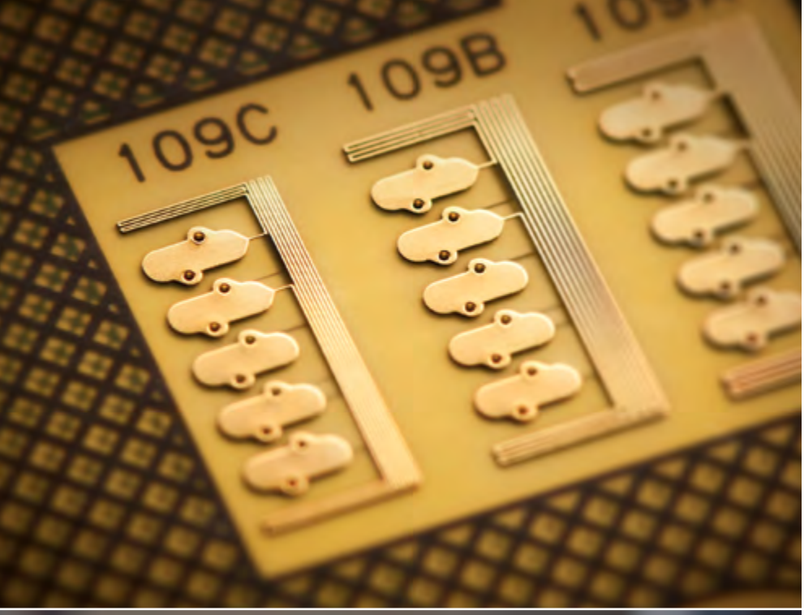
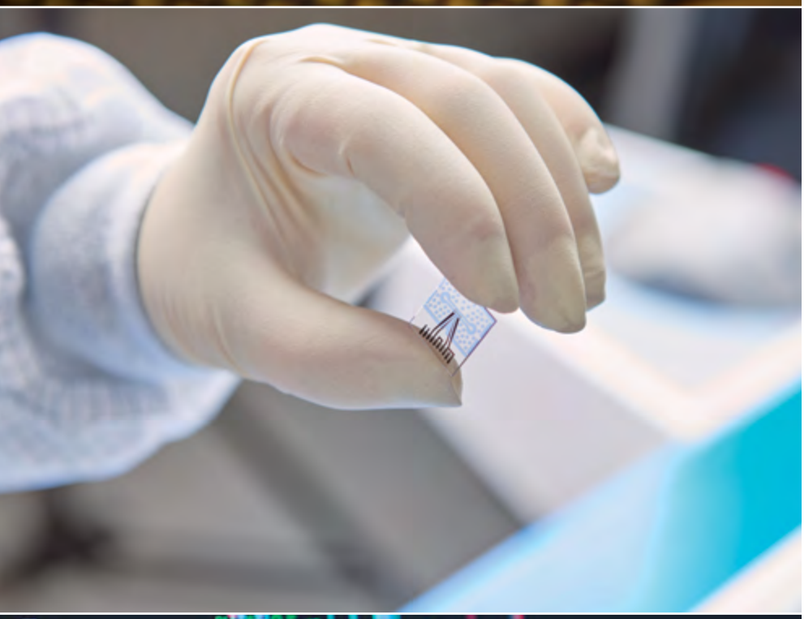
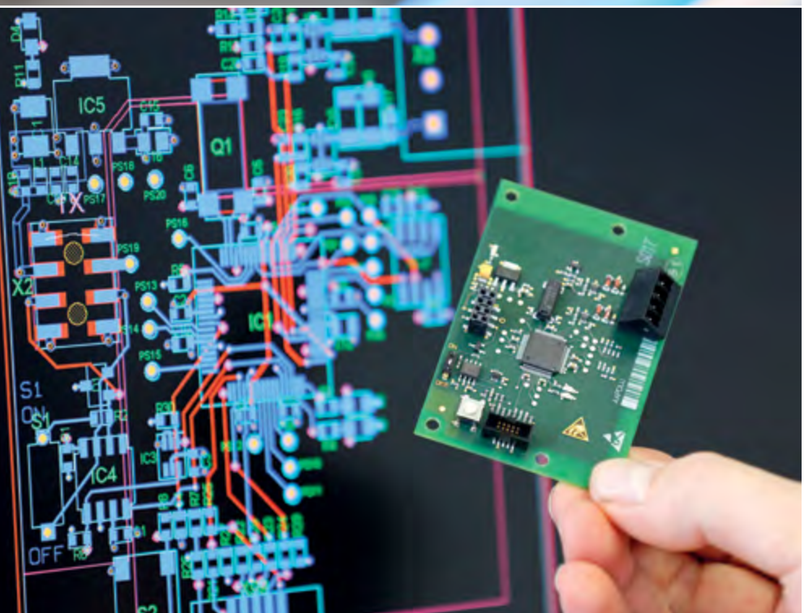
cicor

Your technology partner

From design to finished product







Innovative technology solutions for electronics

cicor

Founded in 1966 in Lausanne (Switzerland) under the name Cicorel SA, today's Cicor Group is a solutions provider with worldwide operations and a globally unique portfolio of services and technologies. With about 2000 employees at ten production sites, the Cicor Group offers highly complex printed circuit boards and hybrid circuits as well as comprehensive electronic manufacturing services (EMS) including microelectronic assembly and plastic injection molding. Cicor supplies customized products and services from design to finished product from one source.

The latest discoveries combined with many years of experience, state-of-the art technologies together with exceptional expertise make Cicor a dependable and innovate partner in the development and production of compelling electronics solutions.

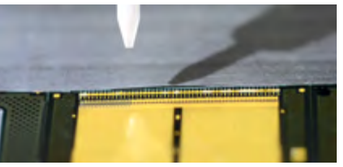
A global partner

Printed circuit boards (PCBs)

The Cicor site in Boudry (Switzerland) is a PCB manufacturer specialized in sophisticated applications and miniaturized circuits in all three dimensions. The site develops and produces high-quality rigid, rigid-flexible and flexible PCBs, focusing on high- and ultra-high density interconnects.

Hybrid circuits

With its sites in Radeberg (Germany), Ulm (Germany) and Wangs (Switzerland), Cicor is a leading manufacturer of high-quality thin- and thick-film substrates. Thick-film technology is a sophisticated technology for the production of wiring supports that has been used for decades. Thin-film technology is used in cases where cheaper technologies cannot provide an adequate technical solution.



Printed electronics

The Cicor site in Bronschhofen (Switzerland) offers printed electronics with a unique printing technology which enables a wide range of conductive, non-conductive and biocompatible materials to be printed on a wide range of substrates and forms. In addition, new opportunities exist for interconnect technologies that can lead to performance improvements and cost optimization.

