NS6009 Single 12.8Gbps HSMT to Single MIPI CSI-2 Automotive Deserializer

Introduction

The NS6009 Deserializer chip is compliant to Automotive Wired High-Speed Media Transmission (HSMT) standard. Pairing with a compatible HSMT serializer, the NS6009 is used for transmission of forward video and bidirectional audio and control data for automotive display applications. The NS6009 converts an HSMT serial input to one MIPI CSI-2 D-PHY or C-PHY output. The HSMT link operates at a data rate up to 12.8Gbps in the forward direction, and 100Mbps in the backward direction. The NS6009 supports Power-over-Cable (PoC) operation over 15m Coaxial cable or 8m Shielded Twisted Pair (STP) cable, with multiple inline connectors. The NS6009 is ISO 26262 ASIL-B and AEC-Q100 Grade 2 certified with automotive temperature range of -40℃ to +105℃.

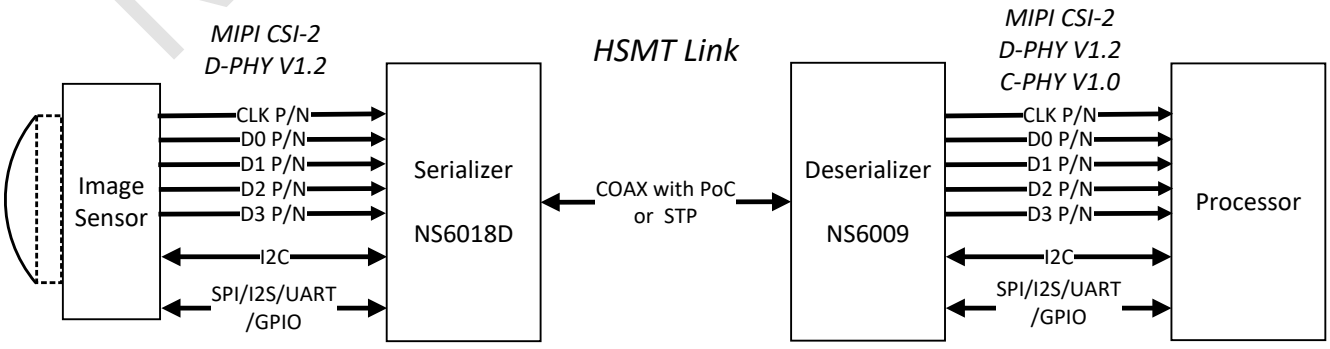
The NS6009 supports I2C and SPI control ports, flexible GPIO with trigger mode, constant latency mode and oversample mode, tunneled UART, forward and backward audio channels, a built-in ADC, temperature sensor, and an extensive set of diagnostics for functional safety.

Applications

- High-Definition 17MP Camera Systems
- Advanced Driver Assistance Systems (ADAS)
- Front Vision Camera Systems (FVC)
- Surround View Systems (SVS)
- Driver Monitor Systems (DMS)
- Automatic Parking Assist (APA)

Features

- HSMT link for system and power flexibility
  - 2.0/3.2/4.0/6.4Gbps forward-link rates (NRZ)
  - 8.0/12.8Gbps forward-link rates (PAM4)
  - 100Mbps backward link rate to allow small POC inductor
- Robust communication in automotive environment
  - Forward channel adaptive equalization
  - RS-FEC for protection of forward video and control-channel data
  - Video data error correction and retransmission
  - Advanced DSP continuously tracking changes in cable, connector, PCB and other channel characteristics over time and temperature
- Single MIPI CSI-2 output configurable as D-PHY/C-PHY
  - RAW8/10/12/14/16/20/24, RGB888, YUV422 8/10-bit
  - D-PHY V1.2 up to 2.5Gbps/lane, 1x4-lane
  - C-PHY V1.0 up to 5.7Gbps/trio, 1x2-trio
  - 16-channel virtual channel support (D-PHY)
  - 32-channel virtual channel support (C-PHY)
- Supports bulk and tunneling modes I2C (master up to 833Kbps, slave up to 1Mbps)
- Supports SPI (master/slave up to 50Mbps), UART (Tx/Rx), and GPIO
- Digital audio with I2S and TDM interface
  - Supports forward-direction 7.1 HD audio and up to 192kHz sample rate
  - Supports backward-direction 8 channels at 48kHz sample rate or 2 channels at 192kHz sample rate
- ISO 26262 ASIL-B and AEC-Q100 Grade 2 certified
- CRC protection of control-channel data(I2C and SPI)
- Video watermark and video test pattern generation
- Supports line fault detection and voltage monitor
- 7mm x 7mm 48-pin QFN package



NOREL Systems Ltd.

Floor 11-12, West Tower, Putian Innovation Industrial Park, No. 22 Kaihua Road, Huayuan, Tianjin, China

EDN-5237 Tel: +86 22 58668220 Fax: +86 22 58668221