PCB Insertion Loss

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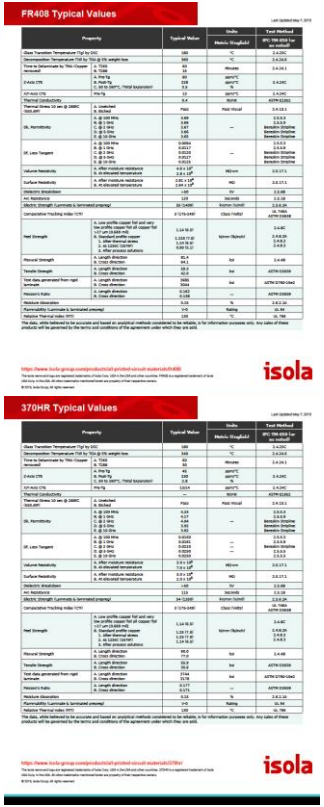
PCB Board Materials

- Isola FR408



- Isola 370HR

PCB Trace Parameters

- Width = 4 mils
- Thickness = 1.4 mils (assuming 1-oz copper)
- Length = 4.5 inches
- Material = Isola FR408

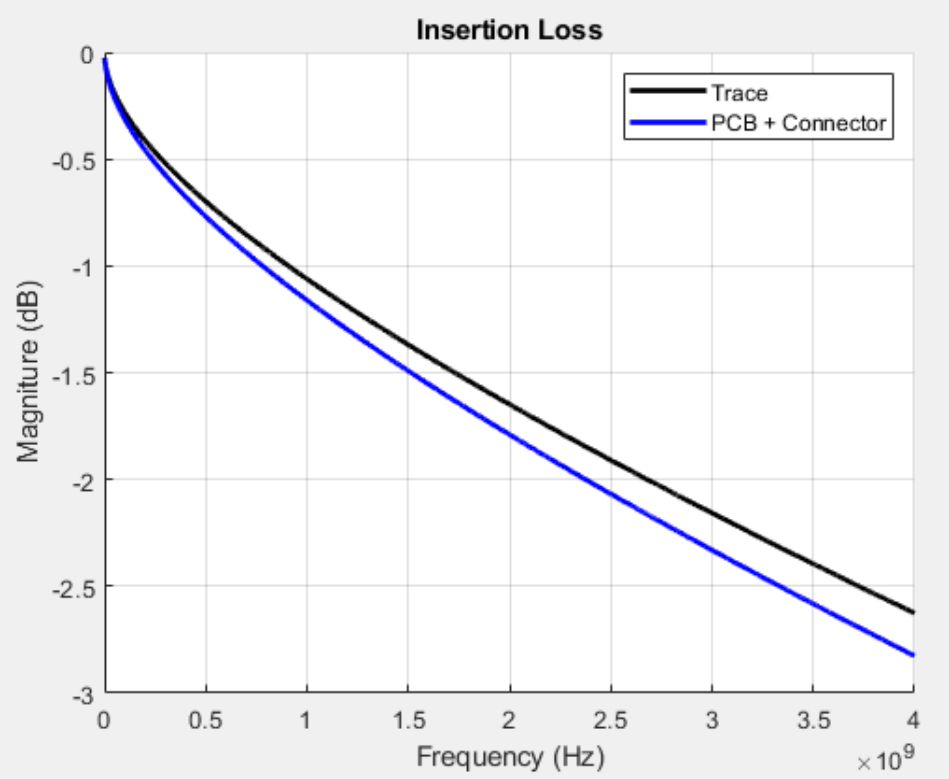
Equation for loss is

$$IL = \alpha_c\sqrt{f} + \alpha_d f$$

$$IL = 0.18\sqrt{f(GHz)} + 0.0559f(GHz) \text{ dB/in}$$

$$IL = 0.81\sqrt{f(GHz)} + 0.2515f(GHz) \; when \; Length \; is \; 4.5in$$

Insertion Loss Plot for Isola FR408



Connector is assumed to have

$$IL = 0.1\sqrt{f\ (GHz)}$$

PCB Trace Parameters

- PCB Trace Parameters
  - Width = 4 mils
  - Thickness = 1.4 mils (assuming 1-oz copper)
  - Length = 4.5 inches
  - Material = Isola 370HR

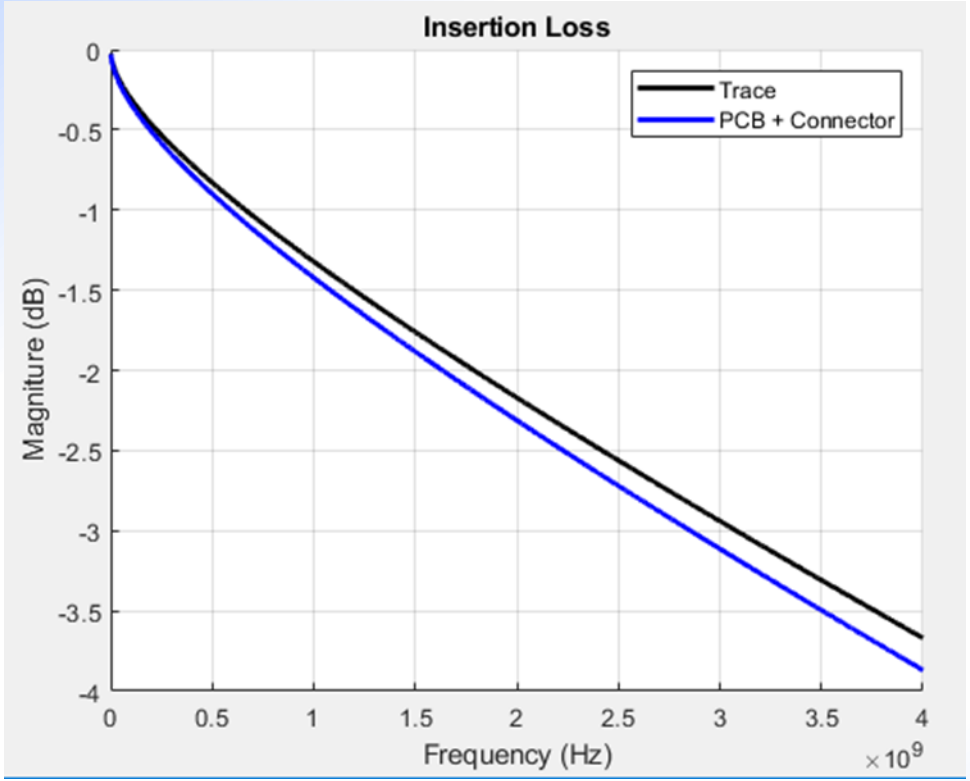
Equation for loss is

$$IL = \alpha_c\sqrt{f} + \alpha_d f$$

$$IL = 0.18\sqrt{f(GHz)} + 0.1138f(GHz) \text{ dB/in}$$

$$IL = 0.81\sqrt{f(GHz)} + 0.5123f(GHz) \; when \; Length \; is \; 4.5in$$

Insertion Loss Plot for Isola 370HR



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$$IL = 0.1\sqrt{f\ (GHz)}$$

Future Items

- Determine offset for loss at DC?
- What extra loss needs to be incorporated for on board components (e.g. CMC, termination, DC blocking caps, ESD Diodes, Vias, etc.)?
- Is 4.5in to long? Should the board space be shorter?
- How much of the overall budget is the board requiring?

Questions / Discussion