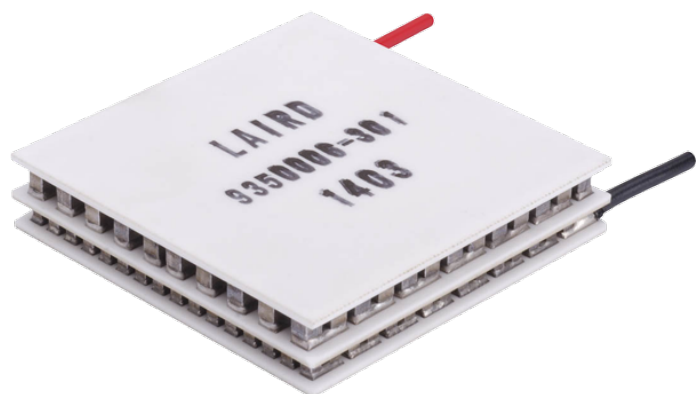


### Multistage MS Series Thermoelectric Cooler

The MS2-192-14-20-11-18-21-W8 multistage thermoelectric cooler is able to reach colder temperatures than single stage thermoelectric coolers. It has a maximum  $Q_c$  of 38 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 90 °C at  $Q_c = 0$ .

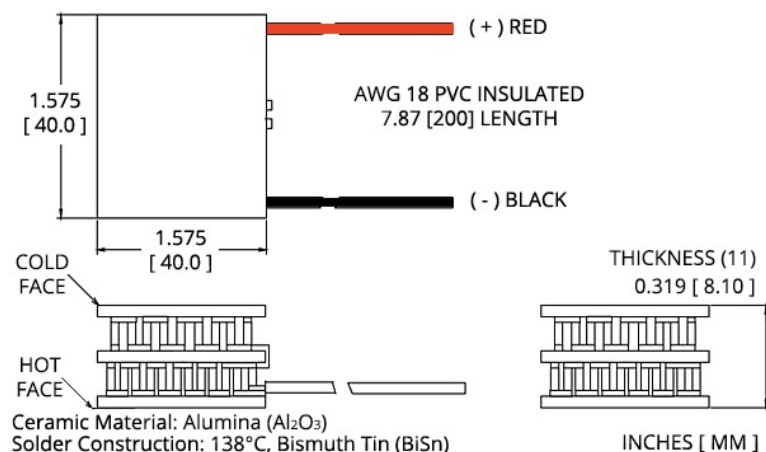


### Features

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

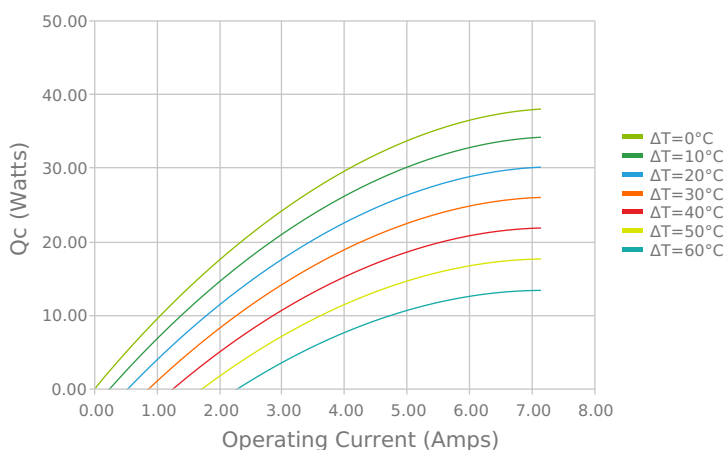
### Applications

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

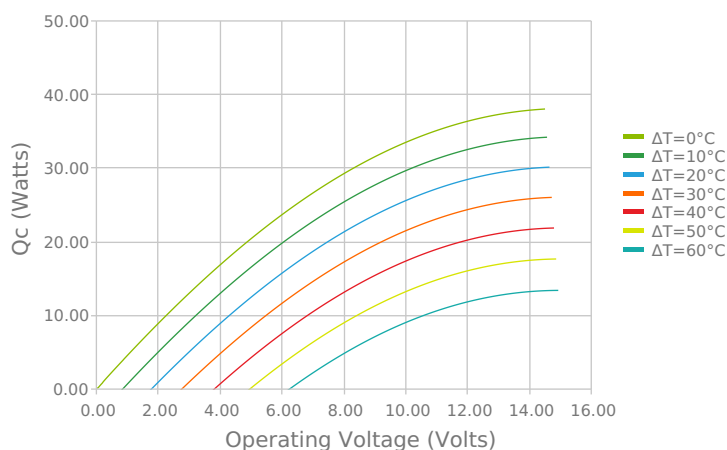


## ELECTRICAL AND THERMAL PERFORMANCE

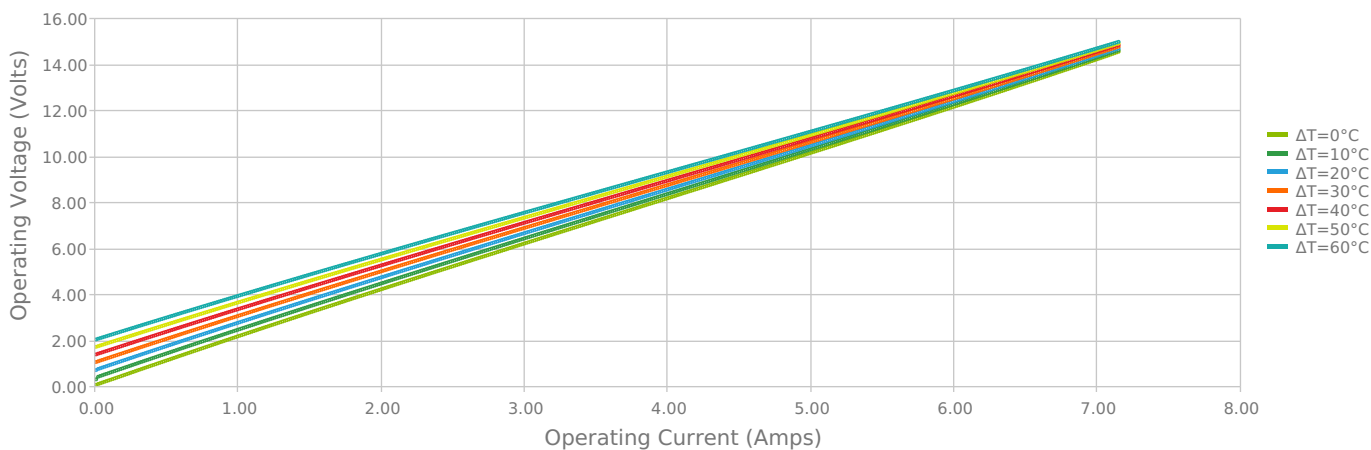
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



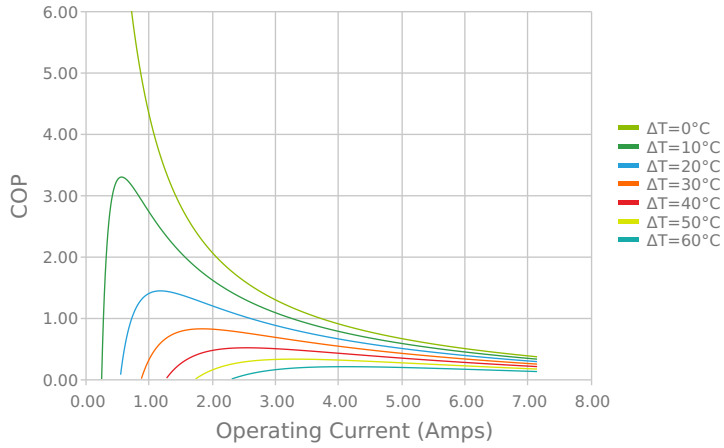
Heat Pumped at Cold Side  
 $T_{hot} = 27\text{ °C}$



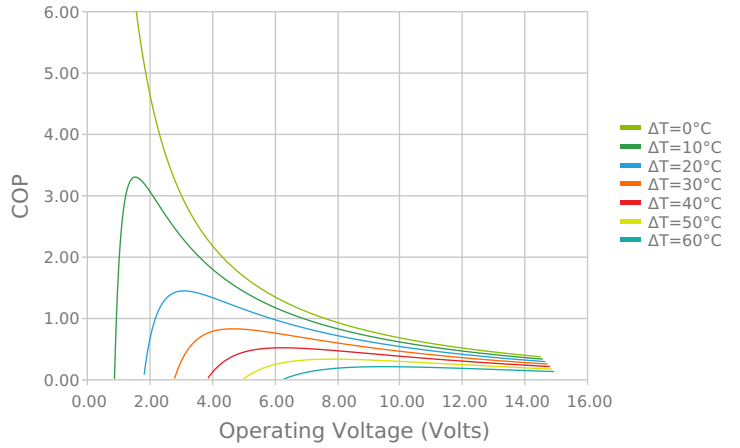
Current vs Voltage (I vs V)  
 $T_{hot} = 27\text{ °C}$



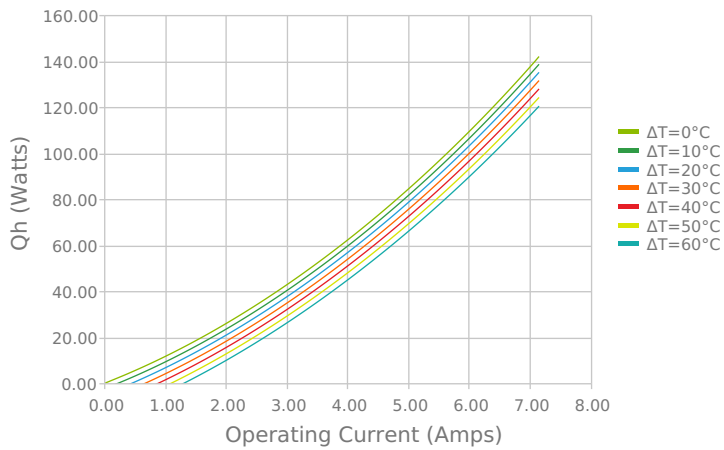
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



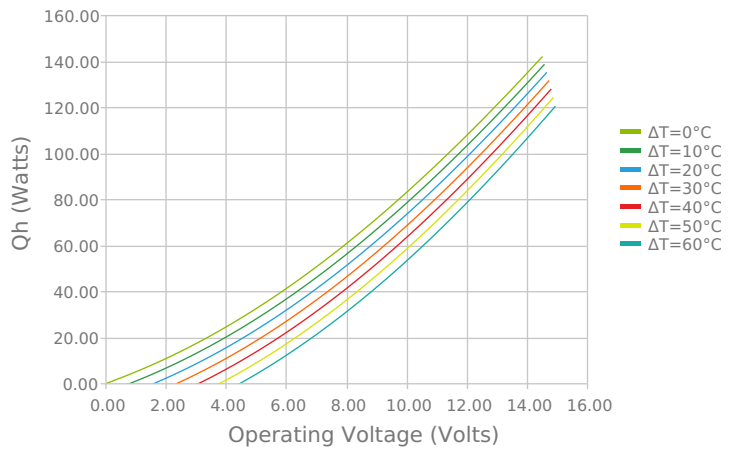
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



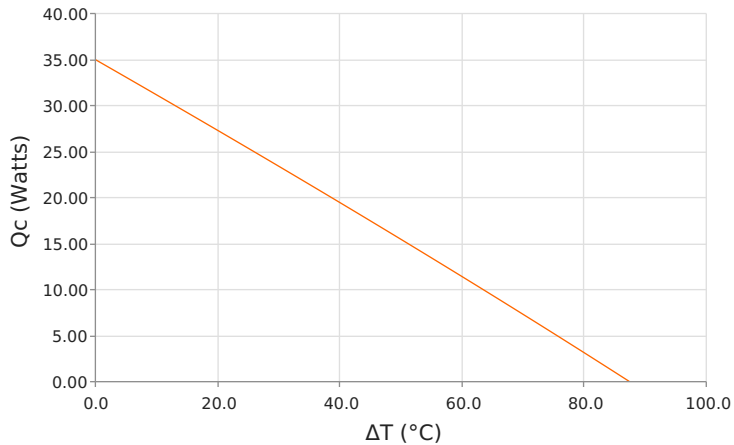
Total Heat Dissipated at Hot Side ( $Q_h = Q_c + P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



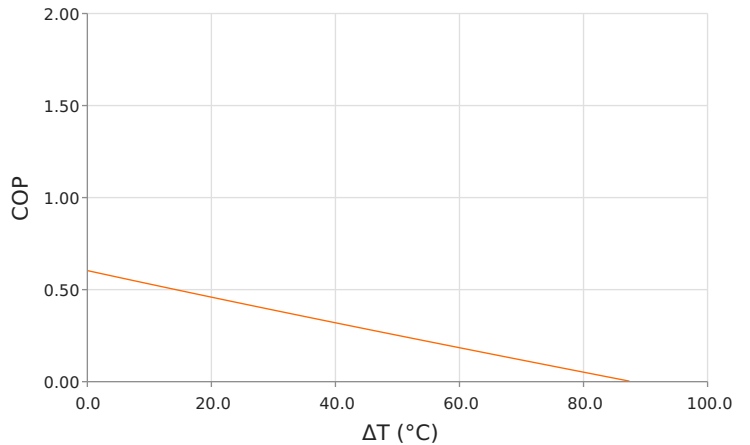
Total Heat Dissipated at Hot Side ( $Q_h = Q_c + P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$  | Current = 5.4 Amps



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27\text{ }^{\circ}\text{C}$  | Current = 5.4 Amps



## SPECIFICATIONS\*

<b>Hot Side Temperature</b>	<b>27.0 °C</b>
<b>Qcmax (<math>\Delta T = 0</math>)</b>	38.0 Watts
<b><math>\Delta T_{max}</math> (<math>Q_c = 0</math>)</b>	90.0 °C
<b>I<sub>max</sub> (I @ <math>\Delta T_{max}</math>)</b>	6.9 Amps
<b>V<sub>max</sub> (V @ <math>\Delta T_{max}</math>)</b>	14.8 Volts
<b>Module Resistance</b>	2.14 Ohms
<b>Max Operating Temperature</b>	80 °C
<b>Weight</b>	60.0 gram(s)

\* Specifications reflect thermoelectric coefficients updated March 2020

## FINISHING OPTIONS

Suffix	Thickness	Flatness / Parallelism	Hot Face	Cold Face	Lead Length
00	40.203 $\pm$ 0.203 mm 1.583 $\pm$ 0.008 in	0.025 mm / 0.203 mm 0.001 in / 0.008 in	Metallized	Metallized	199.9 mm 7.87 in

## SEALING OPTIONS

Suffix	Sealant	Color	Temp Range	Description
	None			No sealing specified

## NOTES

1. Max operating temperature: 80°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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