

# RMCF / RMCP Series

General Purpose Thick Film Standard Power  
and High-Power Chip Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

## Features:

- RMCF – standard power ratings
- RMCP – high power ratings
- Nickel barrier terminations standard
- Power derating from 100% at 70°C to zero at +155°C
- AEC-Q200 Compliant (except RMCP0201)
- RoHS compliant and halogen free



## Electrical Specifications - RMCF

| Type / Code | Power Rating<br>(W)<br>@ 70°C | Max.<br>Working<br>Voltage (V) <sup>(1)</sup> | Max.<br>Overload<br>Voltage (V) | Max.<br>Jumper Current<br>(A) | TCR (ppm/°C) | Ohmic Range (Ω) and Tolerance <sup>(2)</sup> |            |
|-------------|-------------------------------|-----------------------------------------------|---------------------------------|-------------------------------|--------------|----------------------------------------------|------------|
|             |                               |                                               |                                 |                               |              | 1%                                           | 5%         |
| RMCF01005   | 0.03                          | 15                                            | 30                              | 0.5                           | ± 300        | 10 - 97.6                                    |            |
|             |                               |                                               |                                 |                               | ± 200        | 100 - 1M                                     |            |
| RMCF0201    | 0.05                          | 25                                            | 50                              | 0.5                           | ± 400        | 1 - 9.76                                     |            |
|             |                               |                                               |                                 |                               | ± 200        | 10 - 10M                                     |            |
| RMCF0402    | 0.063                         | 50                                            | 100                             | 1                             | ± 200        | 1 - 9.76 <sup>(4)</sup>                      |            |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |            |
|             |                               |                                               |                                 |                               | ± 200        | 1.02M - 10M                                  | 1.1M - 20M |
| RMCF0603    | 0.1                           | 75                                            | 150                             | 1                             | ± 500        | 0.1 - 0.499                                  |            |
|             |                               |                                               |                                 |                               | ± 400        | 0.5 - 0.976                                  |            |
|             |                               |                                               |                                 |                               | ± 200        | 1 - 9.76                                     | 1 - 20M    |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      | -          |
|             |                               |                                               |                                 |                               | ± 200        | 1.02M - 10M                                  | -          |
| RMCF0805    | 0.125                         | 150                                           | 300                             | 2                             | ± 200        | 0.1 - 9.76                                   | 0.1 - 20M  |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      | -          |
|             |                               |                                               |                                 |                               | ± 200        | 1.02M - 10M                                  | -          |
| RMCF1206    | 0.25                          | 200                                           | 400                             | 2                             | ± 200        | 0.1 - 9.76                                   | 0.1 - 20M  |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      | -          |
|             |                               |                                               |                                 |                               | ± 200        | 1.02M - 10M                                  | -          |
| RMCF1210    | 0.33 <sup>(3)</sup>           | 200                                           | 400                             | 3                             | ± 200        | 0.1 - 0.976                                  |            |
|             |                               |                                               |                                 |                               | ± 400        | 1 - 9.76                                     |            |
|             |                               |                                               |                                 |                               | ± 200        | -                                            | 10 - 20M   |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 10M                                     | -          |
| RMCF2010    | 0.75                          | 200                                           | 400                             | 3                             | ± 200        | 0.1 - 0.976                                  |            |
|             |                               |                                               |                                 |                               | ± 400        | 1 - 9.76                                     |            |
|             |                               |                                               |                                 |                               | ± 200        | -                                            | 10 - 10M   |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 10M                                     | -          |
| RMCF2512    | 1                             | 200                                           | 400                             | 3                             | ± 200        | 0.1 - 0.976                                  |            |
|             |                               |                                               |                                 |                               | ± 400        | 1 - 9.76                                     |            |
|             |                               |                                               |                                 |                               | ± 200        | -                                            | 10 - 10M   |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 10M                                     | -          |

Notes: (1) Lesser of  $\sqrt{P \cdot R}$  or maximum working voltage

(2) Contact factory for extended ohmic values

(3) Power rating is 0.5W for ohmic values 1K Ω and below

(4) Contact factory for lower ohmic values

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| Type / Code | Power Rating<br>(W)<br>@ 70°C | Max.<br>Working<br>Voltage (V) <sup>(1)</sup> | Max.<br>Overload<br>Voltage (V) | Max.<br>Jumper Current<br>(A) | TCR (ppm/°C) | Ohmic Range (Ω) and Tolerance <sup>(2)</sup> |
|-------------|-------------------------------|-----------------------------------------------|---------------------------------|-------------------------------|--------------|----------------------------------------------|
|             |                               |                                               |                                 |                               |              | 1%, 5%                                       |
| RMCP0201    | 0.063                         | 25                                            | 50                              | 1                             | -200 / +400  | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 200        | 10 - 1M                                      |
| RMCP0402    | 0.125                         | 50                                            | 100                             | 1.5                           | ± 200        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |
| RMCP0603    | 0.25                          | 75                                            | 150                             | 2                             | ± 200        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |
| RMCP0805    | 0.33                          | 150                                           | 300                             | 2.5                           | ± 200        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |
| RMCP1206    | 0.5                           | 200                                           | 400                             | 3.5                           | ± 400        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |
| RMCP1210    | 0.66                          | 200                                           | 400                             | 5                             | ± 400        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |
| RMCP2010    | 1                             | 200                                           | 400                             | 6                             | ± 200        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |
| RMCP2512    | 2                             | 250                                           | 500                             | 7                             | ± 200        | 1 - 9.76                                     |
|             |                               |                                               |                                 |                               | ± 100        | 10 - 1M                                      |

Notes: (1) Lesser of  $\sqrt{P \cdot R}$  or maximum working voltage

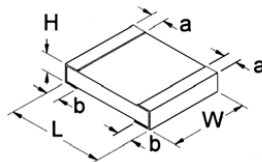
(2) Contact factory for extended ohmic values

## Electrical Specifications - Jumper

| Type / Code | Jumper Rated Current<br>(A) | Max Overload Current<br>(A)* | Jumper Resistance Value<br>(Ω) |
|-------------|-----------------------------|------------------------------|--------------------------------|
| RMCP0201    | 0.5                         | 1                            | 0.025 max.                     |
| RMCP0402    | 1                           | 3                            |                                |
| RMCP0603    | 1                           | 5                            |                                |
| RMCP0805    | 1                           | 5                            |                                |
| RMCP1206    | 2                           | 10                           |                                |
| RMCP1210    | 2                           | 12                           |                                |
| RMCP2010    | 2                           | 12                           |                                |
| RMCP2512    | 2                           | 15                           |                                |

\* < 1 second and 1 time

## Mechanical Specifications



| Type / Code          | Average Unit<br>Weight (mg) | L<br>Body Length              | W<br>Body Width               | H<br>Body Height              | a<br>Top Termination          | b<br>Bottom Termination       | Unit         |
|----------------------|-----------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------|
| RMCF01005            | 0.07                        | 0.016 ± 0.0008<br>0.40 ± 0.02 | 0.008 ± 0.0008<br>0.20 ± 0.02 | 0.005 ± 0.0008<br>0.13 ± 0.02 | 0.004 ± 0.0012<br>0.10 ± 0.03 | 0.004 ± 0.0012<br>0.10 ± 0.03 | inches<br>mm |
| RMCF0201<br>RMCP0201 | 0.16                        | 0.024 ± 0.0012<br>0.60 ± 0.03 | 0.012 ± 0.0012<br>0.30 ± 0.03 | 0.009 ± 0.0012<br>0.23 ± 0.03 | 0.006 ± 0.002<br>0.15 ± 0.05  | 0.006 ± 0.002<br>0.15 ± 0.05  | inches<br>mm |
| RMCF0402<br>RMCP0402 | 0.57<br>0.62                | 0.039 ± 0.004<br>1.00 ± 0.10  | 0.020 ± 0.002<br>0.50 ± 0.05  | 0.012 ± 0.002<br>0.30 ± 0.05  | 0.008 ± 0.004<br>0.20 ± 0.10  | 0.010 ± 0.006<br>0.25 ± 0.15  | inches<br>mm |
| RMCF0603<br>RMCP0603 | 1.88<br>2.04                | 0.061 ± 0.006<br>1.55 ± 0.15  | 0.031 ± 0.006<br>0.80 ± 0.15  | 0.018 ± 0.004<br>0.45 ± 0.10  | 0.012 ± 0.008<br>0.30 ± 0.20  | 0.012 ± 0.008<br>0.30 ± 0.20  | inches<br>mm |
| RMCF0805<br>RMCP0805 | 5.00<br>4.37                | 0.079 ± 0.008<br>2.00 ± 0.20  | 0.049 ± 0.004<br>1.25 ± 0.10  | 0.020 ± 0.006<br>0.50 ± 0.15  | 0.014 ± 0.010<br>0.35 ± 0.25  | 0.014 ± 0.010<br>0.35 ± 0.25  | inches<br>mm |
| RMCF1206<br>RMCP1206 | 8.86<br>8.95                | 0.126 ± 0.010<br>3.20 ± 0.25  | 0.063 ± 0.006<br>1.60 ± 0.15  | 0.022 ± 0.006<br>0.55 ± 0.15  | 0.020 ± 0.012<br>0.50 ± 0.30  | 0.020 ± 0.012<br>0.50 ± 0.30  | inches<br>mm |

Rev Date: 07/09/2020

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This specification may be changed at any time without prior notice  
Please confirm technical specifications before you order and/or use.

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## Mechanical Specifications (cont.)

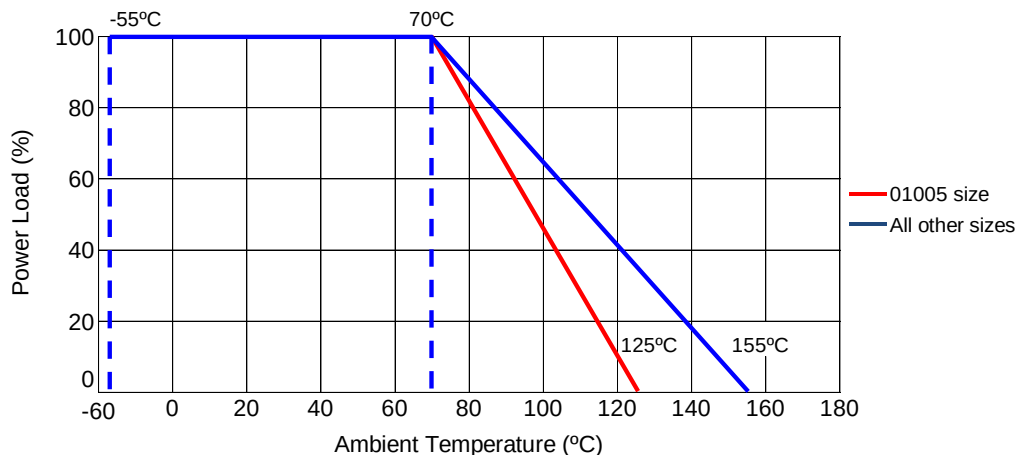
| Type / Code | Average Unit Weight (mg) | L<br>Body Length | W<br>Body Width | H<br>Body Height | a<br>Top Termination | b<br>Bottom Termination | Unit   |
|-------------|--------------------------|------------------|-----------------|------------------|----------------------|-------------------------|--------|
| RMCF1210    | 15.55                    | 0.126 ± 0.010    | 0.098 ± 0.010   | 0.022 ± 0.006    | 0.020 ± 0.012        | 0.020 ± 0.012           | inches |
| RMCP1210    | 15.96                    | 3.20 ± 0.25      | 2.50 ± 0.25     | 0.55 ± 0.15      | 0.50 ± 0.30          | 0.50 ± 0.30             | mm     |
| RMCF2010    | 23.56                    | 0.197 ± 0.008    | 0.098 ± 0.008   | 0.022 ± 0.006    | 0.024 ± 0.012        | 0.024 ± 0.014           | inches |
| RMCP2010    | 24.24                    | 5.00 ± 0.20      | 2.50 ± 0.20     | 0.55 ± 0.15      | 0.60 ± 0.30          | 0.60 ± 0.35             | mm     |
| RMCF2512    | 40.02                    | 0.248 ± 0.008    | 0.126 ± 0.010   | 0.022 ± 0.006    | 0.024 ± 0.012        | 0.024 ± 0.014           | inches |
| RMCP2512    | 39.45                    | 6.30 ± 0.20      | 3.20 ± 0.25     | 0.55 ± 0.15      | 0.60 ± 0.30          | 0.60 ± 0.35             | mm     |

## Performance Characteristics

| Test                            | Test Specifications                                                                                    | Test Conditions (JIS-C 5202)                                                                                                                         |
|---------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short Time Overload             | ± (2% + 0.1Ω)                                                                                          | 2.5 X rated voltage for 5 seconds                                                                                                                    |
|                                 | Jumper: Max 0.05Ω after test                                                                           | 0201 = 1A<br>0402 / 0603 / 0805 = 2.5A<br>1206 / 1210 / 2010 / 2512 = 5A                                                                             |
| Dielectric Withstanding Voltage | No flashover or breakdown                                                                              | 100 VAC, 1 minute                                                                                                                                    |
| Resistance to Soldering Heat    | ± 1%                                                                                                   | 260°C ± 5°C, for 10 seconds ± 0.5 seconds (Solder Bath)                                                                                              |
| Solderability                   | 95% coverage, minimum                                                                                  | 235°C ± 5°C, for 2 seconds ± 0.5 seconds (Colophonium flux)                                                                                          |
| Temperature Cycle               | ± (1% + 0.05Ω)<br>Jumper (< 0.05Ω)                                                                     | -65°C: 30 minutes 25°C: 2 to 3 minutes<br>155°C: 30 minutes 25°C: 2 to 3 minutes<br>(5 Cycles)                                                       |
| Endurance (Damp load)           | ± (3% + 0.1Ω)<br>Jumper (<0.05Ω)                                                                       | 40°C ± 2°C, 90% RH, Rated Load<br>90 minutes On, 30 minutes Off for 1000 hours -0 hour / +48 hours                                                   |
| Load Life<br>(Endurance)        | Values < 1Ω: ± (3% + 0.1Ω)<br>Jumper: Max. 0.1Ω after test                                             | 70 ± 2 °C, RCWV or max. working voltage whichever is less<br>for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"                                   |
| Voltage Coefficient             | ± 100 (ppm/V)                                                                                          | 1/10 rated voltage for 3 seconds max. then rated voltage for<br>3 seconds max.                                                                       |
| Robustness of Termination       | ± (1% + 0.05Ω)                                                                                         | Bend of 3 mm for 5 ± 1 seconds                                                                                                                       |
| Resistance to Solvent           | 1%: ± (0.5% + 0.05Ω)<br>5%: ± (0.5% + 0.05Ω)<br>Jumper: Max. 0.05Ω after test                          | The tested resistor should be immersed into isopropyl alcohol of<br>20 ~ 25°C for 60 seconds. Then the resistor is left in the room<br>for 48 hours. |
| Damp Heat with Load             | 1%: ± (1% + 0.05Ω)<br>5%: ± (2% + 0.05Ω)<br>Values < 1Ω: ± (3% + 0.1Ω)<br>Jumper: Max. 0.1Ω after test | 40 ± 2 °C, 90 ~ 95% R.H. RCWV or max. working voltage whichever is<br>less for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF"                    |

Operating Temperature Range: -55°C to +125°C (01005 size)  
-55°C to +155°C (all others)

## Power Derating Curve:



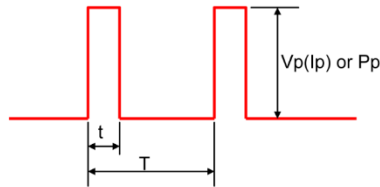
## Repetitive Pulse Information

(This information is for reference only and is not guaranteed performance.)

If repetitive pulses are applied to resistors, pulse wave form must be less than “Pulse limiting voltage”, “Pulse limiting current” or “Pulse limiting wattage” calculated by the formula below.

$$\begin{aligned} V_p &= K \sqrt{P \times R \times T / t} \\ I_p &= K \sqrt{P / R \times T / t} \\ P_p &= K^2 \times P \times T / t \end{aligned}$$

Where:  $V_p$ : Pulse limiting voltage (V)  
 $I_p$ : Pulse limiting current (A)  
 $P_p$ : Pulse limiting wattage (W)  
 $P$ : Power rating (W)  
 $R$ : Nominal resistance (ohm)  
 $T$ : Repetitive period (sec)  
 $t$ : Pulse duration (sec)  
 $K$ : Coefficient by resistors type (refer to below matrix)  
 $[V_r$ : Rated Voltage (V),  $I_r$ : Rated Current (A)]

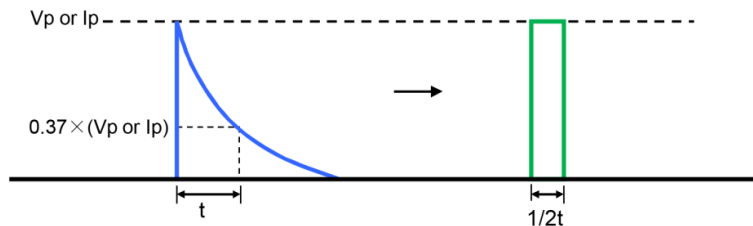


RMCF Coefficient (K) Matrix

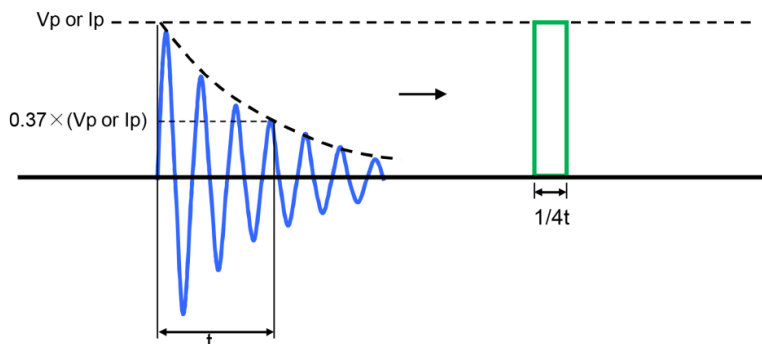
| Resistor Type                   | K    |
|---------------------------------|------|
| $R < 10 \Omega$                 | 0.50 |
| $10 \Omega \leq R < 100 \Omega$ | 0.45 |
| $100 \Omega \leq R < 1K \Omega$ | 0.35 |
| $1K \Omega \leq R < 10K \Omega$ | 0.25 |
| $10K \Omega \leq R$             | 0.20 |

## Waveform Transformation to Square Wave

1. Discharge curve wave with time constant “t” → Square wave



2. Damping oscillation wave with time constant of envelope “t” → Square wave



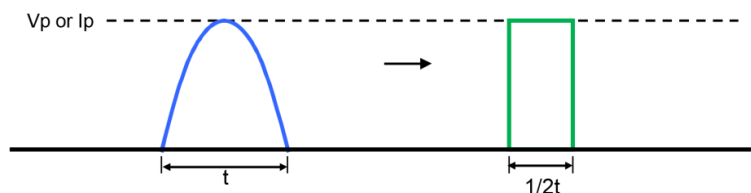
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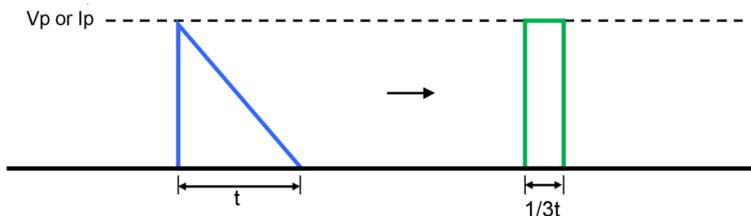
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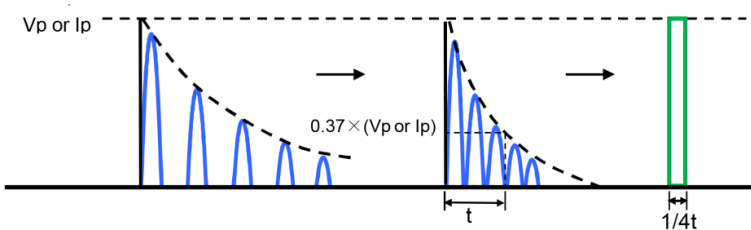
## 3. Half-wave rectification wave → Square wave



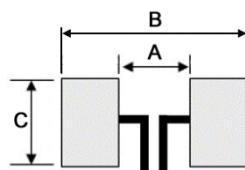
## 4. Triangular wave → Square wave



## 5. Special wave → Square wave



## Recommended Pad Layout



| Size  | A             | B             | C             | Unit         |
|-------|---------------|---------------|---------------|--------------|
| 01005 | 0.008<br>0.20 | 0.020<br>0.50 | 0.008<br>0.20 | inches<br>mm |
| 0201  | 0.012<br>0.30 | 0.039<br>1.00 | 0.016<br>0.40 | inches<br>mm |
| 0402  | 0.020<br>0.50 | 0.059<br>1.50 | 0.024<br>0.60 | inches<br>mm |
| 0603  | 0.031<br>0.80 | 0.083<br>2.10 | 0.035<br>0.90 | inches<br>mm |
| 0805  | 0.047<br>1.20 | 0.118<br>3.00 | 0.051<br>1.30 | inches<br>mm |
| 1206  | 0.087<br>2.20 | 0.165<br>4.20 | 0.063<br>1.60 | inches<br>mm |
| 1210  | 0.087<br>2.20 | 0.165<br>4.20 | 0.110<br>2.80 | inches<br>mm |
| 2010  | 0.138<br>3.50 | 0.240<br>6.10 | 0.110<br>2.80 | inches<br>mm |
| 2512  | 0.193<br>4.90 | 0.315<br>8.00 | 0.138<br>3.50 | inches<br>mm |

# RMCF / RMCP Series

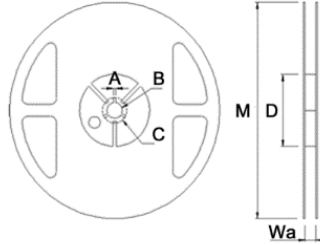
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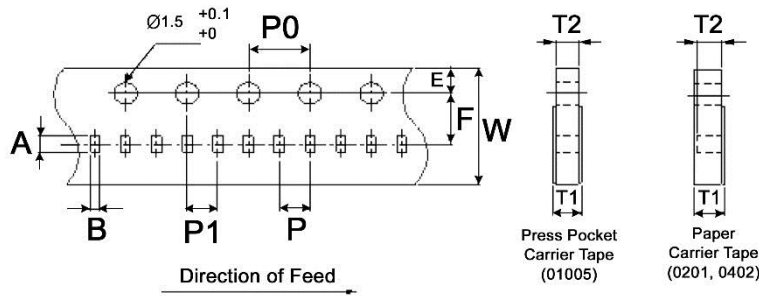
Packaging (EIA Standard RS-481)

## Packaging Specifications



| Reel Type                 | Wa                            | M                               | A                            | B                             | C                             | D                              | Unit         |
|---------------------------|-------------------------------|---------------------------------|------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------|
| 7" reel for<br>8 mm tape  | 0.354 ± 0.020<br>9.00 ± 0.50  | 7.008 ± 0.079<br>178.00 ± 2.00  | 0.079 ± 0.020<br>2.00 ± 0.50 | 0.531 ± 0.020<br>13.50 ± 0.50 | 0.827 ± 0.020<br>21.00 ± 0.50 | 2.362 ± 0.039<br>60.00 ± 1.00  | inches<br>mm |
| 10" reel for<br>8 mm tape | 0.394 ± 0.020<br>10.00 ± 0.50 | 10.000 ± 0.079<br>254.00 ± 2.00 | 0.079 ± 0.020<br>2.00 ± 0.50 | 0.531 ± 0.020<br>13.50 ± 0.50 | 0.827 ± 0.020<br>21.00 ± 0.50 | 3.937 ± 0.039<br>100.00 ± 1.00 | inches<br>mm |

## Taping Specifications - 01005, 0201, 0402



| Size  | 7" Reel<br>Quantity | Typical Full<br>Reel Weight (g) | Tape<br>Width | A                            | B                            | W                            | E                            | F                            | Unit         |
|-------|---------------------|---------------------------------|---------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| 01005 | 10000               | 127.3 ± 12.0                    | 0.315<br>8.00 | 0.018 ± 0.001<br>0.45 ± 0.02 | 0.010 ± 0.001<br>0.25 ± 0.02 | 0.315 ± 0.012<br>8.00 ± 0.30 | 0.069 ± 0.004<br>1.75 ± 0.10 | 0.138 ± 0.002<br>3.50 ± 0.05 | inches<br>mm |
| 0201  | 10000               | 97.2 ± 9.0                      | 0.315<br>8.00 | 0.027 ± 0.002<br>0.68 ± 0.05 | 0.015 ± 0.001<br>0.38 ± 0.03 | 0.315 ± 0.004<br>8.00 ± 0.10 | 0.069 ± 0.004<br>1.75 ± 0.10 | 0.138 ± 0.002<br>3.50 ± 0.05 | inches<br>mm |
| 0402  | 10000               | 94.5 ± 9.0                      | 0.315<br>8.00 | 0.045 ± 0.002<br>1.15 ± 0.05 | 0.026 ± 0.002<br>0.65 ± 0.05 | 0.315 ± 0.008<br>8.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | 0.138 ± 0.002<br>3.50 ± 0.05 | inches<br>mm |

| Size  | T1                           | T2                           | P                            | P0                           | P1                           | Unit         |
|-------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| 01005 | 0.012 ± 0.001<br>0.31 ± 0.03 | 0.007 ± 0.001<br>0.17 ± 0.03 | 0.079 ± 0.002<br>2.00 ± 0.05 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |
| 0201  | 0.017 ± 0.004<br>0.42 ± 0.10 | 0.011 ± 0.001<br>0.28 ± 0.02 | 0.079 ± 0.002<br>2.00 ± 0.05 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |
| 0402  | 0.016 ± 0.008<br>0.40 ± 0.20 | 0.016 ± 0.002<br>0.40 ± 0.05 | 0.079 ± 0.004<br>2.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |

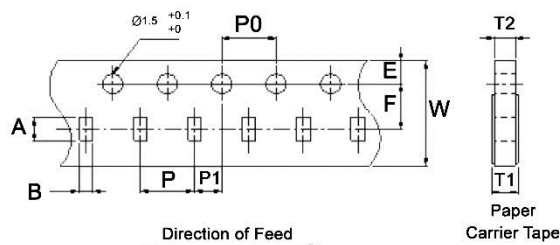
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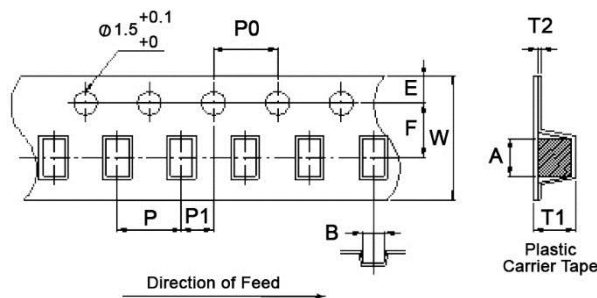
Resistive Product Solutions

## Taping Specifications - 0603, 0805, 1206, 1210



| Size | 7" Reel Quantity <sup>(1)</sup> | Typical Full Reel Weight (g) | Tape Width                   | A                            | B                            | W                            | E                            | Unit         |
|------|---------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| 0603 | 5000                            | 118.3 ± 11.0                 | 0.315<br>8.00                | 0.071 ± 0.004<br>1.80 ± 0.10 | 0.039 ± 0.004<br>1.00 ± 0.10 | 0.315 ± 0.008<br>8.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | inches<br>mm |
| 0806 | 5000                            | 139.2 ± 13.0                 | 0.315<br>8.00                | 0.091 ± 0.004<br>2.30 ± 0.10 | 0.061 ± 0.004<br>1.55 ± 0.10 | 0.315 ± 0.008<br>8.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | inches<br>mm |
| 1206 | 5000                            | 151.4 ± 15.0                 | 0.315<br>8.00                | 0.138 ± 0.008<br>3.50 ± 0.20 | 0.075 ± 0.008<br>1.90 ± 0.20 | 0.315 ± 0.008<br>8.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | inches<br>mm |
| 1210 | 4000                            | 175.7 ± 17.0                 | 0.315<br>8.00                | 0.138 ± 0.008<br>3.50 ± 0.20 | 0.110 ± 0.008<br>2.80 ± 0.20 | 0.315 ± 0.008<br>8.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | inches<br>mm |
| Size | F                               |                              | T1                           | T2                           | P                            | P0                           | P1                           | Unit         |
| 0603 | 0.138 ± 0.002<br>3.50 ± 0.05    |                              | 0.024 ± 0.008<br>0.60 ± 0.20 | 0.024 ± 0.004<br>0.60 ± 0.10 | 0.157 ± 0.004<br>4.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |
| 0805 | 0.138 ± 0.002<br>3.50 ± 0.05    |                              | 0.030 ± 0.008<br>0.75 ± 0.20 | 0.030 ± 0.004<br>0.75 ± 0.10 | 0.157 ± 0.004<br>4.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |
| 1206 | 0.138 ± 0.002<br>3.50 ± 0.05    |                              | 0.030 ± 0.008<br>0.75 ± 0.20 | 0.030 ± 0.004<br>0.75 ± 0.10 | 0.157 ± 0.004<br>4.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |
| 1210 | 0.138 ± 0.002<br>3.50 ± 0.05    |                              | 0.030 ± 0.008<br>0.75 ± 0.20 | 0.030 ± 0.004<br>0.75 ± 0.10 | 0.157 ± 0.004<br>4.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm |

## Taping Specifications (2010, 2512)



| Size | 7" Reel Quantity             | Typical Full Reel Weight (g) | Tape Width                   | A                            | B                            | W                             | E                            | F                            | Unit         |
|------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|------------------------------|------------------------------|--------------|
| 2010 | 4000                         | 183.1 ± 18.0                 | 0.472<br>12.00               | 0.217 ± 0.008<br>5.50 ± 0.20 | 0.110 ± 0.008<br>2.80 ± 0.20 | 0.472 ± 0.008<br>12.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | 0.217 ± 0.002<br>5.50 ± 0.05 | inches<br>mm |
| 2512 | 4000                         | 255.3 ± 25.0                 | 0.472<br>12.00               | 0.264 ± 0.008<br>6.70 ± 0.20 | 0.134 ± 0.008<br>3.40 ± 0.20 | 0.472 ± 0.008<br>12.00 ± 0.20 | 0.069 ± 0.004<br>1.75 ± 0.10 | 0.217 ± 0.002<br>5.50 ± 0.05 | inches<br>mm |
| Size | T1                           | T2                           | P                            | P0                           | P1                           | Unit                          |                              |                              |              |
| 2010 | 0.043 ± 0.006<br>1.10 ± 0.15 | 0.009 ± 0.006<br>0.23 ± 0.15 | 0.157 ± 0.004<br>4.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm                  |                              |                              |              |
| 2512 | 0.043 ± 0.006<br>1.10 ± 0.15 | 0.009 ± 0.006<br>0.23 ± 0.15 | 0.157 ± 0.004<br>4.00 ± 0.10 | 0.157 ± 0.002<br>4.00 ± 0.05 | 0.079 ± 0.002<br>2.00 ± 0.05 | inches<br>mm                  |                              |                              |              |

Note: Plastic carrier tape used for 2010 and 2512 sizes.

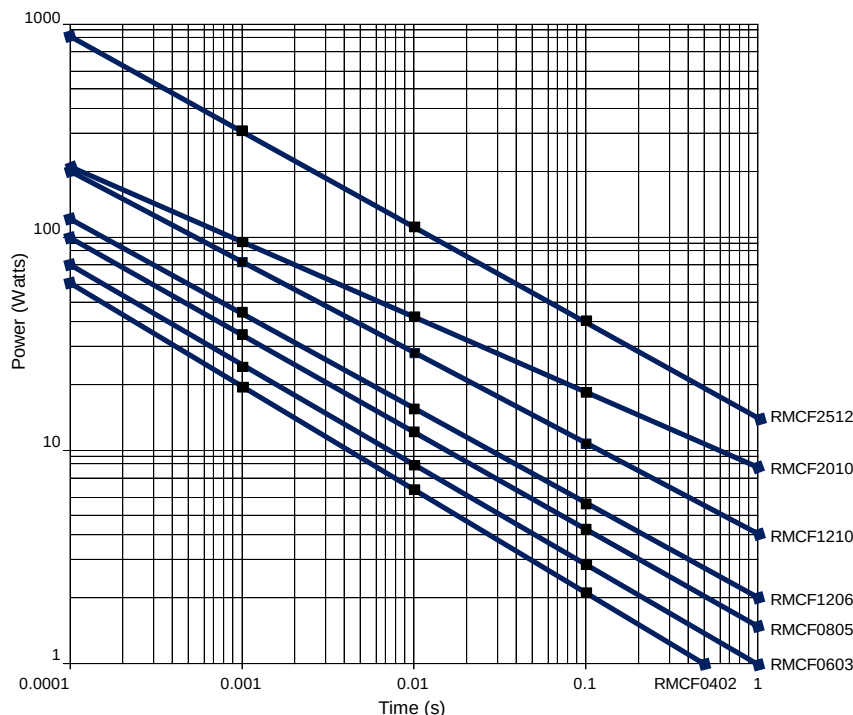
# RMCF / RMCP Series

General Purpose Thick Film Standard Power  
and High-Power Chip Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

## Single Pulse Power



| Size | Time (s) |       |      |     |     | Unit |
|------|----------|-------|------|-----|-----|------|
|      | 0.0001   | 0.001 | 0.01 | 0.1 | 1   |      |
| 0402 | 60       | 18    | 6.3  | 2.2 | 0.7 | W    |

## Single Pulse Power (cont.)

| Size | Time (s) |       |      |     |     | Unit |
|------|----------|-------|------|-----|-----|------|
|      | 0.0001   | 0.001 | 0.01 | 0.1 | 1   |      |
| 0603 | 70       | 21.5  | 7.6  | 2.8 | 1   | W    |
| 0805 | 94       | 34    | 12   | 4.4 | 1.6 | W    |
| 1206 | 120      | 43    | 15   | 5.6 | 2   | W    |
| 1210 | 240      | 86    | 31   | 11  | 4   | W    |
| 2010 | 210      | 96    | 41   | 18  | 8   | W    |
| 2512 | 800      | 300   | 110  | 42  | 16  | W    |

The data provided are for reference only. They are typical performance for this product but are not guaranteed. The actual pulse handling of each individual resistor may vary depending on a variety of factors including resistance tolerance and resistance value. Stackpole Electronics, Inc. assumes no liability for the use of this information. Customers should validate the performance of these products in their applications. Contact Stackpole marketing to discuss specific pulse application requirements.

## Temperature Measurement of Resistor Surface

Description: The resistor surface generated temperature variation after applied rated voltage.  
Products and power:

| Size                  | 0201 | 0402  | 0603  | 0805 | 1206 | 1210 | 2010 | 2512 |
|-----------------------|------|-------|-------|------|------|------|------|------|
| R-V                   | 15K  | 40.2K | 57.6K | 180K | 182K | 100K | 100K | 75K  |
| Rated Power (W)       | 1/20 | 1/16  | 1/10  | 1/8  | 1/4  | 1/2  | 3.4  | 1    |
| Max Rated Voltage (V) | 25   | 50    | 75    | 150  | 200  | 200  | 200  | 200  |

Test method: Measure component surface temperature directly after the temperature stabilizes.

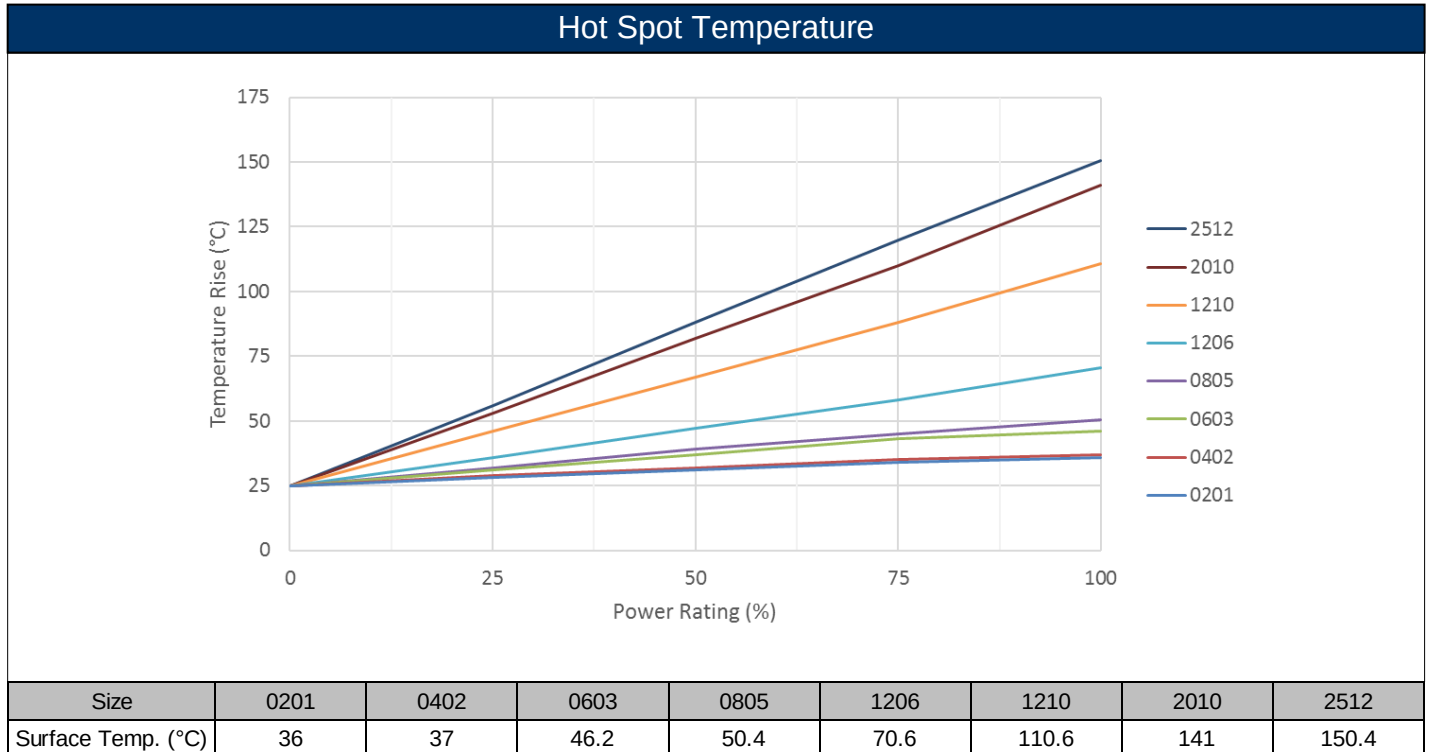
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Test result: As per table below:



## Part Marking Specifications



### 1% Marking

The nominal resistance is marked on the surface of the overcoating with the use of 4 digit markings.  
0201 and 0402 are not marked.



### 5% Marking

The nominal resistance is marked on the surface of the overcoating with the use of 3 digit markings.  
0201 and 0402 are not marked.

For shared E24/E96 values, 1% tolerance product may be marked with three digit marking instead of the standard four digit marking for all other E96 values. All E24 values available in 1% tolerance are also marked with three digit marking.

## Mark Instructions for 0603 1% Chip Resistors (per EIA-J)

A two-digit number is assigned to each standard R-Value (E96) as shown in the chart below. This is followed by one alpha character which is used as a multiplier. Each letter "Y" – "F" represents a specific multiplier as follows:

|          |              |            |             |
|----------|--------------|------------|-------------|
| Y = 0.1  | X = 1        | A = 10     | B = 100     |
| C = 1000 | D(d) = 10000 | E = 100000 | F = 1000000 |

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EXAMPLE:

| Chip Marking | Explanation                  | Value                                    |
|--------------|------------------------------|------------------------------------------|
| 01B          | 01 means 10.0 and B = 100    | $10.0 \times 100 = 1 \text{ K ohm}$      |
| 25C          | 25 means 17.8 and C = 1,000  | $17.8 \times 1,000 = 17.8 \text{ K ohm}$ |
| 93D          | 93 means 90.9 and D = 10,000 | $90.9 \times 10,000 = 909 \text{ K ohm}$ |

| E96  |    |      |    |      |    |      |    |      |    |      |    |
|------|----|------|----|------|----|------|----|------|----|------|----|
| 1%   | #  | 1%   | #  | 1%   | #  | 1%   | #  | 1%   | #  | 1%   | #  |
| 10.0 | 01 | 14.7 | 17 | 21.5 | 33 | 31.6 | 49 | 46.4 | 65 | 68.1 | 81 |
| 10.2 | 02 | 15.0 | 18 | 22.1 | 34 | 32.4 | 50 | 47.5 | 66 | 69.8 | 82 |
| 10.5 | 03 | 15.4 | 19 | 22.6 | 35 | 33.2 | 51 | 48.7 | 67 | 71.5 | 83 |
| 10.7 | 04 | 15.8 | 20 | 23.2 | 36 | 34.0 | 52 | 49.9 | 68 | 73.2 | 84 |
| 11.0 | 05 | 16.2 | 21 | 23.7 | 37 | 34.8 | 53 | 51.1 | 69 | 75.0 | 85 |
| 11.3 | 06 | 16.5 | 22 | 24.3 | 38 | 35.7 | 54 | 52.3 | 70 | 76.8 | 86 |
| 11.5 | 07 | 16.9 | 23 | 24.9 | 39 | 36.5 | 55 | 53.6 | 71 | 78.7 | 87 |
| 11.8 | 08 | 17.4 | 24 | 25.5 | 40 | 37.4 | 56 | 54.9 | 72 | 80.6 | 88 |
| 12.1 | 09 | 17.8 | 25 | 26.1 | 41 | 38.3 | 57 | 56.2 | 73 | 82.5 | 89 |
| 12.4 | 10 | 18.2 | 26 | 26.7 | 42 | 39.2 | 58 | 57.6 | 74 | 84.5 | 90 |
| 12.7 | 11 | 18.7 | 27 | 27.4 | 43 | 40.2 | 59 | 59.0 | 75 | 86.6 | 91 |
| 13.0 | 12 | 19.1 | 28 | 28.0 | 44 | 41.2 | 60 | 60.4 | 76 | 88.7 | 92 |
| 13.3 | 13 | 19.6 | 29 | 28.7 | 45 | 42.2 | 61 | 61.9 | 77 | 90.9 | 93 |
| 13.7 | 14 | 20.0 | 30 | 29.4 | 46 | 43.2 | 62 | 63.4 | 78 | 93.1 | 94 |
| 14.0 | 15 | 20.5 | 31 | 30.1 | 47 | 44.2 | 63 | 64.9 | 79 | 95.3 | 95 |
| 14.3 | 16 | 21.0 | 32 | 30.9 | 48 | 45.3 | 64 | 66.5 | 80 | 97.6 | 96 |

## RoHS Compliance

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union's directive regarding "Restrictions on Hazardous Substances" (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

| RoHS Compliance Status  |                                                        |                            |                                |                                   |                                                    |                                       |
|-------------------------|--------------------------------------------------------|----------------------------|--------------------------------|-----------------------------------|----------------------------------------------------|---------------------------------------|
| Standard Product Series | Description                                            | Package / Termination Type | Standard Series RoHS Compliant | Lead-Free Termination Composition | Lead-Free Mfg. Effective Date (Std Product Series) | Lead-Free Effective Date Code (YY/WW) |
| RMCF                    | General Purpose Thick Film Surface Mount Chip Resistor | SMD                        | YES <sup>(1)</sup>             | 100% Matte Sn over Ni             | Jan-04 (Japan)<br>Jan-05 (Taiwan, China)           | 04/01<br>05/01                        |
| RMCP                    | General Purpose High Power Thick Film Chip Resistor    | SMD                        | YES <sup>(1)</sup>             | 100% Matte Sn over Ni             | Always                                             | Always                                |

Note (1): RoHS Compliant by means of exemption 7c-I.

## "Conflict Metals" Commitment

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the "conflict region" of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

# RMCF / RMCP Series

General Purpose Thick Film Standard Power  
and High-Power Chip Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

## Compliance to "REACH"

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, "The Registration, Evaluation, Authorization and Restriction of Chemicals", otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

## Environmental Policy

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

### How to Order - RMCF

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| R | M | C | F | 0 | 6 | 0 | 3 | J | T  | 4  | K  | 7  | 0  |

| Product Series |                 | Size  |         | Tolerance |     |          | Packaging |                        |                  |          | Resistance Value                                                                                 |  |  |  |  |
|----------------|-----------------|-------|---------|-----------|-----|----------|-----------|------------------------|------------------|----------|--------------------------------------------------------------------------------------------------|--|--|--|--|
| Code           | Description     | Size  | W       | Code      | Tol | Value    | Code      | Description            | Size             | Quantity | Four characters with the multiplier used as the decimal holder.                                  |  |  |  |  |
| RMCF           | Thick Film Chip | 01005 | 0.03    | F         | 1%  | E96, E24 | T         | 7" Reel - Paper Tape   | 01005            | 10000    | 0.1 ohm = R100<br>4.70 ohm = 4R70<br>10.0 Kohm = 10K0<br>1 Mohm = 1M00<br>Zero ohm jumper = 0R00 |  |  |  |  |
|                |                 | 0201  | 0.05    | J         | 5%  | E24      |           |                        | 0201, 0402       | 10000    |                                                                                                  |  |  |  |  |
|                |                 | 0402  | 0.063   | Z Jumper  |     |          |           |                        | 0603, 0805, 1206 | 5000     |                                                                                                  |  |  |  |  |
|                |                 | 0603  | 0.1     |           |     |          |           |                        | 1210             | 4000     |                                                                                                  |  |  |  |  |
|                |                 | 0805  | 0.125   |           |     |          |           | 7" Reel - Plastic Tape | 2010, 2512       | 4000     |                                                                                                  |  |  |  |  |
|                |                 | 1206  | 0.25    |           |     |          |           |                        |                  |          |                                                                                                  |  |  |  |  |
|                |                 | 1210  | 0.33(*) |           |     |          | G         | 10" Reel - Paper Tape  | 0603, 0805, 1206 |          |                                                                                                  |  |  |  |  |
|                |                 | 2010  | 0.75    |           |     |          |           |                        |                  |          |                                                                                                  |  |  |  |  |
|                |                 | 2512  | 1       |           |     |          |           |                        |                  |          |                                                                                                  |  |  |  |  |

(\*) Power rating is 0.5 W for ohmic values below 1 K  $\Omega$

### How to Order - RMCP

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| R | M | C | P | 0 | 6 | 0 | 3 | J | T  | 4  | K  | 7  | 0  |

| Product Series |             |
|----------------|-------------|
| Code           | Description |
| RMCP           | High Power  |

| Size |       |
|------|-------|
| Size | W     |
| 0201 | 0.063 |
| 0402 | 0.125 |
| 0603 | 0.25  |
| 0805 | 0.33  |
| 1206 | 0.5   |
| 1210 | 0.66  |
| 2010 | 1     |
| 2512 | 2     |

| Tolerance |        |          |
|-----------|--------|----------|
| Code      | Tol    | Value    |
| F         | 1%     | E96, E24 |
| J         | 5%     | E24      |
| Z         | Jumper |          |

| Packaging |                     |            |          |
|-----------|---------------------|------------|----------|
| Code      | Description         | Size       | Quantity |
| T         | 7" Reel Paper Tape  | 0201, 0402 | 10000    |
|           |                     | 0603, 0805 | 5000     |
|           |                     | 1206, 1210 | 5000     |
|           |                     | 2010, 2512 | 4000     |
| G         | 10" Reel Paper Tape | 0603, 0805 | 10000    |
|           |                     | 1206, 1210 | 10000    |
|           |                     | 2010       | 8000     |

| Resistance Value                                                |  |
|-----------------------------------------------------------------|--|
| Four characters with the multiplier used as the decimal holder. |  |
| 1 ohm = 1R00                                                    |  |
| 10 Kohm = 10K0                                                  |  |
| 1 Mohm = 1M00                                                   |  |