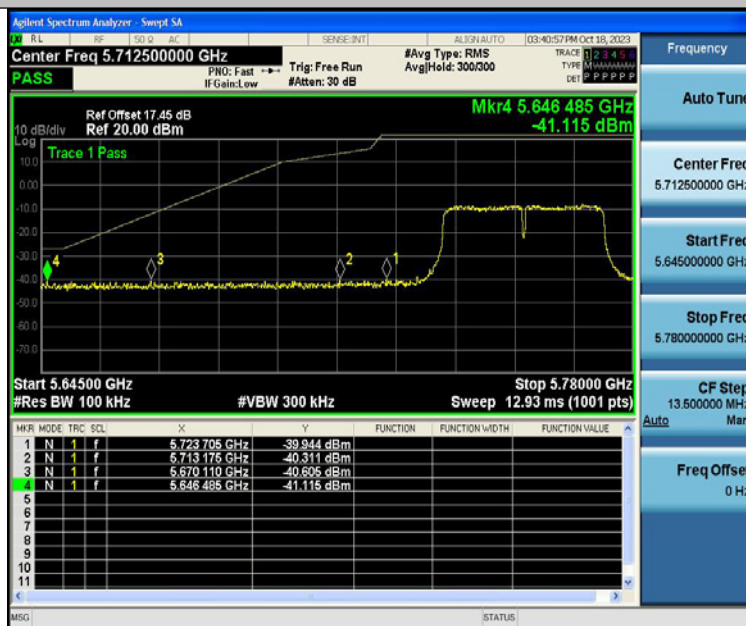




11N20SISO-Ant1-5825-PASS



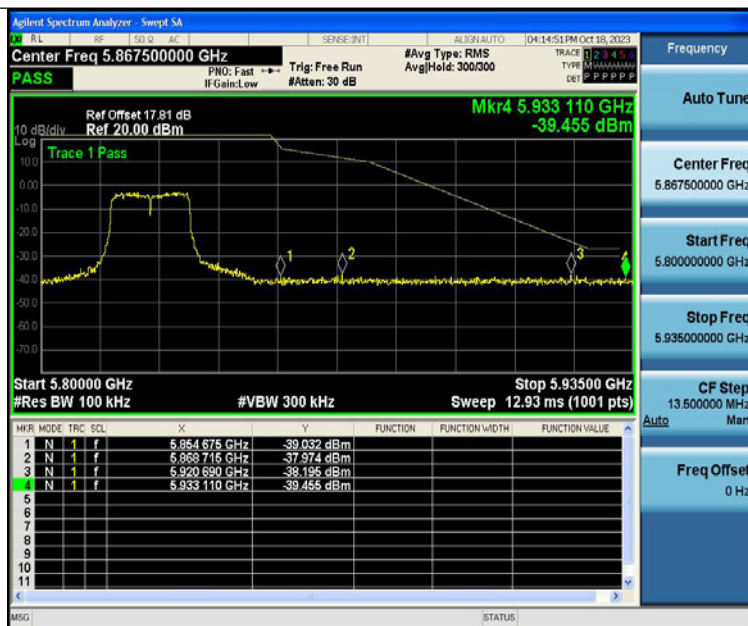
11N40SISO-Ant1-5755-PASS



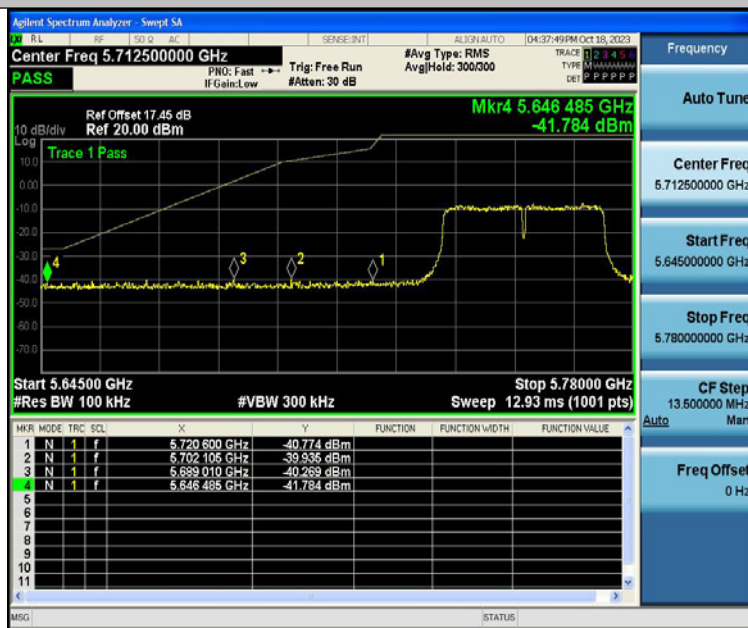
11N40SISO-Ant1-5795-PASS



11AC20SISO-Ant1-5745-PASS



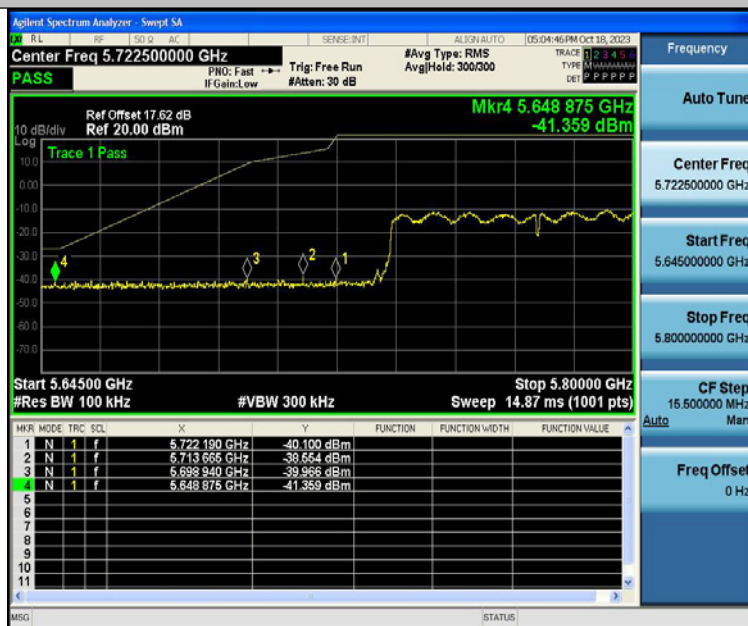
11AC20SISO-Ant1-5825-PASS



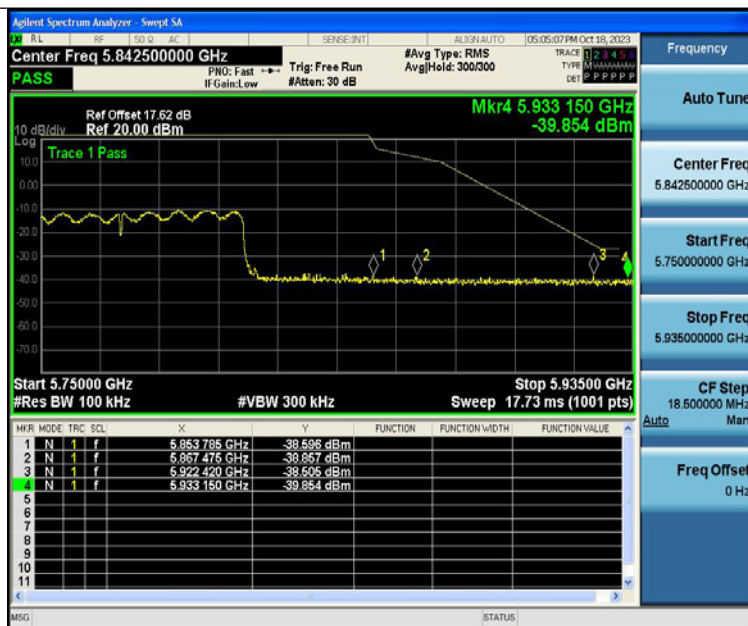
11AC40SISO-Ant1-5755-PASS



11AC40SISO-Ant1-5795-PASS



11AC80SISO-Ant1-5775-PASS



11AC80SISO-Ant1-5775-PASS



7 Emission Bandwidth and Occupied Bandwidth

Test Requirement	: FCC CFR47 Part 15 Section 15.407(a)(e)
Test Method	: ANSI C63.10:2013
Test Limit	According to FCC §15.407(a), The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth. As per FCC §15.407(e): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

7.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01,
Emission Bandwidth (EBW)

a) Set RBW = approximately 1% of the emission bandwidth; b) Set the VBW > RBW; c) Detector = Peak; d) Trace mode = max hold; e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%; 99% Occupied Bandwidth

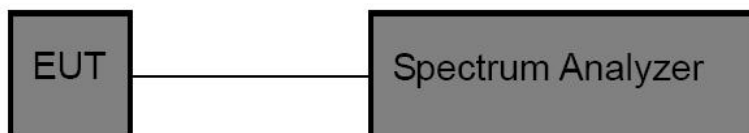
The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99% occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set $VBW \geq 3 \cdot RBW$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

7.2 Test Setup



7.3 Test Result

PASS

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations / data rates and antenna ports.

Following channel was selected for the final test as listed below.

26 dB emission bandwidth

Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	20.200	5170.040	5190.240	---	---
11A	Ant1	5200	20.240	5189.840	5210.080	---	---
11A	Ant1	5240	20.080	5229.880	5249.960	---	---
11N20SISO	Ant1	5180	20.920	5169.520	5190.440	---	---
11N20SISO	Ant1	5200	21.080	5189.520	5210.600	---	---
11N20SISO	Ant1	5240	21.040	5229.360	5250.400	---	---
11N40SISO	Ant1	5190	41.680	5169.200	5210.880	---	---
11N40SISO	Ant1	5230	41.920	5209.040	5250.960	---	---
11AC20SISO	Ant1	5180	21.200	5169.440	5190.640	---	---
11AC20SISO	Ant1	5200	21.280	5189.280	5210.560	---	---
11AC20SISO	Ant1	5240	21.160	5229.400	5250.560	---	---
11AC40SISO	Ant1	5190	41.440	5169.280	5210.720	---	---
11AC40SISO	Ant1	5230	41.280	5209.360	5250.640	---	---
11AC80SISO	Ant1	5210	82.720	5169.360	5252.080	---	---



