



November 6, 2015

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

RE: Maximum Permissible Exposure

FCC ID: V5FDDR002
Model: DDRXXX
Public Safety Fiber DAS Remotes (33dBm)

To Whom It May Concern:

The equipment operating in the 800MHz public safety band and the UHF public safety band complies 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.

The equipment operating in the 700MHz public safety band require a separation distance of at least **36.2cm**. This distance must be maintained between the user and antenna when the product is used with a 5.5dBi antenna. For point-to-point use with a 17dBi antenna, this distance must be increased to a user separation distance of **136.1cm**.

The equipment operating in the VHF public safety band require a separation distance of at least **69.1cm**. This distance must be maintained between the user and antenna when the product is used with a 10.5dBi antenna. For point-to-point use with a 17dBi antenna, this distance must be increased to a user separation distance of **146cm**.

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 ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6

(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	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/cm²)
P Conducted Power (mW)
R Distande (cm)
G Numerical Antenna Gain

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

In the calculations we have assumed no feeder loss and the max antenna gain was calculated based on the noise figure limits.

Amplifier	Freq (MHz)	Output power to antenna (dBm)	Antenna gain (max) (dBi)	G	P	S	S	R
				Antenna Gain Numerical	TX Power conducted (mW)	Power density limit* (mW/cm ²)	Power density calculated (mW/cm ²)	Calculated safety distance (cm)
VHF	150	29.5	10.5	11.22	1070	0.20	2.39	69.1
UHF	470	33.45	-3.43	0.45	2656	0.31	0.24	17.5
700PS DL	763	32.94	5.5	3.55	2361	0.51	1.67	36.2
800PS DL	851	32.38	0.53	1.13	2076	0.57	0.47	18.1

* 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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