一种低耦合翻转的数据总线编码方法

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摘　要： 针对片上系统中数据总线功耗显著的特点，提出了一种低耦合翻转的数据总线编码方法.利用数据总线前一时刻传输的数据对当前时刻需要传输的数据进行异或编码、同或编码，并将异或编码、同或编码、反转编码及原码中耦合翻转次数最少的数据送到数据总线上进行传输，有效降低了数据总线的功耗.实验结果表明，对于常用的 32 bit 数据总线，该编码方法可以将总线功耗降低 33.06%，优于传统的 CBI 编码方法和 E/O BI 编码方法.

关键词： 耦合翻转；低功耗编码；数据总线；片上系统

A Novel Data Bus Encoding with Low Coupling Transitions

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Abstract： Data bus consumes a large amount of energy in the system-on-chip. This paper proposes a novel data bus encoding with low coupling transitions to save the data bus power dissipation. The encoder utilizes the previous data on the data bus to encode the current data with XOR and XNOR operations, and chooses the data with minimal coupling transitions among XOR encoding data, XNOR encoding data, invert encoding data and the original data to send on the data bus. This method can reduce a majority of data bus coupling transitions, thus saving the data bus power dissipation significantly. Experimental results show that this method could save 33.06% of the common 32-bit data bus power dissipation, superior to the traditional CBI encoding and E/O BI encoding

Key words： coupling transitions; low power encoding; data bus; system on chip

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