

## Features

- RoHS compliant\* (see How to Order "Termination" option)
- Medium profile offers increased power handling
- Compatible with automatic insertion equipment
- Superior package integrity
- Marking on contrasting background for permanent identification
- Now available with improved tolerance to  $\pm 0.5\%$

## 4300M Series - Thick Film Molded SIPs

### Product Characteristics

Resistance Range ..... 10 ohms to 10 megohms  
 Maximum Operating Voltage ..... 100 V  
 Temperature Coefficient of Resistance  
 50 ohms to 2.2 megohms  $\pm 100$  ppm/ $^{\circ}$ C  
 below 50 ohms  $\pm 250$  ppm/ $^{\circ}$ C  
 above 2.2 megohms  $\pm 250$  ppm/ $^{\circ}$ C  
 TCR Tracking ..... 50 ppm/ $^{\circ}$ C  
 maximum; equal values  
 Resistor Tolerance ..... See circuits  
 Operating Temperature  
 ..... -55  $^{\circ}$ C to +125  $^{\circ}$ 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 .....  $\Delta R$  MAX.  
 Short Time Overload .....  $\pm 0.25\%$   
 Load Life .....  $\pm 1.00\%$   
 Moisture Resistance .....  $\pm 0.50\%$   
 Resistance to Soldering Heat  
 .....  $\pm 0.25\%$   
 Terminal Strength .....  $\pm 0.25\%$   
 Thermal Shock .....  $\pm 0.25\%$

### Physical Characteristics

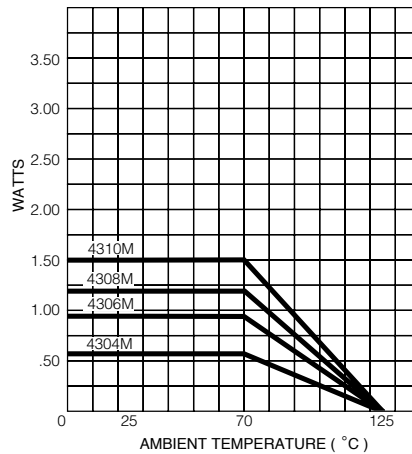
Flammability ..... Conforms to UL94V-0  
 Lead Frame Material  
 ..... Copper, solder coated  
 Body Material ..... Novolac epoxy

### How To Order

**43 06 M - 101 - 222**

Model \_\_\_\_\_  
 (43 = Molded SIP)  
 Number of Pins \_\_\_\_\_  
 Physical Config. \_\_\_\_\_  
 (M = Thick Film Medium Profile)  
 Electrical Configuration \_\_\_\_\_  
 • 101 = Bussed  
 • 102 = Isolated  
 • 104 = 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 104:  
 LF = Tin-plated (RoHS compliant version)  
 • ONLY electrical configuration 104:  
 L = Tin-plated (RoHS compliant version)  
 • Blank = Tin/Lead-plated  
 Consult factory for other available options.

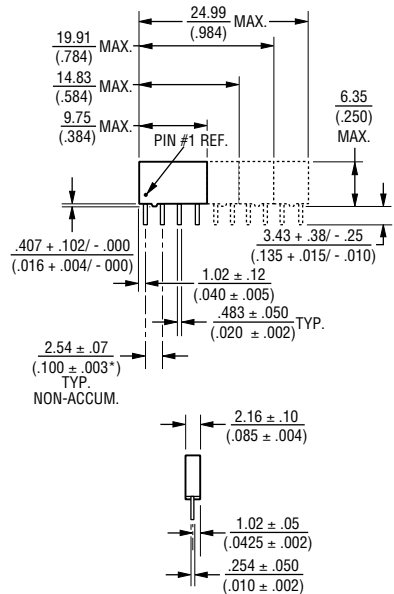
### Package Power Temp. Derating Curve



### Package Power Rating at 70 °C

4304M ..... 0.60 watts  
 4306M ..... 0.90 watts  
 4308M ..... 1.20 watts  
 4310M ..... 1.50 watts

### Product Dimensions

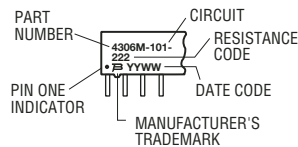


Governing dimensions are in metric. Dimensions in parentheses are inches and are approximate.

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

### Typical Part Marking

Represents total content. Layout may vary.



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

\*RoHS Directive 2002/95/EC Jan 27 2003 including Annex  
 Specifications are subject to change without notice.  
 Customers should verify actual device performance in their specific applications.

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

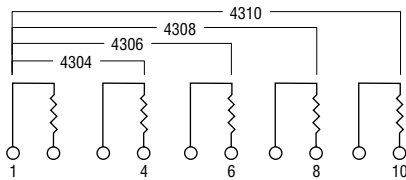
- [DRAM Applications](#)
- [Dual Terminator Resistor Networks](#)
- [R/2R Ladder Networks](#)
- [SCSI Applications](#)

# 4300M Series - Thick Film Molded SIPs



## Isolated Resistors (102 Circuit)

- Model 4304M-102-RC (4 Pin)
- Model 4306M-102-RC (6 Pin)
- Model 4308M-102-RC (8 Pin)
- Model 4310M-102-RC (10 Pin)



These models incorporate 2, 3, 4, or 5 isolated thick-film resistors of equal value, each connected between two pins.

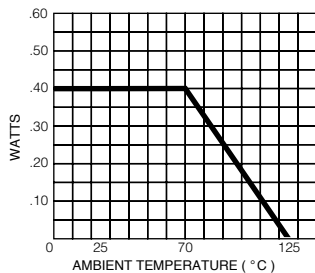
### Resistance Tolerance

10 ohms to 49 ohms .....±1 ohm  
 50 ohms to 5 megohms.....±2 %\*  
 Above 5 megohms.....±5 %

### Power Rating per Resistor

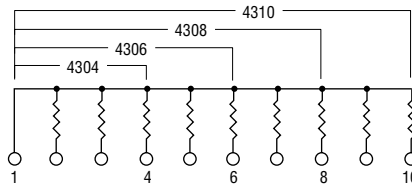
At 70 °C .....0.40 watt

### Power Temperature Derating Curve



## Bussed Resistors (101 Circuit)

- Model 4304M-101-RC (4 Pin)
- Model 4306M-101-RC (6 Pin)
- Model 4308M-101-RC (8 Pin)
- Model 4310M-101-RC (10 Pin)



These models incorporate 3, 5, 7, or 9 thick-film resistors of equal value, each connected between a common bus (pin 1) and a separate pin.

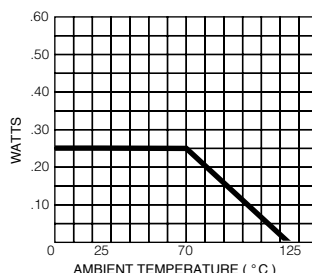
### Resistance Tolerance

10 ohms to 49 ohms .....±1 ohm  
 50 ohms to 5 megohms.....±2 %\*  
 Above 5 megohms.....±5 %

### Power Rating per Resistor

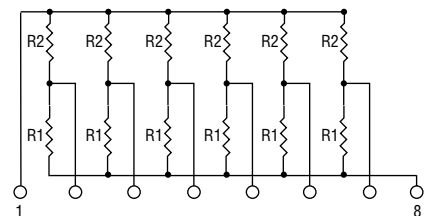
At 70 °C .....0.25 watt

### Power Temperature Derating Curve



## Dual Terminator (104 Circuit)

- Model 4304M-104-R1/R2
- Model 4306M-104-R1/R2
- Model 4308M-104-R1/R2 (shown)
- Model 4310M-104-R1/R2



4308M-104 (shown above) is an 8-pin configuration and terminates 6 lines. Pins 1 and 8 are common for ground and power, respectively. Twelve thick-film resistors are paired in series between the common lines (pins 1 and 8).

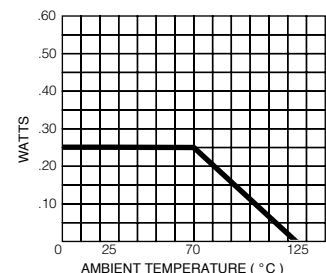
### Resistance Tolerance

Below 100 ohms.....±2 ohms  
 100 ohms to 5 megohms.....±2 %\*  
 Above 5 megohms.....±5 %

### Power Rating per Resistor

At 70 °C .....0.25 watt

### Power Temperature Derating Curve



## Popular Resistance Values (101, 102 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.

## Popular Resistance Values (104 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            |