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Subject: RF MPE EXPOSURE  
Re: FCC ID: PWO2B3425

To Whom It May Concern:

The MPE calculations for model 2B3425 signal booster were done for each frequency band: 700 MHz (Band 12), 700 MHz (Band 13), 2100 MHz, 800 MHz, and 1900 MHz. The power density for multiple radiators was calculated as well as two calculations for each band; these included the different possibilities of antennas that may be connected to this signal booster: fixed outside and inside antennas. The order of the attached calculations is as follows:

700 MHz band (12):

1. Fixed Outside Antenna
2. Mobile Outside Antenna
3. Inside Antenna

700 MHz band (13):

4. Fixed Outside Antenna
5. Mobile Outside Antenna
6. Inside Antenna

2100 MHz band:

7. Fixed Outside Antenna
8. Mobile Outside Antenna
9. Inside Antenna

800 MHz band:

10. Fixed Outside Antenna
11. Mobile Outside Antenna
12. Inside Antenna

1900 MHz band:

13. Fixed Outside Antenna
14. Mobile Outside Antenna
15. Inside Antenna

Radiation Safety

16. Calculated Combined Power Density

The most conservative of these calculations is used to determine the safe distances and gains for antennas that may be connected to this signal booster as summarized below:

	Fixed Outside Antenna	Mobile Outside	Inside Antenna
Maximum Gain less Cable Loss (dBi)	3.4	3.4	15
Minimum Distance from All People (cm/in)	21/9	21/9	21/8.5



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	698
Pout Watts	0.61600
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.20
Coax Loss dB	0.00
Distance From Antenna In cm	21.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	6.20
Distance From Antenna In Inches	8.27
ERP (Watts)	1.5658
EIRP (Watts)	2.5679
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47
Calculated Power Density (mw/cm <sup>2</sup> )	0.46

### REFERENCE DATA

Pout dBm	27.90
Antenna Gain (non-log)	4.17
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



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

### INPUT DATA

Frequency MHz	698
Pout Watts	0.61600
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.00
Coax Loss dB	0.00
Distance From Antenna In cm	20.5

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	6.00
Distance From Antenna In Inches	8.07
ERP (Watts)	1.4953
EIRP (Watts)	2.4523
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47
Calculated Power Density (mw/cm <sup>2</sup> )	0.46

### REFERENCE DATA

Pout dBm	27.90
Antenna Gain (non-log)	3.98
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



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

### INPUT DATA

Frequency MHz	728
Pout Watts	0.00204
Duty Cycle Percent	100.0%
Ant. Gain dBi	15.00
Coax Loss dB	0.00
Distance From Antenna In cm	20.6

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	15.00
Distance From Antenna In Inches	8.11
ERP (Watts)	0.0393
EIRP (Watts)	0.0645
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.49
Calculated Power Density (mw/cm <sup>2</sup> )	0.01

### REFERENCE DATA

Pout dBm	3.10
Antenna Gain (non-log)	31.62
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



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

### INPUT DATA

Frequency MHz	776
Pout Watts	0.43700
Duty Cycle Percent	100.0%
Ant. Gain dBi	8.10
Coax Loss dB	0.00
Distance From Antenna In cm	21.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	8.10
Distance From Antenna In Inches	8.27
ERP (Watts)	1.7204
EIRP (Watts)	2.8215
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.52
Calculated Power Density (mw/cm <sup>2</sup> )	0.51

### REFERENCE DATA

Pout dBm	26.40
Antenna Gain (non-log)	6.46
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	776
Pout Watts	0.43700
Duty Cycle Percent	100.0%
Ant. Gain dBi	7.50
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	7.50
Distance From Antenna In Inches	7.87
ERP (Watts)	1.4984
EIRP (Watts)	2.4574
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.52
Calculated Power Density (mw/cm <sup>2</sup> )	0.49

### REFERENCE DATA

Pout dBm	26.40
Antenna Gain (non-log)	5.62
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	746
Pout Watts	0.00229
Duty Cycle Percent	100.0%
Ant. Gain dBi	15.00
Coax Loss dB	0.00
Distance From Antenna In cm	20.6

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	15.00
Distance From Antenna In Inches	8.11
ERP (Watts)	0.0442
EIRP (Watts)	0.0724
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.50
Calculated Power Density (mw/cm <sup>2</sup> )	0.01

### REFERENCE DATA

Pout dBm	3.60
Antenna Gain (non-log)	31.62
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	1710
Pout Watts	0.45700
Duty Cycle Percent	100.0%
Ant. Gain dBi	3.40
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.40
Distance From Antenna In Inches	7.87
ERP (Watts)	0.6096
EIRP (Watts)	0.9998
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.20

### REFERENCE DATA

Pout dBm	26.60
Antenna Gain (non-log)	2.19
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00





## Minimum Safe Distance From Antennas

### Based upon FCC OET Bulletin 65 and other FCC Sources

#### INPUT DATA

Frequency MHz	1710
Pout Watts	0.45700
Duty Cycle Percent	100.0%
Ant. Gain dBi	3.40
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

#### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	3.40
Distance From Antenna In Inches	7.87
ERP (Watts)	0.6096
EIRP (Watts)	0.9998
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.20

#### REFERENCE DATA

Pout dBm	26.60
Antenna Gain (non-log)	2.19
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	2110
Pout Watts	0.00870
Duty Cycle Percent	100.0%
Ant. Gain dBi	15.00
Coax Loss dB	0.00
Distance From Antenna In cm	20.6

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	15.00
Distance From Antenna In Inches	8.11
ERP (Watts)	0.1678
EIRP (Watts)	0.2751
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.05

