

TABLE 2. Summary of thermal and thermo-fluid simulation.

AREA OF CONCERN	ISSUES	DRIVER (PRODUCT SECTOR)
<ul style="list-style-type: none">■ Buoyancy-radiation■ Coupling■ Transient simulations	<ul style="list-style-type: none">■ Slow convergence, radiation complexity in heat sinks■ Fast algorithms needed	PC
<ul style="list-style-type: none">■ Solder reflow, melting■ Board warping coupling■ Underfill flow	<ul style="list-style-type: none">■ Robust user-friendly codes required■ Thermo-mechanical code interfaces■ Need faster algorithms	OB, DA, AU
<ul style="list-style-type: none">■ Turbulent thermo-fluid■ Component/system models■ Underhood radiation, complex geometries	<ul style="list-style-type: none">■ Fast, low memory■ Compact models independent of boundaries■ Robust codes needed	OB, AU
<ul style="list-style-type: none">■ Electro-thermal simulations	<ul style="list-style-type: none">■ Complex contact phenomena■ Current densities/Si BEOL	OB, DA

AU = automotive, DA = Defense/Aerospace, OB = office/large business/communication systems, PC = portable/consumer