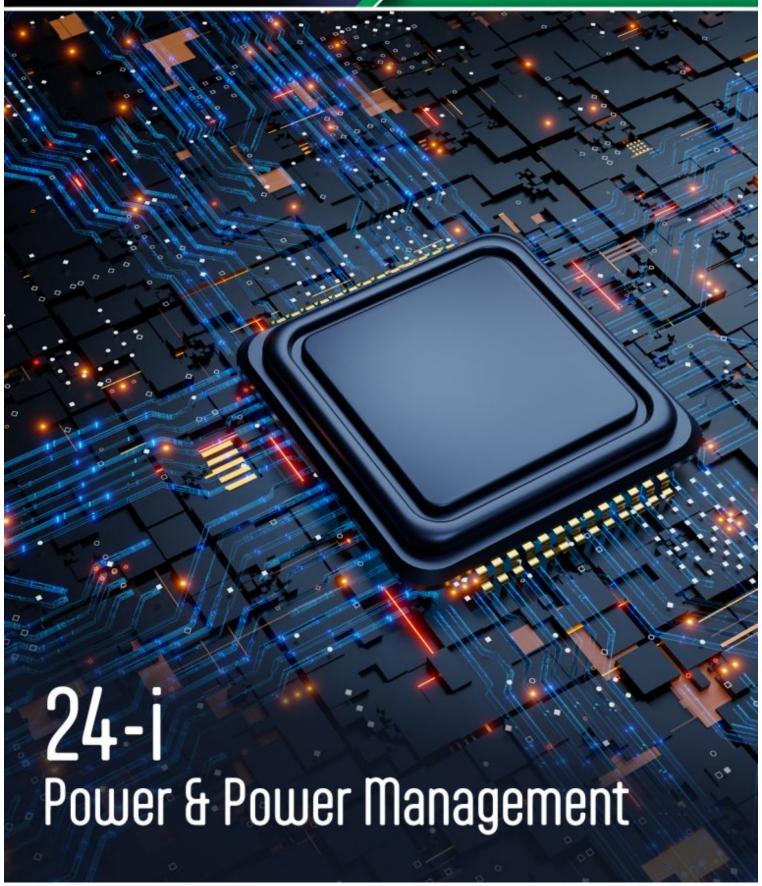






NPI's, DESIGN & TECHNOLOGY NEWS







Synchronous buck controller ideal for stepping down high-voltage battery supply

The STMicroelectronics L3751, which operates from a very wide input-voltage range of 6 V to 75 V, can step the input from a power distribution bus down to a power rail at 12 V or 5 V.



The L3751 from STMicroelectronics is a synchronous dc-dc step-down power controller which can support extreme voltage-conversion ratios with good power efficiency.

Operating from an input-voltage range of 6 V to 75 V, the L3751 provides an adjustable output of between 0.8 V and 60 V while switching at frequencies ranging from 100 kHz to 1 MHz. The controller is ideal for circuits that convert the output from a high-voltage battery or unregulated 24 V and 48 V bus to an application's 12 V or 5 V power rail.

In diode emulation mode, the L3751 implements a pulse-skipping function which maximizes efficiency at light loads, and limits output-voltage ripple. Forced PWM operation over the entire load range holds the switching frequency constant, and also minimizes output-voltage ripple.

The controller features a Power Good output which validates the regulated output voltage: this is useful for implementing power sequencing during a digital IC power-up phase.

The L3751 includes 7.5 V gate drivers compatible with standard MOSFETs, eliminating the need for external gate drivers in a converter circuit. Embedded protection functions include output over-current, under-voltage lockout, internal voltage monitoring, and thermal shutdown.

Developers can use the ST eDesignSuite software tool to configure the L3751 buck converter for the application. **The tool is available by clicking here.**



life.augmented

FEATURES

- 40 ns minimum on-time
- · Internal voltage monitoring
- Low drop-out operation during line transients
- Adjustable soft-start or input-voltage tracking
- Operating-temperature range: -40°C to 150°C

APPLICATIONS

- Telecoms and networking equipment
- Fail-safe systems
- Industrial equipment

FREE DEV BOARD

Evaluation board for L3751 dc-dc stepdown power controller.

Orderable Part Number STEVAL-L3751V12

APPLY HERE NOW

























Load switch supports multiplexing between 5 V and 12 V power rails

The SLG59H1405V from Renesas offers a broad set of circuit-protection features. The device is housed in a compact package which can withstand high ESD voltages.



Renesas has developed the SLG59H1405V dual load switch to provide a robust solution for switch-over between 5 V and 12 V power rails in multiplexed power circuits.

The SLG59H1405V contains one load switch rated for 5 V/3 A, and a second load switch rated for 12 V/1.25 A, both sharing a common output. The device supports manual selection of power rails and seamless transition between the power inputs.

The SLG59H1405V's numerous protection features include:

- Input under-voltage lockout
- Input over-voltage protection
- Over-temperature protection
- Active current limit for each channel, adjustable by resistor
- · Internal short-circuit current limit
- · Open-drain fault flag output

The SLG59H1405V is supplied in a 12-lead QFN package which has a 2.0 mm x 2.5 mm footprint.

RENESAS

FEATURES

- Input-voltage ranges:
 - o 5 V nominal: 1.4 V to 5.5 V
 - $\circ~$ 12 V nominal: 2.4 V to 13.2 V
- Low on-resistance
- Ideal diode behavior during switchover
- True reverse-current blocking
- · Robust ESD capability

APPLICATIONS

- · Consumer electronics
- Smart home appliances
- Computing equipment
- Networking equipment
- Portable devices

FREE DEV BOARD

The SLG59H1405V-EVB board provides a ready-made platform for evaluating the SLG59H1405V high-voltage GreenFET load switch.

Orderable Part Number SLG59H1405V-EVB

APPLY HERE NOW





























New 650 V SiC MOSFETs in TOLL packaging offer high reliability, low losses and superior thermal performance

Robust IMT65RxxxM1H series of CoolSiC[™] silicon carbide (SiC) MOSFETs from Infineon provides high reliability even in harsh conditions, such as repetitive hard-switching topologies.



Infineon has released new 650 V CoolSiC silicon carbide (SiC) MOSFETs, supplied in a TO leadless (TOLL) package, which can reduce the losses and improve the reliability of power conversion circuits. The MOSFETs are an ideal choice for topologies with repetitive hard commutation, such as totem-pole power factor correction.

The new IMT65RxxxM1H family devices are supplied in a JEDEC-qualified TOLL package which has low parasitic inductance, allowing for higher switching frequency and reduced switching losses. The TOLL package, which is compatible with automated assembly equipment, also offers lower thermal impedance than the familiar D2PAK package. Thermal performance is enhanced by the inclusion of innovative .XT interconnect technology.

The IMT65RxxxM1H MOSFETs are notable for their high reliability even in harsh operating conditions. A gate threshold voltage higher than 4 V secures the device against parasitic turnon. The MOSFET also features a robust body diode, and strong gate oxide which helps produce extremely low failures in time (FIT) rates.

Infineon has worked to make these CoolSiC MOSFETs easy to use. While a cut-off voltage of 0 V is generally recommended to simplify the driving circuit, the new products support a broad gate-source voltage spread, from a turn-off voltage down to -5 V up to a maximum turn-on voltage of 23 V. This makes the IMT65RxxxM1H products compatible with other SiC MOSFETs and with standard MOSFET gate drivers.



FEATURES

- Total gate-charge range: 6 nC to 67 nC
- On-resistance range: 22 m Ω to 260 m Ω
- Max continuous drain-current range:
 6 A to 79 A
- Withstands up to 200 V/ns transients
- · Small form factor
- Low parasitic inductance and Kelvin source connection
- Reduced thermal impedance
- .XT interconnect technology
- Suitable for wave or reflow soldering
- Qualified to JEDEC industrial standards
 J-STD20 and JESD22

APPLICATIONS

- Server power supplies
- Telecoms infrastructure
- Energy storage systems
- EV battery formation equipment
- Motor drives
- Solar inverters

運 BUY NOW



























300 mA LDOs provide point-of-load supply to battery-powered automotive systems

The AP7583AQ and AP7583Q LDOs from Diodes Incorporated include a power-good indicator to help maintain a reliable power supply and to enable rapid identification of power faults.



Diodes Incorporated has introduced two new automotive-compliant LDO voltage regulators which are ideal for providing a point-of-load power supply to battery-connected automotive ICs or systems. The AP7583AQ and AP7583Q LDOs provide a maximum output current of 300 mA. Their dropout voltage is 320 mV.

The LDOs feature a power-good indicator which enables continual power-supply monitoring. It also provides fault reporting capabilities and facilitates power sequencing.

The AP7583AQ and AP7583Q LDOs are available with a fixed output voltage of 3.3 V or 5 V, or with an adjustable output. They operate over a wide input-voltage range of 3 V to 42 V. This allows these LDOs to support cold-cranking and to handle load dumps.

The ultra-low quiescent current of 3 μ A is another key characteristic of the AP7583AQ and AP7583Q series, helping to restrict power consumption in always-on components such as microcontrollers and CAN transceivers in standby systems.



FEATURES

- AEC-Q100 Grade 1 qualified
- ±1.5% output-voltage accuracy
- Compatible with low-ESR ceramic capacitor
- Excellent line and load regulation
- Protection functions:
 - o Thermal shutdown
 - Short-current protection
 - o Output current limit

APPLICATIONS

- Automotive circuits:
 - Point-of-load power supplies
 - Head units
 - o Battery management systems
 - Body control modules
 - o Transmission control units
 - o Exterior lighting infrastructure
 - o Instrument clusters

BUY NOW

























Medical-grade 6 W ac-dc converter occupies tiny 1" x 1" footprint

The space-saving RACM06E-K/277 from RECOM operates from a universal mains power input, and offers a choice of output-voltage options. This converter is certified for use in medical, industrial and home applications.



RECOM has launched the RACM06E-K/277, a family of board-mount, through-hole 6 W ac-dc converters which are supplied in a low-profile encapsulated package with a footprint of just 1" x 1". Featuring reinforced isolation and rated for two means of patient protection (2MOPP), these converter modules are suitable for use in patient-connected medical equipment, as well as a wide variety of other applications.

The RACM06E-K/277 converters operate over a broad input-voltage range for use with mains power worldwide: from 100 V to 277 V ac, and from 120 V to 430 V dc. Output-voltage options are 3.3 V, 5 V, 12 V, 15 V, and 24 V.

The converters' high efficiency, maintained with light loads, enables operation at ambient temperatures ranging from -40°C to 90°C, with a full load rating up to 60°C.

