

CONNECTOR TECHNOLOGY

Solving design dilemmas can expand bottom lines

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New developments in the design of BGA devices are now occurring on a regular basis. Reduction of device size is always a consideration while incorporating new capabilities into the device, so a frequent “improvement” is the reduction of a device’s pin-to-pin pitch.

DESIGN DILEMMA

One of the many dilemmas facing design engineers in the semiconductor industry today is how to incorporate a new, reduced pitch BGA device into an existing PWB design.

If the existing design is on 1.27mm pitch, and one of the BGA components is now available with additional features on a 0.5mm pitch, how can you use the two together?

Redesigning the entire board to 0.5mm can be very costly (not to mention that the other devices on the design may not be available on 0.5mm) and redesigning a 1.27 mm board so that a small area is on 0.5mm can be even more so.

Restructuring the board also leaves you with existing PWB inventory, which, in turn, is a waste of money if not utilized. With all of these factors working against a board designer, the challenge lies in finding the happy medium.

One viable design solution is a pitch-altering BGA adapter. Adapters have been available for years, with most common designs allowing the use of one type of termination (such as SOIC) on a board designed for a different termination (such as through-hole DIP).

Unfortunately, however, most adapter designs do not have “bottoms” that can be used on boards designed for BGA devices. These so-called adapters really don’t adapt to every application and technology.

ADAPTERS THAT REALLY ADAPT

Some recent out-of-the-box thinking has led to innovative adapters with tops where the BGA “landing pads” (on the top of the adapter) can be on a 0.4mm-, 0.5mm- or 0.65mm pitch, while the adapter bottoms are populated with BGA balls that are on a 1.00mm- or 1.27mm pitch.

This unique adapter technology can reduce high density interconnect (HDI) construction while enabling the use of standard line-and-trace spacing. But most notable is that the adapters allow the use of new, tighter pitch devices on existing larger pitch designs

which greatly lower the PWB cost, since larger boards are so readily available.

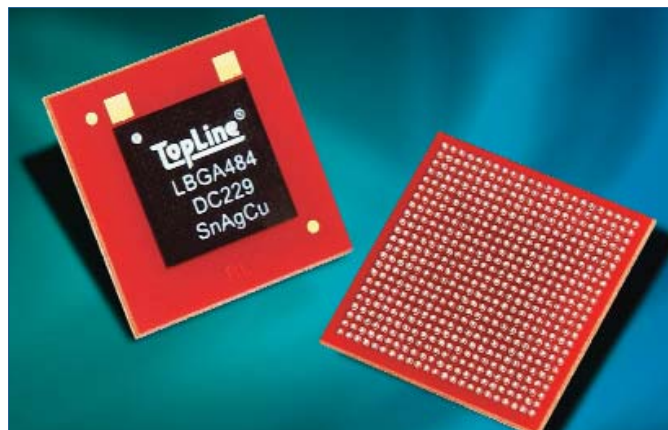
Designers can save money when incorporating new, smaller pitch devices by staying with existing larger pitch boards by simply mounting the new device on the adapter and keeping the current, larger pitch board.

Since the top of the adapter board can leave open space around the small device, adapter manufacturers may add components to the design at a very low cost. The need for laser-drilled microvias on motherboards is eliminated through this innovative adapter design.

This saving becomes particularly important in military applications, where it may cost up to \$800,000 to re-spin a board. Any strategy that helps save both precious time and money is a welcome addition to any design

‘PLUGABILITY’

Another interesting fact about this technology is that, if the top of the adapter is on a 0.80mm to 1.27mm pitch, a female surface mount connector can be soldered to the adapter top, allowing “plugability” for the new device that will be used.



Innovative adapters can save design time and money.

Restructuring a board to meet a reduced pitch on a BGA device isn’t the only way to take advantage of the newer technologies available in connectors today.

And since the semiconductor industry will continue to ask for smaller pitches, connector manufacturers will strive to develop products that both meet the board designer’s plans and provide cost-effective connection.

As the year progresses, we should start to see other innovations from manufacturers that offer designers even more options and flexibility.

Mr. Folmsbee is Aries’ sales and marketing manager, with 30 years experience in the connector industry. Prior to joining Aries, he was a regional sales manager for Texas Instruments Connector Systems.

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