

ECT 310

EnOcean powered by Thermal Energy

ECT 310 is a low-cost ultra-low-voltage DC/DC converter for powering battery-less EnOcean radio modules by Thermal Energy. Wireless sensors and even actuators can be operated.

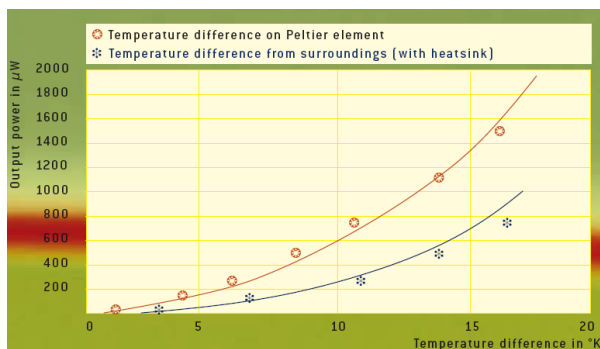
Operation starts at typ. 20 mV which corresponds to a 2 Kelvin temperature difference at a low-cost Peltier element.

The output power is in the range from μW to mW and depends on the actual temperature difference at the Peltier element.

ECT 310 is designed and optimized for powering EnOcean radio modules in sensors and actuators. To achieve best system efficiency the output voltage is regulated only roughly.

A typical thermal-powered sensor consists of a suitable Peltier element, the ECT 310 DC/DC converter and an EnOcean STM 300 wireless sensor transceiver module.

Energy Calculation Example

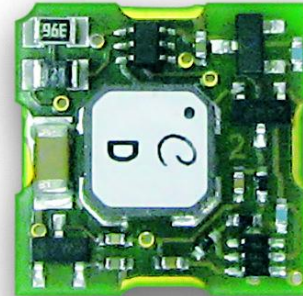


Output power from ECT 310 in combination with Peltier element TEC2L-15-15-15-5.6:

- Red = temp. diff. @ Peltier, blue = temp. diff. against ambient temp. (via heat sink).
- Start up at 2K, $\sim 100 \mu\text{W}$ of energy is already produced for a temp. diff. of 7 K.

Note:

An EnOcean radio module that wakes up every 2 minutes to transmit a radio telegram requires an average energy of $\sim 5 \mu\text{W}$ only.



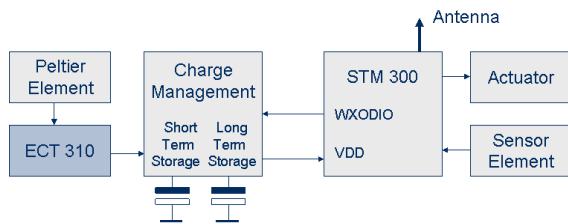
ECT 310 Key Features

- Best in-class thermo harvester solution
- Low-cost DC/DC converter, works with lowest-cost standard Peltier elements
- Designed and optimized for thermo-powered EnOcean wireless applications
- SMD footprint
- Can supply an STM 300 module to realize bi-directional wireless sensors and actuators

Key Applications

- Sensors for building and industrial automation (heat cost allocator, temperature sensor, process control, preventive maintenance, etc.)
- Actuators for building and industrial automation (water valve, air flap, other mech. dev.)

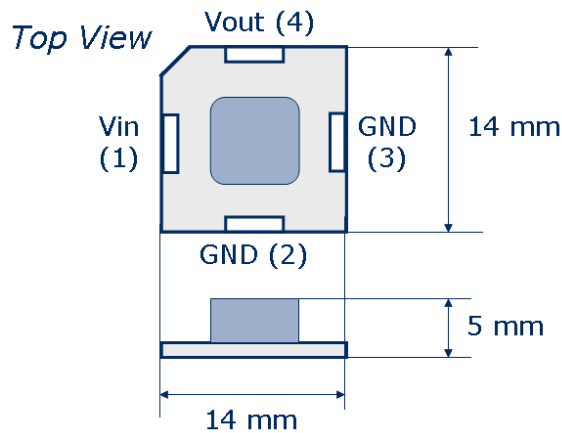
Thermo powered actuator with STM 300



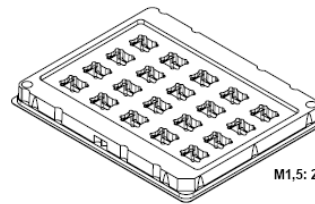
Technical Data

Input start-up voltage	20 mV typ. oc
Input voltage max.	500 mV oc (oc = open circuit)
Output voltage	3 .. 5 V (input = 20 .. 500 mV, load < 10 MΩ)
Input source impedance	< 2 Ohm
Efficiency @ 25 mV	30 % typ.
Operating temperature	-20 °C .. +60 °C
Storage temperature	-40 °C .. +85 °C
Humidity	0 .. 93 % rH, non-condensing

Dimensions & Pinout (Top View)



Packaging Information



Ordering Information

Type ECT 310 Module	Ordering Code S3004-P310
-------------------------------	------------------------------------

Note

EnOcean GmbH owns multiple patents in the area of self-powered applications. An overview can be found at following link: <http://www.enocean.com/en/patents/> . Patent pending for ECT 310.

Purchase of the ECT 310 DC/DC converter module or ECT 310 developer kit does not give the right to use this component to power any radio interface other than the EnOcean Radio protocol.