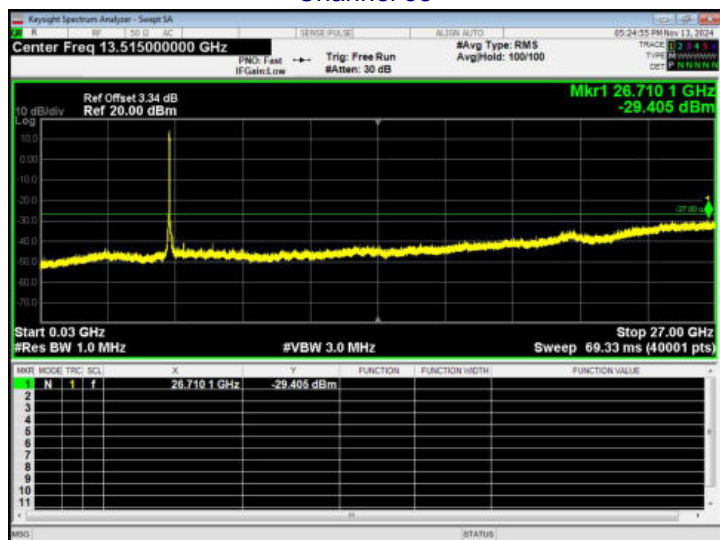




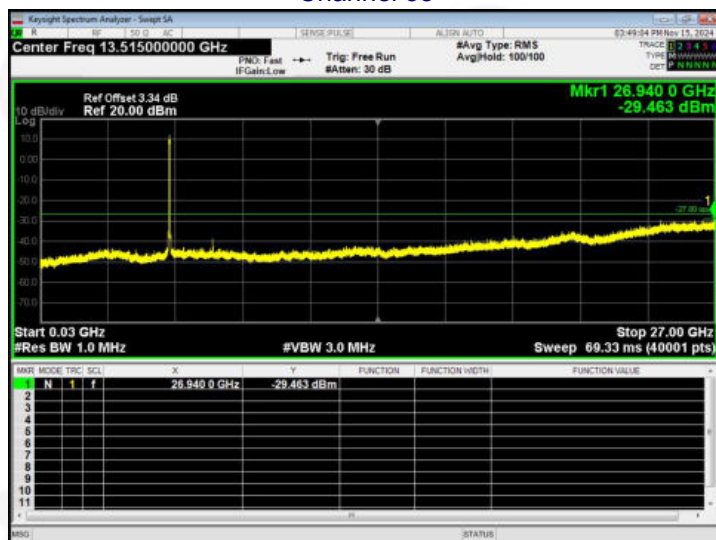
SISO ANT A - 802.11ax40

MIMO A - 802.11ax40

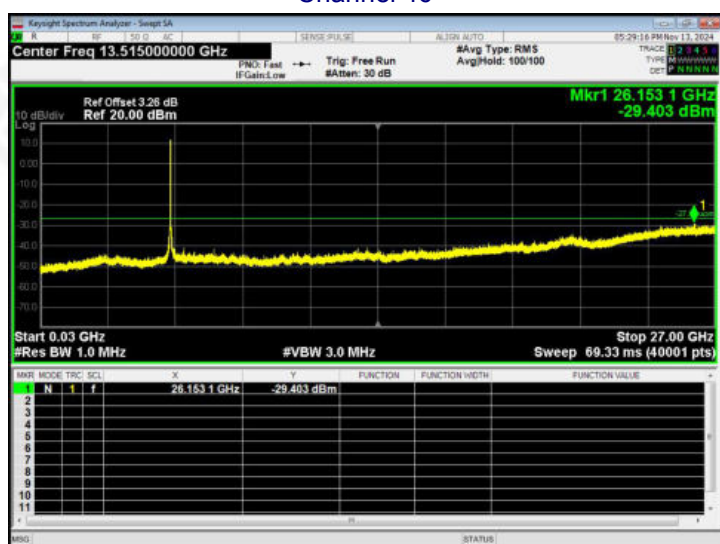
Channel 38



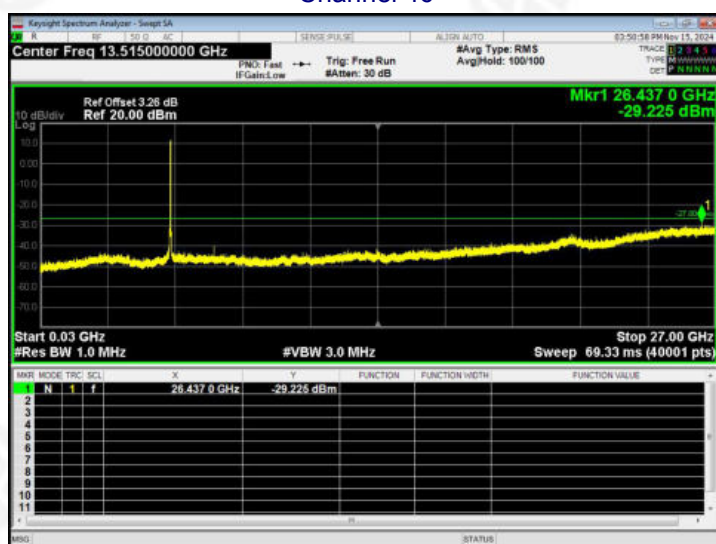
Channel 38



Channel 46



Channel 46

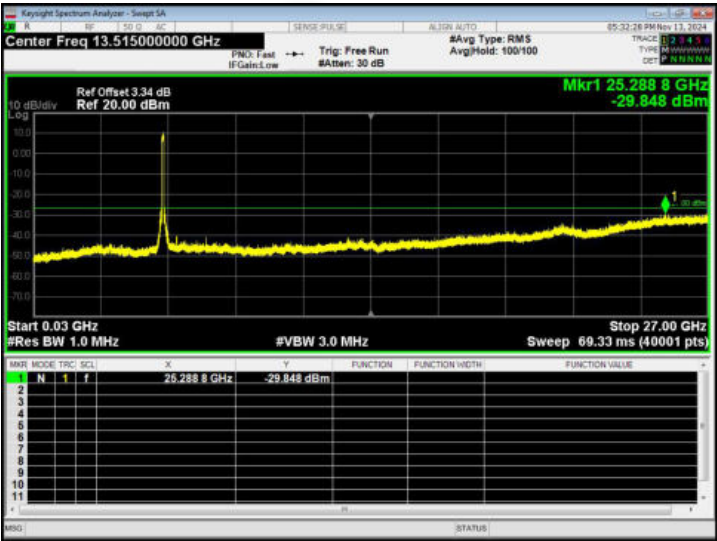


Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.

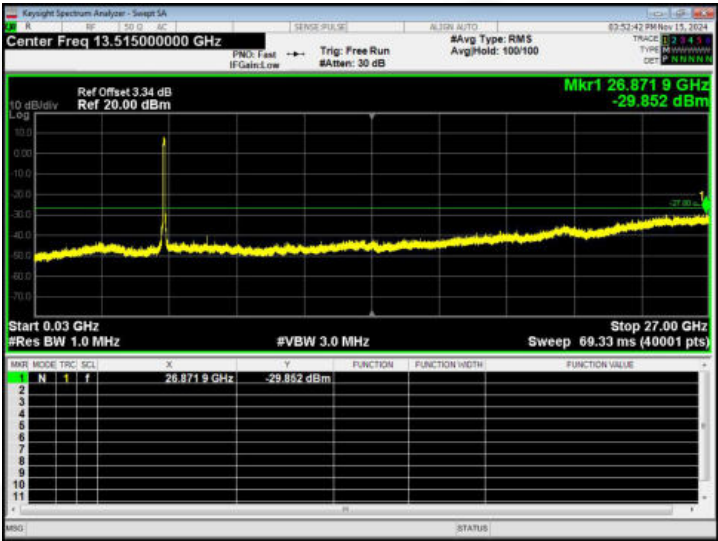


SISO ANT A - 802.11ax80

Channel 42



Channel 42



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO ANT A.



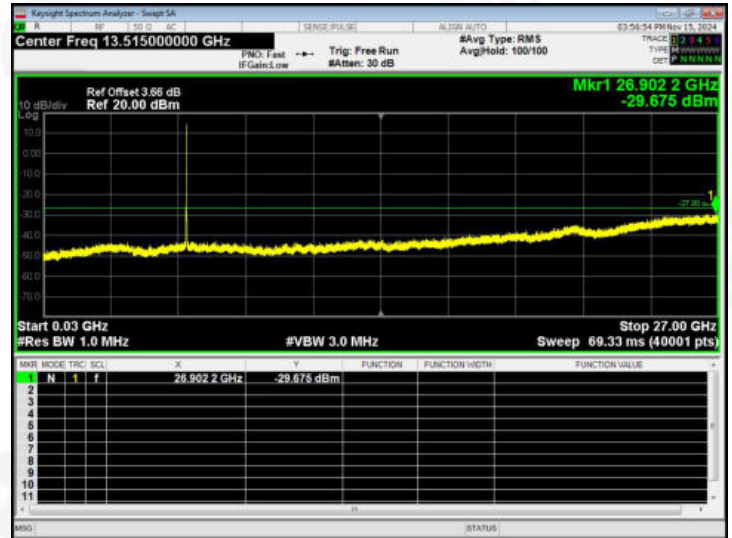
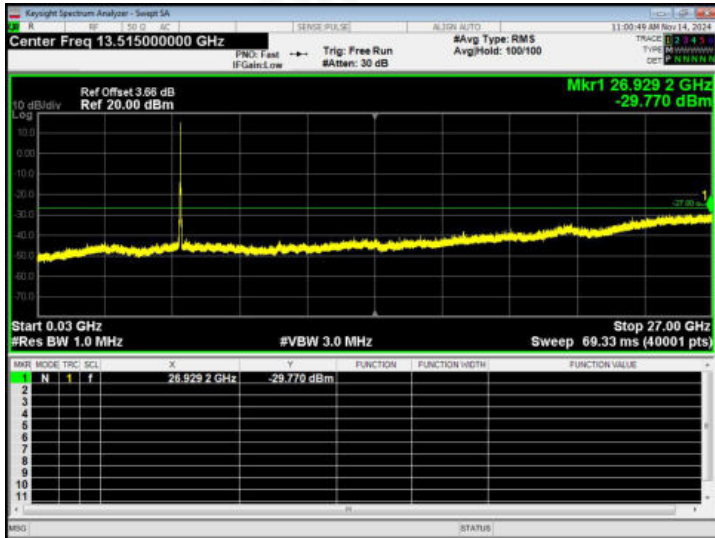
5.8G Test Chart

SISO ANT A - 802.11a

SISO ANT B - 802.11a

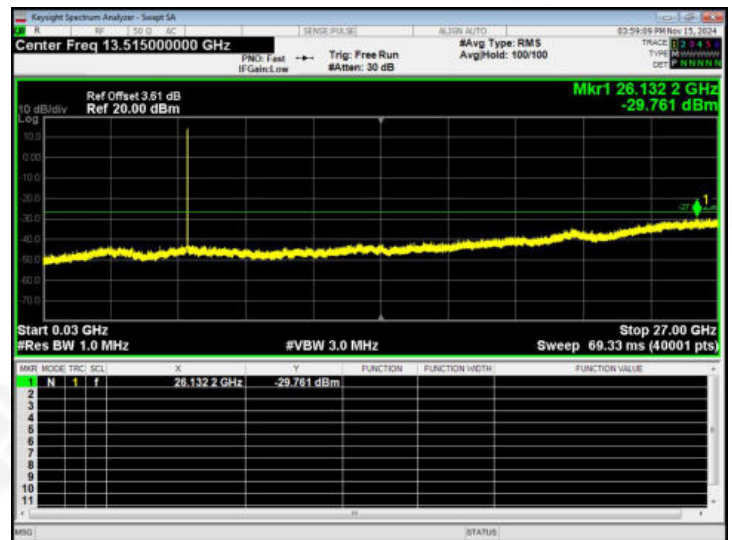
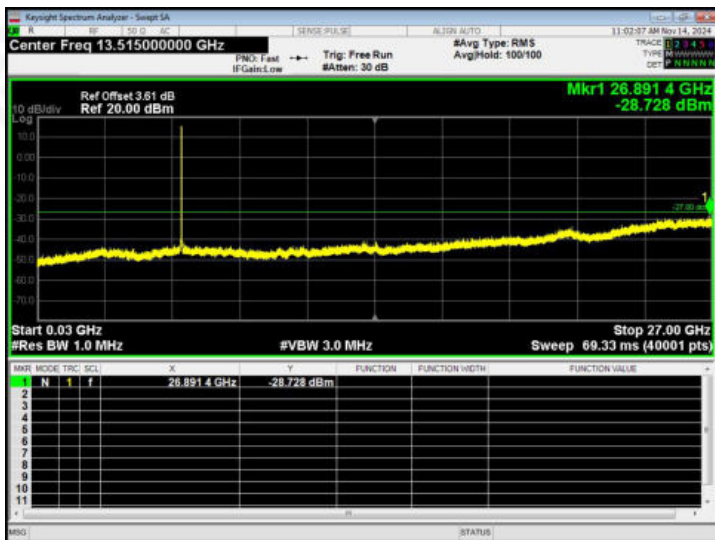
Channel 149

Channel 149



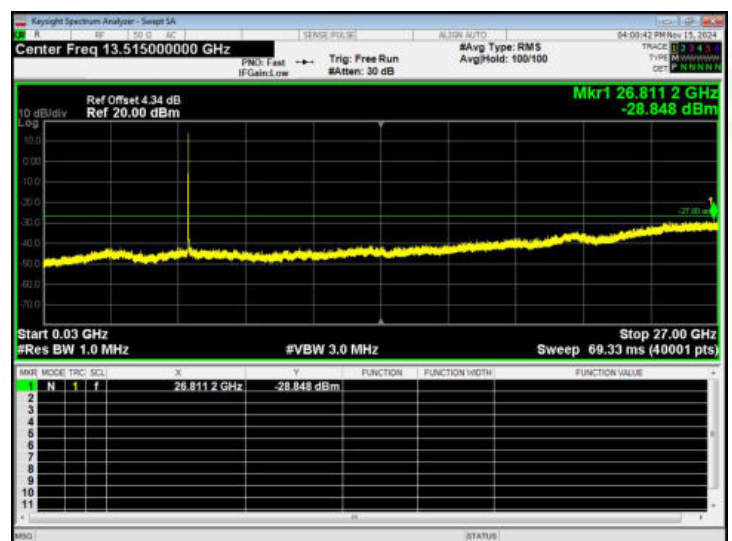
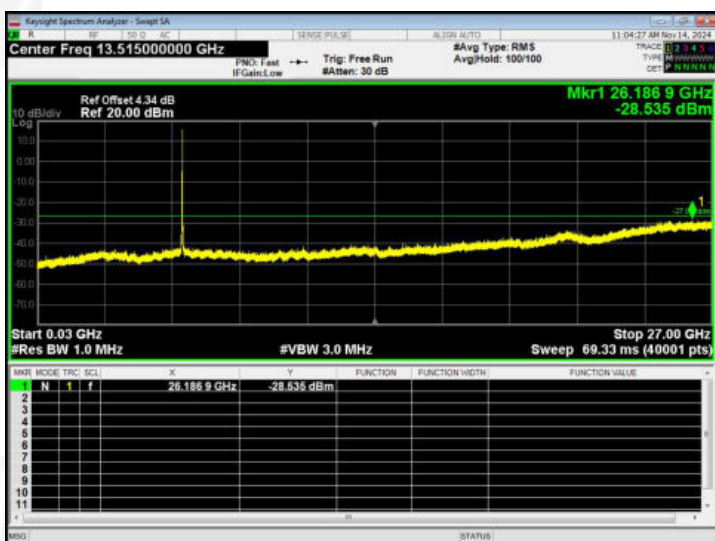
Channel 157

Channel 157



Channel 165

Channel 165





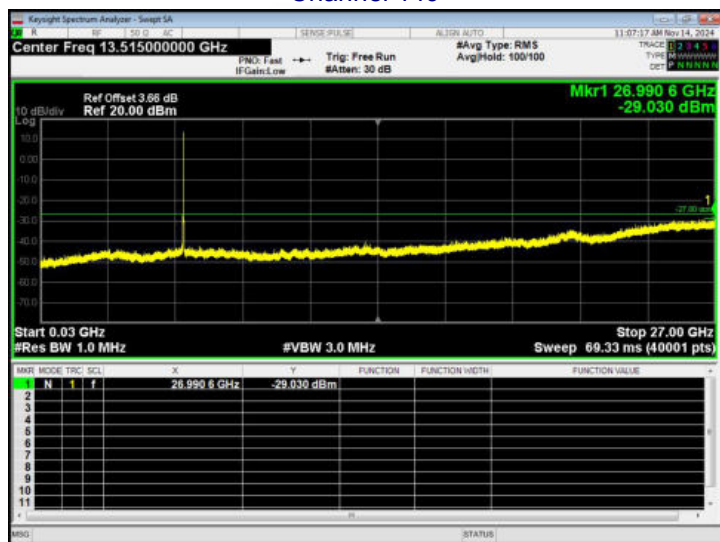
SISO ANT A - 802.11n20

Project No.: ZKT-24110414621E-4

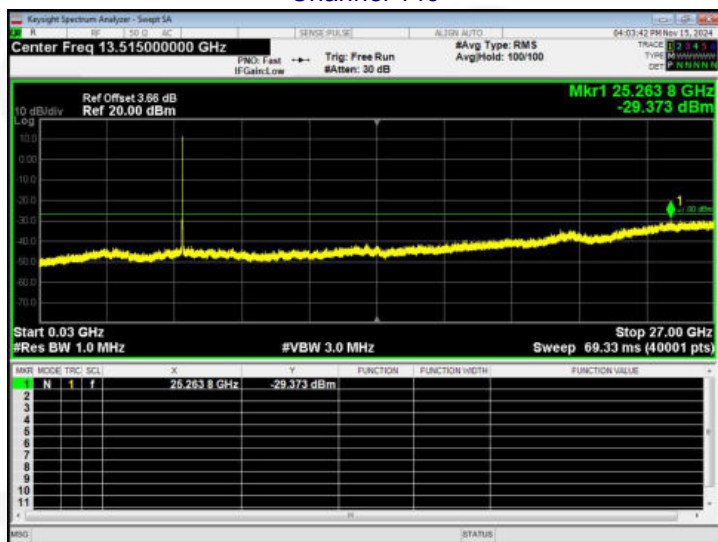
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MIMO A - 802.11n20

