applied micro™

BUILT ON Power™

Power™ Architecture Products
Product Selector Guide

Table of Contents

Power Architecture 405 Family

Power Architecture 440 Family

Power Architecture 460 Family

Introduction

Connecting the Technology that Connects Us All

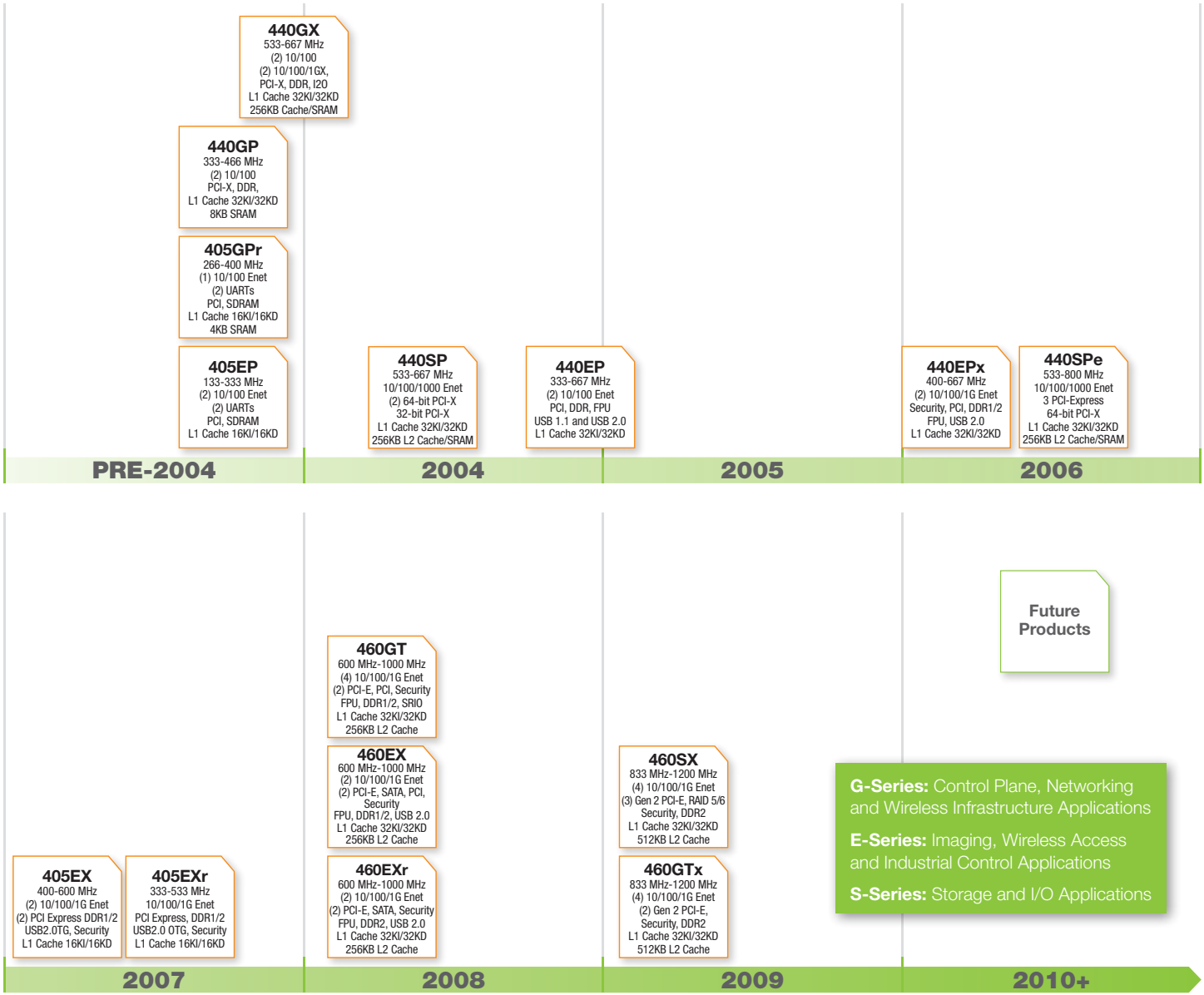
Network
Convergence

applied micro™

Triple-Play
Applications

Digital Content
Storage

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

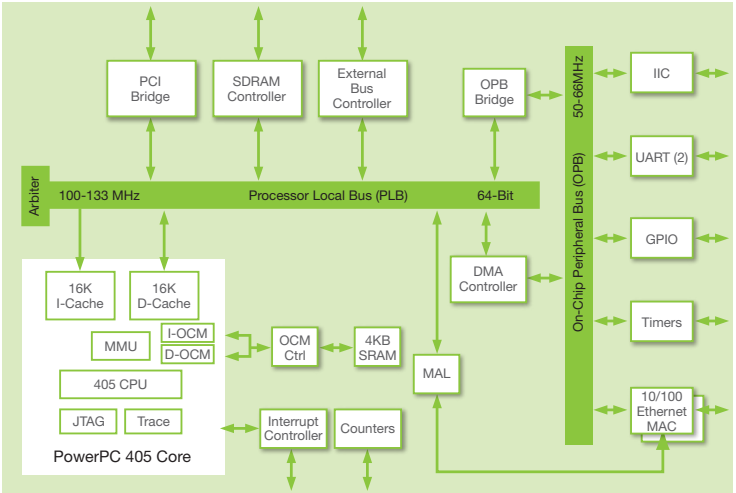
- Two on-chip Ethernet MACs
- Two UARTs

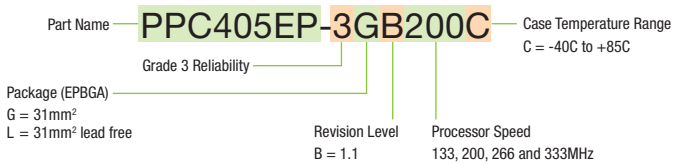
Power

- 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

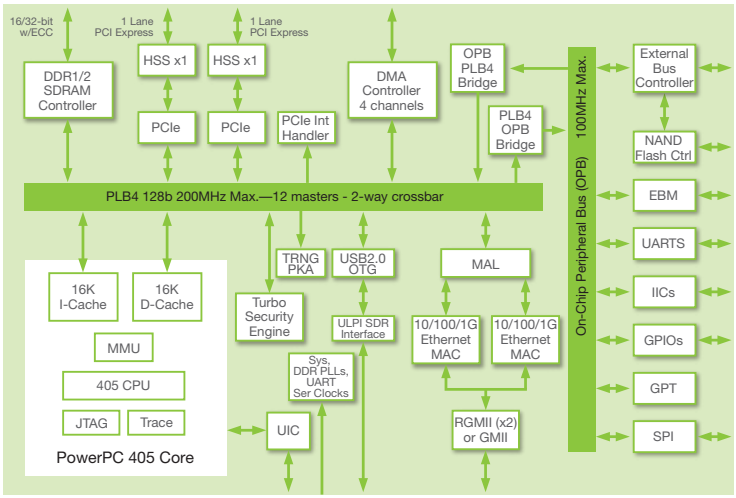
- Turbo Security Engine: Optional on-chip IPSec/SSL/bulk data security acceleration engine (Crypto Engine)

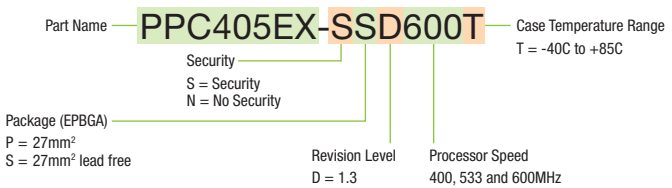
Power

- <1.5W est. typical power @ 400 MHz CPU
- Extended Temperature Range: 533 MHz part can operate at case temperature up to +95ºC 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

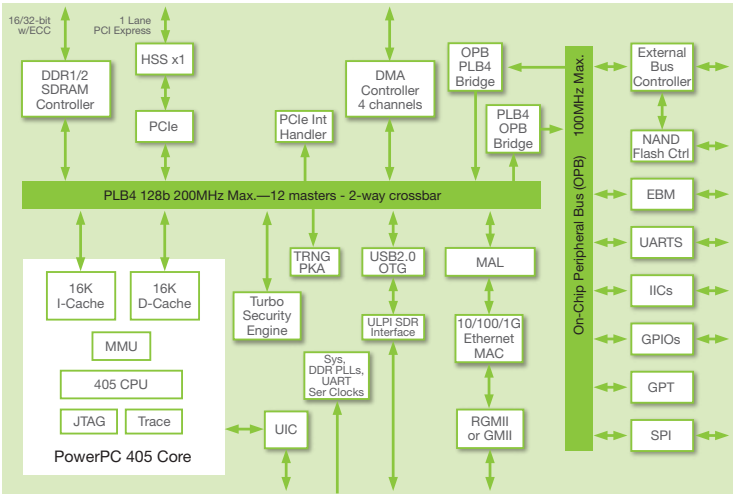
- Turbo Security Engine: Optional on-chip IPSec/SSL/bulk data security acceleration engine (Crypto Engine)

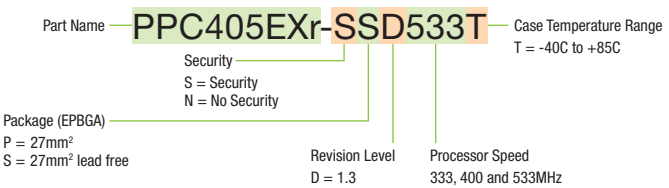
Power

- <1.3W est. typical power @ 400 MHz CPU
- Extended Temperature Range: 533 MHz part can operate at case temperature up to +95ºC 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

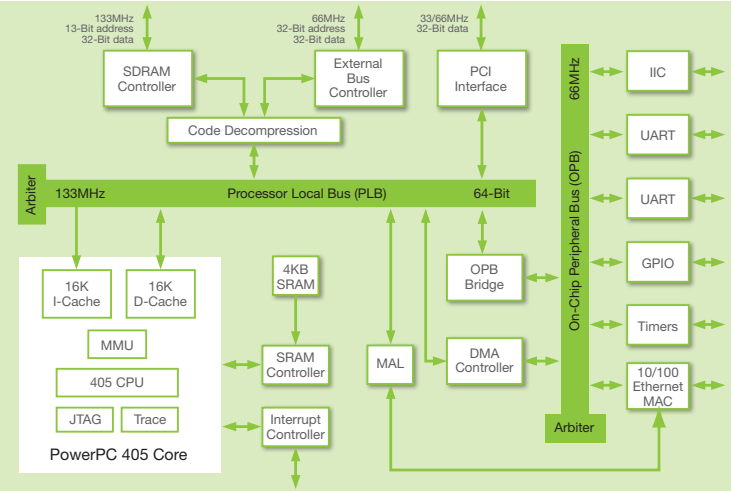
- 10/100 Ethernet MAC
- Two UARTs

Power

- 0.72W typical power @ 266 MHz
- Extended Temperature Range: 333 MHz part can operate at case temperature up to +105ºC 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

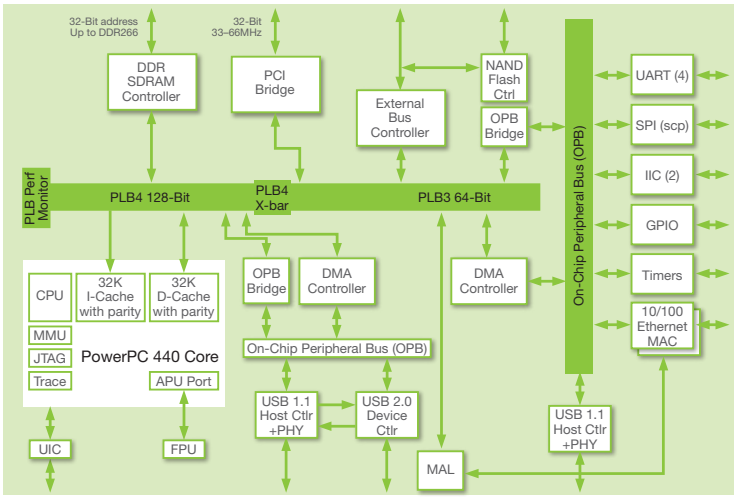
- Two 10/100 Ethernet MACs
- USB 1.1 Host and Device Controllers and PHYs
- USB 2.0 Device Controller
- Four UARTs

