



# Application Alley

## Planar Transformers

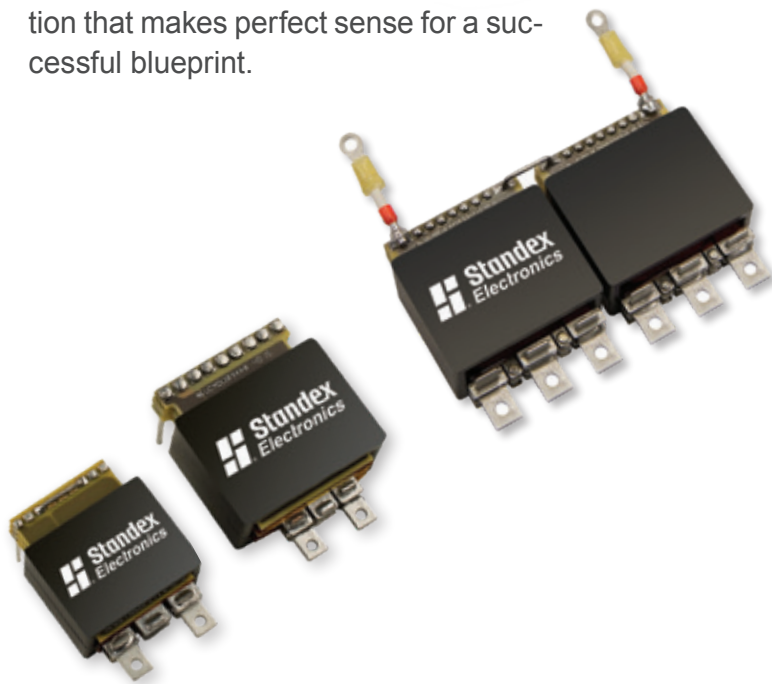
For Renewable Energy, Fast Charging Solutions  
and Industrial Electronics Applications

**Efficiency: Updating capabilities, improving capacity, reducing costs**

If I were to tell you that there was a way to reduce costs, electrical efficiency capabilities, and enhance electrical capacity through a product you needed – would you buy it? Of course you would! Smaller, faster, cheaper – the name of today’s engineering game.

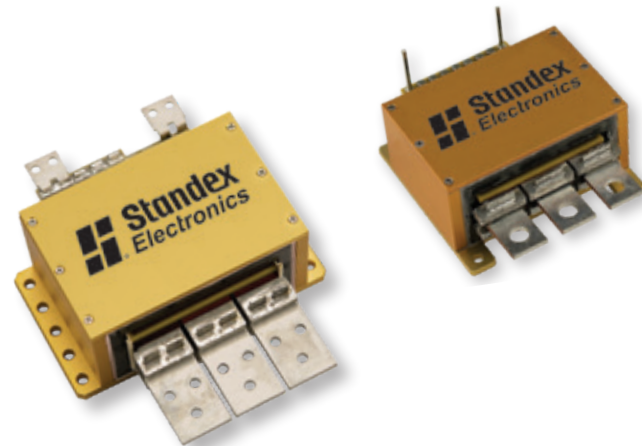
Planar transformers are steadily replacing the need for traditional wire-wound transformers in many industries. Electric vehicles, solar inverters, wind power, telecommunications, mil-aero, aviation, health-care, industrial applications, tools, LED lighting, induction heating/charging, appliances, electronics (TV’s, radios, etc.), and many others. Core materials, their shapes, and manufacturing techniques are all developments Standex have been in tune with to deliver to various requirements.

With the ever increasing need to be faster, perform with greater accuracy, improve time to market, and reduce costs – planar transformers replace the traditional wire wound transformers with a solution that makes perfect sense for a successful blueprint.



**Why Standex Planar Transformers?**

- Repeatability, high-performance and reliability
- Multiple winding options and topologies
- Low profile height and lightweight
- Low leakage inductance
- Space savings and capacity improvement (retro/custom fits)
- High efficiency (resistance, flux density)
- Customized terminations
- Volumetric efficiency (small size)
- High voltage isolation transformers
- Low turns count improves Cu loss
- Large core surface promotes heat transfer
- PCB construction yields lowest Cu loss
- AC resistance and proximity Cu loss minimized

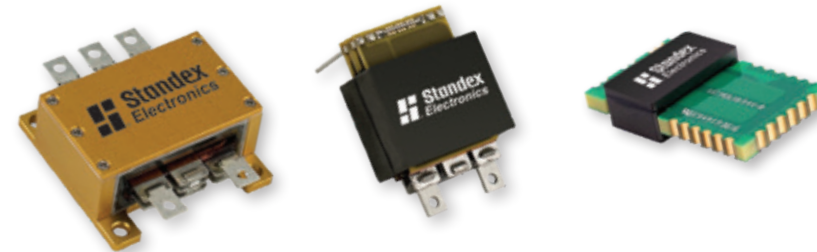


- Opportunity to embed planar into PCB module (integrated magnetics)
- Optimized core cross section lowers core loss

For a switched-mode power supply (SMPS), our planar transformers act as the main component and the smart choice for converting power and doing the transformation of the voltage effectively. Smaller volume planars can handle the same amount of work as larger wire-wound transformers.

**General guide on how to design and use planar transformers**

- Choose optimum core cross section
- Choose optimum core window height
- Iterate turns vs. duty cycle
- Core loss
- Cu loss
- Evaluate thermal methods
- Estimate temperature rise
- Tradeoff cost vs. number of layers
- Mechanical design fit envelope pad layout
- Fit within core window height
- Size sufficient for power loss and thermal solution



**Example where planar transformers reside**

- Distributed isolated power
- Battery charging and operation (12V, 24V, 48V, and 1-10KW)
- Isolated inverters (to 50KW)
- Renewable energy sources (wind and photovoltaic)
- AC-DC resonant designs

**Markets/Applications**

Automotive, Aviation, Military, Medical, Telecommunications, Electronics, Industrial, Power, Appliances, Transportation, Alternative/Solar Energy, Lighting/LED, and others where planar transformers provide efficient power distribution and high frequency switching.

**Component Corner (Expert Insights)**  
Will Schellin, Standex Engineer

*The difference planar transformers allow over traditional wire-wound transformers is the planar’s use of flat copper windings that allow for greater efficiency. The planar’s windings are built by utilizing flat copper layers (lead frames) or printed circuit boards (PCB’s) to create a laminate style winding construction. The flat wire construction allows us to keep the AC resistance at a minimum. The result is a compact high power density planar transformer that is typically 30% of the volume and weight of a traditional wire-wound transformer. This reduction in size from a bulky part eliminates design constraints.*

Find out more about our ability to propel your business with our products by visiting [www.standexelectronics.com](http://www.standexelectronics.com) or by giving us a [hello@standexelectronics.com](mailto:hello@standexelectronics.com) today! One of our brilliant engineers or sales leaders will listen to you intently.



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### About Standex Electronics

Standex Electronics is a worldwide market leader in the design, development and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetic offerings include planar, Rogowski, current, and low- and high-frequency transformers and inductors. Our reed switch-based solutions include KOFU, MEDER and KENT brand reed switches, as well as a complete portfolio of reed relays, and a comprehensive array of fluid level, proximity, motion, water flow, HVAC condensate, hydraulic pressure differential, capacitive, conductive and inductive sensors.

We offer engineered product solutions for a broad spectrum of product applications in the automotive, medical, test and measurement, military and aerospace, as well as appliance and general industrial markets.

Standex Electronics has a commitment to absolute customer satisfaction and customer-driven innovation, with a global organization that offers sales support, engineering capabilities, and technical resources worldwide.

Headquartered in Cincinnati, Ohio, USA, Standex Electronics has nine manufacturing facilities in six countries, located in the United States, Germany, China, Mexico, the United Kingdom, and Japan.

For more information on Standex Electronics, please visit us on the web at [www.standexelectronics.com](http://www.standexelectronics.com)

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