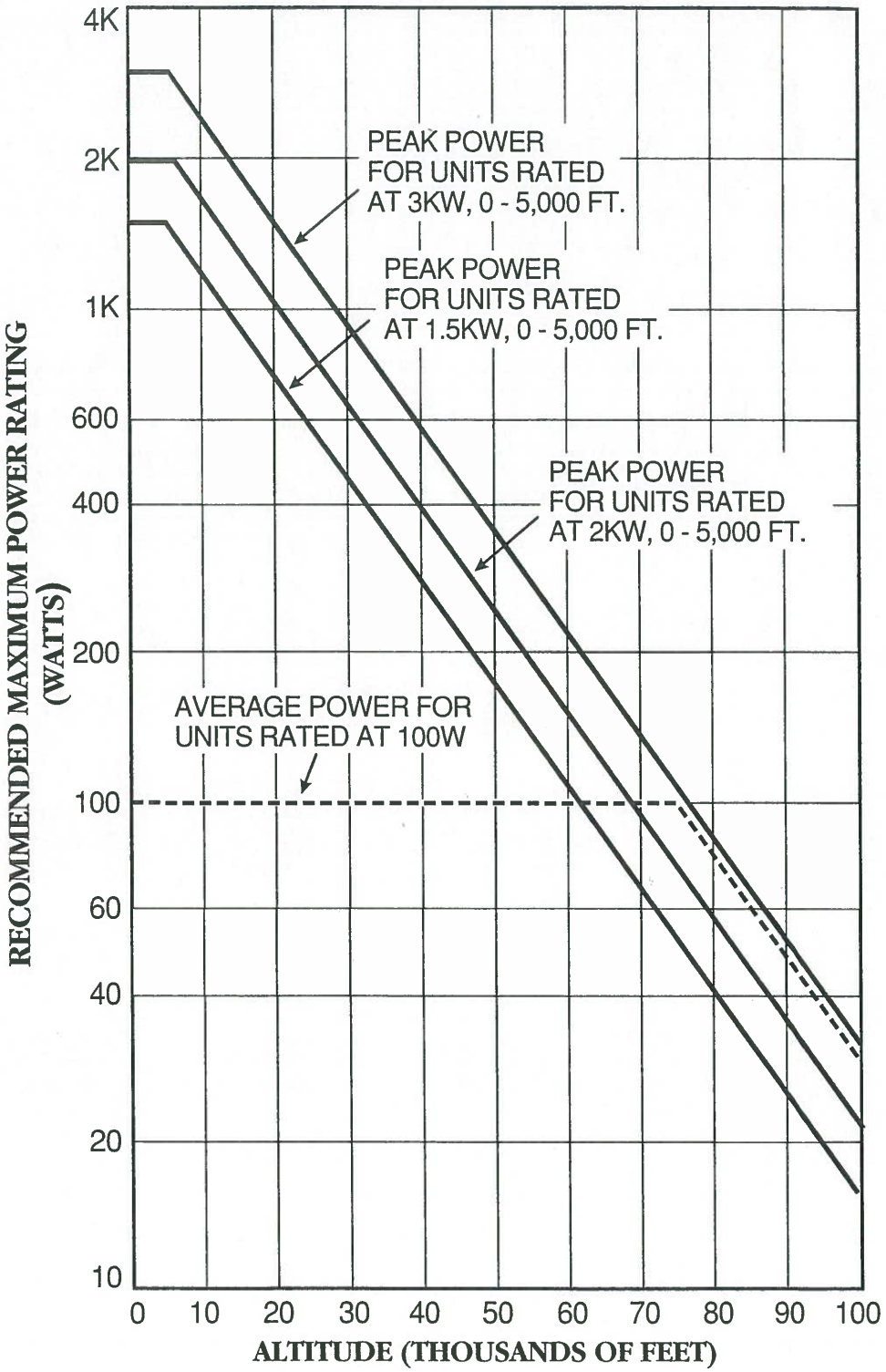
POWER DERATING CURVES



sage
PHONE: (508) 653-0844 FAX: 508+653+5671

Average incident power & peak power

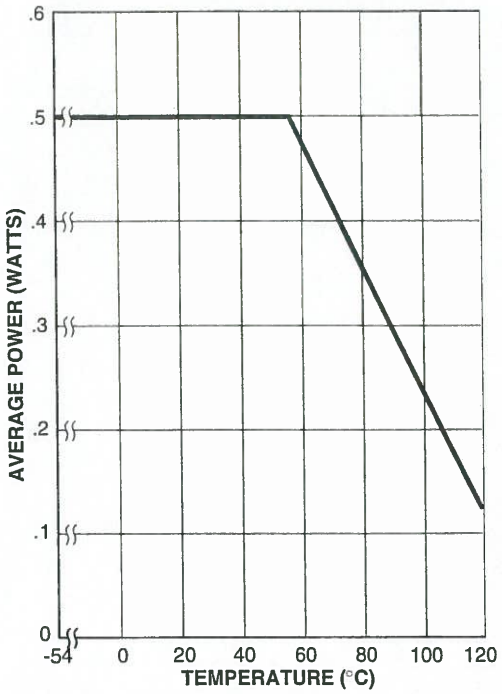
This graph illustrates the maximum recommended average incident and peak power for our hybrid, in-line, and broadband couplers.

The maximum recommended peak power is based on RF voltage breakdown, and is a function of altitude. As air pressure decreases, ionized molecules are accelerated by RF fields through a longer distance before striking another molecule. When the distance is large enough, the ionized accelerated molecule can have sufficient kinetic energy to ionize another molecule when they collide. This process can continue and produce an RF short across the transmission line. The acceleration depends on the electric field strength. The electric field strength for a given RF power is inversely proportional to the transmission line cross section. The smallest gaps, hence the most susceptible to breakdown, are the SMA connector interfaces and the SMA-to-stripline junction. This graph shows the maximum recommended peak power at altitudes from sea level to 100,000 feet. At much higher altitudes there are insufficient molecules to support an ionized gas path. At those orbital altitudes, breakdown is caused by multipactor which is sensitive to power, frequency, transmission line dimensions. and surface finishes. It is no longer dependent on altitude.

The maximum recommended average power is based on the coupling value, directivity, maximum power dissipation of the RF termination, and operating frequency. The average incident power is derated with frequency (see page X) and in some cases at high altitudes is limited by RF breakdown rather than RF power dissipation. This graph illustrates an example of 100 watts average power where the average power curve intersects and follows the peak power curve.

The maximum recommended power ratings shown, presume that all ports are terminated in 50 ohms, and that the couplers are mounted on metal plates or other heat sinks which are at ambient temperature.

POWER DERATING CURVES

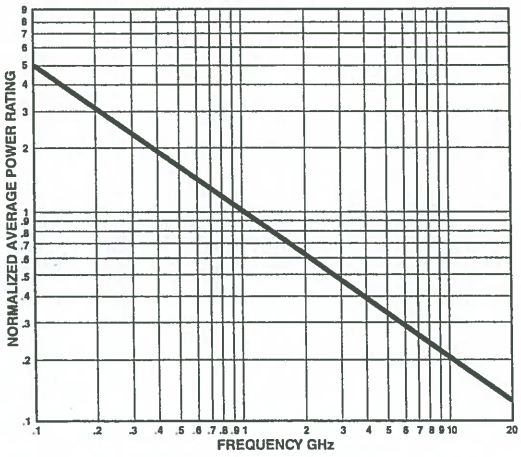


Maximum reflected power

This curve illustrates the maximum recommended reflected average power for our in-line broadband couplers. The values shown are for the terminations used in our couplers. To determine the power rating for a specific coupler, multiply the reading on the graph by $\log_{10}\left(\frac{dB}{10}\right)$, where dB is the coupling value of the coupler.

The maximum reflected power is based on the assumption that a signal is fed or reflected into the main line output port, and hence power is coupled into the RF termination. The maximum rating is a function of temperature and cooling.

If you drive the coupled output port with an RF source, use the graph without correction.



Power derating versus frequency

When the power handling capability of a component is given for a specific frequency, use this graph to determine the power handling capability at other frequencies.

sage
PHONE: (508) 653-0844 FAX: 508+653+5671