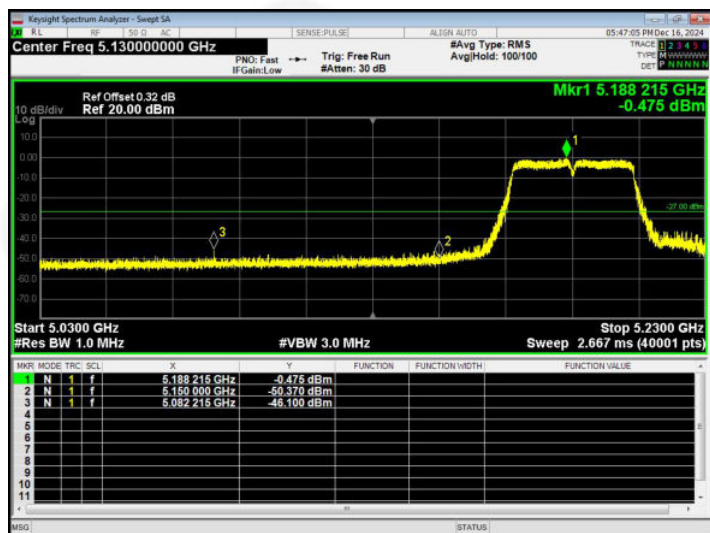
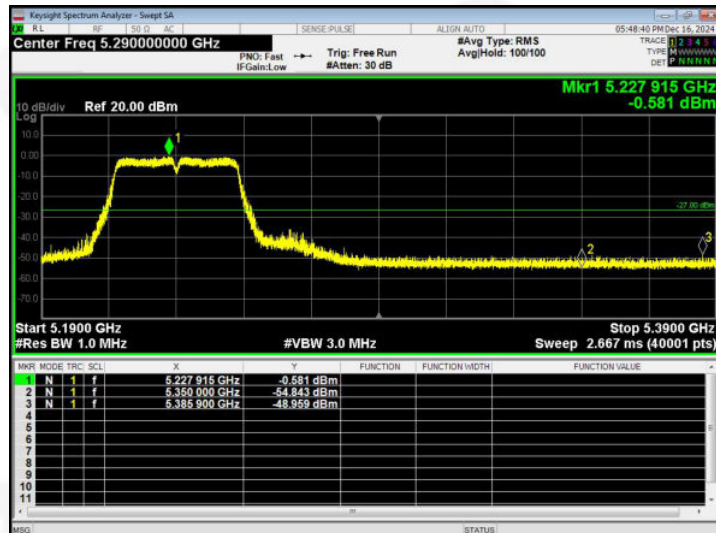




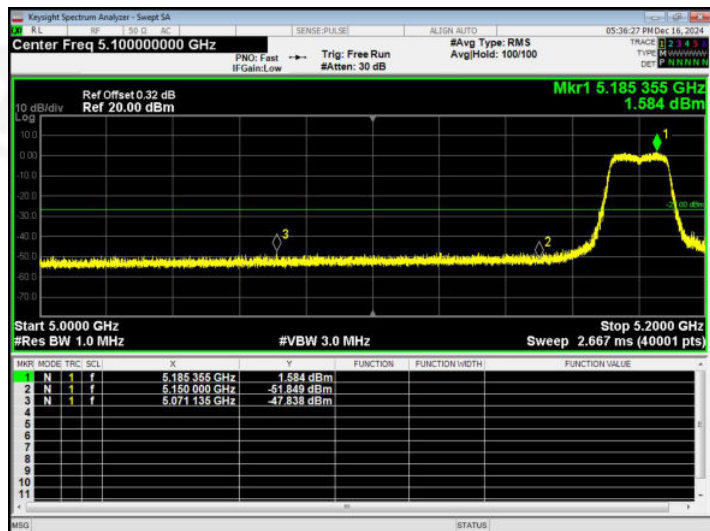
(802.11n40) Band Edge, Left Side



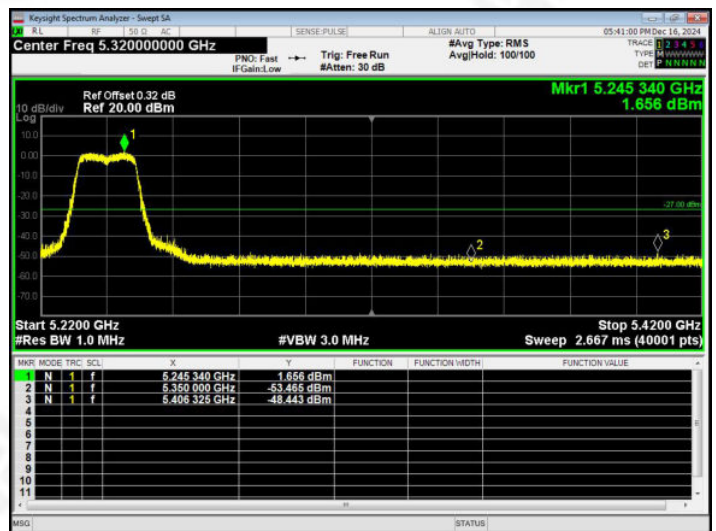
(802.11n40) Band Edge, Right Side



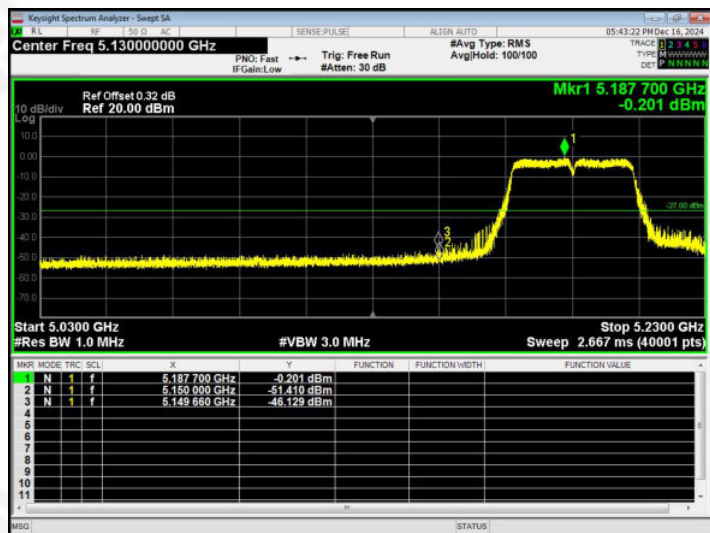
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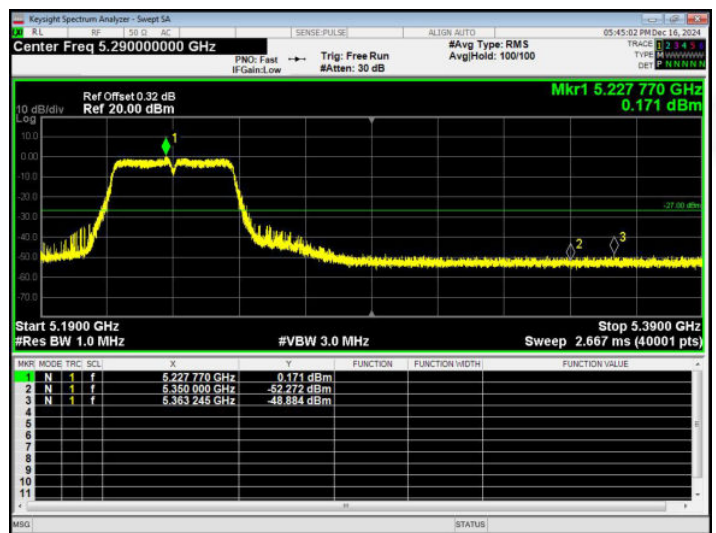
(802.11ac20) Band Edge, Right Side



(802.11ac40) Band Edge, Left Side

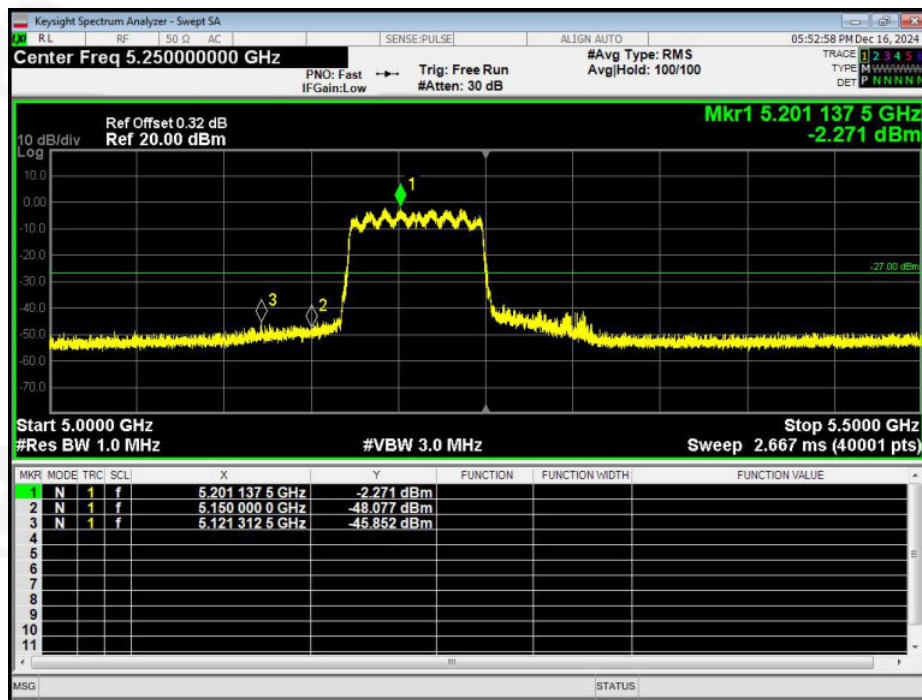


(802.11ac40) Band Edge, Right Side





(802.11ac40) Band Edge - Channel 42

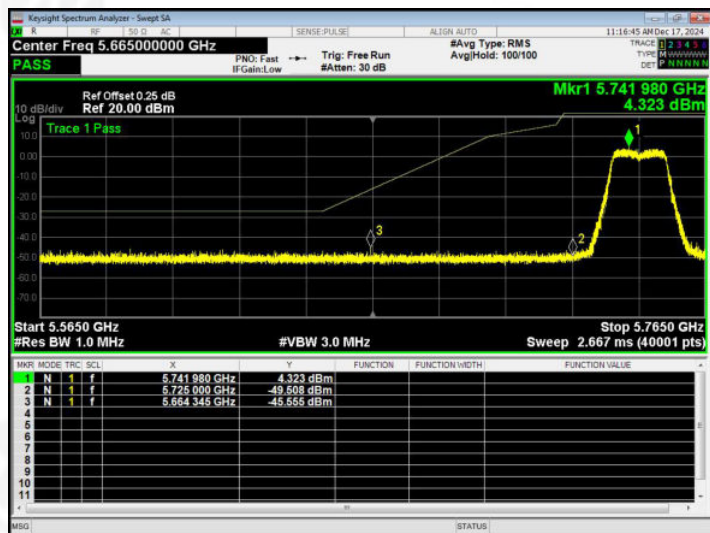




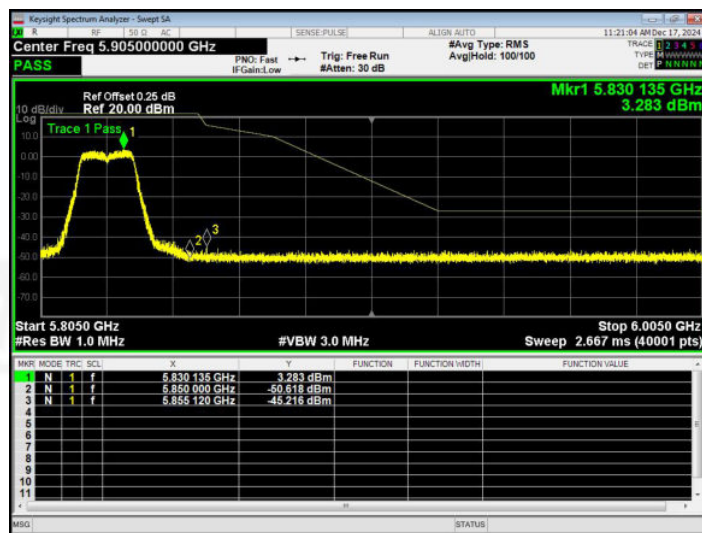
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test band :	5.8G	Antenna gain :	0.25dBi

5.745~5.825 GHz

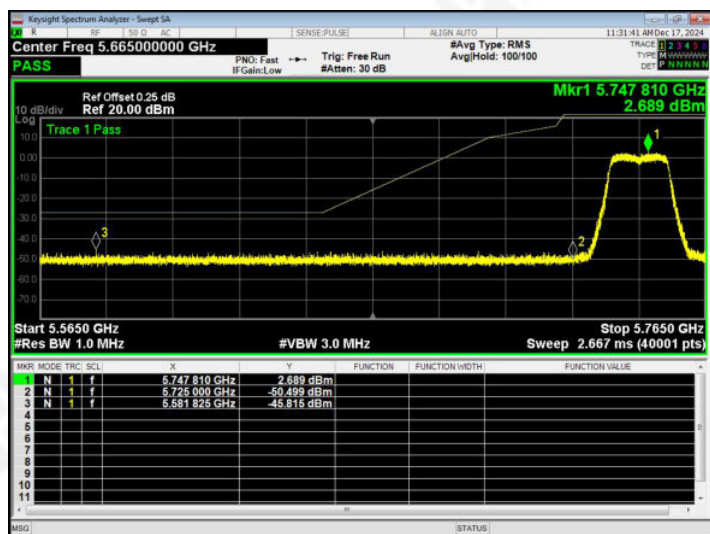
(802.11a) Band Edge, Left Side



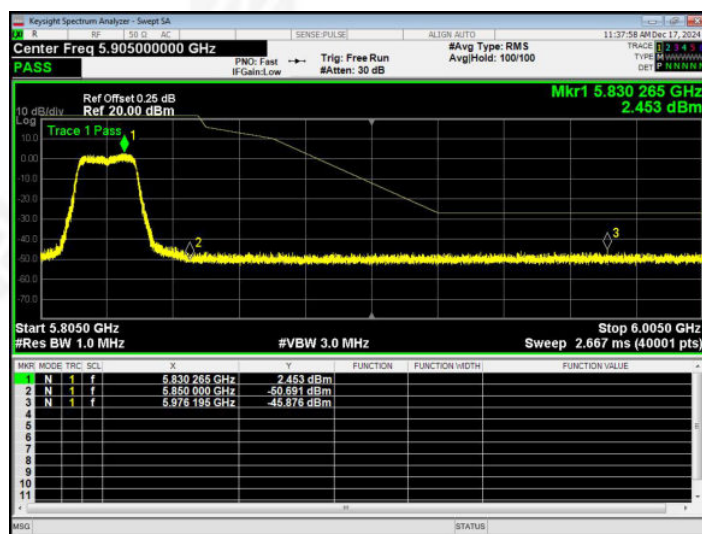
(802.11a) Band Edge, Right Side



(802.11n20) Band Edge, Left Side

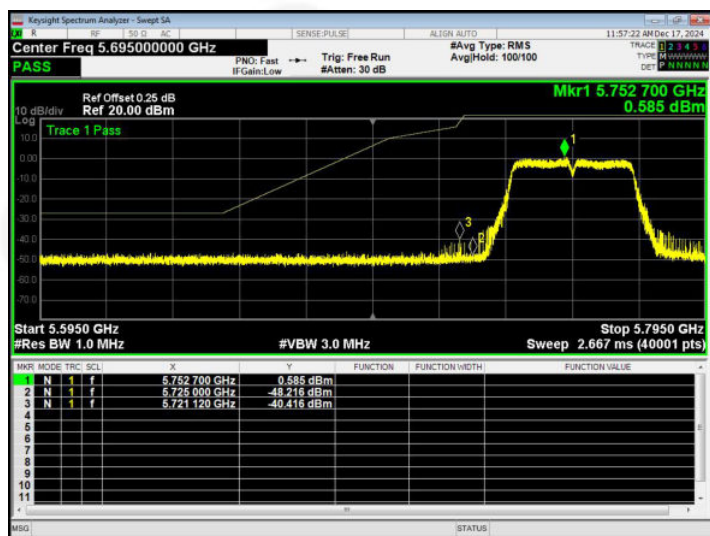


(802.11n20) Band Edge, Right Side

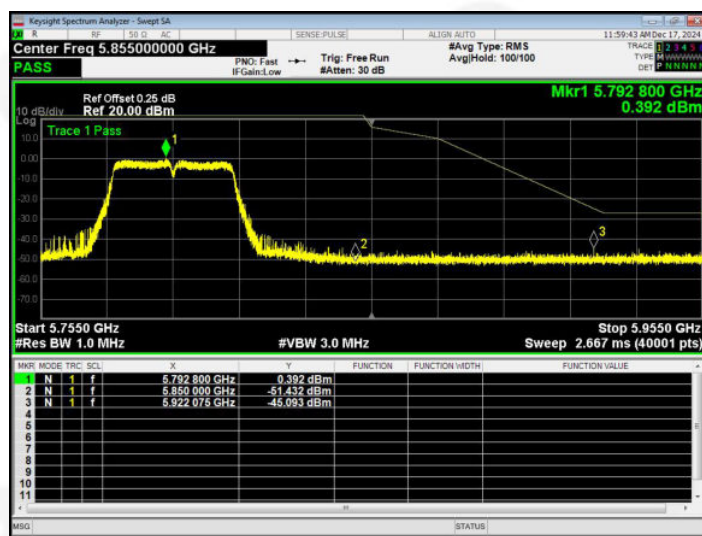




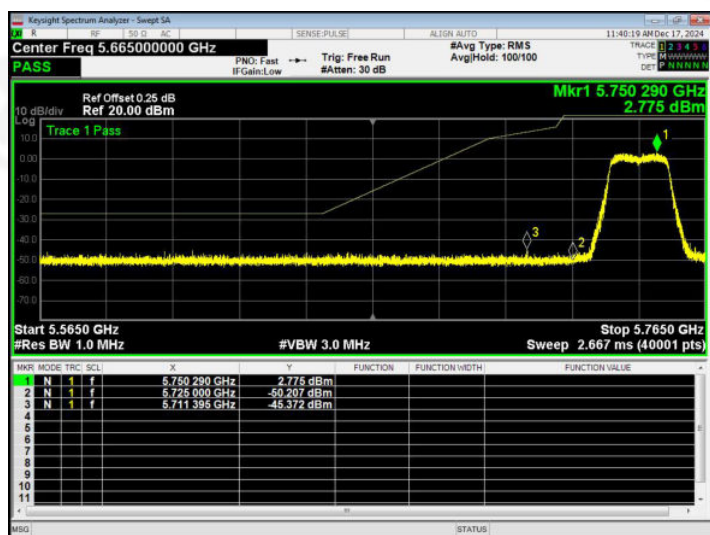
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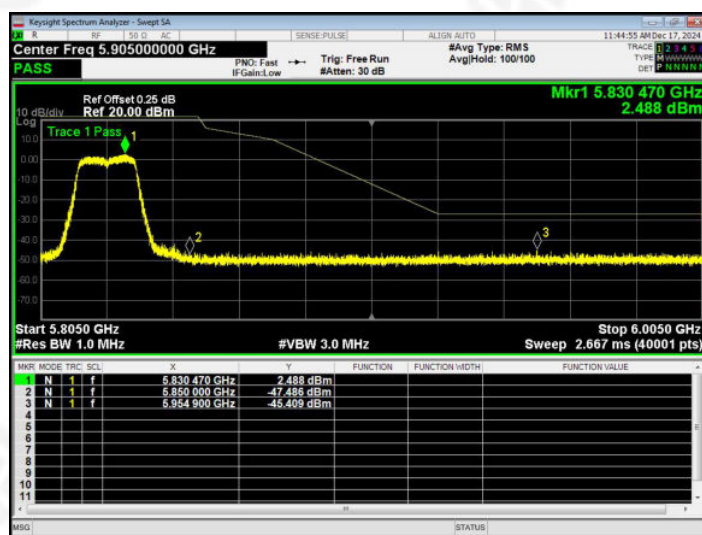
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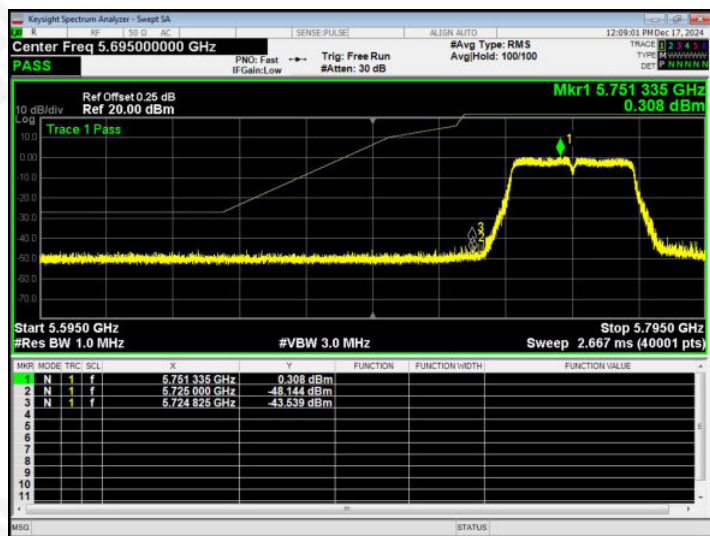
(802.11ac20) Band Edge, Left Side



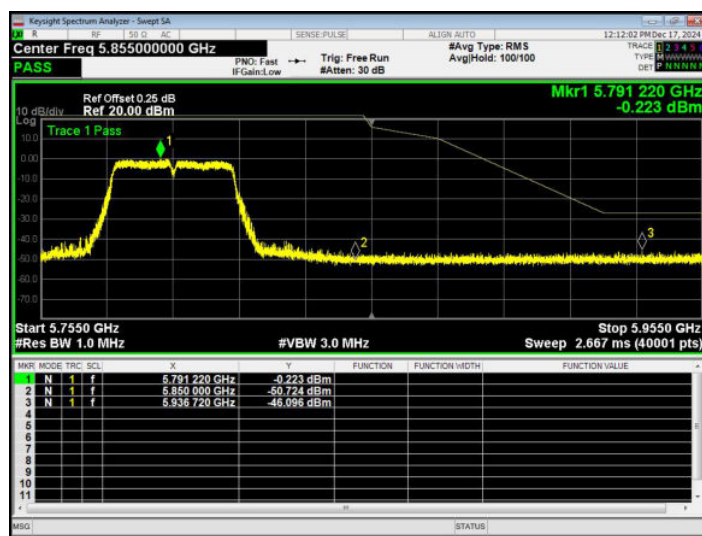
(802.11ac20) Band Edge, Right Side



(802.11ac40) Band Edge, Left Side

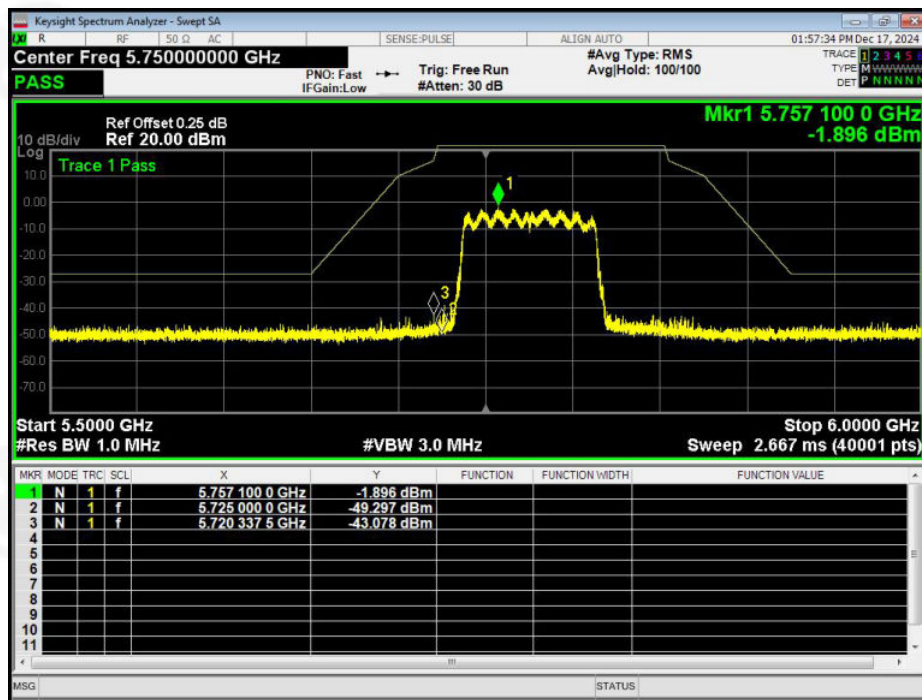


(802.11ac40) Band Edge, Right Side





(802.11ac40) Band Edge - Channel 155





9.SPURIOUS RF CONDUCTED EMISSIONS

9.1 CONFORMANCE LIMIT

Frequency Band (MHz)	Limit
5150 - 5250	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5250 - 5350	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5470 - 5725	Outside of the 5.47-5.725 GHz band: e.i.r.p. -27 dBm
5725 - 5850	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

9.2 MEASURING INSTRUMENTS

The Measuring equipment is listed in the section 6.3 of this test report.

