

8.4 Maximum Power Spectral Density

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.

- Peak Power Spectral Density Limit Calculation(FCC)

Band	Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
U-NII 1	11	0.48	11
U-NII 2A	11	0.48	11
U-NII 2C	11	0.48	11
U-NII 3	30	1.03	30

RSS-247[6.11]

- (1) For band 5150 - 5250 MHz
The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
- (2) For band 5250 - 5350 MHz
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
- (3) For band 5470 - 5600 MHz and 5650 - 5725 MHz
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
- (4) For band 5725 - 5850 MHz
The power spectral density shall not exceed 30 dBm in any 500 kHz band.

- Peak Power Spectral Density Limit Calculation(IC)

Band	Limit [dBm]	ANT Gain [dBi]	Determined Limit [dBm]
U-NII 1	11	0.48	11
U-NII 2A	11	0.48	11
U-NII 2C	11	0.48	11
U-NII 3	30	1.03	30

Multiple Transmit

Mode	Channel	Frequency [MHz]	Reading [dBm]			T.F [dB] Note 1	Test Result [dBm]
			ANT 1	ANT 2	SUM		SUM
802.11n HT20	36	5180	-2.690	-1.240	1.106	0.120	1.226
	40	5200	-2.600	-1.350	1.080		1.200
	48	5240	-2.550	-1.250	1.159		1.279
	52	5260	0.410	-1.470	2.581		2.701
	60	5300	0.330	-0.160	3.102		3.222
	64	5320	1.080	1.740	4.433		4.553
	100	5500	5.120	4.790	7.968		8.088
	116	5580	4.540	5.000	7.786		7.906
	140	5700	3.670	5.240	7.536		7.656
	149	5745	-4.900	-4.680	-1.778	7.110	5.331
	157	5785	-4.840	-4.620	-1.718		5.391
	165	5825	-6.750	-4.730	-2.613		4.496
802.11n HT40	38	5190	-6.500	-4.880	-2.605	0.240	-2.365
	46	5230	-2.670	-1.010	1.249		1.489
	54	5270	-0.450	-1.600	2.023		2.263
	62	5310	-3.400	-4.260	-0.798		-0.558
	102	5510	-0.720	-0.540	2.381		2.621
	110	5550	-0.250	1.900	3.967		4.207
	134	5670	1.560	1.440	4.511		4.751
	151	5755	-9.670	-9.650	-6.650	7.220	0.570
	159	5795	-9.610	-7.590	-5.473		1.746
802.11ac VHT80	42	5210	-9.660	-8.100	-5.800	0.430	-5.370
	-	-	-	-	-		-
	58	5290	-8.670	-7.120	-4.816		-4.386
	-	-	-	-	-		-
	106	5530	-7.770	-6.720	-4.203		-3.773
	-	-	-	-	-		-
	-	-	-	-	-		-
	155	5775	-17.810	-17.770	-14.780	7.420	-7.360
	-	-	-	-	-		-

Note 1: "Band 1, 2A, 2C [T.F] = D.C.F"

"Band 3 [T.F] = 10*LOG(500/100) + D.C.F"

For D.C.F., please refer to appendix II.

Note 2: Test Result = Measurement Data + T.F

Single Transmit

Mode		Channel	Frequency [MHz]	Reading [dBm]		T.F [dB] Note 1	Test Result [dBm]	
				ANT 1	ANT 2		ANT 1	ANT 2
802.11ac VHT20	U-NII 2C	144	5720	-5.666	-6.583	10.060	4.394	3.477
	U-NII 3	144	5720	-7.003	-7.147	7.050	0.047	-0.097
802.11ac VHT40	U-NII 2C	142	5710	-6.434	-5.669	10.130	3.696	4.461
	U-NII 3	142	5710	-10.066	-9.091	7.120	-2.946	-1.971
802.11ac VHT80	U-NII 2C	138	5690	-9.478	-11.739	10.260	0.782	-1.479
	U-NII 3	138	5690	-13.404	-15.245	7.250	-6.154	-7.995

Multiple Transmit

Mode		Channel	Frequency [MHz]	Reading [dBm]			T.F [dB]	Test Result [dBm]
				ANT 1	ANT 2	SUM		
802.11ac VHT20	U-NII 2C	144	5720	-4.433	-5.106	-1.746	10.120	8.374
	U-NII 3	144	5720	-5.804	-6.011	-2.896	7.110	4.214
802.11ac VHT40	U-NII 2C	142	5710	-7.618	-7.593	-4.595	10.230	5.635
	U-NII 3	142	5710	-11.089	-10.448	-7.746	7.220	-0.526
802.11ac VHT80	U-NII 2C	138	5690	-8.931	-8.428	-5.662	10.430	4.768
	U-NII 3	138	5690	-12.951	-13.037	-9.983	7.420	-2.563

Note 1: "Band 1, 2A, 2C [T.F] = D.C.F"

"Band 3 [T.F] = 10*LOG(500/100) + D.C.F"

For D.C.F., please refer to appendix II.

Note 2: Test Result = Measurement Data + T.F



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.48





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.52



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.60



Test Mode: 802.11a & ANT 1 & Ch.64





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.100



Maximum Power Spectral Density

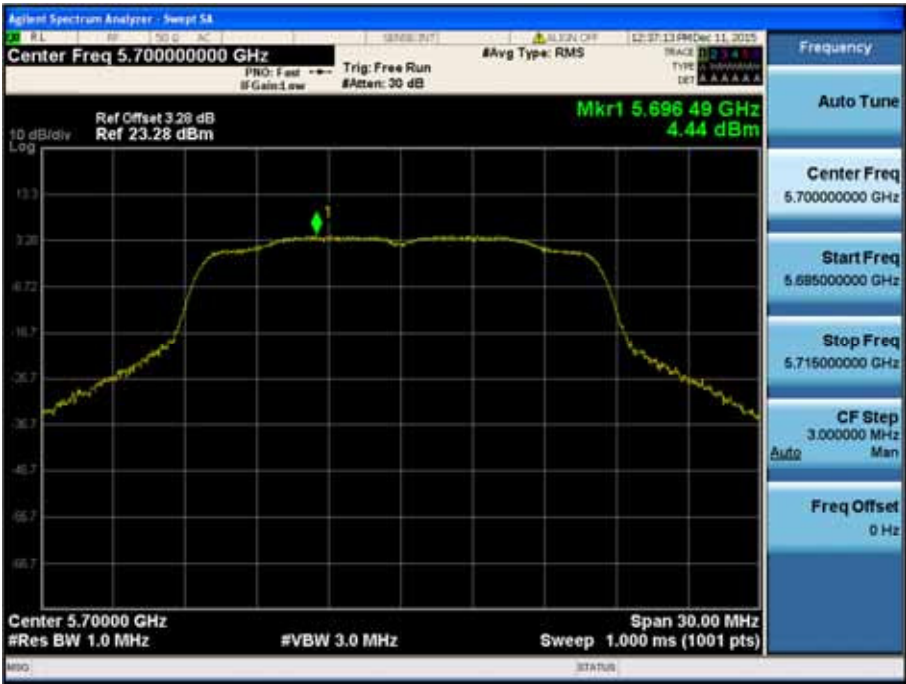
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Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.140





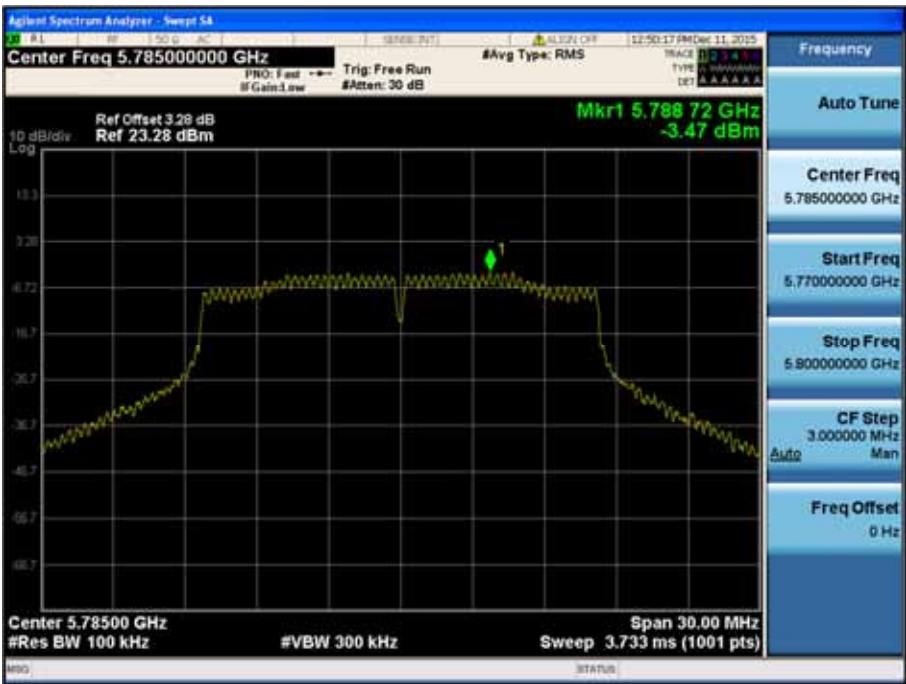
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.149



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.157



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.165





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.36



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.40





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.48





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.52



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.60





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.64





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.100



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.116





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.140





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.149



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.157





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.165





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.38



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.46





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.102



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.110





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.134





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.151



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.159



Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.42



Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.58

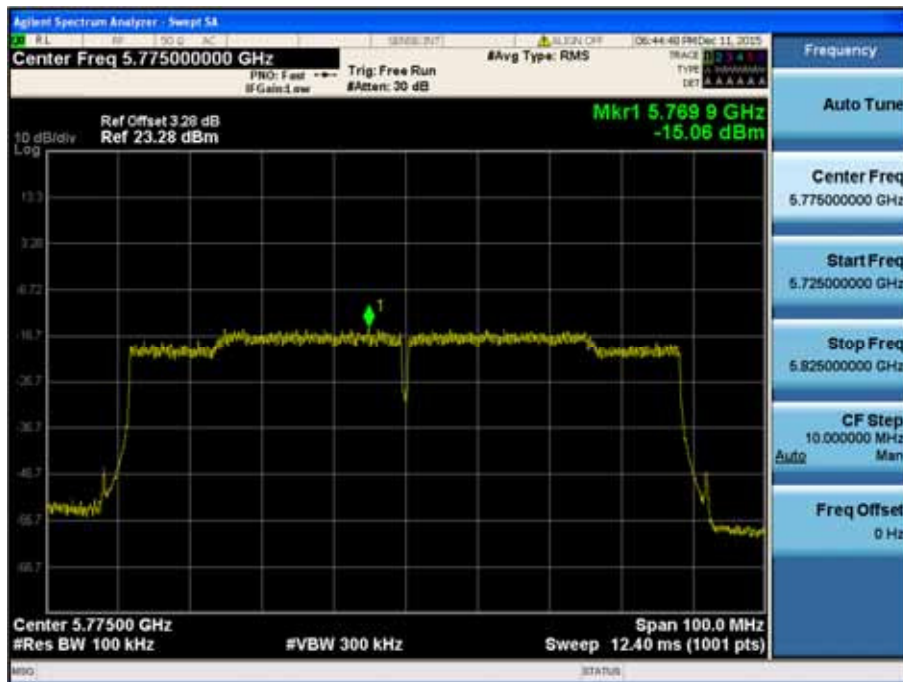


Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.106

**Maximum Power Spectral Density**

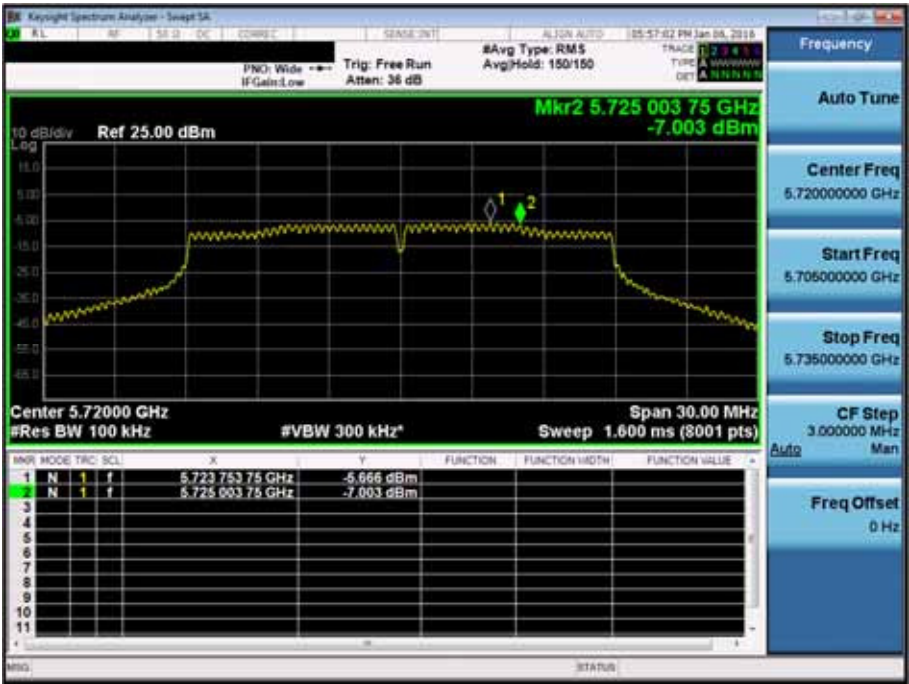
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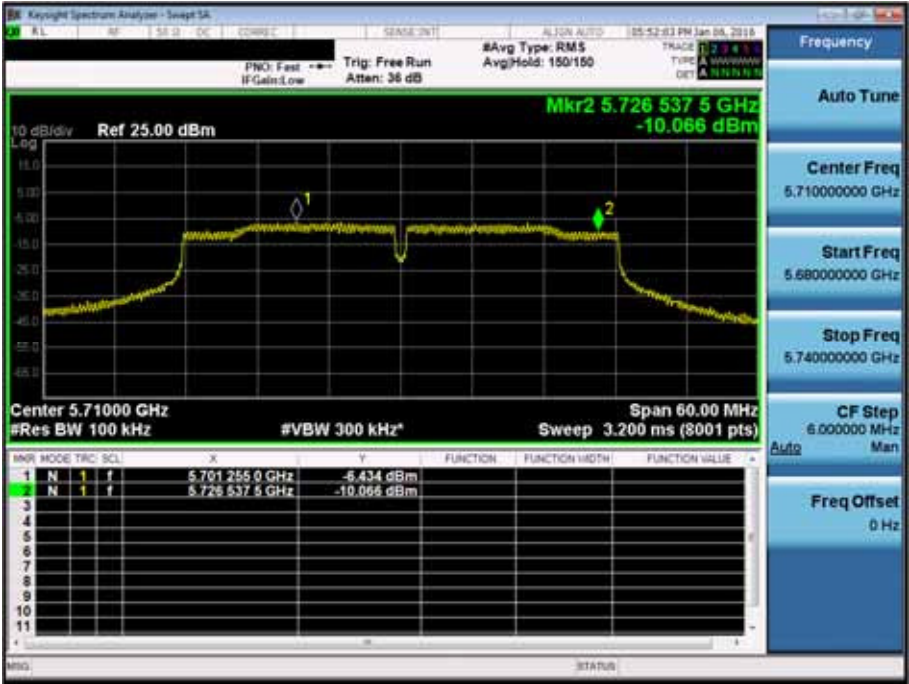
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.144



Maximum Power Spectral Density

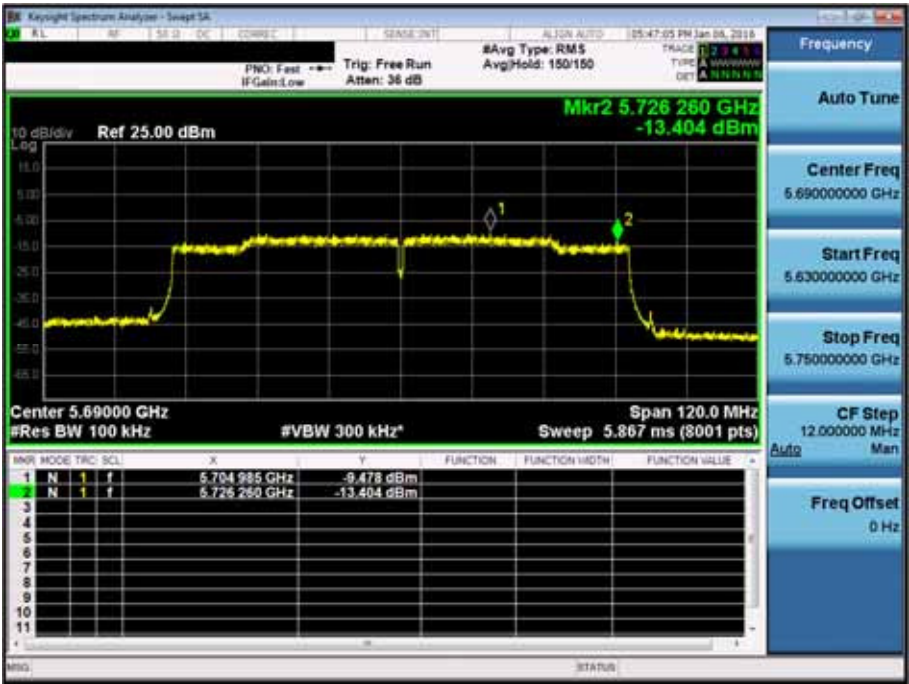
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Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.36



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.40





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.48





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.52



Maximum Power Spectral Density

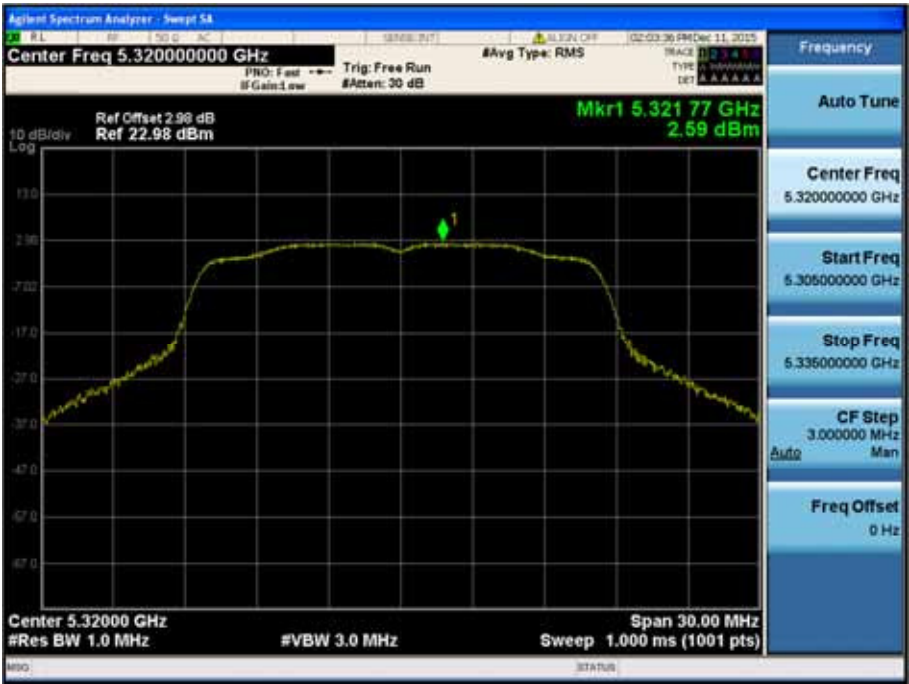
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Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.64





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.100



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.116





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.140





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.149



Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.157





Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.165



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.36

**Maximum Power Spectral Density**

Test Mode: 802.11n(HT20) & ANT 2 & Ch.40





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.48





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.52



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.60





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.64



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.100



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.116





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.140





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.149



Maximum Power Spectral Density

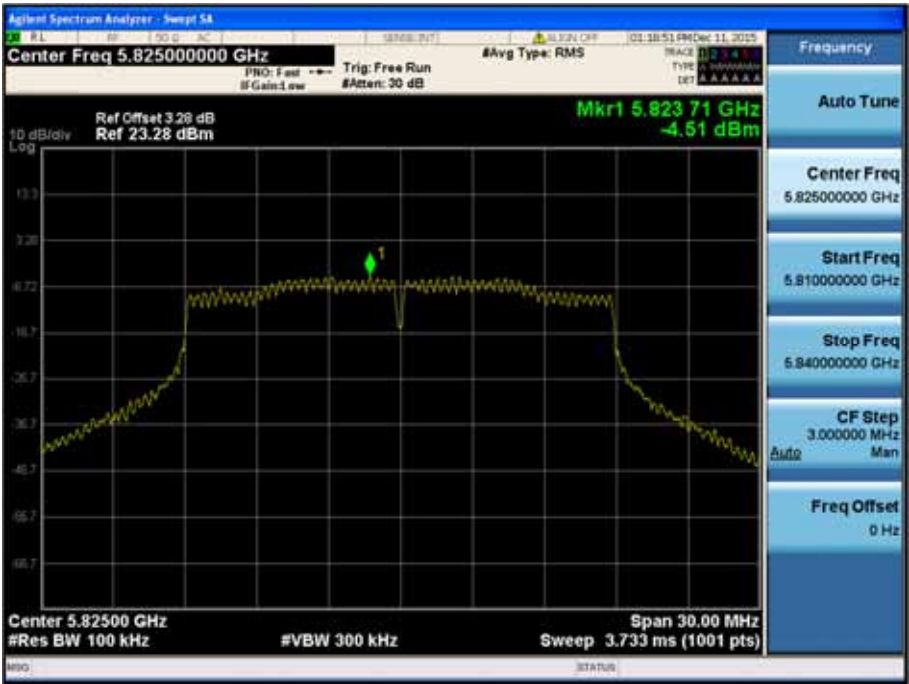
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Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.165





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.38



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.46





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.54



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.62





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.102



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.110





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.134





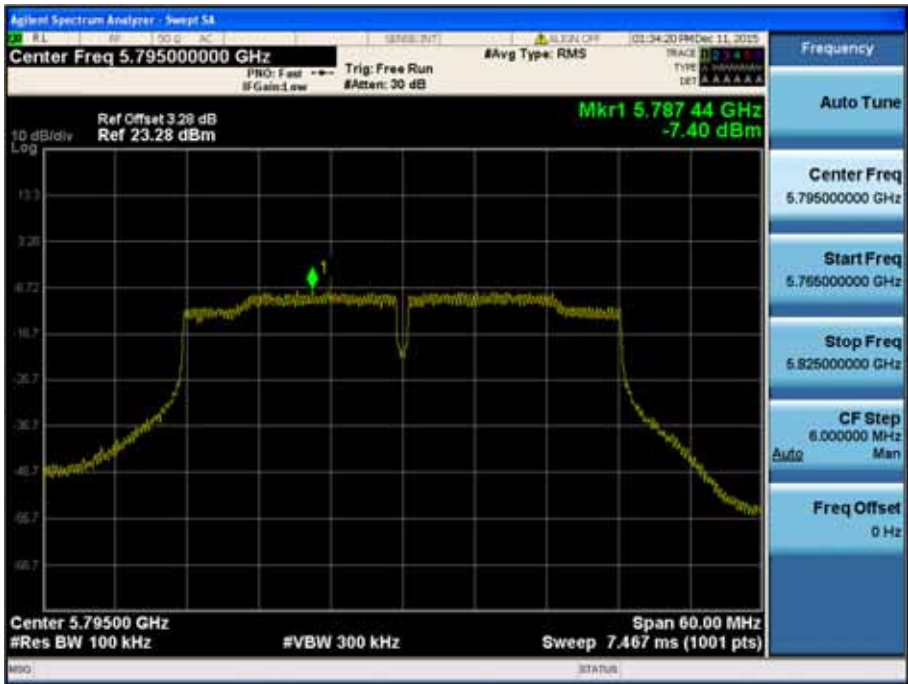
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.151



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.159





Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.42



Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.58





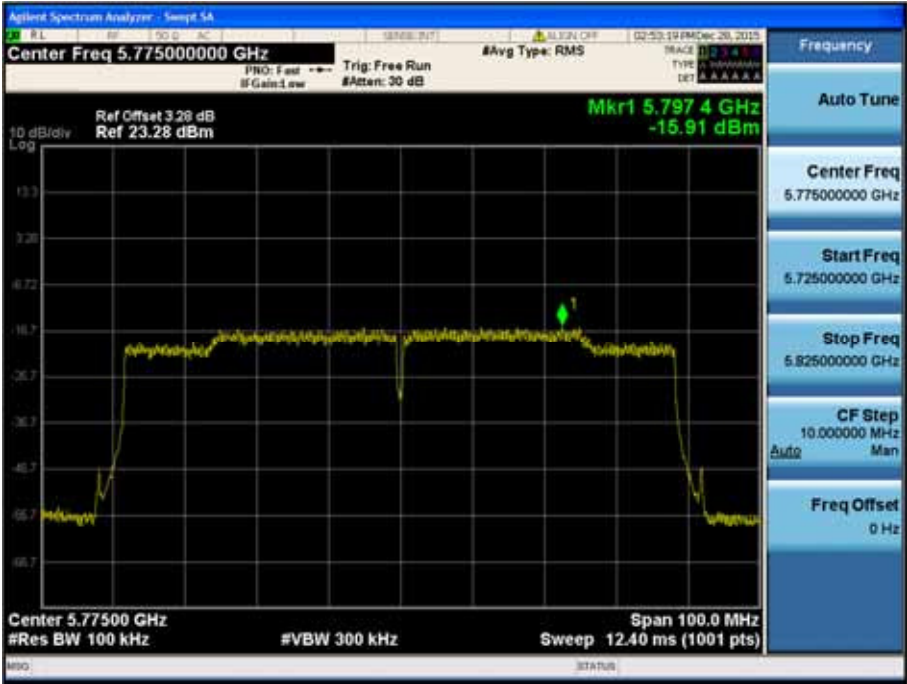
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.106



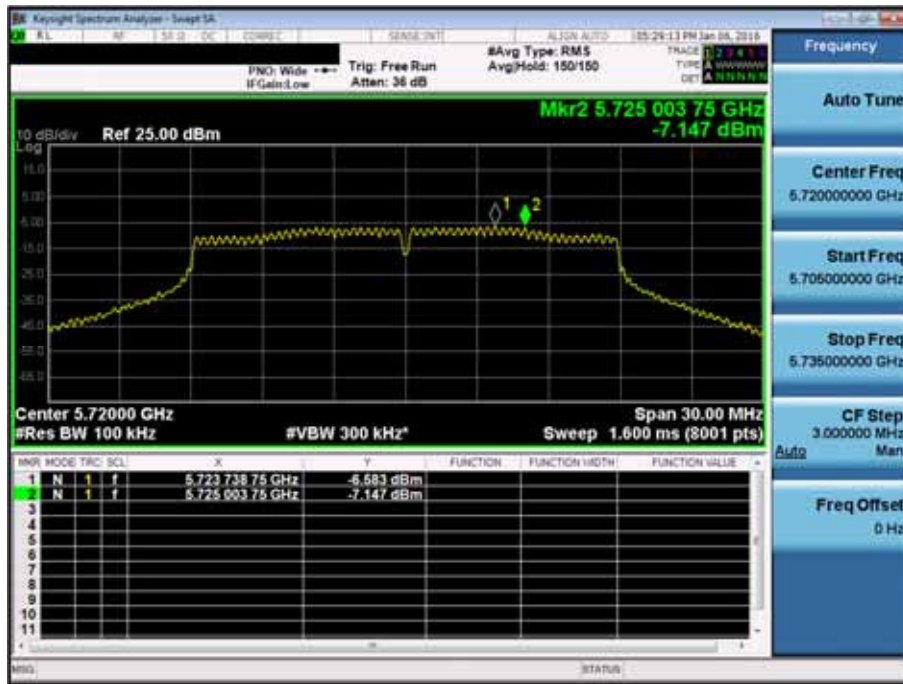
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.155



Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.144

**Maximum Power Spectral Density**

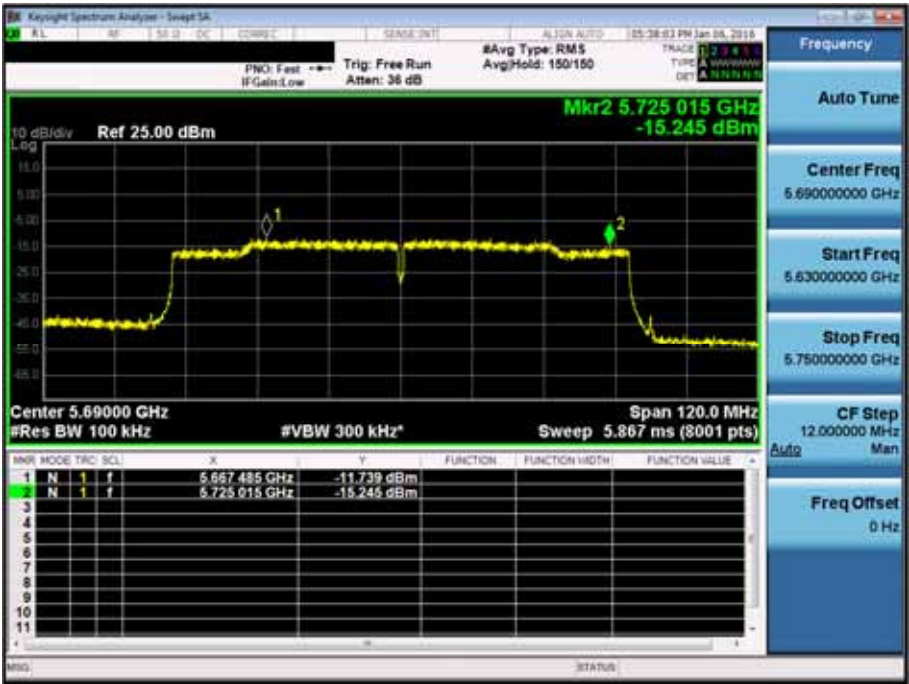
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Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.138



Multiple Transmit

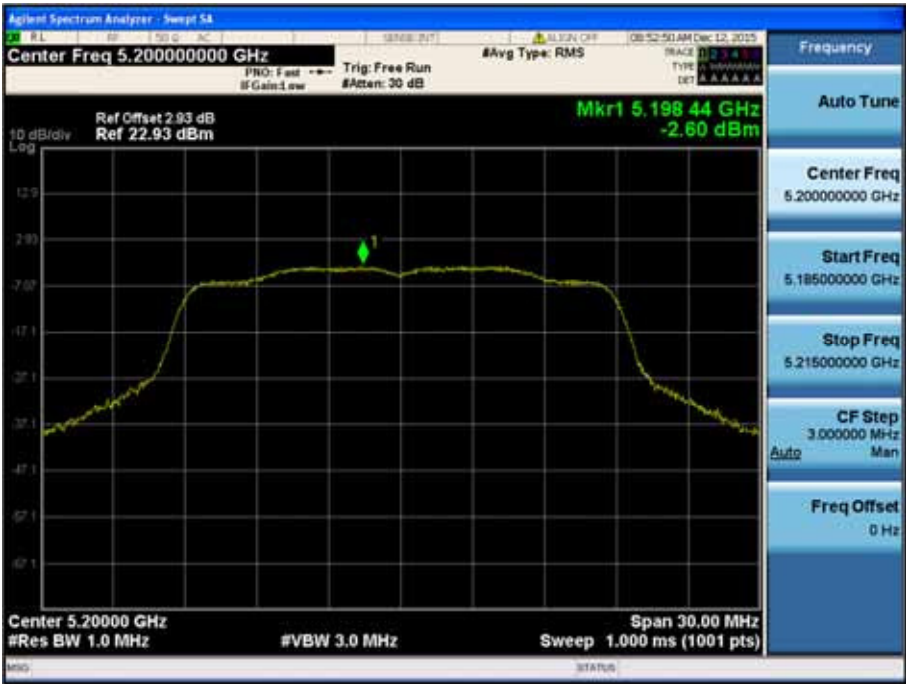
Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.36



