

# Specification of Thermoelectric Module

## TES1-03120

### Description

The 31 couples, 12mmx12mm size module is a single stage module which is designed for cooling and heating up to 100°C applications. If higher operation or processing temperature is required, please specify, we can design and manufacture the custom made module according to your special requirements.

### Features

- 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

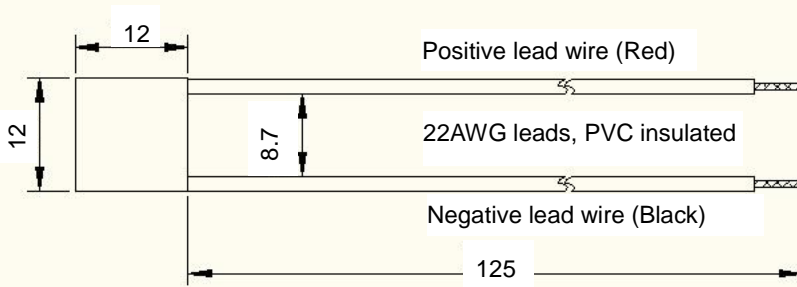
### Application

- Food and beverage service refrigerator
- Portable cooler box for cars
- Liquid cooling
- Temperature stabilizer
- CPU cooler and scientific instrument
- Photonic and medical systems

### Performance Specification Sheet

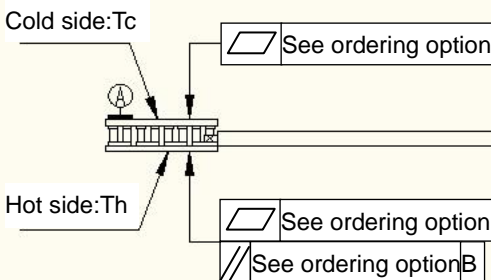
Th(°C)	27	50	Hot side temperature at environment: dry air, N <sub>2</sub>
DT <sub>max</sub> (°C)	68	76	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	3.78	4.23	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	2.4	2.4	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	5.7	6.3	Cooling capacity at cold side of the module under DT=0°C
AC resistance(ohms)	1.3~1.5	1.43~1.66	The module resistance is tested under AC

### Geometric Characteristics Dimensions in millimeters



### Sealing Option

Suffix	Sealant
NS	No sealing
SS	Silicone sealant
EPS	Epoxy
OS	Customer specify sealing other than above



### Ordering Option

Suffix	Thickness (mm)	Flatness/Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0: 3.4±0.1	0: 0.020/0.020	125±1/Specify
TF	1: 3.4±0.05	1: 0.015/0.015	125±1/Specify
TF	2: 3.4±0.03	2: 0.010/0.010	125±1/Specify
Eg. TF01: Thickness 3.4±0.1(mm) and Flatness 0.015/0.015(mm)			

### Additional

Ceramic material: Alumina (Al<sub>2</sub>O<sub>3</sub>, white 96%)  
Solder tinning: Bismuth Tin (BiSn) M.P. 138°C

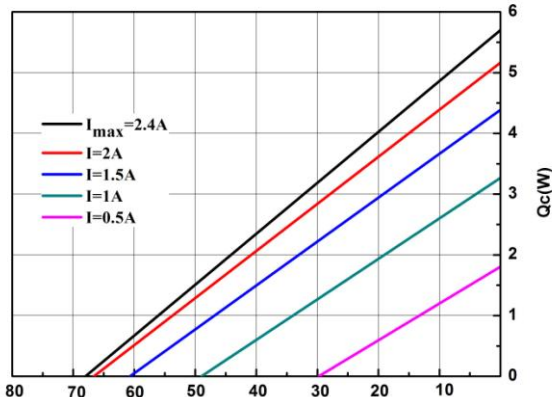
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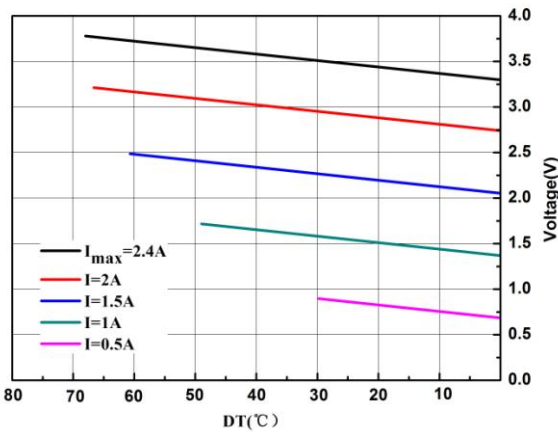
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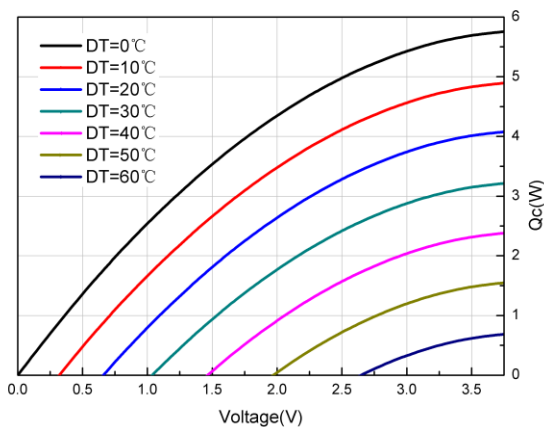
## Performance Curves at Th=27°C



The chart for  $Q_c$  Vs  $DT$  under various currents

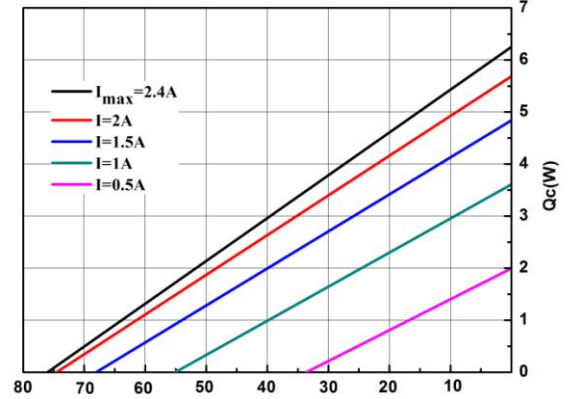


The chart for Voltage Vs  $DT$  under various currents

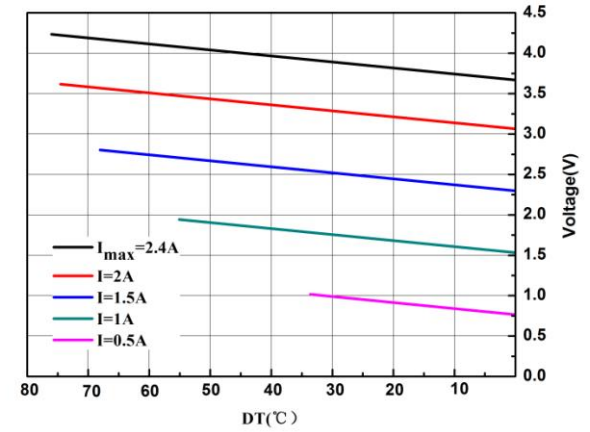


The chart for  $Q_c$  Vs Voltage under various  $DT$

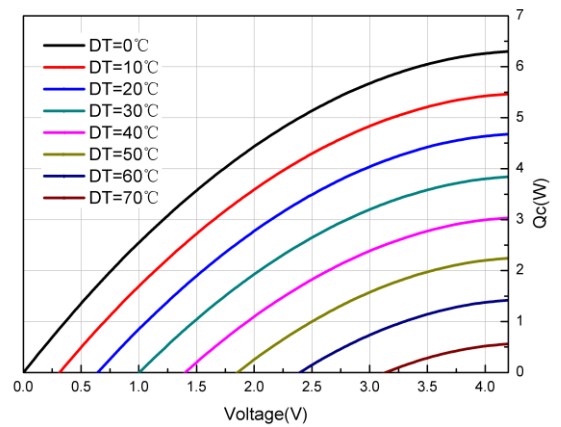
## Performance Curves at Th=50°C



The chart for  $Q_c$  Vs  $DT$  under various currents



The chart for Voltage Vs  $DT$  under various currents



The chart for  $Q_c$  Vs Voltage under various  $DT$

## Operation Cautions

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