Power Magnetics Component Roundup

by David G. Morrison, Editor, How2Power.com

Over time, automotive grade is looking more and more like a standard feature among off-the-shelf magnetic components such as power inductors and chokes. Browsing the latest magnetic product news reported in this roundup will bear that out. But adding to this trend is the introduction of numerous inductors for a very specific automotive application—power over coax (PoC). The familiar vendors who continually add to their inductor catalogs have recently unleashed to market a number of PoC inductors in various current ratings and sizes.

In introducing these parts, inductor suppliers are quick to point out the application of PoC in advanced driver-assistance systems (ADASs) where a coax cable can carry both power and data to the cameras. They also note that the filters that separate power and data require multiple inductors—hence the current proliferation of PoC inductor options. In addition to touting high current ratings in small device sizes, the suppliers of PoC inductors emphasize their high impedance across a broad frequency range.

Another common attribute among power inductor offerings is shielding and many of the recent product introductions highlight their novel use of materials and device construction to yield lower magnetic field radiation. Naturally, the other, evergreen trends such as offering higher current ratings in smaller components, and extending performance over temperature, are on-going.

And despite the dominance of automotive applications, some of the latest inductor products continue to address the broader requirements for these components in high-current POL converters and power supplies, battery-powered devices and dc-dc converters in distributed power systems for various end applications. Additionally, there are also more-specialized parts among the latest introductions. Examples discussed in this feature include versatile, dual-winding power inductors (for SEPIC converters and other uses) and high-current inductors with I_{SAT} ratings in the hundreds of amps. In the chokes category, one notable product employs integrated magnetics to provide common-mode and differential-mode attenuation in a single component.

With the new transformer offerings, which are typically fewer in number, specialization is unavoidable. Among the latest offerings covered here are a high-power planar magnetic combining transformer and resonant inductor for the dual active bridge and low-profile gate-drive transformers for 500-V systems. This article also presents some news about custom current sensors and magnetic cores.

Covering power magnetics news released over the second half of this year, this article represents a follow-up to the Power Magnetics Component Roundup published in the December 2024 issue and earlier magnetics articles published in How2Power Today.

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Power Inductors

Metal Compound Molding Enables Good Electrical Performance And Shielding

Sumida's 0615CDMCC/DS is a metal-compound-molding-type power inductor. The metal compound molding construction is used to achieve high electrical performance, high magnetic shielding, low audible core noise, low profile and high current performance. The device operates over a temperature range of -55°C to 125°C (including coil temperature rise). Applications include high-current POL converters and power supplies, battery-powered devices and dc-dc converters in distributed power systems. Key electrical specifications are shown in the table.

Table. Key specs for the 0615CDMCC/DS.

Part Name	Inductance [Within] (µH) ※1	D.C.R. at 20°C [within] (A) Max. (Typ.) (mΩ)	Saturation Current (A) Max.(Typ.) ※2	Temperature Rise Currrent (A) (Typ.) ※3
0615CDMCCDS-R12MC	0.12 ± 20%	3.65 (3.00)	25.00 (29.00)	(19.00)
0615CDMCCDS-R33MC	0.33 ± 20%	6.50 (5.60)	19.00 (21.00)	(13.50)
0615CDMCCDS-R47MC	0.47 ± 20%	8.50 (7.20)	15.50 (18.00)	(13.00)
0615CDMCCDS-1R0MC	1.00 ± 20%	21.00 (18.50)	10.00 (12.00)	(8.20)
0615CDMCCDS-1R5MC	1.50 ± 20%	28.00 (25.00)	7.70 (8.50)	(7.20)

For more information see the 0615CDMCC/DS SMD power inductor page.

Dual-Winding Shielded Inductors Are Versatile

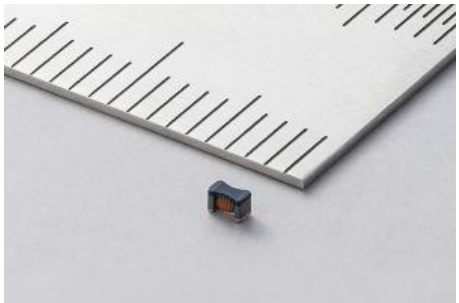
Bourns' Model SRF0703HA series dual-winding shielded, AEC-Q200 compliant power inductors can be used in parallel, series, dual-inductor or transformer configurations, giving designers outstanding rated current and inductance versatility. In addition, the single package dual-winding inductors provide a space-saving and cost-efficient solution compared to using two individual inductors.

Delivering a superior solution for SEPIC topologies, automotive systems and power supplies, the SRF0703HA series features a broad operating temperature range of -55°C to +150°C. These power inductors also are magnetically shielded to provide low radiation, which is especially important for applications that need to adhere to reduced noise requirements.

The SRF0703HA series is available now and is RoHS compliant and halogen free. For more information, see the Power Inductors - SMD Dual-Winding Shielded page.

In-Vehicle PoC Inductors In 0603 Cases Save Size And Weight

Murata Manufacturing's LQW18FT_0H series in-vehicle PoC inductors are offered in the 0603-in. size, offering size reductions from that of comparable components in the 0805-inch package size. The 0603 package has metric measurements of 1.6 x 0.94 x 1.15 mm. The AEC-Q200-compliant series offers inductances ranging from 0.55 to 2.2 µH and an operating temperature range of -40°C to 125°C.



With advanced driver assistance systems (ADASs) becoming more commonplace in recent years, the numbers of high-definition cameras on vehicles are also increasing. High-speed interface PoC that combine both signal and power transmissions on a single coaxial cable is being used on vehicle camera systems with LVDS transmission. In a PoC circuit, a circuit processor handles broadband signals, and usually multiple inductors are used for a wider bandwidth to maintain the high impedance required to separate the signal and the power.

In response, Murata applied its proprietary ceramic materials and product structures to achieve a product with the same high impedance as that of conventional 0805-inch size products in the 0603-inch size. This enables component size and weight reductions.

For more information, see the LQW18FT_0H search results page.

Ferrite Core And Shield Limit Magnetic Field Radiation For Inductors

Bourns' Model SRR6838A series shielded, AEC-Q200-compliant power inductors give designers of high-reliability consumer, industrial and telecom applications an expanded range of inductive options. Designed with a ferrite core and ferrite shield that delivers low magnetic field radiation, the advanced features of these power inductors make them a superior power conversion solution, according to the vendor, for applications that need to operate in low-noise environments such as in automotive driver assistance, infotainment, and lighting systems.

In addition, the SRR6838A series provides excellent inductance and heating current capabilities featuring an inductance range up to 100 µH and heating current up to 6.8 A. These shielded inductors also offer a broad operating temperature range of -55°C to +150°C. The model SRR6838A series is available now, and is RoHS compliant and halogen free. For more information, see the Power Inductors - AEC-Q200 Compliant page.

Resin-Shielded Inductors Offer Better Magnetic Shielding, Reduced Size

Sumida America's family of resin-shielded surface-mount power inductors enhances both the magnetic shielding effect and the mechanical impact strength of the components. Cost is competitive or better than traditional construction, says the vendor.

The CDxxxxMB/DS 105°C ferrite core series is available in 12 inductance values from 1 µH to 1,000 µH. Maximum saturation current ranges from 2.2 to 13.6 A. The CDxxxxMB/DS 125°C ferrite core series is available in three inductance values of 42, 220, and 1,000 µH. Its maximum saturation current range is 3, 4.7, and 13.7 A. The CdxxxxME/DS 125°C metal-composite resin-shielded inductor series is available in three inductance values from 500 nH to 10 µH.

Ferrite or metal-composite resin-shielded inductors are produced similarly to traditional drum and ring core shielded inductors but with an important difference. Instead of using an external ring core for shielding, a coating of magnetic powder-impregnated resin encases the insulated copper winding and functions as the magnetic shield. This technology has the performance benefits of an open magnetic inductor (high-temperature rise current and wide inductance range) with reduced flux leakage due to the impregnated resin shielding.

Compared to legacy ferrite-ring construction, resin-shielded power inductors have improved EMI protection, plus size reductions. The overmolding enhances protection from moisture, dust, and mechanical stress, contributing to improved durability and reliability. The resin can also aid in heat dissipation, ensuring stable operation under varying temperature conditions. The product size range is wide including sizes from 3.2 x 3.2 x 1.2 mm to 8.3 x 8.3 x 4.2 mm.

Key features include ferrite or metal core construction, low-profile resin-shielded ferrite or metal core construction, Moisture Sensitivity Level 1, an operating and storage temperature range of -40°C to +105°C (including coil's self-temperature rise) or 40°C to +125°C (depending on series).

All of the Sumida resin-shielded inductors are available for sampling. For more information on the Ferrite Resin Shielded inductors, see the CDxxxxMB series page. For more on the Metal Composite Resin Shielded devices see the CD252012ME/DS, CD252010ME/DS, CD201610ME/DS page.

Wire-Wound Inductors For High-Current PoC Applications

TDK has expanded the ADL4532VK series of wire-wound inductors for automotive power-over-coax (PoC). These inductors, which measure 4.5 x 3.2 x 3.2 mm; deliver high impedance across a broad frequency range from tens of megahertz to hundreds of megahertz by using proprietary materials and structural design innovations. This reduces the number of inductors used, saving space. Key specs for the three available models are listed in the table.

Furthermore, these inductors are compatible with high currents of up to 1650 mA and meet the needs for high functionality, including not only the latest automotive cameras but also the infrared cameras and display.

Additionally, the inductors ensure high reliability with an upper operating temperature limit of +155°C.

Advanced driver-assistance systems (ADASs) are designed to enhance vehicle safety by using automotive cameras and sensors that monitor the driving environment. These systems rely on multiple cameras, typically installed at the front, rear, and sides of the vehicle, to capture real-time imagery for safe and secure driving.

In standard configurations, automotive cameras require two separate lines for power and signal transmission: a power line connected to the vehicle's battery and a signal line connected to the electronic control unit (ECU). However, with PoC technology, a single coaxial cable can simultaneously carry both power and data, simplifying and reducing cabling. The PoC system requires a filter incorporating multiple inductors to effectively separate power from the data signal before processing.

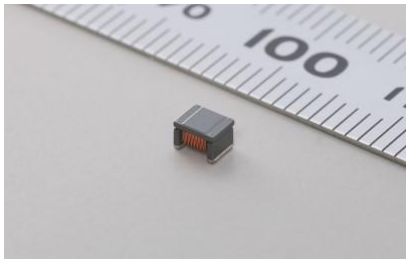
Table. Key specs for the ADL4532VK series.

Type	Inductance @ 100 kHz [µH] ±20%	DC resistance (max.) [Ω]	I_{sat} (typ.,25°C) [mA]	I_{temp} (typ., 105 °C) [mA]	I_{temp} (typ., 125 °C) [mA]
ADL4532VK-3R0M-TL000	3.0	0.125	2100	1650	1300
ADL4532VK-100M-TL000	10.0	0.235	1250	1200	940
ADL4532VK-160M-TL000	16.0	0.470	950	830	640

I_{sat} (25 °C): Current value based on inductance variation (30% lower than the initial inductance value)
I_{temp} (105 °C): Current value based on temperature increase (temperature increase of 50 K by self-heating)
I_{temp} (125 °C): Current value based on temperature increase (temperature increase of 30 K by self-heating)

For more information on the ADL4532VK series, see the announcement.

PoC Inductor In 1210 Case Delivers 22 µH

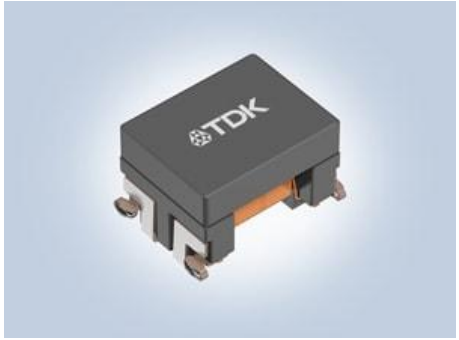


Murata Manufacturing's LQW32FT_2H series offers a 1210-size in-vehicle PoC inductor. Measuring 3.2 x 2.5 x 2.3 mm, the AEC-Q200 compliant device has an inductance value of 22 µH and operates over a temperature range of -40°C to 125°C.

It specifies a saturation current rating of 400 mA. For product details, see LQW32FT_2H.

PoC Inductors Handle Up To 1600 mA In Smaller Size

TDK's ADL3225VF series (3.2 x 2.5 x 2.3 mm; L x W x T) of wire-wound inductors for automotive power-over-coax (PoC) specifies a rated current of 1.6 A, which is equivalent to that of the ADL4532VK series (released on February 13, 2025, see article above on previous page), while achieving a reduction in the mounting area of approximately 45%.



The PoC system requires a filter incorporating multiple inductors to separate power from the data signal before processing effectively. In comparison with conventional products such as the ADL3225VM-2R2M, the ADL3225VF series increases the rated current by approximately 20% by using proprietary materials and structural design innovations.

At the same time, the ADL3225VF series delivers high impedance across a wide frequency range from tens of megahertz to hundreds of megahertz. This reduces the number of inductors used, saving space. Additionally, the inductor ensures high reliability with an upper operating temperature limit of +155°C.

For further information, see the datasheet.

Shielded Inductors Feature I_{SAT} Ratings Up To 420 A

Bourns' HRP3822X and HRP5022X series shielded, high-current power inductors feature low DCR and shielded construction for low radiation. Designed to help maintain stable current flow and enhance efficiency in high power applications, the shielded power inductors are optimized for industrial high-current filters, battery chargers and dc-dc converters.

They feature a metal alloy powder core for high saturation current and an inductance range of 0.68 to 3.3 µH, with DCR from 0.11 to 0.42 mΩ (see the tables). Operating temperature range is -40°C to +125°C.

The HRP3822X and HRP5022X series inductors are available now through Bourns' authorized distribution partners, and are RoHS compliant and halogen free. For more information, see the HRP3822X and HRP5022X datasheets or see the Power Inductors - SMD High Current, Shielded page.

Table 1. HRP3822X key electrical specs.

Bourns Part No.	Inductance @ 0 A		Irms (A) Typ.		Isat (A) Typ.		DCR (mΩ)		Q Min. @ 100 kHz	SRF (MHz) Ref.
	L (µH)	Tol. %	40 °C Rise	100 °C Rise	1	2	Typ.	Max.		
HRP3822X-R68M	0.68	±20	154	235	301	420	0.11	0.13	20	20
HRP3822X-R82M	0.82		132	196	235	332	0.18	0.20	20	18
HRP3822X-1R5M	1.5		120	175	138	193	0.25	0.26	60	13
HRP3822X-2R2M	2.2		115	168	104	150	0.33	0.36	60	11
HRP3822X-3R3M	3.3		96	150	87	124	0.40	0.42	60	8

Table 2. HRP5022X key electrical specs.

Bourns Part No.	Inductance @ 0 A		Irms (A) Typ.		Isat (A) Typ.		DCR (mΩ)		Q Min. @ 100 kHz	SRF (MHz) Ref.
	L (µH)	Tol. %	40 °C Rise	100 °C Rise	1	2	Typ.	Max.		
HRP5022X-2R2M	2.2	±20	125	187	190	280	0.21	0.23	280	12

Automotive-Grade Chip Inductors Pack High Current And High Inductance

Bourns' CWF1610A, CWF1612A and CWF2012A series AEC-Q200-compliant chip inductors feature high inductance, high current and high self-resonant frequency in a compact form factor. The features enable excellent power handling and filtering at high frequency, making the three chip inductor series superior power conversion solutions in RF signal processing, resonant circuits, decoupling, noise filters and low-current dc power lines found in a broad variety of automotive, power, audio and mobile designs.

The CWF1610A, CWF1612A, and CWF2012A series all have wire-wound construction on a ferrite core to provide minimal resistance and exceptional noise filtering across a wide frequency range. As an example, the CWF1610A series offers saturation current from 200 mA up to 1700 mA, rated current from 200 to 1400 mA, and an extended operating temperature range of -55°C to +125°C.

The CWF1610A, CWF1612A and CWF2012A inductors are available now through Bourns' authorized distribution partners and are RoHS compliant and halogen free. For more information, see the CWF1610A, CWF1612A and CWF2012A datasheets.

Composite Core Delivers High Energy Density For Inductors

Sumida's WCDMT series metal-compound-molding-type inductors feature a magnetically shielded structure made of a metal core and compound, which allows a large current to flow with low DCR, high efficiency and soft saturation. Operating temperature range is -40°C to 125°C (including self-heating). This series contains inductors in 15 sizes ranging from 4.3 x 4.3 x 2.1 mm to 16.8 x 15.8 x 13.0 mm, with inductances ranging from 0.22 µH to 2.2 µH for that smallest inductor model to 4.7 µH to 33 µH for that largest model. Those models with links to their product pages are listed below.

- WCDMT0420/DS: 4.3 x 4.3 x 2.1 mm max.
- WCDMT0430/DS: 4.35 x 4.35 x 3.0 mm max.
- WCDMT0440/DS: 4.35 x 4.35 x 4.1 mm max.
- WCDMT0520/DS: 5.7 x 5. 5 x 2.1 mm max.
- WCDMT0530/DS: 5.7 x 5. 5 x 3.1 mm max.
- WCDMT0550/DS: 5.7 x 5. 5 x 5.0 mm max.
- WCDMT0630/DS: 6.8 x 6.6 x 3.0 mm max.
- WCDMT0650/DS: 6.8 x 6.6 x 5.0 mm max.
- WCDMT0660/DS: 6.8 x 6.6 x 6.0 mm max.
- WCDMT0730/DS: 8.05 x 7.85 x 3.1 mm max.
- WCDMT0770/DS: 8.05 x 7.85 x 7.0 mm max.
- WCDMT0880/DS: 9.2 x 8.8 x 8.0 mm max.
- WCDMT1010/DS: 12.2 x 11.3 x 10.0 mm max.
- WCDMT1060/DS: 12.2 x 11.3 x 6.0 mm max.
- WCDMT1510/DS: 16.8 x 15.8 x 10.0 mm max.
- WCDMT1513/DS: 16.8 x 15.8 x 13.0 mm max.
- WCDMT1580/DS: 16.8 x 15.8 x 8.0 mm max

Applications include desktop and server VRMs and EVRDS, low-profile high-current power supplies, multiphase regulators, battery power systems, and point-of-load regulators. For more information, see the product pages linked to above or the announcement.

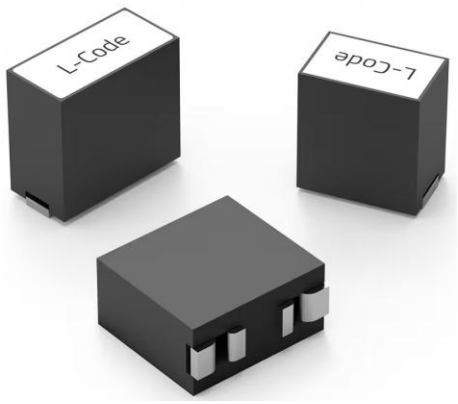
Shielded Power Inductors Feature High Heating And Saturation Current

Bourns' SRP4021HMCT, SRP4021HMT, SRP5030HMCT, and SRP5030HMT shielded power inductor series feature high heating and saturation current with low magnetic field radiation to deliver enhanced power handling, increased efficiency, and optimized power circuit filtering.

The inductors are produced with a hot press molding process that matches design needs for inductive components with greater density and additional mechanical strength. Compared to the previous Bourns SRP series, the electrical characteristics have been enhanced by approximately 20%. This improvement is reflected in parameters such as the series' higher current rating, lower DCR, and reduced power loss. The result is that Bourns is able to offer a smaller size inductive solution while maintaining the same electrical performance.

The four inductor series are available now from Bourns' authorized distribution partners, and are RoHS compliant. For more information, see the SRP4021HMCT, SRP4021HMT, SRP5030HMCT, and SRP5030HMT datasheets or see the Power Inductors - SMD High Current, Shielded page .

Coupled Inductor For TLVR Topology Exhibits Stability At High Temperatures



Würth Elektronik's WE-HCMD (high-current multiphase dual) high-current inductor was specially developed for use in TLVR (trans-inductor voltage regulator) topologies. The coil with MnZn core is characterized by its high permeability and extremely low DCR values. So, it achieves excellent power density and very high efficiency. In the finished device, it excels with its fast transient response and low voltage drop. The component also reduces application costs and saves space, says the vendor, as it allows for a smaller nominal output capacitor.

When designing power supplies for processors today, developers are confronted with increasingly high and significantly varying load transients—for example, in FPGAs used in AI applications. The innovation in TLVRs in this field calls for a new generation of components that achieve consistent efficiency even at high temperatures. Optimal efficiency is key here and must be ensured even at the highest currents. According to the vendor, the selection of materials for the new inductor significantly improves efficiency and allows the potential of the new TLVR topology to be fully exploited.

The WE-HCMD is well suited for TLVR applications that are specifically designed for sudden load transients. Areas of application for the coupled inductor include multiphase voltage regulators for CPU motherboards, FPGAs, GPUs, AI chips, servers, or high-power ASIC applications.

The WE-HCMD family offers coupled inductors with a coupling factor of up to 0.98 and an inductance range from 70 nH to 200 nH. The saturation current goes up to 190 A at a rated current of 78 A. The internal resistance is just 0.125 mΩ. The inductor is designed for operating temperatures up to 125°C.

According to the vendor, internal measurements show that at the high-temperatures resulting from heavy loads, significantly better stability is achieved than for existing solutions on the market. In direct comparison, the inductor stands out through its superior current-dependent inductance stability as well as higher efficiency.

The family of SMT-mountable high-current inductors for TLVR applications includes four versions in an 0910 package and six in a 1111 package. The WE-HCMD is now available from stock without a minimum order quantity. In addition, free samples can be requested. For more information, see the WE-HCMD_2 page.

Shielded Power Inductors For DDR5 PMICs

Bourns' SRP2512CL and SRP3212CL series shielded power inductors feature low ac resistance (ACR) and low dc resistance (DCR), delivering reduced losses and high efficiency. Bourns specifically designed these inductors to meet the latest DDR5 memory technology specifications such as those in DDR5 power management integrated circuits (PMICs) and client DDR5 modules in desktop PCs, notebooks and tablets.

The SRP2512CL and SRP3212CL series inductors are manufactured with a shielded construction for low magnetic field radiation and a nanocrystalline core to support high current with low buzz noise. Bourns developed the nanocrystalline powder construction technique and combined it with the company's latest inductor manufacturing process technologies to give designers a superior ultra-low buzz noise solution. In addition, these inductors have an operating temperature range of -40°C to +125°C, and an inductance range of up to 1.5 µH and are available in 3030 and 2520 package sizes.

The SRP2512CL and SRP3212CL inductors are available now through Bourns' authorized distribution partners, and are RoHS compliant and halogen free. For more information, see the SRP2512CL and SRP3212CL datasheets or see the Power Inductors - SMD Shielded page.

Transformers

More-Compact Gate-Drive Transformers For 500-V Systems

TDK's EPCOS EP9 series (ordering code: B82804E) is more compact than the existing E10EM series of surface-mount transformers and is designed specifically for IGBT and FET gate-driver circuits. Engineered for high performance in demanding e-mobility and industrial applications with a 500-V system voltage, these components offer exceptional insulation, minimal coupling capacitance, and high thermal resilience, according to the vendor.

The EP9 series is built on a MnZn ferrite core with SMD L-pin construction, delivering a height of just 11 mm and a footprint of 13 x 11 mm. These transformers operate across a wide temperature range of -40°C to +150°C, ensuring durability under harsh conditions.

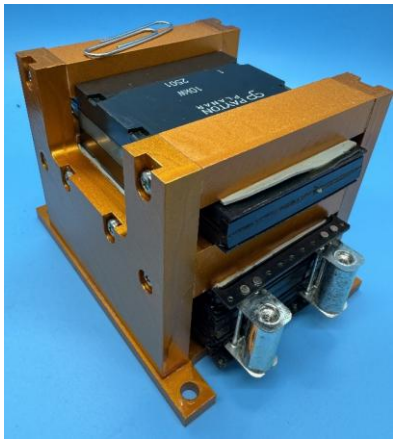
With a coupling capacitance of only 2 pF, complying with the AEC-Q200 Rev. E standard, and creepage and clearance of at least 5 mm, these surface-mount components are generally used in automotive applications and other demanding environments.

The transformers support topologies such as half-bridge and push-pull converters with typical operational frequency of 100 to 400 kHz and turns ratios optimized for specific applications. These components are available in tape-and-reel packaging, ensuring ease of assembly for high-volume production environments.

A sample kit is available under order number B82804X1, containing six transformers of each version. For more information, see the Transformers for IGBT/FET page.

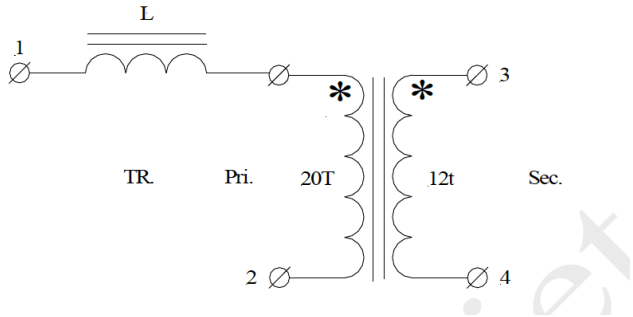
10-kW Planar Transformer And Inductor Module For Dual Active Bridge

Payton Planar, a manufacturer of custom planar magnetics, has developed a 10-kW module consisting of a transformer and resonant inductor for use in a dual active bridge (DAB) converter topology. Payton makes an internal connection for the inductor (30 µH) and the module has two input and two output connections. The module measures 130 mm x 90 mm x 100 mm (H).



Its operating frequency varies from 80 kHz to 300 kHz, depending on the load conditions. Input voltage is 600 to 900 V with 500-V variable output and 50-A max current. Efficiency is 99.5%.

In addition, the module is designed for continuous operation from -55°C to 135°C when mounted on an 80°C cold plate. And it features 5000-Vdc isolation between input, output and core.



For more information, see the website or contact Jim Marinos.

High-Performance Flyback Transformers For LT8304-1 Applications

Sumida's CEP1311F flyback transformers are designed specifically for use with "no-opto" isolated flyback circuits, such as the Analog Devices' LT8304-1 reference design. According to the vendor, this isolated flyback transformer delivers exceptional high-voltage performance, making it well suited for industrial, automotive, medical, and telecom applications. The CEP1311F (13324-T083 to13324-T087) transformers have single outputs, while the CEP1311F (13324-T196) provides dual isolated outputs.

This dual-output CEP1311F (13324-T196) flyback transformer is optimized for LT8304-1 applications. It enables isolated, no-opto flyback conversion with 110-V outputs and 15-V input. Custom configurations are also available.

The single-output CEP1311F (13324-T083 to 13324-T087) is available in five output voltages, ranging from 3.3 V to 400 V. Each maintains excellent regulation across load, line, and temperature variations.

The series is fully RoHS and REACH compliant, meeting stringent environmental standards. With an optimized SMD design measuring just 21 x 21 x 11.8 mm, these transformers ensure efficient performance in space-constrained environments, says the vendor. Designed for reliability, each features a wide operating temperature range of -40°C to 125°C.

In addition, a high 1500-Vrms hi-pot rating provides robust electrical isolation for enhanced safety. The transformers also boast a Moisture Sensitivity Level (MSL) of 1 for unlimited floor life under standard environmental conditions.

The flyback transformers are well-suited for high-voltage power supply applications across multiple industries. In the industrial and telecom sectors, they ensure reliable power solutions for communication and automation systems. For automotive applications, they can support critical vehicle electronics by delivering stable voltage conversion. In the medical field, the transformer can contribute to safe and efficient power management in sensitive devices.

For more information, see the single-output CEP1311F and dual-output CEP1311F pages. Or see the CEP1311F search results page. Alternatively, call (847) 545-6700 or e-mail sales@us.sumida.com.

Current Transformer Provides High Permeability And Low Losses

Bourns' Model PCP300-T414250S current transformer is made with a high-efficiency permalloy material that helps reduce heat loss and energy consumption. This technology also enables fast power conversion rates with elevated precision, making this transformer well suited for power quality analysis. In addition, its advanced features support a wide range of rated current measurements, including high-frequency current sensing in power meters and motor load monitoring.

The PCP300-T414250S has a maximum primary continuous current of 300 A, with a dielectric strength of up to 3.5 kV, which are required to help ensure the safety of both equipment and personnel. Additionally, the transformer features a protective coil housing design suitable for applications that operate in challenging environments. Bourns designed this current transformer line to allow customers to achieve faster, higher stability and safe electricity monitoring and management.

The PCP300-T414250S is available now through Bourns' authorized distribution partners, and is RoHS compliant and halogen free. For more information, see the datasheet or current transformers page.

Flyback Transformer Achieves Exceptional Isolation In Small Footprint

Bourns' model HVMA03F40C-ST10S flyback transformer is designed to support high power density and greater efficiency in a compact form factor. According to the vendor, the HVMA transformer's long list of features makes it a superior solution for electric vehicles, transistor gate drives and high-voltage battery management systems, as well as for isolated power across separate voltage systems in hybrid vehicles. It can also capably support high-frequency SiC, IGBT and GaN switching elements in wide-bandgap designs.

This transformer meets IEC standards for isolation and creepage/clearance distance requirements with a state-of-the-art mechanical and electrical design that helps increase system performance and safety at the same time. Offered in a 10-mm-creepage surface-mount package, the HVMA03F40C-ST10S gives designers up to a 900-V working voltage with the capability to support new designs utilizing the existing platform or to help them streamline the design of new platforms. In addition, this 3-W flyback transformer features switching frequencies from 100 kHz to 400 kHz, and an operating temperature range of -40°C to +155°C.

The HVMA03F40C-ST10S flyback transformer is available now and is RoHS and REACH compliant. For more information, see the datasheet or see the Transformers - Power - AEC-Q200 Compliant page.

The following product was omitted from the last Power Magnetics Component Roundup in December 2024 but is included here:

LLC Transformer Extends Voltage Rating To 1250 Vpk

YAGEO Group's PHT7249NL, an addition to the company's SiC and GaN drive LLC transformers, is suitable for industrial and automotive applications. Similar to the recently released PMT6907NL, which can be configured with LLC controllers such as the TI UCC25800-Q1 to provide positive and negative outputs for robust switch

on/off, this transformer offers high-isolation (4.2-kV hi-pot) in a compact (17.2 x 11 x 8.5 mm max) SMD platform, delivering up to 3 W of drive power.

The enhancement to the earlier product offering is the use of triple insulated wire to extend the voltage rating up to 1250 Vpk. The PHT7249NL can be applied in systems working up to 3500 m altitude without additional limitations. The product is optimized to utilize all features of the UCC25800-Q1 or equivalent controller working within a whole switching frequency range.

"We were delighted with the market's reaction to our new LLC transformer as hardware engineers look to utilize the benefits of the SiC/GaN drive topology to meet their power efficiency targets. However, as battery voltages increase to 800 V and beyond, a higher voltage-rated solution was required. The extended creepage distance of our innovative UI5 platform already satisfies the safety requirements for basic insulation for these higher voltages. However, enhanced wire insulation was needed for a comparable voltage rating," said Gerard Healy, Product Marketing, Specialized Power PBU.

He added, "This new transformer is compliant with the requirements of IEC 60664, for basic insulation and a repetitive peak voltage up to 1250 Vpk, based on the partial discharge method. Further information is available in our white paper 'Partial Discharge Explained' to better understand how this test method is used to define the voltage rating of an insulation barrier."

The PHT7249NL was designed for a cutting-edge E-Sports motor drive application operating from an 800-V battery voltage. The 10-mm creepage distance complies with IEC 61558-1 for basic insulation and a working voltage of up to 1000 Vrms. The extended creepage UI5 platform is one of several high-isolation platforms developed by YAGEO Group, which are available in our High Isolation Transformer Platform Guide. For more information on the PHT7249NL, see the datasheet. To read the Partial Discharge Explained white paper, click here.

Chokes And Filters

Common-Mode Chokes Are Rated To 36 A At High Temperatures

TDK's EPCOS SurfIND is a series of current-compensated ring core double chokes for high currents and surface mounting (ordering code: B82725S2*A/B). With SurfIND, customers who prefer reflow soldering (for example, sandwich packages in telecom equipment and industrial drives) but need high-current common-mode chokes (usually large and heavy) can now obtain an SMD solution. These chokes can be used to suppress CM interference in switch-mode power conversion applications and variable-frequency drives.

B82725S2*A*

These components can filter common-mode noise for rated currents from 24 A to 36 A at a temperature of +70°C. With additional cooling, even higher currents can be achieved. This is easy to implement, says the vendor, as the top side can serve as a direct interface for a heat sink.

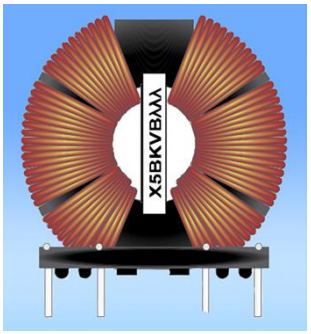
For applications with a voltage of up to 250 Vac, the nominal inductance ranges from 120 µH to 820 µH across seven variants. With stray inductance of up to 1% of the nominal inductance, these chokes also dampen differential-mode noise.

All components meet IEC/EN 60938-2 standards and share a compact footprint of 40 mm x 38 mm (L x W), with heights of 20.7 mm for A types and 22.3 mm for B types. Their typical resistance ranges from 0.78 mΩ to 2.21 mΩ. Rated inductance drops by less than 10% at rated current with dc magnetic bias at +20°C.

SurfIND chokes are mounted on a plastic baseplate, with a ferrite core coated in epoxy to insulate it from the windings; both materials are UL 94 V-0 approved. The special design of the connection wiring eliminates the need for adhesives while self-leading SMD leads ensure easy reflow soldering to PCBs.

For more information, see datasheet.

Chokes Provide Both CM And DM Attenuation, Simplify Assembly



Premier Magnetics' PM-CMCX5 series is the first offering in the company's CM Guard series of advanced-technology chokes, which implements integrated magnetics technology to build common mode (CM) and differential mode (DM) attenuation into a single device. The PM-CMCX5 series devices feature strong winding-to-winding insulation (5 kV), wide operating temperature (-60°C to 155°C) and low-capacitive coupling to the core.

