

LS3A5000

The LS3A5000 is a quad-core processor with four 64-bit super-scalar general-purpose processor cores targeting at personal computers, servers and other field. It has a stable operating main frequency of 2.2-2.5GHz and a peak power consumption of no more than 50W at room temperature. Based on the mature micro-architecture of LA464 processor core, retaining the pin-to-pin compatibility with LS3A4000, the performance is enhanced by more than 50% and the power consumption is reduced by more than 30%. The measured performance of LS3A5000 processor exceeds 27 points for single-core in SPEC CPU 2006 base run set, which indicates the most powerful domestic processor core.



Based on Loongson 3A5000, supports multi-channel interconnection.

Stronger performance

- Based on the LoongArch®, the instruction efficiency of the same micro-architecture is increased by 16%
- Further 50% performance improved for general-purpose processing: single-core SPEC CPU 2006 base exceeds 27 points, which is the most powerful domestic processor core
- High-bandwidth memory interface: more than 25GB/s with DDR4-3200
- Unified ecological compatibility: support real-time translation execution of applications from different architectures
- Fine power management: The power consumption is reduced by more than 30%, built-in power control core for dynamic frequency and voltage adjustment.
- Supporting independently developed GPUs: Equipped with the 7A2000 bridge chip-set and adopting independently designed 3D GPU

Efficient cloudification

- High-end multi-channel: Supports up to 16 channels of multi-channel interconnect structure
- High-speed interconnection: with a new multi-channel cache coherency protocol, the performance is improved by 80%
- High-performance support: 16-way servers reaches 1000 points by SPEC
- Efficient virtualization: the computing efficiency of the KVM virtual machine is increased to more than 95%
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Endogenous safety

- Special mechanisms to prevent Meltdown, Spectre and cache overflow attacks
- Kernel stack protection mechanism
- Access control such as IO protection and safe execution environment
- Secure solution on-chip and trusted computing support
- High-performance cryptography algorithm service capability, supporting commercial encryption algorithms and etc.

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CPU Specifications	Core Name	LA464
	Number of Cores	4
	Number of Threads	4
	Frequency	2.3GHz–2.5GHz
	Peak computing speed	160Gflops
	Vector instructions	128/256 bit
	High-speed Cache	L1 I-cache 64KB each core L1 D-cache 64KB each core L2 cache 256KB each core LL cache 16MB
Typical power consumption	<40W@2.5GHz	
Memory Specifications	Memory Types	72 bit DDR4-3200
	Max # of Memory Channels	2
	ECC Memory Supported	yes
I/O Specifications	HyperTransport Revision	Hyper-Transport 3.0 ×2 Support multi-processor data consistent interconnection (CC-NUMA); Support 2/4/8/16 way interconnection
	Other I/O	SPI, UART, I2C×2, GPIO×16