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.40





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.48





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.52



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.60





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.64





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.100



Maximum Power Spectral Density

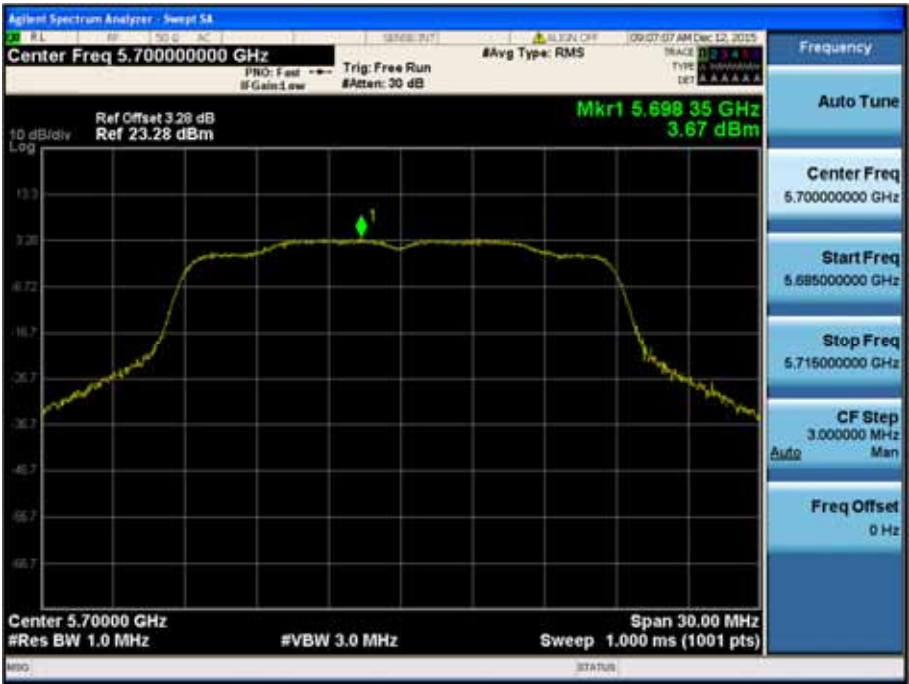
Test Mode: 802.11n HT20 & ANT 1 & Ch.116





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.140





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.149



Maximum Power Spectral Density

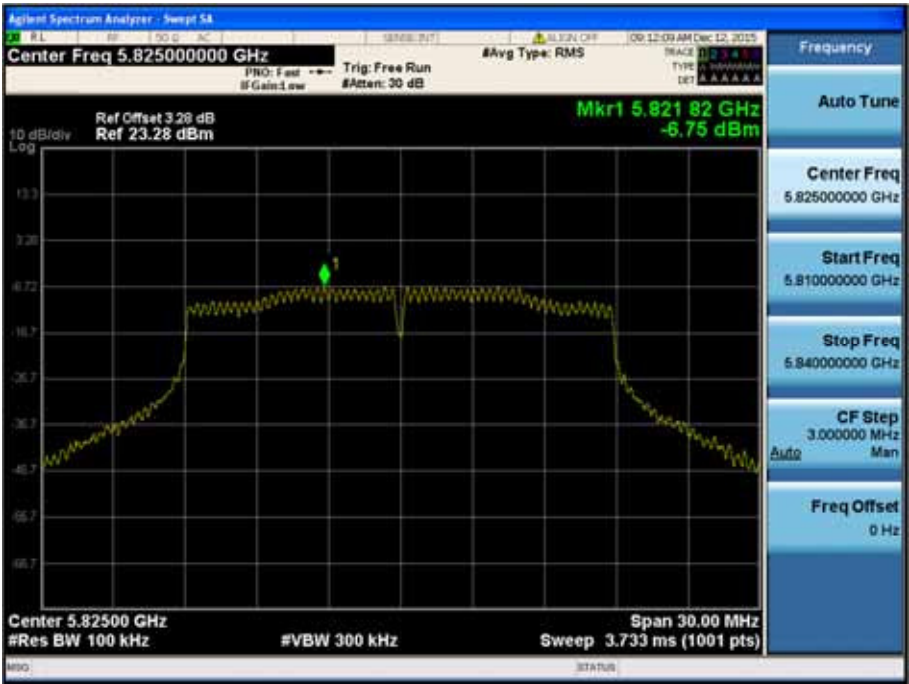
Test Mode: 802.11n(HT20) & ANT 1 & Ch.157





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 1 & Ch.165





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.38



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.46





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.54



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.62





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.102



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.110





Maximum Power Spectral Density

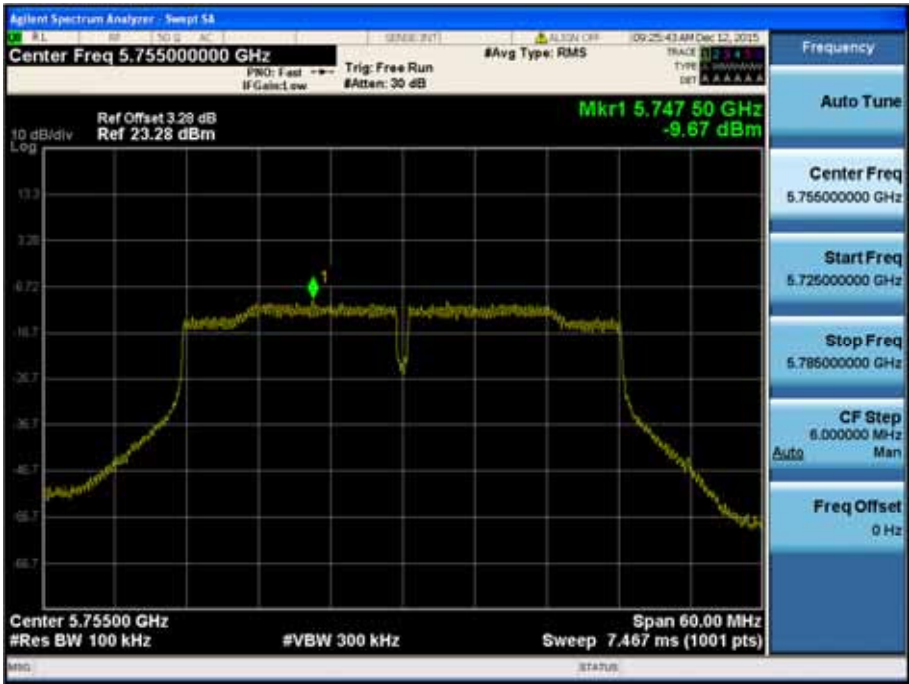
Test Mode: 802.11n HT40 & ANT 1 & Ch.134





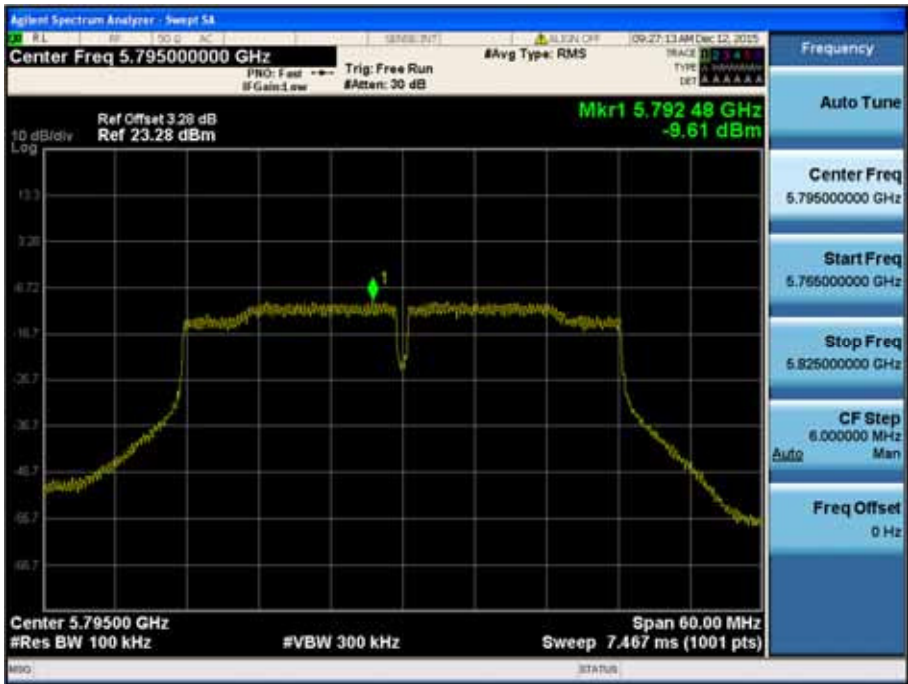
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.151



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.159



Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.42

**Maximum Power Spectral Density**

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.58





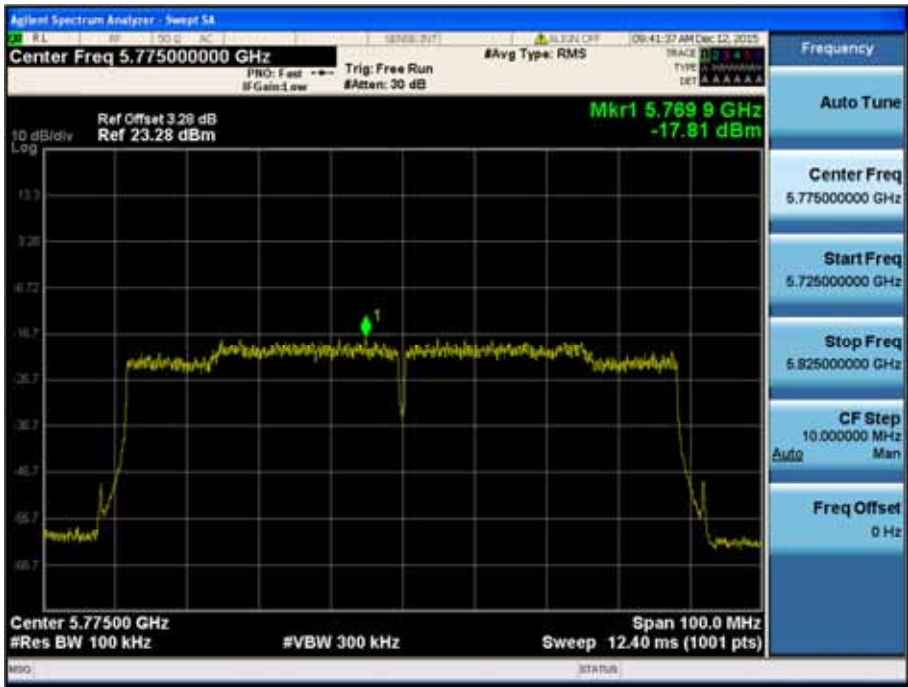
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.106



Maximum Power Spectral Density

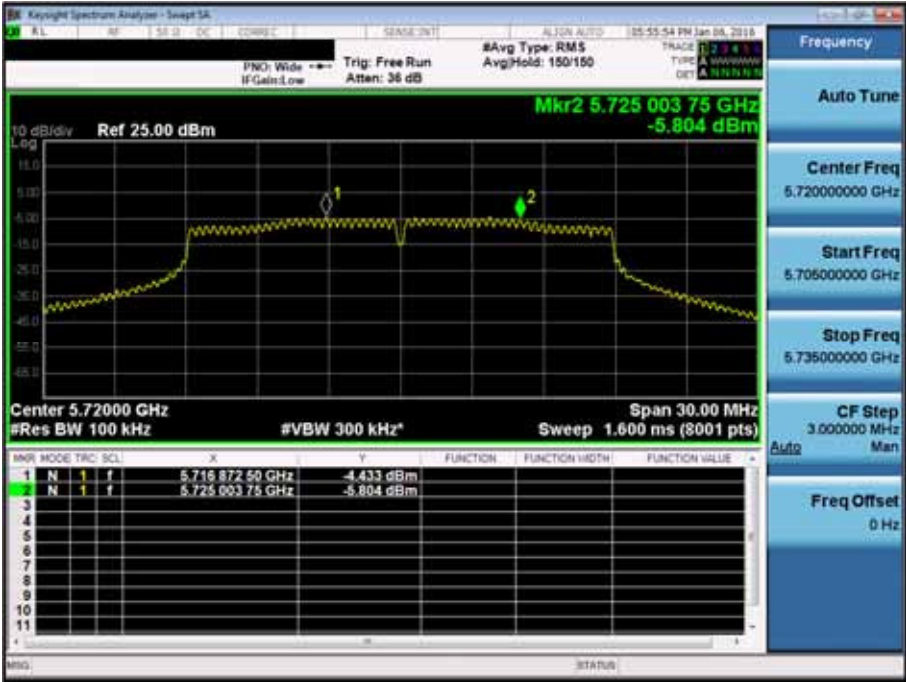
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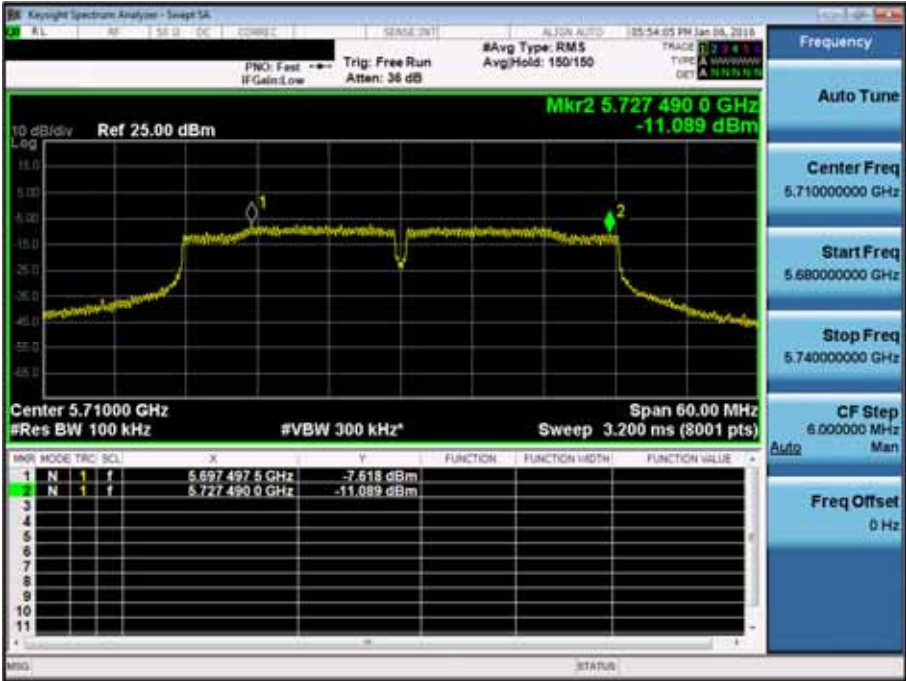
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.144



Maximum Power Spectral Density

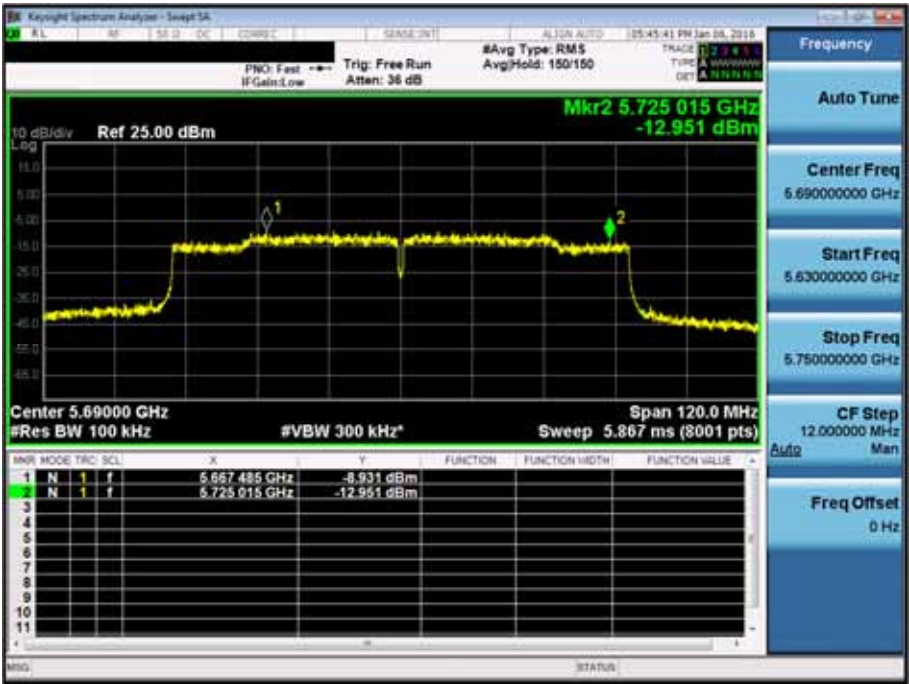
Test Mode: 802.11ac VHT40 & ANT 1 & Ch.142





Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.36



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.40





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.48





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.52



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.60





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.64





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.100



Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.116





Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.140





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.149



Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.157





Maximum Power Spectral Density

Test Mode: 802.11n(HT20) & ANT 2 & Ch.165





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.38



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.46





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.54



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.62





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.102



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.110





Maximum Power Spectral Density

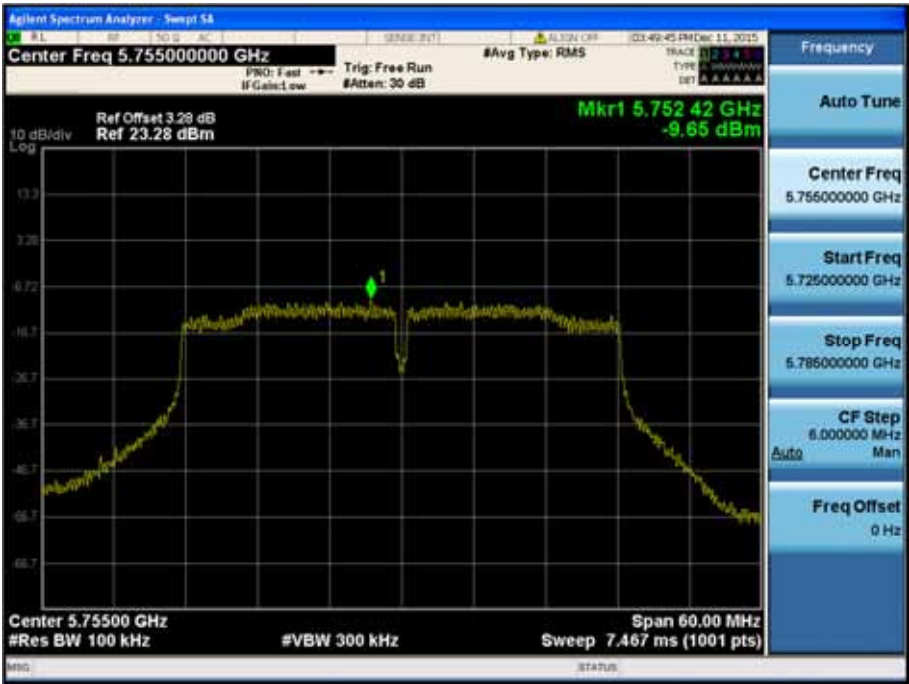
Test Mode: 802.11n HT40 & ANT 2 & Ch.134





Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.151



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.159





Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.42



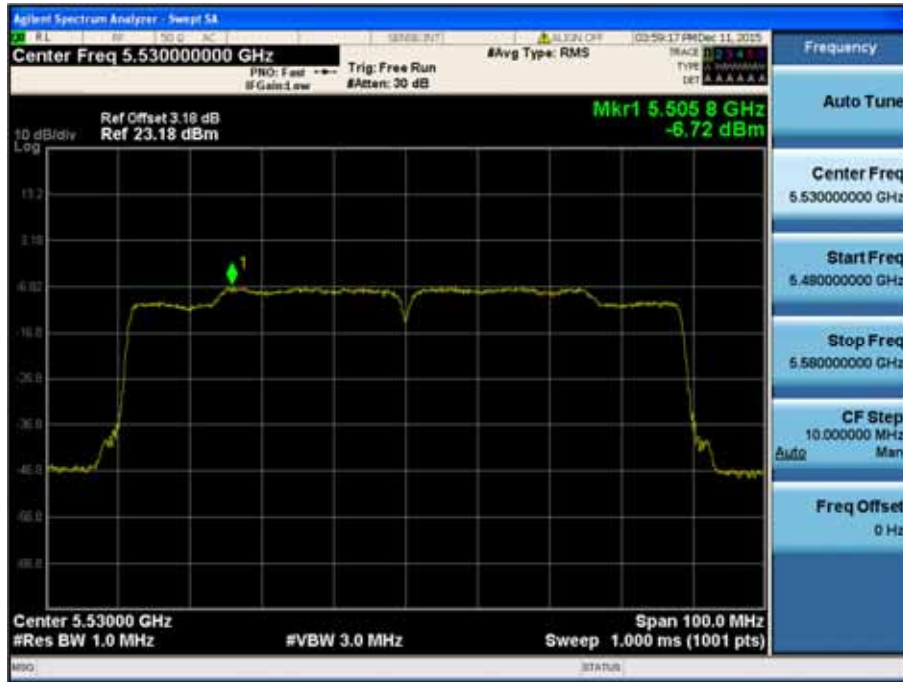
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.58



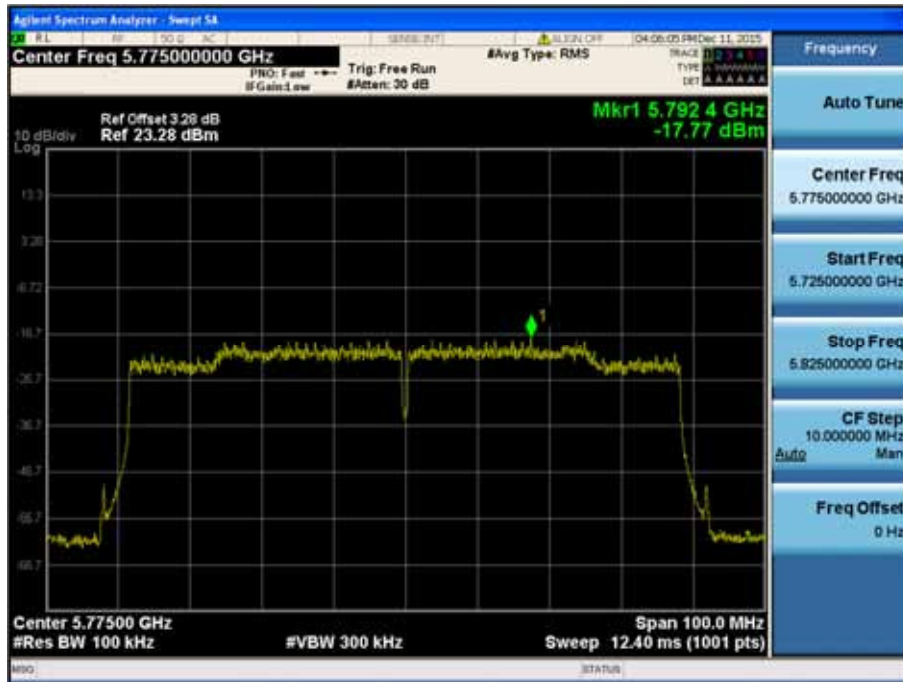
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.106



Maximum Power Spectral Density

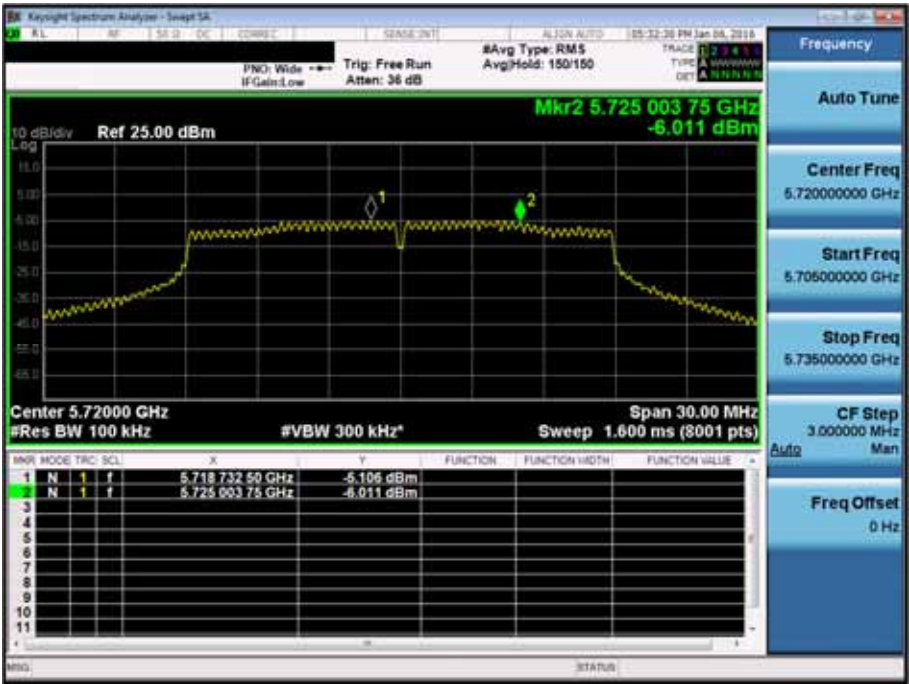
Test Mode: 802.11ac VHT80 & ANT 2 & Ch.155





Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.144



Maximum Power Spectral Density

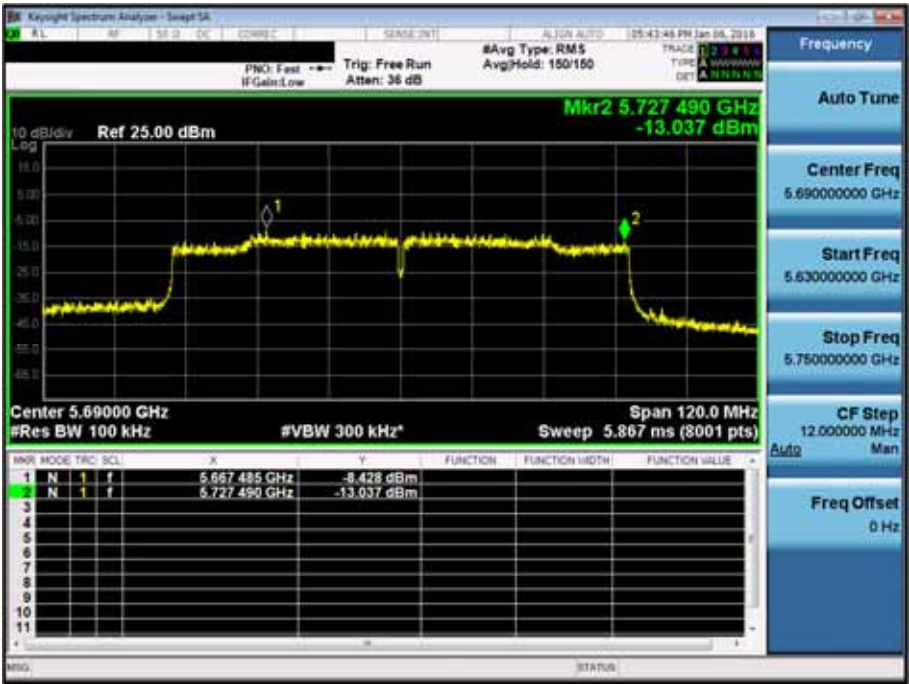
Test Mode: 802.11ac VHT40 & ANT 2 & Ch.142





Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.138



8.5 Frequency Stability



U-NII-2C : (5470 MHz ~ 5725 MHz)_ANT 1

26 dB Bandwidth Reference	
Low edge	High edge
5489.218750	5710.268750

Supply Voltage (V AC)	TEMP (
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U-NII-3 : (5725 MHz ~ 5850 MHz)_ANT 1

6 dB Bandwidth Reference Note 1	
Low edge	High edge
5737.081250	5832.725000

Supply Voltage (V AC)	TEMP (
--------------------------	-----------

U-NII-1 & U-NII-2A : (5150 MHz ~ 5350 MHz)_ANT 2

26 dB Bandwidth Reference	
Low edge(MHz)	High edge(MHz)
5169.162500	5330.531250

Supply Voltage (V AC)	TEMP (
-----------------------------	-----------



U-NII-2C : (5470 MHz ~ 5725 MHz)_ANT 2

26 dB Bandwidth Reference	
Low edge	High edge
5489.150000	5710.518750

Supply Voltage (V AC)	TEMP (
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U-NII-3 : (5725 MHz ~ 5850 MHz)_ANT 2

6 dB Bandwidth Reference Note 1	
Low edge	High edge
5737.212500	5833.000000

Supply Voltage (V AC)	TEMP (
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8.6 Radiated Spurious Emission Measurements

► **Measurements Above 1000 MHz (Peak)**

- a) Follow the requirements in section II.G.3, "General Requirements for Unwanted Emissions Measurements".
- b) Peak emission levels are measured by setting the analyzer as follows:
 - (i) **RBW = 1 MHz.**
 - (ii) **VBW $\geq$ 3 MHz.**
 - (iii) **Detector = Peak.**
 - (iv) Sweep time = Auto.
 - (v) Trace mode = Max hold.
 - (vi) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

► **Measurements Above 1000 MHz (Method AD)**

- (i) **RBW = 1 MHz.**
- (ii) **VBW $\geq$ 3 MHz.**
- (iii) **Detector = RMS**, if $\text{span} / (\# \text{ of points in sweep}) \leq \text{RBW} / 2$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, the detector mode shall be set to peak.
- (iv) Averaging type = power (i.e., RMS)
 - As an alternative, the detector and averaging type may be set for linear voltage averaging. Some analyzers require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- (v) Sweep time = Auto.
- (vi) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of $1/x$, where x is the duty cycle. For example, with 50 percent duty cycle, at least 200 traces shall be averaged.
- (vii) If tests are performed with the EUT transmitting at a duty cycle less than 98 percent, a correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
 - **If power averaging (RMS) mode was used in step (iv) above, the correction factor is $10 \log(1/x)$, where x is the duty cycle.**

For example, if the transmit duty cycle was 50 percent, then 3 dB must be added to the measured emission levels.

 - If linear voltage averaging mode was used in step (iv) above, the correction factor is $20 \log(1/x)$, where x is the duty cycle. For example, if the transmit duty cycle was 50 percent, then 6 dB must be added to the measured emission levels.
 - If a specific emission is demonstrated to be continuous (100 percent duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

Please refer to Appendix II for the duty correction factor

