

Specification of Thermoelectric Module

TEC1-03103

Description

The 31 couples, 20mm × 20mm size single module is made of our high performance ingots to achieve superior cooling performance at 70°C or larger delta Tmax. Designed for superior cooling and heating applications. Beyond the standard below, we can design and manufacture custom made modules according to your custom requirements. Minimums do apply, please contact us.

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

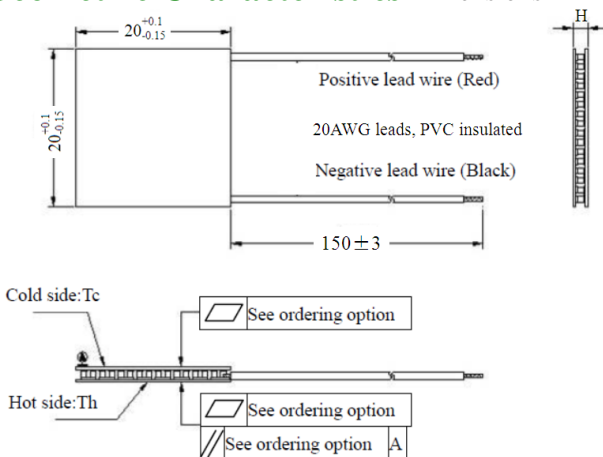
Application

- 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)	4.0	4.38	Voltage applied to the module at DT _{max}
I _{max} (Amps)	4.0	4.0	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	9.8	11.0	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	0.71~0.85	0.76~0.92	The module resistance is tested under AC

Geometric Characteristics Dimensions in millimeters



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%)(AIO)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

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

Flatness/ Parallelism Option

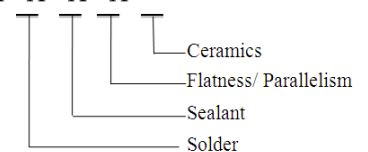
Suffix	Thickness H / (mm)	Flatness/ Parallelism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:4.2±0.1	0:0.05/0.05	150±3/Specify
TF	1:4.2±0.05	1:0.025/0.025	150±3/Specify
TF	2:4.2±0.03	2:0.015/0.015	150±3/Specify

Eg. TF01: Thickness 4.2±0.1 (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- 03103- X - X - X - X



TEC1- 03103- T100 -NS - TF02 - AIO

T100: Solder, BiSn (Melting Point=138 °C)

NS: No sealing

AIO: Alumina white 96%

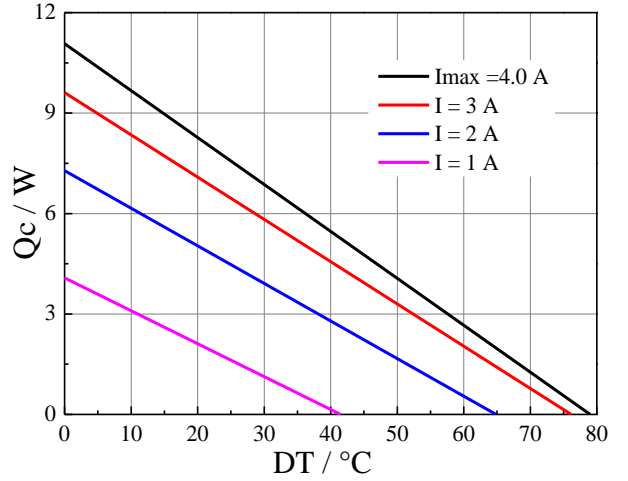
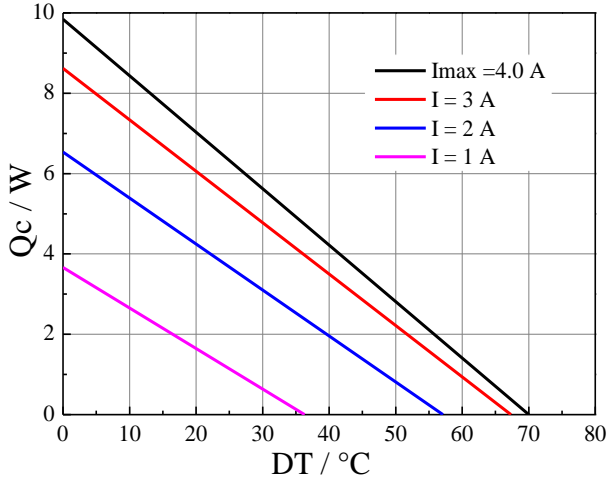
TF02: Thickness ±0.1 (mm) and Flatness/Parallelism 0.015/0.015(mm)