In addition, the chokes achieve excellent mechanical stability utilizing the company's Snap-In Technology to secure parts to the pc board without the use of epoxy during the assembly process.

The series offers sixteen models with a selection of spread or compressed windings and common-mode choke inductances from 0.5 to 30 mH. The datasheet includes a part-number chart providing details on differential mode inductances, typical current to cause a temperature rise of 70°C (IDC), dc resistance (DCR), and self-resonant frequency (SRF).

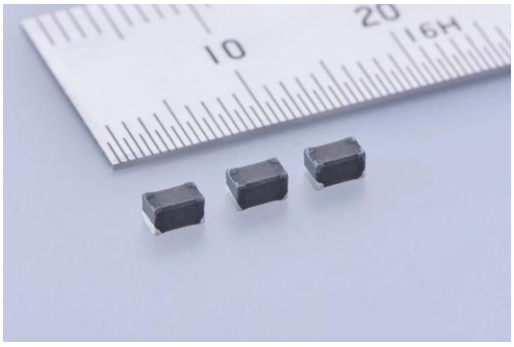
"Our new highly integrated, high-performance CM Guard Series provides common mode and differential mode attenuation in a single device. They can serve to reduce the number of components in a filter assembly," said Premier Magnetics president, Dennis Earley.

"Using our unique Snap-In Technology, they also simplify and speed up product assembly by eliminating time-consuming epoxy application." Earley added, "Over the coming year we'll expand the CM Guard Series portfolio to provide models with higher DM inductance, higher temperature stability and reduced size"

In OEM quantities, unit pricing is $1.50 to $2.45. Samples are available. Lead times for OEM quantities are 12 weeks. For more information, see the datasheet.

Wire-Wound Ferrite Inductors Serve As Chokes And Noise Filters

Taiyo Yuden's LCQPB series of wire-wound ferrite power inductors, which have AEC-Q200 qualification for automotive passive components, are designed for use as choke coils and noise filters in dc-dc converters in power circuits for automotive body and information systems.



They join the previously released LCEN series and LCCN series of metal power inductors made from metallic magnetic substances for automotive applications and the LCXN series and LCXH series of ferrite power inductors. The LCQPB series gives customers more choice by substance and structure and a high degree of freedom in design, says the vendor.

The advancements that we have seen in recent years in electronic controls in vehicles, as typified by ADAS units, have led to a greater number of power supply circuits in vehicles, which in turn has led to growth in the demand for power inductors that are used in these circuits.

In order to miniaturize power supply circuits, engineers demand inductors with specific properties that allow high-density mounting with a high degree of freedom in design and noise suppression by frequency. Therefore, Taiyo Yuden has introduced the LCQPB series, which complies with AEC-Q200. The LCQPB series inductors have a frameless structure that results in a small footprint.

The LCQPB series inductors are manufactured by the company's overseas subsidiary, TAIYO YUDEN (PHILIPPINES). Samples are available for 50 yen per unit. For more information, see the announcement.

8-A Multilayer Chip Beads Reduce Footprint For Noise Suppression

TDK has expanded its MPZ1608-PH series of large-current multilayer chip beads for automotive and commercial power supply lines (1.6 x 0.8 x 0.6 mm – L x W x H). These 1608-size chip beads for power supply lines achieve a rated current of 8 A, the industry's highest value, according to the vendor.

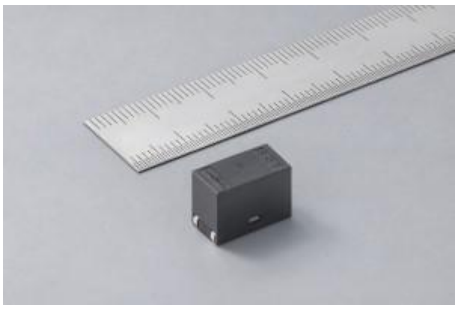
Chip beads are used as noise suppression components in power and signal circuits. In a circuit with a current of 8 A or more, usually two or more chip beads must be used in parallel. This has the disadvantage that the current is not evenly distributed between the ferrite beads. TDK's new product simplifies the circuit structure because fewer components are required compared to conventional methods, and it improves the quality of power circuits.

The MPZ1608-PH series products halve the component footprint in comparison with circuits using two conventional 1608-sized chip beads. Moreover, the highly reliable components with a specified operating temperature of up to +125°C are designed to be used in high-temperature environments like automotive and industrial equipment applications.

Applications include power circuits for different pieces of equipment such as in-vehicle ECUs, power train, vehicle body control, automotive multimedia (telematics), base stations, PCs, servers, set-top box, smart grids, robots, smartphones, tablet devices, and others. For more information, see the datasheet.

Common-Mode Choke Coils For Vehicles Support Environments Of 150°C

Murata Manufacturing's PLT10HH series of common-mode choke coils now includes products that can be used in high-temperature environments of 150°C, which are suited to reducing noise on power supply lines for in-vehicle equipment. The three models with this capability are the PLT10HH8016R0PN, PLT10HH351100PN, and PLT10HH900150PN (see the table).



Nowadays, with the increasing sophistication of in-vehicle equipment following the advancement of autonomous driving technologies in the automotive market, the importance of noise suppression measures on power supply lines has been growing. This has led SMD-type common-mode choke coils that support high temperature environments of 150°C and large currents to be in demand.

Murata's conventional PLT10HH series was only capable of a 1-A current flow in a 125°C environment. However, by adopting new ferrite materials, this product not only enables operation at 150°C but also achieves up to approximately 10 times the current (compared to the conventional PLT10HH series) in a 125°C environment.

Table. Key electrical specs for the PLT10HH series chokes with 150°C operation.

