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October 6, 2016

Subject: RF MPE EXPOSURE
Re: FCC ID: PWO460023

To Whom It May Concern:

The MPE calculations for model 460023 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: 309904-75F

1700/2100 MHz band:

1. Outside Antenna: 314453-40075
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/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 over a light blue horizontal line.

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	0.34674
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)	0.9772
FCC Power Density Limit (mw/cm ²)	0.47
Calculated Power Density (mw/cm ²)	0.1944

REFERENCE DATA

Pout dBm	25.40
Antenna Gain (non-log)	5.37
Coax loss (non-log)	0.52
General FCC Limit (mw/cm ²)	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 ²)	0.49
Calculated Power Density (mw/cm ²)	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 ²)	f/1500



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	777
Pout Watts	0.35481
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)	0.9333
FCC Power Density Limit (mw/cm ²)	0.52
Calculated Power Density (mw/cm ²)	0.1857

REFERENCE DATA

Pout dBm	25.50
Antenna Gain (non-log)	5.25
Coax loss (non-log)	0.50
General FCC Limit (mw/cm ²)	f/1500



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	746
Pout Watts	0.01288
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 ²)	0.50
Calculated Power Density (mw/cm ²)	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 ²)	f/1500



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	824
Pout Watts	0.30200
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)	0.8913
FCC Power Density Limit (mw/cm ²)	0.55
Calculated Power Density (mw/cm ²)	0.1773

REFERENCE DATA

Pout dBm	24.80
Antenna Gain (non-log)	9.12
Coax loss (non-log)	0.32
General FCC Limit (mw/cm ²)	f/1500



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	869
Pout Watts	0.01148
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)	0.0467
FCC Power Density Limit (mw/cm ²)	0.58
Calculated Power Density (mw/cm ²)	0.0093

REFERENCE DATA

Pout dBm	10.60
Antenna Gain (non-log)	4.06
Coax loss (non-log)	1.00
General FCC Limit (mw/cm ²)	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 ²)	1.00
Calculated Power Density (mw/cm ²)	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 ²)	1.00



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	1930
Pout Watts	0.00741
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)	0.0339
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0067

REFERENCE DATA

Pout dBm	8.70
Antenna Gain (non-log)	4.57
Coax loss (non-log)	1.00
General FCC Limit (mw/cm ²)	1.00



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	1710
Pout Watts	0.38019
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)	0.8933
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1777

REFERENCE DATA

Pout dBm	25.80
Antenna Gain (non-log)	6.61
Coax loss (non-log)	0.36
General FCC Limit (mw/cm ²)	1.00



Minimum Safe Distance From Antennas

Based upon FCC OET Bulletin 65 and other FCC Sources

INPUT DATA

Frequency MHz	2110
Pout Watts	0.01175
Duty Cycle Percent	100.0%
Ant. Gain dBi	3.49
Coax Loss dB	0.00
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)	0.0262
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0052

REFERENCE DATA

Pout dBm	10.70
Antenna Gain (non-log)	2.23
Coax loss (non-log)	1.00
General FCC Limit (mw/cm ²)	1.00