

DALLAS
SEMICONDUCTOR

Application Note 70 DS2107A SCSI Bus Waveforms

The DS2107A is used in SCSI systems to provide active termination for 9 signal lines. In the typical 8 bit-wide data configuration (A cable), two DS2107A's are required to fully terminate the bus (9 control lines + 8 data lines + 1 parity line). In the 16-bit wide data configuration (P cable), three DS2107A's are required to fully terminate the bus (9 control lines + 16 data lines + 2 parity lines). The two packages available are DS2107AS, 16-pin SOIC, and DS2107AE, 20-pin TSSOP (Thin Shrink Small Outline Package).

The DS2107AS and DS2107AE were tested with various cable configurations. The following waveforms are the results of this testing. In all plots the driver (7438) is displayed on top, and the receiver on bottom. The 7438 driver has a V_{OL} of 0.4 Volts. In all plots the voltage scale is 1 volt/division.

For Cases 1 through 8, the time scale is 100 ns/division, and a 50 conductor 28 AWG shielded twisted pair cable was used. The characteristic impedance of the cable is 75 ohms which is within the SCSI-3 Parallel Interface specification of 72 to 96 ohms.

For Case 9, a flat ribbon cable of 100 ohms characteristic impedance was used to depict a typical internal SCSI bus configuration. For this case, the time scale is 20 ns/

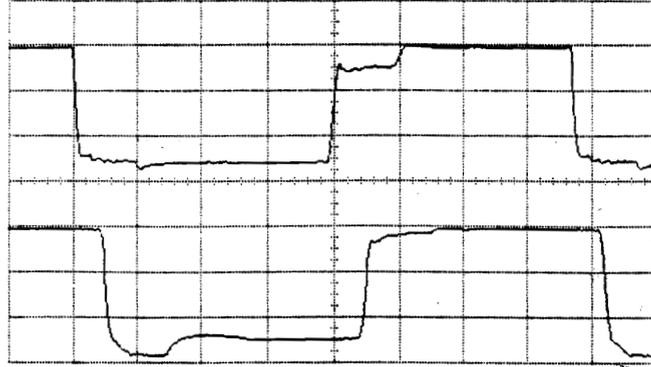
division for better visibility of leading and trailing edges of the signal. Figure 9a shows the leading and trailing edges of the SCSI bus waveform when one line is active. Figure 9b shows the results of a higher duty cycle, active SCSI bus because the other 8 resistors of the terminator package were grounded, or "pulled to true state." This in effect heats up the termination IC. The DS2107AS and DS2107AE do not adversely affect the SCSI bus under these loaded conditions.

KEY:

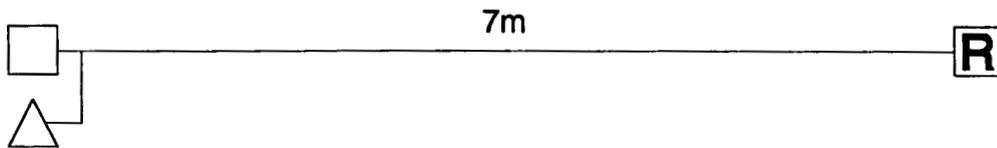
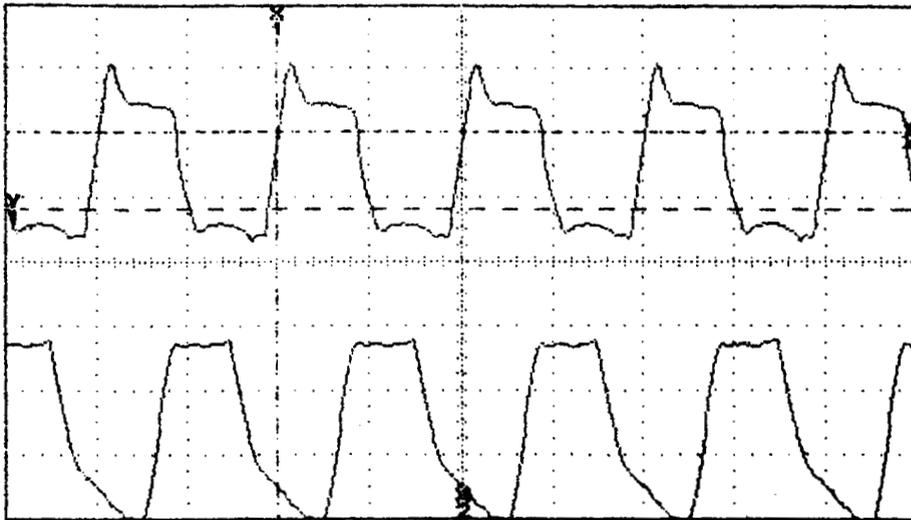
-  = 7438 DRIVER
-  = DS2107A ENABLED (RECEIVER)
-  = DS2107A ENABLED
-  = DS2107A DISABLED

To disable the DS2107A, the power down pin is grounded.

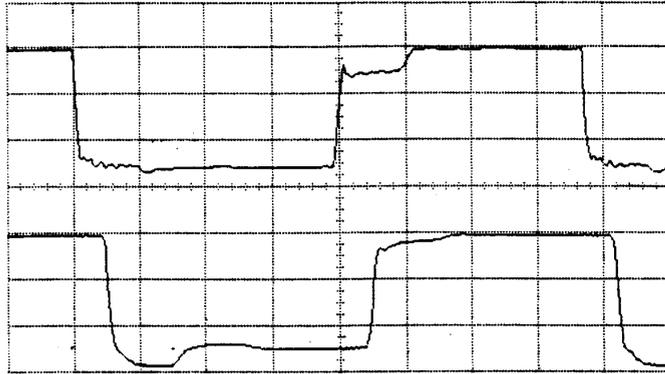
CASE 1 Figure 1



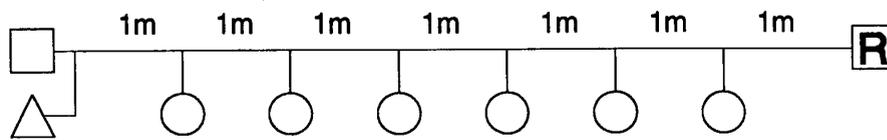
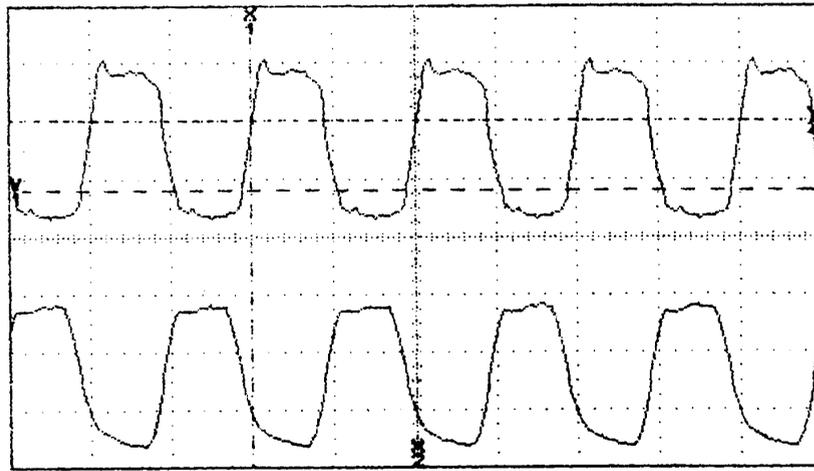
10 MHz High/Low Pulses



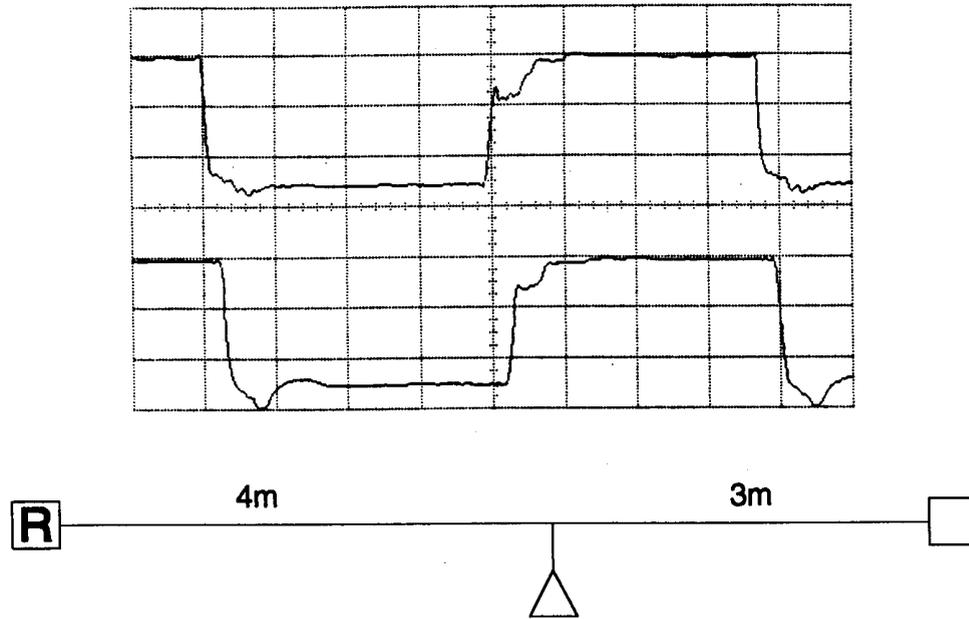
CASE 2 Figure 2



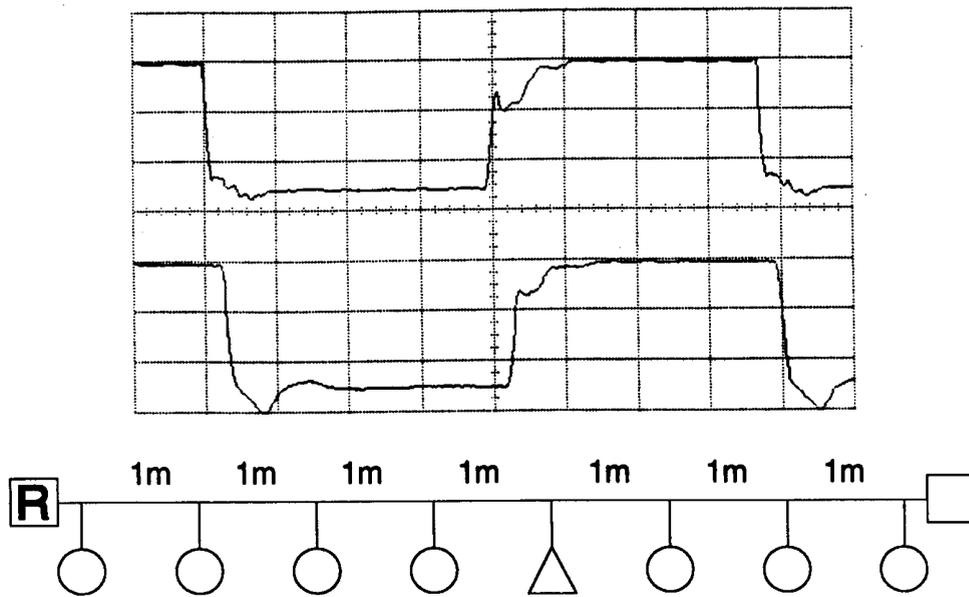
10 MHz High/Low Pulses



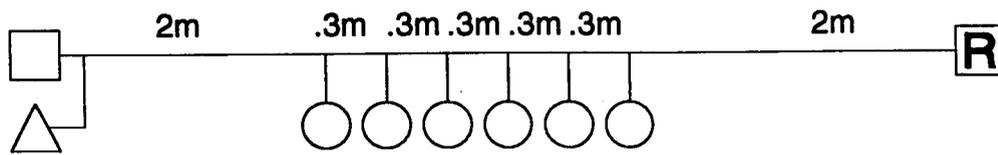
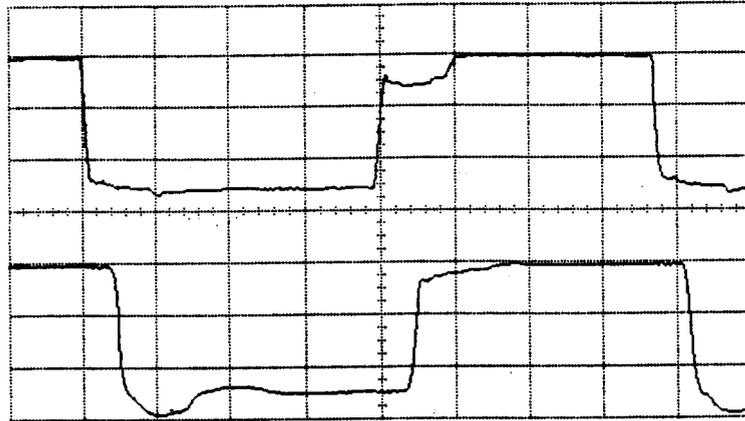
CASE 3 Figure 3



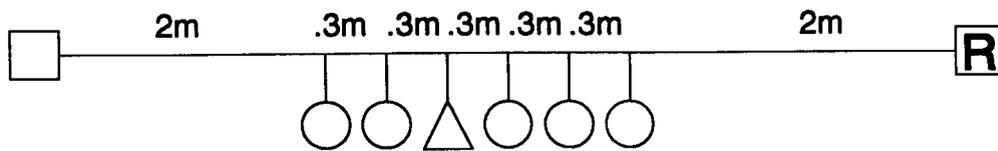
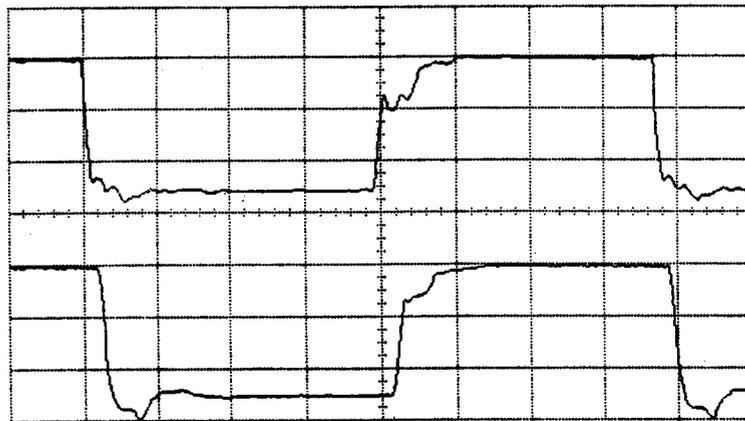
CASE 4 Figure 4



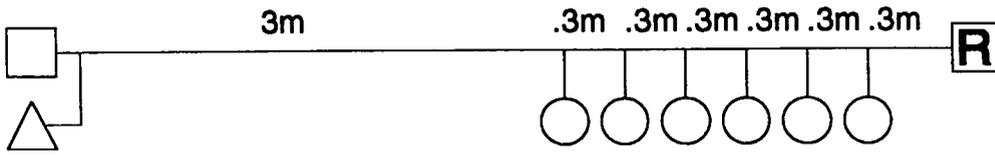
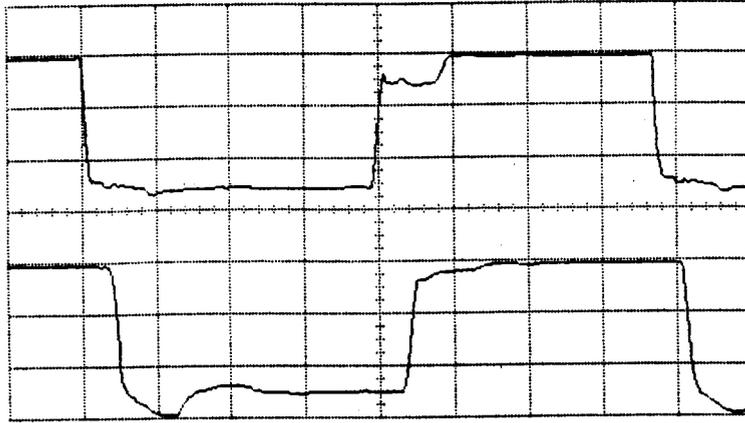
CASE 5 Figure 5



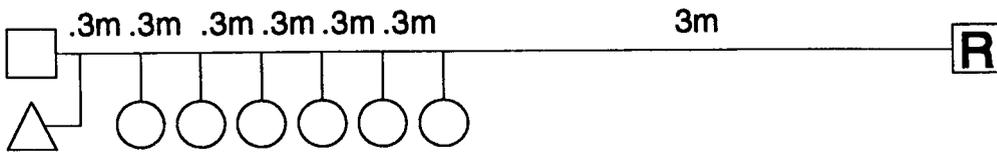
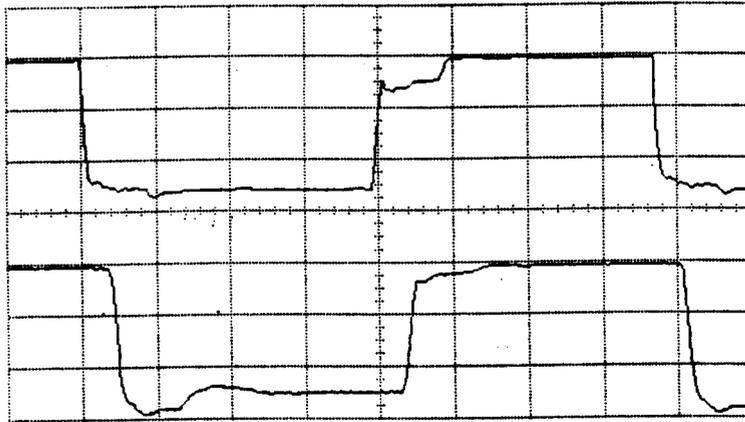
CASE 6 Figure 6



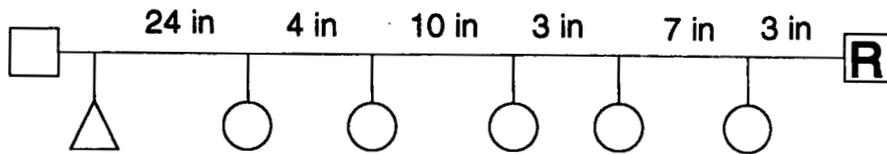
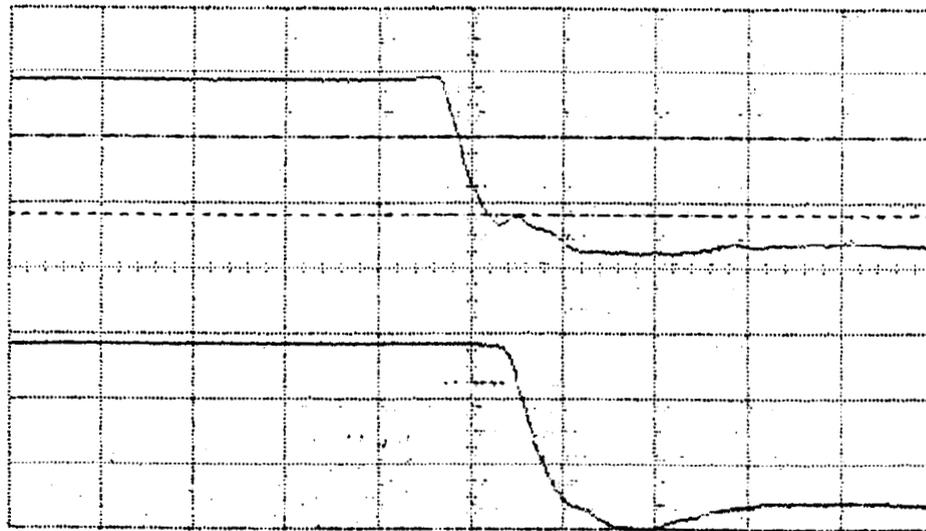
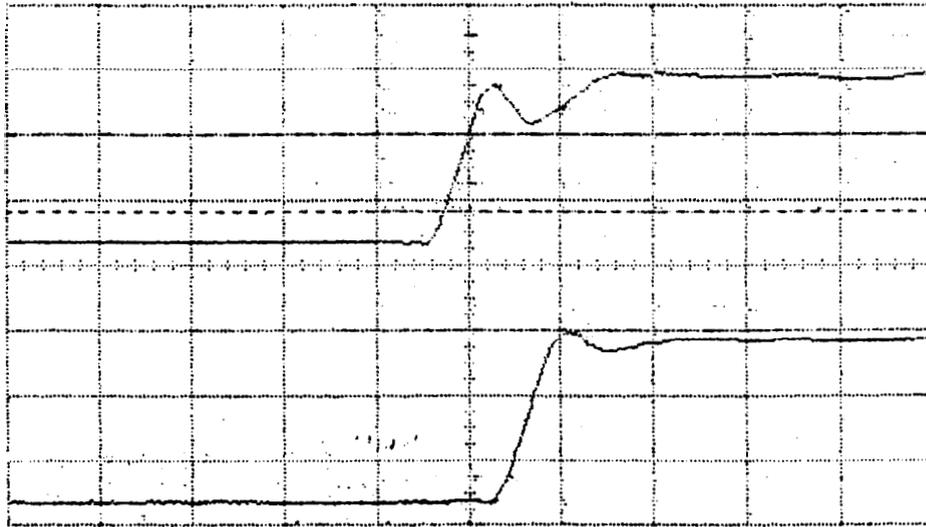
CASE 7 Figure 7



CASE 8 Figure 8



CASE 9 Figure 9a
DS2107A



CASE 9 Figure 9b
DS2107A (other 8 lines "true")

