RF Power introduced its first product in 1987 and has since designed, manufactured and supported the most reliable line of high-power resistive components in the industry. Employing state-of-the-art equipment, manufacturing and quality assurance practices, our line of resistors, terminations and attenuators continue to be among the most cost effective, innovative and reputable solutions in the industry. In addition, RF Power's commitment to customer service excellence has resulted in our receiving several quality awards from major customers.

Traditionally, high-power resistive components have been constructed using a Beryllium Oxide (BeO) ceramic substrate. In recent years several governments and agencies have enacted prohibitions against the use of Beryllium Oxide. In response to these industry developments, RF Power undertook a research and development mission to develop an effective alternative to BeO, using an Aluminum Nitride (AIN) ceramic in its place. AIN has thermal and electrical properties comparable to BeO, but none of the environmental issues associated with it. The most recent addition to our product offering is a new line of RF Power Alumina (Al_2O_3) terminations. Alumina has electrical properties comparable to both BeO and AIN, but with a reduced power handling capability. This line is intended as a low-cost alternative to both BeO and AIN for less demanding applications.

RF Power high-power resistive products are widely used in the wireless industry, as well as in medical, industrial, military and aerospace applications. Our resistive products cover a wide range of communications bands, such as NMT-450, NMT-900, AMPS, ETACS, IS-95, GSM, DCS, PCS, W-CDMA, 3G, Wireless LAN, WCS, ISM and satellite communication bands. Typical applications for our products would be in splitter and combiner networks for power amplifiers, signal sensing in feed-forward amplifiers, isolator and circulator construction, delay line and cavity filter assemblies, and high power RF generators.

RF Power high-power resistive components are available in a wide variety of mechanical configurations including surface mount, chip, flanged, flangeless, coaxial and cable load.

Introduction

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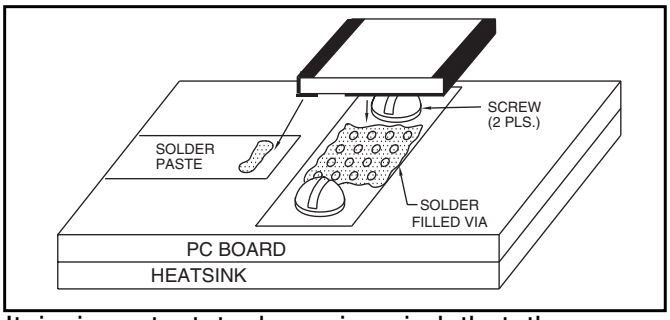
INSTALLATION DETAILS-

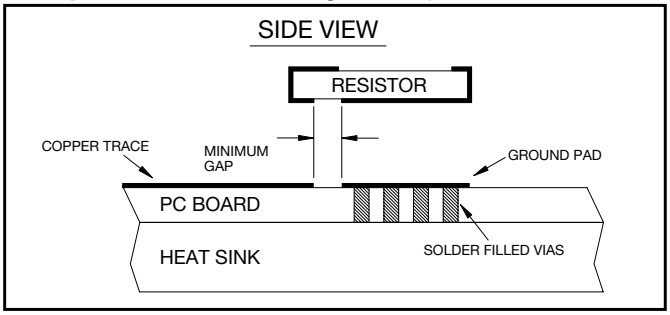
Surface Mount-

When mounting surface mount resistors, it is important to ensure that the best possible thermal path exists between the resistor and the heat sink. This should be done using solder filled vias to connect the ground pad on the resistor with the heat sink. To further improve the thermal connection, two screws should be mounted on either side of the resistor, pressing the PC board tightly against the heat sink.



It is important to keep in mind that the power handling specified for the given resistor assumes that the recommended mounting procedure is followed.

Footprint: When making a footprint for a surface

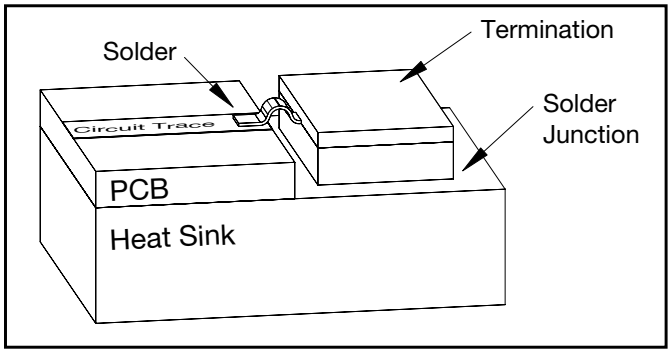


mount resistor, it is important to leave a gap between the input trace and the ground pad that is no less than the gap present on the resistor. All other footprint dimensions can be sized as desired. It is recommended to make traces 10-20 mils larger than the solder terminals on the resistors (to allow for a solder fillet).

Chip and Flangless-

Chip and flangeless resistors should be mounted directly on a flat heat sink surface (0.001" under the device) to achieve the best possible thermal connection to the heat sink. Mount the resistor using a solder with a melting point higher than the one used when attaching the lead.

When mounting the lead, make sure that a stress relief is present either in the form of a small loop or a large S-style bend.



If no stress relief is present repeated thermal cycling will cause metal fatigue in the lead and cause it to break or detach.

Epoxy-

Conductive epoxies such as silver epoxy can also be used to mount the resistor, but be aware that the silver epoxy has a much lower thermal conductivity than solder. The thickness of the silver epoxy used to mount the resistor should be kept to a minimum to avoid introducing a thermally insolating layer between the resistor and heat sink. Be aware that if the resistor is used in a sealed package, outgassing from the epoxy may contaminate other parts.

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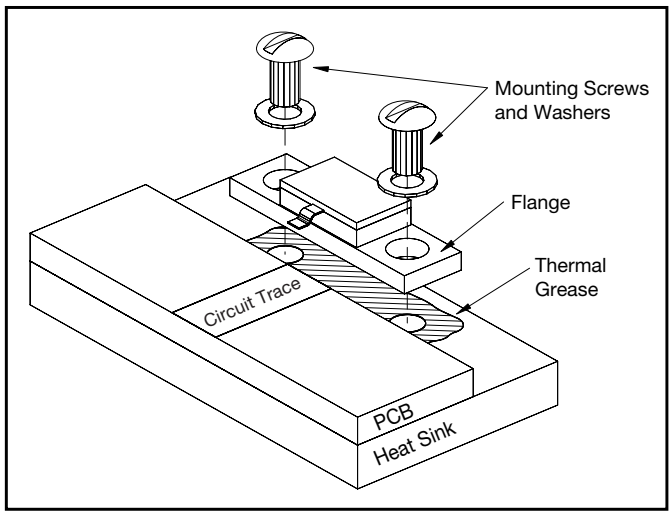
Flanged-

Flange mounted resistors should be bolted down on a flat surface (0.001" under the device) on the heat sink. The heat sink should be drilled and tapped for the appropriate screw and thread size. To further improve the heat transfer, apply a thin layer (max. 0.001") of high quality thermal grease under the device. Mount the resistor with flat and split washers, and torque screws to appropriate



value.

When mounting the lead, make sure that a stress relief is present either in the form of a small loop or a large S-style bend. If no stress relief is present repeated thermal cycling will cause metal fatigue in the lead and make it break or detach.

Introduction

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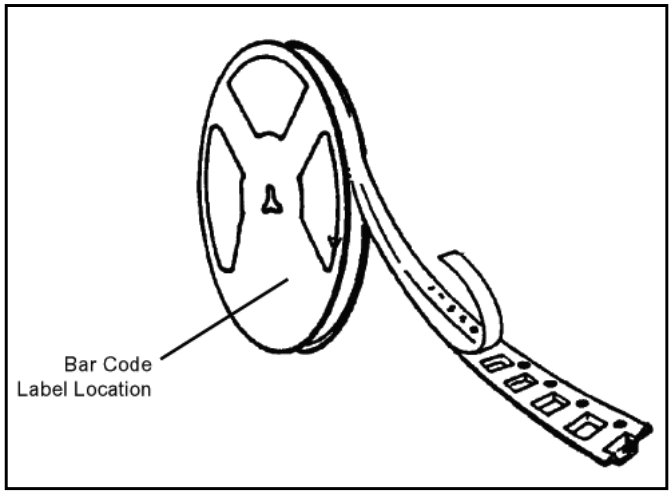
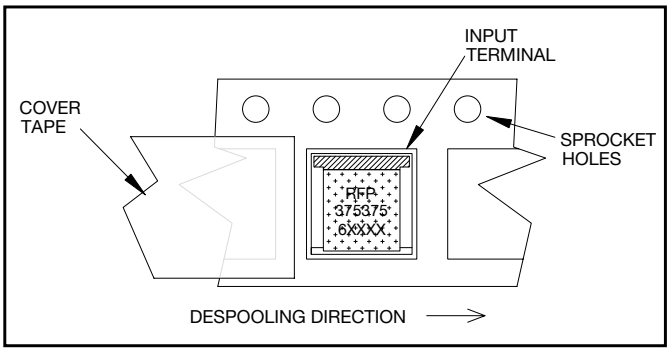
Tape and Reel-

All RF Power surface mount and chip resistors are available on tape and reel. The parts are packaged with the marking facing up, and oriented to have the input terminal towards the sprocket holes.



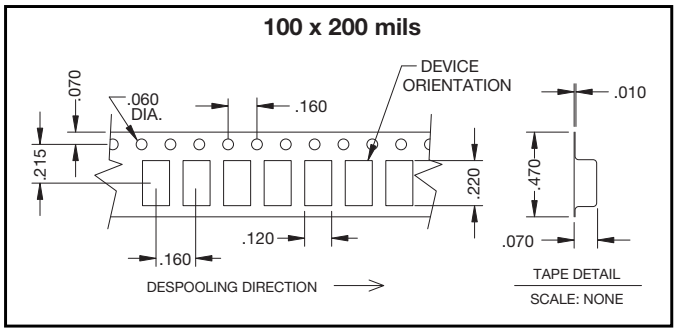
The tape and reel follow the EIA-481-2 Standards with the label mounted on the side.

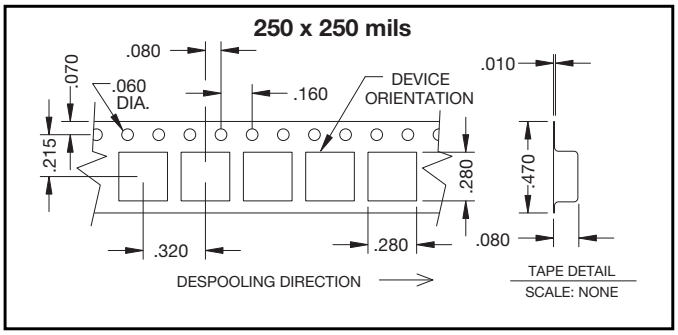


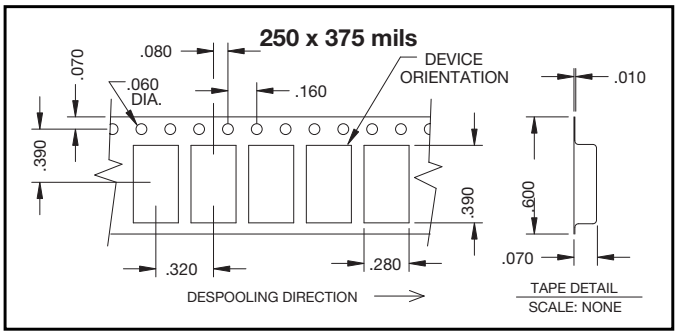
Storage of Components-

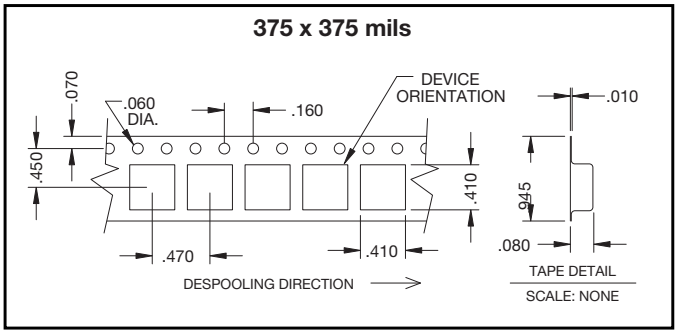
Some of the components have a tin/lead surface finish. Commonly used storage procedures used to control oxidation should be followed for these surface mount components.

Tape and Reel Dimensions-









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Flangeless Resistors

Part Number	Power (Watts)	Frequency	Capacitance	Page
RFP-30-100R	30	DC-6.0 GHz	0.75 pF	4.3.5
RFP-40-100RPP	40	DC-4.0 GHz	1.20 pF	4.3.7
RFP-125-100RF	125	DC-3.0 GHz	3.00 pF	4.3.9
RFP-150-100RCGN	150	DC-2.0 GHz	3.50 pF	4.3.11
RFP-200-100RK	200	DC-2.0 GHz	3.20 pF	4.3.13
RFP-300-100RN	300	DC-2.0 GHz	3.10 pF	4.3.15

Flanged Resistors

Part Number	Power (Watts)	Frequency	Capacitance	Page
RFP-10-100RV	10	DC-6.0 GHz	0.75 pF	4.3.17
RFP-10-100RVV	10	DC-6.0 GHz	0.75 pF	4.3.19
RFP-20-50RP	20	DC-4.0 GHz	1.20 pF	4.3.21
RFP-20-100RP	20	DC-4.0 GHz	1.20 pF	4.3.23
RFP-40-50RE	40	DC-3.0 GHz	1.40 pF	4.3.25
RFP-40-100RE	40	DC-3.0 GHz	1.40 pF	4.3.27
RFP-40-100RH	40	DC-3.0 GHz	1.40 pF	4.3.29
RFP-50-100RCG	50	DC-2.0 GHz	3.50 pF	4.3.31
RFP-100-100RE	100	DC-2.0 GHz	2.90 pF	4.3.33
RFP-100-100RH	100	DC-2.0 GHz	1.40 pF	4.3.35
RFP-100-100RW	100	DC-3.0 GHz	1.50 pF	4.3.37
RFP-150-100RCGF	150	DC-2.0 GHz	3.50 pF	4.3.39
RFP-150-100RJ	150	DC-2.0 GHz	3.20 pF	4.3.41
RFP-150-100RL	150	DC-2.0 GHz	2.90 pF	4.3.43
RFP-250-50RM	250	DC-2.0 GHz	3.30 pF	4.3.45
RFP-250-100RM	250	DC-2.0 GHz	3.30 pF	4.3.47
RFP-250-200RM	250	DC-2.0 GHz	3.30 pF	4.3.49
RFP-400-100R	400	DC-400 MHz	5.00 pF	4.3.51
RFP-800-100R	800	DC-250 MHz	14.00 pF	4.3.53

Resistors

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INTRODUCTION-
RF Power resistors are made as a thick film resistor on a ceramic substrate. This allows for maximum flexibility when it comes to power handling and performance.

RESISTOR VALUE-
The standard resistor value is 100Ω, but a wide range of values is available upon request. Standard resistor value tolerance is 5%, but other tolerance values are available upon request.

CAPACITANCE-
All resistors have been designed for low capacitance. The specified capacitance is the parallel plate capacitance to ground measured at 60 Hz. This capacitance is proportional to the resistor film size, and inversely proportional to the resistors thickness.

FREQUENCY RANGE-
The resistors' frequency range is specified as the 3dB impedance range. This means that for a 100Ω resistor, at the highest frequency specified, the impedance magnitude would be 50Ω.

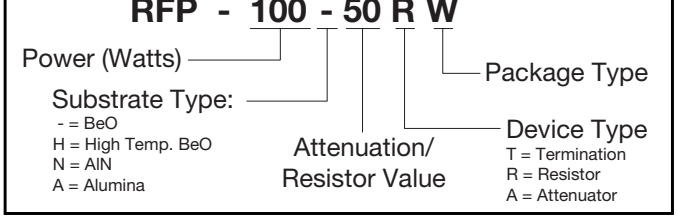
POWER HANDLING-
To achieve the best possible power handling, all resistors in this section are made using Beryllium Oxide (BeO). BeO has a high thermal conductivity, allowing for excellent heat transfer from the resistor to the heat sink.

LEADS-
As a standard all RF Power resistors come with 99.99% pure silver leads. This allows for excellent solderability and easy lead forming. Other types of leads are also available upon request.

MOUNTING-
RF Power resistors are available in two mounting types. **Flangeless** allows for the best possible heat transfer to the heat sink. **Flanged** allows for easy assembly. It is important to follow the described mounting procedure for all types to achieve the best electrical and thermal performance.

PART NUMBERING-
Part numbers are composed in the following way:

PART NUMBERING



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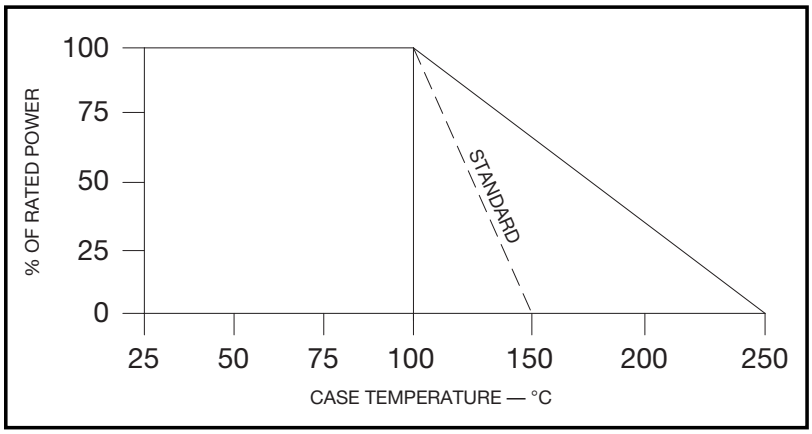
As a supplement to the standard flange mounted resistors, a special line of RF Power high temperature resistors are offered. These resistors have the same excellent electrical performance as the standard line, but have an extended operating temperature range. Below is a list of the high temperature resistors available. The page numbers refer to the electrically equivalent standard part.

Part Number	Power (Watts)	Frequency	Capacitance	Page
RFP-10H100RV	10	DC-6.0 GHz	0.75 pF	4.3.17
RFP-10H100RVV	10	DC-6.0 GHz	0.75 pF	4.3.19
RFP-20H100RP	20	DC-4.0 GHz	1.20 pF	4.3.23
RFP-40H100RE	40	DC-3.0 GHz	1.40 pF	4.3.27
RFP-40H100RH	40	DC-3.0 GHz	1.40 pF	4.3.29
RFP-50H100RCG	50	DC-2.0 GHz	3.50 pF	4.3.31
RFP-100H100RE	100	DC-2.0 GHz	2.90 pF	4.3.33
RFP-100H100RH	100	DC-2.0 GHz	1.40 pF	4.3.35
RFP-100H100RW	100	DC-3.0 GHz	1.50 pF	4.3.37
RFP-150H100RCGF	150	DC-2.0 GHz	3.50 pF	4.3.39
RFP-150H100RJ	150	DC-2.0 GHz	3.20 pF	4.3.41
RFP-150H100RL	150	DC-2.0 GHz	2.90 pF	4.3.43
RFP-250H100RM	250	DC-2.0 GHz	3.30 pF	4.3.47

The power derating for this line of resistors has been extended from the standard 150°C to 250°C, allowing for the use of these high temperature resistors in thermally demanding applications.



Resistors

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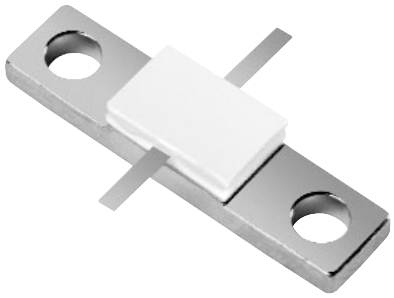

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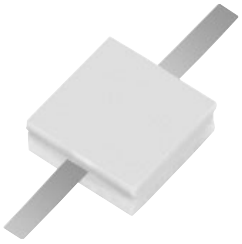

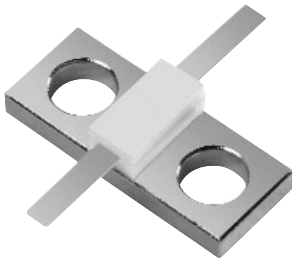

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