



# QorIQ® LS1046A Reference Design Board

The LS1046A reference design board (RDB) is a high-performance computing, evaluation, and development platform that supports the QorIQ LS1046A, a processor with four 64-bit ARM® Cortex®-A72 cores that supports packet processing acceleration and high-speed peripherals.

## PROCESSOR OVERVIEW

The impressive performance of more than 32,000 CoreMarks®, paired with 10 Gbit Ethernet, PCIe Gen. 3, SATA 3.0, USB 3.0 and QSPI interfaces provides a perfect combination for a range of enterprise and service provider networking, storage, security and industrial applications. The LS1046A and LS1026A are available in a 23 x 23 mm package and are pin-compatible with the LS1023A, LS1043A and LS1088A SoCs, offering unprecedented performance scaling for 64-bit ARM processors, ranging from dual-A53 through octal-A53 to quad-A72 core processors, while maintaining hardware and software compatibility. This flexible scaling enables customers to leverage their existing software and reuse hardware design for faster time-to-market.

## REFERENCE DESIGN BOARD

The LS1046A reference design board (RDB) is a high-performance computing, evaluation, and development platform that supports the QorIQ LS1046A communications processor. The RoHS-compliant lead-free and LS1046ARDB board is optimized to support DDR4 memory and a full complement of high-speed SerDes ports.

## BOARD HARDWARE FEATURES

### Processor

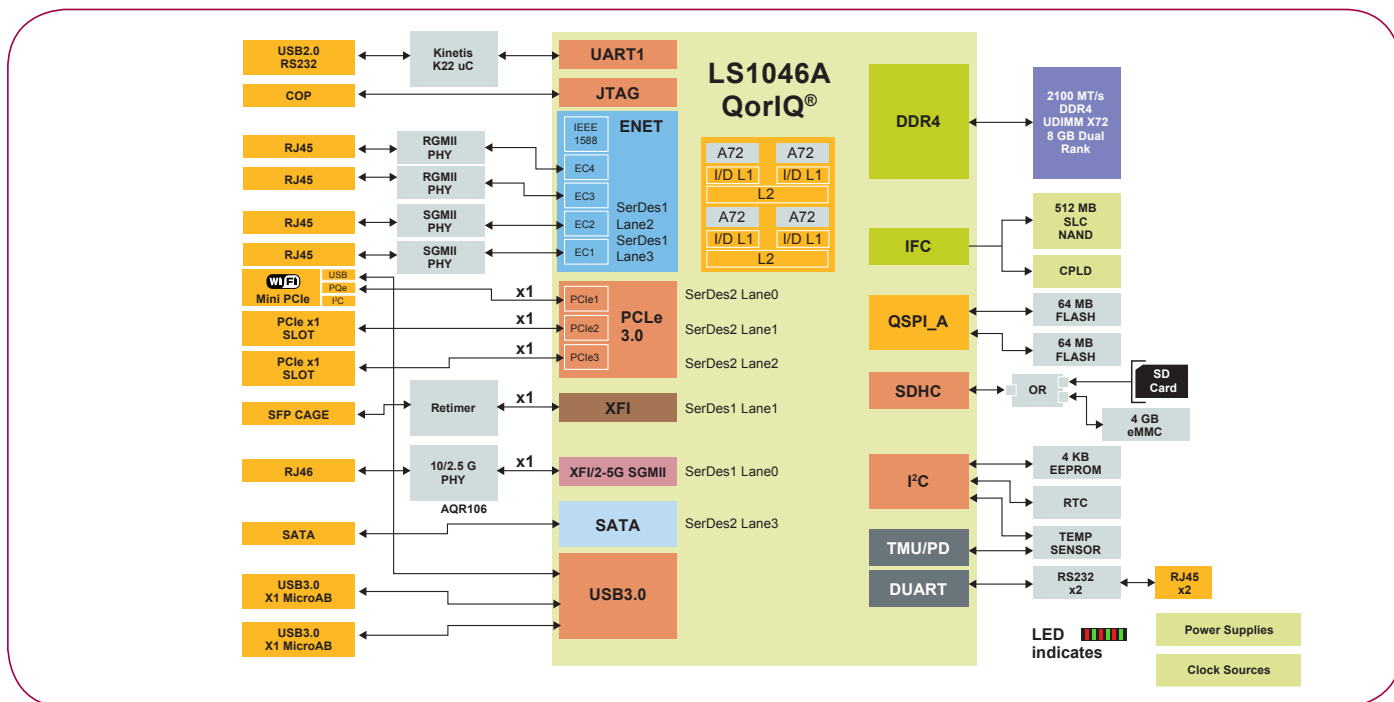
- ▶ Four 32-/64-bit Cortex v8-A72 CPUs with, up to 1.6 GHz core speeds

### Memory

- ▶ Supports 8 GB DDR4 SDRAM memory
- ▶ Supports double-bit error detection and single-bit error correction ECC (8-bit check word across 64-bit data)
- ▶ Supports data rate up to 2100 MT/s
- ▶ Provides one 288-pin DDR4 DIMM connector
- ▶ DIMM connector supports unbuffered X72 8 GB dual rank
- ▶ SDHC port connects directly to an adapter card slot, featuring 4 GB eMMC memory device
- ▶ One 512 MB SLC NAND flash with ECC support (1.8 V)
- ▶ CPLD connection: 8-bit registers in CPLD to configure mux/demux selections
- ▶ Support two 64 MB onboard QSPI NOR flash memories



## QORIQ LS1046A-RDB BLOCK DIAGRAM



### USB

- ▶ Two USB 3.0 controllers with integrated PHYs
- ▶ One USB 3.0 port is connected to a Type A host connector
- ▶ One USB 3.0 port is configured as On-The-Go (OTG) with a Micro-AB connector
- ▶ One USB2.0 is connected to Mini PCIe connector

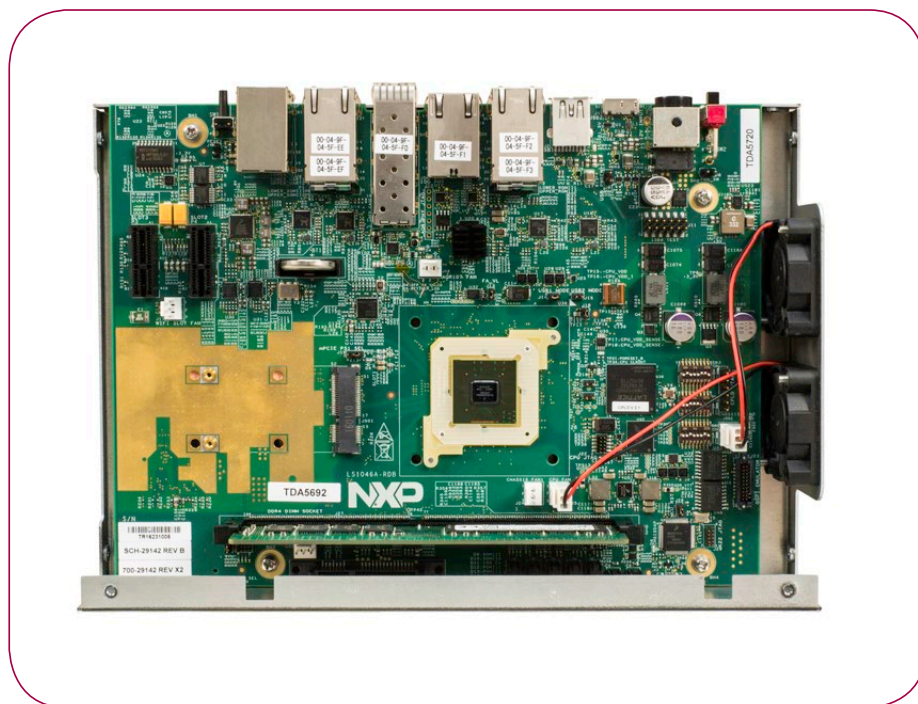
### Ethernet

- ▶ Supports SGMII 1 G PHYs at Lane 2 and Lane 3
- ▶ Supports SFP+ module with XFI retimers
- ▶ Supports AQR106/107 10 G PHY with XFI/2.5G SGMII

### PCI Express and SATA

- ▶ Mini PCIe x1 (Gen1/2/3) card
- ▶ Standard PCIe x1 (Gen1/2/3) card
- ▶ Standard PCIe x1 (Gen1/2/3) card
- ▶ One SATA 3.0 connector

## QORIQ LS1046A-RDB BOARD



## HARDWARE KIT CONTENTS

The LS1046ARDB hardware kit contains:

- ▶ A LS1046ARDB kit enclosure
- ▶ A DB9 to UART (RJ45) cable
- ▶ Ethernet cable, straight through wiring, 6 ft. min., RoHS compliant
- ▶ A USB Micro-B to Type-A cable
- ▶ A USB3.0 Micro-B male to USB3.0 Type-A female cable
- ▶ A 110-240 V AC, 12 V DC 8 A AC-DC power adapter
- ▶ Universal AC input adaptors
- ▶ A SATA cable (with 22 pins) and power combo cable

- ▶ A USB stick that contains the board design files
- ▶ A Getting Started Guide
- ▶ Finisar® FTLX8571D3BCL SFP + module x 1

## SDK ENABLEMENT

- ▶ Boot loader
  - Boot from flash, disk (IFC, NAND, I<sup>2</sup>C, SPI)
  - UEFI, uboot Secure Boot support
- ▶ Linux®
  - Linux platform (32-bit/64-bit), real-time support (RT patch)
  - Linaro® ODP support
  - DPDK support

- ▶ Datapath
  - Production fast path modules:
  - Intelligent forwarding offload, NAT+firewall
  - IPv6, NAT, IPSEC VPN
  - Enablement libraries
- ▶ Virtualization
  - Standard KVM support; Linux containers, I/O virtualization
- ▶ Tools
  - CodeWarrior®, for 64-bit ARM (including 32-bit mode), GNU tool chain

## PRODUCT READY SOFTWARE SOLUTIONS

Product	Linux OpenWRT	BHR ASK	NAS ASK
Solutions	<ul style="list-style-type: none"> <li>• U-Boot</li> <li>• BSPs</li> <li>• Linux Kernel (3.19)</li> <li>• Linux file system</li> <li>• Application drivers</li> <li>• Binary for packet forwarding engine</li> </ul>	<ul style="list-style-type: none"> <li>• Small business router</li> <li>• Next gen. broadband router</li> <li>• Integrated services</li> <li>• Enterprise access point</li> <li>• Security gateway</li> </ul>	<ul style="list-style-type: none"> <li>• Personal storage</li> <li>• Wireless personal storage</li> <li>• Chip on drive</li> <li>• NAS</li> </ul>
Availability	Now	Early access release now	Early access release now
ASK licensing	\$100,000		
KE1 Support plans 5Z	Starting at \$25,000 (100 hours/12 months)		

To evaluate the application solutions kit please go to [www.nxp.com/LS1046A](http://www.nxp.com/LS1046A) and select Software and Tools tab, and chose the ASK that you want to evaluate.

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Document Number:  
LS1046ARDBA4FS REV 0