

Specification of Thermoelectric Module

TEC1-03104

Description

The 31 couples, 20 mm × 20 mm size single 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

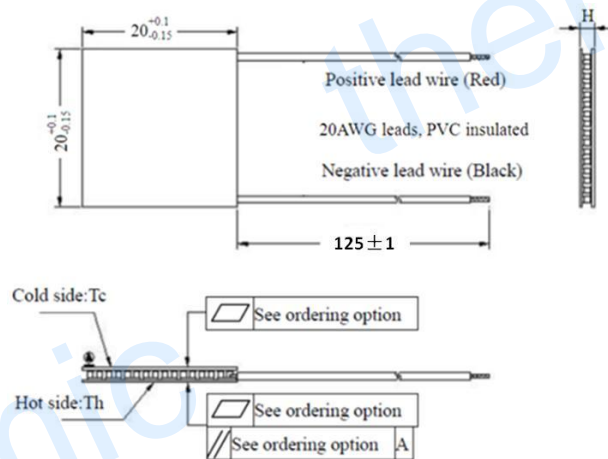
Application

- 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)	4.0	4.3	Voltage applied to the module at DT _{max}
I _{max} (Amps)	4.7	4.7	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	11.81	12.89	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	0.66	0.70	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 (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:

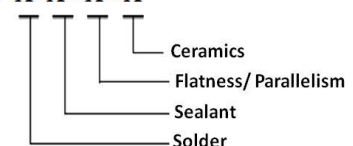
1. Blank ceramics (not metalized)
2. Metalized (Copper-Nickel plating)

Ordering Option

Suffix	Thickness H / (mm)	Flatness/ Parallelism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:4.0±0.1	0:0.05/0.05	125±1/Specify
TF	1:4.0±0.05	1:0.025/0.025	125±1/Specify
TF	2:4.0±0.025	2:0.015/0.015	125±1/Specify
Eg. TF01: Thickness 4.0±0.1 (mm) and Flatness 0.025/0.025(mm)			

Naming for the Module

TEC1-03104- X -X - X - X



TEC1-03104-T100-NS-TF01-AlO

T100: BiSn (T_{melt}=138°C)

NS: No sealing

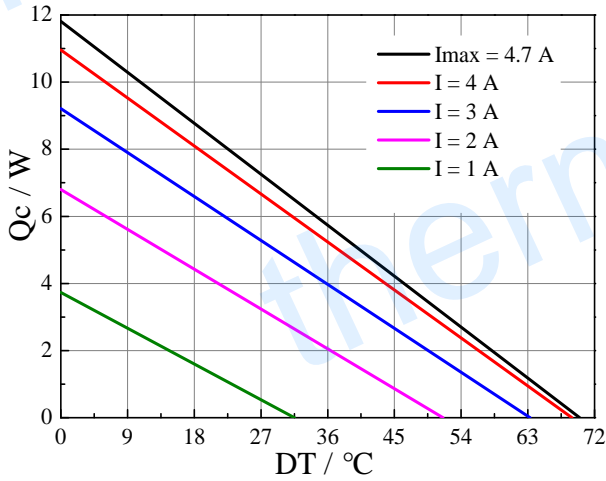
AlO: Alumina, white 96%

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

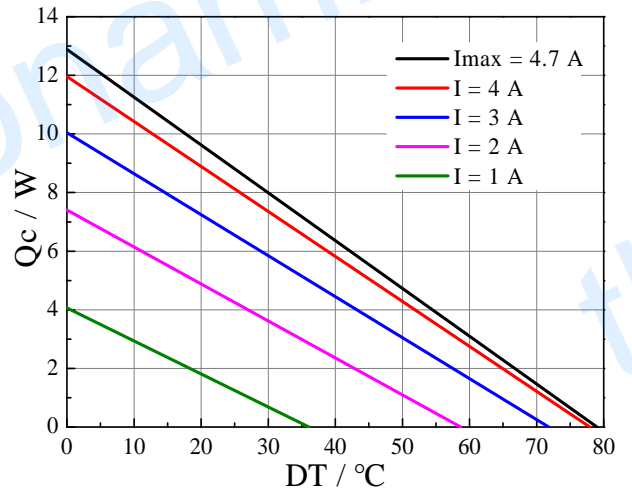
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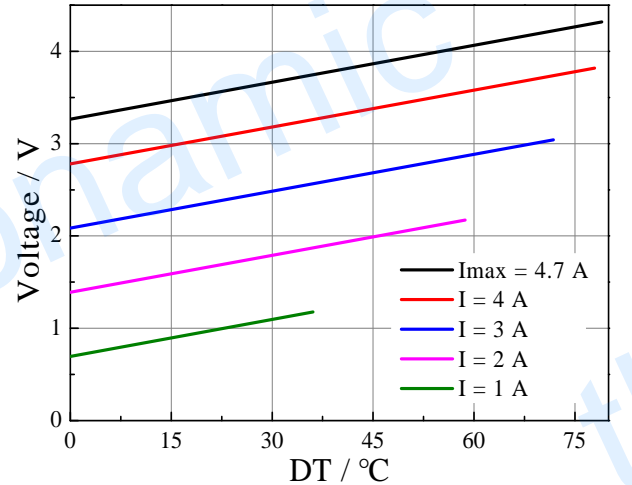
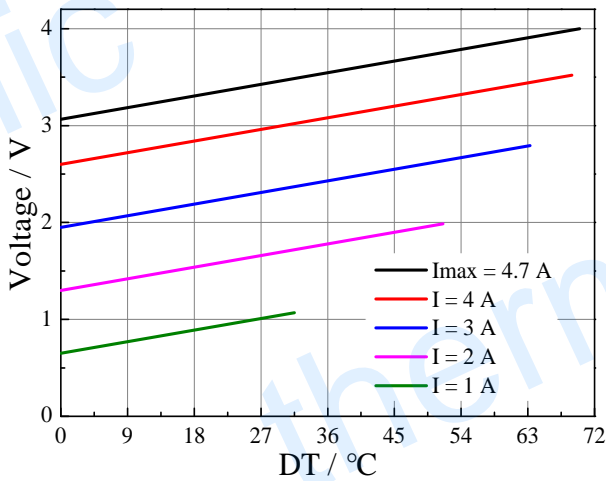
Performance Curves at $T_h=27\text{ }^\circ\text{C}$



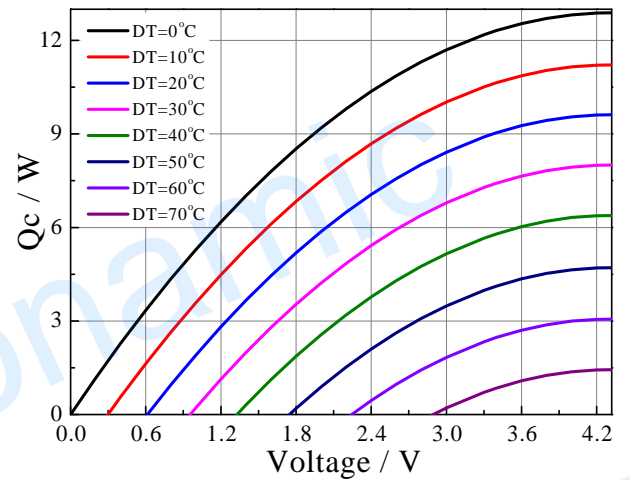
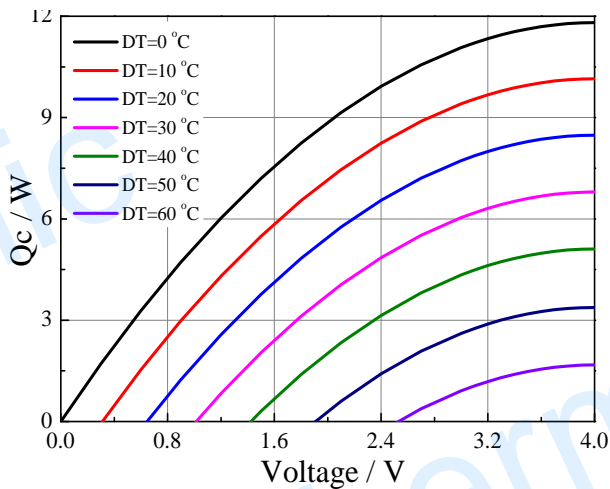
Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(DT)$

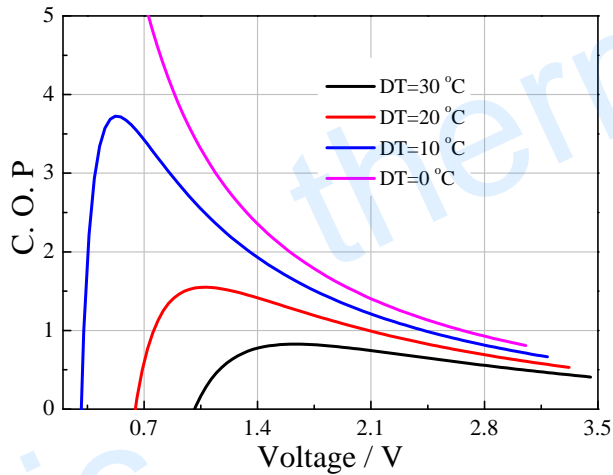


Standard Performance Graph $Q_c = f(V)$

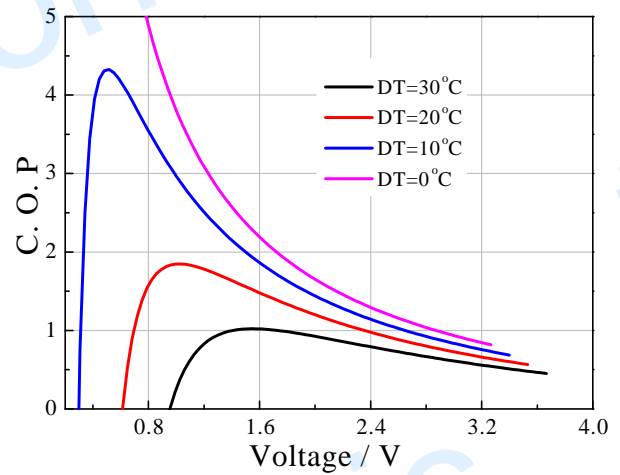
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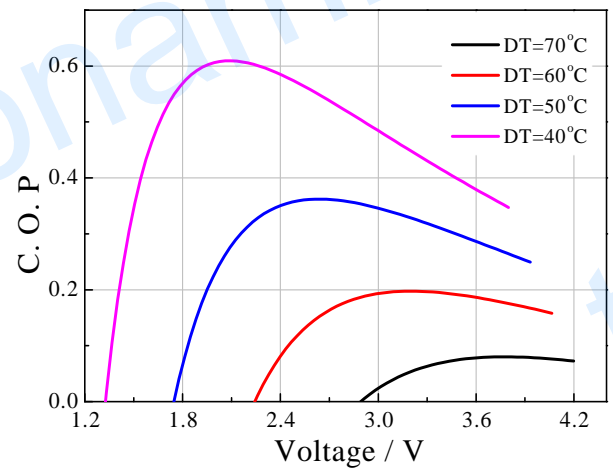
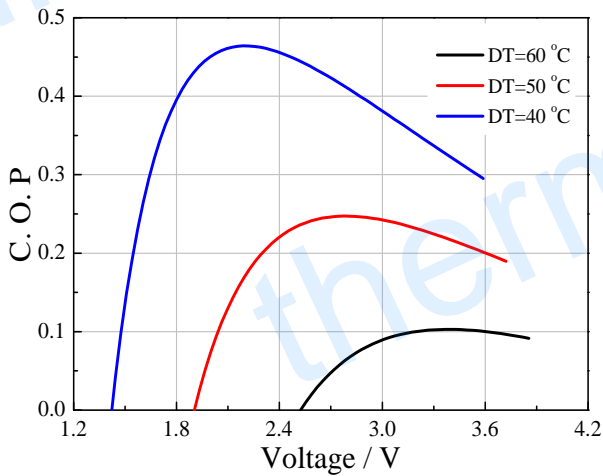
Performance Curves at Th=27 °C



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 stucked on the object being cooled
- Hot side of the module mounted on a heat radiator
- Operation below I_{max} or V_{max}
- Work under DC