(Source: Adobe Stock)

CAN SIC XL transceiver comes in a HVSON8 package

(Source: Bosch)

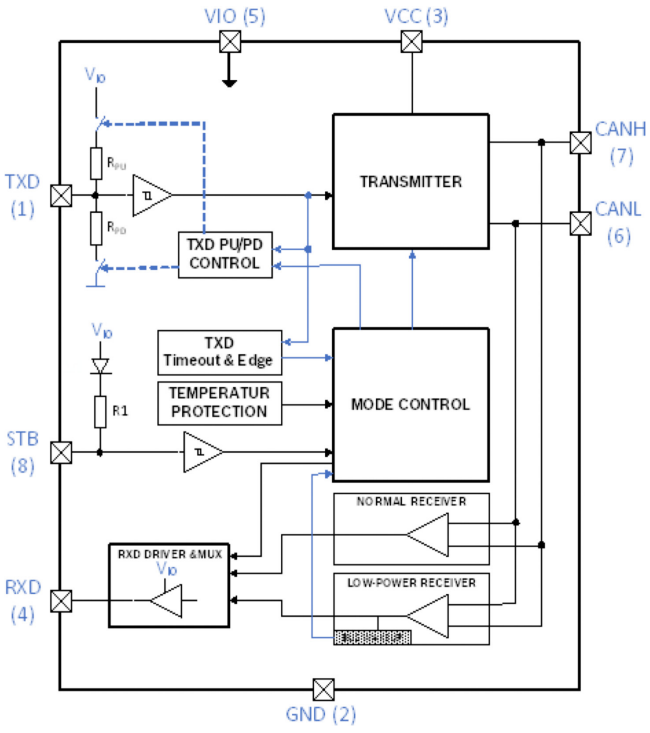
Bosch has launched the NT156 stand-alone transceiver compliant with ISO 11898-2:2024. It supports bit rates up to 20 Mbit/s. On the RxD pin, a wake-up is indicated.

The CAN SIC XL physical medium attachment (PMA) sublayer is internationally standardized in ISO 11898-2:2024. Originally, the requirements for CAN SIC XL transceivers were specified in CiA 601-4 (SIC) and in CiA 610-3 (FAST mode) documents, which have been submitted to ISO. Prototypes of the NT156 transceiver have been successfully tested on interoperability with CAN SIC XL transceivers from Infineon, NXP, and Texas Instruments during a CiA CAN XL plugfest in May 2024. The compatibility and the interoperability were also tested by C&S Group, an independent test house in Wolfenbuettel (Germany). Automotive EMC requirements (IEC 62228-3) have been proofed by IBEE in Zwickau (Germany).

Bosch has launched its CAN SIC XL transceiver at the Electronica tradeshow in Munich (Germany) end of last year. Samples will be available in the 2nd quarter of 2025. The chip is developed according to ISO 26262 (functional safety). According to a preliminary datasheet, the NT156 consumes in normal mode in recessive bus state 10 mA, and in dominant bus state 54 mA. In standby mode, the current consumption is 2 µA. The transition from standby mode to normal mode is specified with 50 µs.

The transceiver is intended to feature a junction temperature from -40 °C to +150 °C. Between +170 °C and +200 °C the chip shuts down, and releases the shutdown at +150 °C. The shutdown junction temperature hysteresis is 20 K. The minimum TXD dominant timeout is 0,8 ms. The chip features an undervoltage detection at V_{cc} and V_{IO} pins.

The CAN SIC XL transceiver featuring sleep-mode and wake-up capability supports in FAST mode bit rates up to 10 Mbit/s. In SIC mode, it can run up to 8 Mbit/s in the data phase depending on the chosen network topology and the selected electromechanical components such as cables and connectors. The transceiver differential impedance is typically 120 Ohm in SIC mode, and both single-ended impedances measured to ground are in FAST mode 66,5 Ohm. *hz*



Application example of the NT156 CAN SIC XL transceiver (Source: Bosch)

Microcontroller with CAN XL modules on chip

Infineon has launched the Aurix TC4Dx microcontroller family, manufactured using 28-nm technology. The MCUs (microcontroller units) support CAN XL connectivity. The German chipmaker is sampling the chip and plans mass production later on this year.

