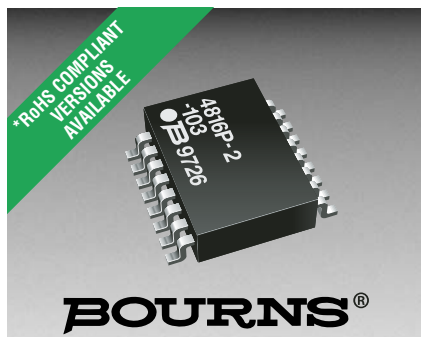




## Features

- RoHS compliant\* (see How to Order "Termination" option)
- 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

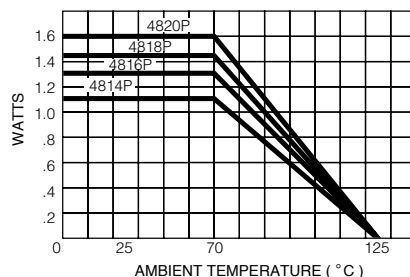
**48 16 P - 1 - 103**

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 (RoHS compliant)  
   • ONLY electrical configuration T03:  
     L = Tin-plated (RoHS compliant)  
   • Blank = Tin/Lead-plated

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

Consult factory for other available options.

### Package Power Temp. Derating Curve

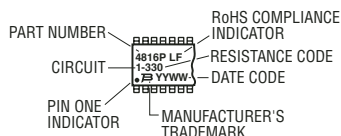


### Package Power Rating at 70 °C

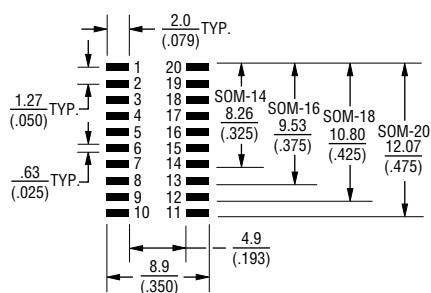
|            |            |
|------------|------------|
| 4814P..... | 1.12 watts |
| 4816P..... | 1.28 watts |
| 4818P..... | 1.44 watts |
| 4820P..... | 1.60 watts |

### Typical Part Marking

Represents total content. Layout may vary.

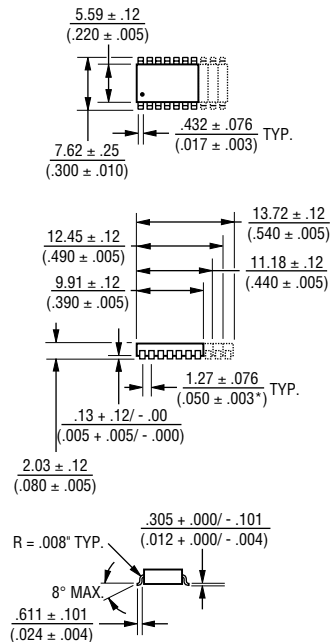


### Recommended Land Pattern



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](#)

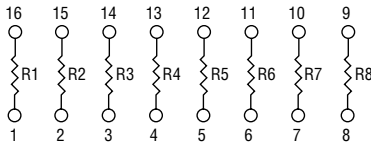
[SCSI Applications](#)

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

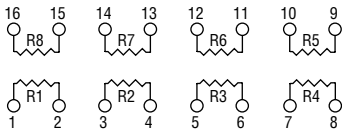
**BOURNS®**

### 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**



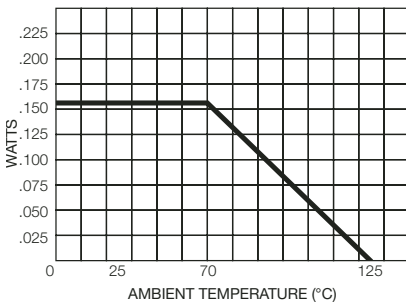
### Resistance Tolerance

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

### Power Rating per Resistor

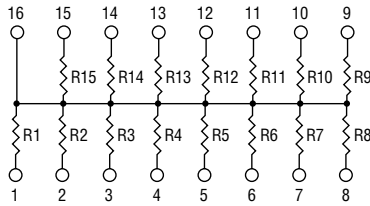
1 Circuit at 70 °C .....0.160 watt  
4 Circuit at 70 °C .....0.160 watt

### Resistor Power Temp. Derating Curve



### Bussed Resistors (2 Circuit)

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



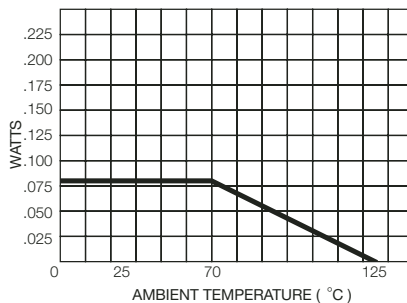
### Resistance Tolerance

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

### Power Rating per Resistor

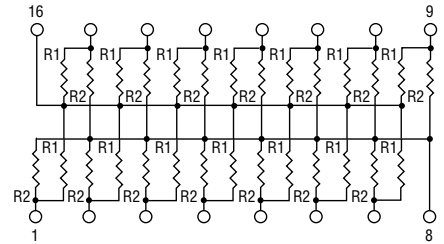
2 Circuit at 70 °C .....0.080 watt

### Resistor Power Temp. Derating Curve



### Dual Terminator (3 Circuit)

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



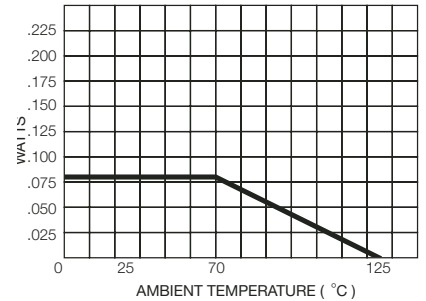
### Resistance Tolerance

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  |

\* 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. 06/08

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

### 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            |