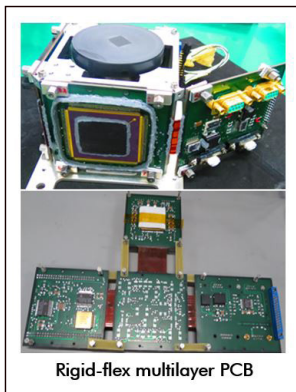


Rigid-flex multilayer PCB Technology

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has Rigid-flex multilayer PCB Technology for high reliability 3D packaging applications in space electronics.

The rigid-flex multilayer PCB technology provides several benefits with minimized connectors, harness, and motherboard assemblies, eliminates human errors, and also results in reduced weight and volume for interconnecting different functional electronics through flexible structures in 3D Packaging.



Salient Features

- ✦ 3D packaging feasibility.
- ✦ Reduced Weight & Volume with minimized Harness & Connectors.

Major Specifications

Parameter	Specifications
Type of PCB	Rigid-flex combination with one (or) two layers of flex
No. of layers	3 layers to 14 layers total, as per layer stack diagram
Total PCB thickness	Minimum 1.6 mm to 2.3 mm maximum (Rigid portion) 0.2 mm to 0.4 mm (Flexible portion)
Material for rigid laminate	Glass-polyimide, Tg > 240°C, complying to IPC 4101/41 specifications
Material for flexible core	All polyimide, adhesive-less, Tg > 210°C, complying to IPC 4204/11 specifications
Material for flexible coverlay	Kapton film (25 to 50 microns thick) with adhesive on one side, complying to IPC 4203/1 specifications
Material for bonding flex and rigid layers	Low-flow glass-polyimide, complying to IPC 4101/42 specifications

Parameter	Specifications
Inner layer copper thickness	35 microns for double side flex 35 microns (or 70 microns) for single side flex 35 microns for all rigid layers
External layers copper thickness	Total 52 microns to 70 microns, including 35 microns plated copper, as specified in layer stack diagram
Etchback	Positive etchback of 5 to 15 μm , complete desmear is also acceptable, negative etchback is not allowed
Multilayer Construction	Laminate type construction
Fabrication Technique	Subtractive process, Electroless Copper, SMOBC
Solder mask material	Electra EMP110 (or) Taiyo PSR-4000BN
Surface finish	Solder or Electroless Nickel Immersion Gold (ENIG)
Solder specifications	Tin - 63% / Lead - 37%
ENIG specifications	0.05 micron Gold with 3 to 6 μm Nickel undercoat
Bare board test (BBT)	Rigid-flex PCB shall pass electrical test for continuity and isolation

Technology Transfer

URSC/ISRO offers to transfer this technology of Rigid-flex multilayer PCB Technology 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.

Technology Transfer & Industry Coordination Division (TTID),

Programme Planning and Evaluation Group (PPEG),

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