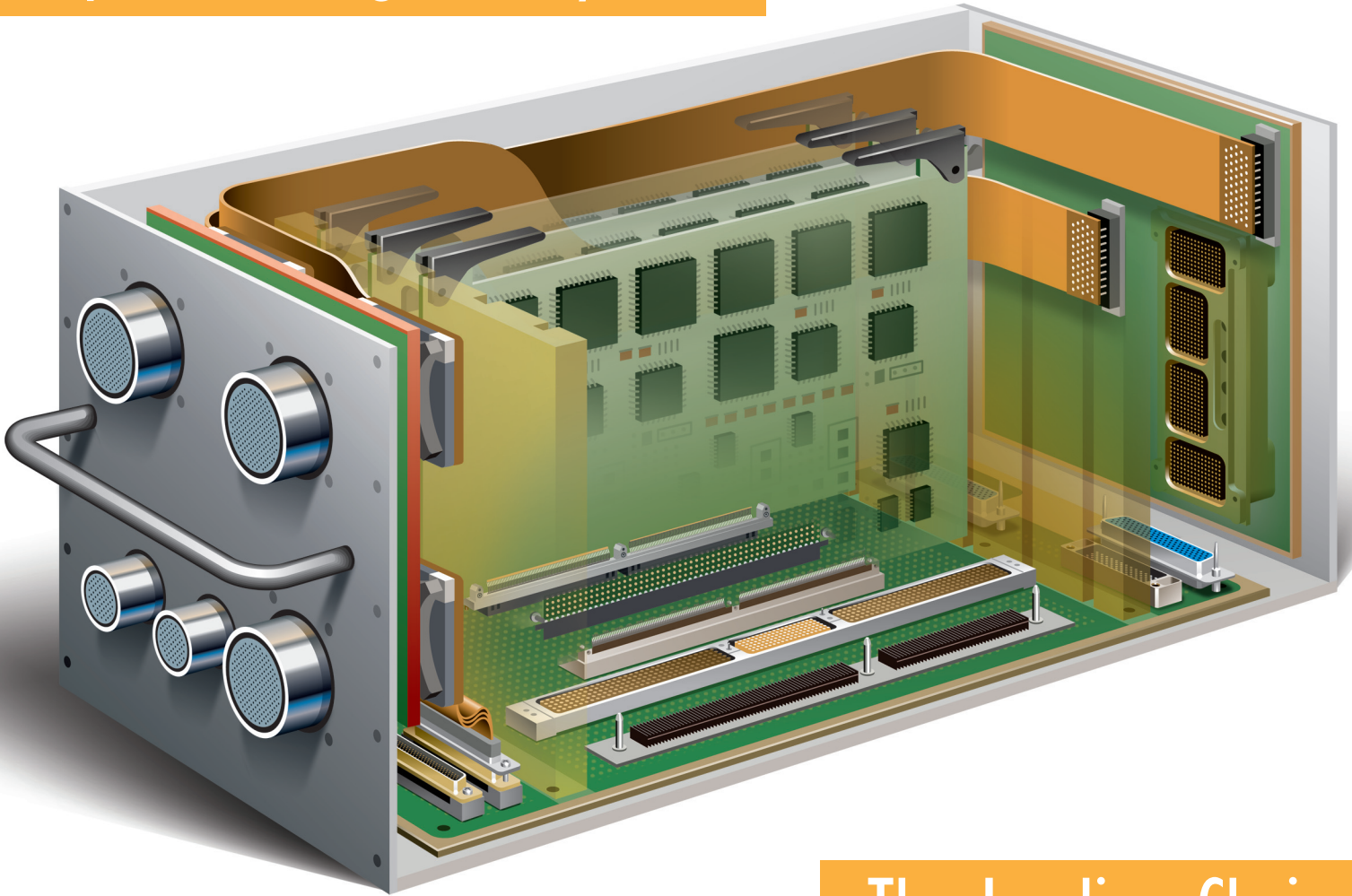


Amphenol

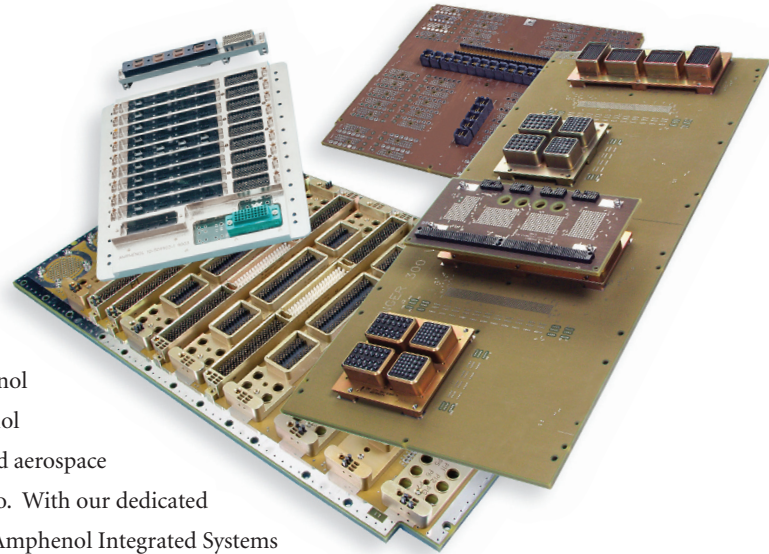
Amphenol Integrated Systems



The Leading Choice

Amphenol Integrated Systems, The Leading Choice

Amphenol is the leading manufacturer of integrated system solutions for the military and aerospace markets. Amphenol Integrated Systems is a synergistic compilation of our backplane assembly operation (Amphenol Backplane Systems), rigid, flexible and rigid-flex printed circuit operation (Amphenol Printed Circuits), and our board level products operation (Amphenol Aerospace Operations Board Level Products). Coupled with our sister Amphenol interconnect operations, we have over 60 years of experience in the military and aerospace market and our commitment to the industry is exemplified in everything we do. With our dedicated facilities in Nashua, New Hampshire; Sidney, New York; and Nogales, Mexico, Amphenol Integrated Systems is the military and aerospace industries premier choice for system-level packaging solutions. We understand the relationship between the interconnect, the printed circuit board, the backplane and the chassis, and we use that knowledge to provide complete solutions for our customers.



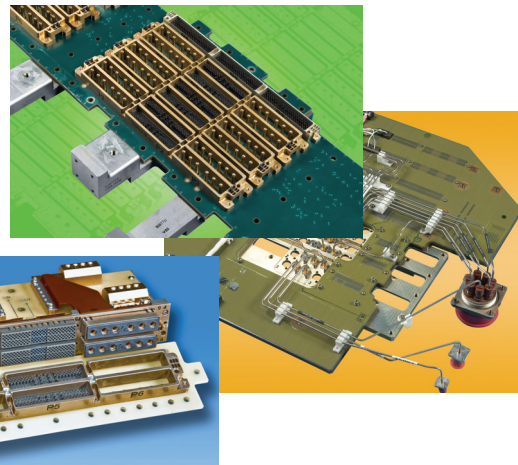
Amphenol products are required to perform in the most demanding environments

Whatever your requirements, Amphenol is the choice for system-level packaging solutions. We lead the industry by offering the elements necessary for success in the military and aerospace OEM supply chain: design and modeling, applications engineering, fabrication, value-added assembly, and testing. Coupled with the largest interconnect offering on the market, Amphenol supports all of your system-level needs.

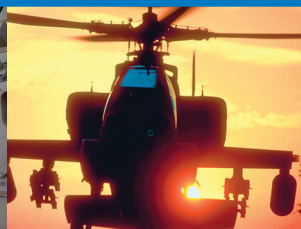
Amphenol's solutions at the pinnacle of technology

Some of the world's most demanding programs rely on Amphenol's packaging solutions, including:

- F-35
- F-22
- F-18
- MIDS/JTRS Radio
- Theater High Altitude Air Defense Radar (THAAD)
- AH-64 Apache
- 787 Dreamliner
- Future Combat Systems
- DDG-51
- DDG-1000



From Avionics to Ground and Naval Systems, Amphenol's Integrated Systems solutions are found aboard commercial airliners, helicopters, Navy and Air Force fighters, C4I electronics, missiles, ground vehicles, Homeland Security Systems, and Navy warships around the world.



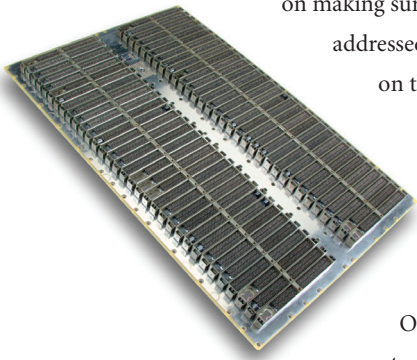
The Amphenol Engineering Edge

Amphenol Integrated Systems tackles problems such as PWB routing, signal integrity, mechanical robustness, and thermal reliability concurrently rather than independently by value-added

applications engineering support. Solving complex packaging challenges depends on making sure that environmental, mechanical, and electrical factors are all addressed at the system-level. By taking this system-level perspective and focusing

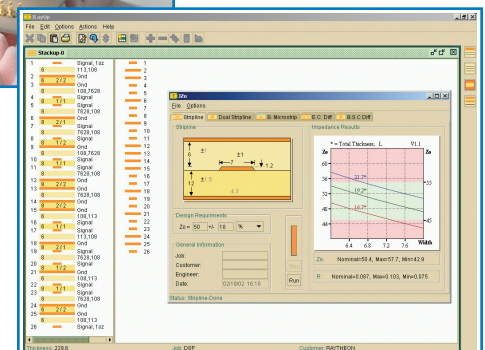
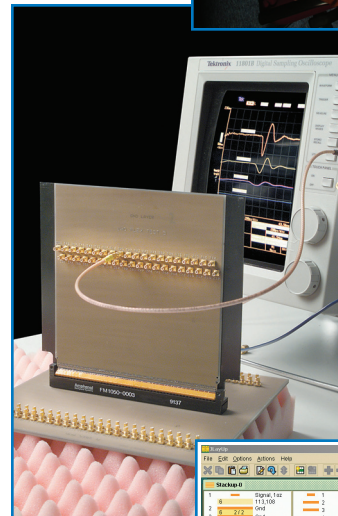
on these factors, Amphenol Integrated Systems is able to meet your program's most challenging packaging requirements. We are an extension of your design team, providing expert design and applications engineering assistance every step of the way to ensure program success. This is a perspective that other connector, board, and backplane assembly suppliers cannot match.

Our engineers evaluate your design for manufacturability and cost-efficiency, suggesting enhancements to meet and exceed your requirements for performance, cost, and reliability. Our expertise is used to optimize your design prior to production.



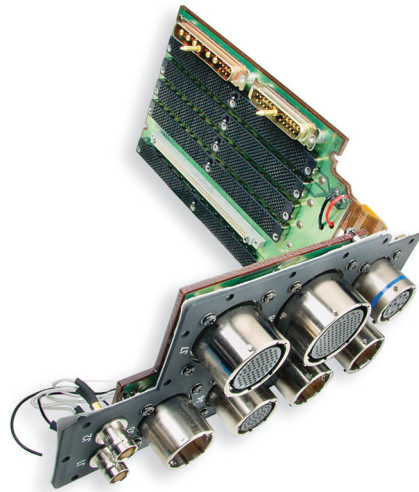
Engineering Capabilities

- Integrated Design Services
- Thermal Analysis
- Concurrent Application Engineering Support
- Connector Selection
- Impedance and Signal Integrity Modeling
- Mechanical Design
- Solid Modeling and CAD Software Tools
- Polar Impedance Modeling & Design
- Risk Analysis
 - Design for Manufacturability and Assembly (DFMA)
 - Design to Cost (DTC)
- PWB Design Rule Check (DRC) software
- PWB Design Services
 - Multiple Software Systems Available
 - PWB Fabrication and Assembly drawings
 - Analysis Reports and Test Specifications
- PWB Design Support
 - Board Materials
 - Impedance/Stack-up modeling
 - Line Widths/Spacing: DFM Optimization
- Innovative Power Solutions
- Metal Plate/Wire-wrap Assembly Conversion to PWB
- Integration of Hybrid Optical Electric backplanes



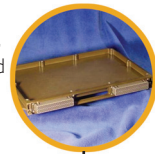
Everything you need inside/outside the box

- **Printed Circuit Boards**
 - Advanced Technology Rigid and Rigid-Flex PCB's
 - Advanced Technology Daughtercards
 - Flex Circuits (Type 1-5)
 - PCB and Flex Circuit Design
- **Interconnect Products**
 - D38999
 - MIL-55302
 - D-Sub and Micro-Miniature
 - SEM
 - RF
 - Digital
 - VME
 - I/O
 - Fiber Optic
 - ARINC
 - Power
 - LVDS
 - High Power/Low Temperature I/O Connectors using Radsok® Technology
- **Backplane Assemblies**
 - Rigid and Rigid-Flex Backplane Assemblies
 - Pressfit
 - Conformal Coating (UR and Parylene)
 - Large Format Surface Mount Capabilities
 - Through-Hole Solder
 - Hybrid Optical Electric
 - Embedded Systems
- **Heatsinks & Metal Enclosures**
- **Value Added Assembly including cabling, bussing, heatsinks, and hardware**
- **Full System Assembly including chassis builds and sub-system integration**
- **Testing**
 - Isolation and Continuity
 - In-Circuit
 - Thermal Cycle
 - Busbar Systems including Radsok® Solutions
 - Custom Flexible and Sculptured Circuit Assemblies
 - Cabling



Metal Machining

Faceplates, enclosures, bus bars, heatsinks and stiffener machining capabilities. Multiple platings available.



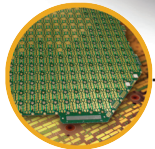
I/O Front Panel Connectors

Rugged, environmentally sealed I/O connectors filtered and non-filtered. Available in a variety of styles and classes, including thread and bayonet coupling as well as special contacts (fiber optic, RF, high-speed).



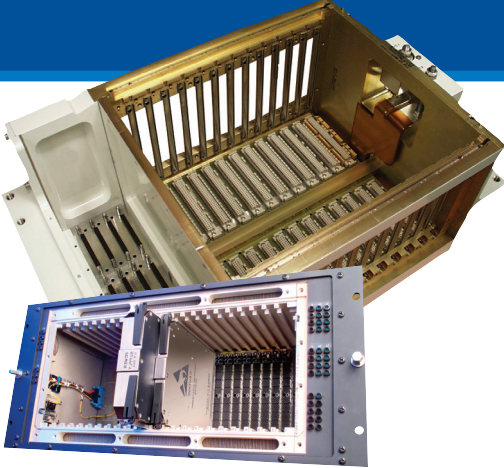
Printed Circuit Boards for Backplanes & Daughtercards

Fabrication capabilities include a wide variety of materials to enable increasing signal speeds, deep microvias, buried, blind and backdrilled vias, sequential lamination, panel sizes from 18" x 24" up to 24" x 54", layer counts to 60+ and board thicknesses up to .500".



Integrated Solutions

Our Enclosure Systems are designed to respond to our customers' performance requirements. We are dedicated to working with our customers in an engineer-to-engineer effort, focused on system development. We provide a full range of design services required to support our customers' applications, applying the breadth of Amphenol products and know-how to meet your requirements. Amphenol's broad offering of products enables our system-level engineering team to take on custom turn-key solutions, such as enclosure integration.



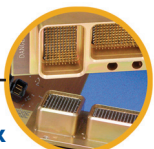
Rigid, Flexible and Rigid-Flex

Rigid-Flex circuit interconnects featuring blind and buried vias, microvias, bookbinder and other cutting-edge technologies including large format panels.



MIL83513 — Micro D

Assembled to flex I/O transition to outside or taking signal off the backplane or CCA.



Blindmate Rack & Panel Connectors: ARINC 600, 404 & 83527

Environmental and non-environmental application rack and panel connectors. Designed per ARINC 600 or ARINC 400 specifications. Single, double, triple, or quad bay insert styles available. Customize insert arrangements to include signal, power coaxial, quadax, and fiber optic contacts. Also available in a filtered interconnect.

Compliant Pin Sealed D-Sub 24308 Style

Standard or high-density available in custom configurations. Through hole or pressfit terminations available EMI filtered.

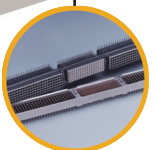


NAFI/UHD

Medium to high-density interconnects with fork and blade contacts — module card connectors with straddle and through hole termination and solderless pressfit backplane connectors for attachment to printed circuit boards. EMI shielding, coax, fiber optic, and power contacts available.

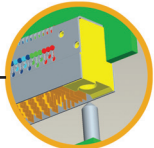
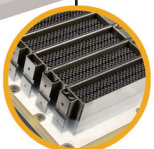
Ruggedized VME 64X

Ruggedized replacement for standard VME connectors. Improved reliability and performance to meet the environmental requirements for avionics packaging.



LRM

Designed to meet the high-density needs of today's integrated electronic modules, this Straddle Mount connector using the Amphenol Bristle Brush Contact (B³) which has been proven in military avionics packages and meets the requirements of MIL-C-55302. The low mating force, extended service life and stable electrical performance of the B³+ contact allows this product to provide the high-level of performance demanded by today's Line Replaceable Module (LRM) applications.



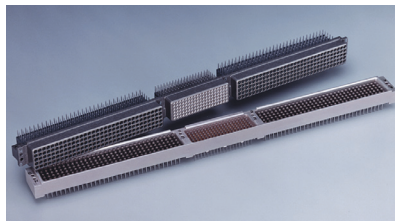
VITA 46/48 (VPX and VPX-REDI) Compliant

High-density, modular; 6+ Gbps, high vibration performance, ESD shielded, VME connectors meeting the specifications for VITA 46 and 48 in 3U and 6U configurations. The wafers and mating contacts (with four points of interface), enhanced power, RF, and fiber optic modules comprise a few of the modular components which can be used in a variety of combinations in COTS and mission critical environments. Developed using proven mechanical and signal integrity technology with unmatched performance in the industry.

Interconnect Products

Amphenol has the world's broadest selection of cylindrical and rectangular connectors that exceed the high reliability and harsh environment requirements for today's mission critical applications. Many of our rectangular connectors offer two-level system maintenance with ESD protection:

- Line Replaceable Module (LRM) Brush Connectors
- Ultra-High Density (UHD) Fork and Blade Connectors
- VITA 46 and 48 Compliant VME Connectors
- Ruggedized VME64x Connectors
- MIL-C-55302/166 thru 172 Low Mating Force Rectangular Connectors
- High Density Brush (HDB3) Connectors
- Ruggedized Rack and Panel Connectors
- MIL-DTL-38999 Series I, II, and III Circular Connectors (Fiber Optic MT Ferrules options)
- MIL-29504 and 28876 Circular Connectors (Fiber Optic Contact)



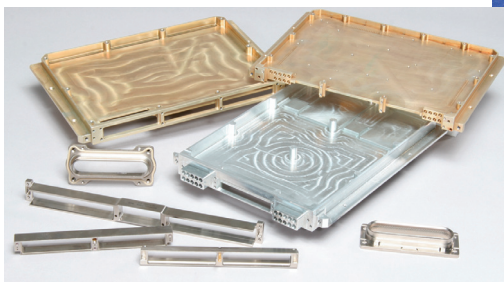
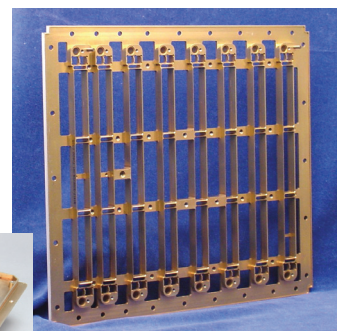
Fiber Optic Products

Amphenol offers fiber optic high performance termini and connector systems within a wide range of cylindrical and rectangular interconnect packaging. Fiber optic connectors and systems provide reliable transfer of data signals for communication systems in many applications. Combined with the proven MIL-DTL-38999 Series III connector, Amphenol offers a multi-channel fiber optic connector system that is unsurpassed. The same fiber termini are incorporated into LRM surface mount rectangular connectors.

Metal Machining Capabilities

Amphenol has extensive experience in manufacturing a wide variety of complex machined components. Our experienced engineering group can design custom heat sinks and enclosures to fit your board or work from your CAD models, assemblies, or step files. Our state-of-the-art twin spindle milling machines with multi-axis control, unique fixturing, and indexing, guarantee true position tolerancing on multiple faces of a machined piece. Other key benefits and features of Amphenol's design and manufacturing operations include:

- Manufacturing studies of geometric dimensioning and tolerancing techniques that can assist in optimizing your design to enhance manufacturability from the initial design phase (DFM)
- Flexibility to handle high or low run quantities.
- Capability to hold very precise positional, size, and profile tolerances.
- Parts can be selectively plated and selectively machined to suit customer requirements.



At Amphenol, your program is assured of success

Amphenol Integrated Systems offers total solutions for military and aerospace programs. Total solutions entail meeting your demands for program management, time-to-market, and reliability with broad connector offerings, advanced printed circuit board technology, custom backplane assemblies, chassis assembly, and test. The Amphenol Integrated Systems team is an extension of your supply chain, providing superior program management, quick turn prototypes and high-technology production volumes cost-effectively, on time, and defect free.

Why do business with us?

Our customer support means customer satisfaction.

Developing close partnerships with our customers allows Amphenol to deliver quality products, on time, in response to your program requirements. Our program management team is focused on your requirements to ensure satisfaction. Our application engineers become an extension of your engineering team, providing support throughout the process from design and product development to manufacturability. And, our worldwide sales coverage is structured and positioned for customer intimacy.

Our investment in technology means more than equipment

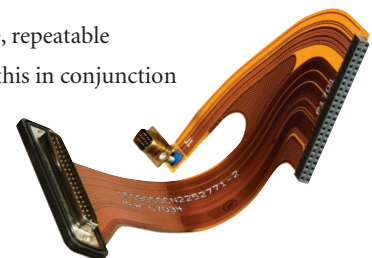
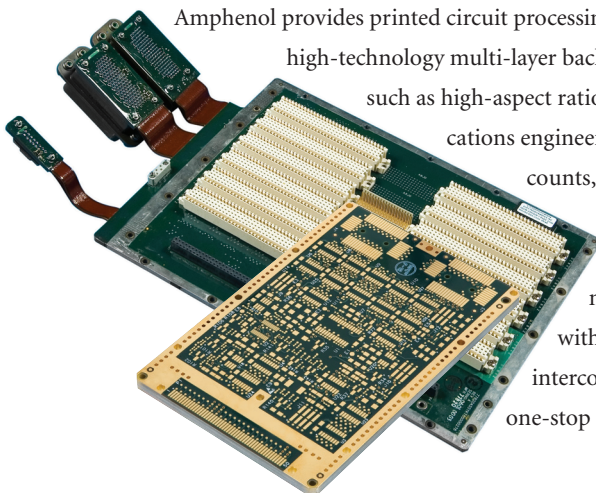
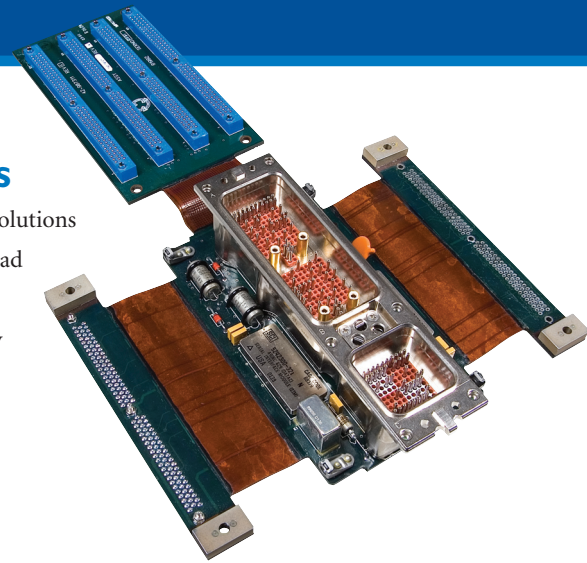
Only Amphenol Integrated Systems combines a wide range of innovative product and process technologies, advanced component manufacturing, and process control with highly focused, customer specific program management and testing at the assembly level. In addition, we provide expert design and unsurpassed applications engineering assistance at every step of the way.

Amphenol Integrated Systems production capabilities are the result of Amphenol's continued investment in state-of-the-art equipment and software. In addition, we focus on process control, as our process engineers work to ensure that we are manufacturing product to your exact requirements to ensure conformance the first time and every time.

Amphenol, your one-stop shop for interconnects, rigid, flexible and rigid-flex printed circuit boards, backplane systems, and chassis assemblies

Amphenol provides printed circuit processing capabilities that are among the world's most advanced, specializing in high-technology multi-layer backplane applications. We offer large panel sizes with high layer counts and features such as high-aspect ratio plating, small diameter plated through-holes, and fine lines and spaces. Our applications engineers assist you through design and manufacturing issues such as board size, layer counts, trace routing, material selection, and power distribution.

Investments at this stage ensure predictable, repeatable manufacturability at reduced costs. We offer this in conjunction with Amphenol's complete breadth of interconnect products, giving our customers a one-stop solution.



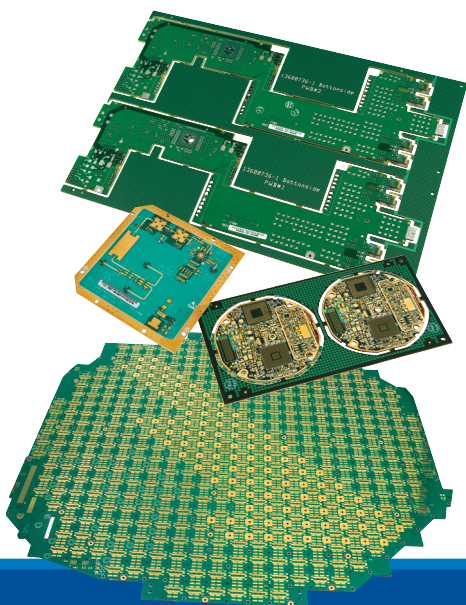
Printed Circuit Board Capabilities

Amphenol Printed Circuits' (APC) capabilities are among the world's broadest and most advanced, delivering consistent quality and reliability for demanding high-bandwidth systems and mission critical applications for more than 25 years. Proven engineering and manufacturing expertise eliminates printed circuit board design obstacles.

APC's North America printed circuit board operation provides tightly controlled processes for prototype through production printed circuit board volumes. The 214,000 square foot New Hampshire facility features state-of-the-art PCB manufacturing equipment and optimized material handling to ensure the highest quality and consistency.



DESIGN FORMATS	Mentor PADS	Cadence Zuken	
MANUFACTURING FORMATS	ODB++ (preferred) DXF Gerber 274X	Autoplot Excellon HPGL	DPF Gerber 274D IPC-D-356
MAXIMUM PANEL SIZE	24" x 54" (609.5mm x 1371.5mm) 30" x 44" (762.0mm x 1117.5mm) 36" x 42" (914.4mm x 1066.8mm)		
MAXIMUM PANEL THICKNESS	.500" (12.7mm)		
LAYER COUNT	Up to 64		
INTERCONNECT FORMATION TYPES	Back Drilled Dual Diameter Thru Hole*	Blind (laser& mechanical)* Electrically Isolated	Buried SMT
	*with conductive and non-conductive via fill		
ASPECT RATIO - DRILLED SIZE	Compliant Holes > = 0.225 Via Holes < .022	17:1 13:1	
FINISHED HOLE SIZE	Compliant Pinned Via (A/R dependent) Buried Vias Microvias (up to 3 electrical layers)	0.018" (0.457mm) 0.008" (0.203mm) 0.006" (0.152mm) 0.004" (0.101mm)	
BLIND VIA ASPECT RATIO	1.25:1		
INTERNAL FEATURES	Lines Spacing Buried Resistors Buried Capacitance Minimum Core Thickness	0.003" (0.0762mm) 0.003" (0.0762mm) No No 0.001" (0.0254mm)	.5 oz. copper .5 oz. copper
EXTERNAL FEATURES	Lines Spacing	0.004" (0.1016mm) 0.004" (0.1016mm)	.5 oz. copper .5 oz. copper
MATERIALS	Low Tg FR4 (including phenolic cure) Getek Nelco 4000-13 & Nelco 4000-13 SI Rogers 4350/FR4 Taconic BT	High Tg FR4 (including phenolic cure) Isola IS620 & Isola FR408 Rogers 4350 Gore Polyimide Cyanate Ester	
	Please contact Applications Engineering for the availability of additional materials		
COPPER PROCESSING	1/4 oz. - 10 oz. copper (U/L 7 oz.)		
IMPEDANCE SINGLE & DIFFERENTIAL	± 10% ± 7.5% ± 5.0%		
SURFACE FINISHES	Electrolytic Ni/Au HASL Immersion Tin Reflowed Tin/Lead	ENIG Immersion Silver OSP-Entek 106	
CERTIFICATIONS	IPC-A-600 Class I, II, and III ISO 9001:2000 ITAR Registration MIL-PRF-31032/2a	IPC-6012 Class I, II, and III ISO 14001:1996 MIL-PRF-31032/1b MIL-P-55110	



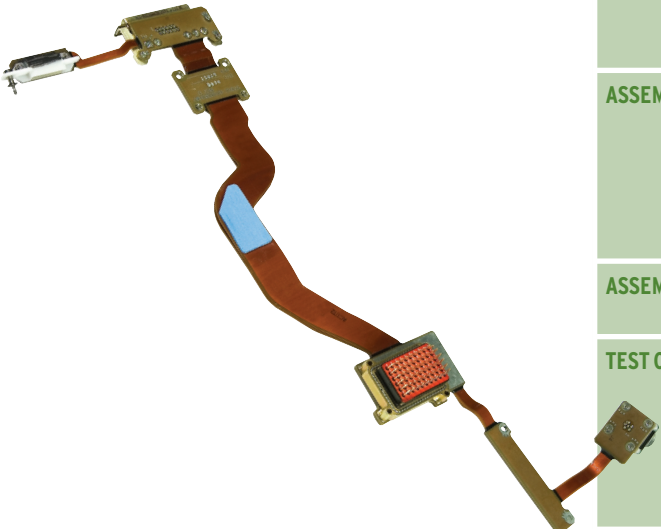
Flexible and Rigid-Flex Printed Circuit Board Capabilities



APC is one of the industry's leading manufacturers of flexible and rigid-flex circuit interconnects. For more than 30 years, APC has been providing quick turn prototypes from initial concept through full rate production with cutting-edge technologies including interconnects with blind and buried vias, microvias, and bookbinder.

Our assembly centers of excellence, located in Nashua, New Hampshire and Nogales, Mexico are fully ITAR qualified, providing competitive value-added services including SMT, wave and manual through-hole assembly as well as many other electro-mechanical solutions.

APC works closely with our customers to understand their true system requirements. This allows us to deliver the most cost-effective interconnect solutions with up-front engineering and consistent manufacturing techniques. From functional testing and turn-key assembly, APC's commitment to our customers success is what sets us apart in the industry.



DESIGN FORMATS	DXF Gerber	IGES Pads
PANEL SIZE	12" x 18" 18" x 24" 24" x 24" 24" x 36"	
PANEL THICKNESS	.003" - .225"	
LAYER COUNT	1-30+	
INTERCONNECT FORMATION TYPES	Thru Hole Buried Blind	SMT Filled Via's Dual Diameter
FINISHED HOLE SIZE	Compliant Pinned (rigid zone only) Via (A/R dependent) Buried Vias Microvias (up to 3 electrical layers)	0.018" (0.457mm) 0.008" (0.203mm) 0.006" (0.152mm) 0.004" - .006" (0.101mm)
BLIND VIA ASPECT RATIO	1.25:1	
INTERNAL FEATURES (COPPER WEIGHT DEPENDENT)	Trace Spacing	0.003" (0.0762mm) 0.003" (0.0762mm)
MATERIALS	Polyimide - Standard Acrylic Polyimide - FR Polyimide - AP Polyimide - GI	Silver Epoxy Shielding Copper Epoxy Shielding Soldermask FR-4/ -24, 26 and 28
COPPER PROCESSING	1/4 oz. - .400"	
IMPEDANCE SINGLE & DIFFERENTIAL	± 10% ± 7%	
SURFACE FINISHES	HASL Reflowed Tin/Lead OSP-Entek 106 ENIG	Immersion Tin Immersion Silver Bright Tin Ni/Au
ASSEMBLY CAPABILITIES	Full Turn-Key Thru-Hole - Wave & Manual SMT - Pick & Place Wire-Bond Crimp RoHS Compliance	
ASSEMBLY FINISHING	Conformal Coat - UR, Acrylic, Parylene, Fluoropoly Glop Top	
TEST CAPABILITIES	Overmolding Impedance Testing Hi-Pot Up To 5,000 VDC 2,000+ Points Per Circuit Insulation Resistance up to 1,000 VDC Four Wire Kelvin .001Ωto 1Ω	Bed of Nails Flying Probe Flex Cycling Environmental Functional Test
CERTIFICATIONS	IPC-6013 Class I, II, and III; Types 1-5 Mil-P-50884 Types 1-5 ITAR Registered AS9100 Certification	IPC-610 UL P4VO ISO 9001:2000

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Amphenol

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ABS-001-0407-1K