

AMD Phenom X4 9650 specifications

General information

Type	CPU / Microprocessor
Market segment	Desktop
Family	AMD Phenom X4
Model number ?	9650
CPU part numbers	HD9650WCJ4BGH is an OEM/tray microprocessor HD9650WCGHBOX is a boxed microprocessor with fan and heatsink
Stepping codes	JAAAB AA JAAFBA AA
Frequency ?	2300 MHz
Bus speed ?	One 1800 MHz 16-bit HyperTransport link (3.6 GT/s)
Clock multiplier ?	11.5
Package	940-pin organic micro-PGA
Sockets	Socket AM2 Socket AM2+
Introduction date	Mar 27, 2008
End-of-Life date	Last order date is end of 4th quarter 2008
Price at introduction	\$215

Architecture / Microarchitecture

Microarchitecture	K10
Platform	Cartwheel (mainstream platform with AMD 780G chipset) Spider (performance platform with AMD 790FX/790GX chipsets)
Processor core ?	Agena
Core stepping ?	DR-B3
CPUID	100F23
Manufacturing process	0.065 micron silicon-on-insulator (SOI) technology 450 million transistors
Die	285mm ²
Data width	64 bit
The number of CPU cores	4
The number of threads	4
Floating Point Unit	Integrated
Level 1 cache size ?	4 x 64 KB 2-way set associative instruction caches 4 x 64 KB 2-way set associative data caches
Level 2 cache size ?	4 x 512 KB 16-way set associative caches
Level 3 cache size	2 MB 32-way set associative shared cache
Multiprocessing	Uniprocessor
Extensions and Technologies	MMX instructions Extensions to MMX 3DNow! technology Extensions to 3DNow! SSE / Streaming SIMD Extensions SSE2 / Streaming SIMD Extensions 2 SSE3 / Streaming SIMD Extensions 3 SSE4a ? AMD64 / AMD 64-bit technology ? EVP / Enhanced Virus Protection ? AMD-V / AMD Virtualization technology
Low power features	Cool'n'Quiet 2.0 CoolCore technology ? Independent Dynamic Core Technology ? Dual Dynamic Power Management ?

Core C1 and C1E states
Package S1, S3, S4 and S5 states

Integrated peripherals / components

Integrated graphics	None
Memory controller	The number of controllers: 1 Memory channels: 2 Channel width (bits): 72 Supported memory: DDR2-1066 DIMMs per channel: up to 2 Maximum memory bandwidth (GB/s): 17.1
Other peripherals	HyperTransport 3.0 technology

Electrical / Thermal parameters

V core ?	1.15V - 1.25V
V NorthBridge	1.25V
Maximum operating temperature ?	55°C - 70°C
Thermal Design Power ?	95 Watt

Notes on AMD Phenom X4 9650

On socket AM2+ platforms in the minimum performance state the processor runs at 1150 MHz / 1.05 Volt core voltage, and has TDP 57.6 Watt
On socket AM2 platforms in the minimum performance state the processor runs at 1150 MHz / 1.15 - 1.25 Volt core voltage, and has TDP 66.1 Watt