

TO: X3T9.2 COMMITTEE (SCSI)  
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 RE: ALTERNATIVE DIFFERENTIAL STANDARD, AND ITS IMPACT

The following document has a brief description of the proposed alternative differential standard, followed by an example of its impact on a "typical" design. A summary, and a list of action items concludes the document.

## 1. ALTERNATIVE DIFFERENTIAL SCSI

Alternative differential SCSI is fully (100%) compatible with existing differential, as long as input voltages do not exceed the 0 to 5 volt range.

### TRANSCEIVER REQUIREMENTS

	min	max	units	Notes
Iil, Iih	-50	+50	uA	(1)
Vinput	0.0	5.0	V	(2)
Vth	-0.2	+0.2	V	(3)
input hysteresis	35		mV	
input resistance	12		k-ohm	
Voh	3.0	5.0	V	
Vol	0.0	2.0	V	
Vod	1.5		V	(4)
Ioh		-55	mA	(5)
Iol		+55	mA	(5)
Ios		100	mA	

- (1) Iil and Iih include leakage current occurring when outputs are tristated.
- (2) Voltage at connection to SCSI bus, when outputs are tristate, measured relative to local ground.
- (3) Vih and Vil must be separated by at least 200mV, for a valid signal to be recognized.
- (4)  $Vod = Voh - Vol$
- (5) measured over all permissible output voltages.

### CABLING AND TERMINATION REQUIREMENTS

New documents are being generated by the committee for normal differential SCSI; they will apply with equal force to the alternative differential SCSI.

2. COMPARISON WITH A "TYPICAL" DIFFERENTIAL SCSI DEVICE TODAY

Currently, a differential SCSI device consists of 18 external transceivers and a single controller chip. With alternative differential, a single, larger controller chip can integrate all functions.

components	cost	power	package
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cheap controller	\$14	.5W	44-PLCC
National driver - tristate	\$.50 (?)	.14W	8-PDIP
National driver - 100 ohm load		.310W	8-PDIP
totals for 18 x Nationals			
(target)	\$6	4.7W	--
(not on bus)	\$6	2.5W	--
new controller - 100 ohm load	\$16-20	1.7-2W	84-PQFP
			100-PQFP

Complete SCSI Device	Cost	Power	Area
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current (target)	\$15	5.7 W	lots
current (not on bus)	\$15	3.0 W	lots
new controller	\$16	2 W	one 84-PQFP or 100-PQFP

To make comparisons valid, Voh was set to 3V and Vol to 1.5V when calculating power consumption. Both cases assume a target mode with 13 active outputs and 5 tristated outputs.

3. SUMMARY

Alternative differential

- is 100% compatible with existing differential, as long as bus voltages do not exceed the range of 0 to 5 volts.
- can be integrated with a controller into a single package.
- consumes less power in its worst case than the current differential does in the best case.
- requires 1/3 to 1/4 the area.

4. ACTION ITEMS

- A. Review the feasibility of alternative differential by systems integrators and cabling experts.
- B. Generate new cable and TERMPower requirements.
- C. Complete the proposed specification for alternative differential.