TJA1445, TJA1446, TJA1465, TJA1466 – CAN FD and CAN SIC transceivers with partial networking

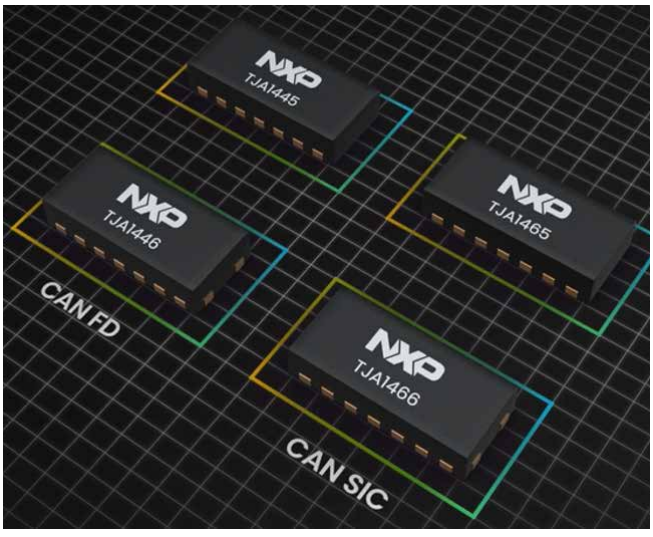
The TJA1445, TJA1446, TJA1465 and TJA1466 are part of NXP's portfolio of high-speed CAN sleep mode transceivers which support partial networking by means of a selective wake up feature, as specified in ISO11898-2.

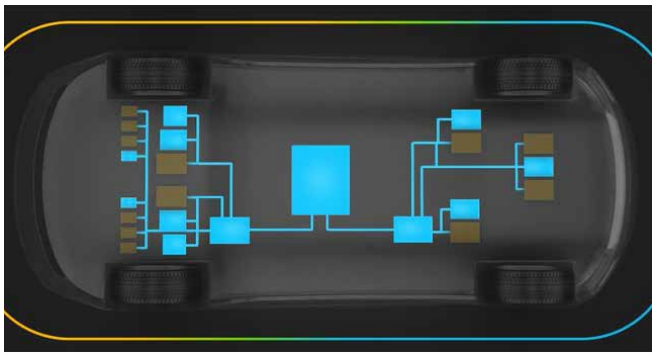
Partial networking transceivers help optimize the system energy efficiency by allowing inactive ECUs to remain in low-power mode (switched-off) while other ECUs remain active on the bus. Switching off ECUs can be done through the INH pin of the CAN transceiver. The switched-off ECUs can wake-up on local wake-up requests or through remote (CAN bus) partial networking wake-up requests which contains the ECU's specific CAN ID.

In electric vehicles, the reduction of energy consumption with a partial networking approach results in CO2 emission reduction and positively impacts the vehicle cruising range and charging needs (= cost).

Keeping ECUs powered-off also prevents electric components be exposed to power with component degradation as a result, hence ECU lifetime can be extended.

In the SDV vehicle concept, partial networking offers the flexibility of dynamically and selectively enabling or disabling ECUs, which allows e.g. functions to be disabled while not being activated (OTA update / purchase) by the end user. Unused ECUs will then not drain the battery, will not degrade and will be functionally blocked for end user access.





The new generation of CAN partial networking transceivers is introduced in combination with two technologies: CAN FD on TJA144x, and CAN FD with Signal Improvement Capabilities (CAN SIC) on the TJA146x, which supports use cases where higher CAN speeds up to 8 Mbit/sec and/or highly complex topologies are targeted.

The products include an SPI for configuration, mode control and diagnostics.

The devices can be configured to ignore CAN FD frames while waiting for a valid wake-up frame. This additional feature of partial networking, called CAN FD passive, is the ideal fit for networks that support a mix of classical CAN or CAN FD communications. It allows classical CAN controllers that do not need to communicate and CAN FD messages to remain in partial networking sleep/standby mode during CAN FD communication without generating bus errors.

On the TJA146x CAN SIC variants, additionally to CAN FD passive, a CAN XL passive functionality is added as well, which allows for a mix of CAN FD and CAN XL traffic on the CAN bus.

The TJA1445B and TJA1465B variants come in a DHVQFN18 package and feature user configurable GPIO pins, which offer flexibility and support a range of functions that may help optimize ECU design.

The TJA1446x and TJA1466x variants also come in the DHVQFN18 package and feature advanced system monitoring functions, like undervoltage and overvoltage monitoring on the VIO supply, a question and answer (Q&A) watchdog with dedicated reset pin to properly trigger a soft system reset in failure cases, and a dedicated LIMP/Fail-Safe output pin to support fail-safe operation. Also, these variants are equipped with two GPIO pins.

This new generation of transceivers supports 1.8V VIO, which can communicate with the latest generations of automotive microcontrollers.

All variants are fully developed, certified and compliant to ISO 26262 ASIL B, and are part of NXP's SafeAssure program.

Find out more on nxp.com/CAN-PN

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