

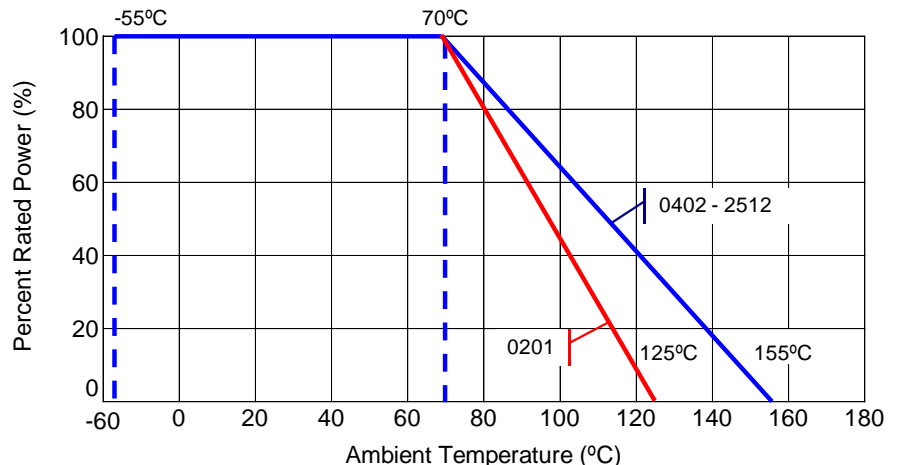
- Features:
- Precision performance
 - RoHS compliant and halogen free
 - Highly stable performance over time
 - Tolerances of 0.1% may be available - contact factory for details
 - Temperature coefficient of resistance as low as $\pm 50\text{ppm}/^\circ\text{C}$
 - 0402 and 0603 package sizes are qualified to AEC-Q200



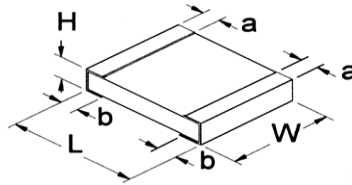
| Electrical Specifications | | | | | | | |
|---------------------------|-----------------------------|--|--------------------------|------------------|--|-------------|----------|
| Type / Code | Power Rating (Watts) @ 70°C | Maximum Working Voltage ⁽¹⁾ | Maximum Overload Voltage | TCR (ppm/°C) | Ohmic Range (Ω) and Tolerance | | |
| | | | | | 0.1% | 0.5% | 1% |
| RGC0201 | 0.05W | 25V | 50V | ± 200 ppm/°C | - | 10 - 10M | - |
| RGC0402 | 0.063W | 50V | 100V | ± 50 ppm/°C | - | 100 - 1M | |
| | | | | ± 100 ppm/°C | - | 10 - 1M | 1 - 1M |
| | | | | ± 200 ppm/°C | - | 1.02M - 10M | - |
| RGC0603 | 0.1W | 75V | 150V | ± 50 ppm/°C | 10 - 1M | 10 - 10M | |
| | | | | ± 100 ppm/°C | 10 - 1M | | 1 - 10M |
| | | | | ± 200 ppm/°C | - | 1.02M - 10M | - |
| RGC0805 | 0.125W | 150V | 300V | ± 50 ppm/°C | 10 - 1M | 10 - 10M | |
| | | | | ± 100 ppm/°C | 10 - 1M | | 1 - 10M |
| | | | | ± 200 ppm/°C | - | 1.02M - 10M | - |
| RGC1206 | 0.25W | 200V | 400V | ± 50 ppm/°C | 10 - 1M | 10 - 10M | |
| | | | | ± 100 ppm/°C | 10 - 1M | | 1 - 10M |
| | | | | ± 200 ppm/°C | - | 1.02M - 10M | - |
| RGC1210 | 0.25W | 200V | 400V | ± 100 ppm/°C | - | - | 1 - 9.76 |
| | 0.33W | 200V | 400V | ± 50 ppm/°C | 10 - 1M | 10 - 10M | |
| | | | | ± 100 ppm/°C | 10 - 1M | | 10 - 10M |
| RGC2010 | 0.75W | 200V | 400V | ± 200 ppm/°C | - | 1.02M - 10M | - |
| | | | | ± 50 ppm/°C | 10 - 1M | 10 - 10M | |
| | | | | ± 100 ppm/°C | 10 - 1M | | 1 - 10M |
| RGC2512 | 1W | 200V | 400V | ± 100 ppm/°C | - | - | 1 - 9.76 |
| | | 250V | 500V | ± 50 ppm/°C | 10 - 1M | 10 - 10M | |
| | | | | ± 100 ppm/°C | 10 - 1M | | 10 - 10M |
| | | | | ± 200 ppm/°C | - | 1.02M - 10M | - |

