

# **ROGERS LABS, INC.**

4405 West 259<sup>th</sup> Terrace  
Louisburg, KS 66053  
Phone / Fax (913) 837-3214

## Class 2 Permissive Change Application Report

HVIN: RBD22UGS-5HPacD2HnD-15S-US  
FCC ID: TV7D2352AC  
IC: 7442A-D2352AC

FOR

### **Mikrotikls SIA**

Brivibas gatve 214i  
Riga, Latvia LV-1039

FCC Designation: US5305  
IC Test Site Registration: 3041A-1  
Test Report Number: 200429

Test Dates: April 29, 2020 to June 16, 2020

Authorized Signatory: *Scot D Rogers*

Scot D. Rogers  
Rogers Labs, Inc.  
4405 West 259<sup>th</sup> Terrace  
Louisburg, KS 66053  
Telephone/Facsimile: (913) 837-3214

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Rogers Labs, Inc.  
4405 W. 259<sup>th</sup> Terrace  
Louisburg, KS 66053  
Phone/Fax: (913) 837-3214  
Revision 1

Mikrotikls SIA  
HVIN: RBD22UGS-5HPacD2HnD-15S-US  
Test: 200429  
Test to: 47CFR (Parts 2, 15) and RSS-247  
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S/N: CCD703CA62E5/015  
FCC ID: TV7D2352AC  
IC: 7442A-D2352AC

Date: July 9, 2020

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## Revisions

Revision 1 Issued June 17, 2020

## Summary

The following information is submitted for consideration in processing Class 2 Permissive Change (C2PC) of authorized equipment. The product was granted authorization with FCC (FCC ID: TV7D2352AC Issued January 23, 2020) and Canada (IC: 7442A-D2352AC Issued April 14, 2020). The design provides communications operations in the United States as Digital Transmission System (DTS) across the 2412-2462 MHz frequency band and Unlicensed National Information Infrastructure (UNII) across 5180-5240 and 5745-5825 MHz. The design provides communications operations in Canada as Digital Transmission System (DTS) across the 2412-2462 MHz frequency band and Unlicensed National Information Infrastructure (UNII) across 5745-5825 MHz. This report presents test results supporting the use of this product in a modified enclosure with integrated internal antenna. The change to equipment addresses the change to enclosure and integrated antenna. The new configuration will hold same identifier and referenced as HVIN: RBD22UGS-5HPacD2HnD-15S-US.

Name of Applicant: Mikrotikls SIA  
 Brivibas gatve 214i  
 Riga, Latvia LV-1039

HVID: RBD22UGS-5HPacD2HnD-15S-US      PMN: mANTBox 52 15S  
 FCC ID: TV7D2352AC      IC: 7442A-D2352AC

## Opinion / Interpretation of Results

| Test Performed per 47CFR, RSS-247 | Minimum Margin (dB) | Results  |
|-----------------------------------|---------------------|----------|
| Radiated Emissions                | -1.9                | Complies |

## Change to Equipment from Original Design

This request addresses use with integrated Dual-Band Antenna manufactured by Mikrotik (model: Inegral) providing 12 dBi for 2.4 GHz and 15 dBi gain for 5 GHz operations. The information contained in this report addresses radiated emissions measured when using the integrated antenna and enclosure. No modification in the transmitter circuitry was required or performed. The transmitter remains electrically identical and functionally equivalent to the original equipment authorizations. This report presets worst-case emissions when operating in U-NII modes across the 5180-5240, and 5745-5825 MHz frequency bands.

## Equipment Tested

| <u>Equipment</u> | <u>Model / PN</u>          | <u>FCC Identifier</u> | <u>IC Identifier</u> |
|------------------|----------------------------|-----------------------|----------------------|
| EUT              | RBD22UGS-5HPacD2HnD-15S-US | TV7D2352AC            | 7442A-D2352AC        |
| AC Supply        | MT48-480095-11SGU          | N/A                   | N/A                  |
| Dell Latitude    | E6520                      | N/A                   | N/A                  |

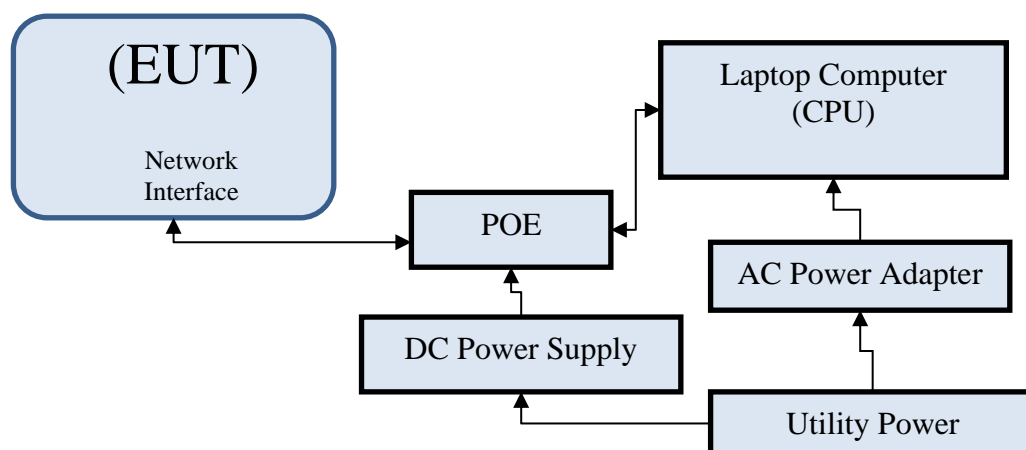
Test results in this report relate only to the items tested.

Software Version: 6.48beta12

## Equipment Function and Configuration

The EUT is a Digital Transmission communications device providing wireless digital communications between network and digital equipment. The design provides input power port, SFP, USB port, and single RJ45 network port. The design provides no other interfacing options than those presented in this report. For testing purposes, the test sample was configured as directed by the manufacturer with all transmitters and chains active and communicating through the network line with the laptop computer. As requested by the manufacturer the equipment was tested for emissions compliance using the available configuration with the worst-case data presented. Test results in this report relate only to the products described in this report.

### Equipment Configuration



## Applicable Standards & Test Procedures

In accordance with the 47CFR, dated April 29, 2020 Part 2, Subpart J, Paragraph 2.932 and applicable parts of paragraph 15, RSS-GEN and RSS-247 the following information is submitted for processing Class 2 Permissive Change (C2PC) and add model to REL Family.

## Test Site Locations

Conducted EMI AC line conducted emissions testing performed in a shielded screen room located at Rogers Labs, Inc., 4405 West 259<sup>th</sup> Terrace, Louisburg, KS

Radiated EMI The radiated emissions tests were performed at the 3 meters, Open Area Test Site (OATS) located at Rogers Labs, Inc., 4405 West 259<sup>th</sup> Terrace, Louisburg, KS

Registered Site information: FCC Site: US5305 and ISED: 3041A, CAB Identifier: US0096

NVLAP Accreditation Lab code 200087-0

## Units of Measurements

Conducted EMI Data presented in dB $\mu$ V; dB referenced to one microvolt

Antenna port Conducted Data is in dBm; dB referenced to one milliwatt

Radiated EMI Data presented in dB $\mu$ V/m; dB referenced to one microvolt per meter

Note: The limit is expressed for a measurement in dB $\mu$ V/m when the measurement is taken at a distance of 3 or 10 meters. Data taken for this report was taken at distance of 3 meters. Sample calculation demonstrates corrected field strength reading for Open Area Test Site using the measurement reading and correcting for receive antenna factor, cable losses, and amplifier gains.

Sample Calculation:

RFS = Radiated Field Strength, FSM = Field Strength Measured

A.F. = Receive antenna factor, Losses = attenuators/cable losses, Gain = amplification gains

$RFS (dB\mu V/m @ 3m) = FSM (dB\mu V) + A.F. (dB/m) + Losses (dB) - Gain (dB)$

## Environmental Conditions

|                      |                    |
|----------------------|--------------------|
| Ambient Temperature  | 24.4° to 25.3° C   |
| Relative Humidity    | 39% to 46%         |
| Atmospheric Pressure | 1015.1 to 10195 mb |

## Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to demonstrate compliance with the CFR47 Parts 2 and 15 and Canada RSS-Gen and RSS-247 requirements. There were no deviations to the specifications.

## Intentional Radiators

The following information is submitted in support of demonstration of compliance with the requirements of 47CFR Parts 2 and 15E and RSS-247 Class 2 Permissible Change.

### ***Restricted Bands of Operation***

Spurious emissions falling in the restricted frequency bands of operation were measured at the OATS. The EUT utilizes frequency, determining circuitry, which generates harmonics falling in the restricted bands. Emissions were investigated at the OATS, using appropriate antennas or pyramidal horns, amplification stages, and a spectrum analyzer. Peak and average amplitudes of frequencies above 1000 MHz were compared to the required limits with worst-case data presented below. Test procedures of ANSI C63.10-2013 were used during testing. No other significant emission was observed which fell into the restricted bands of operation. Computed emission values consider the received radiated field strength, receive antenna correction factor, amplifier gain stage, and test system cable losses. Data presented reflects measurement result corrected to account for measurement system gains and losses. worst-case data presented.

**Table 1 Radiated Harmonic Emissions in Restricted Bands U-NII-1 Data (802.11a)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 5150.0           | 53.4                           | 38.3                              | 53.5                         | 37.3                            | 54.0                      | -15.7                  | -16.7                |
| 5350.0           | 50.3                           | 37.1                              | 51.6                         | 38.2                            | 54.0                      | -16.9                  | -15.8                |
| 15540.0          | 62.3                           | 49.4                              | 61.9                         | 49.5                            | 54.0                      | -4.6                   | -4.5                 |
| 15600.0          | 62.4                           | 49.3                              | 62.9                         | 49.3                            | 54.0                      | -4.7                   | -4.7                 |
| 15720.0          | 63.2                           | 50.3                              | 62.8                         | 50.1                            | 54.0                      | -3.7                   | -3.9                 |
| 20720.0          | 64.9                           | 51.8                              | 64.7                         | 51.7                            | 54.0                      | -2.2                   | -2.3                 |
| 20800.0          | 64.5                           | 51.4                              | 64.5                         | 51.5                            | 54.0                      | -2.6                   | -2.5                 |
| 20960.0          | 64.3                           | 51.4                              | 64.5                         | 51.3                            | 54.0                      | -2.6                   | -2.7                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada



**Table 2 Radiated Harmonic Emissions in Restricted Bands U-NII-1 Data (802.11n)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 5150.0           | 53.3                           | 38.5                              | 54.2                         | 38.1                            | 54.0                      | -15.5                  | -15.9                |
| 5350.0           | 51.2                           | 36.9                              | 52.0                         | 35.5                            | 54.0                      | -17.1                  | -18.5                |
| 15540.0          | 62.3                           | 49.3                              | 62.5                         | 49.5                            | 54.0                      | -4.7                   | -4.5                 |
| 15600.0          | 62.4                           | 49.0                              | 61.8                         | 49.3                            | 54.0                      | -5.0                   | -4.7                 |
| 15720.0          | 63.2                           | 50.2                              | 62.9                         | 50.2                            | 54.0                      | -3.8                   | -3.8                 |
| 20720.0          | 64.6                           | 51.7                              | 64.4                         | 51.8                            | 54.0                      | -2.3                   | -2.2                 |
| 20800.0          | 64.6                           | 51.4                              | 64.0                         | 51.3                            | 54.0                      | -2.6                   | -2.7                 |
| 20960.0          | 64.5                           | 51.3                              | 64.0                         | 51.2                            | 54.0                      | -2.7                   | -2.8                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada

**Table 3 Radiated Harmonic Emissions in Restricted Bands U-NII-1 Data (802.11n40)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 5150.0           | 55.3                           | 37.7                              | 55.6                         | 37.5                            | 54.0                      | -16.3                  | -16.5                |
| 5350.0           | 51.1                           | 36.8                              | 51.9                         | 36.2                            | 54.0                      | -17.2                  | -17.8                |
| 15570.0          | 62.9                           | 49.8                              | 62.9                         | 50.0                            | 54.0                      | -4.2                   | -4.0                 |
| 15690.0          | 61.2                           | 48.0                              | 62.9                         | 49.4                            | 54.0                      | -6.0                   | -4.6                 |
| 20760.0          | 65.7                           | 51.4                              | 64.6                         | 51.3                            | 54.0                      | -2.6                   | -2.7                 |
| 20920.0          | 64.4                           | 51.3                              | 63.9                         | 51.2                            | 54.0                      | -2.7                   | -2.8                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada

**Table 4 Radiated Harmonic Emissions in Restricted Bands U-NII-1 Data (802.11ac80)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 5150.0           | 54.9                           | 38.1                              | 54.5                         | 38.7                            | 54.0                      | -15.9                  | -15.3                |
| 5350.0           | 50.6                           | 37.2                              | 52.0                         | 35.7                            | 54.0                      | -16.8                  | -18.3                |
| 15630.0          | 56.3                           | 42.7                              | 55.6                         | 42.7                            | 54.0                      | -11.3                  | -11.3                |
| 20840.0          | 64.1                           | 51.3                              | 64.5                         | 51.2                            | 54.0                      | -2.7                   | -2.8                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada

**Table 5 Radiated Harmonic Emissions in Restricted Bands U-NII-3 Data (802.11a)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 11490.0          | 57.4                           | 44.6                              | 57.9                         | 45.0                            | 54.0                      | -9.4                   | -9.0                 |
| 11570.0          | 58.3                           | 45.0                              | 58.1                         | 45.2                            | 54.0                      | -9.0                   | -8.8                 |
| 11650.0          | 58.5                           | 45.3                              | 58.2                         | 45.3                            | 54.0                      | -8.7                   | -8.7                 |
| 22980.0          | 65.4                           | 52.1                              | 65.2                         | 52.1                            | 54.0                      | -1.9                   | -1.9                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Table 6 Radiated Harmonic Emissions in Restricted Bands U-NII-3 Data (802.11n)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 11490.0          | 58.1                           | 44.8                              | 58.1                         | 44.9                            | 54.0                      | -9.2                   | -9.1                 |
| 11570.0          | 58.6                           | 45.0                              | 58.0                         | 45.0                            | 54.0                      | -9.0                   | -9.0                 |
| 11650.0          | 58.2                           | 45.1                              | 58.0                         | 45.3                            | 54.0                      | -8.9                   | -8.7                 |
| 22980.0          | 65.4                           | 52.1                              | 65.2                         | 52.0                            | 54.0                      | -1.9                   | -2.0                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Table 7 Radiated Harmonic Emissions in Restricted Bands U-NII-3 Data (802.11n40)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 11510.0          | 57.8                           | 44.6                              | 57.9                         | 44.8                            | 54.0                      | -9.4                   | -9.2                 |
| 11590.0          | 57.9                           | 44.9                              | 58.0                         | 45.0                            | 54.0                      | -9.1                   | -9.0                 |
| 23020.0          | 65.1                           | 52.0                              | 65.3                         | 52.0                            | 54.0                      | -2.0                   | -2.0                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Table 8 Radiated Harmonic Emissions in Restricted Bands U-NII-3 Data (802.11ac80)**

| Frequency in MHz | Horizontal Peak (dB $\mu$ V/m) | Horizontal Average (dB $\mu$ V/m) | Vertical Peak (dB $\mu$ V/m) | Vertical Average (dB $\mu$ V/m) | Limit @ 3m (dB $\mu$ V/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------------|-----------------------------------|------------------------------|---------------------------------|---------------------------|------------------------|----------------------|
| 11550.0          | 57.5                           | 44.8                              | 58.0                         | 44.9                            | 54.0                      | -9.2                   | -9.1                 |
| 23100.0          | 65.3                           | 52.1                              | 65.1                         | 52.1                            | 54.0                      | -1.9                   | -1.9                 |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Summary of Results for Radiated Emissions in Restricted Bands**

The EUT demonstrated compliance with the radiated emissions requirements of 47 CFR Part 15 and RSS-GEN restricted frequency bands requirements. The EUT worst-case operation demonstrated a minimum radiated emission margin of -1.9 dB below the requirements in restricted frequency bands. Peak and average amplitudes were checked for compliance with the regulations. Worst-case emissions are reported with other emissions found in the restricted frequency bands at least 20 dB below the requirements.

## ***Operation in the U-NII, 5150-5825 MHz Frequency Bands***

Radiated emissions were measured on the Open Area Test Site (OATS) at a three-meter distance. Testing followed ANSI C63.10-2013 and FCC 789033 D02 General U-NII Test Procedures New Rules v02r01. The test sample was placed on a turntable elevated as required above the ground plane as required at a 3 meters distance from the FSM antenna located on the OATS for testing radiated emissions. The peak and average amplitude of emissions above 1000 MHz were measured using a spectrum analyzer/EMI receiver. Emissions data was recorded from the measurement results. Data presented reflects measurement result corrected to account for measurement system gains and losses. This report documents emissions governed under the U-NII-1 and U-NII-3 bands operating in the 5180-5240 and 5745-5825 MHz frequency bands as applicable.

### Transmitter Emissions Data

**Table 9 Radiated Transmitter Emissions U-NII-1 Data (802.11a)**

| Frequency in MHz | Horizontal Peak (dBµV/m) | Horizontal Average (dBµV/m) | Vertical Peak (dBµV/m) | Vertical Average (dBµV/m) | Limit @ 3m (dBµV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5180.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10360.0          | 56.3                     | 43.6                        | 56.9                   | 43.8                      | 68.3                | -24.7                  | -24.5                |
| 15540.0          | 62.3                     | 49.4                        | 61.9                   | 49.5                      | 68.3                | -18.9                  | -18.8                |
| 20720.0          | 64.9                     | 51.8                        | 64.7                   | 51.7                      | 68.3                | -16.5                  | -16.6                |
| 25900.0          | 65.8                     | 53.0                        | 66.2                   | 53.0                      | 68.3                | -15.3                  | -15.3                |
| 5200.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10400.0          | 57.2                     | 44.0                        | 57.2                   | 44.1                      | 68.3                | -24.3                  | -24.2                |
| 15600.0          | 62.4                     | 49.3                        | 62.9                   | 49.3                      | 68.3                | -19.0                  | -19.0                |
| 20800.0          | 64.5                     | 51.4                        | 64.5                   | 51.5                      | 68.3                | -16.9                  | -16.8                |
| 26000.0          | 66.1                     | 52.8                        | 65.3                   | 52.9                      | 68.3                | -15.5                  | -15.4                |
| 5240.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10480.0          | 57.6                     | 44.5                        | 57.7                   | 44.6                      | 68.3                | -23.8                  | -23.7                |
| 15720.0          | 63.2                     | 50.3                        | 62.8                   | 50.1                      | 68.3                | -18.0                  | -18.2                |
| 20960.0          | 64.3                     | 51.4                        | 64.5                   | 51.3                      | 68.3                | -16.9                  | -17.0                |
| 26200.0          | 65.8                     | 52.7                        | 66.1                   | 52.7                      | 68.3                | -15.6                  | -15.6                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada

**Table 10 Radiated Transmitter Emissions U-NII-1 Data (802.11n)**

| Frequency in MHz | Horizontal Peak (dBμV/m) | Horizontal Average (dBμV/m) | Vertical Peak (dBμV/m) | Vertical Average (dBμV/m) | Limit @ 3m (dBμV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5180.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10360.0          | 56.3                     | 43.6                        | 56.8                   | 43.9                      | 68.3                | -24.7                  | -24.4                |
| 15540.0          | 62.3                     | 49.3                        | 62.5                   | 49.5                      | 68.3                | -19.0                  | -18.8                |
| 20720.0          | 64.6                     | 51.7                        | 64.4                   | 51.8                      | 68.3                | -16.6                  | -16.5                |
| 25900.0          | 66.3                     | 53.0                        | 66.0                   | 53.0                      | 68.3                | -15.3                  | -15.3                |
| 5200.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10400.0          | 57.0                     | 44.0                        | 56.7                   | 44.1                      | 68.3                | -24.3                  | -24.2                |
| 15600.0          | 62.4                     | 49.0                        | 61.8                   | 49.3                      | 68.3                | -19.3                  | -19.0                |
| 20800.0          | 64.6                     | 51.4                        | 64.0                   | 51.3                      | 68.3                | -16.9                  | -17.0                |
| 26000.0          | 65.3                     | 52.8                        | 66.2                   | 52.8                      | 68.3                | -15.5                  | -15.5                |
| 5240.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10480.0          | 57.6                     | 44.6                        | 58.1                   | 44.7                      | 68.3                | -23.7                  | -23.6                |
| 15720.0          | 63.2                     | 50.2                        | 62.9                   | 50.2                      | 68.3                | -18.1                  | -18.1                |
| 20960.0          | 64.5                     | 51.3                        | 64.0                   | 51.2                      | 68.3                | -17.0                  | -17.1                |
| 26200.0          | 65.7                     | 52.6                        | 65.5                   | 52.6                      | 68.3                | -15.7                  | -15.7                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada

**Table 11 Radiated Transmitter Emissions U-NII-1 Data (802.11n40)**

| Frequency in MHz | Horizontal Peak (dBµV/m) | Horizontal Average (dBµV/m) | Vertical Peak (dBµV/m) | Vertical Average (dBµV/m) | Limit @ 3m (dBµV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5190.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10380.0          | 56.7                     | 44.0                        | 57.5                   | 44.0                      | 68.3                | -24.3                  | -24.3                |
| 15570.0          | 62.9                     | 49.8                        | 62.9                   | 50.0                      | 68.3                | -18.5                  | -18.3                |
| 20760.0          | 65.7                     | 51.4                        | 64.6                   | 51.3                      | 68.3                | -16.9                  | -17.0                |
| 25950.0          | 66.2                     | 52.8                        | 66.2                   | 52.8                      | 68.3                | -15.5                  | -15.5                |
| 5230.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10460.0          | 57.0                     | 44.0                        | 58.1                   | 44.8                      | 68.3                | -24.3                  | -23.5                |
| 15690.0          | 61.2                     | 48.0                        | 62.9                   | 49.4                      | 68.3                | -20.3                  | -18.9                |
| 20920.0          | 64.4                     | 51.3                        | 63.9                   | 51.2                      | 68.3                | -17.0                  | -17.1                |
| 26150.0          | 65.8                     | 52.3                        | 65.5                   | 52.2                      | 68.3                | -16.0                  | -16.1                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada



**Table 12 Radiated Transmitter Emissions U-NII-1 Data (802.11ac80)**

| Frequency in MHz | Horizontal Peak (dBμV/m) | Horizontal Average (dBμV/m) | Vertical Peak (dBμV/m) | Vertical Average (dBμV/m) | Limit @ 3m (dBμV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5210.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 10420.0          | 57.5                     | 44.4                        | 57.3                   | 44.3                      | 68.3                | -23.9                  | -24.0                |
| 15630.0          | 56.3                     | 42.7                        | 55.6                   | 42.7                      | 68.3                | -25.6                  | -25.6                |
| 20840.0          | 64.1                     | 51.3                        | 64.5                   | 51.2                      | 68.3                | -17.0                  | -17.1                |
| 26050.0          | 65.9                     | 53.2                        | 66.2                   | 53.2                      | 68.3                | -15.1                  | -15.1                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Note: This function is not authorized in Canada

**Table 13 Radiated Transmitter Emissions U-NII-3 Data (802.11a)**

| Frequency in MHz | Horizontal Peak (dBμV/m) | Horizontal Average (dBμV/m) | Vertical Peak (dBμV/m) | Vertical Average (dBμV/m) | Limit @ 3m (dBμV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5745.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11490.0          | 57.4                     | 44.6                        | 57.9                   | 45.0                      | 68.3                | -23.7                  | -23.3                |
| 17235.0          | 63.4                     | 49.9                        | 63.1                   | 50.1                      | 68.3                | -18.4                  | -18.2                |
| 22980.0          | 65.4                     | 52.1                        | 65.2                   | 52.1                      | 68.3                | -16.2                  | -16.2                |
| 28725.0          | 68.3                     | 55.2                        | 68.9                   | 55.2                      | 68.3                | -13.1                  | -13.1                |
| 5785.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11570.0          | 58.3                     | 45.0                        | 58.1                   | 45.2                      | 68.3                | -23.3                  | -23.1                |
| 17355.0          | 63.8                     | 51.0                        | 63.3                   | 50.7                      | 68.3                | -17.3                  | -17.6                |
| 23140.0          | 65.2                     | 52.1                        | 65.5                   | 52.1                      | 68.3                | -16.2                  | -16.2                |
| 28925.0          | 68.2                     | 55.4                        | 68.1                   | 55.4                      | 68.3                | -12.9                  | -12.9                |
| 5825.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11650.0          | 58.5                     | 45.3                        | 58.2                   | 45.3                      | 68.3                | -23.0                  | -23.0                |
| 17475.0          | 64.4                     | 51.4                        | 64.0                   | 51.5                      | 68.3                | -16.9                  | -16.8                |
| 23300.0          | 65.2                     | 52.0                        | 65.1                   | 52.0                      | 68.3                | -16.3                  | -16.3                |
| 29125.0          | 67.9                     | 55.1                        | 68.2                   | 55.1                      | 68.3                | -13.2                  | -13.2                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Table 14 Radiated Transmitter Emissions U-NII-3 Data (802.11n)**

| Frequency in MHz | Horizontal Peak (dBμV/m) | Horizontal Average (dBμV/m) | Vertical Peak (dBμV/m) | Vertical Average (dBμV/m) | Limit @ 3m (dBμV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5745.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11490.0          | 58.1                     | 44.8                        | 58.1                   | 44.9                      | 68.3                | -23.5                  | -23.4                |
| 17235.0          | 62.6                     | 49.7                        | 62.9                   | 49.8                      | 68.3                | -18.6                  | -18.5                |
| 22980.0          | 65.4                     | 52.1                        | 65.2                   | 52.0                      | 68.3                | -16.2                  | -16.3                |
| 28725.0          | 67.9                     | 55.2                        | 68.2                   | 55.2                      | 68.3                | -13.1                  | -13.1                |
| 5785.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11570.0          | 58.6                     | 45.0                        | 58.0                   | 45.0                      | 68.3                | -23.3                  | -23.3                |
| 17355.0          | 63.7                     | 50.6                        | 63.3                   | 50.5                      | 68.3                | -17.7                  | -17.8                |
| 23140.0          | 65.2                     | 52.1                        | 65.7                   | 52.1                      | 68.3                | -16.2                  | -16.2                |
| 28925.0          | 68.3                     | 55.4                        | 68.4                   | 55.4                      | 68.3                | -12.9                  | -12.9                |
| 5825.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11650.0          | 58.2                     | 45.1                        | 58.0                   | 45.3                      | 68.3                | -23.2                  | -23.0                |
| 17475.0          | 64.0                     | 51.2                        | 64.4                   | 51.3                      | 68.3                | -17.1                  | -17.0                |
| 23300.0          | 65.4                     | 51.9                        | 65.3                   | 51.9                      | 68.3                | -16.4                  | -16.4                |
| 29125.0          | 68.7                     | 55.1                        | 68.2                   | 55.1                      | 68.3                | -13.2                  | -13.2                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Table 15 Radiated Transmitter Emissions U-NII-3 Data (802.11n40)**

| Frequency in MHz | Horizontal Peak (dBμV/m) | Horizontal Average (dBμV/m) | Vertical Peak (dBμV/m) | Vertical Average (dBμV/m) | Limit @ 3m (dBμV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5755.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11510.0          | 57.8                     | 44.6                        | 57.9                   | 44.8                      | 68.3                | -23.7                  | -23.5                |
| 17265.0          | 62.6                     | 49.6                        | 63.3                   | 49.8                      | 68.3                | -18.7                  | -18.5                |
| 23020.0          | 65.1                     | 52.0                        | 65.3                   | 52.0                      | 68.3                | -16.3                  | -16.3                |
| 28775.0          | 67.9                     | 55.2                        | 68.8                   | 55.1                      | 68.3                | -13.1                  | -13.2                |
| 5795.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11590.0          | 57.9                     | 44.9                        | 58.0                   | 45.0                      | 68.3                | -23.4                  | -23.3                |
| 17385.0          | 63.3                     | 50.6                        | 64.4                   | 50.8                      | 68.3                | -17.7                  | -17.5                |
| 23180.0          | 64.7                     | 52.0                        | 65.0                   | 52.0                      | 68.3                | -16.3                  | -16.3                |
| 28975.0          | 68.0                     | 55.2                        | 68.9                   | 55.2                      | 68.3                | -13.1                  | -13.1                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Table 16 Radiated Transmitter Emissions U-NII-3 Data (802.11ac80)**

| Frequency in MHz | Horizontal Peak (dBμV/m) | Horizontal Average (dBμV/m) | Vertical Peak (dBμV/m) | Vertical Average (dBμV/m) | Limit @ 3m (dBμV/m) | Horizontal Margin (dB) | Vertical Margin (dB) |
|------------------|--------------------------|-----------------------------|------------------------|---------------------------|---------------------|------------------------|----------------------|
| 5775.0           | -                        | -                           | -                      | -                         | -                   | -                      | -                    |
| 11550.0          | 57.5                     | 44.8                        | 58.0                   | 44.9                      | 68.3                | -23.5                  | -23.4                |
| 17325.0          | 64.5                     | 51.1                        | 64.0                   | 51.2                      | 68.3                | -17.2                  | -17.1                |
| 23100.0          | 65.3                     | 52.1                        | 65.1                   | 52.1                      | 68.3                | -16.2                  | -16.2                |
| 28875.0          | 68.1                     | 55.1                        | 68.3                   | 55.0                      | 68.3                | -13.2                  | -13.3                |

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

**Summary of Results for Transmitter Radiated Emissions of Intentional Radiator**

The EUT demonstrated compliance with the radiated emissions requirements of 47CFR Part 15E and RSS-247. The minimum radiated harmonic emission provided -12.9 dB margin below requirements. There were no other significantly measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements. There were no other deviations or exceptions to the requirements.

## Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Test Equipment List
- Annex C Rogers Qualifications
- Annex D Roger Labs Certificate of Accreditation

## Annex A Measurement Uncertainty Calculations

The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4. Result of measurement uncertainty calculations are recorded below. Component and process variability of production devices similar to those tested may result in additional deviations. The manufacturer has the sole responsibility of continued compliance.

| Measurement                                     | Expanded Measurement Uncertainty $U_{(lab)}$ |
|---|--|
| 3 Meter Horizontal 0.009-1000 MHz Measurements  | 4.16   |
| 3 Meter Vertical 0.009-1000 MHz Measurements    | 4.33   |
| 3 Meter Measurements 1-18 GHz                   | 5.14   |
| 3 Meter Measurements 18-40 GHz                  | 5.16   |
| 10 Meter Horizontal Measurements 0.009-1000 MHz | 4.15   |
| 10 Meter Vertical Measurements 0.009-1000 MHz   | 4.32   |
| AC Line Conducted                               | 1.75   |
| Antenna Port Conducted power                    | 1.17   |
| Frequency Stability                             | 1.00E-11                                     |
| Temperature                                     | 1.6°C  |
| Humidity  | 3%   |

## Annex B Test Equipment

| <u>Equipment</u>                                    | <u>Manufacturer</u> | <u>Model (SN)</u>               | <u>Band</u>  | <u>Cal Date(m/d/y)</u> | <u>Due</u> |
|---|---------------------|---------------------------------|--------------|------------------------|------------|
| <input type="checkbox"/> LISN                       | FCC                 | FCC-LISN-50-25-10(1PA) (160611) | .15-30MHz    | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> LISN                       | Compliance Design   | FCC-LISN-2.Mod.cd,(126)         | .15-30MHz    | 10/14/2019             | 10/14/2020 |
| <input checked="" type="checkbox"/> Cable           | Huber & Suhner Inc. | Sucoflex102ea(L10M)(303073)     | 9kHz-40 GHz  | 10/14/2019             | 10/14/2020 |
| <input checked="" type="checkbox"/> Cable           | Huber & Suhner Inc. | Sucoflex102ea(1.5M)(303069)     | 9kHz-40 GHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Cable                      | Huber & Suhner Inc. | Sucoflex102ea(1.5M)(303071)     | 9kHz-40 GHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Cable                      | Belden              | RG-58 (L1-CAT3-11509)           | 9kHz-30 MHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Cable                      | Belden              | RG-58 (L2-CAT3-11509)           | 9kHz-30 MHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Antenna                    | Com Power           | AL-130 (121055)                 | .001-30 MHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Antenna:                   | EMCO                | 6509                            | .001-30 MHz  | 10/16/2018             | 10/16/2020 |
| <input type="checkbox"/> Antenna                    | ARA                 | BCD-235-B (169)                 | 20-350MHz    | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Antenna:                   | Schwarzbeck Model:  | BBA 9106/VHBB 9124 (9124-627)   |              | 4/21/2020              | 4/21/2021  |
| <input checked="" type="checkbox"/> Antenna         | Sunol               | JB-6 (A100709)                  | 30-1000 MHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Antenna                    | ETS-Lindgren        | 3147 (40582)                    | 200-1000MHz  | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Antenna:                   | Schwarzbeck Model:  | VULP 9118 A (VULP 9118 A-534)   |              | 4/21/2020              | 4/21/2021  |
| <input checked="" type="checkbox"/> Antenna         | ETS-Lindgren        | 3117 (200389)                   | 1-18 GHz     | 4/21/2020              | 4/23/2022  |
| <input type="checkbox"/> Antenna                    | Com Power           | AH-118 (10110)                  | 1-18 GHz     | 10/14/2019             | 10/14/2020 |
| <input checked="" type="checkbox"/> Antenna         | Com Power           | AH-840 (101046)                 | 18-40 GHz    | 4/21/2020              | 4/21/2021  |
| <input checked="" type="checkbox"/> Analyzer        | Rohde & Schwarz     | ESU40 (100108)                  | 20Hz-40GHz   | 4/21/2020              | 4/21/2021  |
| <input checked="" type="checkbox"/> Analyzer        | Rohde & Schwarz     | ESW44 (101534)                  | 20Hz-44GHz   | 1/27/2020              | 1/27/2021  |
| <input type="checkbox"/> Analyzer                   | Rohde & Schwarz     | FS-Z60, 90, 140, and 220        | 40GHz-220GHz | 12/22/2017             | 12/22/2027 |
| <input type="checkbox"/> Amplifier                  | Com-Power           | PA-010 (171003)                 | 100Hz-30MHz  | 10/14/2019             | 10/14/2020 |
| <input checked="" type="checkbox"/> Amplifier       | Com-Power           | CPPA-102 (01254)                | 1-1000 MHz   | 10/14/2019             | 10/14/2020 |
| <input checked="" type="checkbox"/> Amplifier       | Com-Power           | PAM-118A (551014)               | 0.5-18 GHz   | 10/14/2019             | 10/14/2020 |
| <input checked="" type="checkbox"/> Amplifier       | Com-Power           | PAM-840A (461328)               | 18-40 GHz    | 10/14/2019             | 10/14/2020 |
| <input type="checkbox"/> Power Meter                | Agilent             | N1911A with N1921A              | 0.05-40 GHz  | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Generator                  | Rohde & Schwarz     | SMB100A6 (100150)               | 20Hz-6 GHz   | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Generator                  | Rohde & Schwarz     | SMBV100A6 (260771)              | 20Hz-6 GHz   | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | BRC50722 (009).9G notch         | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | HPM50114 (017)1.5G HPF          | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | HPM50117 (063) 3G HPF           | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | HPM50105 (059) 6G HPF           | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | BRM50702 (172) 2G notch         | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | BRC50703 (G102) 5G notch        | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> RF Filter                  | Micro-Tronics       | BRC50705 (024) 5G notch         | 30-18000 MHz | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Attenuator                 | Fairview            | SA6NFN100W-40 (1625)            | 30-18000 MHz | 4/21/2020              | 4/18/2021  |
| <input type="checkbox"/> Attenuator                 | Mini-Circuits       | VAT-3W2+ (1436)                 | 30-6000 MHz  | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Attenuator                 | Mini-Circuits       | VAT-3W2+ (1445)                 | 30-6000 MHz  | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Attenuator                 | Mini-Circuits       | VAT-3W2+ (1735)                 | 30-6000 MHz  | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Attenuator                 | Mini-Circuits       | VAT-6W2+ (1438)                 | 30-6000 MHz  | 4/21/2020              | 4/21/2021  |
| <input type="checkbox"/> Attenuator                 | Mini-Circuits       | VAT-6W2+ (1736)                 | 30-6000 MHz  | 4/21/2020              | 4/21/2021  |
| <input checked="" type="checkbox"/> Weather station | Davis               | 6312 (A81120N075)               |              | 11/4/2019              | 11/4/2020  |

Rogers Labs, Inc.  
 4405 W. 259<sup>th</sup> Terrace  
 Louisburg, KS 66053  
 Phone/Fax: (913) 837-3214  
 Revision 1

Mikrotikls SIA  
 HVIN: RBD22UGS-5HPacD2HnD-15S-US  
 Test: 200429  
 Test to: 47CFR (Parts 2, 15) and RSS-247  
 File: Mikrotik D2352AC NII C2PC TstRpt 200429

S/N: CCD703CA62E5/015  
 FCC ID: TV7D2352AC  
 IC: 7442A-D2352AC  
 Date: July 9, 2020



| List of Test Equipment   | Calibration | Date (m/d/y) | Due          |
|--|-------------|--------------|--------------|
| <input type="checkbox"/> Frequency Counter: Leader LDC-825 (8060153)                       |             | 4/21/2020    | 4/21/2021    |
| <input type="checkbox"/> LISN: Com-Power Model LI-220A                                     |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> LISN: Com-Power Model LI-550C                                     |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> ISN: Com-Power Model ISN T-8                                      |             | 4/21/2020    | 4/21/2021    |
| <input type="checkbox"/> LISN: Fischer Custom Communications Model: FCC-LISN-50-16-2-08    |             | 4/21/2020    | 4/21/2021    |
| <input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(1.5M)(303070) 9kHz-40 GHz |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(1.5M)(303072) 9kHz-40 GHz |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(L4M)(281184) 9kHz-40 GHz  |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(L10M)(317546)9kHz-40 GHz  |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> Cable Time Microwave 4M-750HF290-750 (4M) 9kHz-24 GHz             |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> RF Filter Micro-Tronics BRC17663 (001) 9.3-9.5 notch 30-1800 MHz  |             | 4/21/2020    | 4/21/2021    |
| <input type="checkbox"/> RF Filter Micro-Tronics BRC19565 (001) 9.2-9.6 notch 30-1800 MHz  |             | 10/16/2018   | 4/21/2021    |
| <input type="checkbox"/> Analyzer HP 8562A (3051A05950) 9kHz-125GHz                        |             | 4/21/2020    | 4/21/2021    |
| <input type="checkbox"/> Analyzer HP External Mixers11571, 11970 25GHz-110GHz              |             | 4/18/2015    | 4/18/2025    |
| <input type="checkbox"/> Analyzer HP 8591EM (3628A00871)                                   |             | 4/21/2020    | 4/21/2021    |
| <input type="checkbox"/> Antenna: Solar 9229-1 & 9230-1                                    |             | 2/22/2020    | 2/22/2021    |
| <input type="checkbox"/> CDN: Com-Power Model CDN325E                                      |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> Injection Clamp Luthi Model EM101                                 |             | 10/14/2019   | 10/14/2020   |
| <input type="checkbox"/> Oscilloscope Scope: Tektronix MDO 4104                            |             | 2/22/2020    | 2/22/2021    |
| <input type="checkbox"/> EMC Transient Generator HVT TR 3000                               |             | 2/22/2020    | 2/22/2021    |
| <input type="checkbox"/> AC Power Source (Ametech, California Instruments)                 |             | 2/22/2020    | 2/22/2021    |
| <input type="checkbox"/> Field Intensity Meter: EFM-018                                    |             | 2/22/2020    | 2/22/2021    |
| <input type="checkbox"/> ESD Simulator: MZ-15  |             | 2/22/2020    | 2/22/2021    |
| <input type="checkbox"/> R.F. Power Amp ACS 230-50W  |             |              | not required |
| <input type="checkbox"/> R.F. Power Amp EIN Model: A301                                    |             |              | not required |
| <input type="checkbox"/> R.F. Power Amp A.R. Model: 10W 1010M7                             |             |              | not required |
| <input type="checkbox"/> R.F. Power Amp A.R. Model: 50U1000                                |             |              | not required |
| <input checked="" type="checkbox"/> Shielded Room  |             |              | not required |

## **Annex C Rogers Qualifications**

**Scot D. Rogers, Engineer**

### **Rogers Labs, Inc.**

Mr. Rogers has approximately 34 years' experience in the field of electronics. Engineering experience includes six years in the automated controls industry and remaining years working with the design, development and testing of radio communications and electronic equipment.

#### Positions Held

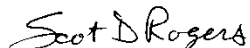
Systems Engineer: A/C Controls Mfg. Co., Inc. 6 Years

Electrical Engineer: Rogers Consulting Labs, Inc. 5 Years

Electrical Engineer: Rogers Labs, Inc. Current

#### Educational Background


- 1) Bachelor of Science Degree in Electrical Engineering from Kansas State University.
- 2) Bachelor of Science Degree in Business Administration Kansas State University.
- 3) Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming.



Scot D. Rogers

**Annex D Rogers Labs Certificate of Accreditation**

United States Department of Commerce  
National Institute of Standards and Technology

**NVLAP** 

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**Certificate of Accreditation to ISO/IEC 17025:2017**

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NVLAP LAB CODE: 200087-0


**Rogers Labs, Inc.**  
Louisburg, KS

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

**Electromagnetic Compatibility & Telecommunications**

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2020-02-25 through 2021-03-31  
*Effective Dates*



  
*For the National Voluntary Laboratory Accreditation Program*

Rogers Labs, Inc.  
4405 W. 259<sup>th</sup> Terrace  
Louisburg, KS 66053  
Phone/Fax: (913) 837-3214  
Revision 1

Mikrotikls SIA  
HVIN: RBD22UGS-5HPacD2HnD-15S-US  
Test: 200429  
Test to: 47CFR (Parts 2, 15) and RSS-247  
File: Mikrotik D2352AC NII C2PC TstRpt 200429 Page 27 of 27

S/N: CCD703CA62E5/015  
FCC ID: TV7D2352AC  
IC: 7442A-D2352AC

Date: July 9, 2020