CI 86	SC 86.7.5.4	P 291	L 36	# 20276
Kolesar, Pau	l	CommScope		

### Comment Type **TR** Comment Status R

The TDP test fails to assess the true chromatic dispersion impairment of the 40G/100GBASE-SR4/10 PMDs. Instead it places a surrogate filter into the test fixture receiver that is set to insert a reduction in channel bandwidth based on assumptions about the optical spectral behavior of the transmitter that are not true. Specifically, the filterbased methodology wrongly assumes the spectrum is constant as a function of time and the spectral shape is smooth and continuous. In fact the spectrum of multi-transverse mode lasers is strongly affected by modulation, typically changing in wavelength throughout a bit period, and their spectrum consists of a few discrete wavelengths with irregular adjacent amplitudes. These features affect the actual dispersion and cannot be accurately represented by a static filter. The problems associated with a filter-based approach are avoided when testing TDP of singlemode PMDs because an actual singlemode test fiber is used in the fixture that inserts the worst-case dispersion of the maximum length channel. This approach captures the effects of modulation and the wavelength variation called "chirp" of SM lasers, providing a much more accurate assessment of the transmitter performance and transmitter/fiber interaction. The availability of multimode fibers with bandwidths exceeding 10.000 MHz\*km now permits the benefits of using a test fiber instead of a filter to be applied to the TDP test for multimode PMDs. In addition to greater accuracy, this approach adds the dimension of dispersion, presently frozen at a single value, to the compliance space. This added dimension enables maximal trade-off of iitter. distortion and dispersion which can positively impact production yield. More details are provided in kolesar 01 0509.pdf.

### SuggestedRemedy

See complete proposal in kolesar\_02\_0509.pdf. Synopsis: a) insert into the TDP test bench a 50 µm fiber with modal bandwidth  $\geq$  10.000 MHz\*km of a length chosen to apply the worst-case chromatic dispersion; b) adjust the receiver filter to remove the component associated with the present static surrogate for dispersion.

Response

Response Status U

REJECT.

The sub task force voted on whether to implement the changes in kolesar\_02\_0509.pdf

Yes 12 No 5

This PMD is supposed to be cost-effective for the objective distance, where chromatic dispersion is not dominant. A new and unfamiliar test element would add cost and be misleading because the chromatic dispersion effects vary over time. It would be far too expensive and time-consuming to do this measurement with a useful level of confidence. Therefore any yield benefit would not flow to cost as hoped.

CI 86	SC 86.7.5.4	P 291	L <b>45</b>	# 20277
Kolesar, Pau		CommScope		

#### Comment Type Comment Status R TR

The use of a fiber-based channel in the TDP test fixture proposed in another comment permits the fixture to easily adapt to screen transmitters with performance that supports distances exceeding the minimum requirements of clause 86. Such transmitters address the need for a cost-effective solution for channels exceeding 100 m (see kolesar 01 0908). The adjustment to the TDP test fixture should be described within the standard to ensure interoperability, for example in an informative annex. See kolesar 01 0509.pdf for supporting information and details.

## SuggestedRemedy

Create informative annex 86A entitled "Transmitter and dispersion penalty (TDP) test for extended-reach capability". If the TDP test fixture adjustment to clause 86.7.5.4 proposed in another comment is accepted, the proposed content for the annex is found in kolesar 03\_0509.pdf. If the TDP test fixture adjustment is not accepted, the proposed content for the annex is found in kolesar 04 0509.pdf.

Response Response Status U

REJECT. [Editor's note: the supporting material that was to be in kolesar\_01\_0509 is now in kolesar 05 05091

A straw poll of the sub-task force was taken.

Do you support the creation of an informative annex similar to that proposed in kolesar 04 0509.pdf?

Yes 10 No 9 Abstain 7

Based on this result, the a vote of the sub-task force was taken on the following Response: ACCEPT IN PRINCIPI F Create an informative annex similar to that proposed in kolesar 04 0509.pdf with editorial license

Yes 12 No 12 Abstain 6

Another comment points out that the surrogate filter causes problems and can be

dispensed with anyway.

