

# Specification of Thermoelectric Module

**TEHC1-01704**

## Description

The 17 couples, 15 mm × 15 mm size single module which is made of our high performance ingot to achieve superior cooling performance and 70° C 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

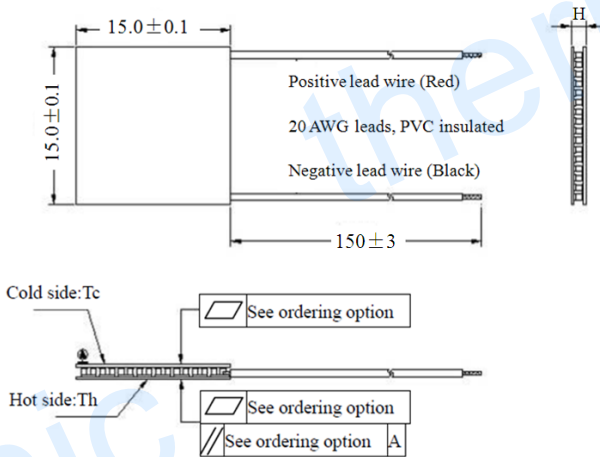
## Application

- 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 (°C)	27	50	Hot side temperature at environment: dry air, N2
DTmax (°C)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
Umax (Voltage)	2.2	2.4	Voltage applied to the module at DTmax
I <sub>max</sub> (Amps)	4.9	4.9	DC current through the modules at DTmax
QC <sub>max</sub> (Watts)	6.8	7.5	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	0.36	0.38	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 (Melting Point=138°C)
2. T200: CuSn (Melting Point= 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%)(AlO)
2. Aluminum Nitride (AlN)

### D. Ceramics Surface Options:

1. Blank ceramics (not metalized)
2. Metalized (Copper-Nickel plating)

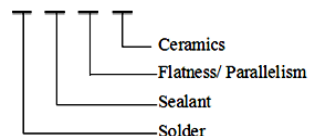
## Ordering Option

Suffix	Thickness H / (mm)	Flatness/ Parallellism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:4.0±0.10	0:0.05/0.05	150±3/Specify
TF	1:4.0±0.05	1:0.025/0.025	150±3/Specify
TF	2:4.0±0.025	2:0.015/0.015	150±3/Specify

Eg. TF01: Thickness 4.0±0.10(mm) and Flatness 0.025/0.025(mm)

## Naming for the Module

TEHC1-01704- X-X-X-X



TEHC1-01704-T100-NS-TF01 -AlO

T100: BiSn(T<sub>melt</sub>=138°C)

NS: No sealing

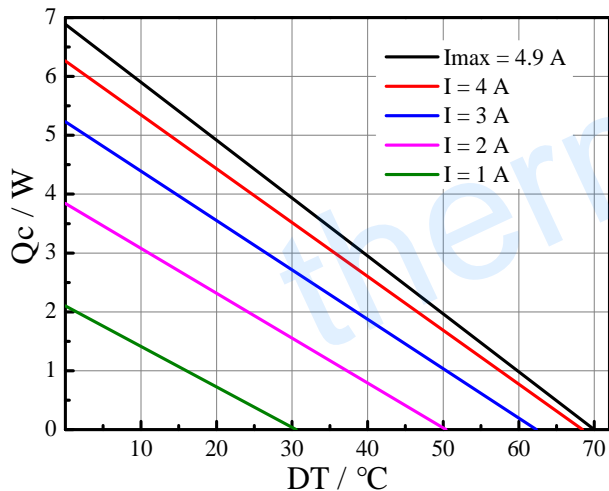
AlO: Alumina white 96%

TF01: Thickness ± 0.1 (mm) and Flatness/Parallellism 0.025/0.025(mm)

