Determining SNR_{ISI} for Clause 136 and Clause 137 (comment #209 and #210)

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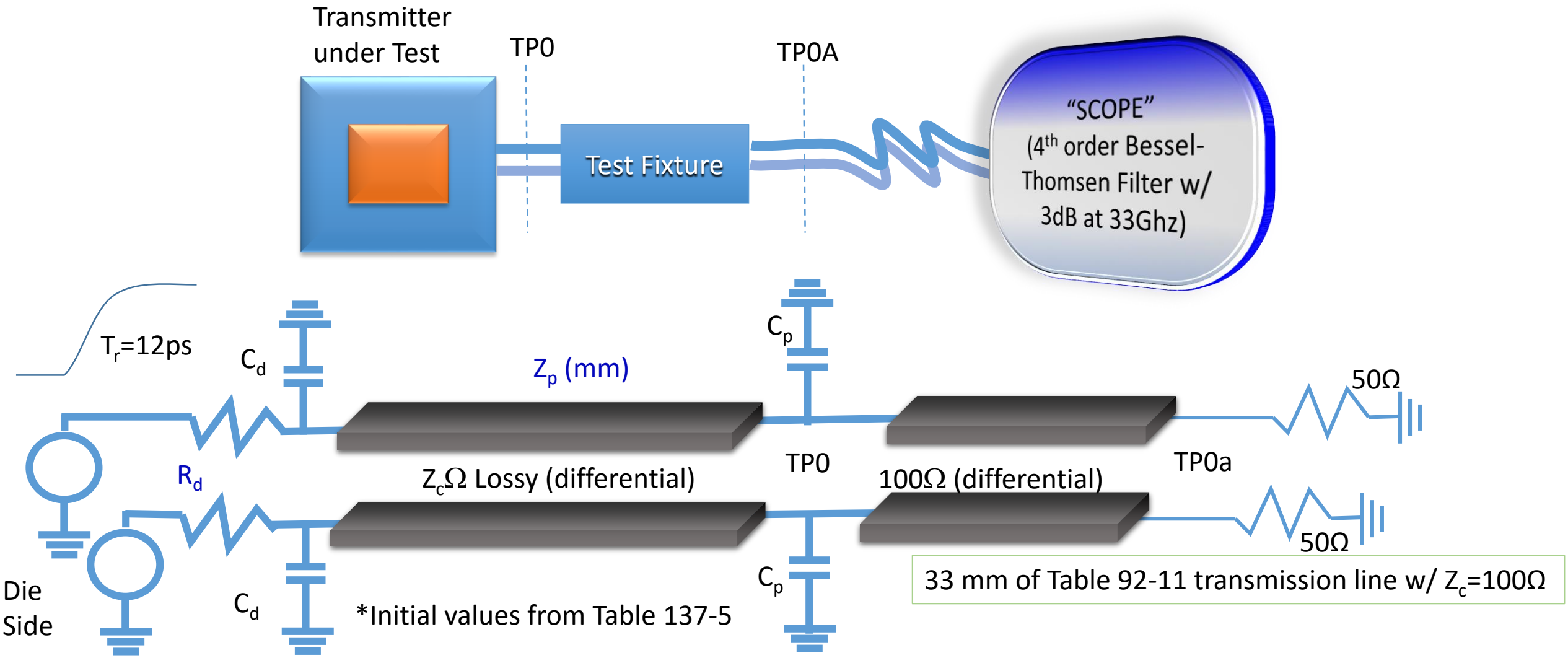
Transmitter Test Set-Up for Clause 137



Test fixture

- Use fixture (tp0 to tp0a) with 1.4 dB at 12.89GHz because other values must be account for.
- That equates to 33 mm of the board transmission line specified in clause 92 at 100 ohms characteristic impedance

93.8.1.1 Transmitter test fixture

Unless otherwise noted, measurements of the transmitter are made at the output of a test fixture (TP0a) as shown in Figure 93–5.

The insertion loss of the test fixture shall be between 1.2 dB and 1.6 dB at 12.89 GHz. The magnitude of the insertion loss deviation of the test fixture shall be less than or equal to 0.1 dB from 0.05 to 13 GHz.

The reference insertion loss of the test fixture is defined by Equation (93–1) where f is the frequency in GHz.

$$IL_{ref}(f) = -0.0015 + 0.144\sqrt{f} + 0.069f \text{ dB} \qquad 0.05 \le f \le 25 \tag{93–1}$$

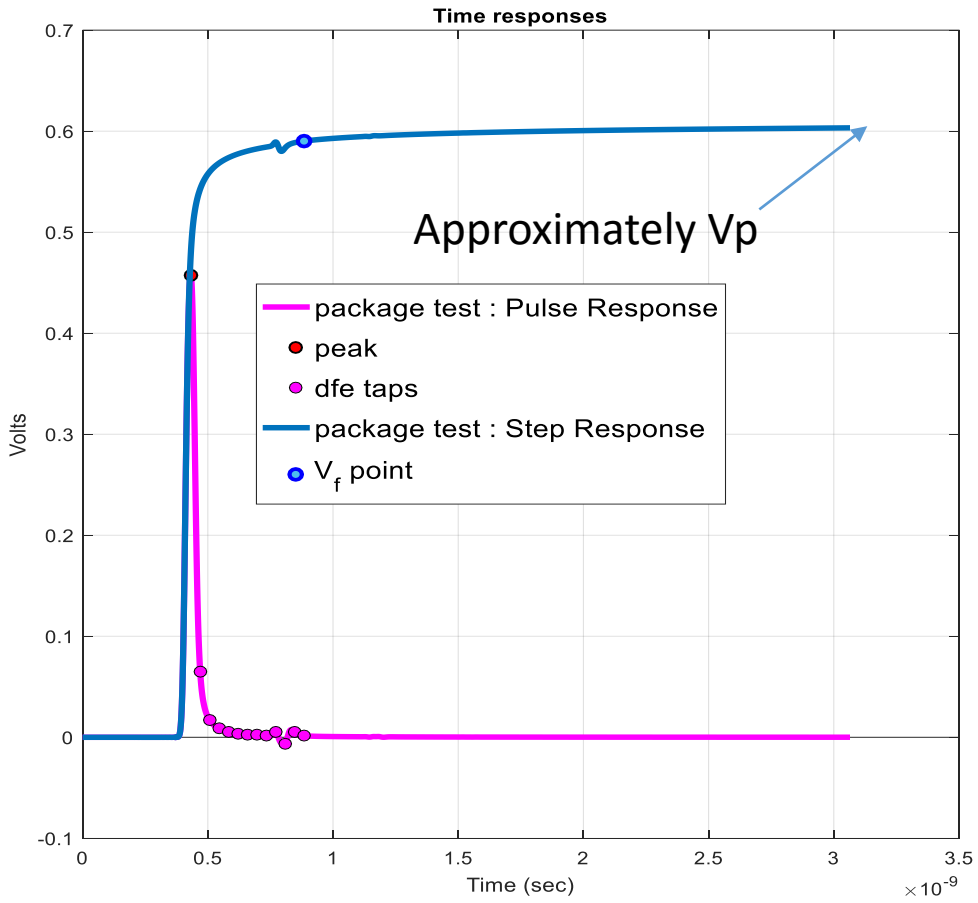
The effects of differences between the insertion loss of an actual test fixture and the reference insertion loss are to be accounted for in the measurements. The reference insertion loss is illustrated in Figure 93–3.

Test Conditions for drive swing

- A_v and A_{fe}
  - Limiting factor is Tx spec: Vf min = 0.4 v
    - which meets v_f /peak ratio (0.75)
    - Vf determined with Nv=15 for dfe12
      - 12 UI from peak
    - For considered values of R_d and Z_c

Vp-p

- A_{ne}
  - Limiting factor is Tx spec: Vp-p 1200 mV
    - which meets v_f /peak ratio
    - Vp-p < 1200 mV for PRBS31 (Vp=0.6 v)
      - 72 UI from peak
    - For considered values of R_d and Z_c



Victim and Far End Simulation Data for COM at TP0a: *Tr=12 ps, N_v=15 and 1.4 dB fixture (33 mm)*

A_v and A_{fe},volts	V_f ,volts	Peak/V_f Spec = 0.75	SNR_{ISI} (dB)	Z_c (package impedance, Ω)	R_d (die termination DC impedance, Ω)	Z_p (package length, mm)
0.436	0.40018	0.76	44.7	83.7	55	30
0.4355	0.40029	0.764	45.3	90	55	30
0.4347	0.40015	0.769	45.9	102.3	55	30
0.4347	0.40024	0.763	46.1	110	55	30
0.39357	0.40004	0.769	45.8	83.7	45	30
0.3933	0.40007	0.77	46.1	90	45	30
0.39319	0.40008	0.766	46.3	102.3	45	30
0.3933	0.40003	0.761	46.2	110	45	30

