Features
- RoHS compliant*
- Standard E.I.A. package compatible with automatic placement equipment
- Compliant leads to reduce solder joint fatigue
- Tape and reel packaging standard
- Standard electrical schematics: isolated, bussed, dual terminator
- Custom circuits are available
- Now available with improved tolerance to ±0.5 %

Product Characteristics
Resistance Range
10 ohms to 2.2 megohms

Maximum Operating Voltage
50 V

Temperature Coefficient of Resistance
±100 ppm/°C

TCR Tracking
±50 ppm/°C

Operating Temperature
-55 °C to +125 °C

Insulation Resistance
10,000 megohms minimum

Dielectric Withstanding Voltage
200 VRMS

Lead Solderability
Meet requirements of MIL-STD-202 Method 208

Environmental Characteristics
Tests per MIL-STD-202

Short Time Overload
±0.25 %

Load Life
±1.00 %

Moisture Resistance
±0.50 %

Resistance to Soldering Heat
±0.25 %

Thermal Shock
±0.25 %

Physical Characteristics
Flammability
Conforms to UL94V-0

Lead Frame Material
Copper, solder coated

Body Material
Novolac epoxy

How To Order
Model
(44 = SMD SOL Pkg.)

Number of Pins
1 or 4 = Isolated
2 = Bussed
3 = Dual Terminator

Resistance Code
Resistance Tolerance

Terminations

All electrical configurations EXCEPT T03:
LF = Tin-plated (RoHS compliant)
ONLY electrical configuration T03:
L = Tin-plated (RoHS compliant)

For tube packaging, use T01, T02, T03 or T04.
Consult factory for other available options.

4400P Series - Thick Film Surface Mounted Wide Body

Package Power Temp. Derating Curve

Package Power Rating at 70 °C
4420P .......... 2.00 watts
4416P .......... 1.60 watts

Recommended Land Pattern

For Standard Values Used in Capacitors, Inductors, and Resistors, click here.

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

Part Numbering

PART NUMBER
PIN ONE INDICATOR
CIRCUIT
MANUFACTURER’S TRADEMARK
COUNTRY OF MANUFACTURE
Date Code

Resistances

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

For tube packaging, use T01, T02, T03 or T04.
Consult factory for other available options.

Specifications are subject to change without notice.
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
Users should verify actual device performance in their specific applications.
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For information on specific applications, download Bourns’ application notes:

- DRAM Applications
- Dual Terminator Resistor Networks
- R/2R Ladder Networks
- SCSI Applications

---

### 4400P Series - Thick Film Surface Mounted Wide Body

#### Isolated Resistors (1 and 4 Circuits)

<table>
<thead>
<tr>
<th>Model 4416P-1</th>
<th>Model 4420P-1 (Shown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>R2</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

#### Bussed Resistors (2 Circuit)

<table>
<thead>
<tr>
<th>Model 4416P-2</th>
<th>Model 4420P-2 (Shown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>R2</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

#### Dual Terminator (3 Circuit)

<table>
<thead>
<tr>
<th>Model 4416P-3</th>
<th>Model 4420P-3 (Shown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>R2</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

4420P-3 terminates 16 lines, convenient for a 16-bit computer bus.

#### Resistance Tolerance

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

#### Power Rating per Resistor

- 2 Circuit at 70 °C ................... 0.160 watt
- 3 Circuit at 70 °C ................... 0.115 watt

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

<table>
<thead>
<tr>
<th>Resistance Values (1, 4 and 2 Circuits)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Ohms</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>27</td>
</tr>
<tr>
<td>33</td>
</tr>
<tr>
<td>39</td>
</tr>
<tr>
<td>47</td>
</tr>
<tr>
<td>58</td>
</tr>
<tr>
<td>68</td>
</tr>
<tr>
<td>82</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>150</td>
</tr>
</tbody>
</table>

* Add “F” after resistance code for ±1 % tolerance available from 100 Ω through 1M Ω, or add “D” after resistance code for ±0.5 % tolerance available from 100 Ω through 1M Ω.

Part number suffix examples:
- -103 = 10K Ω, ±2 %
- -103F = 10K Ω, ±1 %
- -103D = 10K Ω, ±0.5 %

** Non-standard values available, within resistance range.

---

### Popular Resistance Values (3 Circuit)

<table>
<thead>
<tr>
<th>Resistance Values (3 Circuit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Ohms</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>220</td>
</tr>
<tr>
<td>330</td>
</tr>
<tr>
<td>3,000</td>
</tr>
</tbody>
</table>

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### Resistance Curve

- Resistor Power Temp. Derating Curve
- Resistor Power Temp. Derating Curve
- Resistor Power Temp. Derating Curve
Surface Mounted Ordering Guide

<table>
<thead>
<tr>
<th>Electrical Configuration</th>
<th>*Circuit Codes</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape &amp; Reel</td>
<td>Tubes</td>
<td></td>
</tr>
<tr>
<td>Isolated</td>
<td>T01</td>
<td>4416P-1-101 Isolated Circuit in Tape &amp; Reel Package</td>
</tr>
<tr>
<td>Bussed</td>
<td>T02</td>
<td></td>
</tr>
<tr>
<td>Dual Terminated</td>
<td>T03</td>
<td>4416P-T01-101 Isolated Circuit in Slide Tube Package</td>
</tr>
<tr>
<td>Adj. Isolated</td>
<td>T04</td>
<td></td>
</tr>
</tbody>
</table>

*C4416P-X-RC: To specify package type, replace "X" with appropriate “Circuit Code”.

**NOTE: DIMENSIONS NOT SPECIFIED ARE PER EIA RS-481-2.**

**DIMENSIONS:** MM (IN)

---

**Model** | **Standard Quantity per Reel** | **Carrier Tape Width (W)** | **Cover Tape Width (W)** | **Reel Width (T)** | **Pocket Center (F)**
--- | --- | --- | --- | --- | ---
4416P | 1,500 | 24.0 ± .30 (945 ± .12) | 21.0 NOM. | 30.4 (1.197) MAX. | 11.5 ± .10 (.453 ± .004)
4420P | 1,500 | 24.0 ± .30 (945 ± .12) | 21.0 NOM. | 30.4 (1.197) MAX. | 11.5 ± .10 (.453 ± .004)

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

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