

OptoCooler™ UPF40

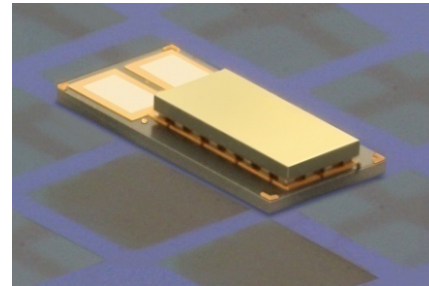
Part #: NCU-4004047-0203A_W Part #: NCU-4004047-0203A_S

Preliminary Data Sheet

OptoCooler UPF40
Thermoelectric Cooler

Description:

Nextreme's *OptoCooler Series* is a family of miniature heat pumps. These high-performance, solid-state thermoelectric devices are optimized for high heat flux cooling up to 80 W/cm² and are ideally suited for photonics, optoelectronics and sensor applications. The miniature size and large heat pumping capacity make this device unique. In addition, the OptoCooler can be operated in forward or reverse polarity to provide either cooling or heating for precise temperature control.



Features:

- High Heat Flux up to 80 W/cm²
- Extremely thin 0.650 mm profile
- Small 2.5mm X 5.1mm footprint
- 4.1 watts maximum cooling
- <2msec response time
- Scalable to higher Q & V applications

Performance Values (typical):

Hot Side Temperature	25°C	85°C
Q _{max} (Watts)	3.4	4.1
ΔT _{max} (°C)	41	51
I _{max} (Amps)	3.8	4.8
V _{max} (Volts)	1.9	2.1
Q _{max} / Area (W/cm ²)	67	80
R _{electrical} (mΩ)	310	
R _{thermal} (K/W)	15	

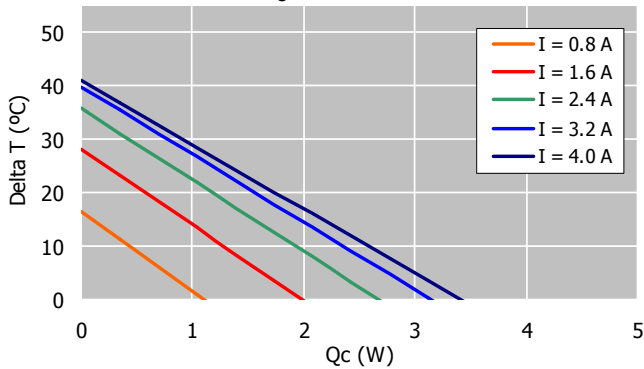
Applications:

- Photonics
- Optoelectronics
- Military
- Aerospace
- Semiconductors
- Bio-medical
- Instrumentation
- Micro-fluidics

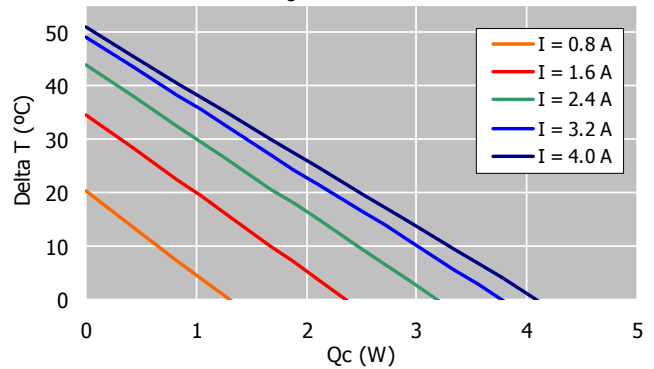
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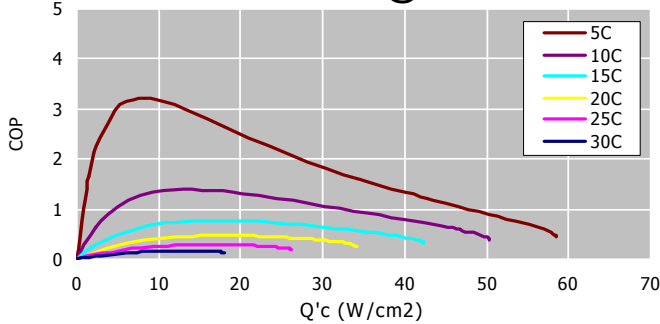
ΔT vs. Q_c @25°C, 10 mTorr



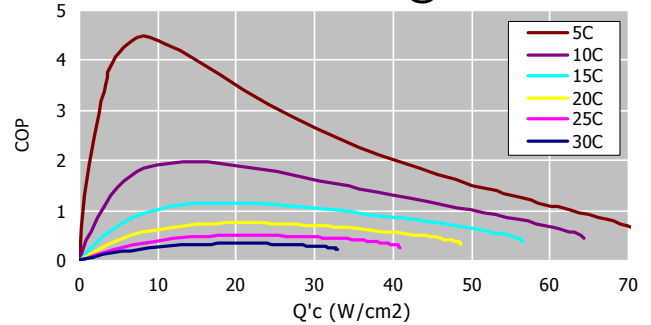
ΔT vs. Q_c @85°C, 10 mTorr



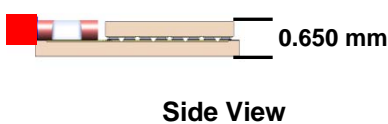
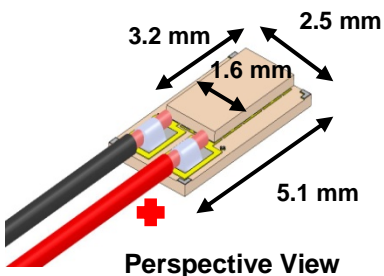
COP vs. Q/A @ 25°C



COP vs. Q/A @ 85°C



Product Dimensions



Ordering Information

1. All devices come with Au on the top and back surfaces.
2. _W part #: 32 AWG wires attached with BiSn - melting point 138°C
3. _S part #: solderable Sn bond pads - wires not attached

Definitions:

- Q_{max} The maximum amount of heat that the Peltier device can pump when operating at I_{max}
- ΔT_{max} The maximum temperature difference the Peltier device can produce
- I_{max} The current which produces ΔT_{max}
- V_{max} The voltage which produces ΔT_{max}
- COP Coefficient of Performance (Heat Pumped / Input Power)
- $R_{thermal}$ Thermal resistance
- $R_{electrical}$ Electrical resistance