

Lab 2 Q3D Package Cross-Section Modeling

Tool used: Ansys Elctronic Desktop (AEDT) 2022 R2

File name: flipchip_bga.aedt

Package Dimensions: 20x20x1.6mm

Create Flipchip BGA Package

Dimensions Substrate Solder Die

Name: Flipchip_BGA2

Plane: XY

Location

xS: 0.0 mm

yS: 0.0 mm

zS: 0.0 mm

Size

xLength: 20 mm

yLength: 21 mm

Package Thickness: 1.6 mm

Model Specs

Model Type: Detailed

Symmetry: ☒ Full ☐ Half ☐ Quarter

☐ Create 3D Component

☐ Fix Values

OK Use Default Cancel

Die Dimensions: 12x12mm, Power: 4mm, include heatsink

Create Flipchip BGA Package

Dimensions Substrate Solder Die

Die

xLength: 12 mm

yLength: 12 mm

Power: 4 W

Material: Si-Typical

Die Underfill

Bump size: 0.01 mm

Material: Flipchip_underfill

Heatsink

Include heatsink: ☒ Yes ☐ No

Thickness: 0.2 mm

Material: Cu-Pure

☐ Create 3D Component

☐ Fix Values

OK Use Default Cancel

Substrate:

Create Flipchip BGA Package

Dimensions Substrate Solder Die

Substrate

Number of Layers: 2

Substrate Thickness: 0.5 mm

Substrate Material: Substrate_material

Trace

Top Trace Coverage %: 55.0

Bottom Trace Coverage %: 0.0

1st Int. Layer Coverage %: 0.0

2nd Int. Layer Coverage %: 0.0

Trace Thickness: 0.033 mm

Trace Material: Cu-Pure

Vias

Number of Thermal Vias: 0

Via Diameter: 0.18 mm

Via Plate Thickness: 0.05 mm

☐ Create 3D Component

☐ Fix Values

OK Use Default Cancel

Solder: 15x15 rows

Dimensions Substrate Solder Die

Distribution
Number of Rows:
X: 15 Y: 15

Array Type:
☒ Full Array ☐ Peripheral Array

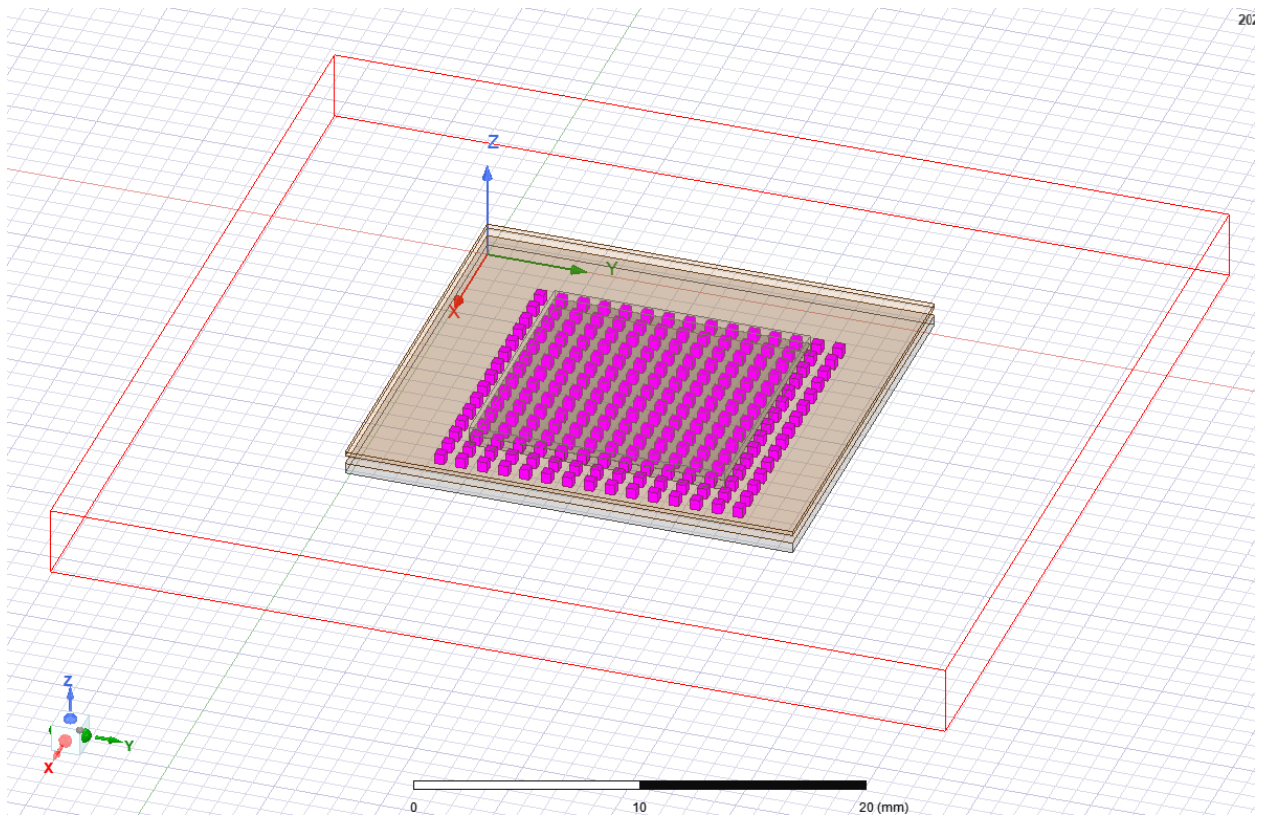
Number of Suppressed Rows:
X: 0 Y: 0

Number of Central Rows:
X: 0 Y: 0

Ball
Ball Pitch: 1.0 mm
Ball Diameter: 0.5 mm
Ball Height: 0.5 mm
Ball Material: Solder-pb50_sn50

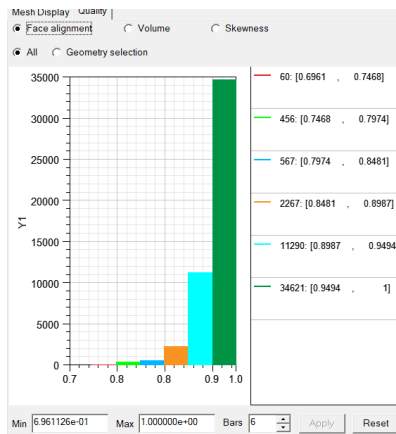
☐ Create 3D Component
☐ Fix Values

OK Use Default Cancel

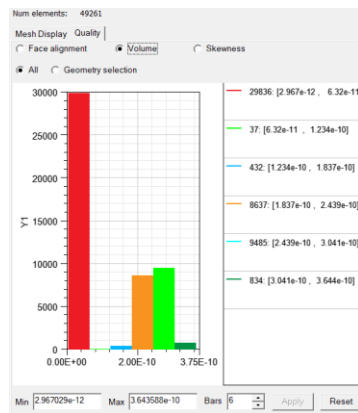


Mesh Quality

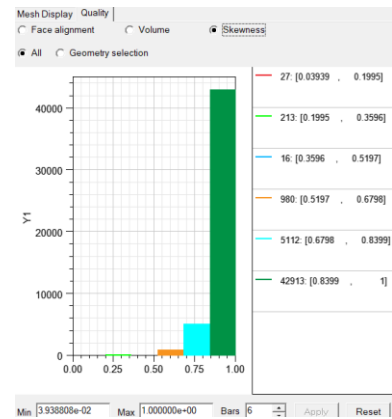
Face alignment



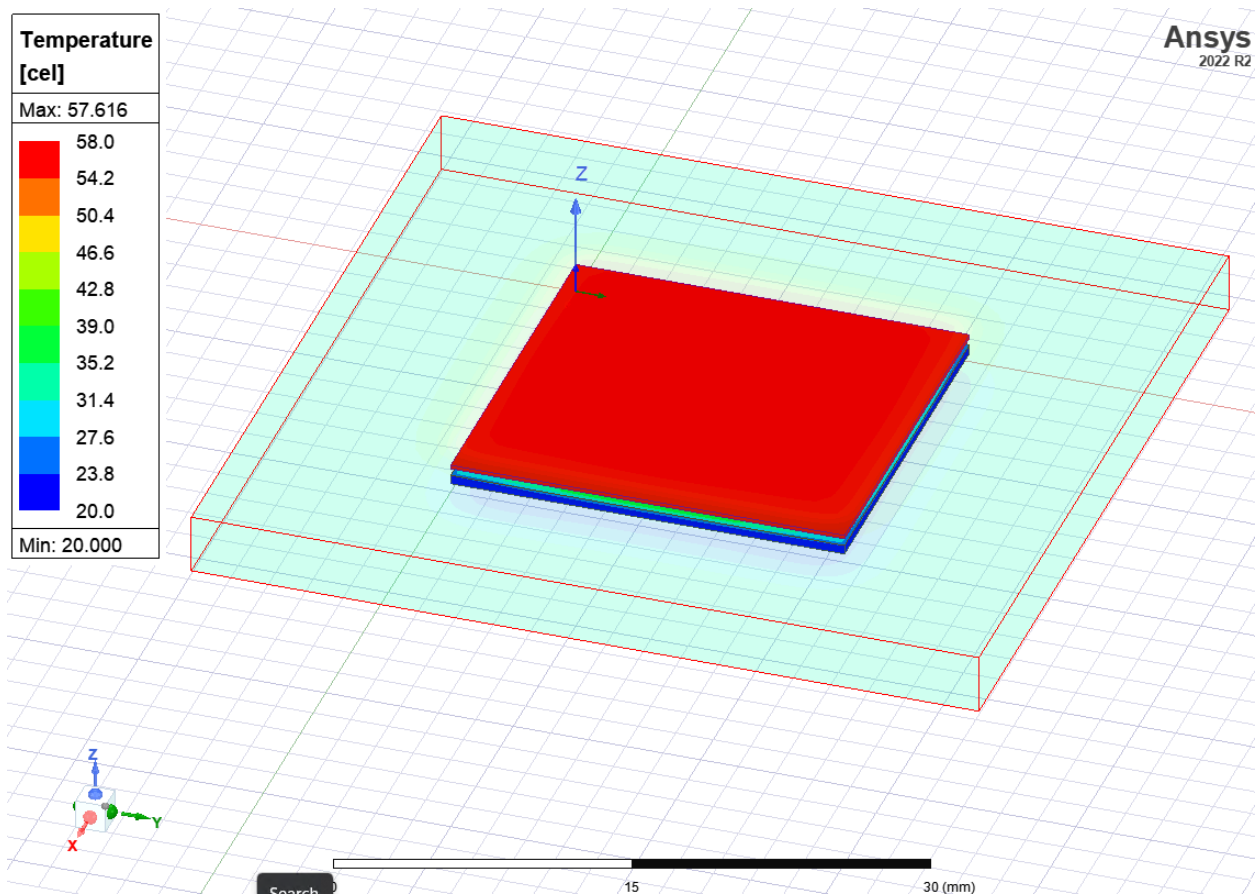
Volume



Skewness

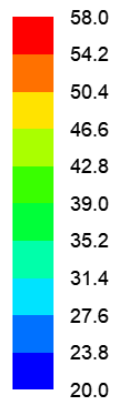


Final results: heatsink was used in design so it brought down the temperature at die (junction)



Temperature
[cel]

Max: 57.616



Min: 20.000

Ansys
2022 R2

