

Date: 25 October 2001

To: T10 Committee (SCSI)

From: Lawrence Barnes (LSI Logic)

Subject: Proposed resolution of SSM Letter Ballot comments

All section, figure, table, and equation references in this document refer to revision 04a of SSM.

Comments from Mr. Michael Wingard of Amphenol Interconnect:

SSM: 1.1) 6.2.2.1

misspelled word "though" should be "through"

Accept: Sentence read "...construction through parameters that are usually thought of..."

SSM: 1.2) 6.2.2.2

Symbol alpha incorrectly written as "a", four places

Accept: Letter a replaced by symbol alpha, 6 places

Equation(s) missing after ending "...for a transmission line is give by"

Accept: Insert new Equation 3 and new Equation 4

SSM: 1.3) 6.2.3

Paragraph beginning "When entering cable detail..."

"The braid in a shielded cable, and the insulation on covering aluminum tape should not be included."

SUGGEST substituting: The overall shields, frequently aluminum tape under braid, should be represented by one circle if modeling a surface ground, or two circles if modeling an ideal ground.

Accept/modification: Sentences read: "Shielded cables are often comprised of a braided shield over a wrap of aluminized mylar tape. Considering the frequencies present in SCSI cables, it is often sufficient to represent the shield as a tubular polygon representing the aluminum while ignoring the mylar and braid. The tube wall is set to the thickness of the aluminum."

After last paragraph, SUGGEST inserting:

Actual performance of physical twist-flat cable is highly complex due to presence of built-in structure, usually periodic. The structure causes frequency dependent variations in impedance phase, and attenuation that are not fully understood at present. Validation of the Maxwell matrix shall be performed by verifying that measured impedance agrees with simulated with reasonable accuracy. The twisted region is often of sufficient length that measured phase may be used to further verify the simulation. The flat region is usually only 25 to 50 mm long, which is too short for practical measurement of accurate phase, so presently it is not practical to verify simulated phase.

Accept/modification: Last two paragraphs read: "The performance of cables with twisted construction is highly complex. This is due to the structure which is usually periodic. This structure causes frequency dependent variations in impedance, phase, and attenuation. The mechanisms which cause these dependencies are not currently fully understood.

Validation should be performed with comparison to a manufactured cable. The impedance of individual pairs of the cable should be measured and the results compared to the model. The twisted regions are often of sufficient length that measured phase may also be used to further verify the simulation. In either case, if the difference between the measured and predicted profiles vary greater than acceptable limits, the simulation input data should be varied and the simulation performed again. Usually small changes in the dielectric constant will bring the results together. Note that only the self terms are determined by measurement. If the self terms are in agreement the coupled terms should also be within acceptable limits. "

SSM: 1.4) 6.2.4

"In general Maxwell matrices are both square and symmetrical."

SUGGEST: In general Maxwell matrices are square, and are frequently symmetrical.

Reject: By definition Maxwell matrices are symmetrical

Comments from Dr. William Ham of Compaq Computer Corp.:

SSM: 2.1) General comment on ballot information:

I thought that there was no public review for technical reports. Is this a mistake in the statement of the purpose of the letter ballot or am I mistaken?

Accept: YES, a mistake was made in the statement of the purpose of the letter ballot.

SSM: 2.2) Comment #: 1

Comment type: E

Document location: Page v (Table of contents)

Comment: Indent every heading level differently (much easier to read)

Suggested remedy: Implement the comment

Reject: Not in conformance with T10, NCITS, and ISO documentation templates.

SSM: 2.3) Comment #: 2

Comment type: E/T

Document location: Page 1 scope

Comment: The document does not contain several of the items listed and does contain additional items that are not listed. Suggest adding the additional items, identifying which ones in the current list are not addressed and adding a comment that future work is underway to address these items.

Suggested remedy: Add the following wording in place of existing wording: The objectives of SCSI signal modeling within T10 are listed below. Some of these objectives are addressed in this document. Others are

being addressed in follow on projects. The objectives addressed in this document are indicated with an asterisk.

- x) create a framework that shows how SCSI signal modeling fits within the context of a SCSI bus and for different purposes *
- a) define a baseline for the exchange of performance measurements,*
- b) define a set of elemental components of the SCSI parallel interface,*
- c) define a set of composite components of the SCSI parallel interface,*
- d) define the interface boundaries of the component sets,*
- e) define the modeling parameters of the component sets,*
- f) define the methodology for translating between physical measurements and necessary modeling parameters,*
- f1) define the general signal modeling methodologies that apply to SCSI *
- f2) define the model constructions to be used for every defined component
- g) define a methodology for integrating the component models into a system model,
- h) define a system simulation strategy, and
- i) define a method for the exchange of information between component suppliers and system integrators.

