Introductions

Alumina Ceramic Heaters are produced by implementing unique metallization and ceramic lamination processes. Due to the advanced manufacturing techniques utilized in the electric element, Alumina Heaters can provide higher reliability than ever before. Currently, applications include use as innovative types of heaters in the automotive, medical and semiconductor industries.

Advantages

Compact, Lightweight and Energy Efficient

1. High watt density, good thermal efficiency
2. Multiple heating elements per unit is available

Superior Thermal Properties

1. Rapid Heat Increase
2. Custom designed temperature distribution available
3. High levels of insulation allow direct contact with water, kerosene and metal and water

High Reliability

1. Superior dielectric strength and electrical insulation
2. Longer life due to oxidation-proof design on resistive material
3. Superior chemical resistance

Environmental Qualities

1. Electric noise
2. Energy-saving due to the superior thermal efficiency
APPLICATIONS

Automotive Components
Glow Plug
Igniter for Cabin Heater
Heater for Oxygen Sensor
Kerosene and Gas Appliances
Igniter
Heater for Vaporizer
Industrial Heater Applications
Heater for Soldering Iron
Heater for Hair Iron
Bonding Heater
Seal Heater
Water-Heating Applications
Heater for Toilet Water
Bath Water Heater
Steam Boiler Heater
Liquid Heater for Small Appliances
Production Technology----High Temperature Co Fired Ceramics (HTCC)

With the advent of the integration of electronic components, electronic devices have posed higher demands on circuit miniaturization, high-density, multi-function, high reliability, high speed and large power. Co-fired multi-layer ceramic substrate meets all these requirements so it has been used in a wide range of applications in recent years. Co-fired multi-layer ceramic substrate can be divided into high temperature co-fired ceramic (HTCC) substrate and low temperature co-fired multi-layer ceramic (LTCC) substrate. Compared to LTCC, high temperature co-fired ceramics (HTCC) has higher mechanical strength, higher wiring density, better chemical stability, higher thermal dissipation coefficient and lower cost and is widely used in the heating and packing applications requiring higher thermal stability performance, less high temperature volatile gases and better sealing. High temperature co-fired ceramic heating element is a good alternate of alloy wire and PTC ceramic heating element and component.

Design Structure

Ceramic heaters are manufactured by printing resistors on alumina sheets or silicon nitride plates, being laminated and sintered into one piece.

- Plate Type
- Rod Type
- Tube Type
### Configuration and Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Dimension (mm)</th>
<th>Tolerance (mm)</th>
<th>Camber (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tube/Rod</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120max</td>
<td>Length</td>
<td>Diameter</td>
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<tr>
<td>200max</td>
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<tr>
<td><strong>Plate or Square/Round</strong></td>
<td>160 x 160 or</td>
<td>Side or Diameter</td>
<td>Thickness</td>
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<tr>
<td></td>
<td>ø160</td>
<td>0.3min</td>
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<td></td>
<td>Ø160</td>
<td>5.4max</td>
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<tr>
<td><strong>SN Heater</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Plate</strong></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Length (ℓ)</td>
<td>Width (w)</td>
<td>Thickness (t)</td>
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<tr>
<td></td>
<td>30~100</td>
<td>4~50</td>
<td>1~20</td>
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</tbody>
</table>

※ Note: Will comply to other requirements besides the above described, whenever required.

### Electrical Properties

1. **Thermal Coefficient of Resistivity**

- **Alumina Heater**
  - Resistance Ratio vs. Temperature

2. **Dielectric Strength**

- Configuration: 130~8e × 53 ²
- Heating Area: 2.123mm²

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*Graph showing resistance ratio vs. temperature for different materials.*

*Graph showing dielectric strength vs. surface temperature.*