

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)(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(F)

8.3.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (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. 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).

(a) (1) (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. 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.

(a) (1) (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. 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.

(a) (1) (iv) For mobile and portable 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. 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 5.25-5.35 GHz and 5.47-5.725 GHz bands

(b) (2) the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, 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.

■ For the band 5.725-5.85 GHz

(a) (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.

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

1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...".

2) Use the peak search function on the instrument to find the peak of the spectrum.

3) The result is the PPSD.

4) The above procedures make use of 500kHz resolution bandwidth to satisfy the 500kHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz "provided that the measured power is integrated to show the total power over the measurement bandwidth" (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 500kHz bandwidth

Note: As a practical matter, it is recommended to use reduced RBW of 500 kHz for the sections 5.c) and 5.d) above, since RBW=500 kHz is available on nearly all spectrum analyzers.

8.3.5 Test Results

Temperature :		☒ 802.11a mode
28		

Temperature : 28 ☒ 802.11ac(VHT20) mode

Temperature : 28 ☒ 802.11ac(VHT40) mode

Power Spectral Density	UNII Band I
Test Model 802.11a	Frequency(MHz) 5180
Ant0	



Ant1



Power Spectral Density	UNII Band I	
Test Model	802.11a	Frequency(MHz)
Ant0		5200



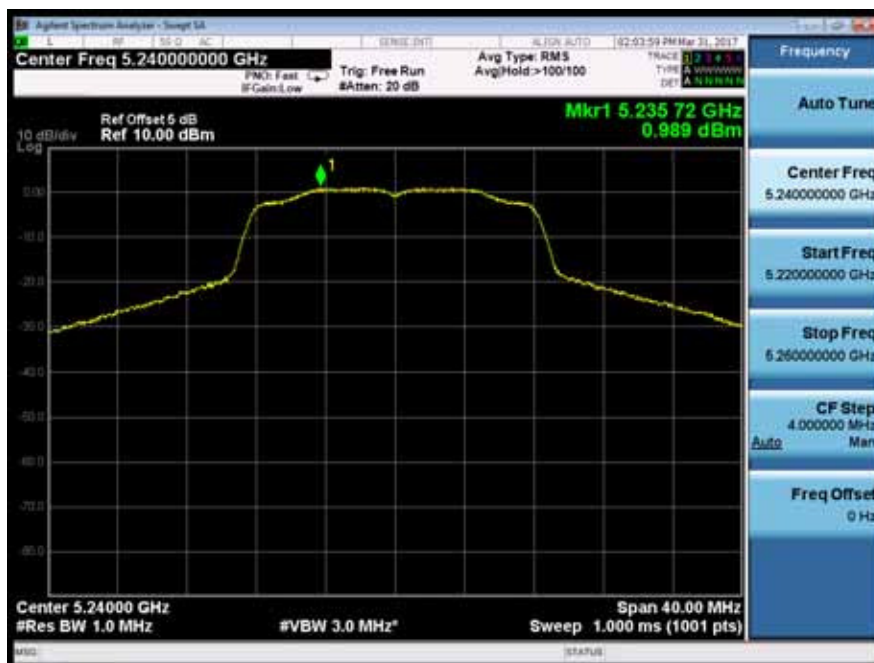
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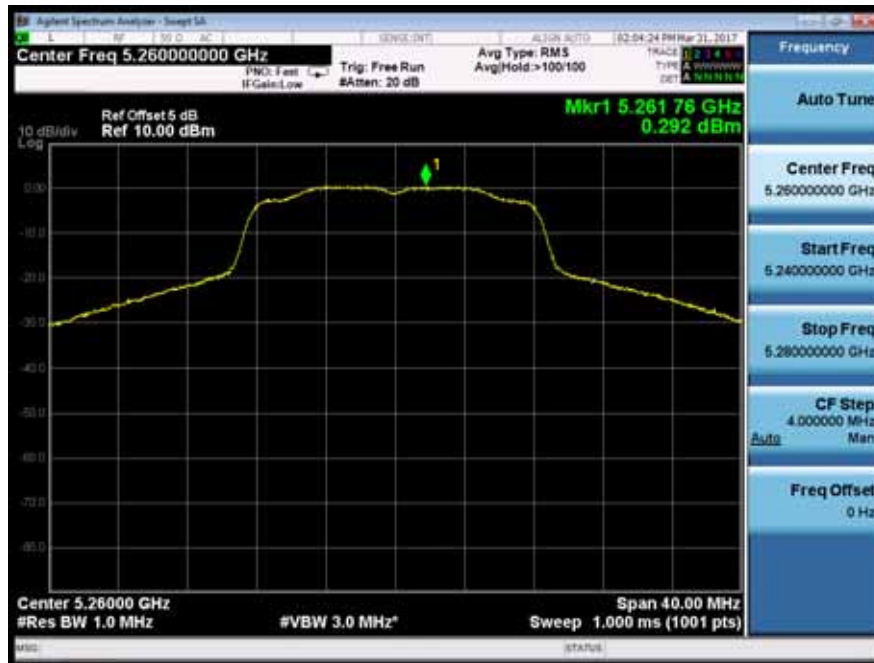
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Test Model	802.11a	Frequency(MHz)
Ant0		5240



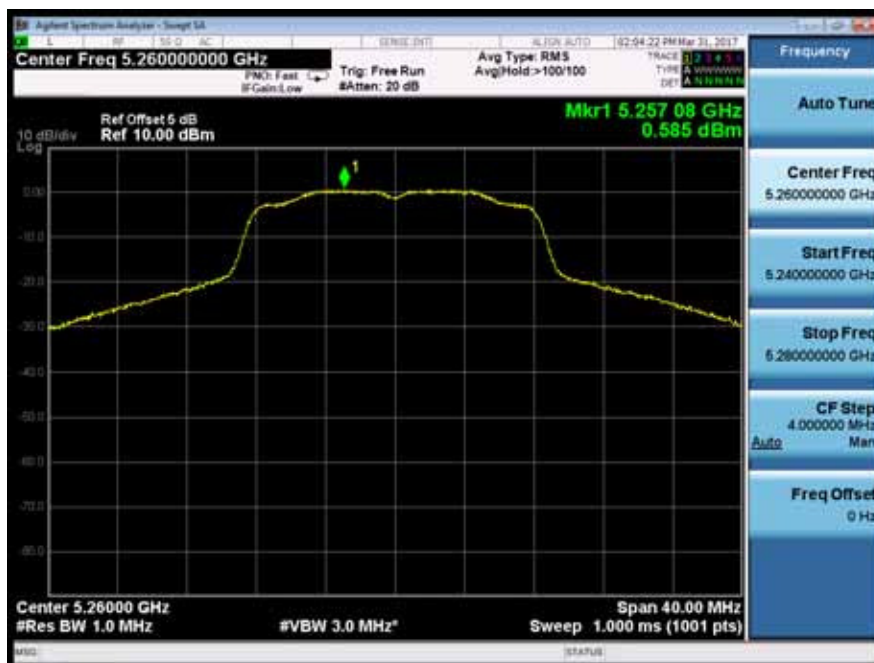
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Power Spectral Density	UNII Band II-A	
Test Model	802.11a	Frequency(MHz)
Ant0		5260



Ant1



Power Spectral Density	UNII Band II-A	
Test Model	802.11a	Frequency(MHz)
Ant0		5280



Ant1



Power Spectral Density	UNII Band II-A
Test Model 802.11a	Frequency(MHz) 5320
Ant0	



Ant1



Power Spectral Density	UNII Band II-C
Test Model 802.11a	Frequency(MHz) 5500
Ant0	



Ant1



Power Spectral Density	UNII Band II-C
Test Model 802.11a	Frequency(MHz) 5600
Ant0	



Ant1



Power Spectral Density	UNII Band II-C
Test Model 802.11a	Frequency(MHz) 5700
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11a	Frequency(MHz) 5745
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11a	Frequency(MHz) 5785
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11a	Frequency(MHz) 5825
Ant0	



Ant1



Power Spectral Density	UNII Band I
Test Model 802.11n(VHT20) mode	Frequency(MHz) 5180
Ant0	



Ant1



Power Spectral Density	UNII Band I
Test Model 802.11n(VHT20) mode	Frequency(MHz) 5200
Ant0	



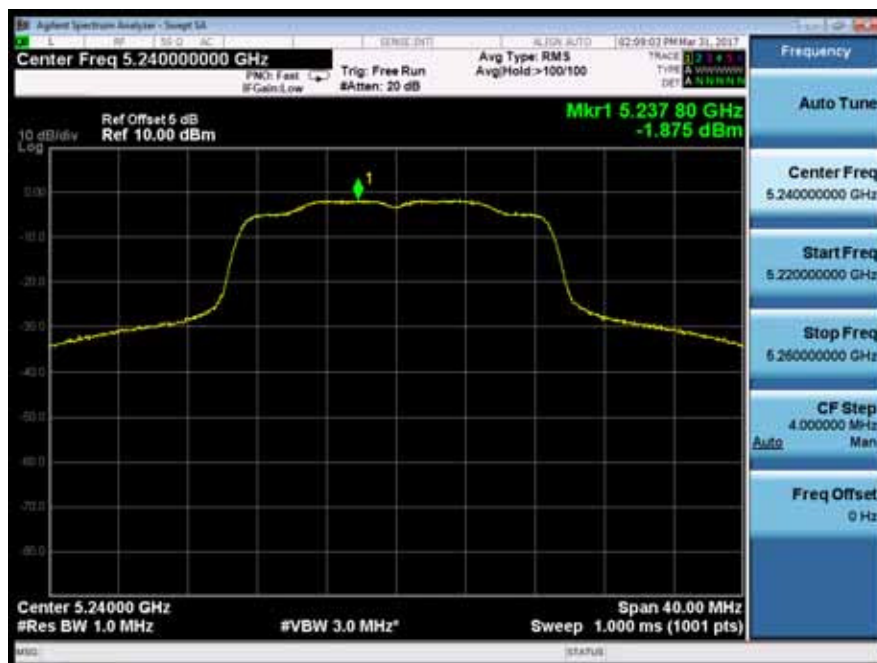
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Power Spectral Density		UNII Band I	
Test Model	802.11n(VHT20) mode	Frequency(MHz)	5240
Ant0			



Ant1



Power Spectral Density		UNII Band II-A	
Test Model	802.11n(VHT20) mode	Frequency(MHz)	5260
Ant0			



Ant1



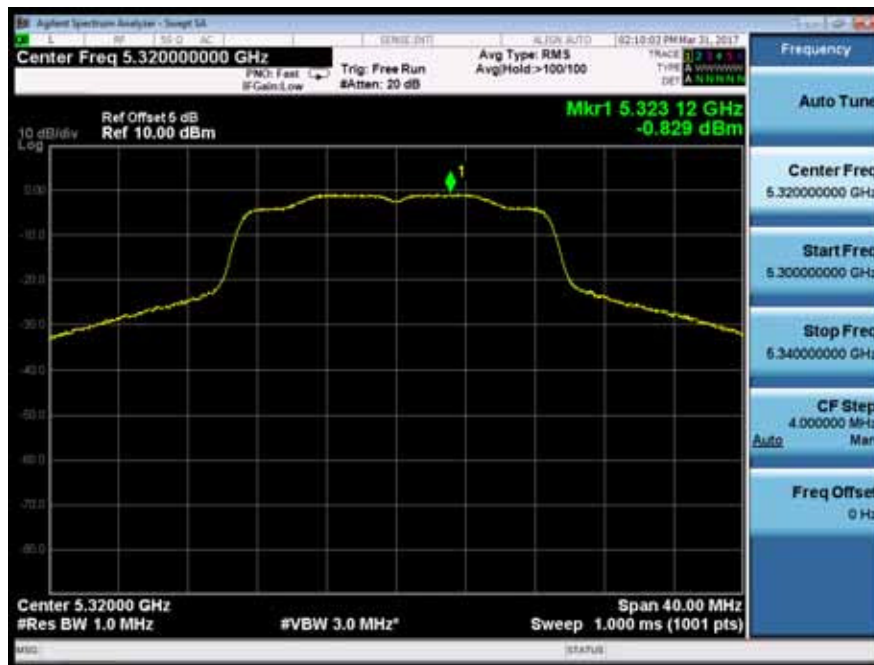
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Test Model	802.11n(VHT20) mode	Frequency(MHz)	5280
Ant0			



Ant1



Power Spectral Density		UNII Band II-A	
Test Model	802.11n(VHT20) mode	Frequency(MHz)	5320
Ant0			



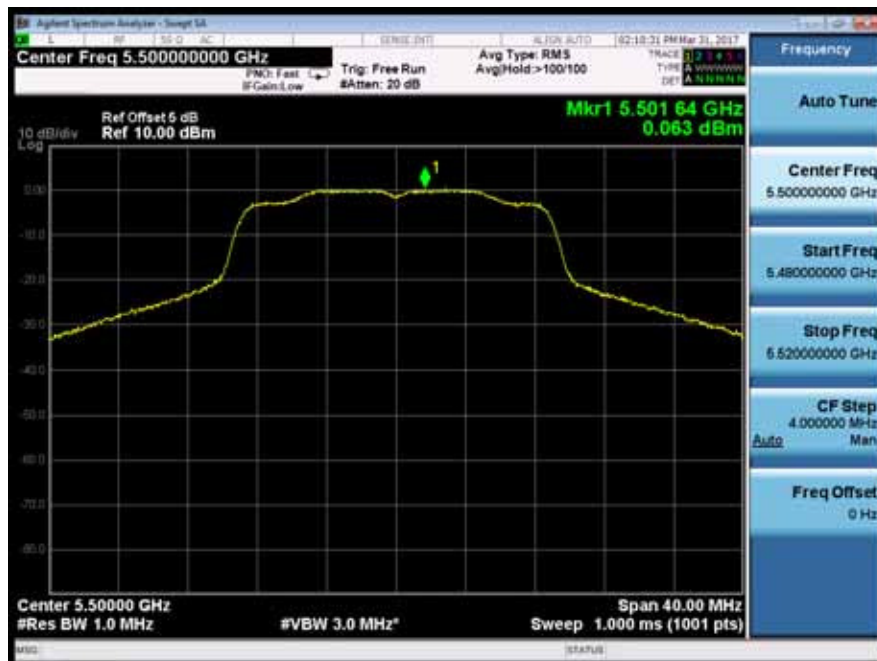
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Power Spectral Density		UNII Band II-C	
Test Model	802.11n(VHT20) mode	Frequency(MHz)	5500
Ant0			



Ant1



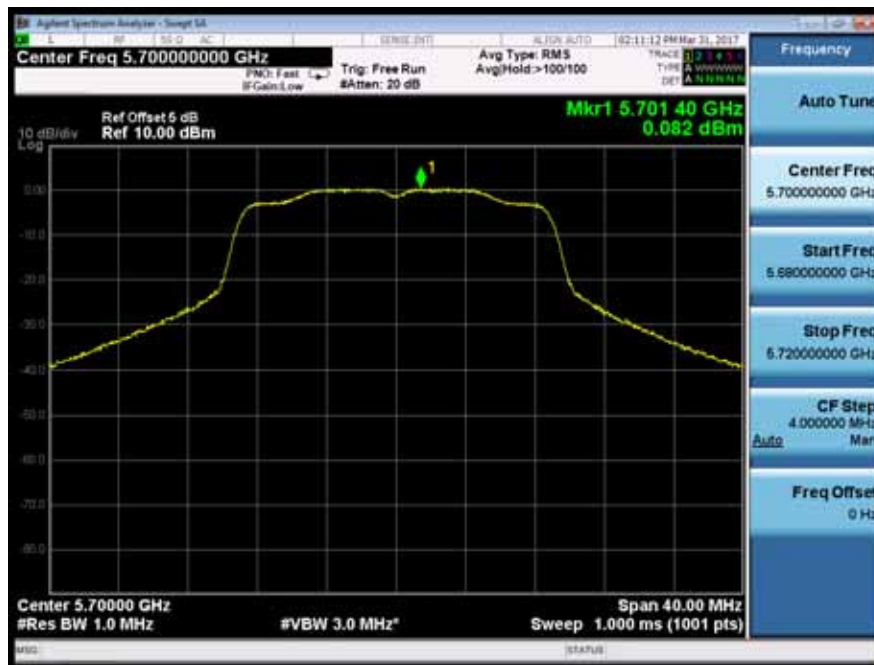
Power Spectral Density		UNII Band II-C	
Test Model	802.11n(VHT20) mode	Frequency(MHz)	5600
Ant0			



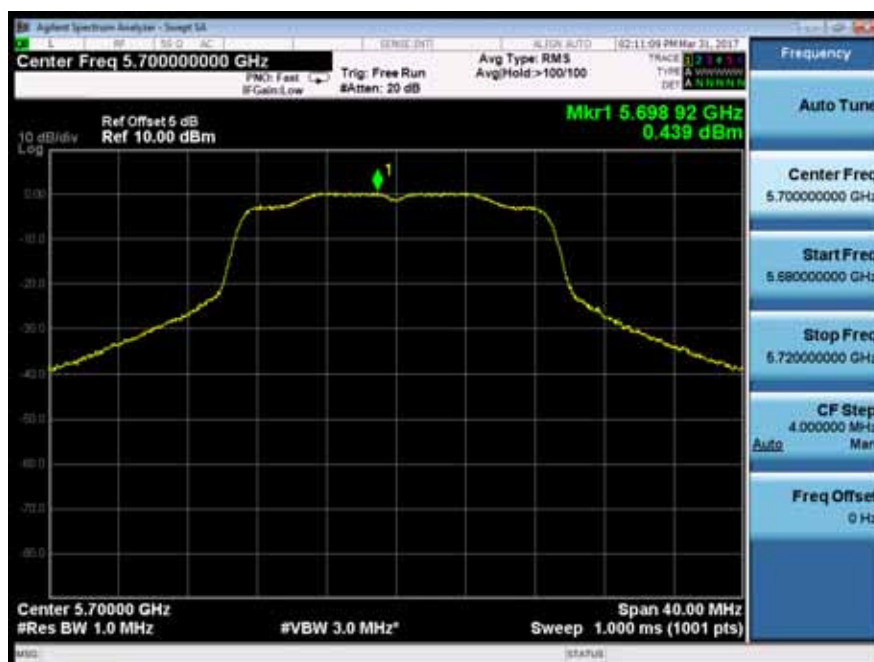
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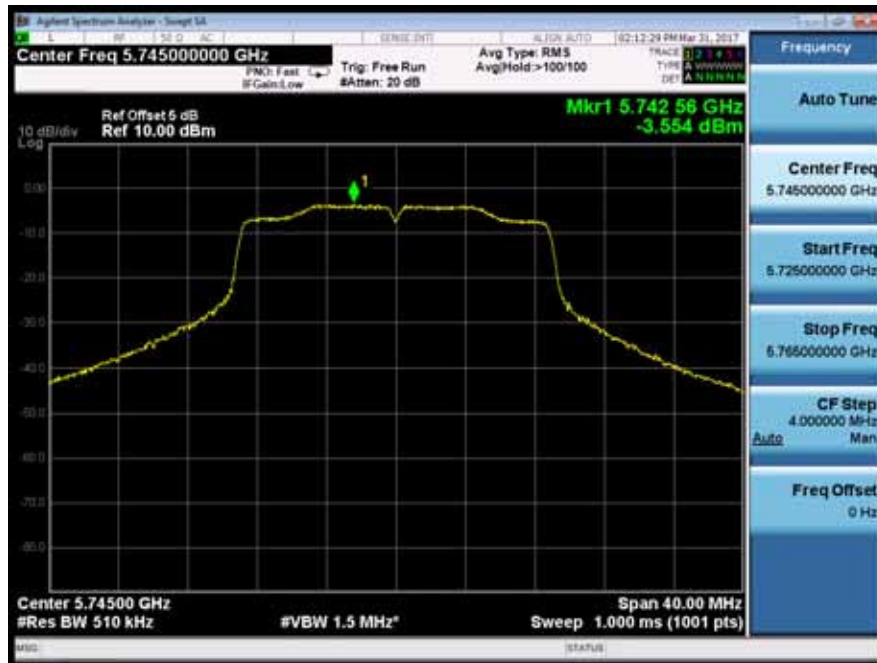
Power Spectral Density	UNII Band II-C		
Test Model	802.11n(VHT20) mode	Frequency(MHz)	5700
Ant0			



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11n(VHT20) mode	Frequency(MHz) 5745
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model	802.11n(VHT20) mode
Frequency(MHz)	5785
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model	802.11n(VHT20) mode
Frequency(MHz)	5825
Ant0	



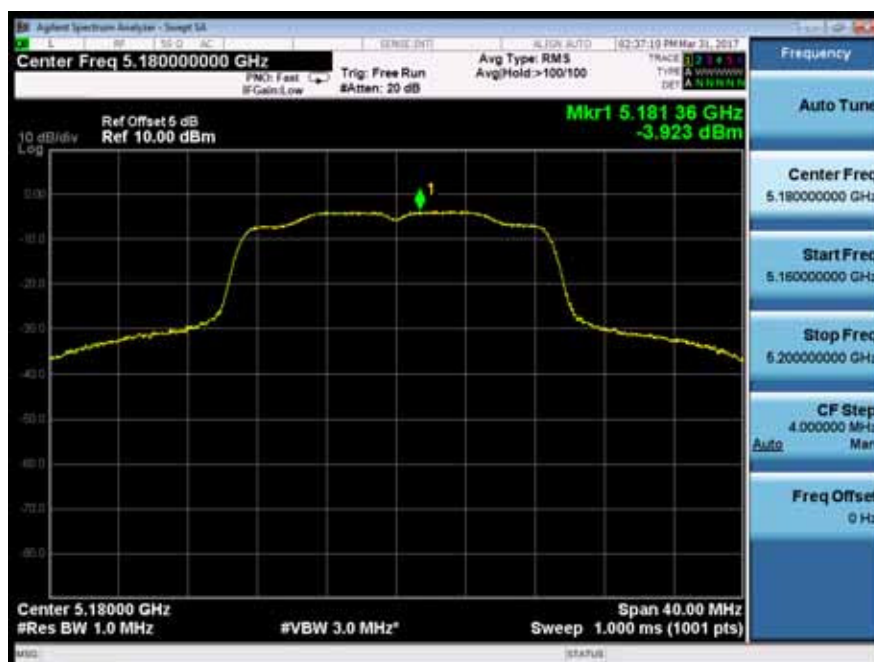
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Power Spectral Density	UNII Band I
Test Model 802.11ac(VHT20) mode	Frequency(MHz) 5180
Ant0	



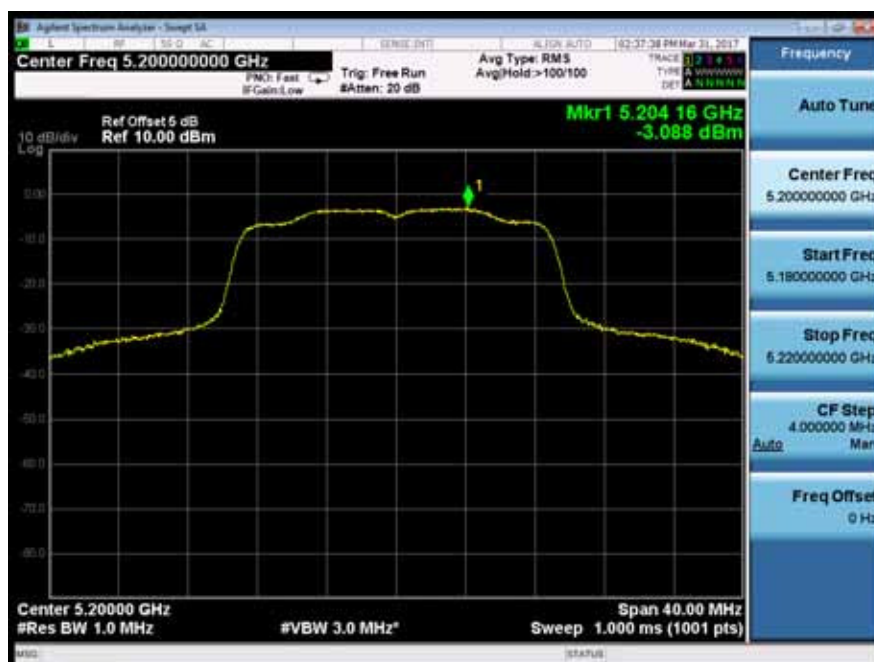
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Power Spectral Density	UNII Band I
Test Model 802.11ac(VHT20) mode	Frequency(MHz) 5200
Ant0	



Ant1



Power Spectral Density		UNII Band I	
Test Model	802.11ac(VHT20) mode	Frequency(MHz)	5240
Ant0			



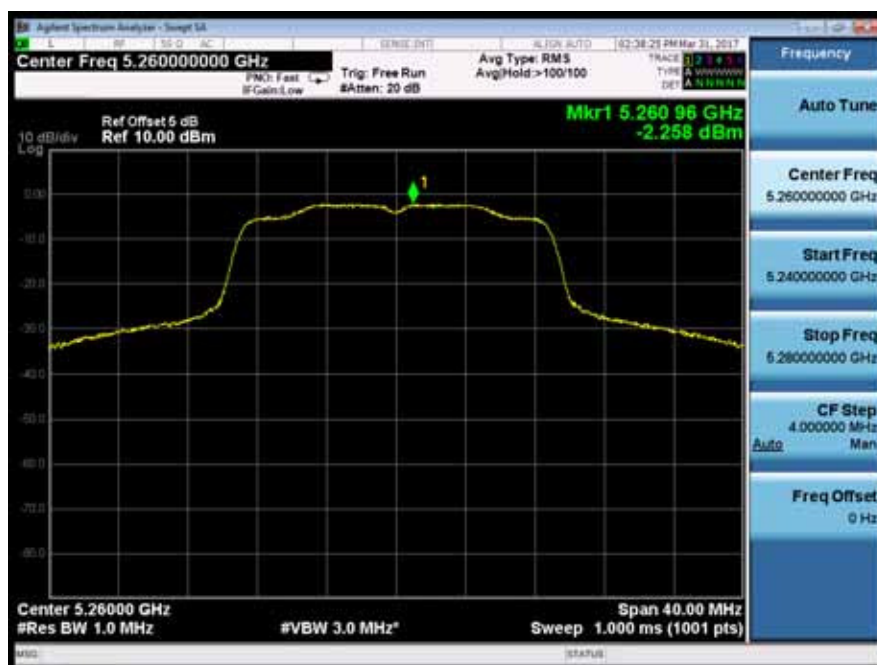
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Power Spectral Density	UNII Band II-A
Test Model 802.11ac(VHT20) mode	Frequency(MHz) 5260
Ant0	



Ant1



Power Spectral Density		UNII Band II-A	
Test Model	802.11ac(VHT20) mode	Frequency(MHz)	5280
Ant0			



Ant1



Power Spectral Density		UNII Band II-A	
Test Model	802.11ac(VHT20) mode	Frequency(MHz)	5320
Ant0			



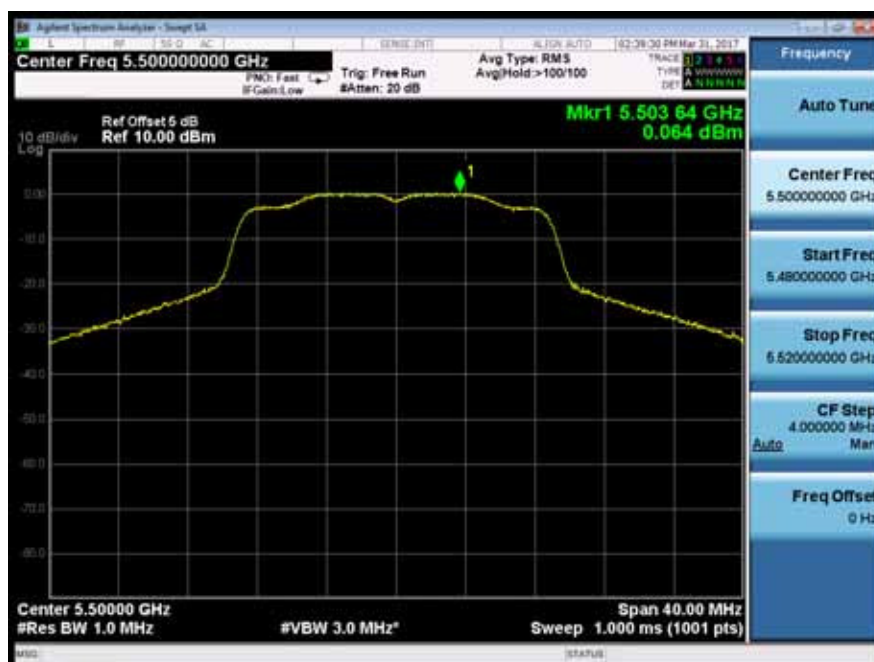
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Power Spectral Density	UNII Band II-C		
Test Model	802.11ac(VHT20) mode	Frequency(MHz)	5500
Ant0			



Ant1



Power Spectral Density		UNII Band II-C	
Test Model	802.11ac(VHT20) mode	Frequency(MHz)	5600
Ant0			



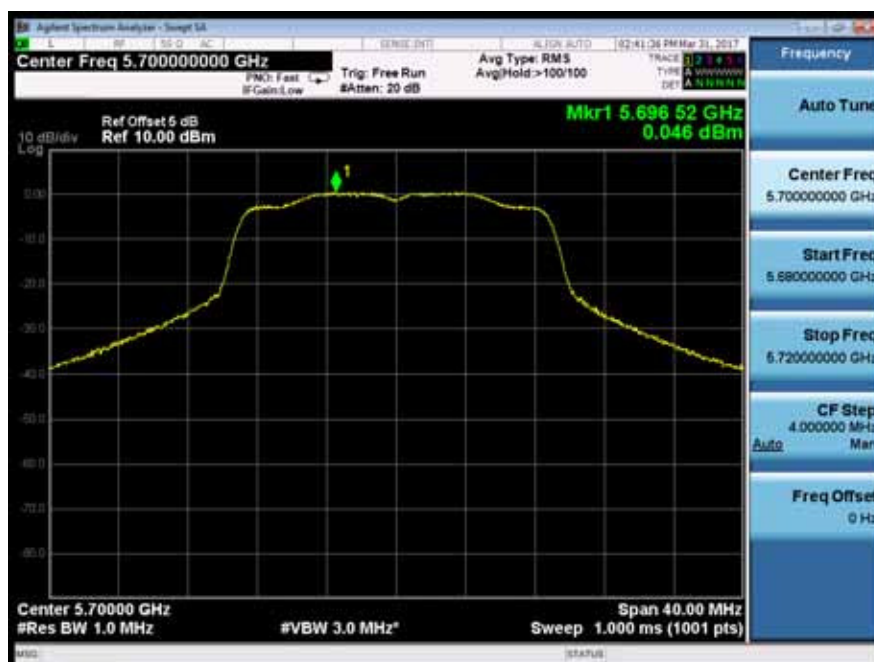
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Power Spectral Density		UNII Band II-C	
Test Model	802.11ac(VHT20) mode	Frequency(MHz)	5700
Ant0			



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11ac(VHT20) mode	Frequency(MHz) 5745
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11ac(VHT20) mode	Frequency(MHz) 5785
Ant0	



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11ac(VHT20) mode	Frequency(MHz) 5825
Ant0	



Ant1



Power Spectral Density	UNII Band I
Test Model	802.11n(VHT40) mode
Frequency(MHz)	5190
Ant0	



Ant1



Power Spectral Density	UNII Band I
Test Model 802.11n(VHT40) mode	Frequency(MHz) 5230
Ant0	



Ant1



Power Spectral Density	UNII Band II-A		
Test Model	802.11n(VHT40) mode	Frequency(MHz)	5270
Ant0			



Ant1



Power Spectral Density		UNII Band II-A	
Test Model	802.11n(VHT40) mode	Frequency(MHz)	5310
Ant0			



Ant1



Power Spectral Density		UNII Band II-C	
Test Model	802.11n(VHT40) mode	Frequency(MHz)	5510
Ant0			



Ant1



Power Spectral Density		UNII Band II-C	
Test Model	802.11n(VHT40) mode	Frequency(MHz)	5590
Ant0			



Ant1



Power Spectral Density	UNII Band II-C		
Test Model	802.11n(VHT40) mode	Frequency(MHz)	5670
Ant0			



Ant1



Power Spectral Density		UNII Band III	
Test Model	802.11n(VHT40) mode	Frequency(MHz)	5755
Ant0			



Ant1



Power Spectral Density	UNII Band III
Test Model 802.11n(VHT40) mode	Frequency(MHz) 5795
Ant0	



Ant1

