

# Specification of Thermoelectric Module

## TEC1-06310

### Description

The 63 couples, 20 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

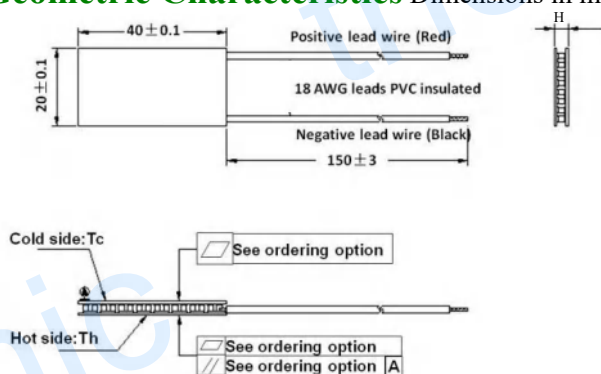
### Application

- 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 <sub>2</sub>  |
| DT <sub>max</sub> (°C)     | 70   | 79   | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| U <sub>max</sub> (Voltage) | 8.7  | 9.4  | Voltage applied to the module at DT <sub>max</sub>  |
| I <sub>max</sub> (amps)    | 10   | 10   | DC current through the modules at DT <sub>max</sub>   |
| Q <sub>Cmax</sub> (Watts)  | 54.9 | 59.4 | Cooling capacity at cold side of the module under DT=0 °C   |
| AC resistance (ohms)       | 0.63 | 0.69 | 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 (T<sub>melt</sub>=138°C)
2. T200: CuAgSn (T<sub>melt</sub> = 217°C)
3. T240: SbSn (T<sub>melt</sub> = 240°C)

#### B. Sealant:

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

#### C. Ceramics:

1. Alumina (Al<sub>2</sub>O<sub>3</sub>, white 96%)

#### D. Ceramics Surface Options:

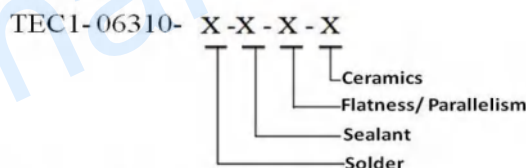
1. Blank ceramics (not metalized)

### Ordering Option

| Suffix | Thickness (mm) | Flatness/ Parallelism (mm) | Lead wire length (mm) Standard/Optional length |
|--------|----------------|----------------------------|--|
| TF     | 0: 3.4 ± 0.1   | 0: 0.08/0.08               | 150±3/Specify                                  |
| TF     | 1: 3.4 ± 0.03  | 1: 0.03/0.03               | 150±3/Specify                                  |

Eg. TF01: Thickness 3.4 ± 0.1 (mm) and Flatness/Parallelism 0.03/0.03(mm)

### Naming for the Module



TEC1-06310-T200-NS-TF01-AIO

T200: CuSn (T<sub>melt</sub>=227°C)

NS: No sealing

AIO: Alumina (Al<sub>2</sub>O<sub>3</sub>, white 96%)

TF01: Thickness ±0.1(mm) and Flatness/Parallelism:0.1/0.13 (mm)

**Creative technology with fine manufacturing processes provides you the reliable and quality products**

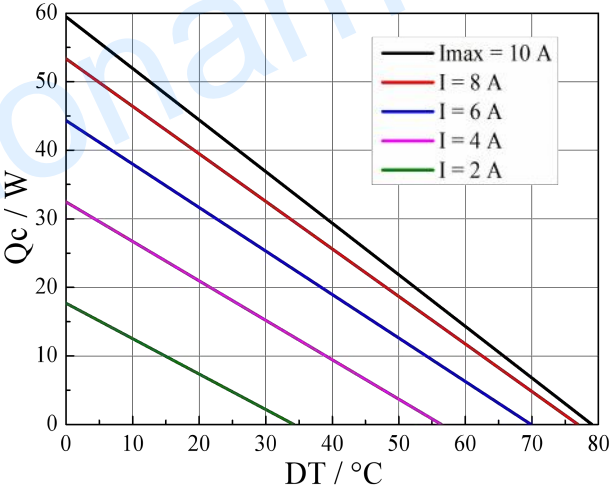
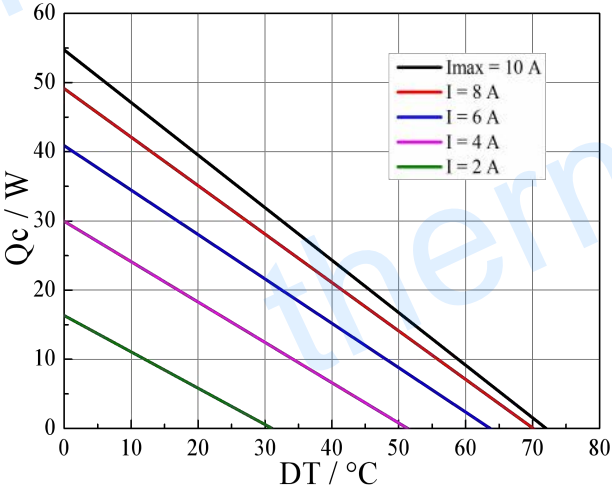
Tel: +86-791-88198288 Fax: +86-791-88198308 Email: [sales@thermonamic.com.cn](mailto:sales@thermonamic.com.cn) Web Site: [www.thermonamic.com.cn](http://www.thermonamic.com.cn)

