Cl **52** *SC* *P* *L* **# 890**

Ohlen, Peter   Optillion

Comment Type **T** *Comment Status* **A** *PENALTY*

For the 1550 nm PMD a dispersion penalty measurement for the transmitter is needed in order to ensure that the transmitter chirp is not too large.

SuggestedRemedy

Add a dispersion penalty measurement in clause 52.7.xx.
------------------------ NEW TEXT --------------------------------------
52.7.xx Dispersion penalty measurement for 10GBASE-ER/EW
===
The setup for measurement of dispersion penalty is shown in figure C and consists of the transmitter under test, an optical attenuator, a test fiber, a golden receiver, and a bit-error rate tester. All BER and sensitivity measurements shall be made with a $2^{23}-1$ PRBS pattern.
The test fiber shall be an ITU-T G.652 fiber with a length chosen to have a total dispersion larger than $40*0.093/4*(x-1300^4/x^3)$ ps/nm where x is the wavelength of the transmitter under test. To verify that the fiber has the correct amount of dispersion, use the measurement method defined in TIA/EIA-455-175A.
The nominal sensitivity of the golden receiver, S, shall be measured in OMA and calibrated at the wavelength of the transmitter under test.
To measure the dispersion penalty the following procedure shall be used:
1. Configure the test equipment as illustrated in figure C.
2. Adjust the attenuation of the optical attenuator to have a BER of 1e-12.
3. Measure the optical modulation amplitude at the input to the golden receiver P_DUT in dB.
4. If P_DUT is larger than S, the dispersion penalty (DP) for the transmitter under test is the difference between P_DUT and S, DP = P_DUT - S. Otherwise the dispersion penalty is zero, DP = 0.
It is to be ensured that the measurements are made in the linear regime of the fiber.
Figure C -- Test setup for measurement of dispersion penalty
[Figure shows five boxes containing the "Transmitter (D.U.T.)", "optical attenuator", "test fiber", "golden receiver", and "BERT"]
The nominal sensitivity of the golden receiver shall be measured in OMA using the setup of figure C without the test fiber. The golden transmitter should use a CW laser modulated by a high-bandwidth external modulator and meet the following requirements:
1. The bandwidth shall be greater than 15 GHz.
2. The output optical eye shall be symmetric and pass the eye mask test of 52.7.5.
3. In the center 20% region of the eye, the worst case vertical eye closure as defined in 52.7.10 shall be less than 0.5 dB.
The sensitivity of the golden receiver shall be compensated for any vertical eye closure of the golden transmitter. The decision threshold of the golden receiver shall be at the average signal level. The sensitivity of the golden receiver should be as good as the receiver used in the 10GBASE-ER/EW transceiver.
--------------------------END NEW TEXT FOR CLAUSE 52 -----------------------
Other changes
When the dispersion penalty measurement is introduced, the RMS spectral width is not critical, and the current specification of 0.034 nm in table 52-13 should be removed.
Specify the maximum dispersion penalty to 3 dB in table 52-13.
Because the transmission penalty is very dependent on the transmitter parameters, and the relevant penalty is measured directly, thetransmitter output power in table 53-13

(measured in OMA/2) should be Ptx = -4.38 dBm + DP.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE. Needs further refinement.

Cl **52** *SC* **52** *P* **353** *L* **1** **# 1315**

Jonathan Thatcher   World Wide Packets

Comment Type **T** *Comment Status* **R** *TECHNICALFEASIBILITY*

**** BIG TICKET ITEM ****
According to our 5 criteria, we must prove technical feasibility for each PMD type prior to going to sponsor ballot

"10 Gb/s Ethernet technology will be demonstrated during the course of the project, prior to the completion of the sponsor ballot. project, prior to the completion of the sponsor ballot."

To date, no optical technology has reported on such a demonstration.

(Commenter agreed to changes in comment)

SuggestedRemedy

Put together a plan including the definition of "demonstration" for approval by the committee. Do it.

Proposed Response *Response Status* **C**

REJECT. There is no change to the text proposed and no remedy proposed.

Vote: 29-3-30

Cl **52** *SC* **52** *P* **364** *L* **45** **# 1072**

Ali Ghiasi   Broadcom

Comment Type **T** *Comment Status* **R** *RIN*

Table 52-8 specifies RIN of -130 dB/Hz. To meet this level of RIN the transmitter design become very complex.

SuggestedRemedy

SM fiber based plant are specified at -26 dB, you should also specify in table 52-9 Return Loss of -26 dB for optimum cost.

Proposed Response *Response Status* **C**

REJECT. In order to not cause problems in the link if the link does not meet the 26dB spec it was decided at the Tampa meetings that RIN should be measured with 12dB reflection independent of the return loss of the receiver.

TYPE: TR/technical required T/technical E/editorial   COMMENT STATUS: D/dispatched A/accepted R/rejected   SORT ORDER: Clause, Subclause, page, line   Page 1 of 34
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Cl **52** *SC* **52**

Cl **52**   *SC* **52.**   *P* **353**   *L* **1**   **#** **338**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **R**
medium should be plural; several fibre types

SuggestedRemedy
Change "medium" to "media".

Proposed Response   *Response Status* **C**
REJECT. This is the name of the layer of the model, not a description of it. This layer is named medium regardless of the number of different media types it supports.

Cl **52**   *SC* **52.**   *P* **353**   *L* **1**   **#** **336**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **R**
"PMD" means Polarisation Mode Dispersion. The abbreviated "Physical Medium Dependent" isn't a noun. We don't have media which aren't physical. Though we have 6 port types, there are are only two media types, so they aren't really medium dependent.

SuggestedRemedy
My first suggestion was:Change "PMD" to MDS" (like PCS and WIS) throughout, except where it means Polarisation Mode Dispersion.Clause title now becomes: "Medium Dependent Sublayer (MDS) and ..."Add MDS to acronym list.but I think we can do better than that. "port"? "Optoelectronic Interface (OEI)"? Suggestions welcome!

Proposed Response   *Response Status* **C**
REJECT.
Physical Medium Dependent is a commonly used Ethernet terminology and has historically been used to indicate this level of the Ethernet model. Changing this terminology for 10 Gig Ethernet would require changes to clauses not under revision in P802.3ae.

Cl **52**   *SC* **52.**   *P* **353**   *L* **2**   **#** **337**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **R**
baseband and BASE are redundant.

SuggestedRemedy
Delete baseband and BASE throughout the 802.3ae clauses (except if needed to describe or contrast a signalling scheme)

Proposed Response   *Response Status* **C**
REJECT.
BASE is the nomenclature of the PMD type, and baseband is a description of the transmission type. They are not redundant.

Cl **52**   *SC* **52.**   *P* **353**   *L* **2**   **#** **340**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **A**
"Laser" is not needed here. We don't tell implementers that they must use a laser, that's their job.

SuggestedRemedy
Delete "Laser from title, three times. Could replace with "signal" if you must.

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.1**   *P* **354**   *L* **11**   **#** **387**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
Table 52?1 is a valuable innovation and can be built upon, to make this complicated clause more accessible.Table title doesn't exactly match contents.An overview table could be more informative.

SuggestedRemedy
Retitle to:
Port types and Referenced Clauses.
Change "PMD" column to "Port type"
Add column for Signaling speed.
Add column for fibre type (simply MMF or SMF -leave details to subsequent clauses)
Add column for nominal wavelength.
Add column for reach.
10G-E would need a footnote about indicative reach not normative.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. May require more than one table (as required). Editor note: Find other references of a similar nature and change to "port type"

Cl **52**   *SC* **52.1**   *P* **354**   *L* **4**   **#** **792**
Booth, Brad   Intel

Comment Type **E**   *Comment Status* **A**
double "the"

SuggestedRemedy
delete one "the"

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

TYPE: TR/technical required T/technical E/editorial   COMMENT STATUS: D/dispatched A/accepted R/rejected   SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open   W/written C/closed   U/unsatisfied Z/withdrawn

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Cl **52**   *SC* **52.1**

Cl **52**   *SC* **52.1.1.1.2**   *P* **355**   *L* **15**   *#* **341**
Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**
PMDs types : too many s's

SuggestedRemedy
delete s on PMDs

Proposed Response   *Response Status*   **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.1.1.4.1**   *P* **356**   *L* **29**   *#* **339**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**
What does "but consequent actions based on PMD_UNITDATA.indicate, where necessary, interpret rx_bit as a logic ZERO." mean? Especially considering that we said that "The effect of receipt of this primitive by the client is unspecified by the PMD sublayer." We don't mean to impose a squelch requirement. Any consequent action would be described in another clause.

SuggestedRemedy
Delete. Add cross-reference if appropriate.

Proposed Response   *Response Status*   **C**
ACCEPT.

Cl **52**   *SC* **52.1.2**   *P* **357**   *L* **9**   *#* **342**
Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**
Missing ,

SuggestedRemedy
Add , after EW

Proposed Response   *Response Status*   **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.10**   *P* **378**   *L* **16**   *#* **361**
Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**
superfluous TLAs

SuggestedRemedy
Replace "PMD MDI type" with "port type". Or "PMD type"

Proposed Response   *Response Status*   **C**
ACCEPT. Choose "port type".

Cl **52**   *SC* **52.11**   *P* **378**   *L* **29**   *#* **367**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**
Channel may be different to this cabling diagram.

SuggestedRemedy
Add after first sentence:A channel may contain additional connectors or other optical elements as long as the optical characteristics of the channel, such as attenuation, dispersion, reflections, polarisation mode dispersion and modal bandwidth meet the specifications.

Proposed Response   *Response Status*   **C**
ACCEPT.

Cl **52**   *SC* **52.11**   *P* **378**   *L* **29**   *#* **362**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**
Building cable may be outside building

SuggestedRemedy
Delete "Building" from Figure 52?8.

Proposed Response   *Response Status*   **C**
ACCEPT IN PRINCIPLE. Replacement terminology is specified:

(from Kolesar & Cobb communication)

Figure 52-7should change only in the terminology for the cable segments. Change Jumper Cable to Patch Cord. Change Building Cable to Link. As you will see the term "link" is very generic and can apply to cables inside or outside buildings, or combinations of both. It simply is everything up to the patch cords that connect to the equipment at the ends.

Here are the definitions of those terms from TIA 568B.1 :

link: A transmission path between two points, not including terminal equipment, work area cables, and equipment cables.

patch cord: A length of cable with a plug on one or both ends.

TYPE: TR/technical required T/technical E/editorial   COMMENT STATUS: D/dispatched A/accepted R/rejected   SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

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Cl **52**   *SC* **52.11**

CI **52**   *SC* **52.11**   *P* **378**   *L* **43**   *#* **365**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**

Channel description table is be incomplete

SuggestedRemedy

Change table title to "Channel characteristics"
Add rows for channel dispersion and DGDmax: maximum envisioned differential group
delay.

Dispersion might be specified elsewhere.   10km   40km
Dispersion see table 58-18 728 ps/nm (1550nm)
DGDmax   10ps   19ps

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Editorial changes need to be made. The 10ps value needs to be
changed subject to confirmation by committee. Create channel dispersion table.

CI **52**   *SC* **52.11**   *P* **378**   *L* **51**   *#* **363**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **R**

40km is only informative

SuggestedRemedy

Add footnote to table 52-17: 40km is informative not normative.

Proposed Response   *Response Status* **C**

REJECT. A change of 40 km from normative to informative would require a change in the
task force's objectives.

CI **52**   *SC* **52.11**   *P* **378**   *L* **51**   *#* **784**

Furlong, Darrell R   Aura Networks

Comment Type   **E**   *Comment Status* **A**

Both the 10,000 and 40,000 values are not in international format.

SuggestedRemedy

Delete the comma and replace with a space.

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

CI **52**   *SC* **52.11**   *P* **378**   *L* **52**   *#* **364**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**

Channel insertion loss boxes are blank

SuggestedRemedy

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 836

CI **52**   *SC* **52.11**   *P* **378**   *L* **52**   *#* **836**

Congdon II, Herbert V   Tyco Electronics

Comment Type   **T**   *Comment Status* **A**

Channel insertion loss values missing from table.

SuggestedRemedy

Recommend inserting these values, in order, along with 1) a note explaining channel
insertion loss is calculated using cable length, maximum attenuation and two connections
at 0.75 dB each and 2) channel insertion loss at 1550 nm calculated using cable length,
attenuation of 0.35 dB/km, two connections at 0.75 dB each and two splices at 0.3 dB
each.1.61, 1.63, 1.75, 1.81, 2.55, 5.5 or 6.5, 16.1

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. ACCEPT IN PRINCIPLE.1310 nm value needs to be changed to
2 dB connection loss. Values to be verified by committee.

Add editorial note below table "These numbers have not been verified….."

CI **52**   *SC* **52.11**   *P* **378**   *L* **52**   *#* **465**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status* **A**

I think we should not have the channel insertion loss numbers blank in this table

SuggestedRemedy

Either delete this row, or insert the numbers from Table 52-15 etc. or reference Table 52.15
etc.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 836.

CI **52** *SC* **52.11** *P* **378** *L* **52** **#** **885**
Ohlen, Peter Optillion

Comment Type **T** *Comment Status* **A**
The channel insertion loss is omitted for the 1550 and the 1310 serial PMDs.

SuggestedRemedy
Insert 13 dB channel insertion loss for the 1550 SMF channel, and 7.04 dB inserion loss for the 1310 SMF channel.

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. See 836 remedy.

CI **52** *SC* **52.12** *P* **379** *L* **8** **#** **366**
Dawe, Piers Agilent

Comment Type **T** *Comment Status* **A**
Cabling is over specified

SuggestedRemedy
Change "includes a connector plug at" to "includes any connector at"

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. Delete sentence.

CI **52** *SC* **52.12.1** *P* **379** *L* **13** **#** **373**
Dawe, Piers Agilent

Comment Type **T** *Comment Status* **A**
Do we need to mention G.652 and G.650 as well as IEC 60793-2:1992?

SuggestedRemedy
Check!

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. G.652 is reference.

CI **52** *SC* **52.12.1** *P* **379** *L* **14** **#** **776**
Dawe, Piers Agilent

Comment Type **T** *Comment Status* **A**
Fibre specs: G.652 is said to be more up to date than IEC 60793-2:1992.

SuggestedRemedy
Make reference to
ITU-T Recommendation G.652 (2000), Characteristics of a single-mode optical fibre cable as well or (for SMF only) instead of IEC 60793-2:1992.

Proposed Response *Response Status* **C**
ACCEPT. ACCEPT.

CI **52** *SC* **52.12.1** *P* **379** *L* **21** **#** **1052**
Paul Kolesar Lucent

Comment Type **T** *Comment Status* **A**
Per motion by Kolesar and Swanson in Tampa, November, 2000 the descriptor for SMF is incorrect.

SuggestedRemedy
Change "10 um SMF" to "Type B1 SMF"

Proposed Response *Response Status* **C**
ACCEPT.

CI **52** *SC* **52.12.1** *P* **379** *L* **27** **#** **1061**
Doug Coleman Corning

Comment Type **T** *Comment Status* **A**
Need to differentiate between OSP and ISP

SuggestedRemedy
Add footnote to address .4 or .5 as being for OSP applications.

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. Add text above table.

"For the single mode case, the 1310 nm attenuation is provided for Outside Plant cable as defined in TIA 568B.3."

Editor's note: However, we need to decide how to deal with dual specifications for fiber attenuation.

CI **52** *SC* **52.12.1** *P* **379** *L* **27** **#** **1053**
Paul Kolesar Lucent

Comment Type **T** *Comment Status* **A**
Per motion by Kolesar and Swanson in Tampa, November, 2000 the attenuation for 62.5 um cable is incorrect.

SuggestedRemedy
Replace "3.75*" with "3.5" and delete note associated with the * below the table.

Proposed Response *Response Status* **C**
ACCEPT.

CI **52**   *SC* **52.12.1**   *P* **379**   *L* **31**   *#* **1054**

Paul Kolesar   Lucent

Comment Type   **T**   *Comment Status* **A**

Per motion by Kolesar and Swanson in Tampa, November, 2000 the modal bandwidth conditions are incorrect.

SuggestedRemedy

The conditions in column one should state: "(min, overfilled launch unless otherwise noted)". This text should not be bold. Add a superscript to the 2000 MHz-km value to mark a note. Add the associated note below the table stating: "Bandwidth measurement details being defined in TIA FO2.2 and IEC 86A".

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Add editorial note indicating that text above MUST change and referenced standard must be approved prior to WG ballot.

CI **52**   *SC* **52.12.2**   *P* **379**   *L* **30**   *#* **837**

Congdon II, Herbert V   Tyco Electronics

Comment Type   **T**   *Comment Status* **A**

The 2000 MHz.km bandwidth is not overfilled.

SuggestedRemedy

This can be corrected in one of several ways (left to editor's discretion): 1) add a note by the 2000 number with accompanying footnote indicating that the bandwidth is based on a laser launch, not overfilled launch, or 2) delete "(min. overfilled launch)" in the title block, and add footnotes by each bandwidth number to indicate OFL or laser launch.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Correct as per remedy in 1054.

CI **52**   *SC* **52.12.2**   *P* **379**   *L* **51**   *#* **368**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**   *CONNECTOR*

Specifying optical connectors is not desirable and not telecoms practice.

SuggestedRemedy

Change "10GBASE-SR/LR/ER/SW/LW/EW PMD" to "10GBASE-SR/SW PMD"

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 370.

CI **52**   *SC* **52.12.2.1**   *P* **380**   *L* **11**   *#* **466**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **E**   *Comment Status* **R**

I think that the paragraph that was deleted is useful and helps to explain the note below table 52-18.

SuggestedRemedy

Re-instate the deleted paragraph.

Proposed Response   *Response Status* **C**

REJECT. This is the same paragraph as above, it need not be replicated.

CI **52**   *SC* **52.12.2.2**   *P*   *L*   *#* **1062**

Doug Coleman   Corning

Comment Type   **E**   *Comment Status* **A**

do not BOLD number 26

SuggestedRemedy

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.12.2.2**   *P* **380**   *L* **20**   **#** 777

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **R**

This draft has
"The return loss for singlemode connections shall be greater than 26 dB."
while latest G.691 tables 5 has
"Maximum discrete reflectance between MPI-S and MPI-R dB -27"
and
"Min ORL of cable plant at MPI-S, including any connectors dB (14 or 24)".

As to the first requirement, I don't think we care whether we write down -26 or -27, let's harmonise. The second is something ITU-T think is necessary and we should consider aligning.

SuggestedRemedy

Align with other standards. Unless IEC 60793 or other authority differs, follow latest G.691 by replacing the sentence with:
"The maximum discrete reflectance between TP2 and TP3 for singlemode channels shall not exceed -27 dB.   The minimum optical return loss of a channel used with 10GBASE-LR/LW PMD shall not exceed -14 dB.   The minimum optical return loss of a channel used with 10GBASE-ER/EW PMD shall not exceed -24 dB."

Note -14 may be too slack, and should be considered again.

Proposed Response   *Response Status* **C**

REJECT. There is no technical justification for change.

Editorial note to be added: more work is needed to determine whether new return loss specification is needed.

Cl **52**   *SC* **52.12.2.2**   *P* **380**   *L* **20**   **#** 369

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **R**

Does -26 dB singlemode connector return loss match other standards?

SuggestedRemedy

Check other standards and align: 26 or 27 dB

Proposed Response   *Response Status* **C**

REJECT. See 777

Cl **52**   *SC* **52.12.3**   *P* **380**   *L* **24**   **#** 370

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**   CONNECTOR

Specifying optical connectors is not desirable and not telecoms practice. Note that 802.3z only specifies to 5 km.Are the performance specifications in ISO/IEC 11801 adequate for 10 GBd operation?

SuggestedRemedy

Change"The 10GBASE-SR/LR/ER/SW/LW/EW PMD is coupled to the fiber optic cabling through a connector plug into the MDI optical receptacle. The PMD MDI optical receptacles shall be the duplex SC, meeting the followingrequirements"to"The 10GBASE-SR/SW PMD is coupled to the fiber optic cabling through a connector plug into the MDI optical receptacle. The PMD MDI optical receptacles shall be the duplex SC, meeting the followingrequirements"At end of subclause, add additional text:Any connector used in the MDI of 10GBASE-LR/ER/LW/EW PMD for links in excess of 5 km shall satisfy ....(where .... is either ITU-T G.nnn or Telcordia GR-326-CORE).Any connector used in the MDI of 10GBASE-LR/ER/LW/EW PMD for links in less than 5 km shall satisfy one of the above sets of criteria.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. We will redefine the MDI as the fiber.

Propose to delete references to particular optical connector types. Delete the requirement for an optical connector. Make reference to a standard for optical connector performance i a connector is being used.

Vote: 48-2-10

Cl **52**   *SC* **52.12.3**   *P* **380**   *L* **24**   **#** 626

William G. Lane   CSU, Chico

Comment Type   **T**   *Comment Status* **R**   CONNECTOR

The MDI connector(s) have not yet been defined

SuggestedRemedy

If the duplex SC connector is chosen, the text in this subclause can be replaced with a reference to 38.11.3

Proposed Response   *Response Status* **C**

REJECT. See 370.

TYPE: TR/technical required T/technical E/editorial   COMMENT STATUS: D/dispatched A/accepted R/rejected   SORT ORDER: Clause, Subclause, page, line
RESPONSE STATUS: O/open   W/written C/closed   U/unsatisfied Z/withdrawn

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Cl **52**   *SC* **52.12.3**

Cl **52**   *SC* **52.2.1**   *P* **357**   *L* **24-32**   **# 216**
Del Hanson   Tripath Technology

Comment Type   **T**   *Comment Status*   **R**

Starting with and only showing test points TP2 and TP3 requires explanation. Subclauses 52.7.8 through 52.7.10 carry over the GbE references to TP1 and TP4.

SuggestedRemedy

Place a note in 52.2.1 explaining why this numbering is used. Correct or eliminate the references to TP1 and TP4 in 52.7.8 through 52.7.10 as part of the overall test methodology.

Proposed Response   *Response Status*   **C**
PROPOSED ACCEPT.

Cl **52**   *SC* **52.2.1**   *P* **357**   *L* **31**   **# 343**
Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**

Double arrows representing connectors are confusing, unspecified and according to Fig. 38?9, erroneous.

SuggestedRemedy

Replace double arrows with X type symbol (back-to-back arrows)

Proposed Response   *Response Status*   **C**
ACCEPT IN PRINCIPLE. Find out if there's a rule or standard for this type of diagram that needs to be observed.

Cl **52**   *SC* **52.2.4**   *P* **358**   *L* **24**   **# 432**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **R**

With the use of optical modulation amplitude it would be better to set the signal detect value with respect to optical modulation amplitude

SuggestedRemedy

Replace "Input_optical_power (less than or equal to) -30dBm" with "Input_Optical_ modulation_Amplitude (less than or equal to)" 2uW (-30dBm)Change paragraph begining on line 37 toVarious implementations of the Signal Detect function are permitted by this standard. However the preferred implementation generates the SIGNAL_DETECT parameter values in response to the amplitude of the modulation of the optical signal.

Proposed Response   *Response Status*   **C**
REJECT. This would be a change in the way we determine whether a signal exists which i in fact not agreed upon by adopting OMA.

Withdrawn.

Cl **52**   *SC* **52.3**   *P* **360**   *L* **22**   **# 834**
Congdon II, Herbert V   Tyco Electronics

Comment Type   **T**   *Comment Status*   **A**

Table lists 2000 MHz.km as an overfilled launch bandwidth (OFL). The 2000 MHz.km bandwidth is a laser launch bandwidth

SuggestedRemedy

This can be corrected in one of several ways (left to editor's discretion): 1) split the table into two - one with the current data minus the 2000Mhz.km 50/125 fiber, and the other listing only the 2000Mhz.km 50/125 fiber and eliminate "(min. overfilled launch)" in the title block, or 2) add a note by the 2000 number with accompanying footnote indicating that the bandwidth is based on a laser launch, not overfilled launch, or 3) delete "(min. overfilled launch)" in the title block, and add footnotes by each bandwidth number to indicate OFL or laser launch.

Proposed Response   *Response Status*   **C**
ACCEPT IN PRINCIPLE. See 1054

Cl **52**   *SC* **52.3**   *P* **360**   *L* **23**   **# 344**
Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**

"10 æm SMF": we are going to rename this but since it isn't supported here...

SuggestedRemedy

Delete "10 æm"

Proposed Response   *Response Status*   **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.3.1**   *P* **361**   *L* **14**   **# 899**
Mike Dudek   Cielo Inc

Comment Type   **T**   *Comment Status*   **R**   *TRIPLE*

The use of a triple trade off curve was agreed upon at the Tampa meeting.   Changes are required to table 52-4 to implement this decsision and are specified by Mike Dudek in his offically submitted comments. Additionally a triple trade off curve should be added (figure X).

SuggestedRemedy

Add the following plot to the standard as figure X below Table 52-4.
http://www.ieee802.org/3/ae/public/jan01/jjarriel_1_0101.pdf

Proposed Response   *Response Status*   **C**
REJECT. Withdrawn

Cl **52** *SC* **52.3.1** *P* **361** *L* **14** *#* **433**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**   *TRIPLE*
The use of a triple trade off curve and OMA was agreed at the meeting in Tampa Changes are required to table 52-4 to implement this decision

SuggestedRemedy
Add a footnote reference to 840 - 860Remove the 0.35 on Line 17 (spectral width) and replace with the same footnote reference.Change line 20 from "Average Launch Power (min)" to Optical Modulation Amplitude (min) remove the -5.5dBm and replace with the same footnote reference as above.Remove the Extinction Ratio (min) line.Change line 25 from "RIN" to "RIN12OMA"The footnote should read "Trade-off's are available between optical modulation amplitude, wavelength, and spectral width see figure X (triple trade off curve to be sent as an ASCII comment referencing my name, but may be sent by Joey Jarriel.)