9.3 TEST SETUP



9.4 TEST PROCEDURE

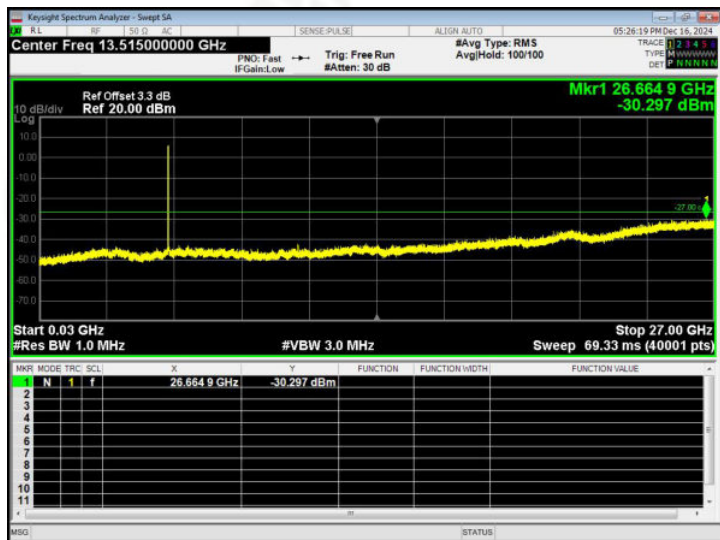
The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=1MHz and VBW= 3MHz to measure the peak field strength, and measure frequency range from 30MHz to 26.5GHz.

9.5 TEST RESULTS

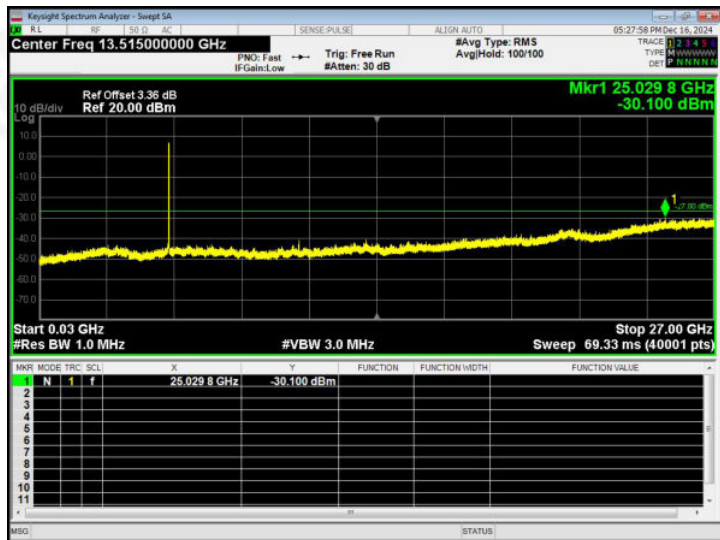
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test band :	5.2G & 5.8G		
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. And above 26.5GHz of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.			



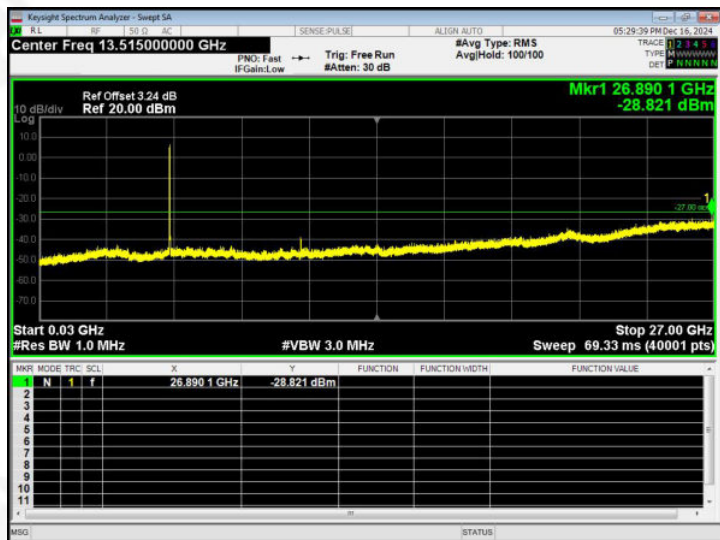
5.2G - 802.11a
CH36



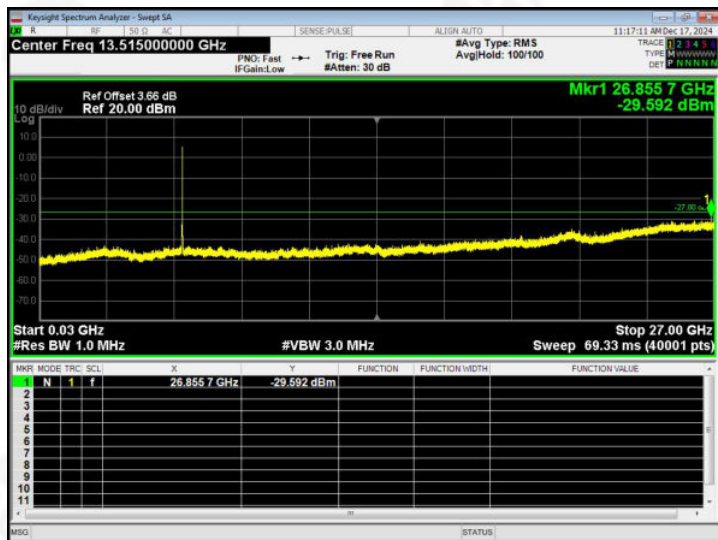
CH40



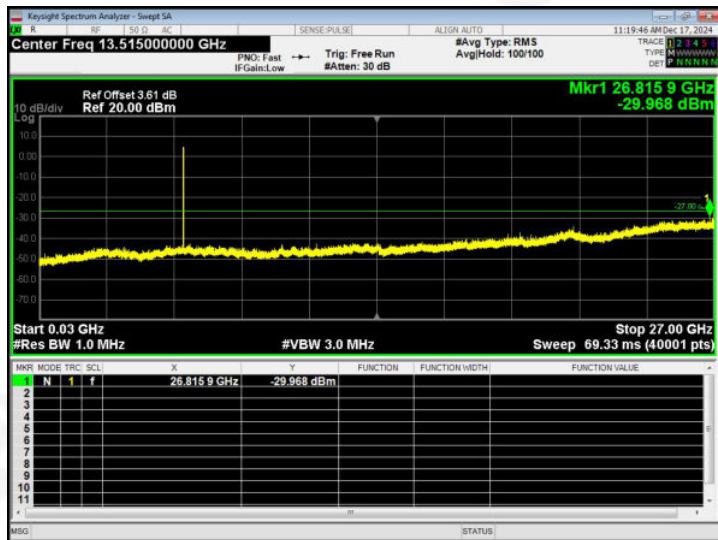
CH48



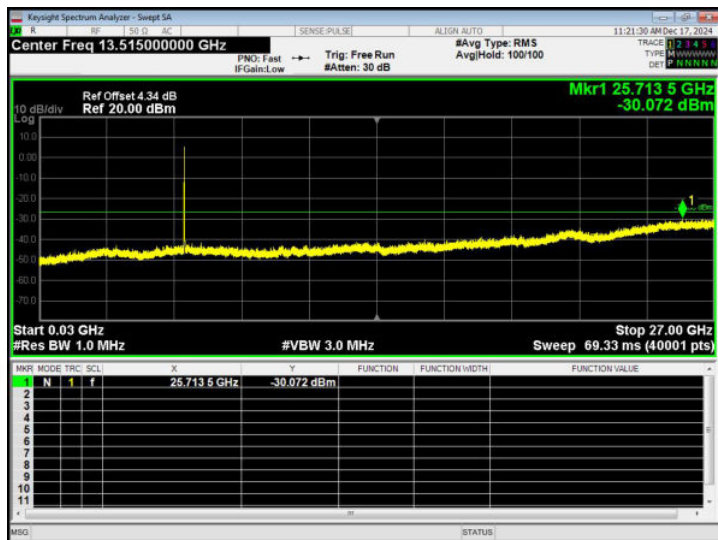
5.8G - 802.11a
CH149



CH157

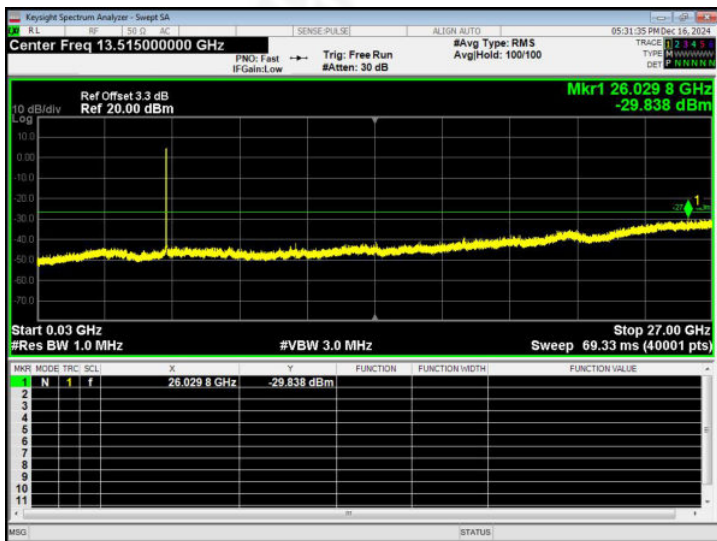


CH165

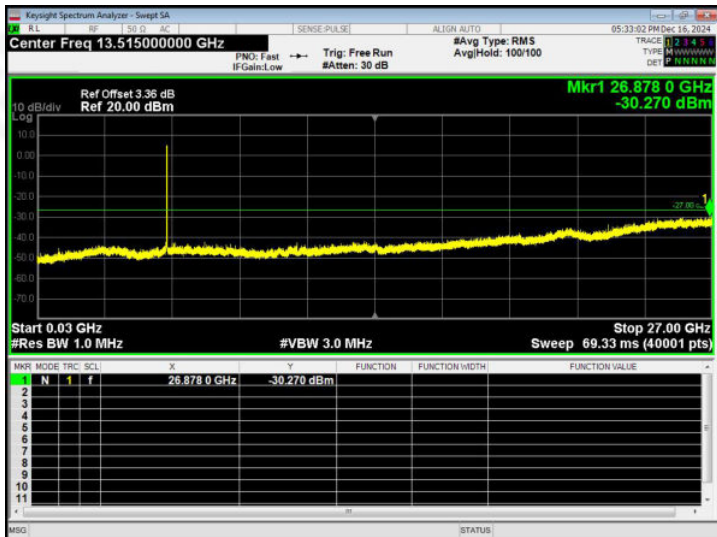




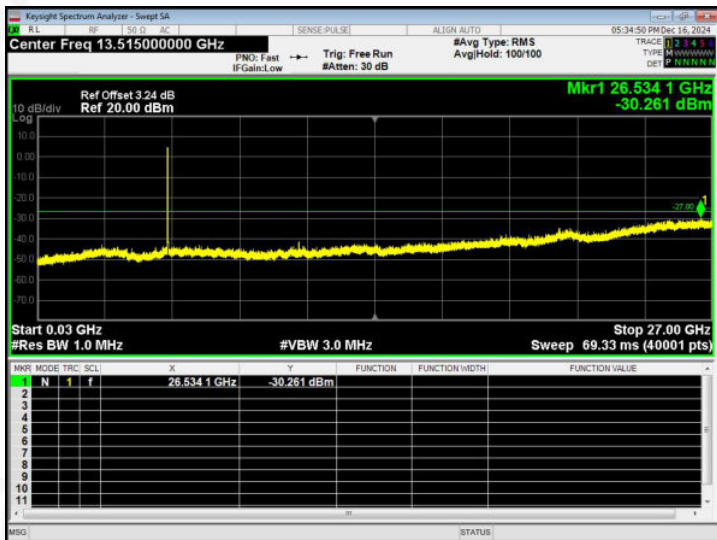
5.2G - 802.11n20
CH36



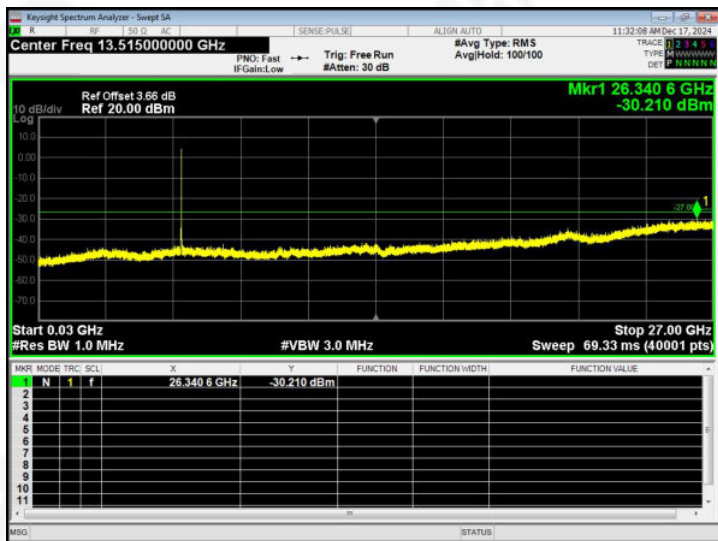
CH40



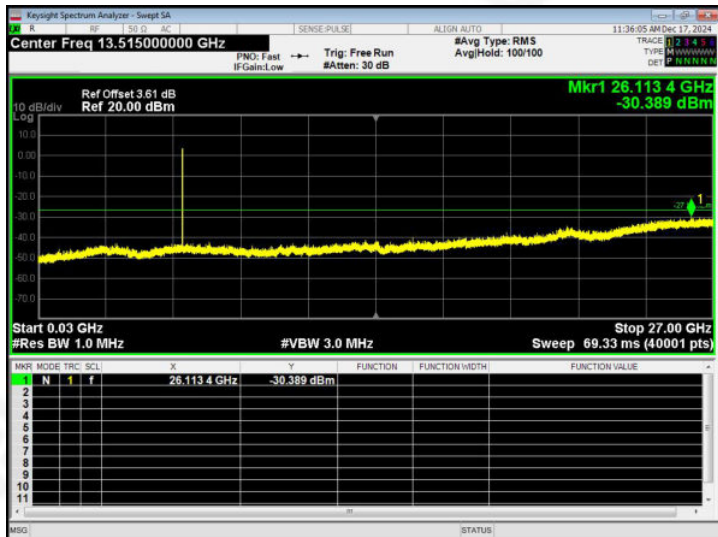
CH48



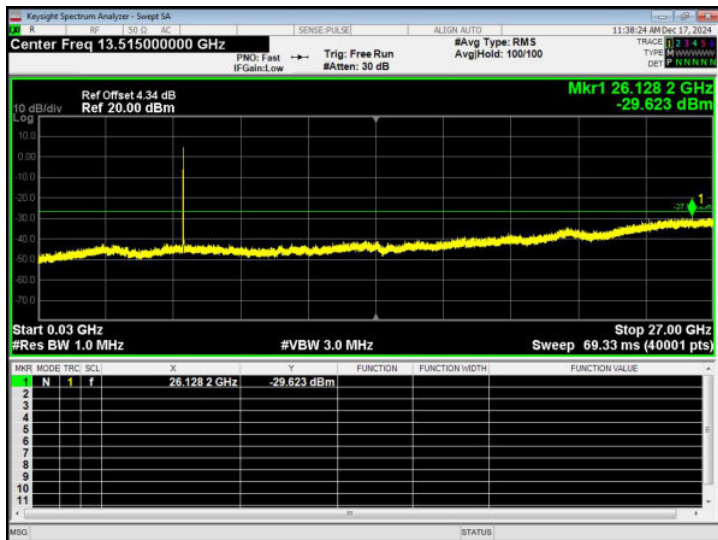
5.8G - 802.11n20
CH149



CH157

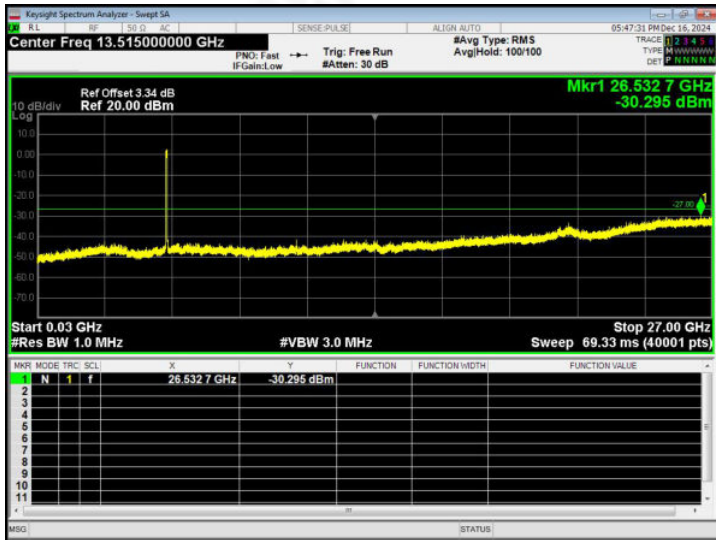


CH165

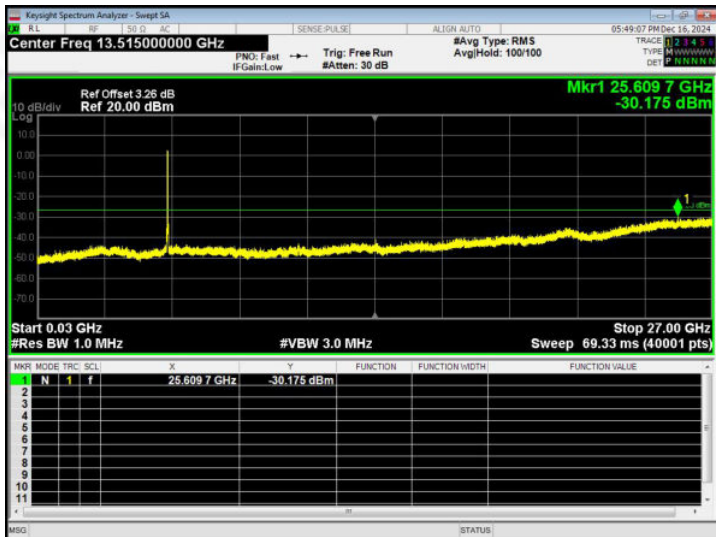




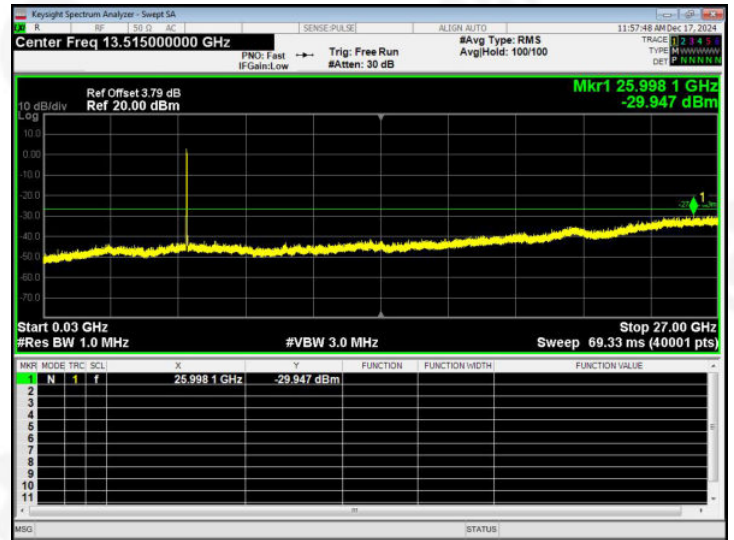
5.2G - 802.11n40
CH38



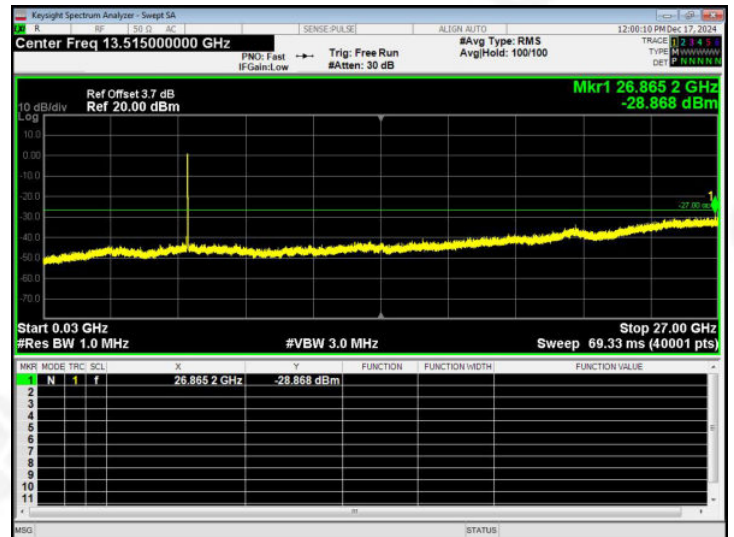
CH46



5.8G - 802.11n40
CH151

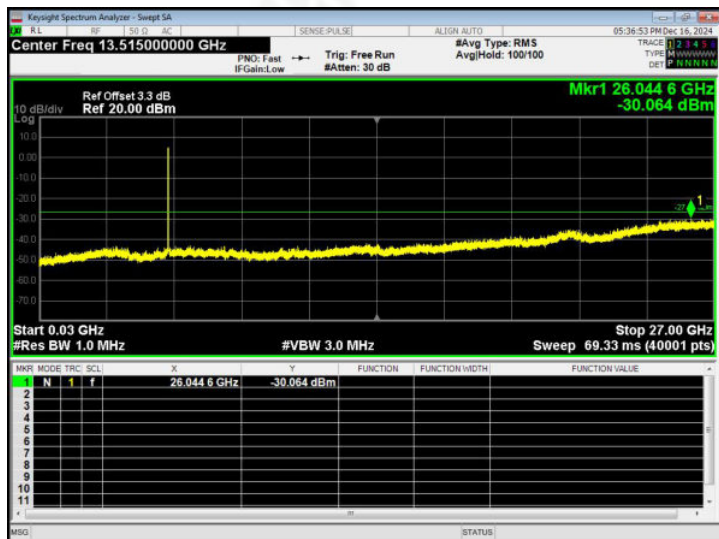


CH159

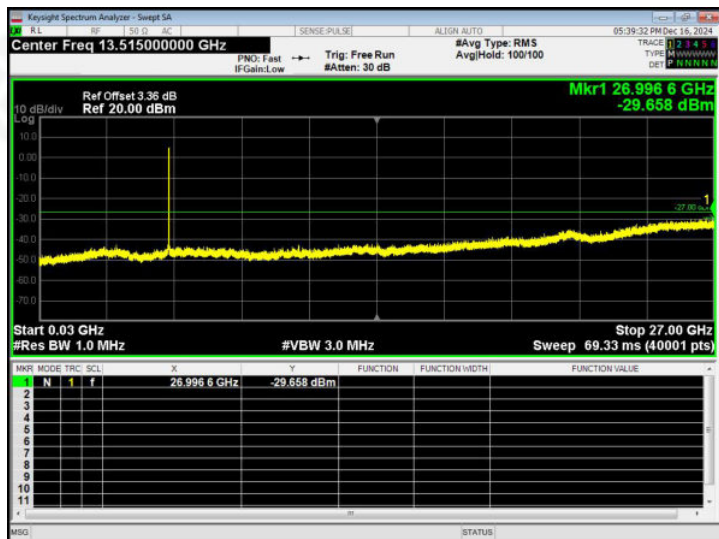




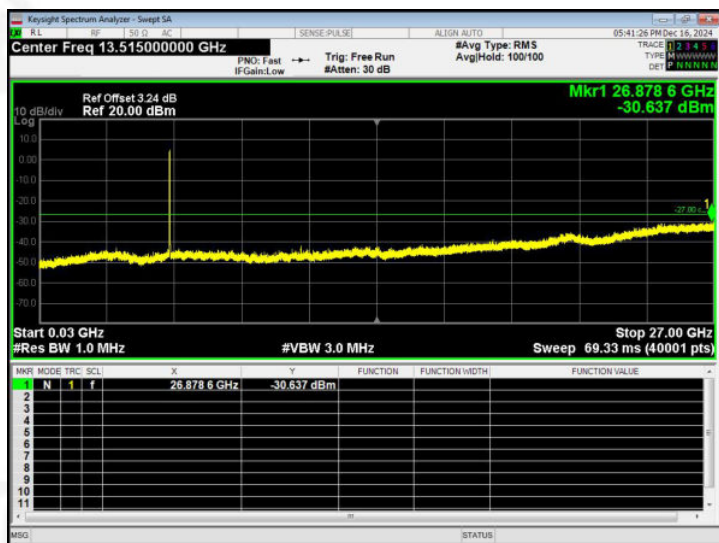
5.2G - 802.11ac20
CH36



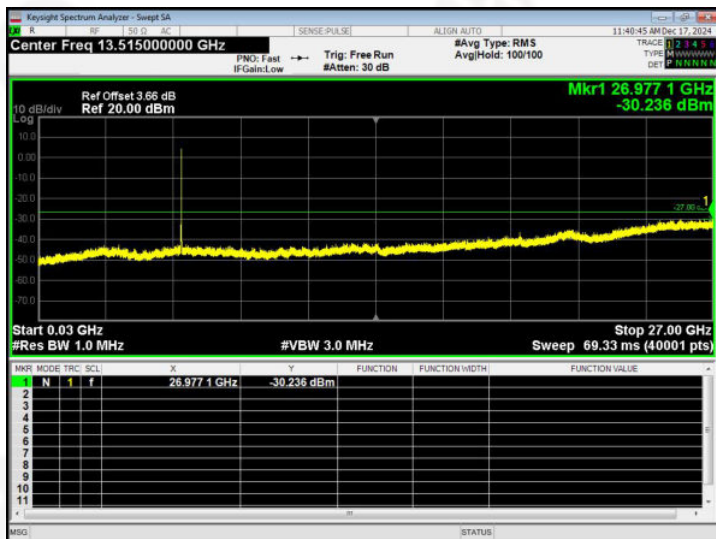
CH40



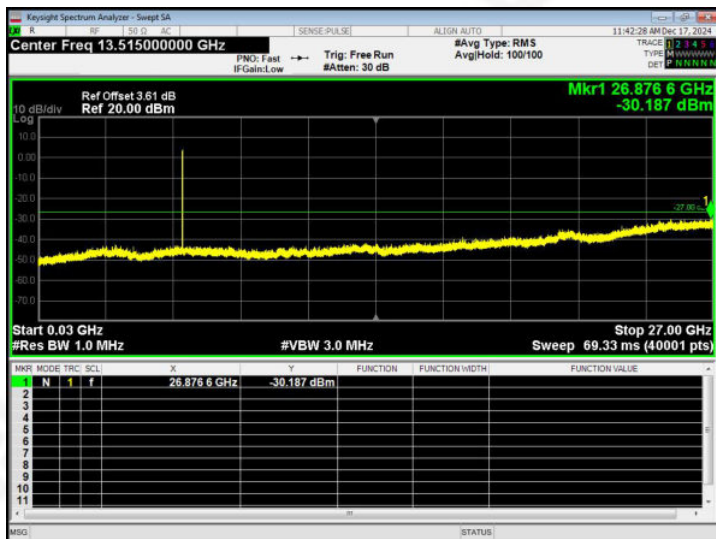
CH48



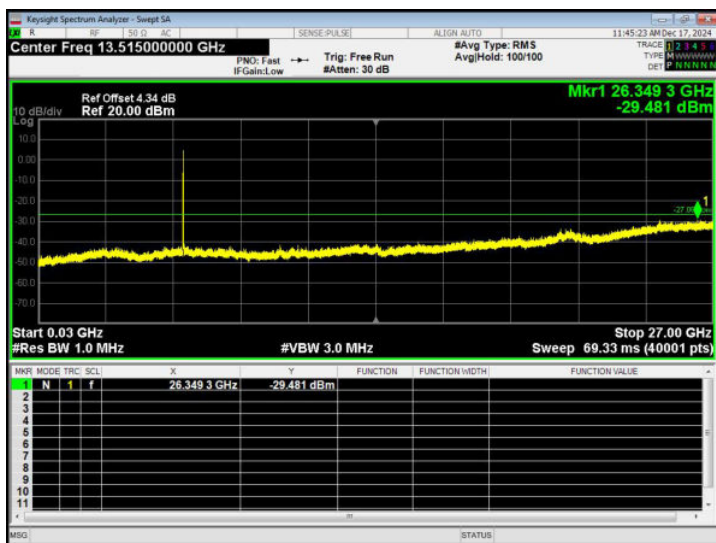
5.8G - 802.11ac20
CH149



CH157

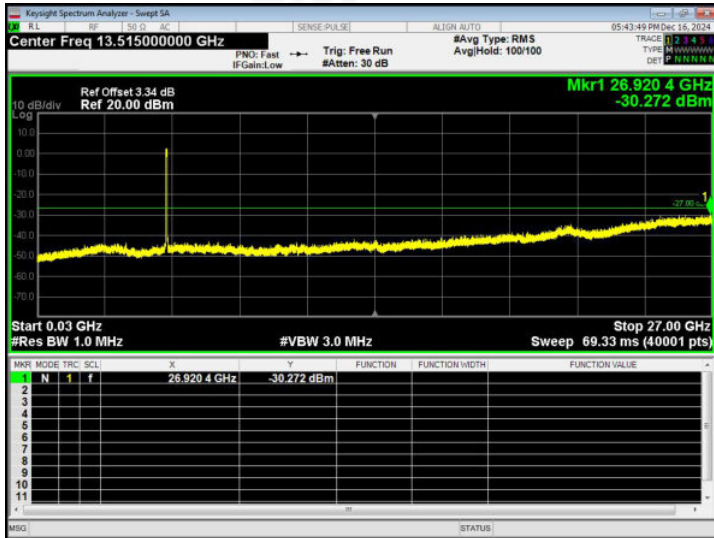


CH165

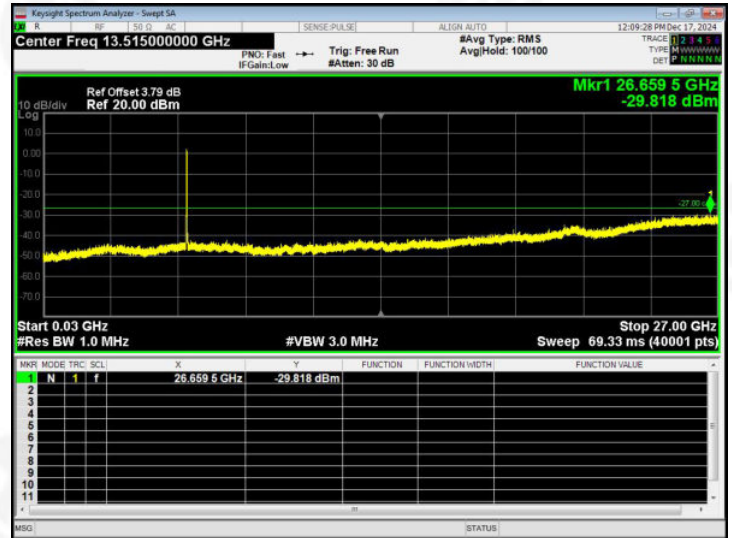




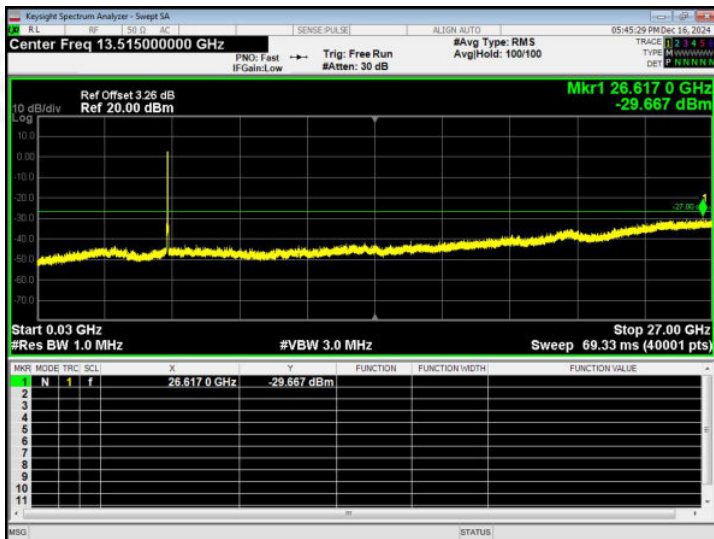
5.2G - 802.11ac40
CH38



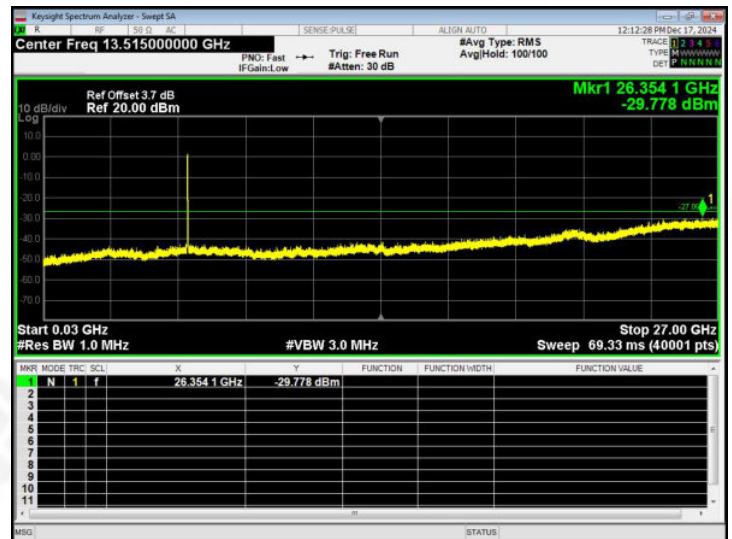
5.8G - 802.11ac40
CH151



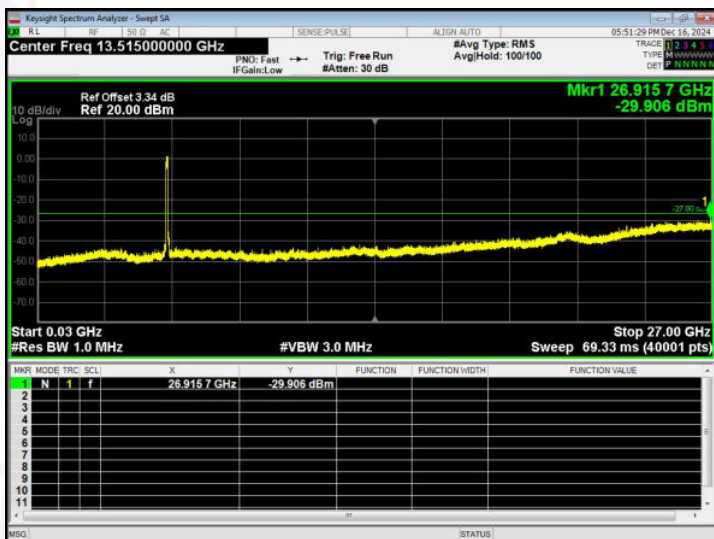
CH46



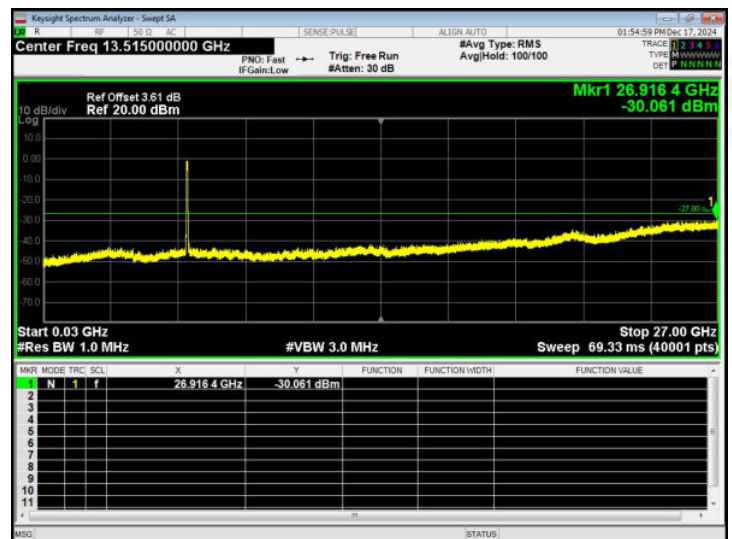
CH159



5.2G - 802.11ac80 - CH42



5.8G - 802.11ac80 - CH155





10.FREQUENCY STABILITY MEASUREMENT

10.1 LIMIT

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

10.2 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$.

10.3 TEST SETUP LAYOUT



10.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.



10.5 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test Band :	5.2G		
Note: Note: All channels have been tested, and only the worst test data is recorded in this report.			

Reference Frequency: 802.11a - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5179.980	-3.927
40	3.8	5179.984	-3.048
30	3.8	5179.988	-2.332
25	3.8	5179.972	-5.347
10	3.8	5179.972	-5.344
0	3.8	5179.976	-4.683
-10	3.8	5179.972	-5.342
-20	3.8	5179.973	-5.163

Reference Frequency: 802.11n20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5179.984	-3.095
40	3.8	5179.971	-5.617
30	3.8	5179.971	-5.582
25	3.8	5179.985	-2.939
10	3.8	5179.981	-3.747
0	3.8	5179.982	-3.545
-10	3.8	5179.988	-2.237
-20	3.8	5179.976	-4.616



Reference Frequency: 802.11n40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5189.974	-4.999
40	3.8	5189.986	-2.776
30	3.8	5189.986	-2.693
25	3.8	5189.982	-3.386
10	3.8	5189.984	-3.053
0	3.8	5189.977	-4.384
-10	3.8	5189.974	-5.078
-20	3.8	5189.986	-2.727

Reference Frequency: 802.11ac20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5179.970	-5.715
40	3.8	5179.988	-2.227
30	3.8	5179.975	-4.733
25	3.8	5179.988	-2.350
10	3.8	5179.989	-2.216
0	3.8	5179.983	-3.241
-10	3.8	5179.979	-3.998
-20	3.8	5179.988	-2.284

Reference Frequency: 802.11ac40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5189.990	-2.002
40	3.8	5189.963	-7.178
30	3.8	5189.981	-3.700
25	3.8	5189.987	-2.424
10	3.8	5189.981	-3.678
0	3.8	5189.978	-4.194
-10	3.8	5189.981	-3.588
-20	3.8	5189.986	-2.680



Reference Frequency: 802.11ac80 - 5210MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5209.985	-2.925
40	3.8	5209.989	-2.207
30	3.8	5209.984	-3.098
25	3.8	5209.982	-3.386
10	3.8	5209.987	-2.557
0	3.8	5209.986	-2.599
-10	3.8	5209.989	-2.104
-20	3.8	5209.985	-2.792



Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test Band :	5.8G		
Note: Note: All channels have been tested, and only the worst test data is recorded in this report.			

Reference Frequency: 802.11a - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5744.961	-6.825
40	3.8	5744.952	-8.413
30	3.8	5744.964	-6.260
25	3.8	5744.973	-4.768
10	3.8	5744.967	-5.799
0	3.8	5744.959	-7.203
-10	3.8	5744.971	-5.027
-20	3.8	5744.963	-6.383

Reference Frequency: 802.11n20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5744.975	-4.357
40	3.8	5744.977	-3.920
30	3.8	5744.962	-6.567
25	3.8	5744.967	-5.734
10	3.8	5744.976	-4.141
0	3.8	5744.955	-7.856
-10	3.8	5744.965	-6.037
-20	3.8	5744.975	-4.330



Reference Frequency: 802.11n40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5754.977	-4.033
40	3.8	5754.959	-7.160
30	3.8	5754.979	-3.725
25	3.8	5754.951	-8.485
10	3.8	5754.963	-6.439
0	3.8	5754.979	-3.706
-10	3.8	5754.979	-3.600
-20	3.8	5754.961	-6.792

Reference Frequency: 802.11ac20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5744.971	-4.983
40	3.8	5744.956	-7.610
30	3.8	5744.977	-3.964
25	3.8	5744.977	-4.053
10	3.8	5744.974	-4.547
0	3.8	5744.974	-4.561
-10	3.8	5744.956	-7.668
-20	3.8	5744.979	-3.717

Reference Frequency: 802.11ac40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5754.961	-6.808
40	3.8	5754.959	-7.063
30	3.8	5754.975	-4.302
25	3.8	5754.956	-7.654
10	3.8	5754.969	-5.360
0	3.8	5754.969	-5.355
-10	3.8	5754.960	-7.008
-20	3.8	5754.966	-5.853



Reference Frequency: 802.11ac80 - 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.8	5774.986	-2.476
40	3.8	5774.979	-3.611
30	3.8	5774.978	-3.765
25	3.8	5774.981	-3.262
10	3.8	5774.980	-3.474
0	3.8	5774.987	-2.272
-10	3.8	5774.978	-3.871
-20	3.8	5774.975	-4.377



11. DUTY CYCLE

11.1 APPLIED PROCEDURES / LIMIT

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

- a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
 - 1) Set the center frequency of the instrument to the center frequency of the transmission.
 - 2) Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.
 - 3) Set $VBW \geq RBW$. Set detector = peak or average.
 - 4) The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7 \mu s$.)

11.2 DEVIATION FROM STANDARD

No deviation.

11.3 TEST SETUP





11.4 TEST RESULTS

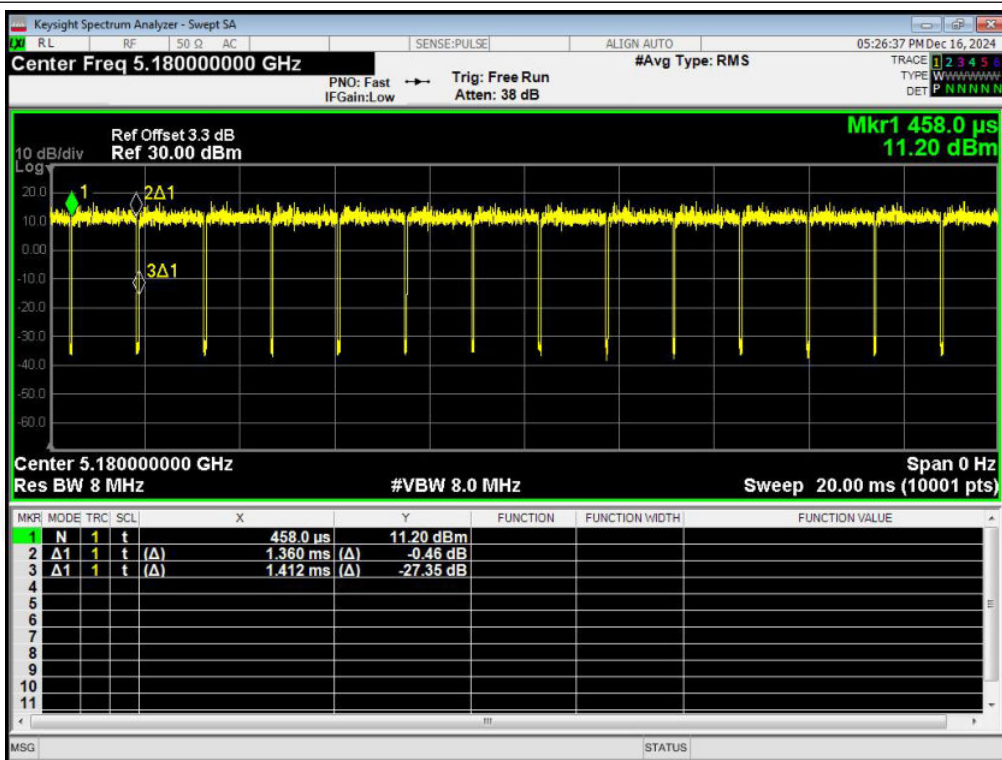
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test Band :	5.2G & 5.8G		

5.2G				
Test Mode	Frequency (MHz)	Duty Cycle (%)	Factor (dB)	Result
802.11a	5180	96.32	0.16	Pass
802.11n20	5180	96.08	0.17	Pass
802.11n40	5190	92.44	0.34	Pass
802.11ac20	5180	96.08	0.17	Pass
802.11ac40	5190	92.42	0.34	Pass
802.11ac80	5210	85.95	0.66	Pass
Note: Duty Cycle= Ton /Total*100% Duty Cycle Correction Factor = 10log (1/Duty Cycle)				

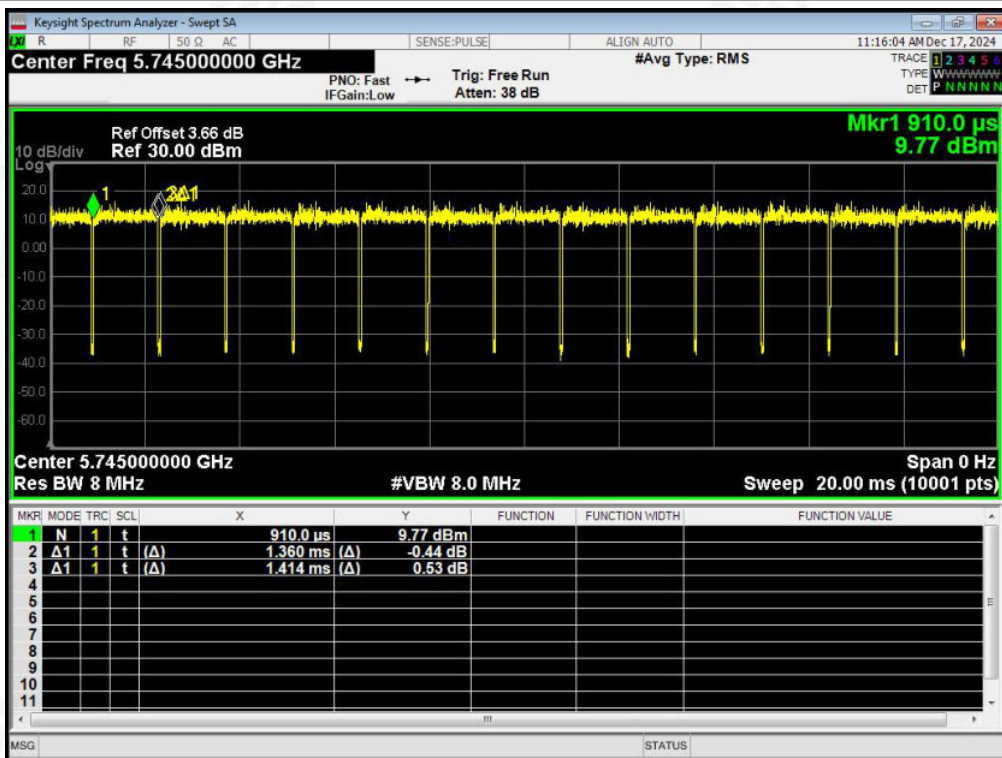
5.8G				
Test Mode	Frequency (MHz)	Duty Cycle (%)	Factor (dB)	Result
802.11a	5745	96.18	0.17	Pass
802.11n20	5745	95.94	0.18	Pass
802.11n40	5755	92.42	0.34	Pass
802.11ac20	5745	95.94	0.18	Pass
802.11ac40	5755	92.46	0.34	Pass
802.11ac80	5775	85.64	0.67	Pass
Note: Duty Cycle= Ton /Total*100% Duty Cycle Correction Factor = 10log (1/Duty Cycle)				



802.11a - 5180MHz



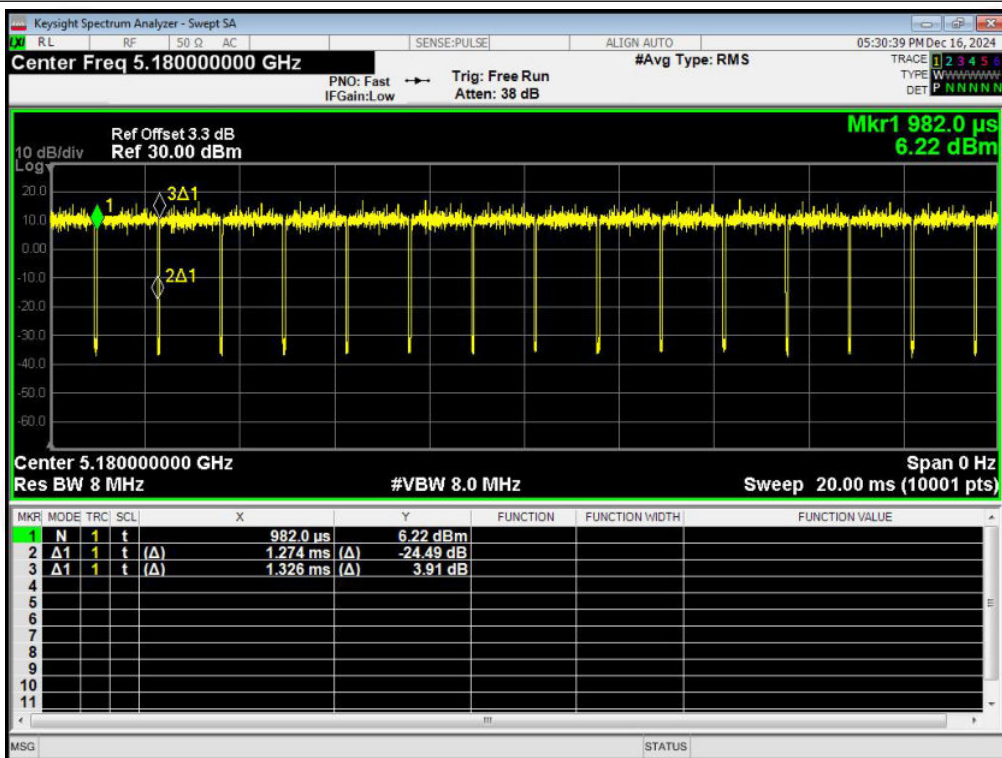
802.11a - 5745MHz



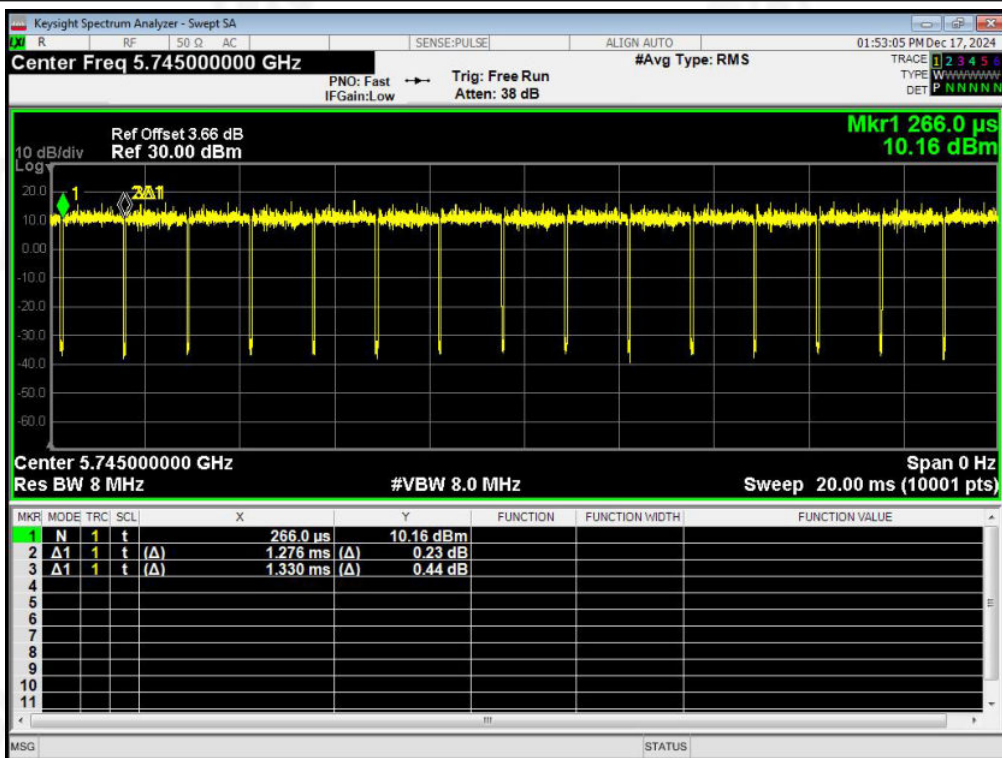
Note: All channel have been tested, and the report only reflects the worst case data.



802.11n20 - 5180MHz



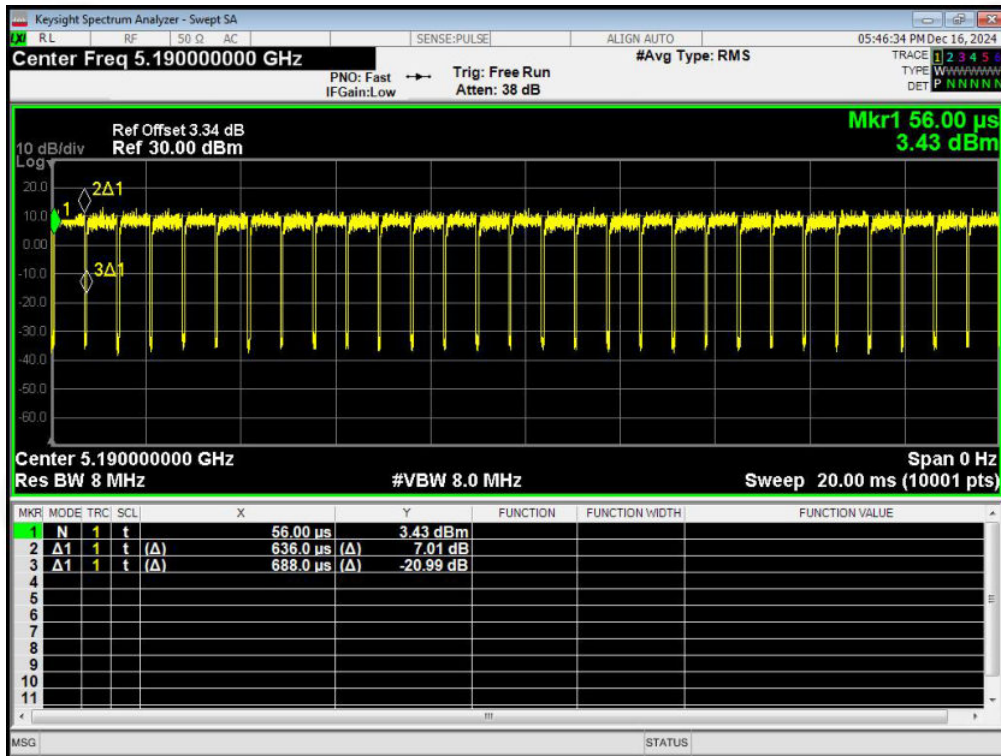
802.11n20 - 5745MHz



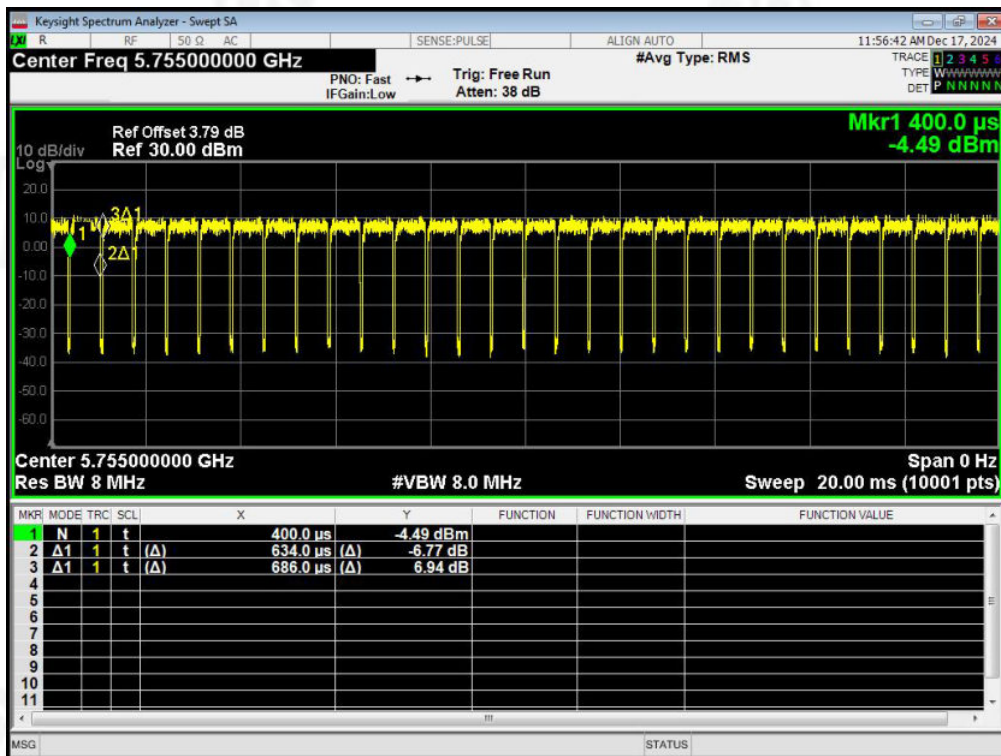
Note: All channel have been tested, and the report only reflects the worst case data.



802.11n40 - 5190MHz



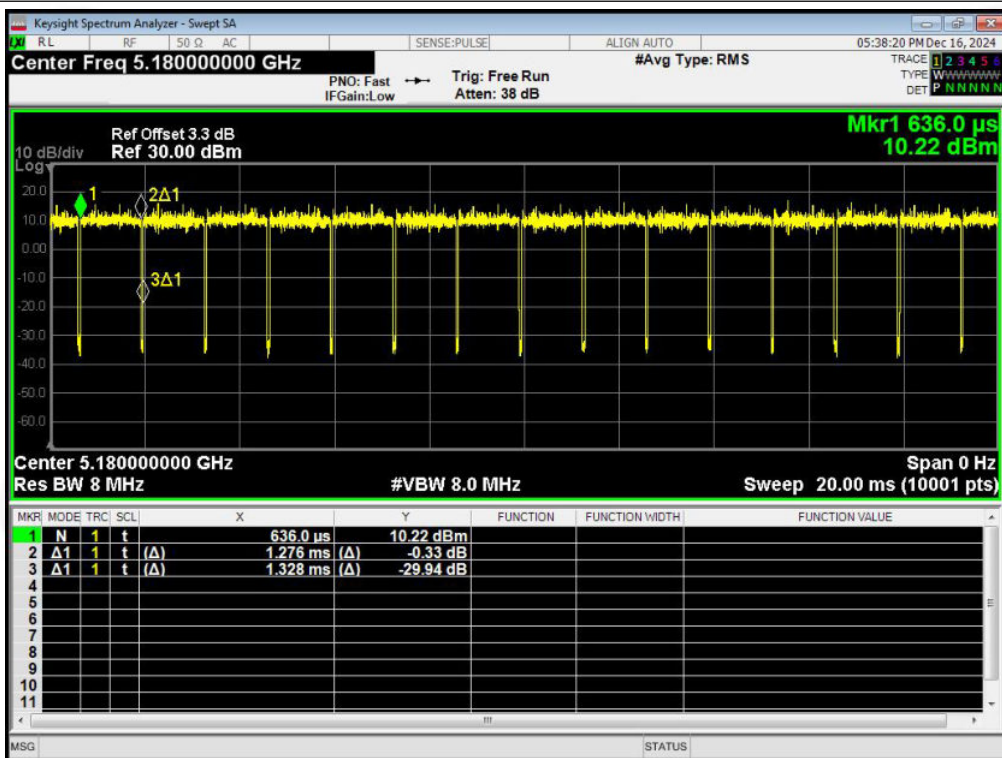
802.11n40 - 5755MHz



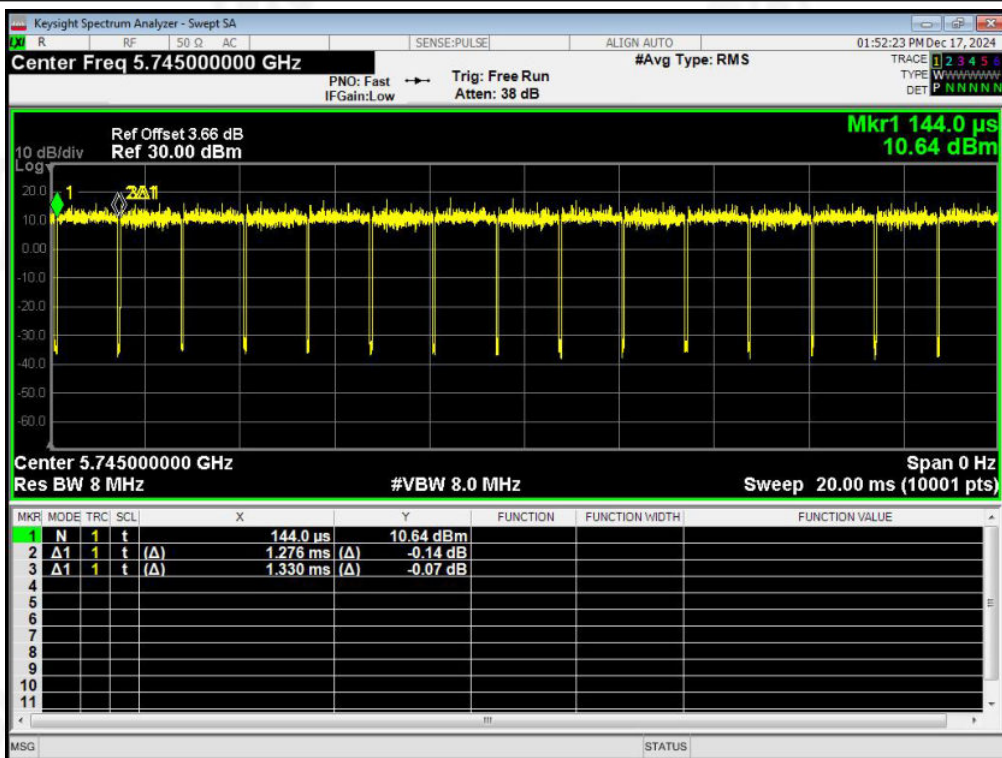
Note: All channel have been tested, and the report only reflects the worst case data.



802.11ac20 - 5180MHz



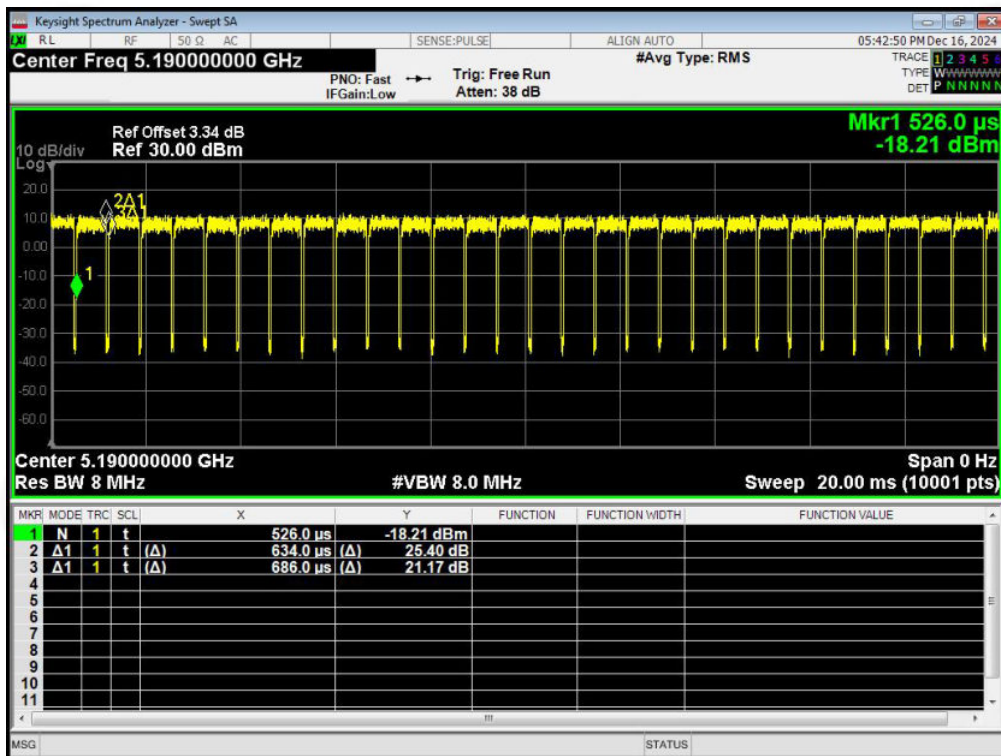
802.11ac20 - 5745MHz



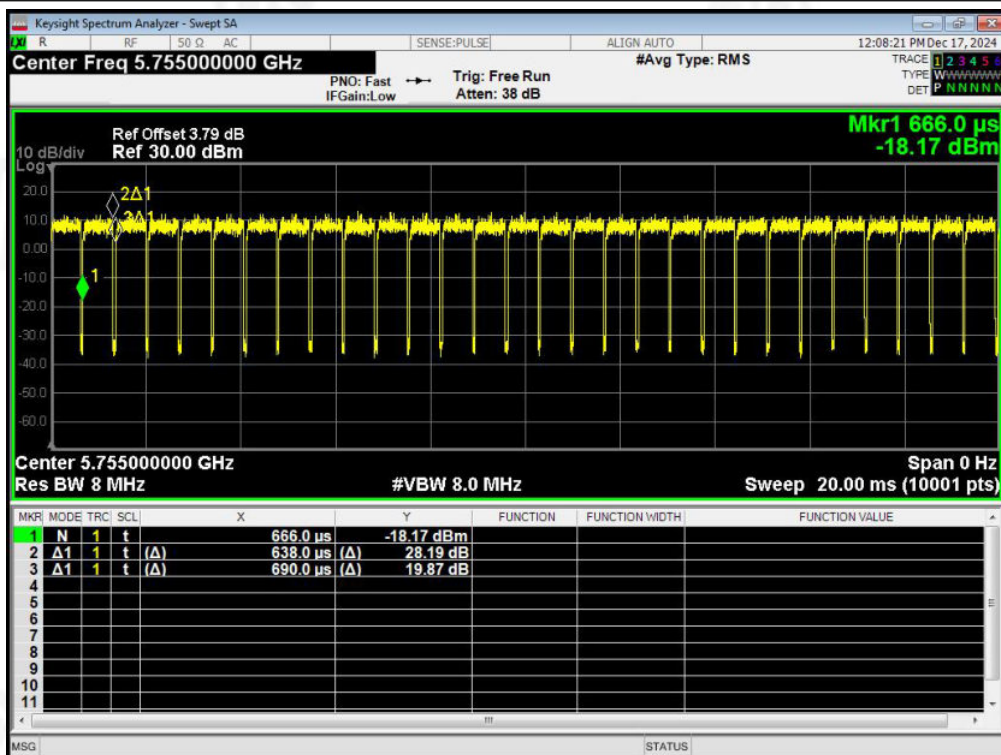
Note: All channel have been tested, and the report only reflects the worst case data.



802.11ac40 - 5190MHz



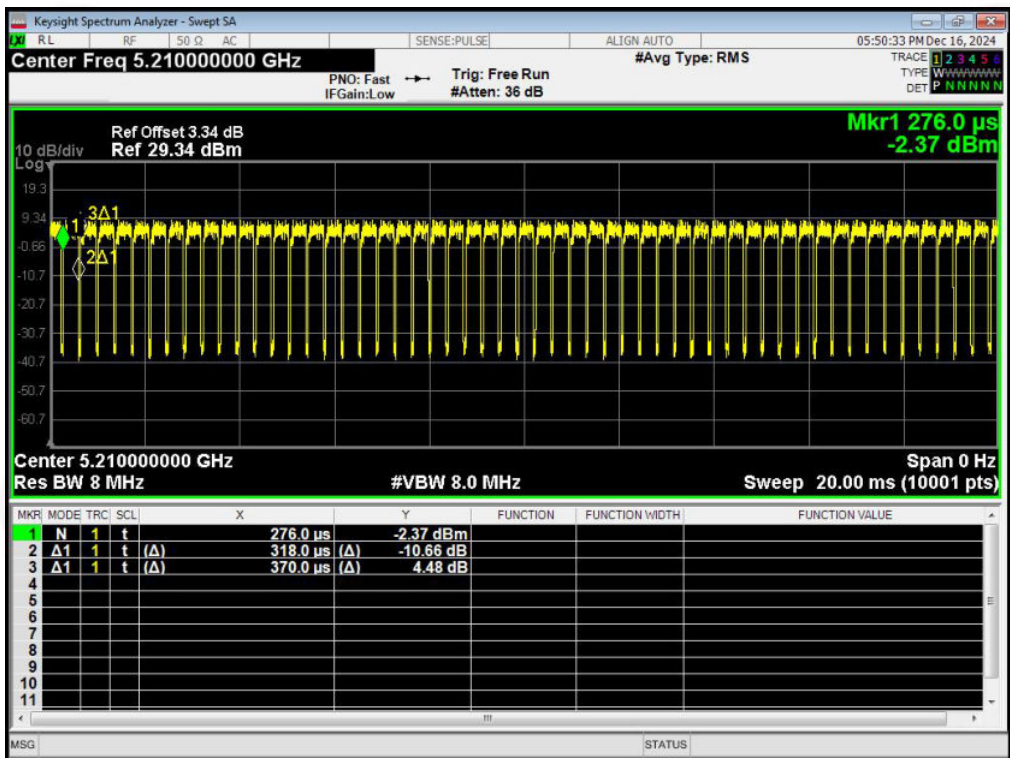
802.11ac40 - 5755MHz



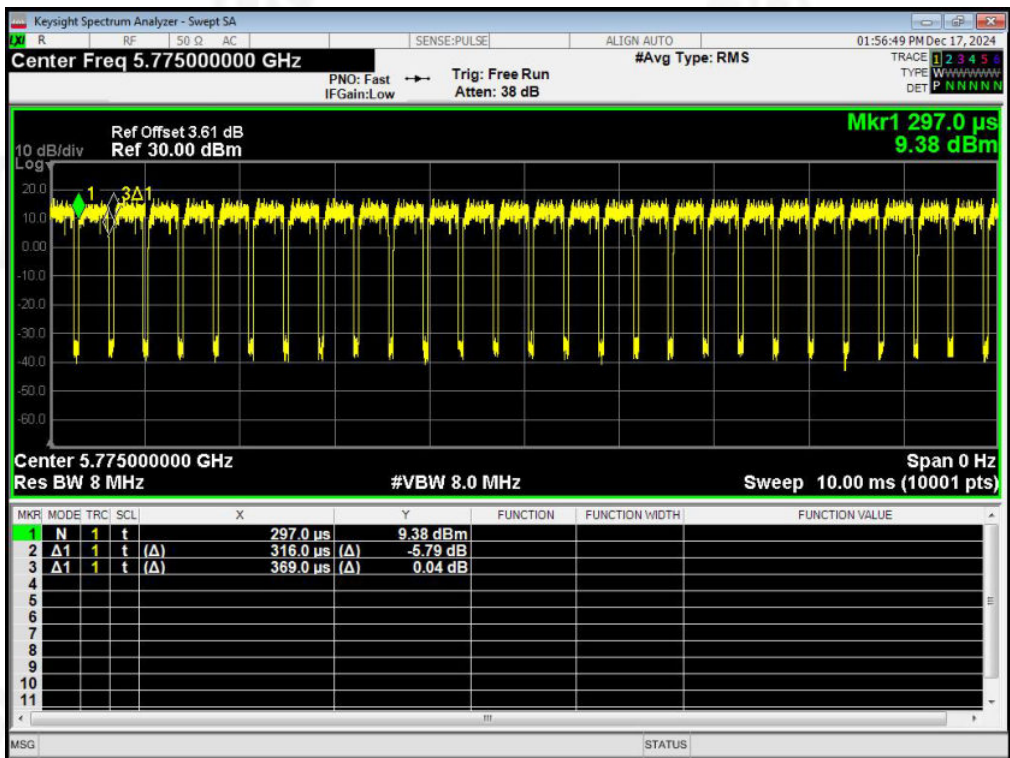
Note: All channel have been tested, and the report only reflects the worst case data.



802.11ac80 - 5210MHz



802.11ac80 - 5775MHz



Note: All channel have been tested, and the report only reflects the worst case data.



12.ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is FPC Antenna, the best case gain of the antenna is 5.2G is 0.32dBi & 5.8G is 0.25dBi, reference to the appendix II for details	



13. TEST SETUP PHOTO

Reference to the appendix I for details.

14. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

***** END OF REPORT *****