

University of Stuttgart

Institute of Robust Power
Semiconductor Systems

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Bachelor's Thesis*
Research Work*
HiWi*

to be assigned

ILH
RF-group

Programmable,
compact, low-
noise four-
quadrant source
measure unit for
MMIC power
supply

Motivation:

The stability of terahertz analog circuits is highly dependent on the quality of the DC supply. MMICs usually require several different DC levels for operation, which are typically very sensitive to the injection of noise. Gate biasing must further be current-limited and possible in four-quadrant operation.

In addition, certain ramp-up and ramp-down sequences must be maintained to avoid damaging the analog circuits. To leave the Lab environment and create self-contained modules, a programmable, high quality and compact DC power supply is required.

Goals:

A DC supply for MMIC must be developed, featuring

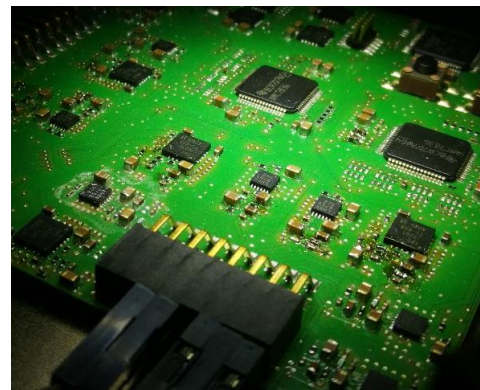
- low noise at all outputs
- four-quadrant operation for low power channels
- two-quadrant operation for high power channels
- programmable voltage, current limit and ramp-up and ramp-down sequences
- Error indication and undervoltage-detection

Your Tasks:

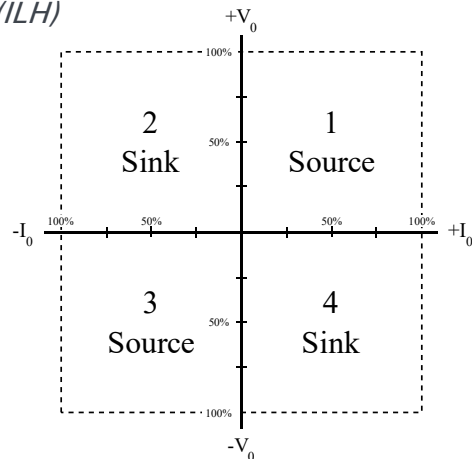
- Profound choice of components according to given specifications
- Design, simulation, layout and assembly of the PCB
- Programming and debugging
- Setup, measurement and characterization
- Documentation

Language: German/English

www.ilh.uni-stuttgart.de



PCB of a programmable voltage DC power supply (ILH)



Four quadrant operation of a power supply

Your Qualifications:

- Hands-on experience in PCB-design
- Familiar with microcontroller programming
- Passion for carefully considered analog circuit design and deliberated PCB layout
- Knowledge of digital and analog circuit design is advantageous

*the workload will be adjusted accordingly

