

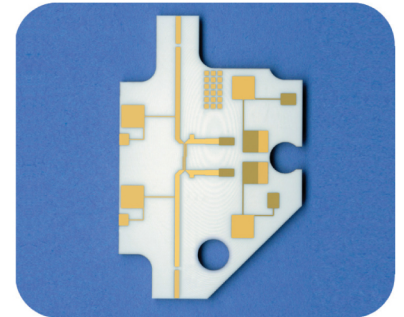


## Thin Film Microcircuits

LEW Techniques' dedicated thin film manufacturing capability offers a build-to-print service for high performance microcircuits on a wide range of materials. From simple single layer interconnects to multilayer, double-sided circuits with fine lines, integrated resistors, inductors, metallised vias and complex substrate profiles, our manufacturing know-how and dedicated in-house facilities allow us to offer a comprehensive and versatile service for demanding applications.

### Capability Outline

- Various substrate materials including alumina, AlN and quartz
- Metallisation schemes suitable for soldering, wire-bonding and epoxy attach
- Deposition by sputtering, evaporation and electroplating
- Laser profiling and drilling
- Fine line circuit definition by photolithography
- Circuit realisation by selective plating and wet chemical and plasma etching
- Metallised thru holes and filled vias
- Resistor trimming to tight tolerances
- Solder dams, air bridges and protective coatings
- Pre-deposited gold/tin solder (AuSn)
- Diamond sawing for superior edge quality
- Comprehensive testing facilities to ensure product quality



### Substrates

Standard substrate materials include:

- As-fired or polished alumina (Al<sub>2</sub>O<sub>3</sub>)
- High thermal conductivity aluminium nitride (AlN)
- Fused quartz for very high frequency applications
- Ferrite
- Glass
- Silicon

### Metallisation

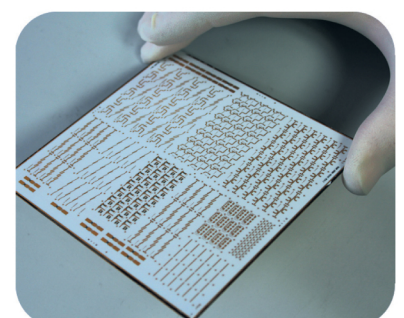
Typical metallisation schemes include:

- TiW/Au For epoxy assembly and AuSn soldering
- TiW/Pd/Au For SnPb, SnAg soldering
- TiW/Pd/Au/Ni/Au For additional soldering leach resistance
- Ti/Pt/Au Best soldering performance but more costly
- NiCr or TaN For integrated resistors

### Patterning

Utilising wet or dry film, positive and negative photo resists and high accuracy mask alignment, fine high density lines and features are resolved to create the desired circuit.

Line widths	Typical	High spec.
Minimum line width	25 µm	10 µm
Minimum gap width	25 µm	10 µm
Line/gap tolerance	±10 µm	±3 µm
Line to feature (e.g. hole)	±50 µm	±25 µm



Images are not to scale

## Resistors

Integrated resistors are formed using NiCr or TaN seed layers which are exposed where desired and may be laser trimmed to precise values.

## Multilayers

Crossovers, air bridges and multilayer circuits can be realised using photo-imagable polyimide as an insulating layer.

## Vias

Plated thru holes or filled vias can be incorporated to provide localised grounding or front-to-backside connections.

## Laser Machining

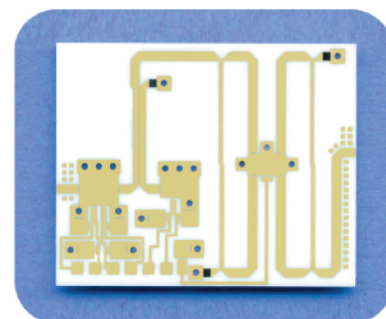
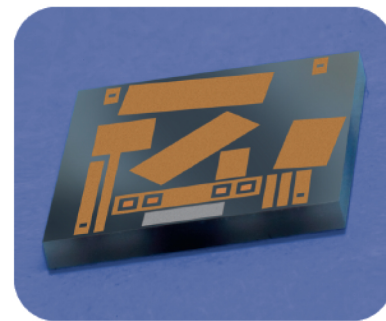
Intricate profiles, pockets, notches and vias can be formed in the substrate before or after metallising. Alignment features, serial numbers and solder dams can also be marked onto the substrate or metallised surfaces.

## Pre-deposited AuSn

AuSn solder can be selectively pre-deposited onto the conductors. This removes the need to use a solder preform. Alignment, thickness and alloy control are dependent upon the underlying conductor metallisation and component geometry.

## Singulation

Individual circuits can be singulated from the substrate by laser profiling or by scribe and snap. For best edge quality diamond sawing is the preferred method.



For further details please contact us for design guidelines or find them on our website.

Images are not to scale

LEW Techniques specialises in the manufacture of miniature components for the mounting of semiconductor devices. Our in-house capabilities include Thin Film, Thick Film and refractory metallising of ceramics and metals, electroplating, precision dicing, laser machining and marking, atmosphere/vacuum brazing and solder assembly.

To ensure end user compatibility, comprehensive in-house testing includes eutectic die bonding, Au wire bonding, shear strength, peel strength, coating thickness and surface finish measurement, heat testing and He leak detection.

To discuss your application in detail please contact our Technical Sales Department who will be pleased to assist you.



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