Thermoelectric Cooler Element, 2.5 A

TEC3-2.5



Description

Thorlabs' 2.5 Amp Single-Stage TEC Element is built with thermally conductive Aluminum Oxide ceramics. It has solid state reliability and high strength for rugged environments. It has superior nickel diffusion barriers on elements and a porched configuration for improved leadwire strength.

Performance Values

Hot Side Temperature (°C)	27 °C	50 °C
ΔT_{max}[a]	65 °C	73 °C
Q_{max}	6.0 W	6.0 W
I_{max}[b]	2.5 A	2.5 A
V_{max}[b,c]	3.6 V	4.1 V
AC Resistance	1.2 Ω	---
Device ZT[d]	0.76	---

a. Environment: 1.0 atm Dry N_2
b. Do not exceed I_{max} or V_{max} when operating the module.
c. DC Voltage
d. Unitless Measurement of Optimal Device Efficiency with Maximum Value of 1.0

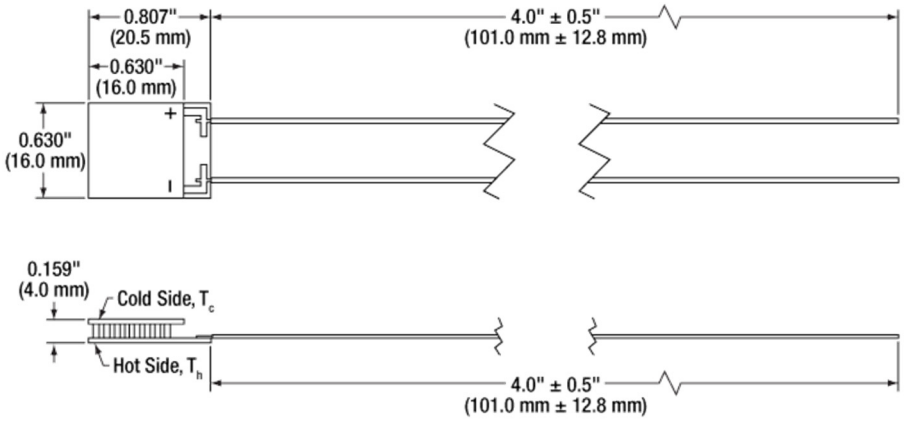
Mechanical Characteristics

Dimensions		
	Length	Width
Hot Side	0.807" (20.5 mm)	0.630" (16.0 mm)
Cold Side	0.630" (16.0 mm)	0.630" (16.0 mm)

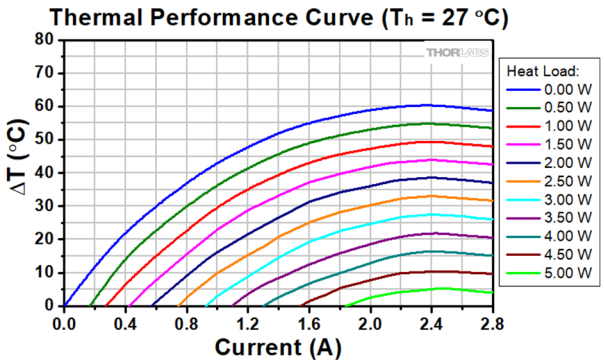
Common Dimensions			
Height	Flatness	Parallelism	Lead Length
0.159" ± 0.005" (4.0 mm ± 0.13 mm)	0.002" (0.05 mm)	0.003" (0.08 mm)	4.00" ± 0.5" (101.0 mm ± 12.8 mm)

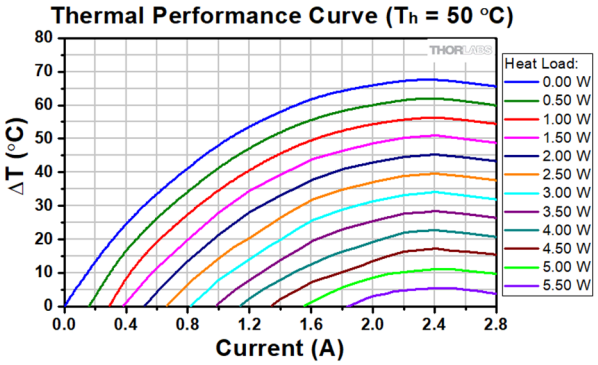
Additional Characteristics	
Ceramic Material	Alumina (Al_2O_3)
Sealing Material	None
Leads	20 AWG, Stranded, PTFE
Max. Operating Temp.	130 °C

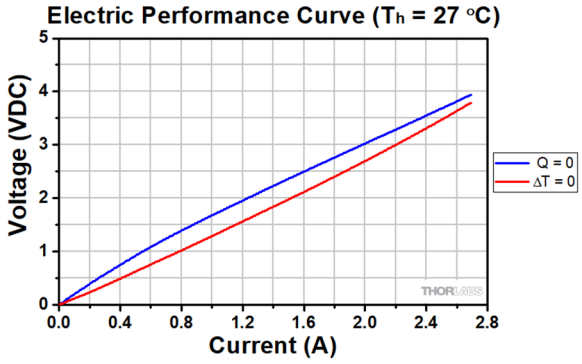
Drawing

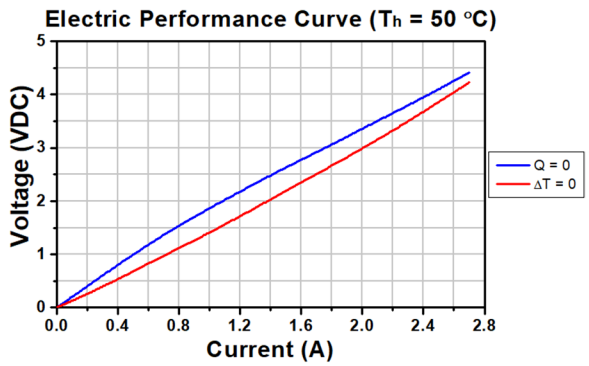


Thermoelectric Cooling Performance Graphs









Power Generation Specifications

Hot Side Temperature, T_h	85 °C	55 °C	35 °C
Cold Side Temperature, T_c	27 °C	27 °C	27 °C
Optimum Efficiency, η_{opt}	2.50%	1.27%	0.37%
Optimum Power, P_{opt}	0.101 W	0.025 W	0.002 W
Optimum Voltage, V_{opt}	0.441 V	0.210 V	0.059 V
Load Resistance for η_{opt}	1.93 Ω	1.80 Ω	1.72 Ω
Open Circuit Voltage, VOC	0.77 V	0.37 V	0.10 V
Short Circuit Current	0.53 A	0.27 A	0.08 A
Thermal Resistance	14.44 °C/W	14.46 °C/W	14.44 °C/W

Power Generation Graphs