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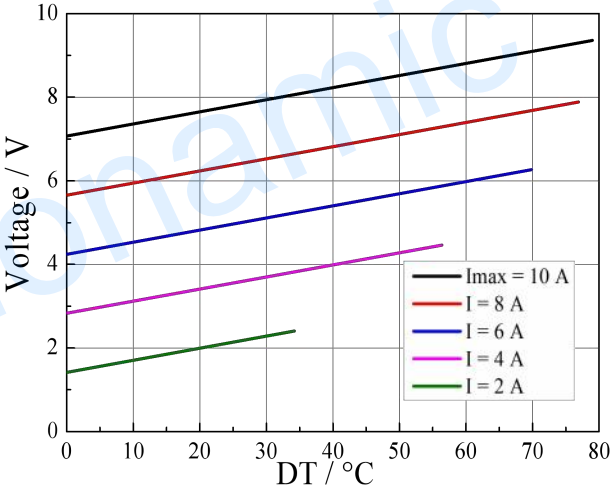
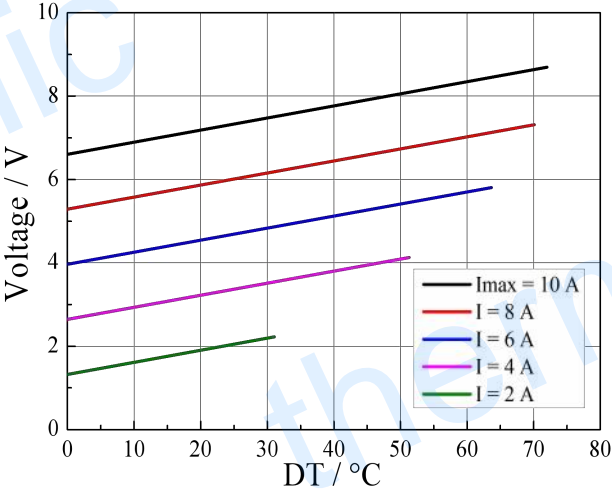
**TEC1-06310**

**Performance Curves at Th=27 °C**

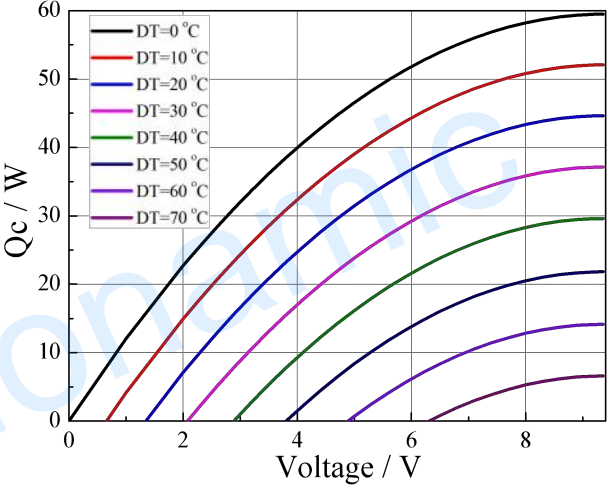
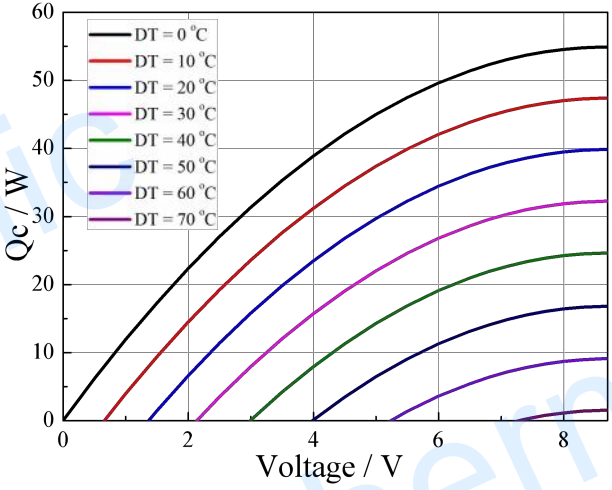
**Performance Curves at Th=50 °C**



Standard Performance Graph  $Q_c = f(DT)$



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

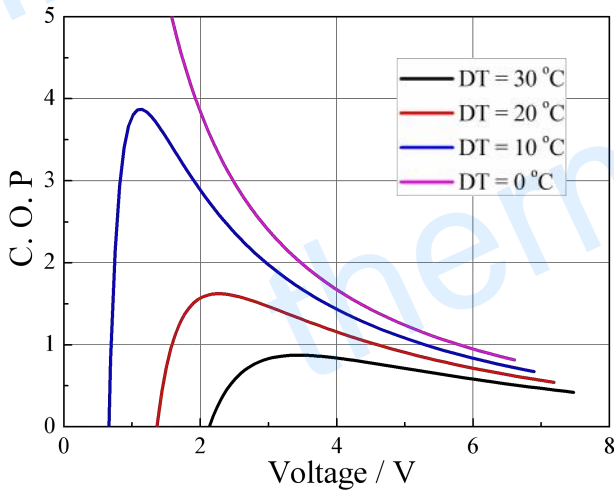


Standard Performance Graph  $Q_c = f(V)$

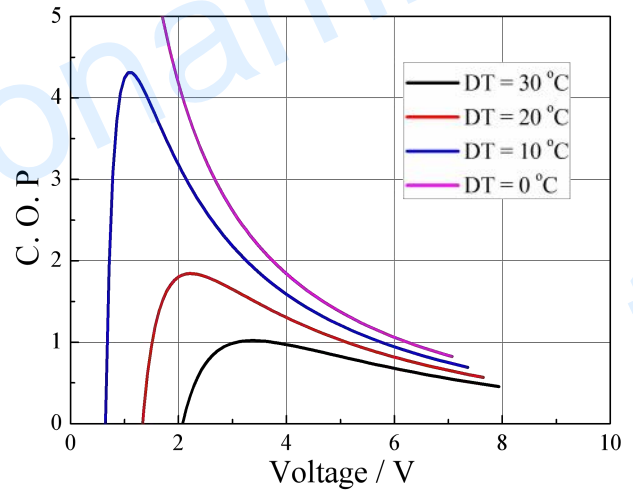
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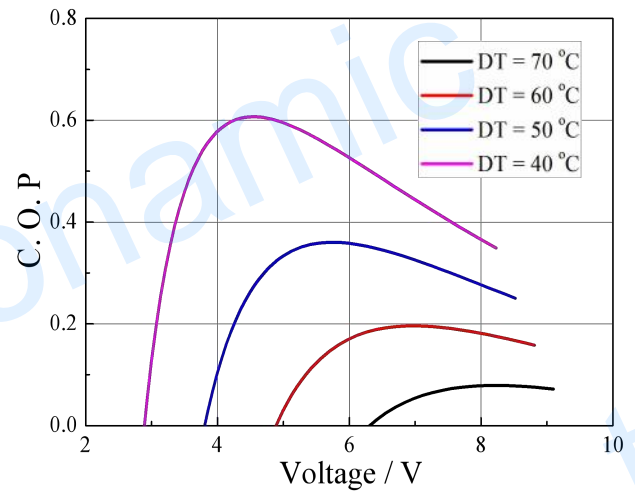
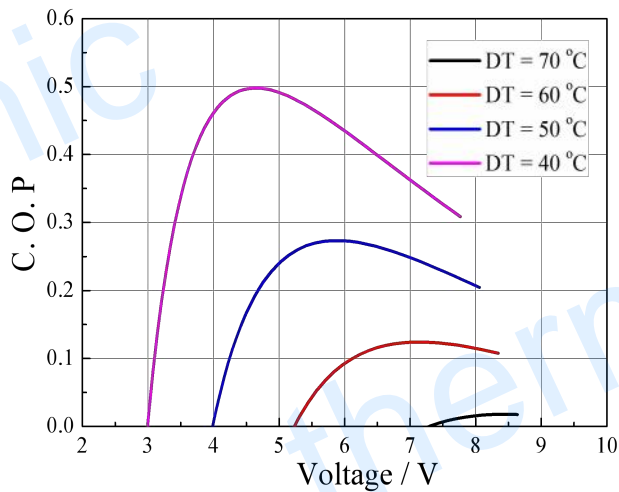
### Performance Curves at $T_h=27\text{ }^\circ\text{C}$



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



Standard Performance Graph COP = f(V) of  $\Delta T$  ranged from 0 to 30 °C



Standard Performance Graph COP = f(V) of  $\Delta T$  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
- Storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC