# Reference for SNDR/linear pulse fit error

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Assumption: we will continue to use something like Clause 85 linear fit error limit in order to limit ISI generated in transmitter.
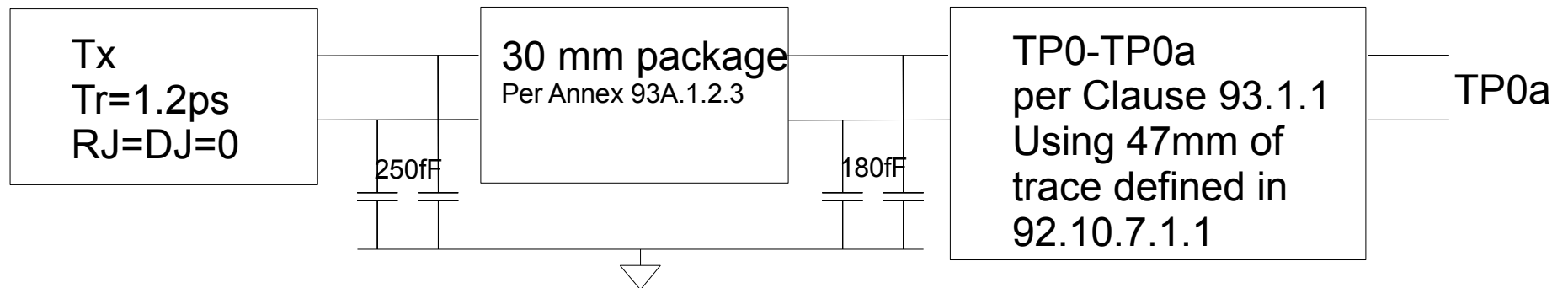
Assumption: reference transmitter in COM should meet all Tx specs but with little or no margin.

Assumption: Clause 72.7.1.11 limit of 40mV on minimum $v_2$ applies to $v_f$ as well.

Note: specs say that we should meet SNDR for all valid Tx equalization settings.

# Tx model to TP0a

Per Annex 93A

| Tx<br>Tr=1.2ps<br>RJ=DJ=0 | 30 mm package<br>Per Annex 93A.1.2.3 | TP0-TP0a<br>per Clause 93.1.1<br>Using 47mm of<br>trace defined in<br>92.10.7.1.1 |