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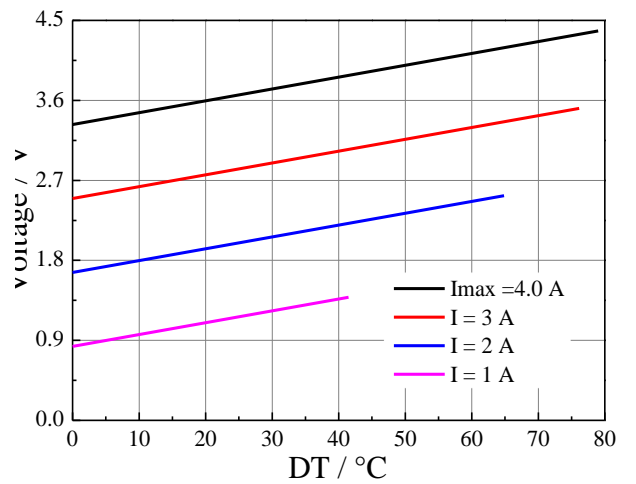
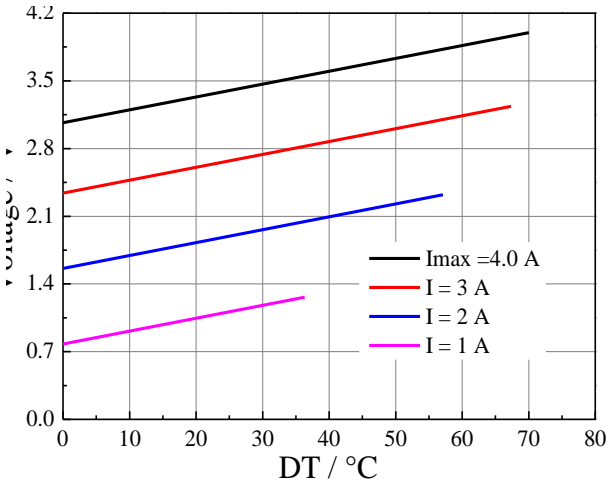
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Performance Curves at $T_h=27^\circ\text{C}$

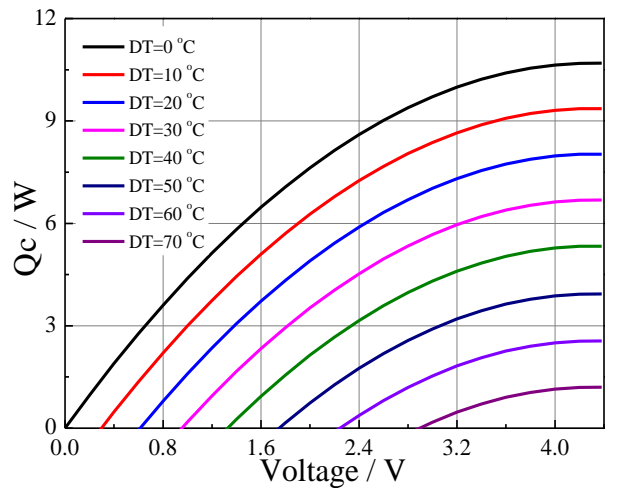
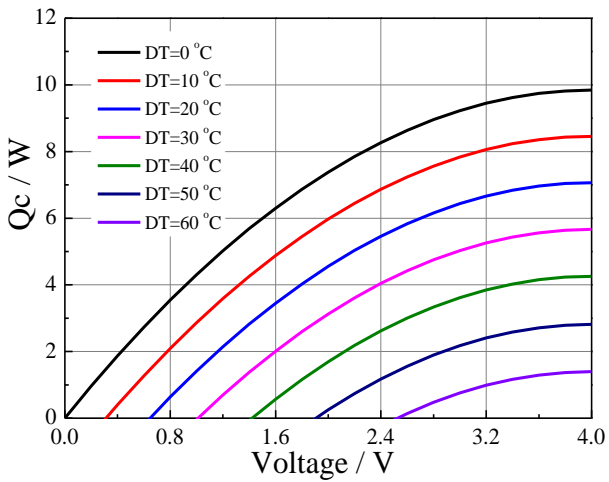
Performance Curves at $T_h=50^\circ\text{C}$



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(DT)$

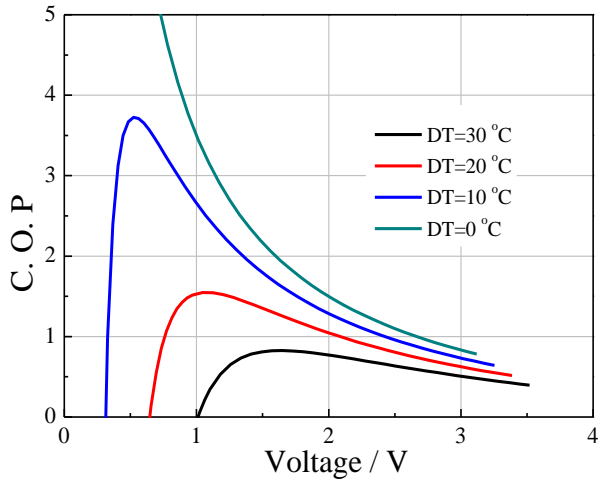


Standard Performance Graph $Q_c = f(V)$

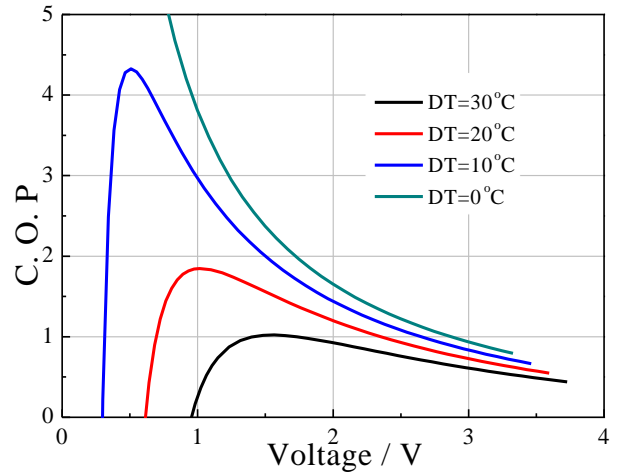
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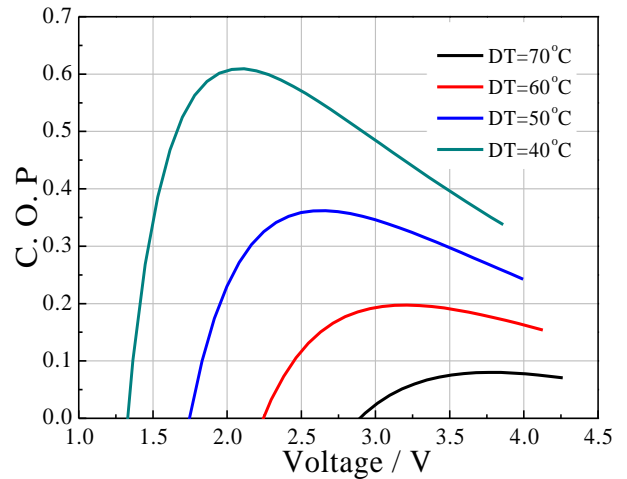
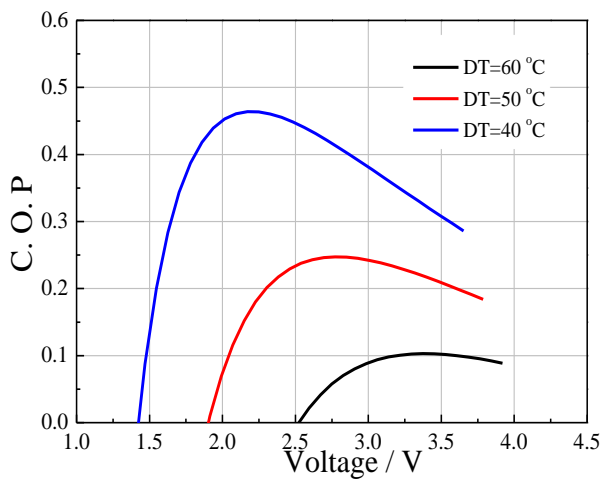
Performance Curves at Th=27 °C



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 Cautions

- Cold side of the module applied to object being cooled
- Hot side of the module mounted on a heat radiant surface.
- Operation below I_{max} or V_{max}
- supplied with a regulated DC current