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March 15, 2018

Subject: RF MPE EXPOSURE
Re: FCC ID: PWO460042

To Whom It May Concern:

The MPE calculations for model 460042 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: 301111-400170
2. Inside Antenna: 311135-400150

700 MHz Band 13:

1. Outside Antenna: 314411-40075
2. Inside Antenna: 311135-400150

800 MHz band:

1. Outside Antenna: 301111-400170
2. Inside Antenna: 311135-400150

1900 MHz band:

1. Outside Antenna: 314453-40075
2. Inside Antenna: 309900-50N

1700/2100 MHz band:

1. Outside Antenna: 314453-40075
2. Inside Antenna: 309900-50N

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	0.12303
Duty Cycle Percent	100.0%
Ant. Gain dBi	10.00
Coax Loss dB	5.80
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)	0.3236
FCC Power Density Limit (mw/cm ²)	0.47
Calculated Power Density (mw/cm ²)	0.0624

REFERENCE DATA

Pout dBm	20.90
Antenna Gain (non-log)	10.00
Coax loss (non-log)	0.26
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	729
Pout Watts	0.04677
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.20
Coax Loss dB	5.50
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-1.30
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0347
FCC Power Density Limit (mw/cm ²)	0.49
Calculated Power Density (mw/cm ²)	0.0067

REFERENCE DATA

Pout dBm	16.70
Antenna Gain (non-log)	2.63
Coax loss (non-log)	0.28
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	0.19498
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)	0.5129
FCC Power Density Limit (mw/cm ²)	0.52
Calculated Power Density (mw/cm ²)	0.0989

REFERENCE DATA

Pout dBm	22.90
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	0.03162
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.20
Coax Loss dB	5.55
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-1.35
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0232
FCC Power Density Limit (mw/cm ²)	0.50
Calculated Power Density (mw/cm ²)	0.0045

REFERENCE DATA

Pout dBm	15.00
Antenna Gain (non-log)	2.63
Coax loss (non-log)	0.28
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	0.18621
Duty Cycle Percent	100.0%
Ant. Gain dBi	10.80
Coax Loss dB	6.30
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)	0.5248
FCC Power Density Limit (mw/cm ²)	0.55
Calculated Power Density (mw/cm ²)	0.1012

REFERENCE DATA

Pout dBm	22.70
Antenna Gain (non-log)	12.02
Coax loss (non-log)	0.23
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	0.03981
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.10
Coax Loss dB	6.80
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-0.70
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0339
FCC Power Density Limit (mw/cm ²)	0.58
Calculated Power Density (mw/cm ²)	0.0065

REFERENCE DATA

Pout dBm	16.00
Antenna Gain (non-log)	4.07
Coax loss (non-log)	0.21
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	0.14791
Duty Cycle Percent	100.0%
Ant. Gain dBi	10.04
Coax Loss dB	5.40
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.64
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.4305
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0831

REFERENCE DATA

Pout dBm	21.70
Antenna Gain (non-log)	10.09
Coax loss (non-log)	0.29
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	0.03548
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.80
Coax Loss dB	8.56
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	1.24
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0472
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0091

REFERENCE DATA

Pout dBm	15.50
Antenna Gain (non-log)	9.55
Coax loss (non-log)	0.14
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	0.26915
Duty Cycle Percent	100.0%
Ant. Gain dBi	8.21
Coax Loss dB	4.40
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.81
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.6471
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.1248

REFERENCE DATA

Pout dBm	24.30
Antenna Gain (non-log)	6.62
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	0.04365
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.70
Coax Loss dB	9.10
Distance From Antenna In cm	20.3

RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	-2.40
Distance From Antenna In Inches	8.00
EIRP (Watts)	0.0251
FCC Power Density Limit (mw/cm ²)	1.00
Calculated Power Density (mw/cm ²)	0.0048

REFERENCE DATA

Pout dBm	16.40
Antenna Gain (non-log)	4.68
Coax loss (non-log)	0.12
General FCC Limit (mw/cm ²)	1.00