# Specification of Thermoelectric Module

## TEC1-12706

## Description

The 127 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 ℃, designed for superior cooling and heating up to 100 ℃ 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

- 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

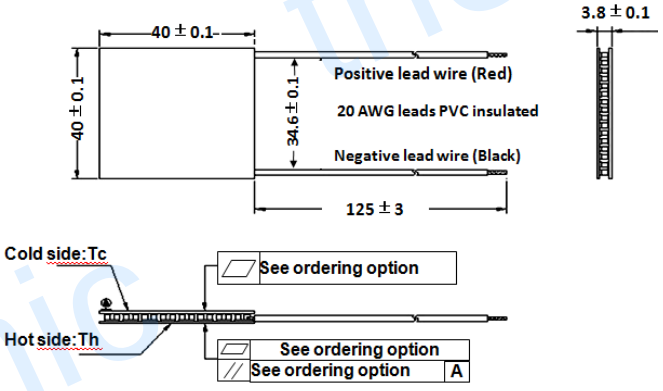
## Application

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

## Peformance Specification Sheet

| | | | |
|---|---|---|---|
| Th(℃) | 27 | 50 | Hot side temperature at environment: dry air, $N_2$ |
| $DT_{max}$(℃) | 70 | 79 | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| $U_{max}$(Voltage) | 16.0 | 17.2 | Voltage applied to the module at $DT_{max}$ |
| $I_{max}$(amps) | 6.1 | 6.1 | DC current through the modules at $DT_{max}$ |
| $Q_{Cmax}$(Watts) | 61.4 | 66.7 | Cooling capacity at cold side of the module under DT=0 ℃ |
| AC resistance(ohms) | 2.0 | 2.2 | The module resistance is tested under AC |
| Tolerance (%) | ± 10 | | For thermal and electricity parameters |

## Geometric Characteristics Dimensions in millimeters




## Sealing Option

**A. Solder:**

1. T100: BiSn (Tmelt = 138 ℃)

**B. Sealant:**

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

**C. Ceramics:**

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

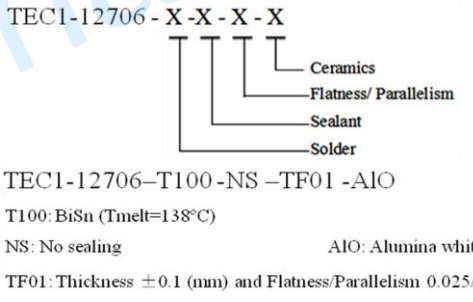
**D. Ceramics Surface Options:**

1. Blank ceramics (not metallized)
2. Metallized (Au plating)

## Ordering Option

| Suffix | Thickness (mm) | Flatness/ Parallelism (mm) | Lead wire length(mm) Standard/Optional length |
|---|---|---|---|
| TF | 0:3.8±0.1 | 0:0.035/0.035 | 125±3/Specify |
| TF | 1:3.8±0.05 | 1:0.025/0.025 | 125±3/Specify |
| TF | 2:3.8±0.025 | 2:0.015/0.015 | 125±3/Specify |
| Eg. TF01: Thickness 3.8 ± 0.1 (mm) and Flatness 0.025 / 0.025 (mm) | | | |

## Naming for the Module





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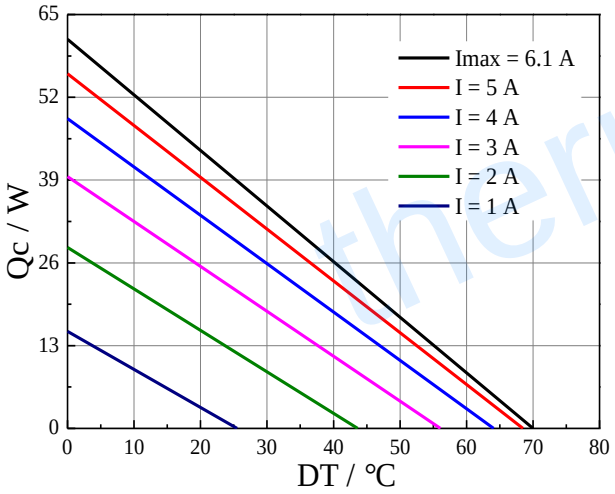
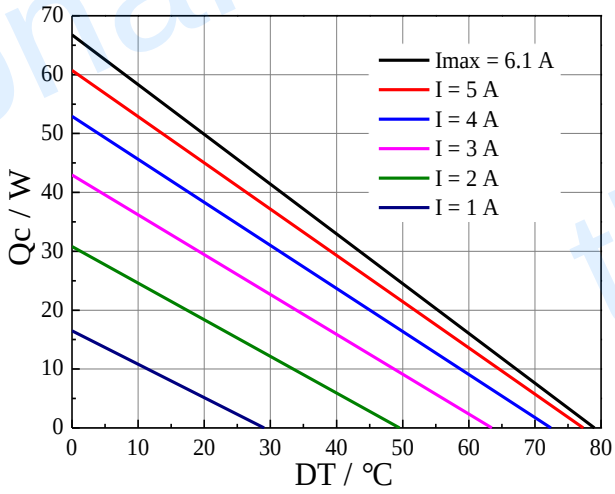
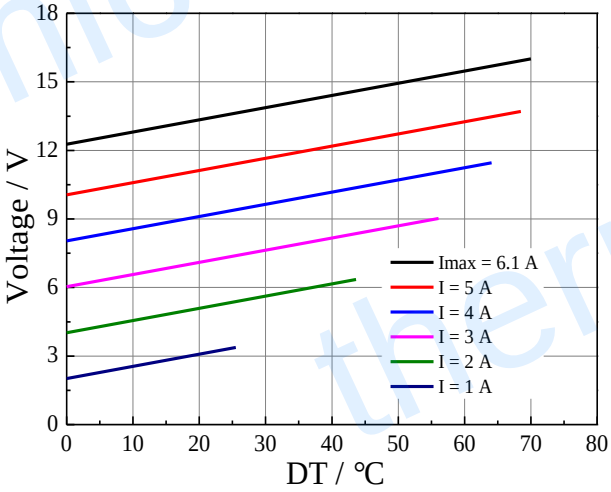
### Performance Curves at Th=27 ℃

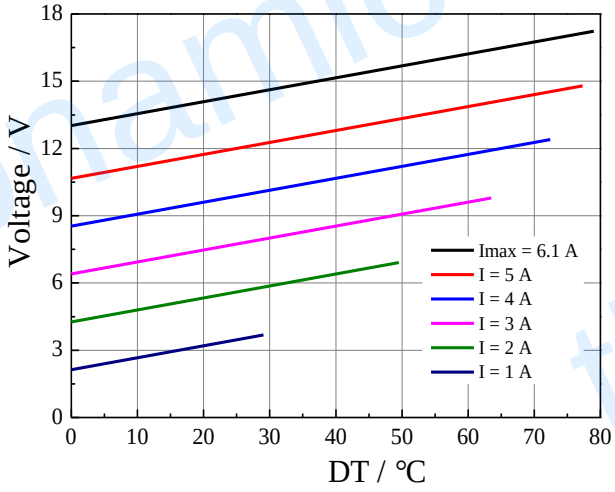



### Performance Curves at Th=50 ℃

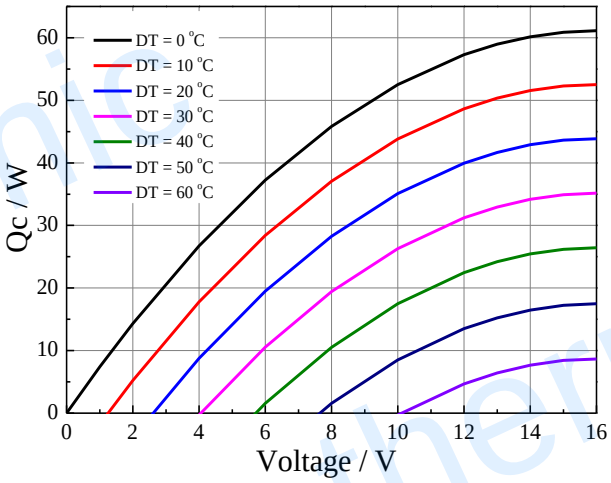


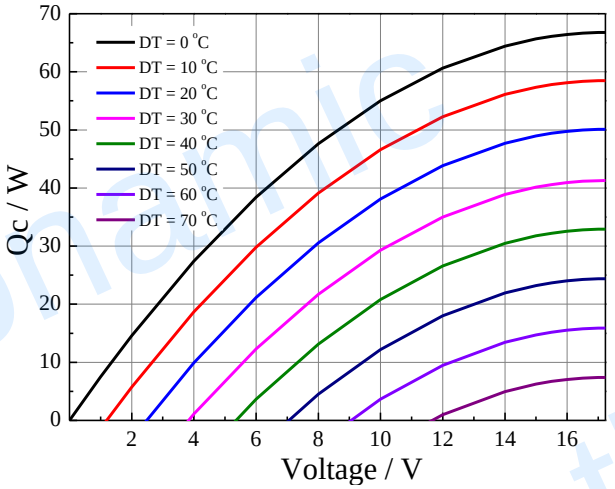

Standard Performance Graph Qc= f(DT)




Standard Performance Graph V= f(ΔT)




Standard Performance Graph Qc= f(V)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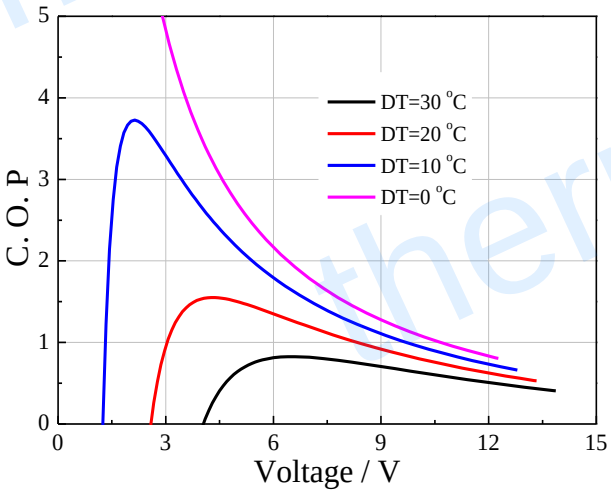
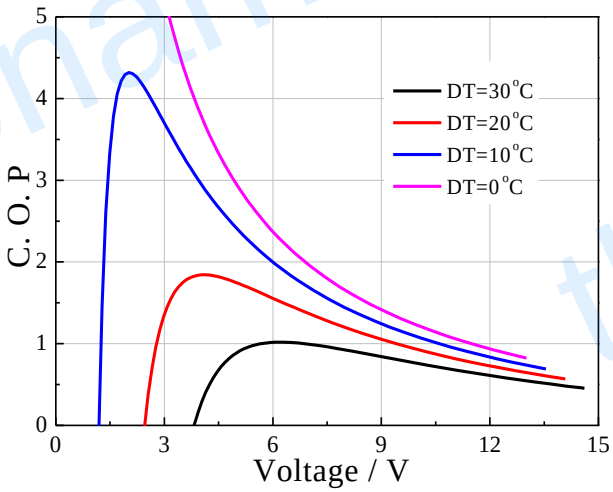
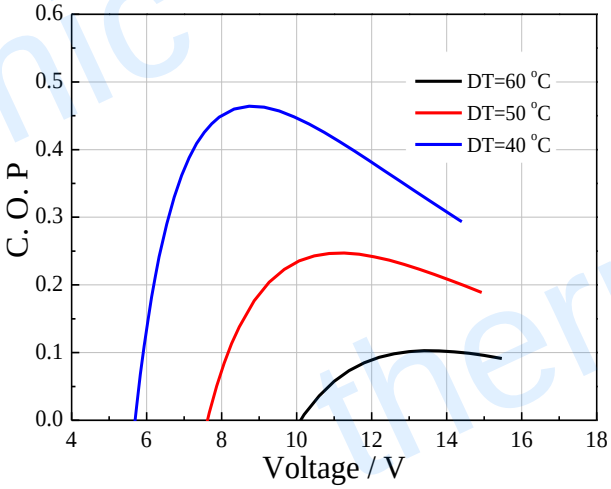
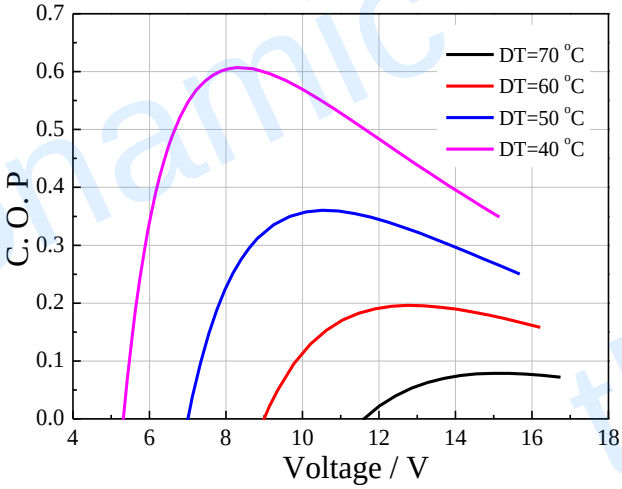



### Performance Curves at Th=50 ℃




Standard Performance Graph COP = f(V) of ΔT ranged from 0 to 30 ˚C




Standard Performance Graph COP = f(V) of ΔT ranged from 40 to 60/70 ˚C

Remark: The coefficient of performance (COP) is the cooling power Qc/Input power (V × I).

## Operation Cautions

- Cold side of the module sticked on the object being cooled
- Hot side of the module mounted on a heat radiator
- Storage module below 100 ℃
- Operation below $I_{max}$ or $V_{max}$
- Work under DC