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January 5, 2017

Subject: RF MPE EXPOSURE
Re: FCC ID: PWO460037

To Whom It May Concern:

The MPE calculations for model 460037 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: 311135-5840

700 MHz Band 13:

1. Outside Antenna: 314411-40075
2. Inside Antenna: 304419-1175

800 MHz band:

1. Outside Antenna: 311129-400100
2. Inside Antenna: 311135-5840

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:

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

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	0.33884
Duty Cycle Percent	100.0%
Ant. Gain dBi	7.30
Coax Loss dB	2.80
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.50
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.9550
FCC Power Density Limit (mw/cm ²)	0.47
Calculated Power Density (mw/cm ²)	0.1842

REFERENCE DATA

Pout dBm	25.30
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	0.03311
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.20
Coax Loss dB	4.80
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-0.60
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0288
FCC Power Density Limit (mw/cm ²)	0.49
Calculated Power Density (mw/cm ²)	0.0056

REFERENCE DATA

Pout dBm	15.20
Antenna Gain (non-log)	2.63
Coax loss (non-log)	0.33
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	776
Pout Watts	0.38019
Duty Cycle Percent	100.0%
Ant. Gain dBi	7.20
Coax Loss dB	3.00
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.20
Distance From Antenna In Inches	8.00
EIRP (Watts)	1.0000
FCC Power Density Limit (mw/cm ²)	0.52
Calculated Power Density (mw/cm ²)	0.1929

REFERENCE DATA

Pout dBm	25.80
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	0.02455
Duty Cycle Percent	100.0%
Ant. Gain dBi	2.10
Coax Loss dB	3.20
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-1.10
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0191
FCC Power Density Limit (mw/cm ²)	0.50
Calculated Power Density (mw/cm ²)	0.0037

REFERENCE DATA

Pout dBm	13.90
Antenna Gain (non-log)	1.62
Coax loss (non-log)	0.48
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	0.29512
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.60
Coax Loss dB	4.90
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.70
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.8710
FCC Power Density Limit (mw/cm ²)	0.55
Calculated Power Density (mw/cm ²)	0.1680

REFERENCE DATA

Pout dBm	24.70
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	0.03467
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.20
Coax Loss dB	4.80
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-0.60
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0302
FCC Power Density Limit (mw/cm ²)	0.58
Calculated Power Density (mw/cm ²)	0.0058

REFERENCE DATA

Pout dBm	15.40
Antenna Gain (non-log)	2.63
Coax loss (non-log)	0.33
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	0.33574
Duty Cycle Percent	100.0%
Ant. Gain dBi	10.00
Coax Loss dB	5.26
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.74
Distance From Antenna In Inches	8.00
EIRP (Watts)	1.0000
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1929

REFERENCE DATA

Pout dBm	25.3
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	0.03467
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.70
Coax Loss dB	9.20
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-2.50
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0195
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0038

REFERENCE DATA

Pout dBm	15.40
Antenna Gain (non-log)	4.68
Coax loss (non-log)	0.12
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	0.41687
Duty Cycle Percent	100.0%
Ant. Gain dBi	8.20
Coax Loss dB	4.49
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.71
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.9795
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1890

REFERENCE DATA

Pout dBm	26.20
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	0.03467
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.70
Coax Loss dB	10.00
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-3.30
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0162
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0031

REFERENCE DATA

Pout dBm	15.40
Antenna Gain (non-log)	4.68
Coax loss (non-log)	0.10
General FCC Limit (mw/cm ²)	1.00