

## Specification of Thermoelectric Module

### TES1-17760

### Description

The 177 couples single module which is 2 pieces 16.7 mm × 34.2 mm size wired together and made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 74 °C, designed for superior cooling and heating up to 100/200 °C applications. 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

- 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

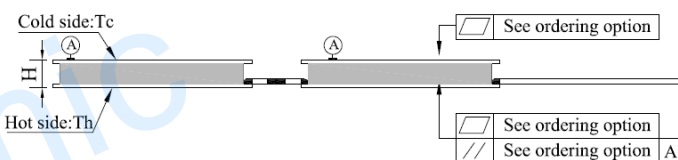
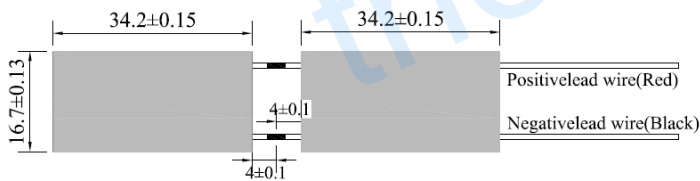
### Application

- 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)	74	83	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	23.4	25.2	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	7.0	7.0	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	104.2	113.7	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (ohms)	2.54	2.73	The module resistance is tested under AC
Tolerance (%)	± 10		For thermal and electricity parameters

### Geometric Characteristics Dimensions in millimeters



### Manufacturing Options

- |   |   |
|---|---|
| <b>A. Solder:</b><br>1. T100: BiSn (T <sub>melt</sub> =138°C)<br>2. T200: CuSn (T <sub>melt</sub> = 227 °C)                           | <b>C. Ceramics:</b><br>1. Alumina (Al <sub>2</sub> O <sub>3</sub> , white 96%)<br>2. Aluminum Nitride (AlN) |
| <b>B. Sealant:</b><br>1. NS: No sealing (Standard)<br>2. SS: Silicone sealant<br>3. EPS: Epoxy sealant<br>4. Customer specify sealing | <b>D. Ceramics Surface Options:</b><br>1. Blank ceramics (not metallized)<br>2. Metallized (Au plating)     |

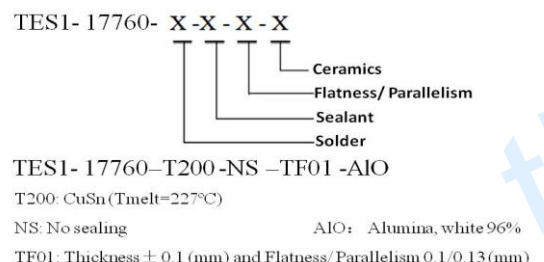
other than above

### Ordering Option

Suffix	Thickness H (mm)	Flatness/Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 2.8 ± 0.1	0: 0.13/0.15	150±3/Specify
TF	1: 2.8 ± 0.05	1: 0.1/0.13	150±3/Specify
TF	2: 2.8± 0.025	2: 0.08/0.01	150±3/Specify

Eg. TF01: Thickness 2.8 ± 0.1 (mm) and Flatness 0.1/0.13 (mm)

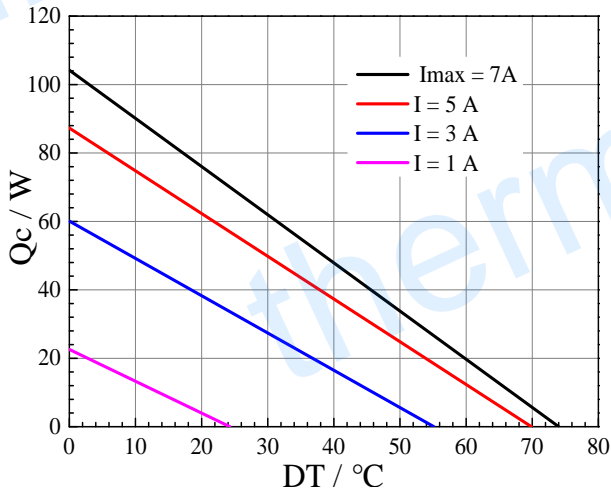
### Naming for the Module



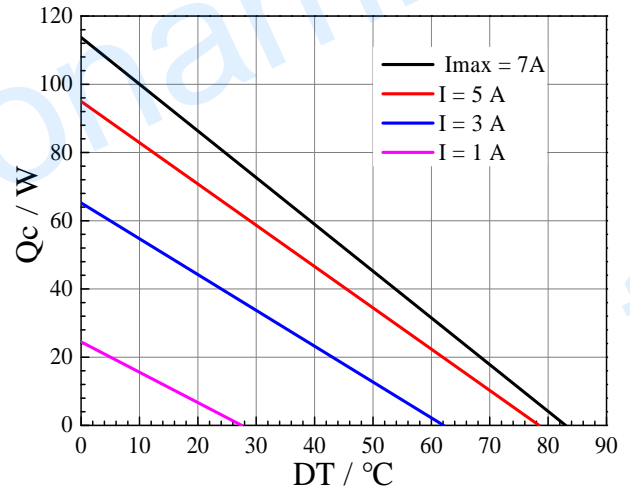
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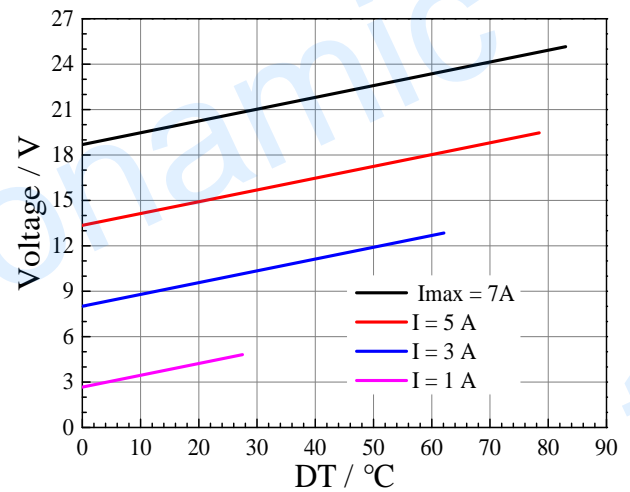
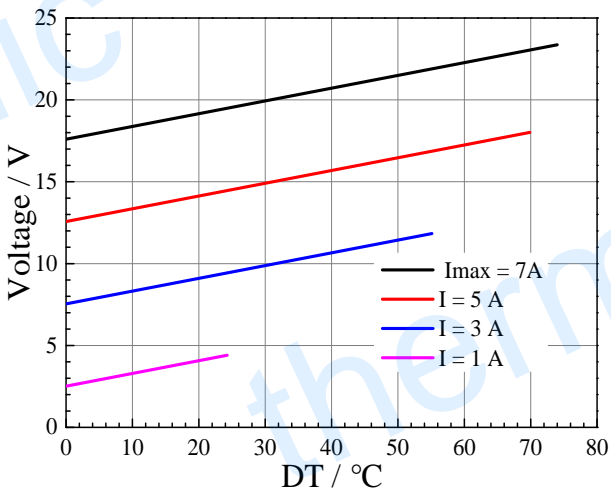
## Performance Curves at Th=27 °C



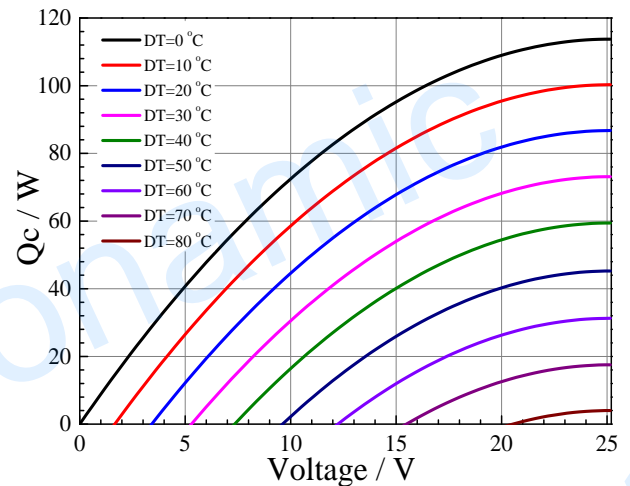
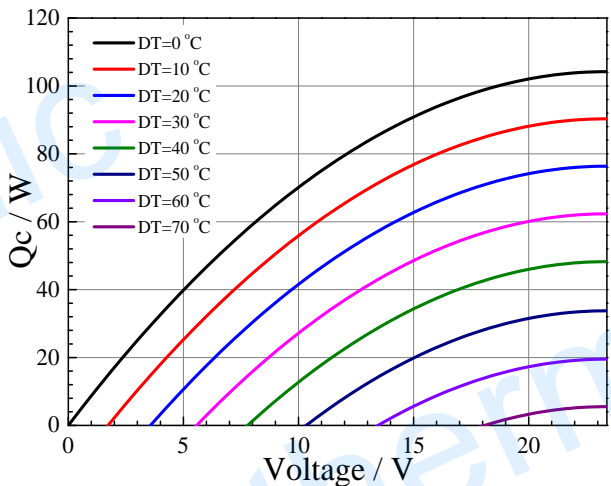
## Performance Curves at Th=50 °C