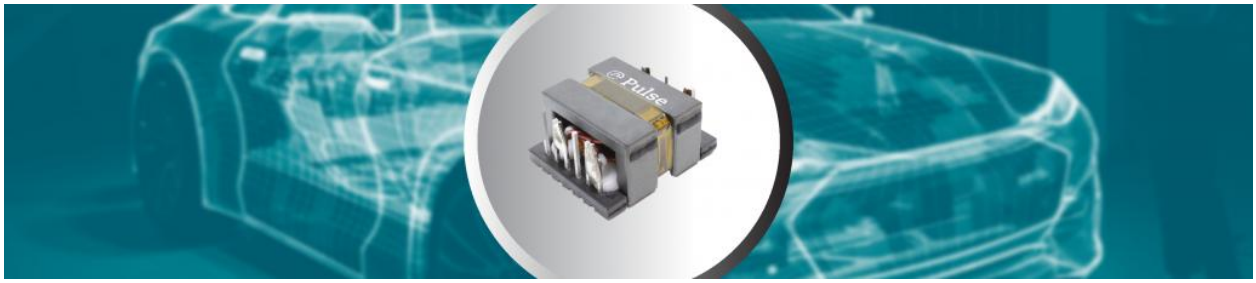
Product number	Common mode impedance Zc (At 10MHz)(Ω)Typ.	Rated voltage V(DC)	Withstand voltage V(DC)	Rated current (A)	DC current (Rdc) (mΩ)	Insulation resistance (IR)(MΩ min.)	Inductance (L)(μH min.)	Operating temperature range	Storage temperature range
PLT10HH8016R0PN	800	100	250	6	8.0±0.5	10	10	-55°C~+150°C	-55°C~+150°C
PLT10HH351100PN	350	100	250	10	3.6±0.5	10	4.5		
PLT10HH900150PN	90	300	750	15	1.8±0.5	10	1.5		

For more information, see the PLT10HH*PN search results page.

The following product was omitted from the last Power Magnetics Component Roundup in December 2024 but is included here:

CM Chokes Feature Low Profile Planar Construction

YAGEO Group's automotive-grade PM9408 series common-mode chokes use the company's round-wire coil winding technology, horizontally mounted in a planar core, to achieve one of the highest current (up to 39 A) CMC products on the market in surface-mount packages. This family offers inductances from 120 µH to 480 µH in the ER19 platform, having a footprint of 24.9 x 21.6 mm, and now up 1500 µH in the ER25 platform, having a footprint of 30.5 x 27mm.



"The widespread interest in the pre-existing industrial-grade product from the automotive market testifies to the cutting edge nature of this design. Unfulfilled application requirements for high-current CMC in SMT platforms drove the development of the initial PM9407 product offering. A further market requirement for high current and in particular for operation temperature range up to 150°C has now driven the qualification and IATF launch of the larger PM9408 series. A 160-µH/39-A common mode choke with a height less than 15 mm is truly a one of a kind product," said Gerard Healy, Specialized Power PBU, YAGEO Group.

YAGEO's fully automated round-wire coil winding technology, developed and in high-volume production for other product lines, is a perfect match for the high-performance, high-reliability requirements of the automotive market, said the vendor. Manufacture is on an IATF-certified production line with full PPAP available on request. For more information, see the PM9408.164NLT page.

Current Sensors

Rogowski Coils And Current Transformers Are Highly Customizable

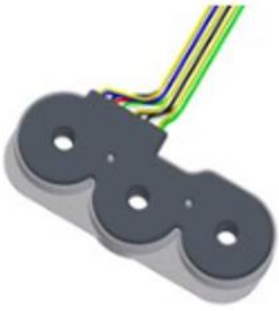

Rogowski Coils

Sumida can realize Rogowski coils with high linearity over a wide temperature range (-40°C to 180°C) and optimal Rogowski factors as well as low external field sensitivity. It achieves this performance by using optimized plastic core geometries and specially developed toroidal winding technology. Both round and oval coil geometries are possible in diameters from 20 mm up to 350 mm.

This has been continuously developed by Sumida in recent years so that high winding speeds and precise winding structures can be realized even in high-volume series production.

For the current transformers, the company uses cores made of ferrite, nanocrystalline, NiFe and SiFe materials. In addition to the selection of optimal core material, the winding technology also plays an important role in achieving high measurement accuracy and performance.


Current Transformers


Current Transformer Modules

By combining Rogowski coils with current transformers, current transformer modules for single-phase and three-phase applications can be achieved. The main applications for these modules are fuse switches (residential molded case and air circuit breakers).

Based on Sumida's global production network, it is possible to manufacture Rogowski coils and current transformers (modules) in Asia, Europe and North America to offer customers a high degree of flexibility and security of supply. A

Center of Excellence was set up at the Sumida location in Obernzell, Germany for the development of customer-specific applications of these components. Here, prototypes, samples and pre-series can be assembled quickly to support new projects.

For more information, see the announcement.

Cores

Bulletin Offers Guidance On Core Selection For Automotive Applications

Magnetics' bulletin, "Cores for Automotive and E-Mobility" provides a technical review of the best magnetic cores for different applications in these two areas. See the bulletin.

Meanwhile the company has also expanded its line of Kool Mu Ultra cores (which use the company's lowest core loss powder core material) to include shapes other than toroids such as blocks, E, U, and others. See the Kool Mu Ultra Cores Manufacturer page.

Toroidal Suppression Cores For CM Chokes Come In Multiple Sizes

Fair-Rite's Attenuation Station now includes a selection of toroidal suppression cores in different sizes ideal for winding common-mode chokes. This kit allows engineers to experiment with different materials and sizes to achieve the required amount of impedance. It includes five materials (31, 44, 52, 61 and 75) to target EMI at frequencies from hundreds of kilohertz up to over 1 GHz.

Separating these cores from normal ferrite toroids, the products in this kit are rated and built to impedance specifications as opposed to the normal low-frequency inductance factor and maximum loss factor specifications. For more information see the Attenuation Station Kit page or click here to request a quote.