



NXP “Clamp-30” HS-CAN transceiver TJA1043 with sleep mode and diagnostics

Higher performance at a lower cost with 3rd-generation HS-CAN transceiver

This standalone HS-CAN solution, our most advanced to date, provides power supply control for the entire node and includes failsafe features, network diagnostics, and wake-up source recognition.

Key features

- ▶ Exceeds ISO11898-2 and ISO11898-5
- ▶ Entire node supply control via low-current Standby and Sleep modes
- ▶ Listen-only mode for node diagnosis and failure containment
- ▶ Suitable for 12 and 24 V systems (± 58 V DC on CANH & CANL, -0,3 to 58 V on BAT)
- ▶ Very low EME
- ▶ Very high EMI
- ▶ ± 8 kV ESD performance per IEC61000-4-2
- ▶ V_{IO} input supports direct interfacing with 3 and 5 V microcontrollers
- ▶ SPLIT voltage output for stabilizing the recessive bus level
- ▶ Rugged reliability in the harsh automotive environment
- ▶ Extensive set of protection and diagnostic functions
- ▶ Automotive-qualified SO14 package

The NXP TJA1043 is a “Clamp-30” high-speed CAN transceiver with wake-up detection and failure diagnostics. Produced in a mature silicon-on-insulator (SOI) process, it delivers improved robustness in the automotive environment and is an ideal choice for nodes that need to be available at all times, even when the internal V_{IO} and V_{CC} supplies are switched off.

The device exceeds the performance requirements of ISO11898-2 and ISO11898-5 and can be used in 12 and 24 V systems. It provides supply control for the entire node, using low-power Sleep and Standby modes with wake-up capabilities.

It offers very low electromagnetic emission (EME), supporting reduced network ringing and choke-less operation. It also offers very high electromagnetic immunity (EMI), with typical flat ratings of 36 dBm. The behavior for all pins under all supply conditions is highly predictable, and the device supports multiple interface levels for use with microcontrollers operating between 3 and 5 V. A SPLIT voltage output stabilizes the recessive bus level.

Low-power management

The Standby and Sleep modes consume very little current and the device can power down the entire node while supporting local, remote, and host wake-up. The device includes wake-up source recognition and becomes “invisible” on the bus when not supplied.



Protection and diagnosis

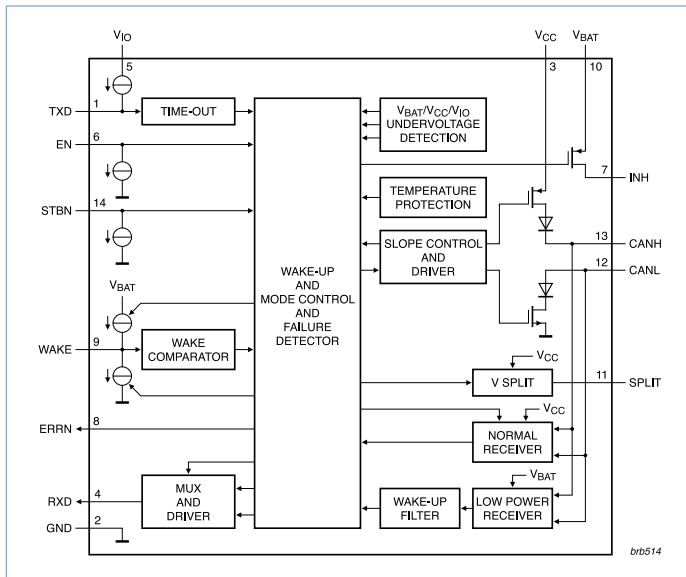
The bus pins provide ± 8 kV ESD performance according to IEC61000-4-2, and both the bus pins and the battery-supply pin are protected against transients in harsh automotive environments. The Transmit Data signal (TXD) offers a dominant time-out function with diagnosis, and there is support for TXD-to-RXD short-circuit handling with diagnosis. Undervoltage detection and recovery is available for all supply pins, including V_{CC} , V_{IO} , and V_{BAT} . Other diagnostic features

include bus line short-circuit, bus dominant clamping, thermal protection and cold start (first battery connection).

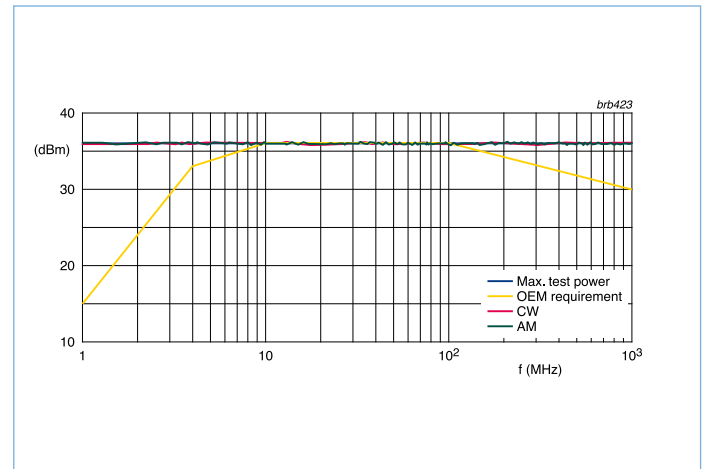
Improved replacement for the TJA1041/TJA1041A

The TJA1043 can be used to replace the TJA1041/TJA1041A. The TJA1043's host wake-up capability and voltage recovery detection enhance the undervoltage recovery mechanism and, as a result, simplify the circuitry of the WAKE pin application.

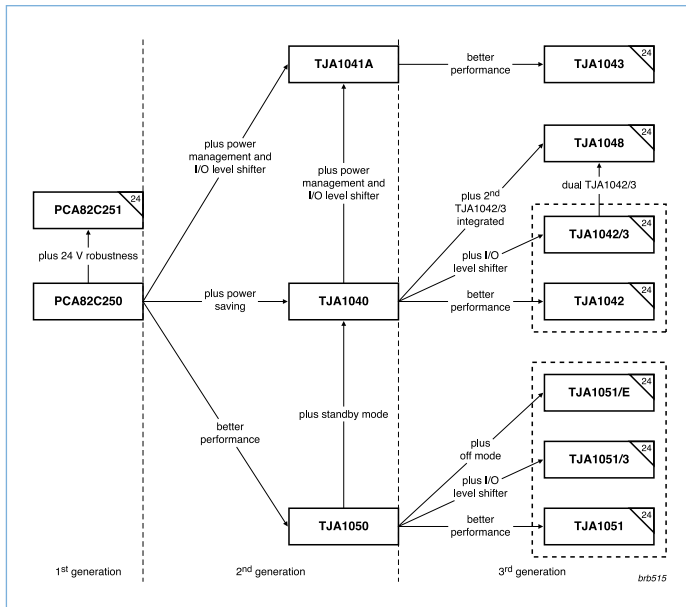
TJA1043 block diagram



Superior EMC performance of the TJA1043



NXP's HS-CAN transceiver portfolio



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