Very High Precision and Stability
Bulk Metal® Foil Resistors, CECC Qualified

FEATURES
- Very tight tolerance ± 0.01% to ± 1% Matching to 0.01%
- Very low temperature coefficient + 0.6ppm/°C (0°C to +25°C), -0.6ppm/°C (+25°C to 60°C), +2.2ppm/°C (-55°C to +20°C), -1.8ppm/°C (+20°C tp +125°C) tracking to 0.5ppm/°C
- Electrical insulation > 10^6 MΩ
- Very high stability < 25ppm/year or < 50ppm/3 years (shelf life)
- Negligible rise time approx. 1-10^-9s

INTRODUCTION
The ultra-high precision planar resistors of the RS92N/AN series are produced according to a special process. The technology used is unique and based on an etched nickel-chromium foil bonded on to an alumina substrate.
The resistor’s small size enables compact side by side mounting on a 2.54mm PCB grid and their unmatched performances make them particularly well suited for all military and high performance applications.

MECHANICAL SPECIFICATIONS
- Insulated case
- Nickel-chromium
- RoHS Compliant
- Tin/Lead Alloy with minimum 5%, nominally 10% Lead content

ENVIRONMENTAL SPECIFICATIONS
- Temperature Limits –55°C + 175°C
- Climatic Category 55 / 155 / 56

STANDARD IMPRINTING AND DIMENSIONS
- The standoffs shall be so located as to give a lead clearance of 0.25mm minimum between the resistor body and the printed circuit board when the standoffs are seated on the printed circuit board. This is to allow for proper cleaning of flux and other contaminants from the unit after all soldering processes.

| Model | Dim | LS | W | L | H | ST | SW | LL | Released to | Weight nominal |
|-------|-----|----|---|---|---|----|----|----| CECC 40302  |     |
| RS92NA| mm  | 3.81 ± 0.13 | 2.67 ± 0.25 | 7.62 ± 0.25 | 8.28 ± 0.25 | 0.254 min | 1.02 ± 0.13 | 25.4 ± 3.18 | - 001 | 0.6g |
| RS92N | mm  | 5.08 ± 0.13 | 2.49 max     | 7.49 max     | 8.00 max     | 0.254 min | 1.02 ± 0.13 | 25.4 ± 3.18 | - 001 | 0.6g |
| AN    | mm  | 5.08 ± 0.13 | 2.49 max     | 7.49 max     | 8.00 max     | 0.254 min | 1.02 ± 0.13 | 25.4 ± 3.18 | - 004 | 0.6g |

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ORDERING INFORMATION

Specify Charcroft CECC Series resistors as follows:

Example:

- **MODEL NO.**
  - RS92N
  - AN

- **TERMINATION**
  - T = RoHS compliant
  - None = Tin/Lead alloy

- **RESISTANCE VALUE**
  - 250R00

- **TOLERANCE**
  - T = ± 0.01%
  - Q = ± 0.02%
  - A = ± 0.05%
  - B = ± 0.1%
  - C = ± 0.25%
  - D = ± 0.5%
  - F = ± 1.0%

- **PACKAGING**
  - TR = Tape & Reel
  - None = Bulk (loose)

Resistance Value, in ohms, is expressed by a series of 6 characters, 5 of which represent significant digits while the 6th is a dual purpose letter that designates both the multiplier and the location of the comma or decimal.

<table>
<thead>
<tr>
<th>RESISTANCE RANGE</th>
<th>LETTER DESIGNATOR</th>
<th>MULTIPLIER FACTOR</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10Ω to &lt;1KΩ</td>
<td>R</td>
<td>x 1</td>
<td>100R01  = 100.01Ω</td>
</tr>
<tr>
<td>1KΩ to 100KΩ</td>
<td>K</td>
<td>x 10³</td>
<td>5K2310  = 5,231Ω</td>
</tr>
</tbody>
</table>

For example: RS92N T 250R00 T - Model: RS92N Version, Termination: RoHS compliant; Value: 250 Ω, Tolerance: 0.01 % Packaging: Bulk

ELECTRICAL SPECIFICATIONS

- **Qualified Ohmic Range**
  - **RS92N**
    - AN
  - 80R to 120K
  - 80R to 92K

- **Qualified Tolerances**
  - 0.01% to 1%

- **Power Rating**
  - 0.5W @ 70°C
  - 0.25W @ 125°C

- **Temperature Coefficient**
  - See diagram

- **Dielectric Strength**
  - 750VRMS

- **Insulation Resistance**
  - > 10 MΩ

- **Thermal EMF**
  - < 0.5µV for 1°C of difference between leads

- **Noise**
  - Non measurable (> - 32dB)

- **Thermal Resistance**
  - 0.14°C/mW

For non qualified product, extended ohmic range and tighter tolerance, refer to S102 series.

POWER RATING CHART

TEMPERATURE COEFFICIENTS

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**PERFORMANCE**

<table>
<thead>
<tr>
<th>TEST</th>
<th>CONDITIONS</th>
<th>REQUIREMENTS</th>
<th>TYPICAL DRIFTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overload</td>
<td>2.5un/5 s U max. &lt; 2Un</td>
<td>± 0.01%</td>
<td>± 0.2% ± 0.002%</td>
</tr>
<tr>
<td>Temperature Cycling</td>
<td>- 55°C + 155°C 5 cycles CEI 68-2-14 Test Na</td>
<td>± 0.01%</td>
<td>± 0.05% ± 0.002%</td>
</tr>
<tr>
<td>Terminals Strength</td>
<td>CEI 68-2-21 Test Ua (pulling) Ub (bending) Uc (twisting)</td>
<td>± 0.01%</td>
<td>± 0.2% ± 0.002%</td>
</tr>
<tr>
<td>Resistance to Soldering Heat</td>
<td>260°C/10s CEI 68-2-20A Test Tb (met. 1A)</td>
<td>± 0.01%</td>
<td>± 0.1% ± 0.002%</td>
</tr>
<tr>
<td>Vibrations</td>
<td>10Hz to 500Hz 0.75mm or 10g 6h met. B4 CEI 68-2-6 Test Fc</td>
<td>± 0.01%</td>
<td>± 0.2% ± 0.002%</td>
</tr>
<tr>
<td>Climatic Sequence</td>
<td>- 55°C + 155°C 6 cycles 95% R.H. 85mbar CEI 68-1</td>
<td>± 0.05% Insulation R &gt; 10² MΩ</td>
<td>± 0.003% Insulation R &gt; 10⁴ MΩ</td>
</tr>
<tr>
<td>Humidity (Steady State)</td>
<td>56 days 95% R.H. 40°C CEI 68-2-3</td>
<td>± 0.05% Insulation R &gt; 10² MΩ</td>
<td>± 0.003% Insulation R &gt; 10⁴ MΩ</td>
</tr>
<tr>
<td>Moisture Resistance</td>
<td>Method 106 MIL-STD-202</td>
<td>-</td>
<td>± 0.02 % Insulation R &gt; 10 MΩ</td>
</tr>
<tr>
<td>Load Life</td>
<td>1000h Pr at 70°C 90/30 cycle</td>
<td>± 0.05%</td>
<td>± 0.5% ± 0.05%</td>
</tr>
<tr>
<td>High Temperature Exposure</td>
<td>1000h/155°C CEI 68-2-20A Test B</td>
<td>± 0.05%</td>
<td>± 0.5% ± 0.01%</td>
</tr>
</tbody>
</table>

**GENERAL APPLICATIONS**

**Discrete components**: any circuits requiring high precision and high stability, standard resistors, fast rise time applications, high stability applications even under severe temperature variations, circuits for analog computers, etc.

**Resistor networks**: ladder networks (R-2R), Kelvin-Varley dividers, current source networks, any type of voltage dividers, etc.

**POWER RATING**

In order to increase stability, it is recommended to reduce the nominal power (Pr) in relation with tolerance.

- For ± 0.1% to ±0.05% Power = Pr x 0.75
- For ± 0.02% to ±0.01% Power = Pr x 0.5
- For ± 0.005% Power = Pr x 0.25

**NOISE**

< 0.025µV/V RMS (> - 32dB).

**HIGH FREQUENCY CHARACTERISTICS**

Very low reactance.
Shunt capacitance is approximately 1pF
Total inductance is approximately 100 nH

**RISE TIME**

Approximately 1 nanosecond.
Allows very high performance in the field of very fast electronics (totally oscillation-free).

TYPICAL RESISTANCE DRIFT DIAGRAMS

**CONDITIONS**

**TEST**

- Temperature Cycles (5 cycles from -35°C to +155°C)
- Humidity (54 days at 95% R.H. 40°C)
- Load Life (0.33W at 125°C for 1000 hours)