

VIA C7® Processor



Desktop Performance, Embedded Design

The VIA C7® processor is the smallest, lowest power, most efficient and most secure native x86 processor in the world, packing unbeatable performance per watt onto the tiny die of just 30mm². Built on the advanced VIA CoolStream™ architecture, the VIA C7® processor is designed to extend the digital lifestyle by combining robust performance, with speeds of up to 2.0 GHz, with ultra low power consumption and highly efficient heat dissipation.

Manufactured using state-of-the-art 90 nm process technology, the VIA C7® processor sets new standards in integration and performance — all within an industry-leading thermal profile. The VIA C7® is ideal for a wide range of next generation compact systems, including quiet desktops and mini PCs, green clients, ultra portable notebooks, personal electronics such as PVRs and home media centers, and high density or very small server appliances.

The VIA C7® processor also heralds an era of practical pervasive security thanks to the greatly augmented VIA PadLock™ Hardware Security Suite — the world's most advanced on-die hardware acceleration security featuring key cryptographic operations which can be quickly and easily deployed in connected PC devices.

The VIA C7® NanoBGA2 package measures just 21 mm x 21 mm, opening up exciting new possibilities in system design innovation. VIA C7® processor systems offer smooth playback of MPEG-2 and MPEG-4 video and MP3 audio, Voice over IP telephony and video conferencing, and much more. It can be combined with a rich selection of VIA companion chips for a balanced platform for selective system design.

Targeted at Key Embedded Markets

- Compact server appliances
- High density servers
- Public information/entertainment kiosks
- Point-of-Sales systems
- Intelligent displays
- Edge networking devices
- Hospital monitoring systems
- Municipal control & monitoring systems

Validated with the Following Chipsets

- VIA VX900 chipset
- VIA VX855 chipset
- VIA VX875 chipset
- VIA VX800 chipset
- VIA VX820UT chipset
- VIA CX700M chipset
- VIA CN700 and VIA VT8237R Plus chipsets
- VIA CN896 and VIA VT8237S chipsets

VIA C7® Processor Family	Processor Brand	Clock Speed	FSB	TDP Max & voltage
	VIA C7®	2.0 GHz	800 MHz	20 W @ 1.196 V
	VIA C7®	1.8 GHz	800 MHz	18 W @ 1.196 V
	VIA C7®	1.6 GHz	400 MHz	15 W @ 1.084 V
	VIA C7®	1.5 GHz	400 MHz	12 W @ 1.004 V
	VIA C7®	1.0 GHz	400 MHz	9 W @ 1.004 V

VIA C7® Processor Specifications

CPU clock speeds up to 2.0 GHz	Superior performance for mainstream digital media and productivity applications
Full x86 Operating System & software application compatibility	Leverages the richest and most cost-effective software development platforms, including Microsoft® Windows®, Linux and OpenBSD

VIA CoolStream™ Architecture

90 nm process technology	State-of-the-art 90 nm manufacturing process enables VIA C7® processor to operate up to 15% faster while using 20% less power
World's smallest x86 processor die (30mm²)	Enables a new generation of small form factor x86 platform designs
VIA PowerSaver™ Technology	Allows VIA processors to dynamically adjust frequency and voltage based on user requirements
Compact VIA NanoBGA2 package (21 mm x 21 mm)	Excellent thermal characteristics and compact package for greater system design innovation

VIA StepAhead™ Technology Suite

VIA Bus up to 800 MHz FSB	High bandwidth connection to system core logic for optimum performance to memory and peripheral devices
16 pipeline stages	Faster processor speed and efficiency
VIA TwinTurbo™ Technology	Enables processor to switch from low power mode to full performance extremely quickly for smoother operation
Efficiency enhanced 128 KB full-speed exclusive L2 cache with 32-way associativity	Greater memory optimization for enhanced digital media streaming and overall performance
Sophisticated branch prediction mechanism	Intuitive processing capability for better system operation
MMX, SSE, SSE2 & SSE3 instruction sets	Enhanced 3D and multimedia performance
Full-speed FPU	Additional processing power for 3D graphics, multimedia, and streaming functions
IO/APIC support	Greatly reduces interrupt latency

VIA PadLock™ Security Engine

AES Encryption	World's fastest x86 security engine for unbreakable encryption of up to 25 Gbps
Secure Hash SHA-1 and SHA-256	Hashes messages using SHA-1 and SHA-256 algorithms at a rate of 5 Gbps for message authentication, providing evidence if message is tampered or altered
Montgomery Multiplier	Provides hardware acceleration of encryption and decryption for public key algorithms such as RSA, reducing processor load
Two Quantum-based Random Number Generators	Provides an unshakable foundation for security, generating truly random numbers at a rate of 20 million random bits per second
NX bit Protection	Prevents worms attaching to programs and executing