

一种并行的 PCS 子层帧同步检测模块设计与实现

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摘要: 为了满足 10 Gbps 传输速率下 PCS 子层帧同步需求, 深入研究 10 G 以太网 PCS 子层帧同步原理及常用帧同步检测方式, 综合考虑面积开销和检测效率, 设计了一种并行的帧同步检测模块, 解决了帧同步检测中同步头跨数据块、标志位对齐等难题, 提高了帧同步效率, 能够满足 10 Gbps 速率 PCS 子层帧同步要求. 采用 ModelSim 对设计的帧同步检测模块进行仿真验证, 结果表明, 该模块能够高效的实现 10 Gbps 速率 PCS 子层帧同步检测功能, 帧同步速度明显提升, 具有较强的适应性、健壮性和稳定性。

关键词: 10G 以太网; PCS; 帧同步; 并行

Design and Implementation of a Parallel PCS Sublayer Frame

Synchronization Detection Module

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Abstract: In order to meet the needs of PCS sublayer frame synchronization at 10 Gbps transmission rate, depth studying of 10 G Ethernet PCS sublayer frame synchronization principle and common frame synchronization detection method, considering the chip area and detection efficiency, a parallel frame synchronization detection module is designed, which solves the problems of the synchronous header cross data blocks and the alignment of bits in the frame synchronization detection, improves the frame synchronization efficiency, and can meet the requirements of the 10 Gbps frame synchronization of the PCS sublayer. ModelSim is used to verify the design of the frame synchronization detection module, the results show that the module can effectively achieve the 10 Gbps PCS sublayer frame synchronization detection function, the frame synchronization speed is markedly improved, with strong adaptability, robustness and stability.

Key words: 10 gigabit ethernet; PCS; frame synchronization; parallel

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