Common-mode return loss limits

P802.3ck D3.0 comments 178 181

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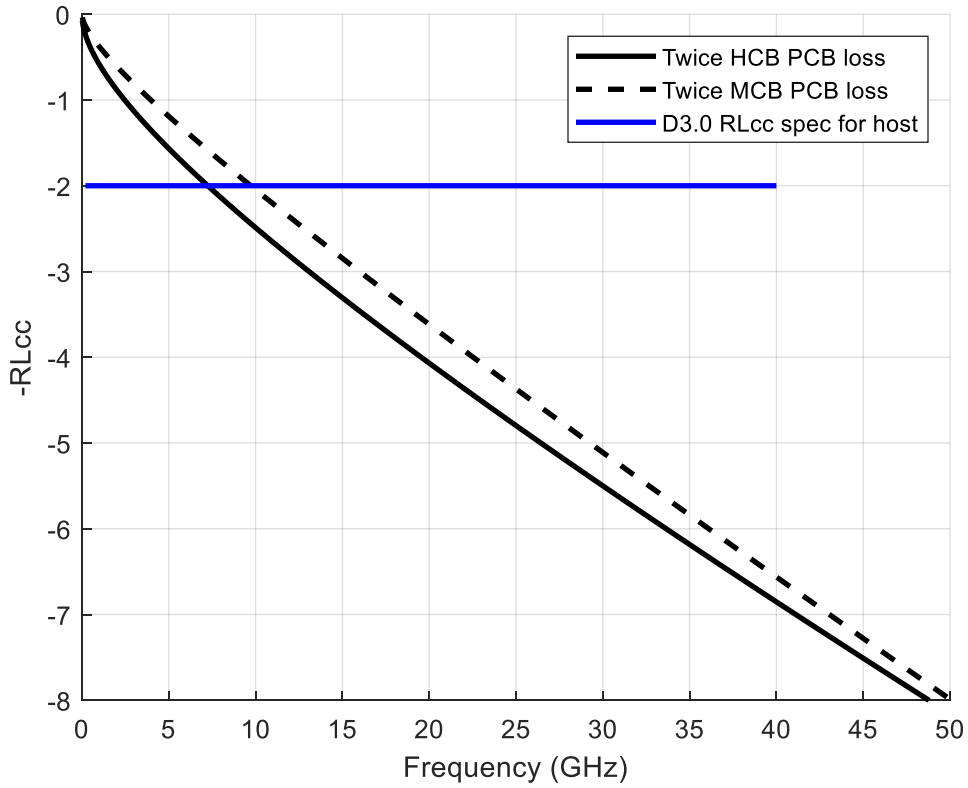
Introduction

- We have common-mode return loss specs to ensure that any common-mode signal can dissipate
- Multiple places
- The limits ~ 2 dB are extremely weak
- A 2 dB limit is ineffective above the frequency where the test fixture PCB loss is 1 dB
  - It acts as an indication that very bad common-mode return loss is not desired, but it does not impose an actual limit

Ineffective above 7.5 GHz

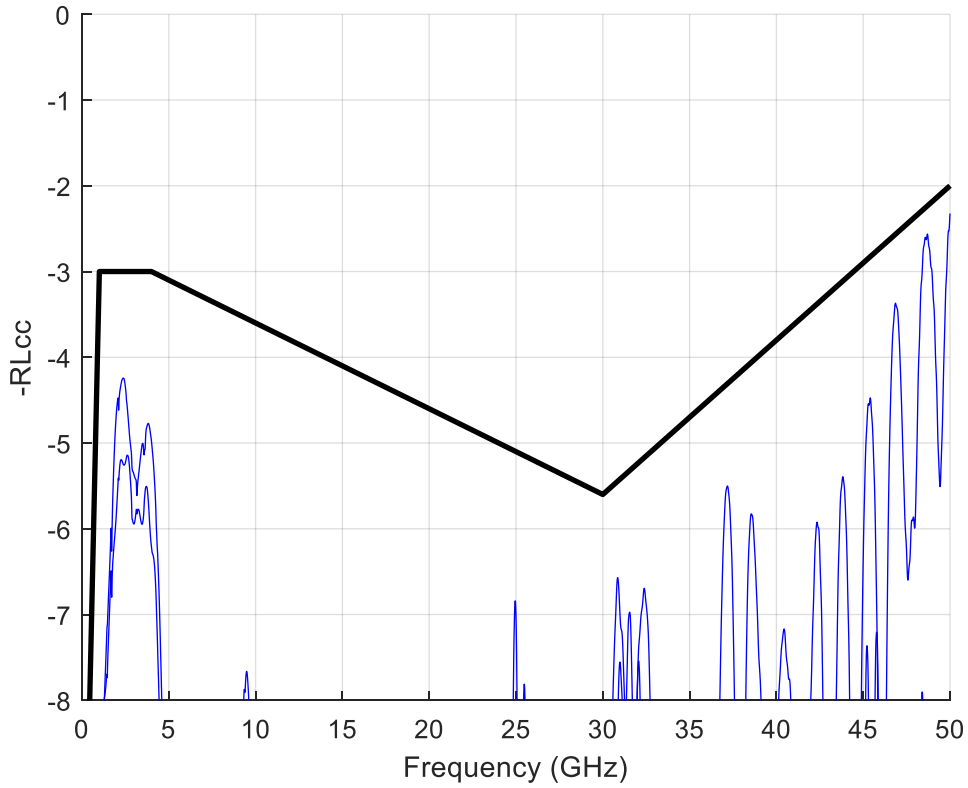
- 

Comment 178 on CR Tx RLcc

- As for the mated test fixtures and the cable, this common mode return loss spec RLcc becomes useless at the frequency when the MCB loss is 2/2 dB, which is only 10 GHz. The spec should trend down with the MCB trace loss at 0.1 dB/GHz
- Use a frequency-dependent mask
  - 2 dB 0.2 <= *f* <= 4
  - 1.6+0.1**f* dB 4 < *f* <= 30
  - 8.5-0.13*f* 30 < *f* <= 40
  - *f* is in GHz

- *It's worse than I said: 10 GHz should have been 7.25 GHz*

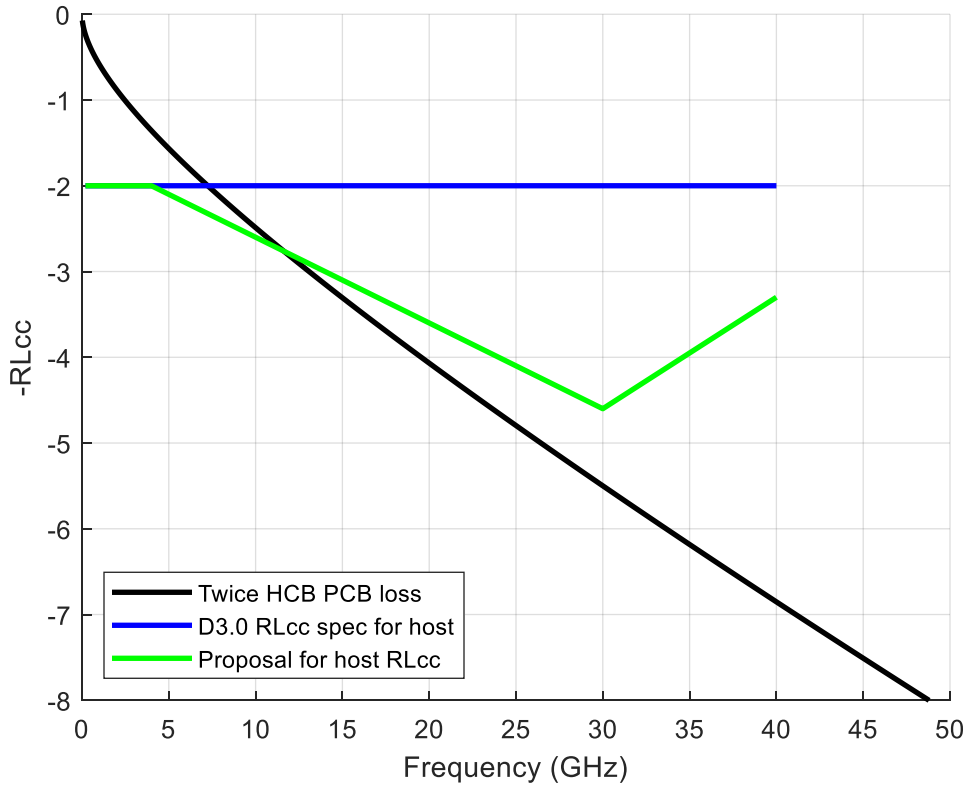
Mated test fixture RLcc for reference



- Measured vs. spec

https://ieee802.org/3/ck/public/19_07/kocsis_3ck_01_0719.pdf

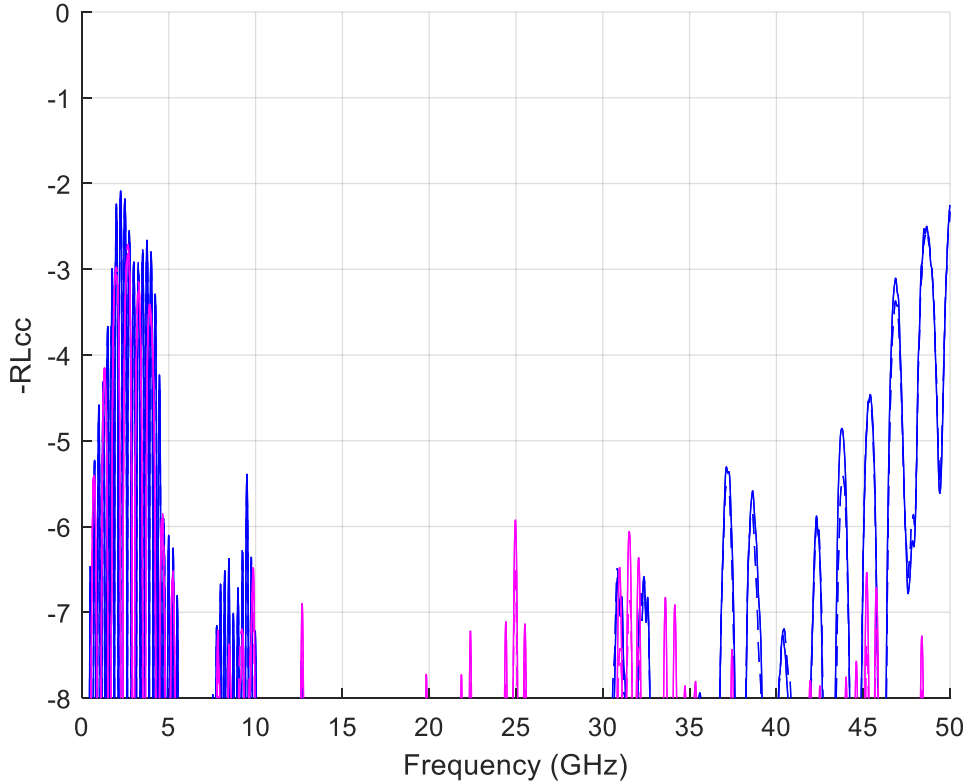
Proposed improved host RLcc spec

- 

Comment 181
The cable RLcc is a little different

- At the lowest frequencies, the measurement can "see" both ends of the cable
- So the spec has to be relaxed at those frequencies
- 1.2 dB 0.05 <= f <= 4
- 0.76+0.11f dB 4 < f <= 30 GHz
- f is in GHz

Two mated compliance board pairs as surrogate for cable



- Mated pairs connected both ways round
- Representing an unreasonably low-loss cable, so very pessimistic

Illustrating the proposed RLcc spec