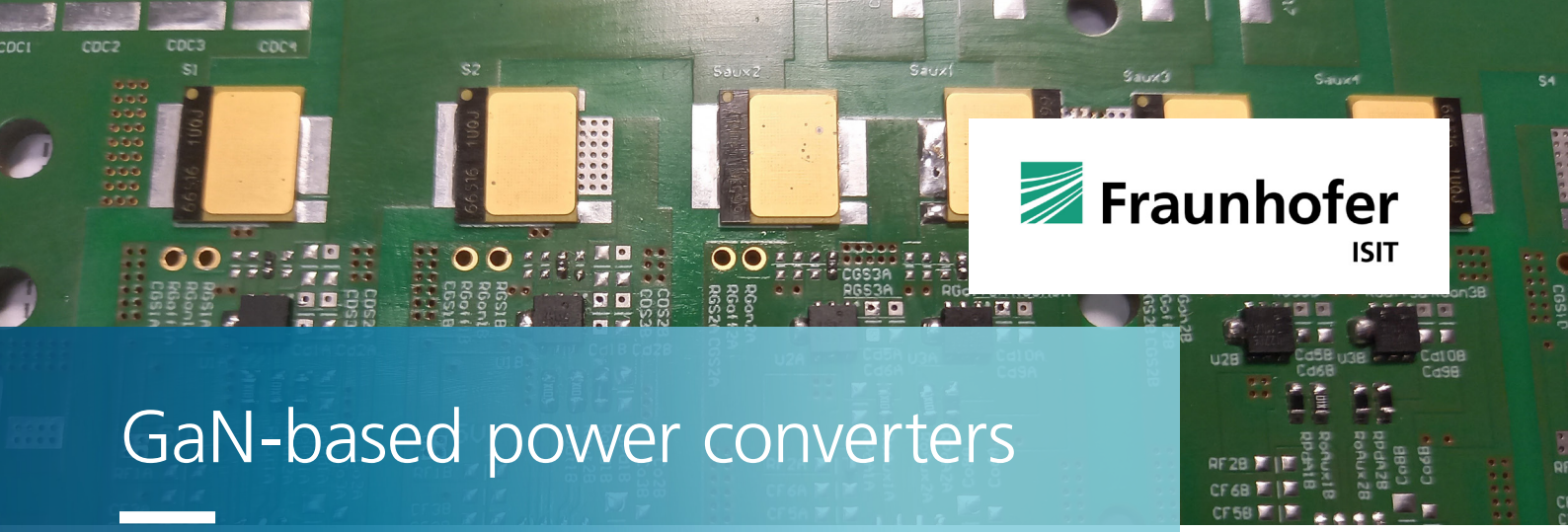


Fraunhofer ISIT

GaN-based power converters

Mastering GaN power conversion with field proven expertise

Prototype of GaN converter for electric drive

GaN technology is revolutionizing the automotive and charging infrastructure industries. Thanks to their improved conduction and switching capabilities, GaN transistors are set to spur greater performance and efficiency in low- to medium-power conversions. Leverage the power of GaN and make the most of the cutting-edge power conversion solutions available today.

Fraunhofer ISIT brings an unmatched expertise in power conversion from design to testing:

- Converter design, from the device to the application
- Multiphysical simulation
- Prototyping
- Wideband electrical testing and characterization
- Reliability analysis

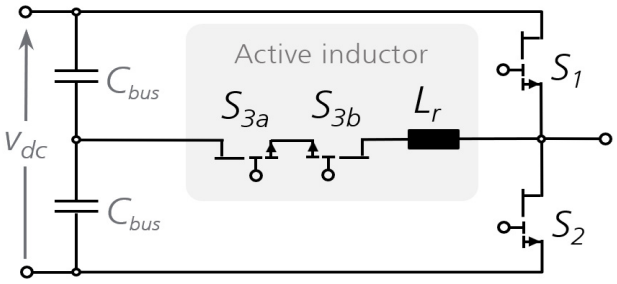
Key advantages of GaN-based power converters:

- High efficiency, limited cooling requirements
- High power density
- High power quality, reduced filtering needs
- High control bandwidth

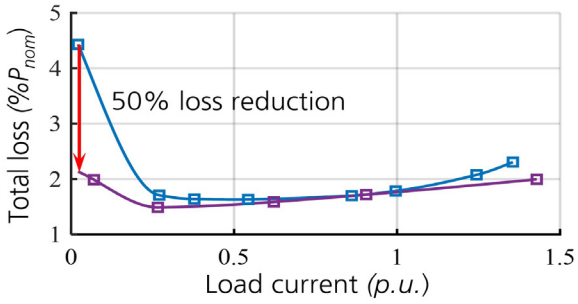
Power converter design @Fraunhofer ISIT:

- GaN-specific topologies, optimized for battery integration
- Isolated and non-isolated structures
- Custom magnetics: conventional, planar, and embedded
- Device-to-system-level modeling and robustness analysis
- Reliability-oriented design and control

GaN-specific topology to cut losses at light load



GaN enable new topologies



Power loss reduction with GaN based auxillary circuit

Key attributes & industry requirements

Datacom & Telecom	UPS	E-mobility	Drives incl. battery
High efficiency over wide power level range	High efficiency enabling lower operating costs	Efficiency enabling range extension	High switching frequency for precision positioning
High density using a limited footprint	Low loss backup-source integration	Light weight	Compactness, light weight
Wide-bandwidth control, envelope tracking	Low footprint	Adapted to multiple use cases (E-bike, on-board charger & MH EV)	Ultra-high efficiency with battery integration
			Low noise, reduced filtering

Fraunhofer ISIT

Highly efficient and reliable electronic energy systems

Applied research from device- to network-level power electronics made in Northern Germany

What we can do for you @Fraunhofer ISIT

Active reliability

- Sensor integration
- Lifetime analysis
- Reliability-driven control
- Multichip power modules

Hybrid grids

- Medium Voltage DC applications
- New components
- Grid forming converter

Battery integration

- Charging stations
- Grid support
- Bidirectional power transfer

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