minimum 6 dB bandwidth

Test Result Band 4

Test Mode	Antenna	Frequency[MHz]	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	16.480	5736.760	5753.240	0.5	PASS
11A	Ant1	5785	16.480	5776.800	5793.280	0.5	PASS
11A	Ant1	5825	16.520	5816.760	5833.280	0.5	PASS
11N20SISO	Ant1	5745	17.680	5736.160	5753.840	0.5	PASS
11N20SISO	Ant1	5785	17.600	5776.200	5793.800	0.5	PASS
11N20SISO	Ant1	5825	17.680	5816.200	5833.880	0.5	PASS
11N40SISO	Ant1	5755	36.400	5736.840	5773.240	0.5	PASS
11N40SISO	Ant1	5795	36.400	5776.840	5813.240	0.5	PASS
11AC20SISO	Ant1	5745	17.640	5736.200	5753.840	0.5	PASS
11AC20SISO	Ant1	5785	17.640	5776.200	5793.840	0.5	PASS
11AC20SISO	Ant1	5825	17.760	5816.160	5833.920	0.5	PASS
11AC40SISO	Ant1	5755	36.400	5736.840	5773.240	0.5	PASS
11AC40SISO	Ant1	5795	36.400	5776.840	5813.240	0.5	PASS
11AC80SISO	Ant1	5775	76.320	5736.920	5813.240	0.5	PASS

26 dB emission bandwidth

Test Graphs



11A-Ant1-5180



11A-Ant1-5200



11A-Ant1-5240



11N20SISO-Ant1-5180



11N20SISO-Ant1-5200



11N20SISO-Ant1-5240



11N40SISO-Ant1-5190



11N40SISO-Ant1-5230



11AC20SISO-Ant1-5180



11AC20SISO-Ant1-5200



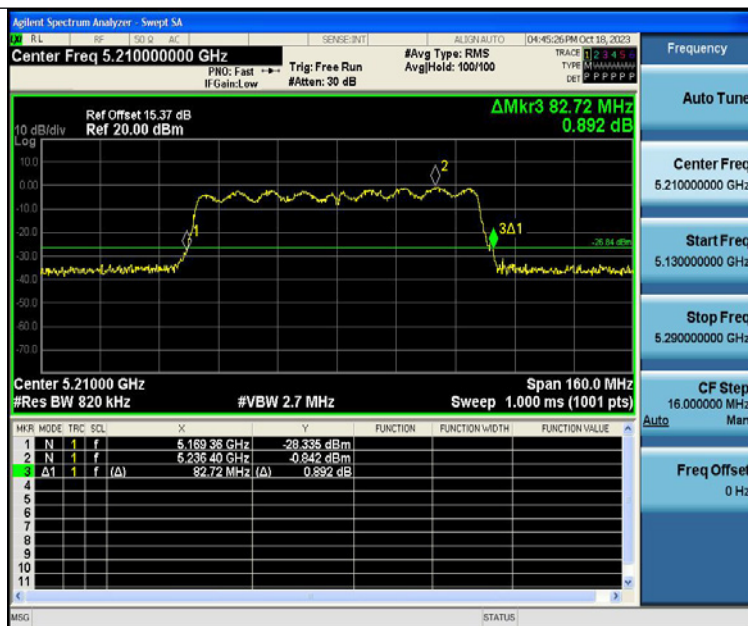
11AC20SISO-Ant1-5240



11AC40SISO-Ant1-5190



11AC40SISO-Ant1-5230



11AC80SISO-Ant1-5210



Min emission bandwidth

Test Graphs Band 4



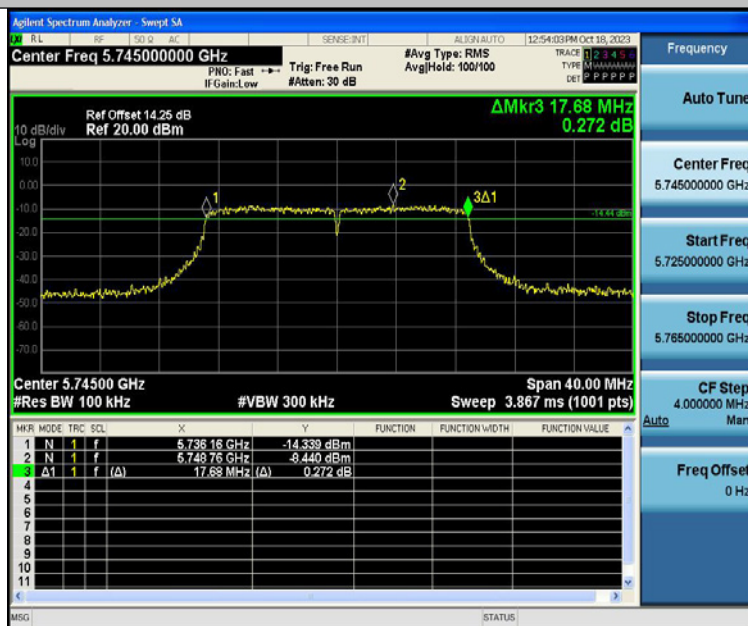
11A-Ant1-5745-PASS



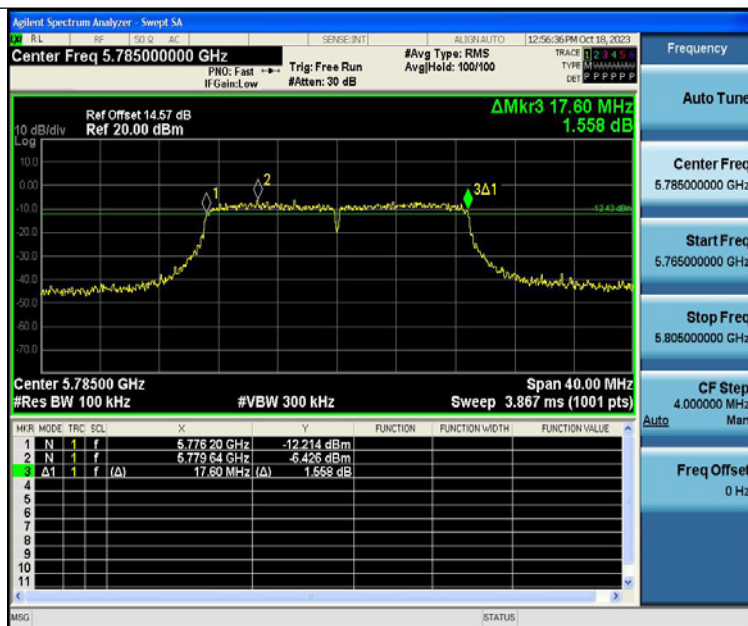
11A-Ant1-5785-PASS



11A-Ant1-5825-PASS



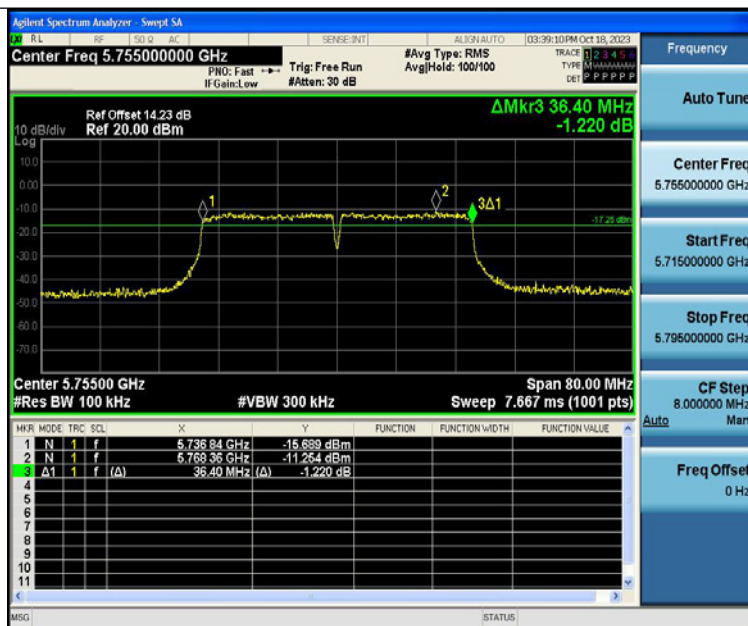
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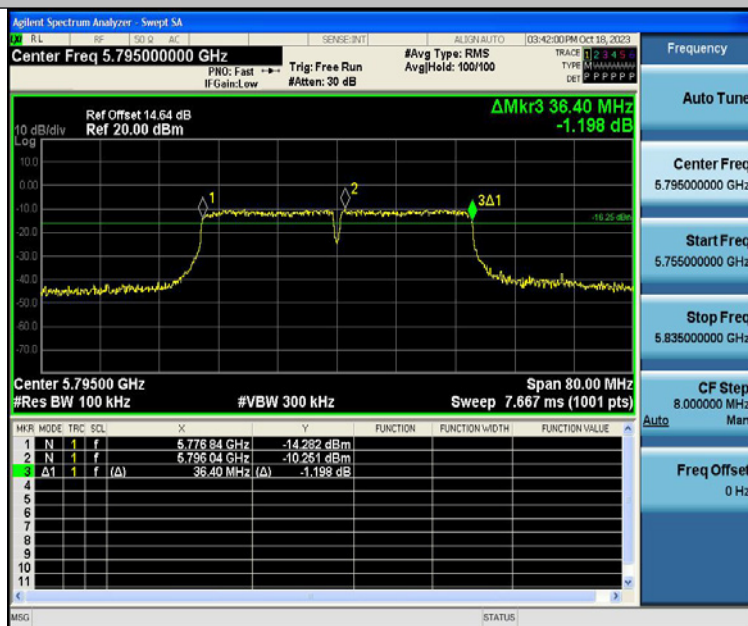
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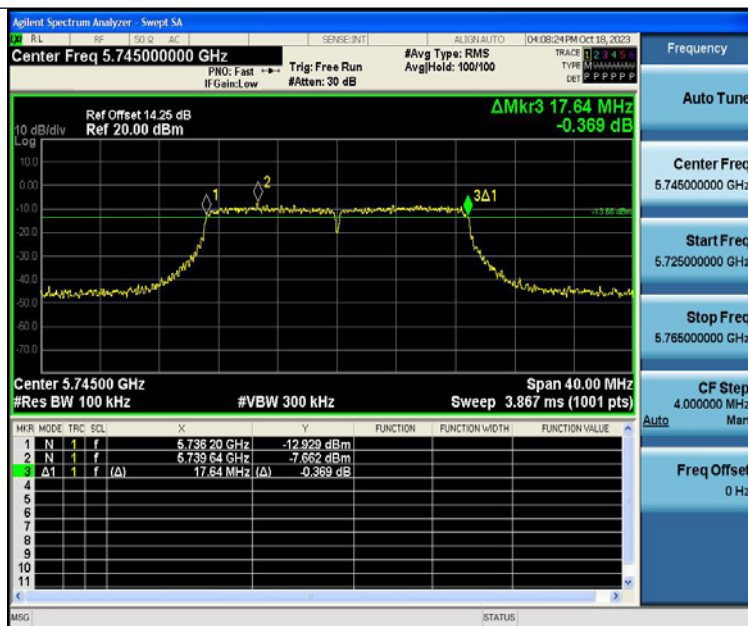
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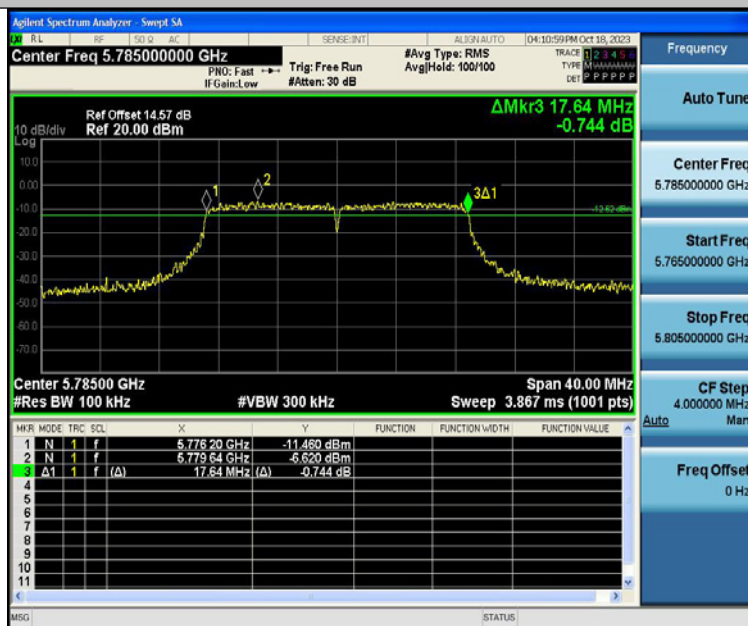
11N40SISO-Ant1-5755-PASS



11N40SISO-Ant1-5795-PASS



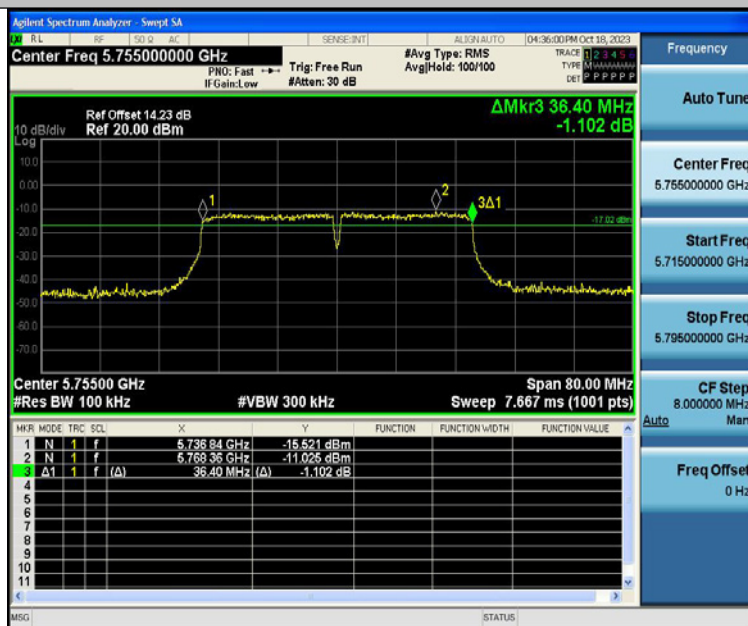
11AC20SISO-Ant1-5745-PASS



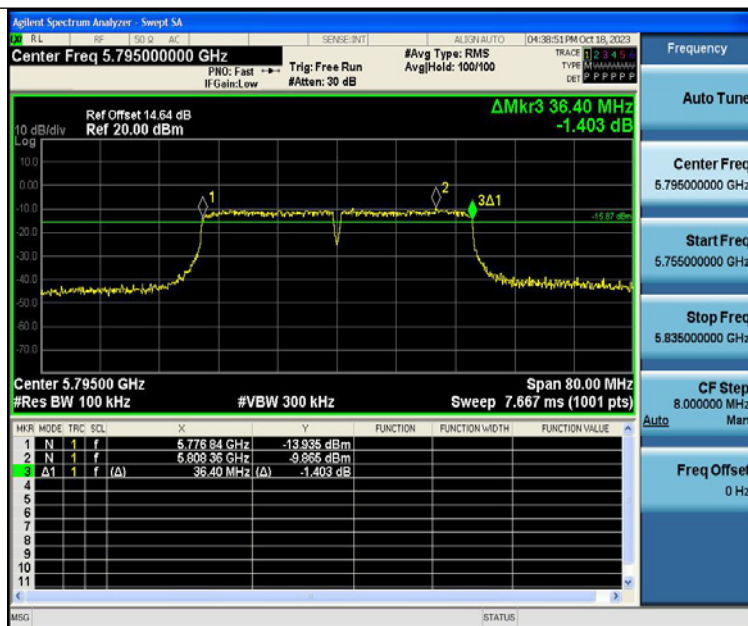
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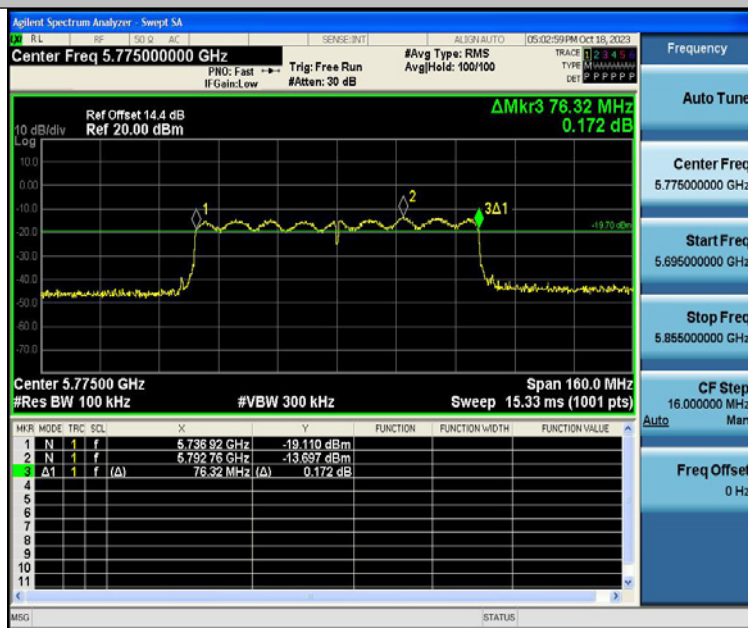
11AC20SISO-Ant1-5825-PASS



11AC40SISO-Ant1-5755-PASS



11AC40SISO-Ant1-5795-PASS



11AC80SISO-Ant1-5775-PASS



8 Maximum Conducted Output Power

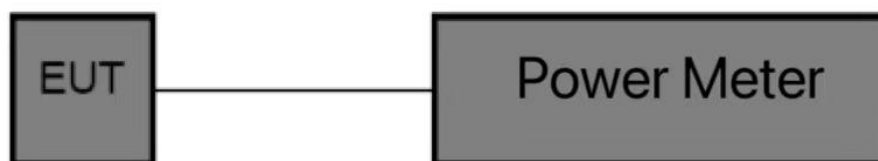
Test Requirement	: FCC CFR47 Part 15 Section 15.407
Test Method	: ANSI C63.10:2013
Test Limit	: For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, 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.

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.

8.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, The use Power Meter 1. Place the EUT on a bench and set it in transmitting mode. 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power meter.

