

RF Exposure – Justification for Exemption from Routine Evaluation

The minimum separation distance, R (m), to qualify for exemption from routine evaluation for rf exposure as detailed in 1.1307 Table 1 (version of April 2021) must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.

TABLE 1 TO §1.1307(b)(3)(i)(C)

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$
1.34-30	$3,450 R^2/f$
30-300	$3.83 R^2$
300-1,500	$0.0128 R^2 f$
1,500-100,000	$19.2 R^2$

Using the formulas from table 1 the power thresholds at the separation distances specified for the different operating frequencies for this series of devices are:

Calculations to determine ERP thresholds above which routine evaluation for RF exposure would be required.							
Refer to 1.1307 Table 1 for formula.							
f (MHz)	$\lambda/2\pi$ (m)	R = Separation Distance * ¹ (m)	ERP Power threshold (W) at distance R (m)	Output Power (dBm) * ²	Antenna Gain (dBi) * ³	ERP (W) * ³	% of Threshold
13.45	3.55	3.55	240	44	2.15	25.12	10%
16.10	2.97		168	44	2.15	25.12	15%
* ¹ The minimum separation distance to qualify for exemption from routine evaluation for rf exposure as detailed in 1.1307 Table 1 must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.							
* ² The nominal output power for this system is 40W peak with a production tolerance of +1dB. Therefore the maximum peak power is 47dBm. The maximum production average power, based on a maximum duty cycle of 50% as detailed in the operational description exhibit, is 44dBm (25W).							
* ³ Dipole antennas (gain = 2.15 dBi) are used for the frequency bands above 13 MHz and a monopole antenna is used below 13 MHz. The maximum gain for a monopole antenna (i.e. when used above a perfect ground plane) is 5dBi. ERP (dBm) = EIRP(dBm) - 2.15 dB EIRP (dBm) = P(dBm) + Gain (dBi)							

The erp for all bands is below the threshold that would require routine evaluation and therefore the system is exempt from routine evaluation when installed with the minimum separation distances detailed in the installation instructions.