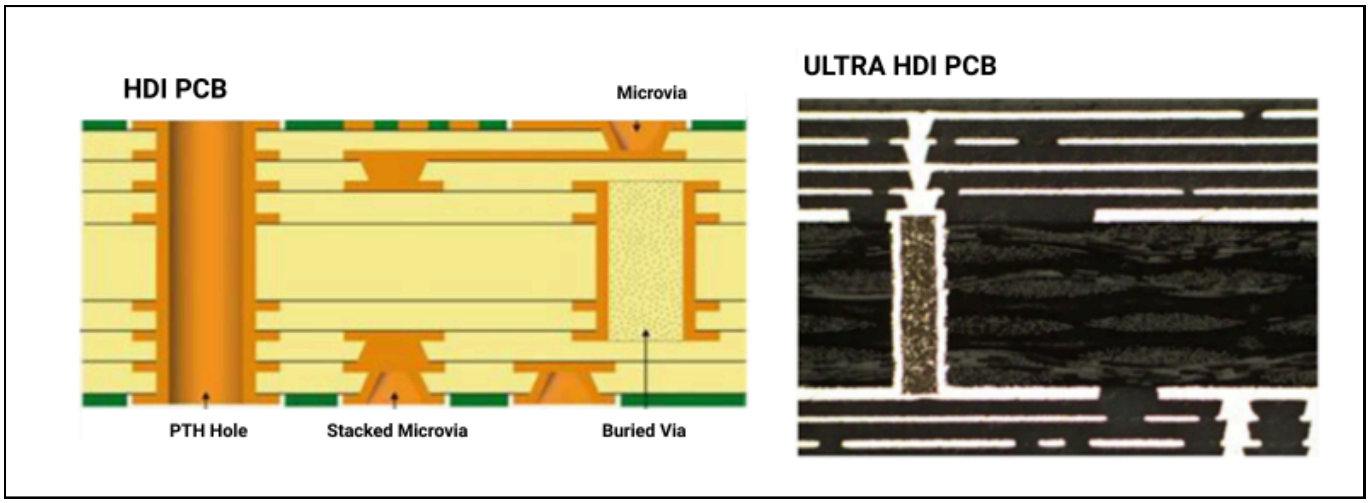
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Ultra High Density Interconnects (UHDI)

Ultra HDI - Beyond The Traces - Via Structures

Ultra HDI is not just enhanced HDI: It requires different Design techniques and Manufacturing methodologies

HDI Boards with high layer count, micro vias, sub-assemblies		Ultra HDI Added complexity for increased capability
Line width/spacing	to 75 microns	to 12.5 microns
Hole sizes/Micro vias	6 mil+ /4 mil+	4 mil+ / 2 mil +
BGA component pitch	at or below 1mm or 0. 8 mm	BGA component pitch 0.8 and lower
Layer count	>40	No limit to layer count



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Ultra HDI enables strategic use of sub-75 micron lines and microvias to reduce layers, eliminate subassemblies, and improve manufacturing yield. Reducing complexity allows for optimized layer counts, resulting in improved reliability: A game-changer for dense BGA architectures.

	HDI	Ultra HDI
Typical Microvia Size	Generally no smaller than **100µ** in diameter(4mils)	**50-75µ** in diameter (2-3 mils)
Capture Pads	**~ 300µ** (12mils) to maintain a minimum annular ring	**~ 200µ** (8mils) for 75µ holes or **150µ** (6mils) for 50µ holes
Dielectric Thickness	**1:1** a 100 um via must use 100 um dielectric or less	**1:1**
Thru Via Size driven by board thickness	**10:1 aspect ratio** = 1.6 mm board for 0.15 mm drilled hole	**15:1 aspect ratio** = 1.6 mm board for 0.1 mm drilled hole

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Ultra HDI Ultra HDI Via Strategy: Staggering, Stacking, and Filling

Flexible Via Configurations

Microvias

- **Staggered** - preferred for cost and reliability - avoid stress under buried vias.

- **Stacked** - for consistent RF shielding/dense shielding structures across layers. Stacked vias are viable with new materials supporting high Tg and low Z-axis expansion. Even 4-stack vias above buried vias can pass 100x reflow simulations. Stacked microvias are an example of dense shielding structures.

Practical Application Example: Consider routing a 0.5 mm pitch BGA with 2,500 I/O. Using traditional 3-mil traces requires 12+ routing layers. UHDI 19-micron lines reduce this to just two routing layers, slashing both material cost and board size.

- **Copper Fill vs Resin Fill:**
  - *Copper fill*: Time-intensive and costly (hours per cycle)
  - *Resin fill*: Fast and effective when paired with staggered layouts

- ***Non-conductively filled and plated over***

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ASC EXPERTS CONSULT WITH OUR CUSTOMERS TO DETERMINE THE RIGHT METHOD FOR DESIRED RESULTS.

CONTACT US TODAY ABOUT IMPROVING THE SWAP FOR YOUR NEXT PROJECT!

ULTRA HDI IS A SOLUTION THAT WORKS WITH OTHER TECHNOLOGIES:
RF/MICROWAVE PRODUCTS – TIGHT LINE/WIDTH CONTROL, LOW PROFILE COPPER SURFACES, TIGHT IMPEDANCE CONTROL
EMBEDDED RESISTOR AND CAPACITORS – ABLE TO INTERFACE WITH RESISTIVE AND CAPACITIVE MATERIALS
FLEX CIRCUITS AND RIGID-FLEX PARTS – ULTRA FINE LINE FLEX CIRCUITS, HIGH COPPER ADHESION TO FLEX
METAL CORE & COINS – COMPATIBLE WITH METAL CORE CONSTRUCTION, ALLOWS COPPER PLATE TO COIN STRUCTURES

ADDITIONAL RESOURCES FOR YOU
OUR WEBSITE:
UHDI NEWSLETTER:
UHDI TECHNOLOGY, ADVANTAGES, DESIGN PARAMETERS AND FAQS IN A BROCHURE: