1. Introduction

The NS6312 Serializer chip is compliant to Automotive Wired High-Speed Media Transmission (HSMT) standard. Pairing with a compatible HSMT deserializer, the NS6312 is used for transmission of forward video and bidirectional audio and control data for automotive camera applications. The NS6312 converts dual MIPI CSI-2 inputs to a single HSMT output, and transmits the output to the paired deserializer over an HSMT link. The HSMT link operates at a data rate up to 6.4Gbps in the forward direction, and 100Mbps in the backward direction. The NS6312 supports 16 meters Coaxial cable or 10 meters STP cable at 6.4Gbps. The NS6312 is ISO 26262 ASIL-B and AEC-Q100 Grade 2 certified with automotive temperature range of -40 ℃ to +105 ℃.

The NS6312 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.

1.1. Applications

- High-Definition 12MP Camera Systems
- Advanced Driver Assistance Systems (ADAS)
- Front Vision Camera Systems (FVC)
- Surround View Systems (SVS)
- Driver Monitor Systems (DMS)
- Automatic Parking Assist (APA)

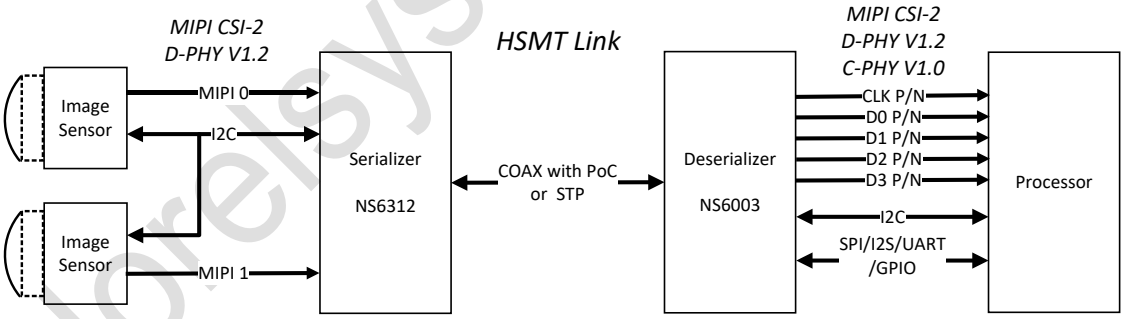

Figure 1. Application Example

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1.2. Features

- Multiple data rates for system and power flexibility
  - 2.0, 3.2, 4.0, or 6.4Gbps forward-link rates
  - 100Mbps backward-link rate to allow small POC inductor
- Robust communication in automotive environment
  - RS-FEC for protection of forward video and control-channel data
  - Physical layer retransmission
- High performance backward receiver
  - Backward channel adaptive equalization
  - Backward channel eye timing margin monitor for continuous link margin diagnosis
  - RS-FEC for protection of backward control-channel data
- Dual MIPI CSI-2 inputs
  - RAW8/10/12/14/16/20/24, RGB888, YUV422 8/10-bit
  - 16 virtual channels
  - DPHY v1.2, up to four lanes per port at 80Mbps–2.5Gbps per lane
  - Dual sensors with differnet video timing and resolutions
- Supports 12MP sensors
- Supports bulk and tunneling modes I2C(master up to 833Kbps, slave up to 1Mbps)
- 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
- Supports SPI (master/slave up to 50Mbps), GPIO, and UART(TX/RX)
- Supports data transfers I2C**<->**I2C, I2C**<->**SPI, UART**<->**UART, I2C**->**UART TX, SPI**->**UART TX
- Supports transfer from GPIO to GPIO with trigger mode, constant latency mode and oversample mode
- Functional safety
  - ISO 26262 ASIL-B certified
  - CRC protection of control-channel data (I2C, SPI)
  - Video data error correction and retransmission
- Video watermark insertion and detection
- Video test pattern generation
- Advanced diagnostics
  - Line fault detection
  - Supply voltage monitor
- Generates reference clock for image sensor synchronizing to back channel clock
- Generates frame sync signal to image sensor

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- Programmable spread spectrum for EMI reduction
- 7mm x 7mm 48-pin QFN package

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