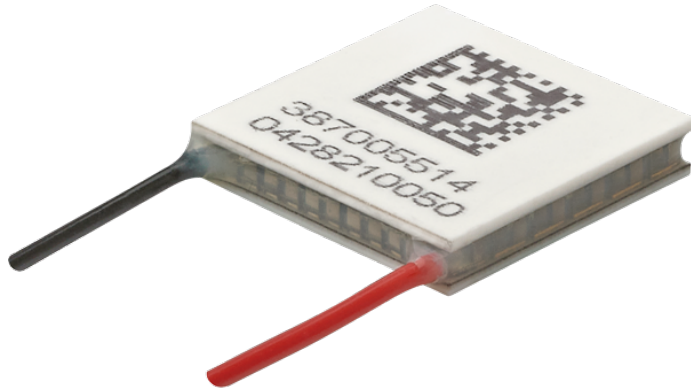


## PowerCycling PCX Series Thermoelectric Cooler

The PCX4-7-F1-2020-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 19.4 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 73.6 °C at  $Q_c = 0$ .

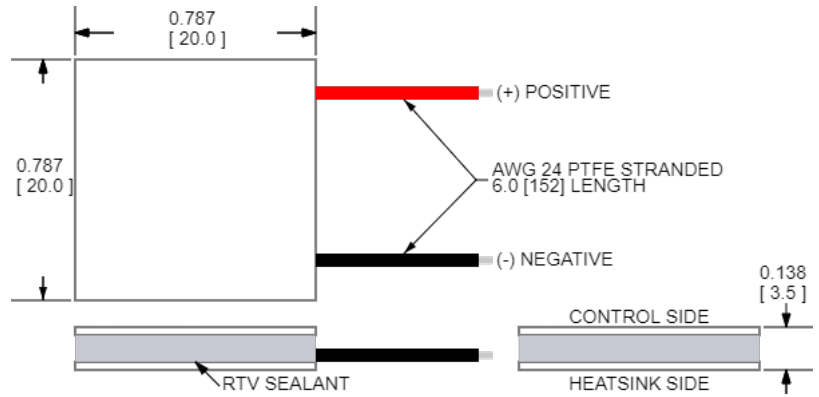


## Features

- 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

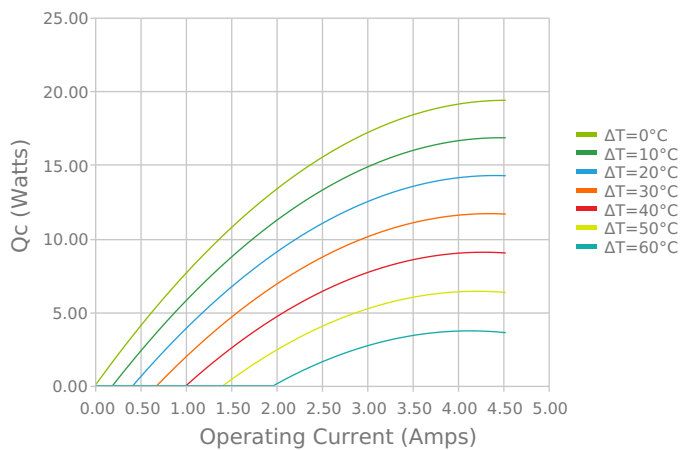
Note: Allow 0.020 in [0.5 mm] around perimeter of the thermoelectric cooler and lead wire attachment to accommodate sealant

INCHES [MM]

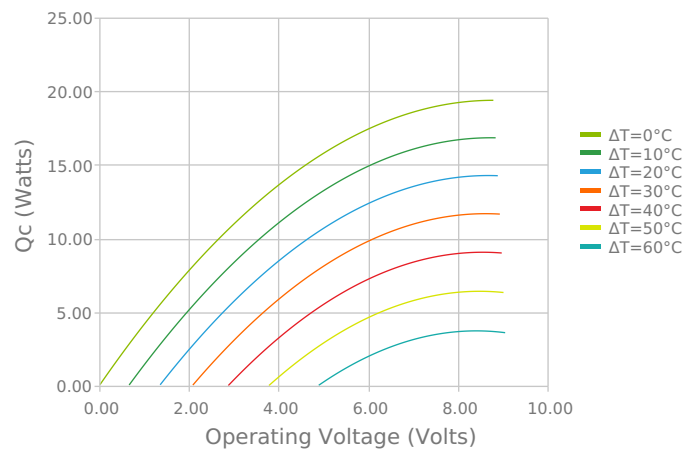
## ELECTRICAL AND THERMAL PERFORMANCE

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.

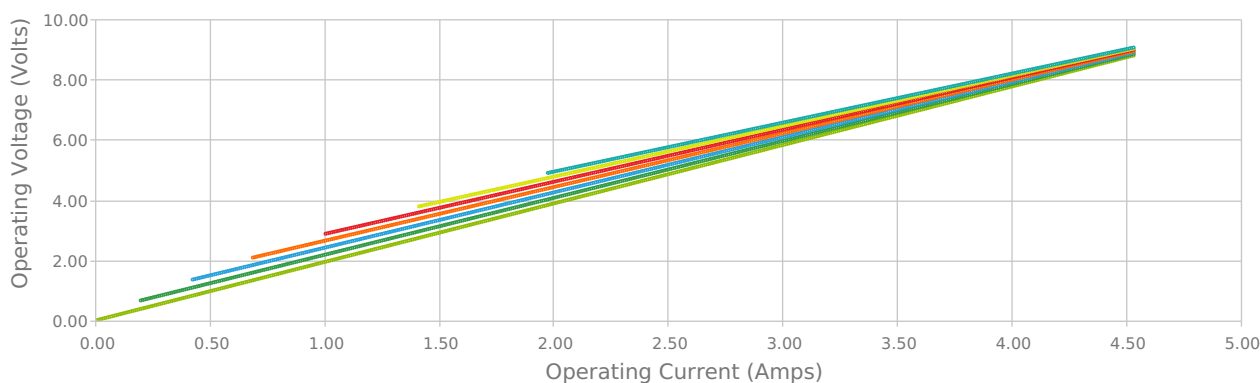
Heat Pumped at Cold Side  
 $T_{hot} = 27^\circ C$



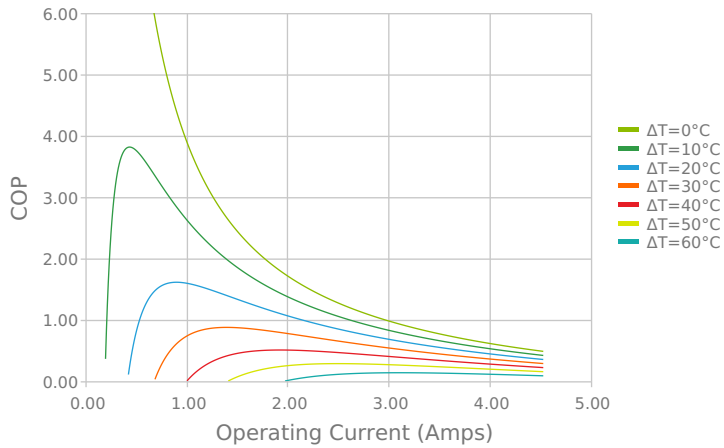
Heat Pumped at Cold Side  
 $T_{hot} = 27^\circ C$



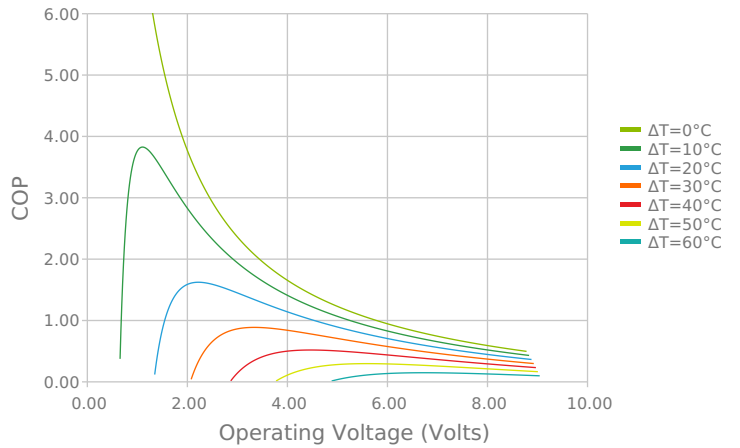
Current vs Voltage (I vs V)  
 $T_{hot} = 27^\circ C$



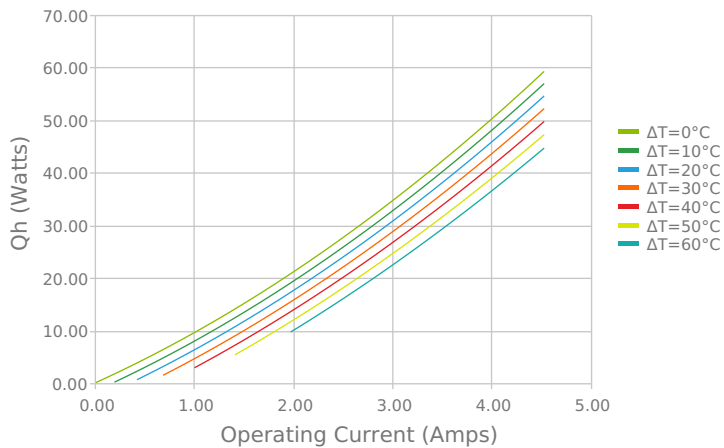
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



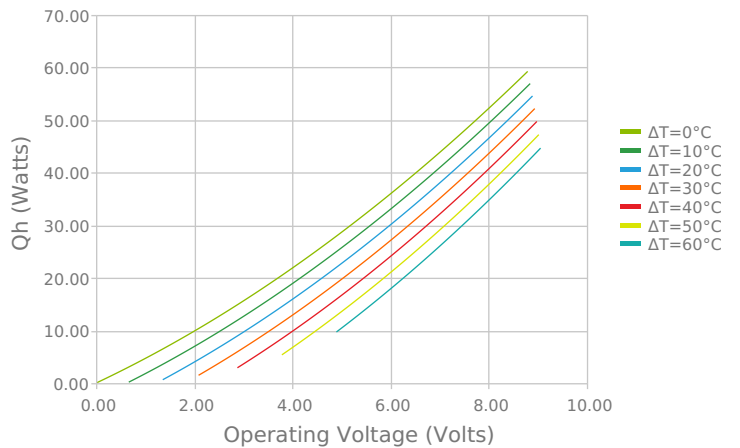
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



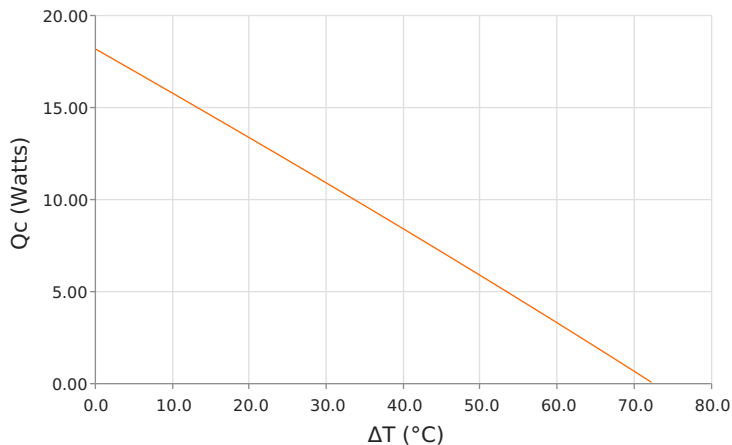
Total Heat Dissipated at Hot Side ( $Q_h = Q_c + P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



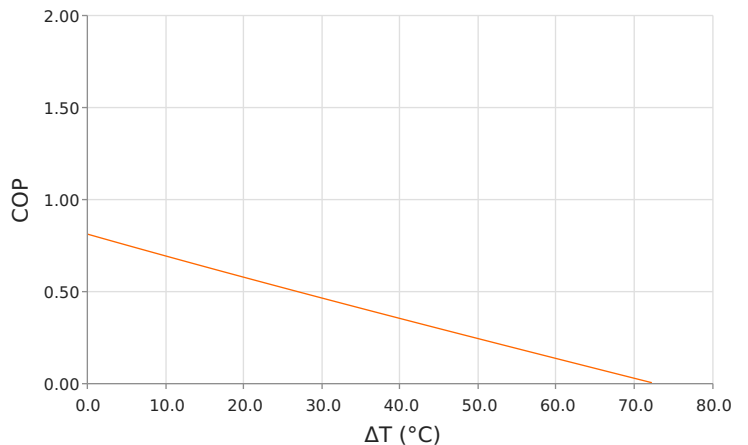
Total Heat Dissipated at Hot Side ( $Q_h = Q_c + P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$  | Current = 3.4 Amps



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$  | Current = 3.4 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 ( $\Delta T = 0$ )                 | 19.4 Watts  | 20.9 Watts | 22.4 Watts |
| $\Delta T_{max}$ ( $Q_c = 0$ )           | 73.6°C      | 82.6°C     | 93.1°C     |
| I <sub>max</sub> (I @ $\Delta T_{max}$ ) | 4.0 Amps    | 3.9 Amps   | 3.8 Amps   |
| V <sub>max</sub> (V @ $\Delta T_{max}$ ) | 8.3 Volts   | 9.2 Volts  | 10.4 Volts |
| Module Resistance                        | 1.94 Ohms   | 2.18 Ohms  | 2.50 Ohms  |
| Max Operating Temperature                | 120 °C      |            |            |
| Weight                                   | 9.0 gram(s) |            |            |

\* Specifications reflect thermoelectric coefficients updated March 2020

## FINISHING OPTIONS

| Suffix | Thickness                             | Flatness / Parallelism                     | Hot Face | Cold Face | Lead Length         |
|--------|---------------------------------------|--|----------|-----------|---------------------|
| TA     | 3.500 ± 0.025 mm<br>0.138 ± 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

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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