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Understanding [Embedded - Microprocessors](#)

Embedded microprocessors are specialized computing chips designed to perform specific tasks within an embedded system. Unlike general-purpose microprocessors found in personal computers, embedded microprocessors are tailored for dedicated functions within larger systems, offering optimized performance, efficiency, and reliability. These microprocessors are integral to the operation of countless electronic devices, providing the computational power necessary for controlling processes, handling data, and managing communications.

Applications of [Embedded - Microprocessors](#)

Embedded microprocessors are utilized across a broad spectrum of applications, making them indispensable in

Details

| | |
|---------------------------------|---|
| Product Status | Obsolete |
| Core Processor | PowerPC e300c4s |
| Number of Cores/Bus Width | 1 Core, 32-Bit |
| Speed | 667MHz |
| Co-Processors/DSP | Security; SEC 3.0 |
| RAM Controllers | DDR, DDR2 |
| Graphics Acceleration | No |
| Display & Interface Controllers | - |
| Ethernet | 10/100/1000Mbps (2) |
| SATA | - |
| USB | USB 2.0 + PHY (1) |
| Voltage - I/O | 1.8V, 2.5V, 3.3V |
| Operating Temperature | 0°C ~ 125°C (TA) |
| Security Features | Cryptography, Random Number Generator |
| Package / Case | 689-BBGA Exposed Pad |
| Supplier Device Package | 689-TEPBGA II (31x31) |
| Purchase URL | https://www.e-xfl.com/product-detail/nxp-semiconductors/mpc8378evralg |

MPC837x PowerQUICC® II Pro

Overview

Today's small-to-medium business (SMB) and consumer applications are driving the need for highly integrated and cost effective solutions that deliver high performance. The next generation PowerQUICC® II Pro MPC837x family provides an e300 core, built on Power Architecture® technology, integrated with PCI Express® and Serial-ATA (SATA) controllers, as well as dual Gigabit Ethernet controllers, to specifically address the needs of SMB and consumer applications. The new MPC837x family, based in 90 nm process technology, provides high integration that simplifies board design and offers a cost-effective solution that is critical for applications such as wireless access points, printers, network attached storage and SMB routers.

e300 Platform Built on Power Architecture Technology

The next generation MPC837x family utilizes the 32-bit superscalar e300 core. It integrates two integer units and a floating-point unit, making it ideal for computational applications. It supports 32 KB L1 data and instruction cache, and has an operating frequency from 400 MHz to 800 MHz. The MPC837x family is software compatible with existing 603e core-based products.

Integrated Fabric Controllers (PCI Express & Serial-ATA)

A key differentiator for the MPC837x family is the integration of PCI Express and Serial-ATA (SATA), which reduces the number of external controller chips and provides customers with a cost-effective solution. The PCI Express controller is revision 1.0a compatible

MPC837x Family Block Diagram



Note

*SGMII only available on MPC8378

**PCI-Express only available on MPC8378, MPC8377

†SATA only available on MPC8377 (2 x SATA), MPC8379 (4 x SATA)

■ Core ■ Accelerators ■ I/O

and supports either x1 or x2 widths, making it an excellent choice for wireless access points and low-end printers. The integrated SATA controllers support both SATA I and II data rates (1.5 and 3.0 Gbaud), providing integrated support for hard disk drive applications such as network attached storage.

Key Advantages

- High performance e300 core operating up to 800 MHz with 32 KB L1 cache
- Integrated PCI Express and SATA controllers providing a cost-effective System-on-Chip (SoC) solution
- Key networking capabilities enabled by dual Gigabit Ethernet ports
- Integrated security engine

| | | | | | | | |
|---|---|--|---|--|--|---------------------------------------|---|
| MPC Product Code KMPC = Sample Pack (2-10) MPC = Full Qual | 8379 8379 Family Device Number 8379—X4 SATA 8378—2x1 PCI Express, SGMII 8377—2x1 PCI Express, X2 SATA | E Encryption Acceleration Blank = Not included E = Included | C Temp Range (Junction) Blank = 0° to +105°C C* = -40° to +105°C *Availability: TBD | VR Package VR = 689 Pb-free TePBGA | AL e300 Frequency CPU/Platform ANG = 800/400 ALG = 667/400 AJF = 533/333 AGD = 400/266 | G Platform Frequency | Die Revision Blank = Production Rev 0 |
|---|---|--|---|--|--|---------------------------------------|---|

| MPC837xE PowerQUICC® II Pro Family | MPC8379E | MPC8378E | MPC8377E |
|------------------------------------|--|---|--|
| Core | e300 | e300 | e300 |
| CPU Speed | 400, 533, 667, 800 MHz | 400, 533, 667, 800 MHz | 400, 533, 667, 800 MHz |
| L1 I/D Cache | 32 KB | 32 KB | 32 KB |
| Memory Controller | 32/64-bit DDR/2 up to 400 MHz | 32/64-bit DDR/2 up to 400 MHz | 32/64-bit DDR/2 up to 400 MHz |
| Local Bus | 32-bit with NAND boot support | 32-bit with NAND boot support | 32-bit with NAND boot support |
| PCI | 32-bit up to 66 MHz (2.3) | 32-bit up to 66 MHz (2.3) | 32-bit up to 66 MHz (2.3) |
| PCI Express® | – | 2x1 or 1x2 | 2x1 or 1x2 |
| SATA | 4 x 1 SATA 2.0 with PHY | – | 2 x 1 SATA 2.0 with PHY |
| Ethernet | Two 10/100/1000 (RGMII, RTBI, RMII, MII) | Two 10/100/1000 (SGMII, RGMII, RTBI, RMII, MII) | Two 10/100/1000 (RGMII, RTBI, RMII, MII) |
| USB | One 2.0 Host or Device | One 2.0 Host or Device | One 2.0 Host or Device |
| Security | E version only | E version only | E version only |
| Additional Interfaces | 2 x UART, 2 x I²C, SPI | 2 x UART, 2 x I²C, SPI | 2 x UART, 2 x I²C, SPI |
| Interrupt Controller | Yes | Yes | Yes |
| Package | 689 Te PBGA | 689 Te PBGA | 689 Te PBGA |

Technical Specifications

- e300 core built on Power Architecture technology
 - Operating from 400 to 800 MHz
 - Integrated floating point and dual integer units
 - 32 KB L1 data and instruction cache with parity checking
- Memory Controller
 - 32- or 64-bit DDR1/2 memory controller, up to 400 MHz data rate
- I/O Support
 - Dual 10/100/1000 Ethernet Controllers with support for MII, RMII, RGMII, RTBI and SGMII
 - Support for IEEE® 1588
 - USB 2.0 host and device controller
 - 32-bit PCI interface operating up to 66 MHz, Rev 2.3 compatible
 - PCI Express with two interfaces support x1 and x2 widths
 - Integrated SATA controllers with support for SATA I and II (1.5 Gbps and 3 Gbps),
- Integrated Security (optional, indicated with an E in the device number)
 - Public Key Encryption unit supports RSA and Diffie Hellman
 - Data Encryption Standard Execution Unit supports DES/3DES, ECB, CBC and OFB modes
 - Advanced Encryption Standard Unit supports key lengths up to 256b, and supports ECB, CBC, CTR, CCM, GCM, CMAC, OFB, CFB and LRW
 - Message Digest Execution unit supports HSA1/2 and SHA-384/512
 - ARC Four Execution Unit, Kasumi Execution Unit and CRC Execution Unit
 - XOR acceleration
- Additional Support
 - An enhanced local bus controller with support for boot from NAND and NOR flash
 - 4-channel DMA controller
 - Dual I²C controller, DUART, SPI interface

Learn More:

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Document Number: MPC837XFFS
REV 1

