

# Specification of Thermoelectric Module

## TEHC1-03114

### Description

The 31 couples, 30 mm × 30 mm size single module which is made of our high performance ingot to achieve superior cooling performance and 74 °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

- 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

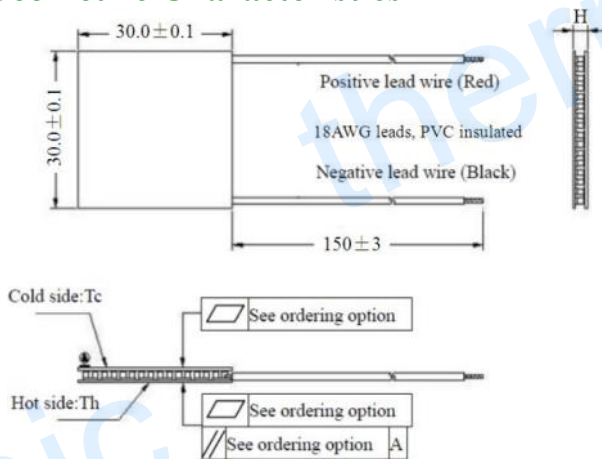
### Application

- Food and beverage service refrigerator
- 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, N2
DTmax (°C)	74	83	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
Umax (Voltage)	4.09	4.4	Voltage applied to the module at DTmax
I <sub>max</sub> (Amps)	14	14	DC current through the modules at DTmax
QC <sub>max</sub> (Watts)	35.8	38.8	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	0.20	0.22	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)

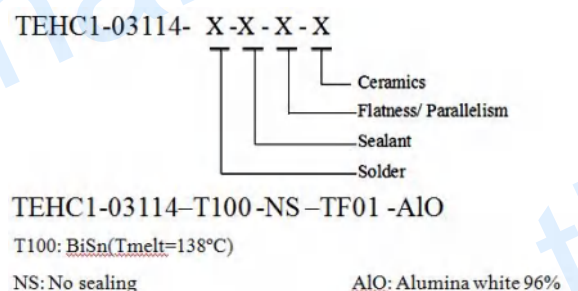
#### D. Ceramics Surface Options:

1. Blank ceramics (not metalized)
2. Metalized

### Ordering Option

Suffix	Thickness H / (mm)	Flatness/ Parallelism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:4.4±0.10	0:0.07/0.07	150±3/Specify
TF	1:4.4±0.03	1:0.025/0.025	150±3/Specify
Eg. TF01: Thickness 4.4±0.10(mm) and Flatness 0.025/0.025(mm)			

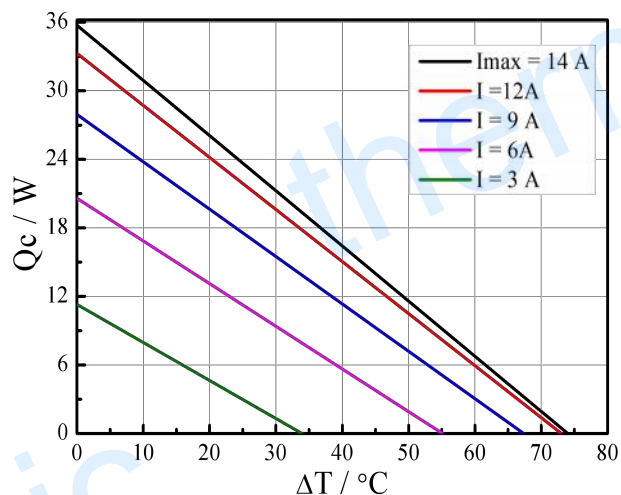
### Naming for the Module



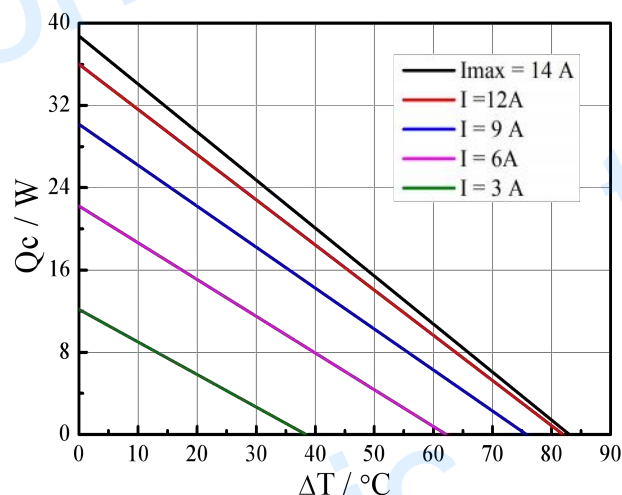
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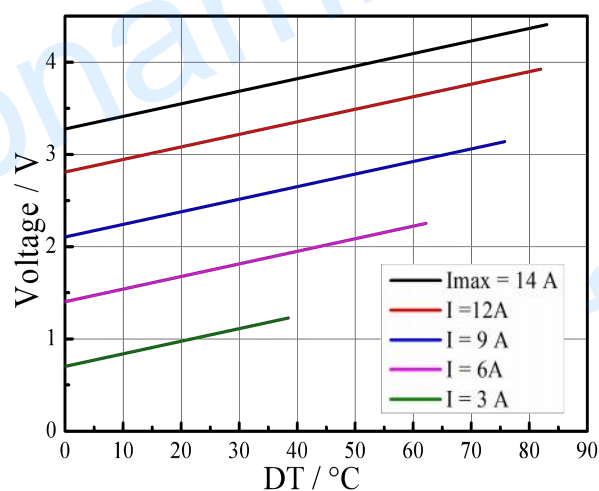
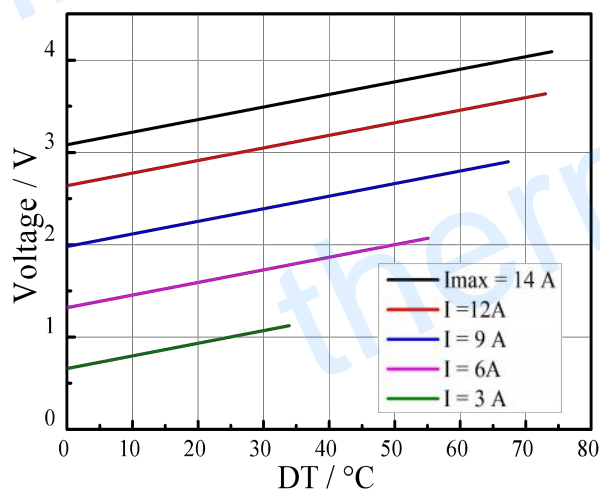
**Performance Curves at Th=27 °C**



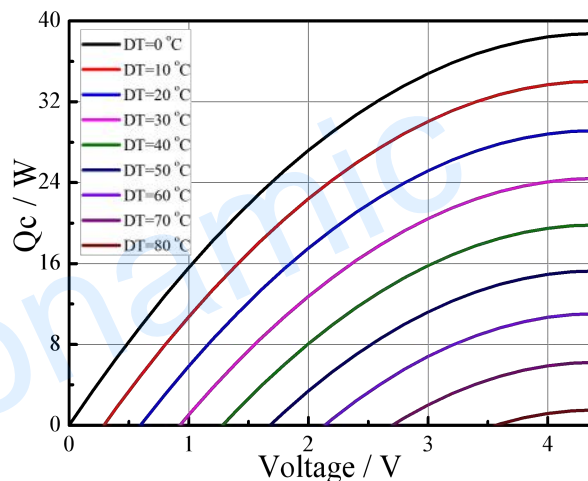
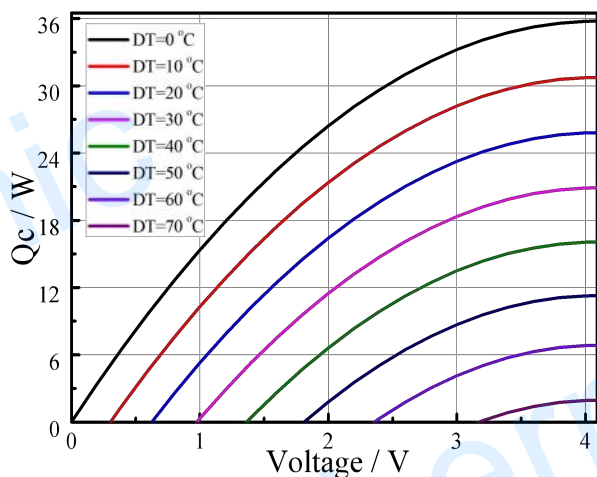
**Performance Curves at Th=50 °C**



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



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

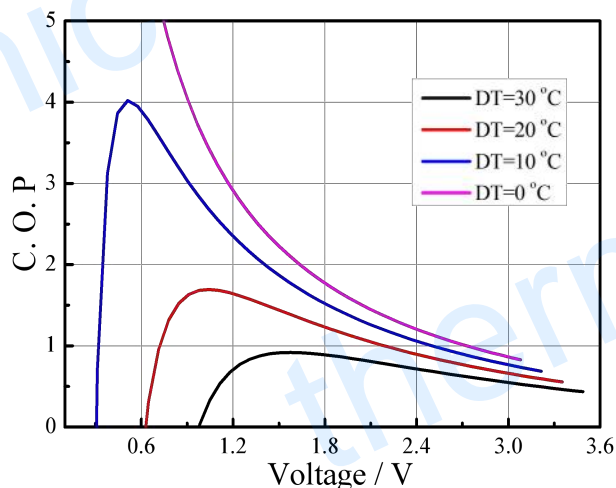


Standard Performance Graph  $Q_c = f(V)$

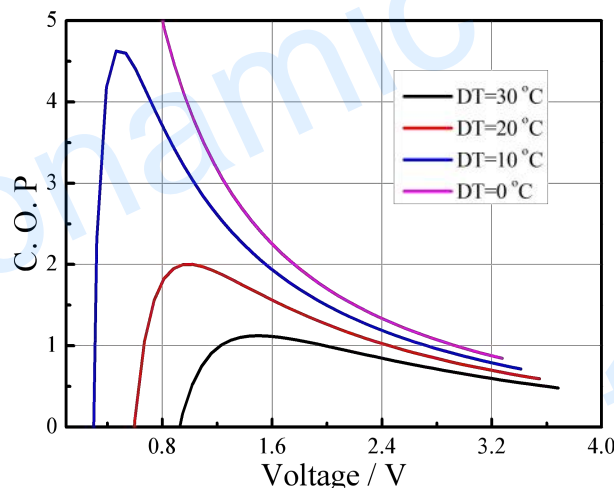
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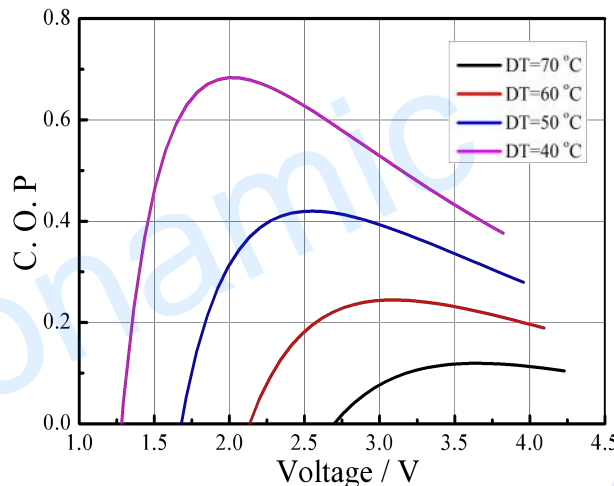
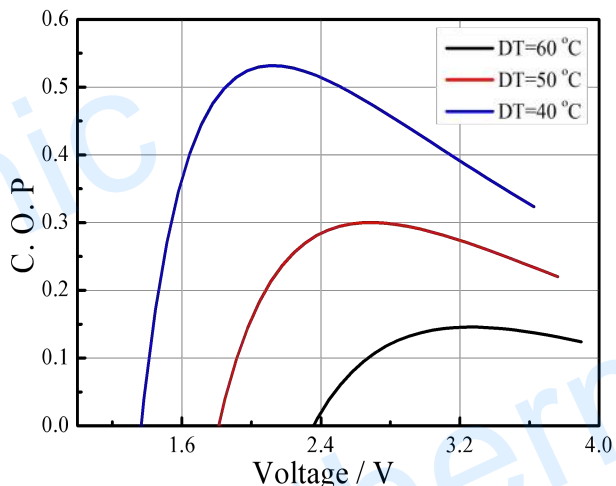
### Performance Curves at $T_h = 27\text{ °C}$



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



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

- 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