250fF

180fF

TP0a

I used the above channel as a model of the COM reference transmitter

This channel has the fitted pulse response shown below if $N_p$=16.  But for KR4 $N_p$=8 so the echo will cause fitting errors
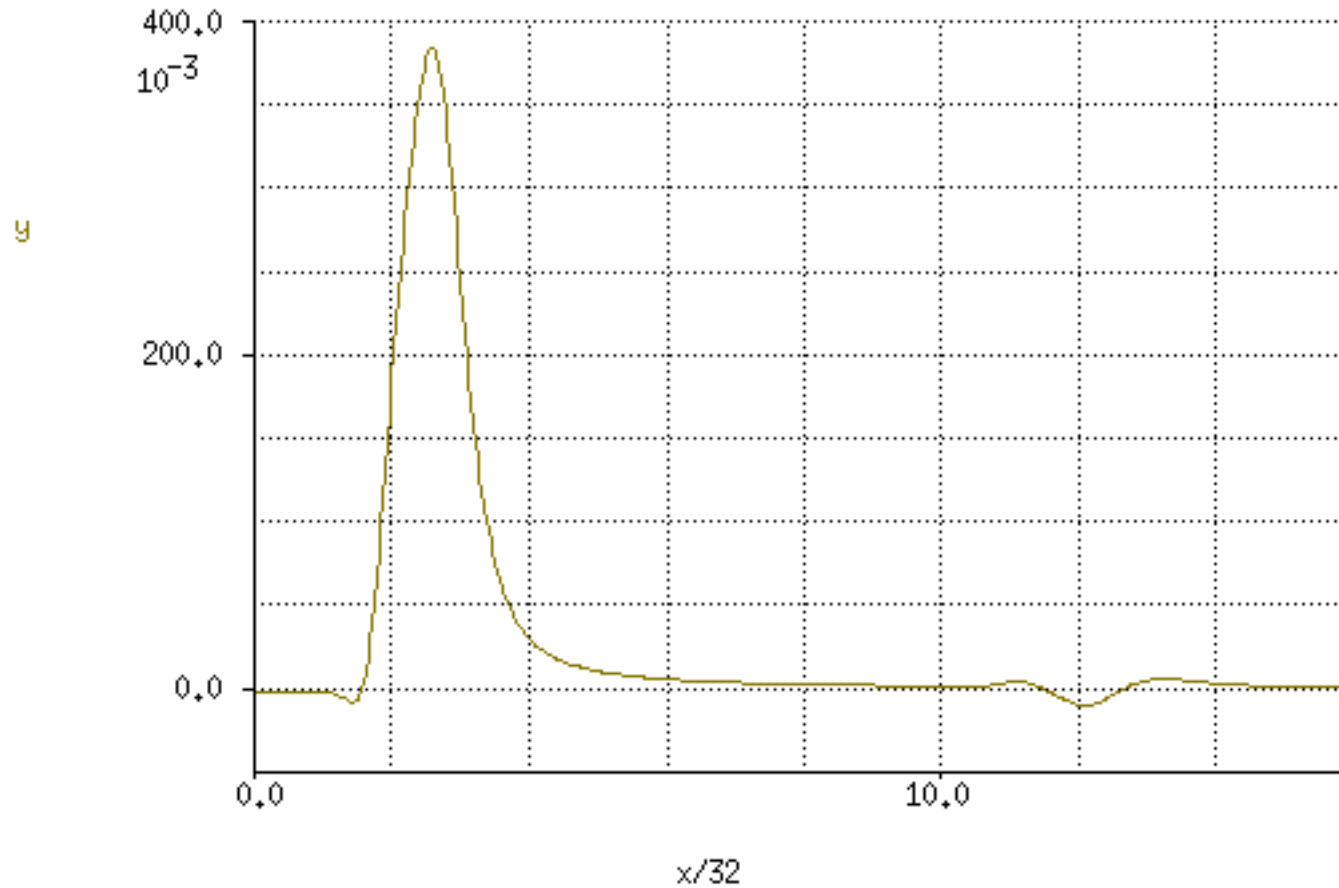
If I sweep first post-cursor tap (c1) $v_f$ drops rapidly.  Fitting error also falls but much less.  Peak amplitude also changes slowly but not as slowly as fitting error.
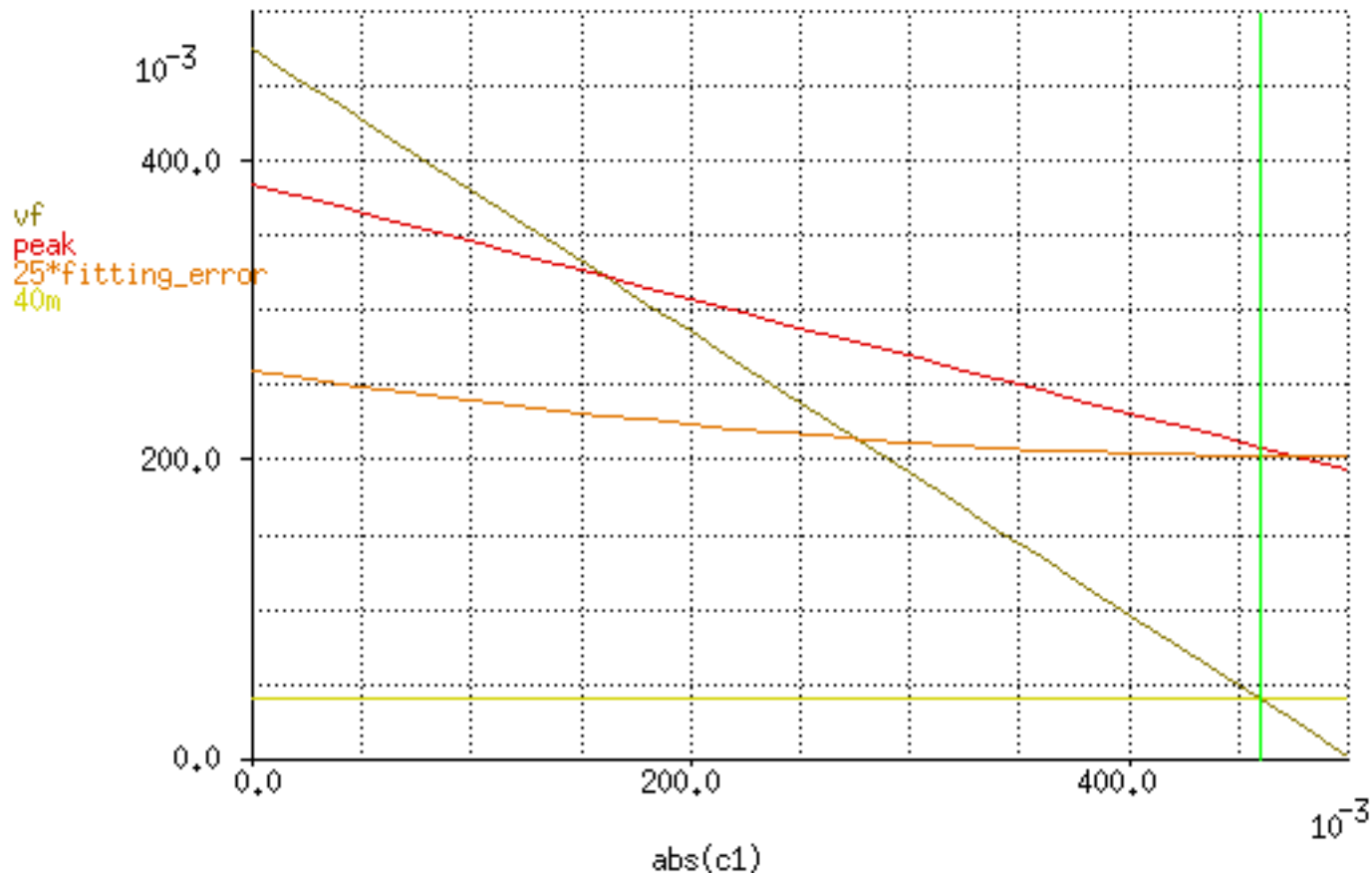
SNDR due to fitting error only is falling off a cliff, and below 15dB when $v_f$ reaches 40mV (green line). If we use pulse peak as a reference it hold up much better.
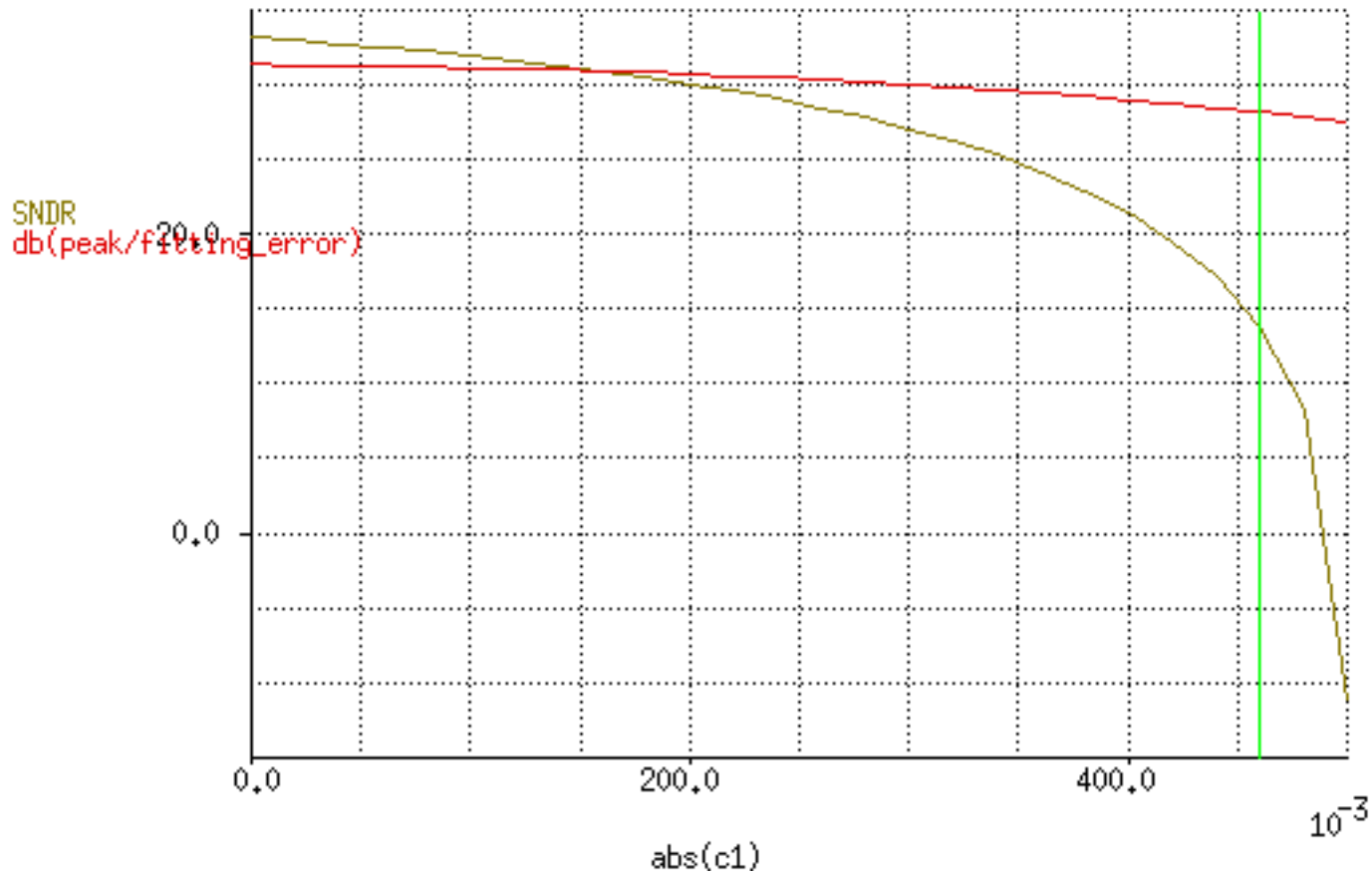
Recommendation:

- Define SNDR as a ratio to pulse peak not $v_f$ .
- Reduce SNDR to 27dB if it includes noise or 28dB if it does not.