

Constructing ~ 1M Improved FR4 Channels with the New Attenuation Limit

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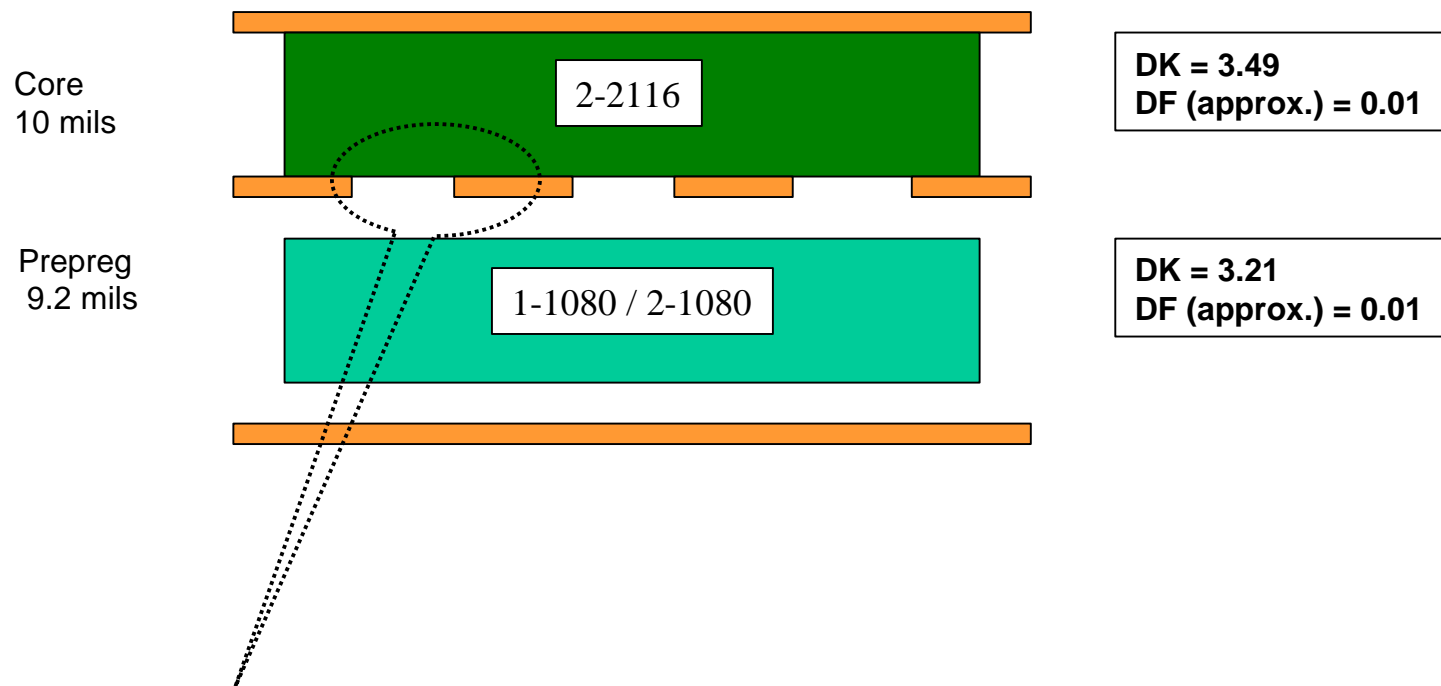
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Molex INC.

Introduction

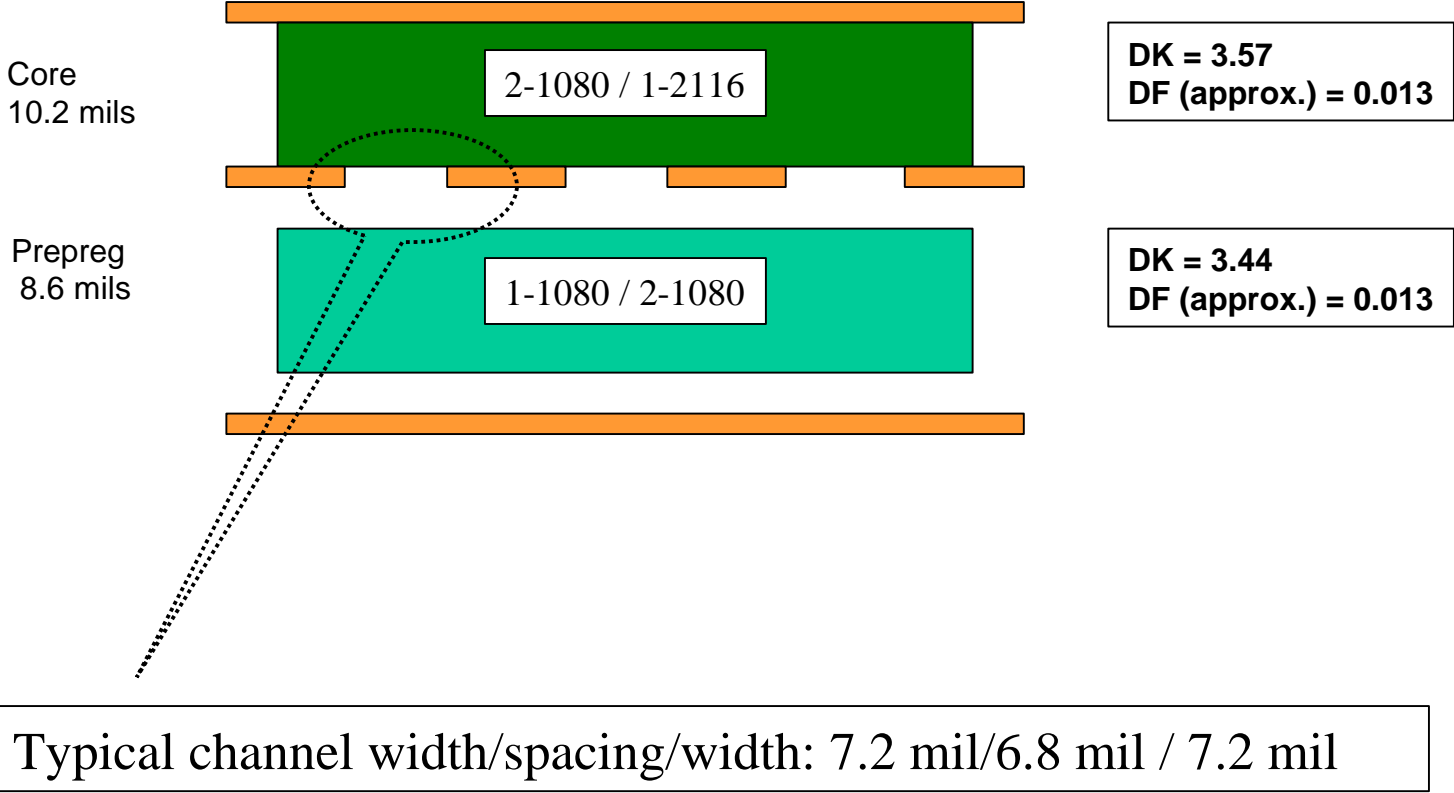
- The new A_{\min} line makes it more difficult to hit the “1 m in improved FR4” target.
- Can such channels be constructed?
- I looked at available Molex channels in Nelco 4000-13SI and FR408 backplanes as well as combinations of the two (FR408 backplane and N-13SI line cards).
- Results are presented.
- A couple of new channels are offered to the library to aid in simulations with the new limit.

Backplane Construction: Nelco 4000-13SI.



Typical channel width/spacing/width: 7.75 mil/6.25 mil / 7.75 mil

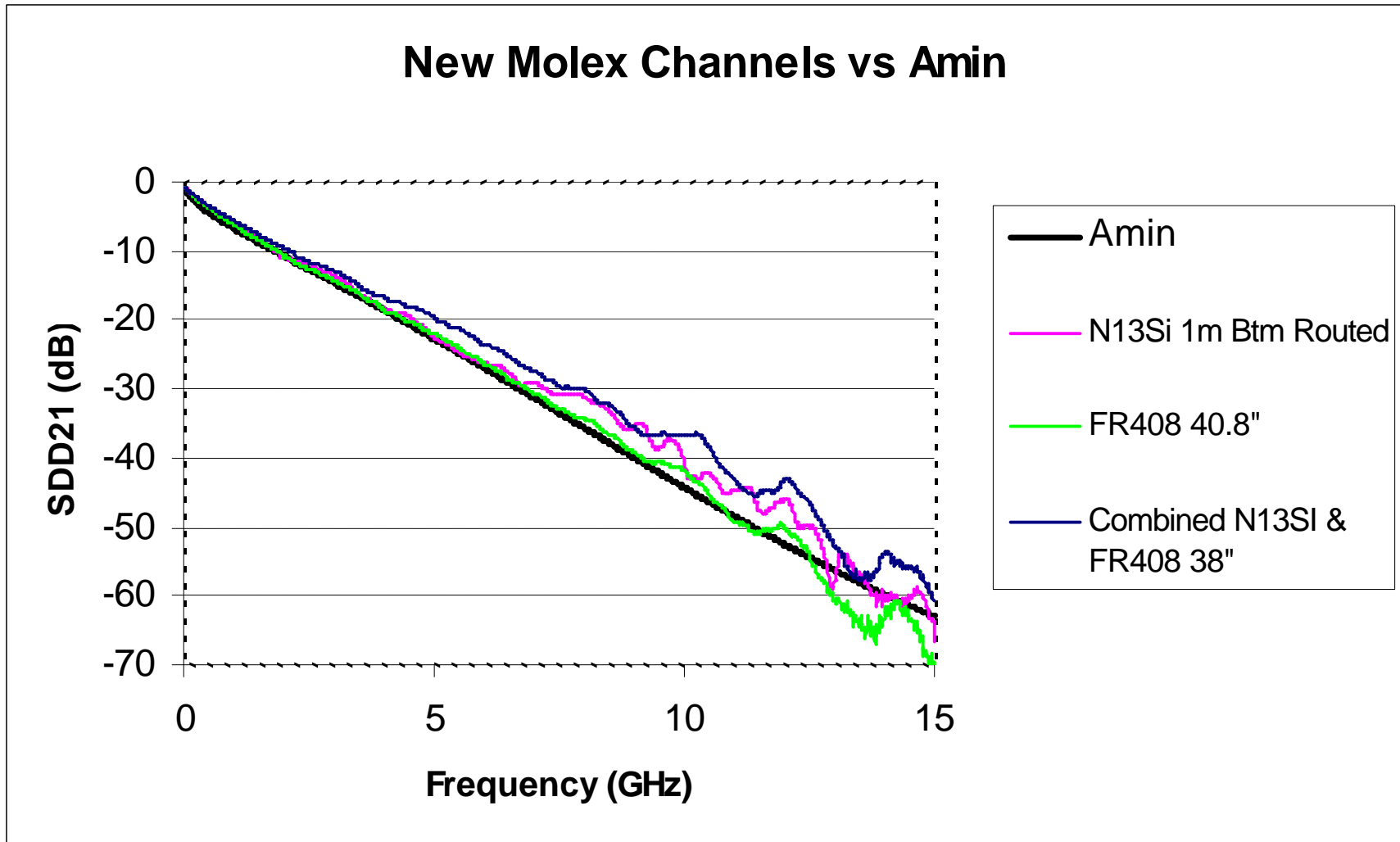
Backplane Construction: Isola FR408.



Backplane Channel Description.

- 1 m Nelco 13-SI (Bottom routed): 2.5” of trace on each line card, the rest in the backplane. ~ 35 mil stub.
- 38” Combined N-13SI and FR408: 25” trace on the N13SI Backplane, 10.5” trace on one line card, 2.5” on the other line card.
- 40.8” FR408 Channel: 25” trace on FR408 Backplane, 7.9” on each line card (channel margin cards).

Results



Conclusions

- Possible to meet the new A_{min} for $\sim 1m$ length with careful choice of material and channel construction.
- The 1m Nelco 4000-13SI bottom routed channel is “hugging” the line. If a backdrilled channel were available on the board, it would have been above the line.
- Backdrill is needed at 1m, and lower loss laminates should be used.

New Channels for the Library

- Offering a couple of extra channels to aid in simulations given the new Amin limit and the EIT discussions:
- 1 m Nelco 400-13SI as in this presentation (J2K2 Inbound in the old definition, was submitted before but in a inconvenient format). Nomenclature: Molex2006-1_T: Thru; Molex2006-1_N1, Molex2006-1_N2, Molex2006-1_N3: NEXT; Molex2006-1_F1, Molex2006-1_F2, Molex2006-1_F3: FEXT;
- 30” FR408 backdrilled (comfortably above the line). Nomenclature: Molex2006-2_T, Molex2006-2_N1, etc.

Thank You!