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July 28, 2016

Subject: RF MPE EXPOSURE

Re: FCC ID: PWO460031

To Whom It May Concern:

The MPE calculations for model 460031 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: 311155

700 MHz Band 13:

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

800 MHz band:

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

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: 311135-400150

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:

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

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

Calculated Power Density=1000\*EIRP (Watts)/(4\*π\*(Distance from Antenna (cm)<sup>2</sup>))

Sincerely,

A handwritten signature in black ink, appearing to read "P. L. Cook".

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	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.50
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.8318
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47
Calculated Power Density (mw/cm <sup>2</sup> )	0.1655

### 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	0.01230
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)	0.0321
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.49
Calculated Power Density (mw/cm <sup>2</sup> )	0.0064

### REFERENCE DATA

Pout dBm	10.90
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	777
Pout Watts	0.37154
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)	0.9772
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.52
Calculated Power Density (mw/cm <sup>2</sup> )	0.1944

### REFERENCE DATA

Pout dBm	25.70
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	0.01230
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)	0.0321
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.50
Calculated Power Density (mw/cm <sup>2</sup> )	0.0064

### REFERENCE DATA

Pout dBm	10.90
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	824
Pout Watts	0.33884
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.60
Coax Loss dB	4.90
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.70
Distance From Antenna In Inches	7.87
EIRP (Watts)	1.0000
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.55
Calculated Power Density (mw/cm <sup>2</sup> )	0.1989

### REFERENCE DATA

Pout dBm	25.30
Antenna Gain (non-log)	9.12
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	869
Pout Watts	0.01230
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)	0.0500
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.58
Calculated Power Density (mw/cm <sup>2</sup> )	0.0099

### REFERENCE DATA

Pout dBm	10.90
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	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	0.00851
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.77
Coax Loss dB	8.80
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	0.97
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0106
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.0021

### REFERENCE DATA

Pout dBm	9.30
Antenna Gain (non-log)	9.48
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	0.40738
Duty Cycle Percent	100.0%
Ant. Gain dBi	8.20
Coax Loss dB	4.49
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.71
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.9572
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.1904

### REFERENCE DATA

Pout dBm	26.10
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	0.01202
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.66
Coax Loss dB	10.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-3.34
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0056
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.0011

### REFERENCE DATA

Pout dBm	10.80
Antenna Gain (non-log)	4.63
Coax loss (non-log)	0.10
General FCC Limit (mw/cm <sup>2</sup> )	1.00