

# TEST RESULTS WITH CONTROLLED LOADS FOR LVD SCSI

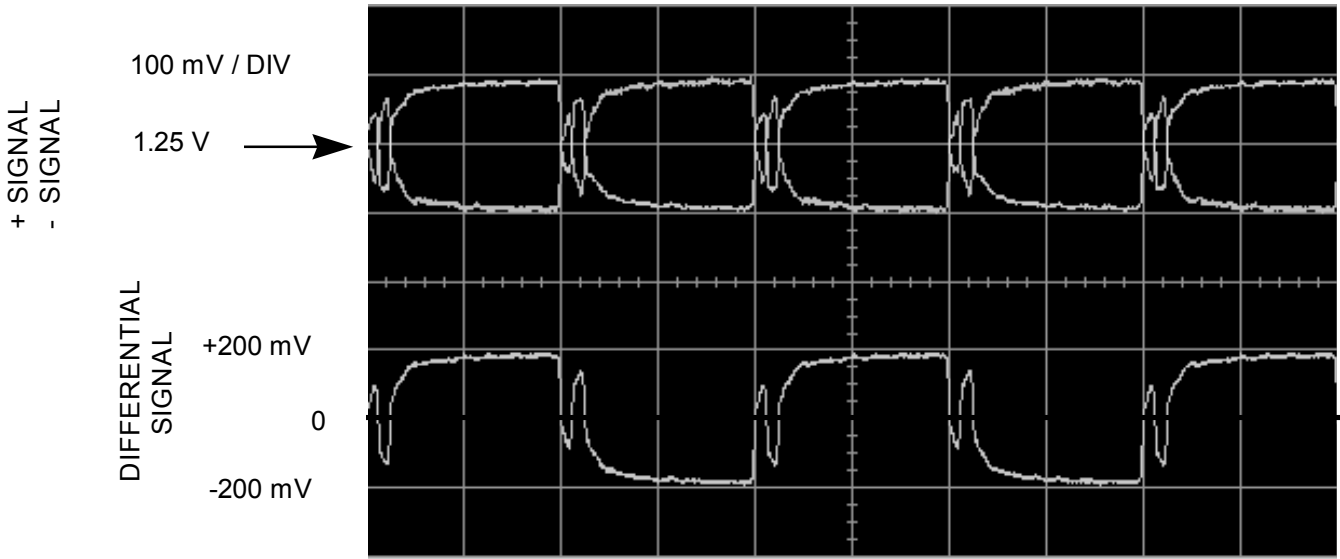
- THE FIRST ROUND OF TESTING HAS BEEN COMPLETED USING THE NEW CONTROLLED LOAD BOARDS
- THESE BOARDS ALLOW PLACING A KNOWN CAPACITIVE LOAD ON THE SCSI BUS
- THE PRESENT SPECIFICATIONS IN SPI-2 WERE USED AS THE MAIN TEST POINT (20/20/10 pF)
- LVD SCSI IS QUITE SENSITIVE TO PROPER LOADING: THE SENSITIVITY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

# TEST RESULTS WITH CONTROLLED LOADS FOR LVD SCSI

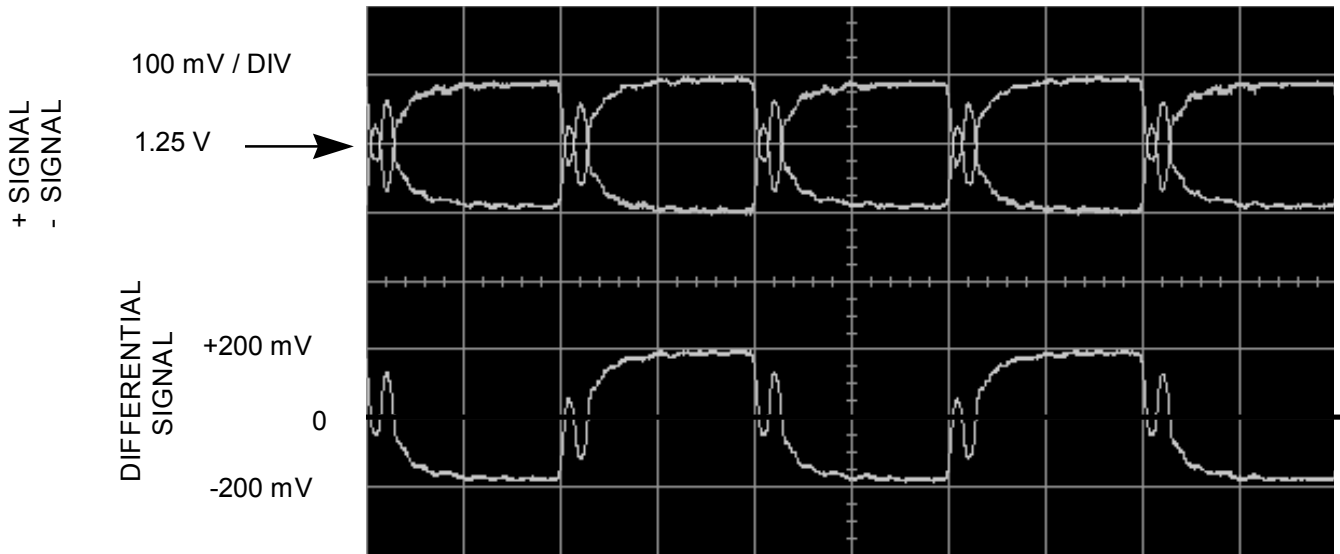
- THE WORST CASE APPEARS TO BE THE FIRST SET OF CLUSTERED LOADS AFTER A LONG UNLOADED RUN
- SPREADING OUT THE LOADS AND/OR USING HIGHER CAPACITANCE CABLE IS BENEFICIAL
- ASYMMETRICAL DRIVERS WERE NOT USED BUT WILL BE APPARENTLY BE NECESSARY
- A 5 TO 7 NS DIGITAL GLITCH FILTER WOULD BE BENEFICIAL FOR 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

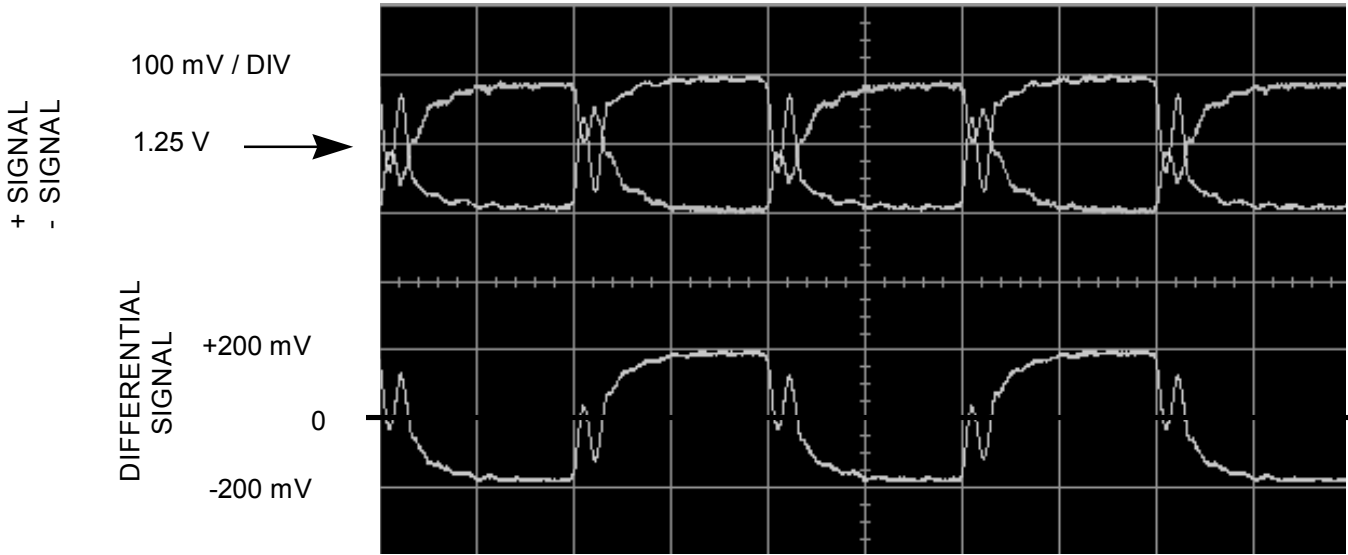


100 NS/DIV C1 = C2 ≈ 20 pF; C3 ≈ 10 pF

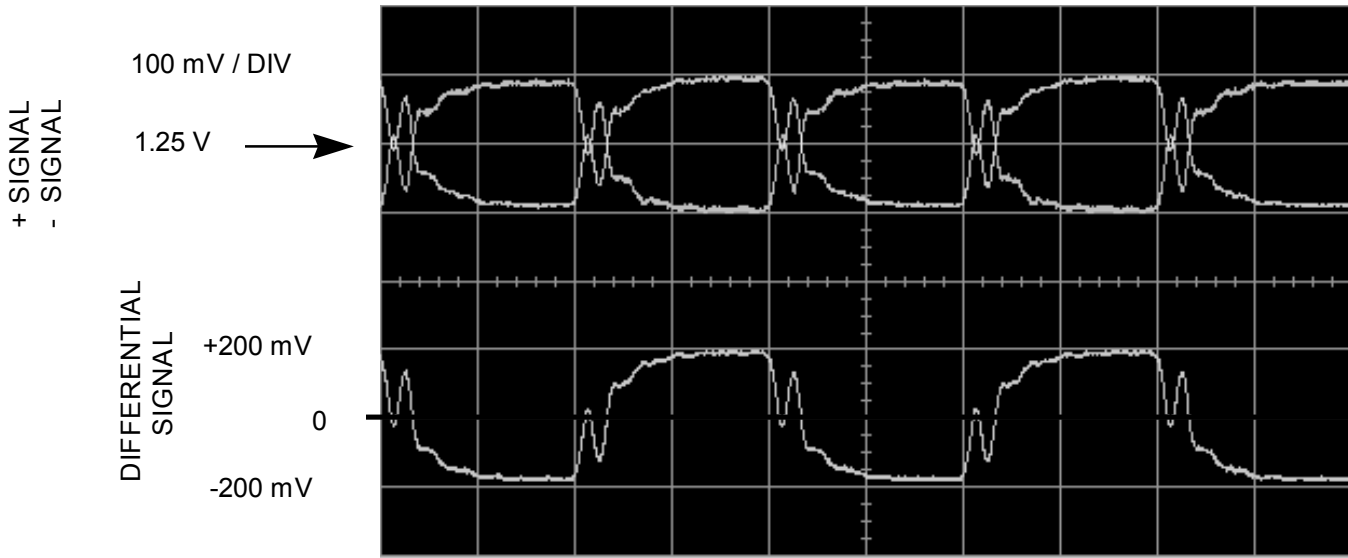
200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FAR TERM

# FAST 40 LVD SCSI REQ / ACK SIGNALS

## EFFECT OF UNBALANCED LOADS



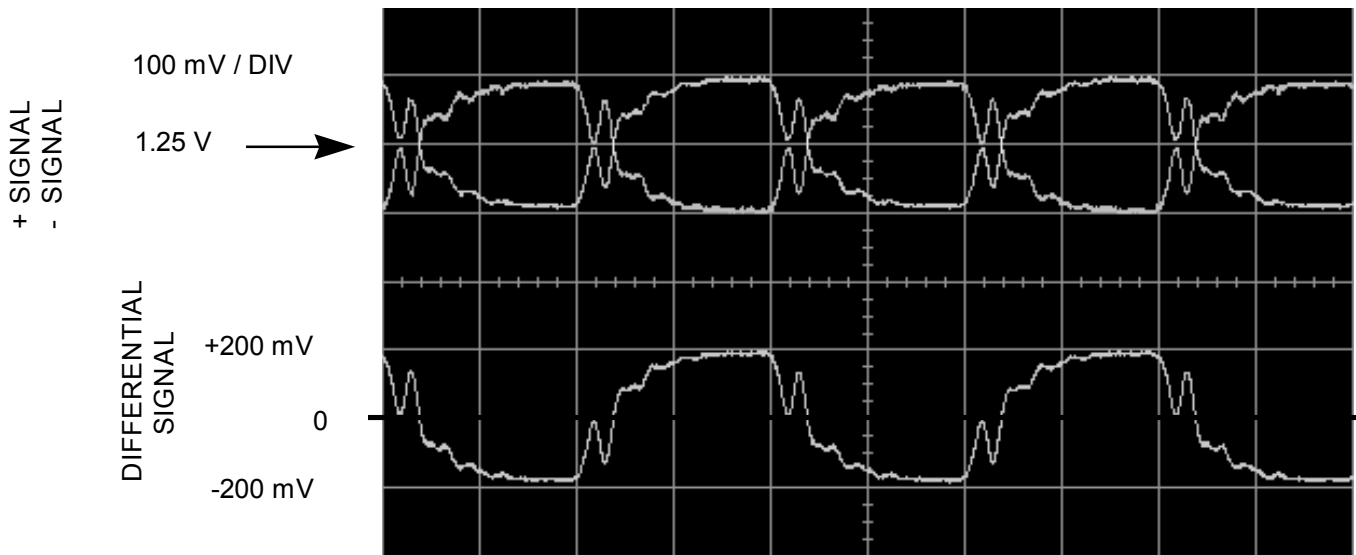
C1 ≈ 60 pF; C2 ≈ 20 pF



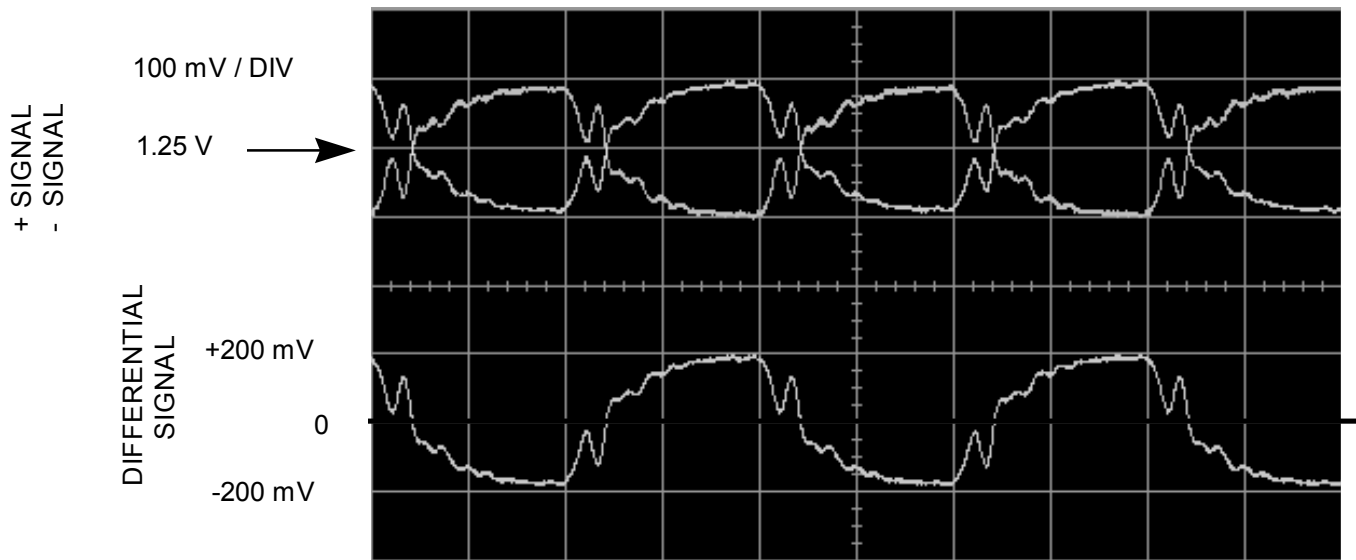
100 NS/DIV C1 = C2 ≈ 60 pF

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



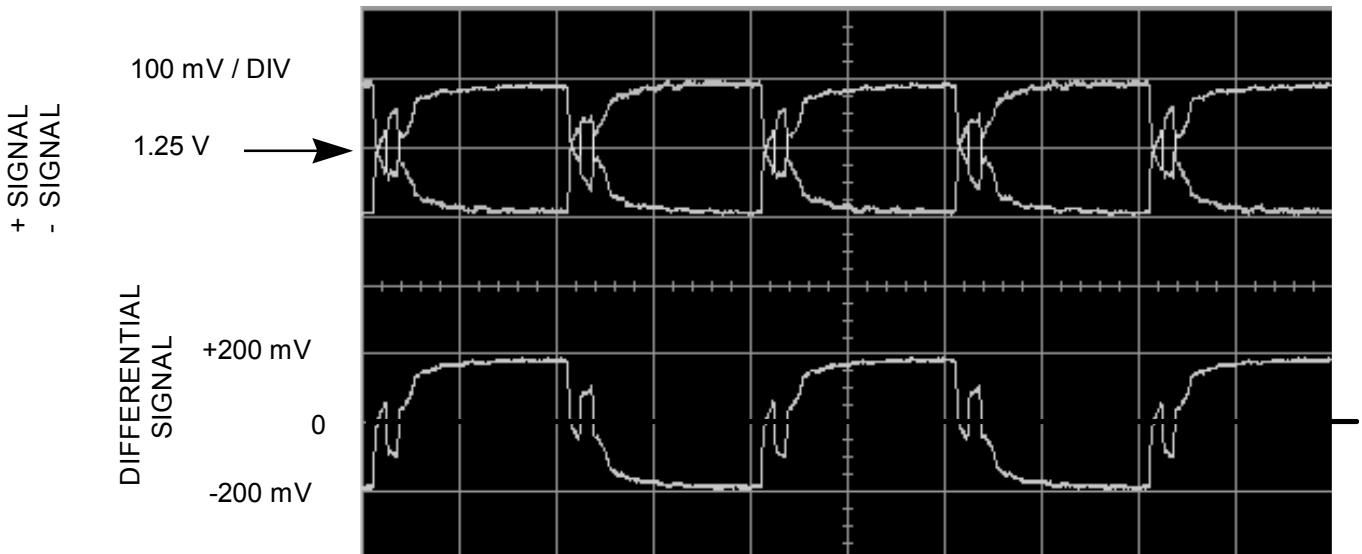
$C1 = C2 \approx 20 \text{ pF}; C3 \approx 50 \text{ pF}$



