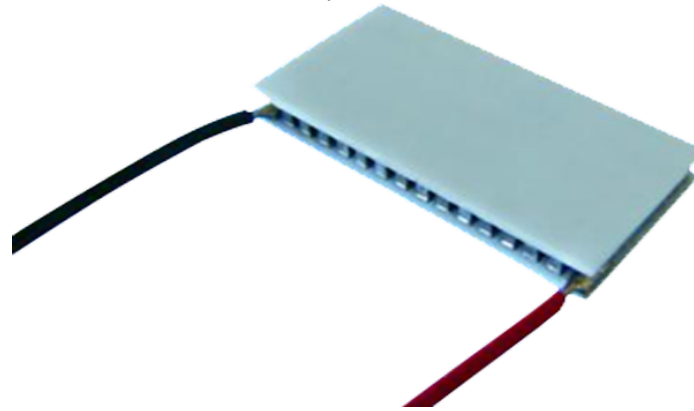


## PowerCycling PCX Series Thermoelectric Cooler

The PCX12-248-F1-5040-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 206.5 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 73.6 °C at  $Q_c = 0$ .

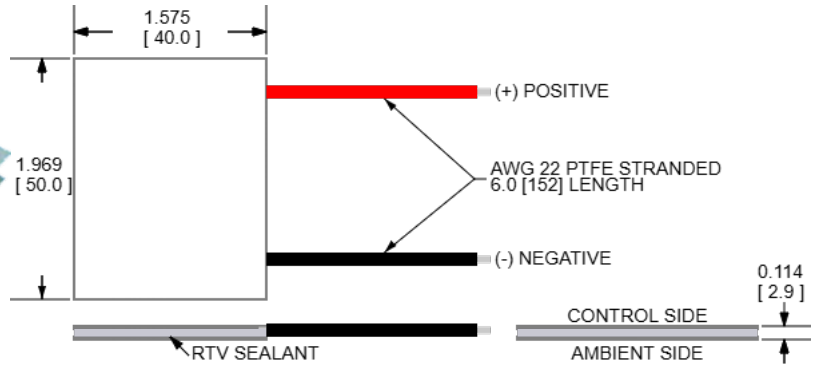


## Features

- High thermal cycling capability
- 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

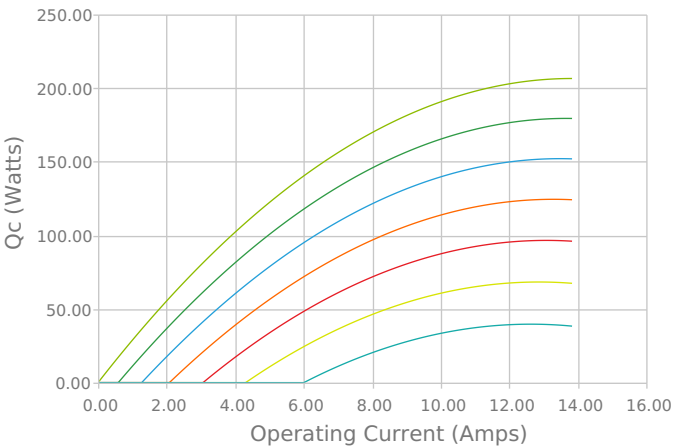
INCHES [MM]

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

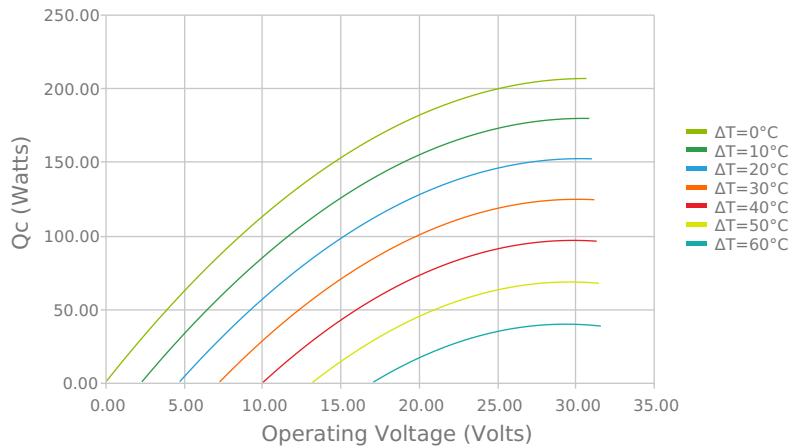
## Electrical and Thermal Performance

For maximum performance, be sure to orient the CONTROL side of the TEC against the application to be managed and the AMBIENT 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.

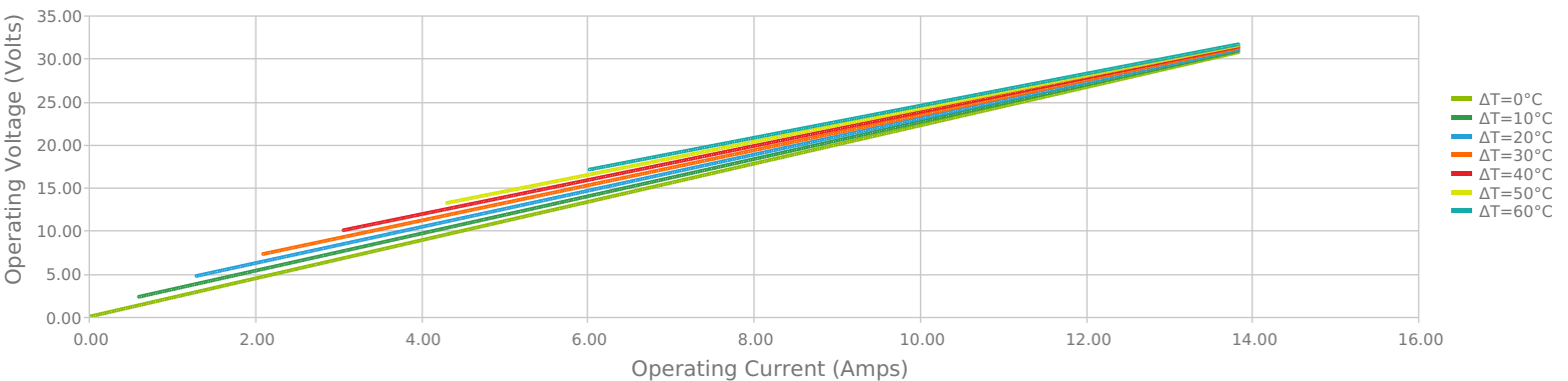
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



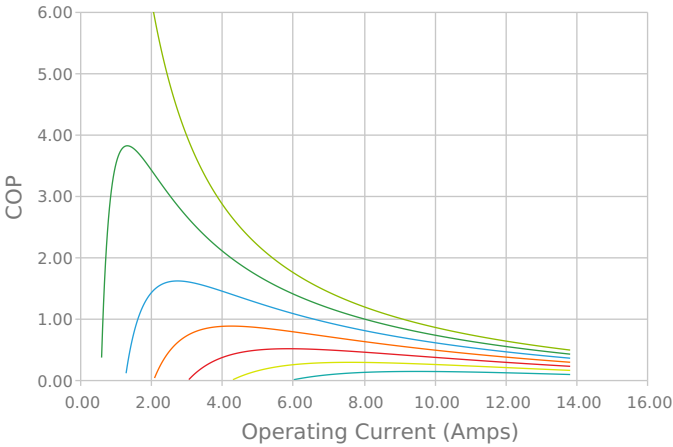
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



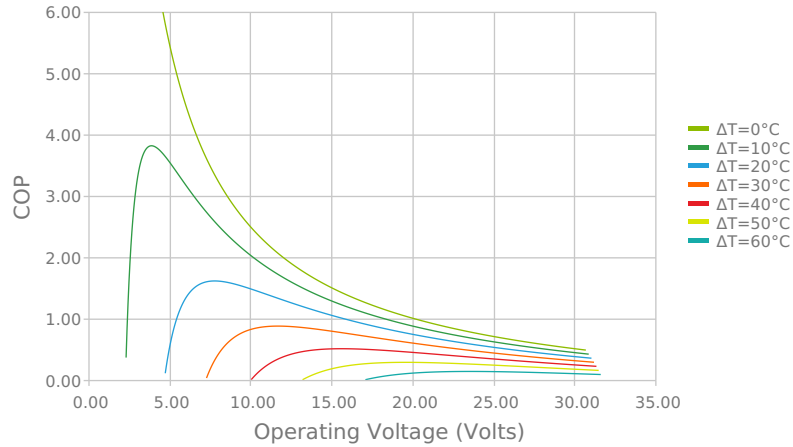
Current vs Voltage (I vs V)  
 $T_{hot} = 27\text{ °C}$



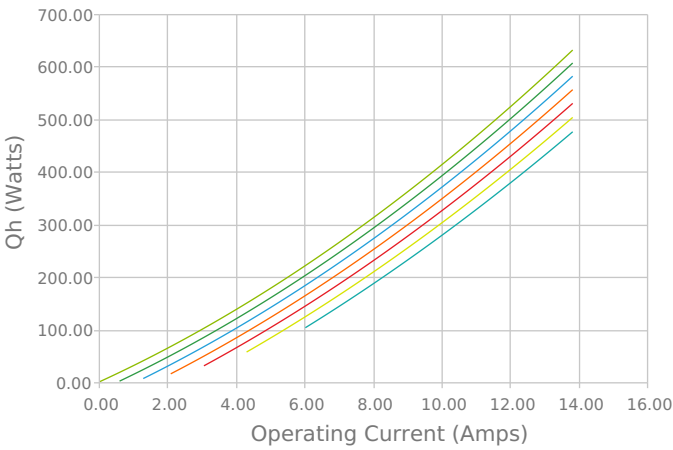
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



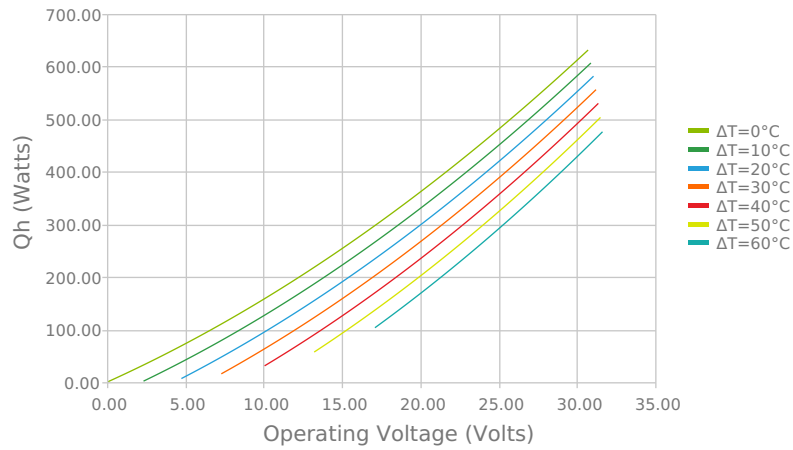
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



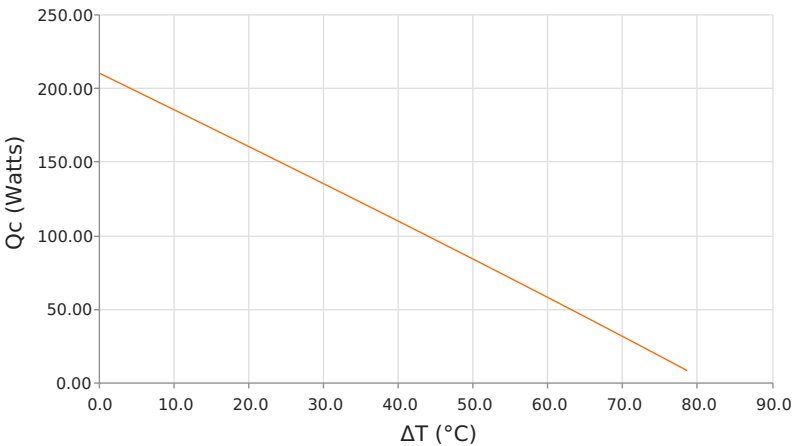
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



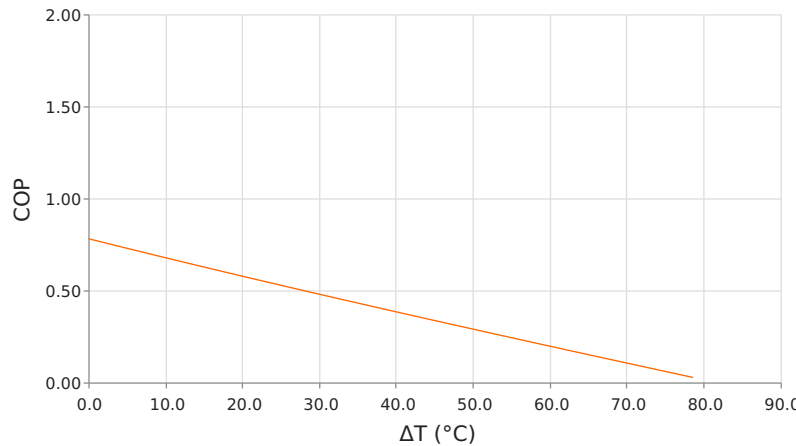
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 50\text{ }^{\circ}\text{C}$  | operating = 10.4 Amps



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 50\text{ }^{\circ}\text{C}$  | operating = 10.4 Amps



Specifications

| Hot Side Temperature      | 27.0 °C      | 50.0 °C     | 80.0 °C     |
|---------------------------|--------------|-------------|-------------|
| Qcmax (ΔT = 0)            | 206.5 Watts  | 222.2 Watts | 238.3 Watts |
| ΔTmax (Qc = 0)            | 73.6°C       | 82.6°C      | 93.1°C      |
| Imax (I @ ΔTmax)          | 12.3 Amps    | 12.0 Amps   | 11.7 Amps   |
| Vmax (V @ ΔTmax)          | 29.0 Volts   | 32.3 Volts  | 36.4 Volts  |
| Module Resistance         | 2.22 Ohms    | 2.50 Ohms   | 2.86 Ohms   |
| Max Operating Temperature | 120 °C       |             |             |
| Weight                    | 36.0 gram(s) |             |             |

Finishing Options

| Suffix | Thickness                            | Flatness / Parallelism                     | Hot Face | Cold Face | Lead Length         |
|--------|--------------------------------------|--------------------------------------------|----------|-----------|---------------------|
| TA     | 2.900 ±0.025 mm<br>0.114 ± 0.0010 in | 0.025 mm / 0.025 mm<br>0.001 in / 0.001 in | Lapped   | Lapped    | 152.4 mm<br>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

Max operating temperature: 120°C  
Do not exceed Imax or Vmax when operating module  
Reference assembly guidelines for recommended installation  
Solder tinning also available on metallized ceramics

Any information furnished by Tark Thermal Solutions and its agents, whether in specifications, data sheets, product catalogues or otherwise, is believed to be (but is not warranted as being) accurate and reliable, is provided for information only and does not form part of any contract with Tark Thermal Solutions. All specifications are subject to change without notice. Tark Thermal Solutions assumes no responsibility and disclaims all liability for losses or damages resulting from use of or reliance on this information. All Tark products are sold subject to the Tark Thermal Solutions Terms and Conditions of sale (including Tark’s limited warranty) in effect from time to time, a copy of which will be furnished upon request.

© Copyright 2025 Tark Thermal Solutions, Inc. All rights reserved.

Revision: 00 Date: 06-01-2022

Print Date: 05-16-2025