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Needs further refinement and addition of appropriate curves.

Cl **52** *SC* **52.3.1** *P* **361** *L* **14** *#* **832**
Mike Dudek   Cielo Inc

Comment Type **T**   *Comment Status* **R**   *TRIPLE*
The use of a triple trade off curve was agreed upon at the Tampa meeting. Changes are required to table 52-4 to implement this decsision and are specified by Mike Dudek in his offically submitted comments. The transmitter maximum rise and fall times are also overly strict (31.5ps) and should be increased to 35ps.Additionally a triple trade off curve should be added (figure X).

SuggestedRemedy
Add the following plot to the standard as figure X below Table 52-4. http://www.ieee802.org/3/ae/public/jan01/jjarriel_2_0101.pdf

Proposed Response   *Response Status* **C**
REJECT. Withdrawn

Cl **52** *SC* **52.3.1** *P* **361** *L* **15** *#* **872**
Ohlen, Peter   Optillion

Comment Type **E**   *Comment Status* **A**
A right parenthesis is missing in table 52-4.

SuggestedRemedy
Insert a ")" on p. 361:15

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52** *SC* **52.3.1** *P* **361** *L* **16** *#* **441**
Mike Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**   *TRIPLE*
With the use of triple trade off curves the transmitter risetime is unnecessarily stringent.

SuggestedRemedy
Line 16. Replace 31.5ps with 35ps. Use the modified triple trade off curve to be submitted by ASCII file. (Submission will reference my name, but may be made by Joey Jarriel).

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See other comments for triple trade-off curves.

Cl **52** *SC* **52.3.1** *P* **361** *L* **20** *#* **1317**
Jonathan Thatcher   World Wide Packets

Comment Type **T**   *Comment Status* **A**   *OUCH*
An average launch power (min) of -5.5 dBm is only realistic with an increase in the CDRH laser safety limit for 850 nm operation. We must have confirmation of this change prior to sponsor ballot.

SuggestedRemedy
Get confirmation or remove SR/SW before sponsor ballot. Add editors note regarding this (like note on page 360).

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Let's get confirmation.

Cl **52** *SC* **52.3.1** *P* **361** *L* **20** *#* **345**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**   *OMA*
Tx changing to OMA

SuggestedRemedy
Change:Average launch power (min) -5.5 dBmto OMA definition in uW and dBm

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See comment 873.

Cl **52** *SC* **52.3.1** *P* **361** *L* **23** *#* **346**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**   *ER*
Extinction ratio requirement is stricter than needs be but not redundant.

SuggestedRemedy
Change 6.5 to 3.0 . Do not delete the line.This number needs further review.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 888.

Cl **52**   *SC* **52.3.1**   *P* **361**   *L* **25**   # **347**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **R**   *RIN*

RIN values need revisiting now Mike Dudek has pointed out that link model always dealt in OMA-RIN. We need to find room in the power budget for slightly more RIN.

SuggestedRemedy

Change to "RIN(OMA) (max) -120 dB/Hz.Add footnote:RIN measurement is made with a return loss at 12 dB.

Proposed Response   *Response Status*   **C**

REJECT. Needs discussion

Editor's note: Need more input.

Cl **52**   *SC* **52.3.1**   *P* **361**   *L* **28**   # **348**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**

"During all conditions when the PMA is powered, the AC signal (data) into the transmit port will be valid encoded 8B/10B patterns (this is a requirement of the PCS layers) except for short durations during system power-on-reset or diagnostics when the PMA is placed in a loopback mode."This is left over from clause 38. We don't have physical PMA<>PMD "transmit ports" or 8B/10B patterns at the PMD.

SuggestedRemedy

Delete the sentence.

Proposed Response   *Response Status*   **C**

ACCEPT.

Cl **52**   *SC* **52.3.1**   *P* **361**   *L* **30**   # **434**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **E**   *Comment Status*   **A**

The serial PMD's use 64B/66B coding not 8B/10B

SuggestedRemedy

Replace 8B/10B with 64B/66B in this footnote.

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. As per 348.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **18**   # **350**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**   *OMA*

Receive sensitivity to be converted to OMA.

SuggestedRemedy

Convert Receive sensitivity to OMA.

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. See 873.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **18**   # **436**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **A**   *OMA*

It was agreed at the Tampa meeting to change to OMA Table 52-5 requires changes to implement this.Also the footnote refering to measuring the stressed receiver sensitivity at 9dB extinction ratio is wrong (it should have been at 6.5dB extinction ratio)

SuggestedRemedy

Replace "sensitivity -13dBm with "Sensitivity (OMA) 64 (-14.9) uW (dBm)
Replace "stressed receiver sensitivity" with "stressed receiver sensitivity (OMA) on line 21
The 62.5 um cell would become 220 (-9.6) uW (dBm). The 50 um cell would become 179 (-10.5) uW (dBm)
Delete the footnote on lines 27 and 28 referring to the extinction ratio at which the stressed receiver power should be measured.

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. See 873.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **22**   # **351**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**

SR/SW Vertical eye closure penalty needs revision.

SuggestedRemedy

Change 2.5 to ?Change 3.0 to 3.6

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. Needs further work to develop correct numbers.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **27**   *#* **874**
Ohlen, Peter   Optillion

Comment Type **E**   *Comment Status* **A**
-12 should be written in superscript

SuggestedRemedy
Write -12 in superscript

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **27**   *#* **385**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **R**   *OMA*
Stressed test extinction ratio is left over from GigE. For now, we can change it to align with our average-power definitions. It can get rewritten into OMA style sometime.

SuggestedRemedy
Change 9 dB to 6.5 dB.

Proposed Response   *Response Status* **C**
REJECT. See 893.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **4**   *#* **349**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
"The sampling instant is defined to occur at the eye center."This sentence may get changed (to a receive eye) or deleted later, following jitter and eye specs.Also subclause 4.2 page 365 line 4, subclause 5.2 page 370 line 4.

SuggestedRemedy

Proposed Response   *Response Status* **C**
ACCEPT. Thank you for the comment. No remedy provided.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **4**   *#* **435**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **E**   *Comment Status* **A**   *OMA*
With the change to OMA the comment on extinction ratio penalty is unnecessary

SuggestedRemedy
Remove the sentence "The receive Sensitivity includes the extinction ratio penalty"

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Accepting changed phraseology recommended by 403.

Cl **52**   *SC* **52.3.2**   *P* **362**   *L* **4**   *#* **403**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**   *OMA*
Changing Rx to OMA

SuggestedRemedy
Change"The receive sensitivity includes the extinction ratio penalty ."to"The stressed receive sensitivity includes the extinction ratio penalty."or take a comment to convert stressed receive sensitivity to OMA.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Delete sentence.

Cl **52**   *SC* **52.3.2,4.2,5.2**   *P*   *L*   *#* **892**
Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**   *OMA*
In the first paragraph of clauses 52.3.2, 52.4.2, and 52.5.2, it is stated that the receive sensitivity includes the extinction ratio penalty. With the change to OMA, the receive sensitivity does not depend on the extinction ratio, and the text should be changed accordingly.

SuggestedRemedy
Change the sentence on p. 370:4-5, p. 365:4-5, p. 362:4-5 to:
The receive sensitivity is measured using optical modulation amplitude (OMA) and does not depend on the extinction ratio.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Use change proposed in 403 in all three instances.

Cl **52**   *SC* **52.3.2,4.2,5.2**   *P* **362**   *L* **28**   *#* **893**
Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**   *ER*
In the footnotes of the tables for receive characteristics, it is stated that measurements are made with a signal have a 9 dB extinction ratio and that the stressed sensitivity should be corrected for the extinction ratio penalty if another extinction ratio is used.With OMA, it is not necessary to correct for the extinction ratio. Also, if an extinction ratio is in the footnote it should be 3 dB which is the lowest extinctino ratio suggested in another comment.Testing at a low extinction will make both external and directly modulated laser sources more linear which can be an advantage.

SuggestedRemedy
Change the single-dagger footnote on p. 362:27-28, p. 365:29-30, p. 370:30-32 to:Measured with a transmit signal having a 3 dB extinction ratio.

Proposed Response   *Response Status* **C**
ACCEPT.

Cl **52**   *SC* **52.3.3**   *P* **363**   *L* **12**   *#* **377**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **R**   *RIN*
Penalties and margins will change following recalculation and re-optimisation of RIN.

SuggestedRemedy
Change:
50u 500 MHz
Link power penalties 5.23
Unallocated margin   0.46
Similar changes to other columns.

Proposed Response   *Response Status* **C**
REJECT. See comment 347.

Cl **52**   *SC* **52.3.3**   *P* **363**   *L* **13**   *#* **378**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
Unallocated margin is sometimes misunderstood.

SuggestedRemedy
Add text:The unallocated margin is not available for use as additional insertion losses. It simply represents unknown penalties and uncertainties in the known parameters.

Proposed Response   *Response Status* **C**
ACCEPT. .

Cl **52**   *SC* **52.3.3**   *P* **363**   *L* **6**   *#* **437**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**
The modal bandwidth for the 2000 MHz.Km cell is not measured with overfilled launch.

SuggestedRemedy
Change (minimum overfilled launch) to (minimum) and add a footnote reference.Footnote to read "For fibers other than the 50u 2000MHz.Km this is for an overfilled launch. For the 200MHz.Km fiber this is measured according to FOTP xxxxx.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Alternate nomenclature and methodology were specified in 1054.

Cl **52**   *SC* **52.3-5**   *P*   *L*   *#* **873**
Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**   *OMA*
In the last meeting it was approved (with a 75% technical vote) that optical modulation amplitude (OMA) should be used to specify receiver sensitivities and minimum transmitter optical power. It was approved that OMA should be specified in both mW's and dBm's. These changes have not been made in D2.0, and should be inserted. This applies to multiple subclauses and tables.

SuggestedRemedy
Table 52-4 (850 serial TX):
1. (p. 361:20) Specify launch power (min) in OMA as 0.357 mW and in OMA/2 as -7.48 dBm. (Instead of "average launch power (min)")
Table 52-5 (850 serial RX):
1. (p. 362:18) Specify receive sensitivity in OMA as 0.0636 mW and in OMA/2 as -14.98 dBm. (Instead of "average launch power (min)")
2. (p. 362:21) Specify stressed sensitivity in OMA as 0.179 mW and in OMA/2 as -10.48 dBm for the 50 um MMF.
3. (p. 362:21) Specify stressed sensitivity in OMA as 0.220 mW and in OMA/2 as -9.58 dBm for the 62.5 um MMF.
Table 52-8 (1310 serial TX):
1. (p. 364:39) Specify launch power (min) in OMA as 0.477 mW and in OMA/2 as -6.23 dBm. (Instead of "average launch power (min)")
Table 52-9 (1310 serial RX):
 1. (p. 365:19) Specify receive sensitivity in OMA as 0.0477 mW and in OMA/2 as -16.23 dBm.
2. (p. 365:22) Specify stressed sensitivity in OMA as 0.0857 mW and in OMA/2 as -13.68 dBm.
Table 52-13 (1550 serial TX):
1. (p. 369:22) Specify launch power (min) in OMA as 1.45 mW and in OMA/2 as -1.39 dBm. (Instead of ""average launch power (min)")
Table 52-14 (1550 serial RX):
 1. (p. 370:21) Specify receive sensitivity in OMA as 0.0230 mW and in OMA/2 as -19.39 dBm.
2. (p. 370:24) Specify stressed sensitivity in OMA as 0.0663 mW and in OMA/2 as -14.80 dBm.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Further refinement needed to coordinate with addition of triple tradeoff curves.

Cl **52**   *SC* **52.3-5**   *P*   *L*   *#* **888**
Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**   *OMA*

With the OMA proposal, which was voted for in the last meeting, the extinction ratio specification was removed. There is an implicit (very low) lower limit for the extinction ratio imposed by the maximum average power. Still, operating at a very low extinction ratio could pose some problems and it should be limited to a minimum of 3 dB.

SuggestedRemedy

Table 52-4 on p. 361 (850 serial):
Specify the minimum extinction ratio to be 3 dB.
Table 52-8 on p. 364 (1300 serial):
Specify the minimum extinction ratio to be 3 dB.
Table 52-13 on p. 369 (1505 serial):
Specify the minimum extinction ratio to be 3 dB.

Proposed Response   *Response Status* **C**

ACCEPT. .

Cl **52**   *SC* **52.4**   *P* **364**   *L* **3**   *#* **386**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **R**

The information in Table 52?7 doesn't really deserve a table.

SuggestedRemedy

Either: Change text to:The operating range for 10GBASE-LR/LW PMDs is (shall be?) 2 m to 10 km.Or: Add a column to table 52-1 and change its title to:"Port types, reaches and Referenced Clauses."Or my preferred remedy, do both. 10G-S entry would be "see table 52-3" and 10G-E would need a footnote about indicative reach not normative.

Proposed Response   *Response Status* **C**

REJECT. This table is designed for consistency with other sections, for example, 52.3. Although short, it presents the same type of information consistently for each PMD type.

Cl **52**   *SC* **52.4**   *P* **364**   *L* **4**   *#* **380**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

"10 æm singlemode" is deprecated

SuggestedRemedy

Replace "10 æm" by ITU-T, IEC or SONET terminology as recommended by Paul Kolesar, for the rest of the clause.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See also 1052

Editor's note and remedy: All instances of 10 um SMF will be replaced with SMF and a reference to the table on fiber types.

Cl **52**   *SC* **52.4**   *P* **364**   *L* **6**   *#* **782**
Furlong, Darrell R   Aura Networks

Comment Type **E**   *Comment Status* **A**

I believe the value 10,000 is not in internation format. Also Line 15

SuggestedRemedy

Remove the comma and replace with a space.

Proposed Response   *Response Status* **C**

ACCEPT. This occurs in multiple places in clause 52. Editor's note: replace ALL instances with accepted format (do some homework to check consistency against other clauses and existing standard). Maybe scientific notation would be less regional?

Cl **52**   *SC* **52.4**   *P* **364**   *L* **Multiple**   *#* **372**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**   *INTERFEROMETRIC*

Need to consider interferometric noise.

SuggestedRemedy

Homework!

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

See 895-896 (Krister Frojdh)

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **28**   *#* **618**
William G. Lane   CSU, Chico

Comment Type **E**   *Comment Status* **A**

In table 52-8, the signaling speed is not defined as a range

SuggestedRemedy

Change "range" to "nominal"

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **31**   # **438**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**   *TRIPLE*

At the Tampa meeting it was agreed to use triple trade off curves and OMA Table 52-8 does not do so.

SuggestedRemedy

Line 31 Wavelength range delete the 1st box and add footnote reference
Line 34 combine to one box replace the numbers with the same footnote reference
Line 39 change "Average launch power (min) to "Optical Modulation Amplitude (min) remove the -4.0 and replace with the same footnote reference
Line 43 Delete the line in the table referring to Extinction ratio
Line 44 Replace "RIN" with "RIN12OMA
Footnote should read "Trade-offs are available between Optical Modulation Amplitude, wavelength, and spectral width see figure y. (Figure y would be the triple trade off curve that will be supplied via ASCII format referencing my name, but may be submitted by Joey Jarriel).

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Further refinement may be necessary.

Editorial note below text: The maximum RMS Spectral Width may be limited. Check link model for accuracy and validity for singlemode laser.

Keep line 43 ER.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **32**   # **1073**
Ali Ghiasi   Broadcom

Comment Type **T**   *Comment Status* **R**

Rise and fall time are redundant in presence of eye mask.

SuggestedRemedy

Make rise and fall time informative or instead specify geometric rise+fall
If your rise time is very fast you can have slower fall time.

Proposed Response   *Response Status* **C**

REJECT. Rise and fall times are required input to the link model.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **34**   # **833**
Mike Dudek   Cielo Inc

Comment Type **T**   *Comment Status* **R**   *TRIPLE*

The use of a triple trade off curve was agreed upon at the Tampa meeting.   Changes are required to table 52-4 to implement this decsision and are specified by Mike Dudek in his offically submitted comments. Additionally a triple trade off curve should be added (figure X).

SuggestedRemedy

Add the following plot to the standard as figure X below Table 52-4
http://www.ieee802.org/3/ae/public/jan01/jjarriel_3_0101.pdf

Proposed Response   *Response Status* **C**

REJECT. Withdrawn.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **34**   # **376**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

"Spectral width" is ambiguous. Does this mean full-width or half-width?

SuggestedRemedy

Replace "spectral width" with "spectral half-width" I think

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See response 375.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **34**   # **371**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **R**

RMS spectral width entry needs updating to bring in line with standard DFB measurement method.

SuggestedRemedy

Replace "RMS spectral width" row with
-20 dB spectral width (max)   1   nm

Proposed Response   *Response Status* **C**

REJECT. Superceded by use of triple trade-off curves as mandated in Tampa meeting and presented in comment: 438.

Editor's note: Triple tradeoff changes are in comments 833, 438, 899, 832,433, 441.

Establish a measurement procedure to measure narrow linewidth lasers.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **39**   **#** **381**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**   OMA

Tx changing to OMA

SuggestedRemedy

Change:Average launch power (min) -4 dBmto OMA definition, 477 æW and -6.23 dBm

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. As per comment 873.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **40**   **#** **895**

Frojdh, Krister   Optillion

Comment Type   **T**   *Comment Status* **A**   INTERFEROMETRIC

A specified minimum return loss and a minimum extintion ratio for the transmitter is needed to avoid problem with interferometric noise. I will present more on this in Irvine.

SuggestedRemedy

Add two rows in table 52-8:
Extinction ratio(min) 3   dB
Return loss(min)   12   dB   (or 20 dB)

(Edit in suggested remedy OKed by commenter)

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

See 896.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **42**   **#** **382**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**

Extinction ratio requirement is stricter than needs be but not redundant.

SuggestedRemedy

Change 6 to 3.0 . Do not delete the line.This number needs further review.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See comment 888.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **42**   **#** **619**

William G. Lane   CSU, Chico

Comment Type   **T**   *Comment Status* **A**

The PMD subgroup voted during the November plenary to replace Extinction ratio specification with Optical Modulation Amplitude specification

SuggestedRemedy

Revise the extinction ratio entry in table 52-8 to reflect OMA

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. As per other comments from Mike Dudek and 873 (Peter Ohlen).

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **44**   **#** **383**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**   RIN

RIN values need revisiting now Mike Dudek has pointed out that link model always dealt in OMA-RIN. There is room in the power budget for slightly more RIN. After further work we may remove the RIN measurement altogether and rely on path penalty, path tolerance measurements.

SuggestedRemedy

Change to "RIN(OMA) (max) -125 dB/Hz.Add footnote:RIN measurement is made with a return loss at 12 dB.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. We need to review the new RIN OMA specifications in the entire clause.

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **47**   **#** **384**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**

"During all conditions when the PMA is powered, the AC signal (data) into the transmit port will be valid encoded 8B/10B patterns (this is a requirement of the PCS layers) except for short durations during system power-on-reset or diagnostics when the PMA is placed in a loopback mode."This is left over from clause 38. We don't have physical PMA<>PMD "transmit ports" or 8B/10B patterns at the PMD.

SuggestedRemedy

Delete the sentence.

Proposed Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required T/technical E/editorial   COMMENT STATUS: D/dispatched A/accepted R/rejected   SORT ORDER: Clause, Subclause, page, line   Page 15 of 34

RESPONSE STATUS: O/open   W/written   C/closed   U/unsatisfied   Z/withdrawn   *Cl* **52**   *SC* **52.4.1**

Cl **52**   *SC* **52.4.1**   *P* **364**   *L* **48**   **#** **439**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**

This serial PMD uses 64B/66B coding not 8B/10B coding

SuggestedRemedy

Replace 8B/10B with 64B/66B.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See comment 891.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **12**   **#** **620**

William G. Lane   CSU, Chico

Comment Type **E**   *Comment Status* **A**

In table 52-9, the signaling speed is not defined as a range

SuggestedRemedy

Change "range" to "nominal"

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **15**   **#** **442**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**   *OMA*

The change to OMA agreed at the Tampa meeting requires changes to table 52-9

SuggestedRemedy

Change line 19 from "Receiver Sensitivity -14.0 dBm" to "Receiver Sensitivity OMA 48 (-16.2) uW (dBm)
Change line 22 from "Stressed receiver sensitivity -11.45 dBm" to "Stressed receiver sensitivity OMA 86 (-13.7) uW (dBm)

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 873.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **19**   **#** **389**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**   *OMA*

Receive sensitivity to be converted to OMA.

SuggestedRemedy

Change Receive sensitivity to 48 uW and -16.23 dBm.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 873.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **21**   **#** **896**

Frojdh, Krister   Optillion

Comment Type **T**   *Comment Status* **A**   *INTERFEROMETRIC*

The current combination of ER and return loss of receiver will give problems with interferometric noise. This will be further covered in my Irvine presentation

SuggestedRemedy

Table 52-9
Return loss (min) 20 dB

(Edit in suggested remedy OKed by commenter)

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Interferometric noise needs to be studied further and measured where possible. A IN ad hoc will suggest necessary steps and submit changes as required as a single technical comment to the next draft (D2.1).

This draft (D2.1) will contain editorial notes presenting the comment and solution currently proposed.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **22**   **#** **621**

William G. Lane   CSU, Chico

Comment Type **T**   *Comment Status* **A**

Because the PMD subgroup voted during the November plenary to replace Extinction ratio specification with Optical Modulation Amplitude specification, the extinction ratio footnote for the stressed receive sensitivity in table 52-9 is no longer appropriate

SuggestedRemedy

Delete the extinction ratio footnote

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 893.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **23**   **#** **410**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

LR/LW Vertical eye closure penalty needs revision to account for PMD.

SuggestedRemedy

Change 1.71 to 1.78

Proposed Response   *Response Status* **C**

ACCEPT.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **29**   **#** **443**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **R**

The Extinction Ratio for measuring the stressed receiver sensitivity is incorrect and no longer needed.

SuggestedRemedy

Delete the footnote to table 52-9 begining "measured with a transmit ...."

Proposed Response   *Response Status*   **C**

REJECT. See 893.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **29**   **#** **390**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **R**   *OMA*

Stressed test extinction ratio is left over from GigE. For now, we can change it to align with our average-power definitions. It can get rewitten into OMA style sometime.

SuggestedRemedy

Change 9 dB to 6.0 dB.

Proposed Response   *Response Status*   **C**

REJECT. See 893.

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **4**   **#** **406**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **R**   *OMA*

Changing Rx to OMA

SuggestedRemedy

Change"The receive sensitivity includes the extinction ratio penalty ."to"The stressed receive sensitivity includes the extinction ratio penalty."or take a comment to convert stressed receive sensitivity to OMA.

Proposed Response   *Response Status*   **C**

REJECT. See 403

Cl **52**   *SC* **52.4.2**   *P* **365**   *L* **4**   **#** **440**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **A**   *OMA*

With the change to OMA the sentence referring to extinction ratio is unnecessary

SuggestedRemedy

Delete the sentence begining "The receiver ...."

Proposed Response   *Response Status*   **C**

ACCEPT. See 406.

Cl **52**   *SC* **52.4.2,5.2**   *P***365-370**   *L*   **#** **894**

Ohlen, Peter   Optillion

Comment Type   **T**   *Comment Status*   **A**

For the 1310 and 1550 PMDs, there is no upper cut-off specified for the receiver, whereas there is a 12.3 GHz cut-off specified for 850.I think there should be an upper cut-off for all serial PMDs that should be the same if there are no good reasons that they should be different.

SuggestedRemedy

Table 52-9 (1310), p. 365:25
Insert 12.3 GHz in the empty cell.
Table 52-14 (1550), p. 370:27
Insert 12.3 GHz in the empty cell.

Proposed Response   *Response Status*   **C**

ACCEPT.

Cl **52**   *SC* **52.4.3**   *P* **365**   *L* **49**   **#** **391**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**   *RIN*

Penalties and margins will change following incorporation of PMD and recalculation and re-optimisation of RIN.

SuggestedRemedy

Change:Link power penalties to 2.46 dBUnallocated margin to   0.50 dB

Proposed Response   *Response Status*   **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.4.3**   *P* **365**   *L* **50**   **#** **392**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**

Unallocated margin is sometimes misunderstood.

SuggestedRemedy

Add text:The unallocated margin is not available for use as additional insertion losses. It simply represents unknown penalties and uncertainties in the known parameters.

Proposed Response   *Response Status*   **C**

ACCEPT. See 378.

CI **52**   *SC* **52.4.3**   *P* **366**   *L* **3**   **#** **444**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**
The lowest wavelength is now 1265 nm

SuggestedRemedy
Replace "1290" with "1265"

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

CI **52**   *SC* **52.5**   *P* **367**   *L* **3**   **#** **396**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
Table 52?11 needs revision to clarify that it's a dispersion and attenuation based standard.Here I assume that dispersion is measured at 1550 nm.

SuggestedRemedy
Replace "PMD Type" column with "Parameter"Replace "Nominal wavelength" and Minimum Range" column with three columns, "Minimum" "Maximum" and "Units"Insert rows:
Channel attenuation   min 7   max 13   dB
Channel dispersion   min 0   max 728   ps/nm
Operating distance   min 2   max See text   m
Change first sentence of text to:The operating range for 10GBASE-LR/LW PMDs is designed to achieve a typical range of 40 km on typical G.652 fiber using light in the 1550 nm band.Check sign of dispersion.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. ER/EW is PMD type. Could be two separate tables as required for editorial purposes.

CI **52**   *SC* **52.5**   *P* **367**   *L* **6**   **#** **783**
Furlong, Darrell R   Aura Networks

Comment Type **E**   *Comment Status* **A**
The value 40,000 is not in international format. Also line 15

SuggestedRemedy
Remove the comma and replace with a space.

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

CI **52**   *SC* **52.5**   *P* **367**   *L* **Multiple**   **#** **374**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **R**   *INTERFEROMETRIC*
Path penalty technique should include reflections.

SuggestedRemedy

Proposed Response   *Response Status* **C**
REJECT. No remedy provided.

Editorial note: Following discussion of interferometric noise

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CI **52**   *SC* **52.5**   *P* **371**   *L* **8**   **#** **835**
Congdon II, Herbert V   Tyco Electronics

Comment Type **T**   *Comment Status* **A**
The channel loss value of 13 dB becomes too restrictive at 40km and may require premium (low loss) fiber to satisfy the requirement. Additionally, cabling attenuation delta, splice loss and fiber overlength in loose tube cables reduce the margin even further. Cabling attenuation delta is any increase in attenuation from the bare fiber attenuation to the cabled fiber attenuation (usually some finite, positive value). Generally, at least one splice point (usually two or more) will be required in a 40 km run. Typically, cables are designed to have more fiber length than cable length.

SuggestedRemedy
Possible suggestions: 1) increase the budget to 15 dB (may be the simplest way to solve this problem, but may create a host of other issues), or 2) add a note explaining that premium cable performance may be necessary for lengths longer than 35 km.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. (Option 2) This specification is well defined by fiber types and by the channel characteristics. 40 km represents an objective of the committee that is certainly acheivable under specified fiber and link conditions.

Editor's note: Straw poll 17 to 7 for normative (in Serial PMD breakout at Irvine)

CI **52**   *SC* **52.5.1**   *P* **367**   *L* **20**   # **388**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**

We agreed (voted, I think) to tell the cabling installers what to do but leave them to work out how to do it.

SuggestedRemedy

Change text to:The 10GBASE-ER/EW channel shall have an attenuation between 7? and 13 dB. Attenuators shall be used if necessary to achieve the minimum attenuation. An example attenuator management plan is shown in Figure 52?2 and Table 52?12.

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. Will be removing table as per another comment, and adding graph. Add text above graph "The 10GBASE-ER/EW channel shall have an attenuation between 7? and 13 dB".

Ed note: Vote taken was to: "Move to incorporate table and figure as shown in bradshaw_1_1100 for attenuation management at 1550 nm".

CI **52**   *SC* **52.5.1**   *P* **367**   *L* **21**   # **393**

Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**

sentence ends in ,

SuggestedRemedy

Change to . (but see another comment anyway)

Proposed Response   *Response Status*   **C**
ACCEPT. ACCEPT.

CI **52**   *SC* **52.5.1**   *P* **367**   *L* **32**   # **886**

Ohlen, Peter   Optillion

Comment Type   **T**   *Comment Status*   **A**

The left-most column should indicate a range for the link loss, and the attenuator should be a fixed attenuator chosen for that range of link loss.

SuggestedRemedy

New table values:
Link loss   ....   Attenuator

0-2   ....   10 dB
2-7   ....   5 dB
7-13   ....   0 dB

Proposed Response   *Response Status*   **C**
ACCEPT IN PRINCIPLE. Will remove table.

CI **52**   *SC* **52.5.1**   *P* **367**   *L* **34**   # **445**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **A**

Table 52-12 numbers do not seem to compute and I could not find bradshaw_1_1100 on the web site to clarify.

SuggestedRemedy

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. Suggest we remove this table.

CI **52**   *SC* **52.5.1**   *P* **367**   *L* **38**   # **394**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**

The last line of Table 52?12 describes an out-of-standard link/channel loss. The maximum is 12, allowing 1 for connectors, making 13.

SuggestedRemedy

Change last line of table to:
12   0 to 4   -13 to -8   0   -13 to -8

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. The table is to be removed.

CI **52**   *SC* **52.5.2**   *P* **369**   *L* **11**   # **622**

William G. Lane   CSU, Chico

Comment Type   **E**   *Comment Status*   **A**

In table 52-13, the signaling speed is not defined as a range

SuggestedRemedy

Change "range" to "nominal"

Proposed Response   *Response Status*   **C**

ACCEPT. ACCEPT.

CI **52**   *SC* **52.5.2**   *P* **369**   *L* **14**   # **395**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**

Tx: We agreed that wavelength range would be tweaked to match ITU-T C band

SuggestedRemedy

Change "1530 to 1565" to whatever ITU-T say. Try reading latest draft G.691?

Proposed Response   *Response Status*   **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.5.2**   *P* **369**   *L* **17**   **#** **397**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **R**

RMS spectral width entry needs updating to bring in line with standard DFB measurement method and path penalty specification.

SuggestedRemedy

Replace "RMS spectral width" row with

-20 dB spectral width (max)   1   nm

Add new row to table:

Path penalty   2   dB (or as agreed).

Add note to refer to the path penalty text.

Proposed Response   *Response Status* **C**

REJECT. Remove RMS Spectral Width row altogether. As per 371.

Cl **52**   *SC* **52.5.2**   *P* **369**   *L* **17**   **#** **375**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

"Spectral width" is ambiguous. Does this mean full-width or half-width?

SuggestedRemedy

Replace "spectral width" with "spectral half-width" I think

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Multiple instances of this terminology exist within Clause 52. For each instance, leave "Spectral Width", footnote it with definition below table:

"RMS Spectral Width" is the standard deviation for a Gaussian distribution fit for a multimode laser spectrum.

Cl **52**   *SC* **52.5.2**   *P* **369**   *L* **20**   **#** **897**

Frojdh, Krister   Optillion

Comment Type **T**   *Comment Status* **R**   *PEAKPOWER*

For 1550 nm, eye safety is no problem. The peakpower is instead limited by saturation of the receiver.Receiver saturation is typically controlled by either peakpower or the modulated power (OMA), not by the average. An change to peakpower would be more relevant. This would allow future high power sources that could be used for higher link insertion losses. A minimum ER is also needed. I will cover this in a presentation in Irvine.

SuggestedRemedy

Peak launch power (max) 7 dBm.
(Definition should be Pav+OMA/2)
ER (min)   3 dB

(Remedy change OKed by commenter)

Proposed Response   *Response Status* **C**

REJECT. Put in editor's note subject to further refinement and verification by March plenary. The editor will reinitiate this comment.

Cl **52**   *SC* **52.5.2**   *P* **369**   *L* **22**   **#** **446**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**   *OMA*

At the Tampa meeting it was decided to use OMA. Table 52-13 needs to be revised based on this decision

SuggestedRemedy

Line 22 replace "Average launch power (min) 0dBm" with "Optical Modulation Amplitude (min) 1450 (-1.4) uW (dBm)
Delete line 26 "extinction ratio...."
Line 27 replace "RIN" with "RIN12OMA

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. This needs to be coordinated with other commenters. Keep Line 27 change.

Cl **52**   *SC* **52.5.2**   *P* **369**   *L* **22**   **#** **399**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**   *OMA*

ER/EW Tx changing to OMA

SuggestedRemedy

Change:
Average launch power (min) -4 dBm
to OMA definition, 1453 æW and -1.39 dBm

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 873.

CI **52**　　*SC* **52.5.2**　　　　*P* **369**　　*L* **25**　　*#* **400**

Dawe, Piers　　　　　　　　Agilent

Comment Type **T**　　*Comment Status* **A**

Extinction ratio requirement is stricter than needs be but not redundant.

SuggestedRemedy

Change 8.0 to 3.0 . Do not delete the line.This number needs further review.

Proposed Response　　*Response Status* **C**

ACCEPT IN PRINCIPLE. See 888.

CI **52**　　*SC* **52.5.2**　　　　*P* **369**　　*L* **26**　　*#* **623**

William G. Lane　　　　　　CSU, Chico

Comment Type **T**　　*Comment Status* **A**

The PMD subgroup voted during the November plenary to replace Extinction ratio specification with Optical Modulation Amplitude specification

SuggestedRemedy

Revise the extinction ratio entry in table 52-8 to reflect OMA specifications

Proposed Response　　*Response Status* **C**

ACCEPT IN PRINCIPLE. See 873.

CI **52**　　*SC* **52.5.2**　　　　*P* **369**　　*L* **27**　　*#* **401**

Dawe, Piers　　　　　　　　Agilent

Comment Type **T**　　*Comment Status* **A**　　　　　*RIN*

RIN values need revisiting now Mike Dudek has pointed out that link model always dealt in OMA-RIN. There is room in the power budget for slightly more RIN. After further work we may remove the RIN measurement altogether and rely on path penalty, path tolerance measurements.

SuggestedRemedy

Change to "RIN(OMA) (max) -125 dB/Hz.

Proposed Response　　*Response Status* **C**

ACCEPT IN PRINCIPLE. See 400.

CI **52**　　*SC* **52.5.2**　　　　*P* **369**　　*L* **27**　　*#* **889**

Ohlen, Peter　　　　　　　　Optillion

Comment Type **T**　　*Comment Status* **A**　　　　　*RIN*

The RIN for the 1550 PMD is now specified at -140 dB/Hz, which is a very hard requirement that can be difficult to achieve. Lowering the RIN specification to -130 dB only gives a total RIN penalty of 0.04 dB (from the Excel link model) which is still quite q low penalty.Keeping the specification at -140 dB/Hz would not give us any real benefit, but would make it much harder to make the components.

SuggestedRemedy

Change the RIN specification in table 52-13 for the 1550 serial PMD to -130 dB/Hz.

Proposed Response　　*Response Status* **C**

PROPOSED ACCEPT.

CI **52**　　*SC* **52.5.2**　　　　*P* **369**　　*L* **30**　　*#* **402**

Dawe, Piers　　　　　　　　Agilent

Comment Type **T**　　*Comment Status* **A**

"During all conditions when the PMA is powered, the AC signal (data) into the transmit port will be valid encoded 8B/10B patterns (this is a requirement of the PCS layers) except for short durations during system power-on-reset or diagnostics when the PMA is placed in a loopback mode."This is left over from clause 38. We don't have physical PMA<>PMD "transmit ports" or 8B/10B patterns at the PMD.

SuggestedRemedy

Delete the sentence.

Proposed Response　　*Response Status* **C**

ACCEPT. See 348.

CI **52**　　*SC* **52.5.2**　　　　*P* **369**　　*L* **31**　　*#* **447**

Mike Dudek, Mike T Dudek　　　　Cielo Communications

Comment Type **T**　　*Comment Status* **A**

This serial PMD uses 64B/66B not 8B/10B

SuggestedRemedy

Replace 8B/10B with 64B/66B.

Proposed Response　　*Response Status* **C**

ACCEPT. See 348.

Editor's Note: This occurs many times, needs a consistent solution (PRBS for WAN PHY, 64B/88B for LAN PHY?

Cl **52**   *SC* **52.5.3**   *P* **365**   *L* **4**   # **407**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **R**   OMA
Changing Rx to OMA

SuggestedRemedy
Change"The receive sensitivity includes the extinction ratio penalty ."to"The stressed receive sensitivity includes the extinction ratio penalty."or take a comment to convert stressed receive sensitivity to OMA.

Proposed Response   *Response Status*   **C**
REJECT. See 403.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **12**   # **624**
William G. Lane   CSU, Chico

Comment Type   **E**   *Comment Status*   **A**
In table 52-14, the signaling speed is not defined as a range

SuggestedRemedy
Change "range" to "nominal"

Proposed Response   *Response Status*   **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **15**   # **408**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**
Rx: We agreed that wavelength range would be tweaked to match ITU-T C band

SuggestedRemedy
Change "1530 to 1565" to whatever ITU-T say. Try reading latest draft G.691?

Proposed Response   *Response Status*   **C**
ACCEPT. Values are already correct.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **18**   # **409**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **A**   OMA
Receive sensitivity to be converted to OMA.

SuggestedRemedy
Change Receive sensitivity to 23 uW and -19.39 dBm.

Proposed Response   *Response Status*   **C**
ACCEPT IN PRINCIPLE.. See 873 (mislabeled line number).

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **21**   # **449**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **A**   OMA
Table 52-14 needs to be changed based on the decision in Tampa to use OMA.

SuggestedRemedy
Line 21 replace "Receiver sensitivity -18dBm" with "Receiver sensitivity OMA 23(-19.4) uW (dBm)"
Line 23 replace "stressed receive sensitivity -13.41dBm" with "stressed receive sensitivity OMA 66 (-14.8) uW (dBm)

Proposed Response   *Response Status*   **C**
ACCEPT IN PRINCIPLE. See 873.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **22**   # **404**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **R**
Does -26 dB return loss match other standards?

SuggestedRemedy
If ITU-T or IEC have -27 dB, change to that.

Proposed Response   *Response Status*   **C**
REJECT. See other comment on -27 dB value: 777.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **23**   # **625**
William G. Lane   CSU, Chico

Comment Type   **T**   *Comment Status*   **R**
Because the PMD subgroup voted during the November plenary to replace Extinction ratio specification with Optical Modulation Amplitude specification, the extinction ratio footnote for the stressed receive sensitivity in table 52-14 is no longer appropriate

SuggestedRemedy
Delete the extinction ratio footnote

Proposed Response   *Response Status*   **C**
REJECT. See 893.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **25**   *#* **411**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**
ER/EW Vertical eye closure penalty needs revision to account for path penalty specification.(Note to self: Uw now 0.0332)

SuggestedRemedy
Change 2.72 to 2.79

Proposed Response   *Response Status* **C**
ACCEPT.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **30**   *#* **412**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **R**   *OMA*
Stressed test extinction ratio is left over from GigE. For now, we can change it to align with our average-power definitions. It can get rewitten into OMA style sometime.

SuggestedRemedy
Change 9 dB to 8.0 dB.

Proposed Response   *Response Status* **C**
REJECT. See 893.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **31**   *#* **450**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status* **R**   *OMA*
The stressed receiver sensitivity should not be measured with an extinction ratio of 9dB and this footnote is not needed with the use of OMA

SuggestedRemedy
Delete the footnote beginning "measured with a transmit...."

Proposed Response   *Response Status* **C**
REJECT. See 893.

Cl **52**   *SC* **52.5.3**   *P* **370**   *L* **4**   *#* **448**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status* **A**   *OMA*
The reference to extinction ratio is no longer needed with the use of OMA

SuggestedRemedy
Delete the sentence "The receiver ...."

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 403.

Cl **52**   *SC* **52.5.4**   *P* **369**   *L* **12**   *#* **398**
Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status* **A**
Rogue c's

SuggestedRemedy
Delete superscript c : two occurrences in table 52-15

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **10**   *#* **413**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **R**
Does -26 dB return loss match other standards?

SuggestedRemedy
If ITU-T or IEC have -27 dB, change to that.

Proposed Response   *Response Status* **C**
REJECT. See 777.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **12**   *#* **414**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**   *RIN*
Penalties and margins will change following incorporation of PMD and recalculation and re-optimisation of RIN.

SuggestedRemedy
Change:
Link power penalties to 3.59 dB
Unallocated margin to   1.42 dB

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **12-13**   *#* **875**
Ohlen, Peter   Optillion

Comment Type   **E**   *Comment Status* **A**
There is no footnote "c" below the table.

SuggestedRemedy
Remove "c", substitute it with the correct footnote sign, or add the appropriate footnote.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Will be removing the 'c'. Thought I got all of these things.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **13**   **#** **427**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

Unallocated margin is sometimes misunderstood.

SuggestedRemedy

Add text:
The unallocated margin is not available for use as additional insertion losses. It simply represents unknown penalties and uncertainties in the known parameters.

Proposed Response   *Response Status* **C**

ACCEPT. See 378

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **17**   **#** **876**

Ohlen, Peter   Optillion

Comment Type **E**   *Comment Status* **A**

The reference to table 52-7 of wrong and should read "52-11".

SuggestedRemedy

Change the table reference to "52-11".

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **18**   **#** **451**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **E**   *Comment Status* **A**

Incorrect table reference.

SuggestedRemedy

Replace "Table 52-7" with "Table 52-11"

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **7**   **#** **405**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

Channel/link/path criteria are loss and dispersion. Distance is now indicative only.Note to self 40 km nominal =
726.5 ps/nm if measured at 1565 nm
728 ps/nm if measured at 1550 nm

SuggestedRemedy

Move Channel Insertion loss to top item in table 52-15.
Insert new second item: Channel dispersion 762.5 ps/nm
Change "Operating distance" to "Indicative operating distance" (or maybe ITU-T's words).
Check dispersion figure vs. ITU-T documents.
Check dispersion sign.
Check standard wavelength for dispersion measurement.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Need refinement and provisos to operating distance need to be removed. Change to 1550 nm dispersion value.

Cl **52**   *SC* **52.5.4**   *P* **371**   *L* **8**   **#** **452**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **R**

It appears that only 1dB has been allocated for connector losses and 1.64dB is unallocated. I suggest that 2dB is allocated for connector losses leaving 0.64dB unallocated.

SuggestedRemedy

Line 8 Change "13" to "14"Line 13 change "1.64" to "0.64"

Proposed Response   *Response Status* **C**

REJECT. This should be part of a larger discussion on allocation of budget between connectors, unallocated, etc.

TYPE: TR/technical required T/technical E/editorial   COMMENT STATUS: D/dispatched A/accepted R/rejected   SORT ORDER: Clause, Subclause, page, line   Page 24 of 34

RESPONSE STATUS: O/open   W/written   C/closed   U/unsatisfied Z/withdrawn

Cl **52**   *SC* **52.5.4**

CI **52**   *SC* **52.6**   *P* **371**   *L* **22**   **# 431**

Lysdal, Henning   Giga

Comment Type **T**   *Comment Status* **R**   *JITTER*

This is a placeholder comment for a problem that most people are aware off. The methodology used to specify jitter (separate power and jitter budgets) yields unrealistic (tougher than SONET) receiver specifications. Especially the receiver conformance test signal with 65ps jitter will be hard (= expensive) to meet. The problem arise for two reasons: 1) the jitter budget is specified separate to the power budget. In ITU they specify the jitter budget at a fixed point in the power budget (where BER=10E-9), there is an existance proof that this yields a realistic budget. 2) the jitter budget is specified with no jitter-frequency conditions. In the 1550nm single-mode case SONET provides an existence proof. However in the multi-mode implementations we can't prove that we meet our distance objective until we have a power and jitter budget and a set of demonstrater parts that meet these and comprise a working link.

SuggestedRemedy

Change the jitter specificaiton methodology to the one used by the ITU and relax the spec where appropriate. For the multi-mode PMDs, optics vendors should test a link using the specified fiber and SONET PMAs. If this does not meet the distance criteria, we know we will end up with a PMA/PMD spec. that's tougher than SONET. I would expect this to cause us to revisit the objectives or the PMD selection.

Proposed Response   *Response Status* **C**

REJECT. Jitter ad hoc will present jitter methodology.

CI **52**   *SC* **52.6**   *P* **371**   *L* **24**   **# 217**

Del Hanson   Tripath Technology

Comment Type **T**   *Comment Status* **A**   *JITTER*

In 52.6 through section 52.7.5, there are many carry-over references to Clause 38 of GbE.

SuggestedRemedy

Decide on jitter testing methodology for this standard and remove the Clause 38 references

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Need a jitter methodology.

CI **52**   *SC* **52.6**   *P* **371**   *L* **24**   **# 424**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

Jitter corner is wrong

SuggestedRemedy

Change 637 kHz to 6 MHz or if within 20% of 6 MHz, value from ITU-T recommendation.

Proposed Response   *Response Status* **C**

ACCEPT. ACCEPT.

CI **52**   *SC* **52.6**   *P* **371**   *L* **35**   **# 453**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**

Jitter contribution from the cable is likely to be different for the 3 different serial systems and hence there should be different jitter budgets for each system.

SuggestedRemedy

Triplicate section 52.6 as 52.3.4, 52.4.4, and 52.5.5 changing the title as appropriate and renumbering other sections.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. In general the methodology should be common, but the numbers different. As to where to put these numbers, it would be beneficial to NOT triplicate the entire sections, but point out the differences in numbers where applicable. I.E, put the jitter metholodology up front, and the numbers with each specific PMD, with references back to the methodology. This was brought up in one of the Serial-PMD conference calls.

CI **52**   *SC* **52.6**   *P* **373**   *L* **37**   **# 1074**

Ali Ghiasi   Broadcom

Comment Type **T**   *Comment Status* **R**

TP2 to TP3 DJ portion of TJ is too low.

SuggestedRemedy

Most of channel degradation are deterministic sugggest to increase the DJ to 0.1 UI.

Proposed Response   *Response Status* **C**

REJECT. This section is a placeholder. The values are wrong, so let's not go into details trying to fix every one. See 217.

CI **52**   *SC* **52.7**   *P*   *L*   **# 887**

Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**   *OMA*

There are no specifications on how OMA should be measured.

SuggestedRemedy

Insert a subclause after 52.7.3 describing OMA measurements.
52.7.xx Optical modulation amplitude (OMA) test procedure
==
OMA is the difference in optical power for the nominal "1" and "0" levels of the optical signal. OMA shall be measured for a node transmitting a repeating "00001111" pattern corresponding to a 1.25 GHz (10GBASE-EW) or 1.29 GHz (10GBASE-ER) square wave.
The recommended technique for measuring optical modulation amplitude is illustrated in figure A. Optionally, a 4th order Bessel Thompson filter as specified in 52.7.5 can be used after the O/E converter. The measurement system consisting of the O/E converter, the optional filter and the oscilloscope has the following requirements:
a) Then bandwidth of the measurement system shall be at least 7.5 GHz.
b) The measurement system shall be calibrated at the appropriate wavelength for the transmitter under test.
With the device under test transmitting the square wave described above, use the following procedure to measure optical modulation amplitude.
a) Configure the test equipment as illustrated in figure A.
b) Measure the mean optical power P1 of the logic "1" as defined over the center 20% of the time interval where the signal is in the high state. (See figure B)
c) Measure the mean optical power P0 of the logic "0" as defined over the center 20% of the time interval where the signal is in the low state. (See figure B)
d) OMA = P1 - P0.
An alternative method of measurement is to measure the average optical power A (in mW) and the extinction ratio E = P1/P0 (absolute ratio NOT dB), with P1 and P0 defined as above. Then OMA = 2A((E-1)/(E+1)).
Figure A -- Recommended test equipment for measurement of optical modulation amplitude.
[Figure shows four boxes containing the "Transmitter (D.U.T.)", "O/E converter", "optional filter", and "oscilloscope"]
Figure B -- Optical modulation amplitude waveform measurement
[figure illustrates the square wave used for the measurements, and shows the 20% measurement windows, the zero level, and the definitions of P1, P0 and OMA]

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. OMA measurement technique is required and should be specified here. Methodology for OMA measurement should be coordinated with commenter #454 (Mike Dudek).

CI **52**   *SC* **52.7.1**   *P* **371**   *L* **52**   **# 415**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

To measure spectral width, there is no need for a validly coded 10G Ethernet signal. A PRBS will do.

SuggestedRemedy

change to "... modulated conditions using an appropriate PRBS or a valid 10GBASE-SR/LR/ER/SW/LW/EW or OC-192 or STM-64 signal.Check standards for choice of PRBS.Add PRBS to Abbreviations list.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. Need to get appropriate text and references.

CI **52**   *SC* **52.7.10**   *P* **374**   *L* **45**   **# 354**

Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**

Receiver testing can be done with random data.

SuggestedRemedy

Change"The conformance test signal shall be generated using the short continuous random test pattern defined in subclause 36A.5."to"The conformance test signal shall be generated using an appropriate PRBS or a valid 10GBASE-SR/LR/ER/SW/LW/EW or OC-192 or STM-64 signal.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 459.

CI **52**   *SC* **52.7.10**   *P* **374**   *L* **48**   **# 882**

Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**

The test signal defined in 36A.5 is based on 8b/10b code groups and not suitable for 10G serial.

SuggestedRemedy

Specify that a 2^23-1 PRBS pattern is used to generate the conformance test signal.

Proposed Response   *Response Status* **C**

ACCEPT IN PRINCIPLE. See 459.

Cl **52** *SC* **52.7.10** *P* **374** *L* **48** **#** **459**
Mike Dudek, Mike T Dudek Cielo Communications

Comment Type **T** *Comment Status* **A**
The pattern used for this test should be changed to one appropriate for 64B/66B coding. eg. PRBS 2exp23 -1.

SuggestedRemedy
Line 48 replace "the short continuous test pattern defined in clause 36A.5" with "a PRBS sequence of 2exp23-1.

Proposed Response *Response Status* **C**
ACCEPT.

Cl **52** *SC* **52.7.10** *P* **374** *L* **51** **#** **460**
Mike Dudek, Mike T Dudek Cielo Communications

Comment Type **T** *Comment Status* **R**
The Dj component needs to be scaled to 10Gbit/s

SuggestedRemedy
Replace "65ps" with "6ps".

Proposed Response *Response Status* **C**
REJECT. Changed to 8 ps as per 356.

Cl **52** *SC* **52.7.10** *P* **374** *L* **51** **#** **356**
Dawe, Piers Agilent

Comment Type **T** *Comment Status* **A**
DCD is not 65ps.

SuggestedRemedy
Change to c".. no less than specified in table 52-17". Add new table 52-17-Duty Cycle DistortionPort type | Minimum DCD (ps)and populate.Alternatively, put the DCD values in tables 52?5, 52?9 and 52?14.Current values are S: 9.7 ps, L and E: 8 ps.

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. Needs further refinement. 8ps is new number.

Cl **52** *SC* **52.7.10** *P* **375** *L* **28** **#** **461**
Mike Dudek, Mike T Dudek Cielo Communications

Comment Type **T** *Comment Status* **A** *OMA*
Define what the stressed receiver sensitivity OMA is.

SuggestedRemedy
Insert a line at line 28"The stressed receiver OMA is AN "

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. Needs further refinement.

Cl **52** *SC* **52.7.10** *P* **375** *L* **42** **#** **883**
Ohlen, Peter Optillion

Comment Type **T** *Comment Status* **A**
At bandwidths larger than 10 GHz, laser sources are generally not linear. Therefore the words "linearly modulated" should be removed. As the shape of the eye is verified after the transmitter it is not really necessary to use a linear transmitter.

SuggestedRemedy
Remove "linearly modulated" on p. 375:42, and "linear" in figure 52-6.

Proposed Response *Response Status* **C**
ACCEPT IN PRINCIPLE. Change wording to "approximately" linear.

Cl **52** *SC* **52.7.10** *P* **375** *L* **44** **#** **358**
Dawe, Piers Agilent

Comment Type **T** *Comment Status* **A**
Description of eye verification can be simplified. Need to change "filter" to "response"

SuggestedRemedy
Replace:"The vertical and horizontal eye closures to be used for receiver conformance testing are verified using a fast photodetector and amplifier. This receiver is specified in G.691 as the ITU-T STM-64 reference. This represents a 7.5 GHz reference receiver with a fourth order Bessel-Thompson filter."with:"The vertical and horizontal eye closures to be used for receiver conformance testing are verified using an optical reference receiver with 7.5 GHz fourth order Bessel-Thompson response as specified in G.691 as the ITU-T STM-64 reference."

Proposed Response *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52** *SC* **52.7.10** *P* **376** *L* **1** **#** **359**
Dawe, Piers Agilent

Comment Type **T** *Comment Status* **A**
Not so special.Draft says: "Special care should be taken to ensure that all the light from the fiber is collected by the fast photodetector and that there is negligible mode selective loss, especially in the optical attenuator."   These days attenuators and reference receivers can be bought in so the degree of care needed in the lab is not so special.

SuggestedRemedy
Delete "Special".

Proposed Response *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.7.10**   *P* **376**   *L* **8**   **#** **357**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **A**
BT means either bit time (subclause 1.4.50) or a phone company.

SuggestedRemedy
In figure 38-5, replace "BT" with "Bessel-Thompson".

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **52.7.11**   *P* **376**   *L* **21**   **#** **360**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
Measurement of the receiver 3 dB electrical upper cutoff frequency is not feasible this way would need extra fast lasers.

SuggestedRemedy
Consider using two lasers and an optical power combiner.Consider deleting test.Consider stressing multimode receiver with split-and-delayed pulses.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Using two lasers and optical combiner.

Cl **52**   *SC* **52.7.11**   *P* **376**   *L* **22**   **#** **884**
Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**
At frequencies above 10 GHz, most (if not all) transmitters are nonlinear. Therefore the measurement procedure described in cl. 52.7.11 may be inadequate for measuring the receiver 3-dB electrical cut-off frequency.

SuggestedRemedy
An alternative set-up where the data signal and the RF signal are generated optically at different wavelengths and then combined could be used.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 360.

Cl **52**   *SC* **52.7.11**   *P* **376**   *L* **28**   **#** **462**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**
The 8B/10B pattern is not appropriate

SuggestedRemedy
Replace "the short continuous random test pattern defined in subclause 36A.5" with" a prbs 2exp23 -1 sequence

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 459.

Cl **52**   *SC* **52.7.11**   *P* **376**   *L* **47**   **#** **463**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**   *OMA*
Using OMA in this section simplifies it.

SuggestedRemedy
Line 47 remove "Measure the laser's extinction ratio according to 38.6.3. With the exception of extinction ratio"
Line 53 replace "taking into account the extinction ratio of the source, set the optical power" with "set the Optical Modulation Amplitude"Page 377 line 4 replace "Optical Power" with "Optical Modulation Amplitude"

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. More changes are necessary to this section to remove extraneous references to clause 38.

Cl **52**   *SC* **52.7.2**   *P* **372**   *L* **4**   **#** **416**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
To measure optical power, there is no need for a validly coded 10G Ethernet signal. A PRBS will do.

SuggestedRemedy
change to "... with the node transmitting an appropriate PRBS or a valid 10GBASE-SR/LR/ER/SW/LW/EW or OC-192 or STM-64 signal.Check standards for choice of PRBS.Add PRBS to Abbreviations list.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 415.

CI **52**   *SC* **52.7.2**   *P* **372**   *L* **4**   *#* **355**

Dawe, Piers   Agilent

Comment Type   **E**   *Comment Status*   **A**

Transmitter tests do not only apply to nodes; can apply to parts.

SuggestedRemedy

Change "node" to "transmitter" or "DUT" or "PMD" or its replacement term. Also at line 9.

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. Let's discuss this.

CI **52**   *SC* **52.7.3**   *P* **372**   *L*   *#* **877**

Ohlen, Peter   Optillion

Comment Type   **T**   *Comment Status*   **A**

Currently it is suggested that a repeating K28.7 pattern (five "1" + five "0") should be used for extinction ratio measurements, which corresponds to a 125 MHz square wave at 1.25 Gb/s. For 10 GbE is would simpler to use 4x"1" + 4x"0", which corresponds to a 1.25 Gb/s square wave.

SuggestedRemedy

<MODIFIED TEXT IN 52.7.3>

Extinction ratio shall be measured using the methods specified in TIA/EIA-526-4A. The extinction ratio is measured under fully modulated conditions with worst case reflections. This measurement may be made with the node transmitting a data pattern consisting of a repeating sequence of 4 logical zeros (light off) followed by 4 logical ones (light on). For example: ...11110000111100001111000011110000...
Note: this pattern generates a 1.25 GHz square wave.
--<END NEW TEXT>
Alternatively, this pattern could be described in an annex to clause 52 which would be refered to in 52.7.

Proposed Response   *Response Status*   **C**

ACCEPT.

CI **52**   *SC* **52.7.3**   *P* **372**   *L* **6**   *#* **454**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **A**   *OMA*

OMA measurement method is required instead of Extinction ratio

SuggestedRemedy

Replace subclause 52.7.3 with either a reference to ANSI T11 FC-PI Annex A.5 or the text below. Note that the figures have not imported into this document. They can be found in dudek_2_1100. However I believe that a framemaker version of this Annex has been made available which could reduce work for the editors.52.7.3_ Optical modulation amplitude (OMA) test procedureThe recommended technique for measuring optical modulation amplitude requires test equipment with the following minimum requirements:
a) An oscilloscope w ith 5000 MHz bandw idth (minimum)
b) A signal generator capable of supplying a 1000 MHz square w ave w ith rise and fall characteristics compliant with 802.3ae transmitter requirements.
c) Optical to electrical converter w ith 5000 MHz minimum bandw idth. The O/E converter shall be calibrated at the appropriate wavelength for the transmitter under test.
d) A 4th order Bessel Thomson filter w ith a 3 dB bandw idth of 0.75 Baudrate (optional).
While supplying the optical transmitter with 1000MHz square wave, use the following procedure to measure optical modulation amplitude.
a) Configure the test equipment as illustrated in Figure B.1 such that the O/E converter is used as a front end for the oscilloscope input electrical channel.
b) With a valid w aveform displayed on the oscilloscope, place the first cursor at the mean voltage level of the logic "1" as defined over the center 20% of the time interval which is in the high state. (See figure)
c) Place the second cursor on the mean voltage level of the logic "0" as defined over the center 20% of the time interval which the laser is in the low state.
d) Measure and record the voltage difference betw een the tw o cursors.
e) Calculate the OMA by multiplying the voltage difference by the conversion gain of the O/E converter at the wavelength of the laser source.
 Figure A.2 - Optical modulation amplitude test equipment configuration
 Figure A.3 - Optical modulation amplitude waveform measurement
An alternative method of measurement is to measure the average optical power A (in mW) and the extinction ratio E (absolute ratio NOT dB) as described in OFSTP-4. The OMA = 2A((E-1)/(E+1))

Proposed Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE. OMA measurement technique is required and should be specified here. Methodology for OMA measurement should be coordinated with commenter #887 (Peter Ohlen).

Cl **52**   *SC* **52.7.3**   *P* **372**   *L* **8**   **#** **417**

Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status*   **R**

Extinction ratio measurements: This clause may get radically changed to accommodate OMA. If it doesn't, our obvious path is to follow SONET/ITU-T who will tell us how to measure Extinction ratio on scrambled data. If we were to propose optional test patterns for enhanced accuracy or speed, "LAN" patterns should keep the 66 bit frame lenght and the 2-bit master transition untouched. Candidate patterns would be runs of 64-1-1-64-1-1 (equals 65-65-1-1) bits or of 8-8-8-8-8-8-8-1-1 bits.

SuggestedRemedy

Delete all text in clause and refer to appropriate ITU-T recommendation O.nnn or similar from TIA/EIA or ANSI

Proposed Response   *Response Status*   **C**

REJECT. The clause has been substantially changed with the introduction of OMA.

Cl **52**   *SC* **52.7.4**   *P* **372**   *L* **15**   **#** **455**

Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type   **T**   *Comment Status*   **A**   *RIN*

The measurement method for RIN12OMA should be described instead of RIN

SuggestedRemedy

Replace section 52.7.4 with either a reference to ANSI T11 FC-PI A.4 or the text below.Note that the figures can be found in Dudek_2_1100.52.7.4_ Relative intensity noise (RIN) (OMA) measuring procedure
This procedure describes a component test which may not be appropriate for a system level test depending on the implementation.
52.7.4.1_ Test objective
When lasers which are subject to reflection induced noise effects are operated in a cable plant with a low optical return loss the lasers will produce an amount of noise which is a function of the magnitude and polarization state of the reflected light.The magnitude of the reflected light tends to be relatively constant. However, the polarization state varies significantly as a function of many cable parameters, particularly cable placement. In a cable plant which is physically fixed in place the variation is slow. If the fibre is subject to motion, such as occurs in a jumper cable, the change may be sudden and extreme. The effect is unpredictable changes in the noise from the laser with the result that the communication link may exhibit sudden and unexplainable bursts of errors.The solution to this is to assure that the lasers used do not generate excessive noises under conditions of the worst case combination of polarization and magnitude of reflected optical signal.The noise generated is a function of the return loss of the cable plant. For the Fibre Channel the specified return loss is 12 dB resulting in the notation of RIN[12] for the relative intensity noise.
52.7.4.2_ General test description
The test arrangement is shown in figure . The test cable between the Device Under Test (DUT) and the detector forms an optical path having a single discrete reflection at the detector with the specified optical return loss. There shall be only one reflection in the system as the polarization rotator can only adjust the polarization state of one reflection at a time.
 Figure A.1 - RIN (OMA) test setup
Both the OMA power and noise power are measured by AC coupling the O/E converter into the high frequency electrical power meter. If needed, an amplifier may be used to boost the signal to the power meter.A low pass filter is used between the photodetector and the power meter to limit the noise measured to the passband appropriate to the data rate of interest.In order to measure the noise the modulation to the DUT shall be turned off.
A.4.3_ Component descriptions
Test Cable: The test cable and detector combination must be configured for a single dominate reflection with an optical return loss of 12dB. (The Optical return loss may be determined by the method of FOTP-107) If multiple lengths of cable are required to complete the test setup they should be joined with splices or connectors having return losses in excess of 30 dB. The length of the testcable is not critical but should be in excess of 2 m.Polarization Rotator: The polarization rotator shall be capable of transforming an arbitrary orientation elliptically polarized wave into a fixed orientation linearly polarized wave. A polarization rotator consisting of two quarter wave retarders ha the necessary flexibility.O/E converter (and amplifier): The O/E converter may be of any type which is sensitive to the wavelength range of interest. The frequency response of the O/E converter shall be higher than the cut-off frequency of the low pass filter. If necessary the noise may be amplified to a level consistent with accurate measurement by the power

---

meter.Filter: The low pass filter shall have a 3 dB bandwidth of approximately 75% of the bit rate. Recommended values are shown in table . The total filter bandwidth used in the RIN calculation shall take the low frequency cut-off of the d.c. blocking capacitor into consideration. The low frequency cutoff is recommended to be <1 MHz.Table A.1 - Filter 3 dB point
Bit rate Filter 3dB point
1,0625 GBd 800 MHz
2,125 GBd 1 600 MHz
4,250 GBd 3 200 MHZ
The filter should be placed in the circuit as the last component before the power meter so that any high frequency noise components generated by the detector/amplifier are eliminated. If the power meter used has a very wide bandwidth care should be taken in the filter selection to ensure that the filter does not lose its rejection at extremely high frequencies.Power Meter: The power meter should be an RF type designed to be used in a 50 W coaxial system. The meter shall be capable of being zeroed in the absence of input optical power to remove any residual noise from the detector or its attendant amplifier, if used.A.4.4_ Test Procedure
a) Connect and turn on the test equipment. Allow the equipment to stabilize for the manufacturers recommended warm up time.b) With the DUT disconnected zero the power meter to remove the contribution of any noise power from the detector and amplifier, if used.c) Connect the DUT, turn on the laser, and ensure that the laser is not modulated.d) Operate the polarization rotator w hile observing the pow er meter output to maximize the noise read by the power meter. Note the maximum power, PN.e) Turn on the modulation to the laser and note the power measurement, PM.
f) Calculate RIN from the observed detector current and electrical noise by use of the equation: Equation 4 - Relative intensity noise
RIN12 (OMA) = 10 log [PN/(BW*PM)] (dB/Hz)
Where:
RIN12 (OMA) = Relative Intensity Noise referred to optical modulation amplitude
PN = Electrical noise pow er in Watts w ith modulation off
PM = Electrical noise pow er in Watts w ith modulation on
BW = Low pass bandw idth of filter - high pass bandw idth of DC blocking capacitor [noise bandwidth of the measuring system (Hz)].
 For testing multimode components or systems, the polarization rotator shall be removed from the setup and the single mode fiber replaced with a multimode fiber. Step d) of the test procedure shall be eliminated.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Remove references to extraneous standards. Needs further refinement.

Cl **52**   *SC* **52.7.5**   *P* **372**   *L* **24**   # **422**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**
Eye mask: Need to specify the line rate and the test procedure.

SuggestedRemedy
Add new text to the effect of:Measurement with the node transmitting an appropriate PRBS or a valid 10GBASE-SR/LR/ER/SW/LW/EW or OC-192 or STM-64 signal.Reference measurement procedure ITU-T O.nnn or ANSI or TIA/EIA as appropriate.Measurement at 10.3125 GBd shall qualify for type W and type R use, measurement at 9.95328 GBd shall qualify for type W use only.

(changes Oked by commenter)

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. References need to be corrected and other text changes may be necessary: needs further refinement.

Cl **52**   *SC* **52.7.5**   *P* **372**   *L* **25**   # **353**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **R**
The transmit mask is a useful way of jitter qualification.

SuggestedRemedy
Delete "and jitter" from the sentence "The transmit mask is not used for response time and jitter specification."

Proposed Response   *Response Status* **C**
REJECT. Jitter ad hoc still in process of developing jitter specification and test methodology.

Cl **52**   *SC* **52.7.5**   *P* **372**   *L* **29**   # **419**
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**
Reference receiver from G.691 rather than reference filter from G.957

SuggestedRemedy
Change "using a fourth-order Bessel Thompson filter" to "using a receiver with a fourth-order Bessel Thompson response"And line 39: change "filter is defined in ITU-T G.957," with "receiver is defined in ITU-T G.691,"and line 42: change "This Bessel Thompson filter is not intended to represent the noise filter used within an optical receiver, but is intended toprovide uniform measurement conditions at the transmitter." with "This Bessel Thompson receiver is not intended to represent the noise filter used within a compliant optical receiver, but is intended to provide uniform measurement conditions at the transmitter."

Proposed Response   *Response Status* **C**
ACCEPT.

Cl **52**　　*SC* **52.7.5**　　　　*P* **372**　　*L* **29**　　# **420**
Dawe, Piers　　　　　　　　　　Agilent

Comment Type **E**　　*Comment Status* **A**
IEEE and ITU-T differ in their spelling of Thompson/Thomson. Surely there was one person?

SuggestedRemedy
Check spelling of Thompson/Thomson.

Proposed Response　　*Response Status* **C**
ACCEPT IN PRINCIPLE. Excellent query. I cannot find a definitive answer at this time. I need help. Call to arms: Find Mr. T(h)om(p)son and ask him how to spell his name.

Cl **52**　　*SC* **52.7.5**　　　　*P* **372**　　*L* **36**　　# **878**
Ohlen, Peter　　　　　　　　　　Optillion

Comment Type **T**　　*Comment Status* **A**
Currently, the measurement filter is specified as a 0.9375 GHz Bessel-Thompson filter. A 7.5 GHz filter should be used for 10 Gb/s.

SuggestedRemedy
Change to "f_r = 7.5 GHz"

Proposed Response　　*Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**　　*SC* **52.7.5**　　　　*P* **372**　　*L* **36**　　# **456**
Mike Dudek, Mike T Dudek　　　　Cielo Communications

Comment Type **T**　　*Comment Status* **A**
The filter bandwidth for the Bessel Tompson filter is incorrect

SuggestedRemedy
Replace "0.9375GHz" with "7.5GHz"

Proposed Response　　*Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**　　*SC* **52.7.5**　　　　*P* **372**　　*L* **36**　　# **423**
Dawe, Piers　　　　　　　　　　Agilent

Comment Type **T**　　*Comment Status* **A**
Bessel fr is wrong

SuggestedRemedy
Change "fr = 0.9375GHz" to "fr = 7.5 GHz (or whatever G.691 says if different)

Proposed Response　　*Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**　　*SC* **52.7.5**　　　　*P* **373**　　*L* **4**　　# **421**
Dawe, Piers　　　　　　　　　　Agilent

Comment Type **T**　　*Comment Status* **A**
Revision to transmit eye mask - hardware costs and harmonisation with SONET

SuggestedRemedy
Change time points to 0.3, 0.4, 0.6, 0.7 UIChange Normalized Amplitude points to -0.4, 0.25, 0.75, 1.4

Proposed Response　　*Response Status* **C**
ACCEPT.

Cl **52**　　*SC* **52.7.7**　　　　*P* **373**　　*L* **42**　　# **457**
Mike Dudek, Mike T Dudek　　　　Cielo Communications

Comment Type **T**　　*Comment Status* **A**
References to extinction ratio should be removed.

SuggestedRemedy
Line 42 remove "using a worst case extinction ratio penalty"
Line 46 remove "After correcting for the extinction ratio of the source"

Proposed Response　　*Response Status* **C**
ACCEPT IN PRINCIPLE. See 879.

Cl **52**　　*SC* **52.7.7**　　　　*P* **373**　　*L* **42**　　# **879**
Ohlen, Peter　　　　　　　　　　Optillion

Comment Type **T**　　*Comment Status* **A**　　　　　　　*OMA*
In subclause 52.7.7 it is described how receive sensitivity should be corrected if different extinction ratios are used. With the introduction of OMA there is no need to correct for extinction ratio.

SuggestedRemedy
1. Remove the word "penalty" on line 42.
2. Remove ""After correcting ..... source, " on line 46.

Proposed Response　　*Response Status* **C**
ACCEPT.

Cl **52**　　*SC* **52.7.8**　　　　*P* **374**　　*L* **13**　　# **881**
Ohlen, Peter　　　　　　　　　　Optillion

Comment Type **T**　　*Comment Status* **A**
The golden PLL is specified to have a -3 dB cut-off at 637 kHz, which is too low at 10 Gb/s

SuggestedRemedy
Change 637 kHz to 4 MHz.

Proposed Response　　*Response Status* **C**
ACCEPT IN PRINCIPLE. See 424 for numbers.

Cl **52**   *SC* **52.7.8**   *P* **374**   *L* **13**   **#** **425**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
Jitter corner is wrong

SuggestedRemedy
Change 637 KHz to 6 MHz or if within 20% of 6 MHz, value from ITU-T recommendation.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 424.

Cl **52**   *SC* **52.7.8**   *P* **374**   *L* **2**   **#** **458**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**
This jitter section needs significant work. The test pattern 36A.3 is not appropriate for the 64B/66B signal. The roll off frequency (line 13)should be scaled to 6MHz. etc. I think the remedy needs to wait for the results of the jitter sub group.

SuggestedRemedy

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. This section is a placeholder and needs to be replaced. However, references to inapplicable test patterns shall be removed as per this comment.

Cl **52**   *SC* **52.7.8**   *P* **374**   *L* **5**   **#** **880**
Ohlen, Peter   Optillion

Comment Type **T**   *Comment Status* **A**
This section refers to jitter measurements at TP4. Since TP4 is no longer a compliance point, the section from line 4-9 should be removed.

SuggestedRemedy
Remove the section on line 4-9 on p. 374.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. This section is a placeholder, and it's content is wrong, however references to nonexistent test points can be removed as per this comment.

Cl **52**   *SC* **52.7.8**   *P* **374**   *L* **6**   **#** **426**
Dawe, Piers   Agilent

Comment Type **E**   *Comment Status* **A**   *OMA*
Changing to OMA

SuggestedRemedy
Change:
"The optical power shall be 0.5 dB greater than (to account for eye opening penalty) the stressed receive sensitivity level in Table 52?5 for 10GBASE-SR/SW, in Table 52?9 for 10GBASE-LR/LW, and in Table 52?14for 10GBASE-ER/EW. This power level shall be corrected if the extinction ratio differs from the specified extinction ratio (min) of 9 dB."to:"To account for eye opening penalty, the optical power (OMA) shall be 0.5 dB greater than the stressed receive sensitivity level in Table 52?5 for 10GBASE-SR/SW, in Table 52?9 for 10GBASE-LR/LW, and in Table 52?14for 10GBASE-ER/EW."

Proposed Response   *Response Status* **C**
ACCEPT.

Cl **52**   *SC* **52.7.9**   *P* **374**   *L* **33**   **#** **352**
Dawe, Piers   Agilent

Comment Type **T**   *Comment Status* **A**
Whole subclause needs review

SuggestedRemedy
Delete or replace subclause

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. The jitter subsection is effectively a placeholder, and needs to be replaced with text and content recommended by the work of the Jitter Ad Hoc.

Cl **52**   *SC* **52.8.2**   *P* **377**   *L* **24**   **#** **464**
Mike Dudek, Mike T Dudek   Cielo Communications

Comment Type **T**   *Comment Status* **A**
The European laser safety standards have been updated since the 1st edition.

SuggestedRemedy
Replace "1st edition (11/1993) with the updated reference.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Need to find appropriate reference.

Cl **52**   *SC* **all**   *P*   *L*   **#** 1409
Booth, Brad   Intel

Comment Type   **E**   *Comment Status* **A**
H2 headings are formatted to start at top of page

SuggestedRemedy
ensure 52.2 to 52.12 are set to start anywhere

Proposed Response   *Response Status* **C**
ACCEPT. ACCEPT.

Cl **52**   *SC* **All**   *P* **Multiple**   *L* **Multiple**   **#** 379
Dawe, Piers   Agilent

Comment Type   **T**   *Comment Status* **A**
Should "link" be called "channel" as in ISO 11801, EN 50173 and TIA/EIA-568-B3 and later in this clause? Or should we align with the terminology of ITU-T and SONET? Probably we should attempt both, for campus wiring and outside the building.

SuggestedRemedy
Check other standards for link/channel/path terminology.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Let's figure out the appropriate terminology, but base our choice on Ethernet, not on other standards.

Cl **52**   *SC* **multiple**   *P*   *L*   **#** 891
Ohlen, Peter   Optillion

Comment Type   **T**   *Comment Status* **A**
In the tables specifying the transmitter characteristics in clause 52 there are footnotes (e.g. on p. 361, line 30) stating that the AC signal into the transmit port will be a valid 8b/10b signal, which is not the case for the serial PMDs.

SuggestedRemedy
State that the input signal to the transmit port will be a valid 10GBASE-Serial data stream or one of the test patterns to be defined in clause 52A:Changed text in the single dagger footnotes of table 52-4 (p. 361:29), 52-8 (p. 364:48), 52-13 (p. 369:31):During all conditions when the PMA is powered, the AC signal (data) into the transmit port will be valid encoded 10G-Serial data stream or one of test patterns defined in 52A except for short durations during system power-on-reset or diagnostics when the PMA is placed in a loopback mode.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Remove annex ref. Remove requirement for specific pattern. Change nomenclature where required.

Cl **52**   *SC* **Table 52-10**   *P* **366**   *L* **3**   **#** 1059
Doug Coleman   Corning

Comment Type   **T**   *Comment Status* **A**
1290nm is used for attenuation.

SuggestedRemedy
Use 1265nm for worst case or segregate table for encoding types.

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. Use 1265 nm.

Cl **52**   *SC* **Table 52-17**   *P* **378**   *L* **53**   **#** 1060
Doug Coleman   Corning

Comment Type   **T**   *Comment Status* **A**
Channel Insertion Loss values.

SuggestedRemedy
Values were omitted and need to be added to table. We suggest the following numbers:
62.5um 62.5um 50um 50um 50um 10um SMF 10um SMF Units
28   35   69   86   300   10000   40000   M
1.60   1.62   1.74 1.80 2.55 6   18   dB

Proposed Response   *Response Status* **C**
ACCEPT IN PRINCIPLE. See 836.

Cl **52**   *SC* **Table 52-3**   *P*   *L*   **#** 1057
Doug Coleman   Corning

Comment Type   **T**   *Comment Status* **A**
Delete SMF from Table.   Multimode fiber is identified in the preceding paragraph.

SuggestedRemedy

Proposed Response   *Response Status* **C**
ACCEPT.

Cl **52**   *SC* **Table 52-6**   *P*   *L*   **#** 1058
Doug Coleman   Corning

Comment Type   **T**   *Comment Status* **R**
The 50um 2000MHz bw is RML not OFL.   Attenuation values for 840nm should be apparent to check numbers.

SuggestedRemedy

Proposed Response   *Response Status* **C**
REJECT. Reference comment 1054.