Topics of concern (clause 52)

- Jitter (definition and) measurement
- Test patterns
- Calibration of Stressed Rx sensitivity eye

- *Generally, we don't have a complete standard if we specify key interoperability parameters in ways that cannot be measured*

Jitter measurement

- Accuracy of measurement equipment is insufficient or equipment does not exist
  - Inaccuracies on same order as specs in some cases
- Compensation for inaccuracy requires assumptions that are difficult to validate
  - No suitable references

Jitter measurement, cont’d

- Specific equipment concerns
  - Golden PLL (see FC 99-112v2)
    - RJ generation
    - DDJ generation vs pattern
    - Amplitude & phase frequency response
    - Delay
  - BERT scan
    - Setup and hold
    - Input RJ & DDJ contributions & sampling uncertainty
    - Amplitude sensitivity/threshold
    - Edge rate sensitivity (stressed eye)

Jitter measurement, cont’d

- Not as, but still challenging
  - Golden filter O/E response
  - Golden channel
    - Dispersion, back reflection & polarization
  - Delay filter for 10GBASE–S

Test patterns

- Some results show that pattern 1 may be more stressful than pattern 2
  - This turns out to have been a problem in D3.3 and has been corrected – pattern 1 and 2 were switched
- Some results show that pattern 2 may be less stressful than PRBS-31
  - Corrected per above
- Still, do we have the right patterns?

Test patterns, cont'd

- Test patterns 1 & 2 are "short", will tend to have more discrete spectral lines than PRBS's and may interact with circuit resonances in positive or negative ways
- None of the feasibility studies used the test patterns
  - All used PRBS
  - Still significant lack of data

Calibration of Stressed Rx eye

- All jitter measurement issues
  - Except channel or delay filter
- Pattern choices
  - What pattern to test with? Does it provide the right stress for all systems?
  - What pattern to cal with? Is it observable? How does it relate to the test pattern?

Cal of Stressed eye, cont'd

- Per Figure 52-14, cal requires good observability for DCD and VECP
- However, actual eye will not be so distinct
  - Golden PLL will add jitter domain version of baseline wander
  - Baseline wander in test source?
  - Under-sampling of lower probability events with long patterns
  - O/E and scope noises

Figure 52-14
Real situation not like this…

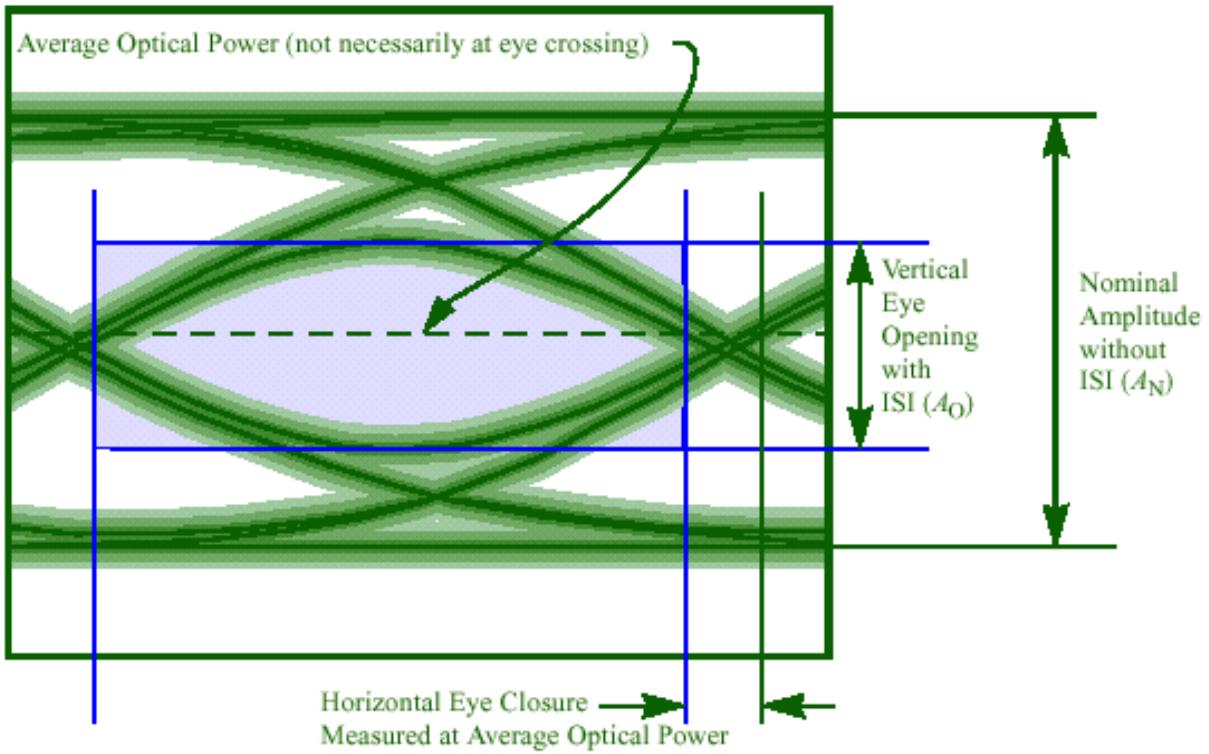

Figure 52–14—Required characteristics of the conformance test signal at TP3

Cal of Stressed eye, cont'd

- Other issues
  - Jitter cal (& therefore VECP) not predictable, but empirical & iterative
    - Convolution of jitter terms, not addition
    - W & sigma are "effective", not actual terms
    - Golden PLL HPF effects
  - RJ source Gaussian down to 1E-12?
  - Frequency range of SJ to >10x LB
  - TJ>0.5UI may be more than instruments can handle at 10G