THIN FILM PROCESS

Figure 1: Basic thin film processing.

- Thin Film Processing
  - A resistive layer is sputter before the metallization, if required.
  - Circuits with resist layer will require an additional mask.
  - When processing resistors, steps 2 – 7 (Figure 1) are repeated again after step 7 in order to remove the metallization and expose the resist layer. (See Figure 2).
  - For pre-drilled substrates, the vias are filled during the metallization process.
  - Vias are filled from both sides.
GUIDELINES

- **CAD Drawings**
  - Define layers for related objects i.e. conductor, resists, via, chip, polyimide, solder.
  - CAD drawing should be drawn in inches (with an aspect ratio of 1:1).
  - The lower left chip corner is defined as the datum.
  - Objects should be closed polylines.
  - One polyline defining the outer perimeter of an object, i.e., no additional lines (or polyline objects) crossing other lines (or polyline objects).
  - Use a rectangle to define the chip perimeter; fiducials are not required.
  - Leave 0.005 pull-back from edge to minimize jagged metals edges after dice.

- **Vias**
  - Via Holes should be 1:1 (ratio of via diameter to substrate thickness).
  - Via Hole ratio of 3:4 is possible for special applications.
  - Via Hole must have a pad (circular or square) and must be double the via diameter.
  - Via Pad can be 3:2 (ratio of via pad diameter to via hole diameter), however, the yield will decrease.
  - For Via Pad of 3:2 or smaller, a filled via can improve the yield but at an increased cost.
  - For wrap around vias, the dicing pull-back is 0.002".
Resistors
- Standard Resistivity: 50 and 100 Ω/□
- Special Resistivity: 20 to 200 Ω/□ (increased cost)
- Resistor Tolerance (Bake): ±10% or ±5% (reduced yields)
- Resistor Tolerance (Laser Trimmed): ±1% or ±0.5% (reduced yields)
- Minimum Resistor Dimension: 0.001

Manufacturing Tolerance
- Smallest Feature: 0.0005 line and spaces
- Feature Tolerance: ±0.0001 (special); ±0.0002 (typical)
- Dice Tolerance: ±0.002 (typical)
- Via hole location tolerance: ± 0.002 (relative to datum)
- Via diameter tolerance: ± 0.001 (typical) on front side
- Via diameter from front-to-back: 10% reduction