![NXP logo]

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QorIQ Multicore Processor Development

QorIQ T1023 Reference Design Board

## Compact Form Factor for Secure Wired and Wireless Embedded, Networking & Industrial Applications

Overview

The QorIQ T1023 Reference Design Board (T1023RDB) is a high-performance evaluation, development and test platform supporting the QorIQ T1023 communications processor. The board will support the evaluation and development of the dual core T1023 and the single core T1013 communications processors built on Power Architecture® technology. This system addresses networking and Ethernet-centric applications, such as mixed control and data plane in fixed routers, switches, Internet access devices, industrial data concentrators, factory automation, firewall and other packet filtering applications, as well as general-purpose embedded computing. The T1023RDB also comes equipped with an 802.11ac 4x4 radio and the ability to support Power over Ethernet.

The QorIQ T1023RDB will help shorten your time to market. This system is an ideal reference for your hardware and software development, debugging and performance evaluation prior to production. Schematics and design files are available at Freescale's discretion, upon request.

The T1023RDB supports two mini-PCI Express® connectors, an SD/MMC connector interface and one USB 2.0 port. These components, integrated with the T1023 processor and low power next generation DDR4 memory, provides an application-specific platform that can help you get a jump start on your next design.

QorIQ T1023 Reference Design Board Block Diagram

BUILT ON
Power™
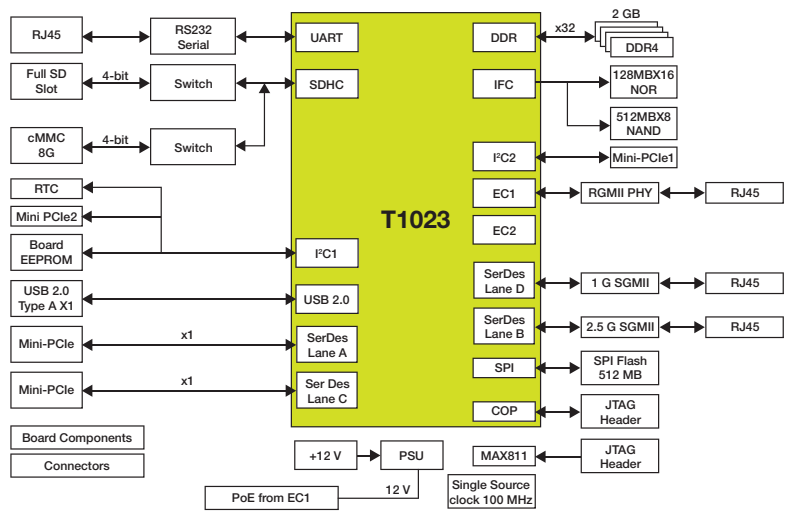
The T1023RDB also supports 2 GB of DDR4 at 1600 MHz, 128 MB of NOR flash, and 512 MB NAND flash.

The QorIQ T1023RDB is loaded with the Linux® Software Development Kit (SDK) for QorIQ Processors v1.7. The SDK includes a 64-bit SMP Linux kernel, hugetlbfs for applications with a large memory footprint, user space DPAA for high-performance packet handling, U-boot, the GCC tool chain, virtualization support and many other features.

QorIQ T1023RDB Board Features:

Processor:

- QorIQ T1023 processor at 1.4 GHz dual-core with 1600 MT/s DDR4 data rate
- Multiple SysClk inputs for generating various device frequencies

Memory:

- 2 GB DDR4 SDRAM UDIMM/RDIMM (32-bit bus)
- 128 MB NOR flash, 16-bit
- 512 MB SLC NAND flash
- SD connector to interface

PCI Express

- Two Mini-PCIe Gen 2.0 x1 lane connectors

USB 2.0:

- One USB port, connected to USB PHY

Ethernet

- One on-board SGMII 10/100/1000 Mbps Ethernet Port
- One on-board SGMII 2.5 G Ethernet Port
- One on-board RGMII 10/100/1G Ethernet port
- PoE (Power over Ethernet)

UART

- One UART (RJ45) port at up to 115,200 bps

Other

- JTAG/COP for debug
- Thermal Monitor

About the T1 Family

The QorIQ T1 family is based on the 64-bit e5500 core, built on Power Architecture® technology, offering speeds up to 1400 MHz. It has a three-level cache hierarchy with 32 KB of instruction and data cache per core, 256 KB of low-latency backside L2 cache per core, and a 256 KB shared platform cache. This scalable, pin-compatible family also features the industry's first 64-bit embedded processor with an integrated Gigabit Ethernet switch that simplifies hardware design, reduces power and overall system cost.

The QorIQ T1 family of communications processors also supports a 32/64-bit DDR3L and DDR4 SDRAM memory controller with ECC support running at up to 1600 MT/s data rate. It includes two high-speed USB2.0 controllers (with integrated PHY), four UARTs, an SD/MMC interface, an integrated flash controller supporting NAND and NOR flash memory, four I2C and SPI. It also includes the accelerator blocks collectively known as the Data Path Acceleration Architecture, that offload various tasks from the core, including routine packet handling, security algorithm calculation, and pattern matching. In addition, the T1024 and T1040 family of processors integrate a QUICC Engine module offering support for legacy protocols such as TDM, HDLC, UART and ISDN and includes support for hardware-assisted virtualization.

Software and Tool Support

Freescale and our partner network deliver a wide range of tools, run-time software, reference solutions and services to accelerate your designs.

- QorIQ T1023 reference design board (T1023RDB-PC)
- CodeWarrior Development Studio for Power Architecture
- Freescale Linux SDK
- VortiQa Application Software
  - VortiQa application identification software (AIS)
  - Enterprise software for networking
  - VortiQa open network switch software
  - VortiQa open network director software
- Professional Services and Support
  - Commercial services
  - Linux SDK support package
  - Reference Design Software (RDS support package)
- Third-party software and tools
  - Enea, Green Hills, Mentor Graphics and Wind River

Orderable parts:

T1023RDB-PC

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