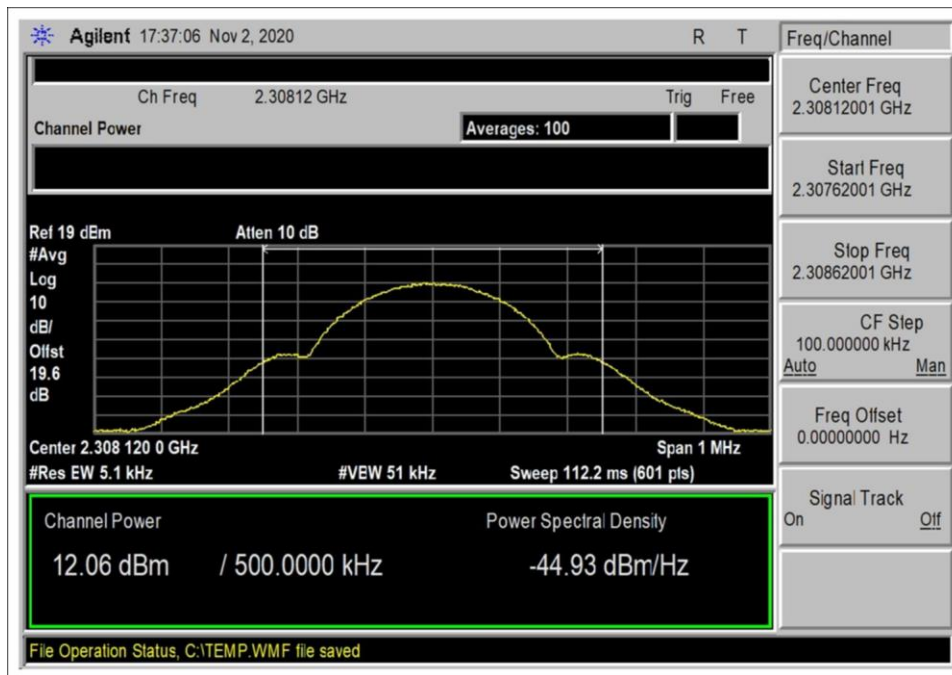
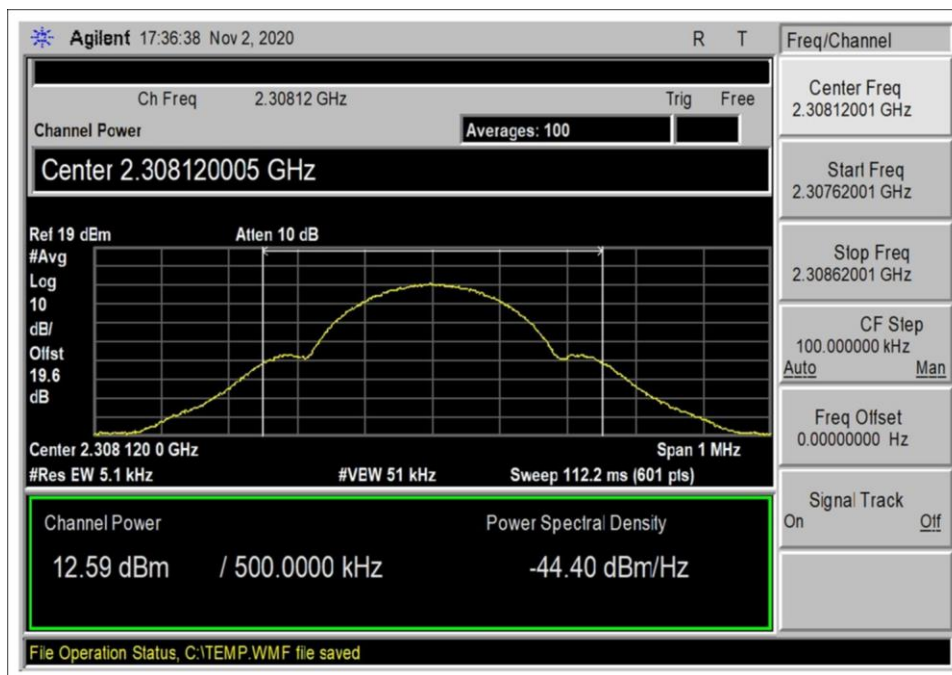




UL 2305-2315 AGC+3dB



UL 2305-2315 pre AGC

3.6.2 Out of Band / Out of Block Emission Conducted Emission

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen
Test Method:	KDB 935210 D05 Indus Booster Basic Meas v01r04, 04/03/2020	Test Date(s):	11/3/2020
Configuration:	1		
Test Setup:	The EUTs (Antenna and Equipment units) are placed on test bench and connected to 12Vdc and 48Vdc external power supplies. Input port (BDA) is connected to two signal generators via combiner. Output port (Antenna) is connected a spectrum analyzer. Uplink (Equipment) unit and Downlink (Antenna) Unit are connected via an unshielded optical cable. The manufacturer declares that the Equipment Unit output port is only intended for BDA unit and is not connected to an antenna. All tests are performed only on the Antenna Unit output port.		
Declaration:	None		

Environmental Conditions			
Temperature (°C)	24.2	Relative Humidity (%):	46

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
03643	Spectrum Analyzer	Agilent	E4440A	5/20/2020	5/20/2022
P06660	Cable	Gore	PHASEFLEX FJR01N01036.0	3/27/2020	3/27/2022
P07243	Cable	H&S	32022-29094K- 29094K-24TC	5/29/2020	5/29/2022
03431	Attenuator	Aeroflex/Weinschel	89-20-21	12/20/2019	12/20/2021
P07037	Signal Generator	Agilent	E4432B	2/7/2019	2/7/2021
03715	Signal Generator	Agilent	E4433B	3/20/2019	3/20/2021
00786	Preamplifier	HP	83017A	5/20/2020	5/20/2022
P06794	Splitter/Combiner	Anaren	41130	5/14/2019	5/14/2021
P06662	Cable	Gore	PHASEFLEX EJR01N01024.0	3/27/2020	3/27/2022
P06664	Cable	Gore	PHASEFLEX FJR01N01036.0	3/27/2020	3/27/2022

Limit for Conducted Spurious Emission

$$\begin{aligned}
 \text{REQUIRED ATTENUATION} &= 43 + 10 \log P \text{ dB} \\
 \text{Limit} &= \text{Power} - \text{Required Attenuation} \\
 &= 10 \log P - (43 + 10 \log P) \\
 &= 10 \log P - 43 - 10 \log P \\
 &= -43 \text{ dBW} \\
 &= 0.00005 \text{ W (0.05 mW)} \\
 &= 10 \log 0.00005 / 0.001 \\
 &= -13 \text{ dBm (94 dBuV) at any power level.}
 \end{aligned}$$

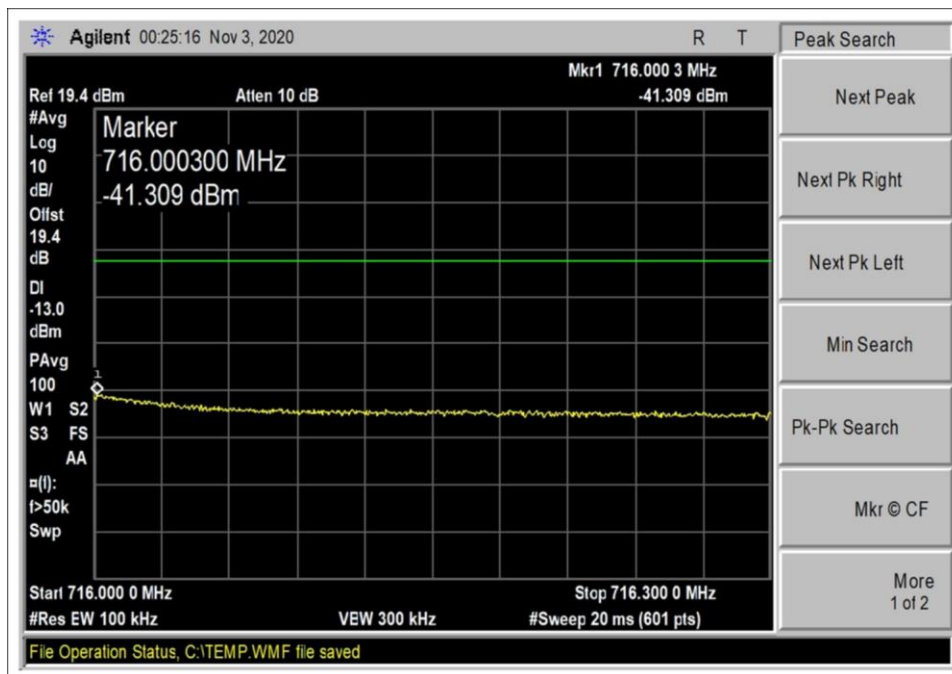
AWGN													
Operational Frequencies (MHz)	Link	Band	Adjacent Freqs (MHz)	Single Freq (MHz)	Two Signals PreAGC (dBm)	Two Signals AGC+3dB (dBm)	Single Signal PreAGC (dBm)	Single Signal AGC+3dB (dBm)	OOB Limit (dBm)	Margin Two Signals preAGC (dB)	Margin Two Signals AGC+3dB (dB)	Margin Single Signal preAGC (dB)	Margin Single Signal AGC+3dB (dB)
698-716	UL	Upper	708.5, 713.5	713.5	-44.87	-39.05	-43.49	-41.31	-13	-31.87	-26.05	-30.49	-28.31
698-716	UL	Lower	700.5, 705.5	700.5	-42.52	-41.74	-42.07	-38.87	-13	-29.52	-28.74	-29.07	-25.87
776-787	UL	Upper	779.5, 784.5	784.5	-45.46	-41.66	-40.56	-35.22	-13	-32.46	-28.66	-27.56	-22.22
776-787	UL	Lower	778.5, 783.5	778.5	-45.41	-40.49	-42.28	-39.00	-13	-32.41	-27.49	-29.28	-26.00
817-824	UL	Upper	NA	821.5	NA	NA	-44.29	-44.22	-13	NA	NA	-31.29	-31.22
817-824	UL	Lower	NA	819.5	NA	NA	-46.17	-43.45	-13	NA	NA	-33.17	-30.45
824-849	UL	Upper	841.5, 846.5	846.5	-46.71	-40.92	-43.57	-39.17	-13	-33.71	-27.92	-30.57	-26.17
824-849	UL	Lower	826.5, 831.5	826.5	-45.75	-38.81	-43.64	-39.61	-13	-32.75	-25.81	-30.64	-26.61
1850-1915	UL	Upper	1907.5, 1912.5	1912.5	-33.59	-31.33	-33.43	-30.46	-13	-20.59	-18.33	-20.43	-17.46
1850-1915	UL	Lower	1852.5, 1857.5	1852.5	-32.23	-42.02	-29.48	-25.56	-13	-19.23	-29.02	-16.48	-12.56
1710-1755	UL	Upper	1747.5, 1752.5	1752.5	-34.09	-29.45	-29.78	-26.78	-13	-21.09	-16.45	-16.78	-13.78
1710-1755	UL	Lower	1712.5, 1717.5	1712.5	-35.46	-30.76	-32.60	-27.61	-13	-22.46	-17.76	-19.60	-14.61
2305-2315	UL	Upper	2307.5, 2312.5	2312.5	-22.10	-23.55	-22.15	-22.18	-13	-9.10	-10.55	-9.15	-9.18
2305-2315	UL	Lower	2307.5, 2312.5	2307.5	-23.70	-22.76	-21.31	-22.04	-13	-10.70	-9.76	-8.31	-9.04

NA: EUT cannot accommodate two adjacent signals simultaneously within the passband.

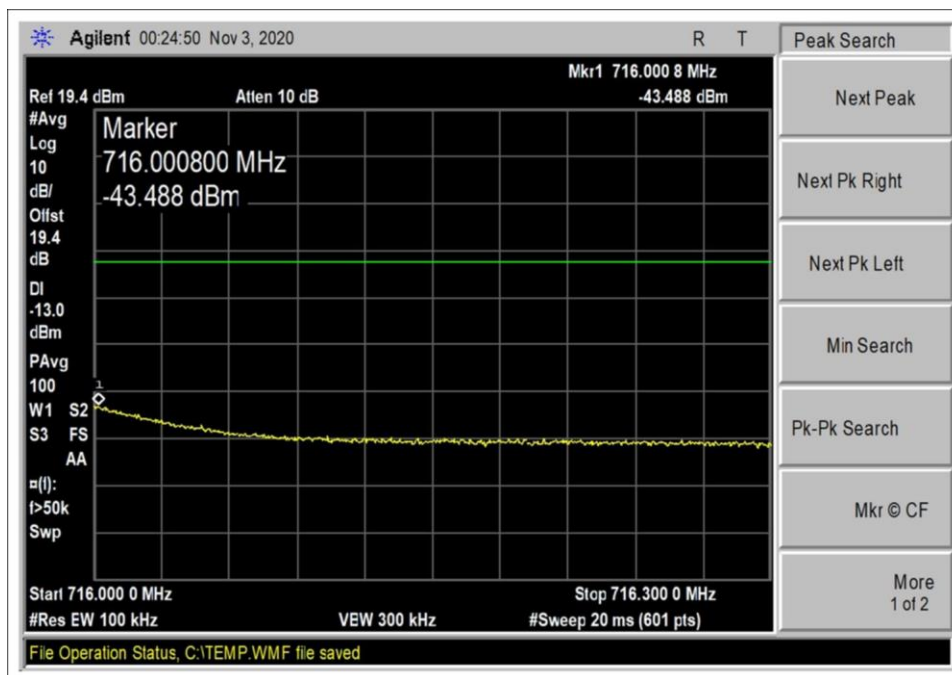
GSM													
Operational Frequencies (MHz)	Link	Band	Adjacent Freqs (MHz)	Single Freq (MHz)	Two Signals PreAGC (dBm)	Two Signals AGC+3dB (dBm)	Single Signal PreAGC (dBm)	Single Signal AGC+3dB (dBm)	OOB Limit (dBm)	Margin Two Signals preAGC (dB)	Margin Two Signals AGC+3dB (dB)	Margin Single Signal preAGC (dB)	Margin Single Signal AGC+3dB (dB)
698-716	UL	Upper	715.6, 715.8	715.8	-32.63	-32.44	-29.74	-29.50	-13	-19.63	-19.44	-16.74	-16.50
698-716	UL	Lower	698.2, 698.4	698.2	-31.84	-31.20	-28.95	-28.60	-13	-18.84	-18.20	-15.95	-15.95
776-787	UL	Upper	786.6, 786.8	786.8	-32.43	-31.30	-29.19	-29.34	-13	-19.43	-18.30	-16.19	-16.19
776-787	UL	Lower	776.2, 776.4	776.2	-32.36	-31.76	-29.39	-29.48	-13	-19.36	-18.76	-16.39	-16.39
817-824	UL	Upper	823.6, 823.8	823.8	-33.33	-33.42	-29.69	-30.18	-13	-20.33	-20.42	-16.69	-16.69
817-824	UL	Lower	817.2, 817.4	817.2	-33.98	-33.74	-31.24	-31.37	-13	-20.98	-20.74	-18.24	-18.24
824-849	UL	Upper	848.6, 848.8	848.8	-33.36	-33.33	-31.53	-31.21	-13	-20.36	-20.33	-18.53	-18.53
824-849	UL	Lower	824.2, 824.4	824.2	-33.41	-32.95	-30.04	-29.92	-13	-20.41	-19.95	-17.04	-17.04
1850-1915	UL	Upper	1914.6, 1914.8	1914.8	-20.94	-20.89	-18.64	-20.94	-13	-7.94	-7.89	-5.64	-5.64
1850-1915	UL	Lower	1850.2, 1850.4	1850.2	-20.12	-18.73	-17.45	-17.32	-13	-7.12	-5.73	-4.45	-4.45
1710-1755	UL	Upper	1754.6, 1754.8	1754.8	-19.77	-20.15	-16.60	-16.32	-13	-6.77	-7.15	-3.60	-3.60
1710-1755	UL	Lower	1710.2, 1710.4	1710.2	-21.67	-21.94	-18.98	-18.69	-13	-8.67	-8.94	-5.98	-5.98
2305-2315	UL	Upper	2314.6, 2314.8	2314.8	-21.63	-20.86	-18.93	-19.02	-13	-8.63	-7.86	-5.93	-5.93
2305-2315	UL	Lower	2305.2, 2305.4	2305.2	-21.27	-19.92	-19.13	-19.06	-13	-8.27	-6.92	-6.13	-6.13

