

Specification of Thermoelectric Module

TEC1-12703

Description

The 127 couples, 40 mm × 40 mm size 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

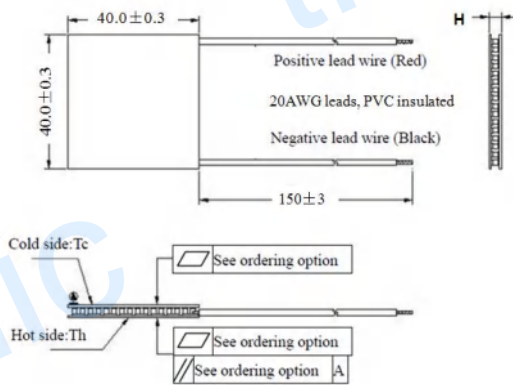
Application

- 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)	15.8	17.2	Voltage applied to the module at DT _{max}
I _{max} (amps)	4	4	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	39.8	43.8	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (ohms)	3.0	3.35	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	0:4.2±0.1	0:0.08/0.08	150±3/Specify
TF	1:4.2±0.03	1:0.03/0.03	150±3/Specify

Eg. TF01: Thickness 4.2 ± 0.1 (mm) and Flatness 0.03/0.03(mm)

Manufacturing Options

A. Solder:

1. T100: BiSn (Tmelt=138°C)
2. T200: CuAgSn (Tmelt = 217°C)
3. T240: SbSn (Tmelt = 240°C)

B. Sealant:

1. NS: No sealing (Standard)
2. SS: Silicone sealant
3. EPS: Epoxy sealant

C. Ceramics:

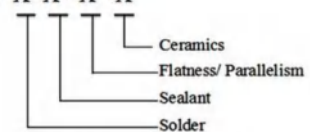
1. Alumina (Al₂O₃, white 96%)

D. Ceramics Surface Options:

1. Blank ceramics (not metalized)

Naming for the Module

TEC1-12703- X - X - X - X



TEC1-12703-T200 -NS -TF01 -AIO

T200: CuSn(Tmelt=227°C)

NS: No sealing

AIO: Alumina white 96%

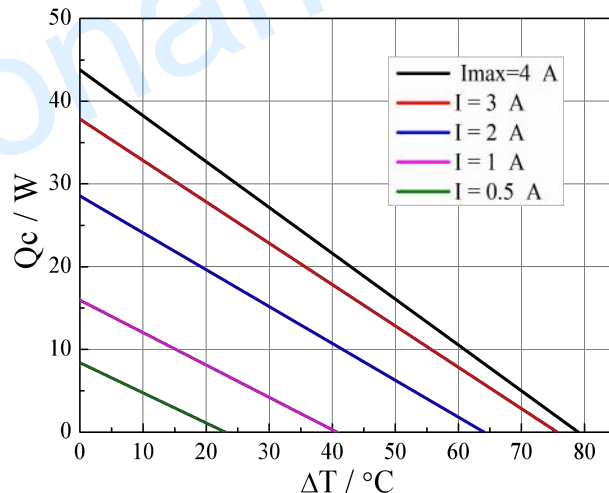
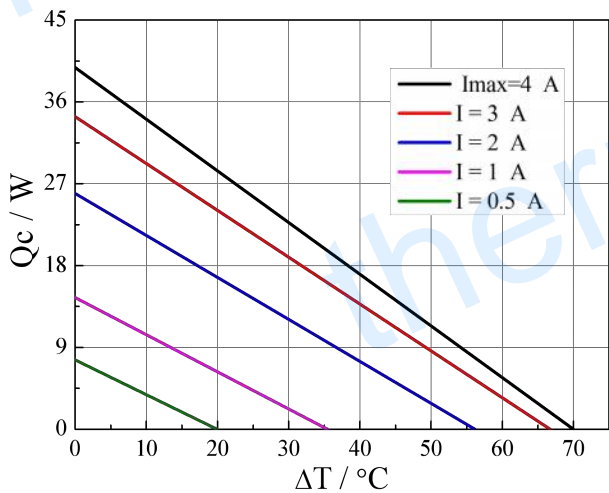
TF01: Thickness ± 0.1(mm)and Flatness/ Parallelism (mm): 0.025/0.025

