9.6 Radiated

Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.407	**Ambient Temp. (ºC):**	20.0 - 24.5
Test Heading:	Radiated Spurious and Band-Edge Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.407 (b), 15.205, 15.209	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Radiated Spurious and Band-Edge Emissions
Radiated emissions for restricted bands above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.
Measurements on any restricted band frequency or frequencies above 1 GHz are based on the use of measurement instrumentation employing peak and average detectors. All measurements were performed using a resolution bandwidth of 1 MHz.

Test configuration and setup for Undesirable Measurement were per the Radiated Test Set-up specified in this document.

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 e.i.r.p. 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 e.i.r.p. 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 e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

(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 §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §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.

Limits for Restricted Bands (15.205, 15.209)
Peak emission: 74 dBuV/m
Average emission: 54 dBuV/m

Field Strength Calculation
The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.
FS = R + AF + CORR - FO

where:
FS = Field Strength
R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain
FO = Distance Falloff Factor
NFL = Notch Filter Loss

Example:
The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dBµV/m);

$$E = \frac{1000000 \times \sqrt{30P}}{3} \ \mu V/m$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz equates to 68.23 dBuV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are as follows:
Level (dBmV/m) = 20 * Log (level (mV/m))

40 dBmV/m = 100 mV/m
48 dBmV/m = 250 mV/m

Restricted Bands of Operation (15.205)
(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

Frequency Band			
MHz	**MHz**	**MHz**	**GHz**
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

(b) Except as provided in paragraphs (d) and (e) of this section, 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.

(c) Except as provided in paragraphs (d) and (e) of this section, regardless of the field strength limits specified elsewhere in this subpart, the provisions of this section apply to emissions from any intentional radiator.

(d) The following devices are exempt from the requirements of this section:

(1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a) of this section, the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a) of this section, and the fundamental emission is outside of the bands listed in paragraph (a) of this section more than 99% of the time the device is actively transmitting, without compensation for duty cycle.

(2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.

(3) Cable locating equipment operated pursuant to §15.213.

(4) Any equipment operated under the provisions of §15.253, 15.255, and 15.256 in the frequency band 75-85 GHz, or §15.257 of this part.

(5) Biomedical telemetry devices operating under the provisions of §15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.

(6) Transmitters operating under the provisions of subparts D or F of this part.

(7) Devices operated pursuant to §15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.

(8) Devices operated in the 24.075-24.175 GHz band under §15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in §15.245(b).

(9) Devices operated in the 24.0-24.25 GHz band under §15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in §15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).

9.6.1 TX Spurious & Restricted Band Emissions

9.6.1.1 Mikrotik RBLHGG-5acD-XL

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5260.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5264.82	65.22	-2.64	-12.05	50.53	Fundamental	Vertical	129	0	--	--	
#2	6250.55	62.76	-2.87	-9.34	50.55	Peak (NRB)	Horizontal	156	345	--	--	Pass
#3	7013.62	53.09	-3.04	-7.77	42.28	Peak (NRB)	Horizontal	156	345	--	--	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5300.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	3533.56	50.32	-2.14	-11.88	36.30	Peak (NRB)	Horizontal	134	352	--	--	Pass
#2	5294.59	61.20	-2.66	-12.12	46.42	Peak (NRB)	Vertical	100	0	--	--	Pass
#3	7066.42	49.91	-3.01	-7.52	39.38	Peak (NRB)	Horizontal	144	352	--	--	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5320.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5318.88	64.68	-2.67	-12.18	49.83	Peak (NRB)	Vertical	200	0	--	--	Pass
#2	7093.66	62.55	-3.01	-7.62	51.92	Peak (NRB)	Horizontal	190	360	--	--	Pass
#3	16045.17	58.47	-4.91	-0.11	53.45	Max Peak	Horizontal	134	254	68.2	-14.8	Pass
#4	16045.17	45.48	-4.91	-0.11	40.46	Max Avg	Horizontal	134	254	54.0	-13.5	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2151.44	50.34	-1.66	-12.90	35.78	Peak (NRB)	Vertical	161	0	--	--	Pass
#2	3667.11	61.22	-2.15	-11.64	47.43	Max Peak	Vertical	179	350	68.2	-20.8	Pass
#3	3667.11	54.29	-2.15	-11.64	40.50	Max Avg	Vertical	179	350	54.0	-13.5	Pass
#4	5494.94	53.37	-2.70	-11.55	39.12	Peak (NRB)	Vertical	192	0	--	--	Pass
#5	6250.17	52.91	-2.87	-9.34	40.70	Peak (NRB)	Horizontal	161	0	--	--	Pass
#6	7333.47	66.24	-3.00	-7.90	55.34	Max Peak	Vertical	176	353	68.2	-12.9	Pass
#7	7333.47	62.41	-3.00	-7.90	51.51	Max Avg	Vertical	176	353	54.0	-2.5	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5600.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	3733.19	64.22	-2.20	-11.70	50.32	Max Peak	Horizontal	179	350	68.2	-17.9	Pass
#2	3733.19	54.78	-2.20	-11.70	40.88	Max Avg	Horizontal	179	350	54.0	-13.1	Pass
#3	3733.72	64.98	-2.20	-11.70	51.08	Max Peak	Vertical	181	354	68.2	-17.2	Pass
#4	3733.72	56.40	-2.20	-11.70	42.50	Max Avg	Vertical	181	354	54.0	-11.5	Pass
#5	5605.76	65.07	-2.73	-11.22	51.12	Peak (NRB)	Vertical	159	0	--	--	Pass
#6	6250.32	57.71	-2.87	-9.34	45.50	Peak (NRB)	Vertical	159	0	--	--	Pass
#7	7466.21	62.85	-2.96	-8.26	51.63	Max Peak	Vertical	176	354	68.2	-16.6	Pass
#8	7466.21	57.05	-2.96	-8.26	45.83	Max Avg	Vertical	176	354	54.0	-8.2	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5720.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	3800.23	67.17	-2.22	-11.60	53.35	Max Peak	Vertical	181	349	68.2	-14.9	Pass
#2	3800.23	60.87	-2.22	-11.60	47.05	Max Avg	Vertical	181	349	54.0	-7.0	Pass
#3	3800.23	65.36	-2.22	-11.60	51.54	Max Peak	Horizontal	187	0	68.2	-16.7	Pass
#4	3800.23	62.06	-2.22	-11.60	48.24	Max Avg	Horizontal	187	0	54.0	-5.8	Pass
#5	5702.22	53.04	-2.75	-11.00	39.29	Peak (NRB)	Horizontal	121	0	--	--	Pass
#6	6250.17	57.54	-2.87	-9.34	45.33	Peak (NRB)	Horizontal	161	0	--	--	Pass
#7	7600.28	63.19	-2.94	-7.37	52.88	Max Peak	Vertical	177	353	68.2	-15.4	Pass
#8	7600.28	58.87	-2.94	-7.37	48.56	Max Avg	Vertical	177	353	54.0	-5.4	Pass

9.6.1.2 Mikrotik RBSXTsqG-5acD

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5260.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5264.25	83.24	-2.63	-12.06	68.55	Fundamental	Vertical	100	0	--	--	
#2	7013.41	59.61	-3.04	-7.77	48.80	Peak (NRB)	Vertical	100	0	--	--	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11n HT-20
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5300.00	**Data Rate:**	6.5 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5294.11	81.04	-2.66	-12.12	66.26	Peak (NRB)	Vertical	100	0	--	--	Pass
#2	7066.70	58.45	-3.01	-7.52	47.92	Peak (NRB)	Vertical	100	0	--	--	Pass
#3	16243.89	58.52	-4.93	-0.16	53.43	Max Peak	Vertical	101	149	68.2	-14.8	Pass
#4	16243.89	45.21	-4.93	-0.16	40.12	Max Avg	Vertical	101	149	54.0	-13.9	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5494.13	64.78	-2.70	-11.53	50.55	Fundamental	Vertical	100	0	--	--	
#2	7333.39	63.10	-3.00	-7.90	52.20	Max Peak	Vertical	172	3	68.2	-16.0	Pass
#3	7333.39	57.86	-3.00	-7.90	46.96	Max Avg	Vertical	172	3	54.0	-7.0	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5600.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5604.79	73.07	-2.72	-11.24	59.11	Peak (NRB)	Vertical	100	0	--	--	Pass
#2	7466.07	56.80	-2.96	-8.26	45.58	Peak (Scan)	Vertical	100	0	68.2	-22.7	Pass

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5700.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5715.79	76.29	-2.77	-11.01	62.51	Peak (NRB)	Horizontal	100	0	--	--	Pass

9.6.2 Edge & Band-Edge Emissions

9.6.2.1 Mikrotik RBLHGG-5acD-XL

RESULTS SUMMARY FOR RADIATED BAND-EDGE EMISSIONS

5470 - 5725 MHz

MikrotikRBLHGG-5acD-XL		Restricted-Edge Freq	Limit 68.2dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11a	5500.00	5460.00	61.03	52.11	Max
802.11ac-80	5500.00	5460.00	60.52	51.88	Max
802.11n HT-20	5500.00	5460.00	62.15	52.22	Max
802.11n HT-40	5500.00	5460.00	61.27	52.11	Max

MikrotikRBLHGG-5acD-XL		Band-Edge Freq	Limit 68.23dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	
802.11a	5500.00	5470.00	61.03	Max
802.11ac-80	5500.00	5470.00	60.52	Max
802.11n HT-20	5500.00	5470.00	62.15	Max
802.11n HT-40	5500.00	5470.00	61.27	Max

5250 - 5350 MHz

MikrotikRBLHGG-5acD-XL		Band-Edge Freq	Limit 68.2dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11a	5320.00	5350.00	61.08	49.46	Max
802.11ac-80	5290.00	5350.00	60.90	52.34	Max
802.11n HT-20	5320.00	5350.00	60.21	52.66	Max
802.11n HT-40	5310.00	5350.00	60.07	52.66	Max

Click on the links to view the data.

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5439.86	20.31	-2.70	34.50	52.11	Max Avg	Horizontal	179	349	54.0	-1.9	Pass
#2	5450.68	29.23	-2.70	34.50	61.03	Max Peak	Horizontal	179	349	68.2	-7.2	Pass
#4	5460.38	28.73	-2.69	34.53	60.57	Max Avg	Horizontal	179	349	68.2	-7.6	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11ac-80
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5439.86	20.08	-2.70	34.50	51.88	Max Avg	Horizontal	179	349	54.0	-2.1	Pass
#2	5440.16	28.72	-2.70	34.50	60.52	Max Peak	Horizontal	179	349	68.2	-7.7	Pass
#4	5461.52	29.19	-2.69	34.53	61.03	Max Peak	Horizontal	179	349	68.2	-7.2	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11n HT-20
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5439.86	20.42	-2.70	34.50	52.22	Max Avg	Horizontal	179	349	54.0	-1.8	Pass
#2	5458.80	30.32	-2.69	34.52	62.15	Max Peak	Horizontal	179	349	68.2	-6.1	Pass
#4	5461.52	23.77	-2.69	34.53	60.99	Max Peak	Horizontal	179	349	68.2	-7.2	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11n HT-40
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5439.86	20.31	-2.70	34.50	52.11	Max Avg	Horizontal	179	349	54.0	-1.9	Pass
#2	5456.71	29.44	-2.69	34.52	61.27	Max Peak	Horizontal	179	349	68.2	-7.0	Pass
#4	5463.93	29.44	-2.69	34.52	61.27	Max Peak	Horizontal	179	349	68.2	-7.0	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#3	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5320.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5356.41	29.30	-2.69	34.47	61.08	Max Peak	Vertical	179	349	68.2	-7.2	Pass
#3	5424.07	17.63	-2.68	34.51	49.46	Max Avg	Vertical	179	349	54.0	-4.5	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11ac-80
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5290.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5440.10	20.54	-2.70	34.50	52.34	Max Avg	Horizontal	179	349	54.0	-1.7	Pass
#3	5440.12	29.10	-2.70	34.50	60.90	Max Peak	Horizontal	179	349	68.2	-7.3	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11n HT-20
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5320.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5440.10	28.41	-2.70	34.50	60.21	Max Peak	Horizontal	179	349	68.2	-8.0	Pass
#3	5440.12	20.86	-2.70	34.50	52.66	Max Avg	Horizontal	179	349	54.0	-1.3	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11n HT-40
Antenna Gain (dBi):	27.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5310.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5440.10	20.86	-2.70	34.50	52.66	Max Avg	Horizontal	179	349	54.0	-1.3	Pass
#3	5440.12	28.27	-2.70	34.50	60.07	Max Peak	Horizontal	179	349	68.2	-8.2	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

9.6.2.2 Mikrotik RBSXTsqG-5acD

RESULTS SUMMARY FOR RADIATED BAND-EDGE EMISSIONS

5470 - 5725 MHz

MikrotikRBSXTsqG-5acD		Restricted-Edge Freq	Limit 68.2dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11a	5500.00	5460.00	67.10	53.48	Max
802.11ac-80	5530.00	5460.00	66.35	53.48	Max
802.11n HT-20	5500.00	5460.00	66.35	53.48	Max
802.11n HT-40	5510.00	5460.00	67.81	53.49	Max

MikrotikRBSXTsqG-5acD		Band-Edge Freq	Limit 68.23dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	
802.11a	5500.00	5470.00	67.10	Max
802.11ac-80	5530.00	5470.00	66.35	Max
802.11n HT-20	5500.00	5470.00	66.35	Max
802.11n HT-40	5510.00	5470.00	67.81	Max

5250 - 5350 MHz

Mikrotik RBSXTsqG-5acD		Band-Edge Freq	Limit 68.2dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11a	5230.00	5150.00	67.53	52.57	Max
802.11ac-80	5260.00	5350.00	67.22	52.57	Max
802.11n HT-20	5320.00	5350.00	68.04	52.55	Max
802.11n HT-40	5310.00	5350.00	67.53	52.57	Max

Click on the links to view the data.

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	16.00	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5438.66	35.29	-2.70	34.51	67.10	Max Peak	Horizontal	151	358	68.2	-1.1	Pass
#2	5456.99	21.65	-2.69	34.52	53.48	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
#4	5468.74	33.63	-2.69	34.82	65.08	Max Peak	Horizontal	151	358	68.2	-3.1	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11ac-80
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5530.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5455.79	21.66	-2.70	34.52	53.48	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
#2	5459.10	34.52	-2.69	34.52	66.35	Max Peak	Horizontal	151	358	68.2	-1.9	Pass
#4	5466.63	34.14	-2.69	34.50	65.95	Max Peak	Horizontal	151	358	68.2	-2.3	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11n HT-20
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5500.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5446.77	34.55	-2.70	34.50	66.35	Max Peak	Horizontal	151	358	68.2	-1.9	Pass
#2	5456.99	21.65	-2.69	34.52	53.48	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
#4	5462.73	34.54	-2.69	34.50	66.35	Max Peak	Horizontal	151	358	68.2	-1.9	Pass
#3	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--
#5	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11n HT-40
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5510.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5405.29	35.99	-2.71	34.53	67.81	Max Peak	Horizontal	151	358	68.2	-0.4	Pass
#2	5459.70	21.65	-2.69	34.53	53.49	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
#4	5463.03	34.93	-2.69	34.50	66.74	Max Peak	Horizontal	151	358	68.2	-1.5	Pass
#3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
#5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5320.00	**Data Rate:**	6 Mbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5320.65	84.26	-2.67	-12.17	69.42	Peak (NRB)	Horizontal	100	0	--	--	Pass
#2	7093.75	58.04	-3.01	-7.62	47.41	Peak (NRB)	Horizontal	100	0	--	--	Pass

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11ac-80
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5260.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5355.13	35.44	-2.69	34.47	67.22	Max Peak	Horizontal	151	358	68.2	-1.0	Pass
#3	5356.09	20.79	-2.69	34.47	52.57	Max Avg	Horizontal	151	358	54.0	-1.4	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11n HT-20
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5320.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5380.78	20.70	-2.66	34.51	52.55	Max Avg	Horizontal	151	358	54.0	-1.5	Pass
#3	5448.76	36.25	-2.70	34.49	68.04	Max Peak	Horizontal	151	358	68.2	-0.2	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Equipment Configuration for Restricted Upper Band-Edge Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11n HT-40
Antenna Gain (dBi):	16.0	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	5310.00	**Data Rate:**	MCS0
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#2	5361.22	20.79	-2.70	34.48	52.57	Max Avg	Horizontal	151	358	54.0	-1.4	Pass
#3	5365.39	35.74	-2.69	34.48	67.53	Max Peak	Horizontal	151	358	68.2	-0.7	Pass
#1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

9.6.3 Digital Emissions

Radiated Test Conditions for Radiated Digital Emissions (0.03 – 1 GHz)			
Standard:	FCC CFR 47:15.247	**Ambient Temp. (ºC):**	20.0 - 24.5
Test Heading:	Digital Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.209	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Radiated Digital Emissions (0.03 – 1 GHz)
Testing 30M-1 GHz was performed in a 3-meter anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed.

Test configuration and setup for Radiated Spurious and Band-Edge Measurement were per the Radiated Test Set-up specified in this document.

Field Strength Calculation
The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

FS = R + AF + CORR

where:
FS = Field Strength
R = Measured Receiver Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain

For example:
Given a Receiver input reading of 51.5dBmV; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. The Field Strength of the measured emission is:

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3dBmV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are done as:

Level (dBmV/m) = 20 * Log (level (mV/m))

40 dBmV/m = 100mV/m
48 dBmV/m = 250mV/m

Limits for Radiated Digital Emissions (0.03 – 1 GHz) (15.209)

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength		Measurement Distance (m)
	µV/m (microvolts/meter)	dBµV/m (dB microvolts/meter)	
0.009-0.490	2400/F(kHz)	--	300
0.490-1.705	24000/F(kHz)	--	30

1.705-30.0	30	29.5	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46.0	3
Above 960	500	54.0	3

**Except as provided in paragraph (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.

(b) In the emission table above, the tighter limit applies at the band edges. (c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. (d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. (e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part. (f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device. (g) Perimeter protection systems may operate in the 54-72 MHz and 76-88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

Equipment Configuration for Digital Emissions

Antenna:	Mikrotik RBLHGG-5acD-XL	**Variant:**	802.11a
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	Not Applicable
Channel Frequency (MHz):	5500.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	33.38	45.30	3.55	-10.40	38.45	MaxQP	Vertical	98	225	40.0	-1.6	Pass
#2	101.94	33.65	4.02	-17.70	19.97	Peak (NRB)	Horizontal	101	0	--	--	Pass
#3	112.26	42.51	4.06	-15.40	31.17	MaxQP	Vertical	98	138	43.0	-11.8	Pass
#4	145.32	32.41	4.22	-15.70	20.93	Peak (NRB)	Horizontal	101	0	--	--	Pass

Equipment Configuration for Digital Emissions

Antenna:	Mikrotik RBSXTsqG-5acD	**Variant:**	802.11a
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	Not Applicable
Channel Frequency (MHz):	5500.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	30.79	26.49	3.52	-8.40	21.61	MaxQP	Horizontal	396	142	40.0	-18.4	Pass
#2	30.79	42.54	3.52	-8.40	37.66	MaxQP	Vertical	112	204	40.0	-2.3	Pass
#3	108.82	44.25	4.04	-16.10	32.19	MaxQP	Vertical	100	94	43.0	-10.8	Pass
#4	108.82	35.45	4.04	-16.10	23.39	MaxQP	Horizontal	215	158	43.0	-19.6	Pass

9.7 AC Wireline

Scope

This test assesses the ability of the EUT to limit its internal noise from being present on the AC mains power input/output ports.

Test Procedure

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

Limits

The equipment shall meet the class B limits given in FCC Part 15: 107. Alternatively, for equipment intended to be used in non-residential environments, the class A limits given in FCC Part 15: 107 may be used.

Limits for conducted disturbance at the mains ports of class B ITE

Frequency of emission (MHz)	Quasi-peak dBuV	Average dBuV
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50
Note 1	* Decreases with the logarithm of the frequency	
Note 2	* The lower limit applies at the boundary between frequency ranges	

Limits for conducted disturbance at the mains ports of class A ITE

Frequency of emission (MHz)	Quasi-peak dBuV	Average dBuV
0.15–0.5	79	66
0.5–30	73	60
Note 1	* The lower limit shall apply at the transition frequency.	

Traceability

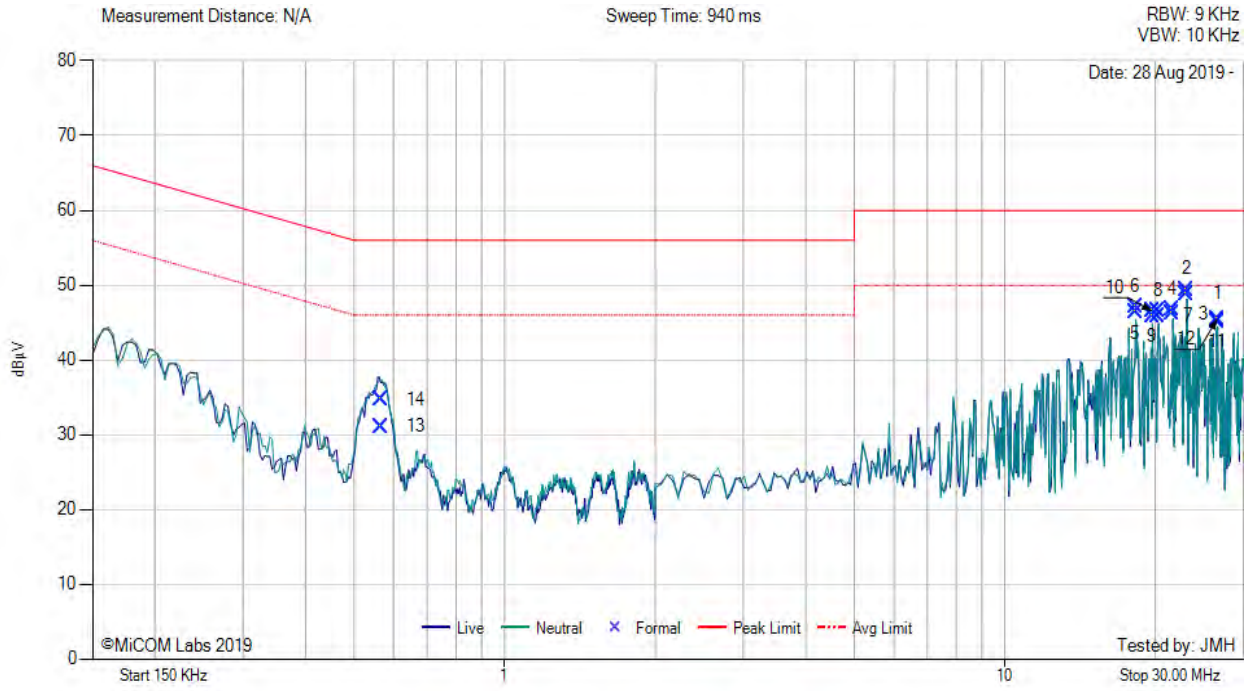
All conducted emission measurements are traceable to national standards. The uncertainty of measurement at a confidence level of not less than 95 %, with a coverage factor of k=2, in the range 9 kHz – 30 MHz (Average & Quasi-peak) is ±2.64 dB.

Laboratory Measurement Uncertainty	
Measurement uncertainty	±2.64 dB

Method
Measurements were made per work instruction WI-EMC-01 ‘Measurement of Conducted Emissions’

Model:	Mikrotik RBLHGG-5ac-XL	Configuration tested:	PoE Powered
Input power:	120V_{AC}/60Hz	Standard:	FCC 15B

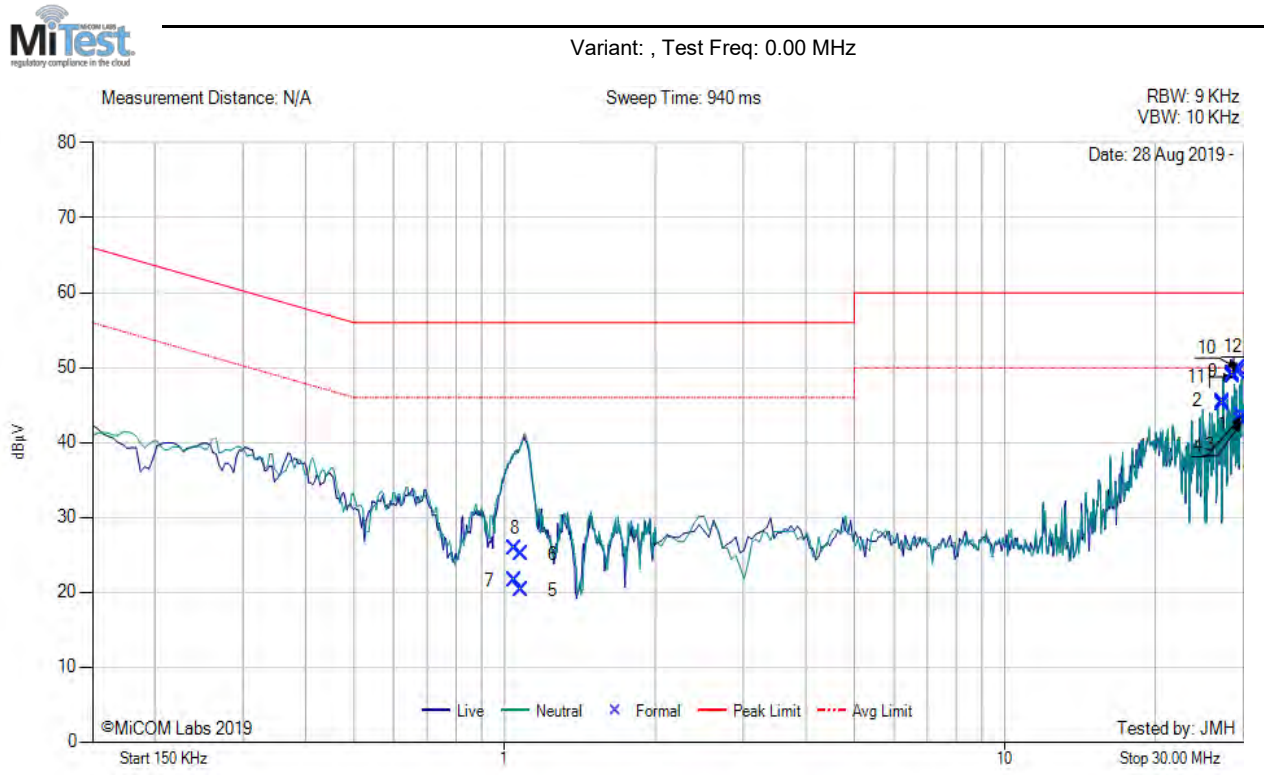
Variant: , Test Freq: 0.00 MHz



Num	Frequency MHz	Raw dBµV	Cable Loss dB	Factor dB	Total Correction dBµV	Corrected Value dBµV	Measurement Type	Line	Limit dBµV/m	Margin dB	Pass /Fail
1	23.130	37.36	0.64	10.85	11.49	48.85	Max Avg	Live	50.0	-1.2	Pass
2	23.130	37.91	0.64	10.85	11.49	49.40	Max Qp	Live	60.0	-10.6	Pass
3	21.664	34.80	0.65	10.72	11.37	46.17	Max Avg	Neutral	50.0	-3.8	Pass
4	21.664	35.37	0.65	10.72	11.37	46.74	Max Qp	Neutral	60.0	-13.3	Pass
5	18.244	35.15	0.56	10.61	11.17	46.32	Max Avg	Live	50.0	-3.7	Pass
6	18.244	35.91	0.56	10.61	11.17	47.08	Max Qp	Live	60.0	-12.9	Pass
7	20.258	34.62	0.61	10.66	11.27	45.89	Max Avg	Live	50.0	-4.1	Pass
8	20.258	35.23	0.61	10.66	11.27	46.50	Max Qp	Live	60.0	-13.5	Pass
9	19.709	34.66	0.60	10.64	11.24	45.90	Max Avg	Live	50.0	-4.1	Pass
10	19.709	35.30	0.60	10.64	11.24	46.54	Max Qp	Live	60.0	-13.5	Pass
11	26.610	33.56	0.73	10.88	11.61	45.17	Max Avg	Neutral	50.0	-4.8	Pass
12	26.610	33.92	0.73	10.88	11.61	45.53	Max Qp	Neutral	60.0	-14.5	Pass
13	0.567	21.07	0.10	9.92	10.02	31.09	Max Avg	Live	46.0	-14.9	Pass
14	0.567	24.64	0.10	9.92	10.02	34.66	Max Qp	Live	56.0	-21.3	Pass

Test Notes: EUT powered by POE Injector. 120V AC Mains

Model:	Mikrotik RBSXTsqG-5acD	Configuration tested:	PoE Powered
Input power:	120V_{AC}/60Hz	Standard:	FCC 15B



Num	Frequency MHz	Raw dBµV	Cable Loss dB	Factor dB	Total Correction dBµV	Corrected Value dBµV	Measurement Type	Line	Limit dBµV/m	Margin dB	Pass /Fail
1	27.343	33.50	0.73	10.90	11.63	45.13	Max Avg	Live	50.0	-4.9	Pass
2	27.343	33.92	0.73	10.90	11.63	45.55	Max Qp	Live	60.0	-14.5	Pass
3	29.786	31.11	0.78	10.93	11.71	42.82	Max Avg	Live	50.0	-7.2	Pass
4	29.786	31.83	0.78	10.93	11.71	43.54	Max Qp	Live	60.0	-16.5	Pass
5	1.081	10.25	0.08	9.94	10.02	20.27	Max Avg	Neutral	46.0	-25.7	Pass
6	1.081	15.10	0.08	9.94	10.02	25.12	Max Qp	Neutral	56.0	-30.9	Pass
7	1.049	11.58	0.08	9.94	10.02	21.60	Max Avg	Live	46.0	-24.4	Pass
8	1.049	15.79	0.08	9.94	10.02	25.81	Max Qp	Live	56.0	-30.2	Pass
9	29.236	37.73	0.81	10.91	11.72	49.45	Max Avg	Live	50.0	-0.6	Pass
10	29.236	38.17	0.81	10.91	11.72	49.89	Max Qp	Live	60.0	-10.1	Pass
11	28.686	37.05	0.79	10.91	11.70	48.75	Max Avg	Live	50.0	-1.3	Pass
12	28.686	37.48	0.79	10.91	11.70	49.18	Max Qp	Live	60.0	-10.8	Pass

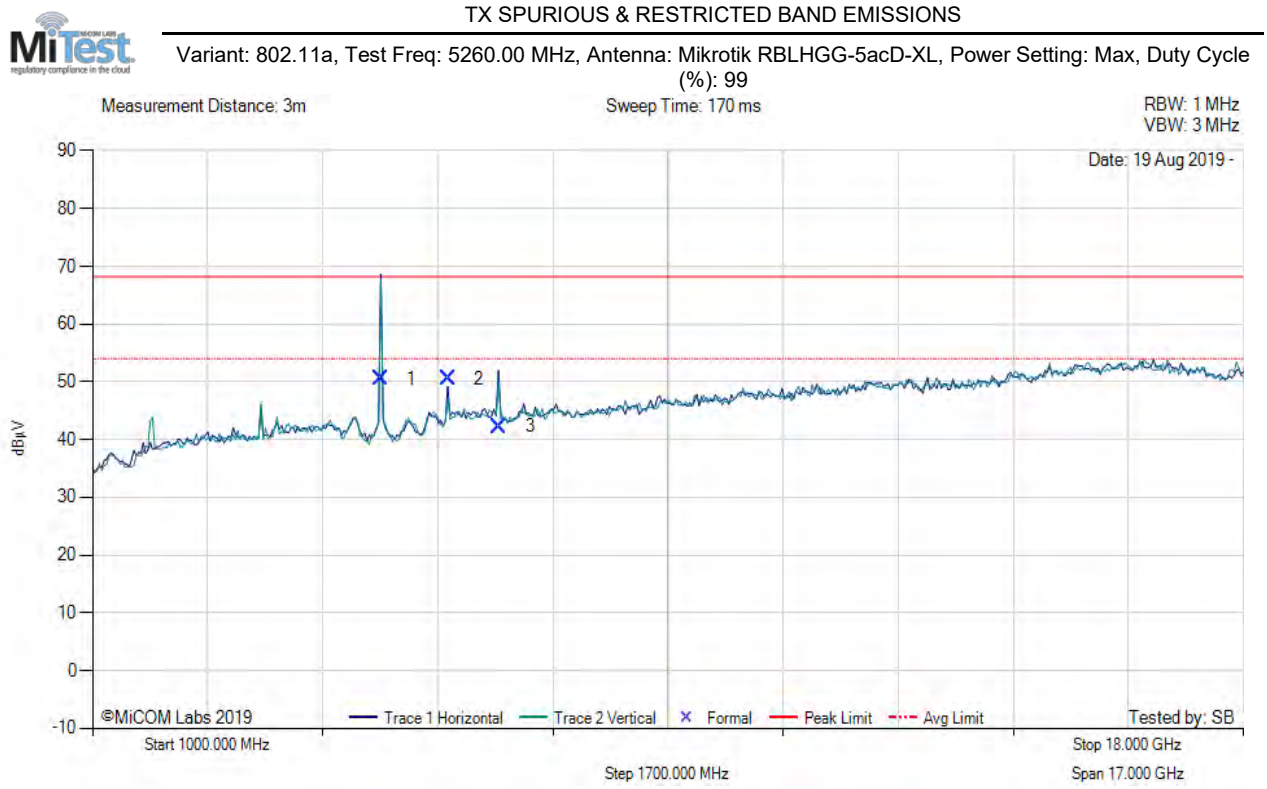
Test Notes: EUT powered by POE Injector. 120V AC Mains

A. APPENDIX - GRAPHICAL IMAGES

A.4 Radiated

A.4.1 TX Spurious & Restricted Band Emissions

A.4.1.1 Mikrotik RBLHGG-5acD-XL

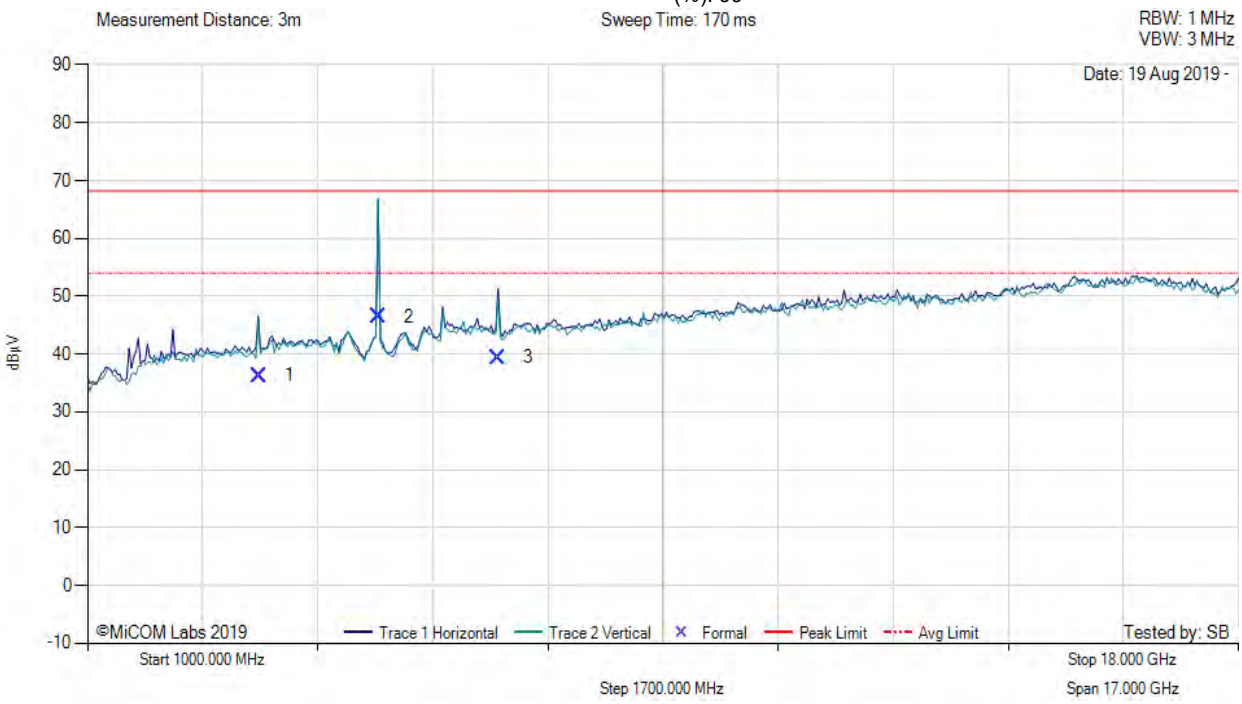


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5264.82	65.22	-2.64	-12.05	50.53	Fundamental	Vertical	129	0	--	--	
2	6250.55	62.76	-2.87	-9.34	50.55	Peak (NRB)	Horizontal	156	345	--	--	Pass
3	7013.62	53.09	-3.04	-7.77	42.28	Peak (NRB)	Horizontal	156	345	--	--	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5300.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

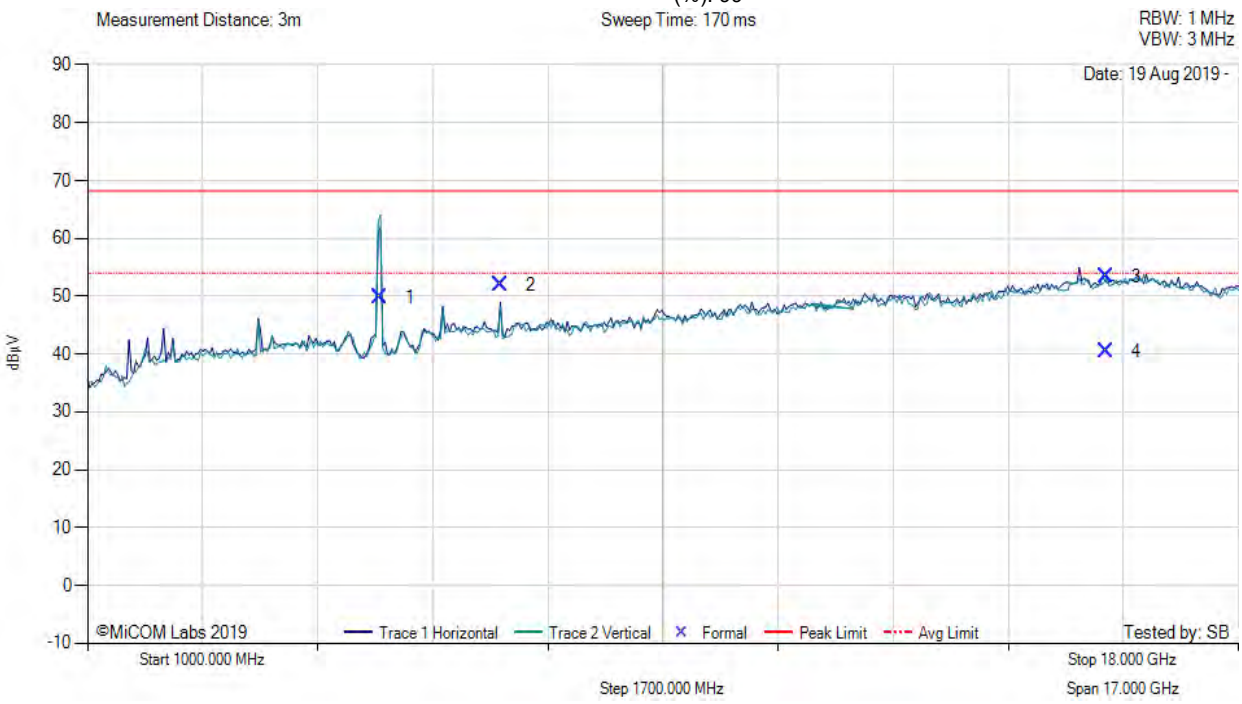


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	3533.56	50.32	-2.14	-11.88	36.30	Peak (NRB)	Horizontal	134	352	--	--	Pass
2	5294.59	61.20	-2.66	-12.12	46.42	Peak (NRB)	Vertical	100	0	--	--	Pass
3	7066.42	49.91	-3.01	-7.52	39.38	Peak (NRB)	Horizontal	144	352	--	--	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

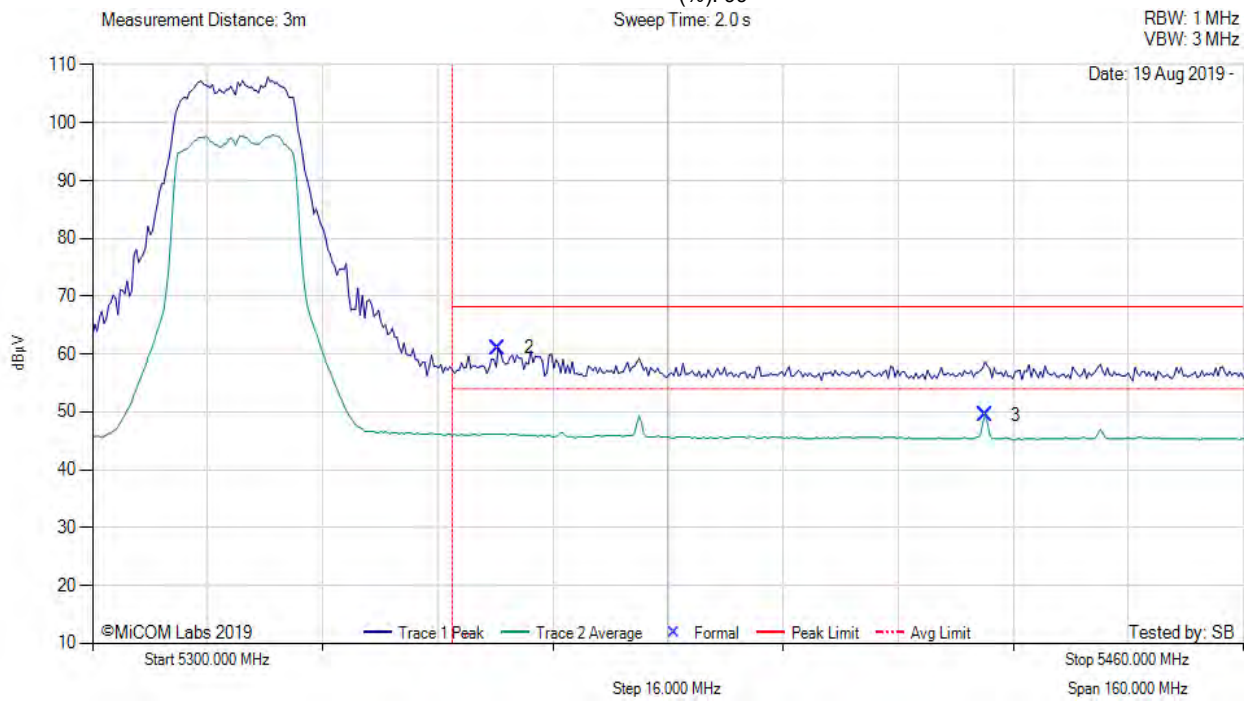


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5318.88	64.68	-2.67	-12.18	49.83	Peak (NRB)	Vertical	200	0	--	--	Pass
2	7093.66	62.55	-3.01	-7.62	51.92	Peak (NRB)	Horizontal	190	360	--	--	Pass
3	16045.17	58.47	-4.91	-0.11	53.45	Max Peak	Horizontal	134	254	68.2	-14.8	Pass
4	16045.17	45.48	-4.91	-0.11	40.46	Max Avg	Horizontal	134	254	54.0	-13.5	Pass

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

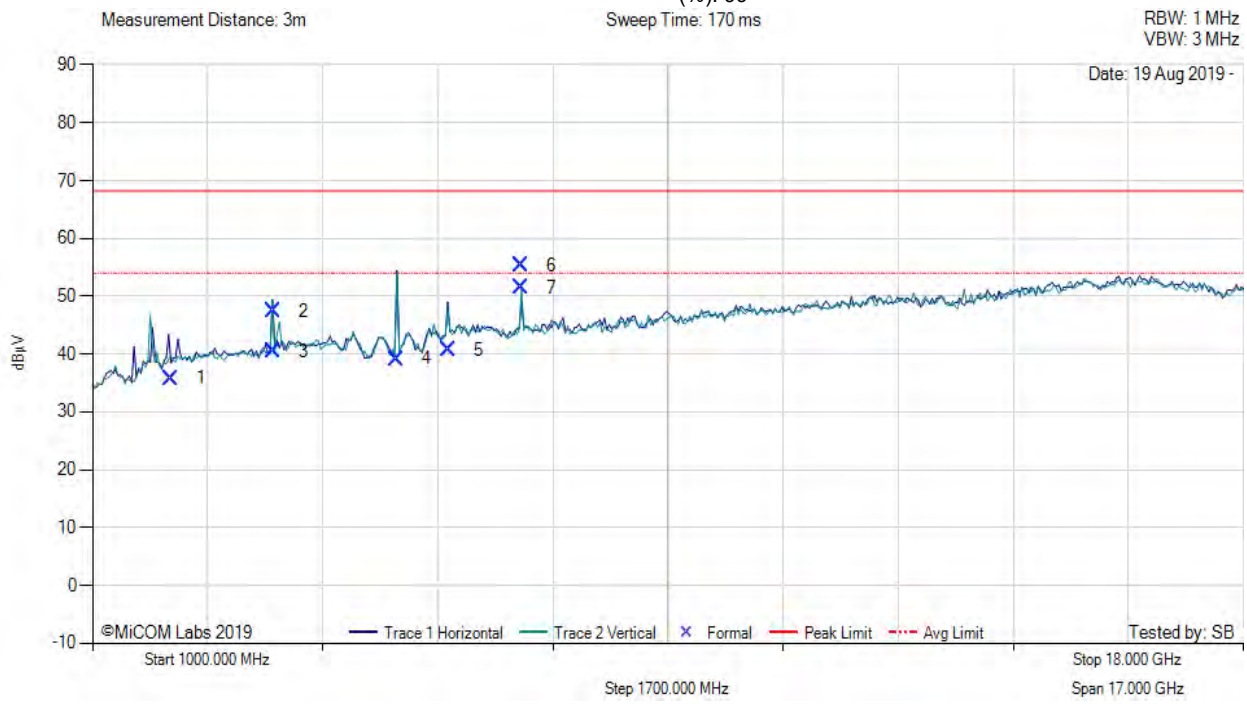


5300.00 - 5460.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
2	5356.41	29.30	-2.69	34.47	61.08	Max Peak	Vertical	179	349	68.2	-7.2	Pass
3	5424.07	17.63	-2.68	34.51	49.46	Max Avg	Vertical	179	349	54.0	-4.5	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

