

# Specification of Thermoelectric Module

**TES1-05350**

## Description

The 53 couples, 12 mm × 36 mm size module which 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 100/200 °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

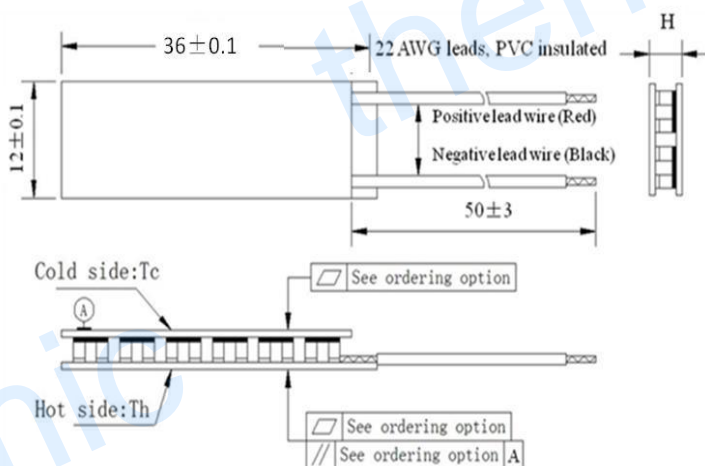
## Application

- CCD Sensor
- Laser 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)	6.8	7.4	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	5	5	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	21.4	23.3	Cooling capacity at cold side of the module under DT=0 °C
AC resistance(ohms)	1.01	1.09	The module resistance is tested under AC
Tolerance (%)	± 10		For thermal and electricity parameters

## Geometric Characteristics Dimensions in millimeters



## Manufacturing Options

### A. Solder:

1. T100: BiSn (T<sub>melt</sub>=138°C)
2. T200: CuAgSn (T<sub>melt</sub> = 217°C)
3. T240: SbSn (T<sub>melt</sub> = 240°C)

### B. Sealant:

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

### 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 metalized)
2. Metalized

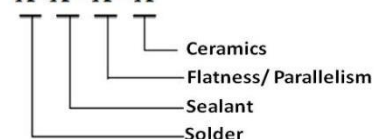
## Ordering Option

Suffix	Thickness H (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 3.2 ± 0.1	0: 0.08/0.08	50±3/Specify
TF	1: 3.2 ± 0.03	1: 0.03/0.03	50±3/Specify

Eg. TF01: Thickness 3.2 ± 0.1 (mm) and Flatness 0.03/0.03 (mm)

## Naming for the Module

TES1-05350- X-X-X-X



TES1-05350-T200-NS-TF01-AIO

T200: CuSn (T<sub>melt</sub>=227°C)

NS: No sealing

AIO: Alumina, white 96%

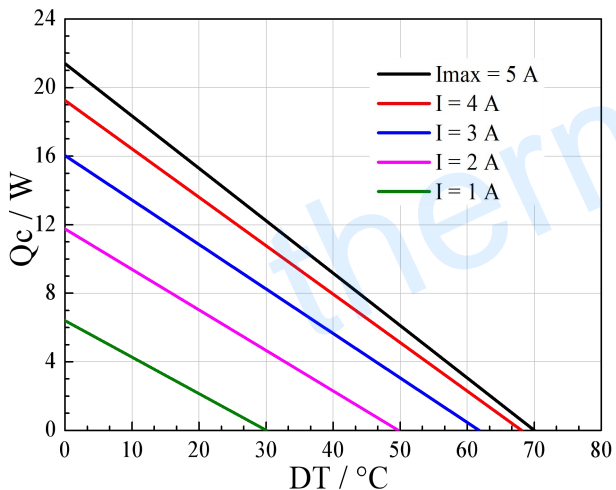
**Creative technology with fine manufacturing processes provides you the reliable and quality products**

