

Specification of Thermoelectric Module

TES1-03120

Description

The 31 couples, 12mmx12mm size module is a single stage module which is made of our high performance ingot to achieve superior cooling performance and 70°C or larger delta Tmax, 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

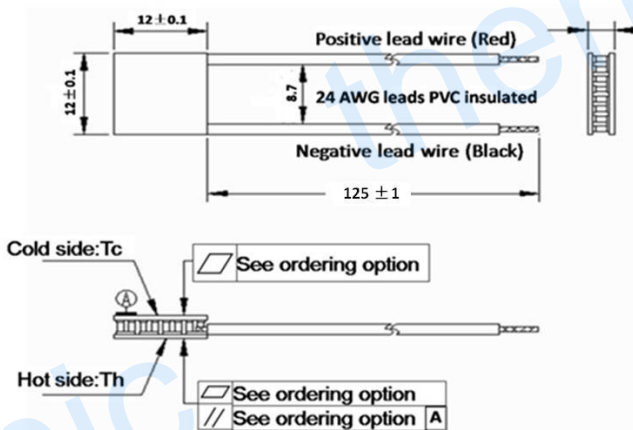
Application

- 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

| | | | |
|----------------------------|------|-----|---|
| Th (°C) | 27 | 50 | Hot side temperature at environment: dry air, N ₂ |
| DT _{max} (°C) | 70 | 79 | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| U _{max} (Voltage) | 3.9 | 4.2 | Voltage applied to the module at DT _{max} |
| I _{max} (Amps) | 2.1 | 2.1 | DC current through the modules at DT _{max} |
| Q _{Cmax} (Watts) | 5.2 | 5.6 | Cooling capacity at cold side of the module under DT=0 °C |
| AC resistance (Ohms) | 1.4 | 1.5 | The module resistance is tested under AC |
| Tolerance (%) | ± 10 | | For thermal and electricity parameters |

Geometric Characteristics Dimensions in millimeters



Manufacturing Options

A. Solder:

1. T100: BiSn (T_{melt}=138°C)
2. T200: CuSn (T_{melt} = 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%)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

1. Blank ceramics (not metallized)
2. Metallized (Au plating)

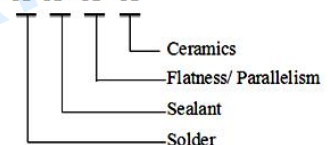
Ordering Option

| Suffix | Thickness H (mm) | Flatness/ Parallelism (mm) | Lead wire length(mm) Standard/Optional length |
|--------|------------------|----------------------------|---|
| TF | 0:3.7± 0.1 | 0: 0.05/0.05 | 125±1/Specify |
| TF | 1:3.7 ± 0.05 | 1: 0.025/0.025 | 125±1/Specify |
| TF | 2:3.7 ± 0.025 | 2: 0.015/0.015 | 125±1/Specify |

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

Naming for the Module

TES1-03120- X-X - X - X



TES1-03120-T100 -NS -TF01 -AIO

T100: BiSn(T_{melt}=138°C)

NS: No sealing

AIO: Alumina white 96%

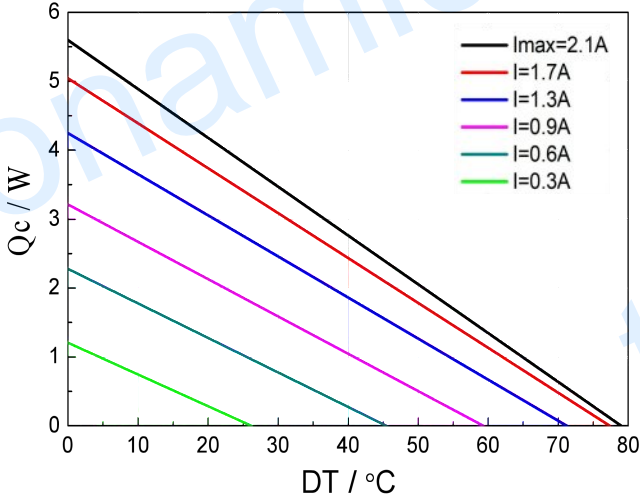
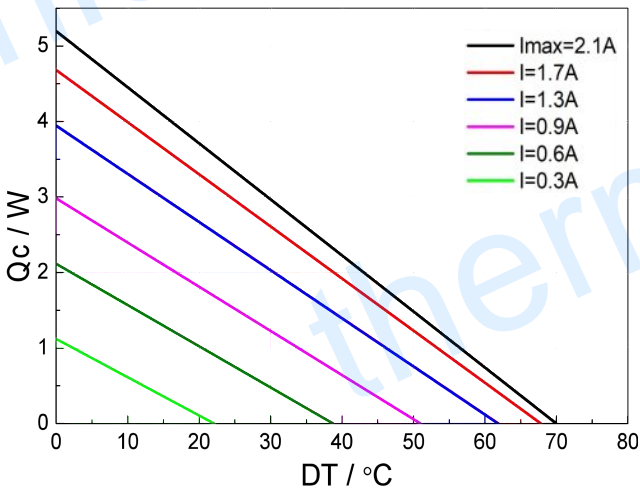
TF01: Thickness ± 0.1 (mm) and Flatness/Parallelism 0.025/0.025(mm)

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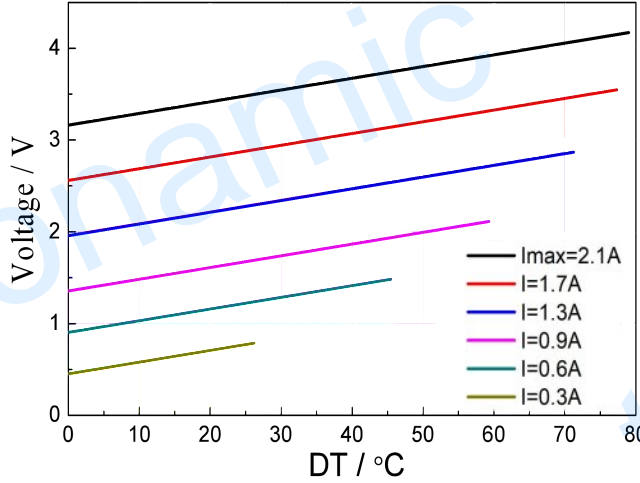
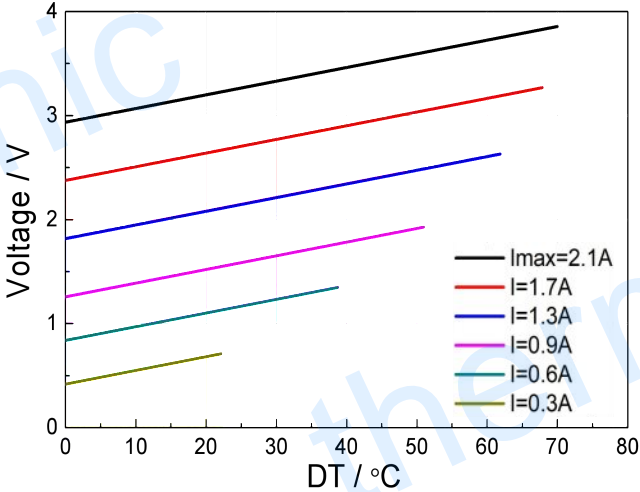
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Performance Curves at Th=27 °C

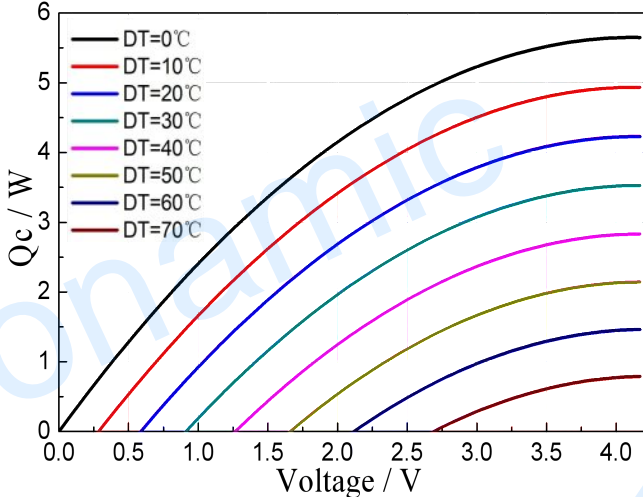
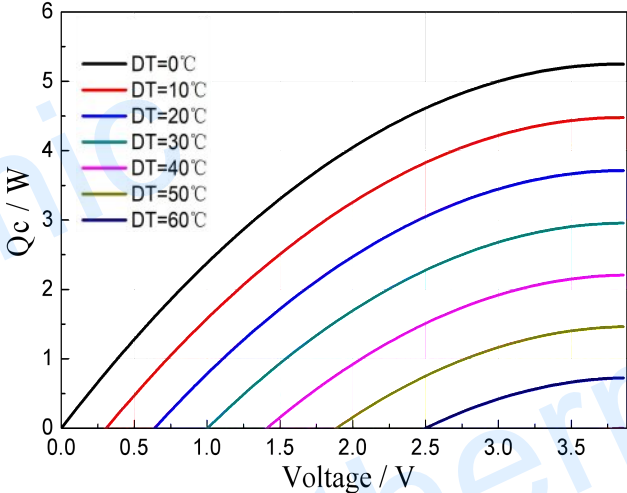
Performance Curves at Th=50 °C



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(DT)$

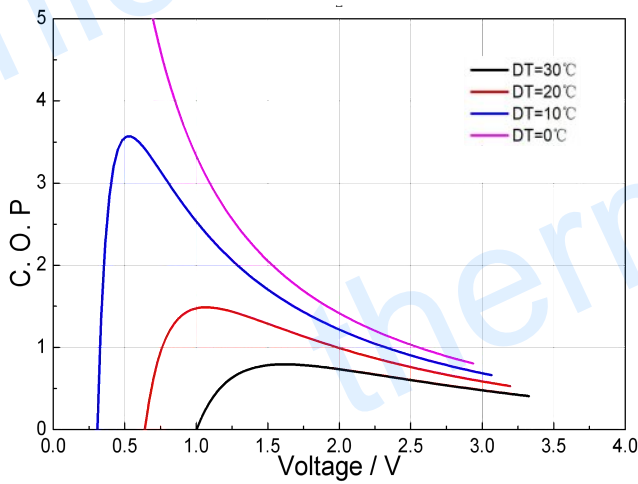


Standard Performance Graph $Q_c = f(V)$

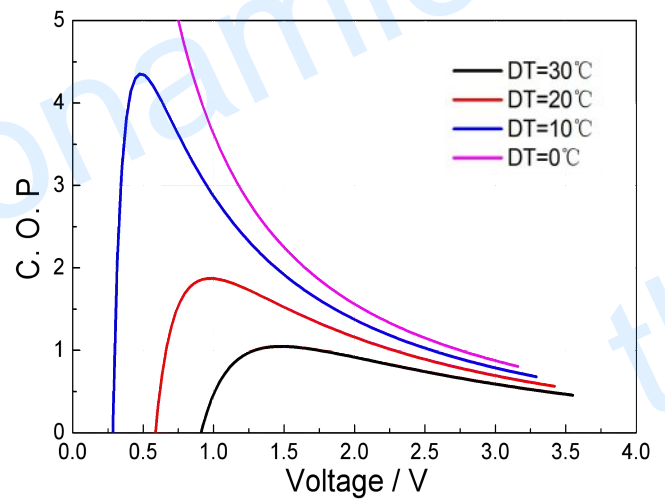
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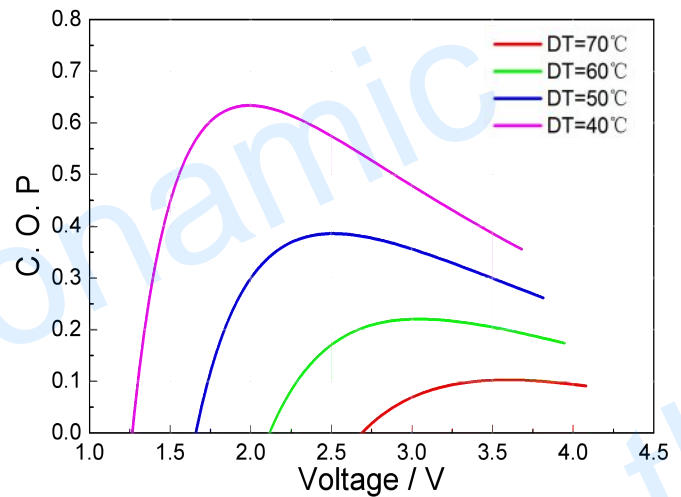
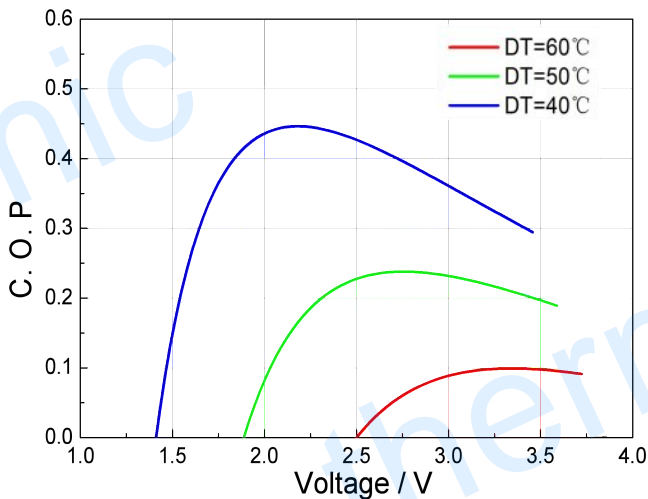
Performance Curves at Th=27 °C



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 Q_c /Input power ($V \times I$).

Operation Caution

- 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

Note: All specifications subject to change without notice.