Neumüller
Elektronik GmbH

Thermoelectric Coolers

Peltier Module

passion.experience.reliability.

1952-2022
70
Neumüller
Elektronik GmbH

Uwe Fischer (managing director), Tanja Hollfelder (managing and training director), Georg Fischer (managing director)

Who we are ...

For 70 years, we have been one of the leading design-in distributors for electronic components and systems. At five locations in Germany and one in Austria with a total of 65 employees.

Headquarters:
Weisendorf

Branch office:
Ahrensburg

Offices:
Berlin, Dortmund, München, Linz

... and what we do

As a traditional and family-owned company, we work exclusively with renowned and leading manufacturers. Our focus is on individual consulting as well as solutions and custom-fit products for our customers. Because only when our customers are 100% satisfied we have done a good job.

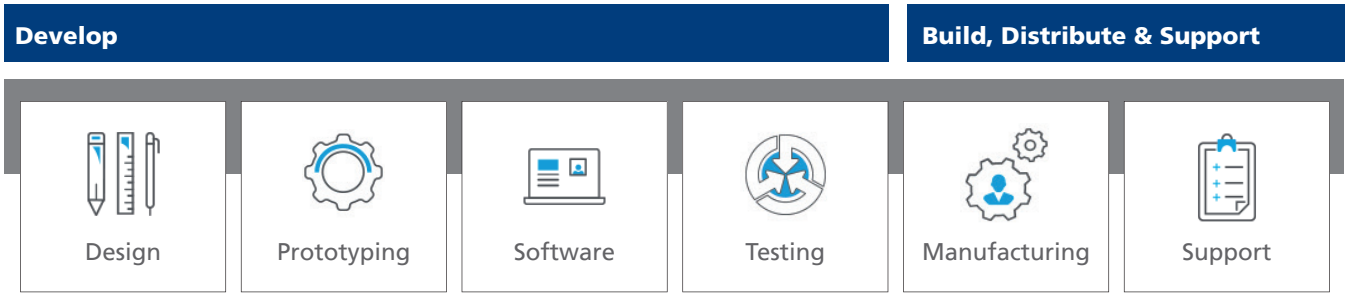
You can also find us here

Liard Thermal Systems

Laird Thermal Systems develops 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. Our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems. By offering a broad range of design, prototyping and in-house testing capabilities, we partner closely with our customers across the entire product development lifecycle to reduce risk and accelerate their time-to-market. Our global manufacturing and support resources help customers maximize productivity, uptime, performance and product quality. Laird Thermal Systems is the optimum choice for standard or custom thermal solutions.

Custom thermal solutions for applications in industries including:

- Medical Diagnostics
- Medical Imaging
- Battery Cooling
- Industrial Laser Systems
- Optoelectronics
- Analytical Instrumentation
- Semiconductor Fabrication
- Aerospace Defense
- Food & Beverage
- Automotive



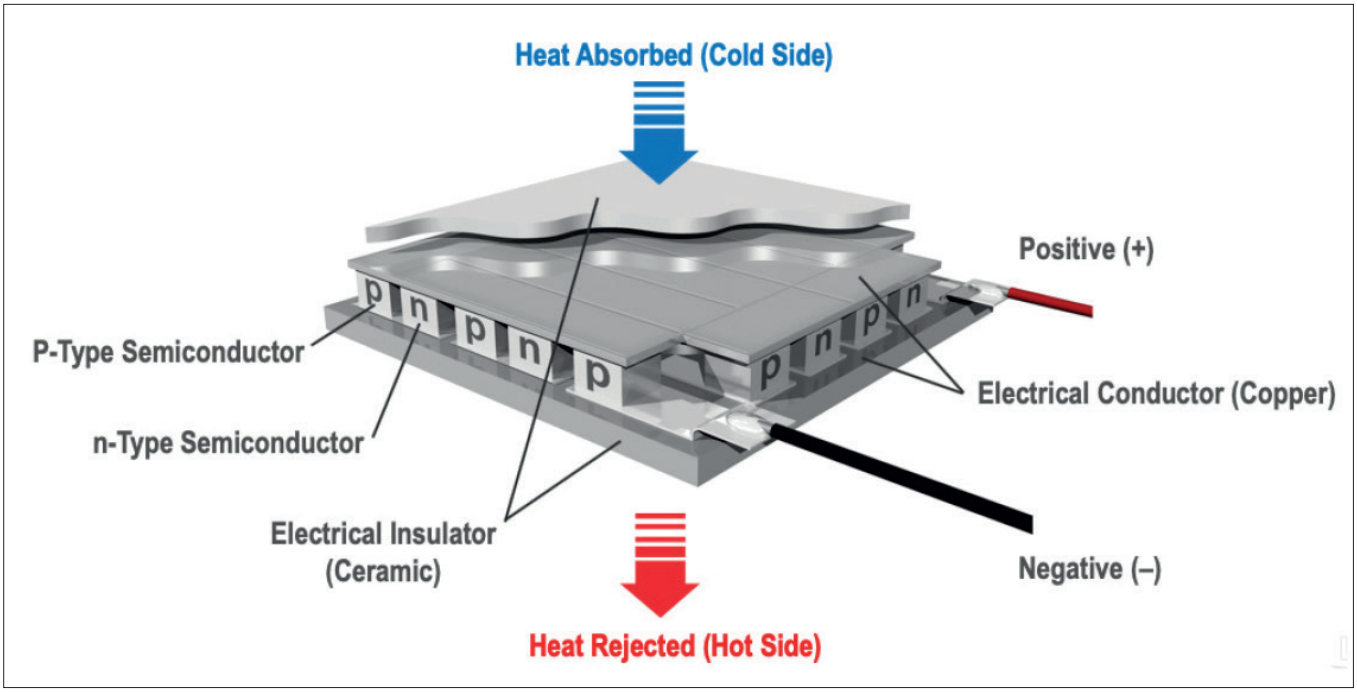
Rapid Prototyping Center

Since there are so many unique attributes that need to be ascertained for each application, often a customized thermoelectric cooler will yield a more optimal thermal solution. Laird Thermal Systems offers strong engineering services with a global presence that supports onsite concept generation, thermal modeling, thermal design and rapid prototyping. We also offer validation test services to meet unique compliance standards for each industry, such as Telcordia, MIL-STDs or standards specific to unique application. Minimum order quantity (MOQ) applies for all custom thermoelectric cooler designs and validation testing.

Custom Thermoelectric Coolers

- Patterning and Plating on Subtrates
- Test Validation
- TE semiconductor Processing
- Lapping, Wiring and Sealing
- Tooling Fabrication
- Thermoelectric Cooler Assembly

Thermoelectrics

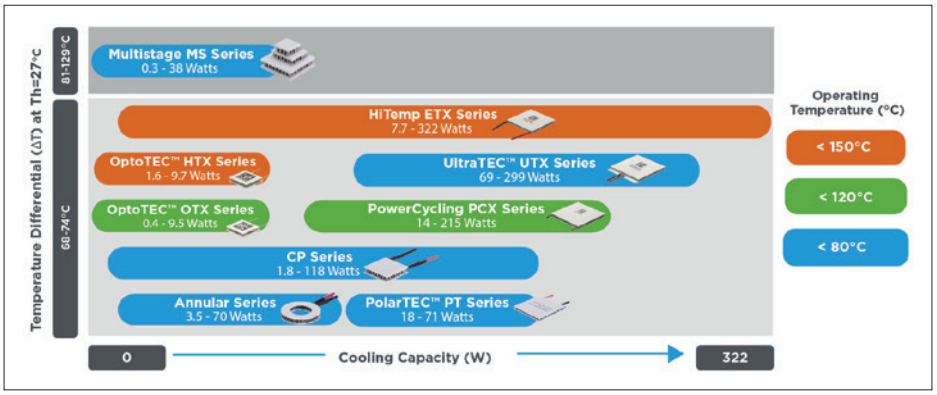


Solid state heat pumps have been in existence since the discovery of the Peltier effect in 1834. The devices became commercially available several decades ago with the development of advanced semiconductor thermocouple materials in combination with ceramics substrates. Thermoelectric coolers are solid-state heat pumps that require a heat exchanger to dissipate heat utilizing the Peltier Effect. During operation, DC current flows through the thermoelectric cooler to create heat transfer and a temperature differential across the ceramic substrates, causing one side of the thermoelectric cooler to be cold, while the other side is hot. A standard single-stage thermoelectric cooler can achieve temperature differentials of up to 70°C.

A typical thermoelectric cooler's geometric footprint can vary from 2 x 2 mm's to 62 x 62 mm's and are light in weight. This makes thermoelectrics ideal for applications with tight geometric space constraints and low weight requirements when compared too much larger cooling technologies, such as conventional compressor-based systems. Thermoelectric coolers can also be used as a power generator to convert waste heat into usable output DC power.

Thermoelectrics are ideal for applications that require active cooling to below ambient and have cooling capacity requirements < 600 Watts. A design engineer should consider thermoelectric coolers when the system design criteria includes such factors as precise temperature control, high reliability, compact geometry constraints, low weight and environmental friendly requirements.

Product Portfolio



Laird Thermal Systems designs and manufactures thermoelectric coolers which adhere to strict process control standards and pass/fail criteria, assuring our customers receive the best possible modules.

Our extensive standard product portfolio covers a wide range of cooling capacities, temperature differentials, input power requirements and geometric footprints. Standard finishing options are available to accommodate alternate lead lengths, lapping thickness tolerances, and moisture protective sealants.

Standard pre-tinning and solder constructions are available to accommodate solderable mounting of the thermoelectric cooler to the heat exchanger, or processing of thermoelectric cooler through a reflow oven to solder onto an optoelectronic package.

Laird Thermal Systems offers several thermoelectric cooler product families that can be classified by cooling capacity, temperature differential, form factor or thermal cycling capability. Reference perceptual map below as a general guide as to where each product family fits with regards to these attributes.

Benefits of using Thermoelectrics

Thermoelectric coolers have several advantages over alternate cooling technologies:

- They have no moving parts, so the solid state construction results in high reliability and units can be mounted in any orientation.
- Thermoelectric coolers can cool devices down to well below ambient. Colder temperatures can be achieved, down to minus 100°C, by using a multistage thermoelectric cooler in a vacuum environment.
- In heating mode, thermoelectric coolers are much more efficient than conventional resistant heaters because they generate heat from input power supplied plus additional heat generated by the heat pumping action.
- Thermoelectrics are able to heat and cool by simply reversing the polarity, which changes the direction of heat transfer. This allows temperature control to be very precise, where up to ±0.01°C can be maintained under steady-state conditions.
- Devices are environmentally friendly because they use no CFC's and electrical noise is minimal.
- Thermoelectric coolers can be used as energy harvesters, turning waste heat into usable output DC power.

Thermoelectric Applications

Thermoelectric cooler assemblies are used in a wide range of applications to stabilize the temperature of sensitive electronic components or to cool devices and compartments below ambient.