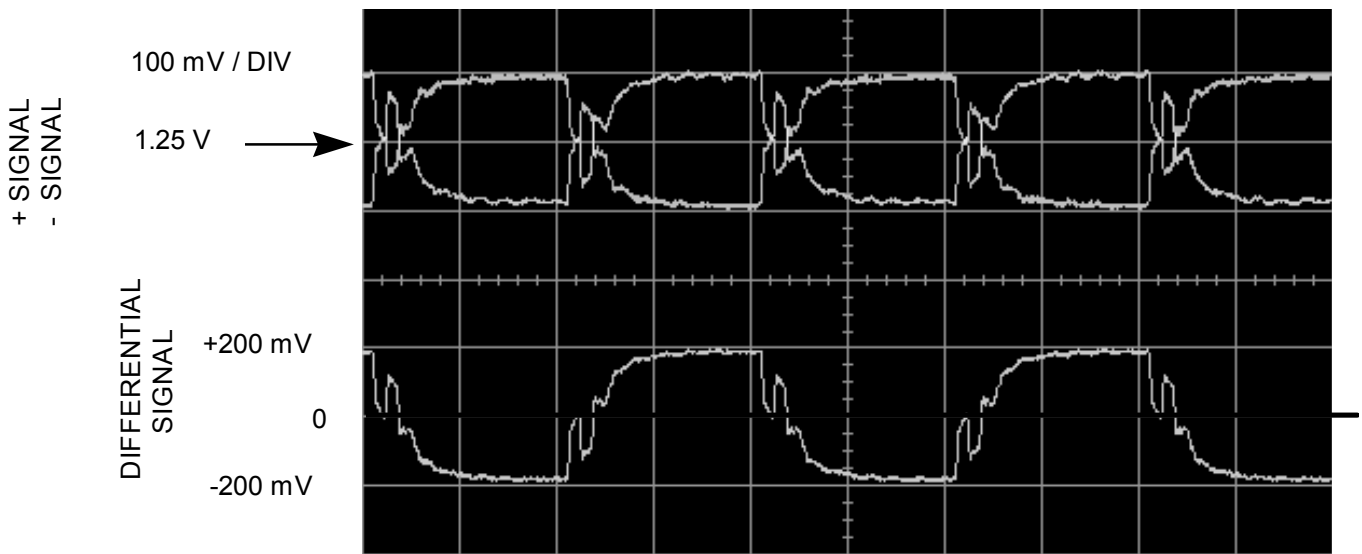
100 NS/DIV  $C1 = C2 \approx 60 \text{ pF}; C3 \approx 50 \text{ pF}$

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE  $\sim 10 \text{ pF/FT}$ , NO TERM BIAS; PLOTS AT FAR TERM

# FAST 40 LVD SCSI REQ / ACK SIGNALS



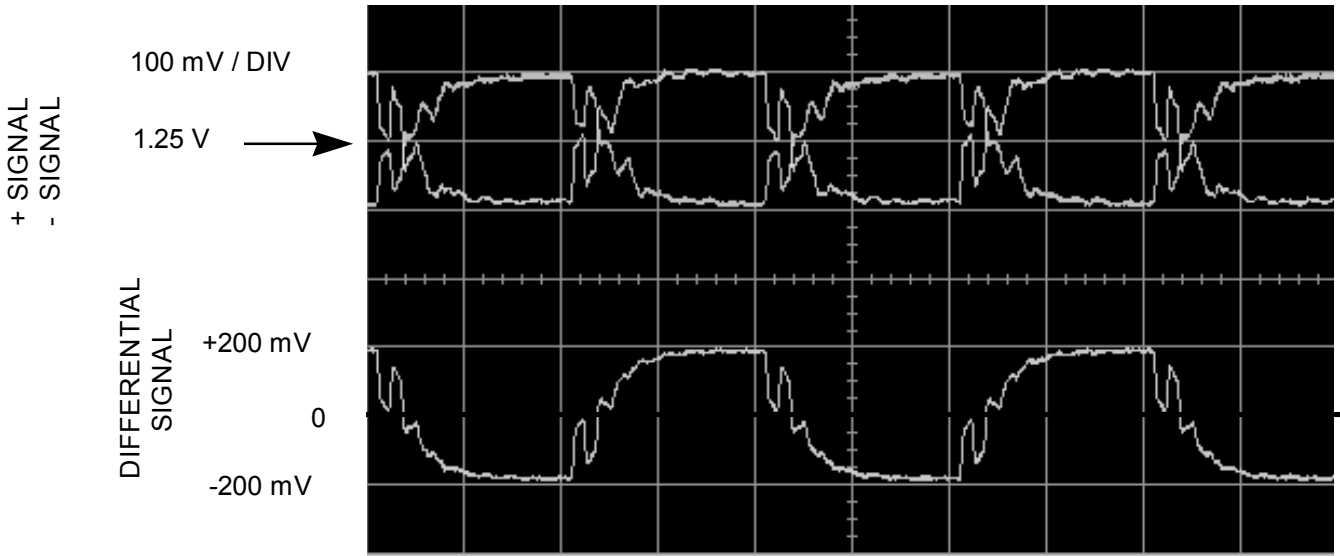
$C1 = C2 \approx 10 \text{ pF}$ ;  $C3 \approx 5 \text{ pF}$



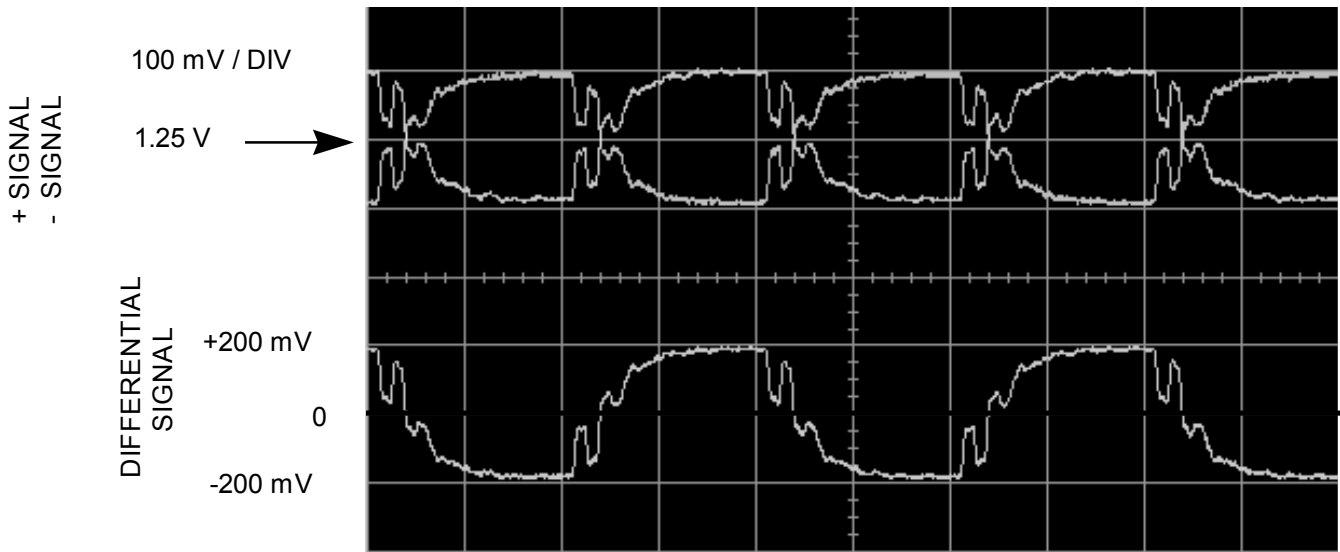
100 NS/DIV  $C1 = C2 \approx 20 \text{ pF}$ ;  $C3 \approx 10 \text{ pF}$

200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE  $\sim 10 \text{ pF/FT}$ , NO TERM BIAS; PLOTS AT FIRST LOAD

# FAST 40 LVD SCSI REQ / ACK SIGNALS



C1  $\approx$  60 pF; C2  $\approx$  20 pF; C3  $\approx$  10 pF?

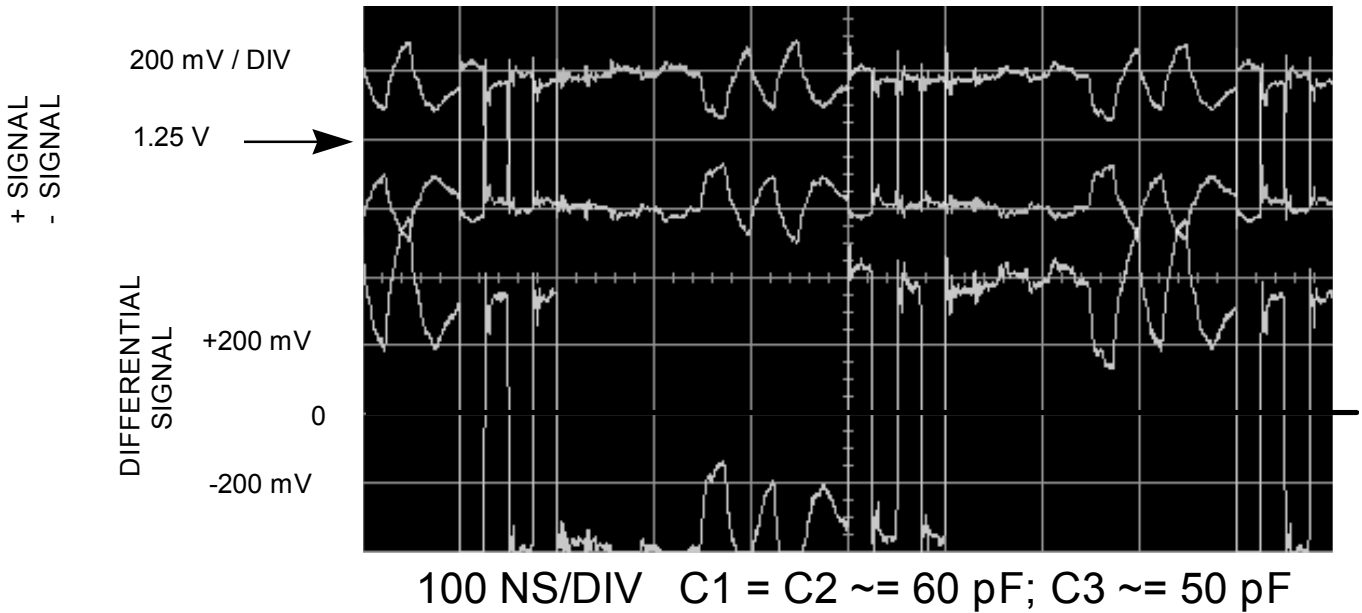


100 NS/DIV C1 = C2  $\approx$  60 pF; C3  $\approx$  10 pF?

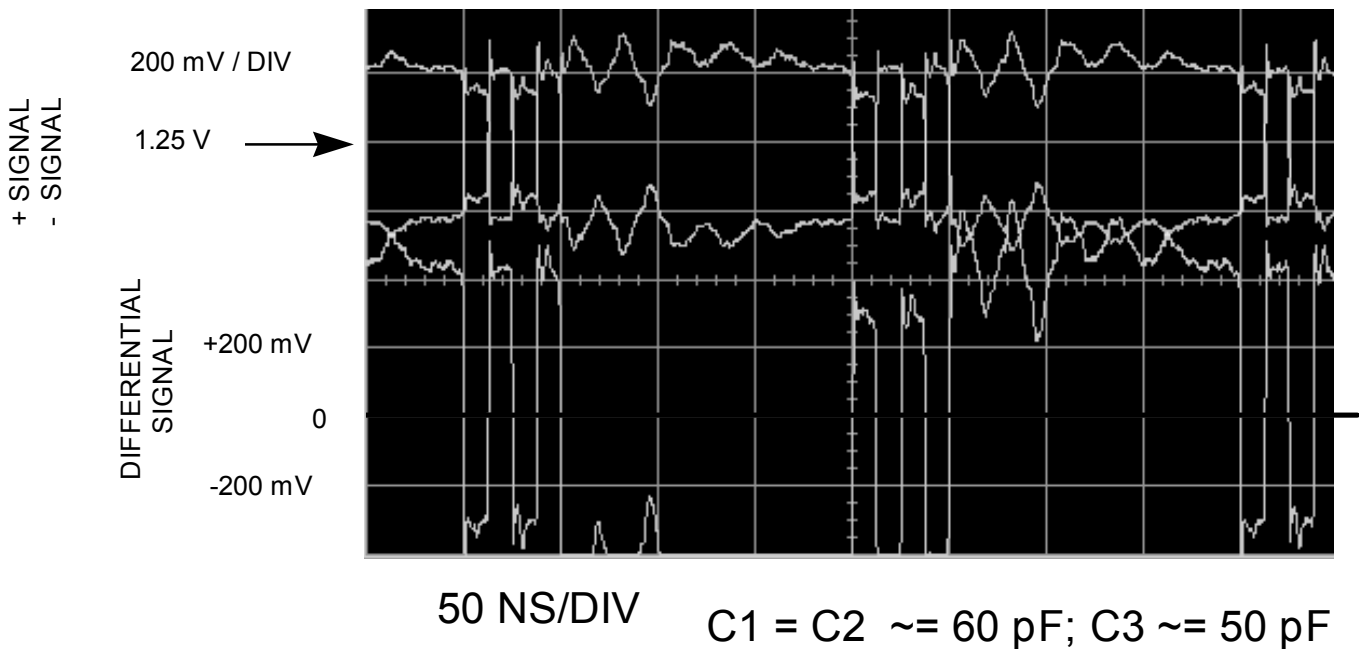
200 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING, LOADS ON FEP CABLE  $\sim$  10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD

# FAST 40 LVD SCSI REQ / ACK SIGNALS

## FAST 20



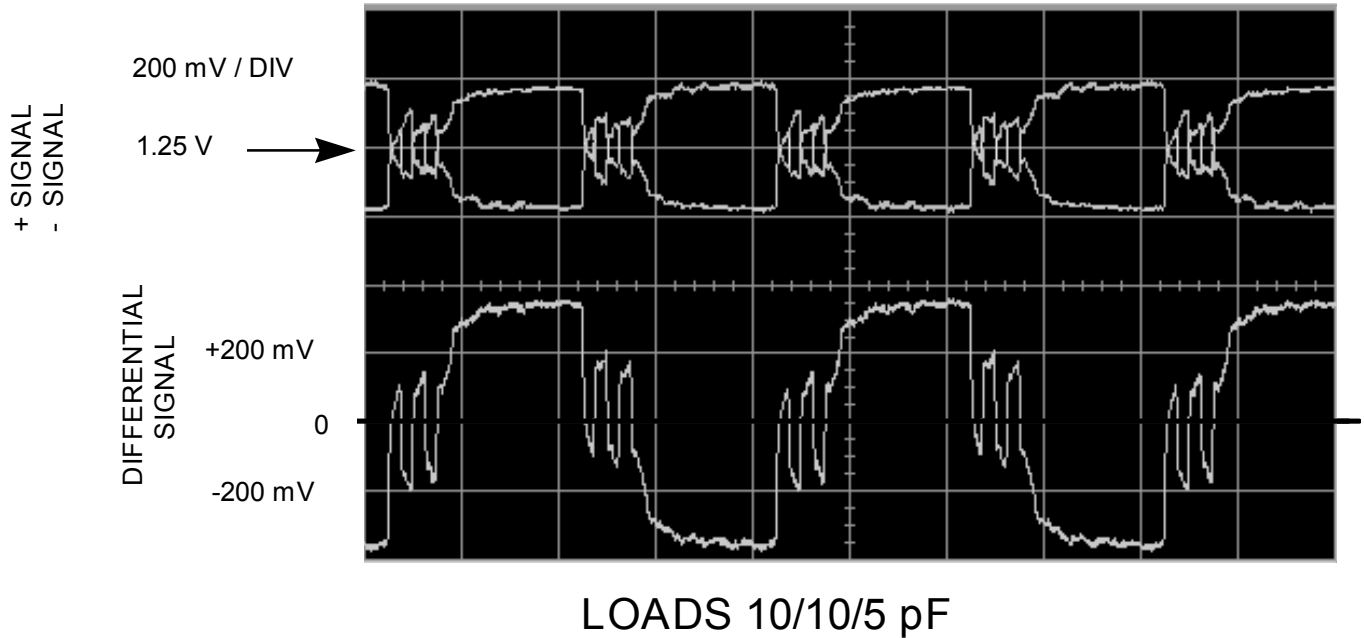
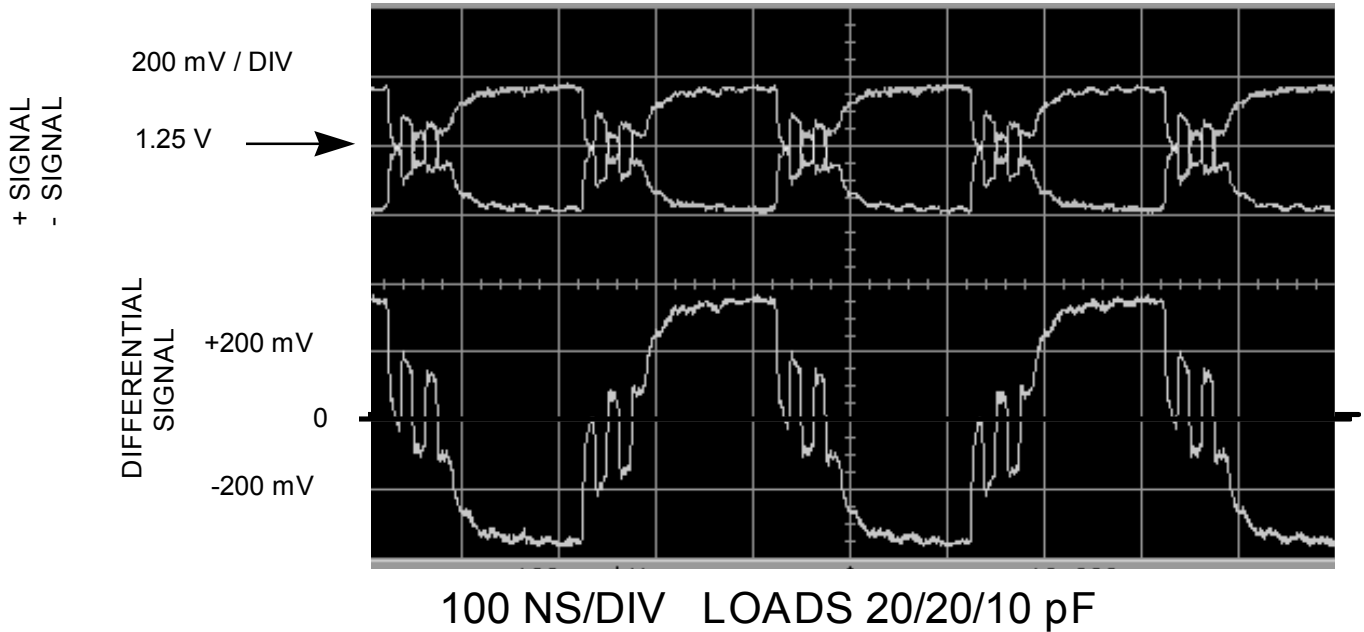
## FAST 40



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

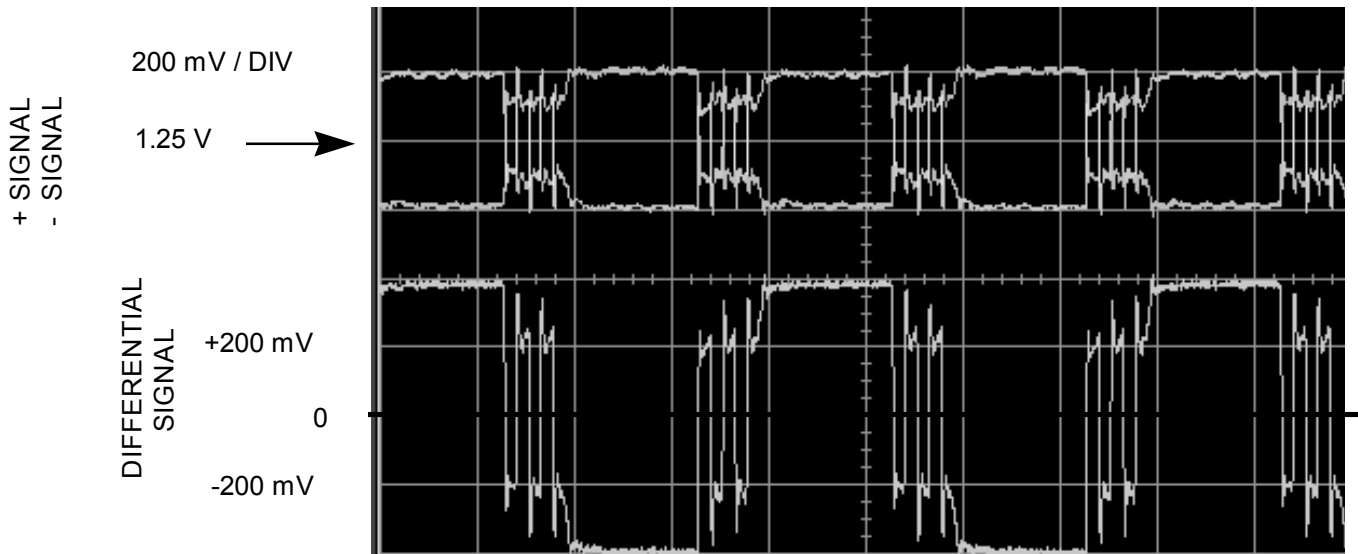


# FAST 40 LVD SCSI REQ / ACK SIGNALS

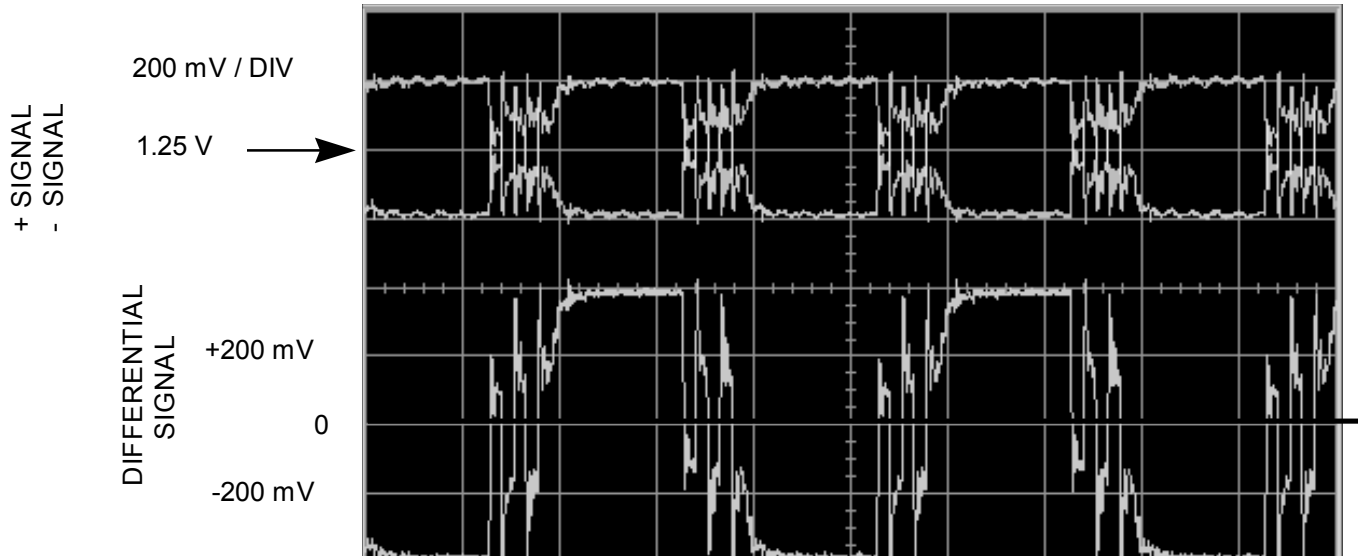


400 mV DRIVERS; 26 METERS 10 DEVICE LOADS CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 4" SPACING  
FEP CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD

# FAST 40 LVD SCSI REQ / ACK SIGNALS



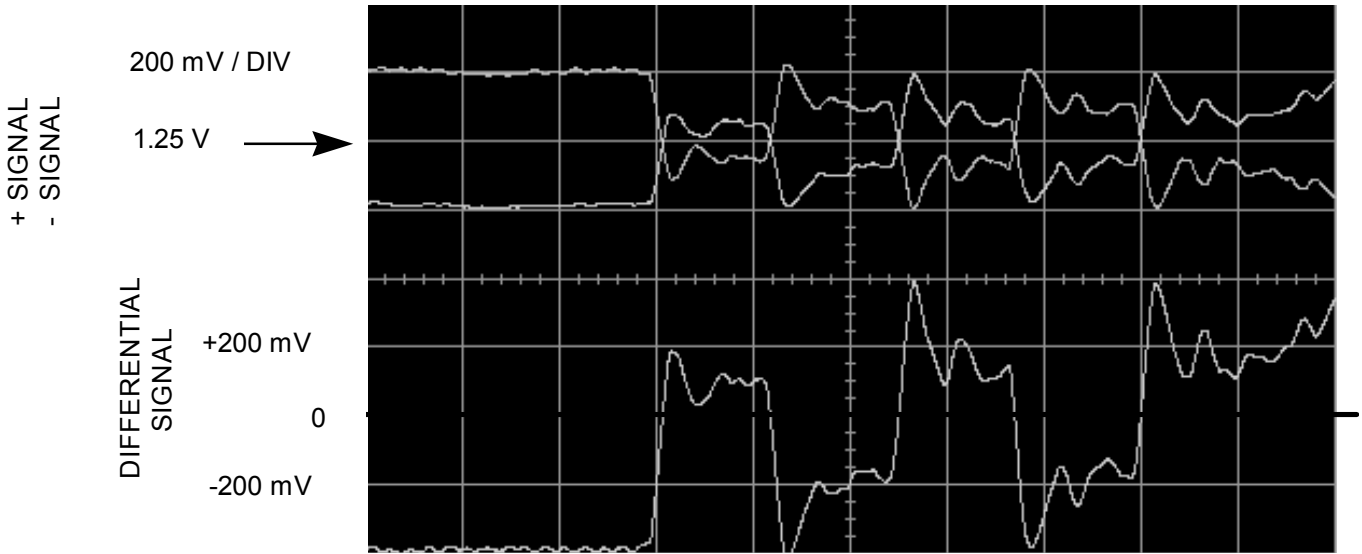
100 NS / DIV 10/10/5 pF LOADS



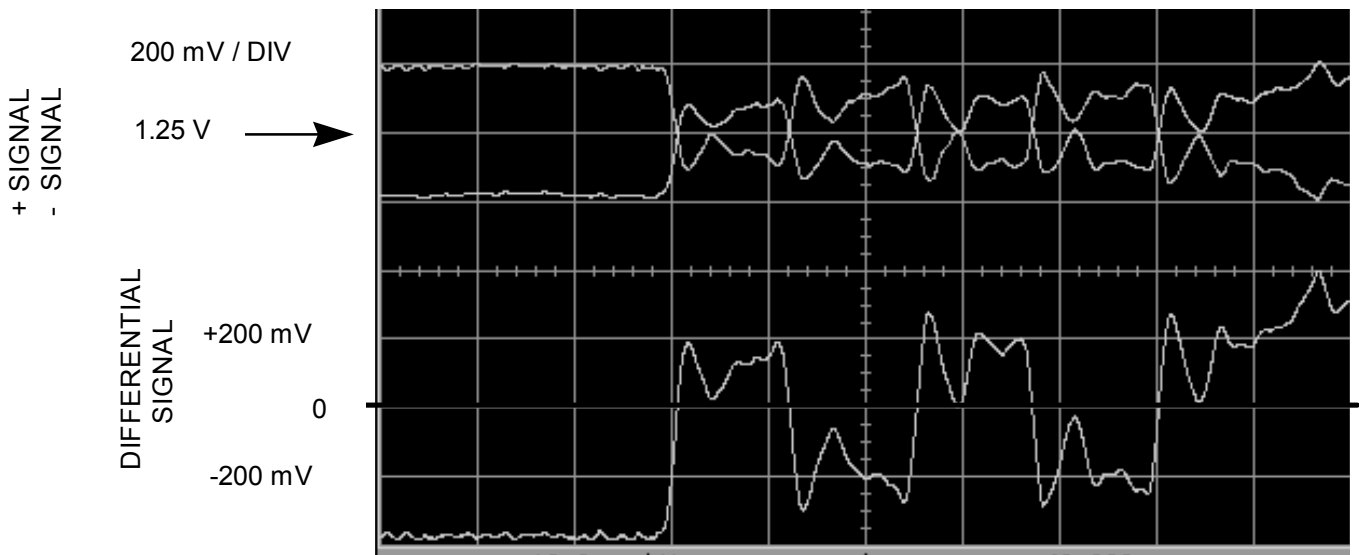
20/20/10 pF LOADS

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



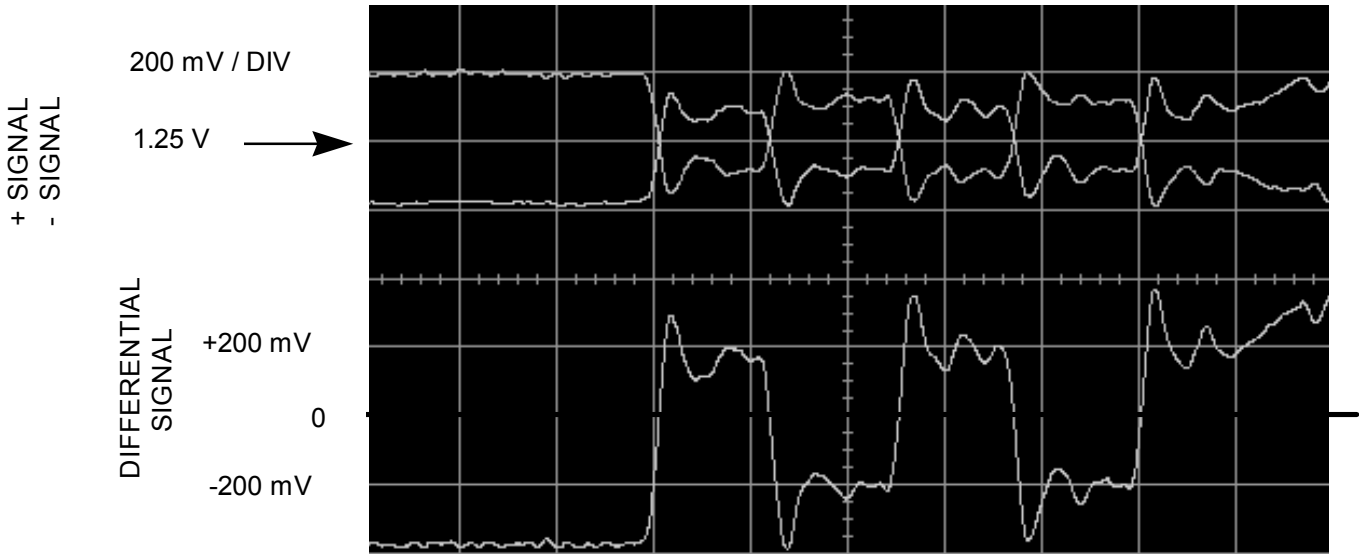
10 NS/DIV 20/20/10 pF LOADS  
SAME AS LAST SLIDE BUT WITH  
EXPANDED TIME SCALE



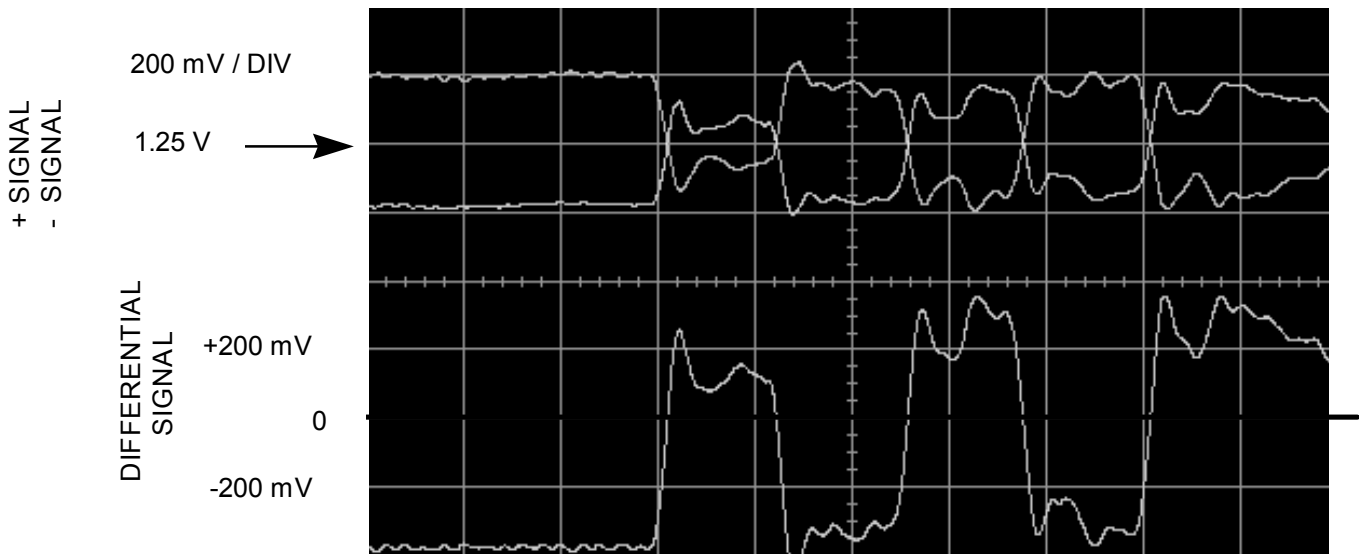
AS ABOVE BUT WITH LOADS 6, 8, 9 UNPLUGGED

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



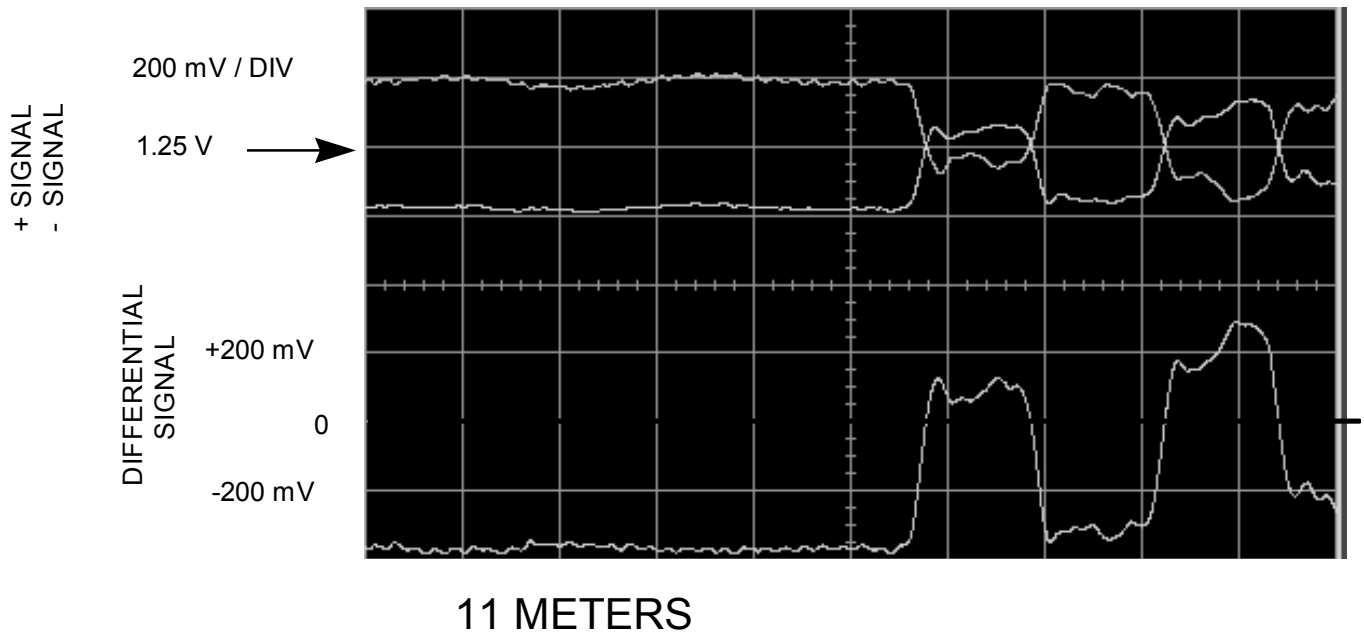
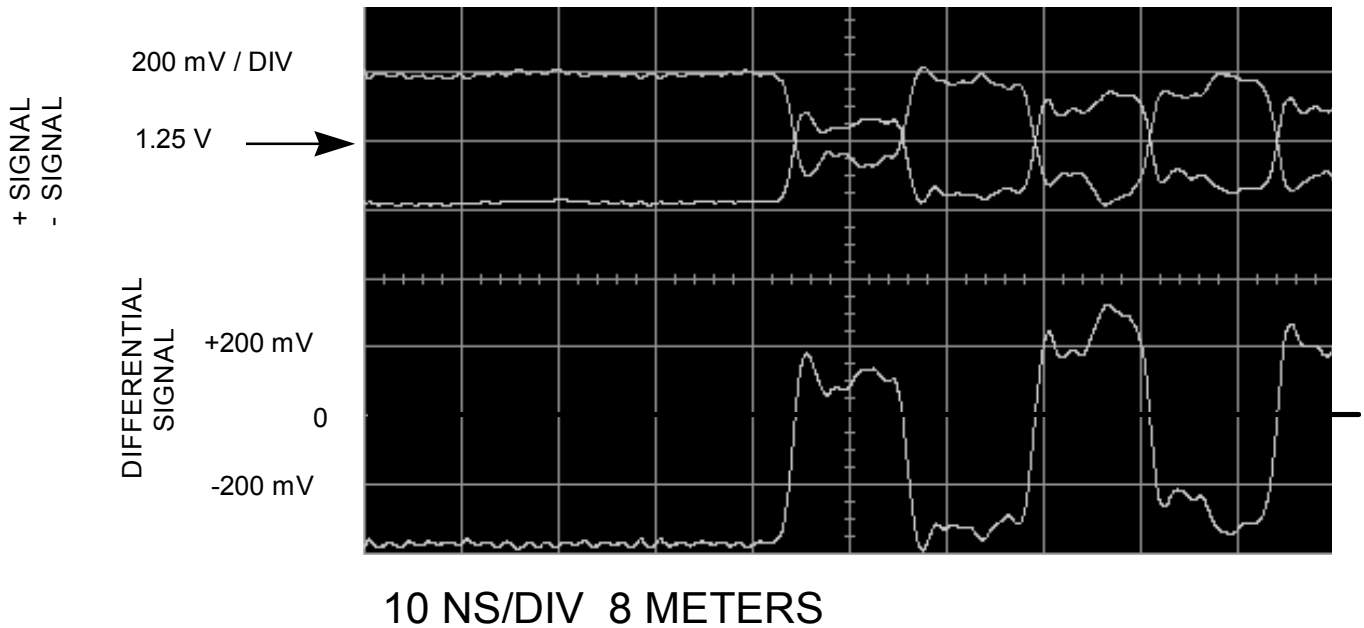
10 NS/DIV 20/0/10 pF LOADS 4 METERS  
UNPLUGGED 2, 4, 6, 8 ONLY HAVE TOTAL OF  
6 LOADS SPACED 8" APART (EXCEPT 9 & 10)  
ALL FEP CABLE NEAR LOADS



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

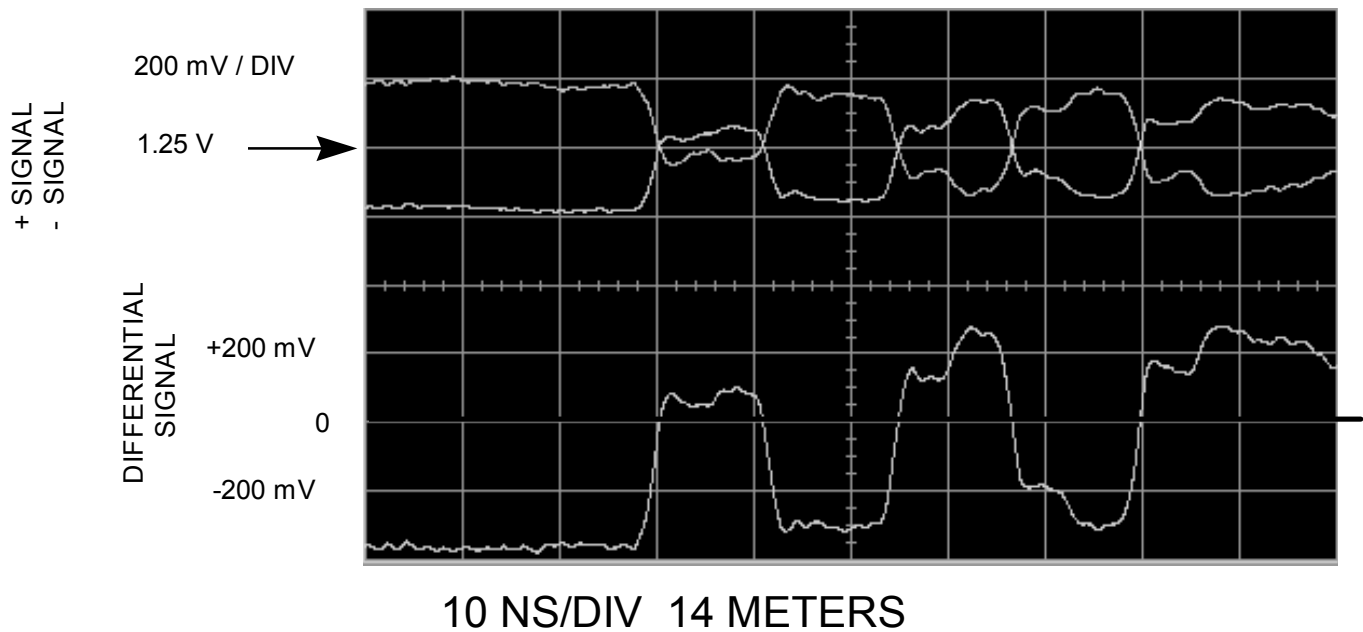
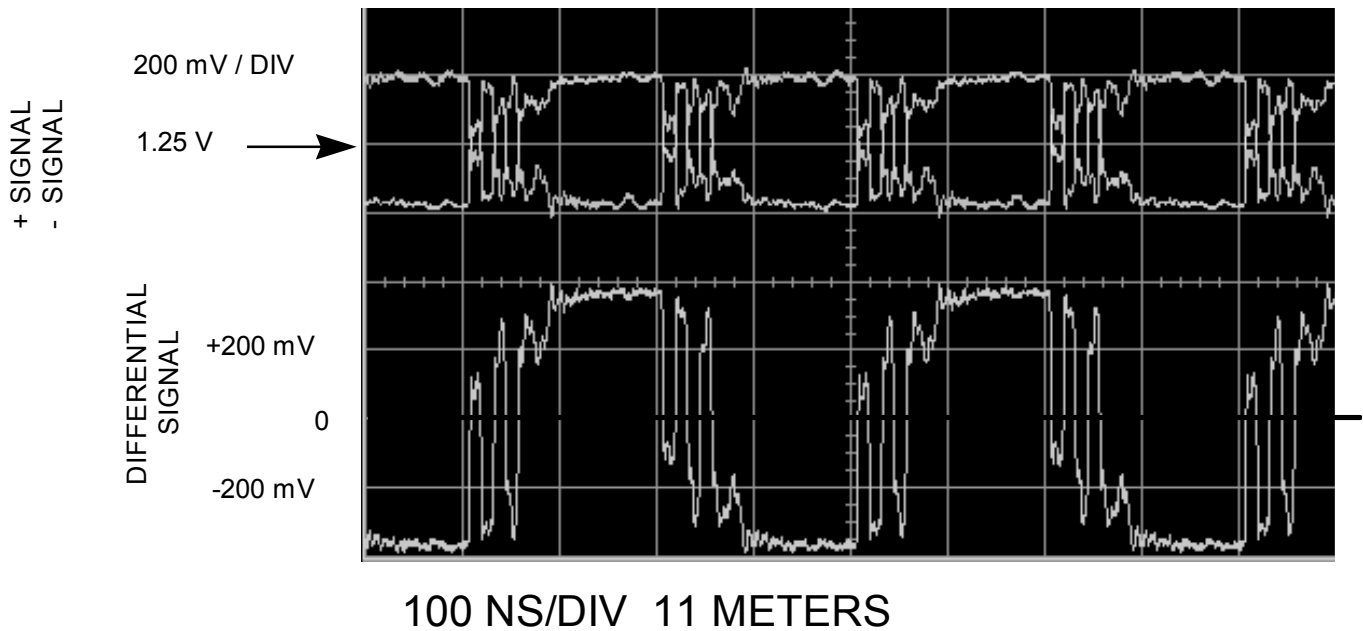
400 mV DRIVERS; VAR # DEVICE LOADS CLUSTERED  
NEAR FAR TERMINATOR, 2.5" STUBS,, NO TERM BIAS;  
PLOTS AT FIRST LOAD

# FAST 40 LVD SCSI REQ / ACK SIGNALS



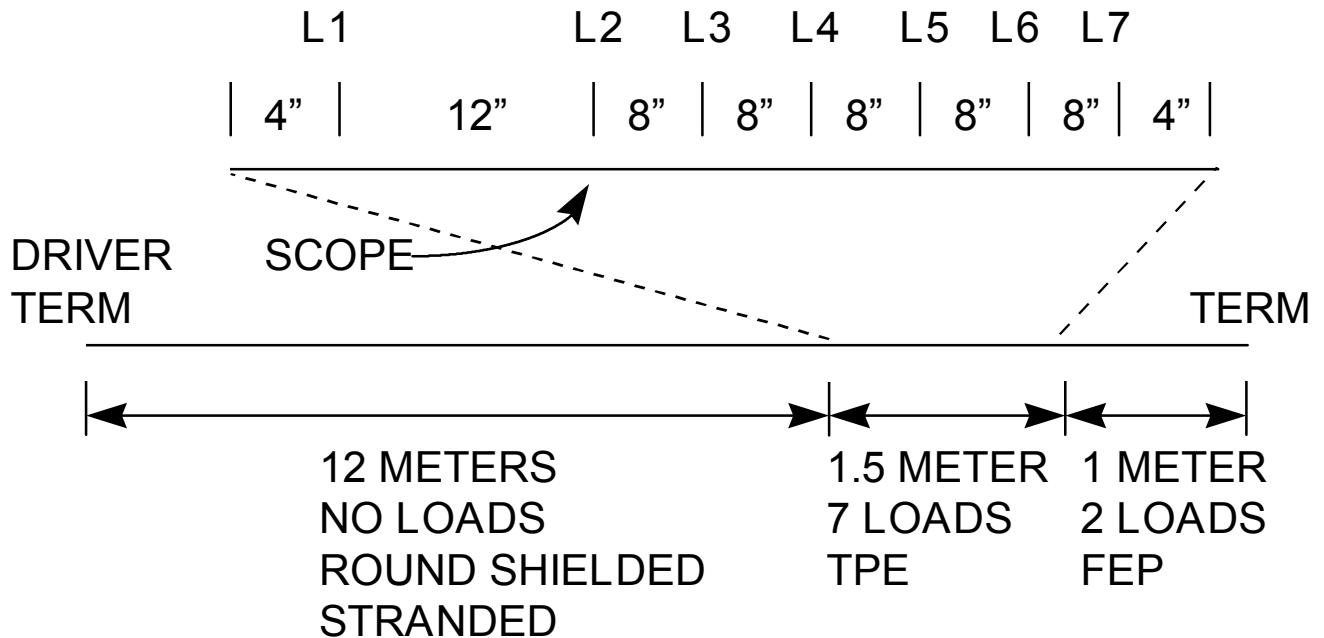
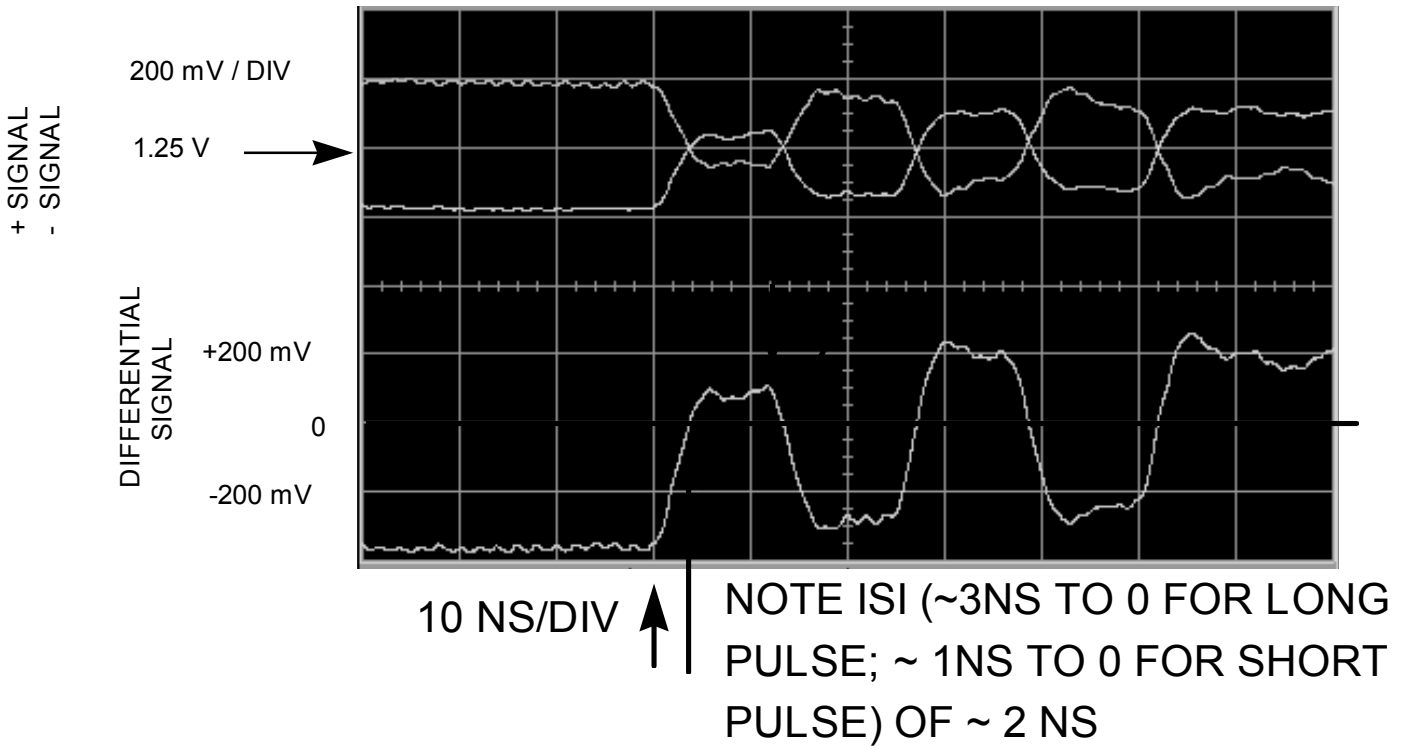
400 mV DRIVERS; 10 DEVICE LOADS (20/20/10 pF) CLUSTERED NEAR FAR TERMINATOR, 2.5" STUBS, 8" SPACING, LOADS ON TPE CABLE ~ 10 pF/FT, NO TERM BIAS; PLOTS AT FIRST LOAD

# 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



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