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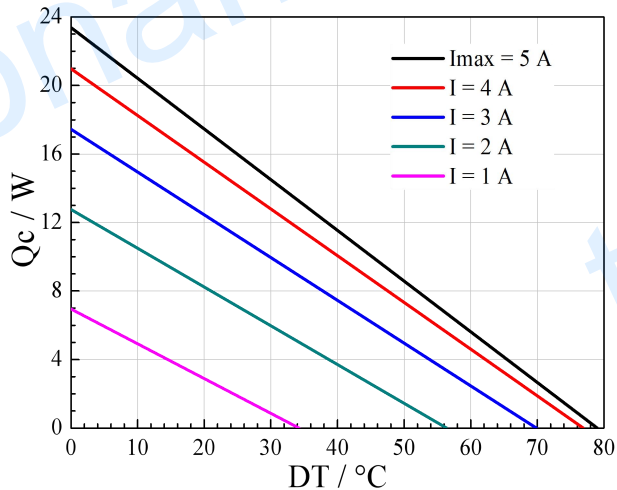
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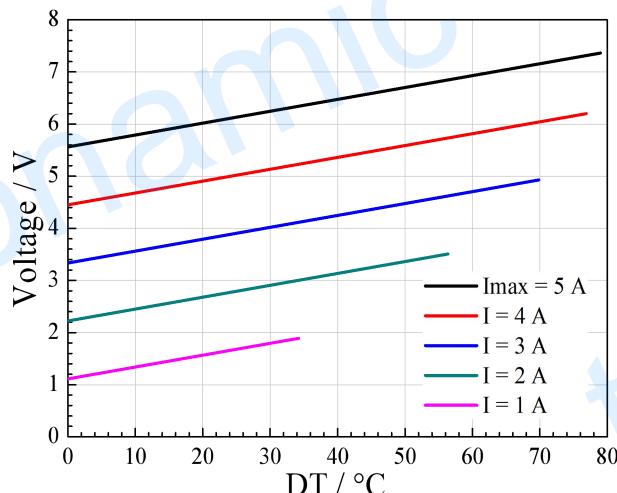
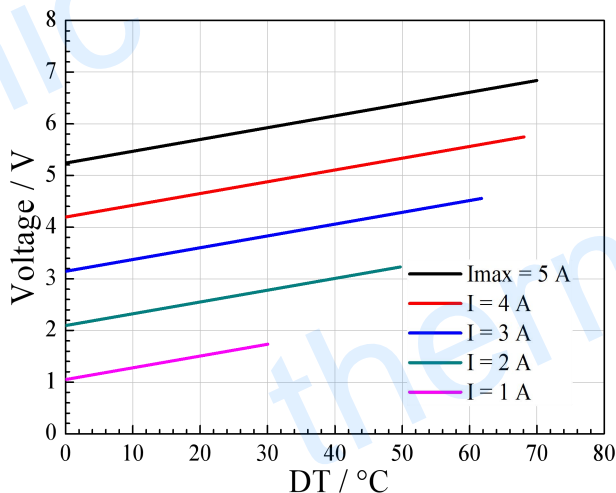
## Performance Curves at $T_h=27^\circ\text{C}$



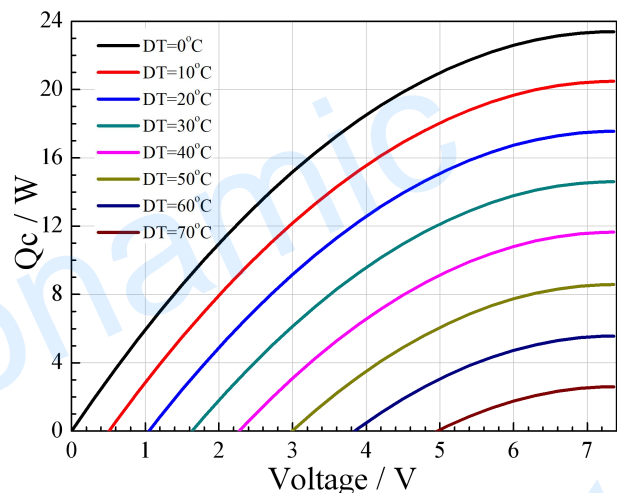
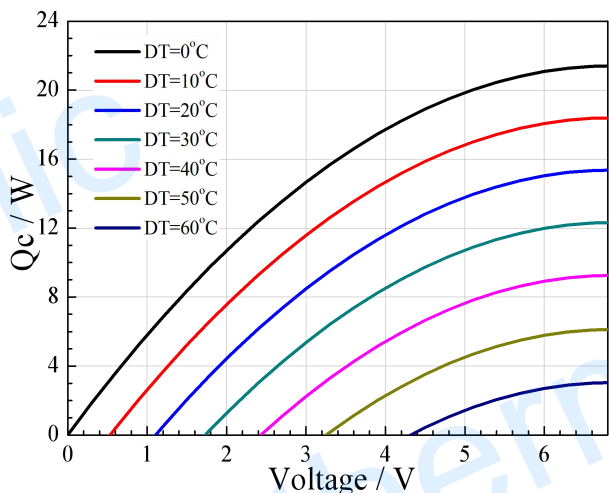
## Performance Curves at $T_h=50^\circ\text{C}$



