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Abstract: Implementing monolithic DC-DC converters for low power portable applications with a standard low voltage CMOS technology leads to lower production costs and higher reliability. Moreover, it allows miniaturization by the integration of two units in the same die: the power management unit that regulates the supply voltage for the second unit, a dedicated signal processor, that performs the functions required. This paper presents original techniques that limit spikes in the internal supply voltage on a monolithic DC-DC converter, extending the use of the same technology for both units. These spikes are mainly caused by fast current variations in the path connecting the external power supply to the internal pads of the converter power block. This path includes two parasitic inductances inbuilt in bond wires and in package pins. Although these parasitic inductances present relative low values when compared with the typical external inductances of DC-DC converters, their effects can not be neglected when switching high currents at high switching frequency. The associated overvoltage frequently causes destruction, reliability problems and/or control malfunction. Different spike reduction techniques are presented and compared. The proposed techniques were used in the design of the gate driver of a DC-DC converter included in a power management unit implemented in a standard 0.35 mu m CMOS technology.

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