Date: October 9, 2002
To: T10 Technical Committee
From: Alvin Cox (alvin.cox@seagate.com)
Subject: SAS Test Loads

The following changes to text and test load figure are made to aid the testing process by clarifying and defining the compliance channel test load and zero-length test load.

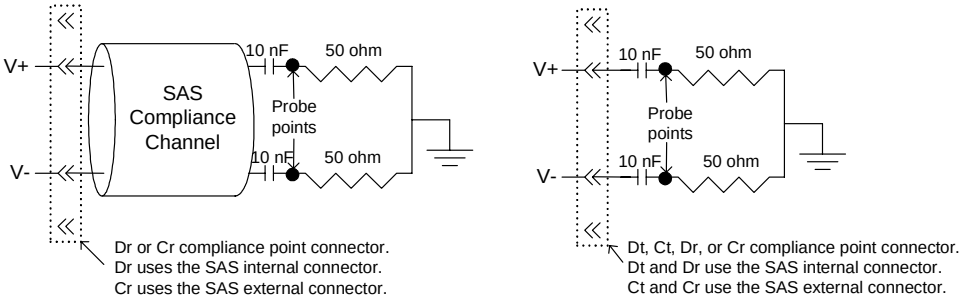
5.7.11 Driver characteristics

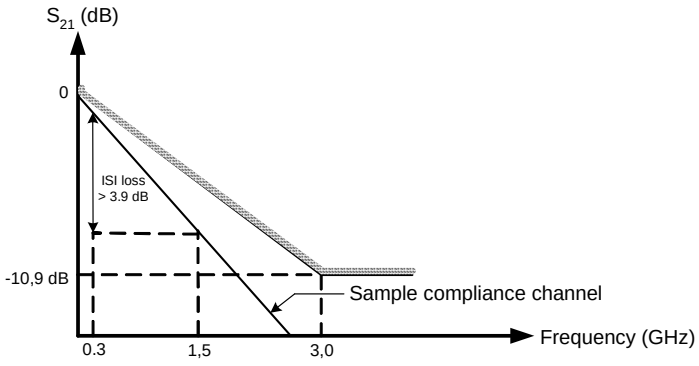
For all inter-enclosure TxRx connections, the output shall be A.C. coupled to the cable through a transmission network.

For intra-enclosure TxRx connections the expander shall be A.C. coupled to the media. Other drivers may be A.C. or D.C. coupled.

The driver shall have the output voltages and timing listed in table 17 and table 19 measured at the designated interoperability points. The default point is Ct for inter-cabinet TxRx connections and Dt for intra-cabinet TxRx connections. The measurements shall be made across a load equivalent to **the zero-length load ~~that~~** shown in figure 33 **unless otherwise specified**.

The relevant eye diagrams are given in 5.7.4. The normalized amplitudes, Y1 and Y2, allow signal undershoots. The driver shall meet both the normalized and absolute values.





Compliance channel magnitude response and ISI loss example for 3,0 Gbps

Figure 33 — Test loads

5.7.12 Receiver characteristics

The receiver shall be A.C.-coupled to the media through a receive network. The receive network shall terminate the TxRx connection by a 100 ohm equivalent impedance as specified in table 21.

The receiver shall operate within the BER objective (10^{-12}) when a SAS signal with valid voltage and timing characteristics is delivered to the interoperability point from a 100 ohm source. The delivered SAS signal shall be considered valid if it meets the voltage and timing limits specified in table 19 when measured across **both the zero-length and compliance channel a** ~~-~~load**s** equivalent to those of figure 33 **unless otherwise specified**. **The transmission magnitude response, [S_{21}], of the compliance channel in dB satisfies the following equation:**

$|S_{21}| \leq -20 \log(e) \{[6.5 \times 10^{-6}(f^{-.5})] + [2.0 \times 10^{-10}(f)] + [3.3 \times 10^{-20}(f^{2})]\}$ dB

A compliance channel magnitude response and ISI loss example for 3 Gbps is shown in figure 33.

Additionally the receiver shall also operate within the BER objective when the signal at a receiving phy has the additional sinusoidal jitter present that is specified in the table 20. Jitter tolerance figures are given in 5.7.4.4 for all interoperability points in a TxRx connection. The figures given assume that any external interference occurs prior to the point at which the test is applied. When testing the jitter tolerance capability of a receiver the additional 0,1 UI of sinusoidal jitter may be reduced by an amount proportional to the actual externally induced interference between the application point of the test and the input to the receiving phy. The addition of additional jitter reduces the eye opening in both voltage and time; see the Jitter tolerance masks in 5.7.8.