The RACM06E-K/277 holds safety certifications for use in IT/multimedia, medical, industrial, and household applications. It meets the requirements of Class B EMC specifications with a wide margin when supplying a floating load. For medical use, touch current is less than 0.1 mA for body-floating patient-connected applications.

RECOM

FEATURES

- Three years' warranty
- 120 mW maximum no-load power consumption
- · Protection functions:
 - o Over-temperature
 - o Output short circuit
 - o Over-voltage
- Almost 2 millions hours' mean time before failure

APPLICATIONS

- Medical equipment
- Industrial equipment
- Household appliances
- Portable devices
- IoT devices
- Auxiliary power supplies

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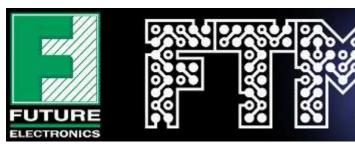












800 V MOSFET enables designers to achieve high power density

The STP80N240K6 from STMicroelectronics features very low on-resistance as a function of area, helping designers to develop power systems that are both compact and efficient.



The STP80N240K6 from STMicroelectronics is a very high-voltage superjunction power MOSFET supplied in a TO-220 package.

The device uses ST's MDmesh K6 technology, which is the result of 20 years of experience in the development of superjunction MOSFETs. This K6 technology enables ST to produce high-performance 800 V-rated MOSFETs which are extremely easy to use.

The N-channel STP80N240K6 is part of the 800 V K6 family of MOSFETs. It combines very low on-resistance of 197 m Ω with low gate charge to produce high switching performance and low overall power losses. Maximum drain current is 16 A.

With the STP80N240K6, ST has achieved the best-in-class on-resistance as a function of area, enabling designers to realize smaller power-system designs. The STP80N240K6 is an ideal fit for applications such as LED drivers and auxiliary power supplies that are based on a flyback converter topology and that require high power density and high efficiency.

In the same K6 family is the STP80N450K6, an 800 V N-channel MOSFET in a TO-220 package. The STP80N450K6 features on-resistance of 380 m Ω , and has a maximum drain current of 10 A.



FEATURES

STP80N240K6

- 3.5 V gate threshold voltage
- 25.9 nC total gate charge
- 100% avalanche tested
- Integrated Zener diode protection
- Operating-temperature range: -55°C to 150°C

APPLICATIONS

- Flyback power converters in:
 - o LED drivers
 - o Power adapters
 - o Auxiliary power supplies
 - Metering equipment













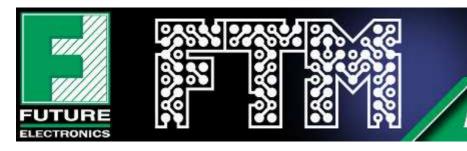






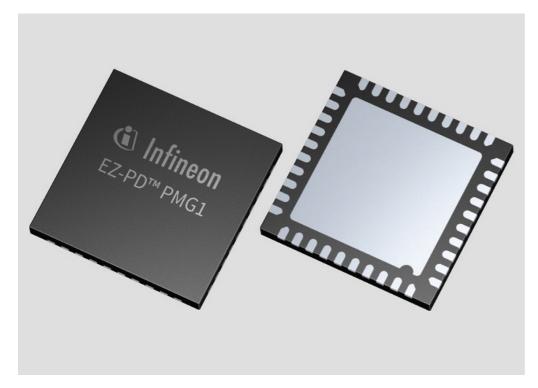






Single-chip solution for devices powered over a USB Type-C connection

The EZ-PD™ PMG1 family of devices from Infineon integrates a high-voltage microcontroller alongside a USB Type-C® Power Delivery controller, streamlining USB Type-C implementation by replacing the main MCU with a single-chip solution.



The EZ-PD PMG1 from Infineon is a family of high-voltage microcontrollers including an integrated USB Type-C Power Delivery (PD) controller. The provision of a single-chip solution solves the problems that design engineers face when implementing USB Type-C connectivity and USB PD capability in their applications. The Infineon integrated option:

- Eliminates the need for in-depth USB Type-C knowledge
- Performs the functions that require the capabilities of a low-cost yet flexible MCU
- Provides on-chip security and protection functions
- Reduces the bill-of-materials and saves board space

The EZ-PD PMG1 MCUs include an Arm[®] Cortex[®]-M0/M0+ core and a USB Type-C PD controller together with configurable analog and digital peripherals. These are suitable for use in any embedded system that provides or consumes power to or from a high-voltage USB Type-C PD port.

The MCUs include a proven USB-PD protocol stack which complies with the USB specifications and ensures interoperability with other USB equipment. Development of USB-PD applications is supported by a software development kit (SDK) provided by Infineon as part of the ModusToolbox™ firmware development environment. ModusToolbox software also enables seamless migration between all EZ-PD PMG1 devices.

Now Infineon has created a new prototyping kit for the EZ-PD PMG1-B1, the USB-C high voltage MCU that has an integrated buck-boost battery charger. The new EVAL_PMG1_B1_DRP board adds to the portfolio of development systems from Infineon, which also includes the CY7110, CY7111, CY7112 and CY7113.



FEATURES

EVAL_PMG1_B1_DRP

- USB Type-C PD sink, USB Type-C PD DRP
- Support for USB Type-C PD 3.1 up to 100 W
- Integrated dc-dc buck-boost converter
- High-voltage protection circuits
- Support for series cell configurations with from two to five cells
- Support for CC/CV mode charging
- SDK supported in ModusToolbox software

APPLICATIONS

- Consumer devices
- Portable devices
- Power tools
- Smart home appliances
- Personal care products

FREE DEV BOARD

Board implements single-chip solution for USB Type-C battery charging.

Orderable Part Number EVAL_PMG1_B1_DRP

APPLY HERE NOW





INFORMATION



DATASHEET























Automotive-grade 650 V SiC MOSFET sets new standard for transistor efficiency, power density, and switching performance

The SCT055HU65G3AG MOSFET from STMicroelectronics, one of the world's largest manufacturers of SiC devices, enables faster switching, lowers losses and improves thermal management in automotive and industrial applications.



The SCT055HU65G3AG, part of the third generation of silicon carbide (SiC) MOSFETs from STMicroelectronics, features a substantially lower figure-of-merit for the product of on-resistance and gate charge than the first and second generations.

Combining low on-resistance over the entire temperature range with low capacitance and fast switching capability, the 650 V SCT055HU65G3AG enables power-system designers to improve energy efficiency while reducing system size and weight when compared to systems based on conventional silicon MOSFETs. SiC MOSFETs also have a higher voltage rating relative to their die size compared to silicon alternatives, making the technology an excellent choice for electric vehicles (EVs) and EV rapid chargers.

The SCT055HU65G3AG has a very fast intrinsic diode, supporting bi-directional power flow, a mandatory characteristic for those automotive on-board chargers that allow the transmission of electricity from an EV's battery to grid infrastructure.

The high-frequency switching capability of the SCT055HU65G3AG enables the use of smaller passive components, producing more compact and lightweight designs for the electrical equipment in vehicles and industrial equipment.

The packages in which ST supplies its third-generation SiC MOSFETs offer innovative design features, such as specially placed cooling tabs that simplify connection to base-plates and heat spreaders in EV applications.



FEATURES

- AEC-Q101 qualified
- 58 mΩ on-resistance
- 30 A maximum continuous drain current
- Source sensing pin for increased efficiency
- Operating-temperature range: -55°C to 175°C

APPLICATIONS

- Electric vehicles:
 - o Main traction inverters
 - o On-board chargers
 - o Dc-dc converters
 - E-climate compressors
- Industrial equipment:
 - Battery charging stations
 - Solar inverters
 - o Energy storage systems
 - Motor drives
- Telecoms and data centers:
 - o Power supplies

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Inductors offer low resistance and high current capability

Monolithic Power Systems supplies families of power inductors with inductance values, dc and ac resistance and saturation current ratings that are ideal for power-system designs based on the company's IC products.





FEATURES

- Operating temperature up to 155°C
- Sample kits available

APPLICATIONS

- Power converters
- Power adaptors
- Power supplies

Monolithic Power Systems supplies surface-mount power inductors for use in power supply and power conversion applications alongside the company's range of power converter and controller ICs.

The molded and semi-shielded series inductors are available in a range of inductance values from 0.33 μ H to 47 μ H, and with saturation current ratings from 0.8 A to 64 A.

The **MPL-SE semi-shielded power inductors** are shielded by an external magnetic epoxy resin to give good magnetic characteristics. They feature low dc resistance and are rated for high current capacity.

The MPL-AT/-AY/-AL series of molded power inductors offers soft saturation due to their molded design, and provide stable behavior at high temperatures. Their molded construction decreases the audible noise generated by alternating currents and pulse-wave frequencies.

The MPL-AT and MPL-AY series inductors offer low dc and ac resistance, and can handle high currents. The MPL-AT series features a very low profile.

The MPL-AL series offers low dc and ac resistance. It has a flat-wire construction, which provides higher current ratings for better performance than round-wire molded inductors.





























FEATURES

temperature

Motor drivesSolar inverters

• 175°C maximum junction

APPLICATIONSSwitch-mode power supplies

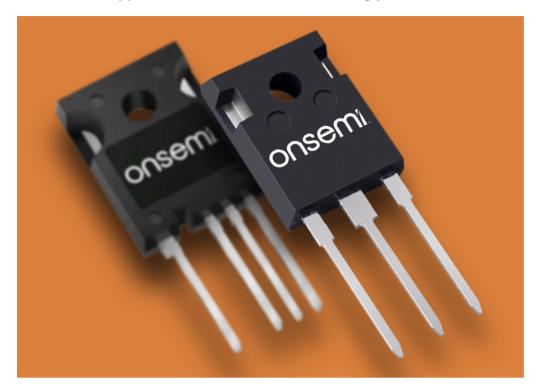
Positive temperature coefficientSmooth and optimized switching

Uninterruptible power suppliesEnergy storage systemsSolid-state relays

onsemi

IGBTs with latest field stop technology are optimized for switching or conduction losses

The onsemi FS7 IGBTs are supplied in two series. Designers can choose the variant which suits their application with either fast-switching power conversion, or three-phase motors.



IGBTs made with the 7th generation of field stop technology (FS7) from onsemi offer high efficiency in power converters and adaptors, and in motor systems.

In high-frequency switching power-converter applications, a substantial contribution to power losses comes from switching; in high-power three-phase motors, conduction losses have a larger impact. So onsemi has tuned the inherent IGBT trade-off between collector-emitter saturation voltage and turn-off energy differently in the two series of 1,200 V FS7 IGBTs:

- The S series is optimized for low turn-off energy, to minimize switching losses in highfrequency converters and inverters
- The R series is optimized for low saturation voltage, to minimize conduction losses in motors, and in solid-state relays

The FS7 IGBTs are supplied with current ratings ranging from 40 A to 160 A, and in three package styles:

- A standard TO-247 three-lead package. Products are available now.
- A power TO-247 three-lead package. Products are available now.
- A power TO-247 four-lead package. Products are planned for release in 2024.

The power four-lead package includes a Kelvin source lead, the effect of which is to produce a substantial reduction in turn-on energy, making for even more efficient switching.

Every production unit is dynamically tested to give OEMs high confidence in the operation and reliability of the IGBT in their application.

| Current Rating (A) | Diode Rating (A) | TO-247 | Power TO-247-3L | | |
|--------------------------|------------------------|--|--|--|--|
| 40 | 40 | FGHL40T120SWD (S series) FGHL40T120RWD (R series) | | | |
| 60 | 60 | FGHL60T120RWD (R series) | FGY60T120SWD (S series) | | |
| 75 | 75 | | FGY75T120SWD (S series) FGY100T120RWD (R series) | | |
| 100 | 100 | | FGY100T120SWD (S series) | | |
| 140 | 140 | | FGY140T120SWD (S series) | | |









SAMPLES

















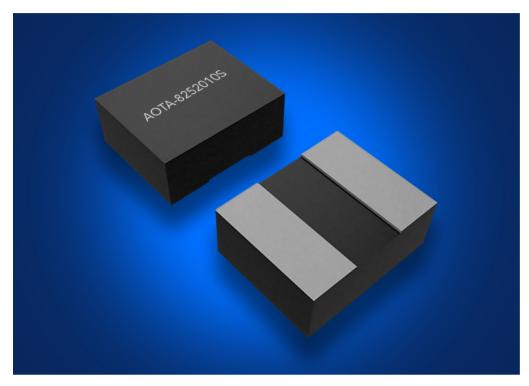
www.FutureElectronics.com

Delighting our customers worldwide



Compact molded inductors offer excellent EMI shielding

The Abracon AOTA-B family of mini molded inductors provides comparable performance to larger molded inductors while reducing the board footprint to less than 3 mm x 3 mm.





FEATURES

- Operating-temperature range: -40°C to 125°C
- Low dc resistance
- Metal alloy powder construction

APPLICATIONS

- Power converters
- Power adaptors
- Power supplies

Abracon has extended its range of molded inductors, now supplying various series of mini molded inductors products that have a footprint smaller than 3 mm x 3 mm.

The space-saving mini molded inductors offer the same attractive characteristics as larger Abracon molded inductors, including:

- Excellent EMI shielding
- High power density
- Low core losses

These inductors reject EMI, and can handle substantial power loads. Users of the Abracon mini molded inductors range can maintain signal integrity, save space and gain high energy efficiency in electronic circuits.

| Series | Inductance (μH) | DC Resistance (mΩ) | Saturation Current (A) | Temperature Rise Current (A) | Package Dimensions (mm) |
|---------------|---------------------------|--------------------------|---------------------------|---------------------------------|-------------------------------|
| AOTA-B160808S | 0.47 to 2.2 | 38 to 240 | 1.3 to 3.6 | 1.1 to 3.3 | 1.6 x 0.8 x 0.8 |
| AOTA-B201608S | 08S 0.24 to 2.2 18 to 134 | | 2.6 to 8.2 | 2.0 to 6.2 | 2.0 x 1.6 x 0.8 |
| AOTA-B201610S | 0.24 to 4.7 | 11 to 213 | 1.9 to 7.8 | 1.5 to 5.6 | 2.0 x 1.6 x 0.8 |
| AOTA-B252008S | 08S 1 to 10 39 to 507 | | 1.4 to 4.8 | 1.1 to 3.8 | 2.5 x 2.0 x 0.8 |
| AOTA-B252010S | 0.33 to 10 | 16 to 420 | 1.7 to 8.5 | 1.4 to 5.5 | 2.5 x 2.0 x 1.0 |



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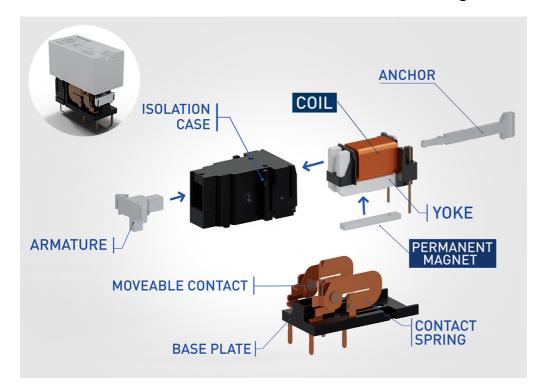






Polarized power relays perform energy-efficient switching operations

Panasonic supplies multiple series of polarized power relays to meet the needs of many applications. These relays offer substantially lower power consumption than other types of electromechanical relay, with low self-heating.



Panasonic Industry offers a broad portfolio of polarized power relays for applications including home and building automation, industrial equipment, and smart city automation. Relays supporting three types of operation are available: single-side stable, one-coil latching, and two-coil latching.

Polarized power relays help to reduce energy consumption: the permanent magnet in the coil reduces the energy required to actuate the load circuit. A latching relay also consumes no energy in the switched state. This results in highly efficient operation with no self-heating caused by power loss in the coil.

The Panasonic portfolio of polarized power relays includes the DE series: these are ideal for small systems that require high energy efficiency. The DE relays are particularly suitable for smart outlets rated for up to 3.6 kW, in which a minimum 8 mm creepage and clearance gap is specified.

Latching variants with one or two coils enhance the application's power efficiency. A monostable version keeps losses low in applications that do not allow the use of latching relays.

The Panasonic portfolio of polarized power relays also includes the DSP, DK, DW and DJ-H series supporting operating current up to 50 A and breakdown voltages up to 277 V ac.

| | C | SP | | DK | | DE | DW | DW-HL | DJ-H |
|---------------------------------|----------|---------------|----------|-------------|----------|---------------|-------------------|-------------------|----------------------|
| Contact Configuration | 1A | 1A1B, 2A | 1A | 1A1B, 2A | 1A | 1A1B, 2A | 1A | 1A | 1A |
| AC Voltage | 250 V | 250 V | 250 V | 250 V | 250 V | 250 V | 250 V | 277 V | 277 V |
| AC Current | 8 A | 5 A | 10 A | 8 A | 16 A | 8 A | 8 A | 16 A | 50 A |
| D C Voltage | 30 V | 30 V | 30 V | 30 V | 30 V | 30 V | | | |
| D C Current | 5 A | 5 A | 10 A | 8 A | 10 A | 8 A | | | |
| Length x Width x Height (mm) | | x 11 x 0.5 | 20 x 1 | 2.5 x 9.7 | | 12.5 x 2.5 | 24 x 10 x 18.8 | 24 x 10 x 15.8 | 39 x 15 x 30.2 |

Panasonic

INDUSTRY

FEATURES

DE relay

- Coil-voltage ratings: 5 V, 12 V or 24 V dc
- 8 mm minimum creepage and clearance
- 200 mW rated operating power
- Variety of contact arrangements:
 - o 1 Form A
 - o 2 Form A
 - o 1 Form A, 1 Form B
- Complies with EN 60730-1, EN 60335-1, and VDE 0631 European safety standards

APPLICATIONS

- Office equipment
- Measuring instruments
- Programmable logic controllers
- Computer numerical control machines
- Smart plugs and lighting
- Building automation controls

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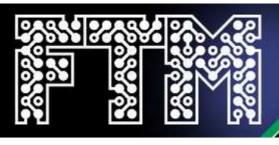












Multi-pixel driver with CAN FD Light powers nextgeneration automotive rear lamp designs

The STMicroelectronics L99LDLH32 provides 32 regulated current sources, enabling the creation of complex light patterns and effects in safety-critical lamps such as turn indicators.



The L99LDLH32 from STMicroelectronics is a linear current regulator which provides a convenient, integrated solution for driving dynamic automotive lighting. It supports the streamlined CAN FD Light protocol.

Ideal for use with OLED lamps, which provide bright, homogeneous, and high-contrast lighting from a small surface area, the new L99LDLH32 driver lets designers produce complex light patterns and effects that enhance safety and styling.

Featuring 32 regulated current sources with independently programmable outputs ranging from 1 mA to 15 mA, the L99LDH32 can drive individual pixels in external and interior lighting applications. It can also perform global dimming in 8-bit resolution. Operating from an input at the vehicle battery's voltage, the driver produces outputs of up to 35 V, sufficient to cover a wide spread of emitter forward voltages.

The integrated CAN FD Light protocol handler and transceiver simplify connection to the vehicle's communication infrastructure and the domain's electronic control unit. The CAN FD Light protocol's synchronized commander/responder communication, intended for the control of simple devices such as lights and sensors, eliminates the need for costly external components such as timing crystals. Data bandwidth of 1 Mbit/s enables designers to create complex animated light patterns, and permits smoothly modulated transitions and dimming.

The L99LDH32 can operate in a failsafe stand-alone mode in case the communication bus or controller malfunction. The driver is supplied in a 7 mm x 7 mm QFN48 package with wettable flanks and an exposed thermal pad to aid heat dissipation.



FEATURES

- Functional safety support:
 - o Fault status pin
 - o Voltage and temperature monitors
 - o Programmable time-out watchdog
 - o Short-circuit detection
- o Open-load detection
- Frequency dithering
- · Low standby current
- Programmable PWM frequency

APPLICATIONS

- Automotive lighting
 - o Tail lights
 - o Stoplights
 - Turn indicators
 - o Interior lighting

FREE DEV BOARD

Evaluation board for L99LDLH32 multichannel automotive LED driver.

> Orderable Part Number EV-L99LDLH32GEN

APPLY HERE NOW















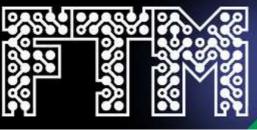














Compact wire-to-wire and wire-to-board connectors fit in tight spaces

The Hirose DF62 series connectors feature strong unmating force and high resistance to shock and vibration, giving reliable power connections. The DF62W is a water-resistant version of the DF62 connector.



Hirose has introduced the DF62 and DF62W series of connectors, which are ideal for making wire-to-wire and wire-to-board connections in small spaces.

The low-profile **DF62 series** features a plug and socket with mated dimensions of just 18.6 mm in length. The connectors have a secure positive locking mechanism, providing tactile feedback and an audible click to confirm correct engagement. Despite their small size, the connectors offer an impressive lock strength of 50 N. The lock structure includes a slot for easy visual confirmation of complete mating.

