Title: A design methodology for integrated inductor-based DC-DC converters

Author(s): Costa, Vítor[1,2]; dos Santos, Pedro Mendonça[1,3]; Borges, Beatriz[1,4]

Abstract: A design methodology for monolithic integration of inductor based DC-DC converters is proposed in this paper. A power loss model of the power stage, including the drive circuits, is defined in order to optimize efficiency. Based on this model and taking as reference a 0.35 mu m CMOS process, a buck converter was designed and fabricated. For a given set of operating conditions the defined power loss model allows to optimize the design parameters for the power stage, including the gate-driver tapering factor and the width of the power MOSFETs. Experimental results obtained from a buck converter at 100 MHz switching frequency are presented to validate the proposed methodology. (C) 2012 Elsevier Ltd. All rights reserved.

Reprint Address: dos Santos, PM (reprint author), Inst Telecomunicações, Av Rovisco Pais, P-1049001 Lisbon, Portugal.

Addresses:
1. Inst Telecomunicações, P-1049001 Lisbon, Portugal
2. Inst Super Engn Lisboa, Lisbon, Portugal
3. Acad Mil, Lisbon, Portugal
4. Inst Super Tecn, Lisbon, Portugal

E-mail Address: pedro.santos@lx.it.pt