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February 23, 2017

Subject: RF MPE EXPOSURE  
Re: FCC ID: PWO460030

To Whom It May Concern:

The MPE calculations for model 460030 signal booster were done for each frequency band: 700 MHz Band 12, 700 MHz Band 13, 800 MHz, 1900 MHz, and 1700/2100 MHz. For each band two calculations were done; these included the worst case scenario for each of the different types of antennas that may be connected to this signal booster: outside and inside antennas. The order of the attached calculations is as follows:

700 MHz Band 12:

1. Outside Antenna: 314411-40075
2. Inside Antenna: 311135-5840

700 MHz Band 13:

1. Outside Antenna: 314411-40075
2. Inside Antenna: 3311135-5840

800 MHz band:

1. Outside Antenna: 314411-5825
2. Inside Antenna: 311135-5840

1900 MHz band:

1. Outside Antenna: 314473-0640
2. Inside Antenna: 311135-5840

1700/2100 MHz band:

1. Outside Antenna: 314453-40075
2. Inside Antenna: 304419-1175

A booster's uplink power must not exceed 1 watt equivalent isotropic radiated power (EIRP) for each band of operation. Composite downlink power must not exceed 0.05 watt EIRP for each band of operation (20.21(e)(8)(i)(D)). The following formula was used to calculate the equivalent isotropic radiated power:

$$\text{EIRP} = \text{Power Out (Watts)} * \text{Duty Cycle Percent} * \text{Antenna Gain (non-log)} * \text{Coax loss (non-log)}$$

The power density (mW/cm<sup>2</sup>) is calculated using the following formula:

$$\text{Calculated Power Density} = 1000 * \text{EIRP (Watts)} / (4 * \pi * (\text{Distance from Antenna (cm)}^2))$$

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick L. Cook', written over a light blue horizontal line.

Patrick L. Cook  
Chief Technology Officer



## Minimum Safe Distance From Antennas

### Based upon FCC OET Bulletin 65 and other FCC Sources

#### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 698     |
| Pout Watts                  | 0.29512 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 7.30    |
| Coax Loss dB                | 2.80    |
| Distance From Antenna In cm | 20.3    |

#### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 4.50   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.8318 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 0.47   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.1605 |

#### REFERENCE DATA

|                                         |        |
|-----------------------------------------|--------|
| Pout dBm                                | 24.70  |
| Antenna Gain (non-log)                  | 5.37   |
| Coax loss (non-log)                     | 0.52   |
| General FCC Limit (mw/cm <sup>2</sup> ) | f/1500 |



## Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 728     |
| Pout Watts                  | 0.03020 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 4.20    |
| Coax Loss dB                | 4.80    |
| Distance From Antenna In cm | 20.3    |

### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | -0.60  |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.0263 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 0.49   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.0051 |

### REFERENCE DATA

|                                         |        |
|-----------------------------------------|--------|
| Pout dBm                                | 14.80  |
| Antenna Gain (non-log)                  | 2.63   |
| Coax loss (non-log)                     | 0.33   |
| General FCC Limit (mw/cm <sup>2</sup> ) | f/1500 |



## Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 776     |
| Pout Watts                  | 0.29512 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 7.20    |
| Coax Loss dB                | 3.00    |
| Distance From Antenna In cm | 20.3    |

### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 4.20   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.7762 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 0.52   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.1498 |

### REFERENCE DATA

|                                         |        |
|-----------------------------------------|--------|
| Pout dBm                                | 24.70  |
| Antenna Gain (non-log)                  | 5.25   |
| Coax loss (non-log)                     | 0.50   |
| General FCC Limit (mw/cm <sup>2</sup> ) | f/1500 |



## Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 746     |
| Pout Watts                  | 0.02692 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 4.2     |
| Coax Loss dB                | 4.9     |
| Distance From Antenna In cm | 20.3    |

### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | -0.70  |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.0229 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 0.50   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.0044 |

### REFERENCE DATA

|                                         |        |
|-----------------------------------------|--------|
| Pout dBm                                | 14.30  |
| Antenna Gain (non-log)                  | 2.63   |
| Coax loss (non-log)                     | 0.32   |
| General FCC Limit (mw/cm <sup>2</sup> ) | f/1500 |



## Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 1850    |
| Pout Watts                  | 0.28184 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 10.00   |
| Coax Loss dB                | 5.26    |
| Distance From Antenna In cm | 20.3    |

### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 4.74   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.8395 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 1.00   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.1619 |

### REFERENCE DATA

|                                         |       |
|-----------------------------------------|-------|
| Pout dBm                                | 24.50 |
| Antenna Gain (non-log)                  | 10.00 |
| Coax loss (non-log)                     | 0.30  |
| General FCC Limit (mw/cm <sup>2</sup> ) | 1.00  |



## Minimum Safe Distance From Antennas

### Based upon FCC OET Bulletin 65 and other FCC Sources

#### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 824     |
| Pout Watts                  | 0.27542 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 7.80    |
| Coax Loss dB                | 4.46    |
| Distance From Antenna In cm | 20.3    |

#### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 3.34   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.5943 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 0.55   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.1146 |

#### REFERENCE DATA

|                                         |        |
|-----------------------------------------|--------|
| Pout dBm                                | 24.40  |
| Antenna Gain (non-log)                  | 6.03   |
| Coax loss (non-log)                     | 0.36   |
| General FCC Limit (mw/cm <sup>2</sup> ) | f/1500 |



## Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 869     |
| Pout Watts                  | 0.03631 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 6.10    |
| Coax Loss dB                | 5.34    |
| Distance From Antenna In cm | 20.3    |

### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 0.76   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.0433 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 0.58   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.0083 |

### REFERENCE DATA

|                                         |        |
|-----------------------------------------|--------|
| Pout dBm                                | 15.60  |
| Antenna Gain (non-log)                  | 4.07   |
| Coax loss (non-log)                     | 0.29   |
| General FCC Limit (mw/cm <sup>2</sup> ) | f/1500 |





## Minimum Safe Distance From Antennas

### Based upon FCC OET Bulletin 65 and other FCC Sources

#### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 1930    |
| Pout Watts                  | 0.03236 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 9.80    |
| Coax Loss dB                | 8.80    |
| Distance From Antenna In cm | 20.3    |

#### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 1.00   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.0407 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 1.00   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.0079 |

#### REFERENCE DATA

|                                         |       |
|-----------------------------------------|-------|
| Pout dBm                                | 15.10 |
| Antenna Gain (non-log)                  | 9.55  |
| Coax loss (non-log)                     | 0.13  |
| General FCC Limit (mw/cm <sup>2</sup> ) | 1.00  |



## Minimum Safe Distance From Antennas

### Based upon FCC OET Bulletin 65 and other FCC Sources

#### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 1710    |
| Pout Watts                  | 0.32359 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 8.20    |
| Coax Loss dB                | 4.49    |
| Distance From Antenna In cm | 20.3    |

#### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | 3.71   |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.7603 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 1.00   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.1467 |

#### REFERENCE DATA

|                                         |       |
|-----------------------------------------|-------|
| Pout dBm                                | 25.10 |
| Antenna Gain (non-log)                  | 6.61  |
| Coax loss (non-log)                     | 0.36  |
| General FCC Limit (mw/cm <sup>2</sup> ) | 1.00  |



## Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

|                             |         |
|-----------------------------|---------|
| Frequency MHz               | 2110    |
| Pout Watts                  | 0.03162 |
| Duty Cycle Percent          | 100.0%  |
| Ant. Gain dBi               | 5.30    |
| Coax Loss dB                | 6.42    |
| Distance From Antenna In cm | 20.3    |

### RESULTS OF CALCULATIONS

|                                                |        |
|------------------------------------------------|--------|
| Ant. Gain less Coax Loss dBi                   | -1.12  |
| Distance From Antenna In Inches                | 8.00   |
| EIRP (Watts)                                   | 0.0244 |
| FCC Power Density Limit (mw/cm <sup>2</sup> )  | 1.00   |
| Calculated Power Density (mw/cm <sup>2</sup> ) | 0.0047 |

### REFERENCE DATA

|                                         |       |
|-----------------------------------------|-------|
| Pout dBm                                | 15.00 |
| Antenna Gain (non-log)                  | 3.39  |
| Coax loss (non-log)                     | 0.23  |
| General FCC Limit (mw/cm <sup>2</sup> ) | 1.00  |