Highly reliable crimp contacts provide robust resistance against rough handling and vibration. The female contact's box-shaped head acts as a mating guide, ensuring smooth and reliable connections while preventing contact buckling. These connectors are available in various versions, including the DF62C with a lock guard, and the DF62P panel-mount plug.

The **DF62W series** is a water-resistant version of the DF62 with a slightly longer mated length of as little as 27.1 mm. The connectors' user-friendly design allows crimped wires to be inserted directly into the housing without additional tooling. Reliable barrel crimp contacts provide strong resistance against rough operation and vibration.



FEATURES

- 2.2 mm contact pitch
- 250 V rated voltage
- Rated current:
 - o 4 A DF62
 - o 5 A DF62W
- 30 mating cycles

APPLICATIONS

- Robotics
- Medical devices
- LED lighting
- Gaming equipment
- Automatic ticket gates
- Home appliances
- E-bikes
- · Factory automation

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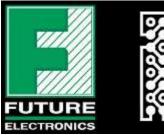


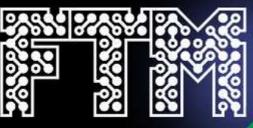








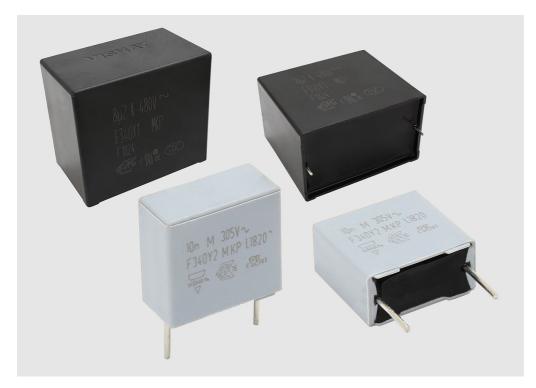






Grade IIIB Class X1 film capacitors for interference suppression

The F340X1, F340X2 and F340Y2 series of film capacitors from Vishay are certified for use in three-phase across-the-line applications, and are supplied with various approvals for standards compliance.



VISHAY.

FEATURES

- AEC-Q200 qualified
- 105°C maximum operating temperature
- 800 V dc maximum permissible voltage at 105°C
- 530 V ac maximum permissible voltage

APPLICATIONS

- Industrial equipment
- · Automotive systems

The F340X1 series capacitors from Vishay are THB Grade IIIB Class X1 film capacitors for interference suppression in three-phase across-the-line X1 and series impedance applications. The rated voltage is 480 V ac.

These film capacitors are available with capacitance values ranging from 220 nF to 8.2 μ F. They comply with the specifications of the IEC 60384-14: 2013 standard to Grade IIIB, URAC certified for 1000 hours' operation at 85°C and 85% relative humidity.

In addition, Vishay supplies the F340Y2 and F340X2 series of film capacitors, also for interference suppression applications.

The devices may be supplied with short or long leads, and with pitch of 27.5 mm, 37.5 mm or 52.5 mm.























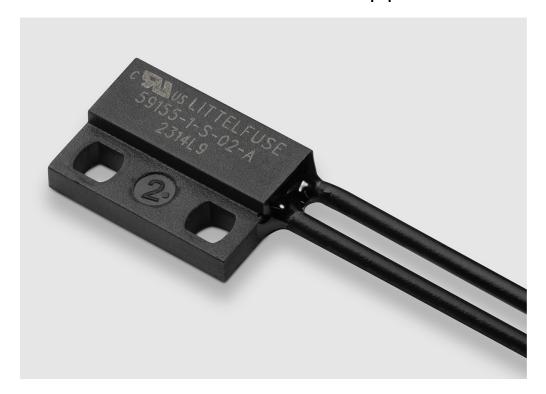






Launch of world's smallest sub-miniature flangemount magnetic reed sensors

The new Littelfuse 59155 and 59156 reed sensors are ideal for products that require proximity or limit sensing. Featuring a wide operating-temperature range, these reed sensors suit factory and process equipment.



The new 59155 and 59156 from Littelfuse are the world's smallest sub-miniature flange-mount magnetic reed sensors, measuring only 12.7 mm x 9.0 mm x 3.0 mm.

The sensors can switch 120 V ac/170 V dc at 10 W. The case design provides for mounting with an M2 screw or with adhesive.

The 59155 and 59156 sensors are available with wires exiting from the left- or right-hand side, making them ideal for use in many applications for use cases including proximity and limit sensing.

Magnetically actuated, the 59155 and 59156's contactless activation prevents exposure to humidity or dust, extending the host equipment's lifespan.



FEATURES

- Normally open contacts
- No leakage current in open state
- Operates through non-ferrous materials
- UL 508 recognized
- Operating-temperature range: -40°C to 105°C

APPLICATIONS

- Home appliances
- Security and access control equipment
- Factory automation
- Process equipment



























Miniature USB 2.0 connectors save space in consumer electronics devices

FCI Basics Mini USB 2.0 connectors from Amphenol Communications Solutions support the full USB 2.0 data-transfer rate and enable battery charging. Robust mounting and mating mechanisms ensure reliability.



Amphenol Communications Solutions supplies the FCI Basics Mini USB 2.0 connectors, which enable designers of computing and consumer equipment to reduce the space devoted to high-speed wired connectivity.

The FCI Basics Mini USB 2.0 connectors, which support a data transfer rate of up to 480 Mbits/s, take up only about one-eighth of the space that a standard USB Type-B interface occupies. They support both data-transfer and charging/power supply use cases.

The Amphenol connectors feature five circuits, with one circuit reserved for future use in host identification between devices.

Plug assembly is via a snap-in catch which provides tactile feedback on mating. A solder pad at the bottom of the shell is solderable to ensure secure mounting.

Amphenol

FEATURES

- Available in surface-mount and through-hole configurations
- Full metal shielding against EMI
- 5,000 mating cycles
- · Reliable gold-plated contacts

APPLICATIONS

- · Consumer electronics:
 - o Laptop computers
 - o Mobile phones
 - o GPS navigation equipment
 - o Portable games consoles
 - Mini speakers
 - o Gaming keyboards
 - o Tablet computers
 - o Video cameras
 - o Hard drives
 - Electric guitars
- Industrial equipment
- Instrumentation
- Automotive infotainment systems

Ⅲ BUY NOW





DATASHEET



















Why MCU users can benefit from exploring the scope to use a low-end FPGA By Patrice Brossard

EMEA Vertical Segment Manager (FPGAs and ASICs), Future Electronics





- chip functions that were previously implemented in multiple discrete logic components. The market for FPGAs grew rapidly as design
- layouts.

rates higher than 30 Gbits/s, and multiple hard-wired IP blocks implementing embedded processors, PLLs, functional SRAM memory and more. High-end FPGAs, the staple solution for applications such as data processing, imaging, and high-bandwidth communications equipment, attract the most attention and take the lion's share of the industry's marketing and promotional dollars. But it is helpful to remember that the original role played by small FPGAs still has value, in functions such as:

 Glue logic integration Simple counter or PWM Basic state-machine Control logic I/O and interface bridging

- · Voltage monitoring
- · Aggregation of multiple sensor inputs

I/O expanders

- A vibrant market for small, low-cost, and low-end FGPAs supports these and other functions. Its importance to OEMs is reflected in the recent
- arrival of a new entrant to the FPGA market, Renesas.

MCUs in many functions.

and very low power consumption.

The basic architecture of an FPGA

This might be true of the high-end FPGAs supplied by Xilinx, now a part of AMD, and Intel. It definitely is not true of the low-end FPGAs supplied by Lattice Semiconductor and Microchip, and Renesas. And in fact, the use of FPGAs offers several important advantages over

In an MCU, tasks are implemented sequentially, and in software. In an FPGA, tasks are performed in parallel, and in hardware. This produces the attractive characteristics of an FPGA's operation; highly deterministic performance, low latency, the flexibility to customize the hardware,

Opinion remains divided, however, about the applicability of FPGAs in mainstream industrial and consumer electronics devices. Design engineers who are familiar with microcontrollers commonly view FPGAs as somehow an alien concept: expensive, power-hungry, and difficult

The purpose of this article is to provide an understanding of the basic operation of an FPGA, and how the design tools supplied by FPGA manufacturers make the implementation of an FPGA in an electronics system design straightforward and predictable.

• Programmable logic elements (LEs) • Programmable routing interconnections Configurable I/Os providing for communication with the external world

memory can be either internal in the FPGA chip, or external.

An FPGA is made up of three basic elements, as shown in Figure 1:

1/0 1/0 1/0 1/0 Programmable B Interconnect Fig. 1: An FPGA provides a highly programmable hardware fabric A logic element is made of a configurable look-up table (LUT) and a sequential element (SE). The LUT can be configured as any type of combinatorial logic, such as OR, AND or XOR. The SE is generally configured as a simple flip-flop. • The LE is the basic functional block of an FPGA, and this is why every FPGA is classified according to the number of LEs that it contains. The low-end of the FPGA market can be considered to cover FPGAs with between a few hundred LEs up to 10,000 LEs The programmable interconnection links the configured LEs together to implement the functions required by an application • The I/Os are also programmable, and can be configured to support any I/O interface standard

How to configure FPGA hardware

Microchip FPGAs are the exception to this rule: their programmable switches are made in a technology which resembles non-volatile Flash

The underlying hardware that implements these elements is a huge number of programmable switches. In most FPGAs, these switches are programmed afresh every time the FPGA is powered up. This requires a programming file to be stored in a configuration memory: this

Place and route · Programming file generation

All FPGA manufacturers supply their own design tool to generate this programming file, more often known as a bitstream. Every

memory. Directly programmed, they have no need of a programming file or configuration memory.

Functional description using a standard hardware description language (HDL), either VHDL or Verilog

manufacturer's tool is basically similar to the others. The tools provide these features

- Place and Synthesis HDL Route

RTL Simulation

Synthesis

Fig. 2: The FPGA design flow is supported by the tool that each FPGA manufacturer provides for its devices Timing analysis forms part of the design flow to check that the propagation delay affecting the transfer of signals through the routing structure is consistent with the performance requirements of the application, shown in Figure 2. It is also important to simulate and verify the code generated by the HDL tool, to verify that the functions programmed into the FPGA operate in accordance with the design specification. Nothing in the entire FPGA development process is as difficult as the implementation of timing analysis and RTL simulation, and they are not especially complex. All the other stages are automatically performed by the design tool, and only take a few minutes to be executed on a standard laptop computer. Each FPGA manufacturer supplies their own toolset; the main difference between them is in the graphical user interface. It is easy to migrate from one to another, as long as the source code has been written using either of the standard VHDL or Verilog description languages. Use of the tools is generally available to FPGA users via a free license. FPGA evaluation boards are readily available at low cost. So the cost of tools and resources is no impediment to engineers who want to begin experimenting with low-end FPGAs. Multiple choices of low-end FPGA products The market for low-end FPGAs is served by three manufacturers: Microchip, Lattice, and most recently Renesas. Microchip's product portfolio is mostly geared to the mid-range FPGA market. The entry-level parts in its IGLOO 2 Flash FPGA family, however, do count as low-end FPGAs, shown in Figure 3.