Analytical

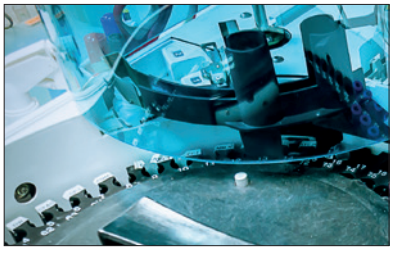
- Sample Storage Compartments
- Liquid Chromatography
- Incubators
- Molecular Diagnostics (PCR)

Industrial

- High Powered Projectors
- Metrology Instrumentation
- Digital Color Printing Systems
- Industrial Laser Systems

Telecom

- Telecom Enclosures
- Battery Backup Systems
- Optical Transceivers



Medical

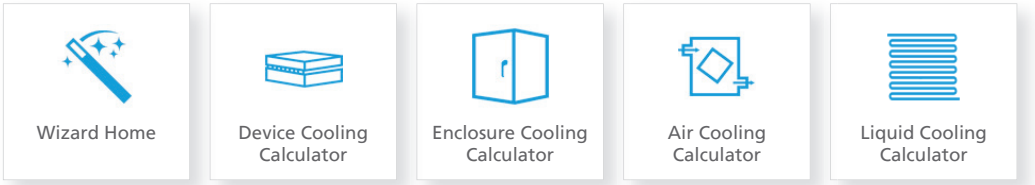
- Medical Diagnostics
- Medical Lasers
- Centrifuges

Transportation

- Smart Lightning
- Heads-Up Displays
- Imaging Sensors

Thermal Wizard

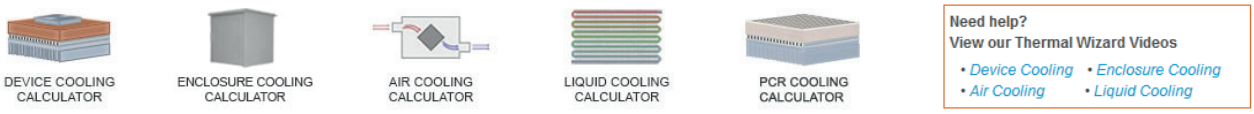
The Thermal Wizard is an online tool that allows engineers to specify a given set of input variables based on application attributes and model the performance of the thermoelectric cooler prior to trial. The tool contains several application examples and an active datasheet that simulates how the thermoelectric cooler will function under a specific set of operating conditions. Available only online, the Thermal Wizard is accessible from the Laird Thermal Systems website at.



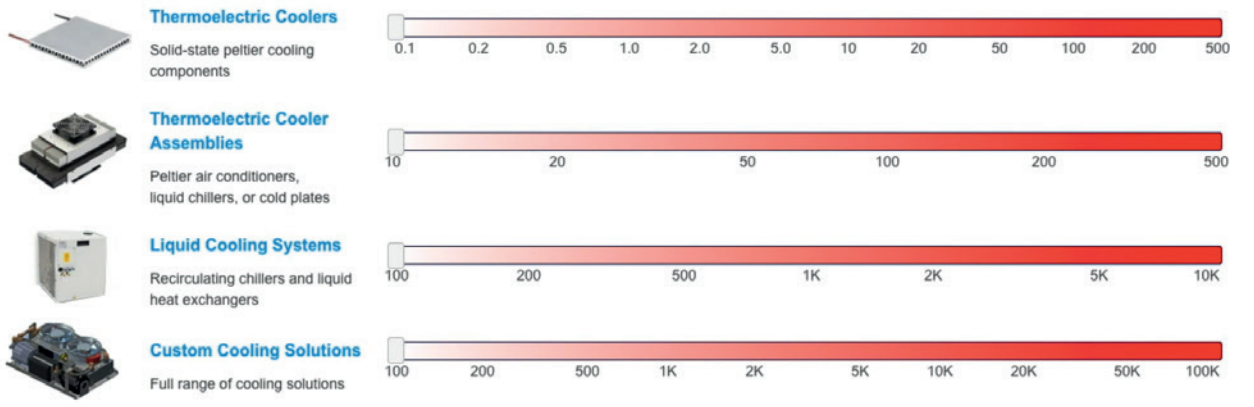
Find the best thermal solution for your needs

Most of Laird's active thermal products can be customized or configured to meet your needs. Laird Thermal's engineering team and rapid prototyping service can assist you with conceptual design, thermal modeling, and mechanical and electrical design to develop an optimal thermal management solution.

Need to calculate your Cooling Requirement? USe the Thermal Wizard Qc Calculators

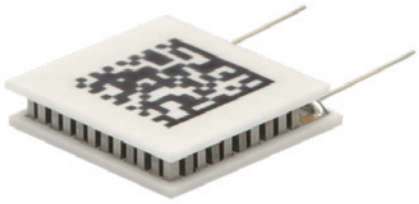


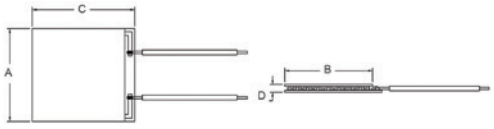
Know your Cooling Requirement (Qc)? Move a slider to the desired Qc and click SEARCH



Cooling Requirement - Qc [0] Watts [ΔT = 0] °C [SEARCH] Click SEARCH to view thermal solutions

Thermoelectric Portfolio





OptoTEC™ OTX-Series

Powerful thermoelectric cooler

Miniature form factor

Protects electronics in high temperature environments (>80°C)

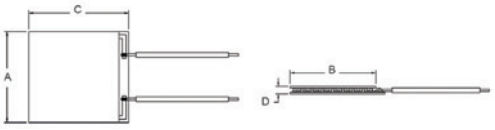
Ideal for temperature stabilization in optoelectronic applications

The OTX series uses SbSn solder, which allows a maximum operating temperature of 120°C and a melting point of 232°C.

MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*3 [mm]
387006791	OTX08-08-F0-0303-11-W2.25	0.4	0.8	0.9	72.9	4.9	3.3	-	2.6
387006650	OTX08-18-F0-0505-11-W2.25	1.0	0.8	2.1	72.9	6.5	4.9	-	2.7
387006795	OTX08-31-F1-0707-11-RT-W2.25	1.7	0.8	3.6	72.9	6.5	6.5	-	2.4
387006897	OTX19-23-F1N-0608-11-W2.25	3.1	1.9	2.7	72.9	6.0	8.2	-	1.7
387006839	OTX15-30-F2A-0610-11-W2.25	3.1	1.5	3.5	72.9	12.3	10.3	12.3	2.0
387006845	OTX15-31-F2A-0909-20-W2.25	3.3	1.5	3.6	72.9	8.8	8.8	11.0	2.8
387006798	OTX08-66-F0-1009-11-RT-W2.25	3.7	0.8	7.7	72.9	11.4	8.9	-	2.4
387006798	OTX08-66-F0-1009-11-RT-W2.25	3.7	0.8	7.7	72.9	11.4	8.9	-	2.4
387007103	OTX24-31-F1-1010-11-W2.25	5.4	2.5	3.6	72.9	10.0	10.0	-	2.5
387006832	OTX12-65-F2A-1312-11-W2.25	5.5	1.2	7.6	72.9	13.2	12.1	13.2	2.7
387006834	OTX12-65-F2A-1312-TB-W2.25	5.5	1.2	7.6	72.9	13.2	12.1	13.2	2.7
387006837	OTX12-66-F0-1211-11-W2.25	5.5	1.2	7.7	72.9	14.2	11.2	-	2.7
387006836	OTX12-66-F0-1211-TB-RT-W2.25	5.5	1.2	7.7	72.9	14.2	11.2	-	2.7
387006847	OTX15-65-F2A-1312-11-W2.25	6.8	1.5	7.6	72.9	13.2	12.1	13.2	2.4
387006891	OTX15-66-F0-1211-11-W2.25	6.9	1.5	7.7	72.9	14.2	11.2	-	2.4
387006893	OTX15-68-F1A-1313-11-W2.25	7.1	1.5	7.9	72.9	13.2	13.2	-	2.4
387006926	OTX20-65-F2A-1312-11-W2.25	9.1	2.0	7.6	72.9	13.2	12.1	13.2	2.2
387006927	OTX20-66-F0-1211-11-W2.25	9.2	2.0	7.7	72.9	14.2	11.2	-	2.2
387006928	OTX20-66-F0-1211-11-EP-W2.25	9.2	2.0	7.7	72.9	14.2	11.2	-	2.2
387006784	OTX20-68-F1A-1313-11-W2.25	9.5	2.0	7.9	72.9	13.2	13.2	-	2.2

*1 QMax nominal value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 QMax nominal value at ΔT = 0°C, Imax and Vmax, Th = 50°C.
*3 Thickness only for non-metallized versions.

OptoTEC™ HTX-Series



The HTX-Seris uses AuSn solder, which allows a maximum operating temperature of 150°C and a melting point of 280°C.

MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*3 [mm]
387007106	HTX12-18-F2A-0606-11-RT-W2.25	1.6	1.2	2.3	81.6	6.1	6.2	7.2	2.7
387006534	HTX12-18-F2A-0606-GG-W2.25	1.6	1.2	2.3	81.6	6.1	6.2	7.2	3.0
387007113	HTX15-30-F2A-0610-11-W2.25	3.4	1.5	3.9	81.6	6.2	10.3	12.3	2.0
387007115	HTX15-31-F2A-0909-TB-W2.25	3.5	1.5	4.0	81.6	8.8	8.8	11.0	2.4
387007120	HTX20-31-F2A-0909-11-W2.25	4.6	2.0	4.0	81.6	8.8	8.8	11.0	2.2
387007108	HTX12-65-F2A-1312-11-W2.25	5.8	1.2	8.4	81.6	13.2	12.1	13.2	2.7
387007112	HTX12-65-F2A-1312-TB-RT-W2.25	5.8	1.2	8.4	81.6	13.2	12.1	13.2	2.7
387007117	HTX15-65-F2A-1312-TB-W2.25	7.3	1.5	8.4	81.6	13.2	12.1	13.2	2.4
387007122	HTX20-65-F2A-1312-11-W2.25	9.7	2.0	8.4	81.6	13.2	12.1	13.2	2.2
387007123	HTX20-65-F2A-1312-TB-W2.25	9.7	2.0	8.4	81.6	13.2	12.1	13.2	2.2

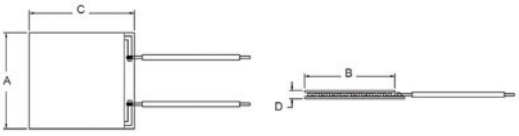
*1 QMax nominal value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 QMax nominal value at ΔT = 0°C, Imax and Vmax, Th = 50°C.
*3 Thickness only for non-metallized versions.

UltraTEC™ UTX-Series

Powerful thermoelectric cooler

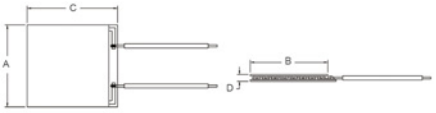
Higher thermal insulation barrier

Ideal for demanding spot cooling



MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*3 [mm]
387004721	UTX6-19-F1-4040-TA-W6	82.6	6.1	22.8	71.7	40	40	40	3.9
387004702	UTX6-24-F1-5555-TA-W6	100.0	6.1	27.6	71.7	55	55	55	3.9
387004705	UTX8-12-F2-2525-TA-W6	68.5	7.9	14.6	71.7	25	25	25	1.9
387004697	UTX8-12-F2-3030-TA-W6	68.5	7.9	14.6	71.7	30	30	34	2.6
387004726	UTX8-24-F1-5555-TA-W6	140.2	8.6	27.6	71.7	55	55	55	3.8
387004679	UTX8-200-F2-4040-TA-W6	116.4	8.6	22.9	71.7	40	40	44	3.8
387004724	UTX8-288-F2-5252-TA-W6	167.6	8.6	33.0	71.7	52	52	56	3.8
387004723	UTX9-28-F2-4040-TA-W6	196.0	10 .0	33.0	71.7	40	40	44	2.8
387004680	UTX11-12-F2-3030-TA-W6	95.2	11.0	14.6	71.7	30	30	34	2.4
387004685	UTX15-12-F2-4040-TA-W6	125.7	14.6	14.6	71.7	40	40	44	2.8
387004719	UTX15-24-F2-5252-TA-W6	251.2	15.3	27.8	71.7	52	52	56	3.3
387004711	UTX15-200-F2-4040-TA-W6	207.6	15.3	22.9	71.7	40	40	44	3.3
387004692	UTX15-288-F2-5252-TA-W6	298.9	15.3	33.0	71.7	52	52	56	3.3

*1 QMax nominal value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 QMax nominal value at ΔT = 0°C, Imax and Vmax, Th = 50°C.
*3 Thickness only for non-metallized versions.



PowerCycling PCX Series

Features a unique module design that enables long-life operation in thermal cycling applications

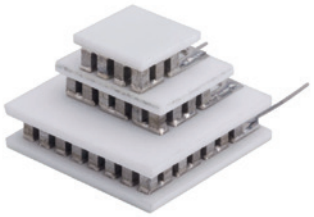
Increases cooling capacity compared to standard products

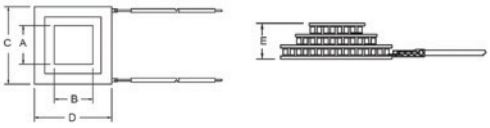
Withstands rigorous cycling tests on a base load of the latest PCR industry test protocol

MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*2 [mm]
387005667	PCX2-12-F1-3030-TA-RT-W6	21.5	2.5	14.9	73.6	30	30		4.0
387005673	PCX4-4-F1-1515-TA-RT-W6	13.5	4.1	5.7	73.6	15	15		2.8
387005674	PCX4-6-F1-2040-TA-RT-W6	16.8	3.9	7.4	73.6	20	40		4.2
387005514	PCX4-7-F1-2020-TA-RT-W6	19.4	4.0	8.3	73.6	20	20		3.5
387005671	PCX4-12-F1-3030-TA-W6	34.7	4.0	14.9	73.6	30	30		3.2
387005672	PCX4-139-F1-1850-TA-RT-W6	37.9	4.0	16.3	73.6	18	50		3.8
387005676	PCX5-16-F1-4040-TA-W6	54.0	4.9	18.8	73.6	40	40		3.7
387005677	PCX5.6-19-F1N-3030-TA-RT-W6	77.7	5.8	23.3	73.6	30	30		2.4
387005678	PCX6-12-F1-4040-TA-RT-W6	51.8	6.0	14.9	73.6	40	40		3.8
387005679	PCX6-24-F1-5555-TA-RT-W6	98.3	6.0	28.2	73.6	55	55		4.2
387005681	PCX6-28-F2-4040-TA-RT-W6	117.4	6.0	33.7	73.6	40	40	44	3.1
387005685	PCX7-16-F1-4040-TA-W6	77.3	7.1	18.8	73.6	40	40		3.3
387005513	PCX7-156-F2-1672-TA-RT-W6	76.5	7.2	18.3	73.6	16	72	76	3.3
387005683	PCX7-159-F1-1466-TA-RT-W6	78.6	7.3	18.6	73.6	14	66		3.1
387005686	PCX7.5-13-F1-4023-TA-RT-W6	68.4	7.7	15.3	73.6	40	23		2.8
387005515	PCX8-6-F1-2040-TA-RT-W6	37.4	8.8	7.4	73.6	20	40		3.3
387007231	PCX8-6-F1-3518-TA-RT-W6	37.4	8.8	7.4	73.6	35.5	18		3.4
387005700	PCX8-7-F2-3030-TA-RT-W6	42.2	8.8	8.3	73.6	30	30	34	3.3
387005696	PCX8-12-F1-4040-TA-W6	75.5	8.8	14.9	73.6	40	40		3.3
387008431	PCX8-12-F2-2525-TA-RT-W6	68.9	8.0	14.9	73.6	24.6	24.3	26.9	2.0
387005698	PCX8-152-F2-1773-TA-RT-W6	88.8	8.6	17.8	73.6	16.8	73.8	76.7	2.6
387005699	PCX8-176-F2-7528-TA-RT-W6	104.6	8.8	20.6	73.6	75	28	32	3.3
387007189	PCX9-3-F2-2525-TB-RT-W6	21.1	10.0	3.6	73.6	25.4	25.4	28.7	5.0
387008429	PCX10-223-F1-3172-TA-RT-W6	155.7	10.3	26.1	73.6	31	72		3.6
387005659	PCX11-12-F2-3030-TA-RT-W6	96.6	11.2	14.9	73.6	30	30	34	2.4
387005660	PCX11-191-F1-3553-TA-RT-W6	147.8	11.4	22.4	73.6	35	53		3.4
387005662	PCX12-139-F1-3550-TA-W6	118.6	12.6	16.3	73.6	35	50		3.0
387005516	PCX12-19-F1-4040-TA-RT-W6	165.7	12.3	23.3	73.6	40	40		2.9
387005663	PCX12-248-F1-5040-TA-RT-W6	206.5	12.3	29.0	73.6	50	40		2.9
387005665	PCX15.6-19-F1-4040-TA-RT-W6	215.2	16.0	23.3	73.6	40	40		2.7
387007227	PCX15-7-F1-4040-TA-RT-W6	78.4	16.3	8.3	73.6	40	40		4.7
387005664	PCX15-128-F2-4040-TA-RT-W6	135.3	15.6	15	73.6	40	40	44	3.3
387005669	PCX24-128-F2-5555-TA-RT-W6	207.9	24.0	15	73.6	55	55	59	4.0

*1 QMax rated value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 Thickness for non-metallized versions only.

