



PLAYSTATION®2 “UNDER THE HOOD” – CHIP SET OVERVIEW

EMOTION ENGINE™

First-Of-Its-Kind:

The 128-bit CPU (“EE” or “Emotion Engine”) is a full 128-bit CPU – the first of its kind in the world – all integrated on a single chip LSI together with the state of the art 0.15 micron process technology.

The new CPU incorporates two 64-bit integer units (IU) with a 128-bit SIMD multimedia command unit, three independent floating point vector calculation units (FPU, VU0, VU1), an MPEG 2 decoder circuit (Image Processing Unit/IPU) and high performance DMA controllers onto one silicon chip.

Four Times The Memory:

The main memory supporting the high speed CPU uses the Direct Rambus® DRAM in two channels to achieve a 3.2 GB/second bus bandwidth – or -- four times the performance of the latest PCs that are built on the PC-100 architecture.

Super Computer:

With a floating point calculation performance of 6.2 GFLOPS/second, the overall calculation performance of this new CPU matches that of a super. When applied to the processing of geometric and perspective transformations normally used in the calculation of 3D computer graphics (3DCG), the peak calculation performance reaches 66 million polygons per second.

New Joint Venture:

Toshiba Corporation and Sony Computer Entertainment Inc. established a joint venture company to produce the Emotion Engine. Sony Computer Entertainment Inc. estimates an investment of 50 billion yen in equipment for the new company.

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GRAPHICS SYNTHESIZER™

Pioneering Technology: The Graphics Synthesizer incorporates a massively parallel rendering engine that contains a 2,560-bit wide data bus -- 20 times the size of leading PC-based graphics accelerators. Very high pixel fill rates and drawing performance is achieved using embedded DRAM process technology pioneered by SCE for use in advanced graphics technology.

Unrivaled Graphics Performance: The original PlayStation introduced the concept of the Graphics Synthesizer via the real-time calculation and rendering of a 3D object. The new GS rendering processor is the ultimate incarnation of this concept – delivering unrivaled graphics performance and capability. The rendering function was enhanced to generate image data that supports NTSC/PAL television. The quality of the resulting screen image is comparable to movie-quality 3D graphics in real time.

Superior Memory Access Bandwidth: In the design of graphics systems, the rendering capability is defined by the memory bandwidth between the pixel engine and the video memory. Conventional systems use external VRAM reached via an off-chip bus that limits the total performance of the system. For the new GS, however, there is a 48-gigabyte memory access bandwidth achieved via the integration of the pixel logic and the video memory on a single high performance chip.

New Subsidiary Company: Sony Computer Entertainment Semiconductor, based in Nagasaki, Japan, is the new chip manufacturing facility responsible for mass production of the Graphic Synthesizer.

I/O PROCESSOR

Backwards Compatibility: Developed with LSI Logic Corporation, the I/O Processor supports IEEE 1394 i.Link and Universal Serial Bus (USB) which are the new standards for digital interconnectivity. The IOP also delivers backwards compatibility with the original PlayStation architecture.

Increased Performance: Based on the original PlayStation CPU with enhanced cache memory and a new, higher performance DMA architecture that permits a four-fold increase in data transfer rates, the serial interface is also upgraded to more than 20 times the performance of the current PlayStation. The USB host controller and the IEEE 1394 link and physical layers are also integrated onto this single LSI chip.

USB Interface Compatibility: The USB 1.0 interface is compatible with OHCI (Open Host Controller Interface) and can handle data transfer rates of between 1.5 Mbps and 12 Mbps (Mega bits per second). IEEE 1394 can handle data transfer rates of between 100 Mbps and 400 Mbps.

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