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November 26, 2014

Subject: RF MPE EXPOSURE
Re: FCC ID: PWO460019

To Whom It May Concern:

The MPE calculations for model 460019 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 antennas. The order of the attached calculations is as follows:

1700/2100 MHz band:

1. Outside Antenna: 314453-40075

800 MHz band:

2. Outside Antenna: 311129-400100

700 MHz Band 13:

3. Outside Antenna: 314411-40075

700 MHz Band 12:

4. Outside Antenna: 314411-40075

1900 MHz band:

5. Outside Antenna: 314473-0640

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/cm²) 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
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	0.36224
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)	0.8511
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1693

REFERENCE DATA

Pout dBm	25.59
Antenna Gain (non-log)	6.61
Coax loss (non-log)	0.36
General FCC Limit (mw/cm ²)	1.00

Antenna # 314453-40075



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

INPUT DATA

Frequency MHz	824
Pout Watts	0.25410
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.60
Coax Loss dB	4.70
Distance From Antenna In cm	20.0

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.90
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.7852
FCC Power Density Limit (mw/cm ²)	0.55
Calculated Power Density (mw/cm ²)	0.1562

REFERENCE DATA

Pout dBm	24.05
Antenna Gain (non-log)	9.12
Coax loss (non-log)	0.34
General FCC Limit (mw/cm ²)	f/1500

Antenna # 311129-400100



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

INPUT DATA

Frequency MHz	776
Pout Watts	0.31117
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)	0.8185
FCC Power Density Limit (mw/cm ²)	0.52
Calculated Power Density (mw/cm ²)	0.1628

REFERENCE DATA

Pout dBm	24.93
Antenna Gain (non-log)	5.25
Coax loss (non-log)	0.50
General FCC Limit (mw/cm ²)	f/1500

Antenna # 314411-40075



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

INPUT DATA

Frequency MHz	698
Pout Watts	0.29717
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.60
Coax Loss dB	5.10
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)	0.8375
FCC Power Density Limit (mw/cm ²)	0.47
Calculated Power Density (mw/cm ²)	0.1666

REFERENCE DATA

Pout dBm	24.73
Antenna Gain (non-log)	9.12
Coax loss (non-log)	0.31
General FCC Limit (mw/cm ²)	f/1500

Antenna # 314411-40075



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

INPUT DATA

Frequency MHz	1850
Pout Watts	0.31623
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)	0.9419
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1874

REFERENCE DATA

Pout dBm	25.00
Antenna Gain (non-log)	10.00
Coax loss (non-log)	0.30
General FCC Limit (mw/cm ²)	1.00

Antenna # 314473-0640