The limits for Maximum Permissible Exposure (MPE) at different frequencies are set forth in C.F.R. 47 section 1.1307(b) and 1.1310(e). The limit for General Population / Uncontrolled Exposures for our frequency of 2.4GHz is set to be 1 mW/cm^2. The limit is compared to our device by measuring the Output Power for our frequency and calculating the Power Density according to the following formula:

Power Density = (Power Out*Antenna Gain) / $(4*\pi*r^2)$

The product under test is the Mini Rad-DX which is produced by VPI Engineering for D-tect Systems.

The Mini Rad-DX uses one antenna for the 802.15.4 transmitter. The gain of the antenna is 2.5dBi, which converts to a numeric gain of 1.78. The antenna will be placed a minimum of 10 mm away from a user and the device is assumed to be used under extremity exposure conditions.

These measurements and calculations for the Mini Rad-DX 802.15.4 transmitter are listed in the table below:

Channel	Frequency MHz	802.15.4 Measured Output Power (mW)	Power Density at r=1cm (mW/cm^2)
11	2405	48.21	6.822228352
18	2440	39.73	5.622218055
25	2475	28.25	3.997675813

The device is qualified for an exemption under the Extremity Exposure Conditions as stated in section 4.2.3 in KDB 447498. In compliance with section 4.3.1 (1) the following 10-g SAR exclusion threshold is calculated – [max power of channel, mW/min test separation distance, mm]/[Square Root (Frequency)]. The calculated values are listed below and must be less than 7.5.

Channel	Frequency MHz	802.15.4 Measured Output Power (mW)	SAR test Exclusion Threshold (must be < 7.5)
11	2405	48.21	7.476436892
18	2440	39.73	6.206024392
25	2475	28.25	4.444327494