CABLING, TERMINATION, AND "TERMPWR"

The cable placement in the system is very critical. Cables should be laid out in a daisy-chained fashion, with no stubs, or stubs shorter than 10 cm, with exactly two terminators located on physical ends of the cable. The terminating circuits protect from reflecting the signals back into the cable. Only the DIFFSENS line is not terminated. Cable termination depends on the electrical connection used. The following illustrations show examples of terminators used on a Single-Ended, HVD, and LVD SCSI bus.

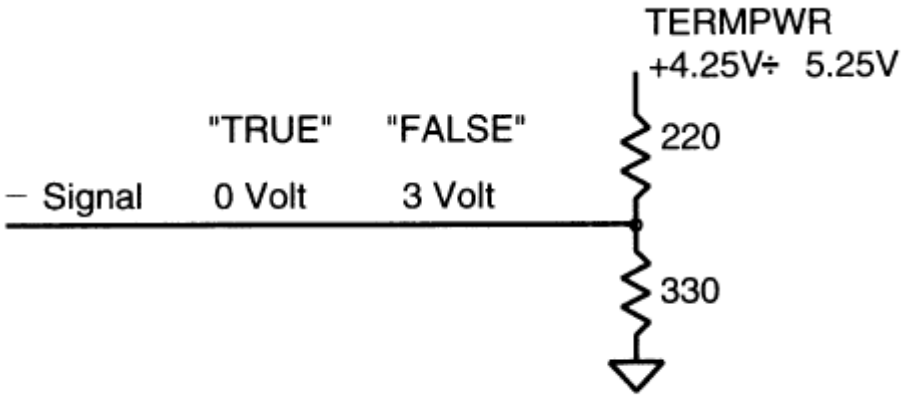

Figure 18. Single-Ended (SE) passive termination

Active termination for Single-Ended is strongly recommended for its high noise immunity. SCSI-3 allows only active termination for the Single-Ended interface. It is permissible to mix the active and passive terminators on the same cable.

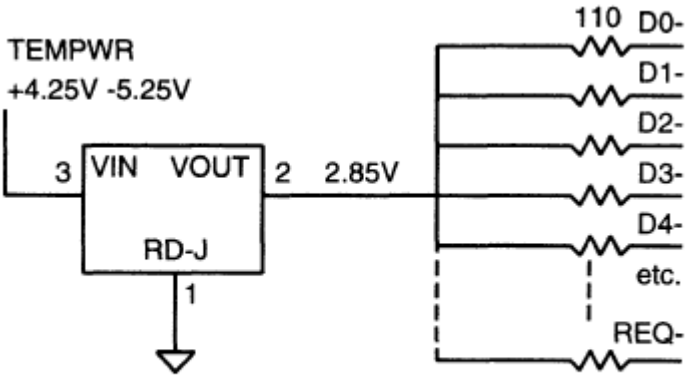

Figure 19. Single-Ended (SE) active termination

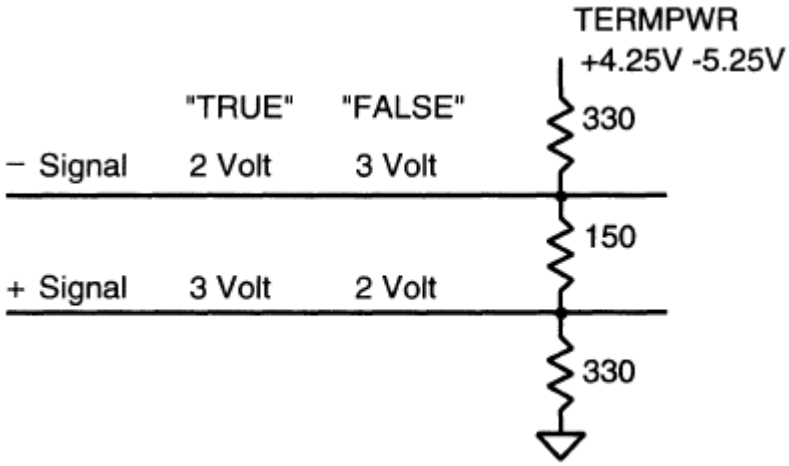

Figure 20. High Voltage Differential (HVD) passive termination

The HVD interface is inherently more immune to noise, so the resistor type termination is generally used. The LVD interface specification calls for active terminators.

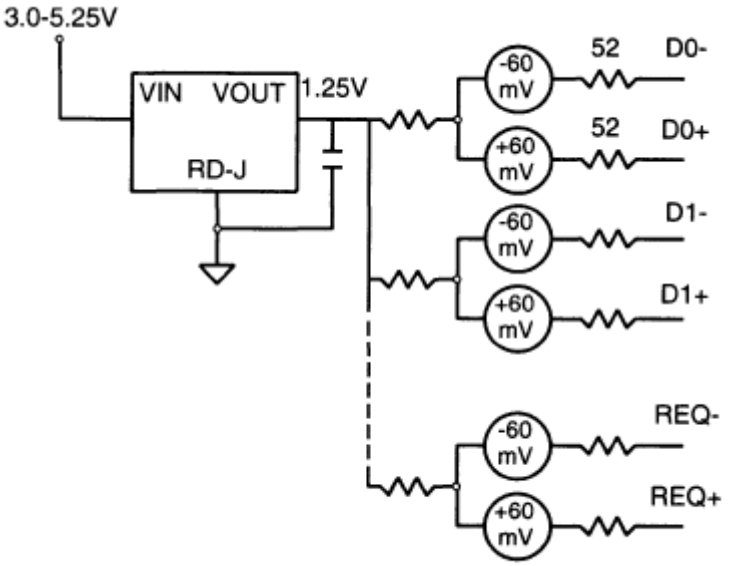

Figure 21. Low Voltage Differential (LVD) active termination

The TERMPWR line is used for providing the power for the terminators. Most often, the devices provide power for their own terminators, but if they don't, the TERMPWR provided by the host adapter will be used. The TERMPWR is specified to be at least 4.25 volts (SCSI-2 specification), but theory and experiments show that the higher the level, the better the noise immunity. Also, it is not sufficient to measure the voltage level at the source. If the cable is longer then you have to consider the voltage drop across the full length of the cable. You may discover that the TERMPWR at the terminator,
where it is finally used, is lower than the specified limit.

SE termination

All SCSI bus signals are common among all devices connected to the bus. All signal lines shall be terminated at both ends with a terminator that is compatible with the type of transceivers used in the SCSI devices. The termination points define the ends of the bus. These termination points may be internal to an SCSI device.

NOTE 3 - If the termination is provided and enabled within an SCSI device that device should not be removed from the SCSI bus while the bus is in use.

All SE conductors not defined as RESERVED, SIGNAL RETURN, or TERMPWR shall be terminated exactly once at each end of the bus. The termination of each signal shall meet the following requirements:

a. the terminators shall be powered by the TERMPWR line and may receive additional power from other sources but shall not require such additional power for proper operation (see 7.6);
b. each terminator shall source current to the signal line whenever its terminal voltage is below 2,5 V D.C. and this current shall not exceed 22,4 mA for any line voltage

above 0,5 V D.C and 25,4 mA for any line voltage between 0,5 V D.C. and 0,2 V D.C. even when all other signal lines are driven at 4.0 V D.C.;

c. the voltage on all released signal lines shall be at least 2,5 V D.C.;

d. these conditions shall be met with any conforming configuration of targets and initiators as long as at least one device is supplying TERMPWR;

e. the terminator at each end of the SCSI bus (see 7.2.4) shall add a maximum of 25 pF capacitance to each signal.

f. the terminator shall not source current to the signal line whenever its terminal voltage is above 3,24 V D.C. except terminators may source current when the voltage is above 3,24 V D.C. in applications where the bus is less than 0,3 m.

Terminators employing a 220 ohm resistor to 5 volts and a 330 ohm resistor to ground shall not be used.

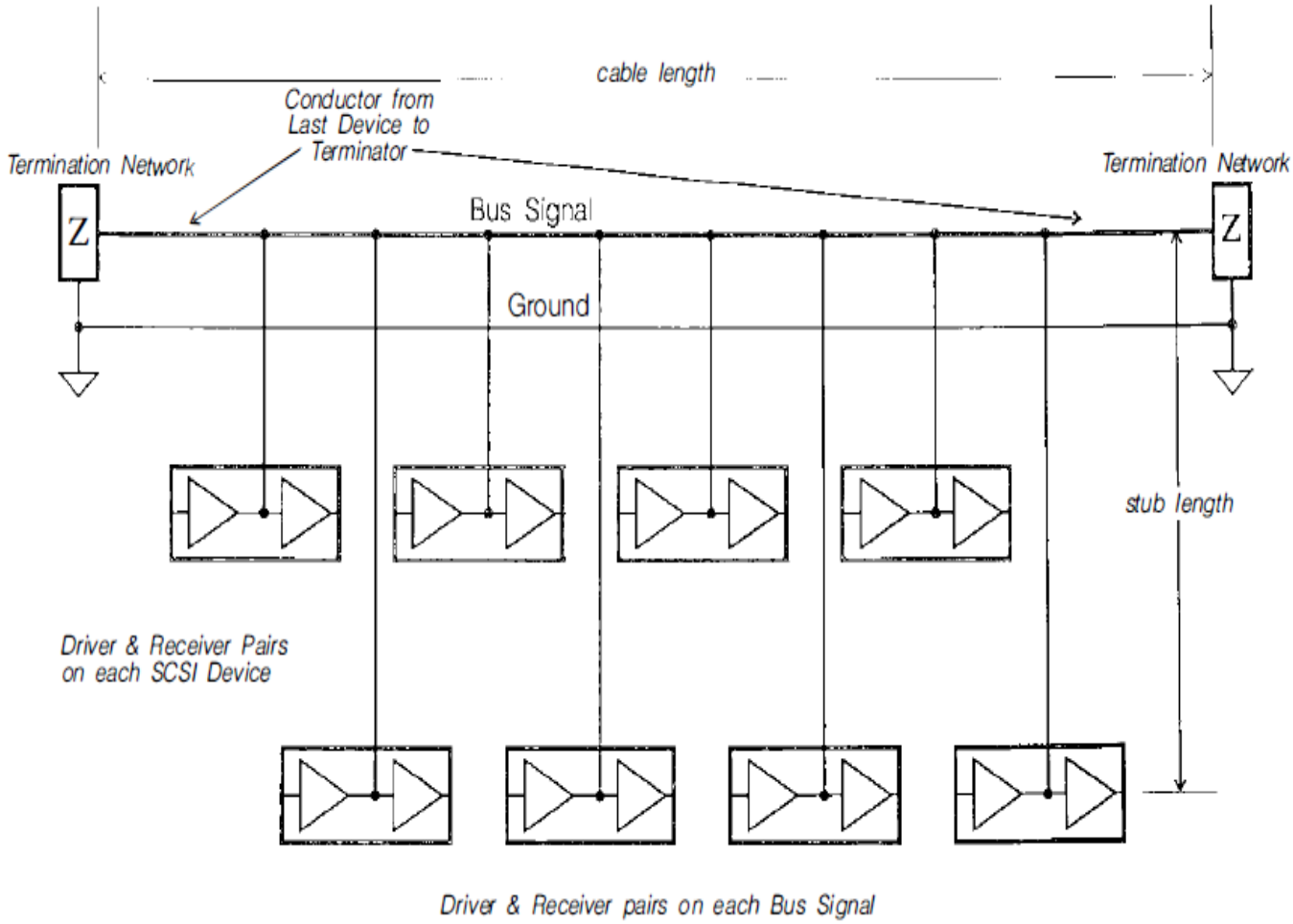

DIAGRAM 14: CABLE AND STUB LENGTH SCHEMATIC

Diagram 14 shows a schematic representation of cable length and stub length . Note that cable length is measured from the Terminator at one end of the system to the terminator at the other end . In other words , if there is any conductor between the last stub to the end device and the terminator on either end of the cab l e , that length should be included in the total cab le length .

Summary

1. Termination is required at both end of the SCSI cable.
2. If the SF2 is required to terminate the bus then **LK2** should be fitted. However, this requirement can only be ascertained by the customer.
3. Termination is powered from the SCSI connector **TERMPWR** pin
4. **TERMPWR** can be supplied from the SF2 if necessary (**LK1** closed)
5. The **LED1** will be lit if **TERMPWR** is available & **LK1** can then be left open.
6. If **LED1** is not lit then **LK1** will need to be closed. This will light **LED1** & supply **TERMPWR** to the system.