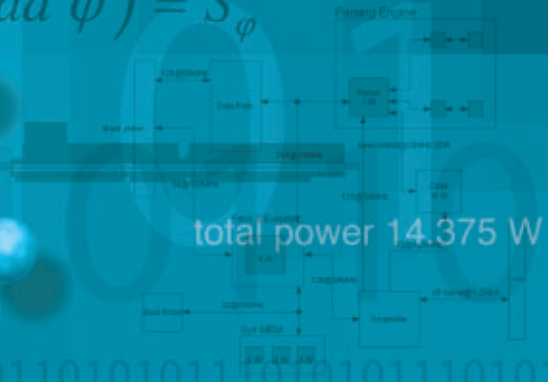


FLOPCB

Optimizing Collaborative PCB
Design by Simulation

board size 90.1876 mm x 121.938 mm

$$\frac{\partial}{\partial t}(\rho\phi) + \text{div}(\rho\vec{V}\phi - \Gamma_\phi \text{grad}\phi) = S_\phi$$



power density 1353.39 W/m²

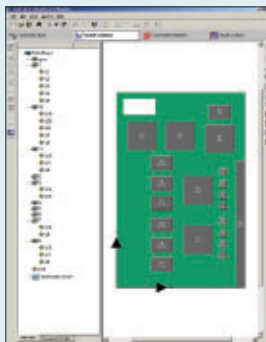
Software for Collaborative Conceptual Design of Printed Circuit Boards

The New Way

Electrical & mechanical engineers collaborate in real time with FLO/PCB.



Create Functional Block Diagrams...



Derive Physical Layout rapidly...



Predict airflow and temperature in minutes.

What is FLO/PCB?

FLO/PCB is a unique, new software program for *streamlining concept development* of printed-circuit boards (PCBs), whilst ensuring good thermal design and accelerating the PCB design process.

FLO/PCB facilitates collaboration between product marketing, electronic engineers and mechanical engineers on PCB design, particularly during the conceptual phase of the design process. FLO/PCB promotes a conceptual design process that is derived from the functional block diagram. Changes made to the functional block diagram are instantly reflected in the physical layout and thermal representations. This keeps all team members in sync and enables them to contribute to concept development in real time. The result is pre-optimized concepts in less time and drastic reductions in late-cycle rework as product marketing, mechanical, thermal and manufacturing issues are solved before concept commit.

Who can use FLO/PCB?

FLO/PCB is designed to be used by all those involved in the conceptual design of PCBs, including Product Marketing, Systems Architects, Hardware Designers, and Mechanical/Thermal Engineers.

Product Marketing:

Interact with all members of the design team rapidly and effectively, viewing and commenting on design concept changes in real time.

Systems Architects:

Stay in control of the conceptual design process with FLO/PCB. Create a functional block diagram rapidly, using software menus developed specifically for this task. Communicate instantly with product marketing, hardware design and mechanical/thermal engineers through graphical outputs and automatically-generated reports. One mouse click flips between functional block diagram, physical layout, and thermal performance views. If thermal questions arise, you can instantly transfer models to your colleagues for more in-depth analysis. Receive feedback more quickly and accurately than ever before as your colleagues work alongside you within the FLO/PCB design environment.

Mechanical/Thermal Engineers:

With FLO/PCB, you finally have the software you need to provide critical feedback on thermo-mechanical issues in time to influence **conceptual** board design and layout. You will receive design updates from electrical engineering and product marketing in real time. When concept design is complete, you already have design information in a format that allows you to instantly start your detailed mechanical design in your CAD software, and your thermal design in FLOTHERM.

Hardware Design Engineers:

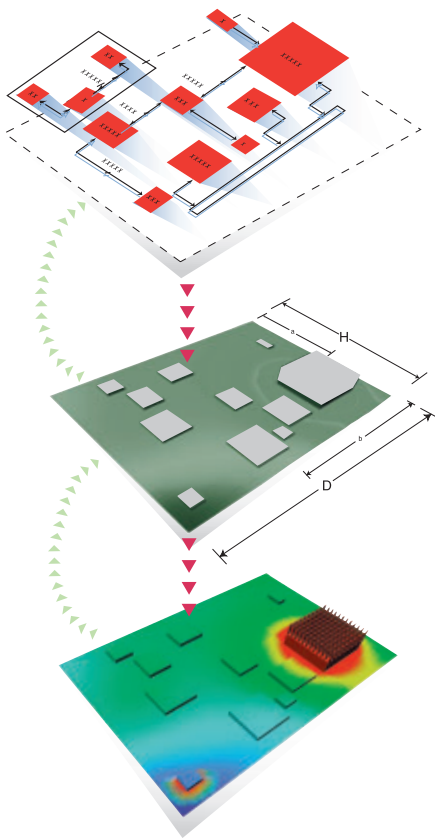
With FLO/PCB, you can influence concept development and find the right balance between concept and detailed design and manufacturing. At "concept commit" stage, you can export the final design information from FLO/PCB directly into your mainstream EDA software.

How does FLO/PCB save my company money?

FLO/PCB saves your company money by addressing major inefficiencies in the board design process. On top of this, FLO/PCB minimizes the risk of board "re-spins" due to thermal problems. In a recent survey, 60% of mechanical engineers in electronics companies stated that thermal issues had forced board layout changes during the previous 12 months. Just **one** such re-spin costs many times the FLO/PCB license fee.

FLO/PCB – Key Features

- Specialized menus for rapid creation of functional block diagrams
- Automatic creation of physical layout and thermal model from the functional block diagram
- 3D airflow and temperature prediction in minutes
- Fully-integrated library capability supporting JEDEC standards for component thermal models
- Leverage libraries from www.SmartParts3D.com* & www.flopack.com**
- Export/import board design information to and from EDA and CAD software via IDF file format
- Native bi-directional interoperability with FLOTHERM
- Automatic report generation via HTML and/or Microsoft Word
- Compatible with WindowsXP, WindowsNT, and Windows2000 operating systems
- Recommended minimum hardware requirements: 512MB RAM, 300MB disk space



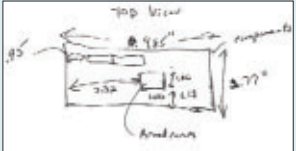
* www.SmartParts3D.com is an online, searchable database of ready-to-run thermal models for many common IC packages and other parts. These models can be used directly in FLO/PCB

** www.flopack.com provides rapid generation of "compact" and "detailed" thermal models for IC packages, which can also be used directly in FLO/PCB

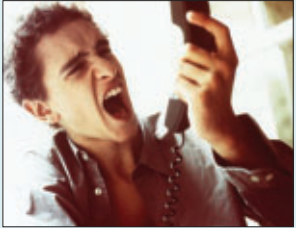
Since 1988, Flomerics has pioneered a different approach to numerical analysis and simulation. Flomerics' software tools and services help bridge the gap between science and industry by embedding complex analysis and optimization software deeply into the design process, in a way which enhances productivity in engineering design. This approach is called "Design-Class Analysis".

The Old Way

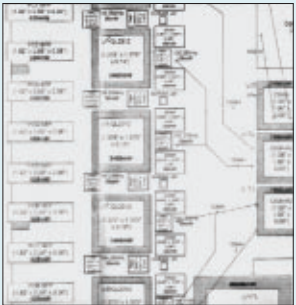
Disjointed communication slows design collaboration.



"Back of envelope" drawings.



Repeated clarification of design requirements and constraints.



Functional Block Diagram (no connection to physical layout or EDA software).

ELECTRONICS COMPANIES AROUND THE WORLD DEPEND ON FLOMERICS FOR DESIGN OPTIMIZATION

Flomerics customers in the electronics industry include every major computer manufacturer, all major telecom switching manufacturers, the top five networking hardware vendors, and the world's largest semiconductor producers.

Aerospace & Defense

Airbus
Alenia Marconi
Allied Signal
BAE Systems
Ball Aerospace
Bechtel
Boeing
China Aviation
EADS
Elta
ESA
Galileo Avionica
General Dynamics
Harris
Lockheed Martin
Naval Surface Warfare
Center
Raytheon
Rockwell International
Siemens
Smiths Industries
THALES
TRW Avionics

Communications

3 COM
ADC Telecommunications
Alcatel Business Systems
Alcatel CIT
Alcatel SEL
Alcatel Submarine
British Telecom
Cisco
Ericsson
Fujitsu
Huawei Technologies
Intel
Hughes Network Systems
Italtel
JDS Uniphase
Lucent Technologies
Marconi
Motorola
NEC
Nokia
Nortel
Philips PKI
QUALCOMM
Rockwell International
Samsung
Scientific Atlanta
Siemens ICN
Tellabs
Telrad
Thales Communications
Tyco Telecommunications

Computers

Apple
Bull
Dell Computers
EMC
Foxconn
Fujitsu
Hewlett-Packard
IBM
ICL
Intel
Inventec
Mercury
Motorola
NEC
NCR
Quanta
Samsung
Seiko-Epson
Siemens
Sony
Storage Technology
Stratus
Sun Microsystems
Toshiba
Unisys
Wistron
Xyratex

Consumer

Blaupunkt-Werke
Bose
Hitachi
InFocus
Konica
LG Electronics
Linn Products
Pace Micro
Philips
Samsung
Sony

Contract Design & Manufacturing

Celestica
Foxconn
Flextronics
Sanmina
Solectron

Instrumentation Control & Medical

Agilent
Analogic
General Electric
Hewlett-Packard
Hitachi
Johnson Controls
Mitsubishi
Siemens
Tektronix
Teradyne
Thales

Power Electronics

Astec
Celestica
CPI
ELDEC Corp.
Emerson
Legrand
Lucent Technologies
Marconi
Powerwave
Schneider Electric
Tectrol
Tyco
Ultra

Semiconductors

3M
Agere
Agilent
AMD
Amkor
Fujitsu
IBM
IDC
Infineon
Intel
International Rectifier
Micron
Motorola
Philips Semiconductor
Rockwell Semiconductor
Samsung
Siemens
ST Microelectronics
Texas Instruments

Transportation

Airbus
Alstom Transport
Caterpillar
Chrysler Alcatel
Delphi-Delco
Delphi Packard
Ford Motor Company
Honda
Magneti Marelli
Motorola
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