



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 – 5825 MHz; UNII-5 5955 - 6415 MHz; UNII-7 6525 - 6885 MHz;

Limit for Uncontrolled exposure: 1 mW/cm² or 10 W/m²

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/cm²)

P = Power Input to antenna (mW)

G = Antenna Gain (numeric value)

R = Distance (cm)

Test Results:

19.5 dBi Horn 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
2442*	7.65	5.82	-1	0.79	0.00	1.0	-1.0	40	Pass
5180	19.66	92.47	19.5	89.13	0.41	1.0	-0.59	40	Pass
5250	10.03	10.07	19.5	89.13	0.05	1.0	-0.95	40	Pass
5610	10.17	10.40	19.5	89.13	0.05	1.0	-0.95	40	Pass
5745*	21.97	157.40	19.5	89.13	0.70	1.0	-0.30	40	Pass
6205	16.40	43.65	19.5	89.13	0.19	1.0	-0.81	40	Pass
6545*	16.48	44.46	19.5	89.13	0.20	1.0	-0.80	40	Pass
*Simultaneous Transmission (Worse case):					0.90	1.0	-0.10	40	Pass

30 dBi 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
2442*	7.65	5.82	-1	0.79	0.00	1.0	-1.0	145	Pass
5240	13.03	20.09	30	1000.00	0.08	1.0	-0.92	145	Pass
5280	-0.70	0.85	30	1000.00	0.00	1.0	-1.0	145	Pass
5690	-0.44	0.90	30	1000.00	0.00	1.0	-1.0	145	Pass
5755*	23.32	214.78	30	1000.00	0.81	1.0	-0.19	145	Pass
6385	5.79	3.79	30	1000.00	0.01	1.0	-0.99	145	Pass
6705*	5.96	3.94	30	1000.00	0.02	1.0	-0.98	145	Pass
*Simultaneous Transmission (Worse case):					0.83	1.0	-0.17	145	Pass

NOTE: This device is professional installed and the output power is set by the professional installer based on the antenna type and gain.

The safe distance for SWX-WAVEML6 where Power Density is less than the MPE Limit listed above was found to be 40 cm for the Horn Antenna and 145 cm for the Dish Antenna. 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.