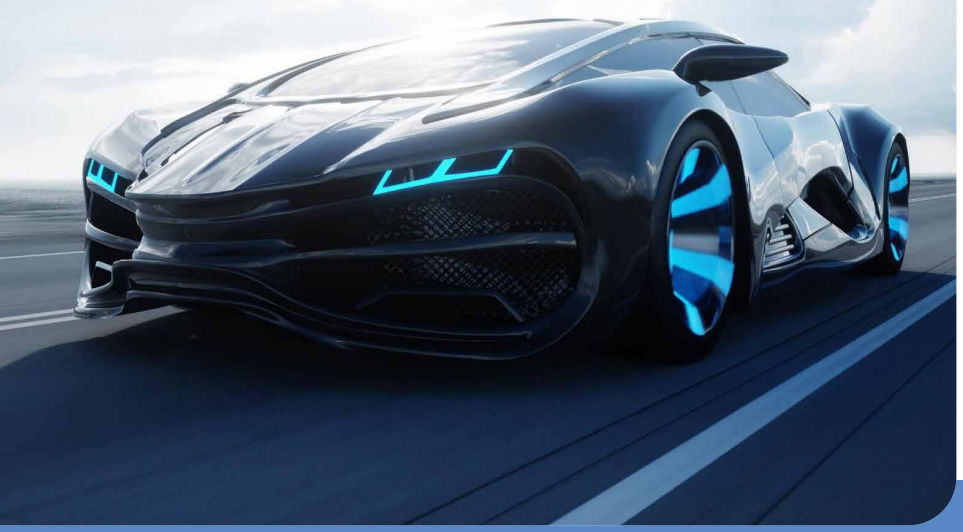


Freedom of topology and higher bit rates

TJA146x CAN Signal Improvement Transceiver Series

NXP's TJA146x series of CAN Signal Improvement transceivers enables more complex topologies and higher bitrates, facilitating system cost savings and greater design freedom for CAN FD network beyond 5 Mbit/s.

THE CAN TRANSCEIVER, REINVENTED

CAN networks are easy to implement, scalable, and support a large number of devices in complex topologies, but only at low speed. The introduction of CAN FD supported faster bit rates, but with the consequence of tight topology restrictions due to signal ringing. This constrained CAN FD to highly linear networks, restricting design freedom and often increasing cabling and system costs.

An additional consequence of ringing is that the communication speed for real world networks is limited to 2 Mbit/s (beyond point-to-point connections), placing a ceiling on how far CAN FD could be accelerated.

But what if you could have the benefits of faster bit rates without the severe topology limitations, and accelerate CAN FD faster than before? The next evolution of CAN FD is here and we call it CAN Signal Improvement.

The TJA146x transceiver family enables complex topologies by actively improving the CAN signals on the bus, significantly reducing ringing effects. Combined with its highly symmetric transmitter, the TJA146x family further enables faster communication, with 5 Mbit/s possible in multi-drop networks and potentially even faster (both dependent on the specific topology). The TJA146x transceivers are also drop-in replacements for existing CAN transceivers, and backward compatible with current CAN solutions, ensuring low implementation effort to create larger, faster, more flexible networks.

PRODUCT SPECIFICATIONS

- High-performance CAN FD communication up to 5 Mbit/s and beyond
- Active Signal Improvement Capability reduces signal ringing and plateau effects
- Excellent EMC performance
- Highly symmetric bit timing performance
- Fulfills CiA601-4 v2.0.0 specification
- Pin compatible with standard HS CAN and CAN FD transceivers

ISO11898-2:2016 compliant and backward compatible with standard CAN solutons

TARGET APPLICATIONS

- Complex CAN FD network topologies at 2 Mbit/s and beyond
- CAN FD networks with reduced specification cable harnesses Industrial control

COST SAVINGS FROM DESIGN FREEDOM

The TJA146x CAN Signal Improvement transceiver family allows for easier network design that moves beyond linear topologies. By incorporating unterminated stubs and star points in the network, the total cable length can be significantly reduced, saving on overall cost and weight. Enabling larger topologies and higher bit rates also brings the potential of combining multiple network branches together into a single network. Additionally, if the network relies on external components, such as ferrites, to manage the signal ringing, the TJA146x family can allow these to be directly removed.

IMPROVED PERFORMANCE

The performance of the TJA146x series is achieved through NXP's CAN Signal Improvement technology, based around a highly symmetric transmitter.

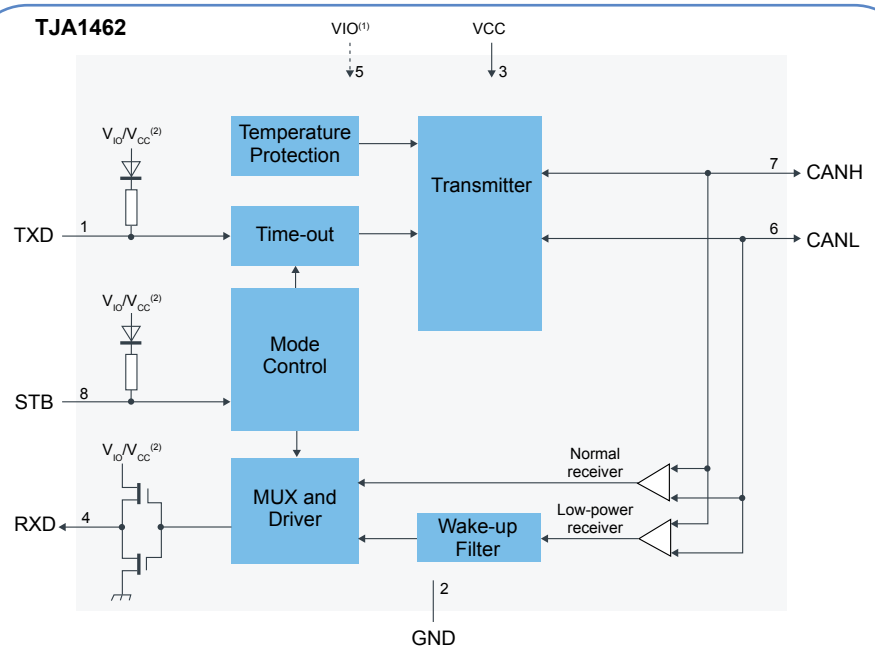
In effect, the TJA146x delivers much tighter bit timing and excellent EMC emission and immunity performance, even at higher bit rates, further supporting robust and reliable communications within a network.

STANDARDISED SOLUTION

The TJA146x transceivers fulfill the CiA 601-4 v2.00 specification for CAN Signal Improvement Capability (SIC) and is fully compliant to the ISO 11898-2:2016 standard, making them fully backwards compatible with existing CAN transceiver solutions.

This makes the TJA146x CAN Signal Improvement transceivers a simple drop-in solution for increasing performance in existing CAN FD networks.

BLOCK DIAGRAM



(1) V_{IO} is only available in the TJA1462A (pin 5 is not connected in the TJA1462B).
(2) V_{IO} in TJA1462A; V_{CC} in TJA1462B.

CAN FD COMMUNICATION AT 2 MBIT/S

Classic CAN FD Transceiver Results

TJA146x Transceiver Results

For more information, visit
www.nxp.com/CANSignalImprovement

www.nxp.com/TJA146x

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