# Specification of Thermoelectric Module

## TES2-127-127-25

## Description

The TES2-127-127-25 is a multistage module designed for greater temperature differential cooling, good for cooling and heating up to 100 ºC applications. It is a 127-127 couples module in size of 30 mm × 30 mm (top)/30 mm×30 mm (bottom). If higher operation or processing temperature is required, please specify, we can design and manufacture according to your special requirements.

## Features

- High Temperature Differential
- 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

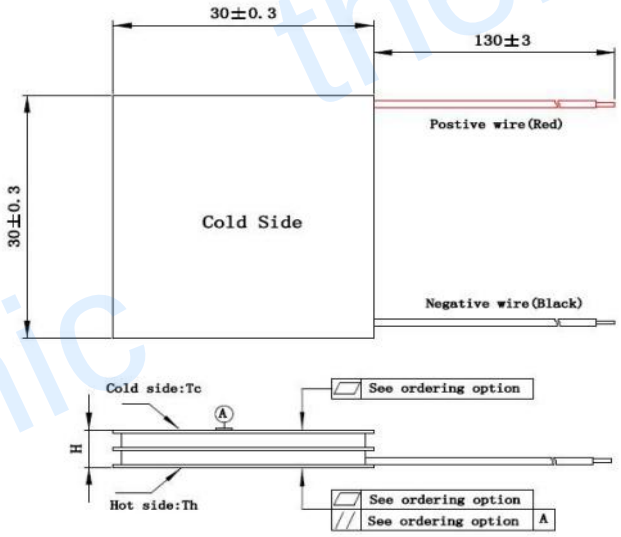
## Application

- Infrared (IR) Sensors
- CCD Sensor
- Gas Analyzers
- Calibration Equipment
- CPU cooler and scientific instrument
- Photonic and medical systems
- Guidance Systems

## Performance Specification Sheet

| | | | |
|---|---|---|---|
| Th (ºC) | 27 | 50 | Hot side temperature at environment: dry air, $N_2$ |
| $DT_{max}$ (ºC) | 89.1 | 100.2 | Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side |
| $U_{max}$ (Voltage) | 16.7 | 18.3 | Voltage applied to the module at $DT_{max}$ |
| $I_{max}$ (Amps) | 2.8 | 2.8 | DC current through the modules at $DT_{max}$ |
| $Q_{Cmax}$ (Watts) | 18.6 | 20.0 | Cooling capacity at cold side of the module under DT=0 ºC |
| AC resistance (Ohms) | 5.10 | 5.50 | 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 | 0:6.8±0.3 | 0: 0.15/0.15 | 130±3/Specify |

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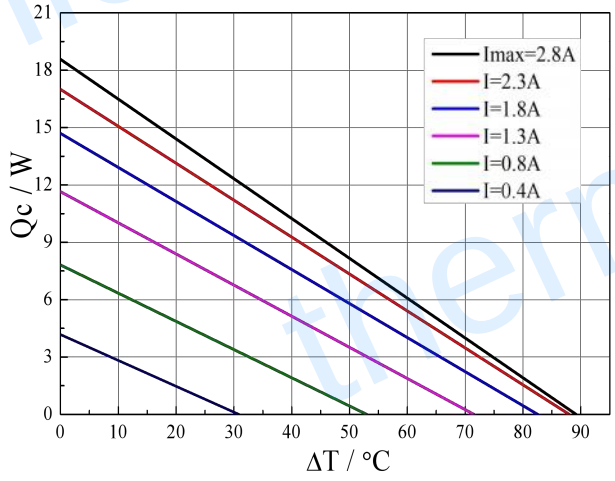
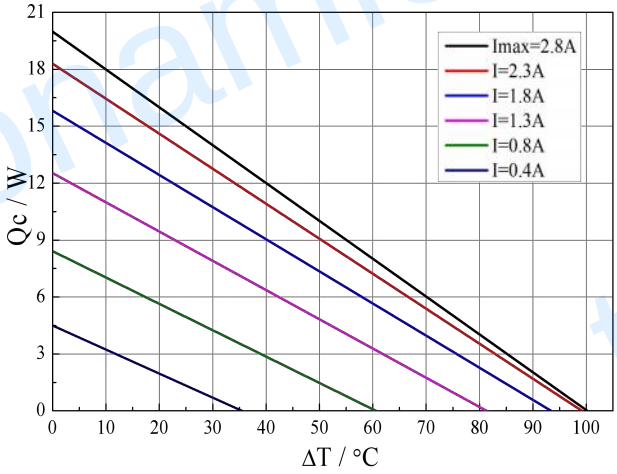
## TES2-127-127-25

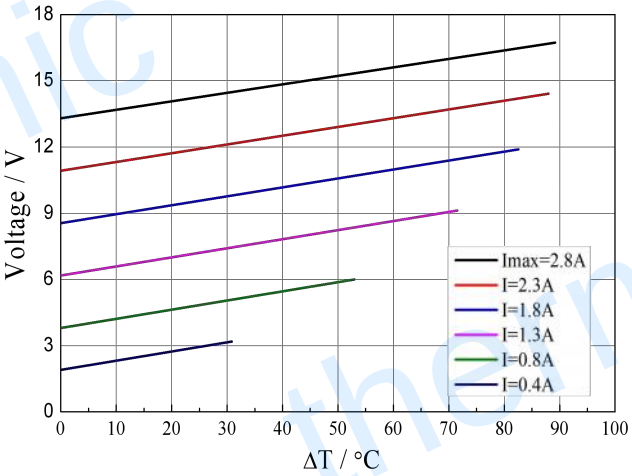
### Performance Curves at Th=27 ºC

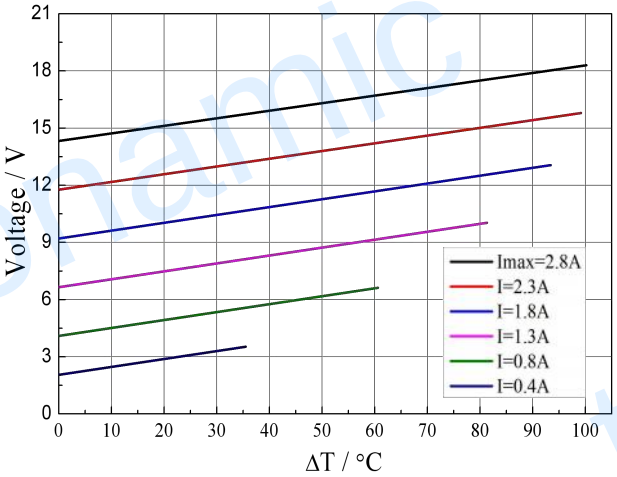



### Performance Curves at Th=50 ºC

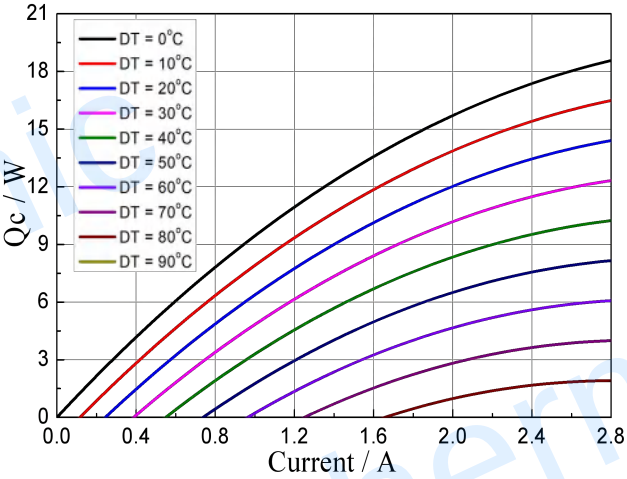


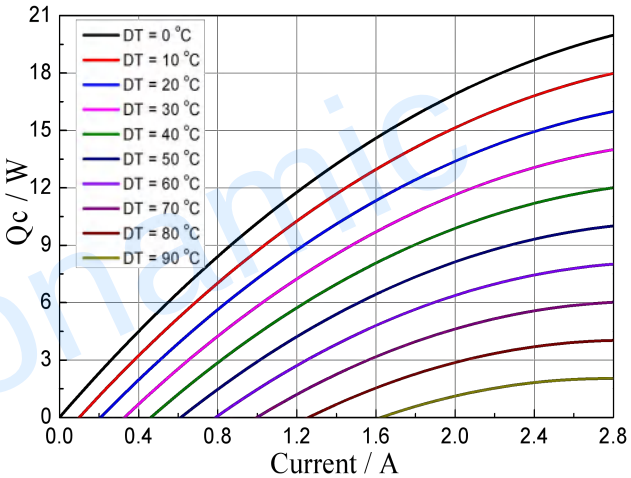

Standard Performance Graph Qc= f(DT)




Standard Performance Graph V= f(DT)




Standard Performance Graph Qc= f(I)

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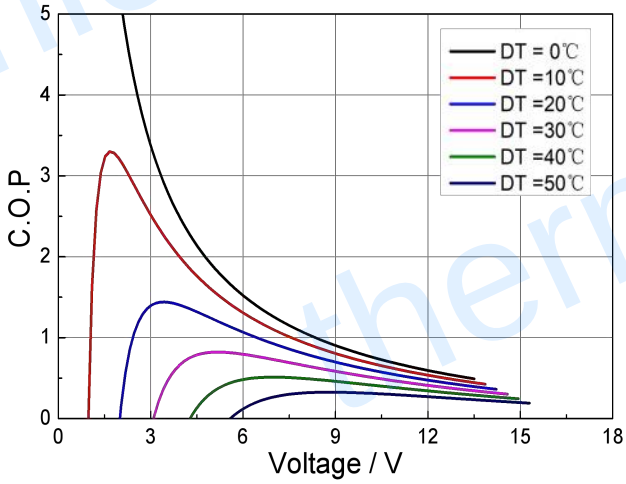
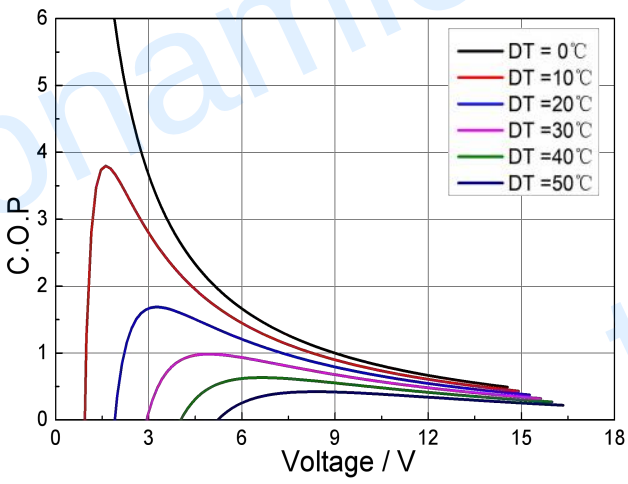
## TES2-127-127-25

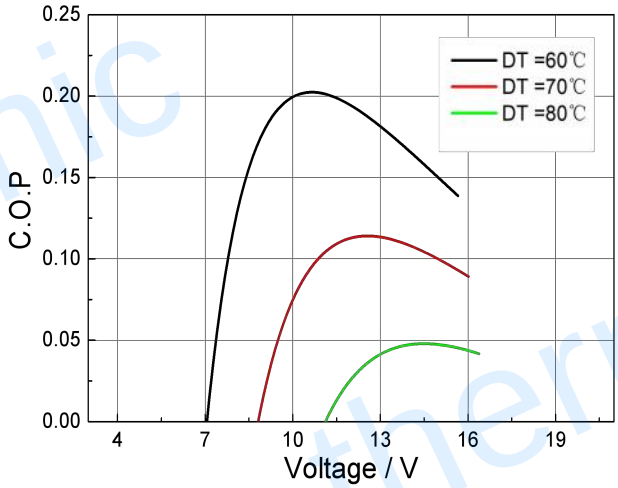
### Performance Curves at Th=27 ºC

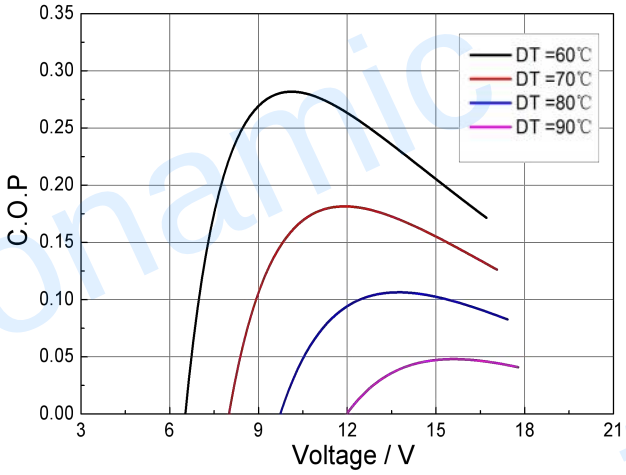



### Performance Curves at Th=50 ºC




Standard Performance Graph COP = f(V) of DT ranged from 0 to 40 ˚C




Standard Performance Graph COP = f(V) of DT ranged from 50 to 90/100 ˚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