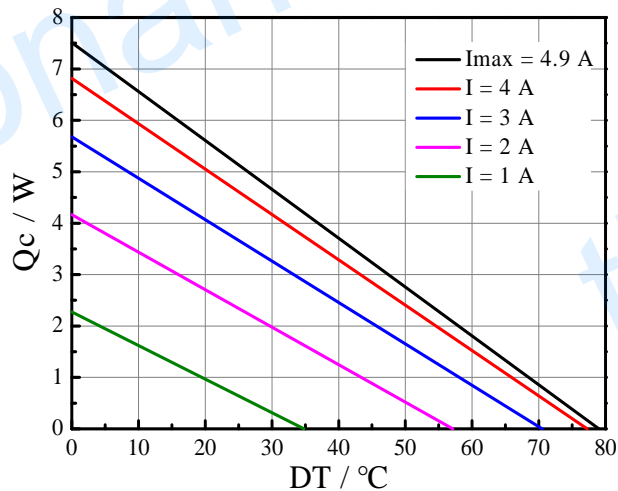
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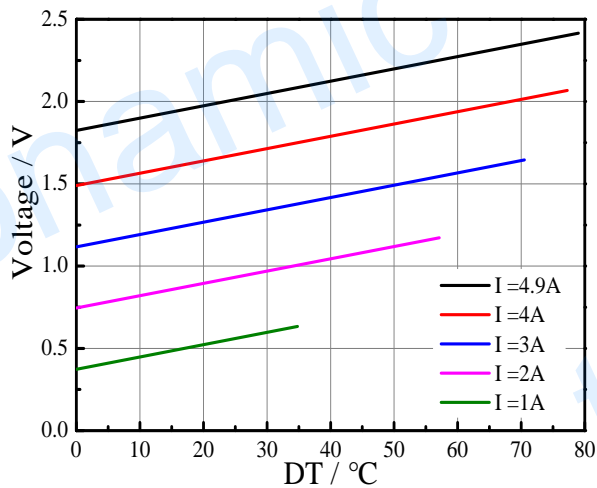
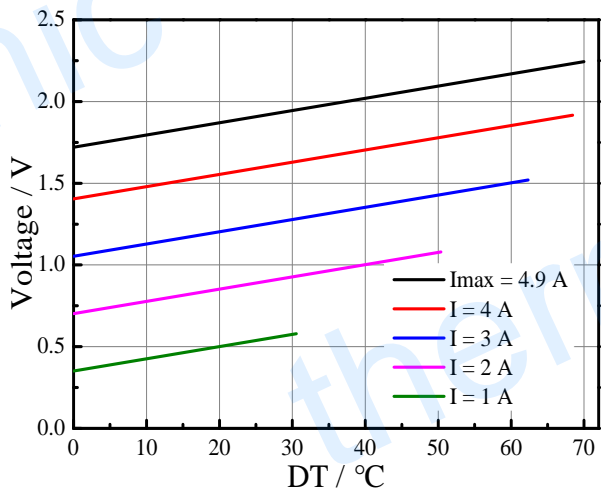
**Performance Curves at Th=27 °C**



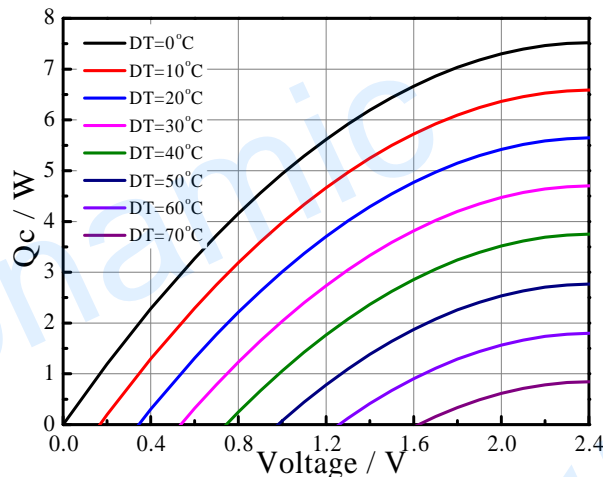
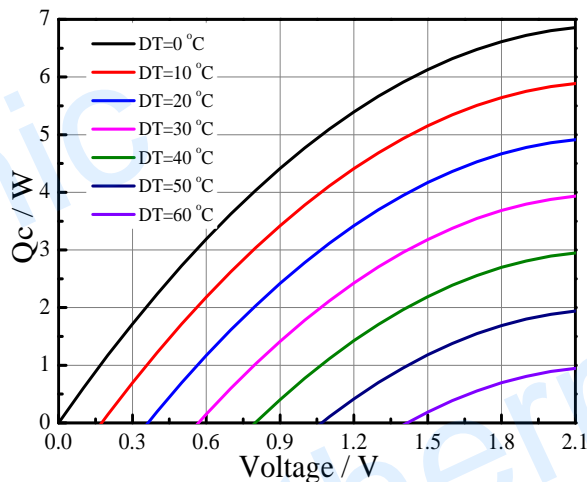
**Performance Curves at Th=50 °C**