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$

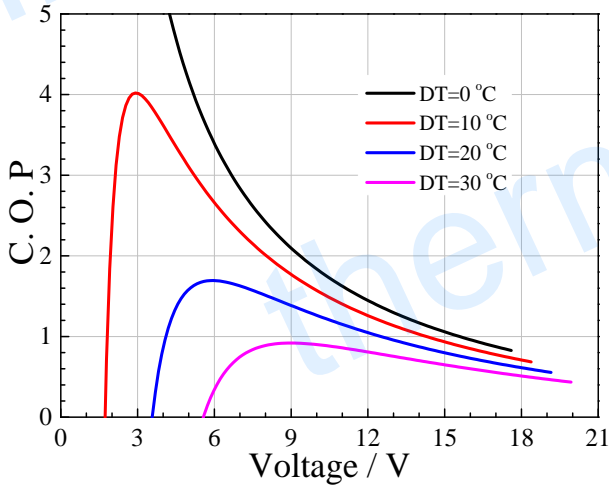


Standard Performance Graph  $Q_c = f(V)$

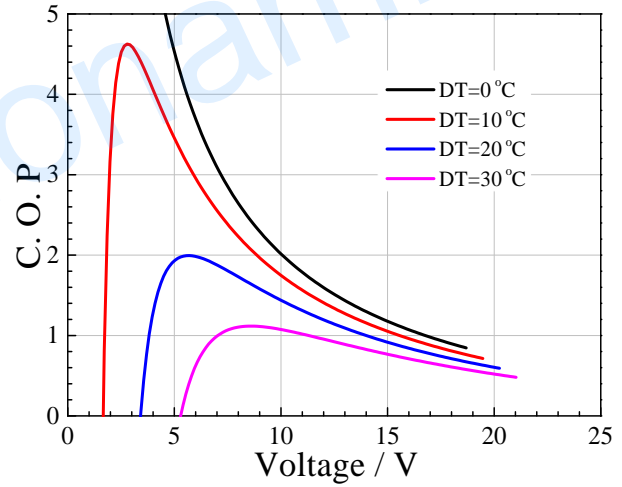
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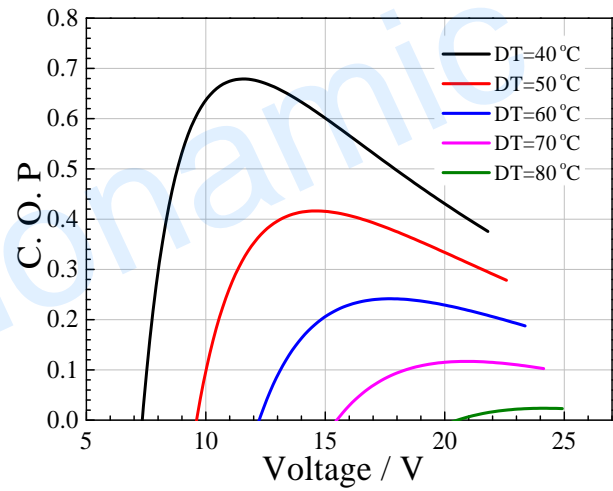
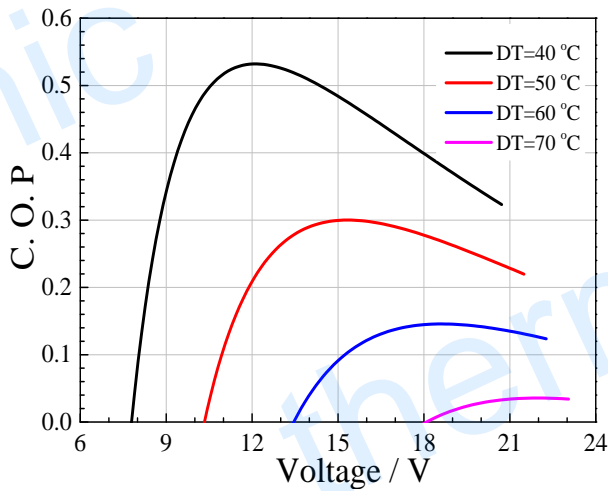
### Performance Curves at Th=27 °C



### Performance Curves at Th=50 °C



Standard Performance Graph COP = f(V) of DT ranged from 0 to 30 °C



Standard Performance Graph COP = f(V) of DT ranged from 40 to 70/80 °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 stucked on the object being cooled
- Hot side of the module mounted on a heat radiator
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC

**Note:** All specifications subject to change without notice.