Abstracts for each session are on the next page. View the 2026 seminar locations and register online.

8:00 – 8:30 a.m.	Check-in and registration
8:30-8:45 a.m.	Introduction to speakers and topics
8:45–9:45 a.m.	Buck converter design basics
9:45–10:45 a.m.	Introduction to digital power control
10:45–11:15 a.m.	Networking break
11:15 a.m.–12:15 p.m.	Constructing your power supply: Layout considerations
12:15–1:30 p.m.	Lunch
1:30–2:30 p.m.	Planar transformer design tutorial
2:30–3:00 p.m.	Networking break
3:00–4:00 p.m.	Current and voltage sensing in power conversion applications
4:00–5:00 p.m.	High power density flyback converter design basics using GaN technology
5:00 p.m.	Seminar ends

Session time	Title and abstract
8:45-9:45 a.m.	**Buck converter design basics** This session provides a practical introduction to the design and testing of buck converters. Buck converters are widely used in voltage step-down applications. After covering the basics of buck converter operation and control, we provide a thorough step-by-step of the design process for a buck converter. The design example covers design parameters, component selection, control loop compensation, circuit board layout, and hardware testing/results. The target audience of this session is those with little to no power electronics design experience.
9:45-10:45 a.m.	**Introduction to digital power control** This paper covers the fundamentals of microcontroller-based digital power control design. It explains the working principles of building blocks in digital power control like feedback sampling, compensators, and actuators. The essential parameters of each block are discussed along with its effects on control loop performance through a step-by-step design process of a voltage-mode controlled buck converter. This topic also explains feedback circuit design and considering the analog to digital converter along with its configurations with respect to the actuator i.e. digital pulse width modulation. Additionally, it covers the selection, implementation and compensation procedure for the digital compensator.
11:15 a.m.-12:15 p.m.	**Constructing your power supply: Layout considerations** Laying out a power supply design is crucial for its proper operation; there are many issues to consider when translating a schematic into a physical product. This topic addresses methods to keep circuit parasitic components from degrading the operation of your designs. It discusses techniques to minimize the impact of parasitic inductance and capacitance of filter components and printed wire board (PWB) traces, together with a description of the impact that PWB trace resistance can have on power supply regulation and current capacity. A general overview of thermal design is also included as well as sample temperature rise calculations in a natural and forced-air environment. Finally, some practical examples of power stage and control device layouts are reviewed.
1:30-2:30 p.m.	**Planar transformer design tutorial** This topic discusses the process for designing a planar transformer suitable for an intermediate bus converter (IBC) application. The principles covered will extend to other planar transformer applications and to transformer design in general. Key transformer design principles will be covered that include, electrical design requirements, size considerations, core selection, winding considerations, and loss predictions. A generalized flow chart will be provided for the transformer design process along with a detailed discussion of each step. Finally, the paper will conclude by examining the measured performance of a transformer designed using this process.
3:00–4:00 p.m.	**Current and voltage sensing in power conversion applications** Voltage and current sensing are crucial in power conversion applications as they provide essential information for control loops, enabling controllers to maintain desired output levels. Integrated converters use internal sensing amplifiers, while high-power or isolated applications require external circuitry. This training covers various solutions, including discrete amplifiers, current-sense amplifiers, and delta-sigma isolated amplifiers and modulators. By the end of this session, you will understand the various technologies and which ones fit your application and the trade-offs between them which in turn will make your design decisions easier.
4:00–5:00 p.m.	**High power density flyback converter design basics using GaN technology** Flyback is the most popular topology for low-power AC/DC conversions due to its simplicity and low cost. With the development of power semiconductor technology, gallium nitride (GaN) devices can further improve flyback's performance through better conduction, switching losses, and simplicity in integration. This presentation demonstrates an improvement in the flyback performance when GaN is adopted. Design steps and tricks to further enhance the flyback converter's performance are also covered.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale, TI’s General Quality Guidelines, or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Last updated 10/2025