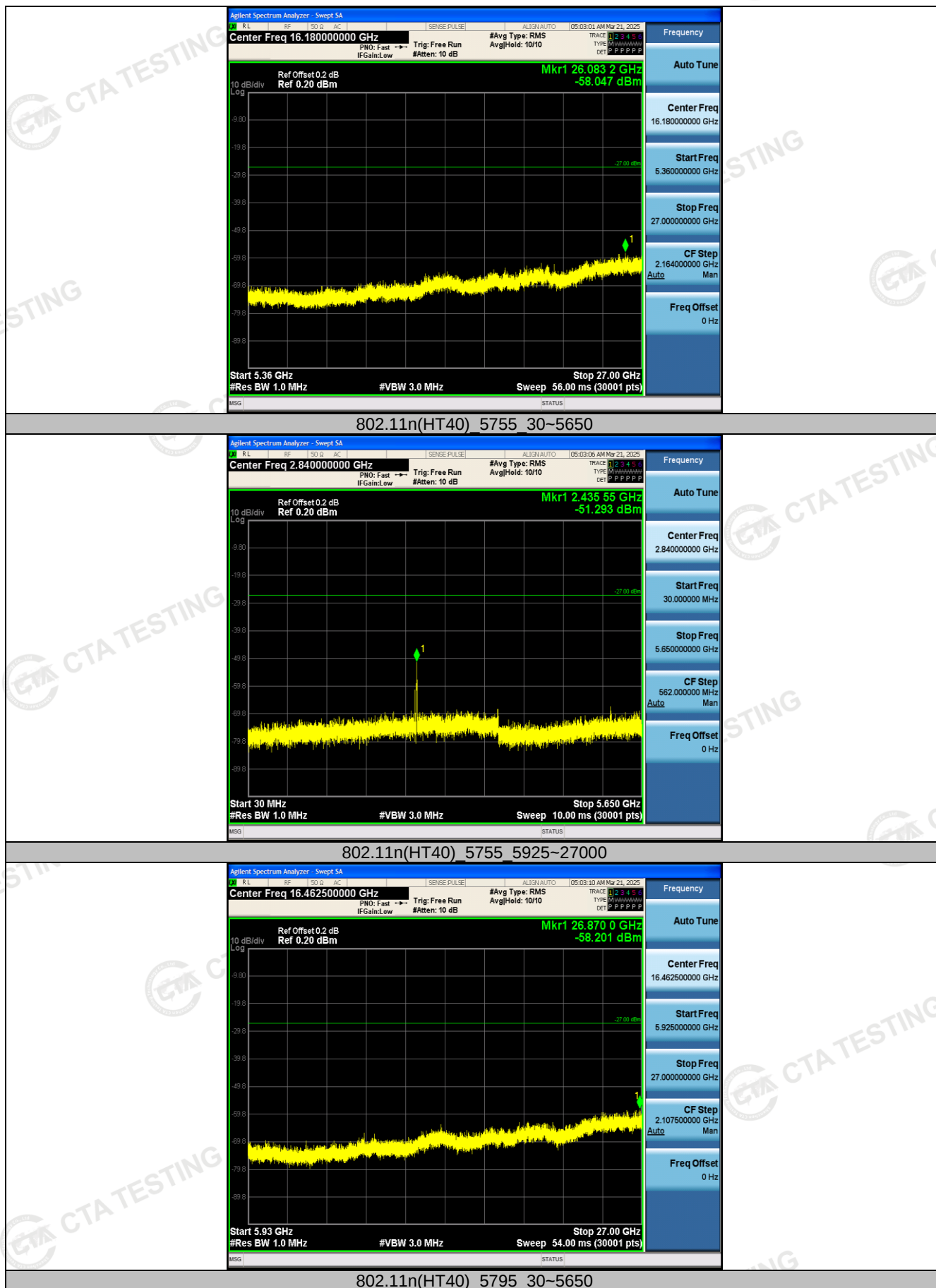
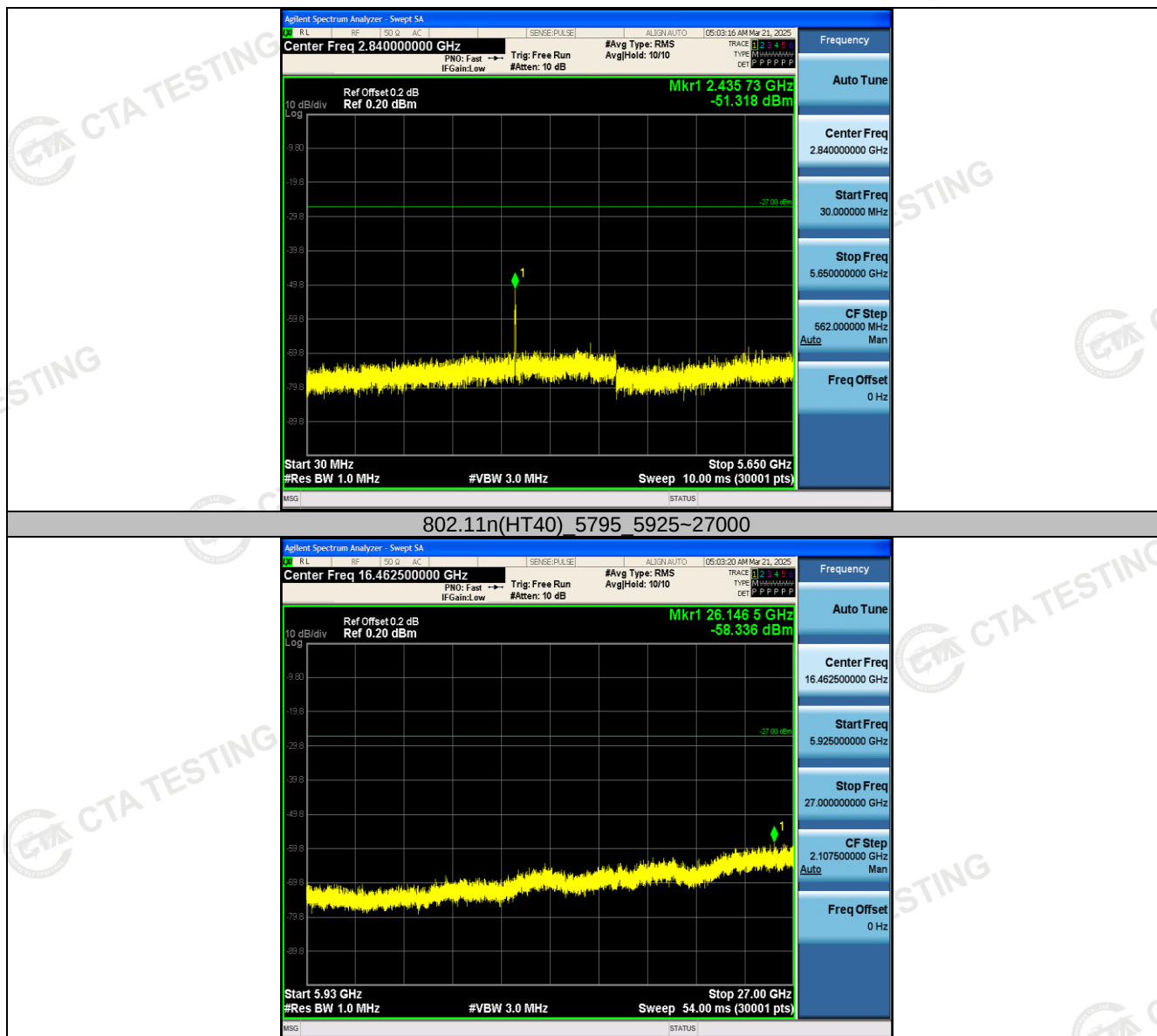






Conducted Band Edge**U-NII 1:**

TestMode	ChName	Freq(MHz)	Result[dBm]	Limit[dBm]	Verdict
802.11a	Low	5180	-42.65	≤-27	PASS
	High	5240	-49.76	≤-27	PASS
802.11n(HT20)	Low	5180	-42.35	≤-27	PASS
	High	5240	-50.31	≤-27	PASS
802.11n(HT40)	Low	5190	-41.59	≤-27	PASS
	High	5230	-50.71	≤-27	PASS

U-NII 3:

TestMode	ChName	Freq(MHz)	FreqRange [MHz]	Result [dBm]	Limit [dBm]	Verdict
802.11a	Low	5745	5650~5700	-52.53	≤-26.96	PASS
			5700~5720	-38.02	≤15.24	PASS
			5720~5725	-36.65	≤17.39	PASS
			5760~5650	-51.26	≤-27	PASS
	High	5825	5850~5855	-42.8	≤17.26	PASS
			5855~5875	-42.96	≤15.16	PASS
			5875~5925	-51.47	≤-26.41	PASS
			5925~5935	-50.22	≤-27	PASS
802.11n(HT 20)	Low	5745	5650~5700	-51.5	≤-26.02	PASS
			5700~5720	-38.06	≤14.82	PASS
			5720~5725	-25.86	≤26.83	PASS
			5760~5650	-51.72	≤-27	PASS
	High	5825	5850~5855	-41.34	≤16.34	PASS
			5855~5875	-41.63	≤15.58	PASS
			5875~5925	-51.11	≤-26.91	PASS
			5925~5935	-50.44	≤-27	PASS
802.11n(HT 40)	Low	5755	5650~5700	-51.2	≤-26.50	PASS
			5700~5720	-33.99	≤15.50	PASS
			5720~5725	-34.88	≤15.74	PASS
			5780~5650	-51.93	≤-27	PASS
	High	5795	5850~5855	-52.46	≤15.66	PASS
			5855~5875	-51.04	≤10.11	PASS
			5875~5925	-49.7	≤-25.12	PASS
			5925~5935	-49.88	≤-27	PASS

Test plot as follows

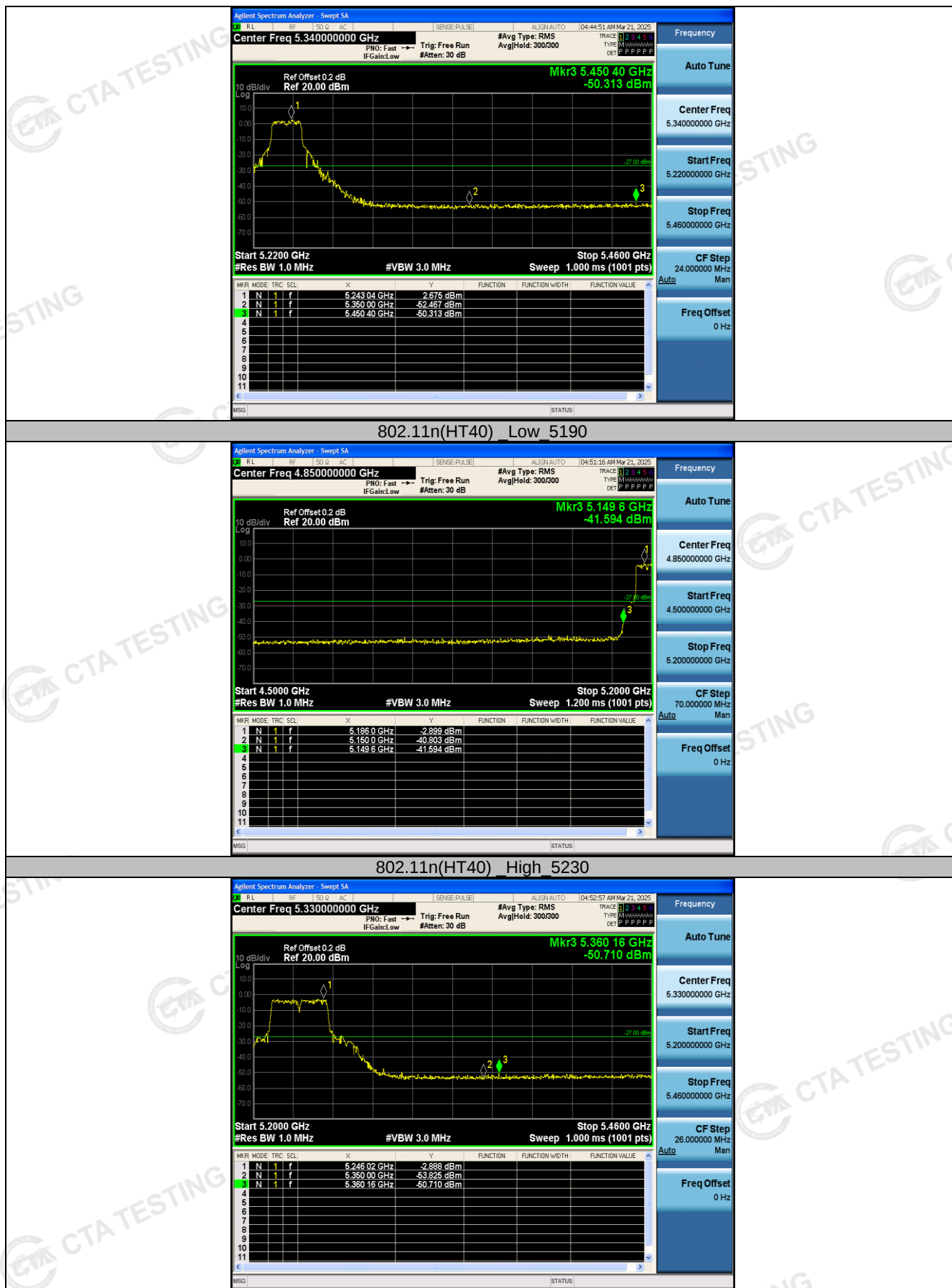
U-NII 1:



Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

Tel:+86-755 2322 5875 E-mail:cta@cta-test.cn Web:http://www.cta-test.cn



U-NII 3:





4.3 Maximum Conducted Average Output Power

Limit

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.

(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.

(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.

(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.

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 $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results**U-NII 1**

Type	Channel	Output power (dBm)	Duty factor (dB)	Total Output power (dBm)	Limit (dBm)	Result
802.11a	36	-0.74	3.83	3.09	24.0	Pass
	44	-0.86	3.83	2.97		
	48	-0.3	3.20	2.90		
802.11n(HT20)	36	-1.45	4.50	3.05	24.0	Pass
	44	-1.32	4.21	2.89		
	48	-1.15	4.06	2.91		
802.11n(HT40)	38	-6.46	6.17	-0.29	24.0	Pass
	46	-6.74	6.46	-0.28		

U-NII 3

Type	Channel	Output power (dBm)	Duty factor (dB)	Total Output power (dBm)	Limit (dBm)	Result
802.11a	149	-5.36	4.06	-1.30	30.00	Pass
	157	-6.65	4.39	-2.26		
	165	-6.5	4.06	-2.44		
802.11n(HT20)	149	-5.93	4.64	-1.29	30.00	Pass
	157	-5.49	3.20	-2.29		
	165	-7.12	4.64	-2.48		
802.11n(HT40)	151	-7.87	5.17	-2.70	30.00	Pass
	159	-9.34	5.86	-3.48		

Total Output Average power(dBm)= Output Average power(dBm)+ Duty Factor(dB)

4.4 Power Spectral Density

Limit

(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 power spectral density shall not exceed 17 dBm in any 1 MHz band.^{note1}

(ii) For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.^{note1}

(iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, 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.

(iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band.^{note1}

(2) For the 5.25 - 5.35 GHz and 5.47 - 5.725 GHz bands, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band.^{note1}

(3) For the band 5.725 - 5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.^{note1, note2}

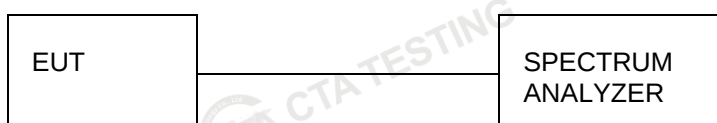
Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note2: 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.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 1MHz for U-NII 1, U-NII 2A, U-NII C band and 510KHz for U-NII 3 band.
3. Set the VBW $\geq 3 \times$ RBW.
4. Set the span to encompass the entire EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.

Test Configuration



Test Results

U-NII 1

Type	Bands	Channel	Power Spectral Density (dBm/MHz)	Duty Factor (dB)	Total Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	U-NII 1	36	-7.47	3.83	-3.64	11.0	Pass
		44	-7.78	3.83	-3.95		
		48	-7.46	3.20	-4.26		
802.11n (HT20)	U-NII 1	36	-7.78	4.50	-3.28		
		44	-8.13	4.21	-3.92		
		48	-7.87	4.06	-3.81		
802.11n (HT40)	U-NII 1	38	-13.84	6.17	-7.67		
		46	-13.53	6.46	-7.07		

U-NII 3

Type	Bands	Channel	Power Spectral Density (dBm/300KHz)	Duty Factor (dB)	Total Power Spectral Density (dBm/300KHz)	RBW factor (dB)	Power Spectral Density (dBm/500KHz)	Limit (dBm /500KHz)	Result
802.11a	U-NII 3	149	-16.83	4.06	-12.77	2.22	-10.55	30.0	Pass
		157	-17.13	4.39	-12.74	2.22	-10.52		
		165	-17.71	4.06	-13.65	2.22	-11.43		
802.11n (HT20)	U-NII 3	149	-16.3	4.64	-11.66	2.22	-9.44		
		157	-17.48	3.2	-14.28	2.22	-12.06		
		165	-17.62	4.64	-12.98	2.22	-10.76		
802.11n (HT40)	U-NII 3	151	-19.88	5.17	-14.71	2.22	-12.49		
		159	-20.14	5.86	-14.28	2.22	-12.06		

