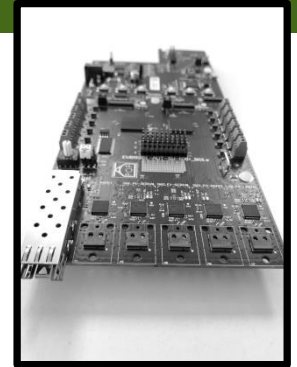# EVB9351-AUT-SW-NXP

Automotive Optical Gigabit Ethernet Switch Evaluation Board

Atumotive

OVERVIEW

The EVB9351-AUT-SW-NXP board is an automotive Ethernet switch with five optical 1000BASE-RHC ports. Additionally it has one SFP slot, 12 100BASE-T1 ports, and one NXP SABRE expansion connector. It is based on the NXP SJA1110A switch part, and the KDPOF KD1053 optical PHY transceiver and the KD9351 optical FOT.

This new board enables an affordable BOM and extended switching functionality, as demanded in common automotive use.

The companion Reference Design provides guidelines for design and evaluation capabilities in a flexible platform, enabling product designers to successfully shorten the time-to-market for optical Ethernet switch automotive products.

KEY FEATURES

- 2.5 Gb/s switching capacity
- 5x 1000/100BASE-RHC ports: Full duplex, 1 Gbps per direction over IEC 60793-2-40 subcategory A4a.2 step-index multimode POF with or without in-line connectors (gigabit mode). Guaranteed bit error rate (BER) better than 10^{-10} at 1 Gbps according to RFC-2544
- 1x SFP slot
- 12x 100BASE-T1 ports
- 1x SABRE expansion connector (NXP)
- Easy monitoring and control of KD1053 through MDIO port thanks to included multi-platform (Linux, Mac, Windows) GUI tool and USB adapter (USB2ALL)
- Low power consumption @12V: 600 mA (traffic on all the optical ports)

MAJOR BENEFITS

- Available with optical connectors and harnesses from different suppliers
- Enables real-time monitoring of the link, reporting key performance parameters like: received average optical power (dBm), local and remote link margin (dB), transmit and receive link speed, and local configuration
- Enables control of the local transceiver, enabling different loopback modes and test modes
- Auto-logging of monitoring parameters
- SDK provided
- The user can customize the software to support higher functionality
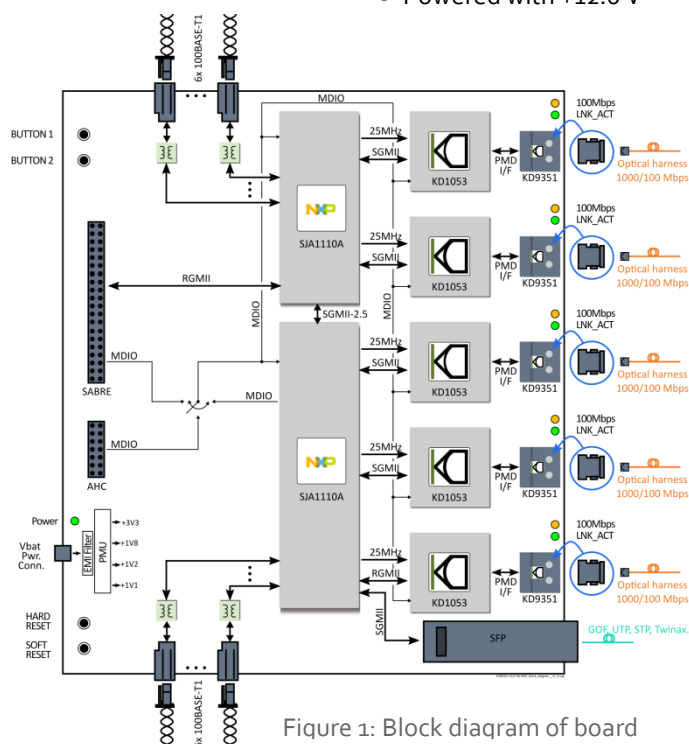- Affordable BOM
- Small PCB area
- Powered with +12.0 V

Figure 1: Block diagram of board

PRODUCT DESCRIPTION

The EVB9351-AUT-SW-NXP automotive optical Ethernet switch evaluation board is a flexible tool that enables testing of KDPOF gigabit POF technology through the five optical 1000/100BASE-RHC ports, which are based on KDPOF KD1053 1000BASE-RH PCS/PMA transceiver and the KDPOF KD9351 optical PMD transceiver. It also allows evaluating the automotive Ethernet switch SJA1110A from NXP.

The user can integrate this board in automotive setups or applications requiring optical interfaces and gigabit switching capability. In addition, the user-friendly GUI included in the kit, and the USB2ALL management bridge can be used for real-time monitoring of several low-level link parameters, so the performance of the KD1053 + KD9351 transceivers can be observed and measured.

Control and status of the KD1053 is accessed through the GUI, which is run on a computer connected via USB. Using either the GUI, the user can configure several chip options.

The GUI, shown in Figure 2, includes several panels which provide complete access to the KD1053 transceiver, link status and parameters.

SETUP

The typical configuration of an evaluation setup would include:

- One EVB9351-AUT-SW-NXP board
- One USB2All management module for USB to MDIO interfacing and configuration via the AHC connector
- SDK and GUI software for easy system debugging and monitoring
- Five optical header connectors (there are several suppliers)
- Five optical harnesses
- Power adapter
- Multi -port traffic generator and a computer
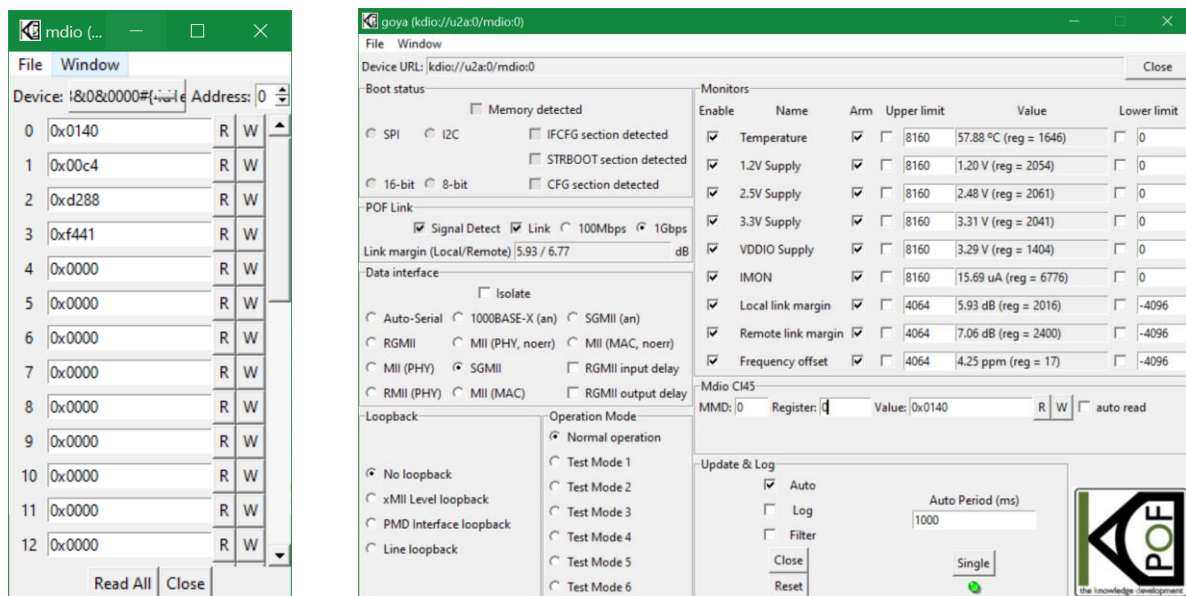- 1000BASE-RHC SFP modules or EVB9351-AUT evaluation boards

Figure 2: Multi-platform GUI tool

Approaching the Shannon Limit