

New series of automotive grade LDOs from Nexperia offer high accuracy and ultra-low quiescent current

Regulated and protected output from wide input voltage range even under cold-crank conditions

Nijmegen, February 13, 2025: Nexperia today introduced a new series of AEC-Q100 qualified general-purpose low-dropout (LDO) voltage regulators with ultra-low quiescent current. This new series includes tracking LDOs with high tracking accuracy and protected outputs, capable of direct connection to vehicle batteries thanks to their wide input voltage tolerance. These LDOs are thermally enhanced and can generate a stable voltage source under cold-crank conditions for ripple-sensitive loads in automotive applications including infotainment systems, ADAS as well as telematics, and lighting systems. The tracking LDO's outstanding output protection enables their use in body control modules, zone controller units and power train systems, even in scenarios involving off-board loads such as sensors. Beyond automotive applications, these LDOs are well-suited for industrial applications, including power tools, e-bikes and battery packs.

In battery-powered automotive applications, low quiescent current (I_q) and shut-down current (I_{SHUT}) are critical for saving energy and extending battery lifetime. Always-on systems require ultra-low I_q and stable output cross temperature range. In CAN-wake systems and some systems with sleep state, ultra-low I_{SHUT} is essential to minimize battery drain even in deep-sleep (disable) mode. Consuming only 5.3 μA (typical) quiescent current at light load and 300 nA (typical) shut-down current under disabled mode, these LDOs are ideal for powering always-on components like microcontrollers (MCUs), controller area network (CAN) or local interconnect network (LIN) transceivers in standby and CAN-wake systems.

The tracking LDOs further address off-board or off-PCB powered scenarios, such as powering sensors. These applications often require robust output requires protection, including safeguards against short-to-ground, short-to-battery and reverse current conditions. These challenges are addressed by the comprehensive protection features of the tracking LDOs in this series, ensuring reliable operation in demanding environments. Additionally, for ratiometric sensing or measurement applications, the tracking LDOs deliver exceptional output accuracy, tracking supply voltages of analog-to-digital converters (ADCs) or MCUs within ± 5 mV.

The general LDOs generate a stable ($\pm 2\%$ accuracy) 3 V or 5 V output from a wide input voltage range (3-40 V), allowing them to be connected directly to a car battery without the requirement for additional pre-regulation. Integrated protection features include short-circuit, over-current and thermal shutdown and these LDOs can operate over a -40 °C to 125 °C (ambient) and -40 °C to



150 °C (junction) temperature range. The series also features devices with a power good (PG) output voltage status monitor that can be used to support functional safety-related system designs.

NEX90x30-Q100 LDOs provide 300 mA of output current capability and are available in a choice of packages including the thermally enhanced, bottom-side cooled 8-pin HTSSOP package measuring 3 mm x 3 mm and a DFN6 package measuring only 2 mm x 2 mm. For lower loading current applications, NEX90x15-Q100 devices with 150 mA output current capability are more cost effective with flexible package choices of SOT23-5, SOT223-4 and HWSO6 (DFN-6). The Tracking LDO NEX91207-Q100 has a 70mA output current and comes in SOT23-5 and SOT23-5S package.

To learn more about Nexperia's LDO regulators, visit: www.nexperia.com/low_dropout_regulator

About Nexperia

Headquartered in the Netherlands, Nexperia is a global semiconductor company with a rich European history and over 12,500 employees across Europe, Asia, and the United States. As a leading expert in the development and production of essential semiconductors, Nexperia's components enable the basic functionality of virtually every electronic design in the world – from automotive and industrial to mobile and consumer applications.

The company serves a global customer base, shipping more than 100 billion products annually. These products are recognized as benchmarks in efficiency – in process, size, power, and performance. Nexperia's commitment to innovation, efficiency, sustainability, and stringent industry requirements is evident in its extensive IP portfolio, its expanding product range, and its certification to IATF 16949, ISO 9001, ISO 14001 and ISO 45001 standards.

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