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November 30, 2015

Subject: RF MPE EXPOSURE  
Re: FCC ID: PWO460008

To Whom It May Concern:

The MPE calculations for model 460008 signal booster were done for each frequency band: 1700/2100 MHz, 800 MHz, 700 MHz Band 13, 700 MHz Band 12, and 1900 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:

1700/2100 MHz band:

1. Outside Antenna: 314453-40075
2. Inside Antenna: 311155

800 MHz band:

1. Outside Antenna: 311129-400100
2. Inside Antenna: 311155

700 MHz Band 13:

1. Outside Antenna: 314411-40075
2. Inside Antenna: 311155

700 MHz Band 17:

1. Outside Antenna: 314411-40075

1900 MHz band:

1. Outside Antenna: 314473-0640
2. Inside Antenna: 311155

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,

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	1710
Pout Watts	0.23988
Duty Cycle Percent	100.0%
Ant. Gain dBi	8.21
Coax Loss dB	4.40
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.81
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.5768
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.1147

### REFERENCE DATA

Pout dBm	23.80
Antenna Gain (non-log)	6.62
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	0.00363
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.66
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	6.66
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0168
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.0033

### REFERENCE DATA

Pout dBm	5.60
Antenna Gain (non-log)	4.63
Coax loss (non-log)	1.00
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	0.32211
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.64
Coax Loss dB	4.70
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.94
Distance From Antenna In Inches	7.87
EIRP (Watts)	1.00
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.55
Calculated Power Density (mw/cm <sup>2</sup> )	0.1999

### REFERENCE DATA

Pout dBm	25.1
Antenna Gain (non-log)	9.20
Coax loss (non-log)	0.34
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	0.00076
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.09
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	6.09
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0031
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.58
Calculated Power Density (mw/cm <sup>2</sup> )	0.0006

### REFERENCE DATA

Pout dBm	-1.20
Antenna Gain (non-log)	4.06
Coax loss (non-log)	1.00
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	0.27542
Duty Cycle Percent	100.0%
Ant. Gain dBi	7.20
Coax Loss dB	3.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.20
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.7244
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.52
Calculated Power Density (mw/cm <sup>2</sup> )	0.1441

### REFERENCE DATA

Pout dBm	24.40
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	0.00039
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.16
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.16
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0010
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.50
Calculated Power Density (mw/cm <sup>2</sup> )	0.0002

### REFERENCE DATA

Pout dBm	-4.10
Antenna Gain (non-log)	2.61
Coax loss (non-log)	1.00
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	698
Pout Watts	0.36728
Duty Cycle Percent	100.0%
Ant. Gain dBi	7.3
Coax Loss dB	2.9
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.4
Distance From Antenna In Inches	7.87
EIRP (Watts)	1.00
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47
Calculated Power Density (mw/cm <sup>2</sup> )	0.1999

### REFERENCE DATA

Pout dBm	25.7
Antenna Gain (non-log)	5.31
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	0.00037
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.16
Coax Loss dB	0.00
Distance From Antenna In cm	20

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.16
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0010
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.49
Calculated Power Density (mw/cm <sup>2</sup> )	0.0002

### REFERENCE DATA

Pout dBm	-4.30
Antenna Gain (non-log)	2.61
Coax loss (non-log)	1.00
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	0.33113
Duty Cycle Percent	100.0%
Ant. Gain dBi	10.00
Coax Loss dB	5.26
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.74
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.9863
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.1962

### REFERENCE DATA

Pout dBm	25.20
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	1930
Pout Watts	0.00251
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.77
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	9.77
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0238
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	4.00
Antenna Gain (non-log)	9.48
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00