Specification of Thermoelectric Module

TEC1-04905

Description
The 49 couples, 25 mm × 25 mm size single module which is made of our high performance ingot to achieve superior cooling performance and 70 °C or larger delta T, is designed for superior cooling and heating applications. Beyond the standard below, we can design and manufacture the custom made module according to your special requirements.

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>Feature</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th (°C)</td>
<td>27</td>
<td>50</td>
<td>Hot side temperature at environment: dry air, N₂</td>
</tr>
<tr>
<td>DT max (°C)</td>
<td>70</td>
<td>79</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>6.3</td>
<td>6.8</td>
<td>Voltage applied to the module at DT max</td>
</tr>
<tr>
<td>I max (Amps)</td>
<td>5.3</td>
<td>5.3</td>
<td>DC current through the modules at DT max</td>
</tr>
<tr>
<td>Q max (Watts)</td>
<td>20.9</td>
<td>22.9</td>
<td>Cooling capacity at cold side of the module under DT=0 °C</td>
</tr>
<tr>
<td>AC resistance (Ohms)</td>
<td>0.88</td>
<td>0.95</td>
<td>The module resistance is tested under AC</td>
</tr>
<tr>
<td>Tolerance (%)</td>
<td>± 10</td>
<td></td>
<td>For thermal and electricity parameters</td>
</tr>
</tbody>
</table>

Geometric Characteristics
Dimensions in millimeters

Ordering Option

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Thickness H / (mm)</th>
<th>Flatness/Parallelism (mm)</th>
<th>Lead wire length (mm)</th>
<th>Standard/Optional length</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF</td>
<td>0.37±0.1</td>
<td>0.05/0.05</td>
<td>150±3 Specified</td>
<td></td>
</tr>
<tr>
<td>TF</td>
<td>1:3.7±0.05</td>
<td>1:0.025/0.025</td>
<td>150±3 Specified</td>
<td></td>
</tr>
<tr>
<td>TF</td>
<td>2:3.7±0.025</td>
<td>2:0.015/0.015</td>
<td>150±3 Specified</td>
<td></td>
</tr>
</tbody>
</table>

Eg. TF01: Thickness 3.7±0.1 (mm) and Flatness 0.025/0.025(mm)

Manufacturing Options

A. Solder:
1. T100: BiSn (Melting Point=138°C)
2. T200: CuSn (Melting Point=227°C)

B. Sealant:
1. NS: No sealing (Standard)
2. SS: Silicone sealant
3. EPS: Epoxy sealant
4. Customer specify sealing

C. Ceramics:
1. Alumina (Al₂O₃, white 96% (AlO))
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:
1. Blank ceramics (not metalized)
2. Metalized (Copper-Nickel plating)

Naming for the Module

TEC1-04905 - X-X-X-X

TF01: Thickness ± 0.1 (mm) and Flatness/Parallelism 0.025/0.025(mm)
specification of thermoelectric module

TEC1-04905

Performance Curves at Th=27 °C

Performance Curves at Th=50 °C

Standard Performance Graph $Q_c = f(DT)$

Standard Performance Graph $V = f(DT)$

Standard Performance Graph $Q_c = f(V)$

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High Performance and Highly Reliable Solution for Cooling and Heating Applications

Speciation of Thermoelectric Module

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Performance Curves at Th=27 °C

Performance Curves at Th=50 °C

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

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

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

Operation Cautions

- Attach the cold side of module to the object to be cooled
- Attach the hot side of module to a heat radiator for heat dissipating
- Operation below I_max or V_max
- Work under DC

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