

## OptoTEC™ MBX Series Thermoelectric Cooler

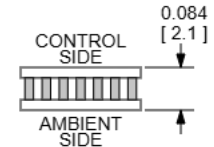
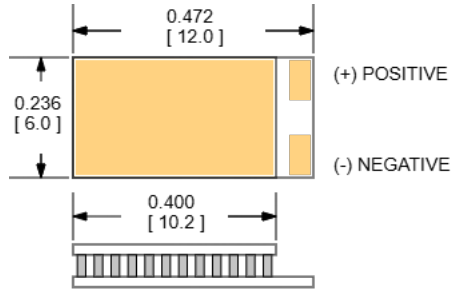
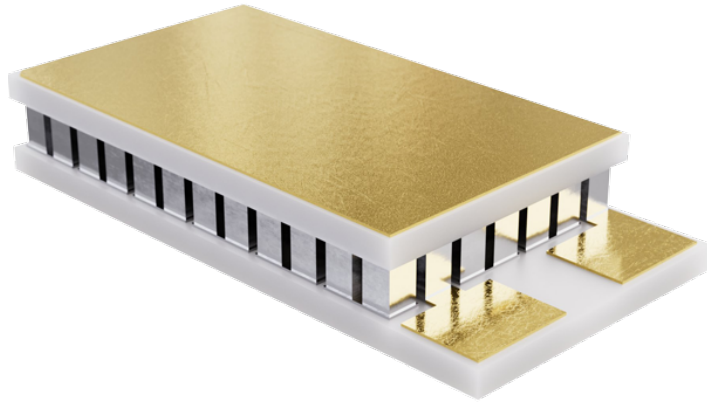
The MBX20-42-F2A-1206-GG-W0 is a high-performance, miniature thermoelectric cooler. The MBX20-42-F2A-1206-GG-W0 is primarily used in applications to stabilize the temperature of sensitive optical components in the telecom and photonics industries. It has a maximum  $Q_c$  of 5.9 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 72.9 °C at  $Q_c = 0$ .

### Features

- Miniature footprint
- Precise temperature control
- Reliable solid-state operation
- Operates in high-temperature applications
- No sound or vibration
- RoHS-compliant

### Applications

- VCSELs
- Laser Diodes
- Optical Transceivers
- Lidar Sensors
- Infrared Range (IR) Sensors
- Autonomous Systems
- Machine Vision



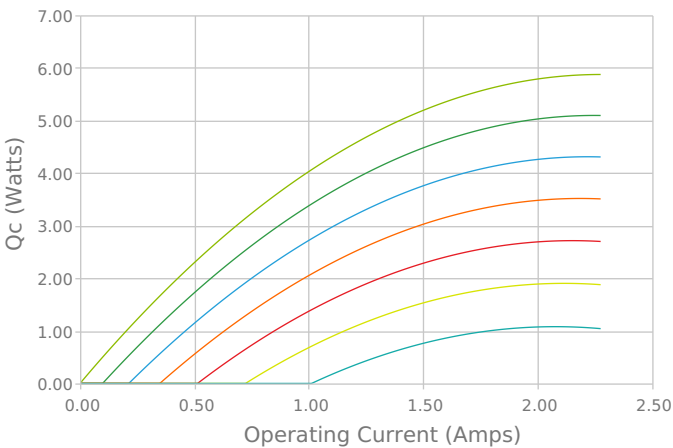
CERAMIC MATERIAL:  $Al_2O_3$   
SOLDER CONSTRUCTION: 232°C, SbSn

INCHES [MM]

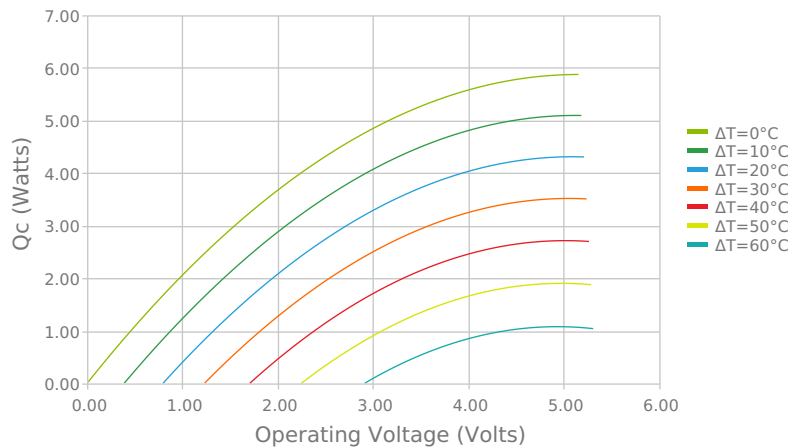
## ELECTRICAL AND THERMAL PERFORMANCE

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.

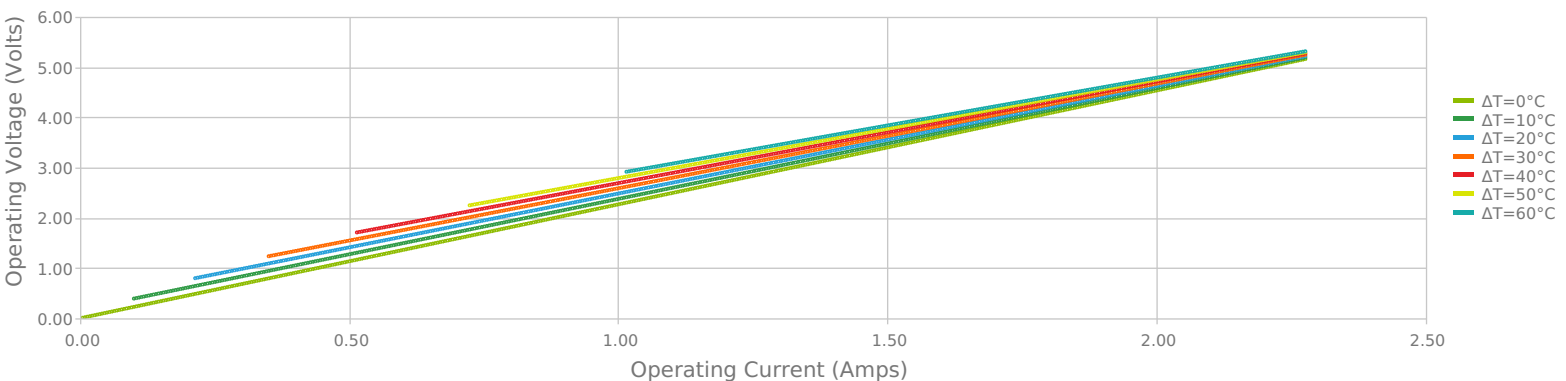
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



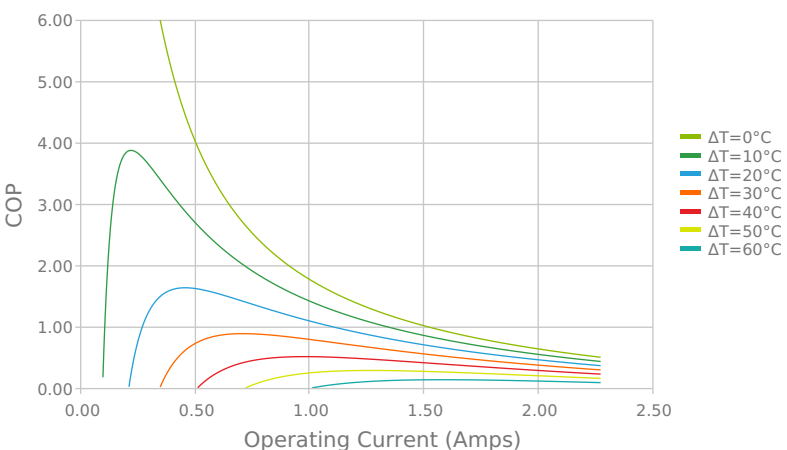
Heat Pumped at Cold Side  
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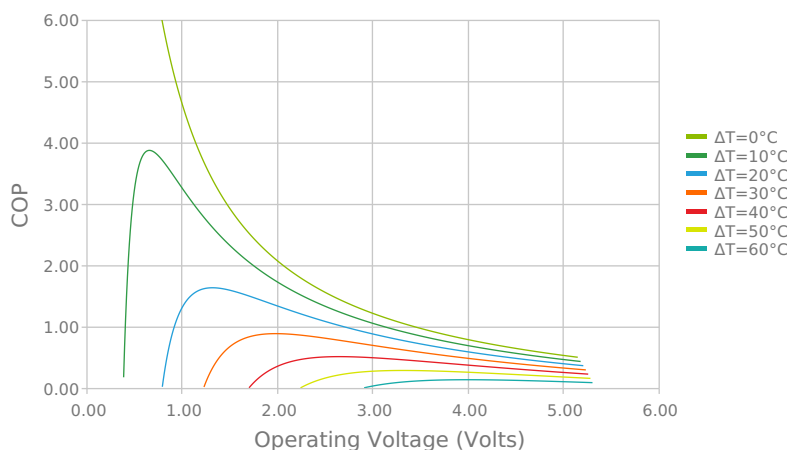
Current vs Voltage (I vs V)  
 $T_{hot} = 27\text{ °C}$



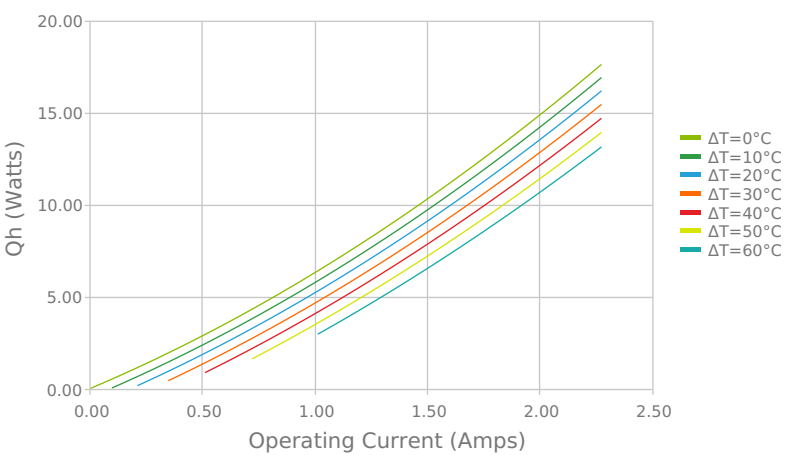
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



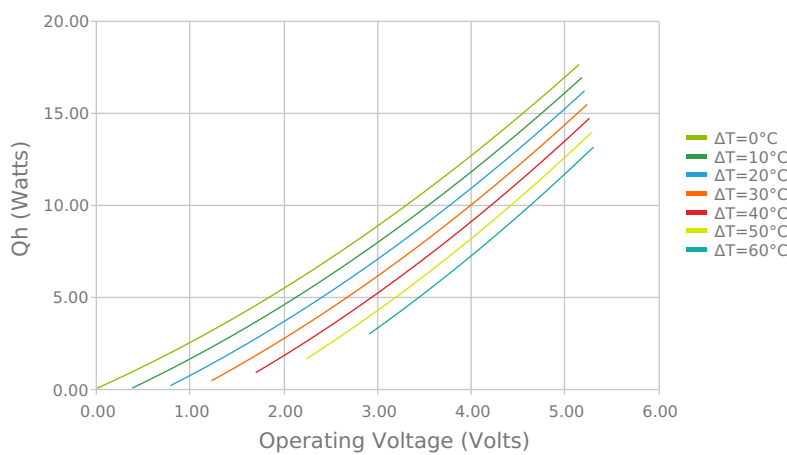
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
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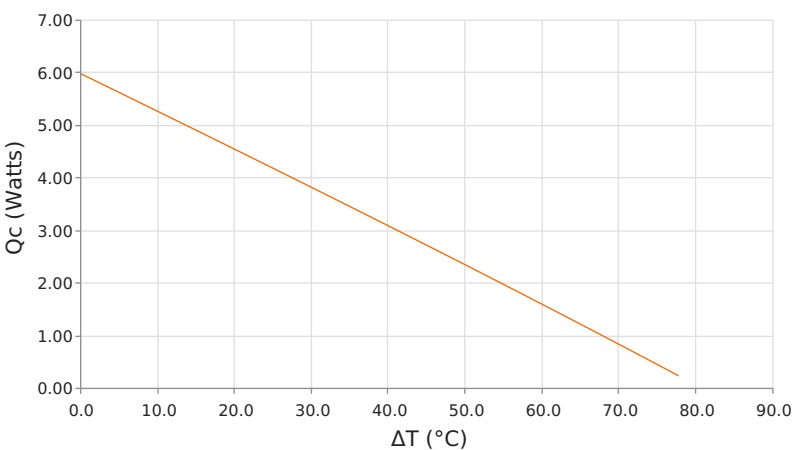
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



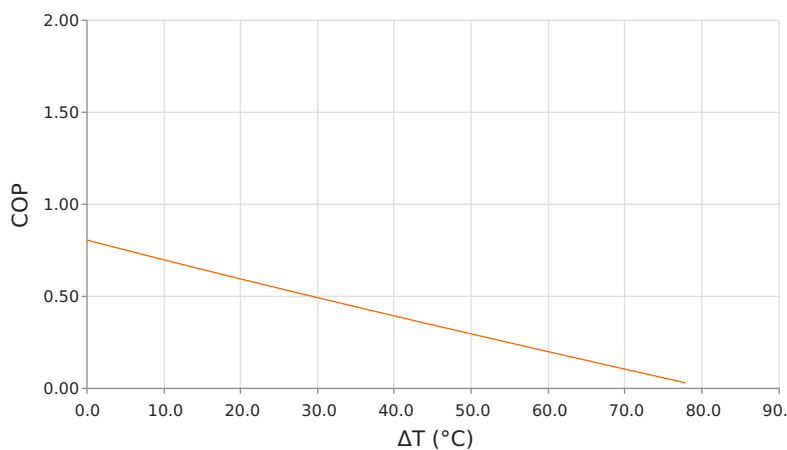
Total Heat Dissipated at Hot Side ( $Q_h=Q_c+P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 50\text{ }^{\circ}\text{C}$  | operating = 1.7 Amps



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 50\text{ }^{\circ}\text{C}$  | operating = 1.7 Amps



SPECIFICATIONS

| Hot Side Temperature      | 27.0 °C     | 50.0 °C   | 80.0 °C   |
|---------------------------|-------------|-----------|-----------|
| Qcmax (ΔT = 0)            | 5.9 Watts   | 6.3 Watts | 6.8 Watts |
| ΔTmax (Qc = 0)            | 72.9°C      | 81.8°C    | 92.1°C    |
| Imax (I @ ΔTmax)          | 2.0 Amps    | 2.0 Amps  | 1.9 Amps  |
| Vmax (V @ ΔTmax)          | 4.9 Volts   | 5.4 Volts | 6.1 Volts |
| Module Resistance         | 2.27 Ohms   | 2.55 Ohms | 2.92 Ohms |
| Max Operating Temperature | 120 °C      |           |           |
| Weight                    | 0.5 gram(s) |           |           |

FINISHING OPTIONS

| Suffix | Thickness                            | Flatness / Parallelism | Hot Face  | Cold Face | Lead Length       |
|--------|--------------------------------------|------------------------|-----------|-----------|-------------------|
| GG     | 2.130 ±0.100 mm<br>0.084 ± 0.0039 in | N/A / N/A              | Au Plated | Au Plated | 0.0 mm<br>0.00 in |

SEALING OPTIONS

| Suffix | Sealant | Color | Temp Range | Description          |
|--------|---------|-------|------------|----------------------|
|        | None    |       |            | No sealing specified |

NOTES

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

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