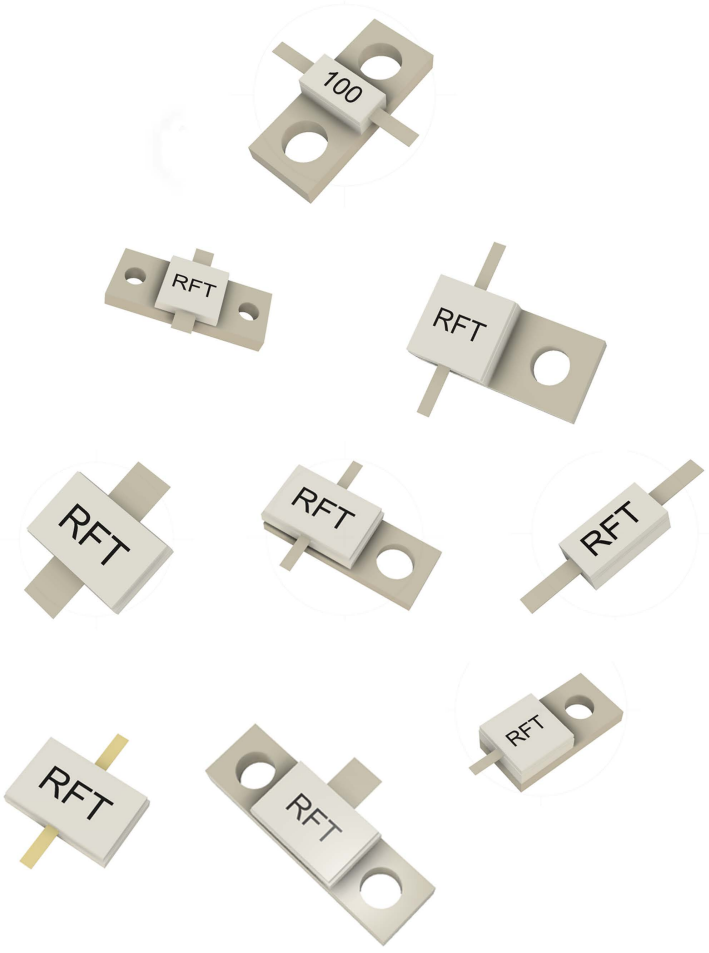
RF Techniques



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RF Techniques Brazed Products

Brazed Construction

RFT uses a high temperature brazing process that yields the lowest possible thermal resistance and allows for higher temperature operation. Higher temperature processing also ensures greater reliability and overall performance during thermal cycling. RFT devices are capable of withstanding a 1 1/2 to 3 lbs pull test. The device will withstand substantial forces applied to the lead due to different rates of contraction and expansion of the lead during temperature variations. Since RFT devices are brazed, the customer need not have to worry about leads coming off during soldering operations.

Power Dissipation

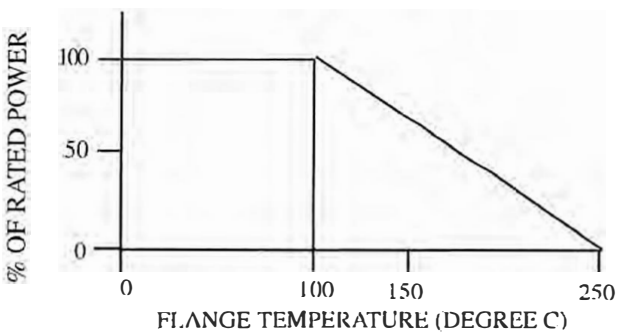
RFT devices dissipate more watts per square inch than any others on the market. RFT can supply devices with up to 500 watts power handling capability for frequency ranges from DC to 6 GHz. RFT devices can handle more RF power than a soldered device.

