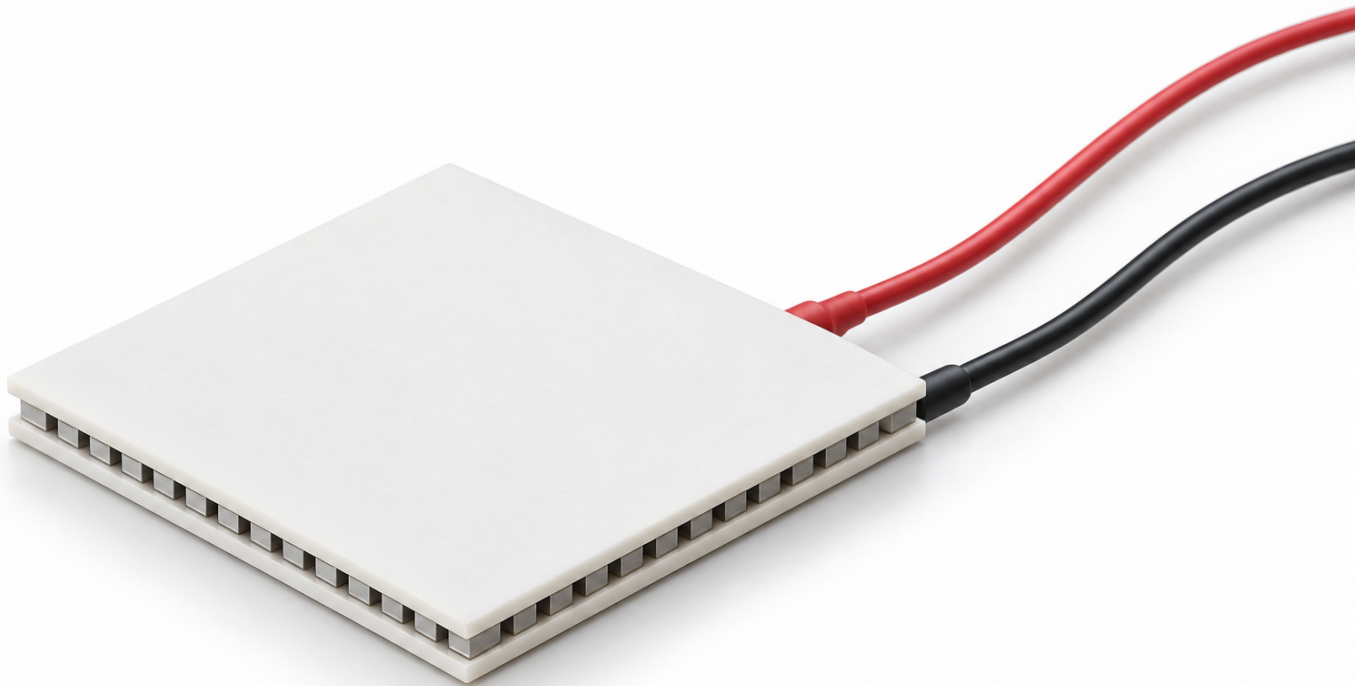


COMPACT THERMOELECTRIC COOLING

Peltier Cooling Module

TEC1-12706SR

A compact thermal-control component for integration into precision fixtures and equipment.



40 × 40 mm

REFERENCE FOOTPRINT

DC DRIVE

EXTERNAL CONTROLLER

127 COUPLES

TEC1-12706 FAMILY

Commercial reference: TEC1-12706SR. Technical references cover the TEC1-12706 family; final manufacturer, grade and supplied-lot specification are to be agreed before ordering.

Representative product visualisation; appearance and lead arrangement may vary.

01 / APPLICATIONS FOR MPT

Target the thermal requirement.

Potential applications for engineering evaluation. Compatibility and performance must be verified on the intended MPT equipment.

01

Temperature-controlled fixtures

Integrate into a cold plate or fixture where the thermal load, target temperature and control stability are defined.

02

Localized equipment cooling

Provide a compact heat-pumping element where space is limited and a suitable hot-side heat sink can be installed.

03

Maintenance replacement

Evaluate against the existing approved part: dimensions, thickness, wiring, electrical limits, seal and thermal performance.

04

Thermal development & trials

Use sample units to establish the operating current, heat-sink requirement and achievable temperature under actual load.

THE MODULE IS ONE PART OF THE THERMAL SYSTEM

Stable temperature control requires a compatible current-limited driver, feedback sensor, thermal interfaces and heat rejection. The module alone does not establish a temperature-accuracy specification.

DEFINE THE APPLICATION BEFORE SELECTING THE PART

Target temperature and tolerance • heat load (W) • ambient / coolant temperature • available mounting space • duty cycle • moisture and cleanliness requirements.

Application guidance: Ferrotec Thermoelectric Reference Guide, Module Selection (Section 9). These are proposed uses, not an MPT qualification or approval claim.

02 / TECHNICAL DATA

Keep the specification tied to its source.

The supplied documents describe different TEC1-12706 variants. Values below remain source-specific; they are not a combined guaranteed specification for the SR item.

PARAMETER	HB / 25°C	HB / 50°C	ROSSMANN / 30°C
Hot-side temperature, T_h	25°C	50°C	30°C
Maximum heat pumping, Q_{max}	50 W	57 W	min. 51 W
Maximum temperature difference	66°C	75°C	min. 65°C
Maximum current, I_{max}	6.4 A	6.4 A	6.0 A
Maximum voltage, V_{max}	14.4 V	16.4 V	15.4 V DC
Module resistance	1.98 Ω	2.30 Ω	2.07 $\pm 0.1 \Omega^*$
Length $\times$ width	40 $\times$ 40 mm	40 $\times$ 40 mm	40 ± 0.5 mm each
Thickness	3.8 mm	3.8 mm	3.7 ± 0.1 mm
Edge sealing	Consult supplier	Consult supplier	RTV: yes

*Roßmann resistance is AC resistance at 25°C. HB resistance is listed under each hot-side-temperature column. These are not interchangeable test conditions.

ADDITIONAL GENERIC FAMILY REFERENCE

Data TEC1 12706.pdf: 127 couples; 40 $\times$ 40 ± 0.5 mm; Q_{max} at least 50 W; ΔT_{max} 65°C; I_{max} 6 A; V_{max} 15.4 V; resistance 2 Ω at $\Delta T = 0^\circ\text{C}$. Hot-side test temperature is not stated.

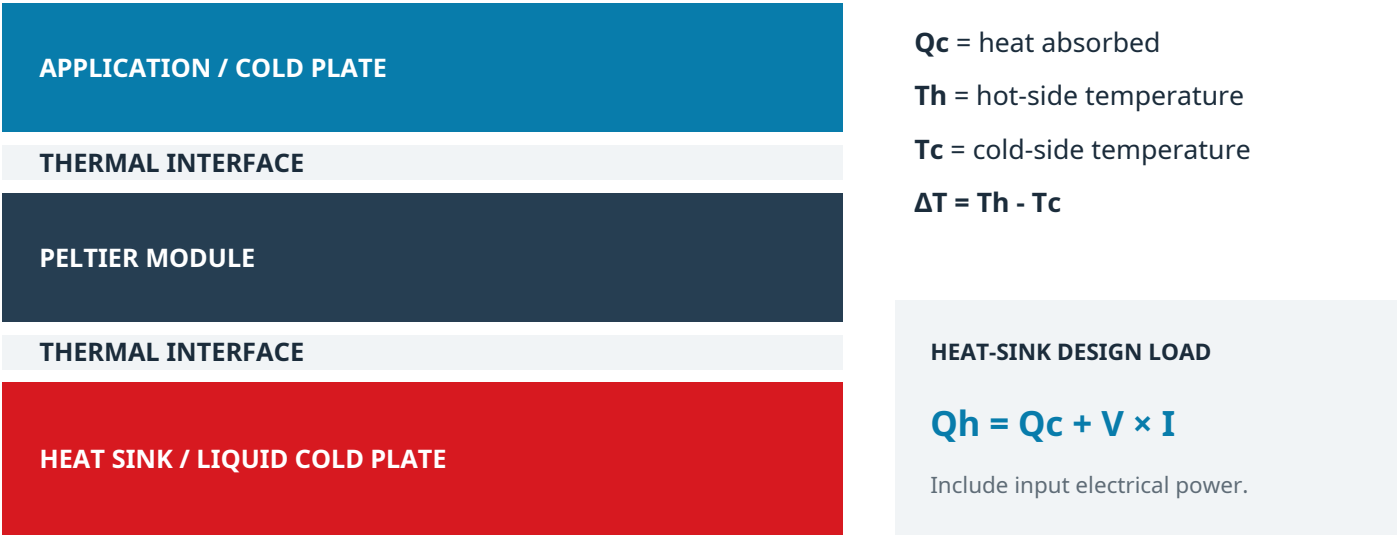
Selection note: Q_{max} and ΔT_{max} are different limiting conditions, not simultaneous performance. A module must be selected at the actual heat load and temperature difference.

Source material: HB TEC1-12706 Rev 2.03, pp. 1 & 3; Roßmann RO6.0-51.4 in TECB1.pdf, p. 1; Data TEC1 12706.pdf. SR equivalence is not established by these references.

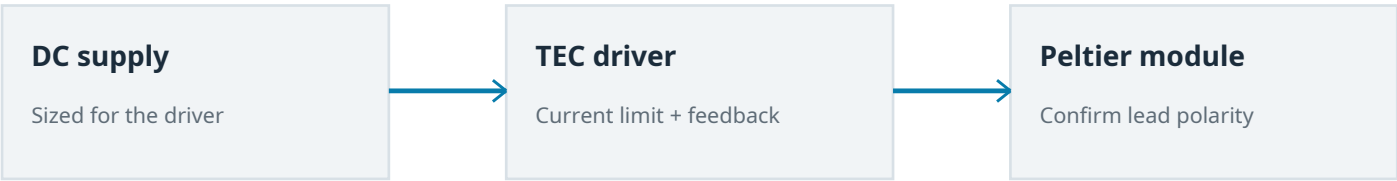
03 / SYSTEM INTEGRATION

Remove the heat from the hot side.

A complete assembly must move heat from the application to the environment and regulate the module within its confirmed electrical limits.



ELECTRICAL CONNECTION / FUNCTIONAL VIEW



Control: use feedback from the temperature-controlled surface and establish the current limit from the selected part. Confirm the cold/hot faces and lead polarity before full-power operation.

Mounting: use flat, clean, parallel contact surfaces and uniform clamping with a compatible thermal interface. Protect the ceramic and leads from bending and shear loads.

Moisture: assess dew point and condensation when cooling below ambient. Sealing materials and thermal-interface compounds require approval for the intended MPT environment.

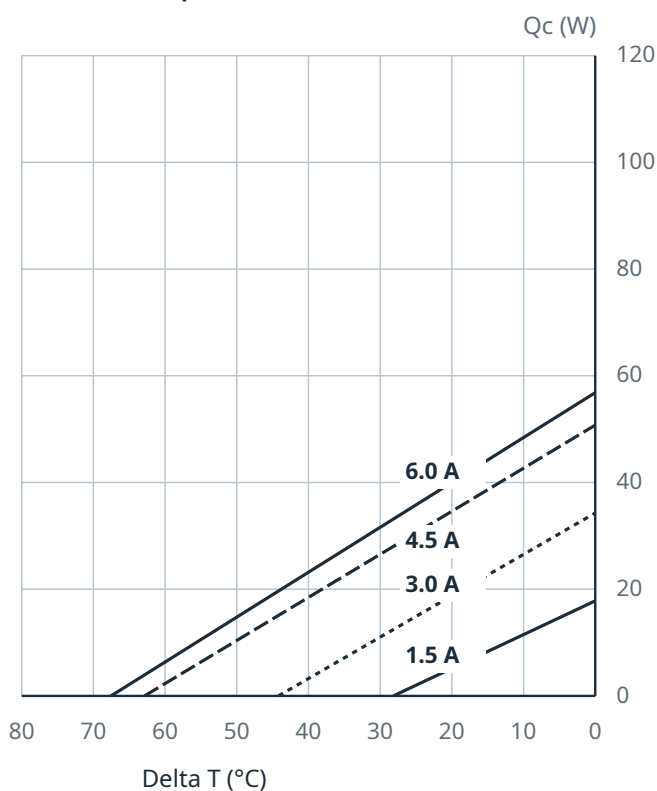
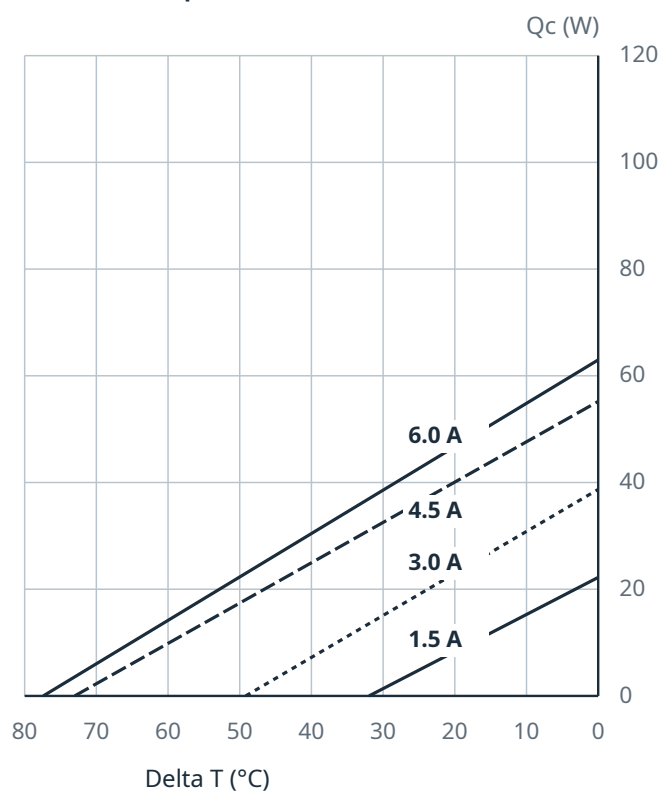
The 138°C value in the references relates to solder / a stated module temperature limit. It is not a recommended operating setpoint or a verified continuous limit for the supplied SR part.

General guidance: Ferrotec Reference Guide, Sections 5, 6 and 9. No controller, heat sink or fixture is included unless quoted.

04 / REFERENCE PERFORMANCE

Cooling performance, clearly.

HB TEC1-12706 reference curves at two hot-side temperatures. Vector redraw from the supplied datasheet, Rev 2.03, page 2.

COOLING CAPACITY / CURRENT CHARACTERISTICS**HOT SIDE | $T_h = 25^\circ\text{C}$** **HOT SIDE | $T_h = 50^\circ\text{C}$** 

How to read: $\Delta T = T_h - T_c$. Select the curve for the drive current, then read the available cooling capacity at the required temperature difference.

 Q_{max} IS NOT AVAILABLE AT ΔT_{max}

Cooling capacity falls as ΔT increases. Select the operating point using actual heat load, hot-side temperature and drive current.

Graphical reference only. Lines are approximately traced from the original HB curves; axis direction and ranges follow the source (ΔT : 80 to 0 $^\circ\text{C}$; Q_c : 0 to 120 W). This is not measured data or a guaranteed specification for the supplied SR lot. Published curves and tabulated limits may differ; confirm the selected part with its manufacturer.

05 / SUPPLY & QUALIFICATION

Define the part. Validate the assembly.

THOR**THEK** thermal-component offering for MPT engineering and maintenance review.

COMMERCIAL MODEL REFERENCE

TEC1-12706SR

Peltier / thermoelectric cooling module

PART & LOT

Confirm manufacturer, SR suffix meaning, seal, thickness, lead specification and lot traceability.

ELECTRICAL

Verify approved I_{max}/V_{max}, resistance test method, polarity and insulation requirements.

THERMAL

Agree target temperature, heat load, hot-side condition, stability and cycle / endurance criteria.

PROCESS FIT

Approve thermal interfaces, sealing materials, cleanliness and installation method for the intended tool.

Standard offer: module supply. Driver, sensor, heat sink, fixture and integration work are quoted separately. Quantity, lead time, warranty and acceptance terms follow the agreed quotation.

THORTHEK****

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