CERMET RESISTOR SYSTEM

• Cadmium-Free Resistor Material

The 3900-J Resistor Series are ruthenium based resistor pastes designed for use in thick film hybrid microelectronic circuits and discrete components. They combine high performance, low cost, with ease of processing.

PASTE DATA

RHEOLOGY:
Thixotropic screen printable paste

VISCOITY:
(Brookfield RVT, ABZ spindle, 10 RPM, 25.5°C±0.5°C) 225±25 Pa-s

SHELF LIFE:
6 months

PROCESSING

SCREEN MESH/EMULSION:
200/12.5 μm

LEVELING TIME: (25°C)
5-10 minutes

DRYING TIME: (125°C)
10-15 minutes

FIRING TEMPERATURE:
850°C

TIME AT PEAK:
10-12 minutes

TOTAL CYCLE:
45 minutes

TERMINATIONS:
9635-B

THINNER:
ESL 401

SUBSTRATE OF CALIBRATION:
96% alumina
CAUTION: Proper industrial safety precautions should be exercised in using these products. Use with adequate ventilation. Avoid prolonged contact with skin or inhalation of any vapors emitted during use or heating of these compositions. The use of safety eye goggles, gloves or hand protection creams is recommended. Wash hands or skin thoroughly with soap and water after using these products. Do not eat or smoke in areas where these materials are used. Refer to appropriate MSDS sheet.

DISCLAIMER: The product information and recommendations contained herein are based on data obtained by tests we believe to be accurate, but the accuracy and completeness thereof is not guaranteed. No warranty is expressed or implied regarding the accuracy of these data, the results obtained from the use here-of, or that any such use will not infringe any patent. Electro-Science assumes no liability for any injury, loss, or damage, direct or consequential arising out of its use by others. This information is furnished upon the condition that the person receiving it shall make their own tests to determine the suitability thereof for their particular use, before using it. User assumes all risk and liability whatsoever in connection with their intended use. Electro-Science’s only obligation shall be to replace such quantity of the product proved defective.

### 3900-J RESISTOR SERIES – TYPICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>3910-J</th>
<th>3911-J</th>
<th>3912-J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity (Pa•s)</td>
<td>225±25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistivity (Ω/sq.)</td>
<td>1</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Tolerance(%)</td>
<td>±30%</td>
<td>±10%</td>
<td>±10%</td>
</tr>
<tr>
<td>Coefficient of</td>
<td>[8]</td>
<td>[8]</td>
<td>[8]</td>
</tr>
<tr>
<td>Variation (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dried Thickness</td>
<td>22.5±2.5µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average TCR (ppm/°C)</td>
<td>0±100</td>
<td>0±100</td>
<td>0±50</td>
</tr>
<tr>
<td>CRV, % (Max)</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
</tr>
<tr>
<td>Wear, % (Max)</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
</tr>
</tbody>
</table>

a. CRV per ESL standard test procedure TM3-18. Resistor size = 1.25mm square.
b. Wear per ESL standard test procedure TM3-18. Resistor size = 2mm x 20mm.

**Typical 850°C Firing Profile**

![Typical 850°C Firing Profile](image-url)