



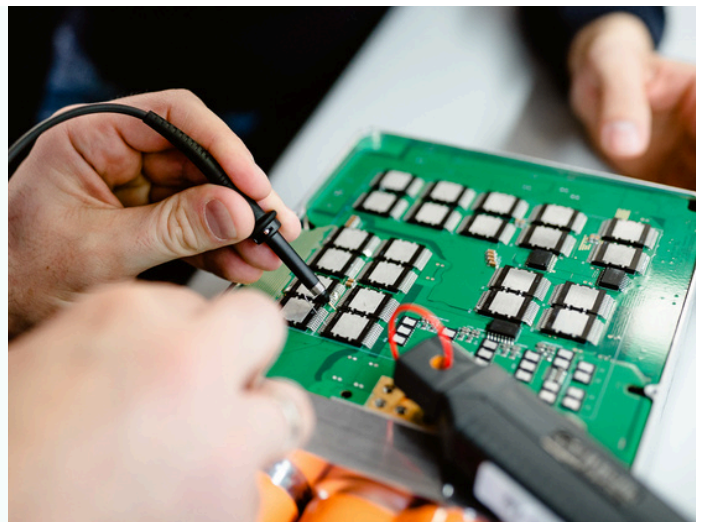
Characterization

Service Portfolio

Characterization is the key for achieving high power density converters: addressing challenges related to high-frequency, high-temperature, and high-power operation with state-of-the-art power devices and passive components.

Power Electronics provides services around the following topics using its beyond state-of-the-art facilities for:

- Static parameter characterization of power devices
- Dynamic parameter characterization of power devices
- Characterization of passive components

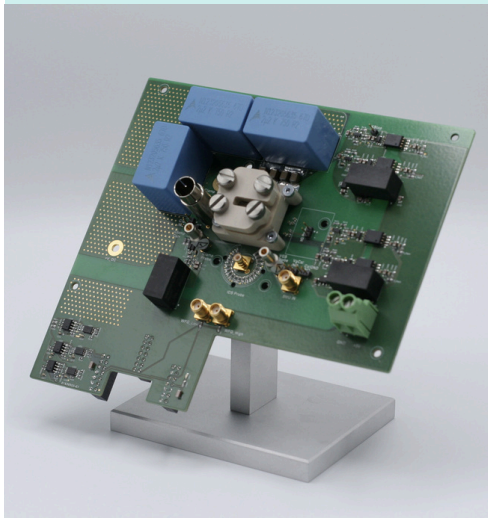


Static Parameter Characterization of Power Devices using Curve-Tracer

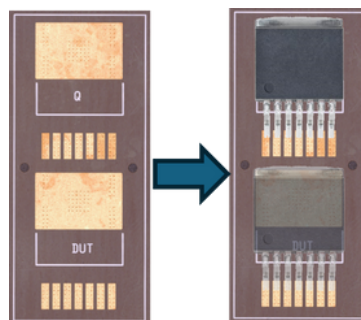


- Datasheet parameters for power devices – SiC/GaN, Discretes/Modules
 - IV- characteristics: Transfer (I_d - V_{gs}), Output (I_d - V_{ds} , R_{ds} - V_{ds}), Drain leakage currents, and Breakdown voltage (BV_{ds})
 - CV-characteristics: Device capacitances (C_{iss} , C_{oss} , C_{rss})
- Temperature aided measurements from -40° to 200° C
- Device specific interface boards
- Easy setup of test routines (with and without temperature control)

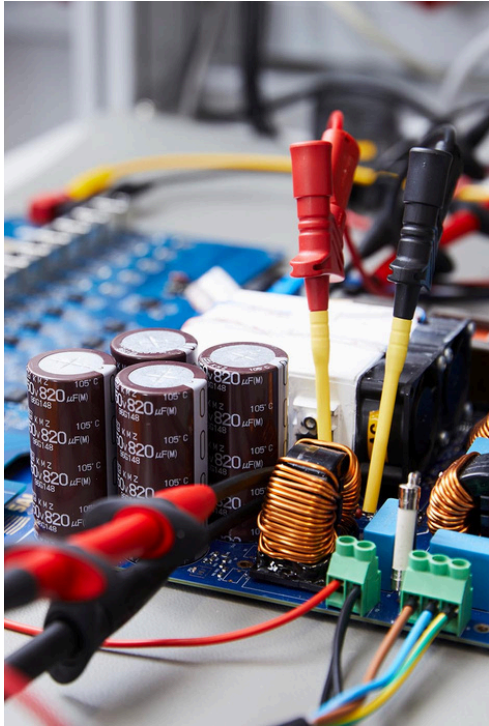
Dynamic Parameter Characterization of Power Devices using Double-Pulse Tester



- Standard hard-switched, and reverse-recovery tests: Large datasets across wide range of operation voltage, current and temperatures
- Easy replacement of DUTs of same package
- Low Inductance, and solderless contact membrane
- Dynamic R_{ds} , on measurement
- Device specific interface boards
- Training on the mechanical socket and membrane designs
- Device model generation in Keysight ADS, SPICE, PLECS



Example lowest impedance contact membranes for exchangeable DUT



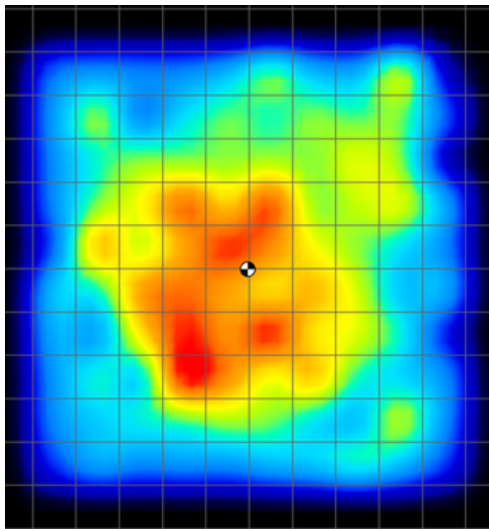
Characterization of Passives

Capacitors and Magnetics

- Detailed characterization of magnetic components, including inductors, transformers, and filters.
- Small- and Large-signal behavior under wide-range of frequency, DC and AC bias, temperatures, and operation specific conditions
- Hysteresis behaviour and dissipation losses
- Broadband impedance (ESR, ESL, HF parasitics)
- Interactive and informative curves for you to choose best configuration
- Testing in different operation specific conditions possible

Material Characterization

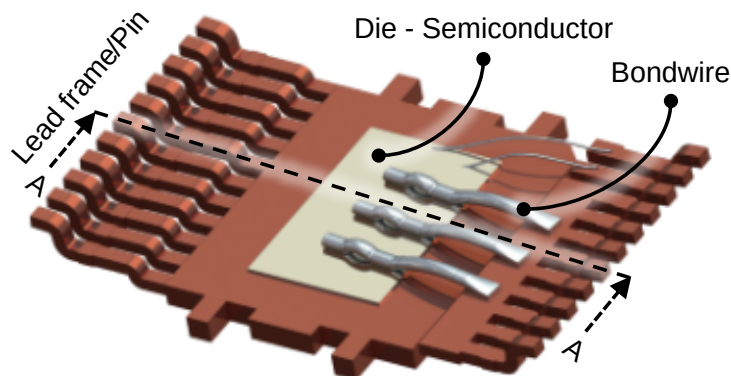
- Extraction of electromagnetic properties like permeability, permittivity and conductivity of material samples
- Measurement of broadband electric impedance (20Hz – 3GHz)
- Artificial aging, thermal stress, vibration



Mechanical and Thermal Characterization

- Thermal and mechanical package analysis
- Thermal Interface Characterization and Cycling Test Bench
- Mechanical Stress Evaluation and pressure dependent TIM characterization
- Novel Tj Evaluation methodologies and in-situ Rth evaluation capabilities
- Profilometer measurements and tolerance analysis of components and system assemblies
- Rth extraction and thermal network modelling
- Material characteristics and thermal properties modeling
- 3D reconstruction and modeling (for FEA)

External components of a discrete power package





Key equipment and infrastructure

- B1505A Keysight Curve Tracer
- PD1500A Double-Pulse Tester
- MPI Thermostream
- TIM Test Bench
- Mechanical Characterization
- Device for Material Parameters μ_r/ϵ_r
- Keysight Autobalanced Bridge
- Microscope
- Profilometer
- Standard LCR Meters and BODE 100



ABOUT SAL

Silicon Austria Labs (SAL) is a top European research center for Electronics and Software Based Systems (ESBS). The application-oriented center offers cooperative research & services at three locations – Graz, Linz and Villach – in the pioneering research areas of Sensor Systems, Microsystems, Intelligent Wireless Systems, Power Electronics and Embedded Systems. | www.silicon-austria-labs.com

CONTACT

DI Dr. Christian Mentin

Head of Research Unit

System-Level Integration Technologies

christian.mentin@silicon-austria.com