ITherm 2025

COLD PLATE DESIGN COMPETITION GUIDELINES

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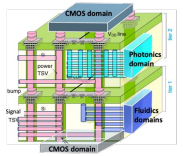
PURDUE UNIVERSITY



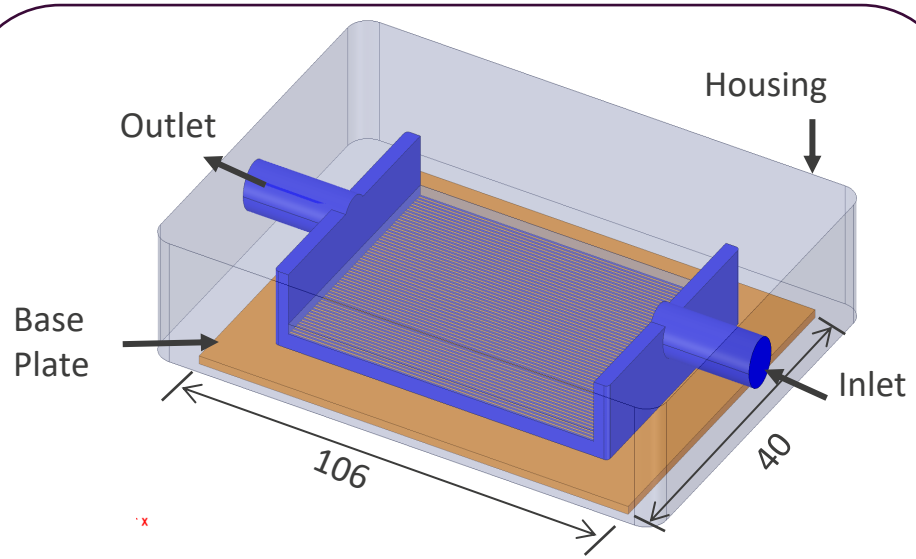
Semiconductor Packaging Laboratory
(All-in-one for Semiconductor Packaging, Heat transfer, and Assembly Lab)

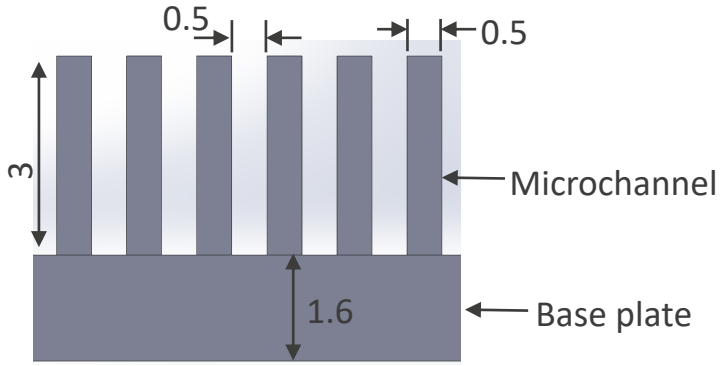
S-PACK Lab
(Advanced Packaging)

COLD PLATE DESIGN GUIDELINES

Simulation performed by Dr. Ketan Yogi from Purdue University.

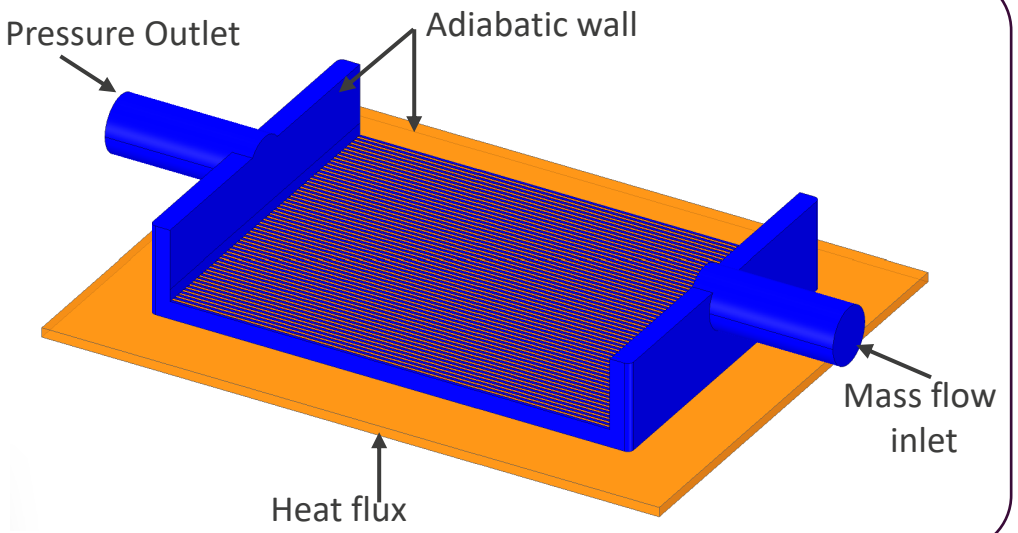
Cold plate with 0.5 microchannel



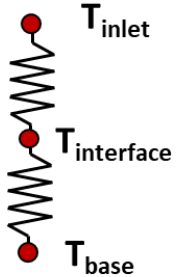


*All dimensions are in mm

Geometry and boundary conditions



Input Parameters and Data reduction



$$R_{th} = \frac{(T_{base,max} - T_{in})}{P}$$

$$\Delta P = P_{inlet} - P_{outlet}$$

Mass flow rate = 0.5 GPM to 1.0 GPM

T_{inlet} = 20 ^{0}C

Power (P) = 350 W

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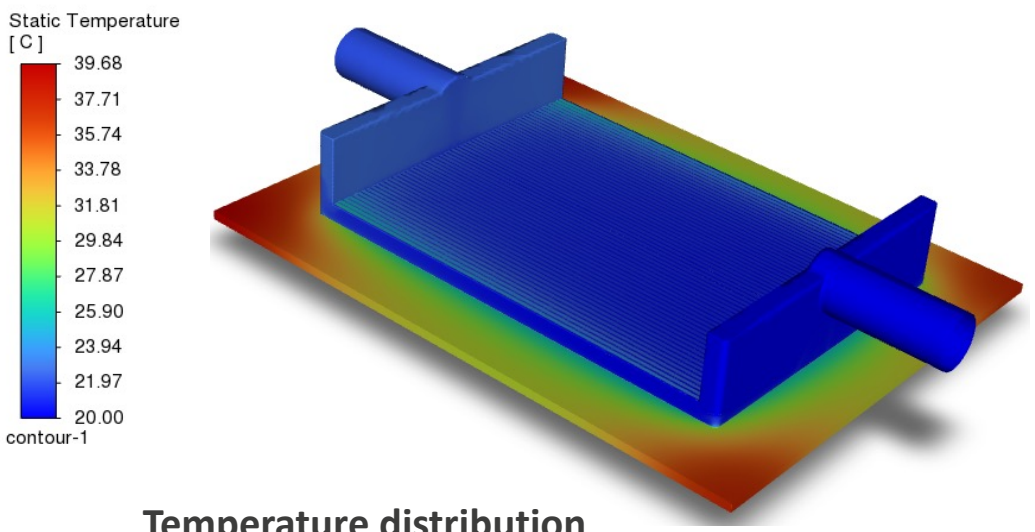
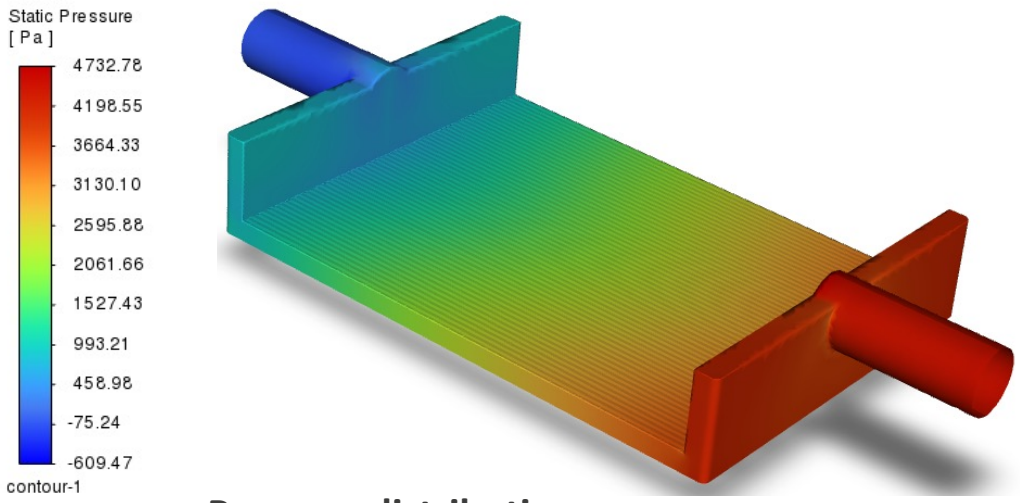
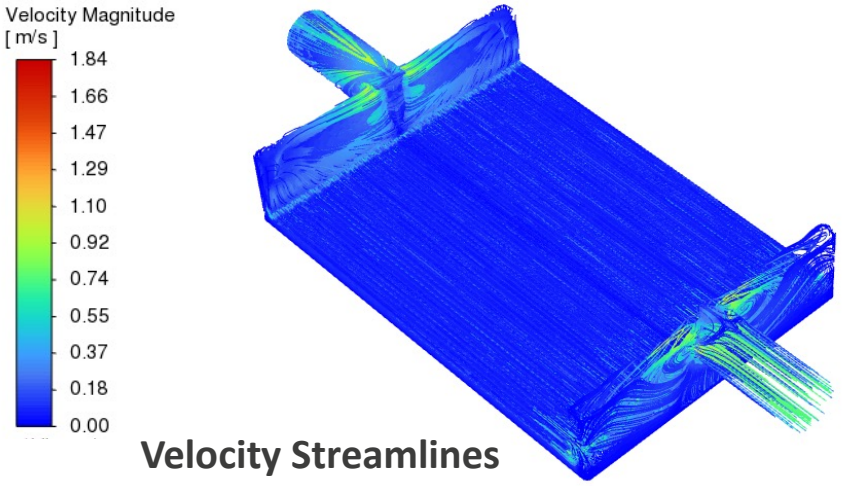
T_{in} = 20°C
P = 350 W
m = 0.5 GPM



Temperature distribution



Pressure distribution



Velocity Streamlines