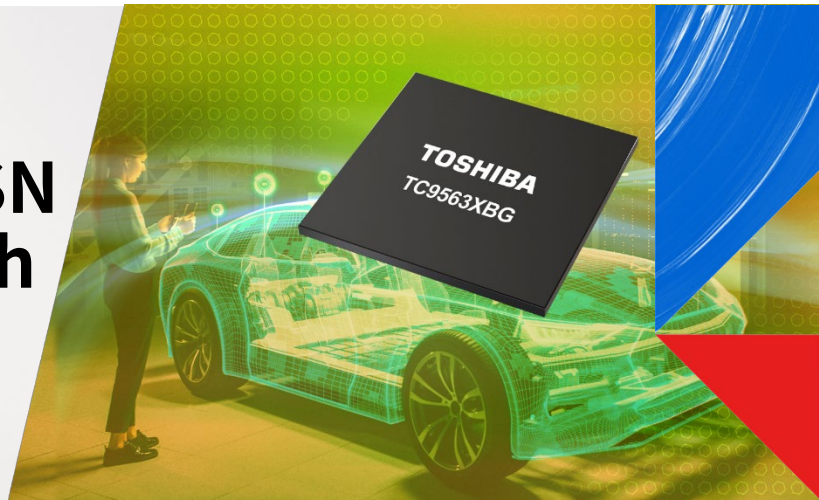


Dual 10Gbps Ethernet-AVB/TSN PCIe Gen3 Switch



High-Performance Networking

The latest member of Toshiba’s Ethernet connectivity IC line-up provides advanced Ethernet capability for automotive and industrial applications. It enables deterministic real-time performance of up to 10Gbps for each Ethernet MAC port, supporting Time Sensitive Networking (TSN) protocol. A host SoC can be connected to the TC9563 PCIe upstream port, utilizing bandwidths of up to 32GT/s. Additional PCIe devices can be connected to the 2 PCIe downstream ports of TC9563.

Applications

- Automotive applications, e.g. telematics, IVI, ADAS, zonal architecture
- Industrial applications, e.g. factory automation

Features

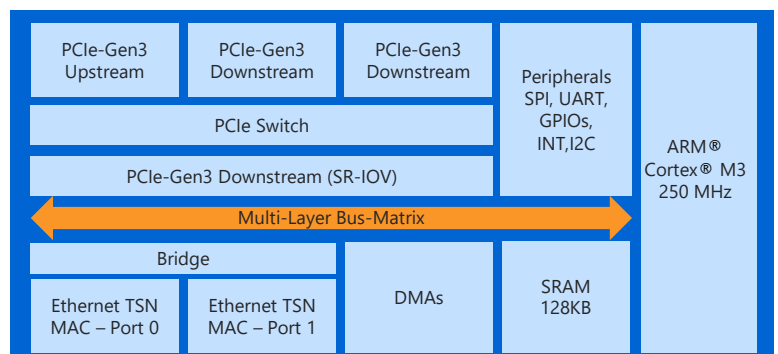
- PCIe Gen3 Switch supporting three external ports with up to 32GT/s
 - 1x PCIe upstream port with up to 4-lanes
 - 2x PCIe downstream ports with up to 2-lanes
- Dual Ethernet 10Gbps MAC ports each configurable to support PHYs
 - 10M/100M/1G/2.5G/5G/10G
 - USXGMII/XFI/SGMII/RGMII
 - Support of AVB as well as TSN
 - Dedicated HW for traffic shaping
 - IEEE 802.1AS, IEEE 802.1Qav, IEEE 802.1Qbv, IEEE 802.3az, IEEE 802.3br, IEEE802.1Qbb, IEEE802.1Qbu
- Wake-up by special magic packet pattern detection
- I2C, SPI, UART, GPIOs
- 4x interrupt inputs
- 1x interrupt output
- Automotive AEC-Q100 / IATF 16949

Advantages

- Automotive qualified high-performance PCIe bridge for Multi-Gigabit Ethernet networks
- Flexible MAC protocols supporting PHYs from various vendors, including Marvel and TI
- Superior QoS performance featuring frame pre-emption
- Share multiple traffic types on the same wire
- Connection of multiple PCIe peripheral devices possible, like 5G- modems, WIFI&BT modules, mass-storage devices, etc.

