

Specification of Thermoelectric Module

TEFC1-00309S

Description

The 3 couples, 1.2 mm × 2.6mm 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 100/200 °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

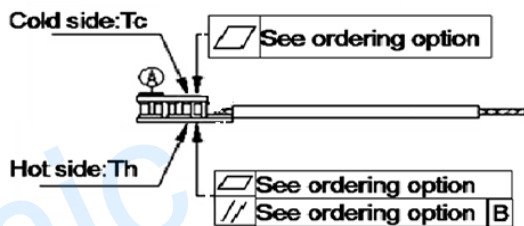
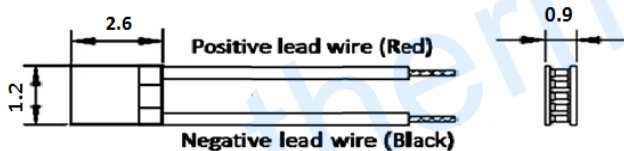
Application

- 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)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U _{max} (Voltage)	0.38	0.40	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)	0.21	0.23	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (Ohms)	0.32	0.34	The module resistance is tested under AC
Tolerance (%)	10%		For thermal and electricity parameters

Geometric Characteristics Dimensions in millimeters



Ordering Option

Suffix	Thickness H (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:0.9± 0.1	0: 0.1/0.13	Connect the Pin
TF	1:0.9 ± 0.05	1: 0.08/0.1	Connect the Pin
TF	2:0.9 ± 0.025	2: 0.05/0.08	Connect the Pin

Eg. TF11: Thickness 0.9± 0.05(mm) and Flatness 0.08/0.1(mm)

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:

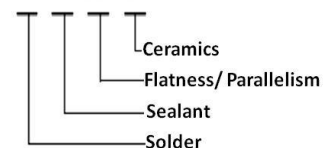
1. Alumina (Al₂O₃, white 96%)
2. Aluminum Nitride (AlN)

D. Ceramics Surface Options:

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

Naming for the Module

TEFC1- 00309S- X -X - X - X



TEFC1- 00309S-T100 -NS -TF11 -AIO

T100: BiSn (T_{melt}=138°C)

NS: No sealing

AIO: Alumina, white 96%

TF11: Thickness ± 0.05 (mm) and Flatness/Parallelism 0.08/0.1 (mm)

