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January 9, 2017

Subject: RF MPE EXPOSURE

Re: FCC ID: PWO460032

To Whom It May Concern:

The MPE calculations for model 460032 signal booster were done for each frequency band: 700 MHz Band 12, 700 MHz Band 13, 800 MHz, 1700/2100 MHz, 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:

700 MHz Band 12:

1. Outside Antenna: eqo Outside Antenna
2. Inside Antenna: 311155

700 MHz Band 13:

1. Outside Antenna: eqo Outside Antenna
2. Inside Antenna: 311155

800 MHz band:

1. Outside Antenna: eqo Outside Antenna
2. Inside Antenna: 311155-1150

1700/2100 MHz band:

1. Outside Antenna: eqo Outside Antenna
2. Inside Antenna: 309904-75F

1900 MHz band:

1. Outside Antenna: eqo Outside Antenna
2. Inside Antenna: 309904-75F

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 "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	0.22387
Duty Cycle Percent	100.0%
Ant. Gain dBi	5.12
Coax Loss dB	0.09
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	5.03
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.7129
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47
Calculated Power Density (mw/cm <sup>2</sup> )	0.1418

### REFERENCE DATA

Pout dBm	23.50
Antenna Gain (non-log)	3.25
Coax loss (non-log)	0.98
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	0.01288
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)	0.0336
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.49
Calculated Power Density (mw/cm <sup>2</sup> )	0.0067

### REFERENCE DATA

Pout dBm	11.10
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	776
Pout Watts	0.26303
Duty Cycle Percent	100.0%
Ant. Gain dBi	5.19
Coax Loss dB	0.09
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	5.10
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.8511
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.52
Calculated Power Density (mw/cm <sup>2</sup> )	0.1693

### REFERENCE DATA

Pout dBm	24.20
Antenna Gain (non-log)	3.30
Coax loss (non-log)	0.98
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	0.01549
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)	0.0404
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.50
Calculated Power Density (mw/cm <sup>2</sup> )	0.0080

### REFERENCE DATA

Pout dBm	11.90
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	0.21380
Duty Cycle Percent	100.0%
Ant. Gain dBi	5.45
Coax Loss dB	0.10
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	5.35
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.7328
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.55
Calculated Power Density (mw/cm <sup>2</sup> )	0.1458

### REFERENCE DATA

Pout dBm	23.30
Antenna Gain (non-log)	3.51
Coax loss (non-log)	0.98
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	0.01622
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.09
Coax Loss dB	2.36
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.73
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0383
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.58
Calculated Power Density (mw/cm <sup>2</sup> )	0.0076

### REFERENCE DATA

Pout dBm	12.10
Antenna Gain (non-log)	4.06
Coax loss (non-log)	0.58
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	1710
Pout Watts	0.26915
Duty Cycle Percent	100.0%
Ant. Gain dBi	5.42
Coax Loss dB	0.17
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	5.25
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.9016
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.1794

### REFERENCE DATA

Pout dBm	24.30
Antenna Gain (non-log)	3.48
Coax loss (non-log)	0.96
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	0.01585
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.66
Coax Loss dB	3.17
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.49
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0354
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.0070

### REFERENCE DATA

Pout dBm	12.00
Antenna Gain (non-log)	4.63
Coax loss (non-log)	0.48
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	1850
Pout Watts	0.22909
Duty Cycle Percent	100.0%
Ant. Gain dBi	10.04
Coax Loss dB	5.12
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.92
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.7112
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.1415

### REFERENCE DATA

Pout dBm	23.60
Antenna Gain (non-log)	10.09
Coax loss (non-log)	0.31
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	0.01072
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.60
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	6.60
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.0490
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.0097

### REFERENCE DATA

Pout dBm	10.30
Antenna Gain (non-log)	4.57
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00