# Specification of Thermoelectric Module

## TEHC1-12703

## Description

The 127 couples, 40 mm × 40 mm size single module which is made of our high performance ingot to achieve superior cooling performance and 74 ºC or larger delta Tmax, is designed for superior cooling and heating applications. Beyond the standard below, we can design and manufacture the custom made module according to your special requirements.

## 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

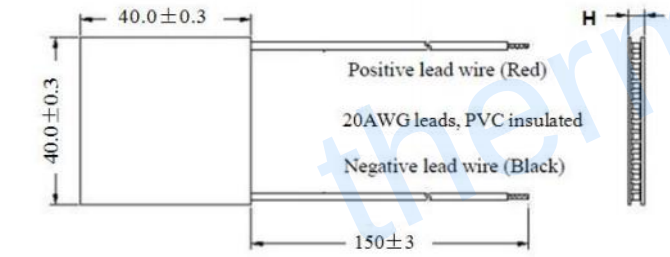
## Application

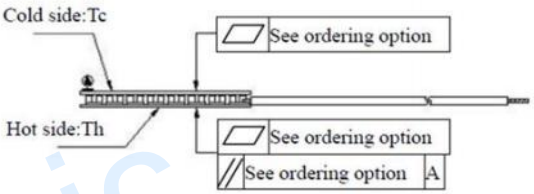
- Food and beverage service refrigerator
- Portable cooler box for cars
- Temperature stabilizer
- Liquid cooling
- CPU cooler and scientific instrument
- Photonic and medical systems

## Performance Specification Sheet

| | | | |
|---|---|---|---|
| Th (ºC) | 27 | 50 | Hot side temperature at environment: dry air, $N_2$ |
| $DT_{max}$ (ºC) | 74 | 83 | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| $U_{max}$ (Voltage) | 16.8 | 18.08 | Voltage applied to the module at $DT_{max}$ |
| $I_{max}$ (Amps) | 4.2 | 4.2 | DC current through the modules at $DT_{max}$ |
| $Q_{Cmax}$ (Watts) | 44.6 | 49.0 | Cooling capacity at cold side of the module under DT=0 ºC |
| AC resistance (Ohms) | 3.03 | 3.26 | 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 (Tmelt=138ºC)
2. T200: CuAgSn (Tmelt = 217°C)
3. T240: SbSn (Tmelt = 240°C)

**B. Sealant:**

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

**C. Ceramics:**

1. Alumina ($Al_2O_3$, white 96%)
2. Aluminum Nitride (AlN)

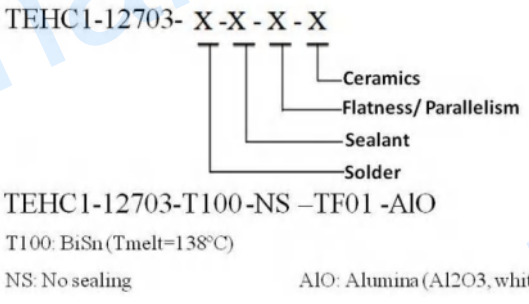
**D. Ceramics Surface Options:**

1. Blank ceramics (not metalized)
2. Metalized

## Ordering Option

| Suffix | Thickness H / (mm) | Flatness/ Parallelism (mm) | Lead wire length (mm) Standard/Optional length |
|---|---|---|---|
| TF | 0:4.2±0.1 | 0:0.08/0.08 | 150±3/Specify |
| TF | 1:4.2±0.03 | 1:0.03/0.03 | 150±3/Specify |
| Eg. TF01: Thickness 4.2±0.1(mm) and Flatness 0.03/0.03(mm) | | | |