Sub-assembly Overview



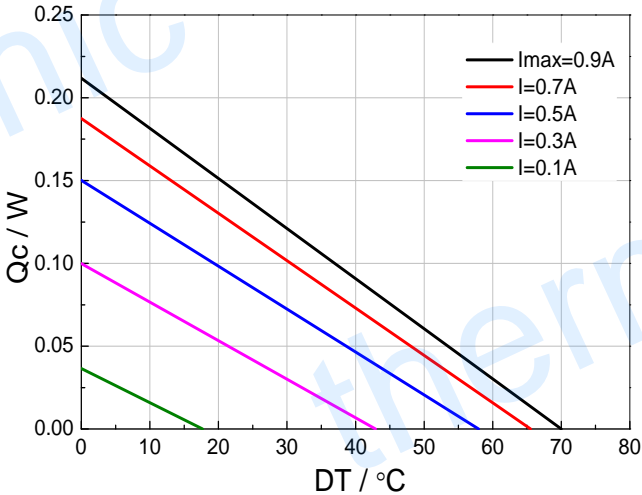
Practical Application

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

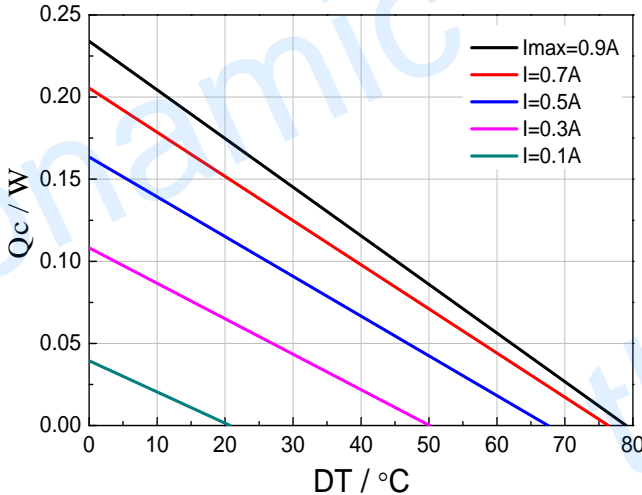
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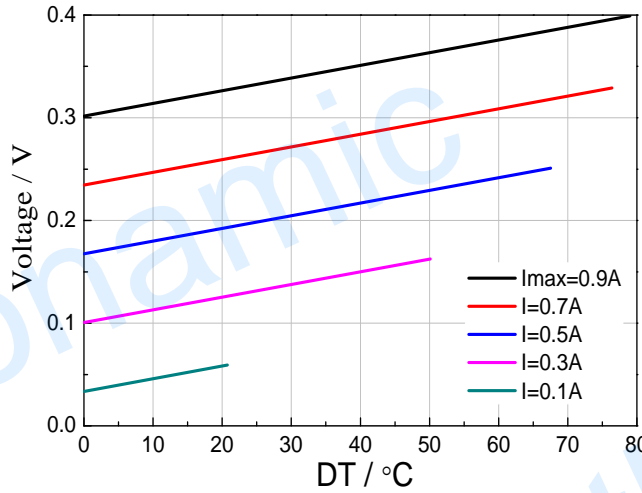
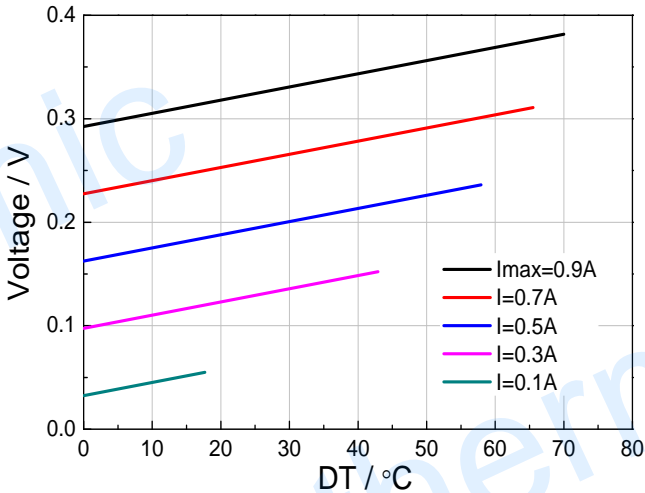
Performance Curves at Th=27 °C



Performance Curves at Th=50 °C



Standard Performance Graph $Q_c = f(DT)$

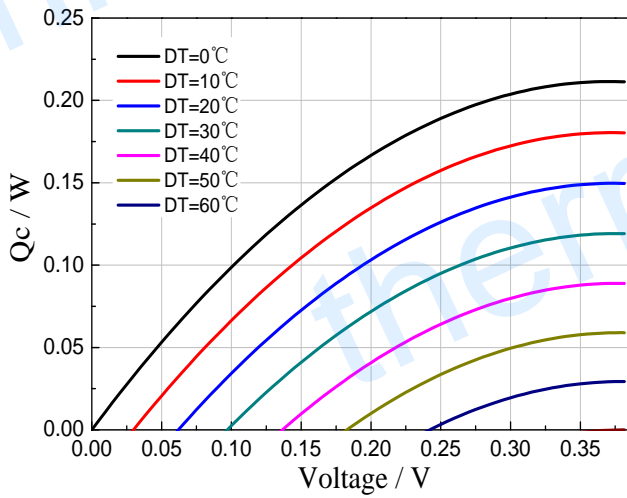


Standard Performance Graph $V = f(DT)$

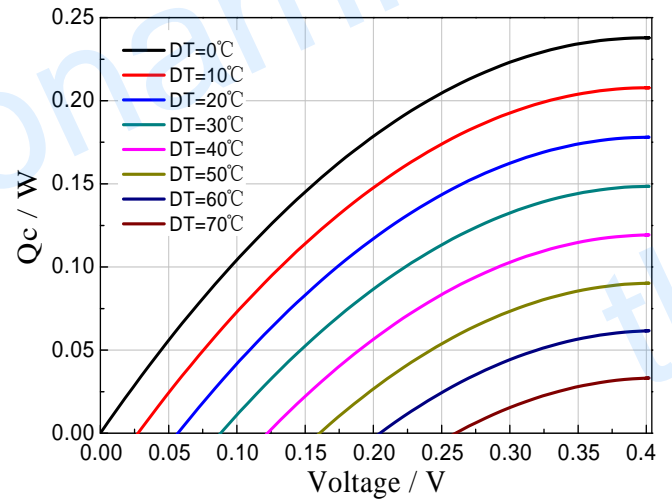
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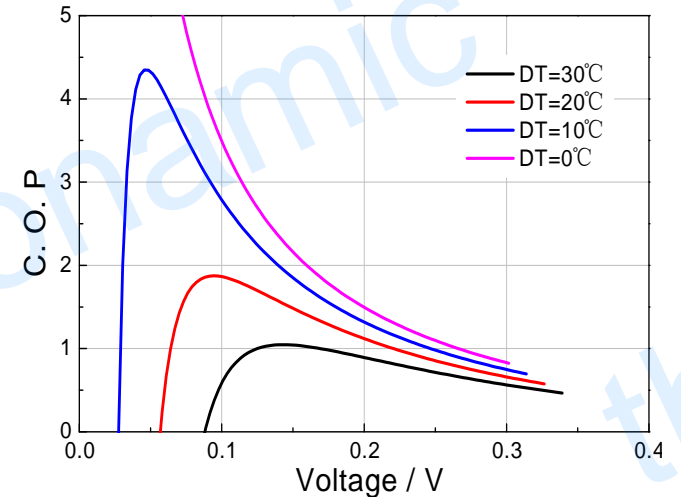
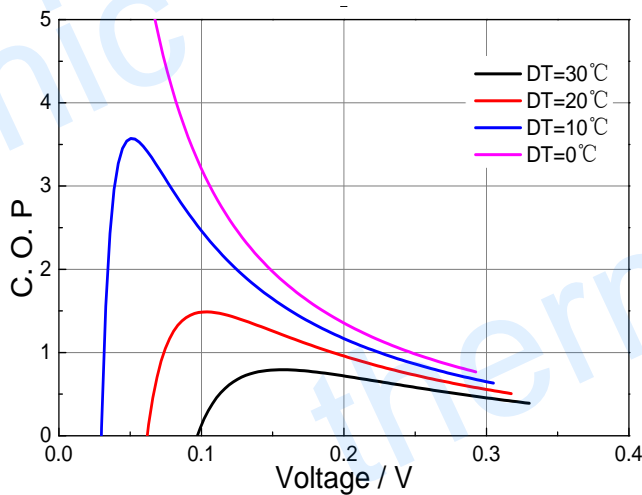
Performance Curves at Th=27 °C



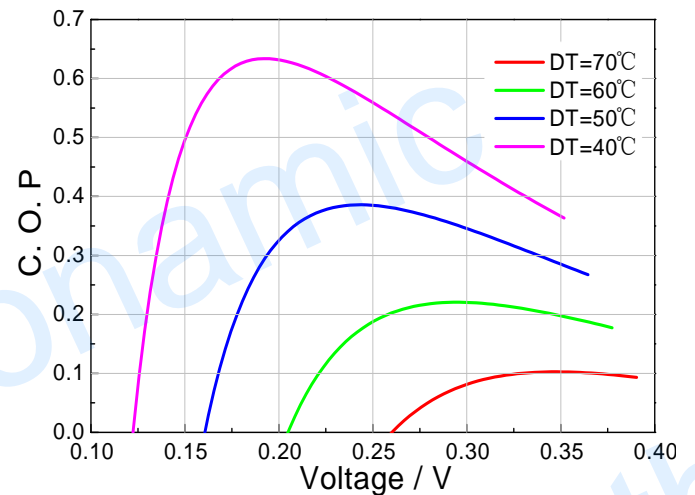
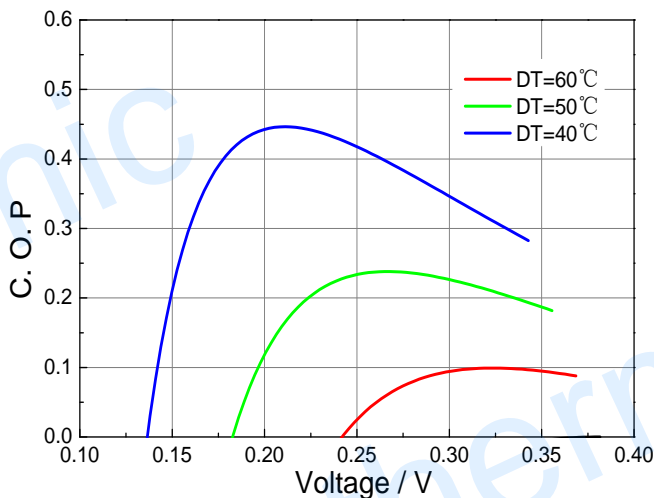
Performance Curves at Th=50 °C



Standard Performance Graph $Q_c = f(V)$



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

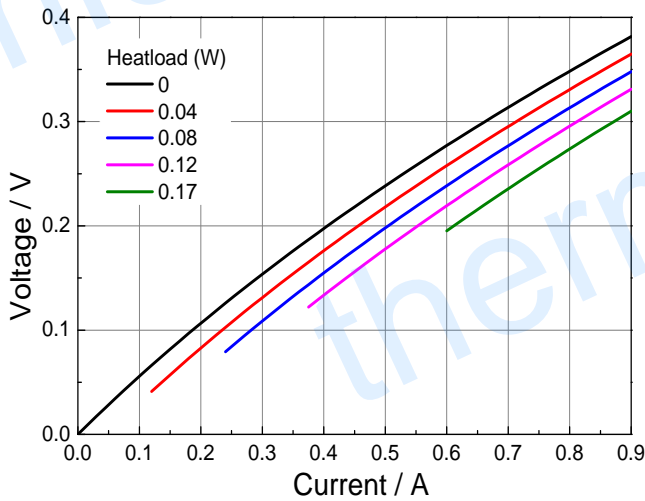


Standard Performance Graph COP = f(V) of DT ranged from 40 to 60/70 °C

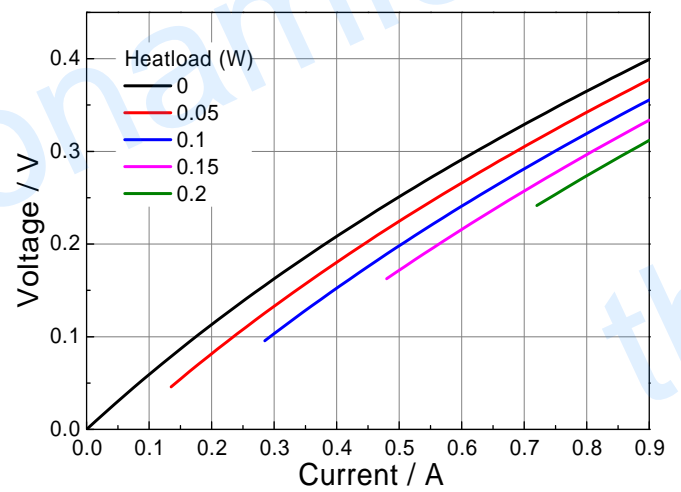
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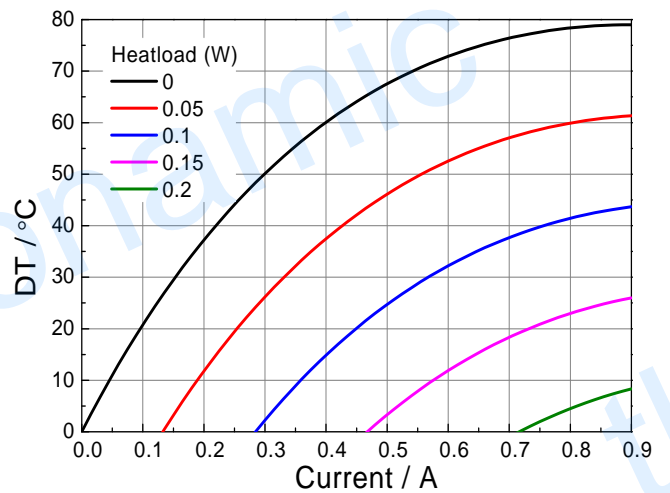
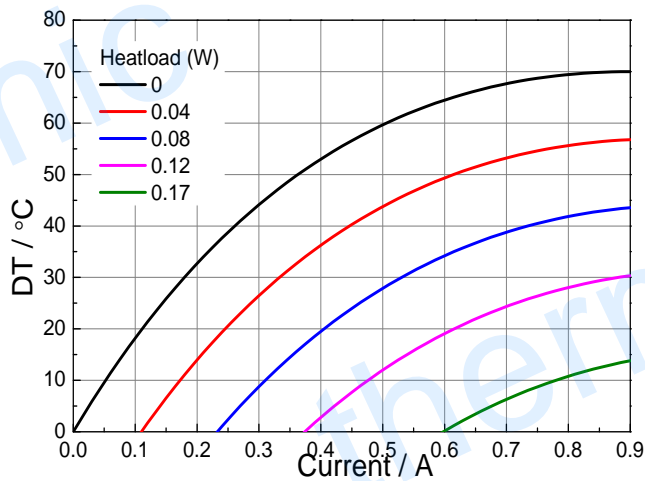
Performance Curves at Th=27 °C



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.