(Source: Infineon)

Besides CAN XL modules, the MCUs provide Ethernet-based interfaces. The chips are intended for automotive ECUs (electronic control units). This includes applications such as vehicle motion control and ADAS (advanced driver assistance systems).

"Microcontrollers like our new Aurix TC4Dx are the backbone of software-defined vehicles. They are essential to further improve vehicle performance, safety and comfort," explained Thomas Boehm from Infineon. "It will contribute to secured processing performance and efficiency, and our customers will benefit from faster time-to-market and lower total system cost."

The products feature a six-core architecture with the 500-MHz Tricore, all with lock-steps for functional safety performance. With its PPU (parallel processing unit), the MCU provides a platform for developing embedded AI-based applications such as motor control, battery management systems, or vehicle motion control. The MCU is supported by a software ecosystem and includes networking accelerators to boost CAN and Ethernet communication, as well as the interfaces such as CAN XL, 5-Gbit/s Ethernet, PCIe, and 10Base-T1S. According to the chipmaker, this increased networking throughput and connectivity gives customers the performance and flexibility needed to implement E/E architectures. Its holistic approach to functional safety meets the functional safety requirements according to ISO 26262 (ASIL D). The MCUs also fulfill cyber security features according to ISO/SAE 21434 including post-quantum cryptography support.

One of the first customers is Marelli, an Italian Tier-1 supplier of automotive ECUs. The company is going to develop zone control units (ZCU). "Marelli and Infineon have a long history of working together and the joint development of our ZCUs is another significant step forward," said Ravi Tallapragada from Marelli. "With Infineon's contribution, Marelli is well positioned to strengthen its role as a partner to carmakers venturing into zonal architectures."

These ZCUs can be applied for software-defined vehicles (SDV). They can act as data-routing engine with low latencies, transferring data form CAN XL networks to an Ethernet-based backbone. Such ZCUs can also run lighting control software, paving the way for future MCU-less lamps. Of course, the ZCUs allow software updates, which are critical to maintaining the latest features without system downtime.

hz

Brief news: CAN SIC transceiver chips

The CAN SIC (signal improvement capability) transceivers were originally specified in the CiA 601-4 document. In the meantime, they are internationally standardized in ISO 11898-2:2024. Technically both documents are equivalent, however the wording has been improved. ISO is working on a new edition, in order to overcome some still misleading descriptions. As stated, this has no impact on the available products. There is also a conformance test plan under development (ISO 16845-2). The C&S Group (Germany) offers the Invio simulation test tool, which is suitable to test CAN SIC transceivers. A related evaluation board is available, too.

- ***Infineon:*** The TLE9371SJ and TLE9371VSJ stand-alone CAN SIC transceiver chips can support bit rates up to 8 Mbit/s. They come in DSO-8 packages and feature network wake-up functionality. They are pin-compatible with legacy CAN FD transceivers. The transceivers support a TXD-timeout function, in order to avoid that the network communication is blocked due to a permanent dominant signal is transmitted by this node.
- ***Novosense:*** The NCA1462-Q1 CAN SIC transceiver complies with ISO 11898-2:2024, featuring bit rates up to 8 Mbit/s even when using star topologies. The Chinese CiA member has a patent on the SIC circuitry implementation, which is optimized for high EMI (electromagnetic interference) performance tested in accordance with IEC 62228-3 (see CAN Newsletter 2/2024, page 17). The chips with an ESD (electrostatic discharge) performance of ±8 kV come in SOP8 and DFN8 packages.
- ***NXP:*** The TJA1463 is a CAN SIC transceiver with sleep-mode capability. It is intended as a replacement for TJA1043 CAN FD transceivers. The AEC-Q100 Grade 0 variant, the TJR1463 is suitable for temperature applications, supporting operation at +150 °C ambient temperature. They are specified for bit rates up to 8 Mbit/s. They are available in SO14 and leadless HVSON14 packages.
- ***Texas Instruments:*** The TCAN146x-Q1 partial networking CAN SIC transceivers are available in SOIC14, VSON14, and SOT23 packages. They are suitable for bit rates up to 8 Mbit/s. The transceivers provide an SPI (serial peripheral interface) for configuration purposes.

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