**Transient Analysis Example**

This example builds on the "Non-isothermal Example w/ a Bracket Attached". The previous model is converted to a model in which a steady-state analysis with fluid flow is first run and is then followed by a transient analysis with no fluid flow.

The transient conditions to be modeled are:

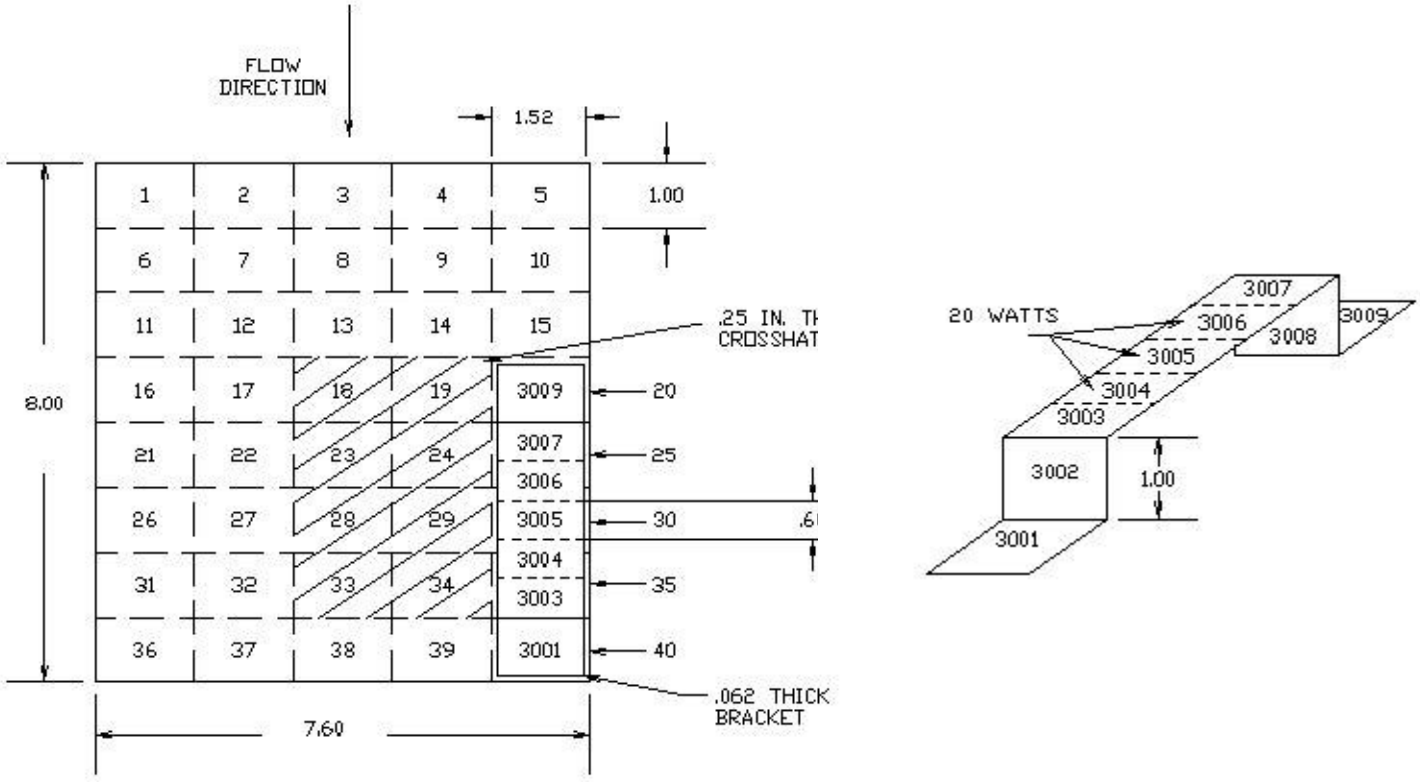
- assume that the thermal mass of the other parts of the assembly that is not being modeled has the effect of quintupling the specific heat of the cold plate base plate so that its effective aluminum specific heat is 5 X 7.07 = 35.35 W-MIN/(LB-C)
- the thermal mass of nodes 3001,3002, 3008 and 3009 is 7.07 W-MIN/(LB-C) X (.062 IN. Thick) X (1.52 IN Wide) X (1.0 IN. LONG) = .067 W-MIN/C
- the thermal mass of nodes 3003 and 3007 is .6 X .067 = .04 W-MIN/C
- the thermal mass of nodes 3004, 3005 and 3006 which includes a TO-3 component is .12 W-MIN/C

Determine the temperatures after the model has reached steady-state and the fluid flow has been turned off for 3 minutes. Write out the results every .5minute.

