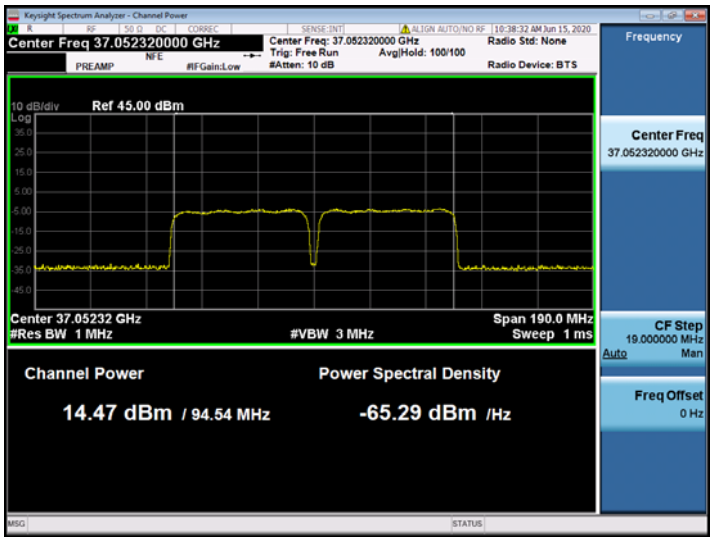
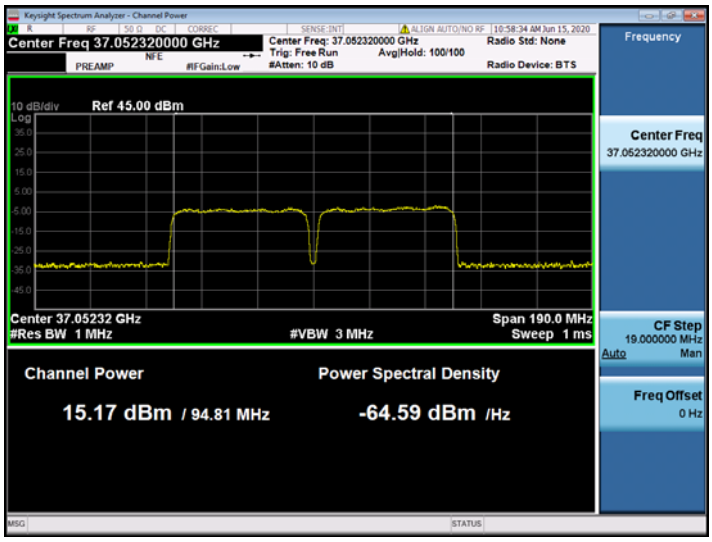
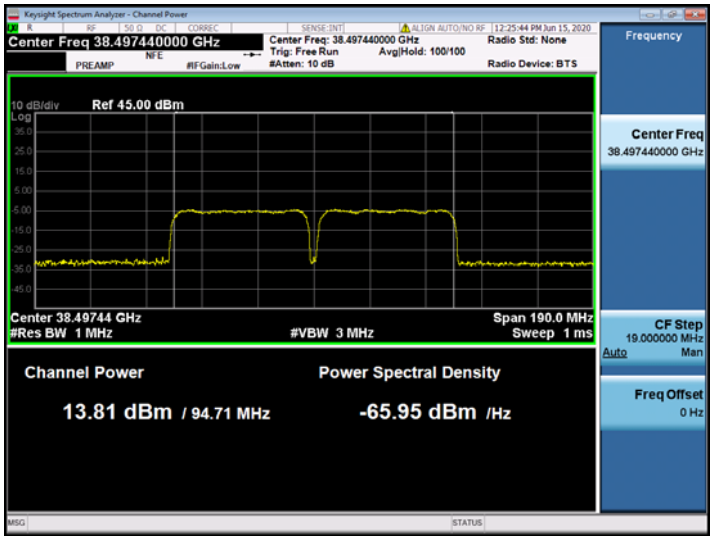
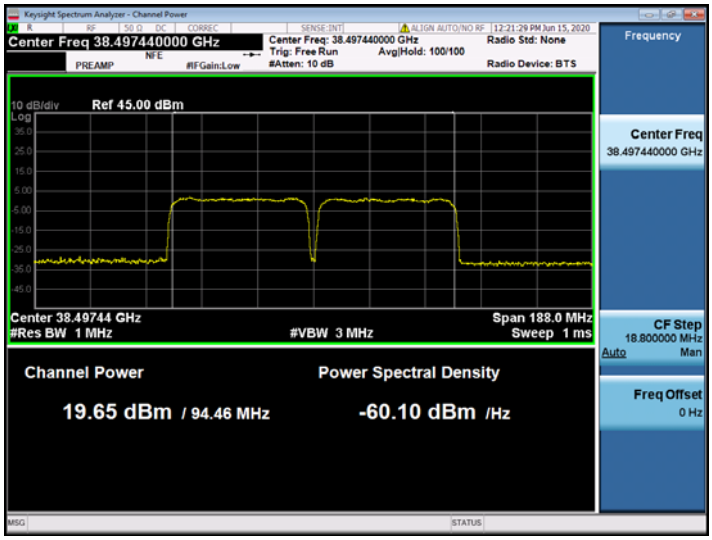
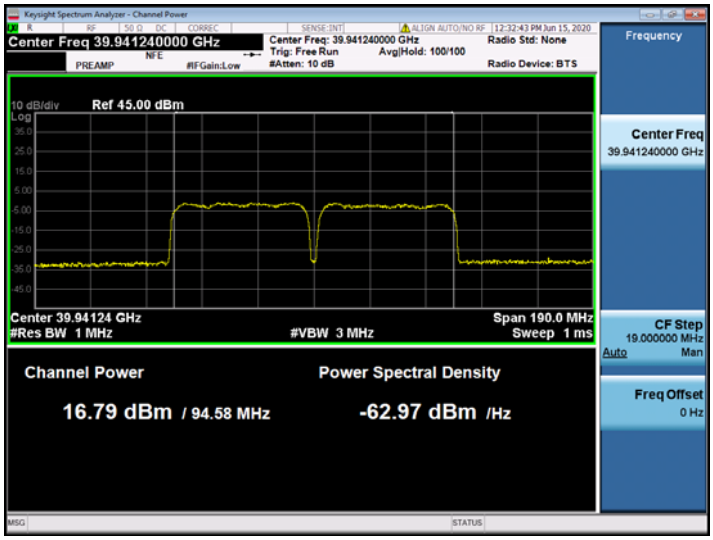
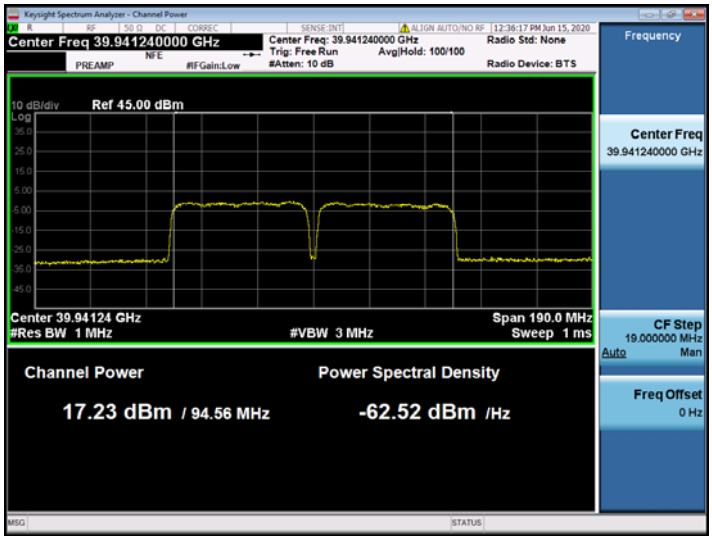
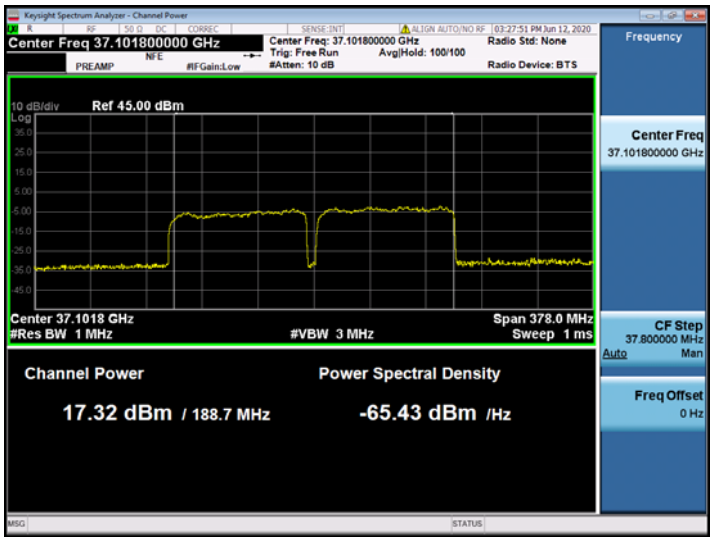
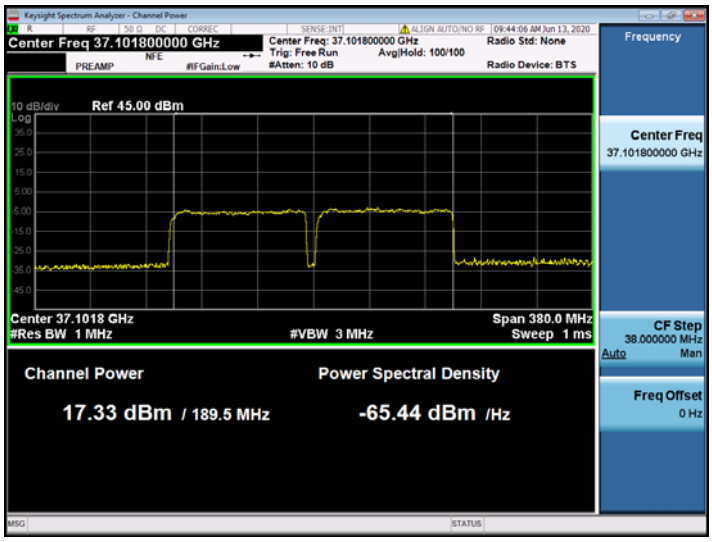
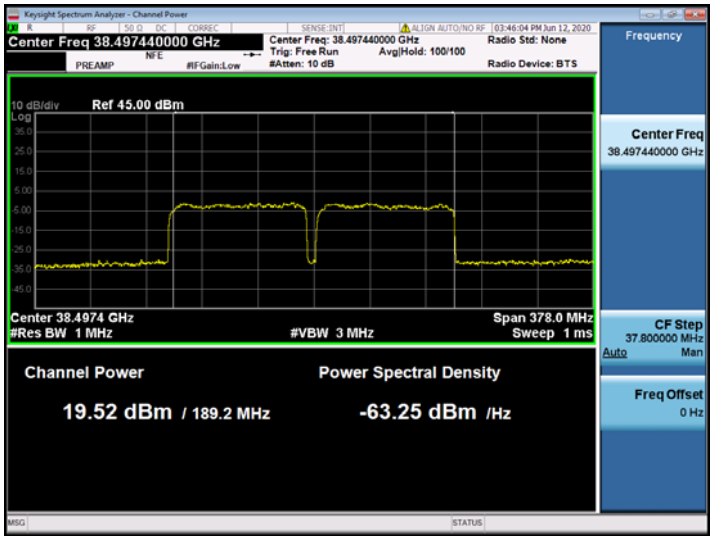
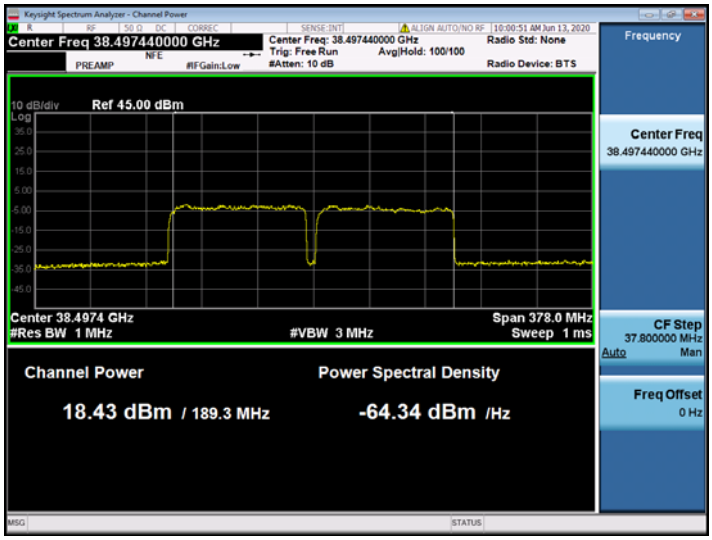
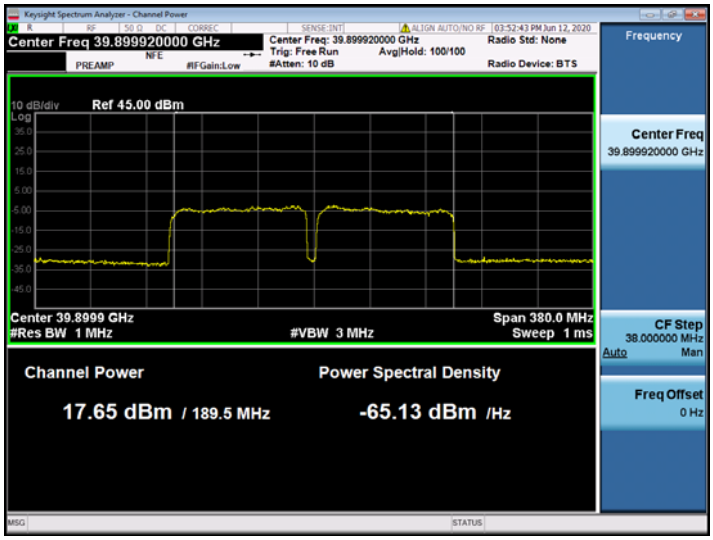
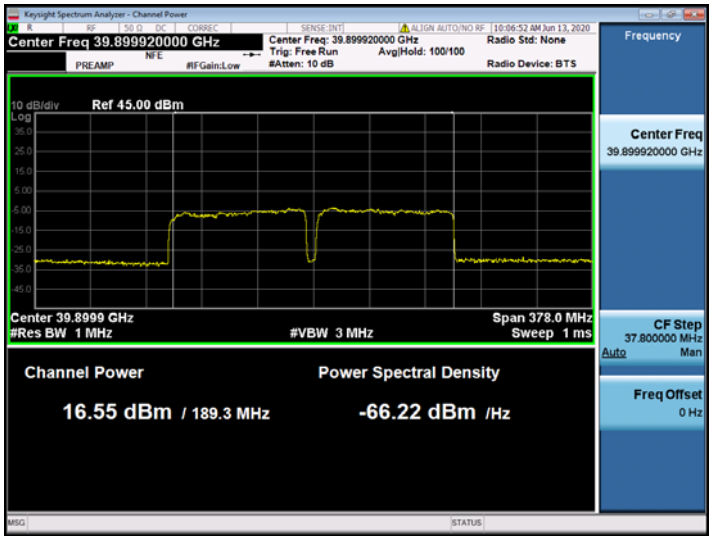
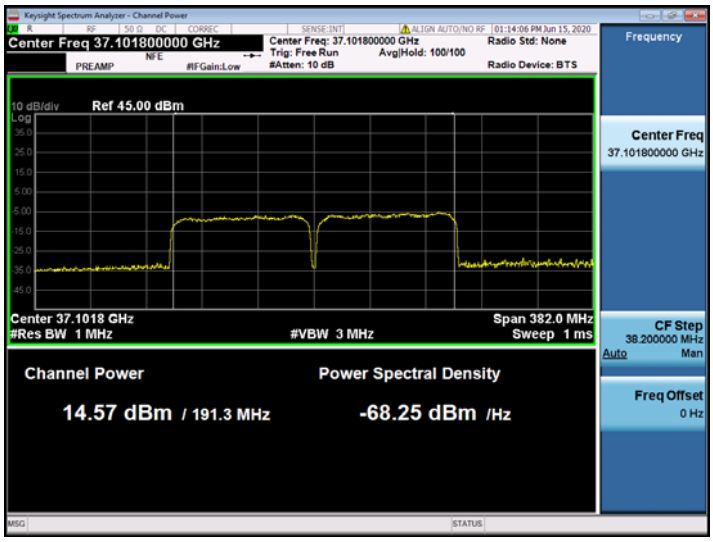
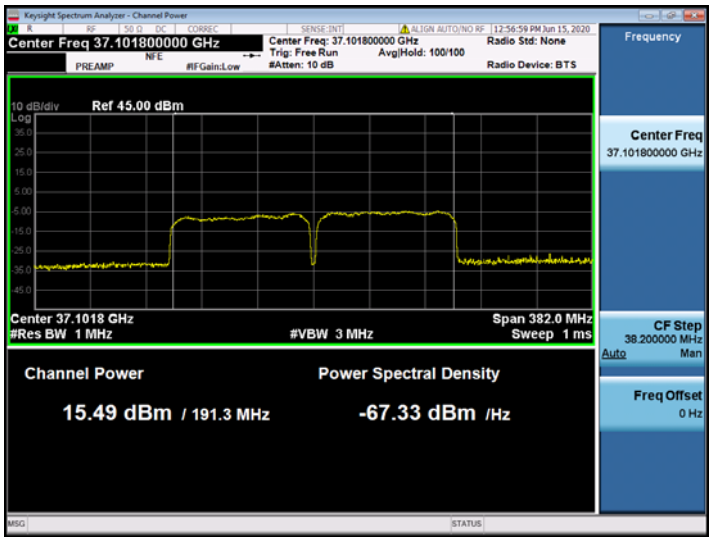
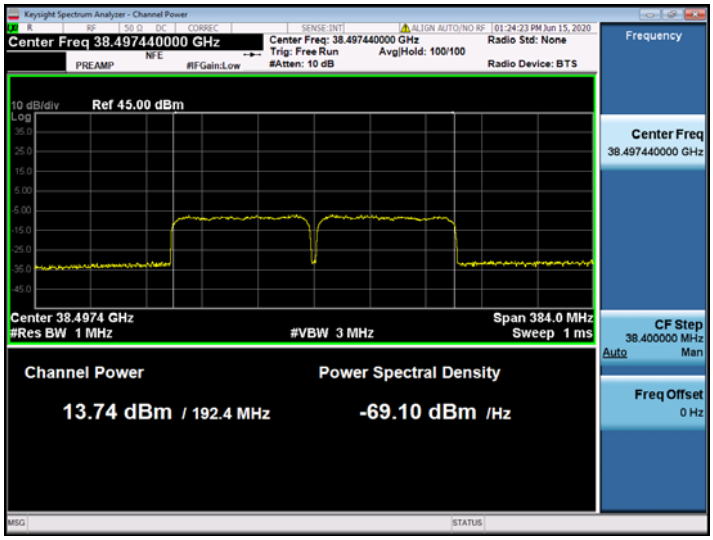
50 MHz, 2CC MIMO	
	
	
	

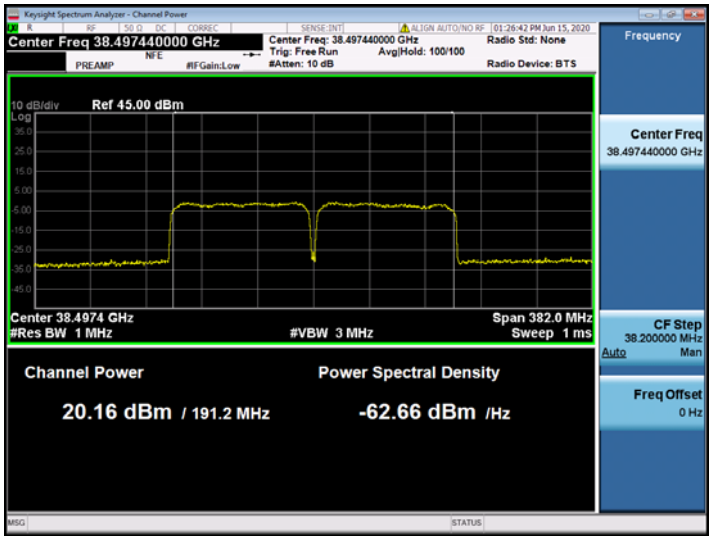
100 MHz, 2CC SISO	
	
	
	

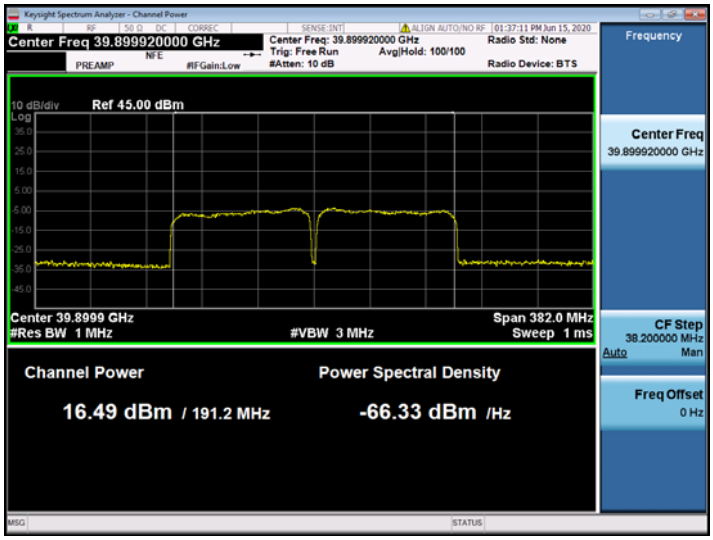
100 MHz, 2CC MIMO

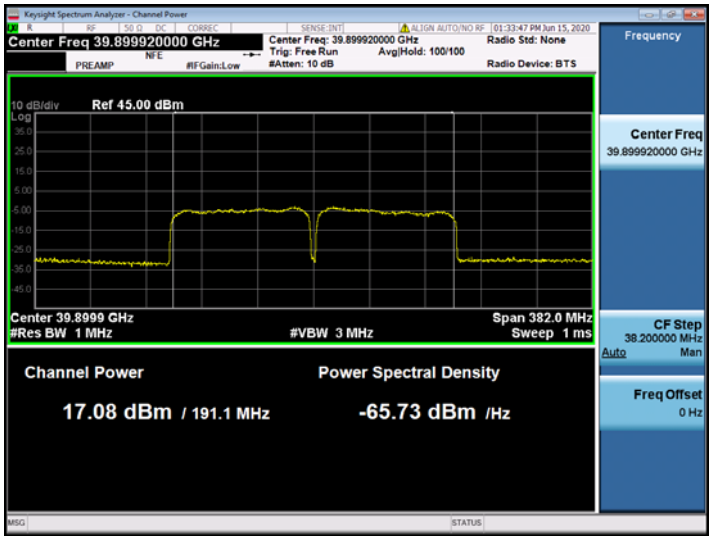












5.3. BAND EDGE

Test Overview

All out of band emissions are measured in a radiated setup while the EUT is operating at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is -13dBm/1MHz. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

FCC Rules

Test Requirements:

§ 30.203 Emission limits.

(a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

(b)(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges as the design permits.

(3) The measurements of emission power can be expressed in peak or average values.

Test Procedures:

The measurement is performed in accordance with Section 5.7.3 of ANSI C63.26.

5.7.3 Out-of-band unwanted emissions measurements

a) Set the spectrum analyzer center frequency to the block, band, or channel edge frequency.

b) Set the span wide enough to capture the fundamental emission closest to the authorized block or band edge, and to include all modulation products that spill into the immediately adjacent frequency band. In some cases, it may be possible to set the center frequency and span so as to encompass the fundamental emission and the unwanted out-of-band (band-edge) emissions on either side of the authorized block, band, or channel. This can be accomplished with a single (slow) sweep, if adequate overload protection and sufficient dynamic range can be maintained.

c) Set the number of points in sweep ≥ 2 × span / RBW.

d) Sweep time should be auto for peak detection. For rms detection the sweep time should be set as follows:

1), 2) Omitted

3) If the device cannot be configured to transmit continuously (duty cycle < 98%) and a free running sweep must be used, set the sweep time so that the averaging is performed over multiple on/off cycles by setting the sweep time > (number of points in sweep) × (transmitter period) (i.e., the transmit on-time + the off-time). The spectrum analyzer readings shall subsequently be corrected by [10 log (1/duty cycle)]. This assumes that the transmission period and duty cycle is relatively constant (duty cycle variation ≤ ±2%).

4) Omitted

e) The test report shall include the plots of the measuring instrument display and the measured data.

f) See Annex I for example emission mask plots.

Test Results:

Antenna 0(L patch), n261

MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	Band Edge [dBm]	SUM [dBm]
1	50 MHz	27534.84	Low	MIMO	QPSK	H	1/0	-29.128	-28.581
		27534.84	Low	MIMO	QPSK	V		-37.853	
		27534.84	Low	MIMO	QPSK	H	32/0	-25.549	-24.347
		27534.84	Low	MIMO	QPSK	V		-30.511	
		28319.52	High	MIMO	QPSK	H	1/31	-32.763	-26.513
		28319.52	High	MIMO	QPSK	V		-27.689	
		28319.52	High	MIMO	QPSK	H	32/0	-24.719	-20.498
		28319.52	High	MIMO	QPSK	V		-22.562	
	100 MHz	27559.32	Low	MIMO	QPSK	H	1/0	-28.121	-25.210
		27559.32	Low	MIMO	QPSK	V		-28.321	
		27559.32	Low	MIMO	QPSK	H	66/0	-28.756	-27.397
		27559.32	Low	MIMO	QPSK	V		-33.106	
		28292.16	High	MIMO	QPSK	H	1/65	-29.900	-28.514
		28292.16	High	MIMO	QPSK	V		-34.147	
		28292.16	High	MIMO	QPSK	H	66/0	-28.050	-23.446
		28292.16	High	MIMO	QPSK	V		-25.293	
2	50 MHz	27559.84	Low	MIMO	QPSK	H	1/0	-22.048	-21.106
		27559.84	Low	MIMO	QPSK	V		-28.207	
		27559.84	Low	MIMO	QPSK	H	32/0	-32.033	-30.571
		27559.84	Low	MIMO	QPSK	V		-36.011	
		28294.52	High	MIMO	QPSK	H	1/31	-26.597	-21.201
		28294.52	High	MIMO	QPSK	V		-22.680	
		28294.52	High	MIMO	QPSK	H	32/0	-32.574	-30.073
		28294.52	High	MIMO	QPSK	V		-33.661	
	100 MHz	27609.32	Low	MIMO	QPSK	H	1/0	-20.778	-19.716
		27609.32	Low	MIMO	QPSK	V		-26.355	
		27609.32	Low	MIMO	QPSK	H	66/0	-34.893	-33.333
		27609.32	Low	MIMO	QPSK	V		-38.535	
		28242.16	High	MIMO	QPSK	H	1/65	-25.553	-21.030
		28242.16	High	MIMO	QPSK	V		-22.920	
		28242.16	High	MIMO	QPSK	H	66/0	-37.464	-33.938
		28242.16	High	MIMO	QPSK	V		-36.487	

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MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	Band Edge [dBm]	SUM [dBm]
1	50 MHz	27534.84	Low	MIMO	QPSK	H	1/0	-27.558	-25.002
		27534.84	Low	MIMO	QPSK	V		-28.520	
		27534.84	Low	MIMO	QPSK	H	32/0	-24.005	-20.940
		27534.84	Low	MIMO	QPSK	V		-23.897	
		28319.52	High	MIMO	QPSK	H	1/31	-27.522	-24.340
		28319.52	High	MIMO	QPSK	V		-27.185	
		28319.52	High	MIMO	QPSK	H	32/0	-26.317	-22.526
		28319.52	High	MIMO	QPSK	V		-24.875	
	100 MHz	27559.32	Low	MIMO	QPSK	H	1/0	-28.135	-25.339
		27559.32	Low	MIMO	QPSK	V		-28.575	
		27559.32	Low	MIMO	QPSK	H	66/0	-25.680	-23.430
		27559.32	Low	MIMO	QPSK	V		-27.363	
		28292.16	High	MIMO	QPSK	H	1/65	-28.102	-24.803
		28292.16	High	MIMO	QPSK	V		-27.543	
		28292.16	High	MIMO	QPSK	H	66/0	-28.516	-24.950
		28292.16	High	MIMO	QPSK	V		-27.468	
2	50 MHz	27559.84	Low	MIMO	QPSK	H	1/0	-18.193	-16.249
		27559.84	Low	MIMO	QPSK	V		-20.675	
		27559.84	Low	MIMO	QPSK	H	32/0	-29.607	-27.431
		27559.84	Low	MIMO	QPSK	V		-31.476	
		28294.52	High	MIMO	QPSK	H	1/31	-21.452	-19.787
		28294.52	High	MIMO	QPSK	V		-24.758	
		28294.52	High	MIMO	QPSK	H	32/0	-31.985	-30.348
		28294.52	High	MIMO	QPSK	V		-35.379	
	100 MHz	27609.32	Low	MIMO	QPSK	H	1/0	-16.815	**-14.452**※
		27609.32	Low	MIMO	QPSK	V		-18.223	
		27609.32	Low	MIMO	QPSK	H	66/0	-30.448	-28.189
		27609.32	Low	MIMO	QPSK	V		-32.108	
		28242.16	High	MIMO	QPSK	H	1/65	-22.140	-20.574
		28242.16	High	MIMO	QPSK	V		-25.764	
		28242.16	High	MIMO	QPSK	H	66/0	-34.992	-32.761
		28242.16	High	MIMO	QPSK	V		-36.721	

※**Note:** For Band Edge used uncorrelated gain to comply conductive limit.
Band Edge(-14.452 dBm) - Peak Ant. Gain(10.50 (dBi)) = **-24.952 dBm**

Antenna 0(L patch), n260

MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	Band Edge [dBm]	SUM [dBm]
1	50 MHz	37027.32	Low	MIMO	QPSK	H	1/0	-32.013	-26.809
		37027.32	Low	MIMO	QPSK	V		-28.369	
		37027.32	Low	MIMO	QPSK	H	32/0	-26.936	-23.575
		37027.32	Low	MIMO	QPSK	V		-26.261	
		39966.24	High	MIMO	QPSK	H	1/31	-26.645	-22.745
		39966.24	High	MIMO	QPSK	V		-25.018	
		39966.24	High	MIMO	QPSK	H	32/0	-21.555	-18.584
		39966.24	High	MIMO	QPSK	V		-21.633	
	100 MHz	37051.80	Low	MIMO	QPSK	H	1/0	-25.956	-23.778
		37051.80	Low	MIMO	QPSK	V		-27.819	
		37051.80	Low	MIMO	QPSK	H	66/0	-26.713	-24.533
		37051.80	Low	MIMO	QPSK	V		-28.571	
		39949.92	High	MIMO	QPSK	H	1/65	-13.627	**-11.307**※
		39949.92	High	MIMO	QPSK	V		-15.138	
		39949.92	High	MIMO	QPSK	H	66/0	-22.085	-19.402
		39949.92	High	MIMO	QPSK	V		-22.766	
2	50 MHz	37052.32	Low	MIMO	QPSK	H	1/0	-27.152	-24.292
		37052.32	Low	MIMO	QPSK	V		-27.458	
		37052.32	Low	MIMO	QPSK	H	32/0	-34.847	-32.477
		37052.32	Low	MIMO	QPSK	V		-36.239	
		39941.24	High	MIMO	QPSK	H	1/31	-18.961	-17.012
		39941.24	High	MIMO	QPSK	V		-21.430	
		39941.24	High	MIMO	QPSK	H	32/0	-27.629	-25.538
		39941.24	High	MIMO	QPSK	V		-29.715	
	100 MHz	37101.80	Low	MIMO	QPSK	H	1/0	-30.082	-27.784
		37101.80	Low	MIMO	QPSK	V		-31.647	
		37101.80	Low	MIMO	QPSK	H	66/0	-39.267	-36.440
		37101.80	Low	MIMO	QPSK	V		-39.641	
		39899.92	High	MIMO	QPSK	H	1/65	-21.993	-19.818
		39899.92	High	MIMO	QPSK	V		-23.863	
		39899.92	High	MIMO	QPSK	H	66/0	-33.907	-31.473
		39899.92	High	MIMO	QPSK	V		-35.148	

※**Note:** Limit: -5 dBm

Antenna 1(K patch), n260

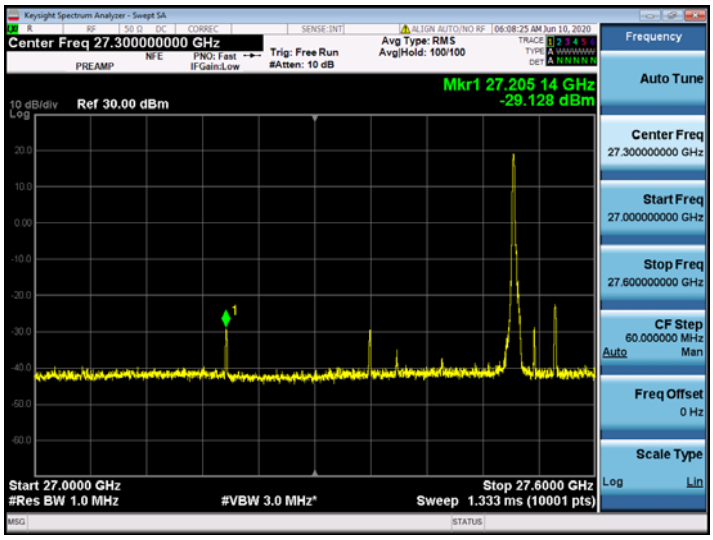
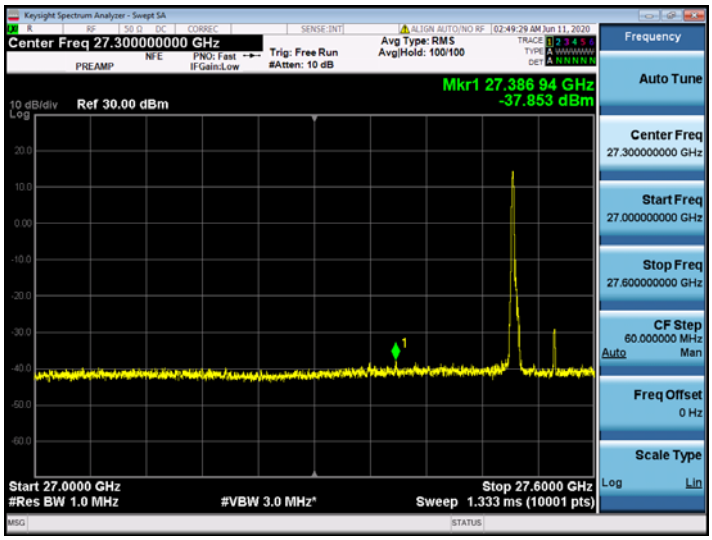
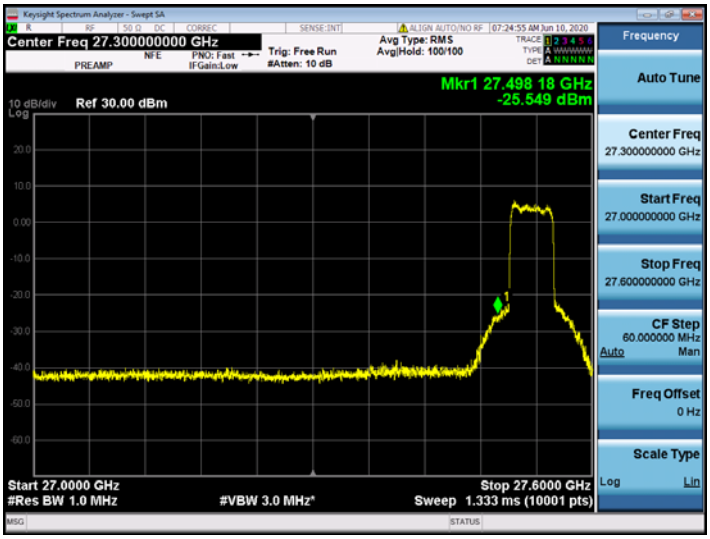
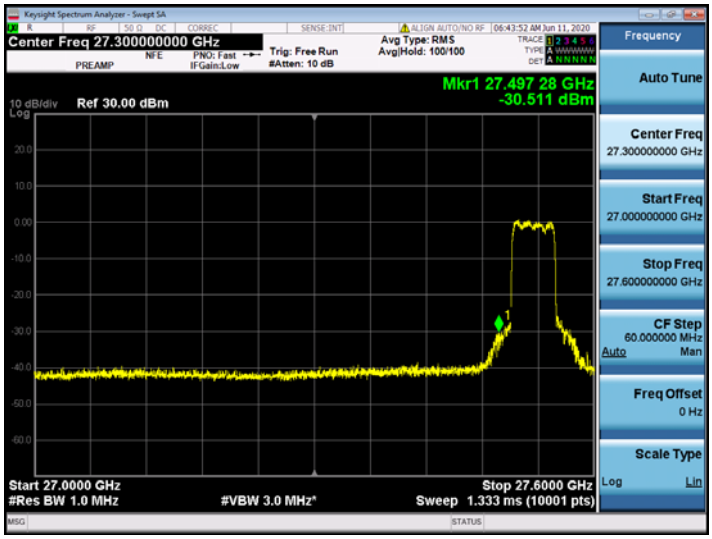
MIMO

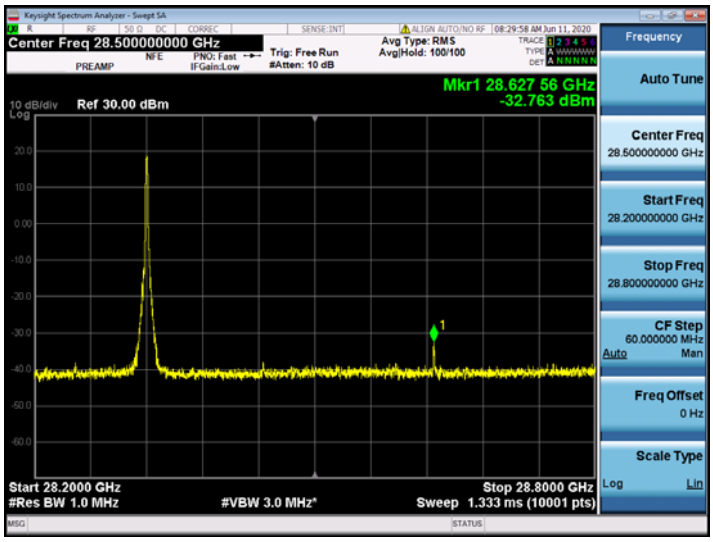
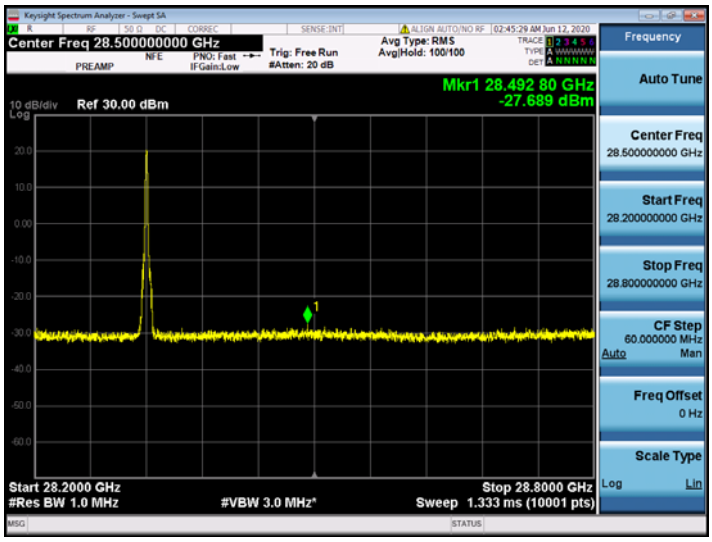
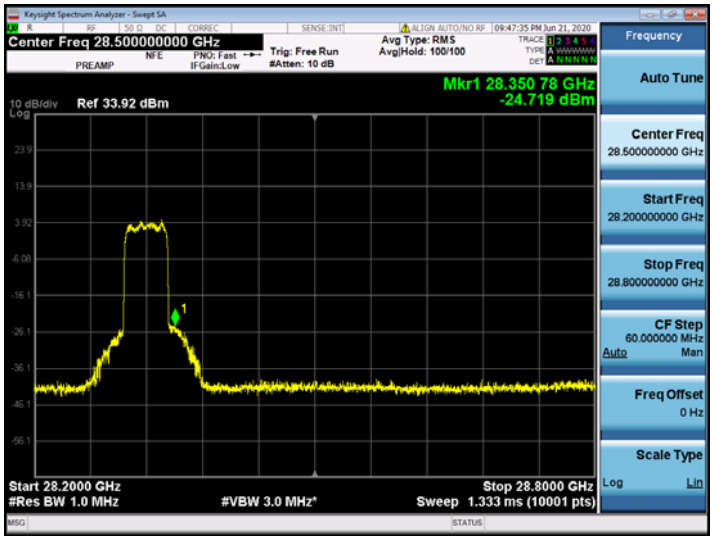
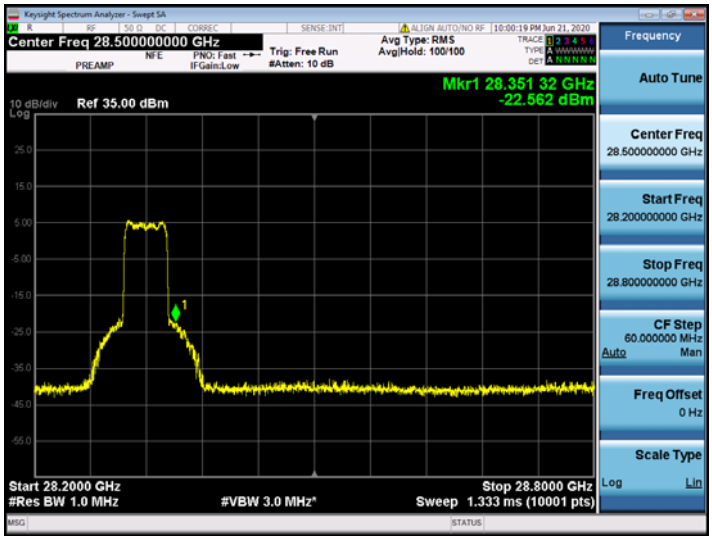
CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	Band Edge [dBm]	SUM [dBm]
1	50 MHz	37027.32	Low	MIMO	QPSK	H	1/0	-26.916	-24.317
		37027.32	Low	MIMO	QPSK	V		-27.781	
		37027.32	Low	MIMO	QPSK	H	32/0	-26.793	-23.855
		37027.32	Low	MIMO	QPSK	V		-26.939	
		39966.24	High	MIMO	QPSK	H	1/31	-26.596	-23.166
		39966.24	High	MIMO	QPSK	V		-25.794	
		39966.24	High	MIMO	QPSK	H	32/0	-23.273	-19.982
		39966.24	High	MIMO	QPSK	V		-22.729	
	100 MHz	37051.80	Low	MIMO	QPSK	H	1/0	-24.083	-21.647
		37051.80	Low	MIMO	QPSK	V		-25.320	
		37051.80	Low	MIMO	QPSK	H	66/0	-27.706	-23.386
		37051.80	Low	MIMO	QPSK	V		-25.392	
		39949.92	High	MIMO	QPSK	H	1/65	-17.245	**-13.206**※
		39949.92	High	MIMO	QPSK	V		-15.386	
		39949.92	High	MIMO	QPSK	H	66/0	-23.252	-20.207
		39949.92	High	MIMO	QPSK	V		-23.182	
2	50 MHz	37052.32	Low	MIMO	QPSK	H	1/0	-34.042	-31.655
		37052.32	Low	MIMO	QPSK	V		-35.393	
		37052.32	Low	MIMO	QPSK	H	32/0	-38.125	-34.202
		37052.32	Low	MIMO	QPSK	V		-36.459	
		39941.24	High	MIMO	QPSK	H	1/31	-22.814	-22.136
		39941.24	High	MIMO	QPSK	V		-30.539	
		39941.24	High	MIMO	QPSK	H	32/0	-33.437	-30.520
		39941.24	High	MIMO	QPSK	V		-33.626	
	100 MHz	37101.80	Low	MIMO	QPSK	H	1/0	-31.268	-28.980
		37101.80	Low	MIMO	QPSK	V		-32.857	
		37101.80	Low	MIMO	QPSK	H	66/0	-38.560	-35.004
		37101.80	Low	MIMO	QPSK	V		-37.529	
		39899.92	High	MIMO	QPSK	H	1/65	-25.485	-22.003
		39899.92	High	MIMO	QPSK	V		-24.588	
		39899.92	High	MIMO	QPSK	H	66/0	-34.281	-31.364
		39899.92	High	MIMO	QPSK	V		-34.469	

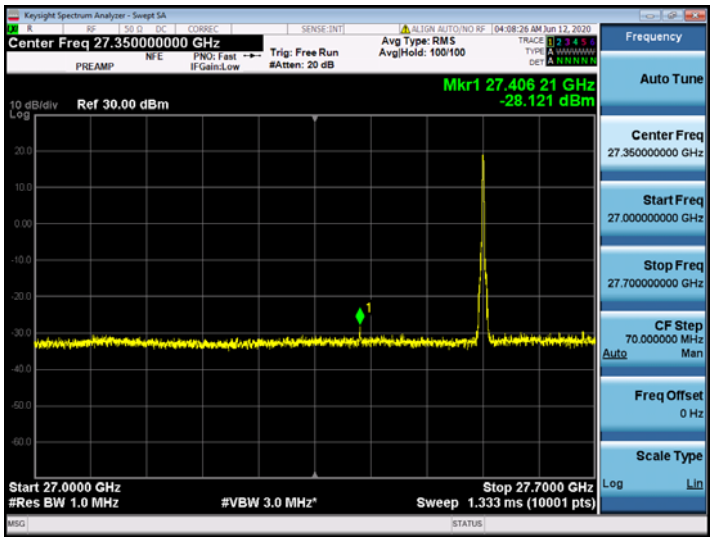
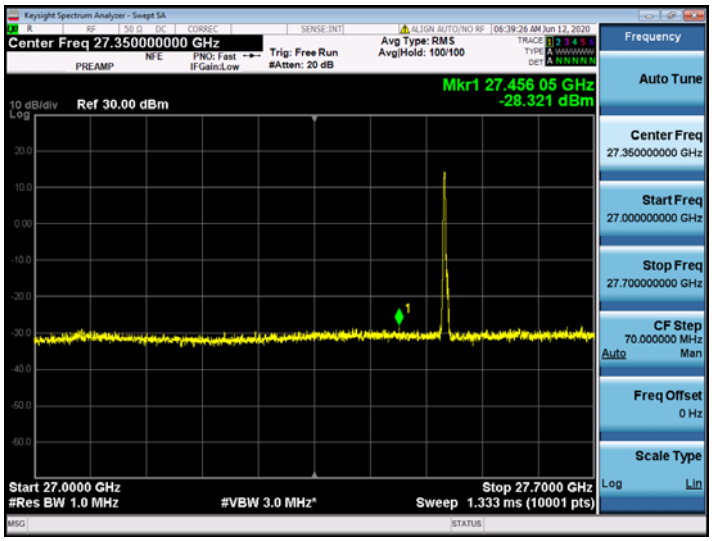
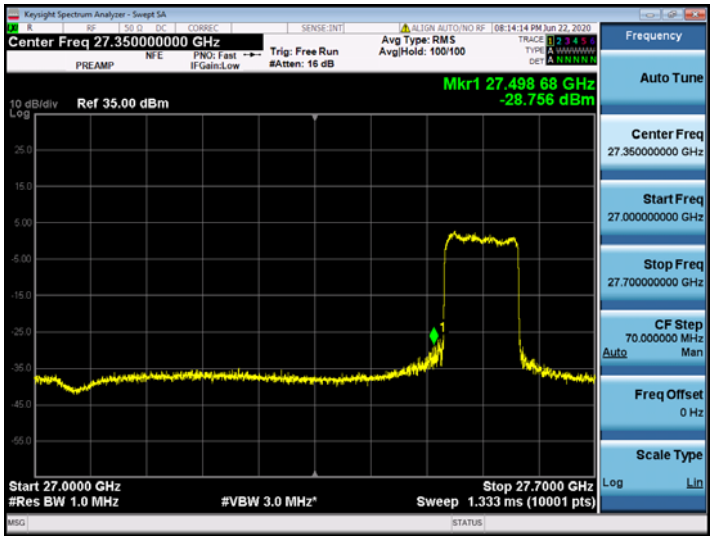
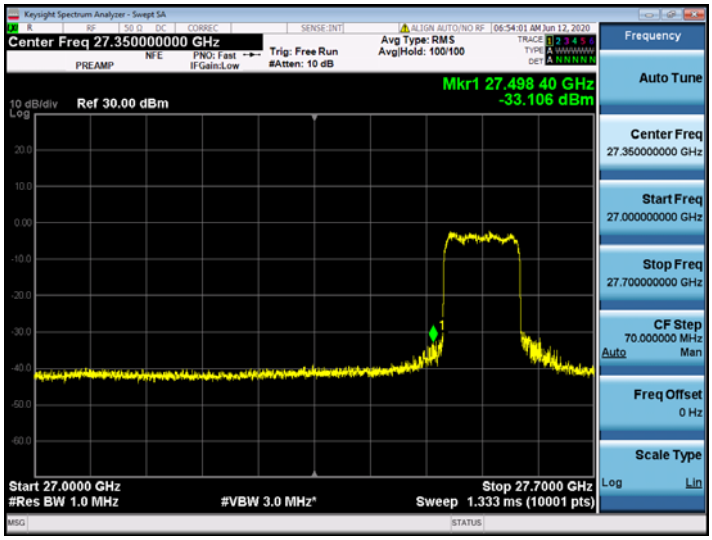
※**Note:** Limit: -5 dBm

Plot data of Band Edge

5. Antenna 0(Lpatch), n261

50 MHz, 1CC MIMO	
	
	

50 MHz, 1CC MIMO	
	
	

100 MHz, 1CC MIMO	
	
	

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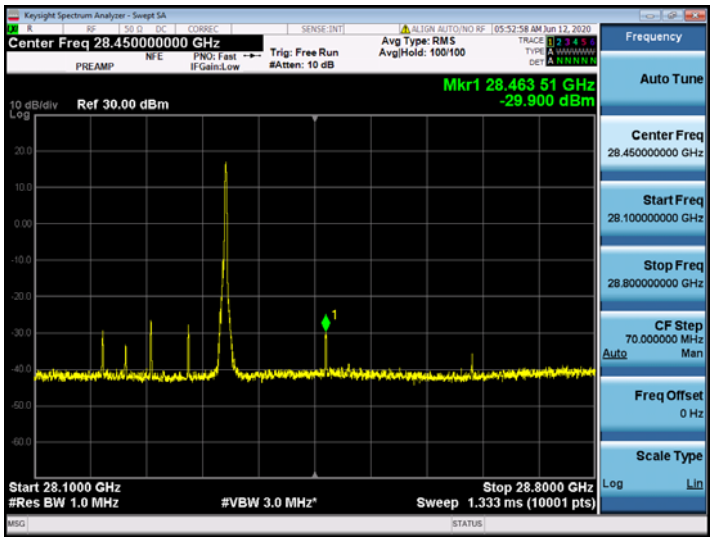
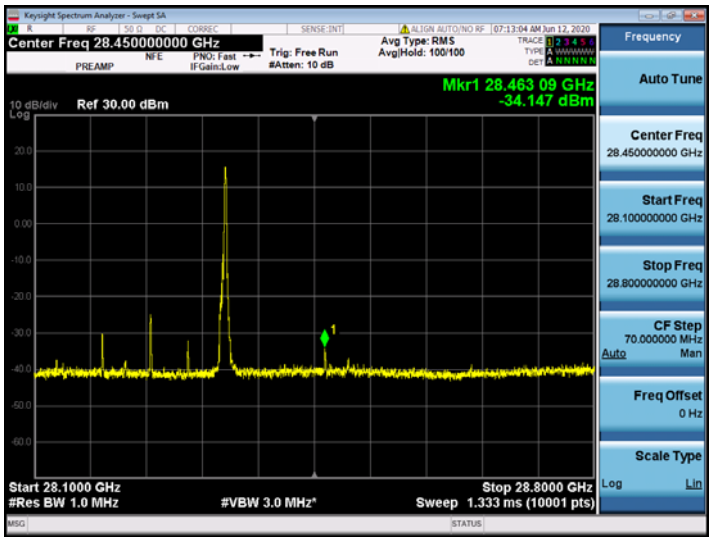
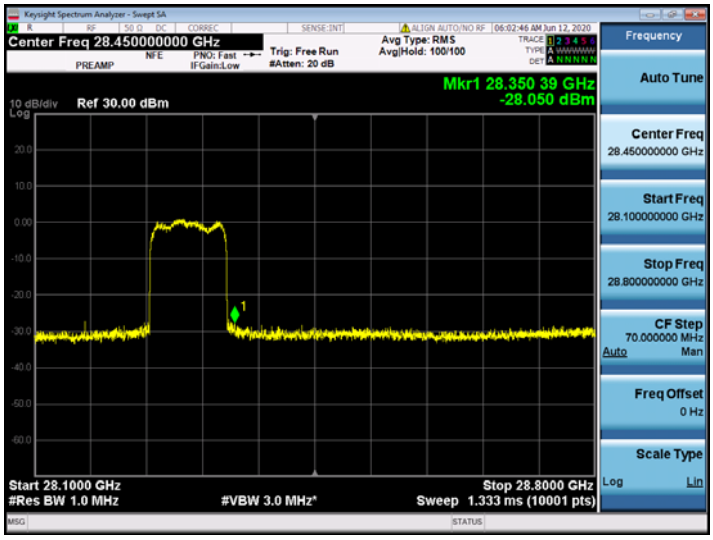
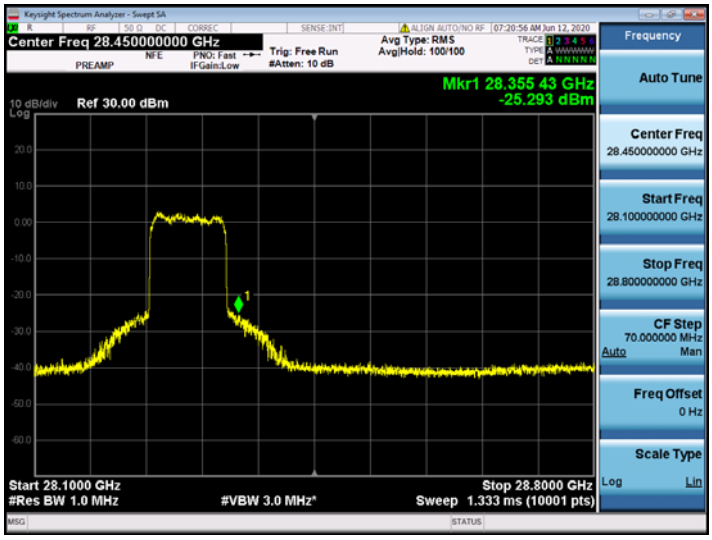
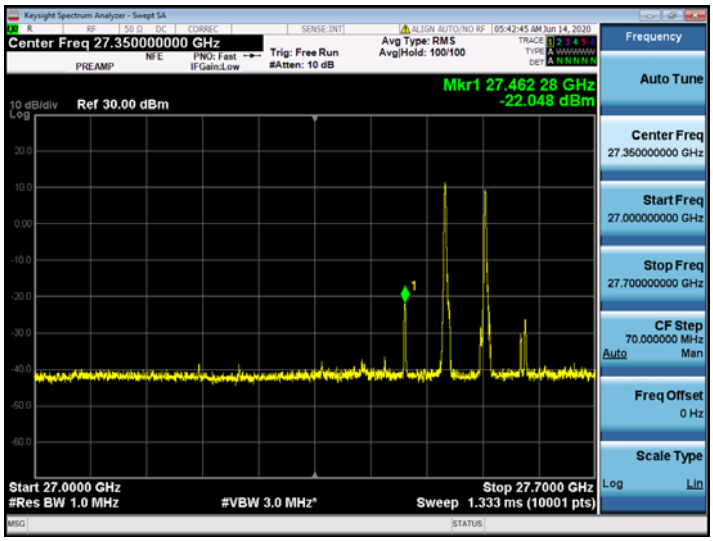
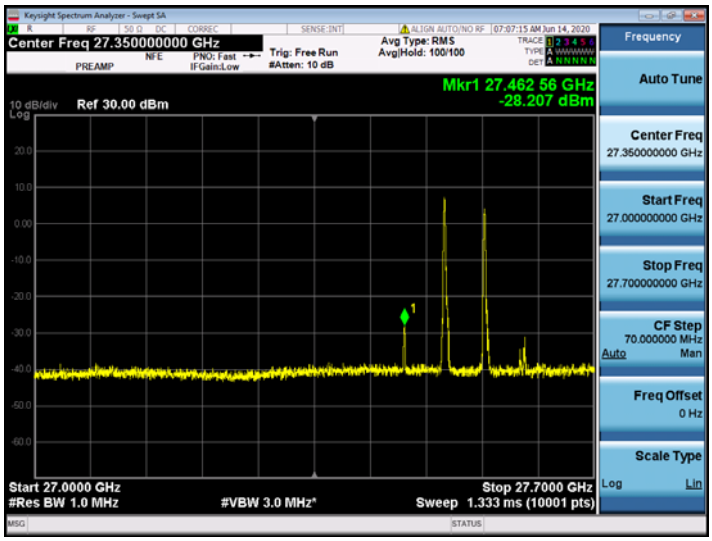
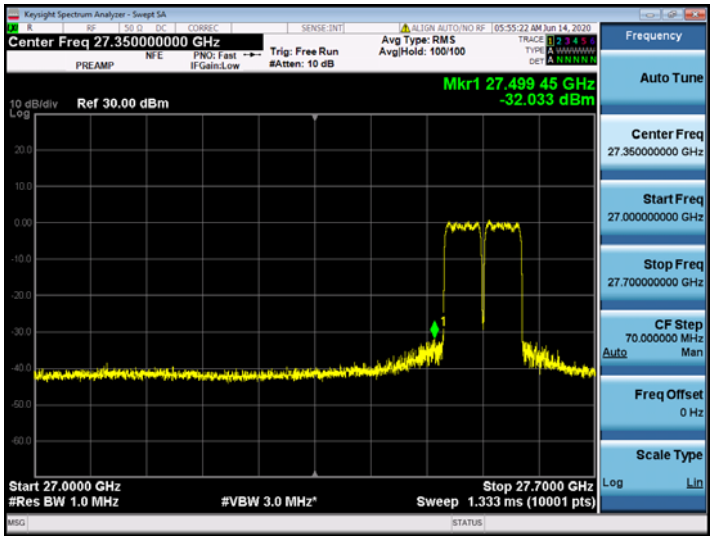
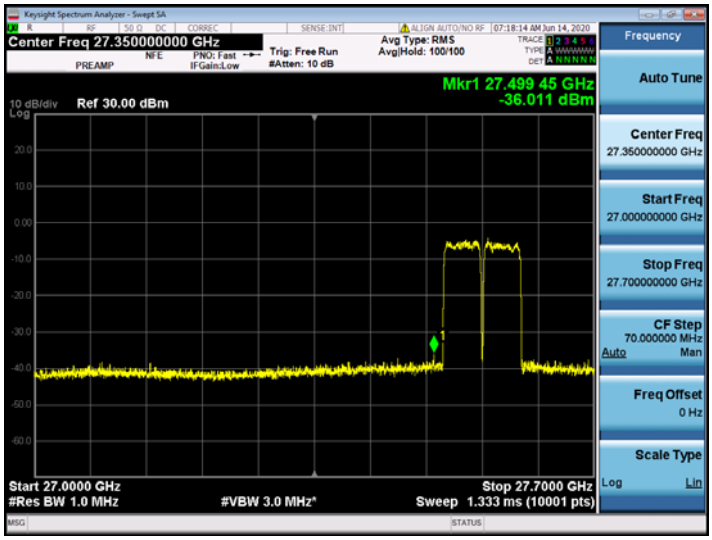
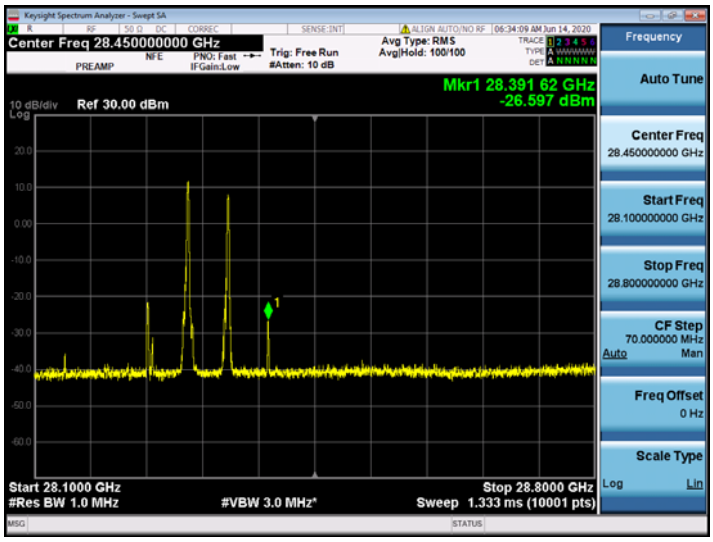
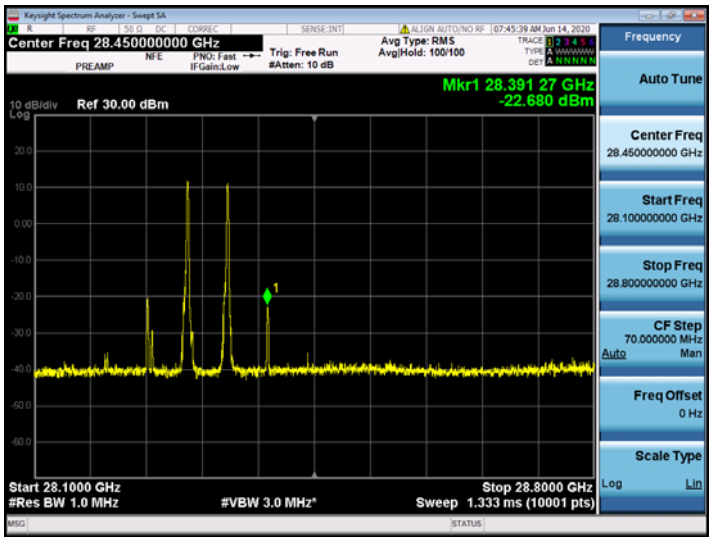
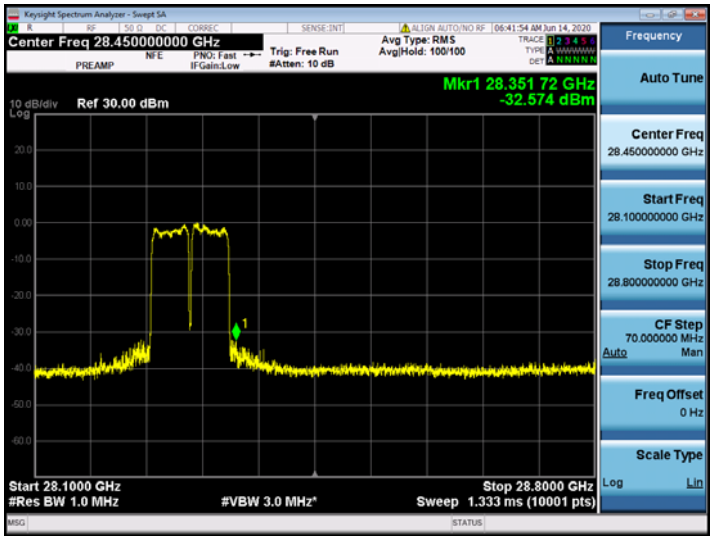
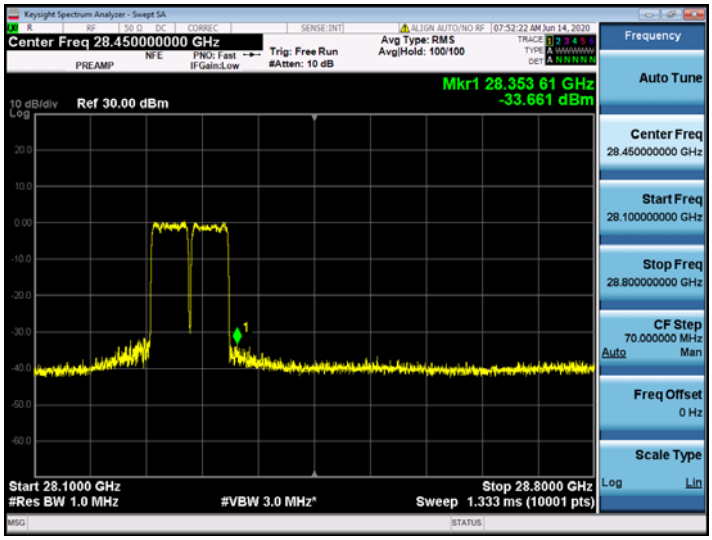
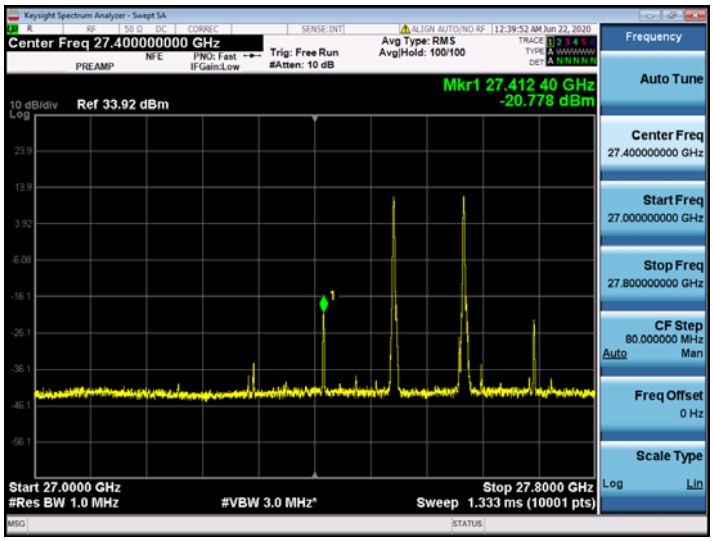
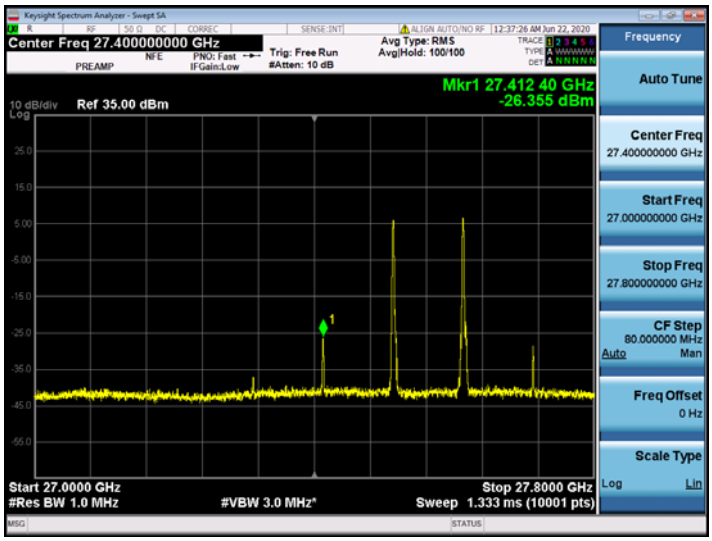
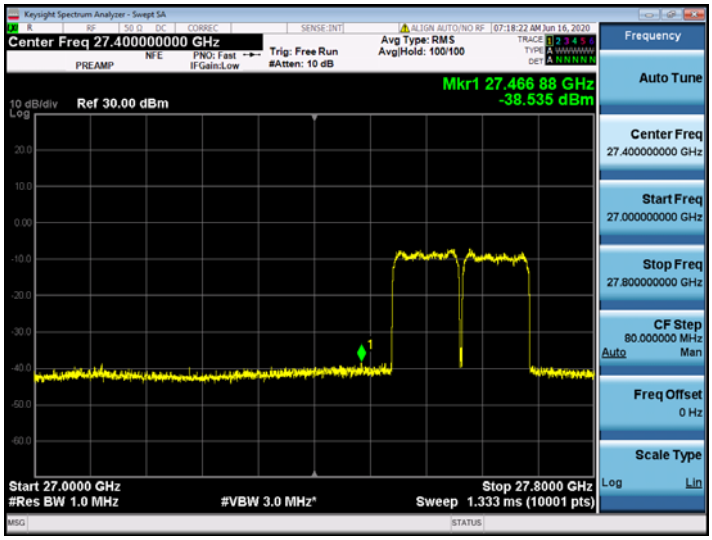
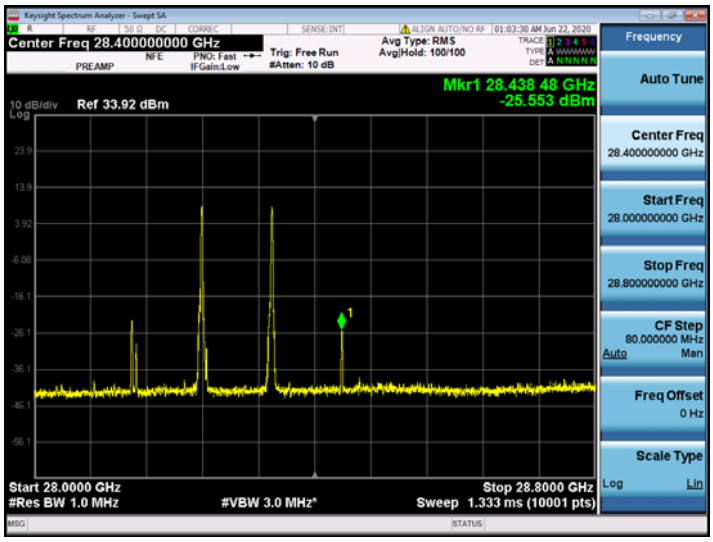
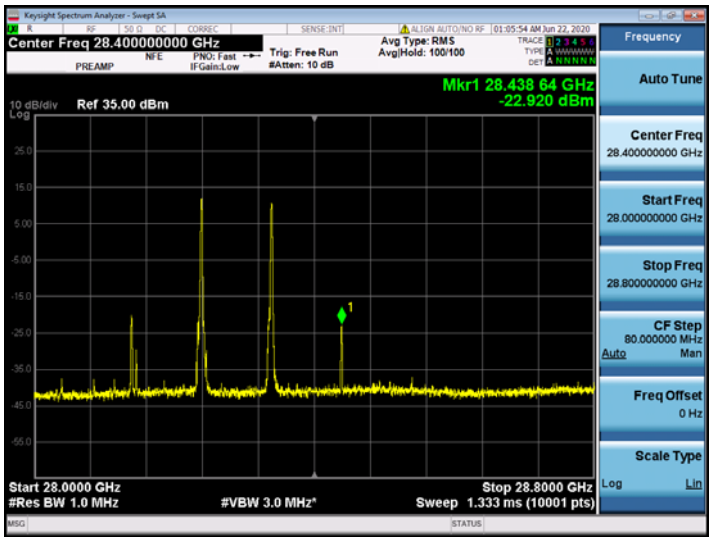
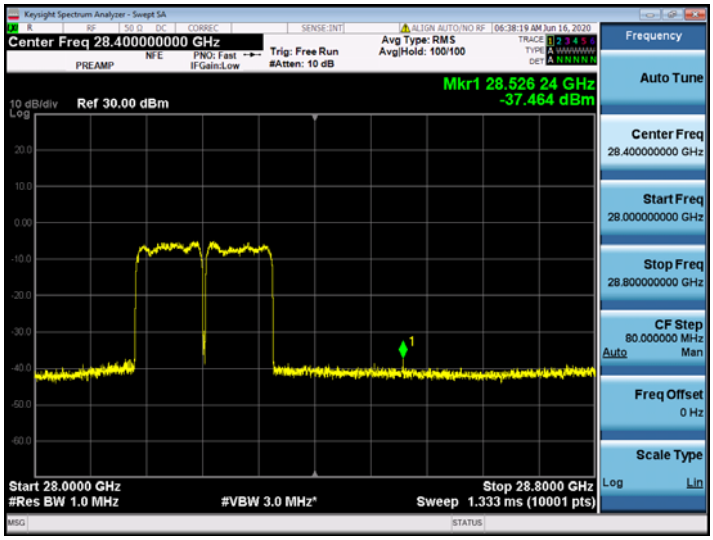
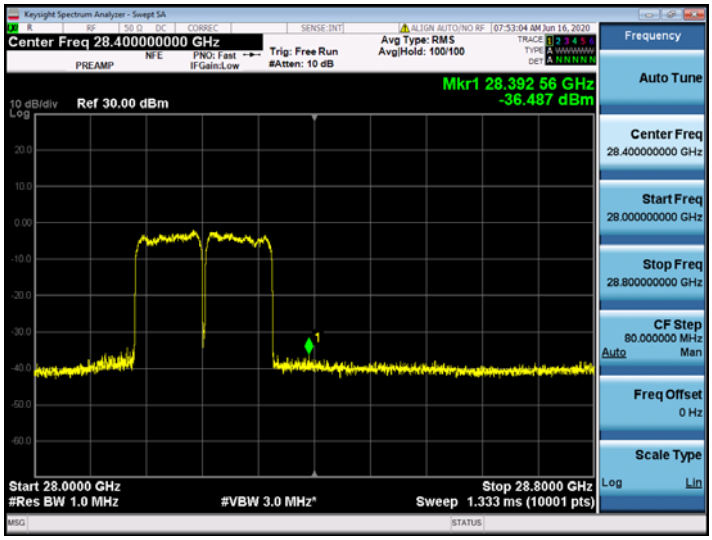
	
	

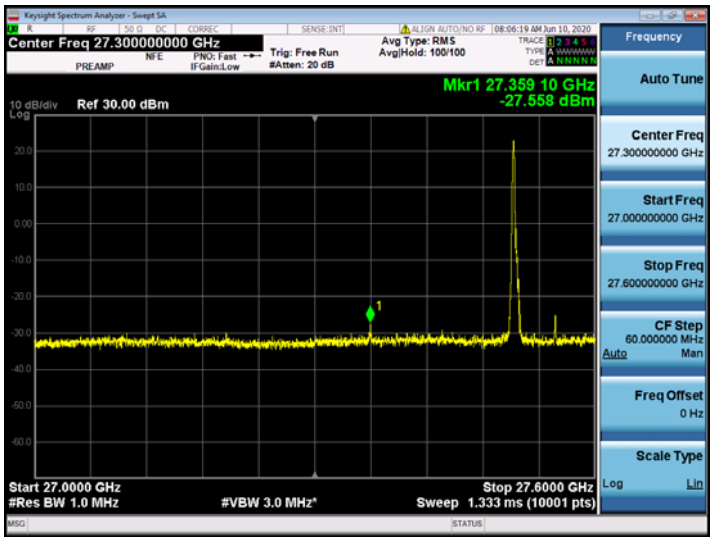
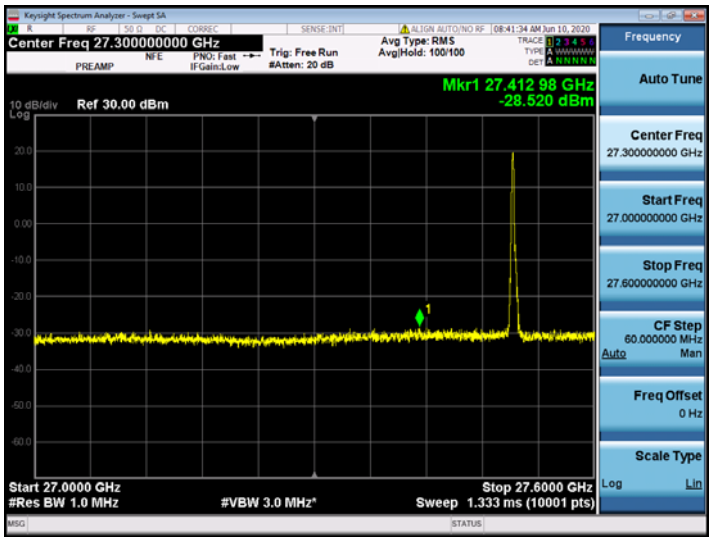
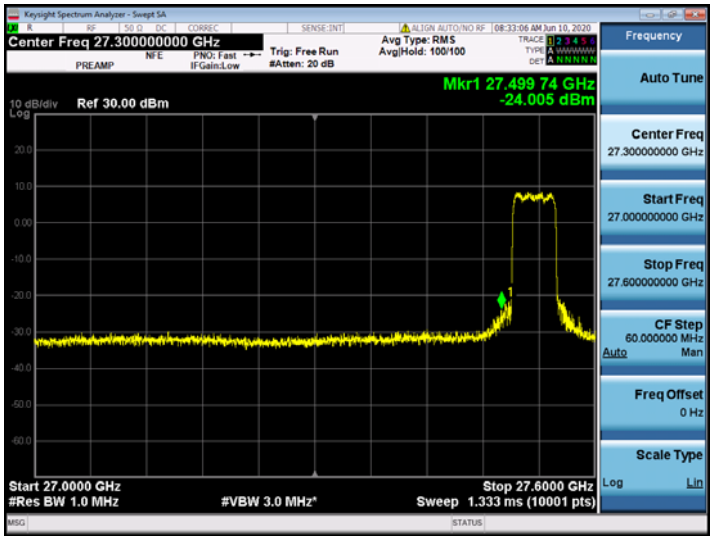
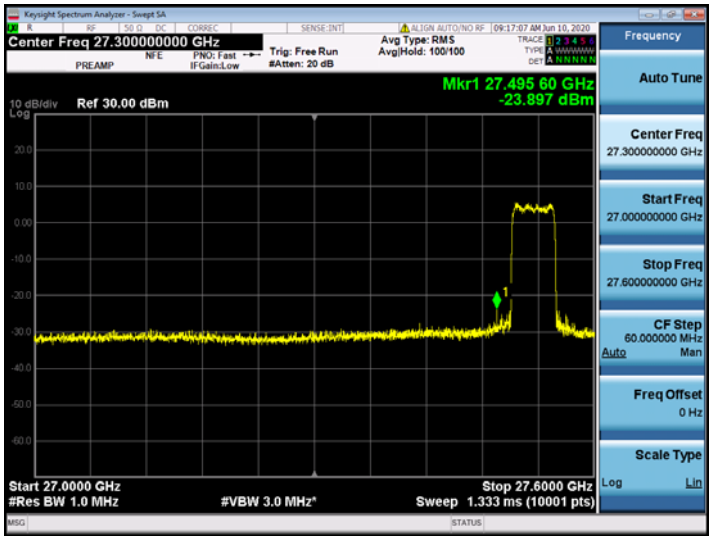
50 MHz, 2CC MIMO	
	
	

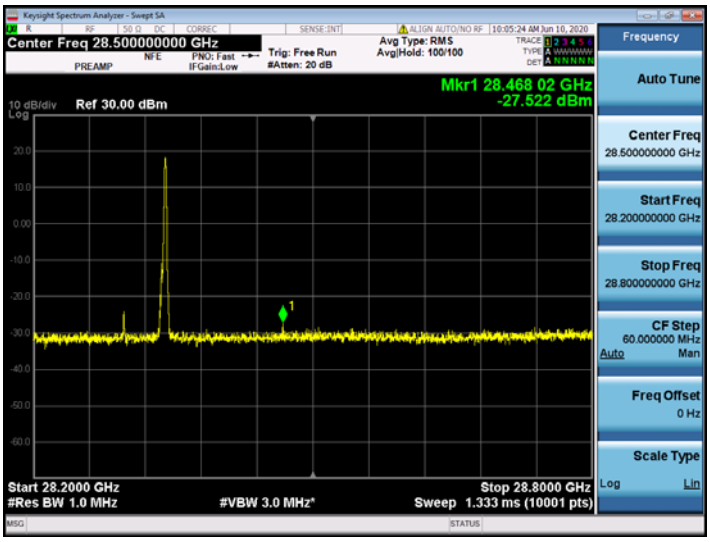
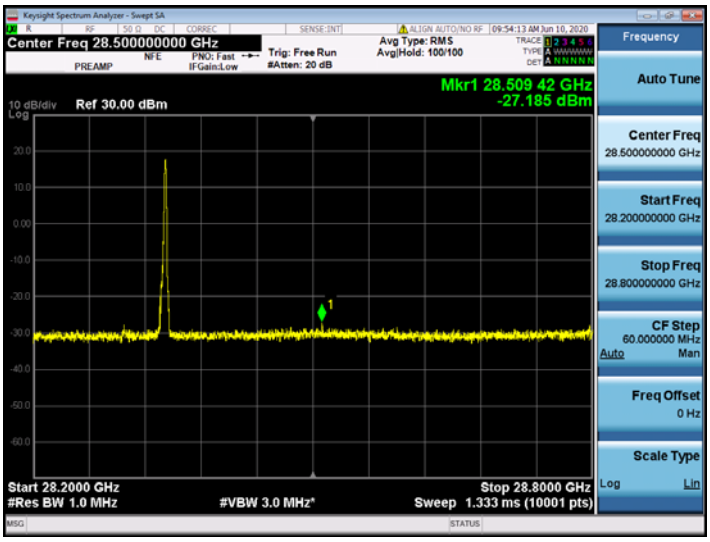
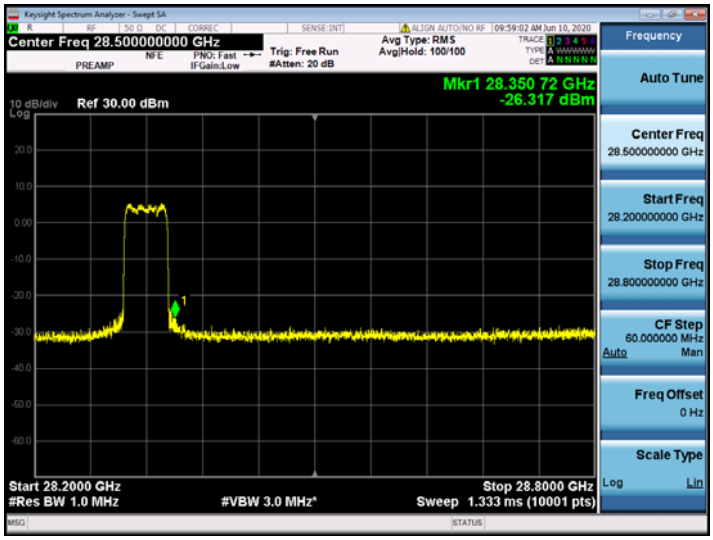
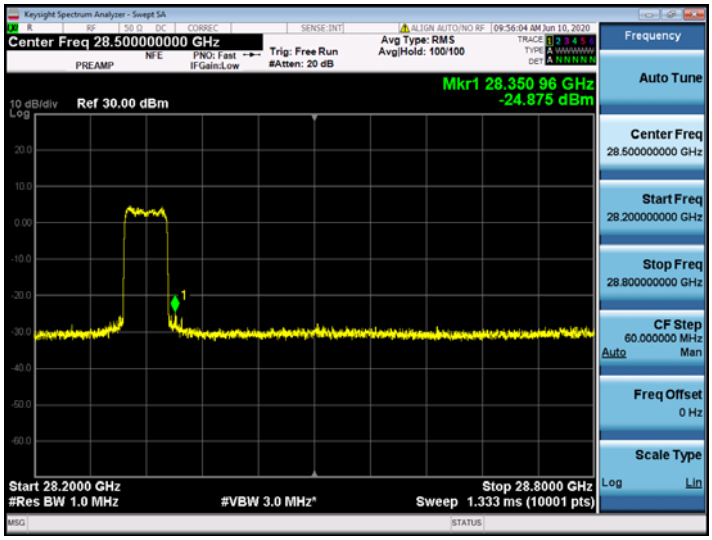
50 MHz, 2CC MIMO	
	
	

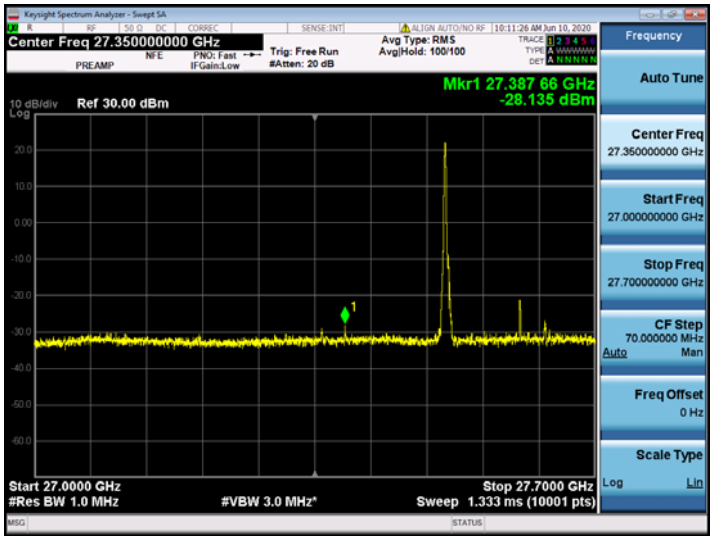
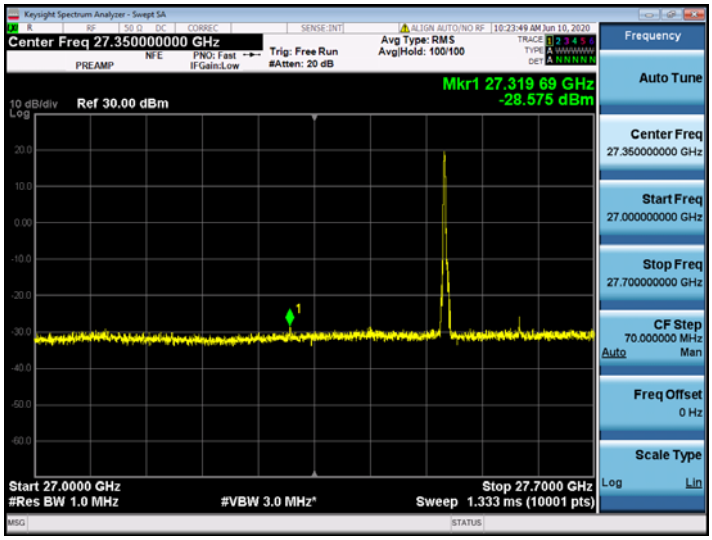
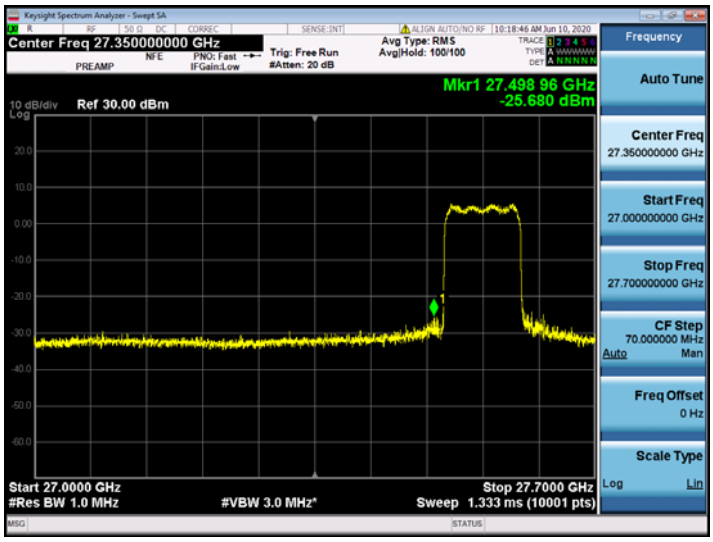
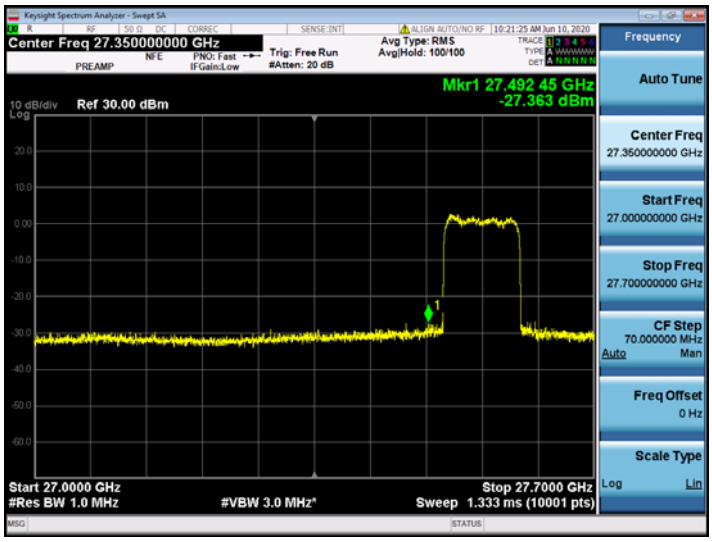
100 MHz, 2CC MIMO	
	
	

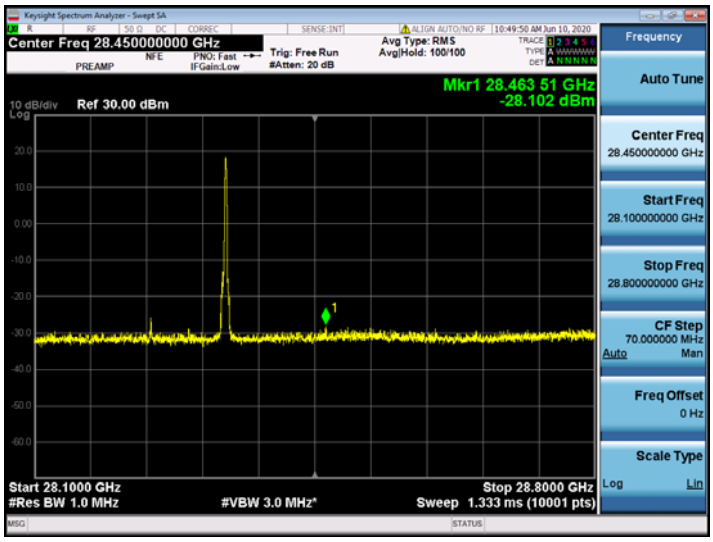
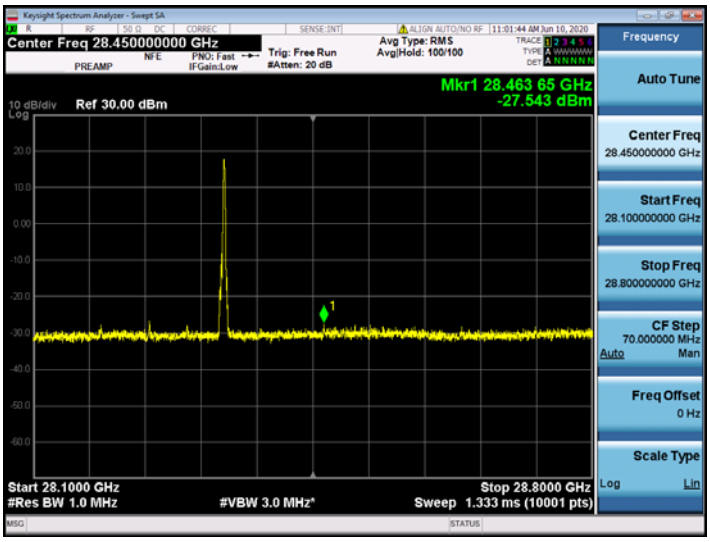
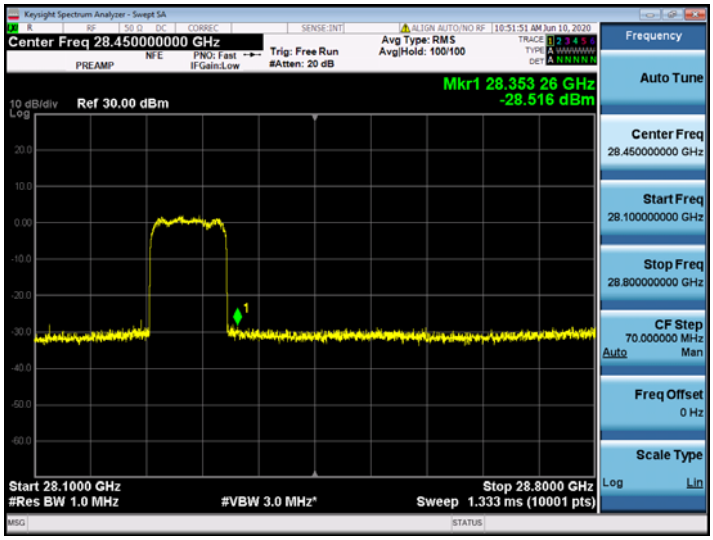
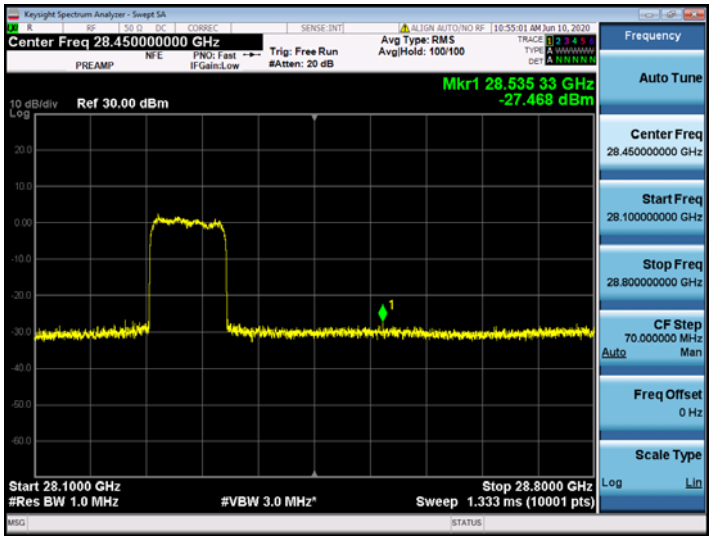
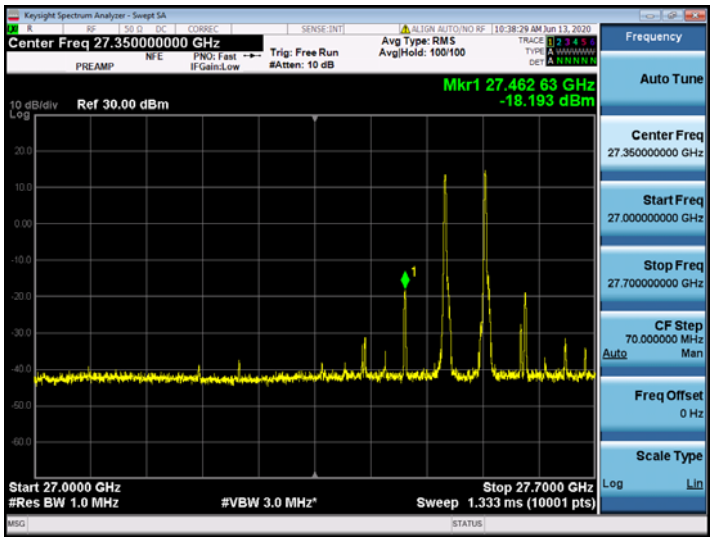
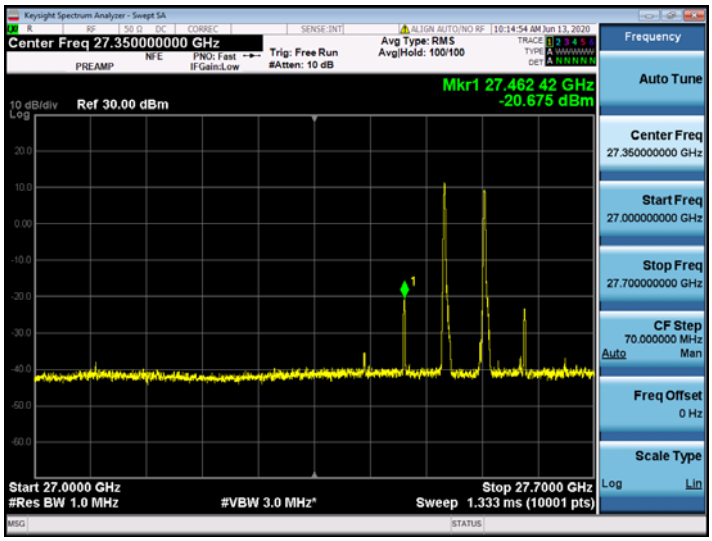
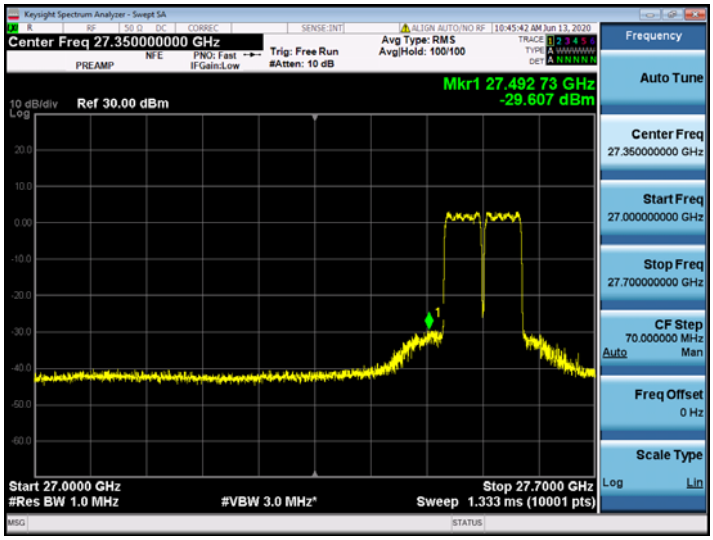
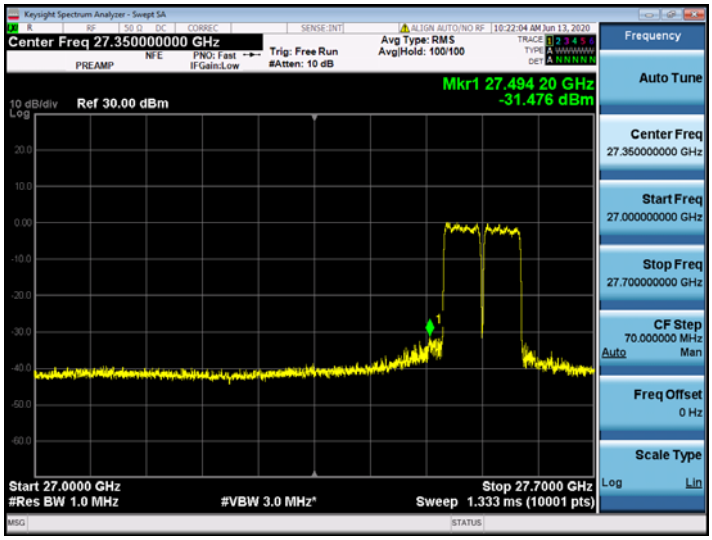
100 MHz, 2CC MIMO	
	
	

6. Antenna 1(Kpatch), n261

50 MHz, 1CC MIMO	
	
	

50 MHz, 1CC MIMO	
	
	

100 MHz, 1CC MIMO	
	
	

100 MHz, 1CC MIMO	
	
	

50 MHz, 2CC MIMO