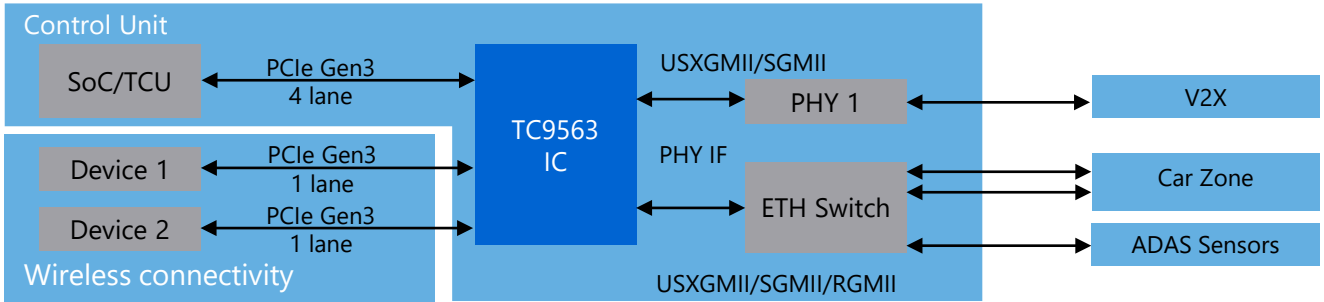
Benefits

- Solves connectivity issues on a system level, in case insufficient high-speed ports are available with the host SoC
- High flexibility for the selection of Ethernet PHY types and switches
- State-of-the-art PCIe and Ethernet interfaces ready for reuse in next generation designs



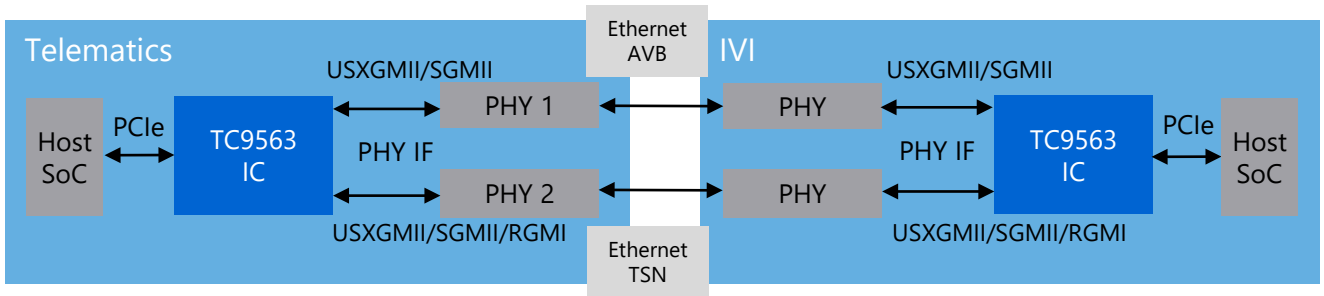
TC9563 applications examples

High speed data transmission in telematics, ADAS, IVI and zonal architectures

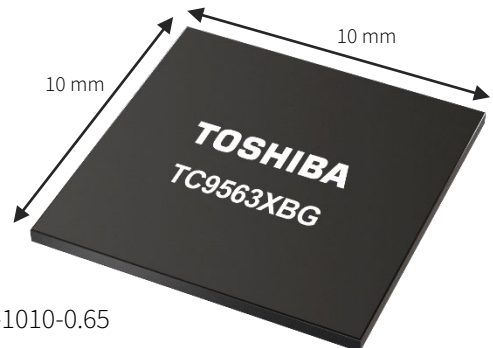


- High-speed interfaces
 - Three PCIe Gen3 interface with 3 external ports
 - Two 10 Gpbs MAC ports
- PCIe Gen3 ports with 8Gbps per lane
- Ethernet MAC for 10G/5G/2.5G/1G/100BASE-T1 PHYs
- Software
 - PC Linux Fedora30 64bit (Kernel 5.4.19)
 - Toshiba: TC9563 firmware and SoC TC9563 Driver
 - Customer: Application, network stack, and Linux Kernel

Video & audio time-sensitive data transmission



- High-speed interfaces
 - One PCIe Gen3 Host interface configurable with 2- or 4-lanes (32GT/S)
 - Two 10Gpbs MAC ports
- Ethernet AVB & TSN
- Support of 10G/5G/2.5G/1G/100BASE-T1 PHYs
- Preserves QoS for real-time traffic in TSN networks
- Time aware shaper with flexible queue management
- Software
 - Linux 64bit Kernel (5.4.19)
 - Toshiba: TC9563 firmware, SoC TC9563 driver and sample application
 - Customer: AVB/TSN stack, network stack, and Linux Kernel



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