6a.6 Effective Radiated Power (ERP)

As described in Exhibit 7.1, the radiated power received at a spectrum analyzer was measured from the radio product specimen with integral antenna at 2 degrees increments as the specimen was rotated. These recorded power readings are uncalibrated ERP measurements. To convert these readings to ERP values a reference reading was obtained from a calibrated (to an ideal dipole) antenna to which was applied the same power level as the measured output power of the radio specimen. The reading at the spectrum analyzer from this calibrated reference antenna served to calibrate the spectrum analyzer readings for ERP measurements. By comparing the readings between the reference antenna and the radio product specimen and with a measurement of the output power of the radio product specimen, this measurement also serves to determine the radio specimen antenna gain.

The following calculations show how the reported scaled max ERP was determined.

For 901 – 902 MHz band operation,

$$Measured\ MaxERP, dBm = 10*\log(measured\ output\ power, mW) + measured\ antenna\ gain, dBd$$

The resulting max ERP was converted to mW:

$$MeasuredMaxERP, mW = 10^{\left(\frac{Measured\ MaxERP, dBm}{10}\right)}$$

Since the measured ERP was not determined at the production maximum output power, a simple scaling is performed to 640 mW:

$$Scaled\ MaxERP, mW = Measured\ MaxERP, mW * \left(\frac{700mW}{measured\ output\ power, mW}\right)$$
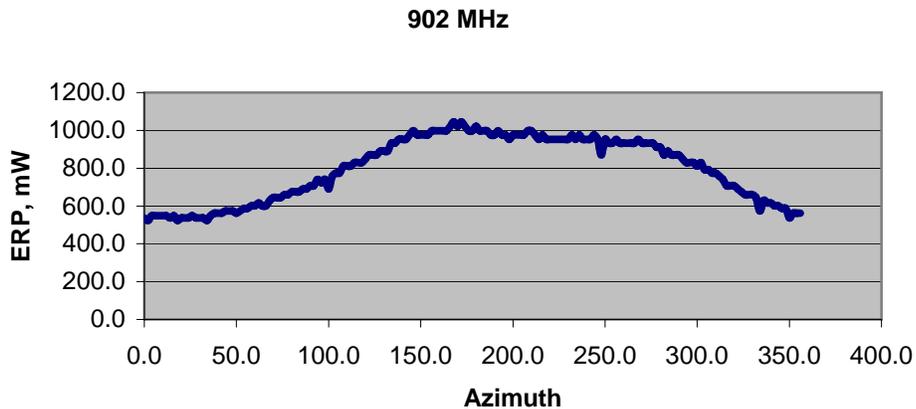
$$= 1,011.7\ mW$$

902 MHz

Figure 6-.6-1. ISM Band: Scaled Maximum ERP vs. Azimuth Angle