

# Specification of Thermoelectric Module

## TEC1-03108

### 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

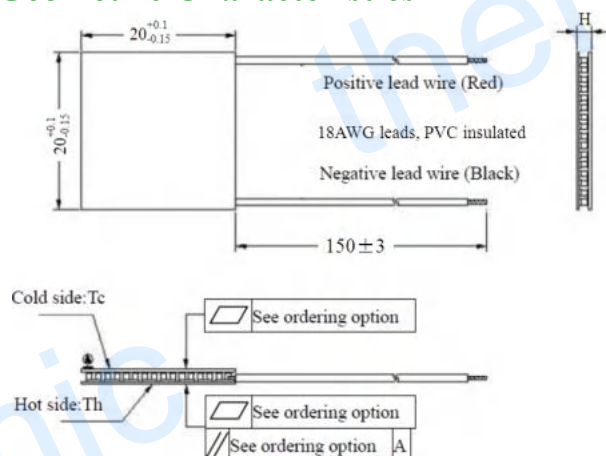
### Application

- 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 <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)	4.0	4.3	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	8.3	8.3	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	20.7	22.6	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (ohms)	0.36	0.39	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 (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 (Al<sub>2</sub>O<sub>3</sub>, white 96%)
2. Aluminum Nitride (AlN)

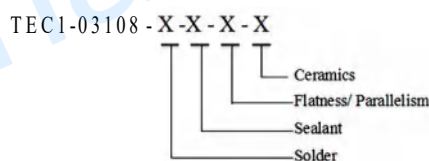
#### D. Ceramics Surface Options:

1. Blank ceramics (not metalized)
2. Metalized

### Ordering Option

Suffix	Thickness H / (mm)	Flatness/ Parallelism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:3.5±0.1	0:0.05/0.05	150±3/Specify
TF	1:3.5±0.03	1:0.02/0.02	150±3/Specify
Eg. TF01: Thickness 3.5±0.1 (mm) and Flatness 0.02/0.02(mm)			

### Naming for the Module



TEC1-03108-T100-NS-TF01-A10

T100: BiSn (Tmelt=138°C)

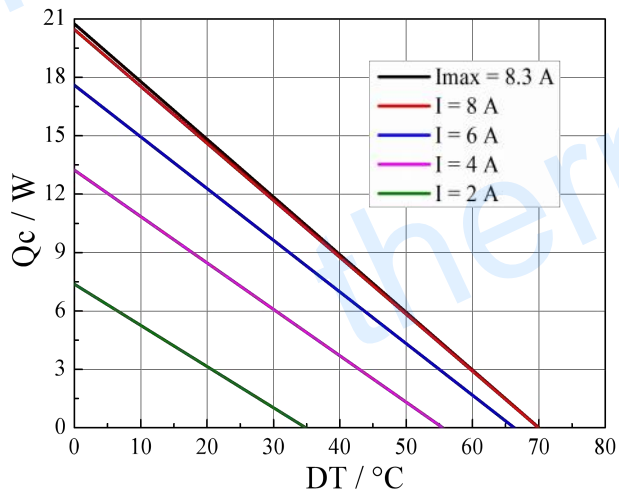
NS: No sealing

A10: Alumina white 96%

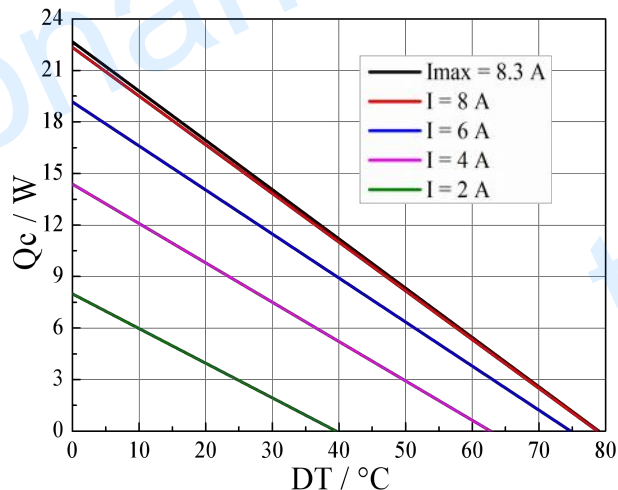
# Specification of Thermoelectric Module

TEC1-03108

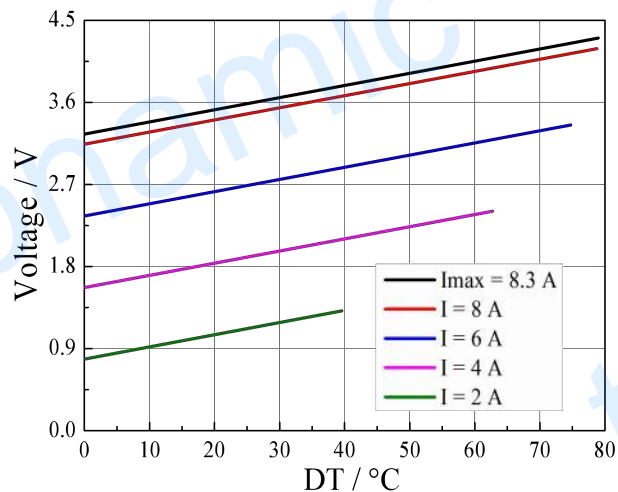
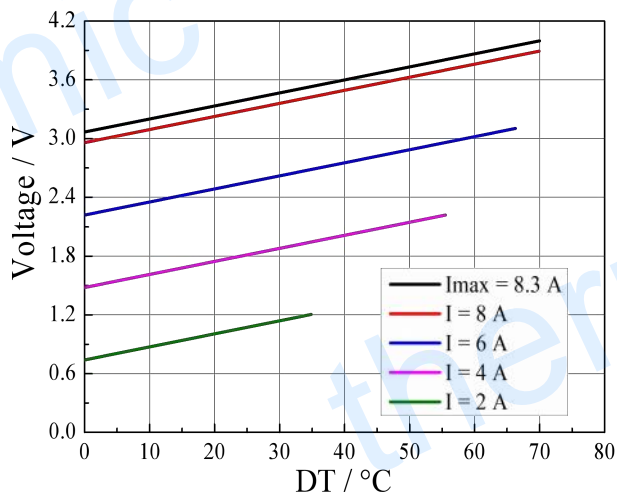
## Performance Curves at $T_h=27^\circ\text{C}$



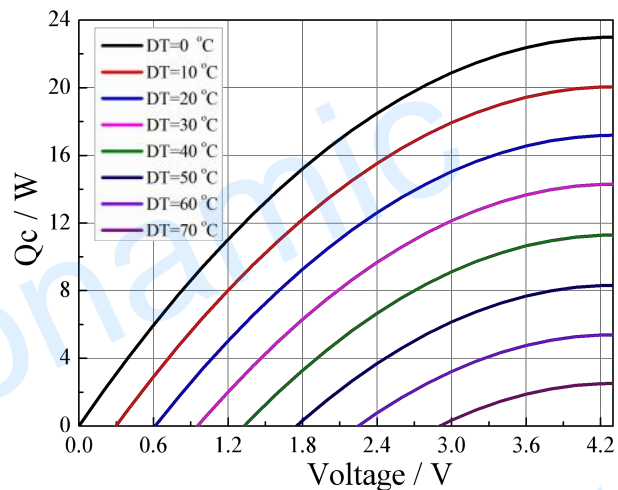
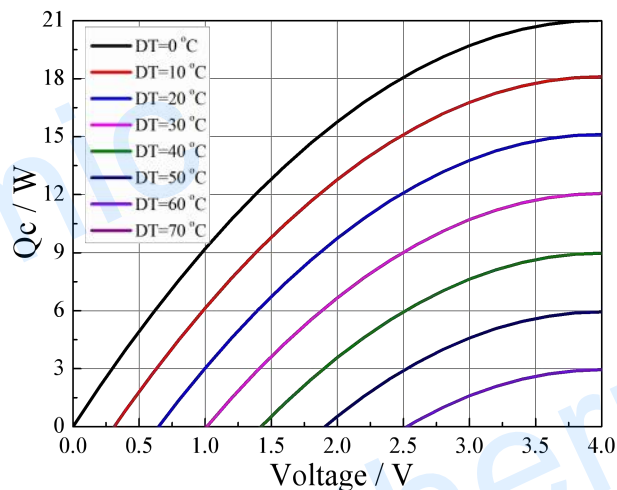
## Performance Curves at $T_h=50^\circ\text{C}$



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$



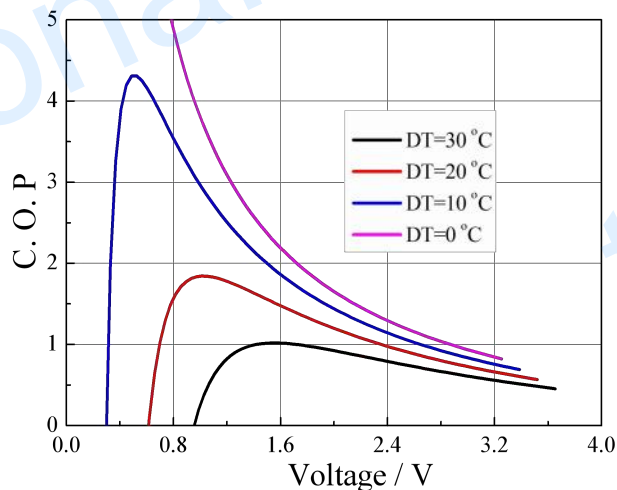
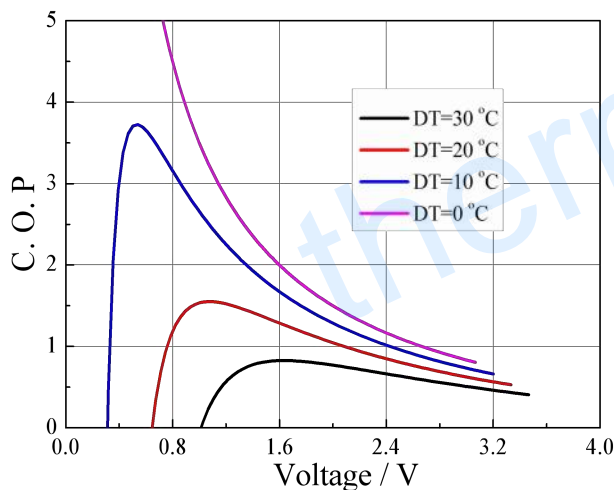
Standard Performance Graph  $Q_c = f(V)$

# Specification of Thermoelectric Module

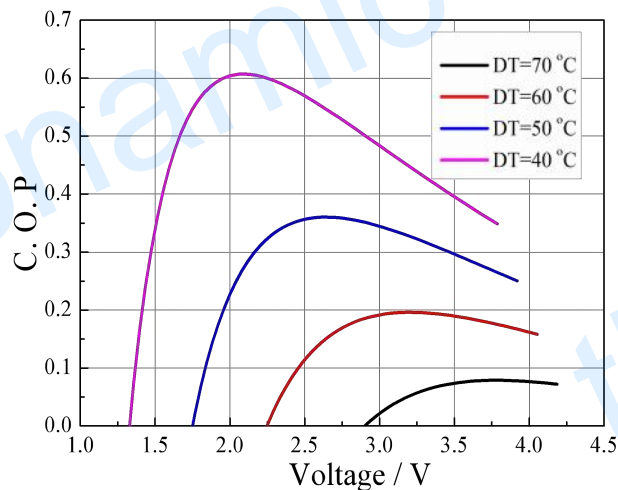
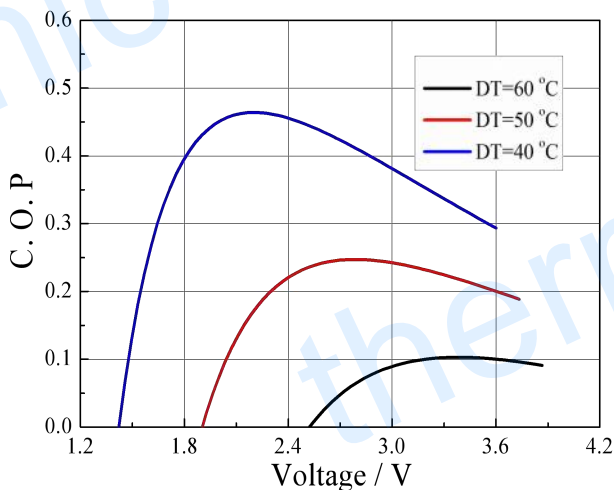
TEC1-03108

## 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 DT ranged from 0 to  $30\text{ }^\circ\text{C}$



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

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
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC