

## Features

- Lead free versions available (see How to Order "Termination" option)
- RoHS compliant (lead free version)\*
- Standard E.I.A. package compatible with automatic placement equipment
- Tape and reel packaging standard
- Custom circuits are available

- Marking on contrasting background for permanent identification
- Compliant leads to reduce solder joint fatiguing
- Standard electrical schematics: isolated, bussed, dual terminator
- Now available with improved tolerance to  $\pm 0.5\%$

## 4800P Series - Thick Film Surface Mounted Medium Body

### Product Characteristics

#### Resistance Range

.....10 ohms to 2.2 megohms

Maximum Operating Voltage.....50 V

Temperature Coefficient of Resistance

50 ohms and above..... $\pm 100$  ppm/ $^{\circ}\text{C}$

below 50 ohms..... $\pm 250$  ppm/ $^{\circ}\text{C}$

TCR Tracking

(for equal values within a package)

..50 ppm/ $^{\circ}\text{C}$  max. for values > 50 ohms;

.....100 ppm/ $^{\circ}\text{C}$  for values  $\leq$  50 ohms

Operating Temperature

.....-55  $^{\circ}\text{C}$  to +125  $^{\circ}\text{C}$

Insulation Resistance

.....10,000 megohms min.

Dielectric Withstanding Voltage

.....200 VRMS

Lead Solderability

.....Meet requirements of MIL-STD-202 Method 208

### Environmental Characteristics

TESTS PER MIL-STD-202 ..... $\Delta R$  MAX.

Short Time Overload..... $\pm 0.25\%$

Load Life..... $\pm 1.00\%$

Moisture Resistance..... $\pm 0.50\%$

Resistance to Soldering Heat..... $\pm 0.25\%$

Thermal Shock..... $\pm 0.25\%$

### Physical Characteristics

Flammability.....Conforms to UL94V-0

Lead Frame Material

.....Copper, solder coated

Body Material.....Thermoplastic

### How To Order

**48 16 P - 1 - 103**

Model \_\_\_\_\_  
(48 = SOM Pkg)

Number of Pins \_\_\_\_\_

Electrical Configuration \_\_\_\_\_

• 1 or 4 = Isolated\*

• 2 = Bussed\*

• 3 = Dual Terminator\*

Resistance Code \_\_\_\_\_

• First 2 digits are significant

• Third digit represents the

number of zeros to follow.

Resistance Tolerance \_\_\_\_\_

• Blank =  $\pm 2\%$  (see "Resistance Tolerance" on

next page for resistance range)

• F =  $\pm 1\%$  (100 ohms - 1 megohm)

• D =  $\pm 0.5\%$  (100 ohms - 1 megohm)

Terminations \_\_\_\_\_

• All electrical configurations EXCEPT T03:

LF = Tin-plated (lead free)

• ONLY electrical configuration T03:

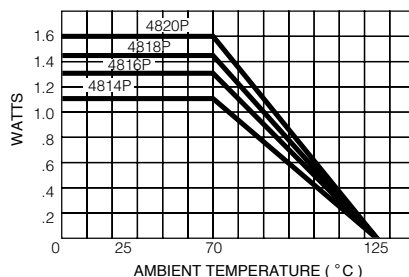
L = Tin-plated (lead free)

• Blank = Tin/Lead-plated

\*For tube packaging, use T01, T02, T03 or T04.

Consult factory for other available options.

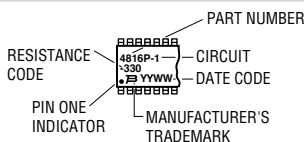
### Package Power Temp. Derating Curve



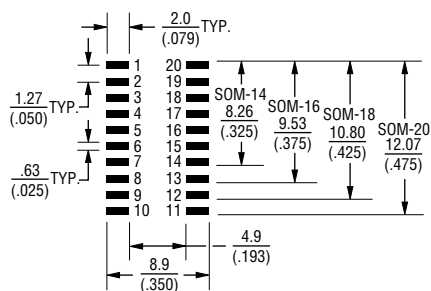
### Package Power Rating at 70 °C

|       |            |
|-------|------------|
| 4814P | 1.12 watts |
| 4816P | 1.28 watts |
| 4818P | 1.44 watts |
| 4820P | 1.60 watts |

### Typical Part Marking

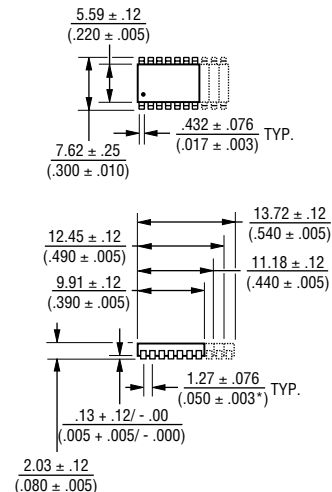


### Recommended Land Pattern



NOTE: Land pattern dimensions are based on design rules established by the Institute for Interconnecting and Packaging Electronic Circuits in IPC-SM-782.

### Product Dimensions



Lead coplanarity .102mm (.004 inch) max. at mounting surface.

Governing dimensions are in metric. Dimensions in parentheses are inches and are approximate.

\*Terminal centerline to centerline measurements made at point of emergence of the lead from the body.

For information on specific applications,  
download Bourns' application notes:

DRAM Applications

Dual Terminator Resistor Networks

R/2R Ladder Networks

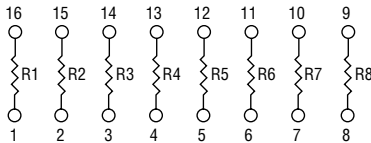
SCSI Applications

# 4800P Series - Thick Film Surface Mounted Medium Body

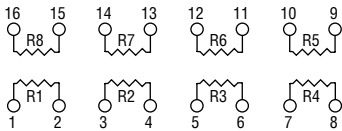


## Isolated Resistors (1 And 4 Circuits)

Model 4814P-1  
Model 4816P-1 (Shown)  
Model 4818P-1  
Model 4820P-1



Model 4816P-4 (Shown)  
Model 4820P-4



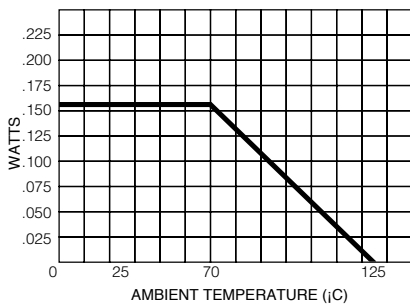
### Resistance Tolerance

10 ohms to 49 ohms .....±1 ohm  
50 ohms to 2.2 megohms.....±2 %\*

### Power Rating per Resistor

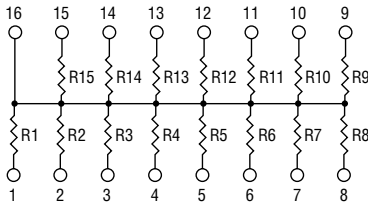
1 Circuit at 70 °C .....0.160 watt  
4 Circuit at 70 °C .....0.160 watt

### Resistor Power Temp. Derating Curve



## Bussed Resistors (2 Circuit)

Model 4814P-2  
Model 4816P-2 (Shown)  
Model 4818P-2  
Model 4820P-2



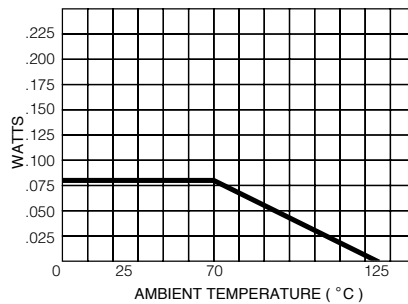
### Resistance Tolerance

10 ohms to 49 ohms .....±1 ohm  
50 ohms to 2.2 megohms .....±2 %\*

### Power Rating per Resistor

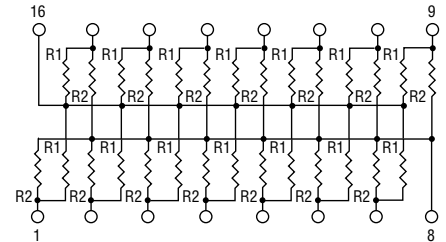
2 Circuit at 70 °C .....0.080 watt

### Resistor Power Temp. Derating Curve



## Dual Terminator (3 Circuit)

Model 4814P-3  
Model 4816P-3 (Shown)  
Model 4818P-3  
Model 4820P-3



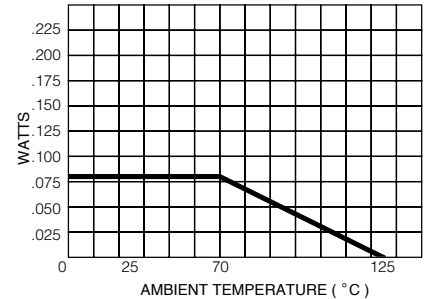
### Resistance Tolerance

Below 100 ohms .....±2 ohms  
100 ohms to 2.2 megohms .....±2 %\*

### Power Rating per Resistor

3 Circuit at 70 °C .....0.080 watt

### Resistor Power Temp. Derating Curve



## Popular Resistance Values (1, 4, And 2 Circuits)\*\*

| Ohms | Code | Ohms  | Code | Ohms   | Code | Ohms    | Code | Ohms      | Code |
|------|------|-------|------|--------|------|---------|------|-----------|------|
| 10   | 100  | 180   | 181  | 1,800  | 182  | 15,000  | 153  | 120,000   | 124  |
| 22   | 220  | 220   | 221  | 2,000  | 202  | 18,000  | 183  | 150,000   | 154  |
| 27   | 270  | 270   | 271  | 2,200  | 222  | 20,000  | 203  | 180,000   | 184  |
| 33   | 330  | 330   | 331  | 2,700  | 272  | 22,000  | 223  | 220,000   | 224  |
| 39   | 390  | 390   | 391  | 3,300  | 332  | 27,000  | 273  | 270,000   | 274  |
| 47   | 470  | 470   | 471  | 3,900  | 392  | 33,000  | 333  | 330,000   | 334  |
| 56   | 560  | 560   | 561  | 4,700  | 472  | 39,000  | 393  | 390,000   | 394  |
| 68   | 680  | 680   | 681  | 5,600  | 562  | 47,000  | 473  | 470,000   | 474  |
| 82   | 820  | 820   | 821  | 6,800  | 682  | 56,000  | 563  | 560,000   | 564  |
| 100  | 101  | 1,000 | 102  | 8,200  | 822  | 68,000  | 683  | 680,000   | 684  |
| 120  | 121  | 1,200 | 122  | 10,000 | 103  | 82,000  | 823  | 820,000   | 824  |
| 150  | 151  | 1,500 | 152  | 12,000 | 123  | 100,000 | 104  | 1,000,000 | 105  |

## Popular Resistance Values (3 Circuit)\*\*

| Resistance     |                |                |                |
|----------------|----------------|----------------|----------------|
| (Ohms)         |                | Code           |                |
| R <sub>1</sub> | R <sub>2</sub> | R <sub>1</sub> | R <sub>2</sub> |
| 160            | 240            | 161            | 241            |
| 180            | 390            | 181            | 391            |
| 220            | 270            | 221            | 271            |
| 220            | 330            | 221            | 331            |
| 330            | 390            | 331            | 391            |
| 330            | 470            | 331            | 471            |
| 3,000          | 6,200          | 302            | 622            |

\* ADD "F" AFTER RESISTANCE CODE FOR ±1 % TOLERANCE AVAILABLE FROM 100 OHMS THROUGH 1 MEGOHM, OR ADD "D" AFTER RESISTANCE CODE FOR ±0.5 % TOLERANCE AVAILABLE FROM 100 OHMS THROUGH 1 MEGOHM.

PART NUMBER SUFFIX EXAMPLES: -103 = 10K OHMS, ±2 % -103F = 10K OHMS, ±1 % -103D = 10K OHMS, ±0.5 %

\*\* NON-STANDARD VALUES AVAILABLE, WITHIN RESISTANCE RANGE.

REV. 01/05

Specifications are subject to change without notice.  
Customers should verify actual device performance in their specific applications.