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Power Magnetics Component Roundup

by David G. Morrison, Editor, How2Power.com

This article presents information on power inductors, transformers, chokes and other magnetic components for power supply applications, covering products introduced over the past six months. Some related products such as a vendor design tool and a white paper on quality in magnetics manufacturing are also included.

As in past roundups, power inductor announcements dominate the news with manufacturers adding to their portfolios of inductors featuring shielding, low dc resistance, high current ratings (rated current and saturation current), high temperature rating, and small size. Some of the newer devices specify a high operating voltage as well.

There continue to be many automotive-grade offerings attesting to the extensive electronics content in conventional vehicles as well as applications in hybrids and EVs. Meanwhile, dc-dc converters and power supplies for other popular applications such as smart phones, laptops, servers, and LED lighting, to name a few, have inspired other inductor products.

This feature also carries news of specialized transformers such as flyback and current-sense transformers, and chokes and beads for filtering and noise suppression in various power supply applications. Some new wireless power coils are reported as well.

This article represents a follow-up to the Power Magnetics Component Roundup published in the December 2019 issue and other magnetics articles published in How2Power Today.

Power Inductors

- High-Current Shielded Inductors For Consumer And High-Temperature Applications (Bourns)
- Shielded Inductors Feature Low Resistance, High Saturation Current (Bourns)
- Molded Inductors Offer Ratings To 120 V And Low Losses (Coilcraft)
- Inductors Reduce DC Resistance By Up To 40% (Coilcraft)
- Expanded Line Of High-Temperature Shielded Drum And Ring Core Inductors (Sumida)
- Compact Dual Inductors With High Saturation Current (TDK)
- Automotive-Grade Inductor Offers Stable Inductance Up To +180°C and 150 A (Vishay Intertechnology)
- Integrated E-Shield Inductors Save Space (Vishay Intertechnology)
- Low-Profile, Edge-Wound Inductor Handles Saturation Current To 230 A (Vishay Intertechnology)

Transformers

- Flyback Transformer Enhances DC-DC Efficiency In Isolated Mode (Bourns)
- Environmentally Resilient Transformers For Low-Voltage Lighting (Signal Transformer)
- Current-Sense Transformers Support Overload Detection And Load Shedding (TDK)

Chokes And Beads

- Common-Mode Toroidal Chokes Provide Vertical PCB Mounting And High Current Capacity (Signal Transformer)
- Surface-Mount High-Voltage Double Chokes Offer Lower Losses (Würth Elektronik eiSos)
- Storage Choke For Filtering In Class D Amplifiers (Würth Elektronik's)

- Ferrite Chip Beads Deliver Small Size For Automotive Power Supplies (Murata)

Wireless Power Coils

- Wireless Charging Coils Are Direct Replacements For EOL Devices (Vishay Intertechnology)
- Wireless Power Coil Combines Charging Function and NFC (Würth Elektronik's)

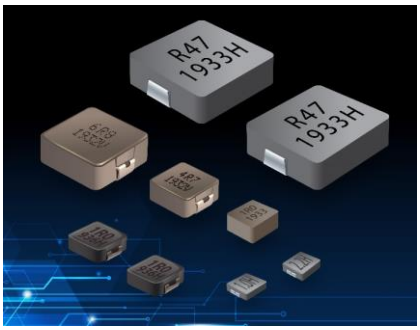
Design Tool And Magnetics Literature

- Tool Calculates Application Parameters For Latest Ferrite Materials And Core Shapes (TDK)
- White Paper Explores Quality Issues And Strategies In Magnetics Manufacturing (Triad Magnetics)

Power Inductors

High-Current Shielded Inductors For Consumer And High-Temperature Applications

The nine new series added to Bourns' SRP series power inductor line are designed to meet high current and low radiation requirements in a small form factor. Bourns' latest inductors feature a coil that is wound with either round or flat wire completely press-molded with an iron-based magnetic metal alloy powder core. This construction delivers magnetic shielding, high current capability, compact size, low buzz noise and excellent temperature stability.



The SRP1040VA and SRP6030VA inductors are built with a new metal alloy powder formulation and round enamel-coated copper wire. The company's innovative metal alloy powder formulation allows an elevated operating temperature of 180°C (including self-heating). This makes these AEC-Q200 compliant inductors well suited for many high-temperature environments and high-reliability designs including LED lighting, dc-dc converters and power supplies. Inductance values range from 0.47 to 22 µH.

The SRP4018FA series is also AEC-Q200 compliant, and uses a flat enamel-coated copper wire in a self-lead terminal construction that provides exceedingly-low dc resistance. Offering lower dc resistance means that the inductor dissipates less power during operation especially at higher current and switching frequencies, thereby allowing a dc-dc converter to achieve higher power efficiency.

This model series features an inductance range of 0.33 to 1.2 µH and an operating temperature range of −55°C to +155°C. Because the SRP4018FA series is AEC-Q200 compliant, it is an optimal choice for a broad range of applications that require both high power efficiency and higher reliability.

In addition, the SRP1245C, SRP1265C, SRP3012C, SRP3020C, SRP5020C and SRP5030C also offer high inductance selection based on their round enamel-coated copper wire construction. These models are commercial grade giving OEMs a cost-effective solution for high-volume consumer electronics applications when an AEC-Q200 compliant inductor is not required. These models feature an inductance range of 0.1 to 33 µH and an operating temperature range of −40°C to +125°C.

Available now, all nine new Bourns inductor model series are RoHS compliant and halogen free. For more information, see the Power Inductors - SMD High Current, Shielded page. For datasheets on specific parts, see SRP1040VA, SRP6030VA,SRP4018FA, SRP1245C, SRP1265C, SRP3012C, SRP3020C, SRP5020C and SRP5030C.

Shielded Inductors Feature Low Resistance, High Saturation Current

Bourns has added 11 new low-resistance, high-saturation-current model series to its shielded power inductor line. Featuring a very low profile (less than 2 mm), the Bourns Model SRP0xxx series has a metal alloy powder core and flat-wire construction that provides a range of benefits including low copper loss, dc resistance and audible core noise as well as high current saturation. This type of shielded construction also produces low magnetic radiation offering good EMI performance and excellent temperature stability.

In addition, higher reliability is achieved from the use of external laser welding between wire and terminal, which eliminates potential mechanical stress on the solder joint from the high pressure molding process. Plus, the alpha-winding construction used enables a wider inductance range at a given form factor while maintaining a very low-height profile across all of the new series' inductance values.

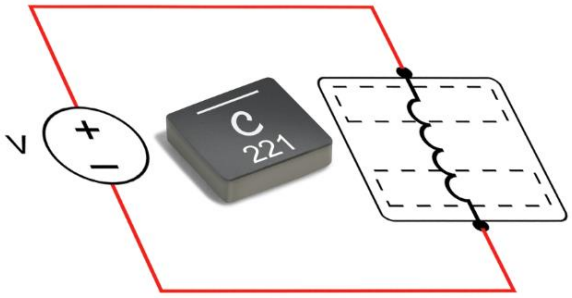
Bourns designed the 11 model series to meet today's high current density requirements in various consumer electronics applications such as smartphones, tablet terminals, laptop computers, hard disk drives, solid-state drives, servers, voltage regulators and compact power supply modules.

Because of their high current density, these applications typically operate at higher temperatures due to increased heat production, which can lead to higher degradation rates. By providing lower dc resistance, Bourns' latest inductor models dissipate less power during operation, especially at higher current and switching frequencies. This helps enable a dc-dc converter or power supply to achieve higher power efficiency and meet application specifications.

Available now, all 11 new Bourns Model SRP0xxx shielded power inductor series are RoHS compliant and halogen free. For additional information, see the website.

Molded Inductors Offer Ratings To 120 V And Low Losses

Coilcraft has expanded its XEL family of high-performance, molded power inductors to include three new higher-voltage series: the XEL401xV, XEL4020V and XEL4030V. All three offer operating voltage ratings of 120 V, 50% higher than the standard versions. They also offer exceptionally low dc resistance and ultra-low ac losses for greater power converter efficiency at high frequencies (2 to 5+ MHz) and high ripple current.

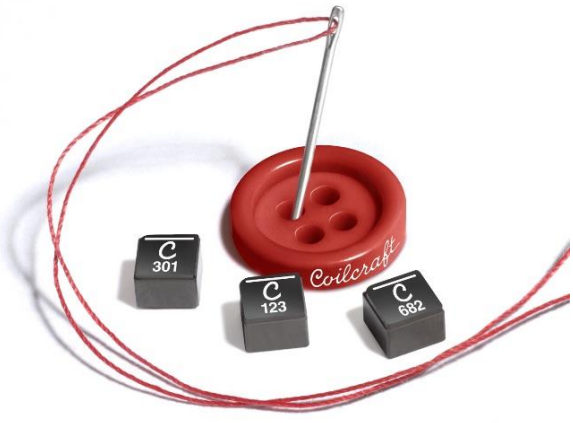


The XEL40xxV family inductors measure just 4.0 x 4.0 mm with a maximum height of 3.2 mm and feature a rugged, composite construction that provides magnetic shielding and minimizes audible buzzing. The XEL401xV series is available in six inductance values from 92 to 780 nH, with current ratings up to 24.0 A. The XEL4020V series has 10 inductance values from 0.08 to 2.2 µH and current ratings up to 33.2 A. The XEL4030V series is offered in 13 values from 0.10 to 6.8 µH and current ratings up to 30.0 A.

All models offer soft saturation characteristics to withstand high current spikes. They are qualified to AEC-Q200 Grade 1 (−40°C to +125°C) standards and exhibit no thermal aging issues, making them ideal for automotive and other harsh-environment applications. They also feature RoHS-compliant, tin-silver-over-copper terminations and are halogen free. For more information see the pages for the XEL4012V, 4014V, XEL4020V and XEL4030V inductors. Free evaluation samples are available online.

Inductors Reduce DC Resistance By Up To 40%

Coilcraft's XGL4030 series of high-performance, molded power inductors offer up to 40% lower DCR than the previous best-in-class inductors as well as extremely low ac losses, resulting in the best overall efficiency over a wide range of ac ripple current. They are well suited for dc-dc converters with switching frequencies ranging from hundreds of kilohertz to 5 MHz and above.



The XGL4030 features an expanded inductance range, including 18 values from 0.13 to 12.0 µH, with current ratings up to 26.5 A and soft saturation characteristics. It also offers a 30% increase in Irms self-heating current, allowing the XGL4030 to operate much cooler than previous-generation components.

These inductors are qualified to AEC-Q200 Grade 1 standards (-40°C to +125°C ambient) with a maximum part operating temperature of +165°C and exhibit no thermal aging issues, making them suitable for automotive and other harsh-environment applications. They feature RoHS-compliant, tin-silver-over-copper terminations and are halogen free. Their composite construction also minimizes audible buzzing. Free evaluation samples are available online. For more information, see the XGL4030 series page.

Expanded Line Of High-Temperature Shielded Drum And Ring Core Inductors

Sumida's CDRH50D28B/T150 series of high-temperature shielded drum and ring core inductors, which are AEC-Q200-qualified SMD inductors, has been expanded in response to growth in demand for high-temperature automotive and industrial circuitry. Five additional package sizes have now been added to the family, with over 50 devices offered overall. The smallest measures 5.3 x 5.0 x 2.8 mm and the largest is 13.1 x 12.8 x 8.0 mm. Inductances range from 0.8 to 680 µH, with DCR as low as 4.5 mΩ, and a saturation current of up to 31 A.

These inductors rely on Sumida's Ni-Zn ferrite core technology. Using this material and a special geometric construction allows the CDRH*0D**BT150 series to be highly space-efficient. Dc resistance and saturation current performance are superior to other similar-size devices in the market, according to the vendor. At the same time, the ferrite drum and ring core architecture is said to offer very effective magnetic shielding. As automotive circuit densities increase, the effectiveness of this shielding grows in importance, in order to minimize EMI that could interfere with adjacent circuitry.

The custom lead-frame construction with metal compound molding supports the mechanical demands required for the automotive environment and will allow the parts to more than tolerate automotive vibration and shock requirements. On the electrical side, the inductors can withstand a voltage of up to 120 Vdc. A summary of the specifications for each size device is shown below in the table.

Table. Key specifications for the CDRH50D28B/T150 series.

Device	Size (mm)	Inductance (µH)	DCR (mΩ)	Saturation current (A)
CDRH50D28BT150	5.3 x 5.0 x 2.8	1 to 100	18 to 780	6.5 to 0.65
CDRH60D45BT150	6.6 x 6.3 x 4.8	1 to 330	11 to 970	4.8 to 0.49
CDRH70D45BT150	7.7 x 7.3 x 4.8	0.8 to 680	7.0 to 1750	10.7 to 0.35
CDRH80D65BT150	6.6 x 6.3 x 4.8	1 to 330	11 to 970	8.5 to 0.5
CDRH10D60BT150	10.3 x 10 x 6.35	0.8 to 470	5.4 to 770	21.2 to 0.88
CDRH12D77BT150	13.1 x 12.8 x 8.0	1 to 470	4.5 to 510	31 to 1.40

The full operating temperature range is -55°C to 150°C (including the coil's self-temperature rise) and all six families are fully qualified to the automotive AEC-Q200 reliability test requirements.

Popular automotive applications include advanced driver assistance systems (ADASs), LED headlight driver circuits, adaptive driving beam (ADB), adaptive front-lighting system (AFS), dc-dc converters and other automotive applications. These may include ECU, BMS, navigation systems, infotainment systems, hybrid engine controls, ABS, or any high-reliability application. The CDRH*0D**BT150 series power inductors are available now and are in-stock at Digi-Key. For more information see the RH*0D**BT150 product page or see the datasheet.

Compact Dual Inductors With High Saturation Current

TDK has extended its range of dual inductors to include the EPCOS series B82477D6. The seven series types cover an inductance range from 2 x 3.9 µH to 2 x 47 µH and are designed for maximum rated currents from 2.83 A to 7.05 A. High saturation currents of up to 16.1 are a special feature of the inductors, which are certified according to AEC-Q200 and compatible with RoHS.

The magnetically shielded inductors have dimensions of just 12.5 x 12.5 x 10.5 mm and are designed for a wide temperature range of -55°C to +150°C. Depending on the type, the inductors offer very high coupling factors of the two windings from 97% to 99%.

The fields of application of dual inductors are diverse. They can be used as coupled inductors in SEPIC converters or 1:1 transformers in flyback topologies. A further application involves use as a common-mode inductor in power supply lines. The isolation voltage between the two windings is >500 V.

Table. Key electrical specifications for the EPCOS series B82477D6.

Order number	Inductance L1 and L2 (µH)	Max. rated current (A)	Saturation current (A)	DC resistance L1 and L2 (mΩ)
B82477D6392M603	3.9	7.05	16.1	13.9
B82477D6682M603	6.8	6.40	11.8	17.0
B82477D6103M603	10	5.65	9.9	22.5
B82477D6153M603	15	4.92	8.7	29.6
B82477D6223M603	22	3.85	7.2	45.0
B82477D6333M603	33	3.22	5.6	60.5
B82477D6473M603	47	2.83	4.7	81.8

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

Automotive-Grade Inductor Offers Stable Inductance Up To +180°C And 150 A

Vishay Intertechnology's new IHDM automotive-grade edge-wound, through-hole inductor is rated for currents up to 150 A for under-the-hood applications. Featuring powdered iron alloy core technology, the Vishay Custom Magnetics IHDM-1008BC-3A provides stable inductance and saturation over a demanding operating temperature range from -40°C to +180°C with low power losses and excellent heat dissipation.

The edge-wound coil of this device provides low DCR down to 0.25 mΩ, which minimizes losses and improves rated current performance for increased efficiency. Compared to competing ferrite-based solutions, the IHDM-1008BC-3A offers 30% higher rated current and 30% higher saturation current levels at +125°C and above, according to the company. The inductor's soft saturation provides a predictable inductance decrease with increasing current, with stable inductance across the operating temperature range.

With an operating voltage up to 350 V, the device is well suited for high-current, high-temperature power applications, including dc-dc converters, inverters, and filters for motor and switching noise suppression in hybrid, full-electric, and hydrogen fuel cell vehicles.

The IHDM-1008BC-3A's standard through-hole mounting terminals are stripped and hot-dip tinned to reduce the risk of tin whisker growth. However, Vishay can customize the device's mounting method, and performance, on request. Options include bare copper, surface mount, and press fit. The device is RoHS-compliant, halogen-free, and Vishay Green.

Samples and production quantities of the inductor are available now. Pricing for U.S. delivery only is $8.13 per piece in 1000-piece quantities. For more information, see the IHDM-1008BC-3A product page.

Table. Key device specifications for the IHDM-1008BC-3A.

Case size	1008
Dimensions (mm)	25 x 20 x 23
Inductance (µH)	1.2 to 4.7
DCR typ. (mΩ)	0.25 to 0.86
DCR max. (mΩ)	0.30 to 0.95
Heat rating current (A)	45 to 80
Saturation current (A)	50 to 110[1]/70 to 150[2]
SRF typ. (MHz)	15 to 90

[1]Dc current (A) that will cause L_0 to drop approximately 20%.
[2]Dc current (A) that will cause L_0 to drop approximately 30%.

Integrated E-Shield Inductors Save Space

Vishay Intertechnology has expanded its IHLE series of low-profile, high-current inductors featuring integrated e-shields for the reduction of EMI with new commercial- and automotive-grade devices in the 5050 case size. The Vishay Dale IHLE-5050FH-51 and IHLE-5050FH-5A lower costs and save board space by eliminating the need for separate board-level Faraday shielding.

These devices contain the electric and B field associated with EMI in a tin-plated copper integrated shield, providing up to -20 dB of electric field reduction at 1 cm (above the center of the inductor) when the integrated shield is connected to ground.

Featuring high temperature operation to +155°C and coplanarity of their four terminals within ≤100 µm, the inductors are optimized for energy storage in dc-dc converters up to 2 MHz and provide excellent attenuation of noise in high-current filtering applications up to the SRF of the inductor.

Applications for the IHLE-5050FH-51 include servers and desktop PCs; high-current POL converters; low-profile, high-current power supplies; and battery-powered devices. The AEC-Q200-qualified IHLE-5050FH-5A will be used in automotive engine and transmission control units, diesel injection drivers, noise suppression for motors, windshield wipers, power mirrors and seats, entertainment/navigation systems, heating and ventilation blowers, and LED and HID lighting.

Packaged in a 100% lead (Pb)-free shielded, composite construction that reduces buzz to ultra low levels, the inductors offer high resistance to thermal shock, moisture, and mechanical shock, and handle high transient current spikes without saturation. The IHLE-5050FH-51 and IHLE-5050FH-5A are RoHS-compliant, halogen-free, and Vishay Green.

Table. Key device specifications for the IHLE-5050FH-51 and IHLE-5050FH-5A.

Part number	IHLE-5050FH-51 and IHLE-5050FH-5A
Case size	5050
Inductance @ 100 kHz (µH)	0.33 to 100

DCR typ. at 25°C (mΩ)	0.83 to 175
DCR max. at 25°C (mΩ)	0.92 to 205.0
Heat rating current typ. (A)	3.1 to 62
Saturation current typ. (A)	3.7 to 44
SRF typ. (MHz)	2.8 to 79.9

Samples and production quantities of these devices are available now. Pricing for U.S. delivery only starts at $0.90 per piece in 10,000-piece quantities. For more information, see the IHLE-5050FH-51 page and the IHLE-5050FH-5A page.

Low-Profile, Edge-Wound Inductor Handles Saturation Current To 230 A

From Vishay Intertechnology, the Vishay Dale IHDF-1300AE-10 is an edge-wound, through-hole inductor with rated current up to 72 A and saturation currents up to 230 A for industrial and military applications. Featuring ferrite core technology and a low 15.4-mm maximum profile, the inductor operates over a demanding temperature range from -55°C to +125°C with low ac and dc power losses and excellent heat dissipation.

The edge-wound coil of the device released today provides low DCR of 1.1 mΩ maximum, which minimizes losses and improves rated current performance for increased efficiency. Compared to competing ferrite-based solutions, the IHDF-1300AE-10 offers 75% higher saturation current, according to the company. The device's low-profile package allows designers to meet harsh mechanical shock and vibration requirements while minimizing board height to save space.

With an operating voltage up to 500 Vdc, the device is well suited for dc-dc converters, inverters, and motor and switching noise suppression, and high-power switch-mode power supplies in high-current, high-temperature applications, including industrial solar systems and charging stations for electric vehicles, as well as military defense systems.

Vishay can customize the IHDF-1300AE-10's mounting orientation, termination type, nominal inductance, and isolation voltage rating on request. To reduce the risk of whisker growth, the inductor features a hot-dipped tin plating. The device is RoHS-compliant, halogen-free, and Vishay Green.

Table. Key device specifications for the IHDF-1300AE-10.

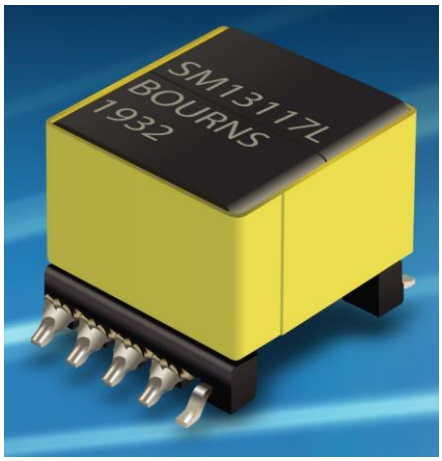
Case size	1300
Profile (mm)	15.4
Inductance (µH)	1.0 to 10
DCR max. (mΩ)	0.79 to 1.11
Heat rating current (A)	58 to 72
Saturation current (A)	35 to 230*
SRF typ. (MHz)	9 to 39

Dc current (A) that will cause L_0 to drop approximately 20%.

Samples and production quantities of the inductor are available now. Pricing for U.S. delivery only is $5.98 per piece in 1,000-piece quantities. For more information, see the IHDF-1300AE-10 page.

Transformers

Flyback Transformer Enhances DC-DC Efficiency In Isolated Mode



An addition to the company's flyback power transformer line, Bourns' Model SM13117EL supports IEEE 802.3 af-compliant, integrated Power-over-Ethernet (PoE) powered device (PD) and pulse width modulation (PWM) controller applications, providing dc-dc conversion in isolated mode. The SM13117EL flyback transformer features 13 W of output power, 36 to 72 Vdc and 250-kHz input, 12-Vdc/1.08-A output and 1.5-kVrms withstanding voltage.

This low-profile, small-form-factor PoE flyback transformer also offers an extended -40°C to +125°C operating temperature range, low leakage inductance and excellent EMI performance. Ensuring safe operation, the electrical insulation of the transformer complies with the UL 1446 Class B (130°C) insulation system. The transformer bobbin carries the UL 94 V-0 flammability rating.

The features of Bourns' latest flyback power transformer make it an excellent power conversion solution for a broad range of PoE-powered devices including VoIP phones, WLAN access points and network cameras as well as with integrated PoE PD interface and PWM controllers offered by several leading IC manufacturers. The Model SM13117EL is available now and is RoHS compliant. For more information, see the datasheet.

Environmentally Resilient Transformers For Low-Voltage Lighting

Signal Transformer's Lighting Transformer (LT) series features small size and safety extra low voltage (SELV) outputs designed for industries and OEM installations of landscape, track, recessed and LED lighting, as well as security systems, in the commercial, consumer and industrial sectors. When SELV outputs are required to operate control equipment and other electronic devices, a stepdown transformer is needed to convert from 120 V or 277 V to 12 V. Offering a safer work environment, the SELV isolation provided by Signal's LT transformer series eliminates potential shock hazards.

The LT277-50-12 is well suited for 480-V, three-phase four-wire systems, where line voltage to neutral is equal to single-phase 277 V 50/60 Hz. The LT120-50-12 is designed for single-phase 120-V 50-/60-Hz supplies. The LT Series is easy to mount and can be hardwired via standard 0.5-in. conduit hardware and a straight box connection.

Signal's design features a corrosion-resistant surface coating that is environmentally resilient, with insulation Class B 130°C 1446. All the lead connections are 18 AWG UL 1015. The LT series is UL recognized to North American Harmonized standards: UL5085-1-2 and CSA C22.2 No. 66. With rugged construction at a reasonable price, Signal's experienced engineering team has utilized the latest software in transformer design to develop the LT series. For more information, see the LT Series product page.

Current-Sense Transformers Support Overload Detection And Load Shedding

TDK's B82801A1 series compact EPCOS SMT current-sense transformers are designed for measuring currents of up to 7 A at frequencies between 50 kHz and 1 MHz. The B82801A1 series comprises nine models that offer transformation ratios from 1:20 to 1:150 between the primary and secondary winding. The maximum dc resistance of the primary winding for all types is only 2.5 mΩ. Excellent reproducibility and reliability are ensured by highly automated production using laser welding technology.

The compact design of the RoHS-compatible components is particularly noteworthy: The footprint is only 4.5 x 4.85 mm and the height is 3.5 mm. Thanks

to the insulating coating of the ferrite cores, a particularly space-saving installation on tightly populated boards is possible. The test voltage of the windings is 500 V. Applications of the current-sense transformers include overload detection and detection of load shedding in switch-mode power supplies.

Further information on the products can be found on the SMT Current Sense Transformers (EPCOS)

page.

Chokes And Beads

Common-Mode Toroidal Chokes Provide Vertical PCB Mounting And High Current Capacity

Signal Transformer's HCTC series common-mode toroidal chokes for design engineers and manufacturers who specify power supplies accommodating common-mode noise reduction and line filtering. The HCTC series features a solid carrier base for stable vertical PCB mounting and fixed-pin spacing for easy PCB insertion, high current capacity and excellent EMI suppression, which provides flexibility in the selection process with multiple options to choose from.

A wide range of inductance and current ratings enables an optimal board layout, allowing cooler running EMI/RFI filtering to be incorporated into multiple applications, including power supplies, LCD panels, computers and monitors, dc-dc converters and electric vehicle charging. Utilization of the largest possible conductor size for reduced heat rise and selection of low-loss core material ensures high efficiency in a small package, while maintaining competitive cost for industrial, electronic, telecommunications, power and electric vehicle (EV) industries.

The HCTC series will be available for prototype and production quantities through Digi-Key and Mouser. For more detailed information, download the datasheet.

Surface-Mount High-Voltage Double Chokes Offer Lower Losses

Würth Elektronik eiSos' WE-TDC HV series double chokes are optimized for SMT assembly. The magnetically shielded 1:1 transformers with an isolation voltage of 2,000 V are said to stand out from similar components through lower losses and a low level of stray inductance. The WE-TDC HV product family encompasses nine different models—five in an 8038 package and four in 8018. The height of just 1.8 mm makes these chokes unique in their class, according to the vendor.

WE-TDC HV chokes are specified for the extended operating temperature from -40 to +125°C and have a functional isolation for a working voltage of 250 Vrms. They are suitable for use in switching controllers with a second, unregulated output voltage, in buck, boost, SEPIC, Zeta, and Cuk converters, as well as in isolated converter applications with high packaging density (e.g. flyback converters). The components are available from stock.

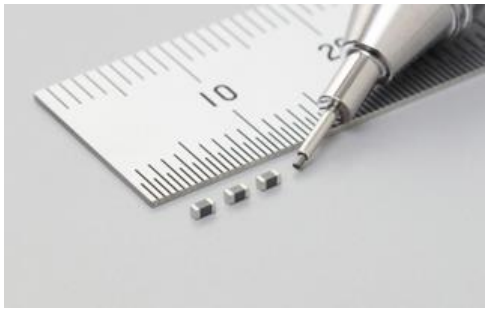
Storage Choke For Filtering In Class D Amplifiers

Würth Elektronik's WE-LHMD is a surface-mount storage choke optimized for filter topologies in class D amplifiers. Thanks to their iron powder cores, the high-current inductors for audio applications (available in 1008 and 1213 packages) display stable behavior at high peak currents.

The WE-LHMD features the 2-in-1 design from non-coupled inductors and is therefore suitable for compact bridge-tied load) applications. The inductors are characterized by high saturation currents from 13 A to 25 A and low dc resistances from 16 mΩ to 104 mΩ. The operating temperature is specified for -40°C to +125°C. All chokes are available from stock without a minimum order quantity.

Ferrite Chip Beads Deliver Small Size For Automotive Power Supplies

Members of Murata Manufacturing's BLM18SP_SH1 series are described as the world's smallest chip ferrite beads for noise suppression in automotive power supply applications. More specifically, these components are said to be the world's smallest products with impedance values of 30 Ω to 1 kΩ and rated current values of 6 A to 1.2 A. (Based on internal study, as of June 8, 2020)



In recent years, in keeping with the progress of automobile electrification, cars have been equipped with an increasing number of electronic components such as cameras, radar, LiDAR and ECUs in order to support ADAS and autonomous driving. To ensure that the numerous in-vehicle components function properly and that a high degree of safety is maintained, it is essential to employ countermeasures against noise in power supply circuits and to ensure a stable power supply to each component. As the number of in-vehicle components increases, needs are growing for improved noise suppression capabilities as well as for miniaturization.

With a new structural design that utilizes internal electrode fabrication technology, the BLM18SP_SH1 series realizes improved impedance acquisition efficiency along with lower resistance, which leads to a large current. In addition, commercialized in an 0603 size (1.6-mm × 0.8-mm) package, this series has a 50% smaller base area compared to conventional products which are typically packaged in 0805-size (2.0-mm × 1.25-mm), according to the company. This provides manufacturers with more flexibility when designing automotive power supply circuits.

Murata also has two other series in the 0603-in. size—the BLM18SP_SZ1 series for in-vehicle infotainment and the BLM18SP_SN1 series for consumer devices. Other features of the BLM18SP_SH1 series include compliance with AEC-Q200, two times the rated current and three times the impedance of Murata's conventional product (BLM18PG221SH1) and support of current ratings up to 6 A or 1-kΩ impedance (in the BLM18SP_SH1 series).

Table 1. Key specifications of the BLM18SP_SH1 series with specs for BLM18PG_SH1 series also shown for comparison.

Product number	Impedance (Ω) (at 100 MHz)		Rated current (mA)	
	Impedance	Tolerance	At ambient temperature 85°C	At ambient temperature 125°C
BLM18SP300SH1	30	±10Ω	6000	4000
BLM18SP101SH1	100	±25%	3700	2500
BLM18SP221SH1	220	±25%	2800	1900
BLM18SP601SH1	600	±25%	1500	1000
BLM18SP102SH1	1000	±25%	1200	800
For Comparison:				
BLM18PG221SH1	220	±25%	1400	1000
BLM18PG221SH1	220	±25%	1400	1000

The company has started shipping samples, and volume production is scheduled to begin in June 2020. For more product details, see the website. Or see the links in the table for details on specific part numbers.

Wireless Power Coils

Wireless Charging Coils Are Direct Replacements For EOL Devices

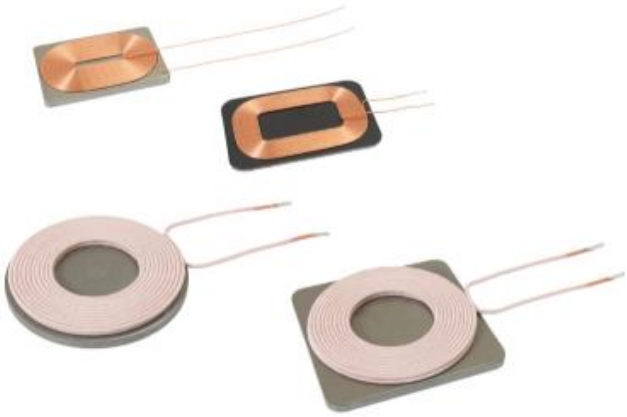
Vishay Intertechnology's powdered-iron-based, Wireless Power Consortium (WPC) compliant wireless charging coils offer direct replacements for devices for which end-of-life (EOL) was announced in 2017. Offering a durable construction and high-permeability shielding, the Vishay Dale receiver and transmitter coils provide high efficiency in a variety of industry-standard sizes.

For wireless charging up to 10 W in portable electronics, the six new receiver coils feature inductance of 10.8 µH to 22 µH at 200 kHz with ±5% inductance tolerance, typical Q from 29 to 65 at 200 kHz, and DCR from 175 mΩ to 427 mΩ (± 5%) at +25°C.

For Qi wireless charging pads, the three new transmitters offer inductance of 6.3 µH to 24 µH at 200 kHz with a ± 5% inductance tolerance, DCR from 40 mΩ to 75 mΩ (±5%) at +25°C, and a typical Q from 185 to 200 at 200 kHz. The devices are available with heat rated current of 6 A and 7 A, and saturation current of 20 A and 22 A.

Table. Cross references of original and replacement part numbers.

Original part number	Replacement part number
IWAS3222BZEB190J50	IWAS3222CZEB190JF1
IWAS3827ECEB100J50	IWAS3827ABEB110JF1
IWAS3827ECEB100J54	IWAS3827ABEB100JF1
IWAS4832FFEB9R7J50	IWAS4832ABEB110JF1
IWAS4832FEEB150J50	IWAS4832ADEB150JF1
IWAS4832ECEB220J50	IWAS4832AAEB220JF1
IWTX4646BEEB240J50	IWTX4646DCEB240JF1
IWTX47R0BEEB6R3J11	IWTX47R0DAEB6R3JF1
IWTX47R0BEEB240K11	IWTX47R0EBEB240JF1



Samples and production quantities of the wireless charging coils are available now. Pricing for U.S. delivery only ranges from $0.75 to $3.00 per piece. For more information, see the product pages linked to in the table.

Wireless Power Coil Combines Charging Function And NFC

Würth Elektronik's WE-WPCC WPT/NFC combines wireless power transmission with the near field communication (NCF) standard enabling, for example, the combination of a charging station for smartphones with identification and payment functions. Other additions to the company's large range of wireless power transfer coils include a high power coil (WE-WPCC 760308101311) with 400-W output and a "flat" version, two coils whose respective heights of 2.8 mm and 3.1 mm are said to be half as high as those of other transmitter coils (WE-WPCC 760308101411 and 760308101410).

The NFC coil in the WE-WPCC WPT/NFC enables data rates up to 848 kbps and the WPT coil allows wireless power transmission output up to 100 W (at 20-V input voltage) in one efficient solution. Data can be transferred while wirelessly charging sensors, smartphones, wearables, handhelds, digital cameras, smart watches or tablets.

The coil combination in the compact PET sleeve with adhesive surface can be used according to the Qi (5 W and 15 W) and AirFuel Alliance standards as well as in proprietary solutions with higher power. This means the transmitter is equally suitable for consumer electronics and industrial applications. Stranded wire and high-quality ferrite material ensure maximum energy transmission efficiency and the high permeability of the shielding concentrates the magnetic field and protects sensitive electronics or batteries from interfering signals.

The new transmitter coils are available from stock without a minimum order quantity. Free samples can be requested. For more information, see the datasheets for the WE-WPCC 760308101311, 760308101411 and 760308101410. For the optimal combination of transmitter and receiver coils, Würth Elektronik recommends its "Mix and Match" tool and also the Wireless Power Development Kits.

Design Tool And Magnetics Literature

Tool Calculates Application Parameters For Latest Ferrite Materials And Core Shapes

TDK has announced a completely revised Magnetic Design Tool with enhanced functionality. The updated tool now enables the fast and easy calculation and graphical representation of application-related parameters for all EPCOS ferrite materials, including new materials for high-frequency switch-mode power supplies, and core shapes.

The powerful Magnetic Design Tool is available as a browser-based application and has been tested in commonly used browsers such as Chrome, Firefox, Internet Explorer and Opera. Alternatively, it can be downloaded and used with Windows 10.

In the current version, the Magnetic Design Tool allows users to define the parameters for their own cores and then use them in their calculations. The versatile tool can be used to calculate and display the most important material properties, such as power loss versus frequency, flux density, temperature and the performance factor.

In addition, it can also perform a comprehensive range of core calculations, including the AL-value in dependence to the air gap, the determination of transferable power, or the calculation of impedance versus frequency. Further information on the tool can be found on TDK's Magnetic Design Tool page.

White Paper Explores Quality Issues And Strategies In Magnetics Manufacturing

A white paper from Triad Magnetics "Why Is Quality Important? Quality Control and Quality Assurance in Magnetics" discusses why quality is central to Triad's culture, and explains "the key points of QC and QA strategies and how they can influence a magnetic company's health and performance." This 9-page paper is available as a PDF-formatted eBook.

This eBook breaks down important quality processes unique to the industry, including:

- Quality control vs. quality assurance
- How magnetics' quality impacts cost
- Quality initiatives
- Quality assurance tools.

To download a copy, see the website.