

# Correcting the module stressed input loss calibration

P802.3ck D2.3 comment 32

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# Add mated compliance boards and clean transmission line

- **CI 120G SC 120G.3.4.3.2 P 272 L 25 # 32** *Comment Type TR*
- The mated compliance boards should approximate Eq 162B-5, and the frequency-dependent attenuator should look like a clean PCB transmission line. The two in series will NOT look like another clean transmission line with no  $f^2$  term because if that were attempted, the loss curve of the frequency-dependent attenuator would have to bend the wrong way. This is unrealistic and impractical.
- *Suggested Remedy*
- Revise text and equation 120G-3 to make this clear. Show all three curves (Eq 162B-5 mated compliance boards, frequency-dependent attenuator and the combination) in Figure 120G-11.
- L changes from 464 to 296 mm;
- Eq 120G-3 becomes  $0.981\sqrt{f} + 0.2463f$  for the frequency-dependent attenuator;
- The loss of the combination is  $1.425\sqrt{f} + 0.3588f + 0.001884f^2$ .

# Calibrating the components outlined in red

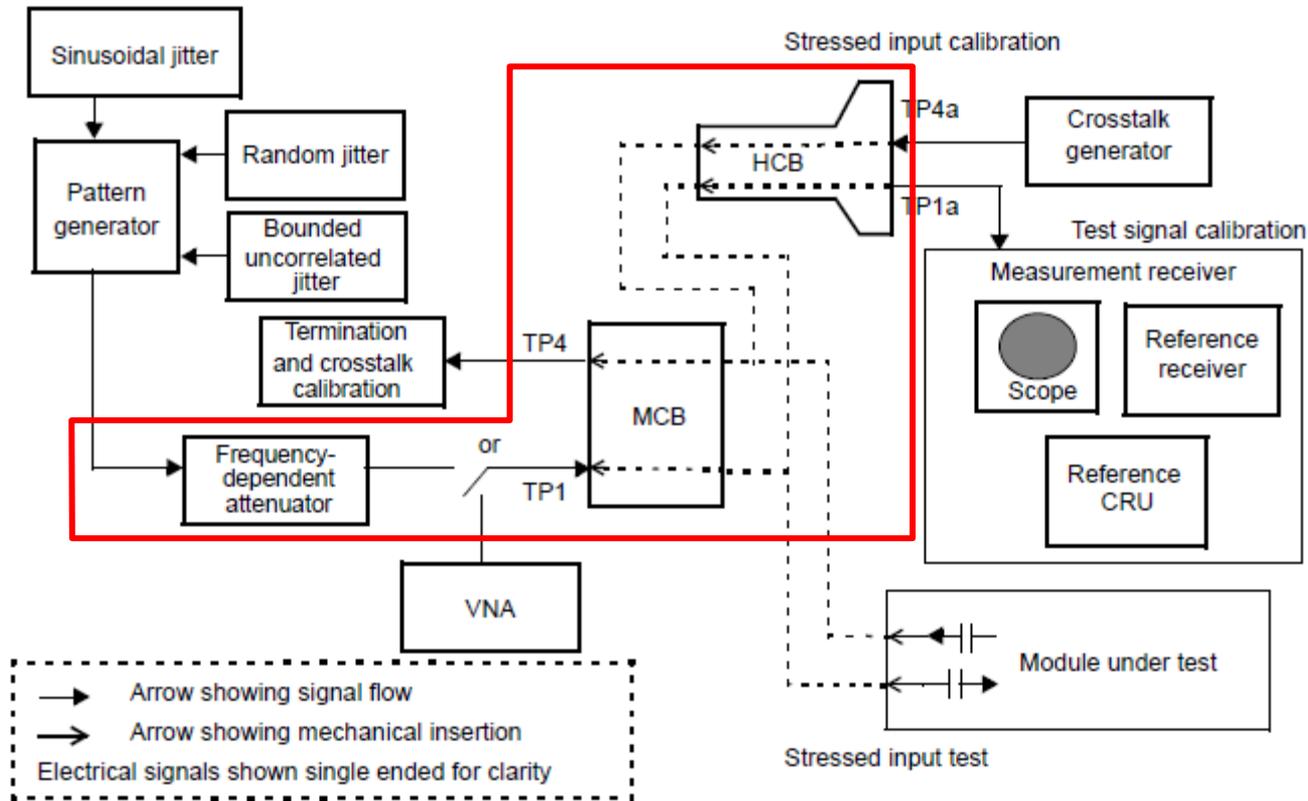


Figure 120G-10—Example module stressed input test

- Loss is calibrated from the output of the pattern generator to TP1a

# From Draft 2.3

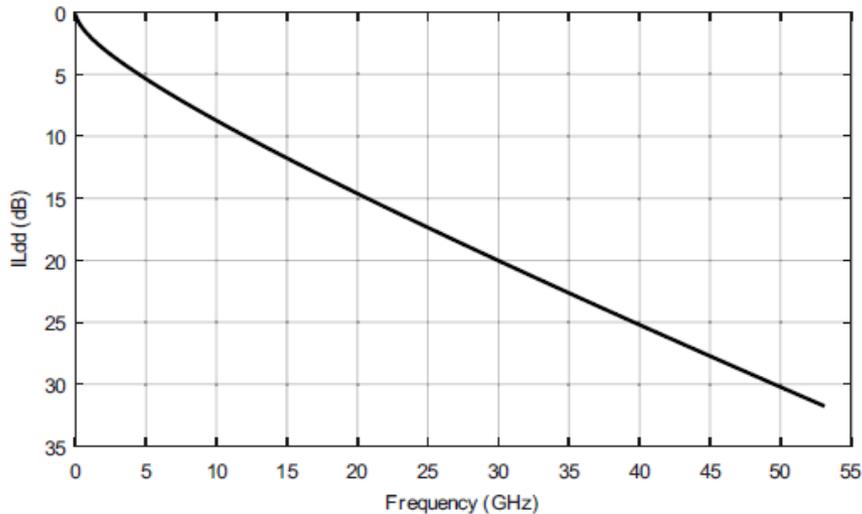
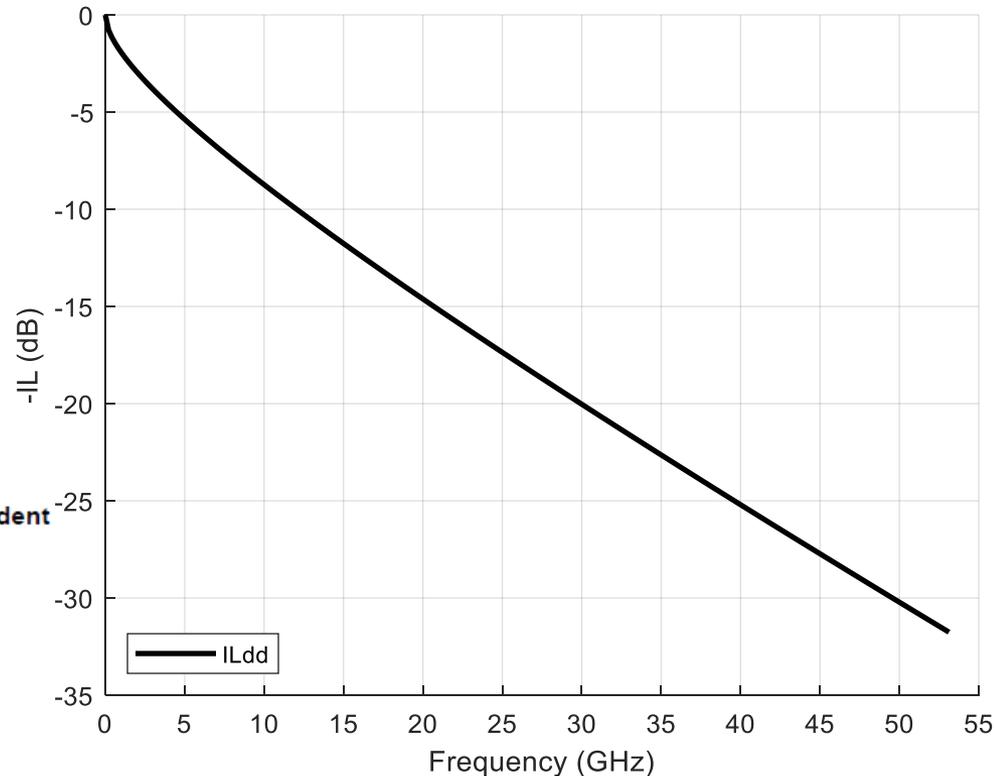
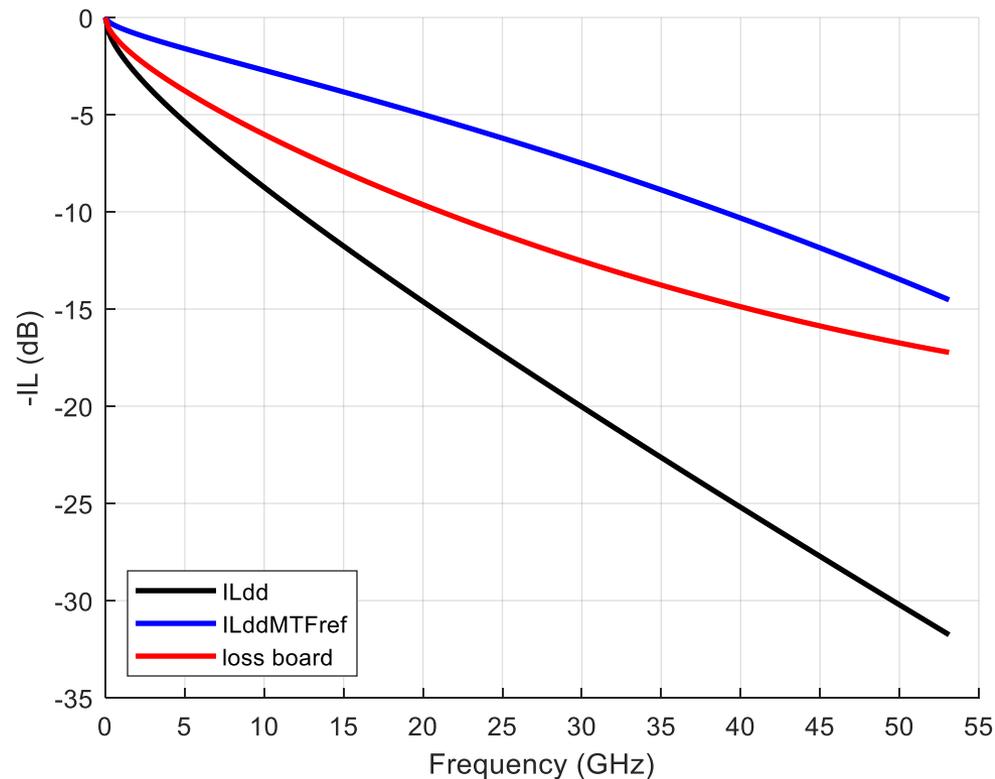


Figure 120G-11—Module stressed input target high-loss frequency-dependent attenuator differential-mode to differential-mode insertion loss

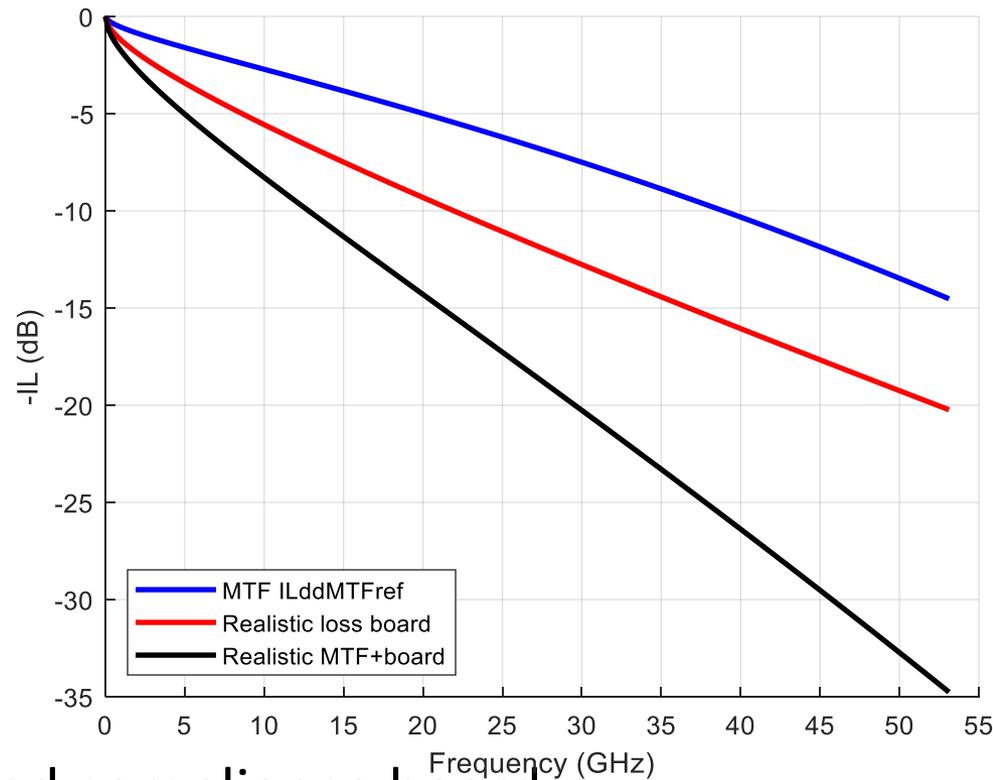


- 18.2 dB at Nyquist
- $IL_{dd}(f) = 1.54\sqrt{f} + 0.3865f$  (120G-3)
- In spite of the figure title, this is not the frequency-dependent attenuator alone



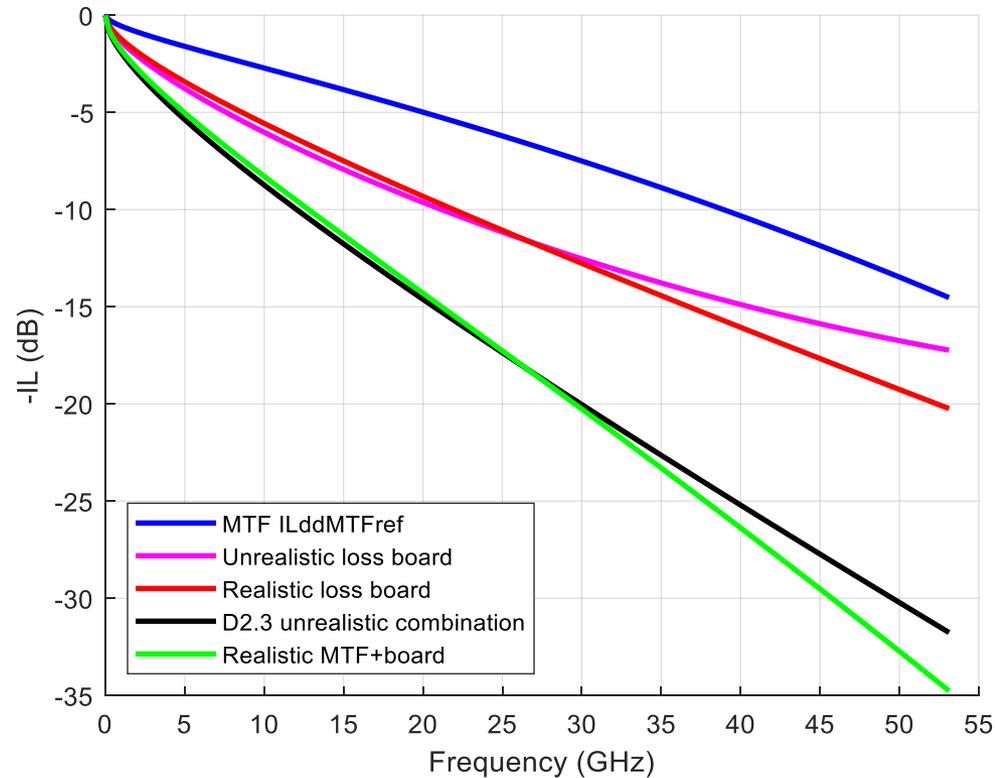
- The mated compliance boards target the blue line
  - $ILddMTFref(f) = 0.942(0.471vf + 0.1194*f + 0.002*f^2)$  Eq 162B–5
  - 6.6036 dB at Nyquist
- So the frequency-dependent attenuator must target the red line which bends too much the wrong way ( $f^2$  term with wrong sign)
- Impractical, and not representative of the host-to-module channel and the channels used for module output compliance

- Instead, choose the transmission line length so that the sum of the mated compliance boards and the frequency-dependent attenuator is the target 18.2 dB
- Frequency-dependent attenuator loss target for ideal compliance boards is 11.5964 dB
  - 295.590 mm



- **Blue: mated compliance boards**
  - $IL_{ddMTFref}(f) = 0.942(0.471vf + 0.1194*f + 0.002*f^2)$  Eq 162B–5
  - 6.6036 dB at Nyquist
- **Red: frequency-dependent attenuator**
  - $0.980926vf + 0.246243f$  (Eq 120G-3 revised) 11.5964 dB at Nyquist
- **Black: total**
  - $1.42461vf + 0.358718*f + 0.001884*f^2$  18.2 dB at Nyquist
- **Practical and representative of the host-to-module channel**

# Comparing D2.3 with proposal



# Summary

- Change L from 464 to 296 mm;
- Revise text and equation 120G-3
- Eq 120G-3 becomes  $0.981\sqrt{f} + 0.2462f$  for the frequency-dependent attenuator;
- Show all three curves (Eq 162B-5 mated compliance boards, frequency-dependent attenuator and the combination) in Figure 120G-11. Revise its title
- The loss of the combination is  $1.425\sqrt{f} + 0.3588f + 0.001884f^2$