

# Specification of Thermoelectric Module

## TEC1-12706

### 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 °C, designed for superior cooling and heating up to 100 °C requirement. 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

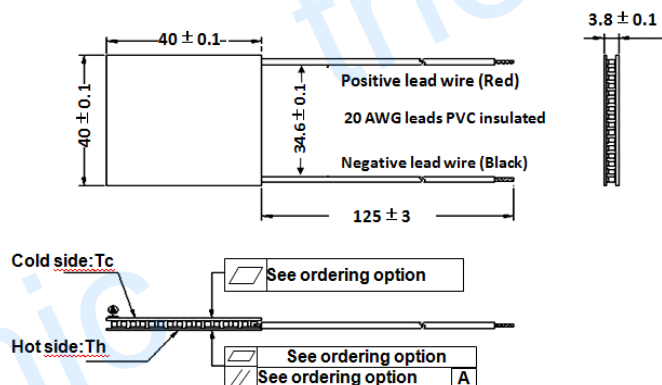
### Application

- Food and beverage service refrigerator
- Portable cooler box for cars
- Liquid cooling
- Temperature stabilizer
- 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)	16.0	17.2	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	6.1	6.1	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	61.4	66.7	Cooling capacity at cold side of the module under DT=0 °C
AC resistance(ohms)	2.0	2.2	The module resistance is tested under AC
Tolerance (%)	± 10		For thermal and electricity parameters

### Geometric Characteristics Dimensions in millimeters



### Ordering Option

Suffix	Thickness (mm)	Flatness/Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:3.8±0.1	0:0.035/0.035	125±3/Specify
TF	1:3.8±0.05	1:0.025/0.025	125±3/Specify
TF	2:3.8±0.03	2:0.015/0.015	125±3/Specify
Eg. TF01: Thickness 3.8 ± 0.1 (mm) and Flatness 0.025 / 0.025 (mm)			

### Sealing Option

#### A. Solder:

1. T100: BiSn (T<sub>melt</sub> = 138 °C)

#### B. Sealant:

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

#### C. Ceramics:

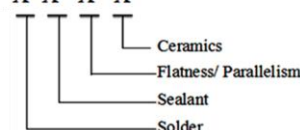
1. Alumina (Al<sub>2</sub>O<sub>3</sub>, white 96%)
2. Aluminum Nitride (AlN)

#### D. Ceramics Surface Options:

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

### Naming for the Module

TEC1-12706 - X - X - X - X



TEC1-12706-T100-NS-TF01-AIO

T100: BiSn (T<sub>melt</sub>=138°C)

NS: No sealing

AIO: Alumina white 96%

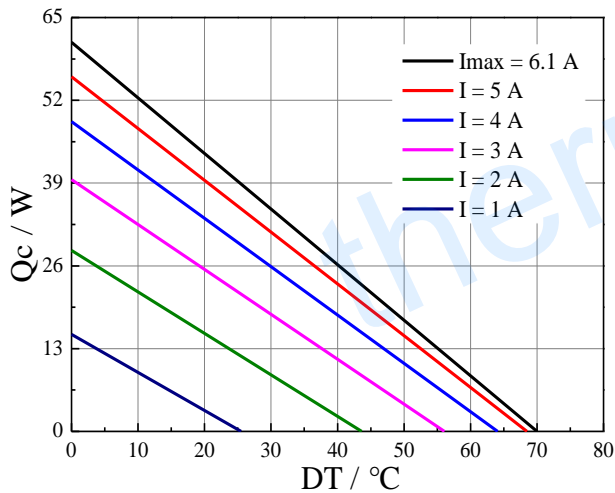
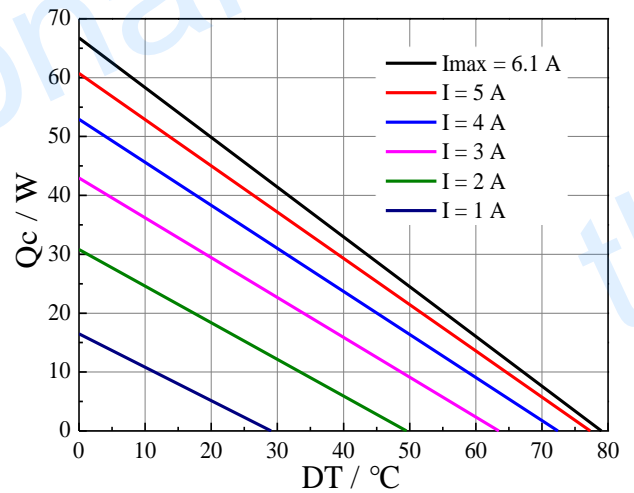
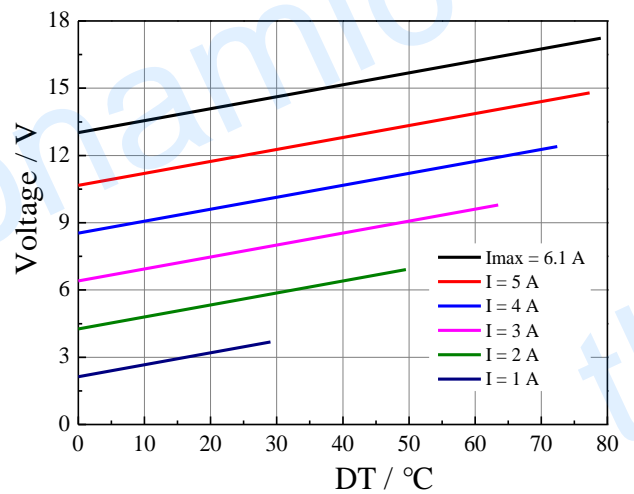
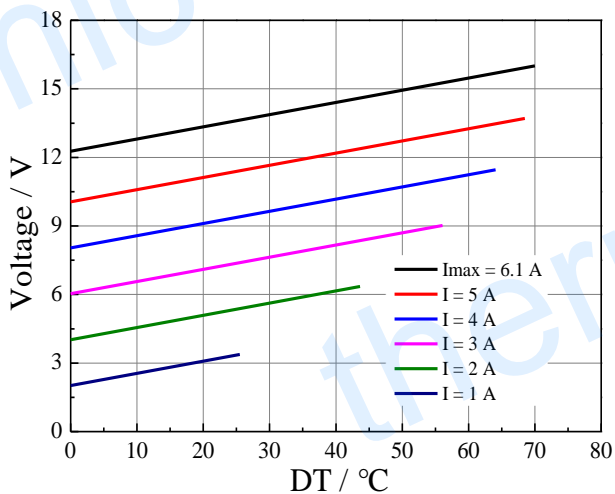
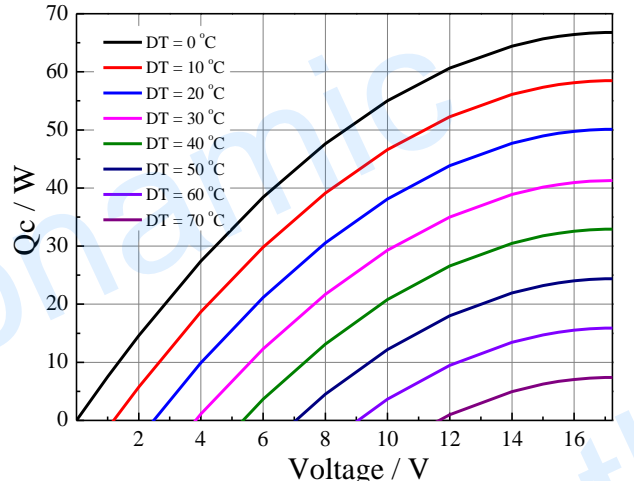
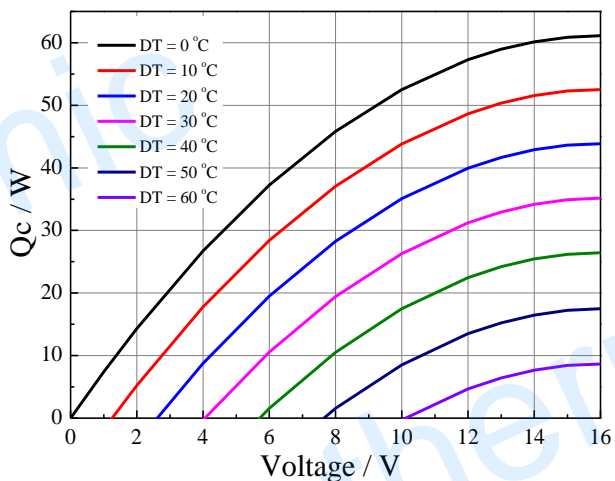
TF01: Thickness ±0.1 (mm) and Flatness/Parallelism 0.025/0.025(mm)

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

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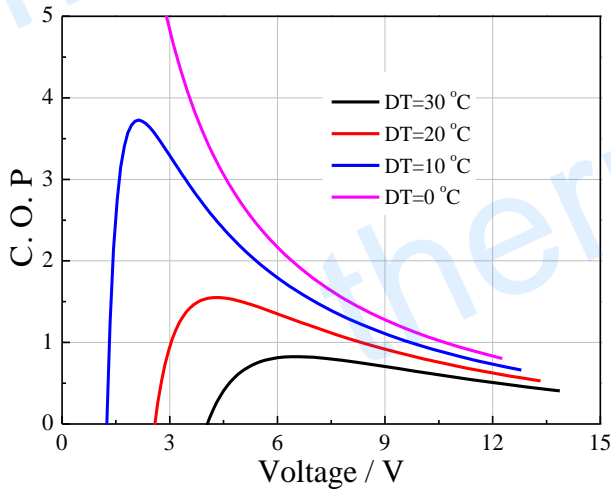
## TEC1-12706

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  $Q_c = f(V)$

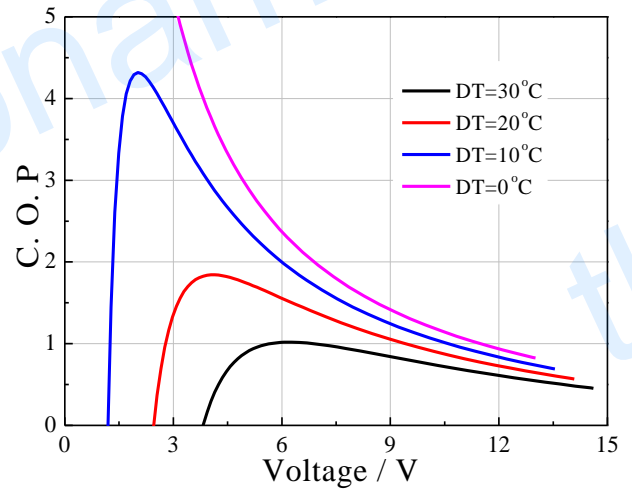
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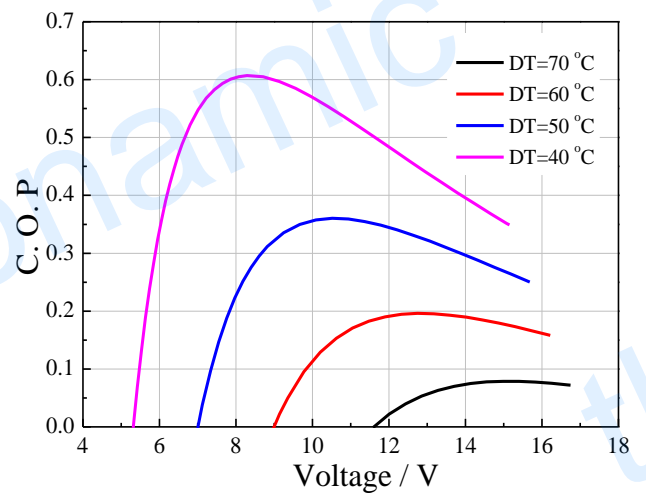
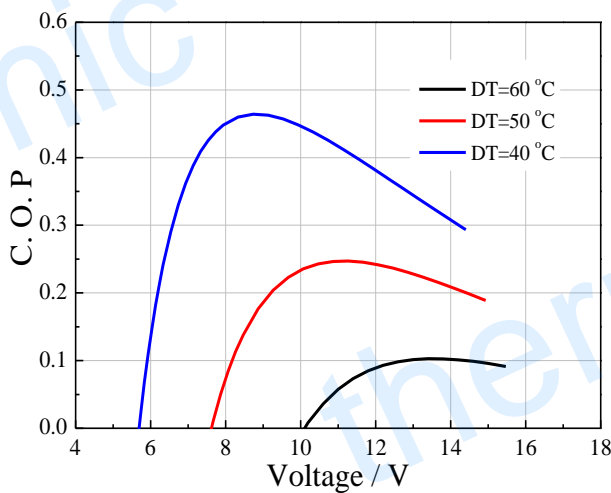
#### Performance Curves at $T_h=27\text{ }^{\circ}\text{C}$



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



Standard Performance Graph  $\text{COP} = f(V)$  of  $\Delta T$  ranged from 0 to  $30\text{ }^{\circ}\text{C}$



Standard Performance Graph  $\text{COP} = f(V)$  of  $\Delta T$  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

- 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  $100\text{ }^{\circ}\text{C}$
- Operation below  $I_{\text{max}}$  OR  $V_{\text{max}}$
- Work under DC