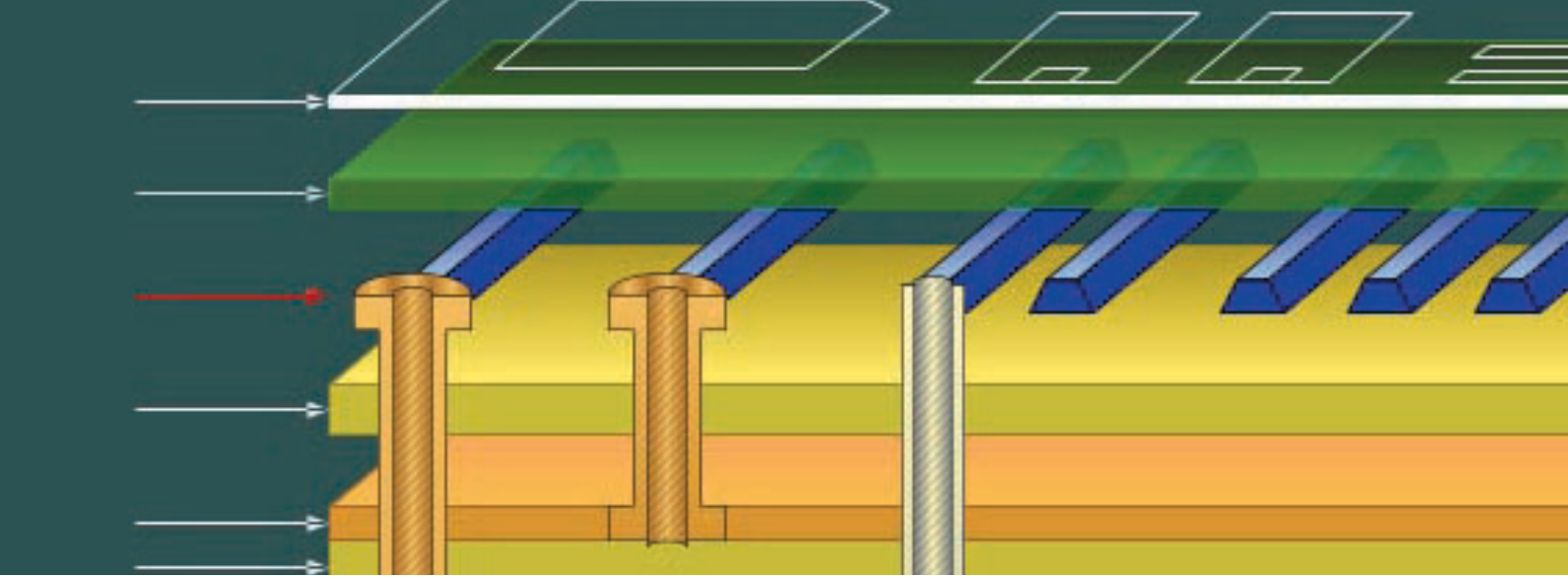
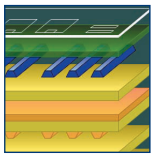


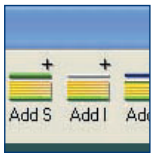
PCB layer stackup and controlled impedance design system

Designed to drastically reduce the time taken to design controlled impedance PCB stacks, the SB8000 PCB layer stackup and controlled impedance design system offers both OEM designers and PCB fabricators a fast and reliable method for layer stackup design and communication.



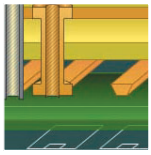
Choosing and designing the most effective layer stackup for your PCB design should be a key stage at the earliest part of your product development. By selecting the most appropriate stack you can optimise your design for cost / signal integrity / thermal performance and reliability. The Polar SB8000 is a powerful package of layer stackup software - the SB200 combined with the industry standard Si8000m controlled impedance field solver.

The layer stackup design section of the SB8000 allows you rapidly to build and share stacks and verify via aspect ratios and track spacing rules. Completed in minutes, your stack contains base material information combined with layer description and a complete listing of transmission line structures deployed in the stack. Materials libraries may be downloaded from most popular base material suppliers in the Polar Material Partner program. Keeping all stack information in one file ensures that manufacturing data is accurately shared between original designer and fabricator.



Need to keep costs down?

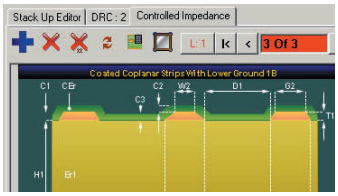
Designers can work with fabricators to use the best material combinations to minimise build costs. Fabricators can share their most popular material libraries with OEMs and ensure the best choice of material is employed in the build.

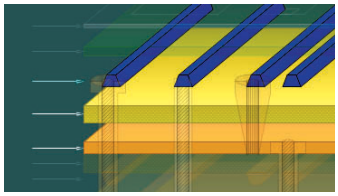
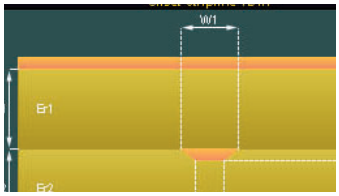


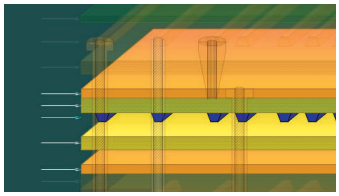
Need to prototype in one location and move to volume in another?

With the SB8000 many "what if" scenarios can be played out before production is transferred between prototype and volume operations....

- What if Mask processes change – how is impedance affected?
- What if nominal thickness changes – how is finished height affected?
- What if a material type is unavailable – can I substitute another core without compromising performance?
- Can my new vendor support this hole aspect ratio?





View stackup in 2d or 3d format, and export the stack as a JPEG into your documentation system. Layer and material annotation is clear and easy to read, and each layer is selectable.

High layercount boards

On boards with high layercounts it can be very easy to make a change resulting in a non-symmetrical stack. The design rules check keeps an eye on symmetry across the stack, and ensures material symmetry is maintained. It is also very easy to set the symmetrical build mode to ensure that any changes you make are applied equally across the stack.

Documentation

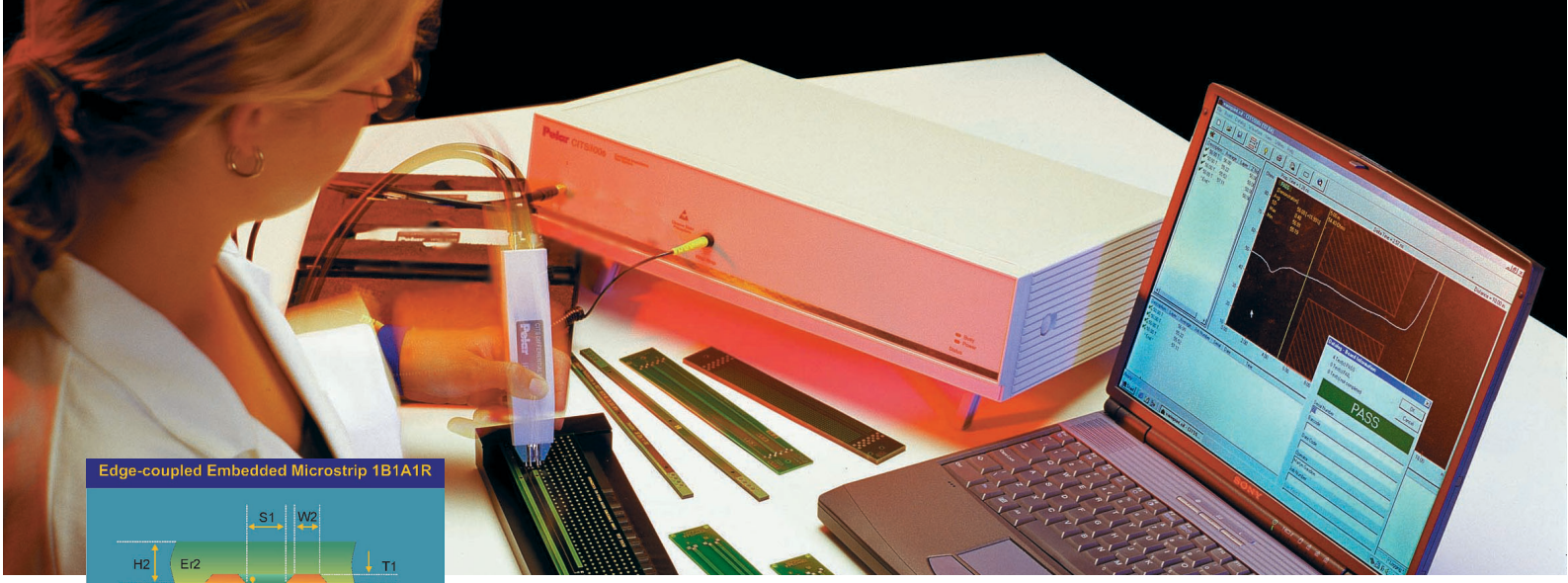
In addition to saving the stack in efficient electronic format, you can output the stack graphics in a variety of formats to suit your requirements. Stacks may be output in Gerber, DXF, bitmap or JPEG. In addition the stack data can be exported in comma-separated form for inclusion in other systems.

Controlled Impedance

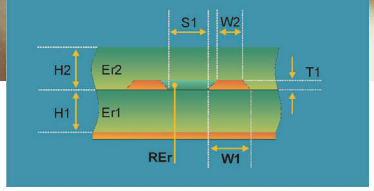
The ever-increasing speeds of modern circuitry demand high quality controlled impedance printed circuit boards. Today's PCB is not just a simple electrical interconnection device, it is a complex, highly specified component in its own right, bringing with it an increased requirement for board design verification prior to manufacture.

With over 80 PCB transmission line structures ready to use, the SB8000 package includes the Si8000m boundary element method field solver to provide accurate line geometries for your impedance control requirements. The SB200 uses the Si8000 calculator engine to check the geometries on prebuilt stacks, and can pass the information across to the Si8000 for more detailed analysis.

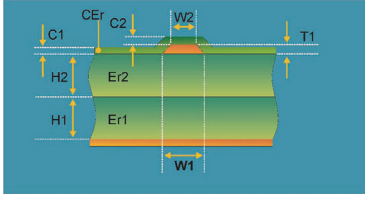
Microns, mils and millimetres... the fabrication industry works in a range of units, often mixing metric and imperial measurements in one specification, the Si8000 allows you to switch back and forth between your preferred units.



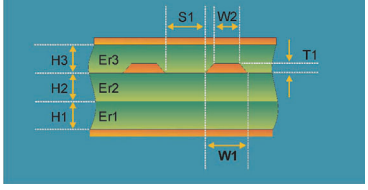
Edge-coupled Embedded Microstrip 1B1A1R



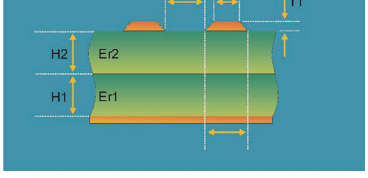
Coated Microstrip 2B



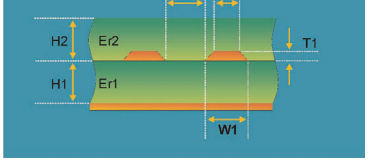
Edge-coupled Offset Stripline 2B1A



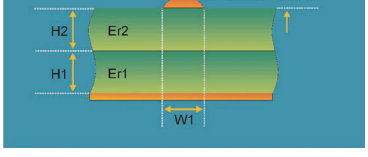
Edge-Coupled Surface Microstrip 2B



Edge-coupled Embedded Microstrip 1B1A



Surface Microstrip 2B



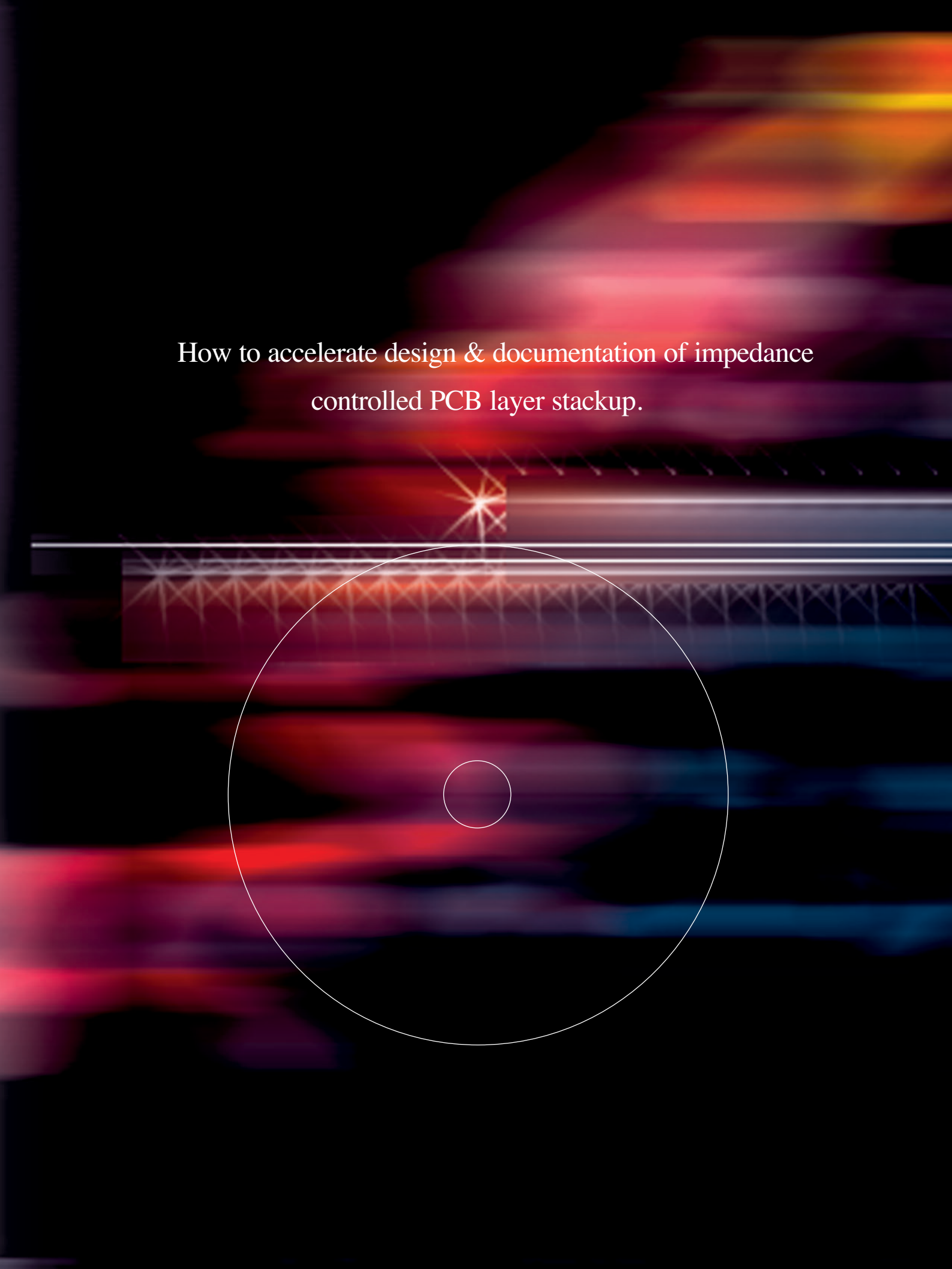
It is becoming extremely important to take manufacturing tolerance into account, especially with the move to ever decreasing line widths; the tolerance facility in the Si8000 allows you to predict the effects of manufacturing tolerance at a given set of conditions, thus allowing you to predict impedance capability and / or yields for a given geometry.

To learn more about how to improve your PCB production process, you can take test results and physical microsection data and by feeding this information back into the Si8000m discover which production process has most effect on impedance values. With experience you will be able to alter production processes to suit incoming material variation.

Imagine as a PCB fabricator you receive a batch of core material all at or around its upper thickness limit. You can use the Si8000m to investigate, whether by altering trace dimensions (within their specified range) you can still meet specification.

If more adjustment is required the Si8000m gives you the information you need to go back to the original designer to seek permission to alter traces further. While this may not always be electrically possible, the designer may find this useful especially if deadlines are tight and waiting for new material could cost a prototype build.

In order to maximize performance whilst keeping costs under control many designers specify high performance laminates in a composite stack up along with lower cost base materials. Multiple dielectric boards offer high performance at low cost but do require increased up front simulation.


How to accelerate design & documentation of impedance
controlled PCB layer stackup.

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LIT:213

Material partner program.
Vendor libraries from most popular base material suppliers are available for download from the Polar material partners page.

www.polarinstruments.com/products/stackup/material_partner.html

Graphical representation

Professional documentation

Design rule checks

Supports mask and Ident layer

Share builds between design & fabrication

Create an 8 layer stack in less than 2 minutes

Design rule checking (DRC)

Symmetry
Minimum Gap
Minimum track width
Copper balance

Aspect ratio checks
- Track
- Drilled hole
- Blind microvia
- Buried microvia

About Polar Instruments

Polar provides innovative and easy to use measurement, test, design tools and utilities for the PCB fabrication industry and related disciplines. Polar is best known for CITS and RITS controlled impedance test systems, and professional impedance calculation tools. Polar also represents PWB Corp Interconnect Stress test systems in Europe and Asia Pacific. The SB200a PCB Stackup Builder adds to the Polar product range by helping simplify the control and documentation of PCB layer stackups for interconnect designers, fabricators and OEMs.

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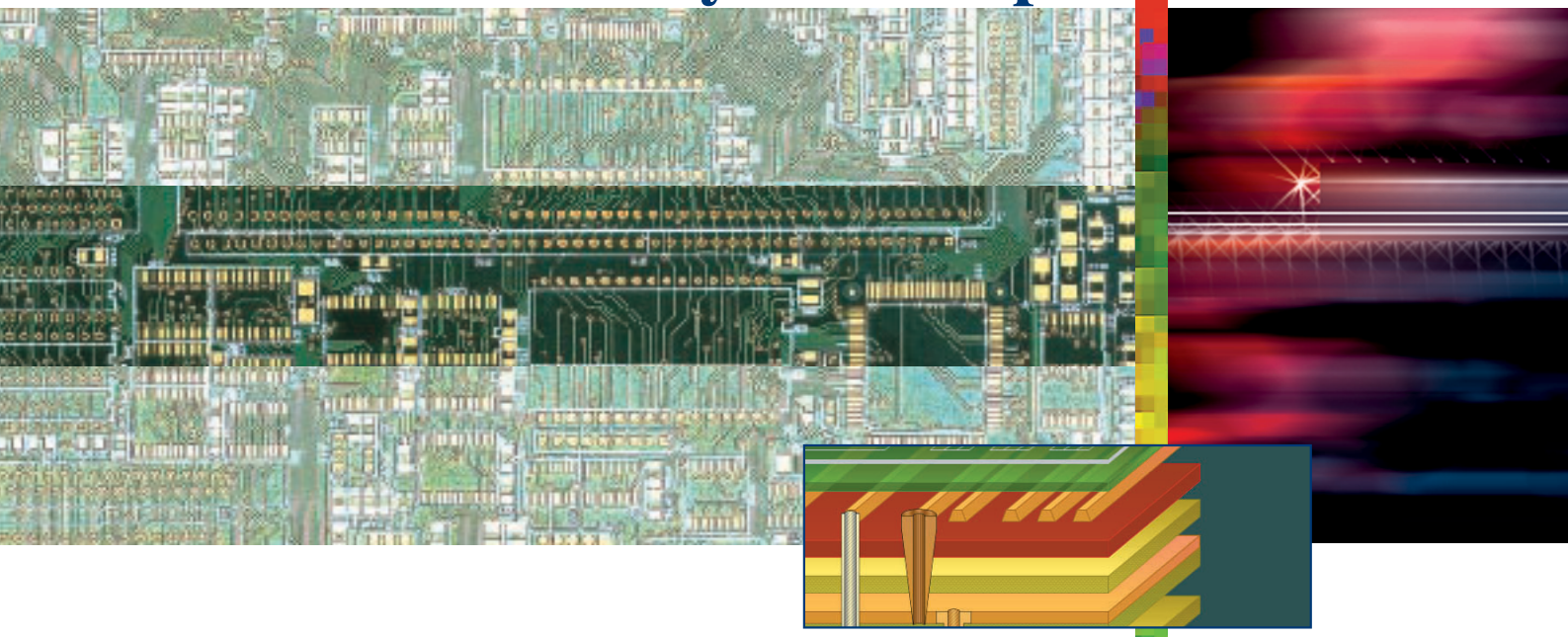
How to accelerate design & documentation of impedance controlled PCB layer stackup.



Design system for PCB layer stackup combined with controlled impedance field solver

SB8000

Fast stack creation

Major material supplier libraries

Accurate BEM impedance field solver

Model odd, even, differential and common impedance

Manufacturing tolerance prediction.

Polar

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