

Extended Temperature Optics



Supporters

- Brad Booth (Intel)
- Ben Brown (AMCC)
- Kevin Daines (WWP)
- Jonathan Thatcher (WWP)
- Bruce Tolley (Cisco)



P802.3ah Objective

 "Provide a family of physical layer specifications: 1000BASE-LX extended temperature range optics"



Problem

Objective not succinct

Committee direction ambiguous based on motions and comment resolutions

P802.3ah must provide clear direction to resolve comments and make progress



Some believe that objective cannot be met without explicitly specifying the temperature range; that capability must be assured.

Some believe that temperature range is an implementation issue; that the existing specifications support the possibility of extended temperature.

History

- Mar 01: Ext Temp Objective
- Jan 02:
 - Ext Temp Range set to -40 to +85 degrees C
 - Objective changed from 1000BASE-X to 1000BASE-LX
- Mar 02:
 - 1000BASE-LX Baseline Informative range –40 to +85 degrees C
 - Fail addition of 100BASE-FX Ext Temp Objective
 - Create Informative Annex (64A)
- Nov 02: Adopt PMD naming convention



Current State

- TRs Unresolved from Jan '03 Interim
 - Failed attempt to resolve issue with motion to add Temp Extended PMD set
 - Extensive reflector discussion

 Positive, unambiguous, definitive decision required for optical STF to move forward



Reflector Recommendation (Howard Frazier)

- A) Ensure that all of the Active Optical Input and Active Optical Output Interface parameters in clauses 58-60 can be met, and the corresponding links function properly, across an "extended temperature range" of operation.
- B) Define what an "extended temperature range" is, and place this definition in informative Annex 66A
- C) Provide an optional PICS entry for each [optical] PMD indicating operation over the "extended temperature range."
- D) Require that compliant systems and field pluggable components be clearly labeled with the operating temperature range over which their operation is guaranteed.



To be inserted before existing 59.5 subclause. All subsequent C59 subclauses to be renumbered.

59.5 1000BASE-LX10 and 1000BASE-BX10 extended temperature option

A 1000BASE-LX10 or 1000BASE-BX10 PMD that supports the XX to YY degrees Centigrade, extended temperature range option described in Annex 64A shall meet all requirements for that PMD across the entire temperature range.

Note: similar text would exist in clauses 58 and 60



Motion: Adopt following as means to accomplish the P802.3ah objective for extended temperature:

- A) Ensure that all of the Active Optical Input and Active Optical Output Interface parameters in clauses 58-60 can be met, and the corresponding links function properly, across an "extended temperature range" of operation.
- B) Define what an "extended temperature range" is, and place this definition in informative Annex 66A
- C) Provide an optional PICS entry for each [optical] PMD indicating operation over the "extended temperature range."
- D) Require that compliant systems and field pluggable components be clearly labeled with the operating temperature range over which their operation is guaranteed.

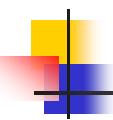
Mover: Seconder:

Technical (75% required) Motion Passes / Fails

EFM: For Against Abstain

802.3: For Against Abstain

3/5/2003 IEEE 802.3ah (EFM) March, 2003



Backup



Baseline Motion

The basis for the first draft of the 802.3ah 1000Base-LX extended temperature objective be met with text that uses 1000Base- LX 5 km single mode specification (clause 38) as the starting point with the following changes and additions:

- Informative temperature range -40- + 85 deg C
- 10 km link length
- Wavelength range = 1260 1360 nm
- Use EFM link budget spreadsheet (v3.1.16) to create triple tradeoff curve for spectral width vs. wavelength vs OMA
- Conversion to OMA spec methodology
- Tx output power (min): -9.5 dBm (ER= 9)
- Rx input (min): -20 dBm (ER= 9)

Made: Steve Joiner; Ignis Optics

Second: Schelto vanDoorn

For: 42 No: 0 Abstain: 5

This motion passes.

Extended Temp Motion #2

The temperature ranges (PMD case) for the various PMDs will be:

P2MP ONU end: -40C to 85C

P2P ONU end: -40C to 85C

P2MP OLT end: TBD

P2P OIT end: TBD

Ammendment [sic] to remove the part in red due to the TBDs.

Motion: Richard Brand

Second: Hugh Barass

802.3ah: Y: 97 N: 0 A: 11

Motion: Vipul Bhatt

Second: not needed as it was approved by OPMDSTF

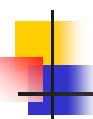
802.3ah: Y:95 N:4 A:8

■ 802.3 voting members: Y:55 N:3 A:1 From http://grouper.ieee.org/groups/802/3/efm/public/mar02/minutes_01_2002.pdf 3/5/2003 IEEE 802.3ah (EFM) March, 2003



Objective for 100BASE-FX Ext Temp

- Motion to add an objective to the family of physical layer specifications- "100BASE-FX Extended Temp Optics"
- Moved : Chris DiMinico
- Second: Lisa Peng
- ALL for 32; Against 30; Abstained 72
- 802.3voters for 16; Against 21; Abstained 30
- Motion fails



Motion to Create Annex

- Motion #11
- Motion: to create informative annex to address environmental considerations.
- Mover: Chris DiMinico
- Second: Alan Flatman
- All: For 59; Against 1; Abstained 40;
- 802.3 voters: For 40; Against 1; Abstained –
 17
- Motion passed



Adopt PMD naming

9. Motion to adopt the optical PMD naming nomenclature per Naming #1 [see next slide] in diab_general_1_1102

Moved: Wael Diab

Second: Jonathan Thatcher

- Technical motion, requires >= 75% in favour to pass
- Among those present:
- Y:74 N:0 A:10
- MOTION PASSES



Naming 1

| PMD layer type | PMD |
|---------------------------|-----------------|
| • 100M | |
| Dual Fiber: 100BASE-LX10 | 100BASE-LX10 |
| BiDi: 100BASE-BX10 | 100BASE-BX10-U |
| BiDi: 100BASE-BX10 | 100BASE-BX10-D |
| • 1G | |
| Dual Fiber: 1000BASE-LX10 | 1000BASE-LX10 |
| BiDi: 1000BASE-BX10 | 1000BASE-BX10-U |
| BiDi: 1000BASE-BX10 | 1000BASE-BX10-D |
| • ePON | |
| 10km: 1000BASE-PX10 | 1000BASE-PX10-U |
| 10km: 1000BASE-PX10 | 1000BASE-PX10-D |
| 20km: 1000BASE-PX20 | 1000BASE-PX20-U |
| 20km: 1000BASE-PX20 | 1000BASE-PX20-D |

From http://www.ieee802.org/3/efm/public/nov02/minutes_1_1102.pdf

3/5/2003 IEEE 802.3ah (EFM) March, 2003

Add Extended Temp PMDs

- 17. Motion to normatively specify additional optional PMDs addressing extended temperature (referenced to PMD case). These PMD's will have identical optical parameters as specified in the current EFM PMD's. Additional specifications are required in order to define test procedures for the extended temperature range.
- 1000BASE-LX(E)10 -40C to 85C
- 1000BASE-BX(E)-U -40C to 85C
- 100BASE-BX(E)-U -40C to 85C
- 100BASE-LX(E) -40C to 85C
- 1000BASE-PX(E)-U -40C to 85C
- 1000BASE-BX(E)-D TBD
- 100BASE-BX(E)-D TBD
- 1000BASE-PX(E)-D TBD
- Moved: Vipul Bhatt on behalf of the Optical STF
- Technical motion, requires >= 75% in favour to pass
- Among those present:
- Y:28 N:38 A:20
- MOTION FAILS
- Among 802.3 voters:
- Y:17 N:23 A:14

From

http://www.ieee802.org/3/efm/public/jan03/minutes_1_0103.pdf



Comments of interest

- http://www.ieee802.org/3/efm/public/comments/d1/ D10_comments_responses_all.pdf
 - # 313
- http://www.ieee802.org/3/efm/public/comments/d1_ 1/D11_comments_responses_all.pdf
 - **#** 565
- http://www.ieee802.org/3/efm/public/comments/d1_ 2/D12_comments_final.pdf
 - **#** 296
 - **#** 678

Annex 66A (D1.3)

66A.2.1 Temperature, humidity, and handling

Ethernet Subscriber Access optical and copper links are expected to operate in environmental conditions consistent with the outside plant. Explicit requirements for the operating temperature range are given for 1000BASE-LX10. Other values for these parameters related to temperature, humidity, and physical handling (such as shock and vibration) are considered to be beyond the scope of this standard.

Manufacturers are recommended to indicate in their literature associated with the PMD the operating envi-ronmental conditions to facilitate selection, installation, and maintenance. Outside plant operation may necessitate that a broader range of environmental specifications be supported.



Labels Required vs Recommended

- Labels Required (17)
 - 7.3.2; 8.3.2.2; 8.8.6.8; 8.8.7.1; 9.9.3.2; 10.4.2.2; 11.3.3.2; 11.6.1; 15.5.3; 16.6.6.2.1; 16.6.6.27; 18.5.6.17; 18.5.6.23; 27.6; 27.7.4.12; 38.11.4; 41.5
- Labels Recommended (26)
 - 8.6.3; 8.8.6.11; 12.6.3; 14.2.1.7; 14.8; 14.10.4.5.15; 15.7; 15.7.1; 16.6.6.31; 16.6.7.4; 17.5.6.26; 18.3.1.7; 18.5.6.27; 23.4.1.5; 23.10; 27.6; 27.7.4.12; 32.11; 38.9; 40.10; 52.12; 53.12; 58.9.5; 59.9.5, 60.9.5
- Label requirement revoked
 - 25.4.4 revokes 8.3