

Appendix E

RF Test Data for 5.8G WLAN (Conducted Measurement)

Product Name: 4G SMARTPHONE

Test Model: X7

Environmental Conditions

Temperature:	25.5 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond Lu
Supervised by:	Wang Chuang

E.1 Duty Cycle

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5785	100	0.00	0.01
11N20 SISO	5785	100	0.00	0.01
11N40 SISO	5755	100	0.00	0.01

On Time and Duty Cycle

Agilent Spectrum Analyzer - Swept SA

RL RF SO Q AC SENSE:PULSE ALIGN:AUTO 01:39:34 PM 1/01, 2019

Center Freq 5.785000000 GHz Avg Type: RMS

PN0: Fast IFGain:Low Trig: Free Run #Atten: 30 dB

Frequency

Auto Tune

Center Freq 5.785000000 GHz

Start Freq 5.785000000 GHz

Stop Freq 5.785000000 GHz

CF Step 8.000000 MHz

Freq Offset 0 Hz

10 dB/div Ref 20.00 dBm

Log

Center 5.785000000 GHz Res BW 8 MHz #VBW 50 MHz* Sweep 10.13 ms (8001 pts) Span 0 Hz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

IEEE 802.11a

Agilent Spectrum Analyzer - Swept SA

RL RF SO Q AC SENSE:PULSE ALIGN:AUTO 01:58:20 PM 1/01, 2019

Center Freq 5.785000000 GHz Avg Type: RMS

PN0: Fast IFGain:Low Trig: Free Run #Atten: 30 dB

Frequency

Auto Tune

Center Freq 5.785000000 GHz

Start Freq 5.785000000 GHz

Stop Freq 5.785000000 GHz

CF Step 8.000000 MHz

Freq Offset 0 Hz

10 dB/div Ref 20.00 dBm

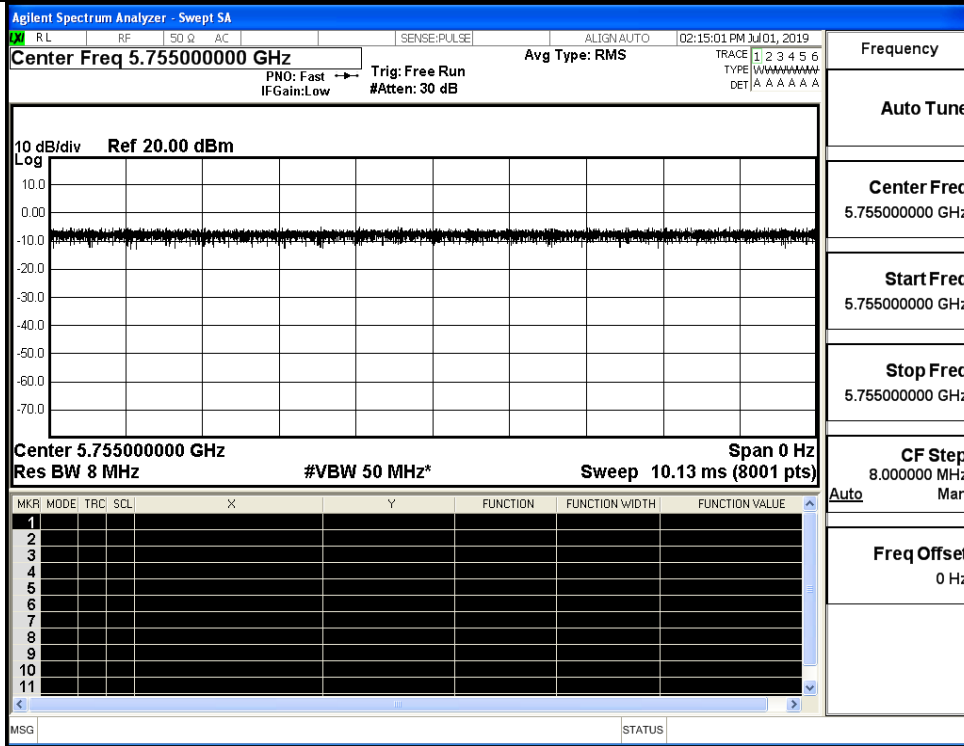
Log

Center 5.785000000 GHz Res BW 8 MHz #VBW 50 MHz* Sweep 10.13 ms (8001 pts) Span 0 Hz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

IEEE 802.11n HT20



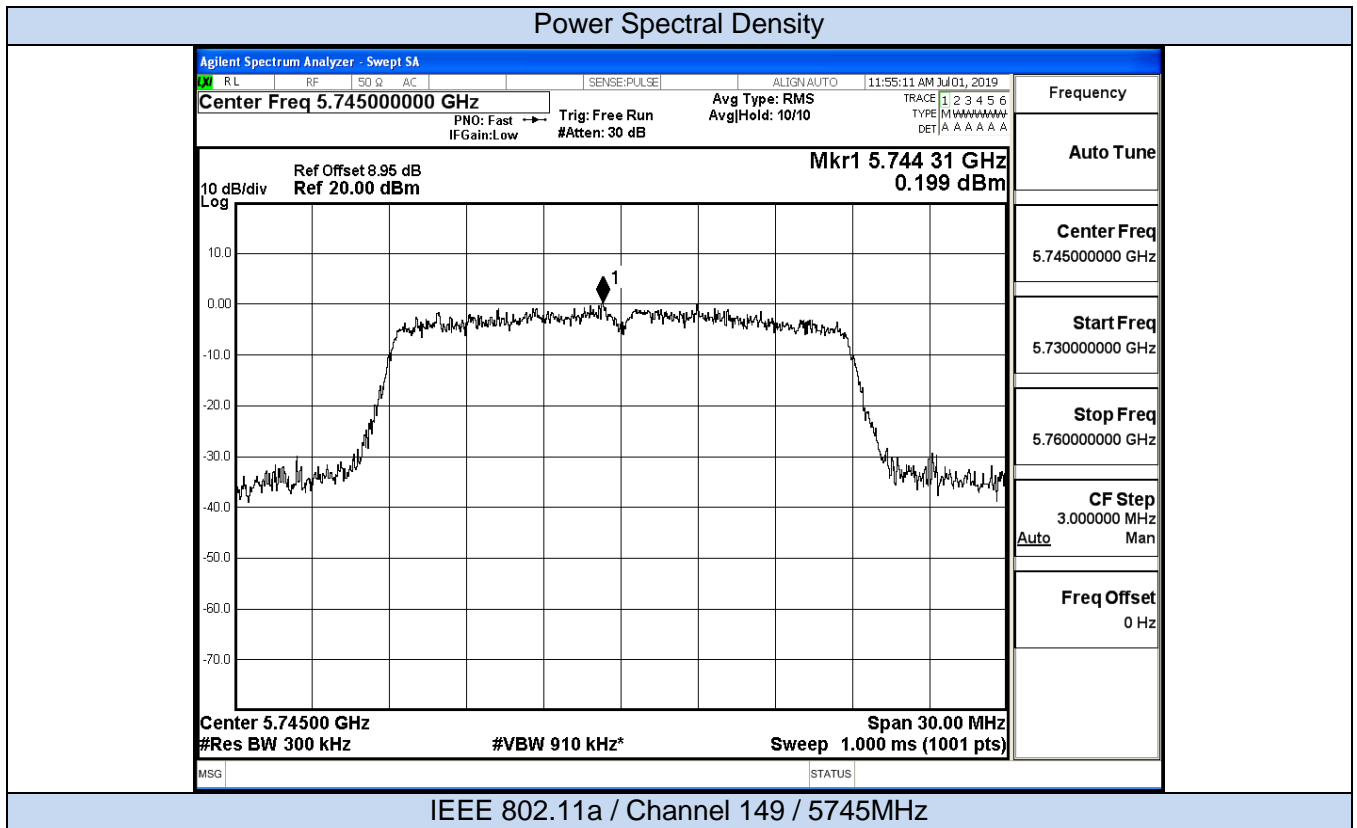
IEEE 802.11n HT40

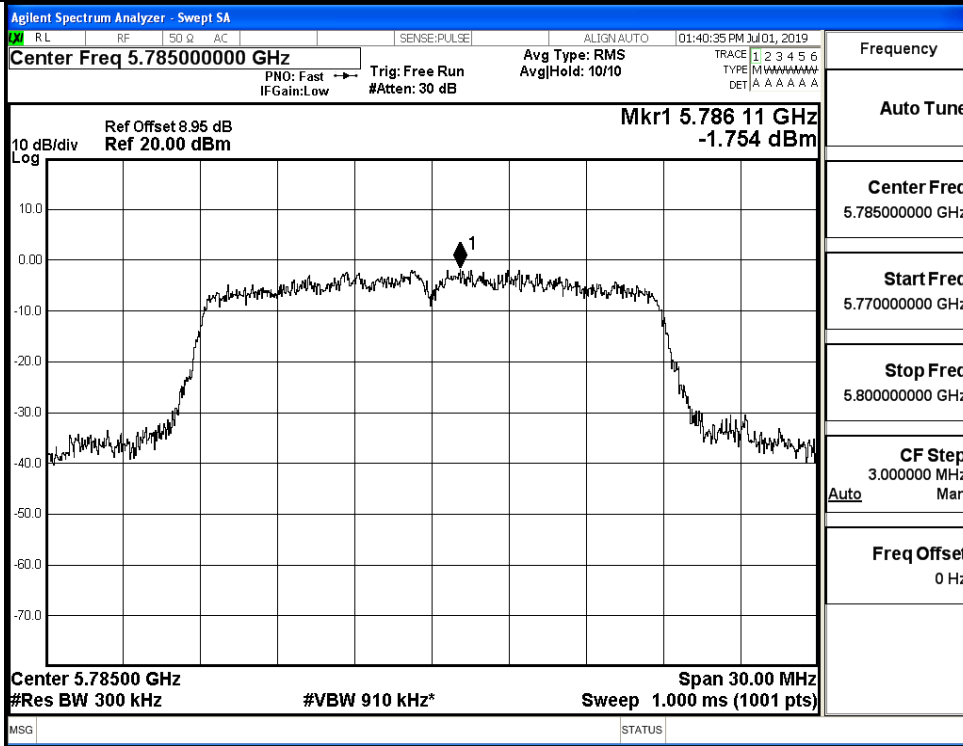
E.2 Maximum Conduct Output Power

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)	Duty Cycle Factor(dB)	Report Conducted Power(dBm)	Limit (dBm)	Verdict
11A	149	5745	9.93	0	9.93	30	Pass
	157	5785	9.96	0	9.96		Pass
	165	5825	10.18	0	10.18		Pass
11N20 SISO	149	5745	9.31	0	9.31	30	Pass
	157	5785	10.15	0	10.15		Pass
	165	5825	10.75	0	10.75		Pass
11N40 SISO	151	5755	9.75	0	9.75	30	Pass
	159	5795	10.02	0	10.02		Pass

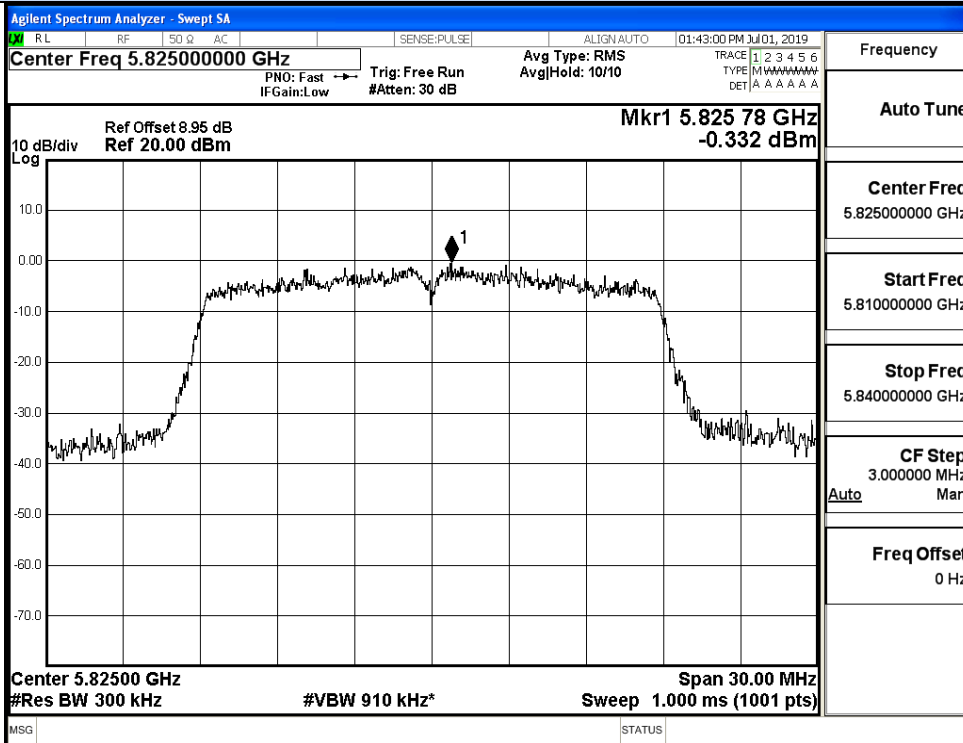
E.3 Power Spectral Density

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/300KHz)	Duty Cycle Factor (dB)	RBW Factor (dB)	Report Power Density (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
11A	149	5745	0.20	0	2.218	2.418	30	Pass
	157	5785	-1.75	0	2.218	0.468		Pass
	165	5825	-0.33	0	2.218	1.888		Pass
11N20 SISO	149	5745	-6.92	0	2.218	-4.702	30	Pass
	157	5785	-1.47	0	2.218	0.748		Pass
	165	5825	-6.05	0	2.218	-3.832		Pass
11N40 SISO	151	5755	-4.99	0	2.218	-2.772	30	Pass
	159	5795	-4.19	0	2.218	-1.972		Pass



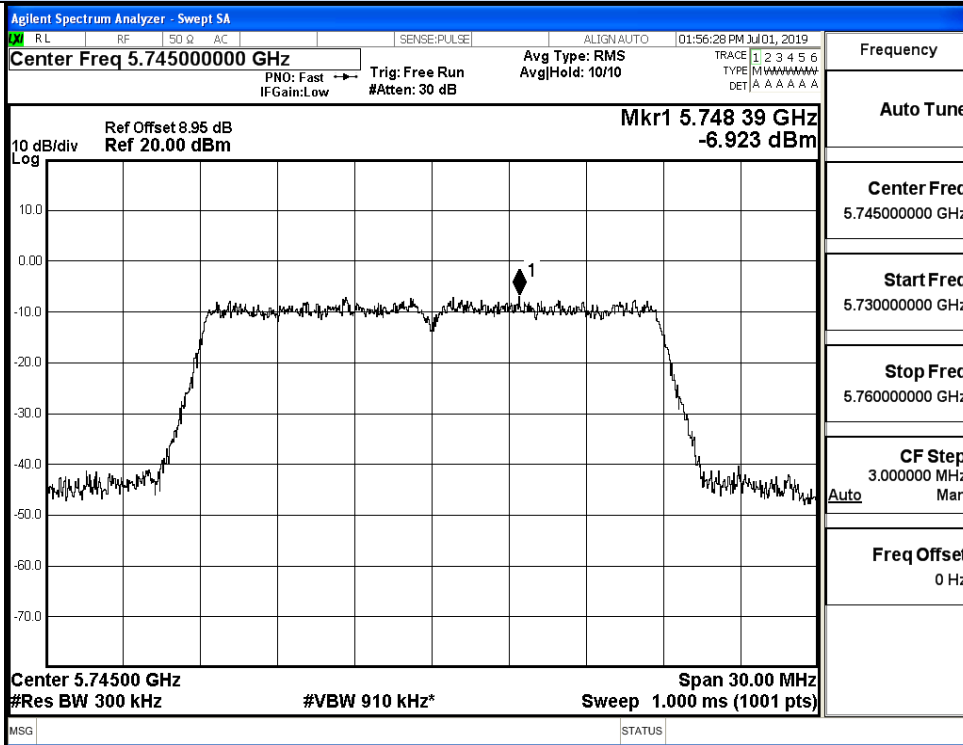


IEEE 802.11a / Channel 157 / 5785MHz

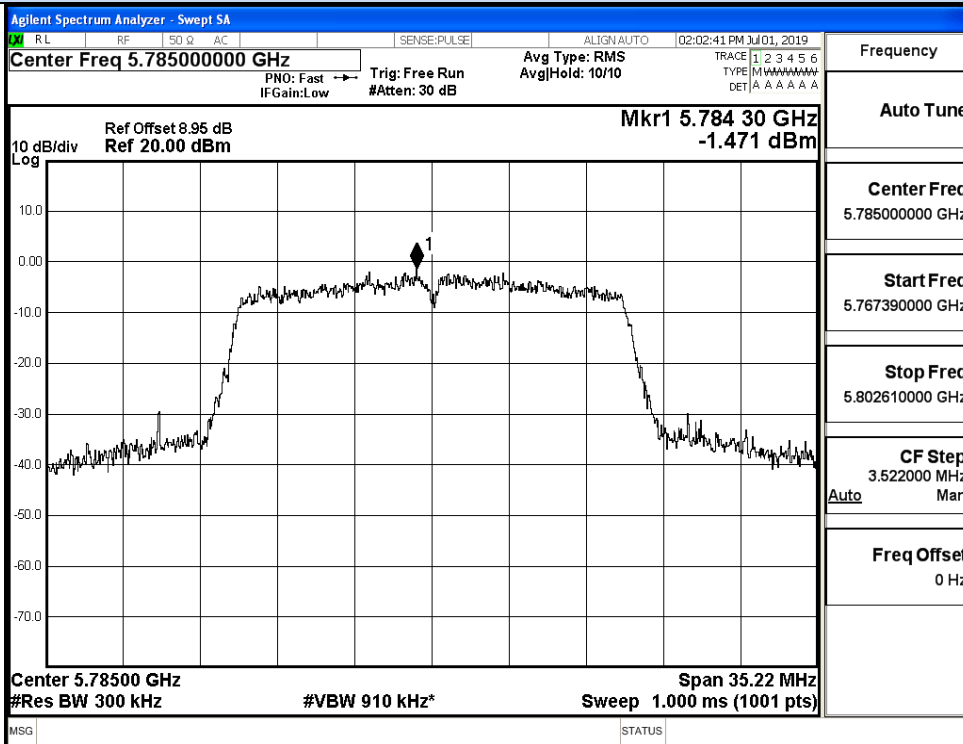


IEEE 802.11a / Channel 165 / 5825MHz

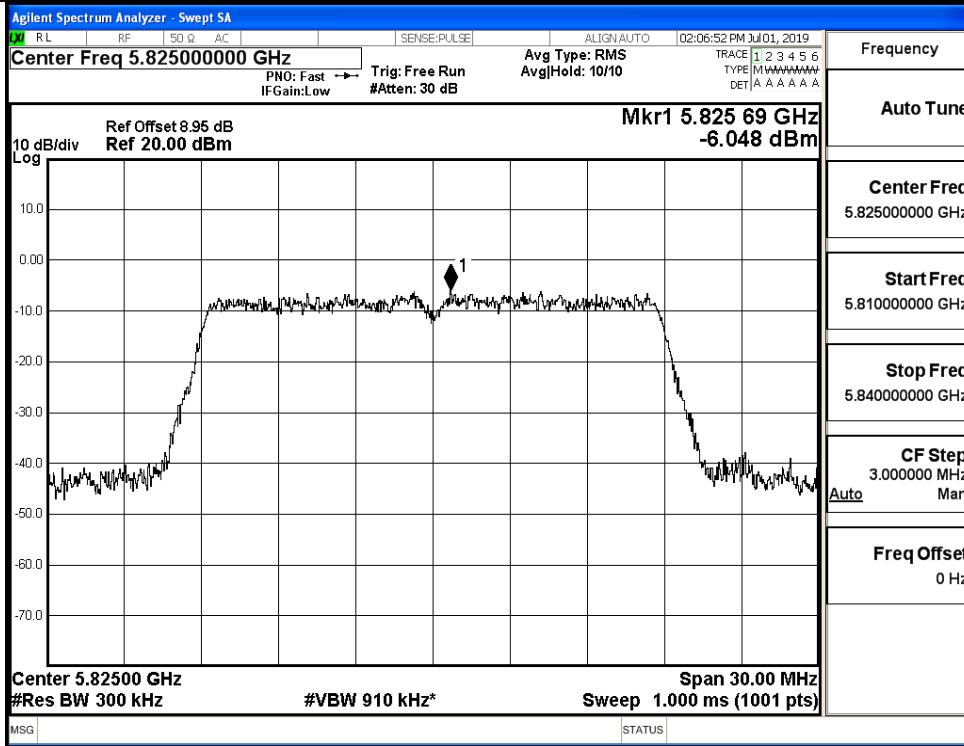
Power Spectral Density



IEEE 802.11n20 / Channel 149 / 5745MHz

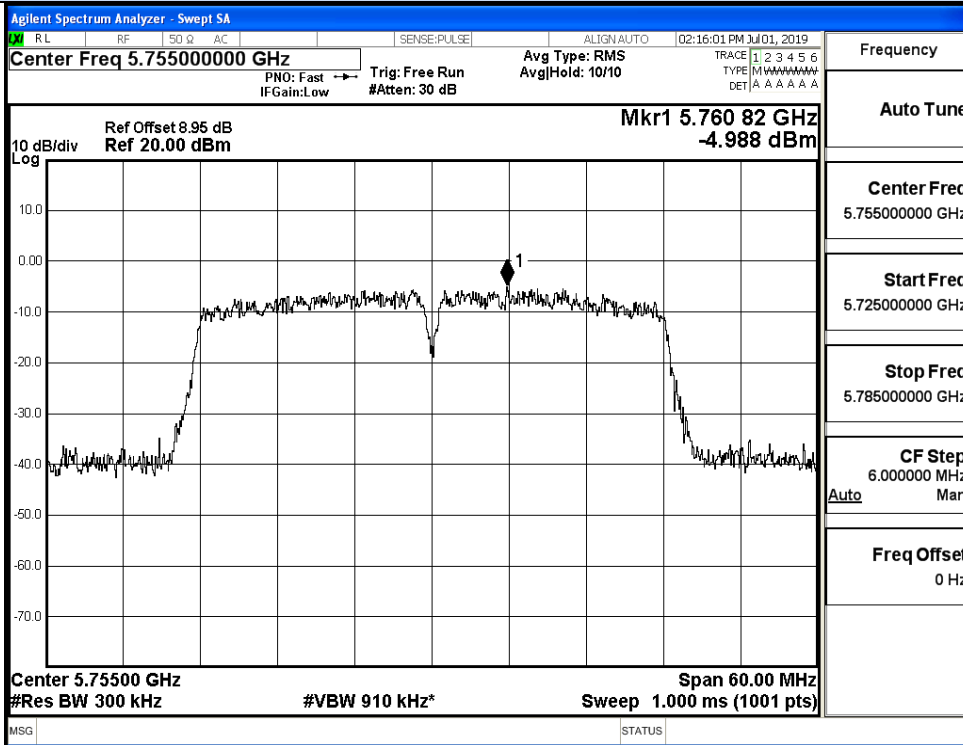


IEEE 802.11n20 / Channel 157 / 5785MHz

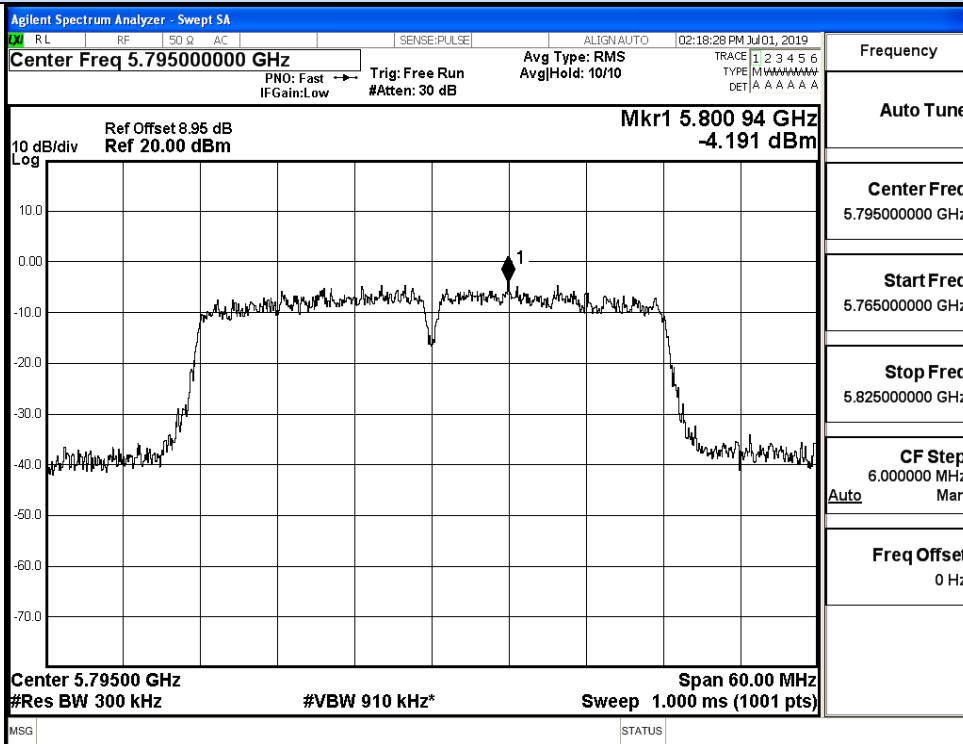


IEEE 802.11n20 / Channel 165 / 5825MHz

Power Spectral Density



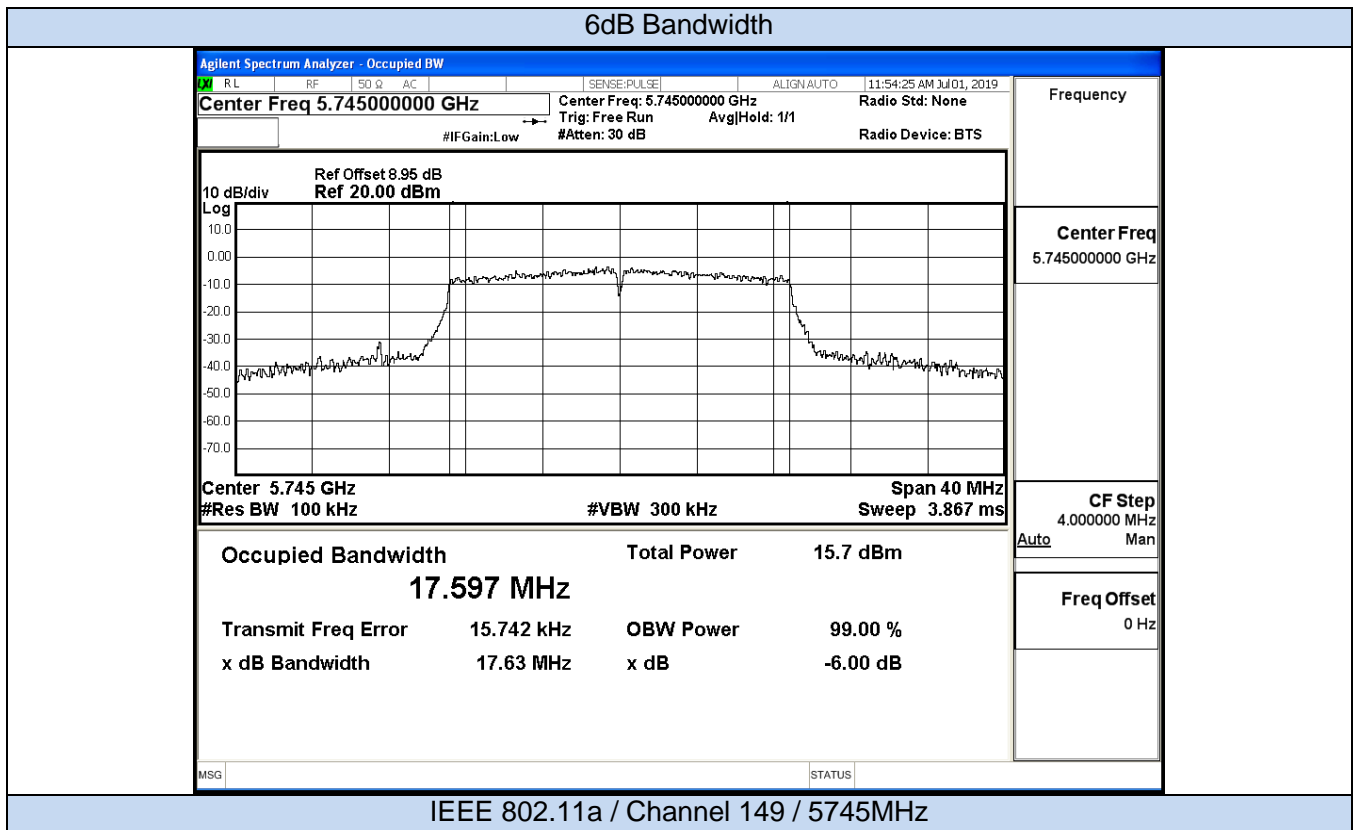
IEEE 802.11n40 / Channel 151 / 5755MHz

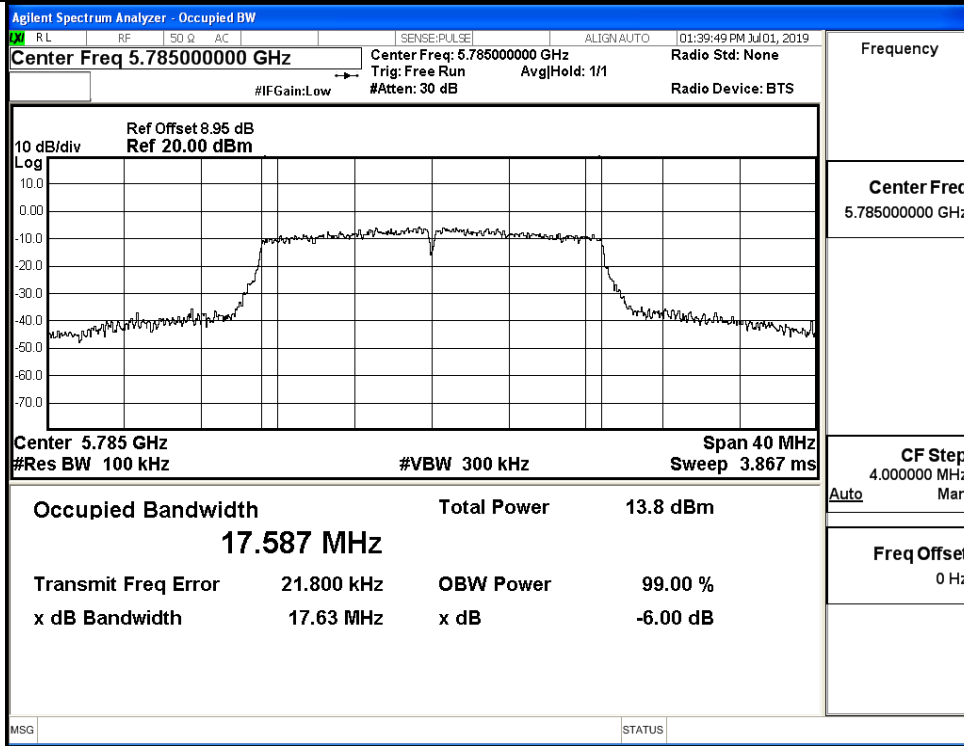


IEEE 802.11n40 / Channel 159 / 5795MHz

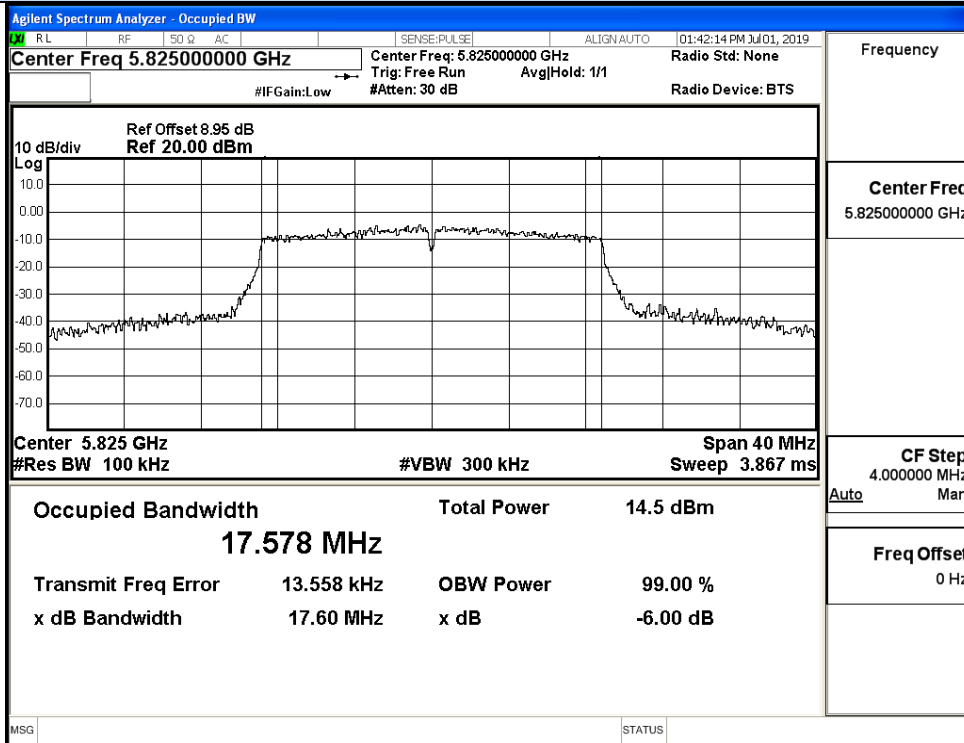
E.4 Emission Bandwidth

Test Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Verdict
11A	149	5745	17.63	>=0.5	Pass
	157	5785	17.63		Pass
	165	5825	17.60		Pass
11N20 SISO	149	5745	17.83	>=0.5	Pass
	157	5785	17.61		Pass
	165	5825	17.83		Pass
11N40 SISO	151	5755	36.35	>=0.5	Pass
	159	5795	36.23		Pass



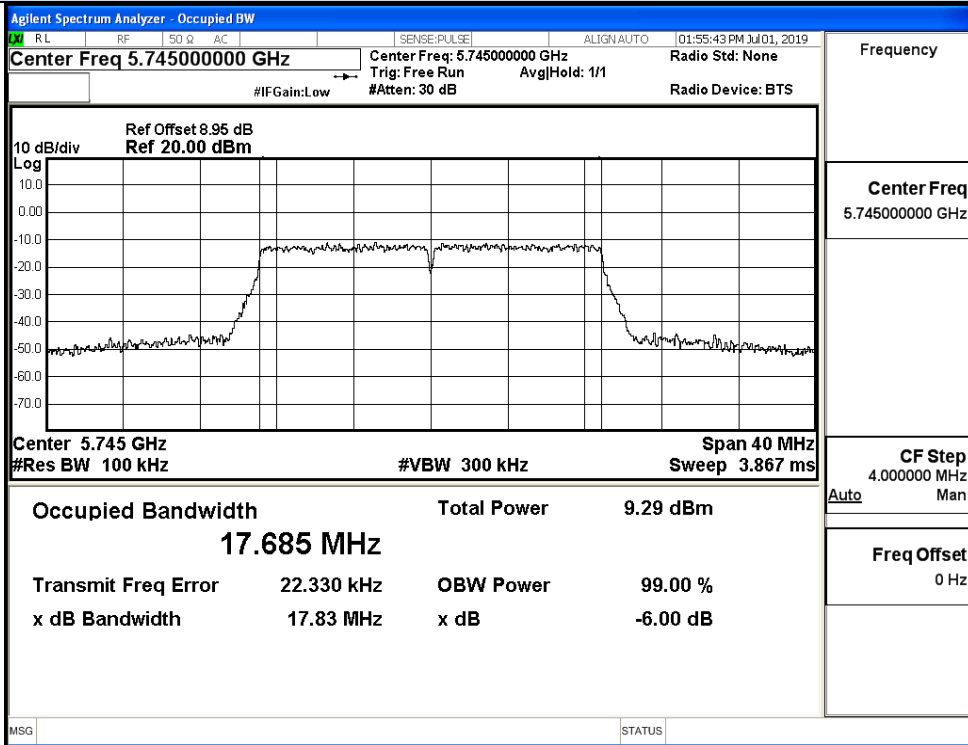


IEEE 802.11a / Channel 157 / 5785MHz

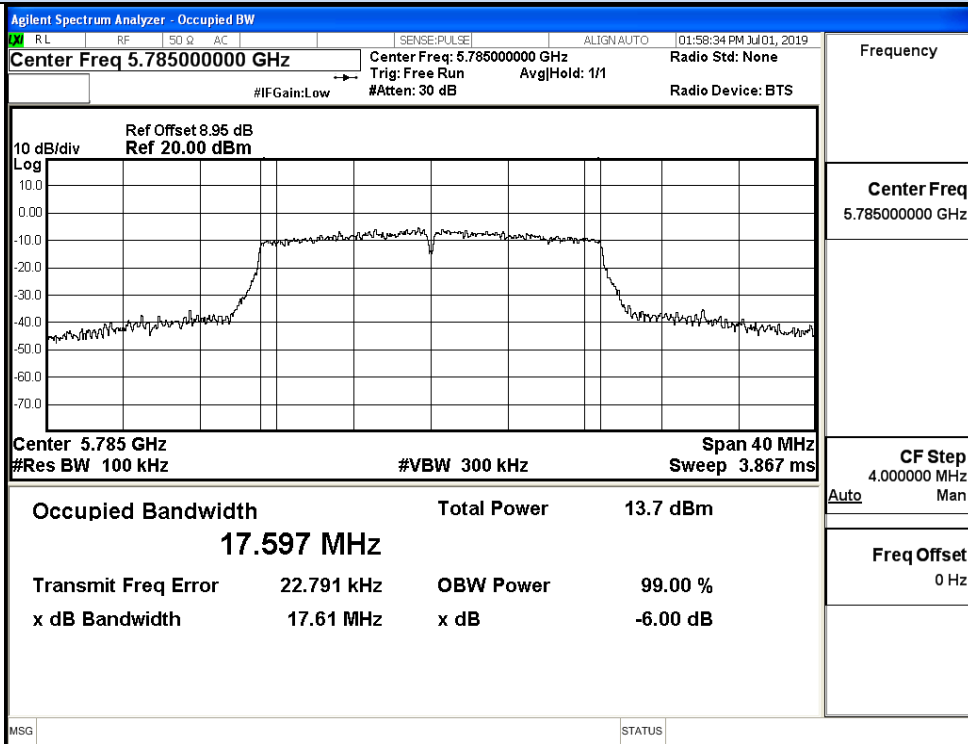


IEEE 802.11a / Channel 165 / 5825MHz

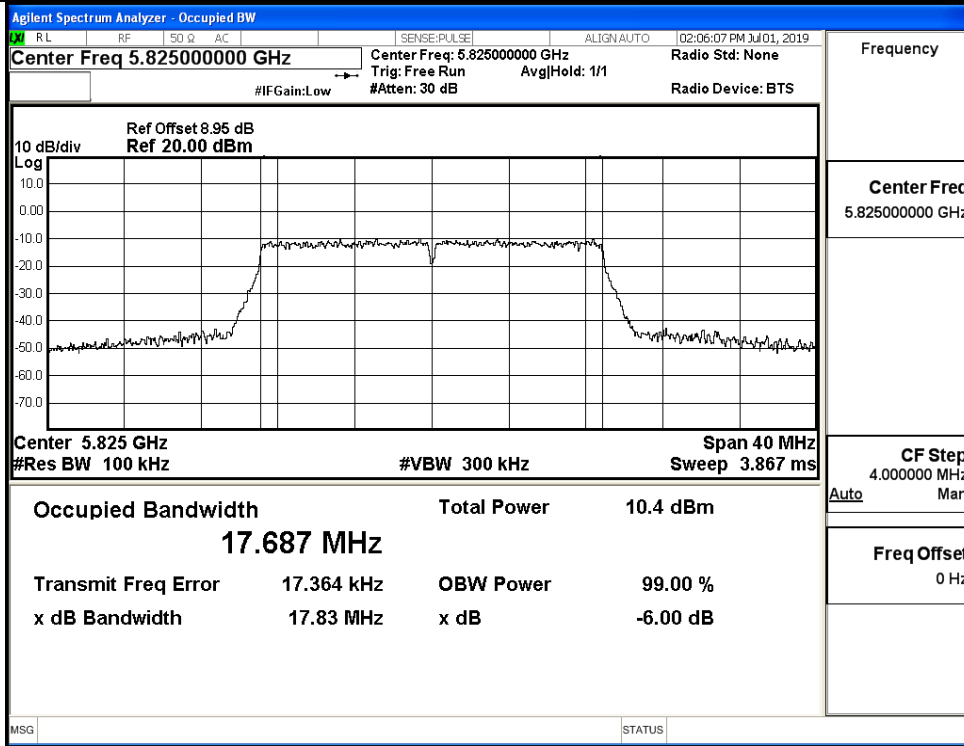
6dB Bandwidth



IEEE 802.11n20 / Channel 149 / 5745MHz



IEEE 802.11n20 / Channel 157 / 5785MHz



IEEE 802.11n20 / Channel 165 / 5825MHz

26dB Bandwidth

Agilent Spectrum Analyzer - Occupied BW

RL	RF	SO Q AC	SENSE:PULSE	ALIGN:AUTO	02:15:15 PM 1/01, 2019
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Center Freq 5.755000000 GHz Center Freq: 5.755000000 GHz Radio Std: None
 Trig: Free Run AvgHold: 1/1
 #IFGain:Low #Atten: 30 dB Radio Device: BTS

10 dB/div Ref Offset 8.95 dB
 Ref 20.00 dBm

Center 5.755 GHz Span 80 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 7.667 ms

Occupied Bandwidth	Total Power	13.9 dBm
35.914 MHz		
Transmit Freq Error	17.246 kHz	OBW Power
		99.00 %
x dB Bandwidth	36.35 MHz	x dB
		-6.00 dB

Frequency: 5.755000000 GHz
 CF Step: 8.000000 MHz (Auto)
 Freq Offset: 0 Hz

IEEE 802.11n40 / Channel 151 / 5755MHz

Agilent Spectrum Analyzer - Occupied BW

RL	RF	SO Q AC	SENSE:PULSE	ALIGN:AUTO	02:17:43 PM 1/01, 2019
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Center Freq 5.795000000 GHz Center Freq: 5.795000000 GHz Radio Std: None
 Trig: Free Run AvgHold: 1/1
 #IFGain:Low #Atten: 30 dB Radio Device: BTS

10 dB/div Ref Offset 8.95 dB
 Ref 20.00 dBm

Center 5.795 GHz Span 80 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 7.667 ms

Occupied Bandwidth	Total Power	14.2 dBm
35.916 MHz		
Transmit Freq Error	45.389 kHz	OBW Power
		99.00 %
x dB Bandwidth	36.23 MHz	x dB
		-6.00 dB

Frequency: 5.795000000 GHz
 CF Step: 8.000000 MHz (Auto)
 Freq Offset: 0 Hz

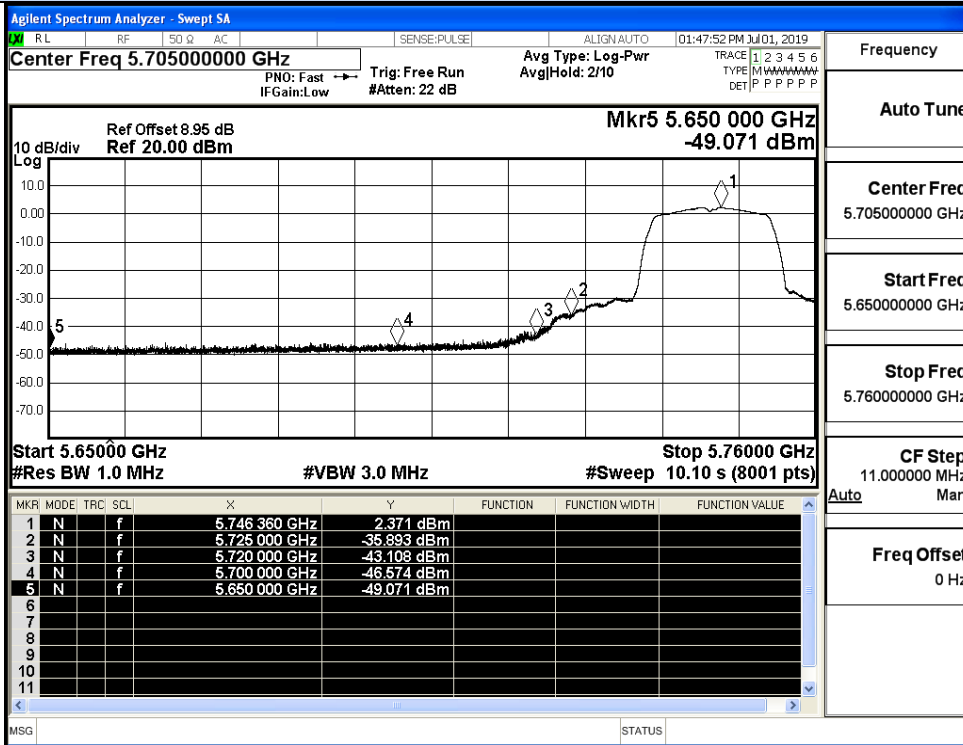
IEEE 802.11n40 / Channel 159 / 5795MHz

D.5 Undesirable Emissions Measurement

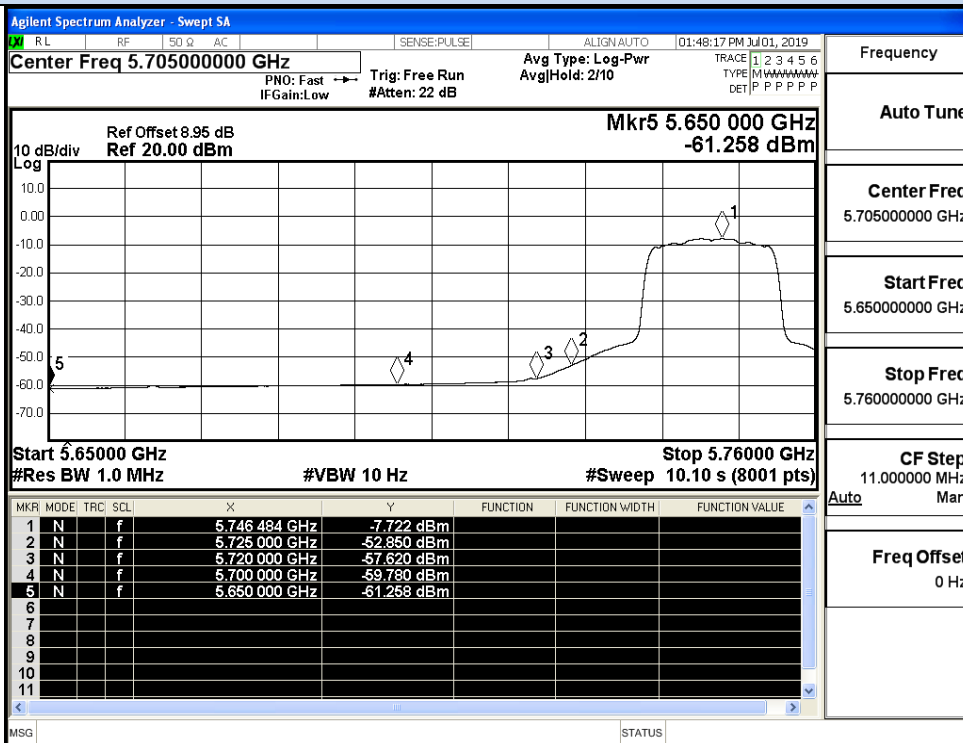
Test Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/MHz)	Detector	Limit (dBm/MHz)	Verdict
11A	149	5650.0	-49.07	2.00	-47.07	Peak	-27.0	Pass
		5650.0	-61.26	2.00	-59.26	Average	-27.0	Pass
		5700.0	-46.57	2.00	-44.57	Peak	10	Pass
		5700.0	-59.78	2.00	-57.78	Average	10	Pass
		5720.0	-43.11	2.00	-41.11	Peak	15.6	Pass
		5720.0	-57.62	2.00	-55.62	Average	15.6	Pass
		5725.0	-35.89	2.00	-33.89	Peak	27.0	Pass
	5725.0	-52.85	2.00	-50.85	Average	27.0	Pass	
	165	5850.0	-33.48	2.00	-31.48	Peak	27.0	Pass
		5850.0	-51.70	2.00	-49.70	Average	27.0	Pass
		5855.0	-37.57	2.00	-35.57	Peak	15.6	Pass
		5855.0	-54.69	2.00	-52.69	Average	15.6	Pass
		5875.0	-45.43	2.00	-43.43	Peak	10	Pass
		5875.0	-57.17	2.00	-55.17	Average	10	Pass
5925.0		-47.48	2.00	-45.48	Peak	-27.0	Pass	
5925.0	-59.50	2.00	-57.50	Average	-27.0	Pass		
11N20 SISO	149	5650.0	-48.08	2.00	-46.08	Peak	-27.0	Pass
		5650.0	-61.42	2.00	-59.42	Average	-27.0	Pass
		5700.0	-47.70	2.00	-45.70	Peak	10	Pass
		5700.0	-58.69	2.00	-56.69	Average	10	Pass
		5720.0	-44.03	2.00	-42.03	Peak	15.6	Pass
		5720.0	-60.28	2.00	-58.28	Average	15.6	Pass
		5725.0	-37.28	2.00	-35.28	Peak	27.0	Pass
	5725.0	-54.46	2.00	-52.46	Average	27.0	Pass	
	165	5850.0	-42.92	2.00	-40.92	Peak	27.0	Pass
		5850.0	-57.20	2.00	-55.20	Average	27.0	Pass
		5855.0	-46.90	2.00	-44.90	Peak	15.6	Pass
		5855.0	-58.43	2.00	-56.43	Average	15.6	Pass
		5875.0	-47.60	2.00	-45.60	Peak	10	Pass
		5875.0	-59.04	2.00	-57.04	Average	10	Pass
5925.0		-49.10	2.00	-47.10	Peak	-27.0	Pass	
5925.0	-60.53	2.00	-58.53	Average	-27.0	Pass		

Test Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/MHz)	Detector	Limit (dBm/MHz)	Verdict
11N40 SISO	151	5650.0	-49.51	2.00	-47.51	Peak	-27.0	Pass
		5650.0	-60.61	2.00	-58.61	Average	-27.0	Pass
		5700.0	-42.75	2.00	-40.75	Peak	10	Pass
		5700.0	-55.79	2.00	-53.79	Average	10	Pass
		5720.0	-33.83	2.00	-31.83	Peak	15.6	Pass
		5720.0	-46.94	2.00	-44.94	Average	15.6	Pass
		5725.0	-31.11	2.00	-29.11	Peak	27.0	Pass
		5725.0	-44.87	2.00	-42.87	Average	27.0	Pass
	159	5850.0	-37.30	2.00	-35.30	Peak	27.0	Pass
		5850.0	-54.57	2.00	-52.57	Average	27.0	Pass
		5855.0	-41.12	2.00	-39.12	Peak	15.6	Pass
		5855.0	-55.39	2.00	-53.39	Average	15.6	Pass
		5875.0	-45.64	2.00	-43.64	Peak	10	Pass
		5875.0	-57.62	2.00	-55.62	Average	10	Pass
		5925.0	-48.49	2.00	-46.49	Peak	-27.0	Pass
		5925.0	-59.85	2.00	-57.85	Average	-27.0	Pass

Undesirable Emissions Measurement

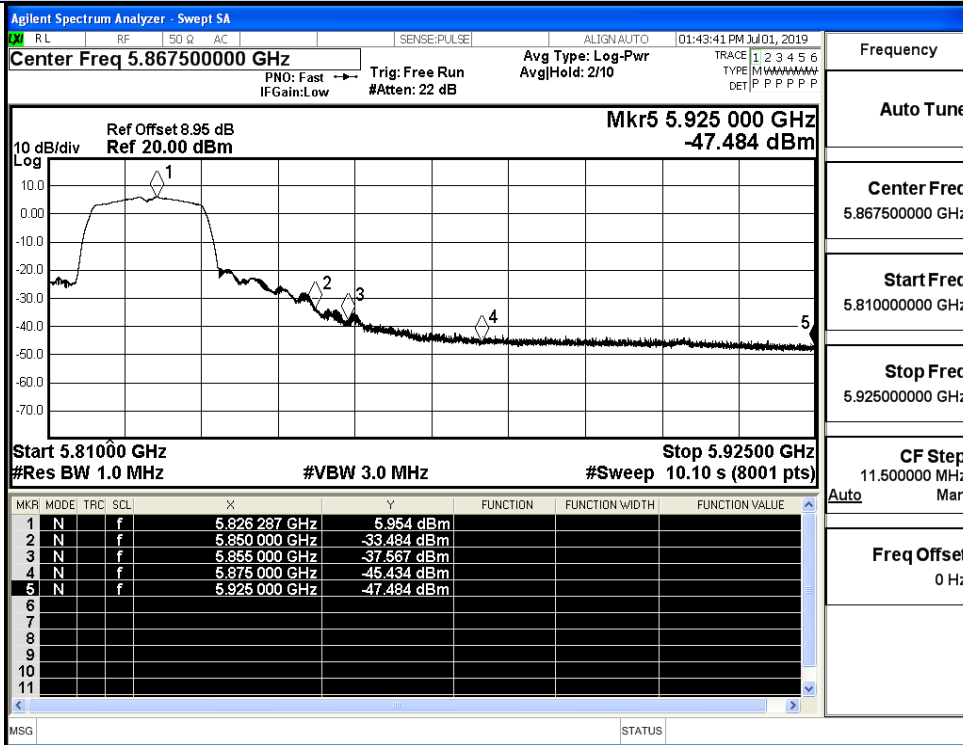


IEEE 802.11a / Channel 149 / 5745MHz / Peak

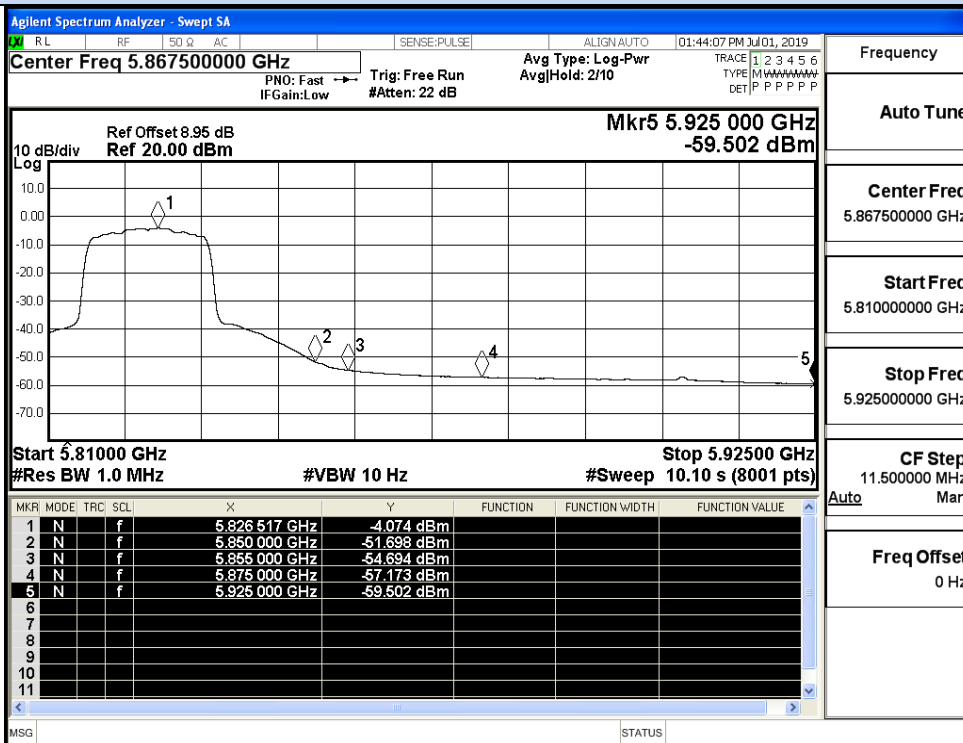


IEEE 802.11a / Channel 148 / 5745MHz / Average

Undesirable Emissions Measurement

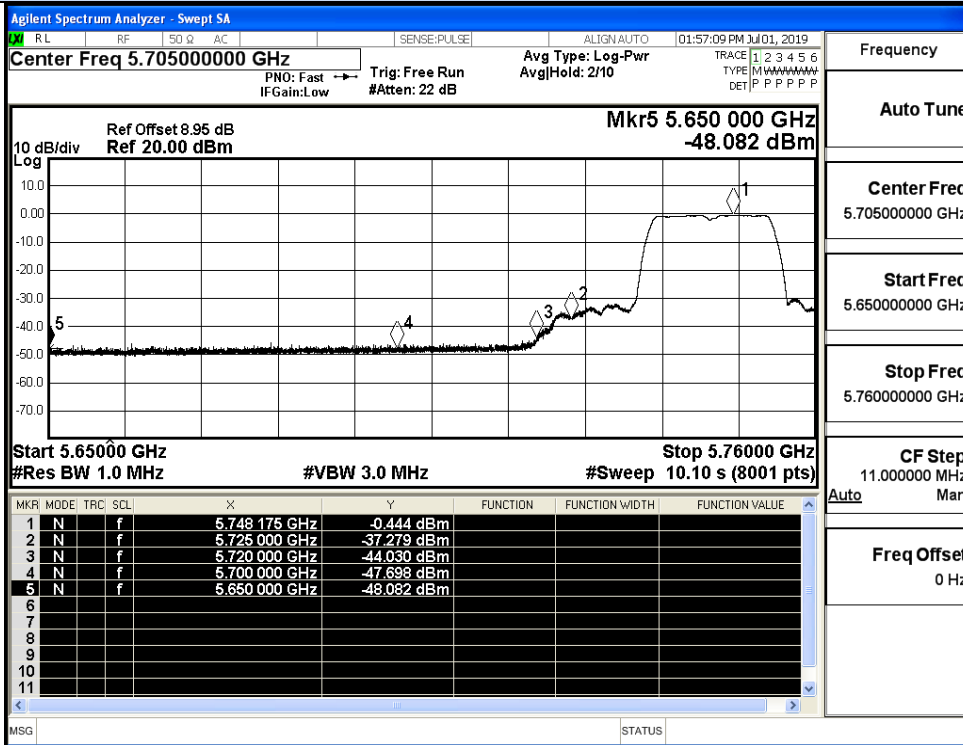


IEEE 802.11a / Channel 165 / 5825MHz / Peak

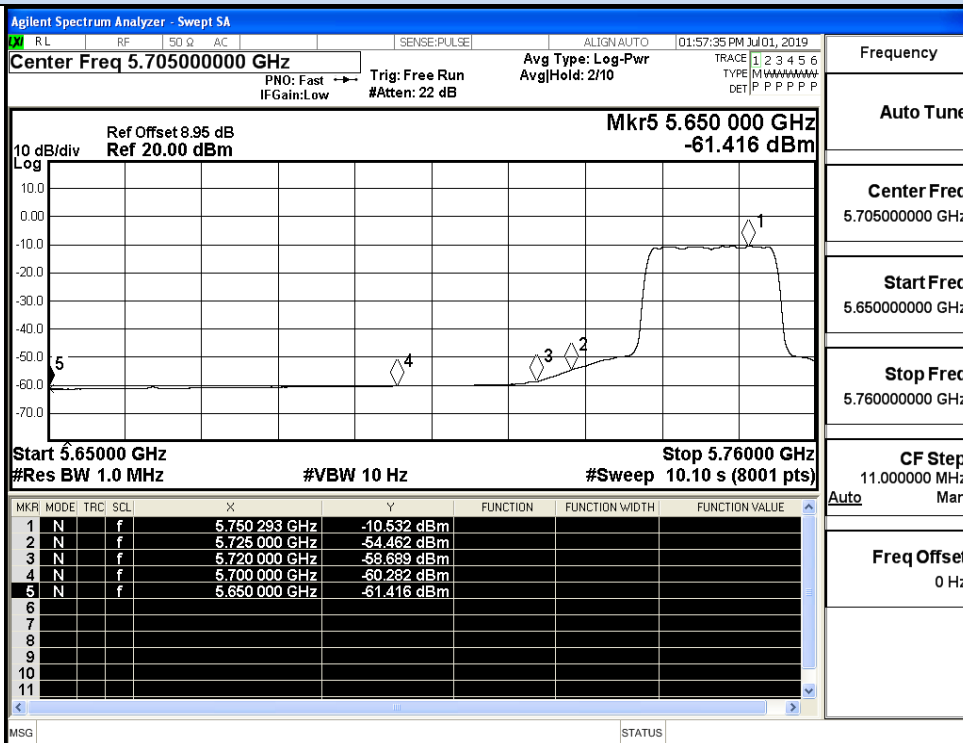


IEEE 802.11a / Channel 165 / 5825MHz / Average

Undesirable Emissions Measurement

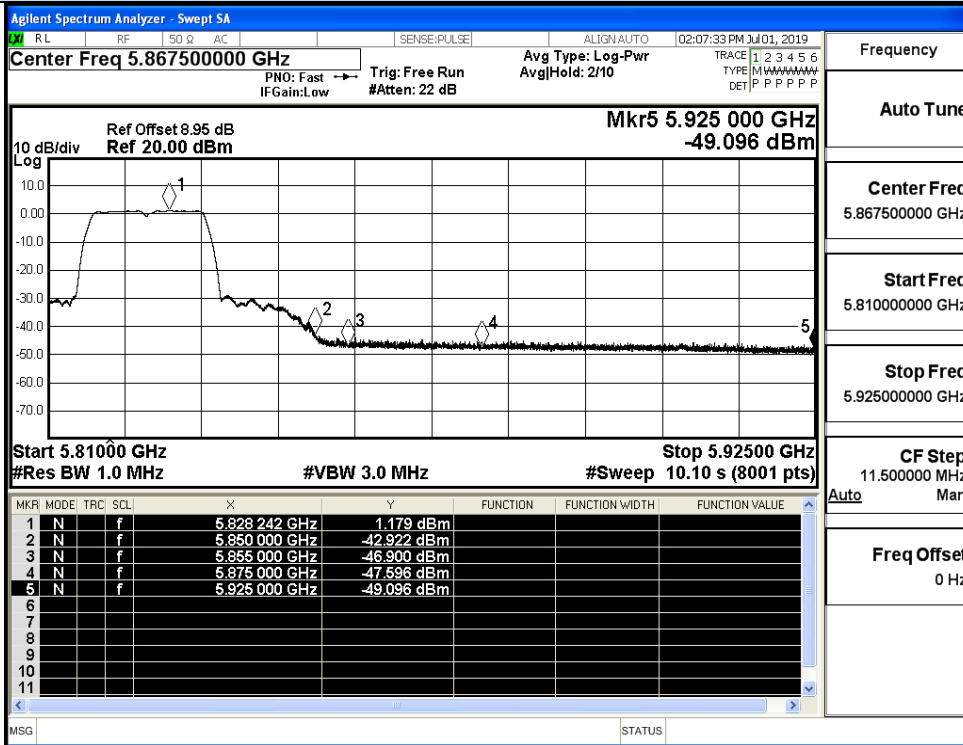


IEEE 802.11n20 / Channel 149 / 5745MHz / Peak

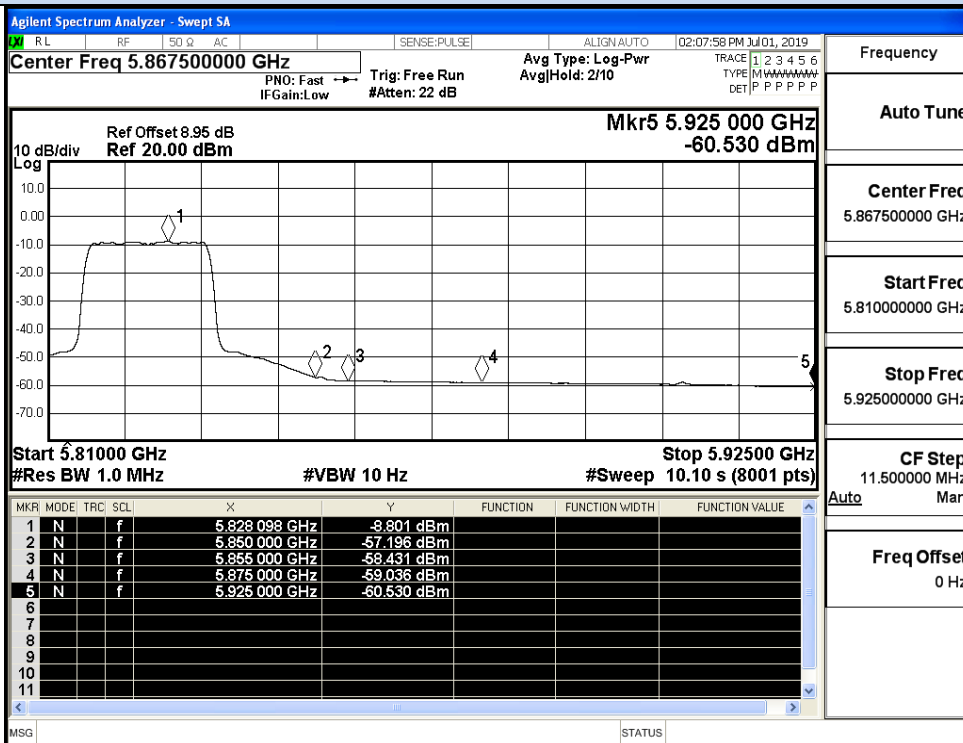


IEEE 802.11n20 / Channel 149 / 5745MHz / Average

Undesirable Emissions Measurement

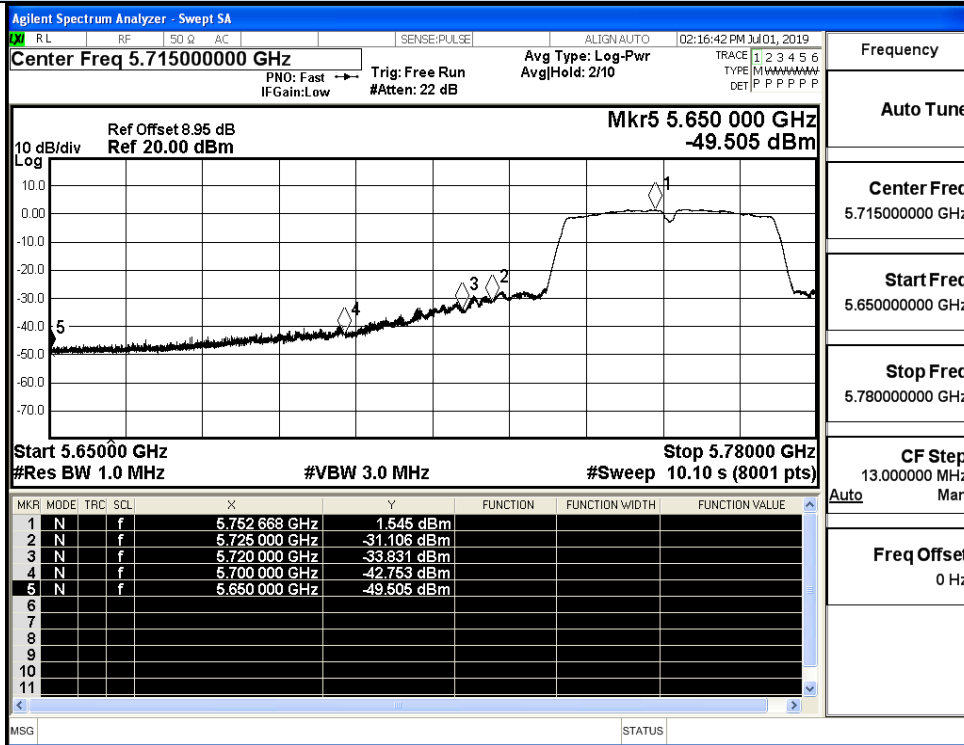


IEEE 802.11n20 / Channel 165 / 5825MHz / Peak

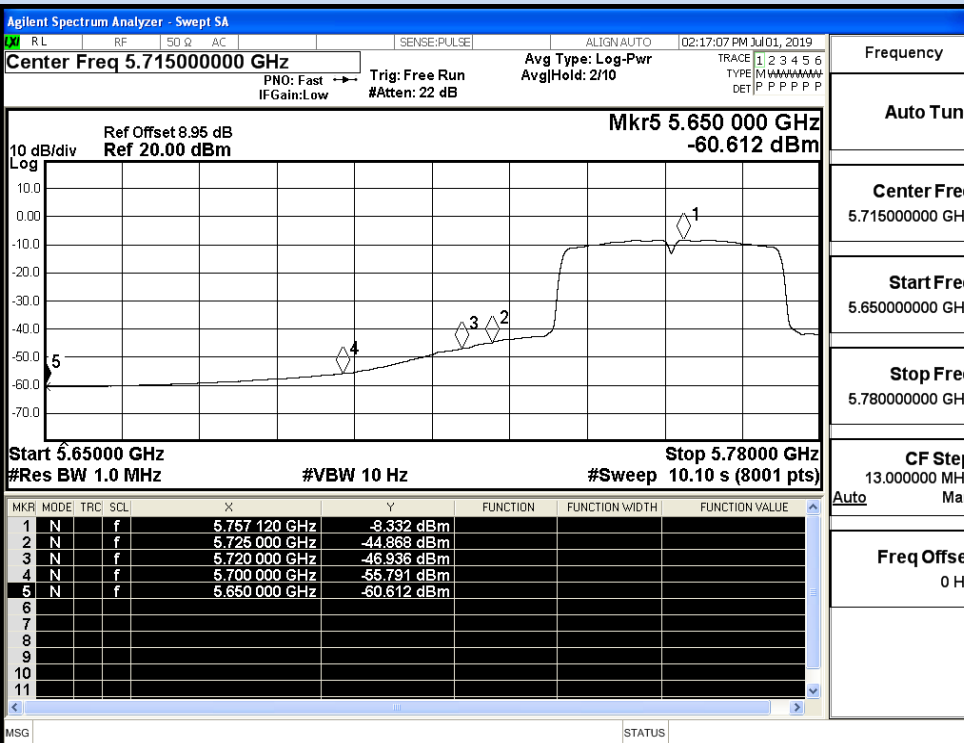


IEEE 802.11n20 / Channel 165 / 5825MHz / Average

Undesirable Emissions Measurement

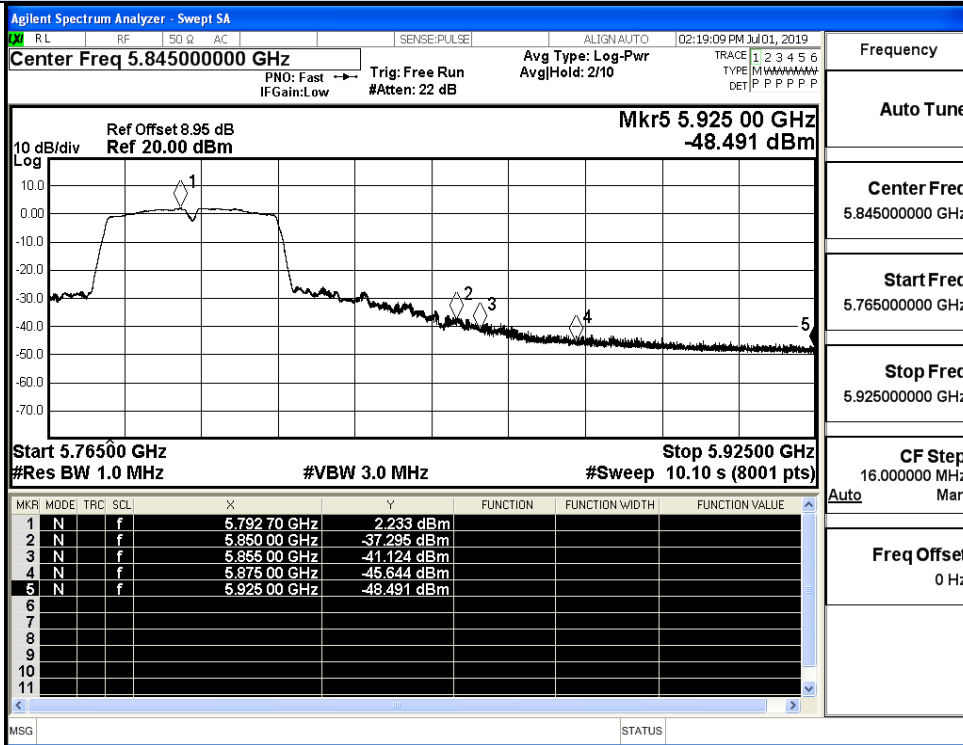


IEEE 802.11n40 / Channel 151 / 5755MHz / Peak

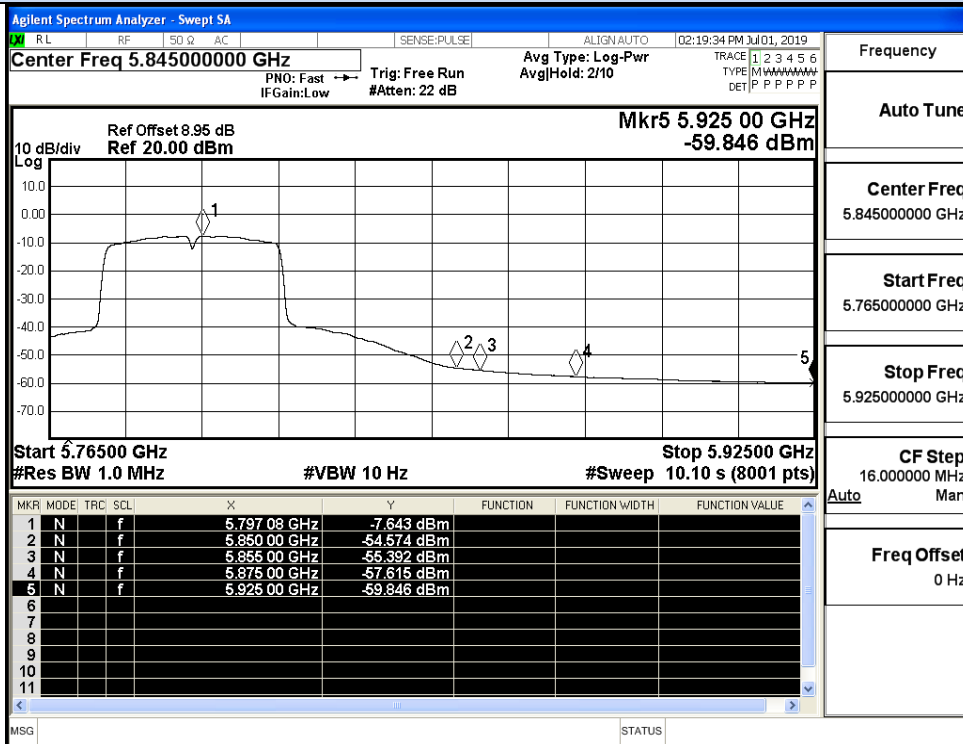


IEEE 802.11n40 / Channel 151 / 5755MHz / Average

Undesirable Emissions Measurement



IEEE 802.11n40 / Channel 159 / 5795MHz / Peak



IEEE 802.11n40 / Channel 159 / 5795MHz / Average