



9. POWER SPECTRAL DENSITY MEASUREMENT

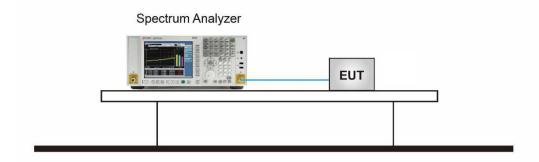
9.1 MEASUREMENT LIMITS

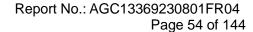
Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	17dBm/ MHz
		Indoor Access Point	17dBm/ MHz
		Client devices	11dBm/ MHz
U-NII-2A	/		11dBm/ MHz
U-NII-2C	/		11dBm/ MHz
U-NII-3	/		30 dBm/500kHz

9.2 MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through.
- 2. Span was set to encompass the entire 26dB EBW of the signal.
- 3. RBW = 1MHz.
- 4. If measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100KHz
- 5. Set VBW≥[3×RBW].
- 6. Sweep Time=Auto couple.
- 7. Detector function=RMS (i.e., power averaging).
- 8. Trace average at least 100 traces in power averaging (rms) mode.
- 9. When the measurement bandwidth of Maximum PSD is specified in 100 kHz, add a constant factor 10*log(500kHz/100kHz) = 6.99 dB to the measured result.
- 10. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
- 11. Add [10 log (1/D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is 25%.
- 12. Record the test results in the report.

9.3 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)



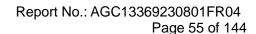




9.4 MEASUREMENT RESULT

Test Data of Conducted Output Power Density for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail	
802.11a	5180	1.052	11	Pass	
	5200	0.417	11	Pass	
	5240	-0.068	11	Pass	
802.11n20	5180	0.327	11	Pass	
	5200	0.230	11	Pass	
	5240	-0.002	11	Pass	
802.11n40	5190	-2.426	11	Pass	
	5230	-2.614	11	Pass	
802.11ac20	5180	0.211	11	Pass	
	5200	0.183	11	Pass	
	5240	0.060	11	Pass	
802.11ac40	5190	-2.415	11	Pass	
	5230	-2.905	11	Pass	
802.11ac80	5210	-5.270	11	Pass	

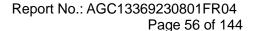
Test Data of Conducted Output Power Density for band 5.25-5.35 GHz					
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail	
802.11a	5260	-0.128	11	Pass	
	5300	0.470	11	Pass	
	5320	0.337	11	Pass	
802.11n20	5260	0.004	11	Pass	
	5300	-0.021	11	Pass	
	5320	-0.007	11	Pass	
802.11n40	5270	-2.875	11	Pass	
	5310	-2.857	11	Pass	
802.11ac20	5260	-0.268	11	Pass	
	5300	-0.012	11	Pass	
	5320	-0.049	11	Pass	
802.11ac40	5270	-2.611	11	Pass	
	5310	-2.949	11	Pass	
802.11ac80	5290	-5.605	11	Pass	





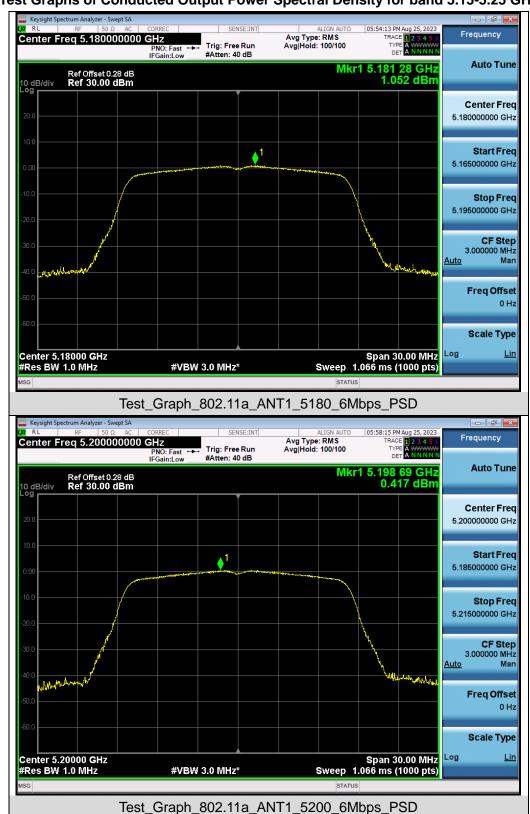
Test Data of Conducted Output Power Density for band 5.725-5.85 GHz Test **Average Power** Average Power Limits Test Mode Channel Density Density Pass or Fail (dBm/500kHz) (MHz) (dBm/100kHz) (dBm/500kHz) 5745 -11.481 -4.491 30 **Pass** 5785 -11.709 -4.719 30 **Pass** 802.11a **Pass** 5825 -11.417 -4.42730 Pass 5745 -12.118 -5.12830 802.11n20 5785 -11.925 -4.93530 **Pass** 5825 -11.593 -4.60330 Pass 5755 -14.640 -7.650 30 **Pass** 802.11n40 5795 -14.887 -7.89730 **Pass** 5745 -12.028 -5.038 30 **Pass** 802.11ac20 5785 -12.041 -5.051 30 **Pass** 5825 -11.622 -4.632 30 **Pass** 5755 -14.914 -7.92430 **Pass** 802.11ac40 5795 -14.625 -7.63530 **Pass** 5775 -16.965 -9.975 30 **Pass** 802.11ac80

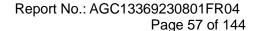
Note:1.Power density(dBm/500kHz) = Power density(dBm/100kHz)+10*log(500/100).



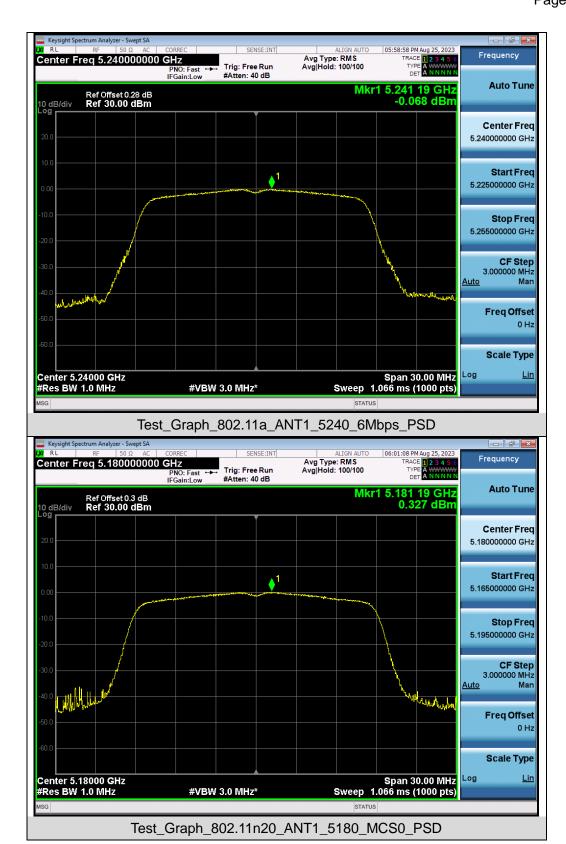


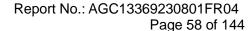
Test Graphs of Conducted Output Power Spectral Density for band 5.15-5.25 GHz



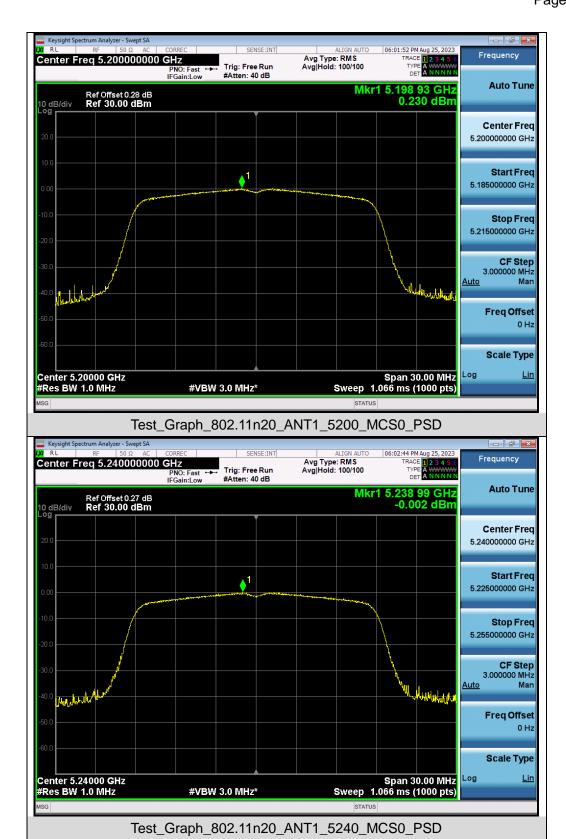


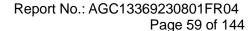




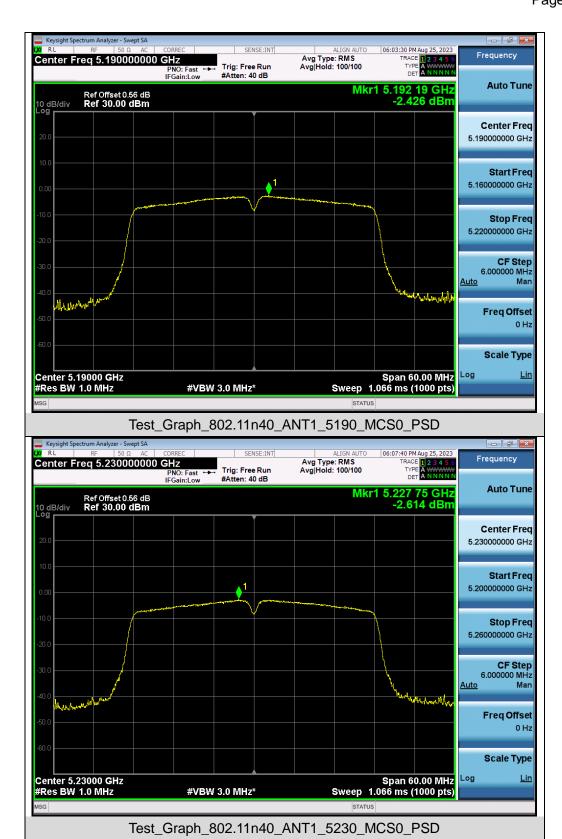


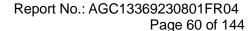






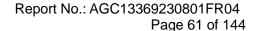




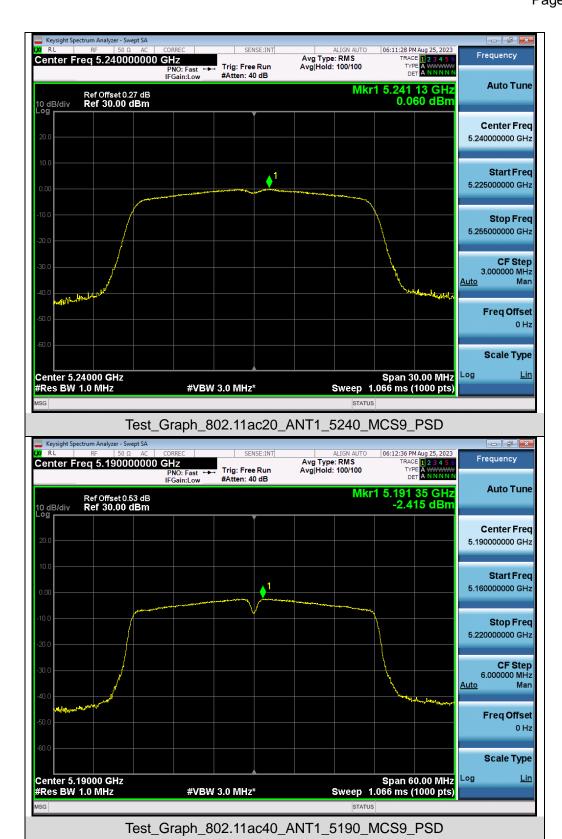


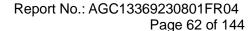




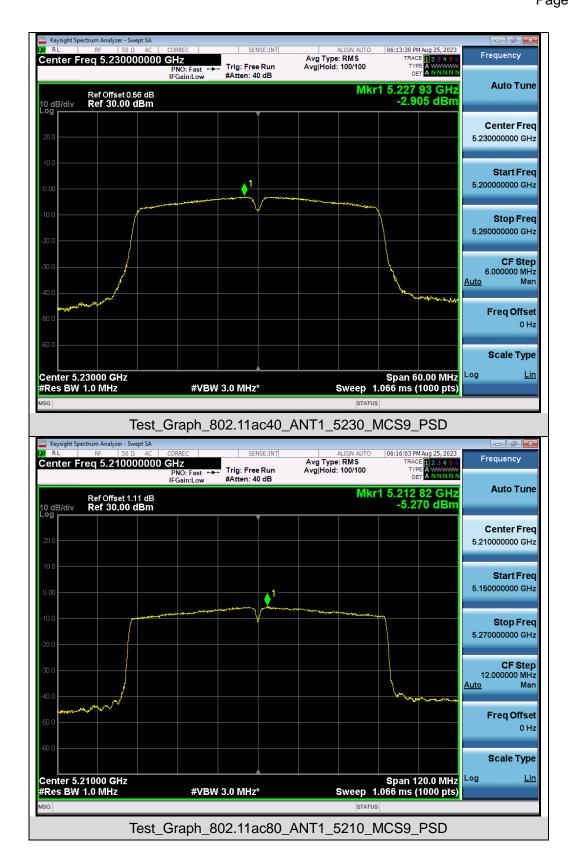


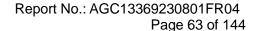






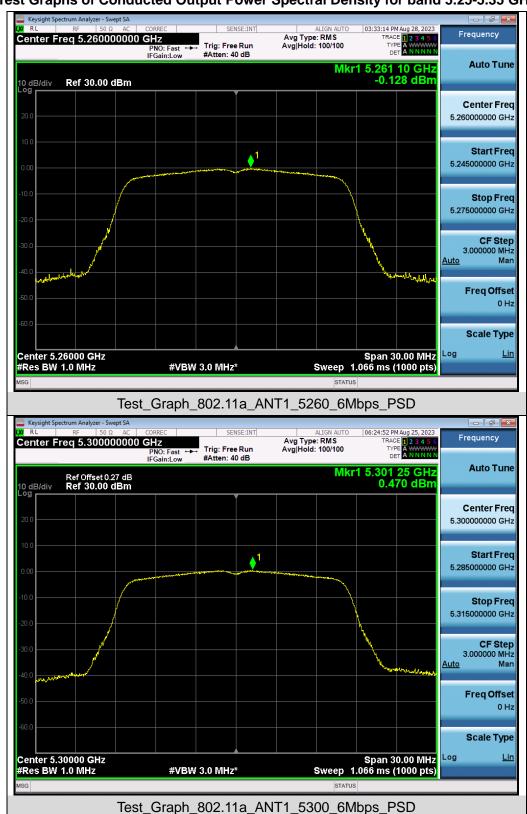


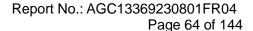




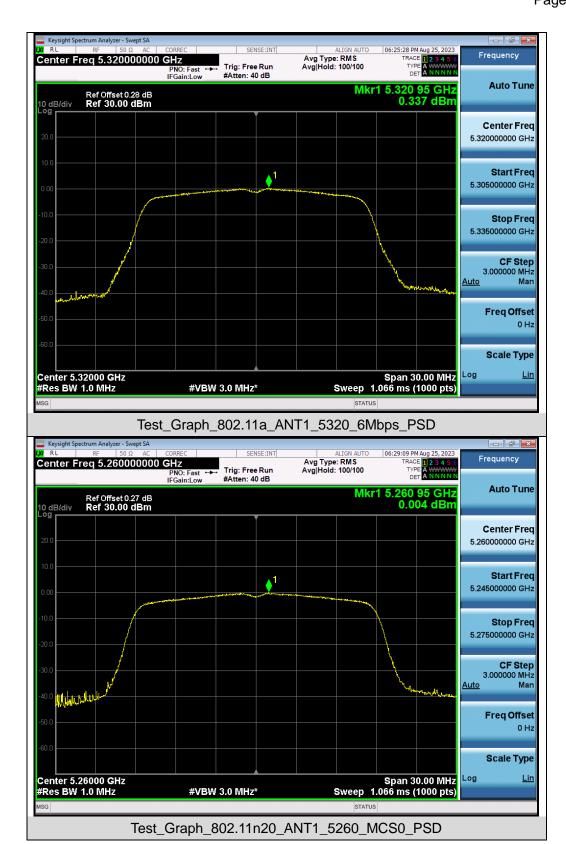


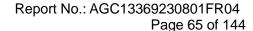
Test Graphs of Conducted Output Power Spectral Density for band 5.25-5.35 GHz



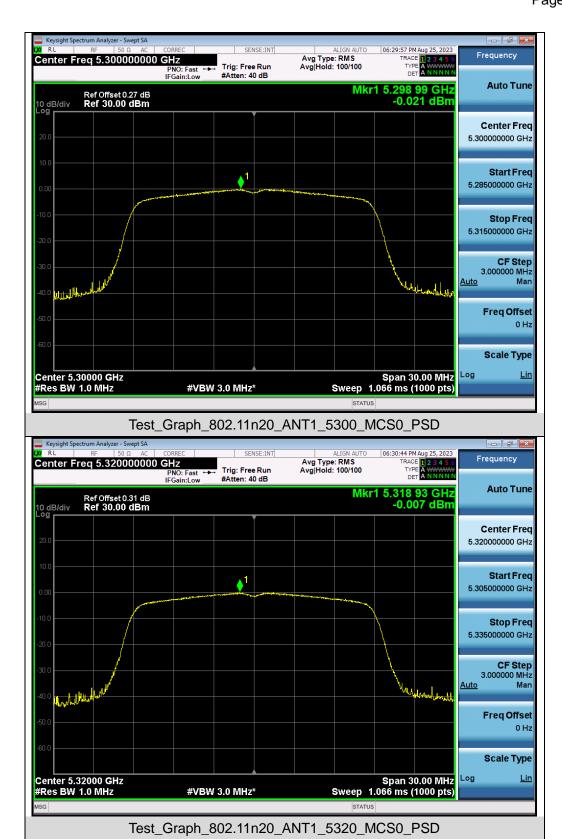


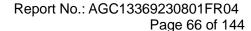




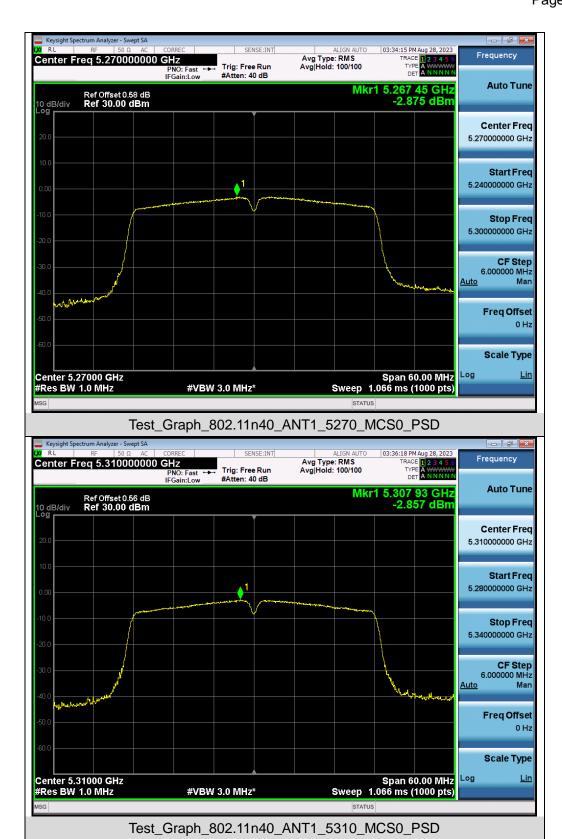


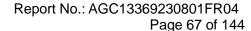






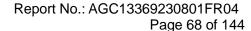




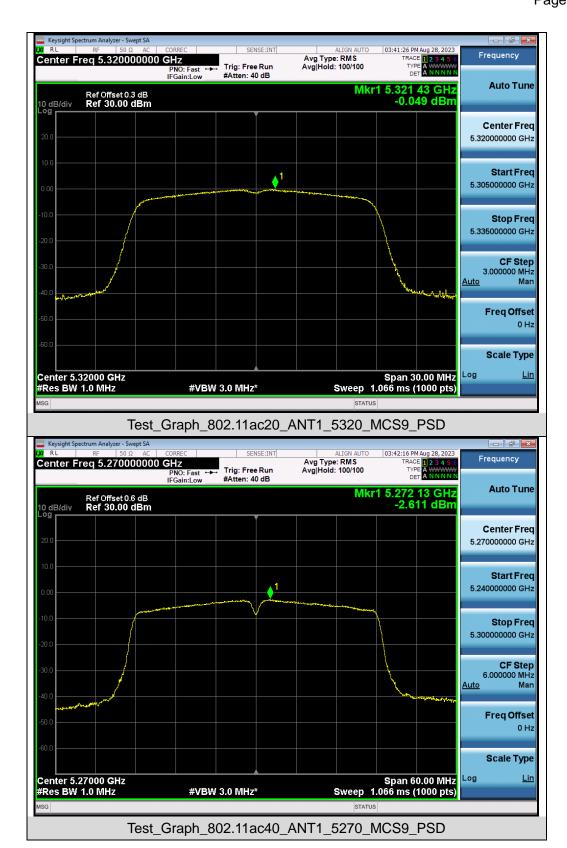


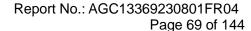






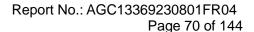






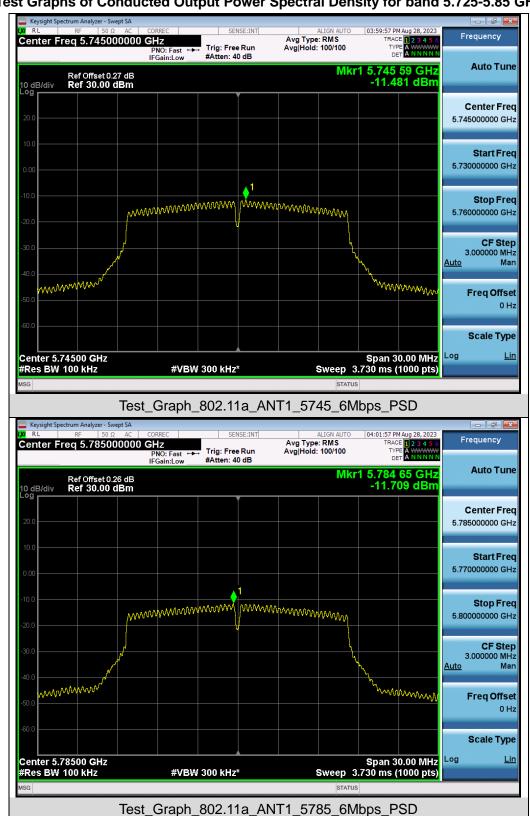


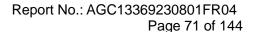




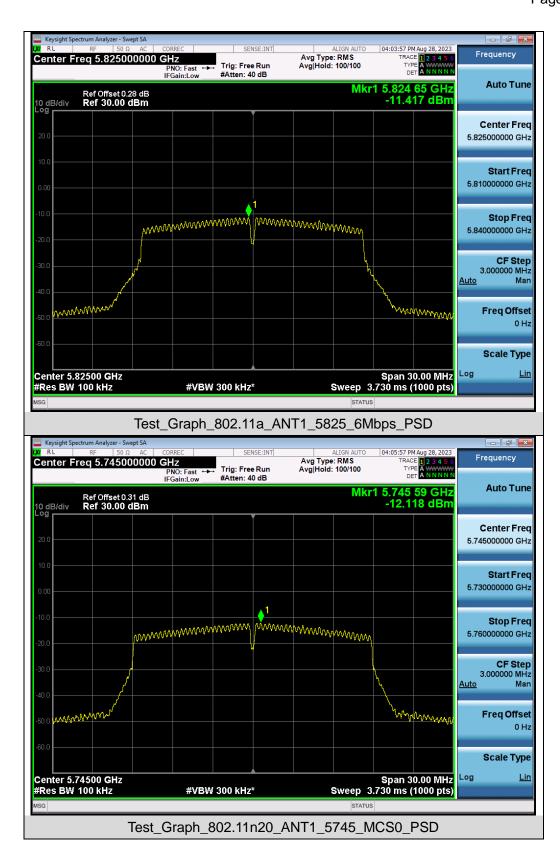


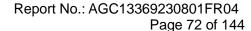
Test Graphs of Conducted Output Power Spectral Density for band 5.725-5.85 GHz



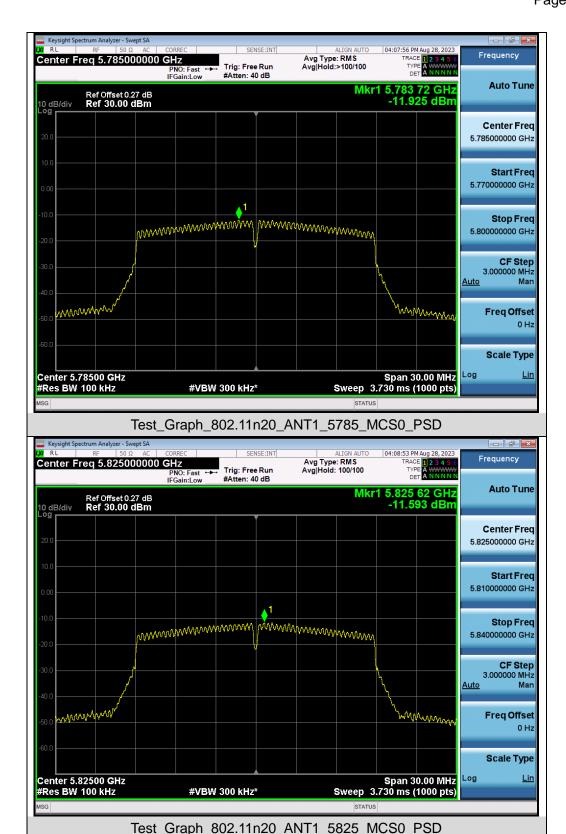


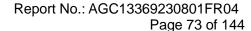




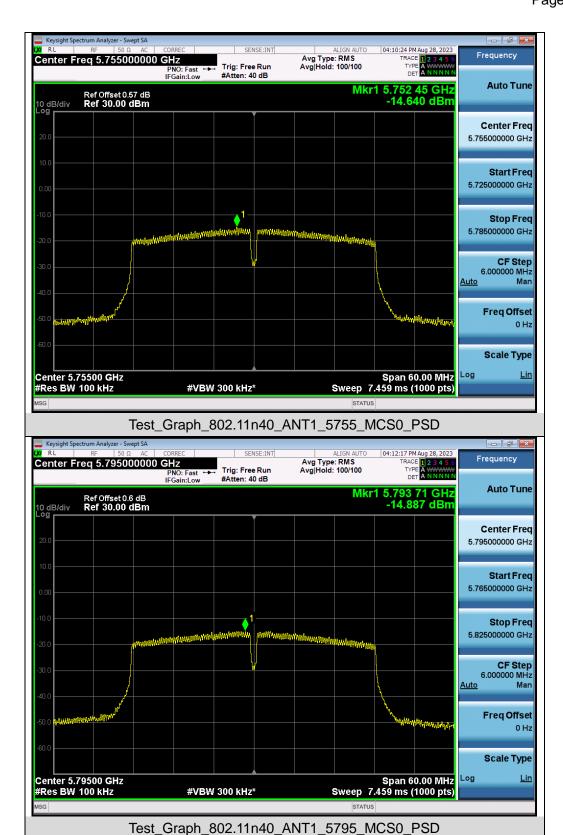


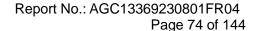




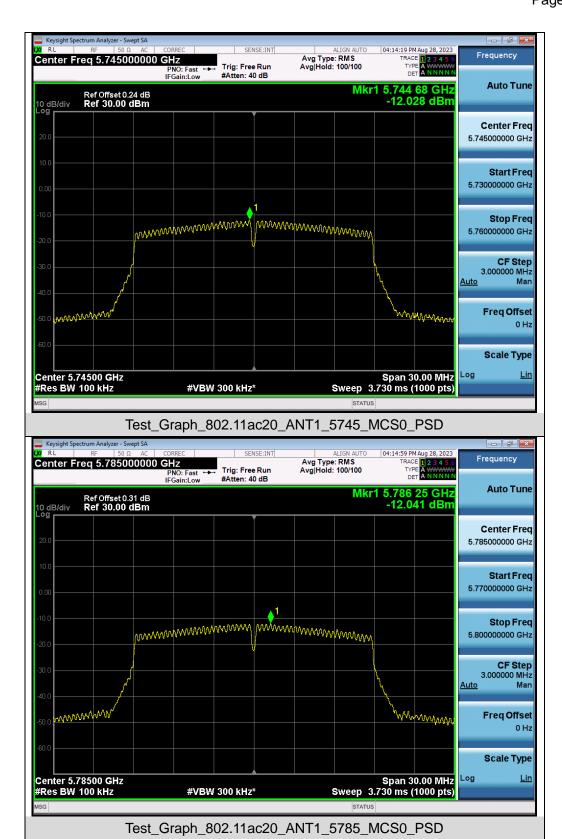


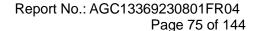






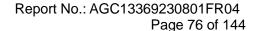




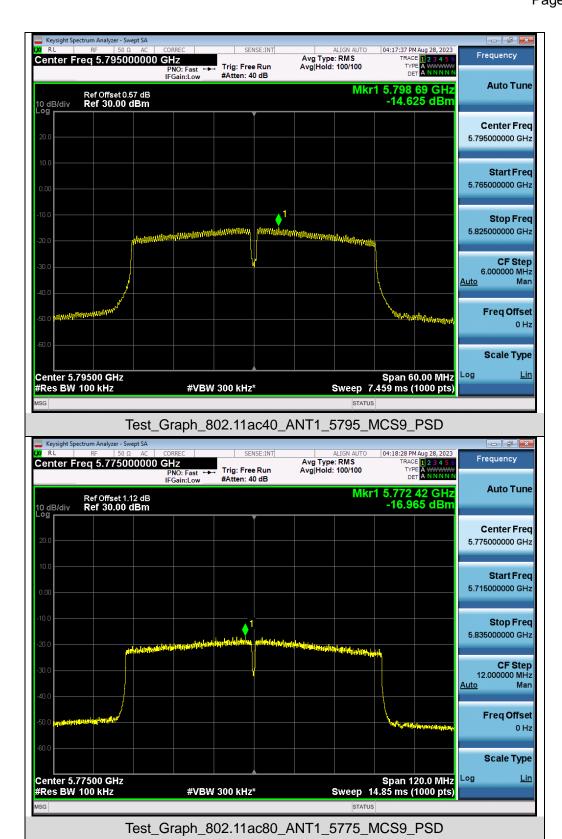














10. CONDUCTED SPURIOUS EMISSION

10.1 MEASUREMENT LIMIT

	Applicable to	Limit		
Restricted bands	789033 D02 General UNII Test	Field strength at 3m (dBuV/m)		
	Procedures New Rules v02r01	PK: 74	AV: 54	
Out of the restricted bands	Applicable to	EIRP Limit (dBm/MHz)	Equivalent field Strength at 3m (dBuV/m)	
	FCC 15.407(b)(1)			
	15.407(b)(2)	PK: -27	PK: 68.2	
	15.407(b)(3)			
	15.407(b)(4)	See Note 2		

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

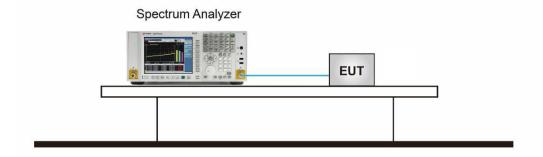
E =
$$\frac{1000000 \sqrt{30 P}}{2}$$
 µV/m, where P is the eirp (Watts).

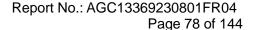
Note 2: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

10.2 MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through.
- 2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
- 3. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
- 4. RBW = 100 kHz; VBW= 300 kHz; Sweep = auto; Detector function = peak.(Test frequency below 1GHz)
- 5. RBW = 1 MHz; VBW= 3 MHz; Sweep = auto; Detector function = peak.(Test frequency Above 1GHz)
- 6. Set SPA Trace 1 Max hold, then View.
- 7. Mark the maximum useless stray point and compare it with the limit value to record the result.

10.3 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)

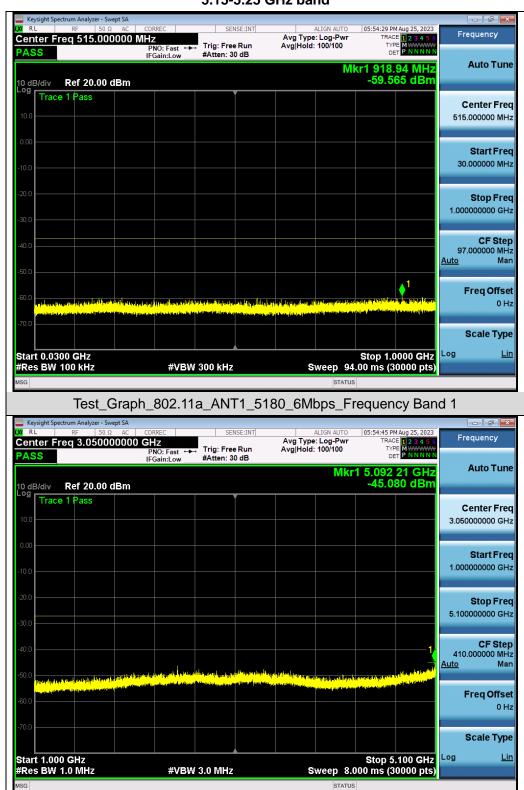






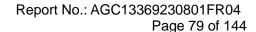
10.4 MEASUREMENT RESULTS

Test Graphs of Spurious Emissions outside of the 5.15-5.25 GHz band for transmitters operating in the 5.15-5.25 GHz band

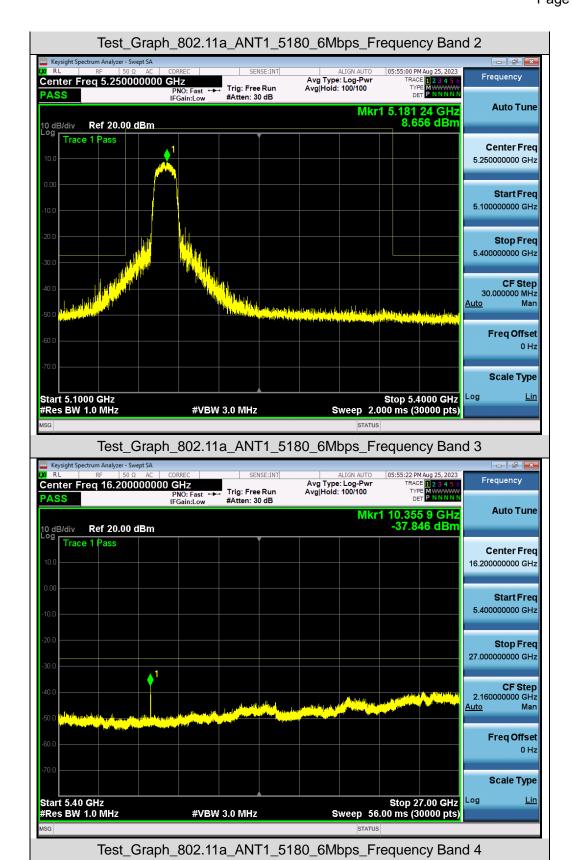


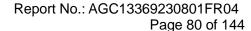
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/









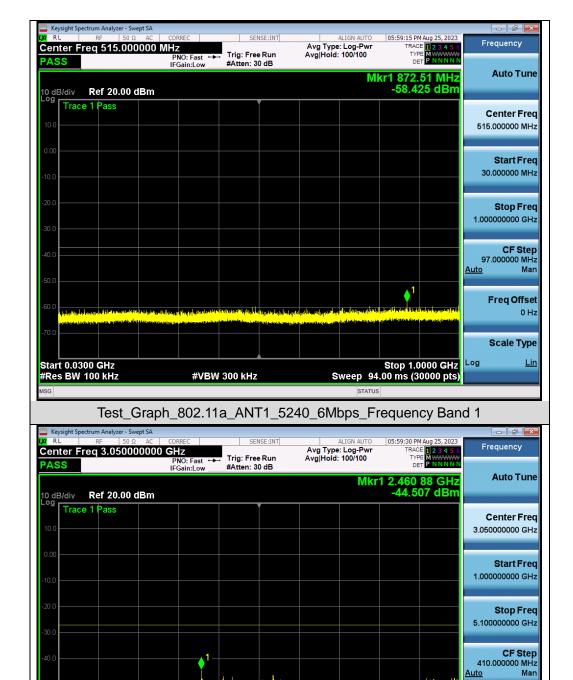
Freq Offset 0 Hz

Scale Type

Log

Stop 5.100 GHz Sweep 8.000 ms (30000 pts)



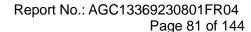


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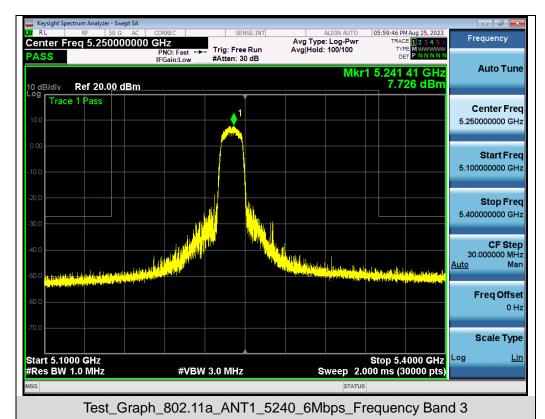
Test Graph 802.11a ANT1 5240 6Mbps Frequency Band 2

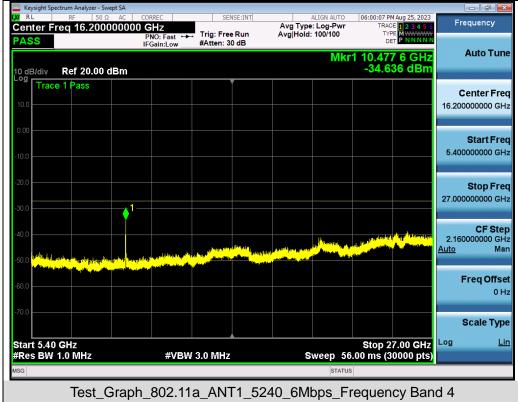
#VBW 3.0 MHz

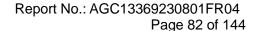
Start 1.000 GHz #Res BW 1.0 MHz



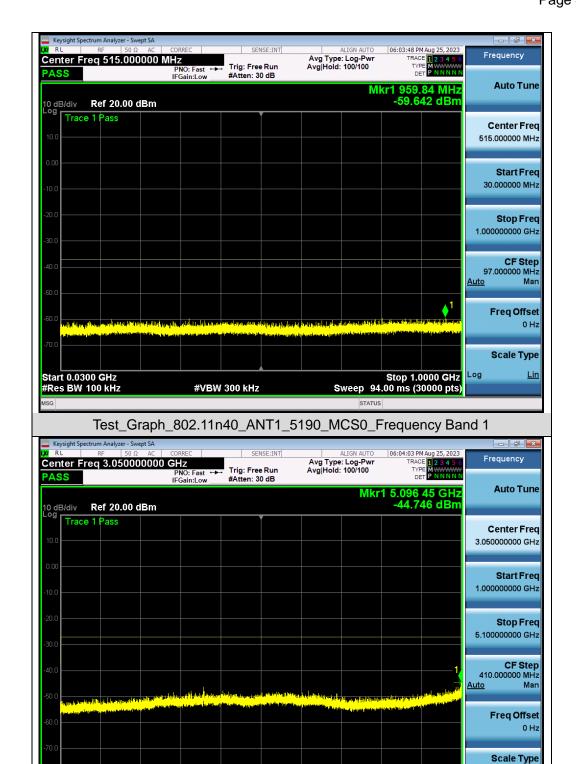










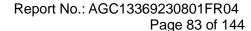


Test Graph 802.11n40 ANT1 5190 MCS0 Frequency Band 2

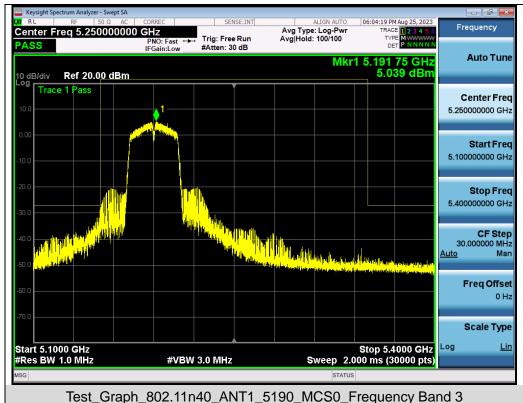
#VBW 3.0 MHz

Stop 5.100 GHz Sweep 8.000 ms (30000 pts)

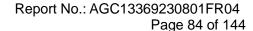
Start 1.000 GHz #Res BW 1.0 MHz











5.100000000 GHz

CF Step 410.000000 MHz

Freq Offset 0 Hz

Scale Type

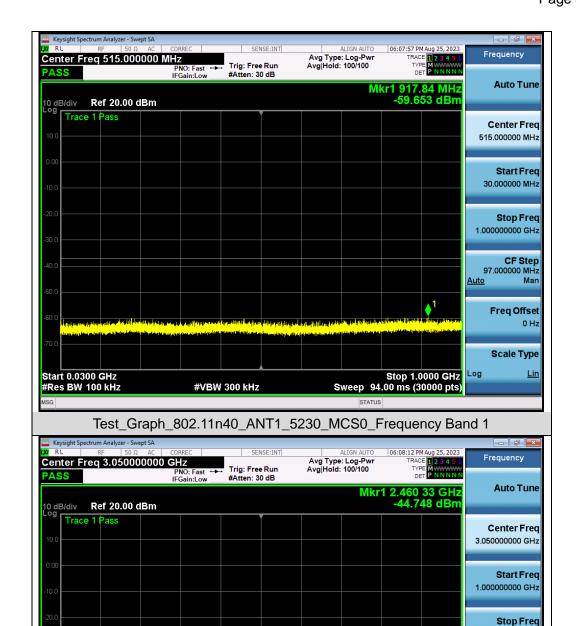
Man

<u>Auto</u>

Log

Stop 5.100 GHz Sweep 8.000 ms (30000 pts)



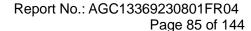


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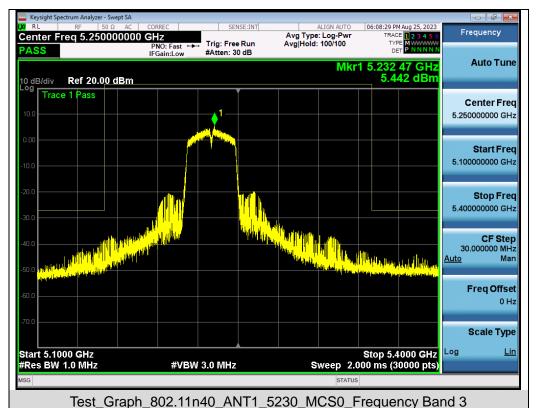
Test Graph 802.11n40 ANT1 5230 MCS0 Frequency Band 2

#VBW 3.0 MHz

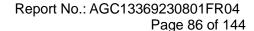
Start 1.000 GHz #Res BW 1.0 MHz







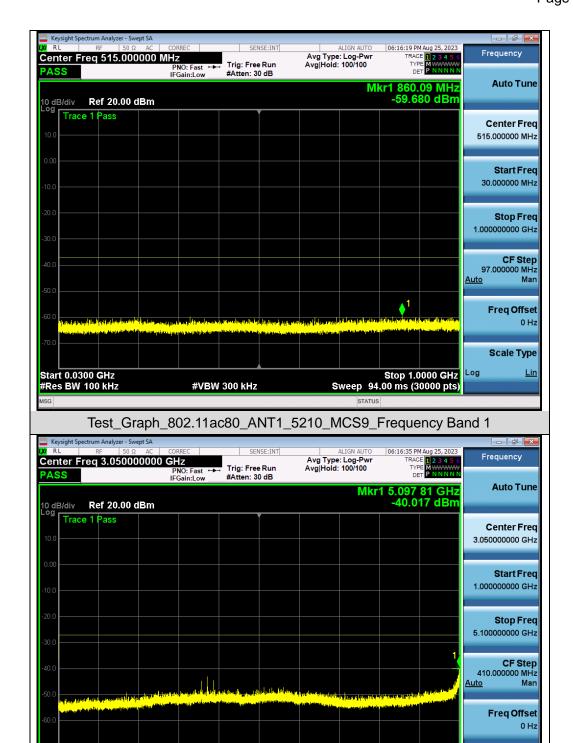




Scale Type

Stop 5.100 GHz Sweep 8.000 ms (30000 pts)

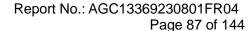




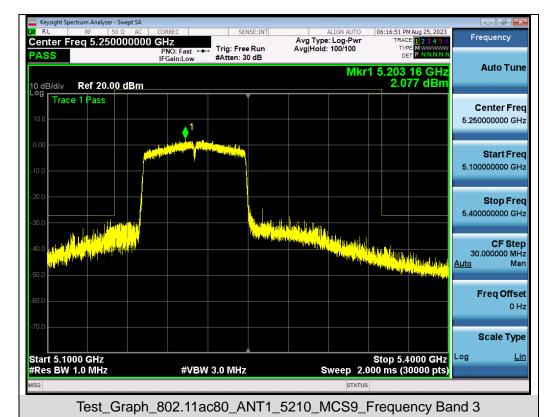
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Test_Graph_802.11ac80_ANT1_5210_MCS9_Frequency Band 2

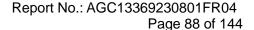
#VBW 3.0 MHz





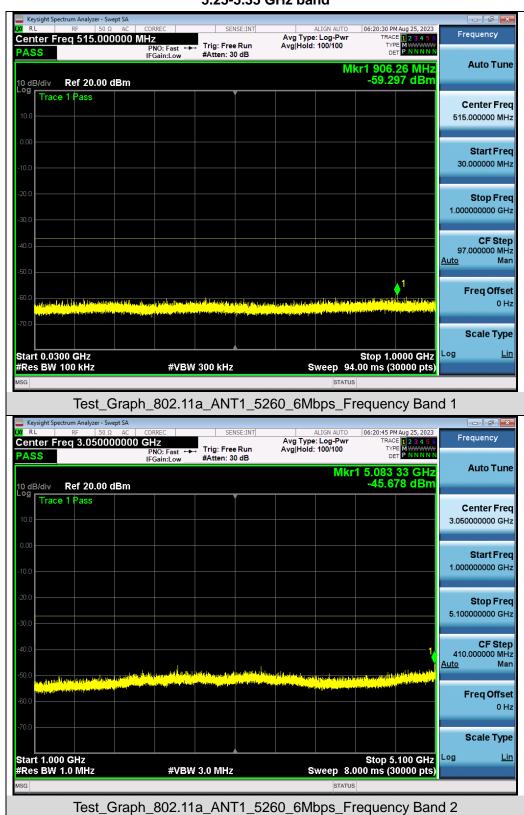


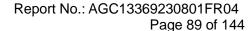




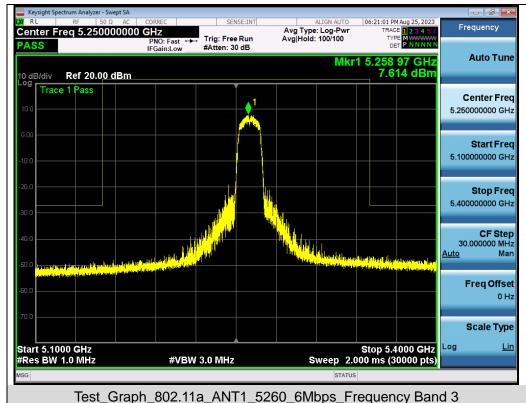


Test Graphs of Spurious Emissions outside of the 5.25-5.35 GHz band for transmitters operating in the 5.25-5.35 GHz band

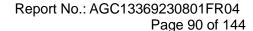












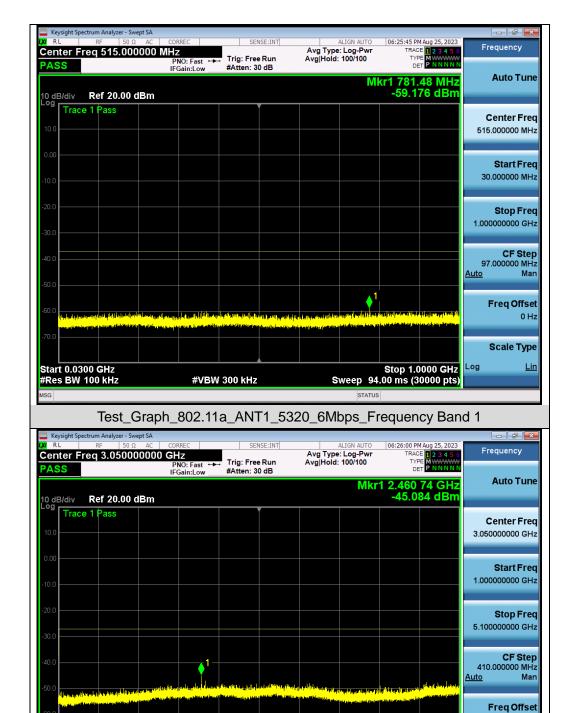
0 Hz

Scale Type

Log

Stop 5.100 GHz Sweep 8.000 ms (30000 pts)

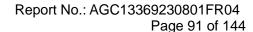




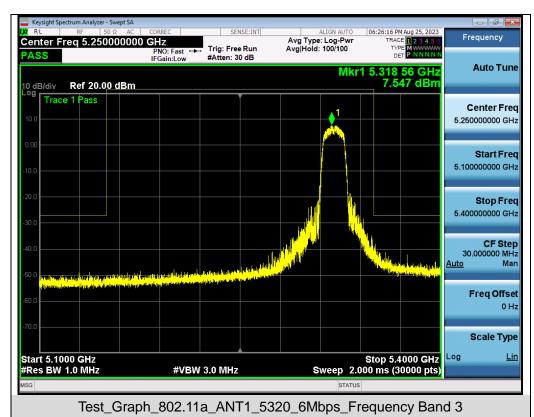
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Test Graph 802.11a ANT1 5320 6Mbps Frequency Band 2

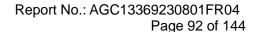
#VBW 3.0 MHz



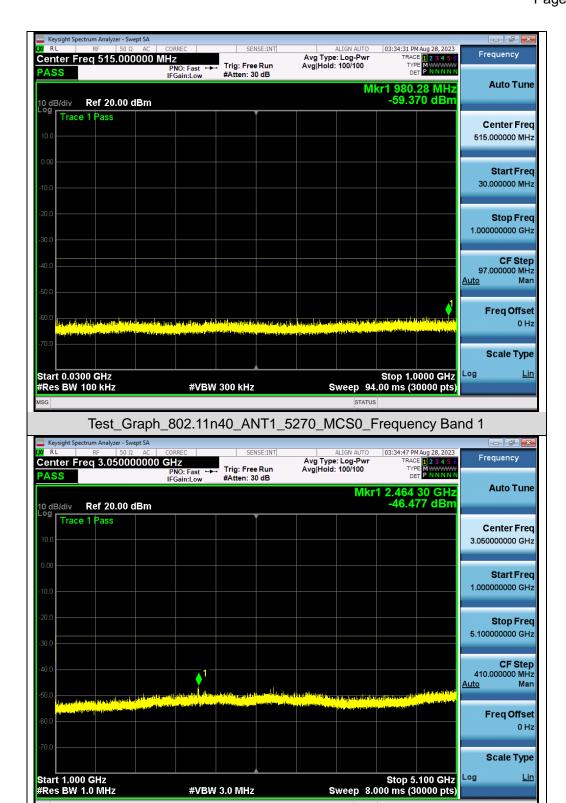




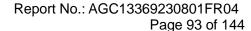




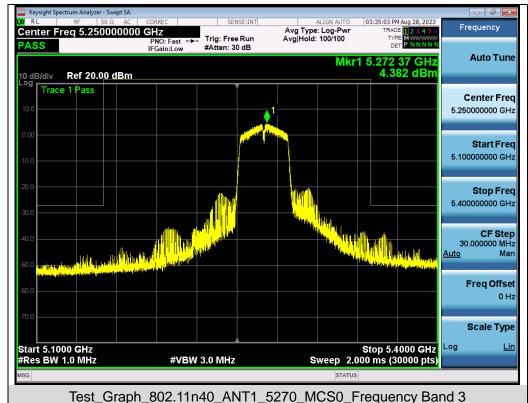




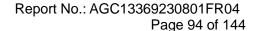
Test Graph 802.11n40 ANT1 5270 MCS0 Frequency Band 2



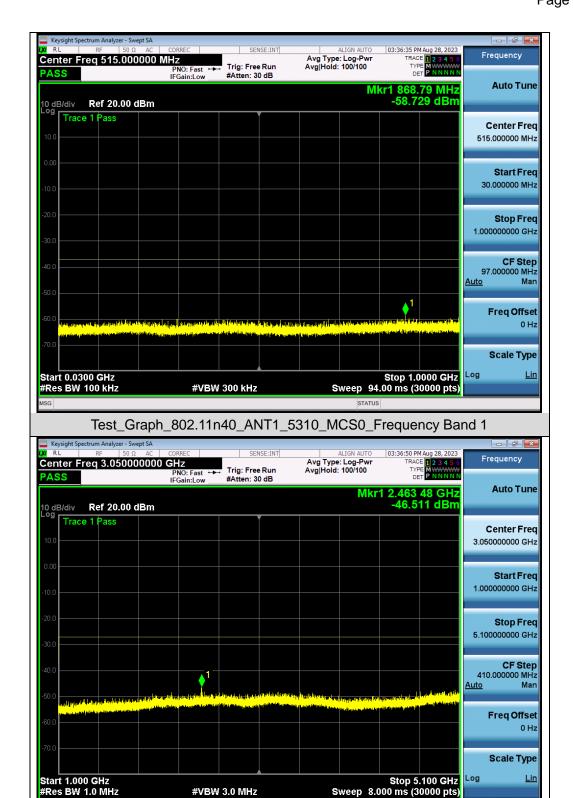






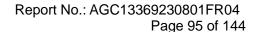






Test Graph 802.11n40 ANT1 5310 MCS0 Frequency Band 2

#VBW 3.0 MHz



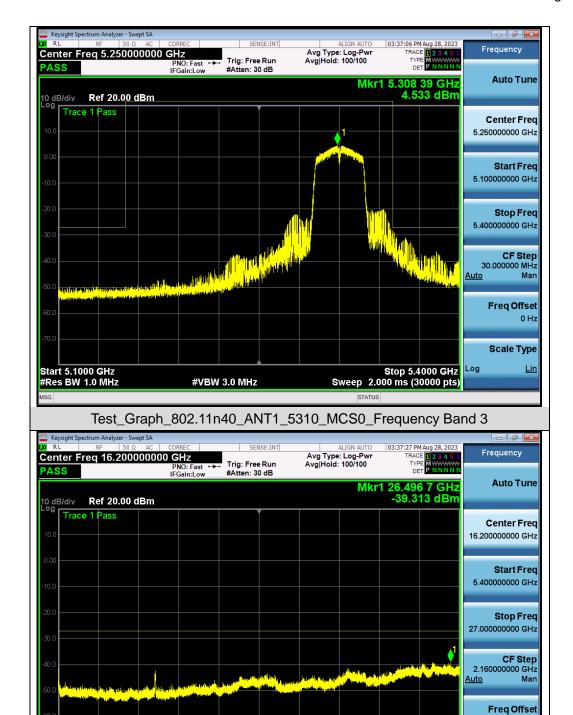
0 Hz

Scale Type

Log

Stop 27.00 GHz Sweep 56.00 ms (30000 pts)

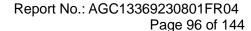




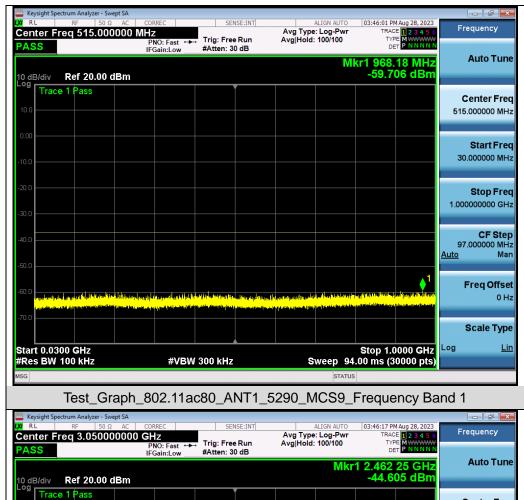
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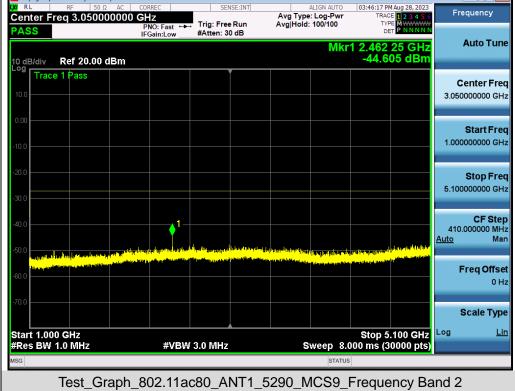
Test Graph 802.11n40 ANT1 5310 MCS0 Frequency Band 4

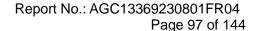
#VBW 3.0 MHz



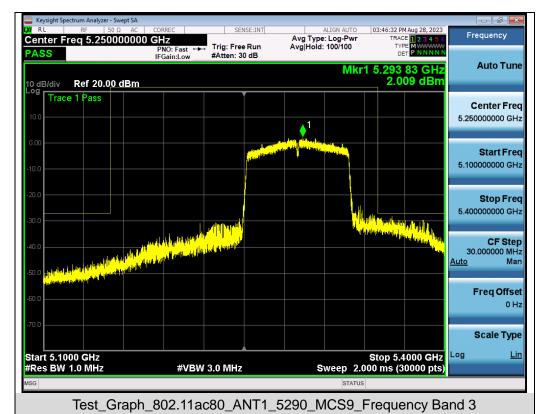




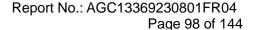






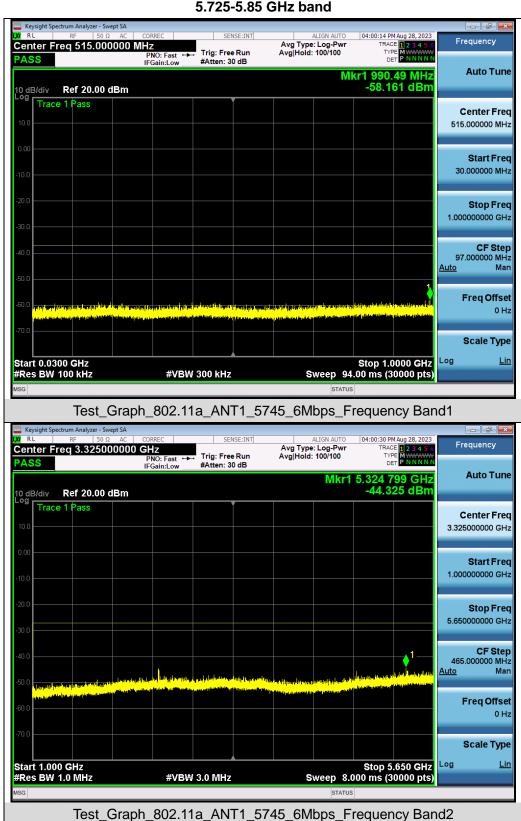


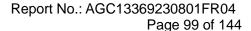




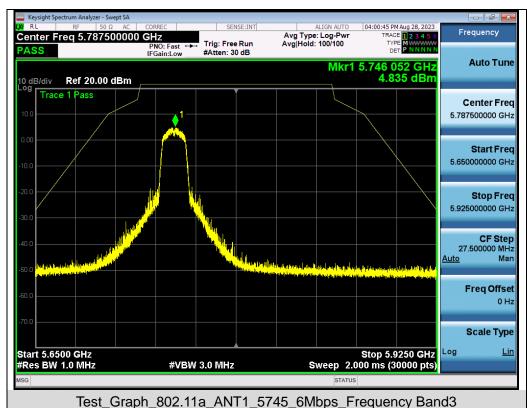


Test Graphs of Spurious Emissions outside of the 5.725-5.85 GHz band for transmitters operating in the 5.725-5.85 GHz band

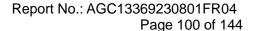








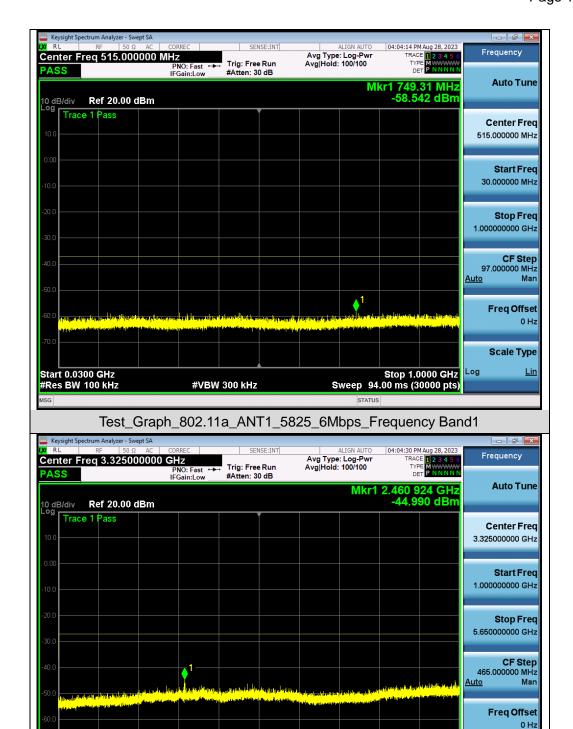




Scale Type

Stop 5.650 GHz Sweep 8.000 ms (30000 pts)

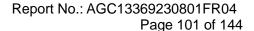




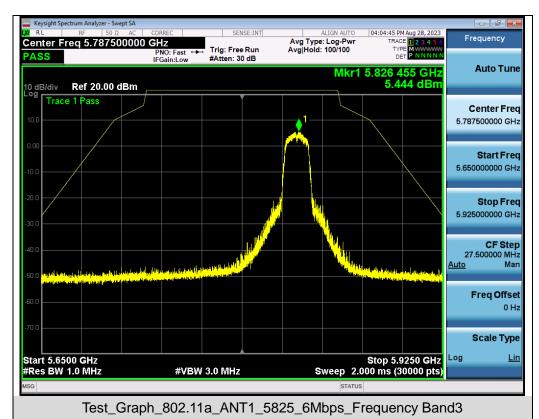
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Test Graph 802.11a ANT1 5825 6Mbps Frequency Band2

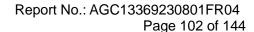
#VBW 3.0 MHz









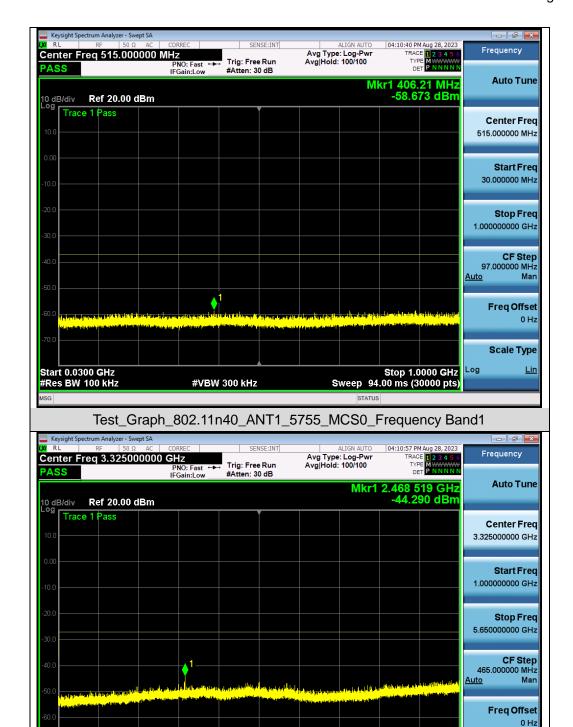


Scale Type

Log

Stop 5.650 GHz Sweep 8.000 ms (30000 pts)

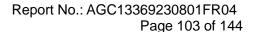




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Test Graph 802.11n40 ANT1 5755 MCS0 Frequency Band2

#VBW 3.0 MHz



CF Step 2.107500000 GHz

Freq Offset 0 Hz

Scale Type

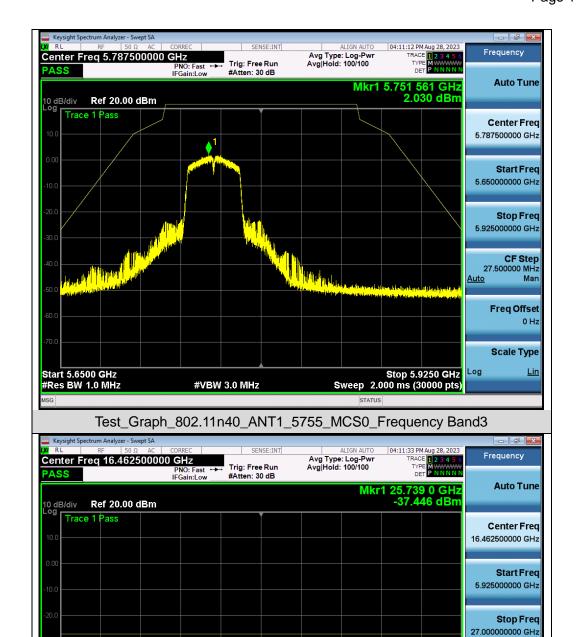
Man

<u>Auto</u>

Log

Stop 27.00 GHz Sweep 54.00 ms (30000 pts)



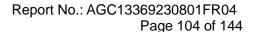


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Test Graph 802.11n40 ANT1 5755 MCS0 Frequency Band4

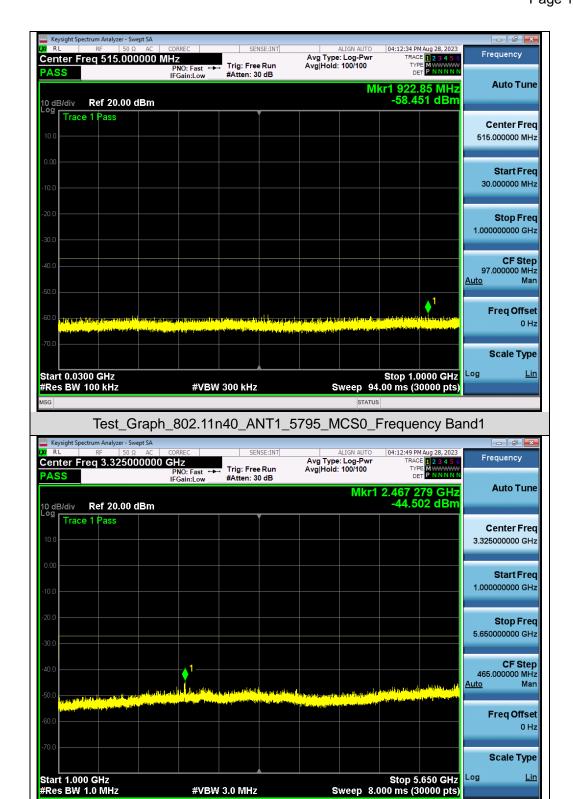
#VBW 3.0 MHz

Start 5.93 GHz #Res BW 1.0 MHz



Log





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Test Graph 802.11n40 ANT1 5795 MCS0 Frequency Band2

#VBW 3.0 MHz