

# Specification of Thermoelectric Module

## TEC1-12708

### Description

The 127 couples, 40 mm × 40 mm size single stage module is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70, designed for superior cooling and heating up to 100 °C requirement. It has higher cooling efficiency than normal type module. 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

- High effective cooling and efficiency.
- 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

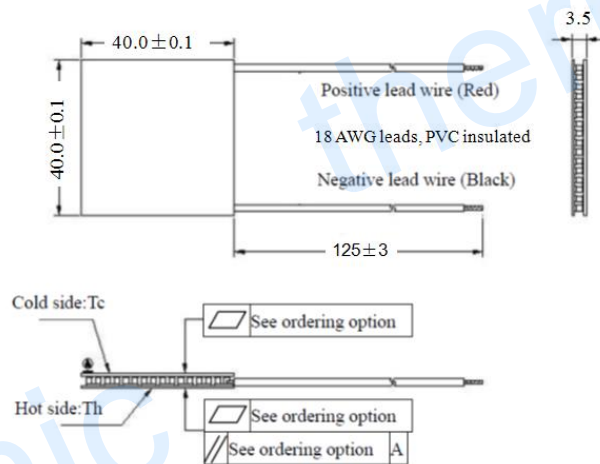
### Application

- Food and beverage service refrigerator
- Photonic and medical systems
- Portable cooler box for cars
- Temperature stabilizer
- Liquid cooling

### 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) | 16.2 | 17.3 | Voltage applied to the module at DT <sub>max</sub>  |
| I <sub>max</sub> (amps)    | 8.2  | 8.2  | DC current through the modules at DT <sub>max</sub>   |
| Q <sub>Cmax</sub> (Watts)  | 81.7 | 88.8 | Cooling capacity at cold side of the module under DT=0 °C   |
| AC resistance (ohms)       | 1.48 | 1.61 | 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)

#### B. Sealant:

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

#### C. Ceramics:

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

#### D. Ceramics Surface Options:

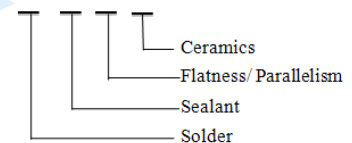
1. Blank ceramics (not metallized)
2. Metallized (Au plating)

### Ordering Option

| Suffix   | Thickness (mm) | Flatness/ Parallelism (mm) | Lead wire length(mm) Standard/Optional length |
|--|----------------|----------------------------|---|
| TF   | 0:3.5±0.1      | 0:0.035/0.035              | 125 ±3/Specify                                |
| TF   | 1:3.5±0.05     | 1:0.025/0.025              | 125 ±3/Specify                                |
| TF   | 2:3.5±0.03     | 2:0.015/0.015              | 125 ±3/Specify                                |
| Eg. TF01: Thickness 3.5 ±0.1 (mm) and Flatness 0.025 / 0.025(mm) |                |                            |   |

### Naming for the Module

TEC1- 12708- X - X - X - X



TEC1- 12708- T100 -NS - TF00 - AlO

T100: Solder, BiSn (Melting Point=138°C)

NS: No sealing AlO: Alumina white 96%

TF00: Thickness ±0.1(mm) and Flatness/Parallelism 0.035/0.035(mm)

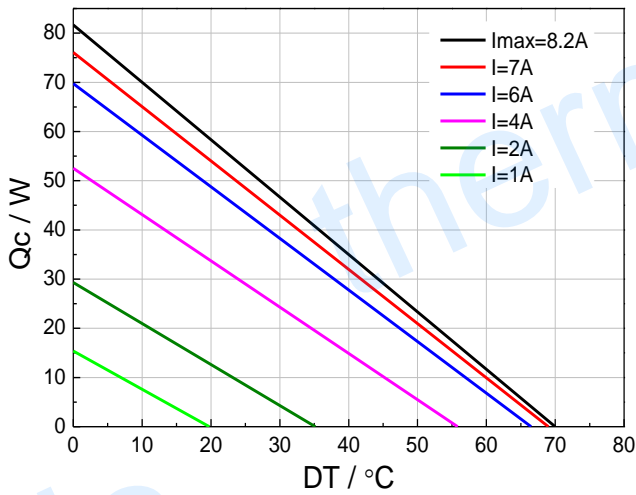
Creative technology with fine manufacturing processes provides you the reliable and quality products

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)

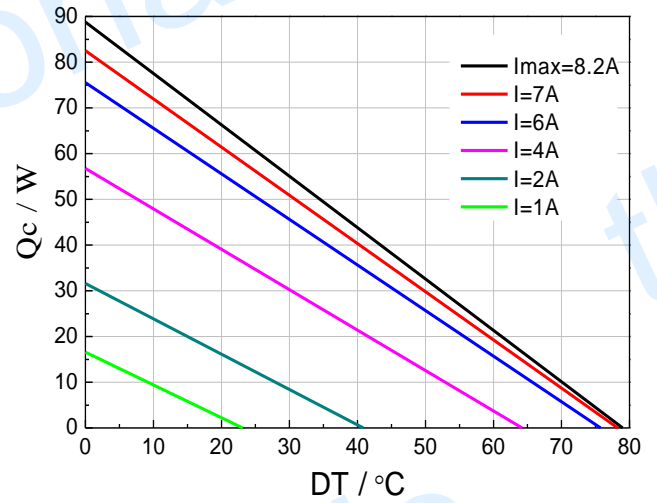
# Specification of Thermoelectric Module

## TEC1-12708

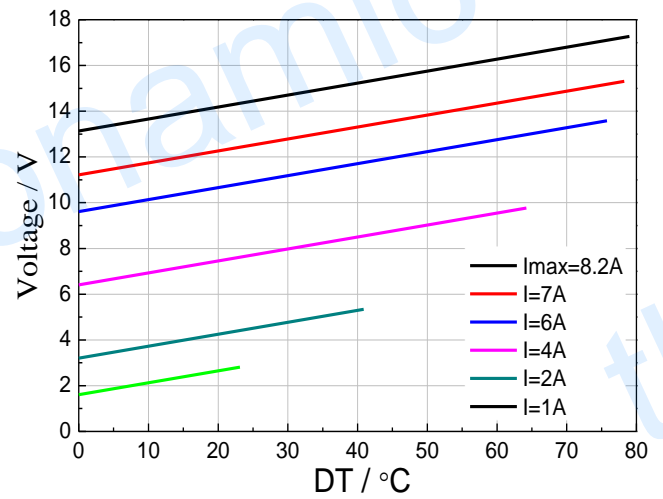
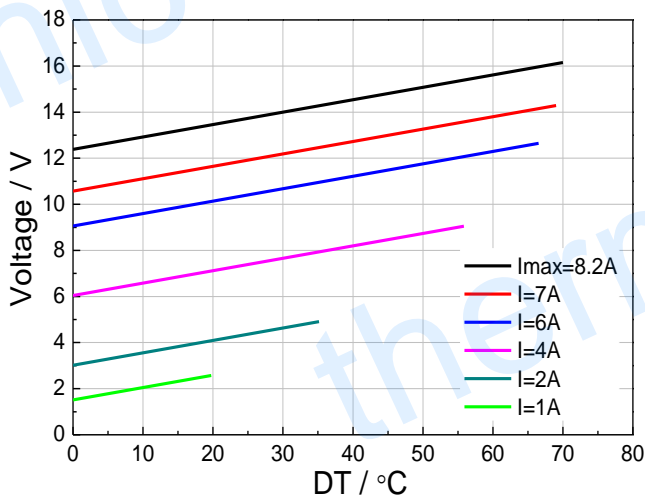
### Performance Curves at $T_h = 27\text{ }^\circ\text{C}$



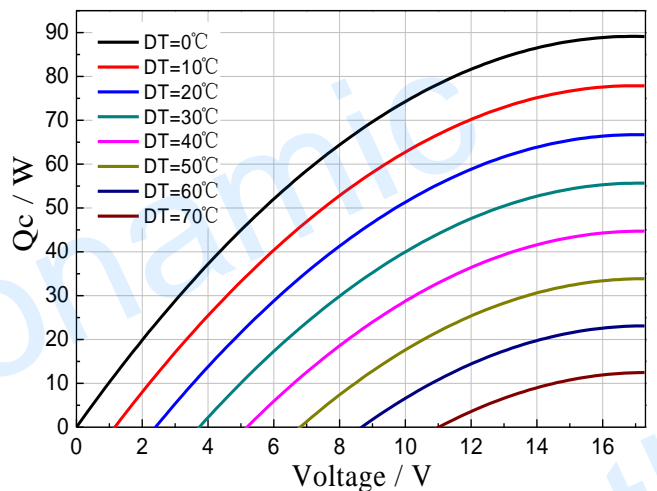
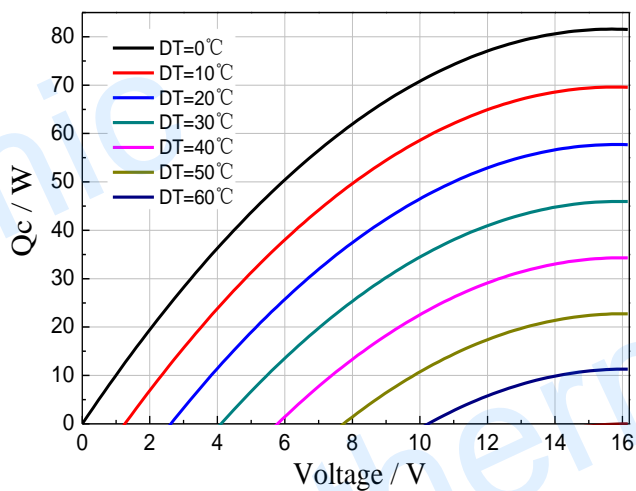
### Performance Curves at $T_h = 50\text{ }^\circ\text{C}$



Standard Performance Graph  $Q_c = f(DT)$



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

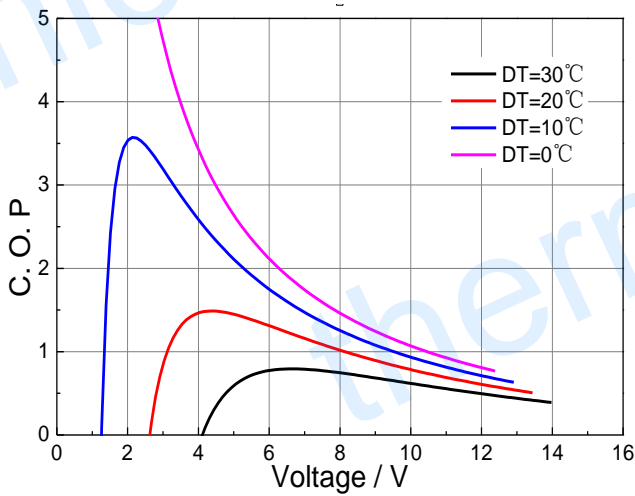


Standard Performance Graph  $Q_c = f(V)$

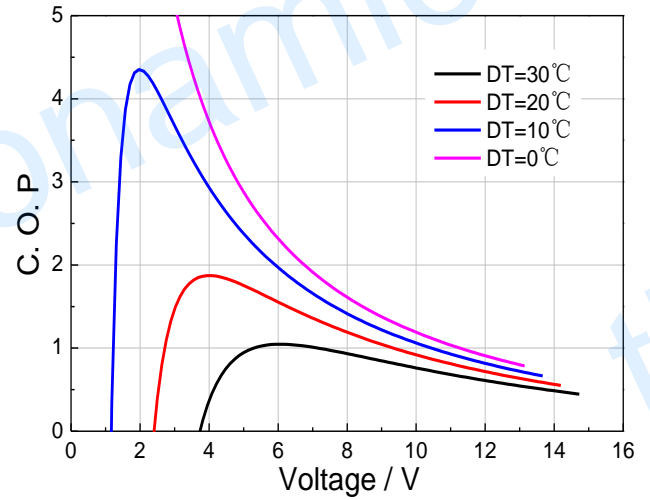
## Specification of Thermoelectric Module

TEC1-12708

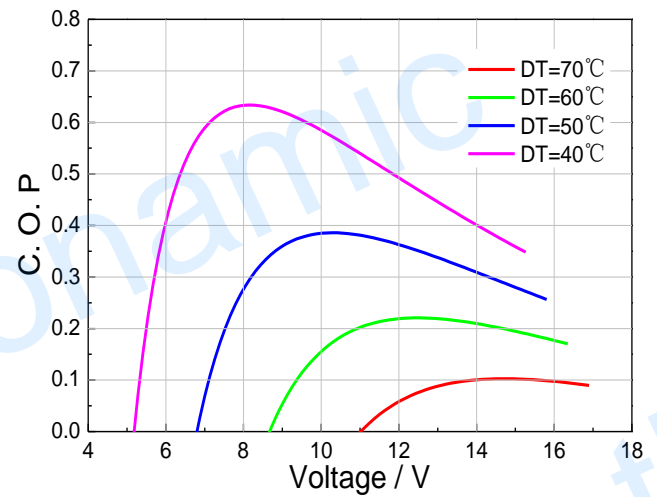
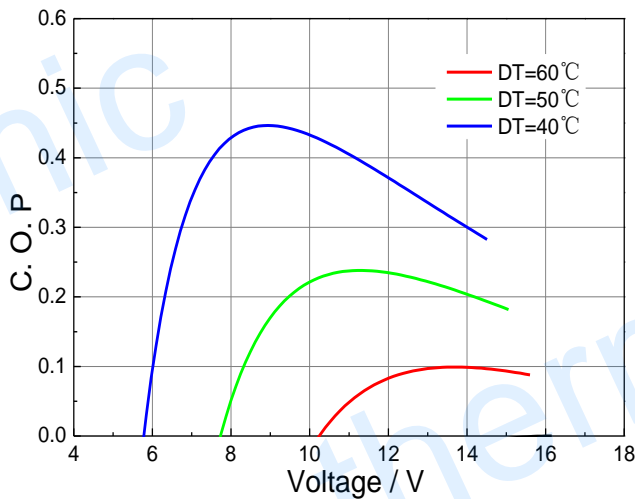
### Performance Curves at Th=27 °C



### Performance Curves at Th=50 °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

- Cold side of the module stuck on the object being cooled
- Hot side of the module mounted on a heat radiator
- Operation or storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC