

## Antenna Information

Type	Gain	Manufacturer	Model #	Connector Type
Microstrip	3 dBi	Armstrong	i-Ceilings™ Antenna Panel	Reverse Polarity SMA

### **Compliance with 47 CFR 15.203**

*“An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. ....” (Excerpt taken from 47 CFR 15.203)*

The antenna complies with the requirements of 15.203. It utilizes a reverse polarity SMA connector to attach it to the output of the transmitter. This satisfies the requirement for a “unique coupling”.

### **Compliance with 47 CFR 15.247(b)(3) - De Facto EIRP Limit of + 36 dBm**

*“Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, 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 paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.” (Excerpt taken from 47 CFR 15. 247(b)(3))*

The antenna and EUT combination comply with the de facto EIRP limit of +36 dBm described in 15.247(b)(3). The output of the transmitter is +19.2 dBm. The antenna gain is +3 dBi. The EIRP is 22.2 dB.

## **Compliance with 47 CFR 15.247(b)(4)**

*“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. See Sec. 1.1307(b)(1) of this chapter.” (Excerpt taken from 47 CFR 15.247(b)(4))*

Per 47 CFR 15.247 (b)(4), the EUT meets the requirement that it be operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines (ref . 47 CFR 1.1307, 1.1310, 2.1091, and 2.1093. Also OET Bulletin 65, Supplement C).

The EUT will be used only in the applicant's patient monitors and can therefore be considered a mobile transmitter per 47 CFR 2.1091. The EUT supports the connection of only one antenna at a time.

The MPE estimates are as follows:

Table 1 in 47 CFR 1.1310 defines the maximum permissible exposure (MPE) for the general population as  $1\text{mW}/\text{cm}^2$ . The exposure level at a 20 cm distance from the EUT's transmitting antenna is calculated using the general equation:

$$S = (PG)/4\pi R^2$$

Where:

- S = power density
- P = power input to the antenna (83 mW)
- G = linear power gain relative to an isotropic radiator (3dBi = numeric gain of 2)
- R = distance to the center of the radiation of the antenna (20 cm = limit for MPE estimates)

Solving for S, the maximum power density 20 cm from the transmitting antenna is  $0.033\text{ mW}/\text{cm}^2$