Q&A Session from Webinar:
Accurate Component Junction and Case Temperate

Q: The compact model has big practical advantage. But, the problem is that we don't have them for most packages. I hope the IC industry will take steps to provide standard resistance models to make it possible to do more meaningful thermal analysis and predictions.

A: I hope so too. It is great that JEDEC has issued standards as it gives the Delphi model a better standing to be taken up by more manufacturers.

Q: The TC temp given by a chip vender is, let's say, 85, so if my case temperature on the PCB, under the chip, is 85 or less, does that mean it is OK? Or, is it very important to model the chip properly for it to be OK?

A: As everything it would depend on the accuracy of your model. As you saw a 2R model may give you around 30% error in some cases, if the temperature is critical it would always be best practice to model in as much detail as you are able, although typically a Delphi model would be around 5% error.

Q: If I use a cuboid to simulation a component, since I do not have any information, how would I get max junction temperature?

A: You wouldn't be able to get a junction temperature with just a cuboid with a conductivity, you should however get an indication of case temperature.

Q: If a manufacturer doesn't give the resistance values how can you obtain them to use a compact thermal model?

A: Mentor Graphics has an online service that can be used to create two resistor and Delphi models. If you do not know the exact detail of the component the FloTHERM.Pack will make some standard assumptions about the package design for you.

Q: Does the online service have any associated cost?

A: Yes there is a cost associated with this service. Your local Mentor Graphics office will be able to help you more with that.

Q: If a package has one heat path that dominates all others, will a theta-JC model then produce reasonably accurate results?

A: Theta-JC is not a good characterization to use in simulation. If there is only one heat path it is more likely that a 2R model would be OK - depends on what the heat path is.

Q: This may be a little out of the scope, but how do you deal with components that rely heavily on circuit board contribution to the overall heat transfer path (i.e. QFN packeages with a bottom thermal paddle). Which CTM is better suited? Do you need to have a detailed model of all of the copper in the PCB including thermal vias?

A: A Delphi model would be better suited, however the real problem in those cases is getting the representation of the PCB accurate. It is possible now with FloEDA within FloTHERM to more accurately represent the copper traces in the layers of the board for these cases.