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$

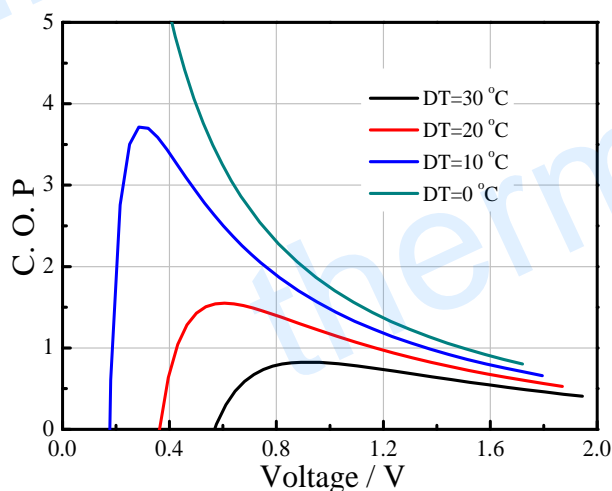


Standard Performance Graph  $Q_c = f(V)$

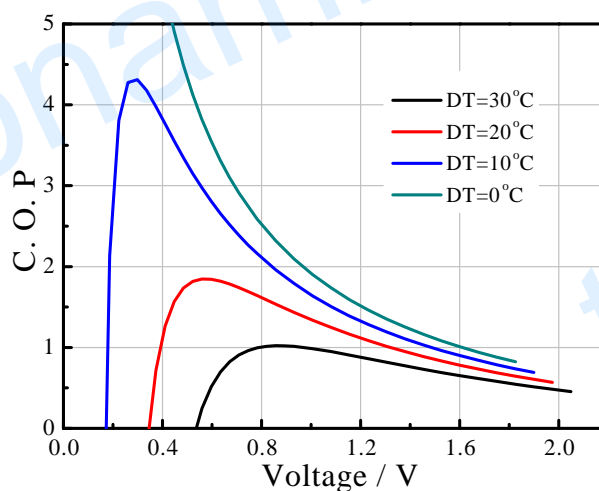
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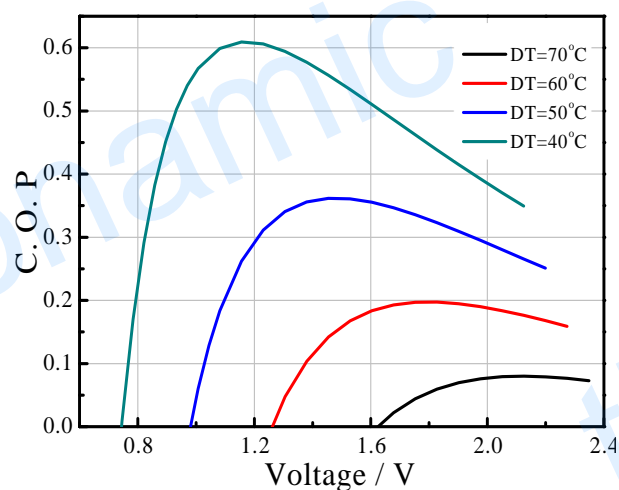
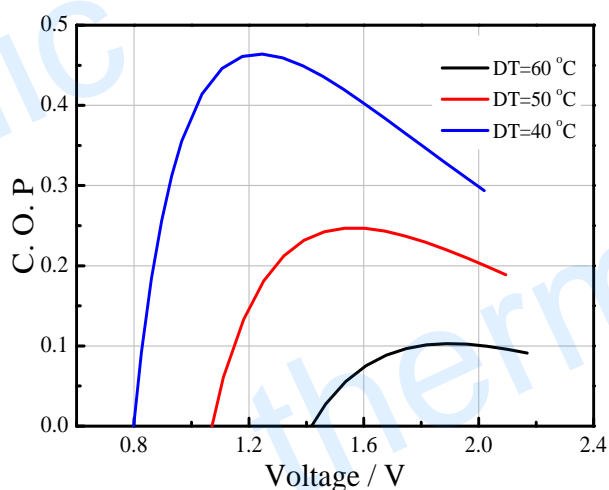
### Performance Curves at Th=27 °C



### 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 60/70 °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