

# 图元装配的硬件实现与验证

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**摘 要:** 图形流水线是 GPU (Graphics Processing Unit)工作的通用模型.在图形流水线中, 图元装配位于关键环节, 为了提高改善图形流水线的速度和渲染效果, 快速准确地产生图元成为主要因素之一.立足当前图形流水线的要求, 首先采用 SystemC 语言建立图元装配单元的行为模型.然后采用 Verilog 语言实现其硬件电路描述, 同时采用 SystemVerilog 语言搭建验证平台, 完成图元装配单元的功能验证.通过各方面验证, 表明所设计的图元装配单元满足系统设计的要求.

**关键词:** 图形处理器; SystemC 行为模型; 硬件实现; SystemVerilog

## Hardware Primitive Assembler Implementation and Verification

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**Abstract:** Graphics pipeline is a common model of GPU (Graphics Processing Unit)work. primitive assembler is one of the key stage in the graphics pipeline, in order to improve the efficiency and quality of rendering by the graphics pipeline, quickly and accurately generate primitives as one of the main factors. This paper meets the requirements of the current graphics pipeline, this paper uses SystemC language to build the behavior model of primitive assembler. And uses Verilog language to perform hardware design of primitive assembler unit. And further more, this paper uses SystemVerilog language to build the hierarchical verification environment which facilitates the design modules. Through all aspects of verification, this paper shows that the design of the primitive assembler unit metaphor to meet the system design requirements.

**Key words:** graphics processing unit; systemC behavioral modeling; hardware implementation; SystemVerilog

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