

# ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

## STMicroelectronics/DET - Design and implementation of a low-quiescent current (IQ) voltage regulator in CMOS integrated technology

<b>Funded By</b>	STMICROELECTRONICS S.R.L. [P.iva/CF:00951900968] Dipartimento DET
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<b>Contact</b>	
<b>Context of the research activity</b>	<p>Aim of this project is to work on the design of an integrated voltage regulators with very-low quiescent current (IQ), that is the current absorbed when no energy, or a negligible energy is provided to the output.</p> <p>The design shall investigate all components of a linear voltage regulator, including biasing, references generators and feedback circuits. All innovative solutions recently proposed in the literature shall be investigated and taken into account in the project development.</p>
<b>Objectives</b>	<p>One of the main pillars of the green digital transition is the development of low-energy systems, a key-enabling technology for extending lifetime of electronic systems relying on battery, and enabling autonomous circuits running on any sort of energy-harvesting approach.</p> <p>Aim of this project is the design and the development, possibly up to a commercial level, of power supply integrated circuits (with focus on low-dropout voltage regulators) with very high performance in terms of low-energy. In particular, the focus on the project is on the reduction of the quiescent current (IQ), that is the current absorbed when no energy, or a negligible energy, is required at its output (i.e., when the driven circuit is in deep energy saving mode). Since the power supply circuit is the only part of the system that cannot be turned off, in many conditions (such as, when the system in a deep energy saving mode), the energy due to the IQ may be the dominant one and sets an upper bound on the lifetime of the device.</p> <p>The project is in collaboration with STMicroelectronics s.r.l., that will provide the CMOS technology for designed the circuit.</p>
<b>Skills and competencies for the development of</b>	<p>The candidate must be familiar (possibly already experienced) with the design methodology of analog electronics as well as integrated circuit design and testing.</p> <p>A good knowledge of related CAD is fundamental prerequisite (mainly Cadence/Synopsis systems).</p>

**the activity**

Competences in signal processing analysis, in particular with the propagation of noise in a circuit, is required.