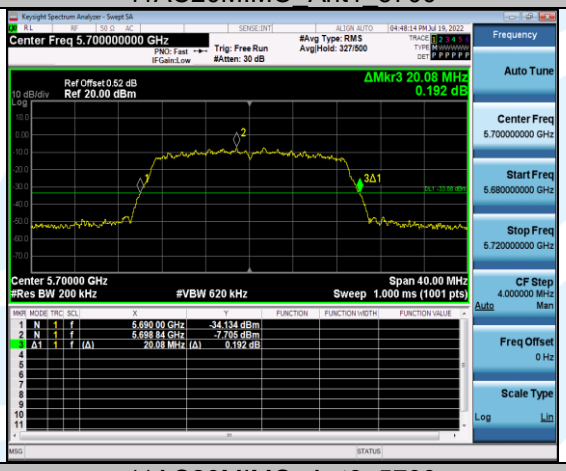
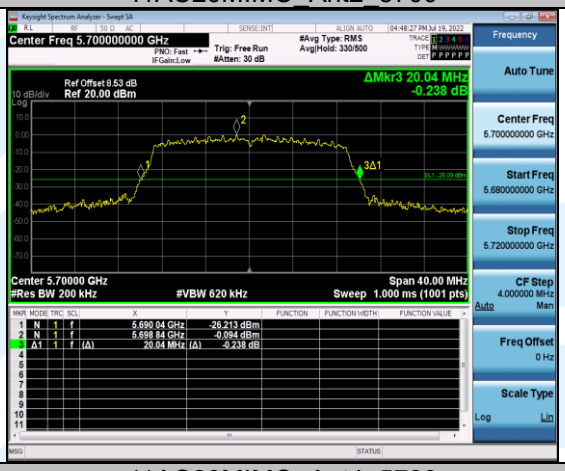
11AC20MIMO_Ant1_5700

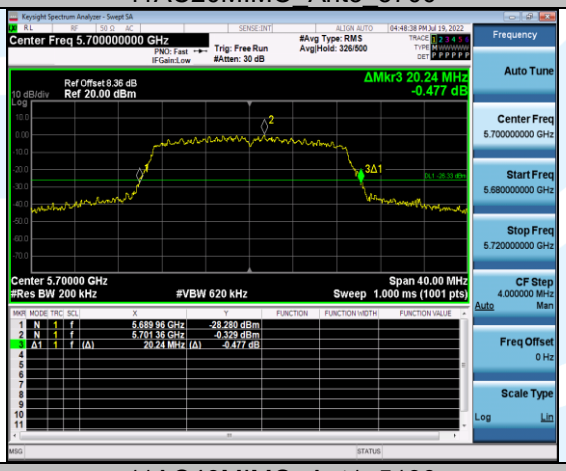
11AC20MIMO_Ant2_5700



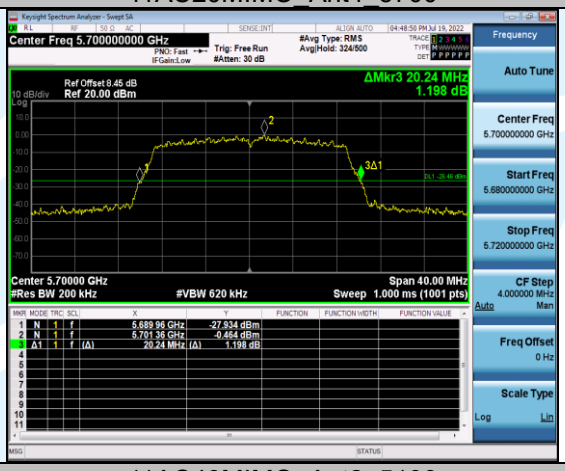
11AC20MIMO_Ant3_5700



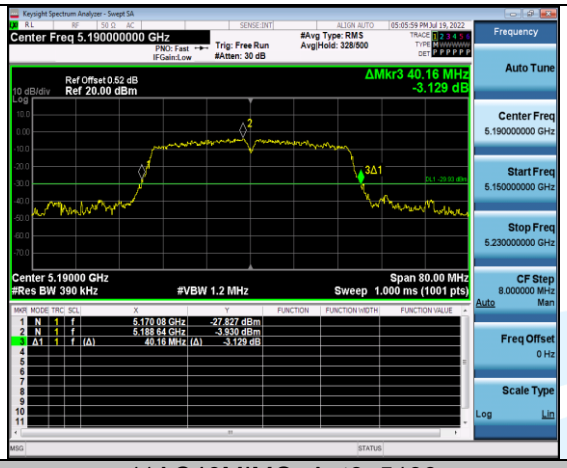
11AC20MIMO_Ant4_5700



11AC40MIMO_Ant1_5190



11AC40MIMO_Ant2_5190



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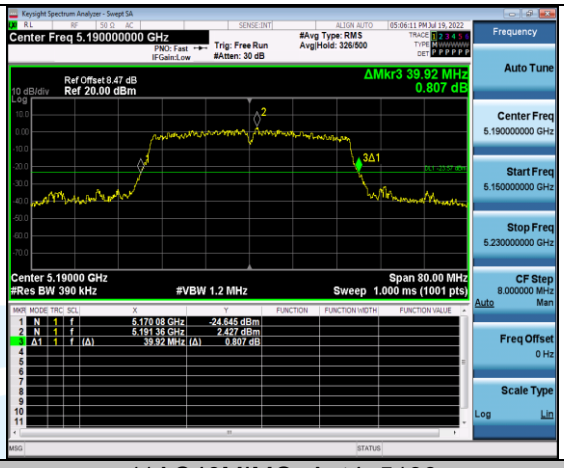

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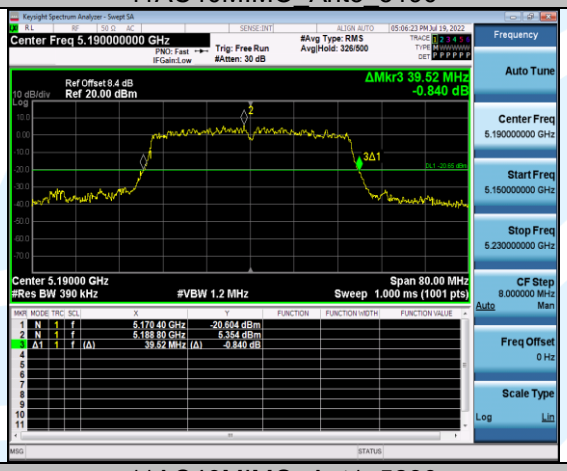
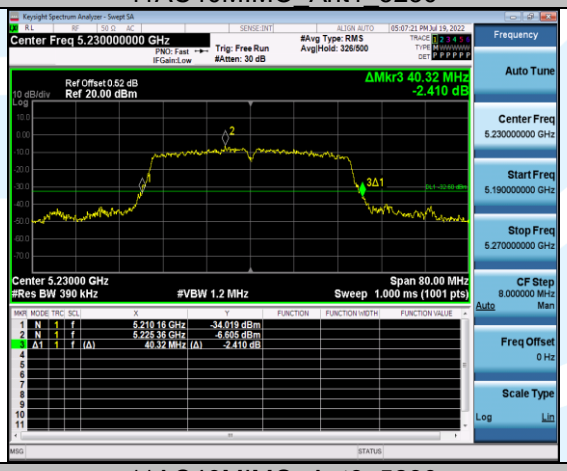
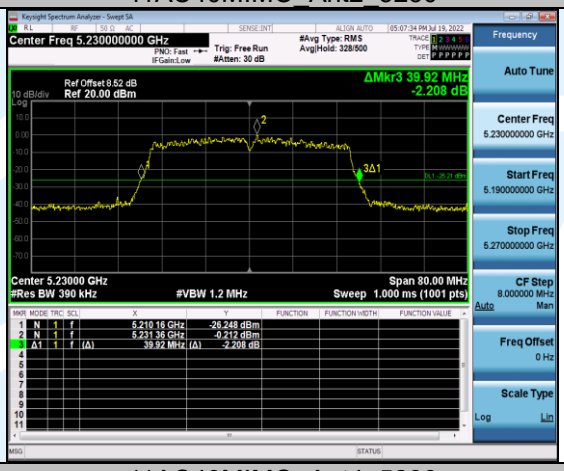


11AC40MIMO_Ant1_5230

11AC40MIMO_Ant2_5230



11AC40MIMO_Ant3_5230



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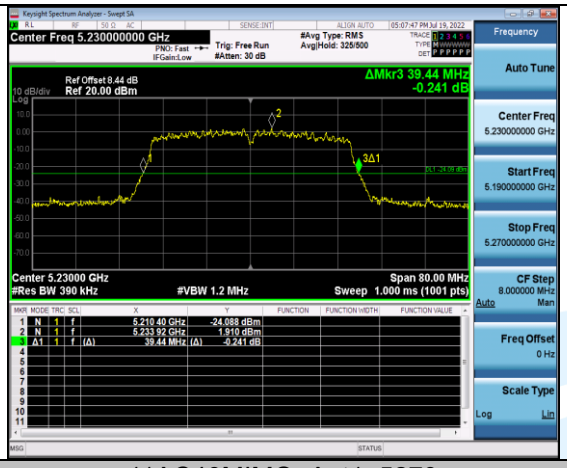
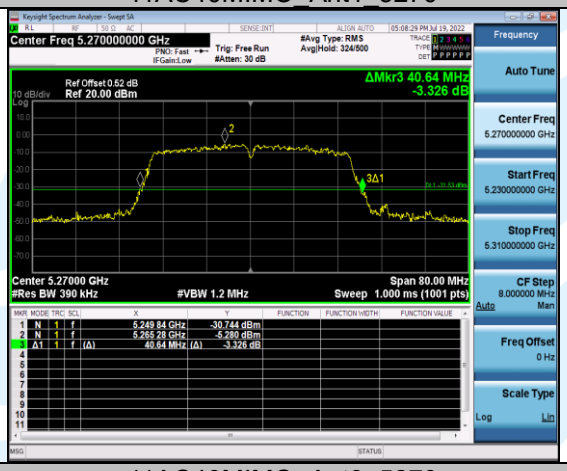


11AC40MIMO_Ant1_5270

11AC40MIMO_Ant2_5270



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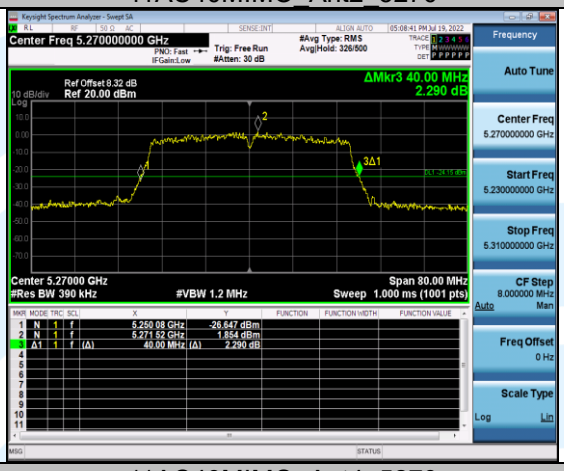
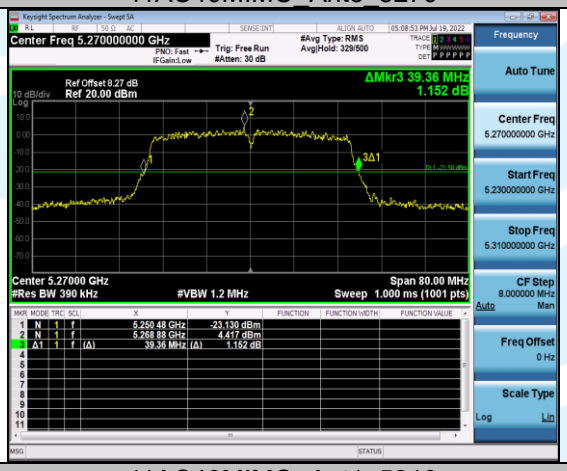
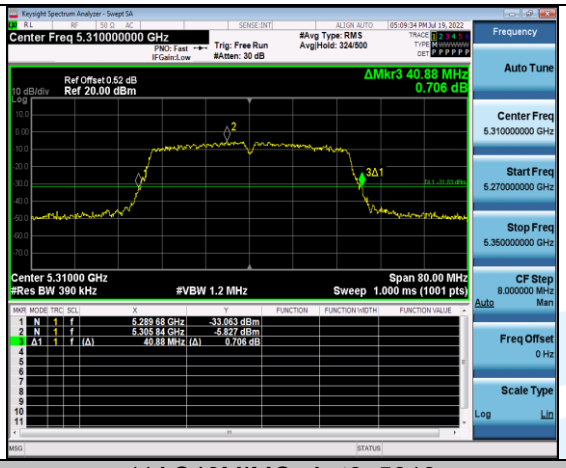


11AC40MIMO_Ant4_5270

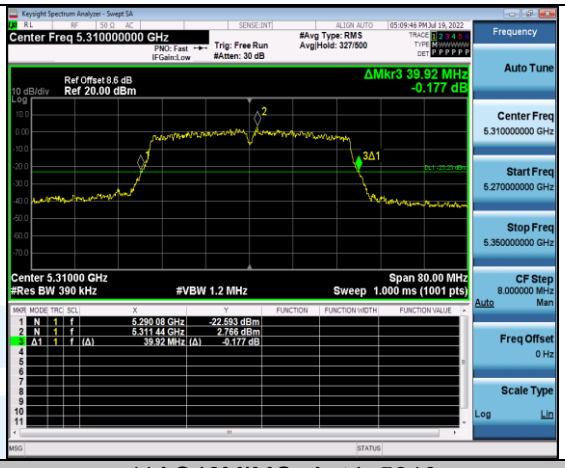


11AC40MIMO_Ant1_5310

11AC40MIMO_Ant2_5310



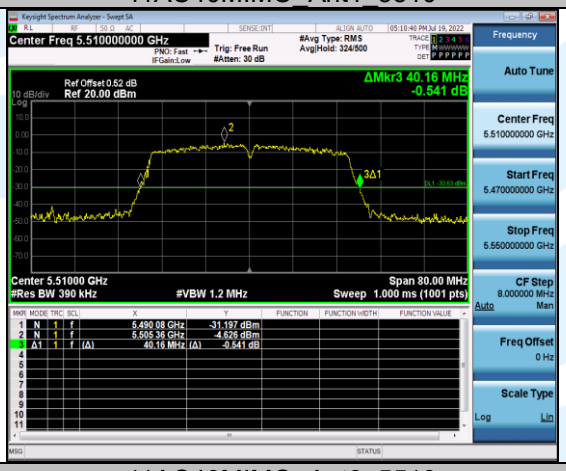
11AC40MIMO_Ant3_5310



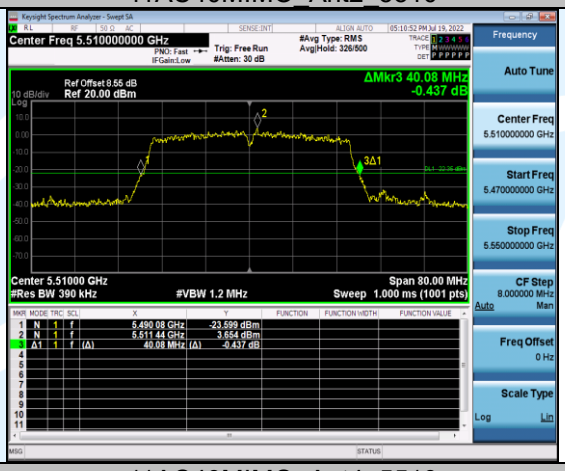
11AC40MIMO_Ant4_5310

11AC40MIMO_Ant1_5510

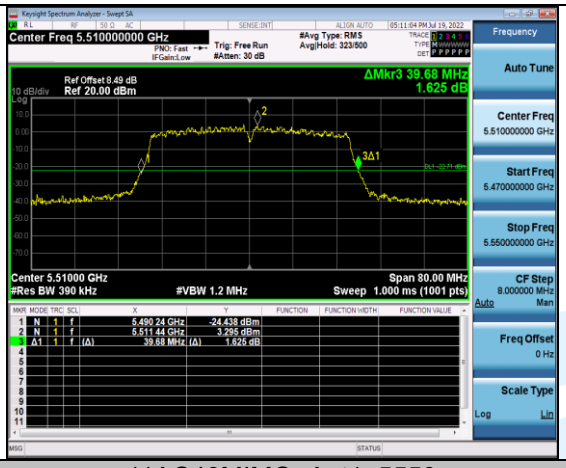
11AC40MIMO_Ant2_5510



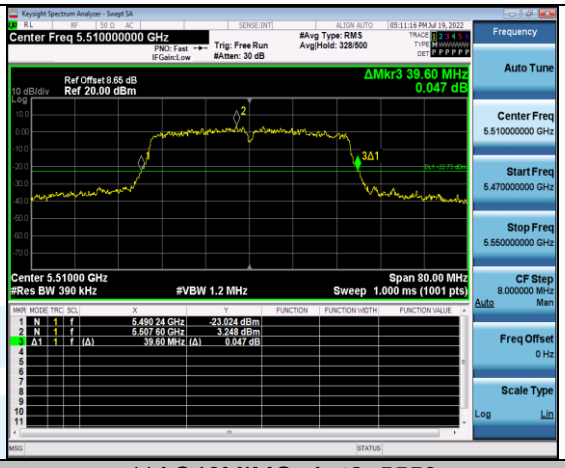
11AC40MIMO_Ant3_5510



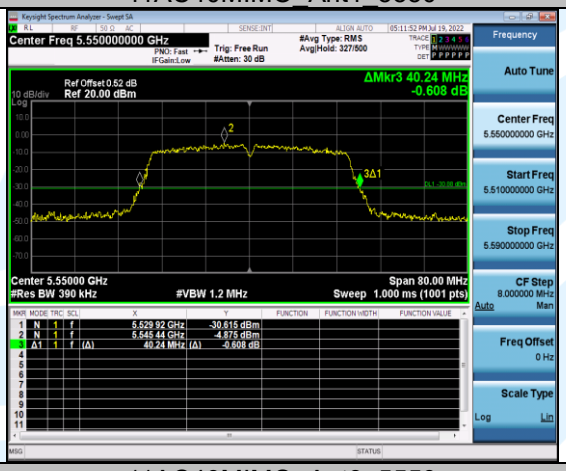
11AC40MIMO_Ant4_5510



11AC40MIMO_Ant1_5550



11AC40MIMO_Ant2_5550