M2GL005

6,606

11

2

1 each

AES256 and SHA256 encryption, random

number generator

128 kbytes

10

11

64 kbytes each

703 kbytes

1 x 18

0

0

Microchip provides the Libero SoC tool for development of IGLOO 2 FPGAs. The license is free for devices with up to 25,000 LEs. IGLOO 2 FPGAs are notable for their numerous memory options, including functional embedded non-volatile memory, as well as high-speed interfaces.

Lattice has long maintained a policy of supporting the low gate-density FPGA market, and has a strong offering based on two families:

The XO2/XO3 family is based on volatile technology; it provides the configuration memory on the same die as the FPGA matrix, giving the

uSRAM 1 K Memory Blocks eSRAM Memory Total RAM

Features

Maximum LEs

Math Blocks (18 x 18)

PLLs and Clocked Conditioning Circuitry

(CCCs) SPI/HPDMA/PDMA

Fabric Interface Controllers

Security

eNVM Memory

LSRAM 18 K Memory Blocks

DDR Controllers

SerDes Lanes

PCle End Points

Single-voltage and low-power options

smallest package, at just 1.4 mm x 1.4 mm.

XO2/XO3, and iCE40.

Fig. 3: Key features of the low-end parts in the Microchip IGLOO 2 FPGA product family

designer a single-chip FPGA solution, with no need for an external configuration memory.

Almost instant-on operation thanks to the on-chip non-volatile configuration memory

· Hard-wired I2C and serial peripheral interfaces, PLLs, Flash memory, and internal oscillator

The Diamond design tool for the XO2/XO3 is available from Lattice under a free license. Lattice's other family of low-end FPGAs, the iCE40 series, is split into several sub-families: iCE40LP, iCE40UL, iCE5LP, iCE40UP, iCE40UM, and iCE40HX. The family covers the range from 384 LEs to 8,000 LEs. In the iCE40 family, Lattice has optimized the power/size/performance

The XO2/XO3 devices give a wide choice of density options, from as few as 256 LEs up to 10,000 LEs. Their main features are:

The ForgeFPGA™ family provides relatively small amounts of programmable logic that can be quickly and efficiently designed into costsensitive applications. ForgeFPGA devices provide dramatic cost savings versus other alternatives, including non-FPGA designs. Renesas provides the Go Configure™ design software hub for its FPGAs under a free license.

programmable mixed-signal product technology. This technology is now complemented by a new FPGA offering.

trade-off for low power and small size: static current is the market's lowest, at less than 100 μ A. The iCE40 also features the FPGA industry's

The third of the low-end FPGA manufacturers, **Renesas** is the most recent entrant to the market. Renesas is well known for its GreenPAK™

In fact, low-end FPGAs are quite the opposite. So Future Electronics suggests a new way of thinking about FPGAs, to recognize their benefits in ordinary industrial and consumer applications such as multiple motor control for robot arms, monitoring/alert management in factory equipment, inverters for electric vehicle chargers, battery management systems, sensor signal processing in smart building and smart city

applications, and much more. The scope for using these deterministic, low-power devices is very wide. Microcontroller developers who explore low-end FPGAs for the first time will find that they have much to gain from the effort.



A Renesas family of ForgeFPGA devices featuring from 1,000 LEs up to 4,000 LEs is expected to be available for sampling and production in FPGAs are widely thought of as a high-end, high-cost, hard-to-use product for high-end applications.

Low-end FPGAs: an accessible option for non-specialists

www.FutureElectronics.com







• How an FPGA manufacturer's tools enable the design engineer to configure its hardware to fit the requirements of the application In the early years of the field programmable gate array, or FPGA, in the 1980s, the limitations of semiconductor technology meant that the devices were small and simple. Featuring just a few hundred logic gates, these early FPGAs were used to integrate in a single programmable

• The differences between the wide range of low-end FPGAs on the market engineers recognized the value to be gained from the FPGA's ability to reduce component count, save board space and simplify board Progress in semiconductor technology means that the FPGA has been transformed since the 1980s, becoming the large and sophisticated device we know today: at the high end of the market, FPGAs feature millions of gates, ultra high-speed interfaces supporting data transfers at

1/0

Program

Debug

Timing & Power

analysis

M2GL010

12,084

22

2

1 each

AES256 and SHA256 encryption, random

number generator

256 kbytes

21

22

64 kbytes each

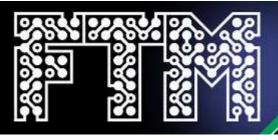
912 kbytes

1 x 18

4

1





Portfolio of SiC MOSFETs, diodes and gate drivers provides wide set of choices to design engineers

The Microchip mSiC[™] portfolio of silicon carbide products and design tools gives power-system designers a flexible way to take advantage of the high efficiency, fast switching and excellent thermal conductivity of this wide-bandgap technology.



The Microchip mSiC portfolio of silicon carbide (SiC) discrete power semiconductors and modules offers the benefits of low system cost, fast time-to-market and low risk. It provides the industry's broadest and most flexible portfolio of SiC MOSFETs, diodes, MOSFET and diode modules, and digital gate drivers.

Wide-bandgap SiC semiconductors are used to control and switch high-power electrical devices and systems. They offer several advantages over traditional silicon devices, including higher operating temperatures, higher breakdown voltage, faster switching speeds, lower onresistance, and higher ruggedness.

SiC devices are an innovative option to improve system efficiency, shrink a design's form factor and withstand higher operating temperatures in industrial, transportation, automotive, medical, aerospace, aviation, defense and renewable energy products.

The mSiC portfolio of products takes advantage of Microchip's more than 20 years of experience in the development, design, manufacturing and support of SiC devices and power solutions. Advanced Microchip research and development and manufacturing capabilities mean that it can produce discrete SiC devices and modules in high volume to the industry's highest standards of ruggedness and reliability.



FEATURES

- Very low switching losses improve system efficiency
- High power density reduces size and weight
- Three times more thermally conductive than silicon
- Reduced heat-sink requirements to achieve a smaller footprint and lighter weight
- High-temperature operation to improve reliability at increased power density

APPLICATIONS

- Data center equipment
- Medical equipment
- Industrial equipment
- Renewable energy equipment
- Aerospace and defense equipment
- Automotive systems:
 - o EV onboard chargers
 - o Dc rapid chargers
 - Traction inverters
 - o Auxiliary power units

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Step-down switching regulator ICs operate over a wide input-voltage range

The ROHM BD9G buck regulators, which feature an integrated MOSFET, have a high fixed switching frequency, so the power-system designer can save space through the use of smaller magnetic components.



The BD9G family from ROHM Semiconductor is a series of switching buck regulator ICs with integrated power MOSFET which operate over a wide input-voltage range, and which can supply an output as low as 0.8 V.

Housed in a small, six-lead SOT-23 (SSOP) package, these non-synchronous regulators operate at high switching frequencies, enabling the use of a small inductor, and reducing system size. Phase compensation components are also built in.

The BD9G family consists of five parts capable of supplying a load current of up to 5 A and operating from an input voltage as high as 76 V.

| | BD9G101G | BD9G341AEFJ | BD9G201EFJ | BD9G401EFJ | BD9G500EFJ |
|--|------------|-------------|------------|------------|------------|
| Input- voltage Range (V) | 6 to 42 | 12 to 76 | 4.5 to 42 | 4.5 to 42 | 7 to 76 |
| Output- voltage Range (V) | 1 to 29.4 | 1 to 76 | 0.8 to 42 | 0.8 to 42 | 1 to 68.4 |
| Maximum Output Current (A) | 0.5 | 3 | 1.5 | 3.5 | 5 |
| Maximum Switching Frequency (MHz) | 1.7 | 0.75 | 0.5 | 0.5 | 0.65 |
| Light-load Mode | - | - | No | No | No |
| Operating- temperature Range (°C) | -40 to 105 | -40 to 85 | -40 to 105 | -40 to 105 | -40 to 125 |



FEATURES

- 0.75 V, ±1.5%, feedback pin voltage
- Protection features:
- o Over-current protection
- Under-voltage lockout
- Thermal shutdown
 0 μA shutdown supply current

APPLICATIONS

- Industrial distributed power systems
- Battery-powered equipment
- Instrumentation

FREE DEV

Evaluation board for BD9G101G nonsynchronous buck dc-dc converter.

Orderable Part Number BD9G101G-EVK-101

APPLY HERE NOW

FREE DEV BOARD

Orderable Part Number BD9G401EFJ-EVK-001

APPLY HERE NOW



























650 V MOSFET in TO-220 package gives higher power density

The STP65N150M9 is based on the STMicroelectronics MDmesh M9 superjunction MOSFET technology, giving low on-resistance as a function of die area, and enabling engineers to realize highly efficient power converter designs.



life.augmented

FEATURES

- High dV/dt capability
- Excellent switching performance
- Easy to drive
 - o 3.7 V gate-threshold voltage
- 100% avalanche tested

APPLICATIONS

- Switch-mode power supplies
- Lighting
- Power adapters

The STP65N150M9 from STMicroelectronics is a 650 V N-channel MOSFET supplied in a three-lead TO-220 package. It is rated for a maximum continuous drain current of 20 A.

This MOSFET is based on MDmesh M9 superjunction MOSFET technology developed by STMicroelectronics: this technology is responsible for the STP65N150M9's very low on-resistance as a function of die area. The M9 technology benefits from a multi-drain manufacturing process which produces a superior device structure.

As well as its low on-resistance of 128 m Ω , the STP65N150M9 also features low gate charge of 32 nC, making it particularly suitable for applications that require high power density and outstanding efficiency.



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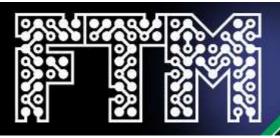












New MOSFET needle trench technology increases power-system efficiency and density

OptiMOS™ 6 100 V power MOSFETs from Infineon have lower on-resistance and gate charge to reduce losses for power-system designers in fast-switching applications.



The ISCxxxN10NM6 family of 100 V power MOSFETs benefits from the company's latest OptiMOS 6 technology, which enables power-system designers to achieve higher power density and higher efficiency, and to make systems more rugged.

The new OptiMOS 6 MOSFET technology at 100 V uses a proprietary needle trench technology which is ideal for high-frequency switching applications. Compared to the previous OptiMOS 5 BSC027N10NS5, the new ISC022N10NM6 offers around 20% lower on-resistance, a 30% better figure-of-merit for the product of on-resistance and total gate charge, and a larger safe operating area (SOA).

This enables designers to increase efficiency, allowing for easier thermal design and less paralleling, and leading to system cost reductions.



FEATURES

ISC022N10NM6

- 175°C maximum junction temperature
- · High avalanche energy rating
- 2.8 V gate-source threshold voltage
- SuperSO8 package

APPLICATIONS

- Telecoms equipment
- Server power supplies
- Drones
- Robots
- Solar inverters
- Servo drives
- Battery management systems

⋙ BUY NOW















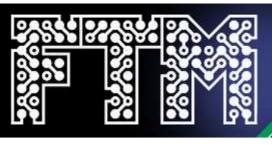












Rugged DIN rail-mount 75 W ac-dc power supply meets requirements of industrial applications

The PDRD-75 series power supplies from CUI Inc are available with a choice of three trimmable output voltages. They comply with the specifications of industrial safety standards.



CUI INC

FEATURES

- Trimmable output voltage
- · Safety Class I
- Supports 120 V to 430 V dc inputvoltage range

APPLICATIONS

- · Factory automation
- · Industrial control equipment

The PDRD-75 series single-output, 75 W ac-dc power supplies from CUI Inc are housed in a compact, DIN rail-mount metal case for easy installation in control cabinets.

Operating from a universal mains input-voltage range of 85 V to 305 V ac, these power supplies are available in versions with an output voltage of 12 V, 24 V or 48 V dc.

Featuring over-current, over-voltage, and output short-circuit protection functions, these DIN rail ac-dc power supplies provide a rugged solution for use in industrial environments. They comply with the specifications of the IEC 61010 and IEC 62368 safety standards, and are supplied with CE, UKCA, and UL approvals.

The dimensions of the PDRD-75 power supplies are 110 mm x 87.5 mm x 32 mm.

| Part Number | Power Rating (W) | Output Voltage (V) | Rated Output Current (A) | |
|-------------|------------------|--------------------|--------------------------|--|
| PDRD-75-12 | 75.6 | 12 | 6.3 | |
| PDRD-75-24 | 76.8 | 24 | 3.2 | |
| PDRD-75-48 | 76.8 | 48 | 1.6 | |



BUY NOW



DATASHEET





















Integrated 5.5 V load switch provides power control and system safety features

New Nexperia NPS4053 provides multiple safety and protection functions, in a smaller board footprint than an equivalent discrete power control circuit. Designers can use the NPS4053 to improve power-system reliability while saving space.



Nexperia has launched the NPS4053, an integrated load switch which has a smaller footprint and offers better system protection than the equivalent circuit made up of discrete components. The NPS4053, which has a built-in, self-protected MOSFET, is optimized for use in portable devices, where it can provide switching and protection functions for components such as USB ports and hubs.

Load switches are essential components in the operation of a wide array of electronics systems. They play a crucial role in managing current and voltage in a controlled manner from the source to the load.

In a typical power chain, the NPS4053 is commonly positioned close to the load, performing power sequencing and inrush-current control functions. It can also be used to shut off power islands to conserve power, making it especially valuable in battery-operated equipment. The NPS4053 load switch includes programmable current-limiting circuitry which allows for precise control of the load current over a range from 110 mA to 2.5 A at an accuracy of $\pm 6\%$. The device also supports true reverse-current blocking, providing robust end-to-end system protection.

The NPS4053 also includes a Fault Indicator pin which alerts the host controller to fault events.

nexperia

FEATURES

- Input-voltage range: 2.5 V to 5.5 V
- 2 A maximum continuous current
- 55 mΩ MOSFET on-resistance at an input voltage of 5.5 V
- Constant current during current limit
- Active reverse-voltage protection
- Soft-start
- UL 62368 recognized
- AEC-Q100 qualified version available

APPLICATIONS

- Notebook computers
- Desktop computers
- Docking stations
- Set-top boxes
- HDTVs
- Automotive infotainment systems























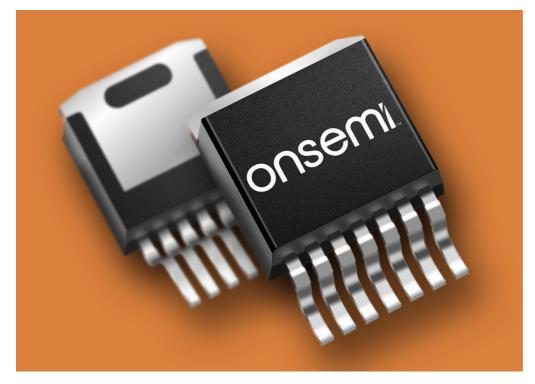






Extension of SiC power device portfolio brings robust 1,700 V capability to MOSFETs and diodes

The EliteSiC family from onsemi incorporates a broad set of silicon carbide (SiC) MOSFETs, diodes, SiC modules, and hybrid SiC/silicon modules, and a new 1,700 V rating for higher-voltage applications.



The onsemi EliteSiC product portfolio is a range of SiC power devices and modules which offer proven quality and robust designs, and which benefit from the fully integrated manufacturing capability that onsemi has established. The EliteSiC family consists of SiC MOSFETs, SiC diodes, power modules made of SiC MOSFETs and SiC diodes, and hybrid SiC/silicon modules.

The latest devices to join the EliteSiC family are 1,700 V-rated for energy infrastructure and industrial drives. The 1,700 V EliteSiC MOSFET and two 1,700 V avalanche-rated EliteSiC Schottky diodes feature a high breakdown voltage to comply with the requirements of high-power industrial applications.

The use of SiC technology enables both 1,700 V avalanche-rated EliteSiC Schottky diodes to maintain high-voltage operation at high temperature with high efficiency. The SiC diodes' key features, such as zero reverse-recovery charge, low forward voltage and temperature-independent current stability, result in superior switching operation with lower power losses, and support effortless paralleling of devices.

The NDSH25170A diode, which has a 400 mJ avalanche energy rating, supports a maximum rectified forward current of 35 A at a case temperature of up to 135°C. The NDSH25170A's forward voltage is 2.32 V at a forward current of 25 A and a junction temperature of 175°C. It is supplied in a through-hole TO-247-2LD package. The other 1,700 V SiC diode, the NDSH10170A has a current rating of 10 A.

The extension of the EliteSiC family also sees the introduction of a 1,700 V MOSFET. The NTBG028N170M1 is the first in the onsemi M1 family of 1,700V planar SiC MOSFETs, which are optimized for fast-switching applications.

Planar technology works reliably with a negative gate voltage and turn-off spikes on the gate. The M1 family devices provide the best performance when driven at 20 V, but also work well with an 18 V gate-drive voltage.

onsemi

FEATURES

NTBG028N170M1

- D2PAK-7L package for low common source inductance
- 28 mΩ on-resistance
- Low turn-on and turn-off energy losses
- 100% avalanche tested

APPLICATIONS

- Solar inverters
- Uninterruptible power supplies
- · Solid-state transformers
- · Medium-voltage grid equipment
- Energy storage systems
- Hydrogen electrolyzers
- Fuel cells





























Integrated flyback controller boosts performance of LED lighting

The HVLED101 controller IC from STMicroelectronics maintains high power factor and very low power in standby mode, for precise regulation across a wide range of LED driver topologies.



The HVLED101 is an enhanced peak current-mode controller for flyback or buck-boost topologies that require a high power factor of at least 0.9 at full load. It also enables power-system designers to produce low total harmonic distortion of less than 5% at full load. Other topologies such as buck, boost and SEPIC can also be implemented with the HVLED101.

The HVLED101 is ideal for use in single-stage LED drivers rated for up to 180 W, and two-stage LED drivers up to 200 W.

Both primary-side regulation of the output voltage and optocoupler control can be applied independently on the chip: both produce precise regulation. Standby power consumption in noload conditions is very low.

The HVLED101 is built with innovative ST high-voltage technology which enables the IC to be connected directly to the input voltage in order to both start-up the device, and to monitor the input voltage without the need for external components. A valley-locking feature guarantees noise-free operation in medium- and low-load conditions.

The maximum power can be controlled by limiting the input power to a level programmed by the engineer, to ensure safe operation of the converter. The HVLED101 also controls abnormal conditions such as open circuit, output short-circuit, and input over- or under-voltage, as well as circuit failures such as open loop and over-currents at the main switch.



FEATURES

- 800 V fast high-voltage start-up
- Programmable frequency foldback with valley locking for noise-free operation
- Programmable brown-out protection
- Smart automatic restart timer

APPLICATIONS

- Street lighting
- Industrial lighting
- Commercial lighting

FREE DEV

50 W converter for LED drivers based on HVLED101 quasi-resonant flyback controller with secondary-side regulation.

Orderable Part Number EVLHV101SSR50W

APPLY HERE NOW

FREE DEV BOARD

50 W converter for LED drivers based on HVLED101 quasi-resonant flyback controller with primary-side regulation.

Orderable Part Number EVLHV101PSR50W

APPLY HERE NOW







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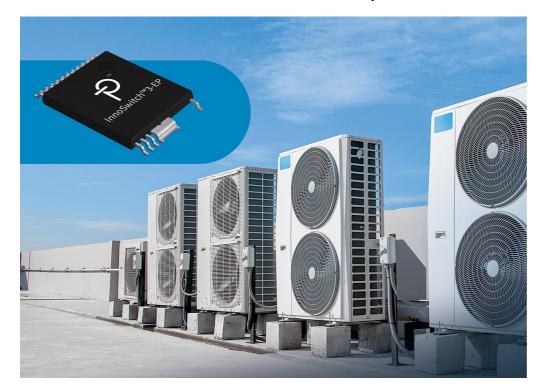






New 900 V GaN-based flyback switcher ICs increase power and efficiency

New InnoSwitch3™ ICs from Power Integrations feature robust and efficient PowiGaN gallium nitride switches, for industrial applications and for 400 V automotive auxiliary power supplies, supporting loads of up to 100 W.



Power Integrations has introduced new products in its InnoSwitch3 family of flyback switcher ICs that feature 900 V gallium nitride (GaN) power switches. The 900 V GaN parts are in the InnoSwitch3-EP series for industrial applications, and the InnoSwitch3-AQ series of automotive-qualified devices.

The new ICs, which feature the company's proprietary PowiGaN technology, supply up to 100 W at more than 93% efficiency, eliminating the need for heat-sinks, and streamlining the design of space-constrained products. InnoSwitch3 designs also offer very high light-load efficiency, making them ideal in the electric vehicle (EV) auxiliary power systems that support low-power sleep modes.

The AEC-Q100 qualified InnoSwitch3-AQ series is particularly suitable for EVs that operate from a 400 V bus; the 900 V PowiGaN switch provides more power, a higher design margin and better efficiency than silicon-based converters. The 900 V PowiGaN switch can easily handle inductive noise spikes, yet can also operate from a voltage as low as 30 V dc, enabling systems the the active discharge requirements of functional safety specifications.

In the industrial market, the PowiGaN switch's extra power and efficiency offer similar benefits. The new 900 V products are pin-for-pin compatible with existing 725 V and 750 V InnoSwitch3-EP parts, and offer increased safety margin, a useful benefit in countries where the mains power grid produces unstable line voltages.

The new 900 V InnoSwitch3-EP and InnoSwitch3-AQ are off-line, constant voltage/constant current flyback switcher ICs which perform synchronous rectification, while their flyback controller implements valley-switching discontinuous conduction mode and continuous conduction mode conversion. The Power Integrations FluxLink™ communication technology enables the IC package to bridge the isolation barrier, optimizing efficiency and eliminating the need for optocouplers.

PowiGaN technology enables InnoSwitch3-EP ICs to supply up to 100 W at 230 V ac without the need for a heat-sink. Automotive InnoSwitch3-AQ devices can supply up to 100 W from a 400 V bus. They provide performance and protection features similar to those of the popular 1,700 V silicon carbide InnoSwitch3-AQ ICs used in 800 V EV systems.

Power integrations

FEATURES

InnoSwitch3-EP

- Protection features:
 - o Line over-voltage protection
 - o Line under-voltage protection
 - $\circ \ \mbox{Output over-voltage protection}$
 - o Output over-current limiting
 - o Over-temperature shutdown
- Available in standard and peakpower delivery options

APPLICATIONS

- Industrial equipment:
 - o Appliances
 - Three-phase motors
 - Auxiliary power supplies
- Automotive systems:
 - Auxiliary power supplies

FREE DEV BOARD

InnoSwitch3-AQ dev board implements 60 W power supply.

Orderable Part Number RDK-919Q

APPLY HERE NOW





























600 W dc-dc regulator modules operate at up to 96% efficiency

The DSQ, DAQ and DCQ power supplies from Murata Power Solutions, which adopt the DOSA-standard quarter-brick footprint for distributed power systems, provide an option for PMBus digital control.



Murata Power Solutions supplies a series of digitally controlled dc-dc regulator power modules which can supply loads of up to 600 W. The DSQ, DAQ and DCQ dc-dc power modules, which are intended for use in distributed power architectures and in intermediate bus-voltage applications, adopt the standard quarter-brick format specified by the Distributed power Open Standards Alliance (DOSA).

The first parts in the series provide a fixed 12 V output from an input-voltage range of 36 V to 75 V, supporting the telecommunications network voltage (TNV) specification, at up to 96% efficiency. The DCQ0150V2 is an analog-controlled quarter-brick module. The analog DAQ0150V2 also provides sensing and output-trimming functions. The DSQ0150V2 is a digital version, providing a PMBus interface for communication with power modules. It also has sensing and output-trimming functions.

The modules incorporate a droop load-sharing option that allows a power-system designer to connect two or more units in parallel to supply loads higher than 600 W, or to provide redundancy in applications that require high reliability.

The modules feature high input-to-output isolation of 2,250 V dc as required in Power-over-Ethernet (PoE) equipment.



FEATURES

- Fully regulated output
- · Low output ripple and noise
- Operating-temperature range: -40°C to 85°C
- Protection functions:
 - o Over-current
 - o Over-voltage
 - o Over-temperature
- Certification:
 - o UL 62368-1
 - CAN/CSA-C22.2 No.62368-1-14,
 2nd Ed, 2014-12-01
 - o IEC 62368-1:2014 second edition

APPLICATIONS

- Servers
- · Storage systems
- Networking equipment
- Telecoms equipment
- Power over Ethernet (PoE) systems
- Fan trays
- Wireless networks
- Wireless pre-amplifiers
- Industrial equipment
- Test and measurement equipment

₩ BUY NOW













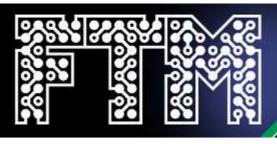






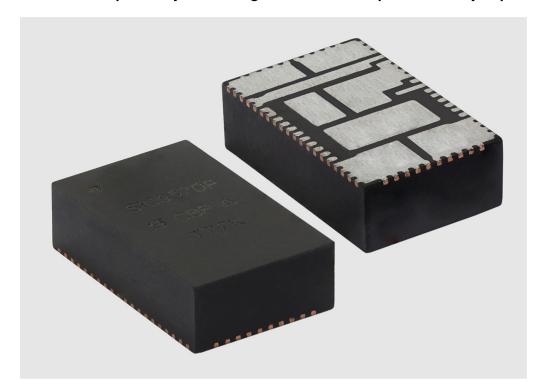






Launch of industry's smallest 6 A, 20 A, and 25 A buck regulator modules

New microBRICK power modules from Vishay are up to 69% smaller than competing solutions, enabling power-system designers to increase power density in point-of-load converters.



Vishay has released new 6 A, 20 A, and 25 A microBRICK synchronous buck regulator modules which provide for higher power density and efficiency in point-of-load power supplies. Supplied in a 10.6 mm x 6.5 mm x 3 mm package, the SiC931, SiC951, and SiC967 are the smallest modules of their kind on the market, with the lowest height.

Operating over a wide input-voltage range, the new regulator modules are comprised of two high-performance MOSFETs, an inductor, and a controller. This means that few external components are needed for configuration and loop compensation, and helps power-system designers to achieve high system-level power density.

The SiC931 features four programmable switching frequencies: 600 kHz, 1 MHz, 1.5 MHz, and 2 MHz, while the SiC967 has an adjustable switching frequency in a range from 100 kHz to 2 MHz. The SiC951's frequency is adjustable between 300 kHz and 1.5 MHz.

All three buck regulator modules offer an adjustable current limit, while the SiC931 features an adjustable soft-start. The PMBus 1.3-compliant SiC951 supports sequential, tracking, and simultaneous operation.

The SiC951 and SiC967 can operate in any of three modes: forced continuous conduction, ultrasonic, and power save. The SiC931 supports forced continuous conduction and power save modes.

The constant on-time (COT) architecture delivers very fast response to transients, with minimum output capacitance and tight ripple regulation at very light loads. It also maintains loop stability regardless of the type of output capacitor used.

| Part Number | Input-voltage Range | Output-voltage Range | Rated Current | Package |
|-------------|---------------------|----------------------|---------------|--------------------|
| SiC931 | 4.5 V to 18 V | 0.6 V to 5.5 V | 20 A | PowerPAK MLP60-A6C |
| SiC951 | 4.5 V to 20 V | 0.3 V to 5.5 V | 25 A | PowerPAK MLP59-A6C |
| SiC967 | 4.5 V to 60 V | 0.8 V to 15 V | 6 A | PowerPAK MLP54-A6C |



FEATURES

- Up to 97% efficiency
- Protection features:
- Over-voltage protection
- Under-voltage protection
- Cycle-by-cycle over-current protection
- Short-circuit protection with autoretry
- o Over-temperature protection
- Power good flag

APPLICATIONS

- Data center servers
- Cloud computing equipment
- High performance computing
- Desktop computers
- Industrial automation
- Motor drives
- Power tools
- Surveillance systems
- Consumer electronics devices
- 5G mobile telecoms equipment















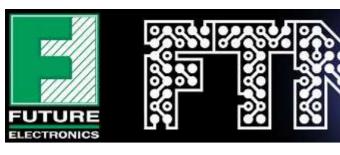






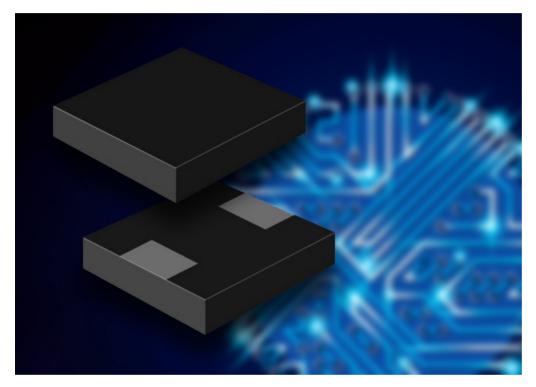






Compact power inductors handle high frequencies and currents

The ECS-MPI4040 shielded inductors from ECS Inc., which are supplied in a low-profile package, feature AEC-Q200 qualification, a rugged construction and can handle high inrush currents.



The ECS-MPI4040 from ECS Inc. is a family of low-profile, AEC-Q200 qualified, shielded power inductors. Supplied in a two-pad package that has a footprint of 4.7 mm x 4.3 mm, the ECS-MPI4040 family gives options for package height of 1.2 mm, 1.5 mm, 1.85 mm and 2.0 mm.

The ECS-MPI4040 power inductors offer inductance values ranging from 90 nH to 22 μ H. Current ratings range from 1.1 A to 32.0 A.

These ECS power inductors are suitable for use in high-frequency circuits operating at up to 10 MHz. They can reliably handle high transient inrush-current spikes.



FEATURES

- ±20% tolerance of inductance
- Operating-temperature range: -55°C to 125°C
- Dc resistance range: 5.3 Ω to 408 Ω
- Saturation current-rating range: 1.8
 A to 32.0 A

APPLICATIONS

- · Automotive systems
 - o Driver assistance
 - Infotainment
 - Lighting
- · Consumer electronics
 - Handheld and mobile devices
 - $\circ \ \ \text{GPS navigation equipment}$
 - o Battery-powered devices
 - Portable media players
 - Notebook computers
 - Tablets
 - Displays
- LED drivers
- Point-of-load power supplies















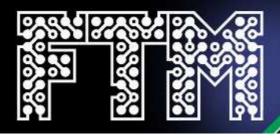












Automotive-qualified LED driver integrates adaptive dc-dc controller for maximized efficiency

The STMicroelectronics ALED7709 combines an AEC-Q100 Grade 1-qualified 4-channel LED driver with a dc-dc controller capable of boost and SEPIC operation from an input-voltage range of 4.5 V to 42 V.



The ALED7709 LED drivers from STMicroelectronics can be used to drive strings of high-brightness LEDs in many types of automotive application. Supported by an integrated dc-dc controller, these LED drivers supply an output voltage of up to 42 V at each channel. The output current at each channel is programmable in a range up to 200 mA, and channels can be paralleled for a combined output of up to 800 mA.

Each LED driver offers ±2% output current accuracy with mixed PWM and analog dimming at a frequency between 100 Hz and 12.8 kHz. This gives a wide brightness range: the dimming ratio is 10,000:1 at 100 Hz.

The integrated dc-dc controller can operate in boost, SEPIC, and adaptive modes in order to maximize the efficiency of operation. The switching frequency is adjustable between 250 kHz and 2.2 MHz, with the option of spread-spectrum operation.

The ALED7709 can operate in stand-alone, bus-driven, or simultaneous modes. Two preconfigured ALED7709 versions are available for single-mode operation: the ALED7709A supports use with a microcontroller for bus-driven operation using I2C serial interfaces, and the ALED7709B accepts PWMI control signals for standalone operation.

The ALED7709 features over-voltage, over-current, over-temperature, and LED fault detection and protections, with automatic channel disconnect capabilities.



FEATURES

- Single-chip 4-channel LED driver and dc-dc controller
- Input-voltage range: 4.5 V to 42 V
- Boost, SEPIC, and adaptive dc-dc modes for low power loss

APPLICATIONS

- · Automotive lighting:
 - o Infotainment display backlighting
 - o Head-up display (HUD)
 - Instrument lighting
 - Ambient lighting

FREE DEV BOARD

Evaluation kit for automotive-qualified ALED7709 LED driver.

Orderable Part Number STEVAL-LLL014V1

APPLY HERE NOW





















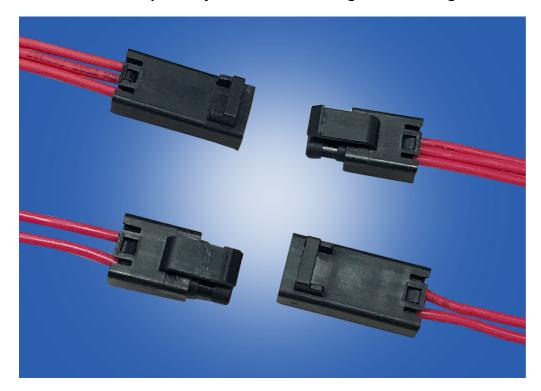




Miniature wire-to-wire connectors offer IP67 waterproofing for harsh industrial environments

The FLHP2100 2-pin wire-to-wire connectors from Amphenol Communications Solutions feature a 2.5 mm pitch to give a compact, sealed connectivity solution in environmentally challenging deployments.

Compatibility with 18 AWG wiring allows for high-current designs at up to 8 A.



Amphenol

FEATURES

- · Compact design
- · Easy installation
- · RoHS compliant

APPLICATIONS

- Lighting appliances
- HVAC systems
- · Harsh-environment applications
- Smart home devices
- Industrial machinery

The FLHP2100 series wire-to-wire connectors have a 400 V ac rating with phosphor bronze contacts, and have a maximum contact resistance of 20 m Ω . Gold contact options are also available

The housing is made from UL94V-0-rated thermoplastic with a minimum insulation resistance of 500 M Ω and an operating temperature range of -40°C to 105°C.

The FLHP2100 accepts 18 AWG wire for a current rating of 8 A. With 20 AWG the current rating is 5 A and with 22 AWG wire, 3 A. The connectors, which provide IP67 protection when mated, are suitable for installations that are exposed to thermal and physical shock, high humidity, vibration, or salt spray.















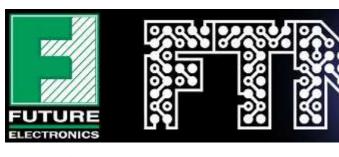






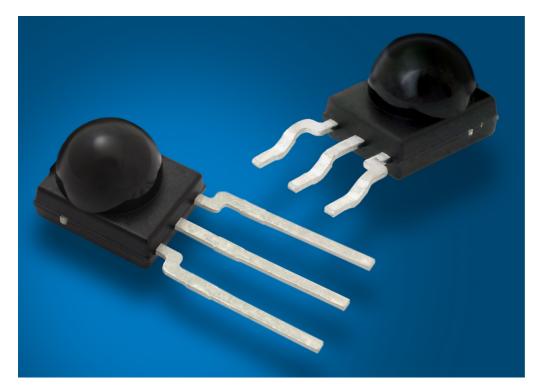






Infrared sensor modules operate reliably even in direct sunlight

The TSSP93038DF1PZA and TSSP93038SS1ZA infrared (IR) sensor modules from Vishay provide a versatile IR sensing solution for presence and proximity detection in interior or exterior applications.



Vishay has launched two infrared (IR) sensor modules which produce robust operation in direct sunlight, while providing enough sensitivity for use in light barrier applications. The surfacemount TSSP93038DF1PZA and leaded TSSP93038SS1ZA, which offer typical irradiance of 1.3 mW/m², are supplied in compact Minimold packages.

Unlike high-sensitivity fixed-gain IR sensor modules, which require an attenuator such as dark cover glass, apertures, or sunshades to protect them against interference from sunlight, the TSSP93038DF1PZA and TSSP93038SS1ZA have controlled sensitivity which allows them to operate in full sunlight without generating unwanted pulses.

For short-range applications such as presence and proximity detection, the sensors' reduced sensitivity eliminates the need for extremely low forward current at the emitter, which can lead to unstable intensity at the output.

The TSSP93038DF1PZA and TSSP93038SS1ZA can perform proximity sensing at a range of up to 1 m. Range is up to 11 m in light-curtain applications when used with the Vishay TSAL6100 IR emitting diode operating at a forward current of 100 mA. Longer ranges can be achieved by using an emitter with a narrower focus, such as the Vishay VSLY5940, or by increasing the forward current to the emitter.

These IR sensor modules are suitable for a wide range of proximity and presence detection use cases, including:

- · Vicinity switches
- · Presence detection for traffic control lights and parking lots, and gateway access
- · Water level detection
- Light barriers for sports racing and robotic lawnmowers
- Reflective sensors for hand dryers, towel and soap dispensers, water faucets, toilets, vending machine fall detection, and security and pet gates













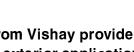














- 940 nm peak wavelength
- 260 μs reaction time
- 0.35 mA supply current
- Sensitive to a carrier frequency of
- Insensitive to ripple noise on the supply voltage

APPLICATIONS

- Toys
- Drones
- Robots
- Home and building automation
- Access control equipment



Compact TVS diodes for automotive system protection boast 40% smaller PCB footprint

Littlefuse's SZSMF4L series of automotive-grade TVS diodes offers sub-nanosecond response times and over-voltage transient suppression at up to 400 W for 1 ms, and are suitable for a wide variety of automotive use cases.



The SZSMF4L from Littelfuse are transient voltage suppression diodes supplied in a compact SOD-123FL package that provides greater design flexibility and occupies less space than previous technologies. The footprint is just 3.85 mm by 2.35 mm. In addition to being AEC-Q101 qualified, the SZSMF4L series meets ESD Class 3 and IEC 61000-4-2 certification standards.

Unidirectional and bidirectional variants are available with a peak reverse voltage range of 5 V to 78 V and 10 V to 78 V respectively. Both offer low zener impedance, high surge tolerance, and excellent clamping with low leakage current.



FEATURES

- Less than 1 ns response time
- Peak power of 400 W at 1 ms
- Up to 175°C operating temperature
- Working peak reverse voltage up to 78 V

APPLICATIONS

- EV powertrain and inverter
- EV on-board charging
- Automotive battery management systems
- Automotive power distribution unit
- Automotive control systems
- Automotive I/O interface protection

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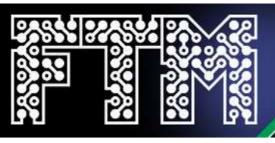








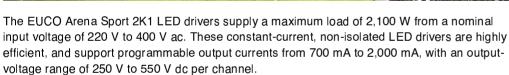




2.1 kW LED drivers with low output-current ripple suit HDTV sports broadcasting

The EUCO Arena Sport 2K1 series from Delta Electronics provides three independent channels for driving LED lighting installations, each with up to 700 W of output power and controllable by DALI2/D4i or DMX-RDM interfaces.





Peak-to-peak output-current ripple of 1% makes these drivers well suited for lighting in HDTV broadcast applications. Constant light output, a wide dimming range down to 0.1%, and autonomous dimming functionality enable versatile operation for supporting different levels of ambient lighting during long sporting events. The drivers can be controlled from a distance of up to 200 metres, which enables their use in the largest of venues.

Suitable for indoor and outdoor installations, the EUCO Arena Sport 2K1 LED drivers come in an IP66, IK08-rated enclosure rated for operation at temperatures between -40°C and 50°C. High-accuracy integrated power monitoring and input-surge protection of up to 10 kV ensures reliable operation in harsh operating conditions.



DATASHEET



SAMPLES



















FEATURES

- Three independent 700 W output channels
- 97.8% efficiency
- DALI2/D4i and DMX-RDM control options

APPLICATIONS

- Indoor or outdoor stadium and arena lighting
- Outdoor area lighting
- Broadcast television lighting



Low-profile mezzanine connectors carry up to 45 A per power contact

The PwrBlade MiniMezz connector series from Amphenol Communications Solutions offers very low stacking heights from 8 mm to 20 mm, with modular tooling to support a wide range of application requirements.



The PwrBlade MiniMezz series of connectors from Amphenol Communications Solutions supports a wide range of current requirements in space-constrained applications.

The PwrBlade MiniMezz mezzanine connectors are supplied as vertical, through-hole receptacles and headers. Guide posts are a built-in feature of the housing to support blind-mate guidance. Optional PCB hold-down features can also be added for better retention. Mating height options range from 8 mm to 20 mm, and are tooled in 1 mm increments.

The connectors feature patented GCS^{\circledR} plating for power contacts, and GXT^{\circledR} plating for signal contacts, to optimize contact resistance.

Video: Introduction to PwrBlade Mini cable-to-board connector

Amphenol

FEATURES

- Power and signal hybrid connector
- Solder-tail or press-fit tail board termination
- ±0.8 mm blind mate gatherability
- 200 mating cycles

APPLICATIONS

- EV chargers
- Data centers
- Servers
- Energy-storage systems
- Uninterruptible power supplies
- Medical equipment
- · Industrial equipment
- Instrumentation

Ⅲ BUY NOW





















