

Specification of Thermoelectric Module

TES1-19970

Description

The 199 couples, 30 mm × 30 mm size module which is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70 °C, designed for superior 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

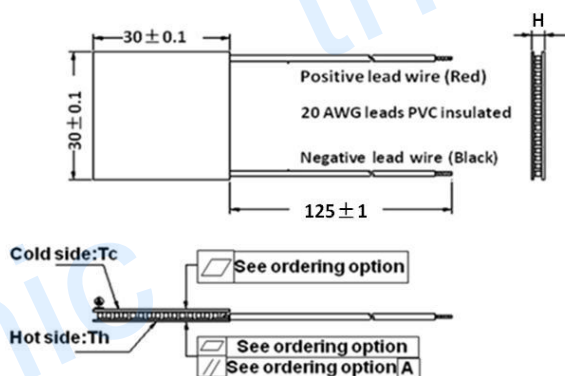
Application

- 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 ₂
DT _{max} (°C)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U _{max} (Voltage)	25.6	27.4	Voltage applied to the module at DT _{max}
I _{max} (amps)	7.0	7.0	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	112.2	122.9	Cooling capacity at cold side of the module under DT = 0 °C
AC resistance (Ohms)	2.72	2.93	The module resistance is tested under AC
Tolerance (%)	± 10		For thermal and electricity parameters

Geometric Characteristics Dimensions in millimeters



Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:2.8 ± 0.1	0:0.05/0.05	125 ± 1/Specify
TF	1:2.8 ± 0.05	1:0.025/0.025	125 ± 1/Specify
TF	2:2.8 ± 0.025	2:0.015/0.015	125 ± 1/Specify

Eg. TF02: Thickness 2.8 ± 0.1(mm) and Flatness 0.025 / 0.025 (mm)

A. Solder:

1. T100: BiSn (Tmelt=138°C)
2. T200: CuSn (Tmelt = 227 °C)

B. Sealant:

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

C. Ceramics:

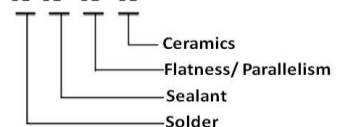
1. Alumina (Al₂O₃, white 96%)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

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

Naming for the Module

TES1- 19970- X -X - X - X



TES1- 19970-T100-NS -TF01 -AlO

T100: BiSn(Tmelt=138°C)

NS: No sealing

AlO: Alumina, white 96%

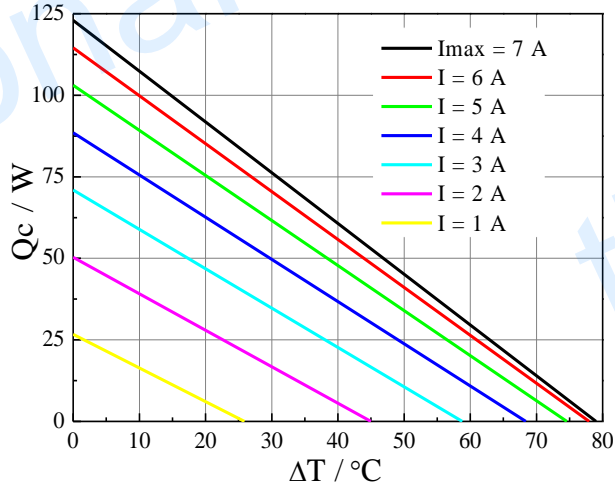
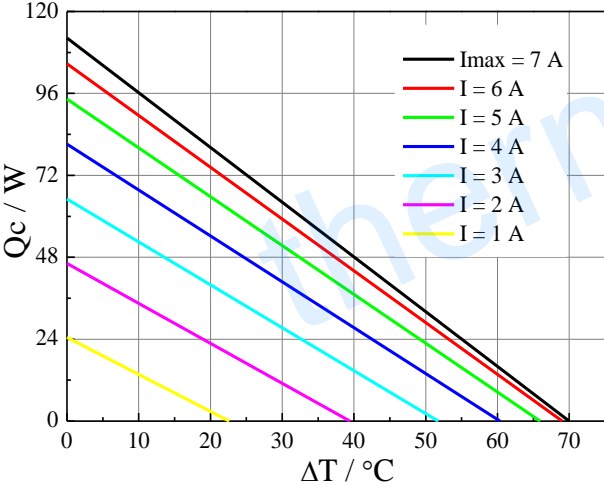
TF01: Thickness ± 0.1 (mm) and Flatness/ Parallelism 0.025/0.025 (mm)

Specification of Thermoelectric Module

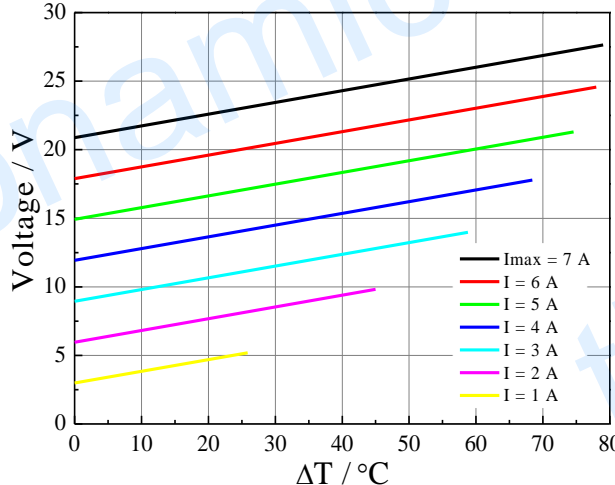
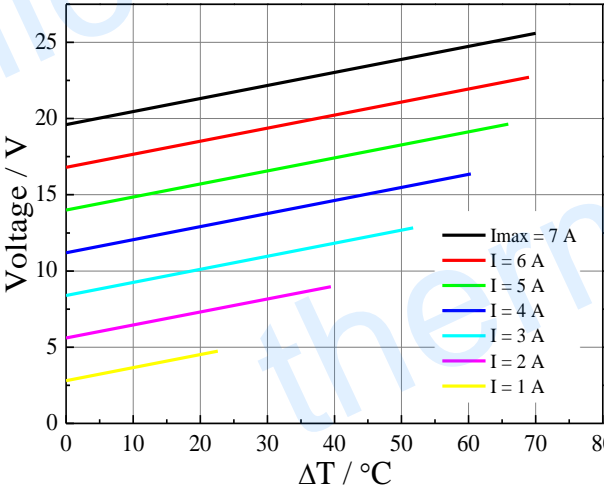
TES1-19970

Performance Curves at Th=27 °C

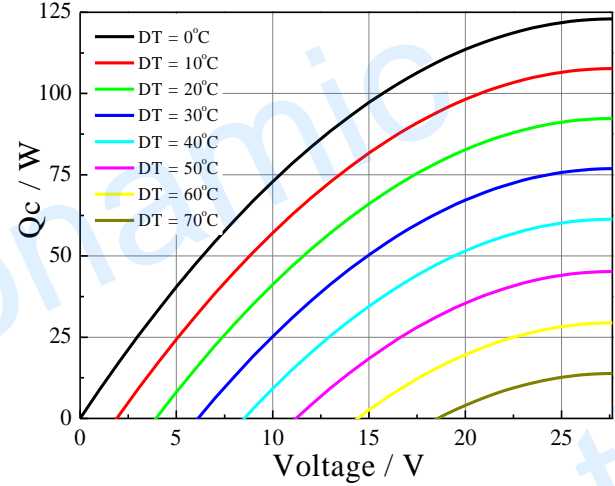
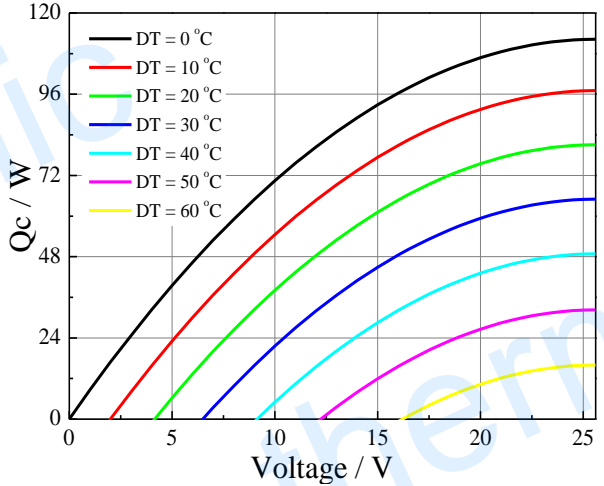
Performance Curves at Th=50 °C



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



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

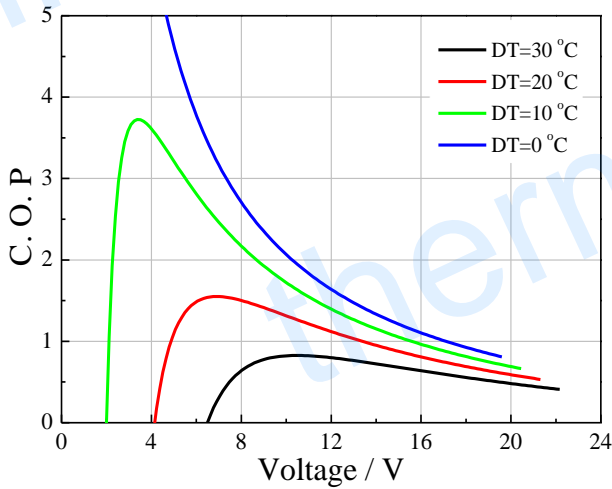


Standard Performance Graph $Q_c = f(V)$

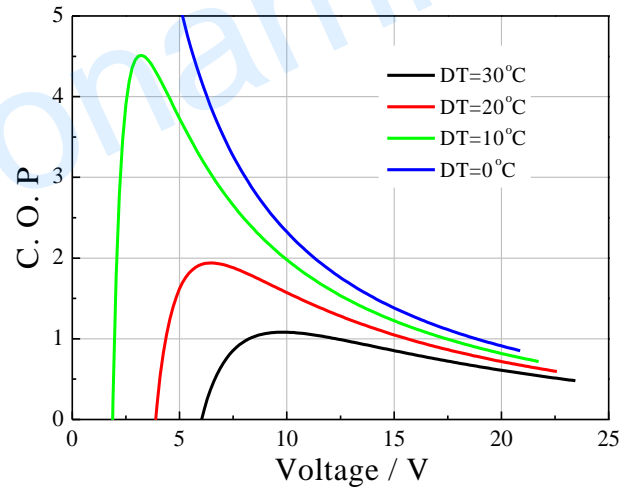
Specification of Thermoelectric Module

TES1-19970

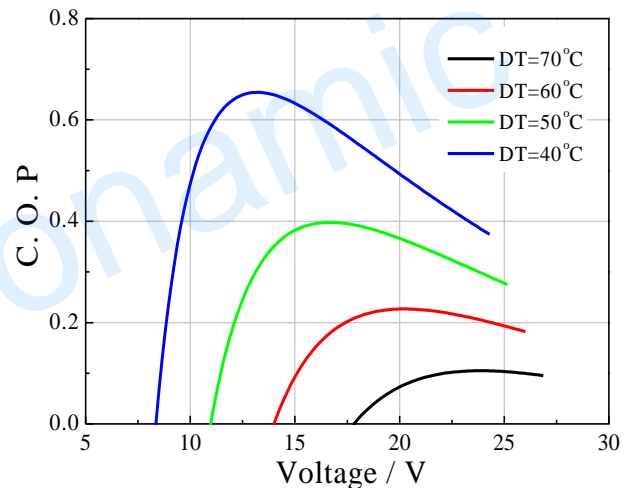
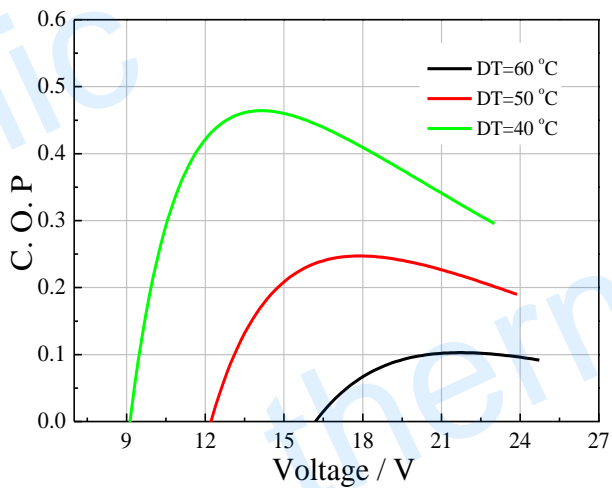
Performance Curves at Th=27 °C



Performance Curves at Th=50 °C



Standard Performance Graph COP = f(V) of ΔT ranged from 0 to 30 °C



Standard Performance Graph COP = f(V) of ΔT ranged from 40 to 60/70 °C

Remark: The coefficient of performance (COP) is the cooling power Q_c /Input power ($V \times I$).

Operation Cautions

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