



*TL carryover comments
#107,102,99*

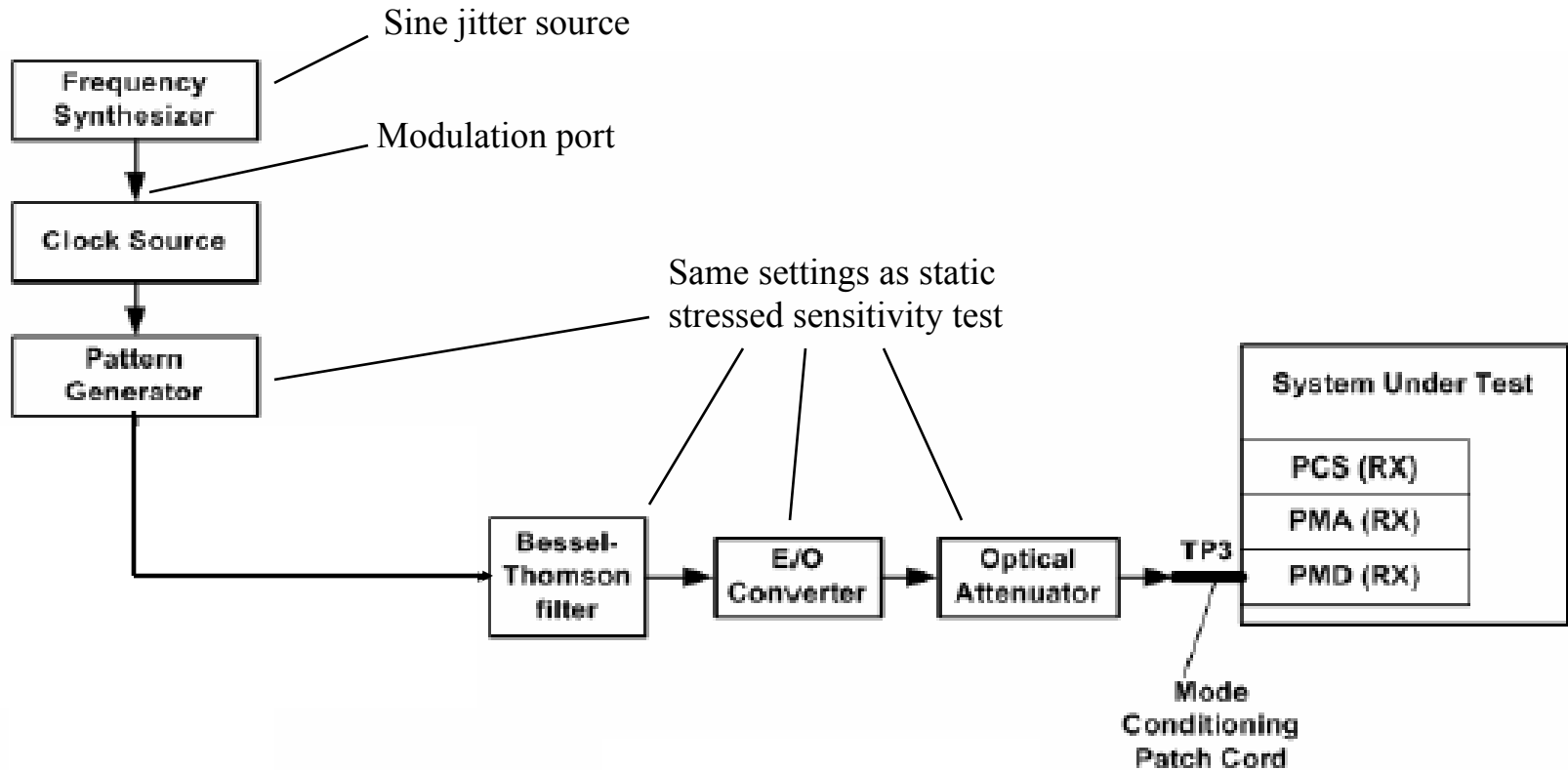
from San Antonio

Today's date: 11/23/04

Comment 107

- # 107 Cl 68 SC 6.5 P 11 L
- *Comment Type T*
 - Need a low frequency jitter test.
- *Suggested Remedy*
 - Propose 5 UI at 40 kHz sine jitter test condition. Use current Stressed eye generator figure but remove Gaussian noise and ISI generator. Keep all else as is. Use words for subclause 68.6.5.1 (modified by another comment) to specify requirements about BER, etc. [It's a BER test, not a sensitivity test]
- *Response Status*
 - Withdrawn.
- *Discussion*
 - As a group, I think we agree on this. It was withdrawn for lack of time and because of the “new rules” for commenting. I have included a figure (see next).
- *New suggested remedy*
 - If we agree with the figure, the values, and the BER statement, then I will re-write the comment per the new rules for the next draft.

Test drawing for #107



Comment 102

- # 102 Cl 68 SC 6.5 P 11 L 43
- *Comment Type E*
 - If we stay with sine jitter, then this may be okay, but even then, phase modulation conveys the idea better.
- *Suggested Remedy*
 - Change from frequency modulation to phase modulation. Also search for other instances of this in the document (such as in paragraph 68.6.5.1).
- *Response Status*
 - Withdrawn.
- *Discussion*
 - I think the term “phase” modulation better conveys the intended relationship between the described impairment and the end effect of jitter. Some modulation approaches indeed use phase modulation; a new method that has become popular is the variable delay line. However, Piers correctly points out that some modulators actually use frequency modulation and a 1/f function that “integrates” to effectively convert to phase.

Comment #102, cont'd

- *New suggested remedies (and/or)*
 - Modify line 43, page 11
 - “frequency (or phase) modulation of the ...”
 - Add another note to Figure 68-6 and to the new figure per comment #107
 - “Although described in this document as frequency modulation, an actual test system may use phase or frequency modulation for inducing sinusoidal jitter. The modulation may occur on the clock source that generates the data, or on the data stream itself. It is up to the implementer to assure the correct values are achieved at the output of the tester.”

Comment #99

- **# 99 Cl 68 SC 5.1 P 8 L 20**
- *Comment Type T*
 - SJ amplitude is not specified. I believe its purpose is to emulate uncorrelated clock jitter, not DDJ. In looking at some 10G electrical specs (XFP and CEI), it seems that non-DDJ of up 0.3 UI pk-pk can be a typical limit. Assuming a crest factor of approx 9 (mixture of some DJ and RJ), then the rms value is 0.033 UI rms. The crest factor for SJ is 2.828, such that SJ with an equivalent amount of rms jitter would be approx 0.1 pk-pk.
- *Suggested Remedy*
 - Use 0.1 UI pk-pk. Other clock jitter in the test system should be minimized. The 0.1 UI value is for SJ and should not be compensated (reduced) due the presence of other jitter.
- *Response Status*
 - Withdrawn due to confusion around the “new rules”.
- *Discussion*
 - See next slides.

Comment #99, cont'd

- Per lindsay_3_1104, I believe that TP3 tests should have a direct bearing on TP2 requirements, and vice versa
- Purpose of SJ at TP3 is to emulate uncorrelated jitter at TP2
- Therefore, a small value for SJ imposes a tight uncorrelated jitter requirement on TP2, and vice versa

Comment #99, cont'd

- XFP and CEI spec max uncorrelated jitter = 0.3 UI pk-pk; However,
 - I've since talked to some CDR providers who believe that 0.3 is higher than needed for single-device CDRs such as used in modules
 - Our spec must include the effects of the laser driver (very small) and the laser, so 0.3 UI pk-pk may still be a reasonable value at TP2
- Approach
 - Expect mix of Gaussian & bounded jitter at TP2, assume pk-pk/rms ~ 9 with centrally weighted pdf
 - Relate/equate SJ to real jitter via rms values
 - SJ pdf too harsh to equate pk-pk
 - Clock jitter rms value = $0.3/9 = 0.033$
 - SJ = $0.033 * 2.828 = 0.1$ pk-pk
 - Value cannot be compensated due to presence of DDJ

Comment #99, cont'd

visual pdf comparisons

- “Typical” & sine pdfs
- Both ~ 0.033 UI rms
 - ~ 0.3 UI pk-pk for typical
 - @1E-12
 - 0.1 UI pk-pk for SJ

