

Test Mode: 802.11n HT20 & Ch.100



Maximum Power Spectral Density









Test Mode: 802.11n HT20 & Ch.149



Maximum Power Spectral Density







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Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.38



Maximum Power Spectral Density





Test Mode: 802.11n HT40 & Ch.54



Maximum Power Spectral Density

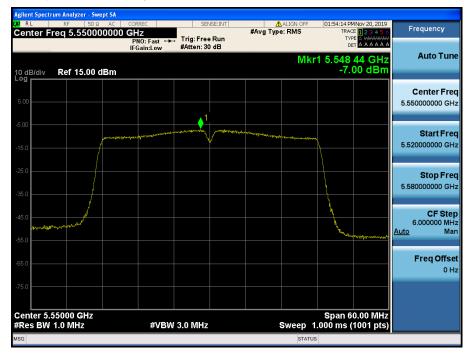




Test Mode: 802.11n HT40 & Ch.102



Maximum Power Spectral Density





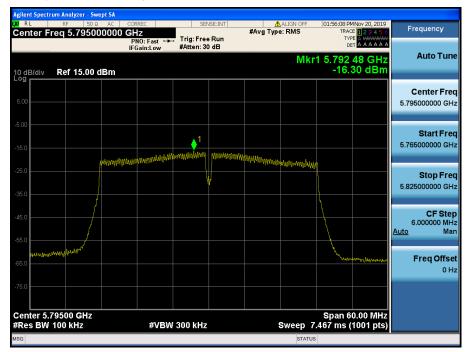




Test Mode: 802.11n HT40 & Ch.151



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Test Mode: 802.11ac VHT80 & Ch.42



Maximum Power Spectral Density



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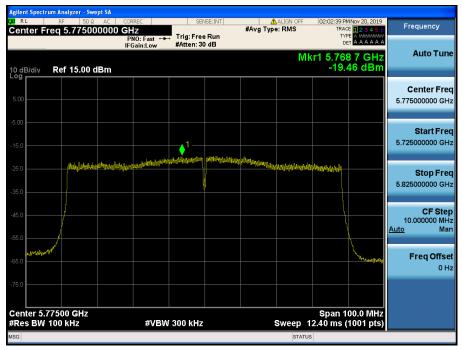
Test Mode: 802.11ac VHT80 & Ch.106



Maximum Power Spectral Density









8.5 Radiated Spurious Emission Measurements

Test Requirements

• FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
0.009 - 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

• FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	160.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	160.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	160.7 ~ 160.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240	3600 ~ 4000		
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

• FCC Part 15.205(b): The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

• FCC Part 15.407 (b): Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the **5.15-5.25 GHz band**: all emissions outside of the **5.15-5.35 GHz band** shall not exceed an **EIRP of -27 dBm/MHz**.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.



Test Configuration

Refer to the APPENDIX I.

Test Procedure

- 1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m.
- 2. The turn table shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 1m or 3 m away from the receiving antenna, which is varied from 1m to 4 m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.

Radiated spurious emission measured using following Measurement Procedure of KDB789033 D02v02r01

► General Requirements for Unwanted Emissions Measurements

The following requirements apply to all unwanted emissions measurements, both in and outside of the restricted bands:

- EUT Duty Cycle
 - (1) The EUT shall be configured or modified to transmit continuously except as stated in (ii), below. The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.
 - (2) If **continuous transmission (or at least 98 percent duty cycle) cannot be achieved** due to hardware limitations of the EUT (e.g., overheating), the following additions to the measurement and reporting procedures are required:
 - The EUT shall be configured to operate at the maximum achievable duty cycle.
 - Measure the duty cycle, x, of the transmitter output signal.
 - Adjustments to measurement procedures (e.g., increasing test time and number of traces averaged) shall be performed as described in the procedures below.
 - The test report shall include the following additional information:
 - ${\scriptstyle \circ}$ The reason for the duty cycle limitation.
 - The duty cycle achieved for testing and the associated transmit duration and interval between transmissions.
 - \circ The sweep time and the amount of time used for trace stabilization during max-hold measurements for peak emission measurements.
- (3) Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.



Measurements below 1000 MHz

- a) Follow the requirements in section II.G.3, "General Requirements for Unwanted Emissions Measurements".
- b) Compliance shall be demonstrated using **CISPR quasi-peak detection**; however, **peak detection** is permitted as an alternative to quasi-peak detection.

► 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 ≥ 3 MHz.
- (iii) Detector = RMS, if span / (# of points in sweep) ≤ 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

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Test Results:

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : 802.11a

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5147.77	V	Х	PK	51.52	3.06	N/A	N/A	54.58	74.00	19.42
	36 (5180 MHz)	5148.49	V	Х	AV	41.77	3.06	0.21	N/A	45.04	54.00	8.96
U-NII 1	· · · ·	10360.34	V	Х	PK	46.78	5.21	N/A	N/A	51.99	68.20	16.21
	40 (5200 MHz)	10400.35	V	Х	PK	47.63	5.29	N/A	N/A	52.92	68.20	15.28
	48 (5240 MHz)	10479.83	V	Х	PK	47.59	5.44	N/A	N/A	53.03	68.20	15.17
	52 (5260 MHz)	10519.88	V	Х	PK	46.89	5.54	N/A	N/A	52.43	68.20	15.77
	60	10599.59	V	Х	PK	46.08	5.79	N/A	N/A	51.87	74.00	22.13
	(5300 MHz)	10599.74	V	Х	AV	36.00	5.79	0.21	N/A	42.00	54.00	12.00
U-NII 2A		5350.53	V	Х	PK	51.75	3.28	N/A	N/A	55.03	74.00	18.97
	64	5350.27	V	Х	AV	40.99	3.28	0.21	N/A	44.48	54.00	9.52
	(5320 MHz)	10640.15	V	Х	PK	45.97	5.92	N/A	N/A	51.89	74.00	22.11
		10640.00	V	Х	AV	35.41	5.92	0.21	N/A	41.54	54.00	12.46

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result. - Calculation of distance factor = $20 \log(1 \text{ gplied distance / required distance}) = 20 \log(1 \text{ m / 3 m}) = -9.54 \text{ dB}$

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : 802.11a

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5458.27	V	Х	PK	48.94	3.72	N/A	N/A	52.66	74.00	21.34
		5458.49	V	Х	AV	38.88	3.72	0.21	N/A	42.81	54.00	11.19
	100 (5500 MHz)	5464.53	V	Х	PK	49.30	3.77	N/A	N/A	53.07	68.20	15.13
		10999.66	V	Х	PK	47.27	7.06	N/A	N/A	54.33	74.00	19.67
U-NII 2C		11000.06	V	Х	AV	36.67	7.06	0.21	N/A	43.94	54.00	10.06
	116	11159.85	V	Х	PK	47.53	7.41	N/A	N/A	54.94	74.00	19.06
	(5580 MHz)	11159.75	V	Х	AV	36.20	7.41	0.21	N/A	43.82	54.00	10.18
	144	11439.76	V	Х	PK	47.26	8.02	N/A	N/A	55.28	74.00	18.72
	(5720 MHz)	11440.13	V	Х	AV	36.10	8.02	0.21	N/A	44.33	54.00	9.67
		5714.11	V	Х	PK	52.19	3.65	N/A	N/A	55.84	68.20	12.36
	149	5718.86	V	Х	PK	50.93	3.74	N/A	N/A	54.67	78.20	23.53
	(5745 MHz)	11489.76	V	Х	PK	46.23	8.13	N/A	N/A	54.36	74.00	19.64
		11490.00	V	Х	AV	36.54	8.13	0.21	N/A	44.88	54.00	9.12
U-NII 3	157	11570.05	V	Х	PK	46.70	8.18	N/A	N/A	54.88	74.00	19.12
U-INII S	(5785 MHz)	11570.12	V	Х	AV	36.83	8.18	0.21	N/A	45.22	54.00	8.78
		5853.25	V	Х	PK	49.88	3.86	N/A	N/A	53.74	74.00	20.26
	165 (5825 MHz)	5861.45	V	Х	PK	49.19	3.88	N/A	N/A	53.07	74.00	20.93
		11649.90	V	Х	PK	46.90	8.21	N/A	N/A	55.11	74.00	18.89
		11649.92	V	Х	AV	36.99	8.21	0.21	N/A	45.41	54.00	8.59

