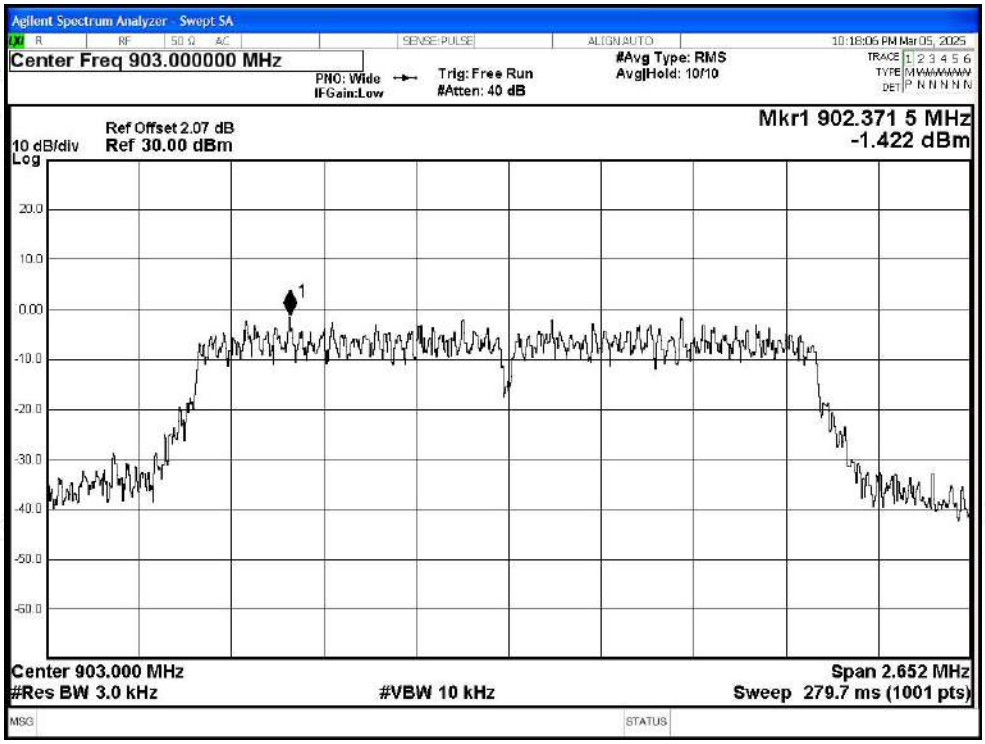
PSD NVNT 802.11ah 1M 914.5MHz Ant1



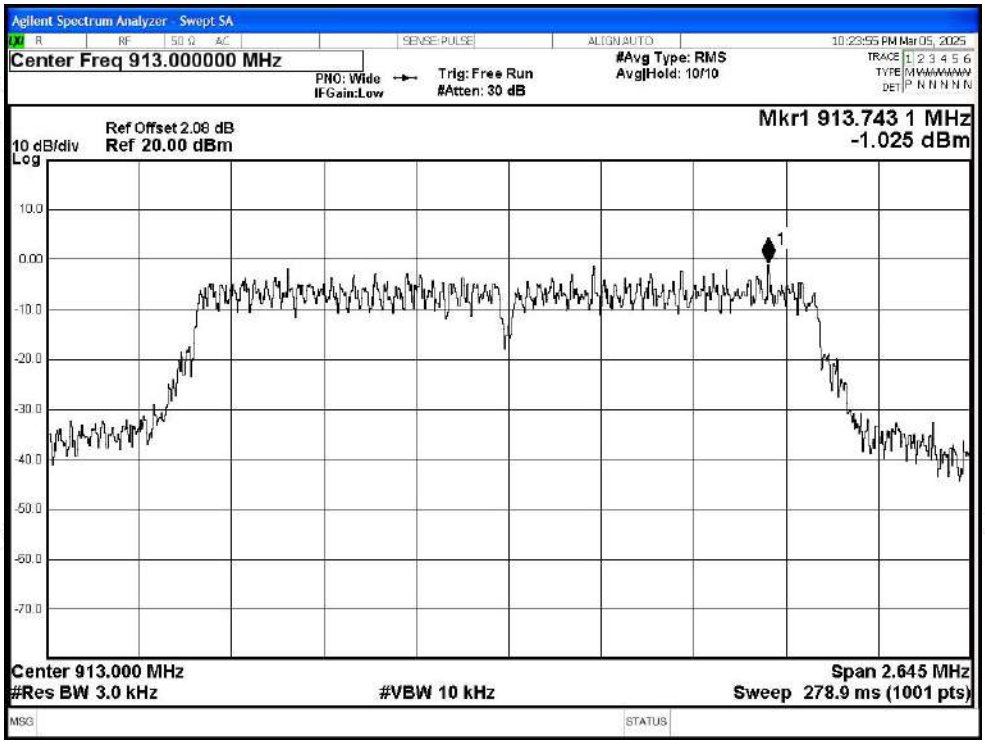
PSD NVNT 802.11ah 1M 927.5MHz Ant1



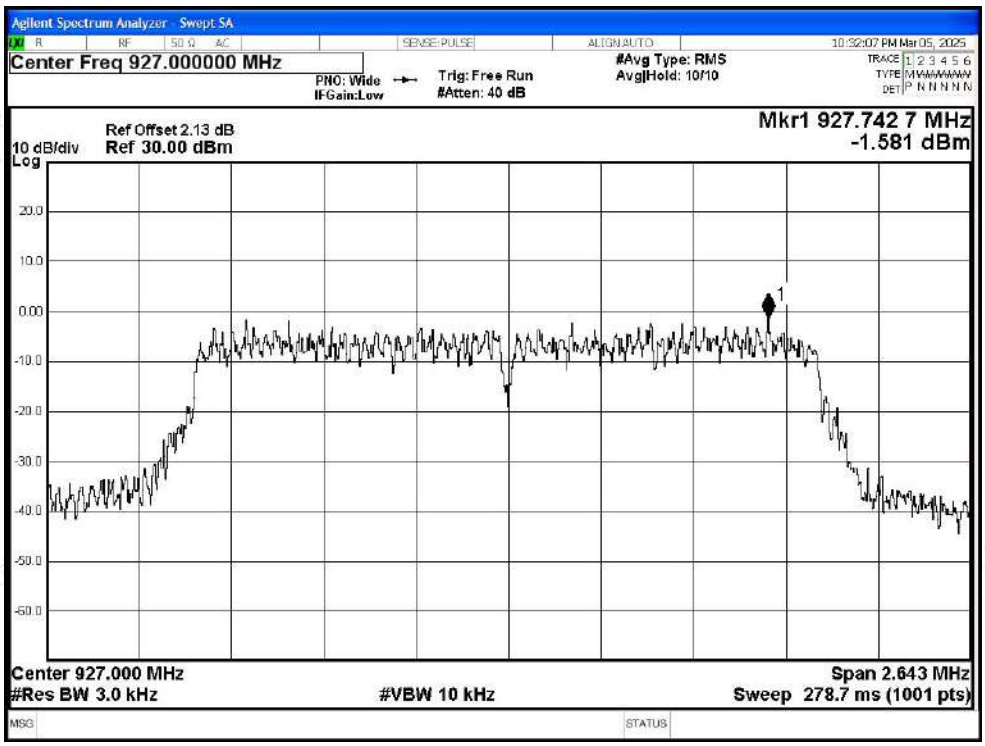
PSD NVNT 802.11ah 2M 903MHz Ant1



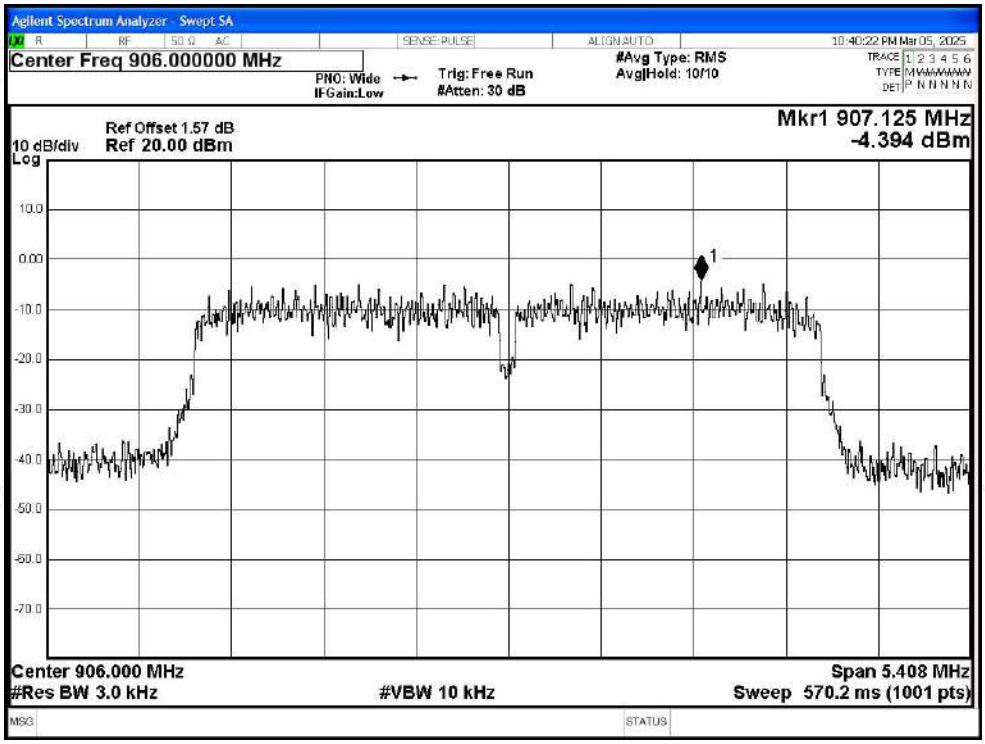
PSD NVNT 802.11ah 2M 913MHz Ant1



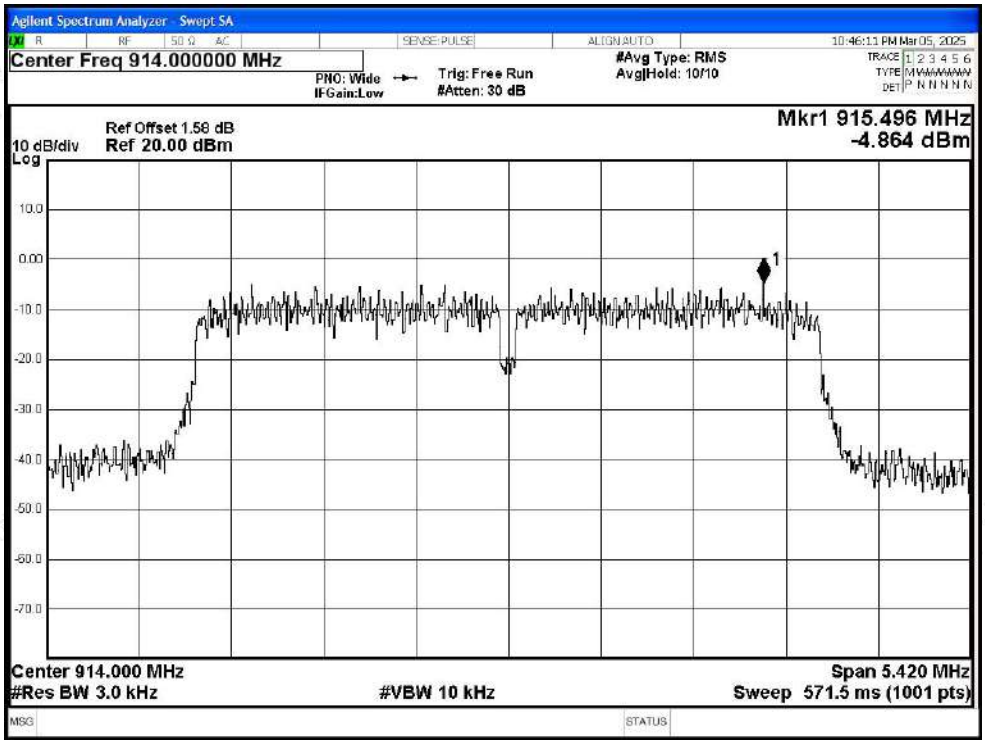
PSD NVNT 802.11ah 2M 927MHz Ant1



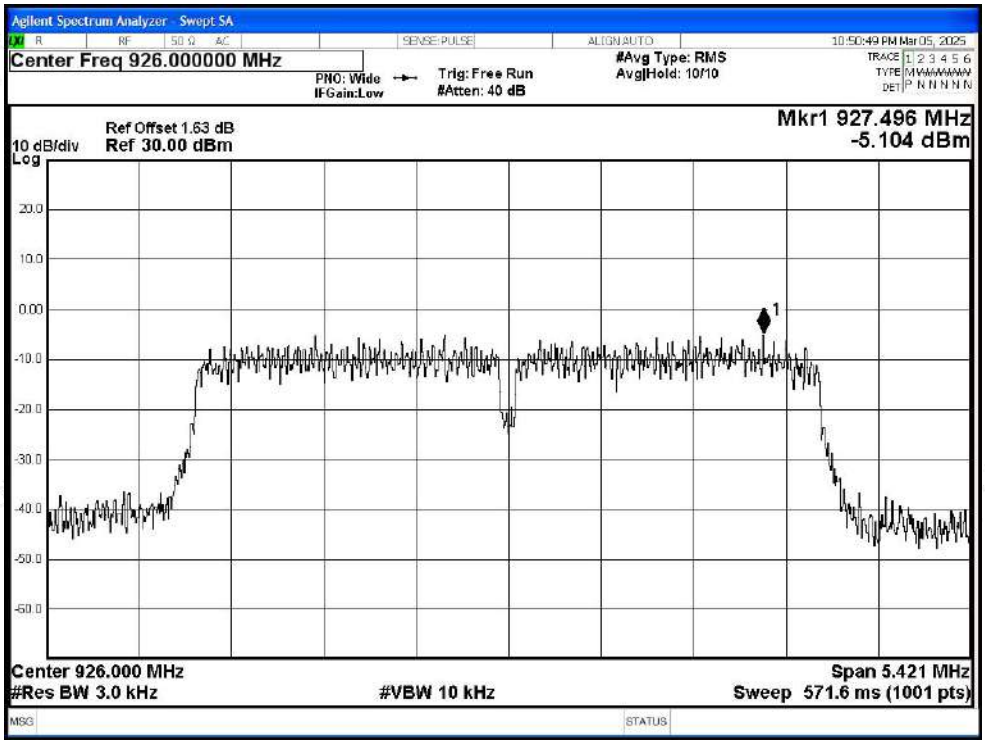
PSD NVNT 802.11ah 4M 906MHz Ant1



PSD NVNT 802.11ah 4M 914MHz Ant1



PSD NVNT 802.11ah 4M 926MHz Ant1

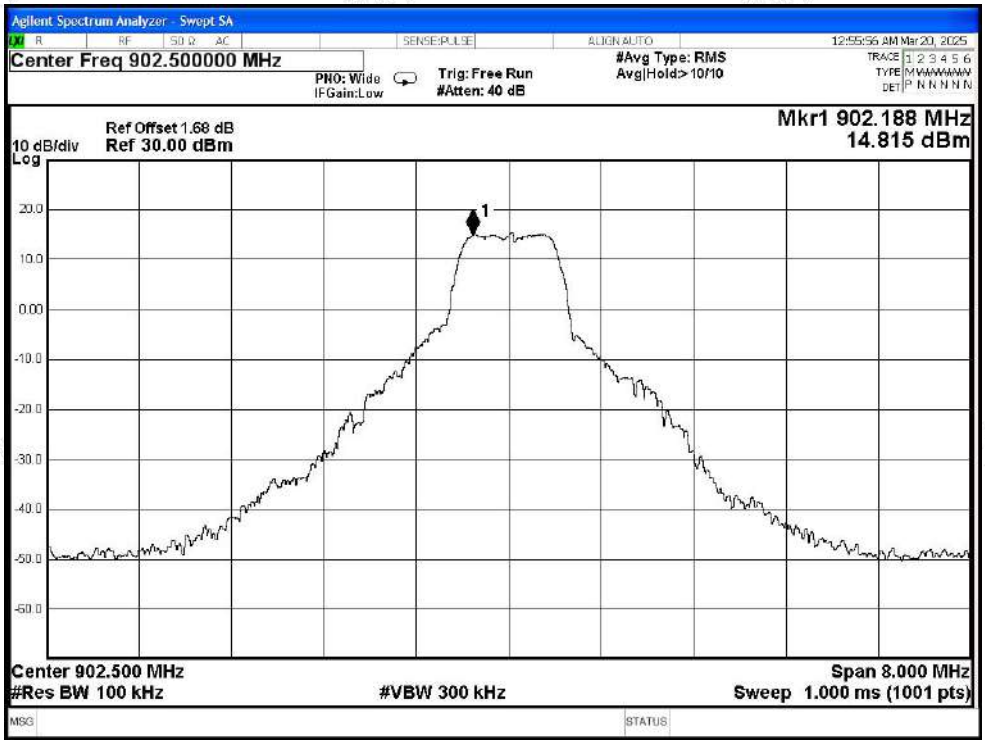


