CADMP-II Training Exercise

Component Packaging Design Tradeoff Analysis

Enter the CADMP-II program by typing Username: CADMP; Password: CADMP

Select [Components] then select [Device] then choose [LCC] and select [OK].
Next select [Model] then [Package].

Starting with the LCC, use the attached list of parameters to generate a CADMP model for a surface mount ceramic power module in the package designer.

Then select [Model] then [Profile] and choose [Office].
Ensure that the parameters are the same as in the attached environmental parameters list.

Using your model perform the following exercises:

1) Perform a thermal analysis of the package using the boundary conditions listed below, and determine the maximum temperature of the die.

- Top – Ambient temperature = 25C, H = 50
- Sides – Leads = 25C, Non-leads = Insulated
- Bottom = 25C
- Grid = 10 x 10
- Maximum Iterations = 500
- Temperature Convergence = 0.5 C
- Conductivity Convergence = 1%
- Relaxation Factor = 1.000

What is the maximum temperature of the die?

2) Perform a reliability analysis of the package using the results of the thermal analysis.

What is the failure mechanism causing failure in the shortest time?
What is the time-to-failure by that mechanism?
What is the mechanism causing failure in the next shortest time?
What is the time-to-failure by that mechanism?

3) Return to the package designer and increase the thickness of the device attach from 1.5 mils to 6 mils. Then rerun the thermal analysis with the same boundary conditions.

What is the maximum temperature of the die now?
Is it higher or lower than before? Why?

4) Rerun the reliability analysis with the results of the new thermal analysis.

Now what is the failure mechanism causing failure in the shortest time?

What is the time-to-failure by that mechanism?
What is the mechanism causing failure in the next shortest time?
What is the time-to-failure by that mechanism?

5) Run the sensitivity analysis program using start at –20%, end at 20%, and number of steps at 40 to determine

What is the current density at which the two mechanisms cause failure in the same time?

What is the temperature at which the two mechanisms cause failure in the same time?