Plots

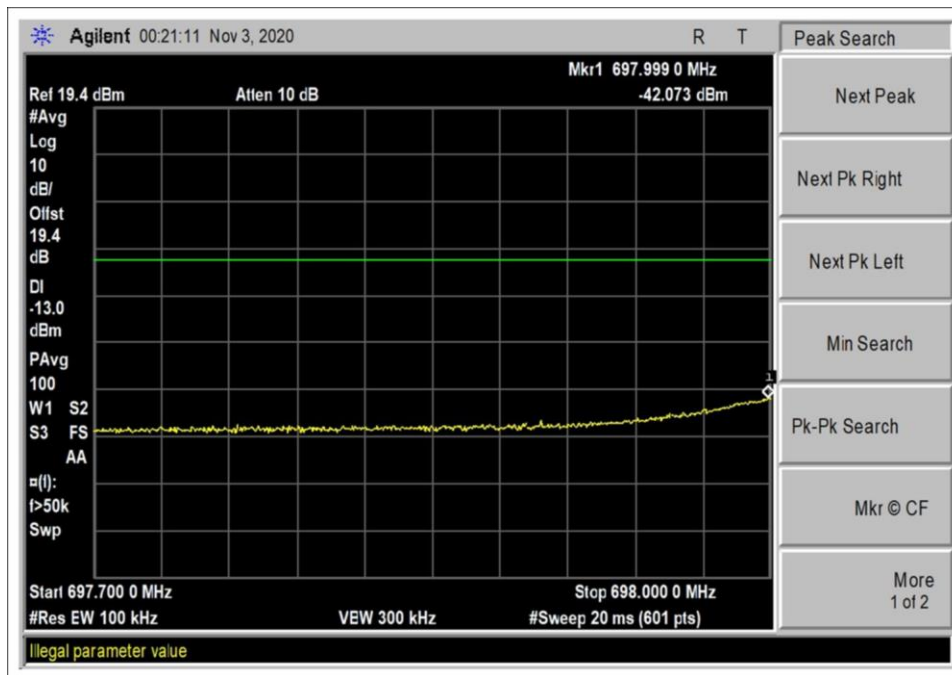
AWGN - Single Signal



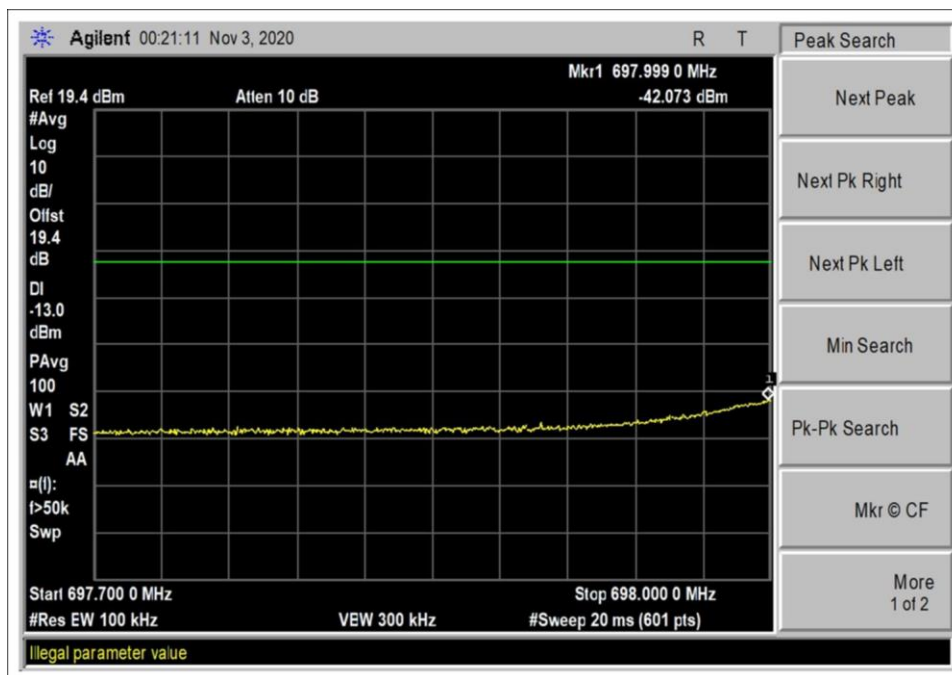
UL 698-716 High band AGC+3dB



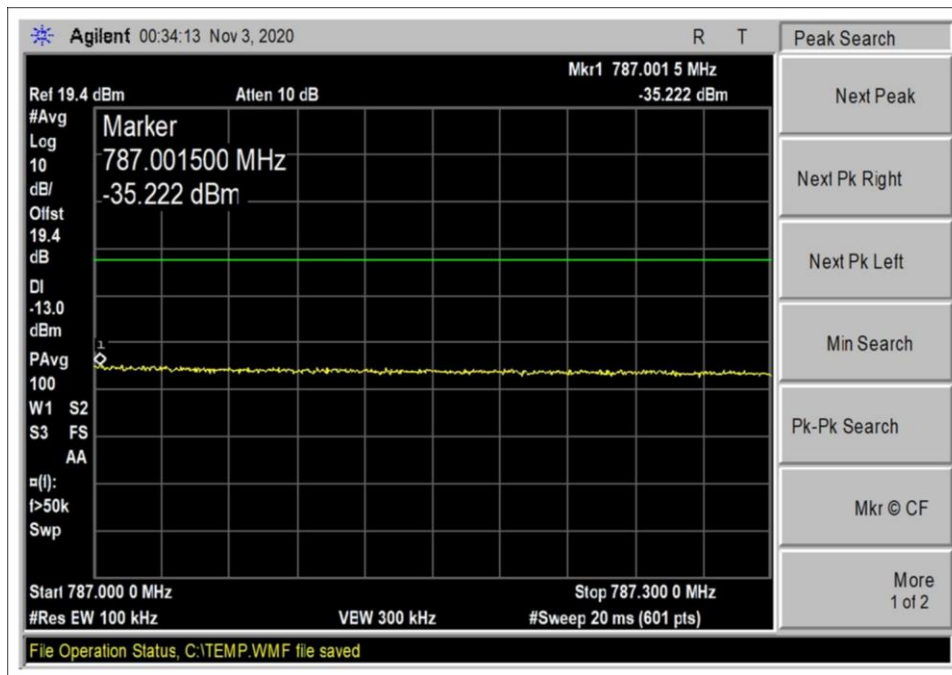
UL 698-716 High band pre AGC



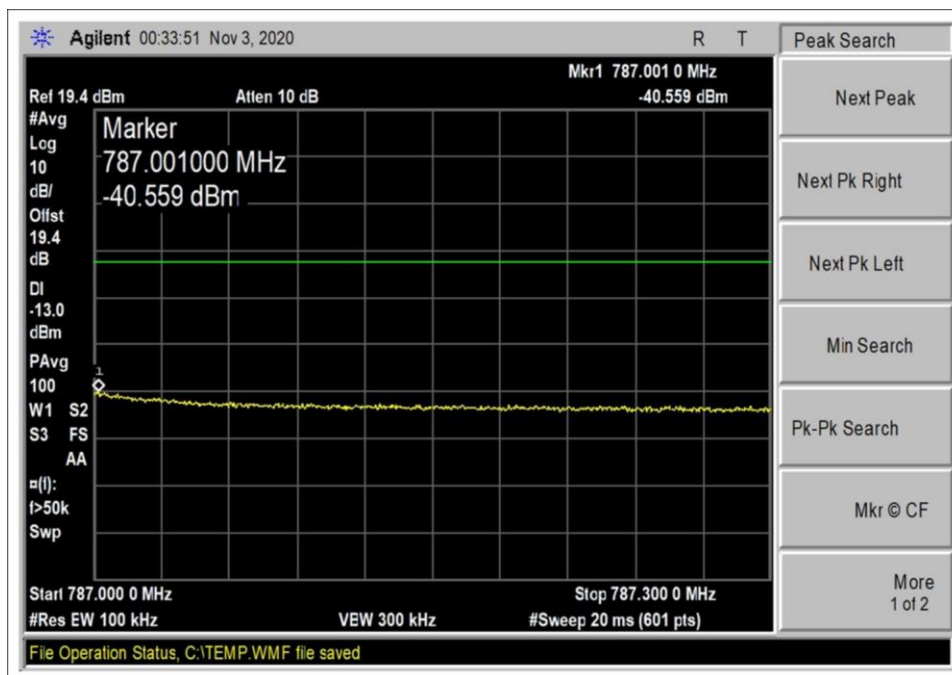
UL 698-716 Low band AGC+3dB



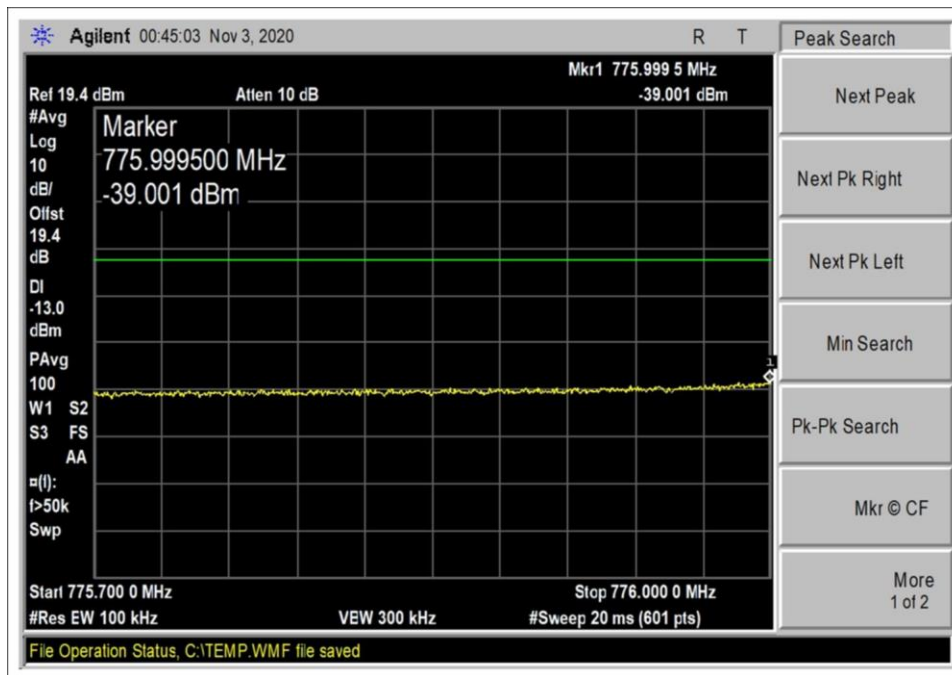
UL 698-716 Low band pre AGC



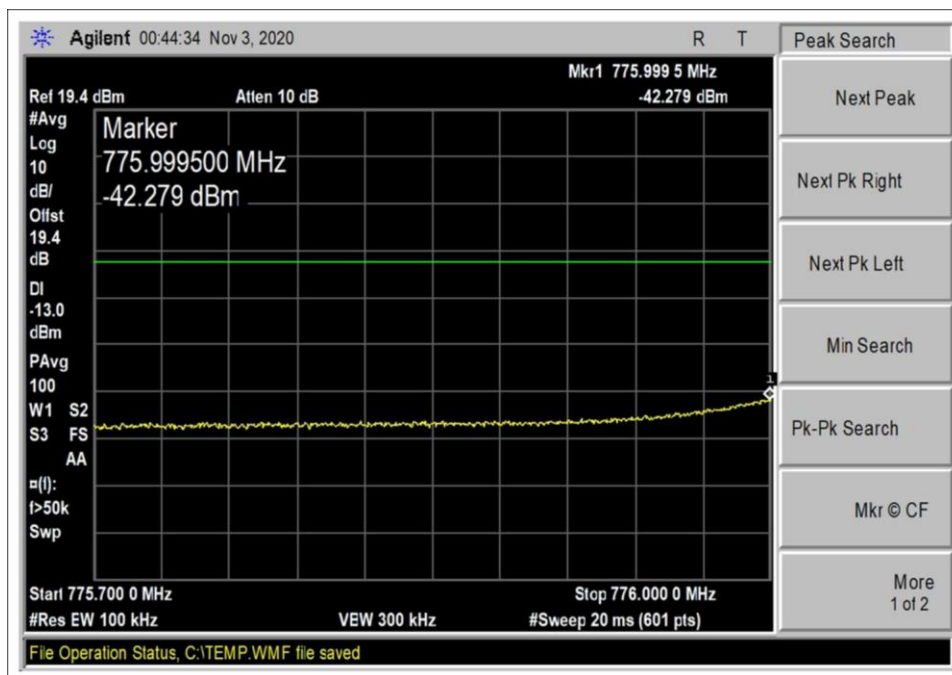
UL 776-787 High band AGC+3dB



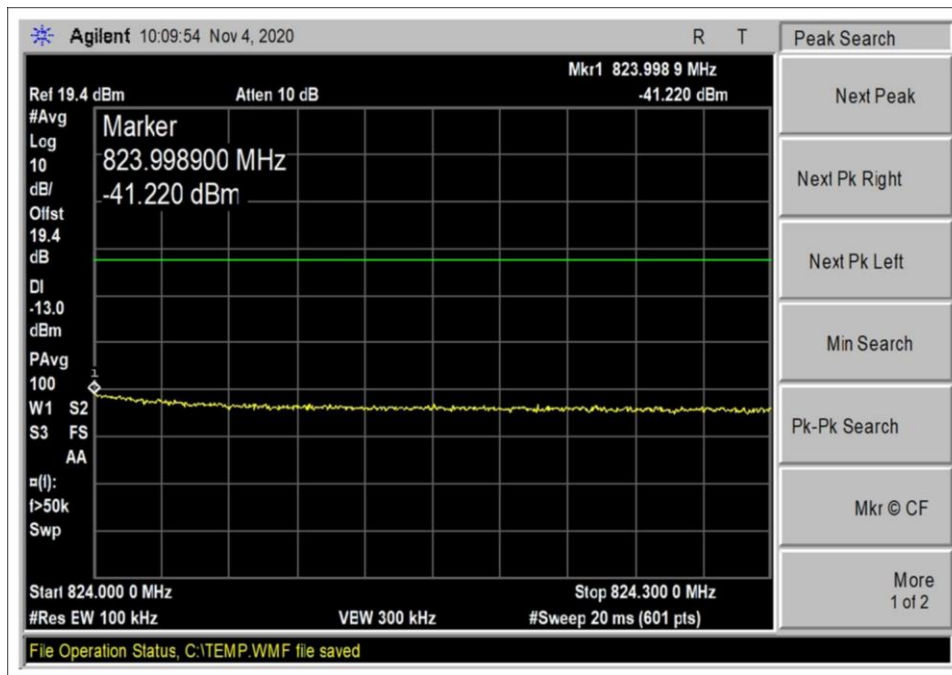
UL 776-787 High band pre AGC



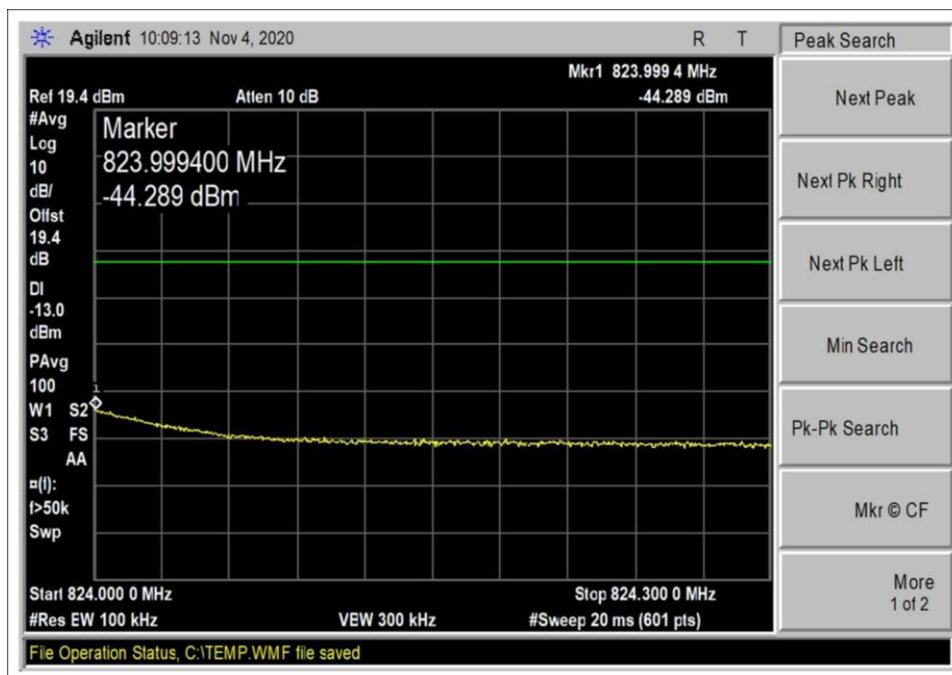
UL 776-787 Low band AGC+3dB



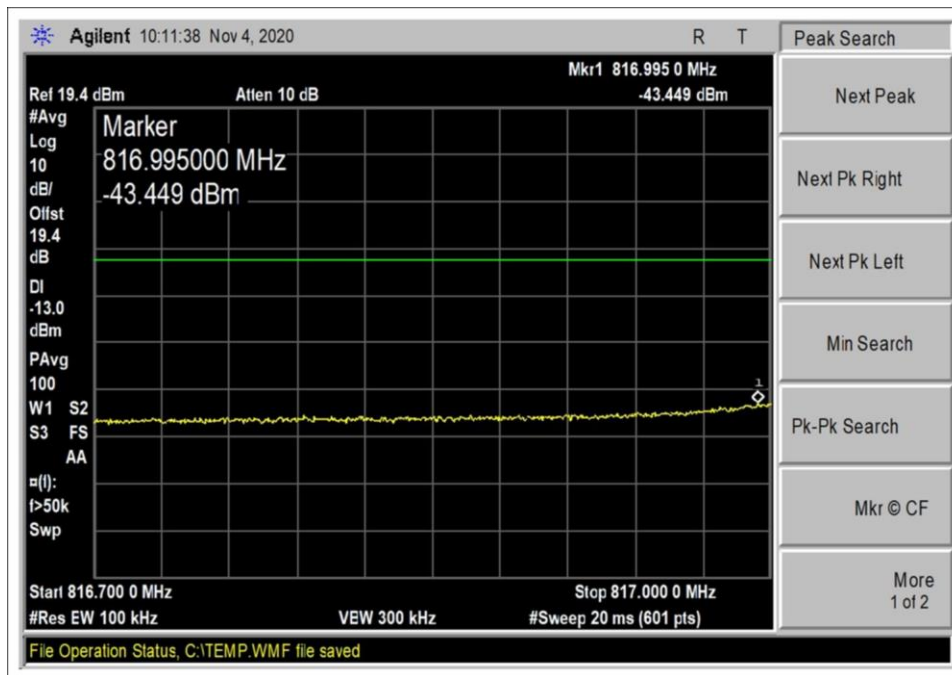
UL 776-787 Low band preAGC



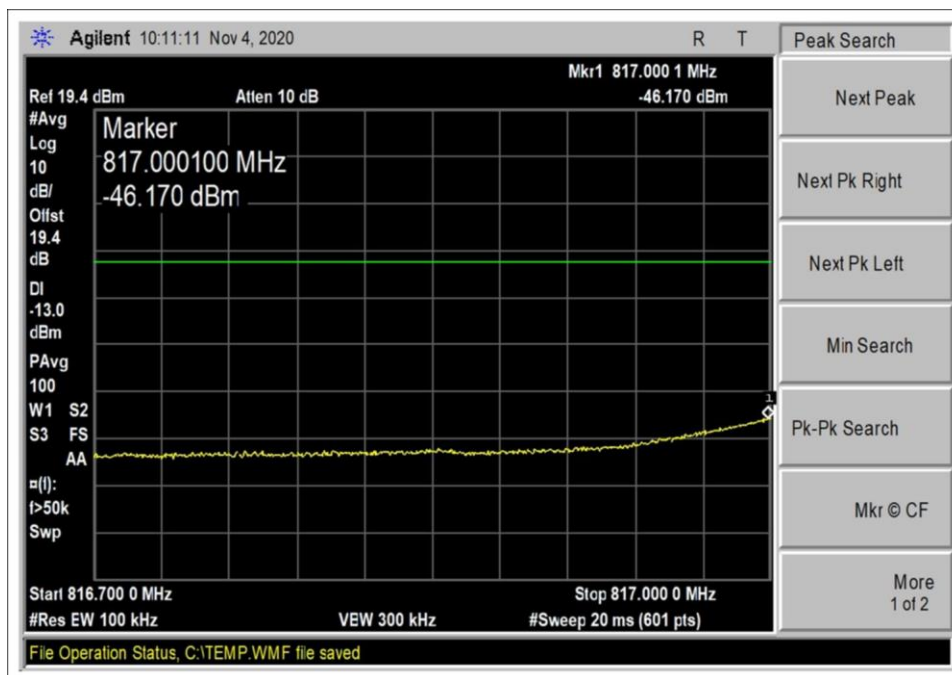
UL 817-824 High band AGC+3dB



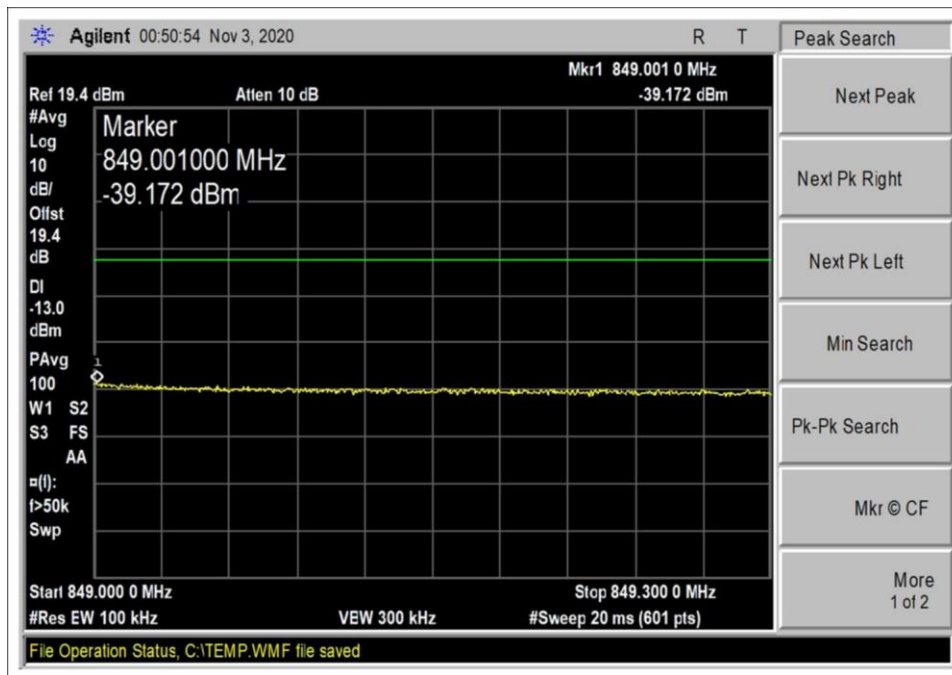
UL 817-824 High band preAGC



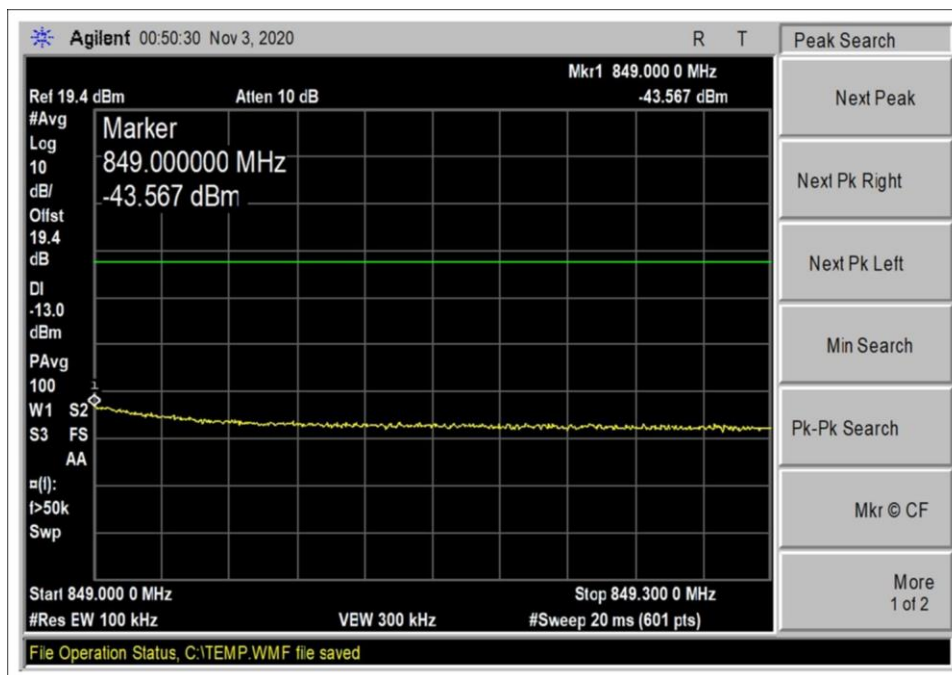
UL 817-824 Low band AGC+3dB



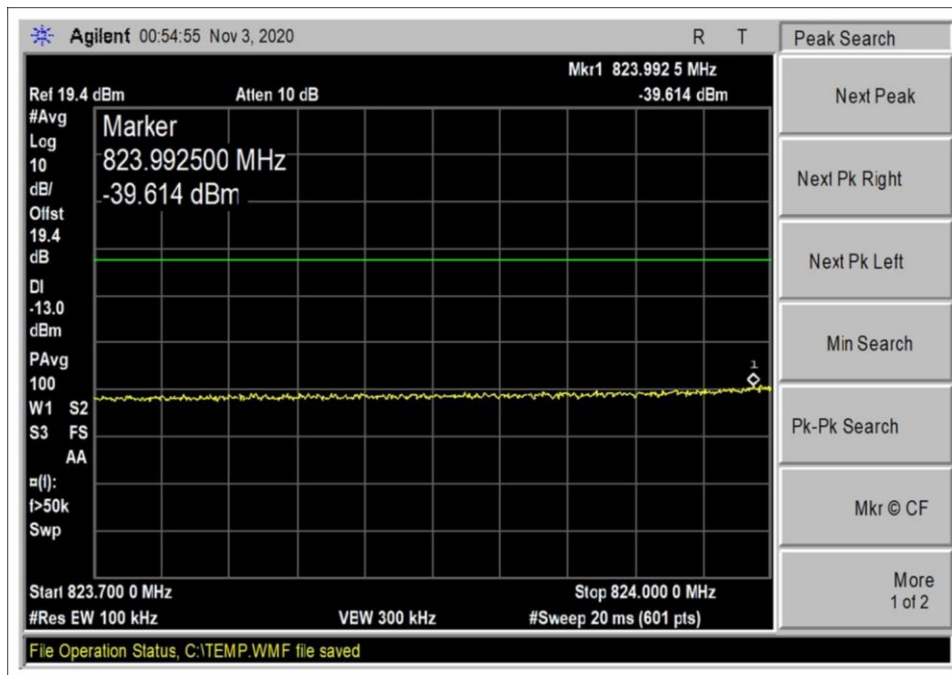
UL 817-824 Low band preAGC



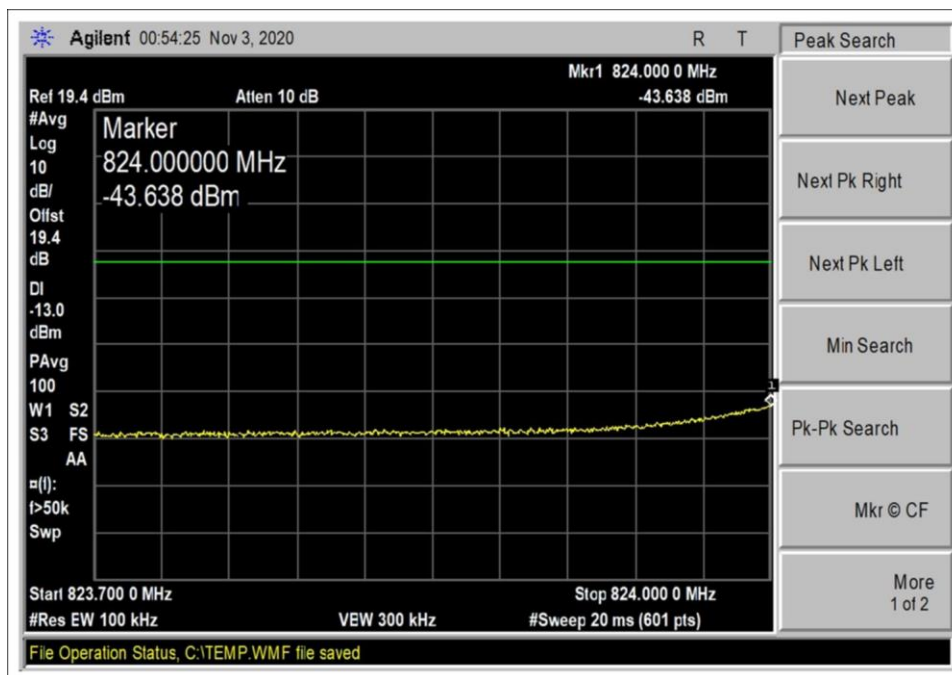
UL 824-849 High band AGC+3dB



UL 824-849 High band pre AGC



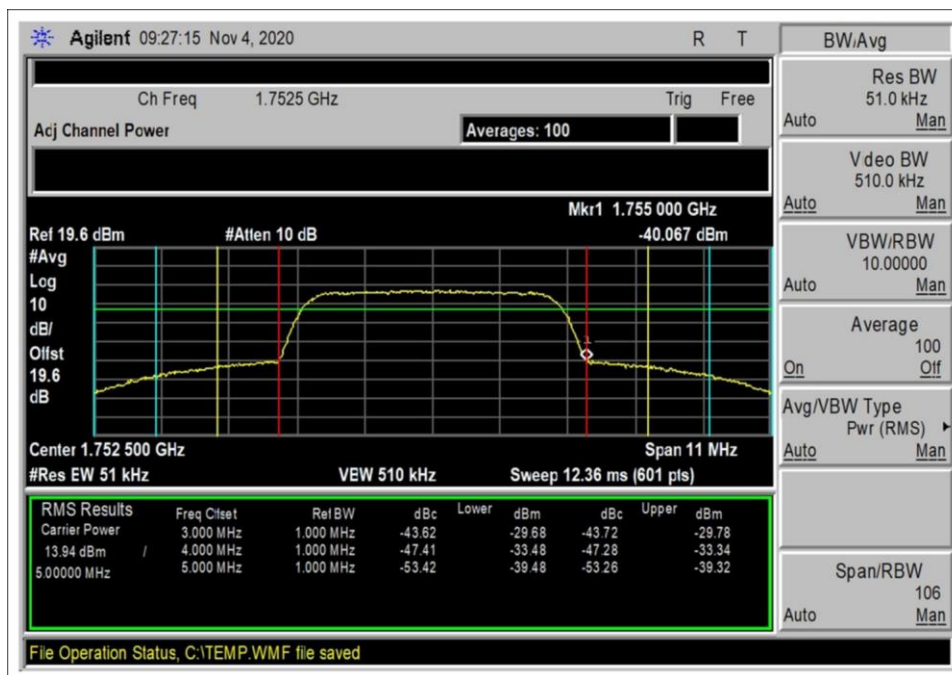