A.4 Band Edge

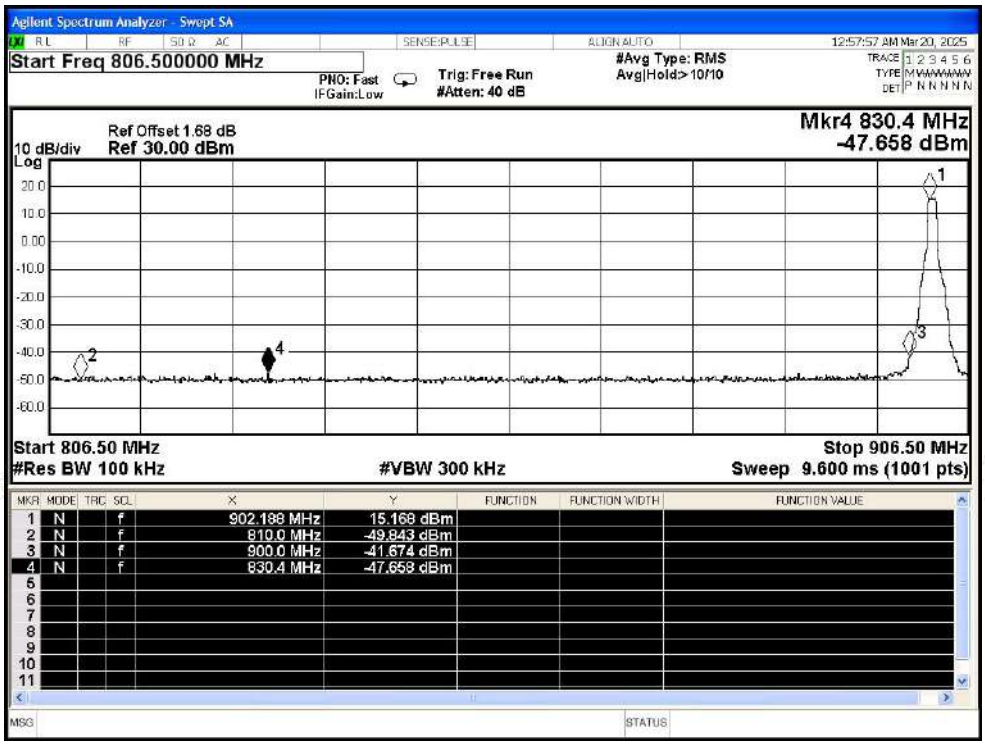
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	11ah 1M	902.5	Ant1	-41.674	-20	Pass
NVNT	11ah 1M	927.5	Ant1	-49.346	-20	Pass
NVNT	11ah 2M	903	Ant1	-34.109	-20	Pass
NVNT	11a 2M	927	Ant1	-49.346	-20	Pass
NVNT	11ah 4M	903	Ant1	-36.558	-20	Pass
NVNT	11ah 4M	927	Ant1	-42.974	-20	Pass

Test Graphs

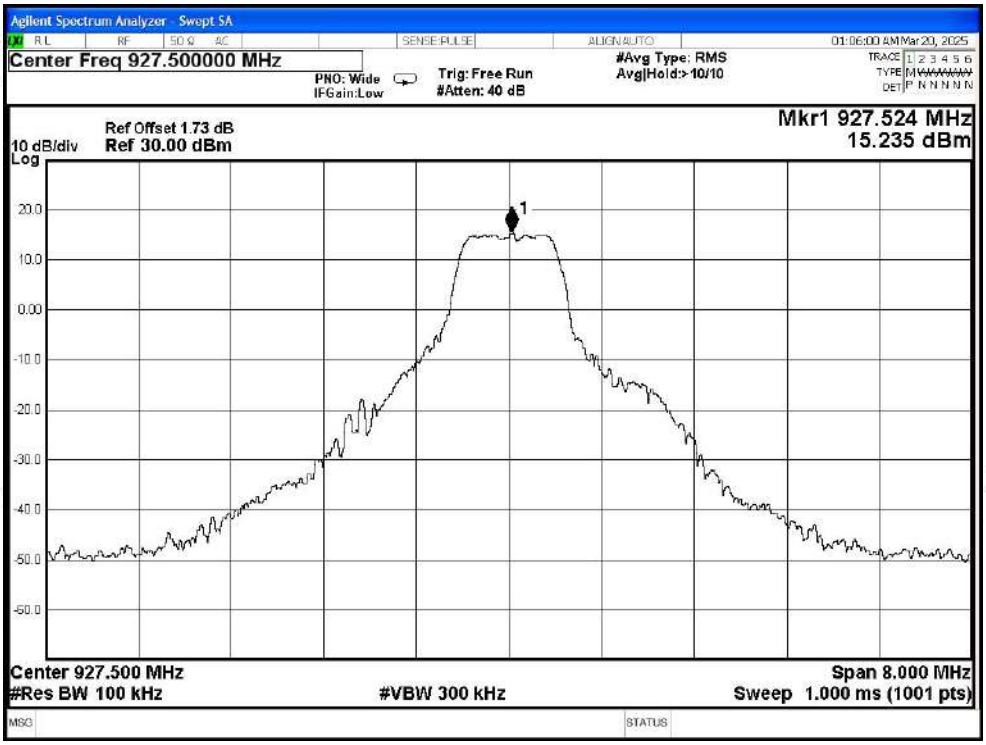
Band Edge NVNT 802.11ah 1M 902.5MHz Ant1 Ref



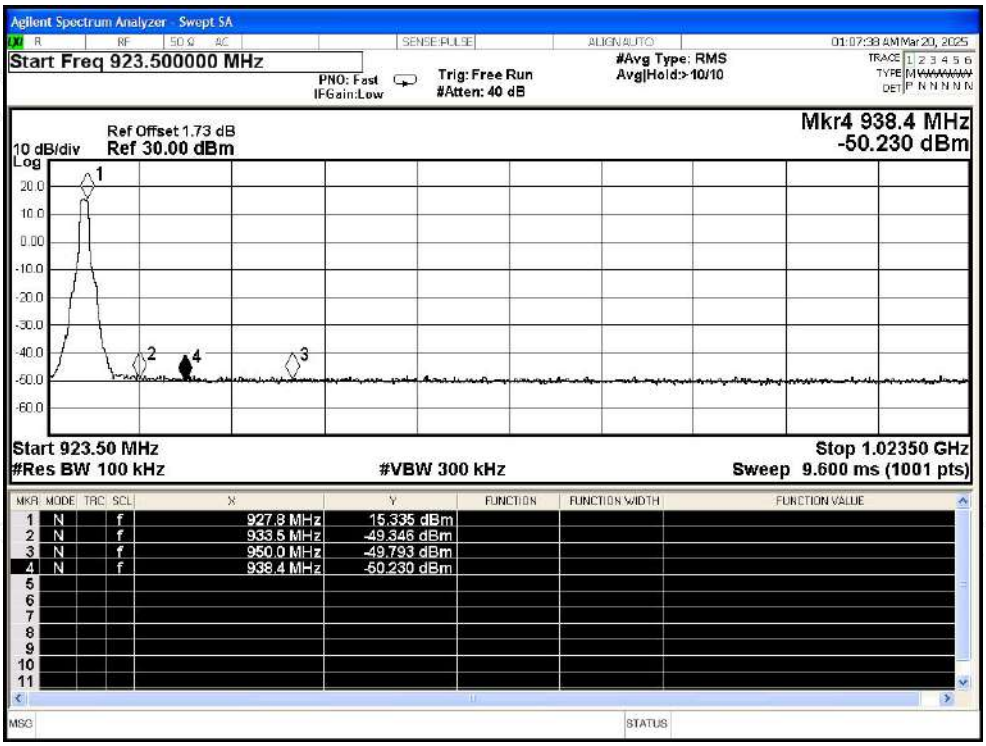
Band Edge NVNT 802.11ah 1M 902.5MHz Ant1 Emission



Band Edge NVNT 802.11ah 1M 927.5MHz Ant1 Ref

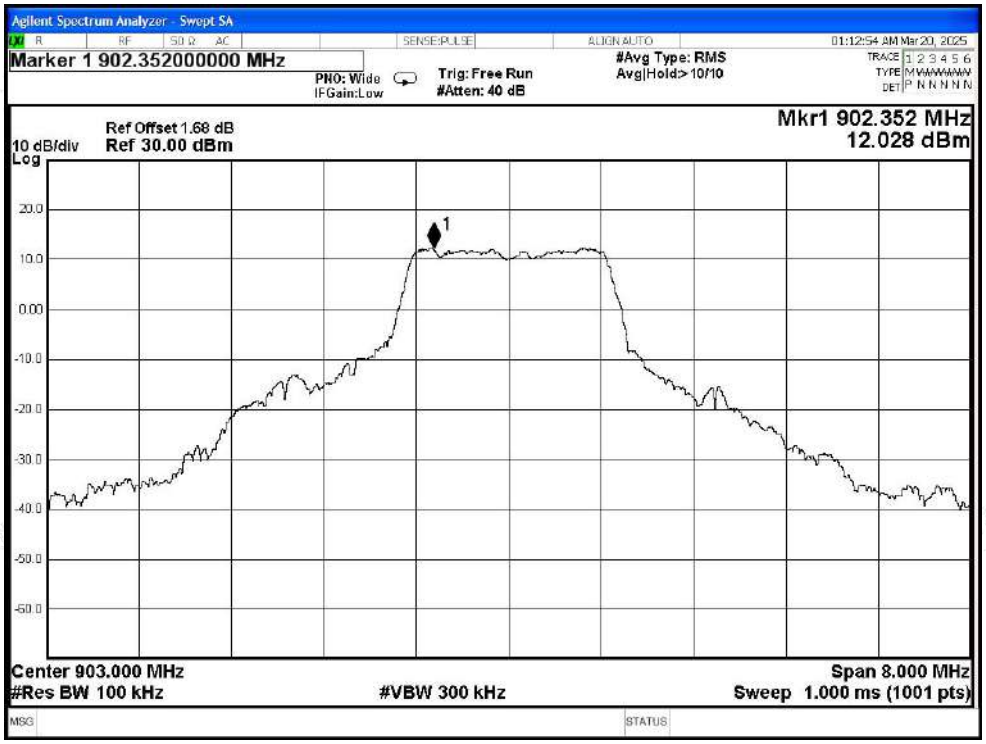


Band Edge NVNT 802.11ah 1M 927.5MHz Ant1 Emission

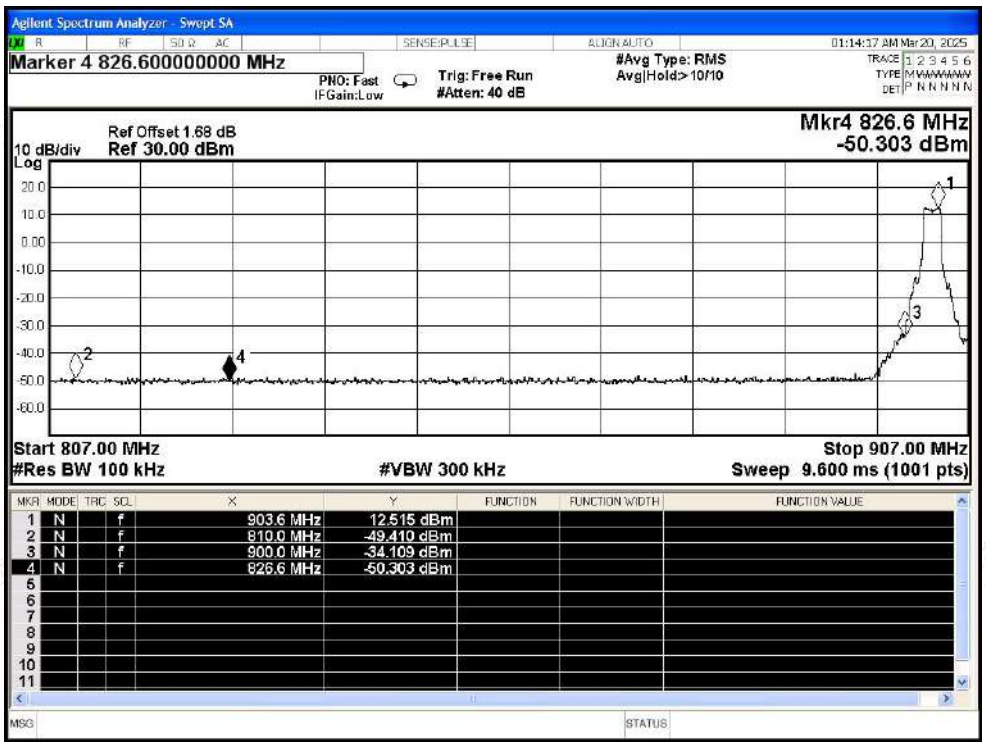


Test Graphs

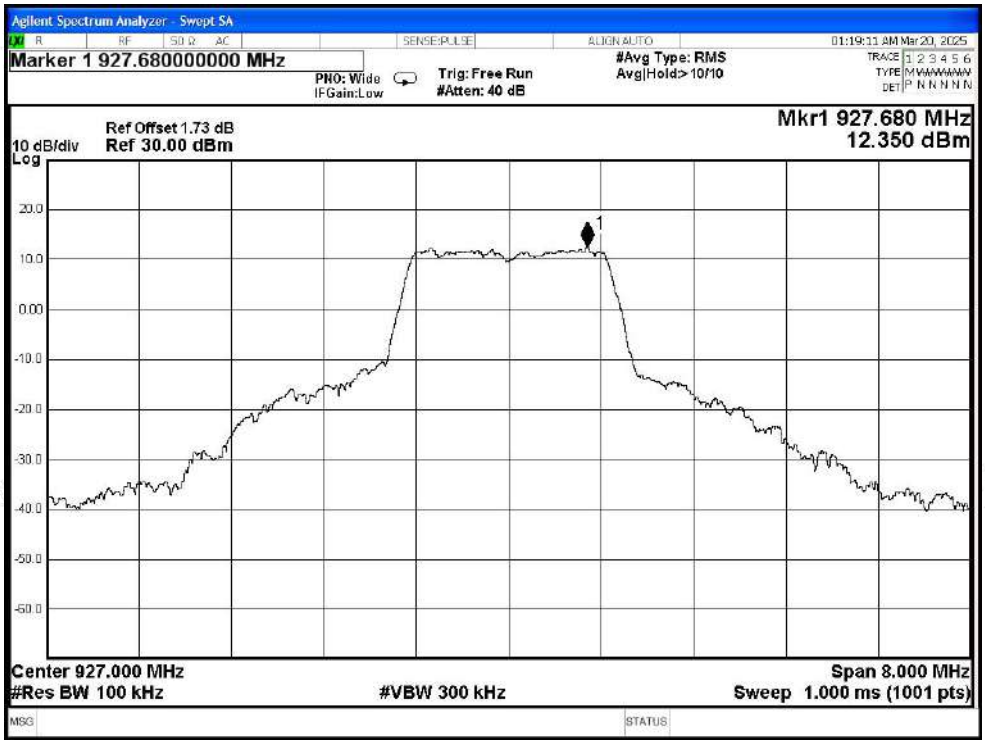
Band Edge NVNT 802.11ah 2M 903MHz Ant1 Ref



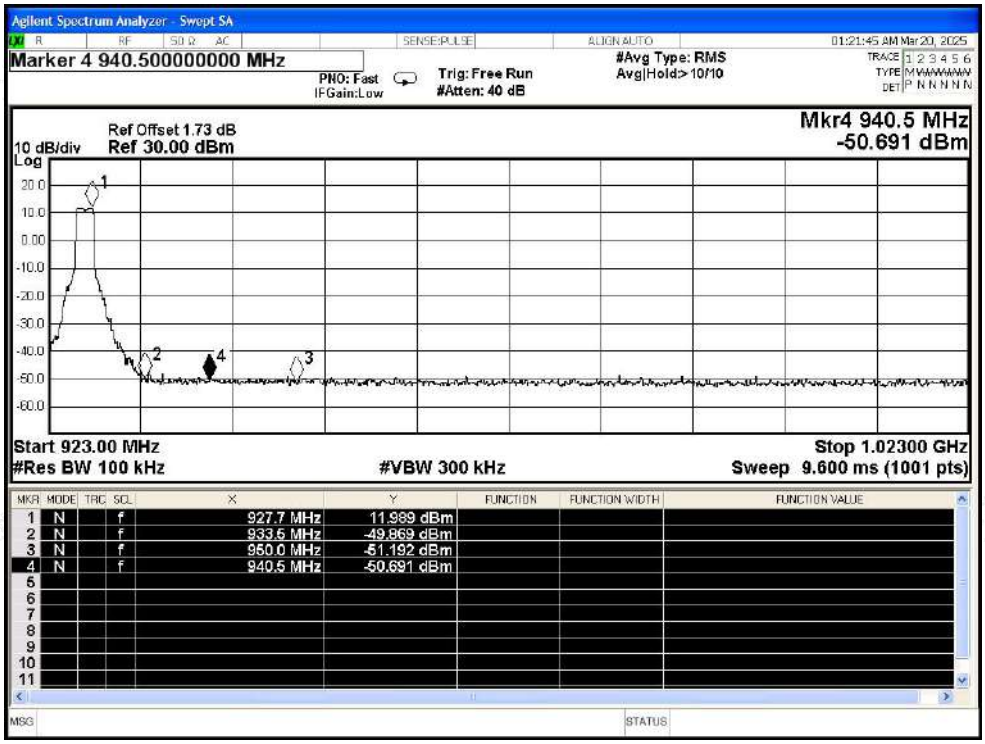
Band Edge NVNT 802.11ah 2M 903MHz Ant1 Emission



Band Edge NVNT 802.11ah 2M 927MHz Ant1 Ref

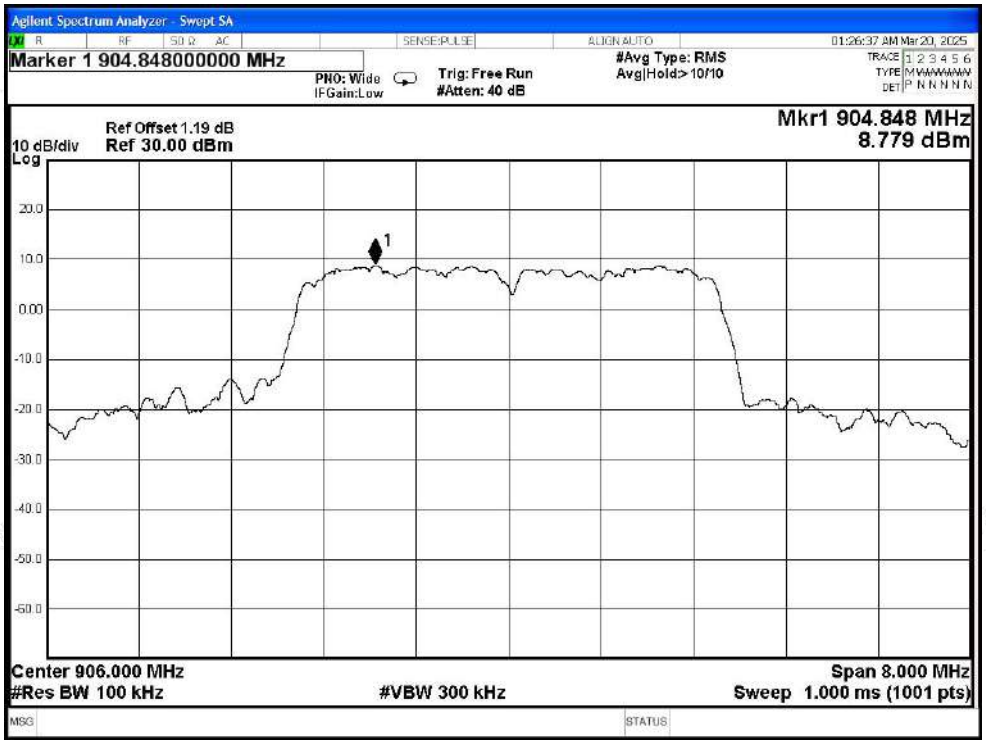


Band Edge NVNT 802.11ah 2M 927MHz Ant1 Emission

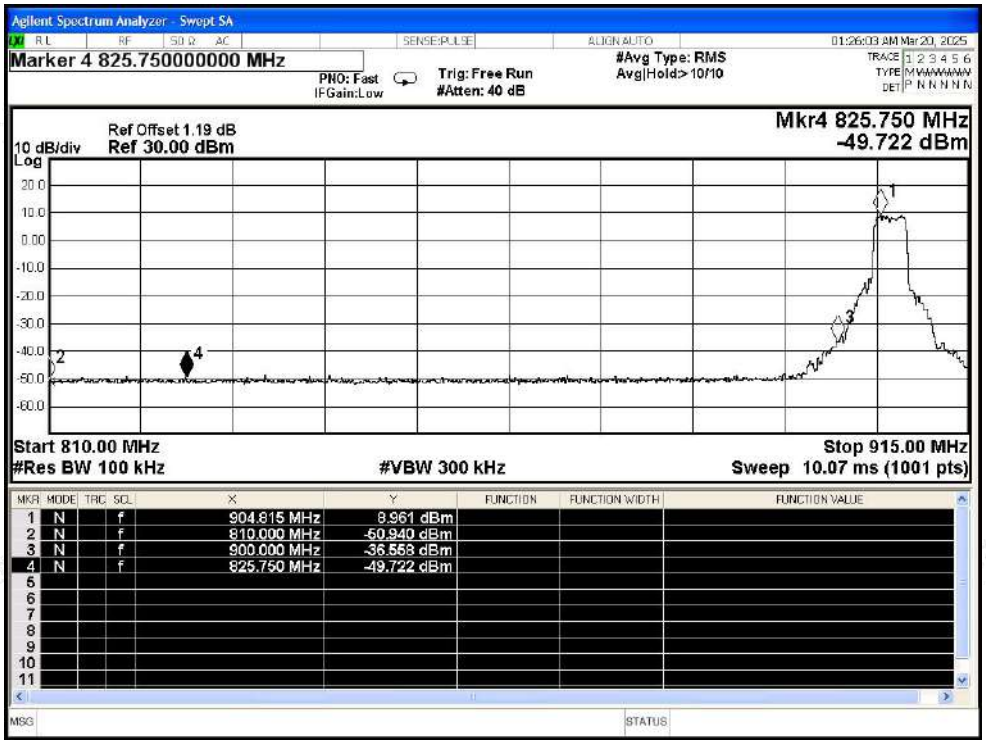


Test Graphs

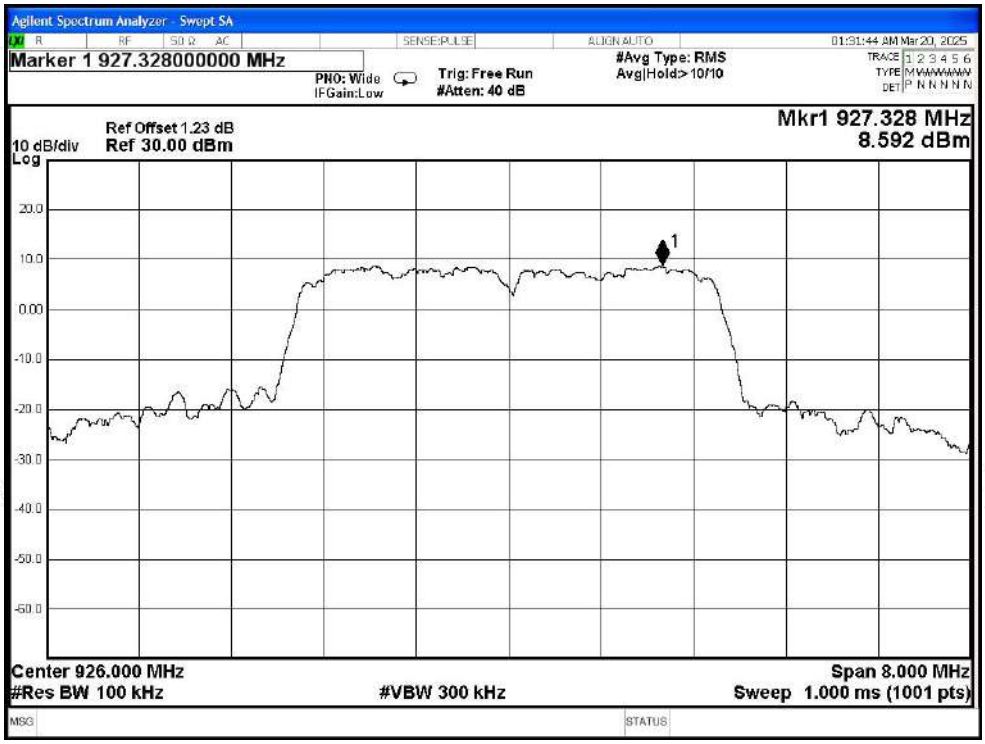
Band Edge NVNT 802.11ah 4M 906MHz Ant1 Ref



