

Frequently Ask Questions about Coaxial Terminations....

What are the advantages of Aeroflex / Weinschel's terminations?

Most Aeroflex / Weinschel coaxial terminations feature a combination of advantages over other designs:

1. Most Aeroflex / Weinschel terminations feature injection molded dielectric for better center pin captivation and alignment. Injection molded dielectric also eliminates the need for the epoxy hole "stake" as seen in other designs. This epoxy hole in other designs is subject to RF leakage and movement when exposed to environmental extremes and prolonged use.
2. Aeroflex / Weinschel coaxial terminations have a proprietary resistor element fired at high temperatures (950°) for superior long term stability over temperature, power and time.
3. Aeroflex / Weinschel coaxial terminations have no solder contacts. They feature spring loaded plunger contacts to the resistor cards that provide expansion tolerant operation over wide temperature and power ranges.
4. Aeroflex / Weinschel terminations are made with high quality materials and machined to very close tolerances, the result is a design that stands up to severe environments and usage.
5. High power designs feature special high temperature support beads.

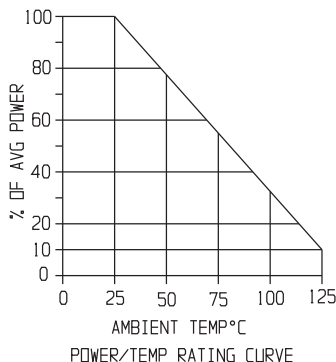
Can Aeroflex / Weinschel provide special terminations?

Yes. Aeroflex / Weinschel has produced many custom fixed attenuators and terminations. Specialized designs continue to be a significant part of Aeroflex / Weinschel's product offering. Special features may include:

1. Custom Connector Configurations
2. Matched Pairs or Sets
3. Lower VSWR
4. Conductive Cooled
5. Special Mounting & Environmental Conditions

How is the power rating calculated?

A termination will handle specified power at ambient temperatures as specified in the catalog. No special fan cooling is required. At higher temperatures the power rating

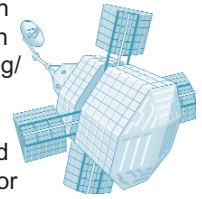


is calculated by using catalog specifications and a straight line graph. For instance the power rating of the Model 1430 attenuator is 100 watts at 25°C ambient and 10 watts at 125°C. Using linear graph paper, plot a straight line between these two points. This plot shows that the power rating at 75°C is approximately 56 Watts.

Can Aeroflex / Weinschel provide terminations for space applications?

Yes. Aeroflex / Weinschel terminations are being used on most major U.S. military and commercial communication satellites. Aeroflex / Weinschel Terminations can be screened to your specifications and testing requirements.

Aeroflex / Weinschel's use of precision connectors, injection molded captivation of connector contacts, internal pring/plunger contacts (no solder or contact fingers) and very precise and stable resistors result in a superior electrical and mechanical design that is ideally suited for space applications. Page 17 provides a list of Aeroflex / Weinschel's program experience and available testing programs for space qualified components.



Does Aeroflex / Weinschel offer High Reliability Models?

Most Aeroflex / Weinschel Corporation Terminations & Loads can be supplied according to customer specified testing, environmental or military or government specification requirements.

What is Third-Order Intermodulation Distortion?

(IM3) Intermodulation distortion (IM) consists of the spurious signals which result from the mixing of nth order frequencies in the non-linear elements of a component. Third order intermodulation distortion is of particular interest because third order products typically represent the highest level distortion appearing close to the desired signal, and as such the highest level non-filterable distortion. Third order IM level (IM3) is tested by injecting two pure tones of equal magnitude (f1 and f2) into the component to be tested. The third order IM products will appear in the output spectrum at the frequencies 2f1-f2 and 2f2-f1. These products are characterized by defining their level (in dBc) relative to the fundamental output tones at either f1 or f2.

Does Aeroflex / Weinschel offer any of terminations with IM3 specified?

Yes, Aeroflex / Weinschel has recently introduced new as well as updated models specifically for applications requiring low intermodulation distortion. These models are available in 25, 50, 150 Watt varieties. Aeroflex / Weinschel can also modify or specify IM3 on several of its standard standard models such as 1418, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1435, 1439, & 1442. Refer to the specific data sheet for IM3 details.

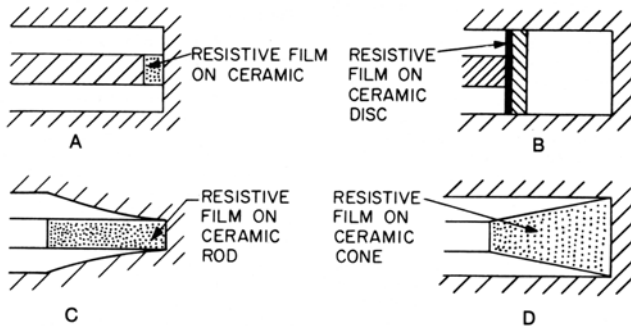
Terminations & Loads



How do I select a termination for my application?

Termination applications exist in almost every phase of microwave technology from design and measurement to systems. Good terminations are an indispensable aid in making bench measurements on microwave components in the engineering laboratory, as those ports of a multiport microwave device which are not involved in the measurement should be terminated in their characteristic impedance in order to ensure an accurate measurement. Many microwave systems employ directional couplers which require terminations on at least one port, and most have various modes of operation or test where terminations are needed on certain terminals.

A matched termination of a generalized transmission line is ideally represented by an infinite length of that line having small, but non-zero loss per unit length so that all incident energy is absorbed and none is reflected. Although this type of matched load (termination) was actually used extensively during the early exploration of high frequencies where the wavelength was short enough for the method to be employed, more efficient and practical types of termination have been developed.



There are several ways in which a matched termination for a 50-ohm coaxial line may be realized. Some of these are shown below. Illustration A of the Figure shows a cross-section of coaxial line terminated in a lumped 50-ohm series resistor which is a short length of resistive film on a cylindrical ceramic substrate. Illustration B is similar to A except that the 50-ohm resistor is a film on a ceramic disc and appears in shunt with the open of the coaxial line.

More effective matched loads for very high frequencies are shown in illustration C and D.

The outer conductor in the design of illustration C is tapered in either an exponential or a tractrix curve from the region near the start of the resistive film on the inner conductor to the end of the resistor. The design of illustration to these parameters, it is usually necessary to specify the shaped ceramic body extending from the inner conductor. The advantage of this design is that it dissipates more power. Aeroflex / Weinschel matched termination designs are similar to those shown in C.

A well-matched attenuator of at least 20 dB loss can also be utilized as a termination. This is particularly useful in high power applications. For example our new Model 1456 1,000 Watt termination is supplied with a second connector for power monitoring

