

RFID Research Activities

Institute of Microwave and Photonic
Engineering

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URSI Austria, Commission D
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Institute of Microwave and Photonic Engineering

RFID Applications

- Automotive
- Health
- City
- Home
- ...

RFID Components and Devices

- Miniaturized RFID Tags
- RF Chip Design
- ...



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RFID

Technologies

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Francesco Berra



RFID System Solutions

- RFID Localization
- Sensor Tags
- ...

RFID Services and Tools

- System Design
- Performance Analysis
- ...

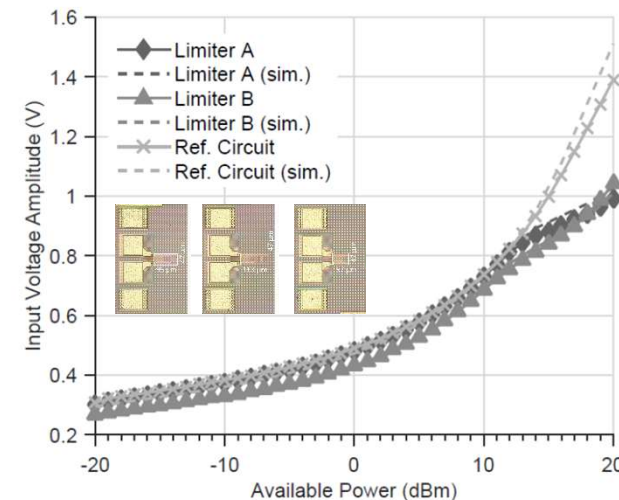
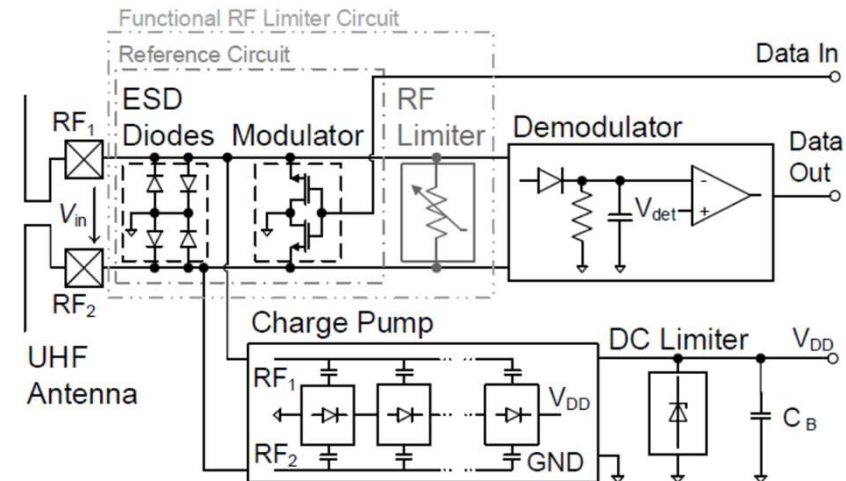
RFID Components and Devices

Dual band RFID transponders (tags) for active check-in and passive check-out in public transportation

- Active check-in: HF RFID
- Passive check-out: UHF RFID

40nm CMOS technology

- UHF frontend design: Radio frequency (RF) limiter circuits to prevent overvoltages
- Maximum voltage rating of 1.1V @ 20dBm



L. Zöscher, et al., HF/UHF Dual Band RFID Transponders for an Information-Driven Public Transportation System, *Elektrotechnik & Informationstechnik* (2016) 133/3, 2016

RFID System Solutions

Rapid prototyping platform for advanced UHF RFID applications

- Low cost state-of-the-art UHF RFID system (smart logistics in automotive test factories)
- RFID reader based on a software defined radio (NI USRP 2942R)

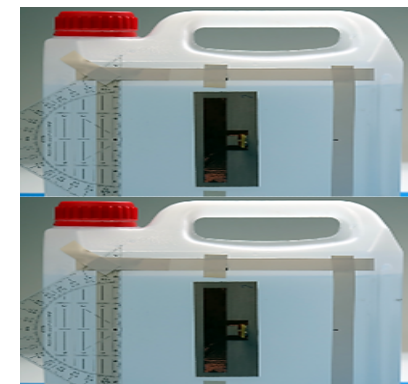
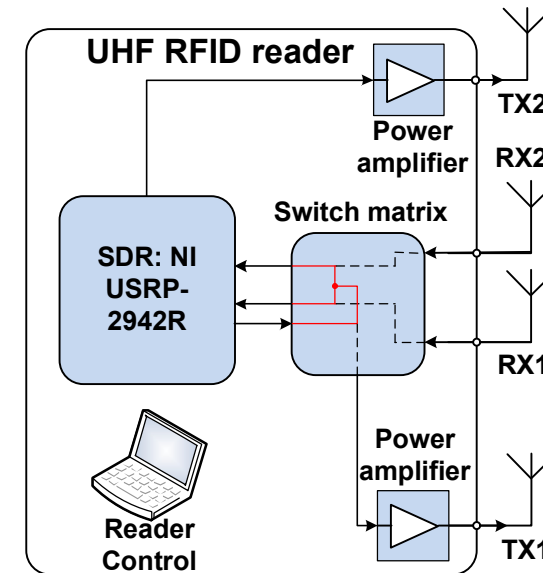
Localization of passive RFID tags

- Phase difference of arrival based position estimation (multipath environment: max. error of 38cm)

Passive RFID sensor tags

L. Görtschacher, et al., SIMO UHF RFID Reader Using Sensor Fusion for Tag Localization in a Selected Environment, e&i, 2016

J. Grosinger et al., Passive RFID Sensor Tag Concept and Prototype Exploiting a Full Control of Amplitude and Phase of the Tag Signal, IEEE Trans. Microwave Theory a. Techniques, 2016, in press



Exploitation and Dissemination

Six awards and prices

- AWARD OF EXCELLENCE 2015, W. Pachler, Ph.D. thesis: Miniaturized RFID Tags Exploring Passive Boosting Technologies, 2015

More than 16 filed patents (8 published)

- J. Grosinger and J. Griffin, Backscatter RFID Sensor with a Bend Transducer, US Patent: US 2014/0049421 A1, February, 2014

More than 30 peer-reviewed publications

- J. Grosinger et al., Passive RFID Sensor Tag Concept and Prototype Exploiting a Full Control of Amplitude and Phase of the Tag Signal, IEEE Trans. Microwave Theory a. Techniques, 2016, in press



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