

C:\Windows\system32\cmd.exe

C:\>cd SEME_Model_Builder.Utility

C:\SEME_Model_Builder.Utility>

C:\SEME_Model_Builder.Utility>

C:\SEME_Model_Builder.Utility>cloc-1.80.exe src/
194 text files.
194 unique files.
4 files ignored.

github.com/AlDanial/cloc v 1.80 T=6.00 s (31.8 files/s, 271712.2 lines/s)

Language	files	blank	comment	code
Fortran 90	189	47316	37388	1545369
Fortran 77	2	45	76	79
SUM:	191	47361	37464	1545448

C:\SEME_Model_Builder.Utility>_

Model Builder Utility

Creates Thermal & Structural
Analysis Models For Use w/
NASTRAN

Status: “A Work-in-progress”

Model Builder Utility

- Development driven by real-time analysis requirements
- Has evolved and grown over last 2-years
 - Approx. 130 subroutines (~ 67k lines code)
 - 66 Block Data Routines (~1.5M lines data)
 - PC Executable Size: ~ 45.5Mb
 - Typical Model: 64K Elements, 82K Nodes, < 3 CPU Min. Solution Time (Thermal, Yar)

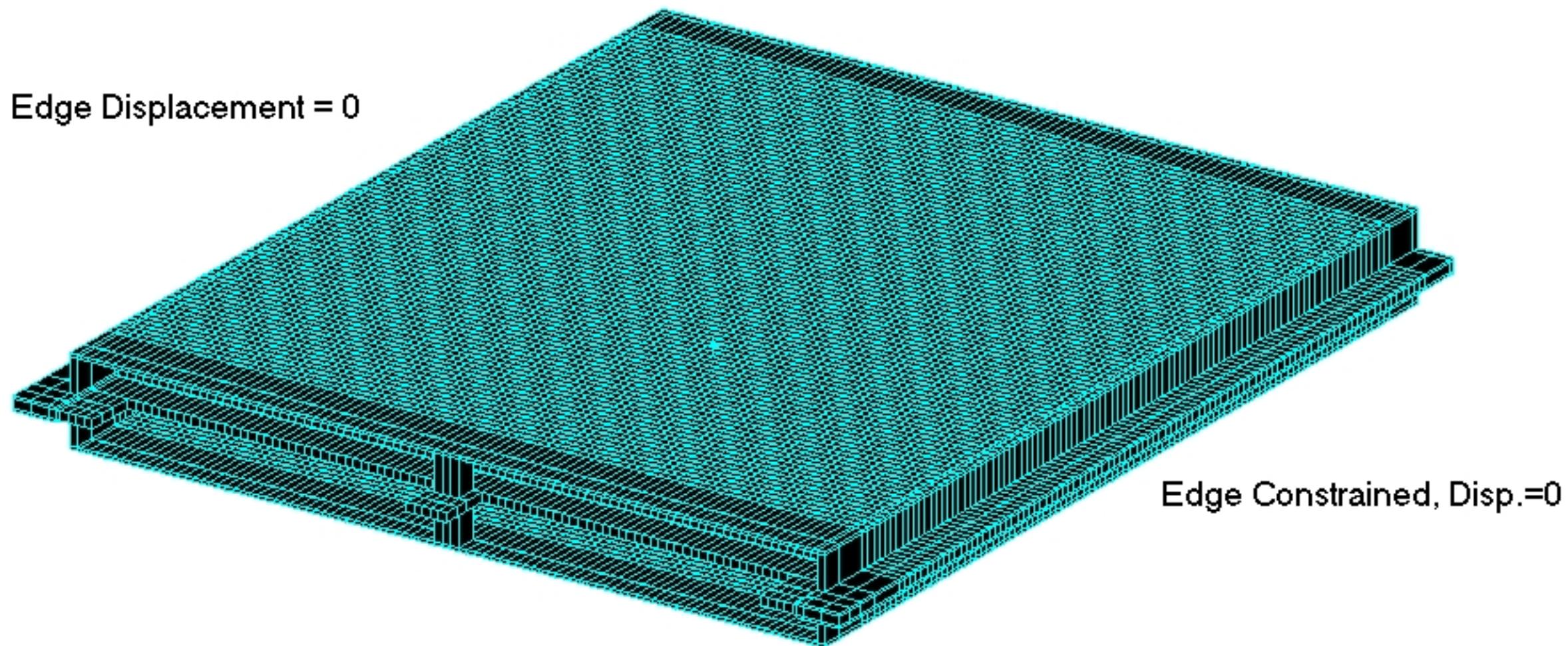
MB: Functionality

- Can be used to create thermal or structural analysis models
- Uses text-files as input
- Creates NASTRAN “BDF” input file (Bulk Data File)
- BDF file directly imported into PATRAN to create model database
- NASTRAN thermal and structural analysis results imported into PATRAN model database for review

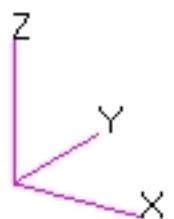
MB: Capabilities

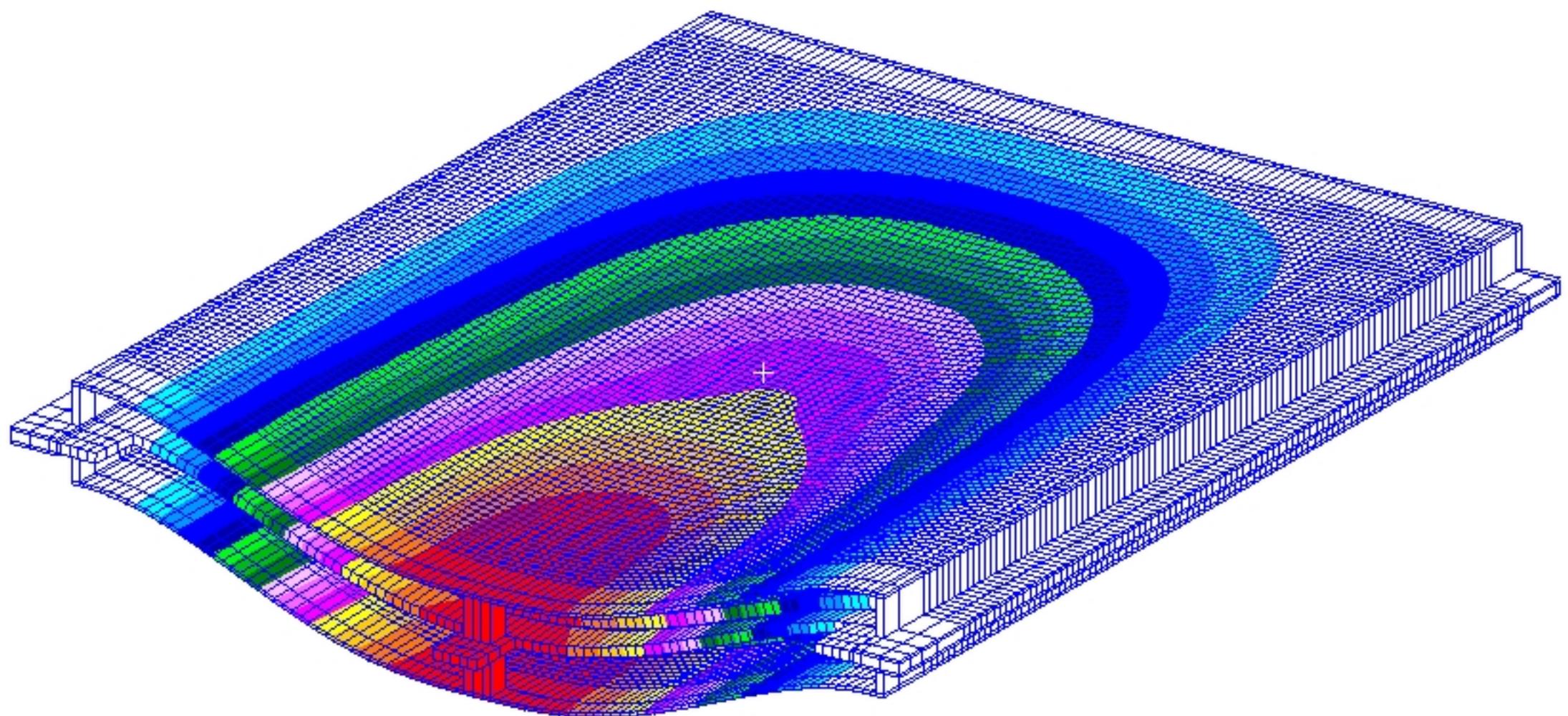
- SIM-E format LRM's (DRM & Comanche)
- Thermal or structural analysis model creation from text-file input
- Reads MENTOR neutral files for PCB data input (if available)
- Single or multiple PCB's per side of LRM
- Determines PCB X/Y/Z conductivity from input lay-up information
- PCB regions for Z-Direction Conductivity variation with location of vias
- Lumped or discrete via representation
- PCB's modeled w/ single element or layer-by-layer in z-direction
- Discrete component model option
- Discrete thermal shroud model option
- Discrete hybrid model option

Edge Displacement = 0



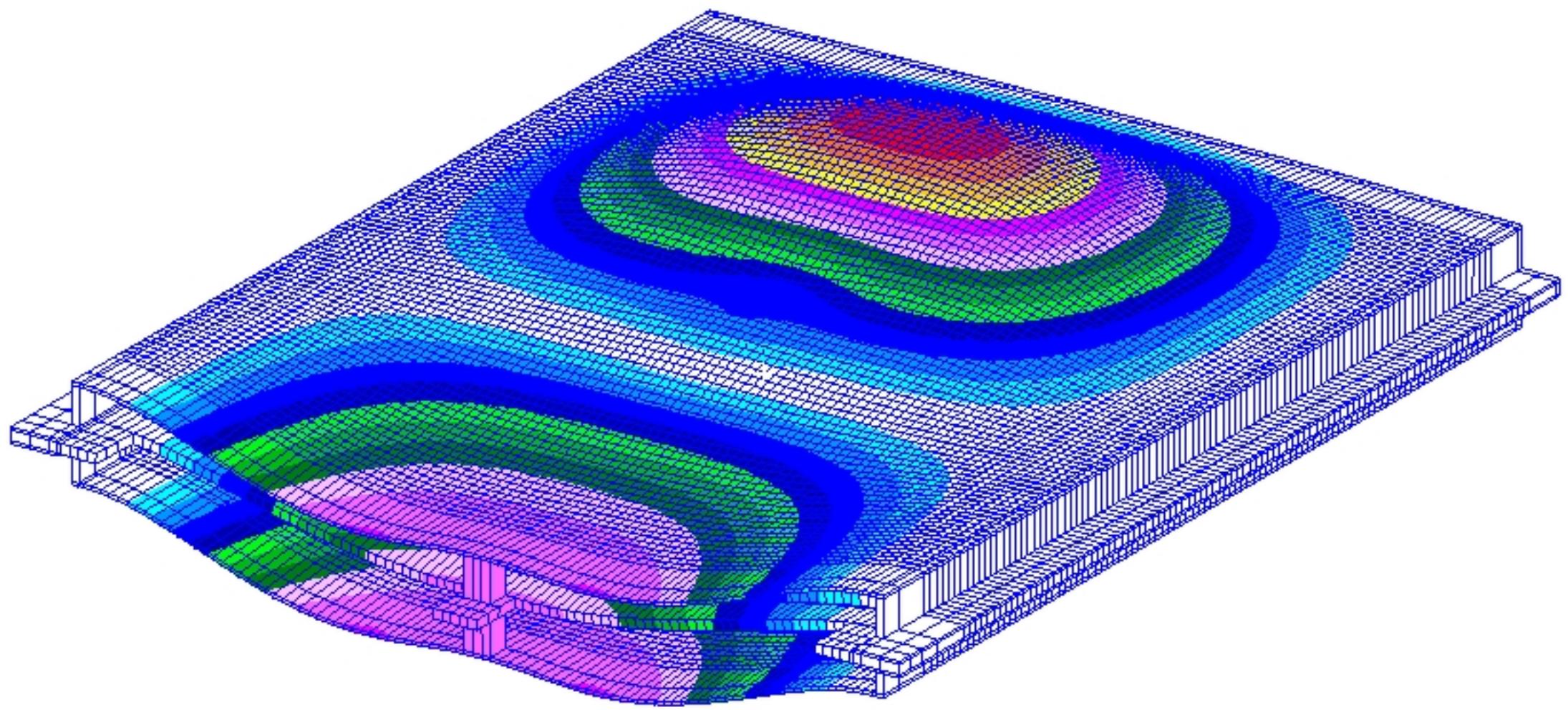
Comanche Digital LRM Finite Element Model





First Mode Shape (Frequency = 456 hz)



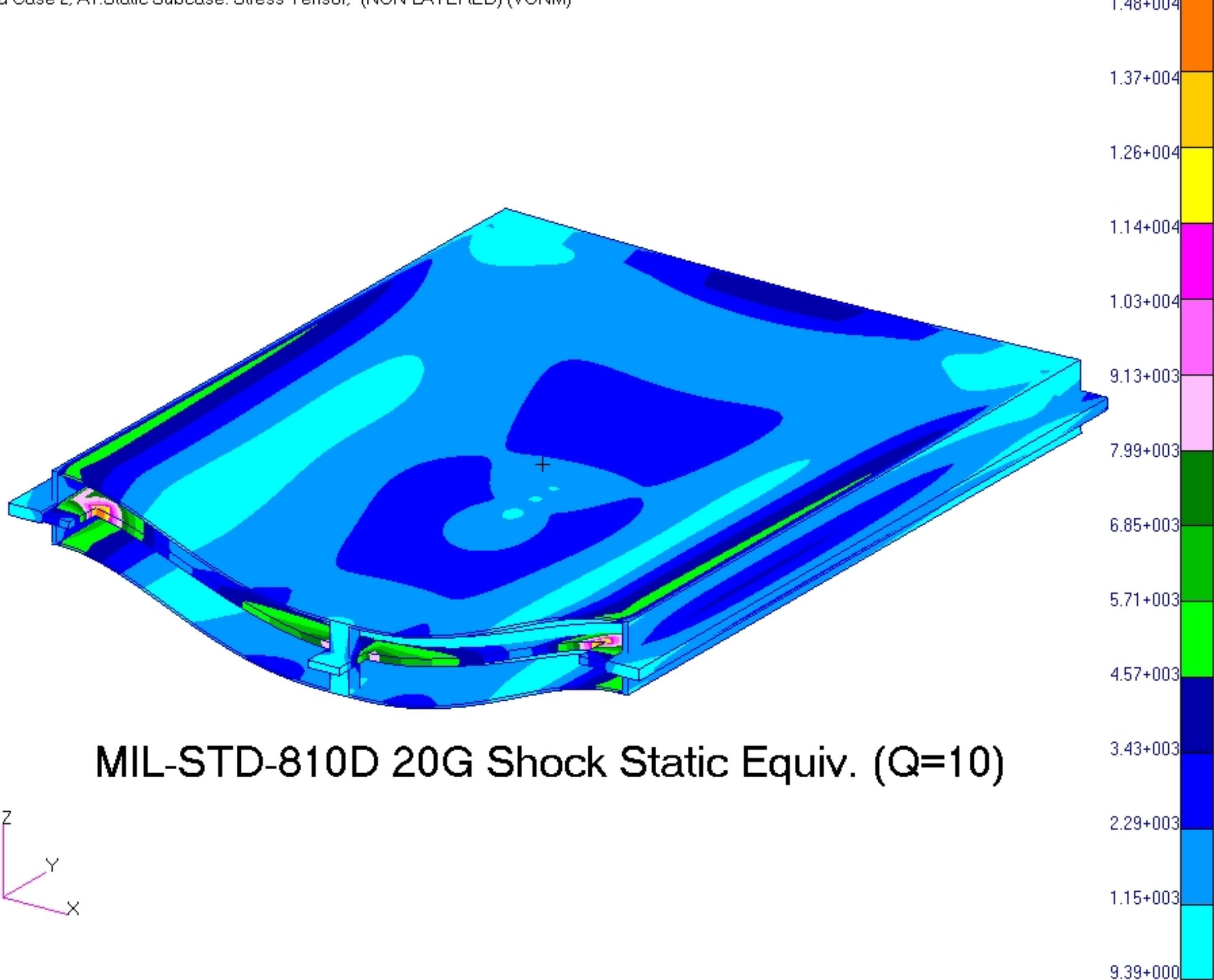


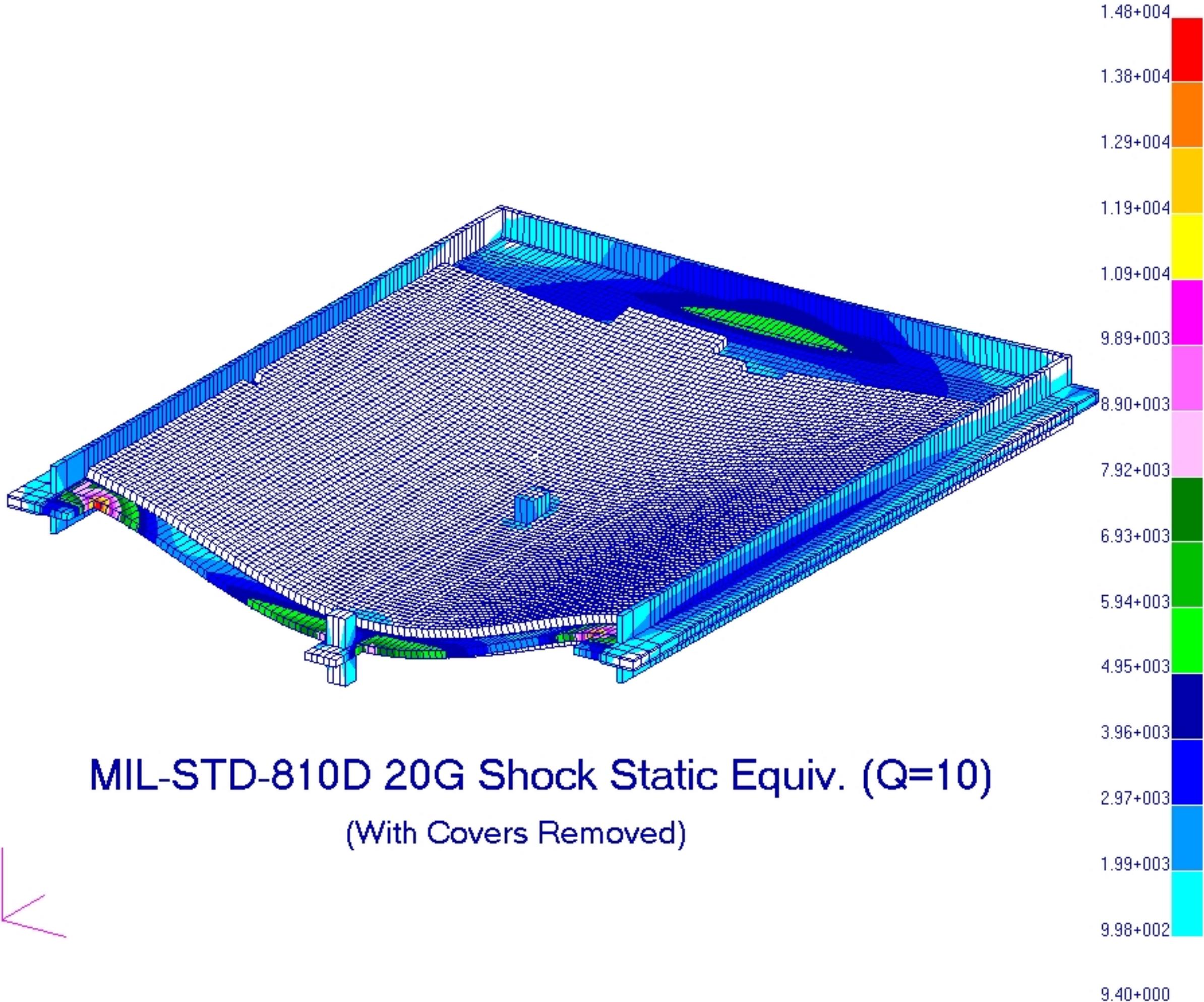
Second Mode Shape (Frequency = 753 hz)



MSC.Patran 2000 r2 10-Oct-02 12:44:32

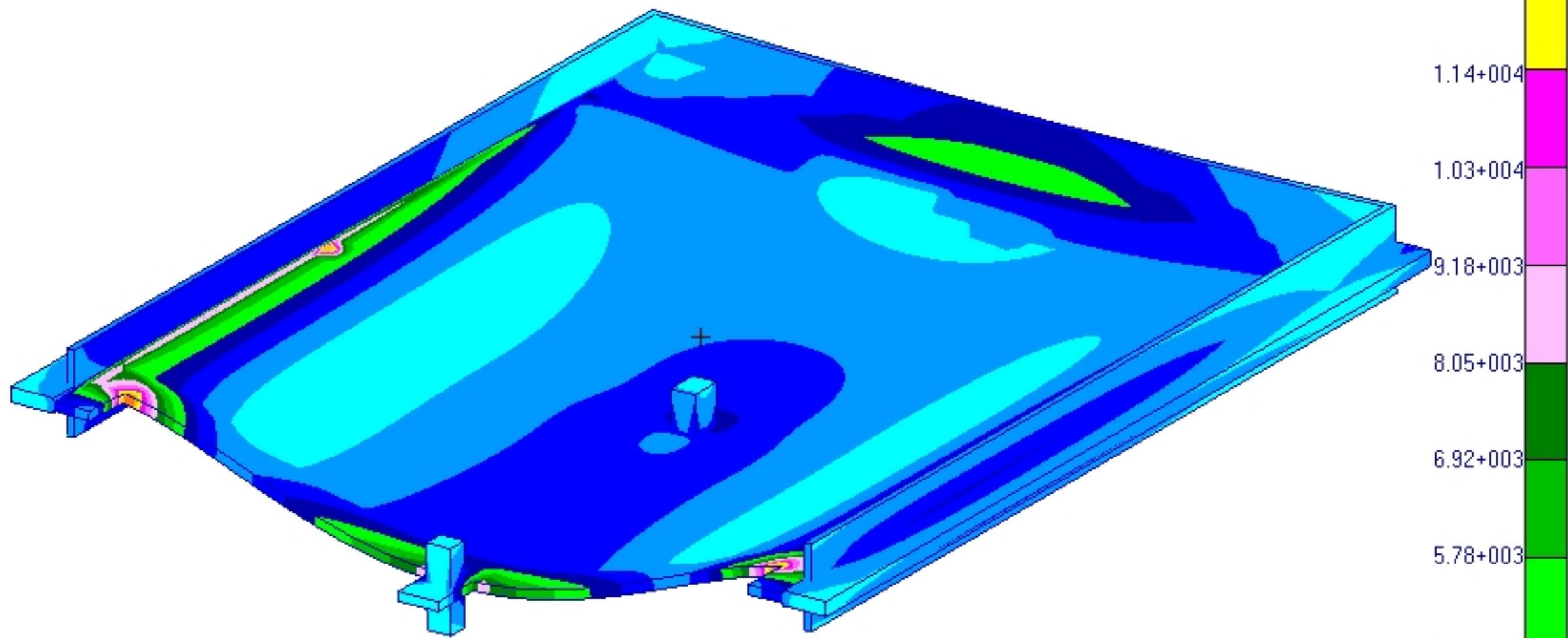
Fringe: Load Case 2, A1:Static Subcase: Stress Tensor, -(NON-LAYERED) (VONM)





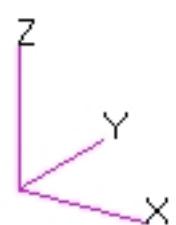
MSC.Patran 2000 r2 10-Oct-02 12:48:07

Fringe: Load Case 2, A1:Static Subcase: Stress Tensor, -(NON-LAYERED) (VONM)



MIL-STD-810D 20G Shock Static Equiv. (Q=10)

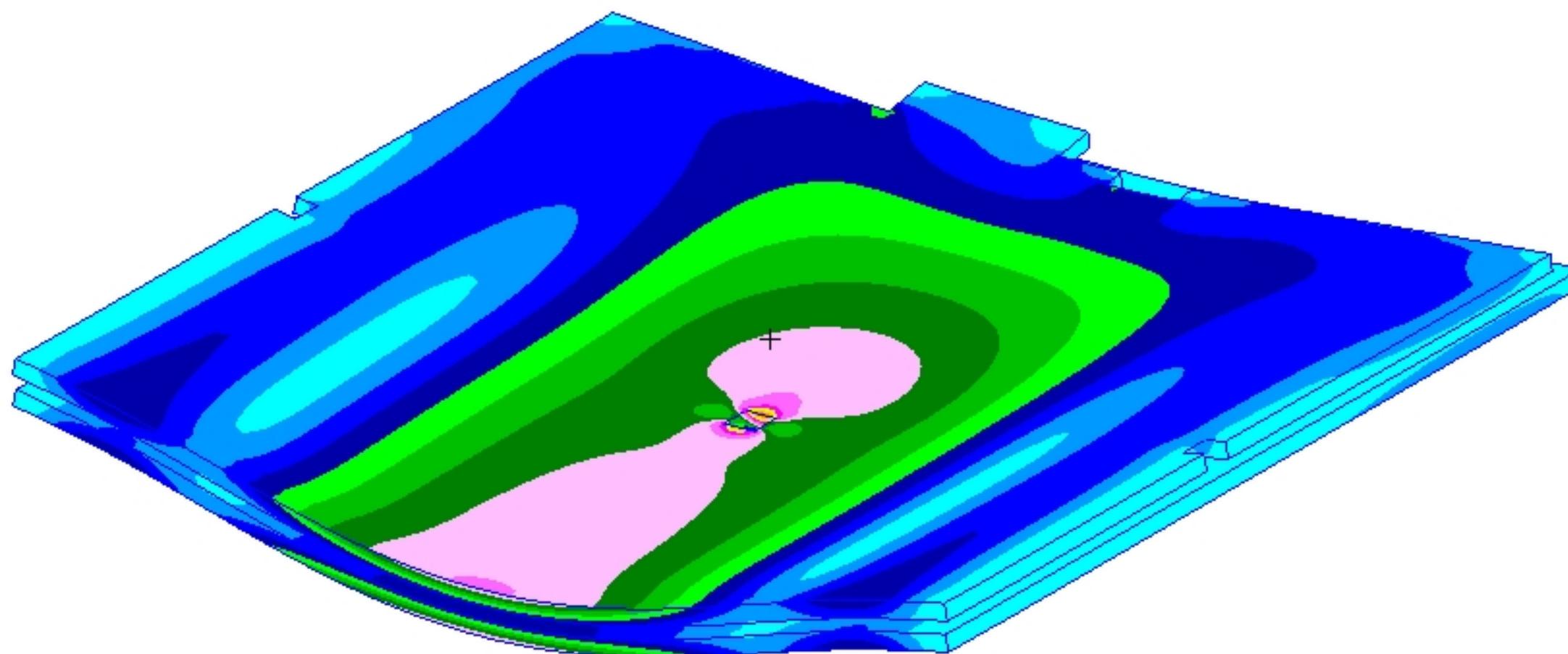
(With Covers and PCB's Removed)



MSC.Patran 2000 r2 10-Oct-02 14:49:19

Fringe: Load Case 2, A1:Static Subcase: Stress Tensor, -(NON-LAYERED) (VONM)

Deform: Load Case 2, A1:Static Subcase: Displacements, Translational



PCB Max Von Mises Stress

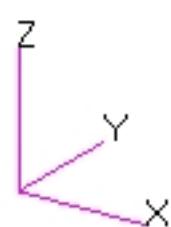
default_Fringe :

Max 1.63+003 @Nd 24351

Min 9.39+000 @Nd 19248

default_Deformation :

Max 1.43-002 @Nd 70450



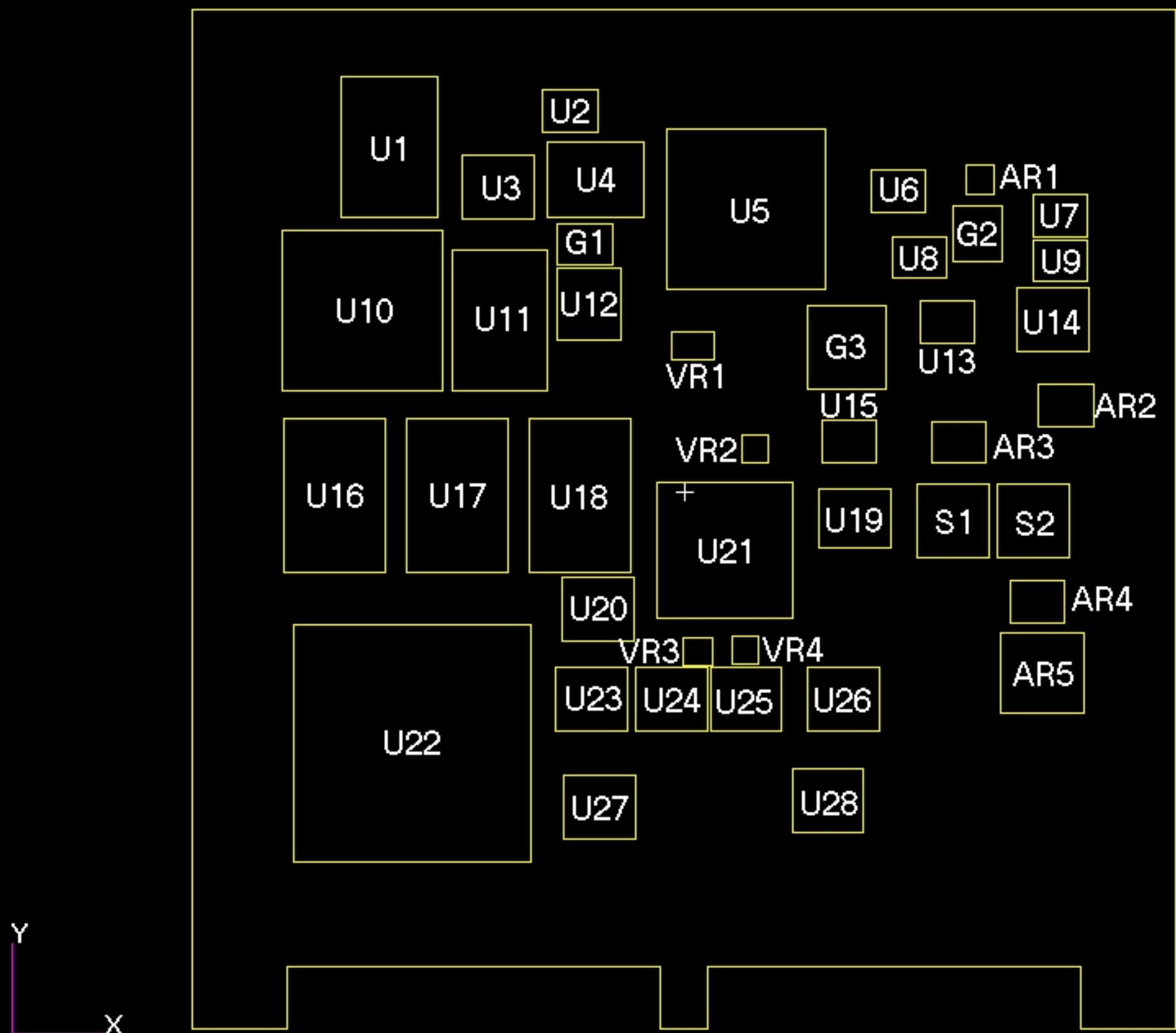


Figure 5: Side "A" Component Layout & Reference Designators

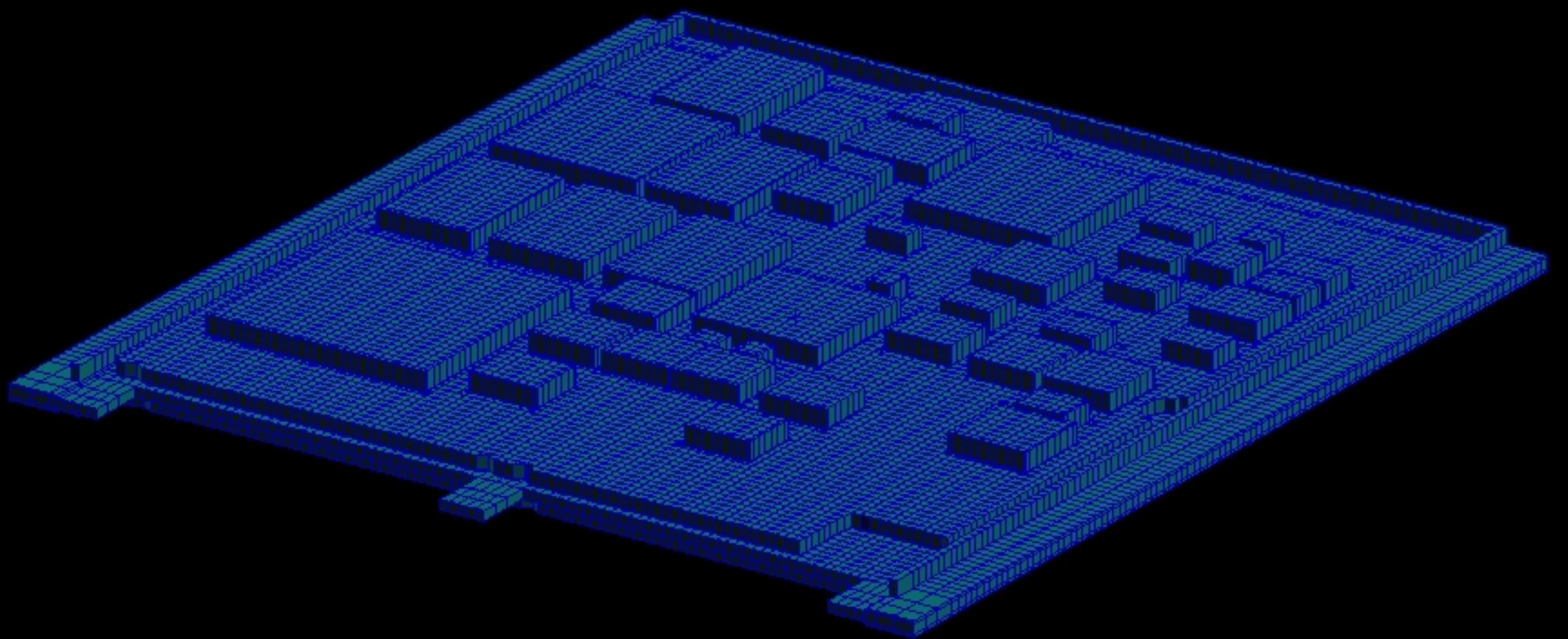
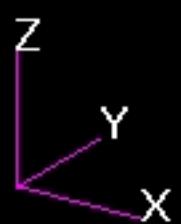


Figure 1: Isometric View of Side "A" Mesh



MSC.Patran 2000 r2 19-May-03 10:36:03

Fringe: DEFAULT.SC1, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

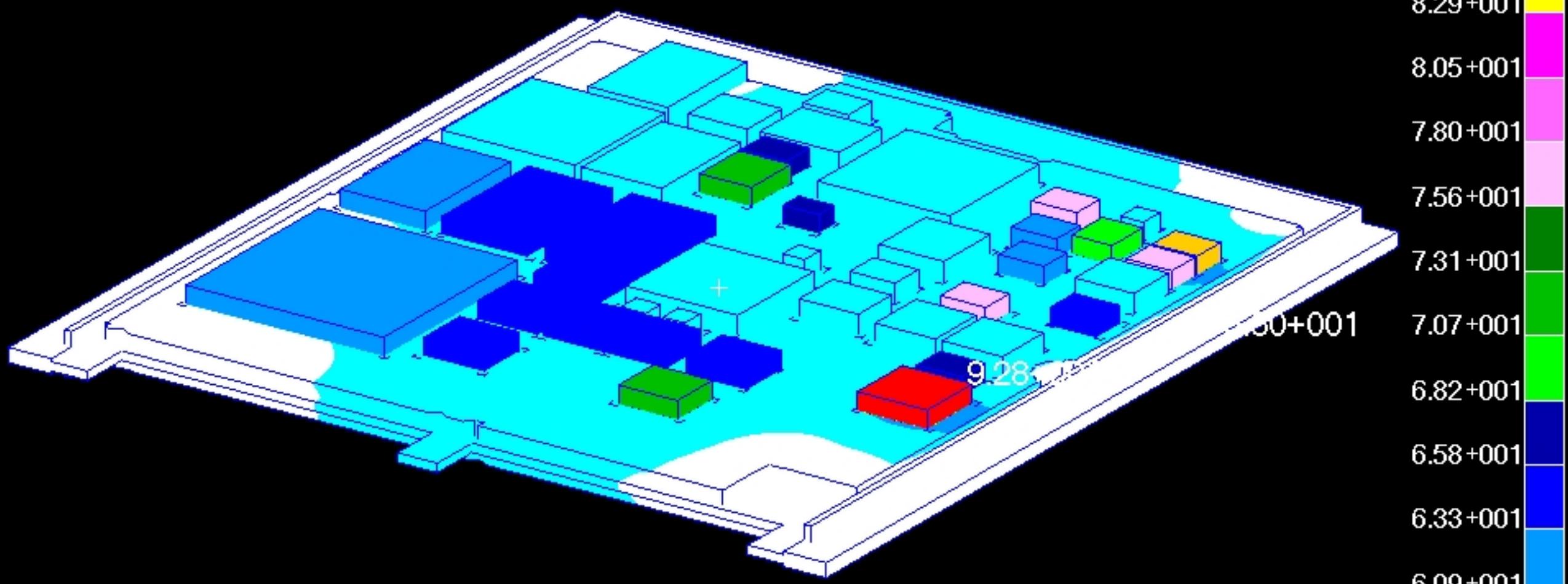


Figure 3: Isometric View of Side "A" Results



default_Fringe :
Max 9.28+001 @Nd 43692
Min 5.60+001 @Nd 6900

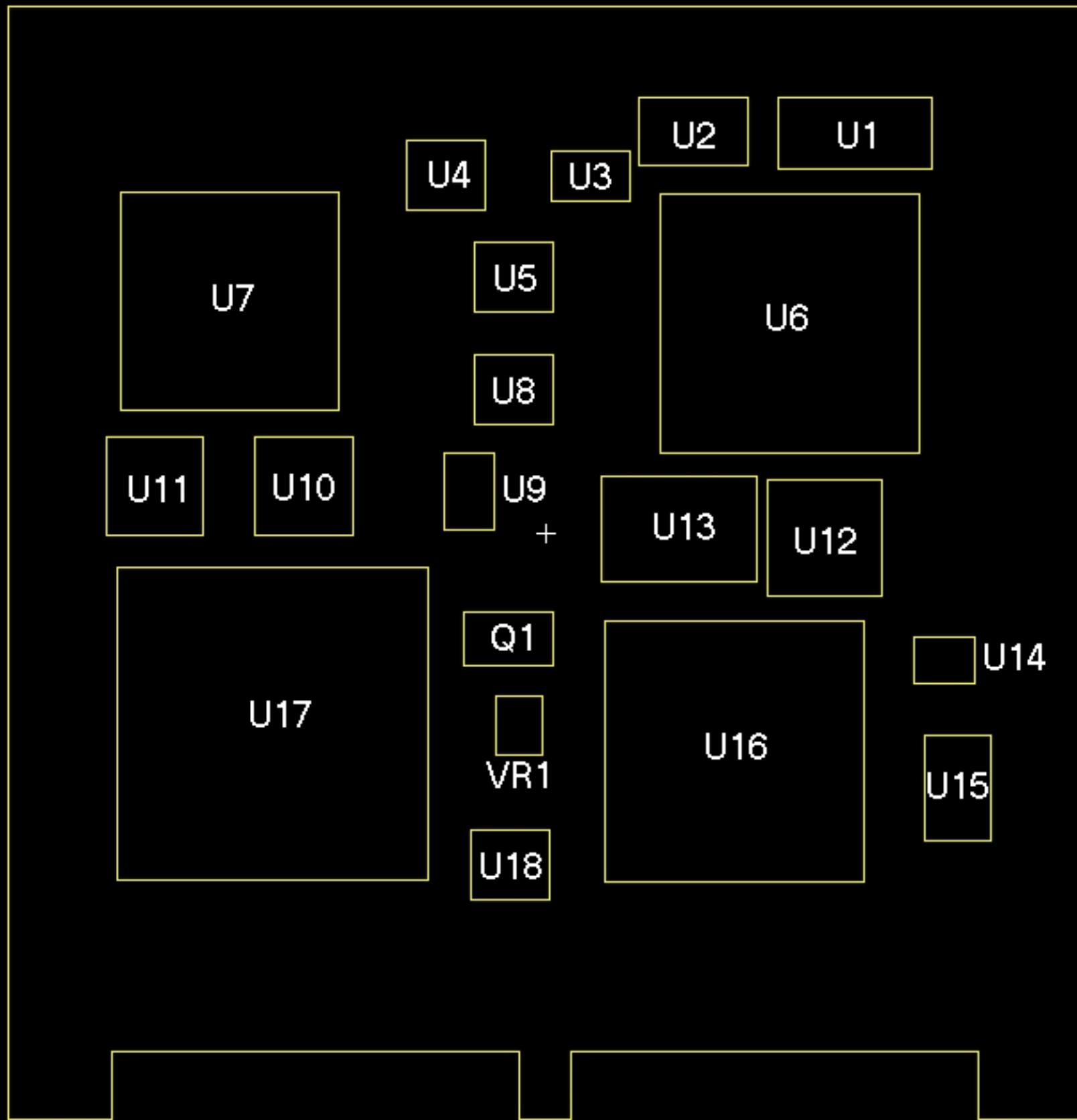


Figure 6: Side "B" Component Layout & Reference Designators

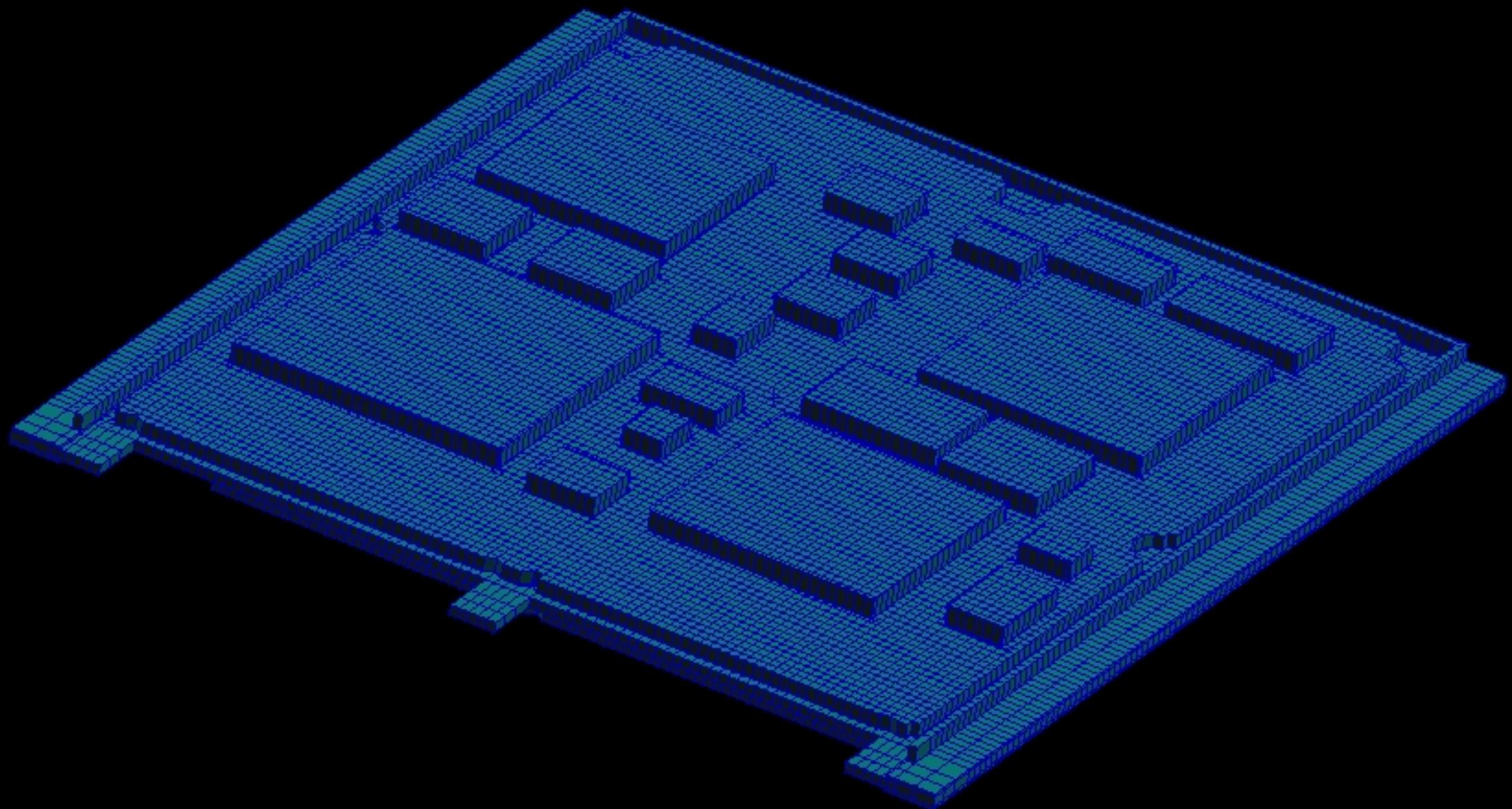
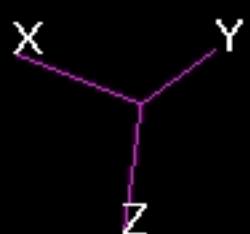


Figure 2: Isometric View of Side "B" Mesh



MSC.Patran 2000 r2 19-May-03 10:41:18

Fringe: DEFAULT.SC1, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

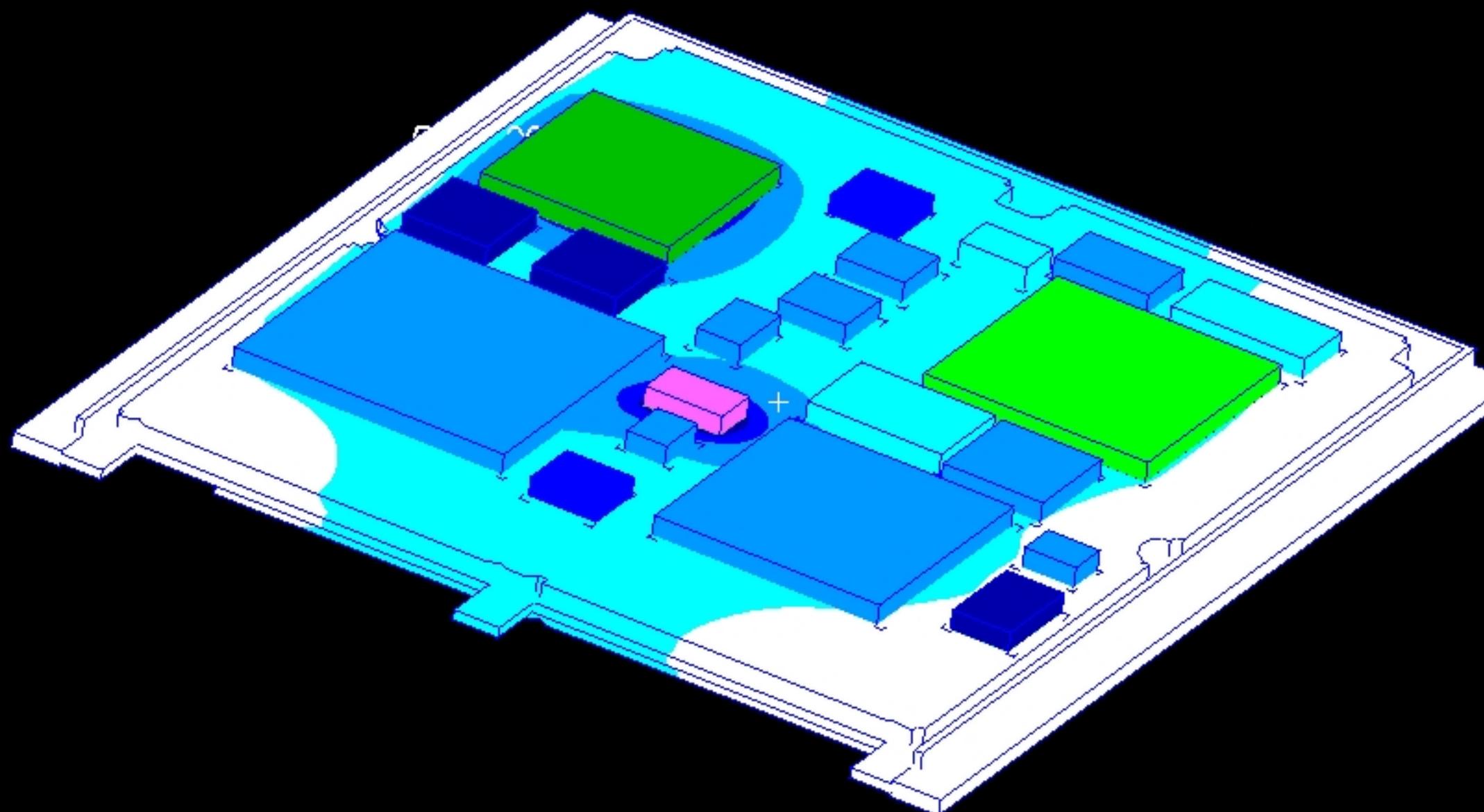
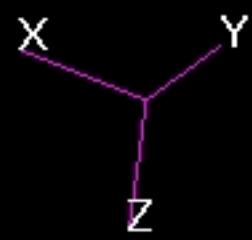


Figure 4: Isometric View of Side "B" Results



default_Fringe :
Max 9.28+001 @Nd 43692
Min 5.60+001 @Nd 6900

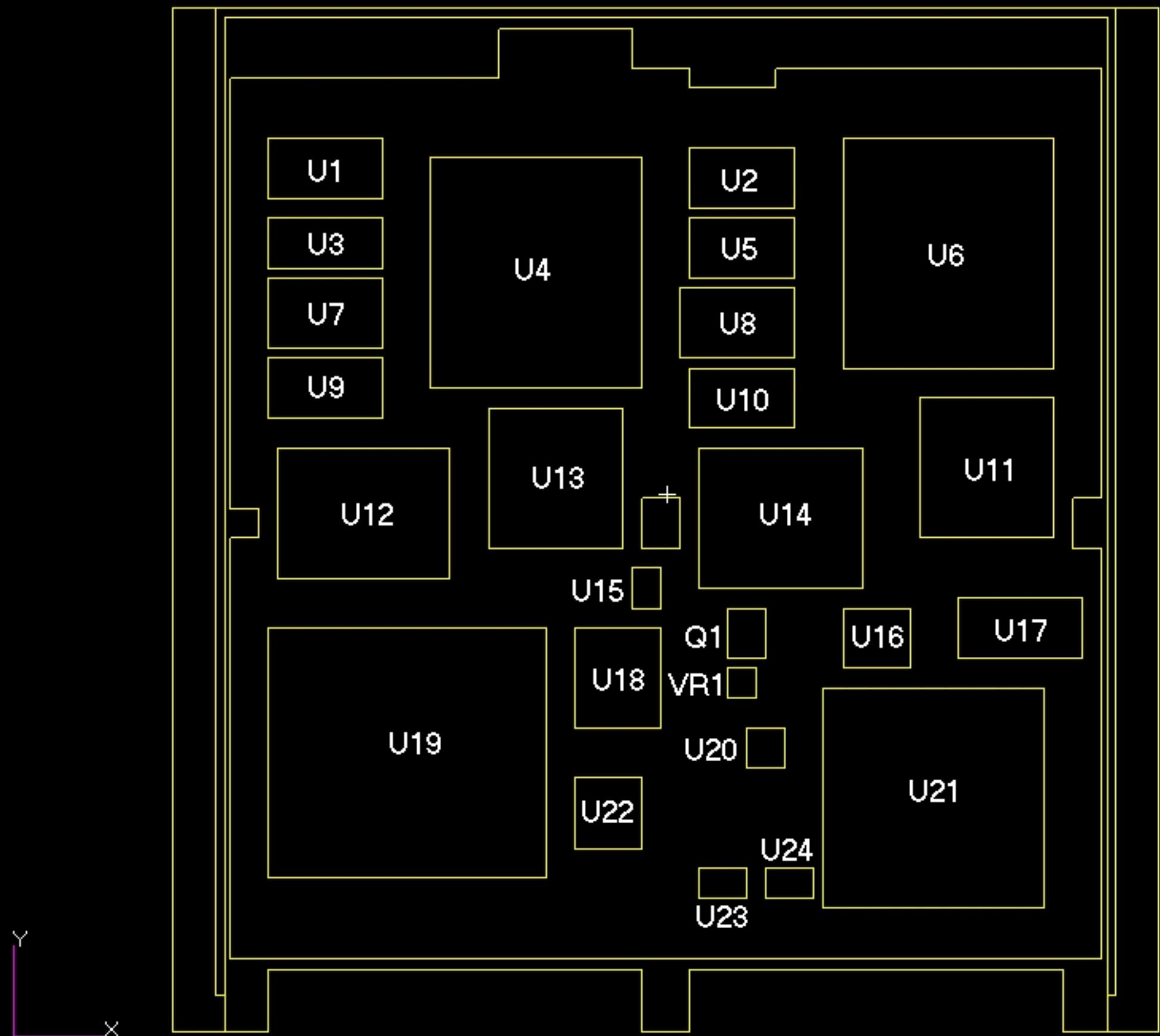


Figure 6: Side "A" Component Layout & Reference Designators

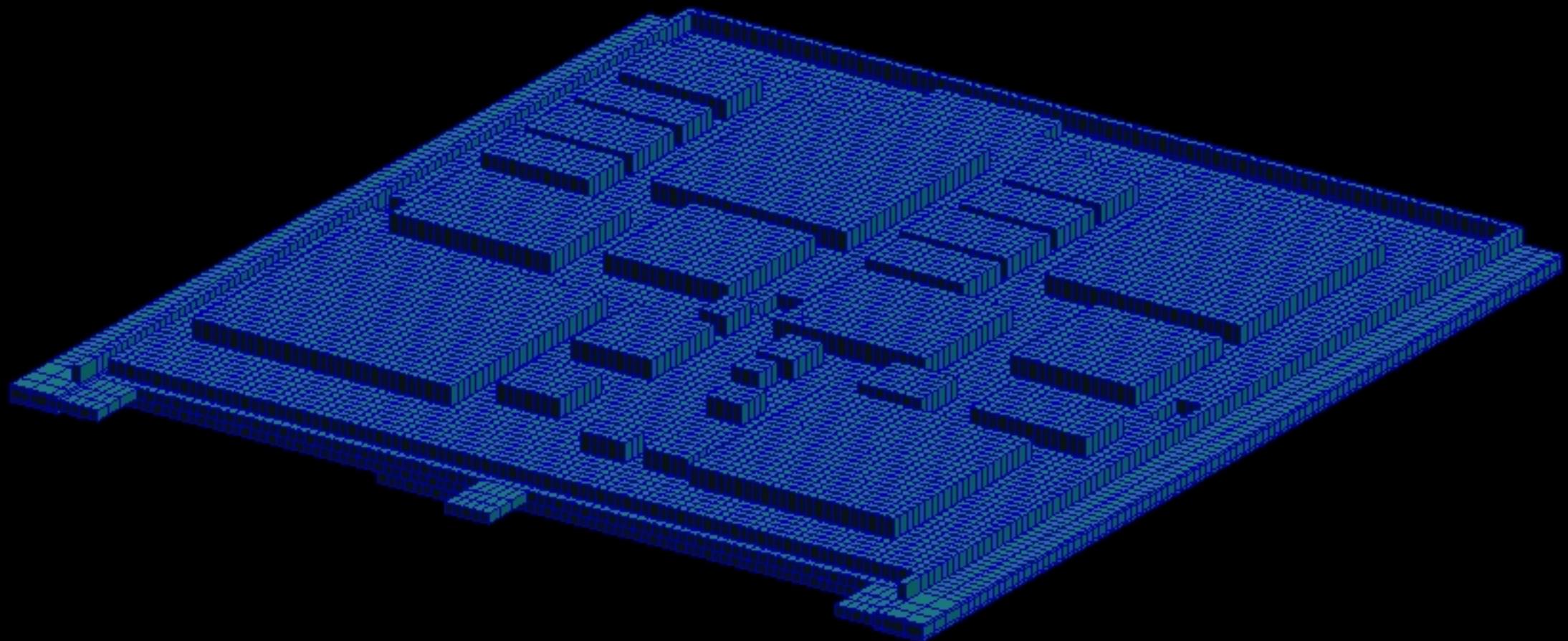
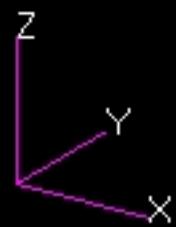


Figure 1: Isometric View of Side "A" Mesh w/o Shroud



MSC.Patran 2000 r2 20-Jun-01 14:26:37

Fringe: Default PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

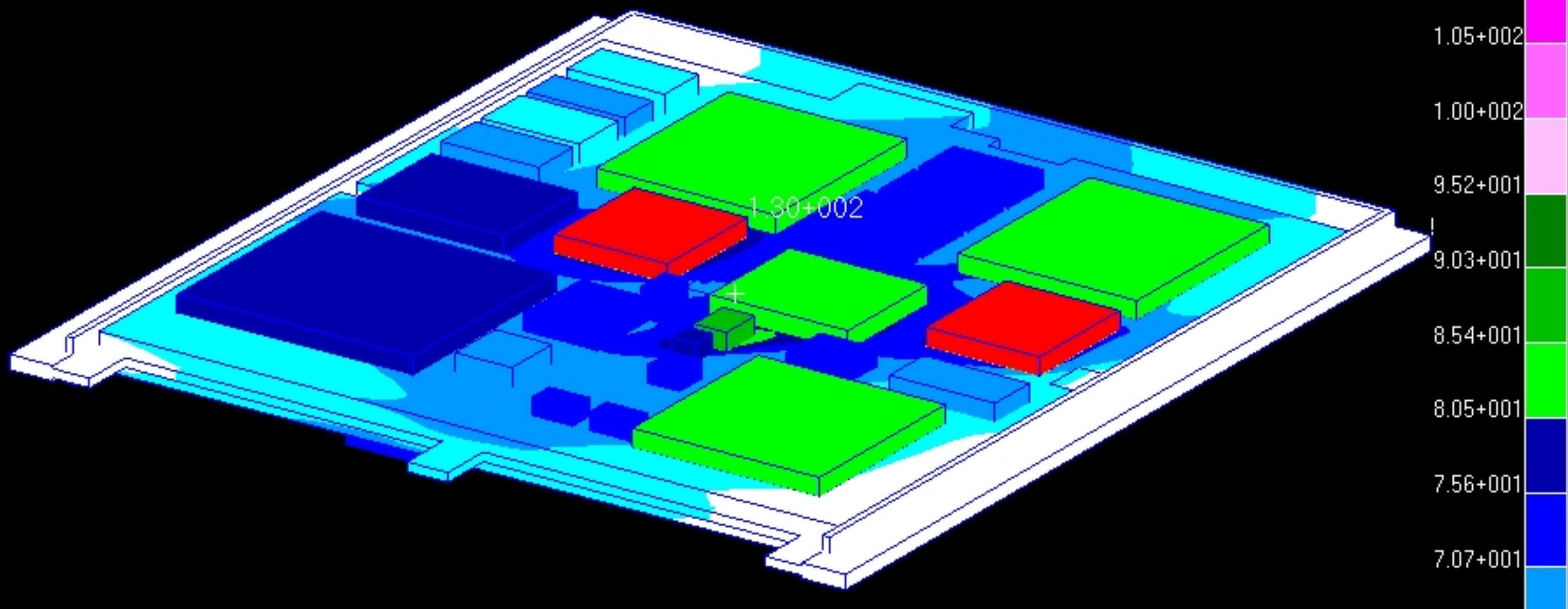
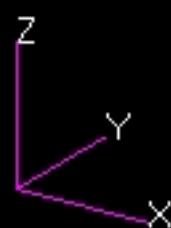


Figure 3: Isometric View of Side "A" Results w/o Shroud



default_Fringe :

Max 1.30+002 @Nd 45946

Min 5.60+001 @Nd 10000

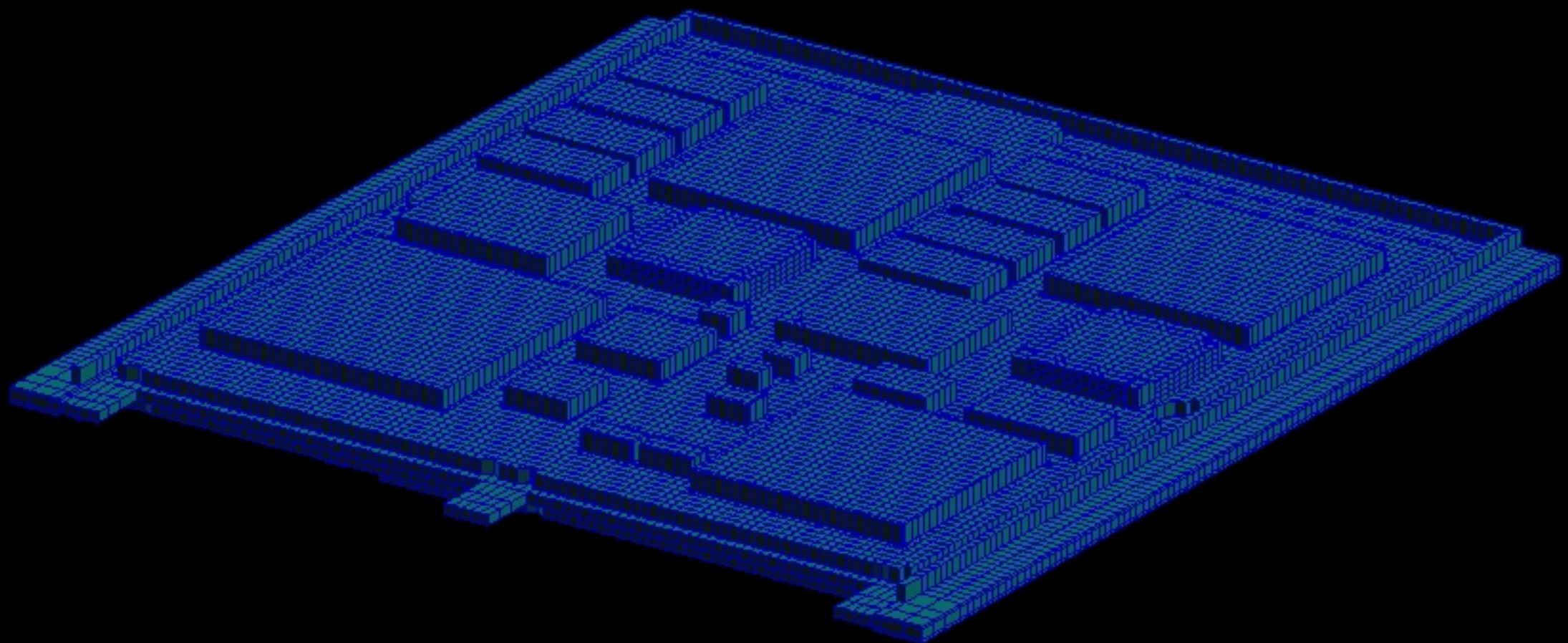
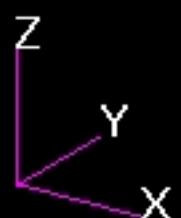


Figure 1: Isometric View of Side "A" Mesh



MSC.Patran 2000 r2 21-Jun-01 10:08:34

Fringe: Default PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

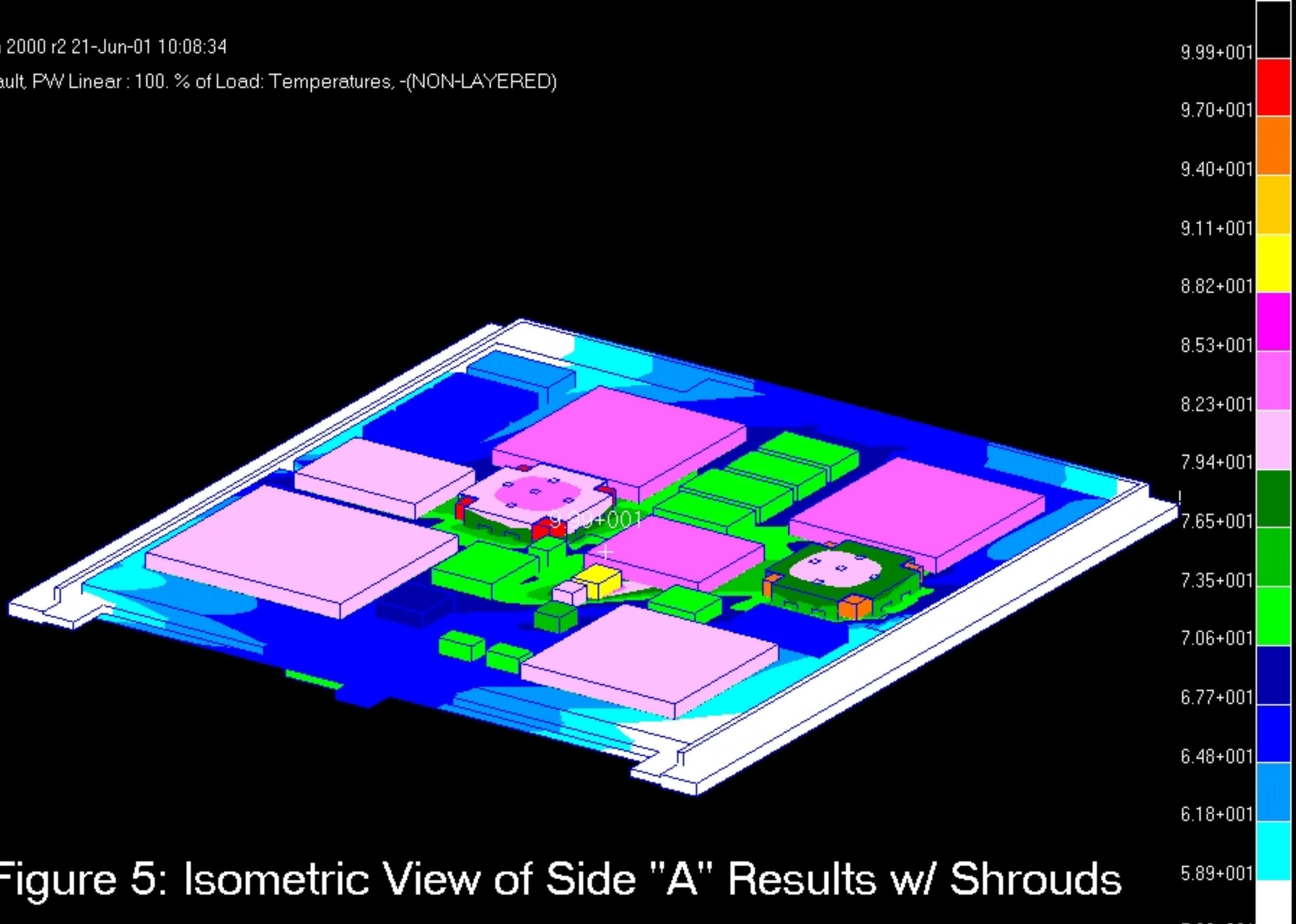


Figure 5: Isometric View of Side "A" Results w/ Shrouds

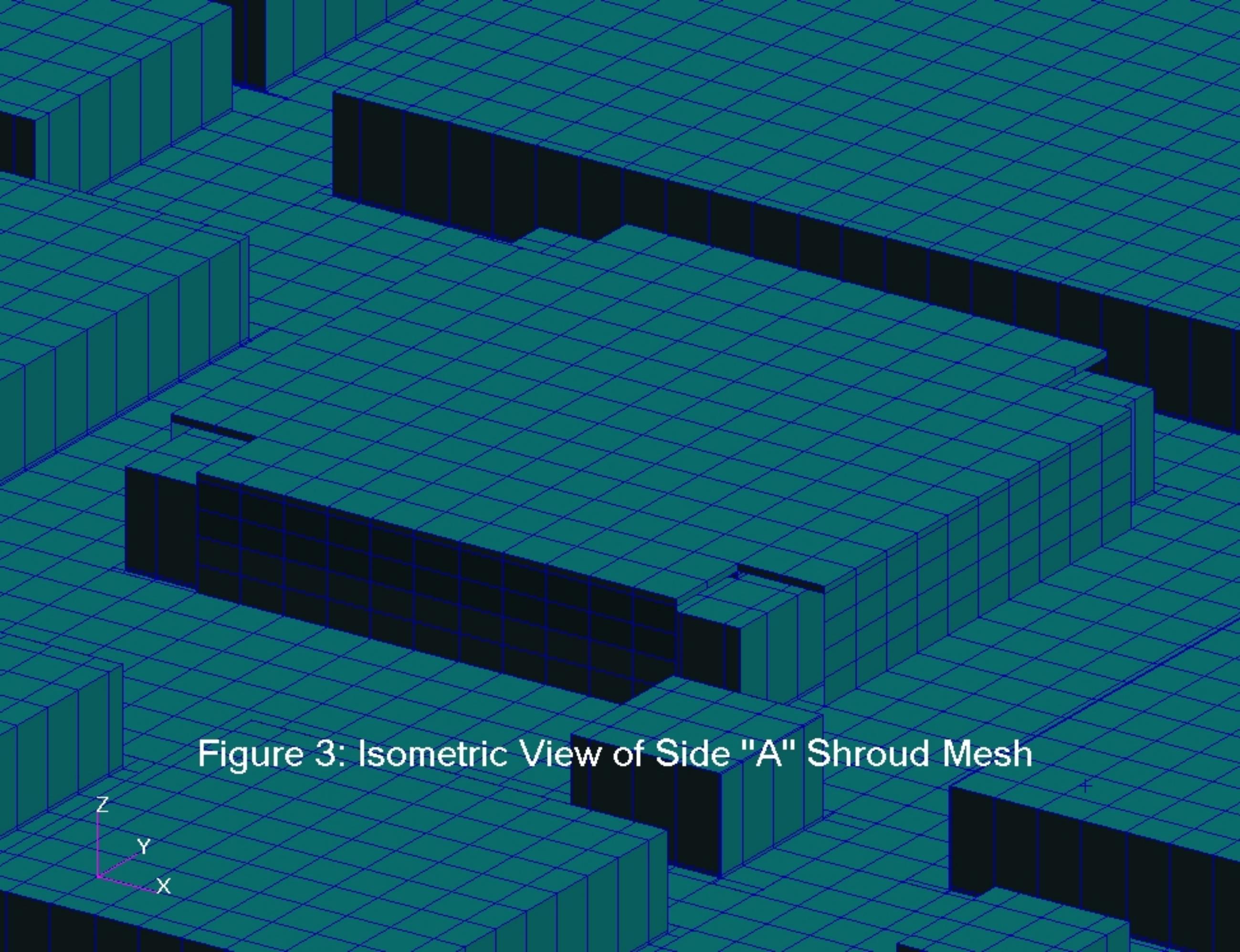
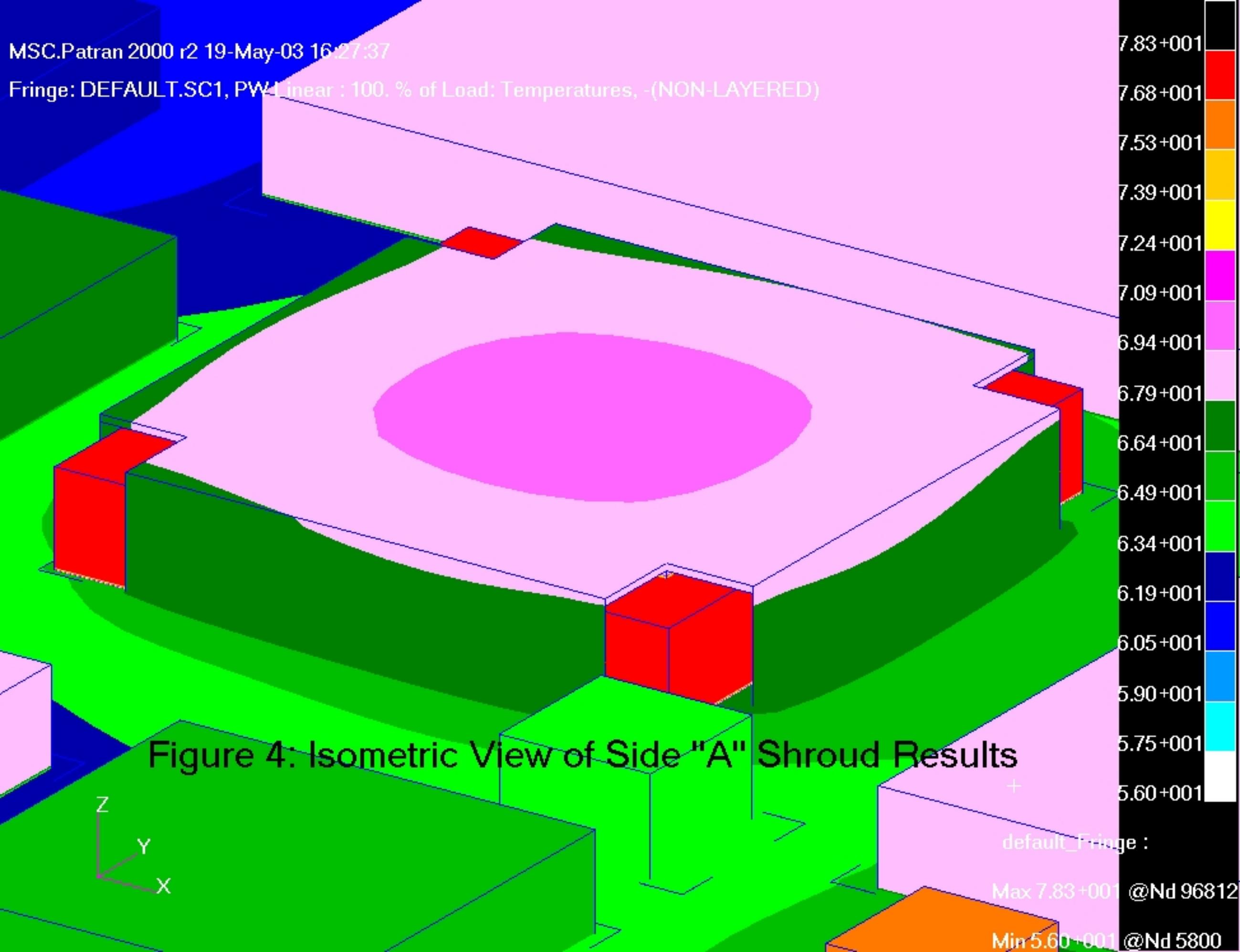


Figure 3: Isometric View of Side "A" Shroud Mesh

MSC.Patran 2000 r2 19-May-03 16:27:37

Fringe: DEFAULT.SC1, PWI Linear : 100. % of Load: Temperatures, -(NON-LAYERED)



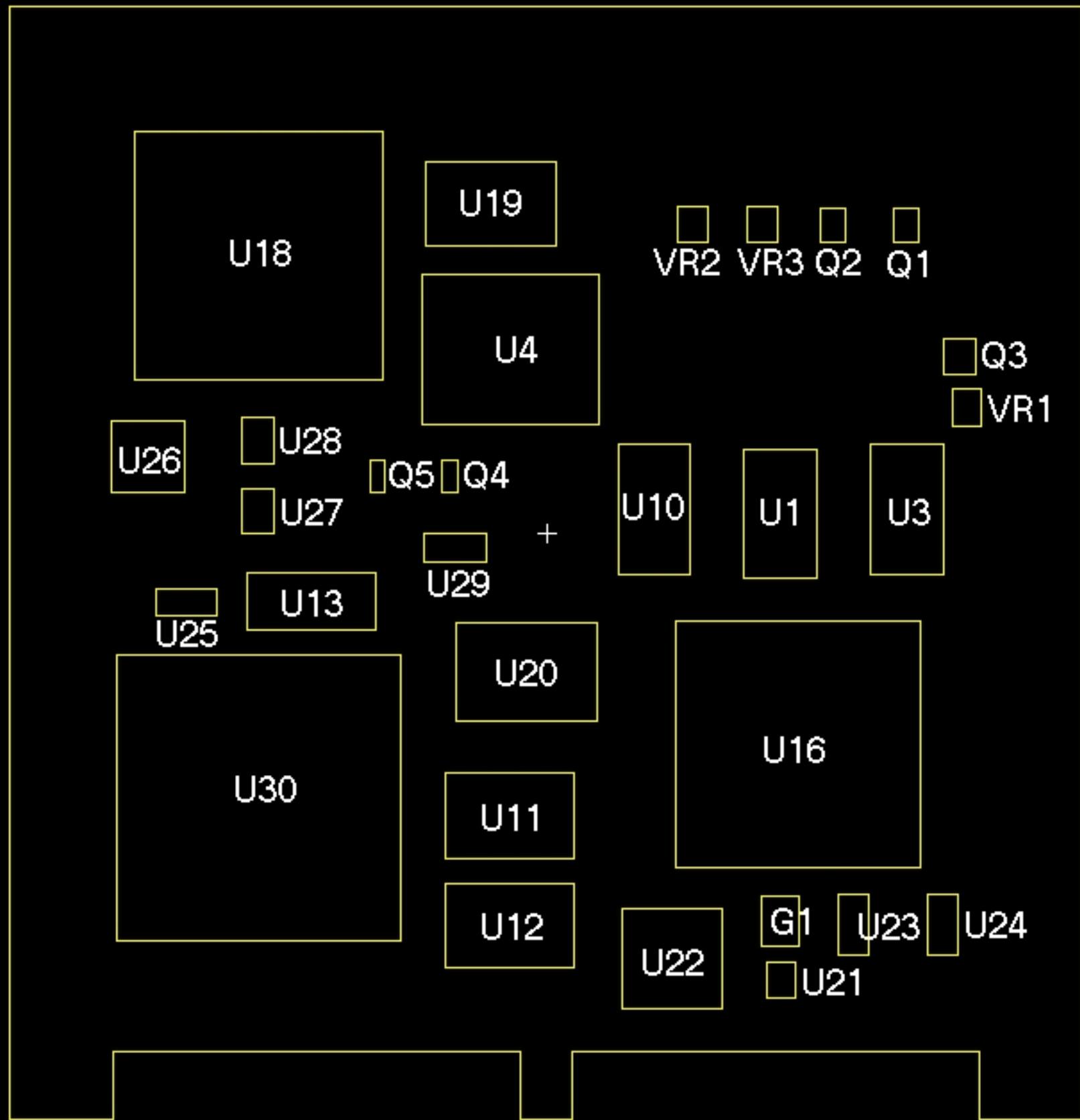


Figure 8: Side "B" Component Layout & Reference Designators

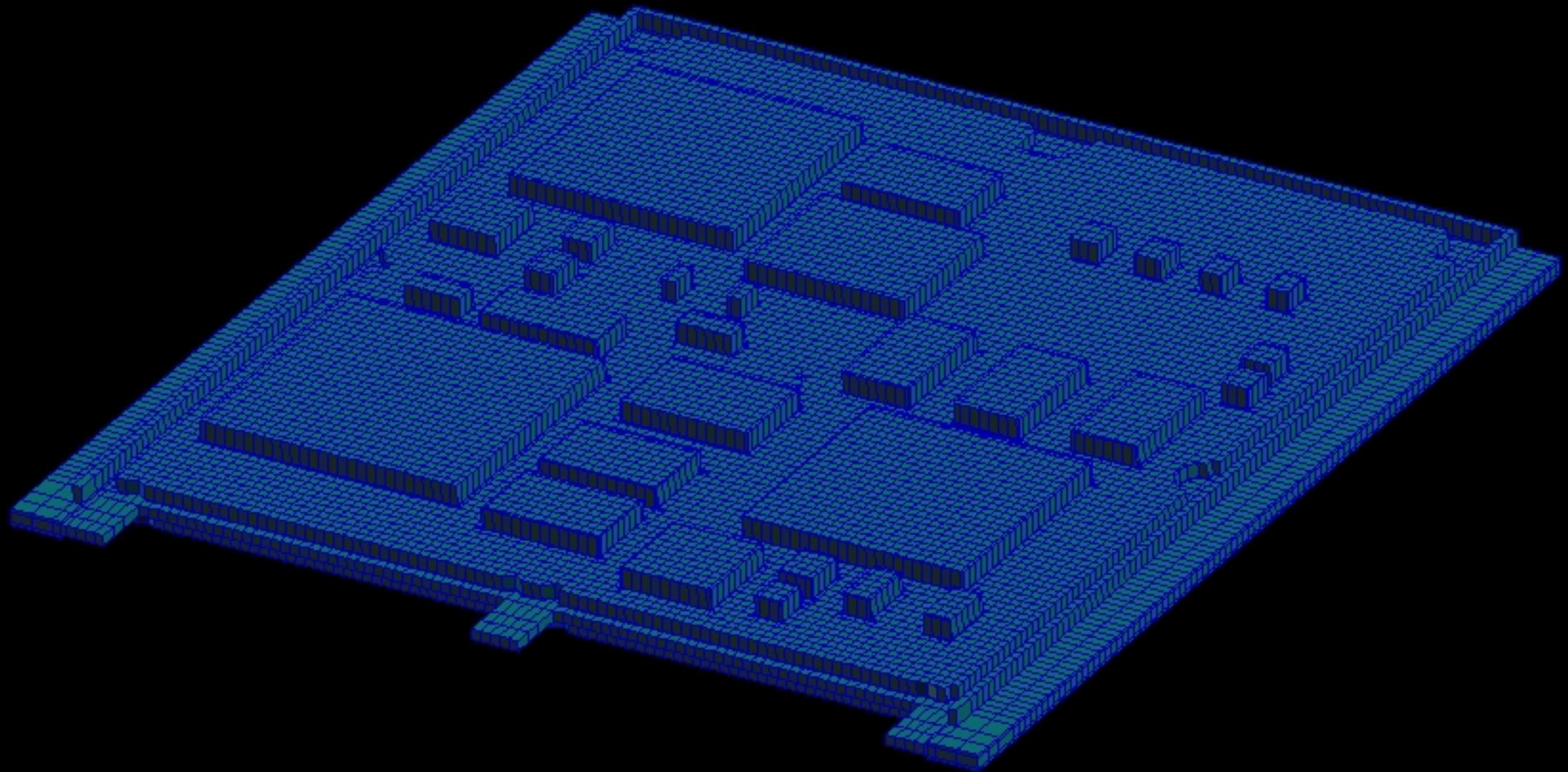
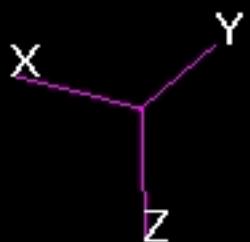


Figure 5: Isometric View of Side "B" Mesh



MSC.Patran 2000 r2 19-May-03 16:31:30

Fringe: DEFAULT.SC1, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

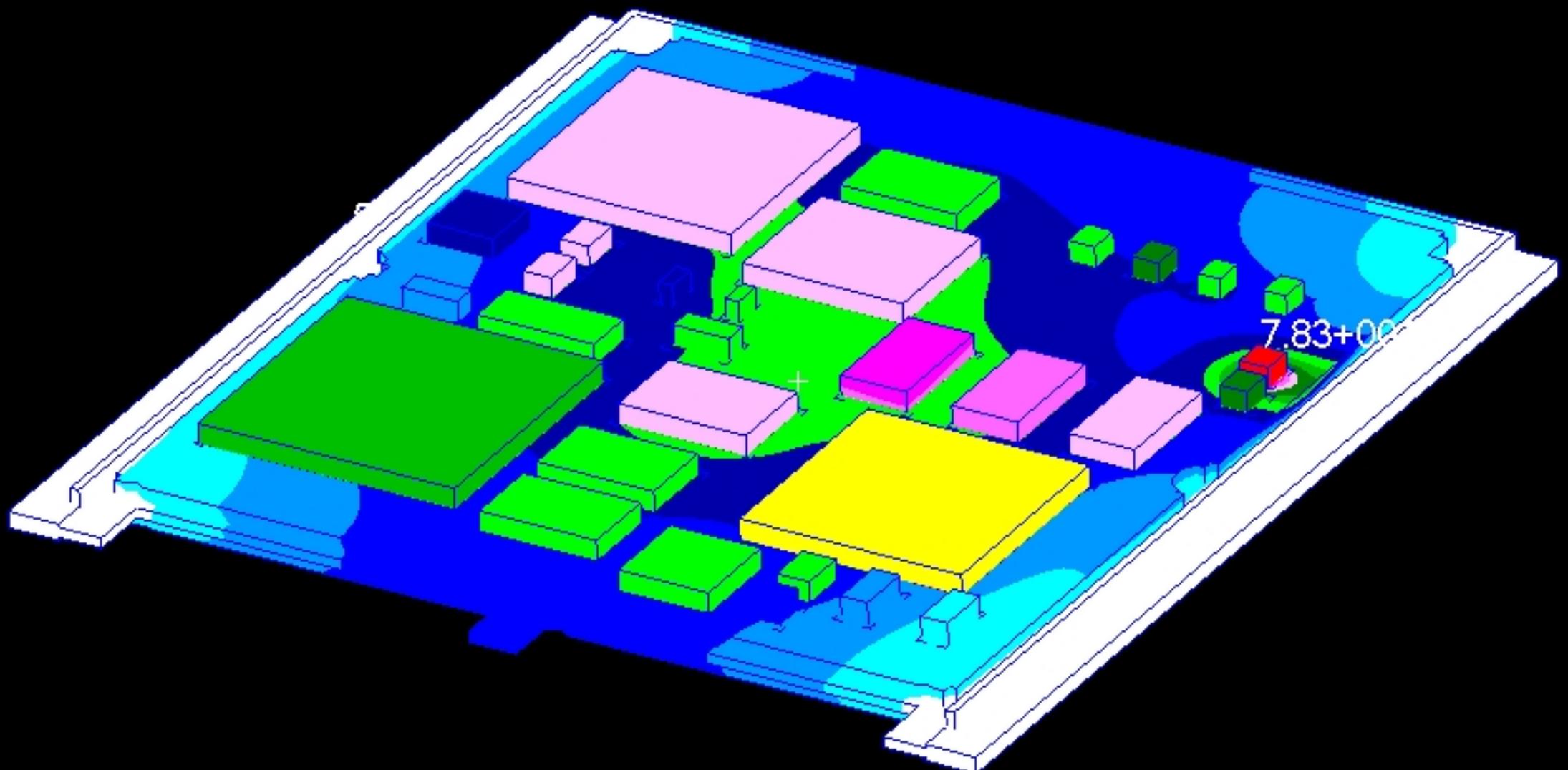
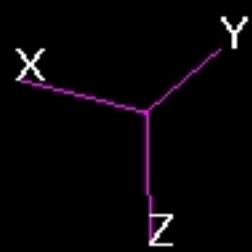
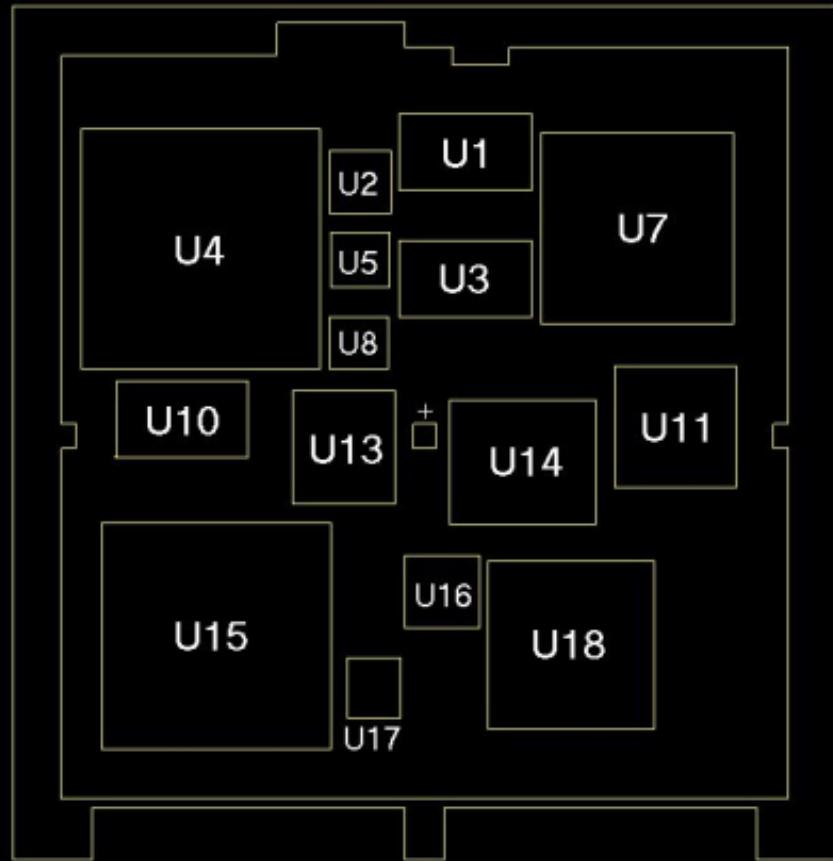


Figure 6: Isometric View of Side "B" Results



default_Fringe :
Max 7.83+001 @Nd 96812
Min 5.60+001 @Nd 5800

 Y
 X



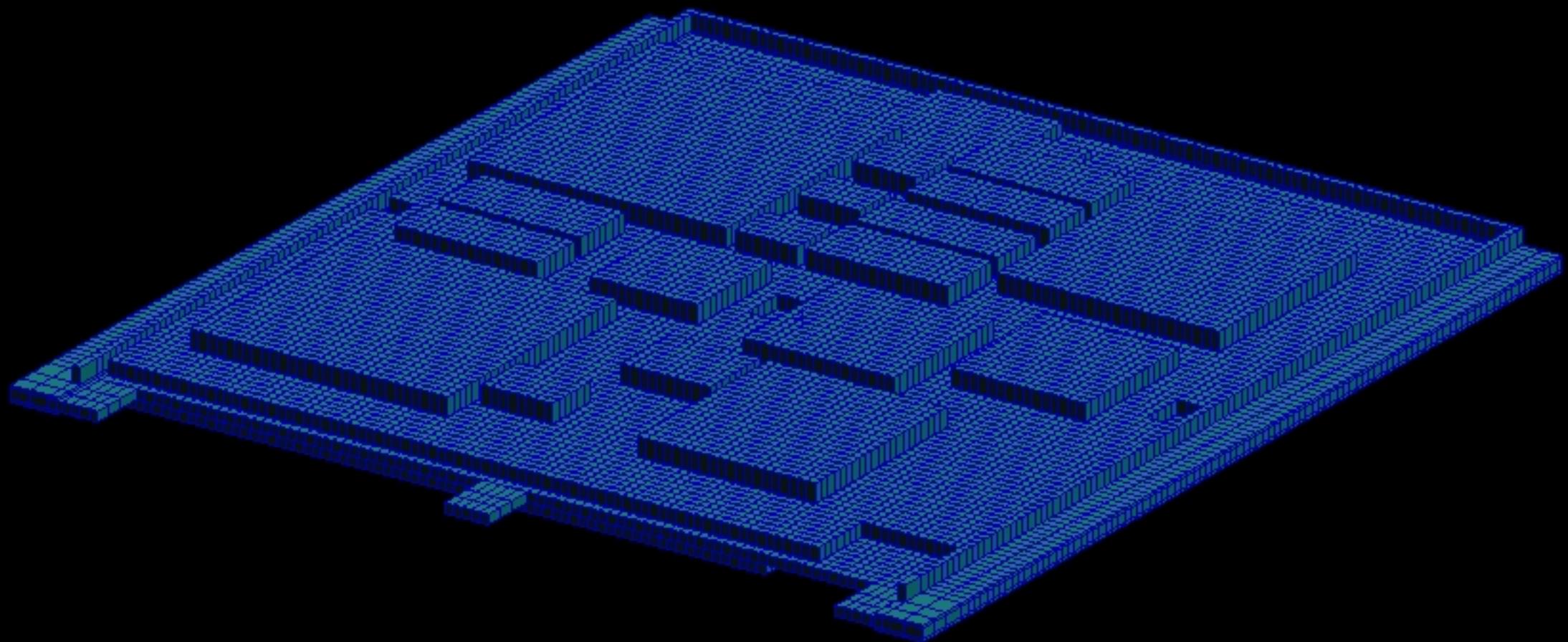


Figure 1: Isometric View of Side "A" Mesh w/o Shroud



MSC.Patran 2000 r2 27-Jun-01 09:56:50

Fringe: Default PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

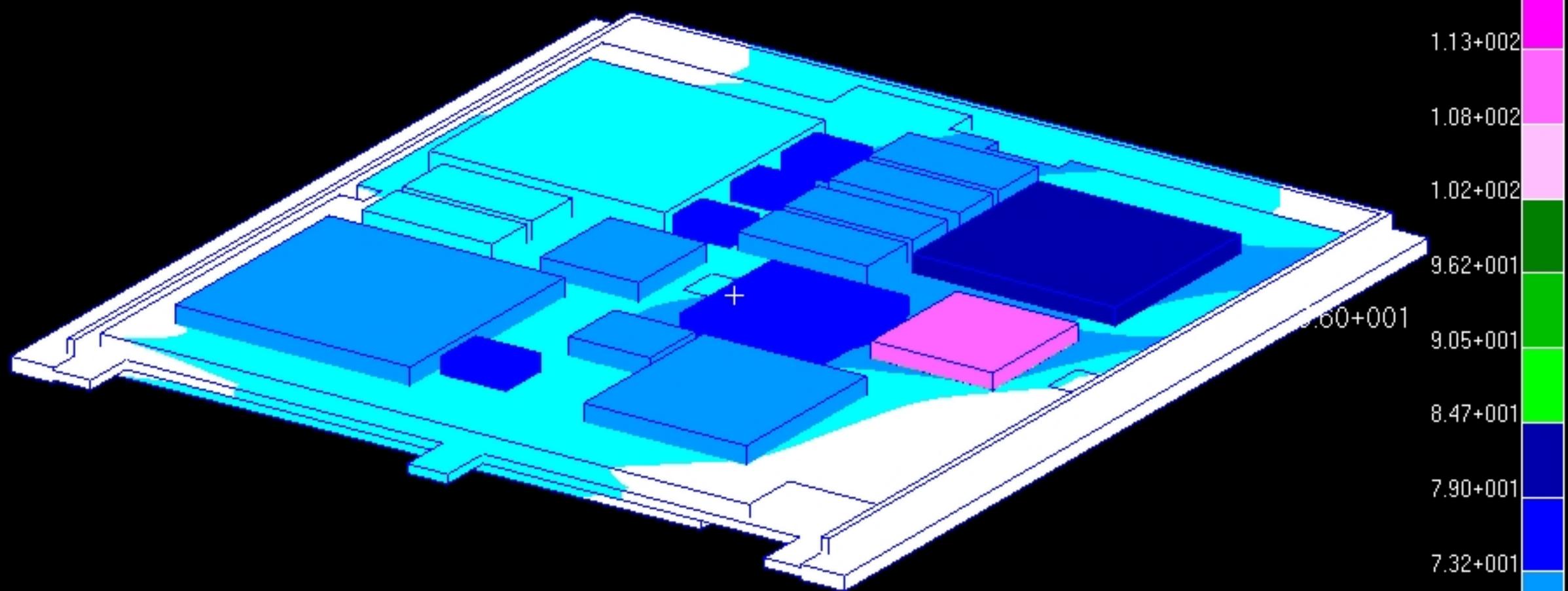


Figure 3: Isometric View of Side "A" Results w/o Shroud



default_Fringe :
Max 1.42+002 @Nd 136931
Min 5.60+001 @Nd 57700

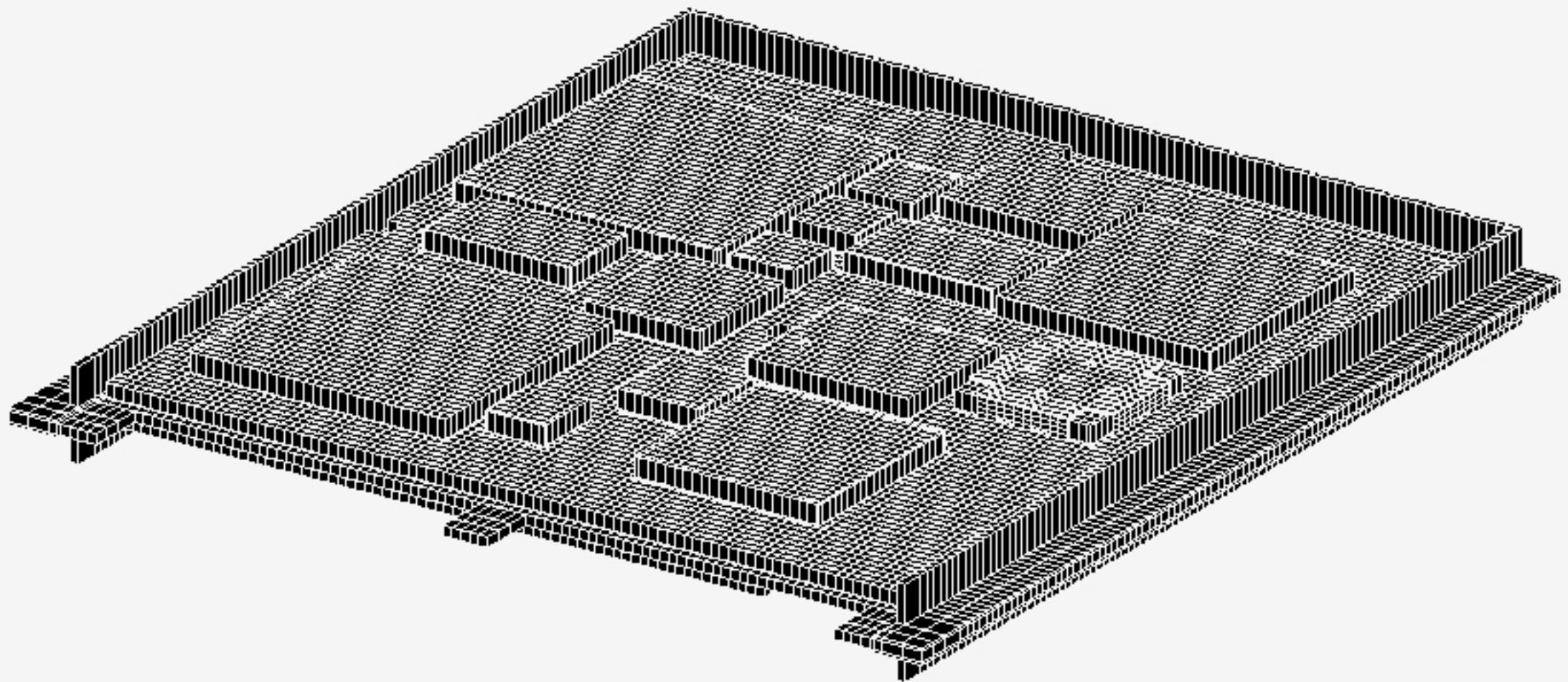
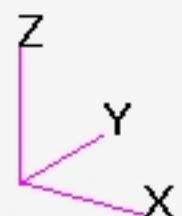


Figure 1: Isometric View of Side "A" Mesh w/ Shroud



MSC.Patran 2000 r2 25-Nov-02 12:51:46

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

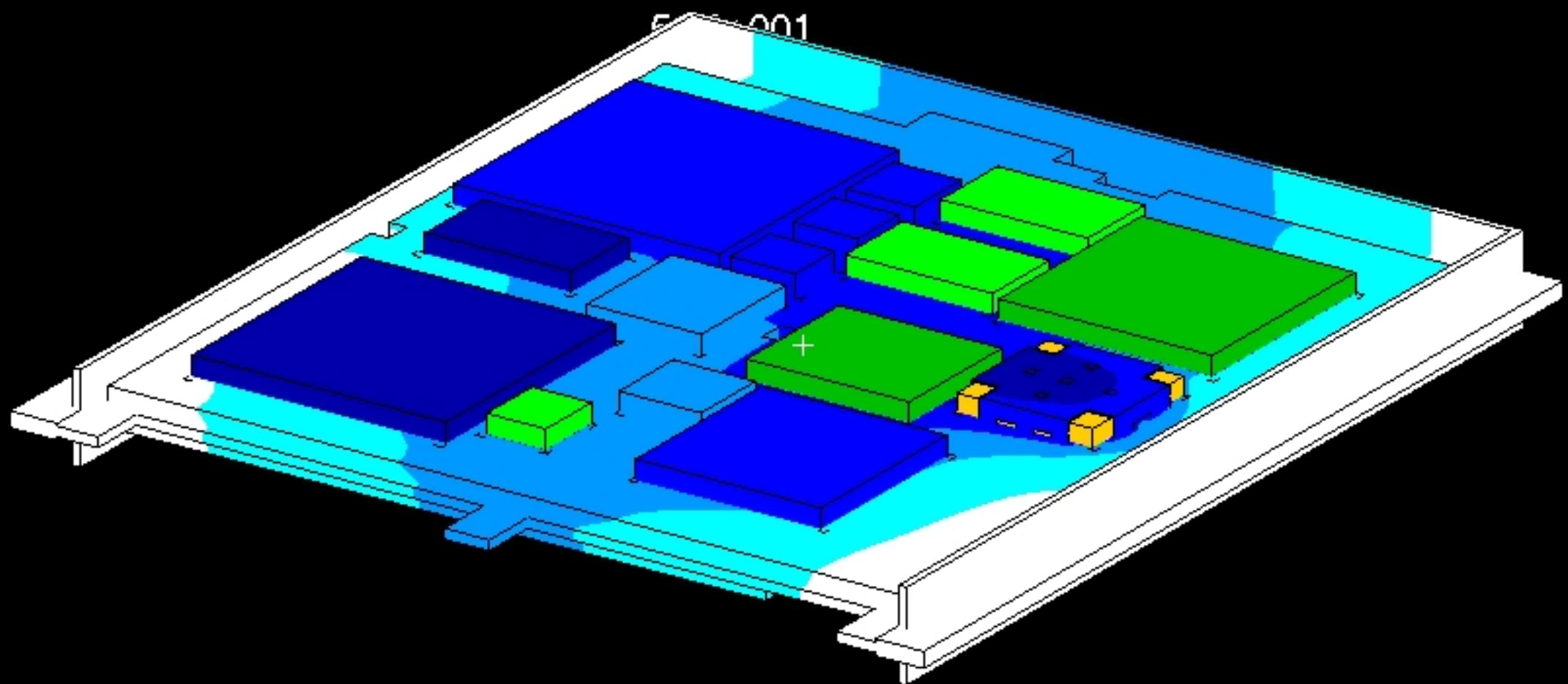


Figure 5: Isometric View of Side "A" Nominal Results



default_Fringe :

Max 9.49+001 @Nd 136629

Min 5.60+001 @Nd 9901

MSC.Patran 2000 r2 25-Nov-02 12:26:34

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

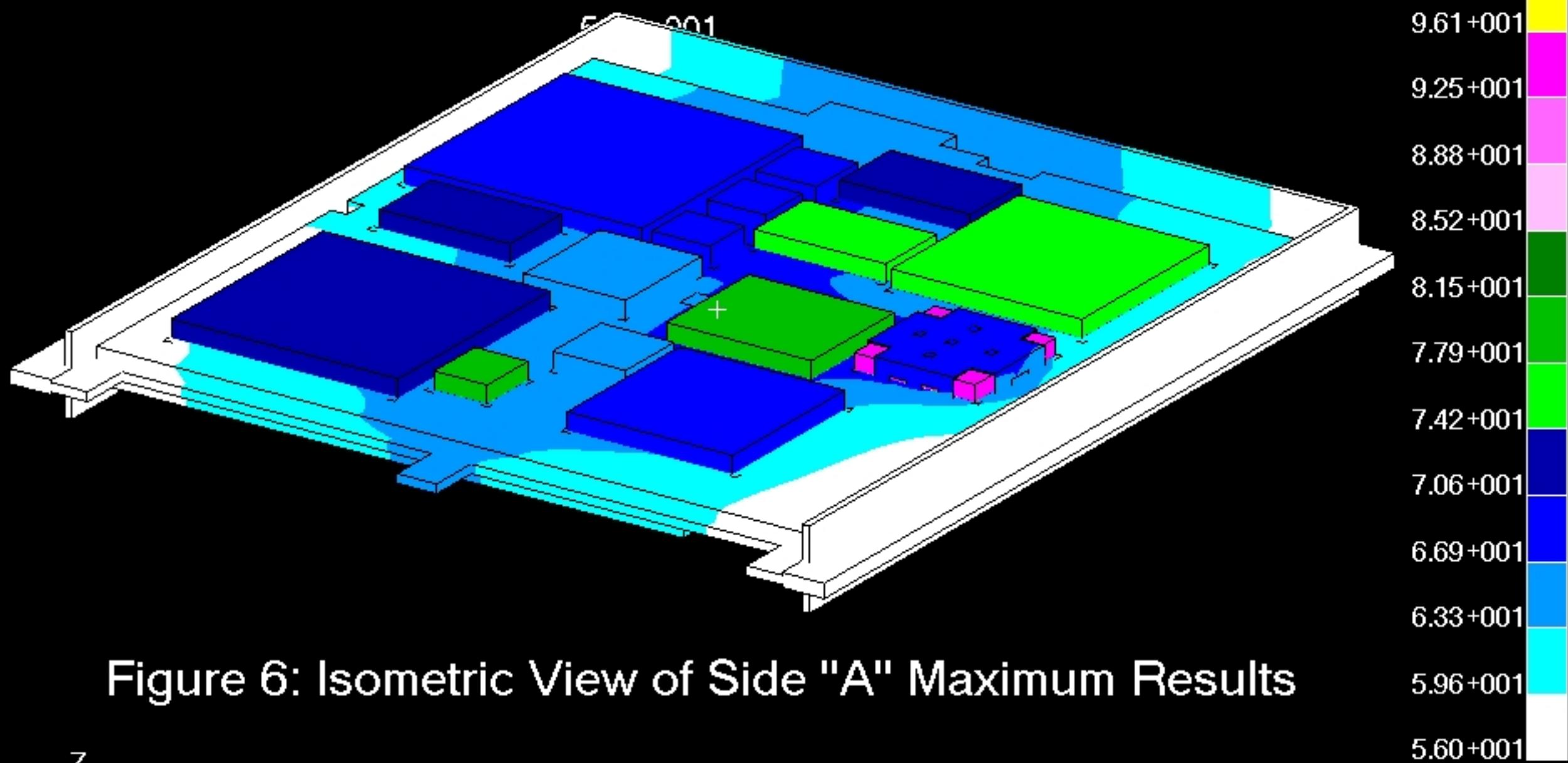
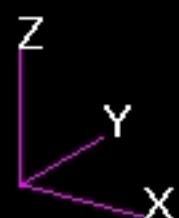


Figure 6: Isometric View of Side "A" Maximum Results



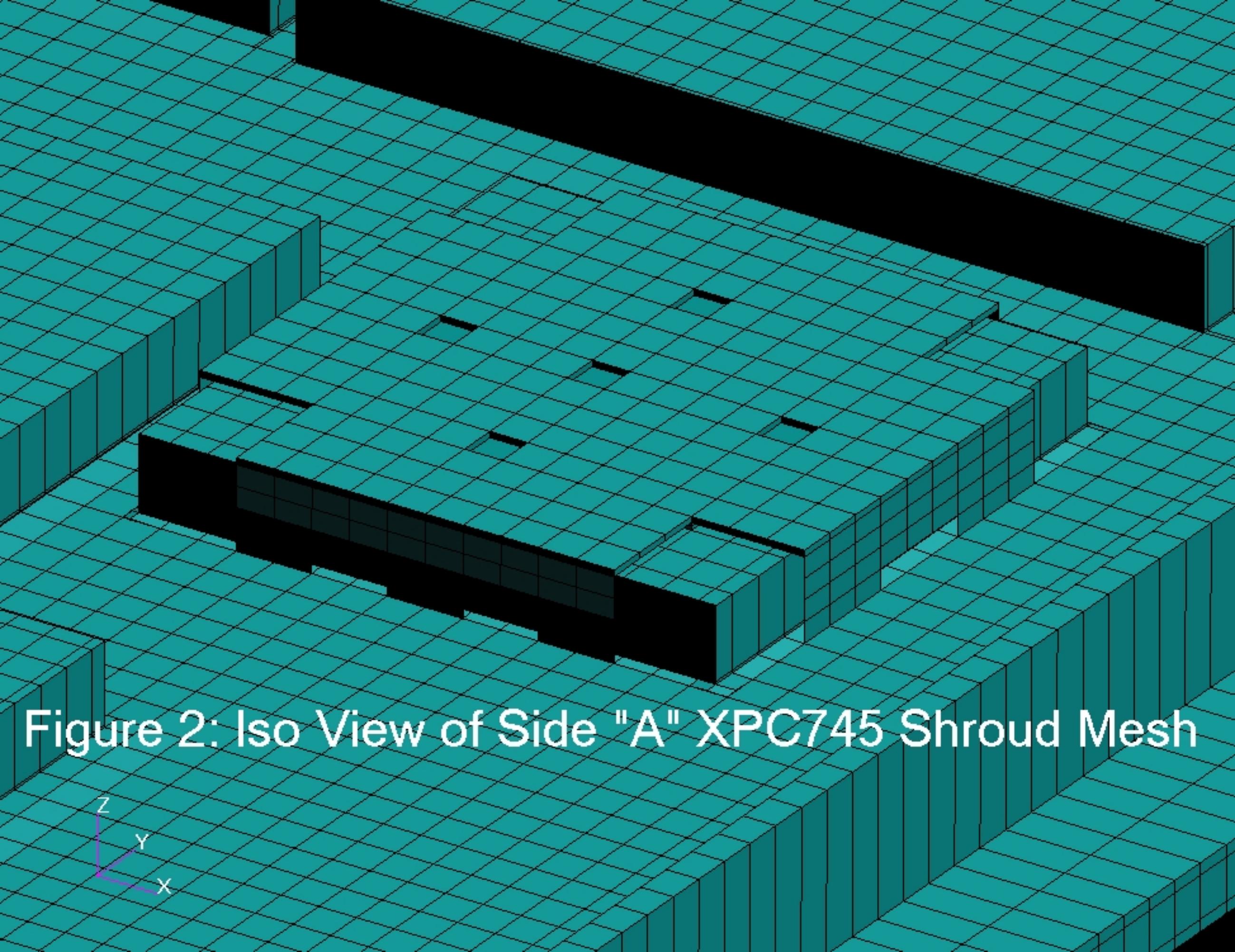


Figure 2: Iso View of Side "A" XPC745 Shroud Mesh

MSC.Patran 2000 r2 25-Nov-02 12:54:06

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

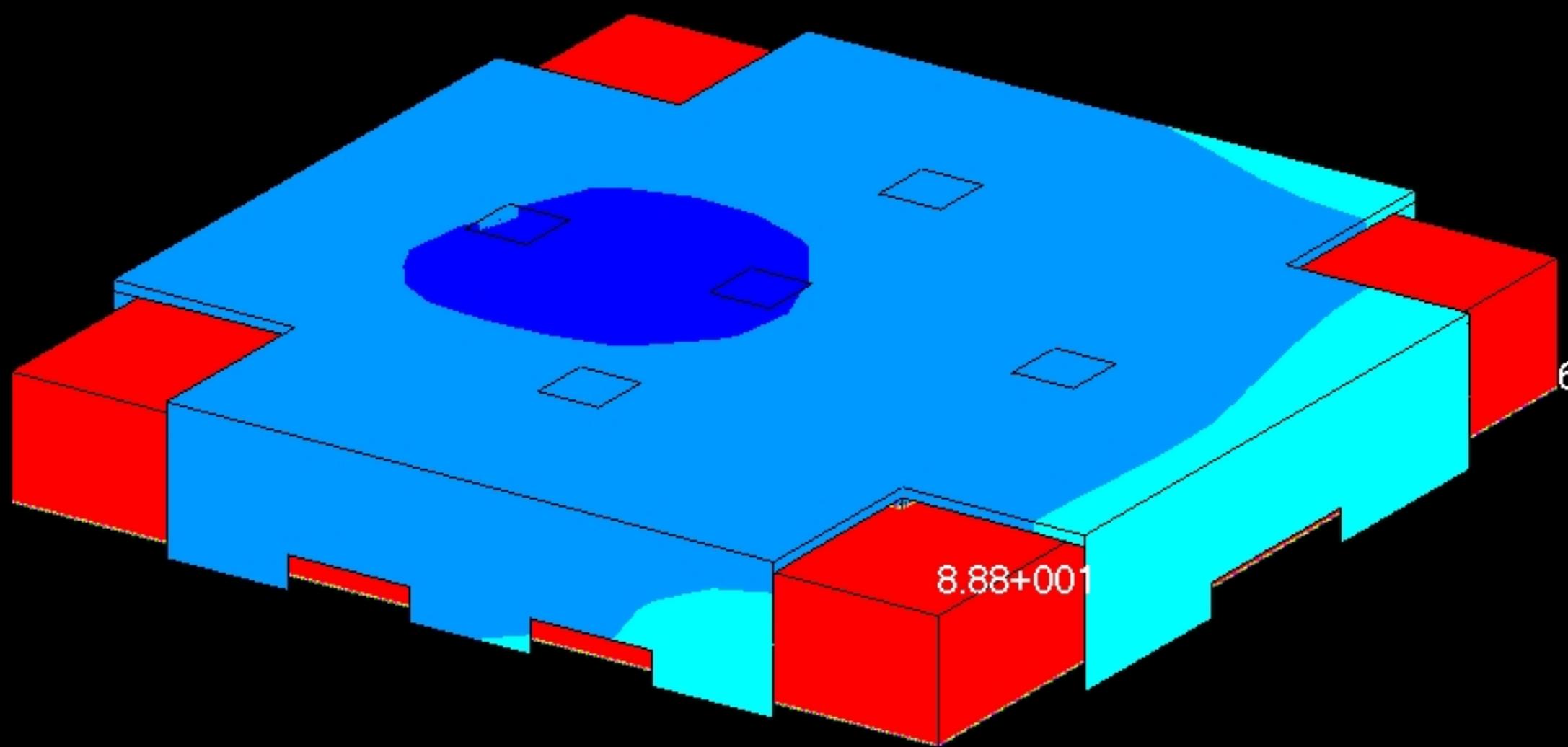


Figure 7: Iso View of Side "A" XPC745 w/ Shroud Nom. Results



default_Fringe :

Max 8.88+001 @Nd 44289

Min 6.18+001 @Nd 1255892

MSC.Patran 2000 r2 25-Nov-02 12:31:41

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

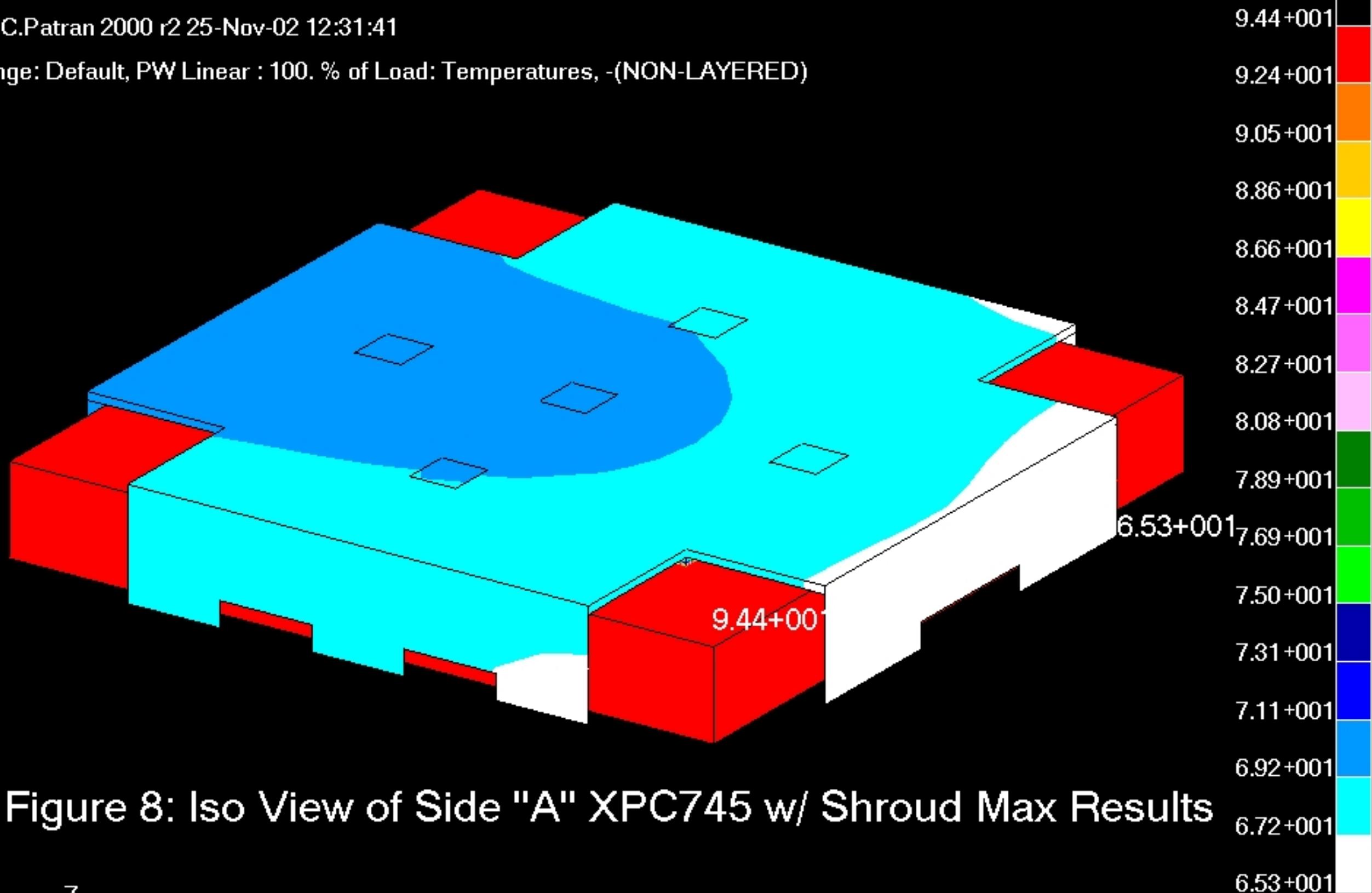


Figure 8: Iso View of Side "A" XPC745 w/ Shroud Max Results



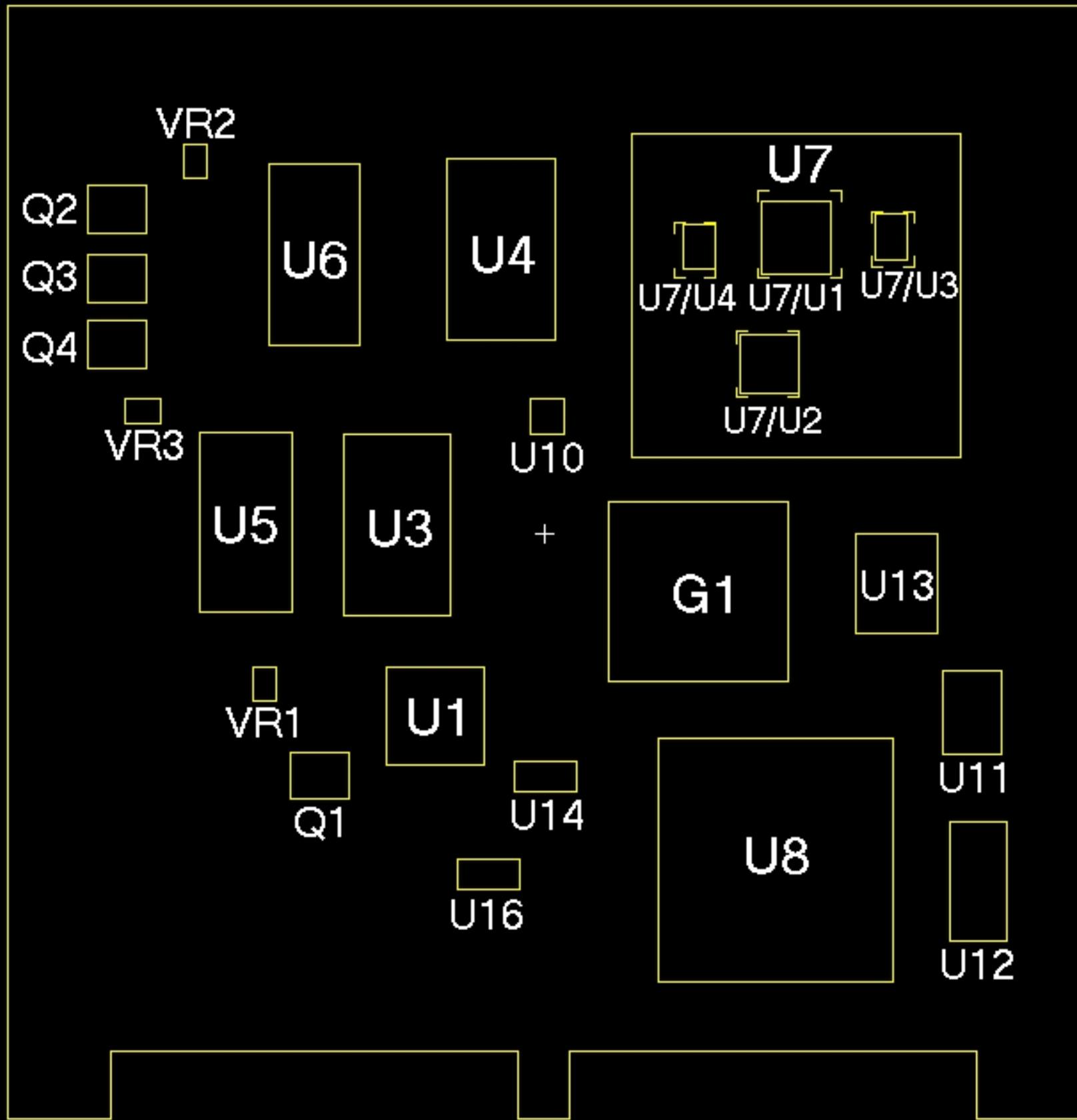


Figure 14: Side "B" Component Layout & Reference Designators

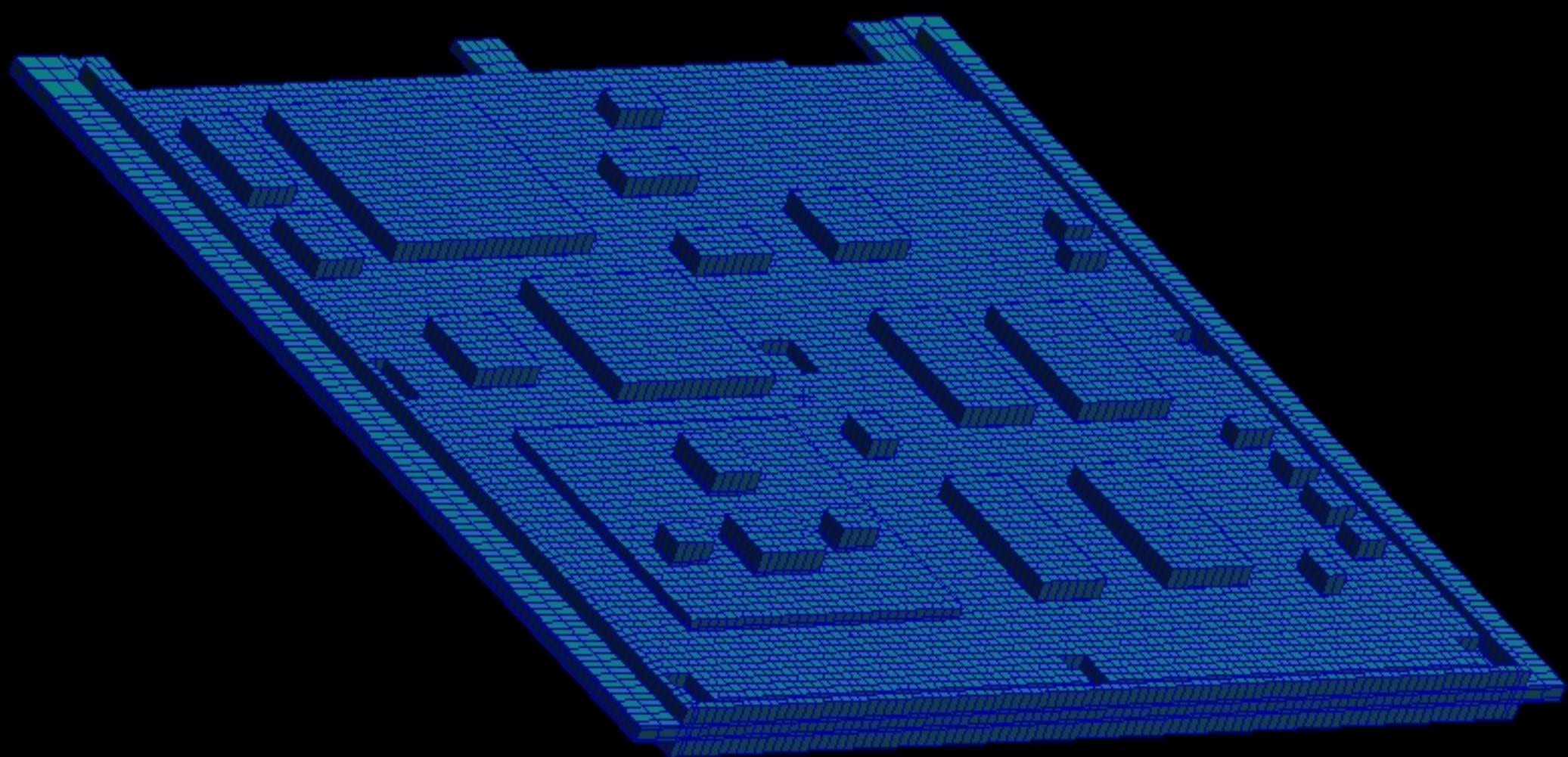


Figure 2: Isometric View of Side "B" Mesh



MSC.Patran 2000 r2 25-Nov-02 12:49:49

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

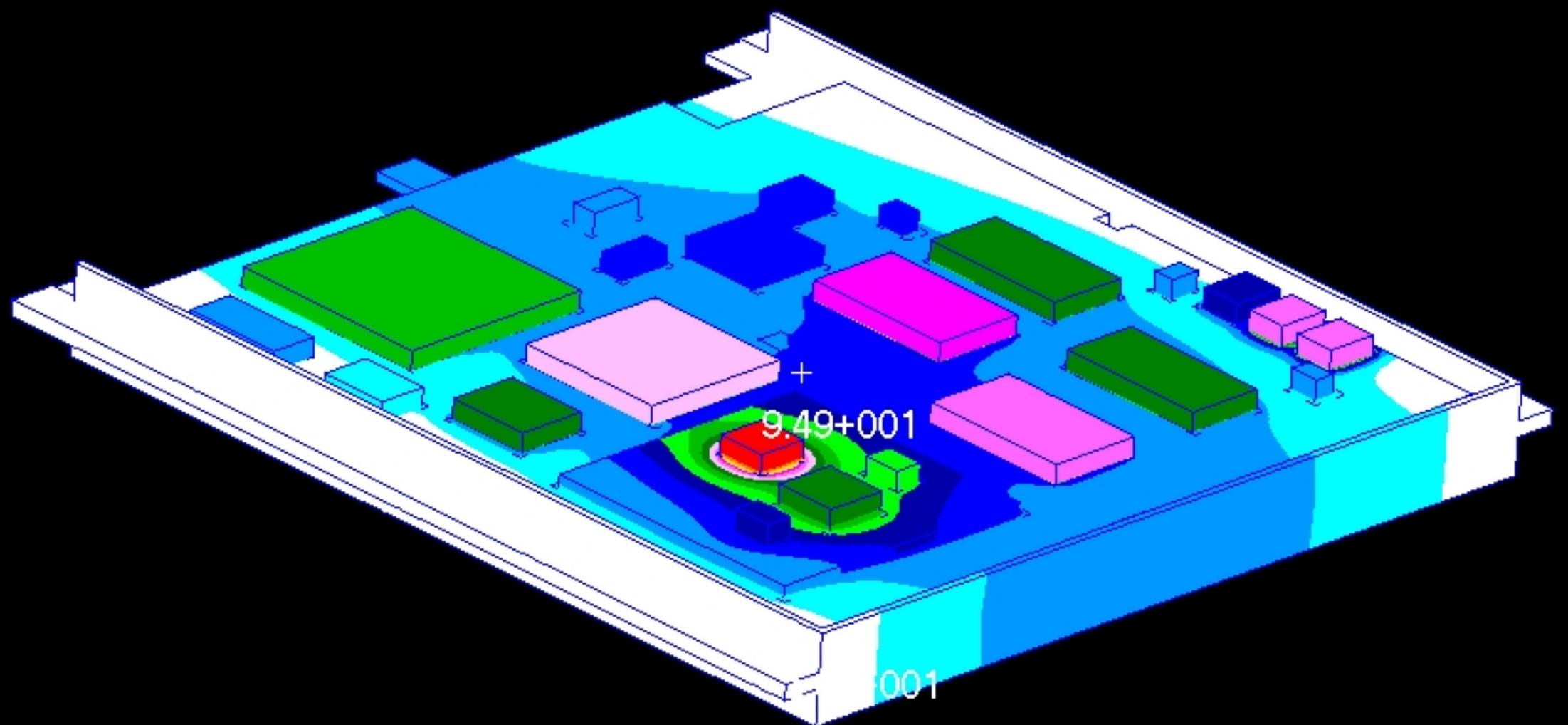


Figure 9: Isometric View of Side "B" Nominal Results

X
Y
Z

default_Fringe :
Max 9.49+001 @Nd 136629
Min 5.60+001 @Nd 9901

MSC.Patran 2000 r2 25-Nov-02 12:26:34

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

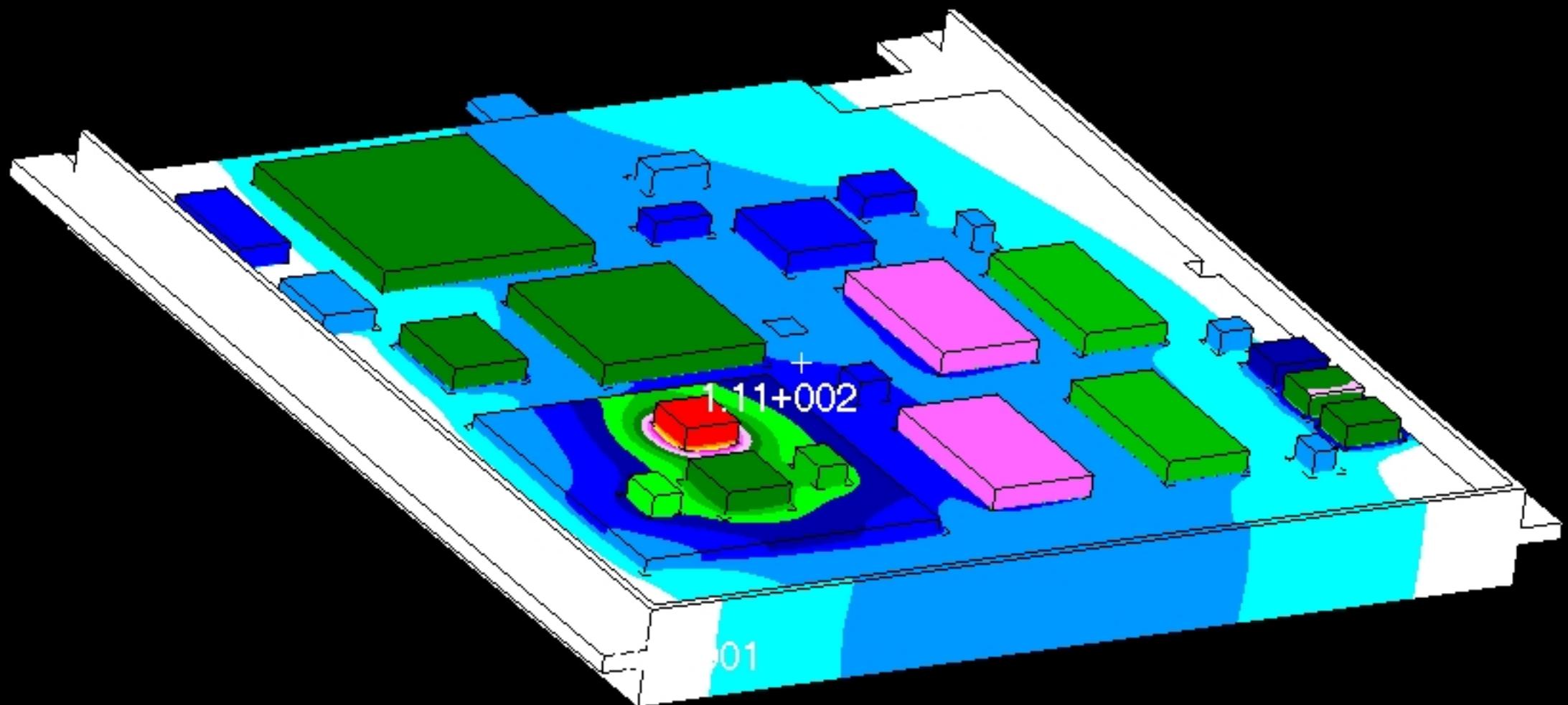


Figure 10: Isometric View of Side "B" Maximum Results



default_Fringe :
Max 1.11+002 @Nd 136629
Min 5.60+001 @Nd 9901

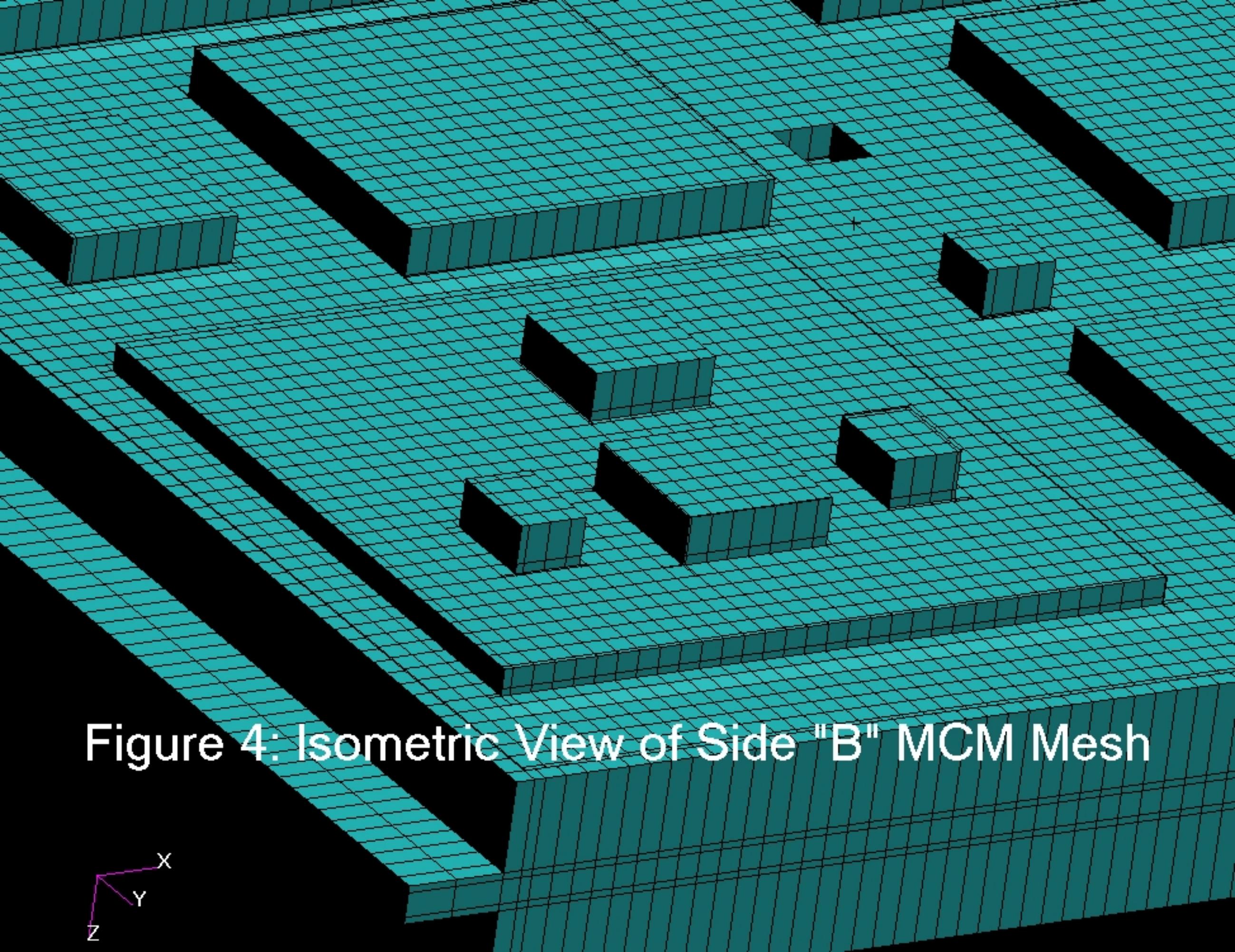


Figure 4: Isometric View of Side "B" MCM Mesh

MSC.Patran 2000 r2 25-Nov-02 12:35:56

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

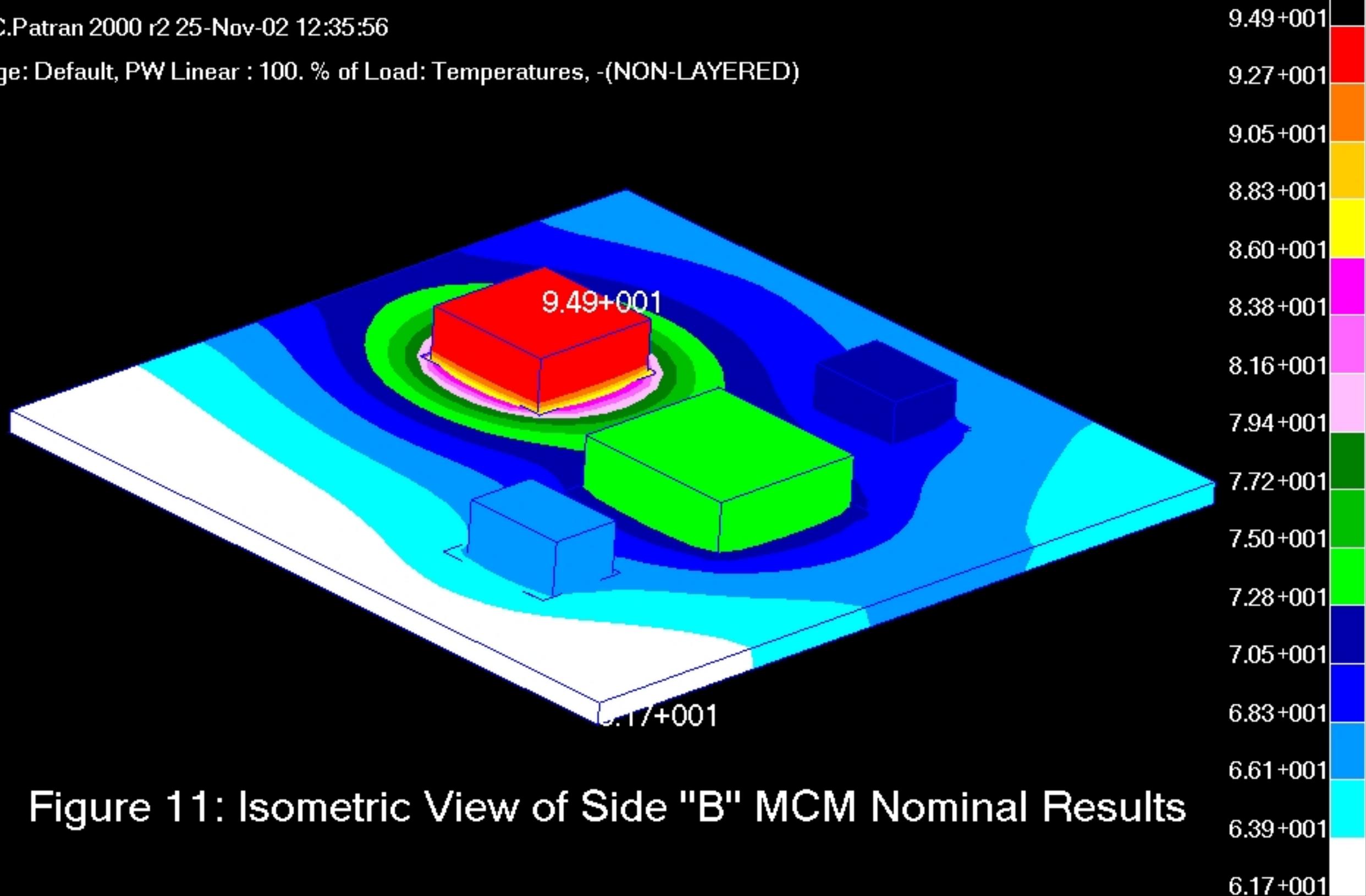


Figure 11: Isometric View of Side "B" MCM Nominal Results

X
Y
Z

default_Fringe :
Max 9.49+001 @Nd 136629
Min 6.17+001 @Nd 1887102

MSC.Patran 2000 r2 25-Nov-02 12:16:33

Fringe: Default, PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

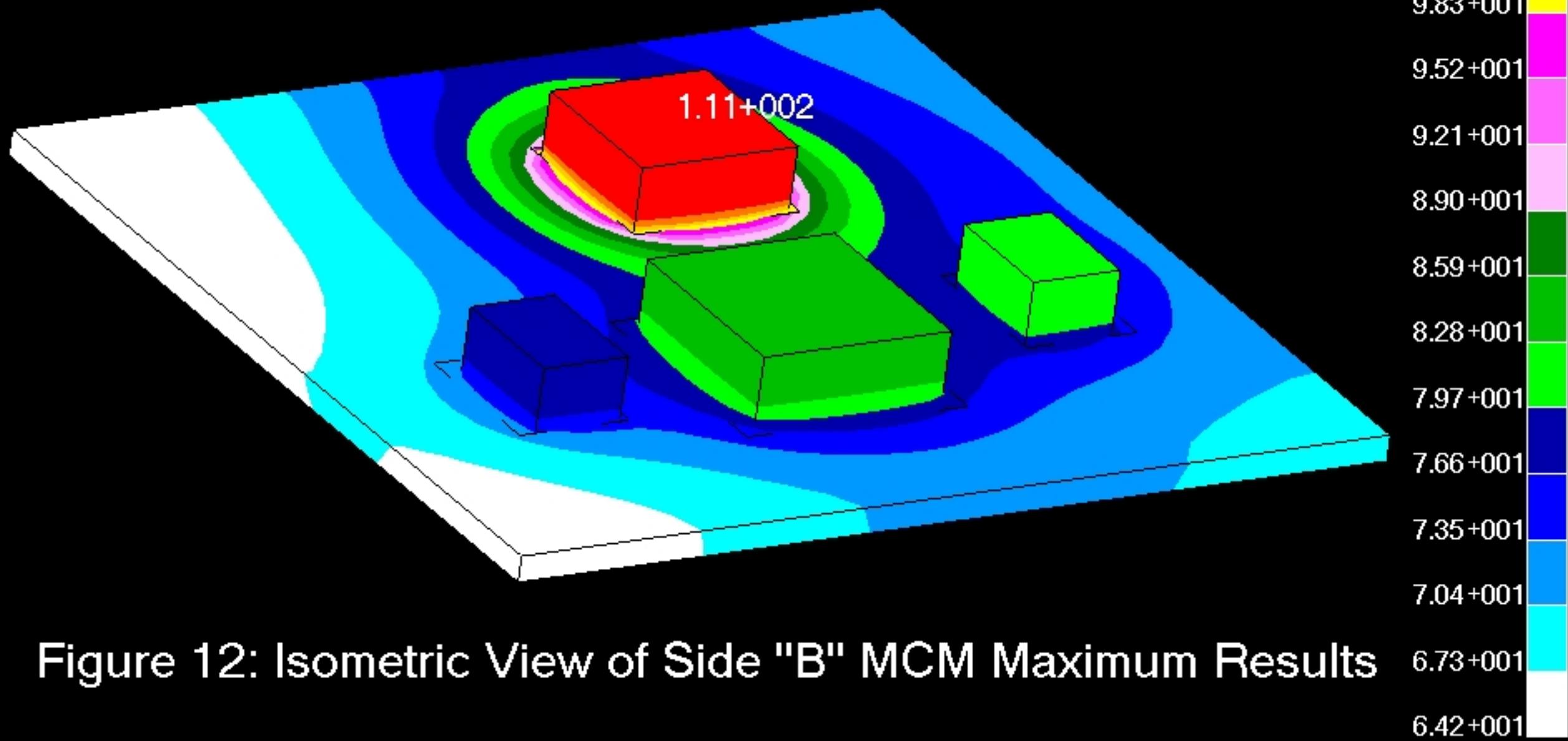


Figure 12: Isometric View of Side "B" MCM Maximum Results



default_Fringe :

Max 1.11+002 @Nd 136629

Min 6.42+001 @Nd 1857102

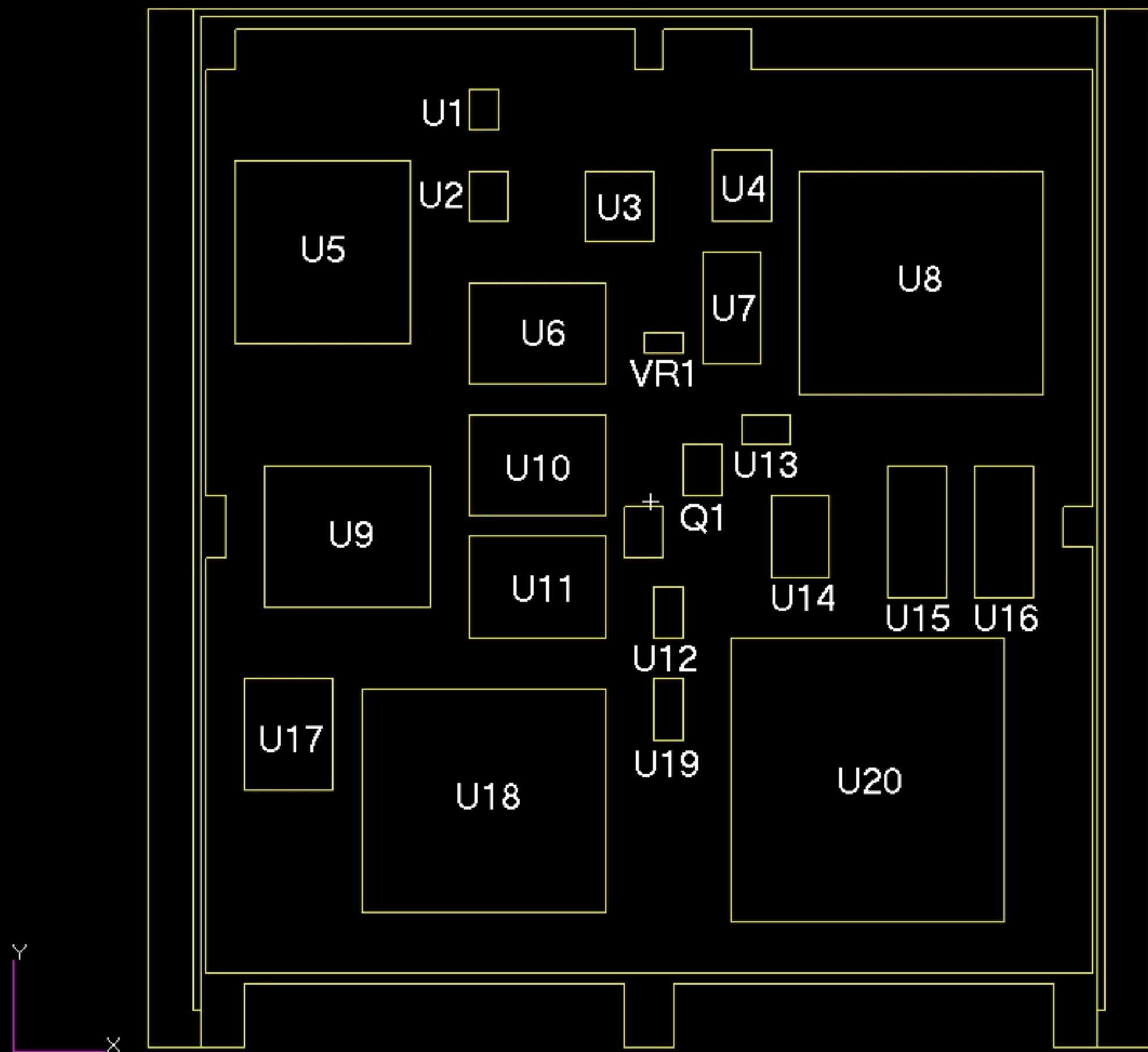


Figure 5: Side "A" Component Layout & Reference Designators

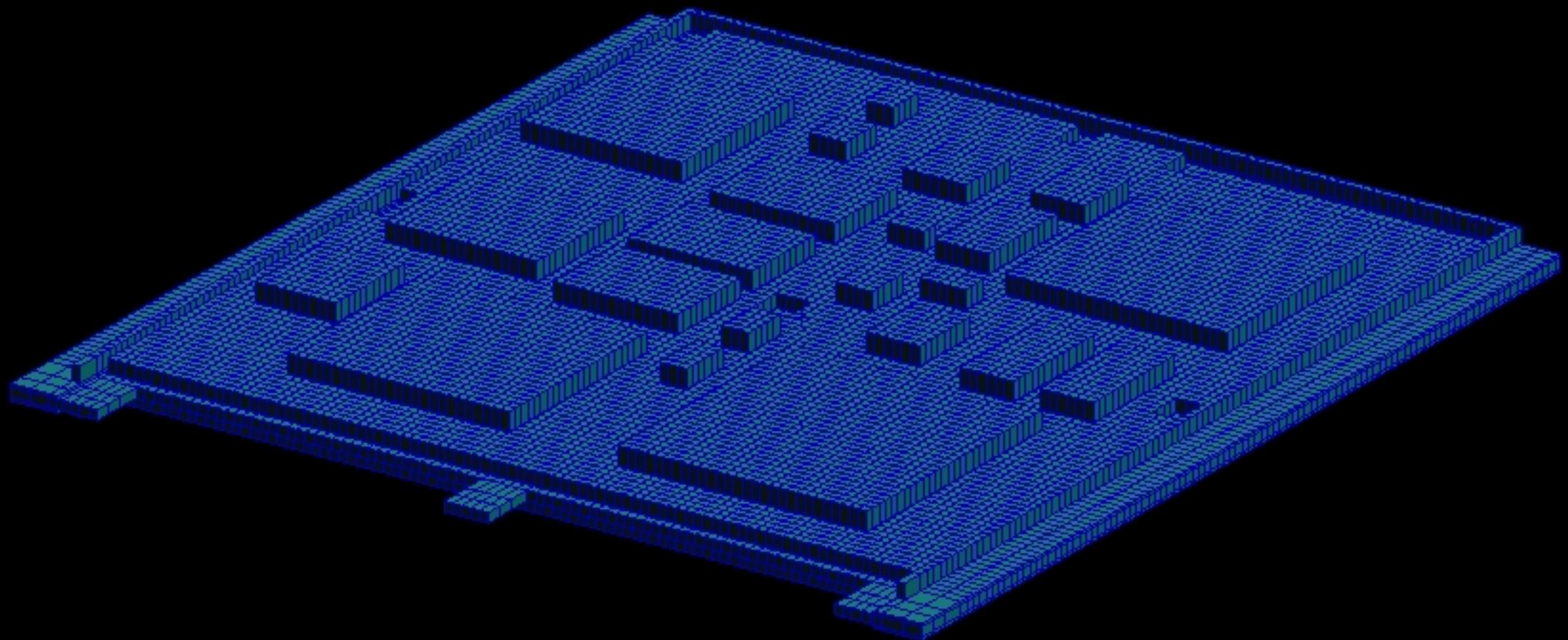
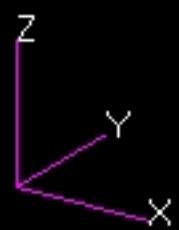


Figure 1: Isometric View of Side "A" Mesh



MSC.Patran 2000 r2 25-Jun-01 07:07:04

Fringe: Default PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

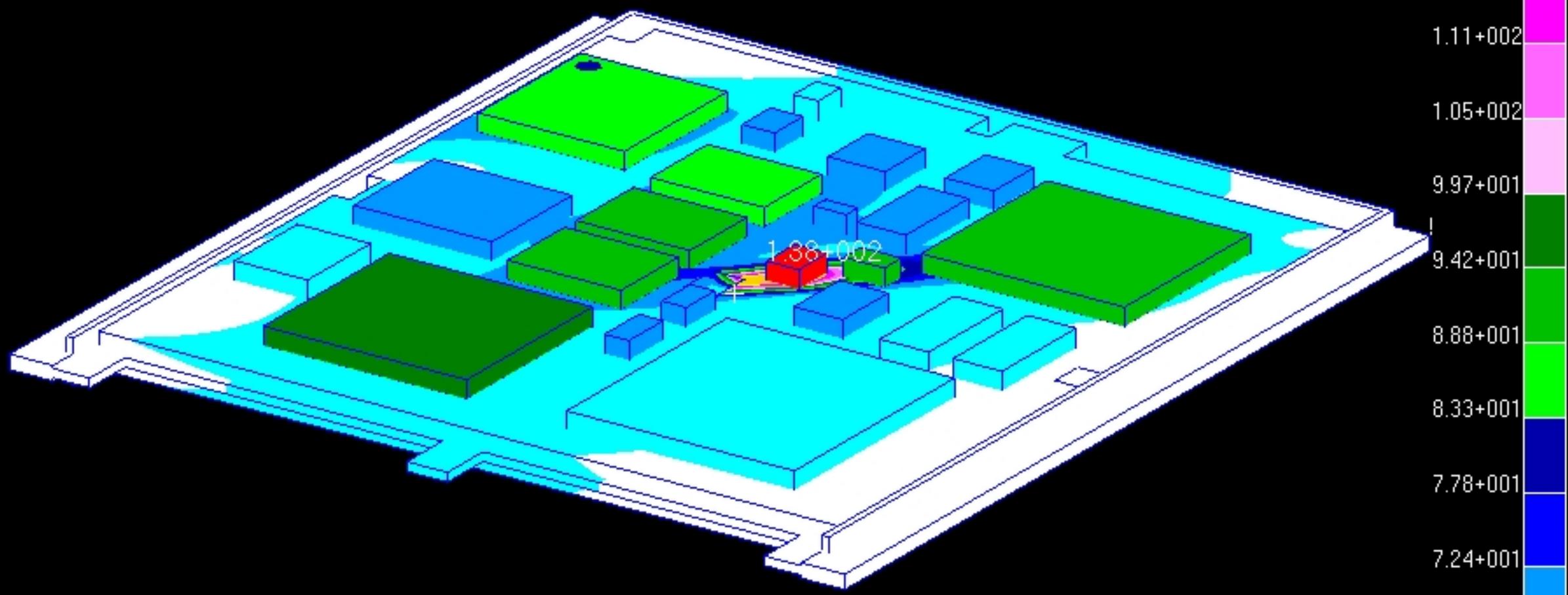
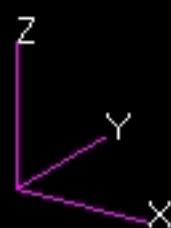


Figure 3: Isometric View of Side "A" Results



default_Fringe :
Max 1.38+002 @Nd 45154
Min 5.60+001 @Nd 10000

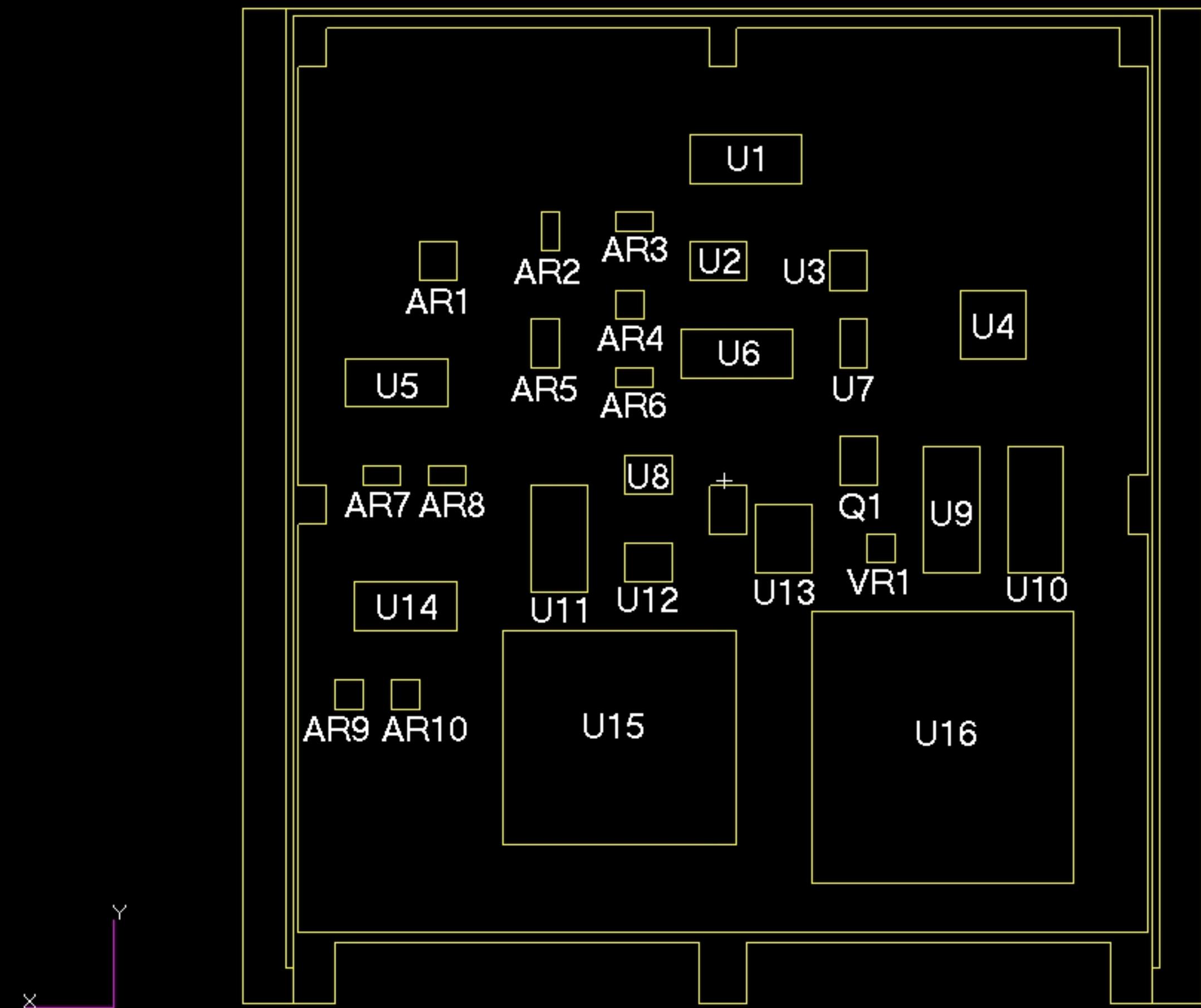


Figure 6: Side "B" Component Layout & Reference Designators

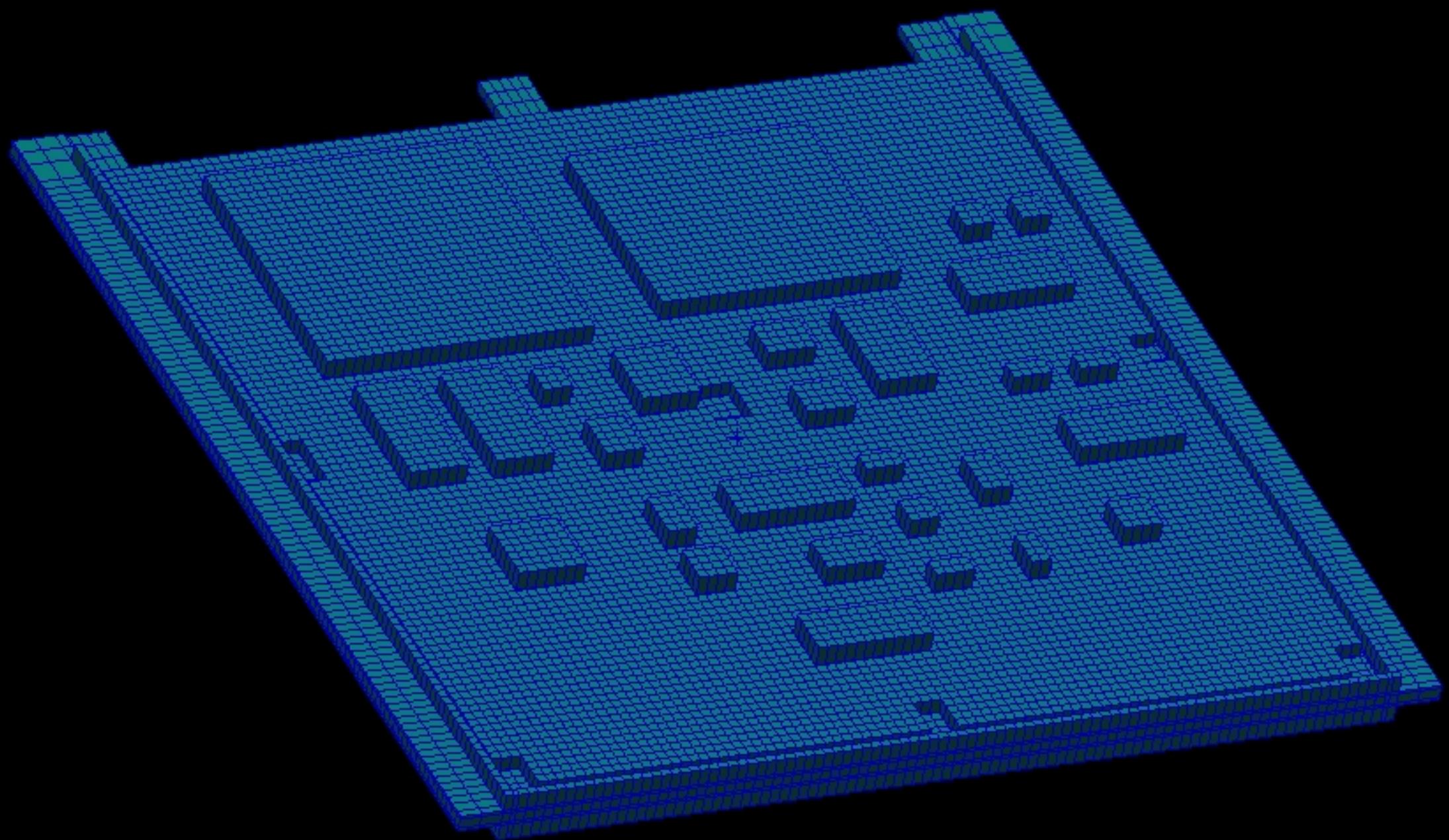


Figure 2: Isometric View of Side "B" Mesh



MSC.Patran 2000 r2 25-Jun-01 07:17:11

Fringe: Default PW Linear : 100. % of Load: Temperatures, -(NON-LAYERED)

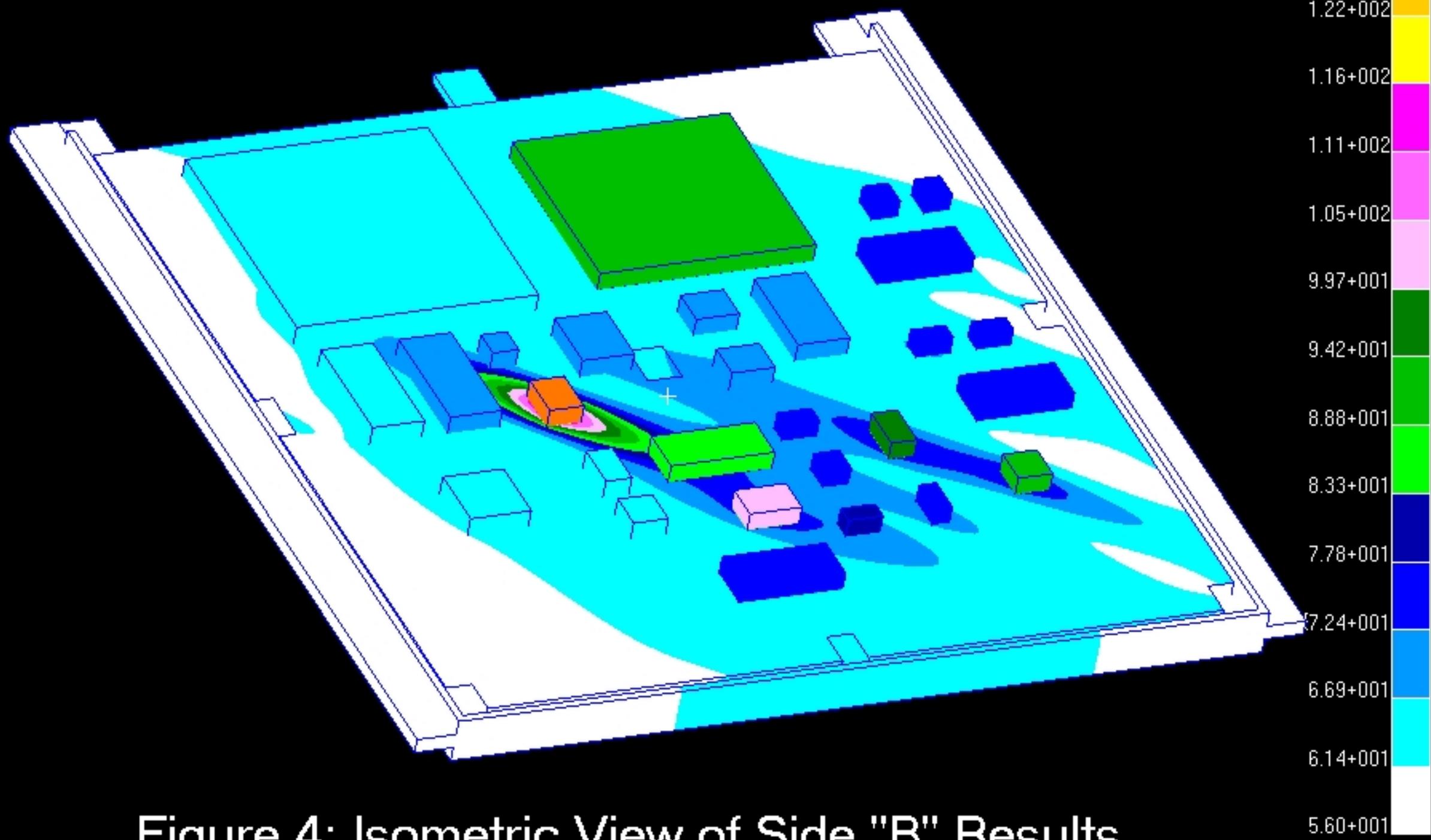


Figure 4: Isometric View of Side "B" Results



default_Fringe :
Max 1.38+002 @Nd 45154
Min 5.60+001 @Nd 10000