

# Specification of Thermoelectric Module

TES2-31-17-20

## Description

The TES2-31-17-20 is a multistage module designed for greater temperature differential cooling, good for cooling and heating up to 100 °C applications. It is a 17-31 couples module in size of 11.5mm x 11.5mm (top)/15mm x 15mm (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

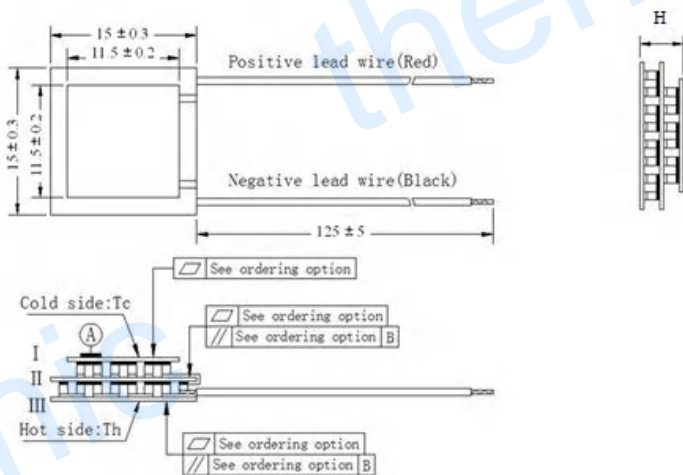
- Infrared (IR) Sensors
- CCD Sensor
- Gas Analyzers
- Calibration Equipment
- CPU cooler and scientific instrument
- Photonic and medical systems
- Guidance Systems

## Performance Specification Sheet

Th (°C)	27	50	Hot side temperature at environment: dry air, N <sub>2</sub>
DT <sub>max</sub> (°C)	91	101	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	3.6	4.0	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (Amps)	2.3	2.3	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	3.9	4.3	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	1.45	1.6	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

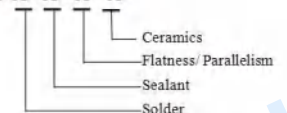
## Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:6.6± 0.2	0: Face II 0.05/0.05, Face III 0.05/0.05	125 ± 5 / Specify
TF	1:6.6± 0.1	1: Face II 0.02/0.02, Face III 0.02/0.02	125 ± 5 / Specify

Eg. TF00: Thickness 6.6 ± 0.2(mm) and Flatness Face II 0.05/0.05, Face III 0.05/0.05

## Naming for the Module

TES2-31-17-20-X-X-X-X



TES2-31-17-20- T100 - NS - TF00 - AlO  
 T100: Solder, BiSn (Melting Point=138 °C)  
 NS: No sealing AlO: Alumina white 96%  
 TF01: Thickness ± 0.3(mm) and Flatness/Parallelism 0.1/0.1mm

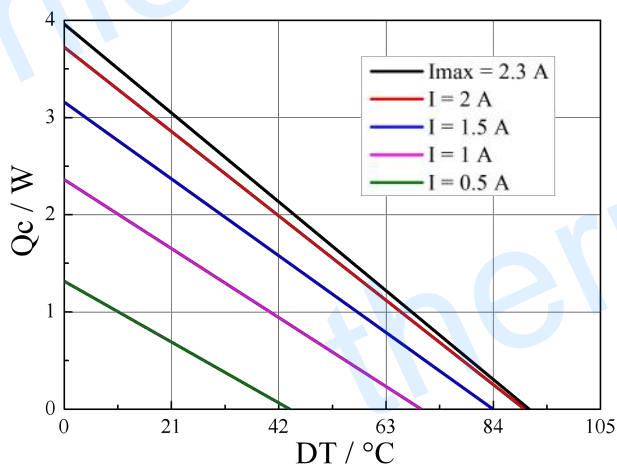
Creative technology with fine manufacturing processes provides you the reliable and quality products

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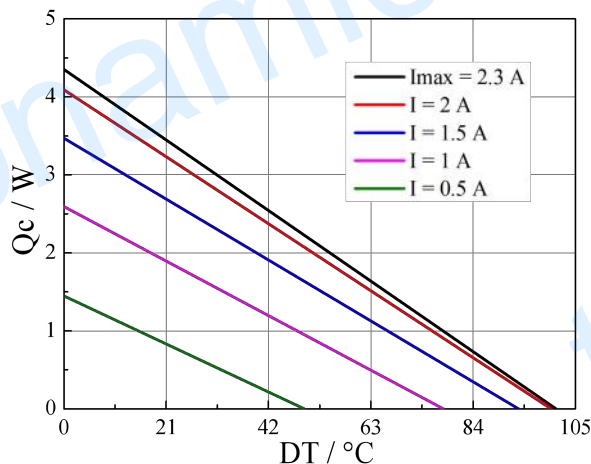
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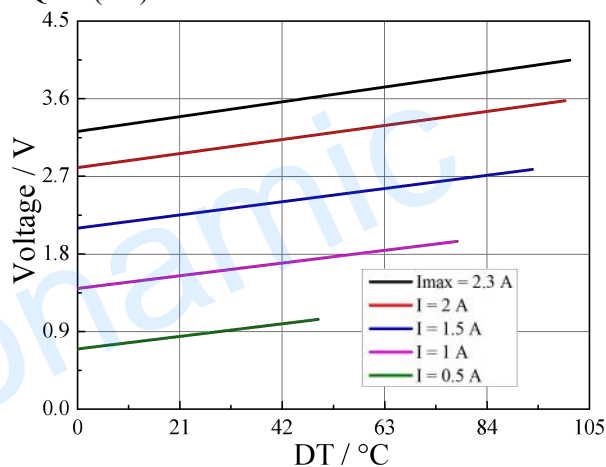
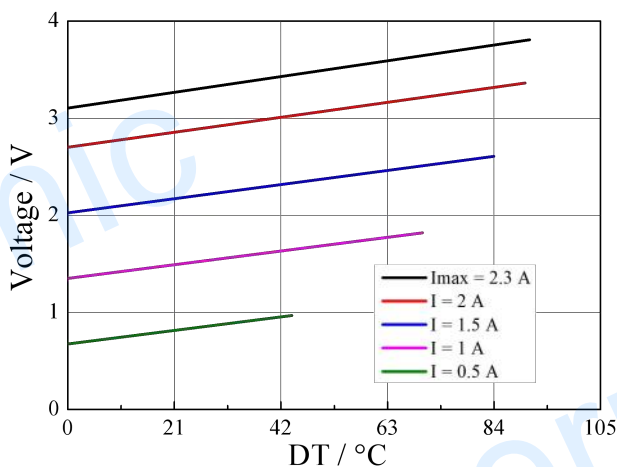
## Performance Curves at $T_h=27\text{ }^\circ\text{C}$



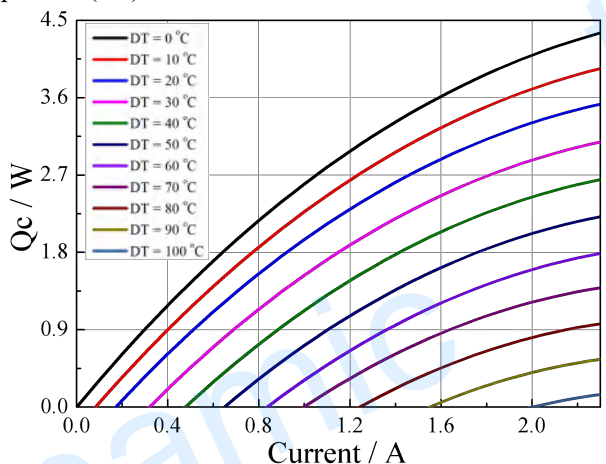
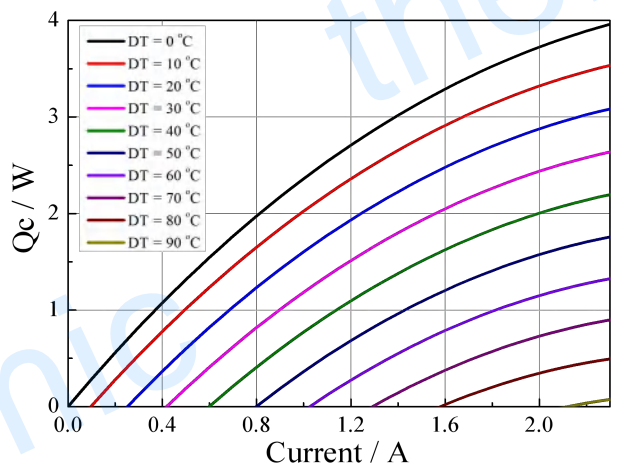
## Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$



Standard Performance Graph  $Q_c = f(V)$

## 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  $100\text{ }^\circ\text{C}$
- Operation below  $I_{max}$  or  $V_{max}$
- Work under DC