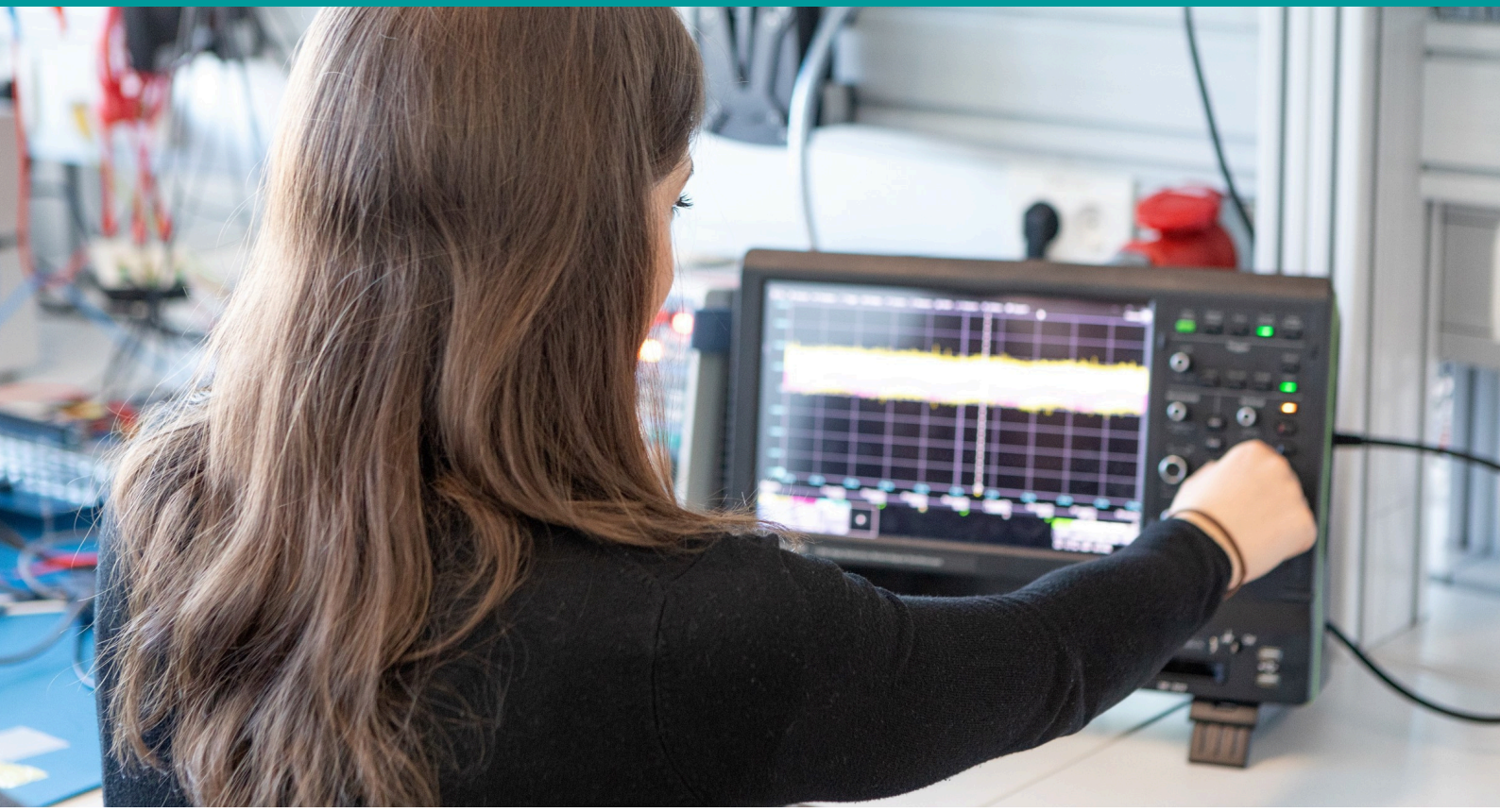


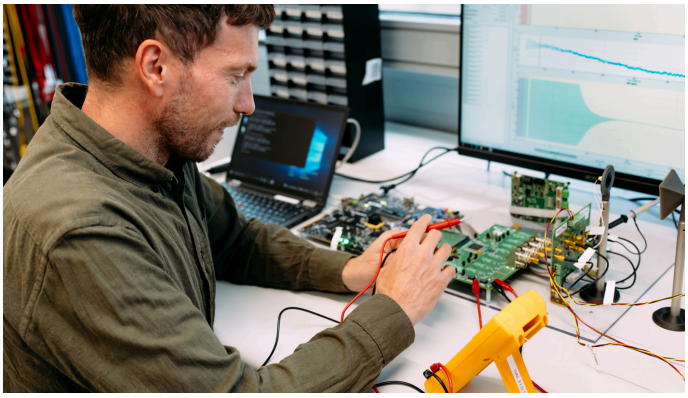
Measurement & Testing

Service Portfolio

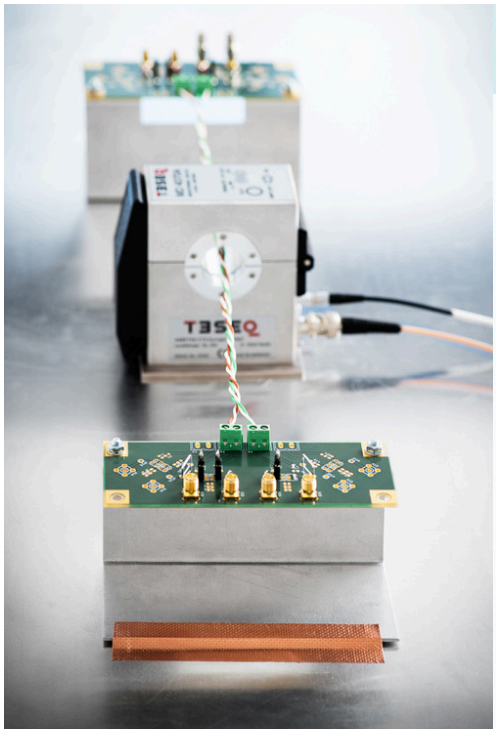
Accurate measurement and testing solutions to optimize power electronics for both peak performance and reliability.

Silicon Austria Labs provides expert testing and measurement services for power electronic components and systems, ensuring efficiency, reliability and compliance with relevant standards around the following topics:

- Efficiency measurements
- Power factor/THD measurements
- Power Hardware in the Loop testing
- Thermal and calorimetric measurements
- Magnetic component testing and optimization



Measurement & Testing



Efficiency, Power factor and THD measurements

Optimize your systems with precise Efficiency, Power Factor, and THD measurements.

Our services include:

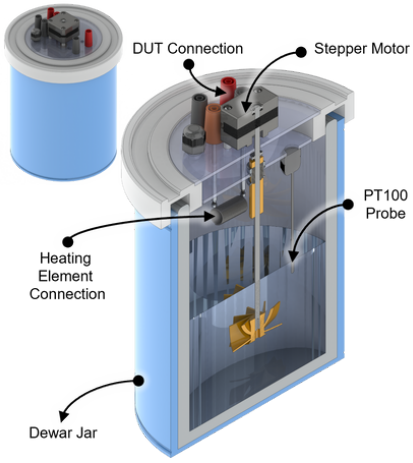
- **Efficiency:** Identify inefficiencies in inverters, converters, and power supplies, ensuring compliance with industry standards and improving overall system reliability.
- **Power factor measurement:** We analyze the power factor of your system to determine how effectively it utilizes electrical power. Our precise measurements help identify reactive power issues, improve grid compatibility, and ensure compliance with regulations, reducing energy costs and enhancing operational efficiency.
- **Total Harmonic Distortion:** We evaluate the harmonic distortion in your power electronics to ensure clean and stable power delivery, compliant with IEC and IEEE standard.

Power Hardware in the Loop (PHIL) testing

Emulate real-world conditions and validate your power systems and their control with accurate PHIL testing.

Our services include:

- **Real-Time Performance Testing:** Evaluate inverters, converters, and motor drives under real-world operating conditions. Emulate dynamic loads, grid disturbances, and faults.
- **Power System Emulation & Grid Compliance Testing:** Emulate AC/DC grids, renewable energy sources (solar, wind), and microgrids. Tests compliant with IEC and IEEE standards and grid codes for distributed energy resources.
- **Fault and Protection Testing:** Inject grid faults, voltage sags, frequency variations, and test system response. Verify protection algorithms, islanding detection, and fault ride-through performance.
- **Controller and Algorithm Validation:** Test MPPT (Maximum Power Point Tracking) for PV inverters. Validate adaptive control, real-time optimization, and machine learning algorithms for power electronics.



Thermal and calorimetric measurements

Optimize heat management and efficiency with precise thermal and calorimetric testing.

We provide advanced thermal and calorimetric measurements to help you evaluate heat dissipation, energy losses, and thermal stability in power electronics and electrical components to improve the reliability and longevity of your components.

Our services include:

- **Power Loss & Efficiency Measurement:** Accurate calorimetric testing to quantify energy losses in power electronics.
- **Hot Spot Detection & Failure Analysis:** Identification of overheating risks and weak points in electronic components.
- **Active & Passive Cooling System Evaluation:** Performance validation of heat sinks, fans, and liquid cooling systems.
- **Steady-State & Transient Thermal Analysis:** Dynamic testing to assess thermal response under varying load conditions.
- **Advanced Simulation & Modeling:** Finite element analysis (FEA) for thermal simulations and optimization.

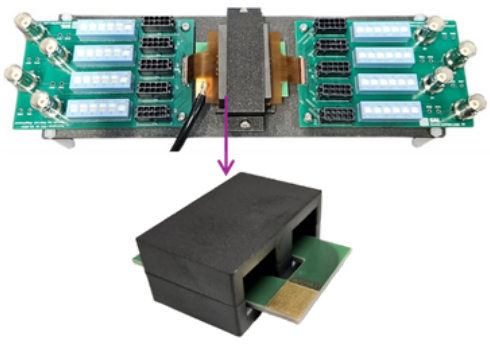
Magnetic Component Testing & Optimization

Optimize your inductors, transformers, and magnetic materials with precise testing, finite element simulations and analysis.

We provide comprehensive characterization services to ensure your magnetic components meet the highest performance and efficiency standards.

Our services include:

- **Core Loss Analysis:** Evaluation of energy losses under real operating conditions to optimize efficiency.
- **Optimization of magnetic components**: Tailored solutions for reducing AC losses, improving flux distribution, and enhancing manufacturability.
- **Power Loss & Efficiency:** Accurate assessment of transformer and inductor performance.
- **Thermal Performance:** Infrared (IR) imaging to analyze heat dissipation and thermal stability.
- **Finite Element Simulations:** Using 2D/3D electromagnetic, thermal, and mechanical simulations to predict performance, losses, and field distribution.



Measurement & Testing

Key equipment and infrastructure

- 8 Channel Oscilloscopes
- Power Analyzers
- Power Hardware in the Loop setup
- High power and high frequency application capability
- Rapid Control Prototyping System
- AC/DC Power Supplies
- Thermal Imaging System
- High current, high frequency current and optically isolated voltage probes

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

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