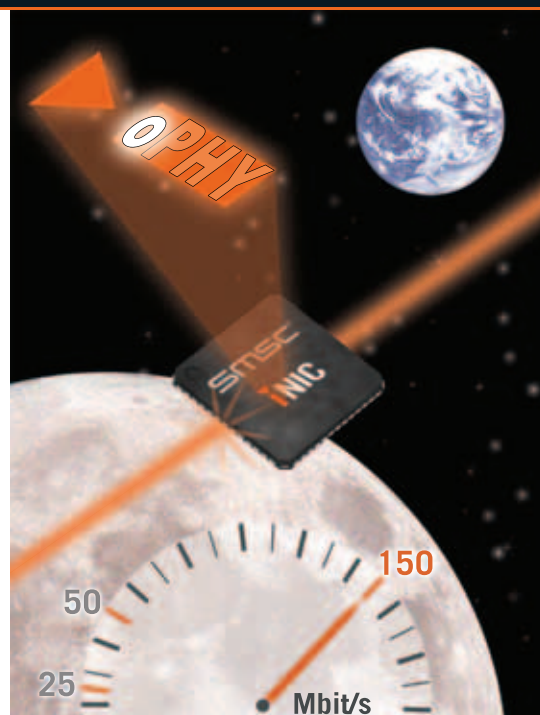# OS81110 INIC150

Intelligent Network Interface Controller for MOST®

Features

- 150 Mbits/s MOST network bandwidth
- Intelligent Network Interface Controller (INIC) architecture
    - Complete network interface on a single chip
    - Familiar INIC API
    - Compatible with INIC25 and INIC50
    - Seamless migration of applications to MOST150
- Supports a low cost LED/POF-based optical physical layer
    - MOST25 optical wire harness and connectors can be used
    - LVDS interfaces for FOTs
- Flexible dynamic management of available bandwidth
- Supports all legacy MOST data types:
    - Control channel – double the bandwidth of MOST25
    - Asynchronous packet channel – enhanced low-level flow control
    - Synchronous channels – enhanced management
- New MOST Ethernet channel
    - Transport of legacy Ethernet frames
    - On-chip support of IEEE MAC addressing
    - Ethernet applications such as TCP/IP stacks can be used without change
- New isochronous channels
    - Similar to synchronous channels
    - Transport of streams that are not synchronized to MOST such as: SPDIF Audio, MPEG video, Voice over IP
    - Clock samplers and synthesizers for flexible application clock management and tunneling
- Versatile generic application connectivity
    - No glue logic required for most applications
    - I^2C for control
    - Four high-speed I^2S/SPDIF streaming interfaces for audio
    - Up to two serial Transport Stream Interfaces (TSI) for video
    - Serial Peripheral Interface (SPI) for packet
- Powerful MediaLB® multiplex interface to transport all types of MOST data on a single medium
    - Legacy single ended modes
    - New high-speed (6-Pin) differential mode
- Operating voltages: 1.8 V/3.3 V
- 48-pin QFN lead-free, RoHS-compliant package
- Temperature range: -40 °C to +105 °C

Ordering Information

The OS81110 INIC150 is available as:

OS81110 INIC Engineering Sample

Order No. B10207

OS81110 INIC Tape & Reel

Order No. B10208

SMSC®
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Description

The OS81110 is a new Network Interface Controller that supports MOST data transport at 150 Mbits/s. The chip has been architected to enable a seamless migration of existing MOST applications and systems to MOST150. It uses SMSC's familiar Intelligent Network Interface Controller (INIC) architecture, also used for MOST25 and MOST50 applications. It fully encapsulates the network interface functions and can also operate as a stand-alone solution. The OS81110 uses the same INIC API for the legacy features, which allows existing application software including the NetServices driver stack to be migrated to MOST150 with minimal required changes.

The chip supports a low-cost LED/POF-based optical fiber physical layer. Since existing optical wire harnesses and connectors can be used without modification, the migration to MOST150 is straight forward.

OS81110 supports legacy control, synchronous, and packet channel data formats from MOST25 and MOST50. The control channel can be used for real-time status exchange and control of devices. It runs independently from the other transport mechanisms and has its own data integrity methods. For bigger packets and data transmission with no real-time requirements, MOST provides a separate legacy embedded asynchronous packet channel. It also has its own data integrity and flow control mechanisms. The synchronous channels are completely separated from the other transport mechanisms. Collisions or priority conflicts do not occur and therefore maximum Quality of Service (QoS) can be achieved. The necessary bandwidth is allocated via commands on the control channel. Once established, a synchronous channel is always available for the source of the data and one or more sinks. The signal itself can be streamed onto MOST without any need for packetizing or addressing. Unlike networks that originate in the IT world, MOST has been specifically designed to utilize bandwidth efficiently and deliver high-QoS audio and video streaming, even in a demanding automotive environment.

The delay from node to node is very low and predictable. It has been reduced from that of MOST25 and is just 162 nanoseconds per timing slave node and 20.8 microseconds across the timing master device. These delays can usually be neglected but, if necessary, they can be compensated as they are predictable. Therefore, MOST150 is well-suited to help minimize echoes, wow and flutter effects in multi-room sound systems and surround sound as well as home theater systems with active speakers.

In addition to supporting legacy MOST data formats, the OS81110 features two new types of data transport:
The new MOST Ethernet channel allows the transport of legacy Ethernet packets and supports MAC addressing. From an application perspective, the MOST Ethernet channel behaves like Ethernet. MOST looks like Ethernet to applications that use Ethernet frames or IP, such as TCP/IP stacks. These Ethernet applications can be used on MOST without modification or an adapter layer since MOST150 is an automotive grade physical layer for Ethernet and IP communications.

The new isochronous channels and clocking capabilities of the chip close the gap between synchronous and packet transport. While they are managed like synchronous streams, they make it possible to transport streams that are not synchronized to MOST and its frame rate. These streams range from PCM audio streams, which by nature are synchronous but might not have been synchronized to MOST, to bursty MPEG streams, to streams of packet data.

Allocation of bandwidth between the different channels can be managed dynamically in a highly flexible manner. All MOST data types, including MOST150, are very efficient in managing bandwidth when compared to other, mostly packet-orient, networks.

MOST150 can flexibly transport data and data streams that can occur in a modern infotainment system. The OS81110 provides legacy serial interfaces for all kinds of control, audio, video and packet data to support many applications at a minimum system cost. In addition to using I^2C for control, the OS81110 provides an SPI for high-speed packet communication. The OS81110 also provides two dedicated Transport Stream Interfaces that carry streaming data directly to or from video SoCs. Glue logic is typically not required, which allows for highly cost effective digital audio and video solutions. To support audio applications, the OS81110 features four high-speed streaming ports that can handle various formats including SPDIF or I^2S, to allow that a 7.1 channel surround sound source or amplifier can be hooked up directly to the INIC. In addition to generic interfaces, MediaLB can be used as a single serial interface for all MOST data types. The OS81110 also provides a high-speed differential mode, called MediaLB 6-Pin that delivers a data throughput of up to approximately 300 Mbits/s between INICs and other MediaLB 6-Pin implementations.
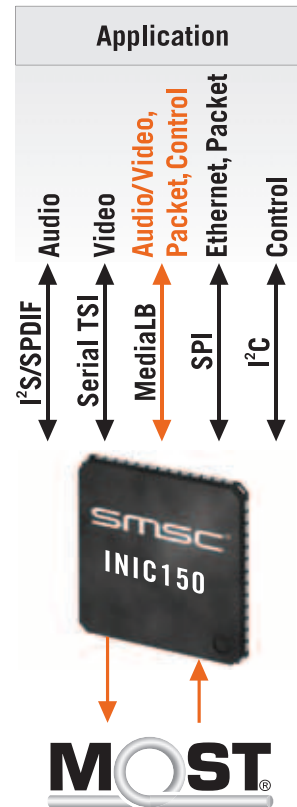
Hardware Block Diagram
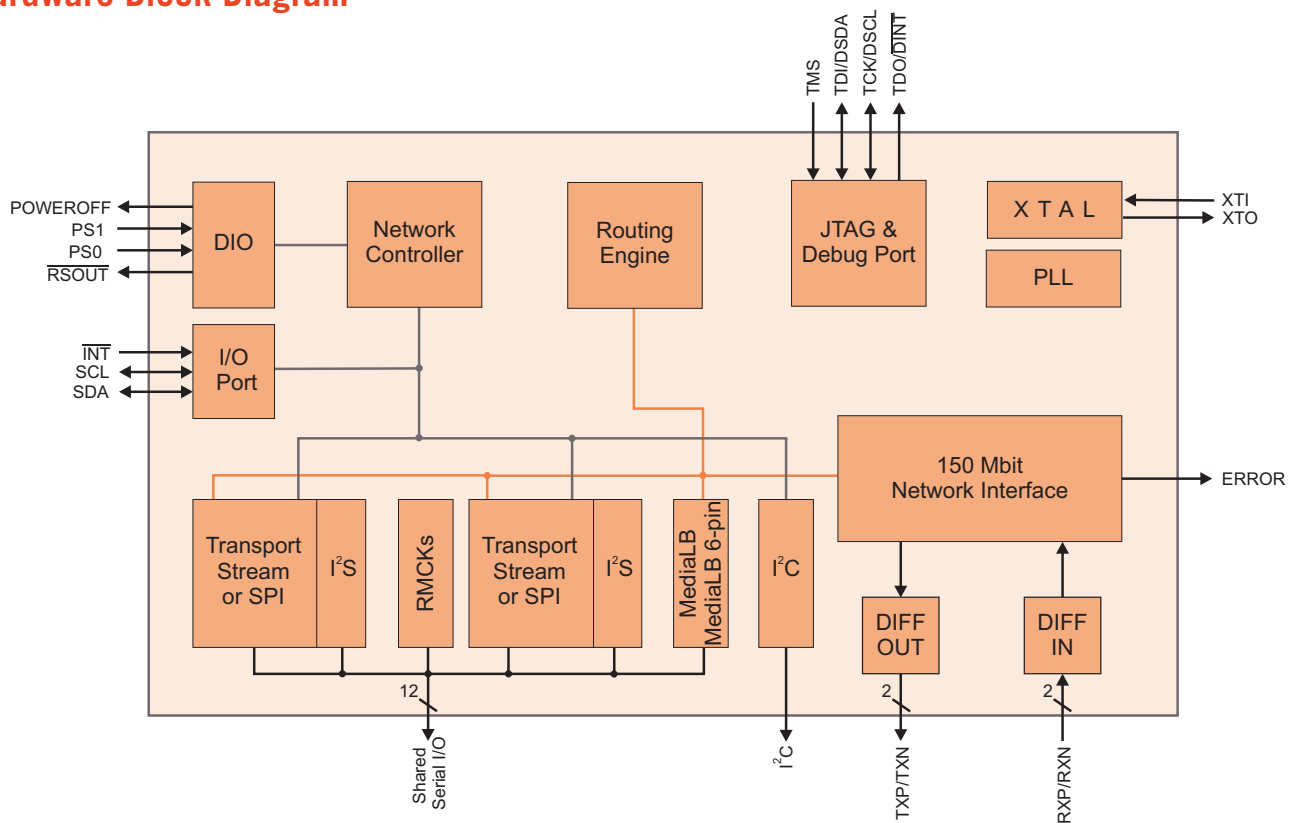
MOST150 Demonstrator

SMSC has developed various demonstrators and reference designs that highlight the different features of MOST150.

The MOST150 video demonstrator (graphic and photo below) focuses on how video applications can be efficiently implemented using MOST technology. A variety of source devices stream 20 or more single definition (SD) and three high definition (HD) video and/or audio streams onto the network to be accessed by the various SD and HD decoders, which then deliver the content towards displays and/or loudspeakers. Each of the sink devices can access any available stream served by the MOST network. This demonstrates how MOST can be highly effective in transporting audio and video content.

As the management of all this content uses only two thirds of the available bandwidth, the demo also shows how Ethernet tunneling is possible: one network interface is connected to a local network while the other interface is connected to a PC. A user can surf the Internet using the PC while the streaming content continues to flow with un-interrupted QoS.

The demonstrator also highlights the glueless connectivity between the various video processing ICs and the OS81110 to help lower the system cost for full digital video transmission.
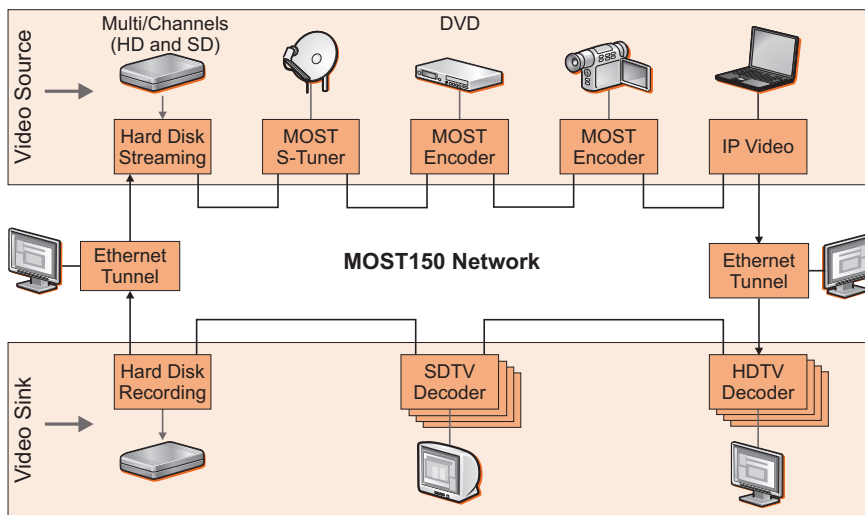
SMSC's MOST150 Video Demonstration Set-Up