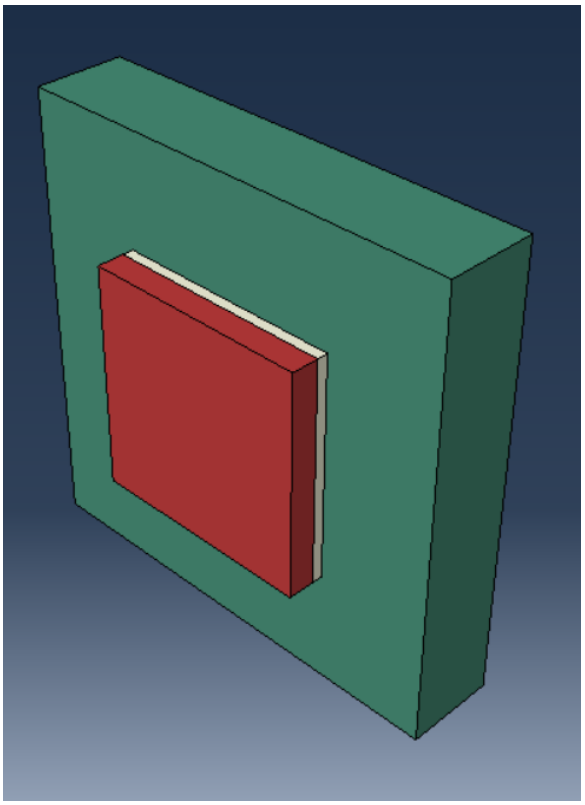
Project 10: ABAQUS Thermal Analysis of a Flip Chip Package

Problem Statement: Conduct a thermal analysis of a flip chip package (chip+STIM layer+heat spreader) and calculate nodal temperature of each layer of the package.

Geometry:



Material Properties:

Heat Spreader: Density: 8.96e-6, k=0.401, sp.heat = 380.

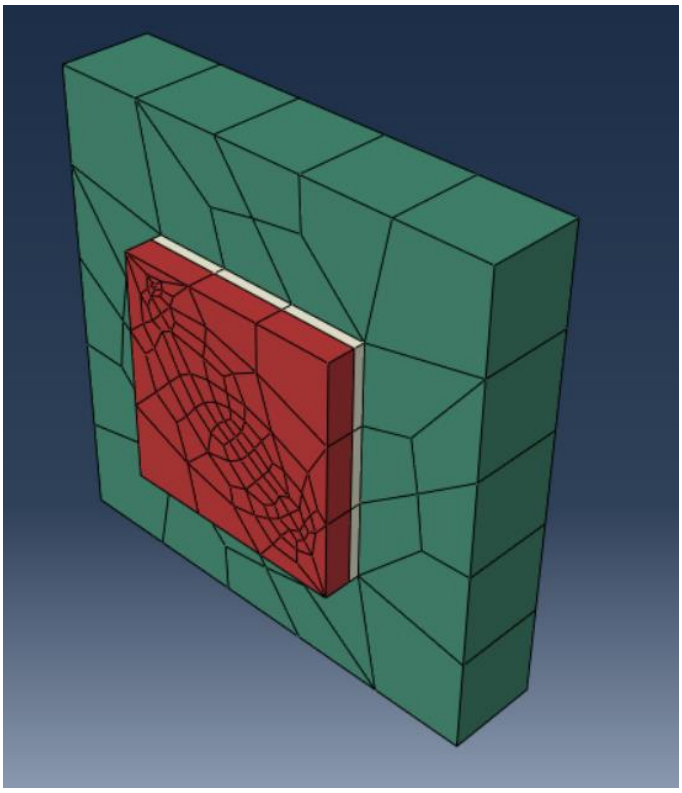
STIM layer: Density: 8.41e-6, k=0.0578, sp.heat = 8.41e-6.

Silicon Chip: Density: 2.32e-6, k=0.11, sp.heat = 700.

Loading and boundary conditions:

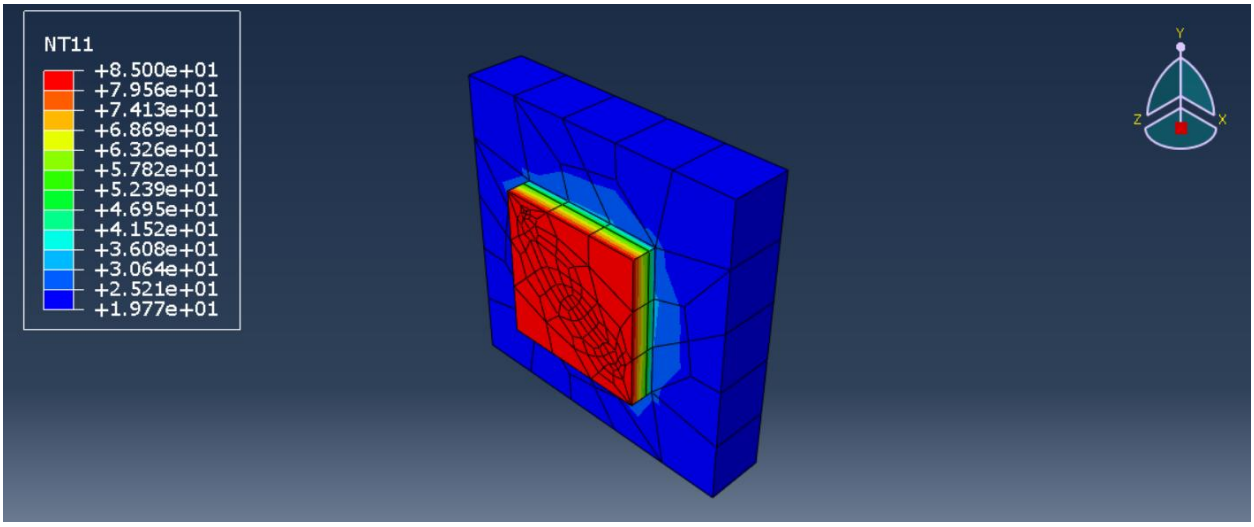
1) Top surface of chip has temperature of 85.
2) Bottom surface of heat spreader has temperature of 20.

Mesh: (coarse due to limitation of 1000 nodes in ABAQUS educational version).

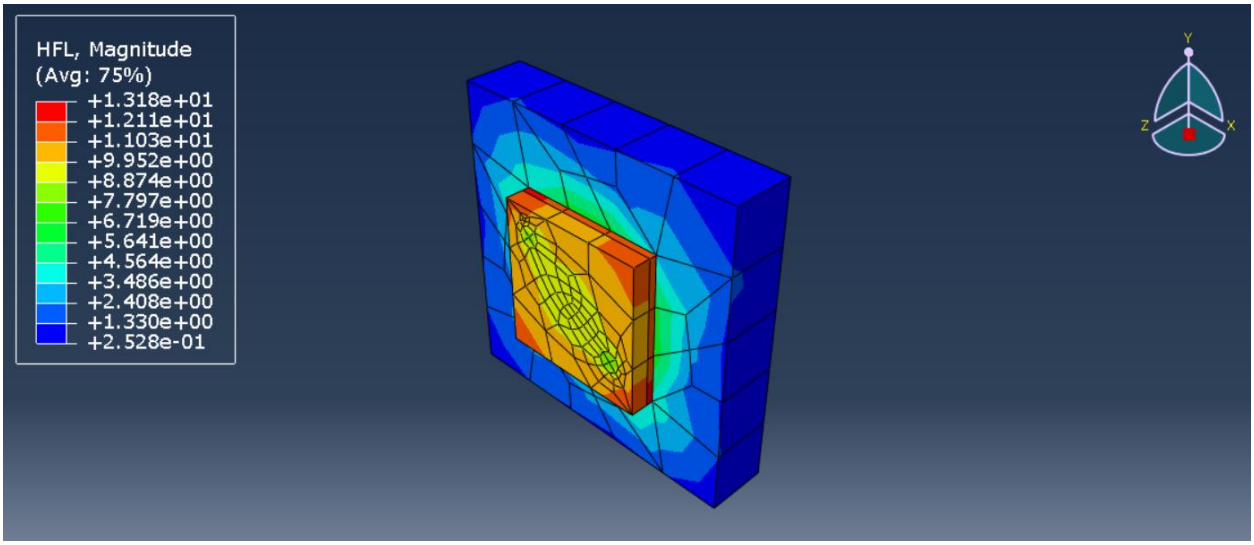


Results:

Nodal temperature:



Heat flux:



Nodal temperature of STIM layer: