

T10/04-378r0 SAS-1.1 Clarification of SATA Signaling Level Specification

To: T10 Technical Committee  
From: Barry Olawsky, HP (barry.olawsky@hp.com)  
Date: 8 November 2004  
Subject: T10/04-378r0 SAS-1.1 Clarification of SATA Signaling Level Specification

**Revision History**

Revision 0 (8 November 2004) first revision

**Related Documents**

sas1r05 - Serial Attached SCSI 1.1 revision 5

03-240r1 - SAS-1.1 Merge IT and IR with XT and XR (Rob Elliott, Hewlett Packard)

**Overview**

Evaluate validity of SATA mode receiver sensitivity spec for XR and IR.

**Proposed Changes**

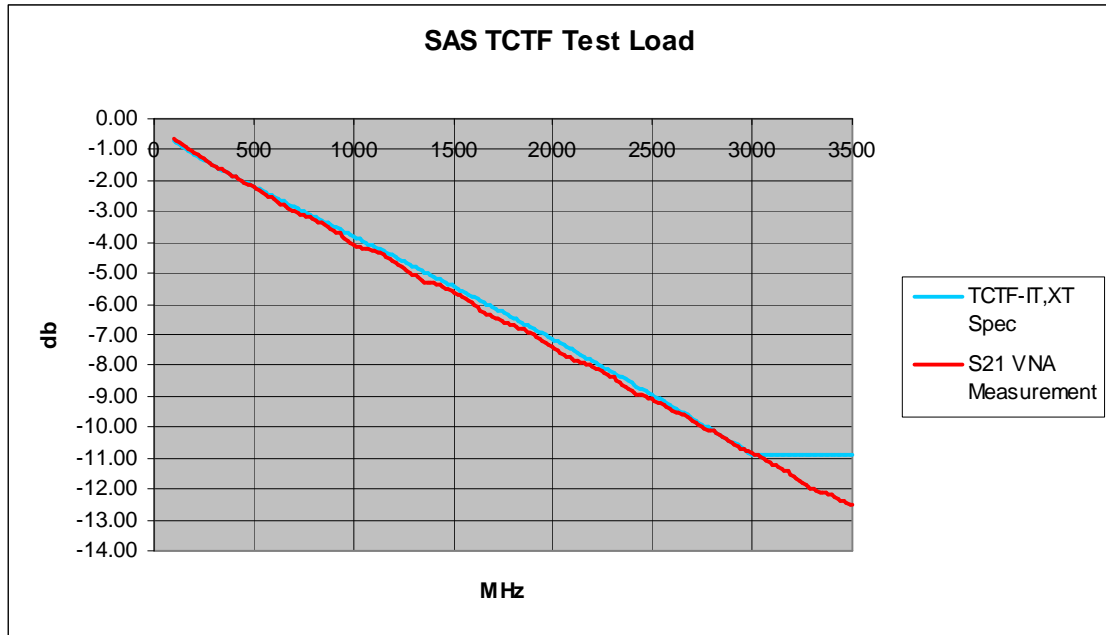
Add following note to table 30 referencing the 225mV cell in SATA column.

Worst case rise/fall time and jitter of SATA device may reduce amplitude at XR/IR point.

Supporting Information Only (NOT part of SAS-1.1 proposal):

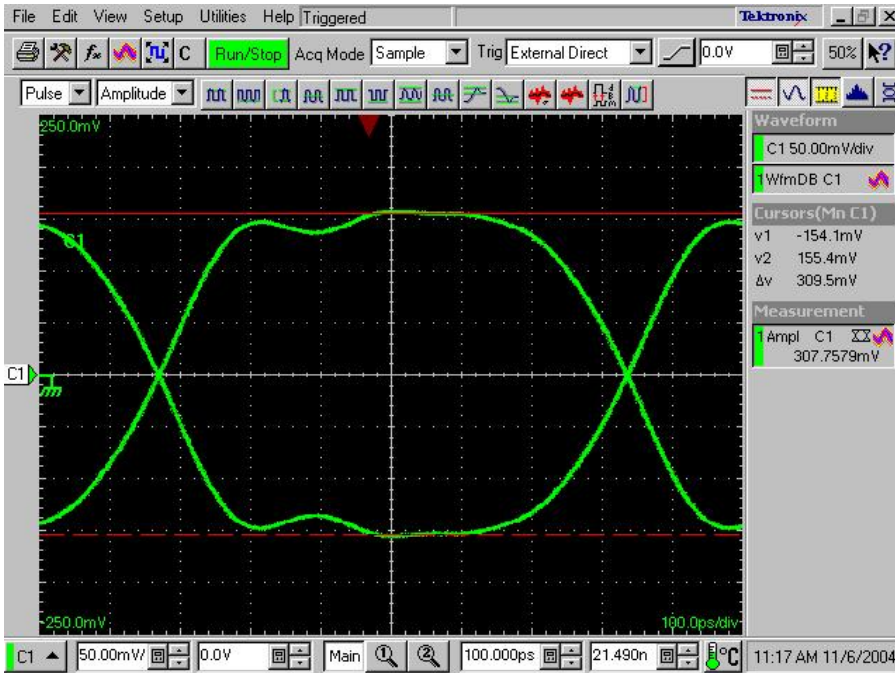
To evaluate the existing SATA mode receive output level specification, a TCTF test load for IT/XT was constructed. The amplitude was measured at the far end of the TCTF test load with a variety of transmitter and data pattern configurations as detailed below with each scope capture.

S21 of TCTF test load:



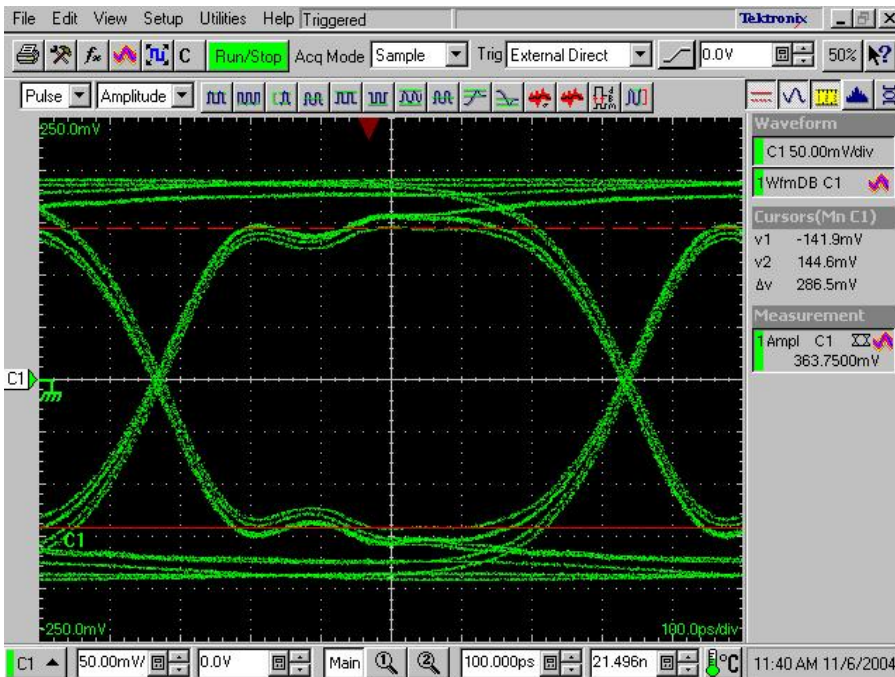
Vpp at receiver end of TCTF test load with

- D3186 pattern generator transmitting D10.2
- Vpp at transmitter of 400mVpp
- Measured amplitude of 310mVpp at scope terminated load



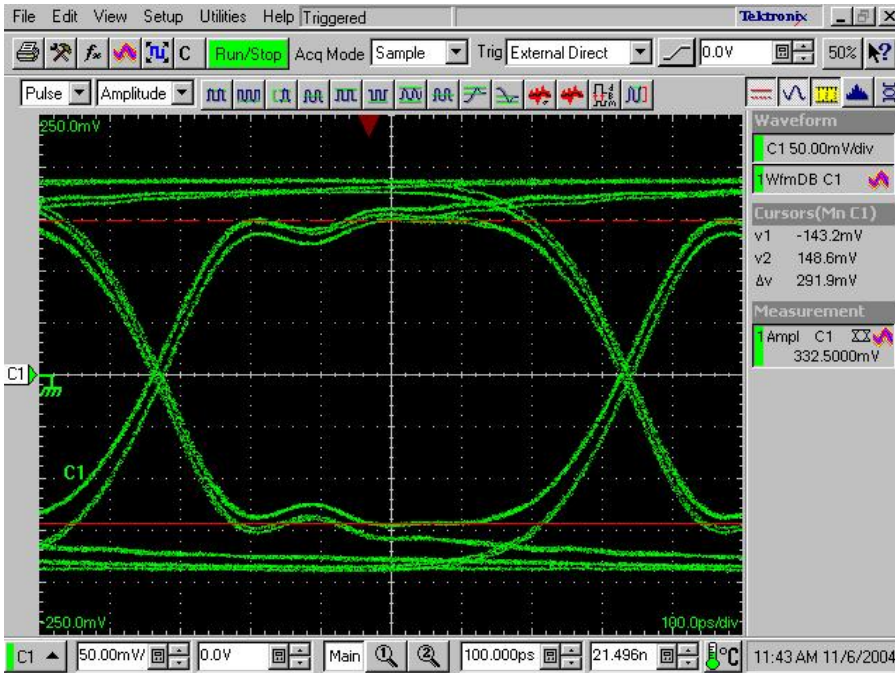
Vpp at receiver end of TCTF test load with

- D3186 pattern generator transmitting K28.5+, K28.5- (Note, this pattern is invalid)
- Vpp at transmitter of 400mVpp
- Measured amplitude of 287mVpp at scope terminated load



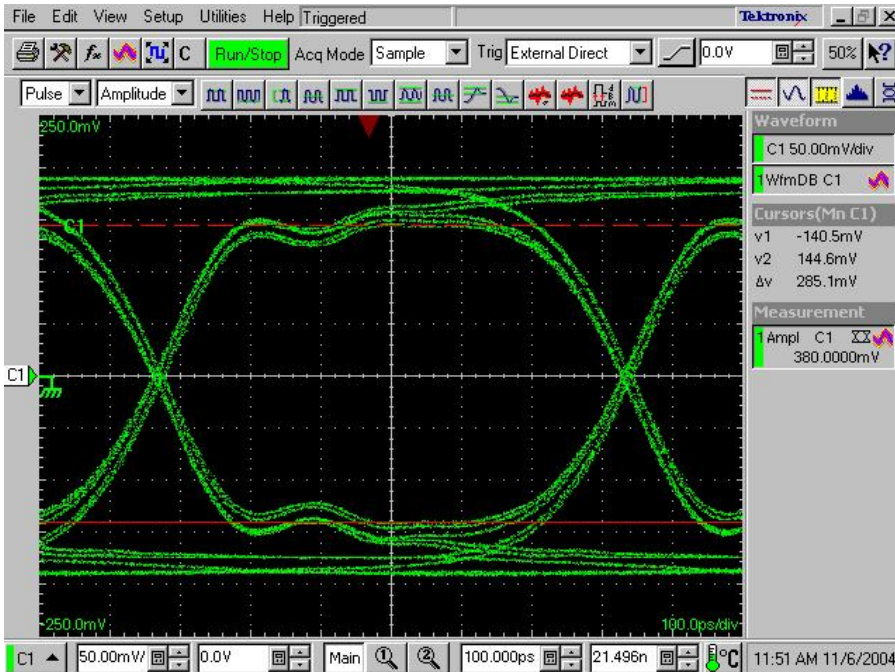
Vpp at receiver end of TCTF test load with

- D3186 pattern generator transmitting D12.0-, D11.4+
- Vpp at transmitter of 400mVpp
- Measured amplitude of 292mVpp at scope terminated load



Vpp at receiver end of TCTF test load with

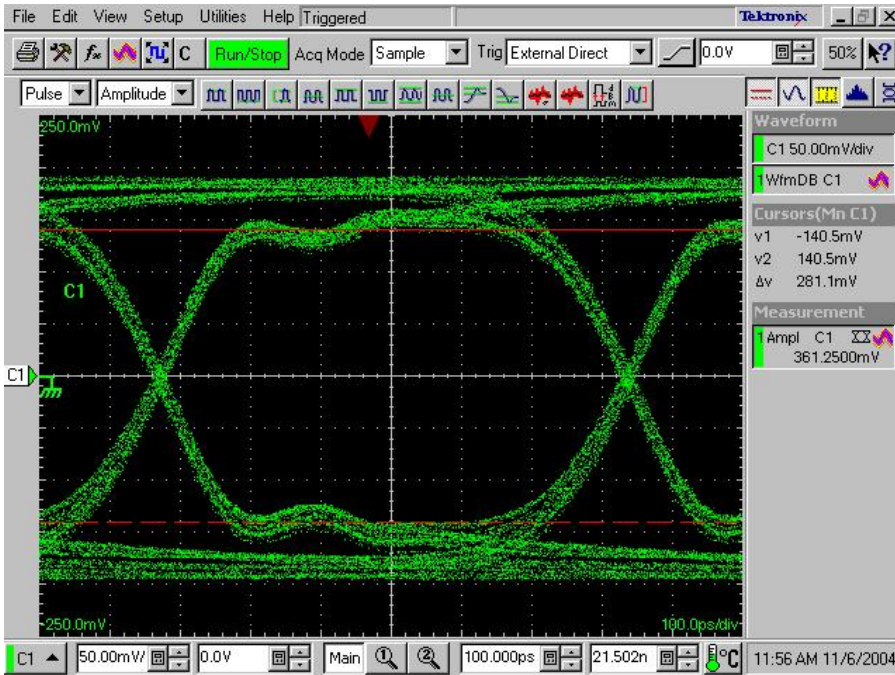
- D3186 pattern generator transmitting D11.7+, D20.7-
- Vpp at transmitter of 400mVpp
- Measured amplitude of 285mVpp at scope terminated load





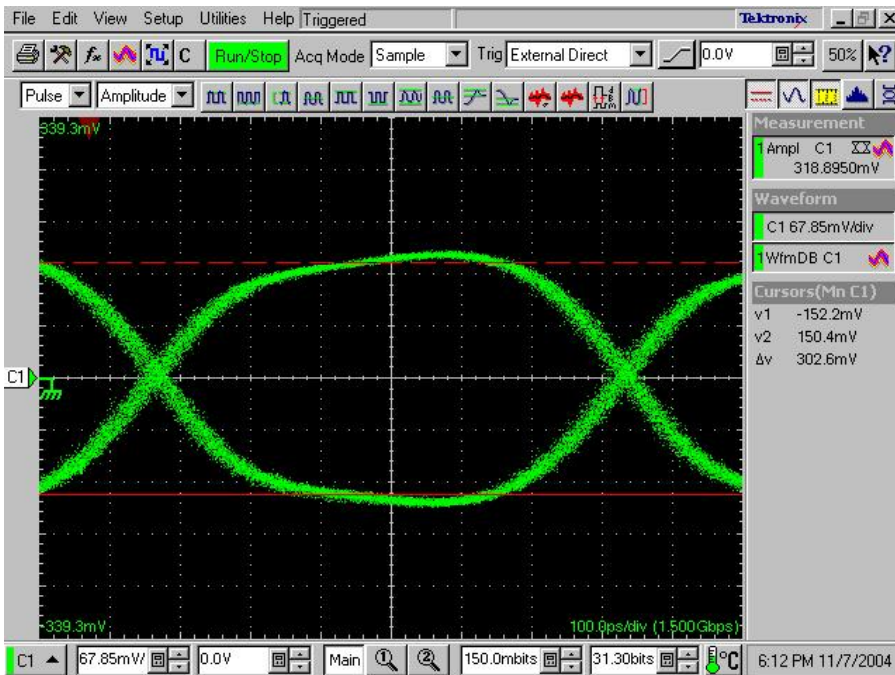
Vpp at receiver end of TCTF test load with

- D3186 pattern generator transmitting PRBS7
- Vpp at transmitter of 400mVpp
- Measured amplitude of 281mVpp at scope terminated load



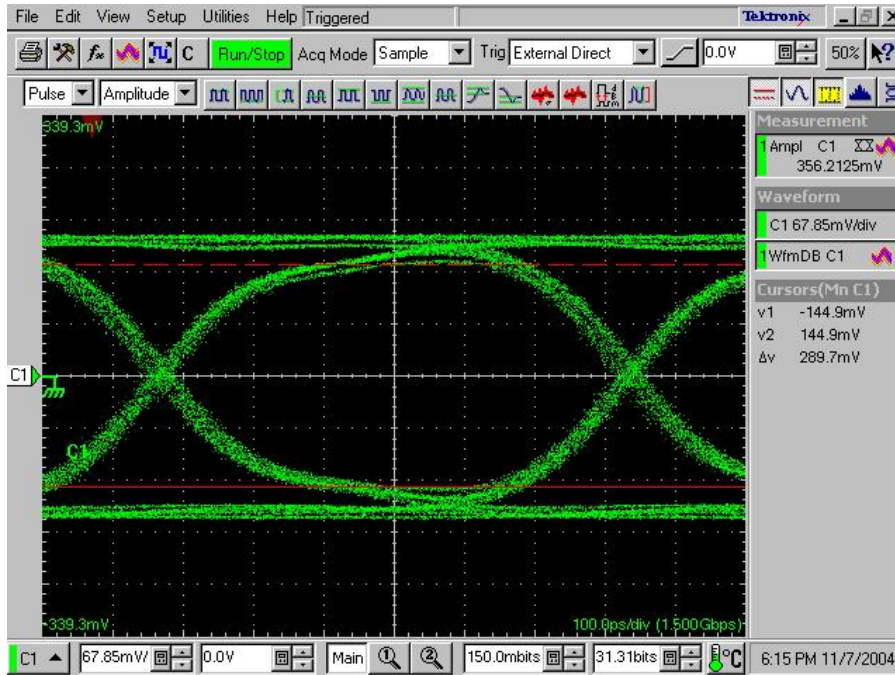
Vpp at receiver end of TCTF test load with

- 100ps edge rate reference phy transmitting D10.2
- Vpp at transmitter of 400mVpp (with scaling factor on scope)
- Measured amplitude of 303mVpp at scope terminated load



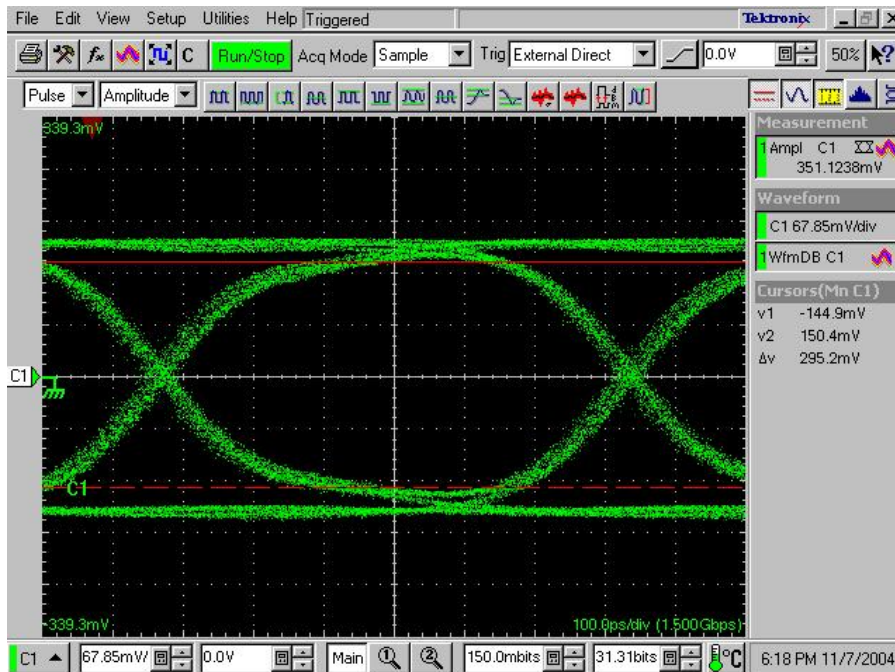
Vpp at receiver end of TCTF test load with

- 100ps edge rate reference phy transmitting K28.5+, K28.5- (Note, this pattern is invalid)
- Vpp at transmitter of 400mVpp
- Measured amplitude of 290mVpp at scope terminated load



Vpp at receiver end of TCTF test load with

- 100ps edge rate reference phy transmitting D12.0-, D11.4+
- Vpp at transmitter of 400mVpp
- Measured amplitude of 295mVpp at scope terminated load



Vpp at receiver end of TCTF test load with

- 100ps edge rate reference phy transmitting D11.7+, D20.7-
- Vpp at transmitter of 400mVpp
- Measured amplitude of 286mVpp at scope terminated load

