

# Specification of Thermoelectric Module

## TEC1-12704

### Description

The 127 couples, 40mm × 40mm size 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 temperatures are required, please contact us. We can design and manufacture custom made module according to your requirements.

### Features

- 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

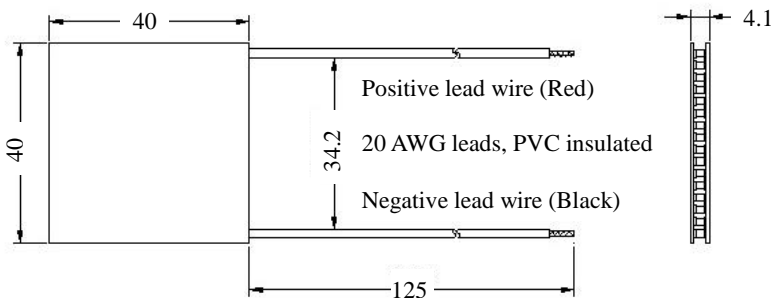
### Application

- 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

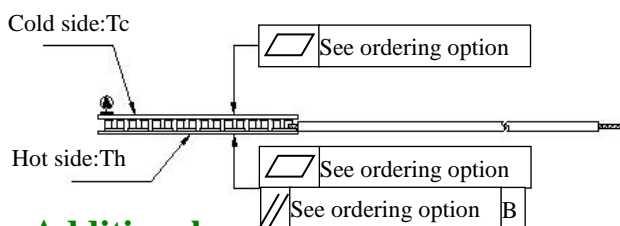
Th(°C)	27	50	Hot side temperature at environment: dry air, N <sub>2</sub>
DT <sub>max</sub> (°C)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	16	17.2	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	4.9	4.9	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	49.2	53.4	Cooling capacity at cold side of the module under DT=0 °C
AC resistance(ohms)	2.4~2.7	2.5~3.0	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

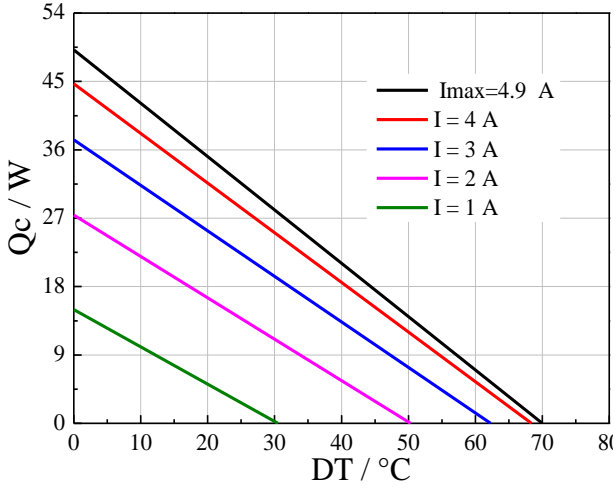
Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:4.1±0.1	0:0.035/0.035	125±1/Specify
TF	1:4.1±0.05	1:0.025/0.025	125±1/Specify
TF	2:4.1±0.03	2:0.015/0.015	125±1/Specify

Eg. TF0: Thickness 4.1 ± 0.1 (mm) and Flatness 0.035/0.035 (mm)

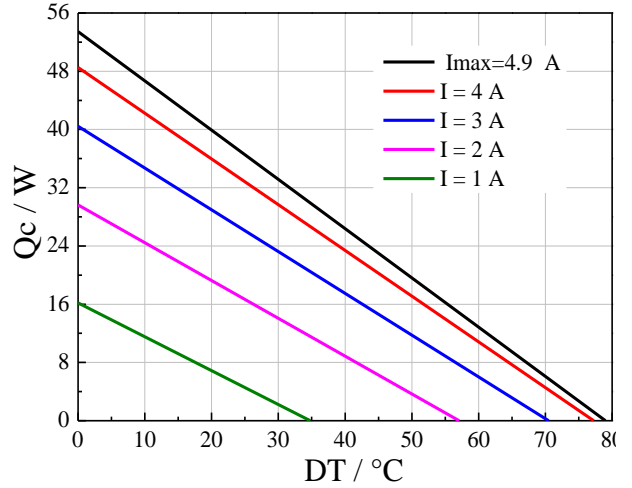
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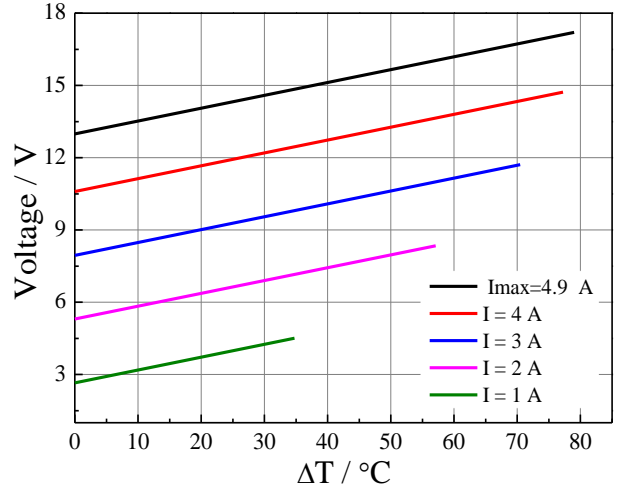
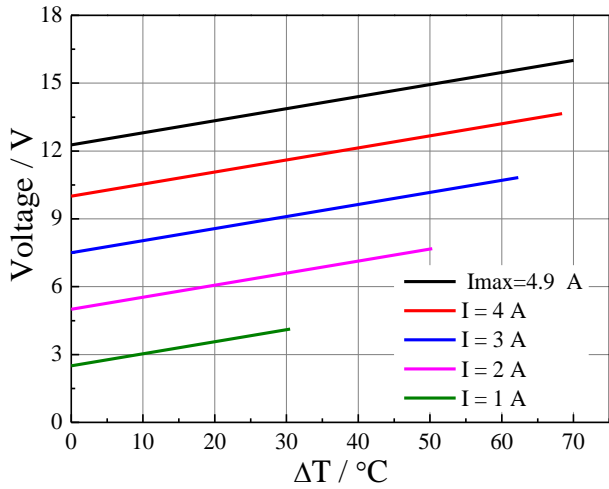
### Performance Curves at Th=27 °C



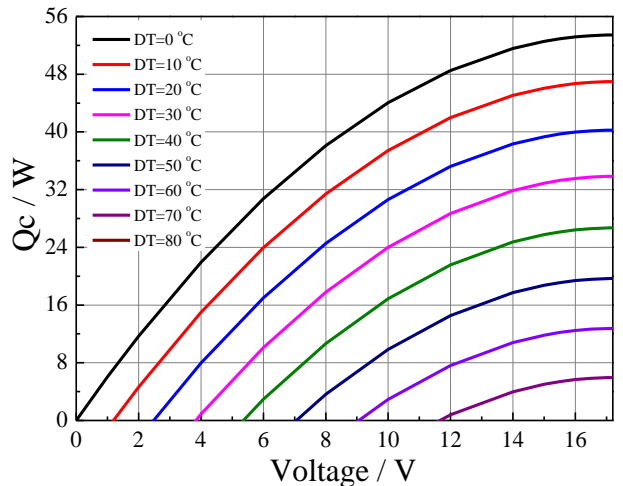
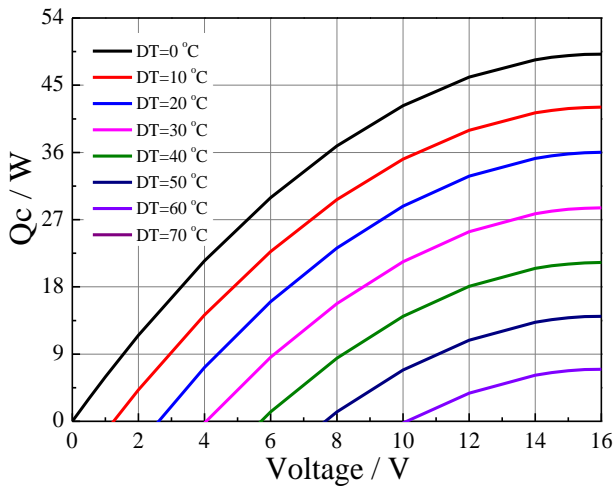
### Performance Curves at Th=50 °C



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



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

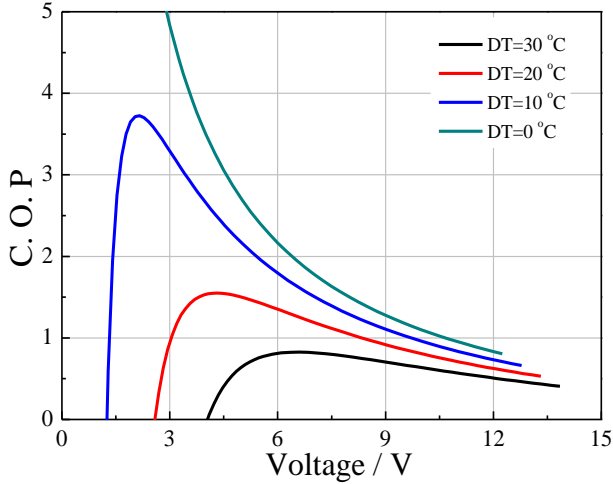


Standard Performance Graph  $Q_c = f(V)$

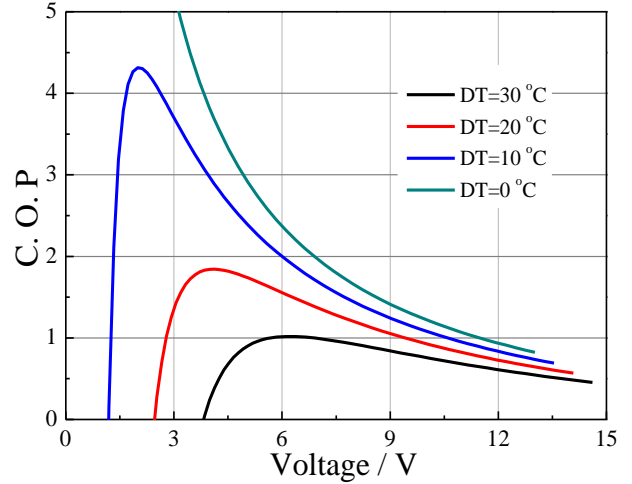
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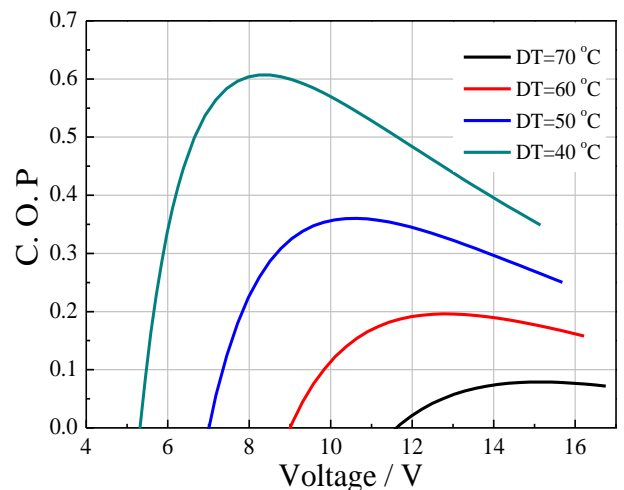
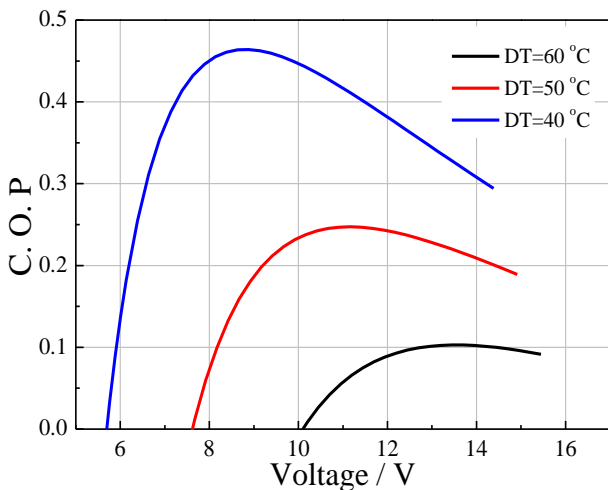
#### Performance Curves at $T_h = 27^\circ\text{C}$



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



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



Standard Performance Graph COP = f(V) of  $\Delta T$  ranged from 40 to  $60/70^\circ\text{C}$

Remark: The coefficient of performance (COP) is the cooling power  $Q_c$ /Input power ( $V \times I$ ).

### Operation Cautions

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