UL 824-849 Low band AGC+3dB



UL 824-849 Low band pre AGC



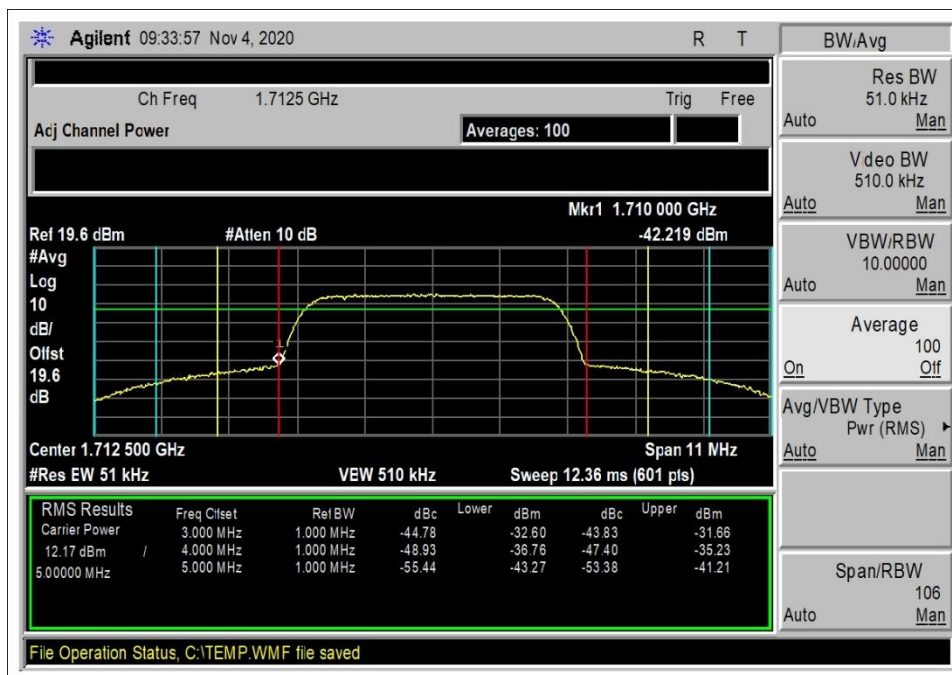
UL 1710-1755 High band AGC+3dB



UL 1710-1755 High band preAGC



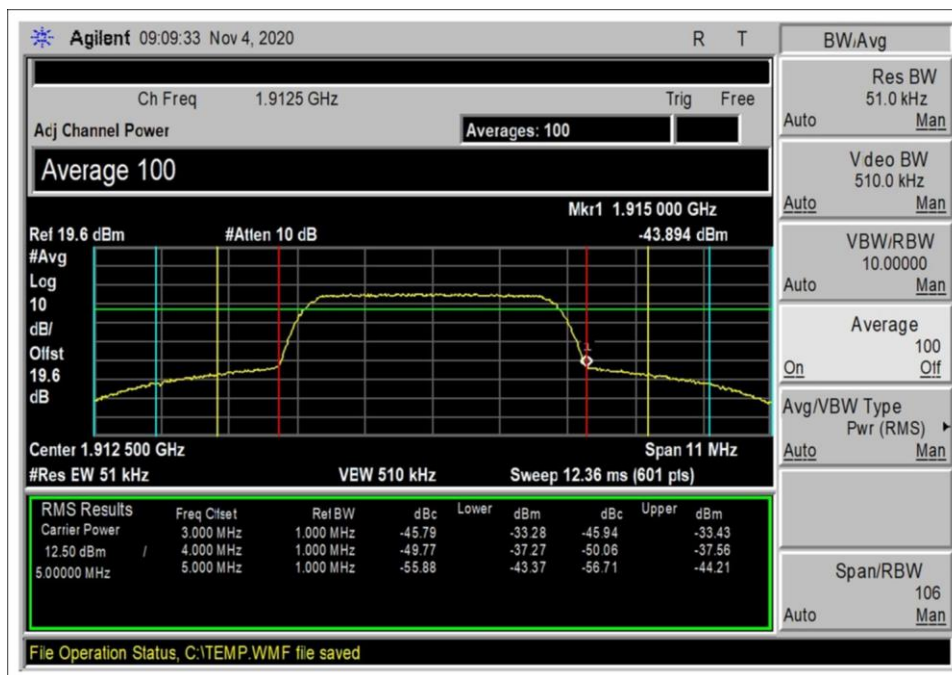
UL 1710-1755 Low band AGC+3dB



UL 1710-1755 Low band preAGC



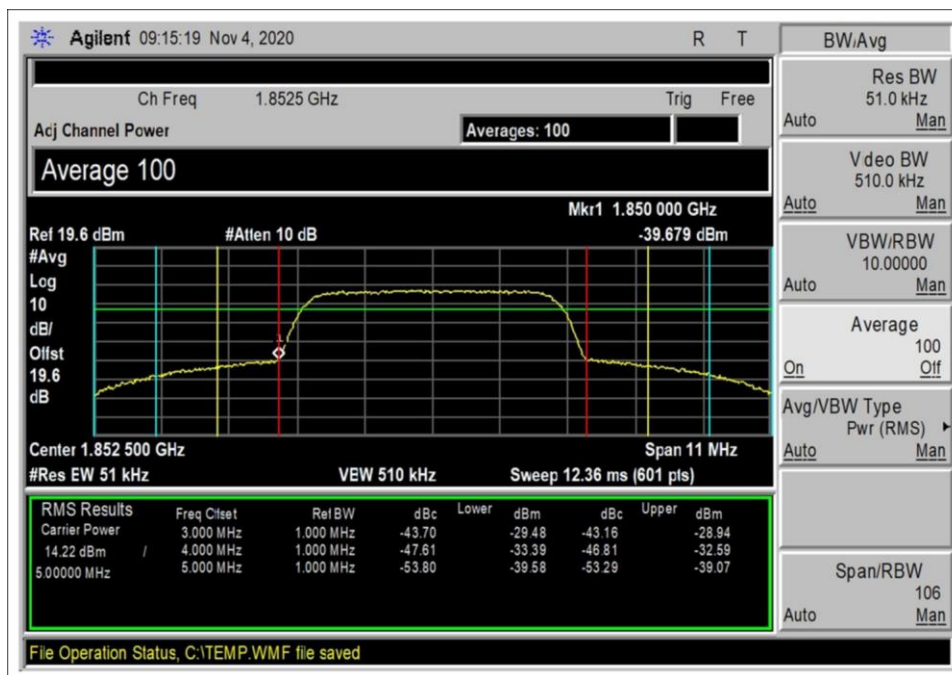
UL 1850-1915 High band AGC+3dB



UL 1850-1915 High band preAGC



UL 1850-1915 Low band AGC+3dB



UL 1850-1915 Low band preAGC



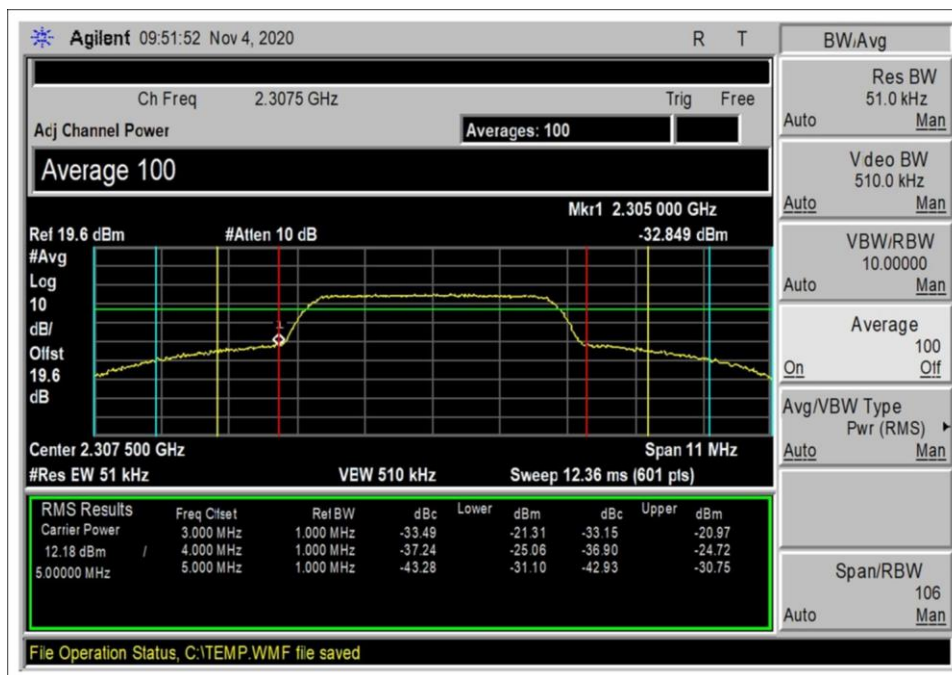
UL 2305-2315 High band AGC+3dB



