The presentation on dual-edge clock signals follows.
TEST SETUP

• Data and Req signal driven as in dual edge
• Data is pseudo random pattern of 127 bits with run length of 7
• All lines driven with same pattern but different phase (except D0)
• Various loaded cables used
• Signal monitored at different positions
• Data not checked if received correctly but observed eye pattern at each device.
• REQ and DATA Monitered
• Driver is 0.35 micron design used in Adaptec Target Ultra 2 chip
• Drive and Bias level nominal
D00 IS SQUARE WAVE AT BIT RATE
**Note:**
1) Termination = 100
2) DB1 is pseudo-random data

"Eye pattern for 25 m point-to-point configuration"
(trigger at center of REQ)
Note:
1) Termination =100
2) DB1 is pseudo-random data

“Eye pattern for 25 m point-to-point configuration”
(trigger +/- 60 mV from center of REQ)
Note:
1) Termination = 100
2) DB1 is pseudo-random data

“Eye pattern for 8 m multi-drop configuration”
(trigger at center of REQ)
Note:
1) Termination =100
2) DB1 is psuedo-random data

“Eye pattern for 8 m multi-drop configuration”
(trigger +/- 60 mV from center of REQ)
“Eye pattern for 8 m multi-drop configuration”
(trigger at center of REQ)

Note:
1) Termination = 100
2) DB1 is pseudo-random data
**Note:**
1) Termination = 100
2) DB1 is pseudo-random data

**Eye pattern for 8 m multi-drop configuration**
(trigger +/- 60 mV from center of REQ)
Note:
1) Termination = 100
2) DB1 is pseudorandom data

“Eye pattern for 12 m multi-drop configuration”
(trigger at center of REQ)
1) Termination =100
2) DB1 is pseudo-random data

“Eye pattern for 12 m multi-drop configuration”
(trigger +/- 60 mV from center of REQ)
Note:
1) Termination = 100
2) DB1 is pseudo-random data

"Eye pattern for 12 m multi-drop configuration"
(trigger at center of REQ)
“Eye pattern for 12 m multi-drop configuration”
(trigger +/- 60 mV from center of REQ)

Note:
1) Termination =100
2) DB1 is pseudo-random data
“Eye pattern for 8 m multi-drop configuration with driver in the middle”
(trigger at center of REQ)

Note:
1) Termination =100
2) DB1 is pseudo-random data
“Eye pattern for 8 m multi-drop configuration with driver in the middle”
(trigger +/- 60 mV from center of REQ)

Note:
1) Termination = 100
2) DB1 is pseudo-random data
SUMMARY

• Worst case is tightly spaced loads
• Drive level is important when reflections are present
• More sensitive receiver would provide more margin
• Must add in worst case cable skew
SPECIFY MARGIN USING EYE PATTERNS

• Use eye pattern to evaluate driver and receiver compliance
• FC and 1394 specify this way but clock embedded in data
• In parallel system like SCSI need to account for cable skew
RECEIVER MARGIN (SETUP AND HOLD)

12.5 ns

CLOCK SKEW
MARGIN = 1/2 X^ - CABLE SKEW - 1/2 CLOCK SKEW

X^ IS SMALLER OF X1 OR X2
X1 AND X2 ARE MEASURED AT THRESHOLD OF RECEIVER