Automotive Zone Controller

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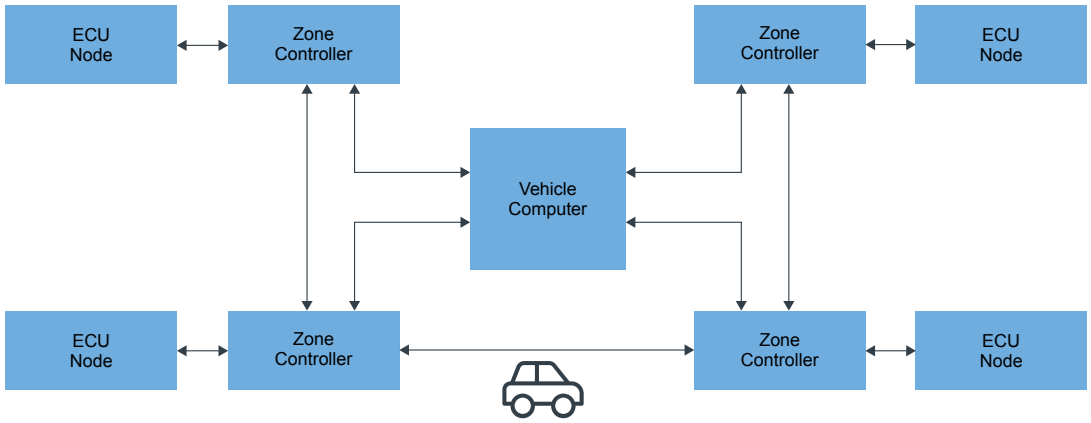
Zonal architectures enable efficient power and data distribution around the vehicle, while improving wire cost, weight, and manufacturing. A key component in this architecture is the zone controller, it is responsible for connecting the high number of actuators and sensors to a central compute ECU and, depending on application distribution, can have a significant role in strategy within a zone.

OEMs are looking for more scalable and cost-efficient solutions to evolve the E/E architecture and meet future requirements for connected, electric, self-driving vehicles, as the number of services/ECUs within the vehicle grows. This evolution can come via logical distribution of functions onto less diverse software/hardware platforms, and through physical changes to a zonal-based network.