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$

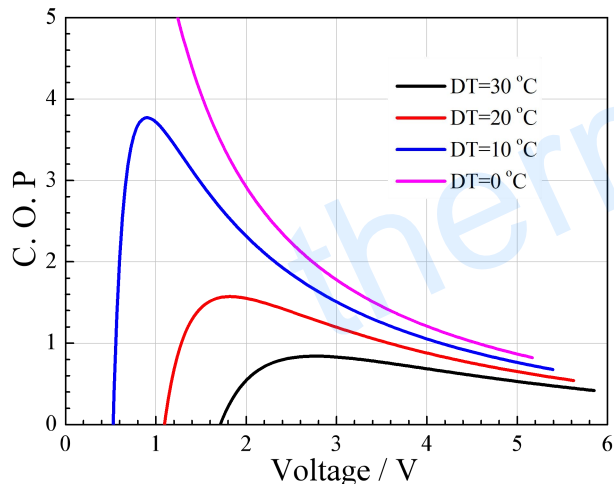


Standard Performance Graph  $Q_c = f(V)$

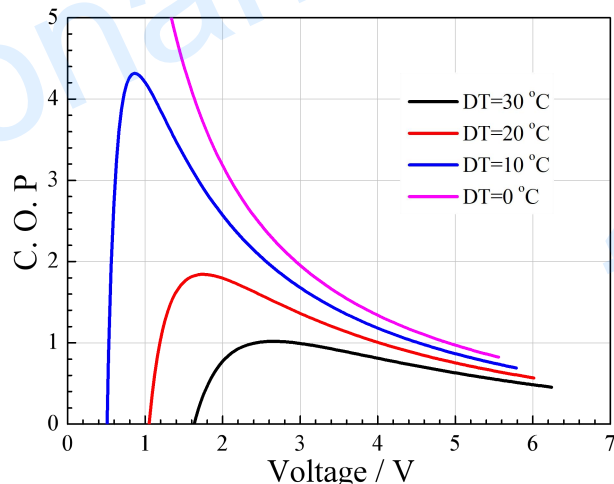
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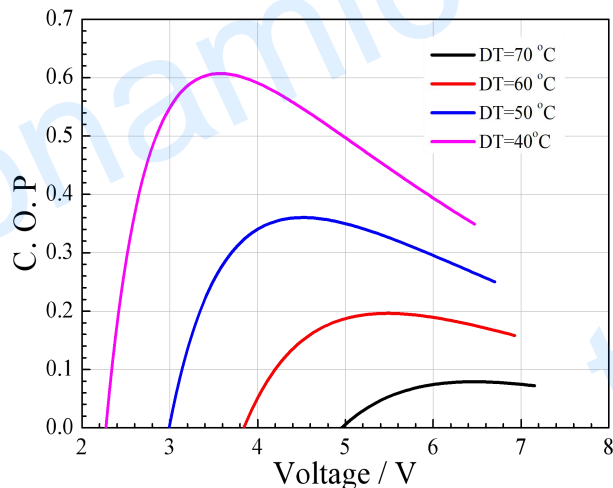
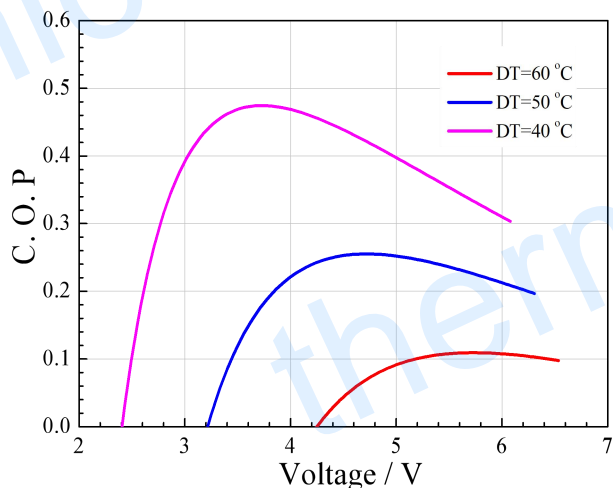
Performance Curves at  $T_h=27\text{ }^\circ\text{C}$



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



Standard Performance Graph 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 Cautions

- 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
- Storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC

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