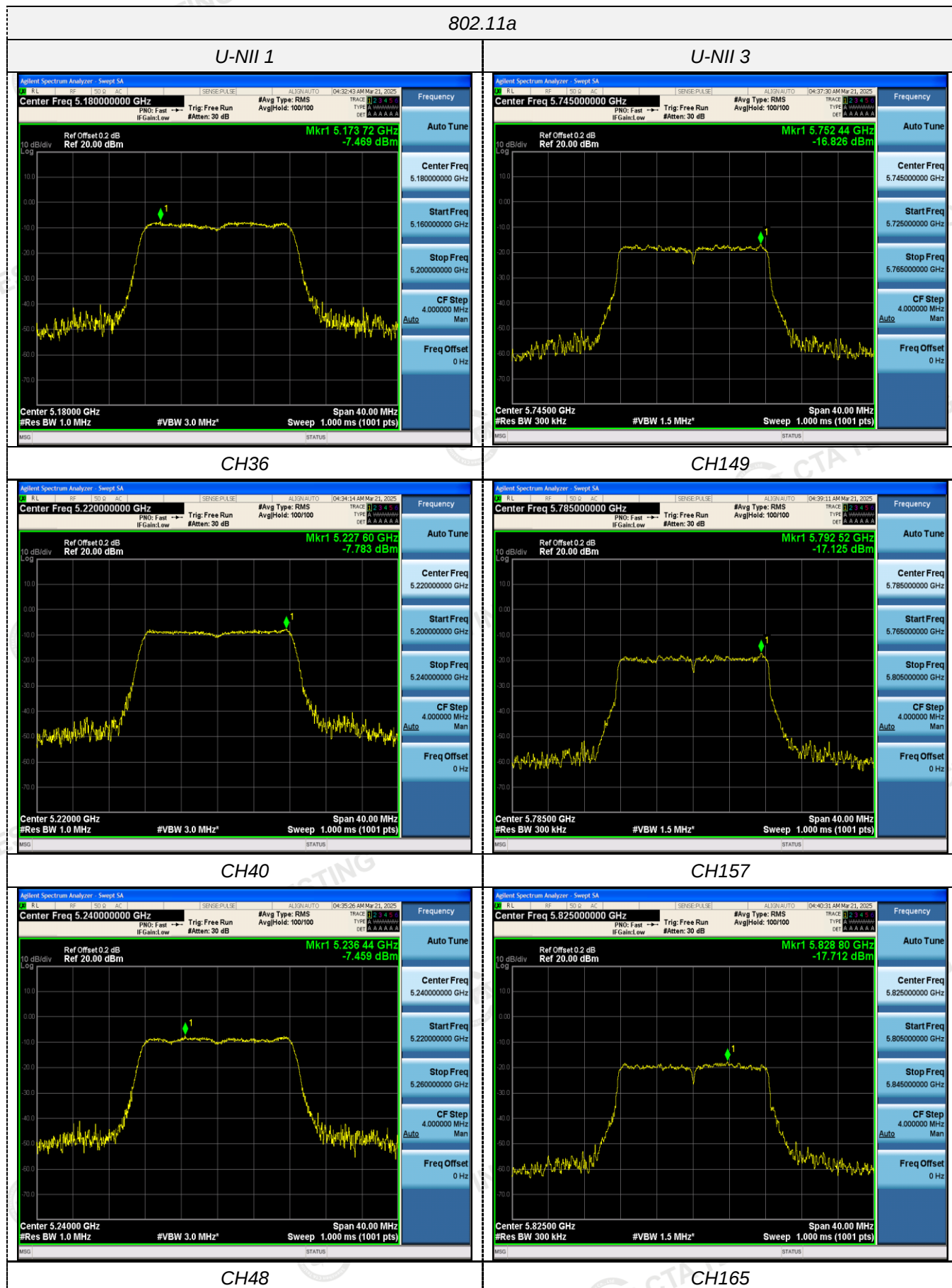
Total Power Spectral Density (dBm/MHz)= Power Spectral Density (dBm/MHz)+ Duty Factor (dB)

Remark: P.S.D(dBm/500KHz)= P.S.D(dBm/300KHz)+10 log (500 kHz/300KHz).

RBW factor = 10 log (500 KHz / 300 KHz) = 2.22 dB

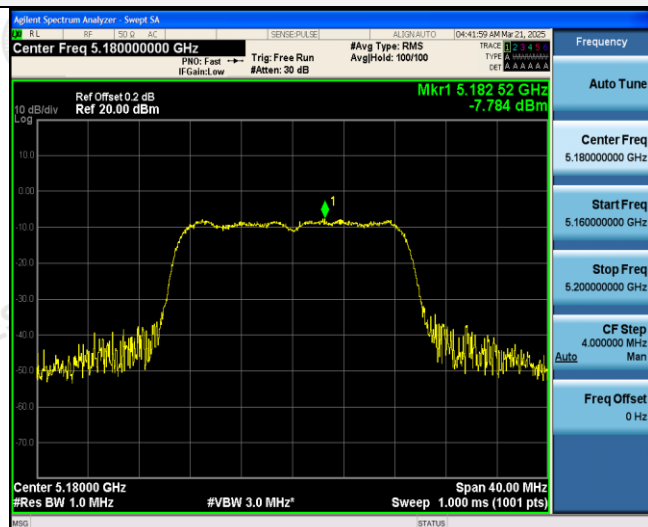
Test plot as follows

802.11a

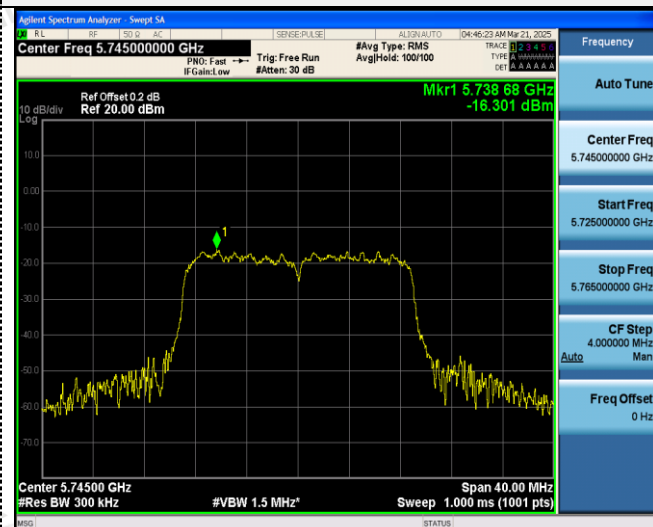


802.11n(HT20)

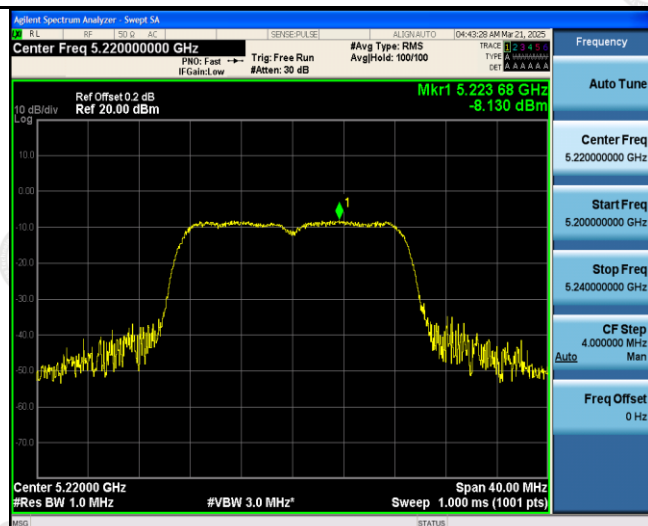
U-NII 1



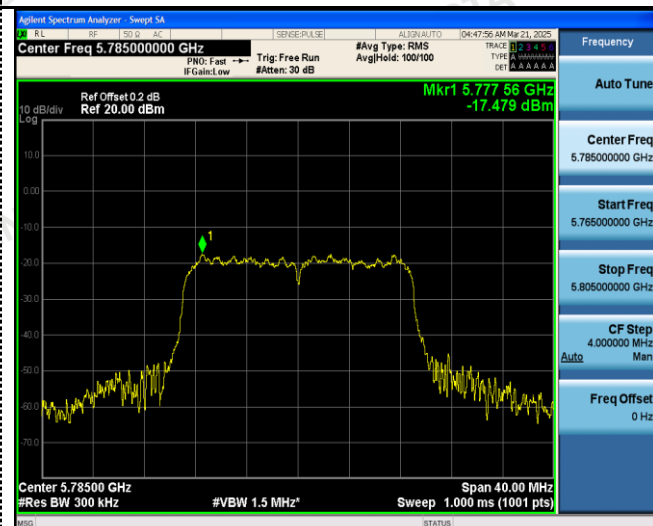
U-NII 3



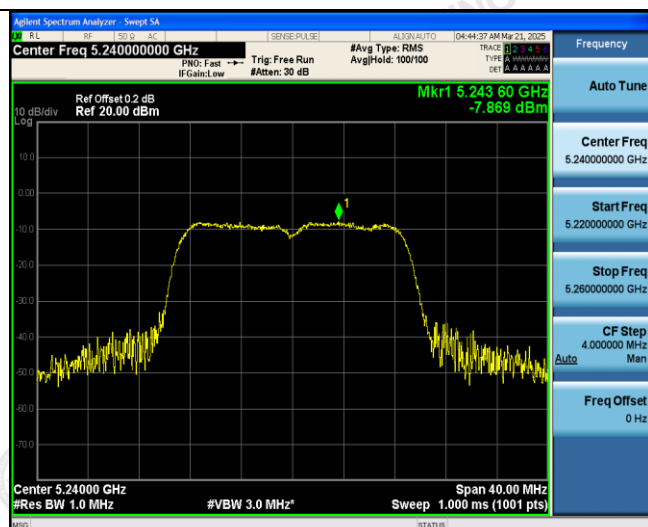
CH36



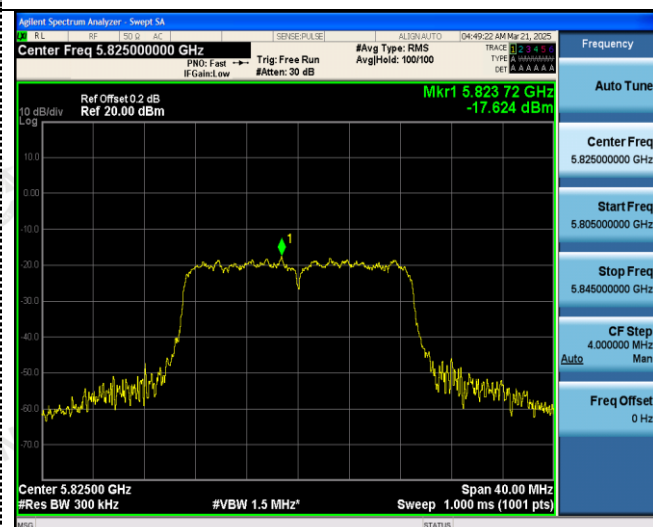
CH149



CH40



CH157



CH48

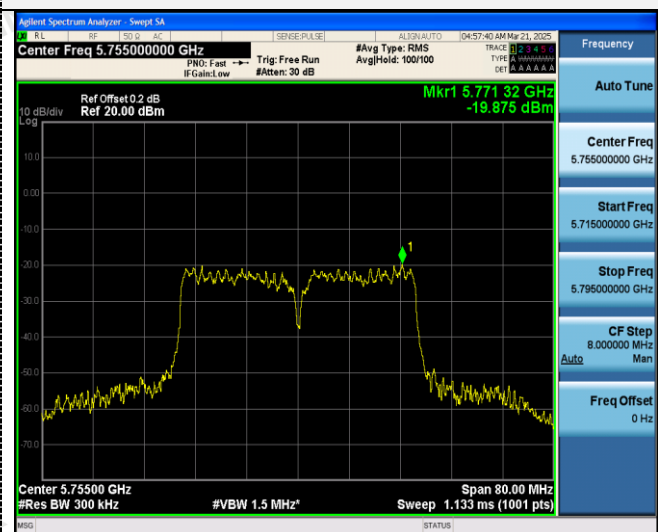
CH165

802.11n(HT40)

U-NII 1



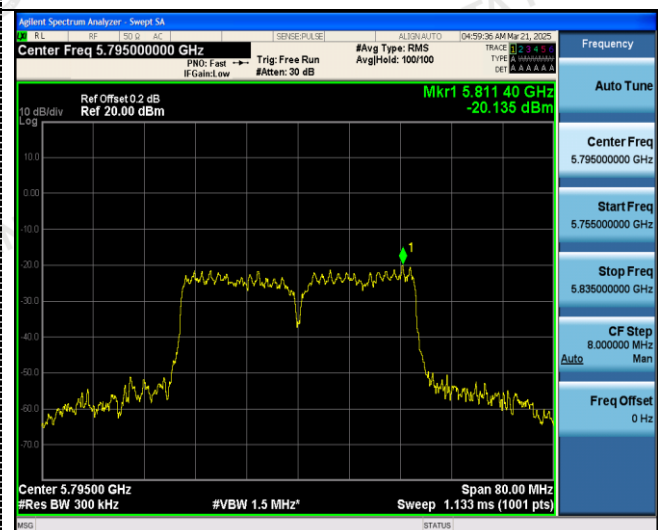
U-NII 3



CH38



CH151



CH46

CH159

4.5 Emission Bandwidth (26dB Bandwidth)

Limit

N/A

Test Procedure

1. Set resolution bandwidth (RBW) = approximately 1 % of the EBW.
2. Set the video bandwidth (VBW) > RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak 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 %.

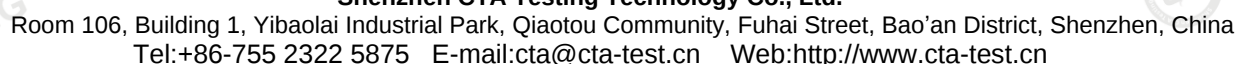
Test Configuration



Test Results

Type	Bands	Channel	26dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	U-NII 1	36	26.920	N/A	Pass
		40	20.960		
		48	23.080		
802.11n(HT20)	U-NII 1	36	24.760		
		40	27.280		
		48	25.080		
802.11n(HT40)	U-NII 1	38	43.680		
		46	43.920		

Test plot as follows:



802.11n(HT40)		/																																				
Agilent Spectrum Analyzer - Swept SA RL RF SD AC SENSE: PULSE ALGN: AUTO 04:50:03 AM Mar 21, 2005 Center Freq 5.190000000 GHz PRN: Fast Trig: Free Run #Avg Type: RMS Avg/Hold: 100/100 TYPE: Minimum SET: P P P P P P Ref Offset 0.2 dB Ref 20.00 dBm ΔMkr3 43.68 MHz -0.502 dB 10 dB/div Log Center 5.19000 GHz #Res BW 430 kHz #VBW 1.3 MHz Span 80.00 MHz Sweep 1.000 ms (1001 pts) <table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>5.18888 GHz</td><td>-33.406 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.20648 GHz</td><td>-6.034 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>Δ1</td><td>1</td><td>f (Δ)</td><td>43.68 MHz (Δ)</td><td>-0.502 dB</td><td></td><td></td><td></td></tr></tbody></table> Auto Tune Center Freq 5.190000000 GHz Start Freq 5.150000000 GHz Stop Freq 5.230000000 GHz CF Step 8.000000 MHz Man Freq Offset 0 Hz MAG STATUS		MNR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	5.18888 GHz	-33.406 dBm				2	N	1	f	5.20648 GHz	-6.034 dBm				3	Δ1	1	f (Δ)	43.68 MHz (Δ)	-0.502 dB				
MNR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																														
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CH38		/																																				
Agilent Spectrum Analyzer - Swept SA RL RF SD AC SENSE: PULSE ALGN: AUTO 04:51:48 AM Mar 21, 2005 Center Freq 5.230000000 GHz PRN: Fast Trig: Free Run #Avg Type: RMS Avg/Hold: 100/100 TYPE: Minimum SET: P P P P P P Ref Offset 0.2 dB Ref 20.00 dBm ΔMkr3 43.92 MHz 0.646 dB 10 dB/div Log Center 5.23000 GHz #Res BW 430 kHz #VBW 1.3 MHz Span 80.00 MHz Sweep 1.000 ms (1001 pts) <table><thead><tr><th>MNR</th><th>MODE</th><th>TRC</th><th>SOL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>5.20880 GHz</td><td>-33.283 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>5.24640 GHz</td><td>-6.307 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>Δ1</td><td>1</td><td>f (Δ)</td><td>43.92 MHz (Δ)</td><td>0.646 dB</td><td></td><td></td><td></td></tr></tbody></table> Auto Tune Center Freq 5.230000000 GHz Start Freq 5.190000000 GHz Stop Freq 5.270000000 GHz CF Step 8.000000 MHz Man Freq Offset 0 Hz MAG STATUS		MNR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	5.20880 GHz	-33.283 dBm				2	N	1	f	5.24640 GHz	-6.307 dBm				3	Δ1	1	f (Δ)	43.92 MHz (Δ)	0.646 dB				
MNR	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																														
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2	N	1	f	5.24640 GHz	-6.307 dBm																																	
3	Δ1	1	f (Δ)	43.92 MHz (Δ)	0.646 dB																																	
CH46		/																																				

4.6 Minimum Emission Bandwidth (6dB Bandwidth)

Limit

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth 3 x RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Configuration



Test Results

Type	Bands	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	U-NII 3	149	16.320	≥500KHz	Pass
		157	16.320		
		165	16.320		
802.11n(HT20)	U-NII 3	149	17.160		
		157	16.840		
		165	16.440		
802.11n(HT40)	U-NII 3	151	35.920		
		159	35.760		

Test plot as follows: