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## RF Exposure Evaluation Report

|                            |                                              |
|----------------------------|----------------------------------------------|
| <b>APPLICANT</b>           | RADIO SOLUTIONS, INC.                        |
|                            | 70 ACCORD PARK DRIVE<br>NORWELL MA 02061 USA |
| <b>FCC ID</b>              | 2AHVPSB400M1A                                |
| <b>MODEL NUMBER</b>        | UHF (450-490MHz)                             |
| <b>PRODUCT DESCRIPTION</b> | UHF INDUSTRIAL BOOSTER                       |
| <b>STANDARD APPLIED</b>    | CFR 47 Part 2.1091                           |
| <b>PREPARED BY</b>         | Cory Leverett                                |

We, TIMCO ENGINEERING, INC. would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and meets the requirements.

The attached report shall not be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

## GENERAL REMARKS

### Attestations

This equipment has been evaluated in accordance with the standards identified in this report. To the best of my knowledge and belief, these evaluations were performed using the procedures described in this report.

I attest that the necessary evaluations were made, under my supervision, at:

**Timco Engineering Inc.**  
**849 NW State Road 45**  
**Newberry, FL 32669**

### Authorized Signatory Name:

Cory Leverett

Engineering Project Manager

**Date: 05/ 20/ 2016**

Report reviewed and approved by:

Sid Sanders

Engineer

**Date: 05/ 20/ 2016**

Applicant: RADIO SOLUTIONS, INC.

FCC ID: 2AHVPSB400M1A

Report: V:\R\RADIO SOLUTIONS\673AUT16\673AUT16RF EXP MPE RPT\_REV2.DOCX

# RF Exposure Requirements

## General information

Device type: UHF INDUSTRIAL BOOSTER

Devices that operate under Part 90 of this chapter are subject to RF exposure evaluation prior to equipment authorization or use.

## Antenna

The manufacturer does not specify an antenna, based on the 5 Watt ERP requirement and the 32 dBm conducted output power of this device antennas with a gain of up to  $\leq 7.13$  dBi may be used.

| Configuration | Antenna p/n | Type | Max. Gain (dBi) |
|---------------|-------------|------|-----------------|
| Fixed mounted | Any         | Yagi | 7.13            |
|               |             |      |                 |

## Operating configuration and exposure conditions:

The conducted output power is shown in the table below. Typical use qualifies for a maximum duty cycle factor of 100%.

## MPE Calculation:

The minimum separation distance is calculated as follows:

|                                                  |                                                   |
|--------------------------------------------------|---------------------------------------------------|
| $E(V/m) = \frac{\sqrt{30 \times P \times G}}{d}$ | Power density: $P_d (mW/cm^2) = \frac{E^2}{3770}$ |
|--------------------------------------------------|---------------------------------------------------|

The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.11310, Table 1.

| Minimum Separation Distance for Mobile or Fixed Devices<br>General Population/Uncontrolled Exposure |      |                    |                               |                    |                    |
|-----------------------------------------------------------------------------------------------------|------|--------------------|-------------------------------|--------------------|--------------------|
| Insert values in yellow highlighted boxes to determine Minimum Separation Distance                  |      |                    |                               |                    |                    |
| Max Power                                                                                           | 1.58 | W                  | <i>equals</i>                 | Max Power          | 1580 mW            |
| Duty Cycle                                                                                          | 100  | %                  | <i>equals</i>                 | Duty Factor        | 1 numeric          |
| Antenna Gain                                                                                        | 7.13 | dBi                | <i>equals</i>                 | Gain numeric       | 5.164164 numeric   |
| Coax Loss                                                                                           | 0    | dB                 |                               | Gain - Coax Loss   | 5.164164 numeric   |
| Power Density                                                                                       | 0.3  | mW/cm <sup>2</sup> |                               |                    |                    |
| Enter power Density from the chart to the right                                                     |      |                    |                               |                    |                    |
| Frequency                                                                                           | 490  | MHz                |                               |                    |                    |
|                                                                                                     |      |                    | Rule Part 1.1310, Table 1 (B) |                    |                    |
|                                                                                                     |      |                    | Frequency range               | Power density      | Enter this value   |
|                                                                                                     |      |                    | MHz                           | mW/cm <sup>2</sup> | mW/cm <sup>2</sup> |
|                                                                                                     |      |                    | 0.3-1.34                      | 100                | 100                |
|                                                                                                     |      |                    | 1.34-30                       | 180/f <sup>2</sup> | 0.0                |
|                                                                                                     |      |                    | 30-300                        | 0.2                | 0.2                |
|                                                                                                     |      |                    | 300-1,500                     | f/1500             | 0.3                |
|                                                                                                     |      |                    | 1,500-100,000                 | 1                  | 1                  |
|                                                                                                     |      |                    | f = frequency in MHz          |                    |                    |
| Minimum Separation Distance                                                                         |      |                    | 47 cm                         |                    | 0.47 m             |
| Minimum Separation in Inches                                                                        |      | 18.30195 Inches    |                               |                    |                    |

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