

# Specification of Thermoelectric Module

**TEFC2-59-31-02**

## Description

The TEFC2-59-31-02 is a multistage module designed for greater temperature differential cooling, good for cooling and heating up to 180 °C applications. It is a 59-31 couples module in size of 12 mm × 12 mm (top) / 15 mm × 18 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

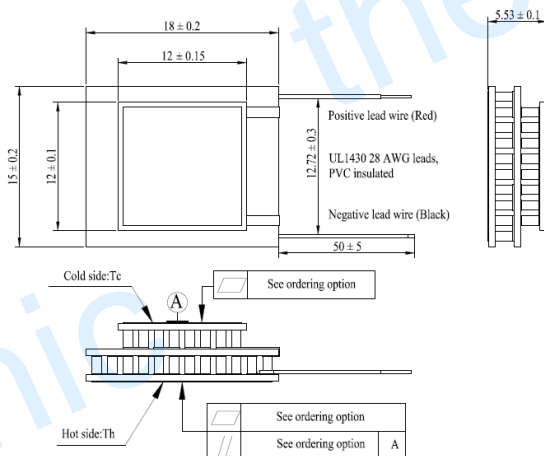
## Application

- 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)	94	105	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	6.9	7.6	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (Amps)	1.7	1.7	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	4.4	4.9	Cooling capacity at cold side of the module under DT = 0 °C
AC resistance (Ohms)	4.8	5.2	The module resistance is tested under AC
Tolerance (%)	± 5		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: 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:

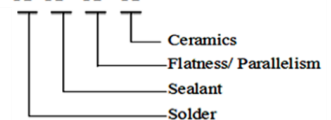
1. Blank ceramics (not metallized)
2. Metallized (Au plating)

## Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 6.1 ± 0.40	0: 0.050/0.050	50 ±5/Specify
TF	1: 6.1 ± 0.30	1: 0.030/0.030	50 ±5/Specify
TF	2: 6.1 ± 0.15	2: 0.015/0.015	50 ±5/Specify
Eg. TF01: Thickness 6.1 ± 0.40 (mm) and Flatness/ Parallelism 0.030/0.030			

## Naming for the Module

TEFC2-59-31-02 - X-X-X-X



TEFC2-59-31-02-T100-NS-TF01-AIO

T100: BiSn(T<sub>melt</sub>=138°C)

NS: No sealing

AIO: Alumina white 96%

TF01: Thickness ± 0.40 (mm) and Flatness/ Parallelism 0.030/0.030

**Creative technology with fine manufacturing processes provides you the reliable and quality products**

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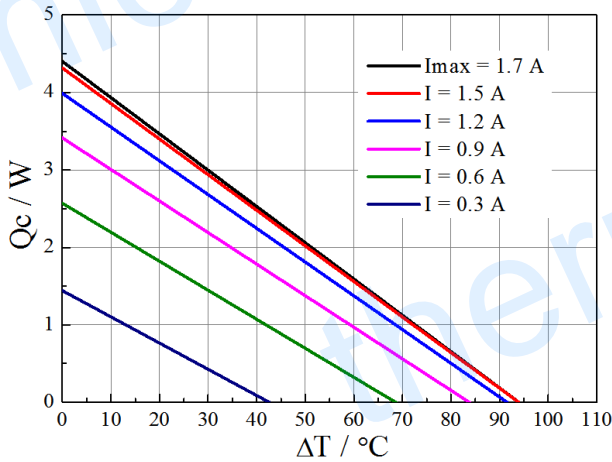
Email: [sales@thermonamic.com.cn](mailto:sales@thermonamic.com.cn)

Web Site: [www.thermonamic.com.cn](http://www.thermonamic.com.cn)

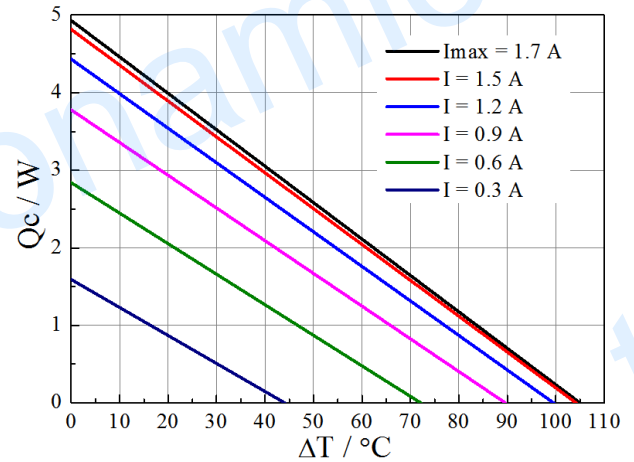
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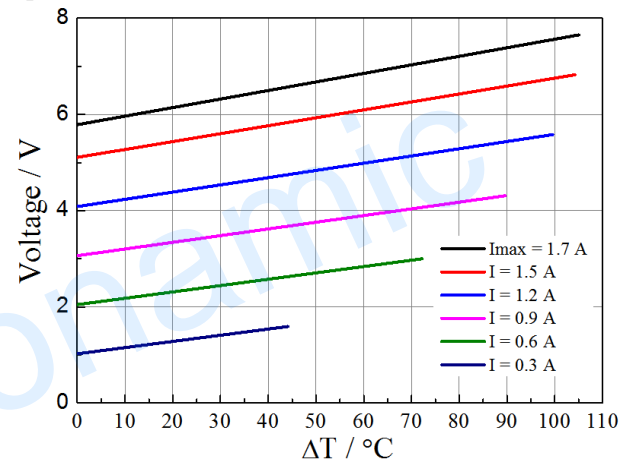
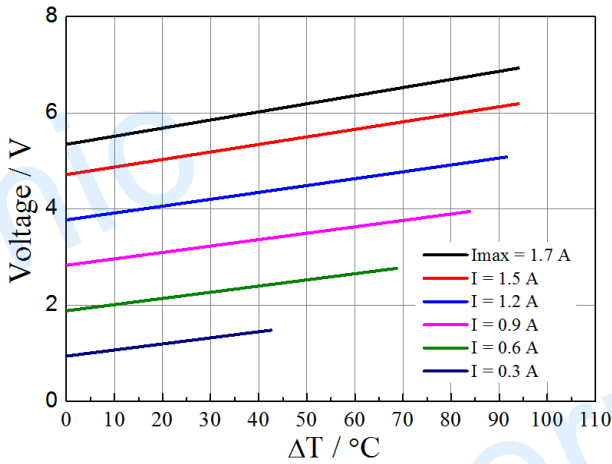
Performance Curves at  $T_h=27^\circ\text{C}$



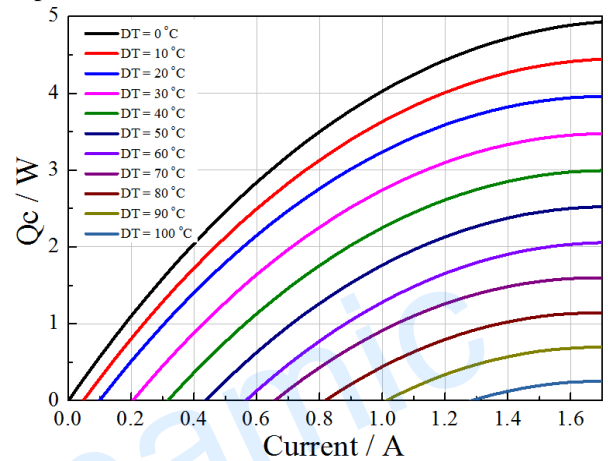
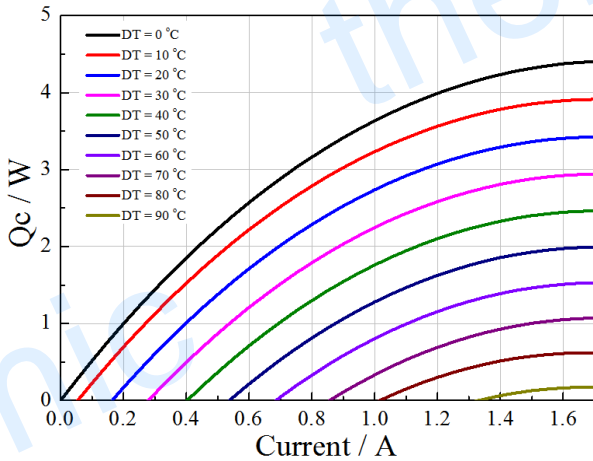
Performance Curves at  $T_h=50^\circ\text{C}$



Standard Performance Graph  $Q_c = f(\Delta T)$



Standard Performance Graph  $V = f(\Delta T)$



Standard Performance Graph  $Q_c = f(V)$

## Operation Cautions

- Cold side of the module stucked on the object being cooled
- Hot side of the module mounted on a heat radiator
- Operation or storage module below  $100^\circ\text{C}$

- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC