11AC40MIMO_Ant1_5755

11AC40MIMO_Ant2_5755

11AC40MIMO_Ant3_5755

11AC40MIMO_Ant4_5755

11AC40MIMO_Ant1_5795

11AC40MIMO_Ant2_5795

11AC40MIMO_Ant3_5795

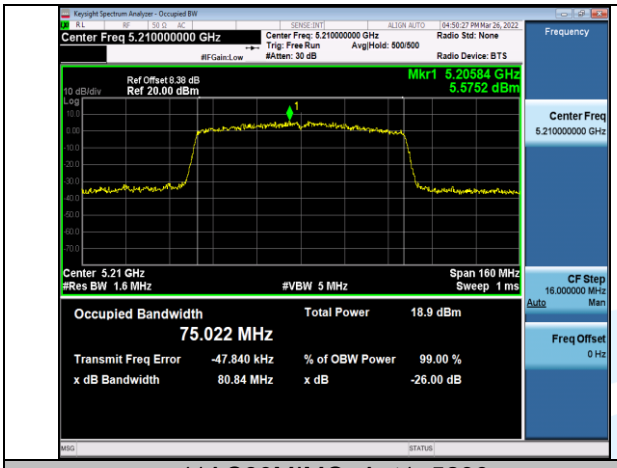
11AC40MIMO_Ant4_5795

11AC80MIMO_Ant1_5210

11AC80MIMO_Ant2_5210

11AC80MIMO_Ant3_5210

11AC80MIMO_Ant4_5210



11AC80MIMO_Ant1_5290

11AC80MIMO_Ant2_5290

11AC80MIMO_Ant3_5290

11AC80MIMO_Ant4_5290

11AC80MIMO_Ant1_5530

11AC80MIMO_Ant2_5530

11AC80MIMO_Ant3_5530

11AC80MIMO_Ant4_5530

11AC80MIMO_Ant1_5610

11AC80MIMO_Ant2_5610

11AC80MIMO_Ant3_5610

11AC80MIMO_Ant4_5610

11AC80MIMO_Ant1_5775

11AC80MIMO_Ant2_5775

11AC80MIMO_Ant3_5775

11AC80MIMO_Ant4_5775

5.5 MAXIMUM CONDUCTED OUTPUT POWER OR E.I.R.P

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)
RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1

Test Method: KDB 789033 D02 v02r01 Section E.3.a (Method PM)

Limits: FCC 47 CFR Part 15 Subpart E

1. For the band 5.15-5.25 GHz.
   (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

   (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

   (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

   (iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is

professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Limits: RSS-247 Issue 2

1. **Frequency band 5150-5250 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

2. **Frequency band 5250-5350 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Additional requirements

In addition to the above requirements, devices shall comply with the following, where applicable:

a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:

i. -13 dBW/MHz for $0^o \leq \theta < 8^o$
ii. -13 − 0.716 (θ-8) dBW/MHz for $8^o \leq \theta < 40^o$
iii. -35.9 − 1.22 (θ-40) dBW/MHz for $40^o \leq \theta \leq 45^o$
iv. -42 dBW/MHz for $\theta > 45^o$

The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.

b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:

i. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or
ii. devices shall implement a method to permanently reduce their e.i.r.p. via a firmwarefeature in the event that the Department requires it. The test report must demonstratehow the device's power table can be updated to meet this firmware requirement. Themanufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

3. **Frequency bands 5470-5600 MHz and 5650-5725 MHz**
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4. **Frequency band 5725-5850 MHz**
The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices

operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

Test Procedure:

1. Connected the EUT's antenna port to measure device by 10dB attenuator.
2. Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of Tx on burst.

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:

Directional gain and the maximum output power limit:

Antenna Information:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Chain 3 Antenna Gain (dBi)
U-NII-1	4.50	5.00	3.00	3.50
U-NII-2A	4.50	5.00	3.00	3.50
U-NII-2C	4.50	5.00	3.00	3.50
U-NII-3	4.50	5.00	3.00	3.50

According to the list of antenna information above, antenna gains are not equal and the maximum antenna gain is 5.0 dBi.

According to KDB 662911VDO1 v02r01, for power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4; so the

Directional gain = GANT MAX + Array Gain = 5dBi < 6 dBi

So, the maximum output power limit does not need to be reduced.

According to KDB 662911VDO1 v02r01, for power spectral density (PSD) measurements on IEEE 802.11 devices, the

Array Gain = 10 log (NANT/NSS) dB;

So, the

Directional gain = GANT MAX + 10 log (NANT/NSS) = 5 + 10 log (4/1) = 11.02dBi > 6 dBi

So, the maximum power spectral density limit should be reduced (11.02 -6) dBi = 5.02 dBi.

Test Result:

For FCC 47 CFR Part 15 Subpart E (U-NII-1):

Test Mode	Antenna	Channel	POWER [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	18.65	30	PASS
	Ant2		18.5		PASS
	Ant3		18.74		PASS
	Ant4		18.26		PASS
	Ant1	5220	21.06		PASS
	Ant2		21.62		PASS
	Ant3		21.44		PASS
	Ant4		19.91		PASS
	Ant1	5240	21.59		PASS
	Ant2		22.04		PASS
	Ant3		21.71		PASS
	Ant4		20.27		PASS
11N20MIMO	Ant1	5180	15.74	30	PASS
	Ant2		15.37		PASS
	Ant3		15.64		PASS
	Ant4		15.43		PASS
	total		21.57		PASS
	Ant1	5220	15.87		PASS
	Ant2		15.26		PASS
	Ant3		15.48		PASS
	Ant4		15.38		PASS
	total		21.52		PASS
	Ant1	5240	15.9		PASS
	Ant2		15.28		PASS
	Ant3		15.72		PASS
	Ant4		15.57		PASS
	total		21.64		PASS
11N40MIMO	Ant1	5190	13.62	30	PASS
	Ant2		13.32		PASS
	Ant3		13.53		PASS
	Ant4		13.36		PASS
	total		19.48		PASS
	Ant1	5230	17.91		PASS
	Ant2		17.57		PASS
	Ant3		17.61		PASS
	Ant4		17.65		PASS
	total		23.71		PASS
11AC20MIMO	Ant1	5180	15.27	30	PASS
	Ant2		15.04		PASS
	Ant3		15.35		PASS

	Ant4		15.23		PASS
	total		21.24		PASS
	Ant1	5220	15.32		PASS
	Ant2		14.69		PASS
	Ant3		15.1		PASS
	Ant4		15.05		PASS
	total		21.07		PASS
	Ant1	5240	15.93		PASS
	Ant2		15.34		PASS
	Ant3		15.7		PASS
	Ant4		15.7		PASS
	total		21.69		PASS
11AC40MIMO	Ant1	5190	13.8	30	PASS
	Ant2		13.61		PASS
	Ant3		13.83		PASS
	Ant4		13.71		PASS
	total		19.76		PASS
	Ant1	5230	13.1		PASS
	Ant2		12.52		PASS
	Ant3		12.9		PASS
	Ant4		12.68		PASS
	total		18.83		PASS
11AC80MIMO	Ant1	5210	11.03	30	PASS
	Ant2		10.47		PASS
	Ant3		11.12		PASS
	Ant4		10.37		PASS
	total		16.78		PASS

FOR RSS-247 Issue 2 and FCC 47 CFR Part 15 Subpart E (Excluding Band U-NII-1 for FCC):

Test Mode	Antenna	Channel	POWER [dBm]	Conducted Limit [dBm]	e.i.r.p. [dBm]	e.i.r.p. Limit [dBm]	Verdict
11A	Ant1	5180	10.19	---	14.69	22.30	PASS
	Ant2		9.56	---	14.56	22.26	PASS
	Ant3		10.98	---	13.98	22.26	PASS
	Ant4		10.38	---	13.88	22.23	PASS
	Ant1	5220	10.26	---	14.76	22.30	PASS
	Ant2		9.53	---	14.53	22.26	PASS
	Ant3		10.93	---	13.93	22.26	PASS
	Ant4		10.53	---	14.03	22.24	PASS
	Ant1	5240	10.33	---	14.83	22.29	PASS
	Ant2		9.59	---	14.59	22.26	PASS
	Ant3		11.02	---	14.02	22.27	PASS
	Ant4		10.59	---	14.09	22.23	PASS
	Ant1	5260	15.55	23.32	20.05	29.32	PASS
	Ant2		15.32	23.29	20.32	29.29	PASS
	Ant3		15.53	23.32	18.53	29.32	PASS
	Ant4		15.21	23.26	18.71	29.26	PASS
	Ant1	5300	15.83	23.33	20.33	29.33	PASS
	Ant2		15.59	23.28	20.59	29.28	PASS
	Ant3		15.7	23.29	18.70	29.29	PASS
	Ant4		15.64	23.25	19.14	29.25	PASS
	Ant1	5320	15.67	23.31	20.17	29.31	PASS
	Ant2		15.56	23.29	20.56	29.29	PASS
	Ant3		15.59	23.30	18.59	29.30	PASS
	Ant4		15.57	23.25	19.07	29.25	PASS
	Ant1	5500	15.65	23.33	20.15	29.33	PASS
	Ant2		15.53	23.29	20.53	29.29	PASS
	Ant3		15.76	23.30	18.76	29.30	PASS
	Ant4		15.77	23.27	19.27	29.27	PASS
	Ant1	5580	15.98	23.33	20.48	29.33	PASS
	Ant2		15.74	23.30	20.74	29.30	PASS
	Ant3		15.9	23.32	18.90	29.32	PASS
	Ant4		15.73	23.26	19.23	29.26	PASS
	Ant1	5700	15.7	23.36	20.20	29.36	PASS
	Ant2		15.26	23.30	20.26	29.30	PASS
	Ant3		14.54	23.32	17.54	29.32	PASS
	Ant4		15.74	23.26	19.24	29.26	PASS
	Ant1	5745	20.08	30.00	24.58	---	PASS
	Ant2		20.96	30.00	25.96	---	PASS
	Ant3		19.59	30.00	22.59	---	PASS
	Ant4		20.56	30.00	24.06	---	PASS
	Ant1	5785	19.65	30.00	24.15	---	PASS

	Ant2		20.74	30.00	25.74	---	PASS
	Ant3		19.92	30.00	22.92	---	PASS
	Ant4		21.3	30.00	24.80	---	PASS
	Ant1	5825	19.88	30.00	24.38	---	PASS
	Ant2		20.65	30.00	25.65	---	PASS
	Ant3		19.33	30.00	22.33	---	PASS
	Ant4		20.67	30.00	24.17	---	PASS
11N20MIMO	Ant1	5180	-1.93	---	2.57	22.53	PASS
	Ant2		-1.65	---	3.35	22.50	PASS
	Ant3		-1.7	---	1.30	22.51	PASS
	Ant4		-2.29	---	1.21	22.51	PASS
	total		4.14	---	9.14	22.50	PASS
	Ant1	5220	-3.2	---	1.30	22.53	PASS
	Ant2		-3.01	---	1.99	22.50	PASS
	Ant3		-3.41	---	-0.41	22.51	PASS
	Ant4		-3.73	---	-0.23	22.52	PASS
	total		2.69	---	7.69	22.50	PASS
	Ant1	5240	-2.96	---	1.54	22.53	PASS
	Ant2		-2.85	---	2.15	22.50	PASS
	Ant3		-3.14	---	-0.14	22.51	PASS
	Ant4		-3.59	---	-0.09	22.52	PASS
	total		2.89	---	7.89	22.50	PASS
	Ant1	5260	10.13	23.49	14.63	29.49	PASS
	Ant2		10.23	23.50	15.23	29.50	PASS
	Ant3		10.37	23.50	13.37	29.50	PASS
	Ant4		9.85	23.51	13.35	29.51	PASS
	total		16.17	23.49	21.17	29.49	PASS
	Ant1	5300	9.83	23.51	14.33	29.51	PASS
	Ant2		10	23.49	15.00	29.49	PASS
	Ant3		10.05	23.50	13.05	29.50	PASS
	Ant4		9.47	23.50	12.97	29.50	PASS
	total		15.86	23.49	20.86	29.49	PASS
	Ant1	5320	9.86	23.51	14.36	29.51	PASS
	Ant2		10.01	23.49	15.01	29.49	PASS
	Ant3		10	23.49	13.00	29.49	PASS
	Ant4		9.3	23.50	12.80	29.50	PASS
	total		15.82	23.49	20.82	29.49	PASS
	Ant1	5500	9.69	23.51	14.19	29.51	PASS
	Ant2		10.06	23.49	15.06	29.49	PASS
	Ant3		10.18	23.49	13.18	29.49	PASS
	Ant4		9.05	23.49	12.55	29.49	PASS
	total		15.79	23.49	20.79	29.49	PASS
	Ant1	5580	9.9	23.51	14.40	29.51	PASS
	Ant2		10.07	23.49	15.07	29.49	PASS
	Ant3		10.3	23.50	13.30	29.50	PASS

	Ant4		9.47	23.49	12.97	29.49	PASS
	total		15.97	23.49	20.97	29.49	PASS
	Ant1	5700	9.67	23.51	14.17	29.51	PASS
	Ant2		9.63	23.49	14.63	29.49	PASS
	Ant3		8.84	23.50	11.84	29.50	PASS
	Ant4		8.78	23.50	12.28	29.50	PASS
	total		15.27	23.49	20.27	29.49	PASS
	Ant1	5745	19.18	30.00	23.68	---	PASS
	Ant2		19.65	30.00	24.65	---	PASS
	Ant3		18.88	30.00	21.88	---	PASS
	Ant4		20.52	30.00	24.02	---	PASS
	total		25.62	30.00	30.62	---	PASS
	Ant1	5785	18.2	30.00	22.70	---	PASS
	Ant2		19.1	30.00	24.10	---	PASS
	Ant3		18.28	30.00	21.28	---	PASS
	Ant4		20.12	30.00	23.62	---	PASS
	total		25.02	30.00	30.02	---	PASS
	Ant1	5825	18.09	30.00	22.59	---	PASS
	Ant2		18.93	30.00	23.93	---	PASS
	Ant3		17.86	30.00	20.86	---	PASS
	Ant4		19.36	30.00	22.86	---	PASS
	total		24.62	30.00	29.62	---	PASS
11N40MIMO	Ant1	5190	-3.24	---	1.26	23.01	PASS
	Ant2		-2.71	---	2.29	23.01	PASS
	Ant3		-2	---	1.00	23.01	PASS
	Ant4		-2.05	---	1.45	23.01	PASS
	total		3.55	---	8.55	23.01	PASS
	Ant1	5230	-2.01	---	2.49	23.01	PASS
	Ant2		-1.78	---	3.22	23.01	PASS
	Ant3		-1.43	---	1.57	23.01	PASS
	Ant4		-2.58	---	0.92	23.01	PASS
	total		4.09	---	9.09	23.01	PASS
	Ant1	5270	11.46	23.98	15.96	30.00	PASS
	Ant2		11.47	23.98	16.47	30.00	PASS
	Ant3		11.64	23.98	14.64	30.00	PASS
	Ant4		11.17	23.98	14.67	30.00	PASS
	total		17.46	23.98	22.46	30.00	PASS
	Ant1	5310	12.54	23.98	17.04	30.00	PASS
	Ant2		12.37	23.98	17.37	30.00	PASS
	Ant3		12.43	23.98	15.43	30.00	PASS
	Ant4		12.02	23.98	15.52	30.00	PASS
	total		18.36	23.98	23.36	30.00	PASS
	Ant1	5510	12.3	23.98	16.80	30.00	PASS
	Ant2		12.63	23.98	17.63	30.00	PASS
	Ant3		12.62	23.98	15.62	30.00	PASS

	Ant4		11.44	23.98	14.94	30.00	PASS
	total		18.29	23.98	23.29	30.00	PASS
	Ant1	5550	12.53	23.98	17.03	30.00	PASS
	Ant2		12.77	23.98	17.77	30.00	PASS
	Ant3		12.54	23.98	15.54	30.00	PASS
	Ant4		11.43	23.98	14.93	30.00	PASS
	total		18.37	23.98	23.37	30.00	PASS
	Ant1	5670	12.84	23.98	17.34	30.00	PASS
	Ant2		12.65	23.98	17.65	30.00	PASS
	Ant3		11.9	23.98	14.90	30.00	PASS
	Ant4		11.52	23.98	15.02	30.00	PASS
	total		18.28	23.98	23.28	30.00	PASS
	Ant1	5755	19.43	30.00	23.93	---	PASS
	Ant2		19.37	30.00	24.37	---	PASS
	Ant3		17.51	30.00	20.51	---	PASS
	Ant4		18.76	30.00	22.26	---	PASS
	total		24.85	30.00	29.85	---	PASS
	Ant1	5795	19.42	30.00	23.92	---	PASS
	Ant2		19.71	30.00	24.71	---	PASS
	Ant3		18	30.00	21.00	---	PASS
	Ant4		19	30.00	22.50	---	PASS
	total		25.1	30.00	30.10	---	PASS
11AC20MIMO	Ant1	5180	-2.62	---	1.88	22.54	PASS
	Ant2		-2.53	---	2.47	22.50	PASS
	Ant3		-2.5	---	0.50	22.52	PASS
	Ant4		-2.75	---	0.75	22.51	PASS
	total		3.42	---	8.42	22.50	PASS
	Ant1	5220	-3.06	---	1.44	22.55	PASS
	Ant2		-2.95	---	2.05	22.50	PASS
	Ant3		-3.1	---	-0.10	22.50	PASS
	Ant4		-2.65	---	0.85	22.52	PASS
	total		3.08	---	8.08	22.50	PASS
	Ant1	5240	-3.1	---	1.40	22.55	PASS
	Ant2		-2.94	---	2.06	22.50	PASS
	Ant3		-3.26	---	-0.26	22.51	PASS
	Ant4		-2.73	---	0.77	22.51	PASS
	total		3.02	---	8.02	22.50	PASS
	Ant1	5260	9.58	23.53	14.08	29.53	PASS
	Ant2		9.85	23.49	14.85	29.49	PASS
	Ant3		10.01	23.50	13.01	29.50	PASS
	Ant4		9.57	23.50	13.07	29.50	PASS
	total		15.78	23.49	20.78	29.49	PASS
	Ant1	5300	9.85	23.53	14.35	29.53	PASS
	Ant2		10.1	23.49	15.10	29.49	PASS
	Ant3		10.17	23.50	13.17	29.50	PASS

	Ant4		9.66	23.51	13.16	29.51	PASS
	total		15.97	23.49	20.97	29.49	PASS
	Ant1	5320	9.84	23.52	14.34	29.52	PASS
	Ant2		10.06	23.49	15.06	29.49	PASS
	Ant3		10.11	23.50	13.11	29.50	PASS
	Ant4		9.47	23.49	12.97	29.49	PASS
	total		15.9	23.49	20.90	29.49	PASS
	Ant1	5500	9.66	23.53	14.16	29.53	PASS
	Ant2		10.09	23.49	15.09	29.49	PASS
	Ant3		10.27	23.49	13.27	29.49	PASS
	Ant4		9.26	23.51	12.76	29.51	PASS
	total		15.86	23.49	20.86	29.49	PASS
	Ant1	5580	9.96	23.52	14.46	29.52	PASS
	Ant2		10.18	23.49	15.18	29.49	PASS
	Ant3		10.41	23.50	13.41	29.50	PASS
	Ant4		9.66	23.50	13.16	29.50	PASS
	total		16.08	23.49	21.08	29.49	PASS
	Ant1	5700	9.75	23.52	14.25	29.52	PASS
	Ant2		9.77	23.49	14.77	29.49	PASS
	Ant3		9.1	23.50	12.10	29.50	PASS
	Ant4		9.1	23.50	12.60	29.50	PASS
	total		15.46	23.49	20.46	29.49	PASS
	Ant1	5745	19.01	30.00	23.51	---	PASS
	Ant2		19.59	30.00	24.59	---	PASS
	Ant3		18.82	30.00	21.82	---	PASS
	Ant4		20.43	30.00	23.93	---	PASS
	total		25.53	30.00	30.53	---	PASS
	Ant1	5785	18.32	30.00	22.82	---	PASS
	Ant2		19.32	30.00	24.32	---	PASS
	Ant3		18.53	30.00	21.53	---	PASS
	Ant4		20.21	30.00	23.71	---	PASS
	total		25.18	30.00	30.18	---	PASS
	Ant1	5825	17.98	30.00	22.48	---	PASS
	Ant2		18.97	30.00	23.97	---	PASS
	Ant3		17.94	30.00	20.94	---	PASS
	Ant4		19.87	30.00	23.37	---	PASS
	total		24.79	30.00	29.79	---	PASS
11AC40MIMO	Ant1	5190	-2.98	---	1.52	23.01	PASS
	Ant2		-3.02	---	1.98	23.01	PASS
	Ant3		-2.96	---	0.04	23.01	PASS
	Ant4		-2.89	---	0.61	23.01	PASS
	total		3.06	---	8.06	23.01	PASS
	Ant1	5230	-2.33	---	2.17	23.01	PASS
	Ant2		-2.37	---	2.63	23.01	PASS
	Ant3		-2.55	---	0.45	23.01	PASS

	Ant4		-2.09	---	1.41	23.01	PASS
	total		3.69	---	8.69	23.01	PASS
	Ant1	5270	12.57	23.98	17.07	30.00	PASS
	Ant2		12.4	23.98	17.40	30.00	PASS
	Ant3		12.54	23.98	15.54	30.00	PASS
	Ant4		12.11	23.98	15.61	30.00	PASS
	total		18.43	23.98	23.43	30.00	PASS
	Ant1	5310	12.98	23.98	17.48	30.00	PASS
	Ant2		12.69	23.98	17.69	30.00	PASS
	Ant3		12.7	23.98	15.70	30.00	PASS
	Ant4		12.29	23.98	15.79	30.00	PASS
	total		18.69	23.98	23.69	30.00	PASS
	Ant1	5510	12.83	23.98	17.33	30.00	PASS
	Ant2		12.82	23.98	17.82	30.00	PASS
	Ant3		12.77	23.98	15.77	30.00	PASS
	Ant4		11.8	23.98	15.30	30.00	PASS
	total		18.6	23.98	23.60	30.00	PASS
	Ant1	5550	13.03	23.98	17.53	30.00	PASS
	Ant2		13.01	23.98	18.01	30.00	PASS
	Ant3		12.97	23.98	15.97	30.00	PASS
	Ant4		11.99	23.98	15.49	30.00	PASS
	total		18.79	23.98	23.79	30.00	PASS
	Ant1	5670	12.83	23.98	17.33	30.00	PASS
	Ant2		12.42	23.98	17.42	30.00	PASS
	Ant3		11.74	23.98	14.74	30.00	PASS
	Ant4		11.46	23.98	14.96	30.00	PASS
	total		18.17	23.98	23.17	30.00	PASS
	Ant1	5755	19.3	30.00	23.80	---	PASS
	Ant2		19.77	30.00	24.77	---	PASS
	Ant3		17.92	30.00	20.92	---	PASS
	Ant4		19.3	30.00	22.80	---	PASS
	total		25.15	30.00	30.15	---	PASS
	Ant1	5795	18.07	30.00	22.57	---	PASS
	Ant2		18.99	30.00	23.99	---	PASS
	Ant3		17.74	30.00	20.74	---	PASS
	Ant4		19.39	30.00	22.89	---	PASS
	total		24.62	30.00	29.62	---	PASS
11AC80MIMO	Ant1	5210	-1.1	---	3.40	23.01	PASS
	Ant2		-0.4	---	4.60	23.01	PASS
	Ant3		-0.13	---	2.87	23.01	PASS
	Ant4		-0.51	---	2.99	23.01	PASS
	total		5.5	---	10.50	23.01	PASS
	Ant1	5290	10.64	23.98	15.14	30.00	PASS
	Ant2		10.56	23.98	15.56	30.00	PASS
	Ant3		10.53	23.98	13.53	30.00	PASS

	Ant4		9.86	23.98	13.36	30.00	PASS
	total		16.43	23.98	21.43	30.00	PASS
	Ant1	5530	11.52	23.98	16.02	30.00	PASS
	Ant2		11.99	23.98	16.99	30.00	PASS
	Ant3		11.73	23.98	14.73	30.00	PASS
	Ant4		10.04	23.98	13.54	30.00	PASS
	total		17.4	23.98	22.40	30.00	PASS
	Ant1	5610	11.33	23.98	15.83	30.00	PASS
	Ant2		11.22	23.98	16.22	30.00	PASS
	Ant3		11.49	23.98	14.49	30.00	PASS
	Ant4		10.52	23.98	14.02	30.00	PASS
	total		17.18	23.98	22.18	30.00	PASS
	Ant1	5775	19.8	30.00	24.30	---	PASS
	Ant2		19.89	30.00	24.89	---	PASS
	Ant3		20.09	30.00	23.09	---	PASS
	Ant4		19.46	30.00	22.96	---	PASS
	total		25.84	30.00	30.84	---	PASS

Note: The Duty Cycle Factor is compensated in the graph.

5.6 PEAK POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)
RSS-247 Issue 2 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1

Test Method: KDB 789033 D02 v02r01 Section F

Limits: FCC 47 CFR Part 15 Subpart E

1. For the band 5.15-5.25 GHz.
   (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

   (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

   (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

   (iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Limits: RSS-247 Issue 2

1. **Frequency band 5150-5250 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

2. **Frequency band 5250-5350 MHz**
For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Additional requirements
In addition to the above requirements, devices shall comply with the following, where applicable:

a) Outdoor fixed devices with a maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:
   i. -13 dBW/MHz for $0^o \leq \theta < 8^o$
   ii. -13 − 0.716 (θ-8) dBW/MHz for $8^o \leq \theta < 40^o$
   iii. -35.9 − 1.22 (θ-40) dBW/MHz for $40^o \leq \theta \leq 45^o$
   iv. -42 dBW/MHz for $\theta > 45^o$

The measurement procedure defined in Annex A of this document shall be used to verify the compliance to the e.i.r.p. at different elevations.

b) Devices, other than outdoor fixed devices, having an e.i.r.p. greater than 200 mW shall comply with either i. or ii. below:
   iii. devices shall comply with the e.i.r.p. elevation mask in 6.2.2.3(a); or
   iv. devices shall implement a method to permanently reduce their e.i.r.p. via a firmwarefeature in the event that the Department requires it. The test report must demonstratehow the device's power table can be updated to meet this firmware requirement. Themanufacturer shall provide this firmware to update all systems automatically incompliance with the directions received from the Department.

3. **Frequency bands 5470-5600 MHz and 5650-5725 MHz**
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4. **Frequency band 5725-5850 MHz**
The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of

point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

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:

1. For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
b) Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
c) Sweep time = auto, trigger set to "free run".
d) Trace average at least 100 traces in power averaging mode.
e) Record the max value and add 10 log (1/duty cycle)

2. For U-NII-3 band:

a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
b) Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
c) Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
d) Sweep time = auto, trigger set to "free run".
e) Trace average at least 100 traces in power averaging mode.
f) Record the max value and add 10 log (1/duty cycle)

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:

Directional gain and the power spectral density limit:

Antenna Information:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Chain 3 Antenna Gain (dBi)
U-NII-1	4.50	5.00	3.00	3.50
U-NII-2A	4.50	5.00	3.00	3.50
U-NII-2C	4.50	5.00	3.00	3.50
U-NII-3	4.50	5.00	3.00	3.50

According to the list of antenna information above, antenna gains are not equal and the maximum antenna gain is 5.0 dBi.
According to KDB 662911VDO1 v02r01, for power measurements on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4; so the
Directional gain = GANT MAX + Array Gain = 5dBi < 6 dBi
So, the maximum output power limit does not need to be reduced.

According to KDB 662911VDO1 v02r01, for power spectral density (PSD) measurements on IEEE 802.11 devices, the
Array Gain = 10 log (NANT/NSS) dB;
So, the
Directional gain = GANT MAX + 10 log (NANT/NSS) = 5 + 10 log (4/1) = 11.02dBi > 6 dBi
So, the maximum power spectral density limit should be reduced (11.02 -6) dBi = 5.02 dBi.

Test Result:
For FCC 47 CFR Part 15 Subpart E (U-NII-1):

Test Mode	Antenna	Channel	Result [dBm/MHz]	PSD [dBm/470kHz]	PSD [dBm/500kHz]	Limit [dBm/MHz]	Verdict
11A	Ant1	5180	7.7	-	-	11.98	PASS
	Ant2	5180	7.81	-	-		PASS
	Ant3	5180	8.22	-	-		PASS
	Ant4	5180	8.14	-	-		PASS
	Ant1	5220	10.84	-	-		PASS
	Ant2	5220	11.53	-	-		PASS
	Ant3	5220	11.28	-	-		PASS
	Ant4	5220	9.97	-	-		PASS
	Ant1	5240	11.37	-	-		PASS
	Ant2	5240	11.79	-	-		PASS
	Ant3	5240	11.45	-	-		PASS
	Ant4	5240	10.25	-	-		PASS
11N20MIMO	Ant1	5180	5.52	-	-	11.98	PASS
	Ant2	5180	4.94	-	-		PASS
	Ant3	5180	5.36	-	-		PASS
	Ant4	5180	5.4	-	-		PASS
	total	5180	11.33	-	-		PASS
	Ant1	5220	5.63	-	-		PASS
	Ant2	5220	5	-	-		PASS
	Ant3	5220	5.21	-	-		PASS
	Ant4	5220	5.06	-	-		PASS
	total	5220	11.25	-	-		PASS
	Ant1	5240	5.75	-	-		PASS
	Ant2	5240	5.1	-	-		PASS
	Ant3	5240	5.57	-	-		PASS
	Ant4	5240	5.06	-	-		PASS
	total	5240	11.4	-	-		PASS
11N40MIMO	Ant1	5190	1.07	-	-	11.98	PASS
	Ant2	5190	0.62	-	-		PASS
	Ant3	5190	0.07	-	-		PASS
	Ant4	5190	0.47	-	-		PASS
	total	5190	6.59	-	-		PASS
	Ant1	5230	5.61	-	-		PASS
	Ant2	5230	4.73	-	-		PASS
	Ant3	5230	4.36	-	-		PASS
	Ant4	5230	4.96	-	-		PASS
	total	5230	10.96	-	-		PASS
11AC20MIMO	Ant1	5180	5.02	-	-	11.98	PASS
	Ant2	5180	4.95	-	-		PASS
	Ant3	5180	5.2	-	-		PASS

	Ant4	5180	5.06	-	-		PASS
	total	5180	11.08	-	-		PASS
	Ant1	5220	5.23	-	-		PASS
	Ant2	5220	4.41	-	-		PASS
	Ant3	5220	4.93	-	-		PASS
	Ant4	5220	4.94	-	-		PASS
	total	5220	10.91	-	-		PASS
	Ant1	5240	5.66	-	-		PASS
	Ant2	5240	5.13	-	-		PASS
	Ant3	5240	5.57	-	-		PASS
	Ant4	5240	5.43	-	-		PASS
	total	5240	11.47	-	-		PASS
11AC40MIMO	Ant1	5190	0.61	-	-	11.98	PASS
	Ant2	5190	0.39	-	-		PASS
	Ant3	5190	0.79	-	-		PASS
	Ant4	5190	0.38	-	-		PASS
	total	5190	6.57	-	-		PASS
	Ant1	5230	-0.13	-	-		PASS
	Ant2	5230	-0.58	-	-		PASS
	Ant3	5230	-0.27	-	-		PASS
	Ant4	5230	-0.74	-	-		PASS
	total	5230	5.6	-	-		PASS
11AC80MIMO	Ant1	5210	-3.95	-	-	11.98	PASS
	Ant2	5210	-3.3	-	-		PASS
	Ant3	5210	-1.64	-	-		PASS
	Ant4	5210	-3.78	-	-		PASS
	total	5210	2.96	-	-		PASS

FOR RSS-247 Issue 2 and FCC 47 CFR Part 15 Subpart E (Excluding Band U-NII-1 for FCC):

Test Mode	Antenna	Channel	Result [dBm/MHz]	Conducted PSD [dBm/470 kHz]	Conducted PSD [dBm/500 kHz]	Conducted Limit 1 [dBm/MHz]	Conducted Limit 2 [dBm/500 kHz]	e.i.r.p. PSD [dBm/MHz]	e.i.r.p. PSD Limit [dBm/MHz]	Verdict
11A	Ant1	5180	-0.03	-	-	-	--	4.47	4.98	PASS
	Ant2	5180	-0.64	-	-	-	--	4.36	4.98	PASS
	Ant3	5180	0.78	-	-	-	--	3.78	4.98	PASS
	Ant4	5180	0.23	-	-	-	--	3.73	4.98	PASS
	Ant1	5220	-0.1	-	-	-	--	4.4	4.98	PASS
	Ant2	5220	-0.54	-	-	-	--	4.46	4.98	PASS
	Ant3	5220	0.66	-	-	-	--	3.66	4.98	PASS
	Ant4	5220	0.27	-	-	-	--	3.77	4.98	PASS
	Ant1	5240	0.07	-	-	-	--	4.57	4.98	PASS
	Ant2	5240	-0.69	-	-	-	--	4.31	4.98	PASS
	Ant3	5240	0.95	-	-	-	--	3.95	4.98	PASS
	Ant4	5240	0.63	-	-	-	--	4.13	4.98	PASS
	Ant1	5260	5.43	-	-	5.98	--	--	--	PASS
	Ant2	5260	5.28	-	-	5.98	--	--	--	PASS
	Ant3	5260	5.35	-	-	5.98	--	--	--	PASS
	Ant4	5260	4.99	-	-	5.98	--	--	--	PASS
	Ant1	5300	5.69	-	-	5.98	--	--	--	PASS
	Ant2	5300	5.4	-	-	5.98	--	--	--	PASS
	Ant3	5300	5.5	-	-	5.98	--	--	--	PASS
	Ant4	5300	5.47	-	-	5.98	--	--	--	PASS
	Ant1	5320	5.62	-	-	5.98	--	--	--	PASS
	Ant2	5320	5.33	-	-	5.98	--	--	--	PASS
	Ant3	5320	5.49	-	-	5.98	--	--	--	PASS
	Ant4	5320	5.48	-	-	5.98	--	--	--	PASS
	Ant1	5500	5.44	-	-	5.98	--	--	--	PASS
	Ant2	5500	5.31	-	-	5.98	--	--	--	PASS
	Ant3	5500	5.55	-	-	5.98	--	--	--	PASS
	Ant4	5500	5.58	-	-	5.98	--	--	--	PASS
	Ant1	5580	5.69	-	-	5.98	--	--	--	PASS
	Ant2	5580	5.47	-	-	5.98	--	--	--	PASS
	Ant3	5580	5.74	-	-	5.98	--	--	--	PASS
	Ant4	5580	5.6	-	-	5.98	--	--	--	PASS
	Ant1	5700	5.68	-	-	5.98	--	--	--	PASS
	Ant2	5700	5.03	-	-	5.98	--	--	--	PASS
	Ant3	5700	4.33	-	-	5.98	--	--	--	PASS
	Ant4	5700	5.46	-	-	5.98	--	--	--	PASS
	Ant1	5745	-	7	7.27	--	24.98	--	--	PASS
	Ant2	5745	-	7.79	8.06	--	24.98	--	--	PASS
	Ant3	5745	-	6.43	6.70	--	24.98	--	--	PASS
	Ant4	5745	-	7.18	7.45	--	24.98	--	--	PASS

	Ant1	5785	-	6.68	6.95	--	24.98	--	--	PASS
	Ant2	5785	-	7.89	8.16	--	24.98	--	--	PASS
	Ant3	5785	-	6.77	7.04	--	24.98	--	--	PASS
	Ant4	5785	-	7.99	8.26	--	24.98	--	--	PASS
	Ant1	5825	-	6.5	6.77	--	24.98	--	--	PASS
	Ant2	5825	-	7.26	7.53	--	24.98	--	--	PASS
	Ant3	5825	-	6.03	6.30	--	24.98	--	--	PASS
	Ant4	5825	-	7.5	7.77	--	24.98	--	--	PASS
11N20 MIMO	Ant1	5180	-12.09	-	-	--	--	-7.59	4.98	PASS
	Ant2	5180	-12.05	-	-	--	--	-7.05	4.98	PASS
	Ant3	5180	-11.95	-	-	--	--	-8.95	4.98	PASS
	Ant4	5180	-12.55	-	-	--	--	-9.05	4.98	PASS
	total	5180	-6.13	-	-	--	--	4.89	4.98	PASS
	Ant1	5220	-13.59	-	-	--	--	-9.09	4.98	PASS
	Ant2	5220	-13.35	-	-	--	--	-8.35	4.98	PASS
	Ant3	5220	-13.76	-	-	--	--	-10.76	4.98	PASS
	Ant4	5220	-13.81	-	-	--	--	-10.31	4.98	PASS
	total	5220	-7.6	-	-	--	--	3.42	4.98	PASS
	Ant1	5240	-13.36	-	-	--	--	-8.86	4.98	PASS
	Ant2	5240	-13.26	-	-	--	--	-8.26	4.98	PASS
	Ant3	5240	-13.48	-	-	--	--	-10.48	4.98	PASS
	Ant4	5240	-13.81	-	-	--	--	-10.31	4.98	PASS
	total	5240	-7.45	-	-	--	--	3.57	4.98	PASS
	Ant1	5260	0	-	-	5.98	--	--	--	PASS
	Ant2	5260	-0.1	-	-	5.98	--	--	--	PASS
	Ant3	5260	0.01	-	-	5.98	--	--	--	PASS
	Ant4	5260	-0.17	-	-	5.98	--	--	--	PASS
	total	5260	5.96	-	-	5.98	--	--	--	PASS
	Ant1	5300	-0.35	-	-	5.98	--	--	--	PASS
	Ant2	5300	-0.25	-	-	5.98	--	--	--	PASS
	Ant3	5300	-0.32	-	-	5.98	--	--	--	PASS
	Ant4	5300	-0.89	-	-	5.98	--	--	--	PASS
	total	5300	5.58	-	-	5.98	--	--	--	PASS
	Ant1	5320	-0.35	-	-	5.98	--	--	--	PASS
	Ant2	5320	-0.35	-	-	5.98	--	--	--	PASS
	Ant3	5320	-0.3	-	-	5.98	--	--	--	PASS
	Ant4	5320	-0.97	-	-	5.98	--	--	--	PASS
	total	5320	5.54	-	-	5.98	--	--	--	PASS
	Ant1	5500	-0.51	-	-	5.98	--	--	--	PASS
	Ant2	5500	-0.07	-	-	5.98	--	--	--	PASS
	Ant3	5500	-0.2	-	-	5.98	--	--	--	PASS
	Ant4	5500	-1.19	-	-	5.98	--	--	--	PASS
	total	5500	5.55	-	-	5.98	--	--	--	PASS
	Ant1	5580	-0.15	-	-	5.98	--	--	--	PASS
	Ant2	5580	-0.05	-	-	5.98	--	--	--	PASS