UL 2305-2315 High band preAGC

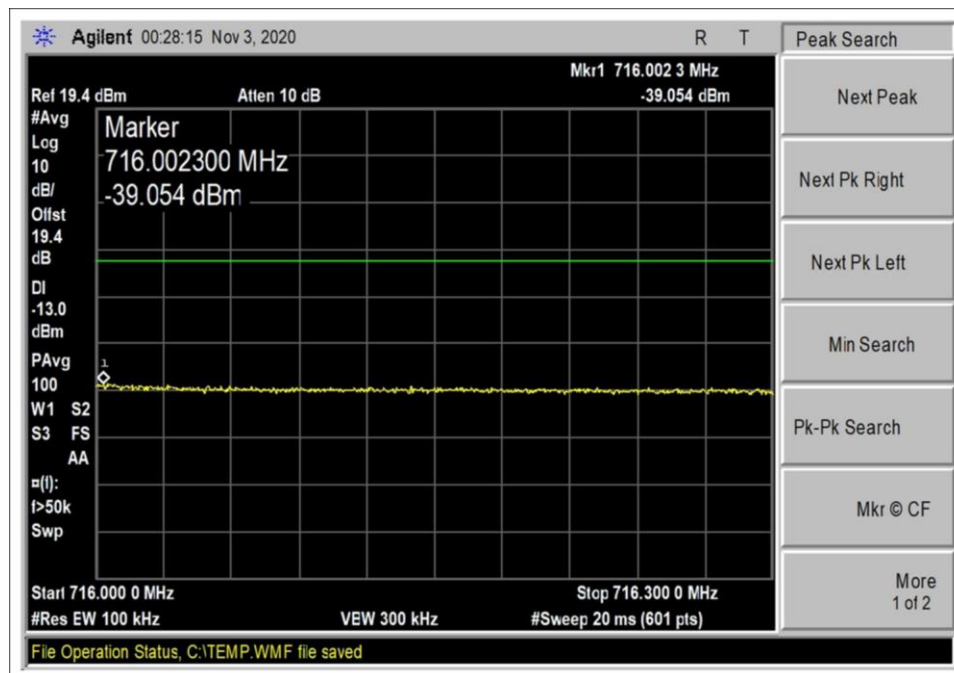


UL 2305-2315 Low band AGC+3dB

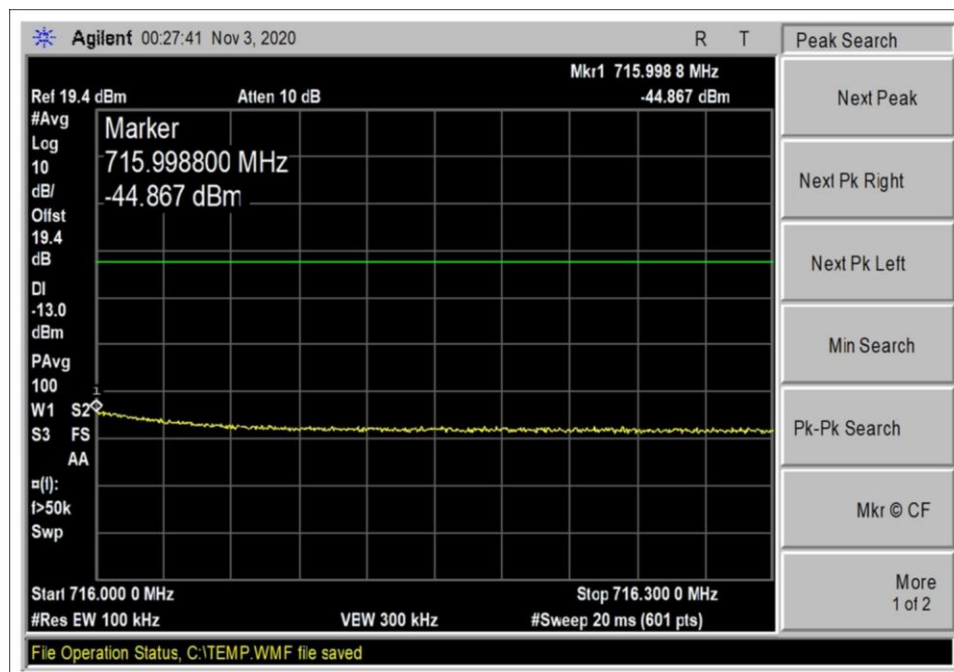


UL 2305-2315 Low band preAGC

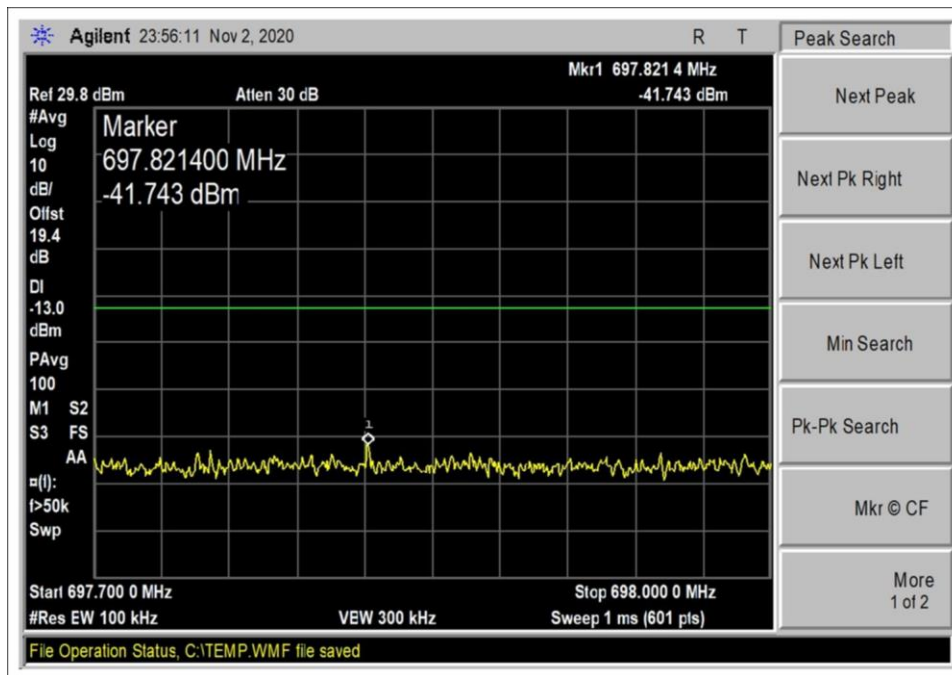
AWGN - Two Signals



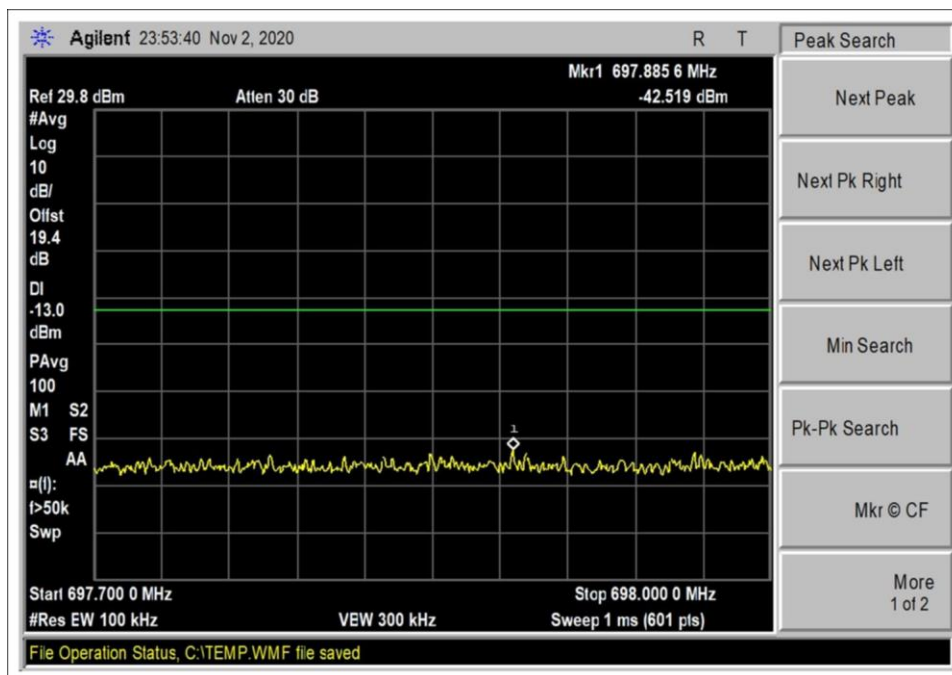
UL 698-716 High band AGC+3dB



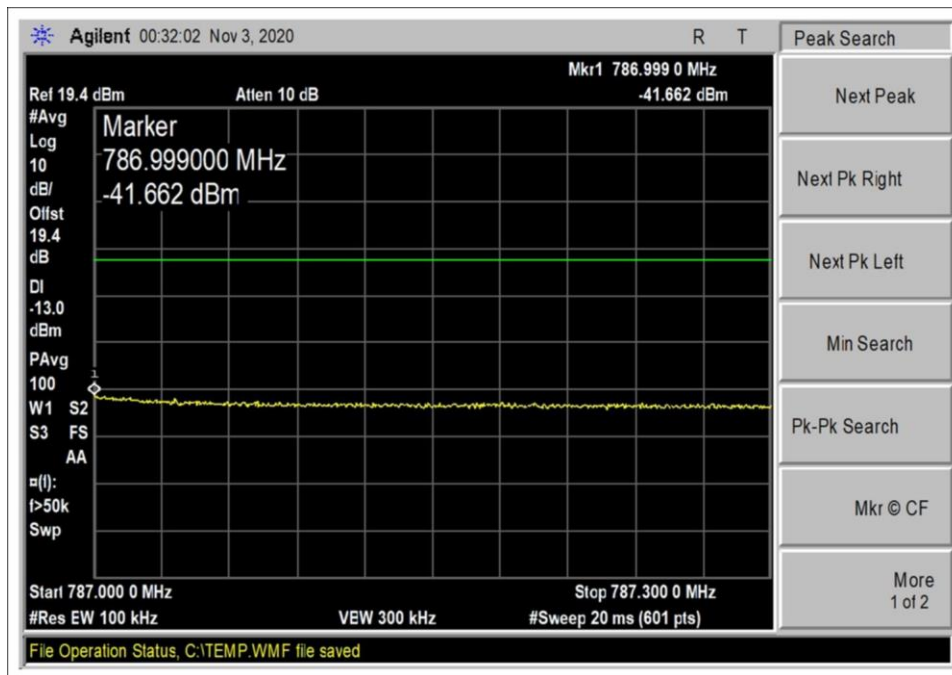
UL 698-716 High band pre AGC



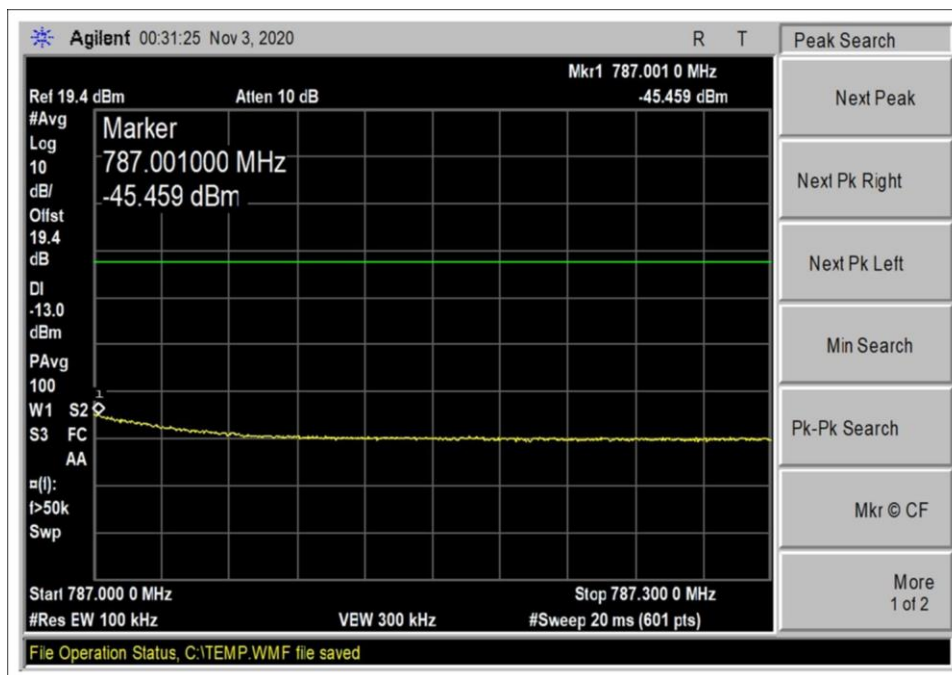
UL 698-716 Low band AGC+3dB



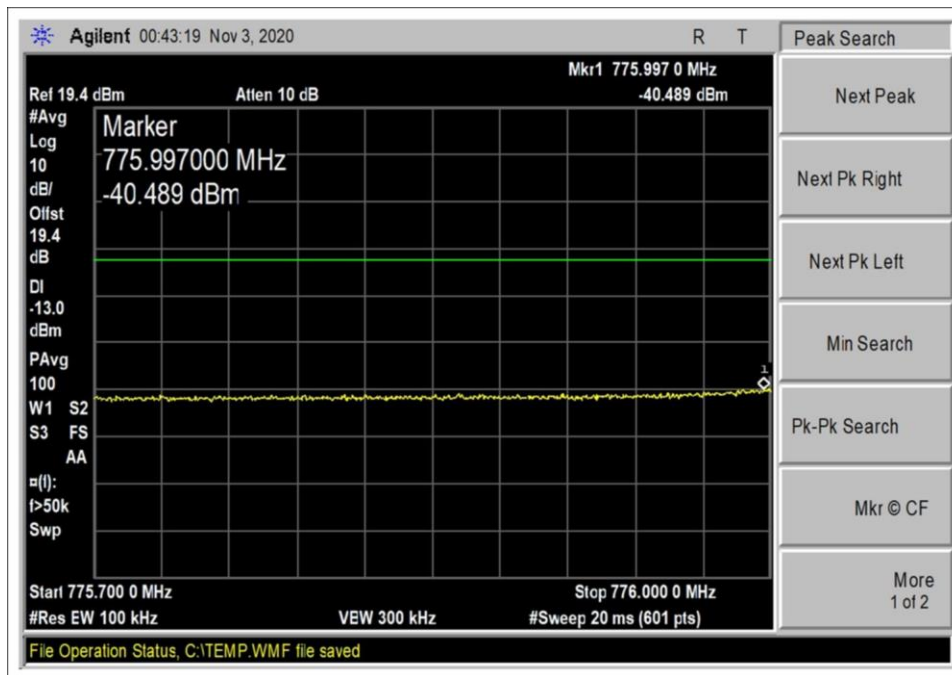
UL 698-716 Low band pre AGC



