Ultra High Precision, High Resolution Z-Foil Audio Resistor, with TCR of ± 0.2 ppm/°C, Tolerance to ± 0.01 % and Noise < - 40 dB

**FEATURES**

- **Temperature coefficient of resistance (TCR):**
  - 55°C to + 125°C, 25°C ref.
  - ± 0.2 ppm/°C typical (see table 1)
- **Rated power:** to 0.4 W at + 70°C
- **Tolerance:** to ± 0.01 %
- **Load life stability:** to ± 0.01 % at 70°C, 2000 h at rated power
- **Resistance range:** 10Ω to 100 kΩ (higher or lower values of resistance are available)
- **Electrostatic discharge (ESD) above 25000 V**
- **Non inductive, non capacitive design**
- **Rise time:** 1 ns without ringing
- **Current noise:** < - 40 dB
- **Thermal EMF:** 0.05 µV/°C typical
- **Voltage coefficient:** < 0.1 ppm/V
- **Low inductance:** < 0.08 µH typical
- **Non hot spot design**
- **Terminal Finishes Available:** RoHS Compliant
  - Tin/Lead Alloy

**APPLICATIONS**

- High precision amplifiers
- High-end speaker system
- High-end audio circuit
- Transducer
- High fidelity audio amplifier

**INTRODUCTION**

The CAR, composed of Vishay's Bulk Metal® Z-foil technology, with improved sound quality, provides a combination of low noise and low inductance/capacitance, making it unrivalled for applications requiring low noise and distortion-free properties.

While the regular foil resistors are already widely acknowledged as the leading resistors for audio applications, the special "naked Z-foil resistor" design without case or encapsulation, adds an additional dimension for reducing signal distortion and increasing clarity in signal processing.

For non standard requirements such as higher values (using multiple chips) and tighter tolerances, please contact our application engineering department.

<table>
<thead>
<tr>
<th>RESISTOR</th>
<th>RESISTANCE VALUE (Ω)</th>
<th>TYPICAL TCR AND MAXIMUM SPREAD (ppm/°C)</th>
<th>TIGHTEST TOLERANCE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>100 to &lt; 100K</td>
<td>± 0.2 ± 1.8</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>50 to &lt; 100</td>
<td>± 0.2 ± 2.8</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>10 to &lt; 50</td>
<td>± 0.2 ± 3.8</td>
<td>0.02</td>
</tr>
</tbody>
</table>

**TABLE 1 - RESISTANCE VERSUS TCR (-55 °C to +125 °C, +25 °C Ref.)**

**FIGURE 1 - TYPICAL TCR CURVE Z-FOIL**

**FIGURE 2 - STANDARD DIMENSIONS**
Ultra High Precision, High Resolution Z-Foil Audio Resistor, with TCR of ± 0.2 ppm/°C, Tolerance to ± 0.01 % and Noise < - 40 dB

<table>
<thead>
<tr>
<th>TABLE 2 - SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESISTANCE RANGE (Ω)</strong></td>
</tr>
<tr>
<td>10 to 100K</td>
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</tbody>
</table>

FIGURE 3 - POWER DERATING CURVE

FIGURE 4 - TRIMMING TO VALUES (CONCEPTUAL ILLUSTRATION)

NOTE: Foil shown in BLACK, etched spaces in white.

TABLE 3 - ORDERING INFORMATION

Specify CAR (Charcroft audio resistors) as follows:

Example:

CAR T 250R00Q - Model CAR, Version, Termination: RoHS compliant; Value: 250 Ω, Tolerance: ± 0.02 % Packaging: Bulk

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: CAR T 250R00Q - Model CAR, Version, Termination: RoHS compliant; Value: 250 Ω, Tolerance: ± 0.02 % Packaging: Bulk