

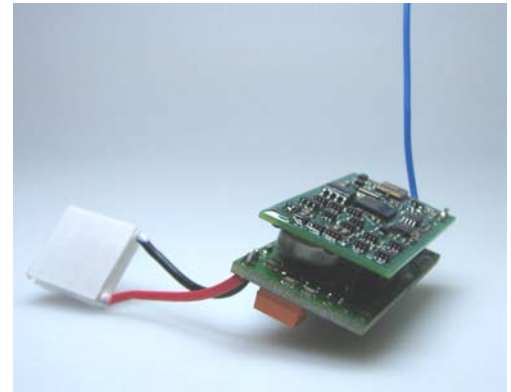
Evaluation Kit Thermal Energy Driven Radio Module



EnOcean has developed a thermal energy harvester which is able to power wireless sensor nodes from temperature differentials of only a few Kelvin.

This new energy harvester is based on a revolutionary DC/DC converter which automatically starts operation at 20mV. For comparison: the leading conventional DC/DC converters need at least 400mV to start operation - a factor of 40 more!

The output power is in the range from micro-watts to milli-watts at 4.5V and depends on the actual temperature differential and the used Peltier element. Therefore it is designed for use with EnOcean radio technology in sensors and actuators.

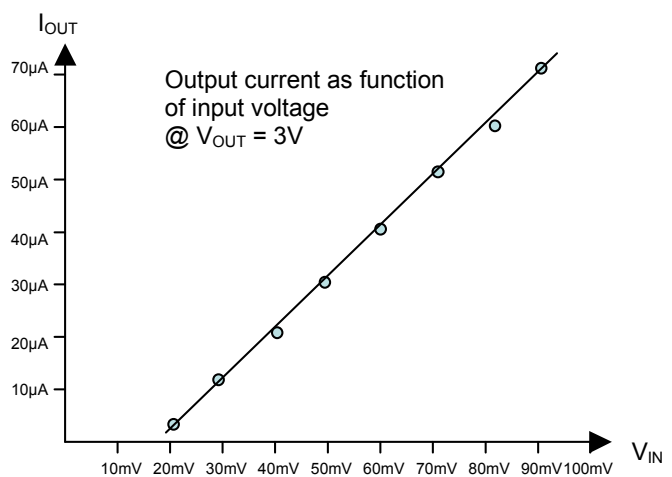
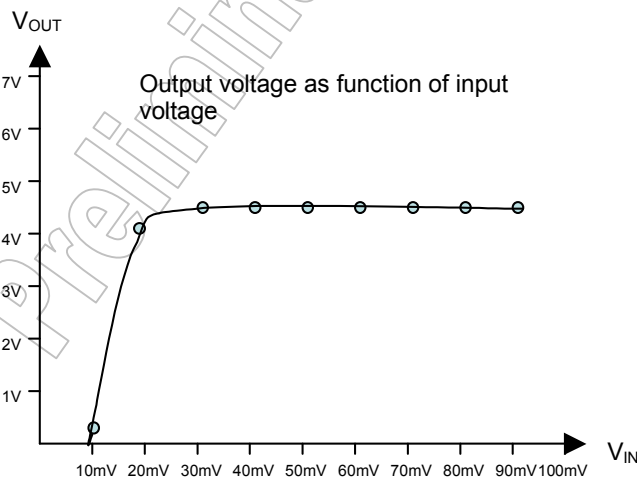


A typical thermo-driven sensor consists of a sensor element, a small Peltier element, the new DC/DC converter and an STM110 radio module from EnOcean. Powered by the thermo differential the STM110 will wake up on a regular basis, e.g. every 10s, acquire sensor values and transmit them via a radio signal over a distance of up to 300m.

The evaluation kit consists of a DC/DC converter PCB, the STM110 (868MHz for Europe) or STM110C (315MHz for North America) radio module and a Peltier element.

Technical Data DC/DC Converter

- Supply voltage:**0.02V – 0.25V
- Output voltage:** limited at 4.5V
- Efficiency:** ~30%
- PCB size:** 43mm x 22mm x 19mm
- On board sensors:** Temperature and supply voltage
- Connectors:** 20pin dual row connector for STM110/STM110C
- Temperature range:** 0 up to +40 °C



$R_{Generator} = 1,5\Omega$

Technical Data Peltier Element

Type	Size L x W x H (mm)	Temperature coefficient	Internal resistance	Thermal conductivity
Eureca TEC2L-15-15-5.6/73CS	15x15x5.6	12.5 mV/K	1.44 Ω	0.046 W/K

Technical Data STM110 / STM110C

Radio technology: 868 MHz (STM110) or 315 MHz (STM110C), up to 300m free field transmission

Input channels:..... 4 digital inputs, 3 analog inputs (2 used for temperature and voltage)

Wake-up cycle: user configurable 1, 10, 100s

Transmission cycle:.....user configurable after every wake up, every 10th or every 100th wake up

For details concerning STM110/STM110C please refer to the STM110 data sheet and user manual.

Preliminary Data Sheet