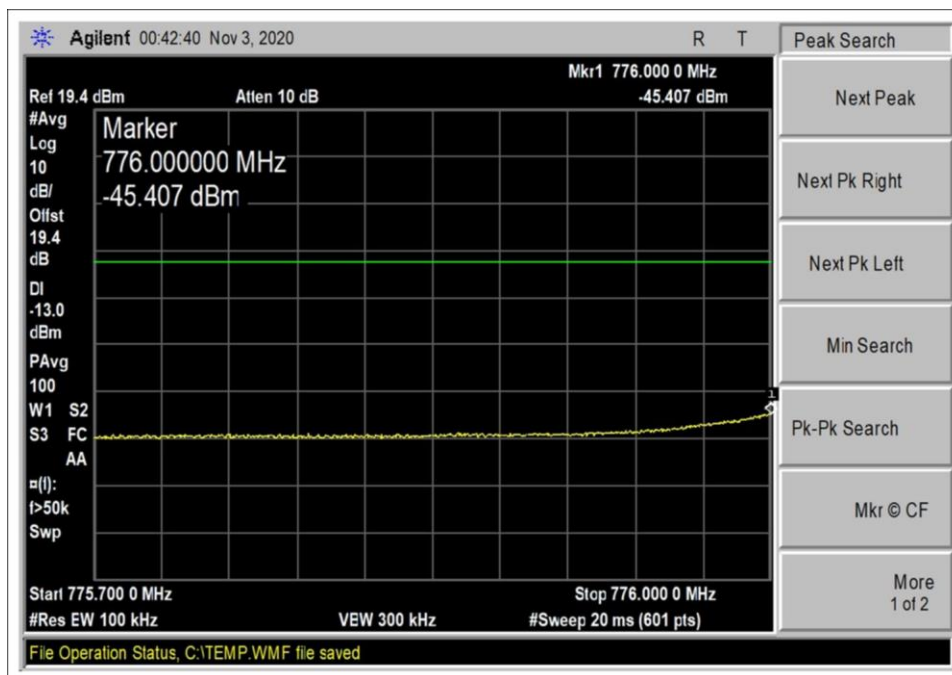
UL 776-787 High band AGC+3dB



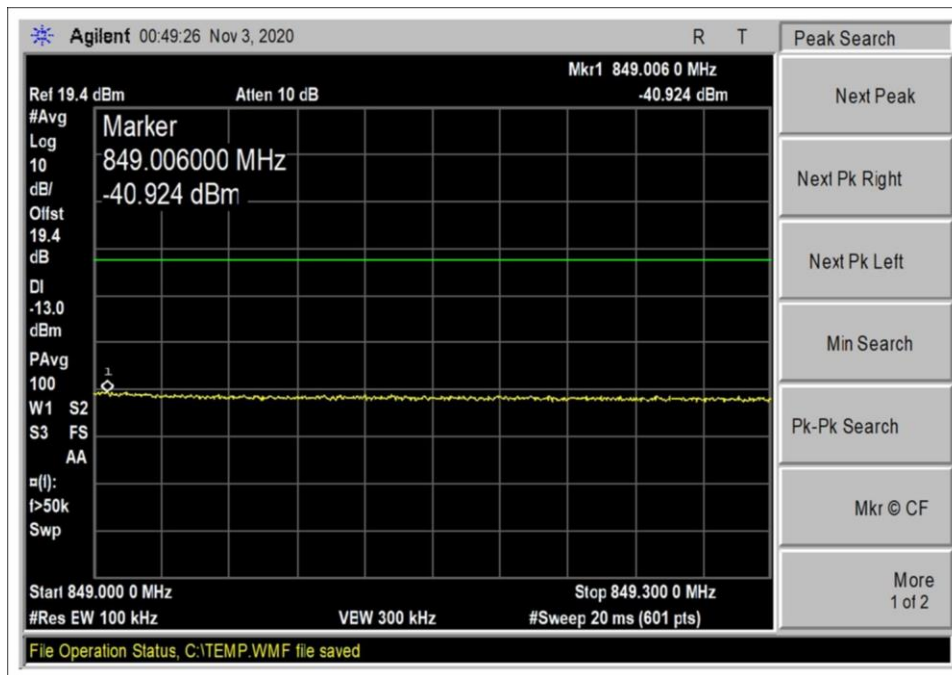
UL 776-787 High band pre AGC



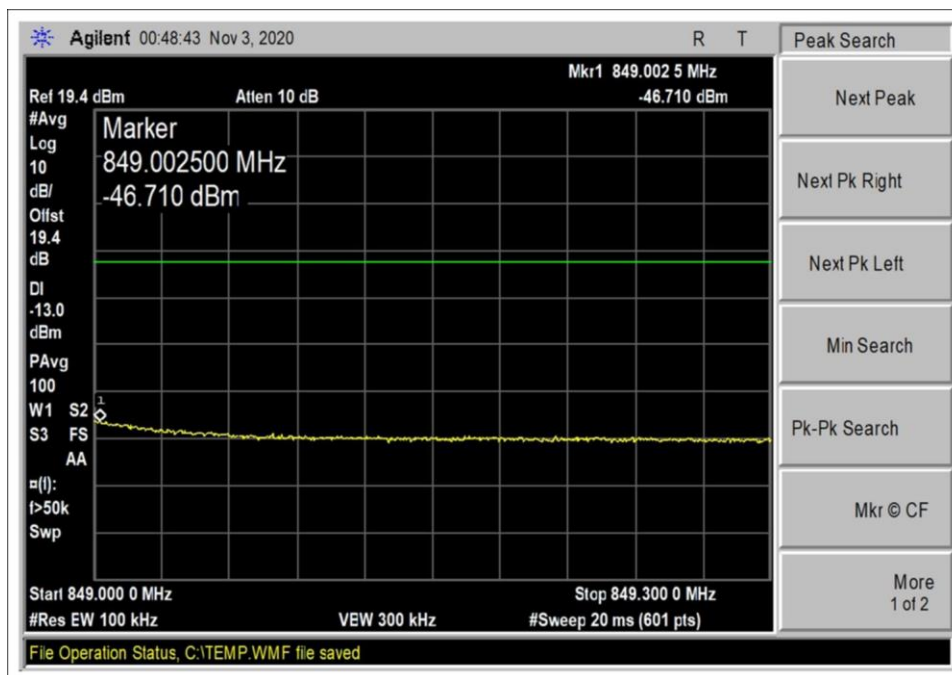
UL 776-787 Low band AGC+3dB



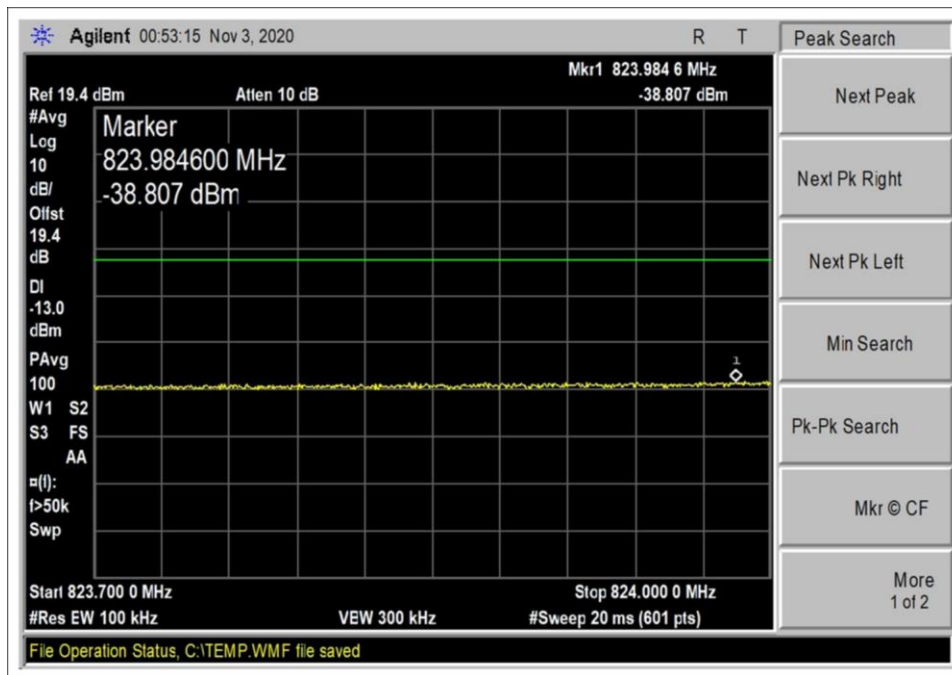
UL 776-787 Low band pre AGC



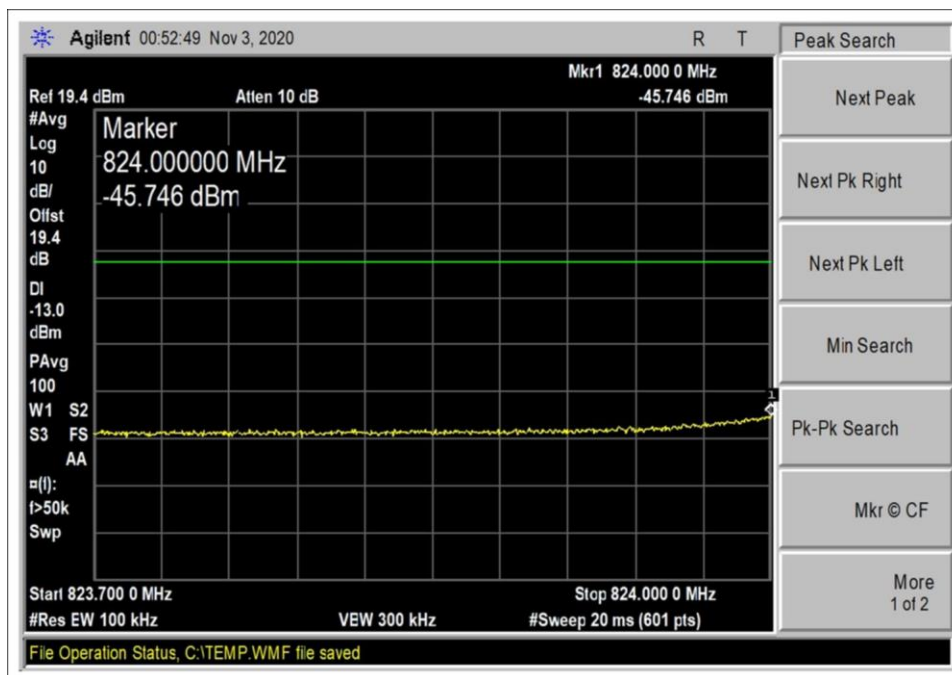
UL 824-849 High band AGC+3dB



UL 824-849 High band pre AGC



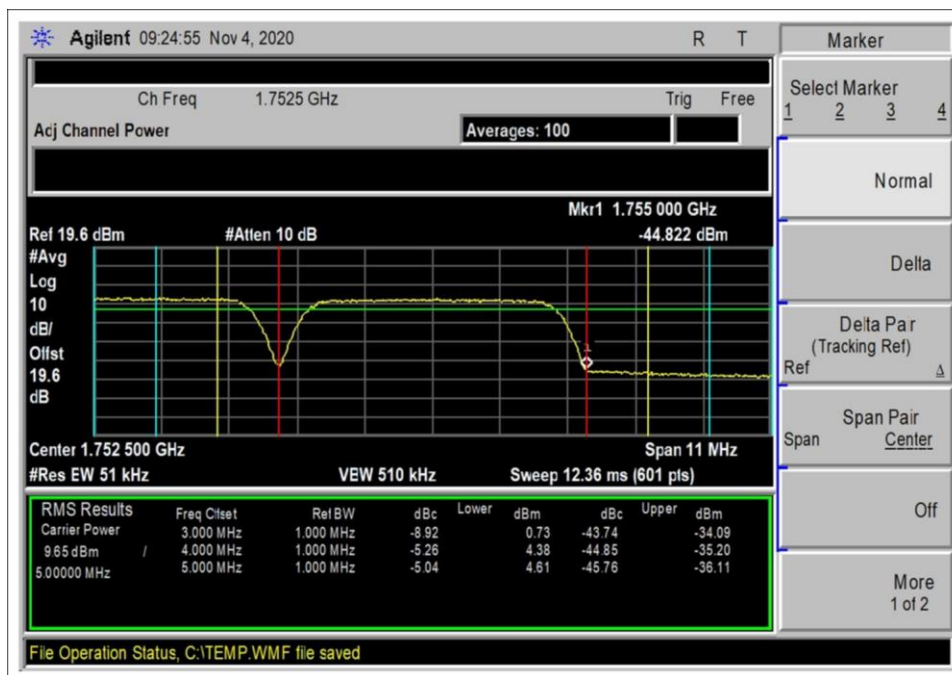
UL 824-849 Low band AGC+3dB



UL 824-849 Low band pre AGC



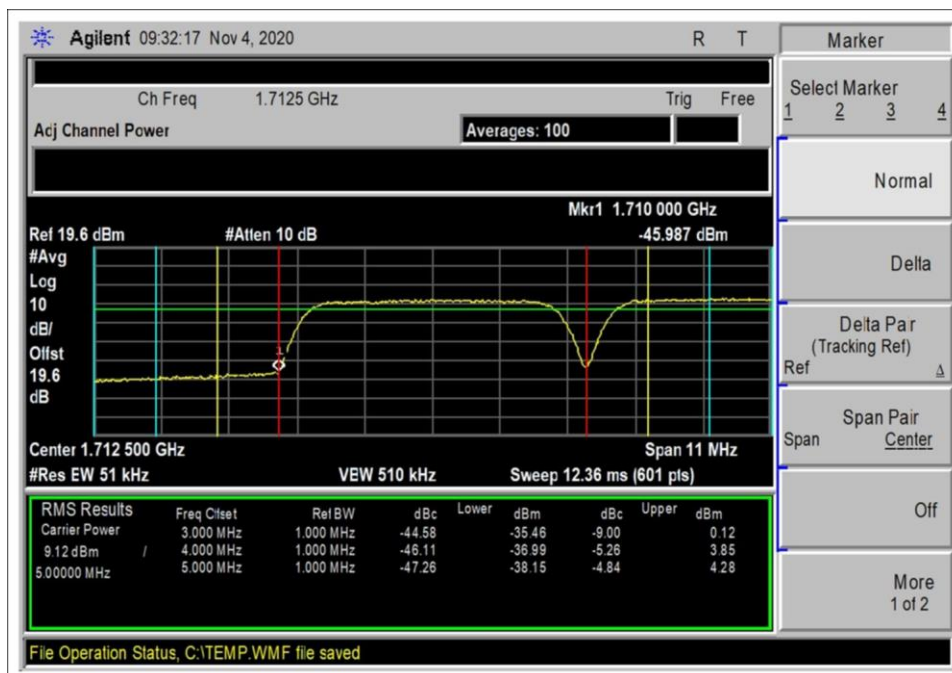
