

Specification of Thermoelectric Module

TEC1-12702

Description

The 127 couples, 40 mm × 40 mm size module is a single stage module which is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70 °C, designed for superior cooling and heating up to 100 °C applications. If higher operation or processing temperature is required, please specify, 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

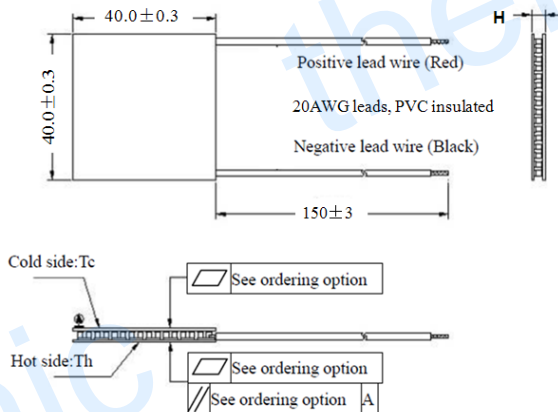
Application

- 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)	16	16.6	Voltage applied to the module at DT _{max}
I _{max} (amps)	3.1	3.1	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	32.3	36.5	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (ohms)	4.05	4.45	The module resistance is tested under AC
Tolerance (%)	10%		For thermal and electricity parameters

Geometric Characteristics Dimensions in millimeters



Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:5.2±0.1	0:0.035/0.035	150±3/Specify
TF	1:5.2±0.05	1:0.025/0.025	150±3/Specify
TF	2:5.2±0.025	2:0.015/0.015	150±3/Specify
Eg. TF01: Thickness 5.2 ± 0.1 (mm) and Flatness 0.025/0.025(mm)			

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:

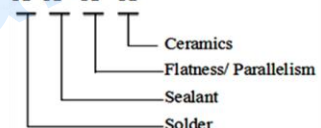
1. Alumina (Al₂O₃, white 96%)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

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

Naming for the Module

TEC1-12702- X-X-X-X



TES1-12702-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)

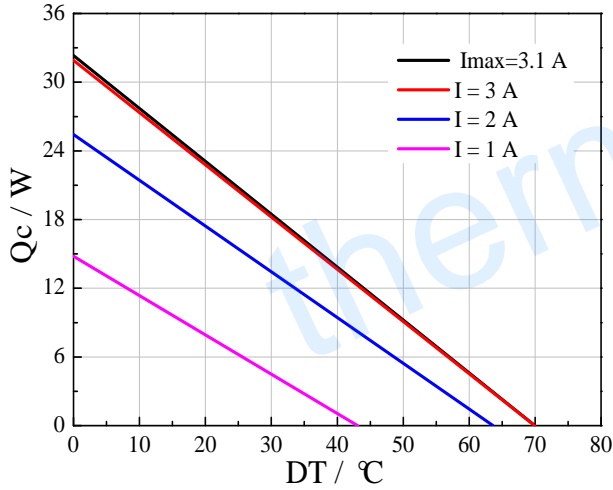
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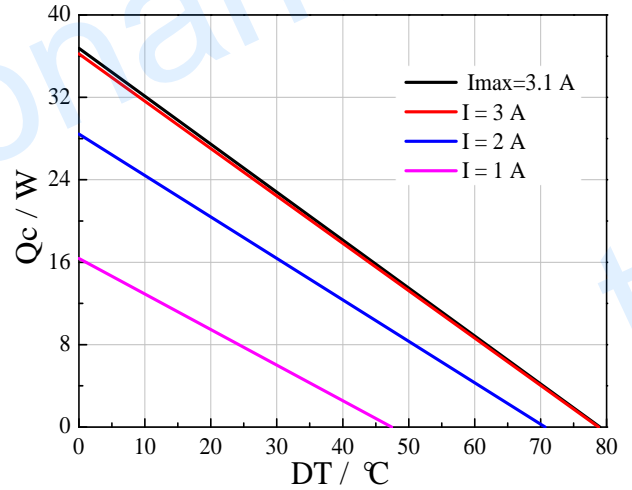
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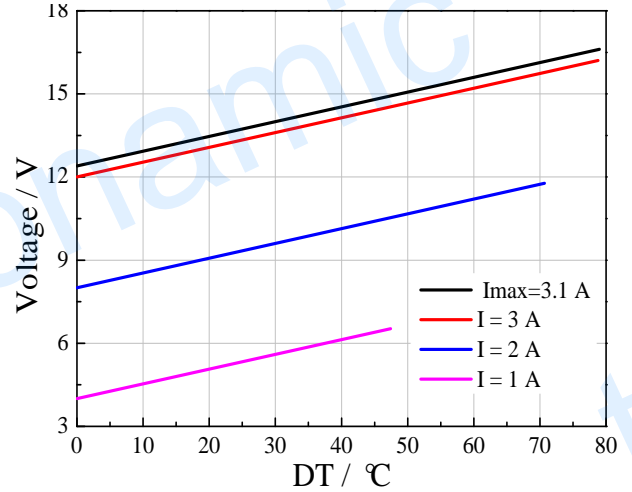
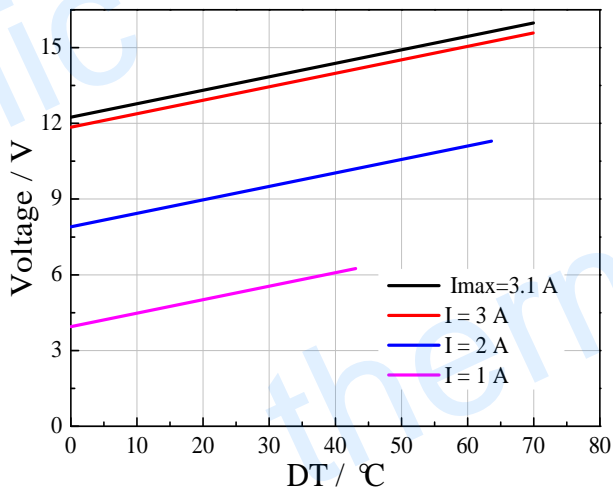
Performance Curves at $T_h=27\text{ }^\circ\text{C}$



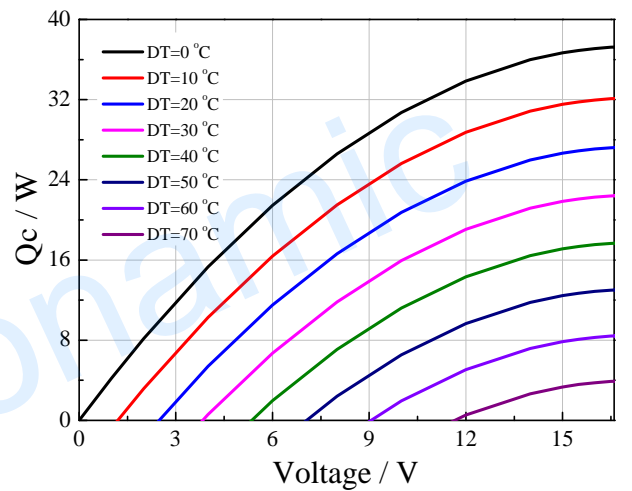
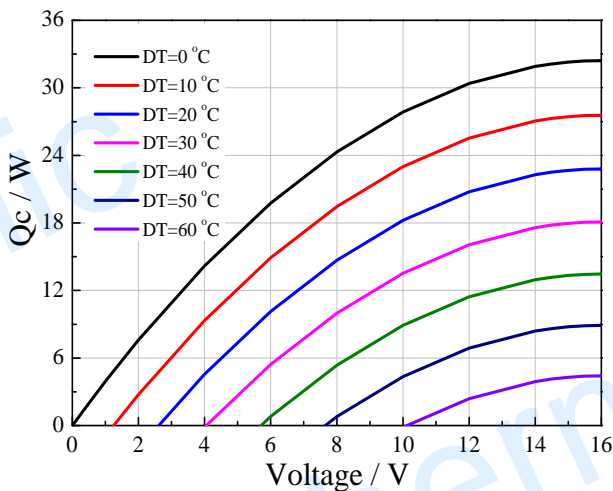
Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(\Delta T)$



Standard Performance Graph $Q_c = f(V)$

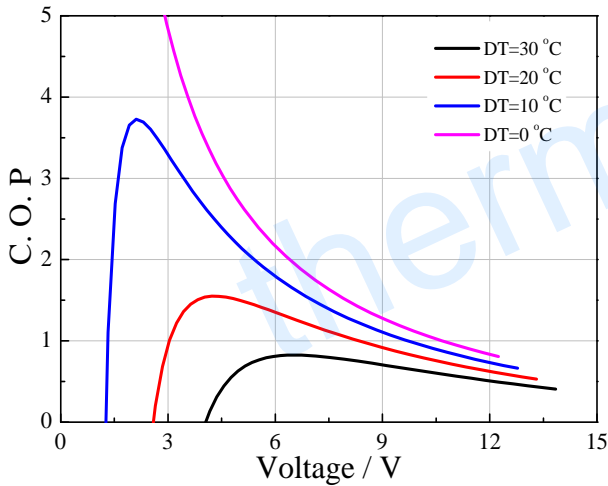
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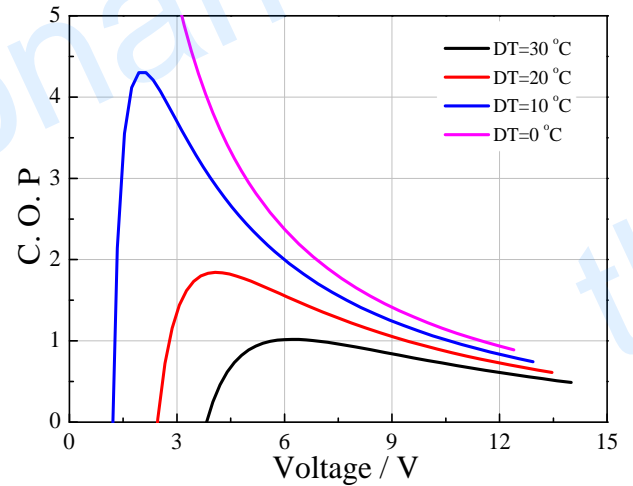
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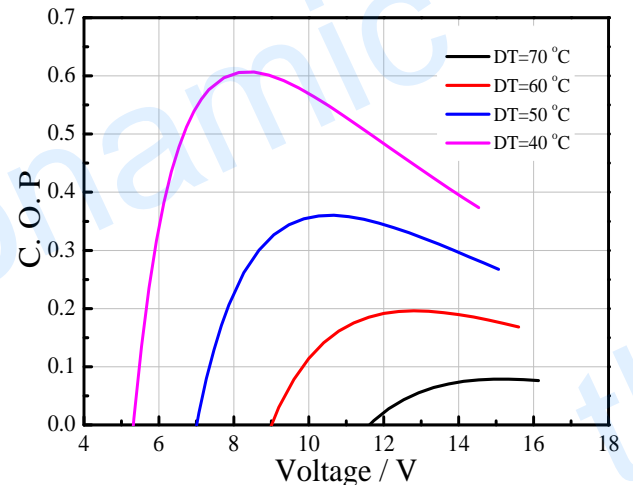
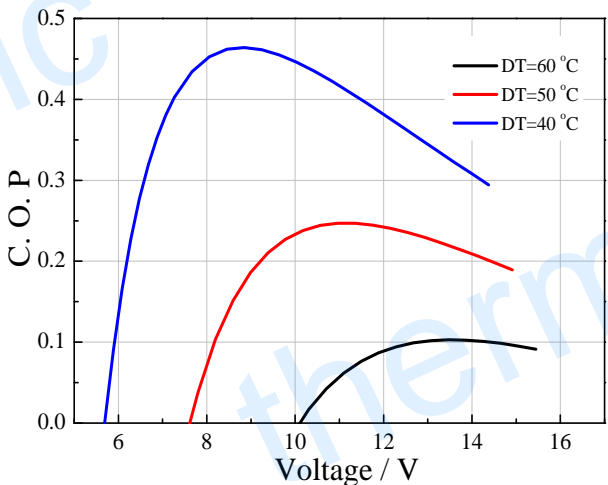
Performance Curves at Th=27 °C



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

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 or storage module below 100 °C
- Operation below I_{max} or V_{max}
- Work under DC

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