

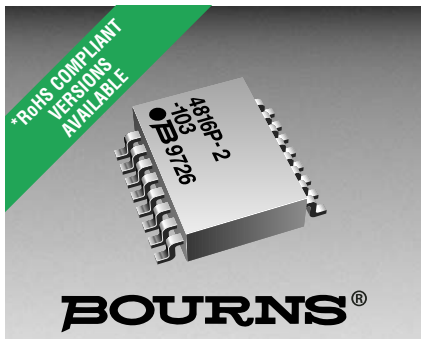
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Jameco Part Number 1160858



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..... ± 100 ppm/ $^{\circ}$ C

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

TCR Tracking

(for equal values within a package)

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

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

Operating Temperature

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

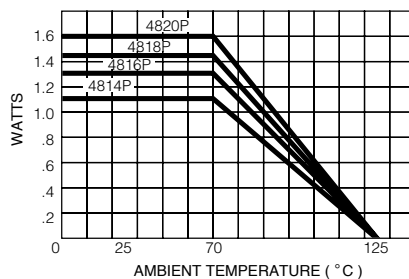
L = Tin-plated (lead free)

• Blank = Tin/Lead-plated

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

Consult factory for other available options.

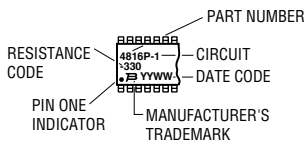
Package Power Temp. Derating Curve



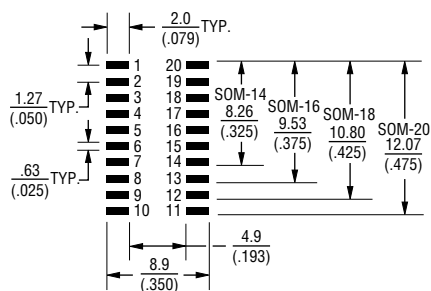
Package Power Rating at 70 $^{\circ}$ C

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

Typical Part Marking



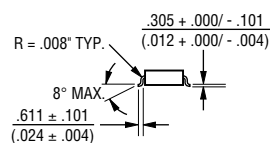
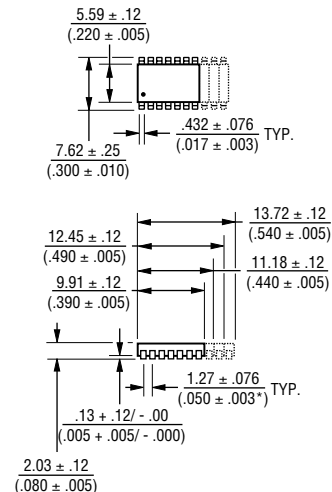
Recommended Land Pattern



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

For Standard Values Used in Capacitors, Inductors, and Resistors, [click here](#).

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:

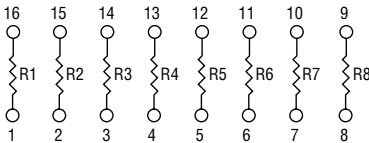
- [DRAM Applications](#)
- [Dual Terminator Resistor Networks](#)
- [R/2R Ladder Networks](#)
- [SCSI Applications](#)

4800P Series - Thick Film Surface Mounted Medium Body

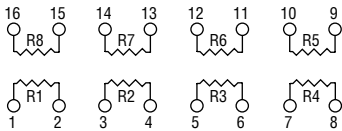


Isolated Resistors (1 And 4 Circuits)

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



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



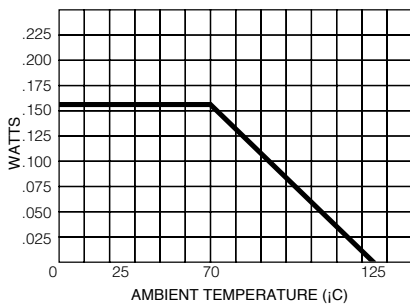
Resistance Tolerance

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

Power Rating per Resistor

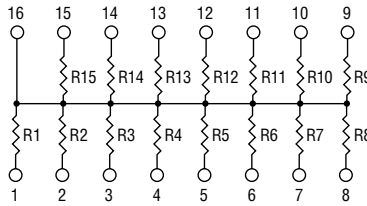
1 Circuit at 70 °C0.160 watt
4 Circuit at 70 °C0.160 watt

Resistor Power Temp. Derating Curve



Bussed Resistors (2 Circuit)

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



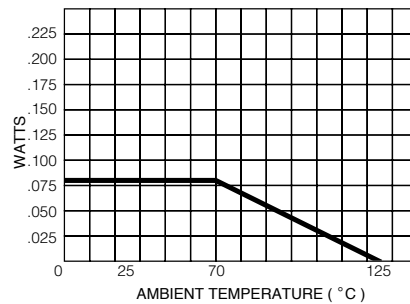
Resistance Tolerance

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

Power Rating per Resistor

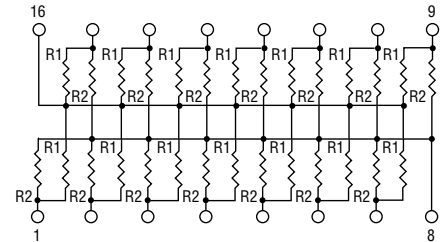
2 Circuit at 70 °C0.080 watt

Resistor Power Temp. Derating Curve



Dual Terminator (3 Circuit)

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



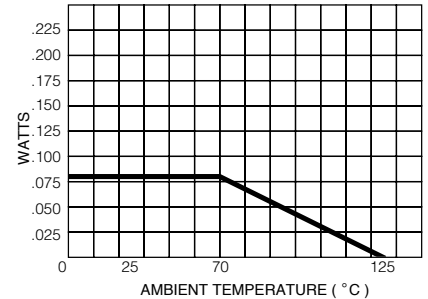
Resistance Tolerance

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

Power Rating per Resistor

3 Circuit at 70 °C0.080 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 ₁ | R ₂ | R ₁ | R ₂ |
| 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. 04/06

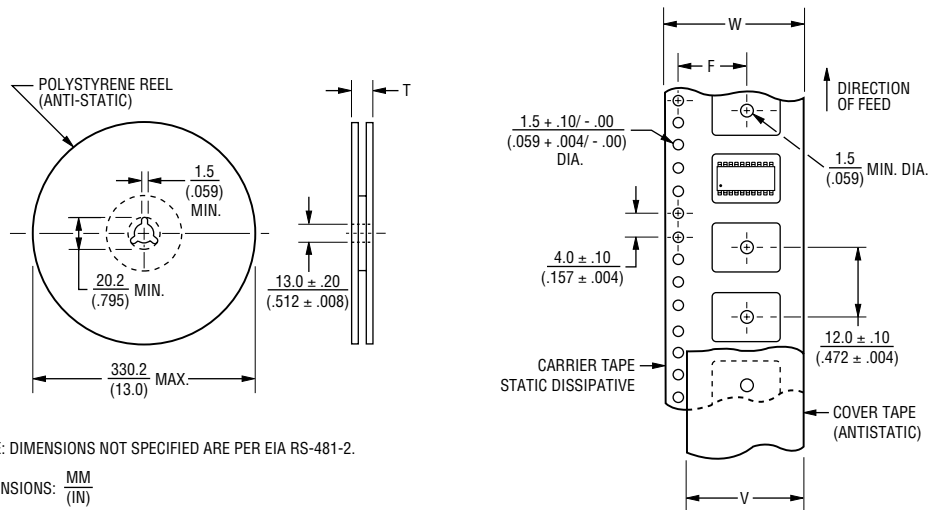
Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

Surface Mounted Ordering Guide



| Electrical Configuration | *Circuit Codes | | Examples |
|--------------------------|----------------|-------|---|
| | Tape & Reel | Tubes | |
| Isolated | 1 | T01 | 4816P-1-101 |
| Bussed | 2 | T02 | Isolated Circuit in Tape & Reel Package |
| Dual Terminated | 3 | T03 | 4816P-T01-101 |
| Adj. Isolated | 4 | T04 | Isolated Circuit in Slide Tube Package |

*4816P-X-RC: To specify package type, replace "X" with appropriate "Circuit Code".



| Model | Standard Quantity Per Reel | Carrier Tape Width (W) | Cover Tape Width (V) | Reel Width (T) | Pocket Center (F) |
|----------------------------------|----------------------------|---------------------------------|-----------------------|------------------------|---------------------------------|
| 4814P 4816P 4818P 4820P | 2,000 | $24.0 \pm .30$ (.945 ± .012) | 21.0 (.827) NOM. | 30.4 (1.197) MAX. | $11.5 \pm .10$ (.453 ± .004) |

Leader Length = 500 min. } Empty Component Pockets
 Trailer Length = 500 mm min. } Sealed with Cover Tape