UL 1710-1755 High band AGC+3dB



UL 1710-1755 High band preAGC



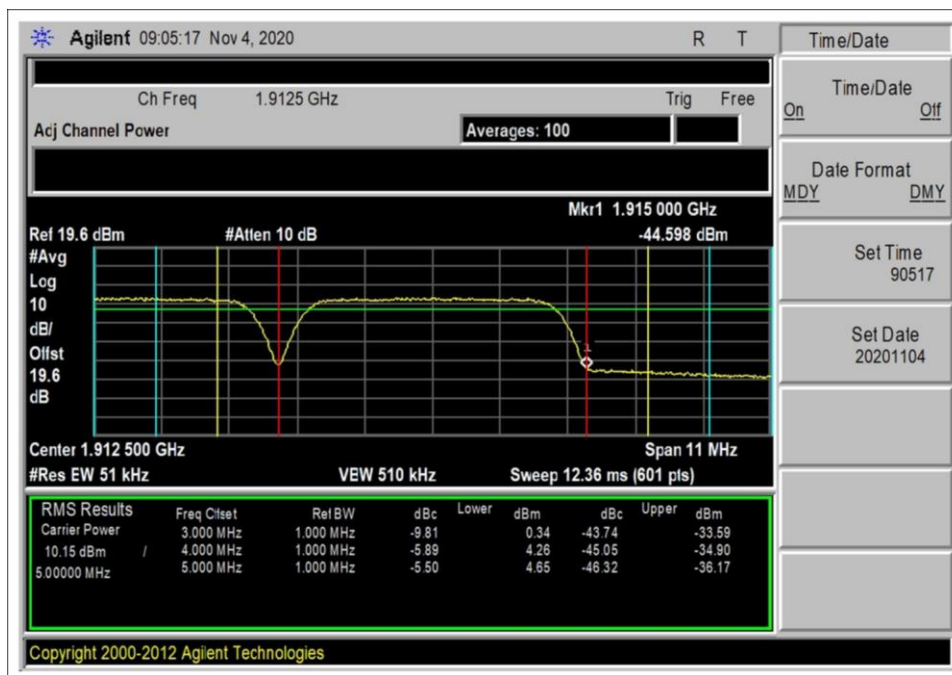
UL 1710-1755 Low band AGC+3dB



UL 1710-1755 Low band preAGC



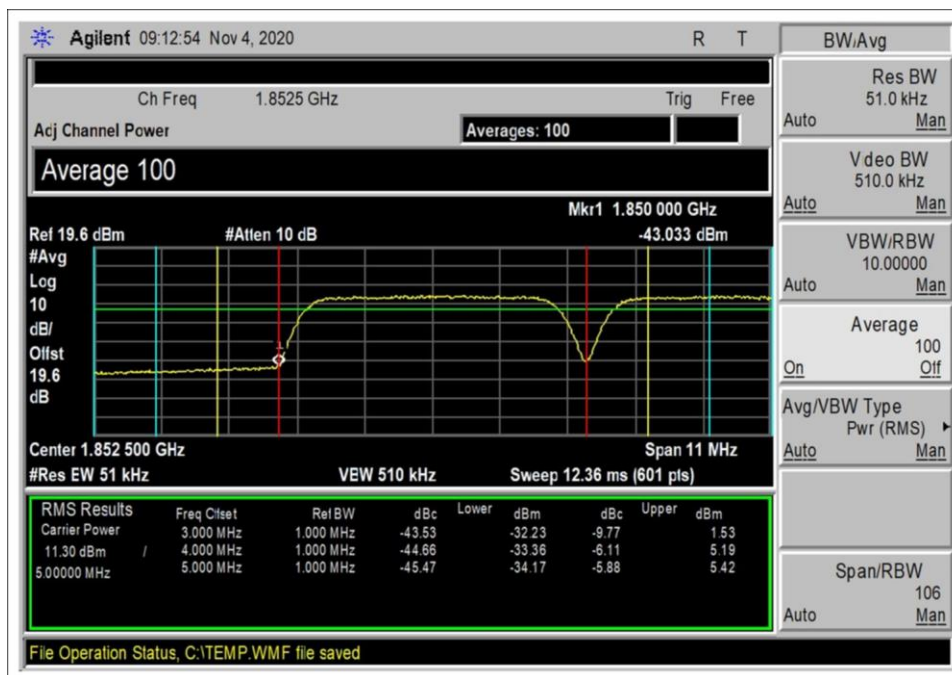
UL 1850-1915 High band AGC+3dB



UL 1850-1915 High band preAGC



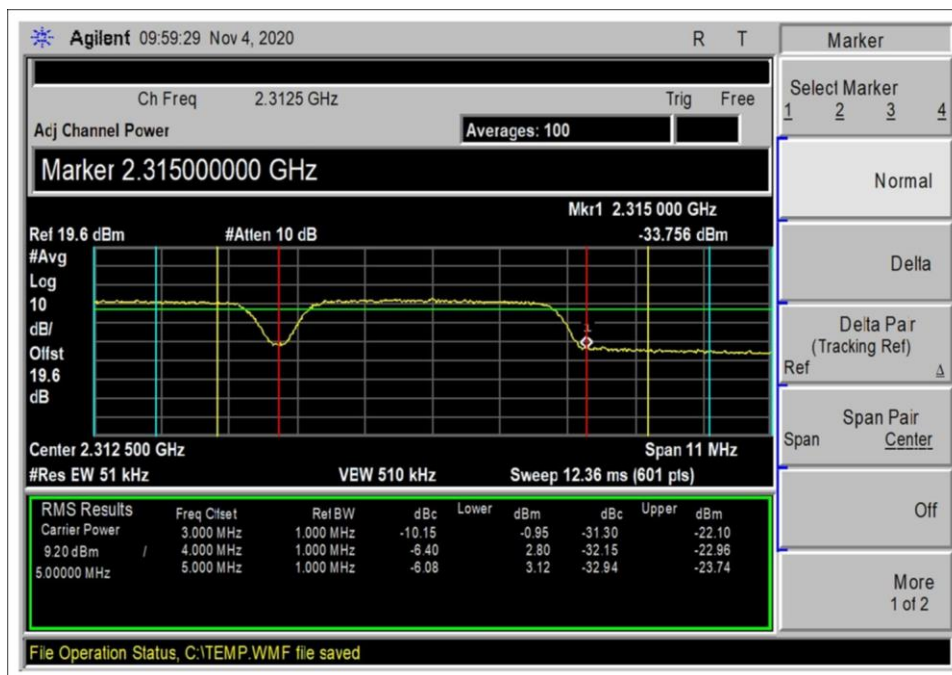
UL 1850-1915 Low band AGC+3dB



UL 1850-1915 Low band preAGC



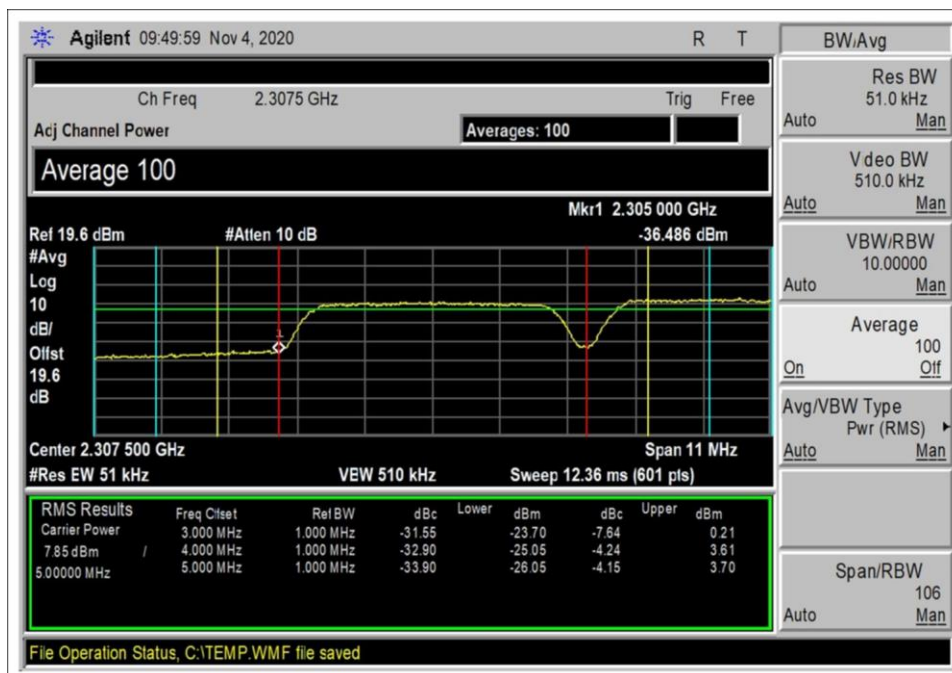
UL 2305-2315 High band AGC+3dB



UL 2305-2315 High band preAGC



UL 2305-2315 Low band AGC+3dB



UL 2305-2315 Low band preAGC