

# Specification of Thermoelectric Module

## TEC1-12706

### Description

The 127 couples, 40mm × 40mm size single stage module is made of selected high performance ingots to achieve superior cooling performance and greater delta T up to 70°C Designed for superior cooling and heating. If higher operational temperature is required, please specify. We can design and manufacture custom made modules according to your requirements. Please contact us for further information. Minimums do apply.

### 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

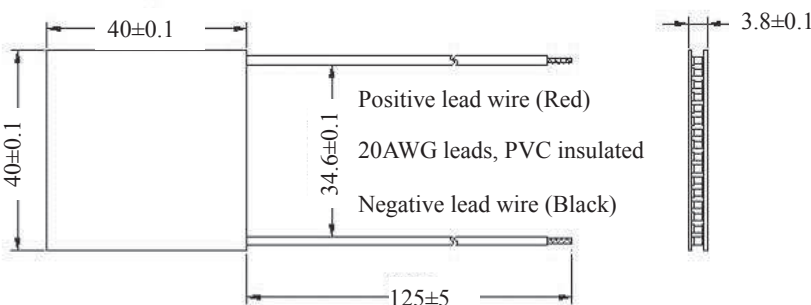
### Application

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

### Performance Specification Sheet

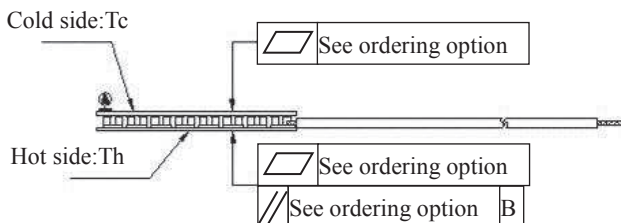
Th(°C)	27	50	Hot side temperature at environment: dry air, N <sub>2</sub>
DT <sub>max</sub> (°C)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	16.0	17.2	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</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)	1.8 ~ 2.2	2.0~2.4	The module resistance is tested under AC

### Geometric Characteristics Dimensions in millimeters



### Sealing Option

Suffix	Sealant
NS	No sealing
SS	Silicone sealant
EPS	Epoxy
OS	Customer specify sealing other than above



### Additional

Ceramic material: Alumina (Al<sub>2</sub>O<sub>3</sub>, white 96%)  
Solder tinning: Bismuth Tin (BiSn) M.P. 138 °C

### Ordering Option

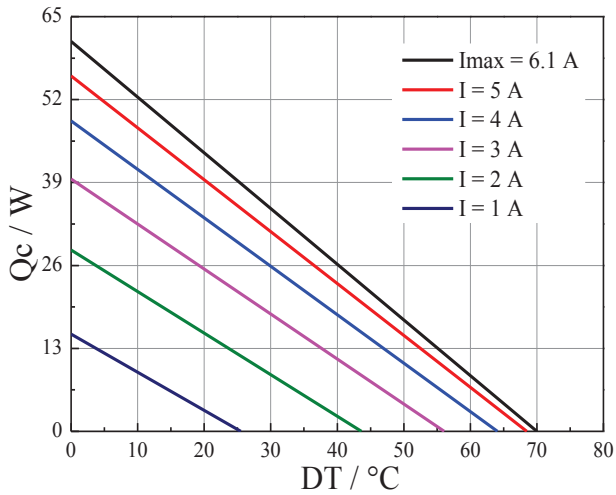
Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:3.8±0.1	0:0.035/0.035	125±1/Specify
TF	1:3.8±0.05	1:0.025/0.025	125±1/Specify
TF	2:3.8±0.03	2:0.015/0.015	125±1/Specify

Eg. TF01: Thickness 3.8 ± 0.1 (mm) and Flatness 0.025 / 0.025 (mm)

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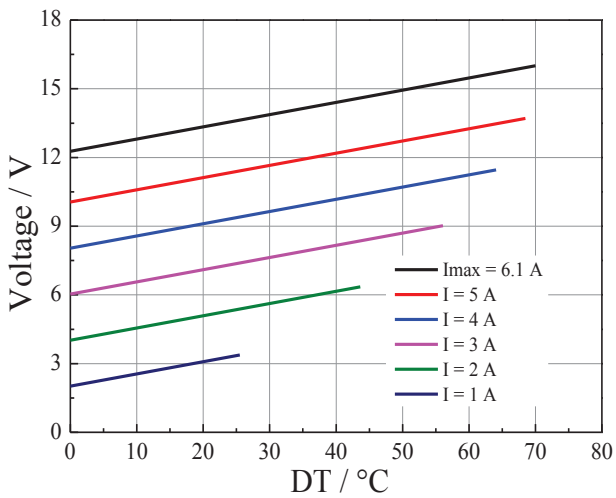
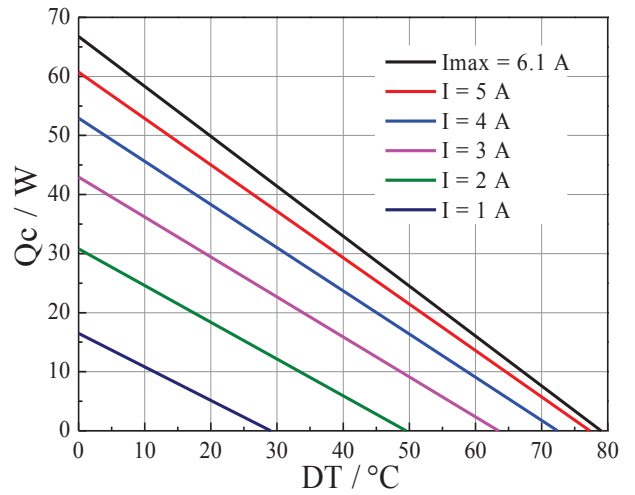
TEC1-12706

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

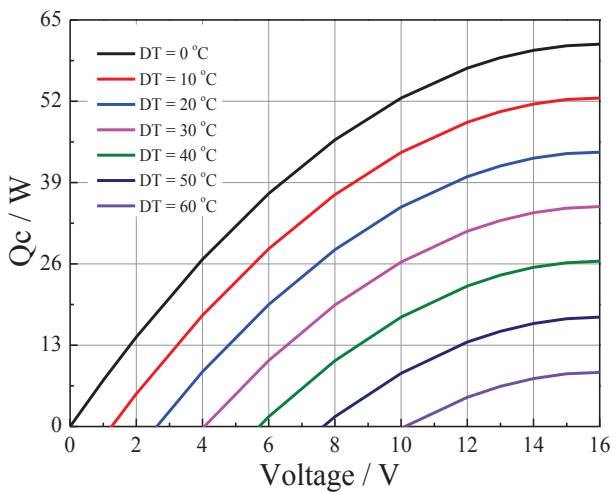
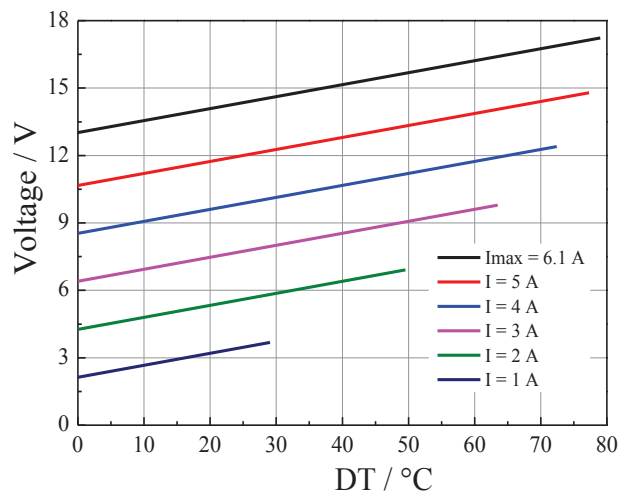


Standard Performance Graph  $Q_c = f(DT)$

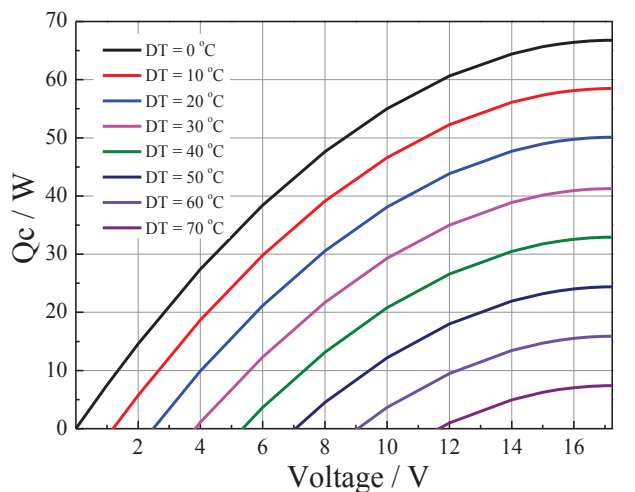
## Performance Curves at $T_h=50^\circ\text{C}$



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



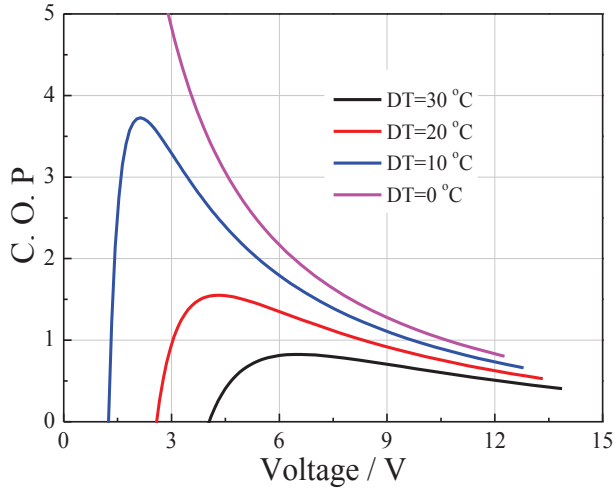
Standard Performance Graph  $Q_c = f(V)$



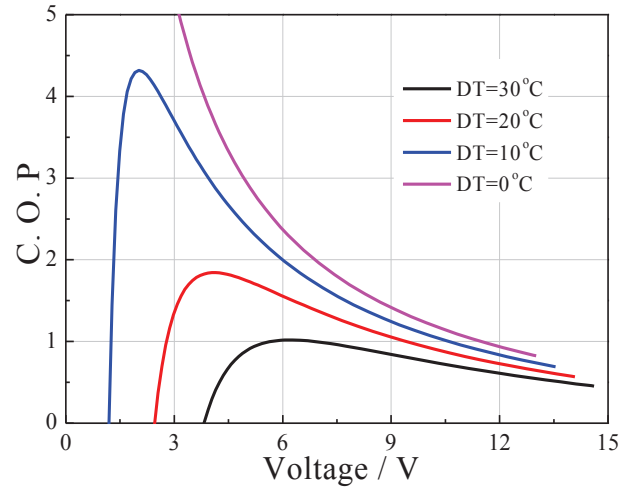
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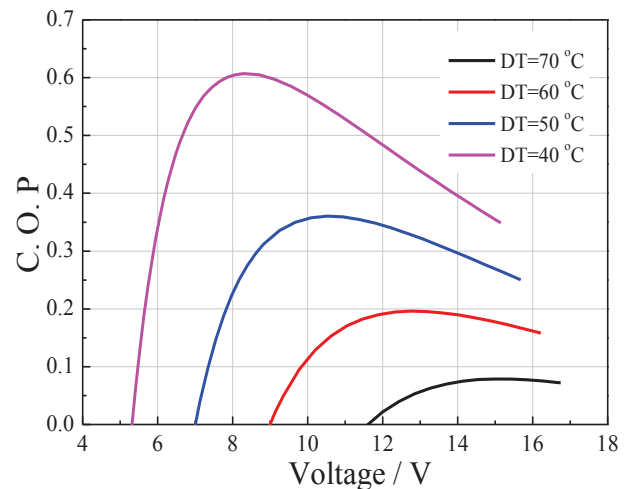
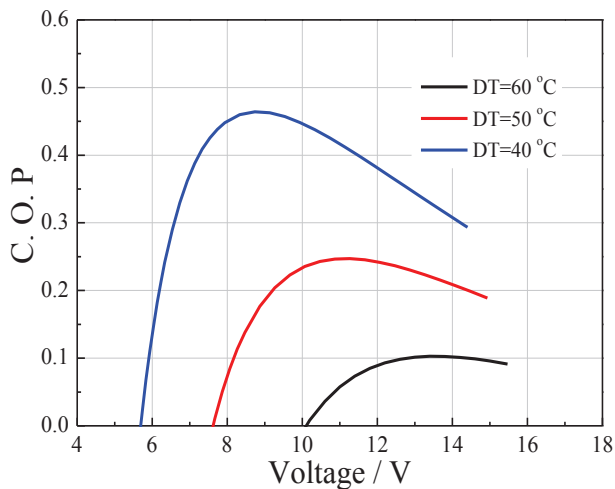
## Performance Curves at Th=27 °C



## 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

- Cold side of the module applied on the object being cooled
- Hot side of the module mounted on a heat sink
- Operation below  $I_{max}$  or  $V_{max}$
- Apply DC Voltage only