

ENERGY MANAGEMENT OF ZF'S ENERGY HARVESTING SOLUTIONS

As a supplement to the technical data you will find information about the energy management of the energy harvesting switch.

1 Function

The energy management prepares the energy provided by the generator for the wireless electronics. The positive or negative voltage pulse is rectified and stored temporarily in a capacitor. Subsequently, the voltage is adjusted using a step down-converter to a constant supply voltage for the microcontroller. Through a diode, the microcontroller can distinguish the positive from the negative voltage pulse. The efficiency of the electric energy management is approximately 70% with 100 Ω load.

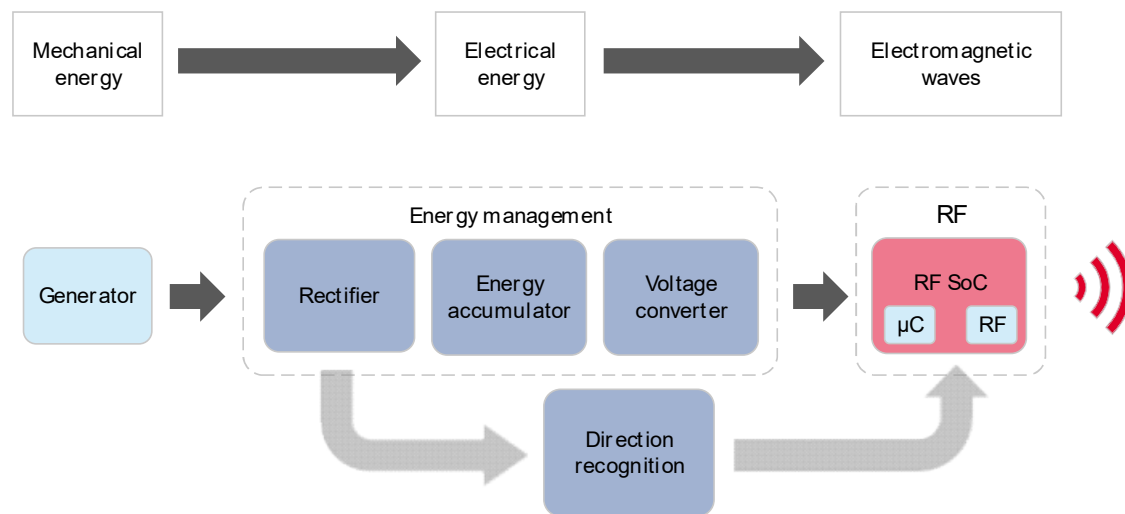


Fig. 1 Conversion of mechanical energy into radio waves

Key:

| | |
|-----|----------------------------------|
| µC | Microcontroller |
| RF | Radio frequency (high frequency) |
| SoC | System-on-Chip |



2 Depending on output voltage and load

The temporary availability of the output voltage VDD at the energy management depends on the load. The greater the load resistance at the energy management output, the smaller the current flow. This leads to longer availability of the energy amount.

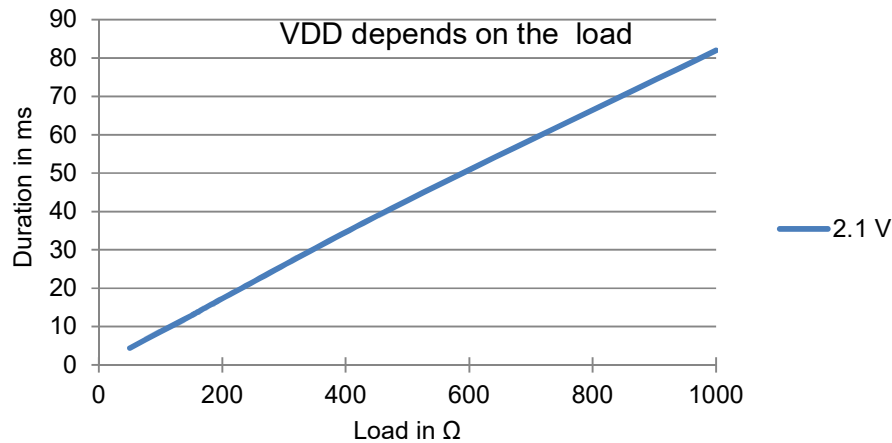


Fig. 2 Time availability of generator VDD vs. resistance, 390 μ Ws at ambient temperature of 23 °C.

3 Design rules layout

→ Note the design rules of the components used in accordance with their data sheets.

4 Circuit diagram reference design

To request a reference design please consult factory.

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