



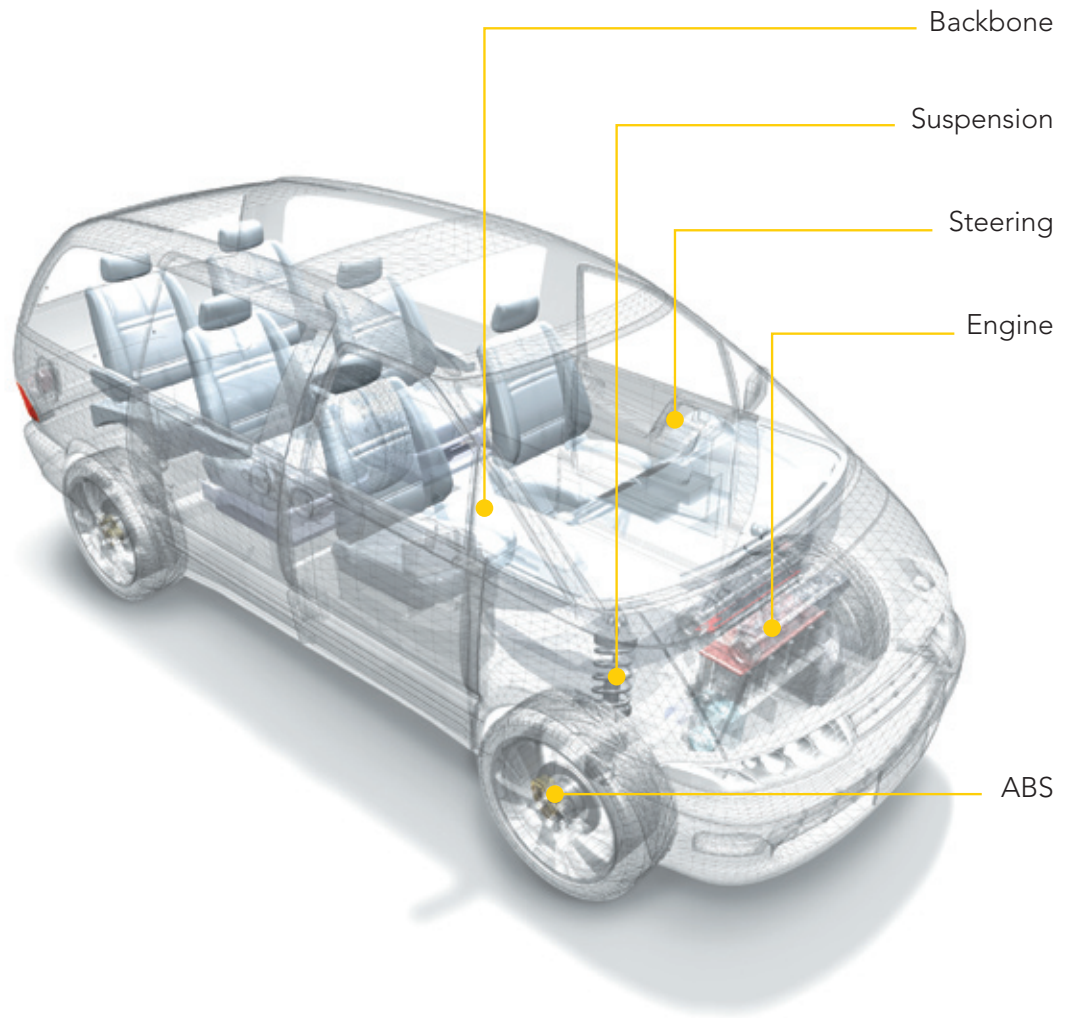
FlexRay node and star transceiver TJA1080

The robust choice in communicating with complete FlexRay architectures

As the world's first silicon solution for the FlexRay electrical physical layer, the high-speed communication system transceiver TJA1080 highlights FlexRay's power and versatility. This key device is helping drive new advanced communications system into today's and tomorrow's cars by offering an extensive feature set, excellent EMC performance and the unique possibility to create active star couplers.

Key features

- ▶ Data transfer from 1 Mbit/s up to 10 Mbits/s
- ▶ Excellent EMC performance
 - Very low ElectroMagnetic Emission to support unshielded cable
 - Differential receiver with high common-mode range for excellent ElectroMagnetic Immunity
- ▶ Can be used for linear passive bus topologies as well as active star topologies
- ▶ Low power management including two inhibit switches enabling power consumption optimized ECU design
- ▶ Very low current in Sleep and Standby mode
- ▶ Autonomous power modes when used in active stars
- ▶ Local wake-up input as well as remote wake-up capability via the FlexRay bus
- ▶ Wake-up source recognition
- ▶ Extensive diagnosis (over temperature and under voltage detection, wake-up source indication, error indication)
- ▶ Detection and fail-safe mode in case of an under voltage on pins V_{BAT} , V_{CC} or V_{IO}
- ▶ ± 8 kV ESD protection (HBM)
- ▶ Protected against transients in automotive environment (ISO 7637 class C compliant)
- ▶ Protected against short-circuit on bus lines
- ▶ Passive behavior of bus lines in the event that transceiver is not powered
- ▶ Supports 2.5, 3.0, 3.3 and 5 V microcontrollers and automatically adapts to interface levels
- ▶ Can be used in 14 V and 42 V systems
- ▶ Interface to optional Bus Guardian for bus access supervision
- ▶ Automotive product qualification in accordance with AEC-Q100

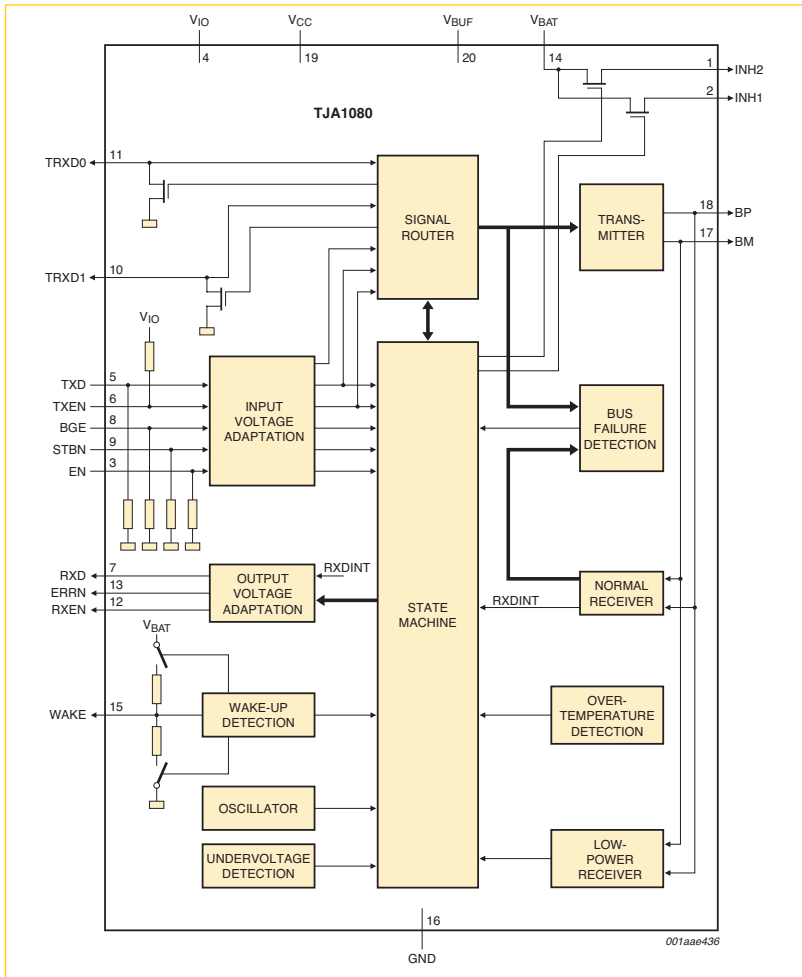


Key benefits

- ▶ Allows full and simplified early development of complete FlexRay networks
 - configurable as a node or as a star transceiver
- ▶ Supports wide range of microcontrollers (including the SJA25xx), maximizing flexibility and lowering cost of nodes
- ▶ In star configuration, fault containment by isolating parts of the network leads to more reliable networks
- ▶ Delivers robust communications due to extensive error diagnosis and protection mechanisms

Key applications

- ▶ Advanced high-speed control applications
 - power train, suspension, steering, braking, etc.
- ▶ Backbone of a complete in-car communications architecture
- ▶ Driver assistance systems
- ▶ Safety relevant applications (e.g. brake-by-wire, steer-by-wire, etc.)



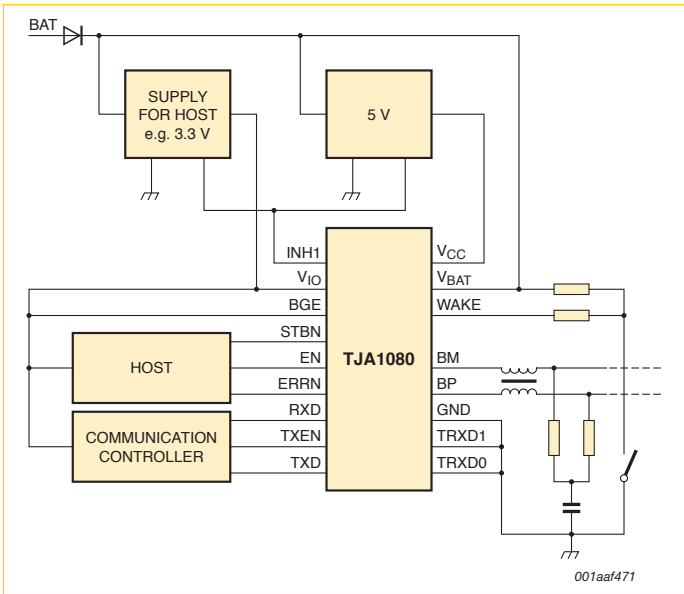
TJA1080 block diagram

FlexRay systems have developed rapidly over the last few years as the industry familiarizes itself with the technology. By taking a smart and flexible approach to building network architectures along with FlexRay's deterministic behavior as well as error confinement capability, manufacturers are gaining fully dependable communications. Systems can also easily incorporate more nodes and new applications thanks to the high bandwidth, and overall system costs are decreasing.

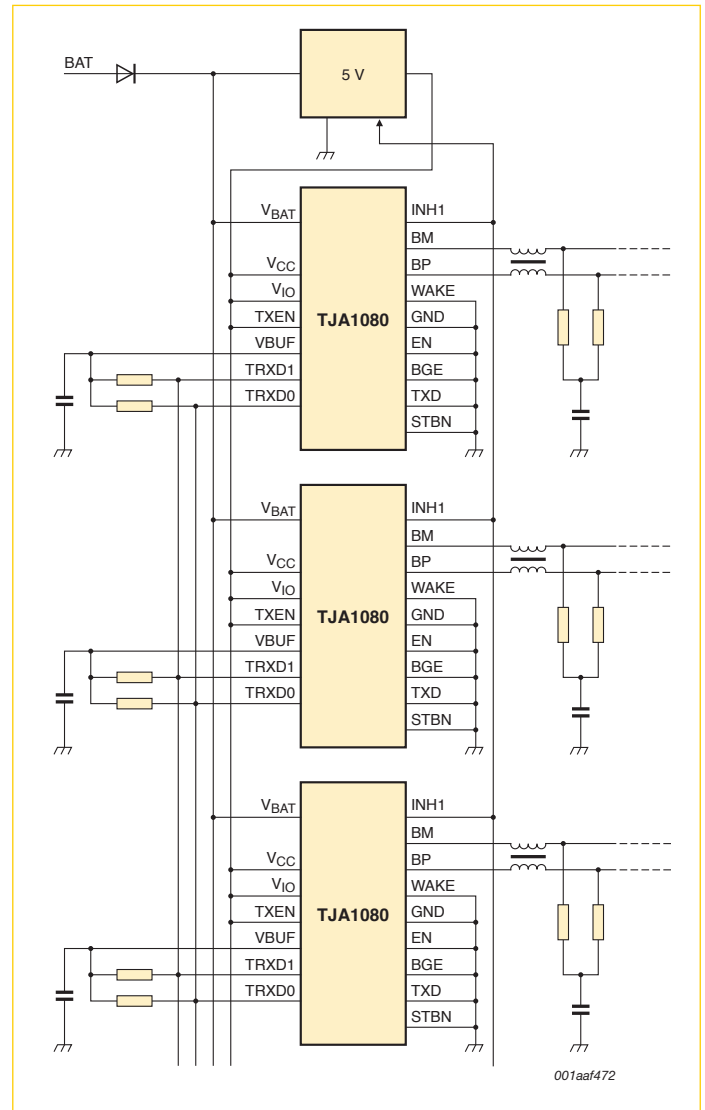
Key to this has been the availability of devices such as the FlexRay transceiver TJA1080. Drawing on our heritage as a founding member of the FlexRay consortium, this transceiver offers an extensive feature set, excellent EMC performance as well as strong ESD protection. By combining both FlexRay node transceiver and FlexRay active star device on a single chip, the TJA1080 also supports the early and simplified development of complete FlexRay network architectures.

Developed in line with the FlexRay electrical physical layer specification V2.1 Rev. A, it is primarily intended for high-speed communication systems supporting every chosen data rate up to 10 Mbits/s. The TJA1080 also provides an advanced interface between the protocol controller and the physical bus in a FlexRay network.

Robust communications are secured by actively monitoring system performance using dedicated error and status information (readable by any microcontroller) along with internal voltage and temperature monitoring. A Bus Guardian interface enables the TJA1080 to be used in systems that require additional supervisions. While in active star and node configurations, features such as sleep and standby power modes serve the need for automotive power management.



Typical node configuration



Typical active star configuration

