



PowerTM Architecture Products

Product Selector Guide

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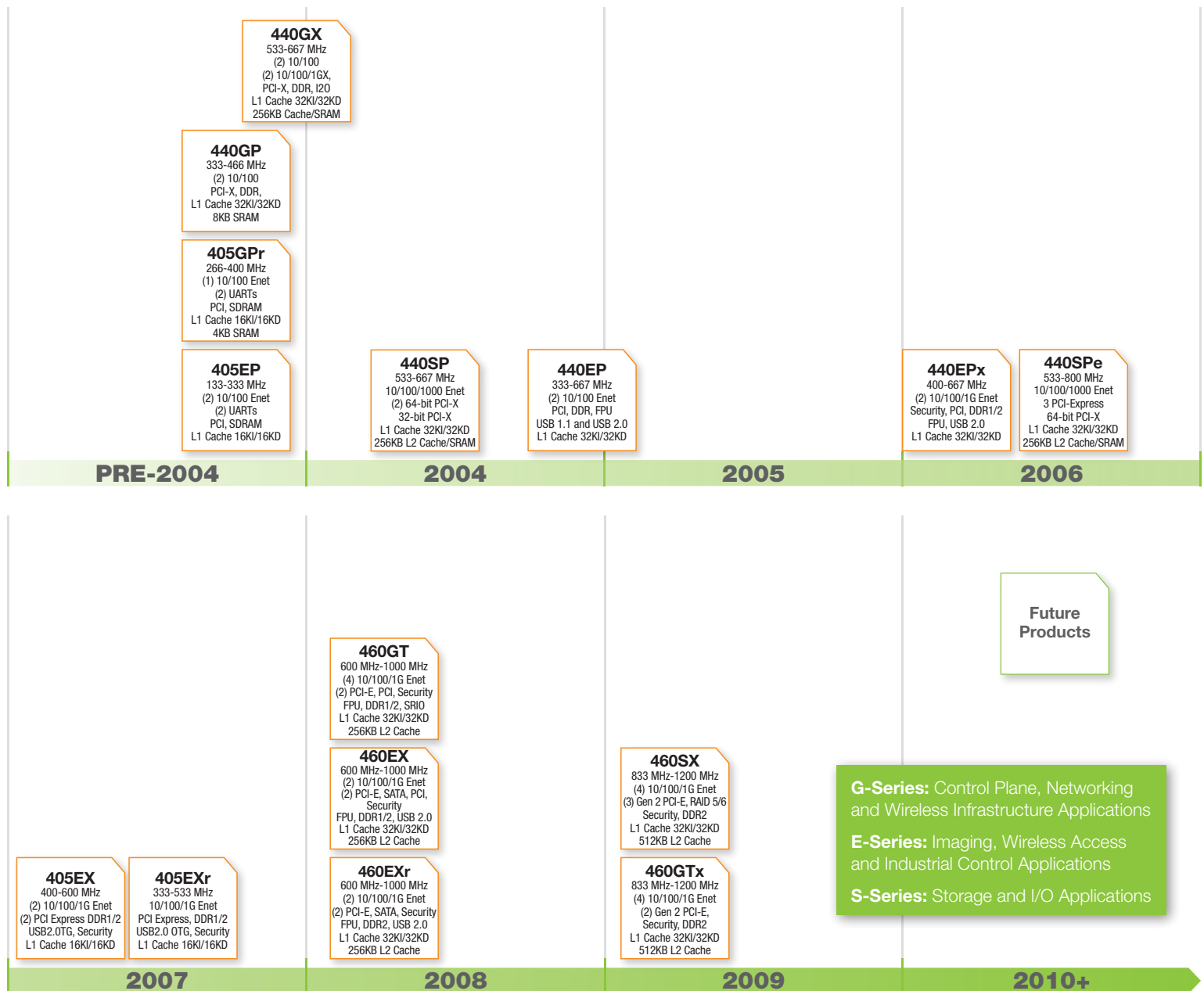
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Introduction

Connecting the Technology that Connects Us All



AppliedMicro Power Architecture Product Roadmap



405EP
405EX
405EXr
405GPr



Power Architecture 405 Family

Power Architecture 405 Family at a Glance

	405EP	405EX	405EXr	405GPr
CPU Complex	- Up to 333 MHz/506 DMIPS 16KB I-cache/16KB D-cache	- Up to 600 MHz/912 DMIPS 16KB I-cache/16KB D-cache	- Up to 533 MHz/810 DMIPS 16KB I-cache/16KB D-cache	- Up to 400 MHz/608 DMIPS 16KB I-cache/16KB D-cache
Memory and Bus Architecture	4KB SRAM - SDRAM controller - External Bus controller	- DDR1/2 SDRAM controller - External Bus Master Interface - External Bus controller - NAND/NOR Flash controller	- DDR1/2 SDRAM controller - External Bus Master Interface - External Bus controller - NAND/NOR Flash controller	- SDRAM controller 4KB SRAM - External Bus controller
System Resources	- Up to 32 GP I/Os - DMA controller	- Interrupt controller - Up to 32 GP I/Os - DMA controller	- Interrupt controller - Up to 32 GP I/Os - DMA controller	- Up to 24 GP I/Os - DMA controller
High Speed and Inter-Chip Connectivity	32-bit PCI controller - IIC controller	2 PCI Express 1-Lane	PCI Express 1-Lane	32-bit PCI controller - IIC controller
Network Connectivity	2 10/100 2 UARTs	2 10/100/1G - USB 2.0 On-the-Go port 2 UARTs	10/100/1G - USB 2.0 On-the-Go port 2 UARTs	10/100 2 UARTs
Special Functionality		Turbo Security Engine	Turbo Security Engine	
Typical Power	0.72W @ 266 MHz	<1.5W @ 400 MHz	<1.3W @ 400 MHz	0.72W @ 266 MHz

Power Architecture 405EP processor

Specifications

CPU Complex

- Power Architecture 405 processor core
- Up to 333 MHz/506 DMIPS
- 16KB I-cache/16KB D-cache

Memory and Bus Architecture

- On-chip 4KB SRAM with single-cycle access
- SDRAM controller
- On-chip external bus controller

System Resources

- Up to 32 general purpose I/Os
- DMA controller

High Speed and Inter-Chip Connectivity

- 32-bit PCI controller, 66 MHz (PCI v2.2 compliant)
- Master and slave IIC controller

Network Connectivity

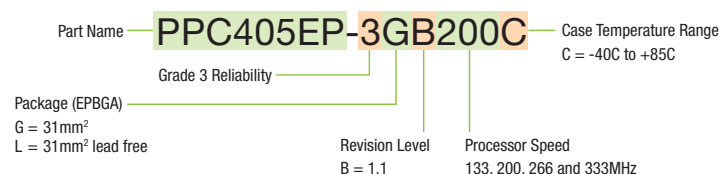
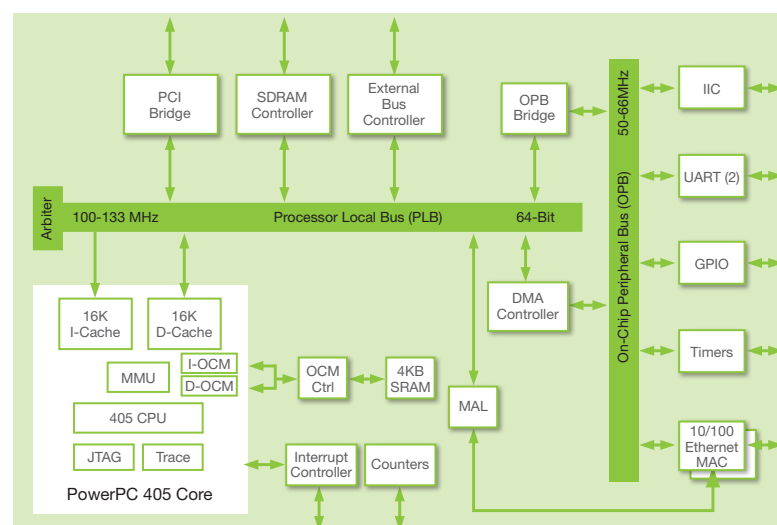
- Two on-chip Ethernet MACs
- Two UARTs

Power

- 0.72W typical power @ 266 MHz

Target Applications

- High-density designs where connectivity is at a premium, including: Wireless LAN access points, Edge routers, and Broadband modems



Power Architecture 405EX processor

Specifications

CPU Complex

- Power Architecture 405 processor core
- Up to 600 MHz/912 DMIPS
- 16KB I-cache/16KB D-cache

Memory and Bus Architecture

- 32-bit DDR1/2 SDRAM controller with ECC, supports both x16 or x32, up to 2GB memory bank
- External Bus Master Interface (EBMI)
- 8/16/32-bit External Peripheral Bus Controller
- NAND Flash controller

System Resources

- Universal Interrupt Controller: 10 external interrupts
- Up to 32 general purpose I/Os
- DMA Controller with four independent channels

High Speed and Inter-Chip Connectivity

- Two PCI Express 1-Lane Interfaces, each with separate controller and SERDES, up to 2.5Gbps per lane

Network Connectivity

- Two 10/100/1G Ethernet MACs
- USB2.0 On-the-Go port, both host and device mode supported
- Two UARTs

Special Functionality

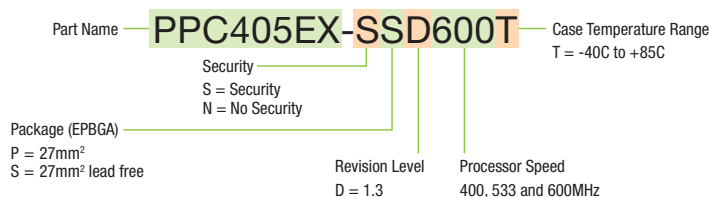
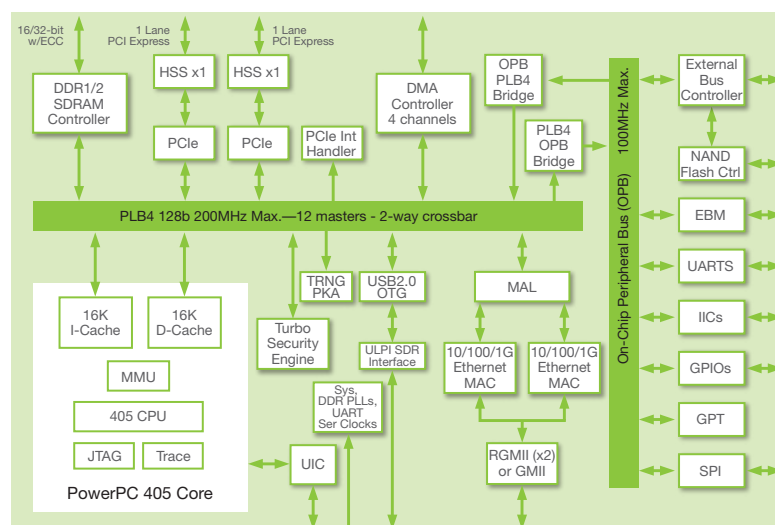
- Turbo Security Engine: Optional on-chip IPsec/SSL/bulk data security acceleration engine (Crypto Engine)

Power

- <1.5W est. typical power @ 400 MHz CPU
- Extended Temperature Range: 533 MHz part can operate at case temperature up to +95°C provided that speed is limited to 400 MHz or slower

Target Applications

- WLAN Access – 802.11n WAP applications for Enterprise and high-end SOHO
- WiMAX base stations, either fixed or mobile
- General Networking
- General Purpose processing



Power Architecture 405EXr processor

Specifications

CPU Complex

- Power Architecture 405 processor core
- Up to 533 MHz/810 DMIPS
- 16KB I-cache/16KB D-cache

Memory and Bus Architecture

- 32-bit DDR1/2 SDRAM controller with ECC, supports both x16 or x32, up to 2GB memory bank
- External Bus Master Interface (EBMI)
- 8/16/32-bit External Peripheral Bus Controller
- NAND Flash controller

System Resources

- Universal Interrupt Controller: 10 external interrupts
- Up to 32 general purpose I/Os
- DMA Controller with four independent channels

High Speed and Inter-Chip Connectivity

- One PCI Express 1-Lane Interface with controller and SERDES, up to 2.5Gbps

Network Connectivity

- One 10/100/1G Ethernet MAC
- USB2.0 On-the-Go port, both host and device mode supported
- Two UARTs

Special Functionality

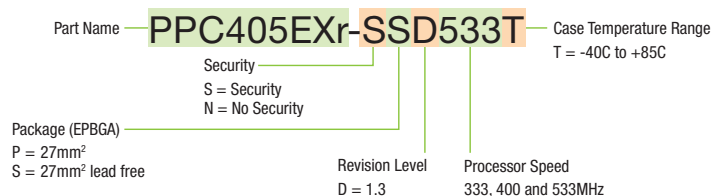
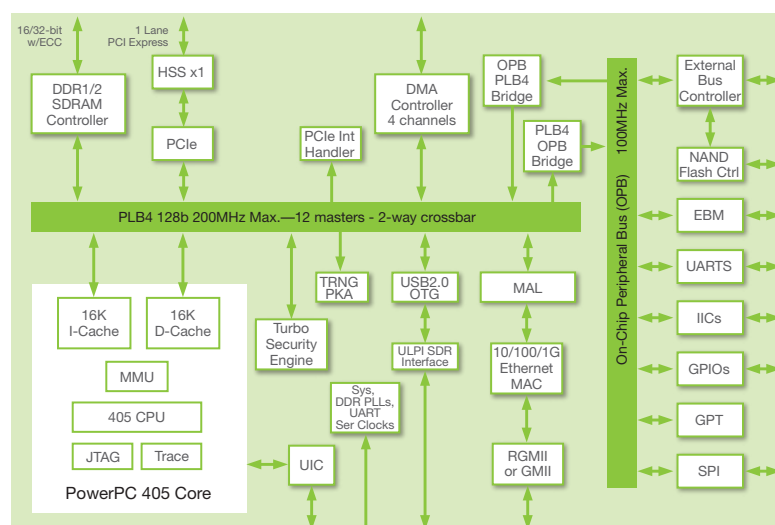
- Turbo Security Engine: Optional on-chip IPsec/SSL/bulk data security acceleration engine (Crypto Engine)

Power

- <1.3W est. typical power @ 400 MHz CPU
- Extended Temperature Range: 533 MHz part can operate at case temperature up to +95°C provided that speed is limited to 400 MHz or slower

Target Applications

- WLAN Access—802.11n WAP applications for small or medium businesses, IP-STBs or residential gateways, and high-end SOHO
- WiMAX CPE, either fixed or mobile
- General Networking
- General Purpose processing



Power Architecture 405GPr processor

Specifications

CPU Complex

- Power Architecture 405 processor core
- Up to 400 MHz/608 DMIPS
- 16KB I-cache/16KB D-cache

Memory and Bus Architecture

- SDRAM controller
- On-chip 4KB SRAM
- External bus controller

System Resources

- Up to 24 general purpose I/Os
- DMA controller

High Speed and Inter-Chip Connectivity

- 32-bit PCI controller, 66 MHz (PCI v2.2 compliant)
- Master and slave IIC controller

Network Connectivity

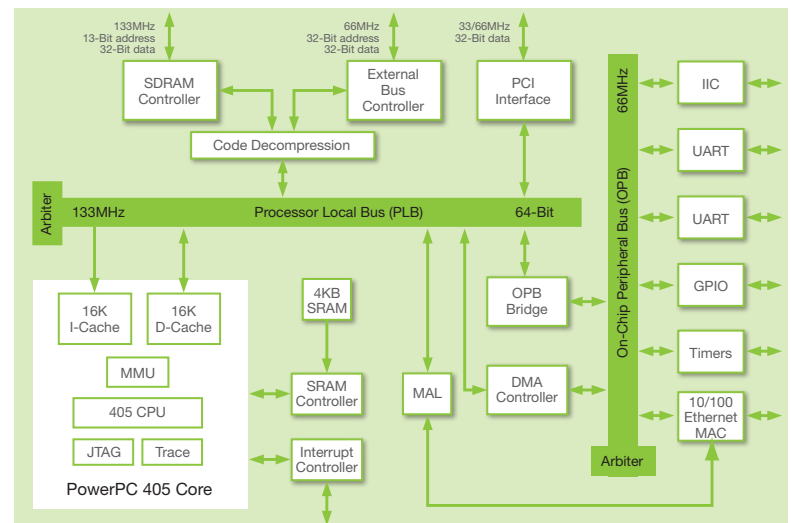
- 10/100 Ethernet MAC
- Two UARTs

Power

- 0.72W typical power @ 266 MHz
- Extended Temperature Range: 333 MHz part can operate at case temperature up to +105°C provided that speed is limited to 266 MHz or slower

Target Applications

- Internet and communications
- Wide variety of embedded networking applications



Package Type	Part Number
35mm leaded EPBGA	PPC405GPr-3BB266
35mm leaded EPBGA	PPC405GPr-3BB400
35mm lead free EPBGA	PPC405GPr-3JB266
35mm lead free EPBGA	PPC405GPr-3JB333
35mm lead free EPBGA	PPC405GPr-3JB400
27mm leaded EPBGA	PPC405GPr-3DB266
27mm leaded EPBGA	PPC405GPr-3DB400
27mm lead free EPBGA	PPC405GPr-3KB266
27mm lead free EPBGA	PPC405GPr-3KB333
27mm lead free EPBGA	PPC405GPr-3KB400

440EP
440EPx
440GP
440GX
440SP
440SPe



Power Architecture 440 Family

Power Architecture 440 Family at a Glance

	440EP	440EPx	440GP	440GX	440SP	440SPe
CPU Complex	- Up to 667 MHz/1334 DMIPS 32KB I-cache/32KB D-cache - FPU	- Up to 667 MHz/1334 DMIPS 32KB I-cache/32KB D-cache - FPU	- Up to 466 MHz 32KB I-cache/32KB D-cache 8KB SRAM	- Up to 667 MHz/1334 DMIPS 32KB I-cache/32KB D-cache 256KB L2 Cache/SRAM	- Up to 667 MHz/1334 DMIPS 32KB I-cache/32KB D-cache 256KB L2 Cache/SRAM	- Up to 800 MHz/1600 DMIPS 32KB I-cache/32KB D-cache 256KB L2 Cache/SRAM
Memory and Bus Architecture	- External Peripheral controller - DDR1 SDRAM controller - NAND Flash controller	- External Peripheral controller - DDR1/2 SDRAM controller - NAND Flash controller 16KB SRAM	- External Peripheral controller - DDR SDRAM controller	- External Peripheral controller - DDR SDRAM controller	- External Peripheral controller - DDR1/2 SDRAM controller	- External Peripheral controller - DDR1/2 SDRAM controller
System Resources	- Up to 64 GP I/Os - Interrupt controller - DMA controller	- Up to 64 GP I/Os - Interrupt controller - DMA controller	- Up to 32 GP I/Os - Interrupt controller - DMA controller	- Up to 32 GP I/Os - Interrupt controller - DMA controller	- Up to 32 GP I/Os - Interrupt controller 2 DMA controllers w/I2O - DMA controller w/XOR	- Up to 32 GP I/Os - Interrupt controller 2 DMA controllers w/I2O - DMA controller w/XOR
High Speed and Inter-Chip Connectivity	- PCI controller 2 IIC controllers - SPI	- PCI controller 2 IIC controllers - SPI	- PCI-X controller 2 IIC controllers	- PCI-X controller 2 IIC controllers	- PCI-X controller: 2 64b PCI-X, 1 32b PCI-X 2 IIC controllers	- PCIe x8 Lane 2 PCIe x4 Lane - PCI-X 2 IIC controllers
Network Connectivity	2 10/100 4 UARTs - USB 1.1 Host and Device - USB 2.0 Device	2 10/100/1G 4 UARTs - USB 2.0 Host - USB 2.0 Device	2 10/100 2 UARTs	2 10/100 2 10/100/1G - TCP/IP Hardware Assist 2 UARTs	10/100/1G (GMII/MII) 3 UARTs	10/100/1G (GMII/MII) 3 UARTs
Special/Optional Functionality		- Turbo Security Engine - Kasumi engine			- RAID 5 XOR - Optional RAID 6 XOR	- RAID 5 XOR - Optional RAID 6 XOR
Typical Power	<3W @ 533 MHz	<3W @ 533 MHz	<4W @ 466 MHz	<4W @ 533 MHz	<6W @ 533 MHz	<6W @ 533 MHz

Power Architecture 440EP processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 667 MHz/1334 DMIPS
- 32KB I-cache/D-cache with parity
- 5 Stage FPU with 2.0 MFLOPS/MHz

Memory and Bus Architecture

- External Bus Controller—
16-bit data, 30-bit address,
50-66 MHz, 6 chip selectors
- 32-bit DDR1 SDRAM controller for DDR200/266 operation
- NAND Flash controller supporting 1 to 4 banks of NAND
Flash memory devices; Boot-from-NAND supported

System Resources

- Up to 64 general purpose I/Os
- Universal programmable interrupt controller
- SPI serial interface 4-channel DMA

High Speed and Inter-Chip Connectivity

- 32-bit PCI controller, 66 MHz (PCI v2.2 compliant)
- Master and slave IIC controller
- One SPI Serial Communications Port (SCP)

Network Connectivity

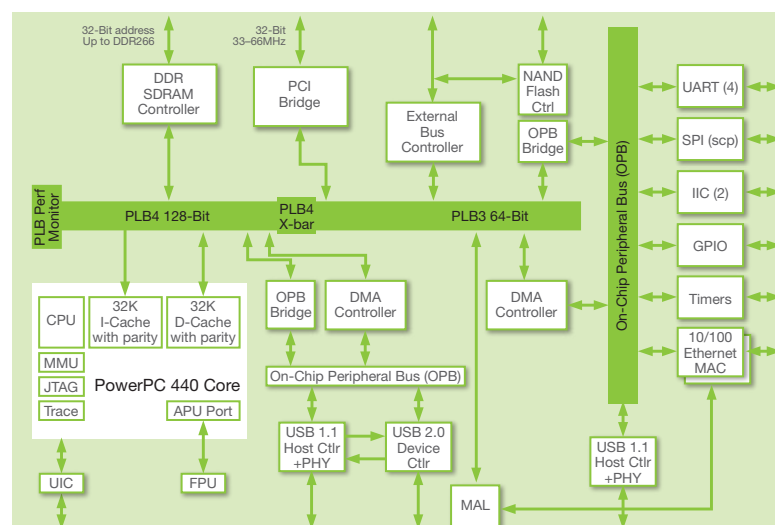
- Two 10/100 Ethernet MACs
- USB 1.1 Host and Device Controllers and PHYs
- USB 2.0 Device Controller
- Four UARTs

Power

- <3W typical power @ 533 MHz

Target Applications

- Imaging
- Industrial Control
- Networking



Package Type	Part Number
35mm leaded EPBGA	PPC440EP-3BC400C
35mm lead free EPBGA	PPC440EP-3JC333C
35mm lead free EPBGA	PPC440EP-3JC400C
35mm lead free EPBGA	PPC440EP-3JC533C
35mm lead free EPBGA	PPC440EP-3JC667C

Power Architecture 440EPx processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 667 MHz/1334 DMIPS
- 32KB I-cache/D-cache with parity
- 5 stage FPU with 2.0 MFLOPS/MHz

Memory and Bus Architecture

- 32-bit, 83 MHz On-chip Peripheral Bus
- 32/64-bit DDR1/2 SDRAM controller with ECC support
- 32/16/8-bit data, 30-bit address external bus controller supporting ROM, EPROM, SRAM, Flash, and Slave peripheral I/O banks including support for NAND Flash
- 16KB On-Chip Memory (OCM)

System Resources

- Up to 64 general purpose I/Os
- Programmable interrupt controller with 10 external inputs
- DMA Controller

