8.2 MAXIMUM CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(E)
According to RSS 247 6.2

8.2.2 Conformance Limit

FCC Limit:

■ For the band 5.15-5.25 GHz

(a) (1) (i) For an outdoor access point, 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. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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).

(a) (1) (ii) For an indoor access point, 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. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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. 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 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.

(a) (1) (iv) For client devices, 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. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(a) (2) 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. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the band 5.725-5.85 GHz

(a) (3) The maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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

IC Limit:

■ Frequency band 5150-5250 MHz

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.

■ Frequency band 5250-5350 MHz

The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less.

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.

■ 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 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.

■ Frequency band 5725-5850 MHz

The maximum conducted output power shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

8.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.2.4 Test Procedure

The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

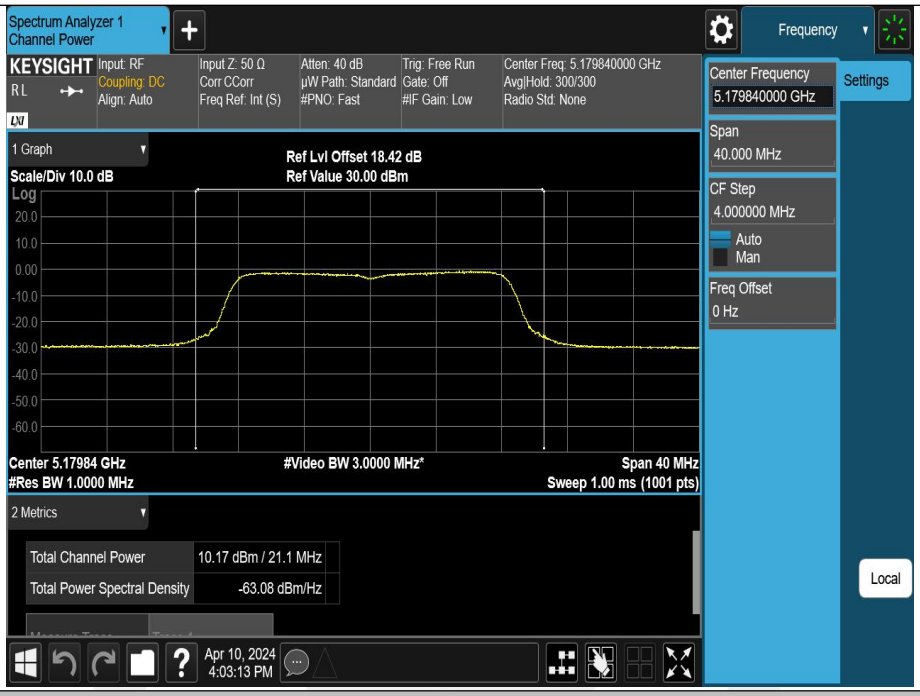
a. The Transmitter output (antenna port) was connected to the power meter.
b. Turn on the EUT and power meter and then record the power value.
c. Repeat above procedures on all channels needed to be tested.

8.2.5 Test Results

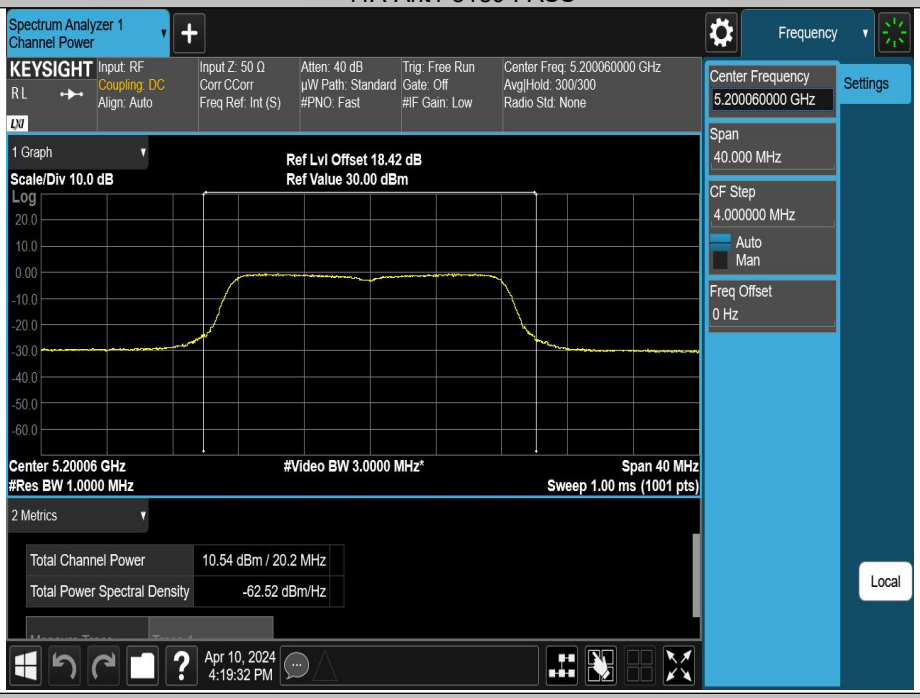
Temperature:	25 °C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

Note: N/A

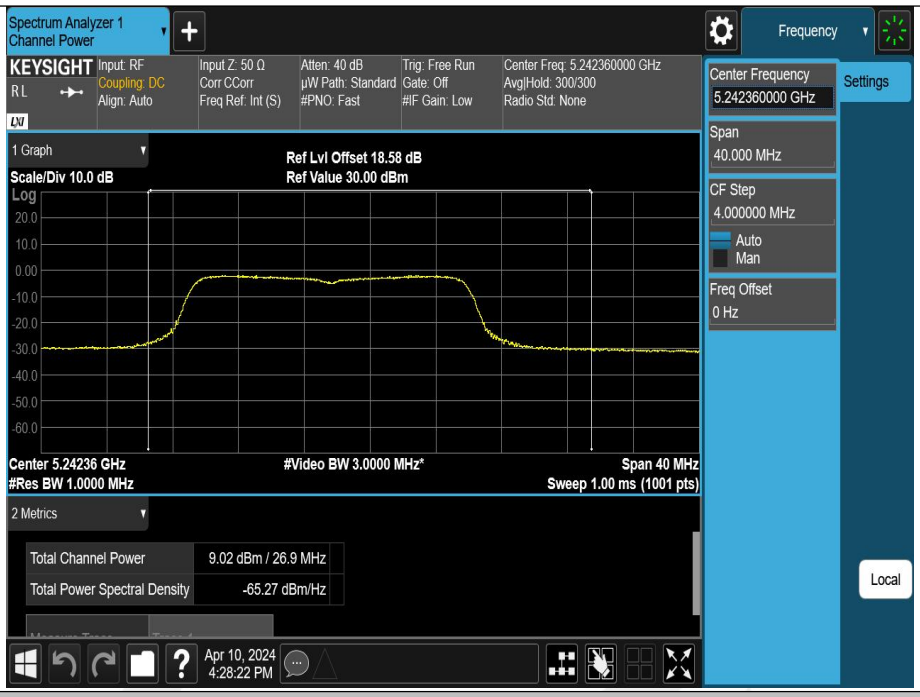
Test Mode	Antenna	Frequency[MHz]	Set Power	TPC Mode	Channel Powert [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11A	Ant1	5180	---	NA	8.41	66.67	1.76	10.17	≤23.98	-1.81	8.36	---	PASS
11A	Ant1	5200	---	NA	8.78	66.67	1.76	10.54	≤23.98	-1.81	8.73	---	PASS
11A	Ant1	5240	---	NA	7.26	66.67	1.76	9.02	≤23.98	-1.81	7.21	---	PASS
11A	Ant1	5745	---	NA	10.40	66.67	1.76	12.16	≤30.00	-0.42	11.74	---	PASS
11A	Ant1	5785	---	NA	9.78	67.00	1.74	11.52	≤30.00	-0.42	11.1	---	PASS
11A	Ant1	5825	---	NA	9.12	66.67	1.76	10.88	≤30.00	-0.42	10.46	---	PASS
11N20SISO	Ant1	5180	---	NA	8.09	65.40	1.84	9.93	≤23.98	-1.81	8.12	---	PASS
11N20SISO	Ant1	5200	---	NA	8.84	65.40	1.84	10.68	≤23.98	-1.81	8.87	---	PASS
11N20SISO	Ant1	5240	---	NA	7.45	65.05	1.87	9.32	≤23.98	-1.81	7.51	---	PASS
11N20SISO	Ant1	5745	---	NA	10.32	65.17	1.86	12.18	≤30.00	-0.42	11.76	---	PASS
11N20SISO	Ant1	5785	---	NA	8.25	65.40	1.84	10.09	≤30.00	-0.42	9.67	---	PASS
11N20SISO	Ant1	5825	---	NA	8.78	65.40	1.84	10.62	≤30.00	-0.42	10.2	---	PASS
11N40SISO	Ant1	5190	---	NA	8.05	48.19	3.17	11.22	≤23.98	-1.81	9.41	---	PASS
11N40SISO	Ant1	5230	---	NA	7.63	48.19	3.17	10.80	≤23.98	-1.81	8.99	---	PASS
11N40SISO	Ant1	5755	---	NA	9.98	48.19	3.17	13.15	≤30.00	-0.42	12.73	---	PASS
11N40SISO	Ant1	5795	---	NA	9.47	48.19	3.17	12.64	≤30.00	-0.42	12.22	---	PASS
11AC20SISO	Ant1	5180	---	NA	8.56	65.40	1.84	10.40	≤23.98	-1.81	8.59	---	PASS
11AC20SISO	Ant1	5200	---	NA	9.25	65.17	1.86	11.11	≤23.98	-1.81	9.3	---	PASS
11AC20SISO	Ant1	5240	---	NA	8.10	65.17	1.86	9.96	≤23.98	-1.81	8.15	---	PASS
11AC20SISO	Ant1	5745	---	NA	10.38	65.52	1.84	12.22	≤30.00	-0.42	11.8	---	PASS
11AC20SISO	Ant1	5785	---	NA	9.57	65.40	1.84	11.41	≤30.00	-0.42	10.99	---	PASS
11AC20SISO	Ant1	5825	---	NA	9.14	65.52	1.84	10.98	≤30.00	-0.42	10.56	---	PASS
11AC40SISO	Ant1	5190	---	NA	8.08	47.94	3.19	11.27	≤23.98	-1.81	9.46	---	PASS
11AC40SISO	Ant1	5230	---	NA	7.68	48.19	3.17	10.85	≤23.98	-1.81	9.04	---	PASS
11AC40SISO	Ant1	5755	---	NA	9.24	48.45	3.15	12.39	≤30.00	-0.42	11.97	---	PASS
11AC40SISO	Ant1	5795	---	NA	9.18	48.19	3.17	12.35	≤30.00	-0.42	11.93	---	PASS
11AC80SISO	Ant1	5210	---	NA	6.80	30.82	5.11	11.91	≤23.98	-1.81	10.1	---	PASS
11AC80SISO	Ant1	5775	---	NA	8.16	30.82	5.11	13.27	≤30.00	-0.42	12.85	---	PASS



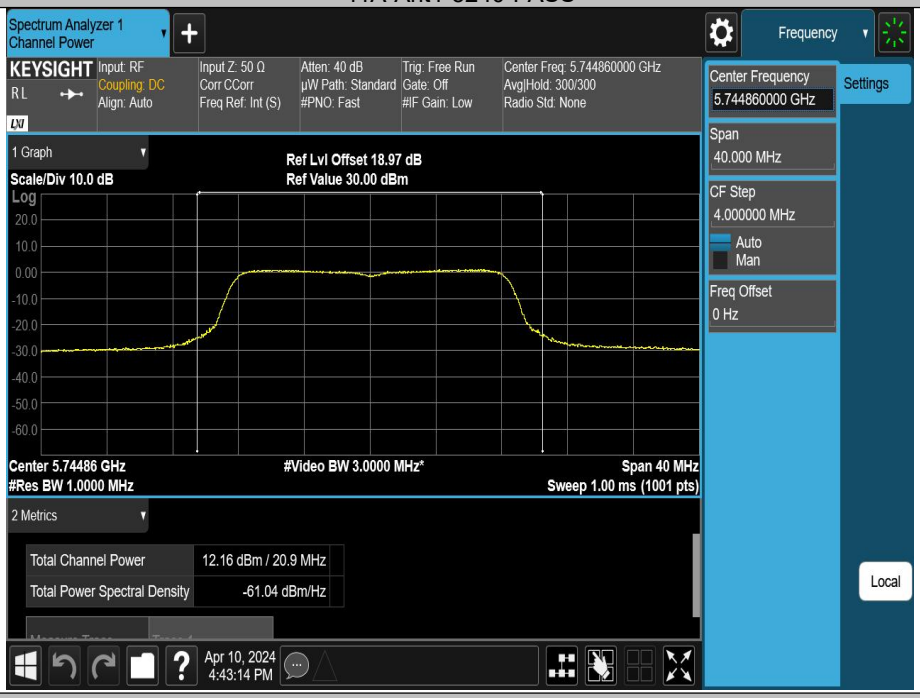
11A-Ant1-5180-PASS



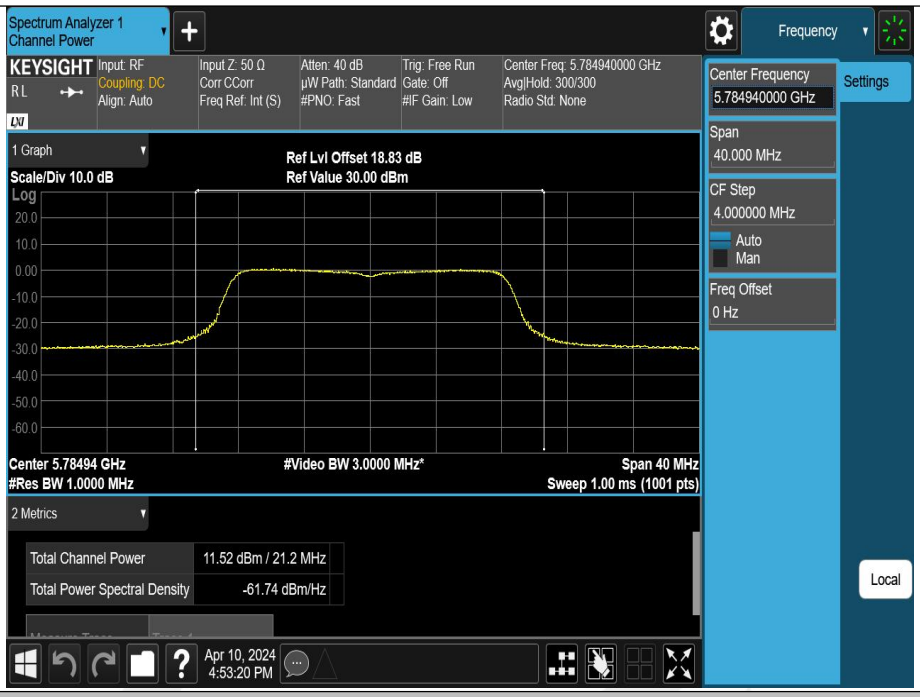
11A-Ant1-5200-PASS



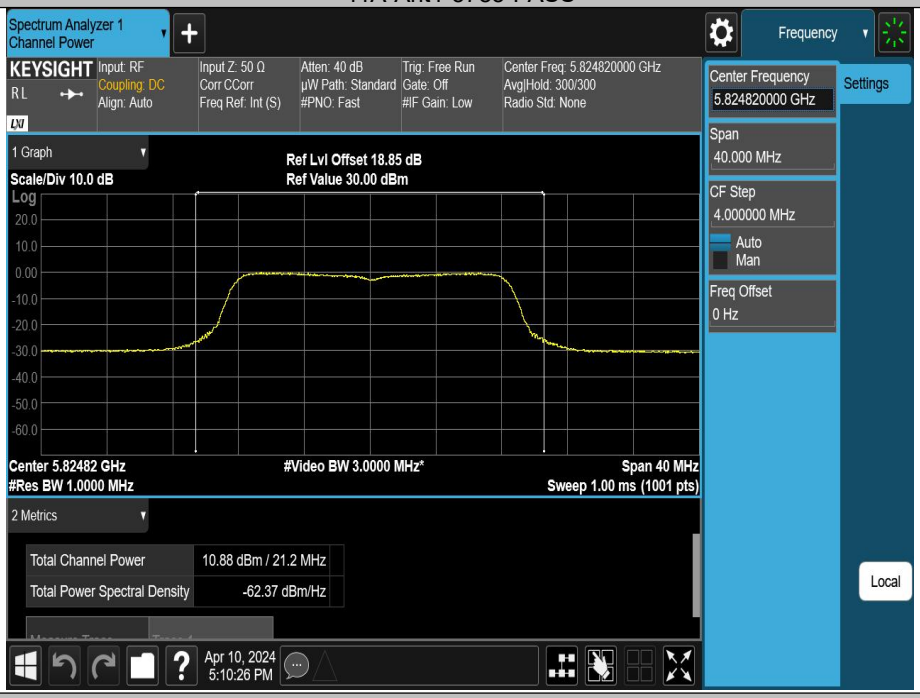
11A-Ant1-5240-PASS



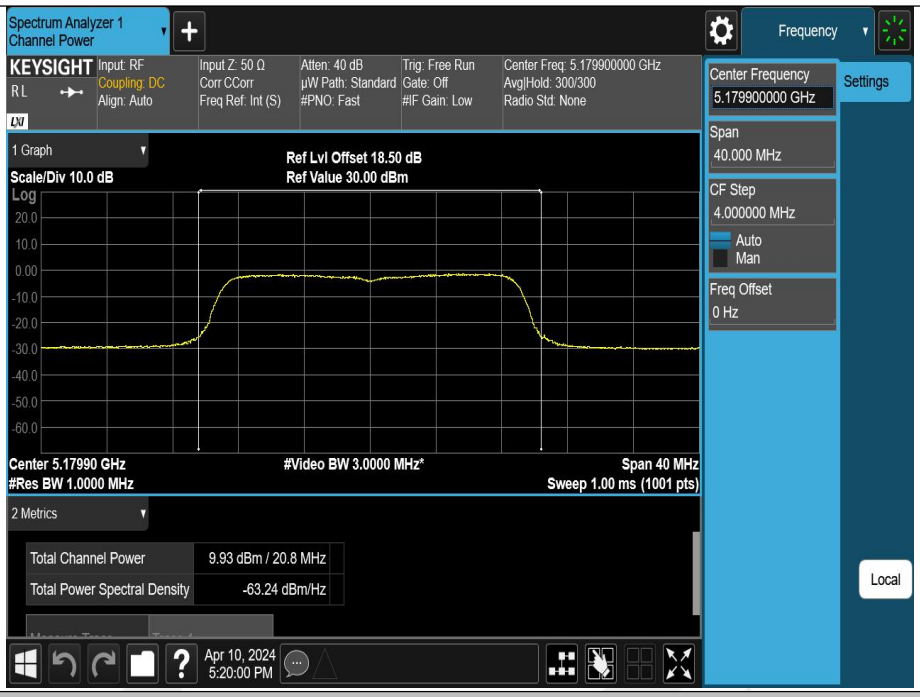
11A-Ant1-5745-PASS



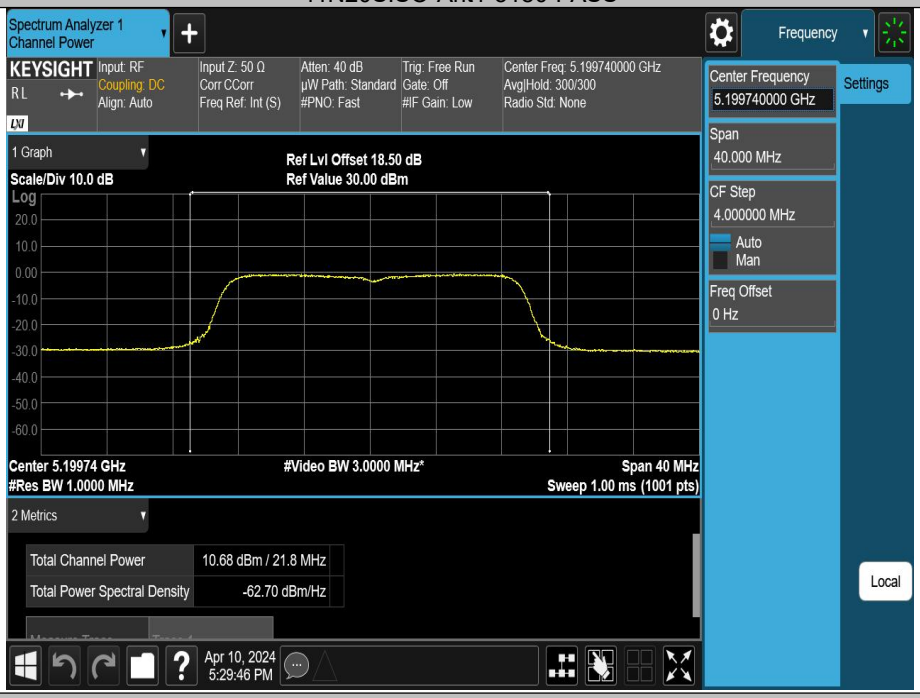
11A-Ant1-5785-PASS



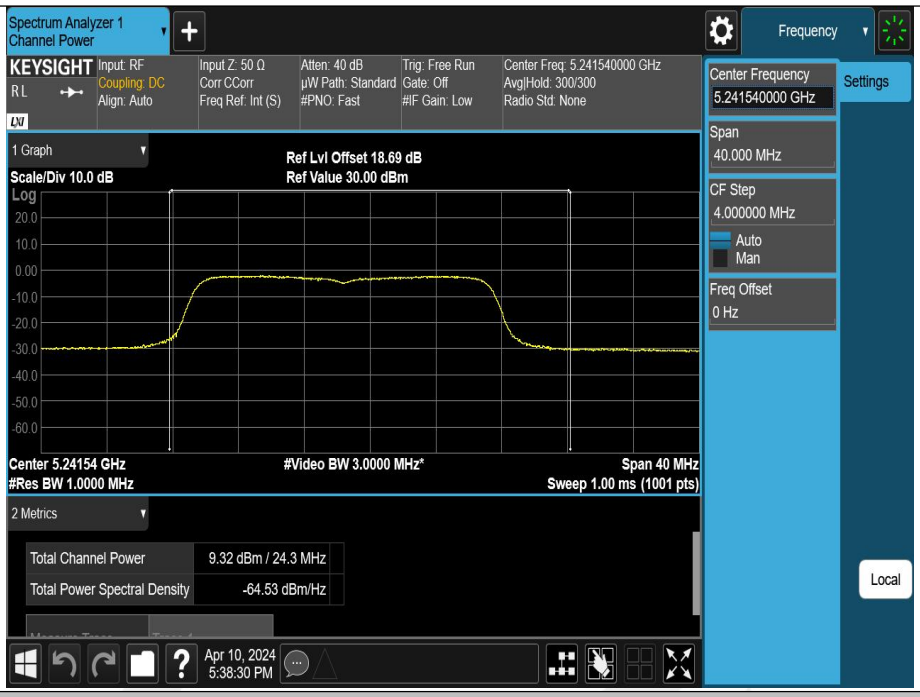
11A-Ant1-5825-PASS



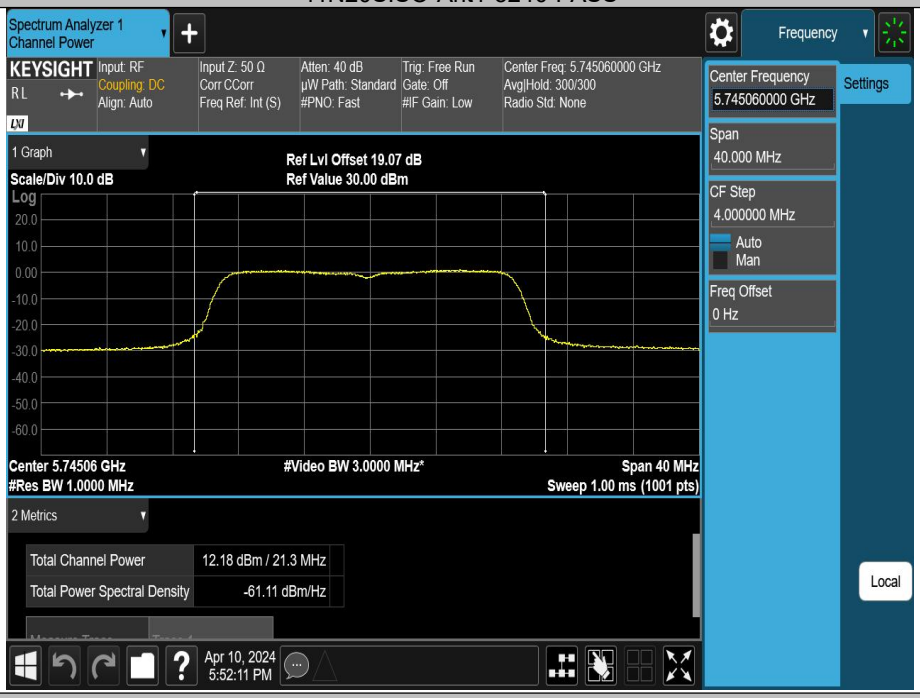
11N20SISO-Ant1-5180-PASS



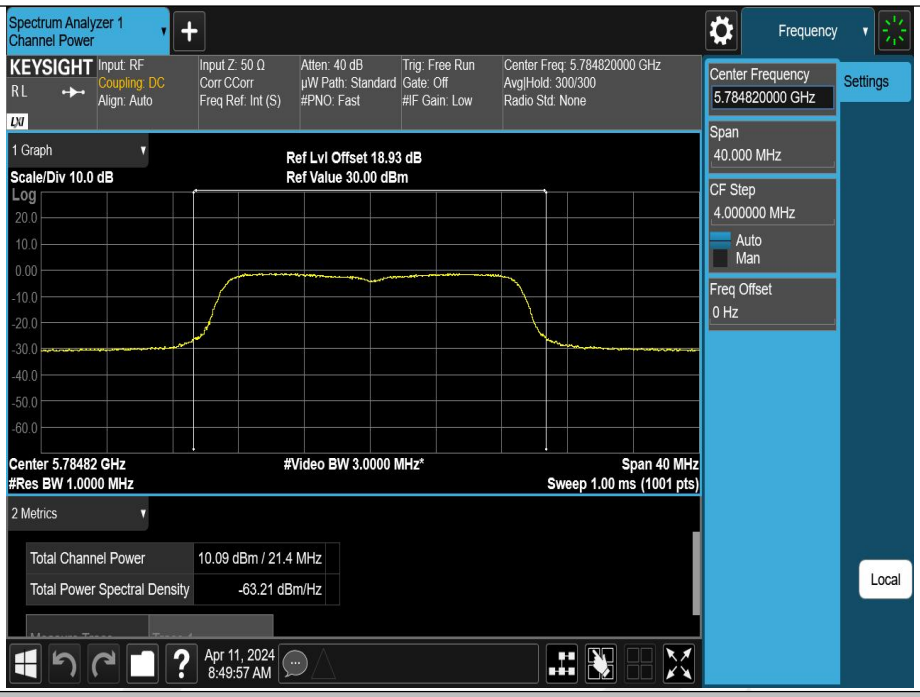
11N20SISO-Ant1-5200-PASS



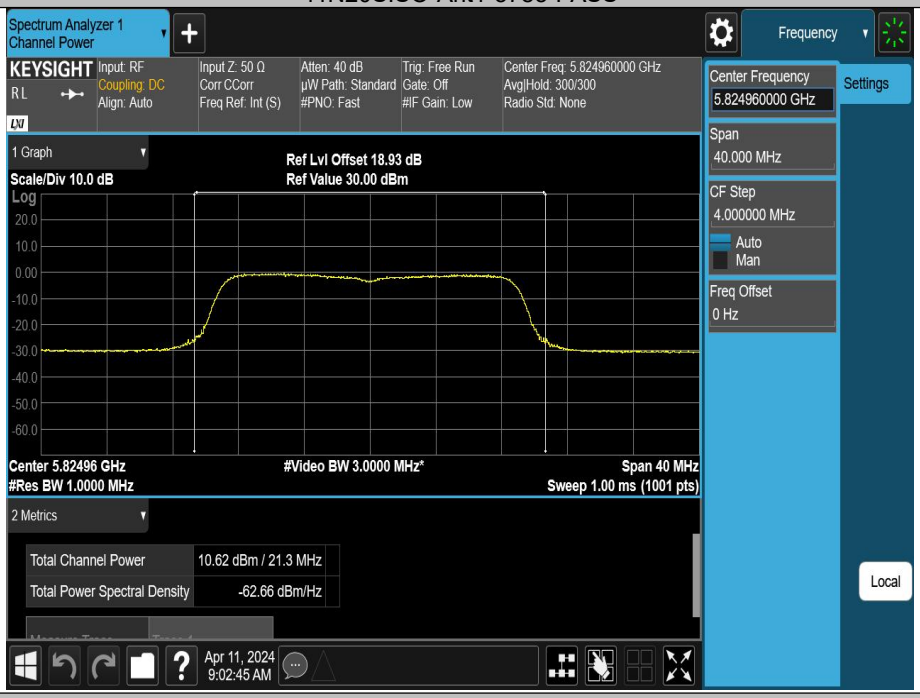
11N20SISO-Ant1-5240-PASS



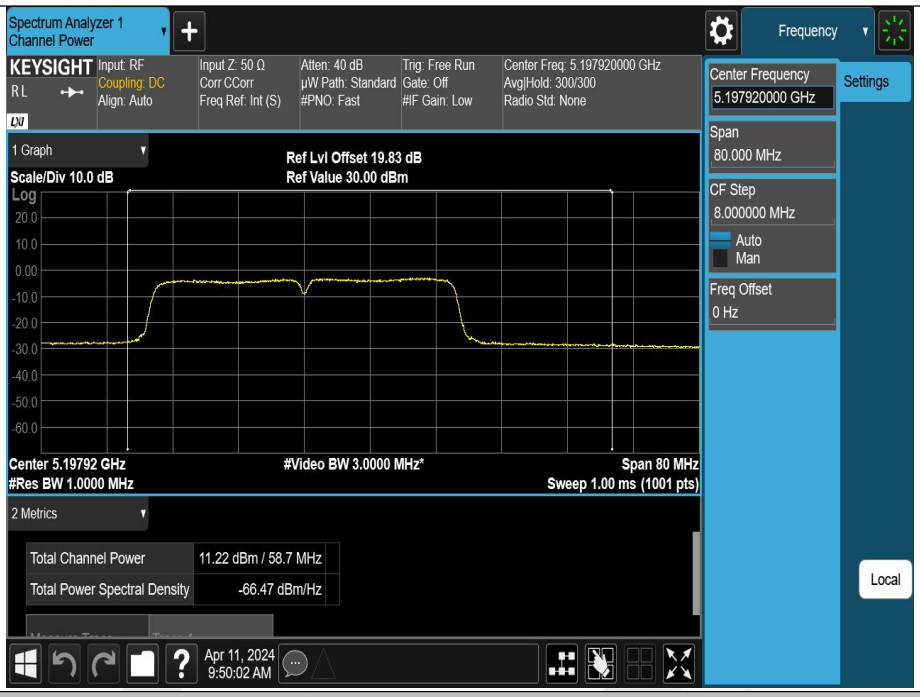
11N20SISO-Ant1-5745-PASS



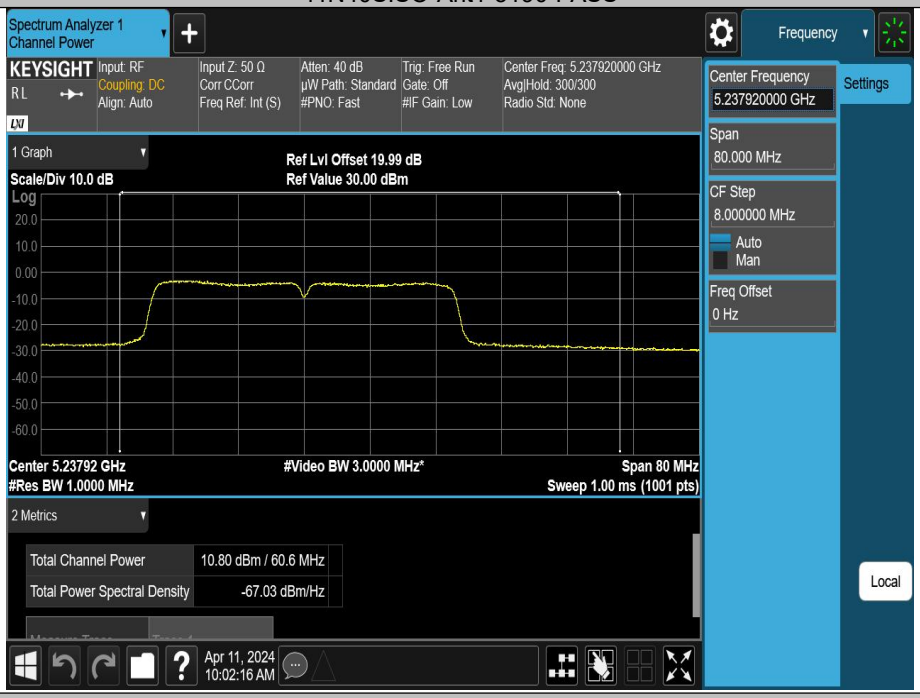
11N20SISO-Ant1-5785-PASS



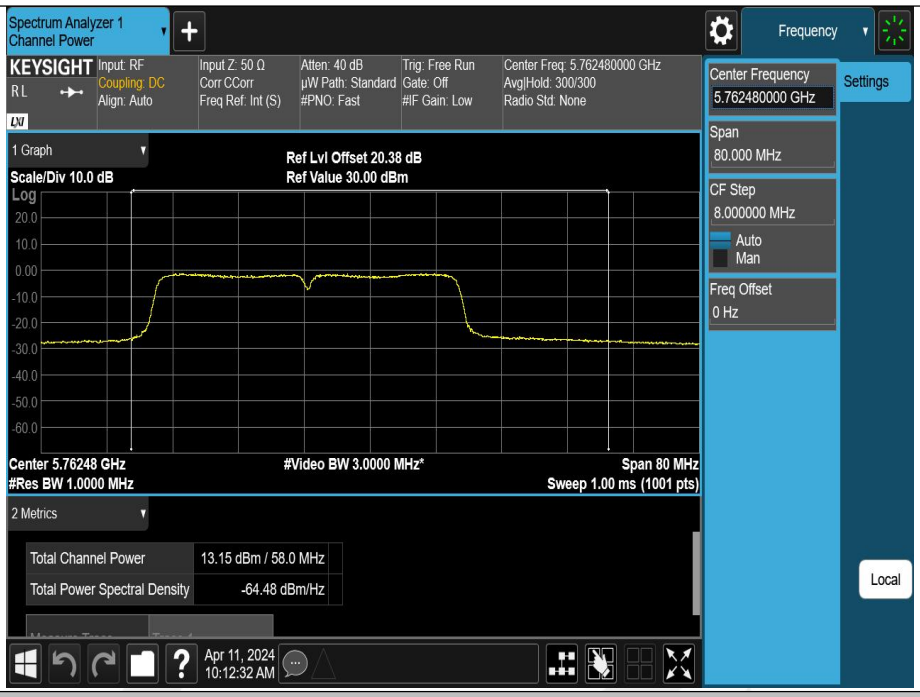
11N20SISO-Ant1-5825-PASS



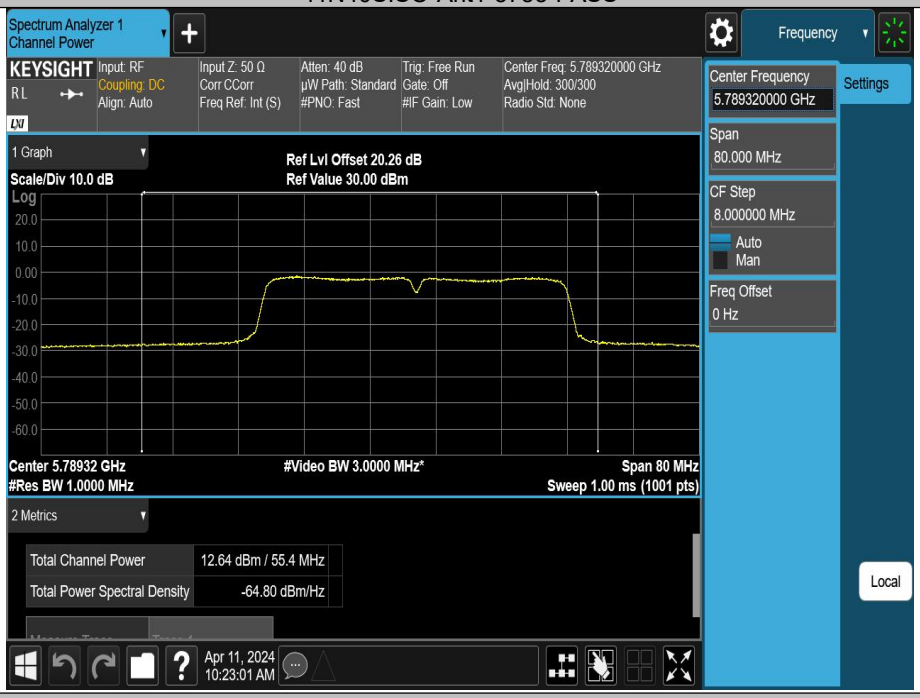
11N40SISO-Ant1-5190-PASS



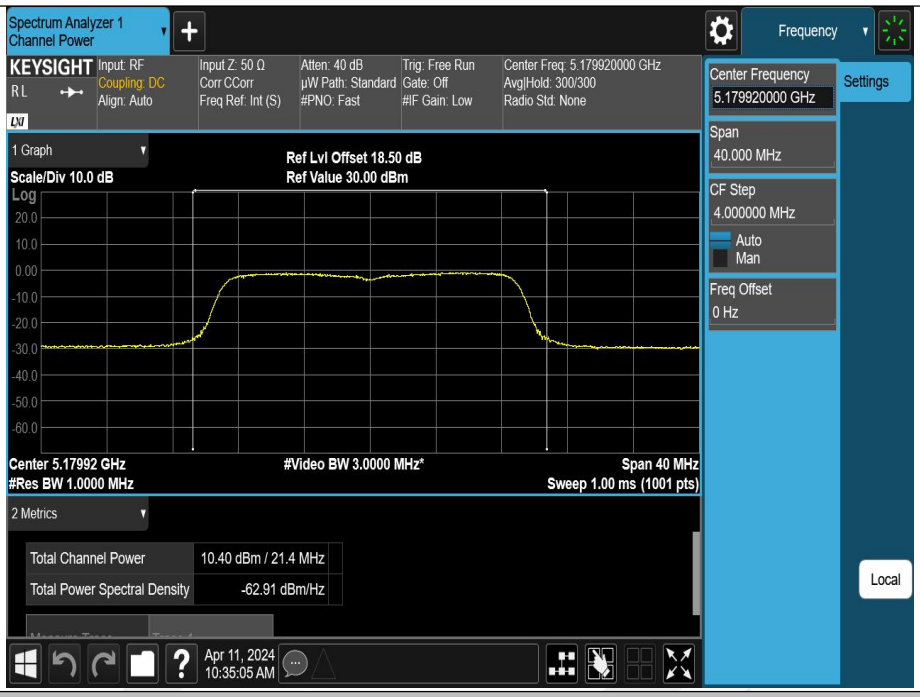
11N40SISO-Ant1-5230-PASS



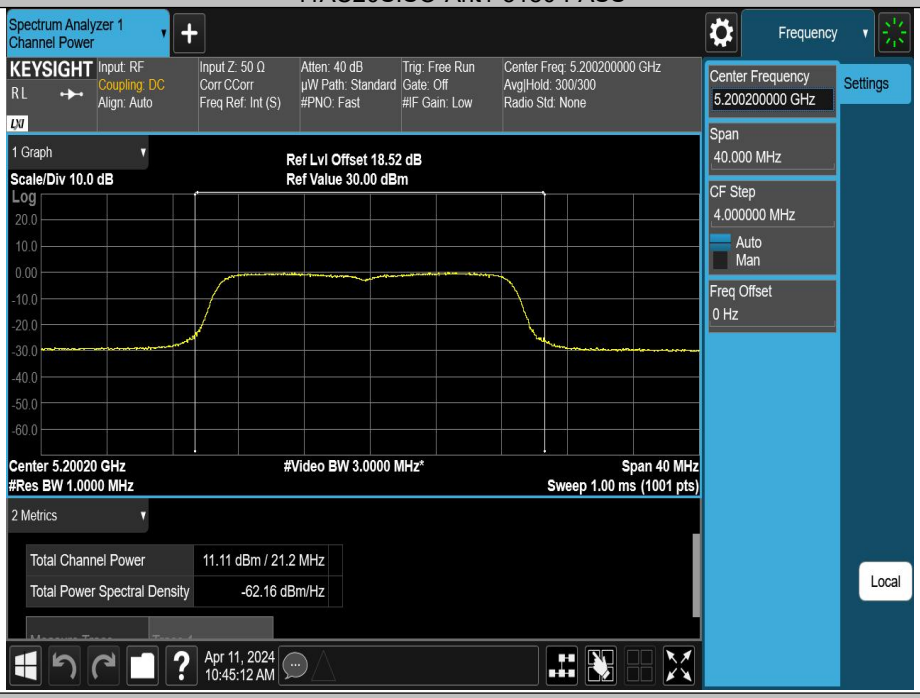
11N40SISO-Ant1-5755-PASS



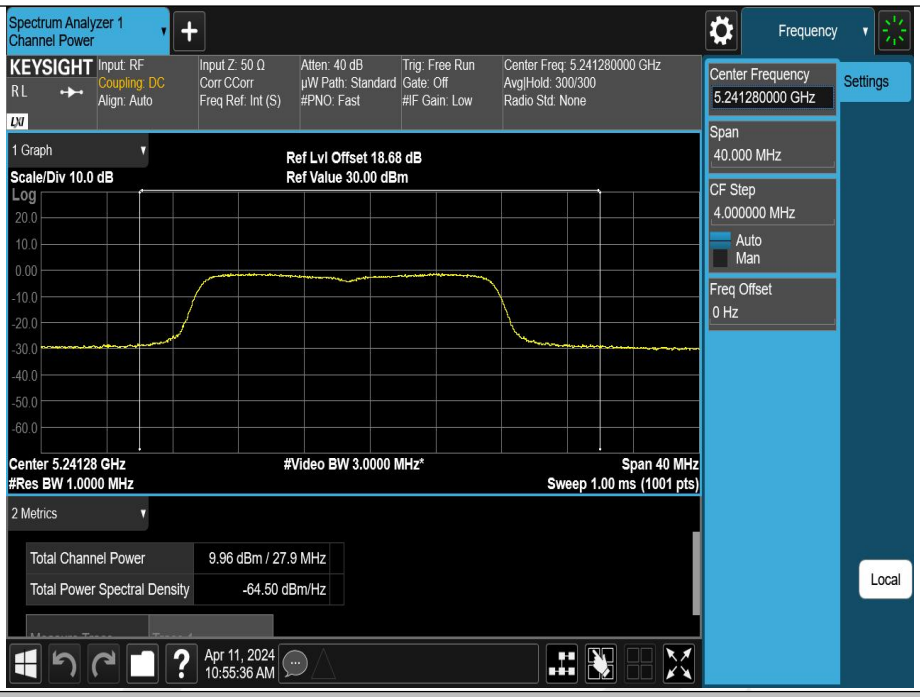
11N40SISO-Ant1-5795-PASS



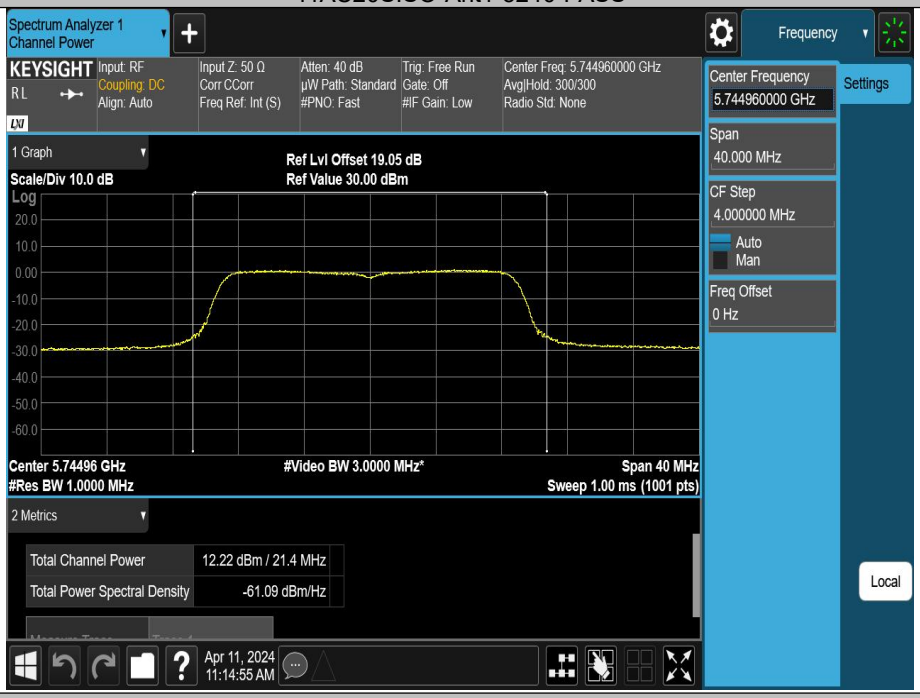
11AC20SISO-Ant1-5180-PASS



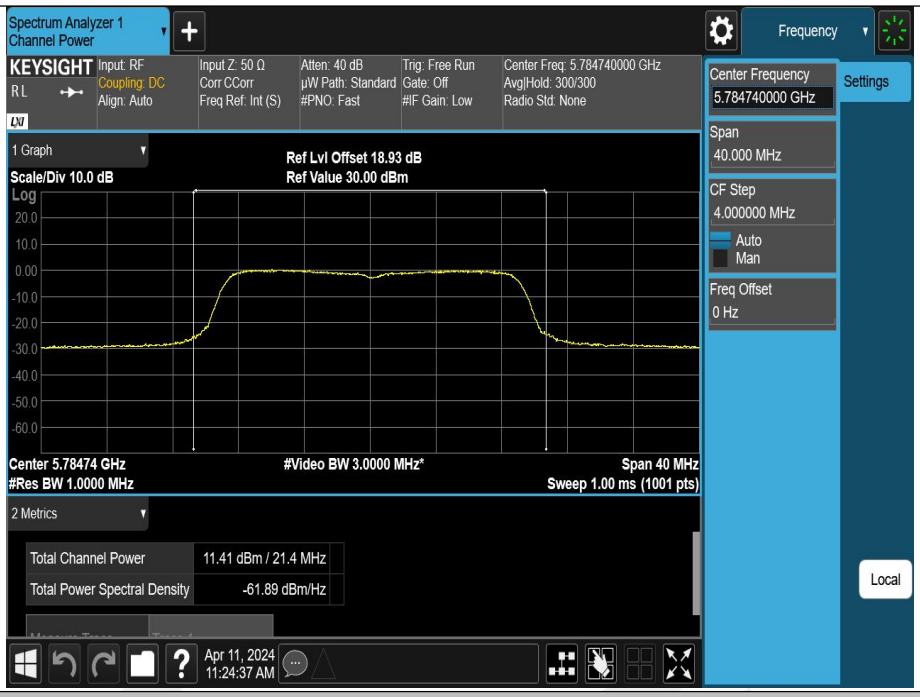
11AC20SISO-Ant1-5200-PASS



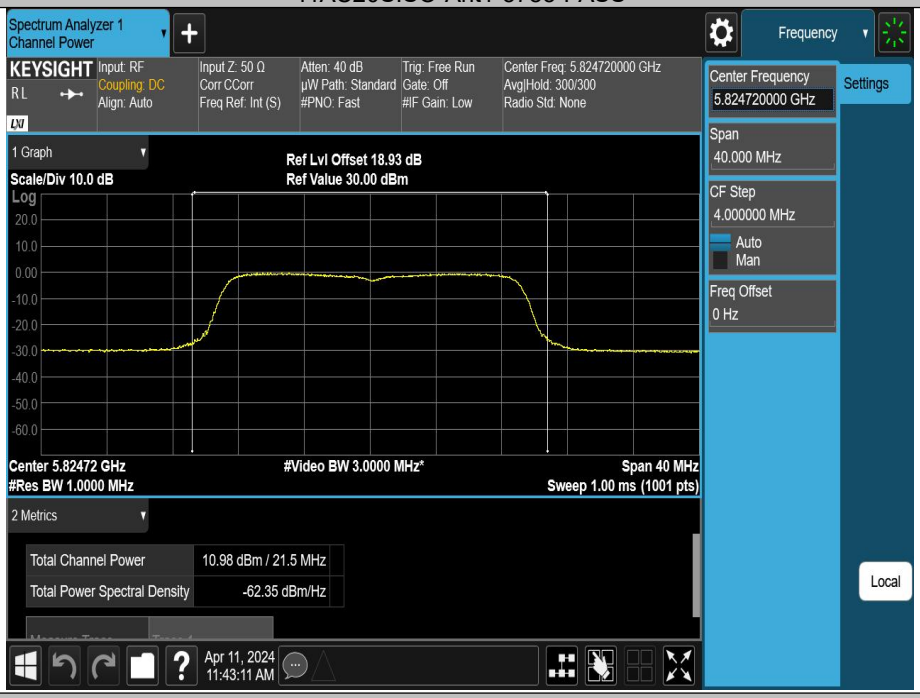
11AC20SISO-Ant1-5240-PASS



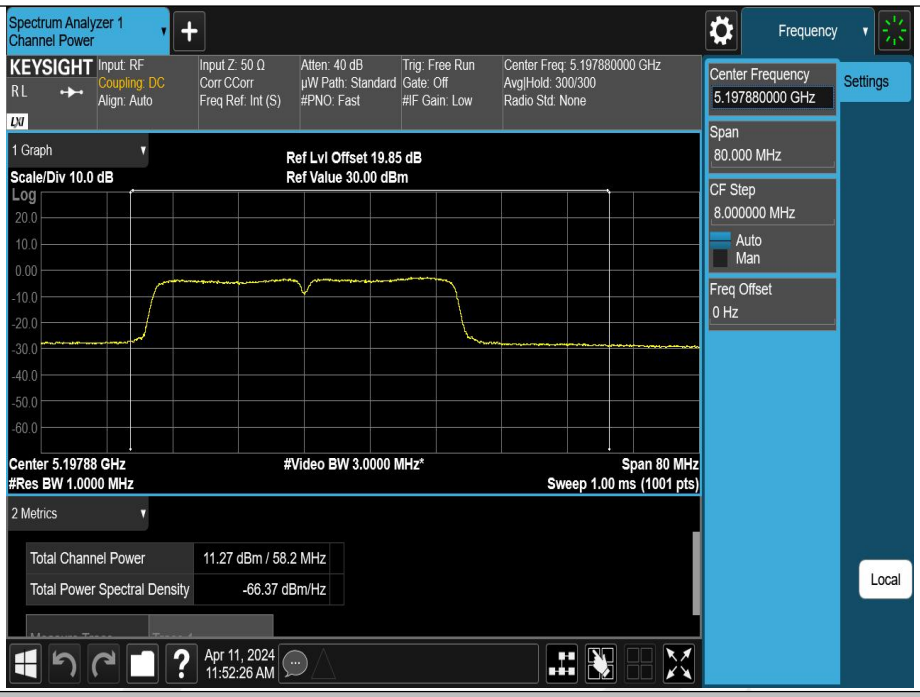
11AC20SISO-Ant1-5745-PASS



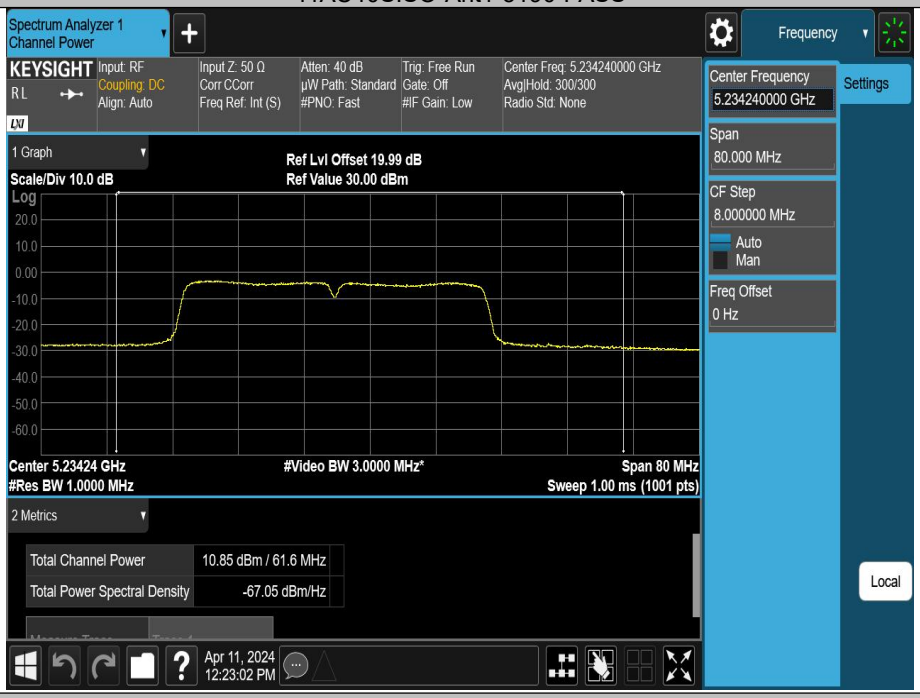
11AC20SISO-Ant1-5785-PASS



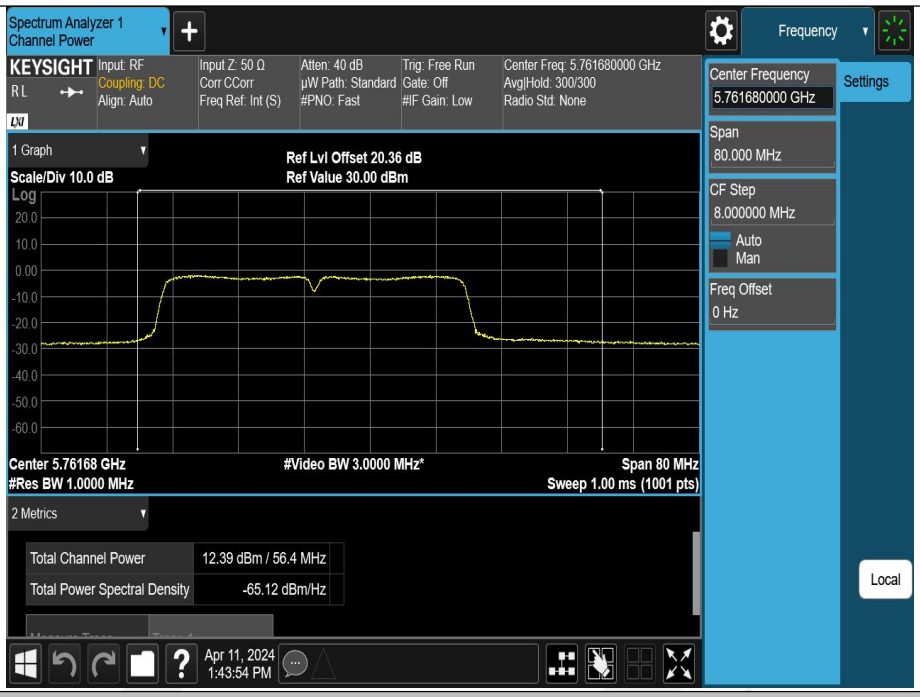
11AC20SISO-Ant1-5825-PASS



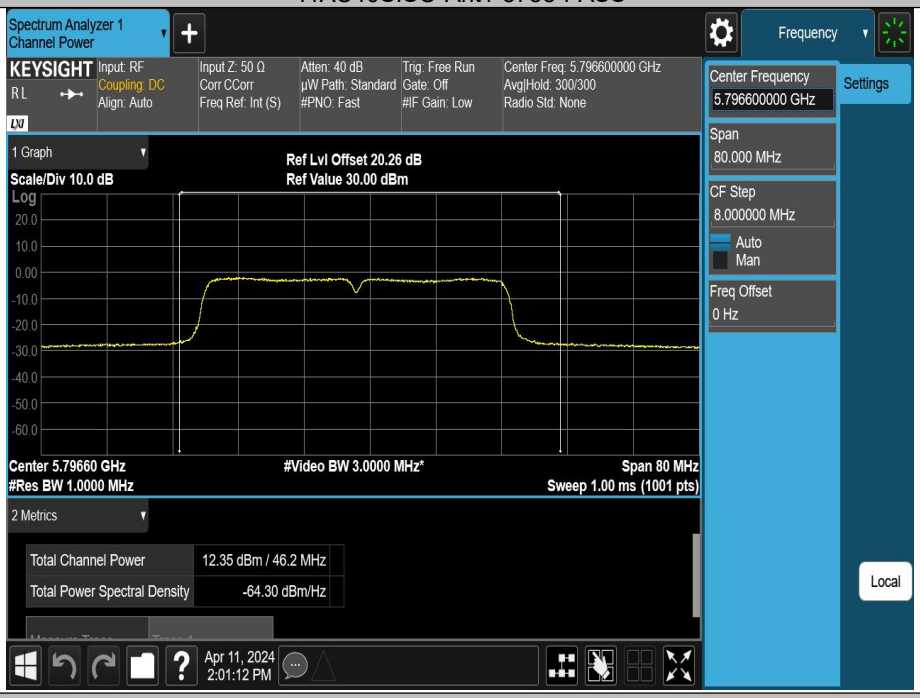
11AC40SISO-Ant1-5190-PASS



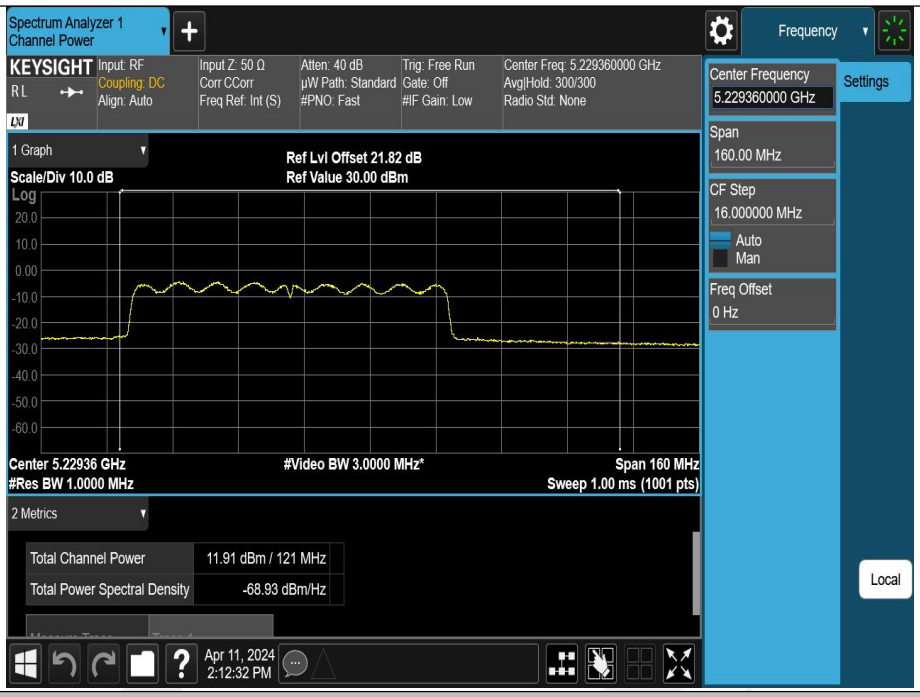
11AC40SISO-Ant1-5230-PASS



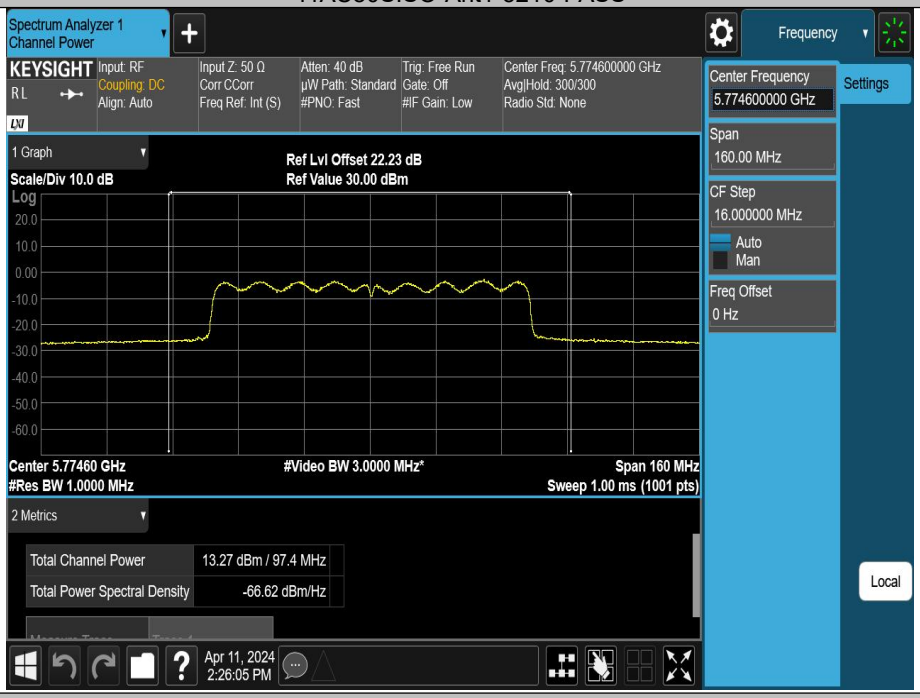
11AC40SISO-Ant1-5755-PASS



11AC40SISO-Ant1-5795-PASS



11AC80SISO-Ant1-5210-PASS



11AC80SISO-Ant1-5775-PASS

8.3 MAXIMUM PEAK POWER DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(F)
According to RSS 247 6.2

8.3.2 Conformance Limit

FCC Limit:

- For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor access point, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (ii) For an indoor access point, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points, 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 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 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.

(a) (1) (iv) For client devices, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(b) (2) The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- For the band 5.725-5.85 GHz

(a) (3)The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, 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

IC Limit:

- Frequency band 5150-5250 MHz

The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

■ Frequency band 5250-5350 MHz
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

■ Frequency bands 5470-5600 MHz and 5650-5725 MHz
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

■ Frequency band 5725-5850 MHz

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, 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 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

8.3.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.3.4 Test Procedure

Methods refer to FCC KDB 789033

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections

5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

8.3.5 Test Results

Temperature:	25 ˚C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

Note: N/A

TestMode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	-0.49	≤11.00	PASS
11A	Ant1	5200	-0.82	≤11.00	PASS
11A	Ant1	5240	-1.19	≤11.00	PASS
11A	Ant1	5745	-1.34	≤30.00	PASS
11A	Ant1	5785	-2.35	≤30.00	PASS
11A	Ant1	5825	-2.69	≤30.00	PASS
11N20SISO	Ant1	5180	-0.32	≤11.00	PASS
11N20SISO	Ant1	5200	0.24	≤11.00	PASS
11N20SISO	Ant1	5240	-1.60	≤11.00	PASS
11N20SISO	Ant1	5745	-1.92	≤30.00	PASS
11N20SISO	Ant1	5785	-3.77	≤30.00	PASS
11N20SISO	Ant1	5825	-3.48	≤30.00	PASS
11N40SISO	Ant1	5190	-2.43	≤11.00	PASS
11N40SISO	Ant1	5230	-2.51	≤11.00	PASS
11N40SISO	Ant1	5755	-3.99	≤30.00	PASS
11N40SISO	Ant1	5795	-3.74	≤30.00	PASS
11AC20SISO	Ant1	5180	-0.29	≤11.00	PASS
11AC20SISO	Ant1	5200	0.09	≤11.00	PASS
11AC20SISO	Ant1	5240	-0.53	≤11.00	PASS
11AC20SISO	Ant1	5745	-1.72	≤30.00	PASS
11AC20SISO	Ant1	5785	-2.26	≤30.00	PASS
11AC20SISO	Ant1	5825	-2.62	≤30.00	PASS
11AC40SISO	Ant1	5190	-2.75	≤11.00	PASS
11AC40SISO	Ant1	5230	-2.73	≤11.00	PASS
11AC40SISO	Ant1	5755	-4.33	≤30.00	PASS
11AC40SISO	Ant1	5795	-3.86	≤30.00	PASS
11AC80SISO	Ant1	5210	-3.34	≤11.00	PASS
11AC80SISO	Ant1	5775	-6.26	≤30.00	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.