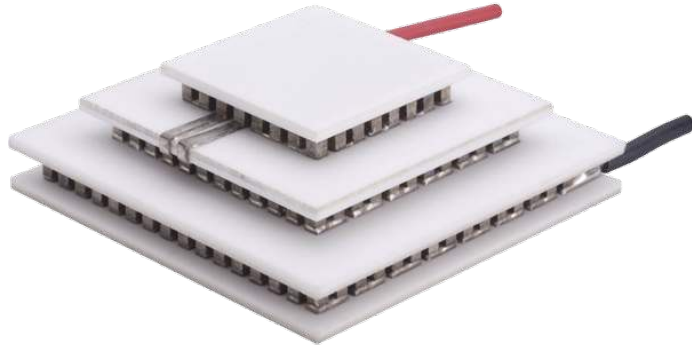


Multistage MS Series Thermoelectric Cooler

The MS3-231-10-15-22-EP-W8 multistage thermoelectric cooler is able to reach colder temperatures than single stage thermoelectric coolers. It has a maximum Qc of 6.7 Watts when $\Delta T = 0$ and a maximum ΔT of 106 °C at Qc = 0.

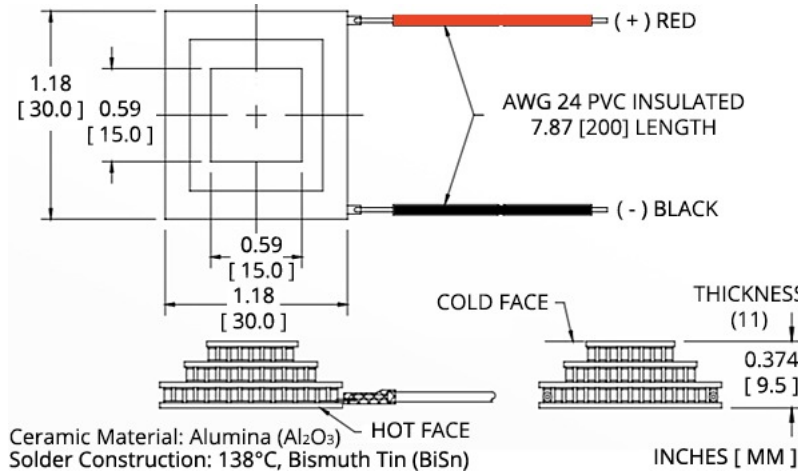


Features

- High temperature differential
- Precise temperature control
- Reliable solid-state operation
- Environmentally-friendly
- DC operation
- RoHS-compliant

Applications

- Thermoelectric Cooling for CMOS Sensors
- Heads-Up Displays, Imaging Sensors

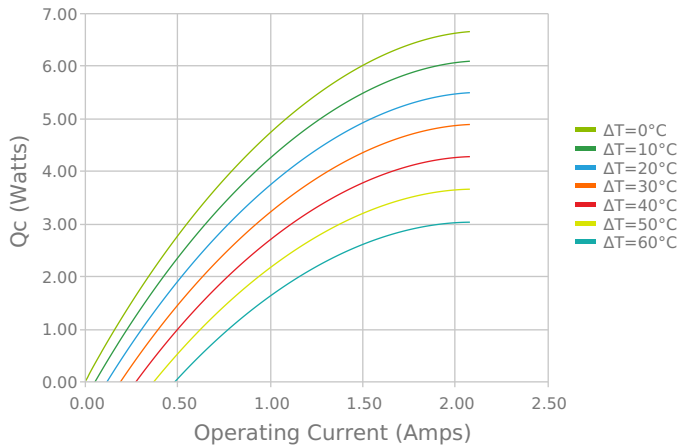


Note: Allow 0.020 in [0.5 mm] around perimeter of the thermoelectric cooler and lead wire attachment to accommodate sealant

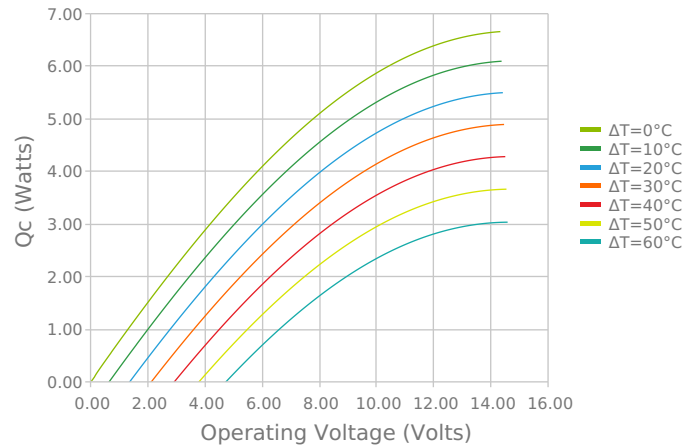
ELECTRICAL AND THERMAL PERFORMANCE

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.

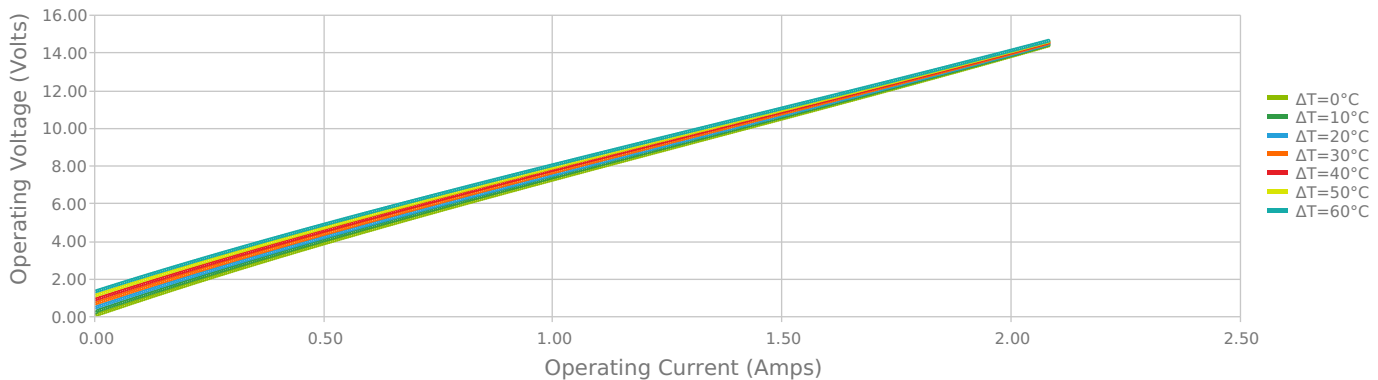
Heat Pumped at Cold Side
 Thot = 27 °C



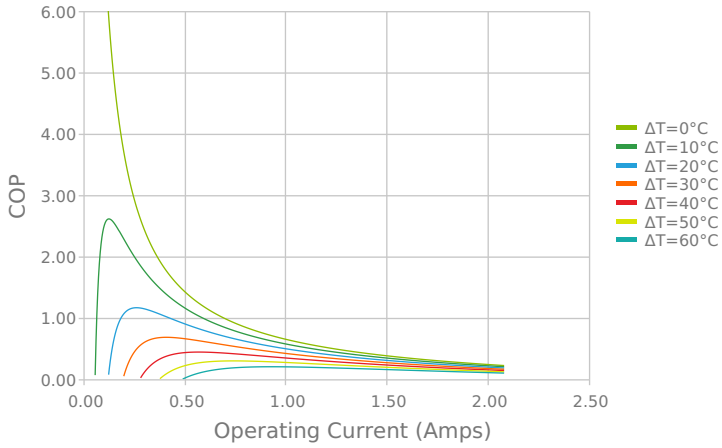
Heat Pumped at Cold Side
 Thot = 27 °C



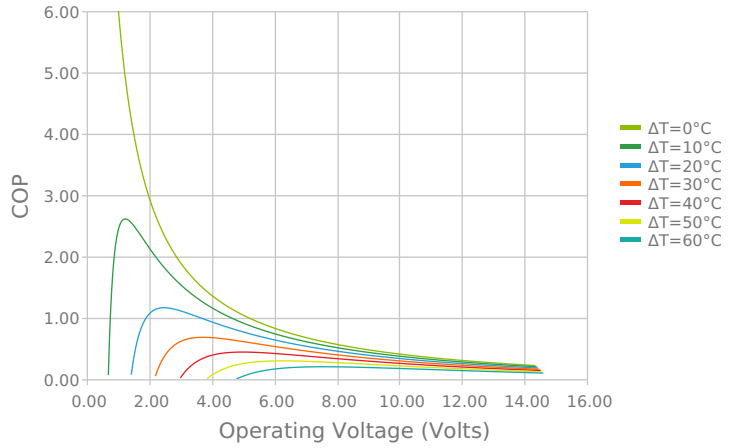
Current vs Voltage (I vs V)
 Thot = 27 °C



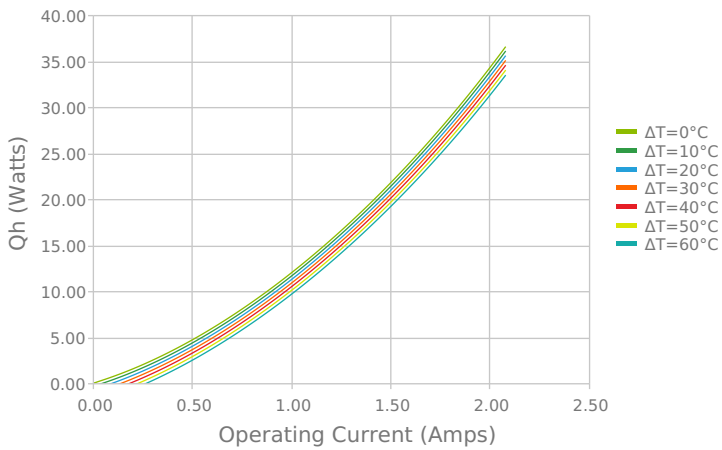
Coefficient of Performance (COP = Qc/Pin)
Thot = 27 °C



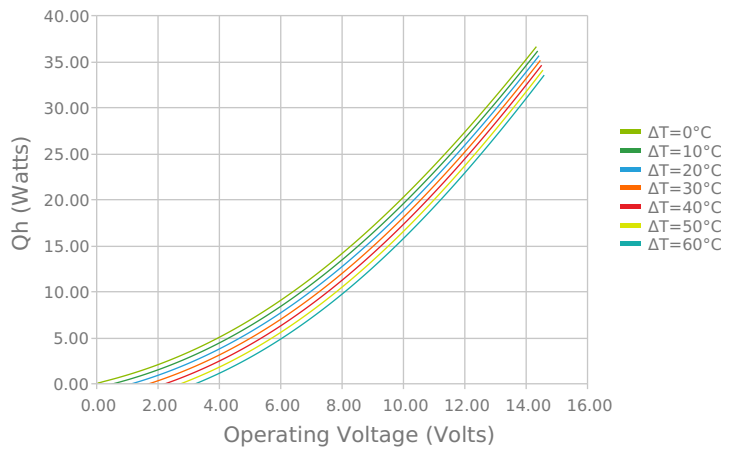
Coefficient of Performance (COP = Qc/Pin)
Thot = 27 °C



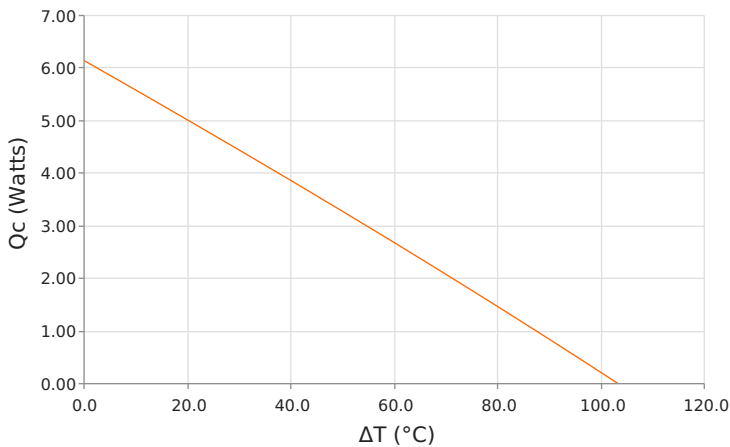
Total Heat Dissipated at Hot Side (Qh=Qc+Pin)
Thot = 27 °C



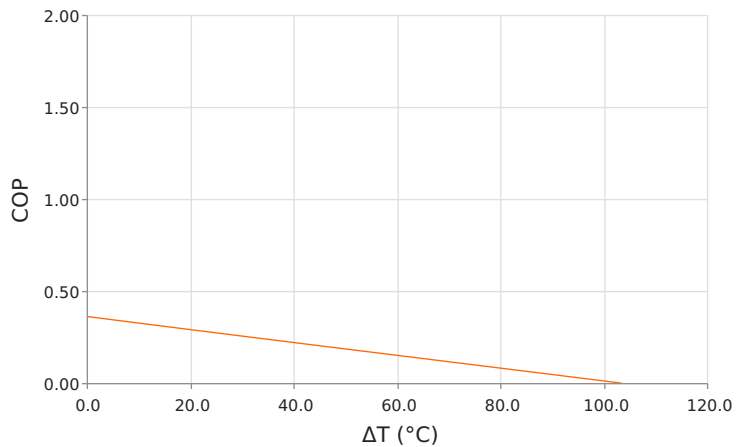
Total Heat Dissipated at Hot Side (Qh=Qc+Pin)
Thot = 27 °C



Heat Pumped at Cold Side (Qc)
Thot = 27 °C | Current = 1.6 Amps



Coefficient of Performance (COP = Qc/Pin)
Thot = 27 °C | Current = 1.6 Amps



SPECIFICATIONS*

| | |
|---|----------------|
| Hot Side Temperature | 27.0 °C |
| Qcmax ($\Delta T = 0$) | 6.7 Watts |
| ΔT_{max} ($Q_c = 0$) | 106.0 °C |
| I_{max} (I @ ΔT_{max}) | 2.0 Amps |
| V_{max} (V @ ΔT_{max}) | 14.3 Volts |
| Module Resistance | 7.15 Ohms |
| Max Operating Temperature | 80 °C |
| Weight | 18.0 gram(s) |

* Specifications reflect thermoelectric coefficients updated March 2020

FINISHING OPTIONS

| Suffix | Thickness | Flatness / Parallelism | Hot Face | Cold Face | Lead Length |
|--------|-------------------------------------|--|------------|------------|---------------------|
| 22 | 9.703 ±0.203 mm 0.382 ± 0.008 in | 0.025 mm / 0.203 mm 0.001 in / 0.008 in | Pre-tinned | Pre-tinned | 199.9 mm 7.87 in |

SEALING OPTIONS

| Suffix | Sealant | Color | Temp Range | Description |
|--------|---------|-------|--------------|--|
| EP | Epoxy | Black | -55 to 150°C | Low density syntactic foam epoxy encapsulant |

NOTES

1. Max operating temperature: 80°C
2. Do not exceed I_{max} or V_{max} when operating module
3. Reference assembly guidelines for recommended installation
4. Solder tinning also available on metallized ceramics

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