



## **MPE/RF EXPOSURE REPORT**

**FCC CFR 47 Part 1.1310**

**Report No.: RDWN71-U2 MPE FCC Rev A**

**Company:** Radwin Ltd.

**Model:** AP0260210



## MPE/RF EXPOSURE REPORT

FROM



Evaluation of: AP0260210

To: FCC CFR 47 Part 1.1310

Report Serial No.: RDWN71-U2 MPE FCC Rev A

This report supersedes: NONE

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Issue Date: 26th August 2020

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## 1. MAXIMUM PERMISSABLE EXPOSURE

### Calculations for Maximum Permissible Exposure Levels

$$\text{Power Density} = P_d \text{ (mW/cm}^2) = \text{EIRP}/(4\pi d^2)$$

$$\text{EIRP} = P * G$$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

$$\text{Numeric Gain} = 10 ^ (G \text{ (dBi)}/10)$$

Equipment is professional installation subject to Radiation Exposure limits for Occupational/Controlled Exposure per FCC CFR 47 §1.1310(e)(1) Table 1 to Limits for Maximum Permissible Exposure (MPE). These calculations represent worst case in terms of the exposure levels. Point to Point operation exposure was assessed for lowest and highest directional antenna gains (15dBi and 31dBi).

### 1.1 Evaluation for each band.

#### Point to Multi Point Operation

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm <sup>2</sup> ) @ 20cm	Power Density Limit (mW/cm <sup>2</sup> )	Min Calculated safe distance for Limit (cm)	Calculated Power Density (mW/cm <sup>2</sup> ) @ Safe Distance
<b>Point to Multi-Point</b>								
5150.0 - 5250.0	10.00	10.00	25.98	396.28	0.788	5.00	7.94	5.00
5725.0 - 5850.0	10.00	10.00	25.97	395.37	0.787	5.00	7.73	5.00

Note1: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

#### Point to Point Operation 15dBi antenna Calculated minimum safe distance = 22 cm

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm <sup>2</sup> ) @ 22cm	Power Density Limit (mW/cm <sup>2</sup> )	Min Calculated safe distance for Limit (cm)	Calculated Power Density (mW/cm <sup>2</sup> ) @ Safe Distance
<b>Point to Point</b>								
5150.0 - 5250.0	15.00	31.62	29.39	868.96	4.518	5.00	20.91	5.00
5725.0 - 5850.0	15.00	31.62	29.79	952.80	4.954	5.00	21.90	5.00

#### Point to Point Operation 31dBi antenna Calculated minimum safe distance = 142 cm

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm <sup>2</sup> ) @ 142cm	Power Density Limit (mW/cm <sup>2</sup> )	Min Calculated safe distance for Limit (cm)	Calculated Power Density (mW/cm <sup>2</sup> ) @ Safe Distance
<b>Point to Point</b>								
5150.0 - 5250.0	31.00	1258.93	30.0	1000.0	4.968	5.00	142.0	5.00
5725.0 - 5850.0	31.00	1258.93	30.0	1000.0	4.968	5.00	142.0	5.00

## 1.2 Assessments for simultaneous operation

### Point to Multipoint

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm <sup>2</sup> ) E <sub>ref</sub>	Power Density (mW/cm <sup>2</sup> ) E <sub>i</sub>	Summation E <sub>i</sub> /E <sub>ref</sub>
5150-5250	10.0	10.00	25.98	396.28	20	5.00	0.788	0.1576
5725-5850	10.0	10.00	25.97	395.37	20	5.00	0.787	0.1574
<b>Total Evaluation:</b>								<b>0.315</b>

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

Ei: calculated E-field Strength for transmitter

Eref: E-field strength related limit

Note1: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

### Point to Point Operation 15dBi antenna Calculated minimum safe distance = 31 cm

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm <sup>2</sup> ) E <sub>ref</sub>	Power Density (mW/cm <sup>2</sup> ) @Calc Safe Distance E <sub>i</sub>	Summation E <sub>i</sub> /E <sub>ref</sub>
5150-5250	15.0	31.62	29.39	868.96	31	5.00	2.276	0.4552
5725-5850	15.0	31.62	29.79	952.80	31	5.00	2.495	0.4990
<b>Total Evaluation:</b>								<b>0.954</b>

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

Ei: calculated E-field Strength for transmitter

Eref: E-field strength related limit

### Assessment for simultaneous operation

**Point to Point Operation 31dBi antenna Calculated minimum safe distance = 201 cm**

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm <sup>2</sup> ) E <sub>ref</sub>	Power Density (mW/cm <sup>2</sup> ) @Calc Safe Distance E <sub>i</sub>	Summation E <sub>i</sub> /E <sub>ref</sub>
5150-5250	31.00	1258.93	30.0	1000.0	201	5	2.480	0.496
5725-5850	31.00	1258.93	30.0	1000.0	201	5	2.480	0.496
<b>Total Evaluation:</b>								<b>0.992</b>

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where  
 E<sub>i</sub>: calculated E-field Strength for transmitter  
 E<sub>ref</sub>: E-field strength related limit

### Specification - Maximum Permissible Exposure Limits

The Limit is defined in Table 1 of FCC §1.1310.

Equipment is professional installation subject to Radiation Exposure limits for Occupational/Controlled Exposure per FCC CFR 47 §1.1310(e)(1) Table 1 to Limits for Maximum Permissible Exposure (MPE).



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