

# Specification of Thermoelectric Module

## TEC1-16106

### Description

The 161 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

- 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

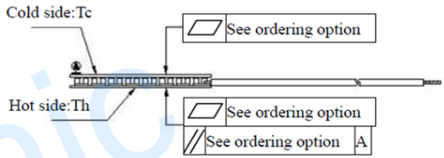
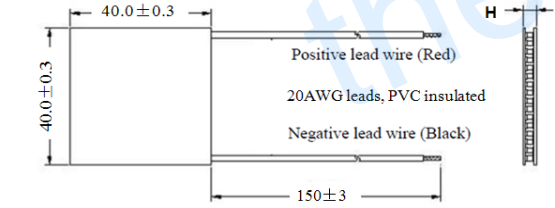
### Application

- 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)	20.4	22.1	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (Amps)	6.3	6.3	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	79.6	85.6	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	2.49	2.68	The module resistance is tested under AC
Tolerance (%)	± 10		For thermal and electricity parameters

### Geometric Characteristics Dimensions in millimeters



### Ordering Option

Suffix	Thickness H (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 3.7 ± 0.1	0: 0.05/0.05	150 ± 3 / Specify
TF	1: 3.7 ± 0.05	1: 0.025/0.025	150 ± 3 / Specify
TF	2: 3.7 ± 0.025	2: 0.015/0.015	150 ± 3 / Specify

Ex. TF01: Thickness 3.7 ± 0.1 (mm) and Flatness 0.025/0.025 (mm)

### Manufacturing Options

#### A. Solder:

1. T100: BiSn (Tmelt=138 °C)
2. T200: CuSn (Tmelt = 227 °C)

#### B. Sealant:

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

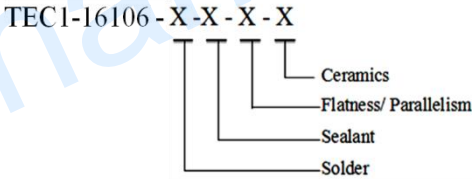
#### C. Ceramics:

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



TEC1-16106-T100-NS-TF02-AIO

T100: BiSn (Tmelt=138°C)

NS: No sealing

AIO: Alumina white 96%

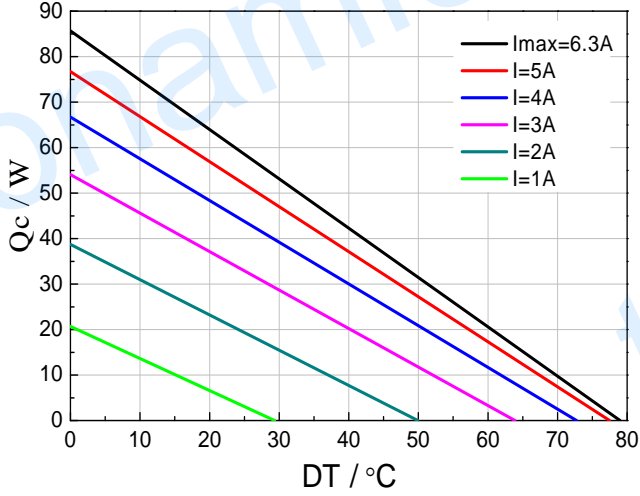
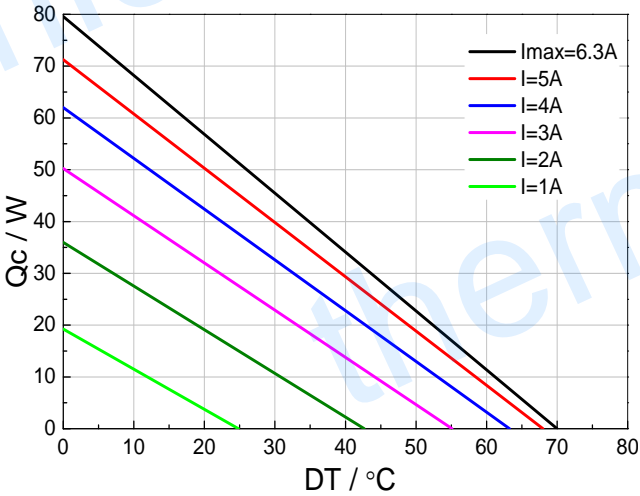
TF01: Thickness ± 0.15 (mm) and Flatness/Parallelism 0.025/0.025(mm)

**Specification of Thermoelectric Module**

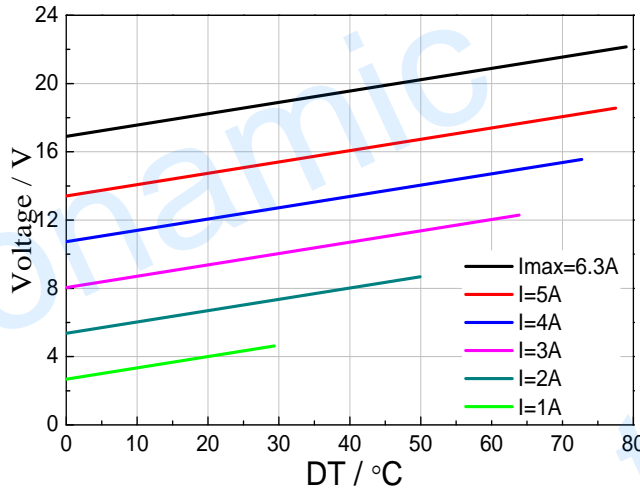
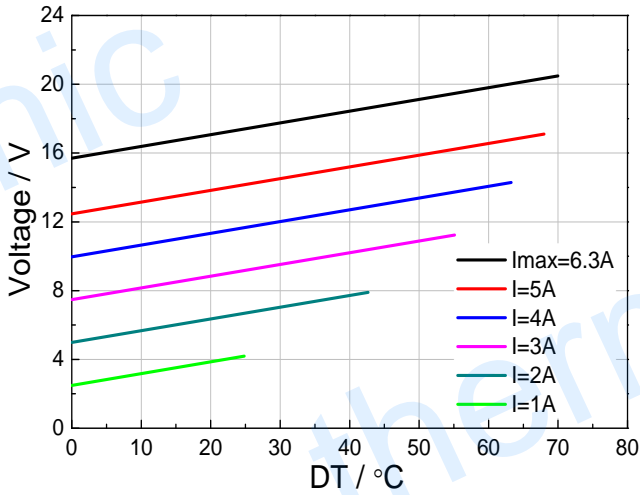
**TEC1-16106**

**Performance Curves at Th=27 °C**

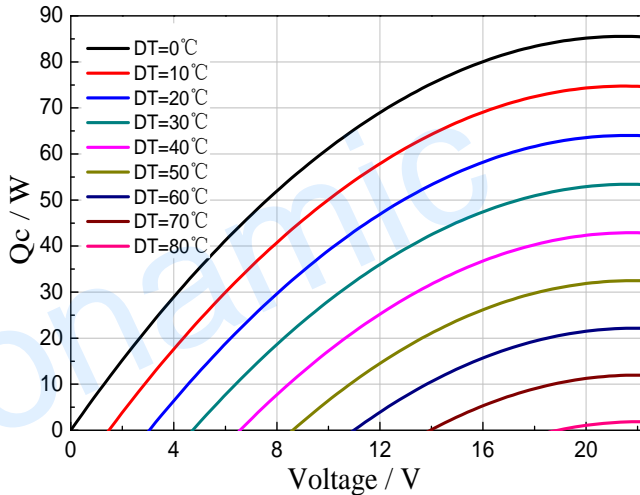
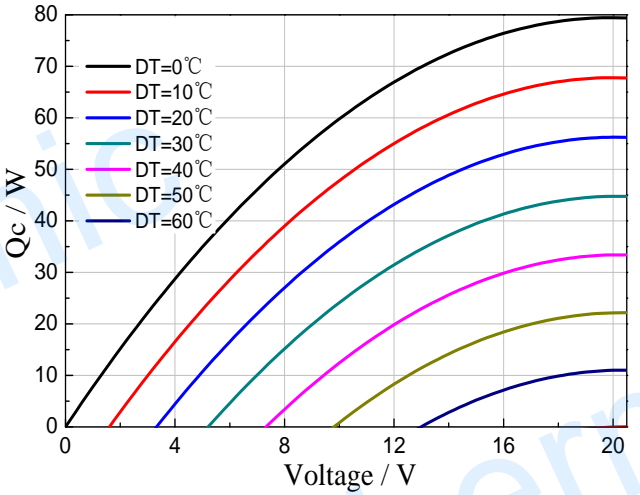
**Performance Curves at Th=50 °C**



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$

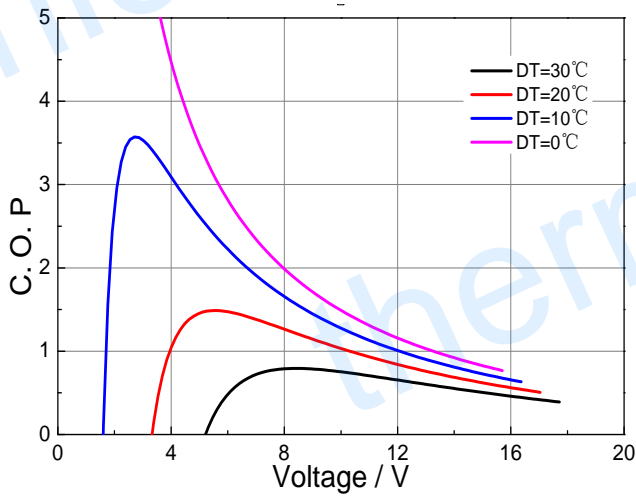


Standard Performance Graph  $Q_c = f(V)$

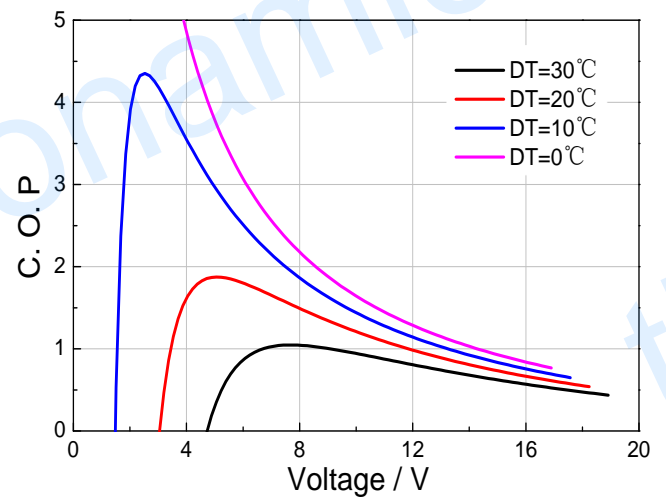
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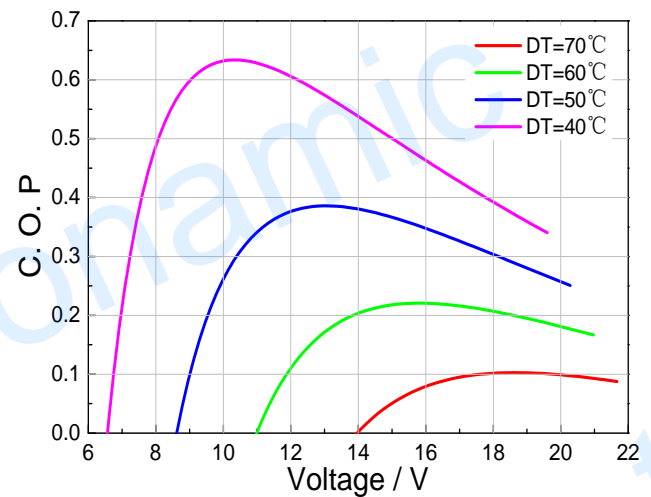
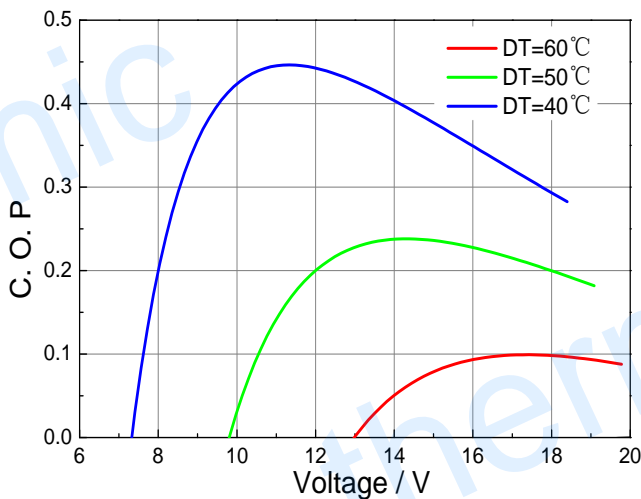
### Performance Curves at Th=27 °C



### 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 60/70 °C

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

### Operation Caution

- 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

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