American Standard Circuits
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Ultra High Density Interconnects (UHDI)

Ultra HDI Routing Capabilities

Are your projects pushing the limits of traditional routing?

Ultra HDI (Ultra High-Density Interconnect) is the technology that opens new routing capabilities: enabling denser, more efficient, and highly flexible designs that meet your demanding performance requirements.

How does Ultra HDI improve routing density and reduce signal integrity issues?

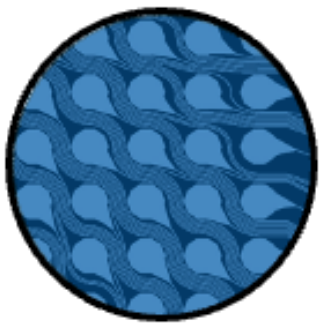
- **UHDI produces vertical sidewalls and precise control of trace/space widths –** allowing for much tighter control of impedance variations for RF
- **High aspect ratio** can reduce insertion loss and improve coupling of differential lines
- **Narrow spacing** improves inductive and capacitive coupling

CIRCUIT DENSITY IMPROVEMENT- 0.5 MM BGA

⟶ Reduced Layer Count
⟶ Improved Reliability
⟶ Lower costs

Ball Pitch	Routing Layers Required	# of Traces between pads	Trace & Space (min feature size)
0.5 mm	12	1	75 µm
0.5 mm	2	6	19 µm

BGA® Grid 50x50



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Are there any limits to layer count with UHDI technology? No.

This technology can be used on high layer count designs, but remember: this approach can reduce layers with the ultra fine line density. Take advantage of that benefit!

Precision geometry equals signal consistency

- **Edge Smoothness:** Subtractive etching creates smoother, more controlled trace edges.
- **High Aspect Ratio Traces:** Up to 2:1 ratios (e.g., 25 µm wide × 50 µm tall) minimize skin and proximity effects.
- **Differential Pair Benefits:** Thinner dielectrics and tighter line spacing improve coupling and reduce insertion loss.

How about impedance structures? Are there problems?

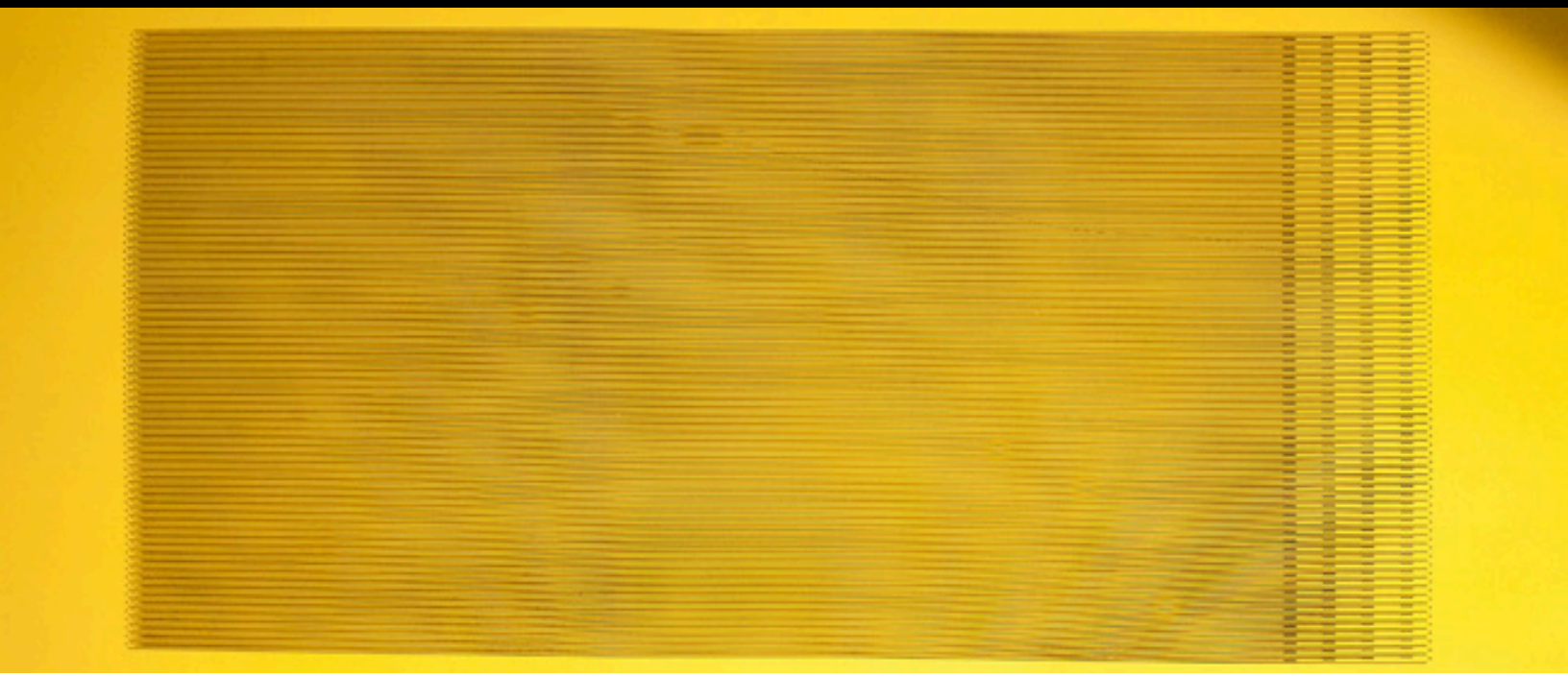
No, but you should consider the rest of the layer.

If routing out of BGAs: use your ultra fines lines in that area but adjust to your desired line width after escape. Tight Impedance control is possible on UHDI

UHDI designs use **very fine BGAs, dense microvias,** and **thin dielectrics** to squeeze more circuitry into less space. This creates enormous benefits in size, weight and performance (SWaP), but it also **dramatically reduces the available area for soldermask dams and pad clearances.**

You can successfully leverage the benefits of Ultra HDI technology by using new **layout guidelines and materials.**

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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: