112G Cabled Backplane Channel and PCB Design Impact Using 112G Ready Connectors

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Motivation

Provide cabled backplane channel models which

- ❑ Illustrate 112 G ready connectors
- ❑ Illustrate BGA via impact on performance
  - At TP0 and TP5
- ❑ Illustrate 3 loss ranges (at 28 GHz)
  - 24 dB
  - 28 dB
  - 32 dB

Cabled Backplane Channel

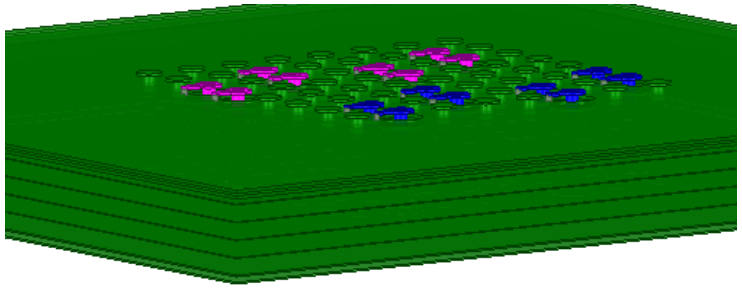
6 channels
2 PCB Via Options
- Opt1, Opt2

3 Loss targets
- 24dB / 28dB / 32dB IL @28GHz

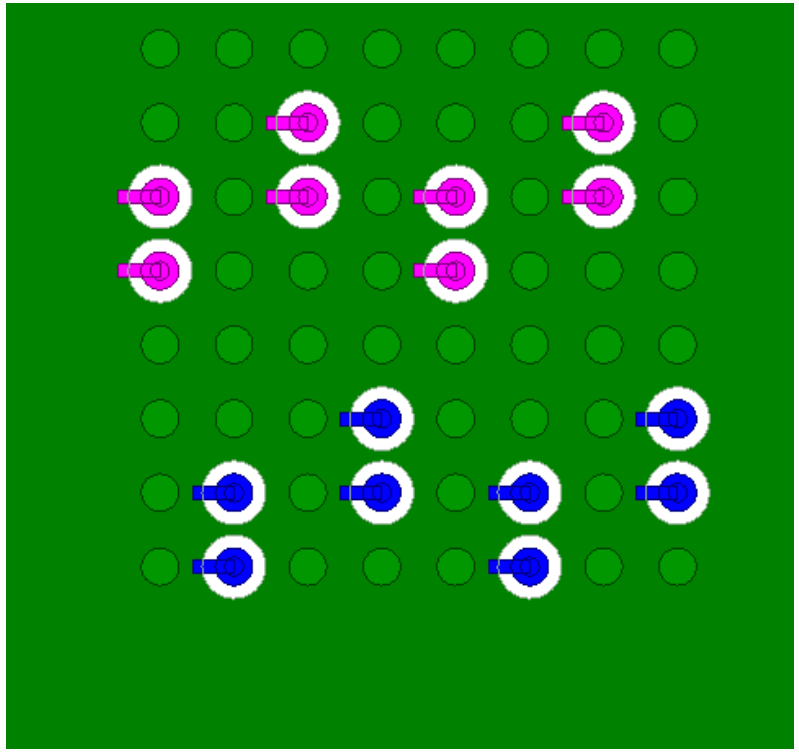
Option 1: Instrumented vias at TP0 and TP5

- This is how a channel would measured on a test cards with 2.4 mm SMA like connectors

Option2 BGA Region Via Model



A simple estimated model for the via field underneath the silicon end-agent was created.
This model is a conservative representation of a 1mm square array and not intended to be worst case.



Assumptions:

- 1mm square grid.
- Tx in Blue, Rx in Magenta
- Conservative Pin assignment
- Layer 1 to Layer 12 of 26 Layer.
  - ~13mil stub, ~64mil thru length
- Breakout routing not simulated.
- 10mil / 20mil / 34mil , drill/pad/anti-pad diameter
- Meg6 PCB Material Used

File Set Key

~ 24 dB @ 28 GHz	~ 28 dB @ 28 GHz	~ 32 dB @ 28 GHz	~ 24 dB @ 28 GHz	~ 28 dB @ 28 GHz	~ 32 dB @ 28 GHz
CaBP_BGAVia_Opt1_24dB.zip	CaBP_BGAVia_Opt1_28dB.zip	CaBP_BGAVia_Opt1_32dB.zip	CaBP_BGAVia_Opt2_24dB.zip	CaBP_BGAVia_Opt2_28dB.zip	CaBP_BGAVia_Opt2_32dB.zip
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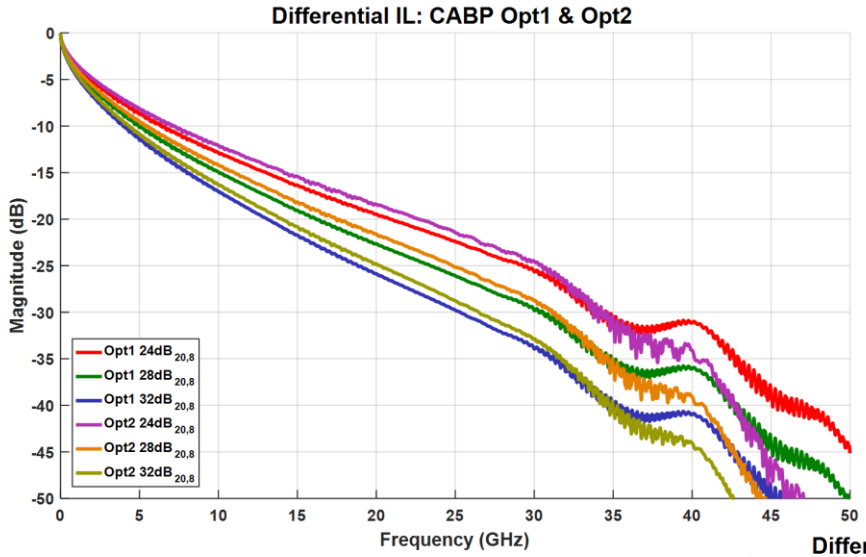
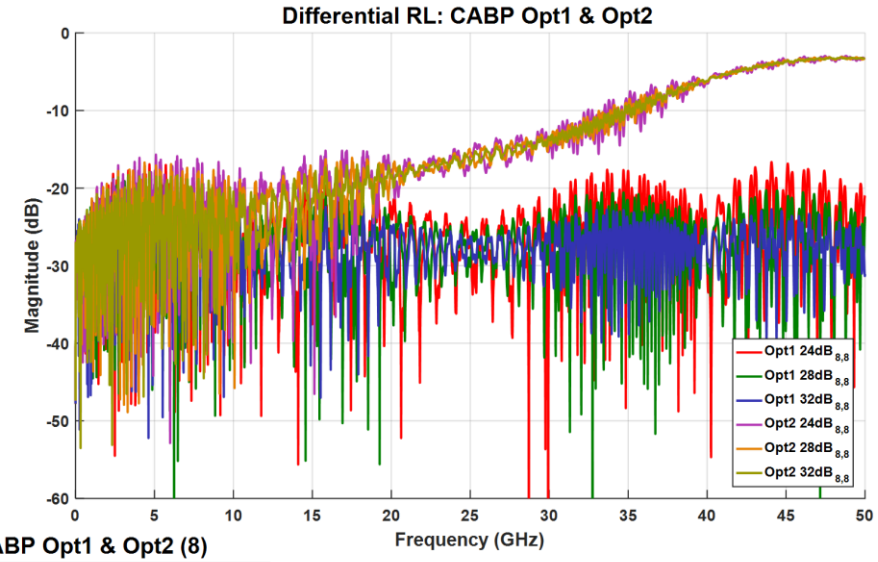
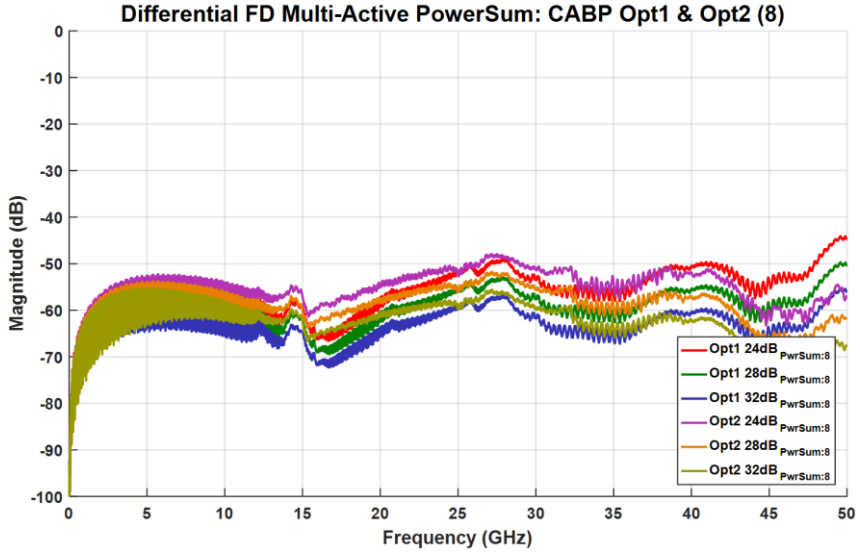
CaBP_BGAVia_Opt1_24dB_FEXT1.s4p	CaBP_BGAVia_Opt1_28dB_FEXT1.s4p	CaBP_BGAVia_Opt1_32dB_FEXT1.s4p	CaBP_BGAVia_Opt2_24dB_FEXT1.s4p	CaBP_BGAVia_Opt2_28dB_FEXT1.s4p	CaBP_BGAVia_Opt2_32dB_FEXT1.s4p
CaBP_BGAVia_Opt1_24dB_FEXT2.s4p	CaBP_BGAVia_Opt1_28dB_FEXT2.s4p	CaBP_BGAVia_Opt1_32dB_FEXT2.s4p	CaBP_BGAVia_Opt2_24dB_FEXT2.s4p	CaBP_BGAVia_Opt2_28dB_FEXT2.s4p	CaBP_BGAVia_Opt2_32dB_FEXT2.s4p
CaBP_BGAVia_Opt1_24dB_FEXT3.s4p	CaBP_BGAVia_Opt1_28dB_FEXT3.s4p	CaBP_BGAVia_Opt1_32dB_FEXT3.s4p	CaBP_BGAVia_Opt2_24dB_FEXT3.s4p	CaBP_BGAVia_Opt2_28dB_FEXT3.s4p	CaBP_BGAVia_Opt2_32dB_FEXT3.s4p
CaBP_BGAVia_Opt1_24dB_FEXT4.s4p	CaBP_BGAVia_Opt1_28dB_FEXT4.s4p	CaBP_BGAVia_Opt1_32dB_FEXT4.s4p	CaBP_BGAVia_Opt2_24dB_FEXT4.s4p	CaBP_BGAVia_Opt2_28dB_FEXT4.s4p	CaBP_BGAVia_Opt2_32dB_FEXT4.s4p
CaBP_BGAVia_Opt1_24dB_FEXT5.s4p	CaBP_BGAVia_Opt1_28dB_FEXT5.s4p	CaBP_BGAVia_Opt1_32dB_FEXT5.s4p	CaBP_BGAVia_Opt2_24dB_FEXT5.s4p	CaBP_BGAVia_Opt2_28dB_FEXT5.s4p	CaBP_BGAVia_Opt2_32dB_FEXT5.s4p
CaBP_BGAVia_Opt1_24dB_NEXT1.s4p	CaBP_BGAVia_Opt1_28dB_NEXT1.s4p	CaBP_BGAVia_Opt1_32dB_NEXT1.s4p	CaBP_BGAVia_Opt2_24dB_NEXT1.s4p	CaBP_BGAVia_Opt2_28dB_NEXT1.s4p	CaBP_BGAVia_Opt2_32dB_NEXT1.s4p
CaBP_BGAVia_Opt1_24dB_NEXT2.s4p	CaBP_BGAVia_Opt1_28dB_NEXT2.s4p	CaBP_BGAVia_Opt1_32dB_NEXT2.s4p	CaBP_BGAVia_Opt2_24dB_NEXT2.s4p	CaBP_BGAVia_Opt2_28dB_NEXT2.s4p	CaBP_BGAVia_Opt2_32dB_NEXT2.s4p
CaBP_BGAVia_Opt1_24dB_NEXT3.s4p	CaBP_BGAVia_Opt1_28dB_NEXT3.s4p	CaBP_BGAVia_Opt1_32dB_NEXT3.s4p	CaBP_BGAVia_Opt2_24dB_NEXT3.s4p	CaBP_BGAVia_Opt2_28dB_NEXT3.s4p	CaBP_BGAVia_Opt2_32dB_NEXT3.s4p

Insertion Loss, Return Loss & Powersum Crosstalk







Thank You!