# Specification of Thermoelectric Module

## TEHC1-19914

## Description

The 199 couples, 40 mm × 40 mm size single module which is made of our high performance ingot to achieve superior cooling performance and 74℃ 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

● No moving parts, no noise, and solid-state

● Compact structure, small in size, light in weight

● Environmental friendly

● RoHS compliant

● Precise temperature control
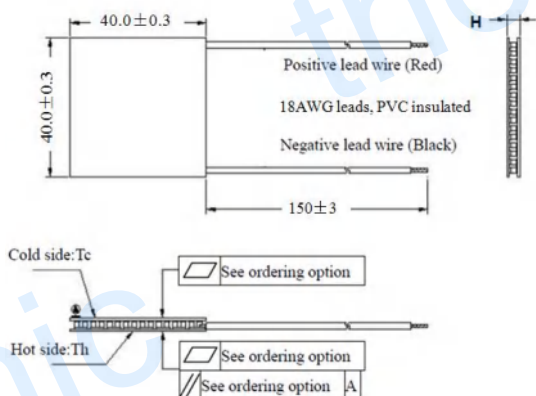
● Exceptionally reliable in quality, high performance

## 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(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) | 26.3 | 28.3 | Voltage applied to the module at $DT_{max}$ |
| $I_{max}$(amps) | 13 | 13 | DC current through the modules at $DT_{max}$ |
| $Q_{Cmax}$(Watts) | 217.2 | 237.5 | Cooling capacity at cold side of the module under DT=0 ºC |
| AC resistance(ohms) | 1.55 | 1.69 | The module resistance is tested under AC |
| Tolerance (%) | ± 10 | | For thermal and electricity parameters |

## Geometric Characteristics Dimensions in millimeters



- 40.0±0.3
- 40.0±0.3
- Positive lead wire (Red)
- 18AWG leads, PVC insulated
- Negative lead wire (Black)
- 150±3
- Cold side:Tc
- See ordering option
- Hot side:Th
- See ordering option
- See ordering option   A

## 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%)

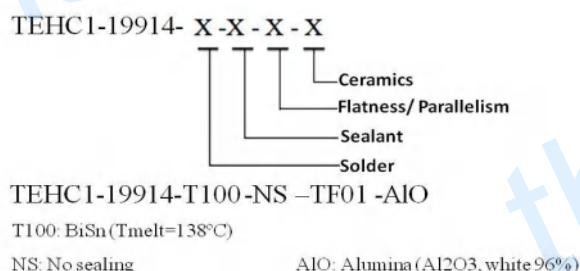2. Aluminum Nitride (AlN)

**D. Ceramics Surface Options:**

1. Blank ceramics (not metalized)

2. Metalized

## Ordering Option

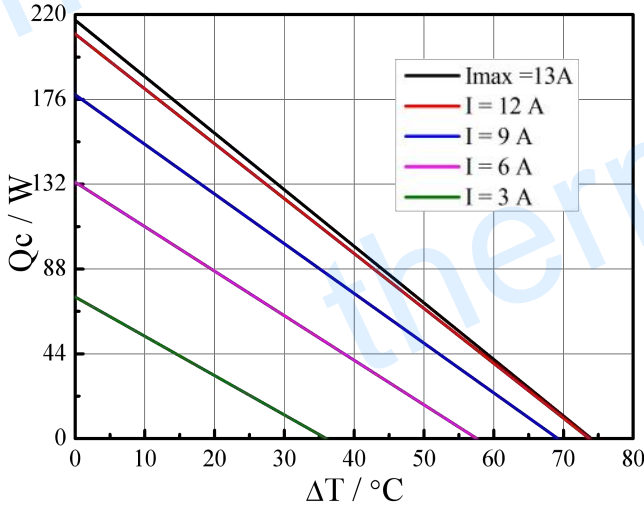| Suffix | Thickness (mm) | Flatness/ Parallelism (mm) | Lead wire length(mm) Standard/Optional length |
|---|---|---|---|
| TF | 0:3.3±0.1 | 0:0.08/0.08 | 150±3/Specify |
| TF | 1:3.3±0.03 | 1:0.03/0.03 | 150±3/Specify |
| Eg. TF01: Thickness 3.3±0.1(mm) and Flatness 0.03/0.03(mm) | | | |

## Naming for the Module

TEHC1-19914- X-X-X-X

- Ceramics
- Flatness/ Parallelism
- Sealant
- Solder

TEHC1-19914-T100-NS –TF01 -AlO

T100: BiSn (Tmelt=138°C)

NS: No sealing          AlO: Alumina (Al2O3, white 96%)

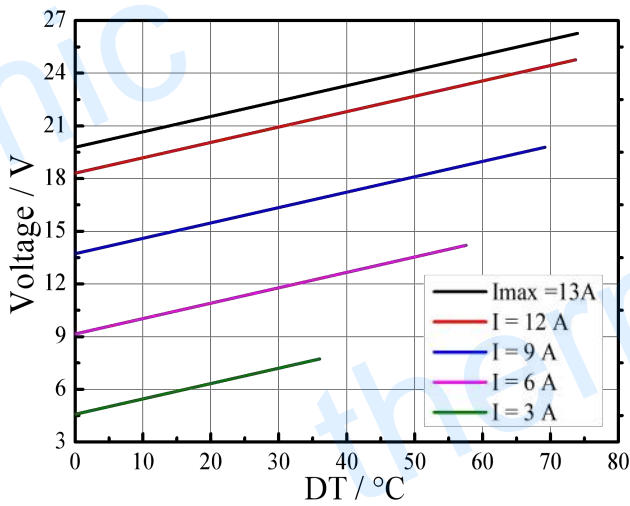# Specification of Thermoelectric Module

## TEHC1-19914

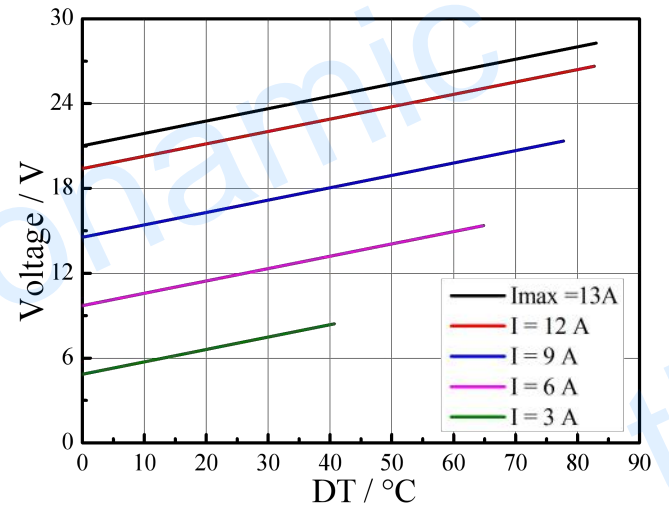### Performance Curves at Th=27 ºC

### Performance Curves at Th=50 ºC

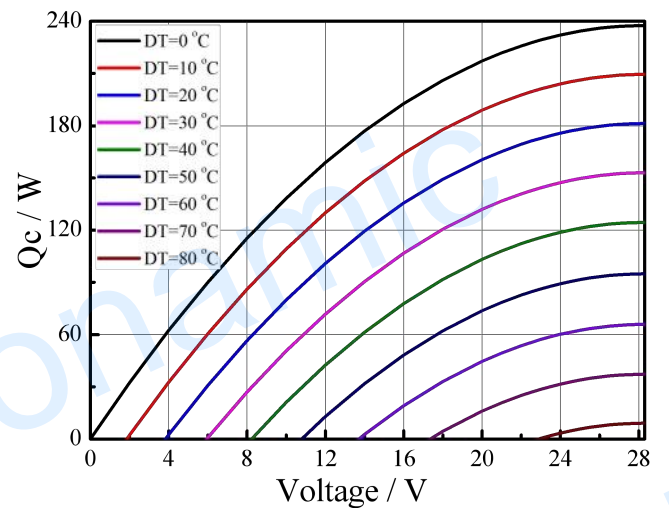Standard Performance Graph Qc= f(DT)
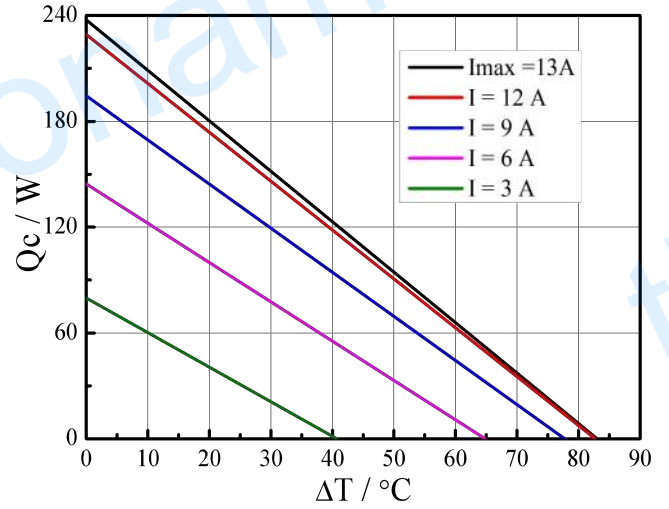
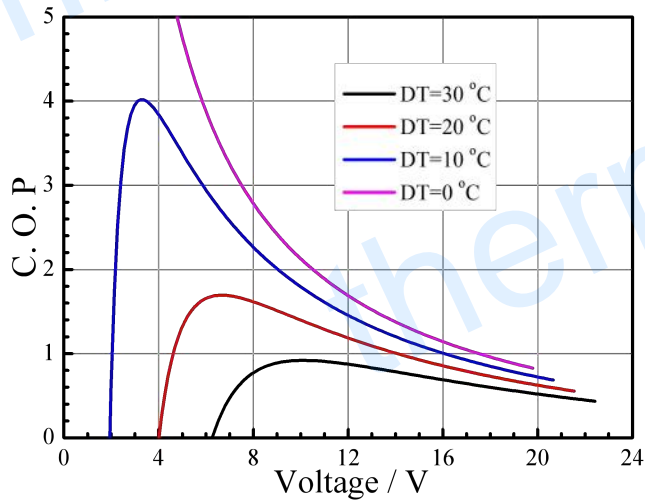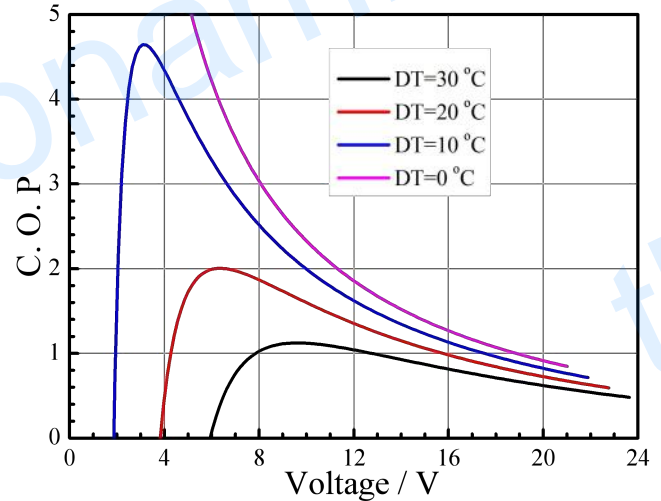Standard Performance Graph V= f(ΔT)
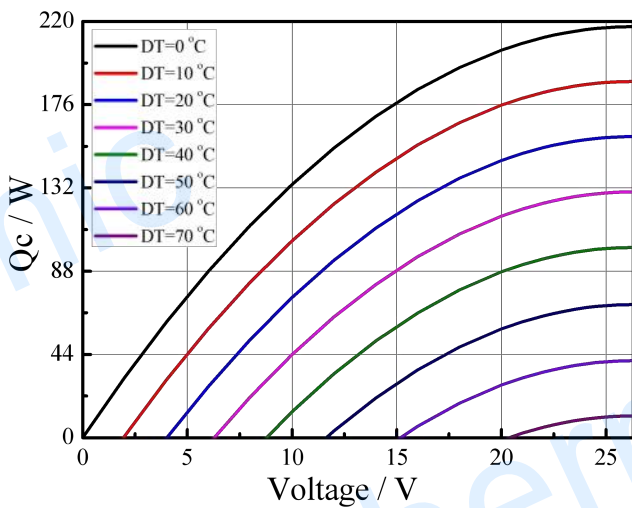
Standard Performance Graph Qc= f(V)

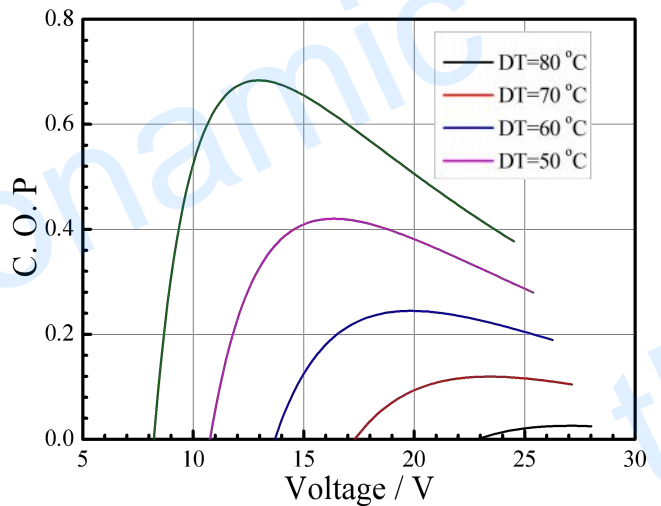# Specification of Thermoelectric Module
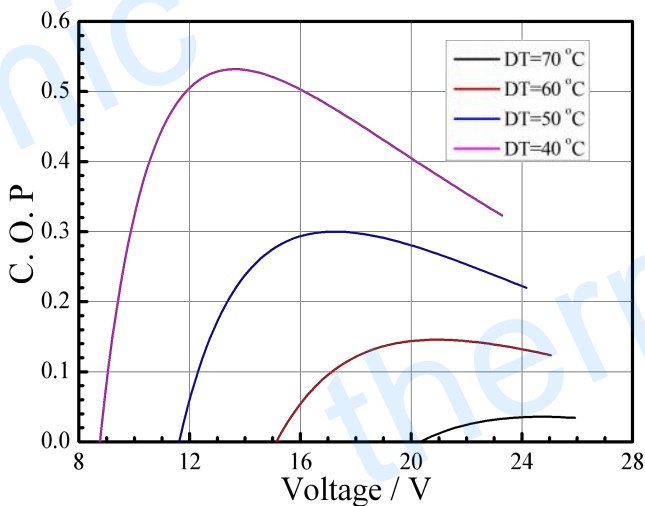
## TEHC1-19914

### 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 70/80 ˚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 $V_{max}$

● Storage module below 100 ºC

● Work under DC