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Power Magnetics Component Roundup

by David G. Morrison, Editor, How2Power.com

This article highlights the latest introductions of power magnetic components, presenting news about power inductors, transformers, and cores introduced over the past six months. Vendors continue to introduce power inductors for use in board-level dc-dc conversion in popular computing, server, telecom, industrial and automotive applications. The trend continues that many of the newer devices are automotive grade, and some target use in specific automotive functions such as ADAS systems, ECUs (engine control units), and LED headlights. Among the more novel uses for the new inductors are the trans-inductor voltage regulator topology and 5G smartphones. A vertical-mount inductor also stands out (pun intended).

As usual, a small number of power transformers have come onto the market for popular applications. These devices include push-pull transformers for isolated interface power supplies for CAN, RS-485, RS-422, RSS-232, SPI, and I^2C buses and uses in ac motor drives, smart metering and solar inverters. There are also current transformers for EV charging stations, and power transformers for low- to mid-power automotive applications including battery management systems, HEV/EV inverters, ECUs, on-board chargers and dc-dc converters.

Recently introduce cores offer higher dc bias in combination with high efficiency or saturation.

This article represents a follow-up to the Power Magnetics Component Roundup published in the June 2021 issue and earlier magnetics articles published in How2Power Today.

Power Inductors

Transformers

Cores

Power Inductors

Inductors Support Trans-Inductor Voltage Regulator Topology

Pulse is introducing its first inductor components specifically designed for use with the trans-inductor voltage regulator (TLVR) topology, which enables faster transient response and utilizes a dual-winding power bead inductor. As an initial offering, Pulse is releasing the PGL6215.XXXHLT trans-inductor and PGL6312.XXXHLT compensation inductor with plans to release an additional five families of trans-inductors and footprint-compatible traditional inductors in various sizes.

The PGL6215.XXXHLT comes in a 12-mm x 6-mm x 12-mm package, with inductances of 105 nH to 200 nH and

saturation currents of 125 A to 60 A. The PGL6312.XXXHLT comes in a 6.5-mm x 6.5-mm x 10-mm package, currently released with a 120-nH inductance and 72-A saturation current.

Traditionally, when powering processors, memory, FPGAs and ASICs in servers, datacenters and storage systems, designers have used single-winding inductors in a multi-phase buck topology which allows currents to be distributed though parallel paths or phases. By operating each phase in a staggered fashion, the ripple currents in each phase tend to cancel at the output and the overall ripple current seen at the load is much smaller than the ripple on each phase.

This approach allows smaller inductances to be used (typically on the order of 50 to 300 nH) and can allow design engineers a tradeoff between how quickly the converter responds to a change in the load current (transient response) versus stability of the control loop. By adjusting the number of phases used in the converter, the designer has flexibility to optimize the circuit for their specific application.

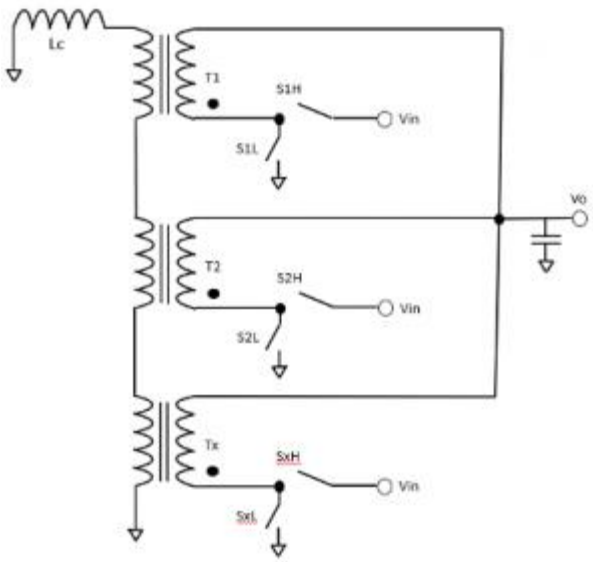
However, as processors and FPGAs demand faster and larger current transients the voltage regulators used must increase their bandwidth to improve on response time. This is usually done by either increasing the number of phases and/or reducing the inductance value of each phase. These solutions create complications in the converter design. Increasing the phase count necessitates less space per phase which means less width for the power stages and inductors.

For the inductor, this space constraint creates "skinny" but tall components that can become mechanically unstable, which limits the ability to shrink the inductor width. Reducing the inductance value used per power stage (which is already sub 100 nH) drives higher ripple currents per phase resulting in higher ac losses as well as complicating the converter control. It is important to note that transient response time of the entire converter is somewhat limited by the fact that each phase will respond to the step by increasing or decreasing its duty cycle in a round-robin fashion, one at a time.

In order to mitigate these issues and further drive performance improvements, a "Trans-Inductor" based voltage regulator was developed in the technical disclosure commons domain. The trans-inductor is very similar to a traditional one-turn VR inductor, but has the addition of a second tightly coupled winding. The main low DCR "primary" is used in the same fashion as in a traditional VR inductor, having a PWM input with several phases feeding the single output. Each single turn "secondary" is tied in a series loop referenced to the local ground.

When a load step occurs on a given phase, the resultant increase or decrease in duty cycle is reflected to its secondary winding and because the secondaries of each phase are in a series loop they all see this change immediately. Through the magnetic coupling this sensed change is reflected to each inductor's primary winding. In effect, this allows all phases to respond simultaneously to a load transient greatly reducing the time needed for the converter to adjust.

Additionally, a compensation inductor has been introduced into the converter circuit. It is typical for this inductor to be similar in construction to a traditional VR inductor. The compensation inductor exists to give design engineers the ability to adjust the total inductance in the secondary loop, allowing for freedom to adjust for converter stability. Due to the ac coupled nature of the secondary circuit, the compensation inductor sees almost no dc current which minimizes the impact of DCR.



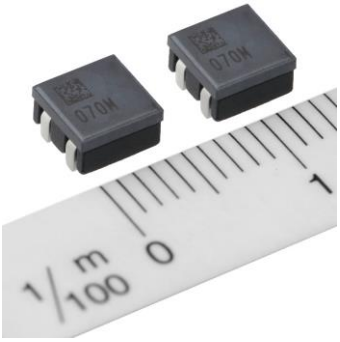
However, the inductor is subject to a superposition of each phase's ripple current. In practice, this means that for a four-phase converter switching at 1 MHz, the compensation inductor will see a reflected ripple current with a frequency of 4 MHz. At such frequencies care must be taken to minimize ac winding loss as well as ensuring a proper high frequency, low-loss core material is chosen.

"Trans-Inductor Voltage Regulators (TLVRs) are an exciting development that enables ultra-fast transient response in multi-phase voltage regulators and leverages our existing automated inductor infrastructure allowing us to quickly and effectively develop products for TLVR," said David Wiest, product marketing, Power PBU, Pulse Electronics.

For more information, go to the Pulse website and do a Search Product Numbers on "PGL6215" and "PGL6312" to see the associated product pages. For samples, quotes, additional inductance values or new design requests, contact your local Pulse sales representative or distributor.

High-Current, Low-Inductance Power Inductors For ADAS

TDK's HPL505032F1 power inductors enable level 5 advanced driver-assistance system (ADAS) applications for cameras by offering high-current and low-inductance for power circuits in central processing units and graphic processing units. These products achieve high efficiency by adopting a low-resistance frame for the highly permeable and low-loss ferrite made of high BS material and low dc resistance that is fully developed in-house.



Its rated current is 1.5 times higher than TDK's existing product (the HPL505028), accommodating currents as high as 40 A to 50 A. While the proprietary structural design generates magnetic flux canceling effects contributing to noise control, the frame that integrates internal with external electrodes reduces the risk of an open circuit and short circuit, ensuring high reliability. Operating temperature range is between -55°C and +155°C (including self-heating).

Mass production of these inductors was scheduled to begin in July 2021. For more information, see the datasheet.

Small Coupled Inductors Feature High Saturation Currents

TDK has extended its range of coupled inductors to include the new EPCOS series B82472D6. The nine series types cover an inductance range of 2 x 2.2 µH to 2 x 47 µH and are designed for maximum rated currents of 1.1 A to 4.3 A. The RoHS-compliant chokes are certified in line with AEC-Q200 and feature high saturation currents of up to 7.95 A.

The magnetically shielded inductors have dimensions of just 7.3 x 7.3 x 4.8 mm and are designed for a wide temperature range of between -55°C and +150°C. Depending on the type, the chokes offer very high coupling factors of the two windings from 97% to 99%.

These compact, robust components are suited for use in various galvanically noninsolated dc-dc converter topologies such as SEPIC, Cuk and Zeta and can also be used as transformers in flyback and multi-output buck topologies. In the latter, coupled inductors provide a second output voltage.

Furthermore, these inductors can be used as common-mode chokes on power supply lines. The insulation voltage between the two windings is >500 V.

For further information, see the SMT Power Inductors (EPCOS) page.

Automotive-Grade Metal Inductors Feature Low DCR

Sumida's CDMCxxDxx/L150 is an automotive-grade SMD metal power inductor series. It is a balanced current type series in I_{SAT} and Irms current with lower DCR than the original T150 series. This AEC-Q200-qualified series includes 4-mm x 4-mm, 5-mm x 5-mm, 6-mm x 6-mm and 10-mm x 10-mm options. They can be used in LED headlight, ECU and other automotive applications. Operating temperature range is -55°C to 150°C (including self heating).

Mass production is scheduled to start in 2022. For more information see the CDMC40D18/L150, CDMC50D28/L150, CDMC60D28/L150 and CDMC10D48/L150 pages.

Inductor Offers Operation To +155°C In 7575 Case Size

Vishay Intertechnology's Vishay Dale IHLP-7575GZ-51 low-profile, high-current inductor is described as the industry's first composite inductor in the 19-mm by 19-mm by 7-mm 7575 case size. Offering high-temperature operation to +155°C for computer, telecom, and industrial applications, the IHLP-7575GZ-51 offers up to 30% lower DCR and up to 35% higher current ratings than devices in the 6767 case size, at a 50% lower cost than devices in the 8787 case, according to the vendor.

The inductor is optimized for energy storage in dc-dc converters up to 2 MHz and high-current filtering applications up to the SRF of the inductor. Applications for the device include notebooks, desktops, and servers; low-profile, high-current power supplies; POL converters; battery-powered devices; and distributed power systems and FPGAs.

Packaged in a shielded, composite construction that reduces buzz noise to ultra low levels, the IHLP-7575GZ-51 offers high resistance to thermal shock, moisture, and mechanical shock, and handles high transient current spikes without saturation.

Samples and production quantities of the IHLP-7575GZ-51 are available now. For more information, see IHLP-7575GZ-51 page.

Table. Key specifications for the IHLP-7575GZ-51 inductor.

Case size	7575
Inductance (µH)	0.56 to 33
DCR typ. (mΩ)	1.02 to 25.2
DCR max. (mΩ)	1.09 to 27.0
Heat rating current (A)	10.2 to 61(1)
Saturation current (A)	9.9 to 70(2) / 14.3 to 101(3)
SRF (MHz)	4.4 to 50.0

(1) Dc current (A) that will cause an approximate ΔT of 40°C. (2) Dc current (A) that will cause L_0 to drop approximately 20%. (3) Dc current (A) that will cause L_0 to drop approximately 30%.

Compact, Thin-Film Inductors For Automotive Power Circuits

TDK's TFM201210ALMA series of thin-film metal power inductors for automotive power circuits features a mounting area of 2.0 mm (L) x 1.25 mm (W). That's downsized approximately 22% from TDK's conventional product, the TFM201610ALMA, which has a mounting area of 2.0 mm (L) x 1.6 mm (W). Both devices have a 1.0-mm height.

Demand has recently increased in ECU mounting for the electrification of various automotive controlling functions, autonomous driving, information communication and other purposes. Downsized inductors for power circuits contribute to space-saving in a mounting substrate, at a time when quick advances in ADAS performance increase the number of components typically used in system architectures. Main applications are in the automotive camera module and the communication module for V2X.

In addition to its compact dimensions, this series uses the TDK proprietary metallic magnetic material as its core material. The thin-film inductors support a wide range of operating temperatures from -55°C to +150°C. Moreover, the series features increased robustness against mechanical stress, such as vibrations and shocks due to the resin electrode structure.

Mass production was scheduled to begin in August. For more information, see the TFM201210ALMA datasheet.

Inductors Balance Shielding And Cost Requirements

Bourns' automotive-grade Model SRN6045HA series power inductors feature semi-shielded construction to combine the features of non-shielded and shielded inductors, and offer lower magnetic field radiation than non-shielded inductors. The new products are a more cost-efficient alternative to fully shielded ferrite-based inductors, yet allow high temperature operation compared to standard semi-shielded inductors.

In addition, the inductor series is AEC-Q200 compliant with an operating temperature range of -55°C to +125°C making the Model SRN6045HA series well suited for power management and EMI filtering solutions in automotive, consumer, industrial and telecom electronics.

The newly developed magnetic silicon-based coating used in the inductors enables high working temperatures and extends the operating temperature range by 20% on the high end compared to standard Bourns semi-shielded power inductors. The high-temperature magnetic silicon-based coating is applied to the perimeter of the inductor winding to provide effective magnetic shielding. The Model SRN6045HA series also features high current capacity with saturation current I_{SAT} ranging from 1.2 to 18 A and heating current Irms of 0.72 to 7.0 A.

The SRN6045HA series is available now with inductance values of 0.55 to 100 µH. For more information, see the website.

Inductor In 2020 Case Size Operates To +180°C

Vishay Intertechnology's Vishay Dale IHLP-2020CZ-8A is an automotive-grade high-current inductor in the 2020 case size. This device comebines a high continuous operating temperature up to +180°C with a low profile of 3 mm to save space in under-the-hood automotive applications.

Table. Key specs for the IHLP-2020CZ-8A.

Case size	2020
Inductance range (µH)	0.22 to 15.0
DCR typ. (mΩ)	3.95 to 195
DCR max. (mΩ)	4.23 to 208
Heat rating current (A)	2.4 to 18
Saturation current (A)	1.6 to 11
SRF typ. (MHz)	14.1 to 190

The AEC-Q200 qualified inductor is optimized for energy storage in dc-dc converters up to 2 MHz. It also provides excellent attenuation of noise in high current filtering applications up to the SRF of the inductor.

With its high operating temperature, the device is designed for filtering and dc-dc conversion in engine and transmission control units, diesel injection drivers, advanced driver assistance systems, exhaust gas recycling pumps, and entertainment/navigation systems, in addition to noise suppression for motors, windshield wipers, power mirrors and seats, HID and LED lighting, and heating and ventilation blowers.

The IHLP-2020CZ-8A features high efficiency with typical DCR from 3.95 mΩ to 195 mΩ and a wide range of inductance values from 0.22 µH to 15.0 µH. The device provides rated current to 18 A and handles high transient current spikes without saturation. Packaged in a shielded, composite construction that reduces buzz to ultra low levels, the RoHS-compliant inductor offers high resistance to thermal shock, moisture, and mechanical shock.

Samples and production quantities of the IHLP-2020CZ-8A are available now. Pricing for U.S. delivery only in 10,000-piece quantities begins at $0.50 per piece.

Vertical-Mount Inductor In 4025 Case Size Saves Space, Increases Efficiency

Vishay Intertechnology's Vishay Dale IHVR-4025JZ-3Z vertical-mount inductor in the 10.25-mm by 6.4-mm by 10-mm 4025 case size optimizes inductance and minimizes DCR for increased efficiency in dc-dc converters. The device offers high temperature operation up to +155°C for computer, server, telecom, and industrial applications.

Compared to traditional inductors, the compact size and unique vertical-mount design of the device saves on board space and allows for more-efficient cooling by using air flow, while enabling 50% lower DCR down to 0.130 mΩ (typical) and higher rated current up to 112 A, according to the vendor. In addition, its rectangular shape provides better integration with other board components, making it easier for designers to keep PCB trace lengths equal to reduce phase imbalances.

The IHVR-4025JZ-3Z is optimized for energy storage in dc-dc converters up to 5 MHz and high-current filtering applications up to the SRF of the inductor. Applications for the device include desktops and servers; low-profile, multi-phase, high-current power supplies; POL converters; and distributed power systems and FPGAs. In these applications, the inductor offers extremely stable inductance and saturation over the full -40°C to +155°C operating temperature range.

Packaged in a shielded, composite construction that reduces buzz noise to ultra low levels, the IHVR-4025JZ-3Z offers high resistance to thermal shock, moisture, and mechanical shock, and handles high transient current spikes without saturation.

Table. Key specs for the IHVR-4025JZ-3Z vertical-mount inductor.

