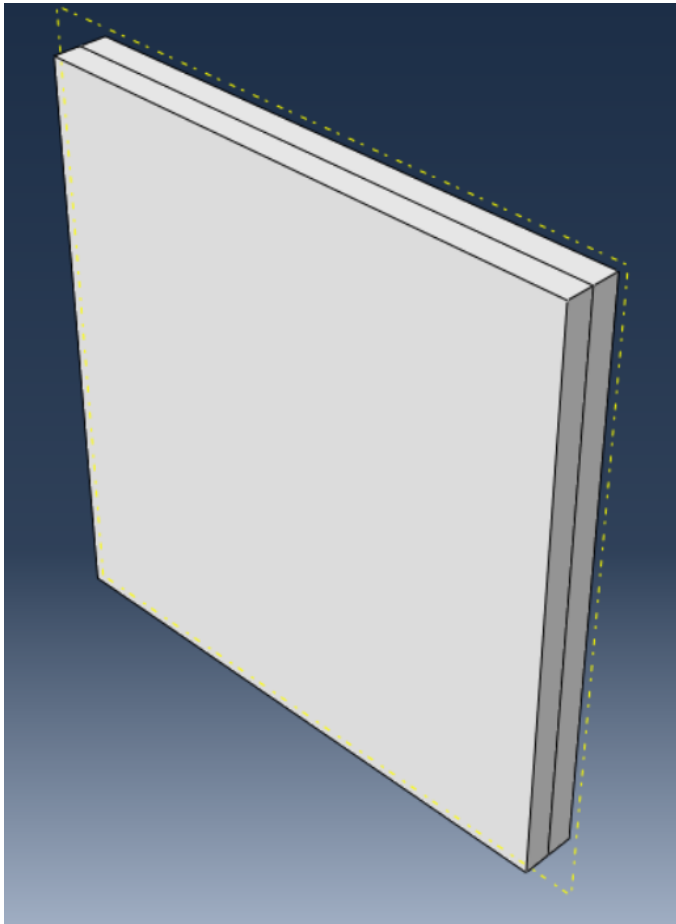Project10: Semiconductor Package and Via Sub modeling

Problem Statement: Model a minimal semiconductor package and calculate stress values in fine features (such as a metal via).

Geometry:

Global Model (core+dielectric):

Material Properties:

Core:

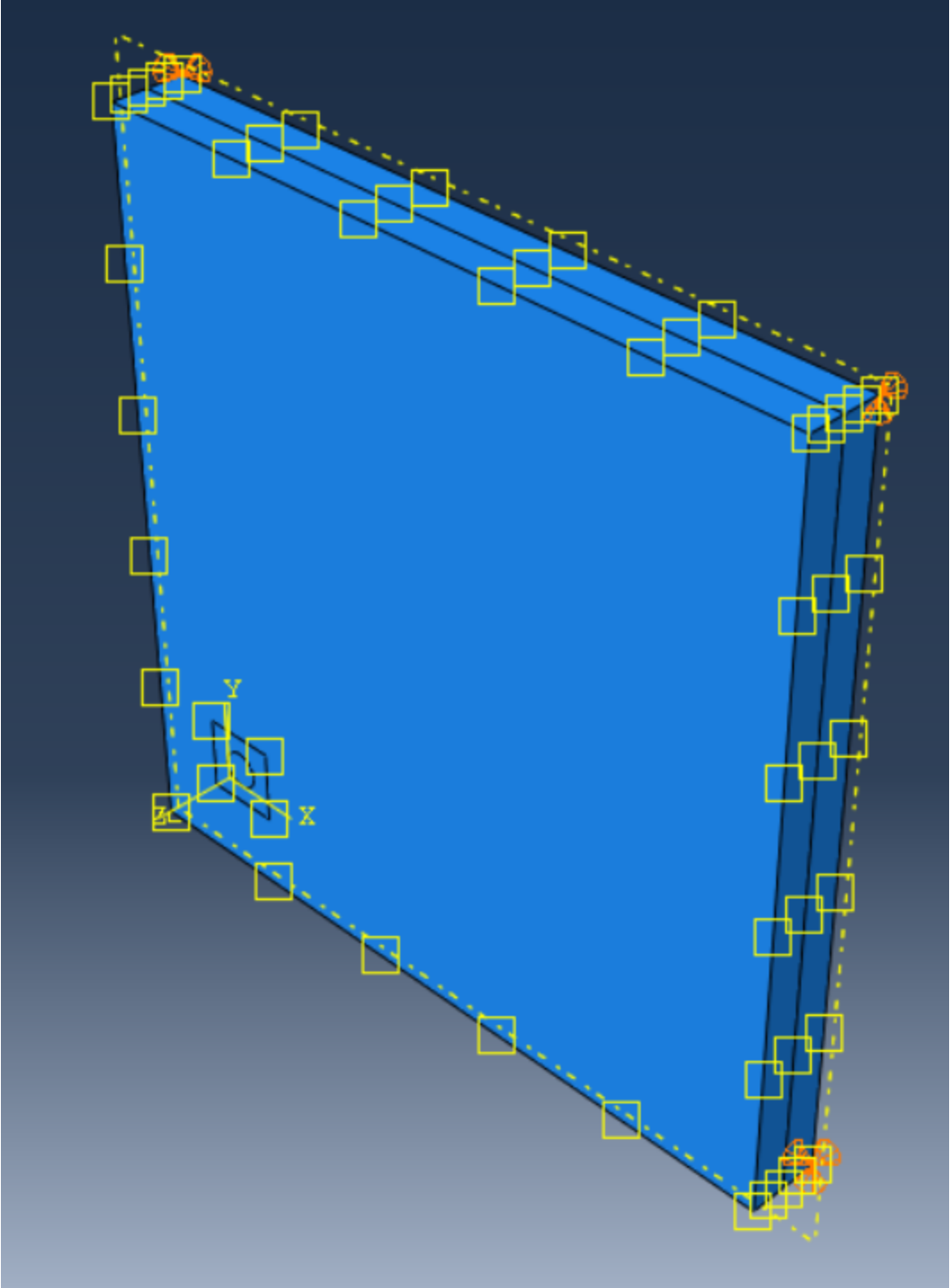| Young's Modulus	Poisson's Ratio	Expansion Coeff
70000	0.22	3.3E-06

Dielectric:

Young's Modulus	Poisson's Ratio	Expansion Coeff
5000	0.3	5E-05

Metal Via:

Young's Modulus	Poisson's Ratio	Expansion Coeff
110000	0.34	1.7E-05

Loading and boundary conditions:

1. Global package model is stabilized by fixing 3 corners.
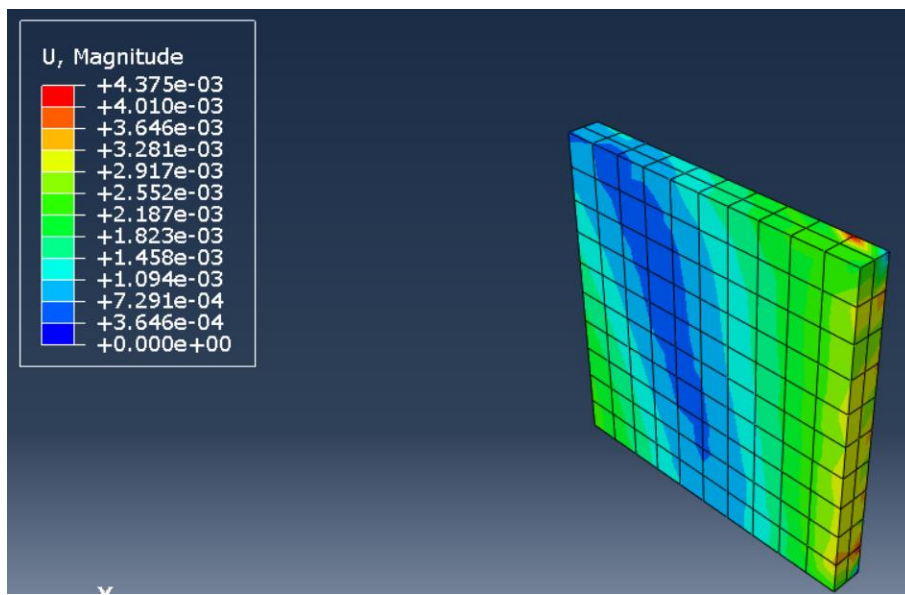
2. Thermal cycling applied: 298K → 498K → 200K → 298K.

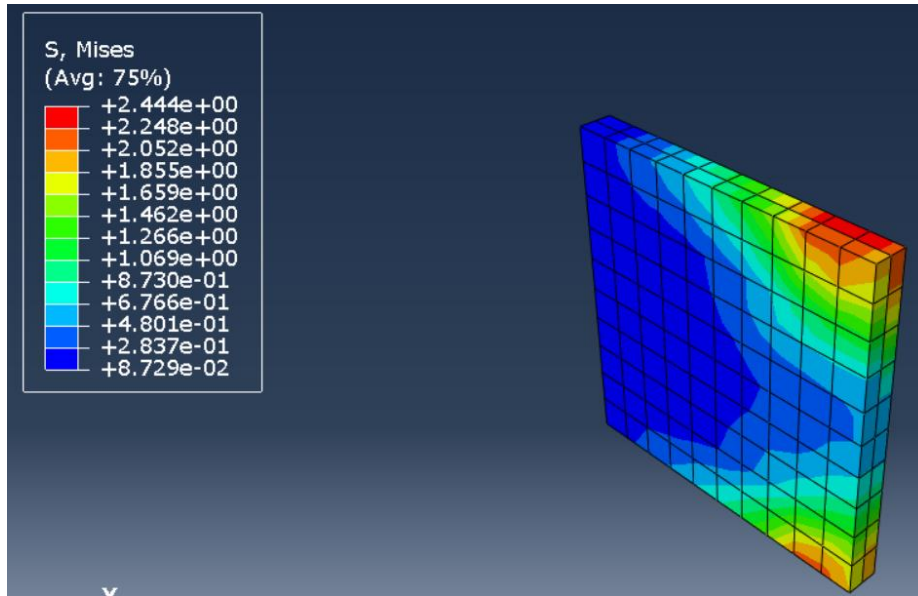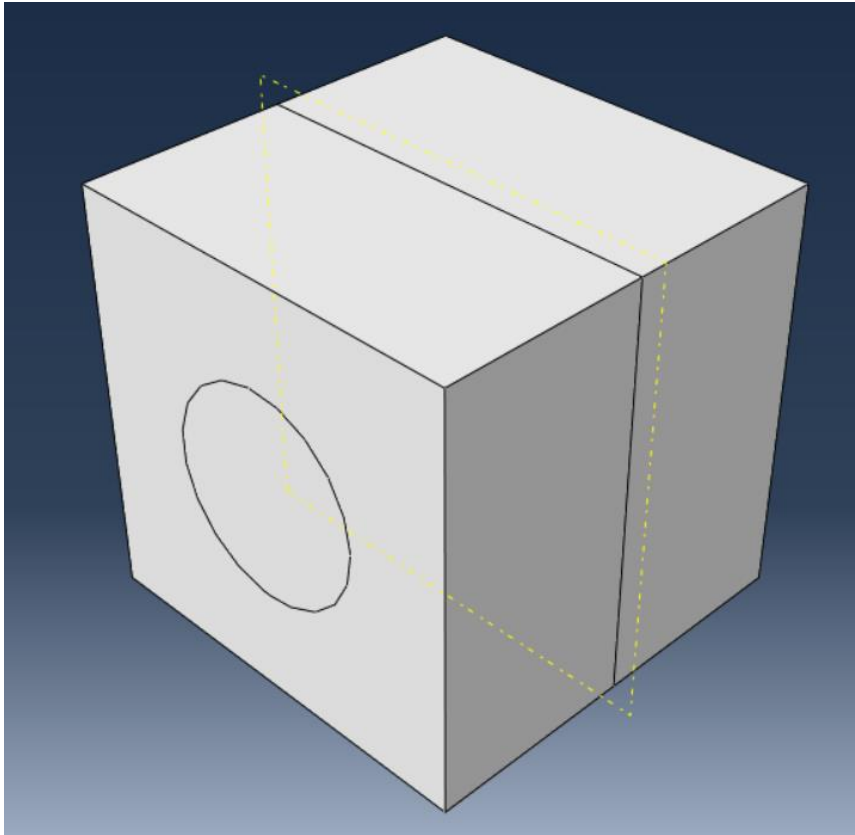Mesh: (coarse due to limitation of 1000 nodes in ABAQUS educational version).
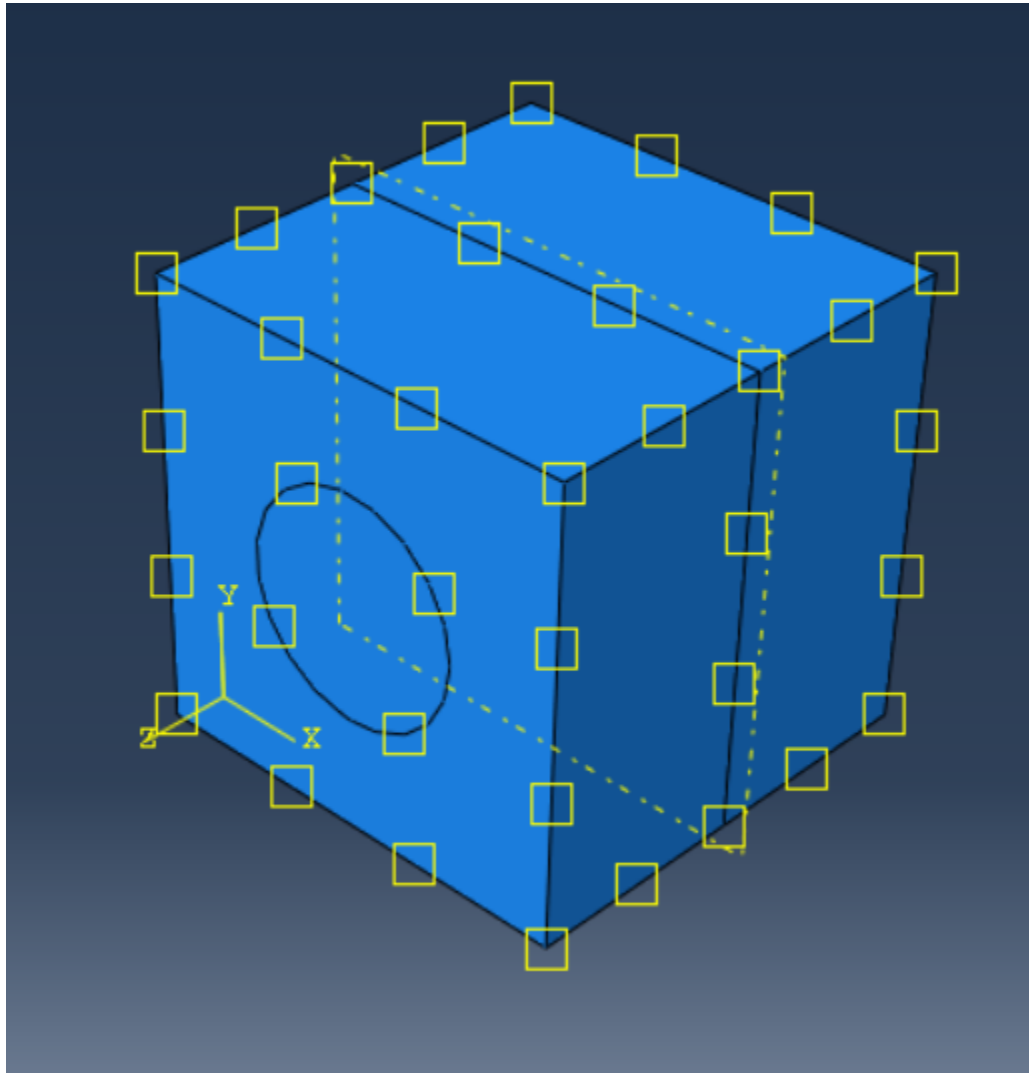
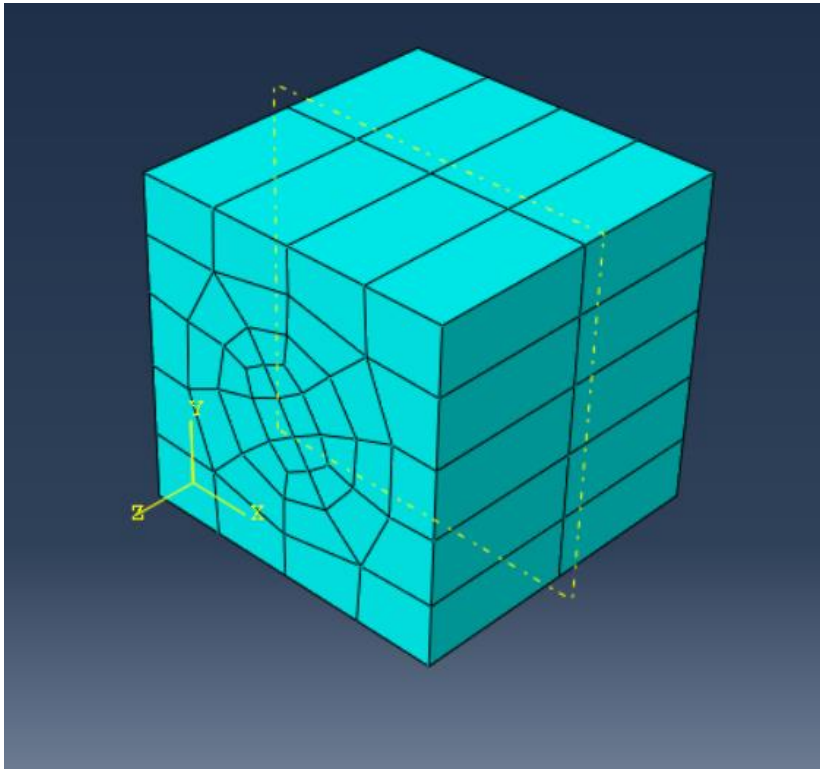Results:

Deformation:

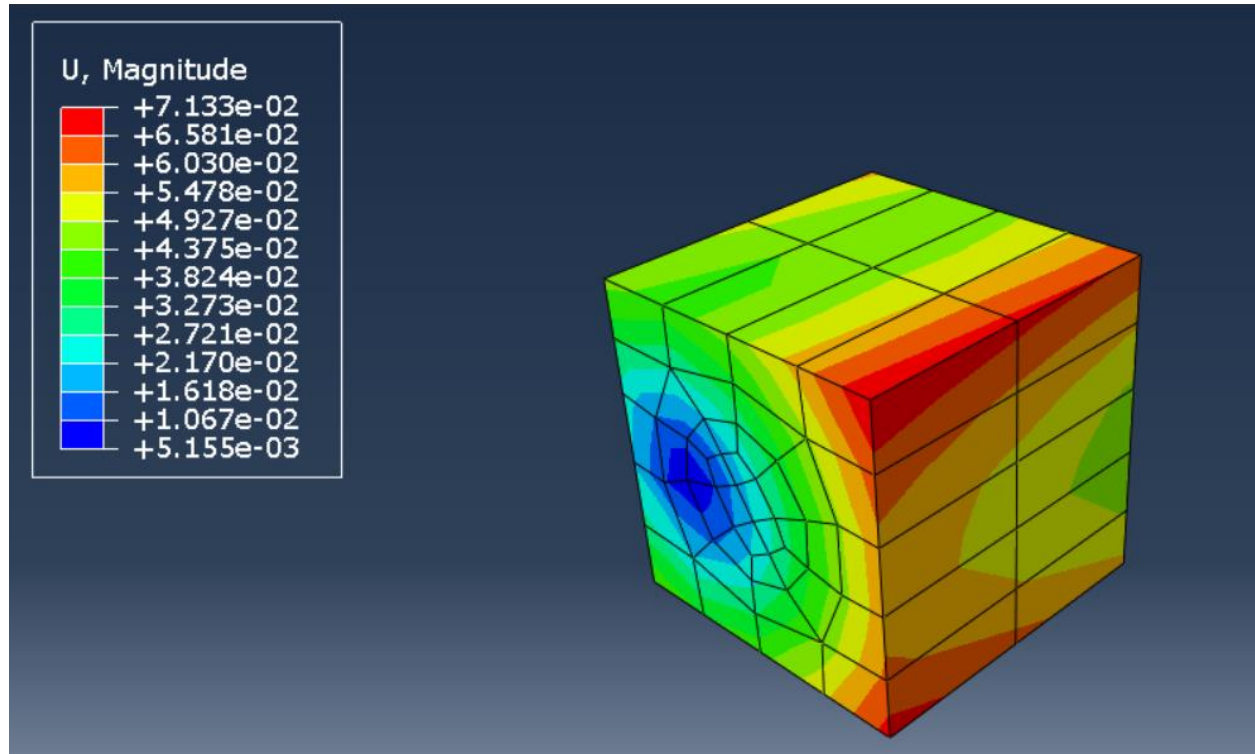Mises stress:

Sub Modeling: Cylindrical Via at the Core layer:

Boundary Condition: Sub-model.

Mesh:

Results:

Deformation:

Mises Stress: