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December 29, 2016

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 calculations were done for 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:

700 MHz Band 12:

1. Outside Antenna: 314411-40075

700 MHz Band 13:

2. Outside Antenna: 314411-40075

800 MHz band:

1. Outside Antenna: 314411-5825

1700/2100 MHz band:

1. Outside Antenna: 314453-40075

1900 MHz band:

2. 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/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 'P. 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	698
Pout Watts	0.28840
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)	0.8128
FCC Power Density Limit (mw/cm ²)	0.47
Calculated Power Density (mw/cm ²)	0.1617

REFERENCE DATA

Pout dBm	24.60
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	776
Pout Watts	0.32359
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)	0.8511
FCC Power Density Limit (mw/cm ²)	0.52
Calculated Power Density (mw/cm ²)	0.1693

REFERENCE DATA

Pout dBm	25.10
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	824
Pout Watts	0.25410
Duty Cycle Percent	100.0%
Ant. Gain dBi	7.80
Coax Loss dB	3.34
Distance From Antenna In cm	20.0

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.46
Distance From Antenna In Inches	7.87
EIRP (Watts)	0.7096
FCC Power Density Limit (mw/cm ²)	0.55
Calculated Power Density (mw/cm ²)	0.1412

REFERENCE DATA

Pout dBm	24.05
Antenna Gain (non-log)	6.03
Coax loss (non-log)	0.46
General FCC Limit (mw/cm ²)	f/1500

Antenna # 314411-5825



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	1710
Pout Watts	0.24547
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)	0.5768
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1147

REFERENCE DATA

Pout dBm	23.90
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	1850
Pout Watts	0.22387
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)	0.6668
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1327

REFERENCE DATA

Pout dBm	23.50
Antenna Gain (non-log)	10.00
Coax loss (non-log)	0.30
General FCC Limit (mw/cm ²)	1.00

Antenna # 314473-0640