

# Specification of Thermoelectric Module

TEC3-69-29-11-045

## Description

The TEC3-69-29-11-045 is a multistage module designed for greater temperature differential cooling, good for cooling and heating up to 100 °C applications. It is a 69-29-11 couples module in size of 13mm×8.6mm (top)/28.3mm ×21.7mm (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

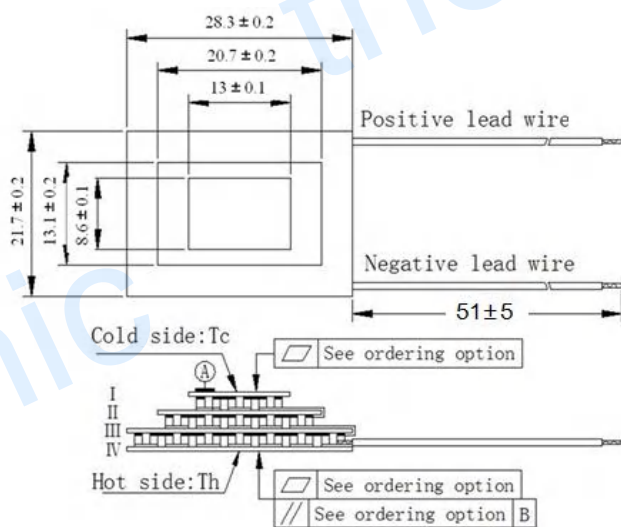
## Application

- 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)	112	126	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	7.82	8.50	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (Amps)	4.5	4.5	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	6.95	7.44	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	1.54	1.65	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 (T<sub>melt</sub>=138°C)
2. T200: CuAgSn (T<sub>melt</sub> = 217°C)
3. T240: SbSn (T<sub>melt</sub> = 240°C)

### B. Sealant:

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

### 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 metalized)
2. Metalized

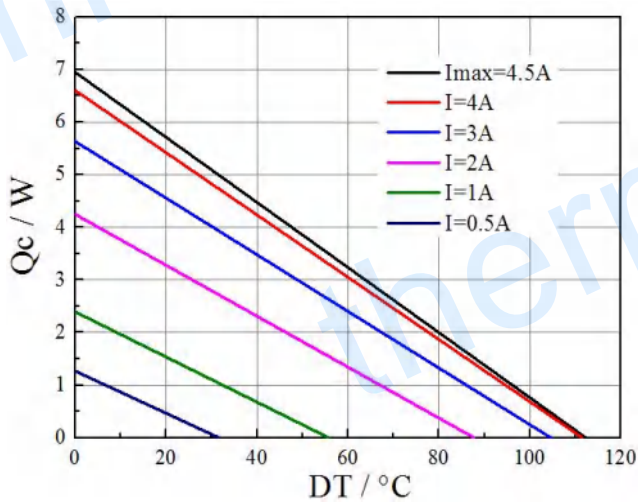
## Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 10.8± 0.3	0: 0.07/0.07	51±5/Specify

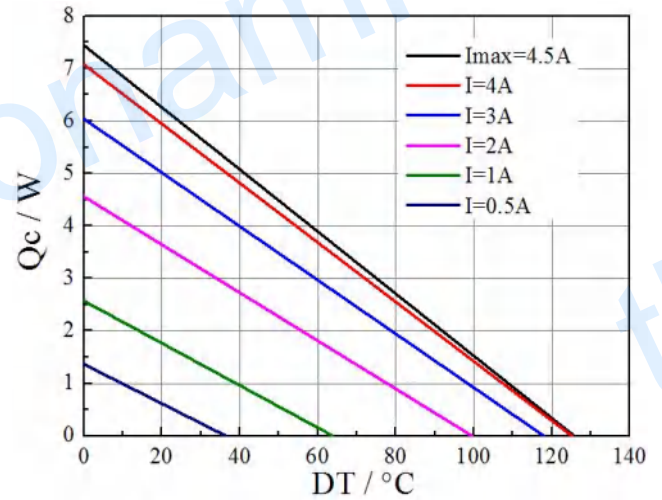
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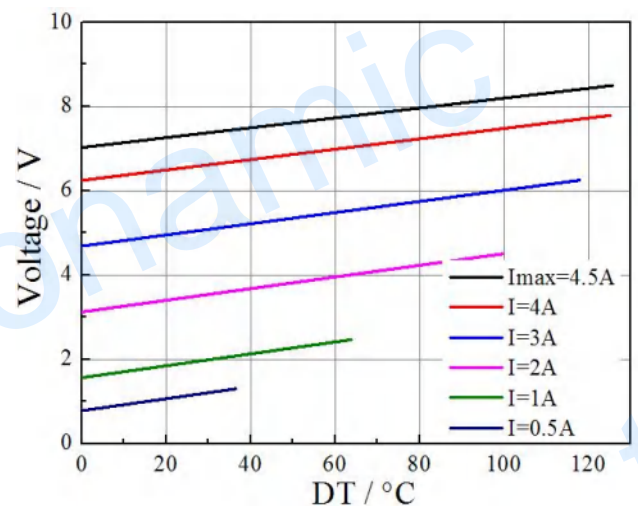
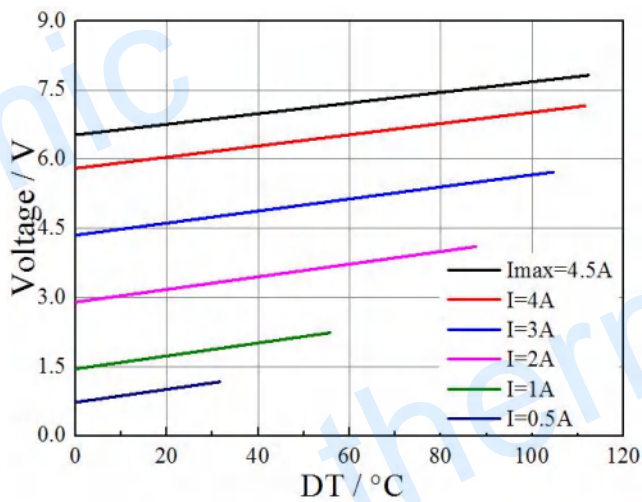
## Performance Curves at Th=27 °C



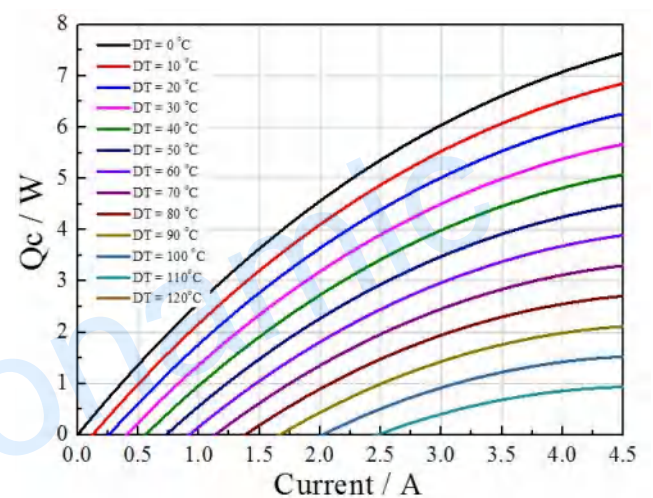
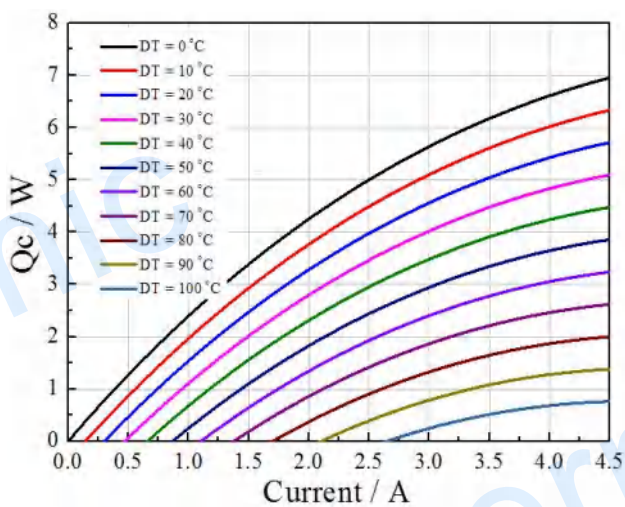
## Performance Curves at Th=50 °C



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$

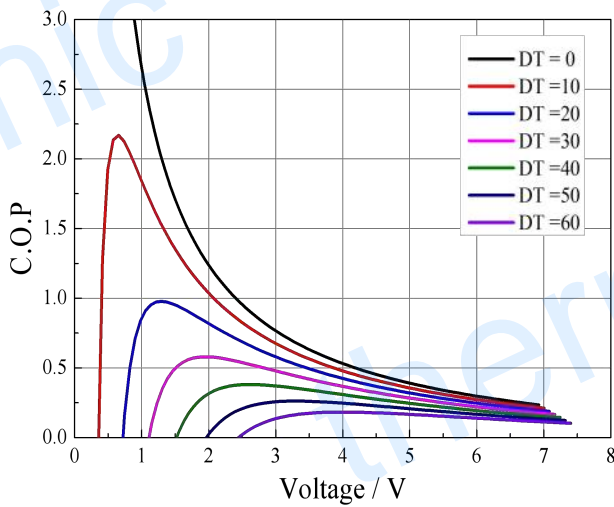


Standard Performance Graph  $Q_c = f(I)$

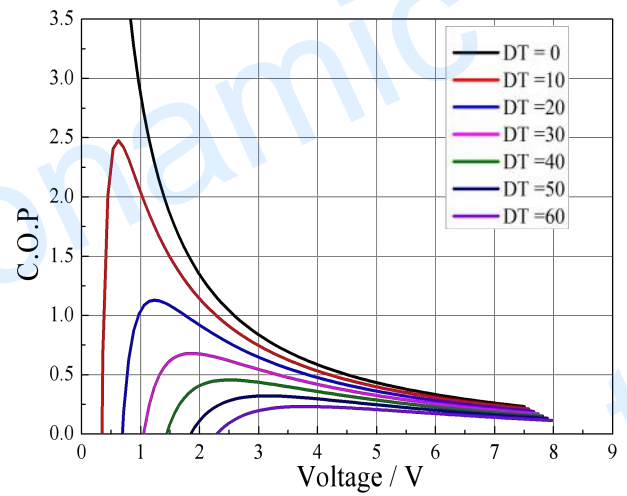
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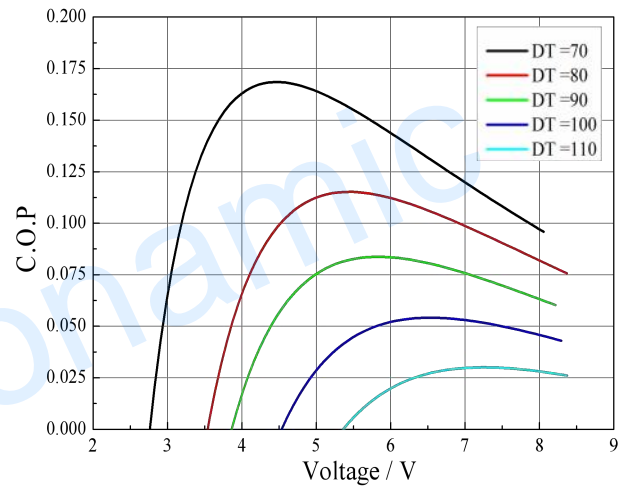
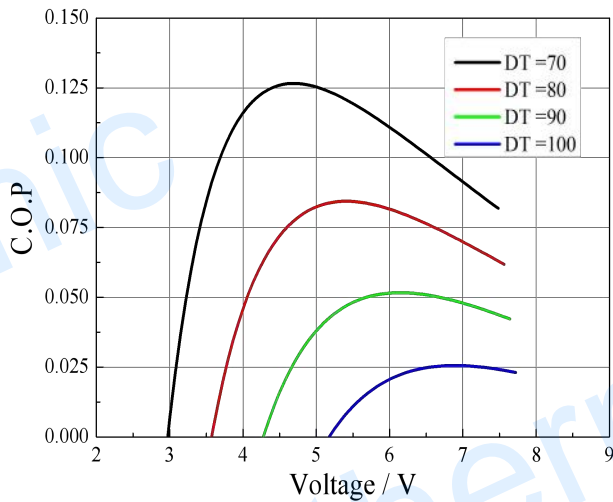
Performance Curves at Th=27 °C



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 100/110 °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
- Storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC

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