

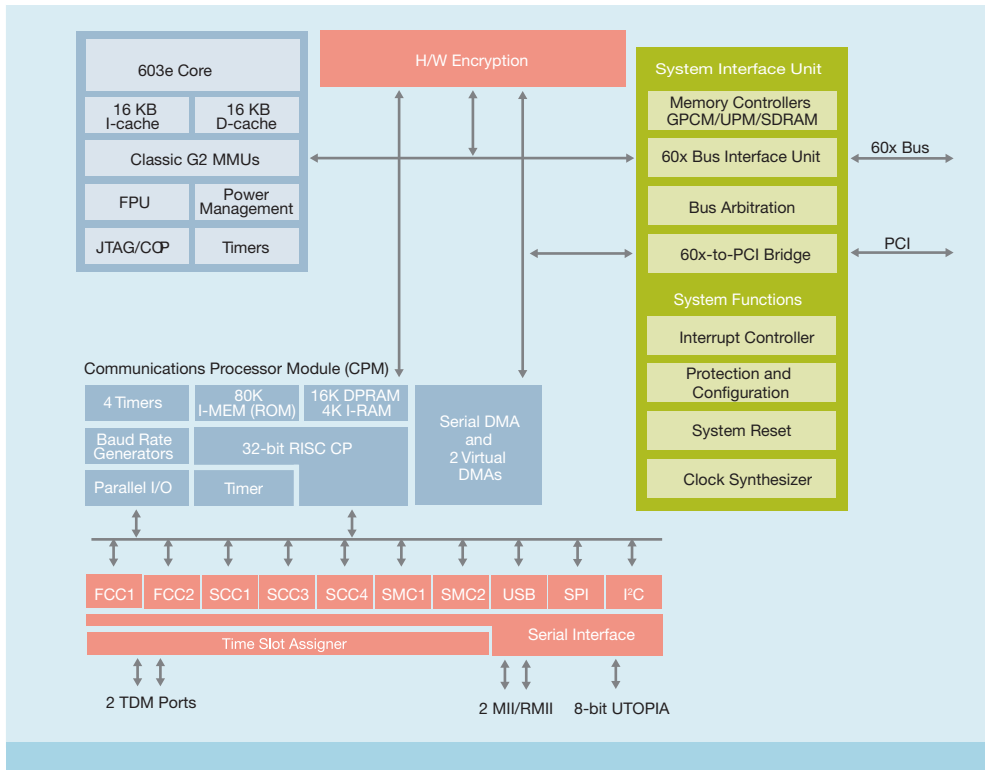
MPC8272 PowerQUICC™ II Processor Family

The high-performance MPC8272 PowerQUICC™ II processor family, built on Power Architecture™ technology, addresses the cost-sensitive needs of a wide variety of networking and communications applications. By offering integrated hardware security, the MPC8272 family is well suited for networking equipment requiring encryption capabilities, such as small and medium enterprise (SME) routers, virtual private network (VPN) and firewall routers, wireless access points, residential gateways and xDSL equipment, as well as imaging, industrial control and test and measurement equipment.

Delivering an ideal combination of price, performance and low-power operation, the MPC8272 family supports CPU frequencies ranging from 266 MHz to 400 MHz while offering the benefits of low power consumption (0.8 watts at 266 MHz). The family's high level of on-chip integration and small footprint enable developers to reduce board space.

The MPC8272 family includes the MPC8247, MPC8248, MPC8271 and MPC8272 processors. Each device integrates two processing blocks: an embedded 603e™ core, built on Power Architecture technology, and a RISC-based Communications Processor Module (CPM). This dual-core architecture is designed to reduce power consumption and offer a more balanced approach to processing than traditional processor architectures. The CPM offloads low-level peripheral communications tasks, enabling the embedded Power Architecture core to manage high-level processing tasks. The MPC8272 family

MPC8272 Block Diagram



supports a variety of protocols and interfaces, including dual fast Ethernet MACs, ATM, HDLC, a 32-bit 33/66 MHz PCI interface and a USB host/device interface.

The MPC8248 and MPC8272 processors feature a security engine that supports DES, 3DES, MD-5, SHA-1, AES and ARC-4 encryption algorithms. The processors also offer a public key accelerator and on-chip random number generator. This embedded security core is derived from Freescale's security coprocessor product line. The core

offers the same direct-memory access (DMA) and parallel processing capabilities as Freescale's security coprocessor product line as well as the ability to perform single-pass encryption and authentication as required by widely used security protocols such as IPsec and 802.11i.

On-chip security makes the MPC8272 family an optimal solution for applications that require security features in concert with high performance and low system-level cost.



| MPC8272 Family Features Checklist Chart | MPC8247 | MPC8248 | MPC8271 | MPC8272 |
|---|---------|---------|---------|---------|
| Fast Communications Controllers | 2 | 2 | 2 | 2 |
| Serial Communications Controllers | 3 | 3 | 3 | 3 |
| ATM/UTOPIA support | No | No | Yes | Yes |
| Hardware Security | No | Yes | No | Yes |
| 10/100 Base-T MAC | 2 | 2 | 2 | 2 |
| USB (low- and full-speed) | Yes | Yes | Yes | Yes |
| 32-bit 33/66 MHz PCI | Yes | Yes | Yes | Yes |

Product Highlights

- Efficient, dual-core architecture that combines the 603e core with a separate RISC-based Communications Processor Module
- High-performance operation with CPU frequencies scaling to 400 MHz, CPM frequencies at up to 200 MHz and bus speeds up to 133 MHz
- Superior integration with features optimized for cost-sensitive designs and security-oriented networking applications
- Economical, powerful integrated security engine that supports industry-standard encryption algorithms
- Smooth migration path for PowerQUICC and PowerQUICC II processor-based designs
- Strong third-party tools support through Freescale's Design Alliance Program members

Typical Applications

- Residential gateways
- SOHO/ROBO and enterprise routers
- Security applications, including VPN routers
- Integrated access devices (IADs)
- Voice-over-Internet Protocol (VoIP) systems
- xDSL equipment
- Wireless access points
- Industrial control

Technical Specifications

- Embedded 603e core, based on Power Architecture technology, available in speeds of 266 MHz
 - 760 MIPS at 400 MHz (Dhrystone 2.1)
 - High-performance, superscalar processor architecture
 - 16 KB instruction cache and 16 KB data cache
 - Floating point unit
 - Memory management units with 32 TLBs and fully associative instruction and data TLBs
- Advanced on-chip emulation debug mode
- Data bus dynamic bus sizing for 8-, 16- and 32-bit buses
- Embedded security engine that supports AES, DES/3DES, SHA/MD-5 with HMAC, ARC-4, Public Key and on-chip Random Number Generator (security engine available on the MPC8272 and MPC8248 devices)
- Communications Processor Module (CPM) to handle communications tasks
 - 32-bit scalar RISC controller
 - General-purpose I/O; parallel I/O registers
 - Onboard 16K of dual-port RAM
 - Serial I/F unit supporting up to two TDM streams
 - Two fast communications controllers (FCCs) supporting:
 - Two 10/100 Base-T Ethernet MACs with MII/RMII interfaces
 - One 8-bit UTOPIA interface for ATM (AAL 0, 1, 2, 5)



- Multi-PHY support for 31 PHYs
- Transparent; HDLC—up to T3 rates (clear channel)
- Three serial communications controllers (SCCs)
- 10-Base-T, HDLC/SDLC, UART, BiSync, Transparent, Multi-channel HDLC supporting up to 64 channels
- Two serial management controllers (SMCs)
- One I²C port; one serial peripheral interface (SPI)
- USB host/device interface (USB 2.0 full/low-speed compatible)
- System interface unit
 - 32-bit 3/66 MHz PCI interface
 - Memory controller built from SDRAM, UPM and GPCM machines
 - System functions
- Available in a 516-pin PBGA package (27 mm x 27 mm)
- 0.13μ process technology
- 1.5V core, 3.3V I/O, 1.2 watts of power dissipation at 400 MHz

PowerQUICC™ II Processor Family

With more than 5,700 design wins, Freescale's PowerQUICC processors are the ideal choice for your embedded networking and communications system needs.

Explore Freescale's embedded solutions, on the web: www.freescale.com/powerquicc.

Learn More:

For current information about Freescale products and documentation, please visit www.freescale.com.



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