3.3 Volt SCSI Termpwr

- **3.3 Volts TERMPWR Source.**
  - 3.3 Volts minus JEDEC tolerance is 3.0 Volts.
  - 3.3 Volt systems should connect to 5 Volt SCSI termpwr requiring a regulator for 2.7 to 5.25 Volt operation.

- **Unidirectional Circuit Breaker Required for less than 0.2 Volt drop.**
  - Section reference SPI 7.3 Add note Use a Unidirectional Circuit Breaker for 3.3 Volt systems.
  - Circuit Breaker Maximum drop, 0.2 Volts under full load
  - Cable drop 0.1 Volts with 1/2 load
  - Terminator regulator drop less than 0.2 Volts, all lines 24 mA load.

- **Change from SPI Table 7 (add) 3.3 Volt Single-ended 2.80 VDC Min 5.25 VDC Max 1000 mA for 8 Data bit buses.**

- **Change from SPI Table 7 (add) 3.3 Volt Single-ended 2.80 VDC Min 5.25 VDC Max 1500 mA for 16 Data bit buses.**
3.3 Volt Basics

- 3.3 Volt Requires 2.7 Volt terminators at the far end or power from an other device.
  - Standard termination requires at least 4.0 Volts.
  - Not all 3.3 Volt systems can provide adequate power for the terminators.
  - 3.3 Volt Terminators must work to 5.25 Volts.
  - Addition Special Icons showing users the limitations instead of the symbols shown in SPI Annex H.

Circle/Slash used when Termpwr is not adequate for the terminators.
Termination

- Regulated Termination
  - SCSI-3 SPI Maximum pull up current is 24 mA at 0,2V.
  - SCSI-3 SPI minimum pull up voltage is 2,5 Volts.

- Battery systems often require TERMPWR to be supplied externally.
  - Termpwr could be from a 5,25 Volt source, which requires all 3,3 Volt systems to run with 2,7 to 5,25 Volt TERMPWR.

- Change from SPI section to 7.1.1 3.3 Volt Systems the terminators must regulate with TERMPWR from 2,7 VDC to 5,25 VDC

- The regulated terminators shall use source/sink regulators to reduce overshoot, high Active Negation Driver pull up voltage, and protect 3,3 Volt Logic.

- High voltage clamp to protect logic 3,6 Volts (AMD)
3.3 Volt Logic Issues

- **Maximum SPI-LV bus Voltage, ViH**
  - 3.6 Volts is the maximum recommended voltage for 3.3 Volt logic. The JEDEC standard is 3.3 Volts +/- 0.3 Volts.
  - Some controllers may require clamping when connected to 5 volt SCSI units that drive signal lines above 3.6 Volts.

- **Standard meet current standard levels except ViH maximum**
  - There is not problem using the standard thresholds for 3.3 Volt logic. 2.0 Volts is the maximum high Threshold.
  - Recommended termination reference voltage is 2.5 to 3.0 Volts.
  - Maximum pull up current with Termpwr from 2.7 to 5.25 Volts is 24 mA at 0.2 Volts.
  - Terminators shall not source current when the line is over 3.24 Volts.
  - Terminators shall sink current when the line is over 3.24 Volts, reducing overshoot. The terminator sink current shall not exceed 12 mA when the line is 3.5 Volts.
Differential Termination

- 3.3 Volt Differential Termination Works With Adequate Bias Voltage
  - TERMPWR = 5 Volts, Bias = 0.93 Volts
  - TERMPWR = 4 Volts, Bias = 0.735 Volts
  - TERMPWR = 3 Volts, Bias = 0.555 Volts

- Alternative Termination Should be defined
  - 0.5 to 1.0 Volt bias across 120 ohms
  - Common mode 120 ohms to a 2 volt bias point

- Alternate AC/DC Termination
Passive Differential Termination

X3T10/94-164R3 (Mar 95)