



August 15, 2016

Compliance Testing LLC  
1724 S. Nevada Way  
Mesa, AZ 85204

RE: Maximum Permissible Exposure

**FCC ID: V5FDDL001**

**Model: DDLXXX**

**Low Power Cellular Remotes**

To Whom It May Concern:

The equipment operating in the 700MHz Full Band, 850 Band, 1900 Band, and the 2100 Band comply with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This was calculated by the following:

MPE limit according to 47CFR §1.1310

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30



The power density can be calculated from the equation below (equation #4 from OET Bulletin 65, 97-01 edition, page 19)

$$S = \frac{P \cdot G}{4 \cdot \pi \cdot R^2}$$

S Power Density (mW/cm<sup>2</sup>)

P Conducted Power (mW)

R Distance (cm)

G Numerical Antenna Gain

From this equation we can calculate the safety distance needed to fulfill the MPE limits

In the calculations we have assumed no feeder loss and the max antenna gains were calculated based on the noise figure limits

Amplifier	Freq (MHz)	Output power to antenna (dBm)	Antenna gain (max) (dBi)	G Numerical	P TX Power conducted (mW)	S Power density limit* (mW/cm <sup>2</sup> )	S Power density calculated (mW/cm <sup>2</sup> )	R Calculated safety distance (cm)
700FB	747.08	27.23	0	1.00	634	0.50	0.13	10.1
850 Band	889.88	26.5	0	1.00	536	0.59	0.11	8.5
1900 Band	1988.45	27.81	0	1.00	725	1.00	0.14	7.6
2100 Band	2162.6	26.71	0	1.00	563	1.00	0.11	6.7

\* Limit for General Population/Uncontrolled Exposure

The Uplink path in the EUT is not radiated by an antenna. It is connected directly to the Base station

Please contact me if there is any other information you may need.

Sincerely,

Amy L Sanvido

On behalf of Deltanode Solutions AB, a Bird Technologies Company

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