

FCC EM Field exposure calculation calculation

RF Exposure – USA

The 308-0007-1 remote unit is installed in a fixed location and designed to be used > 20cm from the body.

The device is designed to be used with a variety of antennas and EMF calculations have been done using 8dBi antenna which is higher gain than any of the recommended options so represents worst case for all of them.

Demonstration of compliance

- As the product is installed in a fixed location, the power density can be calculated at 20cm and compared to the permitted exposure limits
- The product operates over a wide frequency range with one transmit port:
 - Worst case for 300-1500 MHz region is operation at 617.0 MHz with a transmit power of 21 dBm per port.
 - Worst case for >1500 MHz region is operation at 3550.0 MHz with a transmit power of 24 dBm per port.

Using the equation $S = \frac{PG}{4\pi R^2}$, the exposure level at 20 cm can be calculated and compared against the limit

P: power input to antenna in W

G: numeric gain of antenna relative to isotropic radiator

S: power density limit in W/m²

R: distance for evaluation in m, which is 0.2

Freq band	Freq (MHz)	Total rated antenna port power (2 ports) (dBm)	EIRP (W)	S (W/m ²)	FCC limit (W/m ²)
300 - 1500 MHz	617.0	21.0	0.79	1.58	4.11 ¹
> 1500 MHz	3550.0	24.0	1.58	3.15	10.0

Table 1: Calculated Exposure levels at 20 cm

¹ Limit is Frequency/150