

# NS6601 Automotive HSMT Deserializer

## Introduction

The NS6601 Deserializer chip is compliant to Automotive Wired High-Speed Media Transmission (HSMT) standard. The NS6601 converts HSMT input to MIPI CSI-2 D-PHY or C-PHY formatted output. The NS6601 is a quad-receiving chip to accommodate as many as 4 remotely located sensors. HSMT link operates at a fixed data rate of 3.2Gbps or 2.0Gbps in the forward direction, and 100Mbps in the backward direction. The NS6601 supports Power-over-Cable (PoC) operation over 22 meters Coaxial cable or 12 meters Shielded Twisted Pair (STP) cable, with multiple inline connectors. The NS6601 is ISO 26262 ASIL-B and AEC-Q100 Grade 2 certified with automotive temperature range of -40 °C to +105 °C.

Table 1. Typical Maximum Cable Length vs. Attenuation

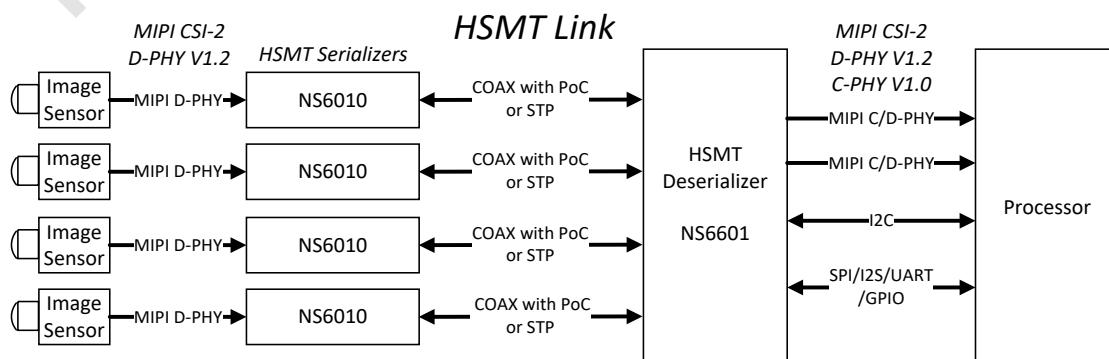
|  | Dacar 302-3<br>50Ω Coax             | RG174<br>50Ω Coax | 100Ω STP |
|--|-------------------------------------|-------------------|----------|
| Attenuation at 3GHz<br>(Typ, Room Temp)    | 0.9dB/m                             | 1.5dB/m           | 1.8dB/m  |
| Attenuation at 3GHz<br>(Max, Aged, 105 °C) | 1.1dB/m                             | 1.8dB/m           | 2.2dB/m  |
| HSMT Forward/<br>Backward Data Rate        | Typical Max. Cable Length at 105 °C |                   |          |
| 3.2Gbps/100Mbps                            | 22m                                 | 12m               | 12m      |

## Applications

- High-Definition 5MP 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

- Multiple data rates for system and power flexibility
  - 2.0 or 3.2Gbps forward-link rates
  - 100Mbps backward link rate to allow small Power-over-Cable inductor
- Robust communication in automotive environment
  - Forward channel adaptive equalization
  - RS-FEC for protection of forward video and control-channel data
  - Retransmission
  - Advanced DSP continuously tracking changes in cable, connector, PCB and other channel characteristics over time and temperature
- MIPI CSI-2 output configurable as D-PHY and/or C-PHY
  - RAW8/10/12/14/16/20/24, RGB888, YUV422 8/10-bit
  - D-PHY V1.2 up to 2.5Gbps/lane, 2x4-lane, 1x4-lane + 2x2-lane, 4x2-lane
  - C-PHY V1.0 up to 5.7Gbps/trio, 2x4-trio, 1x4-trio + 2x2-trio, 4x2-trio
  - 16-channel virtual channel support (D-PHY)
  - 32-channel virtual channel support (C-PHY)
  - Supports aggregation and replication of video data
  - Supports superframe with frame concatenation
- 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
- Line fault detection
- Supports 2x I2C, 2x SPI, 15x GPIO, 4x UART, 2x I2S
- 9mm x 9mm QFN package



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