Power Derating

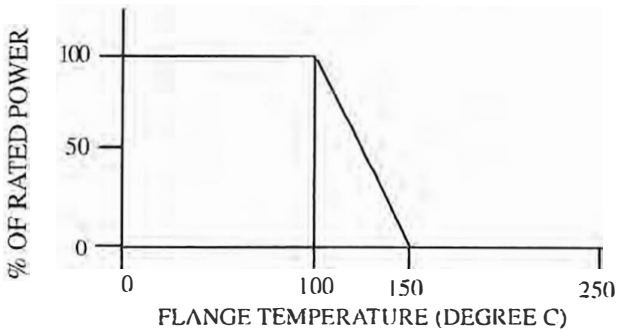
RFT devices offer a significant advantage over the competition in power handling capability due to superior power derating capability. RFT devices can be power de-rated to flange temperatures up to 250 degree C (see figure 1). This high temperature capability provides the user with improved system reliability and a wider margin of performance under abnormal operating conditions.

RFT devices are also capable of withstanding much higher temperature for short period of time without damage.

RFT BRAZED DEVICE



COMPETITIVE DEVICE



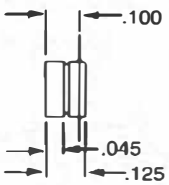
Example: RFT P/N 1J250100 (250 Watts 100 Ohm Resistor)

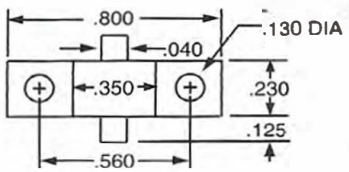
	RFT Part	Competitor's Part
Tcase = 100° C	250 Watts (100%)	250 Watts (100%)
Tcase = 125° C	200 Watts (80%)	125 Watts (50%)
Tcase = 150° C	150 Watts (60%)	0 Watts (0%)

Figure 1

High Power Brazed Resistors

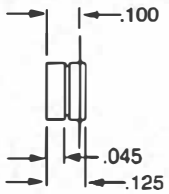
1A100xxx

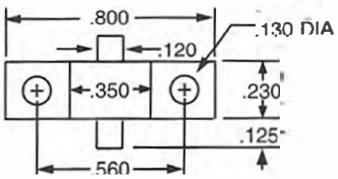




Power	100 Watts
Frequency	2 GHz
Capacitance	1.8 pF

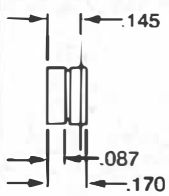
1B150xxx

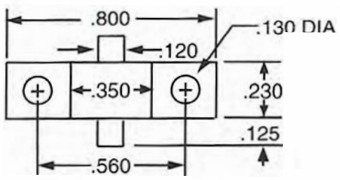




Power	150 Watts
Frequency	2 GHz
Capacitance	1.5 pF

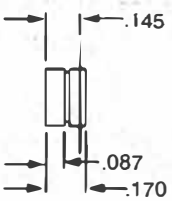
1BB150xxx

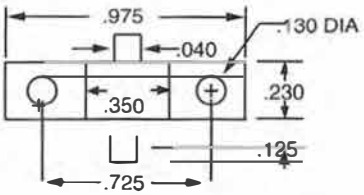




Power	150 Watts
Frequency	2 GHz
Capacitance	1.5 pF

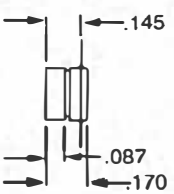
1E100xxx

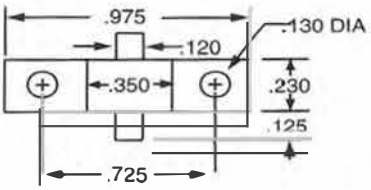




Power	100 Watts
Frequency	2 GHz
Capacitance	1.8 pF

1F150xxx

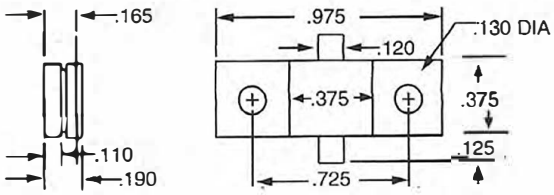




Power	150 Watts
Frequency	2 GHz
Capacitance	1.5 pF

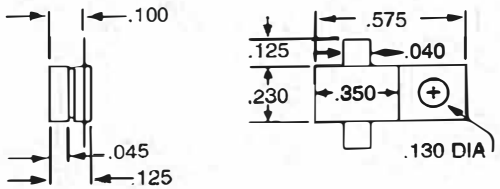
High Power Brazed Resistors

1J250xxx



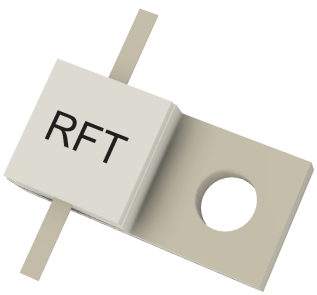
Power	250 Watts
Frequency	2 GHz
Capacitance	4.5 pF

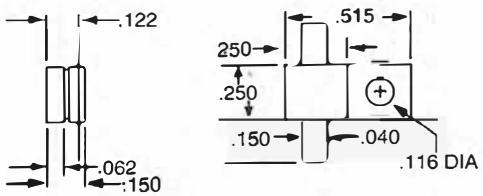
1Y050xxx



Power	50 Watts
Frequency	2 GHz
Capacitance	1.5 pF

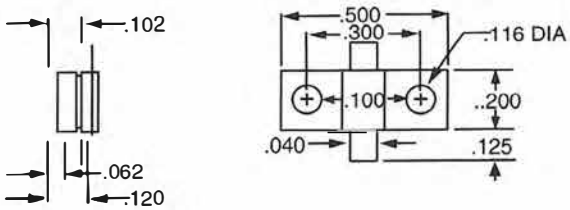
1U040xxx





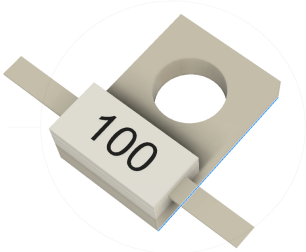
Power	40 Watts
Frequency	2 GHz
Capacitance	1.2 pF

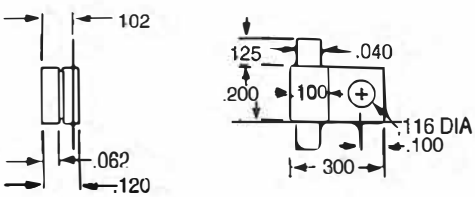
1VF20xxx



Power	20 Watts
Frequency	2 GHz
Capacitance	.75 pF

1VH20xxx

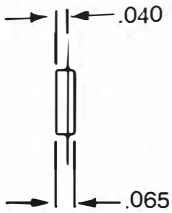


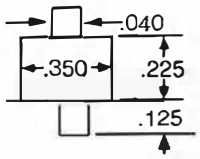


Power	20 Watts
Frequency	2 GHz
Capacitance	.75 pF

High Power Brazed Resistors

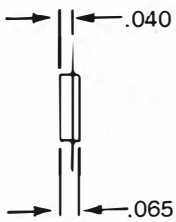
1L125xxx

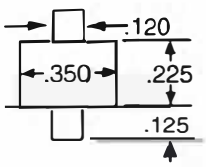




Power	125 Watts
Frequency	2 GHz
Capacitance	0.8 pF

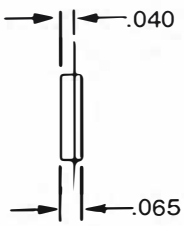
1M200xxx

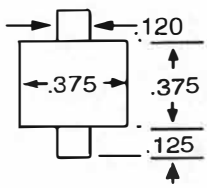




Power	200 Watts
Frequency	2 GHz
Capacitance	1.5 pF

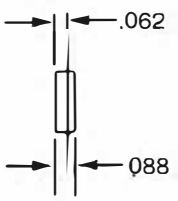
1Q300xxx

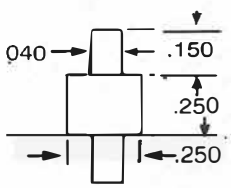




Power	300 Watts
Frequency	2 GHz
Capacitance	2.5 pF

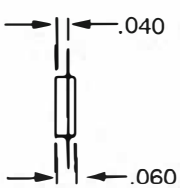
1UU40xxx

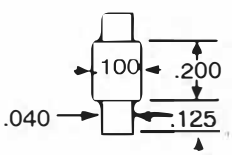




Power	40 Watts
Frequency	2 GHz
Capacitance	1.2 pF

1VV30xxx

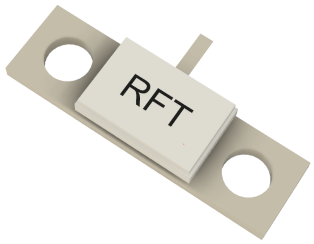


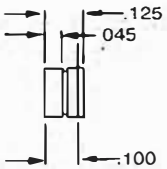


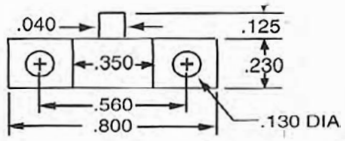
Power	30 Watts
Frequency	2 GHz
Capacitance	.75 pF

High Power Brazed Terminations

3C040xxx

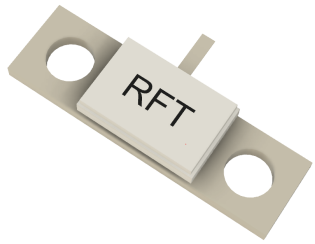


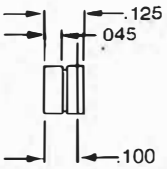


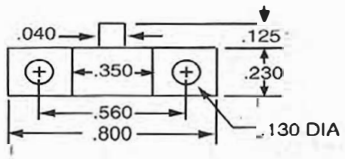


Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 4 GHz	1.35:1

3C100xxx

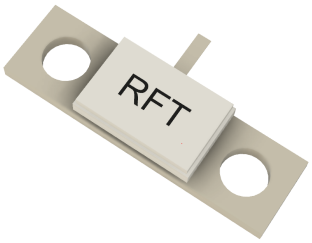


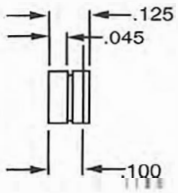


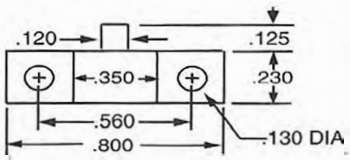


Power	100 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

3D150xxx

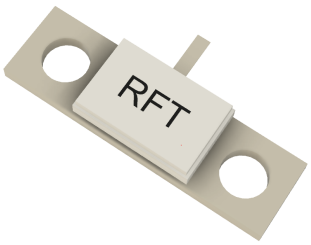


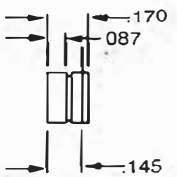


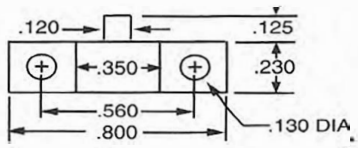


Power	150 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 3 GHz	1.35:1

3DD150xxx

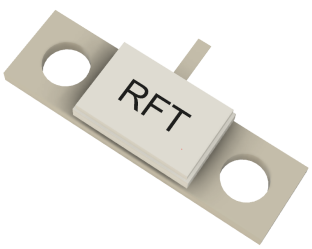


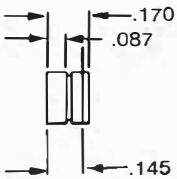


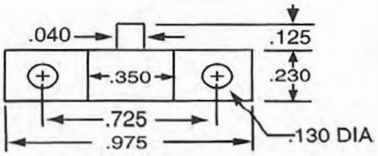


Power	150 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 3 GHz	1.35:1

3G040xxx



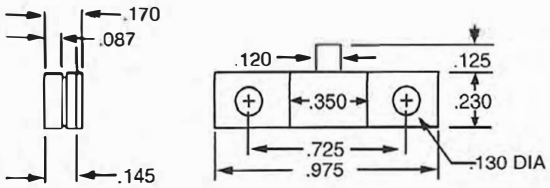




Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 4 GHz	1.25:1

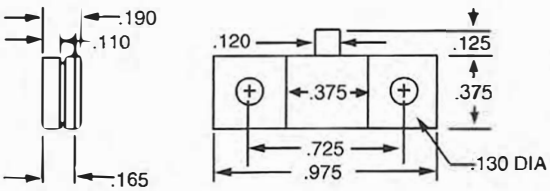
High Power Brazed Terminations

3H150xxx



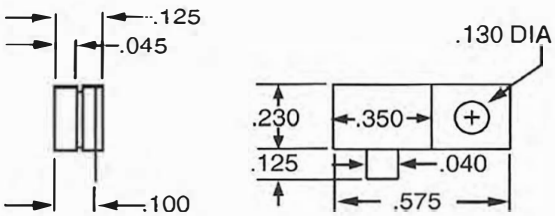
Power	150 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

3K250xxx



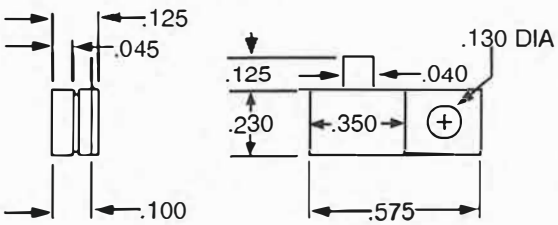
Power	250 Watts
Frequency	VSWR
DC - .5 GHz	1.25:1
.5 - 1 GHz	1.35:1

3CL50xxx



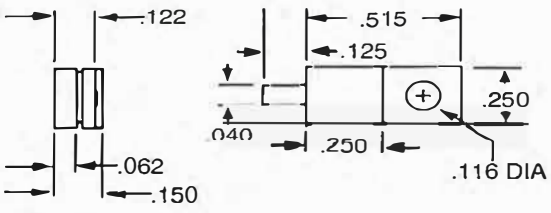
Power	50 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 4 GHz	1.35:1

3CR50xxx



Power	50 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 4 GHz	1.35:1

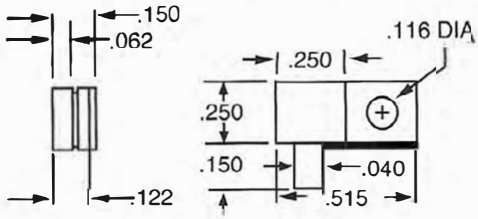
3UC40xxx



Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

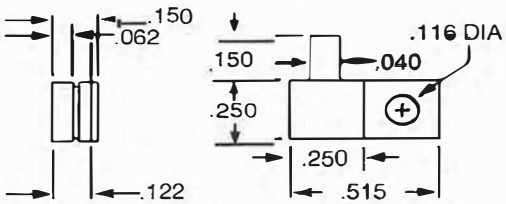
High Power Brazed Terminations

3UL40xxx



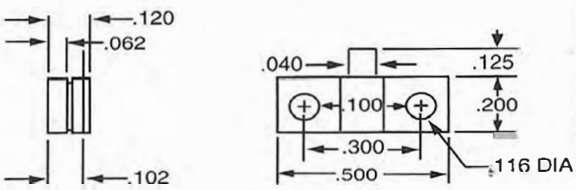
Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

3UR40xxx



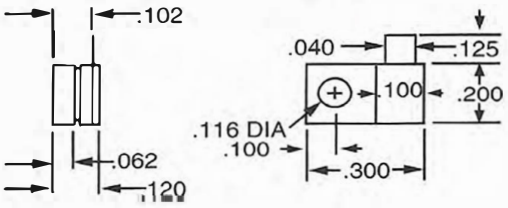
Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

3VF40xxx



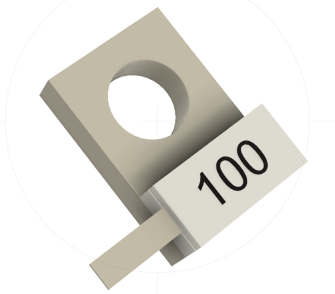
Power	20 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

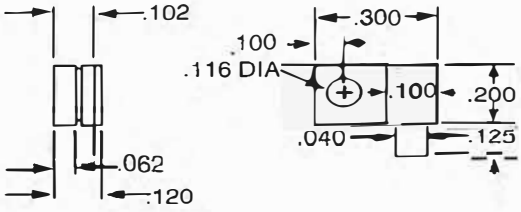
3VL40xxx



Power	20 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

3VR40xxx

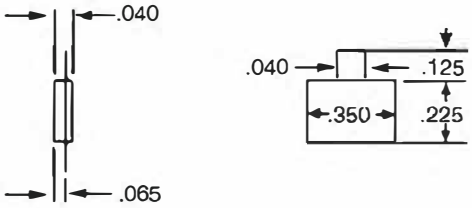




Power	20 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

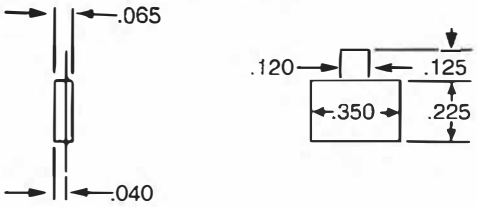
High Power Brazed Terminations

3N040xxx



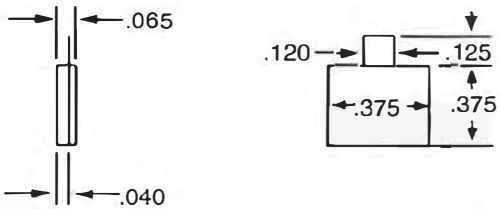
Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1
2 - 4 GHz	1.35:1

3P200xxx



Power	200 Watts
Frequency	VSWR
DC - 1 GHz	1.35:1
1 - 2 GHz	1.50:1

3R300xxx

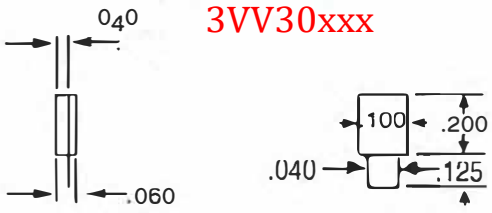


Power	300 Watts
Frequency	VSWR
DC - 1 GHz	1.35:1
1 - 2 GHz	1.50:1

3UU40xxx

Power	40 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

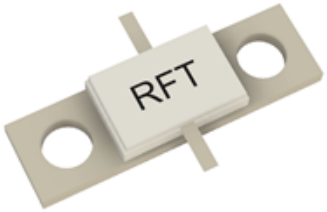
3VV30xxx

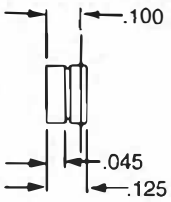


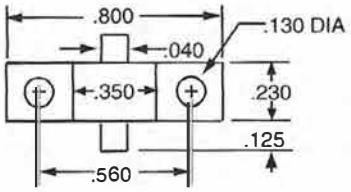
Power	30 Watts
Frequency	VSWR
DC - 2 GHz	1.25:1

High Power Brazed Attenuators

2A100xxx

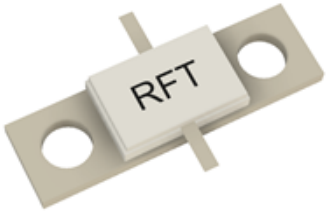


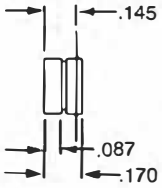


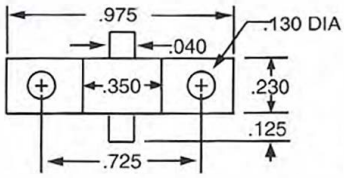


Power	100 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

2E100xxx

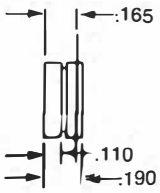


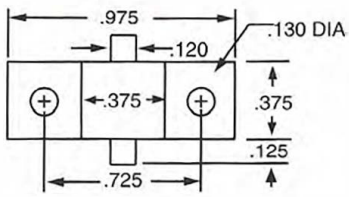




Power	100 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

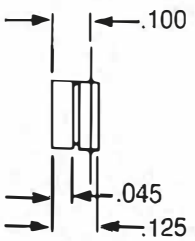
2J250xxx

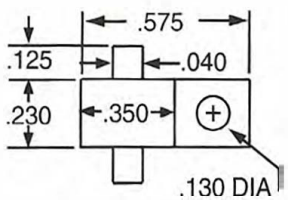




Power	200 Watts
Frequency	VSWR
DC - .5 GHz	1.25:1
.5 - 1 GHz	1.35:1

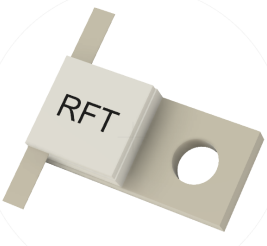
2Y050xxx

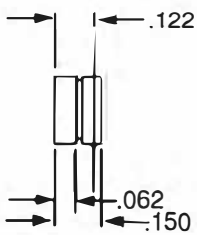


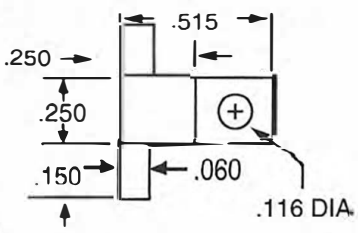


Power	50 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

2Z020xxx



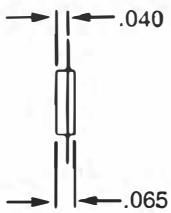


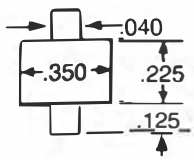


Power	20 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

High Power Brazed Attenuators

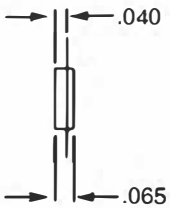
2L010xxx

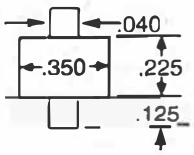




Power	100 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

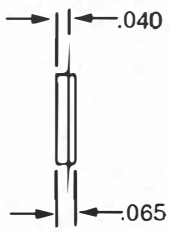
2L100xxx

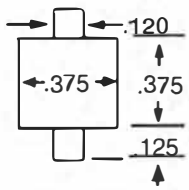




Power	100 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

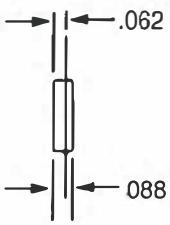
2Q250xxx

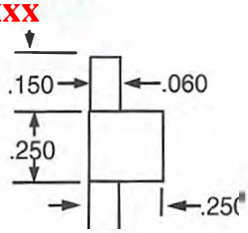




Power	150 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

2ZZ40xxx





Power	40 Watts
Frequency	VSWR
DC - 1 GHz	1.25:1
1 - 2 GHz	1.35:1

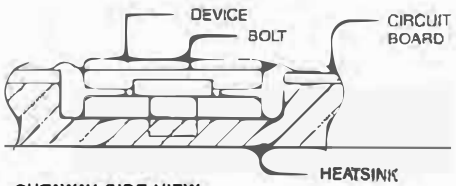
xxx denotes attenuation values. Standard attenuation values:
1dB,2dB,3dB,4dB,5dB,6dB,8dB,10dB,14dB,20dB,30dB.
Other values from .5 to 30dB are available in .5dB steps.
Standard tolerance is +/-.5dB.

Mounting Techniques

All devices should be properly mounted in order to reduce mechanical and thermal stresses, which can degrade the MTBF of the devices. The devices must be mounted on a flat surface (±. 002") in order to produce the maximum heat transfer. (The following is a guideline outlining the proper techniques for mounting RF Techniques power component.

Flanged Parts

Flange Packages should be mounted on a flat surface (±. 002") in order to produce the maximum heat transfer. Also, avoid twisting or bending the flanges before installation. High quality silicone grease should be used sparingly on the flange of the device. The idea is to fill in the micro irregularities of the surfaces rather than creating a continuous layer of silicone grease. The best way to apply the grease is with a flat razor blade. The mounting bolts should be torqued to insure a solid contact with heat sink. Over torqueing can cause the flange to bow in the middle. The devices should be mounted such that they have sufficient stress relief with the circuit board. The package should be as close as possible to the circuit board to reduce parasitic inductance caused by excessive lead length. For more information, contact one of our engineers.



CUTAWAY SIDE VIEW

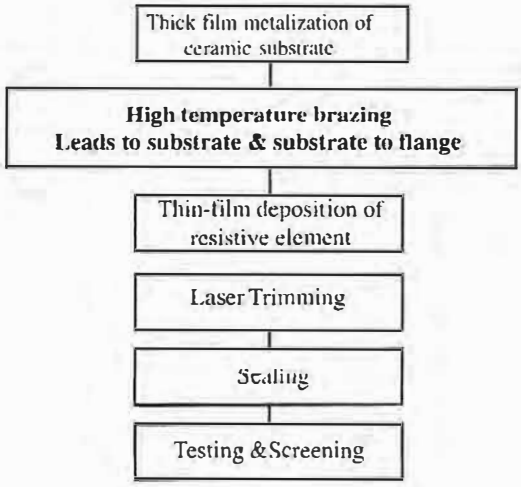
Flangless Parts

There are two basic ways of mounting un-flanged devices. One way is to solder the devices to a heat sink using tin/lead solder. This method assures a continuous ground plane and produces good thermal contact between the devices and the heat sink. This technique requires tin/lead plated heatsink (or other metal that will wet with the gold or nickel plating of the device to produce a good solder connection).

The alternate method is to clamp the device to the heatsink with some type of clamping mechanism. It is recommended that Indium foil be used rather than heatsink compound to ensure a good thermal and electrical contact. This method requires a good clamping mechanism that will work correctly.

Either of the methods described above will work for most applications. The solder technique is used by majority of customers. RFT brazed devices will be able to withstand low or high temperature soldering.

RFT Manufacturing Process



Ordering Information

Resistors

Example: 1Q300050 (300 Watts 50 Ohm Resistor)

	Q	300	xxx
Resistor	Package Style	Average Power	Resistance (Ohm)

Terminations

Example: 3R300050 (300 Watts 50 Ohm Termination)

3	Q	300	xxx
Termination	Package Style	Average Power	Resistance (Ohm)

Attenuators

Example: 2Q250050 (250 Watts 5 dB Attenuator)
2Q250055 (250 Watts 5.5 dB Attenuator)
2Q250200 (250 Watts 20 dB Attenuator)

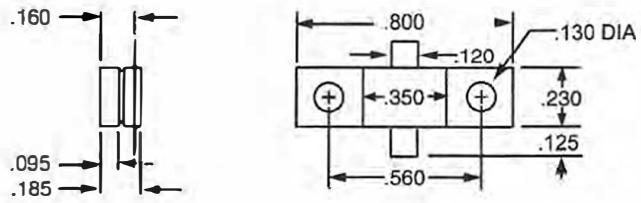
2	Q	300	xxx
Attenuator	Package Style	Average Power	Attenuation Value

Note: S in the begining of part number indicate standard devices.

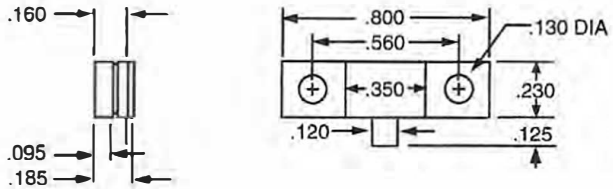
CORRECTIONS

Dimension changes to the following parts

1BB150xxx, S1BB150xxx



3DD150xxx, S3D150xxx



Lead width corrections

Part #	Lead width specified	standard lead width (Inches)
1U040xxx, S1U040xxx	.040 (available)	.060
1UU40xxx, S1UU40xxx	.040 (available)	.060
3UC40xxx, S3UC40xxx	.040 (available)	.060
3UL40xxx, S3UL40xxx	.040 (available)	.060
3UR40xxx, S3UR40xxx	.040 (available)	.060
3UC40xxx, S3UC40xxx	.040 (available)	.060
3UU40xxx, S3UU40xxx	.040 (available)	.060

Part Number changes to the following parts

Page #	Part #	Correct Part #	Power (Watts
9	3VF40xxx	3VF20xxx	20
9	3VL40xxx	3VL20xxx	20
9	3VR40xxx	3VR20xxx	20
14	S1VH20xxx	S1VH10xxx	10
18	S3VF40xxx	S3VF20xxx	20
18	S3VL40xxx	S3VL10xxx	10
18	S3VR40xxx	S3VR10xxx	10

Ordering Instructions for

ALUMINUM NITRIDE PARTS

"A" is added to the part number after before the resistance value (xxx)
Example:
S1A100A050 (100 Watts 50 Ohm AlN Resistor)
S3UL40A050 (40 Watts 50 Ohm AlN Resistor)

RFTechniques