8.2 Test Setup





8.3 Test Result

Test Mode	Antenna	Frequency [MHz]	Set Power	TPC Mode	Channel Power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11A	Ant1	5180	---	NA	9.63	100.00	0.00	9.63	≤23.98	3.22	12.85	---	PASS
11A	Ant1	5200	---	NA	10.46	100.00	0.00	10.46	≤23.98	3.22	13.68	---	PASS
11A	Ant1	5240	---	NA	11.60	100.00	0.00	11.60	≤23.98	3.22	14.82	---	PASS
11A	Ant1	5745	---	NA	6.76	100.00	0.00	6.76	≤30.00	3.22	9.98	---	PASS
11A	Ant1	5785	---	NA	8.04	100.00	0.00	8.04	≤30.00	3.22	11.26	---	PASS
11A	Ant1	5825	---	NA	8.70	100.00	0.00	8.70	≤30.00	3.22	11.92	---	PASS
11N20SISO	Ant1	5180	---	NA	8.49	100.00	0.00	8.49	≤23.98	3.22	11.71	---	PASS
11N20SISO	Ant1	5200	---	NA	9.47	100.00	0.00	9.47	≤23.98	3.22	12.69	---	PASS
11N20SISO	Ant1	5240	---	NA	10.64	100.00	0.00	10.64	≤23.98	3.22	13.86	---	PASS
11N20SISO	Ant1	5745	---	NA	5.82	100.00	0.00	5.82	≤30.00	3.22	9.04	---	PASS
11N20SISO	Ant1	5785	---	NA	7.12	100.00	0.00	7.12	≤30.00	3.22	10.34	---	PASS
11N20SISO	Ant1	5825	---	NA	8.12	100.00	0.00	8.12	≤30.00	3.22	11.34	---	PASS
11N40SISO	Ant1	5190	---	NA	8.45	100.00	0.00	8.45	≤23.98	3.22	11.67	---	PASS
11N40SISO	Ant1	5230	---	NA	10.32	100.00	0.00	10.32	≤23.98	3.22	13.54	---	PASS
11N40SISO	Ant1	5755	---	NA	5.77	100.00	0.00	5.77	≤30.00	3.22	8.99	---	PASS
11N40SISO	Ant1	5795	---	NA	7.24	100.00	0.00	7.24	≤30.00	3.22	10.46	---	PASS
11AC20SISO	Ant1	5180	---	NA	8.31	100.00	0.00	8.31	≤23.98	3.22	11.53	---	PASS
11AC20SISO	Ant1	5200	---	NA	9.22	100.00	0.00	9.22	≤23.98	3.22	12.44	---	PASS
11AC20SISO	Ant1	5240	---	NA	10.56	100.00	0.00	10.56	≤23.98	3.22	13.78	---	PASS
11AC20SISO	Ant1	5745	---	NA	5.83	100.00	0.00	5.83	≤30.00	3.22	9.05	---	PASS
11AC20SISO	Ant1	5785	---	NA	7.42	100.00	0.00	7.42	≤30.00	3.22	10.64	---	PASS
11AC20SISO	Ant1	5825	---	NA	8.13	100.00	0.00	8.13	≤30.00	3.22	11.35	---	PASS
11AC40SISO	Ant1	5190	---	NA	8.45	100.00	0.00	8.45	≤23.98	3.22	11.67	---	PASS
11AC40SISO	Ant1	5230	---	NA	10.31	100.00	0.00	10.31	≤23.98	3.22	13.53	---	PASS
11AC40SISO	Ant1	5755	---	NA	5.80	100.00	0.00	5.80	≤30.00	3.22	9.02	---	PASS
11AC40SISO	Ant1	5795	---	NA	7.20	100.00	0.00	7.20	≤30.00	3.22	10.42	---	PASS
11AC80SISO	Ant1	5210	---	NA	8.60	100.00	0.00	8.60	≤23.98	3.22	11.82	---	PASS
11AC80SISO	Ant1	5775	---	NA	5.48	100.00	0.00	5.48	≤30.00	3.22	8.70	---	PASS

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



9 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.2407(a)
Test Method	: ANSI C63.10:2013
Test Limit	: 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.. 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-kHzband. 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

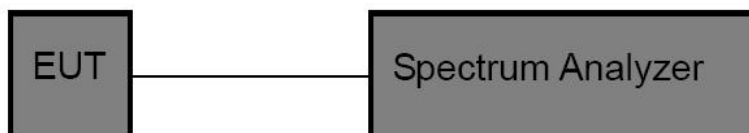


9.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 and ANSI 63.10: 2013 Sec 10.3.7. 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 Section 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 the RBW to 1 MHz.
- b) Set the VBW to be at least 1 MHz (a VBW of 3 MHz is desirable).
- c) Set the frequency span to examine the spectrum across a convenient frequency segment (e.g., 600 MHz).
- d) Select the power averaging (rms) detector.
- e) Set the sweep time so that there is no more than a 1 ms integration period over each measurement bin.
- f) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

9.2 Test Setup





9.3 Test Result

Pre-scan has been conducted to determine the worst-case mode from all possible

combinations between available modulations / data rates and antenna ports.

Following channel was selected for the final test as listed below

Test Mode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	-1.07	≤11.00	PASS
11A	Ant1	5200	-0.35	≤11.00	PASS
11A	Ant1	5240	0.67	≤11.00	PASS
11N20SISO	Ant1	5180	-2.36	≤11.00	PASS
11N20SISO	Ant1	5200	-1.51	≤11.00	PASS
11N20SISO	Ant1	5240	-0.46	≤11.00	PASS
11N40SISO	Ant1	5190	-5.52	≤11.00	PASS
11N40SISO	Ant1	5230	-3.64	≤11.00	PASS
11AC20SISO	Ant1	5180	-2.46	≤11.00	PASS
11AC20SISO	Ant1	5200	-1.68	≤11.00	PASS
11AC20SISO	Ant1	5240	-0.43	≤11.00	PASS
11AC40SISO	Ant1	5190	-5.51	≤11.00	PASS
11AC40SISO	Ant1	5230	-3.72	≤11.00	PASS
11AC80SISO	Ant1	5210	-7.18	≤11.00	PASS

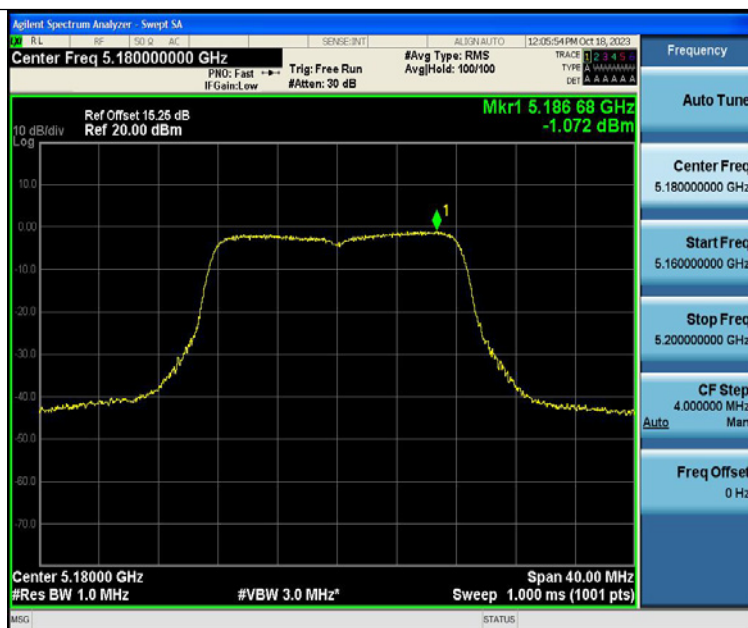
Test Mode	Antenna	Frequency[MHz]	Result [dBm/500 kHz]	Limit[dBm/500 kHz]	Verdict
11A	Ant1	5745	-7.2	≤30.00	PASS
11A	Ant1	5785	-5.88	≤30.00	PASS
11A	Ant1	5825	-4.84	≤30.00	PASS
11N20SISO	Ant1	5745	-8.23	≤30.00	PASS
11N20SISO	Ant1	5785	-6.86	≤30.00	PASS
11N20SISO	Ant1	5825	-5.78	≤30.00	PASS
11N40SISO	Ant1	5755	-11.37	≤30.00	PASS
11N40SISO	Ant1	5795	-9.93	≤30.00	PASS
11AC20SISO	Ant1	5745	-8.12	≤30.00	PASS
11AC20SISO	Ant1	5785	-6.54	≤30.00	PASS
11AC20SISO	Ant1	5825	-5.92	≤30.00	PASS
11AC40SISO	Ant1	5755	-11.1	≤30.00	PASS
11AC40SISO	Ant1	5795	-9.85	≤30.00	PASS
11AC80SISO	Ant1	5775	-13.4	≤30.00	PASS

Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725-5.85 GHz.

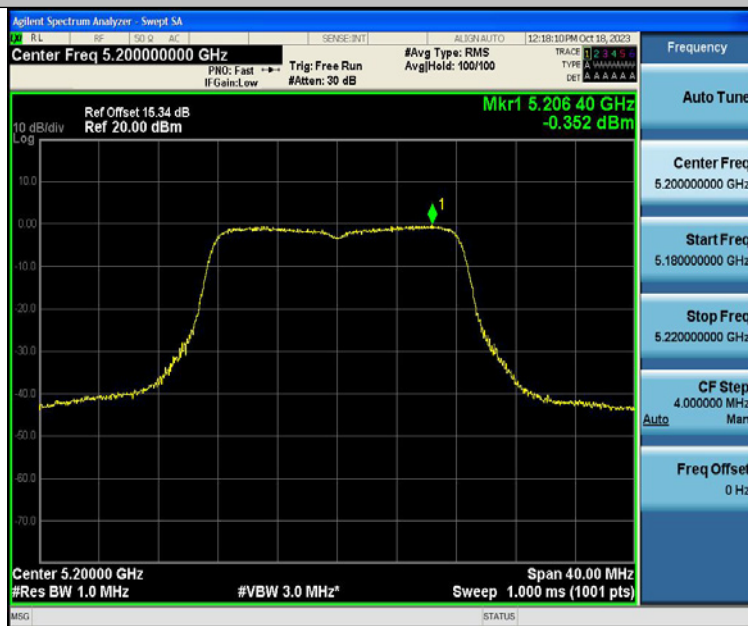
2.The Duty Cycle Factor and RBW Factor is compensated in the graph.



Test Graphs



11A-Ant1-5180-PASS



11A-Ant1-5200-PASS



11A-Ant1-5240-PASS



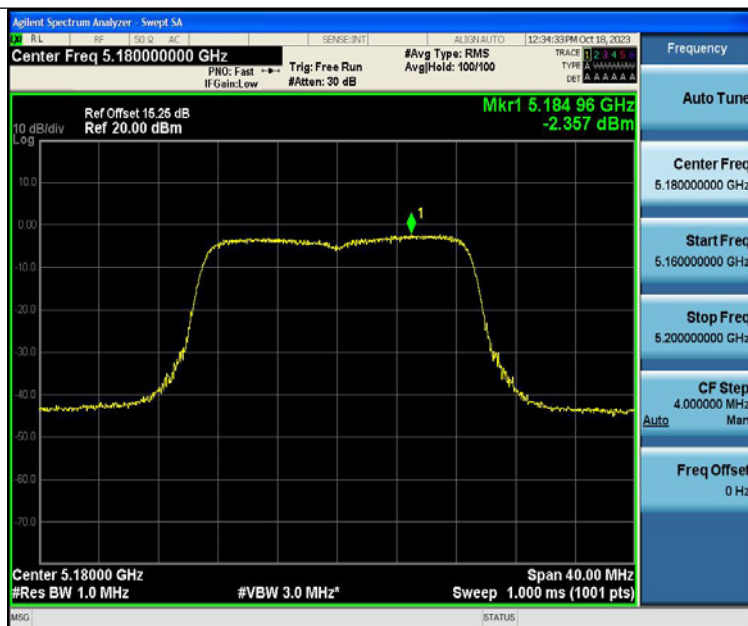
11A-Ant1-5745-PASS



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