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October 17, 2013

Subject: RF MPE EXPOSURE

Re: FCC ID: PWO460002

To Whom It May Concern:

The MPE calculations for model 460002 signal booster were done for each frequency band: 800 MHz and 1900 MHz. For each band two calculations were done; these included the different possibilities of antennas that may be connected to this signal booster: mobile outside and inside antennas. The order of the attached calculations is as follows:

800 MHz band:

1. Outside Antenna: 311127
2. Inside Antenna: 311104

1900 MHz band:

1. Outside Antenna: 311101
2. Inside Antenna: 311106

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^2) 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 in a cursive style.

Patrick L. Cook

Senior Research and Development Engineer



Minimum Safe Distance From Antennas Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

| | |
|-----------------------------|---------|
| Frequency MHz | 824 |
| Pout Watts | 0.00049 |
| Duty Cycle Percent | 100.0% |
| Ant. Gain dBi | 2.50 |
| Coax Loss dB | 0.00 |
| Distance From Antenna In cm | 20.3 |

RESULTS OF CALCULATIONS

| | |
|--|--------|
| Ant. Gain less Coax Loss dBi | 2.50 |
| Distance From Antenna In Inches | 8.00 |
| EIRP (Watts) | 0.0009 |
| FCC Power Density Limit (mw/cm ²) | 0.55 |
| Calculated Power Density (mw/cm ²) | 0.0002 |

REFERENCE DATA

| | |
|---|--------|
| Pout dBm | -3.10 |
| Antenna Gain (non-log) | 1.78 |
| Coax loss (non-log) | 1.00 |
| General FCC Limit (mw/cm ²) | f/1500 |

Antenna # 311104



Minimum Safe Distance From Antennas Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

| | |
|-----------------------------|---------|
| Frequency MHz | 869 |
| Pout Watts | 0.21880 |
| Duty Cycle Percent | 100.0% |
| Ant. Gain dBi | 2.20 |
| Coax Loss dB | 0.00 |
| Distance From Antenna In cm | 20.3 |

RESULTS OF CALCULATIONS

| | |
|--|--------|
| Ant. Gain less Coax Loss dBi | 2.20 |
| Distance From Antenna In Inches | 8.00 |
| EIRP (Watts) | 0.3631 |
| FCC Power Density Limit (mw/cm ²) | 0.58 |
| Calculated Power Density (mw/cm ²) | 0.0701 |

REFERENCE DATA

| | |
|---|--------|
| Pout dBm | 23.40 |
| Antenna Gain (non-log) | 1.66 |
| Coax loss (non-log) | 1.00 |
| General FCC Limit (mw/cm ²) | f/1500 |

Antenna # 311127



Minimum Safe Distance From Antennas Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

| | |
|-----------------------------|---------|
| Frequency MHz | 1850 |
| Pout Watts | 0.00081 |
| Duty Cycle Percent | 100.0% |
| Ant. Gain dBi | 6.10 |
| Coax Loss dB | 0.00 |
| Distance From Antenna In cm | 20.3 |

RESULTS OF CALCULATIONS

| | |
|--|--------|
| Ant. Gain less Coax Loss dBi | 6.10 |
| Distance From Antenna In Inches | 8.00 |
| EIRP (Watts) | 0.0033 |
| FCC Power Density Limit (mw/cm ²) | 1.00 |
| Calculated Power Density (mw/cm ²) | 0.0006 |

REFERENCE DATA

| | |
|---|-------|
| Pout dBm | -0.92 |
| Antenna Gain (non-log) | 4.07 |
| Coax loss (non-log) | 1.00 |
| General FCC Limit (mw/cm ²) | 1.00 |

Antenna # 311101



Minimum Safe Distance From Antennas Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

| | |
|-----------------------------|---------|
| Frequency MHz | 1930 |
| Pout Watts | 0.00081 |
| Duty Cycle Percent | 100.0% |
| Ant. Gain dBi | 0.10 |
| Coax Loss dB | 0.00 |
| Distance From Antenna In cm | 20.3 |

RESULTS OF CALCULATIONS

| | |
|--|--------|
| Ant. Gain less Coax Loss dBi | 0.10 |
| Distance From Antenna In Inches | 8.00 |
| EIRP (Watts) | 0.0008 |
| FCC Power Density Limit (mw/cm ²) | 1.00 |
| Calculated Power Density (mw/cm ²) | 0.0002 |

REFERENCE DATA

| | |
|---|-------|
| Pout dBm | -0.92 |
| Antenna Gain (non-log) | 1.02 |
| Coax loss (non-log) | 1.00 |
| General FCC Limit (mw/cm ²) | 1.00 |

Antenna # 311106