# 4800P Series - Thick Film Surface Mount Medium Body

## 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
- AEC-Q200 qualified
- Compliant leads to reduce solder joint fatiguing
- Standard electrical schematics: isolated, bussed, dual terminator
- Now available with improved tolerance to ±0.5%

## Product Characteristics
- **Resistance Range**: 10 ohms to 2.2 meghoms
- **Maximum Operating Voltage**: 50 V
- **Temperature Coefficient of Resistance**: 50 Ω and above.............. ±100 ppm/°C
- **below 50 Ω**: ±250 ppm/°C
- **TCR Tracking**: ≤ 50 ppm/°C
- **Maximum Operating Voltage**: 50 V
- **Resistance Range**: 10 ohms to 2.2 meghoms

## Environmental Characteristics
- **Tests PER MIL-STD-202**: ± AR MAX.
- **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**: Thermoplastic

## How To Order
- **Model**: 4816P - 1 - 103
- **Number of Pins**: 48
- **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**: ±25% (see "Resistance Tolerance" on next page for resistance range)

## Typical Part Marking
- **Part Number**: CYYWW
- **Date Code**: 611 - 191
- **Country of Manufacture**: C (Costa Rica)
- **RoHS Compliance Indicator**: LF = RoHS compliant
- **RoHS Compliance Code**: SOM-14 - SOM-18

## Package Power Temp. Derating Curve

<table>
<thead>
<tr>
<th>AMBIENT TEMPERATURE (°C)</th>
<th>WATTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>25</td>
<td>1.2</td>
</tr>
<tr>
<td>70</td>
<td>1.4</td>
</tr>
<tr>
<td>125</td>
<td>1.6</td>
</tr>
</tbody>
</table>

## Package Power Rating at 70 °C
- **4814P**: 1.12 watts
- **4816P**: 1.28 watts
- **4818P**: 1.44 watts
- **4820P**: 1.60 watts

## Recommended Land Pattern

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.27</td>
<td>1.00</td>
<td>0.95</td>
<td>0.90</td>
<td>0.85</td>
<td>0.80</td>
<td>0.75</td>
<td>0.70</td>
<td>0.65</td>
<td>0.60</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**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.

---

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011. 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.
4800P Series - Thick Film Surface Mount Medium Body

Isolated Resistors (1 and 4 Circuits)
Model 4814P-1
Model 4816P-1 (Shown)
Model 4818P-1
Model 4820P-1

Bussed Resistors (2 Circuit)
Model 4814P-2
Model 4816P-2 (Shown)
Model 4818P-2
Model 4820P-2

Dual Terminator (3 Circuit)
Model 4814P-3
Model 4816P-3 (Shown)
Model 4818P-3
Model 4820P-3

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

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>100</td>
<td>180</td>
<td>181</td>
<td>1,800</td>
<td>182</td>
<td>15,000</td>
<td>153</td>
<td>120,000</td>
<td>124</td>
</tr>
<tr>
<td>22</td>
<td>220</td>
<td>222</td>
<td>221</td>
<td>2,000</td>
<td>202</td>
<td>18,000</td>
<td>183</td>
<td>150,000</td>
<td>154</td>
</tr>
<tr>
<td>27</td>
<td>270</td>
<td>271</td>
<td>270</td>
<td>2,200</td>
<td>222</td>
<td>20,000</td>
<td>203</td>
<td>180,000</td>
<td>184</td>
</tr>
<tr>
<td>33</td>
<td>330</td>
<td>331</td>
<td>330</td>
<td>2,700</td>
<td>272</td>
<td>22,000</td>
<td>223</td>
<td>220,000</td>
<td>224</td>
</tr>
<tr>
<td>39</td>
<td>390</td>
<td>391</td>
<td>390</td>
<td>3,300</td>
<td>332</td>
<td>27,000</td>
<td>273</td>
<td>270,000</td>
<td>274</td>
</tr>
<tr>
<td>47</td>
<td>470</td>
<td>471</td>
<td>470</td>
<td>5,600</td>
<td>472</td>
<td>39,000</td>
<td>393</td>
<td>390,000</td>
<td>394</td>
</tr>
<tr>
<td>56</td>
<td>560</td>
<td>561</td>
<td>560</td>
<td>7,000</td>
<td>562</td>
<td>47,000</td>
<td>473</td>
<td>470,000</td>
<td>474</td>
</tr>
<tr>
<td>68</td>
<td>680</td>
<td>681</td>
<td>680</td>
<td>5,600</td>
<td>682</td>
<td>56,000</td>
<td>563</td>
<td>560,000</td>
<td>564</td>
</tr>
<tr>
<td>82</td>
<td>820</td>
<td>821</td>
<td>820</td>
<td>6,800</td>
<td>821</td>
<td>68,000</td>
<td>683</td>
<td>680,000</td>
<td>684</td>
</tr>
<tr>
<td>100</td>
<td>101</td>
<td>102</td>
<td>101</td>
<td>8,200</td>
<td>102</td>
<td>82,000</td>
<td>823</td>
<td>820,000</td>
<td>824</td>
</tr>
<tr>
<td>120</td>
<td>121</td>
<td>122</td>
<td>121</td>
<td>12,000</td>
<td>122</td>
<td>122,000</td>
<td>123</td>
<td>120,000</td>
<td>104</td>
</tr>
<tr>
<td>150</td>
<td>151</td>
<td>152</td>
<td>151</td>
<td>15,000</td>
<td>152</td>
<td>152,000</td>
<td>153</td>
<td>140,000</td>
<td>105</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.
** Non-standard values available, within resistance range.

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.
**Surface Mount Ordering Guide**

<table>
<thead>
<tr>
<th>Electrical Configuration</th>
<th><em>Circuit Codes</em></th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape &amp; Reel</td>
<td>Tubes</td>
<td></td>
</tr>
<tr>
<td>Isolated</td>
<td>1</td>
<td>T01</td>
</tr>
<tr>
<td>Bussed</td>
<td>2</td>
<td>T02</td>
</tr>
<tr>
<td>Dual Terminated</td>
<td>3</td>
<td>T03</td>
</tr>
<tr>
<td>Adj. Isolated</td>
<td>4</td>
<td>T04</td>
</tr>
</tbody>
</table>

*Circuit Codes*:

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

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

**DIMENSIONS:**

- **POLYSTYRENE REEL (ANTI-STATIC)**
  - 1.5 ± .10 (0.059 ± 0.004) MIN.
  - 13.0 ± 20 (0.512 ± 0.008) MAX.

- **COVER TAPE (ANTISTATIC)**
  - 12.0 ± 10 (0.472 ± 0.004)

**Model** | **Standard Quantity per Reel** | **Carrier Tape Width (W)** | **Cover Tape Width (W)** | **Reel Width (T)** | **Pocket Center (F)** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4814P</td>
<td>2,000</td>
<td>24.0 ± .30 (.945 ± .012)</td>
<td>21.0 ± .827 NOM.</td>
<td>30.4 ± 1.197 MAX.</td>
<td>11.5 ± 0.10 (.453 ± .004)</td>
</tr>
<tr>
<td>4816P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4818P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4820P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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.