Differential SCSI

\[ VOD/2 \]

\[ 1V \leq |VOD| \leq 6V \]

\[ -7V < VIC < 12V \]

\[ \text{VIT} < 200mV \]

\[ \text{VGND} < 7V \]

\[ 5V \]

\[ 165\Omega, 75\Omega, 375\Omega \]
Differential Driver Power vs VOD

- Bias does not affect average power in driver appreciably
- Integration requires about 50 mW avg per driver
- Lower VCC and/or VOD are the only path(s) to power dissipation reduction and integration
What is LVDS?

LVDS stands for Low-Voltage Differential Signaling and is fundamentally RS-422 with reduced output signal levels, receiver sensitivities, and ground potential differences. It has been and is being standardized in IEEE and EIA/TIA.
LVDS

- $0.05V < VIC < 2.35V$
- $1.125V < VOC < 1.375V$
- $|VGND| < 1V$
- $VIT \leq 100mV$
- $50\Omega$
- $247mV \leq |VOD| \leq 454mV$
- $|VOD/2| < 454mV$
- $0.05V < VIC < 2.35V$
- $50\Omega$
- $VOD/2$
LVDS

- >1Gbps (theoretical)
- 100 Mbps to 10 m over UTP in Laboratory
- Transmission line from the die on out
- Compatible with 3 V- or 5 V-logic semiconductor processes allowing integration and reduction in skew.

260 ps ≤ tr or tf ≤ 1.5 ns
Problems solved

![Graph showing power consumption vs. VOD for 5 V LVDS with 0.2V BIAS and 3V LVDS with 0.2V BIAS. The graph displays bars representing power consumption at various VOD values ranging from -0.45 to 0.45. The y-axis represents power in W, ranging from 0 to 0.07 W.]
Problems created

- Point-to-point vs bus structure
  - A multi-drop bus structure would require doubling the driver output currents (lowering the load impedance) of LVDS
  - High-impedance driver output requirements
  - Stubs and bus loading and noise margins
  - Idle-line failsafe
Problems created

- Backward Compatibility
  - Not even close to the +/-7V ground potential difference capability of RS-485
  - RS-485 signal can be attenuated to interface to LVDS receiver
  - LVDS signal should be detectable by most RS-485 receivers but not assured
  - Idle-line failsafe is not compatible