



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(b) Output Power and RF Exposure

**Test Requirements:** **§15.247(b):** The maximum peak output power of the intentional radiator shall not exceed the following:

Frequency Hopping Systems Band (MHz)	Output Limit for systems with 25 to <50 Channels (Watts)	Output Limit for systems with $\geq$ 50 Channels (Watts)
902-928	0.250	1.000
2400-2483.5	0.125	1.000
5725- 5850	1.000	1.000

**Table 9. Output Power Requirements from §15.247**

Except for: Systems operating in the 2400- 2483.5 MHz band, and

5725- 5850 MHz band that are used exclusively for fixed, point-to-point operations,

if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in the Table 9, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400- 2483.5 MHz band may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725- 5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Fixed, point-to-point operation excludes the use of point-to-multipoint systems, omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.



**Test Requirements (cont.):**

**RF Exposure Requirements - §15.247(b)(5); §1.1307(b)(1):** 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.

MPE Limit Calculation: EUT's operating frequencies @ 902 - 928 MHz; EIRP = 30.25 dBm  
therefore, **Limit for Uncontrolled exposure: 1 mW/cm<sup>2</sup> or 10 W/m<sup>2</sup>**

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

$$S = PG / 4\pi R^2 \quad \text{where, } S = \text{Power Density}$$

P = Power Input to antenna (0.595 Watts)

G = Antenna Gain (2.5 dBi) – numeric gain (1.77)

R = distance to the center of radiation of the antenna (20 cm or 0.2 m)

$$S = 0.595W * 1.77 / 4 * 3.14 * (0.2m)^2 = 1.054W / 0.5024m^2 = 2.099W/m^2$$

**Test Procedure:** The EUT was connected to the spectrum analyzer. The output power was measured and recorded.

**Test Results:** Equipment complies with the Output Power and RF Exposure limits of § 15.247 (b).

The peak output power was determined from the plots on the following page(s).

Modulation	Channel (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP(mW)
FSK	902.4	27.75	2.5	30.25	1059
FSK	915.2	27.68	2.5	30.18	1042
FSK	927.6	27.43	2.5	29.93	984

**Test Engineer:** Shawn McMillen

**Test Date(s):** November 14 – 17<sup>th</sup>, 2005