Case size	4025
Inductance (µH)	0.10 to 0.15
DCR typ. (mΩ)	0.130
DCR max. (mΩ)	0.143
Heat rating current (A)	112(1)
Saturation current (A)	82 to 140(2)/112 to 183(3)
SRF (MHz)	126 to 212

(1) Dc current (A) that will cause an approximate ΔT of 40 °C. (2) Dc current (A) that will cause L_0 to drop approximately 20%. (3) Dc current (A) that will cause L_0 to drop approximately 30%.

High-Temp Inductor Delivers Ultra Low DCR For Multi-Phase Power Supplies

Vishay Intertechnology's Vishay Dale IHSR-2525CZ-51 commercial IHSR high-temperature inductor in the 7.4-mm by 6.6-mm by 3.0-mm 2525 case size is designed for multi-phase, high-current power supplies and filters. The inductor offers a 50% reduction in DCR over typical power inductors, excellent inductance stability over the entire operating temperature range, and soft saturation compared to ferrite solutions.

The device is optimized for energy storage in dc-dc converters up to 10 MHz and high current filtering applications up to the SRF of the inductor. With its high operating temperature up to +155 °C, the device is designed for filtering and dc-dc conversion in notebooks, desktops, and servers; POL converters; graphics cards; distributed power systems; and FPGAs.

The IHSR-2525CZ-51's low typical DCR of 0.38 mΩ and inductance of 0.056 µH allow for higher current density than competing technologies, while its 3-mm profile enables slimmer end products, according to Vishay. Packaged in a shielded, composite construction that reduces buzz noise to ultra low levels, the inductor offers

high resistance to thermal shock, moisture, and mechanical shock, and handles high transient current spikes without saturation.

Samples and production quantities of the IHSR-2525CZ-51 are available now. Pricing for U.S. delivery only is $0.30 per piece in 10,000-piece quantities.

Table. Key specs for the IHSR-2525CZ-51 inductor.

Case size	2525
Inductance (µH)	0.056 to 0.100
DCR typ. (mΩ)	0.38 to 0.97
DCR max. (mΩ)	0.40 to 1.02
Heat rating current (A)	46 to 58(1)
Saturation current (A)	31 to 45(2) / 46 to 64(3)
SRF (MHz)	186 to 535

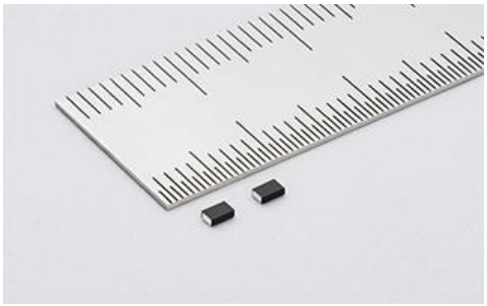
(1) Dc current (A) that will cause an approximate ΔT of 40°C. (2) Dc current (A) that will cause L_0 to drop approximately 20%. (3) Dc current (A) that will cause L_0 to drop approximately 30%.

Inductors For 5G Improve I_{SAT} And DCR

Murata's DFE21CCN_EL series of power inductors for 5G smartphones is intended for use in dc-dc converters and power management circuitry. These 0805-inch sized components signify major enhancements in operational performance parameters when compared to the company's conventional inductors. They exhibit a 20% increase in saturation current (I_{SAT}) and a 50% reduction in dc resistance (DCR) over their predecessors. These parameters help to raise operational efficiency levels and enable downsizing of system designs.

These inductors make use of the company's long-established expertise in materials science with specially developed metal materials and an optimized molding technique. The innovative L-shaped electrodes allow these components to reach considerably higher density levels than those from other manufacturers.

The DFE21CCNR24MEL has a 0.24-µH inductance with a DCR of 20 mΩ (max) and an I_{SAT} of 6.5 A (max). Other members of this series offer the following values:



- DFE21CCNR47MEL—0.47 µH, 29 mΩ and 4.8 A
- DFE21CCN1R0MEL—1.0 µH, 60 mΩ and 3.3 A
- DFE21CCN2R2MEL—2.2-µH, 138 mΩ, and 2.1 A.

"Under normal circumstances, if you look to improve the I_{SAT} value of a power inductor, then its [DCR] will suffer accordingly," explains Tomohiro Yao, EMI Division, general manager of Marketing & Promotion Department, at Murata. "Thanks to the technological advances we have been able to implement, from both process and structural perspectives, we have succeeded in improving I_{SAT} and [DCR] simultaneously, with no necessary tradeoffs."

For more information, see the data sheet or the product details site.

Transformers

Push-Pull Transformers Offer More Options For Low-Power Isolated Power Supplies

Würth Elektronik has expanded its popular MID-PPTI tiny push-pull transformer series, which includes parts that can be used in a host of push-pull and pulse transformer applications. The four parts added to the MID-PPTI series include the 750317828, 750317829, 750317830, and 750317331; all which are AEC-Q200 qualified, and include and an isolation voltage of 2500 Vac.

Both 5-V and 12-V output versions are available for each of the 12-V and 24-V inputs. The 5-V output versions, the 750317828 and

750317830, are capable of handling 250 mA of current. The 12-V output versions, the 750317829 and 750317331, are capable of handling 100 mA of current.

This low-profile, surface-mount series features an operating temperature of -40°C to 125°C, and are built with functional, supplementary, or reinforced insulation. The MID-PPTI transformers are best suited for use in isolated interface power supplies for CAN, RS-485, RS-422, RSS-232, SPI, I2C, low-power LAN, industrial, process control, medical equipment, PLC analog and digital I/O modules, isolated gate driver power supplies, ac motor drives, and solar inverter applications.

"This expands the tool set available when designing low power isolated power supplies," said Dean Huumala, product manager from Würth Elektronik. "This series is so attractive in that the part count is so low, making it a very small and low cost solution."

For more information, see the MID-PPTI Push-Pull Transformers for Texas Instruments page.

Current Transformers For Charging Infrastructure Are Versatile

Vacuumschmelze's current transformer module for EV charging stations combines three precision current transformers with primary bars in a footprint of only 36 mm x 28 mm, making optimum use of the available space. Electrical safety is included as the module is designed according to IEC 61800. The clearance and creepage distances defined there between the primary and secondary sides are controlled by a 100% high-voltage test and a type test with 6-kV (1.2/50 µs) surge voltage, as well as at least 750-Vrms partial discharge extinction voltage.

Current transformers have been used for many years in multifunctional electronic energy meters, so-called smart meters, where they ensure the requirements of both, a decentralized energy supply (including photovoltaics, wind, and smart grid) and a timely exchange of data between energy suppliers, grid operators and consumers. A new application is in stationary charging stations for electric vehicles.

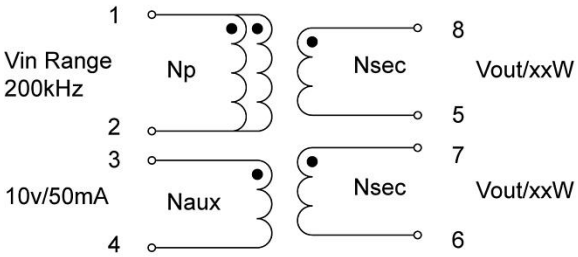
In industrial electricity meters for 1 A (5 A), a measuring transformer is usually connected indirectly to the network to be monitored. Its output current of 1 A or 5 A is measured by a metering device in which the CT module is integrated. Charging stations for electric cars, on the other hand, draw their high power directly from the supply grid. If the current is mapped indirectly, i.e. by means of instruments transformers as described above, the compact three-fold module is particularly suitable for space-saving use in a corresponding measuring device.

"Our current transformer module, nicknamed "Piano," not only saves valuable space in the application, but also assembly and logistics costs," says Stefan Lehmann, product manager Installations. "Instead of three individual power transformers, our customers can rely on just one component. And we have something big in mind for next year, a 32 A module will be added to our product range."

For more information, see the website or contact Hendrik Borgmeier.

Reinforced Power Transformers Are Rated Up To 24 W And 3000 Vrms

Pulse Electronics' EP13R power transformer series uses the industry-standard EP13 footprint but with an increased bobbin flange to enable reinforced safety insulation, 8.0 mm of creepage distance and 3000-Vrms isolation. Maintaining the standard footprint enables customers to minimize their PCB footprint, improve the system power density but still meet all of their safety agency requirements.



The EP13R series is comprised of twelve part numbers designed for both forward and flyback topologies with input voltages ranging from 48 Vdc (33 to 75 V) to universal ac (85 to 265 V) and with outputs of 3.3 V, 5.0 V and 12 V. With power levels up to 24 W, the EP13R series is suitable for a wide-range of applications in the industrial segment where high-isolation power supplies are critical to isolate sensitive circuits from the noisy environment and to ensure user safety.

The EP13R platform can also be made available as a customized PN for as an IATF-compliant part for low- to mid-power automotive applications including battery management systems, HEV/EV inverters, engine control units, on-board chargers and dc-dc converters.

Table. Key specifications for the EP13R power transformer series.

Series	PA5000.XXXNLT	PA5111.XXXNLT	PA5112.XXXNLT
Platform size	EP13R 17.7×13.5×16.5 mm max	EP13R 17.7×13.5×16.5 mm max	EP13R 17.7×13.5×16.5 mm max
Power	20 W	13 W	24 W
Topology	CM flyback	Active clamp forward	CM flyback
Input voltage	33 to 57 V	33 to 57 V	85 to 265 V
Output voltages	2 x 3.3 V 2 x 5.0 V 2 x 12.0 V	2 x 3.3 V 2 x 5.0 V 2 x 12.0 V	2 x 3.3 V 2 x 5.0 V 2 x 12.0 V

For more information, see the website.

Transformers Provide Isolated Power For Serial Communications

Members of Bourns' Model PAD00x-T764 isolation transformer series feature functional isolation and a low 0.4-mm profile to simplify isolated power and serial communication signal integrity in CAN, RS-485, RS-422, RS-232, SPI, I2C, and lower-power LAN-based applications. The Model PAD00x-T763 push-pull transformers are well suited for industrial automation, embedded solutions, ac motor drives, system integration, communication PHYs, smart metering, and many other applications requiring low dc power.

The series was developed for ease of use in maintaining proper communication and necessary isolation between systems. The 3.1-kVAC withstanding voltage provides an isolation barrier from high-voltage hazards, such as high-voltage batteries. Design details include construction with a ferrite toroid core to help ensure a high coupling factor and heightened efficiency. EMI performance is enhanced in the winding of the transformer, enabling reduced emissions.

The PAD00x-T764 series is compatible with Texas Instruments' SN6501 and SN6506B, Maxim's (now Analog Devices') MAX253 and MAX845, Analog Devices' ADM2485, and similar transformer drivers. The series offers 3.3- to 5-V input, industry standard 3.3- to 10-V output, and up to 250-mA output with various turns ratios.

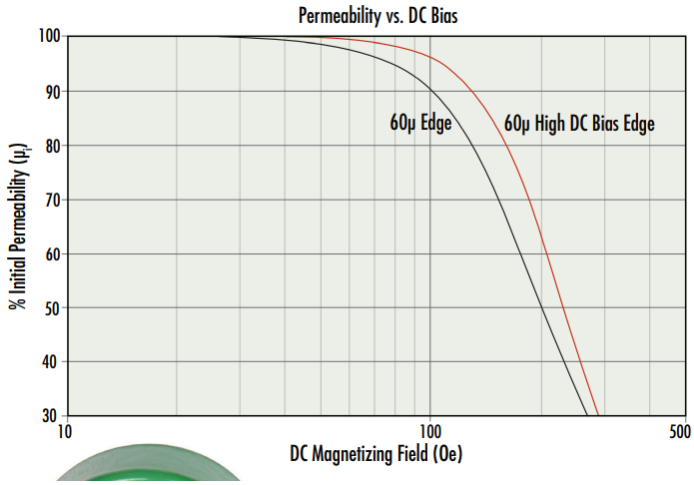
The Bourns Magnetics product line can also support most modification and customization requests for this push-pull transformer series.

The PAD00x-T764 series transformers are available now. For more information, see the Transformers - Power page.

Cores

Cores Feature High Efficiency And Better DC Bias

Designed for cutting-edge performance, Magnetics' High DC Bias Edge cores are said to offer the highest efficiency and best dc bias performance of all alloy powder cores. These cores provide up to 20% improvement in dc bias compared to standard nickel-iron Edge powder cores. For more information, email magnetics@spang.com.



Cores Combine High Saturation And High DC Bias

Magnetics' High DC Bias XFlux cores offer the same high saturation found in standard silicon-iron XFlux while providing up to 20% improvement in dc bias. High DC Bias XFlux allows for smaller core size for use in space-conscious inductor designs. Use of copper wire is minimized by maintaining inductance using fewer turns, resulting in lower copper losses and savings in overall component costs. For more information, email magnetics@spang.com.