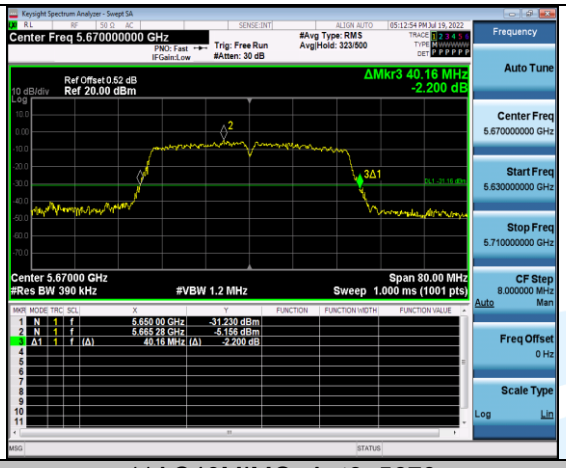


11AC40MIMO_Ant3_5550

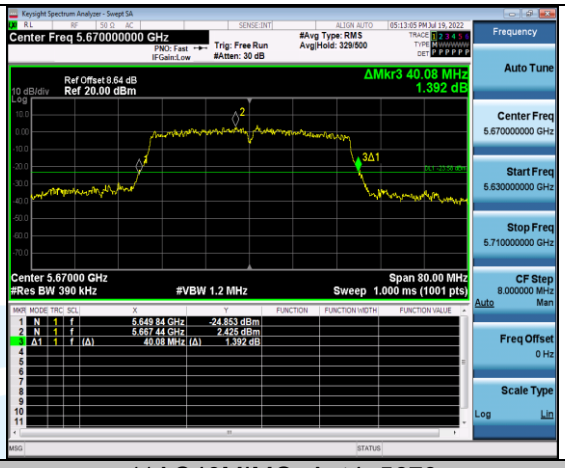
11AC40MIMO_Ant4_5550

11AC40MIMO_Ant1_5670

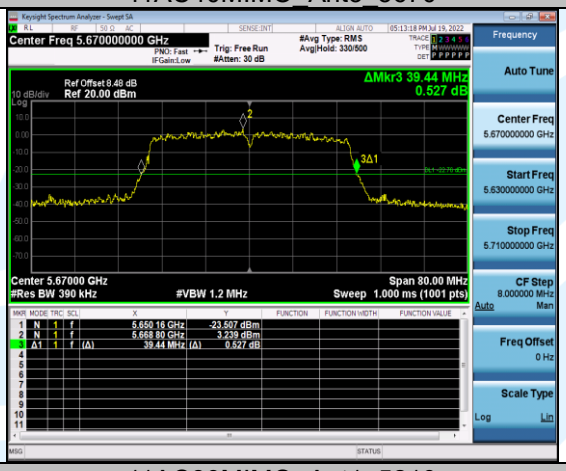
11AC40MIMO_Ant2_5670



11AC40MIMO_Ant3_5670

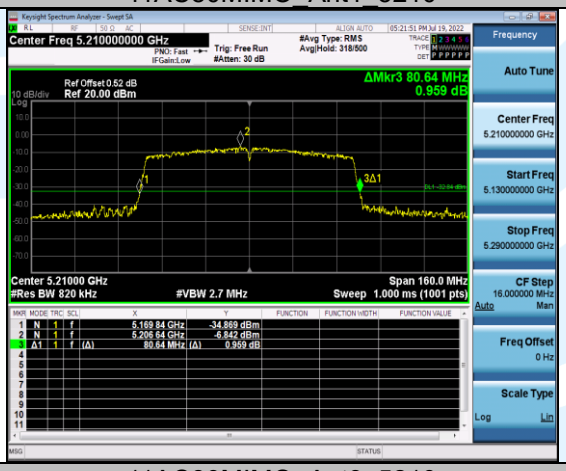


11AC40MIMO_Ant4_5670

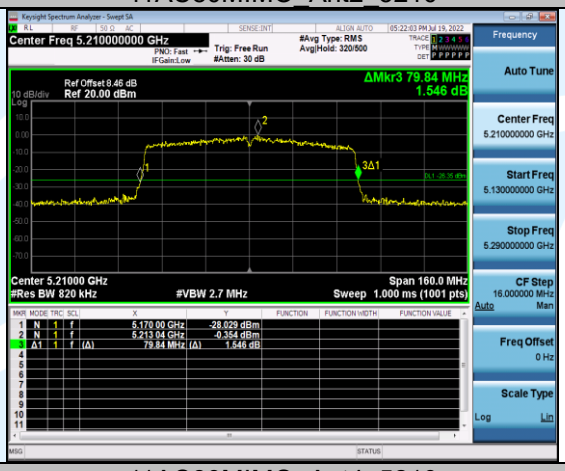


11AC80MIMO_Ant1_5210

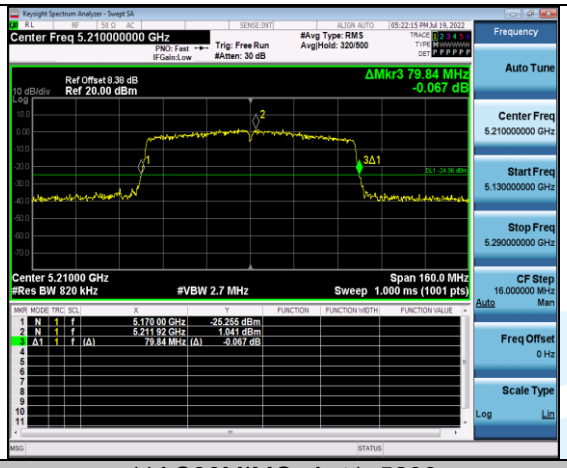
11AC80MIMO_Ant2_5210



11AC80MIMO_Ant3_5210

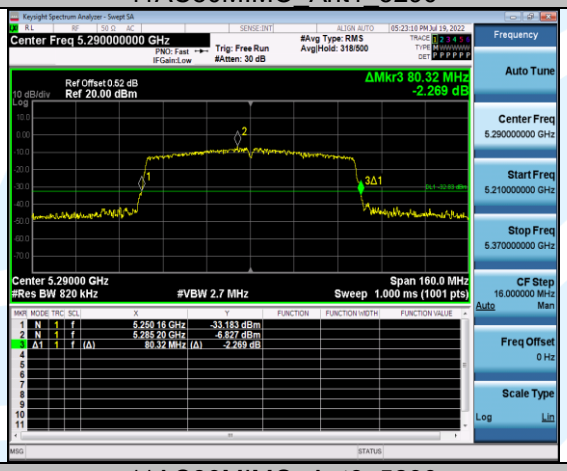


11AC80MIMO_Ant4_5210

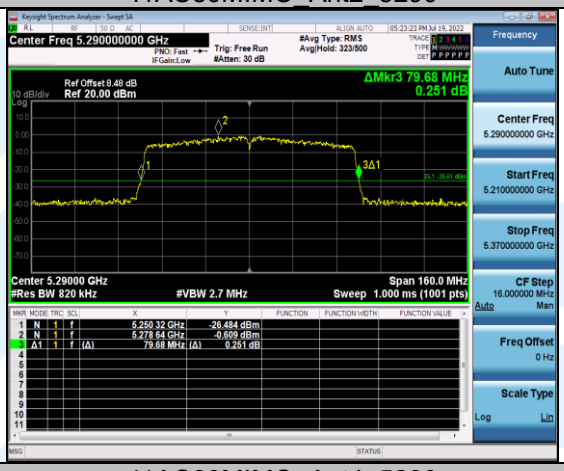


11AC80MIMO_Ant1_5290

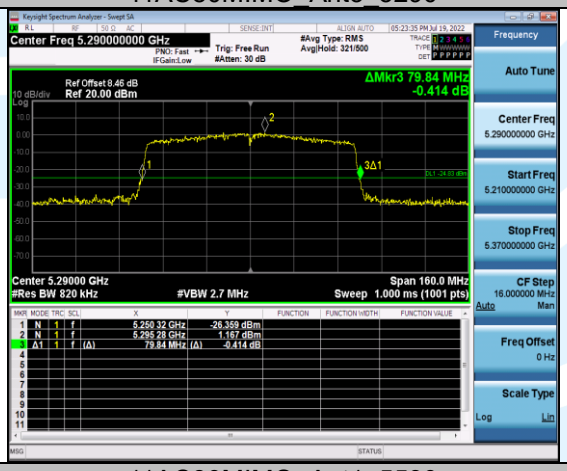
11AC80MIMO_Ant2_5290



11AC80MIMO_Ant3_5290



11AC80MIMO_Ant4_5290



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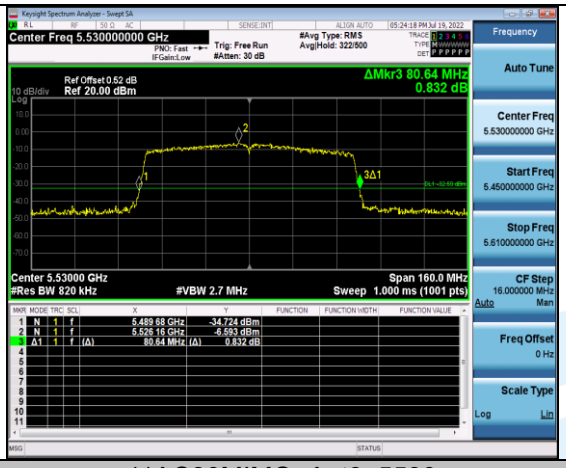
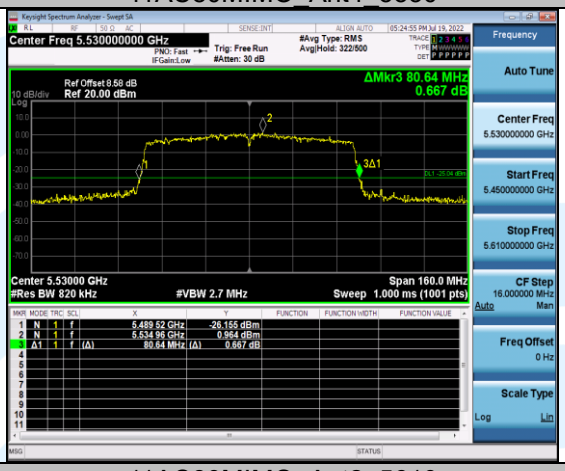
11AC80MIMO_Ant2_5530



11AC80MIMO_Ant3_5530

11AC80MIMO_Ant4_5530

11AC80MIMO_Ant1_5610



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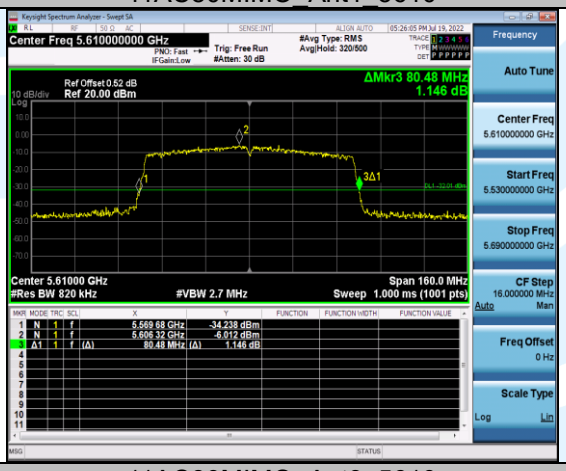

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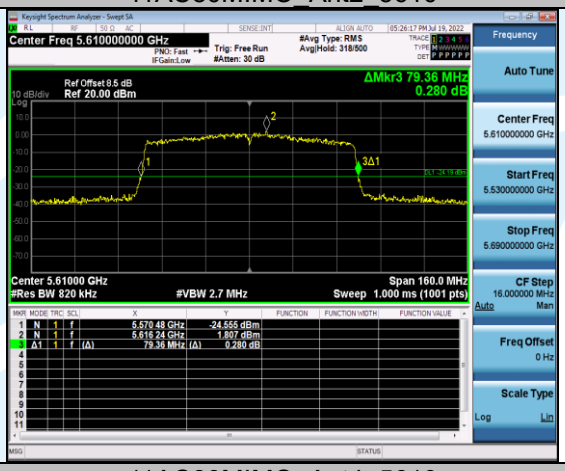
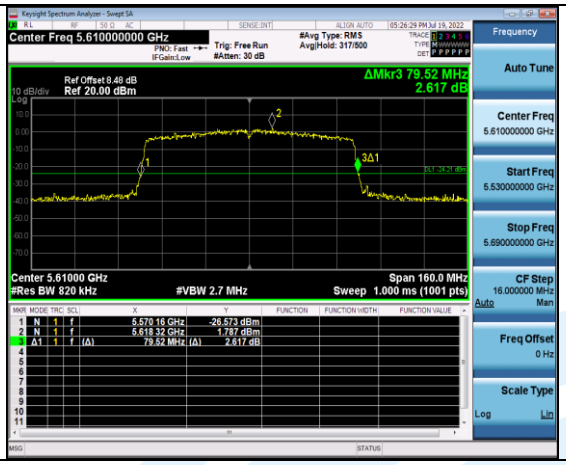
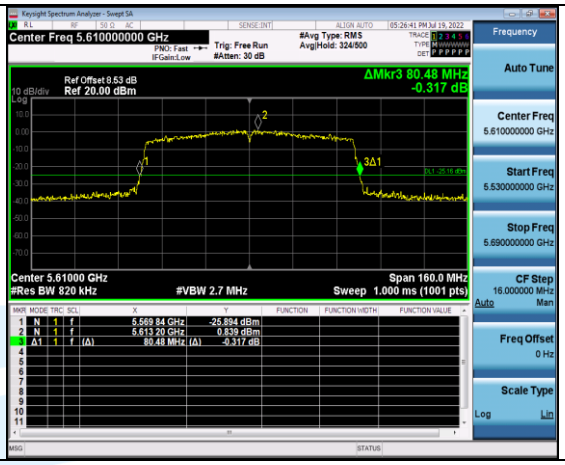


11AC80MIMO_Ant4_5610


Keysight Spectrum Analyzer - Swept SA
Center Freq 5.610000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 317/500
05:26:29 PM Jul 19, 2022
Ref Offset 8.48 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 79.52 MHz
2.617 dB
Center 5.61000 GHz
#Res BW 820 kHz
#VBW 2.7 MHz
Span 160.0 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 5.570 16 GHz -26.573 dBm
2 N 1 f 5.618 32 GHz 1.787 dBm
3 Δ1 1 f (Δ) 79.52 MHz (Δ) 2.617 dB
Frequency
Auto Tune
Center Freq 5.610000000 GHz
Start Freq 5.530000000 GHz
Stop Freq 5.690000000 GHz
CF Step 16.000000 MHz
Auto Man
Freq Offset 0 Hz
Scale Type
Log Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 5.610000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 324/500
05:26:41 PM Jul 19, 2022
Ref Offset 8.53 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 80.48 MHz
-0.317 dB
Center 5.61000 GHz
#Res BW 820 kHz
#VBW 2.7 MHz
Span 160.0 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 5.569 84 GHz -25.894 dBm
2 N 1 f 5.613 20 GHz 0.539 dBm
3 Δ1 1 f (Δ) 80.48 MHz (Δ) -0.317 dB
Frequency
Auto Tune
Center Freq 5.610000000 GHz
Start Freq 5.530000000 GHz
Stop Freq 5.690000000 GHz
CF Step 16.000000 MHz
Auto Man
Freq Offset 0 Hz
Scale Type
Log Lin

5.4 6 DB BANDWIDTH & OCCUPIED BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (e)
RSS-247 Issue 2 Section 6.2.4.1

Test Method: KDB 789033 D02 v02r01 Section C.2

Limit: Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:

6dB Bandwidth

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 * RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

a) Set RBW = 1% to 5% of the occupied bandwidth
b) Set the video bandwidth (VBW) ≥ 3 x RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

6dB Bandwidth

Tes tMode	Antenna	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
11A	Ant1	5745	15.120	5737.480	5752.600	0.5	PASS
	Ant2	5745	15.120	5737.480	5752.600	0.5	PASS
	Ant3	5745	15.080	5737.480	5752.560	0.5	PASS
	Ant4	5745	15.160	5737.440	5752.600	0.5	PASS
	Ant1	5785	15.040	5777.520	5792.560	0.5	PASS
	Ant2	5785	15.080	5777.520	5792.600	0.5	PASS
	Ant3	5785	15.120	5777.480	5792.600	0.5	PASS
	Ant4	5785	15.080	5777.520	5792.600	0.5	PASS
	Ant1	5825	15.120	5817.480	5832.600	0.5	PASS
	Ant2	5825	15.080	5817.480	5832.560	0.5	PASS
	Ant3	5825	15.680	5816.920	5832.600	0.5	PASS
	Ant4	5825	14.360	5818.160	5832.520	0.5	PASS
11N20MIMO	Ant1	5745	15.120	5737.560	5752.680	0.5	PASS
	Ant2	5745	16.000	5736.680	5752.680	0.5	PASS
	Ant3	5745	15.120	5737.600	5752.720	0.5	PASS
	Ant4	5745	15.080	5737.640	5752.720	0.5	PASS
	Ant1	5785	15.120	5777.560	5792.680	0.5	PASS
	Ant2	5785	16.280	5777.000	5793.280	0.5	PASS

	Ant3	5785	15.120	5777.560	5792.680	0.5	PASS
	Ant4	5785	15.120	5777.560	5792.680	0.5	PASS
	Ant1	5825	15.120	5817.560	5832.680	0.5	PASS
	Ant2	5825	15.080	5817.600	5832.680	0.5	PASS
	Ant3	5825	15.080	5817.600	5832.680	0.5	PASS
	Ant4	5825	15.720	5817.560	5833.280	0.5	PASS
11N40MIMO	Ant1	5755	35.040	5737.480	5772.520	0.5	PASS
	Ant2	5755	35.040	5737.480	5772.520	0.5	PASS
	Ant3	5755	35.040	5737.480	5772.520	0.5	PASS
	Ant4	5755	35.120	5737.480	5772.600	0.5	PASS
	Ant1	5795	35.040	5777.480	5812.520	0.5	PASS
	Ant2	5795	35.040	5777.480	5812.520	0.5	PASS
	Ant3	5795	35.040	5777.480	5812.520	0.5	PASS
	Ant4	5795	35.120	5777.480	5812.600	0.5	PASS
11AC20MIMO	Ant1	5745	15.080	5737.560	5752.640	0.5	PASS
	Ant2	5745	16.280	5737.000	5753.280	0.5	PASS
	Ant3	5745	15.080	5737.600	5752.680	0.5	PASS
	Ant4	5745	15.720	5737.600	5753.320	0.5	PASS
	Ant1	5785	15.120	5777.520	5792.640	0.5	PASS
	Ant2	5785	15.680	5776.960	5792.640	0.5	PASS
	Ant3	5785	15.120	5777.520	5792.640	0.5	PASS
	Ant4	5785	15.720	5777.560	5793.280	0.5	PASS
	Ant1	5825	15.120	5817.560	5832.680	0.5	PASS
	Ant2	5825	15.120	5817.560	5832.680	0.5	PASS
	Ant3	5825	15.120	5817.560	5832.680	0.5	PASS
	Ant4	5825	15.720	5817.560	5833.280	0.5	PASS
11AC40MIMO	Ant1	5755	35.040	5737.560	5772.600	0.5	PASS
	Ant2	5755	35.040	5737.560	5772.600	0.5	PASS
	Ant3	5755	35.040	5737.560	5772.600	0.5	PASS
	Ant4	5755	35.120	5737.560	5772.680	0.5	PASS
	Ant1	5795	35.120	5777.560	5812.680	0.5	PASS
	Ant2	5795	35.040	5777.640	5812.680	0.5	PASS
	Ant3	5795	35.040	5777.640	5812.680	0.5	PASS
	Ant4	5795	35.040	5777.640	5812.680	0.5	PASS
11AC80MIMO	Ant1	5775	72.480	5737.560	5810.040	0.5	PASS
	Ant2	5775	72.480	5737.560	5810.040	0.5	PASS
	Ant3	5775	72.640	5737.400	5810.040	0.5	PASS
	Ant4	5775	75.040	5737.560	5812.600	0.5	PASS

Occupied Bandwidth

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
11A	Ant1	5180	17.462	5171.262	5188.724	---	---
	Ant2	5180	17.157	5171.472	5188.629	---	---
	Ant3	5180	17.202	5171.482	5188.684	---	---
	Ant4	5180	17.351	5171.361	5188.712	---	---
	Ant1	5220	24.258	5207.752	5232.010	---	---
	Ant2	5220	22.749	5208.710	5231.459	---	---
	Ant3	5220	22.005	5209.079	5231.084	---	---
	Ant4	5220	18.962	5210.550	5229.512	---	---
	Ant1	5240	25.987	5226.852	5252.839	---	---
	Ant2	5240	24.920	5227.468	5252.388	---	---
	Ant3	5240	23.644	5228.213	5251.857	---	---
	Ant4	5240	19.693	5230.147	5249.840	---	---
	Ant1	5260	17.060	5251.516	5268.576	---	---
	Ant2	5260	16.959	5251.573	5268.532	---	---
	Ant3	5260	17.072	5251.527	5268.599	---	---
	Ant4	5260	16.823	5251.670	5268.493	---	---
	Ant1	5300	17.096	5291.447	5308.543	---	---
	Ant2	5300	16.922	5291.550	5308.472	---	---
	Ant3	5300	16.948	5291.548	5308.496	---	---
	Ant4	5300	16.790	5291.637	5308.427	---	---
	Ant1	5320	17.013	5311.510	5328.523	---	---

	Ant2	5320	16.928	5311.565	5328.493	---	---
	Ant3	5320	16.984	5311.530	5328.514	---	---
	Ant4	5320	16.789	5311.647	5328.436	---	---
	Ant1	5500	17.119	5491.416	5508.535	---	---
	Ant2	5500	16.936	5491.538	5508.474	---	---
	Ant3	5500	16.983	5491.531	5508.514	---	---
	Ant4	5500	16.857	5491.650	5508.507	---	---
	Ant1	5580	17.081	5571.431	5588.512	---	---
	Ant2	5580	16.993	5571.515	5588.508	---	---
	Ant3	5580	17.045	5571.494	5588.539	---	---
	Ant4	5580	16.821	5571.647	5588.468	---	---
	Ant1	5700	17.201	5691.369	5708.570	---	---
	Ant2	5700	16.996	5691.506	5708.502	---	---
	Ant3	5700	17.043	5691.468	5708.511	---	---
	Ant4	5700	16.837	5691.656	5708.493	---	---
	Ant1	5745	25.016	5732.315	5757.331	---	---
	Ant2	5745	27.422	5731.004	5758.426	---	---
	Ant3	5745	24.720	5732.355	5757.075	---	---
	Ant4	5745	20.521	5734.943	5755.464	---	---
	Ant1	5785	22.819	5773.318	5796.137	---	---
	Ant2	5785	26.660	5771.526	5798.186	---	---
	Ant3	5785	26.432	5771.543	5797.975	---	---
	Ant4	5785	27.832	5771.079	5798.911	---	---
	Ant1	5825	23.736	5813.097	5836.833	---	---
	Ant2	5825	27.078	5811.382	5838.460	---	---
	Ant3	5825	24.878	5812.480	5837.358	---	---
	Ant4	5825	23.659	5813.249	5836.908	---	---
11N20MIMO	Ant1	5180	17.877	5171.121	5188.998	---	---
	Ant2	5180	17.780	5171.172	5188.952	---	---
	Ant3	5180	17.810	5171.127	5188.937	---	---
	Ant4	5180	17.862	5171.108	5188.970	---	---
	Ant1	5220	17.885	5211.116	5229.001	---	---
	Ant2	5220	17.734	5211.203	5228.937	---	---
	Ant3	5220	17.768	5211.163	5228.931	---	---
	Ant4	5220	17.817	5211.156	5228.973	---	---
	Ant1	5240	17.870	5231.119	5248.989	---	---
	Ant2	5240	17.775	5231.180	5248.955	---	---
	Ant3	5240	17.812	5231.139	5248.951	---	---
	Ant4	5240	17.813	5231.141	5248.954	---	---
	Ant1	5260	17.823	5251.160	5268.983	---	---
	Ant2	5260	17.742	5251.201	5268.943	---	---
	Ant3	5260	17.774	5251.142	5268.916	---	---
	Ant4	5260	17.780	5251.137	5268.917	---	---
	Ant1	5300	17.833	5291.123	5308.956	---	---
	Ant2	5300	17.752	5291.176	5308.928	---	---
	Ant3	5300	17.765	5291.161	5308.926	---	---
	Ant4	5300	17.787	5291.114	5308.901	---	---
	Ant1	5320	17.806	5311.144	5328.950	---	---
	Ant2	5320	17.741	5311.188	5328.929	---	---
	Ant3	5320	17.745	5311.167	5328.912	---	---
	Ant4	5320	17.791	5311.132	5328.923	---	---
	Ant1	5500	17.832	5491.124	5508.956	---	---
	Ant2	5500	17.760	5491.167	5508.927	---	---
	Ant3	5500	17.755	5491.150	5508.905	---	---
	Ant4	5500	17.761	5491.152	5508.913	---	---
	Ant1	5580	17.841	5571.126	5588.967	---	---
	Ant2	5580	17.748	5571.168	5588.916	---	---
	Ant3	5580	17.778	5571.117	5588.895	---	---
	Ant4	5580	17.753	5571.159	5588.912	---	---
	Ant1	5700	17.844	5691.101	5708.945	---	---
	Ant2	5700	17.745	5691.170	5708.915	---	---
	Ant3	5700	17.768	5691.140	5708.908	---	---
	Ant4	5700	17.776	5691.163	5708.939	---	---

	Ant1	5745	22.498	5733.500	5755.998	---	---
	Ant2	5745	24.567	5732.407	5756.974	---	---
	Ant3	5745	24.779	5732.157	5756.936	---	---
	Ant4	5745	26.225	5731.820	5758.045	---	---
	Ant1	5785	19.970	5774.796	5794.766	---	---
	Ant2	5785	23.388	5772.978	5796.366	---	---
	Ant3	5785	22.785	5773.306	5796.091	---	---
	Ant4	5785	25.947	5771.935	5797.882	---	---
	Ant1	5825	19.573	5815.135	5834.708	---	---
	Ant2	5825	23.111	5813.427	5836.538	---	---
	Ant3	5825	20.885	5814.448	5835.333	---	---
	Ant4	5825	26.117	5811.991	5838.108	---	---
11N40MIMO	Ant1	5190	36.180	5171.873	5208.053	---	---
	Ant2	5190	36.226	5171.963	5208.189	---	---
	Ant3	5190	36.054	5172.000	5208.054	---	---
	Ant4	5190	36.016	5172.030	5208.046	---	---
	Ant1	5230	36.504	5211.647	5248.151	---	---
	Ant2	5230	36.297	5211.966	5248.263	---	---
	Ant3	5230	36.171	5211.953	5248.124	---	---
	Ant4	5230	36.223	5211.927	5248.150	---	---
	Ant1	5270	36.282	5251.834	5288.116	---	---
	Ant2	5270	36.254	5251.979	5288.233	---	---
	Ant3	5270	36.063	5251.992	5288.055	---	---
	Ant4	5270	36.017	5252.101	5288.118	---	---
	Ant1	5310	36.172	5291.886	5328.058	---	---
	Ant2	5310	36.197	5291.960	5328.157	---	---
	Ant3	5310	36.054	5292.011	5328.065	---	---
	Ant4	5310	36.074	5291.977	5328.051	---	---
	Ant1	5510	36.144	5491.867	5528.011	---	---
	Ant2	5510	36.217	5491.937	5528.154	---	---
	Ant3	5510	36.035	5492.048	5528.083	---	---
	Ant4	5510	36.096	5492.022	5528.118	---	---
	Ant1	5550	36.238	5531.796	5568.034	---	---
	Ant2	5550	36.250	5531.966	5568.216	---	---
	Ant3	5550	36.077	5532.008	5568.085	---	---
	Ant4	5550	36.121	5532.039	5568.160	---	---
	Ant1	5670	36.246	5651.777	5688.023	---	---
	Ant2	5670	36.237	5651.937	5688.174	---	---
	Ant3	5670	36.128	5651.944	5688.072	---	---
	Ant4	5670	36.086	5652.043	5688.129	---	---
	Ant1	5755	41.206	5732.552	5773.758	---	---
	Ant2	5755	39.082	5734.582	5773.664	---	---
	Ant3	5755	36.674	5736.591	5773.265	---	---
	Ant4	5755	36.307	5736.880	5773.187	---	---
	Ant1	5795	42.071	5771.867	5813.938	---	---
	Ant2	5795	41.026	5772.801	5813.827	---	---
	Ant3	5795	36.813	5776.509	5813.322	---	---
	Ant4	5795	36.426	5776.823	5813.249	---	---
11AC20MIMO	Ant1	5180	18.062	5171.002	5189.064	---	---
	Ant2	5180	17.764	5171.185	5188.949	---	---
	Ant3	5180	17.841	5171.123	5188.964	---	---
	Ant4	5180	17.889	5171.086	5188.975	---	---
	Ant1	5220	17.963	5211.064	5229.027	---	---
	Ant2	5220	17.739	5211.194	5228.933	---	---
	Ant3	5220	17.775	5211.149	5228.924	---	---
	Ant4	5220	17.797	5211.149	5228.946	---	---
	Ant1	5240	17.964	5231.048	5249.012	---	---
	Ant2	5240	17.747	5231.190	5248.937	---	---
	Ant3	5240	17.754	5231.174	5248.928	---	---
	Ant4	5240	17.813	5231.136	5248.949	---	---
	Ant1	5260	17.898	5251.099	5268.997	---	---
	Ant2	5260	17.739	5251.202	5268.941	---	---
	Ant3	5260	17.779	5251.154	5268.933	---	---