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result. - Calculation of distance factor = $20 \log(1 \text{ gplied distance / required distance}) = 20 \log(1 \text{ m / 3 m}) = -9.54 \text{ dB}$

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit - Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL - AG

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : 802.11n(HT20)

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5148.81	V	Х	PK	52.39	3.06	N/A	N/A	55.45	74.00	18.55
	36 (5180 MHz)	5149.66	V	Х	AV	41.60	3.06	0.22	N/A	44.88	54.00	9.12
U-NII 1	· · · ·	10360.40	V	Х	PK	47.61	5.21	N/A	N/A	52.82	68.20	15.38
	40 (5200 MHz)	10400.09	V	Х	PK	47.07	5.29	N/A	N/A	52.36	68.20	15.84
	48 (5240 MHz)	10479.86	V	Х	PK	47.33	5.44	N/A	N/A	52.77	68.20	15.43
	52 (5260 MHz)	10520.02	V	Х	PK	47.28	5.54	N/A	N/A	52.82	68.20	15.38
	60	10600.23	V	Х	PK	48.30	5.79	N/A	N/A	54.09	74.00	19.91
	(5300 MHz)	10600.12	V	Х	AV	36.34	5.79	0.22	N/A	42.35	54.00	11.65
U-NII 2A		5350.73	V	Х	PK	51.16	3.28	N/A	N/A	54.44	74.00	19.56
	64 (5320 MHz)	5350.20	V	Х	AV	41.02	3.28	0.22	N/A	44.52	54.00	9.48
		10640.36	V	Х	PK	46.05	5.92	N/A	N/A	51.97	74.00	22.03
		10640.33	V	Х	AV	35.16	5.92	0.22	N/A	41.30	54.00	12.70

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result.

- Calculation of distance factor = 20 log(applied distance / required distance) = 20 log(1 m / 3 m) = -9.54 dB

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F + DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : <u>802.11n(HT20)</u>

капа	Tested																
	Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)					
		5458.15	V	Х	PK	49.25	3.72	N/A	N/A	52.97	74.00	21.03					
		5457.20	V	Х	AV	39.09	3.72	0.22	N/A	43.03	54.00	10.97					
(55	100 500 MHz)	5468.84	V	Х	PK	49.05	3.77	N/A	N/A	52.82	68.20	15.38					
	,	11000.30	V	Х	PK	46.72	7.06	N/A	N/A	53.78	74.00	20.22					
U-NII 2C		11000.15	V	Х	AV	36.35	7.06	0.22	N/A	43.63	54.00	10.37					
	116	11159.80	V	Х	PK	46.33	7.41	N/A	N/A	53.74	74.00	20.26					
(55	580 MHz)	11159.98	V	Х	AV	36.14	7.41	0.22	N/A	43.77	54.00	10.23					
	144	11440.32	V	Х	PK	46.42	8.02	N/A	N/A	54.44	74.00	19.56					
(57	(5720 MHz)	11439.88	V	Х	AV	35.45	8.02	0.22	N/A	43.69	54.00	10.31					
		5714.45	V	Х	PK	50.54	3.65	N/A	N/A	54.19	68.20	14.01					
	149	5724.06	V	Х	PK	52.29	3.74	N/A	N/A	56.03	78.20	22.17					
(57	745 MHz)	11490.36	V	Х	PK	47.35	8.13	N/A	N/A	55.48	74.00	18.52					
		11489.95	V	Х	AV	36.71	8.13	0.22	N/A	45.06	54.00	8.94					
U-NII 3	157	11569.83	V	Х	PK	46.81	8.18	N/A	N/A	54.99	74.00	19.01					
U-INII 3 (57	785 MHz)	11569.98	V	Х	AV	36.77	8.18	0.22	N/A	45.17	54.00	8.83					
		5856.82	V	Х	PK	49.28	3.86	N/A	N/A	53.14	78.20	25.06					
	165	5860.46	V	Х	PK	48.72	3.88	N/A	N/A	52.60	68.20	15.60					
(58	825 MHz)	11650.36	V	Х	PK	46.89	8.21	N/A	N/A	55.10	74.00	18.90					
		11650.08	V	Х	AV	36.80	8.21	0.22	N/A	45.23	54.00	8.77					

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result. - Calculation of distance factor = 20 log(applied distance / required distance) = $20 \log(1 \text{ m} / 3 \text{ m}) = -9.54 \text{ dB}$

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F + DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : 802.11n(HT40)

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5149.64	V	Х	PK	51.26	3.06	N/A	N/A	54.32	74.00	19.68
	38 (5190 MHz)	5149.71	V	Х	AV	41.08	3.06	0.44	N/A	44.58	54.00	9.42
U-NII 1	. ,	10379.99	V	Х	PK	47.26	5.25	N/A	N/A	52.51	68.20	15.69
	46 (5230 MHz)	10459.99	V	Х	PK	47.48	5.40	N/A	N/A	52.88	68.20	15.32
	54 (5270 MHz)	10540.11	V	Х	PK	46.66	5.60	N/A	N/A	52.26	68.20	15.94
		5351.41	V	Х	PK	51.93	3.28	N/A	N/A	55.21	74.00	18.79
U-NII 2A	62	5351.85	V	Х	AV	41.20	3.28	0.44	N/A	44.92	54.00	9.08
	(5310 MHz)	10620.29	V	Х	PK	46.83	5.85	N/A	N/A	52.68	74.00	21.32
		10619.85	V	Х	AV	36.08	5.85	0.44	N/A	42.37	54.00	11.63

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result.

- Calculation of distance factor = 20 log(applied distance / required distance) = 20 log(1 m / 3 m) = -9.54 dB

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit - Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL - AG

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : 802.11n(HT40)

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5456.46	V	Х	PK	48.89	3.72	N/A	N/A	52.61	74.00	21.39
		5457.29	V	Х	AV	39.36	3.72	0.44	N/A	43.52	54.00	10.48
	102 (5510 MHz)	5461.91	V	Х	PK	48.26	3.77	N/A	N/A	52.03	68.20	16.17
	· · · ·	11019.98	V	Х	PK	46.30	7.10	N/A	N/A	53.40	74.00	20.60
U-NII 2C		11019.81	V	Х	AV	36.19	7.10	0.44	N/A	43.73	54.00	10.27
	110	11100.21	V	Х	PK	46.45	7.28	N/A	N/A	53.73	74.00	20.27
	(5550 MHz)	11100.10	V	Х	AV	36.10	7.28	0.44	N/A	43.82	54.00	10.18
	142	11419.80	V	Х	PK	46.25	7.98	N/A	N/A	54.23	74.00	19.77
	(5710 MHz)	11420.00	V	Х	AV	36.06	7.98	0.44	N/A	44.48	54.00	9.52
		5713.35	V	Х	PK	50.98	3.65	N/A	N/A	54.63	68.20	13.57
	151	5723.50	V	Х	PK	52.91	3.74	N/A	N/A	56.65	78.20	21.55
	(5755 MHz)	11510.02	V	Х	PK	45.78	8.16	N/A	N/A	53.94	74.00	20.06
U-NII 3		11510.06	V	Х	AV	35.92	8.16	0.44	N/A	44.52	54.00	9.48
U-INII 3		5853.84	V	Х	PK	49.05	3.86	N/A	N/A	52.91	78.20	25.29
	159 (5795 MHz)	5861.82	V	Х	PK	49.65	3.88	N/A	N/A	53.53	68.20	14.67
		11590.16	V	Х	PK	46.33	8.19	N/A	N/A	54.52	74.00	19.48
		11590.07	V	Х	AV	36.39	8.19	0.44	N/A	45.02	54.00	8.98

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result. - Calculation of distance factor = $20 \log(1 \text{ gplied distance / required distance}) = 20 \log(1 \text{ m / 3 m}) = -9.54 \text{ dB}$