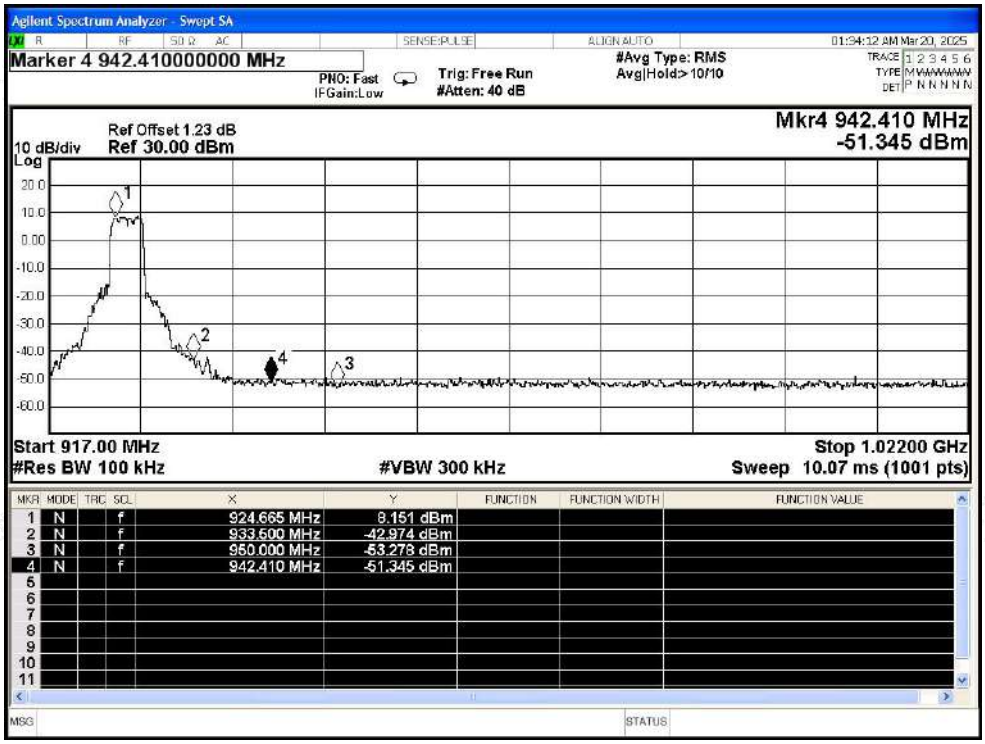
Band Edge NVNT 802.11ah 4M 906MHz Ant1 Emission



Band Edge NVNT 802.11ah 4M 927MHz Ant1 Ref



Band Edge NVNT 802.11ah 4M 927MHz Ant1 Emission

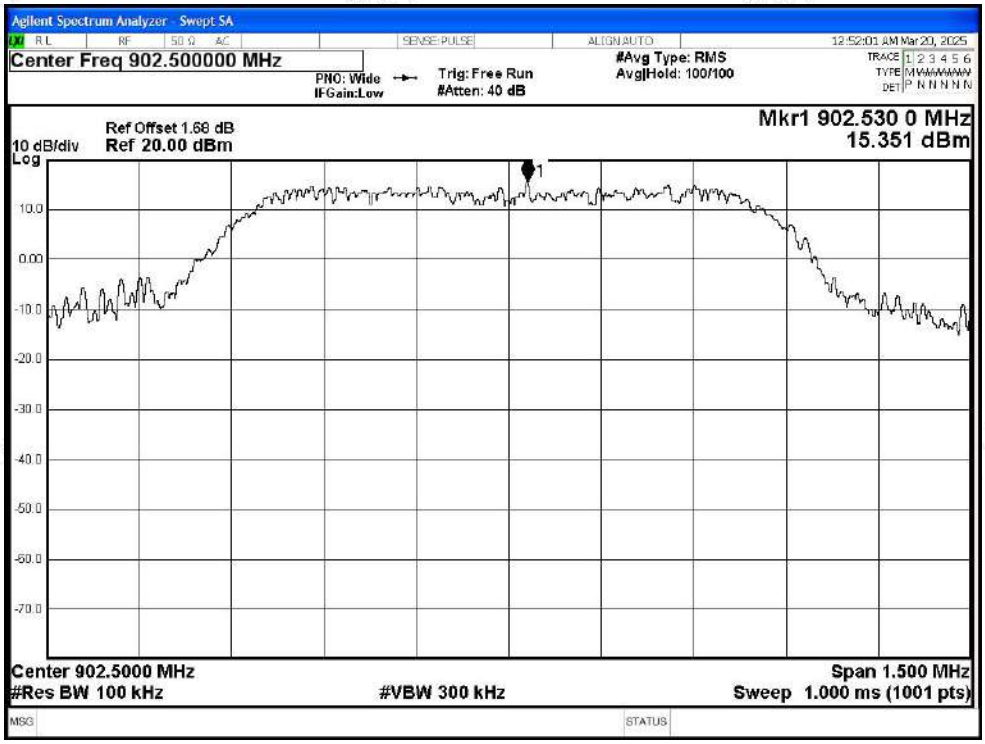


A.5 Conducted RF Spurious Emission

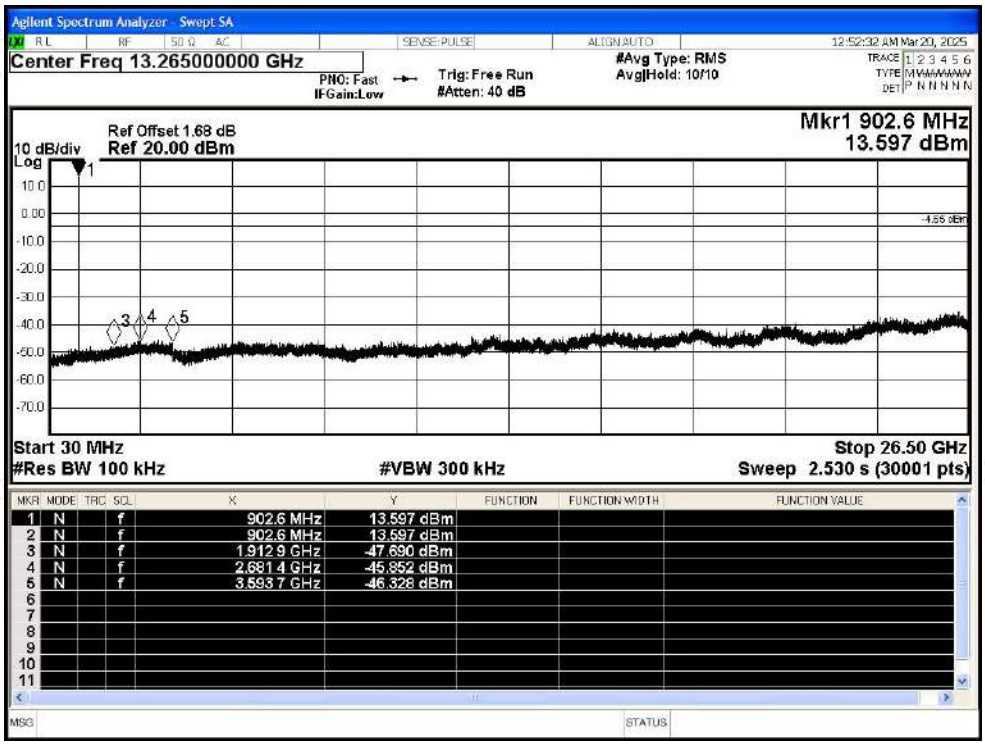
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	11ah 1M	902.5	Ant1	-45.852	-20	Pass
NVNT	11a 1M	914.5	Ant1	-45.207	-20	Pass
NVNT	11ah 1M	927.5	Ant1	-45.640	-20	Pass
NVNT	11ah 2M	903	Ant1	-45.738	-20	Pass
NVNT	11ah 2M	913	Ant1	-45.501	-20	Pass
NVNT	11ah 2M	927	Ant1	-45.526	-20	Pass
NVNT	11ah 4M	906	Ant1	-38.407	-20	Pass
NVNT	11ah 4M	914	Ant1	-38.418	-20	Pass
NVNT	11ah 4M	926	Ant1	-45.346	-20	Pass

Test Graphs

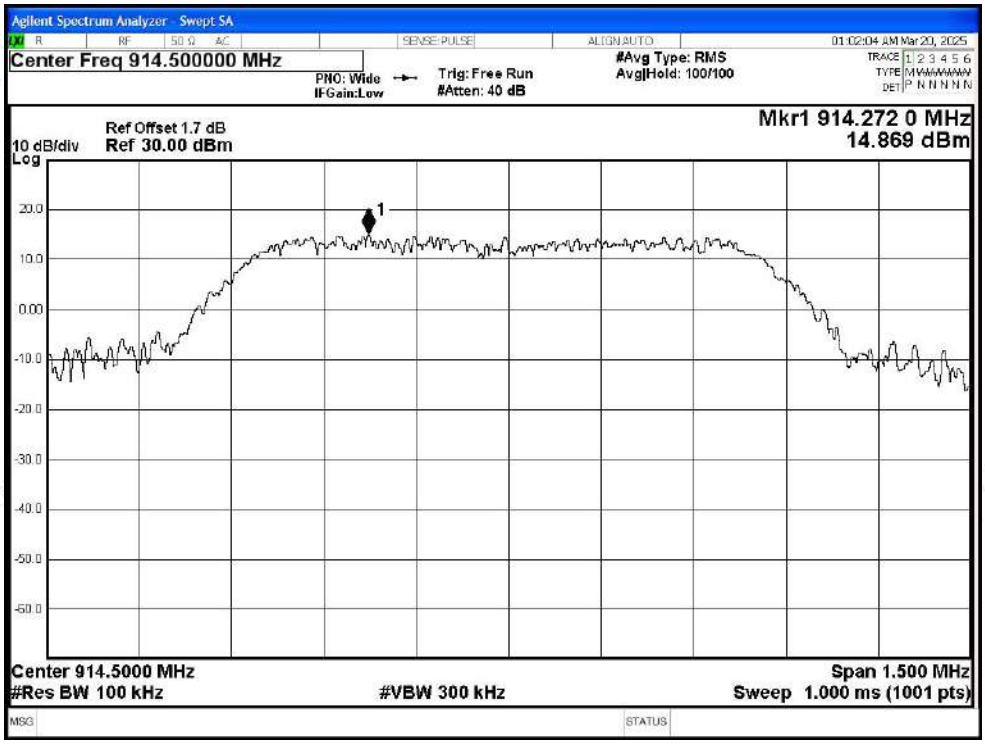
Tx. Spurious NVNT 802.11ah 1M 902.5MHz Ant1 Ref



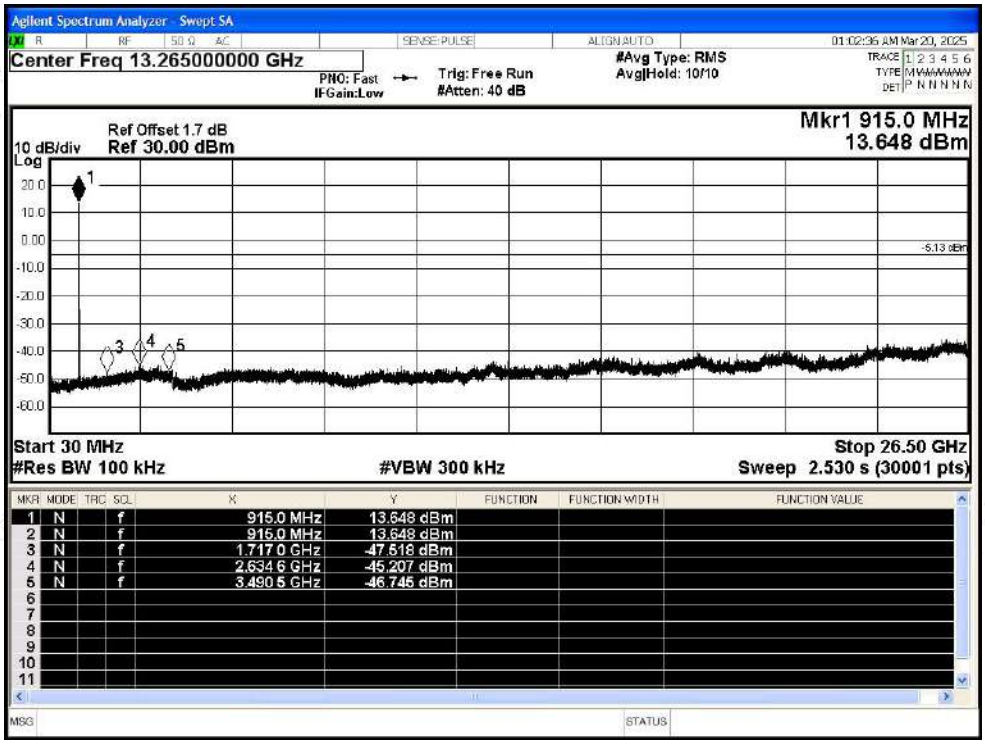
Tx. Spurious NVNT 802.11ah 1M 902.5MHz Ant1 Emission



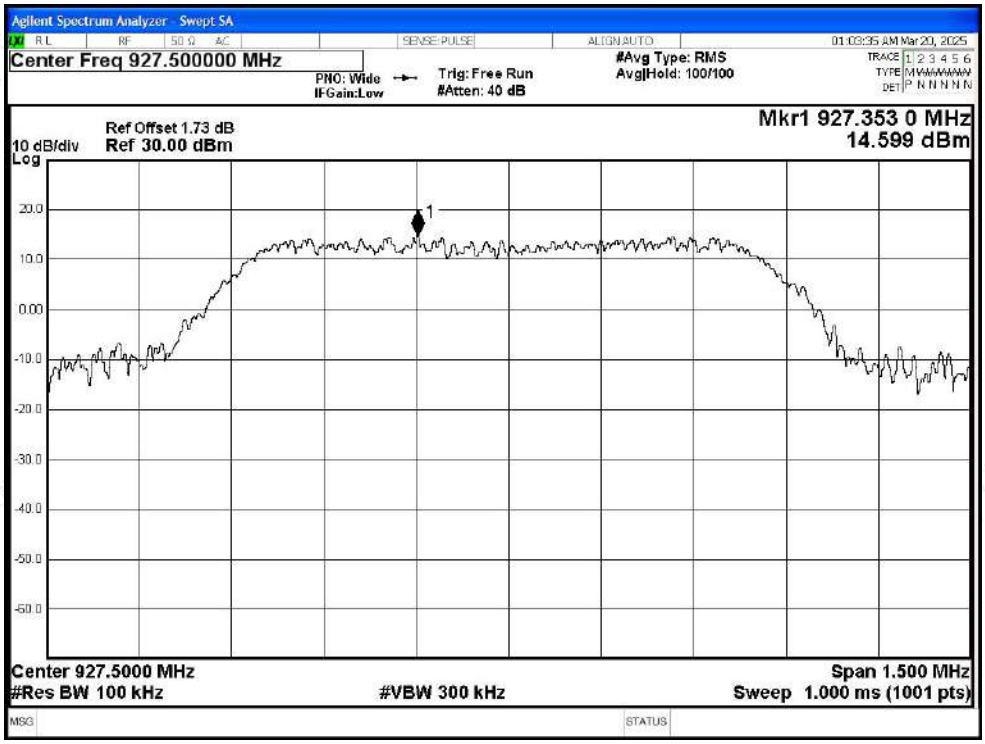
Tx. Spurious NVNT 802.11ah 1M 914.5MHz Ant1 Ref



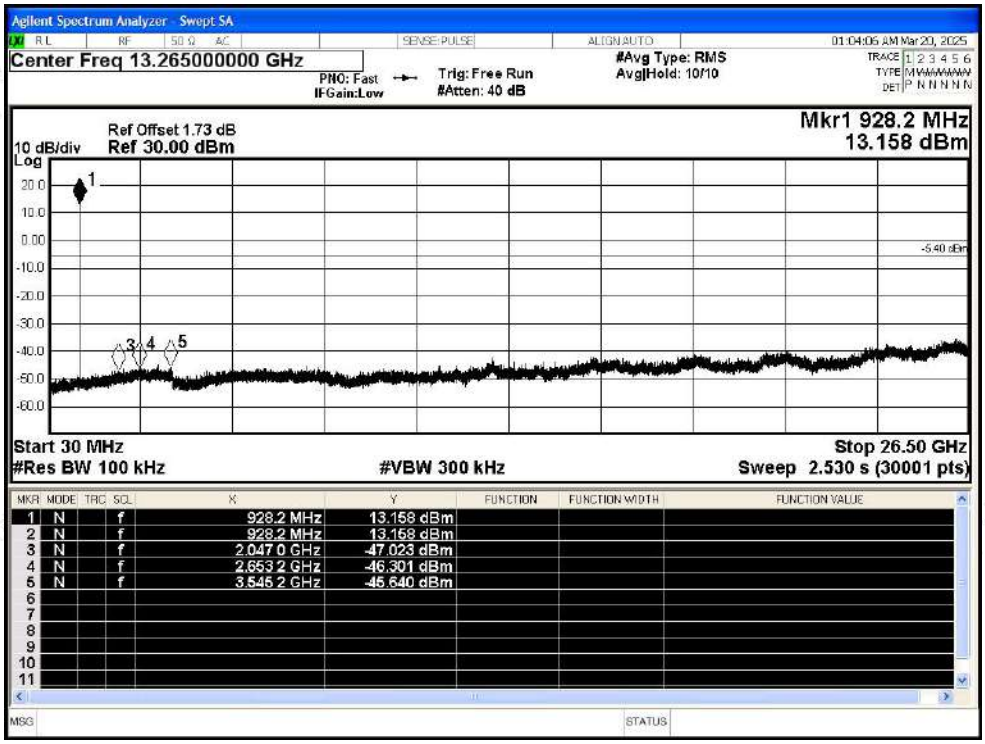
Tx. Spurious NVNT 802.11ah 1M 914.5MHz Ant1 Emission



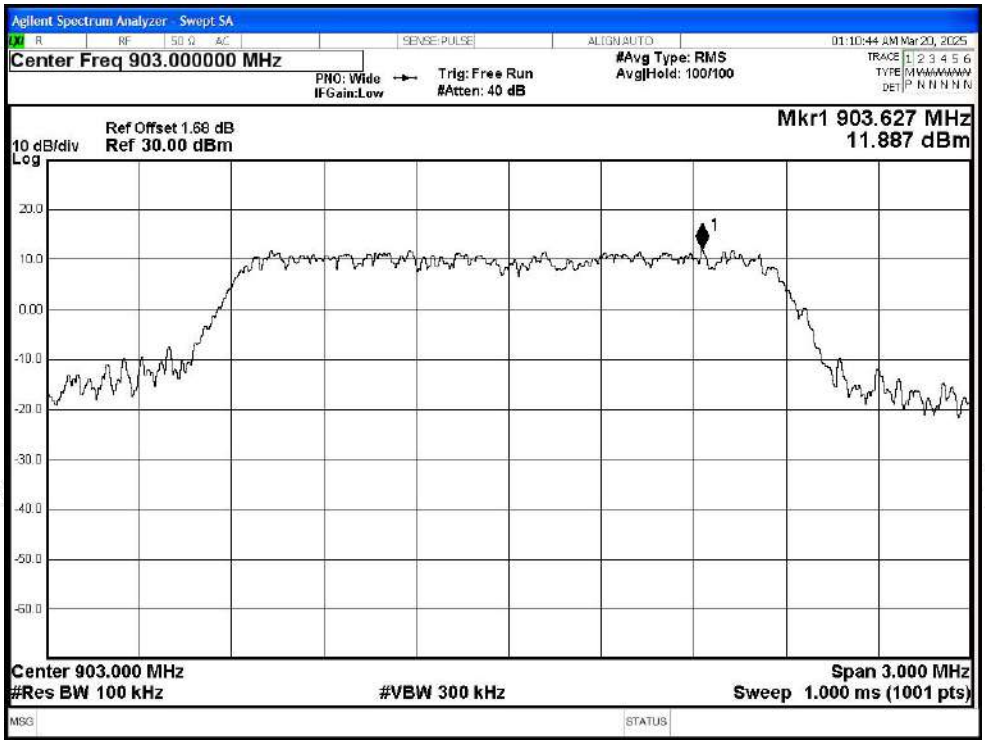
Tx. Spurious NVNT 802.11ah 1M 927.5MHz Ant1 Ref



Tx. Spurious NVNT 802.11ah 1M 927.5MHz Ant1 Emission



Tx. Spurious NVNT 802.11ah 2M 903MHz Ant1 Ref



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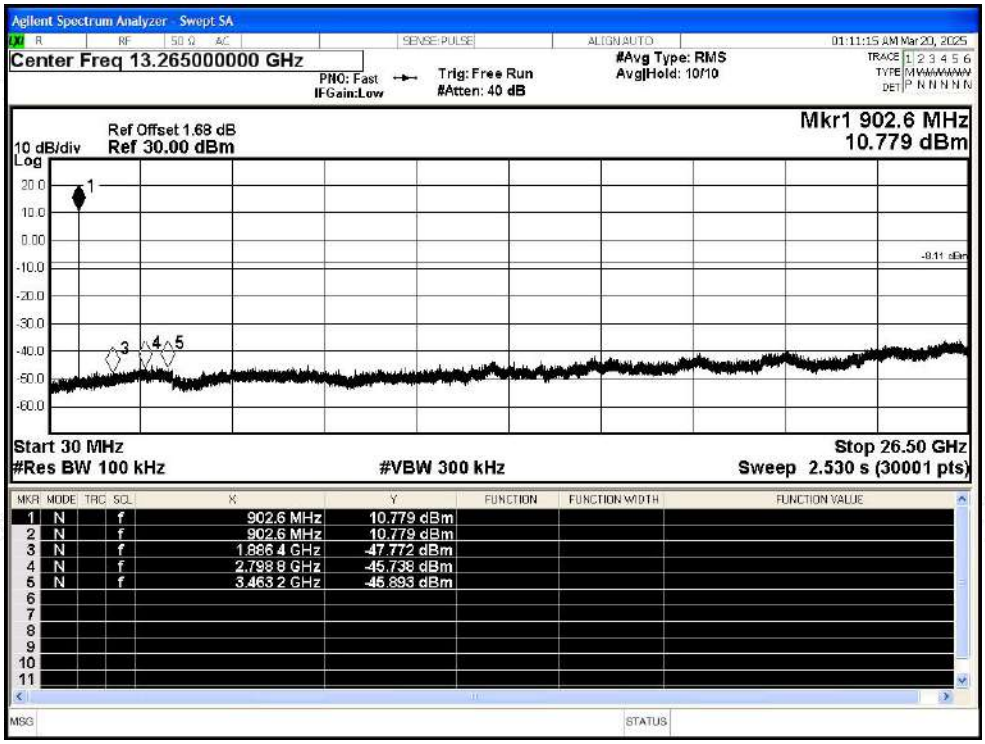
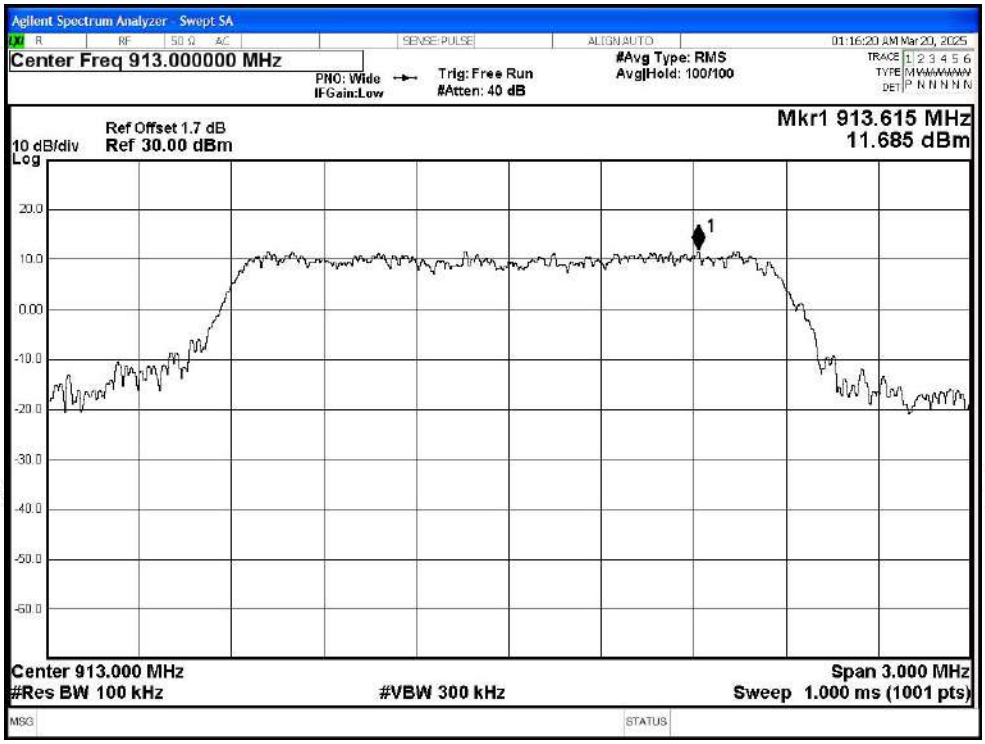


Tx. Spurious NVNT 802.11ah 2M 913MHz Ant1 Ref



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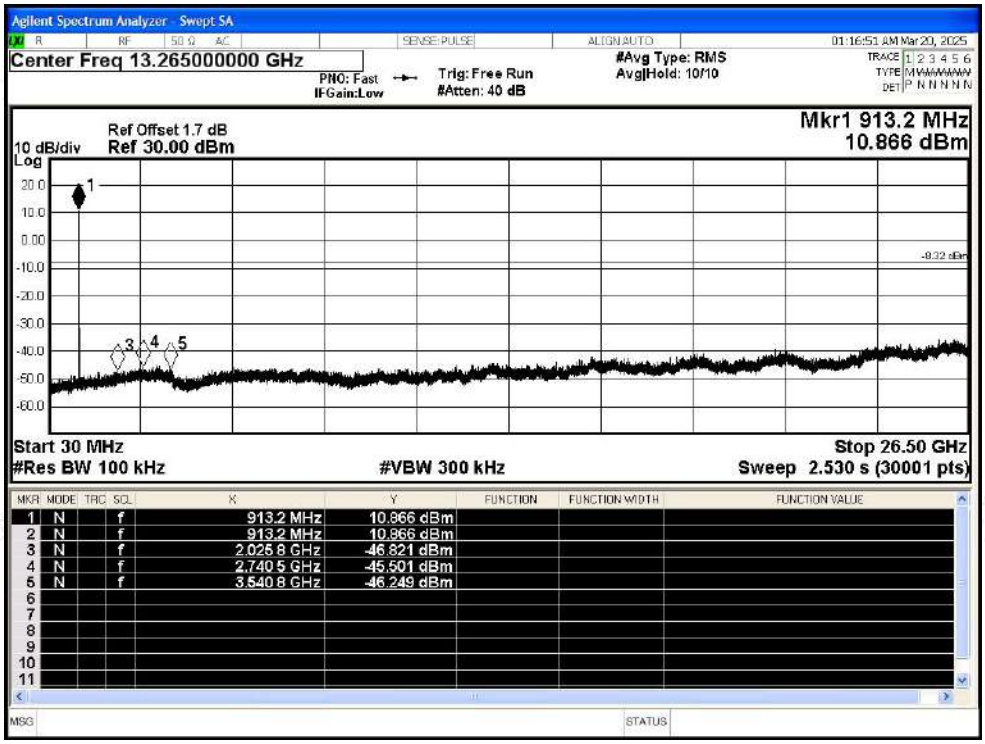

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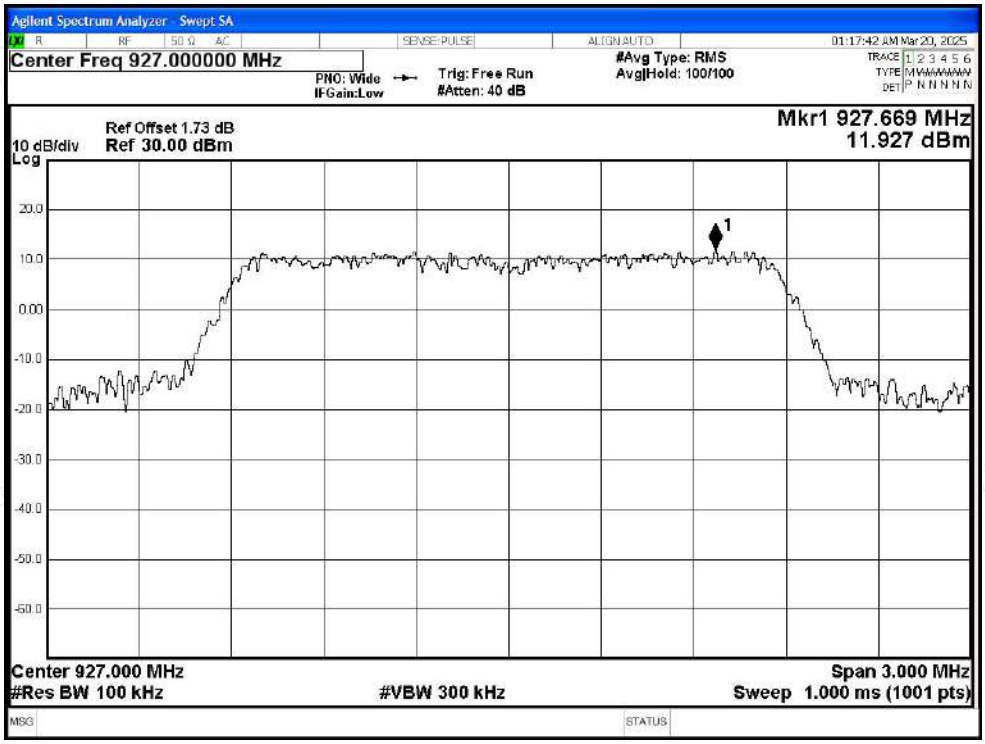
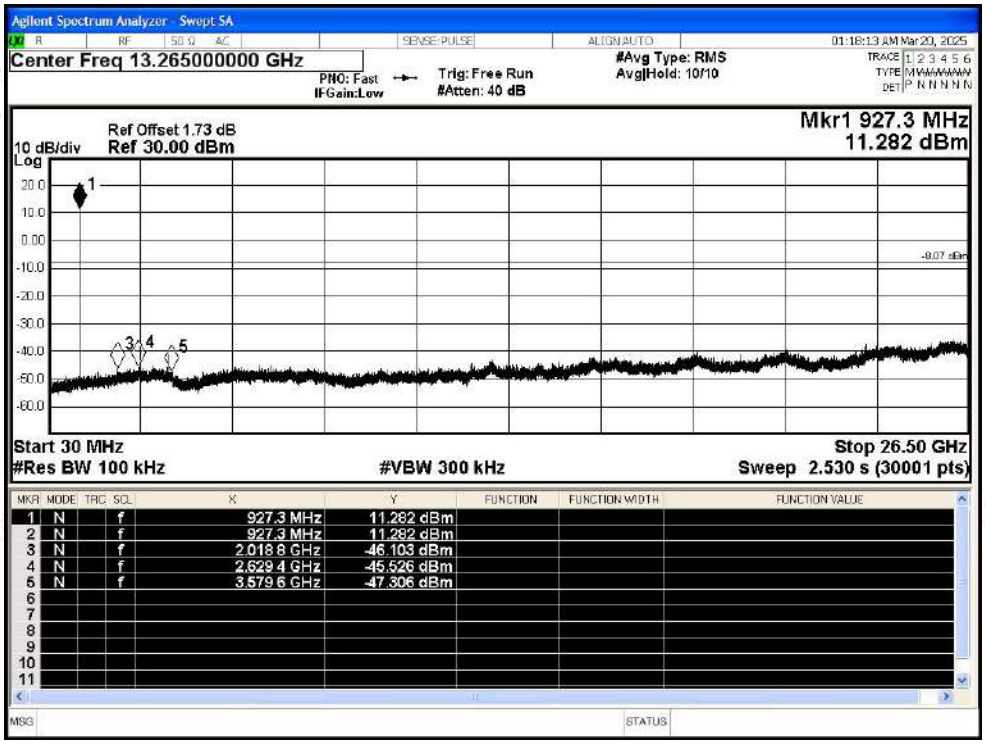
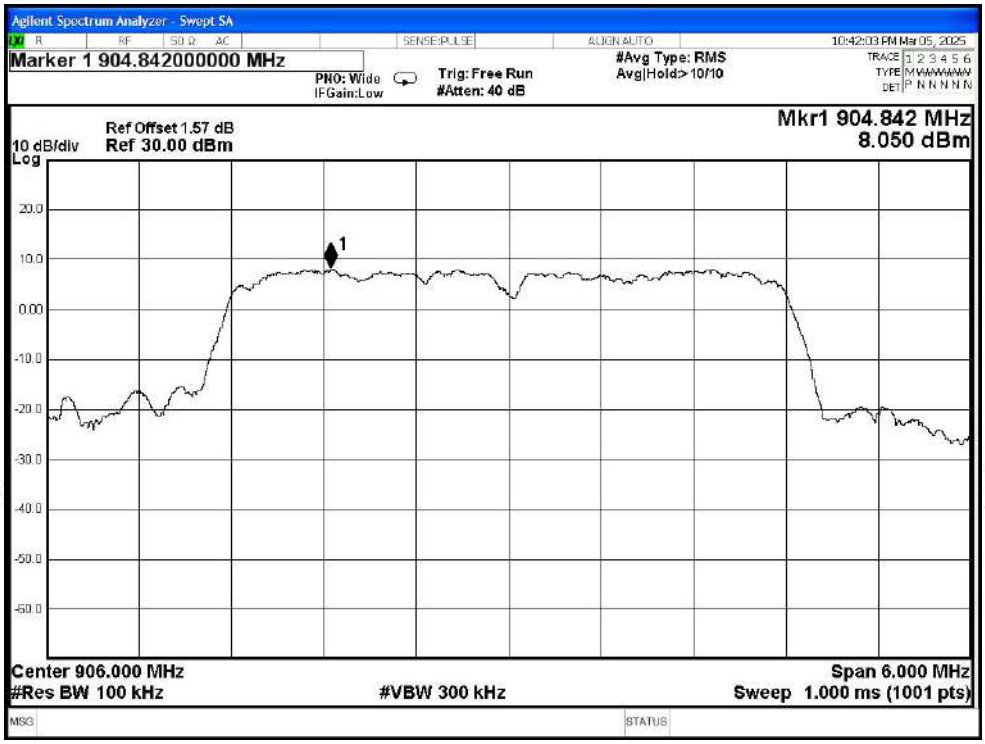


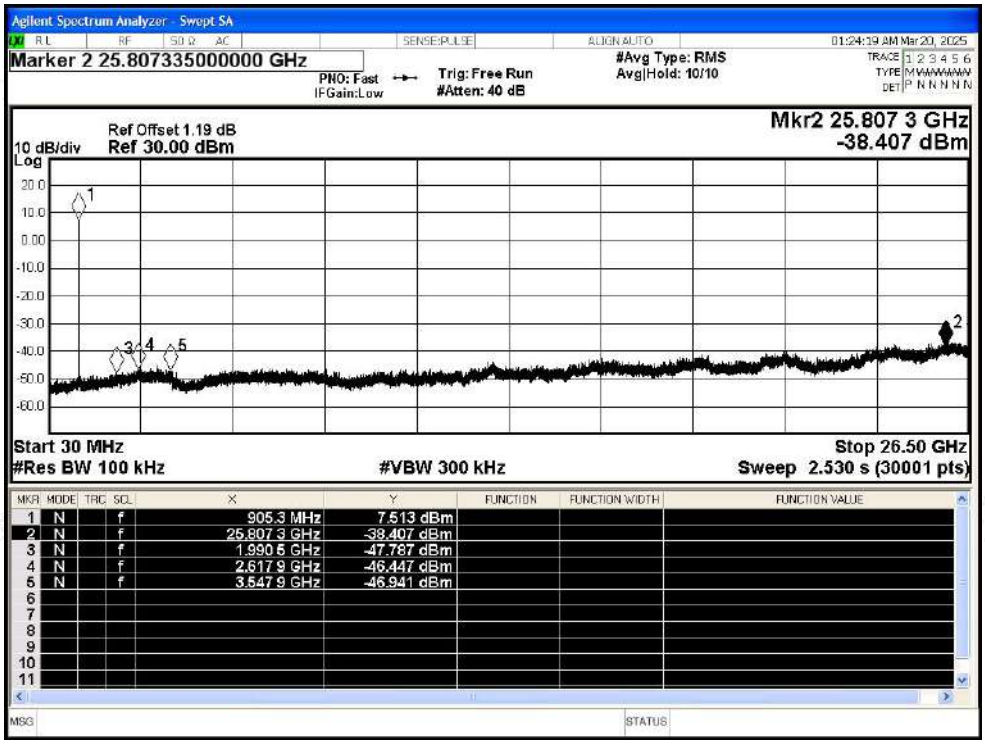
Tx. Spurious NVNT 802.11ah 2M 927MHz Ant1 Emission



Tx. Spurious NVNT 802.11ah 4M 906MHz Ant1 Ref



Tx. Spurious NVNT 802.11ah 4M 906MHz Ant1 Emission



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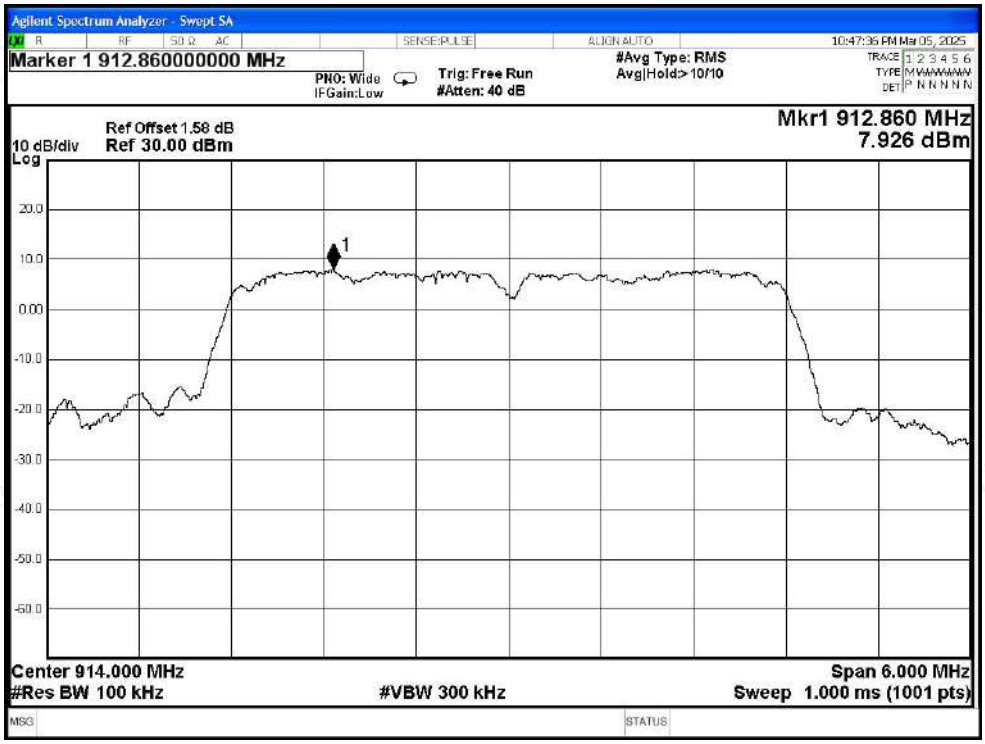

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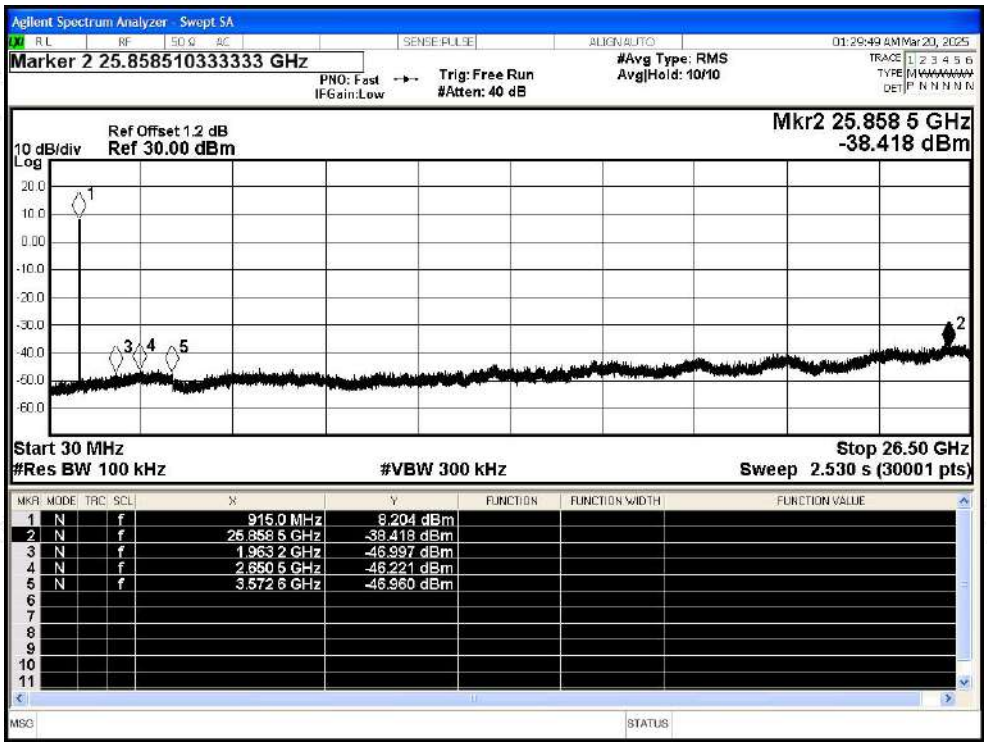
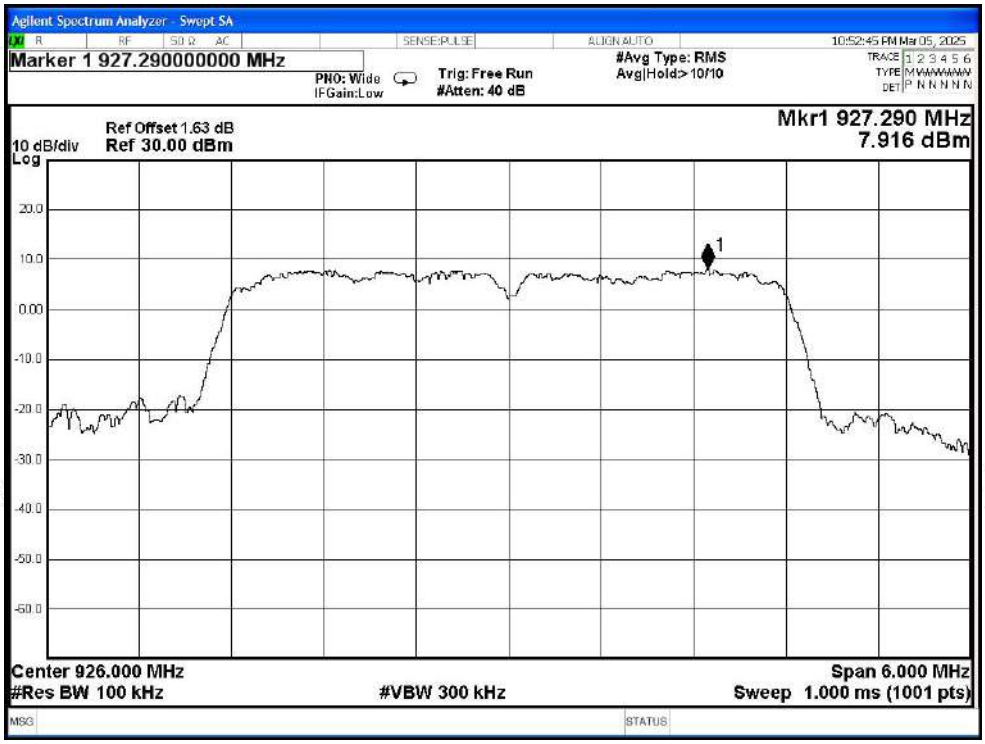
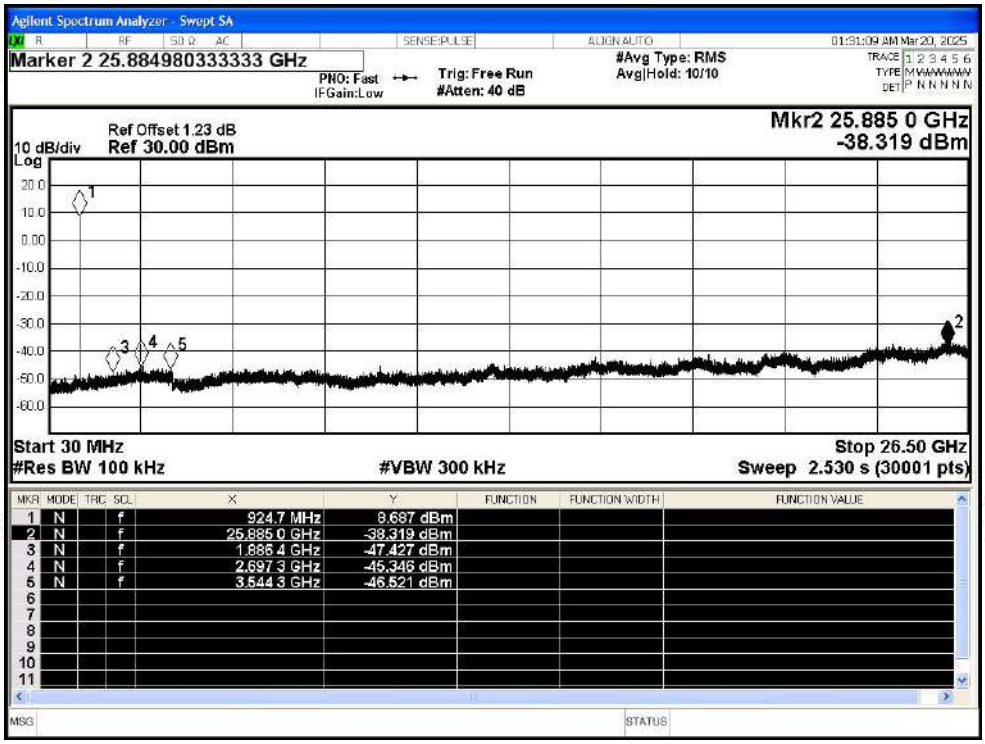


Tx. Spurious NVNT 802.11ah 4M 926MHz Ant1 Ref



Tx. Spurious NVNT 802.11ah 4M 926MHz Ant1 Emission

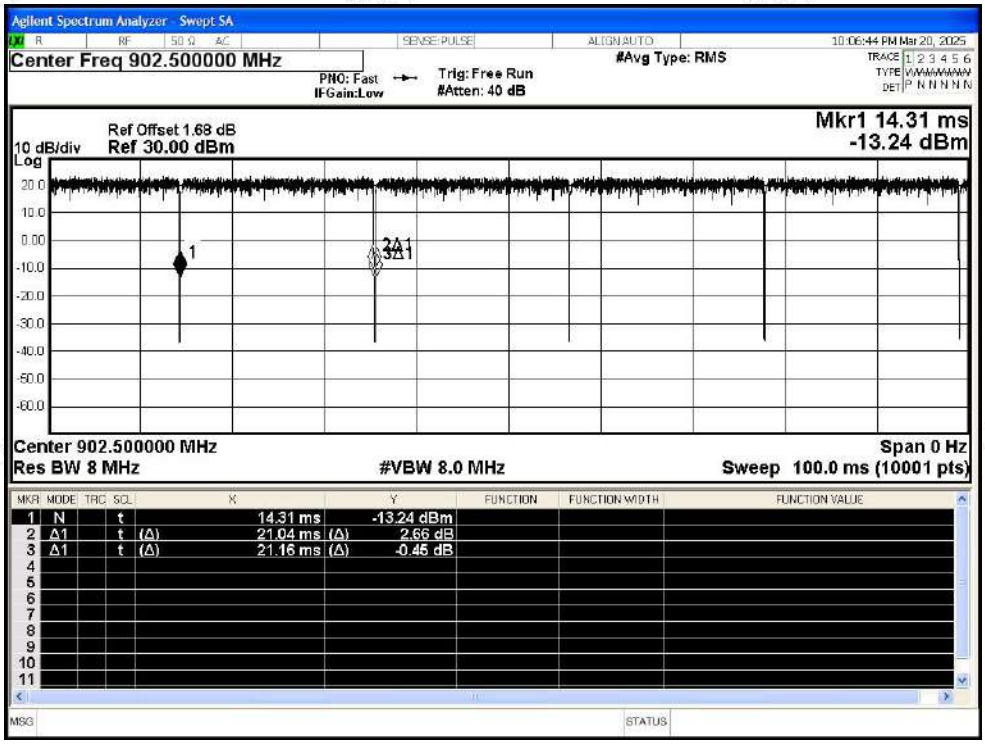


A.6 Duty Cycle

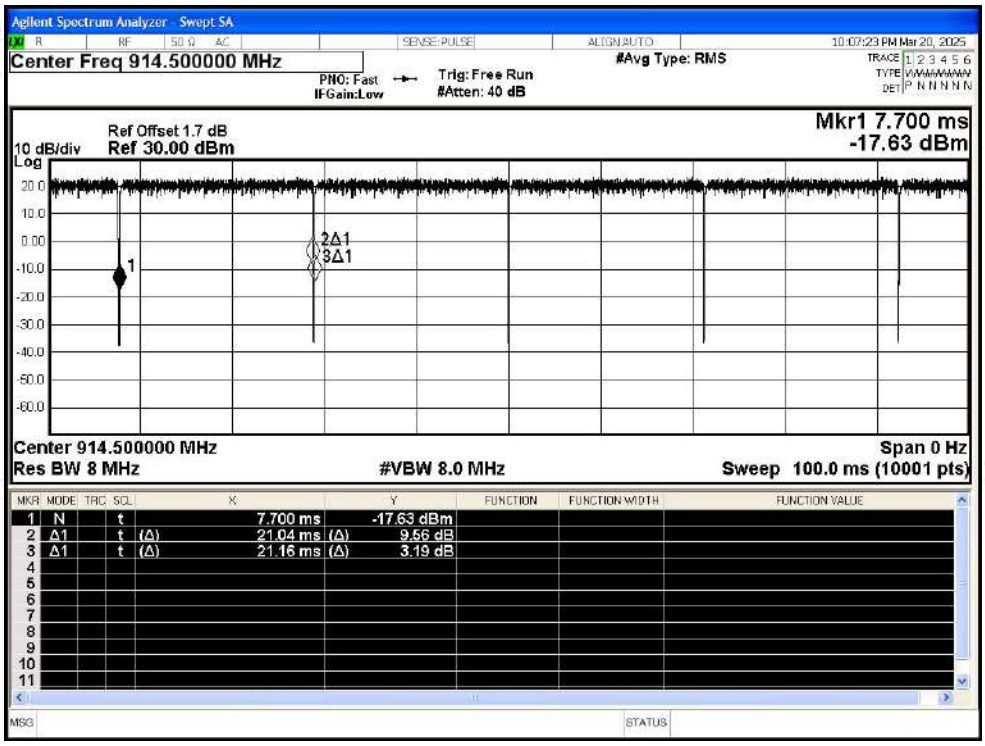
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	11ah 1M	902.5	Ant1	99.43	0	0.05
NVNT	11ah 1M	914.5	Ant1	99.43	0	0.05
NVNT	11ah 1M	927.5	Ant1	99.43	0	0.05
NVNT	11ah 2M	903	Ant1	99.28	0	0.05
NVNT	11ah 2M	913	Ant1	99.28	0	0.05
NVNT	11ah 2M	927	Ant1	99.23	0	0.05
NVNT	11ah 4M	906	Ant1	98.85	0	0.05
NVNT	11ah 4M	914	Ant1	98.85	0	0.05
NVNT	11ah 4M	926	Ant1	98.85	0	0.05

Test Graphs

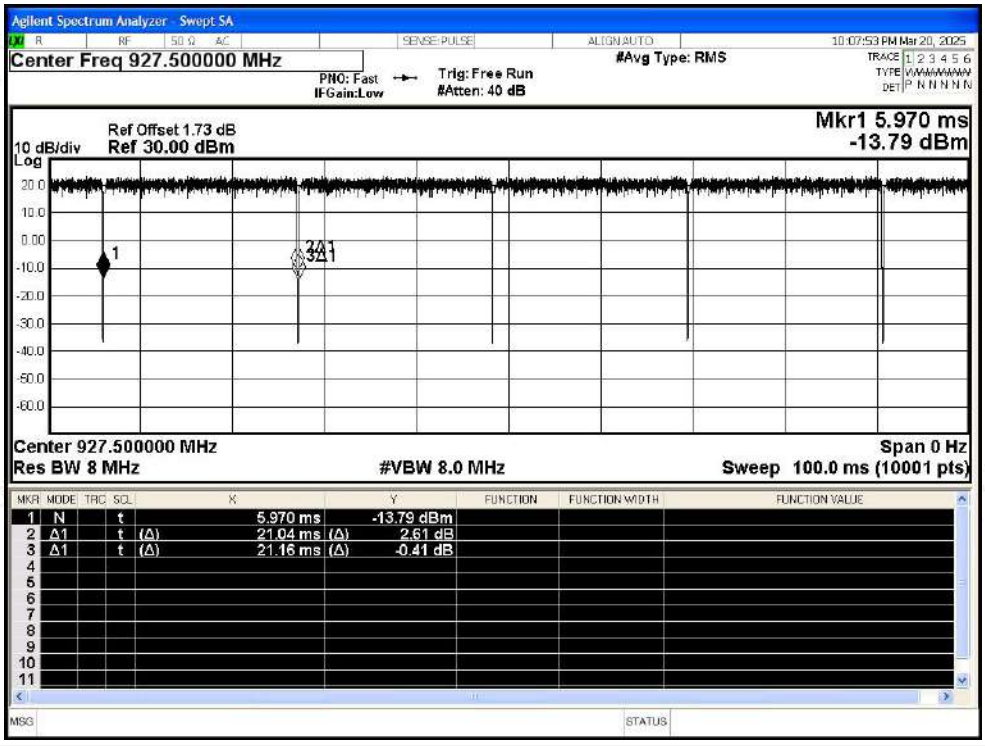
Duty Cycle NVNT 802.11ah 1M 902.5MHz Ant1



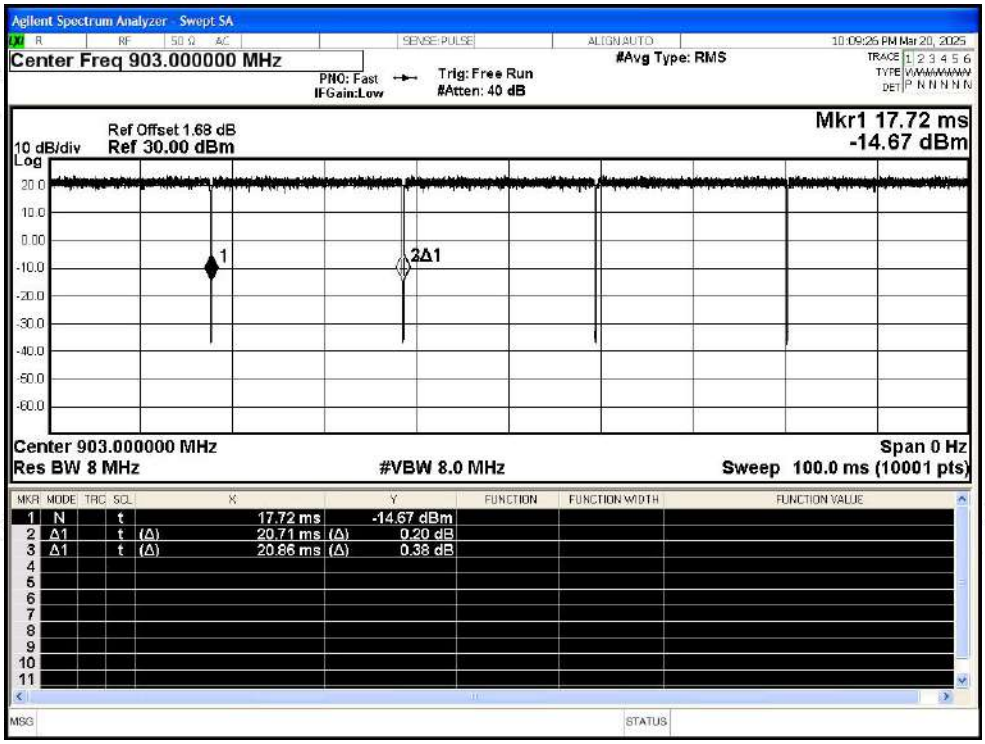
Duty Cycle NVNT 802.11ah 1M 914.5MHz Ant1



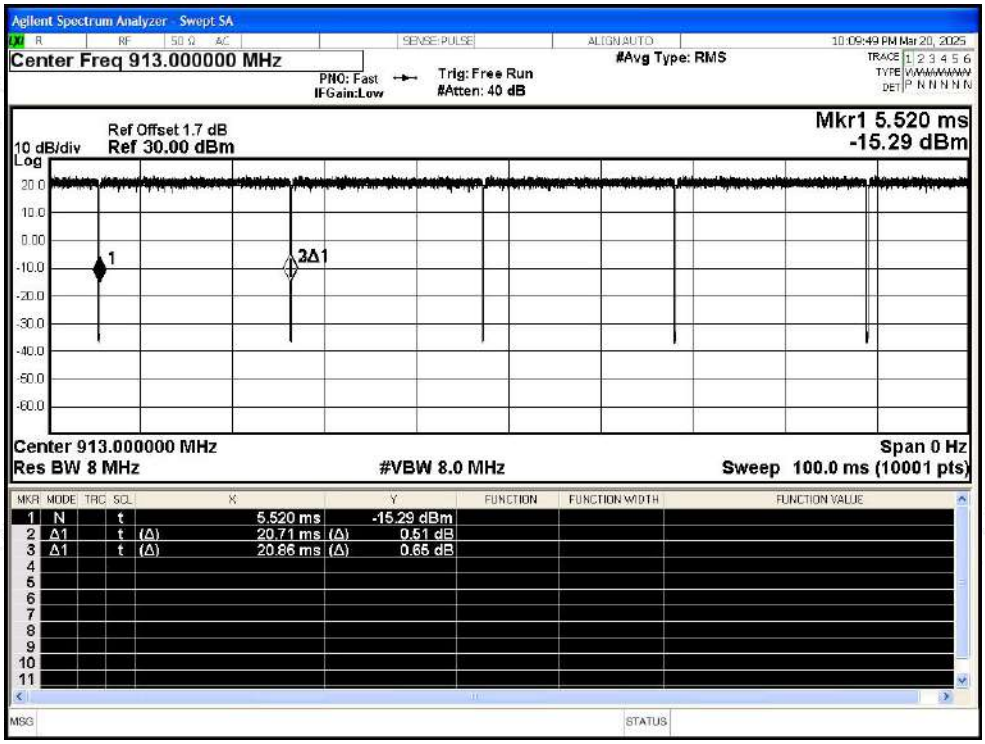
Duty Cycle NVNT 802.11ah 1M 927.5MHz Ant1



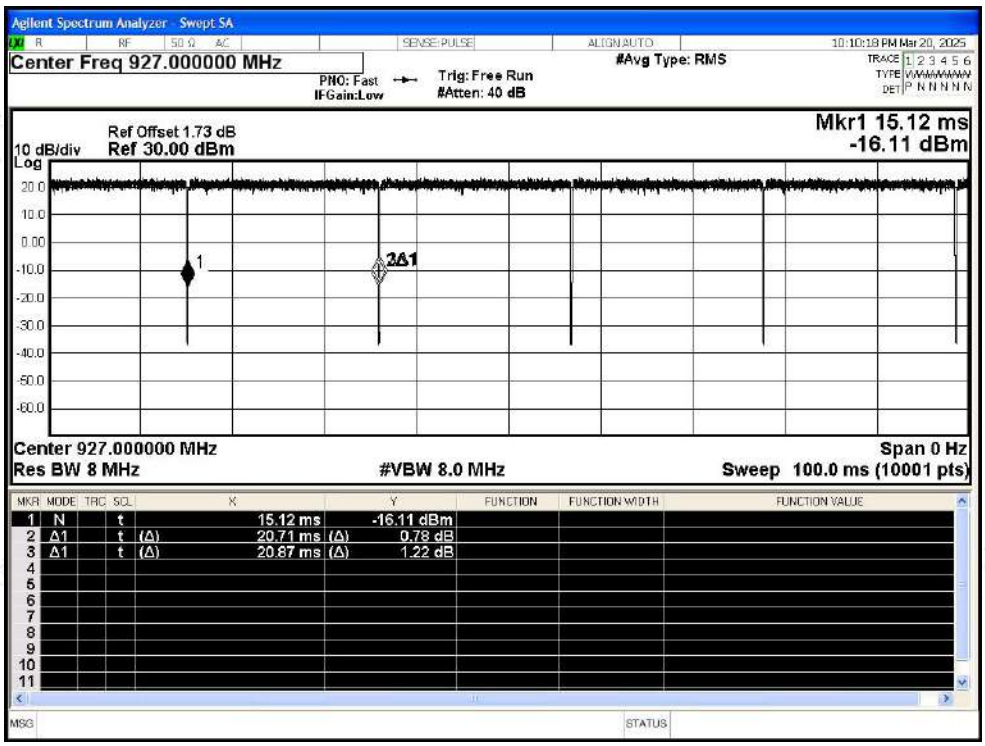
Duty Cycle NVNT 802.11ah 2M 903MHz Ant1



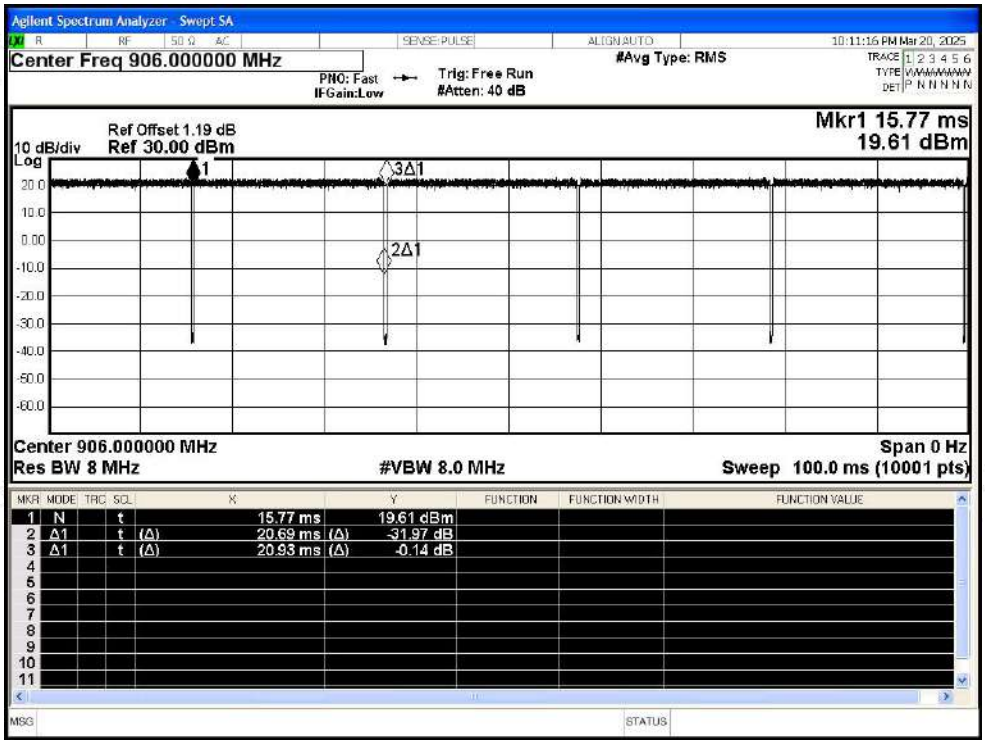
Duty Cycle NVNT 802.11ah 2M 913MHz Ant1



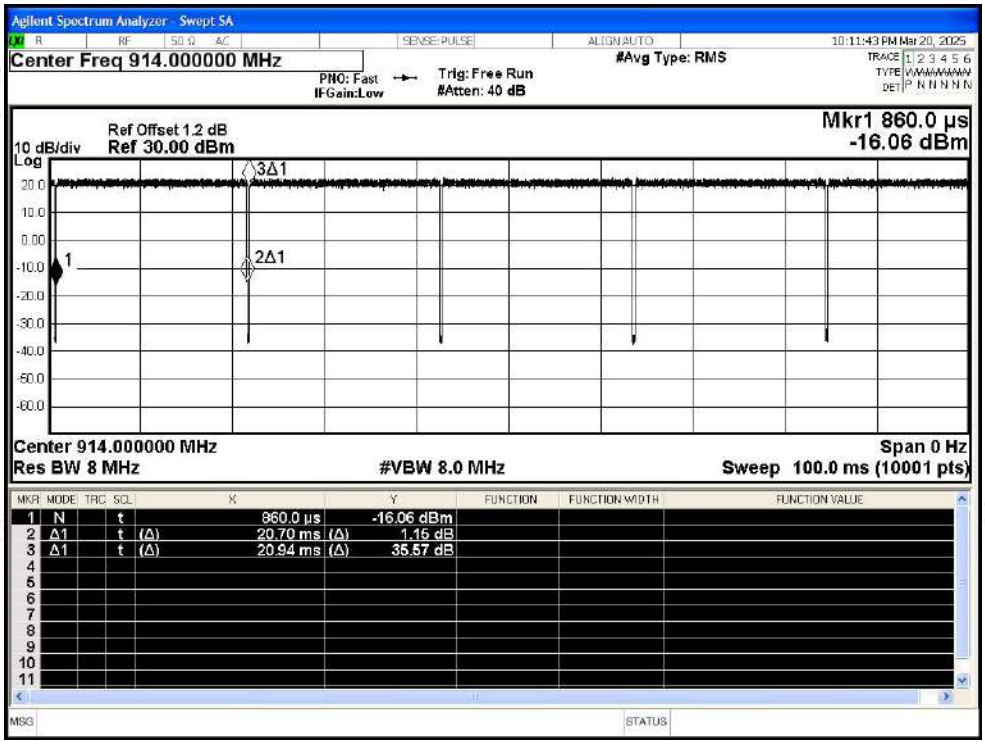
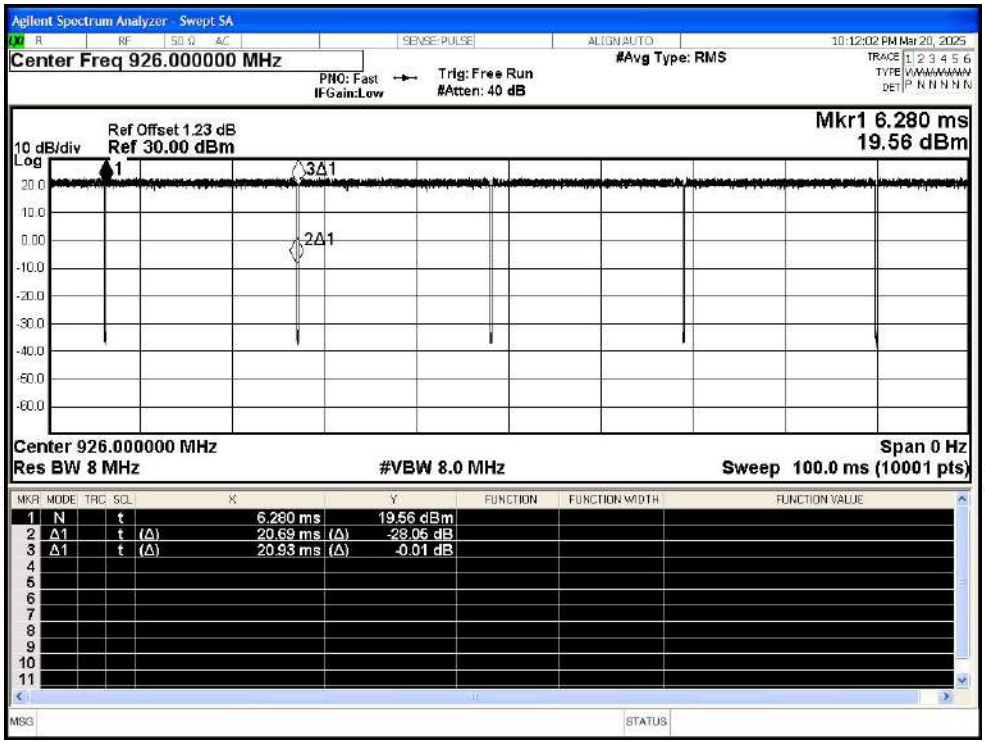
Duty Cycle NVNT 802.11ah 2M 927MHz Ant1



Duty Cycle NVNT 802.11ah 4M 906MHz Ant1



Duty Cycle NVNT 802.11ah 4M 914MHz Ant1



Duty Cycle NVNT 802.11ah 4M 926MHz Ant1