

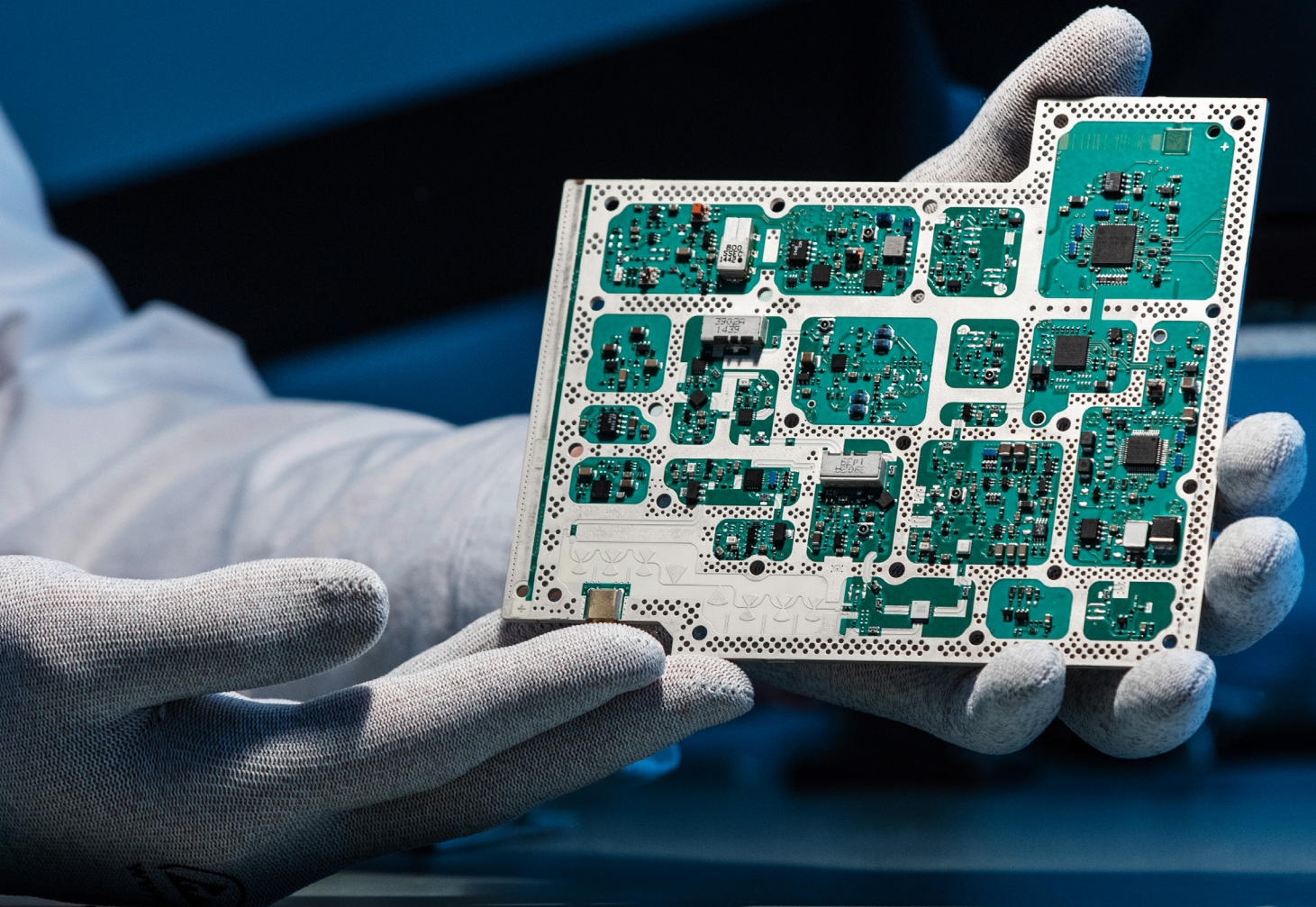
ROHDE & SCHWARZ

Make ideas real



YOUR QUALITY IN SAFE HANDS

Electronics Manufacturing Services
from a world-leading RF specialist



SEE ROHDE & SCHWARZ IN A NEW LIGHT. AS THE MANU- FACTURER OF YOUR PRODUCTS.

Rohde&Schwarz is well-known throughout the world as a manufacturer of quality Test & Measurement equipment. But our Memmingen plant has something more to offer: comprehensive support for anyone who manufactures their own electronics products.

