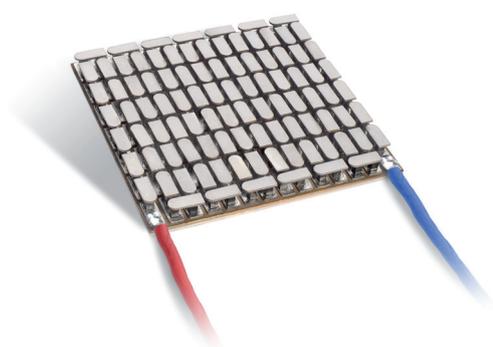




THERMOELECTRIC MODULE (TEM)

Preliminary Version



General description

ISABELLENHÜTTE TEM is a high-temperature thermoelectric generator based on HalfHeusler compounds for the direct conversion of heat into electrical energy. The thermoelectric active part of the TEM consists of p and n doped Halbheusler compounds. These are characterized by excellent chemical resistance, mechanical resistance and temperature stability. Moreover, the two compounds have almost identical thermal expansion coefficients. Of course, the two compounds are non-toxic and RoHS compliant. Custom-tailored TEM for specific requirements are available upon request.

Features

- 15.8 W max. power output
- Excellent chemical and mechanical strength
- High temperature stability
- Excellent long-term stability
- Continuous operating temperature 550 °C in air
- Customizable (dimensions, electrical properties)
- Easy to scale up for large TEM
- REACH/RoHS compliant
- Noiseless operation

Applications

Waste heat recovery in

- Industry applications
- Motor vehicles (combustion engines)
- Marine vessels
- Aircrafts

Heat conversion in electrical energy for

- Combined heat and power units (CHPs)
- Off-grid power supplied heating and gas boiler
- Radioisotope thermoelectric generators (RTGs)

Electrical data²

Hot side temperature	550 °C	350 °C
Cold side temperature	50 °C	50 °C
Temperature difference	500 K	300 K
Max output power	15.8 W	5.2 W
Internal resistance	2.8 Ω	2.4 Ω
Current @MPP	2.4 A	1.5 A
Voltage @MPP	6.6 V	3.5 V
Open circuit voltage	13.9 V	7.5 V
Efficiency	4 %	2 %

Physical data

Maximum operation temperature	550 °C
Physical dimension (module)	40 x 40 x 3.5 mm
Number of unicouples	112
Single leg dimension (l x w x h)	1 x 1 x 1.5 mm
Internal heat resistance	1.7 K/W ¹

¹ ΔT = 500 K

² data based on simulation