### REFERENCE DATA

Pout dBm	9.40
Antenna Gain (non-log)	31.62
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00



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

### INPUT DATA

Frequency MHz	824
Pout Watts	0.72500
Duty Cycle Percent	100.0%
Ant. Gain dBi	6.10
Coax Loss dB	0.00
Distance From Antenna In cm	21.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	6.10
Distance From Antenna In Inches	8.27
ERP (Watts)	1.8009
EIRP (Watts)	2.9535
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.55
Calculated Power Density (mw/cm <sup>2</sup> )	0.53

### REFERENCE DATA

Pout dBm	28.60
Antenna Gain (non-log)	4.07
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	824
Pout Watts	0.72500
Duty Cycle Percent	100.0%
Ant. Gain dBi	5.30
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	5.30
Distance From Antenna In Inches	7.87
ERP (Watts)	1.4979
EIRP (Watts)	2.4566
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.55
Calculated Power Density (mw/cm <sup>2</sup> )	0.49

### REFERENCE DATA

Pout dBm	28.60
Antenna Gain (non-log)	3.39
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	869
Pout Watts	0.00174
Duty Cycle Percent	100.0%
Ant. Gain dBi	15.00
Coax Loss dB	0.00
Distance From Antenna In cm	20.6

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	15.00
Distance From Antenna In Inches	8.11
ERP (Watts)	0.0336
EIRP (Watts)	0.0550
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.58
Calculated Power Density (mw/cm <sup>2</sup> )	0.01

### REFERENCE DATA

Pout dBm	2.41
Antenna Gain (non-log)	31.62
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	f/1500



# Minimum Safe Distance From Antennas

## Based upon FCC OET Bulletin 65 and other FCC Sources

### INPUT DATA

Frequency MHz	1850
Pout Watts	0.66000
Duty Cycle Percent	100.0%
Ant. Gain dBi	9.20
Coax Loss dB	0.00
Distance From Antenna In cm	21.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	9.20
Distance From Antenna In Inches	8.27
ERP (Watts)	3.3473
EIRP (Watts)	5.4896
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.99

### REFERENCE DATA

Pout dBm	28.20
Antenna Gain (non-log)	8.32
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00



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

### INPUT DATA

Frequency MHz	1850
Pout Watts	0.66000
Duty Cycle Percent	100.0%
Ant. Gain dBi	4.80
Coax Loss dB	0.00
Distance From Antenna In cm	20.0

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	4.80
Distance From Antenna In Inches	7.87
ERP (Watts)	1.2153
EIRP (Watts)	1.9932
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.40

### REFERENCE DATA

Pout dBm	28.20
Antenna Gain (non-log)	3.02
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00



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

### INPUT DATA

Frequency MHz	1930
Pout Watts	0.00831
Duty Cycle Percent	100.0%
Ant. Gain dBi	15.00
Coax Loss dB	0.00
Distance From Antenna In cm	20.6

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	15.00
Distance From Antenna In Inches	8.11
ERP (Watts)	0.1602
EIRP (Watts)	0.2628
FCC Power Density Limit (mw/cm <sup>2</sup> )	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.05

### REFERENCE DATA

Pout dBm	9.20
Antenna Gain (non-log)	31.62
Coax loss (non-log)	1.00
General FCC Limit (mw/cm <sup>2</sup> )	1.00





## Calculated Power Density and Minimum Safe Distance For Cellular Phones (Uplink)

### INPUT DATA

Frequency MHz (Uplink)	698	776	1710	824	1850
Radiated Power (Watts)	2.46000	2.46000	1.00000	2.46000	2.00000
Duty Cycle Percent	100.0%	100.0%	100.0%	100.0%	100.0%
Distance From Antenna In cm	20.6	20.6	20.6	20.6	20.6

### RESULTS OF CALCULATIONS

Distance From Antenna In Inches	8.11	8.11	8.11	8.11	8.11
ERP (Watts)	1.5000	1.5000	0.6098	1.5000	1.2195
EIRP (Watts)	2.4600	2.4600	1.0000	2.4600	2.0000
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47	0.52	1.00	0.55	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.46	0.46	0.19	0.46	0.3750

## Calculated Power Density and Minimum Safe Distance For Amplifier (Downlink)

Frequency MHz	728	746	2110	869	1930
Pout Watts	0.00204	0.00229	0.00870	0.00174	0.00831
Duty Cycle Percent	100.0%	100.0%	100.0%	100.0%	100.0%
Ant. Gain dBi	15.00	15.00	15.00	15.00	15.00
Coax Loss dB	0.00	0.00	0.00	0.00	0.00
Distance From Antenna In cm	20.6	20.6	20.6	20.6	20.6

### RESULTS OF CALCULATIONS

Ant. Gain less Coax Loss dBi	15.00	15.00	15.00	15.00	15.00
Distance From Antenna In Inches	8.11	8.11	8.11	8.11	8.11
ERP (Watts)	0.0393	0.0442	0.1678	0.0336	0.1602
EIRP (Watts)	0.0645	0.0724	0.2751	0.0550	0.2628
FCC Power Density Limit (mw/cm <sup>2</sup> )	0.49	0.50	1.00	0.58	1.00
Calculated Power Density (mw/cm <sup>2</sup> )	0.01	0.01	0.05	0.01	0.0493

## Calculated Combined Power Density For Amplifier and Phone at 20.6 cm (8.1 in.)

(Determined by most limiting factors)

FCC Power Density Limit (mw/cm <sup>2</sup> )	0.47	0.50	1.00	0.55	1.00
Combined Power Density for Phone and Amp (mw/cm <sup>2</sup> )	0.47	0.47	0.24	0.47	0.43