Family 12h AMD Sempron™ Processor Product Data Sheet

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Revision History

Date	Revision	Description
December 2011	3.00	First Public Release.

1 Family 12h AMD Sempron™ Processor Features

1.1 Family 12h AMD Sempron™ Processor Features

This section lists the features and capabilities of the Family 12h AMD Sempron™ processor.

- **Compatible with Existing 32-Bit x86 and 64-bit AMD64 Code Base**
  - Including support for SSE, SSE2, SSE3, SSE4A, 3DNow!™, MMX™, and legacy x86 instructions
  - Runs existing operating systems and drivers
  - Local APIC on the chip
- **AMD64 Technology**
  - AMD64 technology instruction set extensions
  - 64-bit integer registers, 48-bit virtual addresses, and 48-bit physical addresses
  - Eight 64-bit integer registers
  - Eight 128-bit SSE registers
- **Multi-Core Architecture**
  - Dual-core
  - Discrete L1 and L2 cache structures for each core
- **Cache Structures**
  - **64-Kbyte 2-Way Associative ECC-Protected L1 Data Cache**
    - Two 64-bit operations per cycle, 3-cycle latency
  - **64-Kbyte 2-Way Associative Parity-Protected L1 Instruction Cache**
    - With advanced branch prediction
  - **512-Kbyte, 16-Way Associative L2 Cache**
    - Exclusive cache architecture storage in addition to L1 caches
- **Floating-Point Unit**
  - AMD floating-point accelerator
    - 128-bit floating-point unit (FPU)
- **Management and Virtualization Features**
  - Temperature Sensor Interface (SB-TSI)
    - Provides access to temperature sensor and temperature threshold registers
  - AMD Virtualization™ technology (AMD-V™)
    - SVM lock and unlock
    - Nested paging
    - Nested paging performance counter event selects
    - Next RIP
    - LBR virtualization
    - 64 address space identifiers
    - Performance counter guest/host bit
    - Improved nested page table fault info
- **Power Management**
  - Multiple low-power states
  - 32-nm process for decreased power consumption
  - AMD PowerNow!™ technology
  - System Management Mode (SMM)
  - ACPI-compliant, including support for processor performance states (P-states), processor power states (C-states), and sleep states including S0, S3, S4, and S5
  - Per-core power gating (CC6)

  - PCIe® core power gating
  - PCIe power-down for unused lanes
- **Electrical Interfaces**
  - DDR3 SDRAM: Compliant with JEDEC DDR3 1.5V and LV-DDR3 1.35V SDRAM specifications
  - Refer to the *AMD Family 12h Processor Electrical Data Sheet,* order# 41609, for electrical details of AMD Family 12h processors.
- **Thermal Controls**
  - Sideband temperature control
  - Hardware thermal control (HTC)
  - Local hardware thermal control (LHTC)
  - DRAM thermal protection
- **PCIe® Technology**
  - PCIe Gen 1.0 and PCIe Gen 2.0 technology supported:
    - Configurable x8 and x16 external discrete graphics card expansion PCIe link†
      † Supports only single discrete graphics card.
    - Configurable x4 General Purpose Ports (GPP) link
    - x4 unified media interface link
- **Integrated Memory Controller**
  - Low-latency, high-bandwidth
  - Socket FM1 package
    - Two 64-bit DDR3 SDRAM controllers operating at frequencies up to 1600 MT/s (800 MHz)
    - Supports up to two dual-rank SODIMMs or unbuffered DIMMs per channel
- **Available Packages**
  - Compliant with RoHS (EU Directive 2002/95/EC), with lead used only in small amounts in specifically exempted applications
  - Socket FM1 package
    - Refer to the *AMD Socket FM1 Processor Functional Data Sheet,* order# 44085, for functional and mechanical details of the socket FM1 package processor.
    - 905-pin lidded micro PGA
    - 1.27-mm pin pitch
    - 40 mm x 40 mm
    - 31 x 31 row pin array
    - Organic C4 die attach

2 Compatible Socket Infrastructures

Refer to the *AMD Infrastructure Roadmap,* order# 41842, for information on platform feature implications of package and infrastructure combinations. Family 12h AMD Sempron™ processors support the following infrastructure:

- **FM1 Infrastructure**
  - Compatible with FM1 package processors
  - Refer to the *AMD Socket FM1 Processor Functional Data Sheet,* order# 44085, for functional and mechanical details of the socket FM1 package processor.