TECHNOLOGY TRANSFER

Interest Exploratory Note

Cr-Cu-Au metallisation for Hi-Rel MIC fabrication

Space Applications Centre (ISRO) is in the field of Microwave Integrated Circuits fabrication for communicational, remote sensing and navigational payloads. SAC has developed the process of Cr-Cu-Au (Chromium-Copper-Gold) metallisation on both sides (top and bottom side) of Alumina substrates using Magnetron sputtering techniques. The base material for MIC fabrication is dielectric ceramic viz. alumina on which the metallisation is to be carried out for MIC pattering.

The salient features of the technology include process repeatability, adhesion, uniformity, and compact structure of deposited thin film. The metallisation is expected to withstand environmental tests and demonstration of compatibility with further processes like pattern engraving and assembly and packaging. Presently, the developed process is utilised for fabrication of subsystems for ongoing IRNSS, GEOSAT and SCATSAT project activity.

Essential Infrastructure Requirements:

- Clean room of Class 100 type
- Magnetron sputtering system with three cathode/sputter gun configuration
- Ultrasonic cleaner
- Vapour degreaser
- Stereo Zoom Microscope up 100X magnification
- DI water plant

Preferable Infrastructure Requirements:

- Thin film characterisation tools like
- High resolution Microscope upto 1000X magnification
- Four probe Sheet Resistivity meter
- Muffle Furnace
- Adhesion tester

Material Requirements:

- Alumina substrates (Coorstek make superstrate- 996 or equivalent)
- High purity sputtering Targets of Cr, Cu & Au
- High purity Argon gas
- Cleaning solvents of electronic grade like Acetone, TCE, IPA, HCL, Ammonia, DI water etc.

Technical Specifications:

- Substrate: Alumina substrates
- Metallisation scheme:
- Cr : ~ 300 Angstrom
- Cu: 4 to 4.5 micrometer
- Au : 2 to 2.5 micrometer
- Total thickness: 5 to 7 microns
- Uniformity : ± 10% on single substrates
  ± 20% batch to batch
- Metallisation required on both sides of substrates
- Sheet Resistivity: < 0.006 ohms/square

Department of Space has authorised NSIL for Technology Transfer of Cr-Cu-Au metallisation for Hi-Rel MIC fabrication to suitable entrepreneurs/ Industry in India. Interested Parties may please fill the enclosed form and send by email to contact-nsil@isro.gov.in

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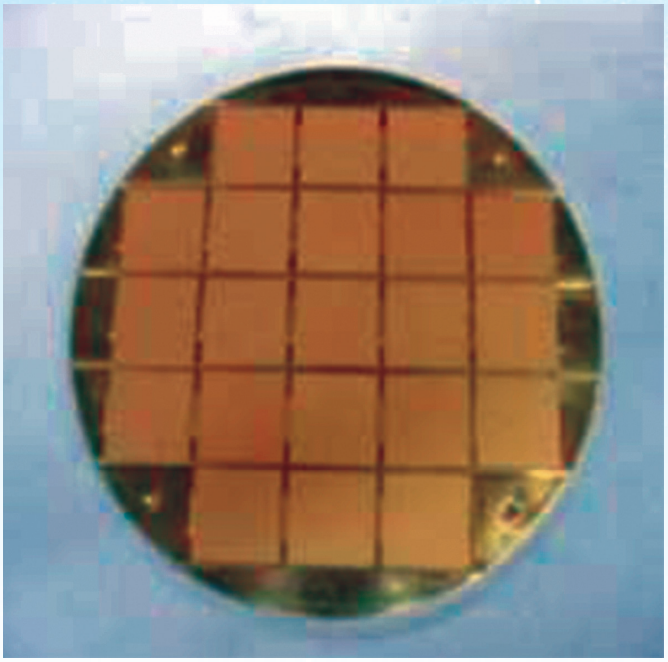

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