OS81119
150 Mbps Dual-Port INIC

Summary

The OS81119 is a Dual Network Port highly integrated Intelligent Network Interface Controller (INIC) for INICnet™ Technology. It supports both Optical Physical Layers (oPHY) and Coaxial (coax) Physical Layers (cPHY) that can efficiently handle audio, video, packet, and control data for infotainment, audio, acoustic, voice, speech, and Advanced Driver Assistance Systems (ADAS) applications. It can be seamlessly incorporated into today's MOST150 systems.

oPHY and cPHY support the classic ring topology, with dual-simplex communication. cPHY also supports daisy-chain connections with full duplex communication.

The OS81119 allows the implementation of hybrid networks that mix physical layers and topologies. This allows the expansion of existing MOST150 networks with innovative applications that are based on cost-efficient daisy chain topologies with little hardware and software design effort. cPHY also supports power over coax.

The OS81119 offers state-of-the-art industry standard user interfaces: I^{2}C, Streaming Port, MediaLB®, SPI, and USB2.0. From the software side, it is supported by Automotive Grade Linux®, QNX and Android™ Automotive; it is compatible with MOST NetServices and Microchip's Unified Centralized Network Stack (UNICENS).
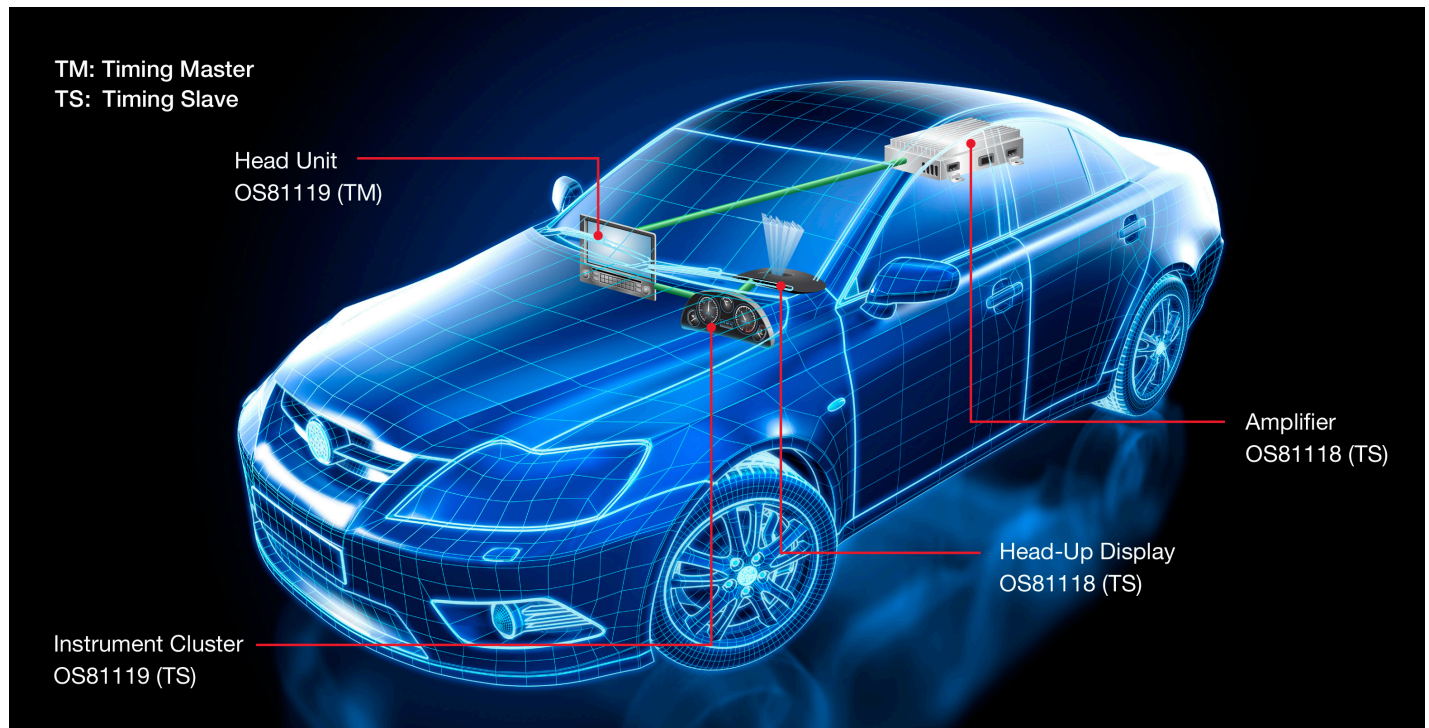
Features

- 150 Mbps network bandwidth
- Intelligent Network Interface Controller architecture that provides a complete network interface on a single chip
- Two network ports
- Supports low-cost LED/POF-based optical physical layer (oPHY) and coax physical layer (cPHY)
  - LVDS interfaces for FOTs
  - The integrated coaxial transceiver supports dual-simplex as well as full-duplex communication
- Enables daisy chain and star topologies with full-duplex communication on cPHY
- Enables ring topology* with dual-simplex communication on oPHY and cPHY
- Enables hybrid physical layers and hybrid topologies
- Supports state-of-the-art industry standard streaming and packet formats
  - Synchronous audio streams (PCM)
  - Isochronous audio/video streams such as MPEG, H-264
  - Ethernet packets for TCP/IP-based applications
  - On-chip IEEE MAC controller
  - MOST High Packets for lean file transfer to small microcontrollers with small memory
  - Clock distribution over the network
- Flexible management of available bandwidth

- Embedded MOST network management
  - Network protection mode
  - Hardware and application watchdog timer
  - Intelligent muting
- Provides remote control mode capability
- Compatible with UNICENS
- Android, QNX, Linux Driver available
- Universal Serial Bus (USB) Port supports high-speed USB 2.0 upstream data transfers using either
  - USB 2.0 physical layer
  - High-Speed Inter-Chip (HSIC) physical layer
- MediaLB controller
  - High-speed differential mode
  - Legacy single-ended mode
- Two configurable streaming ports
  - Two serial data pins per port
  - Capable of routing streaming data in industry standard formats like TDM and PDM
  - Up to 32 streaming channels at 512xFs and 16-bit/channel resolution in sequential mode on each of the four available streaming port pins
- Operating voltages: 1.2V**/1.8V/3.3V
- 88-pin QFN (12 mm x 12 mm)
- RoHS-compliant package
- Wettable flanks
- Ambient Temperature range: –40°C to +85°C

* Ring topology is not available on all ports.   ** Required only when the HSIC interface is used.

Applications

Cost-Effective and Feature-Rich Infotainment Network

The OS81119, in combination with the OS81118, can be used to design a cost-effective, feature-rich infotainment network, as shown in Figure 1. The OS81119 in the Head Unit would be connected in a star topology to two branches of the network that serve different applications. Depending on the requested power, some connections could be powered over the INICnet coaxial data cable, e.g. the connection between the Instrument Cluster and the Head-Up Display.
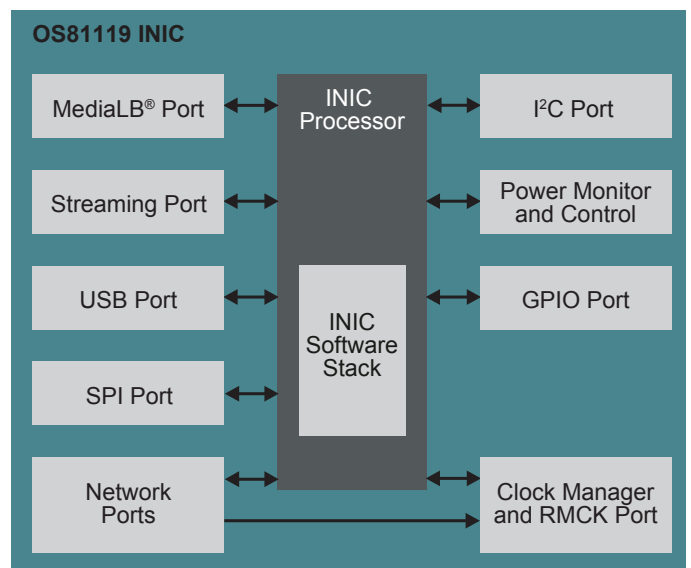

TM: Timing Master
TS: Timing Slave

Head Unit
OS81119 (TM)

Amplifier
OS81118 (TS)

Head-Up Display
OS81118 (TS)

Instrument Cluster
OS81119 (TS)

INICnet 150c cost-effective and feature-rich infotainment network

Development Tools

- MOST NetServices V3.2.x
- MOST Linux Driver
- Microchip's Unified Centralized Network Stack (UNICENS)
- USB-APP-Board (OS81119)
- MOST150 Slim Board family
- K2L OptoLyzer MOCCA compact 150c and 150o
- K2L INIC Explorer and Microchip Automotive Target Manager (MATM) with OS81119 configuration files and software
- K2L MediaLB bus analyzer

Block Diagram

OS81119 INIC

MediaLB® Port — INIC Processor — I²C Port

Streaming Port — Power Monitor and Control

USB Port — INIC Software Stack — GPIO Port

SPI Port

Network Ports — Clock Manager and RMCK Port

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