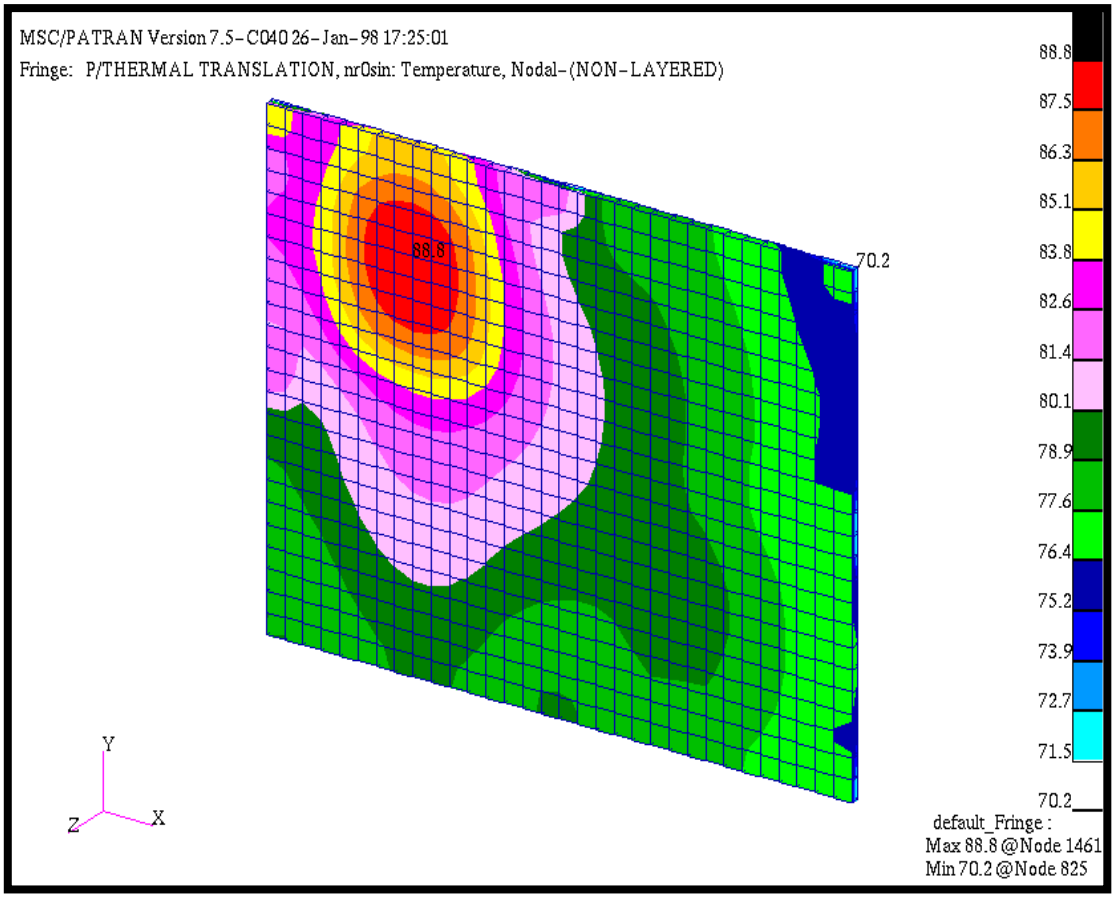
Exercise 20

SINDA Translation of a PWB Model



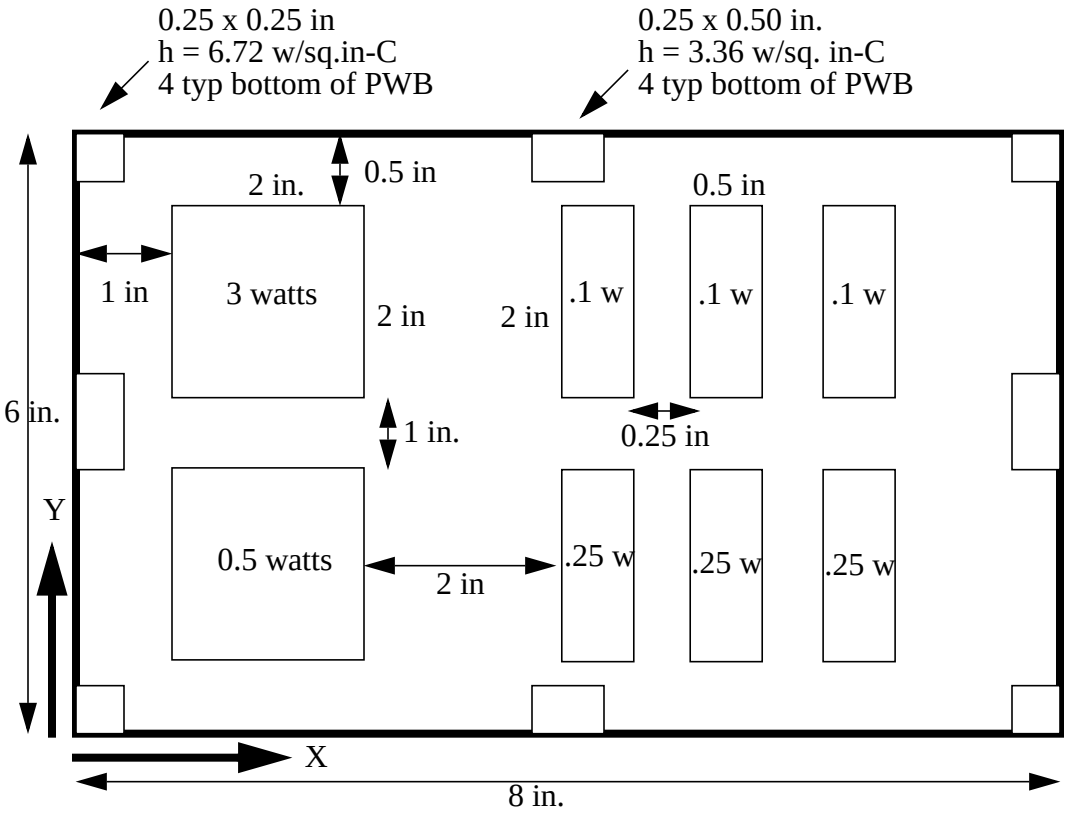
Objective:

- Create a model by playing a session file.
- Produce a run-ready SINDA/G deck from the model and post-process the SINDA/G temperature results.

Model Description:

In this exercise you will read a session file which will construct a board level PWB (Printed Wiring Board) heat transfer model. When the session file ends it will have produced a model that is ready to analyze. You will run the analysis in MSC/THERMAL but you will also produce a run-ready SINDA/G deck.

Since the platform on which you work this exercise may not have a SINDA/G executable module, results from SINDA/G are provided. With the possible exception of actually running the SINDA/G analysis, you will have used MSC/PATRAN to produce a syntactically correct SINDA/G deck and read in the resulting temperatures.



PWB is 0.125 in. thick
kx = ky = 0.825 w/in-C
kz = 0.01 w/in-C
Tambient = 70 C

NOT TO SCALE

Figure 1

Exercise Overview:

- Create a new database named **exercise_20.db.** Set *Tolerance* to **Default,** and the ***Analysis Code*** to **MSC/THERMAL**.
- Use **File/Session/Play...**. to read **exercise_20.ses** file and create the analysis model of Figure 1.
- Prepare and submit model for analysis selecting Submit **Option/Create SINDA File** (model.sin).
- Modify the **Select Results File...** filter to retrieve **nr0.sin**.
- Modify the **Select Rslt Template File...** filter to use the **sinda.res_tmpl** template.
- Plot SINDA/G results.
- Go to the *Job Name* subdirectory to review the contents of **model.sin.01**.
- **Quit** MSC/PATRAN.

Exercise Procedure:

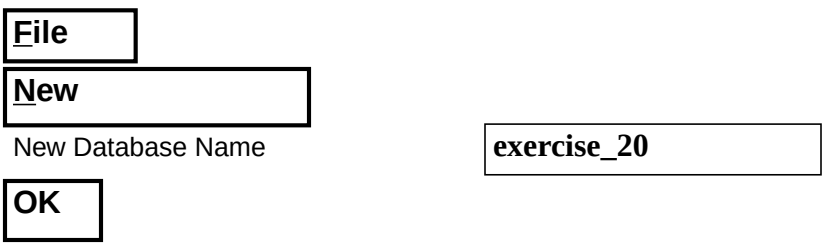
Open a new database

1. Open a new database named **exercise_20.db**.

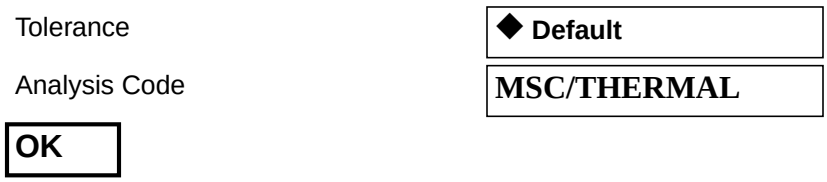
Within your window environment change directories to a convenient working directory. Run MSC/PATRAN by typing **p3** in your xterm window.

Next, select **File** from the *Top Menu Bar* and select **New…** from the drop-down menu. Assign the name exercise_20.db to the new database by clicking in the *New Database Name* box and entering **exercise_20**.

Select **OK** to create the new database



MSC/PATRAN will open a Viewport and change various *Control Panel* selections from a ghosted appearance to a bold format. When the *New Model Preferences* form appears on your screen, set the *Tolerance* to **Default,** and the *Analysis Code* to **MSC/THERMAL**. Select **OK** to close the New Model Preferences form.

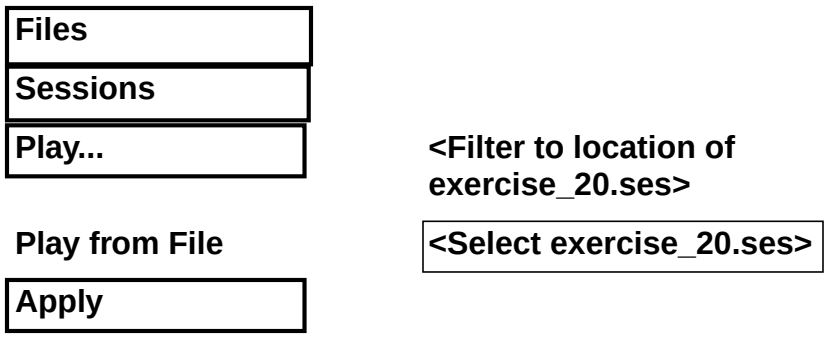


2. Use **File/Session/Play...** to read **exercise_20.ses** file and create the analysis model of Figure 1.

Read Session File

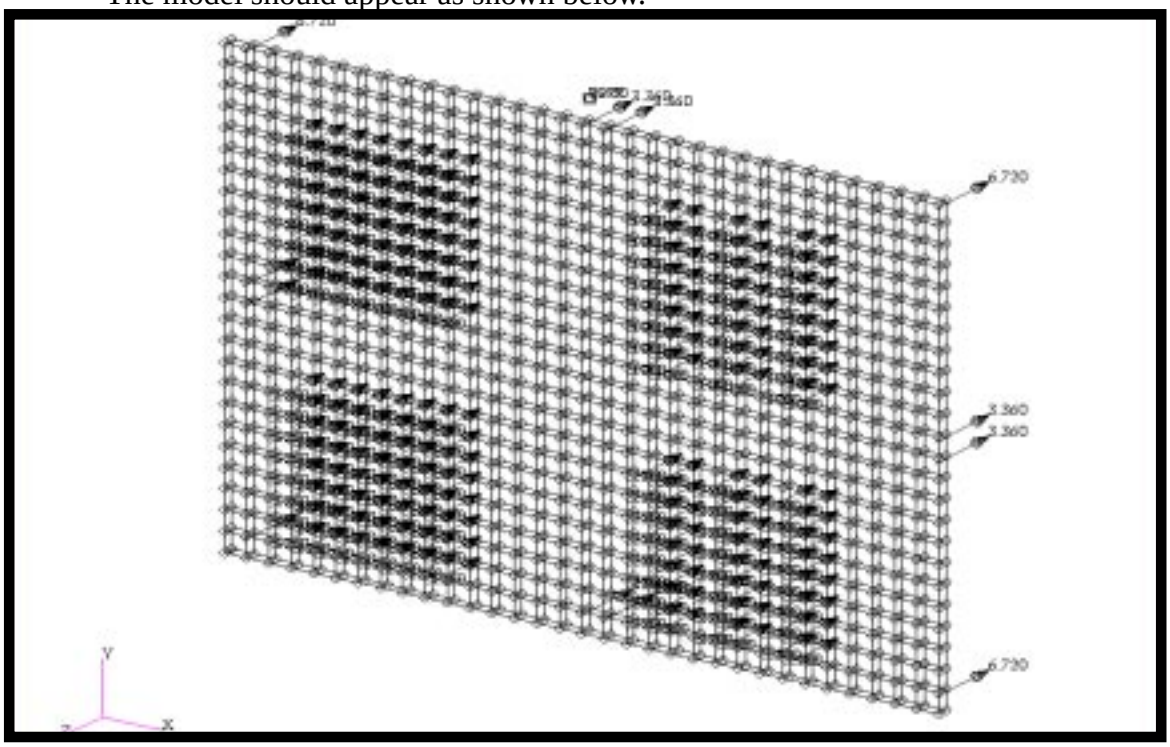
In order to guarantee that the model you crated will have the correct node ID's in the proper sequence, you will create the model from a session file. Node sequence and location is important since the **nr0.sin** file identifies model temperatures with node IDs.

The session file, once initiated, will run autonomously until the model is completed.



Wait until the session file has completed the model. The *Heartbeat* will remain green and the Command Line History Window will indicate that "**Session file stopped playing**"

The model should appear as shown below.



IsoMesh the surfaces

3. Prepare and submit model for analysis.

Use the Tool Bar *Node Size* icon to reduce the size of the nodes.

Go to the Analysis from to setup the analysis.

◆ Analysis

Analyze/Full Model/Full Run

Solution Parameters...

Calculation Temperature Scale — **◆ Celsius**

OK

Output Requests...

Units Scale for Output Temperatures — **◆ Celsius**

OK

Submit Options... — **◆ Create SINDA Input File (model.sin)**

OK

Apply

4. Modify the **Select Results File...** filter to retrieve **nr0.sin**.

Modify Result File

Although the MSC/THERMAL solver is also now solving this network a previous analysis was run on SINDA/G. The results are available in the file called nr0.sin.

In order to locate this SINDA/G model results file you must change the filter in the Select File form.

◆ **Analysis**

Read Result/Result Entities

Select Results File...

Filter — <change ***.nrf*** to ***.***>

Filter

Directories — **<locate the delivered file nr0.sin: it is usually located in your home directory>**

Available Files — **<select nr0.sin>**

OK

Apply

5. Modify the **Select Rslt Template File...** filter to use the **sinda.res_tmpl** template.

Modify Template File

Select Rslt Template File...

Filter — <change **pthermal*.res_tmpl** to ***.res_tmpl**>

Filter

Files — **<select sinda.res_tmpl>**

OK

Apply

Plot results

6. Plot SINDA/G results.

To plot the results to posted FEM use the **Results** *Application radio button*.

◆ **Results**

Create/Quick Plot

Select Result Cases — **TIME: 0.0000000000D+00 S...**

Select Fringe Result — **Temperature,**

Apply

Select the *Fringe Attributes* icon.

Display: — **Element Edges**

Label Style...

Label Format: — **Fixed**

Significant figures — **3 <use slider bar>**

OK

Apply

At this point you may wish to read the MSC/THERMAL results and compare them. Be sure to change the template file for the MSC/THERMAL nr0.nrf.01 results set.

Review Input Deck

7. Go to the *Job Name* subdirectory to review the contents of **model.sin.01**.

To view the SINDA/G input deck which was created, go to a UNIX shell and **cd** to the *Job Name* subdirectory, **exercise_20**. The input deck is the file **model.sin.01** and can be viewed with any editor.

Quit MSC/ Patran

8. Quit MSC/PATRAN

To stop MSC/PATRAN select **File** on the *Menu Bar* and select **Quit** from the drop-down menu.