

JEDEC STANDARD

Scalable Low-Voltage Signaling for 400 mV (SLVS-400)

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Introduction

SLVS is a chip-to-chip signaling protocol which is designed from the beginning for maximum performance and minimum power consumption. It derives from four fundamental principles:

- a) Maximum performance requires that both near- and far-end reflection coefficients be minimized. Therefore both driver and terminator impedances must closely match the line impedance.
- b) For reasonable power consumption, signal swing should be as small as is consistent with receiver performance.
- c) Power supply voltages will continue to decrease, as will the swing needed for receiver performance. Therefore, the signaling protocol should be as independent of the positive supply as possible.
- d) Additional low-impedance supplies, especially ones that can both sink and source current, are expensive both in cost and performance impact.

Item (a) demands shunt termination. (c) and (d) rule out the positive signal supply and any third supply, which leaves ground as the termination potential. Combined with (a) this demands a signal swing between ground and 50% of the output supply, which is consistent with (c). As an added benefit, this simplifies CMOS differential receivers because they don't need to combine N- and P-channel differential inputs. (b) suggests I/O operation below the core-logic supply potential, which minimizes intergenerational incompatibility.

Higher-level data organization is outside of the scope of this specification, but it should be noted that variations in supply and ground current are incompatible with maximum performance. For that reason, SLVS-400 is intended for use with DC-balanced data groupings such as 4B/6B and differential (1B/2B) codes.

Specific applications are also outside of this specification's scope. That said, it should be noted that ground termination greatly simplifies hot-insertion systems. It should also be noted that with a timing budget relaxed to account for line settling and $L \, di/dt$ drops the source-impedance matching of SLVS-400 allows its use in unterminated (reflected-wave) switching environments.