

## Step-Up/Step-Down Converter Features Ultra-Low Quiescent Current

*This design is intended to be used in portable applications where the input power source is provided by three NiCd or NiMH cells (3.6V without load) and where the output voltage is 3V. When the input battery is fully charged, the input voltage is above 3V and when the power source is half or near fully discharged, the input voltage is below 3V. A 3V, 100mA regulated output is generated with a typical quiescent current below 12 $\mu$ A. Input voltage ranges from 2V to 5V and power conversion efficiency is above 60%. It consists of a step-up converter (U1: MAX1833) followed by a LDO (U2: MAX8880). It offers a POK output signal that can be used as  $\mu$ P reset signal, and integrated reverse input battery protection.*

To reduce power consumption, some applications need to be cycled between active and sleep modes. In sleep mode, the quiescent current of the system is dominated by the power supply. Current must be as low as possible because it is impossible to turn off the power supply, as it must remain active to supply some parts of the system.

This design is intended to be used in portable applications where the input power source is provided by three NiCd or NiMH cells ( $\approx$  3.6V without load) and where the output voltage is 3V. When the input battery is fully charged, the input voltage is above 3V and when the power source is half or near fully discharged, the input voltage is below 3V.

Some solutions already exist:

- Step-up converter in a Sepic configuration
- Step-up + LDO such as MAX1672
- Charge pump such as MAX1759

All these solutions have quiescent currents in the 100 $\mu$ A range (MAX1672: 125 $\mu$ A; MAX1759: 180 $\mu$ A). In sleep mode, this is too much for some portable applications.

This design generates a 3V, 100 $\mu$ A regulated output voltage power supply with a typical quiescent current below 12 $\mu$ A. Input voltage ranges from 2V to 5V and power conversion efficiency is above 60%. It consists of a step-up converter (U1: MAX1833) followed by a LDO (U2: MAX8880). It offers a POK output signal that can be used as  $\mu$ P reset signal, and



MAX1833: [QuickView](#) -- [Full \(PDF\) Data Sheet](#) -- [Free Samples](#)

MAX8880: [QuickView](#) -- [Full \(PDF\) Data Sheet](#) -- [Free Samples](#)