Application Note

Extending CAN Performance: CAN FD, CAN SIC, and CAN XL

Michael Ikwuyum

ABSTRACT

As automotive networks continue to demand higher data rates, improved signal integrity, and scalable architectures, next-generation CAN (Controller Area Network) technologies have emerged to meet these challenges. This application report provides a detailed comparison of CAN FD (Flexible Data-Rate), CAN SIC (Signal Improvement Capable) and CAN SIC XL (eXtra Long), highlighting the electrical, physical-layer and protocol-level enhancements that distinguish each standard.

CAN FD extends CAN Classic (CC) with flexible data rate capability and higher payload efficiency, while CAN SIC introduces advanced transceiver features designed to increase robustness, reduce ringing, and enable high data rates over complex network topologies. CAN XL represents the latest evolution per ISO 11898-2:2026, combining multinode operation with data rates up to 20Mbps and payload sizes up to 2048 bytes to further support software-defined vehicles and zonal architectures.

This document examines key performance parameters including loop delay, asymmetry, topology constraints, EMC (Electro-Magnetic Compatibility) performance, fault handling, and interoperability to guide system designers in selecting the optimal TI's CAN transceiver portfolio for future-proof automotive, industrial and commercial applications.

Table of Contents

List of Figures

List of Tables

Trademarks

1 Introduction

Modern automotive and industrial networks are evolving rapidly as system bandwidth, software complexity, and architectural flexibility requirements continue to increase. Traditional CAN provides exceptional robustness and simplicity but is increasingly unable to meet the data rate and payload demands of emerging applications. As a result, the CAN ecosystem has expanded with several next-generation protocols including CAN Classic, CAN FD (and its subset CAN FD light), and CAN XL, each targeting different performance gaps while maintaining backward compatibility with existing CAN applications / physical layer (CAN high-speed, CAN FD, CAN SIC and CAN SIC XL).

CAN CC supports 8 bytes of data while CAN FD introduces a flexible data rate phase and an expanded data payload of up to 64 bytes, enabling significantly higher throughput while preserving CAN CC arbitration behavior.

CAN SIC enhances signal integrity at the physical layer through advanced transceiver techniques such as controlled slew-rate shaping, enhanced symmetry, and reflection mitigation. These improvements allow higher bit rates, more complex topologies, and better EMC performance without requiring changes to the CAN FD protocol.

CAN XL represents today's newest evolution in the CAN family, supporting multi-node communication, payloads up to 2048 bytes, and data rates up to 20Mbps (CAN SIC XL FAST Mode) to support zonal architectures, software-defined vehicles, and much more.

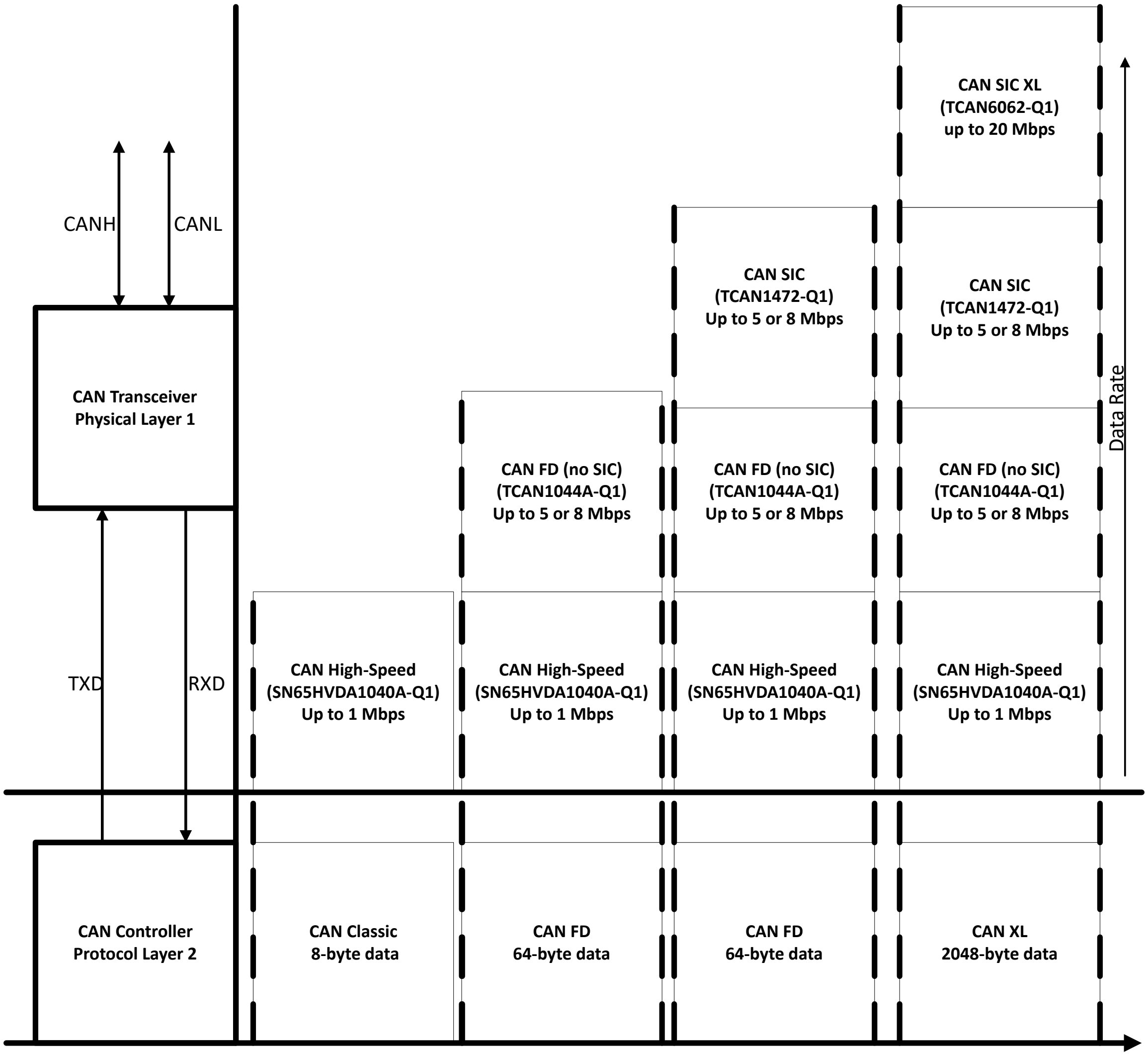


Figure 1-1. Evolution of CAN

CAN remains a foundational in-vehicle communication standard due to its reliability, fault confinement and efficient arbitration. However, as data payloads increase and wiring harnesses become more complex, conventional CAN faces several challenges. Note the requirement for newer controllers as the trend shown in Figure 1-1 emerges, where CAN XL controllers may be able to support CAN FD but CAN FD controllers typically do not support CAN XL applications. Some challenges that led the evolution beyond CAN CC include:

- Ringing caused by impedance mismatches
- Sensitivity to stubs in star or branch networks
- Limited data throughput at higher bit rates
- Increasing EMC challenges in harsh electrical environments

CAN CC and CAN FD are typically known for their robustness. In addition to similar robustness, two major advancements have emerged:

1. CAN SIC — A physical-layer enhancement for CAN FD networks that reduces ringing, increases symmetry, and supports higher bit rates in complex topologies.
2. CAN XL — A newer CAN communication protocol that enables data rates up to 20Mbps while maintaining deterministic multinode operation. CAN SIC XL introduces a high-speed H-bridge driver for the fast data phase. Unlike CAN CC and CAN FD transceivers, which rely on impedance-controlled dominant and recessive states, the CAN SIC XL FAST-mode driver actively drives both CANH and CANL in a push-pull manner. This architecture provides highly symmetric edge timing, reduced loop delay, and accurate zero-crossing detection, enabling reliable operation at significantly higher data rates. By combining SIC-based arbitration with H-bridge fast-mode transmission, CAN XL fills the gap between traditional CAN networks and Ethernet domains.

2 Overview: CAN (CAN FD and CAN SIC)

Figure 2-1 shows a typical CAN bus voltage level where a dominant state is a CAN state with a difference between CANH and CANL, corresponding both the transmitter (TXD) and receiver (RXD) as a logic low (0). Recessive state implies no significant difference, typically with the bus biased by the input resistance (R_{ID}) to $V_{CC}/2$ with both TXD and RXD as a logic high (1).

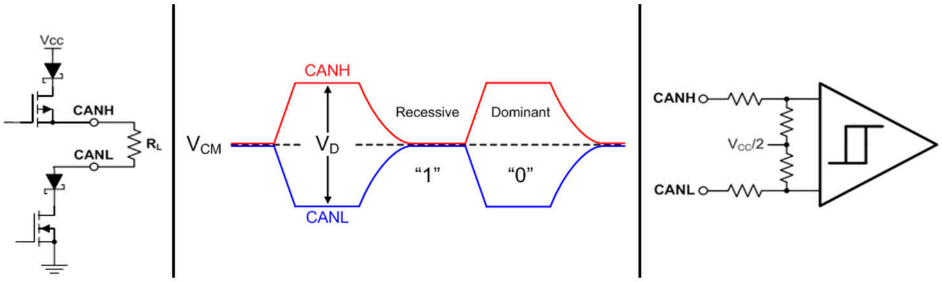


Figure 2-1. CAN Bus Voltage Levels

CAN SIC introduces a controlled dominant-to-recessive shaping and recessive nulling to adjust the output impedance during transitioning from the dominant-to-recessive state, suppressing signal reflections on the bus.

As an example with the typical CAN FD, the driver impedance can change suddenly during dominant-to-recessive transitions and result in reflections. This is transitioning from a typical 50Ω differential impedance (closely matching the 60Ω CAN bus impedance requirement) to 60kΩ (~1000x deviation). This sudden impedance change can cause significant reflections on a bus with additional complexities such as stubs, branches, connectors, harness capacitances, and so on.

With CAN SIC, the driver does not immediately go to the 60kΩ high impedance. Instead, it holds an active recessive drive with a moderate impedance of about 100Ω for a defined $t_{SIC\_TX\_base}$ time, as shown in Figure 2-2. This gives some time for the reflected signal to see the termination impedance to match the cable impedance, allowing the bus to settle and diminish reflections before fully going passive as shown in Figure 2-3.

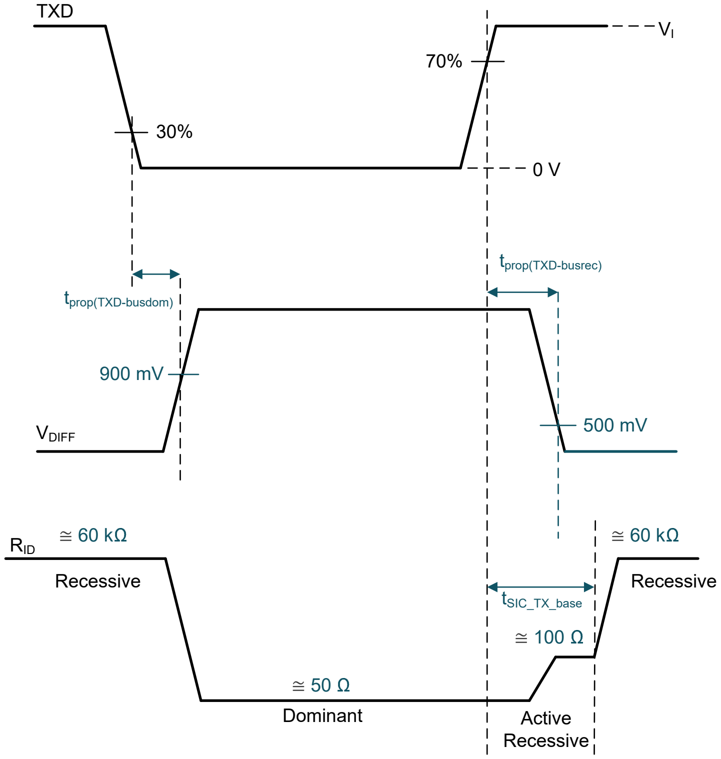


Figure 2-2. CAN SIC Impedance

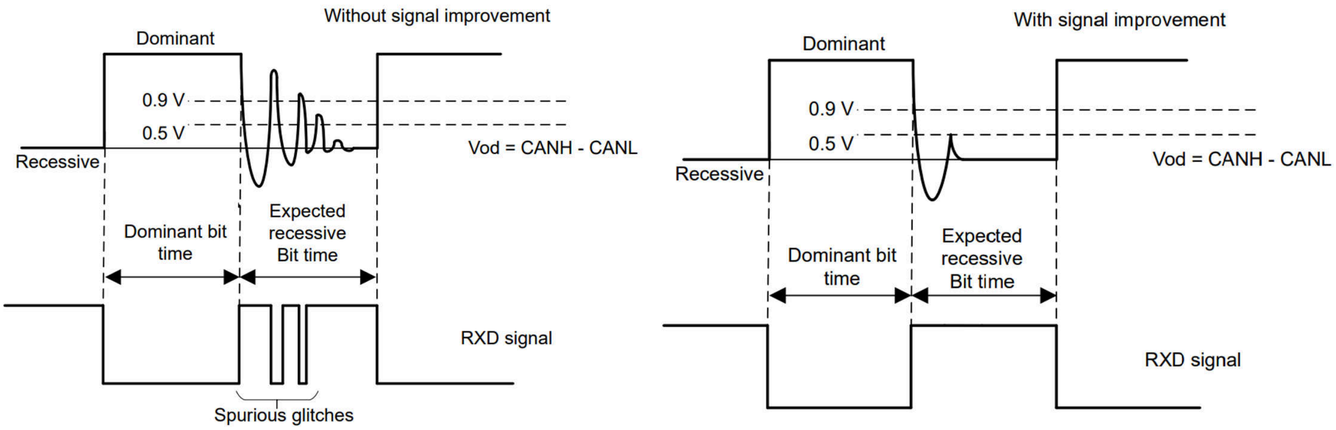


Figure 2-3. CAN SIC Recessive Nulling

Figure 2-4 shows the test condition for the ringing circuit defined by CAN in Automation (CiA-601-4). Where C_{SIC}, L_{SIC} and R_{SIC} are 220pF ± 1%, 3µH ± 5% (RDC ≤ 4Ω) and 60Ω ± 1%, respectively.

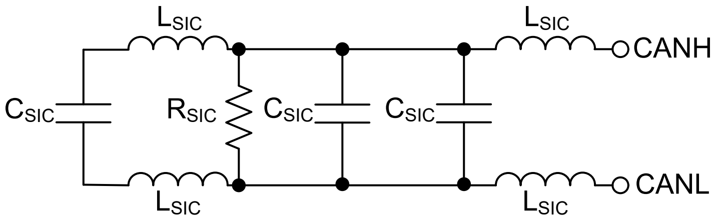


Figure 2-4. CAN SIC Conditions

2.1 Benefits of CAN SIC

The controlled impedance transition reduces high-frequency energy caused by ringing, thereby reducing unwanted emissions. Improved symmetry represents a lower common-mode noise and better cable balance for a reduced antenna behavior. As demonstrated, CAN SIC can help with common pitfalls of CAN FD in real networks. For example:

- Heavy ringing at dominant-recessive edges.
- Glitches on RXD that degrade data reliability.
- Inability to settle reflections at higher data rates.
- Bit asymmetry caused by non-ideal cable impedance.
- Applications where delay is critical (CAN SIC's shorter loop delay provides margin), such as systems that include digital isolators. See *Meeting The Timing Requirements of CAN FD in Isolated CAN Systems for HEV/EVs* for more information.

These effects are more prominent in star topologies, long unterminated stubs, mixed-node legacy networks, harness with poor impedance control, and so on.

2.2 Conformance Testing

The TI CAN families have been successfully tested per internationally recognized third parties to the Interoperability Test Specification for High-Speed CAN Transceiver Conformance Test (ISO 16845-2) to ensure they meet the specifications of ISO 11898-2. An example of testing covering an interoperability test network with non-ideal termination placement, long stubs, mixed CAN FD / CAN SIC nodes is shown in Figure 2-5.

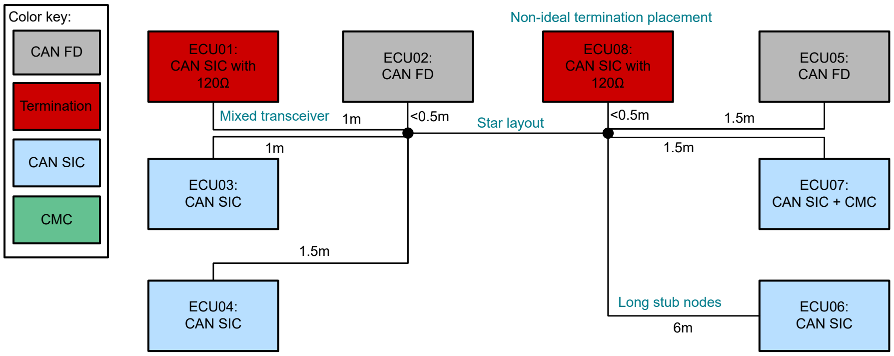


Figure 2-5. Interoperability Test Network

2.2.1 Performance Comparison: CAN FD vs. CAN SIC

This section shows an example automotive network to compare the performance of CAN FD transceivers against the performance of CAN SIC transceivers.

Figure 2-6 shows an example 24-node network harness, where all non-SIC nodes fail to transmit at higher speeds. However, Figure 2-7 shows the same harness with all CAN FD nodes swapped for CAN SIC nodes. When these nodes are upgraded to CAN SIC, all communication occurs error-free. Replacing CAN FD transceivers with CAN SIC transceivers in all nodes enhanced full network functionality in the non-ideal network. This shows an example of how SIC significantly extends CAN FD's reliability in larger, more complex networks.

- CAN SIC nodes transmitted over three million frames error free.
- Mixed networks showed zero errors across over 22 million frames.
- SIC demonstrated full backward compatibility.

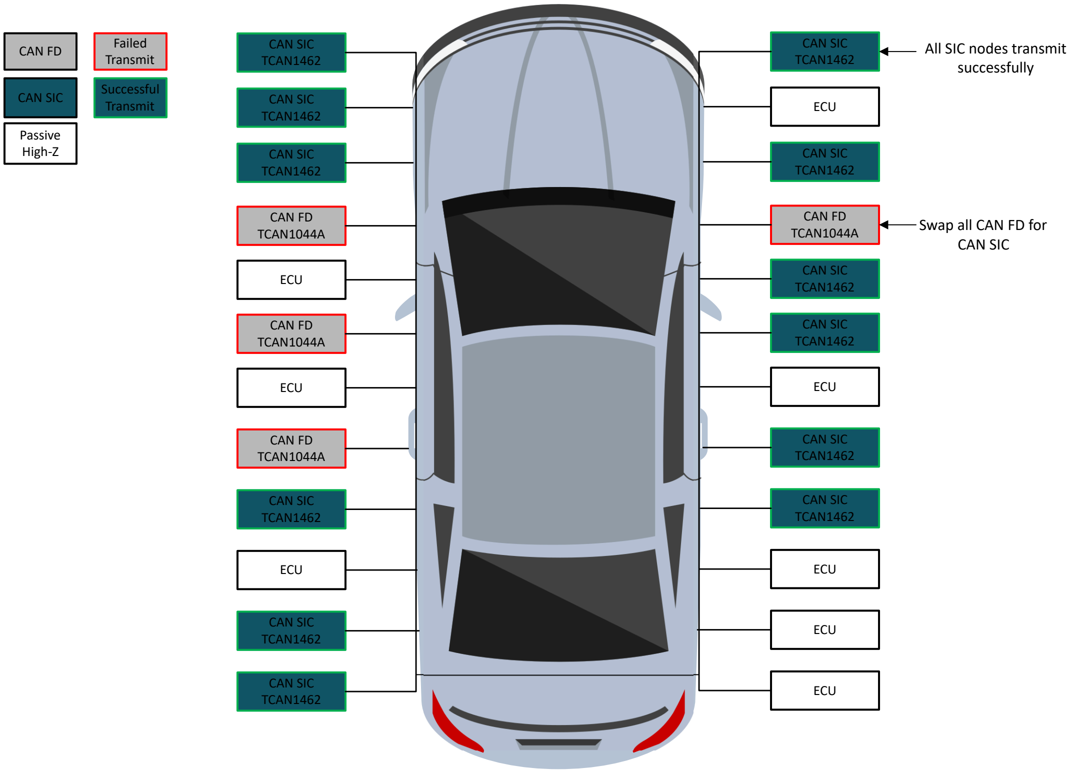


Figure 2-6. 24-Node Application Harness: CAN FD Nodes

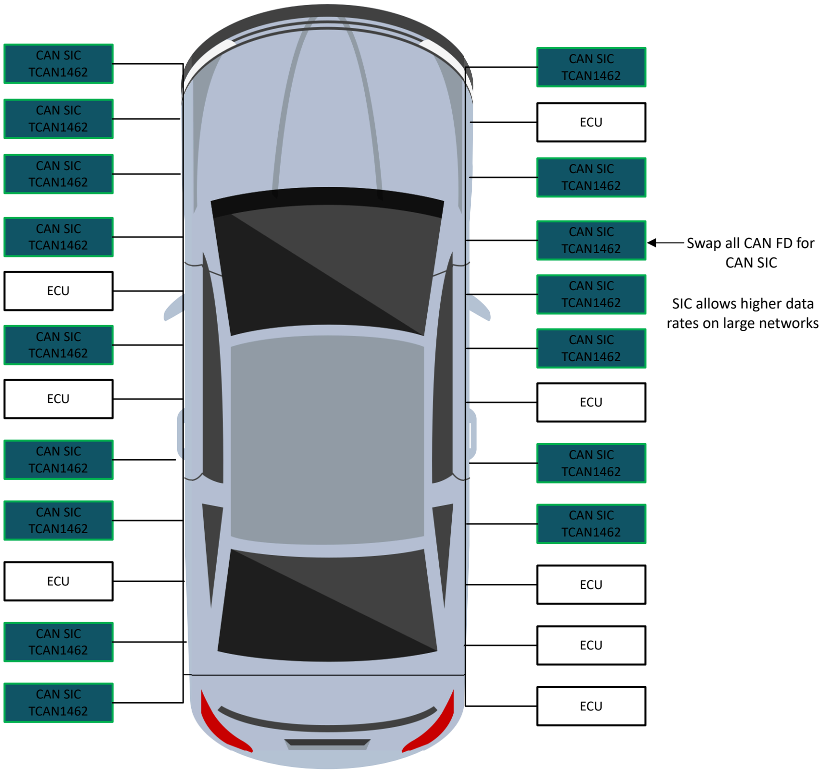


Figure 2-7. 24-Node Application Harness: CAN FD Nodes Replaced with SIC Nodes

This shows mixed CAN FD + CAN SIC networks are viable with a drop-in upgrade path, enabling incremental migration instead of a full redesign.

Table 2-1 shows where CAN SIC / XL may be considered and where CAN FD may be limited.

Table 2-1. Topology Constraints

Topology	CAN FD	CAN SIC / XL
Linear bus	✓	✓
Long stubs	Limited	Improved
Star	Risky	Supported
Mixed Legacy nodes	Limited	Backward Compatible

3 Overview: CAN XL

CAN XL incorporates CAN SIC and further addresses next-generation requirements such as an increased payload of up to 2048 bytes, dramatically increasing data payloads compared to CAN CC (8 bytes) and CAN FD (64 bytes). Up to 32× more data can now be transmitted through a single CAN XL frame compared to a CAN FD frame. This results in higher efficiency due to a lower overhead per byte, with the potential for larger messages to be sent in a single frame. To maintain backward compatibility with CAN FD and CAN SIC, CAN XL's arbitration phase still operates up to 1Mbps. Once arbitration is complete, the CAN XL FAST mode data phase can run up to 20Mbps as shown in Figure 3-1. This allows CAN to reach a data throughput that outperforms designs such as multidrop Ethernet or FlexRay.

C1 2.0V/div 50Ω BW:1.0G
C2 500.0m Offset:2.5V 50Ω BW:1.0G
C3 500.0m Offset:2.5V 50Ω BW:1.0G
C4 1.0V/div 50Ω BW:1.0G
M1 500.0mV 5.0µs

A' C1 Glitch 1.64V
Horz Dly: 0.0s
None Auto

5.0µs/div 2.5GS/s 400.0ps/pt
Stopped
37 acqs RL:125.0k
Auto March 17, 2026 11:39:49

V1	3.24V	t1	30.8µs
V2	2.24V	t2	-200ns
ΔV	-1.0V	Δt	-31.0µs
ΔV/Δt	32.258kV/s	1/Δt	32.258kHz

Figure 3-1. One Complete XL Frame With Arbitration

3.1 CAN XL Modes

A CAN SIC XL transceiver can be used with CAN CC controllers, CAN FD controllers, and CAN XL controllers (with or without FAST mode data).

Note that not all controllers are able to support the FAST phase. A CAN XL controller is needed for CAN XL's FAST mode, configured using a specific pulse width modulated (PWM) signal into the transceiver's TXD input pin. The PWM signal is encoded (PWME) by the controller, received and decoded (PWMD) by the transceiver as shown in Figure 3-2.

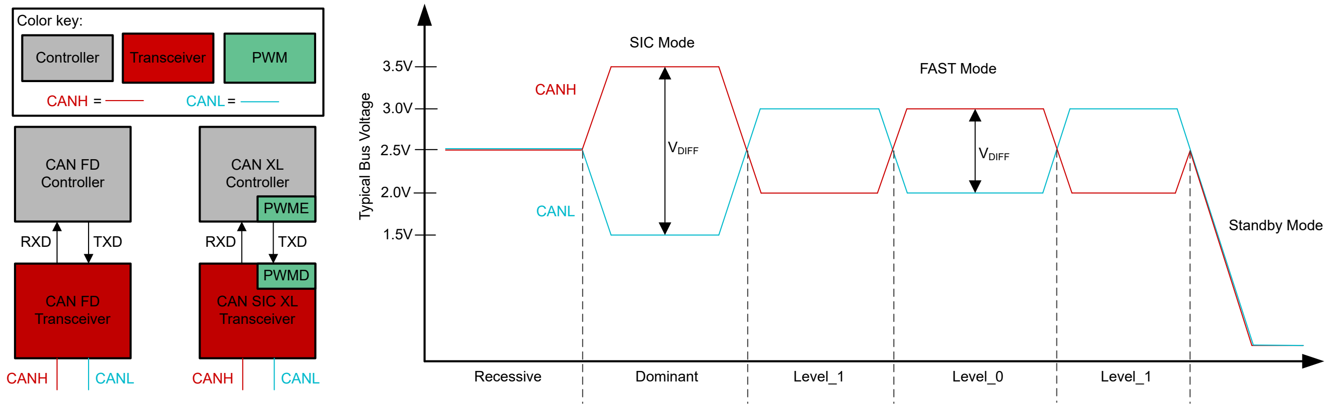


Figure 3-2. CAN XL Mode Switching

The PWM-coded input for CAN XL ensures FAST mode when the pulse width on TXD is shorter than a specified t_{FAST} specification. Therefore, signals with pulse widths slower than t_{FAST} are usable for CAN FD, whereas faster PWM signals are required once the data rate exceeds 8Mbps. Legacy CAN CC and CAN FD controllers are able to communicate without issue per Figure 3-3. A CAN XL controller is required to implement both Figure 3-3 and Figure 3-4.

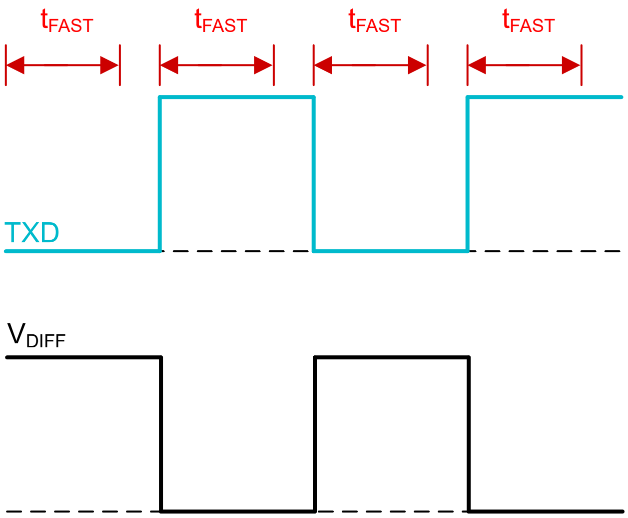


Figure 3-3. Mode Selection: CAN FD

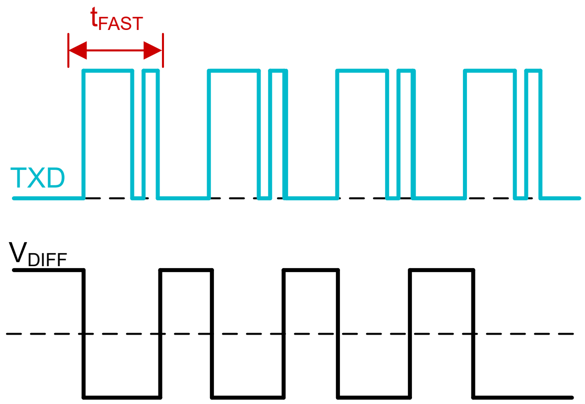


Figure 3-4. Mode Selection: CAN SIC XL

3.2 CAN XL Architecture

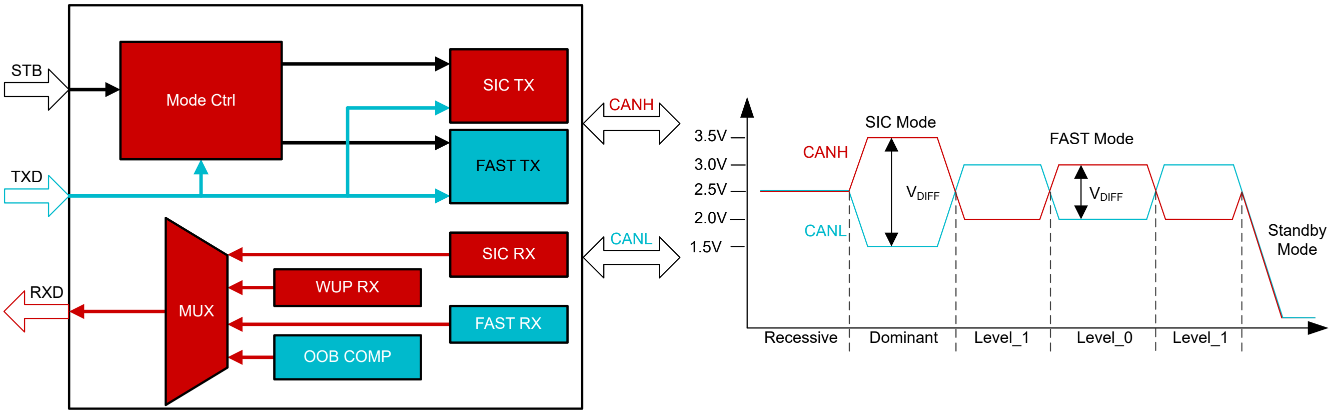


Figure 3-5. CAN XL Architecture

CAN SIC XL supports predictable latency and improved symmetry. SIC based architecture is used for the arbitration phase and the FAST TX / FAST RX H-bridge driver architecture is used for FAST mode in the data phase (up to 20Mbps). A wake-up receiver is used for a wake-up pattern (WUP) detection. An out-of-bounds (OOB) comparator is used in SIC mode to keep the controller aware of FAST mode activity, ensuring seamless integration and reintegration.

3.3 Out-of-Bounds (OOB) Comparator

The OOB comparator allows all nodes to integrate / reintegrate into the network by preventing a mixed fast and slow node collision or a false end-of-frame detection, allowing controllers to determine any ongoing activity on the bus. This avoids destructive arbitration faults. Without the OOB comparator, an integrating or reintegrating SIC mode receiver could misinterpret FAST mode data transmission as inter-frame spacing, causing it to transmit incorrectly and generate frame corruption or bus contention.

Figure 3-6 shows an example where the transmitting node is in the XL / FAST mode while the receiving node is in the SIC / slower mode. In this situation, due to signal degradation across the cables, the receiver's input thresholds (0.9V) could be higher than the bus level, causing RXD may then be permanently high. This can lead to the receiving node comprehending a permanent RXD = 1 as the end-of-frame or inter-frame spacing, and can start transmitting a new packet. This situation could lead to a collision on the bus and packet destruction. To prevent this situation, the OOB comparator implements input thresholds of -450mV to -250mV, allowing the SIC receiver to detect FAST mode data. This in turn allows the receiving node to properly integrate or reintegrate to the bus without any destructive interference to CAN XL traffic.

