WINSOURCE ELECTRONICS

THE DATASHEET OF

LS1044ASE7MQA

QorIQ LS1 Processor Family

QorIQ LS1088A and LS1048A Communications Processors

Enabling the intelligent edge with NXP's next generation DPAA2 data path architecture and ARM v8 64-bit processors.

TARGET APPLICATIONS

- Intelligent edge access
- NFV solutions
- Wireless access point control
- Virtual CPE
- iNIC
- Industrial

OVERVIEW

The QorIQ LS10x8A family of multicore communications processors combines up to eight ARM® Cortex®-A53 cores with the advanced, high-performance datapath and network peripheral interfaces required for wireless access points, networking infrastructure and intelligent edge access, including virtual customer premise equipment (vCPE), and high-performance industrial applications.

The QorIQ LS10x8A processors include NXP's second-generation datapath acceleration architecture (DPAA2). DPAA2 provides the infrastructure required to support simplified and secure networking interface and accelerator sharing by multiple general-purpose CPU cores, while also providing a range of powerful acceleration engines to offload software running on the CPUs.

The ARM® general-purpose processors and DPAA2 are supported by a powerful software toolkit that provides a higher level of hardware abstraction and makes software development quick and simple. This combination balances ease-of-use with high-performance processing in a Linux® environment that is familiar to any software programmer. Customers can fully exploit the underlying hardware and easily adapt to network changes for real-time 'soft' control over the network.

SOFTWARE TOOLKIT

NXP has significant and increasing global investment in software for the embedded marketplace. The NXP software development kit (SDK) delivers foundational technologies (user space, fast path, virtualization) that are continuously 'upstreamed' to support the networking portfolio. With 13+ years experience of commercial ARM software tooling, operating system development and delivery, NXP continues to be a strong

supporter of open source and industry software consortia, including Linaro and the Linux Foundation.

UNPARALLELED INTEGRATION

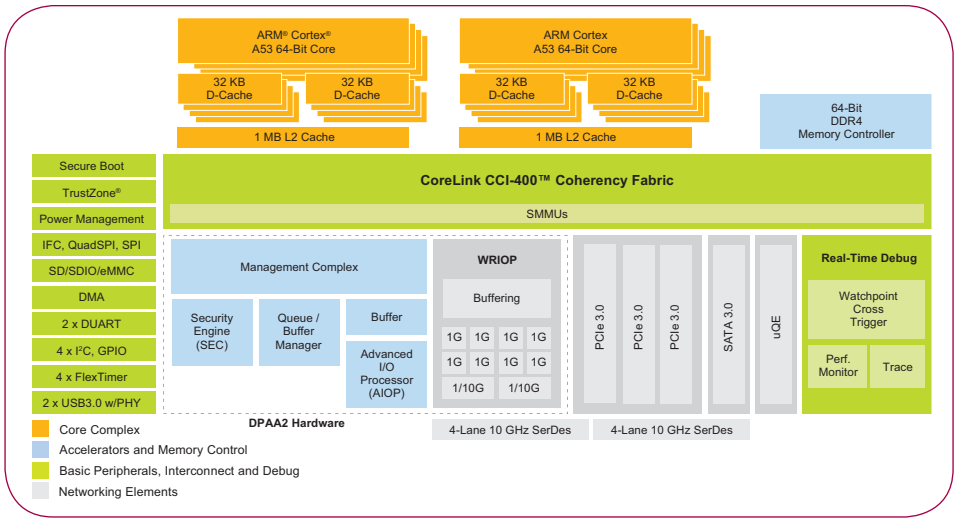
QorIQ LS10x8A processors integrate up to two 10 Gbit/s and eight 1 Gbit/s Ethernet interfaces with hardware supported vSwitch capability for PCIe® controllers (supporting SR-IOV) and next-generation SATAIII and USB3 controllers. The next-generation datapath is complemented with high-performance acceleration, including security and trust, pattern matching and data compression.

NETWORKING PERFORMANCE

The QorIQ LS10x8A processors contain an advanced I/O processor (AIOP) that offloads the general-purpose ARM Cortex-A53 cores with in-line or fully autonomous networking functions, involving complex look-ups, header manipulations, and even encapsulations and encryption.

The next-generation datapath also provides proven acceleration such as crypto acceleration and trust architecture, to meet the ever-increasing demands for network security and power efficiency.

QorIQ LS1088A PROCESSOR BLOCK DIAGRAM



COMPLETE ENABLEMENT, RICH ECOSYSTEM

The QorIQ LS1 family includes a comprehensive ecosystem to assure that ease-of-use is first priority. The complete offering includes:

- APIs that are compliant with industry standard consortiums, including Linaro OpenDataPath (ODP).
- Management software that takes care of setup, initialization and teardown of interfaces, accelerators and networking functions
- Functional datapath libraries that are performance optimized
- NXP VortiQa software applications that are bundled for quick networking application deployment
- Tools (e.g., accelerators, debug) to make sure you spend your time creating value-added software
- Powerful combination of NXP and ARM ecosystems for support
- Open-source software, available upstream for all customers to leverage

QorIQ LS1088A FAMILY COMPARISON CHART

	LS1088A	LS1084A	LS1048A	LS1044A
Cortex A53 cores up to 1.6 GHz	8	8	4	4
L2 cache (MB)	2	2	1	1
Advanced I/O processor	YES	NO	YES	NO
vSwitch acceleration	YES	YES	YES	YES

QorIQ LS10X8A FAMILY FEATURES

Up to 8 cores built on ARM Architecture	• 8 x Cortex-A53 CPUs, 64-bit, 1.6 GHz, clusters of four cores sharing 1 MB L2 cache
Hierarchical interconnect fabric	• Coherency fabric supporting coherent and non-coherent transactions with prioritization and bandwidth allocation
DDR controllers	• One 64-bit DDR4 SDRAM memory controllers with ECC and interleaving support, up to 2.1 GT/s
Accelerated packet processing	• Advanced I/O processor, up to 10 Gbit/s complex packet processing • 10 Gbit/s SEC crypto acceleration
Express packet I/O	• Supports x 4, x 2, 3 x 1 PCIe® Gen 3 controllers • SR-IOV support, root complex • 1 x SATA 3.0, 2 x USB 3.0 with PHY • Two TDM/HDLC interfaces
Network I/O	• Wire rate I/O processor, with HW parsing, classification, and policing, featuring: ◦ Two 1/10 GbE + eight 1 G ◦ vSwitch offload ◦ XFI/KR, QSGMII, SGMII/KX, RGMII ◦ MACSec on up to four 1 GbE
Virtualization	• Support for HW virtualization and partitioning enforcement

www.nxp.com/QorIQ

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