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

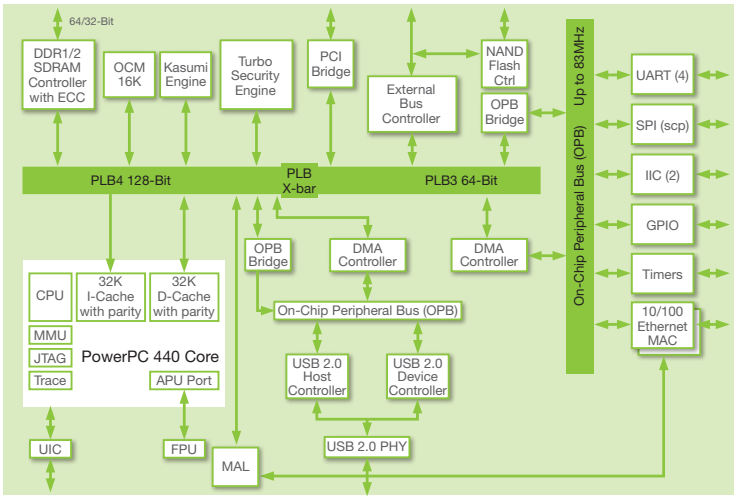
- Turbo Security Engine: Optional on-chip IPSec/SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine

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

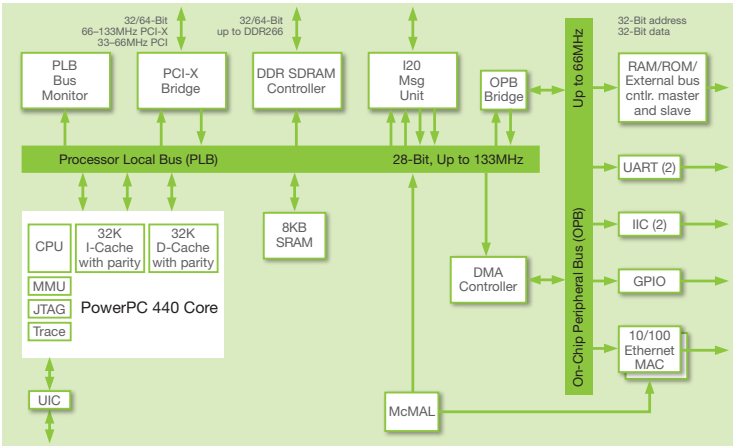
- Two serial ports
- Master and slave IIC controller
- Up to 32 general purpose I/Os

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

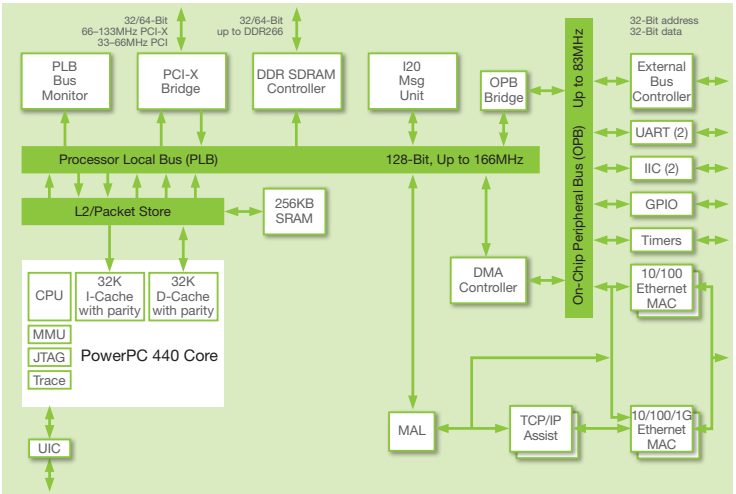
- Two 10/100/1G Ethernet MACs
- Two 10/100 Ethernet MACs
- TCP/IP hardware assist
- 2 UARTs

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

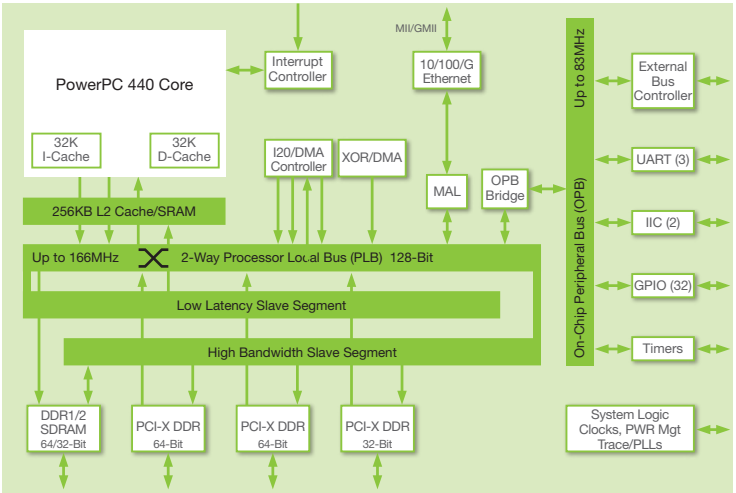
- RAID 5 and RAID 6 acceleration hardware
- RAID XOR function with one-channel DMA for parity generation and checking

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

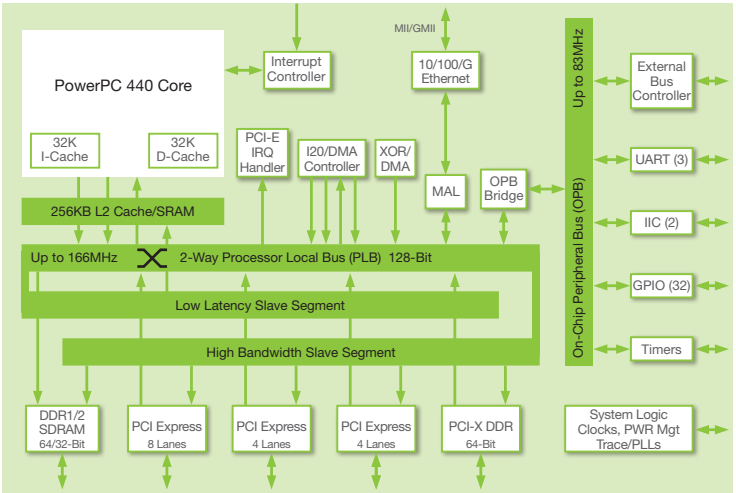
- 10/100/1G Ethernet MAC (GMII/MII)
- Three UARTs

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

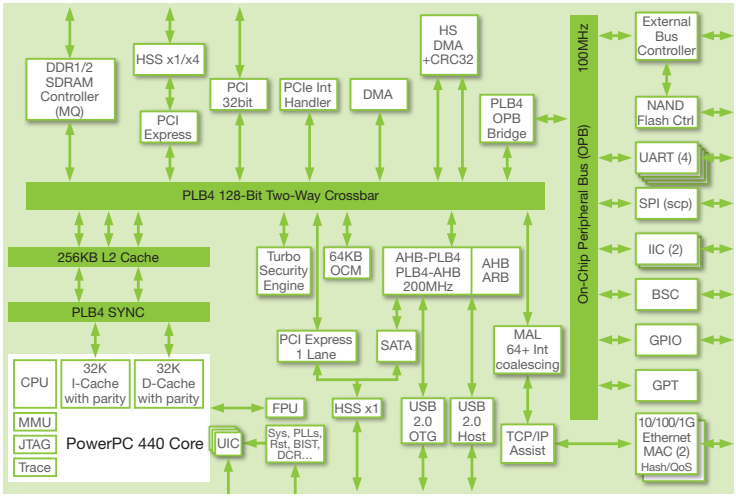
- RAID 5 acceleration
- Turbo Security Engine: Optional on-chip IPSec/ SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine
- SATA II single port (mux’d with 2nd PCI-e port)

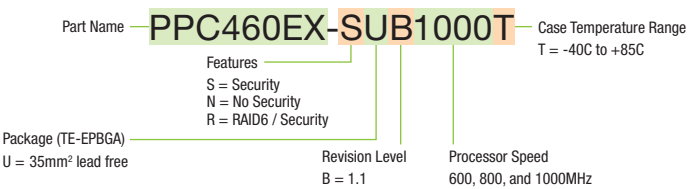
Power

- <3.9W typical power @ 1 GHz

Target Applications

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





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

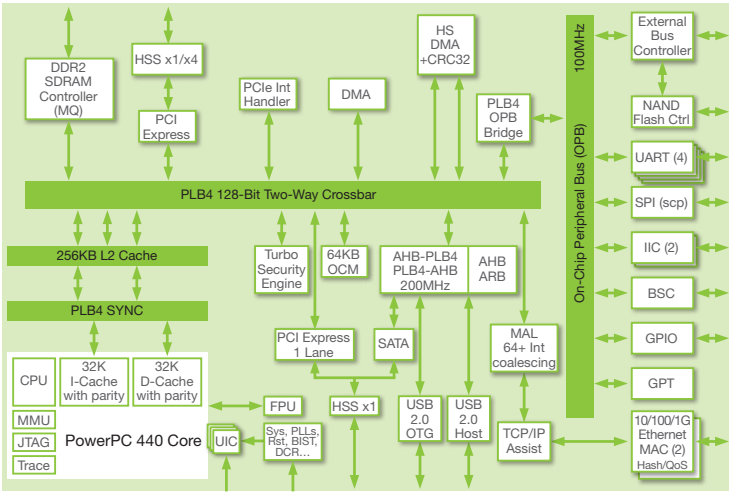
- RAID 5 acceleration (RAID 6 optional)
- Turbo Security Engine: Optional on-chip IPSec/ SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine
- SATA II single port (mux’d with 2nd PCI-e port)

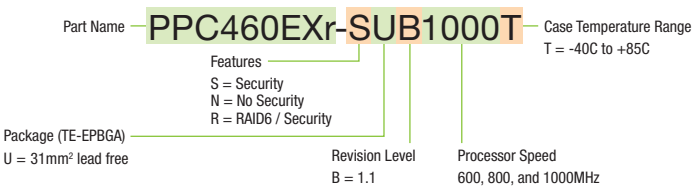
Power

- 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

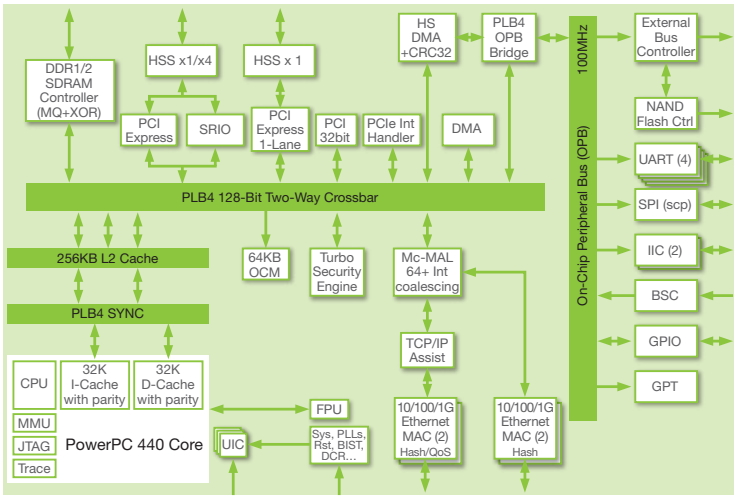
- Turbo Security Engine: Optional on-chip IPSec/ SSL/bulk data security acceleration engine (Crypto Engine)
- Kasumi encryption/decryption engine

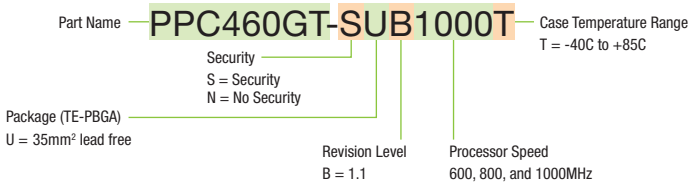
Power

- <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

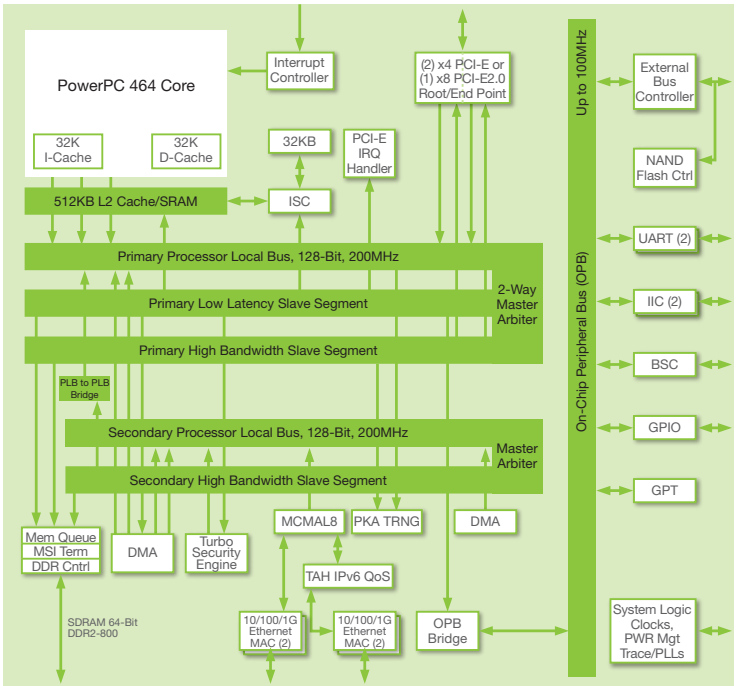
- IPSec/SSL Turbo Security Engine (optional)
- IEEE1588 v2 Clock Synchronization (one port)

Power

- 10.5W typical power @ 1 GHz

Target Applications

- Wireless Infrastructure
- Networking
- General Purpose Control Applications



Part Name — PPC460GTx-SNB1200

- Processor Speed: 833MHz, 1.0GHz and 1.2GHz
- Security: S = Security, N = No Security
- Package (FC-PBGA): N = 29mm² lead free
- Revision Level: B = 1.1

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

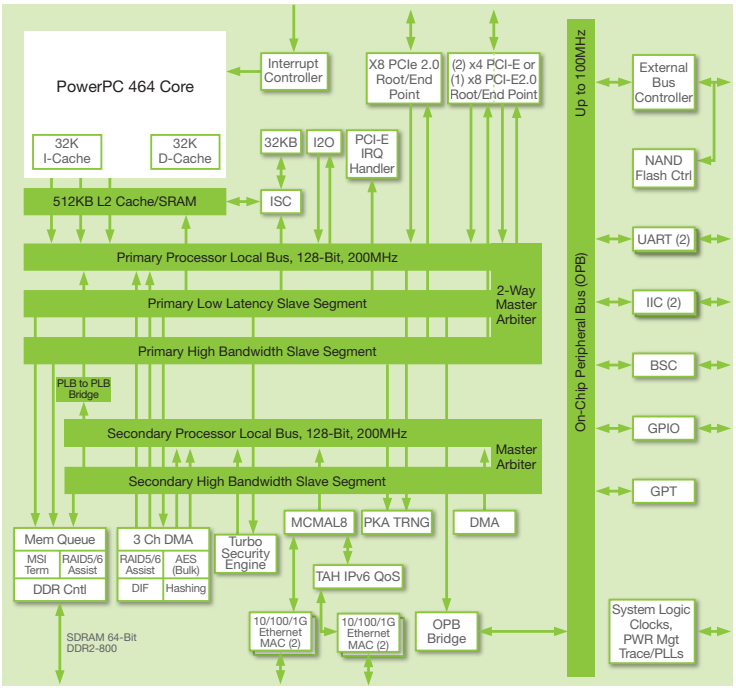
- RAID 5 and RAID 6 Acceleration Hardware
- Network IPSec/SSL Turbo Security Engine

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



Part Name — PPC460SX-RNB1200 — Processor Speed 833MHz, 1.0GHz and 1.2GHz

RAID & Security
R = RAID 5/6 and Security
A = No Security / No RAID

Package (FC-PBGA)
N = 29mm² lead free

Revision Level
B = 1.1

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	405GPr	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	•			•			•						
LynuxWorks	BlueCat Linux				•	•		•	•			•		
LynuxWorks	LynxOS				•	•		•	•			•		
LynuxWorks	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	•	•	•	•	•	•	•	•	•	•	•	•	•
LynuxWorks				•	•		•	•			•		
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.

applied micro™

215 Moffett Park Drive
Sunnyvale, CA 94089
www.appliedmicro.com
408.542.8600

Architecture PSG_Rev 1 041910