

# MMF Ad Hoc meeting minutes

6<sup>th</sup> Feb 2014

Approved minutes  
recorded by jonathan king

# MMF ad hoc meeting minutes, 6<sup>th</sup> Feb. 2014

- **Meeting started** at 9.05 am Pacific, chaired by Jonathan King.
- **Attendee list** was taken from the Webex attendee list, 12 attendees were noted.
- **Presentations** shared in the MMF ad hocs can be found at the MMF ad hoc web page.
  - <http://www.ieee802.org/3/bm/public/mmfadhoc/meetings/index.html>
- **IEEE patent policy:** Attendees were reminded of the IEEE patent policy
  - <http://www.ieee802.org/3/patent.html>
- **House keeping:** When asked, no changes to the agenda were requested.
- **Presentations:** Jonathan summarized his preference (as a module maker) for Tx VEC testing (vs TDP).
- **Discussion:**
  - The relative merits of a TDP vs a VEC test were the main topic of discussion. TDP was referred to as a 'gold standard', and it was said that a VEC test would need guard banding; but John noted that his work indicates that both tests are imperfect, and that VEC needs less guard banding than TDP. Since both tests are imperfect, which test gives the best protection vs economics and practicality ?
  - Piers Dawe said he is planning to simulate the two tests, which will include data statistics (in contrast to the spreadsheet model) to calculate the correct probability level for the Tx VEC test and for VEC used for SRS test signal calibration. Mike Dudek said he would write down some recommendations for evaluation corners (Mike sent some suggestions out after the meeting, which are summarized on the next slide, along with a summary of recommended characteristics for a TDP test fibre).
  - John Petrilla noted that given the target BER of  $5e-5$ , a VEC measurement can give TJ directly, there's no need to extrapolate from data.
  - There was some discussion on using a test fibre as a way to improve the TDP test. The fibre should have worst case chromatic dispersion (CD) so that MPN and CD induced ISI (which is the dominant fibre penalty) are included in the TDP test. Modal noise and modal bandwidth induced ISI would still need to be margined for in the link budget. Mike Dudek said he would write some recommendations for the test fibre characteristics.

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- **Discussion continued**
  - Pete Anslow said the editors will help draw up two versions of draft clause 95, one with a test fibre and TDP test, one with VEC test.
  - There was some discussion on the modal noise penalty allocation (which is still under review), Petar Pepeljugoski said he will verify the ER and other details used in his modeling.
  - Several new topics for review were suggested by Piers Dawe and John Petrilla:
    - Pattern for OMA – ‘two competing definitions’
    - J2 J4 values (SRS)
    - Mask hit ratio and coordinates
    - Review SRS conditions following choice of Tx test (probability levels of VEC and Tx test)
- **Meeting ended** at 10.29 am.
- **Next meeting:** Thursday Feb 13<sup>th</sup>, 2014 , 9 am to 10.30 am (Pacific)

# Recommendations for evaluation corners and TDP test fibre

## TDP vs VEC comparison:

- For evaluation of correlation between TDP and VEC (for measurements or simulations of transmitters), to cover asymmetric waveforms, waveforms that have a lot of noise, and waveforms that have more Dual-Dirac like responses:
  - Modules set up for high extinction ratio are likely to create the asymmetric waveforms.
  - Modules set to very low extinction ratio will create a lot of RIN(OMA). Biasing the laser high (no reliability issues for this test) will also potentially speed up the risetimes making the RIN even more of a dominant effect.
  - Using a pattern generator with SJ added is likely to get the Dual Dirac like response.

## TDP test fibre

- Adds a fiber to the TDP test so that laser chromatic effects are included, which makes the test procedure more like single mode systems, except that the receiver bandwidth might be somewhat narrower to account for modal dispersion. The test fiber should be approximately 100 m of super OM4 (8000 MHz.km modal bandwidth over the 840 to 860 wavelength might be available). The chromatic dispersion should be equal to that of a worst case OM4 fiber.

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# Attendees

Pete Anslow, Ciena

Dave Brown, Semtech

Piers Dawe, Mellanox

Dan Dove, Huawei

Mike Dudek, Qlogic

Myles Kimmitt, Emulex

Jonathan King, Finisar

Greg LeCheminant, Agilent

Petar Pepeljugoski, IBM

John Petrilla, Avago Technologies

Rick Rabanovich, Alcatel-Lucent

Nathan Tracy, TE