

Company: Radwin Ltd.

Test of: Outdoor Subscriber Radio Unit

To: FCC 15.407 & RSS-247 (Issue 2) (DFS Bands)

Report No.: RDWN45-U4\_Master Rev A

## MASTER TEST REPORT



# MASTER TEST REPORT



Test of: Radwin Ltd. Outdoor Subscriber Radio Unit

To: FCC 15.407 & RSS-247 (Issue 2) (DFS Bands)

Test Report Serial No.: RDWN45-U4\_Master Rev A

This report supersedes: RDWN41-U9 Master Rev A

As a result of the 6 Mbyte FCC file size limitation potentially large test reports require to be split into smaller components. This document is the Master document controlling Addendum reports as listed below. This Master document combined with the Addendums demonstrate compliance with the standard

| Master Document Number | Addendum Reports                     |
|------------------------|--------------------------------------|
| RDWN45-U4_Master       | RDWN41-U9_Conducted*                 |
|                        | RDWN41-U9_Radiated*                  |
|                        | RDWN45-U4_Radiated                   |
|                        | RDWN41-U9_DFS*                       |
|                        | RDWN41-U5_(FCC Part 15B & ICES-003)* |

\*RDWN45-U4 adds an additional antenna model to Radwin SU Pro, SU Air product previously tested and reported in MiCOM Labs test report RDWN41-U9.

Applicant: Radwin Ltd.  
27 Habarzel Street  
Tel Aviv 69710  
Israel

Product Function: Outdoor Subscriber Radio Unit  
Issue Date: 6<sup>th</sup> April 2017

## **This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**  
575 Boulder Court  
Pleasanton California 94566  
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Phone: +1 (925) 462-0304  
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[www.micomlabs.com](http://www.micomlabs.com)



**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**



**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 3 of 24

---

## Table of Contents

|                                                          |           |
|----------------------------------------------------------|-----------|
| <b>1. ACCREDITATION, LISTINGS &amp; RECOGNITION.....</b> | <b>4</b>  |
| 1.1. TESTING ACCREDITATION.....                          | 4         |
| 1.2. RECOGNITION .....                                   | 5         |
| 1.3. PRODUCT CERTIFICATION .....                         | 6         |
| <b>2. DOCUMENT HISTORY .....</b>                         | <b>7</b>  |
| <b>3. TEST RESULT CERTIFICATE.....</b>                   | <b>8</b>  |
| <b>4. REFERENCES AND MEASUREMENT UNCERTAINTY .....</b>   | <b>9</b>  |
| 4.1. Normative References .....                          | 9         |
| 4.2. Test and Uncertainty Procedure .....                | 10        |
| <b>5. PRODUCT DETAILS AND TEST CONFIGURATIONS .....</b>  | <b>11</b> |
| 5.1. Technical Details .....                             | 11        |
| 5.2. Scope Of Test Program .....                         | 12        |
| 5.3. Equipment Model(s) and Serial Number(s) .....       | 13        |
| 5.4. Antenna Details .....                               | 13        |
| 5.5. Cabling and I/O Ports .....                         | 13        |
| 5.6. Test Configurations.....                            | 14        |
| 5.7. Equipment Modifications .....                       | 14        |
| 5.8. Deviations from the Test Standard .....             | 14        |
| <b>6. TEST SUMMARY .....</b>                             | <b>15</b> |
| <b>7. TEST EQUIPMENT CONFIGURATION(S) .....</b>          | <b>16</b> |
| 7.1. Conducted .....                                     | 16        |
| 7.2. Radiated Emissions.....                             | 18        |
| 7.3. AC Wireline Emission .....                          | 21        |
| 7.4. DFS - Conducted .....                               | 22        |

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## 1. ACCREDITATION, LISTINGS & RECOGNITION

### 1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



### Accredited Laboratory

A2LA has accredited

**MICOM LABS**

Pleasanton, CA

for technical competence in the field of

**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).



Presented this 4<sup>th</sup> day of February 2016.



Senior Director of Quality & Communications  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to November 30, 2017

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.





**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 5 of 24

## 1.2. RECOGNITION

MiCOM Labs, Inc has widely recognized wireless testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

| Country   | Recognition Body                                                                                 | Status | Phase      | Identification No.                      |
|-----------|--------------------------------------------------------------------------------------------------|--------|------------|-----------------------------------------|
| USA       | Federal Communications Commission (FCC)                                                          | TCB    | -          | US0159<br>Listing #: 102167             |
| Canada    | Industry Canada (IC)                                                                             | FCB    | APEC MRA 2 | US0159<br>Listing #: 4143A-2<br>4143A-3 |
| Japan     | MIC (Ministry of Internal Affairs and Communication)                                             | CAB    | APEC MRA 2 | RCB 210                                 |
|           | VCCI                                                                                             | --     | --         | A-0012                                  |
| Europe    | European Commission                                                                              | NB     | EU MRA     | NB 2280                                 |
| Australia | Australian Communications and Media Authority (ACMA)                                             | CAB    | APEC MRA 1 | US0159                                  |
| Hong Kong | Office of the Telecommunication Authority (OFTA)                                                 | CAB    | APEC MRA 1 |                                         |
| Korea     | Ministry of Information and Communication Radio Research Laboratory (RRL)                        | CAB    | APEC MRA 1 |                                         |
| Singapore | Infocomm Development Authority (IDA)                                                             | CAB    | APEC MRA 1 |                                         |
| Taiwan    | National Communications Commission (NCC)<br>Bureau of Standards, Metrology and Inspection (BSMI) | CAB    | APEC MRA 1 |                                         |
| Vietnam   | Ministry of Communication (MIC)                                                                  | CAB    | APEC MRA 1 |                                         |

EU MRA – European Union Mutual Recognition Agreement.

NB – Notified Body

APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. Recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

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### 1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



United States of America – Telecommunication Certification Body (TCB)  
Industry Canada – Certification Body, CAB Identifier – US0159  
Europe – Notified Body (NB), NB Identifier - 2280  
Japan – Recognized Certification Body (RCB), RCB Identifier - 210



**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 7 of 24

## 2. DOCUMENT HISTORY

| Draft History  |                            |                  |
|----------------|----------------------------|------------------|
| Revision       | Date                       | Comments         |
| Master Rev A   | 6 <sup>th</sup> April 2017 | Initial release  |
| Radiated Rev A | 6 <sup>th</sup> April 2017 | Initial release. |

\*EUT Subscriber Access Point was previously tested in RDWN41-U9. RDWN45-U4 only covers the testing of and additional antenna.

**Details of Referenced reports are noted below for information;-**

| Previous Reports Released Document History RDWN41-U9 |                   |                               |                  |
|------------------------------------------------------|-------------------|-------------------------------|------------------|
| Master Revision                                      | Addendum Revision | Date                          | Comments         |
| Rev A 1 <sup>st</sup> December 2016                  | Rev A Conducted   | 8 <sup>th</sup> November 2016 | Initial release. |
|                                                      | Rev A Radiated    | 8 <sup>th</sup> November 2016 | Initial release. |
|                                                      | Rev A DFS         | 1 <sup>st</sup> December 2016 | Initial release. |
|                                                      |                   |                               |                  |
|                                                      |                   |                               |                  |
|                                                      |                   |                               |                  |
|                                                      |                   |                               |                  |

In the above table the latest report revision will replace all earlier versions.

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**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 8 of 24

### 3. TEST RESULT CERTIFICATE

|                                                                                    |                                                                                               |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Manufacturer:</b> Radwin Ltd.<br>27 Habarzel Street<br>Tel Aviv 69710<br>Israel | <b>Tested By:</b> MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566<br>USA |
| <b>Model:</b> SU-Pro, SU Air                                                       | <b>Telephone:</b> +1 925 462 0304                                                             |
| <b>Type Of Equipment:</b> Outdoor Subscriber Radio Unit                            | <b>Fax:</b> +1 925 462 0306                                                                   |
| <b>S/N's:</b> P13880I200M00208                                                     |                                                                                               |
| <b>Test Date(s):</b> 27 <sup>th</sup> – 28 <sup>th</sup> March 2017                | <b>Website:</b> www.micomlabs.com                                                             |

| STANDARD(S)                                                                              | TEST RESULTS       |
|------------------------------------------------------------------------------------------|--------------------|
| FCC CFR 47 Part 15 Subpart E 15.407 & IC RSS 247 (DFS Bands),<br>FCC Part 15B & ICES-003 | EQUIPMENT COMPLIES |

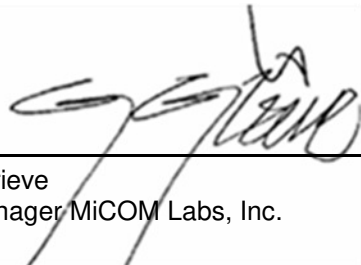
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

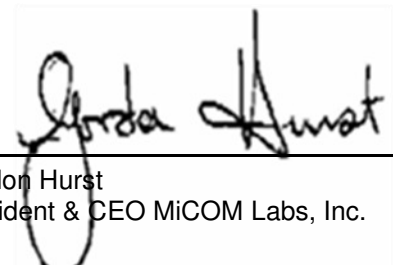
#### Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

**Approved & Released for MiCOM Labs, Inc. by:**



  
\_\_\_\_\_  
Graeme Grieve  
Quality Manager MiCOM Labs, Inc.

  
\_\_\_\_\_  
Gordon Hurst  
President & CEO MiCOM Labs, Inc.

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## **4. REFERENCES AND MEASUREMENT UNCERTAINTY**

### **4.1. Normative References**

| REF.  | PUBLICATION            | YEAR               | TITLE                                                                                                                                                                                                 |
|-------|------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I     | KDB 662911 D01 & D02   | Oct 31 2013        | Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band |
| II    | KDB 905462 D07 v02     | 22nd August 2016   | Test guidance to demonstrate compliance for U-NII devices subject to DFS requirements.                                                                                                                |
| III   | KDB 926956 D01 v02     | 22nd August 2016   | U-NII Device Transition Plan                                                                                                                                                                          |
| IV    | KDB 789033 D02 v01r03  | 22nd August 2016   | General UNII Test Procedures New Rules                                                                                                                                                                |
| V     | A2LA                   | June 2015          | R105 - Requirement's When Making Reference to A2LA Accreditation Status                                                                                                                               |
| VI    | ANSI C63.10            | 2013               | American National Standard for Testing Unlicensed Wireless Devices                                                                                                                                    |
| VII   | ANSI C63.4             | 2014               | American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz                                  |
| VIII  | CISPR 32               | 2015               | Electromagnetic compatibility of multimedia equipment - Emission requirements                                                                                                                         |
| IX    | ETSI TR 100 028        | 2001-12            | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics                                              |
| X     | FCC 06-96              | Jun 30 2006        | Memorandum Opinion and Order                                                                                                                                                                          |
| XI    | FCC 47 CFR Part 15.407 | 2016               | Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices                                                                                                            |
| XII   | ICES-003               | Issue 6 Jan 2016   | Spectrum Management and Telecommunications; Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement.              |
| XIII  | M 3003                 | Edition 3 Nov.2012 | Expression of Uncertainty and Confidence in Measurements                                                                                                                                              |
| XIV   | RSS-247 Issue 2        | Feb 2017           | Digital Transmission Systems (DTSS), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices                                                                           |
| XV    | RSS-Gen Issue 4        | November 2014      | General Requirements and Information for the Certification of Radiocommunication Equipment                                                                                                            |
| XVI   | KDB 644545 D03 v01     | August 14th 2014   | Guidance for IEEE 802.11ac New Rules                                                                                                                                                                  |
| XVII  | FCC 47 CFR Part 2.1033 | 2016               | FCC requirements and rules regarding photographs and test setup diagrams.                                                                                                                             |
| XVIII | EN 55032               | 2012               | Electromagnetic compatibility of multimedia equipment - Emission requirements                                                                                                                         |

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**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 10 of 24

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#### **4.2. Test and Uncertainty Procedure**

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.

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**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 11 of 24

## 5. PRODUCT DETAILS AND TEST CONFIGURATIONS

### 5.1. Technical Details

| Details                          | Description                                                                                                                                                                                           |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Purpose:                         | Test of the Radwin SU Pro, SU-Air to FCC CFR 47 Part 15 Subpart E 15.407 & RSS-247 Issue 2 (DFS Bands).<br>Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices |
| Applicant:                       | Radwin<br>27 Habarzel Street<br>Tel Aviv 69710 Israel                                                                                                                                                 |
| Manufacturer:                    | As Applicant                                                                                                                                                                                          |
| Laboratory performing the tests: | MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566 USA                                                                                                                              |
| Test report reference number:    | RDWN45-U4_Master                                                                                                                                                                                      |
| Date EUT received:               | 22 <sup>nd</sup> March 2017                                                                                                                                                                           |
| Standard(s) applied:             | FCC CFR 47 Part 15 Subpart E 15.407 & RSS-247 Issue 2                                                                                                                                                 |
| Dates of test (from - to):       | 27 <sup>th</sup> – 28 <sup>th</sup> March 2017                                                                                                                                                        |
| No of Units Tested:              | 1                                                                                                                                                                                                     |
| Type of Equipment:               | Outdoor Subscriber Radio Unit                                                                                                                                                                         |
| Product Family Name:             | RADWIN 5000                                                                                                                                                                                           |
| Model(s):                        | SU-Pro, SU-Air                                                                                                                                                                                        |
| Location for use:                | Outdoor                                                                                                                                                                                               |
| Declared Frequency Range(s):     | 5250 – 5350, 5470 - 5725 MHz                                                                                                                                                                          |
| Primary function of equipment:   | Outdoor Subscriber Radio Unit                                                                                                                                                                         |
| Secondary function of equipment: | None provided                                                                                                                                                                                         |
| Type of Modulation:              | BPSK, QPSK, 16QAM, 64QAM, 256QAM                                                                                                                                                                      |
| EUT Modes of Operation:          | 10 MHz; 20 MHz; 40 MHz; 80 MHz;                                                                                                                                                                       |
| Transmit/Receive Operation:      | Transceiver                                                                                                                                                                                           |
| Rated Input Voltage and Current: | POE (POE adaptor sold with unit) 24Vdc                                                                                                                                                                |
| Operating Temperature Range:     | Declared Range -40°C to +60°C                                                                                                                                                                         |
| ITU Emission Designator:         | 10 MHz 10M0W7W<br>20 MHz 20M0W7W<br>40 MHz 40M0W7W<br>80 MHz 80M0W7W                                                                                                                                  |
| Equipment Dimensions:            | 7.5" x 7.1" x 1.2"                                                                                                                                                                                    |
| Weight:                          | 0.4 kg                                                                                                                                                                                                |
| Hardware Rev:                    | Prototype                                                                                                                                                                                             |
| Software Rev:                    | Prototype                                                                                                                                                                                             |

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## **5.2. Scope Of Test Program**

### **Radwin SU-Air, SU-Pro**

The scope of the test program was to test the Radwin SU-Pro, SU-Air Outdoor Subscriber Radio Unit configurations in the frequency ranges 5250 – 5350, 5470 - 5725 ; with additional antenna model number RW-9614-5359 for compliance against the following specification:  
(For previous testing see RDWN41-U9)

### **FCC CFR 47 Part 15 Subpart E 15.407**

Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices

### **RSS-247 Issue 2**

Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices

### **Radwin SU-Pro, SU-Air**



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**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 13 of 24

### 5.3. Equipment Model(s) and Serial Number(s)

| Type              | Description                   | Manufacturer | Model          | Serial no.       | Delivery Date |
|-------------------|-------------------------------|--------------|----------------|------------------|---------------|
| EUT               | Outdoor Subscriber Radio Unit | Radwin Ltd.  | SU Pro, SU Air | P13880I200M00208 | 22 March 2017 |
| Support Equipment | 24V-1A PoE Injector           | GOSPELL      | G0720-240-100  | #RDWN41-2        | 22 March 2017 |

### 5.4. Antenna Details

| Type     | Manufacturer | Model        | Family  | Gain (dBi) | BF Gain | Dir BW                 | X-Pol | Frequency Band (MHz)       |
|----------|--------------|--------------|---------|------------|---------|------------------------|-------|----------------------------|
| Integral | RADWIN Ltd.  | MP0179180    | Flat DP | 16.0       | -       | 17.5° Hor<br>29.1° Ver | Y     | 5250 – 5350                |
| Integral | RADWIN Ltd.  | MP0179180    | Flat DP | 17.0       | -       | 17.5° Hor<br>29.1° Ver | Y     | 5470 - 5725                |
| External | RADWIN Ltd.  | RW-9614-5359 | Flat DP | 23.0       | -       | 10.0°                  | Y     | 5250 – 5350<br>5470 - 5725 |

BF Gain - Beamforming Gain  
Dir BW - Directional BeamWidth  
X-Pol - Cross Polarization

### 5.5. Cabling and I/O Ports

| Port Type  | Max Cable Length | # Of Ports | Screened | Conn Type | Data Type   |
|------------|------------------|------------|----------|-----------|-------------|
| PoE + Data | 100m             | 1          | N        | RJ-45     | Packet Data |

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**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 14 of 24

## 5.6. Test Configurations

Results for the following configurations are provided in this report:

| Operational Mode(s) | Data Rate with Highest Power MBit/s | Channel Frequency (MHz) |          |          |
|---------------------|-------------------------------------|-------------------------|----------|----------|
|                     |                                     | Low                     | Mid      | High     |
| 5250 - 5350 MHz     |                                     |                         |          |          |
| 10 MHz              | 15                                  | 5,255.00                | 5,300.00 | 5,340.00 |
| 20 MHz              | 15                                  | 5,260.00                | 5,300.00 | 5,340.00 |
| 40 MHz              | 15                                  | 5,270.00                | 5,300.00 | 5,330.00 |
| 80 MHz              | 15                                  | 5,290.00                | 5,300.00 | 5,310.00 |
| 5470 - 5725 MHz     |                                     |                         |          |          |
| 10 MHz              | 15                                  | 5,480.00                | 5,595.00 | 5,715.00 |
| 20 MHz              | 15                                  | 5,485.00                | 5,590.00 | 5,710.00 |
| 40 MHz              | 15                                  | 5,495.00                | 5,570.00 | 5,700.00 |
| 80 MHz              | 15                                  | 5,520.00                | 5,560.00 | 5,680.00 |

## 5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

## 5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE



**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 15 of 24

## 6. TEST SUMMARY

List of Measurements

| Test Header                                    | Result                                   | Comments |
|------------------------------------------------|------------------------------------------|----------|
| <b>Conducted Testing</b>                       | See Report RDWN41-U9_Conducted Addendum  |          |
| (a) Peak Transmit Power                        | Complies                                 |          |
| (a) 26 dB & 99% Bandwidth                      | Complies                                 |          |
| (a)(5) Power Spectral Density                  | Complies                                 |          |
| <b>Radiated Testing</b>                        | See Report RDWN45-U4_Radiated Addendum   |          |
| (b)(2) Radiated Spurious & Band-Edge Emissions | Complies                                 |          |
| Integral                                       | Complies                                 |          |
| <b>DFS Testing</b>                             | See Report RDWN41-U9_DFS Addendum        |          |
| (h)(2) Dynamic Frequency Selection (DFS)       |                                          |          |
| (ii) Channel Availability Check                |                                          |          |
| (a) Initial CAC                                |                                          |          |
| (b) Beginning CAC                              |                                          |          |
| (c) End CAC                                    |                                          |          |
| (iii) Channel Close / Transmission Time        |                                          |          |
| (iv) Non-Occupancy Period                      |                                          |          |
| Probability of Detection                       |                                          |          |
| Detection Bandwidth                            |                                          |          |
| <b>Digital Emissions</b>                       | See Report RDWN45-U4 Part 15B & ICES-003 |          |
| 15.109 Digital Emissions                       | Complies                                 |          |
| <b>AC Wireline Emissions</b>                   | See Report RDWN41-U5 Part 15B & ICES-003 |          |
| 15.107 AC Wireline Emissions                   | Complies                                 |          |

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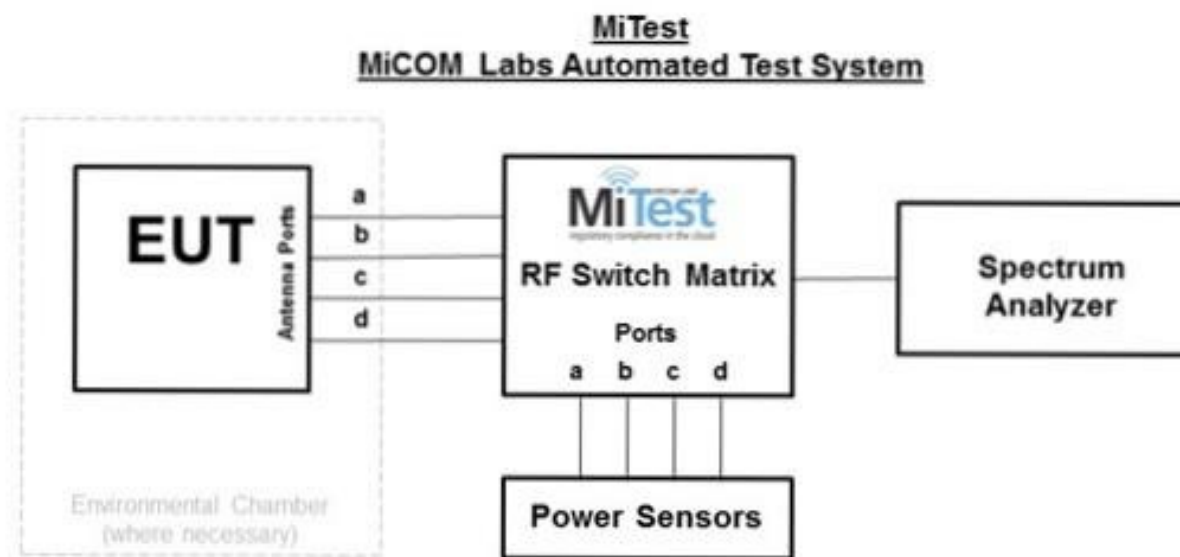
## **7. TEST EQUIPMENT CONFIGURATION(S)**

### **7.1. Conducted**

Conducted RF Emission Test Set-up(s)

The following tests were performed using the conducted test set-up shown in the diagram below.

1. Peak Transmit Power
2. 26 dB & 99% Bandwidth
3. Power Spectral Density
4. Peak Excursion Ratio



### **Conducted Test Measurement Setup**

A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.



**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 17 of 24

| Asset#           | Description                                    | Manufacturer         | Model#                         | Serial#          | Calibration Due Date |
|------------------|------------------------------------------------|----------------------|--------------------------------|------------------|----------------------|
| 158              | Barometer/Thermometer                          | Control Company      | 4196                           | E2846            | 01 Dec 2016          |
| 249              | Resistance Thermometer                         | Thermotronics        | GR2105-02                      | 9340 #2          | 23 Oct 2016          |
| 287              | Rohde & Schwarz 40 GHz Receiver                | Rhode & Schwarz      | ESIB40                         | 100201           | 27 Aug 2016          |
| 361              | Desktop for RF#1, Labview Software installed   | Dell                 | Vostro 220                     | WS RF#1          | Not Required         |
| 378              | Rohde & Schwarz 40 GHz Receiver with Generator | Rhode & Schwarz      | ESIB40                         | 100107/040       | 04 Aug 2016          |
| 380              | 4x4 RF Switch Box                              | MiCOM Labs           | MiTest RF Switch Box           | MIC001           | 06 Dec 2016          |
| 390              | USB Power Head 50MHz - 24GHz -60 to +20dBm     | Agilent              | U2002A                         | MY50000103       | 17 Oct 2016          |
| 398              | Test Software                                  | MiCOM                | MiTest ATS                     | Version 3.0.0.16 | Not Required         |
| 405              | DC Power Supply 0-60V                          | Agilent              | 6654A                          | MY4001826        | Cal when used        |
| 408              | USB to GPIB interface                          | National Instruments | GPIB-USB HS                    | 14C0DE9          | Not Required         |
| 436              | USB Wideband Power Sensor                      | Boonton              | 55006                          | 8731             | 31 Jul 2016          |
| 437              | USB Wideband Power Sensor                      | Boonton              | 55006                          | 8759             | 31 Jul 2016          |
| 445              | PoE Injector                                   | D-Link               | DPE-101GL                      | QTAH1E2000625    | Not Required         |
| 461              | Spectrum Analyzer                              | Agilent              | E4440A                         | MY46185537       | 13 Aug 2016          |
| 75               | Environmental Chamber                          | Thermatron           | SE-300-2-2                     | 27946            | 24 Nov 2016          |
| RF#1 GPIB#1      | GPIB cable to Power Supply                     | HP                   | GPIB                           | None             | Not Required         |
| RF#1 SMA SA #452 | Precision SMA Male RG-402 Spectrun Analyzer    | Fairview Microwave   | Precision SMA Male RG 402 coax | None             | 06 Dec 2016          |
| RF#1 SMA#1       | EUT to Mitest box port 1                       | Flexco               | SMA Cable port1                | None             | 06 Dec 2016          |
| RF#1 SMA#2       | EUT to Mitest box port 2                       | Flexco               | SMA Cable port2                | None             | 06 Dec 2016          |
| RF#1 SMA#3       | EUT to Mitest box port 3                       | Flexco               | SMA Cable port3                | None             | 06 Dec 2016          |
| RF#1 SMA#4       | EUT to Mitest box port 4                       | Flexco               | SMA Cable port4                | None             | 06 Dec 2016          |
| RF#1 USB#1       | USB Cable to Mitest Box                        | Dynex                | USB Cable                      | None             | Not Required         |

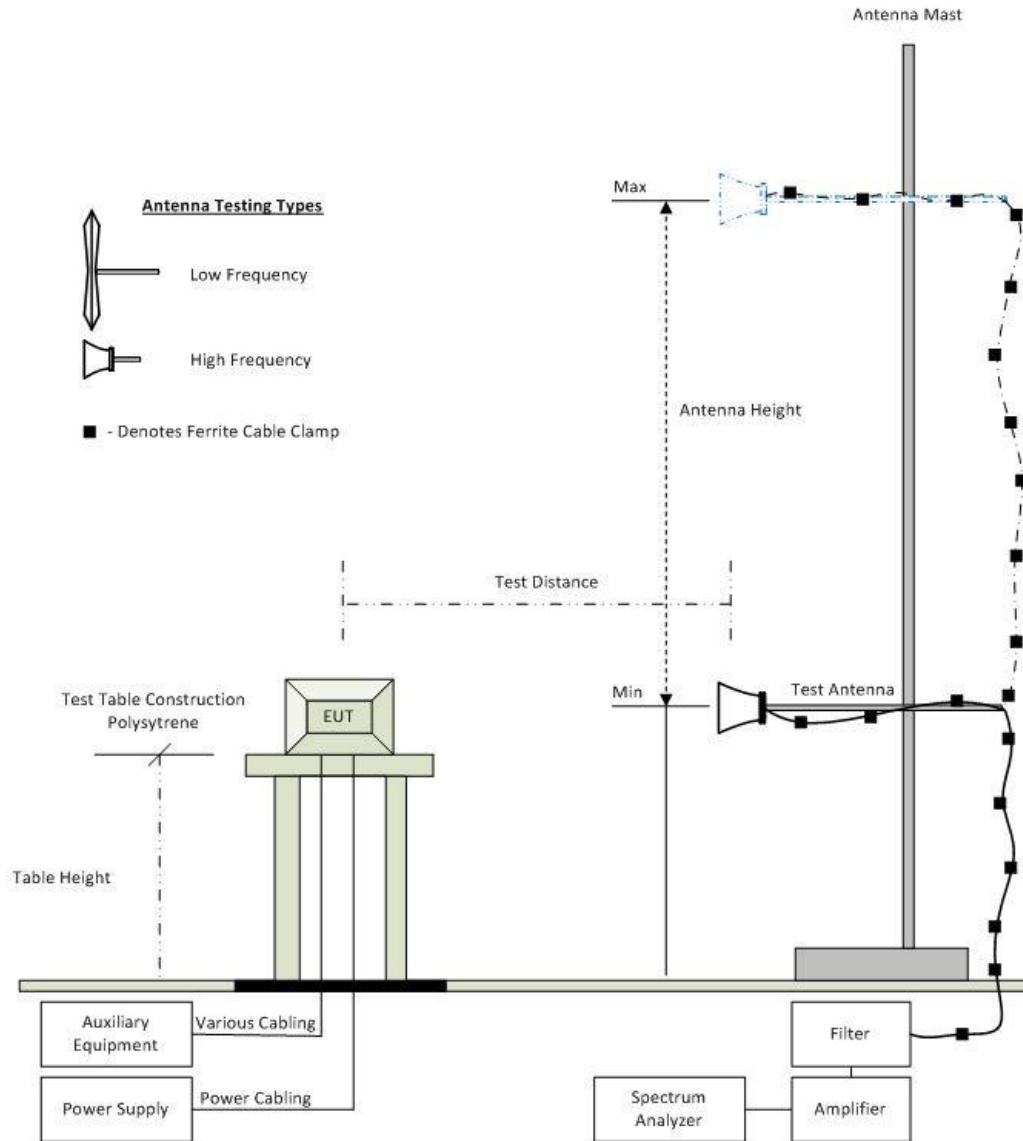
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## 7.2. Radiated Emissions

The following tests were performed using the radiated test set-up shown in the diagram below.

- 1).. Radiated Spurious and Band-Edge Emissions
- 2).. Radiated Digital Emissions (0.03 – 1 GHz)

### Radiated Emission Measurement Setup Pictorial Representation



**Radiated Emission Test Setup**

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**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 19 of 24

| Asset# | Description                                       | Manufacturer         | Model#                                  | Serial#     | Calibration Due Date |
|--------|---------------------------------------------------|----------------------|-----------------------------------------|-------------|----------------------|
| 158    | Barometer/Thermometer                             | Control Company      | 4196                                    | E2846       | 30 Nov 2017          |
| 170    | Video System Controller for Semi Anechoic Chamber | Panasonic            | WV-CU101                                | 04R08507    | Not Required         |
| 287    | Rohde & Schwarz 40 GHz Receiver                   | Rhode & Schwarz      | ESIB40                                  | 100201      | 2 May 2017           |
| 338    | Sunol 30 to 3000 MHz Antenna                      | Sunol                | JB3                                     | A052907     | 15 Aug 2017          |
| 377    | Band Rejection Filter 5150 to 5880MHz             | Microtronics         | BRM50716                                | 034         | 16 Aug 2017          |
| 396    | 2.4 GHz Notch Filter                              | Microtronics         | BRM50701                                | 001         | 16 Aug 2017          |
| 397    | Amp 10 - 2500MHz                                  | MiCOM Labs           | Amp 10 - 2500 MHz                       | NA          | 9 Jun 2017           |
| 399    | ETS 1-18 GHz Horn Antenna                         | ETS                  | 3117                                    | 00154575    | 10 Apr 2017          |
| 406    | Amplifier for Radiated Emissions                  | MiCOM Labs           | 40dB 1 to 18GHz Amp                     | 0406        | 9 Jun 2017           |
| 410    | Desktop Computer                                  | Dell                 | Inspiron 620                            | WS38        | Not Required         |
| 411    | Mast/Turntable Controller                         | Sunol Sciences       | SC98V                                   | 060199-1D   | Not Required         |
| 412    | USB to GPIB Interface                             | National Instruments | GPIB-USB HS                             | 11B8DC2     | Not Required         |
| 413    | Mast Controller                                   | Sunol Science        | TWR95-4                                 | 030801-3    | Not Required         |
| 414    | DC Power Supply 0-60V                             | HP                   | 6274                                    | 1029A01285  | Cal when used        |
| 415    | Turntable Controller                              | Sunol Sciences       | Turntable Controller                    | None        | Not Required         |
| 416    | Gigabit ethernet filter                           | ETS-Lingren          | Gigafoil 260366                         | None        | Not Required         |
| 447    | MiTest Rad Emissions Test Software                | MiCOM                | Rad Emissions Test Software Version 1.0 | 447         | Not Required         |
| 462    | Schwarzbeck cable from Antenna to Amplifier.      | Schwarzbeck          | AK 9513                                 | 462         | 31 May 2017          |
| 463    | Schwarzbeck cable from Amplifier to Bulkhead.     | Schwarzbeck          | AK 9513                                 | 463         | 31 May 2017          |
| 464    | Schwarzbeck cable from Bulkhead to Receiver       | Schwarzbeck          | AK 9513                                 | 464         | 31 May 2017          |
| 465    | Low Pass Filter DC-1000 MHz                       | Mini-Circuits        | NLP-1200+                               | VUU01901402 | 2 Jun 2017           |
| 466    | Low Pass Filter DC-1500 MHz                       | Mini-Circuits        | NLP-1750+                               | VUU10401438 | 2 Jun 2017           |
| 467    | 2495 to 2650 MHz notch filter                     | MicroTronics         | BRM50709                                | 011         | 16 Aug 2017          |
| 468    | Low pass filter                                   | Mini Circuits        | SLP-550                                 | None        | 16 Aug 2017          |
| 469    | Low pass filter                                   | Mini Circuit         | SLP-1000                                | None        | 16 Aug 2017          |
| 480    | Cable - Bulkhead to Amp                           | SRC Haverhill        | 157-157-3050360                         | 480         | 2 Jun 2017           |

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**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 20 of 24

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|      |                              |                 |                 |             |               |
|------|------------------------------|-----------------|-----------------|-------------|---------------|
| 481  | Cable - Bulkhead to Receiver | SRC Haverhill   | 151-151-3050787 | 481         | 2 Jun 2017    |
| 482  | Cable - Amp to Antenna       | SRC Haverhill   | 157-157-3051574 | 482         | 2 Jun 2017    |
| 87   | Uninterruptible Power Supply | Falcon Electric | ED2000-1/2LC    | F3471 02/01 | Cal when used |
| CC05 | Confidence Check             | MiCOM           | CC05            | None        | 26 Apr 2017   |

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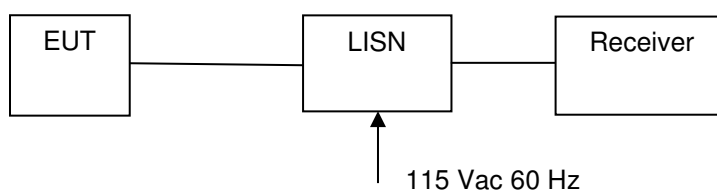
**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 21 of 24

### 7.3. AC Wireline Emission

The following tests were performed using the conducted test set-up shown in the diagram below.

#### 1. AC Wireline Conducted Emissions

#### Conducted Test Set-Up Pictorial Representation

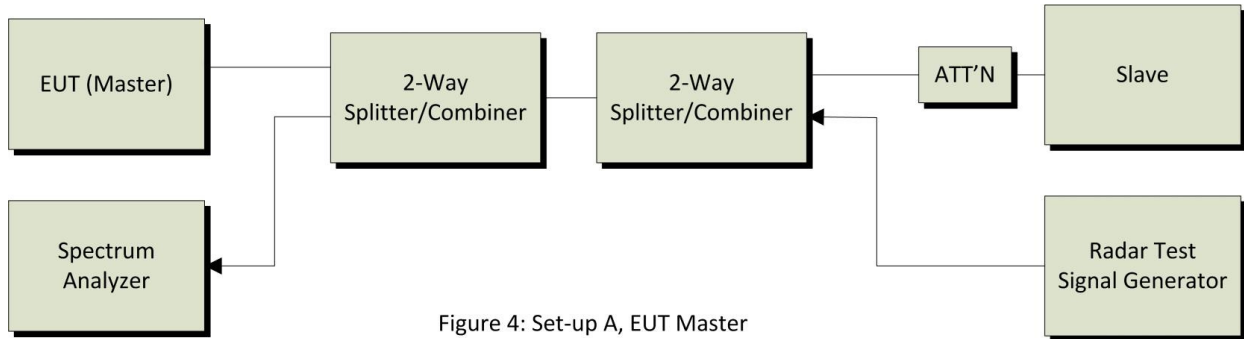
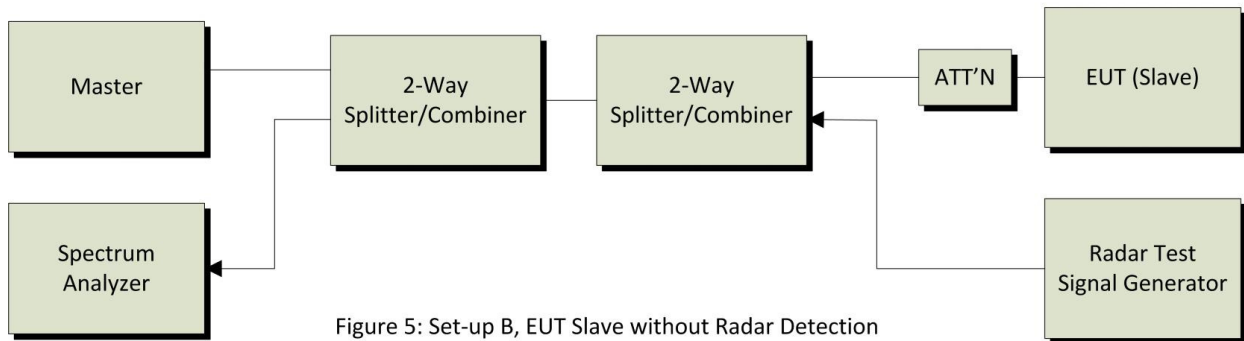
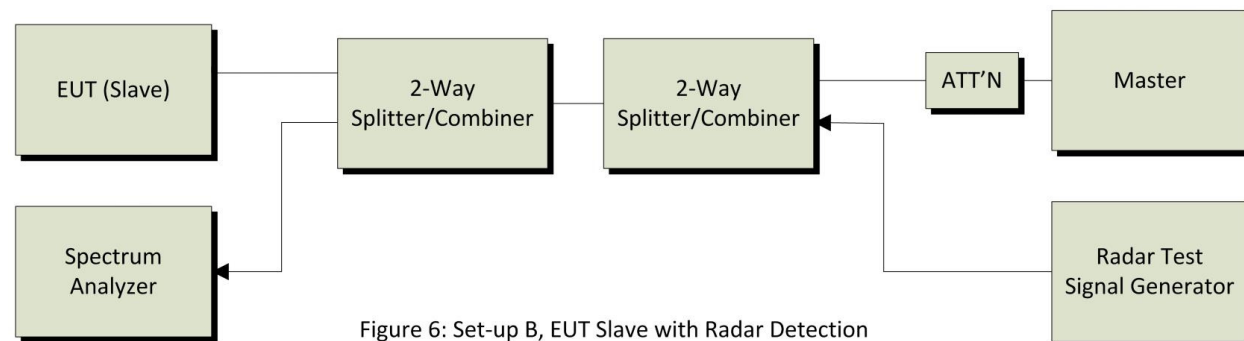


Measurement set up for ac Wireline Conducted Emissions Test

| Asset#      | Description                                    | Manufacturer           | Model#       | Serial#     | Calibration Due Date |
|-------------|------------------------------------------------|------------------------|--------------|-------------|----------------------|
| 158         | Barometer/Thermometer                          | Control Company        | 4196         | E2846       | 01 Dec 2016          |
| 184         | Pulse Limiter                                  | Rhode & Schwarz        | ESH3Z2       | 357.8810.52 | 27 Oct 2016          |
| 190         | LISN (two-line V-network)                      | Rhode & Schwarz        | ESH3Z5       | 836679/006  | 29 Oct 2016          |
| 193         | Receiver 20 Hz to 7 GHz                        | Rhode & Schwarz        | ESI 7        | 838496/007  | 17 July 2016         |
| 287         | Rohde & Schwarz 40 GHz Receiver                | Rhode & Schwarz        | ESIB40       | 100201      | 27 Aug 2016          |
| 307         | BNC-CABLE                                      | Megaphase              | 1689 1GVT4   | 15F50B002   | 27 Oct 2016          |
| 316         | Dell desktop computer workstation with Vasona  | Dell                   | Desktop      | WS04        | Not Required         |
| 372         | AC Variable PS                                 | California Instruments | 1251P        | L06951      | Cal when used        |
| 378         | Rohde & Schwarz 40 GHz Receiver with Generator | Rhode & Schwarz        | ESIB40       | 100107/040  | 04 Aug 2016          |
| 388         | LISN (3 Phase) 9kHz - 30MHz                    | Rohde & Schwarz        | ESH2-Z5      | 892107/022  | 30 Oct 2016          |
| ADAPT SMA#1 | SMA Cable                                      | Megaphase              | SMA Cable #1 | None        | Cal when used        |

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#### 7.4. DFS - Conducted



A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.



**Title:** Radwin Ltd. Outdoor Subscriber Radio Unit  
**To:** FCC 15.407 & RSS 247 (Issue 2)  
**Serial #:** RDWN45-U4\_Master Rev A DFS Bands  
**Issue Date:** 6<sup>th</sup> April 2017  
**Page:** 23 of 24

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| Asset#     | Description                      | Manufacturer         | Model#            | Serial#    | Calibration Due Date |
|------------|----------------------------------|----------------------|-------------------|------------|----------------------|
| 158        | Barometer/Thermometer            | Control Company      | 4196              | E2846      | 01 Dec 2016          |
| 193        | Receiver 20 Hz to 7 GHz          | Rhode & Schwarz      | ESI 7             | 838496/007 | 17 Jul 2016          |
| 299        | Test Software DFS Test System    | Aeroflex             | DFS test Software | V2.7.0     | Not Required         |
| 359        | DFS System                       | Aeroflex             | PXI-1042          | 300001/004 | 13 Dec 2016          |
| 417        | Laptop for DFS with DFS software | Lenova               | W520              | DFS        | Not Required         |
| 418        | PCI-e interface card             | National Instruments | Express 8360      | 174AAC5    | Not Required         |
| 422        | Splitter/Combiner                | Pasternack           | PE 2031           | 001        | Cal when used        |
| 495        | RF Power Divider                 | Micon Precise Corp   | 91002             | 495        | Cal when used        |
| 71         | Spectrum Analyser 9KHz-50GHz     | HP                   | 8565E             | 3425A00181 | 06 Aug 2016          |
| DFS PCIe#1 | PCIe cable for Aeroflex          | National Instruments | PCIe cable        | None       | Not Required         |
| DFS SMA#1  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |
| DFS SMA#2  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |
| DFS SMA#3  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |
| DFS SMA#4  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |

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