Particularly for organizations in aerospace & defence, in broadcast & media, in environmental technologies and in medical engineering, we offer an ideal setup for smooth and efficient contract manufacturing.

Besides taking care of the actual manufacture of your products, we can provide support wherever you need across every phase in the process – from the initial idea to product delivery, including product development, component procurement and fulfillment.

In other words, we offer optimum support for organizations producing high-quality electronics aimed at demanding markets.

Find out more about our product program – we can implement your ideas efficiently and effectively using our broad EMS portfolio.



OUR PORTFOLIO



DEVELOPMENT



BOARD PRODUCTION AND CONFORMAL COATING



INSTRUMENT ASSEMBLY AND SYSTEM INTEGRATION



PROCUREMENT AND LOGISTICS



TESTING



MICROELECTRONICS



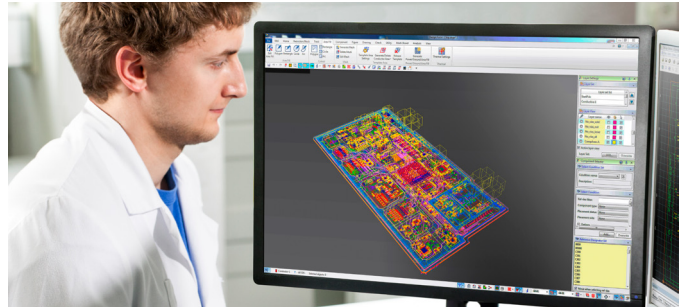
SERVICES

DEVELOPMENT

We support you in the implementation and industrialization of your product idea. Based on your requirements, we develop customized solutions in all phases of the product development cycle. From proof of concept to series production, you profit from the expertise and experience of our specialists. This of course also includes the verification of design and development outputs with respect to compliance with the relevant standards (e.g. CE) as well as environmental testing.

LAYOUT

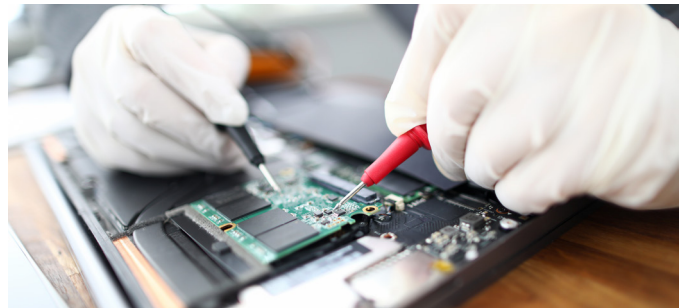
- ▶ EMC-compliant printed board design
- ▶ High-speed design up to 10 Gbit/s
- ▶ Radio frequency designs up to 80 GHz
- ▶ HDI and rigid-flex printed boards
- ▶ Routing of high-current lines on printed boards up to 60 A



OBSOLESCENCE MANAGEMENT

All boards and instruments we develop or manufacture for you are automatically subject to our internal obsolescence management.

In addition to researching substitute or replacement parts, our proactive obsolescence management program can also assess the future availability of components.



DFM / DFT / NPI

- ▶ Optimization of hardware and software concerning manufacturing and test costs
- ▶ Rapid prototyping for early evaluation of designs and functions
- ▶ Production introduction and ramp-up of the products by experienced engineers



EMV ADVICE

- ▶ Our specialists provide you with advice on EMC during the design of printed boards and systems
- ▶ Precompliance measurements in our in-house test chambers and open area test sites allow us to check the effect of modifications



PROCUREMENT AND LOGISTICS

You will fully benefit from our leading market position in the EMS section. More than 60,000 active items with properly qualified suppliers are the basis for short component delivery times. We send your finished products anywhere in the world at any time, clarifying all necessary points.

GLOBAL PROCUREMENT

The best possible prices are essential for your market success. We safeguard your success by means of strategic, worldwide sourcing via our subsidiaries.



SUPPLIER MANAGEMENT

In cooperation with qualified and audited partners, we offer outstanding material availability, delivery reliability and quality at competitive prices.



LOGISTICS SYSTEMS

- ▶ Demand-oriented, inventory-optimized warehousing to ensure availability
- ▶ Just-in-time delivery
- ▶ Vendor-managed inventory



GLOBAL SHIPPING

- ▶ From standard packaging to customer-specific returnable packaging – we find the optimum solution for your product
- ▶ Regional, national or international: you tell us where to deliver and we take care of the rest

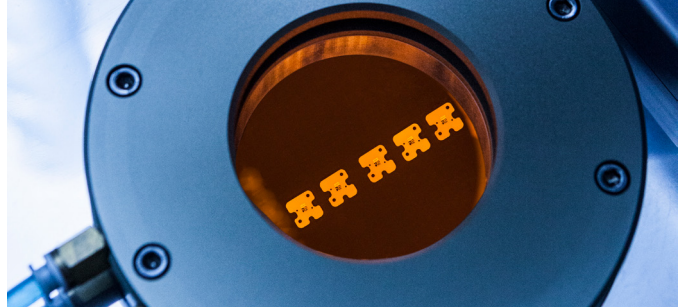


MICROELECTRONICS

At Rohde & Schwarz, microelectronics assembly begins with technology consultation concerning the various manufacturing processes available. In addition to common methods, special processes such as vacuum soldering and thermocompression flip chip bonding with a positioning accuracy of up to $\pm 1 \mu\text{m}$ are available.

SOLDERING AND BONDING PROCESSES

- ▶ Vacuum soldering (also GaN components)
- ▶ Hot-bar soldering
- ▶ Reflow soldering
- ▶ Electrically conductive and nonconductive adhesives (isotropic and anisotropic)
- ▶ Thermally conductive adhesives



BONDING AND MICROWELDING

- ▶ Wedge bonding and ball bonding method
- ▶ Processing of gold and aluminum wires with diameters from $12 \mu\text{m}$ to $50 \mu\text{m}$
- ▶ Assembly of different gold and silver ribbons using microwelding



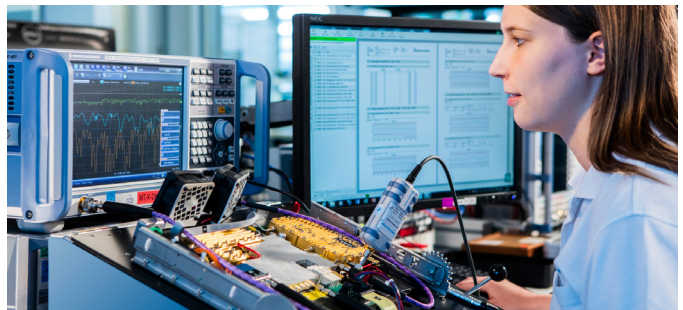
MICROASSEMBLY AND MODULE ASSEMBLY

- ▶ Manufacture of module housings
- ▶ Ultrafine assembly and microassembly under clean room conditions
- ▶ Assembly of individual substrates to form the complete electronic unit



TEST PROCEDURES

- ▶ From automated optical inspection (bond wire AOI and auto-measuring microscope) to electrical testing of microelectronic circuits with frequencies above 110 GHz
- ▶ Pull and shear tests to verify assembly and joining techniques

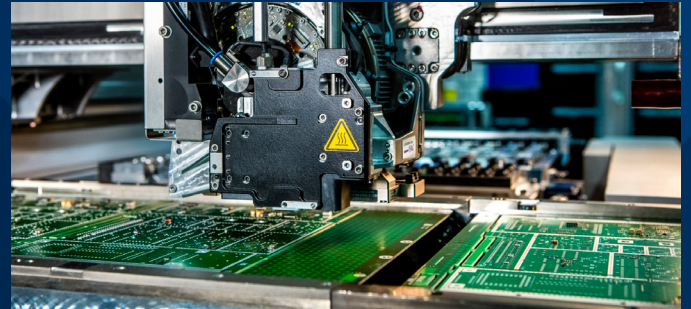


BOARD PRODUCTION AND CONFORMAL COATING

State-of-the-art production equipment for maximum flexibility with all batch sizes are the basis for our production. We manufacture your prototypes under series production conditions in order to ensure that your products are launched smoothly. Control of the entire production processes at our plants with a high level of in-house production ensures a fast turnaround time. Quality requirements as defined in IPC-A-610 Class 2 and 3, as well as the manufacturing of aviation and military products are our standard.

SMT PRODUCTION

- ▶ High-performance SMT lines with miniaturization up to 01005
- ▶ 3D solder paste inspection
- ▶ Lead-free or leaded soldering
- ▶ Reflow soldering with controlled nitrogen atmosphere
- ▶ Inline 3D-AOI on every production line



THT PRODUCTION

- ▶ Manual component placement based on the latest, paperless production documentation
- ▶ Wave soldering / selective soldering lead-free or leaded
- ▶ Manual soldering with nitrogen flooding
- ▶ Stereo microscope workstations in all production areas



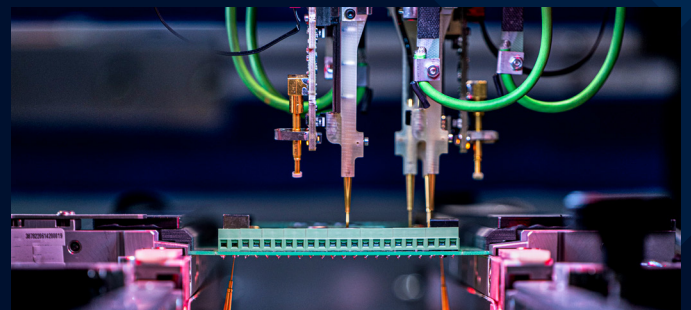
BOARD ASSEMBLY

- ▶ Assembly of mechanical components with torque monitoring up to automated fixing by screwdriving robots
- ▶ Process-monitored press-fit technology
- ▶ Assembly and gluing of optical components and displays



CONFORMAL COATING

- ▶ Cleaning and conformal coating processes in line with aeronautical and military standards
- ▶ Large number of qualified lacquers



INSTRUMENT ASSEMBLY AND SYSTEM INTEGRATION

If a wide variety of different boards are used in instruments or if complex system integration is planned, not only the very latest technical equipment but also a sound command of the various production steps are indispensable. This ensures low-waste, reliable production processes with outstanding manufacturing quality, low warehousing costs, short turnaround times and a high level of economic efficiency.

LEAN MANUFACTURING

- ▶ Transparent and reliable processes
- ▶ Low storage costs thanks to process linking and demand-oriented supplier integration
- ▶ Make-to-order in one-piece flow
- ▶ Well-established continuous improvement process (CIP) culture



INSTRUMENT ASSEMBLY

- ▶ Complex assemblies for technologically sophisticated instruments – also for extreme environmental conditions
- ▶ Product-specific assembly concepts in linked lines or standalone workstations
- ▶ Prototype production and industrialization of engineering samples
- ▶ RF expertise for communications and radar components (up to 100 GHz)



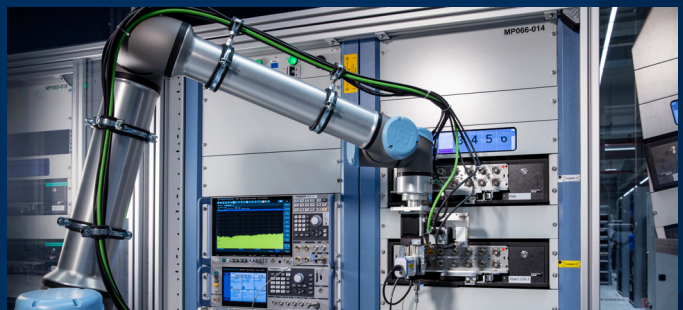
SYSTEM INTEGRATION

- ▶ Prototypes, one-piece and high-volume production as well as industrialization of systems and installations
- ▶ Flexible, customer-specific design and manufacturing of additional system components and adaptations
- ▶ System acceptance testing at the plant or on the customer's premises



ROBOTICS AND AUTOMATION

- ▶ Application of the “design for automation” practice to prepare products for automated production processes
- ▶ Increase in process stability through e.g. patented, automated connection of RF contacts
- ▶ Reduction of turnaround times and costs through the use of robots for board and module testing



OUR FULL CAPABILITIES ARE AT YOUR SERVICE. JUST TELL US WHAT YOU NEED.

Our strength as a contract manufacturer is more than just our high quality standards as a worldwide technology leader. It also lies in our completely customer-driven product and service portfolio.

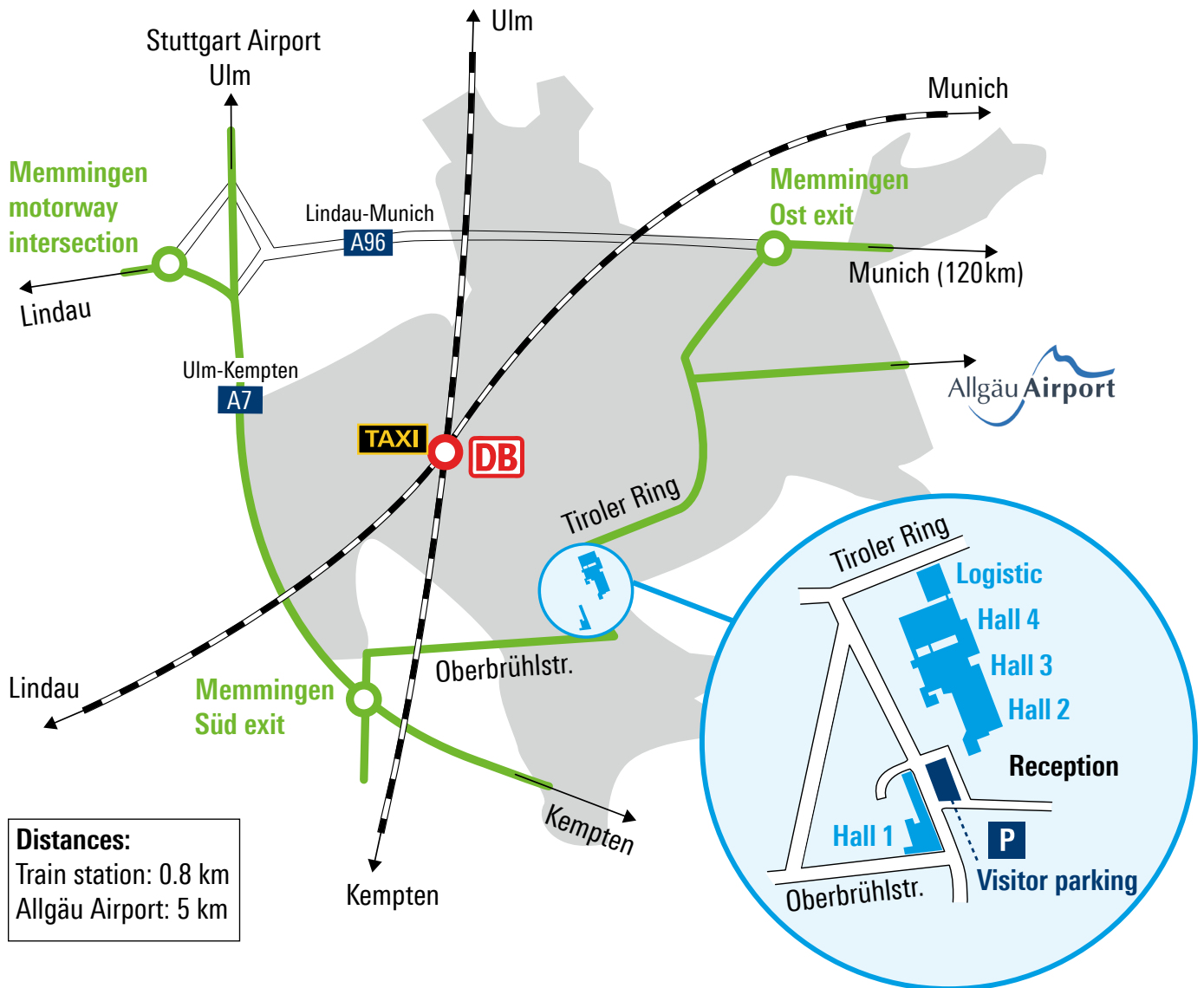
This means you get the support you need from us when and where you need it. You can opt for a comprehensive package of services, or you can pick and choose exactly what you require. Either way, you benefit from a level of professional expertise and a dedication to quality that is hard to match. Trust is good, standards and certificates are better.

When you contract out the manufacturing of highly sensitive technology, you need a partner you can rely on completely. At Rohde&Schwarz in Memmingen, we work in line with standards that speak for themselves:

- ▶ DIN EN ISO 9001 and 14001
- ▶ DIN EN 9100 and 9110
- ▶ IPC A610 Klasse 3
- ▶ EU-VO 748/2012 Appendix (Part 21)
EU-VO 1321/2014 Appendix II (Part 145)

We are also certified to AQAP 2110 and are an authorized components supplier for German Federal Armed Forces aircraft. So with us, even projects with rigorous security requirements are in the right hands.

THIS IS WHERE YOU'LL FIND US:



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Service at Rohde & Schwarz
You're in great hands

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test&measurement, technology systems, and networks&cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001



Visit our website
to find out more.

