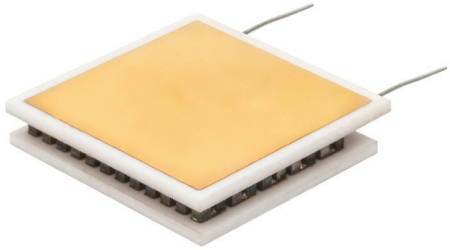
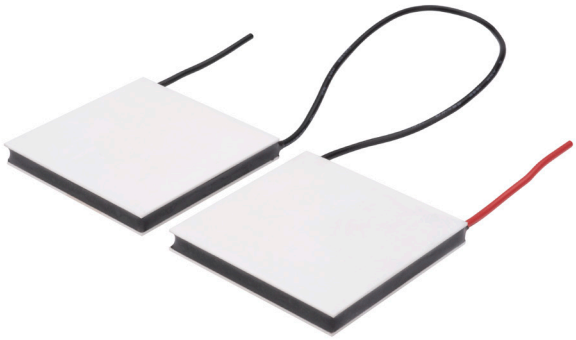
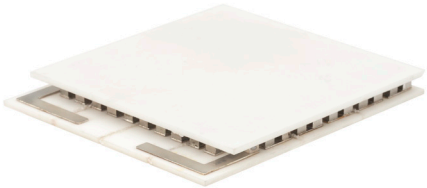
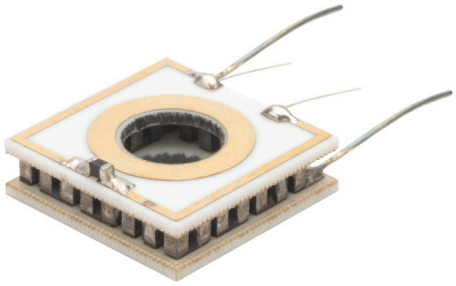
Thermoelectric Cooler Options







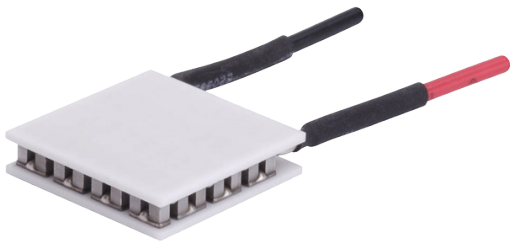


Q-FLEX
www.q-flex.fi info@q-flex.fi
+358 2 4894 500

Laird™
THERMAL SYSTEMS

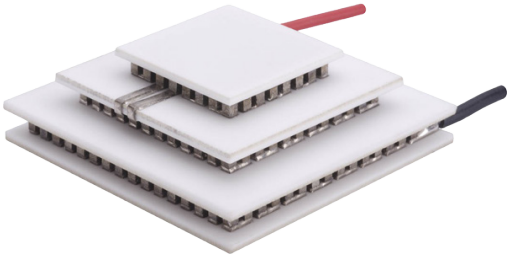
Laird Thermal Systems offers solid-state thermoelectric coolers with a wide range of cooling capacities, temperature differentials, form factors, finishing options and thermal cycling capabilities. Select from our standard thermoelectric cooler products or engage with a Laird Thermal expert to quickly develop a custom thermoelectric cooling solution with our thermoelectric coolers prototyping center for the optimum thermal management solution.

Form Factor



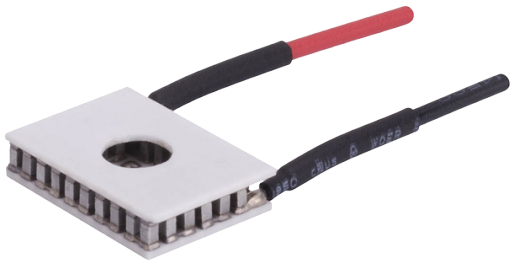
Single Stage Thermoelectric Cooler

- Standard form factor



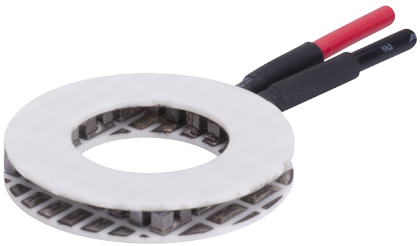
Multistage Thermoelectric Cooler

- Achieves higher temperature differential than single stage thermoelectric coolers



Thermoelectric Cooler with holes

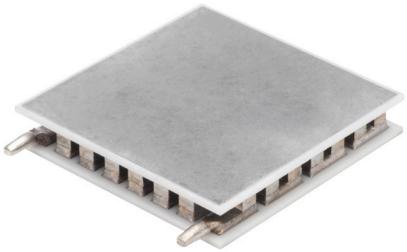
- Central hole accomodates light protrusion for optics, mechanical fastening or temperature probe



Custom Shape Thermoelectric Cooler

- Modification of module to meet specific application requirements

Finish

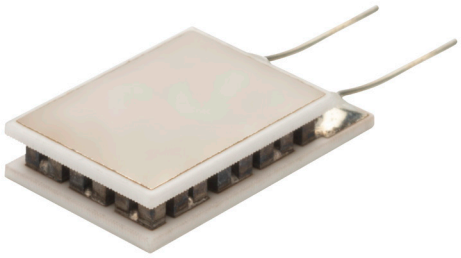


Metallized Surface

- Allows for soldering the thermoelectric cooler directly to mating surfaces without using interface materials that can outgas.
- More cost-effective than gold plating

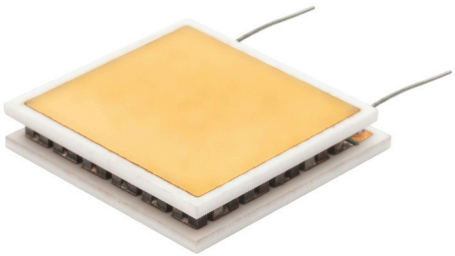
Lapped (Non-Metallized Surface)

- Used for thermoelectric cooler arrays
- Thermal interface material required during assembly



Pre-Tinning

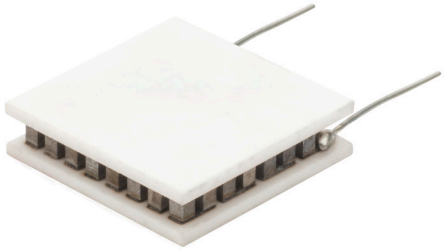
- Simplifies the solder reflow process.
  - InSn Solder (118°C) used for standard thermoelectric coolers
  - BiSn solder (138°C) used for high temperature thermoelectric coolers



Gold (Au) Plating

- Allows for soldering the thermoelectric cooler directly to mating surfaces without using interface materials that can outgas.
- Gold provides greater adhesion than metallized surfaces.

Ceramic Substrate



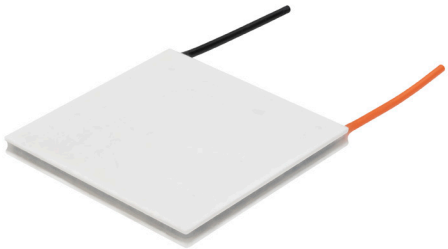
96% Aluminum Oxide (ALO)

- More cost-effective than aluminum nitride

Aluminum Nitride (ALN)

- Better thermal conductivity (10 times better performance) than aluminum oxide (ALO),

Sealant



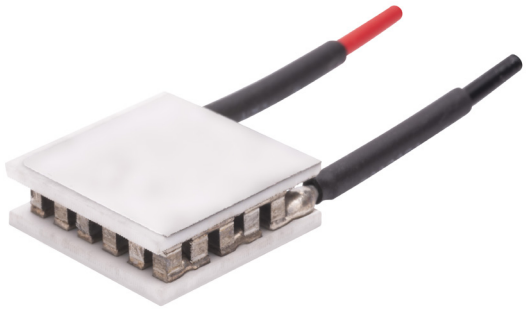
RTV (Translucent or White)

- Non-corrosive, silicone adhesive sealant
- For applications operating below dew point or where rapid changes between hot and cold occur, for example thermal cycling.
- Automation of RTV sealant is more cost effective

Epoxy (black)

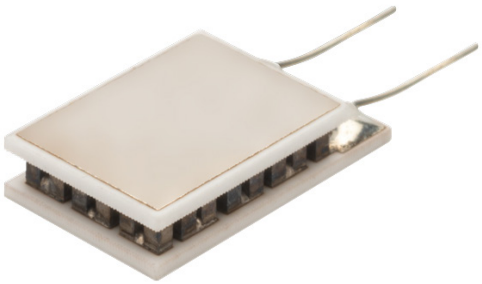
- Low density syntactic foam epoxy encapsulant
- For applications operating below dew point, ideal
- Ideal for refrigeration applications
- Better thermal insulation barrier than RTV sealant.

Wire



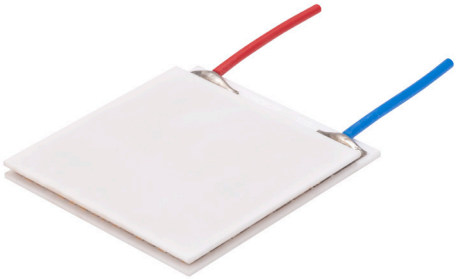
PVC Insulated wire

- Standard for all thermoelectric coolers except HiTemp ETX Series



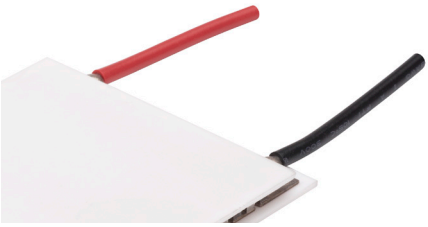
Un-insulated wire

- Used for applications that are sensitive to outgassing



Teflon Wire

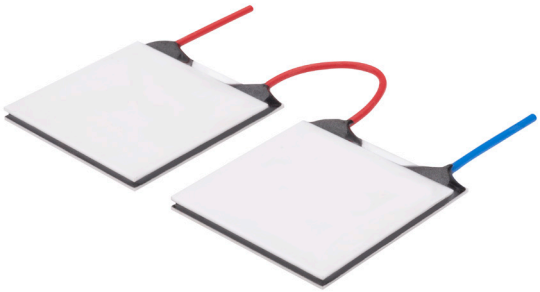
- For high temperature thermoelectric coolers (Hitemp ETX Series)



Optional Lead Length

- Standard and non-standard lead lengths available to accommodate application space constraints
- Standard lead-lengths: 2.25” 4.5”, 6” depending on product series
- Alternate lead lengths range from 2.25” to 24”

Other

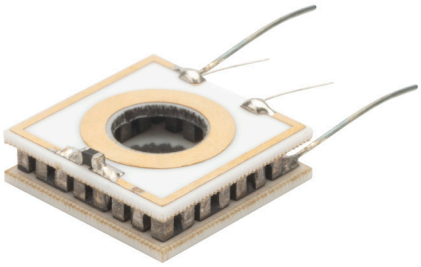


TEC Array or Connector

- We can assemble array to reduce customer work load.

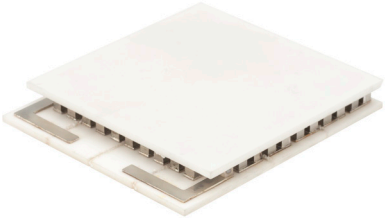
Integrate Thermistors with TEC

- Space saving for customer application
- Allows for closed-loop feedback control



Advanced Patterns

- Allows for small electronics to be mounted on the thermoelectric cooler and eliminates additional ceramic layers



Porch style option

- Front porch or wings
- Allows for accommodating different lead attachment configurations

Wire Bonding Post

- Allows for wire bonding to application

Segmentation of ceramic

- Reduces mechanical stresses to the thermoelectric cooler in thermal cycling applications

Laird™
THERMAL SYSTEMS

Custom Thermoelectric Coolers

Our wide range of sealing and finishing options offer additional configurable flexibility that can provide optimized fit to your application. All thermoelectric coolers are made with high-grade ceramics and semiconductor materials, resulting in Best-in-Class quality performance products. In this table you find the options available for our all our product series. Consult with Laird Thermal Systems on customized thermoelectric cooler solutions Minimum order quantity applies.

SURFACE FINISH OPTIONS	CP	OPTOTEC	HITEMP ETX	POWER CYCLING PCX	ULTRATEC UTX	MULTISTAGE	ANNULAR SH/RH
Metallized Hot/Cold Surface	MM	00	-	-	00	00	MM
Non-Metallized Hot and/or Cold face	L	11	11	11	11	11	L
Pre-tinning Hot and/or Cold face with 118˚C InSn Solder	TT	22	-	-	22	22	TT
Pre-tinning Hot and/or Cold face with 138˚C BiSn Solder	-	33	-	-	-	-	-
Au plating (Hot/Cold Surface)	-	GG	-	-	GG	-	-

Example: CP10-127-05TL = Pre-tinned Hot Face (118˚C InSn), Non-Metallized Cold Face. Note: Metallization and pretinning are not recommended for module sizes larger than 12 x 12 mm's. Consult datasheet for module thicknesses for each surface finishing option. Contact Laird Thermal Systems for finishing options for Multistage Modules.

THICKNESS TOLERANCE OPTIONS	CP	OPTOTEC	HITEMP ETX	POWER CYCLING PCX	ULTRATEC UTX	MULTISTAGE	ANNULAR SH/RH
+/- 0.001" (0.025 mm)	L1	TA	TA	TA	TA	-	TA
+/- 0.0005" (0.013 mm)	L2	TB	TB	TB	TB	-	TB

Example: CP10-127-05-L2 = thickness is 3.2 mm +/- 0.013 mm. Contact Laird Thermal Systems for thickness options for Multistage Modules.

MOISTURE PROTECTION OPTIONS	CP	OPTOTEC	HITEMP ETX	POWER CYCLING PCX	ULTRATEC UTX	MULTISTAGE	ANNULAR SH/RH
RTV perimeter seal, Color: Translucent or White	RT	RT	RT	RT	RT	RT	RT
Epoxy perimeter seal, Color: Black	EP	EP	EP	EP	EP	EP	EP

Example: CP10-127-05-L2-RT = RTV silicone perimeter seal Silicone (RTV) is an all purpose sealant that exhibits good sealing characteristics and retains its elastomeric properties over a wide temperature range, -60 to 200°C. The sealant is non-corrosive to many chemicals and exhibits good electrical properties with low thermal conductivity. Epoxy (EP) is an effective barrier to moisture that exhibits a useable temperature range of -40 to 130°C. When cured the material is completely uni-cellular and therefore the moisture absorption is negligible. The material exhibits a low dielectric constant, low coefficient of thermal expansion and low shrinkage.

WIRE OPTIONS	CP	OPTOTEC	HITEMP ETX	POWER CYCLING PCX	ULTRATEC UTX	MULTISTAGE	CENTER HOLE SH/RH
Custom lead length # in inches, (S denotes special requirement)	W#	W#	W#	W#	W#	W#	W#

Example: CP10-127-05-L2-W8 = Wire length is 8" (203 mm). Reference datasheet for standard lead length, wire type and insulation sleeving. Consult with Laird Thermal Systems for wire bondable posts or thru hole mount.

About Laird Thermal Systems

Laird Thermal Systems designs, develops and manufactures thermal management solutions for demanding applications across global medical, industrial, transportation and telecommunications markets. We manufacture one of the most diverse product portfolios in the industry ranging from active thermoelectric coolers and assemblies to temperature controllers and liquid cooling systems. With un-matched thermal management expertise, our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems.

Learn more by visiting www.lairdthermal.com

LTS-BRO-TEC-OPTIONS-042821

Any Any information furnished by Laird and its agents, whether in specifications, data sheets, product catalogues or otherwise, is believed to be (but is not warranted as being) accurate and reliable, is provided for information only and does not form part of any contract with Laird. All specifications are subject to change without notice. Laird assumes no responsibility and disclaims all liability for losses or damages resulting from use of or reliance on this information. All Laird products are sold subject to the Laird Terms and Conditions of sale (including Laird's limited warranty) in effect from time to time, a copy of which will be furnished upon request.

© Copyright 2020 Laird Thermal Systems, Inc. All rights reserved. Laird™, the Laird Ring Logo, and Laird Thermal Systems™ are trademarks or registered trademarks of Laird Limited or its subsidiaries.