

# Specification of Thermoelectric Module

## TEC1-12708L1

### 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

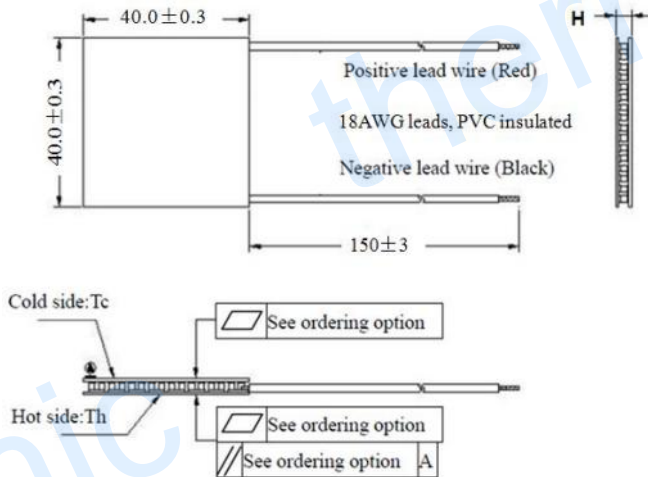
### Application

- 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 (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%)
2. Aluminum Nitride (AlN)

#### D. Ceramics Surface Options:

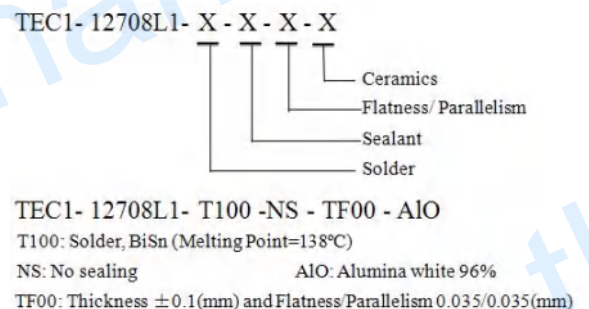
1. Blank ceramics (not metalized)
2. Metalized

### Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:3.3±0.1	0:0.08/0.08	150±3/Specify
TF	1:3.3±0.03	1:0.03/0.03	150±3/Specify

Eg. TF01: Thickness 3.3 ± 0.1 (mm) and Flatness 0.03 / 0.03(mm)

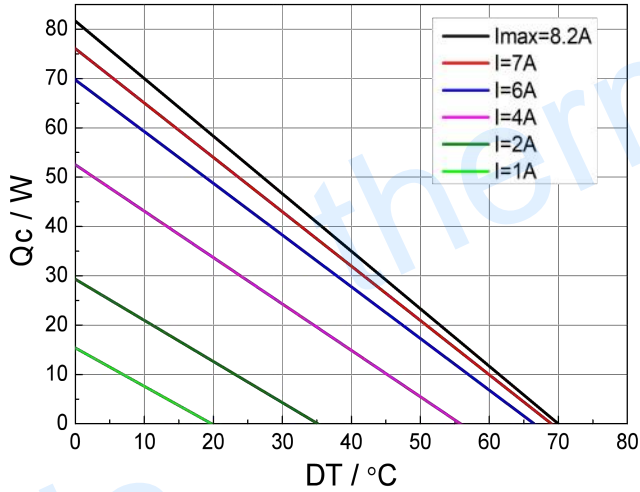
### Naming for the Module



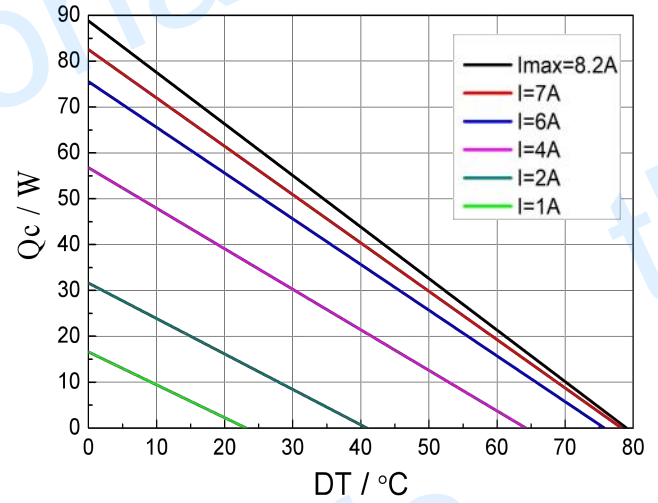
# Specification of Thermoelectric Module

## TEC1-12708L1

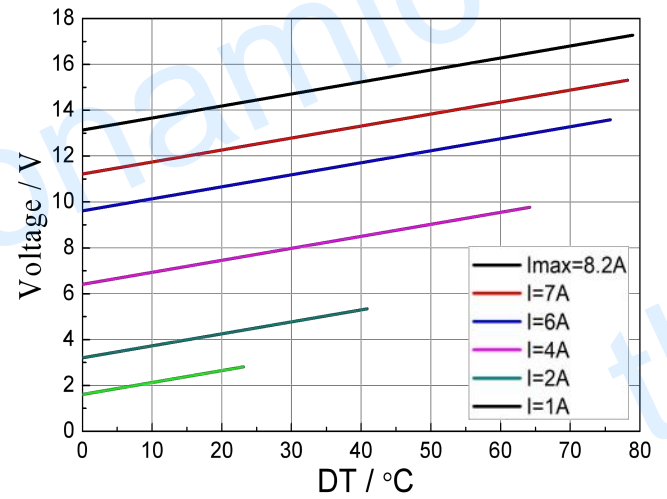
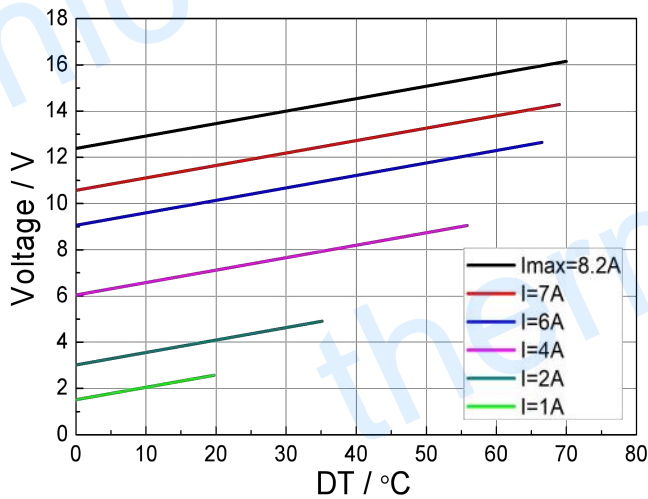
Performance Curves at  $T_h = 27^\circ\text{C}$



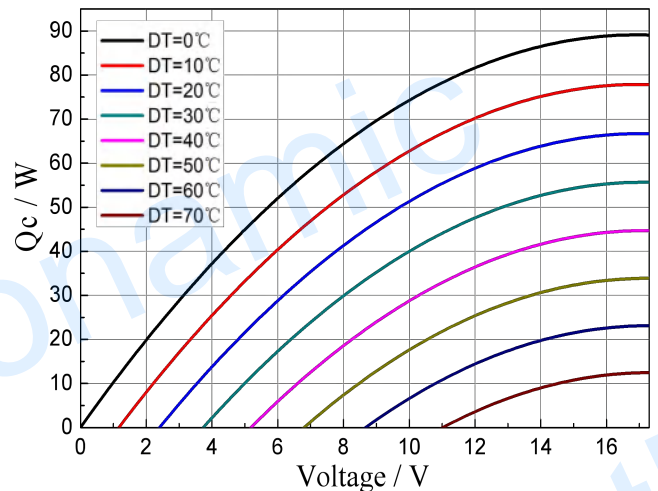
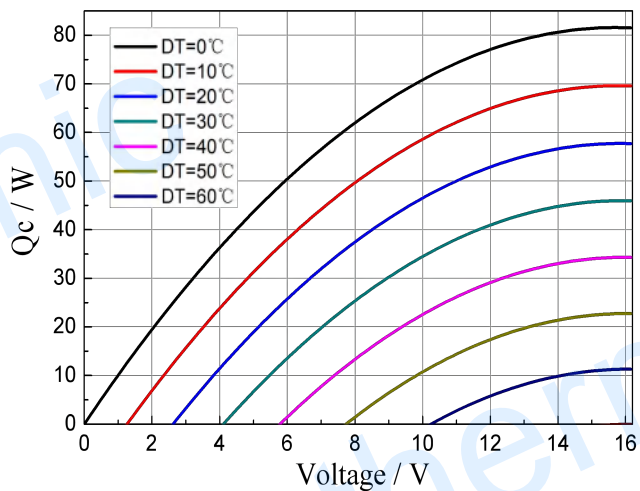
Performance Curves at  $T_h = 50^\circ\text{C}$



Standard Performance Graph  $Q_c = f(DT)$



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

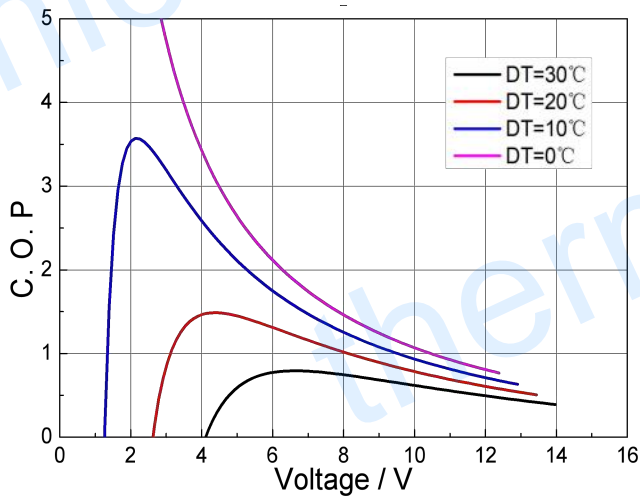


Standard Performance Graph  $Q_c = f(V)$

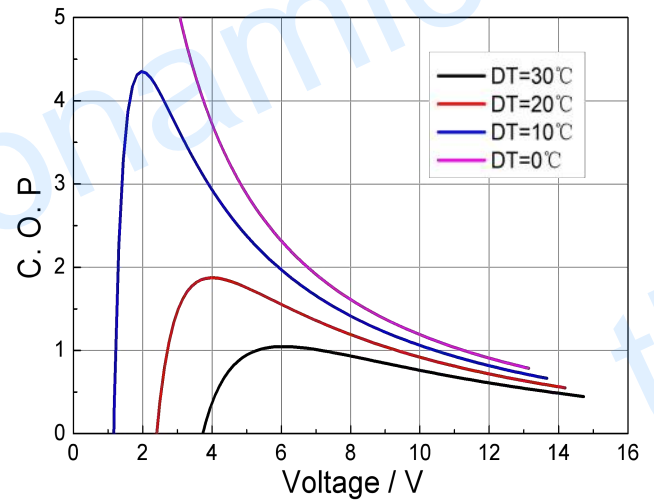
## Specification of Thermoelectric Module

### TEC1-12708L1

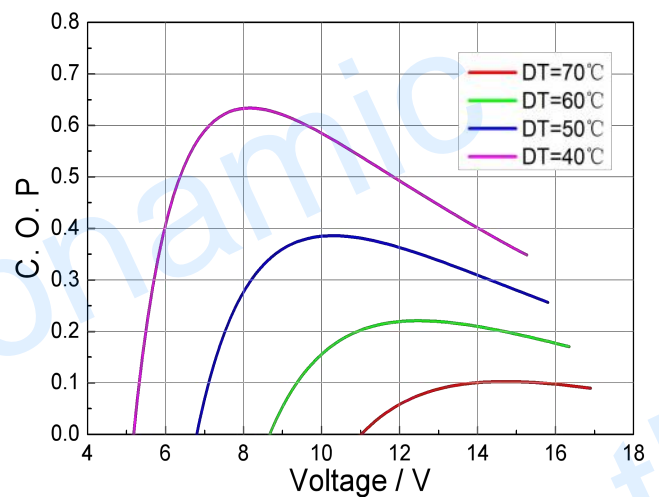
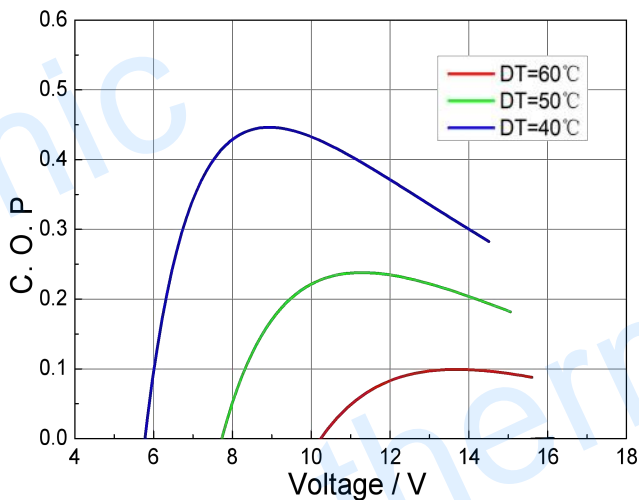
#### Performance Curves at Th=27 °C



#### Performance Curves at Th=50 °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 °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 or storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC