Accounting for Compensable and Un-compensable ISI Considering Adopted SNDR Measurement Requirements (ref: Comment #93)

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Supporters

- Vittal Balasubramanian, Dell

TOC

- Review of Tx fitting, reference package, and test fixture
- Illustrate characteristics of a Tx fitting with Np=200
- Show how ISI_{SNR} can be used to limit package/device ISI
- Recommendations

Background

- Signal to Noise and Distortion Ratio (SNDR) update
  - Fitting is now done with Np = 200

120D.3.1.3 Linear fit to the measured waveform

The test procedure in 94.3.12.5.2 is followed to determine the linear fit pulse response, linear fit error, and normalized transmitter coefficient values with the following exceptions.

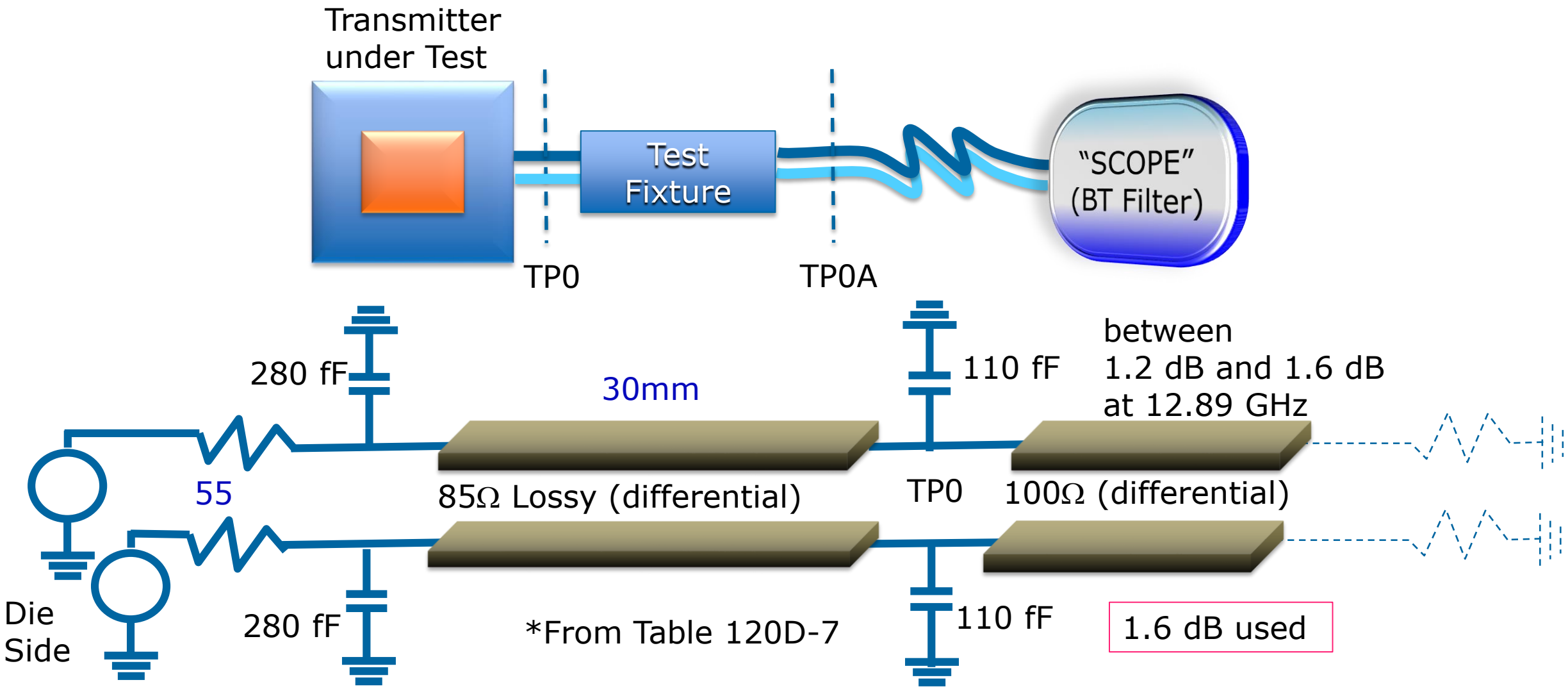
a) The test pattern is PRBS13Q (see 120.5.11.2.3).

b) The aligned symbols *x(n)* are assigned normalized amplitudes −1, −*ES*, *ES*, and 1 to represent the PAM4 symbol values 0, 1, 2, and 3 respectively. *ES* is defined to be (*ES1* + *ES2*)/2 where *ES1* and *ES2* are defined in 120D.3.1.2.

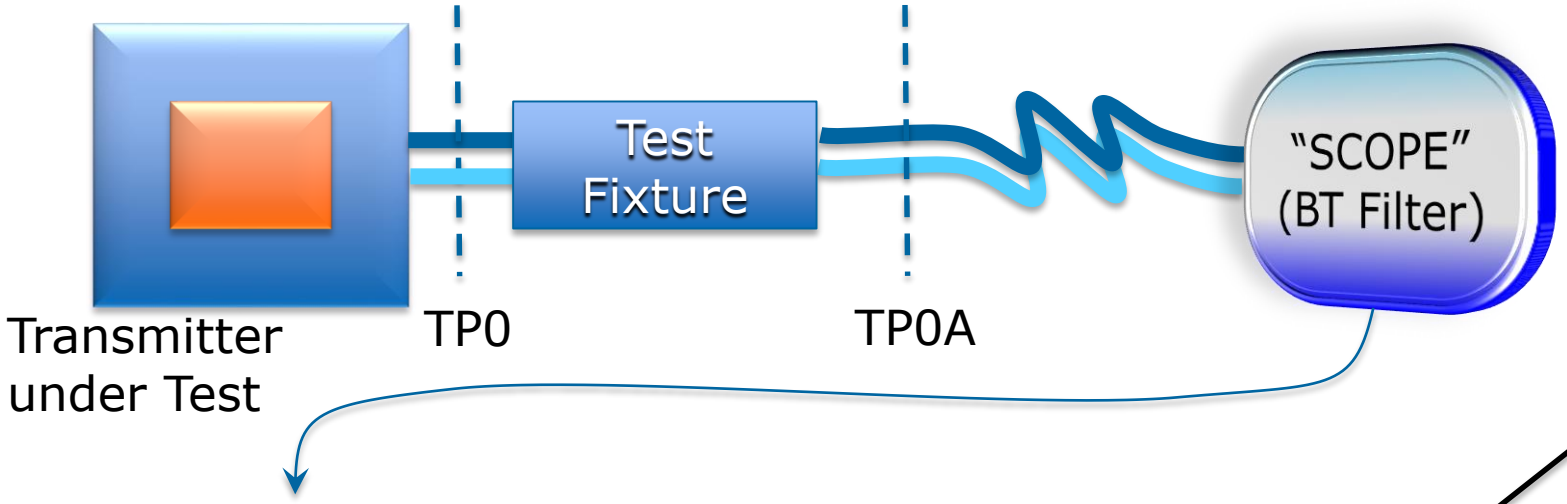
c) The value of D_p is 2, and the value of N_p is 200.

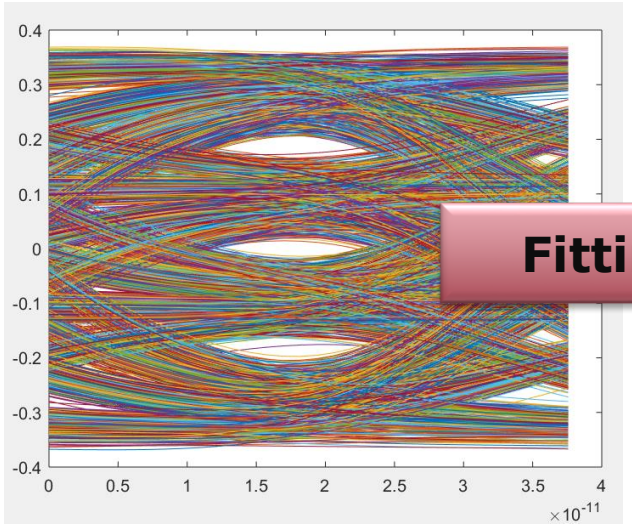
  - This
  - The purpose of this comment is to limit the package/device ISI
- From healey_3bs_02_0916.pdf
  - "How do we ensure alignment between the ISI (at TP0) assumed by COM and the ISI presented by the transmitter under test?"

Transmitter Test Set-Up

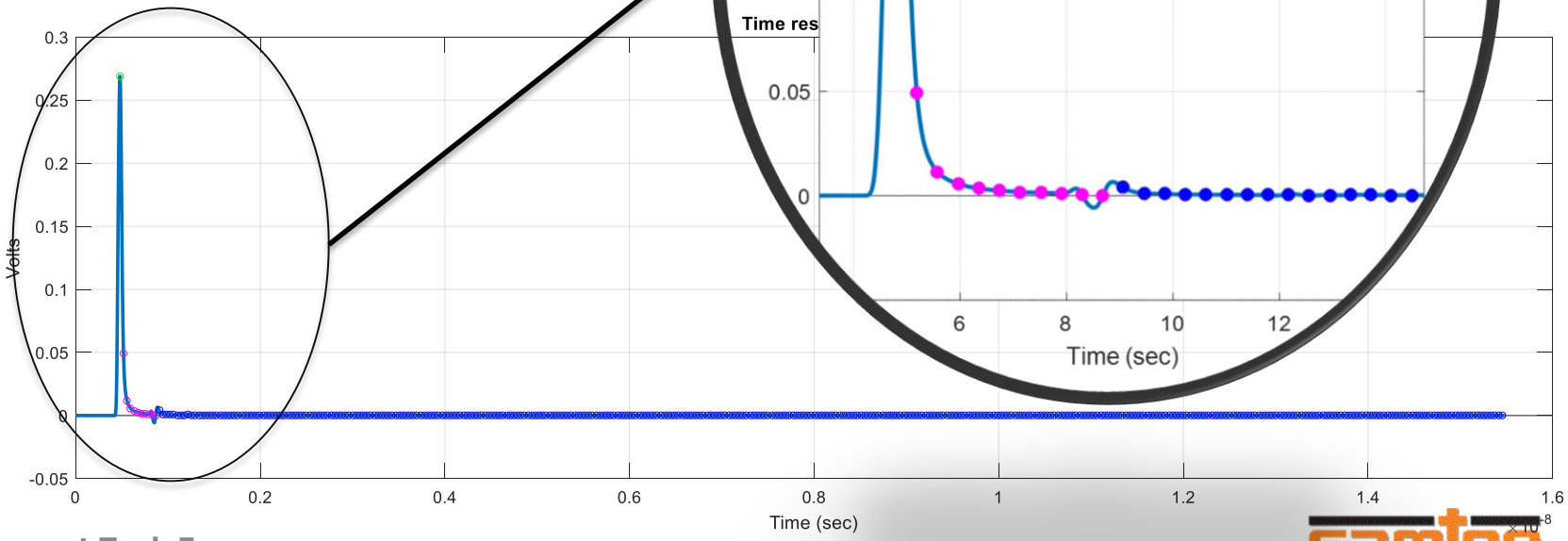


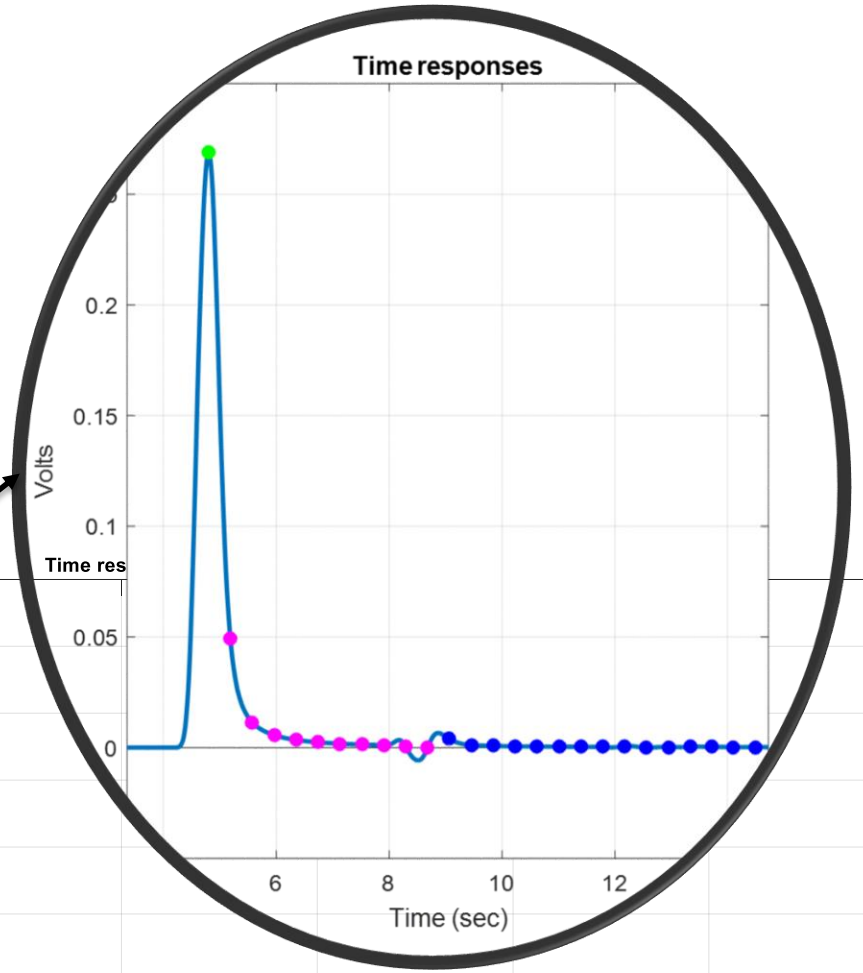
Fitting with Np = 200 produces what looks like a single bit response.



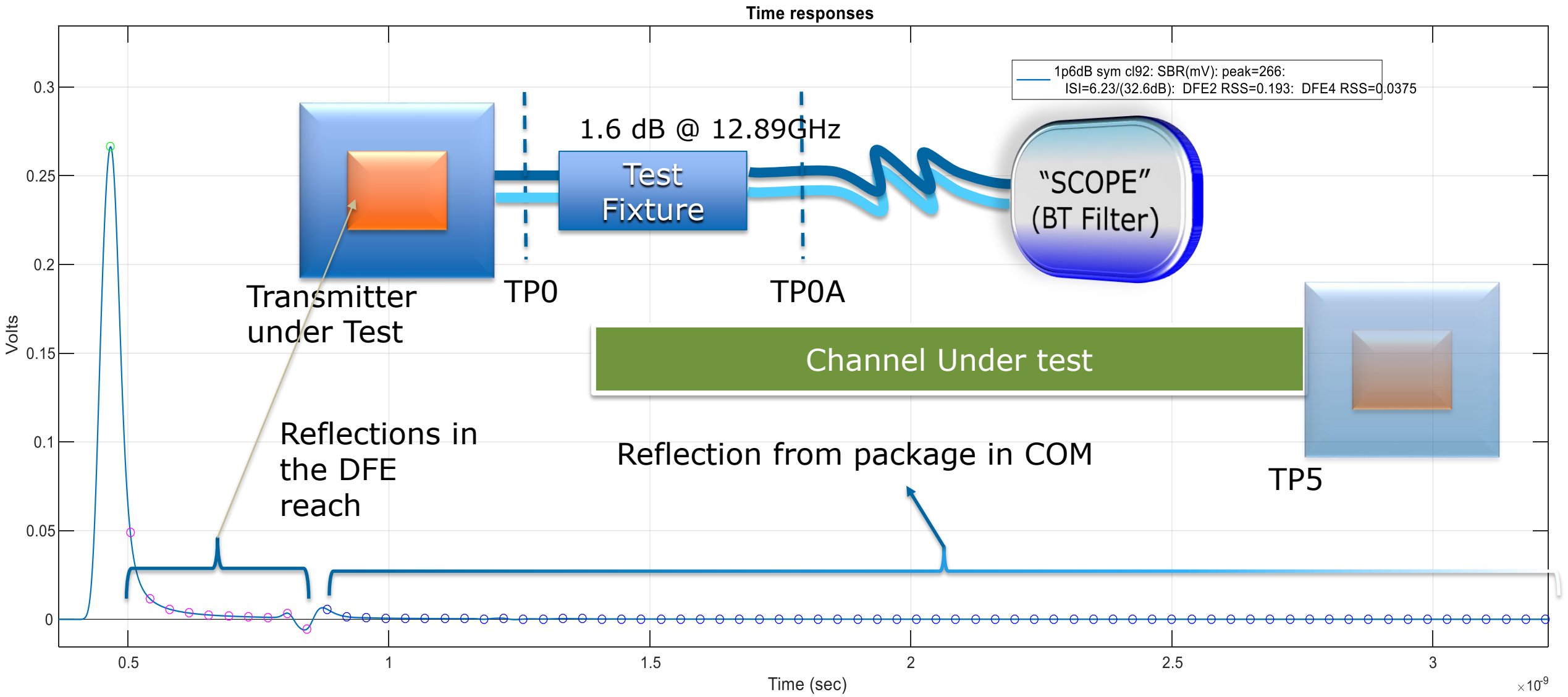


Fitting

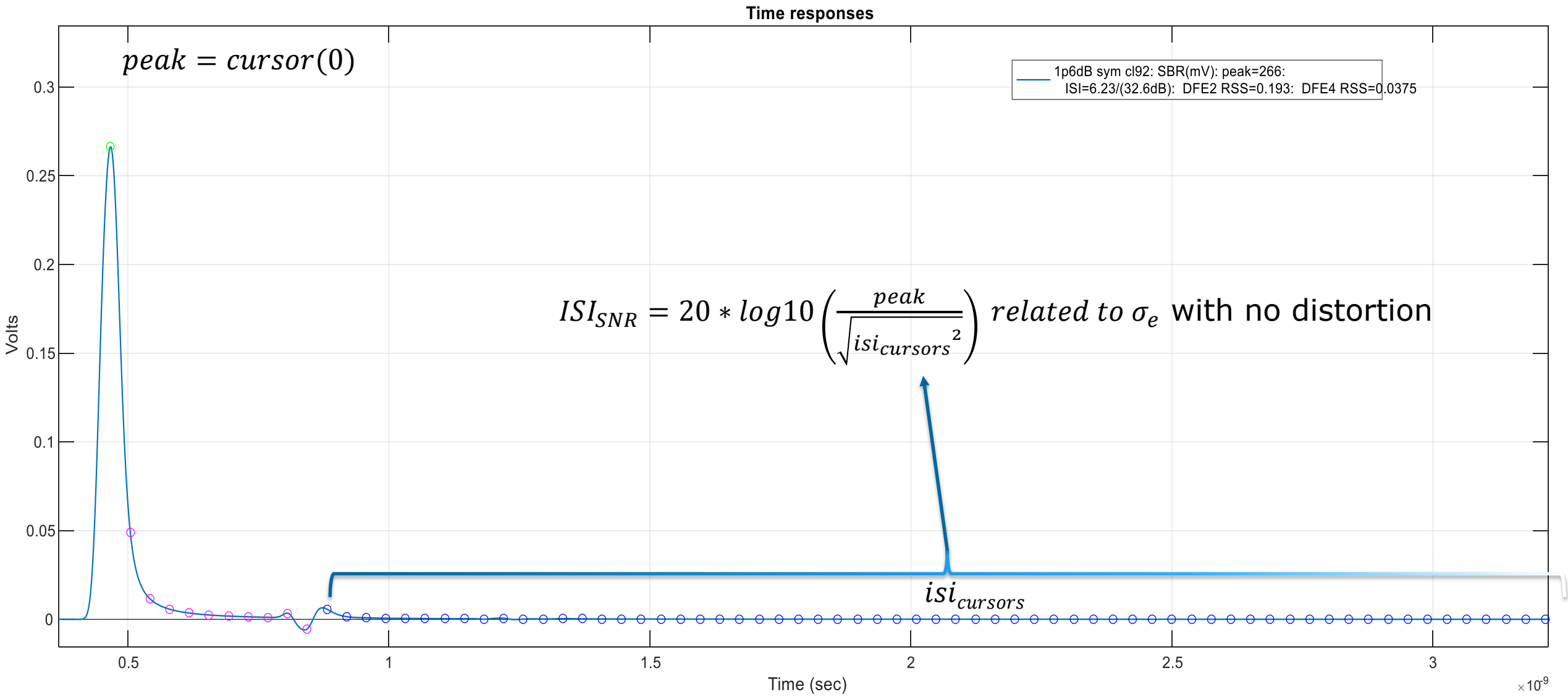




ISI from package show up in COM

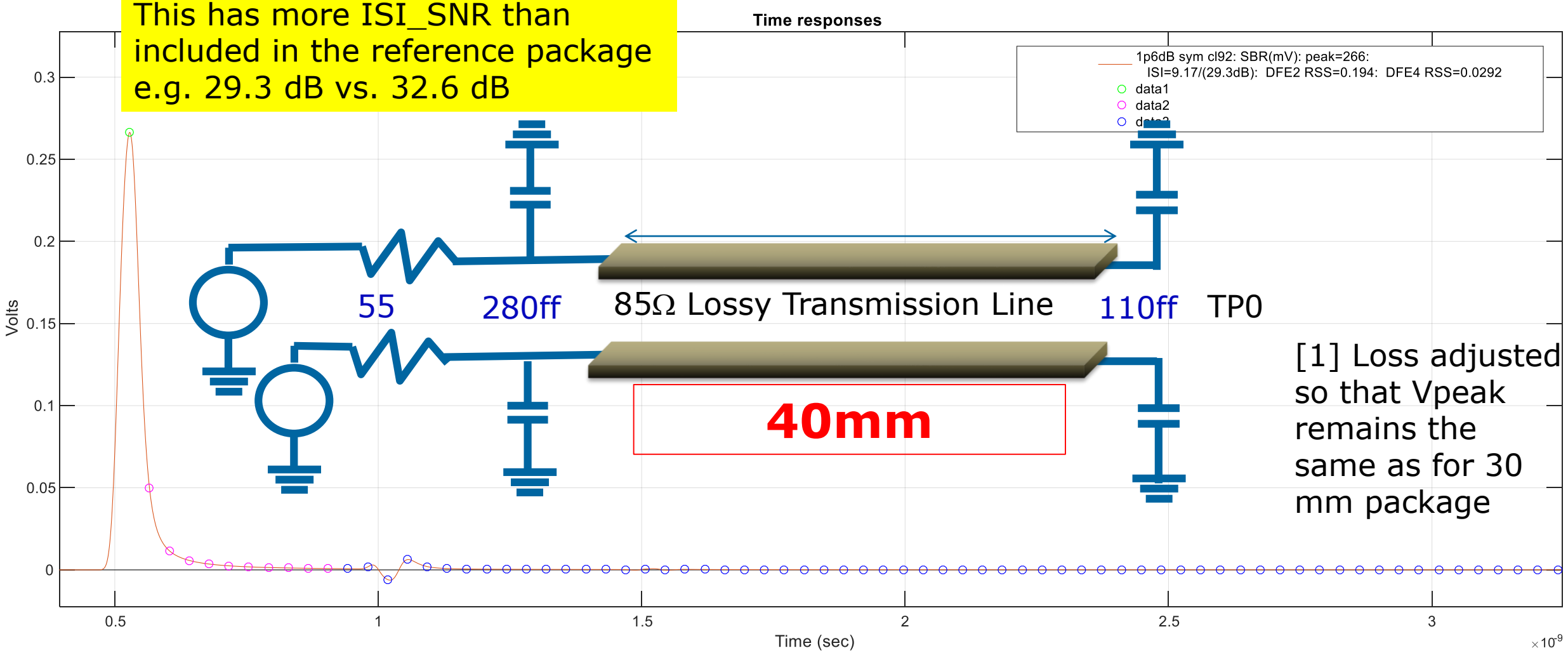


Define terms: ISI_{SNR}



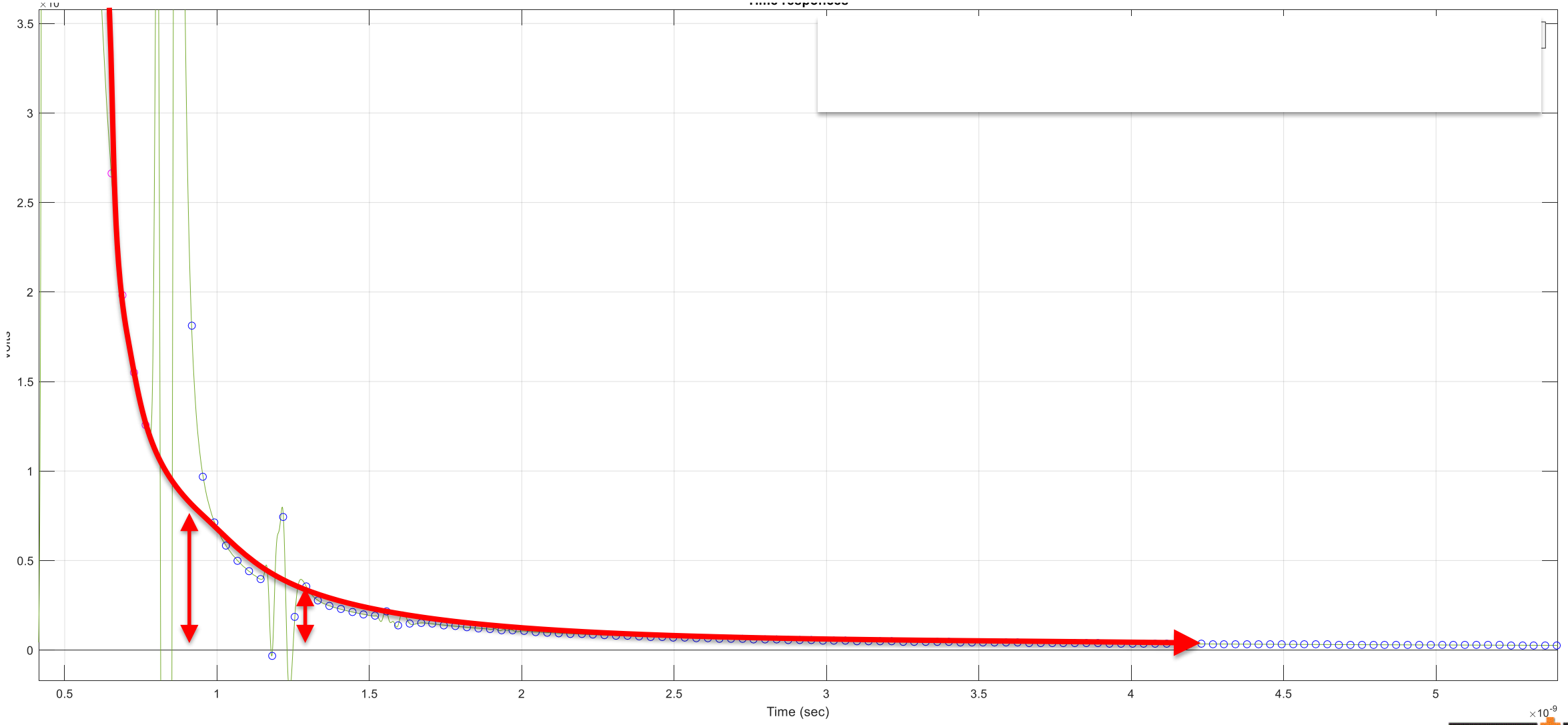
Explore packages which could fail: Zp=40mm [1]

This has more ISI_SNR than included in the reference package e.g. 29.3 dB vs. 32.6 dB



[1] Loss adjusted so that Vpeak remains the same as for 30 mm package

Linear equalization will remove the dispersion effect yielding a more true view of reflections



Recommendation

- Apply CTLE. Optimize for maximum ISI_{SNR}
- Add a table entry, ISI_{SNR} (min) of 32.3 dB
  - Some margin added for fixture variation
- Two options
  1. Perform for the preset Tx equalization setting (no eq.)
  2. Perform for all Tx equalization settings

Recommend option 1