

# Specification of Thermoelectric Module

**TEFC1-00712**

## Description

The 7 couples, 4.2 mm × 4.2 mm size single module which is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70, 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

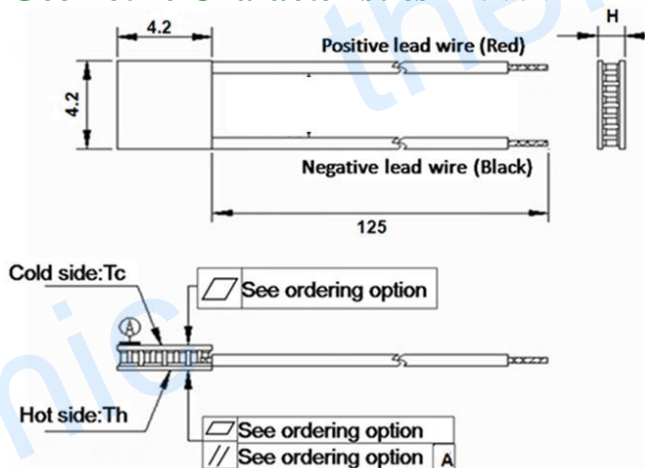
## Application

- 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 <sub>2</sub>
DT <sub>max</sub> (°C)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U <sub>max</sub> (Voltage)	0.89	0.97	Voltage applied to the module at DT <sub>max</sub>
I <sub>max</sub> (amps)	1.47	1.47	DC current through the modules at DT <sub>max</sub>
Q <sub>Cmax</sub> (Watts)	0.80	0.87	Cooling capacity at cold side of the module under DT=0 °C
AC resistance (ohms)	0.46	0.50	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	0:2.3±0.1	0: 0.015/0.015	125±1/Specify
TF	1:2.3±0.05	1: 0.01/0.01	125±1/Specify
TF	2:2.3±0.025	2: 0.008/0.008	125±1/Specify
Eg. TF11: Thickness 2.3 ± 0.05(mm) and Flatness 0.01 / 0.01 (mm)			

## Manufacturing Options

### A. Solder:

1. T100: BiSn (T<sub>melt</sub>=138°C)
2. T200: CuSn (T<sub>melt</sub> = 227 °C)

### B. Sealant:

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

### C. Ceramics:

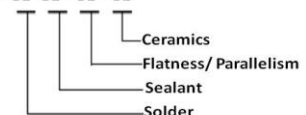
1. Alumina (Al<sub>2</sub>O<sub>3</sub>, white 96%)
2. Aluminum Nitride (AlN)

### D. Ceramics Surface Options:

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

## Naming for the Module

TEFC1- 00712- X-X-X-X



TEFC1- 00712-T100-NS -TF11 -AIO

T100: BiSn (T<sub>melt</sub>=138°C)

NS: No sealing

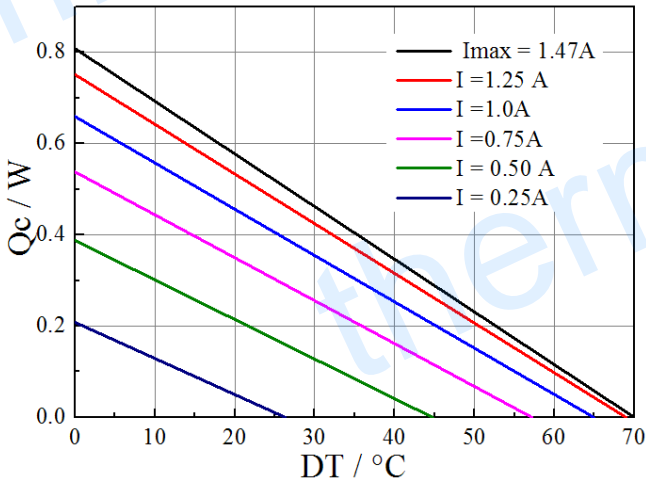
AIO: Alumina, white 96%

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

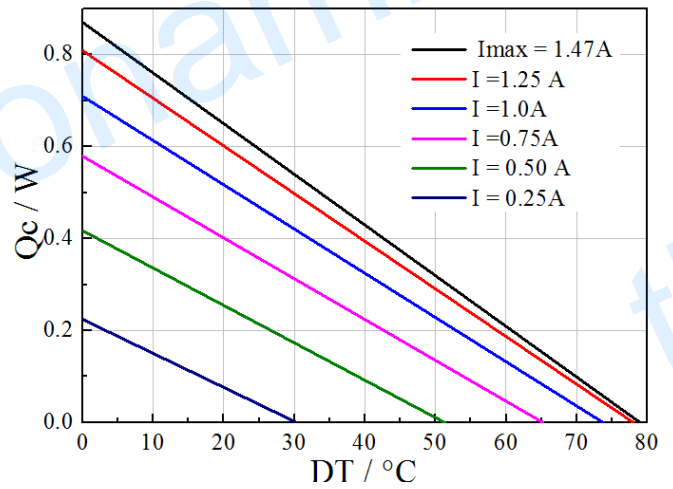
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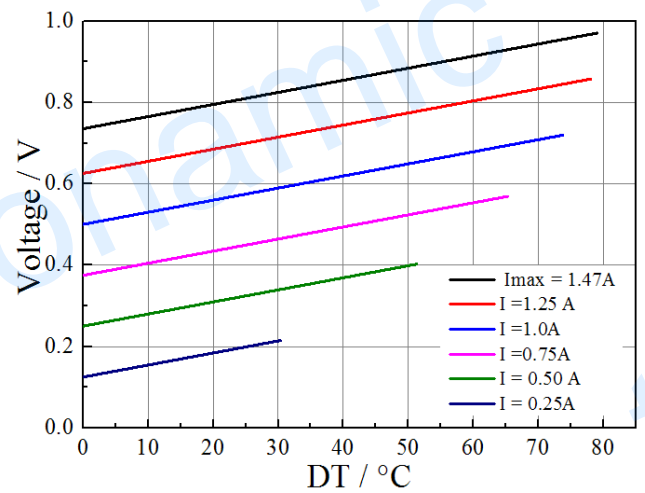
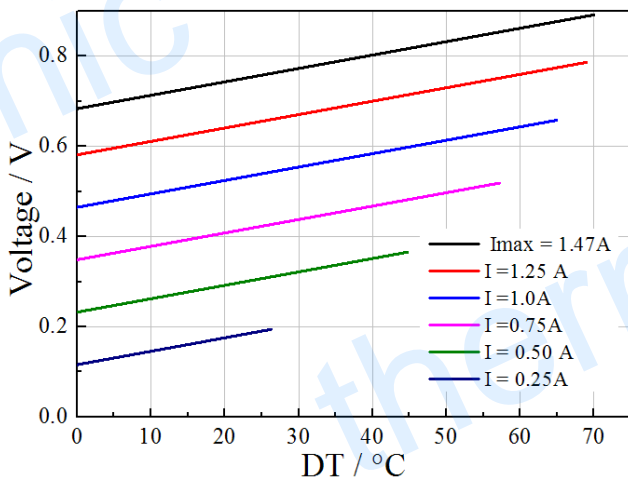
Performance Curves at Th=27 °C



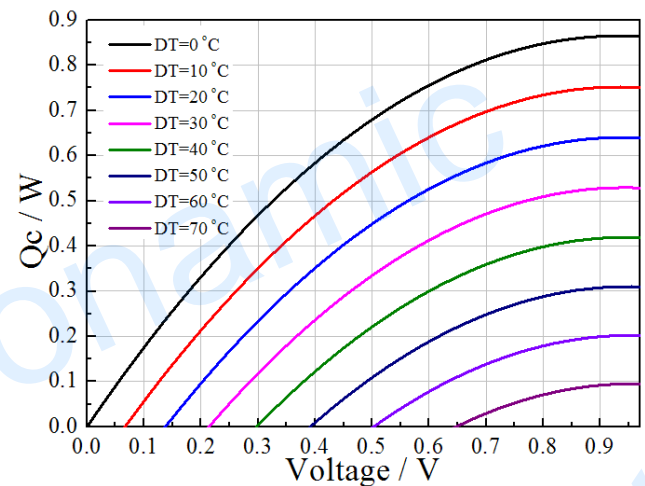
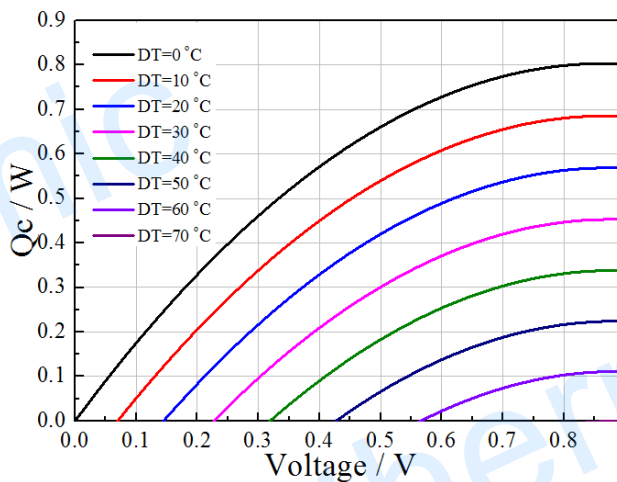
Performance Curves at Th=50 °C



Standard Performance Graph  $Q_c = f(DT)$



Standard Performance Graph  $V = f(DT)$

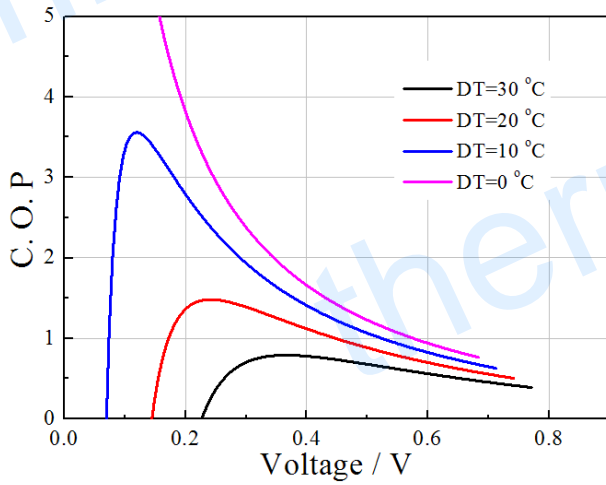


Standard Performance Graph  $Q_c = f(V)$

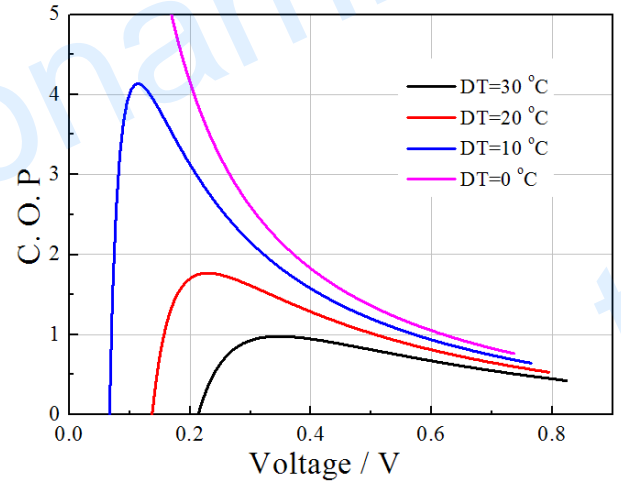
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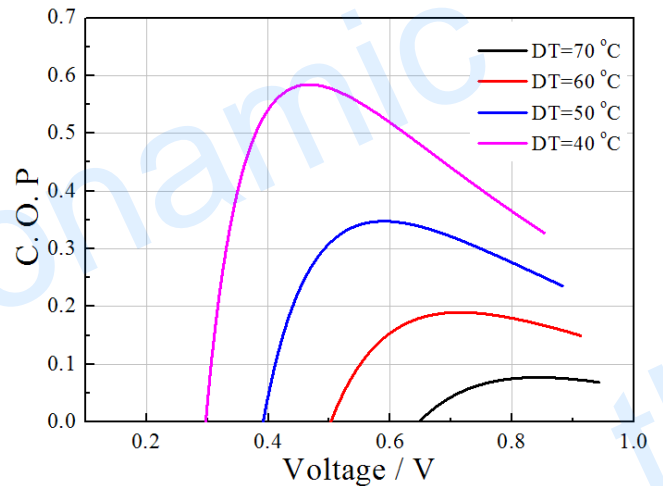
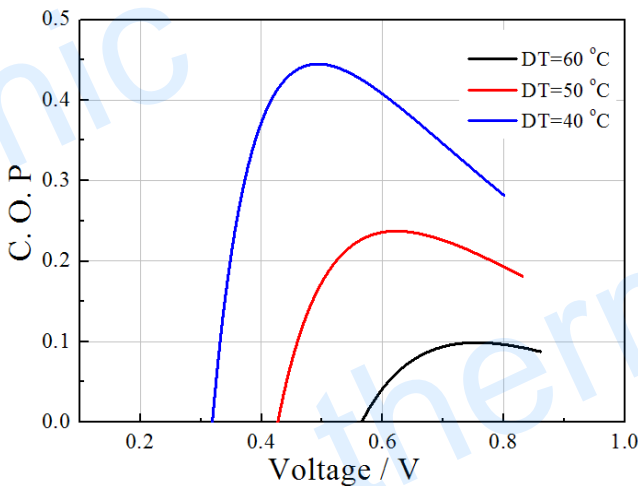
### Performance Curves at Th=27 °C



### Performance Curves at Th=50 °C



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  $Q_c$ /Input power ( $V \times I$ ).

### Operation Cautions

- Cold side of the module stuck 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.