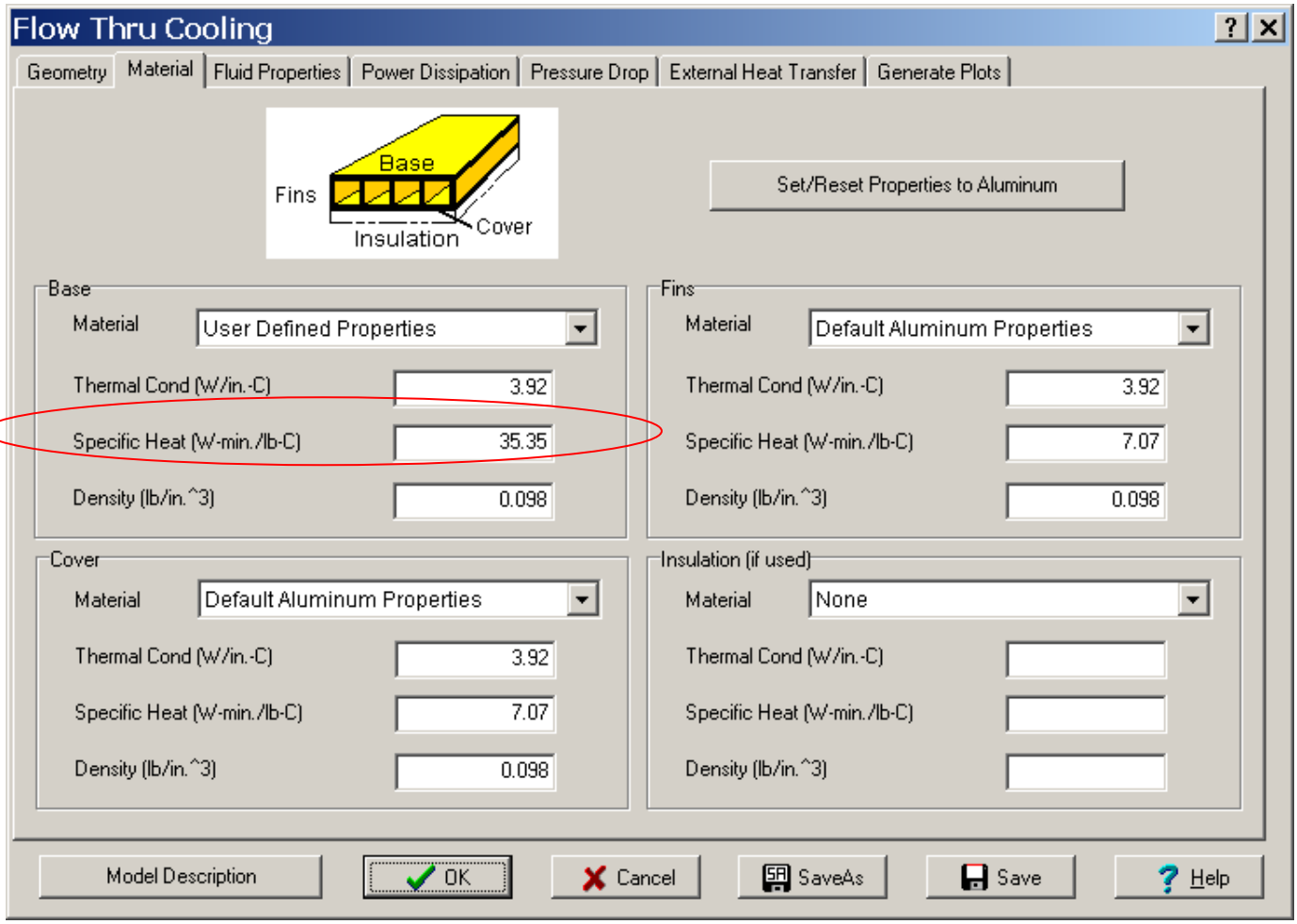
First change the time units to minutes.

Set the type of analysis to a steady-state followed by a transient with no flow. Set the total time to 3 minutes and the output print time to 1.0 minute.

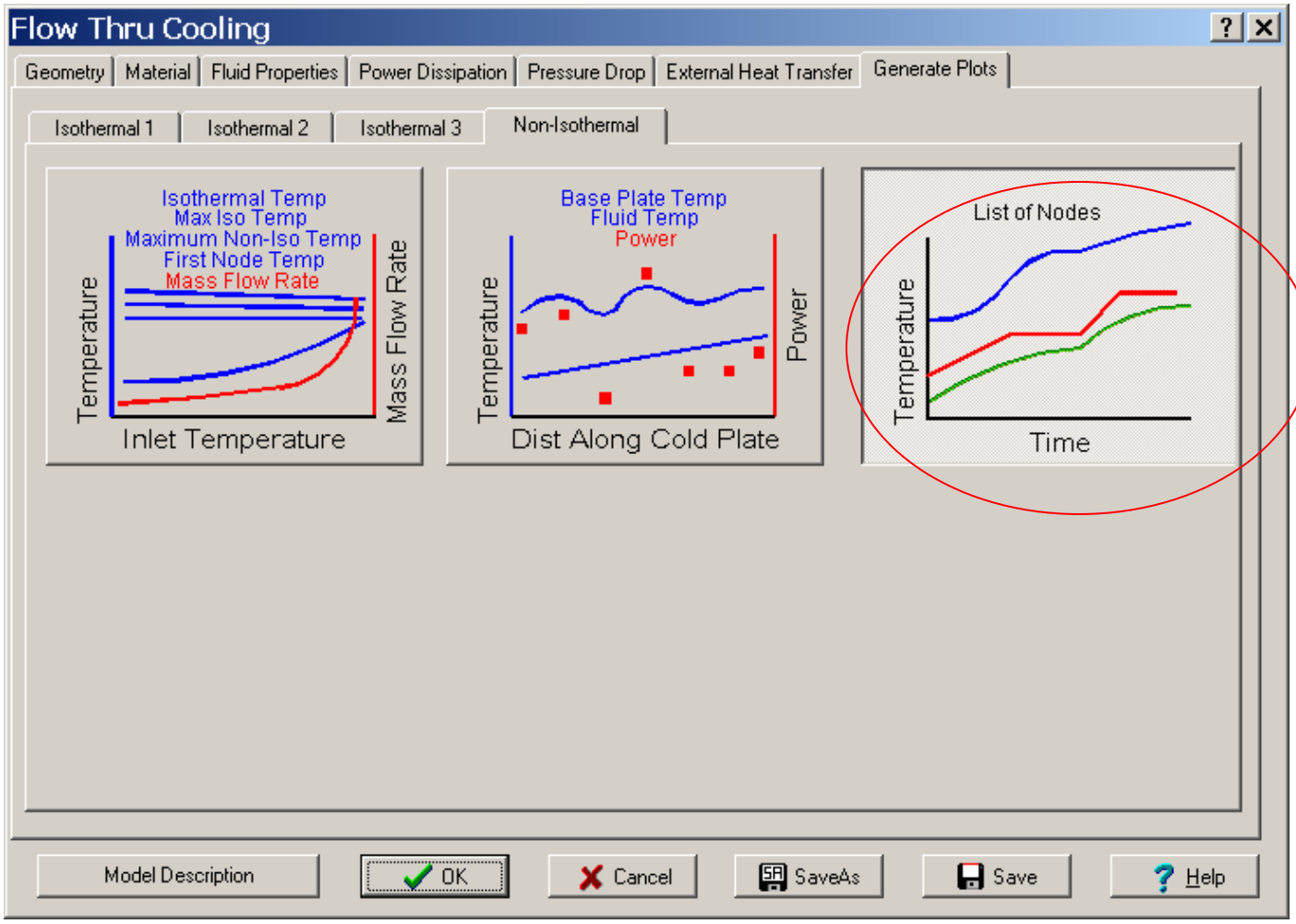
Plot the temperature of nodes 3, 38 and 3005.

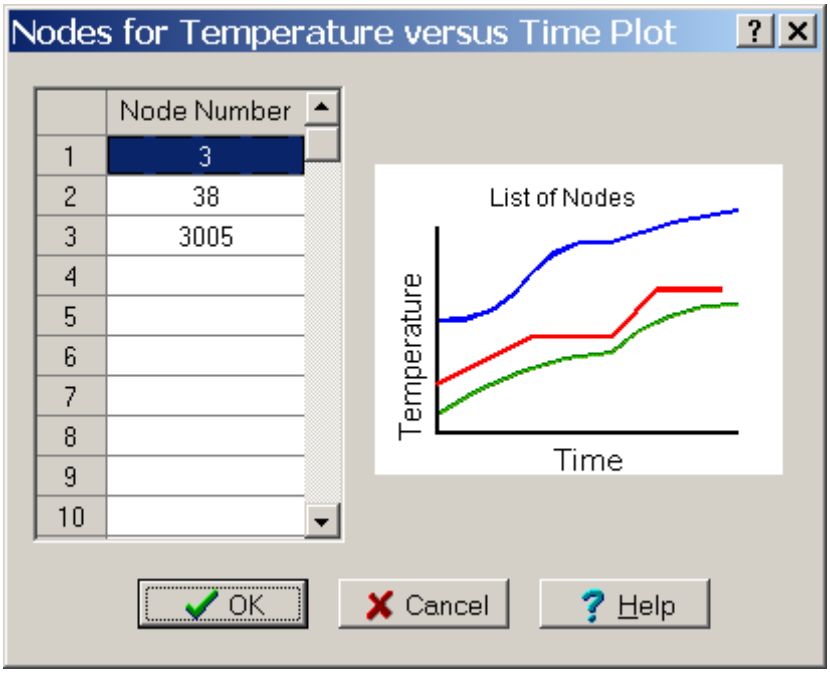


Increased thermal mass of the base plate



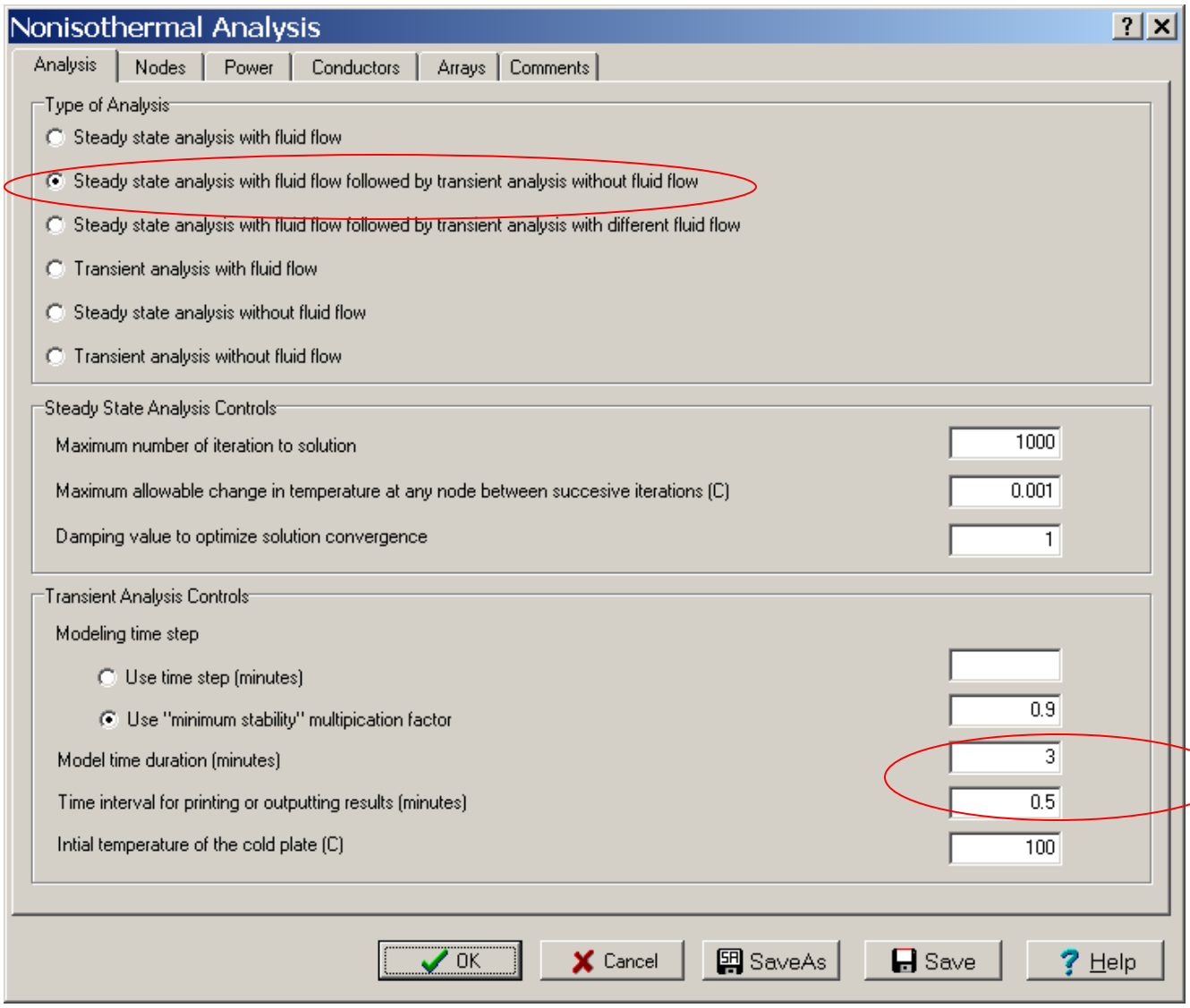
Select Transient Plot to define the nodes to be plotted.



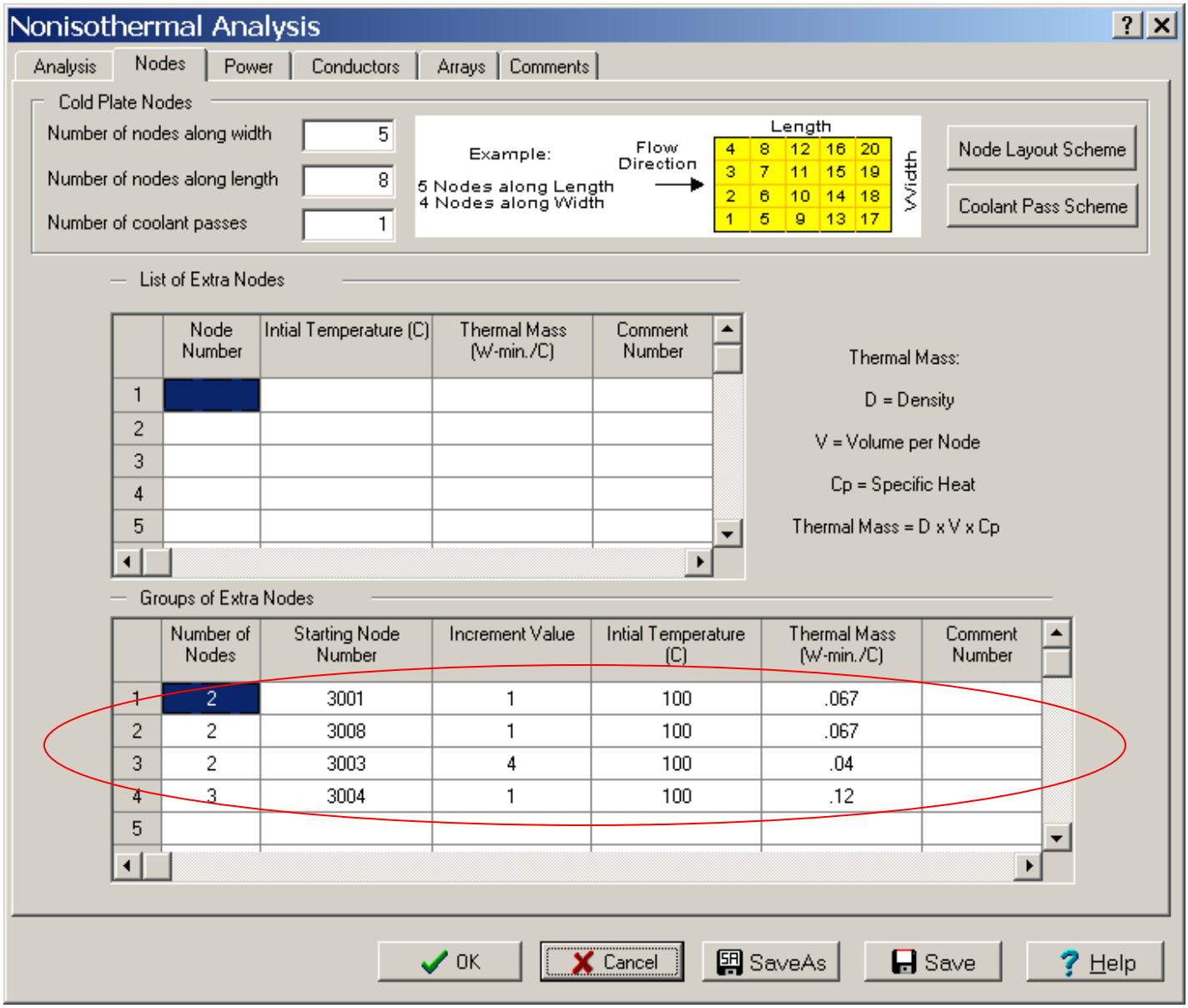

 

Select type of analysis to be preformed and define time duration and output print time.



Define the thermal mass of the bracket nodes.



Results show temperature increase after 3 minutes without cooling air.