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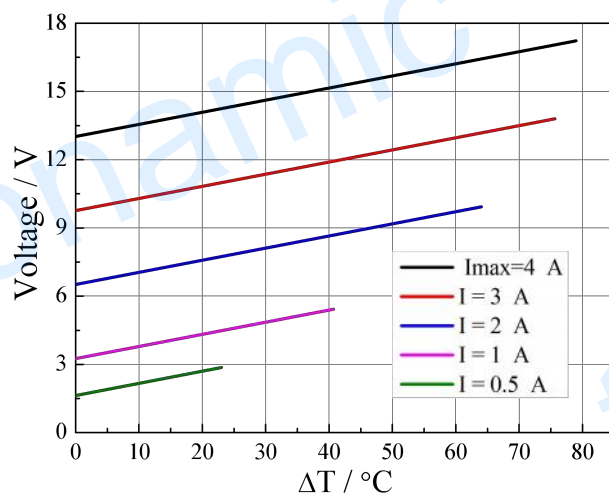
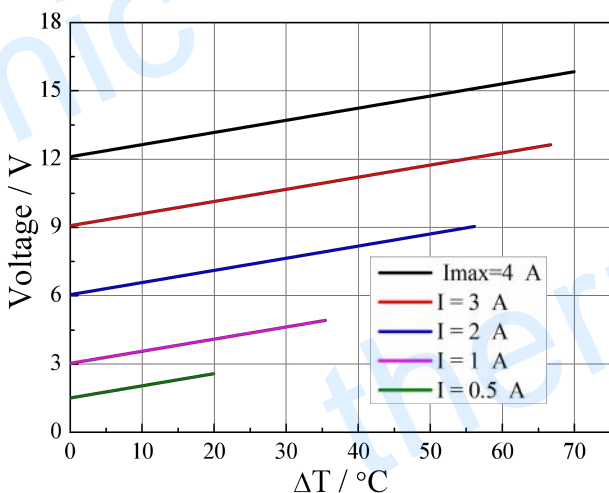
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Performance Curves at Th=27 °C

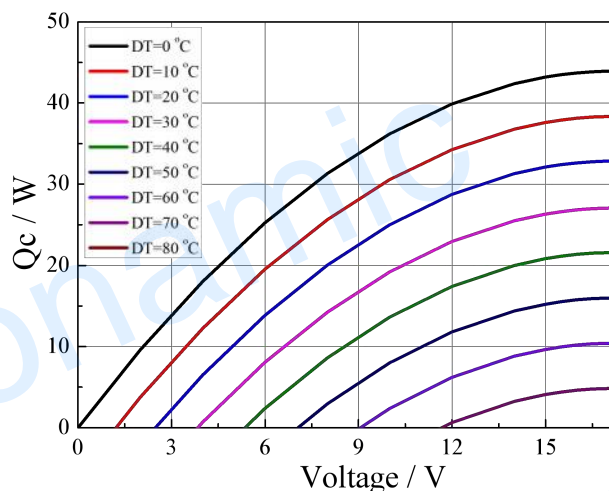
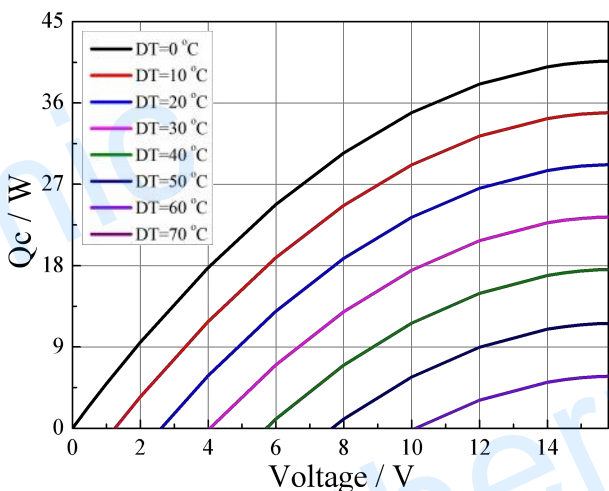
Performance Curves at Th=50 °C



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



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

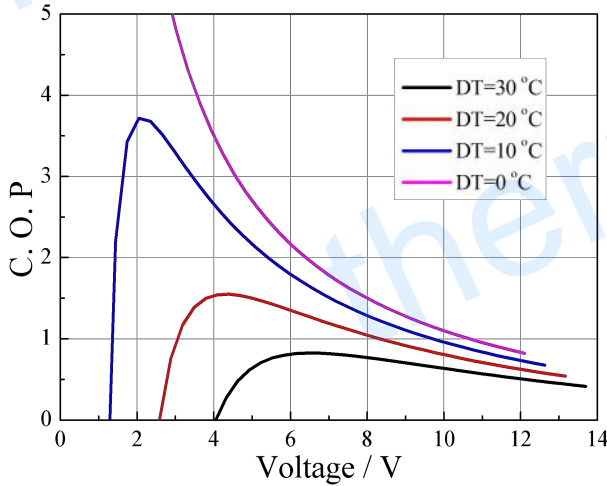


Standard Performance Graph $Q_c = f(V)$

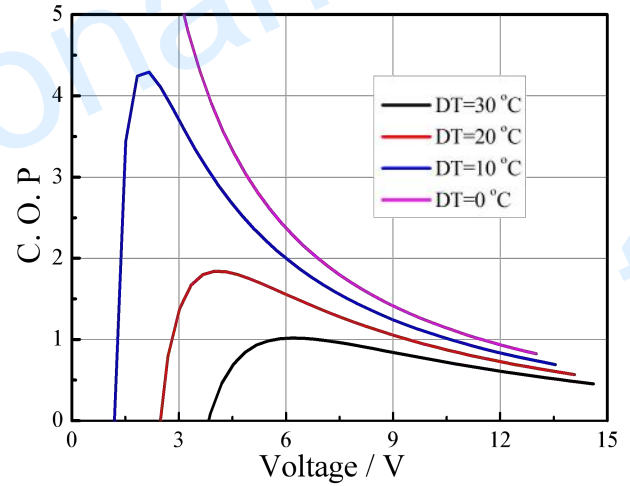
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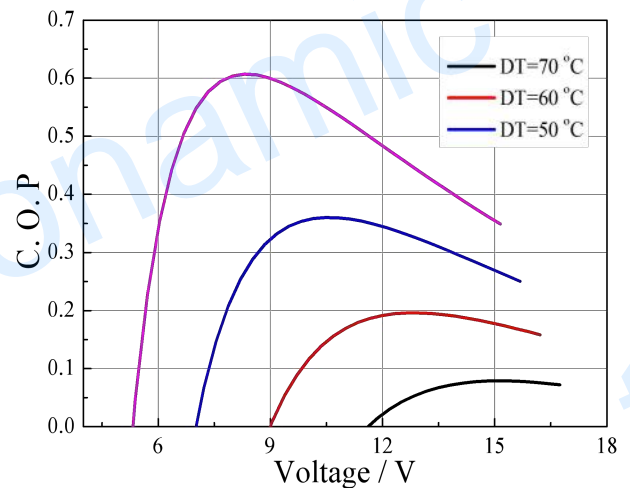
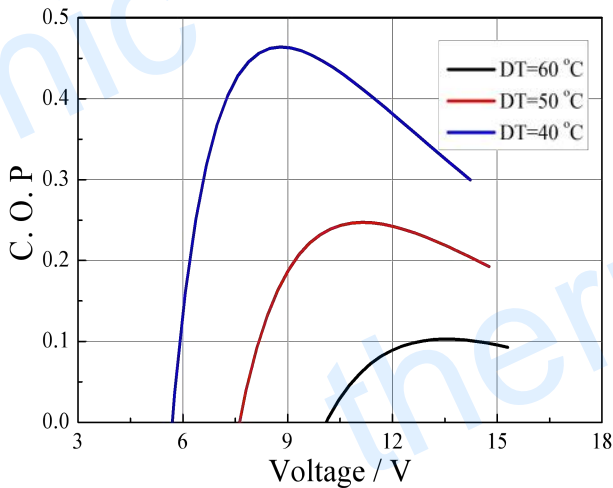
Performance Curves at $T_h=27^\circ\text{C}$



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



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



Standard Performance Graph COP = f(V) of ΔT ranged from 40 to $60/70^\circ\text{C}$

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