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit - Result / Result = Reading + T.F + DCCF + DCF / T.F = AF + CL - AG

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : 802.11ac(VHT80)

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5149.72	V	Х	PK	52.95	3.06	N/A	N/A	56.01	74.00	17.99
U-NII 1	42 (5210 MHz)	5149.62	V	Х	AV	41.30	3.06	0.87	N/A	45.23	54.00	8.77
	· · · ·	10419.96	V	Х	PK	46.94	5.32	N/A	N/A	52.26	68.20	15.94
		5354.42	V	Х	PK	50.62	3.28	N/A	N/A	53.90	74.00	20.10
U-NII 2A	58 (5290 MHz)	5353.99	V	Х	AV	39.36	3.28	0.87	N/A	43.51	54.00	10.49
	·	10580.11	V	Х	PK	46.80	5.73	N/A	N/A	52.53	68.20	15.67

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result. - Calculation of distance factor = $20 \log(1 \text{ gplied distance / required distance}) = 20 \log(1 \text{ m / 3 m}) = -9.54 \text{ dB}$

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

4. The limit is converted to field strength.

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) 802.11ac(VHT80)

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		5456.91	V	Х	PK	49.53	3.72	N/A	N/A	53.25	74.00	20.75
		5457.72	V	Х	AV	39.34	3.72	0.87	N/A	43.93	54.00	10.07
	106 (5530 MHz)	5468.40	V	Х	PK	50.76	3.77	N/A	N/A	54.53	68.20	13.67
U-NII 2C	· · · ·	11060.02	V	Х	PK	46.59	7.19	N/A	N/A	53.78	74.00	20.22
		11060.14	V	Х	AV	36.25	7.19	0.87	N/A	44.31	54.00	9.69
	138	11379.84	V	Х	PK	46.87	7.89	N/A	N/A	54.76	74.00	19.24
	(5690 MHz)	11380.09	V	Х	AV	35.92	7.89	0.87	N/A	44.68	54.00	9.32
		5713.60	V	Х	PK	52.23	3.65	N/A	N/A	55.88	68.20	12.32
		5719.04	V	Х	PK	53.00	3.74	N/A	N/A	56.74	78.20	21.46
	155	5852.32	V	Х	PK	48.85	3.86	N/A	N/A	52.71	78.20	25.49
0-1111 3	U-NII 3 (5775 MHz)	5866.70	V	Х	PK	49.20	3.88	N/A	N/A	53.08	68.20	15.12
		11549.59	V	Х	PK	46.77	8.17	N/A	N/A	54.94	74.00	19.06
		11549.89	V	Х	AV	37.09	8.17	0.87	N/A	46.13	54.00	7.87

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.

2. Information of Distance Factor

For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor (-9.54 dB) is applied to the result. - Calculation of distance factor = 20 log(applied distance / required distance) = $20 \log(1 \text{ m / } 3 \text{ m}) = -9.54 \text{ dB}$

When distance factor is "N/A", the distance is 3 m and distance factor is not applied.

3. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F + DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

```
4. The limit is converted to field strength.
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8.6 AC Conducted Emissions

Test Requirements and limit, §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

	Conducted	Limit (dBuV)
Frequency Range (MHz)	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

NA

Test Procedure

Conducted emissions from the EUT were measured according to the ANSI C63.10-2013.

1. The test procedure is performed in a 6.5 m \times 3.5 m \times 3.5 m (L \times W \times H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) \times 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.

3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.

4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

Test Results: NA

9. LIST OF TEST EQUIPMENT

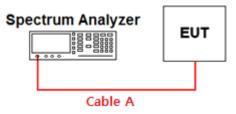
Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	19/06/26	20/06/26	US47360812
Spectrum Analyzer	Agilent Technologies	N9020A	18/12/19	19/12/19	MY48011700
Spectrum Analyzer	Agilent Technologies	N9030A	19/03/15	20/03/15	MY53310140
Spectrum Analyzer	Agilent Technologies	N9020A	19/06/26	20/06/26	MY46471251
DC Power Supply	Agilent Technologies	66332A	18/12/19	19/12/19	US37476998
DC Power Supply	SM techno	SDP30-5D	19/06/24	20/06/24	305DMG305
Multimeter	FLUKE	17B	18/12/18	19/12/18	26030065WS
Signal Generator	Rohde Schwarz	SMBV100A	18/12/19	19/12/19	255571
Signal Generator	ANRITSU	MG3695C	18/12/10	19/12/10	173501
Thermohygrometer	BODYCOM	BJ5478	18/12/27	19/12/27	120612-1
Thermohygrometer	BODYCOM	BJ5478	18/12/27	19/12/27	120612-2
Thermohygrometer	BODYCOM	BJ5478	19/07/03	20/07/03	N/A
Loop Antenna	Schwarzbeck	FMZB1513	18/01/30	20/01/30	1513-128
BILOG ANTENNA	Schwarzbeck	VULB 9160	19/04/23	21/04/23	9160-3362
Horn Antenna	ETS-Lindgren	3115	18/01/30	20/01/30	6419
Horn Antenna	Schwarzbeck	BBHA 9120C	17/12/04	19/12/04	9120C-561
Horn Antenna	A.H.Systems Inc.	SAS-574	19/07/03	21/07/03	155
PreAmplifier	tsj	MLA-0118-J01-45	18/12/19	19/12/19	17138
PreAmplifier	tsj	MLA-1840-J02-45	19/06/27	20/06/27	16966-10728
PreAmplifier	H.P	8447D	18/12/18	19/12/18	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000- 15000-40SS	19/06/26	20/06/26	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300- 18000-60SS	19/06/26	20/06/26	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	19/06/27	20/06/27	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	19/06/27	20/06/27	16012202
Attenuator	SRTechnology	F01-B0606-01	19/06/27	20/06/27	13092403
Attenuator	Aeroflex/Weinschel	20515	19/06/27	20/06/27	Y2370
Attenuator	SMAJK	SMAJK-2-3	19/06/27	20/06/27	2
Attenuator	SMAJK	SMAJK-50-10	19/06/25	20/06/25	15081903
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	18/12/19	19/12/19	1338004 1306053
EMI Receiver	ROHDE&SCHWARZ	ESW44	19/07/30	20/07/30	101645
Cable	Junkosha	MWX241	19/01/14	20/01/14	G-04
Cable	Junkosha	MWX241	19/01/14	20/01/14	G-07
Cable	DT&C	Cable	19/01/14	20/01/14	G-13
Cable	DT&C	Cable	19/01/14	20/01/14	G-14
Cable	HUBER+SUHNER	SUCOFLEX 104	19/01/14	20/01/14	G-15
Cable	Radiall	TESTPRO3	19/01/16	20/01/16	M-01
Cable	Junkosha	MWX315	19/01/16	20/01/16	M-05
Cable	Junkosha	MWX221	19/01/16	20/01/16	M-06
Cable	Radiall	TESTPRO3	19/01/15	20/01/15	RF-65
Test Software	tsj	Radiated Emission Measurement	N/A	N/A	Version 2.00.0177

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017

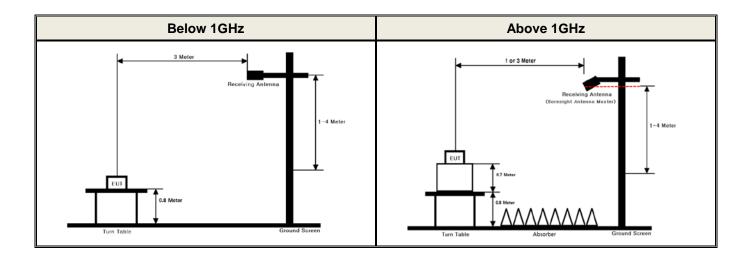
Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

APPENDIX I

- Test set up Diagram
- Conducted Measurement



Radiated Measurement





APPENDIX II

Duty Cycle Information

Test Procedure

Duty Cycle [X = On Time / (On + Off time)] is measured using Measurement Procedure of KDB789033 D02v02r01

- 1. Set the center frequency of the spectrum analyzer to the center frequency of the transmission.
- 2. Set RBW \geq EBW if possible; otherwise, set RBW to the largest available value.
- 3. Set VBW \geq RBW. Set detector = peak.
- 4. Note : The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in section II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)
 - T: The minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
 - (*T* = On time of the above table since the EUT operates with above fixed Duty Cycle and it is the minimum On time)

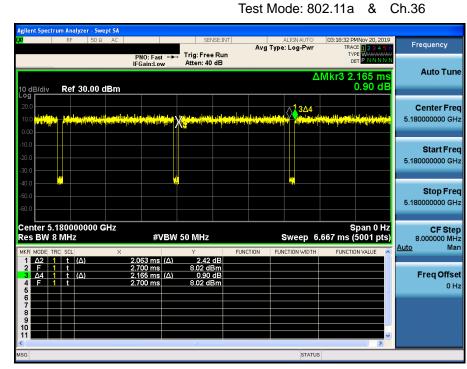
Test Results:

Duty cycle

Mode	Data	Tested Frequency		aximum Achievabl Cycle (<i>x</i>) = On / (On	Duty Cycle Correction	50/ <i>T</i>	
	Rate	[MHz]	On Time [ms]	(On+Off) Time [ms]	x	Factor [dB]	[kHz]
802.11a	6Mbps	5180	2.063	2.165	0.9529	0.21	24.24
802.11n (HT20)	MCS0	5180	1.920	2.021	0.9500	0.22	26.04
802.11n (HT40)	MCS0	5190	0.943	1.044	0.9030	0.44	53.04
802.11ac (VHT80)	MCS0	5210	0.460	0.561	0.8190	0.87	108.79

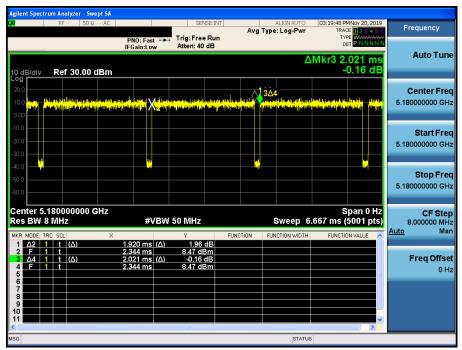


Single Transmit



Duty Cycle

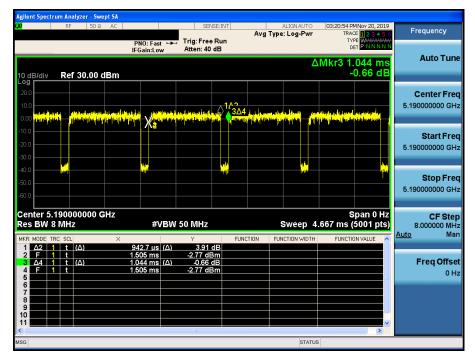
Test Mode: 802.11n HT20 & Ch.36



Duty Cycle

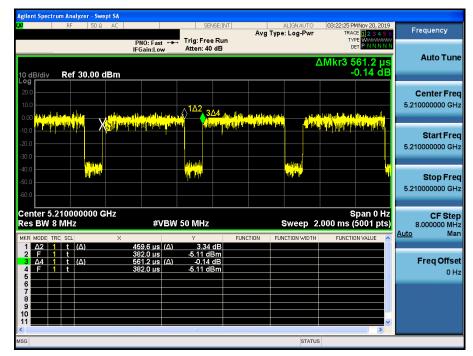
Dt&C

Test Mode: 802.11n HT40 & Ch.38



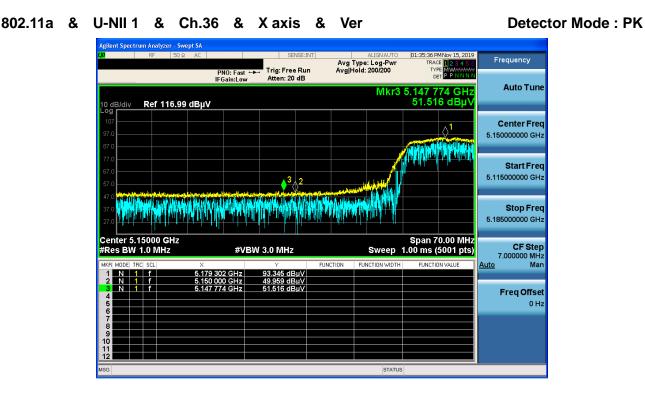
Duty Cycle

Duty Cycle



APPENDIX III

Unwanted Emissions (Radiated) Test Plot



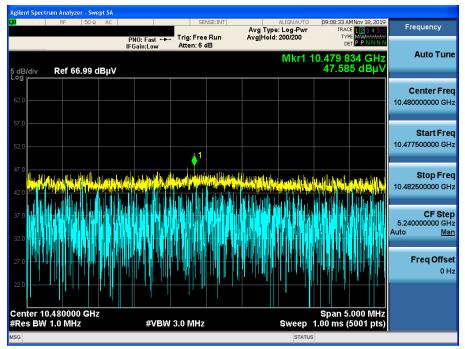
802.11a & U-NII 1 & Ch.36 & X axis & Ver

Detector Mode : AV

RF 50 S	2 AC PNO: 1	SENSE:I Fast ↔ Trig: Free Ru	Avg Type: RMS	01:33:22 PMNov 15, 2019 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
0 dB/div Ref 116.9	IFGain		Mkr3	5.148 488 GHz 41.772 dBμV	Auto Tun
9g 107 17.0					Center Fre 5.150000000 GH
7.0		3 2			Start Fre 5.115000000 GH
7.0		₹ ₩			Stop Fre 5.185000000 GF
enter 5.15000 GHz Res BW 1.0 MHz KR MODE TRC SCL	X	#VBW 3.0 MHz*	Sweep	Span 70.00 MHz 1.00 ms (5001 pts) FUNCTION VALUE	CF Ste 7.000000 Mi <u>Auto</u> Mi
1 N 1 f 2 N 1 f 3 N 1 f 4 5 6	5.179 302 G 5.150 000 G 5.148 488 G	Hz 41.038 dBµV			Freq Offs 0 H
7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					
3			STATU		



802.11a & U-NII 1 & Ch.48 & X axis & Ver

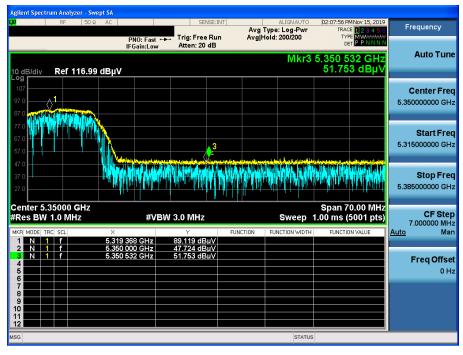


Detector Mode : PK

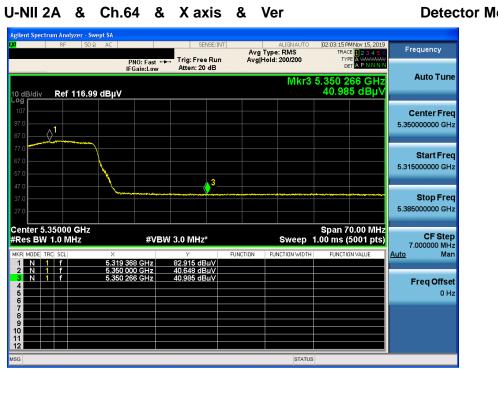
🛈 Dt&C

Detector Mode : PK

802.11a & U-NII 2A & Ch.64 & X axis & Ver



802.11a & U-NII 2A & Ch.64 & X axis & Ver



Detector Mode : AV



Detector Mode : AV

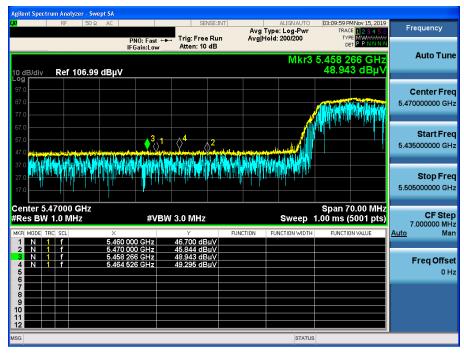
802.11a & U-NII 2A & Ch.60 & X axis & Ver

u 🛛	1	٩F	50 Ω	AC				SENSE:INT	ALIGN AU		8 AM Nov 18, 2019	Frequency
					PNO: F IFGain:	ast ↔► Low	. Trig: Fr Atten:	ee Run 6 dB	Type: RMS Hold: 200/200	Π	RACE 123456 TYPE A WARANAN DET A P N N N N	Frequency
dB/div	R	ef 66.	.99 d	BμV					Mkr	10.599 36.0	744 GHz 004 dBµV	Auto Tu
52.0												Center Fr 10.60000000 G
57.0												Start Fr
52.0												10.597500000 G
17.0												Stop Fr 10.602500000 G
17.0	يد ا بقامان			الدارد الدعام			1					CF St 5.30000000 G
12.0		A STOLEN				. Alimite			yelabile boton'i yittidile	, Algebrand (1993) Algebrand (1993) Algebrand (1993)	while the share of the second second	Auto <u>M</u>
27.0												Freq Offs 0
22.0												
	10.60 W 1.0					#VBW	13.0 MH	z*	Swee	Span 0 1.00 m	5.000 MHz s (5001 pts)	



802.11a & U-NII 2C & Ch.100 & X axis & Ver

Detector Mode : PK



802.11a & U-NII 2C & Ch.100 & X axis & Ver

Detector Mode : AV





Detector Mode : AV

802.11a & U-NII 2C & Ch.144 & X axis & Ver

1	RF	50 \$	2 AC		SE	NSE:INT		ALIGN AUTO	12:49:38 PM		Frequency
				PNO: Fast ↔ IFGain:Low	Trig: Fre			pe: RMS ld: 200/200	TRACE TYPE DET	123456 A <mark>WAANAA</mark> A P N N N N	
dB/div	Re	f 66.99	dBµV					Mkr1 1	1.440 12 36.102		Auto Tu
i2.0											Center Fr 11.440000000 G
i7.0 i2.0											Start Fr 11.437500000 G
17.0											Stop Fr 11.442500000 G
7.0	hter and the state of the state	angle billing and an	State And State Address of the	mhthan taeth	a _n der yw ar fwllendel y 11	1	***********************	Weep State on Lafe and a state	an sitt da met and databa	(helenandroid)	CF St 5.720000000 G
12.0											Auto <u>M</u> Freq Offs
2.0											0
	11.440 W 1.0 I	000 GH VIH7	z	#\/B)/	V 3.0 MHz	*		Sween	Span 5.0 1.00 ms (50	00 MHz	

Detector Mode : PK



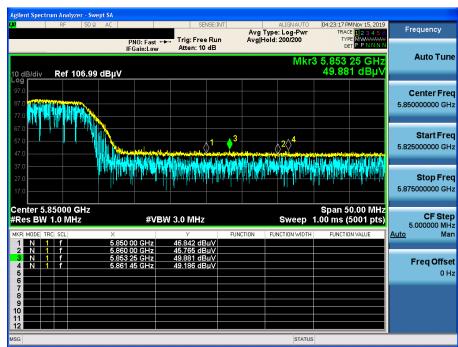
802.11a &

U-NII 3 & Ch.149 & X axis & Ver

Frequency Avg Type: Log-Pwi Avg|Hold: 200/200 Trig: Free Run Atten: 10 dB TYPE DE PNO: Fast + IFGain:Low Auto Tune 5.714 11 GH 52.187 dBµ` Mkr3 Ref 106.99 dBµV **Center Freq** 5.725000000 GHz 11,150 Start Freq ð 5.700000000 GHz Stop Freq 5.750000000 GHz Center 5.72500 GHz #Res BW 1.0 MHz Span 50.00 MHz 1.00 ms (5001 pts) CF Step 5.000000 MHz #VBW 3.0 MHz Sweep Auto Mar EUNCTION FUN Freq Offset 0 Hz 11 12 STATUS

802.11a & U-NII 3 & Ch.165 & X axis & Ver

Detector Mode : PK





Detector Mode : AV

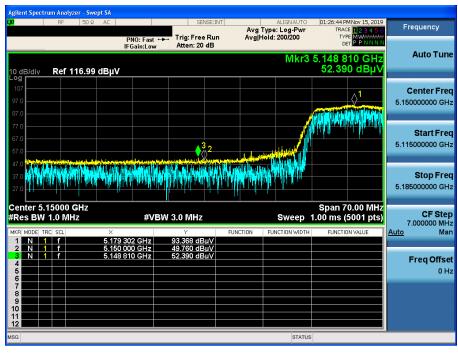
802.11a & U-NII 3 & Ch.165 & X axis & Ver

1	RF	50Ω AC		SE	NSE:INT		ALIGN AUTO	02:11:53 PM Nov 18, 20	
			PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 6		Avg Typ Avg Hold	e: RMS I: 200/200	TRACE 1 2 3 4 TYPE A WANNA DET A P N N	
dB/div	Ref 66	δ.99 dΒμV					Mkr1 ′	11.649 921 GF 36.987 dBµ	
52.0									Center Fre 11.65000000 GH
57.0 52.0									Start Fre
17.0									Stop Fro 11.652500000 G
	horan (ang tang tang tang tang tang tang tang t	1]{+++===bil]+++++[+]=++	herious for the state	é a construir de c	1 M ^{arka} ti ^s iliterisi	the most market of the	the state to be being a	yersensistenseerikkeijakseerikke	CF Ste 5.825000000 GI Auto M
32.0 27.0									Freq Offs
22.0									
	1.650000 / 1.0 MH:		#VBM	/ 3.0 MHz	*		Sweep	Span 5.000 MH 1.00 ms (5001 pt	lz s)



802.11n(HT20) & U-NII 1 & Ch.36 & X axis & Ver

Detector Mode : PK

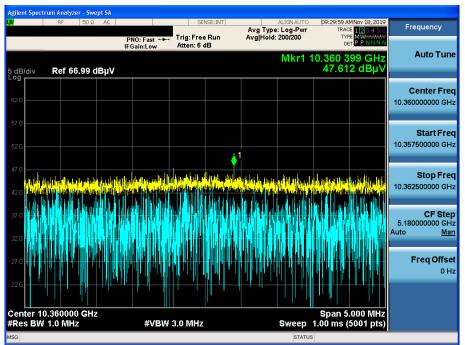


802.11n(HT20) & U-NII 1 & Ch.36 & X axis & Ver



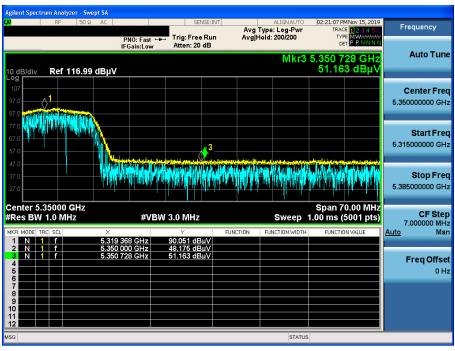


802.11n(HT20) & U-NII 1 & Ch.36 & X axis & Ver





802.11n(HT20) & U-NII 2A & Ch.64 & X axis & Ver



802.11n(HT20) & U-NII 2A & Ch.64 & X axis & Ver

Detector Mode : AV

Frequency Avg Type: RMS Avg|Hold: 200/200 Trig: Free Run Atten: 20 dB TYPE PNO: Fast + IFGain:Low Auto Tune Mkr3 5.350 196 GHz 41.015 dBµ\ Ref 116.99 dBµV **Center Freq** 5.350000000 GHz \Diamond^1 Start Freq 5.315000000 GHz 3 Stop Freq 5.385000000 GHz Center 5.35000 GHz #Res BW 1.0 MHz Span 70.00 MHz 1.00 ms (5001 pts) CF Step 7.000000 MHz Man #VBW 3.0 MHz* Sweep Auto FUNCTION 83.185 dBμV 40.221 dBμV 41.015 dBμV <u>5.319 368 GHz</u> 5.350 000 GHz 5.350 196 GHz Freq Offset 0 Hz 10



Detector Mode : AV

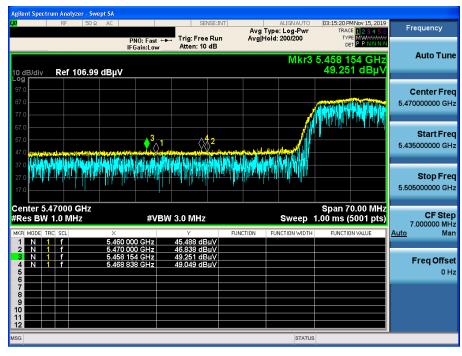
802.11n(HT20) & U-NII 2A & Ch.60 & X axis & Ver

	RF	50 Ω AC			SENSE:INT		ALIGN AUTO	10:49:07 AM Nov 18, 20	
			PNO: Fast IFGain:Low		ree Run 6 dB	Avg Typ Avg Hold		TRACE 1 2 3 4 5 TYPE A WHITE DET A P N N	Frequency
dB/div	Ref 66	.99 dBµV	,				Mkr1 1	0.600 123 GH 36.339 dBµ	Z Auto Tur
2.0									Center Fre 10.60000000 GH
2.0									Start Fre 10.597500000 GF
2.0									Stop Fro 10.602500000 G
7.0 1/1/1/04 2.0		h Mangang Magang King King King King King King King Ki	1874,18 ^{1,1} 8 ^{1,1} 84,144,184,184,184	atery and a state of the	nifingstwisterley,	pel fotbleg vol fill a best given	i for the second se	lanningsalanasyanasya	CF Ste 5.300000000 GI Auto <u>M</u>
7.0									Freq Offs 01
	0.600000 1.0 MHz			BW 3.0 MI				Span 5.000 MH 1.00 ms (5001 pt	IZ



802.11n(HT20) & U-NII 2C & Ch.100 & X axis & Ver

Detector Mode : PK



802.11n(HT20) & U-NII 2C & Ch.100 & X axis & Ver

Detector Mode : AV

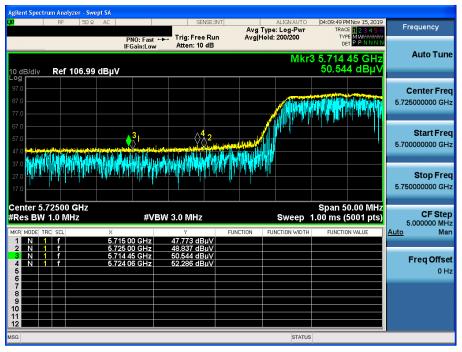
Avg Type: RMS Avg|Hold: 200/200 Frequency TRAC Trig: Free Run Atten: 10 dB TYPE PNO: Fast IFGain:Low Auto Tune Mkr3 5.457 202 GH: 39.094 dBµ\ Ref 106.99 dBµV **Center Freq** 5.470000000 GHz Start Freq 5.435000000 GHz ³ ¹√¹ Stop Freq 5.50500000 GHz Center 5.47000 GHz #Res BW 1.0 MHz Span 70.00 MHz 1.00 ms (5001 pts) CF Step 7.000000 MHz #VBW 3.0 MHz* Sweep Auto Man FUNCTION <u>194 dBµ∖</u> 242 dBµ∖ Freq Offset 0 Hz

802.11n(HT20) & U-NII 2C & Ch.116 & X axis & Ver

	RF	50 Ω AC		SEM	ISE:INT		ALIGN AUTO		Nov 18, 2019	Frequency
			PNO: Fast 🕶	. Trig: Free	Run	Avg Type Avg Hold:		TRACE TYPE	123456 A P N N N N	Frequency
			IFGain:Low	Atten: 6 c				DET	APNNNN	
							Mkr1	11.159 97	75 GHz	Auto Tun
dB/div	Ref 66.9	99 dBµV						36,139)dBµV	
^{og}										0
2.0										Center Fre 11.16000000 GH
2.0										11.16000000 GF
7.0										
										Start Fre
2.0										11.157500000 GH
7.0										Oton Fra
										Stop Fre 11.162500000 GH
2.0										11.10200000 GP
				â	1					
7.0			و والدور في ال	a sette and a first state of the	la di suta su a	a referent				CF Ste 5.58000000 GH
		ente data da fan de antes o	ner series and the series of t	All of the later of the second second	and a part of the second	1876-1987-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	and here and the second	international and the second	atti and a state of the state o	Auto Ma
2.0										
										Freq Offs
7.0										01
2.0										
	.160000	GHz						Span 5.	000 MHz	
Res BW	1.0 MHz		#VBW	3.0 MHz			Sweep	1.00 ms (5	001 pts)	
G							STATU	S		



802.11n(HT20) & U-NII 3 & Ch.149 & X axis & Ver



802.11n(HT20) & U-NII 3 & Ch.165 & X axis & Ver



Frequency Avg Type: Log-Pwi Avg|Hold: 200/200 Trig: Free Run Atten: 10 dB TYPE DE1 PNO: Fast IFGain:Low Auto Tune Mkr3 5.856 82 GH 49.278 dBµ Ref 106.99 dBµV **Center Freq** 5.850000000 GHz Start Freq 13 5.825000000 GHz indiana ar frankrigen i talar <u>iu</u>lh inde de la de l Stop Freq 5.875000000 GHz Center 5.85000 GHz #Res BW 1.0 MHz Span 50.00 MHz 1.00 ms (5001 pts) CF Step 5.000000 MHz #VBW 3.0 MHz Sweep Mar Auto 45.389 dBµV 49.278 dBµV 48.719 dBµV Freq Offset Ň 0 Hz



Detector Mode : AV

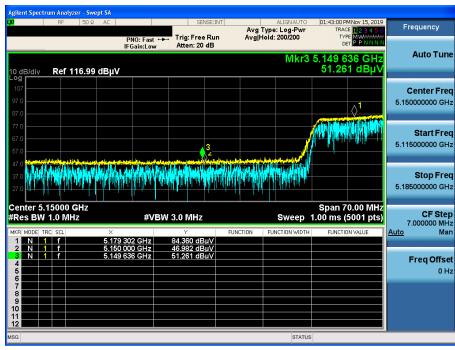
802.11n(HT20) & U-NII 3 & Ch.165 & X axis & Ver

U	RF 50 Ω	2 AC		SEI	VSE:INT		ALIGN AUTO	02:26:13 PM No		Frequency
			PNO: Fast 🔸	Trig: Free Atten: 6 d		Avg Type Avg Hold		TRACE TYPE A DET A	23456 PNNNN	
dB/div	Ref 66.99	dBµV					Mkr1 1	1.650 078 36.802		Auto Tur
										Center Fre
62.0										11.650000000 GI
57.0										Start Fr
52.0										11.647500000 G
47.0										Stop Fr
12.0										11.652500000 G
37.0					∮ ¹					CF Ste
	all which and the state of the state	uliptopy the sec	te alle suited and the set	وللبطاط ومعادمهم الملاجه والمعالم	hell hill be a second and the second	and the spectra second	antoine nightainte	and the state of the	riigiaalir ("langa)	5.825000000 G Auto <u>M</u>
52.0										
27.0										Freq Offs 0
22.0										
enter 1	1.650000 GH	z						Span 5.00	0 MHz	
Res BW	1.0 MHz		#VBW	3.0 MHz*			Sweep	1.00 ms (50		



802.11n(HT40) & U-NII 1 & Ch.38 & X axis & Ver

Detector Mode : PK

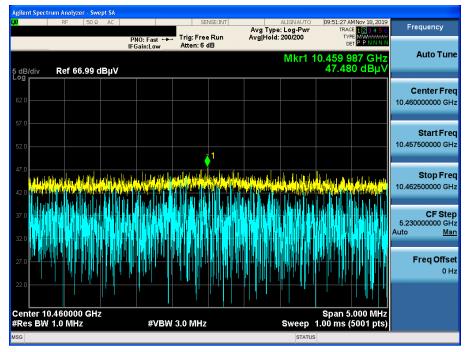


802.11n(HT40) & U-NII 1 & Ch.38 & X axis & Ver



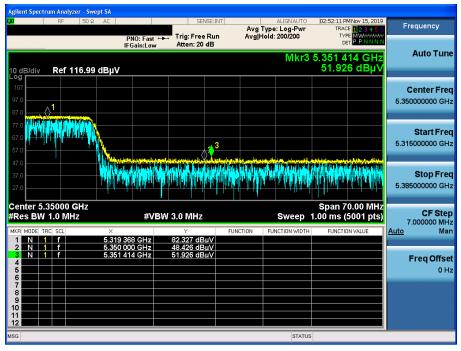


802.11n(HT40) & U-NII 1 & Ch.46 & X axis & Ver





802.11n(HT40) & U-NII 2A & Ch.62 & X axis & Ver



802.11n(HT40) & U-NII 2A & Ch.62 & X axis & Ver





Detector Mode : AV

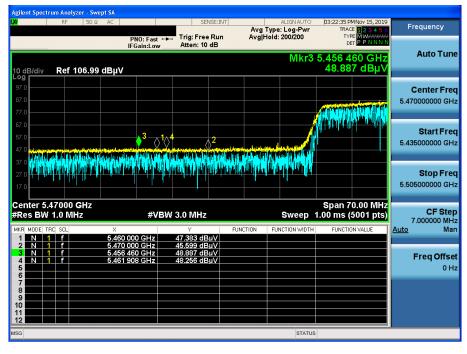
802.11n(HT40) & U-NII 2A & Ch.62 & X axis & Ver

KI (RF 50Ω AC	PNO: Fast ↔	SENSE:IN Trig: Free Run Atten: 6 dB	Avg Ty	ALIGN AUTO pe: RMS id: 200/200	11:03:25 AM Nov 18, 2019 TRACE 1 2 3 4 5 6 TYPE A 444444 DET A P. N.N.N.N	Frequency
5 dB/div	Ref 66.99 dBµV	IFGain:Low	Atten: 6 dB		Mkr1 1	0.619 849 GHz 36.084 dBµV	Auto Tur
- og 62.0							Center Fr 10.620000000 G
57.0							Start Fr 10.617500000 G
47.0							Stop Fr 10.622500000 G
37.0 <mark>Mrhuhyk</mark> 32.0	han an a	arabapady waattawaa	€1 Whateston/fromh	han mi katan ni maya	gunaya (manistir)	Ref. 1-10-10-10-10-10-10-10-10-10-10-10-10-10	CF St 5.310000000 G Auto <u>M</u>
27.0							Freq Offs 0
Center 10	0.620000 GHz 1.0 MHz	<i>#</i>)(5))	3.0 MHz*		.	Span 5.000 MHz 1.00 ms (5001 pts)	

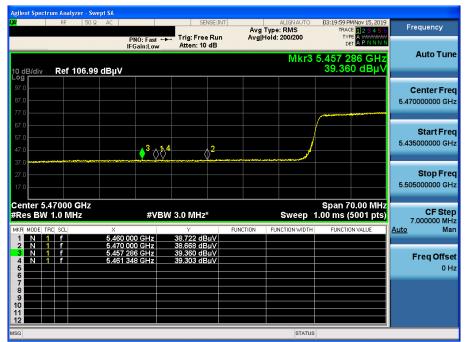


802.11n(HT40) & U-NII 2C & Ch.102 & X axis & Ver

Detector Mode : PK



802.11n(HT40) & U-NII 2C & Ch.102 & X axis & Ver Detector Mode : AV





802.11n(HT40) & U-NII 2C & Ch.142 & X axis & Ver

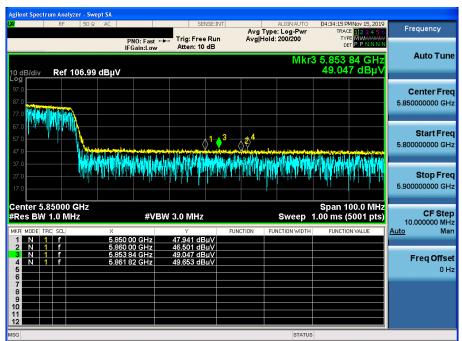
Agilent Spect <mark>XI</mark>	rum Analyzer - Swept Si RF 50 Ω AC		SENSE:INT	ALIGN A Avg Type: RMS Avg Hold: 200/20	TRACE 123456	Frequency
5 dB/div	Ref 66.99 dBµ	IFGain:Low	Atten: 6 dB	0.	r1 11.419 995 GHz 36.061 dBµV	Auto Tune
62.0						Center Fred 11.420000000 GH:
57.0						Start Free 11.417500000 GH
47.0						Stop Fre 11.422500000 GH
37.0 6.1 00 32.0	hensidet discher gesternet dasser	ะเข้อรู้เขาเข้านู้จู้ให้เห็นจะเหมือจะเป็นได้เห	1 Alexy Sector of the Sector	iedensprisededselsessessessesses	dada artikat da setu diga kili da sekara tirak kili ya sekara tara	CF Ste 5.710000000 GH Auto <u>Ma</u>
27.0						Freq Offse 0 ⊢
	1.420000 GHz 1.0 MHz	#VBW	3.0 MHz*	Swe	Span 5.000 MHz ep 1.00 ms (5001 pts)	
ISG					TATUS	



802.11n(HT40) & U-NII 3 & Ch.151 & X axis & Ver