The proposed technique is interesting at a university level but unfamiliar, unproven and prone to unstable results with VCSELs.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Comment ID

Comment ID # 20277

Page 1 of 5 11/18/2009 11:19:48 AM

II	ba D2.1 40Gb/s and	100Gb/s Eth	nernet con	W	Working Group ballot			
P <b>23</b> I	- 46	# 20541	C/ <b>01</b> Booth, Brad	SC 1.4	Р <b>24</b> АМСС	L 10	# 20545	
atus R			Comment Typ E stands	be <b>TR</b> for extra long	Comment Status R g wavelength.			
ayer specification for e-mode fiber using	or 40 Gb/s usin long waveleng	ig 40GBASE-R iths.	SuggestedRe Change t IEEE 802 over four	<i>medy</i> o read: .3 Physical I WDM lanes	Layer specification for 100 Gb/s on single-mode fiber using extr	s using 100GB/ a long waveler	ASE-R encoding ngths.	
_ayer specification	for 100 Gb/s us	sing 100GBASE-R	Response REJECT.		Response Status U			
ASE-ER4 PMDs us letter indicating wa inclature the L does	e identical wav velength. s not stand for	elengths, they long wavelength, it	Since the 100GBASE-LR4 and 100GBASE-ER4 PMDs use identical wavelengths, they cannot be distinguished by means of a letter indicating wavelength. In the 40GBASE and 100GBASE nomenclature the E does not stand for extra long wavelength, it stands for extended reach. This nomenclature was adopted by the task force in May 2008 (See slide 8 of Ganga_02_0508 and Motion #2 in May 2008 minutes).					
tands for long reach. his nomenclature was adopted by the task force in May 2008 (See slide 8 of anga_02_0508 and Motion #2 in May 2008 minutes).					.2 P30 AMCC	L <b>9</b>	# 20549	
P <b>23</b> I	_ 49	# 20542	Comment Typ L refers to	be <b>TR</b> b long wavel	Comment Status R ength.			
atus R			SuggestedRe Change: with long	medy				
ayer specification f	or 40 Gb/s usir	ng 40GBASE-R	To read: using long For 40GE	g wavelength ASE-LR4 ar	h nd 100GBASE-LR4.			
fiber using short wa	velengths.		Response		Response Status U			
l Layer specificatio fiber using short v	n for 100 Gb/s vavelengths.	using 100GBASE-	REJECT.					
ntus <b>U</b> Inclature the S doe task force in May 2 2008 minutes).	s not stand for 2008 (See slide	short wavelength, 8 of	See #541					
	P23 II   P23 II   MCC MCC   atus R   ayer specification free-mode fiber using   _ayer specification   e-mode fiber using   _ayer specification   www.secondermode fiber using   P23 II   MCC   atus   R   ayer specification friber using short was   I Layer specification for using short was   itus U   enclature the S doe:   task force in May 2   2008 minutes).	IEEE P802.3   P23 L46   MCC   atus R   ayer specification for 40 Gb/s using   ayer specification for 100 Gb/s u   e-mode fiber using long waveleng   ayer specification for 100 Gb/s u   e-mode fiber using long waveleng   ayer specification for 100 Gb/s u   e-mode fiber using long wavelengt   tus U   NSE-ER4 PMDs use identical wavelength.   nclature the L does not stand for   task force in May 2008 (See slide   2008 minutes).   P23 L49   MCC   atus R   ayer specification for 40 Gb/s usin   fiber using short wavelengths.   I Layer specification for 100 Gb/s   a fiber using short wavelengths.   It Layer specification for 100 Gb/s   a fiber using short wavelengths.   atus U   enclature the S does not stand for   task force in May 2008 (See slide   2008 minutes).	IEEE P802.30a D2.1 40Gb/s and   P23 L46 # 20541   MCC   aver specification for 40 Gb/s using 40GBASE-R   e-mode fiber using long wavelengths.   Layer specification for 100 Gb/s using 100GBASE-R   e-mode fiber using long wavelengths.   Layer specification for 100 Gb/s using 100GBASE-R   e-mode fiber using long wavelengths, they   etter indicating wavelength.   nclature the L does not stand for long wavelength, it   task force in May 2008 (See slide 8 of 2008 minutes).   P23 L49   MCC   aver specification for 40 Gb/s using 40GBASE-R   "Budget specification for 100 Gb/s using 100GBASE-R   "Bud	IEEE P802.30a D2.1 40Gb/s and 100Gb/s EtrP23L46# $20541$ C/ 01MCCBooth, Bradayer specification for 40 Gb/s using 40GBASE-R e-mode fiber using long wavelengths.Change to IEEE 802 over four.ayer specification for 100 Gb/s using 100GBASE-R e-mode fiber using long wavelengths.REJECTayer specification for 100 Gb/s using 100GBASE-R e-mode fiber using long wavelengths, they letter indicating wavelength. nclature the L does not stand for long wavelength, it task force in May 2008 (See slide 8 of 2008 minutes).C/ 30P23L49# 20542P23L49# 20542MCC atus RL49# 20542Layer specification for 40 Gb/s using 100GBASE- fiber using short wavelengths.SuggestedRe Change: with long To read: using long For 40GBLayer specification for 100 Gb/s using 100GBASE- fiber using short wavelengths.REJECT. See #541Layer specification for 100 Gb/s using 100GBASE- fiber using short wavelengths.REJECT. See #541I Layer specification for 100 Gb/s using 100GBASE- fiber using short wavelengths.REJECT. See #541	IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet cor $P23$ $L46$ # 20541MCCturs RCl 01 SC 1.4ayer specification for 40 Gb/s using 40GBASE-R e-mode fiber using long wavelengths.Change to read: IEEE 802.3 Physical over four WDM lanes.ayer specification for 100 Gb/s using 100GBASE-R e-mode fiber using long wavelengths.Change to read: IEEE 802.3 Physical over four WDM lanes.ayer specification for 100 Gb/s using 100GBASE-R turs UResponse REJECT. Since the 100GBASE cannot be distinguish In the 40GBASE and wavelength, it task force in May 2008 (See slide 8 of 2008 minutes).Cl 30 SC 30.5.1.1 Booth, Brad $P23$ $L49$ # 20542MCC aturs RL49# 20542wave specification for 40 Gb/s using 40GBASE-R iber using short wavelengths.Comment Type TR L refers to long wavel using long wavelength.I Layer specification for 100 Gb/s using 100GBASE- iber using short wavelengths.SuggestedRemedy Change: with long reach To read: using long wavelength.I Layer specification for 100 Gb/s using 100GBASE- iber using short wavelengths.Response REJECT. See #541Itask force in May 2008 (See slide 8 of 2008 minutes).See slide 8 of 2008 minutes).	IEEE P302.30a D2.1 40Gb/s and 100Gb/s Ethernet CommentsP23L46# 20541Cl 01SC 1.4P24MCCMCCAMCCaver specification for 40 Gb/s using 40GBASE-R e-mode fiber using long wavelengths.Change to read: IEEB 02.3 Physical Layer specification for 100 Gb/s using 100GBASE-R e-mode fiber using long wavelengths.SuggestedRemedy Change to read: IEEE AD 2.3 Physical Layer specification for 100 Gb/s using 100GBASE-R e-mode fiber using long wavelengths.SuggestedRemedy Change to read: IEEE AD 2.3 Physical Layer specification for 100 Gb/s using 100GBASE-R to ver four WDM lanes on single-mode fiber using extiayer specification for 100 Gb/s using 100GBASE-R tats force in May 2008 (See slide 8 of 2008 minutes).ResponseResponse Status U REJECT. Since the 100GBASE-LR4 and 100GBASE-LR4 Externed Canag_02_0508 and Motion #2 in May 2008 minutes $P23$ L49# 20542P30Booth, BradAMCC $P23$ L49# 20542MCCComment TypeTR $Ausc R$ Comment TypeTR $Cl 30$ SC 30.5.1.1.2P30Booth, BradAMCC $Comment Type TRComment Status RL refers to long wavelength.SuggestedRemedyChange:with long reachTo read:using long wavelength.IL ayer specification for 100 Gb/s using 100GBASE-ther using short wavelengths.REJECT.See #541IL ayer specification for 100 Gb/s using 100GBASE-ther using short wavelengths.REJECT.See #541IL ayer specification for 100 Gb/s using 100GBASE-ther using short wavelengths.REJECT.$	IEEE PS02.30a D2.1 40G50's and T00G0's Enternet Comments vv   F23 L46 # 20541   MCC MCC AMCC   Merce status R Ci 01 SC 1.4 P24 L10   More status R AMCC Comment Type TR Comment Status R E stands for extra long wavelength.   aver specification for 100 Gb/s using 100GBASE-Re emode fiber using long wavelengths. Change to read: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-Re mode fiber using extra long wavelength.   stat S W REJECT. Since the 100GBASE-LR4 and 100GBASE-ER4 PMDs use identication avavelength, it stands for extended reach. This nomenclature was adopted by the task force in May 2008 (See slide 8 of 2008 minutes).   P23 L49 # 20542 Comment Type TR Comment Status R   Lefers to long wavelength. SuggestedRemedy Change : with long reach to reach distinguisheed preach.   atus R V Comment Type TR Comment Status R   Lefers to long wavelength. SuggestedRemedy Change : with long reach to ing wavelength.   atus C L49 # 20542 Comment Type TR Comment Status R   Lefers to long wavelength. SuggestedRemedy Change : with long reach to ing wavelength.	

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Comment ID

Comment ID # 20549

# Draft 2.1 Comments

# IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

C/ 30	SC 30.5.1.1.2	P <b>30</b>	L18	# 20550	C/ 00	SC 0	P126	L18	# 20577
Booth, Bra	d	AMCC			Booth, Brad		AMCC		
Comment <sup>-</sup> E is for	<i>Type</i> <b>TR</b> r extra long wave	Comment Status R			Comment Ty In the arc	be <b>TR</b> hitectural figu	Comment Status <b>R</b> ires for 802.3ba, there is a ref	erence in the s	ack to 40GBASE-R
Suggested Chang	<i>Remedy</i> le "with extended	reach" to "extra long wavele	ngth" for 100GB	ASE-ER4.	PCS and Clause 8 example, many ins	100GBASE-I 2 which define the 802.3 sp ances throug	R PCS. This is incorrectly dee es it as a 64B/66B PCS. Beir ecification references 8B/10B h the standard. Calling out th	scribed relative g verify specific PCS, 64B/66B le specific port	to the description in s is not required. For PCS or just PCS in type is note required.
RE.IEC	ст				SuggestedRe	medy			
ILUL(					Change a	II diagrams to	o show 40GBASE-PCS and 1	00GBASE-R P	CS as 64B/66B PCS.
See #5	545				Response		Response Status U		
Cl 69 Booth Bro	SC 69.1.3	P <b>94</b>	L14	# 20560	REJECT				
Comment Figure doesn' 1000B	<i>Type</i> <b>TR</b> 69-1 shows the 4 't follow with the F ASE-KX, and it is	Comment Status A 40G PCS as 40GBASE-R PC PCS descriptions for the othe s also used for 10GBASE-KX	CS. This is an ir r PHYs. An 8B 4 even though t	ncorrect reference that /10B PCS is used for hey are different.	and 1000 the 40GE lanes etc	R PCS is no ASE-R PCS	ot the same as a 10G R PCS t is different from the 100GBAS	his specific refe E-R PCS in ter	erence was added. Also, ms of the number of
Suggested Chang	<i>lRemedy</i> je 40GBASE-R P	CS to be 64B/66B PCS.							
Response ACCEI The 8E KX4 so	PT IN PRINCIPL 3/10B encoding u o the current diag	Response Status U E. Ised in 1000BASE-KX is not Iram is misleading.	the same as tha	t used in 10GBASE-					
In Figu "8B/10 "8B/10 "64B/6	ure 69-1 change )B PCS" in the 10 )B PCS" in the 10 )6B PCS" in the 1	000BASE-KX stack to "1000E IGBASE-KX4 stack to "10GE 0GBASE-KR stack to "10GE	ASE-X PCS" ASE-X PCS" ASE-R PCS"						
C/ 80	SC 80.1.3	P <b>126</b>	L17	# 20575					
Booth, Bra	d	AMCC							
Comment <sup>-</sup> In Figu This do	<i>Type</i> <b>ER</b> ure 80-1, the PCS oes not follow the	Comment Status R S are described as a 40GBAS e convention previously estab	E-R PCS and a lished.	100GBASE-R PCS.					
Suggested Chang	IRemedy le 40GBASE-R P	CS and 10GBASE-R PCS to	be 64B/66B PC	cS.					
Response	,	Response Status II							
REJEC	CT.	Nesponse Status U							
See re	sponse to comm	ent #577							

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Comment ID

CI 00	SC 0	P <b>1</b>	L1	#	21255
Booth. Brad		AMCC			

### Comment Type TR Comment Status A

IEEE P802.3ba has selected nomenclature that conflicts with previous uses of the same nomenclature letter. There has been an effort in the past decade to establish a consistent use of letters for port type nomenclature. Unfortunately, this was not noticed until the task force was in working group ballot.

IEEE P802.3ba should strive to keep its nomenclature consistent with IEEE Std. 802.3-2008. Maintaining a consistency will easily permit additional PMD types to be added to the 40GbE and 100GbE family.

See booth\_01\_0709.pdf for more information on nomenclature.

### SugaestedRemedv

In all uses of SR, change from short reach to be short wavelength.

In all uses of LR, change from long reach to be long wavelength.

In all uses of ER, change ER to be HR, and change from extended reach to be high-power long wavelength.

Response

## Response Status U ACCEPT IN PRINCIPLE.

There was no agreement to change the nomenclature (see straw poll below) Replace the two paragraphs starting "The letter C in the port type ..." in 80.1.4 with a description including a table similar to Table 52-1 and including reach.

The nomenclature was adopted by the Task Force in May 2008 (see motion #2). The adopted nomenclature was presented to the WG by the TF Chair during Jul'08 opening plenary.

The nomenclature was discussed in the task force which also included 802.3 WG members. The requirement for 802.3ba was to distinguish reach for different PMDs, and previous distinctions based on wavelength was not considered sufficient. Hence the current nomenclature was adopted. The nomenclature is also documented clearly in Clause 80.

The task force did discuss the consistency issue; during the discussions it was pointed out that the base document already uses same letter(s) to identify different characteristics. (e.g., B, L, S). Also in the base document numeric suffix identifies either number of lanes/wavelengths or distance. After considerable discussion there was consensus in the Task Force to adopt S. L and E to represent reach.

Also see comment #97.

Straw Poll: The Task force was asked to indicate a preference between the options:

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Comment ID

Leave the nomenclature unchanged

change the nomenclature to one of 100GBASE-LRE4, 100GBASE-LR4E, 100GBASE-LR4-F

Grow, Robert	Intel		
C/ 00 SC 0	Р	L	# 21352
802.3 voters Unchanged - 26 Change - 26			
All in the room Unchanged - 25 Change - 25			

#### Comment Type ER Comment Status A

We have a general problem with numbering. Not all projects are following the same convention, for example, P802.3av is inserting clauses and instructing renumbering, but this project attempts to follow the Style Guide (laudable but difficult for us). As is shown by this draft, the Style Manual convention doesn't support adding a new subclause when it is the first at that level (add 45.2.1.4.1a before 45.2.1.4.1), and it doesn't support alphabetic subclause ordering when doing this more than once (something we frequently do. For example in Clause 45, a second amendment would typically place a new bit definition for example as 45.2.1.4.1b before 45.2.1.4.1a which is before 45.2.1.4.1. but place a new register definition 45.2.1.12b after 45.2.1.12a.

## SugaestedRemedv

Work with WG Chair to better coordinate projects and use consistent style for indicating changes. Though it can get painful (and was why I build a spreadsheet for clause 45 to manage amendments), I think we need to not follow the Style Guide for subclause insertions (which is add letters without renumbering) but rather insert and renumber, but I'll leave that decision to the WG Chair and if he chooses to the WGAC.

Response Response Status U

ACCEPT IN PRINCIPLE.

Editorial license to find numbering that does not conflict with the finalized 802.3av amendment.

Draft 2.1 Comments IEEE P802.3ba D2.1 40Gb/s ar					d 100Gb/s Ethernet comments					Working Group ballot	
<i>Cl</i> 86A Ghiasi, Ali	SC 86A.4.2	P <b>430</b> Broadcom	L14	# 22096	<i>Cl</i> <b>86A</b> Ghiasi, Ali	SC 8	36A.4.1	P 428 Broadcom	L <b>27</b>	# 22131	
Comment T	Type <b>TR</b>	Comment Status R			Comment 7	Гуре	TR	Comment Status R			
With cu empha on D2.	urrent set of spec sis 3-5 dB result 1	cifications the SerDes transmi ing in signifincat distortion at <sup>-</sup>	itter may have v TP1a and also s	ery large amount of de- see comment 216/218	With cu empha on D2.	urrent s sis 3-5 1	et of spec dB resulti	ifications the SerDes transming in signifincat distortion at	itter may have TP1a and also	very large amount of de- see comment 216/218	
Suggested	Remedy				Suggested	Remed	У				
The op ghiasi_	tions here are ei _03_0909	ther limit max DDJ to about 0.	.125 or max 3 d	B de-emphasis, see	The op ghiasi_	tions he 03_090	ere are eit )9	her limit max DDJ to about (	).125 UI or max	3 dB de-emphasis, see	
Response		Response Status U			Response			Response Status U			
REJEC see als	CT. so response to co	omment 131			REJEC J2 spec	CT. c const	rains DDJ	and eye mask constrains e	xcessive empha	asis. tion with a near failing	
<i>CI</i> <b>88</b> Ghiasi. Ali	SC 88.8.5.3	P <b>356</b> Broadcom	L12	# 22127	Tx eye require	mask a d in the	at TP2, the spec to a	ere is insufficient information avoid a potential eye-mask is	to determine the sue. Further w	ne corrective action ork is invited.	

Comment Status A

Response Status U

generations where ASIC/SerDes operate at 25 G!

The CRU BW for the TDP measurement is defiend to be 10 MHz also see comment 224 and 225 D2.1 can limit the receiver to analog type instead of more efficent lower power digital implementation. The clock and power supply noise do not scale with higher baudrate so there is very little benifit of higher CRU BW. The CRU increased BW has very little benifit on the VCO noise. The 10 MHz burden will remin even in the case of future

Propose to consider CRU BW 7 MHz instead of current 10 MHz. Higher CRU BW has very little benifit on the VCO noise and power supply nosie but significant penalty on the

A - Leave the CRU corner frequency at 10 MHz and correct the formula in Table 88-13 B - Change the CRU corner frequency to 7 MHz in a consistent manner in clause 88

Comment Type **TR** 

SuggestedRemedy

Response

A 9 B 1

receiver, see ghiasi\_02\_0909

In Table 88-13 correct the formula: change "2 x 10^5/ f" to "5 x 10^5/ f" The Task Force voted on whether to:

ACCEPT IN PRINCIPLE.

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