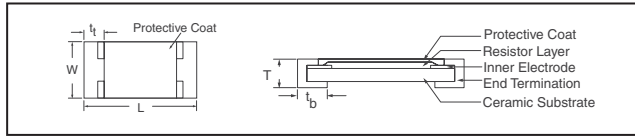


# YAGEO Surface Mount 1% & 5% Thick Film Chip Resistors



**Description:** The resistors are constructed on a high grade ceramic body (aluminum oxide). Internal metal electrodes are added at each end and connected by a resistive paste which is applied to the top surface of the substrate. The composition of the paste is adjusted to give the approximate resistance required and the value is trimmed to within tolerance, by laser cutting of the resistive layer. The resistive layer is covered with a protective coat. Finally, the two external end terminations are added. For ease of soldering the outer layer of these end terminations is a lead/tin alloy. End terminations on RoHS Compliant parts are pure tin.



| Size | Power Rating at 70°C | Working Voltage (Maximum) | Dimensions (mm) |      |      |                |                | Resistance Range  | Temperature Coefficient |
|------|----------------------|---------------------------|-----------------|------|------|----------------|----------------|---|-------------------------|
|      |                      |                           | L               | W    | T    | t <sub>t</sub> | t <sub>b</sub> |   |                         |
| 0402 | 1/16W                | 50V                       | 1.00            | 0.50 | 0.35 | 0.20           | 0.25           | 5%<br>1%<br>10Ω < R ≤ 10MΩ ±100ppm/°C<br>1Ω < R ≤ 10MΩ ±200ppm/°C     |                         |
| 0603 | 1/10W                | 50V                       | 1.60            | 0.80 | 0.45 | 0.25           | 0.25           | 5%<br>1%<br>10Ω < R ≤ 10MΩ ±100ppm/°C<br>R ≤ 10Ω; R > 10MΩ ±200ppm/°C |                         |
| 0805 | 1/8W                 | 150V                      | 2.00            | 1.25 | 0.50 | 0.35           | 0.35           | 5%<br>1%<br>10Ω < R ≤ 10MΩ ±100ppm/°C<br>R ≤ 10Ω; R > 10MΩ ±200ppm/°C |                         |
| 1206 | 1/4W                 | 200V                      | 3.10            | 1.60 | 0.55 | 0.45           | 0.40           | 5%<br>1%<br>10Ω < R ≤ 10MΩ ±100ppm/°C<br>R ≤ 10Ω; R > 10MΩ ±200ppm/°C |                         |

## 1%, 1/10 Watt — 0603 Series

### Resistor Values

|      |      |      |     |     |       |       |       |       |       |       |      |       |
|------|------|------|-----|-----|-------|-------|-------|-------|-------|-------|------|-------|
| 1.00 | 17.4 | 43.2 | 115 | 301 | 750   | 2.05K | 5.10K | 13.3K | 34.8K | 88.7K | 240K | 590K  |
| 2.00 | 17.8 | 44.2 | 118 | 309 | 768   | 2.10K | 5.11K | 13.7K | 35.7K | 90.9K | 243K | 604K  |
| 2.10 | 18.0 | 45.3 | 120 | 316 | 787   | 2.15K | 5.23K | 14.0K | 36.0K | 91.0K | 249K | 619K  |
| 2.15 | 18.2 | 46.4 | 121 | 324 | 806   | 2.20K | 5.36K | 14.3K | 36.5K | 93.1K | 255K | 620K  |
| 2.21 | 18.7 | 47.0 | 124 | 330 | 820   | 2.21K | 5.49K | 14.7K | 37.4K | 95.3K | 261K | 634K  |
| 2.43 | 19.1 | 47.5 | 127 | 332 | 825   | 2.26K | 5.60K | 15.0K | 38.3K | 97.6K | 267K | 649K  |
| 2.49 | 19.6 | 48.7 | 130 | 340 | 845   | 2.32K | 5.62K | 15.4K | 39.0K | 100K  | 270K | 665K  |
| 2.74 | 20.0 | 49.9 | 133 | 348 | 866   | 2.37K | 5.76K | 15.8K | 39.2K | 102K  | 274K | 680K  |
| 3.01 | 20.5 | 51.0 | 137 | 357 | 887   | 2.40K | 5.90K | 16.0K | 40.2K | 105K  | 280K | 691K  |
| 3.32 | 21.0 | 51.1 | 140 | 360 | 909   | 2.43K | 6.04K | 16.2K | 41.2K | 107K  | 287K | 698K  |
| 3.92 | 21.5 | 52.3 | 143 | 365 | 910   | 2.49K | 6.19K | 16.5K | 42.2K | 110K  | 294K | 715K  |
| 4.02 | 22.0 | 53.6 | 147 | 374 | 931   | 2.55K | 6.20K | 16.9K | 43.0K | 113K  | 300K | 732K  |
| 4.42 | 22.1 | 54.9 | 150 | 383 | 953   | 2.61K | 6.34K | 17.4K | 43.2K | 115K  | 301K | 750K  |
| 4.75 | 22.6 | 56.0 | 154 | 390 | 976   | 2.67K | 6.49K | 17.8K | 44.2K | 118K  | 309K | 768K  |
| 4.99 | 23.2 | 56.2 | 158 | 392 | 1000  | 2.70K | 6.65K | 18.0K | 45.3K | 120K  | 316K | 787K  |
| 5.11 | 23.7 | 57.6 | 160 | 402 | 102K  | 2.74K | 6.80K | 18.2K | 46.4K | 121K  | 324K | 806K  |
| 5.23 | 24.0 | 59.0 | 162 | 412 | 105K  | 2.80K | 6.81K | 18.7K | 47.0K | 124K  | 330K | 820K  |
| 5.62 | 24.3 | 60.4 | 165 | 422 | 107K  | 2.87K | 6.98K | 19.1K | 47.5K | 127K  | 332K | 825K  |
| 5.76 | 24.9 | 61.9 | 169 | 430 | 110K  | 2.94K | 7.15K | 19.6K | 48.7K | 130K  | 340K | 845K  |
| 6.04 | 25.5 | 62.0 | 174 | 432 | 113K  | 3.00K | 7.32K | 20.0K | 49.9K | 133K  | 348K | 866K  |
| 6.81 | 26.1 | 63.4 | 178 | 442 | 115K  | 3.01K | 7.50K | 20.5K | 51.0K | 137K  | 357K | 887K  |
| 7.50 | 26.7 | 64.9 | 180 | 453 | 118K  | 3.09K | 7.68K | 21.0K | 51.1K | 140K  | 360K | 909K  |
| 10.0 | 27.0 | 66.5 | 182 | 464 | 120K  | 3.16K | 7.87K | 21.5K | 52.3K | 143K  | 365K | 910K  |
| 10.2 | 27.4 | 68.0 | 187 | 470 | 1.21K | 3.24K | 8.06K | 22.0K | 53.6K | 147K  | 374K | 931K  |
| 10.5 | 28.0 | 68.1 | 191 | 475 | 1.24K | 3.30K | 8.20K | 22.1K | 54.9K | 150K  | 383K | 953K  |
| 10.7 | 28.7 | 69.8 | 196 | 487 | 1.27K | 3.32K | 8.25K | 22.6K | 56.2K | 154K  | 390K | 976K  |
| 11.0 | 29.4 | 71.5 | 200 | 499 | 1.30K | 3.40K | 8.45K | 23.2K | 57.6K | 158K  | 392K | 1.00M |
| 11.3 | 30.0 | 73.2 | 205 | 511 | 1.33K | 3.48K | 8.60K | 23.7K | 59.0K | 160K  | 402K | 1.12M |
| 11.5 | 30.1 | 75.0 | 210 | 511 | 1.37K | 3.57K | 8.77K | 24.0K | 60.4K | 162K  | 412K | 1.21M |
| 11.8 | 30.9 | 76.8 | 215 | 523 | 1.40K | 3.60K | 8.90K | 24.3K | 61.9K | 165K  | 420K | 1.50M |
| 12.0 | 31.6 | 78.7 | 220 | 536 | 1.43K | 3.65K | 9.10K | 24.9K | 62.0K | 169K  | 430K | 2.00M |
| 12.1 | 32.4 | 80.6 | 221 | 549 | 1.47K | 3.74K | 9.31K | 25.5K | 63.4K | 174K  | 432K | 2.21M |
| 12.4 | 33.0 | 82.0 | 226 | 560 | 1.50K | 3.83K | 9.53K | 26.1K | 64.9K | 178K  | 442K | 2.49M |
| 12.7 | 33.2 | 82.5 | 232 | 562 | 1.54K | 3.90K | 9.76K | 26.7K | 66.5K | 180K  | 453K | 2.94M |
| 13.0 | 34.0 | 84.5 | 237 | 576 | 1.58K | 3.92K | 10.0K | 27.0K | 68.0K | 182K  | 464K | 3.01M |
| 13.3 | 34.8 | 88.7 | 240 | 590 | 1.60K | 4.02K | 10.2K | 27.4K | 68.1K | 187K  | 470K | 4.70M |
| 13.7 | 35.7 | 90.9 | 243 | 604 | 1.62K | 4.12K | 10.5K | 28.0K | 69.8K | 191K  | 475K | 4.75M |
| 14.0 | 36.0 | 91.0 | 249 | 619 | 1.65K | 4.22K | 10.7K | 28.7K | 71.5K | 196K  | 487K | 7.00M |
| 14.3 | 36.5 | 93.1 | 255 | 620 | 1.69K | 4.30K | 11.0K | 29.4K | 73.2K | 200K  | 499K |       |
| 14.7 | 37.4 | 95.3 | 261 | 634 | 1.74K | 4.32K | 11.3K | 30.0K | 75.0K | 205K  | 510K |       |
| 15.0 | 38.3 | 97.6 | 267 | 649 | 1.78K | 4.42K | 11.5K | 30.1K | 76.8K | 210K  | 511K |       |
| 15.4 | 39.0 | 100  | 270 | 665 | 1.80K | 4.53K | 11.8K | 30.9K | 78.7K | 215K  | 523K |       |
| 15.8 | 39.2 | 102  | 274 | 680 | 1.82K | 4.64K | 12.0K | 31.6K | 80.6K | 220K  | 536K |       |
| 16.0 | 40.2 | 105  | 280 | 681 | 1.87K | 4.70K | 12.1K | 32.4K | 82.0K | 221K  | 549K |       |
| 16.2 | 41.2 | 107  | 287 | 698 | 1.91K | 4.75K | 12.4K | 33.0K | 82.5K | 226K  | 560K |       |
| 16.5 | 42.2 | 110  | 294 | 715 | 1.96K | 4.87K | 12.7K | 33.2K | 84.5K | 232K  | 562K |       |
| 16.9 | 43.0 | 113  | 300 | 732 | 2.00K | 4.99K | 13.0K | 34.0K | 86.6K | 237K  | 576K |       |

| Value Range           | Digi-Key Part No. | Cut Tape Pricing 10 50 200 | Tape and Reel Qty. |       | Yageo Part No.    |
|-----------------------|-------------------|----------------------------|--------------------|-------|-------------------|
|                       |                   |                            | Qty.               | Price |                   |
| 2.10 - 5.23Ω          | 311-(Value)HCT-ND | .56 1.50 3.46              | —                  | —     | 9C06031AxxxxFGHFT |
| 10.2 - 976K           | 311-(Value)HCT-ND | .56 1.50 3.46              | —                  | —     | 9C06031AxxxxFKHFT |
| <b>RoHS Compliant</b> |                   |                            |                    |       |                   |
| 1.00 - 10.0MΩ         | 311-(Value)HRC-ND | .49 1.31 3.03              | 5,000              | 1.96M | RC0603FR-07xxxxL  |

For Tape and Reel part number, change CT-ND to TR-ND.

| Digi-Key® Assortment Kits 0603 Series 1% Thick Film Chip Resistor Kits - 1/10 Watt — RoHS Compliant |   |       |             |   |       |
|---|---|-------|-------------|---|-------|
| PHH1-KIT-ND   | 50 each of values 1.00Ω - 7.50Ω (22 values (1,100 total pieces))  | 14.48 | PHH4-KIT-ND | 50 each of values 1.00KΩ - 9.76KΩ (114 values (5,700 total pieces)) | 58.04 |
| PHH2-KIT-ND   | 50 each of values 10.0Ω - 97.6Ω (113 values (5,650 total pieces)) | 58.04 | PHH5-KIT-ND | 50 each of values 10.0KΩ - 97.6KΩ (114 values (5,700 total pieces)) | 58.04 |
| PHH3-KIT-ND   | 50 each of values 100Ω - 976Ω (114 values (5,700 total pieces))   | 58.04 | PHH6-KIT-ND | 50 each of values 100KΩ - 1.00MΩ (115 values (5,750 total pieces))  | 58.04 |

## 1%, 1/16 Watt — 0402 Series

### Resistor Values

|      |      |     |       |       |       |       |       |       |       |       |       |      |      |       |
|------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| 1.00 | 36.0 | 150 | 470   | 1.20K | 3.30K | 6.49K | 11.0K | 18.0K | 30.1K | 47.0K | 68.0K | 110K | 226K | 470K  |
| 1.50 | 39.0 | 160 | 499   | 1.21K | 3.74K | 6.80K | 11.3K | 19.1K | 33.0K | 47.5K | 78.7K | 120K | 240K | 499K  |
| 2.20 | 49.0 | 180 | 510   | 1.50K | 3.90K | 7.50K | 11.5K | 20.0K | 35.0K | 49.0K | 80.6K | 121K | 249K | 510K  |
| 3.30 | 51.0 | 220 | 511   | 1.80K | 3.92K | 7.87K | 12.0K | 21.0K | 36.0K | 51.0K | 82.0K | 124K | 261K | 560K  |
| 4.70 | 56.0 | 280 | 560   | 1.82K | 4.30K | 8.06K | 12.1K | 22.0K | 39.0K | 51.1K | 82.5K | 127K | 270K | 562K  |
| 10.0 | 62.0 | 300 | 620   | 1.96K | 4.64K | 8.20K | 13.0K | 22.1K | 39.2K | 53.6K | 88.7K | 150K | 300K | 620K  |
| 22.0 | 68.0 | 301 | 680   | 2.20K | 5.10K | 8.87K | 14.0K | 24.9K | 40.2K | 56.0K | 90.9K | 180K | 301K | 649K  |
| 24.9 | 68.1 | 330 | 715   | 2.21K | 5.36K | 9.10K | 15.0K | 26.1K | 42.2K | 60.4K | 91.0K | 187K | 332K | 768K  |
| 26.1 | 75.0 | 332 | 910   | 2.40K | 5.49K | 9.53K | 16.0K | 27.0K | 43.0K | 61.9K | 95.3K | 200K | 360K | 1.00M |
| 28.0 | 100  | 430 | 1.00K | 2.70K | 5.62K | 10.0K | 16.2K | 28.0K | 45.3K | 62.0K | 97.6K | 210K | 430K | 3.30M |
| 33.0 | 120  | 464 | 1.10K | 3.01K | 6.20K | 10.7K | 17.4K | 30.0K | 46.4K | 64.9K | 100K  | 220K | 442K | 3.60M |

| Value Range           | Digi-Key Part No.  | Cut Tape Pricing 10 50 200 | Tape and Reel Qty. |       | Yageo Part No.    |
|-----------------------|--------------------|----------------------------|--------------------|-------|-------------------|
|                       |                    |                            | Qty.               | Price |                   |
| 26.1 - 768KΩ          | 311-(Value)LCT-ND  | .49 1.31 3.03              | —                  | —     | 9C04021AxxxxFLHF3 |
| <b>RoHS Compliant</b> |                    |                            |                    |       |                   |
| 1.00 - 3.60MΩ         | 311-(Value)LRCT-ND | .49 1.31 3.03              | 10,000             | 1.77M | RC0402FR-07xxxxL  |

For Tape and Reel part number, change CT-ND to TR-ND.

| Digi-Key® Assortment Kits 0402 Series 1% Thick Film Chip Resistor Kits - 1/16 Watt — RoHS Compliant |       | PH3-KIT-ND   |       | PH4-KIT-ND   |       | PH5-KIT-ND   |       |
|---|-------|--|-------|--|-------|--|-------|
| 17 values (850 total pieces)  | 15.21 | 50 each of values 1.00Ω - 75.0Ω (33 values (1,650 total pieces)) | 26.10 | 50 each of values 10.0KΩ - 97.6KΩ (56 values (2,800 total pieces)) | 43.52 | 50 each of values 100Ω - 910Ω (32 values (1,600 total pieces)) | 29.00 |

## 1%, 1/8 Watt — 0805 Series

### Resistor Values

|      |      |      |      |      |     |     |       |       |       |       |       |      |      |       |       |
|------|------|------|------|------|-----|-----|-------|-------|-------|-------|-------|------|------|-------|-------|
| 1.00 | 3.01 | 8.66 | 24.9 | 63.4 | 180 | 470 | 1.27K | 3.48K | 9.09K | 25.5K | 64.9K | 182K | 475K | 1.37M | 4.22M |
| 1.02 | 3.09 | 8.87 | 25.5 | 64.9 | 182 | 475 | 1.30K | 3.57K | 9.10K | 26.1K | 66.5K | 187K | 487K | 1.40M | 4.32M |
| 1.05 | 3.16 | 9.09 | 26.1 | 66.5 | 187 | 487 | 1.33K | 3.60K | 9.31K | 26.7K | 68.0K | 191K | 499K | 1.43M | 4.42M |
| 1.10 | 3.24 | 9.31 | 26.7 | 68.0 | 191 | 499 | 1.37K | 3.65K | 9.53K | 27.0K | 68.1K | 196K | 510K | 1.47M | 4.53M |
| 1.10 | 3.32 | 9.53 | 27.0 | 68.1 | 196 | 510 | 1.40K | 3.74K | 9.76K | 27.4K | 69.8K | 200K | 511K | 1.50M | 4.64M |
| 1.13 | 3.40 | 9.76 | 27.4 | 69.8 | 200 | 511 | 1.43K | 3.83K | 10.0K | 28.0K | 71.5K | 205K | 523K | 1.54M | 4.70M |
| 1.15 | 3.48 | 10.0 | 28.0 | 71.5 | 205 | 523 | 1.47K | 3.90K | 10.2K | 28.7K | 73.2K | 210K | 536K | 1.58M | 4.75M |
| 1.18 | 3.57 | 10.2 | 28.7 | 73.2 | 210 | 536 | 1.50K | 3.92K | 10.5K | 29.4K | 75.0K | 215K | 549K | 1.62M | 4.87M |
| 1.21 | 3.65 | 10.5 | 29.4 | 75.0 | 215 | 549 | 1.54K | 4.02K | 10.7K | 30.0K | 76.8K | 220K | 560K | 1.65M | 4.99M |
| 1.24 | 3.74 | 10.7 | 30.0 | 76.8 | 220 | 560 | 1.58K | 4.12K | 11.0K | 30.1K | 78.7K | 221K | 562K | 1.69M | 5.11M |
| 1.27 | 3.83 | 11.0 | 30.1 | 78.7 | 221 | 562 | 1.60K | 4.22K |       |       |       |      |      |       |       |

**YAGEO Surface Mount 1% & 5% Thick Film Chip Resistors (Cont.)**



**1%, 1/4 Watt — 1206 Series**

**Resistor Values**

|      |      |      |      |      |     |       |       |       |       |       |      |       |       |       |
|------|------|------|------|------|-----|-------|-------|-------|-------|-------|------|-------|-------|-------|
| 1.00 | 3.09 | 8.87 | 27.4 | 78.7 | 243 | 681   | 2.20K | 6.19K | 19.1K | 56.0K | 174K | 499K  | 1.54M | 4.42M |
| 1.02 | 3.16 | 9.09 | 28.0 | 80.6 | 249 | 698   | 2.21K | 6.20K | 19.6K | 56.2K | 178K | 510K  | 1.58M | 4.53M |
| 1.05 | 3.24 | 9.10 | 28.7 | 82.0 | 255 | 715   | 2.26K | 6.34K | 20.0K | 57.6K | 180K | 511K  | 1.60M | 4.64M |
| 1.07 | 3.30 | 9.31 | 29.4 | 82.5 | 261 | 732   | 2.32K | 6.49K | 20.5K | 59.0K | 182K | 523K  | 1.62M | 4.70M |
| 1.10 | 3.32 | 9.53 | 30.0 | 84.5 | 267 | 750   | 2.37K | 6.65K | 21.0K | 60.4K | 187K | 536K  | 1.65M | 4.75M |
| 1.13 | 3.40 | 9.76 | 30.1 | 86.6 | 270 | 768   | 2.40K | 6.80K | 21.5K | 61.9K | 191K | 549K  | 1.69M | 4.87M |
| 1.15 | 3.48 | 10.0 | 30.9 | 88.7 | 274 | 787   | 2.43K | 6.81K | 22.0K | 62.0K | 196K | 560K  | 1.74M | 4.99M |
| 1.18 | 3.57 | 10.2 | 31.6 | 90.9 | 280 | 806   | 2.49K | 6.98K | 22.1K | 63.4K | 200K | 562K  | 1.78M | 5.10M |
| 1.20 | 3.60 | 10.5 | 32.4 | 91.0 | 287 | 820   | 2.55K | 7.15K | 22.6K | 64.9K | 205K | 576K  | 1.80M | 5.11M |
| 1.21 | 3.65 | 10.7 | 33.0 | 93.1 | 294 | 825   | 2.61K | 7.32K | 23.2K | 66.5K | 210K | 590K  | 1.82M | 5.23M |
| 1.24 | 3.74 | 11.0 | 33.2 | 95.3 | 300 | 845   | 2.67K | 7.50K | 23.7K | 68.0K | 215K | 604K  | 1.87M | 5.36M |
| 1.27 | 3.83 | 11.3 | 34.0 | 97.6 | 301 | 866   | 2.70K | 7.68K | 24.0K | 68.1K | 220K | 619K  | 1.91M | 5.49M |
| 1.30 | 3.90 | 11.5 | 34.8 | 100  | 309 | 887   | 2.74K | 7.87K | 24.3K | 69.8K | 221K | 620K  | 1.96M | 5.60M |
| 1.33 | 3.92 | 11.8 | 35.7 | 102  | 316 | 909   | 2.80K | 8.06K | 24.9K | 71.5K | 226K | 634K  | 2.00M | 5.62M |
| 1.37 | 4.02 | 12.0 | 36.0 | 105  | 324 | 910   | 2.87K | 8.20K | 25.5K | 73.2K | 232K | 649K  | 2.05M | 5.73M |
| 1.40 | 4.12 | 12.1 | 36.5 | 107  | 330 | 931   | 2.94K | 8.25K | 26.1K | 75.0K | 237K | 665K  | 2.10M | 5.90M |
| 1.43 | 4.22 | 12.4 | 37.4 | 110  | 332 | 953   | 3.00K | 8.45K | 26.7K | 76.8K | 240K | 680K  | 2.15M | 6.07M |
| 1.47 | 4.30 | 12.7 | 38.3 | 113  | 340 | 976   | 3.01K | 8.66K | 27.0K | 78.7K | 243K | 681K  | 2.20M | 6.19M |
| 1.50 | 4.32 | 13.0 | 39.0 | 115  | 348 | 1.00K | 3.01K | 8.87K | 28.0K | 80.6K | 249K | 698K  | 2.21M | 6.20M |
| 1.54 | 4.42 | 13.3 | 39.2 | 118  | 357 | 1.02K | 3.16K | 9.09K | 28.7K | 82.0K | 255K | 715K  | 2.26M | 6.34M |
| 1.58 | 4.53 | 13.7 | 40.2 | 120  | 360 | 1.05K | 3.24K | 9.10K | 29.4K | 82.5K | 261K | 732K  | 2.32M | 6.49M |
| 1.60 | 4.64 | 14.0 | 41.2 | 121  | 365 | 1.07K | 3.30K | 9.31K | 30.0K | 84.5K | 267K | 750K  | 2.37M | 6.65M |
| 1.62 | 4.70 | 14.3 | 42.2 | 124  | 374 | 1.10K | 3.32K | 9.53K | 30.1K | 86.6K | 270K | 768K  | 2.40M | 6.80M |
| 1.65 | 4.75 | 14.7 | 43.0 | 127  | 383 | 1.13K | 3.40K | 9.76K | 30.9K | 88.7K | 274K | 787K  | 2.43M | 6.81M |
| 1.69 | 4.87 | 15.0 | 43.2 | 130  | 390 | 1.15K | 3.48K | 10.0K | 31.6K | 90.9K | 280K | 806K  | 2.49M | 6.98M |
| 1.74 | 4.99 | 15.4 | 44.2 | 133  | 392 | 1.18K | 3.57K | 10.2K | 32.4K | 91.0K | 287K | 820K  | 2.55M | 7.15M |
| 1.78 | 5.10 | 15.8 | 45.3 | 137  | 402 | 1.20K | 3.60K | 10.5K | 33.0K | 93.1K | 294K | 825K  | 2.61M | 7.32M |
| 1.80 | 5.11 | 16.0 | 46.4 | 140  | 412 | 1.21K | 3.65K | 10.7K | 33.2K | 95.3K | 300K | 845K  | 2.67M | 7.50M |
| 1.82 | 5.23 | 16.2 | 47.0 | 143  | 422 | 1.24K | 3.74K | 11.0K | 34.0K | 97.6K | 301K | 866K  | 2.70M | 7.68M |
| 1.87 | 5.36 | 16.5 | 47.5 | 147  | 430 | 1.27K | 3.83K | 11.3K | 34.8K | 100K  | 309K | 887K  | 2.74M | 7.87M |
| 1.91 | 5.49 | 16.9 | 48.7 | 150  | 432 | 1.30K | 3.90K | 11.5K | 35.7K | 102K  | 316K | 909K  | 2.80M | 8.06M |
| 1.96 | 5.60 | 17.4 | 49.9 | 154  | 442 | 1.33K | 3.92K | 11.8K | 36.0K | 105K  | 324K | 910K  | 2.87M | 8.20M |
| 2.00 | 5.62 | 17.8 | 51.0 | 158  | 453 | 1.37K | 4.02K | 12.0K | 36.5K | 107K  | 330K | 931K  | 2.94M | 8.25M |
| 2.05 | 5.76 | 18.0 | 51.1 | 160  | 464 | 1.40K | 4.12K | 12.1K | 37.4K | 110K  | 332K | 953K  | 3.00M | 8.45M |
| 2.10 | 5.80 | 18.2 | 52.9 | 162  | 470 | 1.43K | 4.22K | 12.4K | 38.3K | 113K  | 340K | 976K  | 3.01K | 8.66M |
| 2.15 | 6.04 | 18.7 | 53.6 | 165  | 475 | 1.47K | 4.30K | 12.7K | 39.0K | 115K  | 348K | 1.00M | 3.09M | 8.87M |
| 2.20 | 6.19 | 19.1 | 54.9 | 169  | 487 | 1.50K | 4.32K | 13.0K | 39.2K | 118K  | 357K | 1.02M | 3.16M | 9.09M |
| 2.21 | 6.20 | 19.6 | 56.0 | 174  | 499 | 1.54K | 4.42K | 13.3K | 40.2K | 120K  | 360K | 1.05M | 3.24M | 9.10M |
| 2.26 | 6.34 | 20.0 | 56.2 | 178  | 510 | 1.58K | 4.53K | 13.7K | 41.2K | 121K  | 365K | 1.07M | 3.30M | 9.31M |
| 2.32 | 6.49 | 20.5 | 57.6 | 180  | 511 | 1.60K | 4.64K | 14.0K | 42.2K | 124K  | 374K | 1.10M | 3.32M | 9.53M |
| 2.37 | 6.65 | 21.0 | 59.0 | 182  | 523 | 1.62K | 4.70K | 14.3K | 43.0K | 127K  | 383K | 1.13M | 3.40M | 9.76M |
| 2.40 | 6.80 | 21.5 | 60.4 | 187  | 536 | 1.65K | 4.75K | 14.7K | 43.2K | 130K  | 390K | 1.15M | 3.48M | 10.0M |
| 2.43 | 6.81 | 22.0 | 61.9 | 191  | 549 | 1.69K | 4.87K | 15.0K | 44.2K | 133K  | 392K | 1.18M | 3.57M |       |
| 2.49 | 6.98 | 22.1 | 62.0 | 196  | 560 | 1.74K | 4.99K | 15.4K | 45.3K | 137K  | 402K | 1.20M | 3.60M |       |
| 2.55 | 7.15 | 22.6 | 63.4 | 200  | 562 | 1.78K | 5.10K | 15.8K | 46.4K | 140K  | 412K | 1.21M | 3.65M |       |
| 2.61 | 7.32 | 23.2 | 64.9 | 205  | 576 | 1.80K | 5.11K | 16.0K | 47.0K | 143K  | 422K | 1.24M | 3.74M |       |
| 2.67 | 7.50 | 23.7 | 66.5 | 210  | 590 | 1.82K | 5.23K | 16.2K | 47.5K | 147K  | 430K | 1.27M | 3.83M |       |
| 2.70 | 7.68 | 24.0 | 68.0 | 215  | 604 | 1.87K | 5.36K | 16.5K | 48.7K | 150K  | 432K | 1.30M | 3.90M |       |
| 2.74 | 7.87 | 24.3 | 68.1 | 220  | 619 | 1.91K | 5.49K | 16.9K | 49.9K | 154K  | 442K | 1.33M | 3.92M |       |
| 2.80 | 8.06 | 24.9 | 69.8 | 221  | 620 | 1.96K | 5.60K | 17.4K | 51.0K | 158K  | 453K | 1.37M | 4.02M |       |
| 2.87 | 8.20 | 25.5 | 71.5 | 226  | 634 | 2.00K | 5.62K | 17.8K | 51.1K | 160K  | 464K | 1.40M | 4.12M |       |
| 2.94 | 8.25 | 26.1 | 73.2 | 232  | 649 | 2.05K | 5.76K | 18.0K | 52.3K | 162K  | 470K | 1.43M | 4.22M |       |
| 3.00 | 8.45 | 26.7 | 75.0 | 237  | 665 | 2.10K | 5.90K | 18.2K | 53.6K | 165K  | 475K | 1.47M | 4.30M |       |
| 3.01 | 8.66 | 27.0 | 76.8 | 240  | 680 | 2.15K | 6.04K | 18.7K | 54.9K | 169K  | 487K | 1.50M | 4.32M |       |

**5%, 1/10 Watt — 0603 Series**

**Resistor Values**

|     |     |    |    |     |     |      |      |     |     |      |      |      |      |
|-----|-----|----|----|-----|-----|------|------|-----|-----|------|------|------|------|
| 0.0 | 3.3 | 10 | 33 | 100 | 330 | 1.0K | 3.3K | 10K | 33K | 100K | 330K | 1.0M | 3.3M |
| 1.0 | 3.6 | 11 | 36 | 110 | 360 | 1.1K | 3.6K | 11K | 36K | 110K | 360K | 1.1M | 3.6M |
| 1.1 | 3.9 | 12 | 39 | 120 | 390 | 1.2K | 3.9K | 12K | 39K | 120K | 390K | 1.2M | 3.9M |
| 1.2 | 4.3 | 13 | 43 | 130 | 430 | 1.3K | 4.3K | 13K | 43K | 130K | 430K | 1.3M | 4.3M |
| 1.3 | 4.7 | 15 | 47 | 150 | 470 | 1.5K | 4.7K | 15K | 47K | 150K | 470K | 1.5M | 4.7M |
| 1.5 | 5.1 | 16 | 51 | 160 | 510 | 1.6K | 5.1K | 16K | 51K | 160K | 510K | 1.6M | 5.1M |
| 1.6 | 5.6 | 18 | 56 | 180 | 560 | 1.8K | 5.6K | 18K | 56K | 180K | 560K | 1.8M | 5.6M |
| 1.8 | 6.2 | 20 | 62 | 200 | 620 | 2.0K | 6.2K | 20K | 62K | 200K | 620K | 2.0M | 6.2M |
| 2.2 | 6.8 | 22 | 68 | 220 | 680 | 2.2K | 6.8K | 22K | 68K | 220K | 680K | 2.2M | 6.8M |
| 2.4 | 7.5 | 24 | 75 | 240 | 750 | 2.4K | 7.5K | 24K | 75K | 240K | 750K | 2.4M | 7.5M |
| 2.7 | 8.2 | 27 | 82 | 270 | 820 | 2.7K | 8.2K | 27K | 82K | 270K | 820K | 2.7M | 8.2M |
| 3.0 | 9.1 | 30 | 91 | 300 | 910 | 3.0K | 9.1K | 30K | 91K | 300K | 910K | 3.0M | 9.1M |

| Value Range           | Digi-Key Part No.  | Cut Tape Pricing | Tape and Reel Qty. | Price         | Yageo Part No.   |
|-----------------------|--------------------|------------------|--------------------|---------------|------------------|
| 1.1 - 8.2MΩ           | 311-(Value)GCT-ND  | 10 50 200        | —                  | .51 1.37 3.15 | —                |
| <b>RoHS Compliant</b> |                    |                  |                    |               |                  |
| 0.0 - 10MΩ            | 311-(Value)GRCT-ND | .46 1.26 2.90    | 5,000              | 1.51/M        | RC0603JR-07xxxxL |

For Tape and Reel part number, change CT-ND to TR-ND.

**Digi-Key® Assortment Kits 0603 Series**  
**5% Thick Film Chip Resistor Kits - 1/10 Watt — RoHS Compliant**

**PHG1A-KIT-ND** 50 each of every other value from 1.0, 1.2, 1.5, 1.8, etc. - 910KΩ 72 values (3,600 total pieces) ..... **36.26**

**PHG2A-KIT-ND** 50 each of every other value from 1.1, 1.3, 1.6, 2.0, etc. - 1.0MΩ 72 values (3,600 total pieces) ..... **36.26**

**PHG1-KIT-ND** 200 each of every other value from 1.0, 1.2, 1.5, 1.8, etc. - 910KΩ 72 values (14,400 total pieces) ..... **65.30**

**PHG2-KIT-ND** 200 each of every other value from 1.1, 1.3, 1.6, 2.0, etc. - 1.0MΩ 72 values (14,400 total pieces) ..... **65.30**

**5%, 1/8 Watt — 0805 Series**

**Resistor Values**

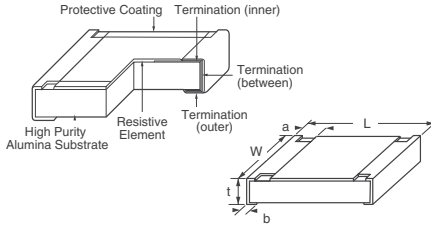
|     |     |    |     |     |      |      |      |     |      |      |      |      |     |
|-----|-----|----|-----|-----|------|------|------|-----|------|------|------|------|-----|
| 0.0 | 3.3 | 11 | 39  | 130 | 470  | 1.6K | 5.6K | 20K | 68K  | 240K | 820K | 3.0M | 10M |
| 1.0 | 3.6 | 12 | 43  | 150 | 510  | 1.8K | 6.2K | 22K | 75K  | 270K | 910K | 3.3M |     |
| 1.1 | 3.9 | 13 | 47  | 160 | 560  | 2.0K | 6.8K | 24K | 82K  | 300K | 1.0M | 3.6M |     |
| 1.2 | 4.3 | 15 | 51  | 180 | 620  | 2.2K | 7.5K | 27K | 91K  | 330K | 1.1M | 3.9M |     |
| 1.3 | 4.7 | 16 | 56  | 200 | 680  | 2.4K | 8.2K | 30K | 100K | 360K | 1.2M | 4.3M |     |
| 1.5 | 5.1 | 18 | 62  | 220 | 750  | 2.7K | 9.1K | 33K | 110K | 390K | 1.3M | 4.7M |     |
| 1.6 | 5.6 | 20 | 68  | 240 | 820  | 3.0K | 10K  | 36K | 120K | 430K | 1.5M | 5.1M |     |
| 1.8 | 6.2 | 22 | 75  | 270 | 910  | 3.3K | 11K  | 39K | 130K | 470K | 1.6M | 5.6M |     |
| 2.0 | 6.8 | 24 | 82  | 300 | 1.0K | 3.6K | 12K  | 43K | 150K | 510K | 1.8M | 6.2M |     |
| 2.2 | 7.5 | 27 | 91  | 330 | 1.1K | 3.9K | 13K  | 47K | 160K | 560K | 2.0M | 6.8M |     |
| 2.4 | 8.2 | 30 | 100 | 360 | 1.2K | 4.3K | 15K  | 51K | 180K | 620K | 2.2M | 7.5M |     |
| 2.7 | 9.1 | 33 | 110 | 390 | 1.3K | 4.7K | 16K  | 56K | 200K | 680K | 2.4M | 8.2M |     |
| 3.0 | 10  | 36 | 120 | 430 | 1.5K | 5.1K | 18K  | 62K | 220K | 750K | 2.7M | 9.1M |     |

| Value Range | Digi-Key Part No. | Cut Tape Pricing | Tape and Reel Qty. | Price | Yageo Part No. |
|-------------|-------------------|------------------|--------------------|-------|----------------|
| 1.1 - 9.    |                   |                  |                    |       |                |

# Panasonic 0201, 0402, 0603, 0805, 1206, 1210, 2010 and 2512

## 1% Precision Thick Film Chip Resistors

### Surface Mount Available in 1/20, 1/16, 1/10, 1/8, 1/4, 1/2 and 1 Watt



| Size | Power Rating at 70° | Maximum RCWV§ | Maximum Overload Voltage | Dimensions |      |      |      |      | Temperature Coefficient | Panasonic Part No. |
|------|---------------------|---------------|--------------------------|------------|------|------|------|------|-------------------------|--------------------|
|      |                     |               |                          | L          | W    | a    | b    | t    |                         |                    |
| 0201 | 1/20W               | 15V           | 30V                      | 0.60       | 0.30 | 0.10 | 0.15 | 0.23 | 10 - 1MΩ ±200ppm/°C     | ERJ-1GEFxxxxC      |
| 0402 | 1/16W               | 50V           | 100V                     | 1.00       | 0.50 | 0.20 | 0.25 | 0.35 | 10 - 1MΩ ±100ppm/°C     | ERJ-2RKFxxxxX      |
| 0603 | 1/10W               | 50V           | 100V                     | 1.60       | 0.80 | 0.30 | 0.30 | 0.45 | 10 - 1MΩ ±100ppm/°C     | ERJ-3EKFxxxxV      |
| 0805 | 1/8W                | 150V          | 200V                     | 2.00       | 1.25 | 0.40 | 0.40 | 0.60 | 10 - 2.2MΩ ±100ppm/°C   | ERJ-6ENFxxxxV      |
| 1206 | 1/4W                | 200V          | 400V                     | 3.20       | 1.60 | 0.50 | 0.50 | 0.60 |                         | ERJ-8ENFxxxxV      |
| 1210 | 1/4W                | 200V          | 400V                     | 3.20       | 2.50 | 0.50 | 0.50 | 0.60 | 10 - 1MΩ ±100ppm/°C     | ERJ-14NFxxxxU      |
| 2010 | 1/2W                | 200V          | 400V                     | 5.00       | 2.50 | 0.60 | 0.60 | 0.60 |                         | ERJ-12SFxxxxU      |
| 2512 | 1W                  | 200V          | 400V                     | 6.40       | 3.20 | 0.65 | 0.60 | 0.60 |                         | ERJ-1TNFxxxxU      |

§ Rated Continuous Working Voltage (RCWV) shall be determined from  $RCWV = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$ , or max. RCWV listed above, whichever is less.

#### 0201, 0402, 0603, 0805, 1206 and 1210 Series Standard Resistor Values

|      |      |      |     |     |       |       |       |       |       |       |      |       |
|------|------|------|-----|-----|-------|-------|-------|-------|-------|-------|------|-------|
| 10.0 | 24.9 | 61.9 | 154 | 383 | 953   | 2.37K | 5.90K | 14.7K | 36.5K | 90.9K | 226K | 562K  |
| 10.2 | 25.5 | 63.4 | 158 | 392 | 976   | 2.43K | 6.04K | 15.0K | 37.4K | 93.1K | 232K | 576K  |
| 10.5 | 26.1 | 64.9 | 162 | 402 | 1.00K | 2.49K | 6.19K | 15.4K | 38.3K | 95.3K | 237K | 590K  |
| 10.7 | 26.7 | 66.5 | 165 | 412 | 1.02K | 2.55K | 6.34K | 15.8K | 39.2K | 97.6K | 243K | 604K  |
| 11.0 | 27.4 | 68.1 | 169 | 422 | 1.05K | 2.61K | 6.49K | 16.2K | 40.2K | 100K  | 249K | 619K  |
| 11.3 | 28.0 | 69.8 | 174 | 432 | 1.07K | 2.67K | 6.65K | 16.5K | 41.2K | 102K  | 255K | 634K  |
| 11.5 | 28.7 | 71.5 | 178 | 442 | 1.10K | 2.74K | 6.81K | 16.9K | 42.2K | 105K  | 261K | 649K  |
| 11.8 | 29.4 | 73.2 | 182 | 453 | 1.13K | 2.80K | 6.98K | 17.4K | 43.2K | 107K  | 267K | 665K  |
| 12.1 | 30.1 | 75.0 | 187 | 464 | 1.15K | 2.87K | 7.15K | 17.8K | 44.2K | 110K  | 274K | 681K  |
| 12.4 | 30.9 | 76.8 | 191 | 475 | 1.18K | 2.94K | 7.32K | 18.2K | 45.3K | 113K  | 280K | 698K  |
| 12.7 | 31.6 | 78.7 | 196 | 487 | 1.21K | 3.01K | 7.50K | 18.7K | 46.4K | 115K  | 287K | 715K  |
| 13.0 | 32.4 | 80.6 | 200 | 499 | 1.24K | 3.09K | 7.68K | 19.1K | 47.5K | 118K  | 294K | 732K  |
| 13.3 | 33.2 | 82.5 | 205 | 511 | 1.27K | 3.16K | 7.87K | 19.6K | 48.7K | 121K  | 301K | 750K  |
| 13.7 | 34.0 | 84.5 | 210 | 523 | 1.30K | 3.24K | 8.06K | 20.0K | 49.9K | 124K  | 309K | 768K  |
| 14.0 | 34.8 | 86.5 | 215 | 536 | 1.33K | 3.32K | 8.25K | 20.5K | 51.1K | 127K  | 316K | 787K  |
| 14.3 | 35.7 | 88.7 | 221 | 549 | 1.37K | 3.40K | 8.45K | 21.0K | 52.3K | 130K  | 324K | 806K  |
| 14.7 | 36.5 | 90.9 | 226 | 562 | 1.40K | 3.48K | 8.66K | 21.5K | 53.6K | 133K  | 332K | 825K  |
| 15.0 | 37.4 | 93.1 | 232 | 576 | 1.43K | 3.57K | 8.87K | 22.1K | 54.9K | 137K  | 340K | 845K  |
| 15.4 | 38.3 | 95.3 | 237 | 590 | 1.47K | 3.65K | 9.09K | 22.6K | 56.2K | 140K  | 348K | 865K  |
| 15.8 | 39.2 | 97.6 | 243 | 604 | 1.50K | 3.74K | 9.31K | 23.2K | 57.6K | 143K  | 357K | 887K  |
| 16.2 | 40.2 | 100  | 249 | 619 | 1.54K | 3.83K | 9.53K | 23.7K | 59.0K | 147K  | 365K | 909K  |
| 16.5 | 41.2 | 102  | 255 | 634 | 1.58K | 3.92K | 9.76K | 24.3K | 60.4K | 150K  | 374K | 931K  |
| 16.9 | 42.2 | 105  | 261 | 649 | 1.62K | 4.02K | 10.0K | 24.9K | 61.9K | 154K  | 383K | 953K  |
| 17.4 | 43.2 | 107  | 267 | 665 | 1.65K | 4.12K | 10.2K | 25.5K | 63.4K | 158K  | 392K | 976K  |
| 17.8 | 44.2 | 110  | 274 | 681 | 1.69K | 4.22K | 10.5K | 26.1K | 64.9K | 162K  | 402K | 1.00M |
| 18.2 | 45.3 | 113  | 280 | 698 | 1.74K | 4.32K | 10.7K | 26.7K | 66.5K | 165K  | 412K | 1.10M |
| 18.7 | 46.4 | 115  | 287 | 715 | 1.78K | 4.42K | 11.0K | 27.4K | 68.1K | 169K  | 422K | 1.20M |
| 19.1 | 47.5 | 118  | 294 | 732 | 1.82K | 4.53K | 11.3K | 28.0K | 69.8K | 174K  | 432K | 1.30M |
| 19.6 | 48.7 | 121  | 301 | 750 | 1.87K | 4.64K | 11.5K | 28.7K | 71.5K | 178K  | 442K | 1.50M |
| 20.0 | 49.9 | 124  | 309 | 768 | 1.91K | 4.75K | 11.8K | 29.4K | 73.2K | 182K  | 453K | 1.60M |
| 20.5 | 51.1 | 127  | 316 | 787 | 1.96K | 4.87K | 12.1K | 30.1K | 75.0K | 187K  | 464K | 1.80M |
| 21.0 | 52.3 | 130  | 324 | 806 | 2.00K | 4.99K | 12.4K | 30.9K | 76.8K | 191K  | 475K | 2.00M |
| 21.5 | 53.6 | 133  | 332 | 825 | 2.05K | 5.11K | 12.7K | 31.6K | 78.7K | 196K  | 487K | 2.20M |
| 22.1 | 54.9 | 137  | 340 | 845 | 2.10K | 5.23K | 13.0K | 32.4K | 80.6K | 200K  | 499K |       |
| 22.6 | 56.2 | 140  | 348 | 866 | 2.15K | 5.36K | 13.3K | 33.2K | 82.5K | 205K  | 511K |       |
| 23.2 | 57.6 | 143  | 357 | 887 | 2.21K | 5.49K | 13.7K | 34.0K | 84.5K | 210K  | 523K |       |
| 23.7 | 59.0 | 147  | 365 | 909 | 2.26K | 5.62K | 14.0K | 34.8K | 86.6K | 215K  | 536K |       |
| 24.3 | 60.4 | 150  | 374 | 931 | 2.32K | 5.76K | 14.3K | 35.7K | 88.7K | 221K  | 549K |       |

#### 2010 Series Resistor Values

|      |      |      |     |       |       |       |       |       |      |       |
|------|------|------|-----|-------|-------|-------|-------|-------|------|-------|
| 10.0 | 28.7 | 82.5 | 237 | 681   | 1.96K | 5.62K | 16.2K | 46.4K | 133K | 383K  |
| 10.5 | 30.1 | 86.6 | 249 | 715   | 2.05K | 5.90K | 16.9K | 48.7K | 140K | 402K  |
| 11.0 | 31.6 | 90.9 | 261 | 750   | 2.15K | 6.19K | 17.8K | 51.1K | 147K | 422K  |
| 11.5 | 33.2 | 95.3 | 274 | 787   | 2.26K | 6.49K | 18.7K | 53.6K | 154K | 442K  |
| 12.1 | 34.8 | 100  | 287 | 825   | 2.37K | 6.81K | 19.6K | 56.2K | 162K | 464K  |
| 12.7 | 36.5 | 105  | 301 | 866   | 2.49K | 7.15K | 20.5K | 59.0K | 169K | 487K  |
| 13.3 | 38.3 | 110  | 316 | 909   | 2.61K | 7.50K | 21.5K | 61.9K | 178K | 511K  |
| 14.0 | 40.2 | 115  | 332 | 953   | 2.74K | 7.87K | 22.6K | 64.9K | 187K | 536K  |
| 14.7 | 42.2 | 121  | 348 | 1.00K | 2.87K | 8.25K | 23.7K | 68.1K | 196K | 562K  |
| 15.4 | 44.2 | 127  | 365 | 1.05K | 3.01K | 8.66K | 24.9K | 71.5K | 205K | 590K  |
| 16.2 | 46.4 | 133  | 383 | 1.10K | 3.16K | 9.09K | 26.1K | 75.0K | 215K | 619K  |
| 16.9 | 48.7 | 140  | 402 | 1.15K | 3.32K | 9.53K | 27.4K | 78.7K | 226K | 649K  |
| 17.8 | 51.1 | 147  | 422 | 1.21K | 3.48K | 10.0K | 28.7K | 82.5K | 237K | 681K  |
| 18.7 | 53.6 | 154  | 442 | 1.27K | 3.65K | 10.5K | 30.1K | 86.6K | 249K | 715K  |
| 19.6 | 56.2 | 162  | 464 | 1.33K | 3.83K | 11.0K | 31.6K | 90.9K | 261K | 750K  |
| 20.5 | 59.0 | 169  | 487 | 1.40K | 4.02K | 11.5K | 33.2K | 95.3K | 274K | 787K  |
| 21.5 | 61.9 | 178  | 511 | 1.47K | 4.22K | 12.1K | 34.8K | 100K  | 287K | 825K  |
| 22.6 | 64.9 | 187  | 536 | 1.54K | 4.42K | 12.7K | 36.5K | 105K  | 301K | 866K  |
| 23.7 | 68.1 | 196  | 562 | 1.62K | 4.64K | 13.3K | 38.3K | 110K  | 316K | 909K  |
| 24.9 | 71.5 | 205  | 590 | 1.69K | 4.87K | 14.0K | 40.2K | 115K  | 332K | 953K  |
| 26.1 | 75.0 | 215  | 619 | 1.78K | 5.11K | 14.7K | 42.2K | 121K  | 348K | 1.00M |
| 27.4 | 78.7 | 226  | 649 | 1.87K | 5.36K | 15.4K | 44.2K | 127K  | 365K |       |

#### 2512 Series Resistor Values

|      |      |      |     |       |       |       |       |       |       |      |       |
|------|------|------|-----|-------|-------|-------|-------|-------|-------|------|-------|
| 10.0 | 27.4 | 68.1 | 191 | 487   | 1.30K | 3.48K | 8.87K | 24.3K | 61.9K | 169K | 432K  |
| 10.5 | 28.7 | 71.5 | 200 | 510   | 1.37K | 3.60K | 9.10K | 25.5K | 63.4K | 178K | 453K  |
| 11.0 | 30.0 | 75.0 | 210 | 523   | 1.43K | 3.74K | 9.53K | 26.7K | 66.5K | 182K | 470K  |
| 11.5 | 30.9 | 78.7 | 220 | 549   | 1.50K | 3.90K | 10.0K | 27.4K | 68.1K | 191K | 487K  |
| 12.0 | 32.4 | 82.0 | 226 | 562   | 1.58K | 4.02K | 10.5K | 28.7K | 71.5K | 200K | 510K  |
| 12.4 | 33.2 | 84.5 | 237 | 590   | 1.62K | 4.22K | 11.0K | 30.0K | 75.0K | 210K | 523K  |
| 13.0 | 34.8 | 88.7 | 243 | 619   | 1.69K | 4.32K | 11.5K | 30.9K | 78.7K | 220K | 549K  |
| 13.7 | 36.0 | 91.0 | 255 | 634   | 1.78K | 4.53K | 12.0K | 32.4K | 82.0K | 226K | 562K  |
| 14.3 | 37.4 | 95.3 | 267 | 665   | 1.82K | 4.70K | 12.4K | 33.2K | 84.5K | 237K | 590K  |
| 15.0 | 39.0 | 100  | 274 | 681   | 1.91K | 4.87K | 13.0K | 34.8K | 88.7K | 243K | 619K  |
| 15.8 | 40.2 | 105  | 287 | 715   | 2.00K | 5.10K | 13.7K | 36.0K | 91.0K | 255K | 634K  |
| 16.2 | 42.2 | 110  | 300 | 750   | 2.10K | 5.23K | 14.3K | 37.4K | 95.3K | 267K | 665K  |
| 16.9 | 43.2 | 115  | 309 | 787   | 2.20K | 5.49K | 15.0K | 39.0K | 100K  | 274K | 681K  |
| 17.8 | 45.3 | 120  | 324 | 820   | 2.26K | 5.62K | 15.8K | 40.2K | 105K  | 287K | 715K  |
| 18.2 | 47.0 | 124  | 332 | 845   | 2.37K | 5.90K | 16.2K | 42.2K | 110K  | 300K | 750K  |
| 19.1 | 48.7 | 130  | 348 | 887   | 2.43K | 6.19K | 16.9K | 43.2K | 115K  | 309K | 787K  |
| 20.0 | 51.0 | 137  | 360 | 910   | 2.55K | 6.34K | 17.8K | 45.3K | 120K  | 324K | 820K  |
| 21.0 | 52.3 | 143  | 374 | 953   | 2.67K | 6.65K | 18.2K | 47.0K | 124K  | 332K | 845K  |
| 22.0 | 54.9 | 150  | 390 | 1.00K | 2.74K | 6.81K | 19.1K | 48.7K | 130K  | 348K | 887K  |
| 22.6 | 56.2 | 158  | 402 | 1.05K | 2.87K | 7.15K | 20.0K | 51.0K | 137K  | 360K | 910K  |
| 23.7 | 59.0 | 162  | 422 | 1.10K | 3.00K | 7.50K | 21.0K | 52.3K | 143K  | 374K | 953K  |
| 24.3 | 61.9 | 169  | 432 | 1.15K | 3.09K | 7.87K | 22.0K | 54.9K | 150K  | 390K | 1.00M |
| 25.5 | 63.4 | 178  | 453 | 1.20K | 3.24K | 8.20K | 22.6K | 56.2K | 158K  | 402K |       |
| 26.7 | 66.5 | 182  | 470 | 1.24K | 3.32K | 8.45K | 23.7K | 59.0K | 162K  | 422K |       |



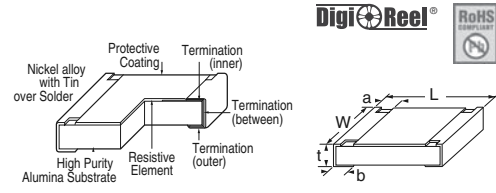
#### Additional 0201, 0402, 0603, 0805 and 1206 Series Resistor Values

|       |       |      |      |        |        |        |        |       |       |
|-------|-------|------|------|--------|--------|--------|--------|-------|-------|
| 12.0◆ | 39.0◆ | 120◆ | 390◆ | 1.20K◆ | 3.90K◆ | 12.0K◆ | 39.0K◆ | 120K◆ | 390K◆ |
| 16.0◆ | 43.0◆ | 160◆ | 430◆ | 1.60K◆ | 4.30K◆ | 16.0K◆ | 43.0K◆ | 160K◆ | 430K◆ |
| 18.0◆ | 47.0◆ | 180◆ | 470◆ | 1.80K◆ | 4.70K◆ | 18.0K◆ | 47.0K◆ | 180K◆ | 470K◆ |
| 22.0◆ | 51.0◆ | 220◆ | 510◆ | 2.20K◆ | 5.10K◆ | 22.0K◆ | 51.0K◆ | 220K◆ | 510K◆ |
| 24.0◆ | 56.0◆ | 240◆ | 560◆ | 2.40K◆ | 5.60K◆ | 24.0K◆ | 56.0K◆ | 240K◆ | 560K◆ |
| 27.0◆ | 62    |      |      |        |        |        |        |       |       |

# Panasonic 01005, 0201, 0402, 0603, 0805, 1206, 1210, 2010 and 2512

## Surface Mount 5% Thick Film Chip Resistors — 1/32, 1/20, 1/16, 1/10, 1/8, 1/4, 1/2 and 1 Watt

| Type  | Power Rating | Max. RCWV | Overload Voltage | Dimensions – mm |      |      |      | Temperature Coefficient | Panasonic Part No.  |          |
|-------|--------------|-----------|------------------|-----------------|------|------|------|-------------------------|---|----------|
|       |              |           |                  | L               | W    | t    | a    | b                       |   |          |
| 01005 | 1/32W        | 15V       | 30V              | 0.40            | 0.20 | 0.13 | 0.10 | 0.10                    | <100Ω: ±300ppm/°C<br>100Ω<: ±200ppm/°C  | ERJ-XGNJ |
| 0201  | 1/20W        | 15V       | 30V              | 0.60            | 0.30 | 0.20 | 0.15 | 0.15                    | <100Ω: -100ppm/°C ~ +600ppm/°C<br>10Ω ~ 1MΩ: ±200ppm/°C<br>1MΩ >: -400ppm/°C ~ +600ppm/°C | ERJ-1GEJ |
| 0402  | 1/16W        | 50V       | 100V             | 1.00            | 0.50 | 0.35 | 0.20 | 0.25                    |   | ERJ-2GEJ |
| 0603  | 1/10W        | 50V       | 100V             | 1.60            | 0.80 | 0.45 | 0.30 | 0.30                    |   | ERJ-3GEY |
| 0805  | 1/8W         | 150V      | 200V             | 2.00            | 1.25 | 0.60 | 0.40 | 0.40                    |   | ERJ-6GEY |
| 1206  | 1/4W         | 200V      | 400V             | 3.20            | 1.60 | 0.60 | 0.50 | 0.50                    |   | ERJ-8GEY |
| 1210  | 1/4W         | 200V      | 400V             | 3.20            | 2.50 | 0.60 | 0.50 | 0.50                    |   | ERJ-14Y  |
| 2010  | 1/2W         | 200V      | 400V             | 5.00            | 2.50 | 0.60 | 0.60 | 0.60                    |   | ERJ-12ZY |
| 2512  | 1W           | 250V      | 500V             | 6.40            | 3.20 | 0.60 | 0.65 | 0.60                    |   | ERJ-1TY  |



| Digi-Key® 1206, 1/4W, 5% Chip Resistor Assortments   | Digi-Key® 0805, 1/8W, 5% Chip Resistor Assortments   | Digi-Key® 0603, 1/10W, 5% Chip Resistor Assortments  | Digi-Key® 0402, 1/16W, 5% Chip Resistor Assortments  |
|--|--|--|--|
| CR1A-KIT-ND 50 ea. of every other value from 10, 12, 15, etc. 1.0M (3,050)..... <b>58.04</b>     | CR3A-KIT-ND 50 ea. of every other value from 10, 12, 15, etc. 1.0M (3,050)..... <b>58.04</b>     | CR5A-KIT-ND 50 ea. of every other value from 10, 12, 15, etc. 1.0M (3,050)..... <b>62.40</b>     | CR7A-KIT-ND 50 ea. of every other value from 10, 12, 15, etc. 1.0M (3,050)..... <b>65.30</b>     |
| CR1-KIT-ND 200 ea. (same values as kit above)..... <b>93.65</b>                                  | CR3-KIT-ND 200 ea. (same values as kit above)..... <b>93.65</b>                                  | CR5-KIT-ND 200 ea. (same values as kit above)..... <b>93.65</b>                                  | CR7-KIT-ND 200 ea. (same values as kit above)..... <b>122.69</b>                                 |
| CR2A-KIT-ND 50 ea. of every other value from 11, 13, 16, 20, etc. 910K (3,000)..... <b>58.04</b> | CR4A-KIT-ND 50 ea. of every other value from 11, 13, 16, 20, etc. 910K (3,000)..... <b>58.04</b> | CR6A-KIT-ND 50 ea. of every other value from 11, 13, 16, 20, etc. 910K (3,000)..... <b>62.40</b> | CR8A-KIT-ND 50 ea. of every other value from 11, 13, 16, 20, etc. 910K (3,000)..... <b>65.30</b> |
| CR2-KIT-ND 200 ea. (same values as kit above)..... <b>93.65</b>                                  | CR4-KIT-ND 200 ea. (same values as kit above)..... <b>93.65</b>                                  | CR6-KIT-ND 200 ea. (same values as kit above)..... <b>93.65</b>                                  | CR8-KIT-ND 200 ea. (same values as kit above)..... <b>122.69</b>                                 |

| 01005 Series Standard Resistor Values |     |      |      | 0201, 0402, 0603, 0805, 1206, 1210, 2010 and 2512 Series Standard Resistor Values |      |     |     |     |    |     |     |     |      |      |      |     |     |      |      |      |      |      |      |
|---------------------------------------|-----|------|------|---|------|-----|-----|-----|----|-----|-----|-----|------|------|------|-----|-----|------|------|------|------|------|------|
| 10                                    | 82  | 680  | 5.6K | 47K   | 390K | 1.0 | 2.7 | 6.8 | 18 | 47  | 120 | 330 | 820  | 2.2K | 5.6K | 15K | 39K | 100K | 270K | 680K | 1.8M | 4.7M | 15M‡ |
| 12                                    | 100 | 820  | 6.8K | 56K   | 470K | 1.1 | 3.0 | 7.5 | 20 | 51  | 130 | 360 | 910  | 2.4K | 6.2K | 16K | 43K | 110K | 300K | 750K | 2.0M | 5.1M | 18M‡ |
| 15                                    | 120 | 1.0K | 8.2K | 68K   | 560K | 1.2 | 3.3 | 8.2 | 22 | 56  | 150 | 390 | 1.0K | 2.7K | 6.8K | 18K | 47K | 120K | 330K | 820K | 2.2M | 5.6M | 22M‡ |
| 18                                    | 150 | 1.2K | 10K  | 82K   | 680K | 1.3 | 3.6 | 9.1 | 24 | 62  | 160 | 430 | 1.1K | 3.0K | 7.5K | 20K | 51K | 130K | 360K | 910K | 2.4M | 6.2M |      |
| 22                                    | 180 | 1.5K | 12K  | 100K  | 820K | 1.5 | 3.9 | 10  | 27 | 68  | 180 | 470 | 1.2K | 3.3K | 8.2K | 22K | 56K | 150K | 390K | 1.0M | 2.7M | 6.8M |      |
| 27                                    | 220 | 1.8K | 15K  | 120K  | 1.0M | 1.6 | 4.3 | 11  | 30 | 75  | 200 | 510 | 1.3K | 3.6K | 9.1K | 24K | 62K | 160K | 430K | 1.1M | 3.0M | 7.5M |      |
| 33                                    | 270 | 2.2K | 18K  | 150K  |      | 1.8 | 4.7 | 12  | 33 | 82  | 220 | 560 | 1.5K | 3.9K | 10K  | 27K | 68K | 180K | 470K | 1.2M | 3.3M | 8.2M |      |
| 39                                    | 330 | 2.7K | 22K  | 180K  |      | 2.0 | 5.1 | 13  | 36 | 91  | 240 | 620 | 1.6K | 4.3K | 11K  | 30K | 75K | 200K | 510K | 1.3M | 3.6M | 10M  |      |
| 47                                    | 390 | 3.3K | 27K  | 220K  |      | 2.2 | 5.6 | 15  | 39 | 100 | 270 | 680 | 1.8K | 4.7K | 12K  | 33K | 82K | 220K | 560K | 1.5M | 3.9M | 11M  |      |
| 56                                    | 470 | 3.9K | 33K  | 270K  |      | 2.4 | 6.2 | 16  | 43 | 110 | 300 | 750 | 2.0K | 5.1K | 13K  | 36K | 91K | 240K | 620K | 1.6M | 4.3M | 12M‡ |      |
| 68                                    | 560 | 4.7K | 39K  | 330K  |      |     |     |     |    |     |     |     |      |      |      |     |     |      |      |      |      |      |      |

‡ 12M, 15M, 18M and 22M are 10% Tolerance

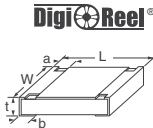
| Description      | Value Range   | Digi-Key Part No.‡ | Pricing |       |       | Digi-Key Part No.‡ | Reel Qty.        | Tape and Reel Pricing |         |        |        |        | Panasonic Part No. |              |
|------------------|---------------|--------------------|---------|-------|-------|--------------------|------------------|-----------------------|---------|--------|--------|--------|--------------------|--------------|
|                  |               |                    | 10      | 50    | 200   | 1,000              |                  | 4,000                 | 5,000   | 10,000 | 12,000 | 15,000 | 20,000             |              |
| 01005, 1/32W, 5% | (10 - 1.0M)‡  | P(Value)AWCT-ND    | 1.41    | 4.98  | 16.41 | 70.35              | P(Value)AWTR-ND  | 20,000                | —       | —      | —      | —      | 34.13M             | ERJ-XGNJxxxY |
| 0201, 1/20W, 5%  | (10 - 1.0M)‡  | P(Value)AGCT-ND†   | .70     | 1.88  | 4.32  | 14.74              | P(Value)AGTR-ND† | 15,000                | —       | —      | —      | 5.81M  | —                  | ERJ-1GEJxxxX |
| 0402, 1/16W, 5%  | (1.0 - 10M)‡  | P(Value)JCT-ND†    | .59     | 1.58  | 3.64  | 12.42              | P(Value)JTR-ND†  | 10,000                | —       | —      | 3.63M  | —      | —                  | ERJ-2GEJxxxX |
| 0603, 1/10W, 5%  | (1.0 - 22M)‡  | P(Value)GCT-ND†    | .52     | 1.39  | 3.19  | 10.98              | P(Value)GTR-ND†  | 5,000                 | —       | 1.96M  | —      | —      | —                  | ERJ-3GEYxxxX |
| 0805, 1/8W, 5%   | (1.0 - 22M)‡  | P(Value)ACT-ND†    | .56     | 1.50  | 3.48  | 11.79              | P(Value)ATR-ND†  | 5,000                 | —       | 3.49M  | —      | —      | —                  | ERJ-6GEYxxxV |
| 1206, 1/4W, 5%   | (1.0 - 22M)‡  | P(Value)ECT-ND†    | .68     | 1.84  | 4.23  | 14.43              | P(Value)ETR-ND†  | 5,000                 | —       | 6.21M  | 5.59M  | —      | —                  | ERJ-8GEYxxxV |
| 1210, 1/4W, 5%   | (1.0 - 10M)‡  | P(Value)YCT-ND     | 1.96    | 5.26  | 12.10 | 41.27              | P(Value)YTR-ND   | 5,000                 | —       | 33.98M | 30.58M | —      | —                  | ERJ-14YJxxxU |
| 2010, 1/2W, 5%   | (1.0 - 10M)‡  | P(Value)WCT-ND     | 2.90    | 7.82  | 17.96 | 61.27              | P(Value)WTR-ND   | 5,000                 | —       | 54.67M | 49.21M | —      | —                  | ERJ-12ZYxxxU |
| 2512, 1W, 5%     | (1.0 - 2.2M)‡ | PT(Value)XCT-ND    | 2.87    | 10.19 | 33.54 | 138.96             | PT(Value)XTR-ND  | 4,000                 | 108.03M | —      | —      | 90.03M | —                  | ERJ-1TYJxxxU |

‡ 12M, 15M, 18M and 22M are 10% tolerance † 0.0Ω (zerohm) value also available § For complete part number, substitute the value from Standard Resistor Values charts for (Value).

# Panasonic 5% - 0402, 0603, 0805, 1206, 1210, 2010, 2512 and 1% - 0402, 0603, 0805, 1206, 2512

## Surface Mount Ultra Low Ohm Thick Film Chip Resistors — 1/10, 1/8, 1/4, 1/2 and 1 Watt

**Rated Continuous Working Voltage (RCWV):**  
The rated voltage at each resistance should be calculated from the following equation:  
RCWV = √P × R  
RCWV(V): P(W): R(Ω)  
Maximum Overload Voltage = RCWV × 2.5



| 5% and 1% 0402 Series Standard Resistor Values |      |     |     |     |     |     |     |
|--|------|-----|-----|-----|-----|-----|-----|
| .047   | .068 | .10 | .15 | .22 | .33 | .47 | .68 |
| .051   | .075 | .11 | .16 | .24 | .36 | .51 | .75 |
| .056   | .082 | .12 | .18 | .27 | .39 | .56 | .82 |
| .062   | .091 | .13 | .20 | .30 | .43 | .62 | .91 |

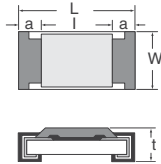
| 5% - 0603, 1206, 1210, 2010 and 2512 Series; 1% - 0603 and 1206 Series Standard Resistor Values |      |      |      |      |      |      |      |     |     | 5% and 1% 0805 Series Standard Resistor Values |     |     |     |     | 1% - 2512 Series Standard Resistor Values |     |      |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|---|------|------|------|------|------|------|------|-----|-----|--|-----|-----|-----|-----|---|-----|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| .010  | .013 | .018 | .024 | .033 | .043 | .056 | .075 | .10 | .18 | .33  | .56 | 1.0 | 1.8 | 3.3 | 5.6                                       | 9.1 | .01  | .013 | .018 | .024 | .033 | .043 | .12 | .22 | .39 | .68 | 1.2 | 2.2 | 3.9 | 6.8 | .22 | .30 | .39 | .51 | .68 | .91 | 1.2 | 1.6 | 2.2 | 3.0 | 3.9 | 5.1 | 6.8 | 9.1 |  |
| .011  | .015 | .020 | .027 | .036 | .047 | .062 | .082 | .12 | .22 | .39  | .68 | 1.2 | 2.2 | 3.9 | 6.8                                       |     | .011 | .015 | .020 | .027 | .036 | .047 | .15 | .27 | .47 | .82 | 1.5 | 2.7 | 4.7 | 8.2 |     | .24 | .33 | .43 | .56 | .75 | 1.0 | 1.3 | 1.8 | 2.4 | 3.3 | 4.3 | 5.6 | 7.5 |  |
| .012  | .016 | .022 | .030 | .039 | .051 | .068 | .091 | .15 | .27 | .47  | .82 | 1.5 | 2.7 | 4.7 | 8.2                                       |     | .012 | .016 | .022 | .030 | .039 | .10  | .18 | .33 | .56 | 1.0 | 1.8 | 3.3 | 5.6 | 9.1 |     | .27 | .36 | .47 | .62 | .82 | 1.1 | 1.5 | 2.0 | 2.7 | 3.6 | 4.7 | 6.2 | 8.2 |  |

| Description     | Value Range    | Digi-Key Part No.‡ | Pricing |       |        | Digi-Key Part No.‡ | Reel Qty.       | Tape and Reel Pricing |        |         |         |        | Panasonic Part No. |               |
|-----------------|----------------|--------------------|---------|-------|--------|--------------------|-----------------|-----------------------|--------|---------|---------|--------|--------------------|---------------|
|                 |                |                    | 10      | 50    | 200    | 1,000              |                 | 4,000                 | 5,000  | 10,000  | 12,000  | 15,000 | 20,000             |               |
| 0402, 1/8W, 5%  | (.047 - .091)‡ | P(Value)AMCT-ND    | 3.76    | 13.33 | 43.91  | 181.91             | P(Value)AMTR-ND | 10,000                | —      | —       | 119.65M | —      | —                  | ERJ-2BWJFxxxX |
| 0402, 1/8W, 1%  | (.047 - .091)‡ | P(Value)AJCT-ND    | 2.93    | 10.37 | 34.15  | 141.48             | P(Value)AJTR-ND | 10,000                | —      | —       | 91.48M  | —      | —                  | ERJ-2BWFxxxX  |
| 0402, 1/8W, 1%  | (.10 - .20)‡   | P(Value)AKCT-ND    | 5.13    | 13.81 | 31.72  | 108.22             | P(Value)AKTR-ND | 10,000                | —      | —       | 92.93M  | —      | —                  | ERJ-2BSFRxxxX |
| 0402, 1/8W, 1%  | (.22 - .91)‡   | P(Value)AJCT-ND    | 4.92    | 13.24 | 30.43  | 103.80             | P(Value)AKTR-ND | 10,000                | —      | —       | 88.80M  | —      | —                  | ERJ-2BFRxxxX  |
| 0603, 1/10W, 5% | (.10 - .18)‡   | P(Value)AHCT-ND    | 2.27    | 6.10  | 14.01  | 47.79              | P(Value)AHTR-ND | 5,000                 | —      | 40.66M  | 36.30M  | —      | —                  | ERJ-3RSJxxxV  |
| 0603, 1/10W, 5% | (.22 - .82)‡   | P(Value)AHCT-ND    | 1.34    | 3.60  | 8.27   | 28.21              | P(Value)AHTR-ND | 5,000                 | —      | 20.33M  | 18.15M  | —      | —                  | ERJ-3RQJxxxV  |
| 0603, 1/10W, 1% | (.10 - .18)‡   | P(Value)AJCT-ND    | 3.89    | 10.48 | 24.07  | 82.11              | P(Value)AJTR-ND | 5,000                 | —      | 76.23M  | 68.61M  | —      | —                  | ERJ-3RSFxxxV  |
| 0603, 1/10W, 1% | (.22 - .82)‡   | P(Value)AJCT-ND    | 2.20    | 5.91  | 13.58  | 46.32              | P(Value)AJTR-ND | 5,000                 | —      | 39.21M  | 35.29M  | —      | —                  | ERJ-3RQFxxxV  |
| 0805, 1/4W, 5%  | (.01 - .047)‡  | P(Value)ARCT-ND    | 14.19   | 38.17 | 87.69  | 299.18             | P(Value)ARTR-ND | 5,000                 | —      | 300.57M | 270.80M | —      | —                  | ERJ-6BWJFxxxV |
| 0805, 1/8W, 5%  | (.10 - .18)‡   | P(Value)BCT-ND     | 5.91    | 15.90 | 36.53  | 124.64             | P(Value)BTR-ND  | 5,000                 | —      | 120.52M | 108.18M | —      | —                  | ERJ-6RSJxxxV  |
| 0805, 1/8W, 5%  | (.22 - 9.1)‡   | P(Value)BCT-ND     | 4.60    | 12.36 | 28.39  | P(Value)BTR-ND     | 5,000           | —                     | 75.15M | 67.63M  | —       | —      | ERJ-6RQJxxxV       |               |
| 0805, 1/4W, 1%  | (.01 - .047)‡  | P(Value)AQCT-ND    | 21.24   | 57.14 | 131.26 | 447.82             | P(Value)AQTR-ND | 5,000                 | —      | 454.48M | 408.74M | —      | —                  | ERJ-6BWFxxxV  |
| 0805, 1/8W, 1%  | (.22 - 9.1)‡   | P(Value)DJCT-ND    | 1.52    | 5.40  | 17.79  | 73.69              | P(Value)DTR-ND  | 5,000                 | —      | 54.02M  | 45.02M  | —      | —                  | ERJ-6ROFxxxV  |
| 1206, 1/2W, 5%  | (.010 - .10)‡  | P(Value)AVCT-ND    | 11.43   | 30.76 | 70.66  | 241.07             | P(Value)AVTR-ND | 5,000                 | —      | 241.04M | 216.35M | —      | —                  | ERJ-8BWJFxxxV |
| 1206, 1/4W, 5%  | (.10 - .18)‡   | P(Value)PCT-ND     | 9.08    | 24.44 | 56.16  | 191.59             | P(Value)PTR-ND  | 5,000                 | —      | 189.49M | 170.54M | —      | —                  | ERJ-8RSJxxxV  |
| 1206, 1/4W, 5%  | (.22 - 9.1)‡   | P(Value)PCT-ND     | 4.39    | 11.82 | 27.15  | 92.64              | P(Value)PTR-ND  | 5,000                 | —      | 87.12M  | 78.41M  | —      | —                  | ERJ-8RQJxxxV  |
| 1206, 1/2W, 1%  | (.010 - .10)‡  | P(Value)AJCT-ND    | 4.93    | 20.03 | 71.50  | 320.51             | P(Value)AUTR-ND | 5,000                 | —      | 270.80M | 228.69M | —      | —                  | ERJ-8BWFxxxV  |
| 1206, 1/4W, 1%  | (.22 - 9.1)‡   | P(Value)RJCT-ND    | 1.96    | 6.94  | 22.87  | 94.74              | P(Value)RTR-ND  | 5,000                 | —      | 71.44M  | 59.54M  | —      | —                  | ERJ-8ROFxxxV  |
| 1210, 1/4W, 5%  | (.10 - .18)    |                    |         |       |        |                    |                 |                       |        |         |         |        |                    |               |

# Panasonic SMD Thick Film Chip Resistors / Low Resistance Type

## 0603, 0805, 1206, 1210, 1812, 2010, 2512 — For Current Sensing Applications

**Features:** • Operating Temperature: ERJ-L: -55°C ~ 125°C, ERJ-M: -55°C ~ 170°C (derating required above 70°C)  
• Resistance Range: • 1.0 to 100mΩ



| Package       | Dimensions (mm) |      |      |      |      |
|---------------|-----------------|------|------|------|------|
|               | L               | W    | a    | t    | I    |
| 0603          | 1.60            | 0.80 | 0.30 | 0.45 | 1.00 |
| 0805          | 2.00            | 1.25 | 0.40 | 0.60 | 1.20 |
| 1206          | 3.20            | 1.60 | 0.50 | 0.60 | 2.20 |
| 1210          | 3.20            | 2.50 | 0.50 | 0.60 | 2.20 |
| 1812          | 4.50            | 3.20 | 0.50 | 0.60 | 3.50 |
| 2010          | 5.00            | 2.50 | 0.60 | 0.60 | 3.80 |
| 2512 (S Type) | 6.40            | 3.20 | 1.00 | 0.80 | 4.40 |
| 2512 (T Type) | 6.40            | 3.20 | 2.10 | 0.80 | 2.20 |
| 2512 (L Type) | 6.40            | 3.20 | 0.65 | 1.10 | 5.10 |

| Standard Resistor Values (mΩ) for 0603, 0805, 1206 |                   |                   |                   |                   |
|--|-------------------|-------------------|-------------------|-------------------|
| Value (Mfg. Code)                                  | Value (Mfg. Code) | Value (Mfg. Code) | Value (Mfg. Code) | Value (Mfg. Code) |
| 47 (47M)   | 50 (50M)          | 75 (75M)*         | 100 (10C)         |                   |
| Standard Resistor Values (mΩ) for 1210, 1812, 2010 |                   |                   |                   |                   |
| Value (Mfg. Code)                                  | Value (Mfg. Code) | Value (Mfg. Code) | Value (Mfg. Code) | Value (Mfg. Code) |
| 20 (20M)   | 25 (25M)          | 39 (39M)          | 50 (50M)          | 100 (10C)         |
| 22 (22M)   | 33 (33M)          | 47 (47M)          | 75 (75M)*         |                   |
| Standard Resistor Values (mΩ) for 2512             |                   |                   |                   |                   |
| Value (Mfg. Code)                                  | Value (Mfg. Code) | Value (Mfg. Code) | Value (Mfg. Code) | Value (Mfg. Code) |
| 1.0 (1M0)  | 4.0 (4M0)         | 10 (10M)          | 20 (20M)          |                   |
| 1.5 (1M5)  | 5.0 (5M0)         | 12 (12M)†         | 47 (47M)          |                   |
| 2.0 (2M0)  | 6.0 (6M0)         | 15 (15M)          | 50 (50M)          |                   |
| 3.0 (3M0)  | 8.0 (8M0)†        | 16 (16M)†         | 100 (10C)         |                   |

\* For 75mΩ parts, change K to U in Manufacturer Part Number † Not in Kit

See below for complete part numbers when ordering.

RoHS Compliant Parts Available

| Description      | Type | Value Range (mΩ) | Temperature Coefficient (ppm/°C) | Digi-Key Part No. | Cut Tape Pricing |       | Digi-Key Part No. | Tape and Reel   |         | Panasonic Part No. |               |
|------------------|------|------------------|----------------------------------|-------------------|------------------|-------|-------------------|-----------------|---------|--------------------|---------------|
|                  |      |                  |                                  |                   | 10               | 200   |                   | Qty.            | Pricing |                    |               |
| 0603, 1/10 W, 5% | —    | 47 ~ 100         | ±200ppm                          | P(Value)NJCT-ND   | 4.45             | 13.27 | 31.22             | P(Value)NJTR-ND | 5,000   | 99.10/M            | ERJ-L03KJxxxV |
| 0603, 1/10 W, 1% | —    | 47 ~ 100         | ±200ppm                          | P(Value)LJCT-ND   | 5.23             | 13.07 | 36.59             | P(Value)LJTR-ND | 5,000   | 104.55/M           | ERJ-L03KFxxxV |
| 0805, 1/8 W, 5%  | —    | 47 ~ 100         | ±100ppm                          | P(Value)NLCT-ND   | 4.86             | 14.51 | 34.12             | P(Value)NLTR-ND | 5,000   | 109.27/M           | ERJ-L06KJxxxV |
| 0805, 1/8 W, 1%  | —    | 47 ~ 100         | ±100ppm                          | P(Value)LLCT-ND   | 5.52             | 13.79 | 38.62             | P(Value)LLTR-ND | 5,000   | 110.36/M           | ERJ-L06KFxxxV |
| 1206, 1/4 W, 5%  | —    | 47 ~ 100         | ±100ppm                          | P(Value)NPCT-ND   | 5.59             | 16.66 | 39.20             | P(Value)NPTR-ND | 5,000   | 127.05/M           | ERJ-L08KJxxxV |
| 1206, 1/4 W, 1%  | —    | 47 ~ 100         | ±100ppm                          | P(Value)LPCT-ND   | 6.80             | 16.99 | 47.57             | P(Value)LPTR-ND | 5,000   | 135.77/M           | ERJ-L08KFxxxV |
| 1210, 1/4 W, 1%  | —    | 20 ~ 39          | ±300ppm                          | P(Value)NACT-ND   | 3.88             | 13.73 | 45.23             | P(Value)NATR-ND | 5,000   | 148.11/M           | ERJ-L14KFxxxU |
| 1812, 1/2 W, 1%  | —    | 20 ~ 39          | ±300ppm                          | P(Value)NBCT-ND   | 5.05             | 20.53 | 73.27             | P(Value)NBTR-ND | 5,000   | 277.70/M           | ERJ-L12KFxxxU |
| 2010, 1/2 W, 1%  | —    | 47 ~ 100         | ±100ppm                          | P(Value)NCCT-ND   | 5.05             | 20.53 | 73.27             | P(Value)NCTR-ND | 5,000   | 277.70/M           | ERJ-L1DKFxxxU |
| 2512, 1 W, 5%    | T    | 1.0 ~ 1.5        | 350 ±100ppm                      | P(Value)TCT-ND    | 5.63             | 22.89 | 81.69             | P(Value)TTR-ND  | 3,000   | 310.37/M           | ERJ-M1WTJxxxU |
|                  | S    | 3.0 ~ 4.0        | ±350ppm                          | P(Value)TCT-ND    | 5.63             | 22.89 | 81.69             | P(Value)TTR-ND  | 3,000   | 310.37/M           | ERJ-M1WSJxxxU |
|                  | L    | 5.0 ~ 20         | ±100ppm                          | P(Value)TCT-ND    | 5.72             | 23.24 | 82.95             | P(Value)TTR-ND  | 3,000   | 315.27/M           | ERJ-L1WKJxxxU |
| 2512, 1 W, 1%    | T    | 1.0 ~ 1.5        | 350 ±100ppm                      | P(Value)NDCT-ND   | 6.96             | 28.26 | 100.85            | P(Value)NDTR-ND | 3,000   | 384.69/M           | ERJ-M1WTFxxxU |
|                  | S    | 3.0 ~ 4.0        | ±350ppm                          | P(Value)MCT-ND    | 5.92             | 24.07 | 85.90             | P(Value)MTR-ND  | 3,000   | 326.70/M           | ERJ-M1WSFxxxU |
|                  | L    | 5.0 ~ 20         | ±100ppm                          | P(Value)MCT-ND    | 6.71             | 27.25 | 97.27             | P(Value)MTR-ND  | 3,000   | 377.52/M           | ERJ-L1WKFxxxU |
|                  | L    | 47               | ±300ppm                          | P(Value)MCT-ND    | 6.82             | 27.73 | 98.95             | P(Value)MTR-ND  | 3,000   | 377.34/M           | ERJ-L1WKFxxxU |

0603, 0805, 1206, 1210 1% Current Sensing Low Resistance Resistor Kit

ERJ1-KIT-ND 20 each of 21 Values (RoHS Compliant) ..... 29.00

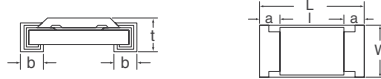
1812, 2010, 2512 1% Current Sensing Low Resistance Resistor Kit

ERJ2-KIT-ND 20 each of 26 Values (RoHS Compliant) ..... 94.34

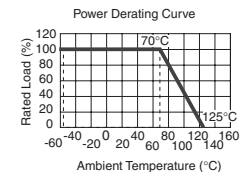
## Panasonic Anti-Surge Thick Film Chip Resistors

**Features:**

- Operating Temperature: -55°C ~ 155°C
- Improved Anti-Surge characteristics compared to metal film resistors
- Metal glaze thick film resistive element and three layers of electrodes result in high reliability
- Suitable for both reflow soldering and flow soldering
- Thick film resistor with excellent Anti-Pulse characteristic and high rated power



| Type | Dimensions (mm) |      |      |      |      |      |
|------|-----------------|------|------|------|------|------|
|      | L               | W    | a    | b    | t    | I    |
| 0805 | 2.00            | 1.25 | 0.25 | 0.40 | 0.60 | 1.50 |
| 1206 | 3.20            | 1.60 | 0.40 | 0.50 | 0.60 | 2.24 |
| 1210 | 3.20            | 2.50 | 0.35 | 0.50 | 0.60 | 2.50 |



| Type   | Power Rating at 70°C (W) | Limiting Element Voltage (Maximum RCWV) <sup>1</sup> (V) | Maximum Overload Voltage <sup>2</sup> (V) | Resistance Tolerance (%) | Resistance Range (Ω) |         | Temperature Coefficient x10 <sup>-6</sup> °C (ppm/°C) | Standard Resistance Values |
|--------|--------------------------|--|---|--------------------------|----------------------|---------|---|----------------------------|
|        |                          |  |   |                          | Minimum              | Maximum |   |                            |
| ERJP06 | 0.125                    | 150  | 200                                       | ±5                       | 10                   | 30      | ±300  | E24 (3 digits)             |
| ERJP06 | 0.125                    | 150  | 200                                       | ±5                       | 33                   | 1.0M    | ±200  | E24 (3 digits)             |
| ERJP08 | 0.25                     | 200  | 400                                       | ±5                       | 10                   | 1.0M    | ±200  | E24 (3 digits)             |
| ERJP14 | 0.5                      | 200  | 400                                       | ±5                       | 1.0                  | 1.0M    | ±200  | E24 (3 digits)             |

(1) Rated Continuous Working Voltage (RCWV) shall be determined from RCWV = √Power Rating x Resistance Values, or Limiting Element Voltage (maximum RCWV) listed above, whichever is less.

(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from SOTV = 2.5 x Power Rating or maximum Overload Voltage listed above whichever is less.

Standard Resistor Values (See below for complete part numbers when ordering.)

|     |     |     |    |     |     |     |      |      |      |     |     |      |      |      |
|-----|-----|-----|----|-----|-----|-----|------|------|------|-----|-----|------|------|------|
| 1.0 | 2.7 | 6.8 | 18 | 47  | 120 | 330 | 820  | 2.2K | 5.6K | 15K | 39K | 100K | 270K | 680K |
| 1.1 | 3.0 | 7.5 | 20 | 51  | 130 | 360 | 910  | 2.4K | 6.2K | 16K | 43K | 110K | 300K | 750K |
| 1.2 | 3.3 | 8.2 | 22 | 56  | 150 | 390 | 1.0K | 2.7K | 6.8K | 18K | 47K | 120K | 330K | 820K |
| 1.3 | 3.6 | 9.1 | 24 | 62  | 160 | 430 | 1.1K | 3.0K | 7.5K | 20K | 51K | 130K | 360K | 910K |
| 1.5 | 3.9 | 10  | 27 | 68  | 180 | 470 | 1.2K | 3.3K | 8.2K | 22K | 56K | 150K | 390K | 1.0M |
| 1.6 | 4.3 | 11  | 30 | 75  | 200 | 510 | 1.3K | 3.6K | 9.1K | 24K | 62K | 160K | 430K |      |
| 1.8 | 4.7 | 12  | 33 | 82  | 220 | 560 | 1.5K | 3.9K | 10K  | 27K | 68K | 180K | 470K |      |
| 2.0 | 5.1 | 13  | 36 | 91  | 240 | 620 | 1.6K | 4.3K | 11K  | 30K | 75K | 200K | 510K |      |
| 2.2 | 5.6 | 15  | 39 | 100 | 270 | 680 | 1.8K | 4.7K | 12K  | 33K | 82K | 220K | 560K |      |
| 2.4 | 6.2 | 16  | 43 | 110 | 300 | 750 | 2.0K | 5.1K | 13K  | 36K | 91K | 240K | 620K |      |

| Description     | Value Range (Ω) | Digi-Key Part No. | Cut Tape Pricing |      |       |       | Digi-Key Part No. | Tape and Reel Pricing |         |         |         | Panasonic Part No. |
|-----------------|-----------------|-------------------|------------------|------|-------|-------|-------------------|-----------------------|---------|---------|---------|--------------------|
|                 |                 |                   | 10               | 50   | 200   | 1,000 |                   | 5,000                 | 10,000  | 25,000  | 50,000  |                    |
| 0805, 1/8 W, 5% | 10 ~ 1.0M       | P(Value)ADCT-ND   | 1.20             | 3.58 | 8.42  | 25.26 | P(Value)ADTR-ND   | 19.32/M               | 16.56/M | 15.18/M | 13.80/M | ERJ-P06JxxxV       |
| 1206, 1/4 W, 5% | 10 ~ 1.0M       | P(Value)ALCT-ND   | 1.46             | 4.35 | 10.24 | 30.71 | P(Value)ALTR-ND   | 25.67/M               | 22.00/M | 20.17/M | 18.34/M | ERJ-P08JxxxV       |
| 1210, 1/2 W, 5% | 1.0 ~ 1.0M      | P(Value)ASCT-ND   | 2.58             | 7.72 | 18.15 | 54.45 | P(Value)ASTR-ND   | 53.37/M               | 45.74/M | 41.93/M | 30.50/M | ERJ-P14JxxxU       |

Free shipping on orders over £50! All prices are in British pound sterling and include duties.

uk.digikey.com — FREEPHONE: 0-800-587-0991 • 0-800-904-7786 — FREEFAX: 0-800-587-0992 • 0-800-904-7783

(UK091) 1793