Frequency Avg Type: Log-Pwr Avg|Hold: 200/200 Trig: Free Run Atten: 10 dB TYPE DET PNO: Fast +++ IFGain:Low Auto Tune Mkr3 5.713 35 GH: 50.977 dBµ\ Ref 106.99 dBµV **Center Freq** 5.725000000 GHz Start Freq <mark>♦</mark>³ (5.70000000 GHz al A. dau talilea dh AN DING ALLAND Stop Freq 5.750000000 GHz Span 50.00 MHz Sweep 1.00 ms (5001 pts) Center 5.72500 GHz CF Step 5.000000 MHz Man BW 1.0 MHz #VBW 3.0 MHz Auto 49.372 dBµV 48.644 dBµV 50.977 dBµV 52.911 dBµV **Freq Offset** 0 Hz 9 10 11 12 STATUS

802.11n(HT40) & U-NII 3 & Ch.159 & X axis & Ver Detector Mode : PK



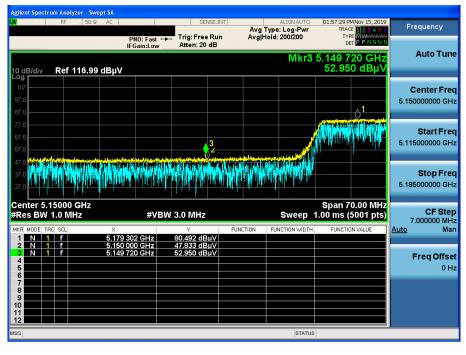


802.11n(HT40) & U-NII 3 & Ch.159 & X axis & Ver

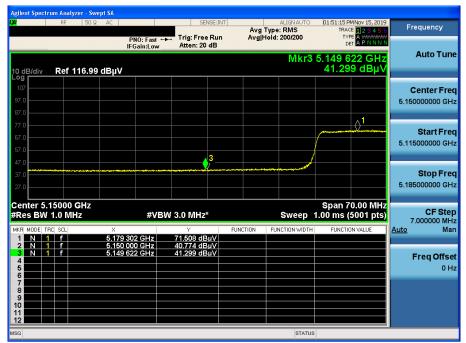
	RF 50 Ω	AC		SE	NSE:INT		ALIGN AUTO	03:00:39 PMNov 18, 2019	
			PNO: Fast 🔸	Trig: Free Atten: 6		Avg Type Avg Hold:		TRACE 1 2 3 4 5 TYPE A WWWW DET A P N N N	Frequency
dB/div	Ref 66.99 d	Βμ∨					Mkr1 ′	11.590 066 GHz 36.385 dBµ\	Auto Tur
52.0									Center Fre 11.590000000 GH
52.0									Start Fre 11.587500000 GF
47.0									Stop Fro 11.592500000 Gi
37.0 ••••••••••••••••••••••••••••••••••••	shangan ng kang kang kang kang kang kang k	wydrydynaniger	te fangelik fersonerts	n an il ange wil in a participation in the	€ ¹ nu ^t uringkl _e ng _{(K}	hidiptoriantation	ntransformation of the	n-veigenselveliken versenderer	CF Ste 5.795000000 GI Auto <u>M</u>
27.0									Freq Offs 01
22.0	1.590000 GHz							Span 5.000 MHz	
	1.0 MHz		#VBW	3.0 MHz	*		Sweep	1.00 ms (5001 pts	

802.11ac(VHT80) & U-NII 1 & Ch.42 & X axis & Ver

Detector Mode : PK

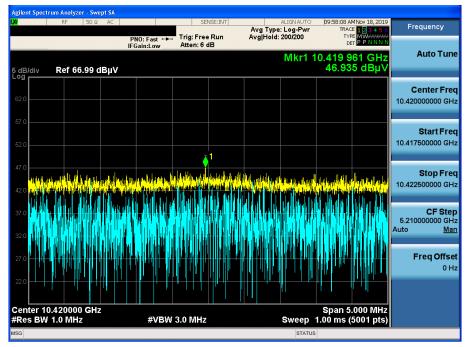


802.11ac(VHT80) & U-NII 1 & Ch.42 & X axis & Ver Detector Mode : AV

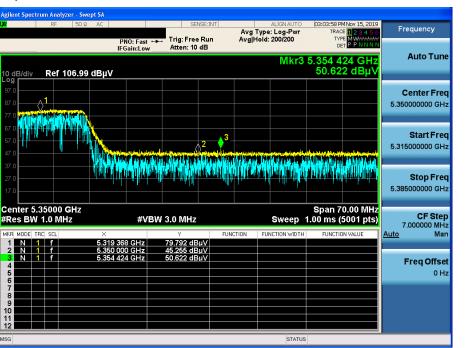




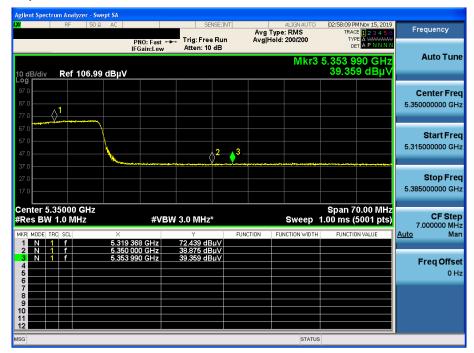
802.11ac(VHT80) & U-NII 1 & Ch.42 & X axis & Ver



802.11ac(VHT80) & U-NII 2A & Ch.58 & X axis & Ver

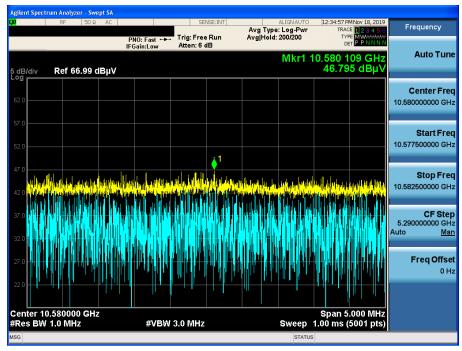


802.11ac(VHT80) & U-NII 2A & Ch.58 & X axis & Ver Detector Mode : AV



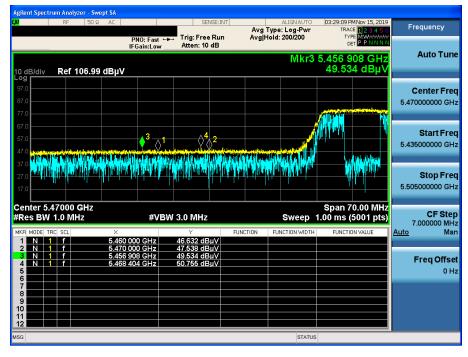


802.11ac(VHT80) & U-NII 2A & Ch.58 & X axis & Ver



802.11ac(VHT80) & U-NII 2C & Ch.106 & X axis & Ver

Detector Mode : PK



802.11ac(VHT80) & U-NII 2C & Ch.106 & X axis & Ver Detector Mode : AV



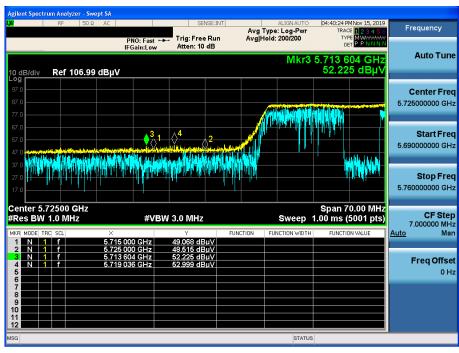


802.11ac(VHT80) & U-NII 2C & Ch.138 & X axis & Ver

	RF 50Ω AC	PNO: Fast 🕶	SENSE:INT Trig: Free Run Atten: 6 dB	ALIG Avg Type: RN Avg Hold: 200/	1S TR/ 1200 T	PMNov 18, 2019 ACE 1 2 3 4 5 6 YPE A WANNAND DET A P N N N N	Frequency
5 dB/div	Ref 66.99 dBµ\	IFGain:Low	Atten: 6 dB	М	kr1 11.380 35.9	089 GHz 19 dBµV	Auto Tun
- og							Center Fre 11.380000000 GF
57.0							Start Fr 11.377500000 G
47.0							Stop Fr 11.382500000 G
37.0 Ny NAME 32.0	and a state with the second second	alytagestationerated	1 	narosolitikanarokalipada panar	nanisi na kanga kalanga kalanga kanga k	n figen fan de skielen fan de skiel	CF St 5.69000000 G Auto <u>M</u>
27.0							Freq Offs 0
22.0 Center 11.3 #Res BW 1	380000 GHz I.0 MHz	#VBW	3.0 MHz*	Sw	Span /eep 1.00 ms	5.000 MHz (5001 pts)	
MSG		<i>"••</i> Вн			STATUS	(eee i proy	



802.11ac(VHT80) & U-NII 3 & Ch.155 & X axis & Ver



802.11ac(VHT80) & U-NII 3 & Ch.155 & X axis & Ver

Frequency Avg Type: Log-Pw Avg|Hold: 200/200 Trig: Free Run Atten: 10 dB PNO: Fast IFGain:Low Auto Tune Mkr3 5.852 32 GH 48.847 dBµ Ref 106.99 dBµV 0 dB/div **Center Freq** 5.85000000 GHz Start Freq 5.80000000 GHz Stop Freq 5.90000000 GHz Center 5.85000 GHz #Res BW 1.0 MHz Span 100.0 MHz 1.00 ms (5001 pts) **CF Step** 10.000000 MHz <u>0</u> Man #VBW 3.0 MHz Sweep <u>Auto</u> 46.125 dBµ\ 48.847 dBµ\ 49.202 dBµ\ Freq Offset 0 Hz



802.11ac(VHT80) & U-NII 3 & Ch.155 & X axis & Ver

	RF	50Ω AC		SEN	SE:INT		ALIGN AUTO		MNov 18, 2019	Frequency
	_		PNO: Fast 🔸	. Trig: Free Atten: 6 d	Run A	Avg Type Avg Hold:		TRAC TYP DI	CE 123456 DE A WAAMAA T A P N N N N	
dB/div	Ref 66.9	99 dBµV					Mkr1		89 GHz 2 dBµV	Auto Tu
62.0										Center F 11.550000000 (
57.0										Start F 11.547500000
47.0										Stop F 11.552500000
37.0 Anii 14 32.0	n jallainen gebrachten	un an	rigitily-related of the state		tillander ogenelogiskelsens	in till skrivet og for	hanna an tao	ah tini dan tini ta	oquatrialityatisensial	CF S 5.775000000 (Auto <u>I</u>
27.0										Freq Off ر
22.0	1.550000 (GHz						Span 5	.000 MHz	