

# UltraSource

TECHNOLOGY PLATFORM

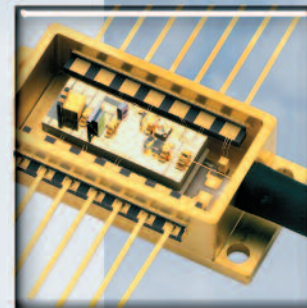
## Your Challenges...

The constant press for competitive products in the commercial wireless, fiber optic telecommunications, and military RF/microwave markets means designers must strive for means of reaching new levels of performance, miniaturization, and lower total system costs. To meet the challenges and requirements for low power consumption and bandwidth efficiency, thin film technology can be used as a powerful packaging solution due to its accuracy, reproducibility, and superior material properties.

For nearly 20 years, UltraSource® has been partnering with its customers to design and fabricate customized thin film components for wireless, fiber optic, and RF/microwave systems. Over the years, UltraSource has developed a sophisticated collection of design solutions and modular processes that include basic single layer components for chip and wire design, integrated multilevel passives, and complex, high density, multilayer circuits. The collection of these design families and modular processes have now been organized into the UltraSource Technology Platform to provide designers with the most comprehensive suite of customizable thin film solutions available anywhere.

UltraSource's Technology Platform provides designers with the opportunity to pursue innovative ideas for solving the most challenging design problems. These modular processes can be tailored to meet precise specifications and provide cost-effective and versatile solutions, including:

- **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 the 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 result in lower costs for purchasing, storage, assembly, and test.



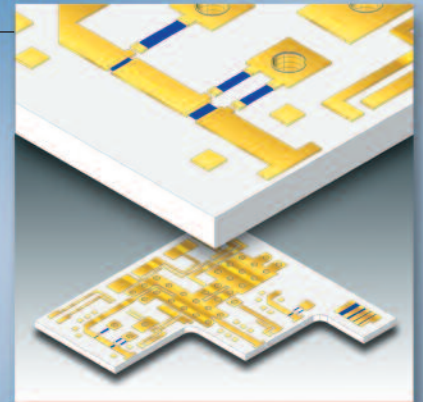
# DESIGN PLATFORMS

## Our Solutions

### BASIC

BASIC solutions consist of conventional single and double sided designs. The BASIC product family can incorporate all classic thin film substrate materials, plated through holes, sheet resistors, high conductivity traces, pre-deposited AuSn solder, and solder damming options. Standard options include:

| Materials                          | Metals  | Machined Features                              | Functional Coatings   | Packaging  | Testing  |
|------------------------------------|---|--|---|--|--|
| Alumina<br>Aluminum Nitride<br>BeO | WTi/Au<br>WTi/Ni/Au<br>TaN/WTi/Au<br>TaN/WTi/Ni/Au<br>High Conductivity | Through Holes<br>Chamfers<br>Radii<br>Cut-outs | Polyimide<br>Solder Stops<br>Silicon Nitride<br>AuSn Solder | Waffle Pack<br>Tape & Reel<br>Thermoformed<br>Customized | First Article<br>Class K<br>Die Shear<br>Solderability<br>Wirebond |



### INTEGRATED

INTEGRATED solutions allow our customers to select from the UltraVia™, UltraBridge®, UltraCapacitor®, or UltraInductor® suite of solid state passive elements to provide higher levels of passive integration and performance. Conductor traces, resistors, capacitors, inductors, multilevel connections, and filled vias can be integrated onto a single microcircuit. Standard options include:

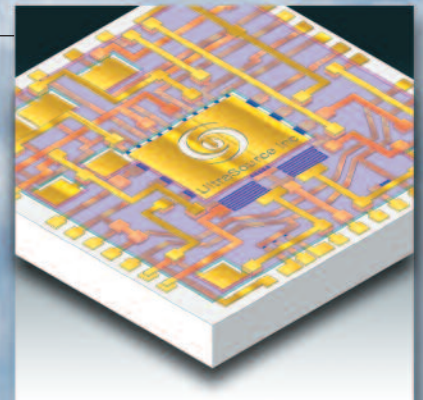
| Materials                   | Metals  | Machined Features             | Functional Coatings   | Packaging  | Testing  |
|-----------------------------|---|-------------------------------|---|--|--|
| Alumina<br>Aluminum Nitride | WTi/Au<br>WTi/Ni/Au<br>TaN/WTi/Au<br>TaN/WTi/Ni/Au<br>High Conductivity | Chamfers<br>Radii<br>Cut-outs | Polyimide<br>Solder Stops<br>Silicon Nitride<br>AuSn Solder | Waffle Pack<br>Tape & Reel<br>Thermoformed<br>Customized | First Article<br>Class K<br>Die Shear<br>Solderability<br>Wirebond |



### MULTILAYER

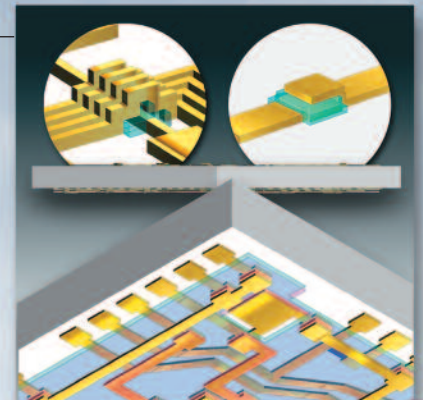
The MULTILAYER solution provides a 5 layer system that includes 3 layers of custom patterned gold conductors separated by 2 layers of polyimide dielectric. The gold layers are pure sputtered gold which provide a low loss conductor system and can be patterned with 20 micron lines and spaces. The polyimide is a well characterized production dielectric and can be custom patterned to any shape (including contact windows) to 40 micron lines and spaces. Standard options include:

| Materials                   | Metals   | Machined Features             | Functional Coatings       | Packaging  | Testing  |
|-----------------------------|--|-------------------------------|---------------------------|--|--|
| Alumina<br>Aluminum Nitride | WTi/Au<br>WTi/Ni/Au<br>TaN/WTi/Au<br>TaN/WTi/Ni/Au | Chamfers<br>Radii<br>Cut-outs | Polyimide<br>Solder Stops | Waffle Pack<br>Tape & Reel<br>Thermoformed<br>Customized | First Article<br>Class K<br>Die Shear<br>Solderability<br>Wirebond |



### ADVANCED

The ADVANCED solution is the ultimate in miniaturization and integrated performance. It combines the BASIC or INTEGRATED platform on one side of the device and the MULTILAYER features on the other side of the circuit. Front to back connections are made using UltraVia™ filled vias.



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