

BBG Tech Tips #3

Blind and Buried Vias

Blind and *buried vias* are needed when the circuit artwork or design is of a very tight or heavy packaging density that would not allow a via or vias to pass entirely through all the layers of the circuit board without interfering with another electrical feature.

Blind vias are used to connect an outer layer to the next adjacent inner layer while buried vias will generally connect any two internal adjacent layers. However, they may connect more than two layers and some circuit boards may contain combinations of either via process to meet a design need.

While the technology is widely available, the budget for these more expensive circuit boards may not! An additional drilling or drilling processes along with the associated plating baths will be required. The costlier process of *laser drilling* may be involved along with the time consuming process of *controlled depth drilling* (one panel at a time).

The process to manufacture a blind and/or buried via printed circuit board is known as *sequential lamination*. It is essentially the manufacture of a simple 2 layer circuit board that is bonded to the required additional outer layers which then is sent through the normal processes of drill and plating to complete the circuit card. Basically, for each set of blind and/or buried vias the cost for an additional plated through board is required not to mention the cost consideration from the fallout or scrap from each of those individual builds.

You can imagine the cost factor for a six layer with blind via connecting layers 1 to 2 and layers 5 to 6. Layers 1 and 2 and also 5 and 6 are manufactured as doubled-sided plated through boards and then have layers 3 and 4 laminated between them. Three drilling and plating processes are required—now image the cost if a buried via is required between layers 3 and 4!

BBG's qualified vendors produce circuit boards requiring blind and buried vias for numerous high-tech customers. Because of the numerous steps in the manufacture of this type of circuit board, the quoting process for this technology will take approximately a day to complete.

Research for the above information may be from, but is not limited to, IPC reference manuals, the PCB Handbook, the Bare Board PWB Design Manual and consultation with industry professionals. Please consult a process engineer familiar with your company's PCB assembly process before making any procedure changes.