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

Power Derating Curve

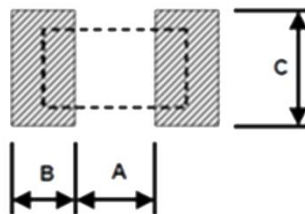


Mechanical Specifications



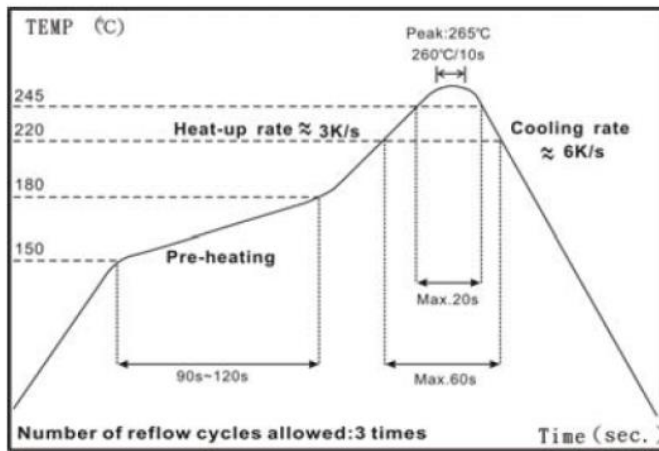
| Type / Code | Weight (g) (1000 pc.) | L Body Length | W Body Width | H Body Height | a Top Termination | b Bottom Termination | Unit |
|-------------|--------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| RGC0201 | 0.150 | 0.024 ± 0.001 0.60 ± 0.03 | 0.012 ± 0.001 0.30 ± 0.03 | 0.009 ± 0.001 0.23 ± 0.03 | 0.006 ± 0.002 0.15 ± 0.05 | 0.006 ± 0.002 0.15 ± 0.05 | inches mm |
| RGC0402 | 0.620 | 0.039 ± 0.004 1.00 ± 0.10 | 0.020 ± 0.002 0.50 ± 0.05 | 0.012 ± 0.004 0.30 ± 0.10 | 0.008 ± 0.004 0.20 ± 0.10 | 0.010 ± 0.006 0.25 ± 0.15 | inches mm |
| RGC0603 | 2.042 | 0.063 ± 0.004 1.60 ± 0.10 | 0.031 ± 0.004 0.80 ± 0.10 | 0.018 ± 0.004 0.45 ± 0.10 | 0.012 ± 0.008 0.30 ± 0.20 | 0.012 ± 0.008 0.30 ± 0.20 | inches mm |
| RGC0805 | 4.368 | 0.079 ± 0.004 2.00 ± 0.10 | 0.049 ± 0.004 1.25 ± 0.10 | 0.020 ± 0.004 0.50 ± 0.10 | 0.016 ± 0.010 0.40 ± 0.25 | 0.016 ± 0.008 0.40 ± 0.20 | inches mm |
| RGC1206 | 8.947 | 0.122 ± 0.006 3.10 ± 0.15 | 0.061 ± 0.004 1.55 ± 0.10 | 0.024 ± 0.006 0.60 ± 0.15 | 0.020 ± 0.010 0.50 ± 0.25 | 0.020 ± 0.012 0.50 ± 0.30 | inches mm |
| RGC1210 | 15.959 | 0.126 ± 0.010 3.20 ± 0.25 | 0.102 ± 0.006 2.60 ± 0.15 | 0.022 ± 0.004 0.55 ± 0.10 | 0.020 ± 0.010 0.50 ± 0.25 | 0.020 ± 0.008 0.50 ± 0.20 | inches mm |
| RGC2010 | 24.241 | 0.197 ± 0.008 5.00 ± 0.20 | 0.098 ± 0.006 2.50 ± 0.15 | 0.022 ± 0.004 0.55 ± 0.10 | 0.024 ± 0.010 0.60 ± 0.25 | 0.024 ± 0.012 0.60 ± 0.30 | inches mm |
| RGC2512 | 39.448 | 0.250 ± 0.008 6.35 ± 0.20 | 0.124 ± 0.008 3.15 ± 0.20 | 0.022 ± 0.004 0.55 ± 0.10 | 0.024 ± 0.010 0.60 ± 0.25 | 0.024 ± 0.012 0.60 ± 0.30 | inches mm |

Recommended Pad Layout

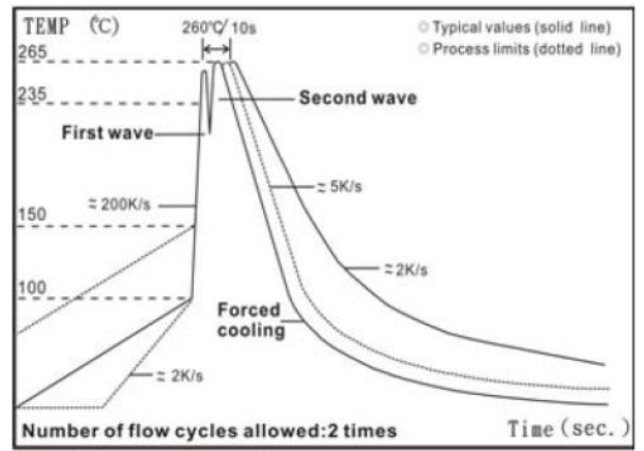


| Type/Code | A | B | C | Unit |
|-----------|---------------|---------------|---------------|--------------|
| RGC0201 | 0.012 0.30 | 0.010 0.25 | 0.012 0.30 | inches mm |
| RGC0402 | 0.020 0.50 | 0.018 0.45 | 0.024 0.60 | inches mm |
| RGC0603 | 0.035 0.90 | 0.024 0.60 | 0.035 0.90 | inches mm |
| RGC0805 | 0.047 1.20 | 0.028 0.70 | 0.051 1.30 | inches mm |
| RGC1206 | 0.079 2.00 | 0.035 0.90 | 0.063 1.60 | inches mm |
| RGC1210 | 0.079 2.00 | 0.035 0.90 | 0.110 2.80 | inches mm |
| RGC2010 | 0.150 3.80 | 0.035 0.90 | 0.110 2.80 | inches mm |
| RGC2512 | 0.193 4.90 | 0.063 1.60 | 0.138 3.50 | inches mm |

Soldering Profiles



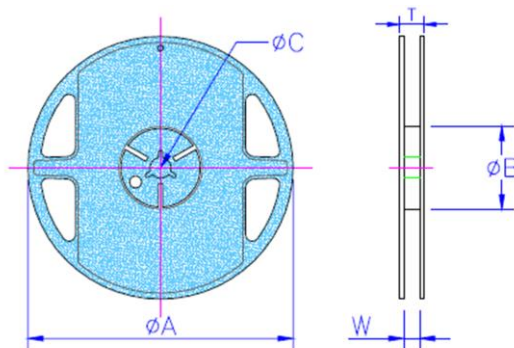
IR Reflow Soldering



Wave Soldering (Flow Soldering)

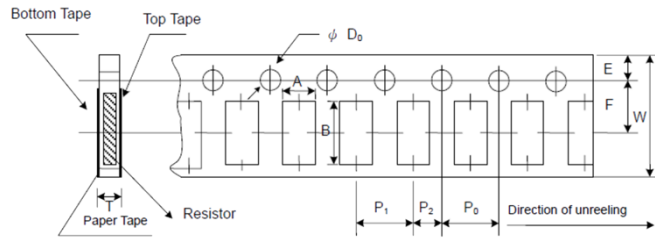
- (1) Time of IR reflow soldering at maximum temperature point 260°C : 10s
- (2) Time of wave soldering at maximum temperature point 260°C : 10s
- (3) Time of soldering iron at maximum temperature point 410°C : 5s

Packaging Specifications



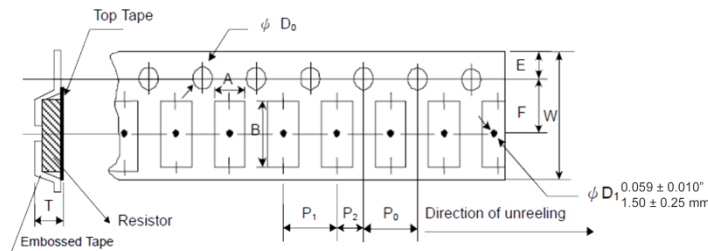
| Type/Code | Packaging Description | Tape Width | Reel Diameter | A | B | C | W | T | Unit |
|--|-----------------------|------------|---------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------|
| RGC0201 RGC0402 RGC0603 RGC0805 RGC1206 RGC1210 | Paper | 8mm | 7 inches | 7.028 ± 0.059 178.50 ± 1.50 | 2.362 ± 0.039 60.00 ± 1.00 | 0.512 ± 0.008 13.00 ± 0.20 | 0.354 ± 0.020 9.00 ± 0.50 | 0.492 ± 0.020 12.50 ± 0.50 | inches mm |
| RGC2010 RGC2512 | Embossed | 12mm | 7 inches | 7.028 ± 0.059 178.50 ± 1.50 | 2.362 ± 0.039 60.00 ± 1.00 | 0.512 ± 0.020 13.00 ± 0.50 | 0.512 ± 0.020 13.00 ± 0.50 | 0.610 ± 0.020 15.50 ± 0.50 | inches mm |

Paper Tape Specifications



| Type/Code | A | B | W | E | F | Unit |
|-----------|---------------|---------------|---------------|---------------|---------------|--------|
| RGC0201 | 0.015 ± 0.002 | 0.027 ± 0.002 | 0.315 ± 0.008 | 0.069 ± 0.004 | 0.138 ± 0.002 | inches |
| | 0.38 ± 0.05 | 0.68 ± 0.05 | 8.00 ± 0.20 | 1.75 ± 0.10 | 3.50 ± 0.05 | mm |
| RGC0402 | 0.026 ± 0.004 | 0.045 ± 0.004 | 0.315 ± 0.008 | 0.069 ± 0.004 | 0.138 ± 0.002 | inches |
| | 0.65 ± 0.10 | 1.15 ± 0.10 | 8.00 ± 0.20 | 1.75 ± 0.10 | 3.50 ± 0.05 | mm |
| RGC0603 | 0.043 ± 0.004 | 0.075 ± 0.004 | 0.315 ± 0.008 | 0.069 ± 0.004 | 0.138 ± 0.002 | inches |
| | 1.10 ± 0.10 | 1.90 ± 0.10 | 8.00 ± 0.20 | 1.75 ± 0.10 | 3.50 ± 0.05 | mm |
| RGC0805 | 0.063 ± 0.004 | 0.094 ± 0.008 | 0.315 ± 0.008 | 0.069 ± 0.004 | 0.138 ± 0.002 | inches |
| | 1.60 ± 0.10 | 2.40 ± 0.20 | 8.00 ± 0.20 | 1.75 ± 0.10 | 3.50 ± 0.05 | mm |
| RGC1206 | 0.075 ± 0.004 | 0.138 ± 0.008 | 0.315 ± 0.008 | 0.069 ± 0.004 | 0.138 ± 0.002 | inches |
| | 1.90 ± 0.10 | 3.50 ± 0.20 | 8.00 ± 0.20 | 1.75 ± 0.10 | 3.50 ± 0.05 | mm |
| RGC2010 | 0.114 ± 0.004 | 0.138 ± 0.008 | 0.315 ± 0.008 | 0.069 ± 0.004 | 0.138 ± 0.002 | inches |
| | 2.90 ± 0.10 | 3.50 ± 0.20 | 8.00 ± 0.20 | 1.75 ± 0.10 | 3.50 ± 0.05 | mm |
| Type/Code | P0 | P1 | P2 | D0 | T | Unit |
| RGC0201 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.017 ± 0.008 | inches |
| | 4.00 ± 0.10 | 2.00 ± 0.05 | 2.00 ± 0.05 | 1.50 ± 0.10 | 0.42 ± 0.20 | mm |
| RGC0402 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.018 ± 0.004 | inches |
| | 4.00 ± 0.10 | 2.00 ± 0.05 | 2.00 ± 0.05 | 1.50 ± 0.10 | 0.45 ± 0.10 | mm |
| RGC0603 | 0.157 ± 0.004 | 0.157 ± 0.002 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.028 ± 0.004 | inches |
| | 4.00 ± 0.10 | 4.00 ± 0.05 | 2.00 ± 0.05 | 1.50 ± 0.10 | 0.70 ± 0.10 | mm |
| RGC0805 | 0.157 ± 0.004 | 0.157 ± 0.002 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.033 ± 0.004 | inches |
| | 4.00 ± 0.10 | 4.00 ± 0.05 | 2.00 ± 0.05 | 1.50 ± 0.10 | 0.85 ± 0.10 | mm |
| RGC1206 | 0.157 ± 0.004 | 0.157 ± 0.002 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.033 ± 0.004 | inches |
| | 4.00 ± 0.10 | 4.00 ± 0.05 | 2.00 ± 0.05 | 1.50 ± 0.10 | 0.85 ± 0.10 | mm |
| RGC2010 | 0.157 ± 0.004 | 0.157 ± 0.002 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.033 ± 0.004 | inches |
| | 4.00 ± 0.10 | 4.00 ± 0.05 | 2.00 ± 0.05 | 1.50 ± 0.10 | 0.85 ± 0.10 | mm |

Embossed Tape Specifications



| Type/Code | A | B | W | E | F | Unit |
|-----------|---------------|---------------|---------------|---------------|---------------|--------|
| RGC2010 | 0.110 ± 0.004 | 0.217 ± 0.004 | 0.472 ± 0.012 | 0.069 ± 0.004 | 0.217 ± 0.002 | inches |
| | 2.80 ± 0.10 | 5.50 ± 0.10 | 12.00 ± 0.30 | 1.75 ± 0.10 | 5.50 ± 0.05 | mm |
| RGC2512 | 0.138 ± 0.004 | 0.264 ± 0.004 | 0.472 ± 0.012 | 0.069 ± 0.004 | 0.217 ± 0.002 | inches |
| | 3.50 ± 0.10 | 6.70 ± 0.10 | 12.00 ± 0.30 | 1.75 ± 0.10 | 5.50 ± 0.05 | mm |
| Type/Code | P0 | P1 | P2 | D0 | T | Unit |
| RGC2010 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.047 ± 0.000 | inches |
| | 4.00 ± 0.10 | 4.00 ± 0.10 | 2.00 ± 0.05 | 1.50 ± 0.10 | 1.20 ± 0.00 | mm |
| RGC2512 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.059 ± 0.004 | 0.047 ± 0.000 | inches |
| | 4.00 ± 0.10 | 4.00 ± 0.10 | 2.00 ± 0.05 | 1.50 ± 0.10 | 1.20 ± 0.00 | mm |

| Performance Characteristics | | | | |
|---------------------------------------|--|---------------|--------|---|
| Test | Test Specification | | | Test Method |
| | ± 1% and below | ± 5% | Jumper | |
| Temperature Coefficient of Resistance | As specified. | | | JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55°C +125 C, 25°C is the reference temperature |
| Short Time Overload | ±(1.0%+0.05Ω) | ±(2.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or max. overload voltage whichever is lower for 5 seconds; 2 seconds for high power series |
| Insulation resistance | ≥10G | | | JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. overload voltage for 1 minute |
| Endurance | ±(1.0%+0.10Ω) | ±(2.0%+0.10Ω) | <100mΩ | JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, RCWV for 1000 h. with 1.5 h. "ON" and 0.5 h. "OFF" |
| Damp Heat with Load | ±(1.0%+0.10Ω) | ±(2.0%+0.10Ω) | <100mΩ | JIS-C-5201-1 4.24 IEC-60115-1 4.24 40±2°C, 90~95% R.H., RCWV for 1000 h. with 1.5 h. "ON" and 0.5 h. "OFF" |
| Dry Heat | ±(1.0%+0.05Ω) | ±(1.5%+0.10Ω) | <50mΩ | JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +125/+155°C for 1000 h. |
| Bending Strength | ±(1.0%+0.05Ω) | ±(1.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 5 seconds 2010, 2512 sizes: 2mm; other sizes: 3mm |
| Solderability | 95% minimum coverage | | | JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds |
| Resistance to Soldering Heat | ±(0.5%+0.05Ω) | ±(1.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds |
| Voltage Proof | No breakdown or flashover | | | JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times max. operating voltage for 1 minute |
| Leaching | Individual leaching area ≤5% Total leaching area ≤10% | | | JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260±5°C for 30 seconds |
| Rapid Change of Temperature | ±(0.5%+0.05Ω) | ±(1.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +125/+155°C, 5 cycles |

RCWV (Rated Continuous Working Voltage) = $\sqrt{P \cdot R}$ or max. operating voltage whichever is lower
Storage Temperature: 25±3°C; humidity < 80% RH

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 2). 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.

| 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) |
| RGC | Semi-Precision Thick Film Surface Mount Resistor | SMD | YES(1) | 100% Matte Sn over Ni | Jul-04 | 04/27 |

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

"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.

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

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

| Product Series | | Size | | Power | | Tolerance | | | Packaging | | | | TCR | | Resistance Value |
|----------------|---------------------------|------|--------|-------|-------|-----------|-------------|--------------------|------------|------------|-------|---|----------------|------------------|------------------|
| Code | Description | Code | Tol | Code | Value | Code | Description | Size | Quantity | Code | ppm | Four characters with the multiplier used as the decimal holder. | | | |
| RGC | Semi-Precision Thick Film | 0201 | 0.05W | B | 0.1% | E24, E96 | T | 7" Reel Paper Tape | 0201, 0402 | 10,000 | C | 50 | 100 ohm = 100R | | |
| | | 0402 | 0.063W | D | 0.5% | | | | | 0603, 0805 | 5,000 | D | 100 | 10.5 Kohm = 10K5 | |
| | | 0603 | 0.1W | F | 1% | | | 1206, 1210 | | L | 200 | 1 Mohm = 1M00 | | | |
| | | 0805 | 0.125W | | | | | 2010(*) | 4,000 | | | | | | |
| | | 1206 | 0.25W | | | | | 2512 | | | | | | | |
| | | 1210 | 0.25W | | | | | | | | | | | | |
| | | 1210 | 0.33W | | | | | | | | | | | | |
| | | 2010 | 0.75W | | | | | | | | | | | | |
| | | 2512 | 1W | | | | | | | | | | | | |

(*) RGC2010F 1Ω to 9.76Ω MOQ is 12,000

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[PCNM2512E3012BST5](#) [4-2176092-6](#) [3-2176091-4](#) [8-2176091-5](#)