



Master Thesis Topic: Design of a LDO for an automotive RADAR IC

Job description

You are a motivated student (f/m/div)* who wants to write the master thesis in an international successful company? This specific job is suitable for students within technical studies in the field of electronics, electrical engineering or similar.

Current Status and Motivation:

An automotive Radar MMIC realized in small feature size CMOS like 28nm demands low noise voltage rails (0.9V and 1.8V) that have to be supplied by a dedicated power supply chipset. The power supply rails are derived from the car's battery using step-down converter for efficiency. To provide suppression of the switching spur and other spurs Post-LDOs and/or passive filtering is used.

LDOs regulate the output voltage using a pass-device placed inside a control loop that turns excess voltage into heat. This power dissipation needs to be included in the thermal budget of the whole system.

The goal of the thesis is to evaluate the state-of-the art regarding LDO design and compare solutions with internal and external pass device. One or more designs should be realized on transistor-level in a 28nm technology. The design should also be optimized for suppression of the switching spur of a switched mode power supply at the LDO input.

Research Topic:

An alternative concept for power generation is to control an external power transistor with the Radar MMIC thus forming a linear regulator loop for the supply rail.

Approach / Methodology:

- Design of one or more LDOs (internal/external transistor) in 28nm
- Evaluation of performance for 0.9V/1.8V output voltage using models for:
 - PCB
 - External Power device
 - Switching noise of pre-regulator
- Generate summary on:
 - Advantages/disadvantages compared to monolithic LDO
 - Spur suppression for a given spur amplitude/frequency
 - Recommended power devices
 - System risks of the concept

At a glance

Location: **Graz (Austria)**
Job ID: **331357**
Start date: **immediately**
Entry level: **0-1 year**
Type: **Full time**
Contract: **Temporary**

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Contact

Nico Steinhauser



Further information

Start: November 2021

Type of employment: Temporary / Full-time (Flexible working hours from Monday to Friday between 6 a.m. and 7 p.m.)

Duration: min. 6 months

This thesis has to be written in cooperation with an university.

University contact:

TU Graz - Institute for electronics

Assoc.Prof. Dipl.-Ing. Dr.techn. Mario Auer (mario.auer(at)tugraz.at)

Profile

You are a motivated student (f/m/div)* in the field of **electronics, electrical engineering** or similar. You are best equipped if you are:

- Knowledgeable and experienced in analog circuit design
- Motivated and eager to learn
- Fluent in English and/or German

This position is subject to the collective agreement for workers and employees in the electrical and electronics industry (full-time), employment group D for master students (<https://www.feei.at/leistungen/informations-service/mindestlohne-und-gehalter-2020>).

Please attach the following documents (German or English) to your application:

- Motivation letter
- CV
- Certificate of matriculation at a university
- Transcript of records
- Highest completed educational certificate (Matura certificate for Bachelor students, Bachelor certificate for Master students)
- Reference letter

