

# Specification of Thermoelectric Module

## TEC2-199-199-10

### Description

The TEC2-199-199-10 is a multistage module designed for greater temperature differential cooling, good for cooling and heating up to 100 °C applications. It is a 199-199 couples module in size of 40 mm × 40 mm (top) / 40 mm × 40 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

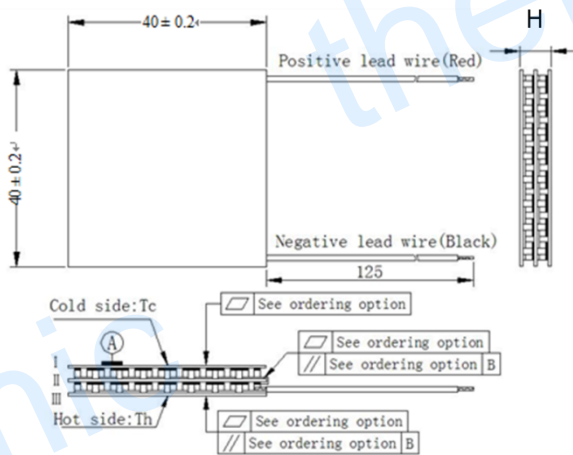
### Application

- 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)	93	104	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	24.5	26.6	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	10.2	10.2	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	98.6	108.3	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (ohms)	2.3	2.6	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: 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)

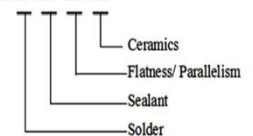
### Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 6.3 ± 0.3	0: Face II 0.010/0.010, Face III 0.015/0.015	125 ± 1 / Specify
TF	1: 6.3 ± 0.2	1: Face II 0.008/0.008, Face III 0.010/0.010	125 ± 1 / Specify
TF	2: 6.3 ± 0.1	2: Face II 0.005/0.005, Face III 0.008/0.008	125 ± 1 / Specify

Eg. TF01: Thickness 6.3 ± 0.3(mm) and Flatness Face II 0.008/0.008, Face III 0.010/0.010

### Naming for the Module

TEC2-199-199-10-X-X-X-X



TEC2-199-199-10-T200-NS-TF01-AIO

T200: CuSn (T<sub>melt</sub>=227°C)

NS: No sealing

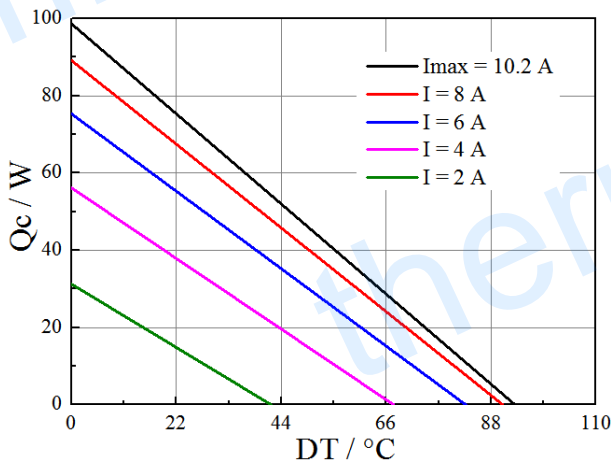
AIO: Alumina white 96%

TF01: Thickness ±0.3(mm) and Flatness Face II 0.008/0.008, Face III 0.010/0.010

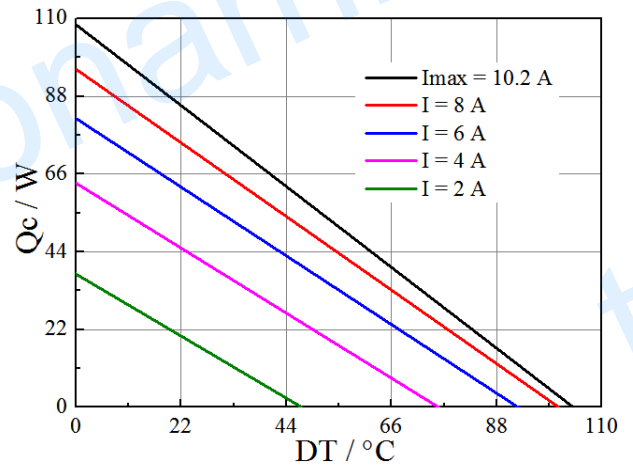
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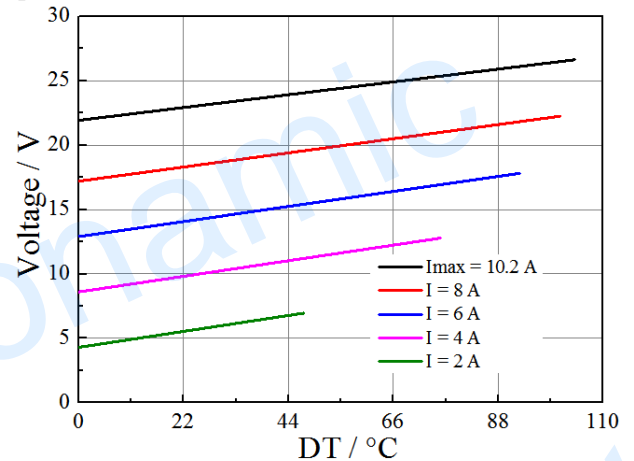
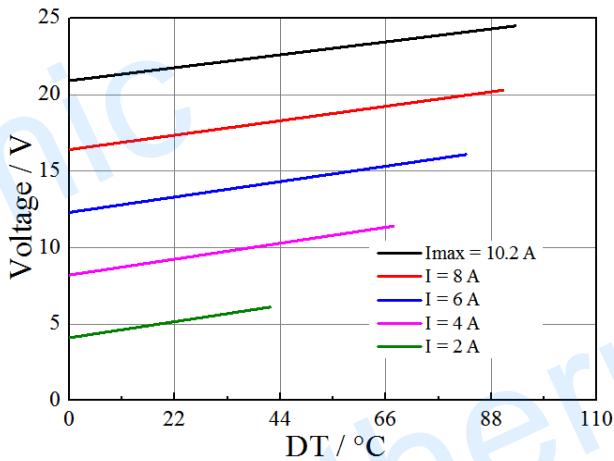
## Performance Curves at Th=27 °C



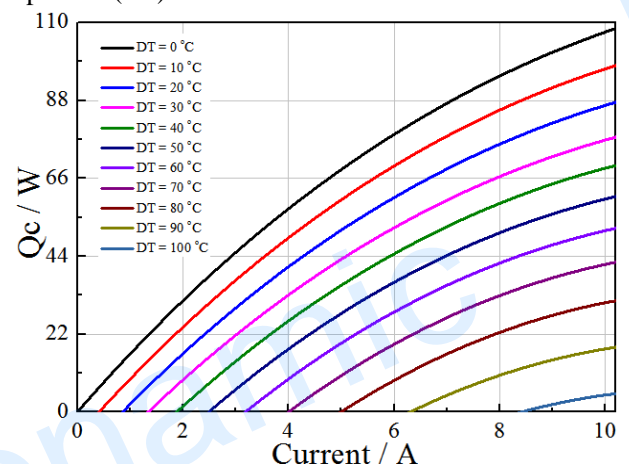
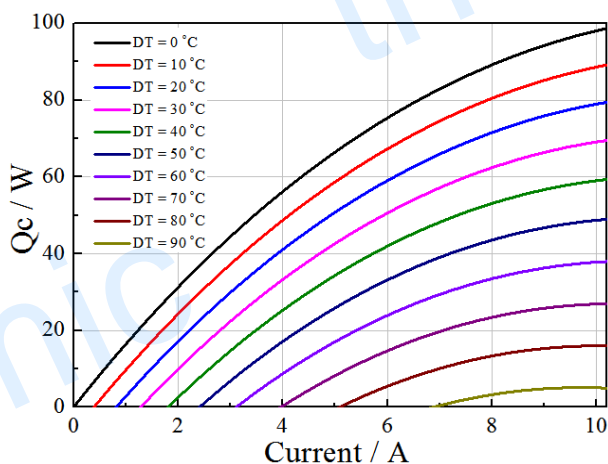
## Performance Curves at Th=50 °C



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$



Standard Performance Graph  $Q_c = f(I)$

## Operation Cautions

- Cold side of the module stuck on the object being cooled
- Hot side of the module mounted on a heat radiator
- Work under DC
- Storage module below 100 °C
- Operation below  $I_{max}$  or  $V_{max}$