Specification of Thermoelectric Module

**TEC1-12705**

**Description**

The 127 couples, 40mm × 40mm size single module is made of our high performance ingots to achieve superior cooling performance at 70°C or larger delta T max. Designed for superior cooling and heating applications. We can design and manufacture custom made module according to your requirements. Minimums apply, contact us for details.

**Features**

- No moving parts, no noise, and solid-state
- Compact structure, small in size, light in weight
- Environmental friendly
- RoHS compliant
- Precise temperature control
- Exceptionally reliable in quality, high performance

**Application**

- Food and beverage service refrigerator
- Portable cooler box for cars
- Liquid cooling
- Temperature stabilizer
- CPU cooler and scientific instrument
- Photonic and medical systems

**Performance Specification Sheet**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th (ºC)</td>
<td>27</td>
</tr>
<tr>
<td>DT max (ºC)</td>
<td>70</td>
</tr>
<tr>
<td>U max (Voltage)</td>
<td>16.0</td>
</tr>
<tr>
<td>I max (Amps)</td>
<td>5.4</td>
</tr>
<tr>
<td>Q C max (Watts)</td>
<td>54.1</td>
</tr>
<tr>
<td>AC resistance (Ohms)</td>
<td>2.0–2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT max (ºC)</td>
<td>Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side</td>
</tr>
<tr>
<td>U max (Voltage)</td>
<td>Voltage applied to the module at DT max</td>
</tr>
<tr>
<td>I max (Amps)</td>
<td>DC current through the modules at DT max</td>
</tr>
<tr>
<td>Q C max (Watts)</td>
<td>Cooling capacity at cold side of the module under DT=0 ºC</td>
</tr>
</tbody>
</table>

**Geometric Characteristics**

Dimensions in millimeters

**Flatness/ Parallelism Option**

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Thickness H / (mm)</th>
<th>Flatness/ Parallelism (mm)</th>
<th>Lead wire length (mm) Standard/Optional length</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF</td>
<td>0:3.70±0.15</td>
<td>0:0.05/0.05</td>
<td>150±3/Specify</td>
</tr>
<tr>
<td>TF</td>
<td>1:3.70±0.10</td>
<td>1:0.025/0.025</td>
<td>150±3/Specify</td>
</tr>
<tr>
<td>TF</td>
<td>2:3.70±0.05</td>
<td>2:0.015/0.015</td>
<td>150±3/Specify</td>
</tr>
</tbody>
</table>

Eg. TF01: Thickness 3.70±0.15(mm) and Flatness 0.025/0.025(mm)

If you need higher strict tolerance on thickness and flatness, please specify, we can cater for.

**Naming for the Module**

TEC1- 12705- X - X - X - X

- **Ceramics**:
  1. Alumina (Al2O3, white 96%)(AlO)

- **Sealant**:
  1. Blank ceramics (not metalized)
  2. Metalized (Copper-Nickel plating)

Eg. TF01: Thickness 3.70±0.15(mm) and Flatness 0.025/0.025(mm)
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TEC1-12705

Performance Curves at Th=27 °C

Performance Curves at Th=50 °C

Standard Performance Graph Qc = f(DT)

Standard Performance Graph V = f(ΔT)

Standard Performance Graph Qc = f(V)
**Specification of Thermoelectric Module**

**TEC1-12705**

**Performance Curves at Th=27 °C**

![Graph showing performance curves at Th=27 °C]

**Performance Curves at Th=50 °C**

![Graph showing performance curves at Th=50 °C]

Standard Performance Graph COP = f(V) of ΔT ranged from 0 to 30 °C

Standard Performance Graph COP = f(V) of ΔT ranged from 40 to 60/70 °C

Remark: The coefficient of performance (COP) is the cooling power Qc/Input power (V × I).

**Operation Cautions**

- Cold side of the module applied on the object being cooled
- Hot side of the module mounted on a heat sink
- Operation below I_{\text{max}} or V_{\text{max}}
- Apply only DC voltage