Maximum Permissible Exposure

FCC Part 2 Sections §2.1091 and §2.1093

Test Requirement(s): **§15.407(f):** U-NII devices are subject to the radio frequency radiation exposure requirements specified in §1.1307(b), §2.1091 and §2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment.

RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

MPE Limit: EUT's operating frequencies @ BLE 2402 – 2480 MHz; UNII-1 5180 – 5240 MHz; UNII-2a 5260 – 5320 MHZ; UNII-2c 5500 – 5720 MHz; UNII-3 5745 – 5855 MHz; **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{(PG / 4\pi S)}$$

where, S = Power Density (mW/cm^2)
P = Power Input to antenna (mW)
G = Antenna Gain (numeric value)
R = Distance (cm)

Test Results: Omni Antenna

FCC									
Frequency (MHz)	**Con. Pwr. (dBm)**	**Con. Pwr. (mW)**	**Ant. Gain (dBi)**	**Ant. Gain numeric**	**Pwr. Density (mW/cm^2)**	**Limit (mW/cm^2)**	**Margin**	**Distance (cm)**	**Result**
2480*	6.58	4.5	-1	0.79	0.00	1.0	-1.0	80	Pass
5240	20.69	117.22	10	10	0.03	1.0	-0.97	80	Pass
5280	19.83	96.16	10	10	0.01	1.0	-0.99	80	Pass
5510	19.79	95.78	10	10	0.01	1.0	-0.99	80	Pass
5745*	25.94	392.64	10	10	0.05	1.0	-0.95	80	Pass
*Simultaneous Transmission (Worse case):					0.05	1.0	-0.95	80	Pass

Test Results: Dish Antenna

FCC									
Frequency (MHz)	**Con. Pwr. (dBm)**	**Con. Pwr. (mW)**	**Ant. Gain (dBi)**	**Ant. Gain numeric**	**Pwr. Density (mW/cm^2)**	**Limit (mW/cm^2)**	**Margin**	**Distance (cm)**	**Result**
2480*	6.58	4.5	-1	0.79	0.000	1.0	-1.0	190	Pass
5240*	17.44	55.46	30	1000	0.122	1.0	-0.878	190	Pass
5250	-0.02	1.0	30	1000	0.002	1.0	-0.998	190	Pass
5510	-0.03	1.0	30	1000	0.002	1.0	-0.998	190	Pass
5745	25.86	385.48	30	1000	0.850	1.0	-0.150	190	Pass
*Simultaneous Transmission (Worse case):					0.850	1.0	-0.150	190	Pass

The safe distance for SWX-WAVEML where Power Density is less than the MPE Limit listed above was found to be 80 cm with the omni antenna and 190 cm with the Dish. This device does not perform power tune-ups, therefore the maximum power is used for this analysis. All chains were measured and summed under the guidance of KDB 789033 Section II. E.2. and KDB 662911 D01.