

# TEXAS INSTRUMENTS



Comments to dpANS SCSI-3 Fast-20 Parallel Interface  
revision 3

P.O. Box 655303 ms8206  
Dallas, Tx 75265-5303

1. Technical Comment. Page no. 3, clause 5.1, line no. 3

Delete: It is recommended that the loads be evenly spaced, especially in 3 meter applications.

Reason: This statement is more appropriate for an annex and is not technically correct. The device spacing is only constrained by a minimum distance (see annex C) and uniformity is not required.

2. Technical Comment. Page no. 3, clause 5.1, line no. 8

Change: ... shall be at least three times the stub length to avoid stub clustering.

To: ... shall be such that the added capacitance per unit length is no more than 2 times the unloaded bus media's capacitance per unit length. (see annex C for guidelines)

Reason: "Rules of thumb" do not belong in a standard. This rule can be followed and result in a non-functioning bus from too much capacitance too close together. The proposed requirement, if followed, will avoid node or stub clustering regardless of the media and node capacitance.

3. Editorial Comment. Page no. 3, clause 5.1, line 10

Delete paragraph (line 10 through 13)

Reason: This paragraph is a repeat of the first paragraph in this clause.

4. Technical Comment. Page no. 3, clause 5.1, line no. 14

Change: The maximum ground offset voltage shall be maintained at or below 50 mV.

To: The magnitude of ground offset voltage between any to devices shall be maintained less than 50 mV.

Reason: Voltage potentials occur between two points and can be either positive or negative (depending upon the zero reference). The existing sentence specifies neither.

5. Technical Comment. Page no. 3, clause 5.2, line no. 5

Change: ... shall be at least three times the stub length to avoid stub clustering.

To: ... shall be such that the added capacitance per unit length is no more than 4.4 times the unloaded bus media's capacitance per unit length.

Reason: "Rules of thumb" do not belong in a standard. This rule can be followed and result in a non-functioning bus from too much capacitance too close together. The proposed requirement, if followed, will avoid node or stub clustering regardless of the media and node capacitance.

6. Technical Comment. Page no. 3, clause 5.2

Add: The magnitude of ground offset voltage between any to devices shall be maintained less than 3.6 V with up to 8 devices and 2.5 V with up to 32 devices on the bus.

Reason: It can be shown that sufficient common-mode voltage potentials on a loaded bus with minimum receiver input impedance can exceed the +/-60 mA output current assured by EIA RS-485 compliant drivers.

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## 7. Technical Comment. Page no. 4, clause 6.1.2, line no. 5

Change: b) VOH (high-level output voltage) = 2,5 to 3,7 V d.c. (signal negated);  
To: b) VOH (high-level output voltage) < 3,7 V d.c. at IOH = 0 mA (signal negated);

Reason: I assume that this requirement is to set an upper bound on the level to which an active negation driver can go. (Requirements c), d) and e) define the operating points at other output currents.) The dc operating point of a circuit must define both voltage and current.

## 8. Technical Comment. Page no. 4, clause 6.1.2, line no. 6 and 7

Change: ... at IOH = 7 mA (signal negated);  
To: ... at IOH = -7 mA (signal negated);

Change: ... at IOH = 20 mA (signal negated);  
To: ... at IOH = -20 mA (signal negated);

Reason: The direction the current IO is defined as positive in the IOL requirement and therefore, must be negative for IOH.

## 9. Technical Comment. Page no. 4, clause 6.1.2, line no. 8

Change: IOH (high-level output current) > 22 mA (signal negated) @ VOH < 2,0 V d.c.  
To: IOH (high-level output current) > -22 mA (signal negated) at VOH < 0,2 V d.c.

Reason: See 9 for the sign change.

The symbol "@" is not used in the previous requirements.

The basis for the -22 mA minimum active-negation current is that this current plus the -48 mA from the terminators will achieve a valid high level with a fully loaded bus. This current requirement occurs when the bus is discharged or near zero volts. The 48 mA requirement for the terminators is specified at 0,2 V and is repeated here for consistency.

## 10. Technical Comment. Page no. 4, clause 6.1.2, line no. 9

Replace Note 2

With: Note 2. The negative sign here refers to the direction of current flow and is not an algebraic convention.

Reason: The current note 2 is explaining the quantitative requirements and is not needed for interpretation. The proposed Note 2 is needed for interpretation.

## 11. Technical Comment. Page no. 4, clause 6.1.2, line no. 16

Change: ... circuit shown in figure 1 with a load capacitor (CL) of 15 pF +/-5%.  
To: ... circuit shown in figure 1 with a load capacitance (CL) of 10 pF to 15 pF.

Reason: CL should be the capacitance introduced by the measurement circuit. Most 10x scope probes do not hold such a tight tolerance for capacitance.

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## 12. Technical Comment. Page no. 4, clause 6.1.2, line no. 17

Change: ... a) trise (rise rate) = 520 mv per ns maximum (0,7 V d.c. to 2,3 V d.c.);  
... b) tfall (fall rate) = 520 mv per ns maximum (2,3 V d.c. to 0,7 V d.c.).

To: The magnitude of the rate of change of the output voltage shall not exceed 520 mV/ns between 20% to 80% of the steady-state output levels.

Reason: In 15+ years in the engineering profession, this is the first occurrence of the terms "rise rate" and "fall rate" that I can remember. Besides, trise or tfall are usually associated with time and not voltage slew rates; there is a polarity associated with slew rates; and there are any number of ways to get to the same goal. This is my preference.

## 13. Technical Comment. Page no. 4, clause 6.1.2, line no. 19

Change: ... in figure 1 with a load capacitor (CL) of 200 pF +/-5%.  
To: ... in figure 1 with a load capacitor (CL) of 10 pF to 15 pF.

Reason: The SCSI bus is a distributed parameter circuit and is closely modeled as a transmission line and cannot be simulated with a simple lumped circuit. The 47 ohm resistor in figure 1 represents the distributed load. If you accept this fact, you cannot justify a load of 200 pF as representing a transmission line. The standard requirement should be defined for the application and not the test engineers' convenience. With the distributed parameter model there is no lumped capacitance so, CL must be from the measurement circuit. A 10x scope probe has a tip capacitance of 10 pF to 15 pF.

## 14. Technical Comment. Page no. 5, clause 6.1.2, Figure 1

Delete the "bubble" from the logic representation of the driver.

Reason: This is an electrical test circuit and logical requirements should not be implied.

## 15. Editorial Comment. Page no. 6, clause 6.2.1, line 6

Change: ... signals described in except ...  
To: ... signals described, except ...

## 16. Technical Comment. Page no. 6, clause 6.2.1, line 8

Change: The characteristic impedance ...  
To: The differential impedance ...

Reason: Characteristic impedance is a parameter of transmission lines and not of resistor networks.

## 17. Technical Comment. Page no. 7, clause 6.2.2

Add: All timing requirements shall be verified with the test circuit of figure 3. Timing instances shall be defined at the point where the difference voltage is zero.

Reason: There is no test circuit defined for compliance testing. There needs to be one and the second added sentence is needed for definition of the timing instance.