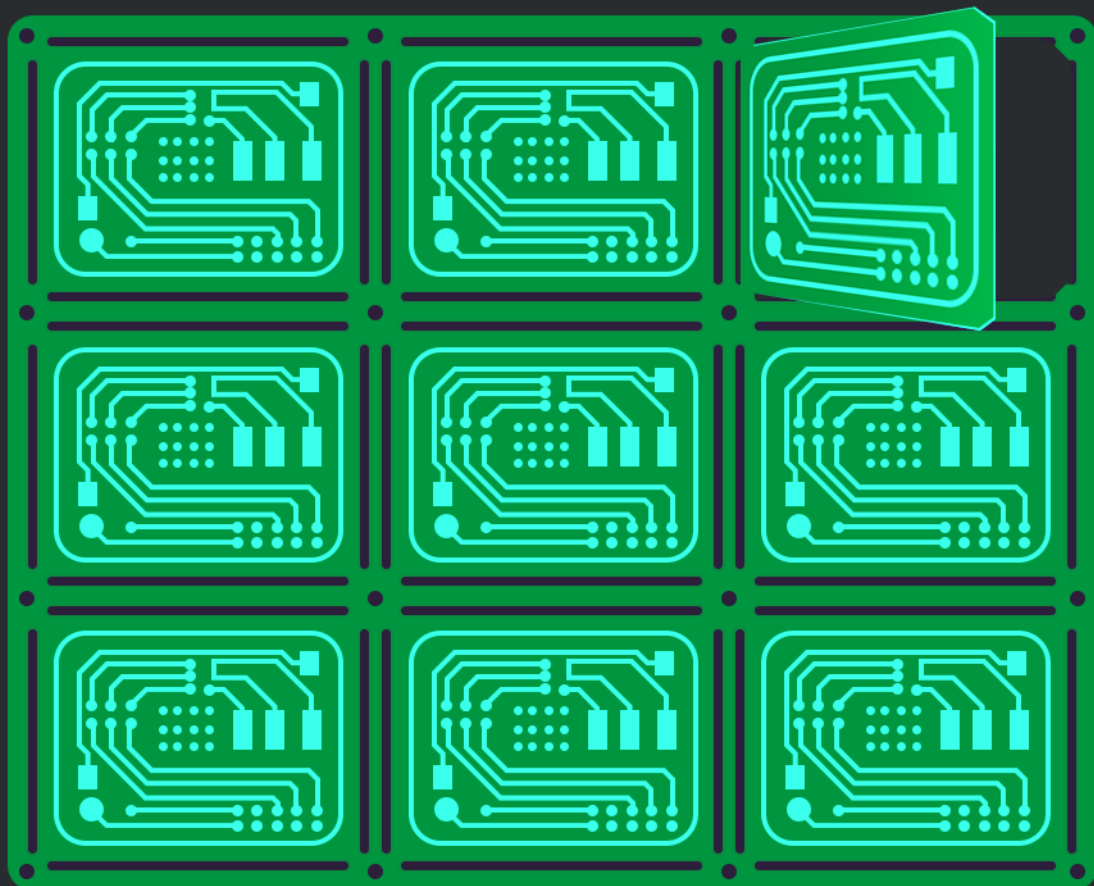




PCB Panelization Using the Embedded Board Array



Mike Moore

Field Application Engineer

USING EMBEDDED BOARD ARRAY TO PRODUCE PCB BOARDS QUICKLY AND COST-EFFECTIVELY

Every designer is concerned with producing the highest quality product as efficiently and effectively as possible. The most cost-effective way of producing a board, which has also been the standard method for quite some time, is through panelization of a standard PCB panel. This paper guides you in using the embedded board array feature of Altium Designer® to help you move quickly through the panelization process.

INTRODUCTION

Panel rails provide manufacturing benefits because they create a clearance between components and the edge of the board. Panels are transported along conveyor lines using these edges, allowing component placement on both sides of the board. Aggregating multiple boards on one panel can also reduce costs. Figure 1 is an example of panelization.

All board houses have a minimum supported PCB size. The handling and protection of many small boards during shipping is safer when produced in a panel. X-ray testing is needed for leadless parts like BGAs and QFNs, and this produces extra costs that are more affected by the number of boards rather than parts, but this cost can be reduced by panelizing.

PANELIZATION OVERVIEW

Proper panel creation can be a time-consuming and tedious process. It can be frustrating when a board change needs to be made, and the panels have to be redone. Altium Designer has added the embedded board array feature to resolve this concern. Panelization in Altium Designer is not a static Gerber creation process. The embedded board array feature dynamically links to the original PCB board(s), so not only can a board be stepped and repeated on a panel, but multiple designs that share the same stack-up can also be included in the same panel. When any of the linked individual boards are changed, you can update the embedded board array with a simple refresh to the latest linked-board data.

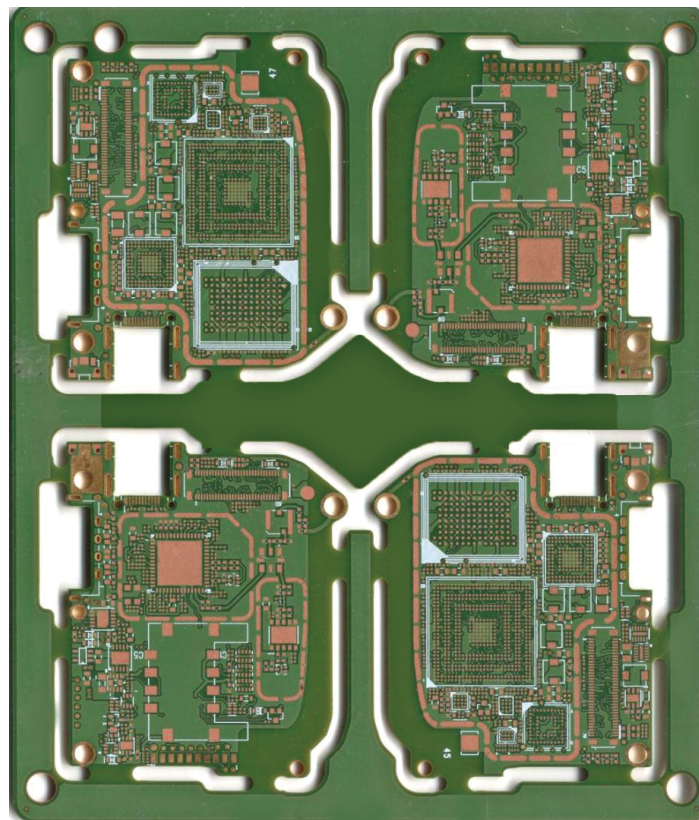


Figure 1: Four boards on a single panel.

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PANELIZATION PROCESS

The embedded board array dialog box allows you to create a PCB panel within the PCB design project. This virtual PCB panel represents the physical board to be manufactured. Any necessary edits are done in the original files and not within the resulting board array.

To access the **Embedded Board Array** dialog box, go to **DXP/Preferences**, then **PCB Editor/Defaults**, then double clicking on **Embedded Board** (Figure 2).

After clicking **OK** in the Embedded Board Array dialog box, the array of boards will be attached to a crosshair cursor (Figure 3). The crosshair will be at the lower left corner of the board array. Where you position the cursor will determine the placement of the board array. A left mouse click or the **Enter key** on the keyboard will lock in the placement of the board array. You may then see a dialog box (Figure 4) if the layer stack-up in the original board and target board array **.pcbdoc** are not identical.

You then have the option of placing further board arrays or escaping the command, either via the **right mouse button** or the **Esc** key on the keyboard.

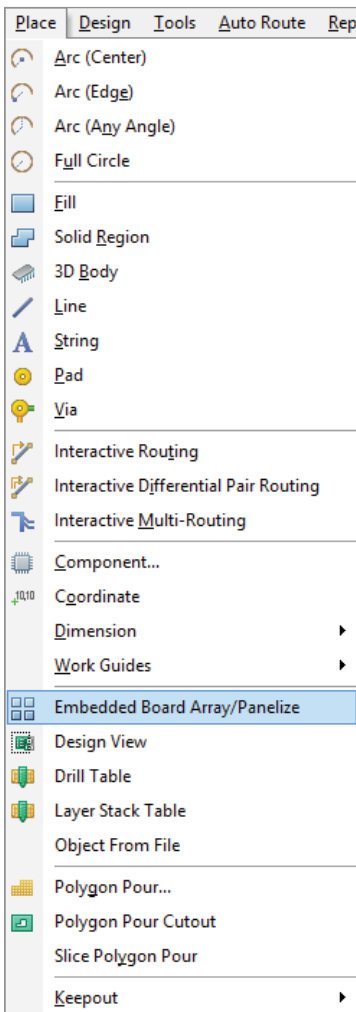


Figure 2

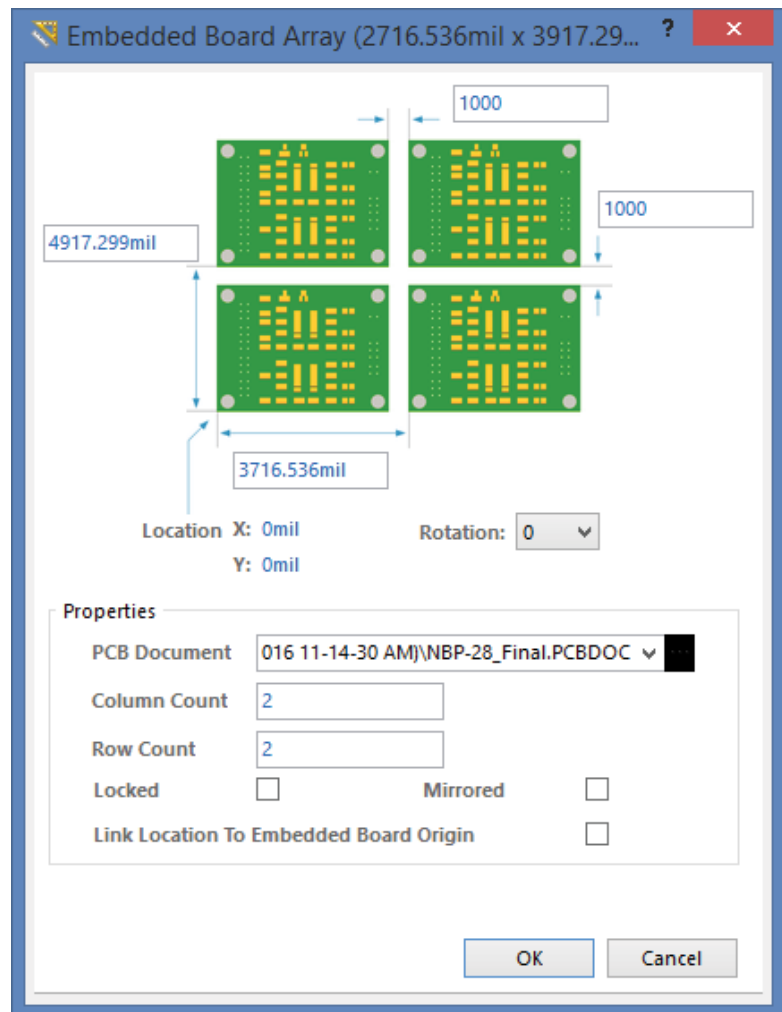


Figure 3

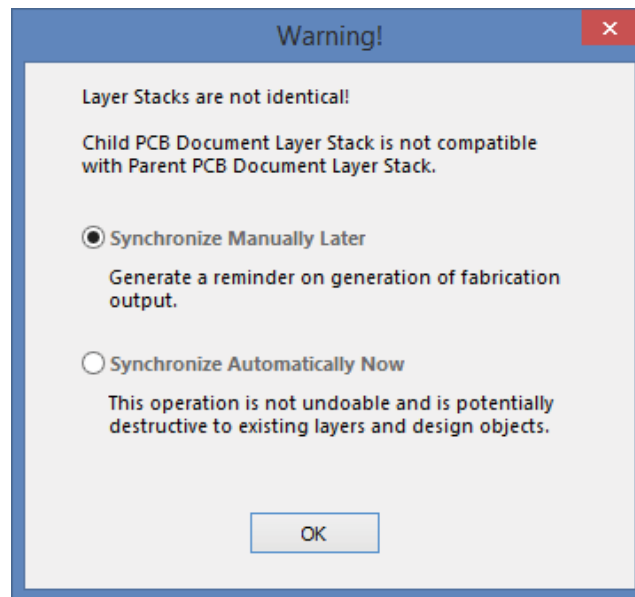


Figure 4

You also have the choice of flipping or rotating the array while placing it. Just use the **L key** on the keyboard to flip the array to the other side, and, the **spacebar** to rotate the embedded board array (counter-clockwise incremented by 90 degrees).

Note that all physical designs need to be separate and not placed within the board array PCB document. You can also place additional manufacturing objects such as free pads or tooling holes. If any changes need to be made, they should be done in the PCB source file and then refreshed in the array panel. You can produce job output files in the same manner as any other board for the resulting embedded board array such as Gerber files, NC Drill, ODB++.

CONCLUSION

PCB panelization is a vital step to help you produce boards in a quick and cost-effective manner. Altium Designer addresses this need in a very straightforward and user-friendly fashion. By using PCB source files that can be dynamically refreshed on an embedded board array; the panelization process becomes an almost effortless and efficient task in the manufacturing of a PCB design.