TEST RESULTS WITH CONTROLLED LOADS FOR LVD SCSI

• THE FIRST ROUND OF TESTING HAS BEEN COMPLETED USING THE NEW CONTROLLED LOAD BOARDS
• THESE BOARDS ALLOW PLACING A KNOWN CAPACITIVE LOAD ON THE SCSI BUS
• THE PRESENT SPECIFICATIONS IN SPI-2 WERE USED AS THE MAIN TEST POINT (20/20/10 pF)
• LVD SCSI IS QUITE SENSITIVE TO PROPER LOADING: THE SENSITIVITY APPEARS GREATER AT SHORTER LENGTHS
TEST RESULTS WITH CONTROLLED LOADS FOR LVD SCSI

• The worst case appears to be the first set of clustered loads after a long unloaded run
• Spreading out the loads and/or using higher capacitance cable is beneficial
• Asymmetrical drivers were not used but will be apparently be necessary
• A 5 to 7 ns digital glitch filter would be beneficial for all edges
• FEP cable is definitely a problem for signal reflections
• With 400 mV drivers it appears that a 15 meter overall length is feasible -- length is limited by reflections not by attenuation
• Some test data with unbalanced loads was acquired
• An apparently worst case intersymbol interference time of 2 ns was measured (in agreement with the values presently in SPI-2)
FAST 40 LVD SCSI REQ / ACK SIGNALS

EFFECT OF DIFFERENT LOADS

C1 = C2 ~= 10 pF; C3 ~= 5 pF

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 4” SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FAR TERM
FAST 40 LVD SCSI REQ / ACK SIGNALS

EFFECT OF UNBALANCED LOADS

C1 = C2 ≈ 60 pF; C2 ≈ 20 pF

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FAR TERM
FAST 40 LVD SCSI REQ / ACK SIGNALS

C1 = C2 ~ 20 pF; C3 ~ 50 pF

C1 = C2 ~ 60 pF; C3 ~ 50 pF

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 4” SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FAR TERM
FAST 40 LVD SCSI REQ / ACK SIGNALS

C1 = C2 ~ 10 pF; C3 ~ 5 pF

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 4” SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

FAST 20

200 mV / DIV
1.25 V

+200 mV
0
-200 mV

Differential Signal

100 NS/DIV C1 = C2 ~ 60 pF; C3 ~ 50 pF

FAST 40

200 mV / DIV
1.25 V

+200 mV
0
-200 mV

Differential Signal

50 NS/DIV C1 = C2 ~ 60 pF; C3 ~ 50 pF

400 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT DRIVER
FAST 40 LVD SCSI REQ / ACK SIGNALS

400 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 4” SPACING
FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

100 NS / DIV 10/10/5 pF LOADS

20/20/10 pF LOADS

400 mV DRIVERS; 4 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 4” SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

10 NS/DIV  20/20/10 pF LOADS
SAME AS LAST SLIDE BUT WITH EXPANDED TIME SCALE

AS ABOVE BUT WITH LOADS 6, 8, 9 UNPLUGGED

400 mV DRIVERS; 26 METERS VAR # DEVICE  LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 4” SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

10 NS/DIV 20/0/10 pF LOADS 4 METERS UNPLUGGED 2, 4, 6, 8 ONLY HAVE TOTAL OF 6 LOADS SPACED 8” APART (EXCEPT 9 & 10) ALL FEP CABLE NEAR LOADS

10 LOADS ON 8” CENTERS; 5 METERS; TPE CABLE FOR 1ST 8. FEP FOR LAST 2

400 mV DRIVERS; VAR # DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

400 mV DRIVERS; 10 DEVICE LOADS (20/20/10 pF) CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 8” SPACING, LOADS ON TPE CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

400 mV DRIVERS; 10 DEVICE LOADS (20/20/10 pF) CLUSTERED NEAR FAR TERMINATOR, 2.5” STUBS, 8” SPACING, LOADS ON TPE CABLE ~ 15 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD
FAST 40 LVD SCSI REQ / ACK SIGNALS

NOTE ISI (~3 NS TO 0 FOR LONG PULSE; ~ 1 NS TO 0 FOR SHORT PULSE) OF ~ 2 NS

400 mV DRIVERS; 9 DEVICE LOADS (20/20/10 pF) CLUSTERSD NEAR FAR TERMINATOR, 2.5" STUBS, 8" SPACING, NO TERM BIAS