Specification of Thermoelectric Module

TEC1-03105

Description

The 31 couple, 20mm × 20mm size single module is made of high performance ingots to achieve superior cooling performance at 70ºC or higher delta Tmax. Designed for superior cooling and heating applications. Beyond the standard below, we use higher temperature solder which allows the module to work up to 190 ºC. We can manufacture custom made modules according to your requirements.

Features

- No moving parts, no noise, and solid-state
- Compact structure, small size, light weight
- Environmental friendly
- RoHS compliant
- Precise temperature control
- Exceptionally reliable in quality, high performance

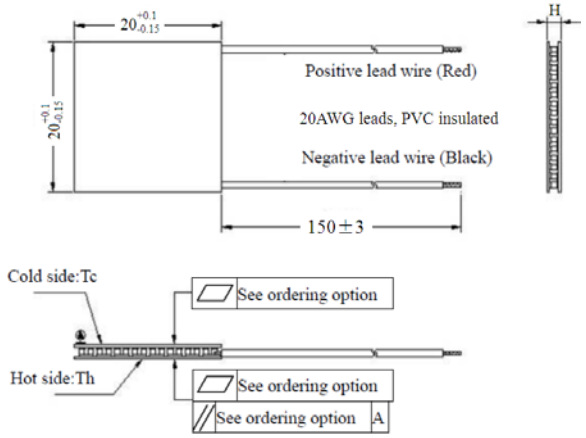
Application

- 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 (ºC)	27	50	Hot side temperature at environment: dry air, N_2
DT_{max} (ºC)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U_{max} (Voltage)	4.0	4.3	Voltage applied to the module at DT_{max}
I_{max} (Amps)	5.4	5.4	DC current through the modules at DT_{max}
Q_{Cmax} (Watts)	13.21	14.43	Cooling capacity at cold side of the module under DT=0 ºC
AC resistance (Ohms)	0.45~0.64	0.5~0.68	Module resistance is tested using AC

Geometric Characteristics Dimensions in millimeters



Manufacturing Options

A. Solder:

1. T100: BiSn (Melting Point=138ºC)
2. T200: CuSn (Melting Point= 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_2O_3, white 96%)(AlO)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

1. Blank ceramics (not metalized)
2. Metalized (Copper-Nickel plating)

Flatness/ Parallelism Option

Suffix	Thickness H / (mm)	Flatness/ Parallelism (mm)	Lead wire length (mm) Standard/Optional length
TF	0:3.9±0.1	0:0.05/0.05	150±3/Specify
TF	1:3.9±0.05	1:0.025/0.025	150±3/Specify
TF	2:3.9±0.03	2:0.015/0.015	150±3/Specify
Eg. TF01: Thickness 3.9±0.1 (mm) and Flatness 0.025/0.025(mm)			
If you need higher tolerance on thickness and flatness, please specify.			

Naming for the Module

TEC1-03105-X-X-X-X

- Ceramics
- Flatness/ Parallelism
- Sealant
- Solder

TEC1-03105 T100 -NS - TF02 - AlO

T100: Solder, BiSn (Melting Point=138 ºC)

NS: No sealing AlO: Alumina white 96%

TF02: Thickness ±0.1 (mm) and Flatness/Parallelism 0.015/0.015(mm)

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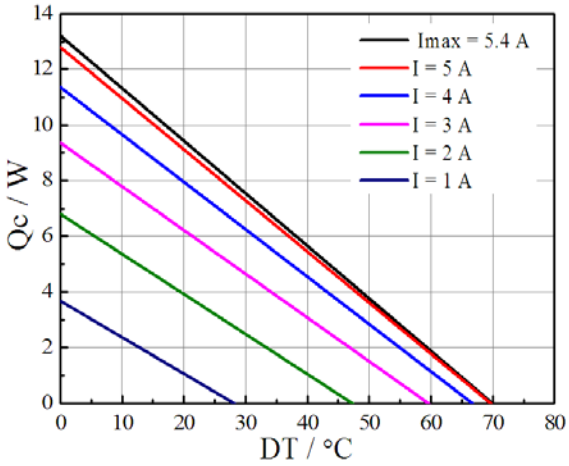
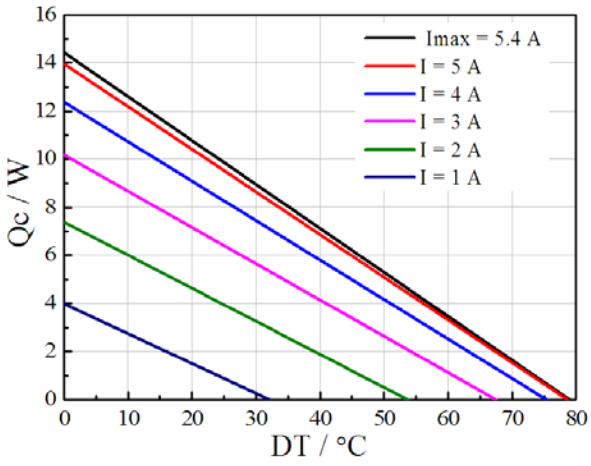
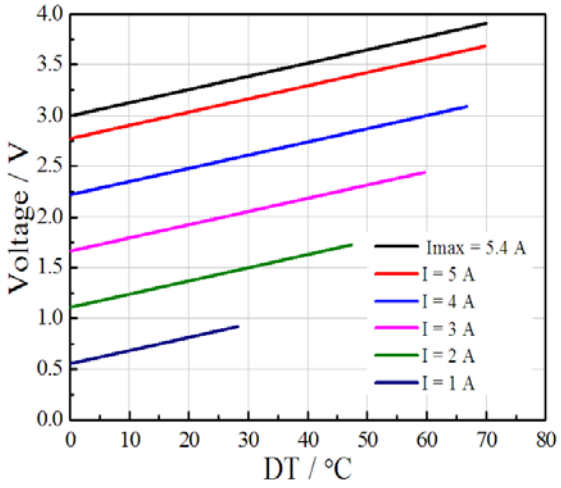
Performance Curves at Th=27 ºC

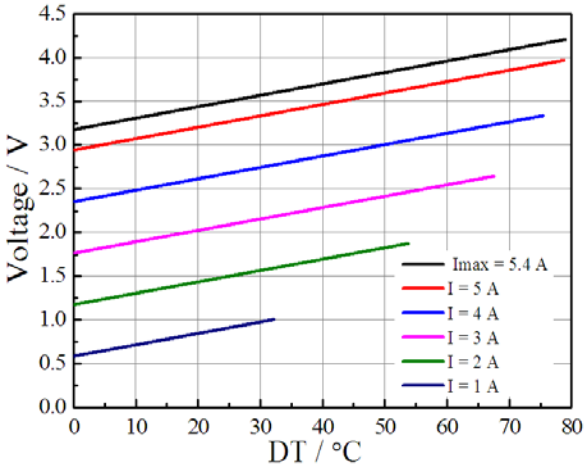


Performance Curves at Th=50 ºC

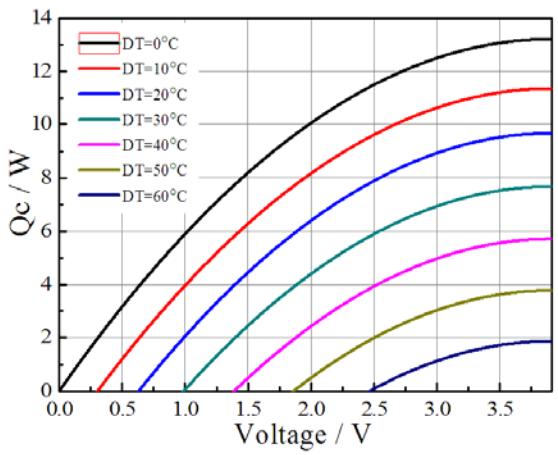


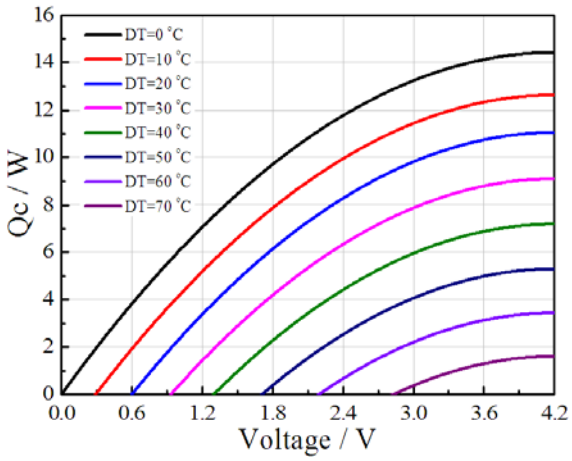
Standard Performance Graph Qc= f(DT)





Standard Performance Graph V= f(DT)





Standard Performance Graph Qc= f(V)

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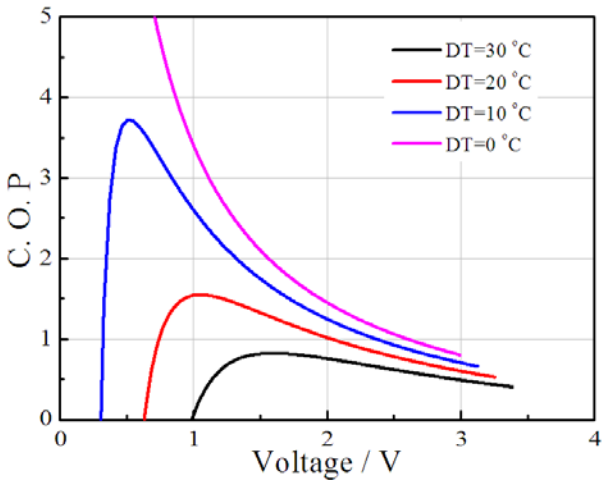
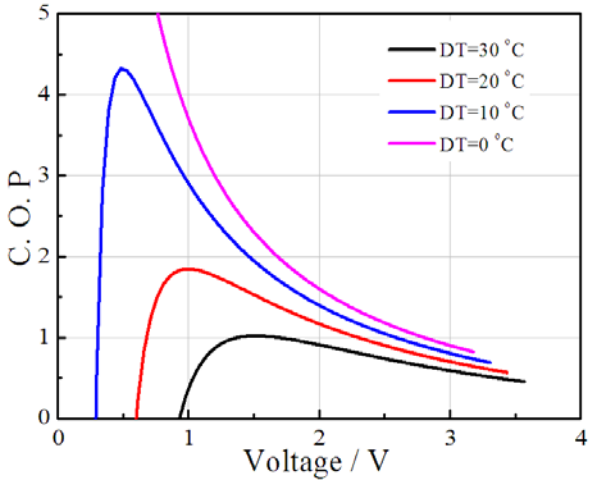
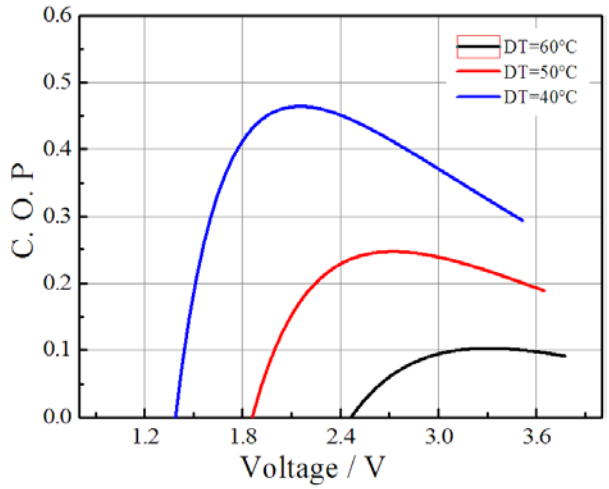
Performance Curves at Th=27 ºC

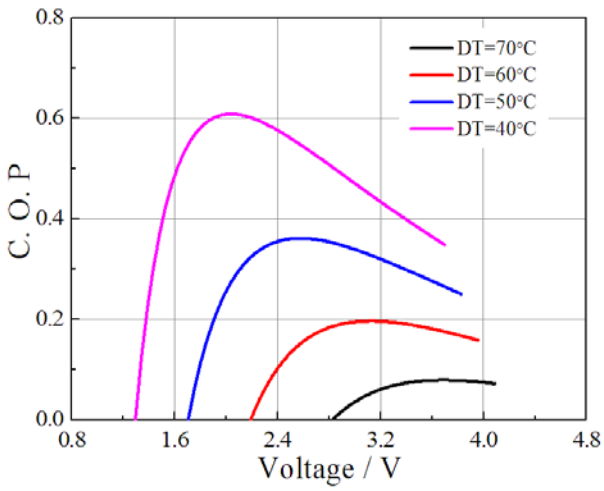


Performance Curves at Th=50 ºC



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





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

Remark: The coefficient of performance (COP) is the cooling power Qc/Input power (V × I).

Operating Conditions

- Cold side of the module applied to the object being cooled
- Hot side of module is mounted to a heat sink
- Operation below I_{max} or V_{max}
- working under DC power