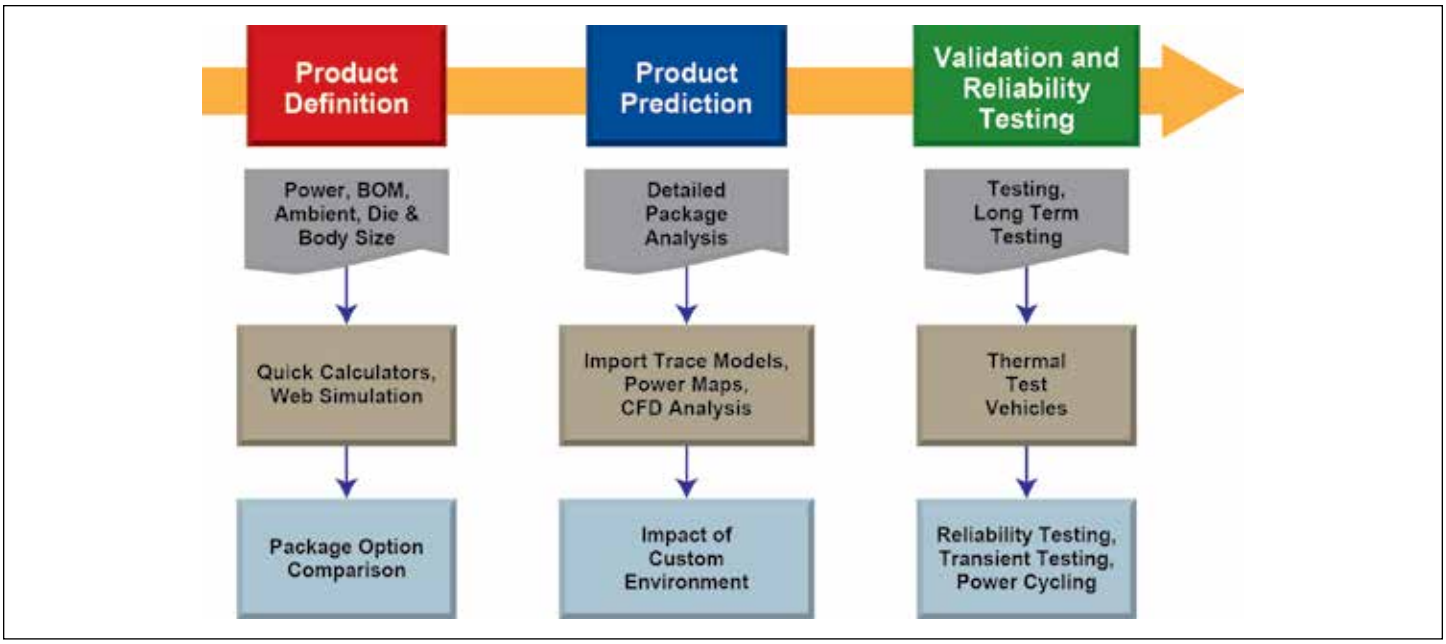
# Service Solutions

# Thermal Characterization

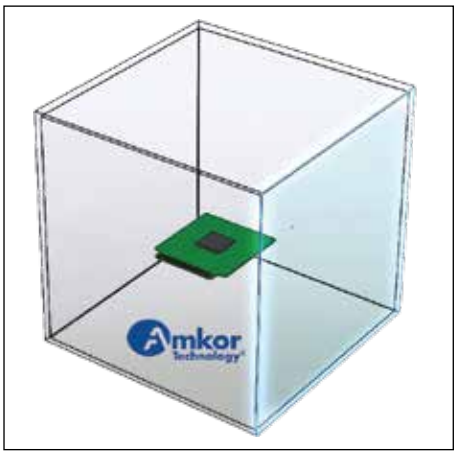
## Thermal Package Characterization

Amkor Technology offers advanced thermal test measurement and state-of-the-art modeling capabilities supporting all major electronic packaging styles and system level characterization.




## Amkor Thermal Testing Capability

Standard JEDEC still air and forced testing facilities available.




**Still air chamber 12″ x 12″ x 12″ closed container**

**Amkor's closed loop wind tunnel is capable of controlling airflow from 50 to 1600 LPM and air temperature from 18°C to 65°C. The tunnel spatial uniformity of velocity is ±1% of the mean value. The test section is 12″ x 12″ with a contraction area of 6.5:1.**

# Thermal Characterization

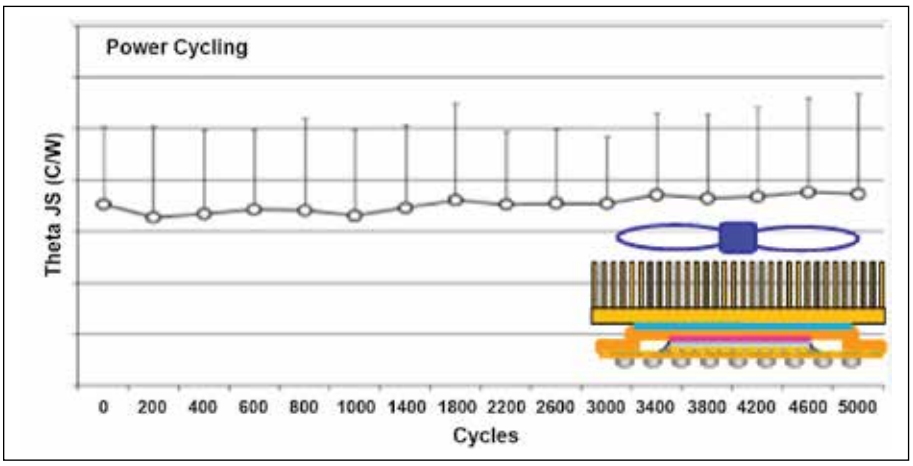
## Test Boards

Amkor maintains a library of JEDEC standard leaded and array format 1S0P and 1S2P test boards. Custom board design capabilities are also available.

## Thermal Test Reports

Amkor amassed over 200 thermal test reports covering a wide array of packages ranging from power application packages such as a PSOP 2 & 3, leaded packages such as LQFP, exposed pad packages such as MLF and array packages such as PBGA. Thermal data includes theta ja over a range of power levels at flow velocities from 0.0 to 2.5 m/s. Psi JT, Psi JB and Theta JC data are available in many of the thermal reports.

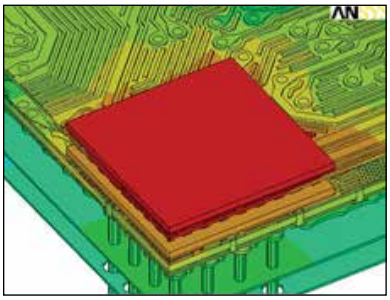
**Material Characterization Testing**



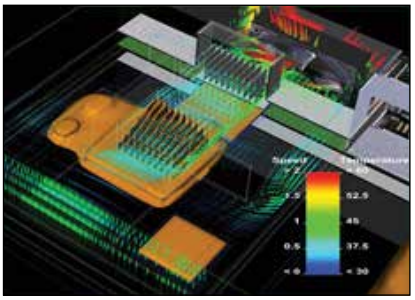

Long term-testing of thermal interface materials to quantify reliability under realistic use conditions.

## Detailed Models

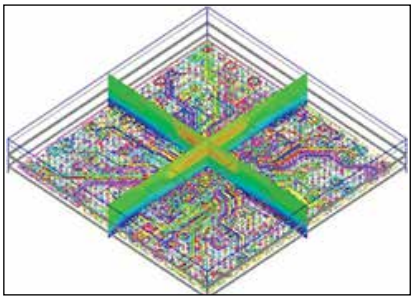
Amkor employs advanced thermal modeling techniques using Finite Element Analysis (FEA). Ansys™ Mechanical, Flotherm™ and IcePak™ modeling software are supported. Detailed trace routing is incorporated into package analyses.



**Ansys™**



**Flotherm™**



**IcePak™**

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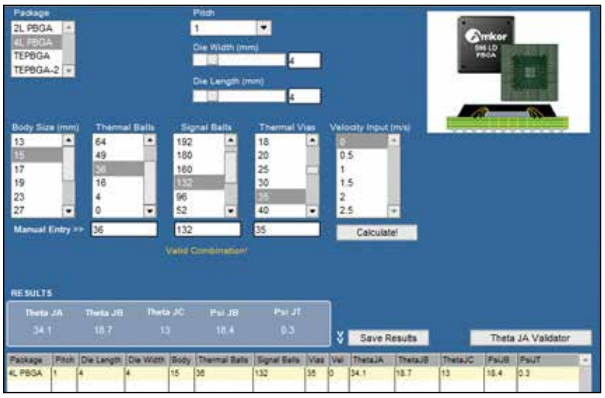
Amkor Technology®

# Thermal Characterization

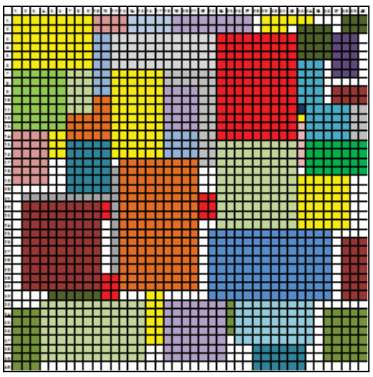
## Quick Thermal Calculators

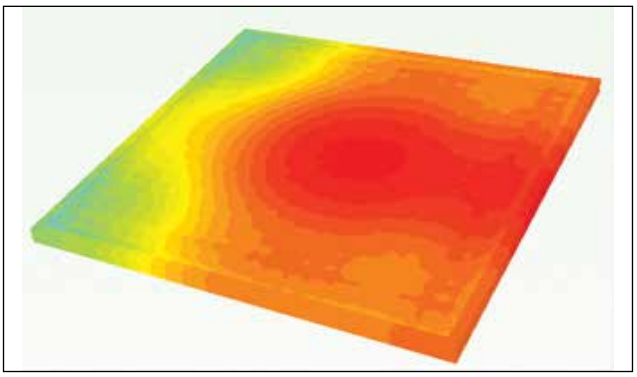
Quick thermal calculators are available for many package styles. Immediate thermal resistance estimations are available via Web.Data.




## Custom Thermal Solutions

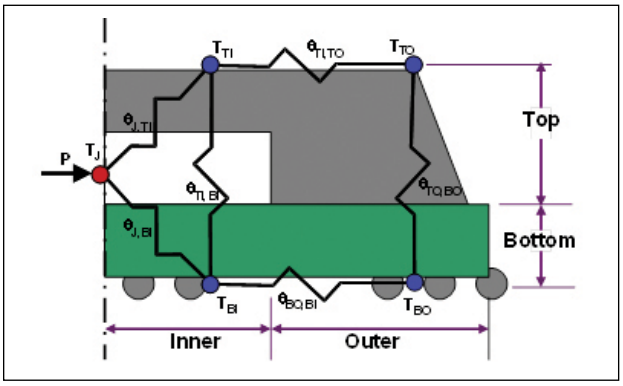
Custom thermal solutions are available at Amkor to optimize component level designs. This may include laminate or leadframe design optimization, material property evaluation, power map and board layout analyses.





## Compact Models

Compact thermal models are available for predicting die temperature in system level performance. They are developed to provide "boundary condition independent" peak die temperature predictions.

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