## Naming for the Module



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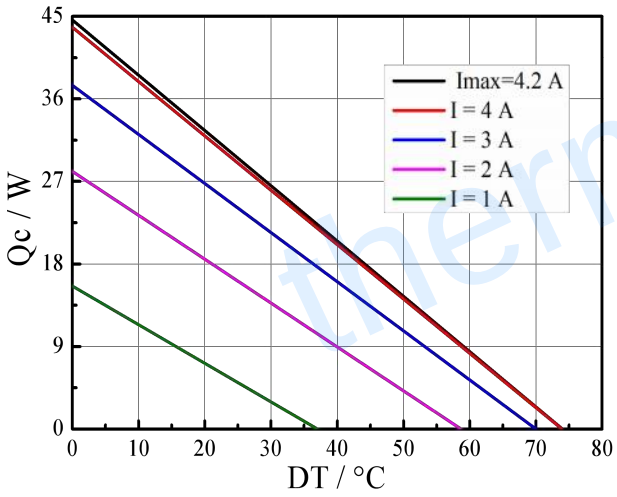
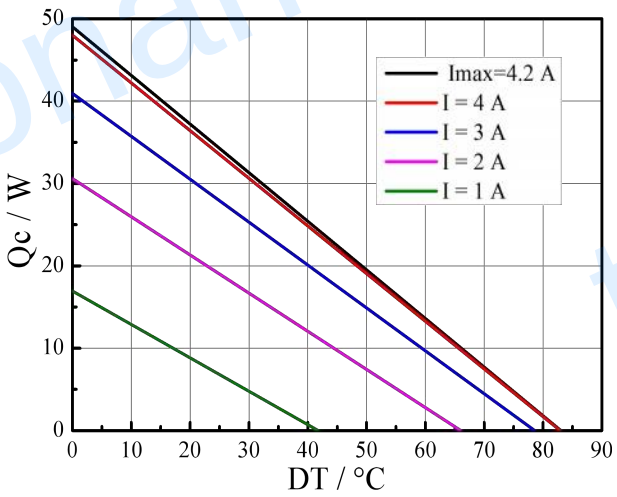
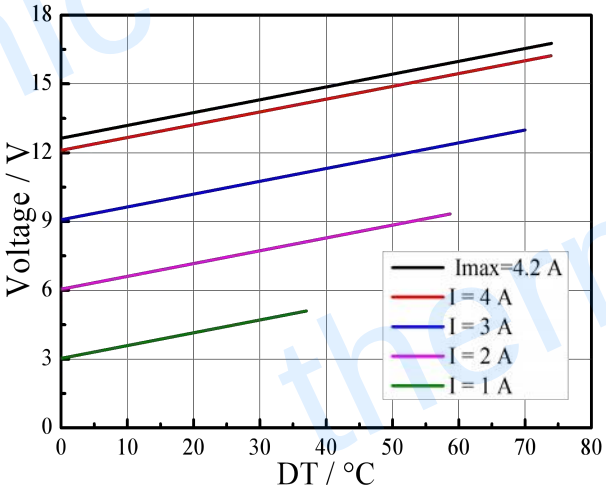
### Performance Curves at Th=27 ºC

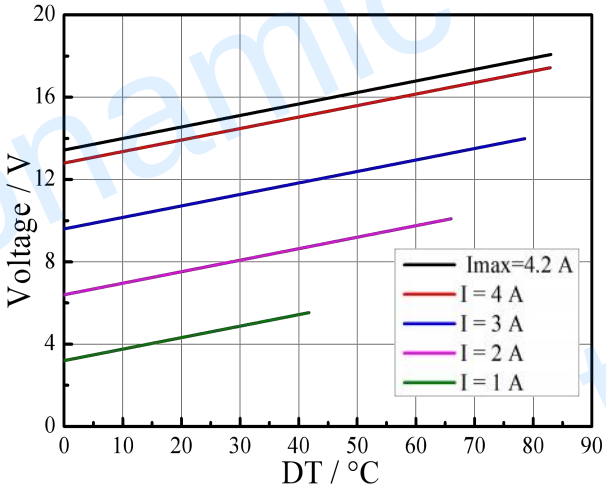



### Performance Curves at Th=50 ºC

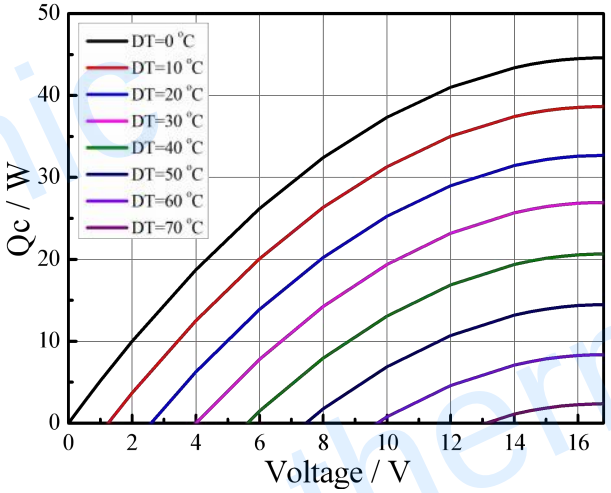


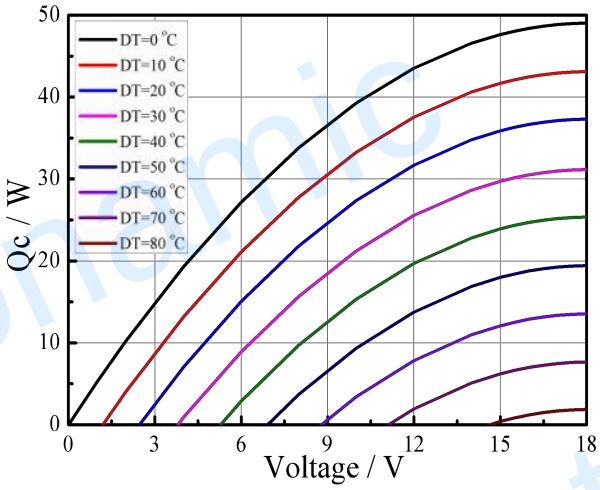

Standard Performance Graph Qc= f(DT)




Standard Performance Graph V= f(DT)




Standard Performance Graph Qc= f(V)

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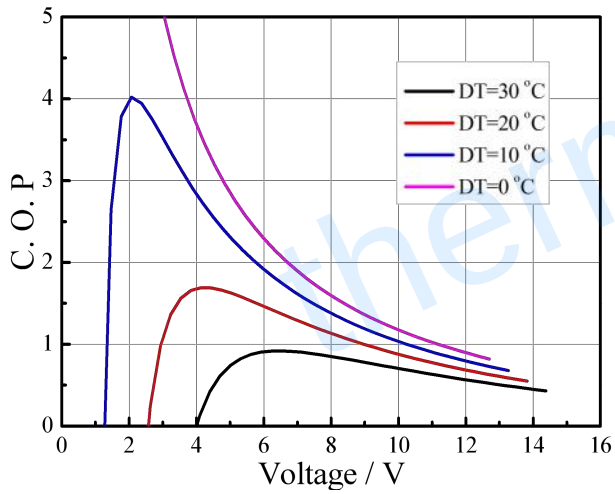
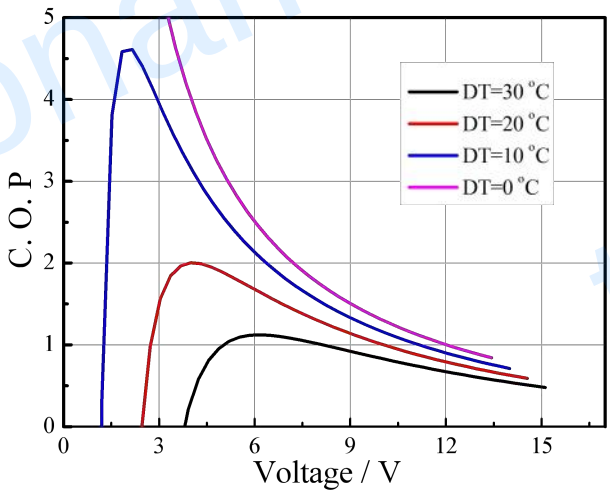
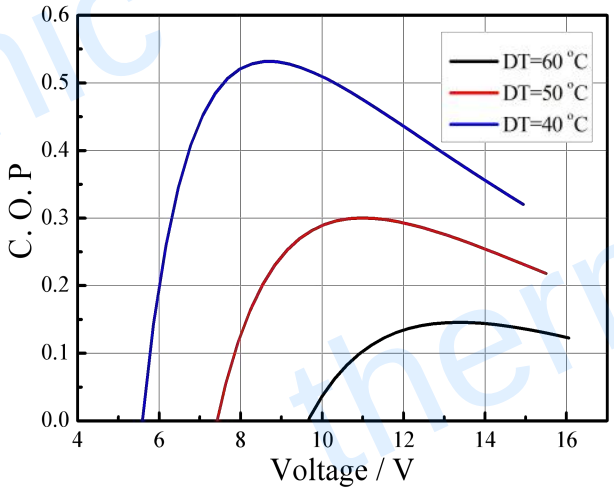
### Performance Curves at Th=27 ºC

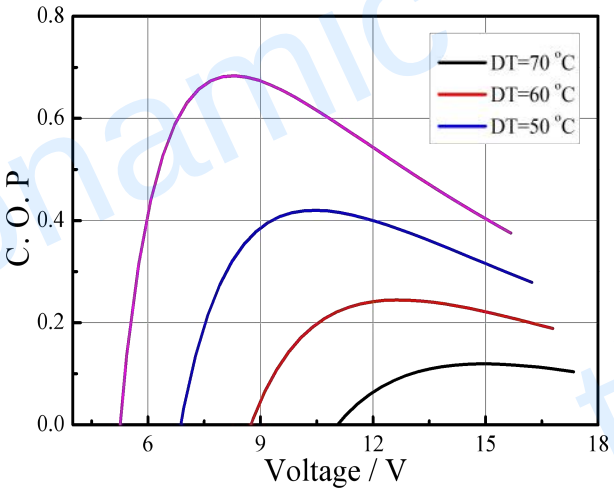



### Performance Curves at Th=50 ºC




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 Qc/Input power (V × 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
- Operation below $I_{max}$ or $V_{max}$
- Work under DC