Multistage MS Series





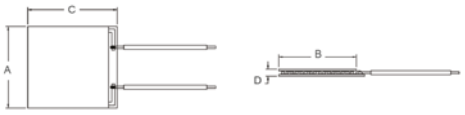
Powerful thermoelectric cooler

Higher thermal insulation barrier

Ideal for demanding spot cooling

MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*2 [mm]	DIM E [mm]
9320001-301	MS2-010-06-06-11-11-11-W2	0.3	1.2	0.78	94	3.2	3.2	3.9	3.9	4.2
9320002-301	MS2-024-06-06-11-11-11-W2	0.8	1.2	1.8	91	4.1	4.1	6.1	6.1	4.6
9380001-301	MS2-065-04-04-11-11-11-W4	0.9	0.5	4.6	87	12	4.0	14	6	4.7
9340001-301	MS2-049-10-10-15-15-11-W8	3.1	2.3	3.5	89	11.5	11.5	15	15	6.6
9350001-301	MS2-049-14-14-15-15-11-W8	6.1	4.5	3.5	89	15.0	15.0	20	20	7.2
475089-301	MS2-068-14-14-15-15-11-W8	7.4	3.7	4.4	81	14.7	14.7	24	24	7.9
9340002-301	MS2-107-10-10-12-12-11-W8	8.6	2.9	8.0	91	22.6	22.6	22.6	22.6	6.25
16503-310	MS2-051-22-25-22-25-11-W8	10.3	6.0	3.4	82	26	26	30	30	10.9
475010-313	MS2-102-14-14-17-17-11-W8	11.6	4.4	8.0	94	20	20	30	30	7.5
9340003-301	MS2-190-10-10-12-12-11-W8	15.4	3.0	14.3	91	30	30	30	30	6.5
9350007-301	MS2-192-14-20-15-25-11-W8	24.3	5.1	14.7	91	40	40	40	40	8.1
16506-302	MS2-102-22-22-17-17-11-W8	27.9	10.6	8.0	94	30	30	44	44	9.1
9350006-301	MS2-192-14-20-11-18-11-W8	38.0	6.9	14.8	90	40	40	40	40	8.1
16068-302	MS3-052-10-17-11-W8	1.4	1.9	3.3	108	7.2	7.2	15	15	9.8
9360001-301	MS3-070-20-25-11-W8	3.0	6.1	5.5	122	14	8	36	36	16.0
9340004-301	MS3-231-10-15-11-W8	6.7	2.0	14.3	106	15	15	30	30	9.5
9350004-301	MS3-119-14-15-11-W8	6.7	4.0	7.5	107	15	15	30	30	10.4
9360002-301	MS3-119-20-15-11-W8	14	8.1	7.6	106	22	22	44	44	12.9
475024-303	MS4-108-10-20-11-W8	1.1	1.4	6.3	120	7.1	7.1	18	24	14.6
9340005-301	MS4-129-10-15-11-W8	1.8	1.8	7.3	120	8.0	8.0	23	23	12.5
9350005-301	MS4-115-14-15-11-W8	2.8	3.9	7.1	124	14.5	4.5	33	24	13.8
9340006-301	MS5-257-10-15-11-W8	2.0	1.7	13.5	129	8.0	8.0	30	30	15.4

*1 QMax rated value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 Thickness for non-metallized versions only.



HiTemp ETX Series

High performance thermoelectric cooler with improved module design.

Higher thermal insulation barrier

Protects electronics in high temperature environments (>80°C).

Ideal for cooling of autonomous systems, machine image processing and digital light processors

MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*3 [mm]
387004952	ETX1.6-12-F2-3030-TA-RT-W6	15.7	1.6	16.6	83.2	30	30	34.0	4.0
387004961	ETX2-6-F1-1225-TA-RT-W6	10.2	2.1	8.2	83.2	12.5	25		3.2
387005318	ETX2-12-F1-2525-TA-W6	20.6	2.1	16.6	83.2	25	25		3.4
387004970	ETX2-12-F2-3030-TA-W6	22.6	2.3	16.6	83.2	30	30	34.0	3.4
387004960	ETX2.3-4-F1-1919-TA-RT-W6	8.7	2.3	6.4	83.2	19.4	19.4		3.58
387004964	ETX2.5-12-F1-3030-TA-RT-W6	24.1	2.5	16.6	83.2	30	30		4.0
387004969	ETX2.5-12-F1-4040-TA-RT-W6	24.1	2.5	16.6	83.2	40	40		4.2
387004959	ETX2.6-6-F1-1225-TA-W6	12.7	2.6	8.2	83.2	12.5	25		3.1
387005354	ETX2.6-12-F1-2525-TA-W6	25.5	2.6	16.6	83.2	25	25		3.1
387004923	ETX3-3-F2-1518-TA-W6	7.7	3.2	4.1	83.2	15	15	18.0	3.6
387004933	ETX3-48-F1-1212-GG-W6	11.3	3.1	6.3	83.2	12	12		2.38
387004968	ETX3-12-F2-3030-TA-RT-W6	31.4	3.2	16.6	83.2	30	30	34.0	3.58
387004942	ETX4-3-F1-1515-TA-RT-W6	9.5	4.0	4.1	83.2	15	15		3.2
387004946	ETX4-3-F1-2020-TA-RT-W6	9.2	3.9	4.1	83.2	20	20		4.7
387004956	ETX4-6-F2-2143-TA-RT-W6	18.5	3.8	8.2	83.2	20.6	38.4	43.2	3.81
387004962	ETX4-7-F1-2323-TA-W6	21.7	4.0	9.3	83.2	23	23		3.2
387004929	ETX4-7-F2-3030-TA-RT-W6	20.9	3.8	9.3	83.2	30	30	34.0	4.14
387004911	ETX4-12-F1-3030-TA-W6	38.8	4.0	16.6	83.2	30	30		3.2
387004915	ETX4-12-F1-4040-TA-RT-W6	37.8	3.9	16.6	83.2	40	40		4.8
387004924	ETX4-12-F1-3030-10-W6	38.8	4.0	16.6	83.2	30	30		3.2
387004936	ETX4-12-F2-3030-TA-RT-W6	38.8	4.0	16.6	83.2	30	30	34.0	3.2
387004938	ETX4-12-F2-4040-TA-RT-W6	37.3	3.8	16.6	83.2	40	40	44.0	4.14
387004949	ETX5-6-F1-2040-TA-RT-W6	25.1	5.2	8.2	83.2	20	40		3.6
387004943	ETX6-3-F1-2020-TA-RT-W6	14.5	6.1	4.1	83.2	20	20		3.2
387004966	ETX6-7-F2-3030-TA-RT-W6	33.2	6.1	9.3	83.2	30	30	34.0	3.81
387004917	ETX6-12-F1-4040-TA-RT-W6	59.4	6.1	16.6	83.2	40	40		3.81
387004947	ETX6-12-F1-3030-TA-W6	59.4	6.1	16.6	83.2	30	30		3.2
387004937	ETX6-19-F1-4040-TA-RT-W6	91.6	6.0	26.0	83.2	40	40		3.91
387004957	ETX7-3-F1-2020-TA-RT-W6	18.5	7.7	4.1	83.2	20	20		3.51
387004951	ETX7-16-F1-4040-TA-RT-W6	84.1	6.8	21.0	83.2	40	40		3.2
387004950	ETX8-7-F1-3030-TA-RT-W6	47.0	8.6	9.3	83.2	30	30		3.33
387004955	ETX8-7-F2-3030-TA-RT-W6	47.0	8.6	9.3	83.2	30	30	34.0	3.33
387004922	ETX8-12-F1-4040-TA-RT-W6	84	8.6	16.6	83.2	40	40		3.33
387004934	ETX8-12-F2-2525-TA-RT-W6	77.8	7.9	16.6	83.2	24.6	24.3	26.9	1.96
387004932	ETX8-28-F2-5252-TA-RT-W6	190.5	8.6	37.6	83.2	52.0	52.0	56.0	3.81
387004939	ETX9-3-F2-2525-TA-W6	23.6	9.9	4.1	83.2	25.4	25.4	28.7	5.0

MFG-Part Number	Model Number	Q max*1 [W]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*3 [mm]
387004963	ETX9-3-F1-3030-TA-RT-W6	22.1	9.2	4.1	83.2	30	30		5.59
387004944	ETX11-12-F1-4040-TA-RT-W6	109	11.0	16.6	83.2	40	40		3.5
387004931	ETX11-12-F2-3030-TA-RT-W6	108.2	11.0	16.6	83.2	30	30	34	2.41
387004958	ETX14-3-F1-3030-TA-RT-W6	33.8	14.1	4.1	83.2	30	30		4.57
387006544	ETX14-12-F1-6262-TA-W6	138	14.1	16.6	83.2	62	62		4.57
387004927	ETX15-12-F2-4040-TA-RT-W6	142.8	14.6	16.6	83.2	40	40	44	2.84
387004919	ETX15-24-F2-5252-TA-W6	269.4	14.5	31.5	83.2	52	52	56	3.3
387004921	ETX15-28-F2-5252-TA-RT-W6	321.9	14.5	37.6	83.2	52	52	56	3.3
387004930	ETX25-12-F1-6262-TA-W6	245.1	25.0	16.6	83.2	62	62		4.1

*1 QMax rated value at ΔT = 0°C, Imax and Vmax, Th = 50°C | *2 Thickness for non-metallized versions only.

Annular Series

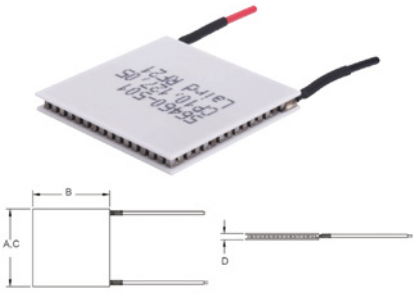
Central hole for the transmission of light, wires, probes or mounting hardware.

Round or square hole configurations available.

Rapid prototyping to meet special shape requirements.

MFG-Part Number	Model Number	Q max*1 [w]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*2 [mm]	DIM E [mm]
71062-514	RH14-14-10-L1-W4.5	3.5	3.9	1.5	70.5	26	26	26	4.7	14
71063-505	RH14-14-06-L1-W4.5	5.4	6	1.5	70.5	26	26	26	3.8	14
66156-505	RH14-32-06-L1-W4.5	12.4	6	3.5	70.5	44	55	55	3.8	27
430058-508	SH08-28-05-L1-W4.5	4.8	2.6	3.1	70.5	14.7	10.3	14.7	3.1	4.4
430511-504	SH10-23-06-L1-W4.5	4.6	3.1	2.5	70.5	15	15	15	3.6	7.2
71049-501	SH10-95-06-L-W4.5	19.1	3.1	10.4	70.5	30	30	30	3.6	14.5
430474-501	SH10-125-05-L1-W4.5	32.5	4	13.7	70.5	30	30	30	3.2	3.6
71092-501	SH14-15-06-L-W4.5	5.8	6	1.6	70.5	14	14	14	3.8	5.1
71061-504	SH14-125-10-L1-W4.5	31.7	3.9	13.7	70.5	40	40	40	4.7	4.7
430478-502	SH14-125-06-L1-W4.5	48.5	6	13.7	70.5	40	40	40	3.8	4.7
71020-505	SH14-125-045-L1-W4.5	70.3	8.6	13.7	70.5	40	40	40	3.3	4.7

*1 QMax rated value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 Thickness for non-metallized versions only.



CP Series

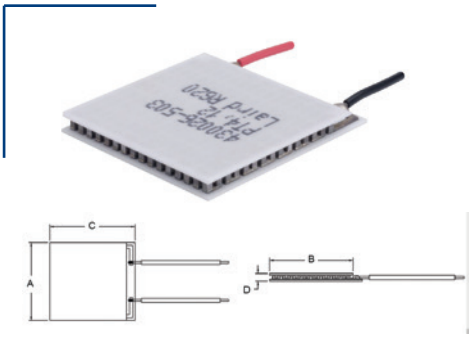
Designed for high current applications and large heat pumps.

Many form factors, input power requirements and pumping capacity.

Ideal for medical diagnostics, analytical instruments, photonic laser systems and battery cooling.

MFG-Part Number	Model Number	Q max*1 [w]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*3 [mm]
62910-510	CP08-127-05-L1-W4.5	21.7	2.6	13.9	70.5	25	25	25	3.1
66195-505	CP08-127-06-L1-W4.5	17.5	2.1	13.9	70.5	25	25	25	3.4
71035-505	CP08-31-06-L1-W4.5	4.3	2.1	3.4	70.5	12	12	12	3.4
71036-505	CP08-63-06-L1-W4.5	8.7	2.1	6.9	70.5	12	25	12	3.4
71212-502	CP085-127-06-L1-W4.5	19.2	2.3	13.9	70.5	30	30	30	3.6
56460-501	CP10-127-05-L1-W4.5	33.0	4.0	13.9	70.5	30	30	30	3.2
56310-503	CP10-127-06-L1-W4.5	25.5	3.1	13.9	70.5	30	30	30	3.6
71012-506	CP10-254-06-L1-W4.5	51.0	3.1	27.7	70.5	60	30	30	3.6
430801-504	CP10-31-05-L1-W4.5	8.1	4.0	3.4	70.5	15	15	15	3.2
63604-511	CP10-31-08-L1-W4.5	5.1	2.5	3.4	70.5	15	15	15	4.0
56430-501	CP10-63-05-L1-W4.5	16.4	4.0	6.9	70.5	15	30	15	3.2
43280-503	CP10-63-06-L1-W4.5	12.6	3.1	6.9	70.5	15	30		3.58
63595-501	CP10-63-08-L-W4.5	10.4	2.5	6.9	70.5	15	30		3.9
44440-501	CP10-71-05-L1-W4.5	18.5	4.0	7.8	70.5	23	23	23	3.2
430436-504	CP10-71-06-L1-W4.5	14.2	3.1	7.8	70.5	23	23	23	3.6
430922-501	CP10-131-04-L1-TOW-W4.5	52.1	6.1	14.3	70.5	40	23		3.0
430848-502	CP12-161-04-L1-W4.5	76.3	7.3	17.6	70.5	40	40	40	3.3
430848-504	CP12-161-06-L1-W4.5	47.7	4.5	17.6	70.5	40	40	40	3.6
56910-502	CP14-127-045-L1-W4.5	71.3	8.6	13.9	70.5	40	40	40	3.3
56760-505	CP14-127-06-L1-W4.5	49.3	6.0	13.9	70.5	40	40	40	3.8
56610-502	CP14-127-10-L1-W4.5	32.2	3.9	13.9	70.5	40	40	40	4.7
44530-501	CP14-17-10-L1-W4.5	4.3	3.9	1.9	70.5	15	15	15	4.7
430875-503	CP14-199-045-L1-W4.5	111.8	8.6	21.7	70.5	40	40	40	3.3
430874-503	CP14-199-06-L1-W4.5	77.3	6.0	21.7	70.5	40	40	40	3.81
56550-501	CP14-31-10-L1-W4.5	7.9	3.9	3.4	70.5	20	20	20	4.7
56860-501	CP14-35-045-L1-W4.5	19.7	8.6	3.8	70.5	15	30	15	3.3
56890-503	CP14-71-045-L1-W4.5	39.9	8.6	7.8	70.5	30	30	30	3.3
430705-503	CP14-71-06-L1-W4.5	27.6	6.0	7.8	70.5	30	30	30	3.8
56590-502	CP14-71-10-L1-W4.5	18.0	3.9	7.8	70.5	30	30	30	4.7
66100-501	CP2-127-06-L1-W4.5	117.8	14.2	13.9	70.5	62	62	62	4.6
64979-501	CP2-127-10-L1-W4.5	76.9	9.3	13.9	70.5	62	62	62	5.6
57125-501	CP2-31-06-L1-W4.5	28.8	14.2	3.4	70.5	30	30	30	4.6
56995-501	CP2-31-10-L1-W4.5	18.8	9.3	3.4	70.5	30	30	30	5.6
57180-501	CP2-71-06-L1-W4.5	65.9	14.2	7.8	70.5	44	44	44	4.6
57040-500	CP2-71-10-L1-W4.5	43.0	9.3	7.8	70.5	44	44	44	4.6

*1 QMax rated value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 Thickness for non-metallized versions only.



PolarTEC™ PT Series

Porch style ceramic for better attachment of the line.

Standard 4A, 6A and 8A configurations.

Designed for high-volume applications in the consumer goods, food and beverage industries.

MFG-Part Number	Model Number	Q max*1 [w]	I max [A]	V max [V]	ΔT max [° C]	DIM A [mm]	DIM B [mm]	DIM C [mm]	DIM D*2 [mm]
430097-507	PT4-7-F2-3030-TA-W6	17.8	3.8	7.8	70.5	30	30	34	4.1
430027-501	PT6-7-F2-3030-TA-W6	28.3	6.1	7.8	70.5	30	30	34	3.8
430026-503	PT4-12-F2-3030-TA-W6	33.0	4.0	13.9	70.5	30	30	34	3.2
430023-507	PT4-12-F2-4040-TA-W6	31.8	3.8	13.9	70.5	40	40	44	4.1
430052-501	PT6-12-F2-4040-TA-W6	50.6	6.1	13.9	70.5	40	40	44	3.8
7050045-502	PT8-12-F2-4040-TA-W6	71.0	8.6	13.9	70.5	40	40	44	3.3

*1 QMax rated value at ΔT = 0°C, Imax and Vmax, Th = 27°C | *2 Thickness for non-metallized versions only.

Finishing Options

Surface Finish Options	CP	OptoTEC OTX/HTX	HiTemp ETX	Power Cycling PCX	Ultratec UTX	Multi-stage	Annular SH/RH
Metallized Hot/Cold Surface	MM	00	10	-	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 OTX/HTX	HiTemp ETX	Power Cycling PCX	Ultratec UTX	Multi-stage	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 OTX/HTX	HiTemp ETX	Power Cycling PCX	Ultratec UTX	Multi-stage	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 OTX/HTX	HiTemp ETX	Power Cycling PCX	Ultratec UTX	Multi-stage	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.

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