

भारत सरकार  
अन्तरिक्ष विभाग

यू.आर. राव उपग्रह केन्द्र

पोस्ट बॉक्स नं. १७९५, ओल्ड एयरपोर्ट रोड,  
विमानपुरा डाक, बेंगलूरु - ५६० ०१७, भारत

दूरभाष :

फैक्स :



Government of India

Department of Space

**U.R. RAO Satellite Centre**

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Group Director

Reliability & Quality, Electrical & Optical Systems Group

### CERTIFICATE OF MAINTENANCE OF QUALIFICATION

CERTIFICATE No: PAD/QUAL/PCB/1/2023

Renewal No.10

Issue Date: January 25, 2023

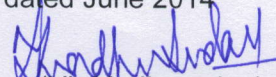
Certificate of maintenance of qualification is herewith issued to M/s. Micropack Limited, Bangalore for the process of single sided, double sided and multi-layer boards up to sixteen layers using glass-epoxy/glass-polyimide laminate with solder coating/selective gold plating for the onboard application with design features given in the following table.

SL No	PARAMETER	CAPABILITY QUALIFIED BY URSC
1.	Track width and copper thickness	4 mil minimum for ½ ounce basic Cu in external layers 20 mil minimum for 2 ounce basic Cu in external layers 8 mil minimum with 1 ounce Cu in inner layers 12 mil minimum with 2 ounce Cu in inner layers
2.	Track spacing	4 mil minimum inner or outer layers
3.	Pad dia	60 mil minimum for 32 mil finished hole. Open via 40 mil minimum for 16 mil finished hole. Filled and cap plated 20 mil in layer1 and 24 mil in rest all layers and 8 mil finished hole at constrained areas. Filled and cap plated
4.	Land size	13 mil minimum
5.	Hole dia	32 mil minimum on standard via PCBs 16 mil minimum on reduced via PCBs 8 mil minimum on constrained area via PCBs Without via fill and with via fill using Taiyo THP DX100 and cap plating.
6.	Cap plating thickness	Minimum 12 microns above basic copper
7.	Minimum wrap distance	25 microns
8.	Minimum wrap thickness at surface	5 microns for microvias and 12 microns for other cap plated vias
9.	Maximum filled via depression / dimple at regular area filled via	76 microns
10.	Maximum filled via protrusion or bump	50 microns
11.	Solder mask bulging on other pads	0.25 mm (0.125 mm on each side)
12.	Effective card size *	Up to 12" x 12 "

13.	Maximum filled via depression / dimple at QFN/BGA area filled via within 2 mm proximity	50 microns
14.	Warp and twist	1.0% maximum
15.	Inner layer core thickness	100 microns minimum for core 150 microns minimum for pre-pregs or 100 microns when layers are more than 10
16.	Finished card thickness	2.2 mm nominal for 16 layer card, 0.8 mm / 1.7 mm for S/S or DSB (without or with fill and cap plated vias) 3.2 mm when via size is limited to 0.8 mm (Filled & cap plated via is not qualified for this card thickness). Tolerance as per PCB layout design requirements
17.	Buried vias	32 mil or 16 mil buried vias, No blind vias permitted.
18.	Copper thickness	½ ounce minimum basic copper on external layers 1 ounce minimum basic copper in inner layers 2 oz/1oz minimum basic copper in inner layers when number of layers ≤ 12 layers
19.	Laminate material	High Tg FR4 : Nelco 4000-13EP or Arlon 35N for MLBs / DSBs. High Tg FR4 : FR370HR for DSBs
20.	Maximum number of layers	16 layers. Controlled impedance type & non-controlled impedance type.
21.	Process	Subtractive process with Laminate type construction SMOBC (Screen printing or Spray Coating)
22.	Annular ring	0.13 mm on external layers, 0.05mm in internal layers. 10 µm. Just visible Annular ring also accepted when cap plated in external layer.
23.	Registration errors	Up to 250 microns, provided annular ring requirements are met.
24.	Protective coating	Solder using HASL, Solder mask 17 to 25 microns. Pale green color. Electra EMP110
25.	Through hole /filled via copper plating thickness	25 to 45 microns
26.	Selective area gold plating	2 to 3 microns

The qualification status is maintained after reviewing the performance of the vendor for past two years.

The renewal certificate is valid for two years (January 2023 to January 2025) and is bound by the terms and conditions mentioned in para 5.7 of Doc No: ISRO-PAX-304 Issue 2 dated June 2014

  
(YL Madhusudan)

To

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BANGALORE 562106