Zonal Architecture Block Diagram

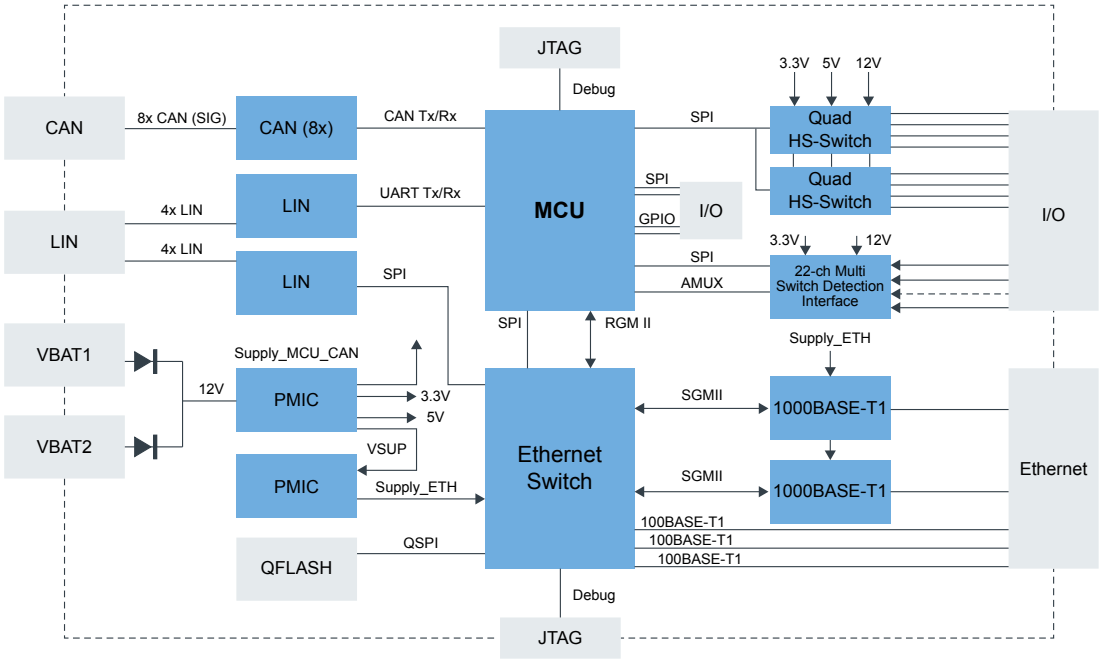


NXP Technology Non NXP Technology Optional Technology

Recommended Products for Zonal Architecture	
Vehicle Computer	• S32G3 Vehicle Networking Reference Design • S32G3: S32G3 Processors for Vehicle Networking • SJA1110: Multi-Gig Safe and Secure TSN Ethernet Switch with Integrated 100BASE-T1 PHYs • TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • TJA1104: TJA1104, MACsec Enabled ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • VR5510: Multi-Channel (9) PMIC for S32G Processor – 8 High Power, 1 Low Power, Fit for ASIL D Safety Level • PF53: 12 A / 8 A / 15 A Core Supply Regulator with AVP and Watchdog
Microcontrollers (MCU)	• S32K3: S32K3 Microcontrollers for Automotive General Purpose
Zone Controller	• S32K3: S32K3 Microcontrollers for Automotive General Purpose • S32Z2: S32Z2 Safe and Secure High-Performance Real-Time Processors • S32E2: S32E2 Safe and Secure High-Performance Real-Time Processors with Actuation Support

	• S32G3: S32G3 Processors for Vehicle Networking • S32G2: S32G2 Processors for Vehicle Networking • SJA1110: Multi-Gig Safe and Secure TSN Ethernet Switch with Integrated 100BASE-T1 PHYs • TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • TJA1104: TJA1104, MACsec Enabled ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • SJA1124: Quad LIN Commander Transceiver with LIN Commander Controller • TJA1463: CAN Signal Improvement Capability Transceiver with Sleep Mode • VR5510: Multi-Channel (9) PMIC for S32G Processor – 8 High Power, 1 Low Power, Fit for ASIL D Safety Level • PF53: 12 A / 8 A / 15 A Core Supply Regulator with AVP and Watchdog • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • PF5030: Multi-Channel PMIC for Automotive Applications • FS86: Safety System Basis Chip For Domain Controller, Fit For ASIL B and D
ECU Node	• S32M2: S32M2 Integrated Solution for 12V Motor Control • S32K3: S32K3 Microcontrollers for Automotive General Purpose • S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K39-37: S32K39/37/36 Microcontrollers for Electrification Applications • TJA1463: CAN Signal Improvement Capability Transceiver with Sleep Mode • TJA1103: TJA1103, ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • TJA1104: TJA1104, MACsec Enabled ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • FS24: Safety Mini CAN FD SBC for Automotive Applications Fit for ASIL-B • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems

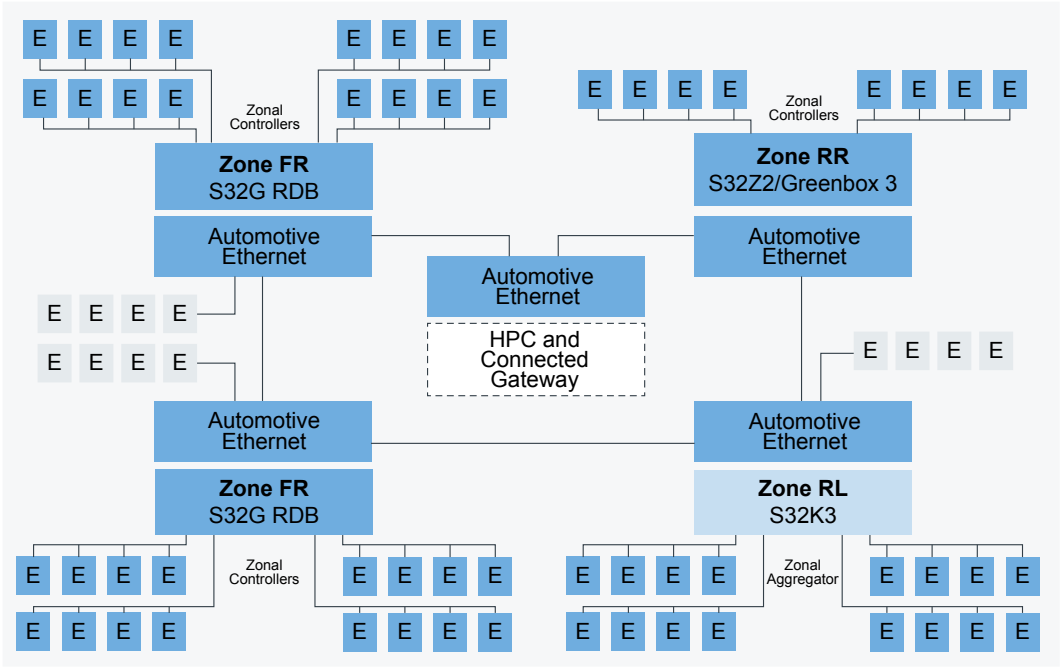
Zone Controller Reference Design Block Diagram



Recommended Products for Zone Controller Reference Design	
CAN	• TJA1463: CAN Signal Improvement Capability Transceiver with Sleep Mode
LIN	• TJA1124: Quad LIN Commander Transceiver for In-Vehicle Subnetworks
Second LIN	• SJA1124: Quad LIN Commander Transceiver with LIN Commander Controller
PMIC	• FS26: Safety System Basis Chip with Low Power, for ASIL D Systems

MCU	• S32K3: S32K3 Microcontrollers for Automotive General Purpose
Quad HS-Switch	• XS2410: Quad 100 mΩ / Dual 50 mΩ, 3.0 V to 60 V High-Side Switch
22Ch MSDI	• MC33978: 22 I/O MSDI Programmable Current Analog Mux
1Giga Ethernet Phy	• TJA1121: TJA1121, MACsec Enabled ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver
Ethernet Switch	• SJA1110: Multi-Gig Safe and Secure TSN Ethernet Switch with Integrated 100BASE-T1 PHYs

Zone Control POC Block Diagram



Recommended Products for Zone Control POC	
Zone FR	• S32G2: S32G2 Processors for Vehicle Networking • S32G3: S32G3 Processors for Vehicle Networking • VR5510: Multi-Channel (9) PMIC for S32G Processor – 8 High Power, 1 Low Power, Fit for ASIL D Safety Level • PF53: 12 A / 8 A / 15 A Core Supply Regulator with AVP and Watchdog
Zone RR	• S32Z2: S32Z2 Safe and Secure High-Performance Real-Time Processors • FS86: Safety System Basis Chip For Domain Controller, Fit For ASIL B and D • PF5030: Multi-Channel PMIC for Automotive Applications
Zone RL	• S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems
Automotive Ethernet	• TJA1121: TJA1121, MACsec Enabled ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver • TJA1120: TJA1120, ASIL B Compliant Automotive Ethernet 1000BASE-T1 PHY Transceiver

	• TJA1104: TJA1104, MACsec Enabled ASIL B Compliant Automotive Ethernet 100BASE-T1 PHY Transceiver • SJA1110: Multi-Gig Safe and Secure TSN Ethernet Switch with Integrated 100BASE-T1 PHYs

View our complete solution for Automotive Zone Controller.

Note: The information on this document is subject to change without notice.