



# Specification of Thermoelectric Module

## SM-TH C4-127-124

### Description

The SM-TH C4-127-124 is a multistage module designed for greater temperature differential cooling, good for cooling and heating up to 100 °C applications. It is a C4-127-124 couples module in size of 8.5 mm × 13 mm (top) / 19.3 mm × 20.8 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

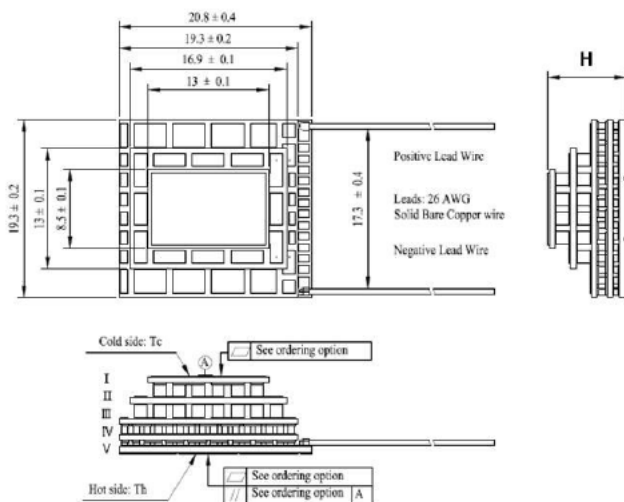
### Application

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

### Performance Specification Sheet

Th (°C)	27	50	Hot side temperature at environment: dry air, N <sub>2</sub>
DT <sub>max</sub> (°C)	128	144	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	14.6	16.4	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (Amps)	4.7	4.7	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	6.5	7.2	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	2.9~3.3	3.1~3.5	The module resistance is tested under AC

### Geometric Characteristics Dimensions in millimeters



### Manufacturing Options

#### A. Solder:

1. T100: BiSn (T<sub>melt</sub>=138°C)
2. T200: CuSn (T<sub>melt</sub> = 227 °C)

#### B. Sealant:

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

#### C. Ceramics:

1. Alumina (Al<sub>2</sub>O<sub>3</sub>, 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: 7.7±0.3	0: 0.1/0.1	125±1/Specify
TF	1: 7.7±0.15	1:0.05/0.05	125±1/Specify

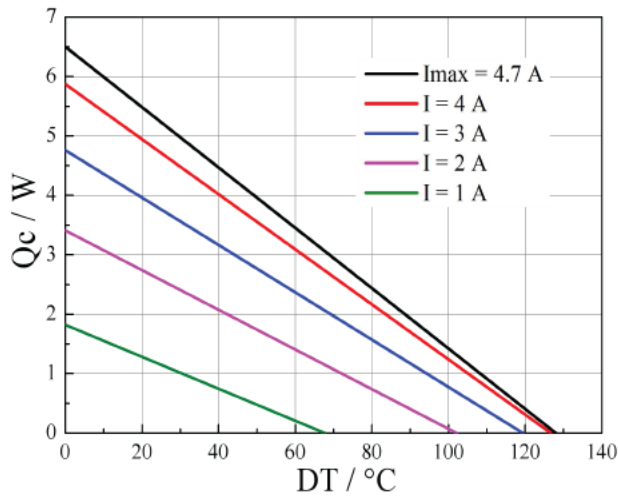
Eg. TF01: Thickness 7.7± 0.3 (mm) and Flatness/ Parallelism : 0.05/0.05(mm)



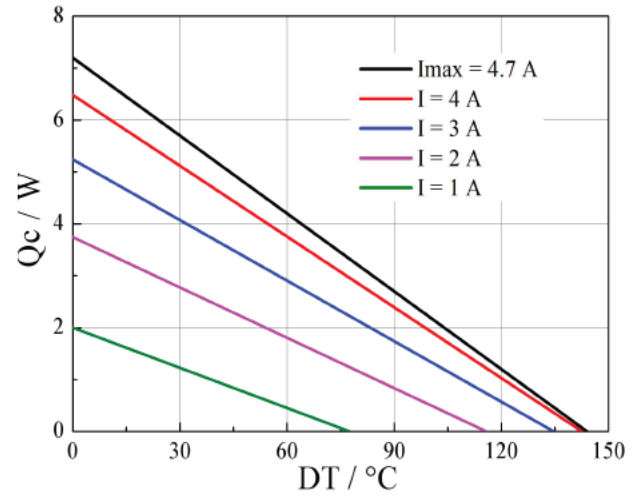
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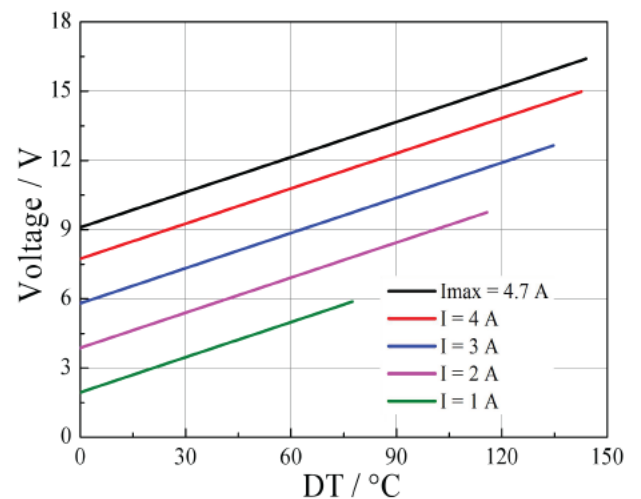
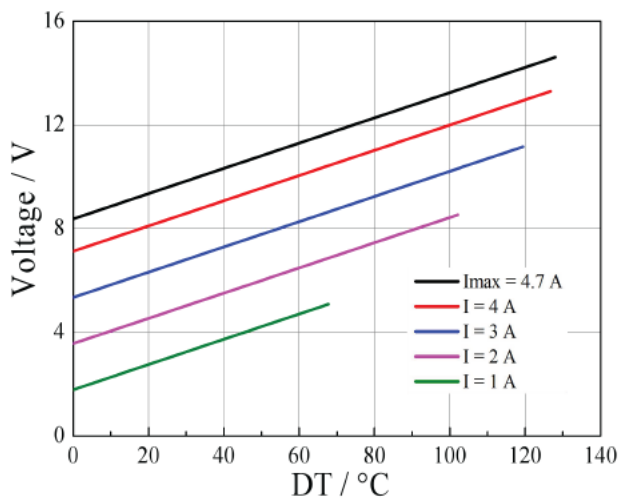
Performance Curves at  $T_h=27\text{ }^\circ\text{C}$



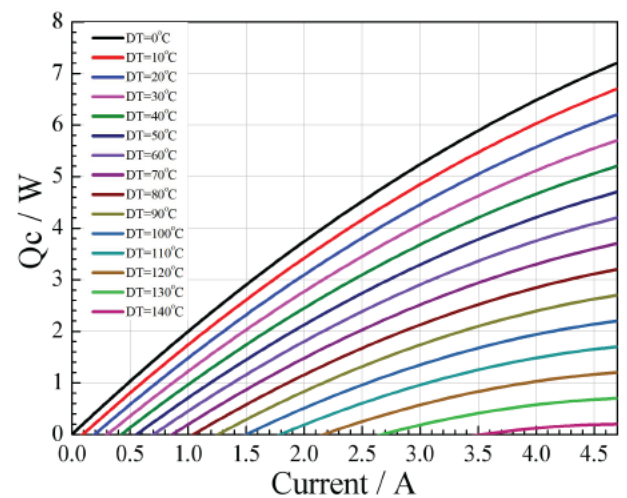
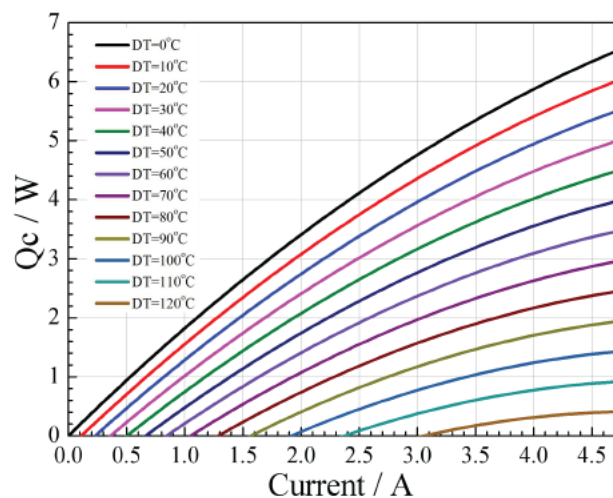
Performance Curves at  $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$



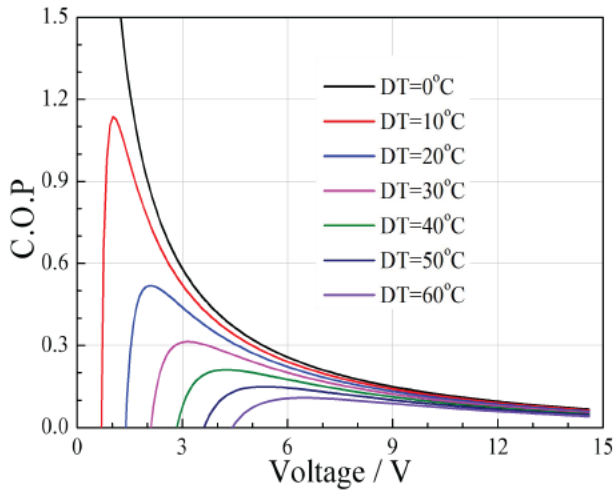
Standard Performance Graph  $Q_c = f(I)$

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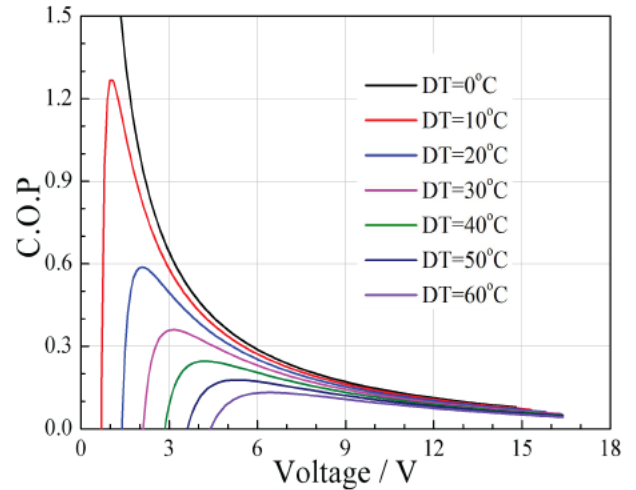


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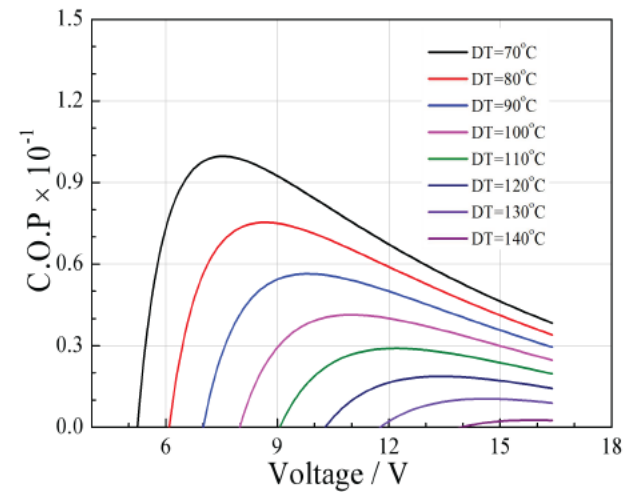
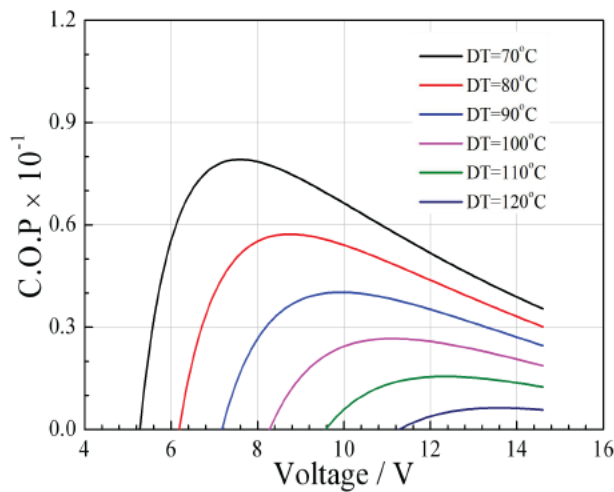
## Performance Curves at Th=27 °C



## Performance Curves at Th=50 °C



Standard Performance Graph COP = f(V) of DT ranged from 0 to 60 °C



Standard Performance Graph COP = f(V) of DT ranged from 70 to 120/140 °C

**Remark:** The coefficient of performance (COP) is the cooling power  $Q_c$ /Input power ( $V \times I$ ).

## 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 or storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC

**Note:** All specifications subject to change without notice.