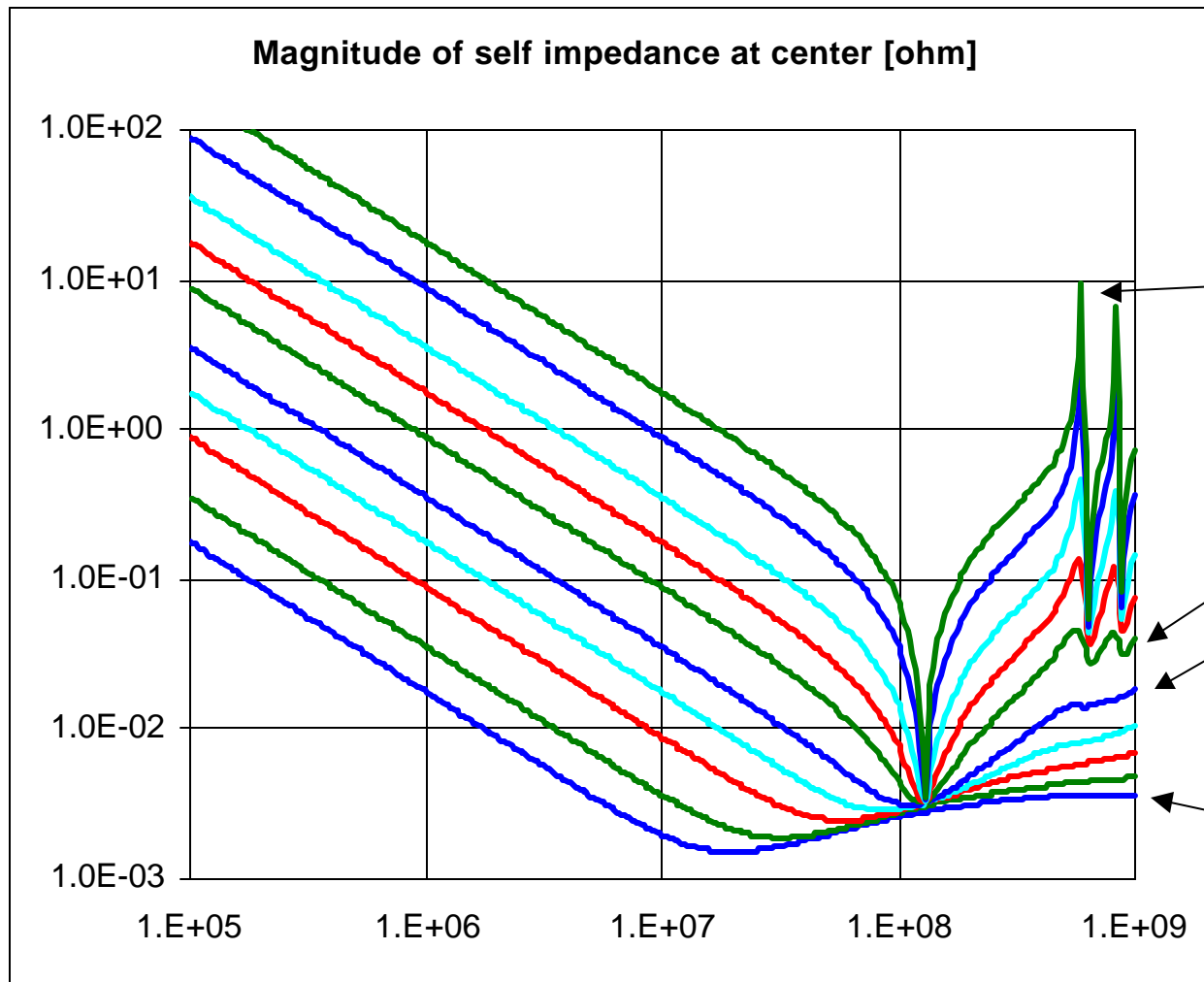


Thin Laminate Electrical Benefits

- Inductance (L) is proportional to thickness (t)
- $dV=L*di/dt$: SSN is less if L is lower
- Plane resonances are suppressed if $t<0.3$ mils
- Low-pass noise propagation if $t<1\mu m$
- Radiation is less from thinner laminates
- Dielectric constant increases static capacitance, but L is unchanged

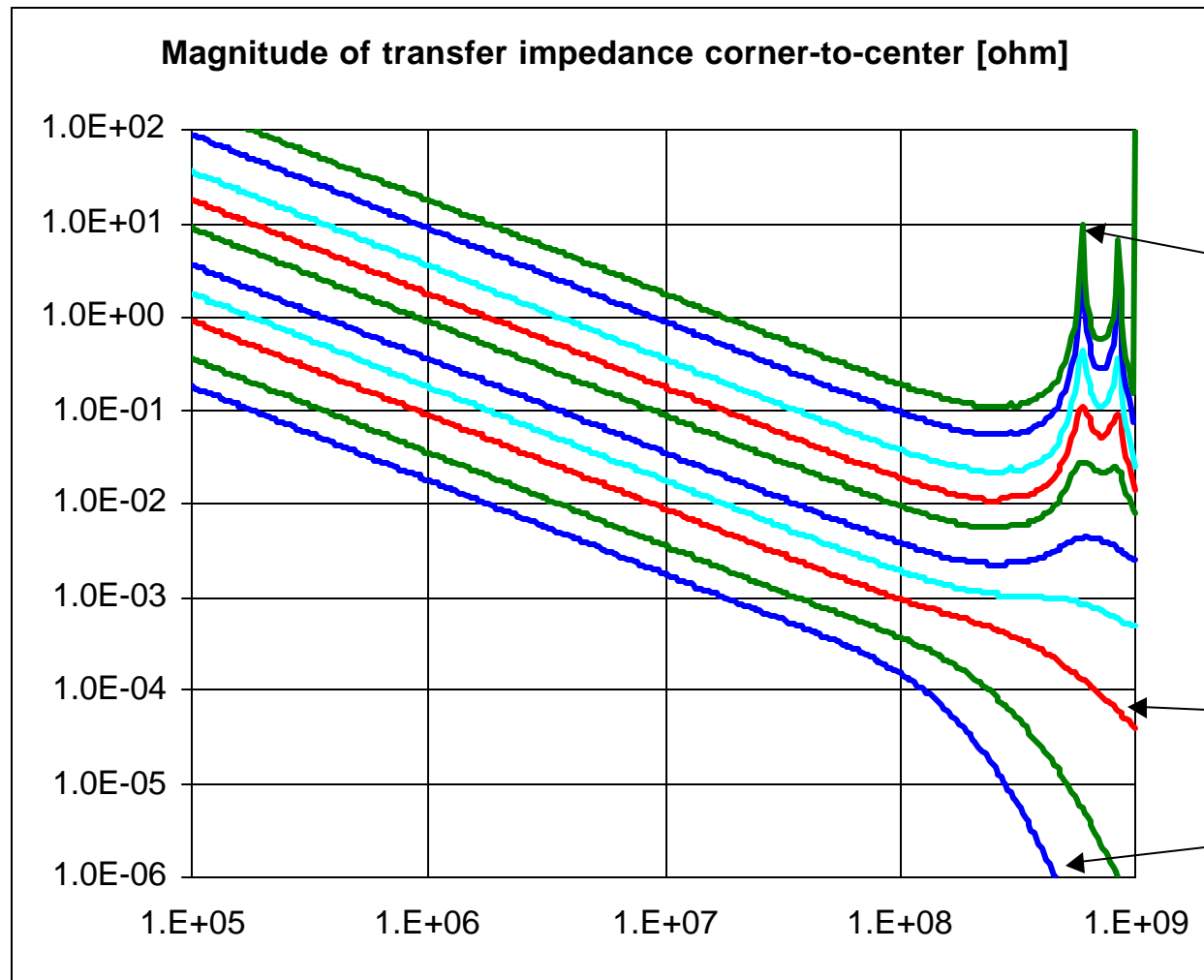
Resonance-Free Planes for $t < 0.3$ mils



10"x10" planes
Bare board
Simulated, $t =$

- 10-mil
- 5-mil
- 2-mil
- 1-mil
- 0.5-mil
- 0.2-mil
- 0.1-mil
- 0.05-mil
- 0.02-mil
- 0.01-mil

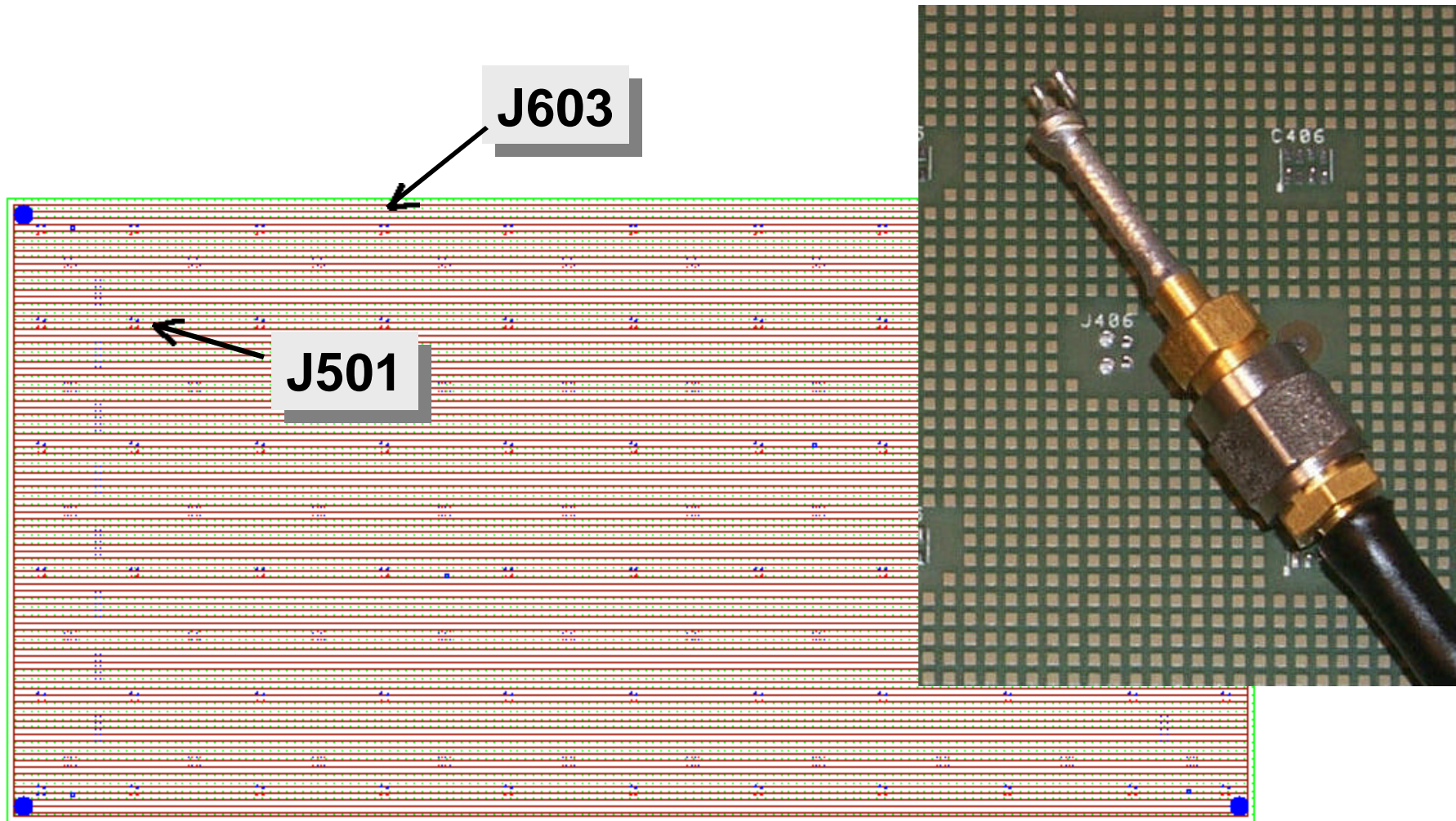
Low-pass Transfer for $t < 1\mu\text{m}$



10"x10" planes
Bare board
Simulated, $t =$

- 10-mil
- 5-mil
- 2-mil
- 1-mil
- 0.5-mil
- 0.2-mil
- 0.1-mil
- 0.05-mil (1.2um)
- 0.02-mil
- 0.01-mil

10"x5" Test Board



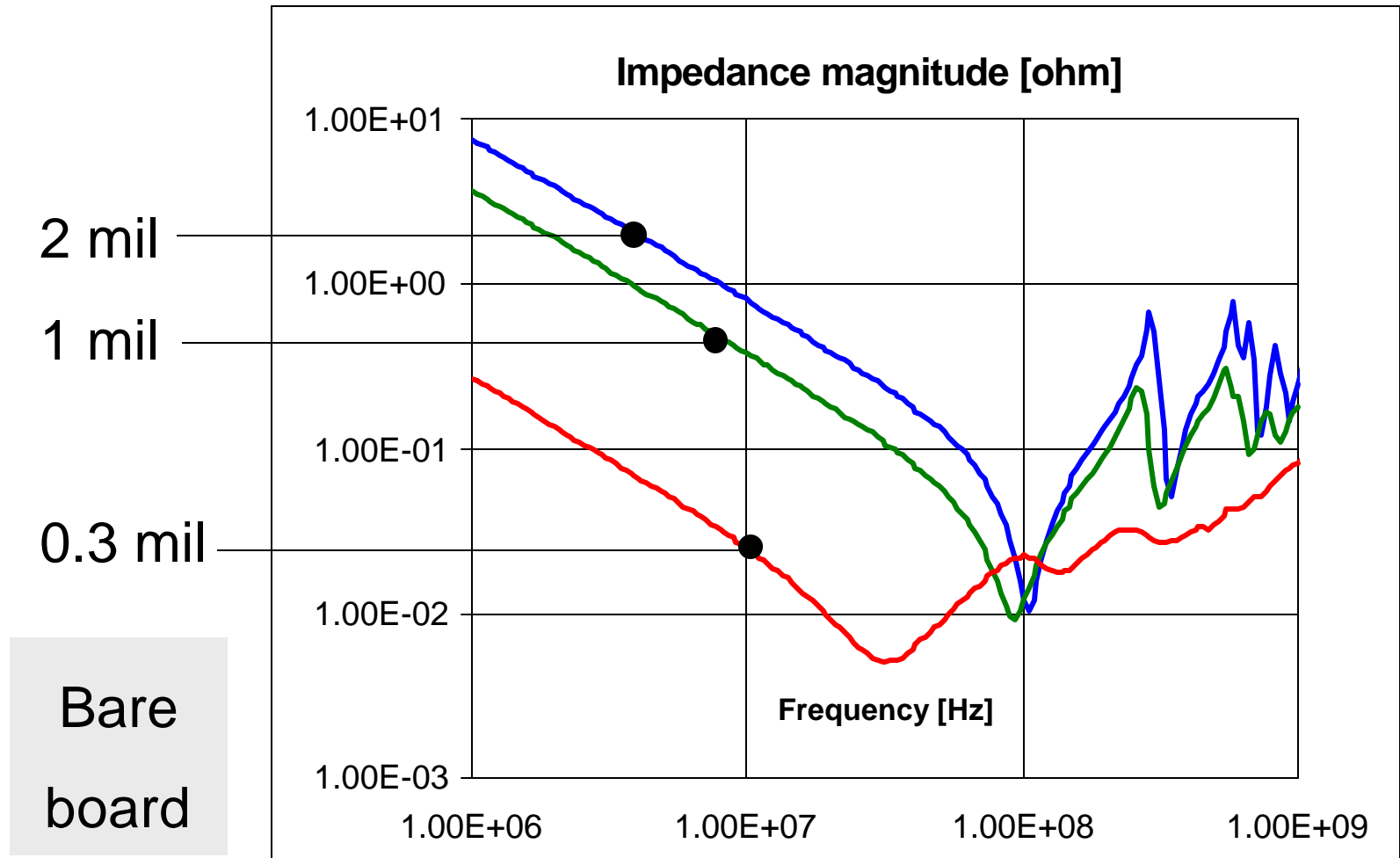
Thin laminate TecForum

4

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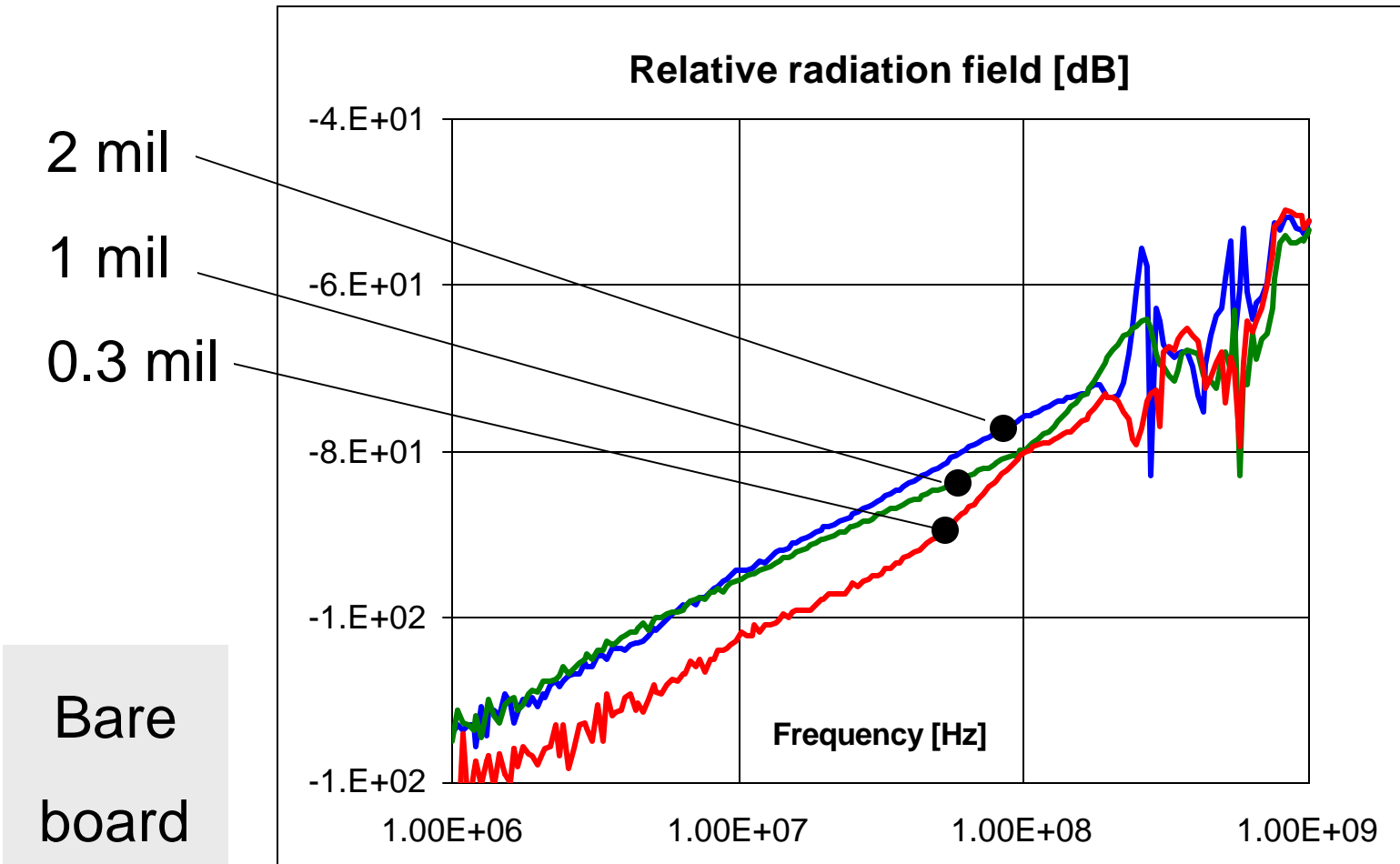


Measured Self Impedance

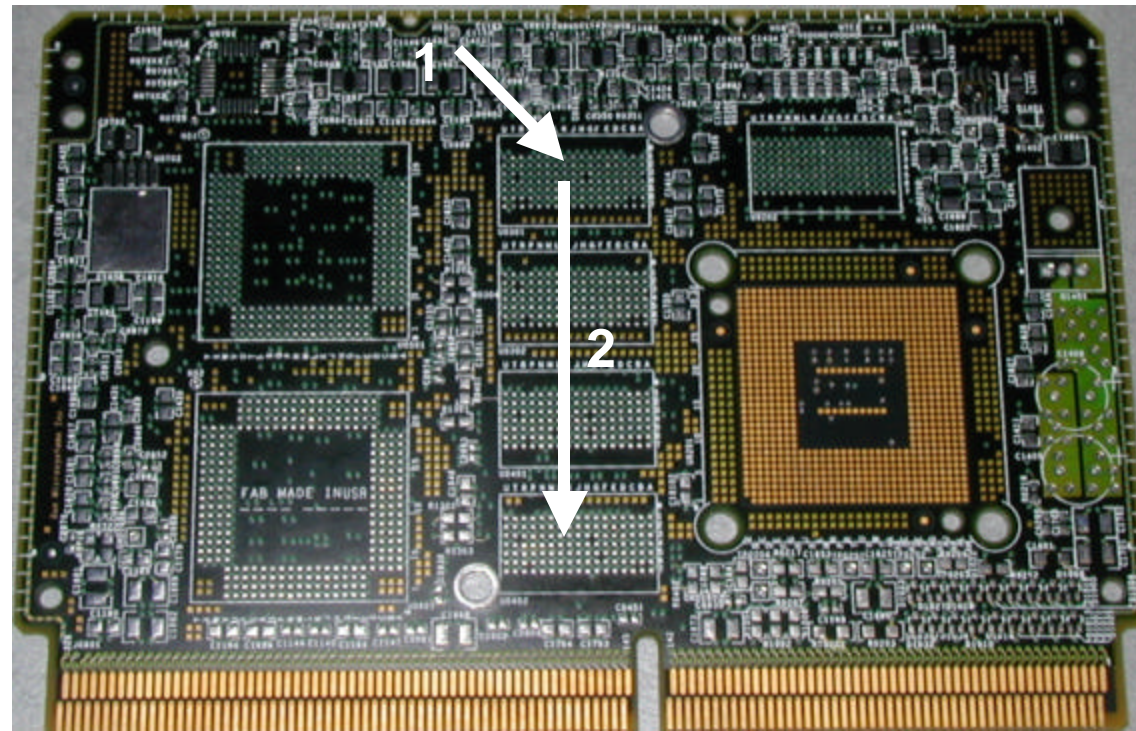


Bare
board

Measured Close-Field Radiation



Impedance on Small Board Geometry



← 6" →

Paralleled plane pairs

Bare board

Same construction, with

- Aromat 2-mil FR4 BC2000
- DuPont 1-mil HiK
- Aromat 1-mil FR4
- 3M 0.3-mil C-Ply

4"

Thin laminate TecForum

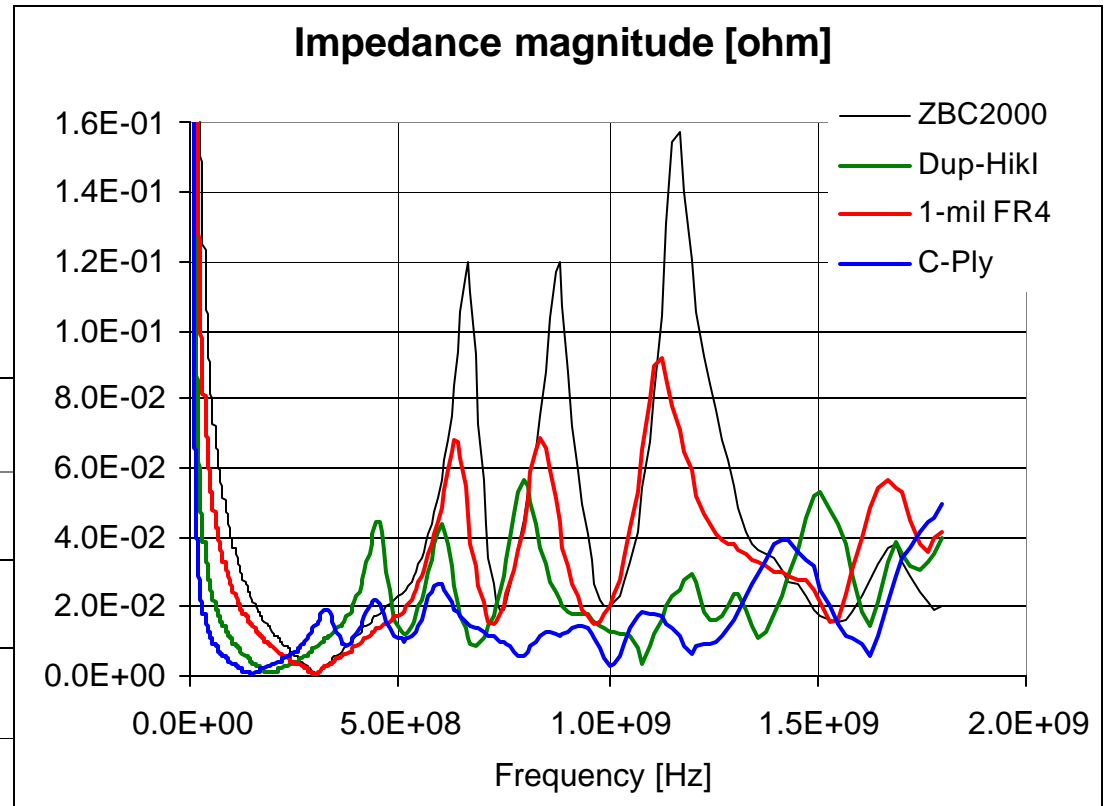
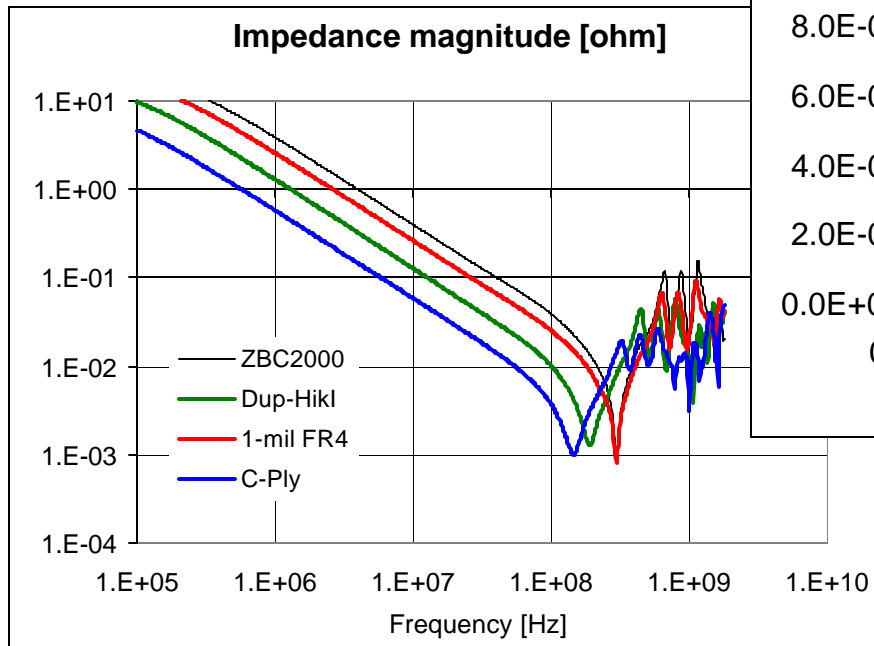
7

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Impedance on Small Board

Self-impedance at (1)



Impedance on Small Board

Transfer-impedance (2)