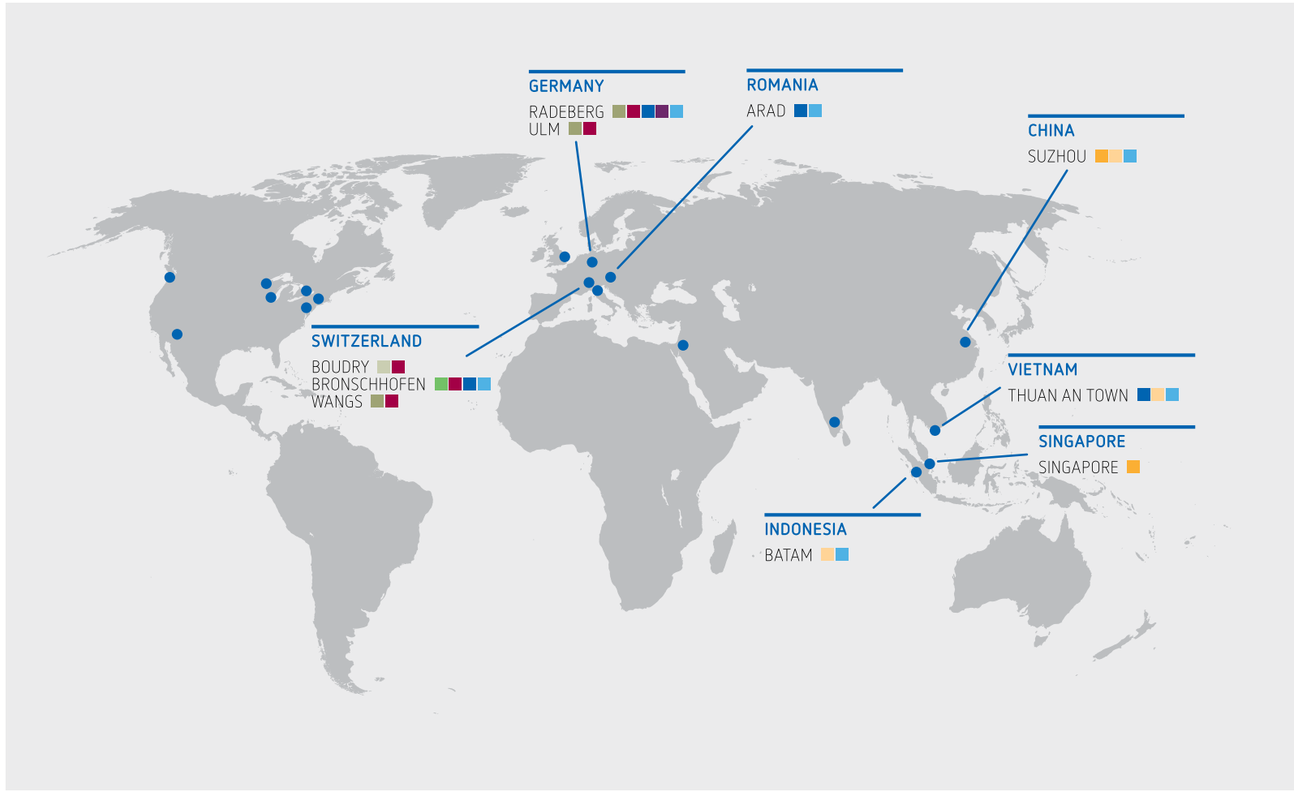
Electronic manufacturing services (EMS)

The production sites in Bronschhofen (Switzerland), Arad (Romania), Radeberg (Germany), Singapore (Singapore), Suzhou (China), Batam (Indonesia) and Thuan An Town (Vietnam) are service providers in hardware and software development, as well as manufacturing of electronic components, devices and systems. With a wide range of production options in printed circuit board assembly, microelectronic assembly in box building and system assembly, control cabinet construction as well as cable assembly, tool design and fabrication and plastic injection molding, Cicor offers outsourcing solutions from the idea to finished product.

Cicor sales offices and representatives

The keys to success for Cicor are its global positioning and proximity to its customers. With a range of sales offices and representatives in the focus countries, Cicor ensures a consistently high level of service quality throughout the entire product life cycle.

cicor



- Printed circuit boards
- Hybrid circuits
- Printed electronics
- Engineering

Electronic manufacturing services (EMS)
- PCB assembly
- Microelectronic assembly
- Tool design and fabrication
- Plastic injection molding
- Box building and system assembly

- Cicor sales offices and representatives

Cicor supplies customized products and services from design to the finished product from one source.

Markets and applications

Medical
In medical technology, technological advances are constantly broadening the range of new, fascinating opportunities for the development and manufacture of electronic devices. In the medical field especially, the use of new technologies leads to convincing solutions for intelligent implants, lung respiratory devices, bio-compatible sensors and miniature hearing aids. New technologies make it possible for increasingly complex devices to combine more and more functions in less and less space.

Industrial
In industrial technology, electronics can deliver a number of applications for use in building safety, access control systems, building controls and sanitary installations. In the energy sector, electronic control systems ensure optimal energy supply and maximum safety. Sensors are used in monitoring and safety systems, in process controls, in industrial automation and in scientific facilities.

Aerospace and defence
In the aerospace and defence sector, the electronics industry is creating solutions for power supply, navigation, control and cabin accessories, ranging from lightweight and complex products to virtually indestructible solutions. Based on the highest testing and production standards, Cicor continuously demonstrates the precision of the manufacturing processes and ensures traceability of the products throughout the supply chain.

Communication
Design and lifestyle aspects play their part in communication technology. In everyday life, computerized traffic management systems help to guide the steadily rising number of vehicles on our roads. Intelligent sensors assist us in our cars and smart living with networked household devices, home automation or multimedia systems enhances comfort and safety.

Automotive and transport
In automotive and transport technology, active safety systems help to prevent accidents. Driver fatigue recognition, lane departure warning systems, parking aids, intelligent headlamp control systems and anticipatory pedestrian protection are concepts that have long become reality. Technological advances are constantly broadening the range of new, fascinating opportunities for the development and manufacture of such electronic systems.

Watches and consumer
In the watches and consumer industry, many devices have become everyday assistants in modern life. Wearable electronics such as smartwatches, data glasses, headphones or smart clothing have become reality and are part of everyday life. Progress in the field of miniaturization is a major driver of new developments.

Hearing aids
As a global outsourcing partner, the Cicor Group is responsible for the production of many electronic and plastic components for the hearing aid industry. As a long-standing partner, Cicor offers one-stop development services, superior PCBs, electronics assembly, toolmaking as well as plastic injection molding and box building.

Satellite communication
The Cicor Group substrate production sites comply with the highest quality and reliability requirements of the aerospace market and ensure traceability. Cicor continuously demonstrates the precision of its manufacturing processes and ensures traceability of its products throughout the supply chain.

Intraocular pressure sensor
The Cicor Group develops and produces for a customer a flexible antenna coil (flexible thin-film substrate based on polyimide) for an implantable intraocular pressure sensor.

Lung respiratory devices
The Cicor Group meets the high requirements for the development and production of electronic medical devices and systems. As an EMS partner, Cicor develops functional safe control systems for jet ventilation lung respiratory devices. Maximum reliability, system stability and functional safety are absolute essentials.

Passenger information systems
As an electronics manufacturer, Cicor is responsible for the production of components and electronic devices for operations control systems in use around the world. As an EMS partner, Cicor carries out complete device and system assembly, box building, including specific tests and after-sales services.

Control systems
As an EMS partner, Cicor develops and produces control systems for temperature control units. Cicor developed a modular control system that can be used in any type of device. The solution is designed as a high-grade distributed system – a group of autonomous controllers that are presented to the user as a single system.

Products and services

Printed circuit boards (PCBs)

Printed electronics

Printed circuit boards (PCBs)

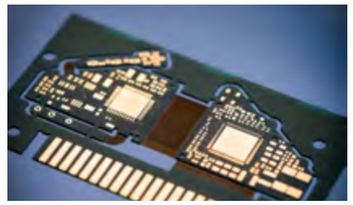
For over 50 years, Cicor has been developing and producing sophisticated flexible, rigid-flexible and rigid printed circuit boards (PCBs), from the idea, through prototypes, to large-series production. Thanks to a comprehensive expertise in multilayer boards (MLBs), multi-chip modules (MCMs) and high-density interconnects (HDIs) Cicor develops innovative and reliable solutions for demanding applications in medical, aerospace and defence, automotive and transport, communication, industrial, watches and consumer markets.

Thin materials and line width and spacing down to 25 µm enable extreme miniaturization and ultra-HDI advanced solutions. The new DenciTec® technology opens up completely new possibilities. Innovative circuits can be produced by combining PCB processes with thin-film technology.

Printed electronics

Cicor's unique printing technology enables the printing of a wide range of conductive, non-conductive and biocompatible materials on a wide variety of substrates and forms. In addition, new opportunities exist for interconnect technologies that can lead to performance improvements and cost optimization.

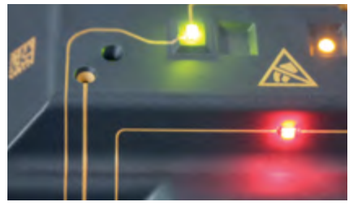
Flexible PCB
Flexible printed circuit boards (FPC) offer the highest level of 3D miniaturization. Very low bending radii in combination with Ultra-HDI (ultra-high density interconnect) make it possible to build increasingly smaller and highly integrated devices. Cicor has been a market leader in this field for many years and manufactures flex circuits with a layer count of 1 to 8.



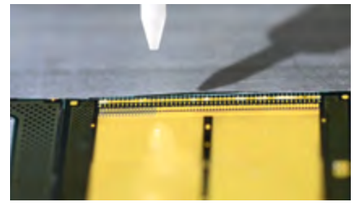
Rigid-flexible PCB
Combining the advantages of both rigid and flexible PCBs in one circuit board offers several benefits, including reducing the size of assemblies and enabling 3-dimensional installation of assembled PCBs. Using this technology is improving signal integrity and reliability, especially in environments where vibration, acceleration and other severe conditions are involved.

Rigid PCB
Rigid PCBs are available in many different varieties, differentiated by the number of layers, base materials used, construction methods, interconnection schemes as well as areas of use. Cicor offers rigid PCB with 1-20 layers with a clear focus on miniaturization in x, y and z axis.

DenciTec®
DenciTec® enables further miniaturization. Capabilities include line widths and spacings down to 25 µm with copper thickness of 20 +/- 5 µm on all conductive layers, laser-via diameters of 30 µm, annular rings with a diameter of 30 µm for the inner layers and 20 µm for the outer layers, copper-filled blind vias with the option of via stacking and vias-in-pads.



3D-MID
3D-MID (3-dimensional molded interconnect devices) technology makes it possible to integrate mechanical and electronic functions within one component in the smallest of spaces. The electronic circuit is integrated into the casing, significantly enhancing the compact design and functional density. Injection-molded circuit boards enable the process stages, assembly times and number of components to be reduced.



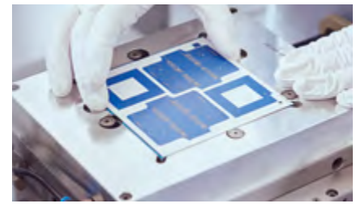
Printed electronics
The integration of the circuits into three-dimensional surfaces often eliminates the need to use an additional substrate. This efficient printing process allows lines and spacing up to 10 µm and a print density from <100 nm up to tenths of µm.

Hybrid circuits

Thin-film substrates are used where conventional PCB technologies cannot provide an adequate technical solution. Rigid and flexible multilayer circuits with highest resolution (10 µm) are possible. Thin-film technology uses semiconductor and microsystem technologies to produce circuit carriers on ceramic or organic materials. Interconnection carriers (substrates) in thin-film technology enable extreme connection densities, high-precision geometries of conductors and insulator materials and high thermal conductivity, while offering maximum reliability. Thin-film technology is impressive in terms of the usability, for example, of ceramic or quartz glass as a substrate material, and the high structural fidelity that can be achieved with tolerances up to ± 2 µm for the track width. Cable lines in thick-film technology are installed in the screen printing process and then burned in. The use of ceramic as a substrate ensures maximum reliability even under the hardest environmental conditions. A thick-film circuit is far better than a standard printed circuit board in terms of temperature resistance and life cycle.

Rigid thin-film substrates
For decades, thin-film substrates based on rigid substrate materials have been produced and used for applications such as space travel, radar technology and sensor systems. In addition to the standard material Al_2O_3, which is available in various grades, aluminum nitride is also becoming increasingly more common, particularly in applications requiring increased thermal conductivity. Circuits are also produced on ferrite material or even glass, for example, which can be adapted to a wide variety of applications.

Flexible thin-film substrates
In the field of flexible thin-film substrates, the technologies and processes used for manufacturing circuits are the same as those used for rigid substrates. However, the emphasis here is on the use of organic materials, which are either processed from the liquid phase as insulators (or substrates) or which may already be present as film material.
In this area, various forms of polyimide or LCP (liquid crystalline polymer) are primarily used as substrate material. When it comes to flexible substrates, the range of material thickness extends from a few micrometers up to several 100 µm, for example in LCP-based multilayer circuits.



Thick-film substrates
Thick-film technology is a highly sophisticated technology for the production of wiring supports that has been in use for decades. Cable lines are installed in the screen printing process and then burned in. The use of ceramic as a substrate ensures maximum reliability even under the hardest environmental conditions.
The main advantages of this technology include the use of ceramic as substrates with excellent heat conduction properties and the realization of printed resistors over a wide spectrum (mOhm to GOhm) with the possibility of producing any value using laser alignment. The option of active calibration of thick-film resistors after component assembly is also useful.

Products and services

Electronic manufacturing services (EMS)

The Cicor Group is an international electronics service provider with a wide range of products and services in the fields of printed circuit board assembly, box building and system assembly, control cabinet construction, cable assembly, tool design and fabrication as well as plastic injection molding.

Cicor offers outsourcing solutions for the development and manufacture of electronic assemblies and complete devices and systems.

As a globally active company with EMS production sites in Switzerland, Germany, Romania and Asia (Singapore, Vietnam, Indonesia, China), the Group exploits synergies and offers solutions based on many years of know-how.

Engineering services
Cicor develops innovative electronics and associated software for customers and supports from the idea to the finished product. Target-costing, design-for-manufacturing, design-for-testability and design-for-traceability are practically implemented in daily work. Product-specific test systems, from in-circuit test to complex functional test systems, are developed and produced in-house.

Printed circuit board assembly
Cicor produces customer-specific electronic modules efficiently and in the highest quality. This covers the entire spectrum from small to large series. Thanks to the global production set-up with locations in Bronschhofen (Switzerland), Arad (Romania) and Anam (Vietnam), Cicor offers cost-effective structures that can be tailored to the customer's needs.

Microelectronic assembly
The Cicor Group offers an extensive portfolio of assembly and interconnection technology for the manufacture of microelectronic modules and assemblies. Several production lines are available for fully automatic and semi-automated processes. The main focuses of the assembly technologies are SMD mounting, chip assembly, wire bonding, encapsulation, screening and testing.

Tool design and fabrication
Cicor specializes in producing precision injection molds made from steel that comply with the highest quality requirements and ensure flawless production with a high capacity throughout the entire product life cycle. Engineers use cutting-edge software to convert even the most complex product designs into precision plastic parts. The sophisticated mold designs comply with the most demanding of customer requirements.

Plastic injection molding
The Cicor Group designs and manufactures high-quality, precision plastic injection molding and offers plastic injection molding with vertically integrated secondary processes as well as the assembly of complete products. The portfolio includes 2K injection molding, insert molding, thin-wall molding/precision molding and micro molding plastic parts of 2 mm diameter with microstructure.

Box building and system assembly
The Cicor Group offers services up to and including the assembly of complex devices and systems. Cicor already supports customers in the idea and development of products suitable for production to ensure the most cost-effective production possible. With complete traceability through the verified quality management system, delivery quality is ensured at the highest level.

Production sites

Arad, Romania

The Cicor site in Arad (S.C. Systronics S.R.L.) offers manufacturing services for electronic products of consistently high-quality. The site supports its clients starting in the planning stage, guaranteeing the ideal outsourcing solution, tailored to the client's specific needs. As an EMS partner over the entire product life cycle, from product development through series production to after-sales-service. The EMS site in Romania offers complete outsourcing solutions for the manufacturing of electronic component assemblies as well as complete devices and systems.

Batam, Indonesia

The Cicor site in Batam (PT Cicor Panatec) is a high grade manufacturer of plastic injection molding with clean-room assembly services for medical products. The site is strategically located in Batam, which is just one hour away from the Cicor site in Singapore. In combination with Singapore the site offers engineering, plastic injection molding, vertically integrated secondary processes and assembly services. The production site has state-of-the-art manufacturing facilities and total 1'200 m^2 clean rooms (ISO class 7) for injection molding, assembly and packaging. The clean rooms are validated for RTU (ready-to-use) medical applications.

Boudry, Switzerland

The Cicor site in Boudry (Cicorel SA, founded in 1966) is a manufacturer of high-end printed circuit boards, specializing in circuit miniaturization and highly demanding applications. The site develops and produces sophisticated rigid, rigid- flexible and flexible printed circuit boards (PCB) and has comprehensive expertise in multilayer boards (MLB) and high-density and ultra-high-density interconnects (HDI and uHDI). The site in Boudry is working closely with its customers in the medical, aerospace and defence, automotive, communication, industrial and watches and consumer industries.

Bronschhofen, Switzerland

The Cicor site in Bronschhofen (Swisstronics Contract Manufacturing AG) offers complete outsourcing solutions for the development and production of electronic assemblies as well as complete devices and systems. Cicor develops and produces small and medium-sized series of electronic assemblies and systems using state-of-the-art equipment at its Bronschhofen site. The site has extensive expertise in medical technology. In the newly created, protected assembly area of ISO class 8, medical devices with increased demands on the assembly environment are manufactured.

Radeberg, Germany

The Cicor site in Radeberg (RHe Microsystems GmbH) is specialized in the production of complex substrates in thick-film technology as well as microelectronic assembly on ceramics or PCBs. Its core industries are aerospace and defence, medical and demanding industrial applications. The site's range of services includes development support, prototype construction, serial production and industry-specific product qualifications. The testing stations for functional tests in series production are developed and set up internally.

Products & services

Electronic manufacturing services (EMS)
- Printed circuit board assembly
- Test engineering
- Box building and system assembly

Electronic manufacturing services (EMS)
- Plastic injection molding
- Box building and system assembly

Printed circuit boards
- Engineering
- Rigid PCB
- Flexible PCB
- Rigid-flexible PCB
- DenciTec®

Electronic manufacturing services (EMS)
- Engineering
- Printed circuit board assembly
- Box building and system assembly
- Test engineering

Printed electronics

Hybrid circuits
- Engineering
- Thick-film substrates

Electronic manufacturing services (EMS)
- Engineering
- Microelectronic assembly

Certifications

- ISO 9001
- ISO 14001
- OHSAS 18001/ISO 45001
- IATF 16949

- ISO 9001
- ISO 13485
- ISO 14001
- ISO 14644
- ISO 17025
- OHSAS 18001/ ISO 45001

- IATF 16949
- GMP certified
- FDA-registered
- UL-registered

- ISO 9001
- ISO 14001
- OHSAS 18001/ISO 45001

- ISO 9001
- ISO 13485
- ISO 14001
- ISO 15378
- MFi partner
- FDA-registered
- UL-registered

- ISO 9001
- ISO 13485
- KTA 1401
- EN 9100

Production sites

Singapore, Singapore

The Cicor site in Singapore (Cicor Ecotool Pte Ltd) designs high-quality precision plastic injection molds. Cicor Singapore has more than 30 years of experience in the production of technically complex molds and plastic parts with superior technical and engineering expertise. The production site sits alongside Cicor Asia Pte Ltd, the Sales arm of Cicor in Asia, providing product & project management including new product introduction.

Suzhou, China

The Cicor site in Suzhou (Suzhou Cicor Technology Co. Ltd) offers tool design and fabrication and plastic injection molding. Suzhou is located in the SND-EPZ Sub-Industrial Park, 18 km from Suzhou City and 100 km from Shanghai's port. Equipped with the latest state-of-the-art equipment, toolmaking and machinery designed to produce customer-specific products. The production site has extensive expertise in 3D-MID (Molded Interconnect Devices) manufacturing.

Thuan An Town, Vietnam

The Cicor site in Thuan An Town (Cicor Anam Ltd.) offers printed circuit boards assembly, box building and system assembly, including plastic injection molding services. The site is located 20 km from Ho Chi Minh City (Saigon) in the Vietnam - Singapore Industrial Park and hosts the latest, state-of-the-art machinery for printed circuit board assembly (PCBA). The production site is serving customers in a variety of sectors, including the medical, industrial, automotive and consumer industries. The site complies with the RoHS directive.

Ulm, Germany

The Cicor site in Ulm (Reinhardt Microtech GmbH) specializes in the production of rigid and flexible substrates in thin-film technology and has extensive development expertise in this field. The production takes place in the clean room using microelectronic manufacturing processes such as lithography, sputtering, etching, electroplating and mechanical processing. The production and processes are designed for maximum flexibility in order to meet special requirements for substrate materials and process combinations. The site offers thin-film substrates (Al2O3, AlN, LCP, polyimide, ferrite, glass) in prototype and volume production.

Wangs, Switzerland

The Cicor site in Wangs (Reinhardt Microtech AG) specializes in the production of rigid and flexible substrates in thin-film technology and has extensive manufacturing expertise in this field. The production takes place in the clean room using microelectronic manufacturing processes such as lithography, sputtering, evaporation, etching, electroplating and passive balancing of resistances. Further machining operations are laser drilling of holes, minimum 60 µm, laser cutting of contours and sawing as separation step from multiple use to chip. The production and processes are designed for maximum flexibility in order to meet special requirements for substrate materials and process combinations.

Products & services

Electronic manufacturing services (EMS)
- Tool design and fabrication

Electronic manufacturing services (EMS)
- Tool design and fabrication
- Plastic injection molding
- 3D-MID

Electronic manufacturing services (EMS)
- Printed circuit board assembly
- Plastic injection molding
- Box building and system assembly

Hybrid circuits
- Engineering
- Rigid thin-film substrates
- Flexible thin-film substrates

Hybrid circuits
- Engineering
- Rigid thin-film substrates
- Flexible thin-film substrates

Certifications

- ISO 9001
- ISO 14001
- IATF 16949

- ISO 9001
- ISO 13485
- IATF 16949
- UL-registered

- ISO 9001
- ISO 13485
- ISO 14001

- ISO 9001

- ISO 9001
- EN 9100

Quality management

By consistently focusing on the requirements of its customers and comply within internationally recognized standards, the Cicor Group ensures that customers receive the most reliable and high-precision products possible.

The Cicor Group quality data management system goes far beyond statutory requirements and has an incredible range of functions. These are configured in line with specific customer requirements, ensuring seamless transparency in all production and after-sales processes across all sites.

All Cicor sites are audited at regular intervals, with processes constantly being reviewed and analyzed.

To see a current overview of all certificate, please go to www.cicor.com.

ISO 9001
Quality management system

ISO 13485
Quality management system for medical products

ISO 14001
Environmental management system

ISO 14644
Cleanroom class 7

ISO 15378
Primary packaging materials for medicinal products

ISO 17025
Quality management system for testing and calibration laboratories

EN 9100
Quality management system for the aerospace industry

KTA 1401
Quality assurance in nuclear power plants

OHSAS 18001/ISO 45001
Occupational health and safety management system

AQAP 2110
NATO quality assurance requirements for design, development and production

FDA
Registered contract manufacturer standard 21CFR820

MFi
Partner in the Made for iPhone, iPod and iPad program

IATF 16949
Quality management system for the automotive industry

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Printed circuit boards

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