	Ant3	5580	0.04	-	-	5.98	--	--	--	PASS
	Ant4	5580	-0.85	-	-	5.98	--	--	--	PASS
	total	5580	5.78	-	-	5.98	--	--	--	PASS
	Ant1	5700	-0.71	-	-	5.98	--	--	--	PASS
	Ant2	5700	-0.64	-	-	5.98	--	--	--	PASS
	Ant3	5700	-1.59	-	-	5.98	--	--	--	PASS
	Ant4	5700	-1.63	-	-	5.98	--	--	--	PASS
	total	5700	4.9	-	-	5.98	--	--	--	PASS
	Ant1	5745	-	5.75	6.02	--	24.98	--	--	PASS
	Ant2	5745	-	6.14	6.41	--	24.98	--	--	PASS
	Ant3	5745	-	5.36	5.63	--	24.98	--	--	PASS
	Ant4	5745	-	7.26	7.53	--	24.98	--	--	PASS
	total	5745	-	-	12.48	--	24.98	--	--	PASS
	Ant1	5785	-	5.27	5.54	--	24.98	--	--	PASS
	Ant2	5785	-	6.39	6.66	--	24.98	--	--	PASS
	Ant3	5785	-	5.36	5.63	--	24.98	--	--	PASS
	Ant4	5785	-	8.13	8.40	--	24.98	--	--	PASS
	total	5785	-	-	12.74	--	24.98	--	--	PASS
	Ant1	5825	-	5.44	5.71	--	24.98	--	--	PASS
	Ant2	5825	-	5.84	6.11	--	24.98	--	--	PASS
	Ant3	5825	-	5.44	5.71	--	24.98	--	--	PASS
	Ant4	5825	-	7.8	8.07	--	24.98	--	--	PASS
	total	5825	-	-	12.54	--	24.98	--	--	PASS
11N40 MIMO	Ant1	5190	-16.26	-	-	5.98	--	-11.76	4.98	PASS
	Ant2	5190	-15.14	-	-	5.98	--	-10.14	4.98	PASS
	Ant3	5190	-15.34	-	-	5.98	--	-12.34	4.98	PASS
	Ant4	5190	-14.29	-	-	5.98	--	-10.79	4.98	PASS
	total	5190	-9.18	-	-	5.98	--	1.84	4.98	PASS
	Ant1	5230	-14.9	-	-	5.98	--	-10.4	4.98	PASS
	Ant2	5230	-14.67	-	-	5.98	--	-9.67	4.98	PASS
	Ant3	5230	-14.56	-	-	5.98	--	-11.56	4.98	PASS
	Ant4	5230	-15.8	-	-	5.98	--	-12.3	4.98	PASS
	total	5230	-8.94	-	-	5.98	--	2.08	4.98	PASS
	Ant1	5270	-0.98	-	-	5.98	--	--	--	PASS
	Ant2	5270	-1.5	-	-	5.98	--	--	--	PASS
	Ant3	5270	-0.54	-	-	5.98	--	--	--	PASS
	Ant4	5270	-0.98	-	-	5.98	--	--	--	PASS
	total	5270	5.03	-	-	5.98	--	--	--	PASS
	Ant1	5310	-0.41	-	-	5.98	--	--	--	PASS
	Ant2	5310	-0.6	-	-	5.98	--	--	--	PASS
	Ant3	5310	0.12	-	-	5.98	--	--	--	PASS
	Ant4	5310	-0.58	-	-	5.98	--	--	--	PASS
	total	5310	5.66	-	-	5.98	--	--	--	PASS
	Ant1	5510	-0.79	-	-	5.98	--	--	--	PASS
	Ant2	5510	-0.31	-	-	5.98	--	--	--	PASS

	Ant3	5510	-0.01	-	-	5.98	--	--	--	PASS
	Ant4	5510	-1.34	-	-	5.98	--	--	--	PASS
	total	5510	5.44	-	-	5.98	--	--	--	PASS
	Ant1	5550	-0.91	-	-	5.98	--	--	--	PASS
	Ant2	5550	0.09	-	-	5.98	--	--	--	PASS
	Ant3	5550	-0.12	-	-	5.98	--	--	--	PASS
	Ant4	5550	-1.51	-	-	5.98	--	--	--	PASS
	total	5550	5.45	-	-	5.98	--	--	--	PASS
	Ant1	5670	0.27	-	-	5.98	--	--	--	PASS
	Ant2	5670	-0.52	-	-	5.98	--	--	--	PASS
	Ant3	5670	-0.84	-	-	5.98	--	--	--	PASS
	Ant4	5670	-1.28	-	-	5.98	--	--	--	PASS
	total	5670	5.47	-	-	5.98	--	--	--	PASS
	Ant1	5755	-	3.65	3.92	--	24.98	--	--	PASS
	Ant2	5755	-	3.39	3.66	--	24.98	--	--	PASS
	Ant3	5755	-	1.82	2.09	--	24.98	--	--	PASS
	Ant4	5755	-	3.96	4.23	--	24.98	--	--	PASS
	total	5755	-	-	9.57	--	24.98	--	--	PASS
	Ant1	5795	-	3.7	3.97	--	24.98	--	--	PASS
	Ant2	5795	-	4.4	4.67	--	24.98	--	--	PASS
	Ant3	5795	-	2.32	2.59	--	24.98	--	--	PASS
	Ant4	5795	-	3.38	3.65	--	24.98	--	--	PASS
	total	5795	-	-	9.80	--	24.98	--	--	PASS
11AC20MIMO	Ant1	5180	-13.01	-	-	--	--	-8.51	4.98	PASS
	Ant2	5180	-12.94	-	-	--	--	-7.94	4.98	PASS
	Ant3	5180	-12.66	-	-	--	--	-9.66	4.98	PASS
	Ant4	5180	-13.13	-	-	--	--	-9.63	4.98	PASS
	total	5180	-6.91	-	-	--	--	4.11	4.98	PASS
	Ant1	5220	-13.29	-	-	--	--	-8.79	4.98	PASS
	Ant2	5220	-13.31	-	-	--	--	-8.31	4.98	PASS
	Ant3	5220	-13.42	-	-	--	--	-10.42	4.98	PASS
	Ant4	5220	-12.96	-	-	--	--	-9.46	4.98	PASS
	total	5220	-7.22	-	-	--	--	3.8	4.98	PASS
	Ant1	5240	-13.42	-	-	--	--	-8.92	4.98	PASS
	Ant2	5240	-13.33	-	-	--	--	-8.33	4.98	PASS
	Ant3	5240	-13.63	-	-	--	--	-10.63	4.98	PASS
	Ant4	5240	-12.61	-	-	--	--	-9.11	4.98	PASS
	total	5240	-7.21	-	-	--	--	3.81	4.98	PASS
	Ant1	5260	-0.66	-	-	5.98	--	--	--	PASS
	Ant2	5260	-0.43	-	-	5.98	--	--	--	PASS
	Ant3	5260	-0.37	-	-	5.98	--	--	--	PASS
	Ant4	5260	-0.65	-	-	5.98	--	--	--	PASS
	total	5260	5.5	-	-	5.98	--	--	--	PASS
	Ant1	5300	-0.37	-	-	5.98	--	--	--	PASS
	Ant2	5300	-0.23	-	-	5.98	--	--	--	PASS

	Ant3	5300	-0.08	-	-	5.98	--	--	--	PASS
	Ant4	5300	-0.76	-	-	5.98	--	--	--	PASS
	total	5300	5.67	-	-	5.98	--	--	--	PASS
	Ant1	5320	-0.43	-	-	5.98	--	--	--	PASS
	Ant2	5320	-0.14	-	-	5.98	--	--	--	PASS
	Ant3	5320	0.24	-	-	5.98	--	--	--	PASS
	Ant4	5320	-1.23	-	-	5.98	--	--	--	PASS
	total	5320	5.66	-	-	5.98	--	--	--	PASS
	Ant1	5500	-0.53	-	-	5.98	--	--	--	PASS
	Ant2	5500	-0.12	-	-	5.98	--	--	--	PASS
	Ant3	5500	-0.09	-	-	5.98	--	--	--	PASS
	Ant4	5500	-1.28	-	-	5.98	--	--	--	PASS
	total	5500	5.54	-	-	5.98	--	--	--	PASS
	Ant1	5580	-0.47	-	-	5.98	--	--	--	PASS
	Ant2	5580	-0.12	-	-	5.98	--	--	--	PASS
	Ant3	5580	0.15	-	-	5.98	--	--	--	PASS
	Ant4	5580	-0.4	-	-	5.98	--	--	--	PASS
	total	5580	5.82	-	-	5.98	--	--	--	PASS
	Ant1	5700	-0.46	-	-	5.98	--	--	--	PASS
	Ant2	5700	-0.32	-	-	5.98	--	--	--	PASS
	Ant3	5700	-0.91	-	-	5.98	--	--	--	PASS
	Ant4	5700	-1.11	-	-	5.98	--	--	--	PASS
	total	5700	5.33	-	-	5.98	--	--	--	PASS
	Ant1	5745	-	5.53	5.80	--	24.98	--	--	PASS
	Ant2	5745	-	6.56	6.83	--	24.98	--	--	PASS
	Ant3	5745	-	5.73	6.00	--	24.98	--	--	PASS
	Ant4	5745	-	6.89	7.16	--	24.98	--	--	PASS
	total	5745	-	-	12.50	--	24.98	--	--	PASS
	Ant1	5785	-	5.17	5.44	--	24.98	--	--	PASS
	Ant2	5785	-	6.16	6.43	--	24.98	--	--	PASS
	Ant3	5785	-	5	5.27	--	24.98	--	--	PASS
	Ant4	5785	-	7.01	7.28	--	24.98	--	--	PASS
	total	5785	-	-	12.20	--	24.98	--	--	PASS
	Ant1	5825	-	4.83	5.10	--	24.98	--	--	PASS
	Ant2	5825	-	5.62	5.89	--	24.98	--	--	PASS
	Ant3	5825	-	4.8	5.07	--	24.98	--	--	PASS
	Ant4	5825	-	6.55	6.82	--	24.98	--	--	PASS
	total	5825	-	-	11.80	--	24.98	--	--	PASS
11AC40MIMO	Ant1	5190	-16.13	-	-	--	--	-11.63	4.98	PASS
	Ant2	5190	-16.14	-	-	--	--	-11.14	4.98	PASS
	Ant3	5190	-16.15	-	-	--	--	-13.15	4.98	PASS
	Ant4	5190	-16.1	-	-	--	--	-12.6	4.98	PASS
	total	5190	-10.11	-	-	--	--	0.91	4.98	PASS
	Ant1	5320	-15.24	-	-	--	--	-10.74	4.98	PASS
	Ant2	5320	-15.58	-	-	--	--	-10.58	4.98	PASS

	Ant3	5320	-15.65	-	-	--	--	-12.65	4.98	PASS
	Ant4	5320	-15.16	-	-	--	--	-11.66	4.98	PASS
	total	5320	-9.38	-	-	--	--	1.64	4.98	PASS
	Ant1	5270	-0.5	-	-	5.98	--	--	--	PASS
	Ant2	5270	-0.6	-	-	5.98	--	--	--	PASS
	Ant3	5270	-0.73	-	-	5.98	--	--	--	PASS
	Ant4	5270	-1.03	-	-	5.98	--	--	--	PASS
	total	5270	5.31	-	-	5.98	--	--	--	PASS
	Ant1	5310	-0.19	-	-	5.98	--	--	--	PASS
	Ant2	5310	-0.64	-	-	5.98	--	--	--	PASS
	Ant3	5310	-0.41	-	-	5.98	--	--	--	PASS
	Ant4	5310	-0.83	-	-	5.98	--	--	--	PASS
	total	5310	5.51	-	-	5.98	--	--	--	PASS
	Ant1	5510	-0.04	-	-	5.98	--	--	--	PASS
	Ant2	5510	-0.49	-	-	5.98	--	--	--	PASS
	Ant3	5510	-0.35	-	-	5.98	--	--	--	PASS
	Ant4	5510	-1.41	-	-	5.98	--	--	--	PASS
	total	5510	5.48	-	-	5.98	--	--	--	PASS
	Ant1	5550	0.1	-	-	5.98	--	--	--	PASS
	Ant2	5550	0.1	-	-	5.98	--	--	--	PASS
	Ant3	5550	-0.54	-	-	5.98	--	--	--	PASS
	Ant4	5550	-1.07	-	-	5.98	--	--	--	PASS
	total	5550	5.7	-	-	5.98	--	--	--	PASS
	Ant1	5670	-0.29	-	-	5.98	--	--	--	PASS
	Ant2	5670	-0.78	-	-	5.98	--	--	--	PASS
	Ant3	5670	-1.42	-	-	5.98	--	--	--	PASS
	Ant4	5670	-1.51	-	-	5.98	--	--	--	PASS
	total	5670	5.05	-	-	5.98	--	--	--	PASS
	Ant1	5755	-	3.18	3.45	--	24.98	--	--	PASS
	Ant2	5755	-	3.2	3.47	--	24.98	--	--	PASS
	Ant3	5755	-	2.17	2.44	--	24.98	--	--	PASS
	Ant4	5755	-	3.45	3.72	--	24.98	--	--	PASS
	total	5755	-	-	9.32	--	24.98	--	--	PASS
	Ant1	5795	-	1.96	2.23	--	24.98	--	--	PASS
	Ant2	5795	-	2.71	2.98	--	24.98	--	--	PASS
	Ant3	5795	-	1.19	1.46	--	24.98	--	--	PASS
	Ant4	5795	-	3.22	3.49	--	24.98	--	--	PASS
	total	5795	-	-	8.63	--	24.98	--	--	PASS
11AC80MIMO	Ant1	5210	-16.54	-	-	--	--	-12.04	4.98	PASS
	Ant2	5210	-15.79	-	-	--	--	-10.79	4.98	PASS
	Ant3	5210	-15.17	-	-	--	--	-12.17	4.98	PASS
	Ant4	5210	-15.48	-	-	--	--	-11.98	4.98	PASS
	total	5210	-9.7	-	-	--	--	1.32	4.98	PASS
	Ant1	5290	-4.14	-	-	5.98	--	--	--	PASS
	Ant2	5290	-4.79	-	-	5.98	--	--	--	PASS

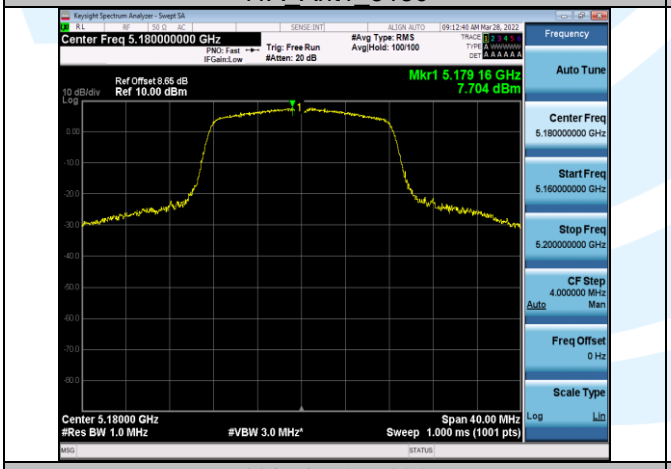
	Ant3	5290	-1.73	-	-	5.98	--	--	--	PASS
	Ant4	5290	-4.59	-	-	5.98	--	--	--	PASS
	total	5290	2.4	-	-	5.98	--	--	--	PASS
	Ant1	5530	-3.85	-	-	5.98	--	--	--	PASS
	Ant2	5530	-2.8	-	-	5.98	--	--	--	PASS
	Ant3	5530	-1.94	-	-	5.98	--	--	--	PASS
	Ant4	5530	-4.1	-	-	5.98	--	--	--	PASS
	total	5530	2.94	-	-	5.98	--	--	--	PASS
	Ant1	5610	-3.54	-	-	5.98	--	--	--	PASS
	Ant2	5610	-3.66	-	-	5.98	--	--	--	PASS
	Ant3	5610	-1.19	-	-	5.98	--	--	--	PASS
	Ant4	5610	-3.54	-	-	5.98	--	--	--	PASS
	total	5610	3.17	-	–	5.98	--	--	--	PASS
	Ant1	5775	-	1.69	1.96	--	24.98	--	--	PASS
	Ant2	5775	-	1.18	1.45	--	24.98	--	--	PASS
	Ant3	5775	-	2.19	2.46	--	24.98	--	--	PASS
	Ant4	5775	-	1.13	1.40	--	24.98	--	--	PASS
	total	5775	-	-	7.86	--	24.98	--	--	PASS

Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725~5.85 GHz.
2.The Duty Cycle Factor and RBW Factor is compensated in the graph.

FCC 47 CFR Part 15 Subpart E(Band U-NII-1):

The test plots as follows:

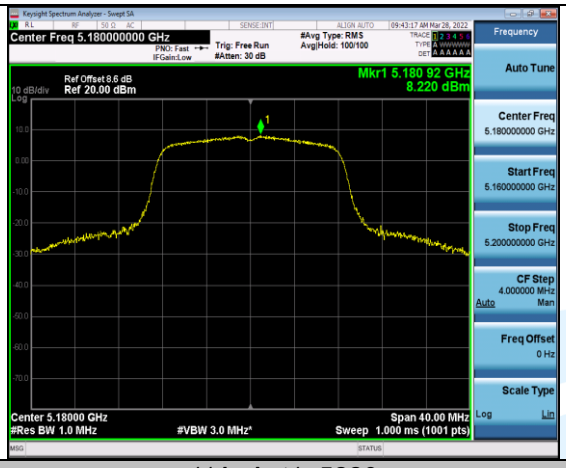
11A_Ant1_5180



11A_Ant2_5180

11A_Ant3_5180

11A_Ant4_5180



11A_Ant1_5220

11A_Ant2_5220

11A_Ant3_5220

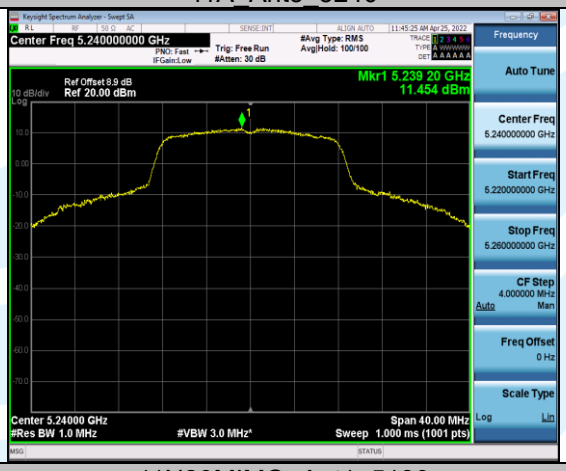
11A_Ant4_5220

11A_Ant1_5240

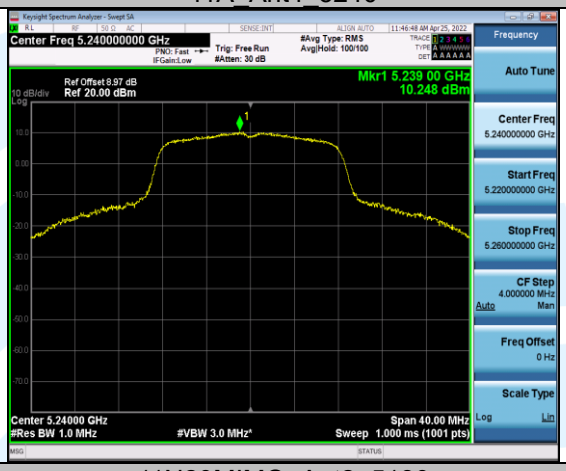
11A_Ant2_5240

11A_Ant3_5240

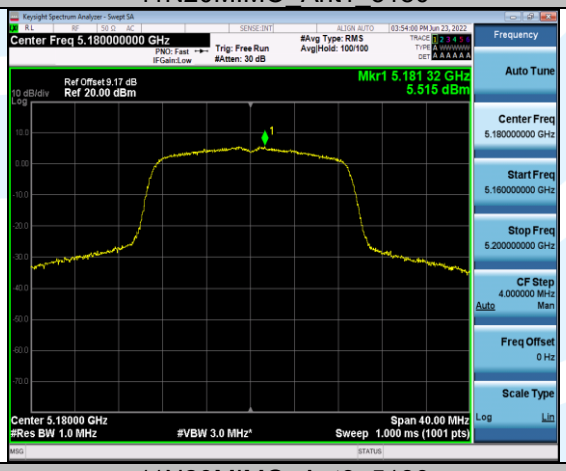
11A_Ant4_5240



11N20MIMO_Ant1_5180



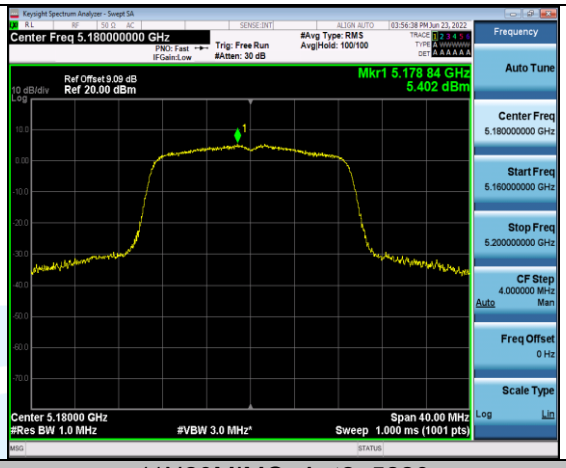
11N20MIMO_Ant2_5180



11N20MIMO_Ant3_5180

11N20MIMO_Ant4_5180

11N20MIMO_Ant1_5220



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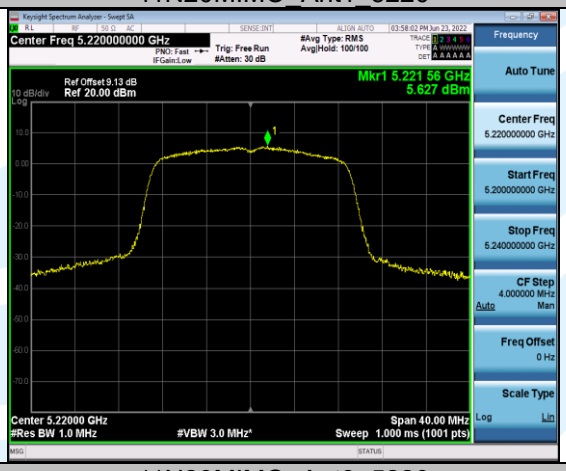
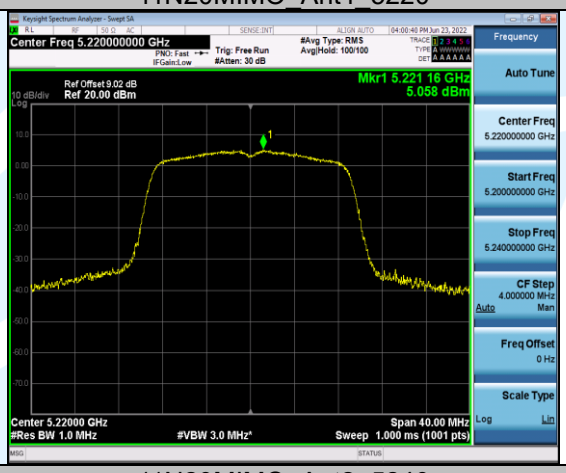


11N20MIMO_Ant3_5220

11N20MIMO_Ant4_5220

11N20MIMO_Ant1_5240



11N20MIMO_Ant2_5240