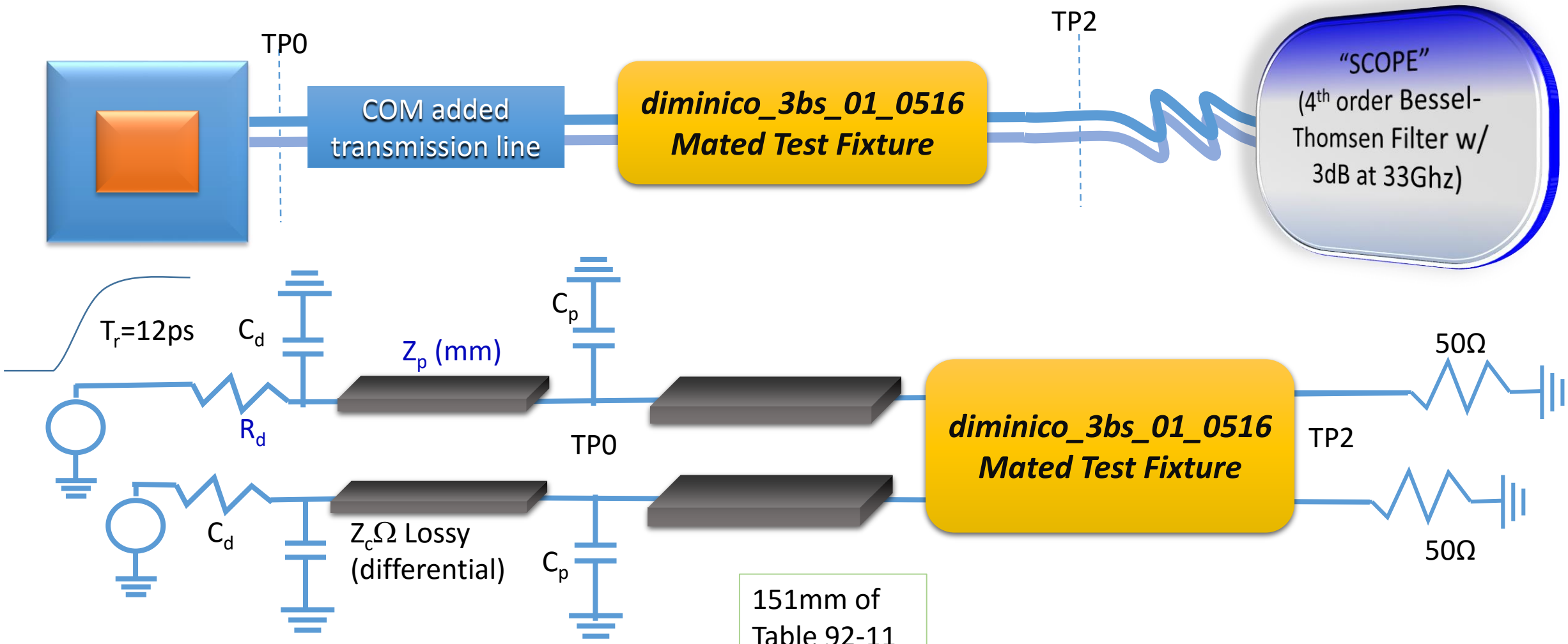
Near End Simulation Data for COM reference package at tp0a

Tr=12 ps, N_v=15 and 1.4 dB fixture (33 mm)

A_{ne},volts	V_{p-p} ,volts	Z_c (package impedance, Ω)	R_d (die termination DC impedance, Ω)	Z_p (package length, mm)
0.6345	1.2005	83.7	55	12
0.6345	1.200	90	55	12
0.6345	1.201	102.3	55	12
0.6345	1.201	110	55	12
0.574	1.200	83.7	45	12
0.574	1.200	90	45	12
0.574	1.200	102.3	45	12
0.574	1.200	110	45	12

Host Transmitter Test Set-Up Clause 136

Host under test model from COM



151mm of Table 92-11 Transmission Line

Victim and Far End Simulation Data for COM reference package at TP2

Tr=12 ps, N_v=15 using
package plus 151 mm COM board trace and diminico_3bs_01_0516

A_v and A_{fe},volts	V_f ,volts	Peak/V_f Spec is 0.49	SNR_{ISI} (dB)	Z_c (package impedance, Ω)	R_d (die termination DC impedance, Ω)	Z_p (package length, mm)
0.436	0.3755	0.474	30.6	83.7	55	30
0.4355	0.3766	0.475	31.1	90	55	30
0.4347	0.3771	0.476	31.8	102.3	55	30
0.4347	0.3774	0.476	31.9	110	55	30
0.39357	0.375	0.479	31.3	83.7	45	30
0.3933	0.3753	0.48	31.7	90	45	30
0.39319	0.3758	0.479	32	102.3	45	30
0.3933	0.3759	0.477	32	110	45	30

Recommendations

- For Clause 136 (Table 136–11) set SNR_{ISI} min to 30 dB
  - Allowing for about a dB of measurement error
- For Clause 137 set SNR_{ISI} min to 43 dB
  - 137.9.2 table: add 120D-1 modifications
  - Allowing for about 2 dB of measurement error
- Adjust drive amplitudes in COM according to tables in slides 5 and 6
  - Resolve COM parameters for Z_c and R_d in Ad Hoc
- Address Peak/V_f in Ad Hoc
  - Values are a little high for clause 136
  - Values are a little low for clause 137
    - V_f values are also a bit high in COM package model