PHOENIX

TECHNICAL MARKETING

Infotainment and telematics Automotive Catalog

nexperia 5 YEARS

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Infotainment and telematics

Car manufacturers are integrating more electronics into their infotainment systems that allow us to connect easily to our personal digital environment. That means more recognized ‘consumer’ interfaces and connections are being used in the noisy car environment. All this is driving demand for more and more connectivity within vehicles using standard high-speed consumer and computing interfaces – from USB (3.2 / 2.0) and HDMI to LVDS, SerDes and SD-card interfaces.

Infotainment and telematics Applications

- **LED backlight for touchscreens and cameras**
- Look in any new car today and you'll see traditional dashboard and central consoles being replaced by LCD displays and in...
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- **Multimedia / infotainment bus protection**
- Essential for entertainment and infotainment systems, multimedia buses are a growing trend in vehicles. For these high-sp...
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- **USB4 connectivity and compatibility**
- As USB Type-C connectors have become the default standard, with the USB4 specification the USB Implementers Forum (USB-IF...
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- **Step-down DC/DC converter**
- This circuit converts 12 V from the car battery to 5 V. It can be used to drive low power units such as the dashboard clu...
- Read more

Infotainment and telematics products

- Automotive MOSFETs
- Schottky diodes and rectifiers IF >= 1 A
- Automotive Schottky diodes and rectifiers
- Automotive infotainment/SerDes
- LIN/CAN(FD)/FlexRay
- Automotive ESD Ethernet
- Low capacitance ESD protection for high-speed interfaces

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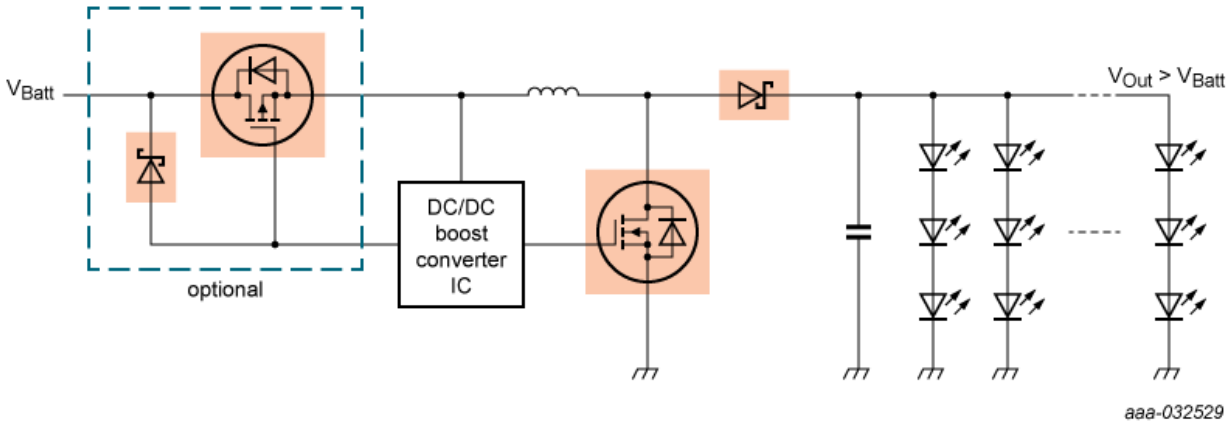
LED backlight for touchscreens and cameras

Look in any new car today and you'll see traditional dashboard and central consoles being replaced by LCD displays and infotainment touchscreens. Soon we may have screens for front and rear passengers and with all the various camera, rear view mirrors could easily switch to an internal display. In fact some analysts believe the average car will have up to 20 cameras and 15 displays by 2030. Of course one issue with LCD displays is the need for good backlighting. That is where a proven step-up DC/DC conversion is vital.



Products

- Boost MOSFET: N-channel, 40 / 80 V, Rdson 3 - 23 mOhm, LFPAK33/56
- Freewheeling Schottky diode: 60-100 V, low VF; CFP3/5/15
- Protection MOSFET: 30-60 V, Rdson 10 - 50 mOhm, LFPAK56
- Schottky diode: 20-100 V, DFN package

Design considerations

- Boost MOSFET must offer a high efficiency and very good thermal behavior
- Low VF delivers required efficiency, and Trench types can offer increased thermal stability
- Range of products and package sizes needed to allow for different LED string lenghts and numbers, and best EMI performance

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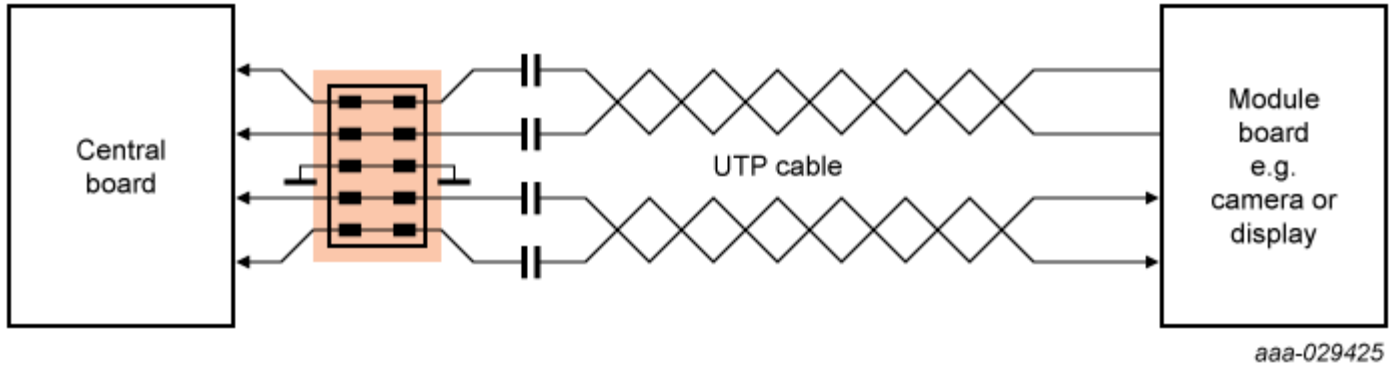
Multimedia / infotainment bus protection

Essential for entertainment and infotainment systems, multimedia buses are a growing trend in vehicles. For these high-speed buses, which often based on consumer network standards, the challenge is to ensure they can survive the harsh automotive environment and as data rates go up so capacitance must come down. So only the best ESD protection is good enough to ensure reliable operation.



Products

- Automotive high-speed network protection

Design considerations

- High ESD robustness up to 30 kV and high surge currents up to 3.5 A (8/20µs)
- Excellent ESD clamping behavior
- Operate at a low capacitance avoiding any unwanted circuit disturbances

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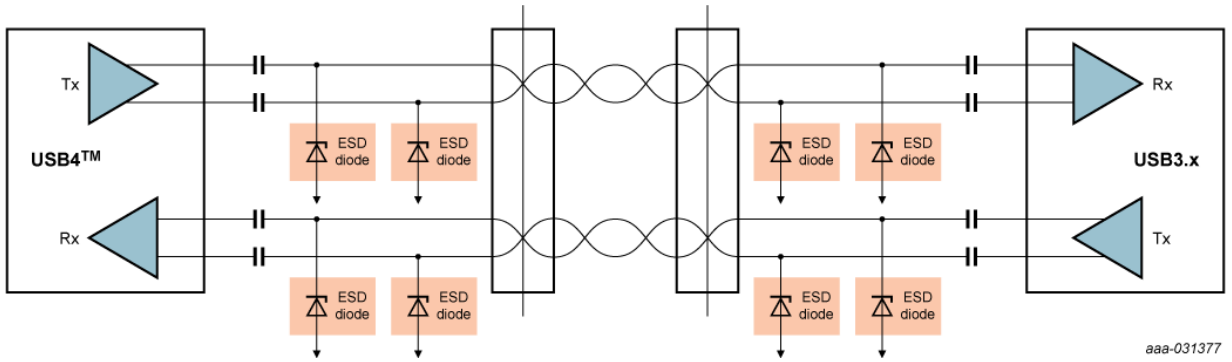
USB4 connectivity and compatibility

As USB Type-C connectors have become the default standard, with the USB4 specification the USB Implementers Forum (USB-IF) is delivering a single standard connection protocol. Designed to unite wired connections via USB Type-C connectors, it is offers compatibility with USB 3.2, USB 2.0, PCIe DisplayPort and Thunderbolt 3. However, ensuring effective protection of devices operating with different backward compatible protocols requires the optimised ESD protection offered by Nexperia's TrEOS protection devices for super-speed lines.



Products - ESD protection

- Position: close to port – Cd (typ) 0.1 pF; DSN0603-2
- Position: at RX inputs - PESD1V2Y1BSF

Design considerations

- 20 Gbps on one differential pair (super-speed)
- Low insertion loss (signal attenuation) and low return loss (signal reflection) required along with low clamping to protect sensitive super-speed data lines
- Need to protect AC-coupling for the receiver inputs (Rx) which are mandatory on USB4
- Different protocols have different operating voltages

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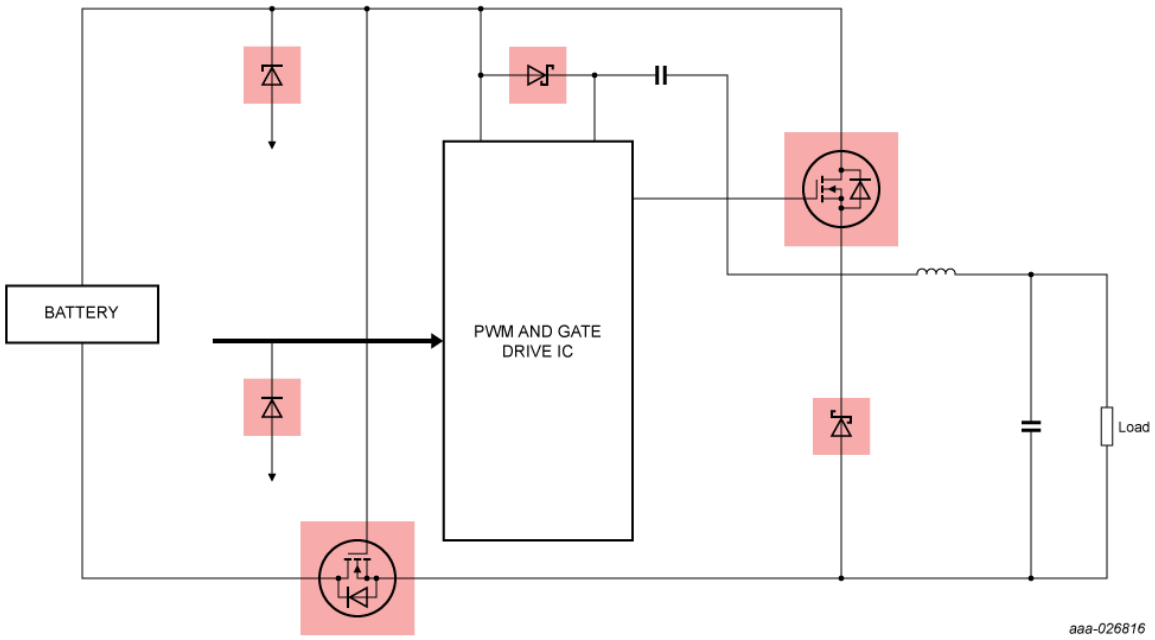
Step-down DC/DC converter

This circuit converts 12 V from the car battery to 5 V. It can be used to drive low power units such as the dashboard cluster.



Products

- MOSFETs: 30-40 V, < 15 mOhm, LFPAK33 / LFPAK56(D)
- Schottky diodes: ≤ 250 mA, SOD523 / DFN1006-2
- Reverse battery: LFPAK56(E) / LFPAK88, 40 V, > 100 A

Design considerations

- Point of load non-isolated DC.DC
- Asynchronous buck converter circuit
- Economical, two-MOSFET design
- Standard efficiency
- Step-down of voltage while stepping up current
- Flexibility to replace MOSFET diode pair with LFPAK56D dual or LFPAK56D half-bridge MOSFET