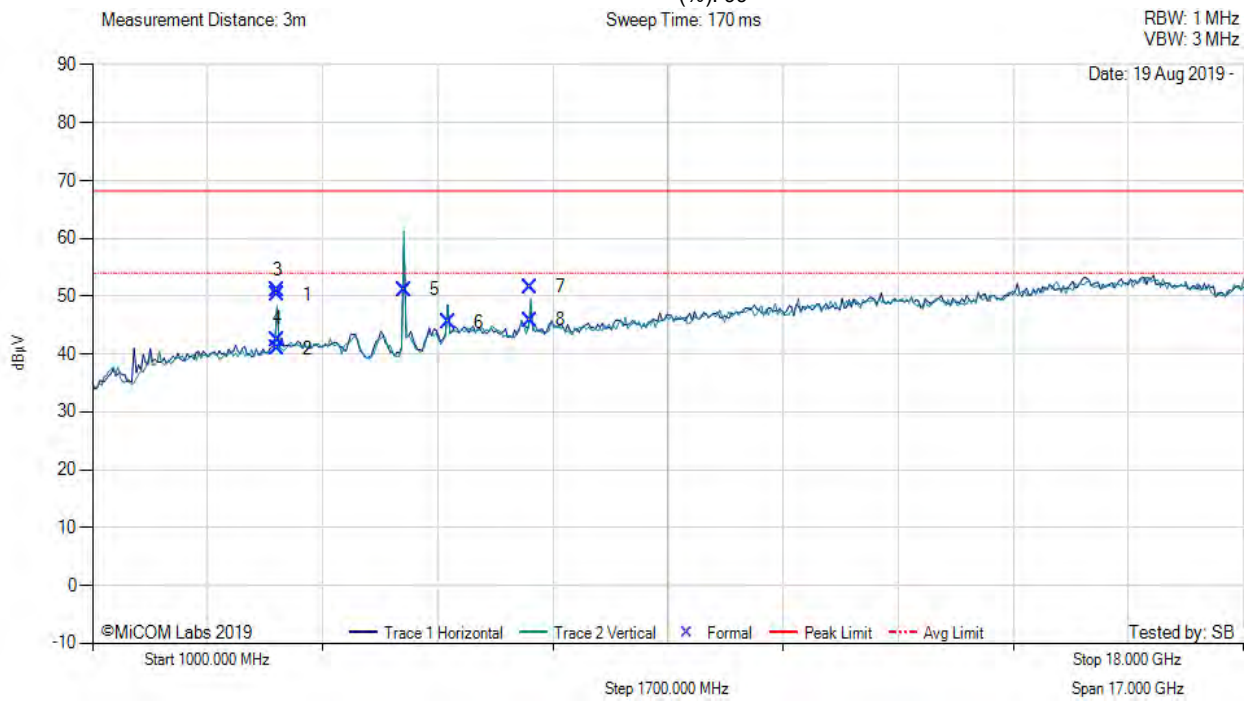


1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	2151.44	50.34	-1.66	-12.90	35.78	Peak (NRB)	Vertical	161	0	--	--	Pass
2	3667.11	61.22	-2.15	-11.64	47.43	Max Peak	Vertical	179	350	68.2	-20.8	Pass
3	3667.11	54.29	-2.15	-11.64	40.50	Max Avg	Vertical	179	350	54.0	-13.5	Pass
4	5494.94	53.37	-2.70	-11.55	39.12	Peak (NRB)	Vertical	192	0	--	--	Pass
5	6250.17	52.91	-2.87	-9.34	40.70	Peak (NRB)	Horizontal	161	0	--	--	Pass
6	7333.47	66.24	-3.00	-7.90	55.34	Max Peak	Vertical	176	353	68.2	-12.9	Pass
7	7333.47	62.41	-3.00	-7.90	51.51	Max Avg	Vertical	176	353	54.0	-2.5	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5600.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

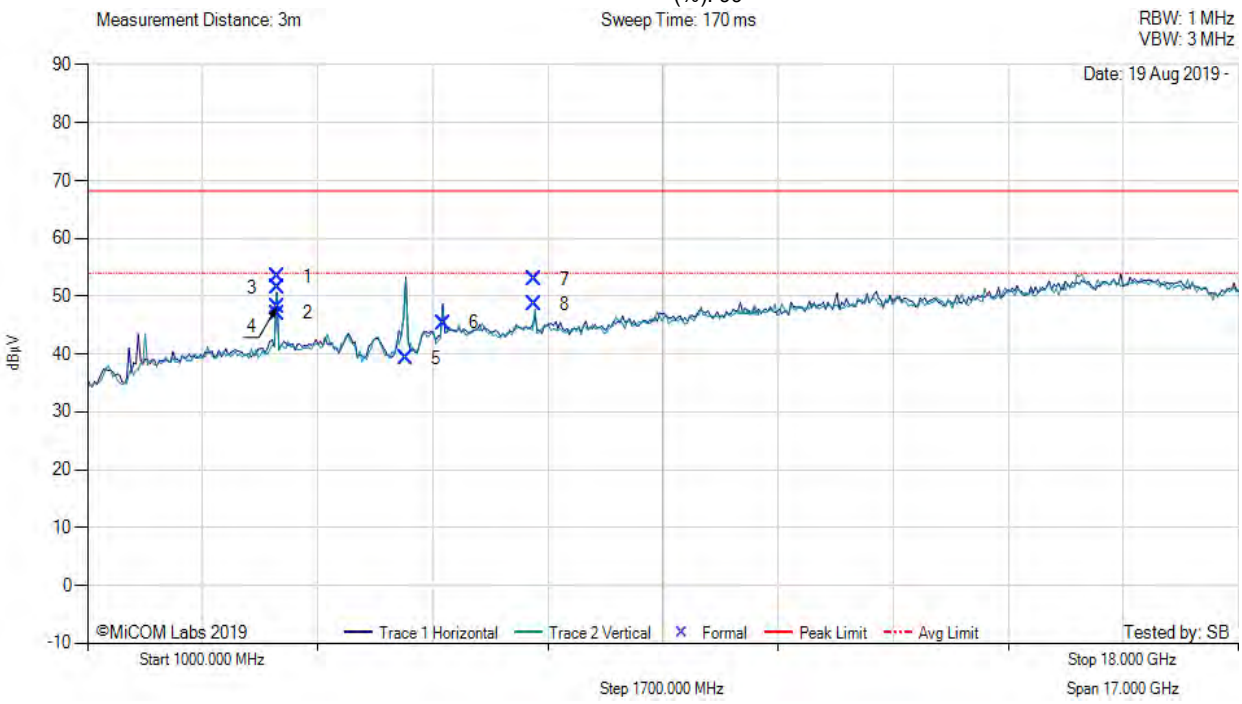


1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	3733.19	64.22	-2.20	-11.70	50.32	Max Peak	Horizontal	179	350	68.2	-17.9	Pass
2	3733.19	54.78	-2.20	-11.70	40.88	Max Avg	Horizontal	179	350	54.0	-13.1	Pass
3	3733.72	64.98	-2.20	-11.70	51.08	Max Peak	Vertical	181	354	68.2	-17.2	Pass
4	3733.72	56.40	-2.20	-11.70	42.50	Max Avg	Vertical	181	354	54.0	-11.5	Pass
5	5605.76	65.07	-2.73	-11.22	51.12	Peak (NRB)	Vertical	159	0	--	--	Pass
6	6250.32	57.71	-2.87	-9.34	45.50	Peak (NRB)	Vertical	159	0	--	--	Pass
7	7466.21	62.85	-2.96	-8.26	51.63	Max Peak	Vertical	176	354	68.2	-16.6	Pass
8	7466.21	57.05	-2.96	-8.26	45.83	Max Avg	Vertical	176	354	54.0	-8.2	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5720.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99



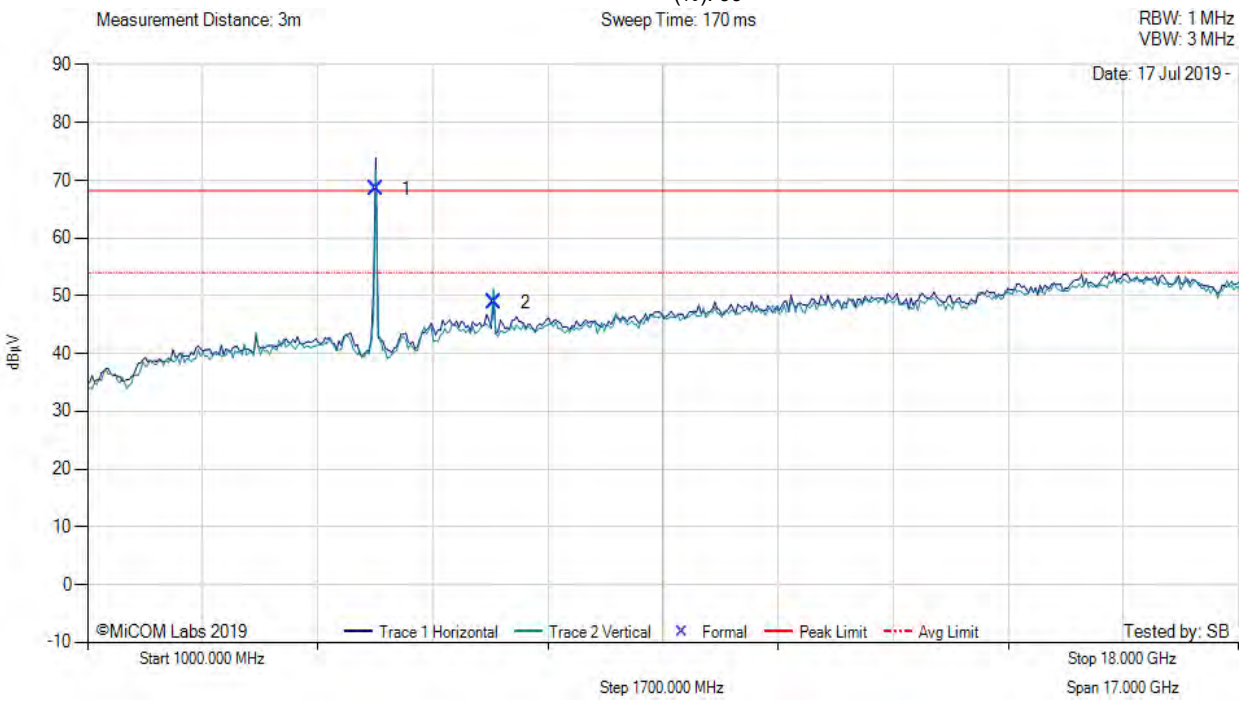
1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	3800.23	67.17	-2.22	-11.60	53.35	Max Peak	Vertical	181	349	68.2	-14.9	Pass
2	3800.23	60.87	-2.22	-11.60	47.05	Max Avg	Vertical	181	349	54.0	-7.0	Pass
3	3800.23	65.36	-2.22	-11.60	51.54	Max Peak	Horizontal	187	0	68.2	-16.7	Pass
4	3800.23	62.06	-2.22	-11.60	48.24	Max Avg	Horizontal	187	0	54.0	-5.8	Pass
5	5702.22	53.04	-2.75	-11.00	39.29	Peak (NRB)	Horizontal	121	0	--	--	Pass
6	6250.17	57.54	-2.87	-9.34	45.33	Peak (NRB)	Horizontal	161	0	--	--	Pass
7	7600.28	63.19	-2.94	-7.37	52.88	Max Peak	Vertical	177	353	68.2	-15.4	Pass
8	7600.28	58.87	-2.94	-7.37	48.56	Max Avg	Vertical	177	353	54.0	-5.4	Pass

back to matrix

A.4.1.2 Mikrotik RBSXTsqG-5acD

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5260.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max, Duty Cycle (%): 99

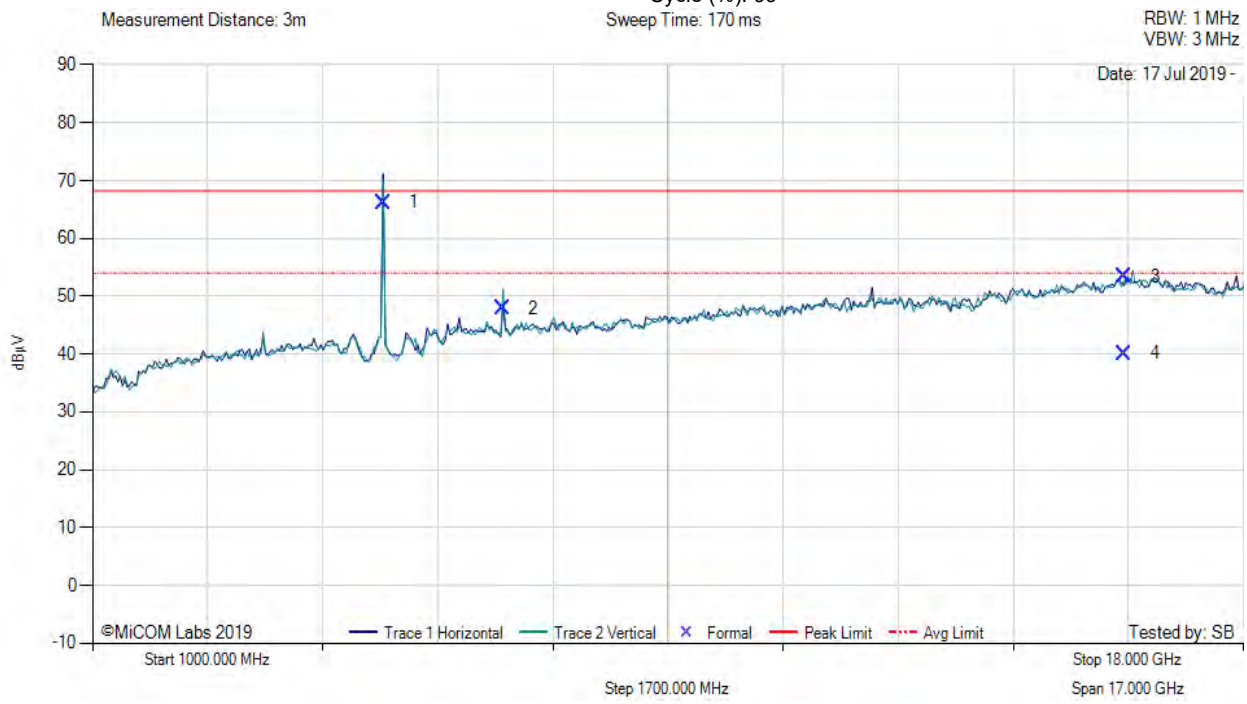


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5264.25	83.24	-2.63	-12.06	68.55	Fundamental	Vertical	100	0	--	--	
2	7013.41	59.61	-3.04	-7.77	48.80	Peak (NRB)	Vertical	100	0	--	--	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5300.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max, Duty Cycle (%): 99

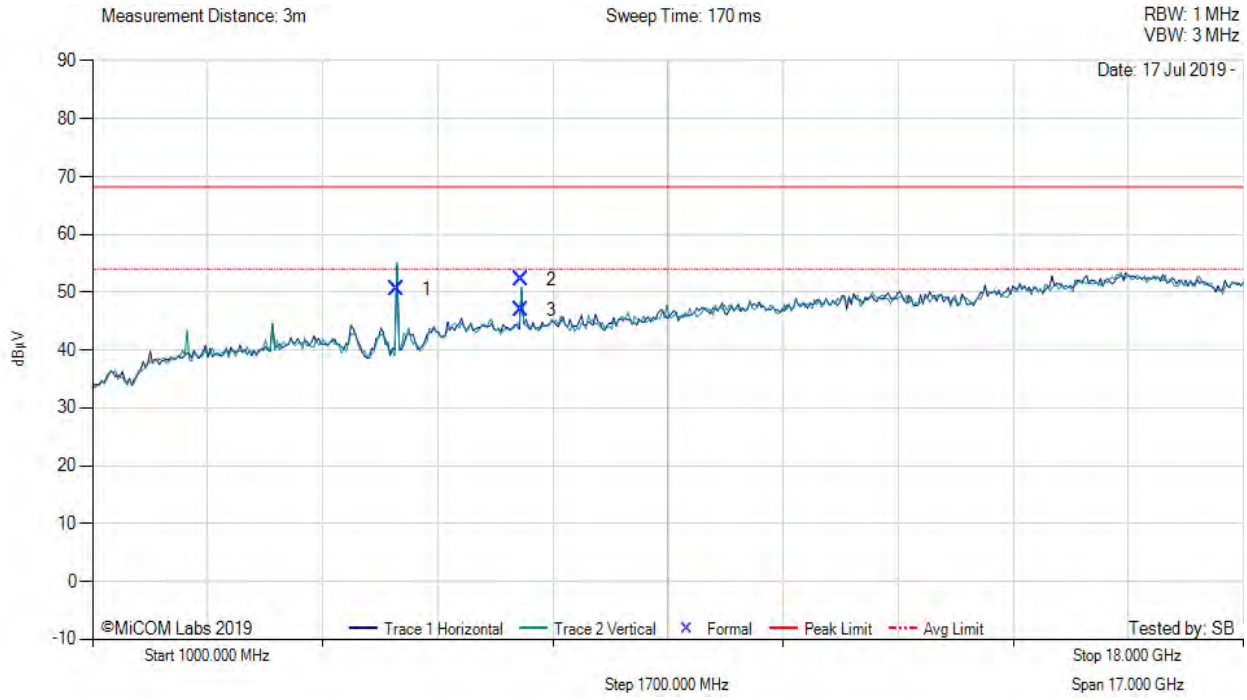


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5294.11	81.04	-2.66	-12.12	66.26	Peak (NRB)	Vertical	100	0	--	--	Pass
2	7066.70	58.45	-3.01	-7.52	47.92	Peak (NRB)	Vertical	100	0	--	--	Pass
3	16243.89	58.52	-4.93	-0.16	53.43	Max Peak	Vertical	101	149	68.2	-14.8	Pass
4	16243.89	45.21	-4.93	-0.16	40.12	Max Avg	Vertical	101	149	54.0	-13.9	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

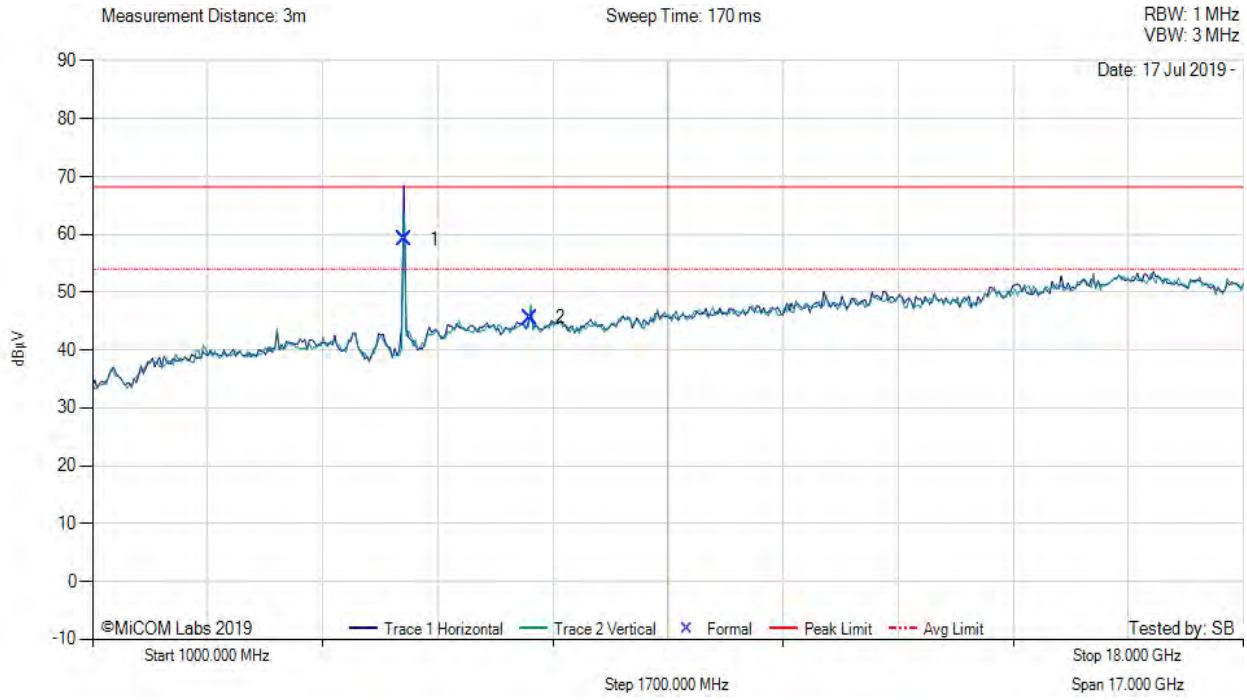


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5494.13	64.78	-2.70	-11.53	50.55	Fundamental	Vertical	100	0	--	--	
2	7333.39	63.10	-3.00	-7.90	52.20	Max Peak	Vertical	172	3	68.2	-16.0	Pass
3	7333.39	57.86	-3.00	-7.90	46.96	Max Avg	Vertical	172	3	54.0	-7.0	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5600.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

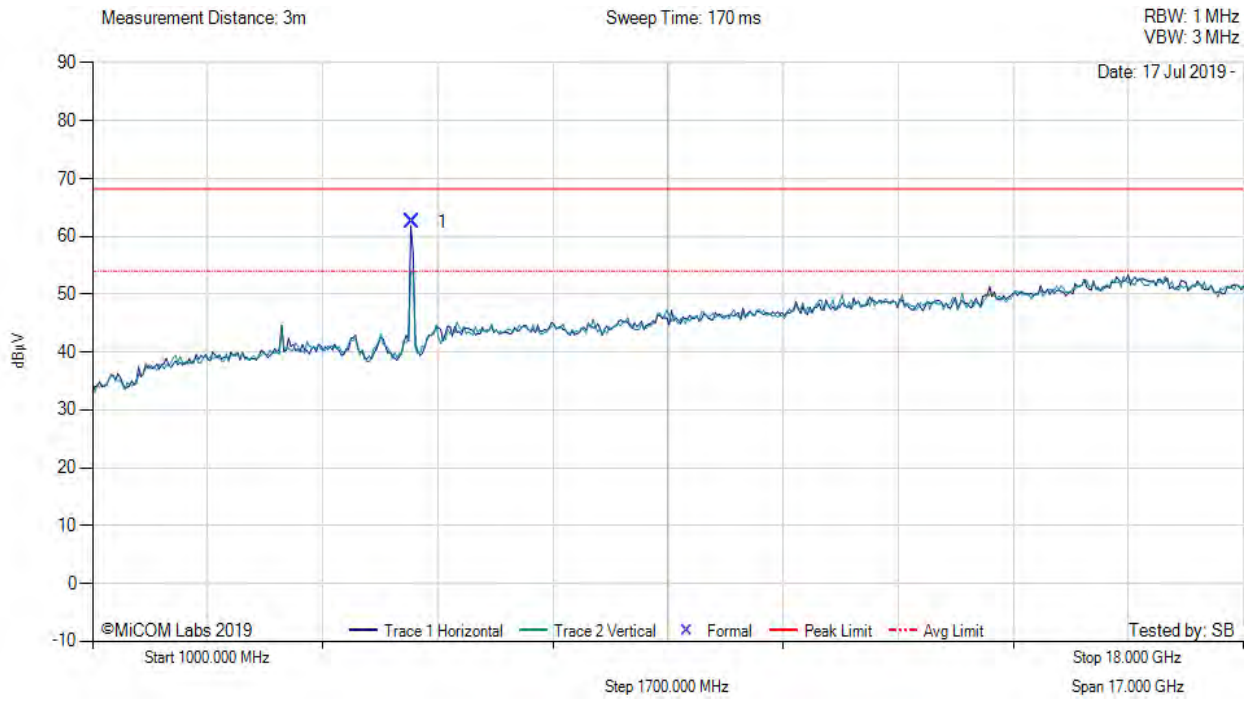


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5604.79	73.07	-2.72	-11.24	59.11	Peak (NRB)	Vertical	100	0	--	--	Pass
2	7466.07	56.80	-2.96	-8.26	45.58	Peak (Scan)	Vertical	100	0	68.2	-22.7	Pass

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5700.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5715.79	76.29	-2.77	-11.01	62.51	Peak (NRB)	Horizontal	100	0	--	--	Pass

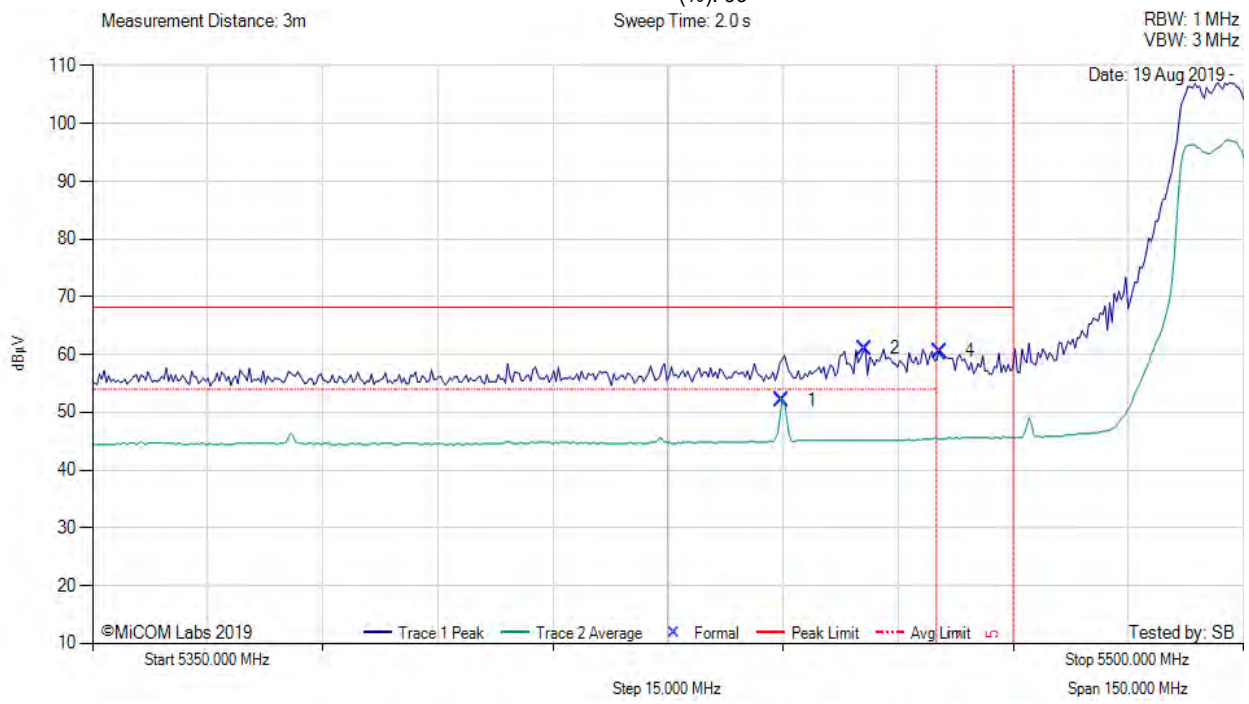
back to matrix

A.4.2 Restricted Edge & Band-Edge Emissions

A.4.2.1 Mikrotik RBLHGG-5acD-XL

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

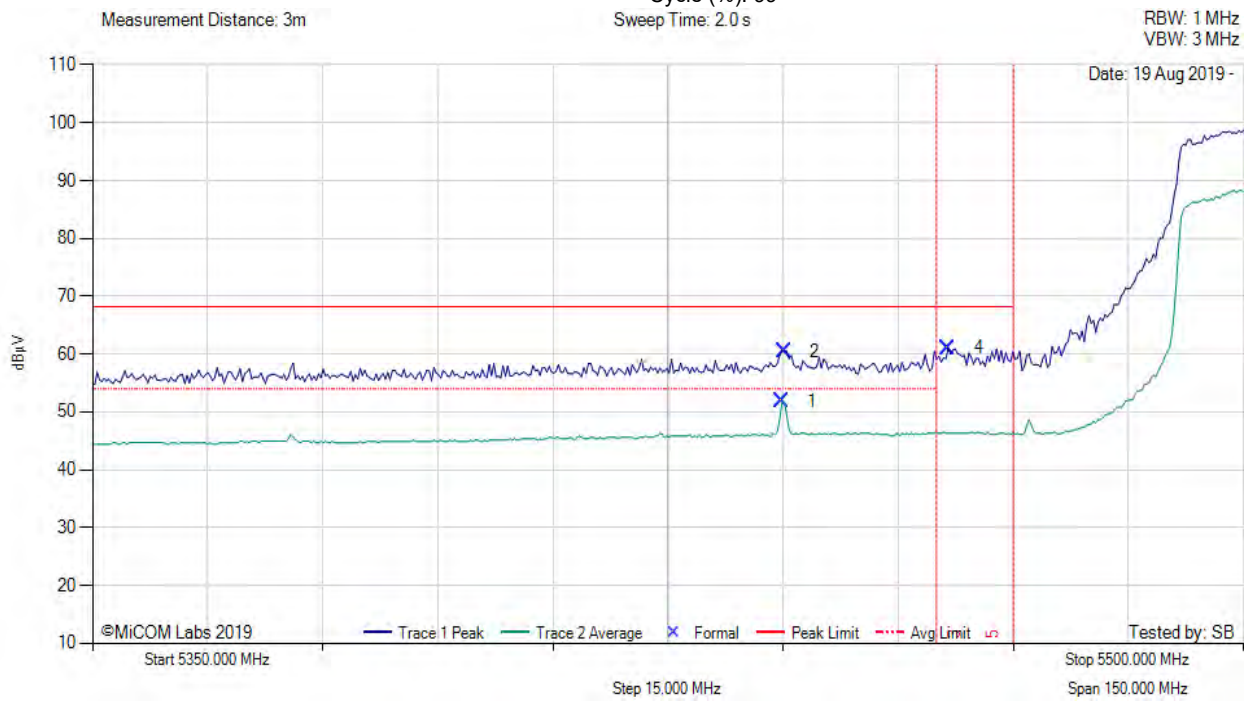


5350.00 - 5500.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5439.86	20.31	-2.70	34.50	52.11	Max Avg	Horizontal	179	349	54.0	-1.9	Pass
2	5450.68	29.23	-2.70	34.50	61.03	Max Peak	Horizontal	179	349	68.2	-7.2	Pass
4	5460.38	28.73	-2.69	34.53	60.57	Max Avg	Horizontal	179	349	68.2	-7.6	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

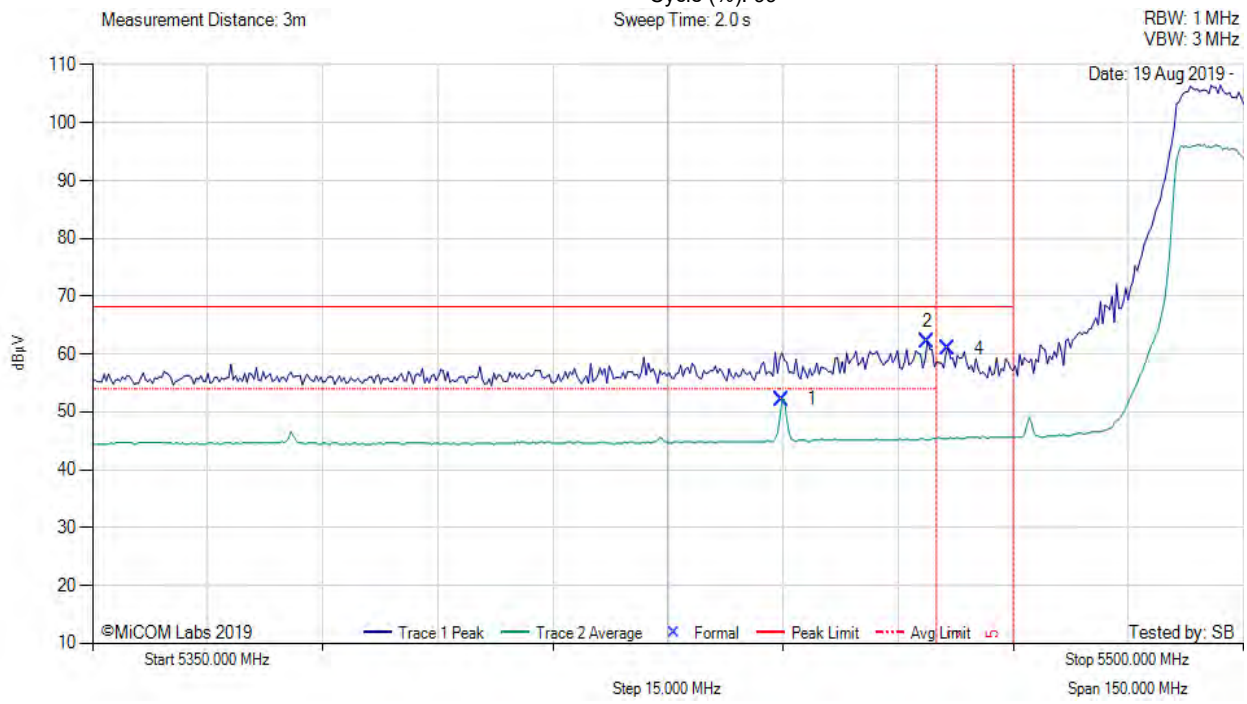


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5439.86	20.08	-2.70	34.50	51.88	Max Avg	Horizontal	179	349	54.0	-2.1	Pass
2	5440.16	28.72	-2.70	34.50	60.52	Max Peak	Horizontal	179	349	68.2	-7.7	Pass
4	5461.52	29.19	-2.69	34.53	61.03	Max Peak	Horizontal	179	349	68.2	-7.2	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

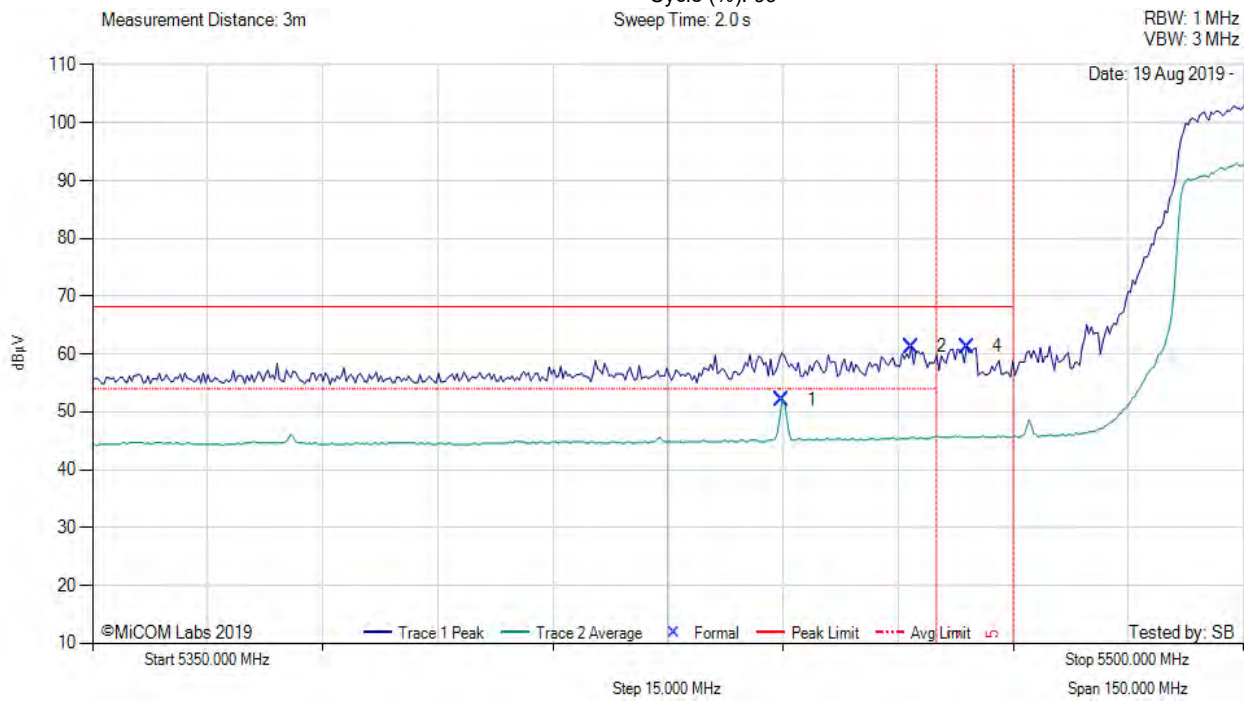


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5439.86	20.42	-2.70	34.50	52.22	Max Avg	Horizontal	179	349	54.0	-1.8	Pass
2	5458.80	30.32	-2.69	34.52	62.15	Max Peak	Horizontal	179	349	68.2	-6.1	Pass
4	5461.52	23.77	-2.69	34.53	60.99	Max Peak	Horizontal	179	349	68.2	-7.2	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

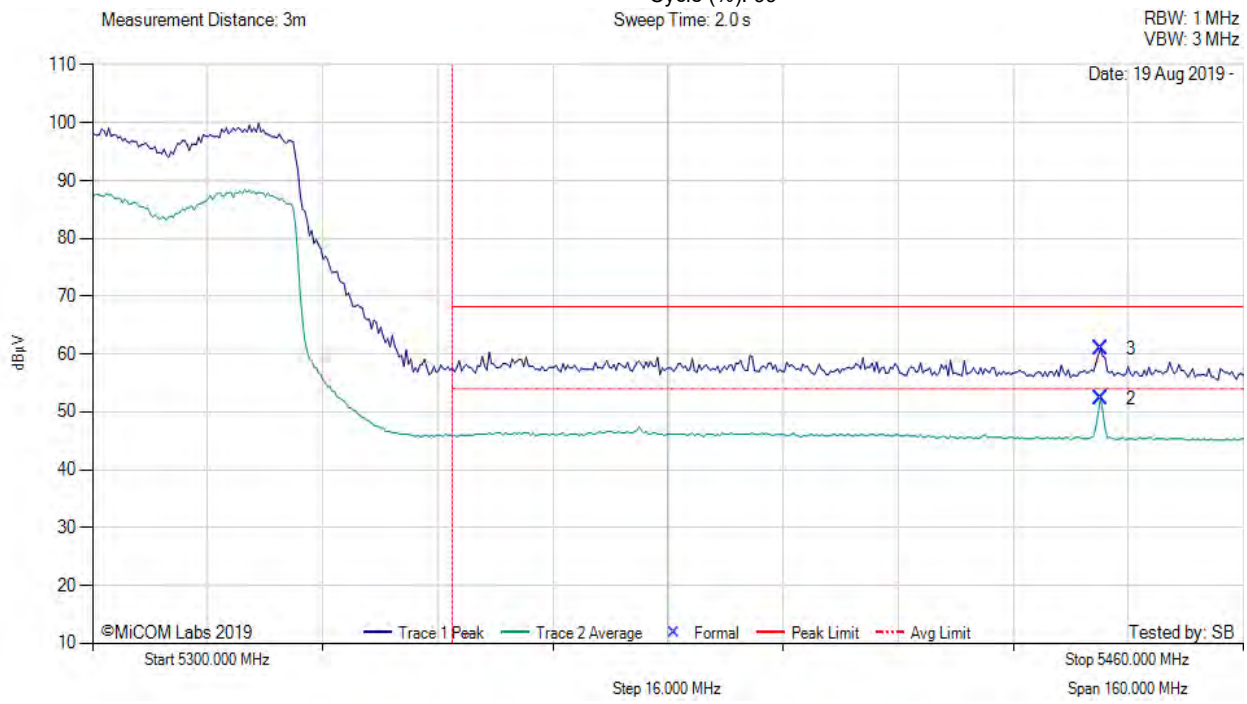


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5439.86	20.31	-2.70	34.50	52.11	Max Avg	Horizontal	179	349	54.0	-1.9	Pass
2	5456.71	29.44	-2.69	34.52	61.27	Max Peak	Horizontal	179	349	68.2	-7.0	Pass
4	5463.93	29.44	-2.69	34.52	61.27	Max Peak	Horizontal	179	349	68.2	-7.0	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5290.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

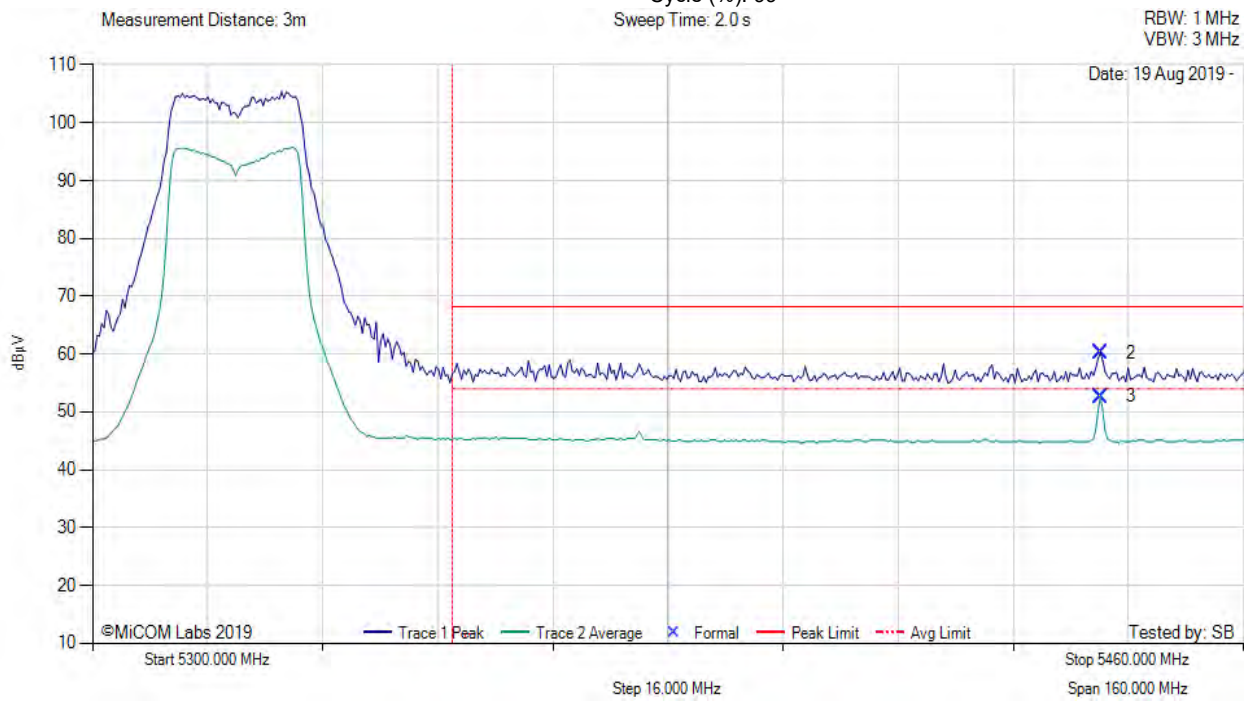


5300.00 - 5460.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
2	5440.10	20.54	-2.70	34.50	52.34	Max Avg	Horizontal	179	349	54.0	-1.7	Pass
3	5440.12	29.10	-2.70	34.50	60.90	Max Peak	Horizontal	179	349	68.2	-7.3	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5320.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99

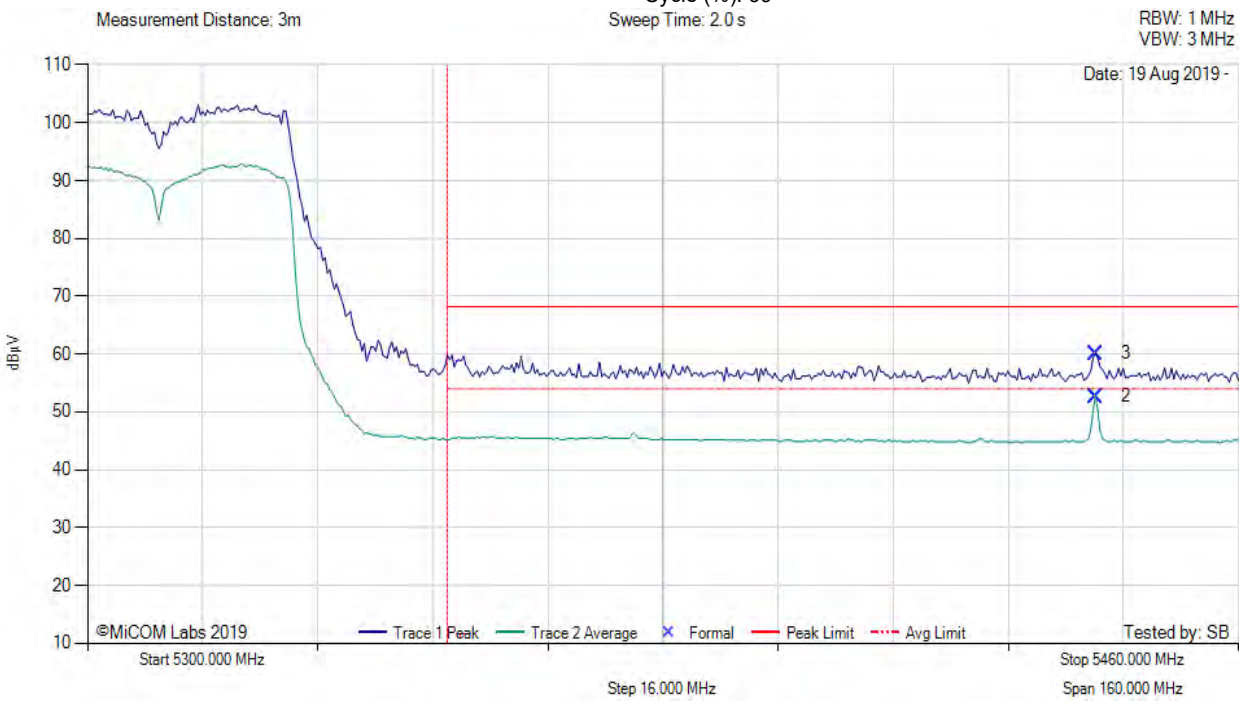


5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
2	5440.10	28.41	-2.70	34.50	60.21	Max Peak	Horizontal	179	349	68.2	-8.0	Pass
3	5440.12	20.86	-2.70	34.50	52.66	Max Avg	Horizontal	179	349	54.0	-1.3	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5310.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): 99



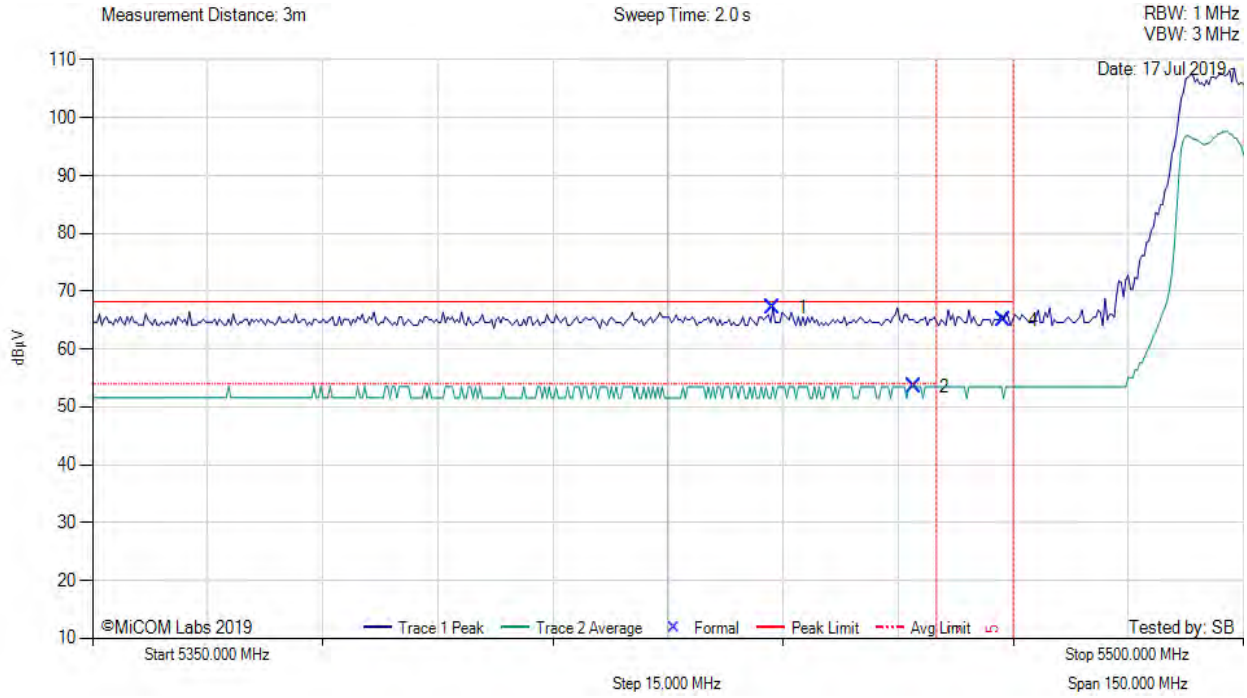
5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
2	5440.10	20.86	-2.70	34.50	52.66	Max Avg	Horizontal	179	349	54.0	-1.3	Pass
3	5440.12	28.27	-2.70	34.50	60.07	Max Peak	Horizontal	179	349	68.2	-8.2	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

A.1.1.1. Mikrotik RBSXTsqG-5acD

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

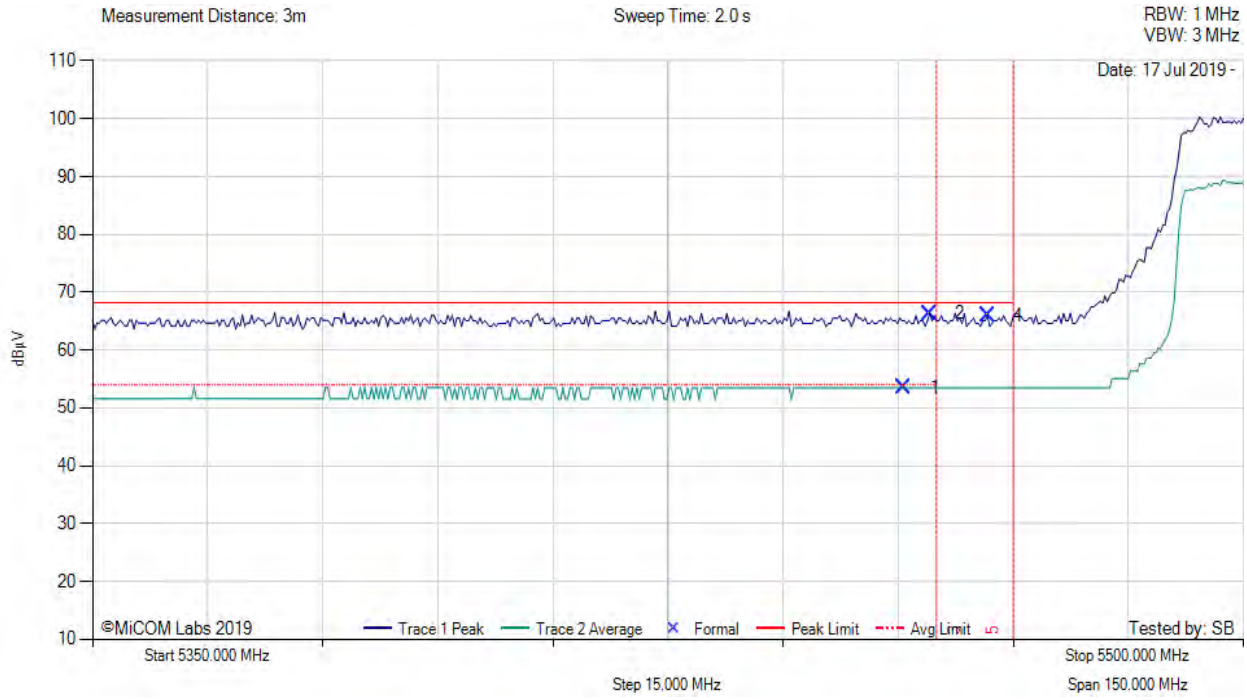


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5438.66	35.29	-2.70	34.51	67.10	Max Peak	Horizontal	151	358	68.2	-1.1	Pass
2	5456.99	21.65	-2.69	34.52	53.48	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
4	5468.74	33.63	-2.69	34.82	65.08	Max Peak	Horizontal	151	358	68.2	-3.1	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5530.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

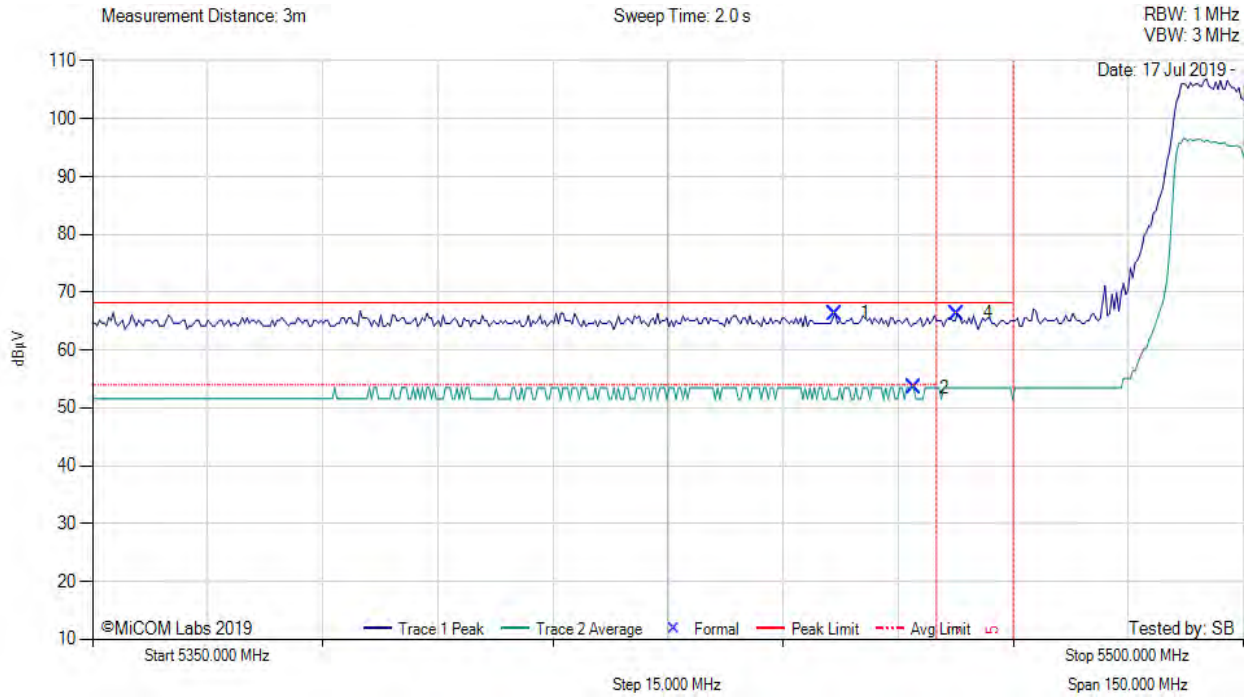


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5455.79	21.66	-2.70	34.52	53.48	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
2	5459.10	34.52	-2.69	34.52	66.35	Max Peak	Horizontal	151	358	68.2	-1.9	Pass
4	5466.63	34.14	-2.69	34.50	65.95	Max Peak	Horizontal	151	358	68.2	-2.3	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

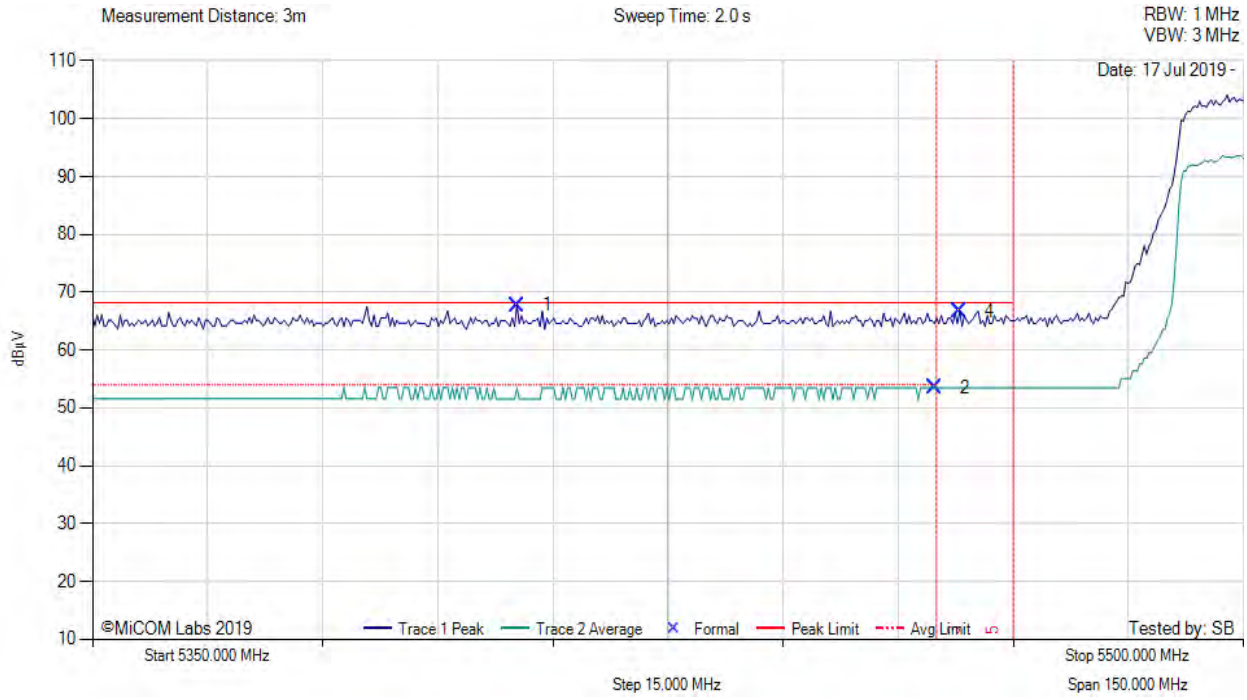


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5446.77	34.55	-2.70	34.50	66.35	Max Peak	Horizontal	151	358	68.2	-1.9	Pass
2	5456.99	21.65	-2.69	34.52	53.48	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
4	5462.73	34.54	-2.69	34.50	66.35	Max Peak	Horizontal	151	358	68.2	-1.9	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5510.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

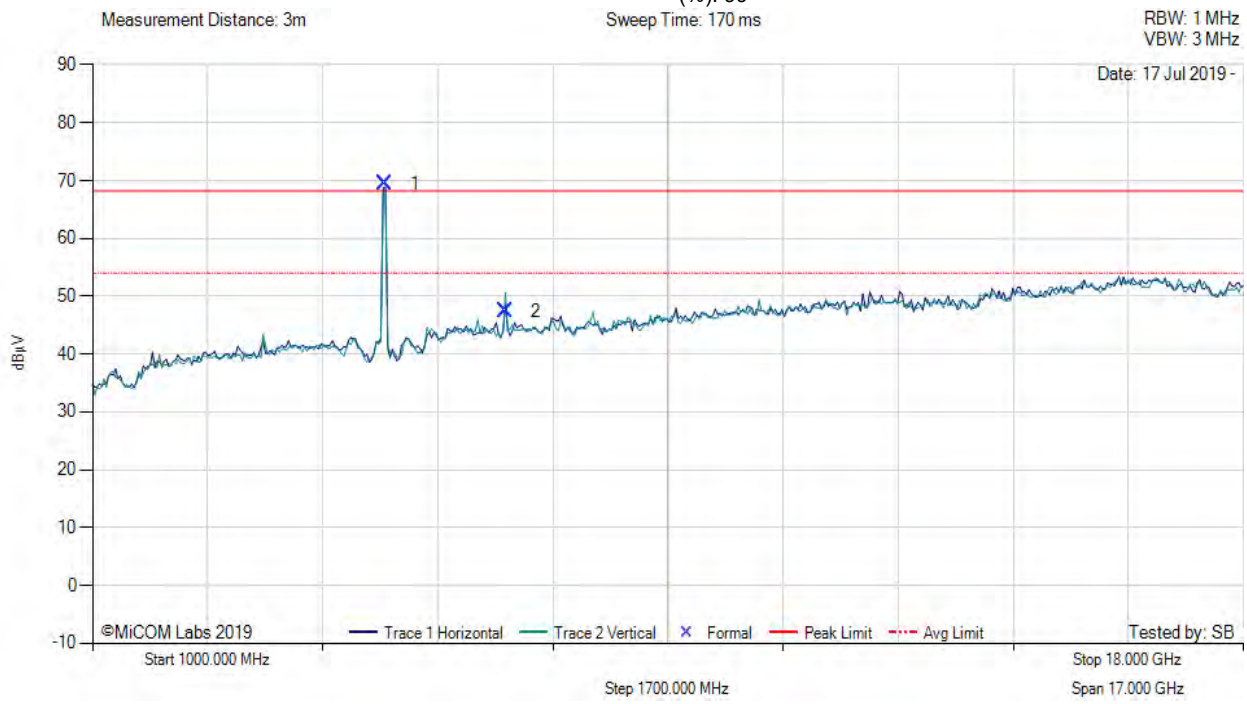


5350.00 - 5500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	5405.29	35.99	-2.71	34.53	67.81	Max Peak	Horizontal	151	358	68.2	-0.4	Pass
2	5459.70	21.65	-2.69	34.53	53.49	Max Avg	Horizontal	151	358	54.0	-0.5	Pass
4	5463.03	34.93	-2.69	34.50	66.74	Max Peak	Horizontal	151	358	68.2	-1.5	Pass
3	5460.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
5	5470.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

back to matrix

TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max, Duty Cycle (%): 99

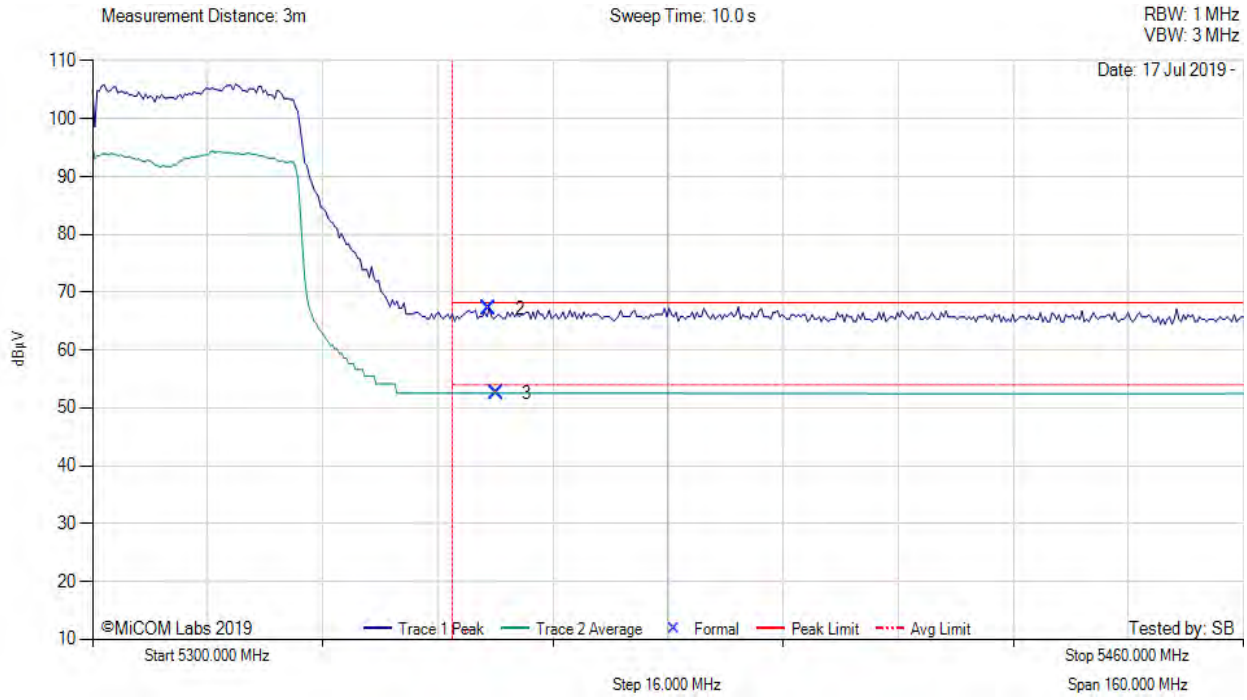


1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	5320.65	84.26	-2.67	-12.17	69.42	Peak (NRB)	Horizontal	100	0	--	--	Pass
2	7093.75	58.04	-3.01	-7.62	47.41	Peak (NRB)	Horizontal	100	0	--	--	Pass

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5260.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

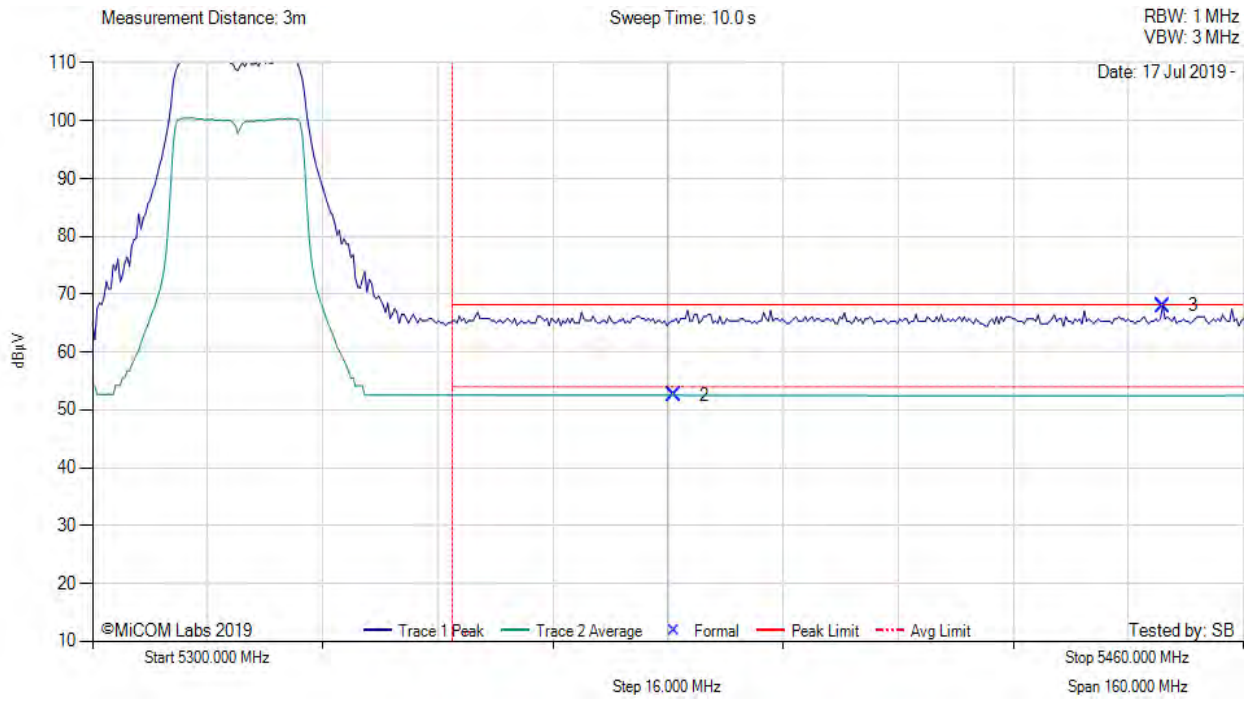


5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
2	5355.13	35.44	-2.69	34.47	67.22	Max Peak	Horizontal	151	358	68.2	-1.0	Pass
3	5356.09	20.79	-2.69	34.47	52.57	Max Avg	Horizontal	151	358	54.0	-1.4	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5320.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max

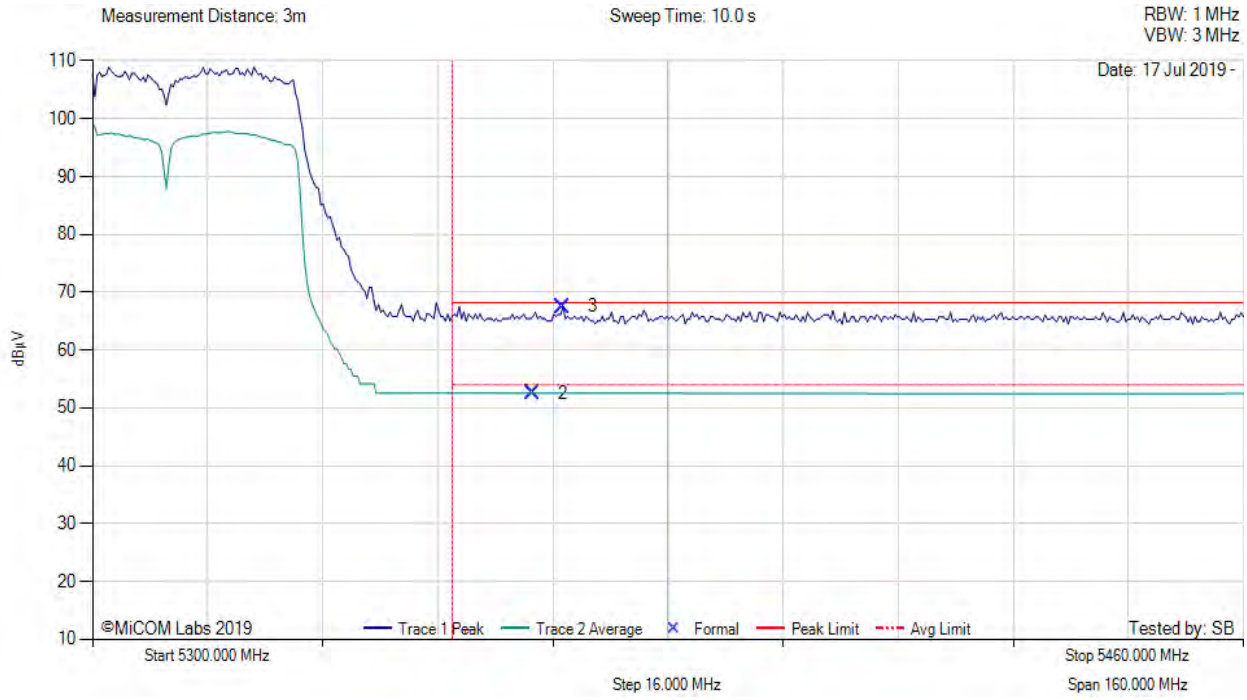


5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
2	5380.78	20.70	-2.66	34.51	52.55	Max Avg	Horizontal	151	358	54.0	-1.5	Pass
3	5448.76	36.25	-2.70	34.49	68.04	Max Peak	Horizontal	151	358	68.2	-0.2	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5310.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max



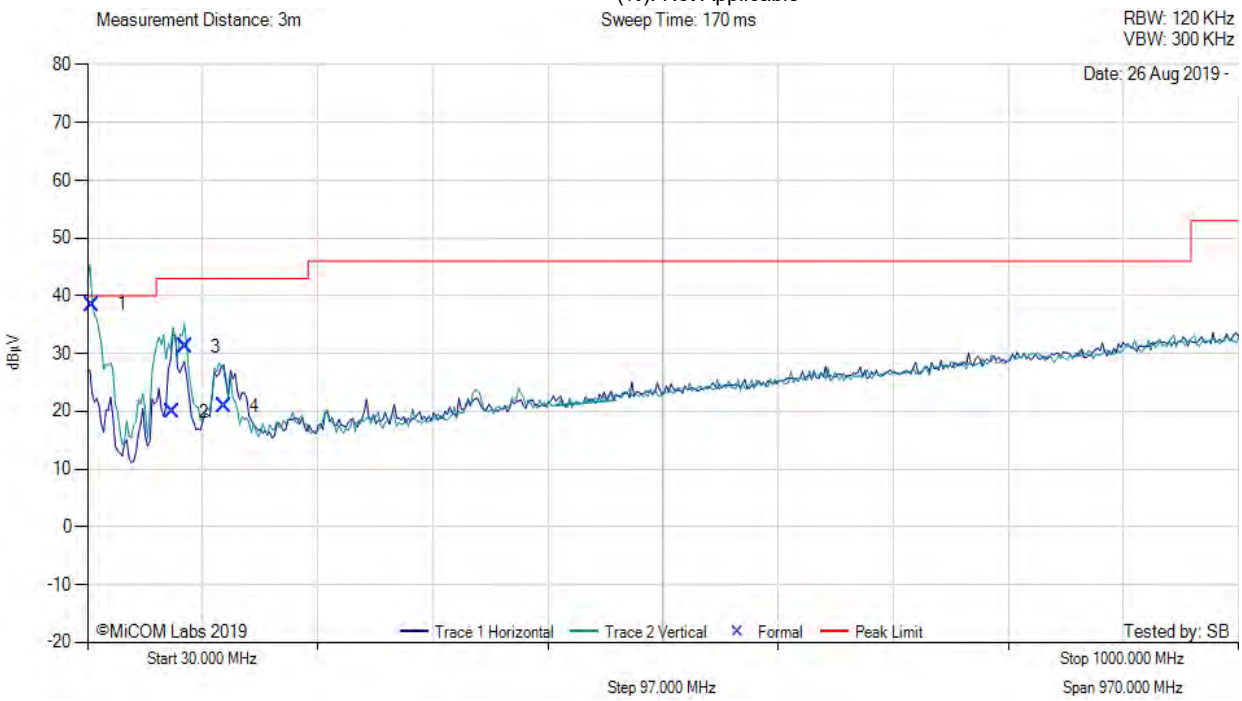
5300.00 - 5460.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
2	5361.22	20.79	-2.70	34.48	52.57	Max Avg	Horizontal	151	358	54.0	-1.4	Pass
3	5365.39	35.74	-2.69	34.48	67.53	Max Peak	Horizontal	151	358	68.2	-0.7	Pass
1	5350.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

back to matrix

A.4.3 Digital Emissions

DIGITAL EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBLHGG-5acD-XL, Power Setting: Max, Duty Cycle (%): Not Applicable

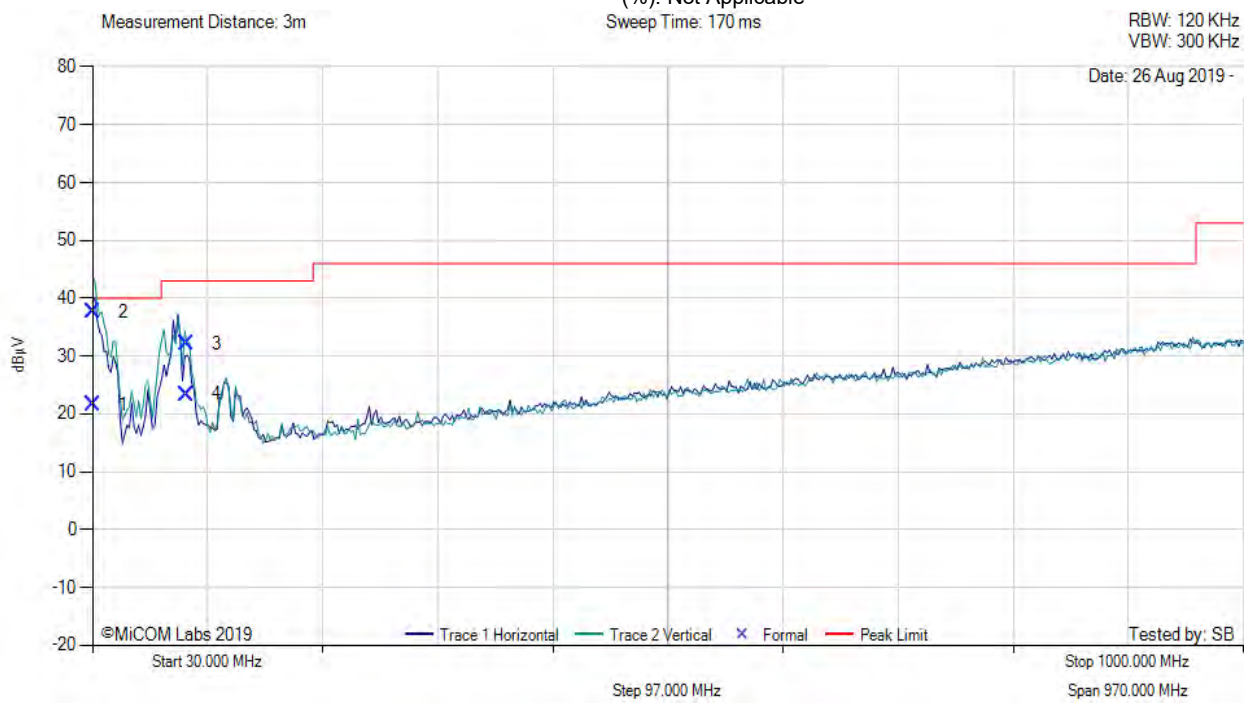


30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	33.38	45.30	3.55	-10.40	38.45	MaxQP	Vertical	98	225	40.0	-1.6	Pass
2	101.94	33.65	4.02	-17.70	19.97	Peak (NRB)	Horizontal	101	0	--	--	Pass
3	112.26	42.51	4.06	-15.40	31.17	MaxQP	Vertical	98	138	43.0	-11.8	Pass
4	145.32	32.41	4.22	-15.70	20.93	Peak (NRB)	Horizontal	101	0	--	--	Pass

back to matrix

DIGITAL EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Mikrotik RBSXTsqG-5acD, Power Setting: Max, Duty Cycle (%): Not Applicable



30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	30.79	26.49	3.52	-8.40	21.61	MaxQP	Horizontal	396	142	40.0	-18.4	Pass
2	30.79	42.54	3.52	-8.40	37.66	MaxQP	Vertical	112	204	40.0	-2.3	Pass
3	108.82	44.25	4.04	-16.10	32.19	MaxQP	Vertical	100	94	43.0	-10.8	Pass
4	108.82	35.45	4.04	-16.10	23.39	MaxQP	Horizontal	215	158	43.0	-19.6	Pass

back to matrix

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