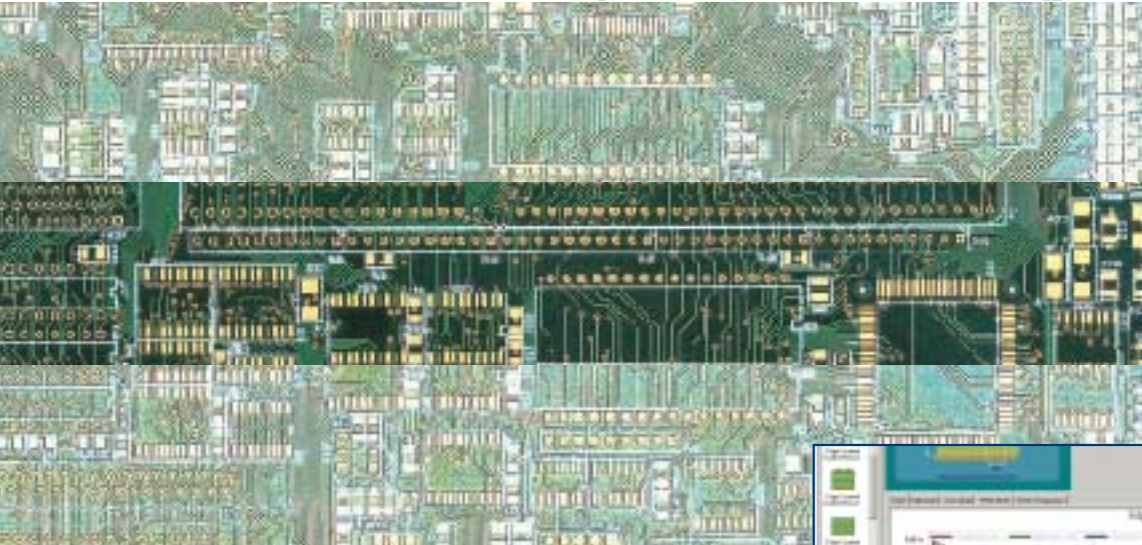


How to model PCB transmission lines and manage layer stackup



Design system for PCB layer stackup combined with PCB transmission line field solver.

SB9000

Fast stack creation

Major material supplier libraries

Accurate BEM impedance field solver

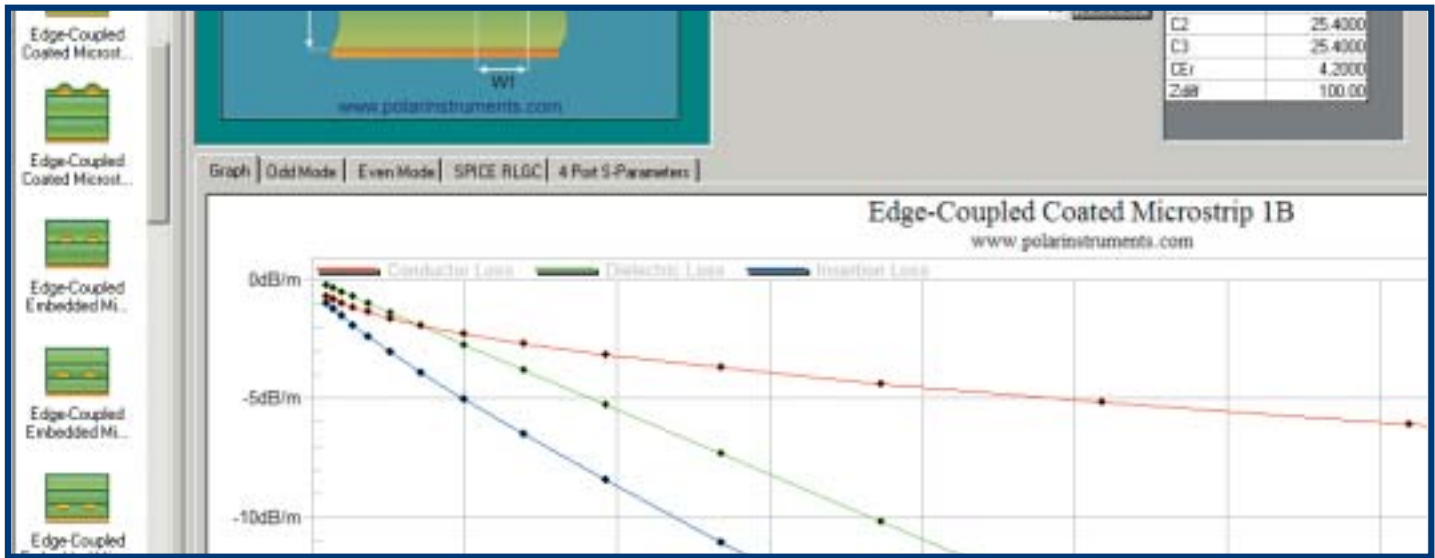
Model odd, even, differential and common impedance

Frequency dependent impedance

Insertion loss

Polar

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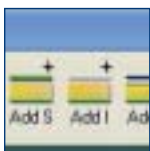
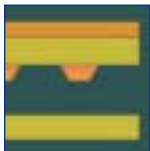
Layer stackup and PCB transmission line design system.

Designed to drastically reduce the time taken to design complex layer stackups, the SB9000 PCB layer stackup and transmission line 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 SB9000 is a powerful package of layer stackup software - the SB200 combined with the Si9000e PCB transmission line design system.

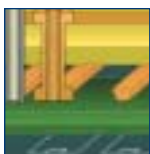


The layer stackup design section of the SB9000 allows you rapidly to build and share stacks and verify via aspect ratios and track spacing rules. Completed in minutes, your stack contains base material information combined with layer description and a complete listing of transmission line structures 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.



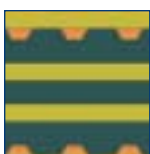
Need to keep costs down?

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.

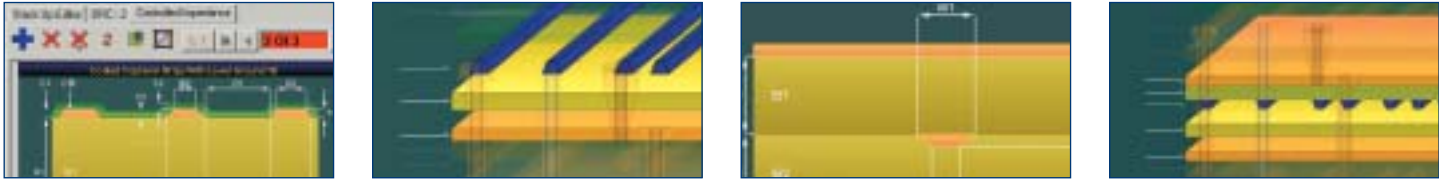


Need to prototype in one location and move to volume in another?

With the SB9000 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 layer count boards

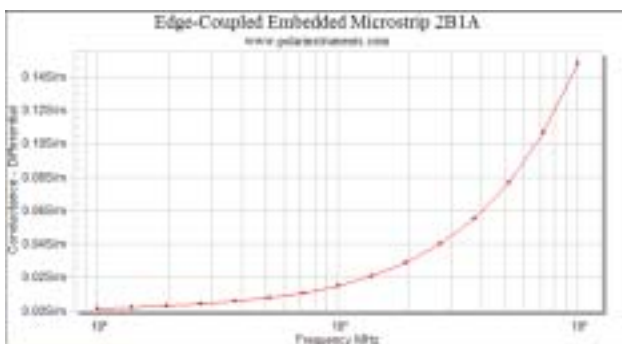
On boards with high layer counts it can be very easy to make a change resulting in a non-symmetrical stack. The design rules check keeps an eye on symmetry across the stack, and ensures material symmetry is maintained. It is also very easy to set the symmetrical build mode to ensure that any changes 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. Customisable printouts make it easy to discuss alternate builds and pricing impacts with fabricators.

PCB transmission lines

Shrinking line widths and increasing edge rates and clock speeds mean that PCB transmission lines are increasingly lossy. Understanding the impact of layer stackup and how materials and trace geometries interact is a time consuming task which is radically simplified by using the SB9000. The SB9000 allows you to model the impact of material choice and line width before committing to production saving time to market and reducing the number of costly prototype iterations.



With over 80 PCB transmission line structures ready to use, the SB9000 package includes the Si9000e boundary element method field solver to provide accurate transmission line information. The SB200 uses the Polar field solving engine to check the geometries on prebuilt stacks and can pass the information across to the Si9000e for more detailed analysis.

Who should use the SB9000?

Electronic design

If you are responsible for electronic design the SB9000 can assist with choice of materials and layer stackup before design is complete. By using the SB9000 layer stackup can be discussed and optimised for cost / signal integrity / manufacturability and reliability with your fabricator before going to production.



Interconnect design

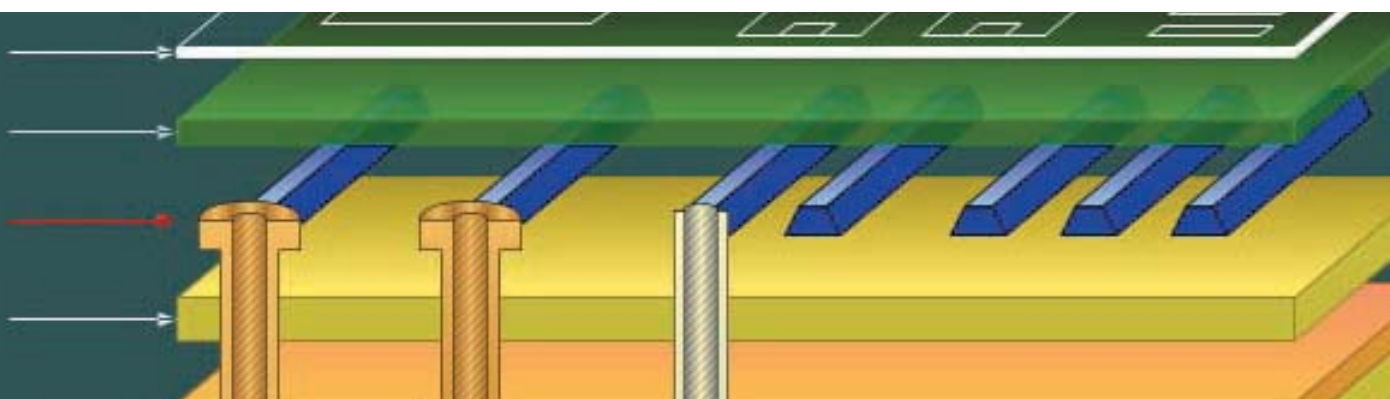
Interconnect designers should use the SB9000 to share layer stackup and ensure the PCB build complies with the intentions of the electronic designers and the fabricators applications team. The .sci (Stackup Controlled Impedance) file format is a convenient format for communicating all the material and transmission line geometries in one simple package. In addition the correct GERBER file names can be included in the .sci to ensure the GERBERS are attached to the correct physical layer.

Supplier management

When multiple sourcing PCBs or when moving from prototype to volume production, the stack and fabrication design rules checks ensure that you do not overlook the manufacturing capabilities of your chosen suppliers. In addition the professional documentation output from the SB9000 ensures that layer stack information is accurately conveyed from your team to your PCB suppliers.

PCB fabrication

Applications engineers, front end and production engineers benefit by receiving stack information in an easy to understand format. The SB9000 .sci file contains everything you need to know about the layer stack up of a particular job. If you need to make changes or share preferred stacks with your customers the SB200 cuts the time for documentation and information sharing to a fraction of the time taken when using traditional methods such as Excel, Word or PowerPoint. The .sci format is also compatible and readable with the SB8000 (Si8000m) field solver, which is a more appropriate tool for most fabricators.





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LIT:215

PCB layer stackup design and documentation

Graphical stackup design

Up to 100 layers

Design rule checks

Minimum track

Minimum gap

Copper balance

Aspect ratio checks:

Track

Drilled hole

Blind / buried via

Microvia

Finished thickness calculation.

Extensive on line material libraries.

Automatic stack documentation

Stack export in

.csv

.dxf

.xml

Gerber

.jpeg

Impedance calculation from stack

Impedance goal seeking from stack

PCB transmission line design:

Over 90 standard PCB transmission line structures

Calculates:

Impedance magnitude

Skin depth

Insertion loss S21

Conductor loss dB

Dielectric loss dB

Propagation velocity

S-Parameters

SPICE RLGC

Production impedance tolerance

Single ended and differential structures

Accurate for lines operating in TEM mode

Material Partner Program.

Vendor libraries from most popular base material suppliers are available for download from the Polar web site Material Partners page.

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

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 SB9000 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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