# Specification of Thermoelectric Module

## TEC1-24111

## Description

The 241 couples, 55 mm × 55 mm size single module which is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70 ºC, designed for superior cooling and heating up to 100 ˚C 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

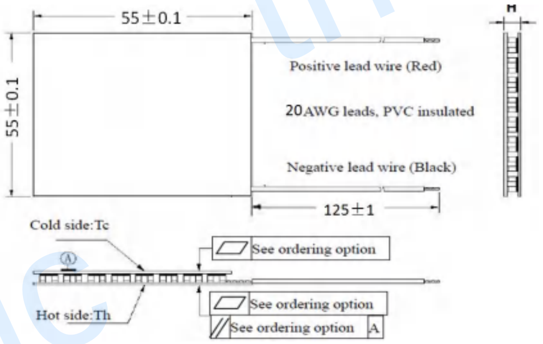
## Application

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

## Performance Specification Sheet

| | | | |
|---|---|---|---|
| Th(ºC) | 27 | 50 | Hot side temperature at environment: dry air, $N_2$ |
| $DT_{max}$(ºC) | 70 | 79 | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| $U_{max}$(Voltage) | 30.3 | 32.7 | Voltage applied to the module at $DT_{max}$ |
| $I_{max}$(amps) | 11 | 11 | DC current through the modules at $DT_{max}$ |
| $QC_{max}$(Watts) | 209.1 | 228.5 | Cooling capacity at cold side of the module under DT=0 ºC |
| AC resistance(ohms) | 2.15 | 2.35 | 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)

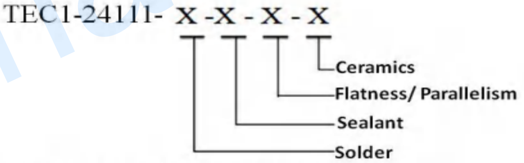
**D. Ceramics Surface Options:**

1. Blank ceramics (not metalized)
2. Metalized

## Ordering Option

| Suffix | Thickness (mm) | Flatness/ Parallelism (mm) | Lead wire length(mm) Standard/Optional length |
|---|---|---|---|
| TF | 0:3.7±0.1 | 0: 0.1/0.1 | 125±1/Specify |
| TF | 1:3.7±0.05 | 1: 0.05/0.05 | 125±1/Specify |
| Eg. TF00: Thickness 3.7 ± 0.1 (mm) and Flatness 0.1 / 0.1 (mm) | | | |

## Naming for the Module



TEC1-24111-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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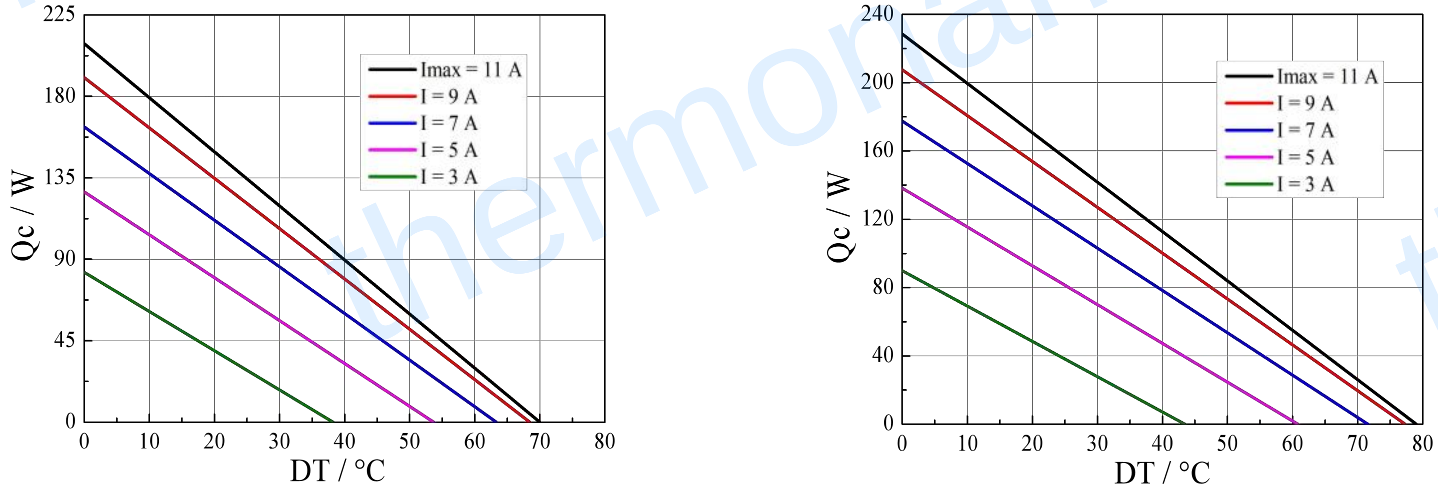
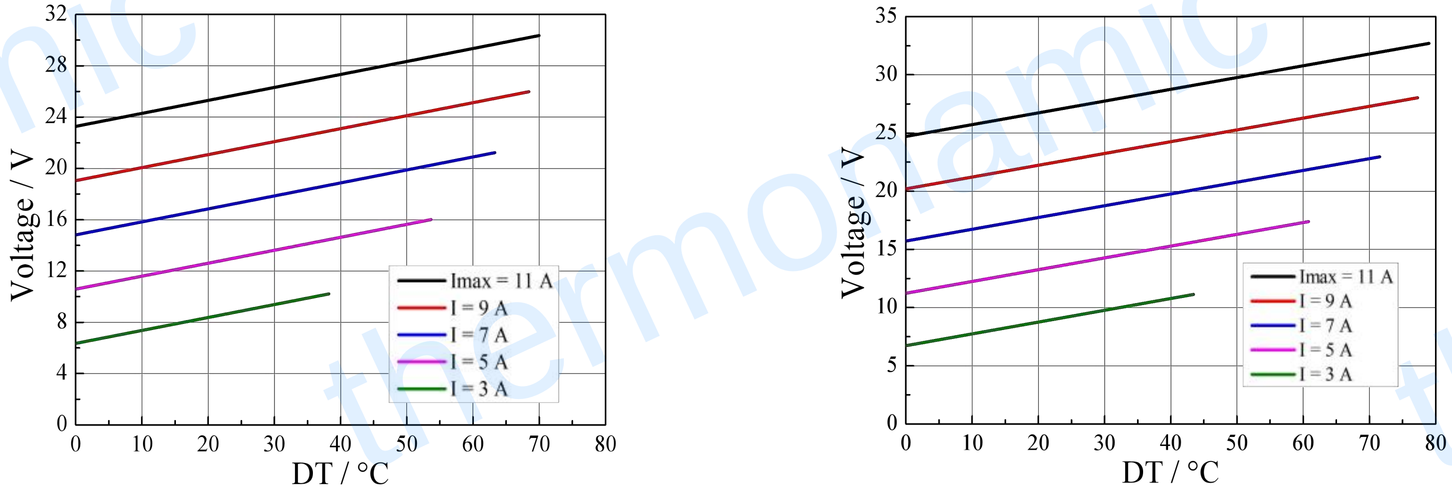
### Performance Curves at Th=27 ºC

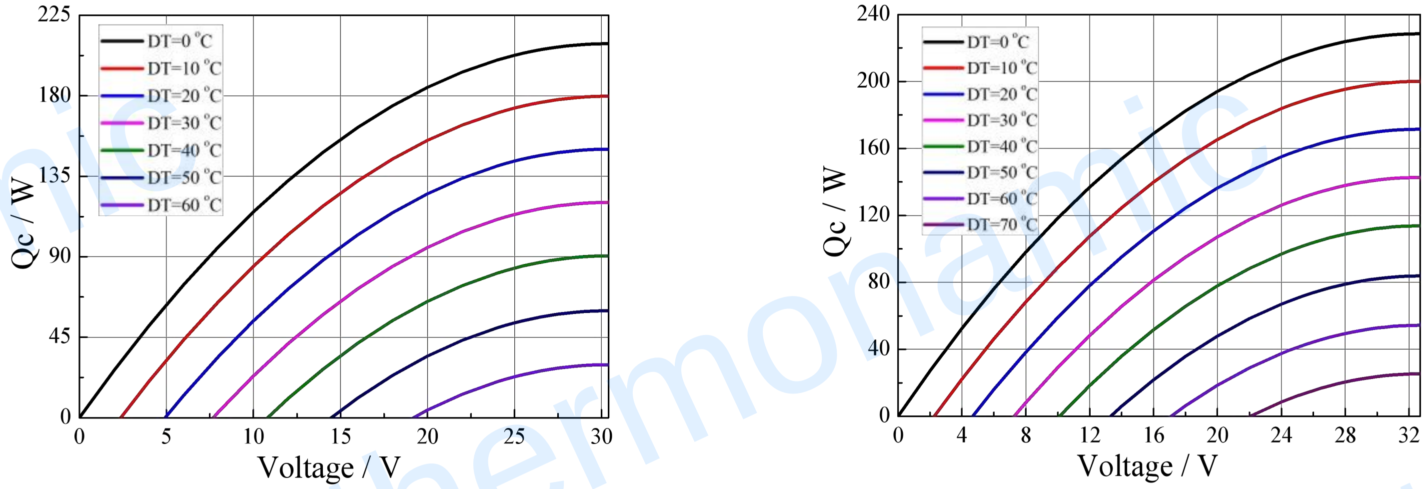
### Performance Curves at Th=50 ºC



Standard Performance Graph Qc= f(DT)



Standard Performance Graph V= f(ΔT)



Standard Performance Graph Qc= f(V)

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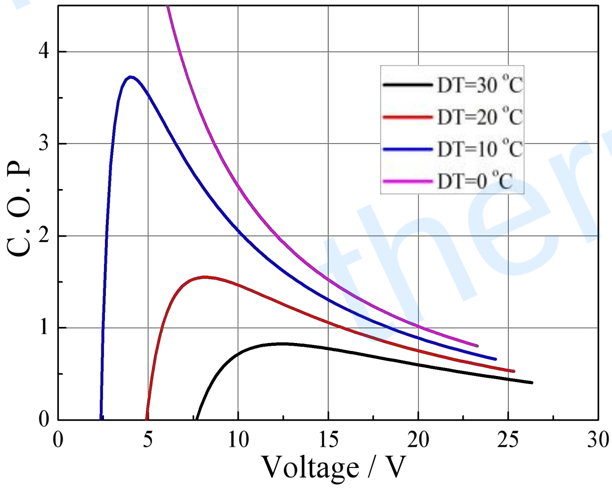
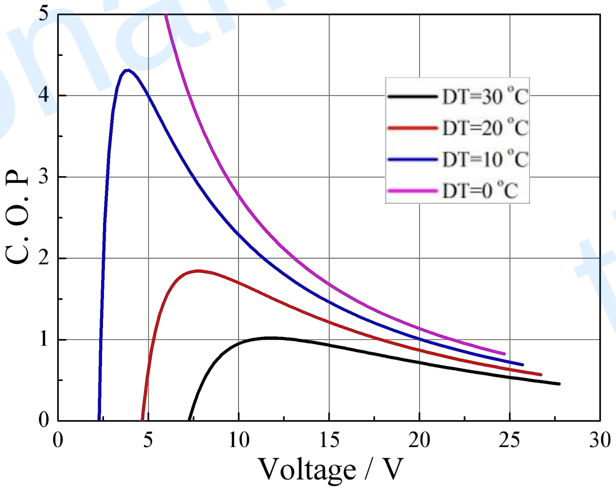
## TEC1-24111

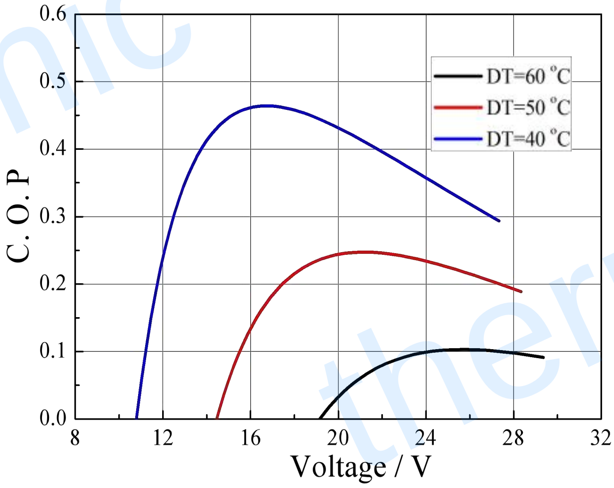
### Performance Curves at Th=27 ºC

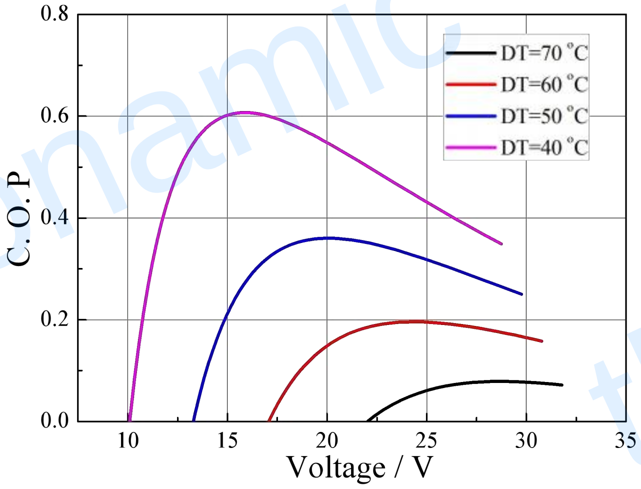


### Performance Curves at Th=50 ºC



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

- 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.
- Storage module below 100 ºC
- Operation below $I_{max}$ or $V_{max}$
- Work under DC