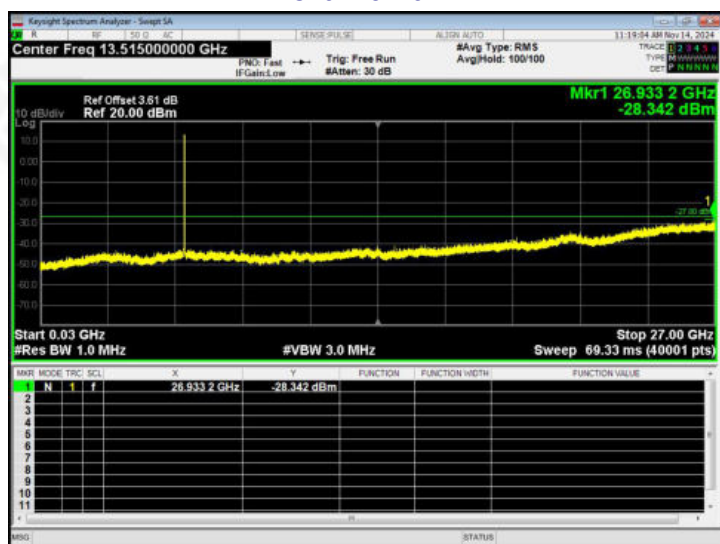
Channel 149



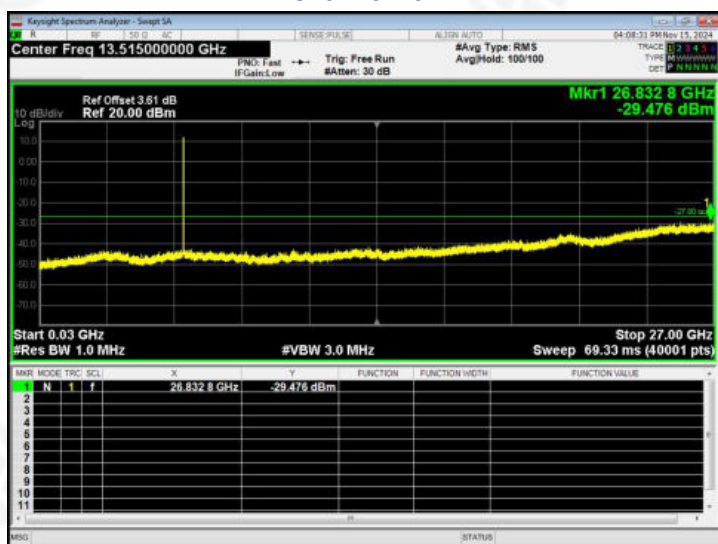
Channel 149



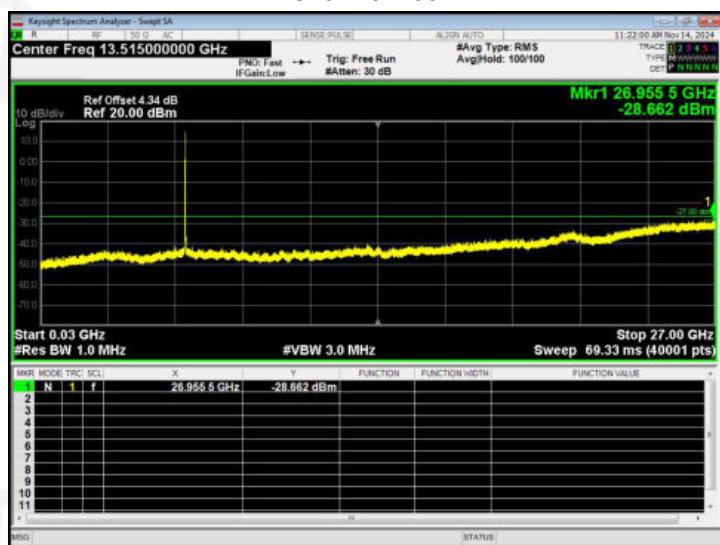
Channel 157



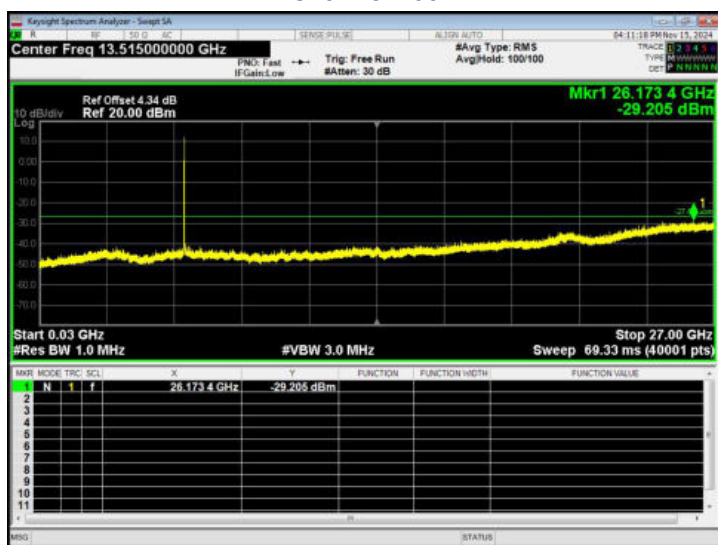
Channel 157



Channel 165



Channel 165



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.

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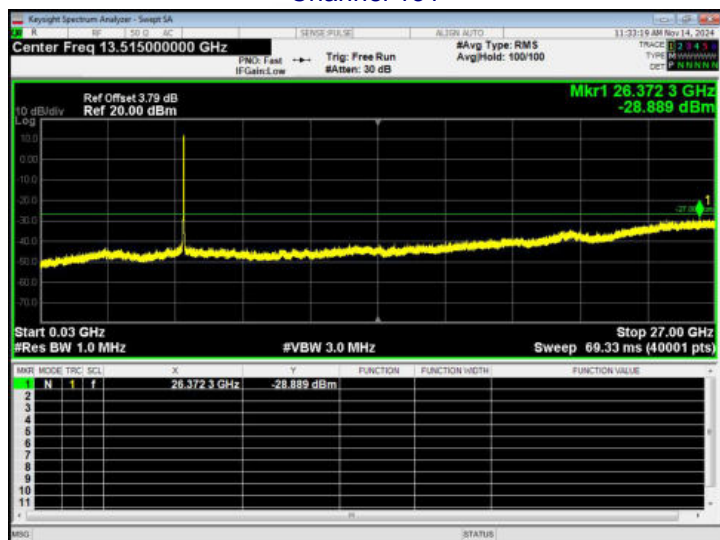
zkt@zkt-lab.com

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SISO ANT A - 802.11n40

Channel 151

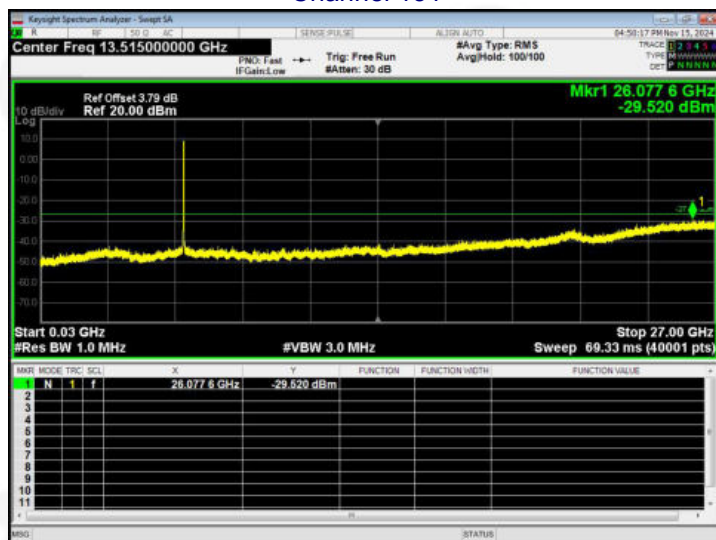


Project No.: ZKT-24110414621E-4

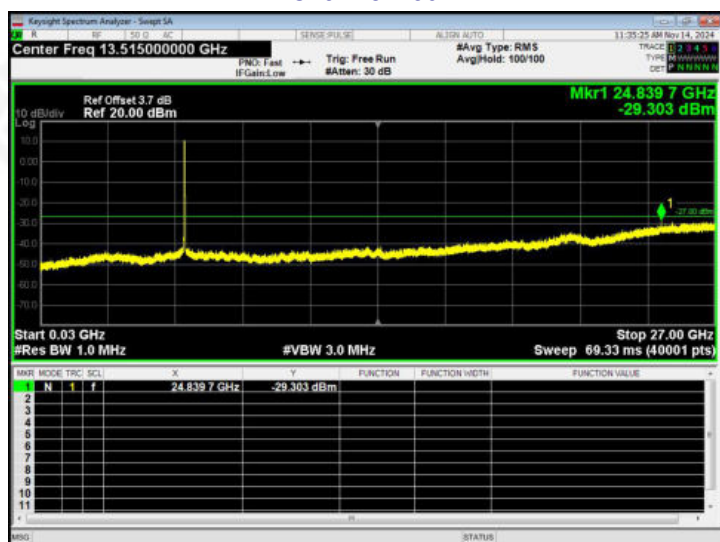
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MIMO A - 802.11n40

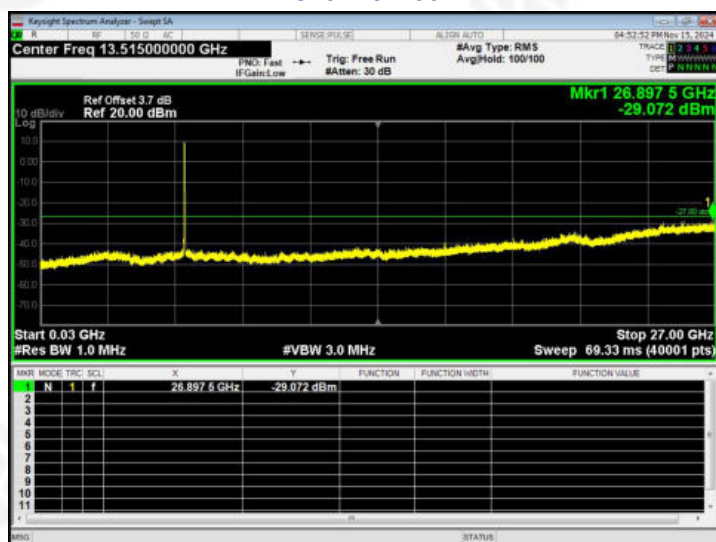
Channel 151



Channel 159



Channel 159



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.



SISO ANT A - 802.11ac20

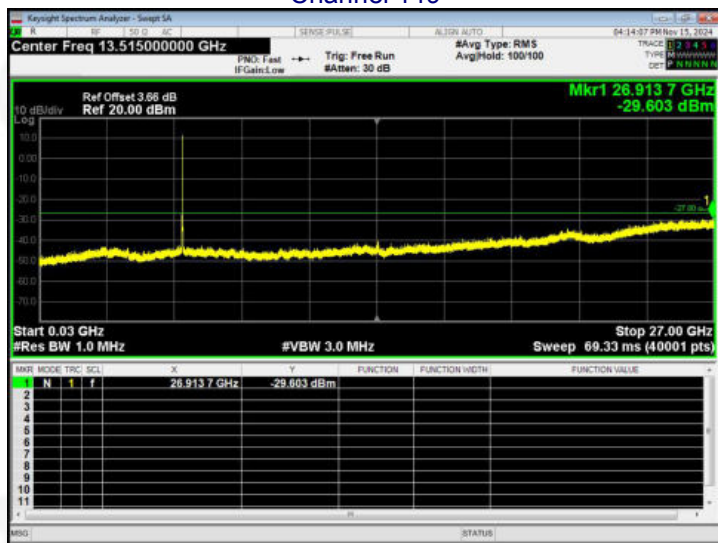
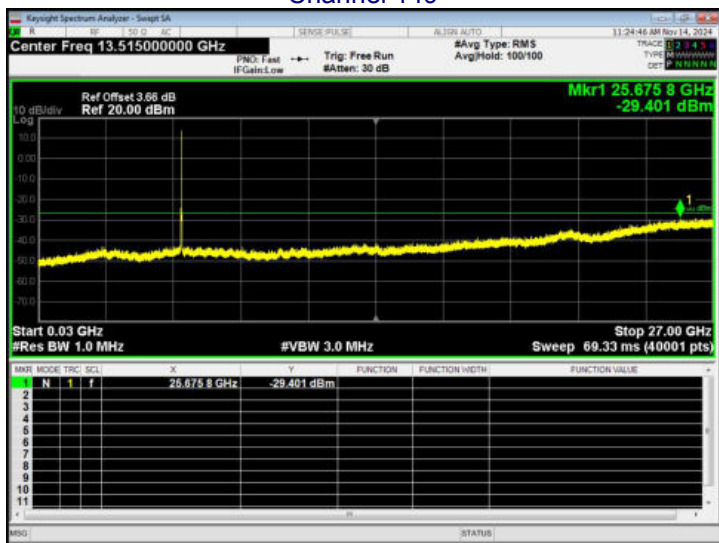
Project No.: ZKT-24110414621E-4

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MIMO A - 802.11ac20

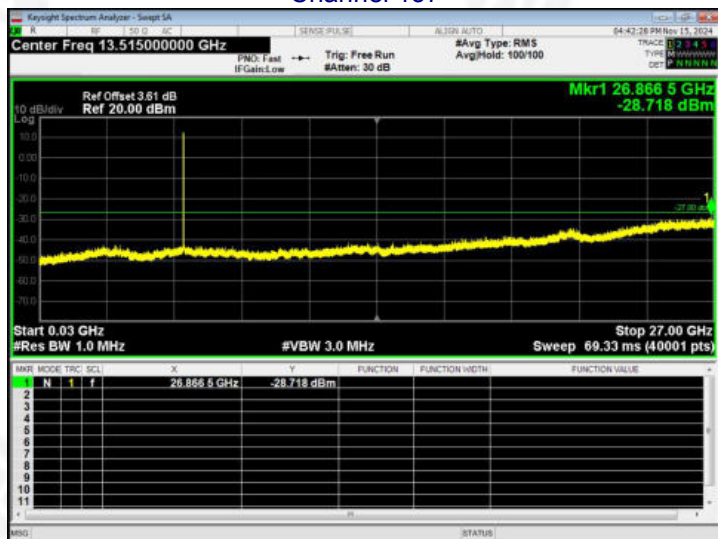
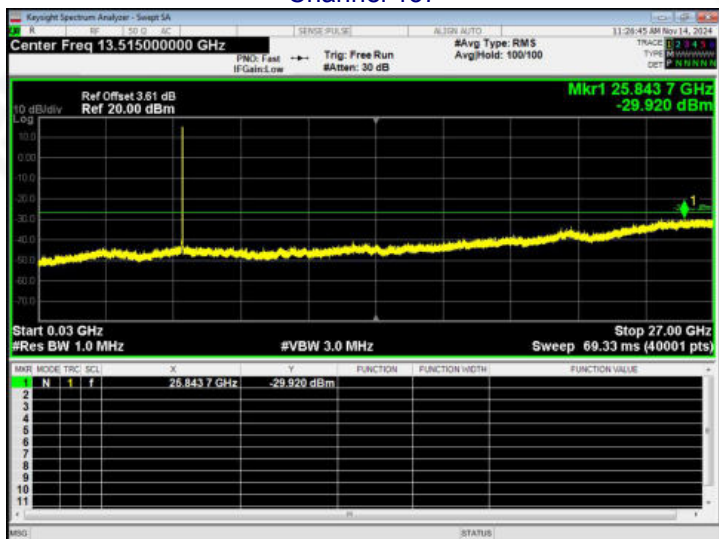
Channel 149

Channel 149



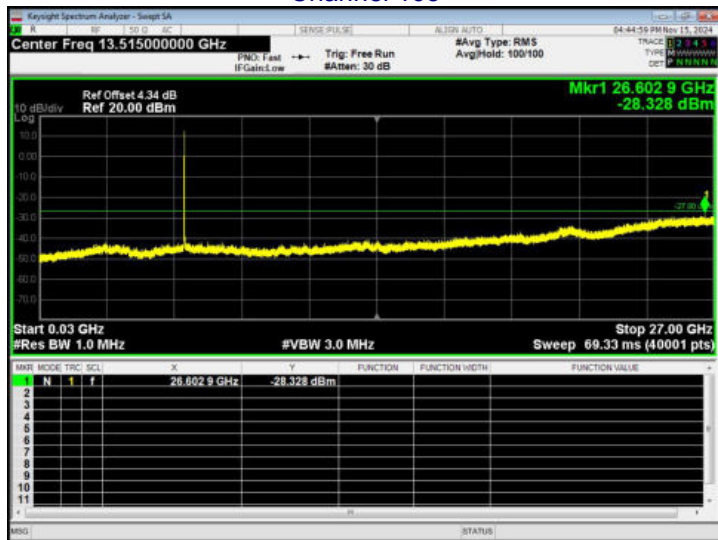
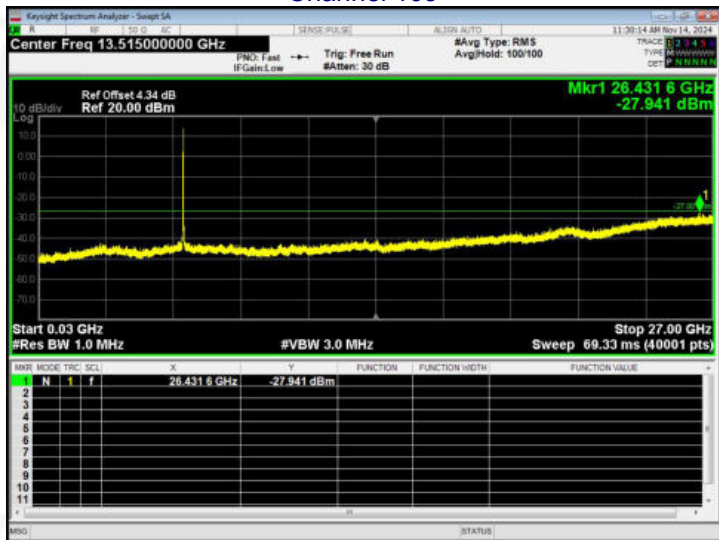
Channel 157

Channel 157



Channel 165

Channel 165



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.

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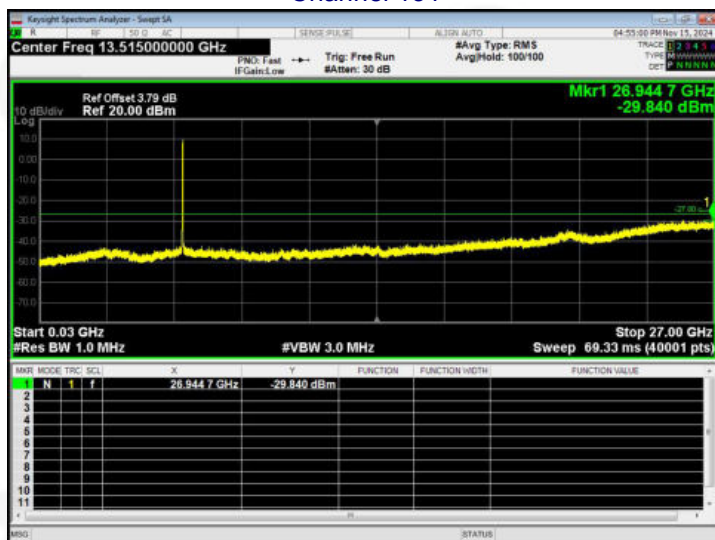
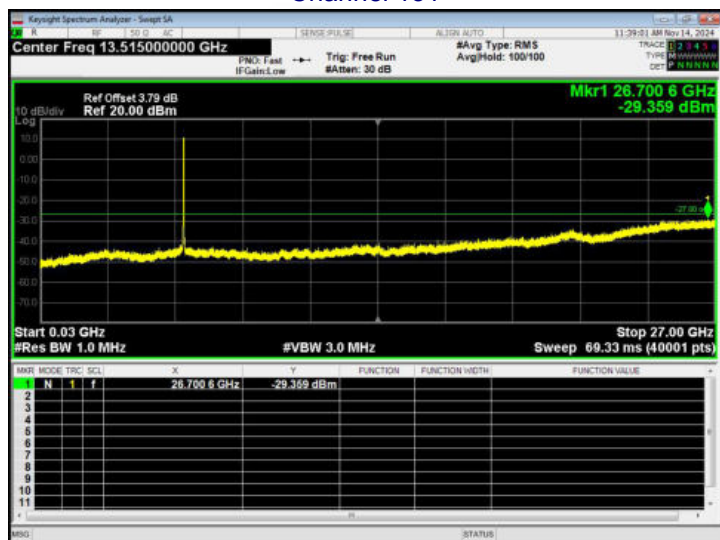


SISO ANT A - 802.11ac40

MIMO A - 802.11ac40

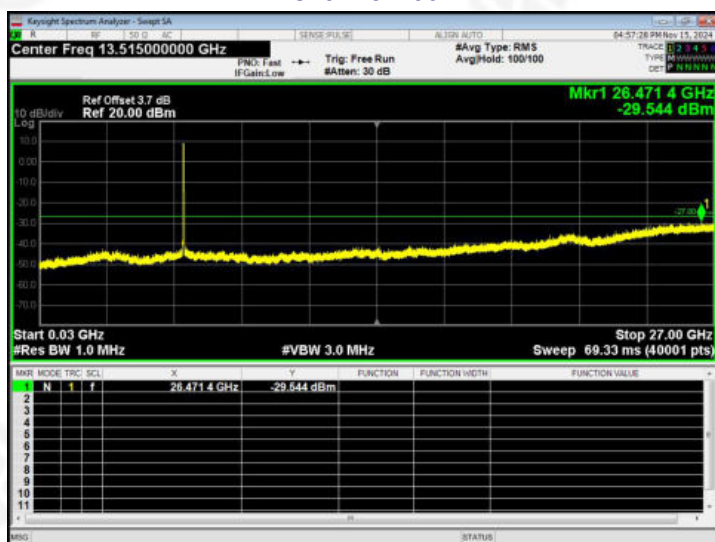
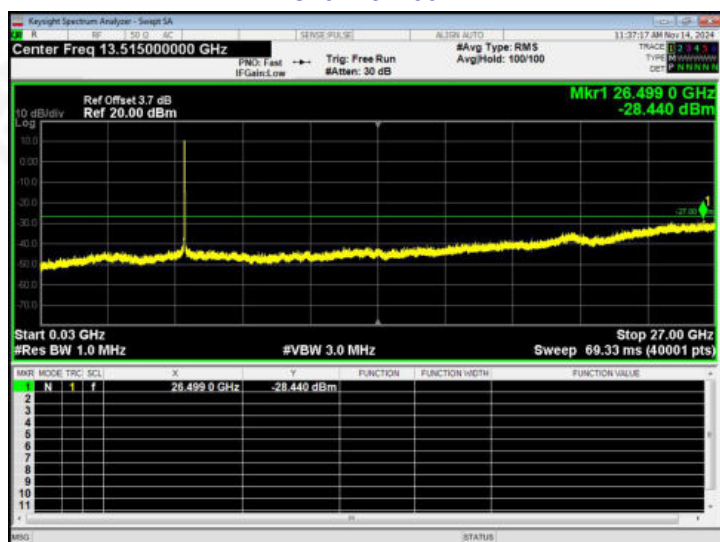
Channel 151

Channel 151



Channel 159

Channel 159



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.

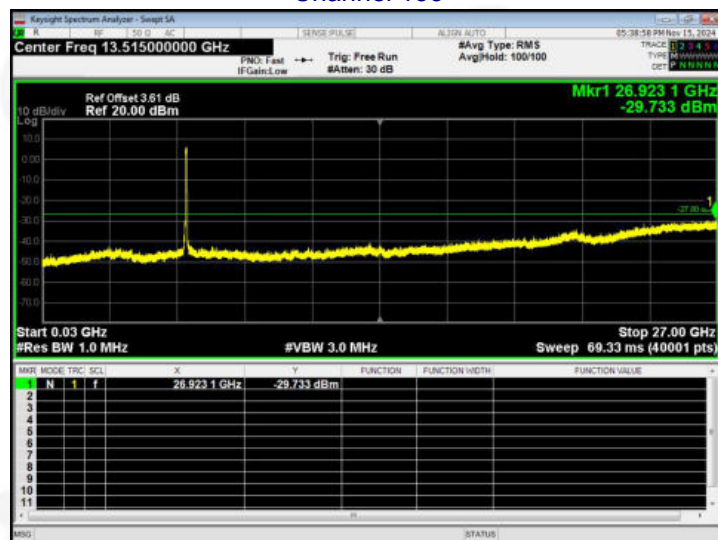
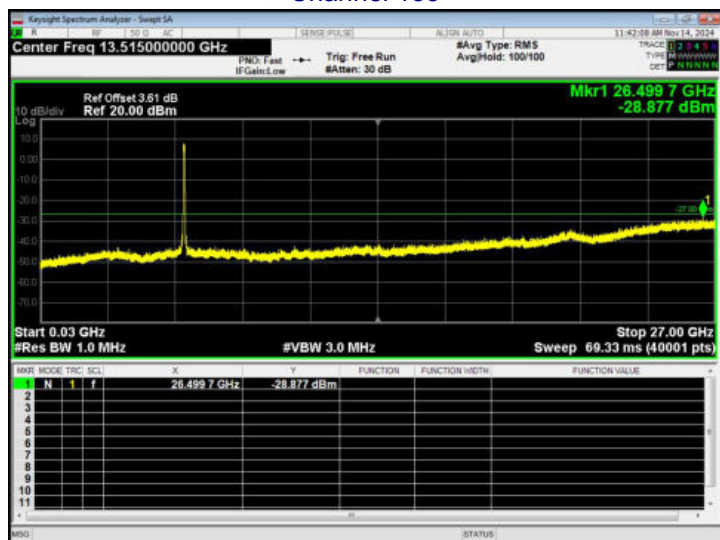


SISO ANT A - 802.11ac80

MIMO A - 802.11ac80

Channel 155

Channel 155



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO ANT A.



SISO ANT A - 802.11ax20

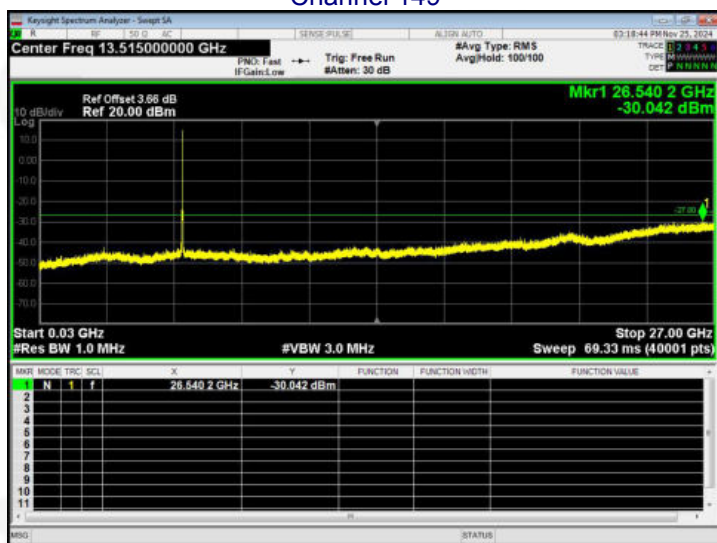
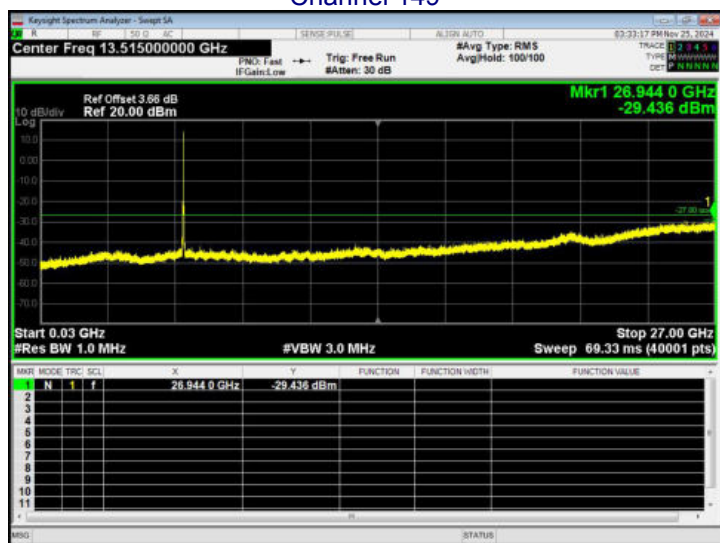
Project No.: ZKT-24110414621E-4

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MIMO A - 802.11ax20

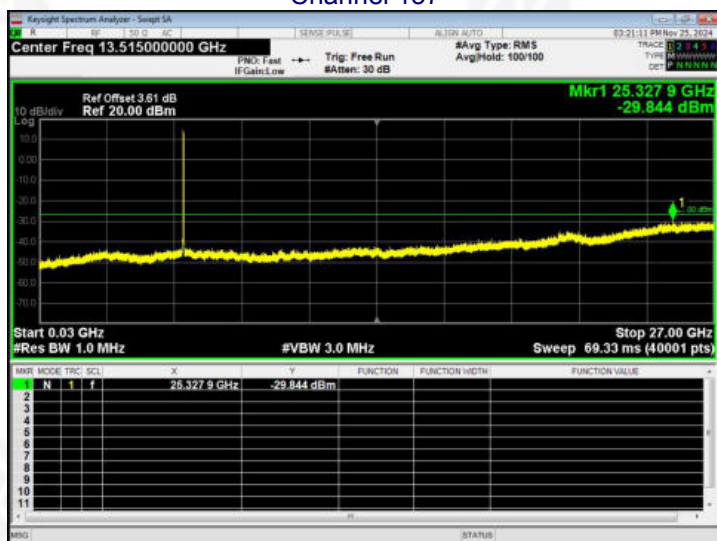
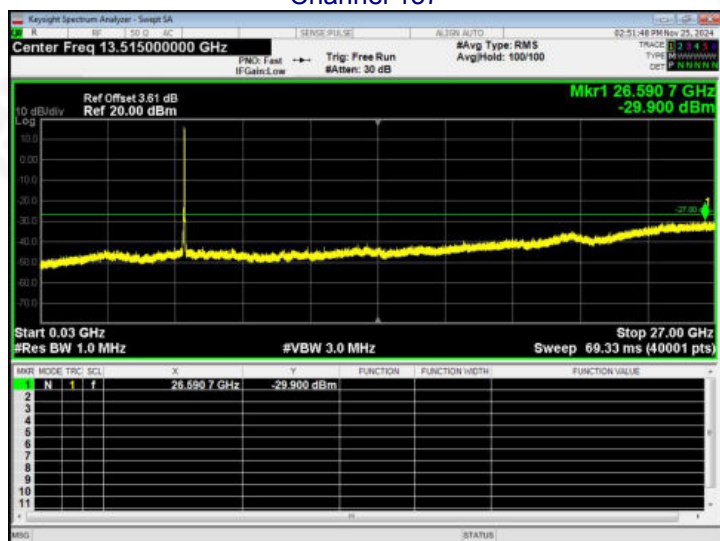
Channel 149

Channel 149



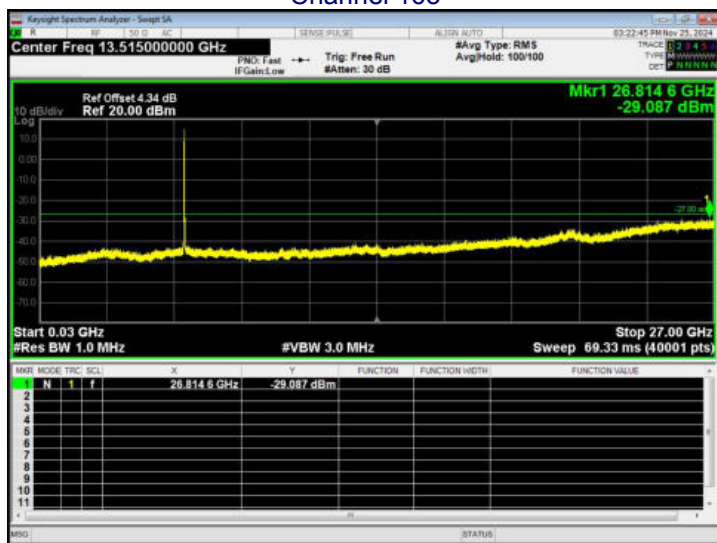
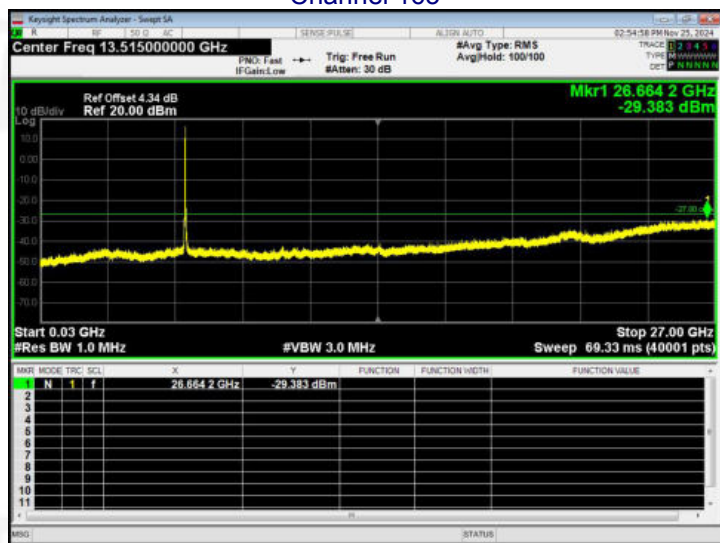
Channel 157

Channel 157



Channel 165

Channel 165



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.

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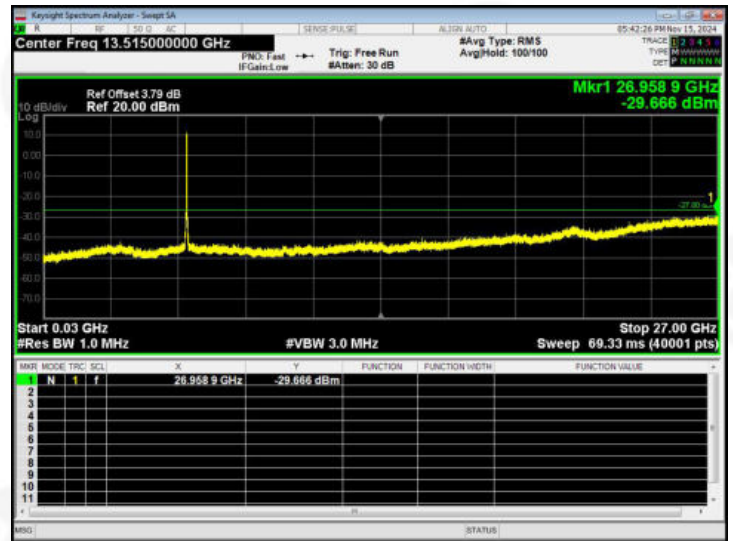
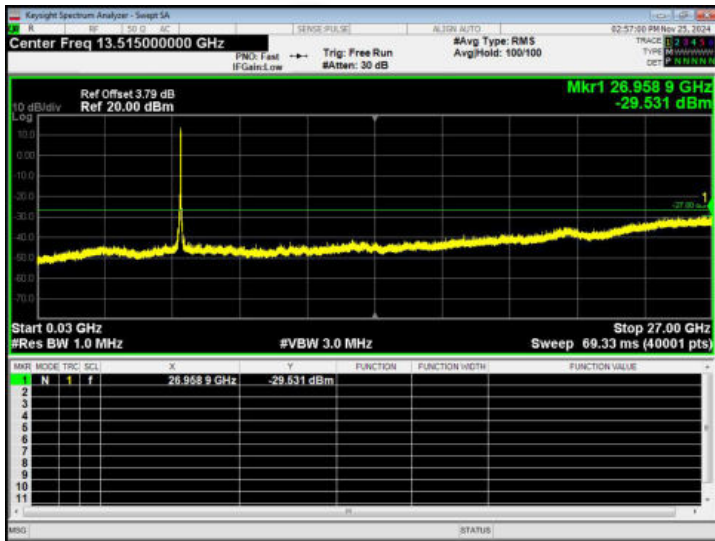


SISO ANT A - 802.11ax40

MIMO A - 802.11ax40

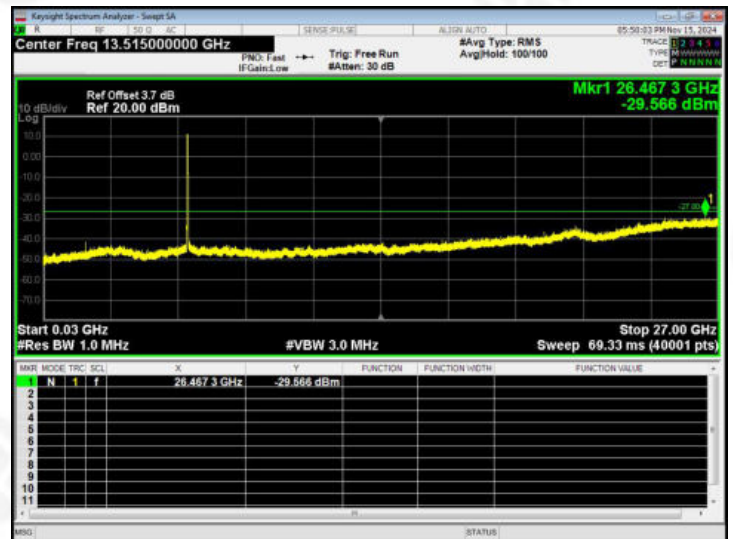
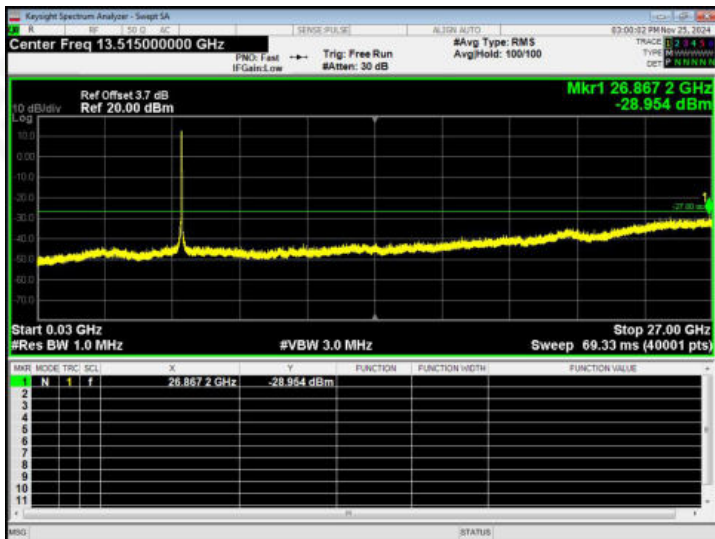
Channel 151

Channel 151



Channel 159

Channel 159



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.

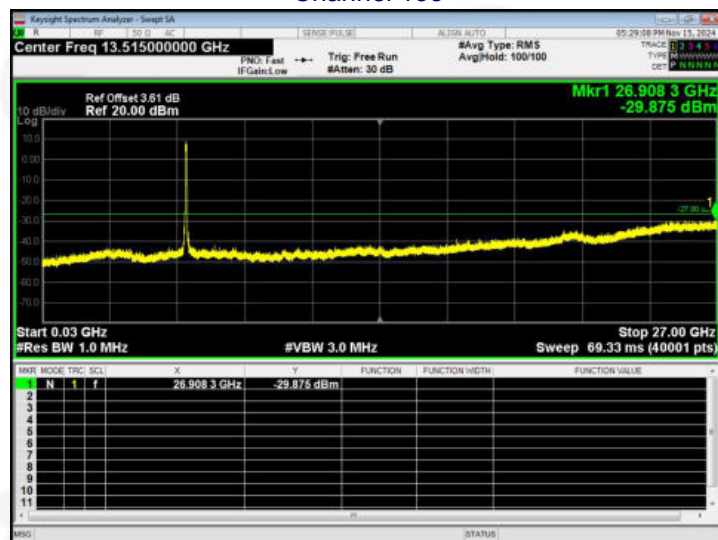
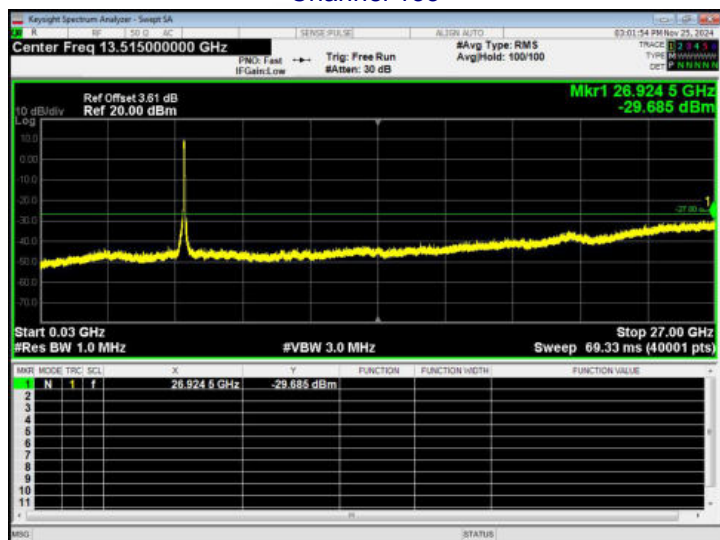


SISO ANT A - 802.11ax80

MIMO A - 802.11ax80

Channel 155

Channel 155



Note: Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO ANT A.



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 3.85V
Test Band :	5.2G & 5.8G		
Note: All channels have been tested, and only the worst test data is recorded in this report. Both SISO ANT A&B and MIMO A&B passed the test, the test data shows only the worst case SISO ANT A and MIMO A.			



Reference Frequency: SISO ANT A 802.11a - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.986	-2.691
40	3.85	5179.975	-4.904
30	3.85	5179.984	-3.060
25	3.85	5179.986	-2.643
10	3.85	5179.980	-3.811
0	3.85	5179.978	-4.214
-10	3.85	5179.980	-3.824
-20	3.85	5179.978	-4.301

Reference Frequency: SISO ANT A 802.11n20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.986	-2.664
40	3.85	5179.970	-5.743
30	3.85	5179.972	-5.500
25	3.85	5179.978	-4.325
10	3.85	5179.979	-4.000
0	3.85	5179.988	-2.373
-10	3.85	5179.978	-4.245
-20	3.85	5179.987	-2.521

Reference Frequency: MIMO A 802.11n20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.989	-2.074
40	3.85	5179.988	-2.235
30	3.85	5179.976	-4.725
25	3.85	5179.984	-2.995
10	3.85	5179.975	-4.744
0	3.85	5179.980	-3.913
-10	3.85	5179.977	-4.427
-20	3.85	5179.973	-5.179



Reference Frequency: SISO ANT A 802.11n40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5189.974	-5.060
40	3.85	5189.988	-2.400
30	3.85	5189.979	-3.983
25	3.85	5189.981	-3.600
10	3.85	5189.990	-1.940
0	3.85	5189.981	-3.657
-10	3.85	5189.971	-5.626
-20	3.85	5189.988	-2.236

Reference Frequency: MIMO A 802.11n40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5189.971	-5.604
40	3.85	5189.979	-4.119
30	3.85	5189.983	-3.281
25	3.85	5189.988	-2.313
10	3.85	5189.978	-4.146
0	3.85	5189.988	-2.245
-10	3.85	5189.984	-2.991
-20	3.85	5189.979	-4.047

Reference Frequency: SISO ANT A 802.11ac20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.968	-6.267
40	3.85	5179.978	-4.156
30	3.85	5179.971	-5.553
25	3.85	5179.969	-5.979
10	3.85	5179.975	-4.810
0	3.85	5179.966	-6.605
-10	3.85	5179.978	-4.335
-20	3.85	5179.975	-4.738



Reference Frequency: MIMO A 802.11ac20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.966	-6.562
40	3.85	5179.968	-6.217
30	3.85	5179.972	-5.384
25	3.85	5179.969	-6.071
10	3.85	5179.980	-3.925
0	3.85	5179.978	-4.285
-10	3.85	5179.978	-4.214
-20	3.85	5179.972	-5.490

Reference Frequency: SISO ANT A 802.11ac40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5189.988	-2.248
40	3.85	5189.986	-2.728
30	3.85	5189.982	-3.531
25	3.85	5189.974	-5.048
10	3.85	5189.981	-3.599
0	3.85	5189.980	-3.942
-10	3.85	5189.988	-2.331
-20	3.85	5189.979	-4.087

Reference Frequency: MIMO A 802.11ac40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5189.990	-2.014
40	3.85	5189.982	-3.426
30	3.85	5189.984	-3.111
25	3.85	5189.978	-4.279
10	3.85	5189.983	-3.255
0	3.85	5189.973	-5.199
-10	3.85	5189.986	-2.667
-20	3.85	5189.980	-3.775



Reference Frequency: SISO ANT A 802.11ac80 - 5210MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5209.985	-2.952
40	3.85	5209.990	-2.014
30	3.85	5209.988	-2.298
25	3.85	5209.989	-2.016
10	3.85	5209.990	-1.976
0	3.85	5209.984	-3.133
-10	3.85	5209.986	-2.663
-20	3.85	5209.984	-3.001

Reference Frequency: MIMO A 802.11ac80 - 5210MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5209.984	-3.100
40	3.85	5209.983	-3.272
30	3.85	5209.986	-2.748
25	3.85	5209.985	-2.887
10	3.85	5209.983	-3.257
0	3.85	5209.982	-3.462
-10	3.85	5209.988	-2.280
-20	3.85	5209.984	-3.082

Reference Frequency: SISO ANT A 802.11ax20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.971	-5.593
40	3.85	5179.964	-6.946
30	3.85	5179.975	-4.869
25	3.85	5179.967	-6.366
10	3.85	5179.977	-4.475
0	3.85	5179.962	-7.370
-10	3.85	5179.979	-3.974
-20	3.85	5179.969	-6.008



Reference Frequency: MIMO A 802.11ax20 - 5180MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5179.972	-5.377
40	3.85	5179.972	-5.326
30	3.85	5179.974	-5.107
25	3.85	5179.975	-4.786
10	3.85	5179.971	-5.606
0	3.85	5179.960	-7.666
-10	3.85	5179.978	-4.200
-20	3.85	5179.968	-6.253

Reference Frequency: SISO ANT A 802.11ax40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5189.987	-2.490
40	3.85	5189.978	-4.312
30	3.85	5189.989	-2.194
25	3.85	5189.982	-3.531
10	3.85	5189.982	-3.517
0	3.85	5189.980	-3.885
-10	3.85	5189.985	-2.836
-20	3.85	5189.974	-4.985

Reference Frequency: MIMO A 802.11ax40 - 5190MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5189.984	-3.118
40	3.85	5189.987	-2.437
30	3.85	5189.986	-2.682
25	3.85	5189.981	-3.677
10	3.85	5189.981	-3.717
0	3.85	5189.987	-2.498
-10	3.85	5189.986	-2.669
-20	3.85	5189.975	-4.795



Reference Frequency: SISO ANT A 802.11ax80 - 5210MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5209.988	-2.275
40	3.85	5209.986	-2.744
30	3.85	5209.984	-3.144
25	3.85	5209.982	-3.367
10	3.85	5209.984	-2.981
0	3.85	5209.987	-2.446
-10	3.85	5209.984	-3.164
-20	3.85	5209.986	-2.759

Reference Frequency: MIMO A 802.11ax80 - 5210MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5209.985	-2.920
40	3.85	5209.987	-2.484
30	3.85	5209.980	-3.832
25	3.85	5209.982	-3.380
10	3.85	5209.984	-3.015
0	3.85	5209.981	-3.593
-10	3.85	5209.984	-3.072
-20	3.85	5209.987	-2.505

Reference Frequency: SISO ANT A 802.11a - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.974	-4.587
40	3.85	5744.954	-7.998
30	3.85	5744.962	-6.606
25	3.85	5744.962	-6.541
10	3.85	5744.979	-3.731
0	3.85	5744.977	-3.954
-10	3.85	5744.969	-5.407
-20	3.85	5744.964	-6.185



Reference Frequency: SISO ANT A 802.11n20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.965	-6.031
40	3.85	5744.968	-5.572
30	3.85	5744.967	-5.718
25	3.85	5744.954	-7.945
10	3.85	5744.966	-5.930
0	3.85	5744.968	-5.532
-10	3.85	5744.966	-5.918
-20	3.85	5744.974	-4.579

Reference Frequency: MIMO A 802.11n20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.972	-4.895
40	3.85	5744.968	-5.519
30	3.85	5744.973	-4.723
25	3.85	5744.974	-4.548
10	3.85	5744.972	-4.877
0	3.85	5744.970	-5.278
-10	3.85	5744.973	-4.720
-20	3.85	5744.967	-5.777

Reference Frequency: SISO ANT A 802.11n40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5754.961	-6.816
40	3.85	5754.957	-7.467
30	3.85	5754.971	-5.008
25	3.85	5754.964	-6.317
10	3.85	5754.980	-3.511
0	3.85	5754.979	-3.705
-10	3.85	5754.964	-6.171
-20	3.85	5754.965	-6.059



Reference Frequency: MIMO A 802.11n40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5754.976	-4.253
40	3.85	5754.969	-5.417
30	3.85	5754.970	-5.159
25	3.85	5754.977	-4.075
10	3.85	5754.962	-6.564
0	3.85	5754.962	-6.667
-10	3.85	5754.972	-4.790
-20	3.85	5754.962	-6.612

Reference Frequency: SISO ANT A 802.11ac20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.973	-4.760
40	3.85	5744.963	-6.463
30	3.85	5744.978	-3.771
25	3.85	5744.968	-5.591
10	3.85	5744.978	-3.760
0	3.85	5744.971	-5.106
-10	3.85	5744.970	-5.195
-20	3.85	5744.965	-6.045

Reference Frequency: MIMO A 802.11ac20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.970	-5.149
40	3.85	5744.964	-6.188
30	3.85	5744.974	-4.451
25	3.85	5744.973	-4.667
10	3.85	5744.977	-3.941
0	3.85	5744.966	-5.912
-10	3.85	5744.973	-4.699
-20	3.85	5744.968	-5.607



Reference Frequency: SISO ANT A 802.11ac40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5754.963	-6.358
40	3.85	5754.970	-5.127
30	3.85	5754.977	-3.934
25	3.85	5754.964	-6.210
10	3.85	5754.977	-3.920
0	3.85	5754.957	-7.483
-10	3.85	5754.958	-7.299
-20	3.85	5754.960	-6.943

Reference Frequency: MIMO A 802.11ac40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5754.976	-4.166
40	3.85	5754.952	-8.371
30	3.85	5754.980	-3.547
25	3.85	5754.954	-7.945
10	3.85	5754.966	-5.876
0	3.85	5754.950	-8.614
-10	3.85	5754.968	-5.640
-20	3.85	5754.963	-6.432

Reference Frequency: SISO ANT A 802.11ac80 - 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5774.974	-4.581
40	3.85	5774.985	-2.563
30	3.85	5774.987	-2.244
25	3.85	5774.977	-3.995
10	3.85	5774.979	-3.665
0	3.85	5774.970	-5.151
-10	3.85	5774.983	-2.895
-20	3.85	5774.984	-2.741



Reference Frequency: MIMO A 802.11ac80 - 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5774.976	-4.099
40	3.85	5774.980	-3.378
30	3.85	5774.977	-3.976
25	3.85	5774.974	-4.491
10	3.85	5774.977	-3.968
0	3.85	5774.972	-4.886
-10	3.85	5774.977	-3.923
-20	3.85	5774.971	-5.053

Reference Frequency: SISO ANT A 802.11ax20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.972	-4.830
40	3.85	5744.971	-5.124
30	3.85	5744.977	-4.074
25	3.85	5744.968	-5.511
10	3.85	5744.980	-3.549
0	3.85	5744.964	-6.325
-10	3.85	5744.975	-4.417
-20	3.85	5744.975	-4.386

Reference Frequency: MIMO A 802.11ax20 - 5745MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5744.976	-4.180
40	3.85	5744.970	-5.263
30	3.85	5744.972	-4.794
25	3.85	5744.975	-4.277
10	3.85	5744.978	-3.766
0	3.85	5744.976	-4.241
-10	3.85	5744.974	-4.555
-20	3.85	5744.962	-6.573



Reference Frequency: SISO ANT A 802.11ax40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5754.974	-4.469
40	3.85	5754.975	-4.344
30	3.85	5754.971	-5.043
25	3.85	5754.970	-5.185
10	3.85	5754.978	-3.788
0	3.85	5754.971	-5.123
-10	3.85	5754.959	-7.097
-20	3.85	5754.972	-4.886

Reference Frequency: MIMO A 802.11ax40 - 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5754.961	-6.695
40	3.85	5754.971	-5.044
30	3.85	5754.979	-3.564
25	3.85	5754.960	-7.008
10	3.85	5754.966	-5.854
0	3.85	5754.963	-6.358
-10	3.85	5754.958	-7.235
-20	3.85	5754.977	-4.013

Reference Frequency: SISO ANT A 802.11ax80 - 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5774.970	-5.131
40	3.85	5774.984	-2.794
30	3.85	5774.981	-3.223
25	3.85	5774.989	-1.909
10	3.85	5774.983	-2.901
0	3.85	5774.980	-3.437
-10	3.85	5774.973	-4.599
-20	3.85	5774.976	-4.114



Reference Frequency: MIMO A 802.11ax80 - 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Measured Frequency (MHz)	Deviation (ppm)
50	3.85	5774.980	-3.417
40	3.85	5774.980	-3.399
30	3.85	5774.982	-3.055
25	3.85	5774.980	-3.530
10	3.85	5774.978	-3.777
0	3.85	5774.984	-2.826
-10	3.85	5774.986	-2.417
-20	3.85	5774.985	-2.553



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 3.85V
Note: All channels have been tested, and only the worst test data is recorded in this report.			

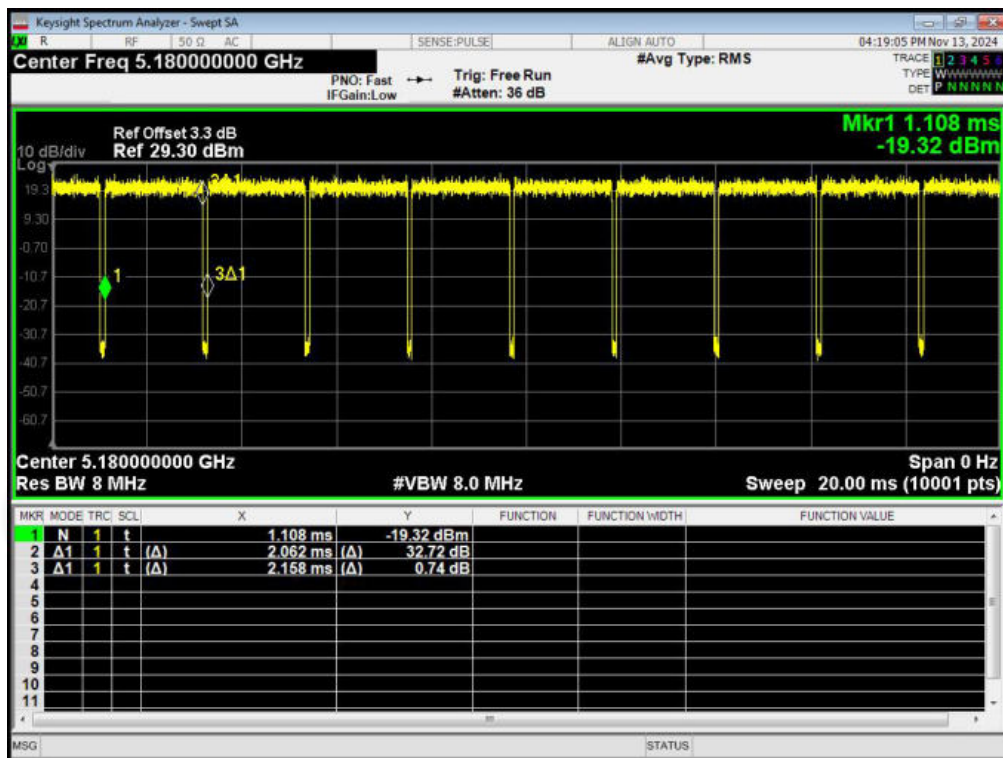
Test Mode	Antenna	Frequency (MHz)	Duty Cycle (%)	Factor (dB)	Result
802.11a	SISO ANT A	5180	95.55	0.198	Pass
	SISO ANT B	5180	95.46	0.202	Pass
802.11n20	SISO ANT A	5180	95.42	0.204	Pass
	SISO ANT B	5180	95.42	0.204	Pass
	MIMO A+B	5180	98.43	0.069	Pass
802.11n40	SISO ANT A	5190	95.38	0.205	Pass
	SISO ANT B	5190	95.38	0.206	Pass
	MIMO A+B	5190	98.39	0.070	Pass
802.11ac20	SISO ANT A	5180	95.42	0.203	Pass
	SISO ANT B	5180	95.42	0.204	Pass
	MIMO A+B	5180	98.43	0.069	Pass
802.11ac40	SISO ANT A	5190	95.34	0.207	Pass
	SISO ANT B	5190	95.29	0.209	Pass
	MIMO A+B	5190	98.33	0.073	Pass
802.11ax80	SISO ANT A	5210	95.39	0.205	Pass
	SISO ANT B	5210	95.39	0.205	Pass
	MIMO A+B	5210	98.40	0.070	Pass
802.11ax20	SISO ANT A	5180	99.85	0.006	Pass
	SISO ANT B	5180	99.90	0.004	Pass
	MIMO A+B	5180	100	0	Pass
802.11ax40	SISO ANT A	5190	99.85	0.006	Pass
	SISO ANT B	5190	99.86	0.006	Pass
	MIMO A+B	5190	100	0	Pass
802.11ax80	SISO ANT A	5210	99.90	0.004	Pass
	SISO ANT B	5210	99.90	0.004	Pass
	MIMO A+B	5210	100	0	Pass

Note: Duty Cycle= Ton /Total*100%

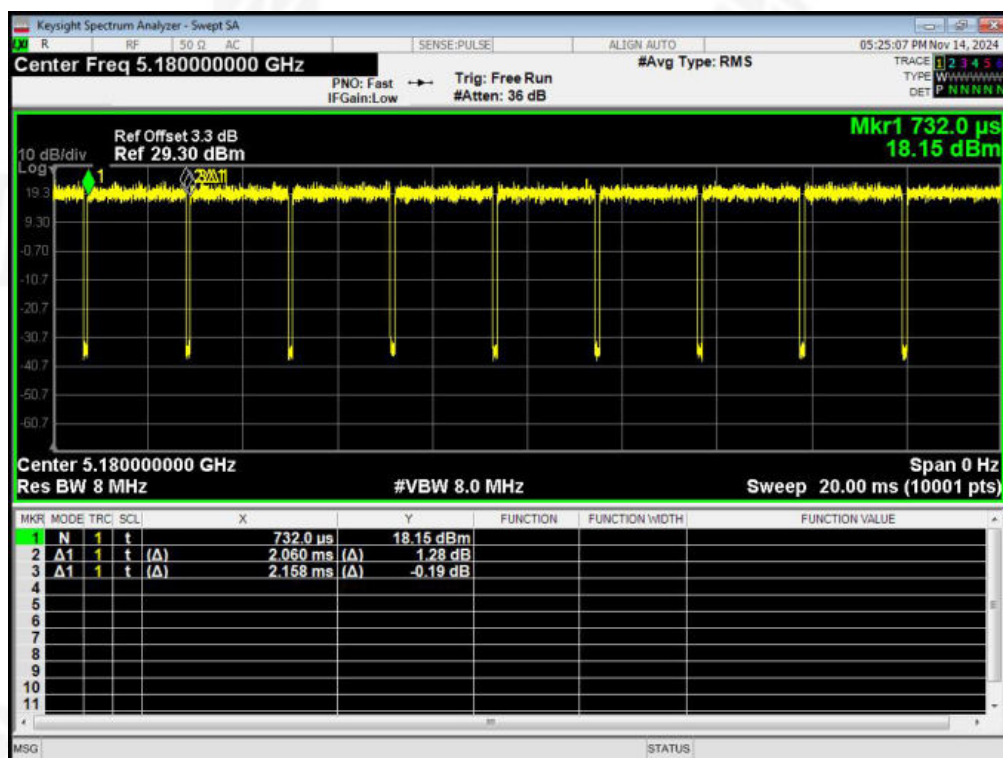
Duty Cycle Correction Factor = 10log (1/Duty Cycle)



SISO ANT A 802.11a - 5180MHz

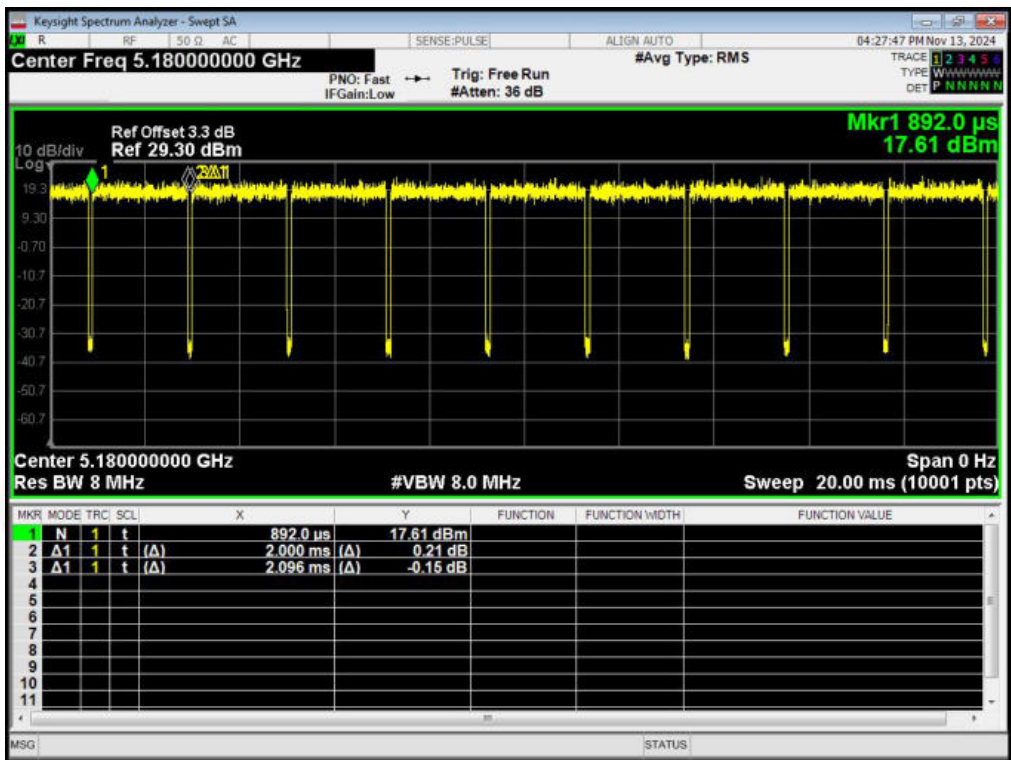


SISO ANT B 802.11a - 5180MHz

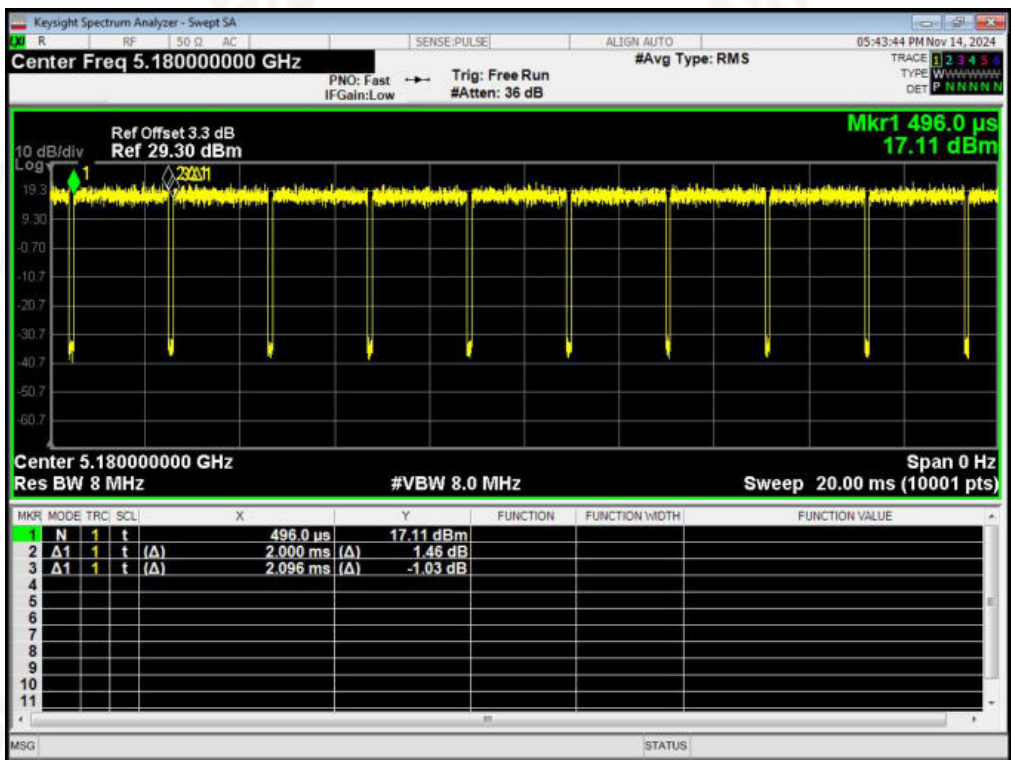




SISO ANT A 802.11n20 - 5180MHz

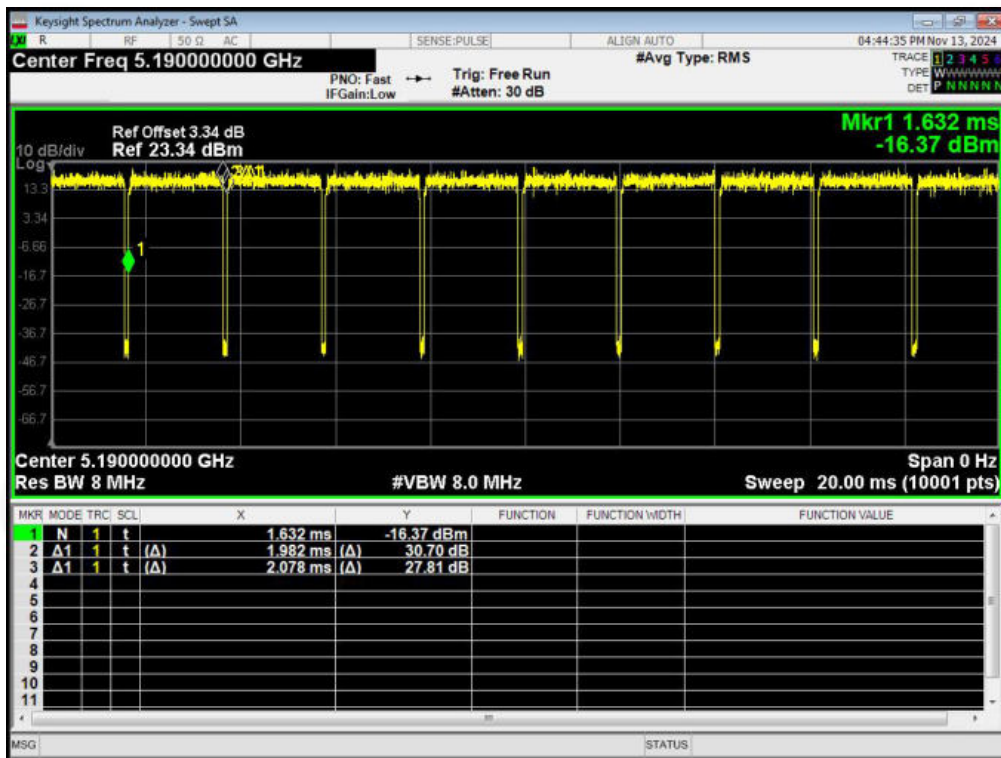


SISO ANT B 802.11n20 - 5180MHz

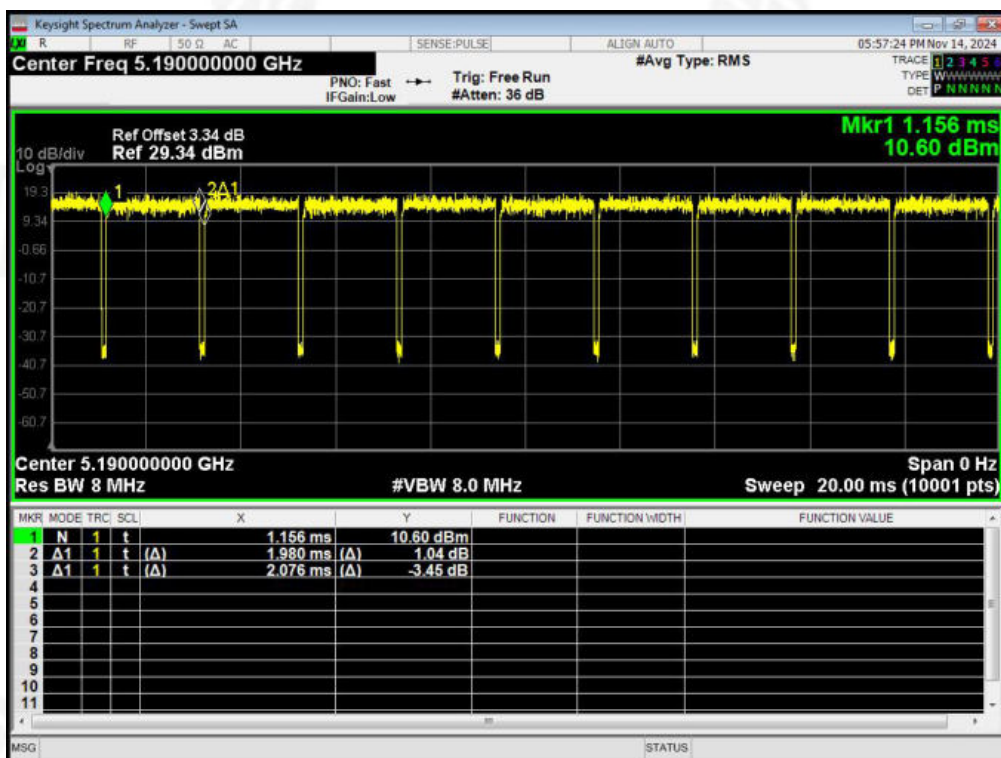




SISO ANT A 802.11n40 - 5190MHz

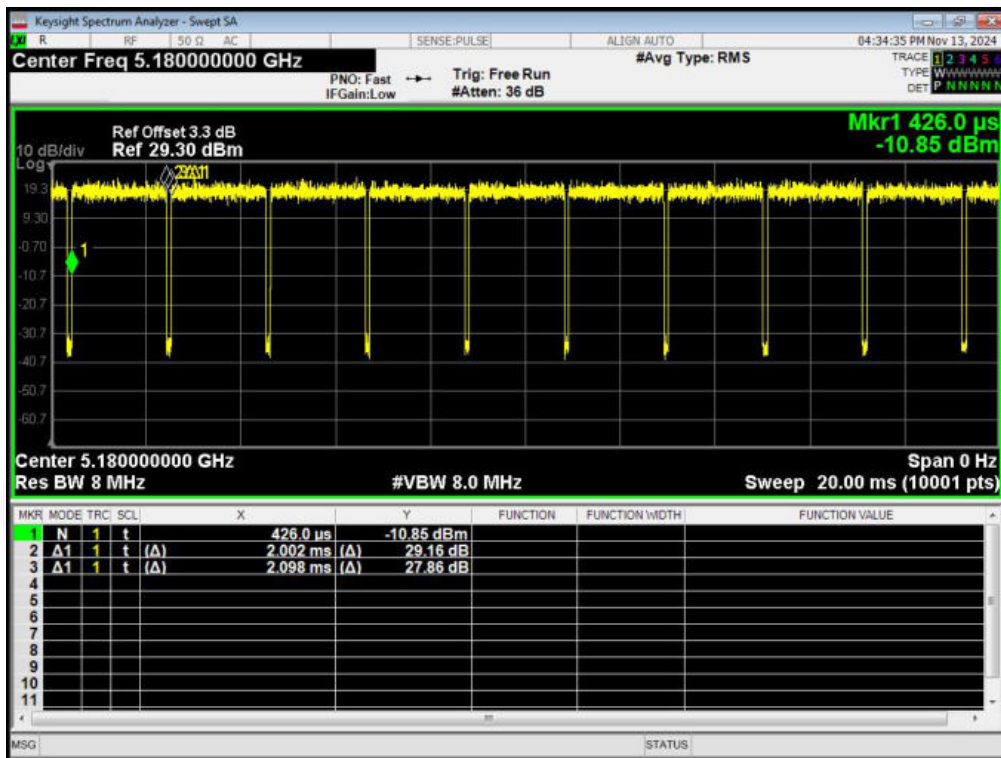


SISO ANT B 802.11n40 - 5190MHz

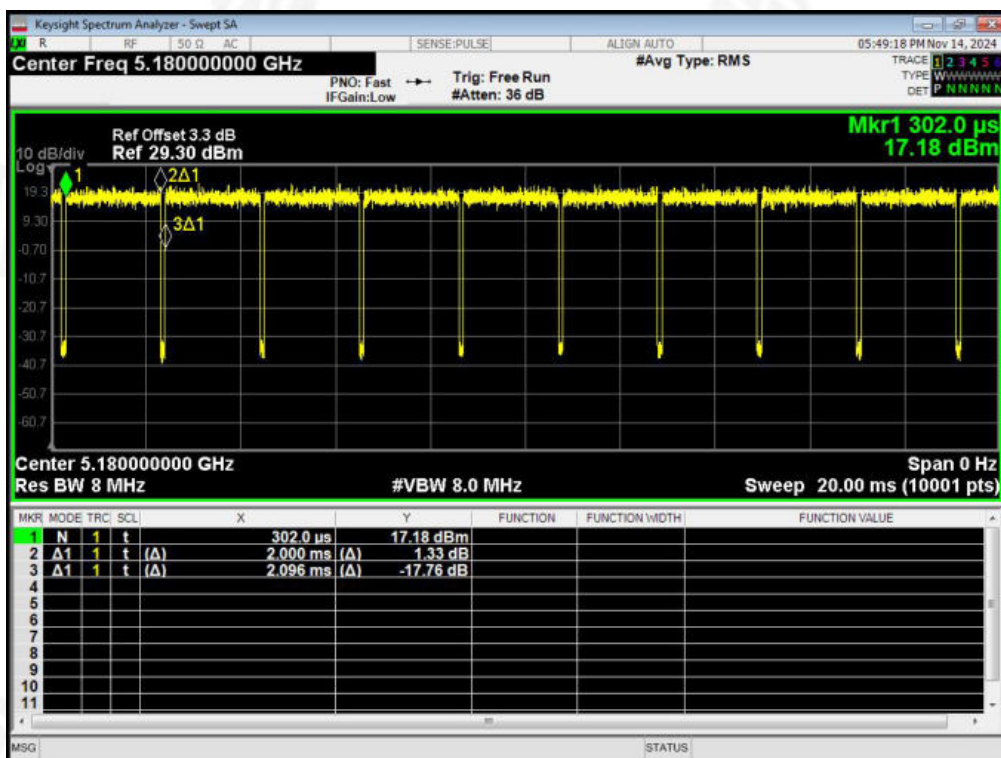




SISO ANT A 802.11ac20 - 5180MHz

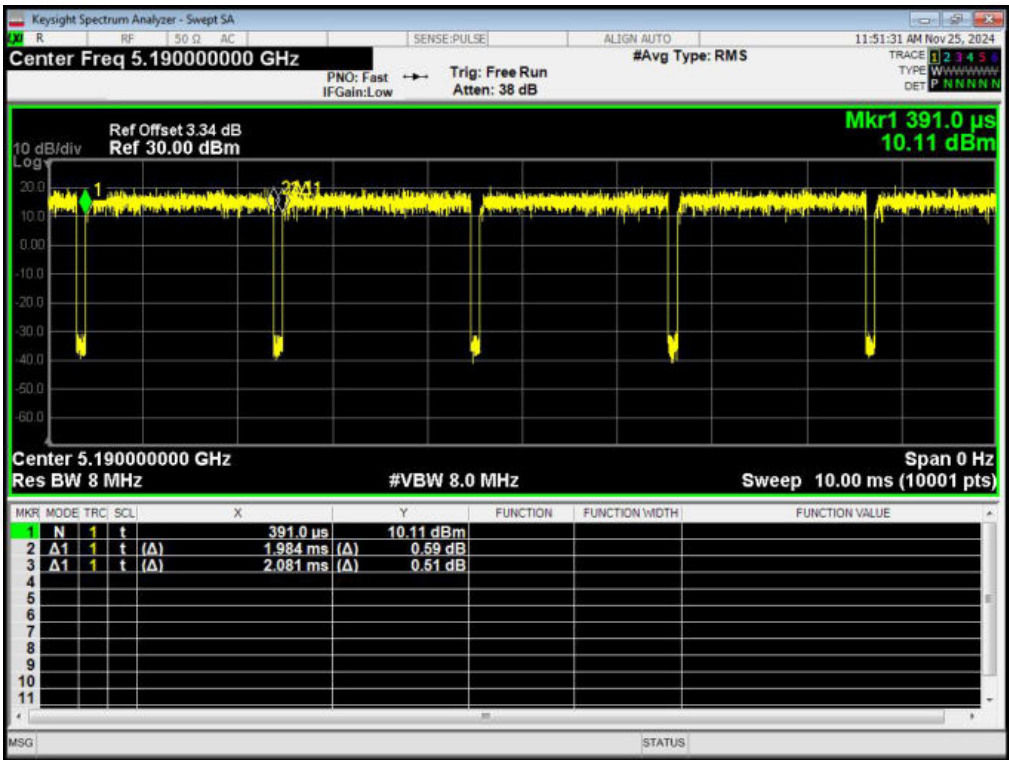


SISO ANT B 802.11ac20 - 5180MHz

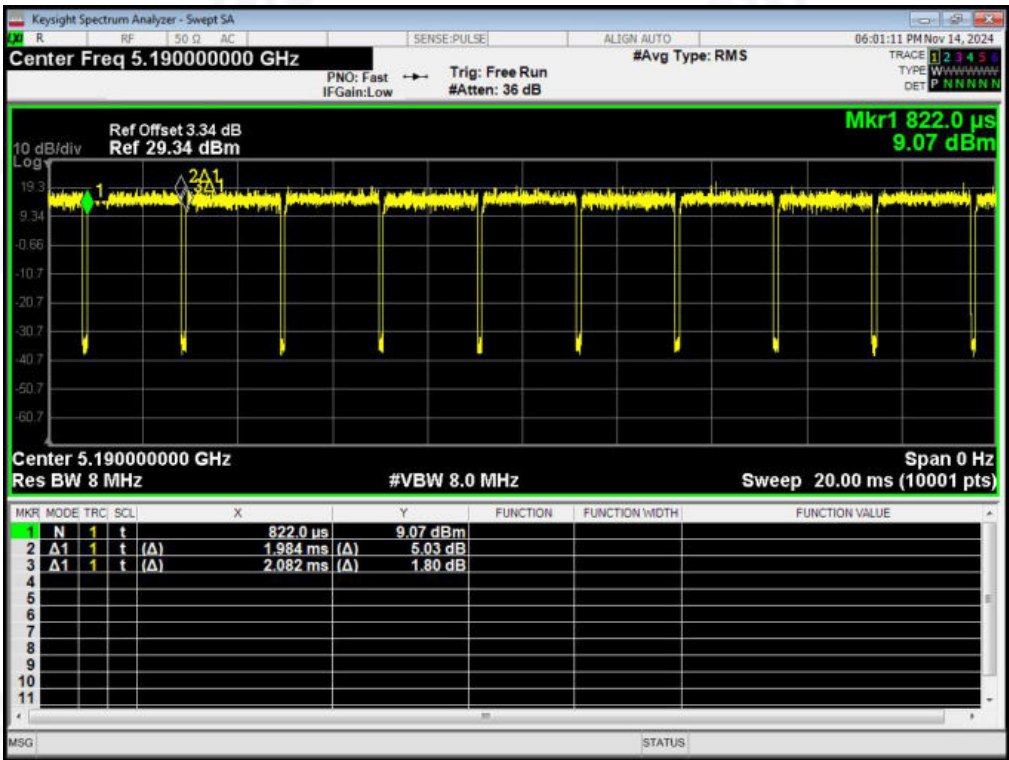




SISO ANT A 802.11ac40 - 5190MHz

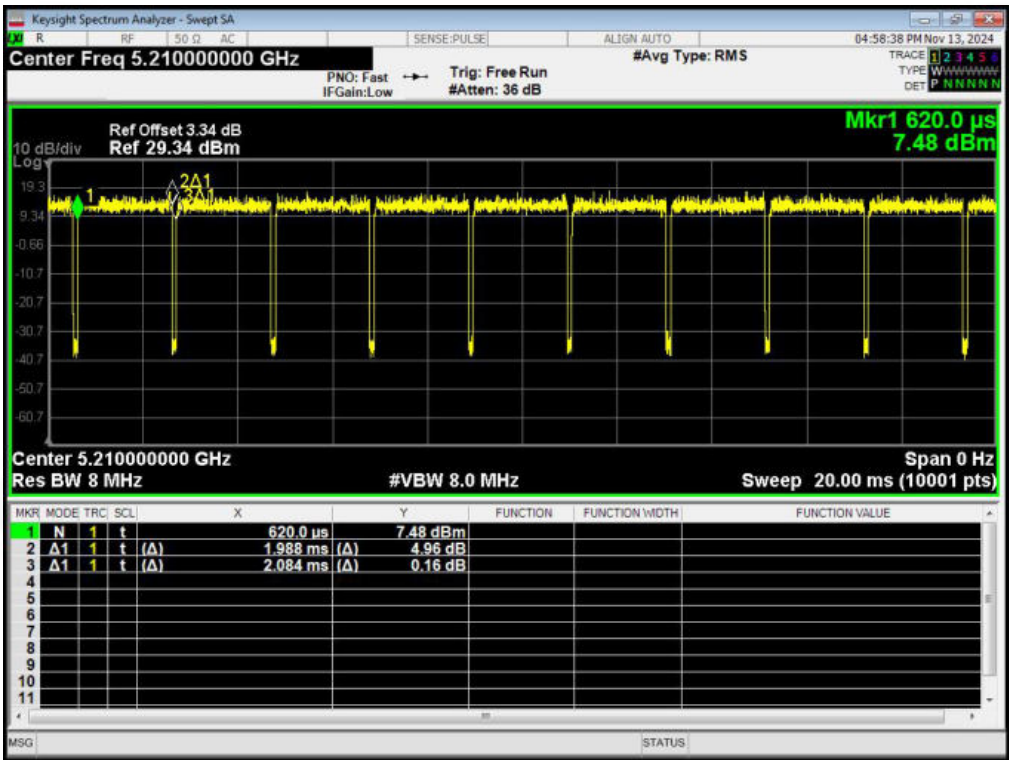


SISO ANT B 802.11ac40 - 5190MHz

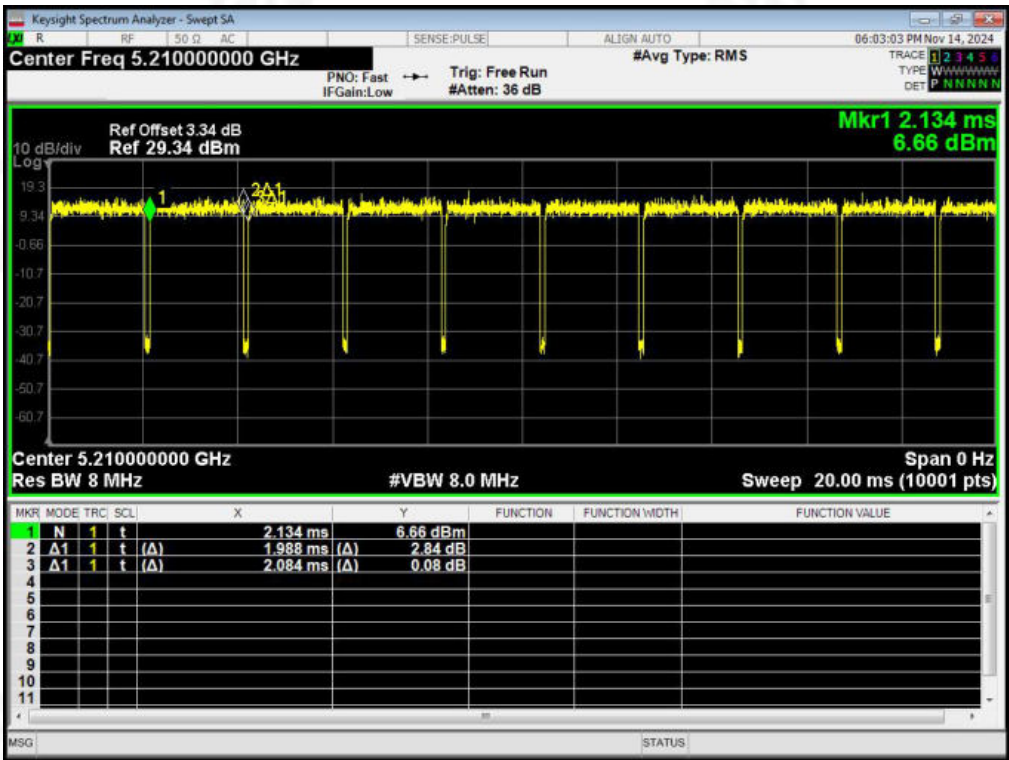




SISO ANT A 802.11ac80 - 5210MHz

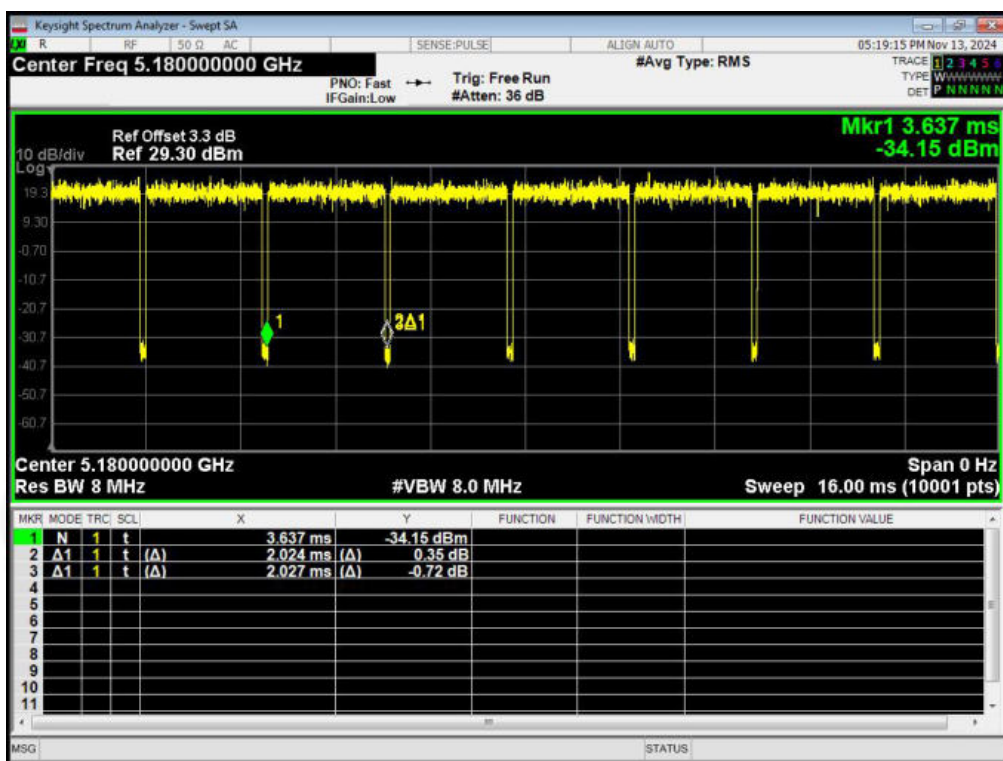


SISO ANT B 802.11ac80 - 5210MHz

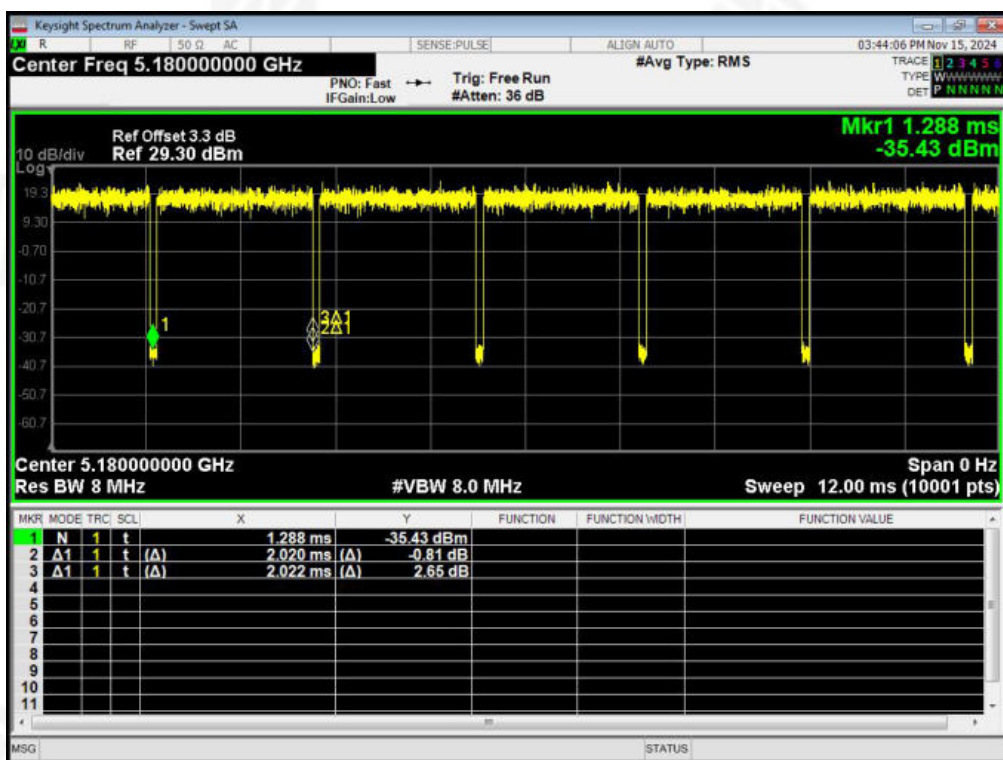




SISO ANT A 802.11ax20 - 5180MHz

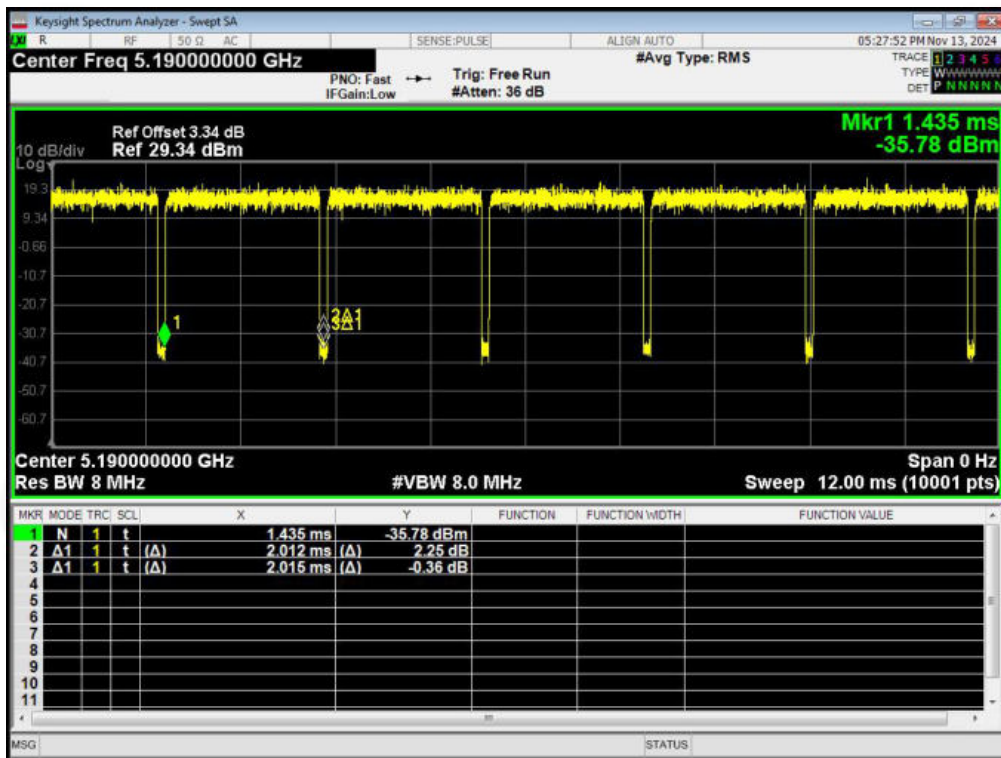


SISO ANT B 802.11ax20 - 5180MHz

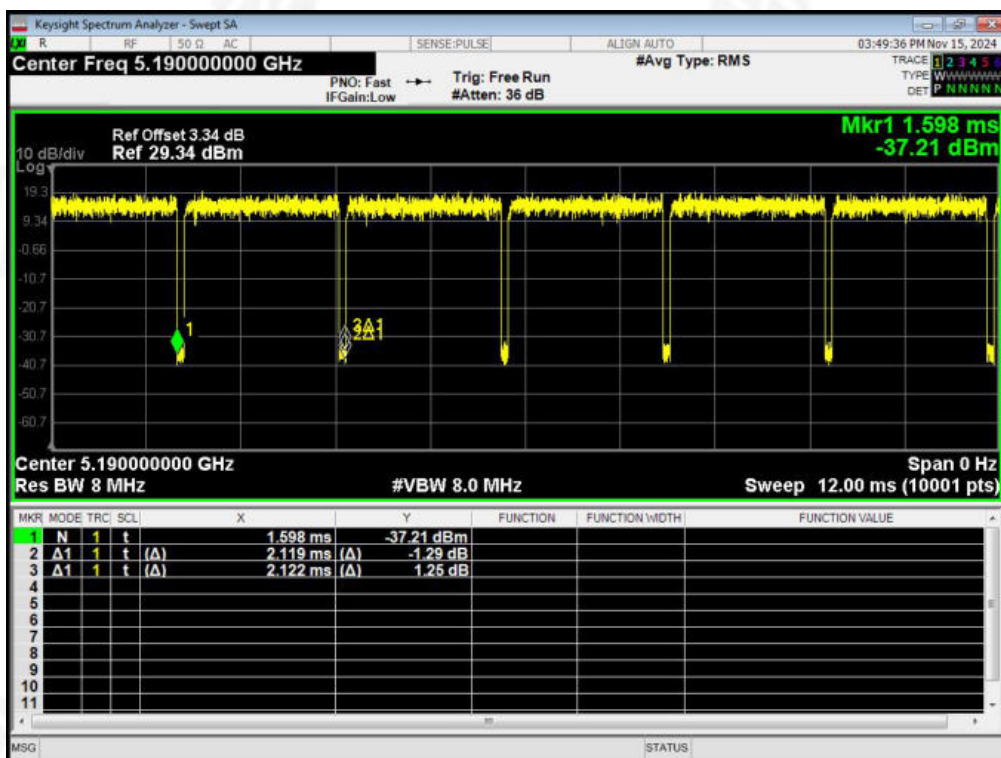




SISO ANT A 802.11ax40 - 5190MHz

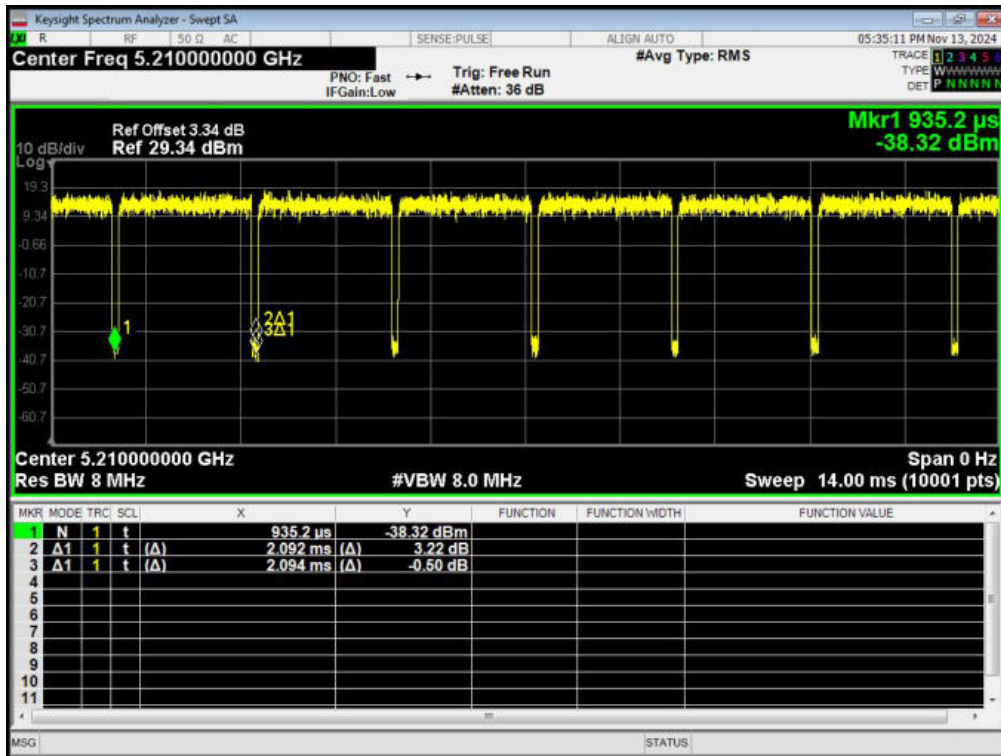


SISO ANT B 802.11ax40 - 5190MHz

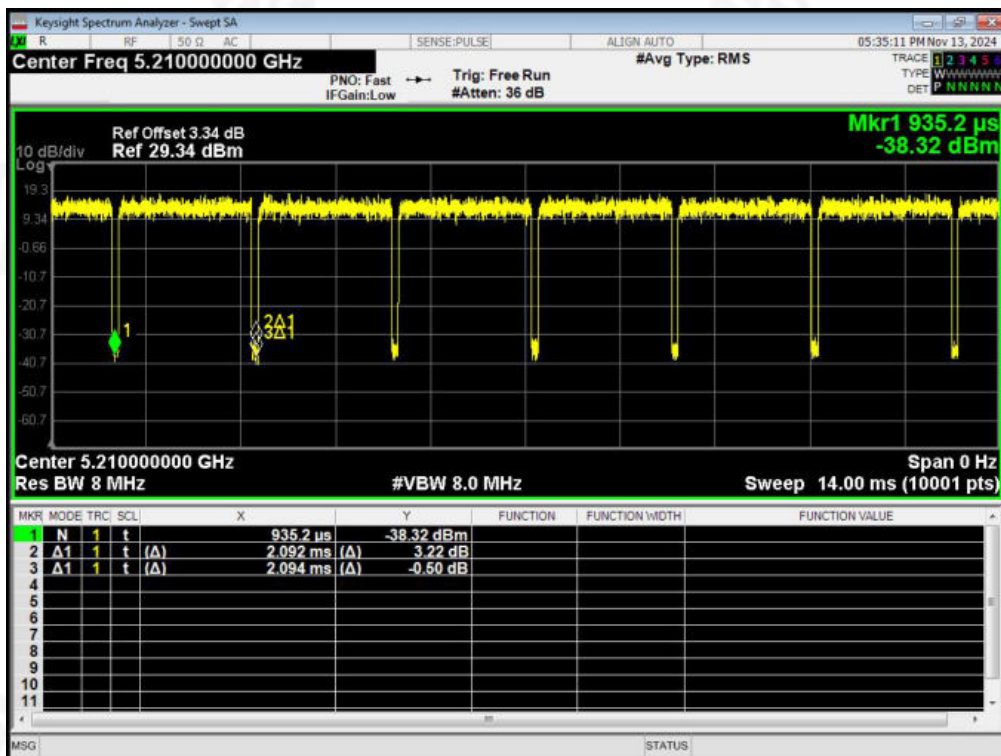




SISO ANT A 802.11ax80 - 5210MHz



SISO ANT B 802.11ax80 - 5210MHz



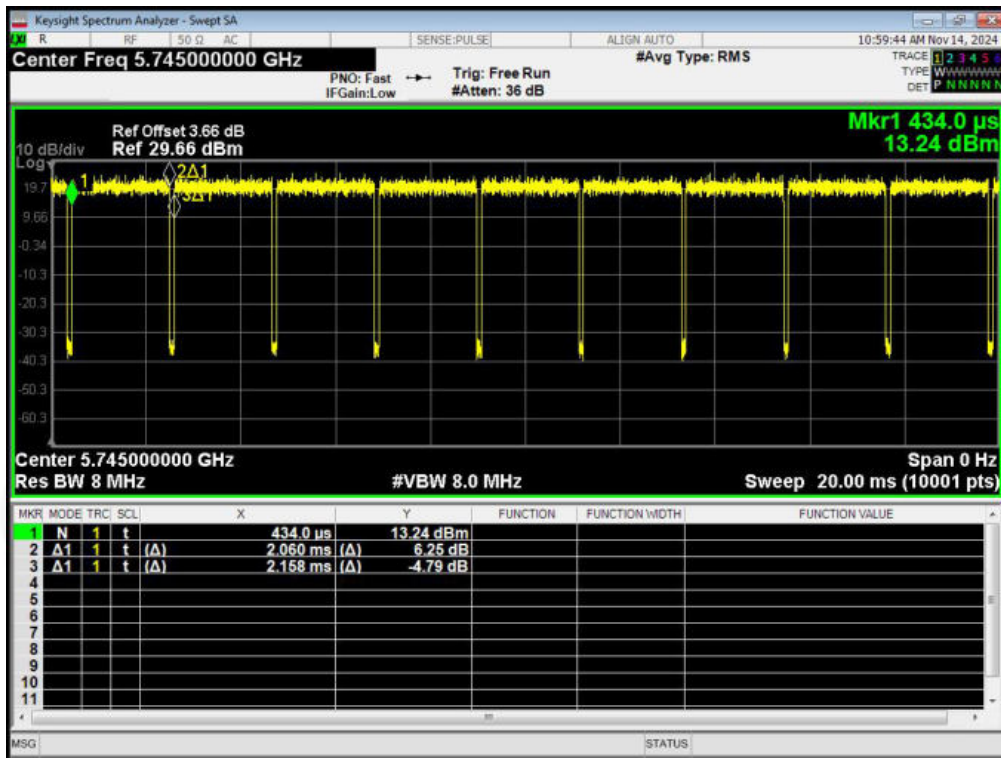


Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.85V
Note: All channels have been tested, and only the worst test data is recorded in this report.			

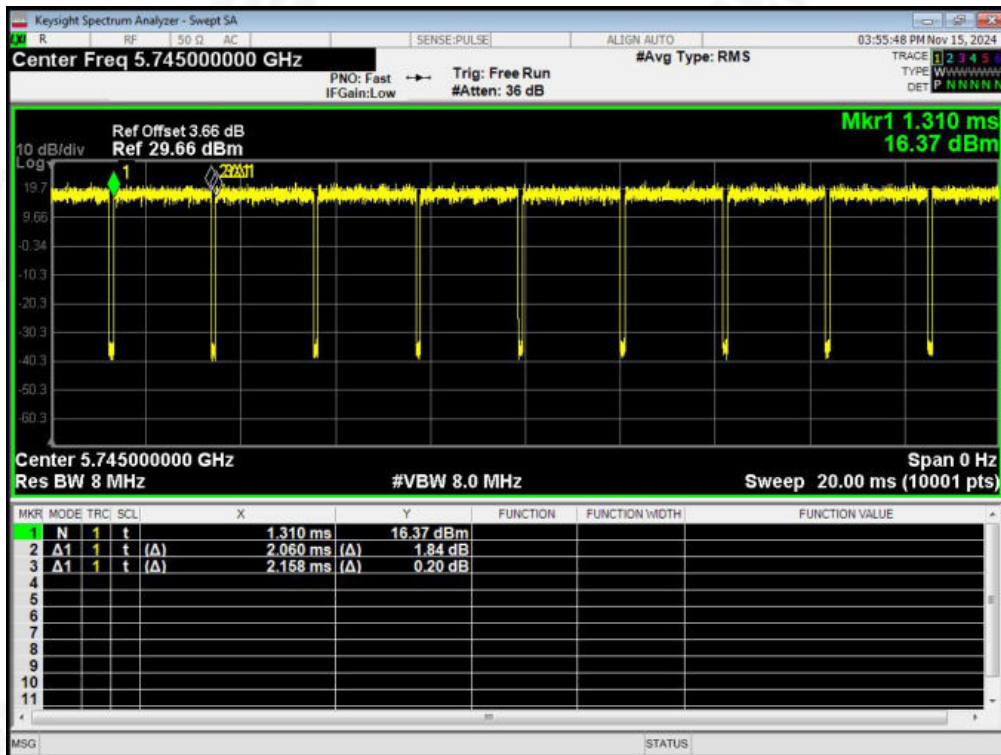
Test Mode	Antenna	Frequency (MHz)	Duty Cycle (%)	Factor (dB)	Result
802.11a	SISO ANT A	5745	95.46	0.202	Pass
	SISO ANT B	5745	95.46	0.202	Pass
802.11n20	SISO ANT A	5745	99.86	0.006	Pass
	SISO ANT B	5745	99.86	0.006	Pass
	MIMO A+B	5745	100	0	Pass
802.11n40	SISO ANT A	5755	95.38	0.206	Pass
	SISO ANT B	5755	95.33	0.208	Pass
	MIMO A+B	5755	98.37	0.071	Pass
802.11ac20	SISO ANT A	5745	99.85	0.006	Pass
	SISO ANT B	5745	99.85	0.006	Pass
	MIMO A+B	5745	100	0	Pass
802.11ac40	SISO ANT A	5755	95.34	0.207	Pass
	SISO ANT B	5755	95.34	0.207	Pass
	MIMO A+B	5755	98.35	0.072	Pass
802.11ax80	SISO ANT A	5775	95.44	0.203	Pass
	SISO ANT B	5775	95.44	0.203	Pass
	MIMO A+B	5775	98.45	0.068	Pass
802.11ax20	SISO ANT A	5745	99.86	0.006	Pass
	SISO ANT B	5745	99.85	0.006	Pass
	MIMO A+B	5745	100	0	Pass
802.11ax40	SISO ANT A	5755	99.85	0.007	Pass
	SISO ANT B	5755	99.85	0.006	Pass
	MIMO A+B	5755	100	0	Pass
802.11ax80	SISO ANT A	5775	99.86	0.006	Pass
	SISO ANT B	5775	99.86	0.006	Pass
	MIMO A+B	5775	100	0	Pass
Note: Duty Cycle= Ton /Total*100%					
Duty Cycle Correction Factor = 10log (1/Duty Cycle)					



SISO ANT A 802.11a - 5745MHz



SISO ANT B 802.11a - 5745MHz



[illegible]

Keysight Spectrum Analyzer - Swept SA

R F 50 Ω AC SENSE:PULSE ALIGN AUTO 04:06:29 PM Nov 15, 2024

Center Freq 5.74500000 GHz #Avg Type: RMS

PNO: Fast Trg: Free Run
IF Gain: Low #Atten: 36 dB

Ref Offset 3.66 dB
Ref 29.66 dBm

Mkr1 851.0 μs
-36.65 dBm

10 dB/div Log

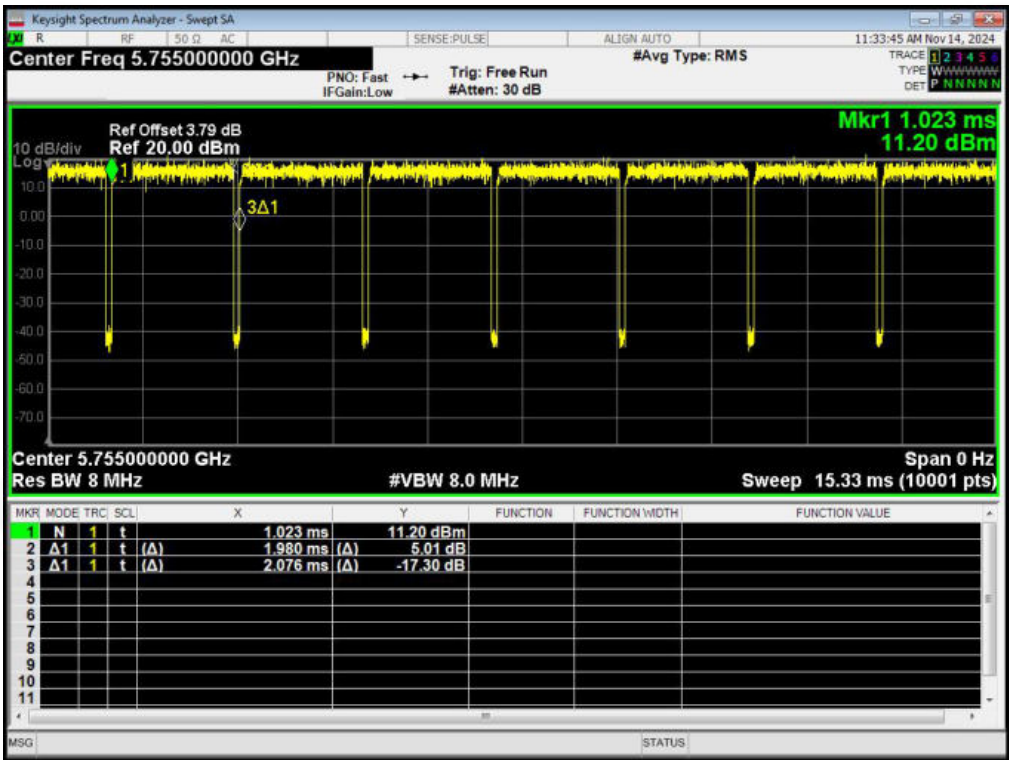
Center 5.74500000 GHz Span 0 Hz
Res BW 8 MHz #VBW 8.0 MHz Sweep 15.33 ms (10001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	t	851.0 μs	-36.65 dBm			
2	Δ1	1	t (A)	2.127 ms (Δ)	-2.54 dB			
3	Δ1	1	t (A)	2.130 ms (Δ)	1.07 dB			
4								
5								
6								
7								
8								
9								
10								
11								

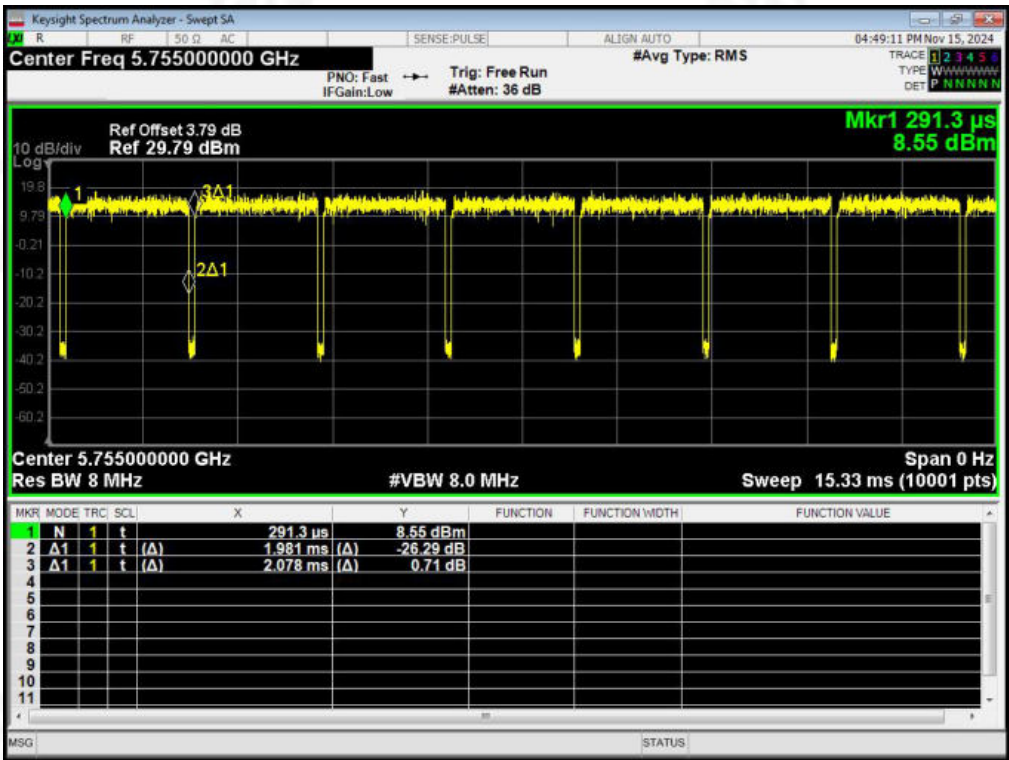
MSG STATUS



SISO ANT A 802.11n40 - 5755MHz

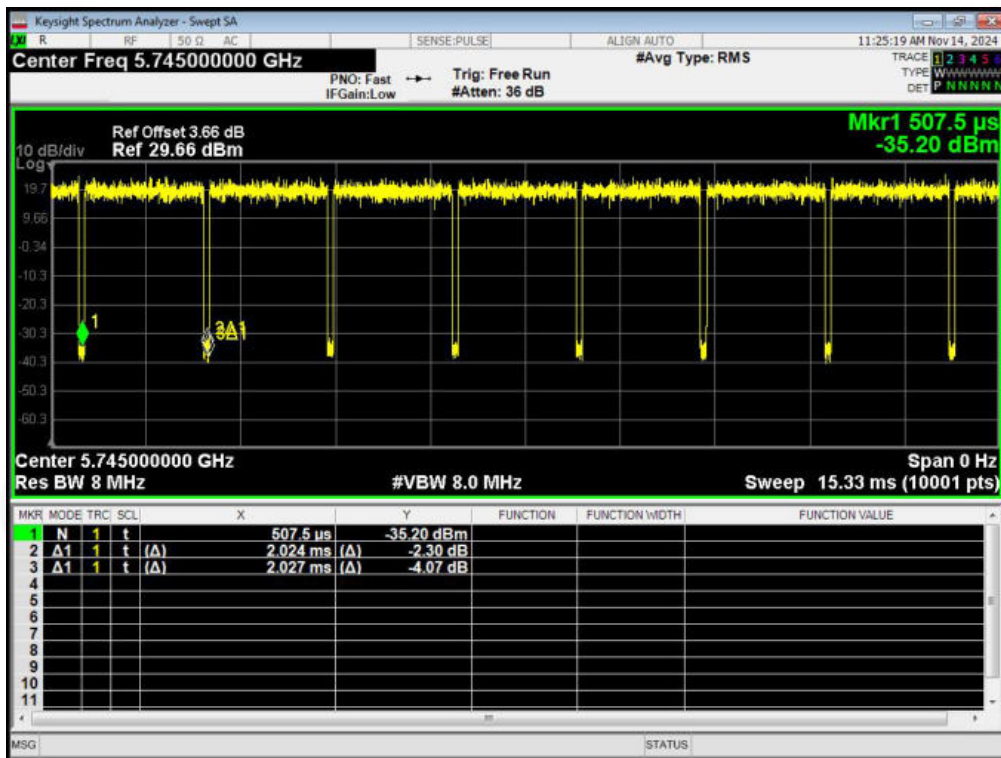


SISO ANT B 802.11n40 - 5755MHz

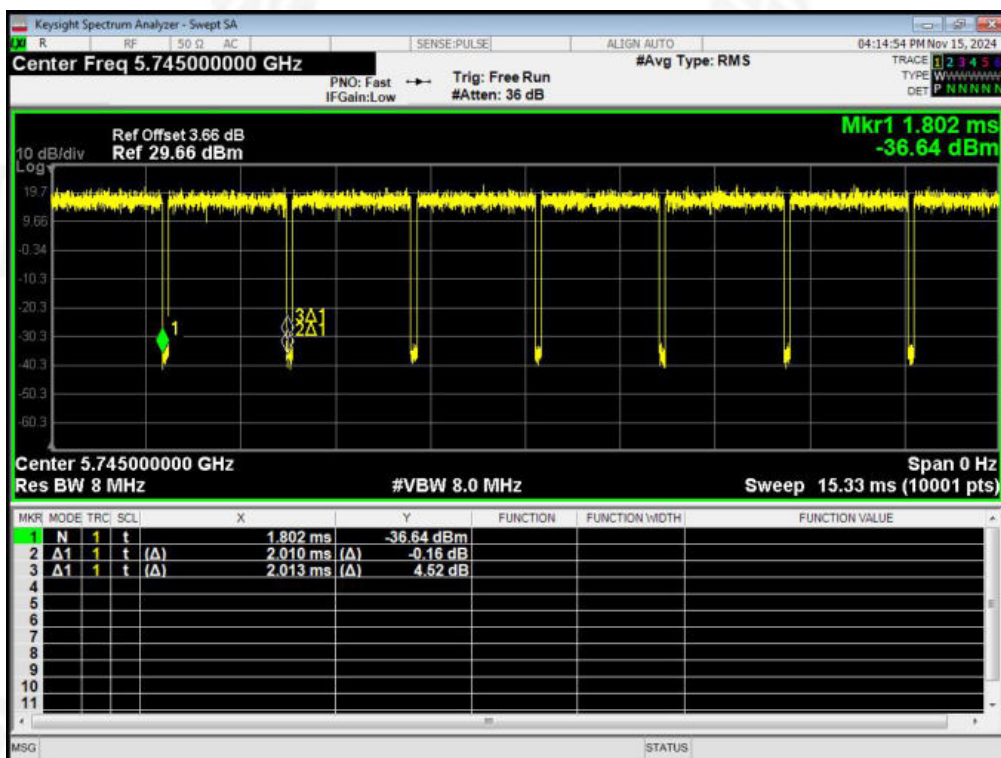




SISO ANT A 802.11ac20 - 5745MHz

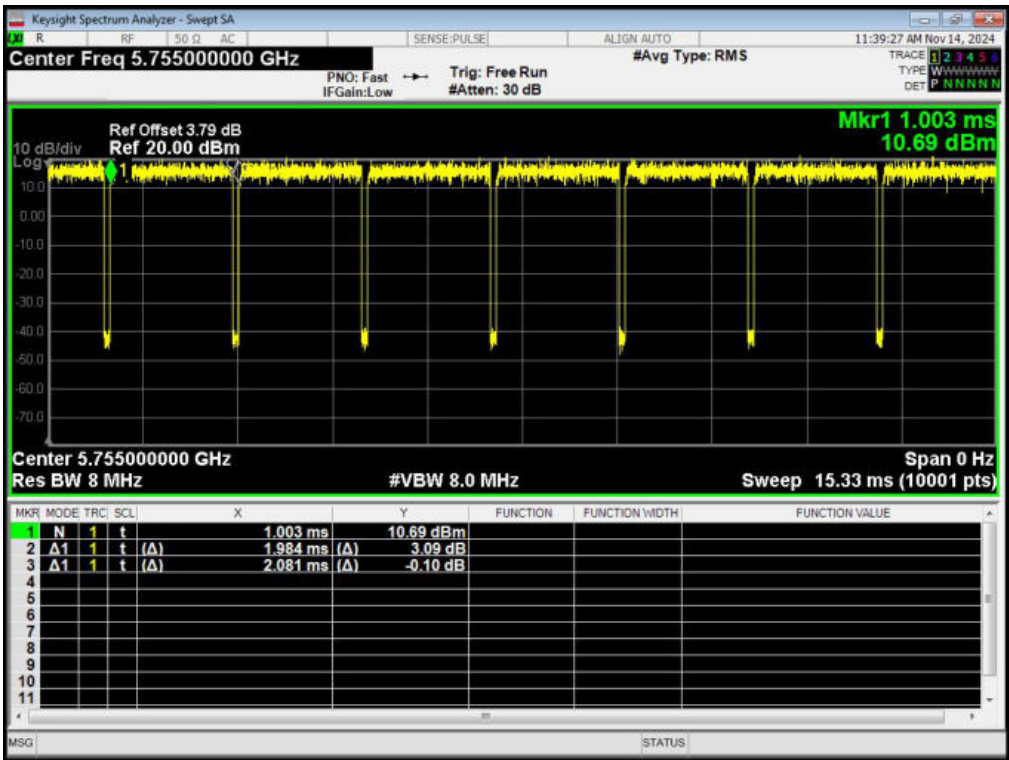


SISO ANT B 802.11ac20 - 5745MHz

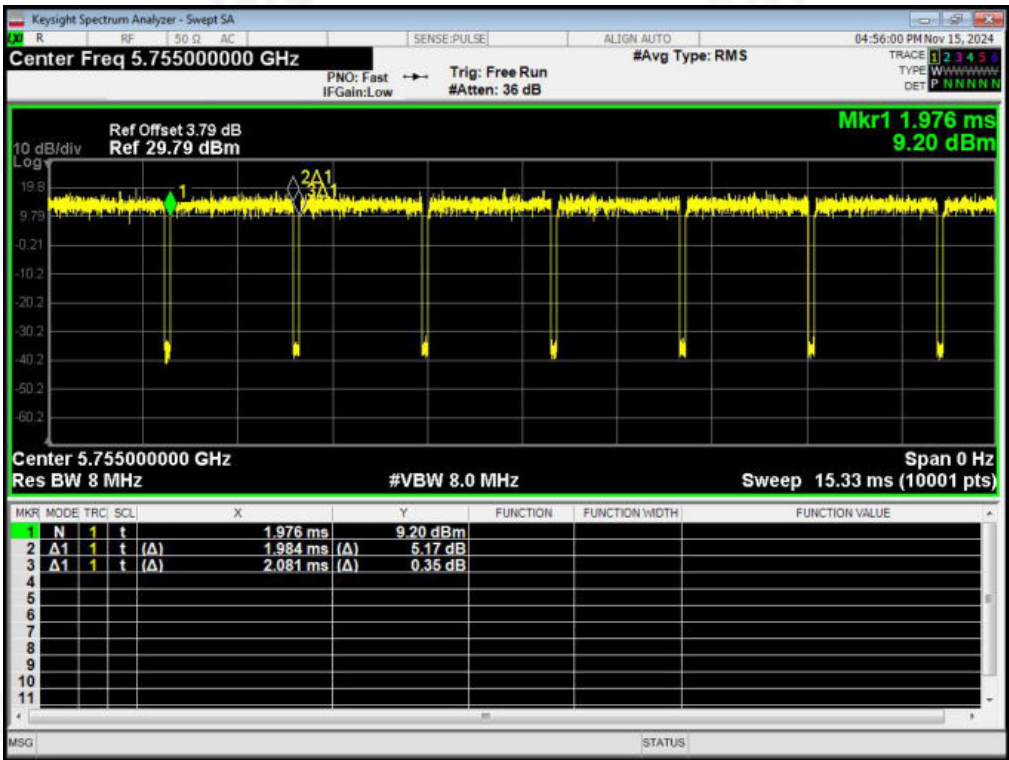




SISO ANT A 802.11ac40 - 5755MHz

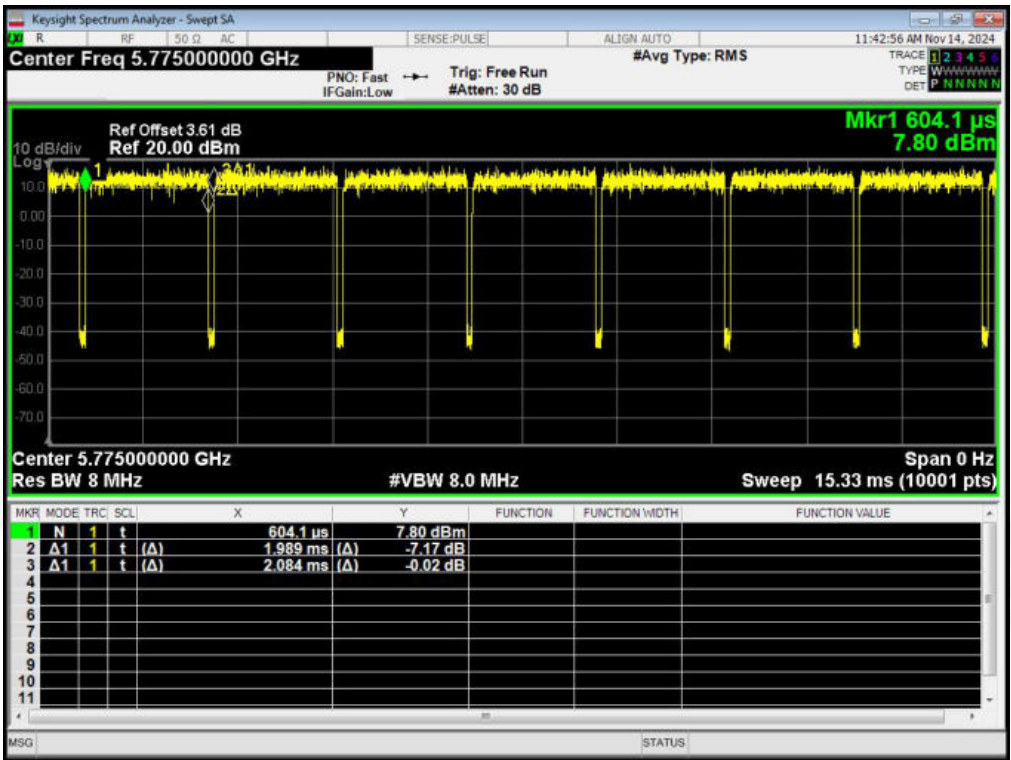


SISO ANT B 802.11ac40 - 5755MHz

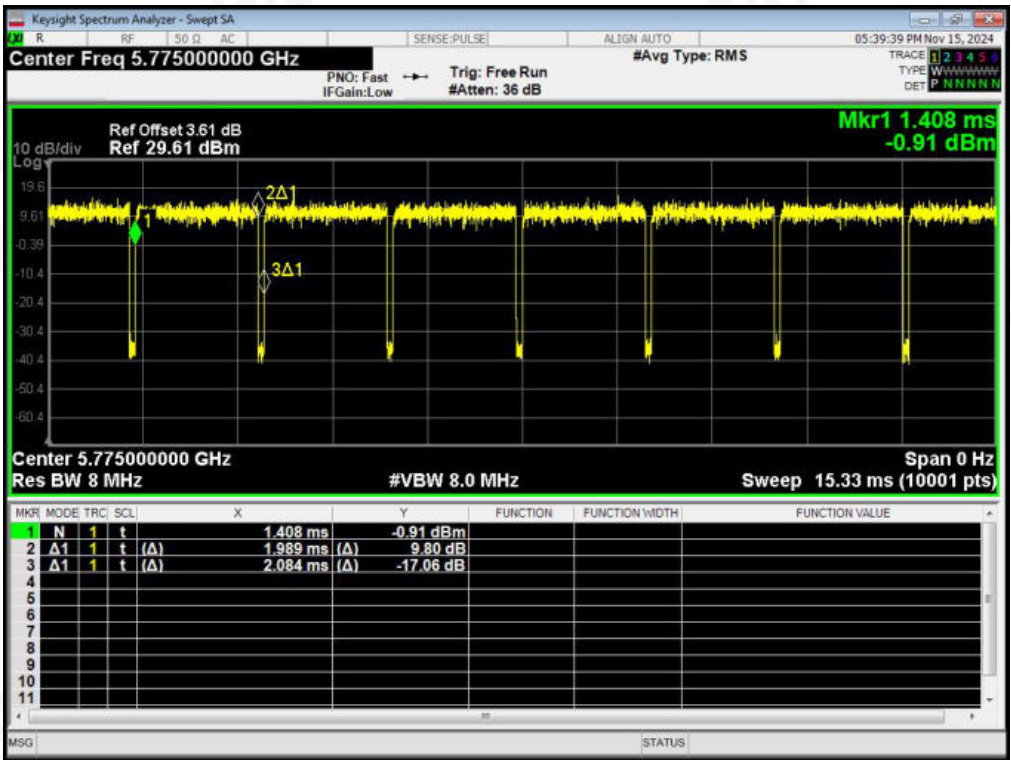




SISO ANT A 802.11ac80 - 5775MHz

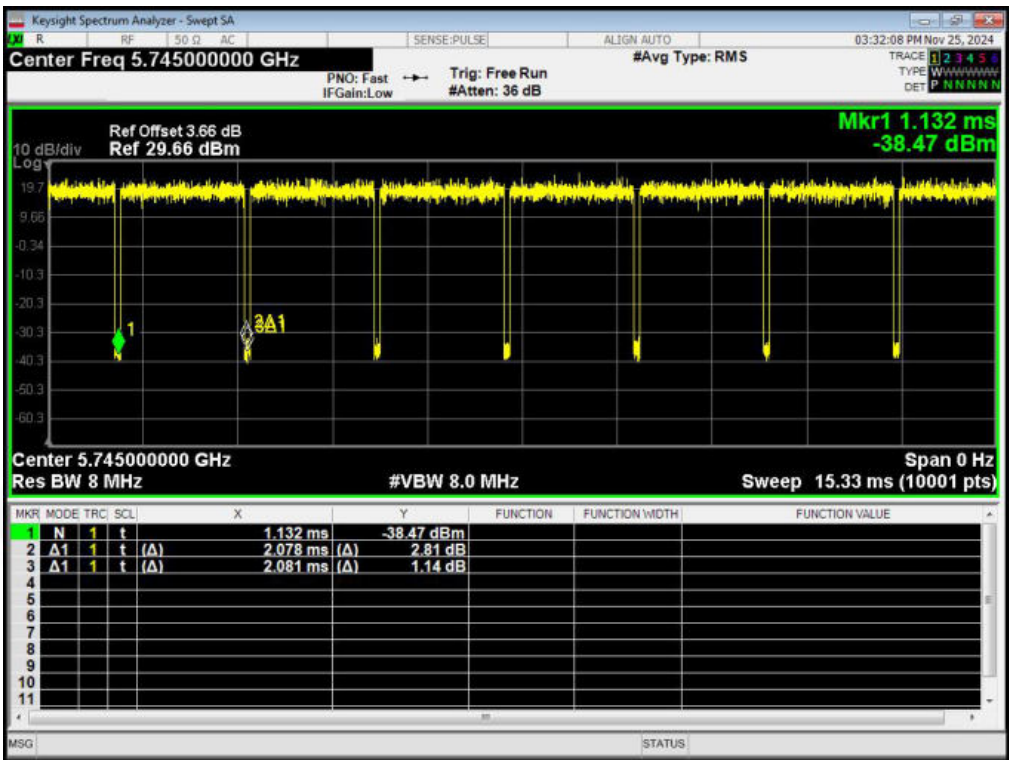


SISO ANT B 802.11ac80 - 5775MHz

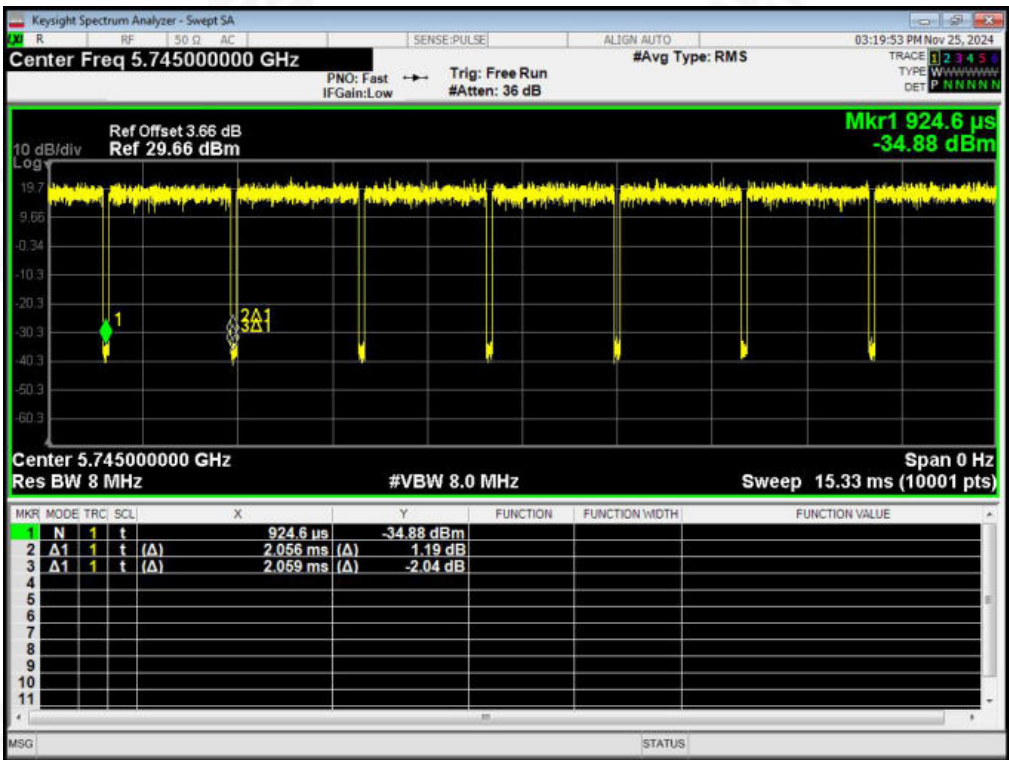




SISO ANT A 802.11ax20 - 5745MHz

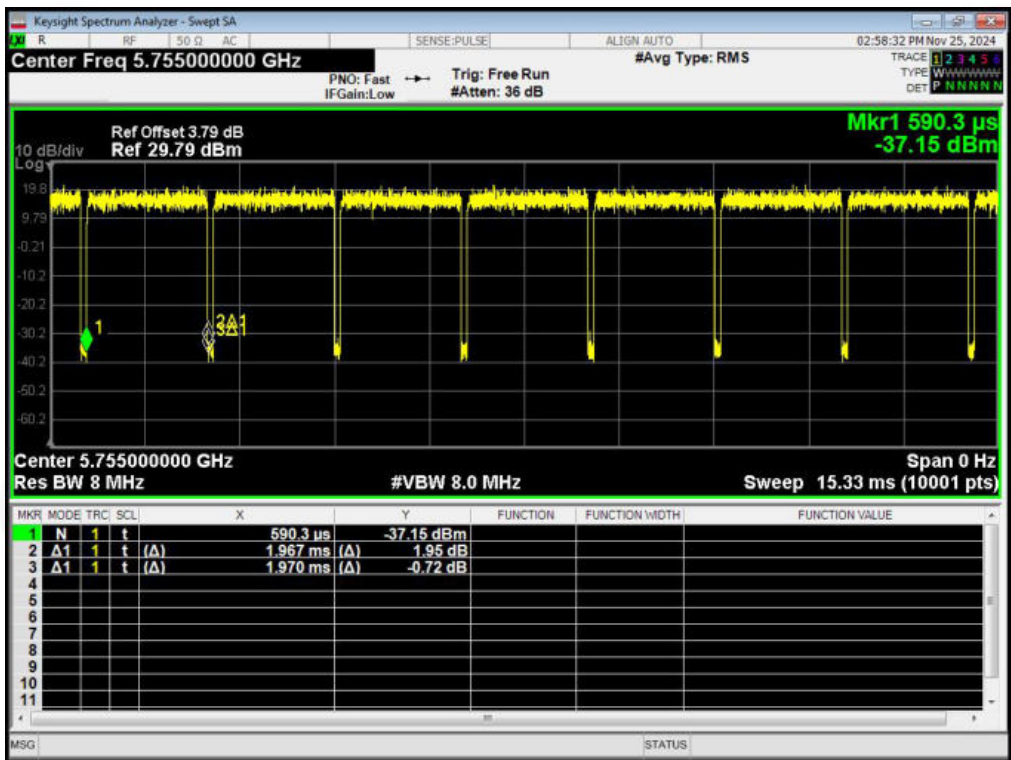


SISO ANT B 802.11ax20 - 5745MHz

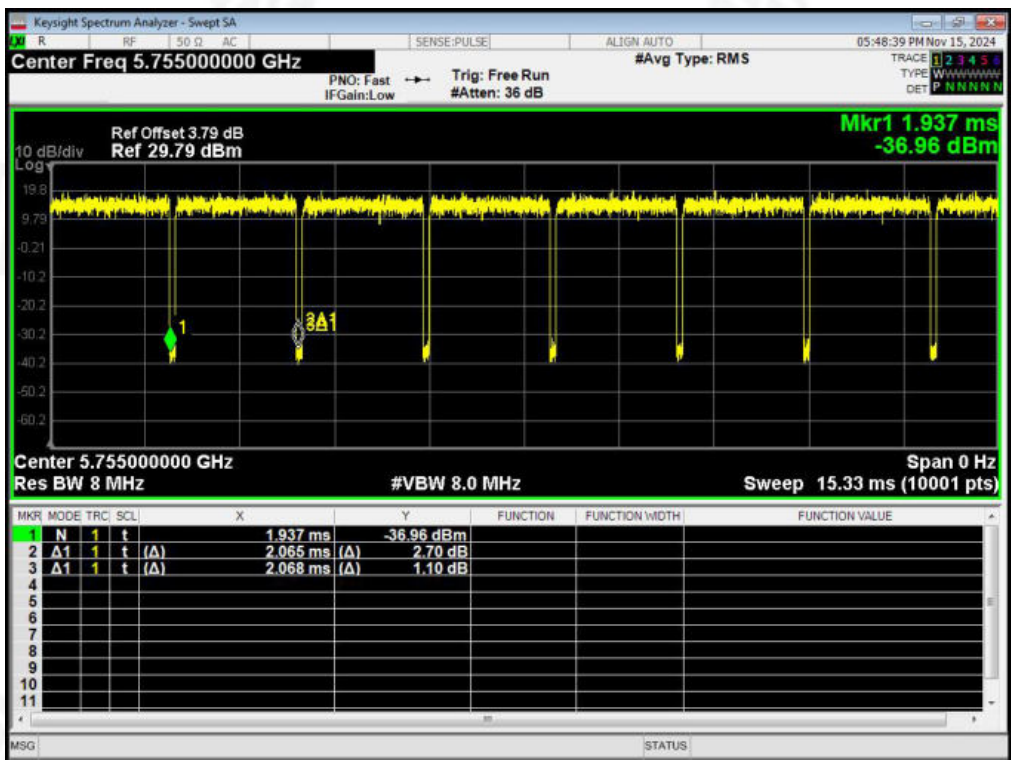




SISO ANT A 802.11ax40 - 5755MHz

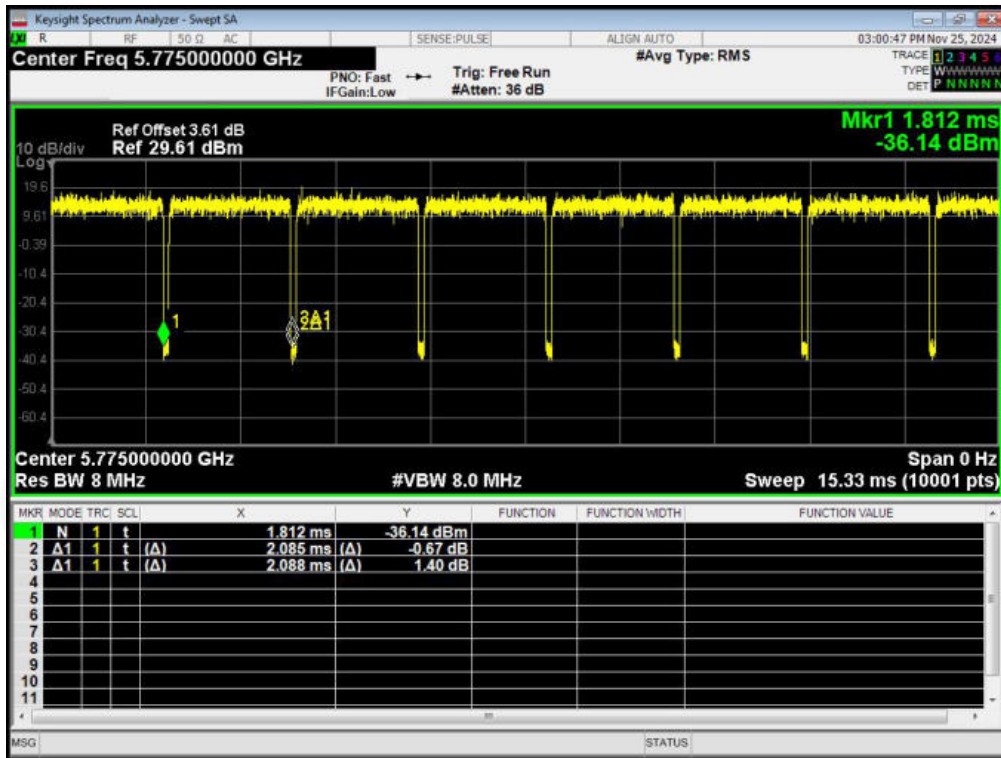


SISO ANT B 802.11ax40 - 5755MHz

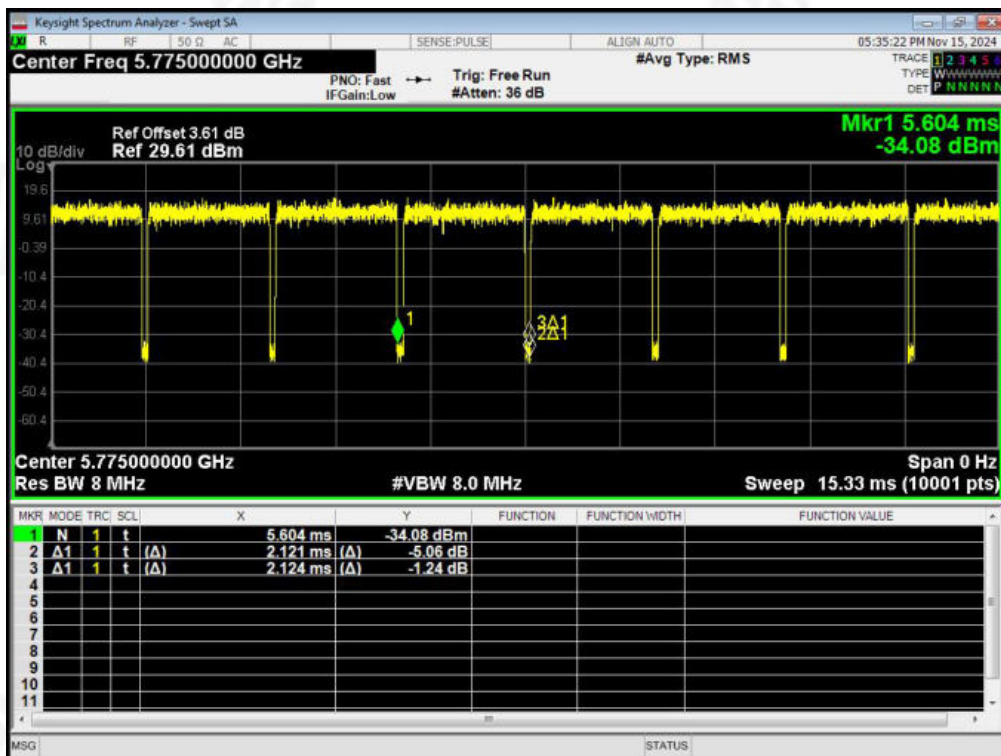




SISO ANT A 802.11ax80 - 5775MHz



SISO ANT B 802.11ax80 - 5775MHz





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 A&B, the best case gain of the antenna is ANT A is 2dBi & 1.2dBi, ANT B is 2.1dBi & 2.2dBi, 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 *****