

## PowerCycling PCX Series Thermoelectric Cooler

The PCX12-139-F1-3550-TA-RT-W6 is a high-performance thermoelectric cooler designed for thermal cycling between multiple temperature set points and is ideal for applications in healthcare among others, where fast temperature changes are required. The thermoelectric module is specially constructed to reduce the amount of stress induced on the thermoelectric elements during operation. It has a maximum  $Q_c$  of 118.6 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 73.6 °C at  $Q_c = 0$ .

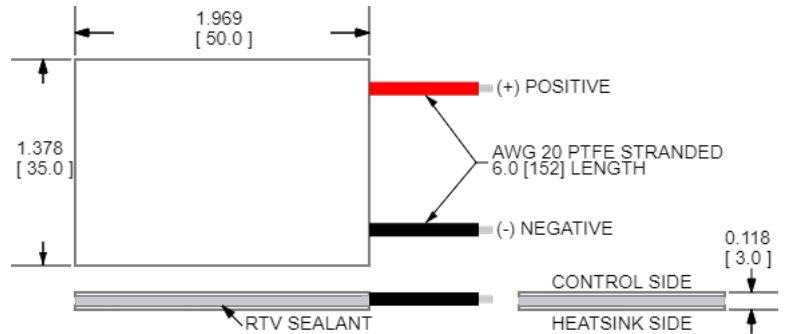


## Features

- High thermal cycling reliability
- Precise temperature control
- Solid-state operation
- Boosted performance with next-gen material
- RoHS-compliant

## Applications

- Molecular Diagnostics (DNA Amplification, PCR)
- Point of Care Testing Devices
- Thermal Test Sockets



CERAMIC MATERIAL:  $Al_2O_3$

SOLDER CONSTRUCTION: 232°C, SbSn

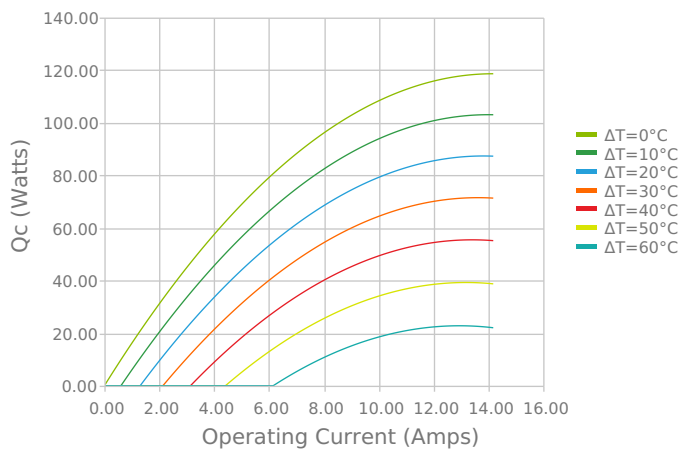
INCHES [MM]

Note: Allow 0.020 in [0.5 mm] around perimeter of the thermoelectric cooler and lead wire attachment to accommodate sealant

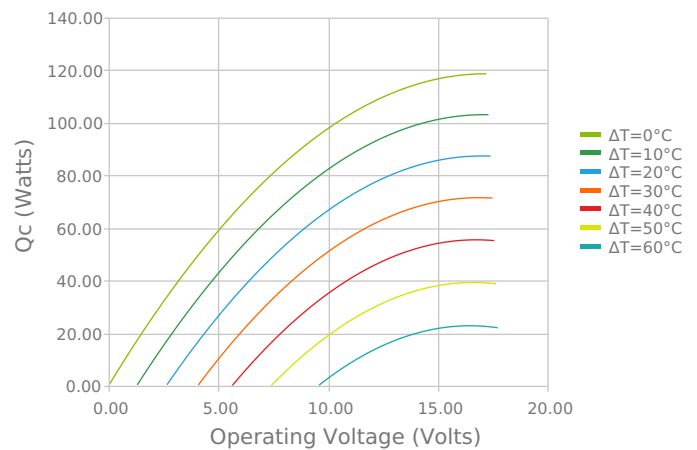
## ELECTRICAL AND THERMAL PERFORMANCE

For maximum performance, be sure to orient the CONTROL side of the TEC against the application to be managed and the HEATSINK side against the heat sink or other heat rejection method. The CONTROL side is always opposite the side with lead attachments. Lead attachment is a passive heat loss and less impactful if located on the side that attaches to the heat exchanger.

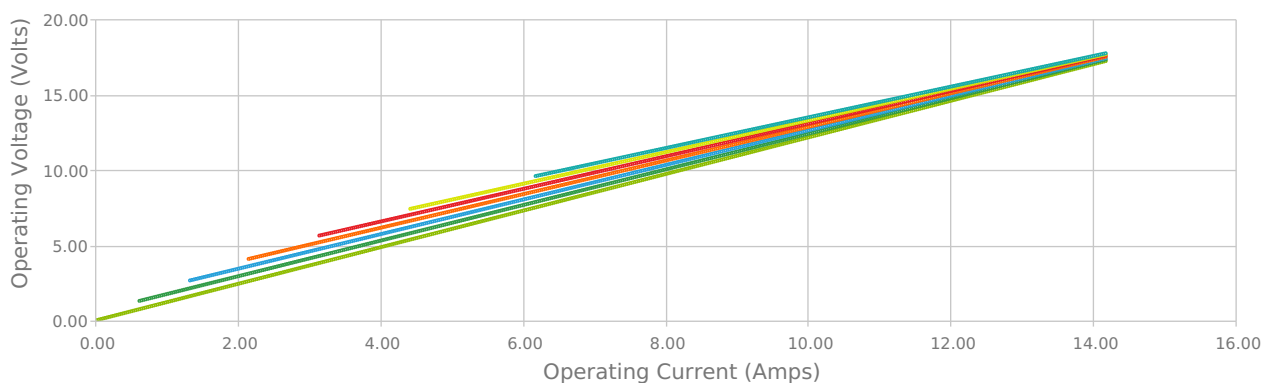
Heat Pumped at Cold Side  
 $T_{hot} = 27^\circ C$



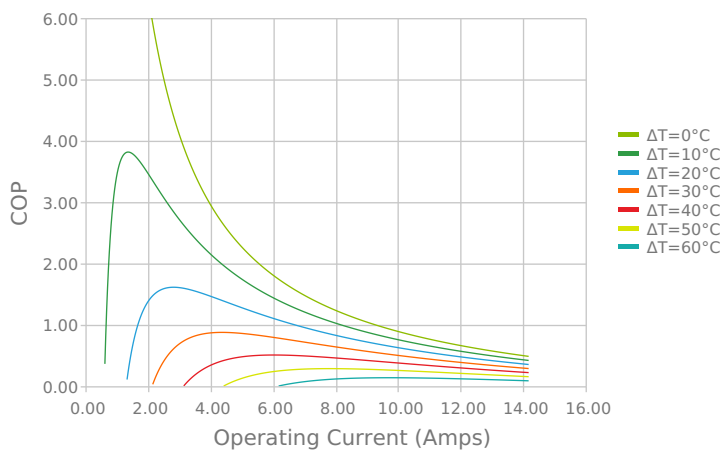
Heat Pumped at Cold Side  
 $T_{hot} = 27^\circ C$



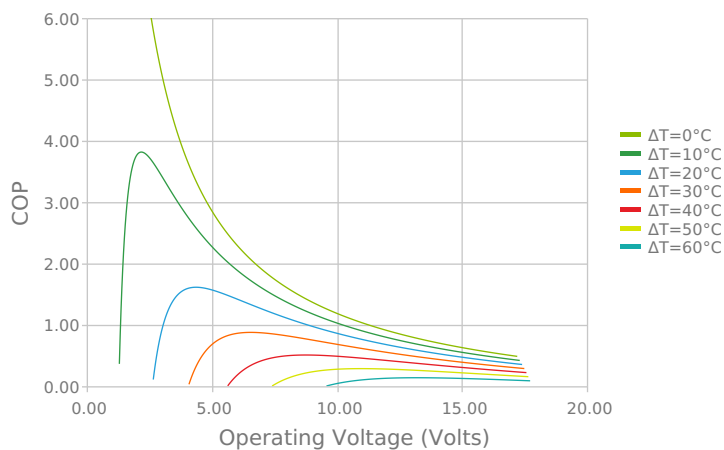
Current vs Voltage (I vs V)  
 $T_{hot} = 27^\circ C$



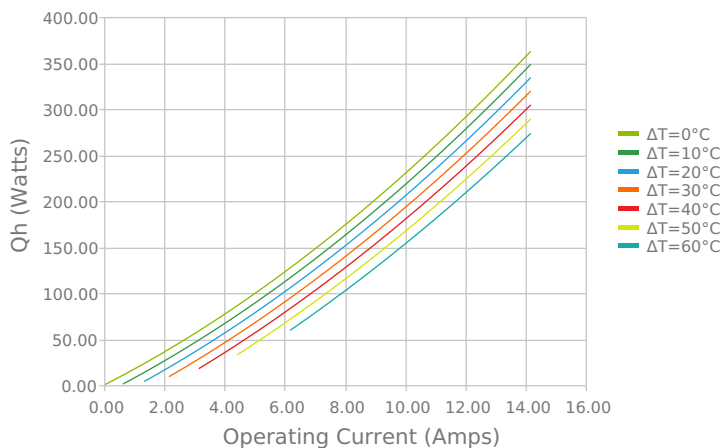
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



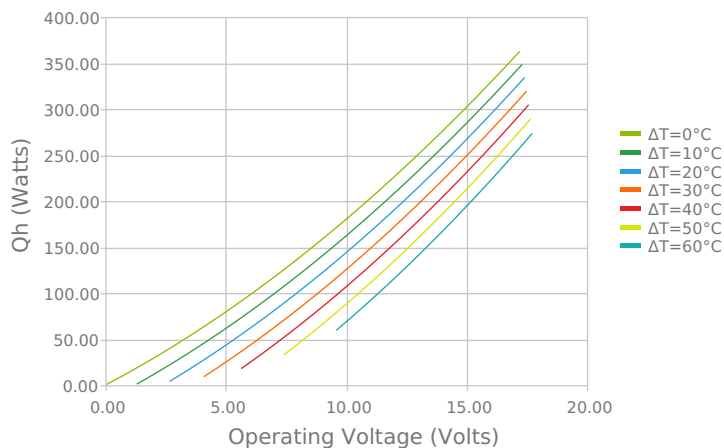
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
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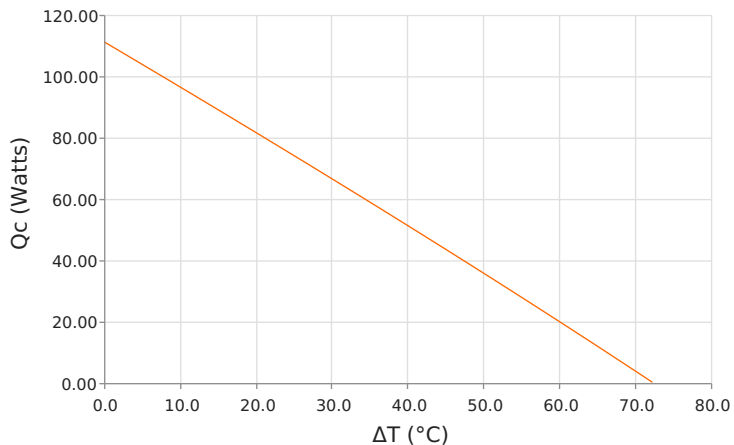
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



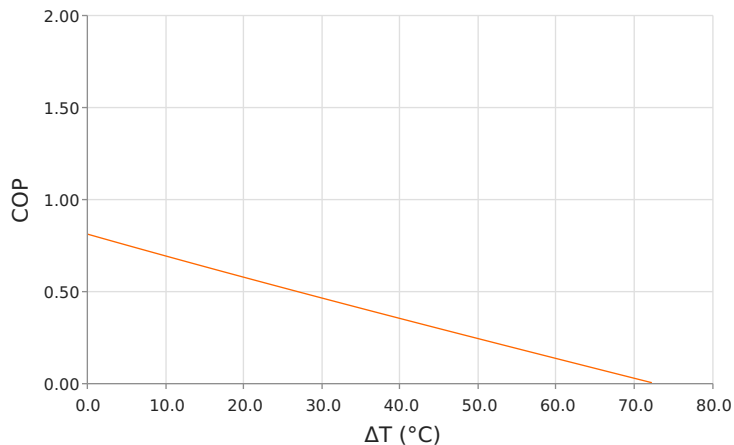
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$  | Current = 10.6 Amps



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$  | Current = 10.6 Amps



## SPECIFICATIONS\*

### Hot Side Temperature

**Qcmax ( $\Delta T = 0$ )**

**$\Delta T_{max}$  ( $Q_c = 0$ )**

**I<sub>max</sub> (I @  $\Delta T_{max}$ )**

**V<sub>max</sub> (V @  $\Delta T_{max}$ )**

**Module Resistance**

**Max Operating Temperature**

**Weight**

	27.0 °C	50.0 °C	80.0 °C
Qcmax ( $\Delta T = 0$ )	118.6 Watts	127.7 Watts	136.9 Watts
$\Delta T_{max}$ ( $Q_c = 0$ )	73.6°C	82.6°C	93.1°C
I <sub>max</sub> (I @ $\Delta T_{max}$ )	12.6 Amps	12.3 Amps	12.0 Amps
V <sub>max</sub> (V @ $\Delta T_{max}$ )	16.3 Volts	18.1 Volts	20.4 Volts
Module Resistance	1.21 Ohms	1.37 Ohms	1.56 Ohms
Max Operating Temperature	120 °C		
Weight	21.0 gram(s)		

\* Specifications reflect thermoelectric coefficients updated March 2020

## FINISHING OPTIONS

Suffix	Thickness	Flatness / Parallelism	Hot Face	Cold Face	Lead Length
TA	3.000 ±0.025 mm 0.118 ± 0.0010 in	0.025 mm / 0.025 mm 0.001 in / 0.001 in	Lapped	Lapped	152.4 mm 6.00 in

## SEALING OPTIONS

Suffix	Sealant	Color	Temp Range	Description
RT	RTV	Translucent or White	-60 to 204°C	Non-corrosive, silicone adhesive

## NOTES

1. Max operating temperature: 120°C
2. Do not exceed I<sub>max</sub> or V<sub>max</sub> when operating module
3. Reference assembly guidelines for recommended installation
4. Solder tinning also available on metallized ceramics

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