

Cadence OrCAD PCB Designer

Advanced place and route technology through to manufacturing

Cadence® OrCAD® PCB Designer products help companies stay competitive in today's electronics market—managing the challenges of shorter design cycles, tighter project goals, and faster time to market. Scalable and production-proven in every EDA industry, OrCAD PCB Designer meets the needs of layout designers as they progress through the design cycle, from netlist to placement and routing through to manufacturing.

The powerful, tightly integrated PCB design technologies include design capture, librarian tools, PCB editing/routing, signal integrity (Professional), and optional circuit simulation. Easy-to-use and intuitive, they offer exceptional value and future-proof scalability to the Cadence Allegro® series of PCB design products.

OrCAD PCB design solutions contain everything needed to take a PCB design from concept to production. A fully integrated design flow includes Constraint Manager, design capture, component tools, a PCB editor, and an auto/interactive router as well as interfaces for manufacturing and mechanical CAD. A common database architecture, use model, and library offer fully scalable PCB solutions for both Cadence OrCAD and Allegro products, giving engineers the ability to expand as their designs and design challenges increase in complexity.

OrCAD PCB Editor is an easy-to-use PCB layout editing tool for creating simple to complex PCBs. Based on production-proven Allegro PCB technology, OrCAD PCB Editor offers a wide array of powerful features to speed designs from placement and routing through to manufacturing.

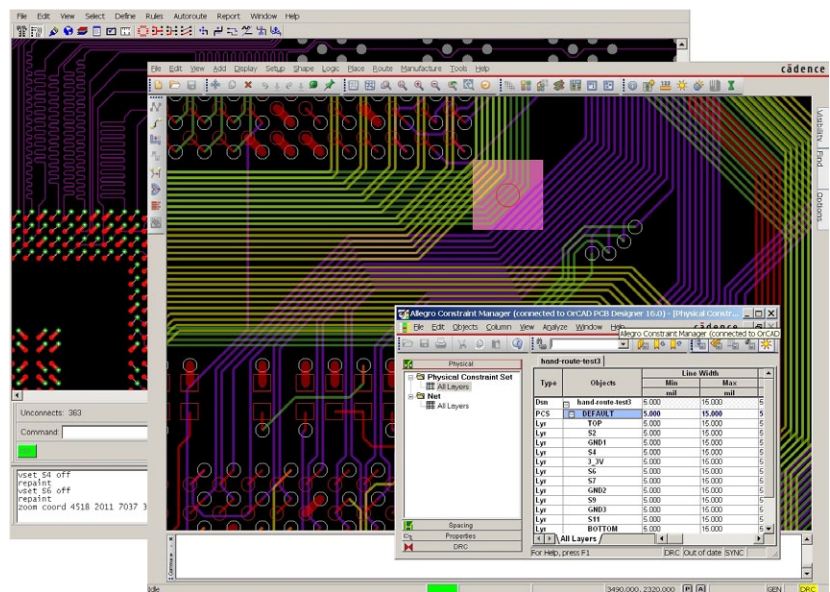


Figure 1: OrCAD PCB design suites provide a complete place-and-route environment including interactive and automatic routing, cross-probing, and constraint management

Included in the OrCAD PCB Designer Standard, OrCAD PCB Designer Professional, and OrCAD PCB Designer Professional with PSpice® suites, OrCAD PCB Editor increases productivity, shortens design cycles, and helps engineers quickly ramp up to volume production.

Benefits

- Proven, scalable, easy-to-use PCB editing and routing solution that grows as needed
- Tight, front-to-back application integration increases productivity and ensures data integrity

- A comprehensive feature set and a seamless PCB design environment delivers a complete solution to take a design from concept to production
- Automatic and interactive etch editing delivers intelligent automation to maintain user control while maximizing routing productivity
- Dynamic shapes technology offers real-time copper pour plowing/healing to eliminate manual, error-prone voiding and rework

Features

At the heart of the OrCAD PCB design suites is OrCAD PCB Editor, an interactive environment for creating and editing simple to complex, multi-layer PCBs.

The extensive feature set addresses a wide range of today's design and manufacturability challenges. OrCAD PCB Editor provides a powerful and flexible set of floorplanning tools and shape-based shove/hug interactive etch creation/editing. Interactive, shape-based, any-angle, push/shove routing allows users to quickly solve interconnect challenges. Dynamic shape capability offers real-time copper pour plowing/healing functionality during placement and routing iterations.

Display and Visualization

The built-in 3D viewer is available in all PCB Editor products. The 3D environment supports several filtering options, camera views, graphic display options such as solid, transparency and wireframe, and mouse-driven controls for pan, zoom, and spinning the display. 3D viewing also supports the display of complex via structures or isolated sections of the board. Multiple display windows can be opened using the context sensitive command structure, and 3D images can be captured and saved in JPEG format.

The flipboard capability "flips" the design about its Y axis inverting the design database in the canvas. This "flip" reorganizes the display of the design such that what was displayed as top through to bottom becomes bottom through to top. Having a true bottom side view from within the CAD system is essential for hardware engineers when debugging a board in the

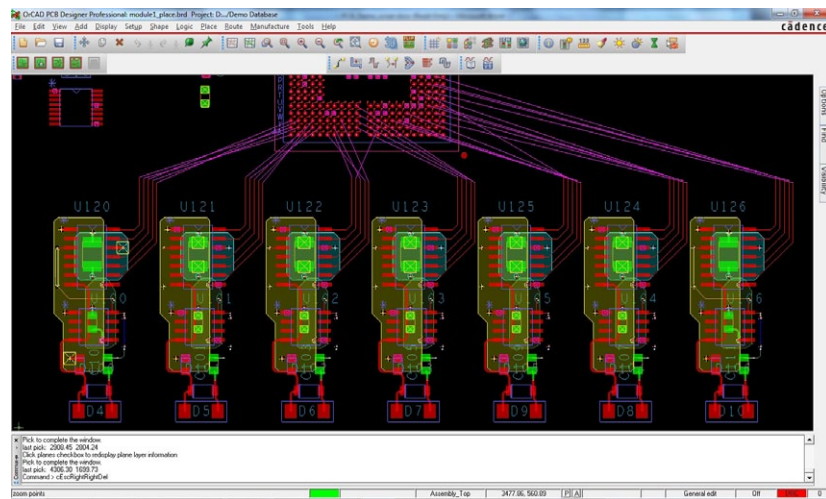


Figure 2: Placement replication automates placement and routing of multiple similar circuits in a design; a template using one instance of a placed-and-routed circuit can be applied to all other instances within the design

lab, or for assembly/test engineers on the manufacturing floor. Flipboard is not just limited to viewing; design edits can also be performed while in this mode.

Constraint Manager

A constraint management system displays physical/spacing, samenet, region, and differential pair & length rules along with their status (based on the current state of the design) in real-time and is available at all stages of the layout process. Each worksheet provides a spreadsheet interface that enables users to define, manage, and validate the different rules in a hierarchical fashion.

With this powerful application, designers can graphically create, edit, and review constraint sets as graphical topologies that act as electronic blueprints of an ideal implementation strategy. Once they exist in the database, constraints can drive the placement and routing processes for constrained signals.

The constraint management system is completely integrated with OrCAD PCB Editor, and constraints can be validated in real-time as the design process proceeds. The result of the validation process is a graphical representation of whether constraints pass (highlighted in green) or fail (highlighted in red). This approach allows designers to immediately see the

progress of the design in the spreadsheets, as well as the impact of any design changes.

Floorplanning and Placement

OrCAD PCB Editor includes a powerful and flexible set of placement capabilities, both interactive and automatic. The designer can assign components or subcircuits to specific "rooms" during design entry or floorplanning. Components can be filtered and selected by reference designator, device package/footprint style, associated net name, part number, or the schematic sheet/page number.

Superior placement replication technology within OrCAD PCB Designer allows users to quickly place and route multiple similar circuits in a design. It allows users to create a template using one instance of placed and routed circuit that can be applied to other instances within the design. The saved placement template can be used with other designs where similar circuits are used.

When replicating placement, users can flip or mirror the circuit from top layer to bottom layer. All associated etch elements, including blind buried vias, are mapped to correct layers when circuit is moved from top layer to bottom layer.

Type	Objects	Referenced Electrical CSet	Total Etch Length			Total Etch Length			Unrouted Net Length	Routed Net Length
			Min	Actual	Margin	Max	Actual	Margin	mil	mil
Bus	cads_routed		2000.00	1767.20	-232.81	3500.00	1767.20	-1732.81		
Net	@PROJECT1_LIBESIDE(SCH_1)A (23)		2000.00	6368.82	4368.82	3500.00	6368.82	-2868.82		
Net	A1		2000.00	6123.23	4123.23	3500.00	6123.23	-2623.23		
Net	A2		2000.00	6091.02	4091.02	3500.00	6091.02	-2591.02		
Net	A3		2000.00	6728.58	4728.58	3500.00	6728.58	-3228.58		
Net	A4		2000.00	6342.57	4342.57	3500.00	6342.57	-2842.57		
Net	A5		2000.00	6278.14	4278.14	3500.00	6278.14	-2778.14		
Net	A6		2000.00	6569.15	4569.15	3500.00	6569.15	-3069.15		
Net	A7		2000.00	6608.68	4608.68	3500.00	6608.68	-3108.68		
Net	A8		2000.00	6219.96	4219.96	3500.00	6219.96	-2719.96		
Net	A9		2000.00	6186.07	4186.07	3500.00	6186.07	-2686.07		
Net	A10		2000.00	6033.20	4033.20	3500.00	6033.20	-2533.20		
Net	A11		2000.00	5482.98	3482.98	3500.00	5482.98	-1982.98		
Net	A12		2000.00	5400.06	3400.06	3500.00	5400.06	-1900.06		
Net	A13		2000.00	5561.49	3561.49	3500.00	5561.49	-2061.49		
Net	A14		2000.00	6985.80	4985.80	3500.00	6985.80	-3485.80		
Net	A15		2000.00	1767.20	-232.81	3500.00	1767.20	-1732.81		
Net	A16		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A17		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A18		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A19		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A20		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A21		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A22		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Net	A23		2000.00	0.00	-2000.00	3500.00	0.00	-3500.00		
Bus	@PROJECT1_LIBESIDE(SCH_1)D (16)									
Bus	@PROJECT1_LIBESIDE(SCH_1)UPREV1 (16)									

Figure 3: Constraint worksheets provide a spreadsheet interface that enables users to define, manage, and validate design rules at any point in the design process

Interactive Etch Editing

The routing feature of the OrCAD PCB Editor provides powerful, interactive capabilities that deliver controlled automation, while maximizing routing productivity. Real-time, shape-based, or any-angle push/shove routing addresses a wide array of routing challenges.

Routing modes include “shove-preferred,” “hug-preferred,” or “hug-only.” The shove-preferred mode constructs the optimum interconnect path while the real-time, shape-based router takes care of dynamically pushing obstacles. Routes automatically “jump” over obstacles such as pins or vias. The hug-preferred mode is the perfect solution when a databus needs to be constructed. In hug-preferred mode, the router contour follows other interconnects as a priority and only pushes aside or jumps over obstacles when there is no other option.

The hug-only option performs like the hug-preferred mode, but without the push-and-shove aggression on other objects. The real-time, embedded, shape-based routing engine optimizes the route by either pushing obstacles or following contours while dynamically jumping over vias or component pins.

Dynamic Shapes

Dynamic shape technology offers real-time copper pour plowing/ healing functionality. Shape parameters can be applied at three different levels: global, shape instance, and object-level hierarchies. Traces, vias, and components added to a dynamic shape will automatically plow and void through the shape. When items are removed, the shape automatically fills back in. Dynamic shapes do not require batch autovoiding or other post-processing steps after edits are made.

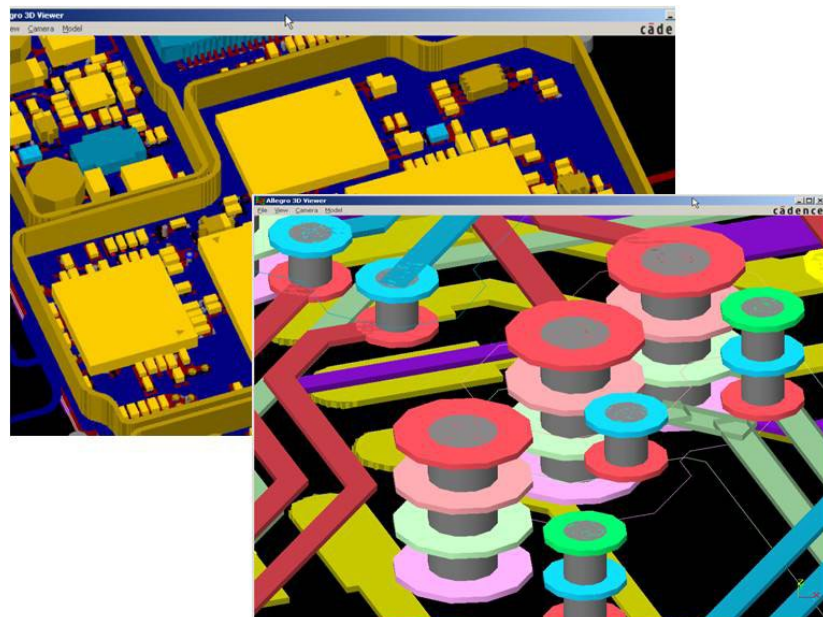


Figure 4: 3D viewing supports the display of complex via structures or isolated sections of the board

PCB Manufacturing

A full suite of phototooling, bare-board fabrication, and test outputs, including Gerber 274x, NC drill, and bare-board test in a variety of formats can be generated. Cadence supports the industry initiative toward Gerber-less manufacturing through an ODB++ interface. The ODB++ data format creates accurate and reliable manufacturing data for high-quality Gerber-less manufacturing.

Automatic Routing

OrCAD PCB Designer Professional and OrCAD PCB Designer Professional with PSpice both include SPECCTRA® for OrCAD, the market-leading PCB solution for automatic and interactive interconnect routing. Designed to handle routing challenges from simple designs to high-density PCBs requiring complex design rules, SPECCTRA for OrCAD uses powerful shape-based algorithms to make the most efficient use of the routing area.

The results are increased completion rates, higher productivity, and shorter design cycle times. SPECCTRA for OrCAD provides two powerful tools for interconnect routing: a route editor and an auto-router. Both can route up to six signal layers concurrently with no restriction on the number of components, component pins, or nets.

Future-Proof Scalability

Unlike other PCB solutions, Cadence PCB design solutions have the ability to grow with changing design needs and future technology challenges. Based on Allegro PCB design technology, OrCAD PCB design solutions provide the security of scalability to meet those challenges easily. Features and technologies are shared across the OrCAD and Allegro product lines. This allows design suites to be easily upgraded and expanded without the need to translate databases or libraries, learn new applications, or change use models.

Sales, Technical Support, and Training

The OrCAD product line is owned by Cadence Design Systems, Inc., and supported by a worldwide network of Cadence Channel Partners (VARs). For sales, technical support, or training, contact your local channel partner. For a complete list of authorized channel partners, visit www.cadence.com/Alliances/channel_partner.



Cadence is transforming the global electronics industry through a vision called EDA360. With an application-driven approach to design, our software, hardware, IP, and services help customers realize silicon, SoCs, and complete systems efficiently and profitably. www.cadence.com