# Specification of Thermoelectric Module

## TEC1-12725

## Description

The 127 couples, 62 mm × 62 mm size module which 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 ℃ 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

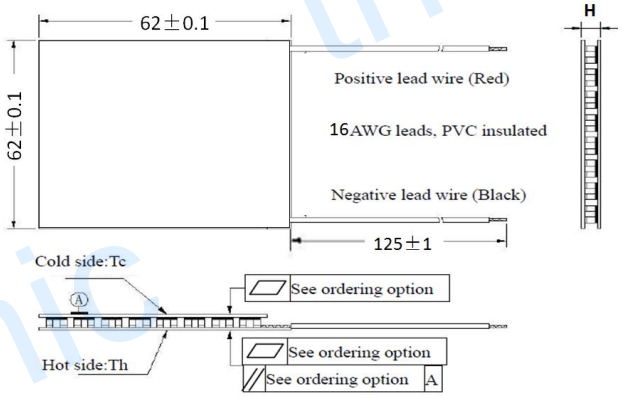
## Application

- Food and beverage service refrigerator
- Portable cooler box for cars
- Liquid cooling
- Temperature stabilizer
- CPU cooler and scientific instrument
- 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 | 17.2 | Voltage applied to the module at $DT_{max}$ |
| $I_{max}$ (amps) | 22 | 22 | DC current through the modules at $DT_{max}$ |
| $Q_{Cmax}$ (Watts) | 220.4 | 240.8 | Cooling capacity at cold side of the module under DT=0 ℃ |
| AC resistance (ohms) | 0.56 | 0.62 | 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=138° C)
2. T200: CuSn (Tmelt = 227 ° C)

**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)

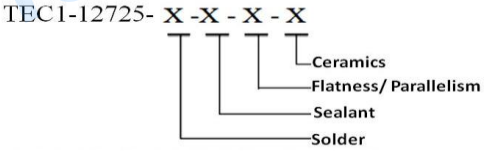
**D. Ceramics Surface Options:**

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 | 0:4.3±0.1 | 0:0.05/0.05 | 125±1/Specify |
| TF | 1:4.3±0.05 | 1:0.025/0.025 | 125±1/Specify |
| Eg. TF00: Thickness 4.3 ± 0.1 (mm) and Flatness 0.05 / 0.05 (mm) | | | |

## Naming for the Module




TEC1-12725-T100 -NS –TF00 -AlO

T100: BiSn (Tmelt=138°C)

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

TF00: Thickness ±0.1 (mm) and Flatness/ Parallelism: 0.05/0.05 (mm)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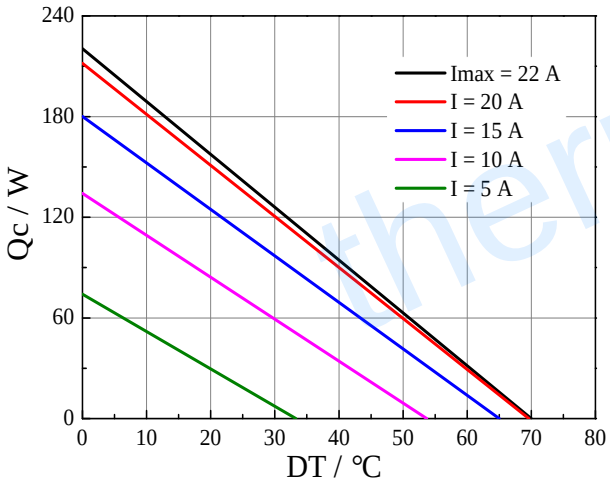
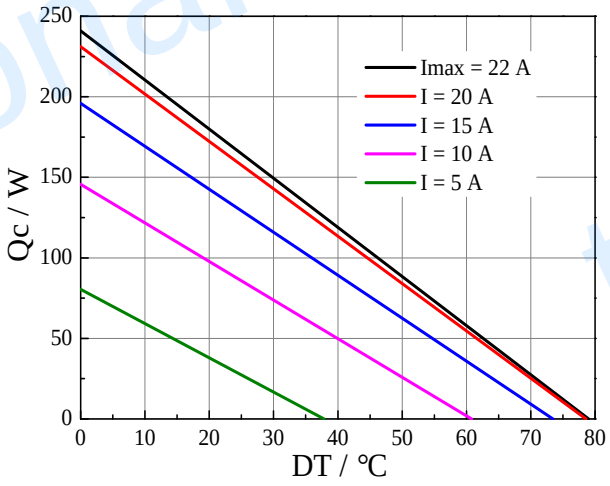
## TEC1-12725

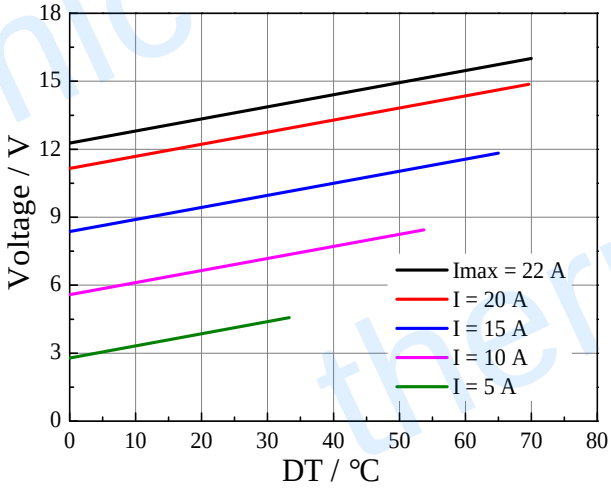
### Performance Curves at Th=27 ℃

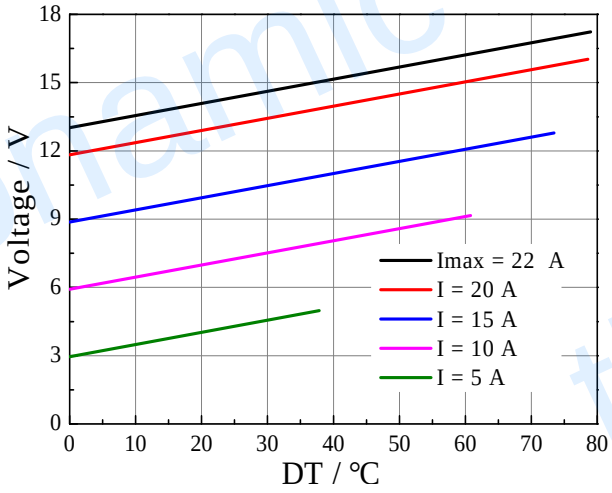



### Performance Curves at Th=50 ℃

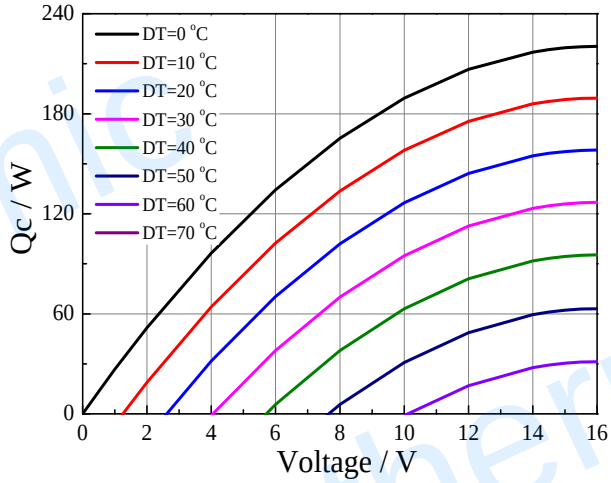


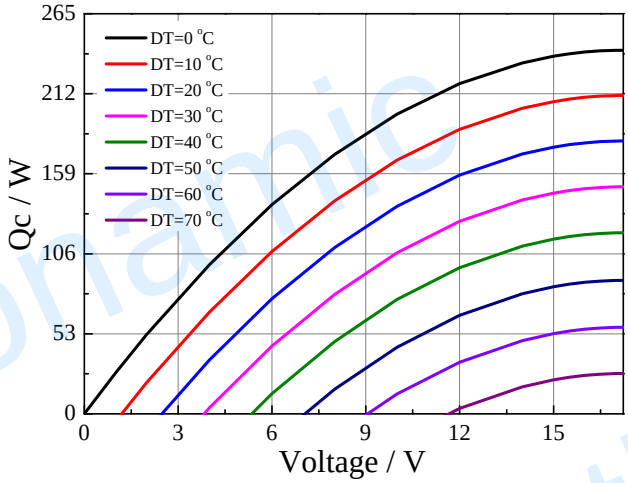

Standard Performance Graph Qc= f(DT)




Standard Performance Graph V= f(ΔT)




Standard Performance Graph Qc= f(V)

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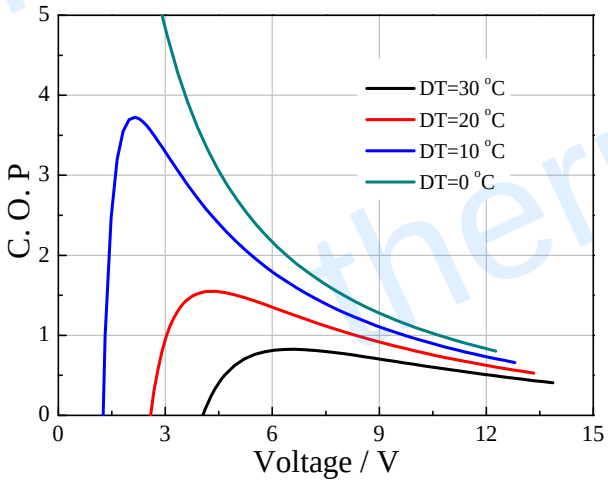
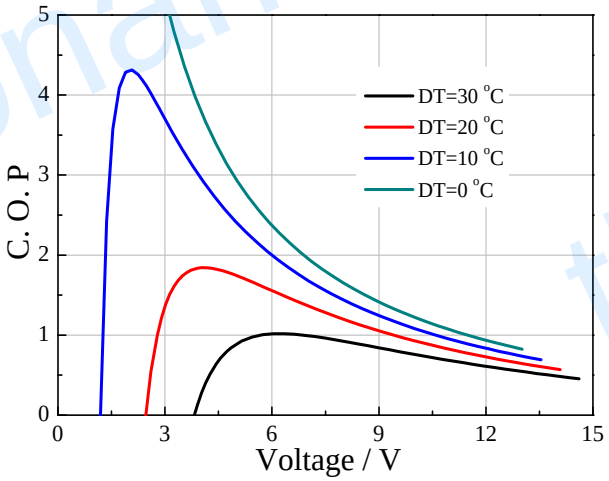
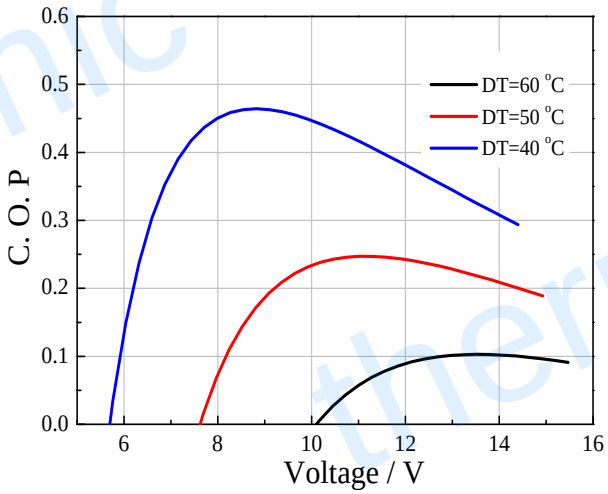
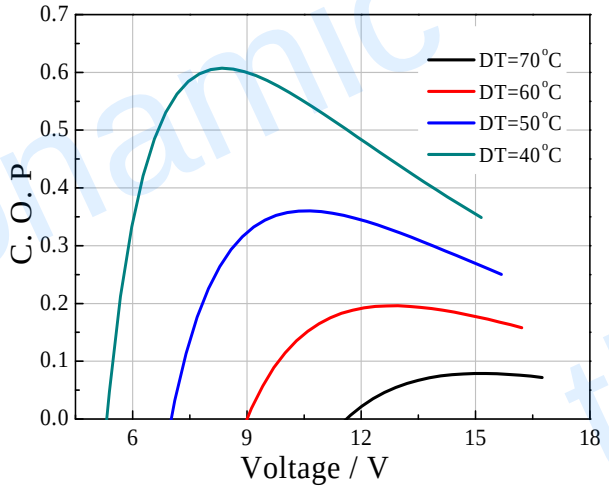



### Performance Curves at Th=50 ℃




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