

lamaPLC: TEC / Peltier Elements

A TEC (*thermoelectric cooler*) or Peltier cooler is a solid-state electronic device that uses the Peltier effect to transfer heat, providing both heating and cooling without moving parts such as compressors. Applying a direct electrical current moves heat from one side of the module to the other. This creates a “cold side” and a “hot side,” making them useful for applications that require precise temperature control of individual components.

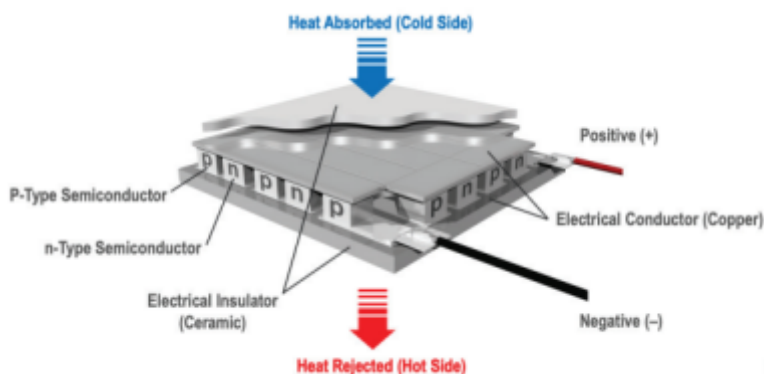


How it works

- **Structure:** The device consists of multiple pairs of P-type and N-type semiconductor “legs” sandwiched between two ceramic plates.
- **Peltier effect:** When a DC electrical current passes through these legs, it forces heat to flow from one side to the other.
- **Hot and cold sides:** One side cools while the other heats up, depending on the direction of the current.
- **Heat dissipation:** The “hot side” must be coupled with a heat sink and fan to dissipate the heat effectively. Without proper heat sinking, the device can be damaged.

Key characteristics

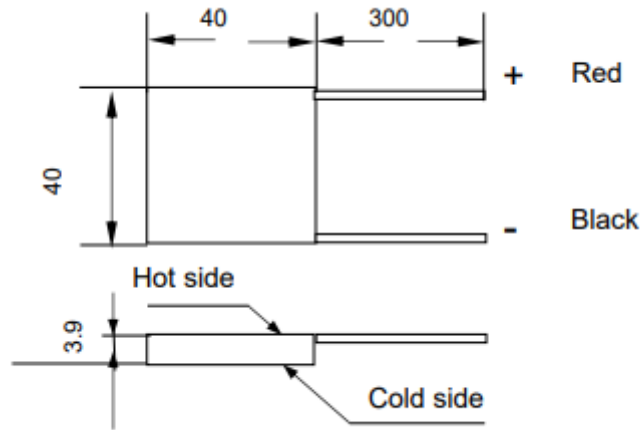
- **Solid-state:** It has no moving parts, making it reliable and quiet.
- **Versatile:** It can be used for both cooling and heating, and can also generate DC power (though less efficiently).
- **Compact:** Its small size is ideal for cooling temperature-sensitive components like CPUs, laser diodes, or voltage references.



If you'd like to support the development of the site with the price of a coffee — or a few — [please do so here](#).

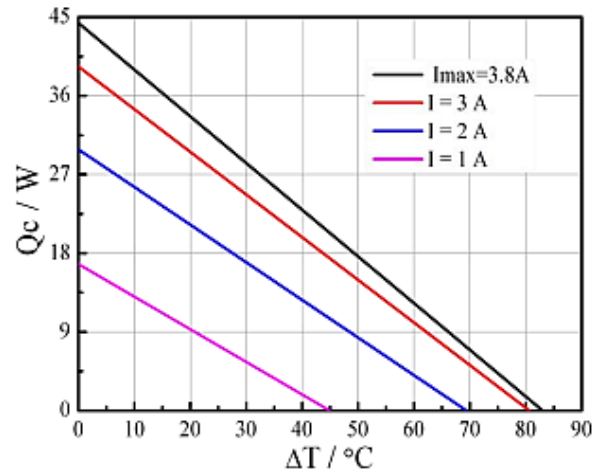
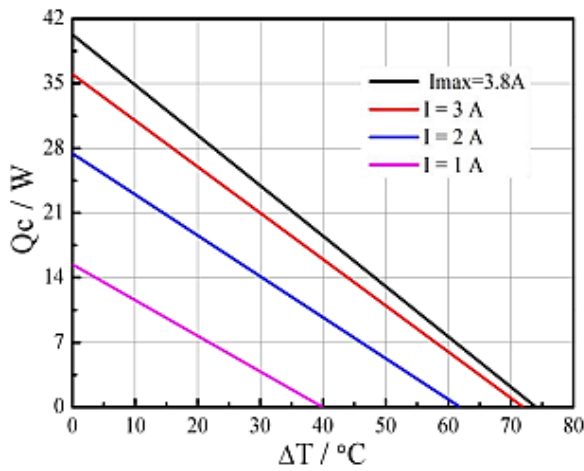
Here's a handy tip: you can quickly save this page as a PDF by clicking “*export to PDF*” in the menu on the right side of the screen.

Typical sizes

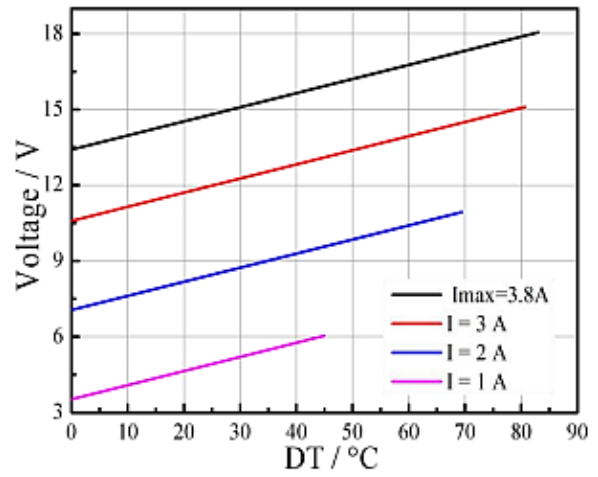
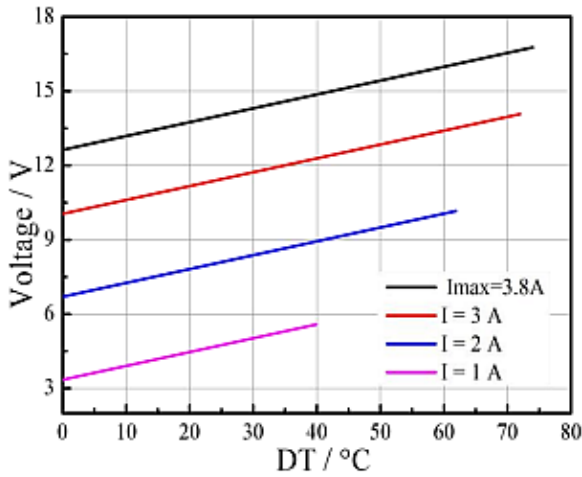


Typical TEC / Peltier Elements characteristic

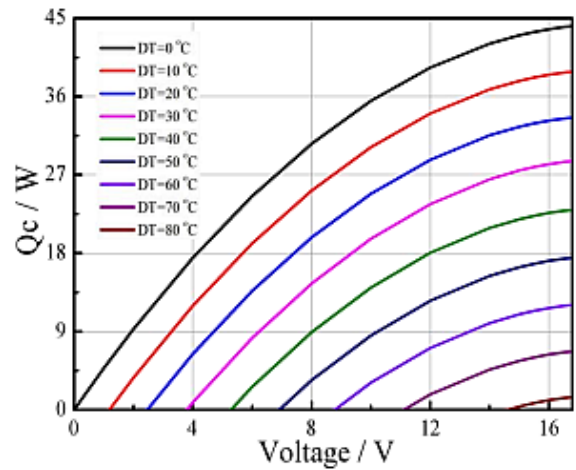
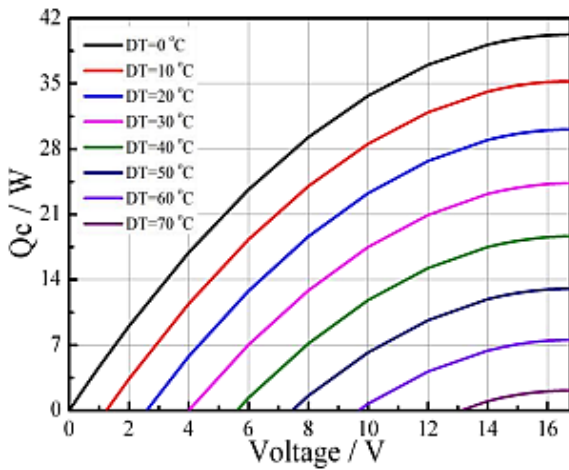
Performance curve (TEC1-12703) when hot surface temperature $T_h = 27^\circ\text{C}$ or 50°C



Performance diagram (TEC1-12703) of cooling power changes with temperature difference under different currents $Q_c = f(\Delta T)$

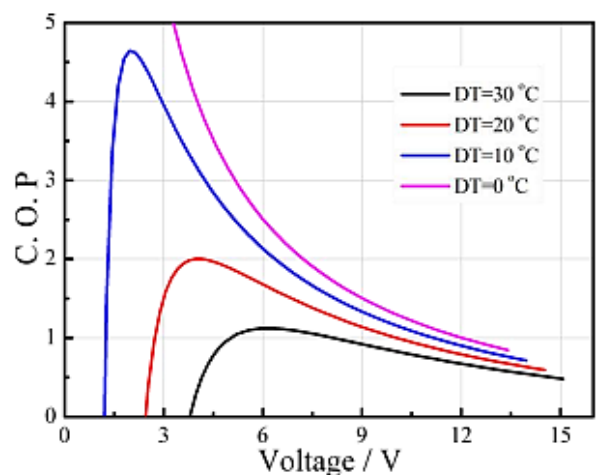
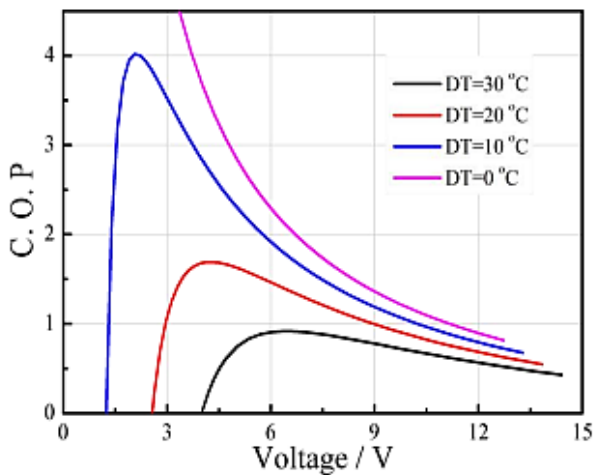


Performance diagram (TEC1-12703) of voltage changing with temperature difference under different currents $V=f(DT)$



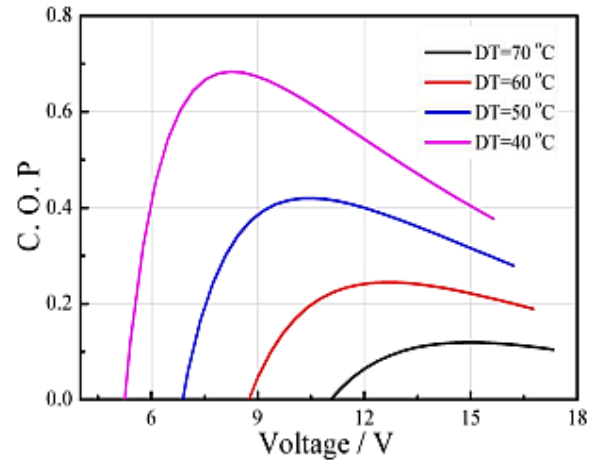
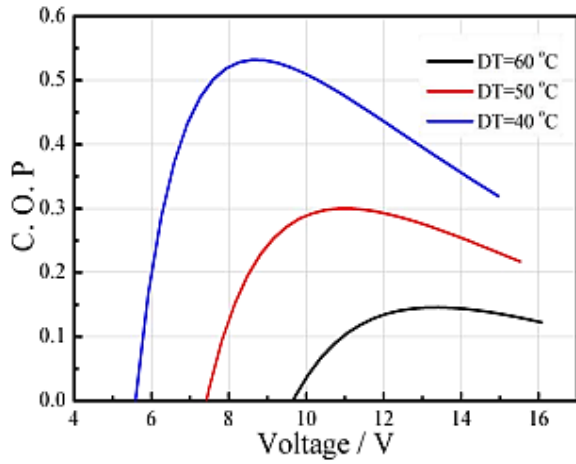
Performance curve (TEC1-12703) when hot surface temperature $T_h=27^\circ\text{C}$ or 50°C

Performance diagram of temperature difference range 0-30°C. Cooling coefficient changes with voltage $COP=f(V)$



Performance curve (TEC1-12703) when hot surface temperature $T_h=27^\circ\text{C}$ or 50°C

Performance diagram of temperature difference range 40~60/70°C. Cooling coefficient changes with voltage $COP=f(V)$



TEC series

Name	Couples	Size	Weight	I _{max}	U _{max}	Resistance	ΔT max	Q _{max} (ΔT = 0)	max COP
TEC1-12703	127	40x40x4.7 mm	31 g	3 A	15.4 V	3.2-3.7 Ω	66 °C	38.0 W	0.63
TEC1-12704	127	40x40x4.7 mm	31 g	4 A	15.4 V	2.85 Ω	66 °C	33.4 W	-
TEC1-12705	127	40x40x4.0 mm	29 g	5.3 A	15.4 V	2.20 Ω	75 °C	57.0 W	-
TEC1-12706	127	40x40x3.9 mm	27 g	6.4 A	15.4 V	2.3 Ω	75 °C	57.0 W	0.61
TEC1-12707	127	40x40x3.5 mm	25 g	7.4 A	15.4 V	1.80 Ω	68 °C	75.0 W	-
TEC1-12708	127	40x40x3.5 mm	23 g	8.5 A	15.4 V	1.55 Ω	68 °C	85.0 W	-
TEC1-12710	127	40x40x3.3 mm	26 g	10.5 A	15.4 V	1.08 Ω	68 °C	100.0 W	-
TEC1-12715	127	40x40x3.9 mm	50 g	15.6 A	15.4 V	0.80 Ω	68 °C	150 W	0.73
TEC1-26316	263	50x50x3.1 mm	65 g	16 A	31.5 V	1.60 Ω	66 °C	300 W	-
TEC1-12730	263	62x62x3.9 mm	90 g	30.7 A	15.4 V	0.35 Ω	68 °C	350 W	-
TEC1-06306	63	40x20x3.9 mm	17 g	6 A	7.6 V	1.05 Ω	63 °C	42 W	-
TEC1-06308	63	40x20x3.9 mm	17 g	8.5 A	7.6 V	0.75 Ω	63 °C	32 W	-
TEC1-06310	63	40x20x3.3 mm	17 g	7.5 A	7.5 V	0.65 Ω	63 °C	45 W	-
TEC1-06312	63	40x20x3.1 mm	17 g	9.5 A	7.5 V	0.55 Ω	63 °C	55 W	-
TEC1-04901	-	20x20x4.9 mm	-	1 A	5 V	5 Ω	50 °C	5 W	-
TEC1-04902	-	20x20x4.5 mm	-	2 A	5 V	2.5 Ω	55 °C	10 W	-
TEC1-04903	-	20x20x3.7 mm	-	3 A	5 V	1.7 Ω	60 °C	15 W	-
TEC1-04904	-	20x20x3.5 mm	-	4 A	5 V	1.3 Ω	60 °C	20 W	-
TEC1-04905	-	20x20x3.1 mm	-	5 A	5 V	1 Ω	60 °C	25 W	-
TEC1-04906	-	20x20x3.1 mm	-	6 A	5 V	0.83 Ω	60 °C	30 W	-

Thermo topics on lamaPLC

Page	Date	Tags
• lamaPLC: TEC / Peltier Elements	2026/04/23 21:51	thermo , thermo element , tec , peltier , cooler , heat , cop

[thermo](#), [thermo element](#), [TEC](#), [Peltier](#), [cooler](#), [heat](#), [COP](#)

This page has been accessed for: Today: 3, Until now: 4

From:

<https://www.lamaplc.de/> - **lamaPLC**

Permanent link:

<https://www.lamaplc.de/doku.php?id=actor:peltier>

Last update: **2026/04/21 20:48**