SSM is the first document in a series that address the general subject of modeling the SCSI bus

Accept/modification: Scope clause to read -

"This technical report establishes a common methodology for SCSI system signal modeling. Using this methodology, SCSI systems may be modeled accurately and consistently. This technical report establishes the requirements for the exchange of signal performance information between component suppliers, system integrators, and those carrying-out simulations. This report defines the acceptable methods for extracting the electrical and signal performance attributes of the constituent parts of a SCSI bus segment. This report establishes the acceptable methods for modeling these parts. It shall be used in conjunction with the requirements within the T10 SCSI Parallel Interface (SPI-x) family of standards.

The objectives of the SCSI Signal Modeling (SSM) Technical report are to:

- a) create a framework that shows how SCSI signal modeling fits within the context of a SCSI bus segment,
- b) define the modeling parameters of the component sets,
- c) define a set of elemental components of the SCSI parallel interface,
- d) define a set of composite components of the SCSI parallel interface,
- e) define the interface boundaries of the component sets,
- f) define the general signal modeling methodologies that apply to the SCSI parallel interface,
- g) define the only acceptable model types and formats for the exchange of performance information and model structure for each component,
- h) define the methodology for translating between physical measurements and necessary modeling parameters, and
- i) define a method for the exchange of information between component suppliers and system integrators.

A common methodology for simulating SCSI bus segments and the establishment of acceptable methods for simulating these parts were also originally intended to be addressed in this document but have been deferred to SSM-2 along with the following:

- a) defining the constructions to be used for every defined component,
- b) defining a methodology for integrating the components into a system, and
- c) defining a system simulation strategy."

SSM: 2.4) Comment #: 3

Comment type: E

Document location: Page 3 clause 3.2

Comment: Suggest that this clause be moved to after the overview clause (present clause 5) so that the way these tools fit into the SSM architecture is more apparent. Also, I question whether there are tools that fits into more than one slot and whether there are tools that comprise more than one of the types listed into a single product.

Suggested remedy: Move Clause 3.2 to a new Clause 6, promote the present clause 3.1 to clause 3, add any additional known examples of tools to the list.

Accept/modification: Add sentence to Clause 3.2 to read - "The usage of these tools are explained in more detail in Clause 5."

SSM: 2.5) Comment #: 4

Comment type: E

Document location: clause 4.1.25 "Device"

Comment: This definition needs to be expanded to address the usage in the present document.

Suggested remedy: Use the following wording: Device: an electron device. In this document a device is equivalent to an "active elemental component". This term does not mean "SCSI device".

Reject: Electron device is correct. See IEEE Std 100-1996 pg. 347.

SSM: 2.6) Comment #: 5

Comment type: E

Document location: clause 5.2.2.2

Comment: Need to distinguish between active and passive elemental components

Suggested remedy: Change the wording to read as follows. Elemental components are limited to the following) bulk cable (passive) b) mated connectors (passive) c) un-mated connector halves (passive) d) transceivers (active) - also termed "devices" in this document e) terminators (active) - also termed "devices" in this document f) unpopulated printed circuit boards (passive)

Accept/modification: Clause 5.2.2.2 reads -

"Elemental components are limited to the following:

- a) bulk cable - passive
- b) mated connectors - passive
- c) un-mated connector halves - passive
- d) transceivers - active
- e) terminators - passive, active
- f) unpopulated printed circuit boards - passive
- g) instrumentation probes - passive, active
- h) instrumentation - passive, active
- i) cable assembly transition regions - passive"

SSM: 2.7) Comment #: 6

Comment type: E

Document location: Clause 6.2.1.1

Comment: The term "buffer" is used in describing IBIS but is nowhere defined. I think that "buffer" means the same thing as "transceiver" but am not sure. In any case a definition seems to be in order. Suggested remedy: add a definition for "buffer" to the definitions list.

Accept: Add buffer definition.

SSM: 2.8) Comment #: 7

Comment type: E

Document location: Clause 6.2.2.2

Comment: there is a sentence that has no end shortly after the last entry in the numbered list. Seems to be an equation missing. Suggested remedy: Add the missing material

Accept:

SSM: 2.9) Comment #: 8

Comment type: E/T

Document location: 6.2.1.1

Comment: This overview does not give the reader much idea of what Maxwell Matrices are. Suggested remedy: Suggest either inserting an example or a reference to an example of a Maxwell Matrix. Also suggest that something like the following words be added:

The form of a Maxwell Matrix is not determined by the design of the component whose behavior it describes but the values entered into the matrix are determined by the design. There is no implied physical circuit topology in a Maxwell Matrix and physically unrealizable matrix values, for example negative conductance, are appropriate in a Maxwell Matrix. Maxwell Matrices may appear similar to circuit models but are truly behavioral.

Accept: Modify clause 6.2.2.1.

SSM: 2.10) Comment #: 9

Comment type: E/T

Document location: Clause 7.1

Comment: This overview needs to describe the basic division of models into “passive” and “active” since that is the organization of clause 7

Suggested remedy: Add words like: Clause 7 describes the properties of models for all types of component. A convenient division is made into models for “active” and “passive” components. Active and passive components may be either elemental or composite.

Accept/modification: Paragraph reads - "This clause describes the model features for all types of components. These models are divided into interconnect components, devices, and instrumentation. Interconnect components are passive while devices are active. Active and passive components may be either elemental or composite."

SSM: 2.11) Comment #: 10

Comment type: E/T

Document location: Clause 7.1

Comment: The term “interconnect component” is not defined in Clause 5. This term appears to describe passive elemental components and passive composite components. Suggested remedy: use the term “passive component” instead of “interconnect component” or define the term “interconnect component” as any type of passive component.

Accept: Add definition of interconnect component.

SSM: 2.12) Comment #: 11

Comment type: E

Document location: Clause 7.1

Comment: the term “active device” is redundant.

Suggested remedy: Change to “active elemental component” or “device”

Accept:

SSM: 2.13) Comment #: 12

Comment type: T

Document location: Clause 7.2.4

Comment: There is a statement that says “Behavioral models describe the function of an active device these include IBIS and Maxwell matrices.” This implies that Maxwell Matrices are not useful for passive devices and, further, that SSM defines no behavioral options for passive components.

Suggested remedy: See comment 11 to address the term “active device” and reword to eliminate the implication that Maxwell Matrices are only useful for active components.

Accept/modification: Paragraphs read - "Behavioral models describe the function of a component while circuit models describe the electrical structure.

IBIS models and Maxwell matrices are forms of behavioral models. IBIS models may be used to render devices, while interconnect components may rendered through Maxwell matrices."

SSM: 2.14) Comment #: 13

Comment type: T

Document location: Clause 7.2.4

Comment: change “Maxwell matrices represent the solution of Maxwells equations for the interconnect. They describe the behavior of the interconnect.” to be consistent with the terminology in the rest of the document.

Suggested remedy: Change to: Maxwell matrices represent the solution of Maxwells equations for the component or system being modeled. They describe the behavior of the component or system.

Accept/modification: Paragraph reads - "Maxwell matrices represent the solution of Maxwell's equations for the interconnect component. They describe the behavior. They consist of matrices of inductance, resistance, capacitance, and possibly dissipation. The matrices contain all mutual coupling information for the interconnect. "

SSM: 2.15) Comment #: 14

Comment type: T

Document location: Clause 7.2.4

Comment: Change “Lumped element models represent the electrical characteristics of the interconnect by single resistors, inductors, and capacitors.” to be consistent with the terminology in the rest of the document

Suggested remedy: Change to: Lumped element models represent the electrical characteristics of the passive component by single resistors, inductors, and capacitors.

Accept/modification: Paragraph reads - "Lumped element models are examples of circuit models. Lumped element models represent the electrical characteristics by physically realizable resistors, inductors, and capacitors."

SSM: 2.16) Comment #: 15

Comment type: T

Document location: Clause 7.2.5

Comment: The term “model element” has not been defined. What is a “model element”?

Suggested remedy: Define the term “model element” or change the wording to not use it.

Accept/modification: Paragraph reads - "The model boundary defines the point where a modeled element joins another modeled element. This is the place where model measurements can be made - not to be confused with the mathematical boundary conditions used within simulation software."

SSM: 2.17) Comment #: 16

Comment type: E

Document location: Clause 7.2.7.4

Comment: There is duplication in this clause of material in clause 5.6. Duplication is not necessarily a problem but there is more material in Clause 5.6 that should be referenced.

Suggested remedy: Add a reference to Clause 5.6 to Clause 7.2.7.4.

Reject:

SSM: 2.18) Comment #: 17

Comment type: T

Document location: 7.2.8.1

Comment: RLGC models apply to more than just bulk cable

Suggested remedy: strike the word “cable” just before the equation

Accept:

SSM: 2.19) Comment #: 18

Comment type: E

Document location: 7.2.8.5

Comment: Same as comment 16

Suggested remedy: same as comment 16

Reject:

SSM: 2.20) Comment #: 19

Comment type: E

Document location: 7.3.2

Comment: the term "bulk cable" is the accepted term within T10 to describe the unconnectorized wire

Suggested remedy: Add the word "bulk" where the intent is to define unconnectorized wire.

Accept:

SSM: 2.21) Comment #: 20

Comment type: E/T

Document location: Clause 7.3.4

Comment: the term "trace netlist" used to describe a type of model yet that type was not identified in the section that described model type/class Suggested remedy: Either do not use the term "trace netlist" or define it as another model type/class.

Accept/modification: Paragraph reads - "The models are supplied in the form of Maxwell matrices. Their connectivity data are described in trace netlists."

SSM: 2.22) Comment #: 21

Comment type: E/T

Document location: Annex sections

Comment: add an annex with the system simulation report done by Bill Troop of IBM

Suggested remedy: Add this annex. Bill Ham, Compaq, has agreed to convert the report to a Frame compatible form for this purpose.

Accept:

SSM: 2.23) Comment #: 22

Comment type: E

Document location: Clause 10.4

Comment: The table for data rates is in the wrong clause

Suggested remedy: Move the table to the appropriate clause

Accept:

SSM: 2.24) Comment #: 23

Comment type: T

Document location: Clause 9.1.1.4

Comment: The point of interest was agreed previously to be the connector pad even for populated boards

Suggested remedy: Change 9.1.1.4 to read "A populated board shall be measured at the pads for the connector on the board."

Accept/modify: Sentence reads - "...at the connector pads."

SSM: 2.25) Comment #: 24

Comment type: T

Document location: 9.1.2

Comment: The term "device" used in this clause heading is inconsistent with the use of the term elsewhere in the document.

Suggested remedy: Delete the clause or define the term to be "SCSI device" or something similar. Need a definition for whatever is used.

Accept:

SSM: 2.26) Comment #: 25

Comment type: E/T

Document location: Clause 9.3

Comment: The only behavioral validation type mentioned is for the transceiver. This suggests that transceivers are the only type of component that has a behavioral model. Suggested remedy: Remove Clause 9.3.1 and state that behavioral validation will be addressed in SSM-2.

Accept/modification: Add sub-clause 9.3.2, 9.3.3, and 9.3.4

SSM: 2.27) Comment #: 26

Comment type: E/T

Document location: Clause 9.4

Comment: The information in Clause 9.4 is very sketchy and it is unclear how this information might be used.

Suggested remedy: Add a statement that only some very basic information is included in SSM and that SSM-2 is expected to seriously expand on this topic.

Accept:

SSM: 2.28) Comment #: 27

Comment type: E

Document location: All

Comment: The editor is to be congratulated for pulling together the information contained in SSM for the first time in the industry. The no vote reflects the fact that some of the inconsistencies are serious and need to be fixed before publication.

Suggested remedy: none

Accept: Agree congratulations are richly deserved by the humble editor.

Comments from Mr. Ralph O. Weber of ENDL Texas:

SSM: 3.1) ENDL 1, PDF Page 10

Pages x and xii are blank. Change the settings for the LOT and LOF files in the book from "read from file" to "next available page" to make these blank pages go away.

Accept:

SSM: 3.2) ENDL 2, PDF Page 14

Page xiv is blank. You may wish to make this blank page go away by changing the book file setup for the file containing the Scope clause.

Accept:

SSM: 3.3) ENDL 3, PDF Page 14

Generally T10 documents contain a Foreword and an Introduction between the table of contents and the Scope clause. These two sections are not numbered and are not part of the formal document. However they are important, particularly the Foreword, since this is where information about obtaining copies of standards (a.k.a., document distribution) is available in the published document. ANSI will remove the first two pages from the document before publishing it, and in the case of SSM this means that the document distribution information will be lost. Finally, when cloning text for the Foreword and Introduction be sure to use very new document such as SPC-2 because the document distribution information changed recently. SPC-2 has the right document distribution information whereas the back side of the SSM cover page does not.

Accept

SSM: 3.4) ENDL 4, PDF Page 16

The format of the references clause is incorrect. The use of footnotes in the references clause fails to conform to the style used by T10. Please see SPI-4 for the correct format of the references clause.:

Reject: The use of footnotes in the references clause is cleaner and more concise than that currently in use in T10. It is not precluded by the ISO document template. Suggest that T10 adopt this configuration.

SSM: 3.5) ENDL 5, PDF Page 17

Please add a paragraph at the beginning of 3.1 describing the purpose, nature, whatever,... of the publications listed. Note 3.2 has such a paragraph.

Accept: Sentence reads - "The following is a list of publications that provide useful information, techniques, and processes for developing, simulating, and analyzing models."

SSM: 3.6) ENDL 6, PDF Page 19

I do not understand the need for footnotes. Is this availability information not present in clause 2?

Accept: Added IEEE Dictionary, NCITS Dictionary to clause 2 w/footnotes

SSM: 3.7) ENDL 7, PDF Page 19

In the definition of 'admittance', why is 'n' in italics, but 'i' and 'j' are not?

Accept: Added italics

SSM: 3.8) ENDL 8, PDF Page 19

In the definition of 'accuracy', instead of 'see precision' why not a cross reference to the sub clause number of the precision definition?

Accept:

SSM: 3.9) ENDL 9, PDF Page 19

Why a '1)' in the definition of 'balanced', I don't see a second definition?

Accept: Added definition 2)

SSM: 3.10) ENDL 10, PDF Page 19

In the definitions of 'bulk cable' and 'cable assembly', is 'connector terminated' a jargon term needing a definition of its own, or would a more common English phrase such as 'connectors at either end' be more appropriate.

Accept/modification: Added definition for "connector terminated"

SSM: 3.11) ENDL 11, PDF Page 20

In the definition of 'computer-aided engineering' and elsewhere in 4.1, T10 documents have recently started putting the acronyms next to the glossary entries (e.g., computer-aided engineering (CAE):). SSM may wish to adopt this style.

Reject:

SSM: 3.12) ENDL 12, PDF Page 20

In the definition of 'device', is 'electron' (one of three constituents of an atom) correct or is 'electronic' (based on electrical signals) better?

Reject: Electron device is correct. See IEEE Std 100-1996 pg. 347.

SSM: 3.13) ENDL 13, PDF Page 20

At the end of the second definition of 'discontinuity', should 'over a length short compared to a wavelength.' be 'over a length that is short compared to a wavelength.'?

Accept/modification: Append description of short as 0,1 wavelength or smaller

SSM: 3.14) ENDL 14, PDF Page 20

In the second definition of 'driver", what is 'binary sate'? Perhaps 'binary state' is meant?

Accept: Change sate to state

SSM: 3.15) ENDL 15, PDF Page 21

Why is there a definition for 'electron device'? The term is not used anywhere in SSM. Also, unless the definition of 'device' is modified, it appears to me that 'electron device' and 'device' are the same thing.

Accept:

SSM: 3.16) ENDL 16, PDF Page 21

The definition of 'false' uses unnecessarily tortured grammar. It would be better to place the comma delimited phrase 'usually represented by 0' in a separate sentence.

Accept:

SSM: 3.17) ENDL 17, PDF Page 21

In the definition of 'gain', why is the second sentence describing the properties of attenuation?

Reject: To satisfy Bill Ham.

SSM: 3.18) ENDL 18, PDF Page 21

In the definition of 'group delay', $\Delta\omega$ appears to be a symbol representing 'group delay'. If this is the case, either add "($\Delta\omega$)" before the colon in the term being defined or replace $\Delta\omega$ with group delay throughout the definition.

Reject/modification: $\Delta\omega$ is specific to network analyzers and is clarified

SSM: 3.19) ENDL 19, PDF Page 21

In the definition of 'group delay time' it appears to this reader that 'change, with angular frequency' should be changed to 'change with respect to angular frequency'. Note particularly the removal of the comma.

Accept/modification: Add comma after angular frequency.

SSM: 3.20) ENDL 20, PDF Page 21

In the definition of 'group velocity', perhaps 'envelope moves without change of shape.' really means to say 'envelope moves without changing shape.', or (less preferably) 'envelope moves without a change of shape.'

Accept/modification: Sentence reads: "...envelope moves without a significant change of shape."

SSM: 3.21) ENDL 21, PDF Page 21

In the definition of 'group velocity', perhaps 'the reciprocal of the rate of change of phase constant with angular frequency.' would read more clearly as 'the reciprocal of the rate of the change of phase constant with respect to the angular frequency.'

Reject: See IEEE Std 100-1996 pg. 468

SSM: 3.22) ENDL 22, PDF Page 21

In the definition of 'hardware description language' remove the comma in 'document, a hardware' to produce 'document a hardware'.

Accept:

SSM: 3.23) ENDL 23, PDF Page 21

In the definition of 'high', either explain why only logic 1 needs to be described, or remove the second sentence.

Reject: See IEEE Std 100-1996 pg. 485

SSM: 3.24) ENDL 24, PDF Page 21

In the definition of 'logical unit' change 'executes' to 'processes'. A global search for the verb 'to execute' with replacement by forms of the verb 'to process' is strongly recommended.

Accept:

SSM: 3.25) ENDL 25, PDF Page 21

In the definition of 'least significant' change 'represents' to 'represent' because 'items... represent' is the sentence structure, not '... a whole... represents'

Reject: See IEEE Std100-1996, pg. 577

SSM: 3.26) ENDL 26, PDF Page 22

In the definition of 'most significant' change 'represents' to 'represent' because 'items... represent' is the sentence structure, not '... a whole... represents'

Reject: See IEEE Std 100-1996 pg. 606

SSM: 3.27) ENDL 27, PDF Page 22

In the definition of 'low', either explain why only logic 0 needs to be described, or remove the second sentence.

Reject: See IEEE Std 100-1996 pg. 606

SSM: 3.28) ENDL 29, PDF Page 22

The definition of 'magnetic coupling' is cryptic. If the intent is to indicate an equivalence between two terms, the form used by other T10 documents is 'Synonymous with inductive coupling, see 4.1.45.'

Accept:

SSM: 3.29) ENDL 30, PDF Page 22

In the definition of 'microstrip', the last sentence either contains a non-word (please run spelling checker) or the last sentence needs to be restructured to more closely follow the conventions of English grammar.

Accept: Sentence reads - "The semi-infinite space above the strips is filled with a medium of relative permittivity and permeability equal to or less than the substrate."

SSM: 3.30) ENDL 31, PDF Page 22

The definition of 'mode' is cryptic. Did you all get lazy after the letter M?

Reject: No. Also, "you all" should have been written "all of you."

SSM: 3.31) ENDL 32, PDF Page 22

In the definition of 'netlist', change 'circuit. It provides,' to either 'circuit, providing,' or to 'circuit. A netlist provides,'.

Accept: Sentence reads "... of a circuit, providing, usually ..."

SSM: 3.32) ENDL 33, PDF Page 22

In the definition of 'network matrix' is it critical that 'n' be in italics?

Reject: Yes, an italicized is conventional usage.

SSM: 3.33) ENDL 34, PDF Page 22

In the definition of 'phase angle', should 'form' be 'from'?

Accept: Yes

SSM: 3.34) ENDL 35, PDF Page 22

In the first definition of 'phase shift', should 'tow' be 'two'?

Accept: Yes

SSM: 3.35) ENDL 36, PDF Page 22

The definition of 'phase velocity' has a highly unusual structure. A more typical wording would be 'the velocity of an equiphase surface in the direction of propagation, for a traveling wave at a given frequency, and for a given mode.'

Accept:

SSM: 3.36) ENDL 37, PDF Page 22

Please change the 'orphan lines' setting for the definition paragraphs so that the two lines in the definition of 'pole' appear on a single page.

Accept:

SSM: 3.37) ENDL 38, PDF Page 23

In the definition of 'port', is 'network' really 'network function' or 'network matrix', or should a glossary entry for 'network' be added? In this reviewer's opinion 'network' is a sufficiently vague term that it needs to be defined if it is going to be used in a T10 document.

Accept: Add glossary entry for network.

SSM: 3.38) ENDL 39, PDF Page 23

In the definition of 'primary bus', perhaps 'the system with the basic' should be 'a system with the basic'. Note the removal of the space between 't' and 'he' as well as the changing of 'the' to 'a'.

Reject: See IEEE Std 100-1996, pg. 815

SSM: 3.39) ENDL 40, PDF Page 23

I cannot find a clear usage of the term 'request' as defined in the glossary. The closest I can come to finding such a usage is 'request model' which appears a couple of times in clause 8. If the definition of 'request' is to support 'request model' perhaps defining 'request model' would better serve the readability of the TR.

Accept: Remove "request" from glossary

SSM: 3.40) ENDL 41, PDF Page 23

I find it most interesting that the definition of 'SCSI bus' could apply equally well to a telephone line.

Accept: It is interesting, isn't it? Amazing what copper can do!

SSM: 3.41) ENDL 42, PDF Page 23

In the definition of 'SCSI device', does the SCSI port connect its drivers and receivers to just any bus, or do they connect to a SCSI bus?

Accept: Revised definition to correspond to that used in SAM-2.

SSM: 3.42) ENDL 43, PDF Page 23

The definition of 'skin depth' appears to have been written by the same person that wrote 'phase velocity'. How about 'the depth at which the surface current density is reduced to 1/e of its value at the surface, for a given conducting material, at a given frequency.'

Reject: See IEEE Std100-1996, pg. 1000

SSM: 3.43) ENDL 44, PDF Page 23

Since no other T10 document contain a definition for SCSI, I wonder if it is critically needed in this one.

Accept:

SSM: 3.44) ENDL 45, PDF Page 24

I cannot tell if 'transmission mode' is defined to have three concurrent elemental types or only one. If the following still says what you mean, I recommend it as the definition of 'transmission mode': 'A form of propagation along a transmission line characterized by the presence of one of the following elemental wave types: transverse electric, transverse magnetic, or transverse electromagnetic.'

Reject:

SSM: 3.45) ENDL 46, PDF Page 24

In the definition of 'transmittance', the wording must be either 'variable is' or 'variables are', depending on whether one or several variables are measures. However, there is a further question about whether the exact variable(s) being measured are well enough known to be mentioned in the definition. If only one variable is being measured, then most certainly I think that variable needs to be named in the definition.

Accept:

SSM: 3.46) ENDL 47, PDF Page 24

The definition of 'true' uses unnecessarily tortured grammar. It would be better to place the comma delimited phrase 'usually represented by 1' in a separate sentence.

Reject: See IEEE Std100-1996, pg.

SSM: 3.47) ENDL 48, PDF Page 24

In the definition of 'unbalanced', could a 'which' be eliminated by replacing the last sentence with 'Unbalanced signifies a circuit where one side is grounded.'?

Accept:

SSM: 3.48) ENDL 49, PDF Page 24

Since there is only one definition of 'unbalanced', the '1)' should be removed.

Accept/modification: Add definition 2).

SSM: 3.49) ENDL 50, PDF Page 24

Delete the second sentence in the definition of 'vendor-specific'.

Accept:

SSM: 3.50) ENDL 51, PDF Page 24

In the definition of 'validation', the use of 'evaluating' appears to be such that 'evaluating' should be replaced by 'verifying', based on the definition of 'verification' a couple of definitions farther on.

Reject:

SSM: 3.51) ENDL 52, PDF Page 24

Incorporate the footnote on Verilog in the text of the definition. This is particularly important because the footnote is separated from the footnote reference by a page break.

Reject: Revised pagination.

SSM: 3.52) ENDL 53, PDF Page 24

In the definition of 'verilog', the phrase 'hardware descriptor language' probably should be 'hardware description language' as in 4.1.43.

Reject: Verilog description is "descriptor"

SSM: 3.53) ENDL 54, PDF Page 25

In the definition for 'vhdl', the acronym should be replaced by the fully spelled out name, see acronyms section.

Reject: Similar argument regarding SFF industry committee and small form factor; KFC Inc. and Kentucky fried chicken.

SSM: 3.54) ENDL 55, PDF Page 25

In the definition of 'vhdl', the phrase 'hardware descriptor language' probably should be 'hardware description language' as in 4.1.43.

Accept:

SSM: 3.55) ENDL 56, PDF Page 25

In the definition of 'y parameter', is 'four-terminal' really 'four- port' as in other definitions or has a new concept been described?

Reject: Four-terminal is correct

SSM: 3.56) ENDL 57, PDF Page 25

It would be useful if those acronyms that have glossary entries contained cross references to the glossary entry.

Reject:

SSM: 3.57) ENDL 58, PDF Page 26

Since MHz is used in the glossary, should it not appear in the abbreviations list in addition to Hz hertz?

Reject: M is defined in abbreviations as a prefix for 10^6

SSM: 3.58) ENDL 59, PDF Page 26

The definition of group delay uses several symbols that are not mentioned in 4.3.

Accept:

SSM: 3.59) ENDL 60, PDF Page 26

Italicized s is used in several definitions and not listed in 4.3.

Accept:

SSM: 3.60) ENDL 61, PDF Page 26

There is a 'p' in the definition of zero that does not appear in 4.3.

Accept: Add p to abbreviations list

SSM: 3.61) ENDL 62, PDF Page 26

Regarding 4.4, it is not clear how keywords such as 'mandatory' and 'shall' or even 'optional' apply to a technical report.

Reject: See John Lohmeyer

SSM: 3.62) ENDL 63, PDF Page 27

In 4.5, since this TR does not discuss messages, command, statuses, sense keys, additional sense codes and additional sense code qualifiers, these should not be mentioned in the first paragraph.

Accept:

SSM: 3.63) ENDL 64, PDF Page 27

In 4.5, change '(e.g., REQUEST SENSE)' to '(e.g., DATA IN phase)'.

Accept:

SSM: 3.64) ENDL 65, PDF Page 27

In 4.5, remove the discussion of fields being in small upper case from the first paragraph and delete the entire second paragraph, since this TR does not discuss these kinds of fields.

Accept:

SSM: 3.65) ENDL 66, PDF Page 28

5.1 appears to say that this TR is predominantly concerned with a 'SCSI bus segment'. Should not there be a glossary definition for something so integral to the purpose of the TR?

Accept:

SSM: 3.66) ENDL 67, PDF Page 28

On behalf of Gene Milligan, I suggest that the following two sentences do not belong in 5.1 or anywhere else in this TR: 'Since this document is the first of its kind in the industry it is being cast as a technical report. Following generations of this document will be a standard.' If they are kept, either change to 'generations... standards' or to 'generation... standard'.

Accept:

SSM: 3.67) ENDL 68, PDF Page 28

In 5.1, what is an 'expander'? Is this another candidate for a glossary definition?

Accept: Added expander glossary definition

SSM: 3.68) ENDL 69, PDF Page 28

Figure 1 leads me to believe that 'transmission medium' and 'transition regions' are the same thing. Both have the same kind of lines in the same left-right position and the same markings in all other respects. I doubt that this is the intent.

Accept: Drawing modified to be clearer to those uninitiated in mechanical drawing standards.

SSM: 3.69) ENDL 70, PDF Page 28

In 5.1 the first paragraph after Figure 1 confuses me, to wit 'Each feature identified in Figure 1 is considered a component with specific interfaces to the bus segment path.' Are transition regions components?

Reject: YES

SSM: 3.70) ENDL 71, PDF Page 28

In the second paragraph after figure 1, 'for example' seems gratuitous and probably should be removed.

Accept:

SSM: 3.71) ENDL 72, PDF Page 28

The last sentence of the second paragraph after figure 1 seems to suggest that the description of multidrop bus segments exists and can be found somewhere, if this is the case then the somewhere should be named. Otherwise, the sentence should be changed to something like 'The simple architecture described in this document provides the basis for describing multidrop bus segments.'

Accept/modification: Sentence reads: "The architecture depicted in Figure 1 provides the basis for describing multidrop bus segments."

Comments from Mr. John Lohmeyer of LSI Logic Corp.:

SSM: 4.1) Comment #1 - (6.2.1.5.4.10) Technical:

Near the end of this section the example of a Driver Schedule implementation should be replaced with the following:

"An example of a Driver Schedule implementation of fallback for Ultra320 plus and minus drivers follows:

[Model] U320P

[Driver Schedule]

| Model_name Rise_on_dly Rise_off_dly Fall_on_dly Fall_off_dly

U320P_hi 0.0s 6.25ns NA NA

U320P_lo 6.25ns 100ms NA NA

[Model] U320M

U320M_hi 0.0s 6.25ns NA NA

U320M_lo 6.25ns 100ms NA NA

The models U320P and U320M are called from the [Pin Mapping] table”

Accept/modification: Concatenate 1st and final sentence to read: “An example of a Driver Schedule implementation of fallback for Ultra320 using separate plus and minus drivers follows. The models U320P and U320M are called from the [Pin Mapping] table.”

Comments from Mr. Erich Oetting of Storage Technology Corp:

SSM: 5.1) 1. (Editorial) - Pg. 73:

Annex A should be “normative” instead of “nomative”.

Accept: Nomative removed altogether.

Comments from Mr. Paul D. Aloisi of Texas Instruments:

SSM: 6.1) 5.2.1:

item a FC should be changed sot SCSI

Accept:

SSM: 6.2) Table 13

the Ultra160 line has an extra coma in the rise/fall time column

Accept:

Comments from Mr. Charles Brill of Tyco Electronics:

SSM: 7.1) Change#1: on page22, sec.5.5 line 3 after Figure 5:

a) experimental data - data gathered by physical measurements

Should read: experimental data - data gathered by physical and electrical measurements

Accept/modification: Sentence reads: “...experimental data - data gathered by mechanical and electrical measurements...”

SSM: 7.2) Change#2: on page42, sec.6.2.2.2 line 3

This method only applies to a single line model.

Should read: This method only applies to a single line model in this report.

Accept/modification: Sentence reads “The following methodology may be used to create a single line model.”

SSM: 7.3) Change#3: on page42, sec.6.2.2.2 line 4

At the end, add: Multiple line model will be developed in SSM-2. This method is practical for creating cable models with complicated physical parameters such as round cables.

Accept/modification: Sentence reads: “A multiple line methodology will be developed in SSM-2. This will be useful for creating cable models with complicated physical parameters.”

SSM: 7.4) Change#4: on page 43, line 7,8,9 and 18

All the 'a's should change to alpha

Accept:

SSM: 7.5) Change#5: on page43, line 10

8) apply RLGC values into a SPICE transmission line model Should read: apply RLGC values into a format of circuit model

Accept/modification: Reads: “apply the RLGC values into a transmission line circuit model”

SSM: 7.6) Change#6: on page 43, line 14, add:

The format of the circuit model is as follow:

Accept/modification: Sentence reads: “A transmission line circuit model using the RLGC values is depicted in Figure 10.

SSM: 7.7) Change#7: on page43, line 17, two equations are missing:

Add: (Eq 1.0), (Eq 2.0)

Accept: Eq 1.0 becomes Equation 3, Eq 2.0 becomes Equation 4

SSM: 7.8) Change#8: on page 43, line 29,

---, a SPICE transmission line model is created by ---

Should read: ---, a circuit model is created by ---

Accept:

SSM: 7.9) Change#9: on page 43, line 36 - 37

The result is a collection of frequency dependent transmission line equations that can be used to determine the overall cable performance.

Should read: The result can be used to determine the overall cable performance.

Accept/modification: Delete entire sentence as tautology.