High Speed and Inter-Chip Connectivity

- 32-bit PCI controller, 66 MHz (PCI v2.2 compliant)
- Two IIC controllers
- One SPI Serial Communications Port (SCP)

Network Connectivity

- USB 2.0 Host and Device Controllers with on-board PHY
- Two 10/100/1G Ethernet MACs
- Four UARTs

Special Functionality

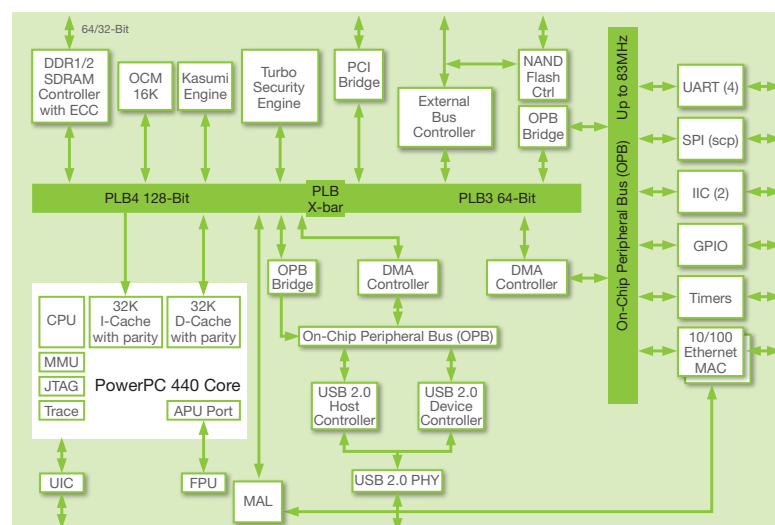
- Turbo Security Engine: Optional on-chip IPsec/SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine

Power

- <3W typical power @ 533 MHz

Target Applications

- Imaging
- Industrial Control
- Networking



Package Type	Part Number	Features
35mm leaded TE-EPBGA	PPC440EPx-STA400T	security
35mm leaded TE-EPBGA	PPC440EPx-NTA667T	no security
35mm lead free TE-EPBGA	PPC440EPx-SUA400T	security
35mm lead free TE-EPBGA	PPC440EPx-SUA533T	security
35mm lead free TE-EPBGA	PPC440EPx-SUA667T	security
35mm lead free TE-EPBGA	PPC440EPx-NUA400T	no security
35mm lead free TE-EPBGA	PPC440EPx-NUA667T	no security

Power Architecture 440GP processor

Specifications

- 440 processor core with 32K instruction cache/32K data cache
- Up to 466MHz performance
- Up to 932 DMIPS
- Two 10/100 Ethernet MACs
- 32-bit PCI V2.2 compatible PCI controller
- On-chip 8KB SRAM
- 32/64-bit DDR200/266 SDRAM controller with ECC
- DMA Controller and external peripheral controller
- Universal Programmable Interrupt Controller with 13 external interrupts and 45 internal interrupts

System Resources

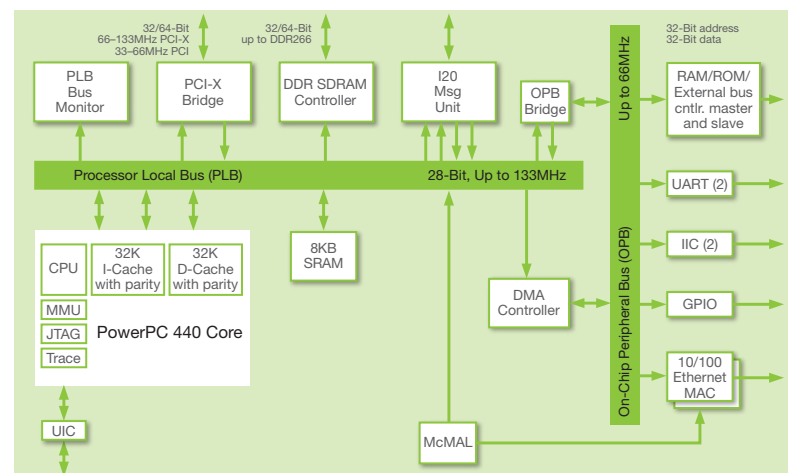
- Two serial ports
- Master and slave IIC controller
- Up to 32 general purpose I/Os

Power

- <4W estimated typical power dissipation at 466MHz

Target Applications

- Storage
- Networking
- Other high-density and power-conscious embedded applications



Package Type	Part Number
25mm leaded FC-PBGA	PPC440GP-3FC400C
25mm leaded FC-PBGA	PPC440GP-3FC466C

Power Architecture 440GX processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 667 MHz/1334 DMIPS
- 32KB I-cache/D-cache with parity
- 256KB on-chip memory or L2 Cache

Memory and Bus Architecture

- 32-bit, 83 MHz external bus controller
- 32/64-bit DDR333 SDRAM controller with ECC

System Resources

- Up to 32 general purpose I/Os
- Universal programmable interrupt controller
- DMA controller

High Speed and Inter-Chip Connectivity

- 32/64-bit PCI-X controller, 133 MHz (PCI v2.2 compliant)
- Master and slave IIC controller

Network Connectivity

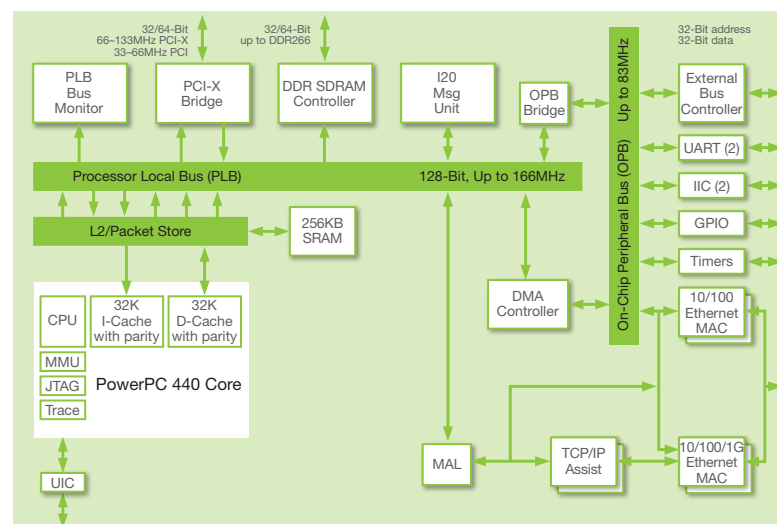
- Two 10/100/1G Ethernet MACs
- Two 10/100 Ethernet MACs
- TCP/IP hardware assist
- 2 UARTs

Power

- <4W typical power @ 533 MHz

Target Applications

- Control plane applications
- RAID controllers
- iSCSI processing
- Storage Area Networking (SAN)



Package Type	Part Number
25mm leaded CBGA	PPC440GX-3CF533C
25mm leaded CBGA	PPC440GX-3CF667C
25mm lead reduced CBGA	PPC440GX-3RF533C
25mm lead reduced CBGA	PPC440GX-3RF667C
25mm leaded FC-PBGA	PPC440GX-3FF667C
25mm lead free FC-PBGA	PPC440GX-3NF533C
25mm lead free FC-PBGA	PPC440GX-3NF667C

Power Architecture 440SP processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 667 MHz/1334 DMIPS
- 32KB I-cache/D-cache with parity
- 256KB L2 cache, may also be used as on-chip SRAM

Memory and Bus Architecture

- High-speed Processor Local Bus (PLB) with 2-way crossbar supports 10.4 GB/s peak bandwidth
- 8-bit, 83 MHz external bus controller
- Dual-ported 32/64-bit SDRAM memory controller, interfaced to both PLB slave segments, supporting 166/333 MHz DDR1 and 333/667 MHz DDR2

System Resources

- Up to 32 general purpose I/Os
- Universal programmable interrupt controller
- Two-channel DMA included with I2O
- DMA controller with XOR

High Speed and Inter-Chip Connectivity

- PCI-X v2.0 DDR compatible (266 MHz) bridge with two 64-bit and one 32-bit PCI-X interfaces
- Opaque PCI-X to PCI-X bridge functionality
- Master and slave IIC controller

Network Connectivity

- 10/100/1G Ethernet MAC (GMII/MII)
- Three UARTs

Special Functionality

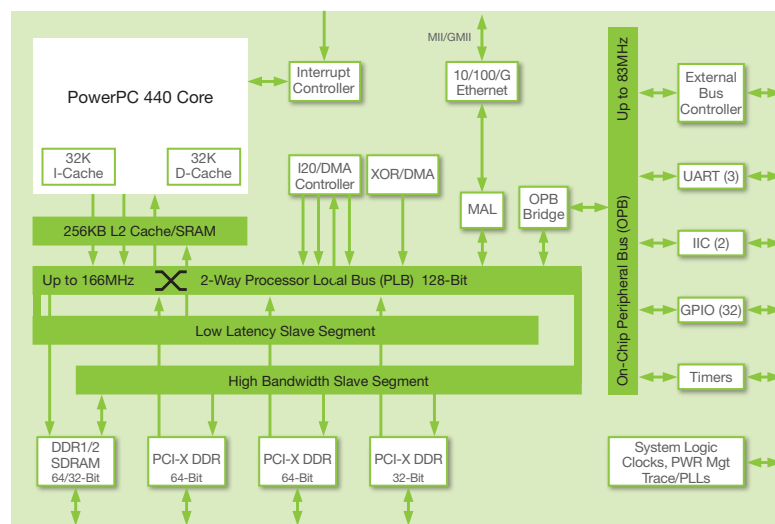
- RAID 5 and RAID 6 acceleration hardware
- RAID XOR function with one-channel DMA for parity generation and checking

Power

- <6W typical power @ 533 MHz

Target Applications

- RAID controllers
- Storage Area Networking (SAN) equipment
- Network Attached Storage (NAS)
- Disk/tape backup storage equipment



Package Type	Part Number	Features
29mm leaded FC-PBGA	PPC440SP-AFC533C	No RAID6
29mm leaded FC-PBGA	PPC440SP-AFC667C	No RAID6
29mm lead free FC-PBGA	PPC440SP-ANC667C	No RAID6
29mm lead free FC-PBGA	PPC440SP-RNC533C	RAID6

Power Architecture 440SPe processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 800 MHz/1600 DMIPS
- 32KB I-cache/D-cache with parity
- 256KB L2 cache, may also be used as on-chip SRAM

Memory and Bus Architecture

- 128-bit, 166 MHz, 2-way Crossbar Processor Local Bus supporting 10.4GB/sec. peak bandwidth
- Dual-ported 32/64-bit SDRAM memory controller, interfaced to both PLB slave segments, supporting 166/333 MHz DDR1 and 333/667 MHz DDR2
- 32-bit, 83 MHz external bus controller

System Resources

- Up to 32 general purpose I/Os
- Two-channel DMA included with I2O; One-channel DMA with XOR

High Speed and Inter-Chip Connectivity

- PCI-Express ports—one “x8” lane and two “x4” lane
- PCI-X interface supporting DDR Operation
- Master and slave IIC controller

Network Connectivity

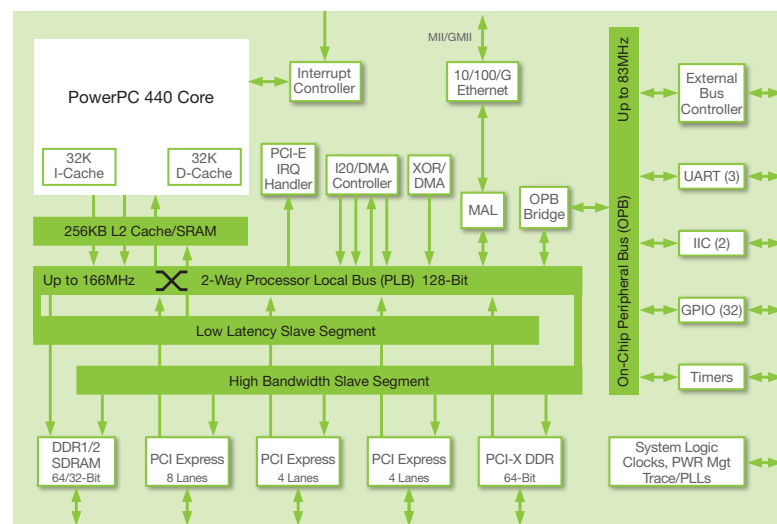
- 10/100/1G Ethernet MAC (GMII/MII)
- Three UARTs

Power

- <6W typical power @ 533 MHz

Target Applications

- RAID controllers
- Storage Area Networking (SAN) equipment
- Network Attached Storage (NAS)
- Disk/tape backup storage equipment



Package Type	Part Number	Features
27mm leaded FC-PBGA	PPC440SPe-AGB533C	No RAID6
27mm lead free FC-PBGA	PPC440SPe-ANB533C	No RAID6
27mm lead free FC-PBGA	PPC440SPe-ANB667C	No RAID6
27mm lead free FC-PBGA	PPC440SPe-ANB800C	No RAID6
27mm lead free FC-PBGA	PPC440SPe-RNB533C	RAID6
27mm lead free FC-PBGA	PPC440SPe-RNB800C	RAID6

460EX
460EXr
460GT
460GTx
460SX



Power Architecture 460 Family

Power Architecture 460 Family at a Glance

	460EX	460EXr	460GT	460GTx	460SX
CPU Complex	- Up to 1000 MHz/ 2000 DMIPS 32KB I-cache/ 32KB D-cache 256KB L2 Cache/SRAM - FPU	- Up to 1000 MHz/ 2000 DMIPS 32KB I-cache/ 32KB D-cache 256KB L2 Cache/SRAM - FPU	- Up to 1000 MHz/ 2000 DMIPS 32KB I-cache/ 32KB D-cache 256KB L2 Cache/SRAM - FPU	- Up to 1200 MHz/ 2400 DMIPS 32KB I-cache/ 32KB D-cache 512KB L2 Cache/SRAM	- Up to 1200 MHz/ 2400 DMIPS 32KB I-cache/ 32KB D-cache 512KB L2 Cache/SRAM
Memory and Bus Architecture	- External Peripheral controller - DDR1/2 SDRAM controller 64KB SRAM	- External Peripheral controller - DDR2 SDRAM controller 64KB SRAM	- External Peripheral controller - DDR1/2 SDRAM controller 64KB SRAM	- External Peripheral controller - DDR2 SDRAM controller - NAND Flash controller 32KB SRAM	- External Peripheral controller - DDR2 SDRAM controller - NAND Flash controller 32KB SRAM
System Resources	- Up to 64 GP I/Os - Interrupt controller - High Speed DMA controller 4-channel DMA controller	- Up to 64 GP I/Os - Interrupt controller - High Speed DMA controller 4-channel DMA controller	- Up to 64 GP I/Os - Interrupt controller - High Speed DMA controller 4-channel DMA controller	- Up to 32 GP I/Os - Interrupt controller 3-channel Enhanced DMA engine 4-channel DMA controller	- Up to 32 GP I/Os - Interrupt controller 3-channel Enhanced DMA engine 4-channel DMA controller
High Speed and Inter-Chip Connectivity	- PCI controller - PCIe x4 Lane - PCIe x1 Lane or SATA x1 Lane 2 IIC controllers - SPI	- PCIe x4 Lane - PCIe x1 Lane or SATA x1 Lane 2 IIC controllers - SPI	- PCI controller - PCIe x4 Lane - PCIe x4 Lane or Serial RapidIO x4 Lane 2 IIC controllers - SPI	1 PCIe x8 Lane or 2 PCIe x4 Lane 2 IIC controllers	1 PCIe x8 Lane 1 PCIe x8 Lane or 2 PCIe x4 Lane 2 IIC controllers
Network Connectivity	2 10/100/1G - TCP/IP Hardware Assist - USB 2.0 OTG, - USB 2.0 Host 4 UARTs	2 10/100/1G - TCP/IP Hardware Assist - USB 2.0 OTG, - USB 2.0 Host 4 UARTs	4 10/100/1G - TCP/IP Hardware Assist 4 UARTs	4 10/100/1G - TCP/IP Hardware Assist 2 UARTs	4 10/100/1G - TCP/IP Hardware Assist 2 UARTs
Special/Optional Functionality	- RAID 5 XOR - Turbo Security Engine - Kasumi engine - Optional RAID 6 XOR	- RAID 5 XOR - Turbo Security Engine - Kasumi engine - Optional RAID 6 XOR	- Turbo Security Engine - Kasumi engine	- Turbo Security Engine - IEEE1588 V2 clock sync	- Optional RAID 5 and 6 XOR - Turbo Security Engine - Storage Security Engine
Typical Power	<3.9W @ 1 GHz	3.5W @ 1 GHz	<3.9W @ 1 GHz	10.5W @ 1 GHz	10.5W @ 1 GHz

Power Architecture 460EX processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 1000 MHz/2000 DMIPS
- 32KB I-cache/D-cache with parity
- 256KB L2 cache with parity
- FPU (2Mflops/MHz Single and Double Precision)

Memory and Bus Architecture

- On-chip Peripheral Bus—32-bit, 100 MHz
- External Bus Controller—32-bit data/27-bit address 100 MHz
- 32/64-bit DDR1/2 up to DDR400 with optional ECC (up to 8GB)
- 64KB of on-chip SRAM (OCM)

System Resources

- Up to 64 general purpose I/Os
- Interrupt Controller with 16 external interrupts
- 4-channel DMA controller

High Speed and Inter-Chip Connectivity

- High Speed DMA controller (HSDMA) for high bandwidth applications
- PCI-Express ports—one “x4” lane and one “x1” lane
- PCI v2.3 compliant, 32-bit, 66 MHz
- 2 IIC with bootstrap controller
- SPI

Network Connectivity

- Two 10/100/1G Ethernet MACs, both with SGMII
- TCP/IP hardware assist and QoS
- USB 2.0 OTG and Host with ULPI Interfaces
- Four UARTs

Special Functionality

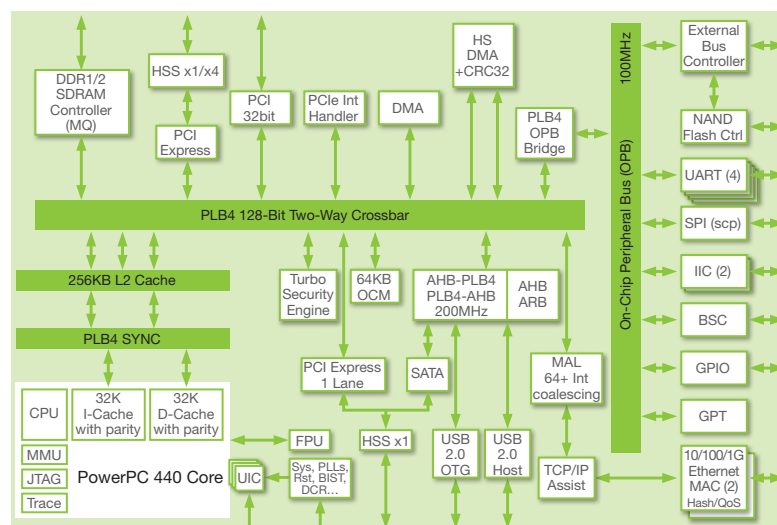
- RAID 5 acceleration
- Turbo Security Engine: Optional on-chip IPsec/SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine
- SATA II single port (mux'd with 2nd PCI-e port)

Power

- <3.9W typical power @ 1 GHz

Target Applications

- Multi-Function Printers
- Industrial Control
- General purpose embedded applications
- Networking



Part Name **PPC460EX-SUB1000T** Case Temperature Range
T = -40C to +85C

Features
S = Security
N = No Security
R = RAID6 / Security

Package (TE-EPBGA)
U = 35mm² lead free

Revision Level
B = 1.1

Processor Speed
600, 800, and 1000MHz

Leaded packaging supported for PPC460EX-STB1000T only.

Power Architecture 460EXr processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 1000 MHz/2000 DMIPS
- 32KB I-cache/D-cache with parity
- 256KB L2 cache with parity
- FPU (2Mflops/MHz Single and Double Precision)

Memory and Bus Architecture

- On-chip Peripheral Bus—32-bit, 100 MHz
- External Bus Controller—32-bit data/27-bit address 100 MHz
- 32/64-bit DDR2 up to DDR400 with optional ECC (up to 8GB)
- 64KB of on-chip SRAM (OCM)

System Resources

- Up to 64 general purpose I/Os
- Interrupt Controller with 16 external interrupts
- 4-channel DMA controller

High Speed and Inter-Chip Connectivity

- High Speed DMA controller (HSDMA) for high bandwidth applications
- PCI-Express ports—one “x4” lane and one “x1” lane
- 2 IIC with bootstrap controller
- SPI

Network Connectivity

- Two 10/100/1G Ethernet MACs
- TCP/IP hardware assist and QoS
- USB 2.0 OTG and Host with ULPI Interfaces
- Four UARTs

Special Functionality

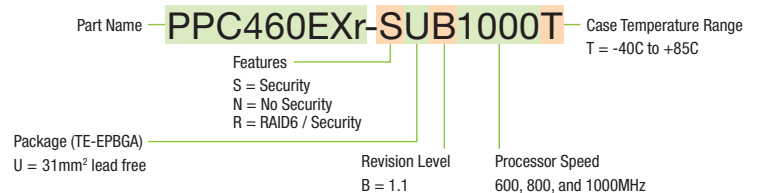
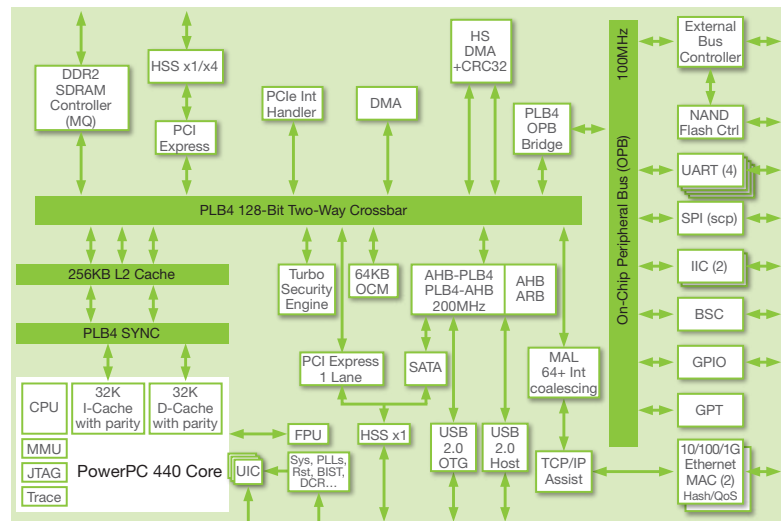
- RAID 5 acceleration (RAID 6 optional)
- Turbo Security Engine: Optional on-chip IPsec/SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine
- SATA II single port (mux'd with 2nd PCI-e port)

Power

- 3.5W typical power @ 1 GHz

Target Applications

- Multi-Function Printers
- Industrial Control
- General purpose embedded applications
- Networking



Power Architecture 460GT processor

Specifications

CPU Complex

- Power Architecture 440 processor core
- Up to 1000 MHz/2000 DMIPS
- 32KB I-cache/D-cache with parity
- 256KB L2 cache with parity
- FPU (2Mflops/MHz Single and Double Precision)

Memory and Bus Architecture

- On-chip Peripheral Bus—32-bit, 100 MHz
- External Bus Controller—32-bit data/27-bit address 100 MHz
- 64KB of on-chip SRAM (OCM)
- 32/64-bit DDR1/2 up to DDR400 with optional ECC (up to 8GB)

System Resources

- 4-channel DMA controller;
- High Speed DMA controller (HSDMA) for high bandwidth applications
- Interrupt Controller with 16 external interrupts

High Speed and Inter-Chip Connectivity

- PCI-Express ports—one “x4” lane and one “x1” lane
- PCI v2.3 compliant, 32-bit, 66 MHz
- 1 SPI, 2 IIC with bootstrap controller
- Serial RapidIO port (HSS shared with PCIe x4 port)

Network Connectivity

- Four 10/100/1G Ethernet MACs, three with SGMII
- TCP/IP hardware assist and QoS on two ports
- Four UART serial ports

Special Functionality

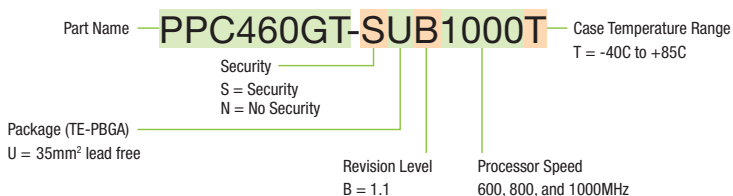
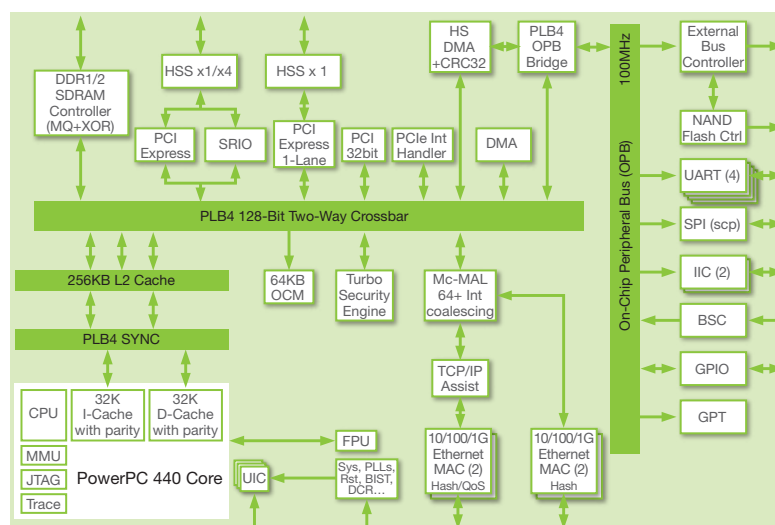
- Turbo Security Engine: Optional on-chip IPSec/SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine

Power

- <3.9W typical power @ 1 GHz

Target Applications

- Wireless Infrastructure
- Control plane applications
- Wide variety of embedded networking applications



Power Architecture 460GTx processor

Specifications

CPU Complex

- Power Architecture 464 processor core
- Up to 1.2 GHz/2400 DMIPS
- 32KB I-cache/D-cache with parity
- 512KB L2 cache with parity

Memory and Bus Architecture

- 128-bit, 200 MHz, 2-way Crossbar Local Bus
 - High bandwidth and Low Latency segments
 - 12.8GB/s combined peak bandwidth
- Second HB Bus, 6.4GB/s
- DDR SDRAM Controller with ECC
 - 32/64-bit DDR2 up to DDR800
- 512KB L2 Cache may also be used as SRAM
- 32-bit, 100-MHz On-chip Peripheral Bus (OPB)
- External Bus Controller
 - Interface to Flash ROM, Boot, or other devices (4 total)

System Resources

- High Bandwidth DMA engine

High Speed and Inter-Chip Connectivity

- Gen2 PCI Express (5 Gb/s per Lane)
 - (1) PCI-E 8-Lane Root/End point, ver2.0 or
 - (2) x4 PCI-E, 4-Lanes Root/End point, ver2.0
- 2 IIC, 32 GPIOs, Interrupt Controller

Network Connectivity

- Four 10/100/1G Ethernet ports, two with TCP/IP assist hardware and QoS
 - Jumbo frame, interrupt coalescence, CRC32, segmentation
- Two UART serial ports

Special Functionality

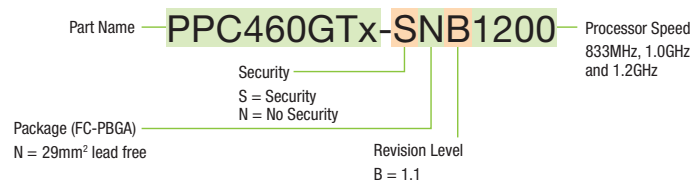
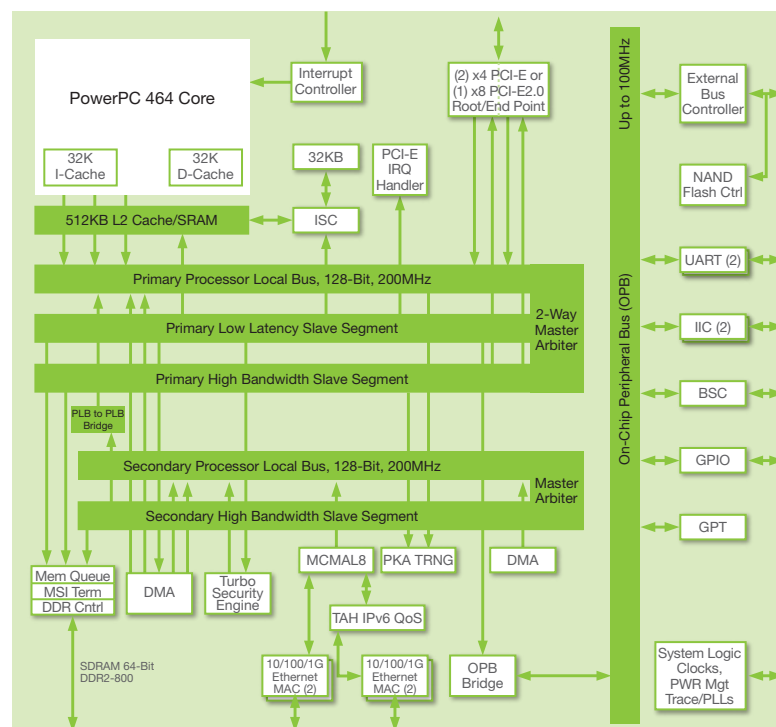
- IPSec/SSL Turbo Security Engine (optional)
- IEEE1588 v2 Clock Synchronization (one port)

Power

- 10.5W typical power @ 1 GHz

Target Applications

- Wireless Infrastructure
- Networking
- General Purpose Control Applications



Power Architecture 460SX processor

Specifications

CPU Complex

- Power Architecture 464 processor core
- Up to 1.2 GHz/2400 DMIPS
- 32KB I-cache/D-cache with parity
- 512KB L2 cache with parity

Memory and Bus Architecture

- 128-bit, 200 MHz, 2-way Crossbar Local Bus
 - High bandwidth and Low Latency segments
 - 12.8GB/s combined peak bandwidth
- Second HB Bus, 6.4GB/s, for RAID 5, RAID 6, and Security
- DDR SDRAM Controller with ECC
 - 32/64-bit DDR2 up to DDR800
 - Data Saver, for data or power saving, sustains memory refresh with battery backup
- 512KB L2 Cache may also be used as SRAM
- 32-bit, 100-MHz On-chip Peripheral Bus (OPB)
- External Bus Controller
 - Interface to Flash ROM, Boot, or other devices (4 total)

System Resources

- High Bandwidth 3-channel DMA engine

High Speed and Inter-Chip Connectivity

- Gen2 PCI Express Multiport Bridge (5 Gb/s per Lane)
 - (1) PCI-E, 8-Lane Root/End point, ver2.0
 - (2) PCI-E, 4-Lanes Root/End point, ver2.0 or (1) PCI-E 8-Lane Root/End point, ver2.0
- 2 IIC, 32 GPIOs, Interrupt Controller

Network Connectivity

- Four 10/100/1G Ethernet Ports, two with TCP/IP assist hardware and QoS
 - Jumbo frame, interrupt coalescence, CRC 32
- Two UART serial ports

Special Functionality

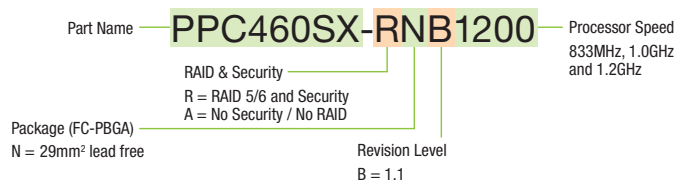
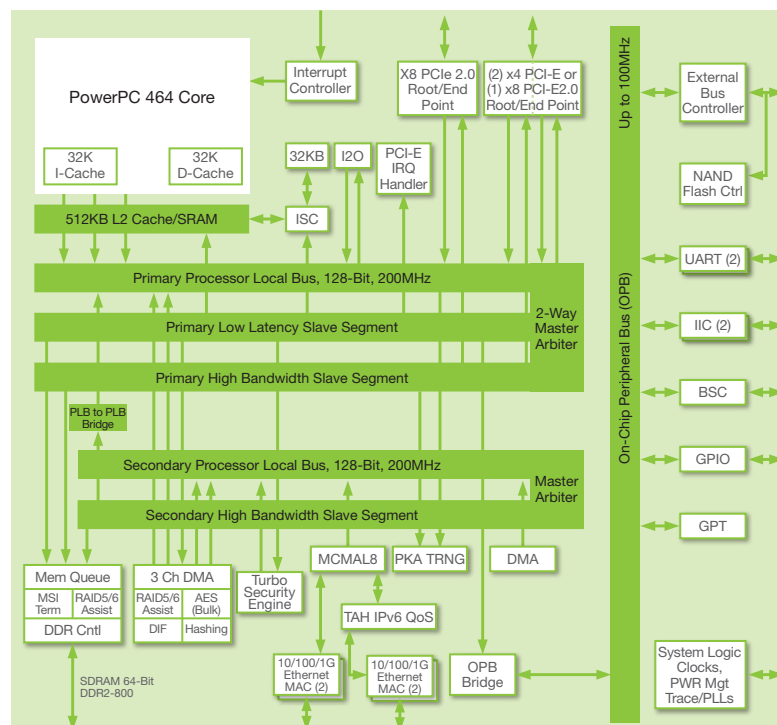
- RAID 5 and RAID 6 Acceleration Hardware
- Network IPSec/SSL Turbo Security Engine

Power

- 10.5W typical power @ 1 GHz

Target Applications

- RAID controllers
- Storage Area Networking (SAN)
- iSCSI
- Network Attached Storage (NAS)
- Other embedded storage and networking applications



Power Architecture Processor Evaluation Boards, Evaluation Kits and Reference Design Kits

Part Number	Host OS	Product Description	Board Name	Support	Availability
EV-405EP-KIT-01	Windows / Linux	405EP Evaluation Kit, Windows and Linux Hosts, tools CDs	Taihu	taihusupport@amcc.com	Now
EV-405EX-KIT-05	Windows / Linux	405EX Evaluation Kit, Windows and Linux Hosts, tools CDs	Kilauea	kilaueasupport@amcc.com	Now
EV-405GPR-WIN-00	Windows	405GPr Evaluation Board, Windows Host	Sycamore	support@amcc.com	Now
EV-440EP-KIT-01	Windows / Linux	440EP Evaluation Kit, Windows and Linux Hosts, tools CDs	Yosemite	yosemitesupport@amcc.com	Now
EV-440EPx-KIT-01	Windows / Linux	440EPx Evaluation Kit, Windows and Linux Hosts, tools CDs	Sequoia	sequoiasupport@amcc.com	Now
EV-440GX-KIT-01	Windows / Linux	440GX Evaluation Kit, Windows and Linux Hosts, tools CDs	Taishan	taishansupport@amcc.com	Now
EV-440SP-MX-02	Windows	440SP Evaluation Board, Windows Host	Luan	support@amcc.com	Now
EV-460EX-KIT-05	Windows / Linux	460EX Evaluation Kit, Windows and Linux Hosts, tools CDs	Canyonlands	canyonlandssupport@amcc.com	Now
EV-460GT-KIT-04	Windows / Linux	460GT Evaluation Kit, Windows and Linux Hosts, tools CDs	Glacier	glaciersupport@amcc.com	Now
RD-460GT-AMC-01	Windows / Linux	Dual-460GT AMC Card Reference Design Kit	Arches	archessupport@amcc.com	Now
EV-460SX-KIT-01	Windows / Linux	460SX Evaluation Kit, Windows and Linux Hosts, Tools CDs	Eiger	eigersupport@amcc.com	Now

Embedded Operating Systems

		405EP	405EX	405EXr	405GP	440EP	440EPx	440GP	440GX	440SP	440SPe	460EX	460GT	460SX
Accelerated Technology	Nucleus+				•									
Aonix	Java	•	•	•	•	•	•	•	•	•	•	•	•	
AppliedMicro	Linux	•	•	•	•	•	•	•	•	•	•	•	•	•
Denx Software Engineering	Linux	•	•	•	•	•	•	•	•	•	•	•	•	
Embedded Brains	RTEMS						•							
Enea	OSE Delta		•	•	•	•		•	•			•	•	
Express Logic	ThreadX		•	•	•	•		•	•	•				
Green Hills Software	Integrity		•	•	•	•	•	•	•					
KADAK Products Ltd.	AMX	•			•			•						
LinuxWorks	BlueCat Linux				•	•		•	•			•		
LinuxWorks	LynxOS				•	•		•	•			•		
LinuxWorks	LynxOS-178				•	•		•	•			•		
Mentor Graphics	Nucleus							•	•					
Micro Digital	Smx	•			•									
Monta Vista	Professional	•	•	•		•	•	•	•			•	•	
Monta Vista	Carrier Grade								•					
MQX Embedded	MQX					•		•						
QNX Software Systems	Neutrino	•			•	•	•	•	•					
Quadros	RTXC	•			•				•					
SYSGO AG	Linux					•		•	•					
TimeSys	Linux					•		•	•	•				
Wasabi	NetBSD	•			•	•			•	•	•			
Wind River	VxWorks	•	•	•		•	•	•	•	•	•	•	•	
Wind River	Linux		•	•										

Hardware and Software Development Tools

	405EP	405EX	405EXr	405GPr	440EP	440EPx	440GP	440GX	440SP	440SPe	460EX	460GT	460SX
Abatron	•	•	•	•	•	•	•	•	•	•	•	•	•
Altium	•			•									
Aonix	•	•	•	•	•	•	•	•	•		•	•	
Apogee	•	•	•	•		•							
Code Sourcery Inc.	•	•	•	•	•	•	•	•	•	•	•	•	•
DENX Software Engineering	•	•	•	•	•	•	•	•	•	•	•	•	
EmuTec Inc.	•			•									
Green Hills Software	•	•	•	•	•	•	•	•	•	•	•	•	•
International Test Technologies	•	•	•	•	•	•	•	•	•	•	•	•	
iSystem AG	•			•	•		•	•					
Klocwork Inc.	•	•	•	•	•	•	•	•	•	•	•	•	
Kozio Inc.	•	•	•	•	•	•	•	•	•	•	•	•	•
Lauterbach	•	•	•	•	•	•	•	•	•	•	•	•	•
LinuxWorks				•	•		•	•			•		
Macraigor Systems LLC	•	•	•	•	•		•	•	•		•	•	
Mentor Graphics	•			•	•		•	•					
Microcross, Inc.	•			•	•		•	•	•	•			
Monta Vista	•			•	•		•	•					
MQX Embedded	•			•	•		•	•	•				
NuDesign Team, Inc.					•		•	•	•				
Quadros	•			•	•		•	•	•				
QNX Software Systems	•			•	•	•	•	•					
SYSGO AG	•			•	•		•	•	•	•			
Theobroma Systems	•	•	•	•	•	•	•	•	•	•	•	•	
TimeSys				•	•		•	•			•	•	
Viosoft Corporation	•	•	•	•	•		•	•	•	•			
Virutech								•					
Wasabi							•	•	•	•			
Wind River	•	•	•	•	•	•	•	•	•	•	•	•	•



For technical questions regarding AppliedMicro's products, please contact our product support group at 1.800.840.6055 or email support@appliedmicro.com.



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