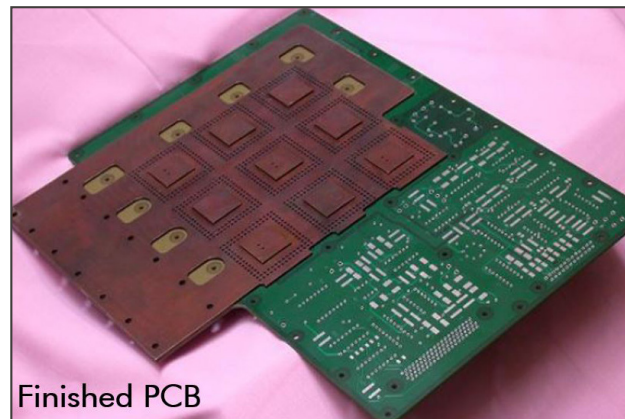


Thermal Management in Space Electronics with externally bonded Heat sinks

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has developed the technology for thermal management in Space Electronics with externally bonded Heat sinks. This technology is highly flexible and can be used for bonding any kind of heat sink to finished PCBs as the vacuum bag takes the contour of the heat sink.



Salient Features & Major Specifications

- ✦ PCB Design Features
 - Clearance for metal bonding: No electrical vias, traces or components in the metal bonding area.
 - Panelisation : Additional tooling holes to align and position the metal plate during bonding.
 - Via Pad design: 1.2mm capture pad on top and 1.5mm pad at the bottom
- ✦ Metal plate design
 - Material: 99.99% purity copper, Thermal Conductivity: 386W/mK, CTE: 17 ppm/K, Low CTE, high thermal conductivity,
 - Thickness : 1 mm thickness with 1.2mm below the detector area so that the component body touches the copper plate.
 - Surface planarity: ± 100 microns.

- Component Lead holes: 1.2mm diameter for 0.7mm lead to pass through without contact.
- ✦ Bonding Methodology
 - Vacuum Bag Technique.
 - Low flow Epoxy Prepreg for bonding.
- ✦ Testing and Evaluation & Results
 - Microsection of metal bonded testcoupon, critical observations.
 - There were no voids in the bonding.
 - No resin starvation.
 - Adequate resin flow.
 - No resin flown to the component holes.
 - Ultrasound testing for qualification
 - No area without bonding.
 - Visual inspection
 - No damage to the HASL surface finish.
 - No warpage beyond acceptance limit.
 - Smooth edge finish.
 - No PTH blocking due to excess resin flow.

Technology Transfer

URSC/ISRO offers to transfer this technology of thermal management in Space Electronics with Externally bonded Heat sinks to industries in India with adequate experience and facilities. Industries interested in obtaining knowhow may write giving details of their present activities, infrastructure and facilities.

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