

Specification of Thermoelectric Module

TEC1-19911

Description

The 199 couples, 40 mm × 40 mm size single module which is made of our high performance ingot to achieve superior cooling performance and 70 °C or larger delta T max, 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

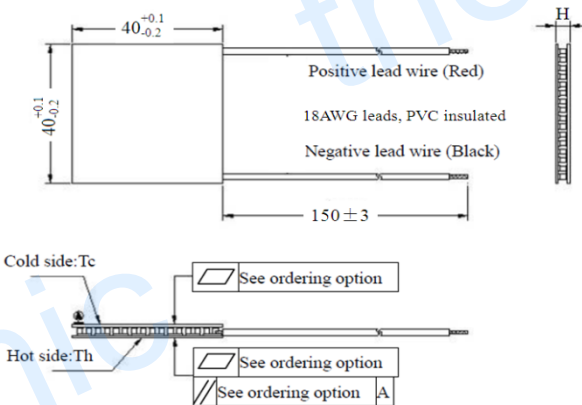
Application

- 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	70	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U _{max} (Voltage)	25.0	26.9	Voltage applied to the module at DT _{max}
I _{max} (Amps)	11	11	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	172.6	188.4	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	1.81	1.93	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%)(AIO)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

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

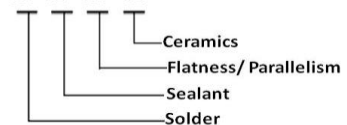
Ordering Option

Suffix	Thickness H / (mm)	Flatness/ Parallelism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:3.1±0.1	0:0.05/0.05	150±3/Specify
TF	1:3.1±0.05	1:0.025/0.025	150±3/Specify
TF	2:3.1±0.025	2:0.015/0.015	150±3/Specify

Eg. TF01: Thickness 3.1±0.1(mm) and Flatness 0.025/0.025(mm)

Naming for the Module

TEC1-19911- X-X-X-X



TEC1-19911-T200-NS-TF01-AIO

T200: CuSn (T_{melt}=227°C)

NS: No sealing

AIO: Alumina, white 96%

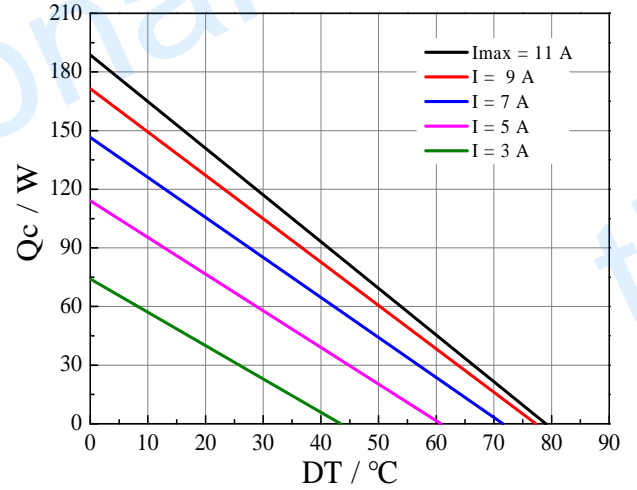
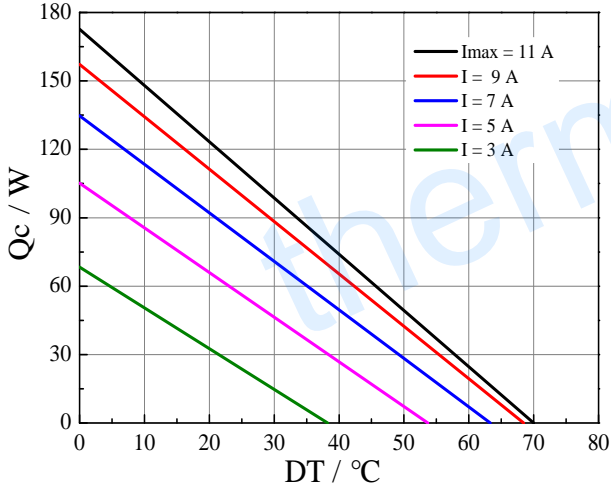
TF01: Thickness ± 0.1 (mm) and Flatness/ Parallelism 0.025/0.025 (mm)

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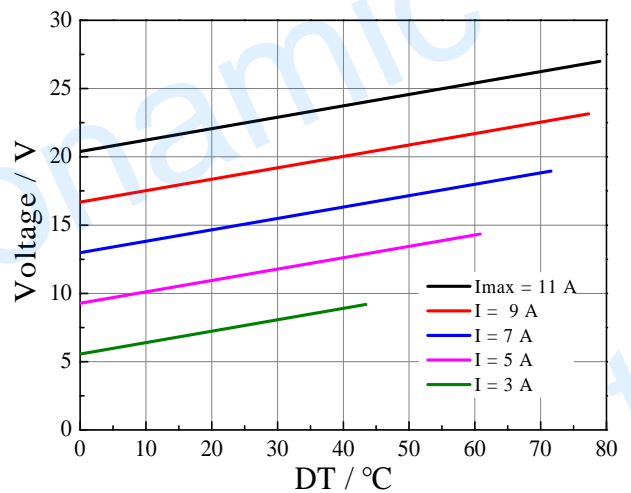
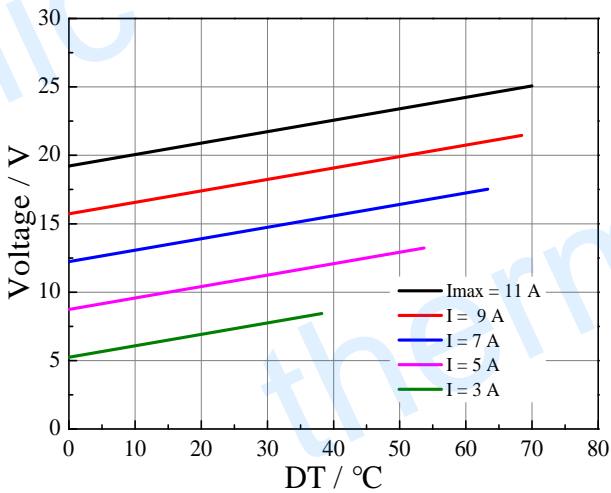
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Performance Curves at $T_h=27\text{ }^\circ\text{C}$

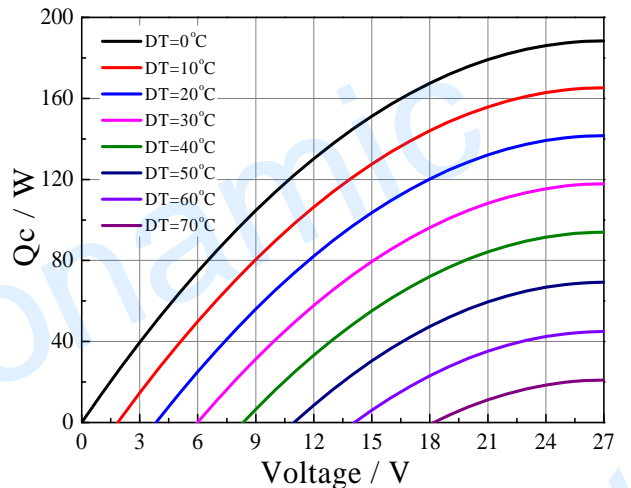
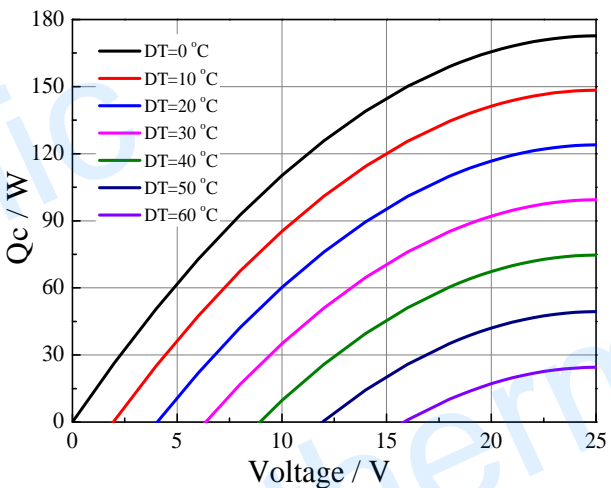
Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(DT)$

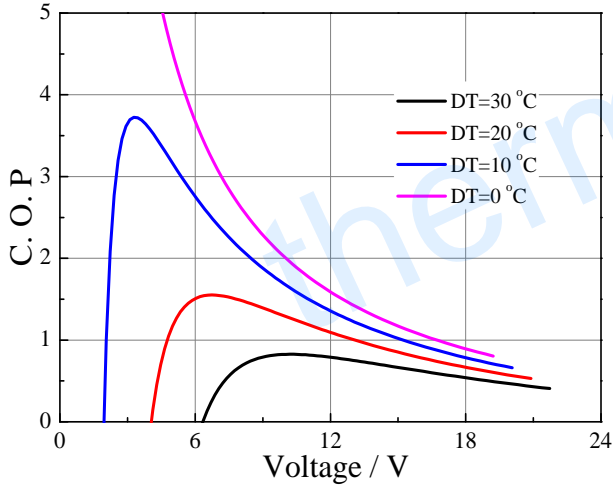


Standard Performance Graph $Q_c = f(V)$

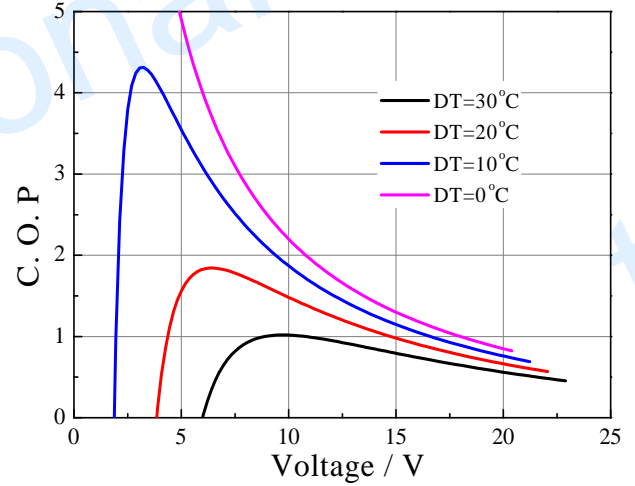
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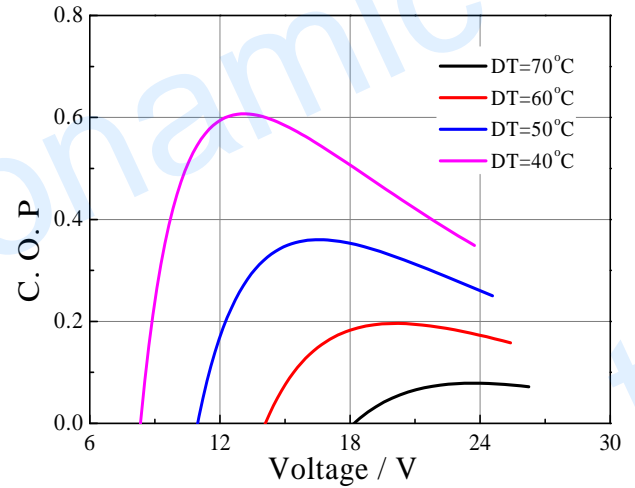
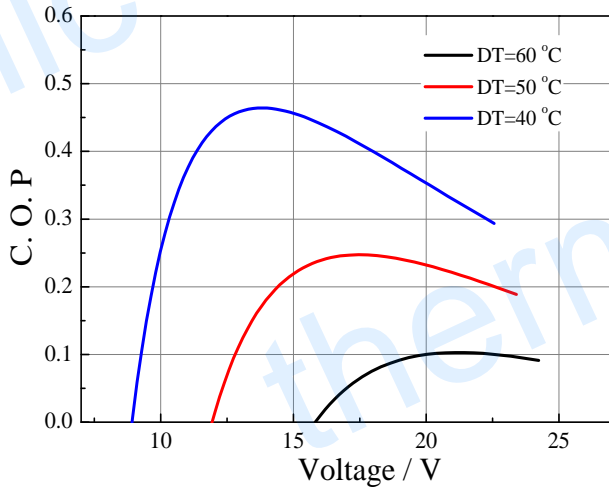
Performance Curves at Th=27 °C



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 stuck 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