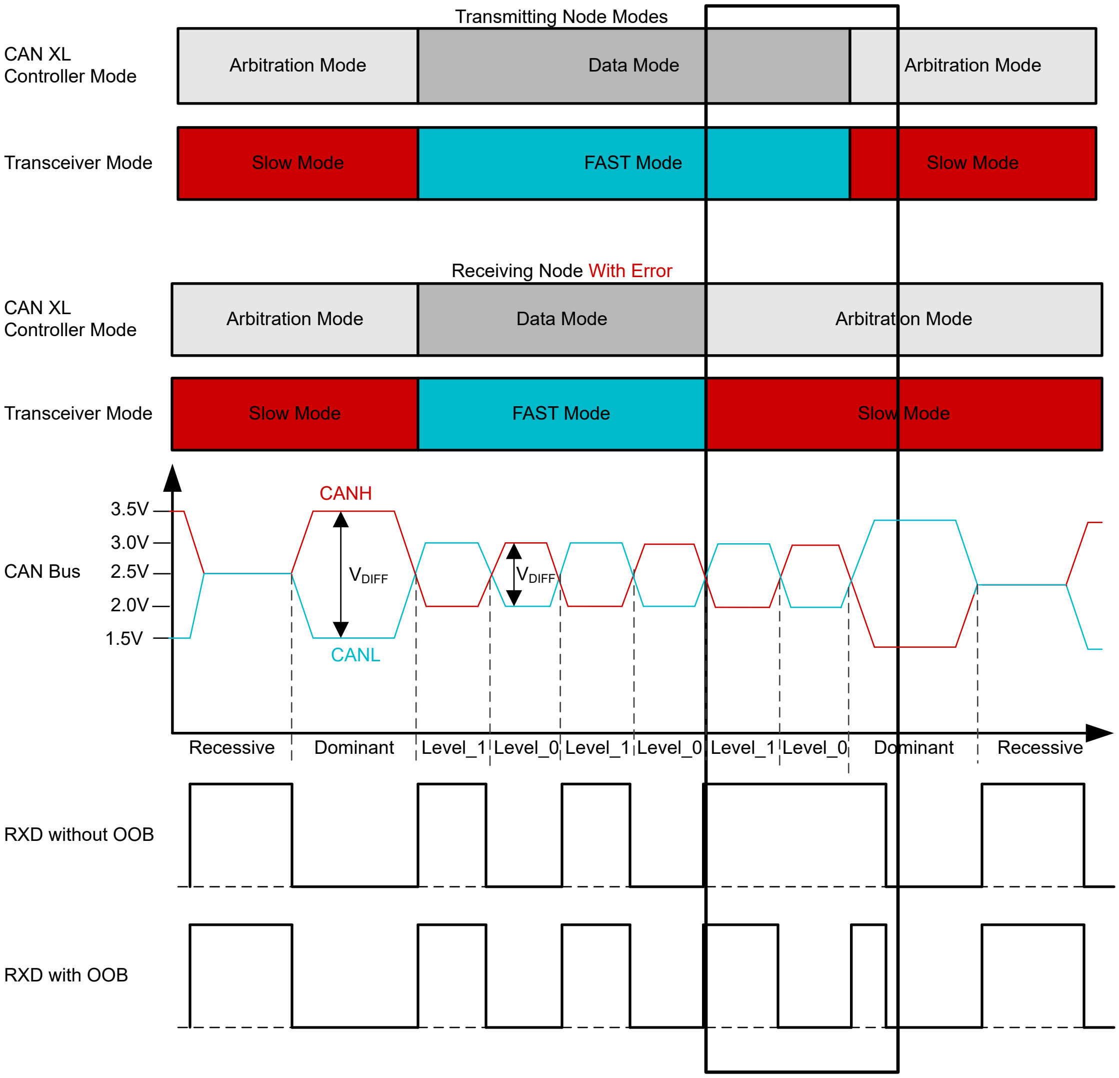


Figure 3-6. Out-of-Bounds (OOB) Comparator

3.4 EMC Performance

EMC performance in such high-speed multidrop networks may be governed by three primary contributors:

1. Differential signal amplitude (V_{OD}) influenced by V_{CC} variations
2. Common-mode conversion due to asymmetry from high L-value common-mode chokes (CMC) and high nodal capacitance (< 50pF is recommended)
3. Reflection-induced radiation from impedance discontinuities / improper termination, impedance differences from harness / connectors / traces.

CAN SIC XL improves EMC performance through architectural enhancements at the driver and receiver levels.

Emissions scale with edge amplitude and current transitions, therefore reducing V_{OD} while ensuring sufficient decoupling capacitors on V_{CC} (keep closer to approximately 5V) directly reduces high-frequency content. This is critical as speed increases up to 20Mbps, where the energy shifts into higher frequency spectral areas.

Common-mode emissions are also often important in automotive applications where high-capacitance loading and / or high inductance CMCs are used by default in production, without considering differences in topology. Studies show ≤50pF and 50µF to 100µH are typical capacitor and inductor implementations, if present.

Furthermore, by reducing reflection magnitude and settling time, ringing-induced emissions decrease, eye opening improves at high data rates, and sampling margin increases. Managing unstable $Z_{diff,}$ connector imbalances, and ground shifts further avoids converting differential edges into radiated energy. By improving symmetry, common-mode excitation is minimized, radiated emissions are reduced and resiliency against external noise improves. This directly benefits EMC margin in complex topologies such as star networks and and networks with long stubs.

EMC performance was verified according to IEC TS 62228-3 conducted emissions standards where TI's CAN SIC XL device performed similarly to legacy CAN CC and CAN FD.

Figure 3-7 shows the noise floor, Figure 3-8 shows CAN CC EMC conducted emissions for 250kbps, Figure 3-7 shows CAN FD EMC conducted emissions for 5Mbps, and Figure 3-8 shows CAN SIC XL EMC conducted emissions for 5Mbps.

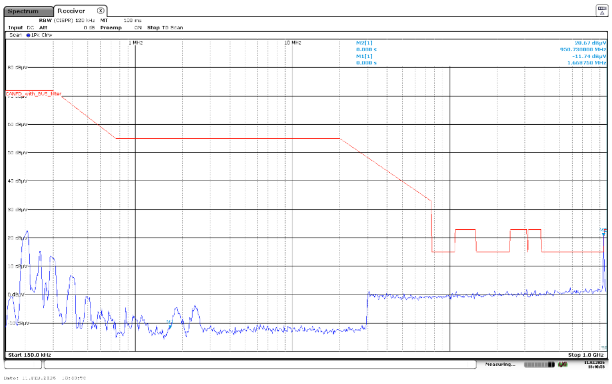


Figure 3-7. Emissions: Noise Floor

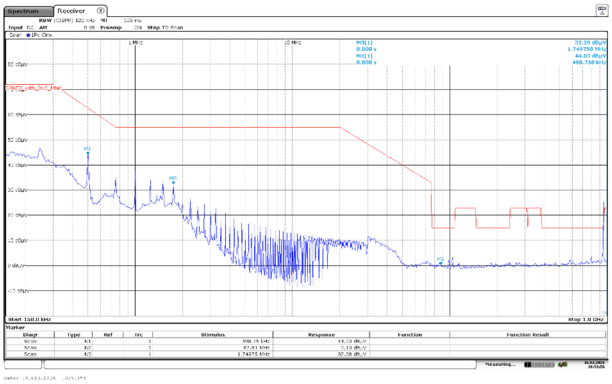


Figure 3-8. Emissions: CAN CC 250kbps

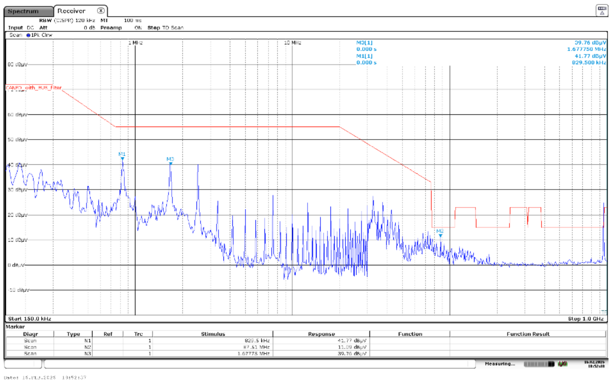


Figure 3-9. Emissions: CAN FD 5Mbps

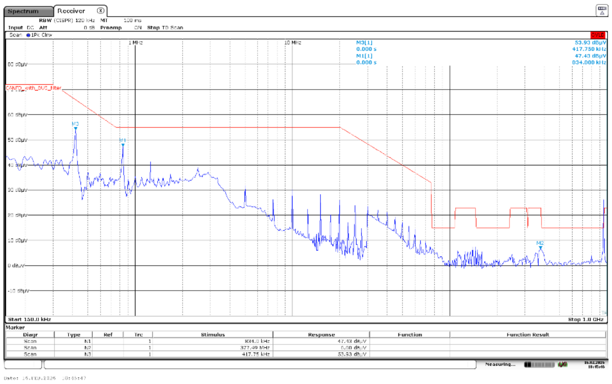


Figure 3-10. Emissions: CAN SIC XL 5Mbps

3.5 Deterministic Arbitration

CAN — Priority-Based Deterministic Arbitration:

Deterministic behavior is a critical requirement in safety-relevant and real-time automotive, commercial and industrial networks. While both CAN XL and Ethernet's 10BASE-T1S provide bounded latency operation, the mechanism by which determinism is achieved differs fundamentally.

CAN XL maintains classical CAN arbitration during the arbitration phase (≤1Mbps), where frames compete based on priority and the lower identifier value wins. Arbitration is non-destructive, meaning no bandwidth is wasted during contention and worst-case latency in CAN networks is governed primarily by:

- Priority assignment
- Maximum frame length of higher-priority traffic
- Overall bus utilization

Due to arbitration being priority-based, high-priority frames are guaranteed access ahead of lower-priority frames. Deterministic latency can therefore be engineered by system-level priority design and bus load budgeting.

Unlike time-slot systems, node count alone does not directly determine latency. Instead, worst-case delay depends on higher-priority traffic occupancy. With proper network design, high-priority traffic latency remains tightly bounded even as additional low-priority nodes are introduced.

10BASE-T1S — PLCA Slot-Based Determinism:

10BASE-T1S (IEEE 802.3cg) employs Physical Layer Collision Avoidance (PLCA), where a coordinator issues a beacon and each node receives a transmit opportunity in a round-robin sequence.

Key characteristics:

- Fairness-based scheduling
- Each node assigned a transmit opportunity per PLCA cycle
- Worst-case latency bounded by PLCA cycle duration and node count

Latency in PLCA systems scales approximately linearly with the number of active nodes and the configured transmit opportunity window. PLCA guarantees bounded access time, but does not provide priority preemption and all nodes are treated equally within the scheduling cycle.

CAN XL is optimized for systems requiring priority-driven safety messaging, preemptive access for critical traffic and deterministic arbitration under heavy load. 10BASE-T1S is optimized for fair bandwidth distribution, moderate real-time constraints and Ethernet-based protocol integration.

Both technologies provide bounded latency, but they solve determinism differently. CAN provides priority determinism while PLCA provides fairness determinism.

3.6 CAN XL Backward Compatibility

In addition to maintaining backwards compatibility with CAN FD arbitration, CAN SIC XL transceivers also maintains pin compatibility with CAN FD / CAN SIC transceivers as shown in Figure 3-11 .

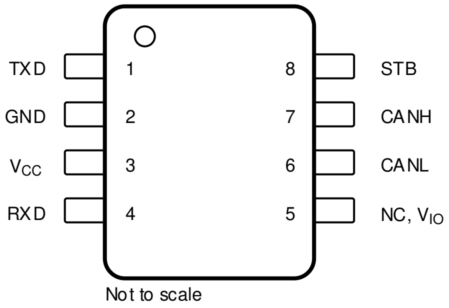


Figure 3-11. CAN SIC XL Pin Compatibility

Table 3-1 shows some key defining specs, distinguishing CAN FD and CAN SIC XL's fast phase.

Table 3-1. CAN Specification Differences

Spec	Description	CAN FD	CAN XL FAST Mode
V_{OD} or V_{DIFF}	Differential voltage (CANH - CANL)	1.5V to 3V (1.5V range)	0.6 to 1.5V (0.9V range)
V_{SYM}	Driver symmetry ($V_{O(CANH)}$ + $V_{O(CANL)}$) / V_{CC}	0.9 to 1.1	0.95 to 1.05
V_{IT}	Input threshold voltage	0.5V to 0.9V	-0.1V to 0.1V
T_{LOOP}	Total Loop Delay	255ns	190ns
Δt_{REC}	Receiver timing symmetry	-65ns to +40ns	-7.5ns to +7.5ns

- V_{OD} specifies the signal amplitude on the bus during the dominant state. It defines the signal to noise margin for EMC emissions, driver power dissipation and the receiver sensitivity requirements. The FAST TX phase's lower V_{OD} implies faster edges but with a smaller swing. This represents manageable EMC, lower emissions and power, with a tighter threshold symmetry for a better signal integrity with less overshoot on the fast edges.
- Tighter symmetry (V_{SYM}) further implies a reduced susceptibility to GND shifts.
- The input threshold (V_{IT}) is used by the receiver to decide if the bus is dominant or recessive and the lower threshold implies a faster detection. The FAST RX phase threshold being centered around 0V implies the smaller signal swing is used for an extremely accurate timing at high speeds. This improves timing, noise, and edge detection accuracy.
- The total loop delay represents the total latency / propagation delay time from TXD assertion at the transmitting node through the CAN bus and back to RXD at the receiving node. As data rates increase beyond 2Mbps, loop delay becomes a first-order constraint for sample point placement, synchronization margin and interoperability, especially with digital isolators. This is critical in networks containing isolation barriers, longer hearness lengths or multidrop topologies.
- The receiver timing symmetry (Δt_{REC}) measures how symmetric the receiver's delay is in both directions. Ideally, when the rising edge delay equals the falling edge delay, the more symmetrical the delay will be, thereby resulting to less bit skews and sampling errors at high speeds. This enables reliable operation up to 20Mbps and less duty cycle distortion for an improved eye opening at higher data rates.

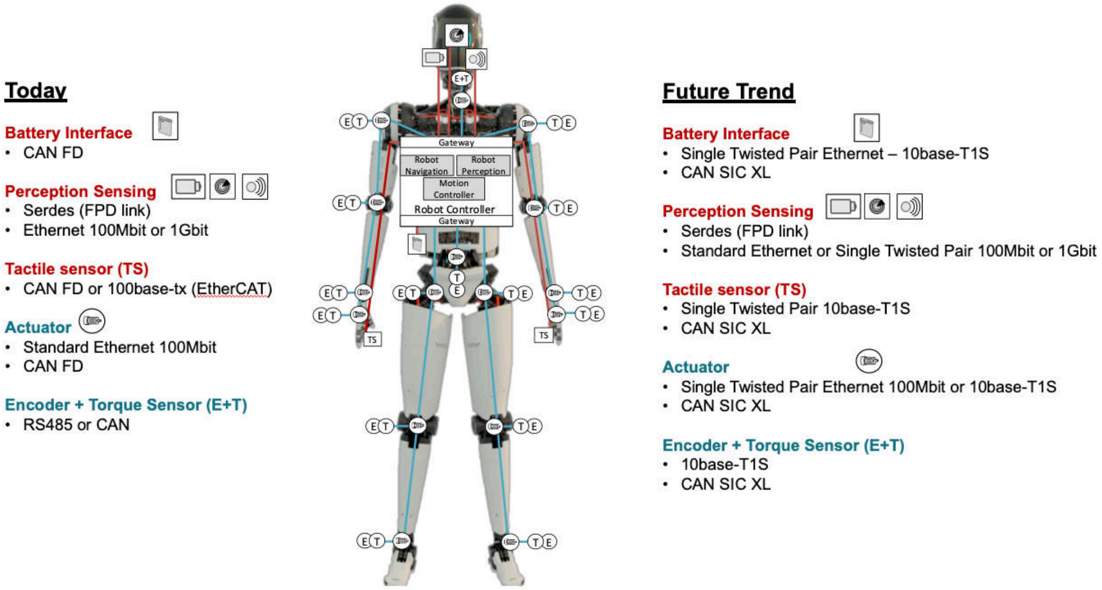
3.7 Other Use-Cases

Ethernet's extreme fast speeds may not be necessary in every application. As an example, communicating with the door and/or seat modules in automotive applications may only require a 10Mbps network protocol such as 10BASE-T1S or CAN XL. This alternative may be cheaper and better suited for lower-speed and less bandwidth-intensive use-cases.

Multiple communication networks currently exist for CAN XL outside automotive. Examples include medical equipment where latency is critical or the growing robotic trend seen in industrial, collaborative, mobile, home-service, and humanoid settings.

In such use-cases, cable length to connect various subsytems, EMC robustness and high bandwidth for increased data rate between CAN FD / CAN XL and Ethernet, becomes critical.

Figure 3-12 shows a breakdown of where CAN may be considered in a humanoid communication example.



Today

Battery Interface
- CAN FD

Perception Sensing
- Serdes (FPD link)
- Ethernet 100Mbit or 1Gbit

Tactile sensor (TS)
- CAN FD or 100base-tx (EtherCAT)

Actuator
- Standard Ethernet 100Mbit
- CAN FD

Encoder + Torque Sensor (E+T)
- RS485 or CAN

Future Trend

Battery Interface
- Single Twisted Pair Ethernet – 10base-T1S
- CAN SIC XL

Perception Sensing
- Serdes (FPD link)
- Standard Ethernet or Single Twisted Pair 100Mbit or 1Gbit

Tactile sensor (TS)
- Single Twisted Pair 10base-T1S
- CAN SIC XL

Actuator
- Single Twisted Pair Ethernet 100Mbit or 10base-T1S
- CAN SIC XL

Encoder + Torque Sensor (E+T)
- 10base-T1S
- CAN SIC XL

Figure 3-12. Use-Case: Humanoid Communication Interface

4 Summary

Because CAN FD, SIC, and XL technologies coexist but serve different design objectives, system designers need a clear understanding of how each option performs under real-world constraints. This report provides a side-by-side comparison of throughput, bus loading, topology limits, signal integrity, physical-layer behavior, noise/EMC considerations and system-level scalability.

The goal is to equip system designers with the insight required to select the appropriate CAN technology for future-proof networks that balance speed, reliability, cost and compatibility.

Table 4-1 lists a comparison between CAN FD, CAN XL and 10BASE-T1S Ethernet.

Table 4-1. Comparison: CAN FD, CAN XL and 10BASE-T1S

Parameter	CAN FD	CAN XL	10BASE-T1S
Standard	ISO 11898-2	ISO 11898-2 (Annex A)	IEEE 802.3cg
Max. Data-Rate (Mbps)	≤5 in actual networks (≤8 in optimized networks)	20	10
Max Packet Size (bytes)	64	2048	1518
Cable Length (m)	40 typical, at 2Mbps (Shorter, at 5Mbps)	40 typical. (Up to 100 at lower speeds)	15 - 25
Number of Nodes	40 (typical)	>16 (data rate dependent)	8 - 16
Cabling	Twisted pair	Twisted pair	Twisted pair
Topology	Multi-drop (bus, star, longer-stub friendly)	Multi-drop (bus, star, longer-stub friendly) with increased size or complexity	Multi-drop (short stubs only)
TI Example Device	TCAN1044A-Q1	TCAN6062-Q1	DP83TD555J-Q1
Bus Wake-up	Yes	Yes	Yes
Package	8-SOIC VSON(3*3mm) / SOIC	8-VSON(3*3mm) / SOIC	20-RGP (4*4mm)
Cost / Design Components	Device ($) + CMC	Device ($) + CMC	Device ($$) + Oscillator + higher-cost CMC
Deterministic	Yes	Yes	Bounded by PLCA and number of nodes
Latency TX/RX (ns)	255	190	8500

CAN SIC XL transceivers and CAN XL protocol may further be used in existing 10BASE-T1S or TCP/IP use-cases by tunneling Ethernet frames, where software stacks and cost pose a critical challenge for Ethernet. As compared to 10BASE-T1S, CAN SIC XL may be considered in the physical layer to save cost where legacy Ethernet IP exists across sub-systems.

Overall, CAN XL offers a higher-performance and lower-cost option for automotive, commercial, and industrial networks, enabling system designers to transition from existing CAN or 10BASE-T1S Ethernet designs with minimal effort.

Examples for 10BASE-T1S Ethernet use-cases where CAN XL may be considered:

- Zonal sensor aggregation with deterministic and predictable latency multidrop requirements.
- Body controllers with large payloads and simple wiring requirements.
- Firmware updates where up to 2048-byte frames are required.
- Diagnostics where PHY clocks or MAC stacks are not required.
- Low power ECUs where a lower bill of material (BOM) than Ethernet is required.
- Safety stringent cases where deterministic / predictable arbitration is critical.
- Cost sensitive use-cases.
- Reduced design complexities with an 8-PIN transceiver footprint (PCB complexities, firmware stack complexities, EMC risks, validation costs, and so on).

The TCAN6062-Q1 family addresses current CAN SIC XL requirements, with compliance to the latest ISO 11898-2:2026 standard, including Annex A: HS-PMA with SIC mode and FAST mode, enhanced bus fault protection, and pin-compatible functionality.

To learn more, visit the TCAN6062-Q1 product page to explore the datasheets, evaluation modules, and design resources that can help users accelerate designs.

5 References

- Texas Instruments, *Introduction to the Controller Area Network (CAN)*, application note.
- Texas Instruments, *How Signal Improvement Capability Unlocks the Real Potential of CAN FD Transceivers*, technical white paper.
- Texas Instruments, *Comparing 10BASE-T1S to RS-485, CAN, and LVDS in Backplane Applications*, application note.
- Texas Instruments, *How Ethernet accelerates the move to software-defined vehicles (Rev. A)*, technical article.
- Texas Instruments, *Meeting The Timing Requirements of CAN FD in Isolated CAN Systems for HEV/EVs*, application brief.
- Texas Instruments, *Isolated CAN With Integrated Power Reference Design*, reference design.
- Texas Instruments, *Top Design Questions About Isolated CAN Bus Design*, application note.
- Texas Instruments, *TCAN6062-Q1 Automotive CAN XL Transceiver with Standby Mode*, datasheet.
- ISO 11898-1: *Road vehicles — Controller area network (CAN), Part 1: Data link layer and physical coding sublayer*
- ISO 11898-2: *Road vehicles — Controller area network (CAN), Part 2: High-speed physical medium attachment (PMA) sublayer*
- ISO 16845-2: *Road vehicles — Controller area network (CAN) conformance test plan, Part 2: High-speed medium access unit — Conformance test plan*
- IEC 62228-3: *Integrated circuits - EMC evaluation of transceivers - Part 3: CAN transceivers*
- CiA 601-4: *CAN FD node and system design - Part 4: Signal improvement*
- IEEE 802.3cg-2019: *IEEE Standard for Ethernet - Amendment 5: Physical Layer Specifications and Management Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balanced Pair of Conductors*

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