

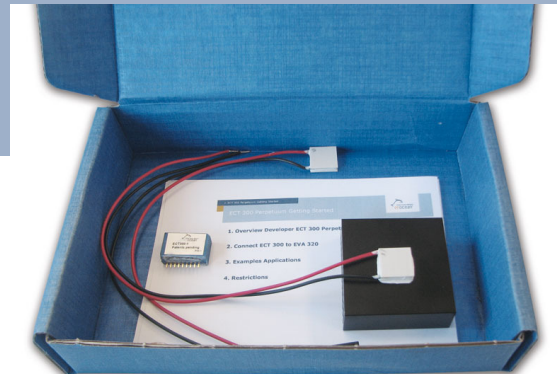
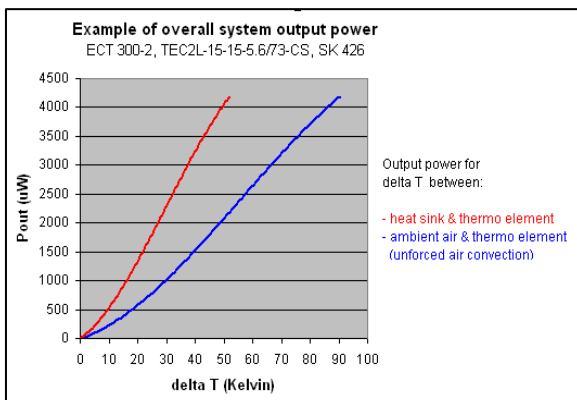
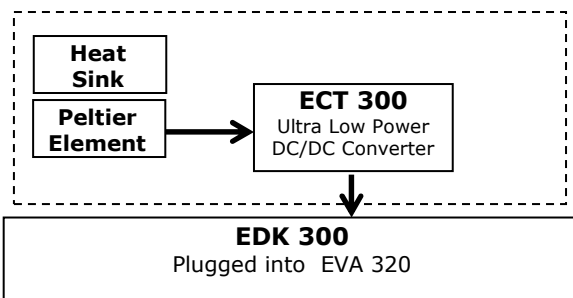
ECT 300 Perpetuum

Ultra Low Power DC/DC Converter for Thermal Energy Harvester

ECT 300 extends EnOcean’s developer kit EDK 300 by thermal energy harvesting technology. Wireless sensor and even actuators can be operated by 1-2 Kelvin temperature difference.

EnOcean’s energy harvester is based on a revolutionary ultra low voltage DC/DC converter which starts operation at already 20mV. For comparison: the leading conventional DC/DC converters need at least 500m-600V to start operation - a factor of 25x more!

The output power is in the range from μW to mW at 3.4V and depends on the actual temperature difference at the Peltier element. It is designed and optimized for use with EnOcean radio technology in sensors and actuators. A typical thermo-driven sensor consists of a sensor element, a small Peltier element, the ultra low voltage DC/DC converter and an EnOcean STM radio module.



Example calculation for accumulated energy from ECT 300-2 in combination with Peltier/Seebeck (TEC2L-15-15-5.6) element and heat sink (SK426).

10°C average temperature difference @ peltier:
 $0.5\text{mW} \times 24\text{h} \times 365\text{d} = 4,380\text{mWh}$ per year

20°C average temperature difference @ peltier:
 $1.4\text{mW} \times 24\text{h} \times 365\text{d} = 12,264\text{mWh}$ per year

Average energy production is comparable to a mignon cell which has about 4,500mWh capacity.

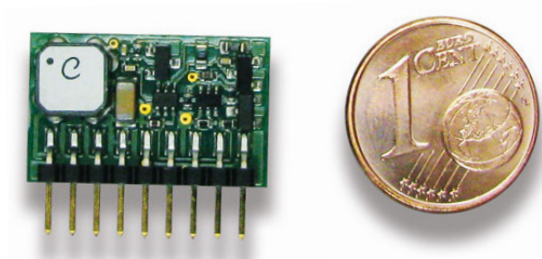
Key features

- Best in-class thermo harvester solution
- Designed for battery less / self-powered applications
- Plug & play solution for EDK 300 power management socket
- Optimized for EnOcean Alliance radio standard
- Works with low cost standard Peltier elements from multiple vendors
- Based on standard technology – ready for mass production

ECT 300 Perpetuum Developer Kit consists of following parts

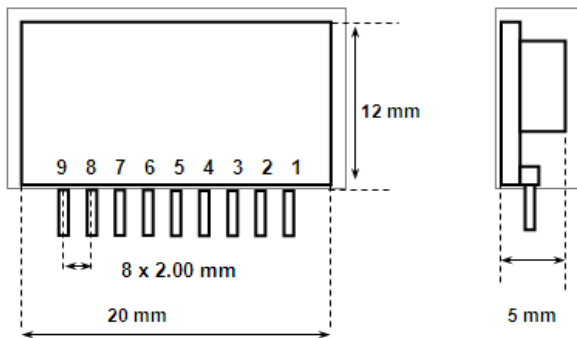
- ECT 300 module, ultra low power DC/DC converter
- Peltier element with heat sink
- Peltier element stand alone
- User manual

**Technical data of ECT 300 module
(ultra low power DC/DC converter):**



Physical dimensions: 20x12x5mm
 Typ. input voltage: 0.02 – 0.5V
 Max. input voltage: 1V
 Typ. source impedance: <20Ω
 Typ. output voltage: 3,4V
 Average efficiency: 30%
 Operating temperature: -20°C – 65°C
 Storage temperature: -40°C – 85°C

ECT 300 module dimensions and pinout



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 300.

Purchase of ECT 300 Perpetuum Developer Kit or ECT 300 DC/DC converter module does not include the right to use this kit or module to power other radio interfaces than EnOcean Alliance compatible.

Pin	Name	Description
1	V _{IN1}	Voltage input 1 connection to Peltier/ Seebeck element
2	NC	Not connected
3	NC	Not connected
4	V _{IN2}	Voltage input 2 connection to Peltier/ Seebeck element
5	V _{OUTAC}	Voltage output AC (internal test only)
6	NC	Not connected
7	V _{OUT}	Voltage output for load
8	NC	Not connected
9	GND	Ground

Type	Ordering Code
ECT 300 Perpetuum Developer Kit	S3004-P300
ECT 300 Module	S3004-P301