

TECHNOLOGY OVERVIEW

To meet a variety of customer identified challenges, UltraSource® has developed a new filled via product, the UltraVia™. This patented technology uses pure metal filled via materials that are bonded directly into the ceramic vias to provide a robust, highly conductive, highly reliable connection in thin film substrates. The UltraVia improves on existing filled via technologies by virtually eliminating epoxy or solder bleed-through while enhancing via conductivity and reliability.

The UltraVia™ can be used to:

- Eliminate the epoxy or solder “extrusion” and “bleed-through” that can occur during die and housing assembly when using plated-through holes or thick film filled vias
- Create an efficient cooling path when high power devices are mounted on top of the thin film component
- Create low inductance or low resistance ground connections through the thin film component

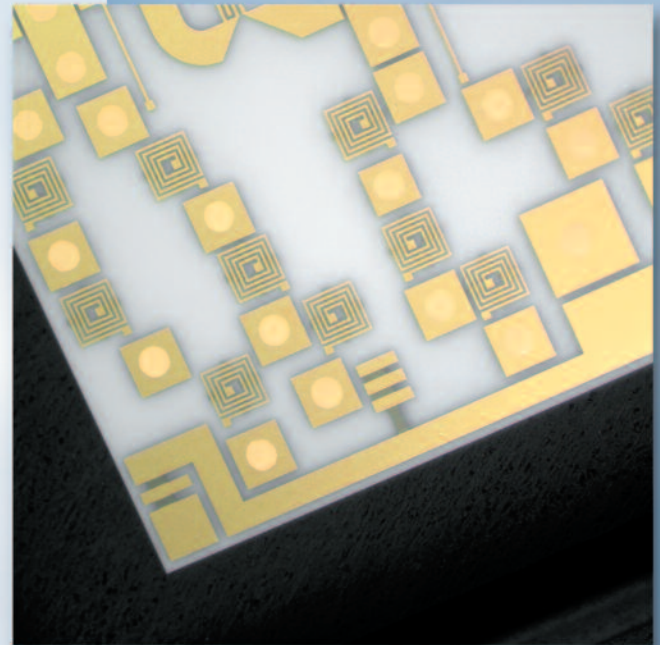
Designers of thin film circuits and interconnects are typically pushing to increase device function and performance while reducing cost and size. The UltraVia allows devices to become smaller and faster through more efficient use of chip geometries allowing a pure gold interconnect between front and back circuitry as well as providing a higher level of thermal dissipation for heat sensitive components.

The UltraVia provides designers with a flexible, reproducible technology that enables the realization of high performance DC, RF/microwave, and optical structures. The UltraVia is an integral part of the UltraSource Technology Platform, which provides designers with the most comprehensive suite of thin film solutions available anywhere. The UltraSource Technology Platform offers competitive advantages for designers looking to break through to new levels of performance in the following areas:

- **Miniaturization:** More functionality fits into a small space and enables new methods of reducing circuit and overall package size.
- **Speed:** Designs can be compacted which means that connections become shorter so overall signal speed increases.
- **Power:** The compact designs possible with a multilayer platform mean that power consumption is reduced.
- **Design:** The platform opens a world of new design possibilities.
- **Bandwidth:** Multilevel integration enables the construction of wide bandwidth connections between the functional blocks of different layers.
- **Part Count:** Less piece parts resulting in lower costs for purchasing, storage, assembly, and test.

www.UltraSource.com

UltraVia



Pure gold filled via cross-section viewed at 100X magnification



Break Through

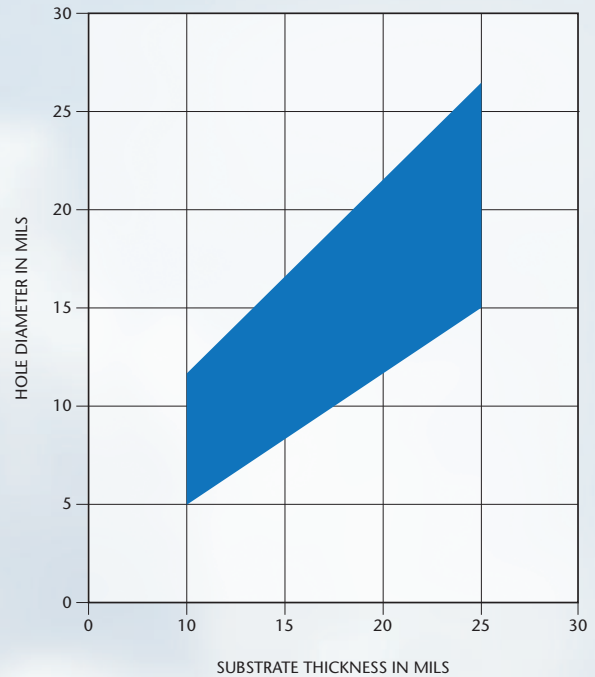
F I L L E D V I A Q U I C K R E F E R E N C E G U I D E

The following design rules represent our standard processes and tolerances. However, sometimes a design mandates “pushing the envelope” in order to provide a break through product success. Many processes can be customized in order to meet exacting design goals. If you find that a need to explore special or custom process parameters then please contact the UltraSource design team for assistance.

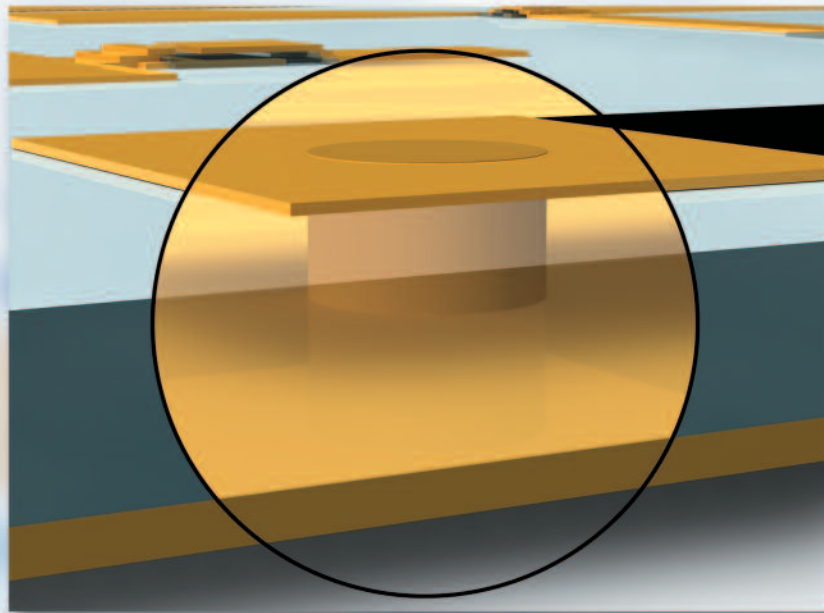
UltraVia Physical Characteristics

Parameter	Value
Thermal Conductivity	300 W/mK
Via Planarity	Flush to $\pm 10 \mu\text{m}$ (.0004")
Via Positional Tolerance	$\pm 25 \mu\text{m}$ (.001")
Top Side Via Diameter Tolerance	$\pm 25 \mu\text{m}$ (.001")
Via Taper	10% reduction in diameter
Via Proximity to Device Edge	1.5x substrate thickness
Annular Ring (Capture Pad)	100 μm (.004") minimum

Allowable Filled Via Sizes as a Function of Substrate Thickness



Illustrated 3D View of the UltraSource UltraVia



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