Integrated Communications Processors

MPC8349E
PowerQUICC II™ Pro

Overview

Freescale Semiconductor's MPC8349E PowerQUICC II™ Pro family of integrated communications processors is a next-generation extension of the popular PowerQUICC II line. Based on a system-on-chip (SoC) architecture, the MPC8349E PowerQUICC II Pro Family integrates the enhanced e300 core, built on Power Architecture™ technology, and advanced features, such as DDR/DDR2 memory, Dual Gigabit Ethernet, Dual PCI and Hi-Speed USB controllers. With clock speeds scaling to 667 MHz, the MPC8349E family of processors offers the highest performing PowerQUICC II devices available.

The MPC8349E PowerQUICC II Pro Family is designed to provide a cost-effective, highly integrated control processing solution that addresses the emerging needs of networking, communications and pervasive computing applications. MPC8349E processors can be used in applications such as Ethernet routers and switches, wireless LAN (WLAN) equipment, network storage, home network appliances, industrial control equipment, copiers, printers and other imaging systems.

e300 SoC Platform

The MPC8349E PowerQUICC II Pro Family is based on the e300 SoC platform—making it easy and fast to add or remove functional blocks and develop additional SoC-based family members targeting emerging market requirements. The e300 core, built on Power Architecture technology, is an enhanced version of the 603e core used in previous generations. Enhancements include twice as much L1 cache

MPC8349E BLOCK DIAGRAM
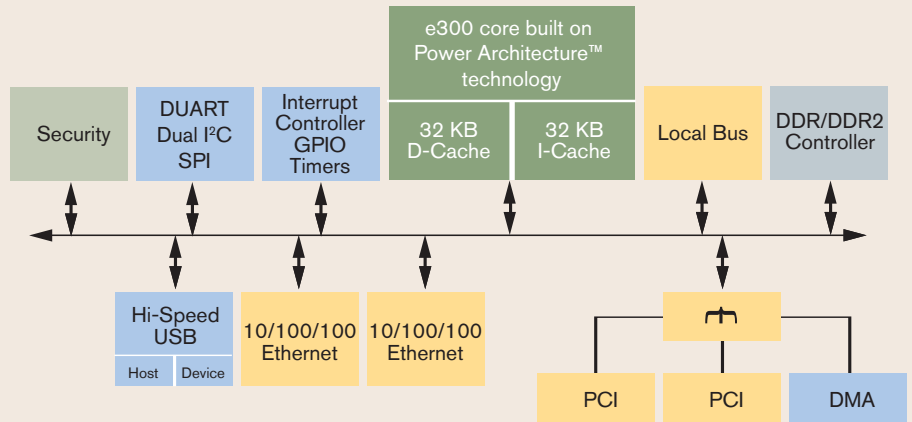
(32 KB data cache and 32 KB instruction cache) with integrated parity checking, and other performance-enhancing features. The e300 core is completely software-compatible with existing 603e core-based products.
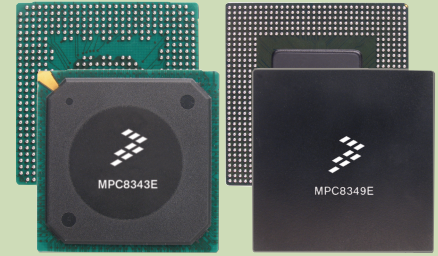
Integrated Security

The MPC8349E Family features a powerful integrated security engine derived from Freescale's security coprocessor product line. The MPC8349E Family's security engine supports DES, 3DES, MD-5, SHA-1, AES and ARC-4 encryption algorithms, as well as a public key accelerator and an on-chip random number generator. The security engine is capable of single-pass encryption and authentication, as required by IPsec, IEEE® 802.11i standard and other security protocols.
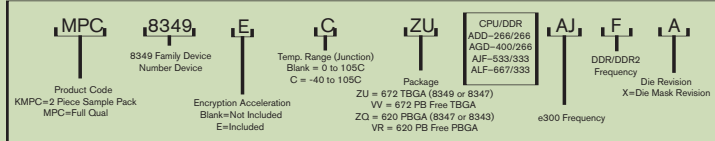
Key Advantages

> Exceptional price/performance for highly integrated, cost-sensitive applications

> Processor speeds up to 667 MHz

> High level of integration enabling simplified board design

> Flexible SoC platform for market-optimized designs and fast time to market

> Dual Gigabit Ethernet and Dual PCI interfaces

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MPC8349E* PowerQUICC II™ Pro Family

