BGA Package Analysis

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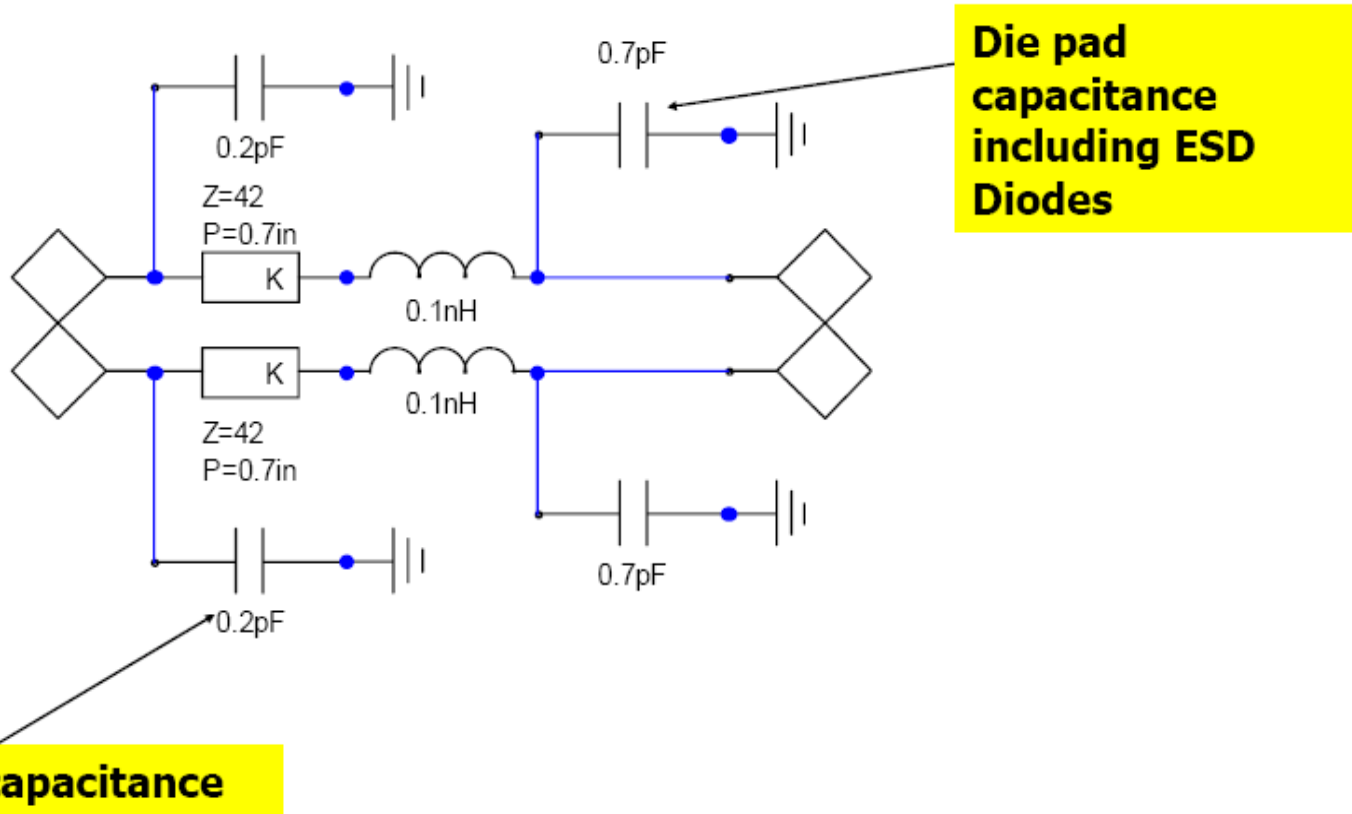
Overview

- Current package model seems to offer two flavors , both an inductive like and cap like model
- Current model based upon specs that are (measured?) from previous estimates
- Verification of these numbers modeled for a sanity check

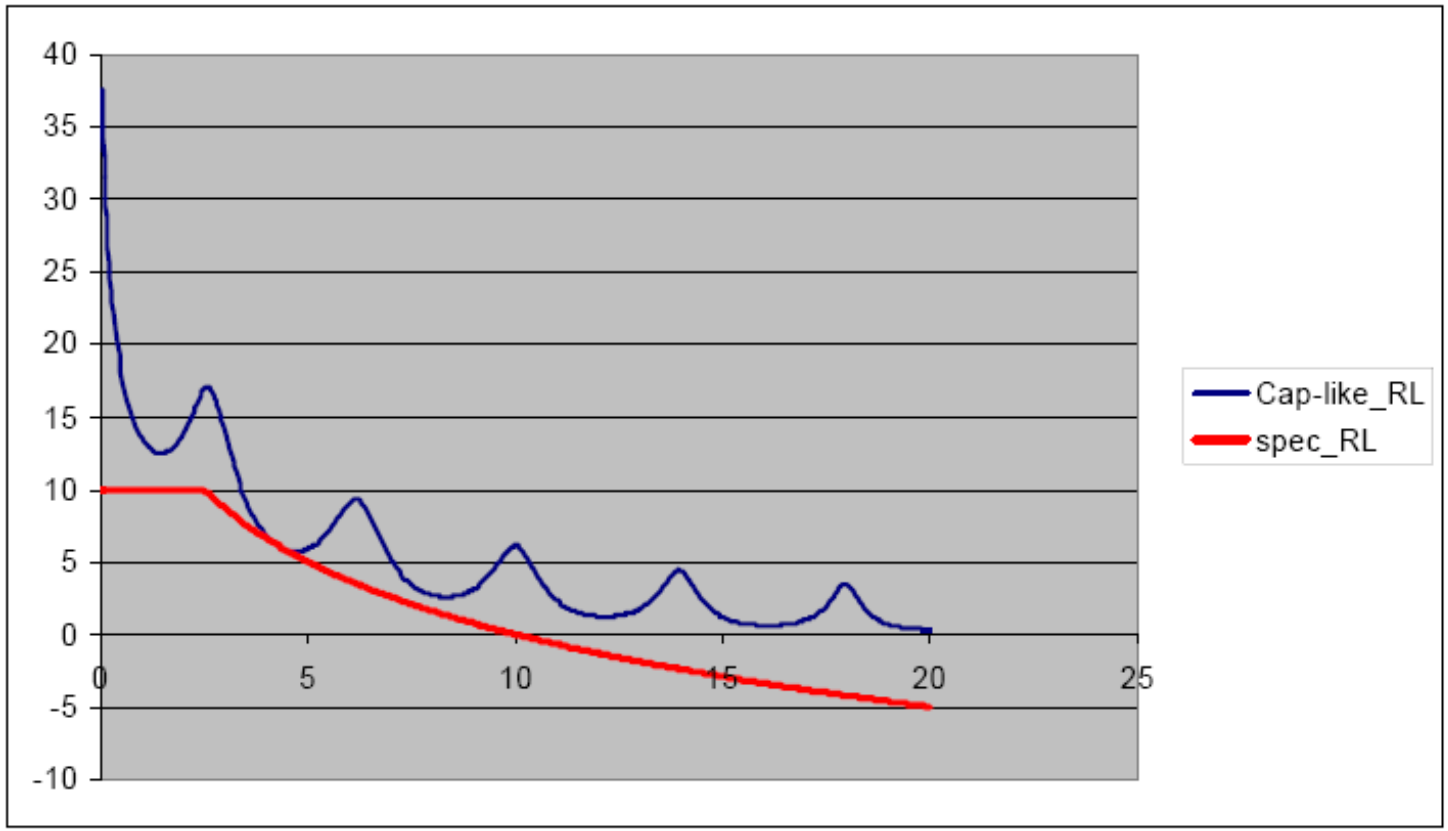
Model construction as of now

Basic Model - Mellitz02_0505



Previous modelled results

Basic Model from latest package info (Mellitz02_05_05)

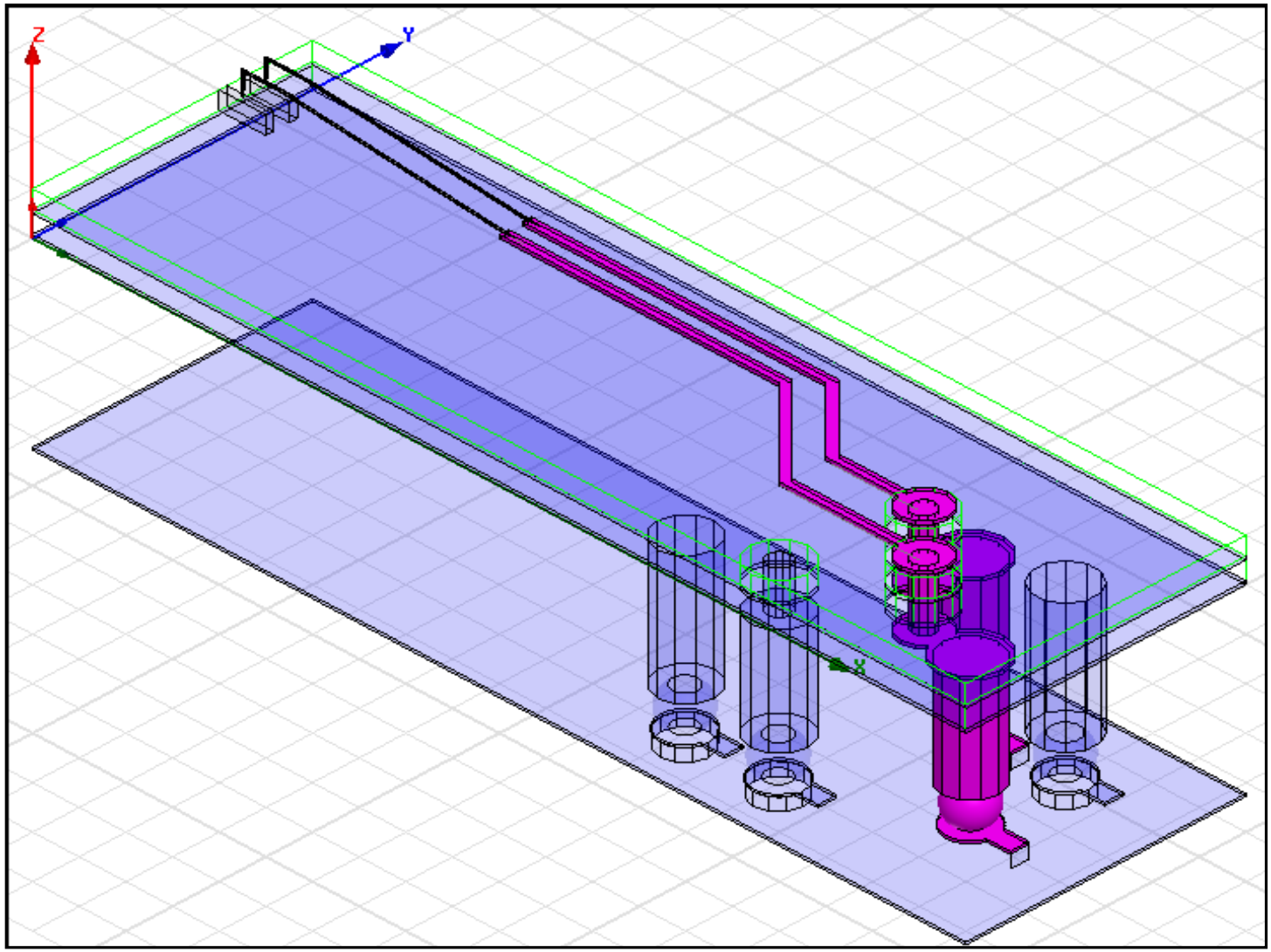


IF(B4<fbr,rl5,rl5-16.6*LOG(B4/fbr)) Fbr=2.5 (in GHz) rl5=10 (in dB)

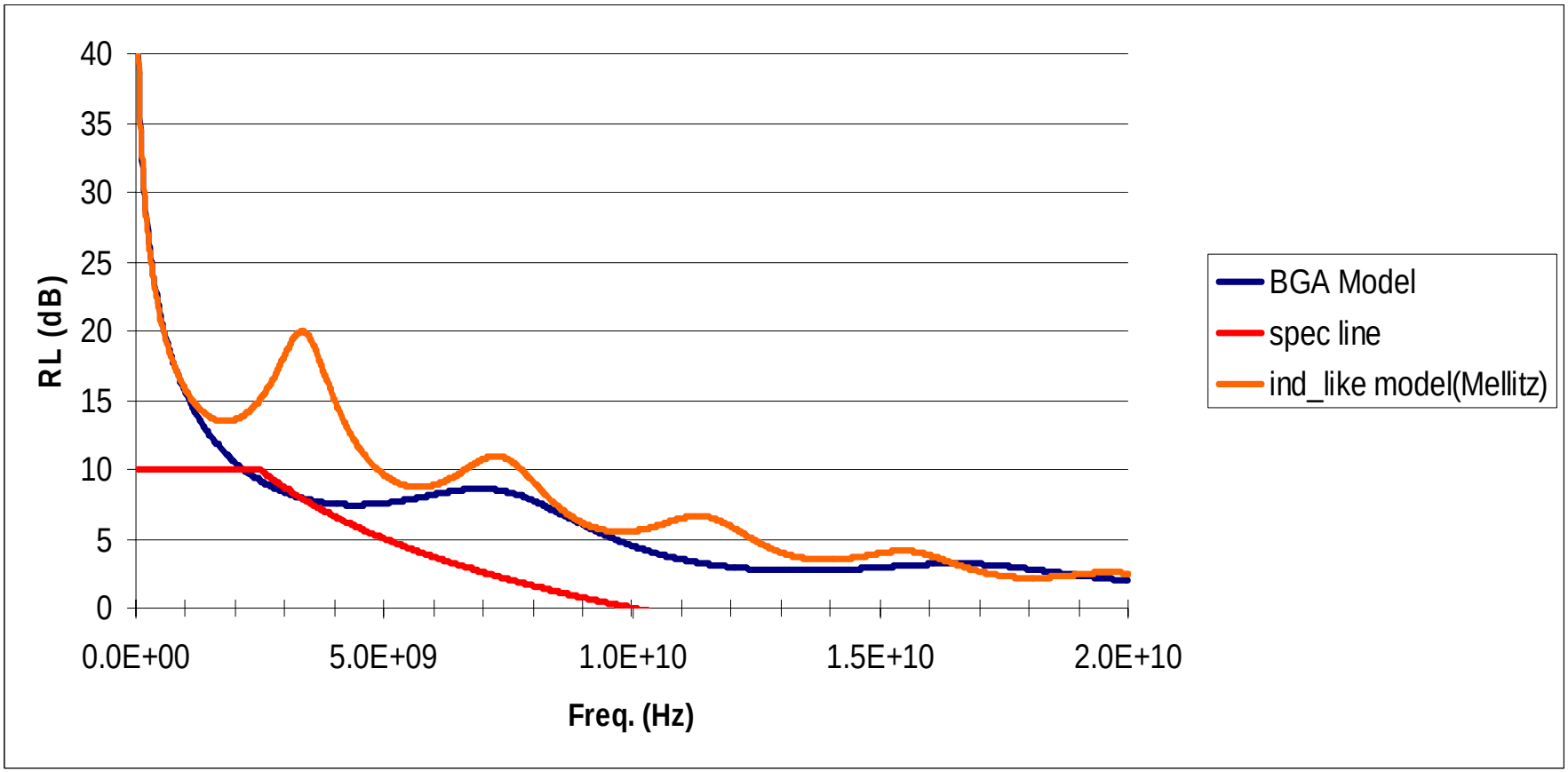
Ansoft simulation - Particulars

- Create BGA model similar to the one described again in Mellitz02_0505
- As worst case, die connects to transmission line via small bond wires
- Traverses no more than 0.5 inch
- Included eutectic solder ball and solder pad- but NOT via below package
  - (diameter of ball and pad are 0.47 and 0.48mm)
- Adjacent GND return path to both traces
- Assume Dk material in and around trace planes (Dk=4.2)

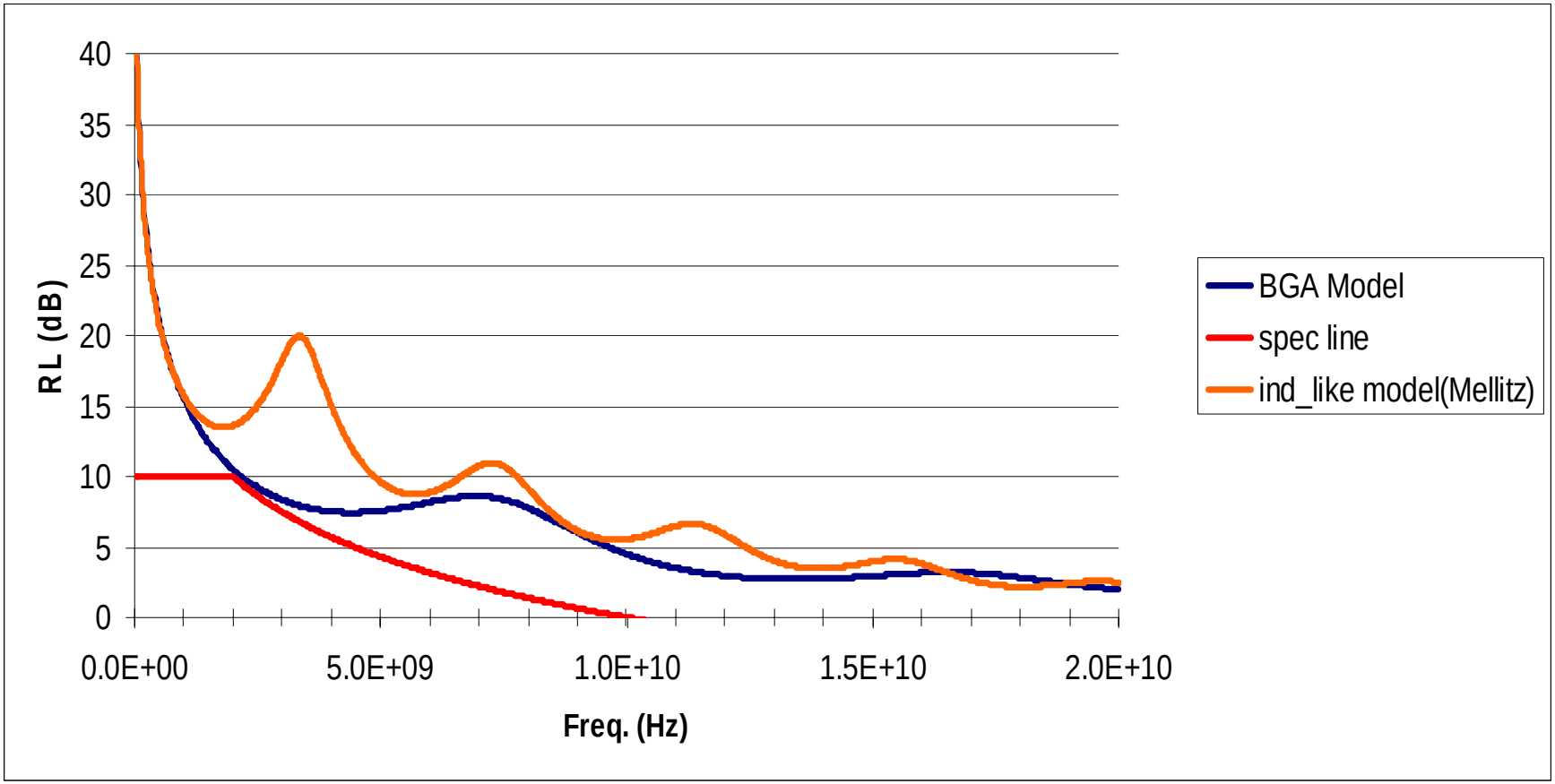
Ansoft Model



Current Spec ((Mellitz02_05_05) and Data



Updated graph Adjusted Spec



Adjusted spec: Fbr=2Ghz, Rl5 = 10dB

If(X<Fbr ,Rl5 else (Rl5-14.31*log(X/Fbr))

Summary

- RL results show similar falloff but a problem at the corner of the suggested RL spec
- Recommend that RL spec be adjusted (Rl5-14.31*log(x/Fbr) slightly to compensate based upon results of package model analysis