Exposure Evaluation

RU37™ VHF-UHF-800 PS
Tri-Band Medium Power Remote Unit

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RF Exposure Evaluation

According to FCC Part 1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. More information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation".

The maximum power density limit allowed for uncontrolled exposures for an average time of 30 minutes is frequency and output power dependent. Although the equipment under test is capable of producing a composite output power of up to 38dBm, the overall ERP can't exceed 37dBm. Cable distribution loss and antenna gain needs to be taken into account as part of the design and installation in order not to exceed the maximum 37dBm ERP limit. The table below illustrates the different operating scenarios with maximum allowed output power of 37dBm at the antenna representing worst case scenarios from a RF Exposure point of view.

Freq Band (MHz)	Conducted Output Power (dBm)	Min. Cable Loss (dB)	Max Antenna Gain (dBi)	Max EIRP (mW)	Power Density Limit Allowed (mW/cm²)	Safe Distance (cm)
150	38	8	7	5012	0.200	45
450	38	8	7	5012	0.267	39
800	38	8	7	5012	0.574	27

RF Exposure Evaluation Distance Calculation

$$d = \sqrt{(EIRP/4\pi S)}$$

Where:

d = Distance to the center of radiation of the antenna (cm) for the allowable Power Density

S = Allowable Power Density Limit (mW/cm^2)

EIRP = Equivalent isotopically radiated power (mW) = $10^{[TX\,Power\,(dBm)\,+\,Ant\,Gain\,(dBi)/10]}$

If the antenna will be positioned closer to end users than the required safe distance, then the installer must calculate the power back off required for a given installation using the formulas provided.