Pro Family	MPC8349E*	MPC8347E*	MPC8343E*
Core	e300	e300	e300
I-Cache/D-Cache (KB)	32/32	32/32	32/32
Frequencies	Up to 667 MHz	Up to 667 MHz	Up to 400 MHz
Memory controller	64-/32-bit DDR/DDR2	64-/32-bit DDR/DDR2	32-bit DDR/DDR2
Local bus	Yes	Yes	Yes
PCI interface	Two 32-bit (up to 66 MHz) or one 64-bit	One 32-bit (up to 66 MHz)	One 32-bit (up to 66 MHz)
Ethernet	Dual 10/100/1000	Dual 10/100/1000	Dual 10/100/1000
Hi-Speed USB	Dual: host and device/OTG	Dual: host and device /OTG	Single: host, device or OTG
Integrated security	Available	Available	Available
DUART	Yes	Yes	Yes
I²C controller	Dual	Dual	Dual
SPI	Yes	Yes	Yes
Interrupt controller	Yes	Yes	Yes
Package options	35 mm x 35 mm TBGA	35 mm x 35 mm TBGA / 29 mm x 29 mm PBGA	29 mm x 29 mm PBGA

*Note: E in the product name designates encryption acceleration through an integrated security engine. MPC8349, MPC8347 and MPC8343 processor versions without integrated security engines are available.

MPC · 8349 · E · C · ZU · CPU/DDR · AJ · F · A

- **MPC** — Product Code
  KMPC=2 Piece Sample Pack
  MPC=Full Qual
- **8349** — 8349 Family Device Number Device
- **E** — Encryption Acceleration
  Blank=Not Included
  E=Included
- **C** — Temp. Range (Junction)
  Blank = 0 to 105C
  C = -40 to 105C
- **ZU** — Package
  ZU = 672 TBGA (8349 or 8347)
  VV = 672 PB Free TBGA
  ZQ = 620 PBGA (8347 or 8343)
  VR = 620 PB Free PBGA
- **CPU/DDR**
  ADD–266/266
  AGD–400/266
  AJF–533/333
  ALF–667/333
- **AJ** — e300 Frequency
- **F** — DDR/DDR2 Frequency
- **A** — Die Revision
  X=Die Mask Revision

Product Family Highlights

- > e300 core, built on Power Architecture technology (enhanced version of 603e core with larger caches)
- > DDR/DDR2 memory controller, up to 333 MHz
- > Dual 10/100/1000 Ethernet channels
- > Dual 32-bit PCI interfaces (configurable as one 64-bit PCI interface)
- > Dual Hi-Speed USB controllers
- > Optional integrated security engine

Typical Applications

- > Ethernet routers and switches
- > Wireless LAN
- > Copier/printer/imaging
- > Home gateways/media gateways
- > Network-attached storage (NAS)
- > Industrial control
- > Line cards

Technical Specifications

- > e300 core, built on Power Architecture technology, operating from 266 MHz to 667 MHz
  - ▪ 32-bit, high-performance superscalar core
  - ▪ 1260 MIPS @ 667 MHz; 504 MIPS @ 266 MHz
  - ▪ Double-precision floating point, integer, load/store, system register and branch processor units
  - ▪ 32 KB data and 32 KB instruction cache with line locking support
- > DDR/DDR2 memory controller
  - ▪ Programmable timing supporting DDR/DDR2 SDRAM
  - ▪ 32- or 64-bit data interface; up to 333 MHz data rate
  - ▪ Four banks of memory, each up to 1 GB
  - ▪ Full ECC support
- > Dual PCI interfaces
  - ▪ Two 32-bit PCI 2.2 bus controllers (3.3V I/O; each controller can operate up to 66 MHz)
  - ▪ Flexibility to configure the two PCI controllers as a single 64-bit PCI controller
- > Dual 10/100/1000 Ethernet controllers
  - ▪ 1000 Mbps IEEE 802.3 GMII/RGMII, 802.3z TBI/RTBI, full-duplex
  - ▪ 10/100 Mbps IEEE 802.3 MII full and half-duplex
  - ▪ Station management interface for control and status
  - ▪ Jumbo frame support up to 9.6 KB
- > Embedded security engine
  - ▪ Public key execution (RSA and Diffie-Hellman)
  - ▪ Data encryption standard execution (DES and 3DES)
  - ▪ Advanced encryption standard (AES) execution
  - ▪ ARC Four execution (RC4-compatible algorithm)
  - ▪ Message digest execution (SHA, MD5, HMAC)
  - ▪ Random number generation (RNG)
- > Dual Hi-Speed USB 2.0 controllers
  - ▪ Support for device, host and On-the-Go (OTG) functionality
  - ▪ Hi-speed (480 Mbps), full-speed (12 Mbps) and low-speed (1.5 Mbps) operation
- > Local bus controller
  - ▪ Multiplexed 32-bit address and data operating up to 133 MHz
  - ▪ 32-, 16- and 8-bit port sizes controlled by on-chip memory controller
- > Dual UART (DUART)
- > Dual I²C interfaces (master or slave mode)
- > Four-channel direct memory access (DMA) controller
- > Serial peripheral interface
- > General-purpose parallel input/output
- > IEEE 1149.1 JTAG test access port
- > Package options: 35 mm x 35 mm TBGA and 29 mm x 29 mm PBGA (both with 1 mm pitch)
- > Process technology: 130 nm CMOS
- > Voltage: 1.3V core voltage for 667 MHz

Learn More: For more information about Freescale products, please visit **www.freescale.com**.

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