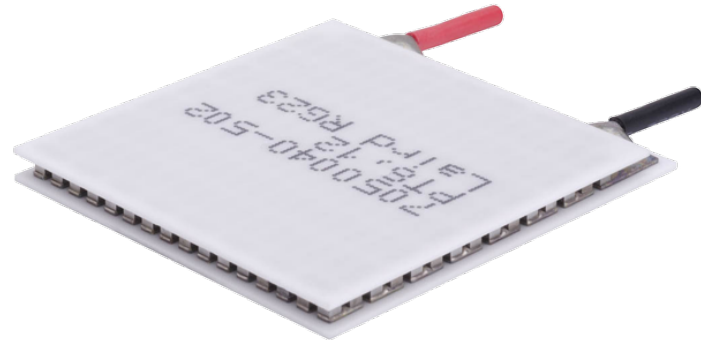


## PolarTEC™ PT Series Thermoelectric Cooler

The PT6-12-F2-4040-TA-W6 is a porch-style thermoelectric cooler. The hot side ceramic has an extended edge, which allows for a strong lead attachment to accommodate the wiring of multiple thermoelectric coolers into an array. It has a maximum  $Q_c$  of 50.6 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 70.5 °C at  $Q_c = 0$ .

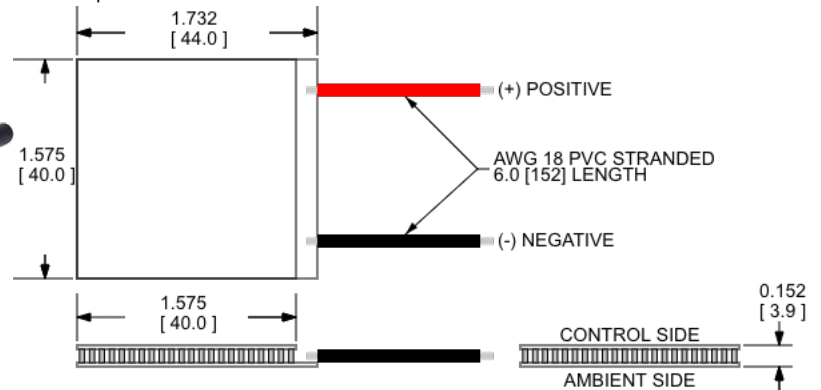


## Features

- Strong lead attachment
- Precise temperature control
- Reliable solid-state operation
- No sound or vibration
- DC Operation
- RoHS-compliant

## Applications

- Cooling for Mobile Base Stations and Cell Towers
- Thermal Management Solutions for Beverage Cooling
- Cooling for Centrifuges
- Energy Storage Systems



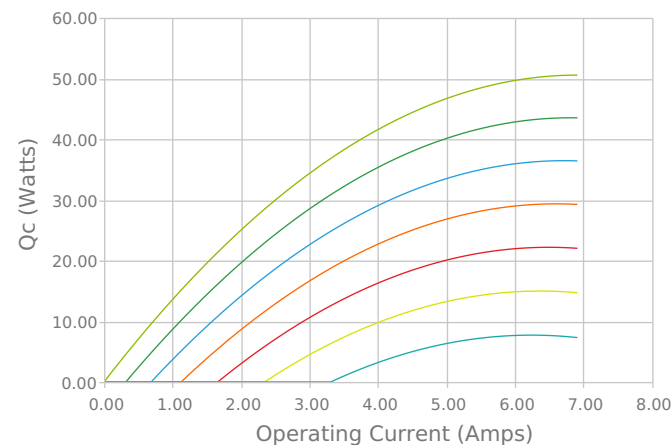
CERAMIC MATERIAL:  $Al_2O_3$   
SOLDER CONSTRUCTION: 138°C, BiSn

INCHES [ MM ]

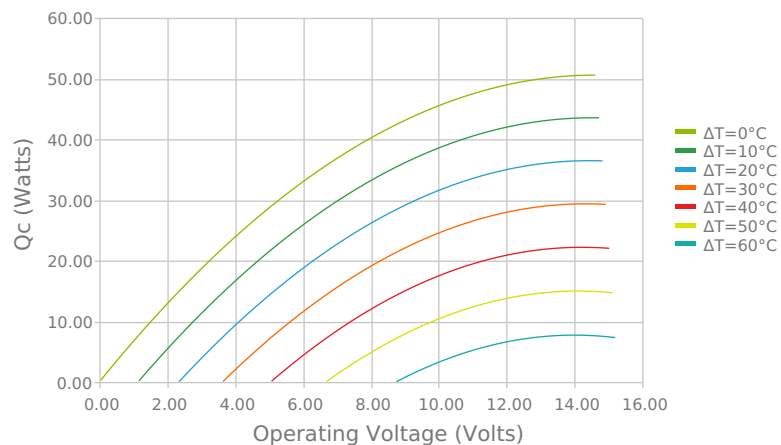
## Electrical and Thermal Performance

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

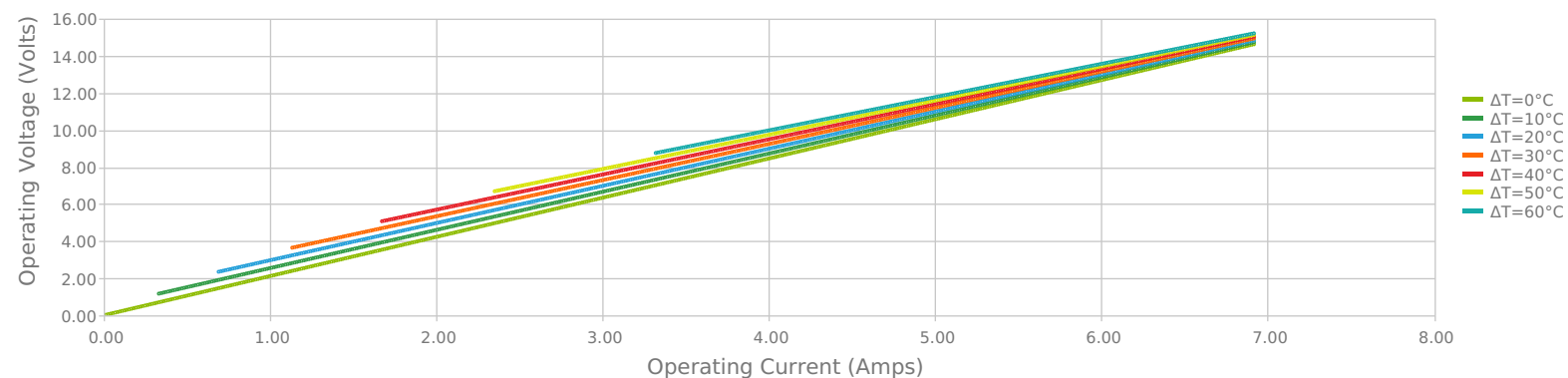
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



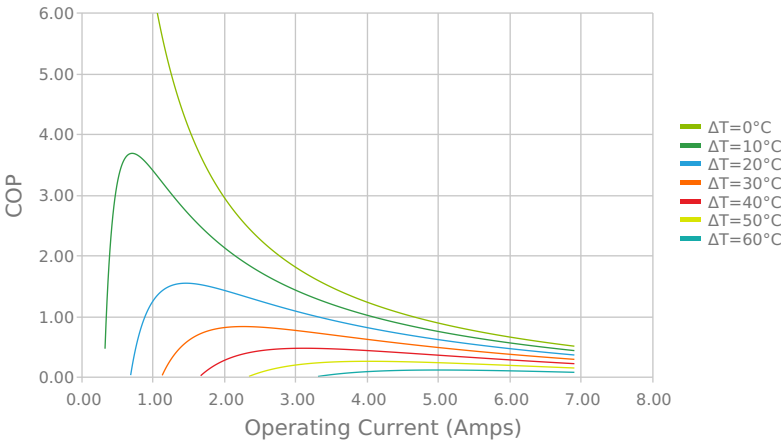
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



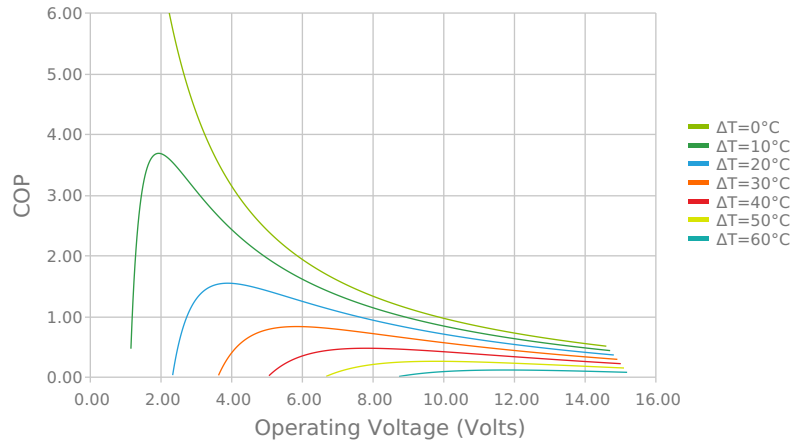
Current vs Voltage (I vs V)  
 $T_{hot} = 27\text{ °C}$



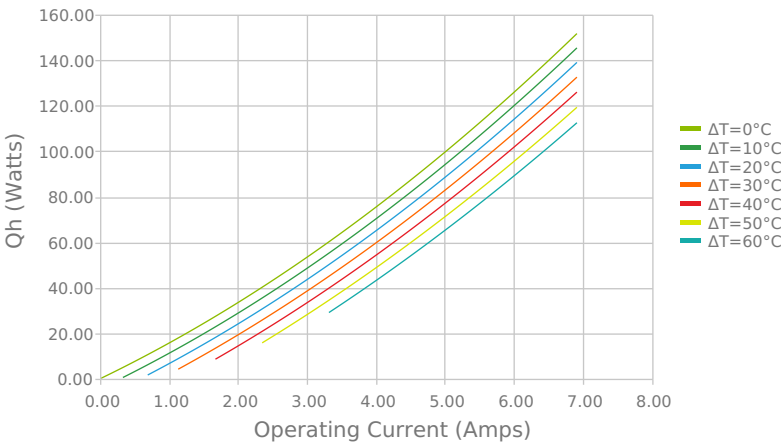
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



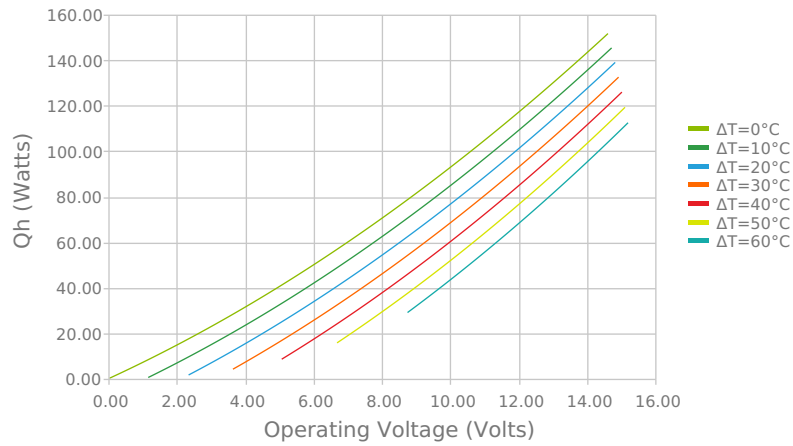
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



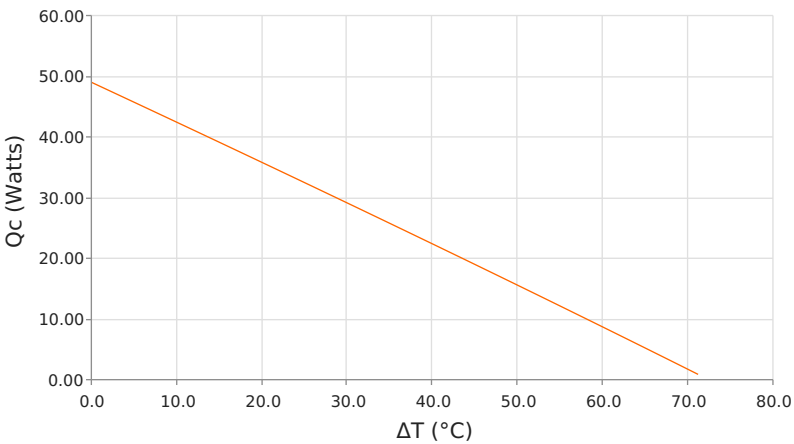
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



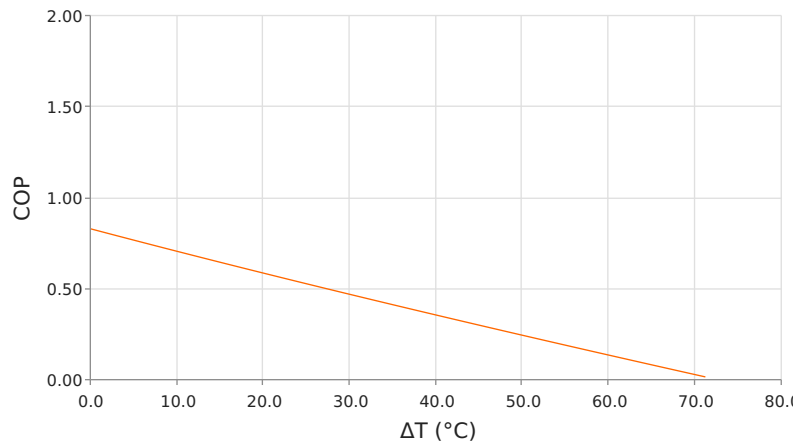
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 35\text{ }^{\circ}\text{C}$  |  $I_{operating} = 5.2\text{ Amps}$



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 35\text{ }^{\circ}\text{C}$  |  $I_{operating} = 5.2\text{ Amps}$



Specifications

| Hot Side Temperature      | 27.0 °C      | 35.0 °C    | 50.0 °C    |
|---------------------------|--------------|------------|------------|
| Qcmax (ΔT = 0)            | 50.6 Watts   | 52.1 Watts | 54.8 Watts |
| ΔTmax (Qc = 0)            | 70.5°C       | 73.5°C     | 78.8°C     |
| Imax (I @ ΔTmax)          | 6.1 Amps     | 6.1 Amps   | 6.0 Amps   |
| Vmax (V @ ΔTmax)          | 13.9 Volts   | 14.4 Volts | 15.4 Volts |
| Module Resistance         | 2.11 Ohms    | 2.20 Ohms  | 2.37 Ohms  |
| Max Operating Temperature | 80 °C        |            |            |
| Weight                    | 23.0 gram(s) |            |            |

Finishing Options

| Suffix | Thickness                            | Flatness / Parallelism                     | Hot Face | Cold Face | Lead Length         |
|--------|--------------------------------------|--------------------------------------------|----------|-----------|---------------------|
| TA     | 3.861 ±0.025 mm<br>0.152 ± 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          |
|--------|---------|-------|------------|----------------------|
|        | None    |       |            | No sealing specified |

Notes

Max operating temperature: 80°C  
Do not exceed Imax or Vmax when operating module  
Reference assembly guidelines for recommended installation

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