

Power efficiency
and CO₂ reduction
for conventional
and electric vehicles

TJA1145A HS-CAN / CAN-FD Transceiver and UJA1168A SBC for Partial Networking

These two devices, a High Speed CAN / CAN FD transceiver and a system basis chip (SBC), let manufacturers reap the benefits of partial networking (PN). They optimize power consumption and help increase energy efficiency in conventional cars and new electric vehicles.

KEY FEATURES

- ▶ "Selective" wake-up function according to ISO11898-2:2016
- ▶ Wake-up only by special messages in PN mode
- ▶ Wake-up on any CAN message if PN mode is disabled
- ▶ Available for high-speed classical CAN up to 1 Mbaud and CAN FD at 2 Mbit/s and 5 Mbit/s
- ▶ Compatible with ISO11898-2:2016, SAE J2284-1 to SAE J2284-5
- ▶ Similar footprint to the TJA1145, TJA1041 and TJA1043 transceivers, for easy upgrade.
- ▶ Quiescent current below 64 μ A for the TJA1145A transceiver (bus inactive)
- ▶ Available in SO14 and HVSON14 packages

BENEFITS

- ▶ Switch off inactive ECUs
- ▶ Reduce current to less than 1 mA (bus active)
- ▶ CO₂ reduction up to 2.6 g/km per vehicle - resulting in cost advantage of 247 € (considering a fee of 95 €/g CO₂/km in 2019)
- ▶ Makes sub-network design more flexible
- ▶ Autonomous biasing helps optimize EMC behavior

The NXP solution for partial networking includes two devices that optimize energy efficiency: the TJA1145A, a high-speed CAN (HS-CAN) transceiver, and the UJA1168A, a system basis chip (SBC) for small electronic control units (ECUs) in body and comfort applications.

The TJA1145A transceiver and the UJA1168A SBC help optimize the energy efficiency of the car by allowing inactive ECUs to remain in low-power mode while other ECUs remain active on the bus. Partial networking enables the system to switch off ECUs that aren't in use. The switched-off ECUs can still listen for special wake-up messages, but don't impact the other ECUs on the bus. The ECUs are only activated when needed by receiving selective wake-up messages, resulting in a more efficient and cost-effective operation.

In electric vehicles, the reduction of energy consumption with the partial networking approach increases cruising range. Battery charging requires a minimum of modules to be active on the CAN bus, while the remaining modules can be kept inactive. This setup saves energy during battery charging and helps increase reliability over the vehicle's lifetime.



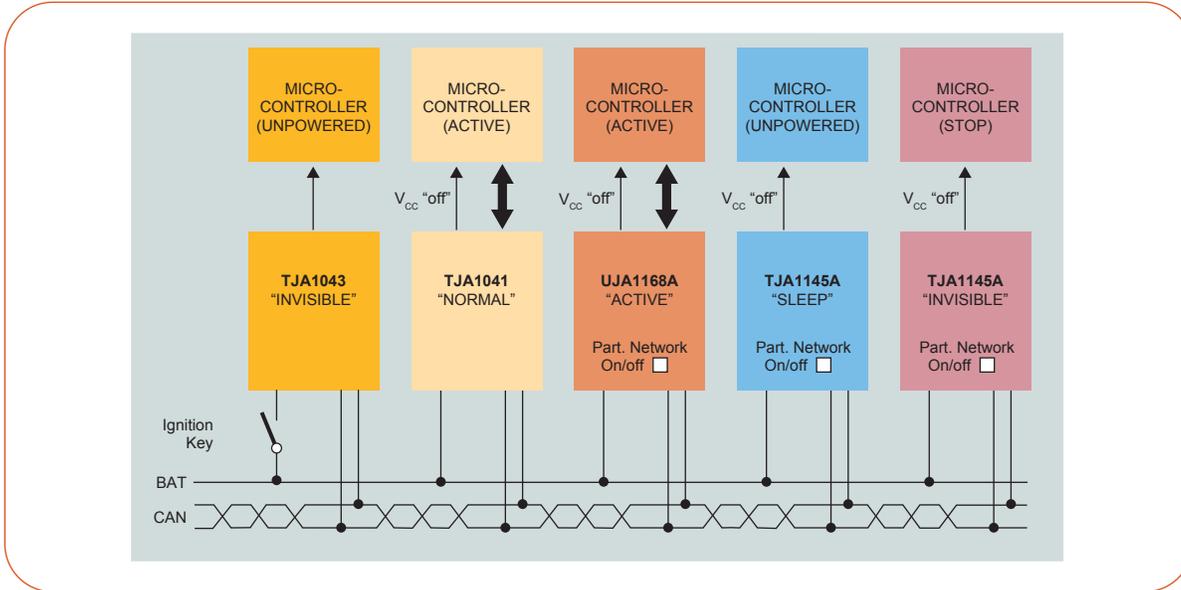
The TJA1145A transceiver may also enhance vehicle features. For example, manufacturers may be able to enable many more functions during ignition off time because unused ECUs do not drain the battery.

The TJA1145A transceiver and UJA1168A SBC both support operation with and without selective wake-up function. They also

deliver high EMI robustness and low EME. No additional hardware is required to implement the PN functions. The required software updates come with AUTOSAR® version 3.2.1 and higher.

The partial networking function can be implemented just on defined ECUs on the bus; hardware of ECUs that don't use the PN feature do not need to be changed.

SAMPLE TJA1145A/UJA1168A APPLICATION



TJA1145A TRANSCEIVER BLOCK DIAGRAM

