10.5 POWER SPECTRAL DENSITY

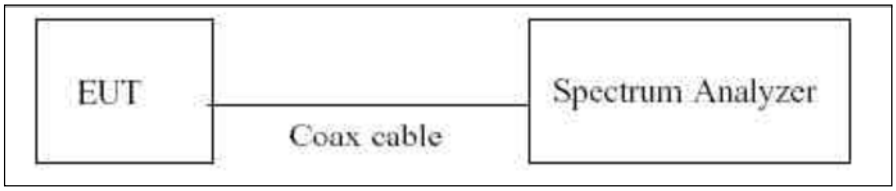
The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

▣ Limit

Power Spectral Density

Band	Mode	Limit
UNII 1	802.11a,n,ac	11 dBm/MHz
UNII 2A	802.11a,n,ac	11 dBm/MHz
UNII 2C	802.11a,n,ac	11 dBm/MHz
UNII 3	802.11a,n,ac	30 dBm/500 kHz

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to Method in KDB 789033 D02 v02r01.

The spectrum analyzer is set to :

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
3. VBW ≥ 3 MHz
4. Number of points in sweep ≥ 2*span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

▣ SAMPLE CALCULATION

PSD = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Ex) PSD = -3 dBm + 10 dB + 0.8 dB + 0.2 dB = 8.0 dBm

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Internal

Band	Loss(dB)
UNII 1, 2A	12
UNII 2C	12.1
UNII 3	12.2

External

Band	Loss(dB)
UNII 1, 2A	14.7
UNII 2C	13.3
UNII 3	14.1

(Actual value of loss for the attenuator and cable combination)

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11a	-2.578	0.214	-2.364	11	Pass
5200	40		-2.743	0.214	-2.529	11	Pass
5240	48		-2.888	0.214	-2.674	11	Pass
5260	52		-2.518	0.214	-2.304	11	Pass
5300	60		-2.484	0.214	-2.270	11	Pass
5320	64		-2.313	0.214	-2.099	11	Pass

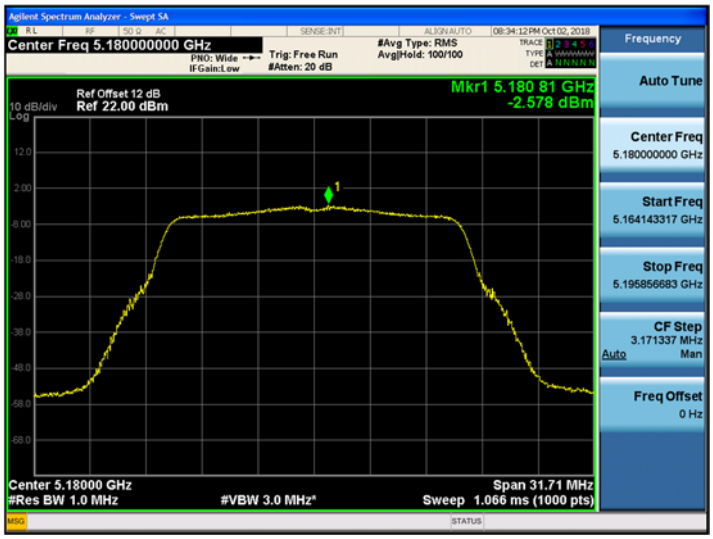
External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11a	1.917	0.399	2.316	11	Pass
5200	40		1.906	0.399	2.305	11	Pass
5240	48		1.726	0.399	2.125	11	Pass
5260	52		1.696	0.399	2.095	11	Pass
5300	60		2.087	0.399	2.486	11	Pass
5320	64		1.999	0.399	2.398	11	Pass

▣ TEST Plot for 802.11a 20 MHz BW

802.11a UNII 1 BAND PSD CH 36_Internal Ant	802.11a UNII 1 BAND PSD CH 40_External Ant
	
802.11a UNII 2A BAND PSD CH 64_Internal Ant	**802.11a UNII 2A BAND PSD CH 60_External Ant**
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11n 20MHz BW	-3.507	0.215	-3.292	11	Pass
5200	40		-3.116	0.215	-2.901	11	Pass
5240	48		-3.085	0.215	-2.870	11	Pass
5260	52		-3.304	0.215	-3.089	11	Pass
5300	60		-2.723	0.215	-2.508	11	Pass
5320	64		-2.879	0.215	-2.664	11	Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11n 20MHz BW	1.301	0.614	1.915	11	Pass
5200	40		1.589	1.604	3.193	11	Pass
5240	48		1.383	0.614	1.997	11	Pass
5260	52		1.356	0.614	1.970	11	Pass
5300	60		1.478	0.614	2.092	11	Pass
5320	64		1.331	0.614	1.945	11	Pass

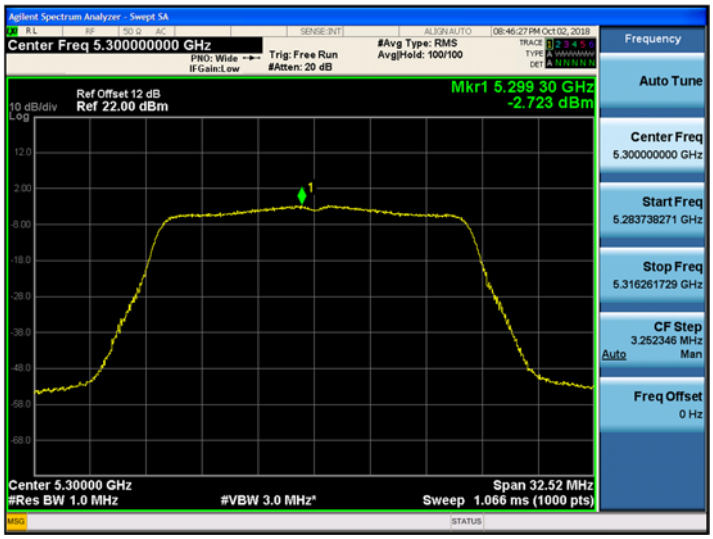
▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11n (HT20)	5180	36	0.428	-5.570	-7.567	-3.44	-3.02	11.00
	5200	40	0.428	-5.265	-6.839	-2.97	-2.54	11.00
	5240	48	0.428	-5.049	-6.658	-2.77	-2.34	11.00
	5260	52	0.428	-4.683	-5.751	-2.17	-1.75	11.00
	5300	60	0.428	-4.513	-4.823	-1.65	-1.23	11.00
	5320	64	0.428	-4.448	-4.880	-1.65	-1.22	11.00

▣ TEST Plot for 802.11n_HT20

802.11n_HT20 UNII 1 BAND PSD CH 48_Internal Ant	802.11n_HT20 UNII 1 BAND PSD CH 40_External Ant
	
802.11n_HT20 UNII 2A BAND PSD CH 60_Internal Ant	**802.11n_HT20 UNII 2A BAND PSD CH 60_External Ant**
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11ac 20MHz BW	-3.243	0.223	-3.020	11	Pass
5200	40		-3.199	0.223	-2.976	11	Pass
5240	48		-3.047	0.223	-2.824	11	Pass
5260	52		-2.705	0.223	-2.482	11	Pass
5300	60		-3.123	0.223	-2.900	11	Pass
5320	64		-2.920	0.223	-2.697	11	Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11ac 20MHz BW	0.916	0.610	1.526	11	Pass
5200	40		1.512	0.610	2.122	11	Pass
5240	48		1.069	0.610	1.679	11	Pass
5260	52		1.182	0.610	1.792	11	Pass
5300	60		1.810	0.610	2.420	11	Pass
5320	64		1.144	0.610	1.754	11	Pass

▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11ac (VHT20)	5180	36	0.422	-5.248	-7.047	-3.04	-2.62	11.00
	5200	40	0.422	-5.442	-7.115	-3.19	-2.77	11.00
	5240	48	0.422	-4.910	-6.638	-2.68	-2.26	11.00
	5260	52	0.422	-5.136	-5.841	-2.46	-2.04	11.00
	5300	60	0.422	-4.538	-5.288	-1.89	-1.46	11.00
	5320	64	0.422	-4.724	-4.818	-1.76	-1.34	11.00

▣ **TEST Plot for 802.11ac_VHT20**

802.11ac_VHT20 UNII 1 BAND PSD CH 48_Internal Ant	802.11ac_VHT20 UNII 1 BAND PSD CH 40_External Ant
	
802.11ac_VHT20 UNII 2A BAND PSD CH 52_Internal Ant	**802.11ac_VHT20 UNII 2A BAND PSD CH 60_External Ant**


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.260000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 100/100
08:54:12 PM Oct 02, 2018
Frequency
Auto Tune
Ref Offset 12 dB
10 dB/div
Log
Ref 22.00 dBm
Mkr1 5.261 36 GHz
-2.705 dBm
Center Freq
5.260000000 GHz
Start Freq
5.244049542 GHz
Stop Freq
5.275950458 GHz
CF Step
3.190092 MHz
Auto
Man
Freq Offset
0 Hz
Center 5.26000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 31.90 MHz
Sweep 1.066 ms (1000 pts)


Agilent Spectrum Analyzer - Swept SA
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: Pwr(RMS)
Avg|Hold: 100/100
10:40:06 PM Sep 27, 2018
Frequency
Auto Tune
Ref Offset 14.7 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.301 14 GHz
1.810 dBm
Center Freq
5.300000000 GHz
Start Freq
5.283912051 GHz
Stop Freq
5.316087949 GHz
CF Step
3.217590 MHz
Auto
Man
Freq Offset
0 Hz
Center 5.30000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 32.18 MHz
Sweep 1.07 ms (1000 pts)

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5190	38	802.11n 40MHz BW	-5.838	0.443	-5.395	11	Pass
5230	46		-5.376	0.443	-4.933	11	Pass
5270	54		-5.503	0.443	-5.060	11	Pass
5310	62		-5.647	0.443	-5.204	11	Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5190	38	802.11n 40MHz BW	-3.013	1.409	-1.604	11	Pass
5230	46		-3.341	2.533	-0.808	11	Pass
5270	54		-2.609	2.533	-0.076	11	Pass
5310	62		-3.678	2.533	-1.145	11	Pass

▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

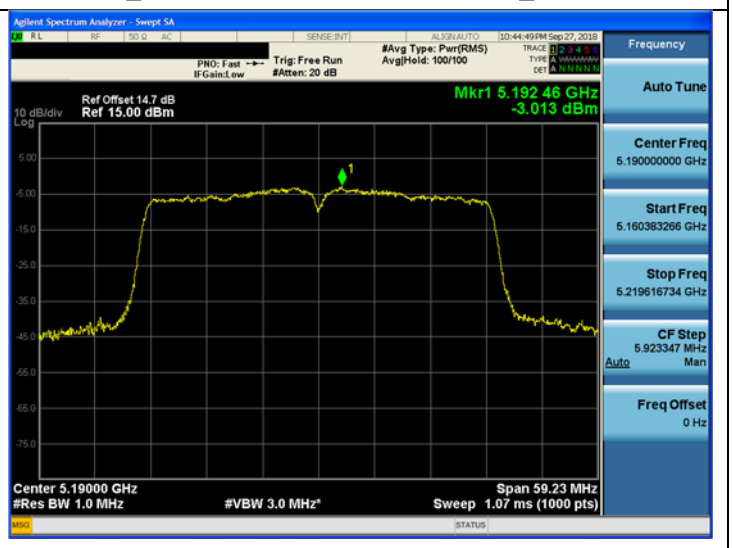
Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11n (HT40)	5190	38	0.804	-7.897	-9.824	-5.74	-4.94	11.00
	5230	46	0.804	-7.804	-9.288	-5.47	-4.67	11.00
	5270	54	0.804	-7.682	-8.535	-5.08	-4.27	11.00
	5310	62	0.804	-7.527	-7.634	-4.57	-3.77	11.00

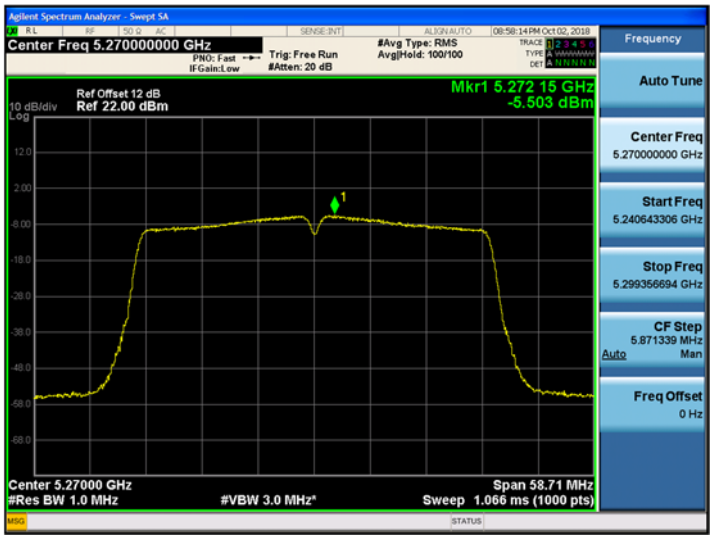
▣ **TEST Plot for 802.11n_HT40**

802.11n_HT40 UNII 1 BAND PSD CH 46_Internal Ant

802.11n_HT40 UNII 1 BAND PSD CH 38_External Ant



802.11n_HT40 UNII 2A BAND PSD CH 54_Internal Ant



802.11n_HT40 UNII 2A BAND PSD CH 54_External Ant

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5190	38	802.11ac 40MHz BW	-5.697	0.442	-5.255	11	Pass
5230	46		-5.141	0.442	-4.699	11	Pass
5270	54		-5.646	0.442	-5.204	11	Pass
5310	62		-5.710	0.442	-5.268	11	Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5190	38	802.11ac 40MHz BW	-2.744	1.389	-1.355	11	Pass
5230	46		-1.427	2.798	1.371	11	Pass
5270	54		-2.235	2.798	0.563	11	Pass
5310	62		-3.455	2.798	-0.657	11	Pass

▣ Sum Data of Internal Ant and External Ant

▣ TEST RESULTS

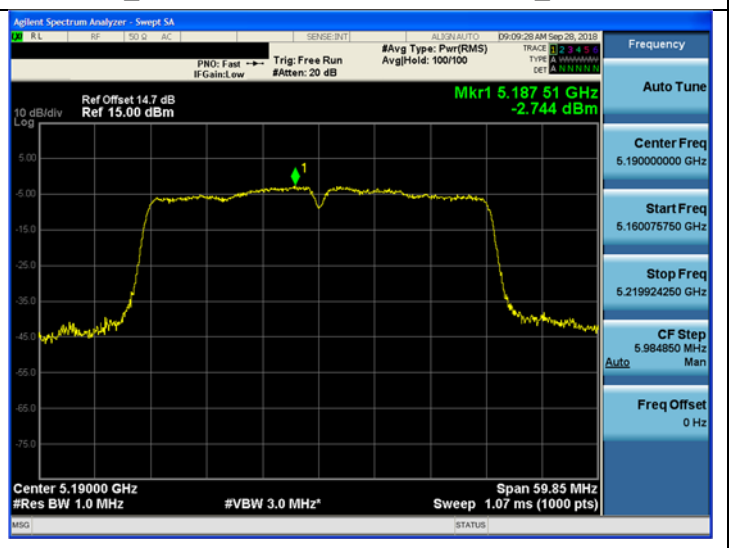
Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11ac (VHT40)	5190	38	0.797	-7.665	-9.750	-5.57	-4.78	11.00
	5230	46	0.797	-7.886	-9.221	-5.49	-4.70	11.00
	5270	54	0.797	-7.912	-8.275	-5.08	-4.28	11.00
	5310	62	0.797	-7.562	-7.673	-4.61	-3.81	11.00

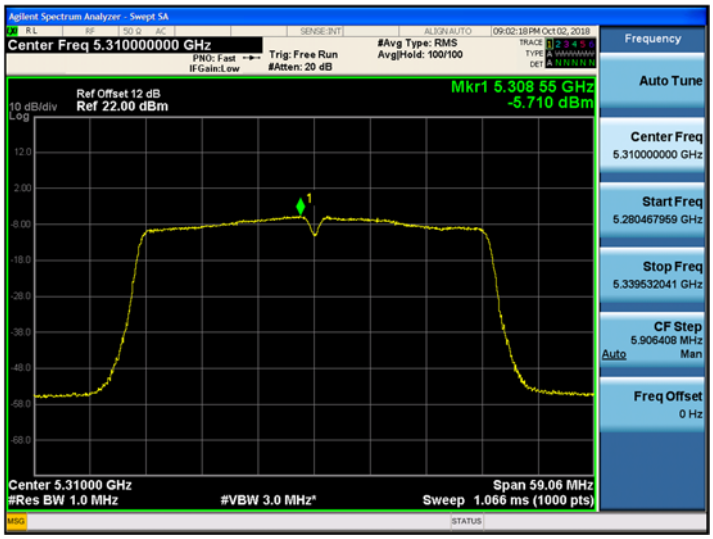
▣ TEST Plot for 802.11ac_VHT40

802.11ac_VHT40 UNII 1 BAND PSD CH 46_Internal Ant

802.11ac_VHT40 UNII 1 BAND PSD CH 38_External Ant



802.11ac_VHT40 UNII 2A BAND PSD CH 62_Internal Ant



802.11ac_VHT40 UNII 2A BAND PSD CH 54_External Ant

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5210	42	802.11ac 80MHz BW	-9.049	0.860	-8.189	11	Pass
5290	58		-8.740	0.860	-7.880	11	Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor (dB)	Limit (dBm)	Pass/Fail
5210	42	802.11ac 80MHz BW	-8.646	2.259	-6.387	11	Pass
5290	58		-7.159	3.843	-3.316	11	Pass

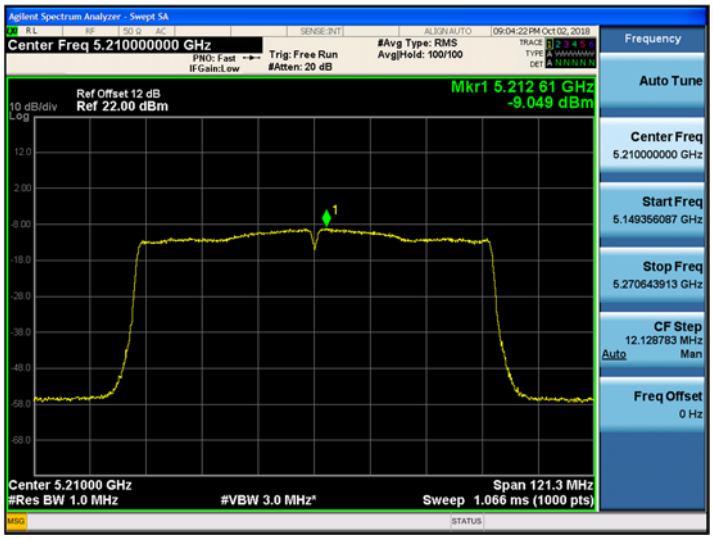
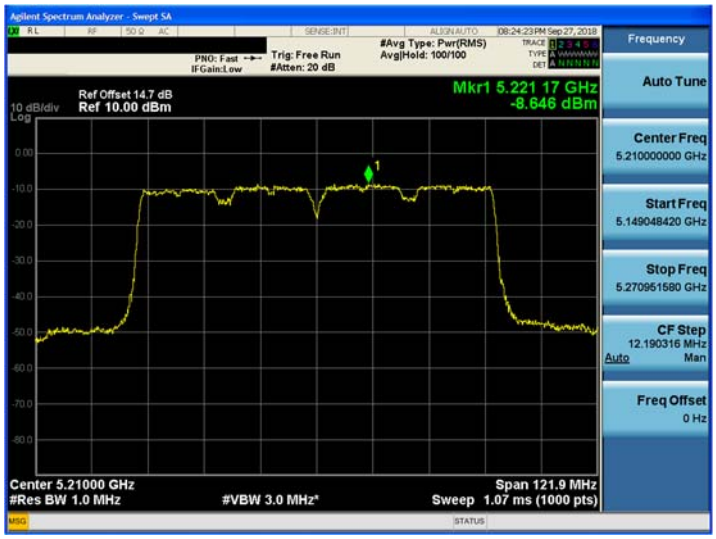
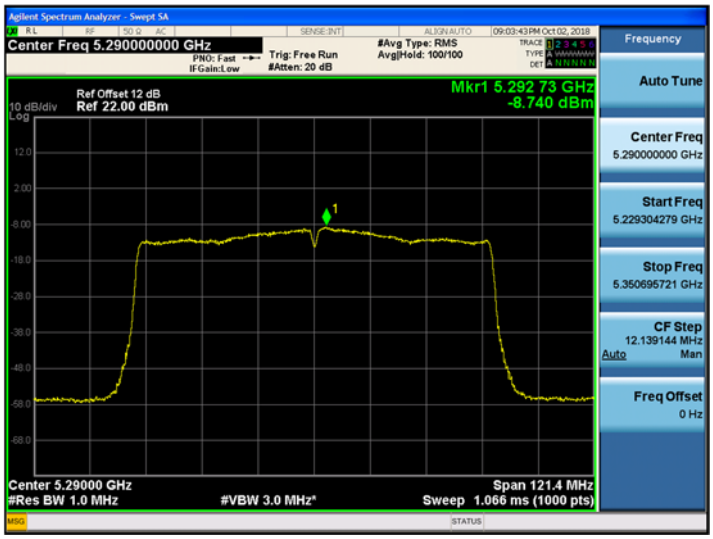
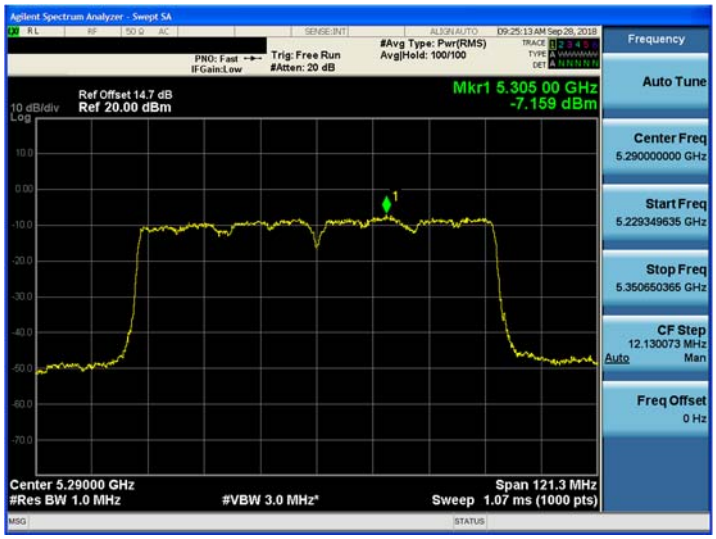
▣ Sum Data of Internal Ant and External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11ac (VHT80)	5210	42	1.447	-11.607	-13.147	-9.30	-7.85	11.00
	5290	58	1.447	-10.606	-12.059	-8.26	-6.81	11.00

▣ TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 1 BAND PSD CH 42_Internal Ant	802.11ac_VHT80 UNII 1 BAND PSD CH 42_External Ant
	
802.11ac_VHT80 UNII 2A BAND PSD CH 58_Internal Ant	**802.11ac_VHT80 UNII 2A BAND PSD CH 58_External Ant**
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5500	100	802.11a	4.136	0.205	4.341	11	Pass
5580	116		9.533	0.205	9.738		Pass
5720	144		9.370	0.205	9.575		Pass
5745	149		6.304	0.205	6.509	30	Pass
5785	157		6.631	0.205	6.836		Pass
5825	165		6.784	0.205	6.989		Pass

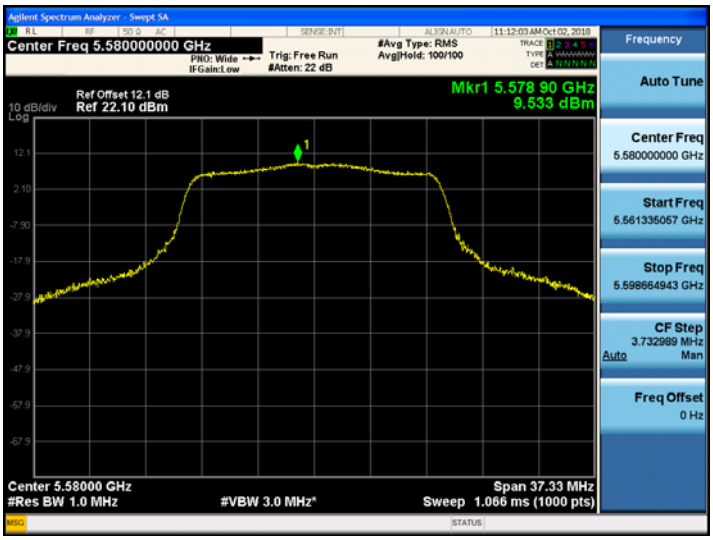
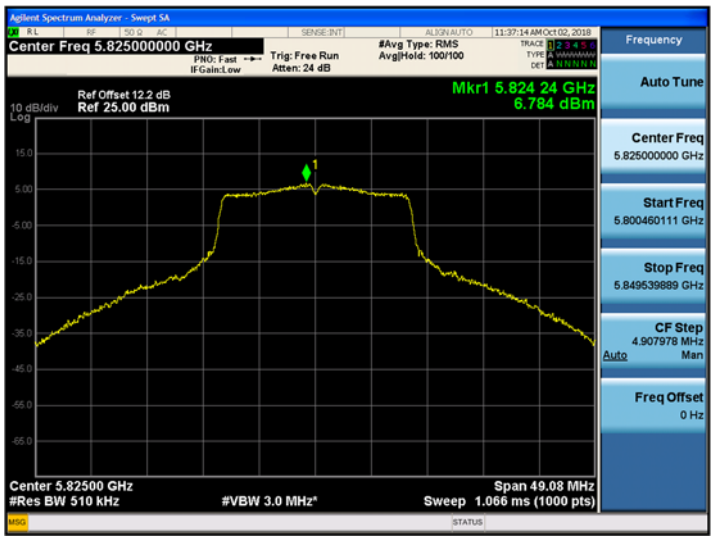
External Ant

▣ TEST RESULTS

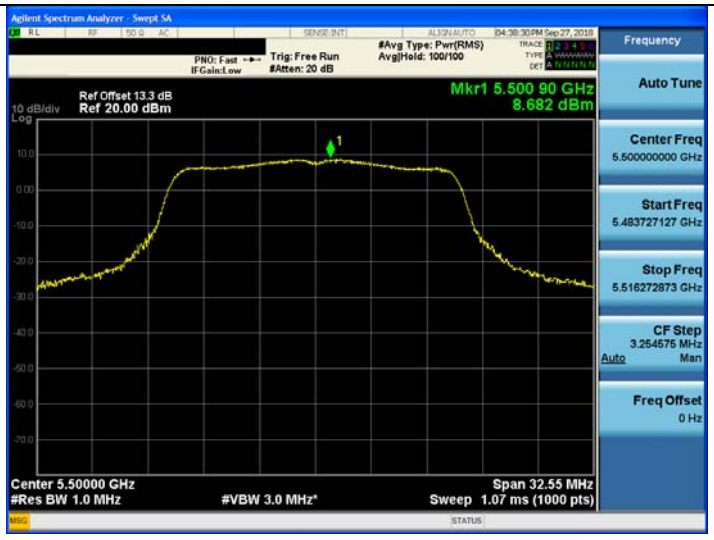
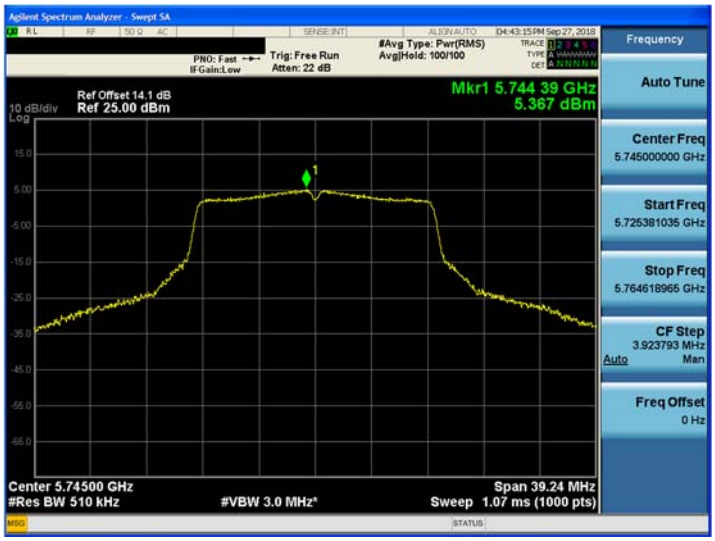
Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5500	100	802.11a	8.682	0.399	9.081	11	Pass
5580	116		8.292	0.399	8.691		Pass
5720	144		6.992	0.399	7.391		Pass
5745	149		5.367	0.399	5.766	30	Pass
5785	157		4.889	0.399	5.288		Pass
5825	165		3.477	0.399	3.876		Pass

▣ TEST Plot for 802.11a 20MHz BW_Internal Ant

802.11a UNII 2C BAND PSD CH 116	802.11a UNII 3 BAND PSD CH 165
	

▣ TEST Plot for 802.11a 20MHz BW_External Ant

802.11a UNII 2C BAND PSD CH 100	802.11a UNII 3 BAND PSD CH 149
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5500	100	802.11n_ HT20	3.479	0.222	3.701	11	Pass
5580	116		8.910	0.222	9.132		Pass
5720	144		9.022	0.222	9.244		Pass
5745	149		6.208	0.222	6.430	30	Pass
5785	157		5.882	0.222	6.104		Pass
5825	165		6.179	0.222	6.401		Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5500	100	802.11n_ HT20	8.705	0.614	9.319	11	Pass
5580	116		8.058	0.614	8.672		Pass
5720	144		6.286	0.614	6.900		Pass
5745	149		4.900	0.614	5.514	30	Pass
5785	157		4.179	0.614	4.793		Pass
5825	165		4.241	0.614	4.855		Pass

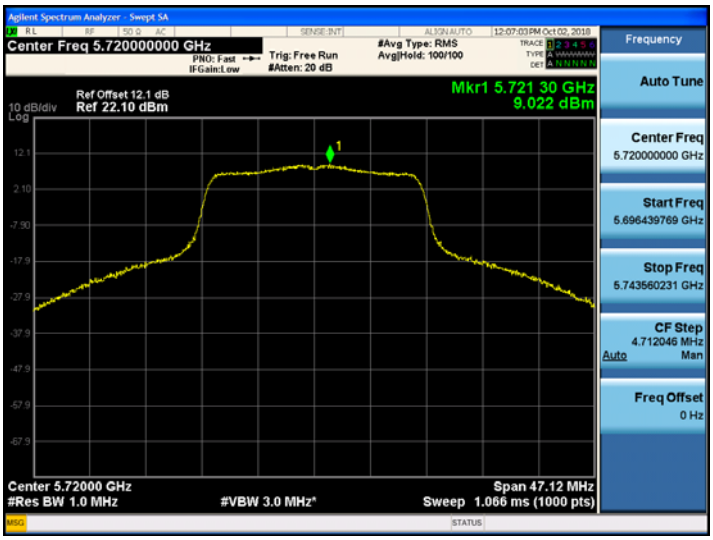
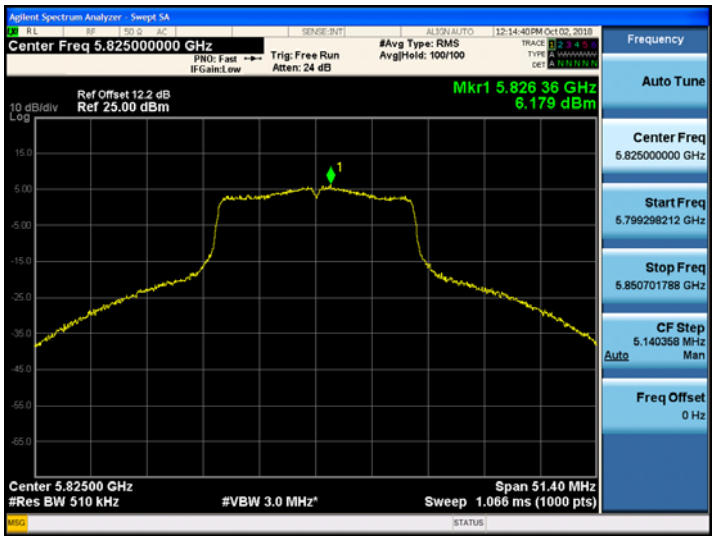
▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

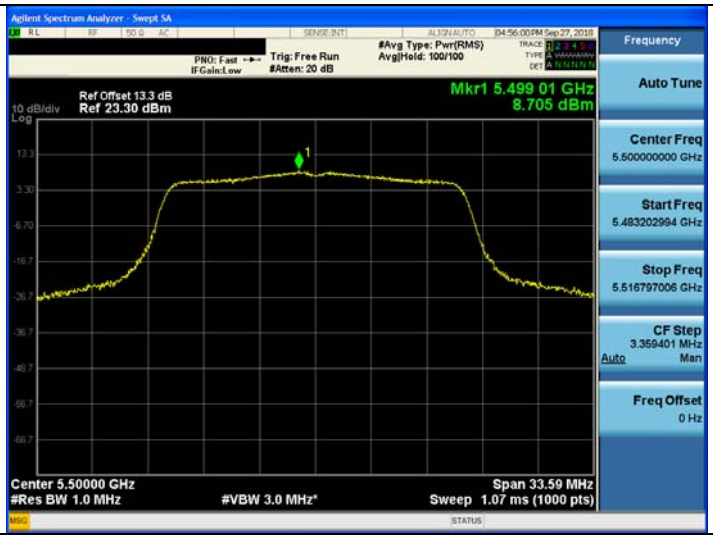
Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11n (HT20)	5500	100	0.428	3.619	3.722	6.68	7.11	11.00
	5580	116	0.428	6.425	6.119	9.28	9.71	11.00
	5720	144	0.428	6.848	5.195	9.11	9.54	11.00
	5745	149	0.428	5.790	5.426	8.62	9.05	30.00
	5785	157	0.428	5.753	4.714	8.27	8.70	30.00
	5825	165	0.428	5.784	4.040	8.01	8.44	30.00

▣ TEST Plot for 802.11n_HT20_Internal Ant

802.11n_HT20 UNII 2C BAND PSD CH 144	802.11n_HT20 UNII 3 BAND PSD CH 165
	

▣ TEST Plot for 802.11n_HT20_External Ant

802.11n_HT20 UNII 2C BAND PSD CH 100	802.11n_HT20 UNII 3 BAND PSD CH 149
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5500	100	802.11ac _VHT20	3.406	0.223	3.629	11	Pass
5580	116		9.064	0.223	9.287		Pass
5720	144		8.777	0.223	9.000		Pass
5745	149		6.371	0.223	6.594	30	Pass
5785	157		6.059	0.223	6.282		Pass
5825	165		3.751	0.223	3.974		Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5500	100	802.11ac _VHT20	8.342	0.610	8.952	11	Pass
5580	116		7.702	0.610	8.312		Pass
5720	144		6.350	0.610	6.960		Pass
5745	149		4.544	0.610	5.154	30	Pass
5785	157		3.972	0.610	4.582		Pass
5825	165		4.166	0.610	4.776		Pass

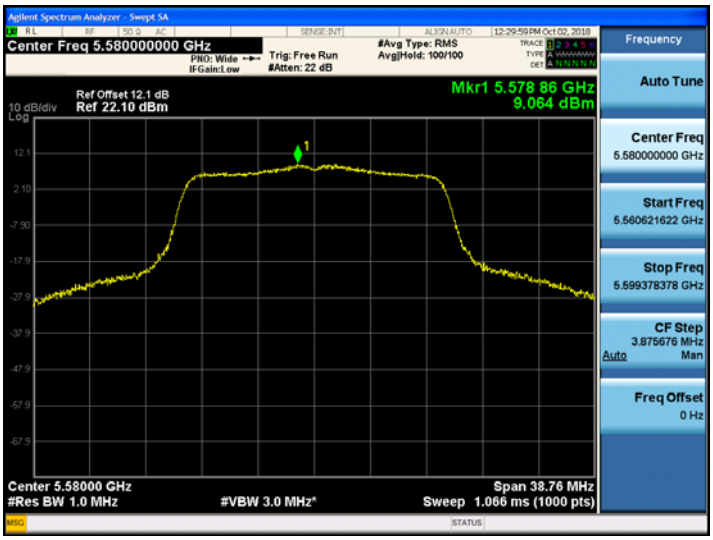
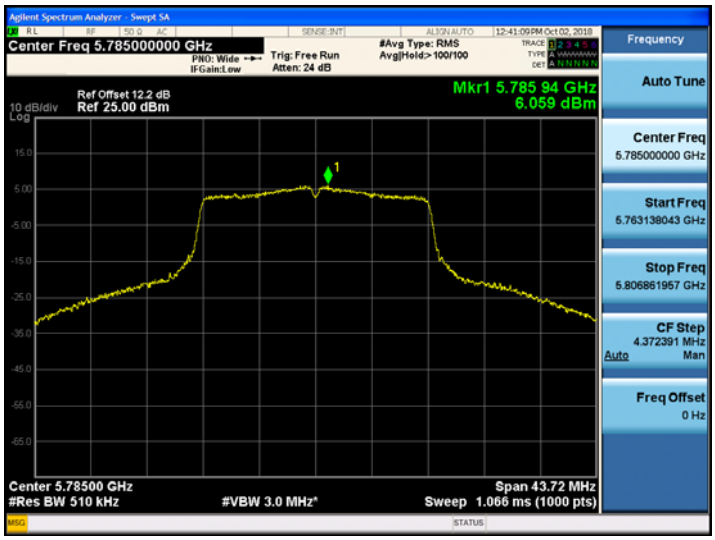
▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

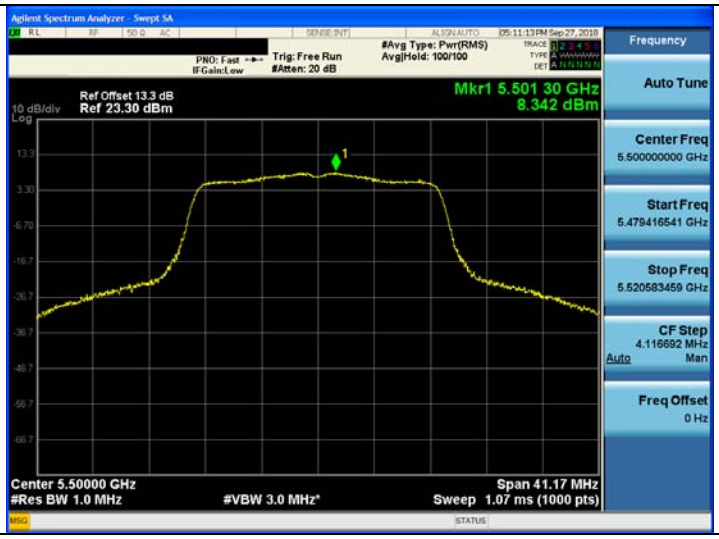
Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11ac (VHT20)	5500	100	0.422	3.721	3.542	6.64	7.06	11.00
	5580	116	0.422	6.725	6.410	9.58	10.00	11.00
	5720	144	0.422	6.813	4.948	8.99	9.41	11.00
	5745	149	0.422	6.035	5.301	8.69	9.12	30.00
	5785	157	0.422	5.653	4.779	8.25	8.67	30.00
	5825	165	0.422	5.872	4.265	8.15	8.57	30.00

▣ TEST Plot for 802.11ac_VHT20_Internal Ant

802.11ac_VHT20 UNII 2C BAND PSD CH 116	802.11ac_VHT20 UNII 3 BAND PSD CH 157
	

▣ TEST Plot for 802.11ac_VHT20_External Ant

802.11ac_VHT20 UNII 2C BAND PSD CH 100	802.11ac_VHT20 UNII 3 BAND PSD CH 149
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5510	102	802.11n _HT40	-2.042	0.446	-1.596	11	Pass
5500	110		5.557	0.446	6.003		Pass
5710	142		6.297	0.446	6.743		Pass
5755	151		3.010	0.446	3.456	30	Pass
5795	159		2.658	0.446	3.104		Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5510	102	802.11n _HT40	1.253	1.409	2.662	11	Pass
5500	110		2.570	2.533	5.103		Pass
5710	142		2.200	1.409	3.609		Pass
5755	151		0.810	1.409	2.219	30	Pass
5795	159		0.228	1.409	1.637		Pass

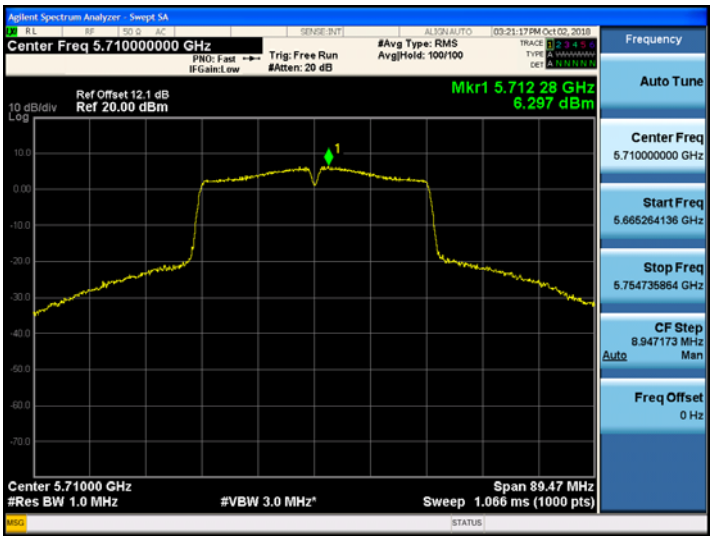
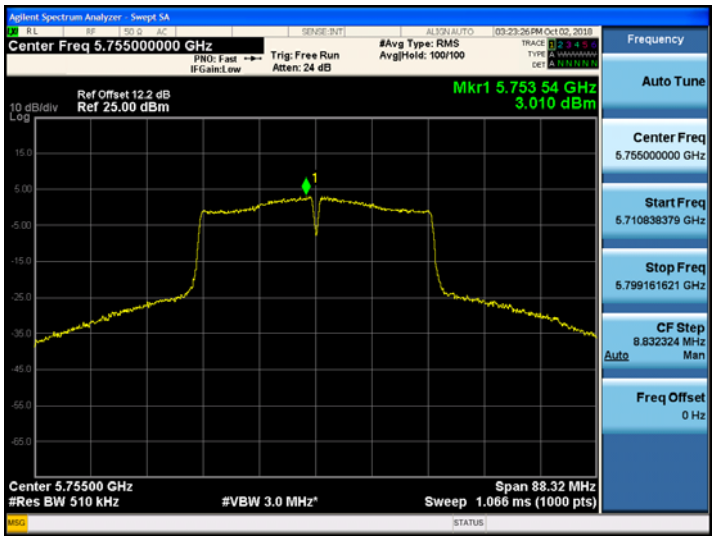
▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

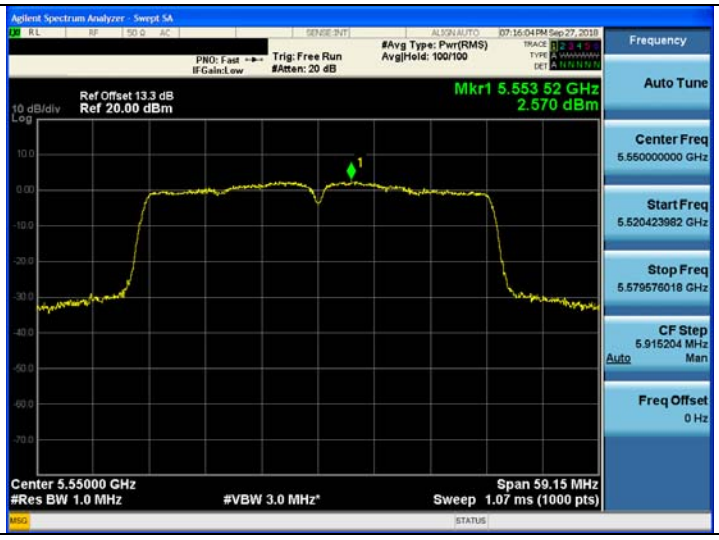
Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11n (HT40)	5510	102	0.804	-2.630	-2.772	0.31	1.11	11.00
	5500	110	0.804	5.074	4.581	7.84	8.65	11.00
	5710	142	0.804	4.978	3.489	7.31	8.11	30.00
	5755	151	0.804	2.165	1.899	5.04	5.85	30.00
	5795	159	0.804	2.151	1.381	4.79	5.60	30.00

▣ TEST Plot for 802.11n_HT40_Internal Ant

802.11n_HT40 UNII 2C BAND PSD CH 142	802.11n_HT40 UNII 3 BAND PSD CH 151
	

▣ TEST Plot for 802.11n_HT40_External Ant

802.11n_HT40 UNII 2C BAND PSD CH 110	802.11n_HT40 UNII 3 BAND PSD CH 151
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5510	102	802.11ac _VHT40	-2.459	0.442	-2.017	11	Pass
5550	110		5.715	0.442	6.157		Pass
5710	142		6.010	0.442	6.452		Pass
5755	151		2.558	0.442	3.000	30	Pass
5795	159		2.693	0.442	3.135		Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5510	102	802.11ac _VHT40	0.394	2.798	3.192	11	Pass
5550	110		2.692	2.798	5.490		Pass
5710	142		2.292	1.389	3.681		Pass
5755	151		0.600	1.389	1.989	30	Pass
5795	159		-0.934	2.798	1.864		Pass

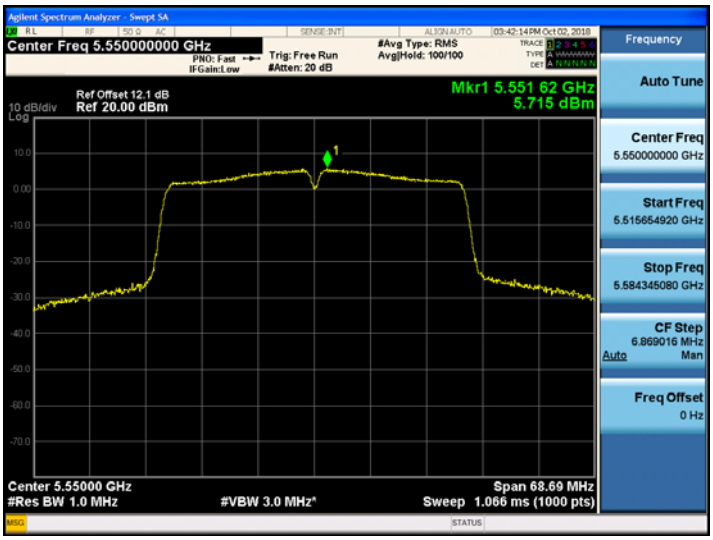
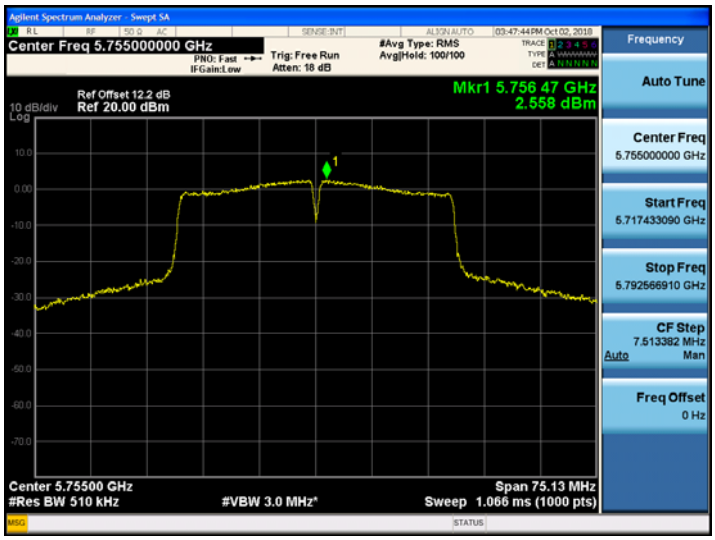
▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

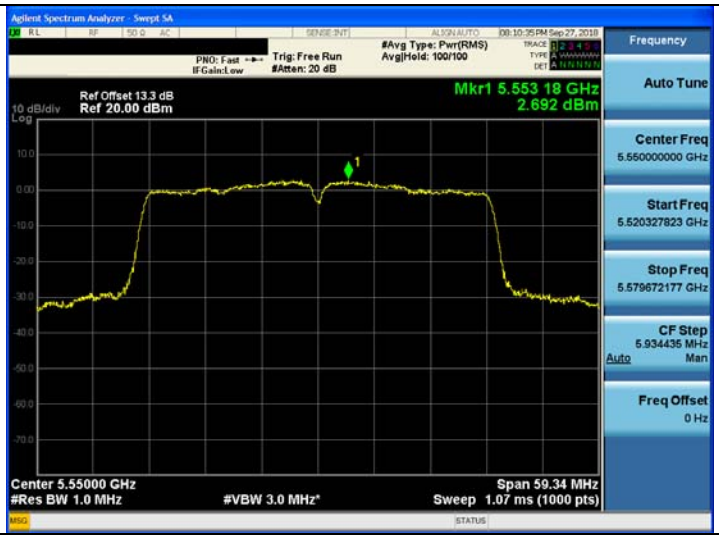
Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11ac (VHT40)	5510	102	0.797	-2.477	-2.884	0.33	1.13	11.00
	5500	110	0.797	4.877	4.700	7.80	8.60	11.00
	5710	142	0.797	5.036	3.444	7.32	8.12	30.00
	5755	151	0.797	2.166	2.032	5.11	5.91	30.00
	5795	159	0.797	1.191	1.215	4.21	5.01	30.00

▣ TEST Plot for 802.11ac_VHT40_Internal Ant

802.11ac_VHT40 UNII 2C BAND PSD CH 110	802.11ac_VHT40 UNII 3 BAND PSD CH 151
	

▣ TEST Plot for 802.11ac_VHT40_External Ant

802.11ac_VHT40 UNII 2C BAND PSD CH 110	802.11ac_VHT40 UNII 3 BAND PSD CH 151
	

Internal Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5530	106	802.11ac _VHT80	-7.844	0.861	-6.983	11	Pass
5610	122		2.269	0.861	3.130		Pass
5690	138		2.331	0.861	3.192		Pass
5775	155		-1.383	0.861	-0.522	30	Pass

External Ant

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5530	106	802.11ac _VHT80	-6.741	3.843	-2.898	11	Pass
5610	122		-2.821	3.843	1.022		Pass
5690	138		-3.992	3.843	-0.149		Pass
5775	155		-4.546	3.843	-0.703	30	Pass

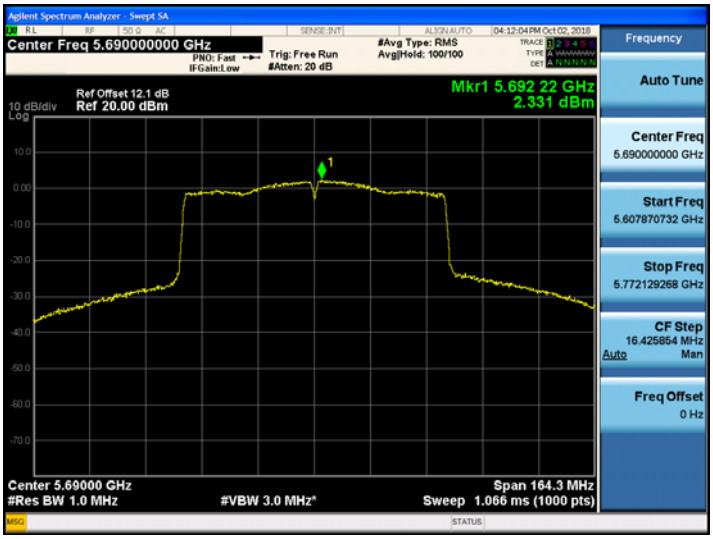
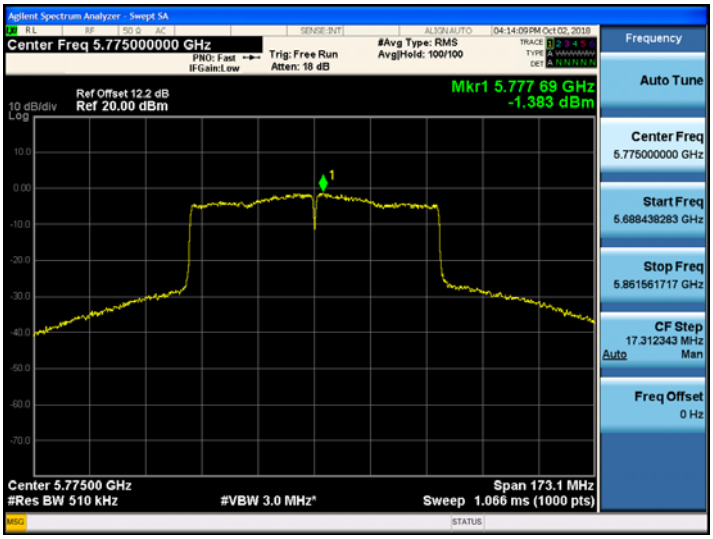
▣ **Sum Data of Internal Ant and External Ant**

▣ **TEST RESULTS**

Conducted Power Density Measurements

Mode	Frequency [MHz]	Channel No.	Duty Cycle Factor (dB)	Measured Power [dBm]			Result (dBm)	Limit (dBm)
				Internal Antenna	External Antenna	Sum		
802.11ac (VHT80)	5530	106	1.447	-8.612	-8.569	-5.58	-4.13	11.00
	5610	122	1.447	0.878	0.498	3.70	5.15	11.00
	5690	138	1.447	0.747	0.107	3.45	4.90	11.00
	5775	155	1.447	-1.841	-2.008	1.09	2.53	30.00

▣ TEST Plot for 802.11ac_VHT80_Internal Ant

802.11ac_VHT80 UNII 2C BAND PSD CH 138	802.11ac_VHT80 UNII 3 BAND PSD CH 155
	

▣ TEST Plot for 802.11ac_VHT80_External Ant

802.11ac_VHT80 UNII 2C BAND PSD CH 122	802.11ac_VHT80 UNII 3 BAND PSD CH 155
	

▣Straddle channels TEST RESULTS for 802.11a/n_HT20/ac_VHT20_Internal Ant

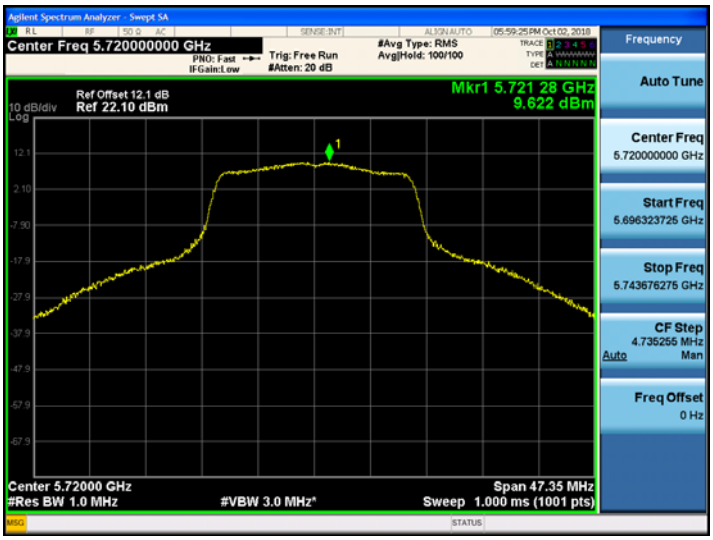
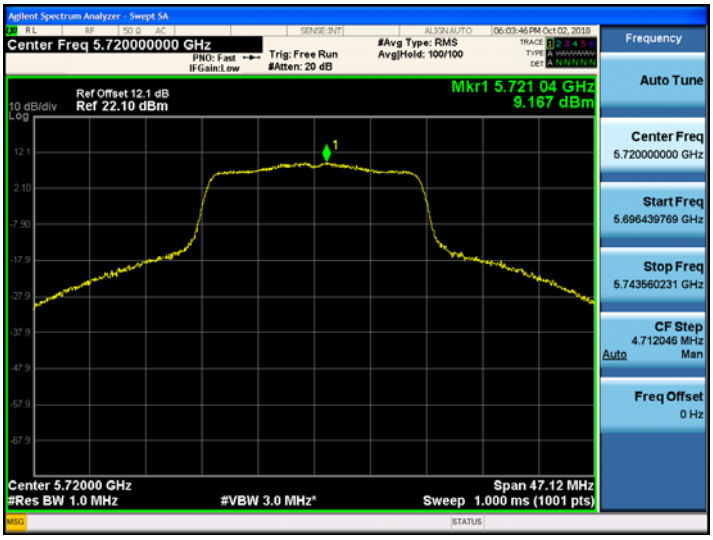
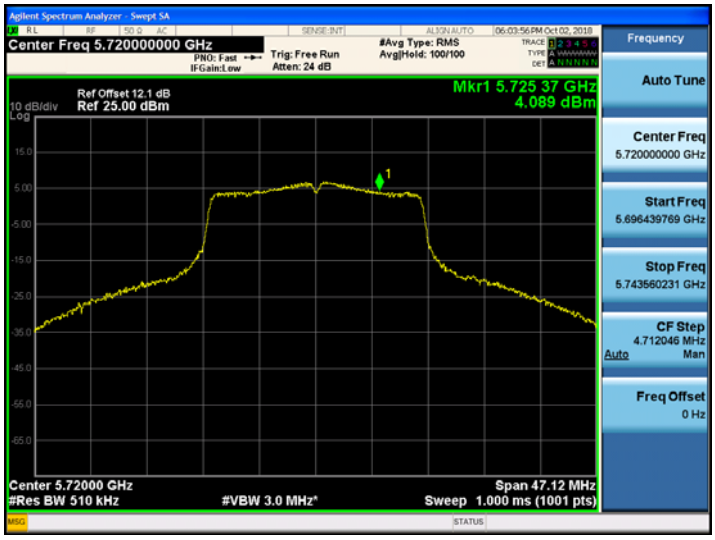
Conducted Power Density Measurements (UNII 2C Band 5720MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	9.622	0.205	9.827	11.00	Pass
		802.11n	9.167	0.222	9.389	11.00	Pass
		802.11ac	9.547	0.223	9.770	11.00	Pass

Conducted Power Density Measurements (UNII 3 Band 5720MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	4.208	0.205	4.413	30.00	Pass
		802.11n	4.089	0.222	4.311	30.00	Pass
		802.11ac	4.567	0.223	4.790	30.00	Pass

▣Straddle channels TEST Plot for 802.11a/n_HT20/ac_VHT20_Internal Ant

802.11a UNII 2C Band PSD CH.144	802.11a UNII 3 Band PSD CH.144
	
802.11n_HT20 UNII 2C Band PSD CH.144	**802.11n_HT20 UNII 3 Band PSD CH.144**
	

802.11ac_VHT20 UNII 2C Band PSD CH.144	802.11ac_VHT20 UNII 3 Band PSD CH.144
	

▣Straddle channels TEST RESULTS for 802.11a/n_HT20/ac_VHT20_External Ant

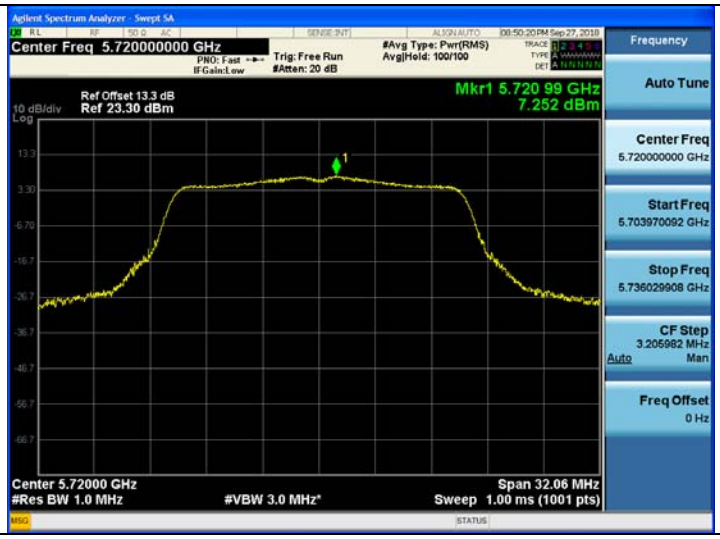
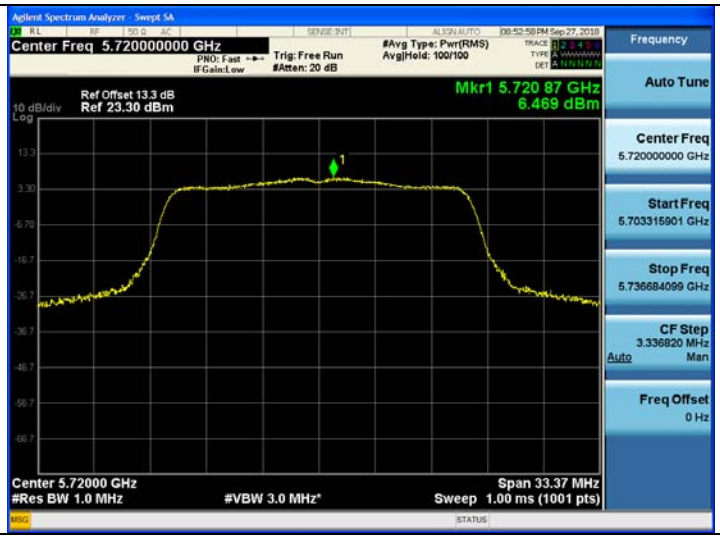
Conducted Power Density Measurements (UNII 2C Band 5720MHz)

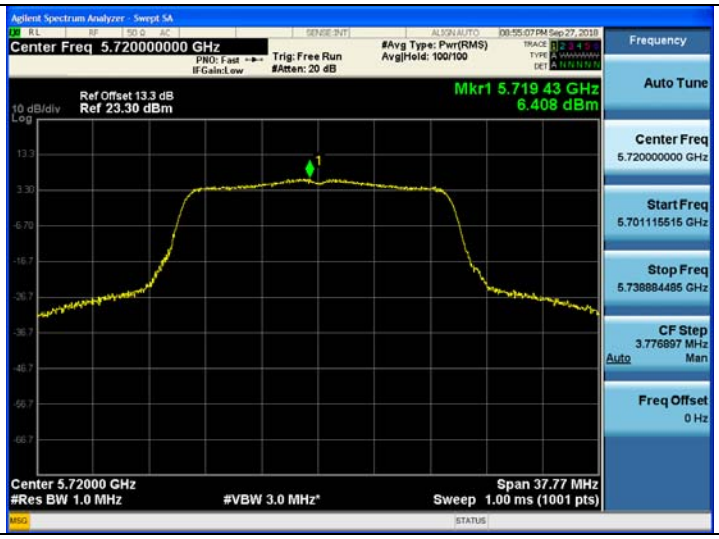
Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	7.252	0.399	7.651	11.00	Pass
		802.11n	6.469	0.614	7.083	11.00	Pass
		802.11ac	6.408	0.610	7.018	11.00	Pass

Conducted Power Density Measurements (UNII 3 Band 5720MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	1.962	0.399	2.361	30.00	Pass
		802.11n	1.207	0.614	1.821	30.00	Pass
		802.11ac	1.572	0.610	2.182	30.00	Pass

▣Straddle channels TEST Plot for 802.11a/n_HT20/ac_VHT20_External Ant

802.11a UNII 2C Band PSD CH.144	802.11a UNII 3 Band PSD CH.144
	
802.11n_HT20 UNII 2C Band PSD CH.144	**802.11n_HT20 UNII 3 Band PSD CH.144**
	

802.11ac_VHT20 UNII 2C Band PSD CH.144	802.11ac_VHT20 UNII 3 Band PSD CH.144
	

▣Straddle channels TEST RESULTS for 802.11n_HT40/ac_VHT40_Internal Ant

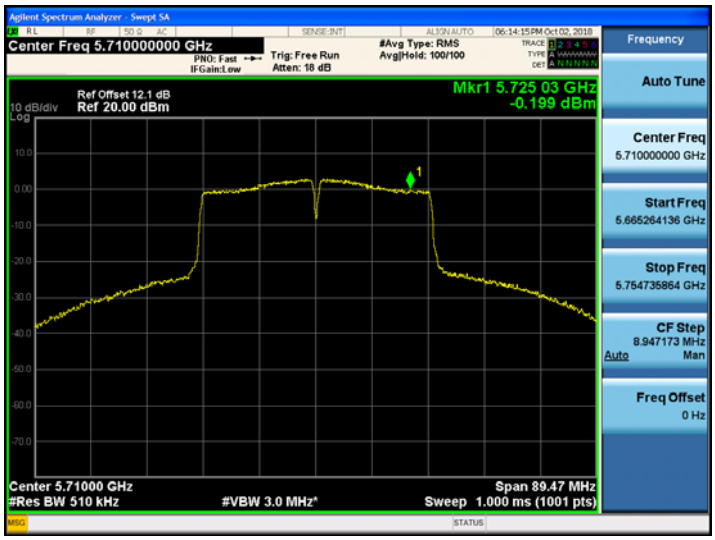
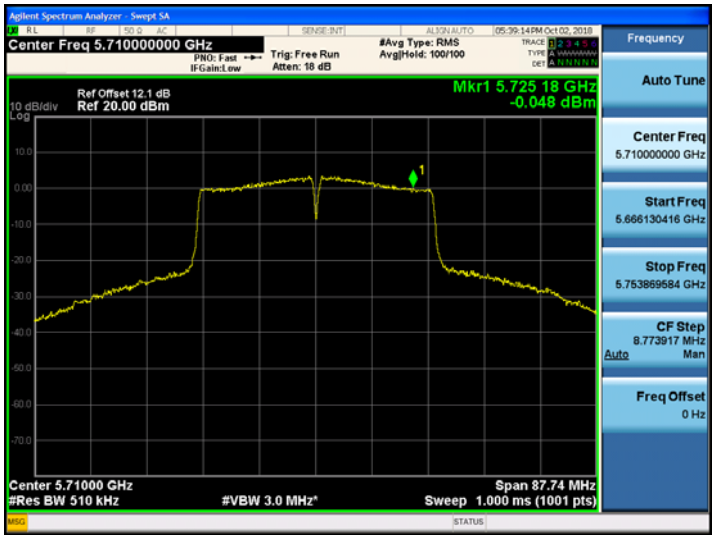
Conducted Power Density Measurements (UNII 2C Band 5710MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5710	142	802.11n	6.367	0.446	6.813	11.00	Pass
		802.11ac	6.373	0.442	6.815	11.00	Pass

Conducted Power Density Measurements (UNII 3 Band 5710MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5710	142	802.11n	-0.199	0.446	0.247	30.00	Pass
		802.11ac	-0.048	0.442	0.394	30.00	Pass

▣Straddle channels TEST Plot for 802.11n_HT40/ac_VHT40_Internal Ant

802.11n_HT40 UNII 2C Band PSD CH.142	802.11n_HT40 UNII 3 Band PSD CH.142
	
802.11ac_VHT40 UNII 2C Band PSD CH.142	**802.11ac_VHT40 UNII 3 Band PSD CH.142**
	

▣Straddle channels TEST RESULTS for 802.11n_HT40/ac_VHT40_External Ant

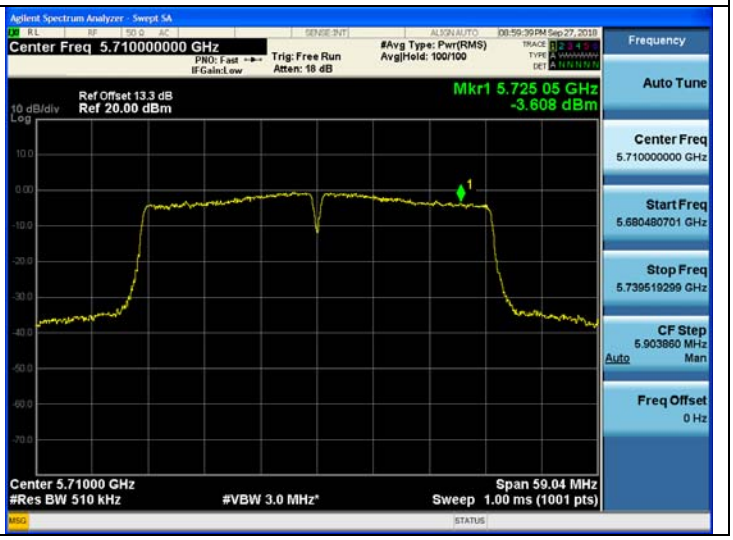
Conducted Power Density Measurements (UNII 2C Band 5710MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5710	142	802.11n	2.062	1.409	3.471	11.00	Pass
		802.11ac	2.368	1.389	3.757	11.00	Pass

Conducted Power Density Measurements (UNII 3 Band 5710MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5710	142	-3.783	1.409	-2.374	-3.783	30.00	Pass
		-3.608	1.389	-2.219	-3.608	30.00	Pass

▣Straddle channels TEST Plot for 802.11n_HT40/ac_VHT40_External Ant

802.11n_HT40 UNII 2C Band PSD CH.142	802.11n_HT40 UNII 3 Band PSD CH.142
	
802.11ac_VHT40 UNII 2C Band PSD CH.142	**802.11ac_VHT40 UNII 3 Band PSD CH.142**
	

▣Straddle channels TEST RESULTS_Internal Ant

Conducted Power Density Measurements (UNII 2C Band 5690MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5690	138	802.11ac	2.541	0.861	3.402	11.00	Pass

Conducted Power Density Measurements (UNII 3 Band 5690MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5690	138	802.11ac	-3.404	0.861	-2.543	30.00	Pass

▣Straddle channels TEST Plot for 802.11ac_VHT80_Internal Ant

802.11ac_VHT80 UNII 2C Band PSD CH.138	802.11ac_VHT80 UNII 3 Band PSD CH.138
	

▣Straddle channels TEST RESULTS_External Ant

Conducted Power Density Measurements (UNII 2C Band 5690MHz)

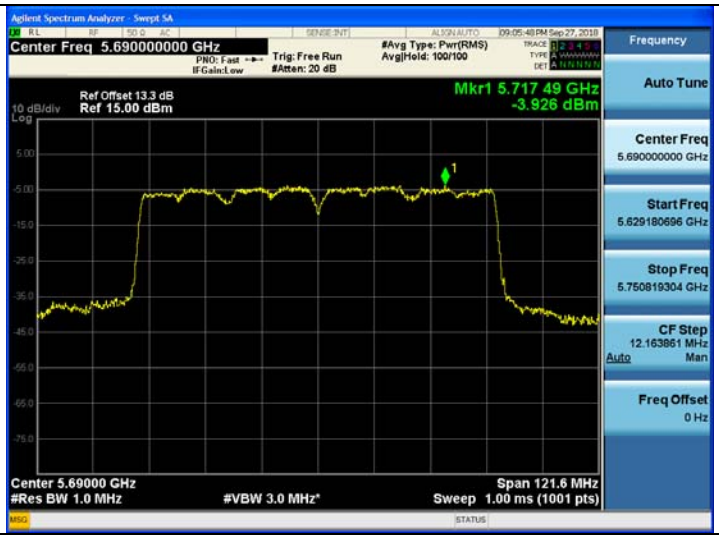
Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5690	138	802.11ac	-3.926	3.843	-0.083	11.00	Pass

Conducted Power Density Measurements (UNII 3 Band 5690MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5690	138	802.11ac	-8.250	3.843	-4.407	30.00	Pass

▣Straddle channels TEST Plot for 802.11ac_VHT80_External Ant

802.11ac_VHT80 UNII 2C Band PSD CH.138



802.11ac_VHT80 UNII 3 Band PSD CH.138

10.6 FREQUENCY STABILITY

The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 ℃ and 50 ℃. The temperature was incremented by 10 ℃ intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

[Internal Ant]

20 MHz BW_ Startup

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5180089.35	89.35
100%		-30	5180049.46	49.46
100%		-20	5180054.64	54.64
100%		-10	5180094.50	94.50
100%		0	5180031.74	31.74
100%		+10	5180052.52	52.52
100%		+30	5180057.68	57.68
100%		+40	5180060.25	60.25
100%		+50	5180051.15	51.15
Max.	16.00	+20	5180046.21	46.21
Min.	9.00	+20	5180084.59	84.59

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5260008.04	8.04
100%		-30	5260040.11	40.11
100%		-20	5260081.17	81.17
100%		-10	5260025.65	25.65
100%		0	5260037.70	37.7
100%		+10	5260011.63	11.63
100%		+30	5260083.51	83.51
100%		+40	5260016.80	16.8
100%		+50	5260048.10	48.10
Max.	16.00	+20	5260004.28	4.28
Min.	9.00	+20	5260046.63	46.63

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5500053.26	53.26
100%		-30	5500049.41	49.41
100%		-20	5500047.67	47.67
100%		-10	5500061.12	61.12
100%		0	5500023.07	23.07
100%		+10	5500009.51	9.51
100%		+30	5500053.71	53.71
100%		+40	5500023.24	23.24
100%		+50	5500004.14	4.14
Max.	16.00	+20	5500071.03	71.03
Min.	9.00	+20	5500009.93	9.93

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5745096.20	96.20
100%		-30	5745086.82	86.82
100%		-20	5745058.88	58.88
100%		-10	5745002.73	2.73
100%		0	5745089.07	89.07
100%		+10	5745013.60	13.6
100%		+30	5745017.10	17.1
100%		+40	5745067.54	67.54
100%		+50	5745058.80	58.80
Max.	16.00	+20	5745056.70	56.70
Min.	9.00	+20	5745064.67	64.67

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

2 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5180030.22	30.22
100%		-30	5180090.78	90.78
100%		-20	5180001.10	1.10
100%		-10	5180024.42	24.42
100%		0	5180063.83	63.83
100%		+10	5180005.23	5.23
100%		+30	5180056.86	56.86
100%		+40	5180098.63	98.63
100%		+50	5180068.71	68.71
Max.	16.00	+20	5180038.13	38.13
Min.	9.00	+20	5180056.53	56.53

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5260071.83	71.83
100%		-30	5260035.35	35.35
100%		-20	5260076.44	76.44
100%		-10	5260056.59	56.59
100%		0	5260008.40	8.4
100%		+10	5260097.67	97.67
100%		+30	5260023.15	23.15
100%		+40	5260037.44	37.44
100%		+50	5260070.31	70.31
Max.	16.00	+20	5260086.64	86.64
Min.	9.00	+20	5260099.32	99.32

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5500008.81	8.81
100%		-30	5500076.70	76.70
100%		-20	5500056.24	56.24
100%		-10	5500060.49	60.49
100%		0	5500039.96	39.96
100%		+10	5500034.61	34.61
100%		+30	5500048.75	48.75
100%		+40	5500095.54	95.54
100%		+50	5500053.13	53.13
Max.	16.00	+20	5500060.78	60.78
Min.	9.00	+20	5500051.98	51.98

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3
OPERATING FREQUENCY: 5,745,000,000 Hz
CHANNEL: 149
REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5745025.81	25.81
100%		-30	5745029.57	29.57
100%		-20	5745031.96	31.96
100%		-10	5745041.90	41.9
100%		0	5745040.19	40.19
100%		+10	5745052.43	52.43
100%		+30	5745065.32	65.32
100%		+40	5745030.90	30.9
100%		+50	5745001.49	1.49
Max.	16.00	+20	5745035.87	35.87
Min.	9.00	+20	5745008.09	8.09

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

5 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5180085.61	85.61
100%		-30	5180095.02	95.02
100%		-20	5180076.27	76.27
100%		-10	5180054.89	54.89
100%		0	5180028.35	28.35
100%		+10	5180053.61	53.61
100%		+30	5180006.84	6.84
100%		+40	5180038.97	38.97
100%		+50	5180069.48	69.48
Max.	16.00	+20	5180088.46	88.46
Min.	9.00	+20	5180015.26	15.26

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5260096.68	96.68
100%		-30	5260019.54	19.54
100%		-20	5260075.81	75.81
100%		-10	5260054.39	54.39
100%		0	5260070.82	70.82
100%		+10	5260023.25	23.25
100%		+30	5260089.97	89.97
100%		+40	5260091.36	91.36
100%		+50	5260095.22	95.22
Max.	16.00	+20	5260011.11	11.11
Min.	9.00	+20	5260036.44	36.44

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5500014.74	14.74
100%		-30	5500038.97	38.97
100%		-20	5500003.94	3.94
100%		-10	5500058.58	58.58
100%		0	5500033.61	33.61
100%		+10	5500036.71	36.71
100%		+30	5500099.17	99.17
100%		+40	5500052.23	52.23
100%		+50	5500045.09	45.09
Max.	16.00	+20	5500057.44	57.44
Min.	9.00	+20	5500094.07	94.07

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5745067.87	67.87
100%		-30	5745043.83	43.83
100%		-20	5745055.15	55.15
100%		-10	5745041.95	41.95
100%		0	5745080.57	80.57
100%		+10	5745029.68	29.68
100%		+30	5745018.32	18.32
100%		+40	5745060.39	60.39
100%		+50	5745050.05	50.05
Max.	16.00	+20	5745042.38	42.38
Min.	9.00	+20	5745063.64	63.64

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

10 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5180039.51	39.51
100%		-30	5180094.41	94.41
100%		-20	5180072.55	72.55
100%		-10	5180067.36	67.36
100%		0	5180048.55	48.55
100%		+10	5180066.20	66.20
100%		+30	5180062.07	62.07
100%		+40	5180077.64	77.64
100%		+50	5180045.08	45.08
Max.	16.00	+20	5180017.63	17.63
Min.	9.00	+20	5180004.13	4.13

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5260021.74	21.74
100%		-30	5260018.35	18.35
100%		-20	5260066.20	66.2
100%		-10	5260049.62	49.62
100%		0	5260067.03	67.03
100%		+10	5260024.83	24.83
100%		+30	5260028.11	28.11
100%		+40	5260006.62	6.62
100%		+50	5260070.53	70.53
Max.	16.00	+20	5260083.98	83.98
Min.	9.00	+20	5260086.40	86.4

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5500095.37	95.37
100%		-30	5500080.70	80.70
100%		-20	5500099.72	99.72
100%		-10	5500017.72	17.72
100%		0	5500027.18	27.18
100%		+10	5500007.65	7.65
100%		+30	5500069.38	69.38
100%		+40	5500088.05	88.05
100%		+50	5500015.66	15.66
Max.	16.00	+20	5500064.74	64.74
Min.	9.00	+20	5500025.09	25.09

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5745074.44	74.44
100%		-30	5745002.74	2.74
100%		-20	5745083.25	83.25
100%		-10	5745022.19	22.19
100%		0	5745031.96	31.96
100%		+10	5745026.89	26.89
100%		+30	5745037.63	37.63
100%		+40	5745040.13	40.13
100%		+50	5745092.65	92.65
Max.	16.00	+20	5745086.61	86.61
Min.	9.00	+20	5745092.52	92.52

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

40 MHz BW_ Startup

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,190,000,000 Hz

CHANNEL: 38

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5190093.15	93.15
100%		-30	5190087.67	87.67
100%		-20	5190034.33	34.33
100%		-10	5190041.53	41.53
100%		0	5190070.42	70.42
100%		+10	5190083.30	83.30
100%		+30	5190070.74	70.74
100%		+40	5190030.06	30.06
100%		+50	5190095.28	95.28
Max.	16.00	+20	5190003.04	3.04
Min.	9.00	+20	5190085.65	85.65

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5270038.05	38.05
100%		-30	5270045.81	45.81
100%		-20	5270063.69	63.69
100%		-10	5270046.63	46.63
100%		0	5270018.29	18.29
100%		+10	5270037.69	37.69
100%		+30	5270071.31	71.31
100%		+40	5270014.98	14.98
100%		+50	5270089.79	89.79
Max.	16.00	+20	5270021.62	21.62
Min.	9.00	+20	5270051.60	51.6

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,510,000,000 Hz

CHANNEL: 102

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5510044.79	44.79
100%		-30	5510086.21	86.21
100%		-20	5510038.33	38.33
100%		-10	5510031.99	31.99
100%		0	5510010.57	10.57
100%		+10	5510009.05	9.05
100%		+30	5510026.70	26.7
100%		+40	5510001.52	1.52
100%		+50	5510033.03	33.03
Max.	16.00	+20	5510042.40	42.40
Min.	9.00	+20	5510006.46	6.46

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,755,000,000 Hz

CHANNEL: 151

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5755008.31	8.31
100%		-30	5755008.63	8.63
100%		-20	5755023.82	23.82
100%		-10	5755021.66	21.66
100%		0	5755021.68	21.68
100%		+10	5755016.59	16.59
100%		+30	5755019.20	19.2
100%		+40	5755035.21	35.21
100%		+50	5755022.27	22.27
Max.	16.00	+20	5755059.45	59.45
Min.	9.00	+20	5755088.17	88.17

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

2 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,190,000,000 Hz

CHANNEL: 38

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5190035.95	35.95
100%		-30	5190022.16	22.16
100%		-20	5190041.28	41.28
100%		-10	5190095.94	95.94
100%		0	5190034.64	34.64
100%		+10	5190017.36	17.36
100%		+30	5190027.05	27.05
100%		+40	5190003.20	3.20
100%		+50	5190019.16	19.16
Max.	16.00	+20	5190063.49	63.49
Min.	9.00	+20	5190087.14	87.14

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5270022.52	22.52
100%		-30	5270017.84	17.84
100%		-20	5270006.07	6.07
100%		-10	5270065.96	65.96
100%		0	5270034.09	34.09
100%		+10	5270010.18	10.18
100%		+30	5270026.06	26.06
100%		+40	5270072.81	72.81
100%		+50	5270056.34	56.34
Max.	16.00	+20	5270078.77	78.77
Min.	9.00	+20	5270061.58	61.58

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,510,000,000 Hz

CHANNEL: 102

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5510010.23	10.23
100%		-30	5510025.44	25.44
100%		-20	5510061.63	61.63
100%		-10	5510080.43	80.43
100%		0	5510064.35	64.35
100%		+10	5510004.88	4.88
100%		+30	5510034.55	34.55
100%		+40	5510058.19	58.19
100%		+50	5510040.66	40.66
Max.	16.00	+20	5510006.59	6.59
Min.	9.00	+20	5510085.47	85.47

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,755,000,000 Hz

CHANNEL: 151

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5755050.51	50.51
100%		-30	5755037.37	37.37
100%		-20	5755058.59	58.59
100%		-10	5755033.96	33.96
100%		0	5755061.31	61.31
100%		+10	5755034.04	34.04
100%		+30	5755081.31	81.31
100%		+40	5755082.99	82.99
100%		+50	5755025.68	25.68
Max.	16.00	+20	5755079.58	79.58
Min.	9.00	+20	5755040.12	40.12

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

5 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,190,000,000 Hz

CHANNEL: 38

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5190040.97	40.97
100%		-30	5190027.48	27.48
100%		-20	5190020.60	20.60
100%		-10	5190061.25	61.25
100%		0	5190014.12	14.12
100%		+10	5190059.41	59.41
100%		+30	5190053.78	53.78
100%		+40	5190038.52	38.52
100%		+50	5190025.77	25.77
Max.	16.00	+20	5190013.42	13.42
Min.	9.00	+20	5190077.19	77.19

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5270060.52	60.52
100%		-30	5270003.80	3.80
100%		-20	5270047.26	47.26
100%		-10	5270084.42	84.42
100%		0	5270064.40	64.4
100%		+10	5270051.83	51.83
100%		+30	5270025.67	25.67
100%		+40	5270021.64	21.64
100%		+50	5270071.46	71.46
Max.	16.00	+20	5270015.08	15.08
Min.	9.00	+20	5270074.39	74.39

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C
OPERATING FREQUENCY: 5,510,000,000 Hz
CHANNEL: 102
REFERENCE VOLTAGE: 12.0 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	12.00	+20(Ref)	5510026.73	26.73
100%		-30	5510065.78	65.78
100%		-20	5510003.96	3.96
100%		-10	5510058.38	58.38
100%		0	5510072.53	72.53
100%		+10	5510088.63	88.63
100%		+30	5510029.33	29.33
100%		+40	5510060.22	60.22
100%		+50	5510044.98	44.98
Max.	16.00	+20	5510036.79	36.79
Min.	9.00	+20	5510008.91	8.91

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.