

Specification of Thermoelectric Module

TEFC1-00709

Description

The 7 couples, 3.2 mm × 3.2mm size module which is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 74 °C, designed for superior cooling and heating up to 100/200 °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

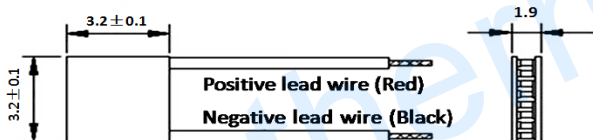
Application

- 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)	74	83	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U _{max} (Voltage)	0.92	0.96	Voltage applied to the module at DT _{max}
I _{max} (Amps)	0.9	0.9	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	0.52	0.57	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	0.77	0.79	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_{melt}=138°C)
2. T200: CuSn (T_{melt} = 227 °C)

B. Sealant:

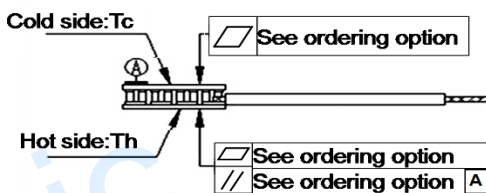
1. NS: No sealing (Standard)
 2. SS: Silicone sealant
 3. EPS: Epoxy sealant
 4. Customer specify sealing
- other than above

C. Ceramics:

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

D. Ceramics Surface Options:

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



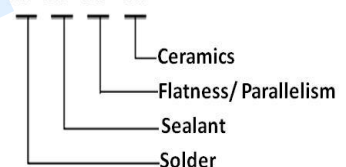
Ordering Option

Suffix	Thickness H (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:1.9± 0.1	0: 0.015/0.015	Connect the Pin
TF	1:1.9 ± 0.05	1: 0.01/0.01	Connect the Pin
TF	2:1.9 ± 0.025	2: 0.008/0.008	Connect the Pin

Eg. TF11: Thickness 1.9± 0.05 (mm) and Flatness 0.01/0.01(mm)

Naming for the Module

TEFC1- 00709- X-X - X - X



TEFC1- 00709-T100-NS -TF11 -AlO

T100: BiSn(T_{melt}=138°C)

NS: No sealing

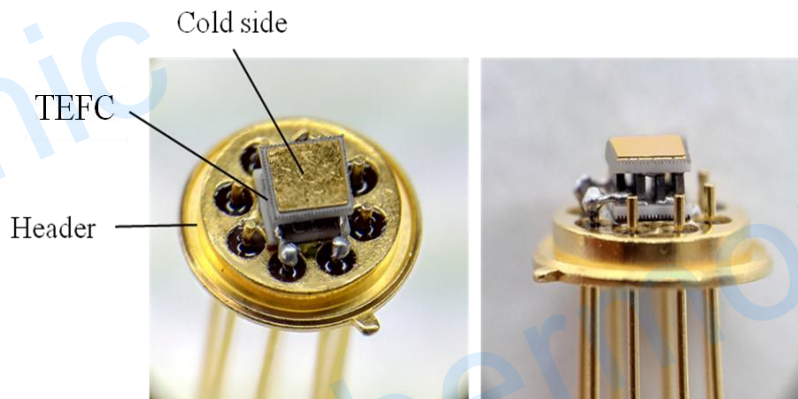
AlO: Alumina, white 96%

TF11: Thickness ± 0.05 (mm) and Flatness/Parallelism 0.01/0.01 (mm)

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Sub-assembly Overview



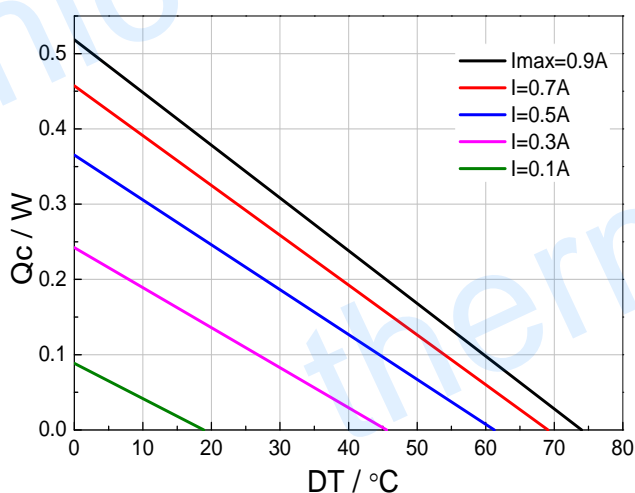
Practical Application

The TEFC module is mounted to a header for cooling in photonic application.

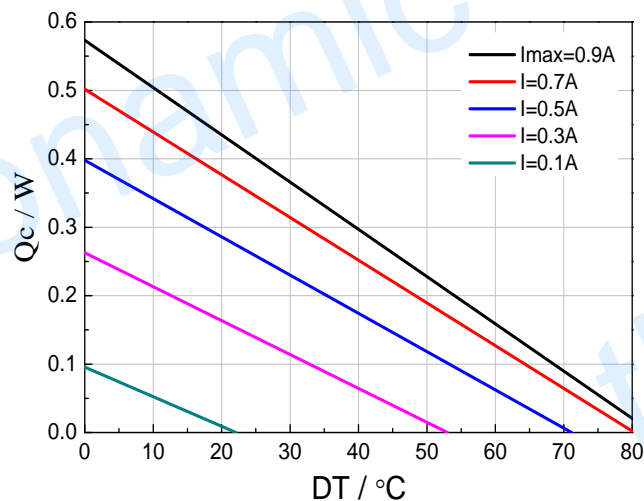
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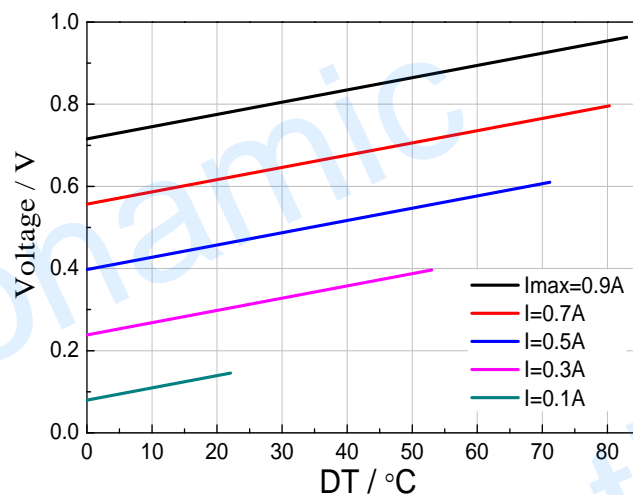
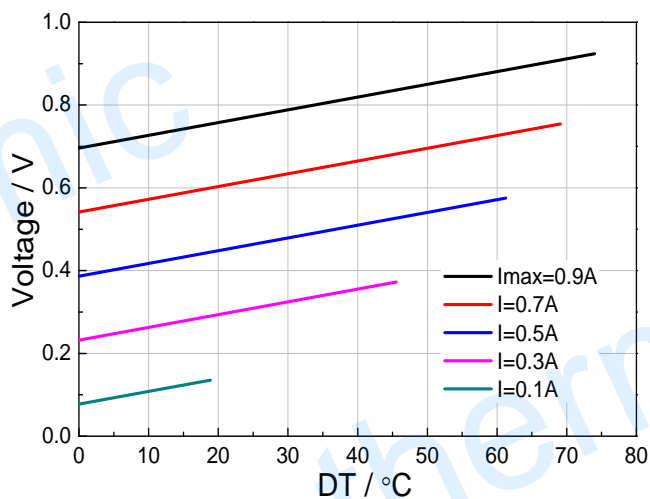
Performance Curves at $T_h=27\text{ }^\circ\text{C}$



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



Standard Performance Graph $Q_c = f(DT)$

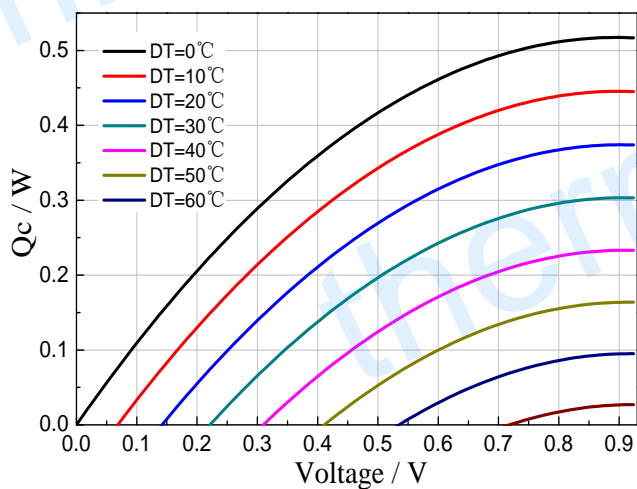


Standard Performance Graph $V = f(DT)$

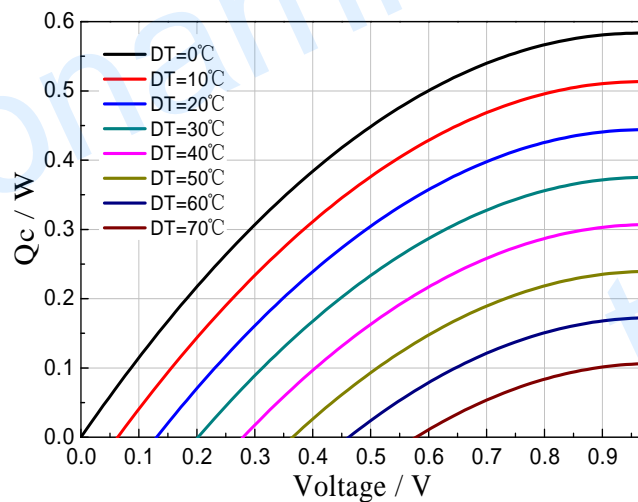
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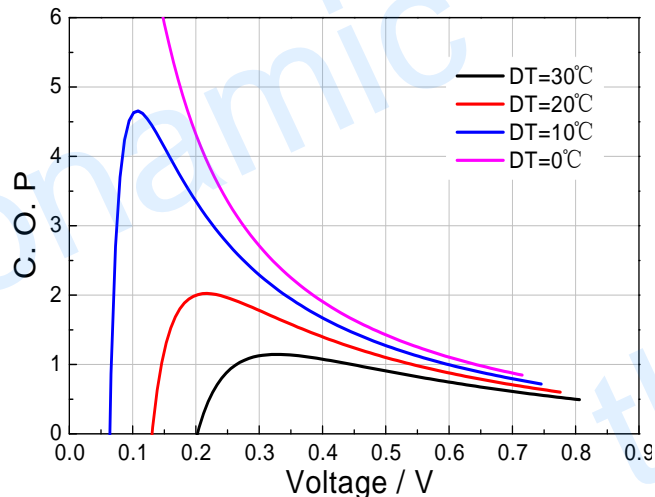
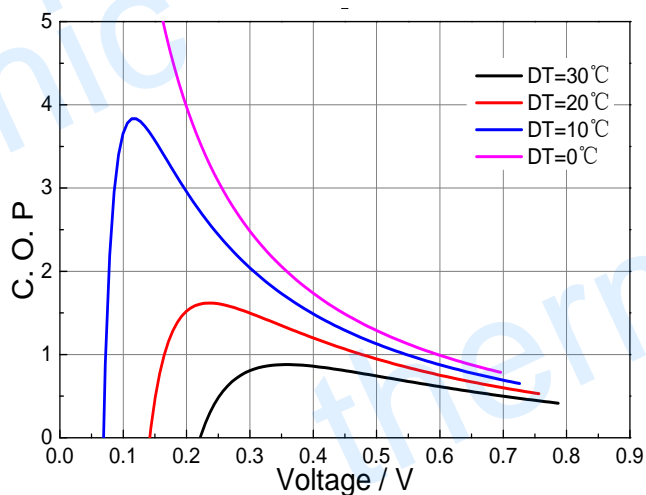
Performance Curves at Th=27 °C



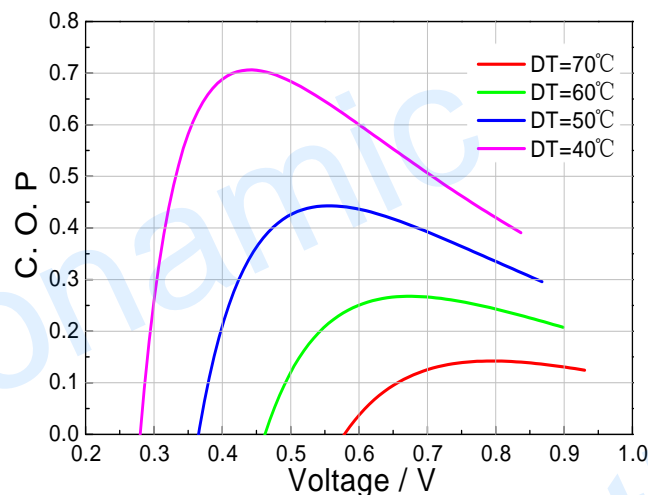
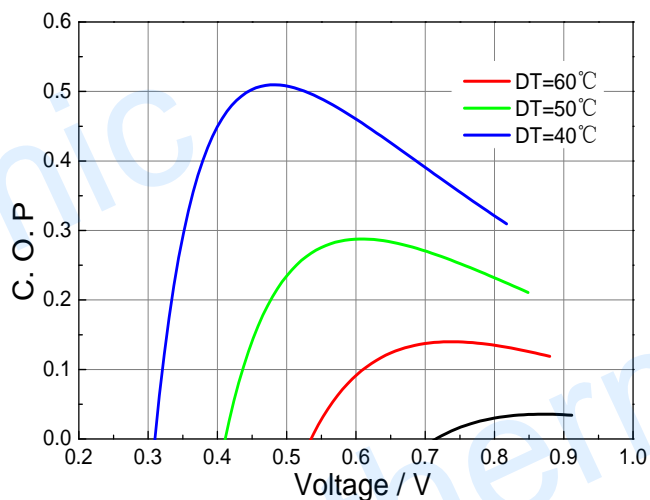
Performance Curves at Th=50 °C



Standard Performance Graph $Q_c = f(V)$



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

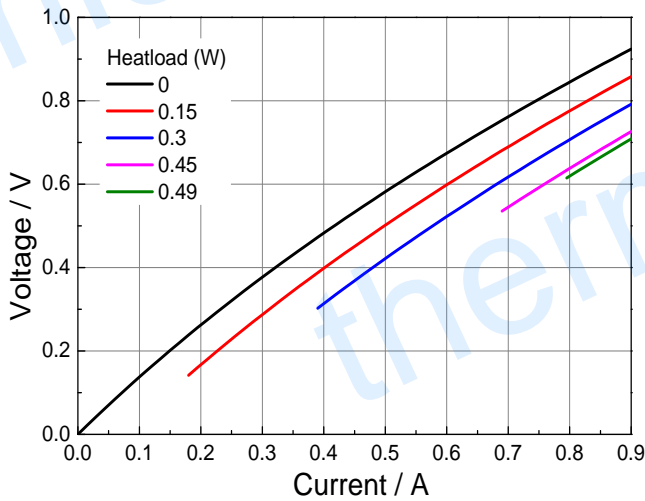


Standard Performance Graph COP = f(V) of DT ranged from 40 to 60/70 °C

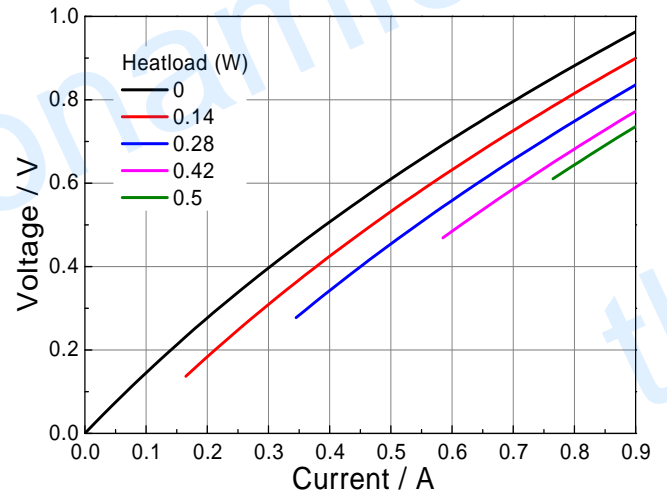
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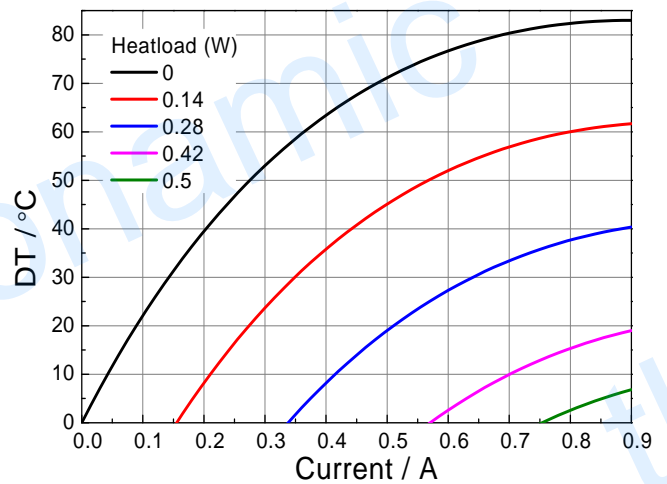
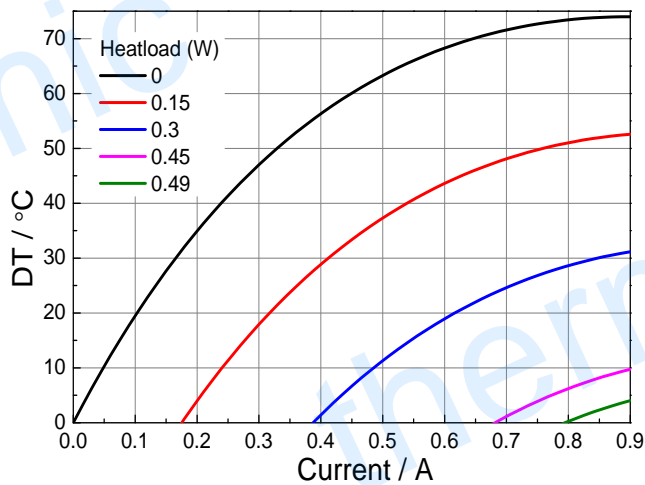
Performance Curves at Th=27 °C



Performance Curves at Th=50 °C



Standard Performance Graph $V = f(I)$



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

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

Operation Caution

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

Note: All specifications subject to change without notice.