Specification of Thermoelectric Module

TETS1-11980

Description

The 119 couples, 18mm x 40mm size single module is made of selected high performance ingot and fabricated by our unique “soft” processes to achieve superior cooling/heating performance, is good for frequently cooling and heating applications. It is designed for superior coolingand heating up to 200℃applications. Beyond the standard below, we can design and manufacture the custom mademodule according to your special requirements.

FeaturesApplication

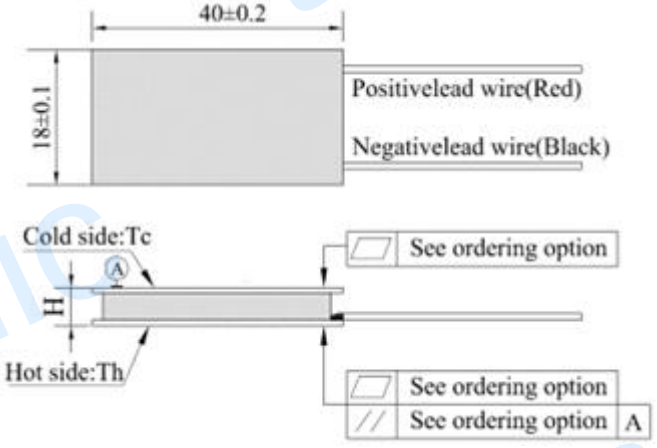
- ●No moving parts, no noise, and solid-state
- ●Compact structure, small in size, light in weight
- ●Environmental friendly
- ●RoHS compliant
- ●Precise temperature control
- ●Exceptionally reliable in quality, high performance
- ●Food and beverage service refrigerator
- ●Portable cooler box for cars
- ●Liquid cooling
- ●Temperature stabilizer
- ●CPU cooler and scientific instrument
- ●Photonic and medical systems

Performance Specification Sheet

Th(℃)	27	50	Hot side temperature at environment: dry air, N_2
DT_{max}(℃)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U_{max}(Voltage)	15.0	16.1	Voltage applied to the module at DT_{max}
I_{max}(Amps)	8.2	8.2	DC current through the modules at DT_{max}
Q_{Cmax}(Watts)	76.9	84.1	Cooling capacity at cold side of the module under DT=0 ℃
AC resistance(Ohms)	1.4	1.5	The module resistance is tested under AC
Tolerance (%)	±10		For thermal and electricity parameters

Geometric Characteristics

Dimensions in millimeters



ManufacturingOptions

A.Solder:

1. T200: CuSn (Tmelt=227 ℃)

B.Sealant:

1. EPS: Epoxy sealing

C. Ceramics:

1. AlO: Al_2O_3, white 96%

D. Ceramics Surface Options:

1. Blank ceramics (not metalized)

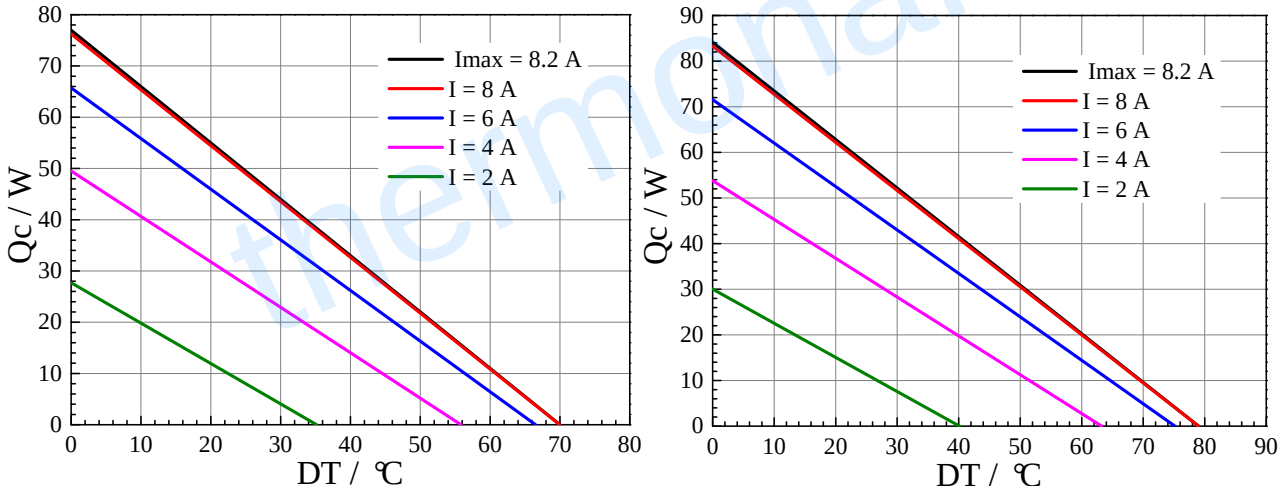
Ordering Option

Suffix	ThicknessH (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:3.35±0.15	0: 0.08/0.08	300±3/Specify

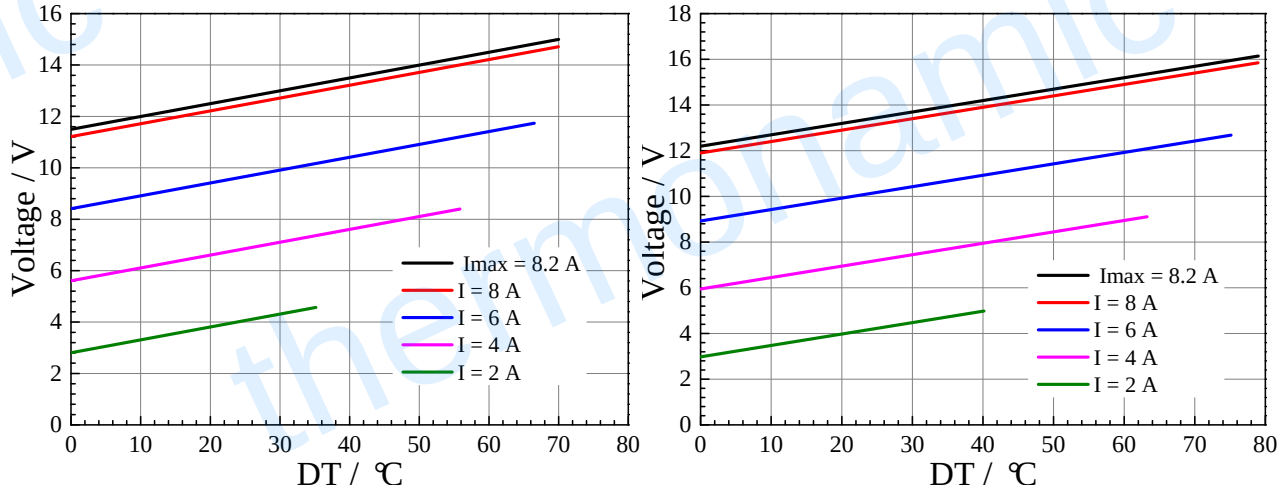
Operation Cautions

●Cold side of the module sticked on the object being cooled●Operation below I_{max} or V_{max}
●Hot side of the module mounted on a heat radiator●Operation or storage module below 100℃
●Work under DC

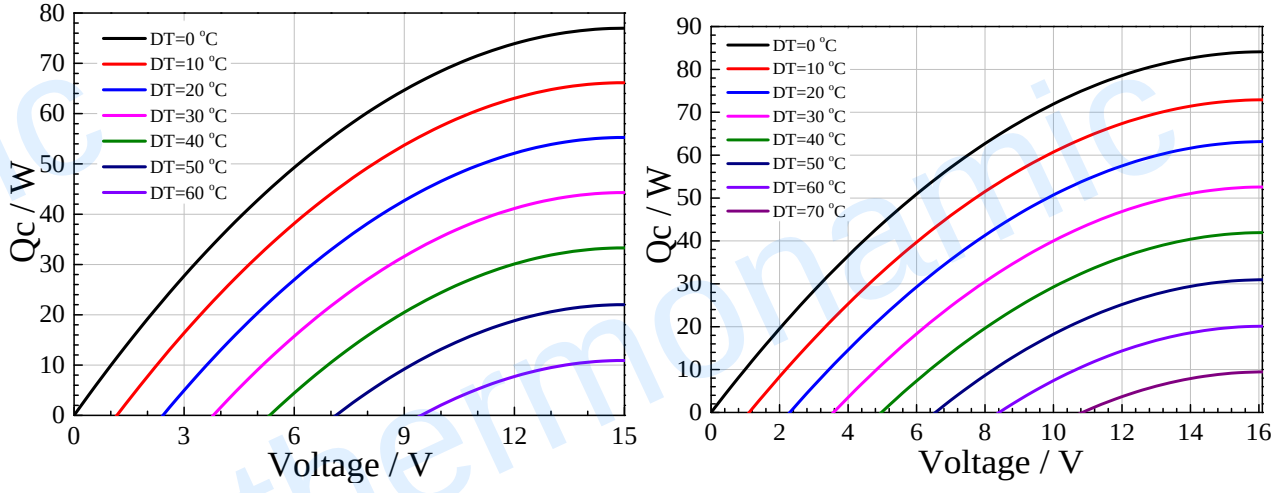
Performance Curves at Th=27 ℃ Performance Curves at Th=50 ℃



Standard Performance Graph Qc= f(DT)

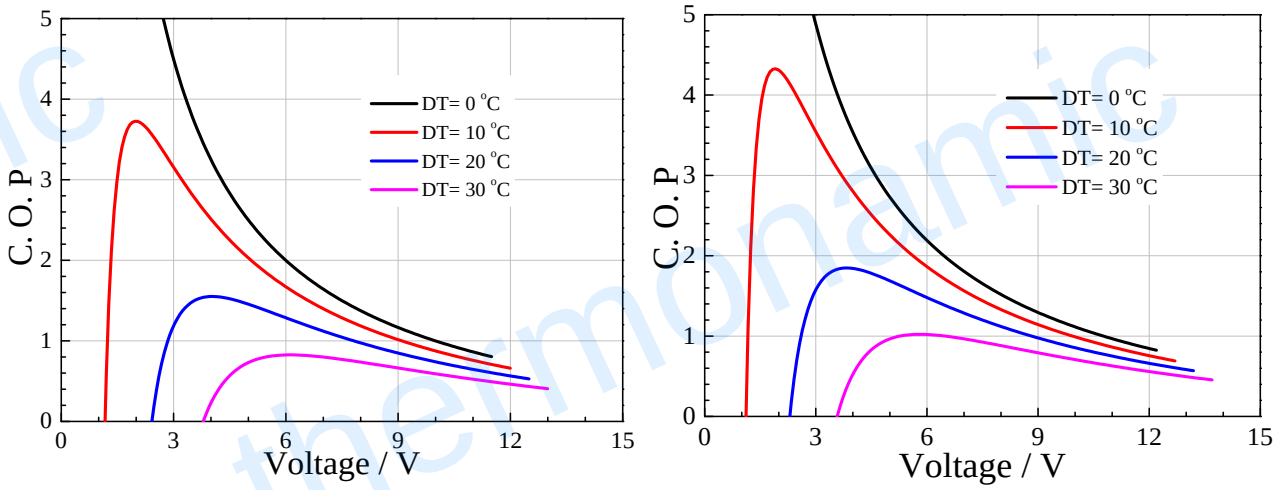


Standard Performance Graph V= f(DT)

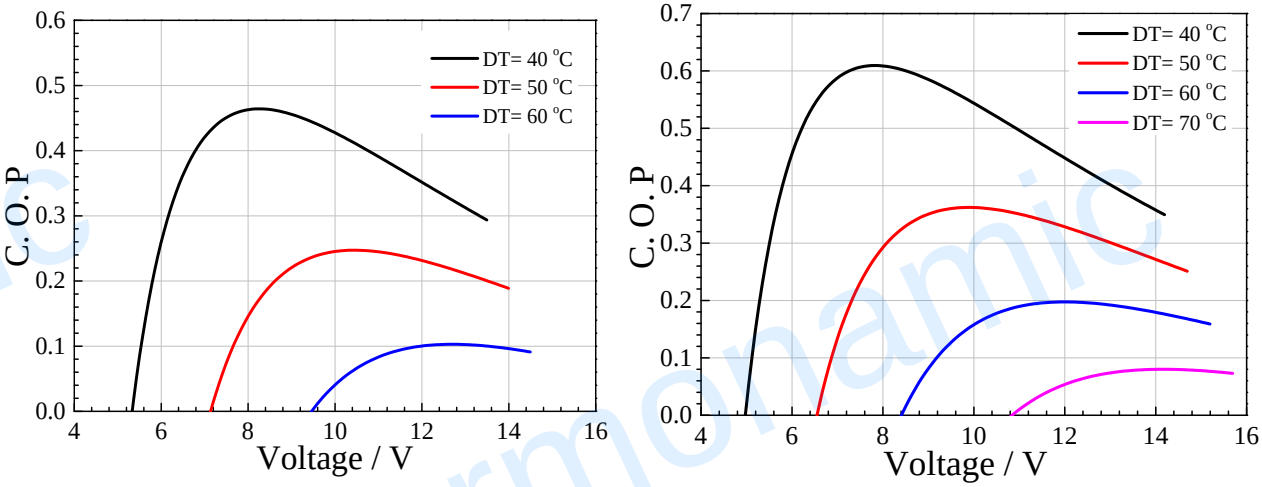


Standard Performance Graph Qc= f(V)

Performance Curves at Th=27 ℃Performance Curves at Th=50 ℃



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

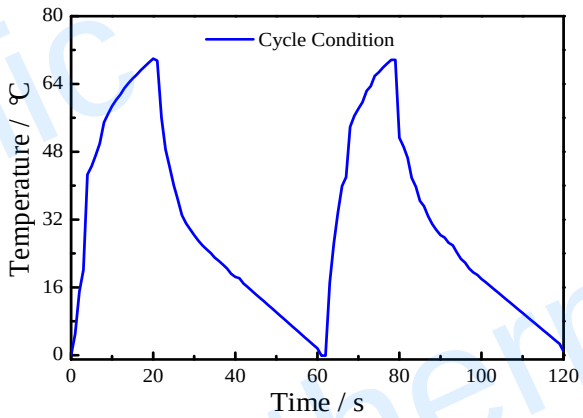


Standard Performance Graph COP = f(V) of DT ranged from 40 to 60/70 ˚C

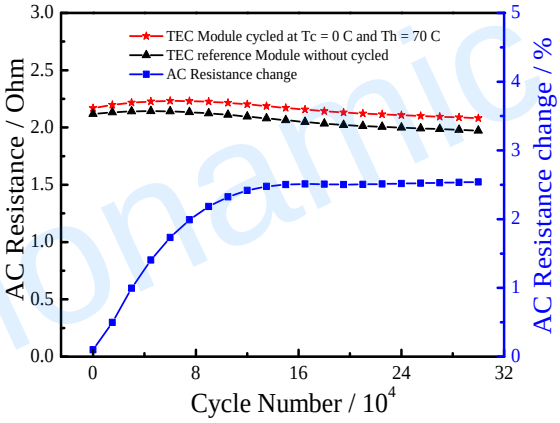
Remark: The coefficient of performance (COP) is the cooling power Qc/Input power (V ×I).

A typical 127 couples module is fabricated by the unique “soft” process and has demonstrated that it only has 2.5% degrading after 300,000 thermal cycling. The below graphic shows that in beginning 120,000 cycles, it degrade about 2.5%, and then go on stable with very tiny degrading in further 180,000 thermal cycles. It is derived out that the modules can go over million thermal cycles.

TEC Thermal Cycle Lifetime TestOn TETC1-12706



cooling-heating cycle



The Chart for AC Resistance and AC ResistanceChanges

Typical

vs Cycle Number