



# APM8018x

## Embedded Power™ Processor

With processor speeds of up to 600 MHz, USB 2.0 OTG, PCI-Express, SATA, Gigabit Ethernet, security, NAND Flash interfaces, and low power dissipation, the APM8018x embedded processor is ideally suited for any embedded applications that require exceptionally low power and a small footprint.

### Features

#### Power™ 405 Processor Core

- CPU Speed (frequency): Up to 600 MHz
- 5-stage pipeline, executes up to one instruction per cycle
- 16-KB-I/16-KB-D L1 caches, 2-way set-associative

#### On-Chip Memory

- 128-KB On-Chip Memory

#### High-Bandwidth Bus Architecture

- 128-bit processor local bus (PLB)
- Separate 128-bit read and 128-bit write data bus
- Up to 6.4 GB/s of peak on-chip bandwidth at 200 MHz

#### DDR2 SDRAM

- On-chip Double Data Rate 2 (DDR2) SDRAM controller with 16-bit interface
- Support for one rank of DDR2 SDRAM up to 512 MB

#### Gen 1 PCI Express Interface

- Two Gen1 x1 lane PCI-Express interfaces (2.5 GB/s per lane)
- Configurable as root or end-point

#### SATA

- One SATA controller operating at up to 3.0 Gb/s with integrated SERDES (muxed with one PCIe port)

#### Ethernet Ports and TCP/IP Acceleration

- Two Ethernet 10/100/1000-Mbit/s, full-duplex MACs (RGMII/TMII/MII)
- TCP/IP Acceleration Hardware, QoS, and Jumbo Frame support
- IEEE 1588 v1 and v2 support

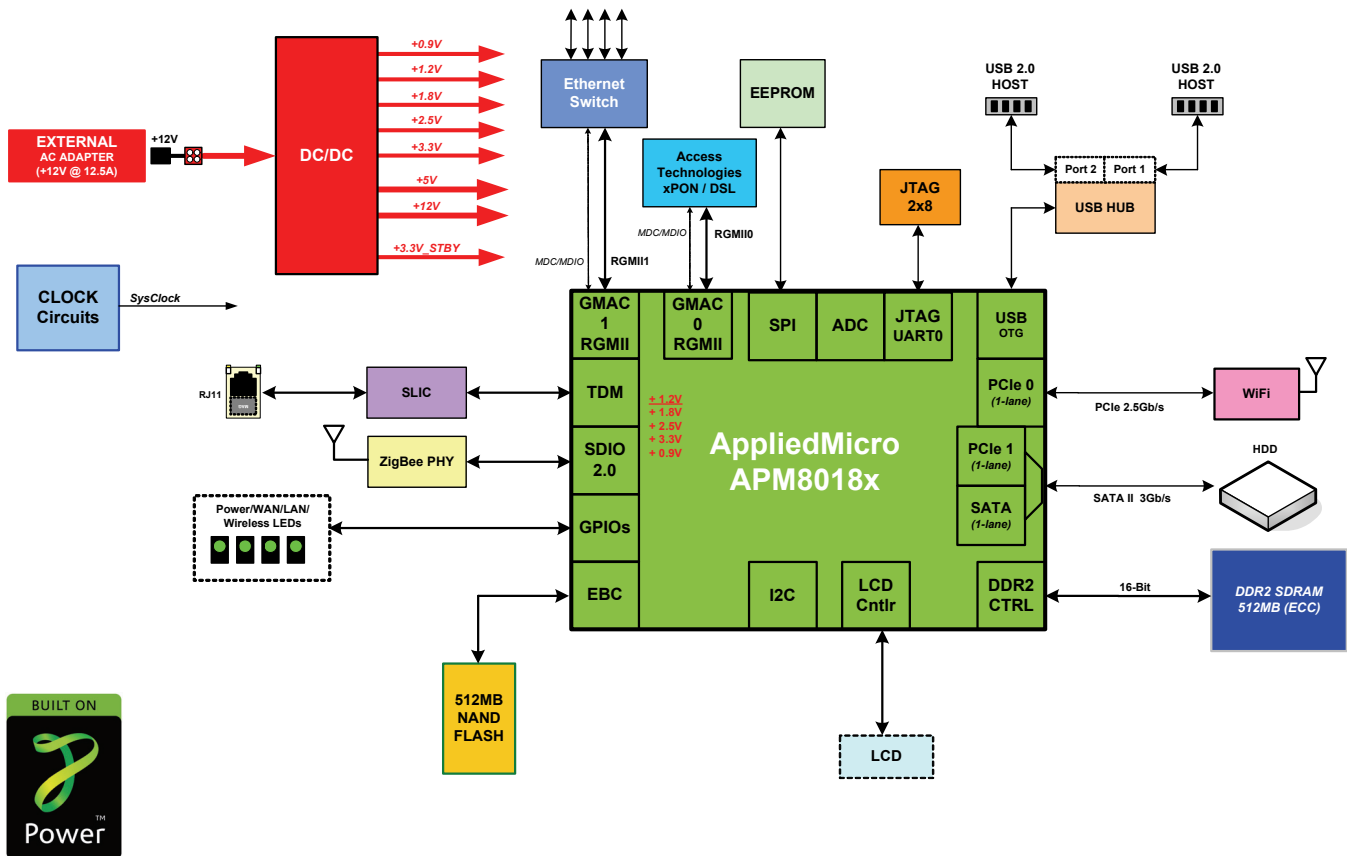
#### Turbo Security (Optional)

- On-chip IPSec acceleration with header/trailer processing
- Supports DES, 3DES, and AES encryption

#### USB 2.0 OTG Interface with Integrated PHY

- Operates at 1.5/12/480 Mbps bus speeds

### APM8018x Block Diagram



# APM8018x

## Features (cont'd)

### NAND Flash Controller

- Supports one to three banks of NAND Flash memory devices
- ECC generation - hamming code, single-bit correction, double-bit detection (SEC/DED):
  - ECC generation assist software with ECC checking of SLC NAND

### Standard Peripherals

- On-chip real-time clock with external battery backup capability
- Up to four UARTs (4x 2-pin)
- Two IIC (with one integrated boot strap controller)
- One SPI/SCP serial interface with up to three chip enables
- 32 General-Purpose I/O
- SDIO 2.0
- 10-bit ADC
- TDM
- NOR flash support
- LCD controller with LVDS serial interface
- Support for JTAG board testing, JTAG debuggers, and 4xx instruction trace

### AppliedMicro Partners Ecosystem

- Extensive ecosystem of products and services from a wide range of leading suppliers
- For details of the products and services available, visit: <http://www.appliedmicro.com/Embedded/Partners>
- AppliedMicro also provides a reference design for this processor

### Targeted Applications

- Energy Meters
- Energy Gateways
- Network Attached Storage
- Access Points
- Residential Gateways
- Connected TV Coprocessors
- All other Embedded Applications

## Specifications

### Technology

- 65nm LP CMOS

### Performance (estimated)

- 912 Dhrystone 2.1 MIPS @ 600 MHz

### Typical Power Dissipation

- 0.3 W (typical standby power)
- 1.0 W to 1.5 W @ 600 MHz (typical operational power)

### Case Temperature Range

- -40°C to +105°C

### Power Supply

- 1.2 V (logic), 1.8 V (DDR2), 2.5 V (Ethernet, PCIe/SATA), 3.3 V (USB, other I/O)

### Signal I/Os

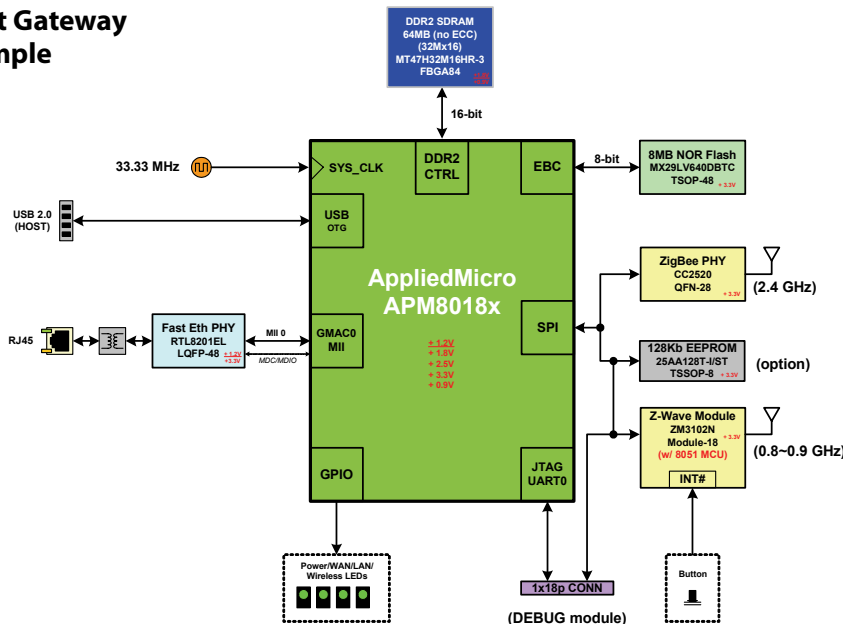
- TBD

### Packaging

- Wirebond Fine-pitched Plastic BGA (FPBGA), 10mm x 10mm, 0.5mm pitch OR
- Wirebond Fine-pitched Plastic BGA (FPBGA), 14mm x 14mm, 0.8mm pitch
- RoHS compliant (lead-free)

For more information, visit <http://www.appliedmicro.com>

## APM8018x Smart Gateway Application Example



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