



 **MICRAN**

# Micran

MICRAN is Russia's leading manufacturer of world-class microwave electronics.

Micran implements a full production cycle that combines several consecutive stages: from microwave electronic component base, nodes and modules, to radio engineering systems.

**10 000+** successful projects worldwide

**30+** years of experience

**85+** production lines

## VERTICAL MANUFACTURING

### RADIO ENGINEERING SYSTEMS

Mobile solutions  
Fixed solutions



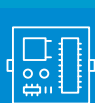
### RADIOELECTRONIC SYSTEMS

Telecommunications  
Test & Measurement equipment  
Radar systems  
Industrial Internet of Things



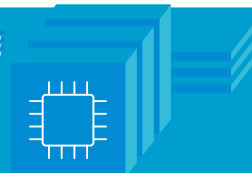
### MICROWAVE MODULES

Interconnected MW devices  
Robotic and mechatronic devices  
Single- and multifunctional MW modules



### SOLID-STATE ELECTRONIC COMPONENT BASE

Monolithic and hybrid integrated circuits based on GaAs & GaN



# Business lines



1. **Telecommunications**



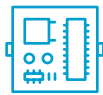
2. **Test & Measurement**



3. **Radar systems**



4. **Microelectronics**



5. **Microwave electronics and modules**



6. **Mechatronics & Robotics**



7. **Industrial Internet of Things**



8. **All-in-one solutions**

# Telecommunications

We strive to supply products and services ahead of market expectations. We offer a full product line of digital microwave radios MIC-RL and Y-Packet and wireless broadband access WiMIC as well as 5G solutions. Micran pays special attention to reliable and uninterrupted data transmission for any level of telecommunication network.

- Microwave radio
  - Wireless broadband access
  - Special-purpose equipment
  - Antennas, antenna rotators and masts
  - Monitoring, control and power tools
  - 5G solutions
- 21 000+ radios over the past 15 years.
  - $-71.2\text{ }^{\circ}\text{C}$  (Russia),  $+40.8\text{ }^{\circ}\text{C}$  (Indonesia) climatic records of equipment operation.
  - Radio solutions in licensed and unlicensed frequency ranges.



# Test & Measurement

Micran is one of the leading Russian T&M equipment manufacturers. The produced equipment has excellent metrological characteristics and is included in the State Register of Measurement Devices.

- Test & Measurement Equipment
  - Hardware and Software Systems
  - Microwave Modules and Assemblies
  - Microwave Accessories
- 100 000 measurements in 45 sec.
  - A full line of measurements up to 50 GHz.
  - 400+ items of microwave elements produced in series.



# Radar systems

Unlike traditional pulse radars, Micran's radars use transmit/receive modules built on a solid-state element base. That greatly enhances the nonfailure operating time without additional maintenance and allows to detect targets with no "blind" zone.

- GUARD series Security Surveillance System
- FishGUARD Security Surveillance System
- Radio navigation system RIVER
- Transport safety certificate  
(according to Russian Government Decree No. 969).
- $< 2 \text{ W}$  — radiated power of the radar  
(safe according to ICNIRP criteria).
- $3 \text{ m}$  — minimum distance of object detection.
- $1^\circ$  — angular resolution.

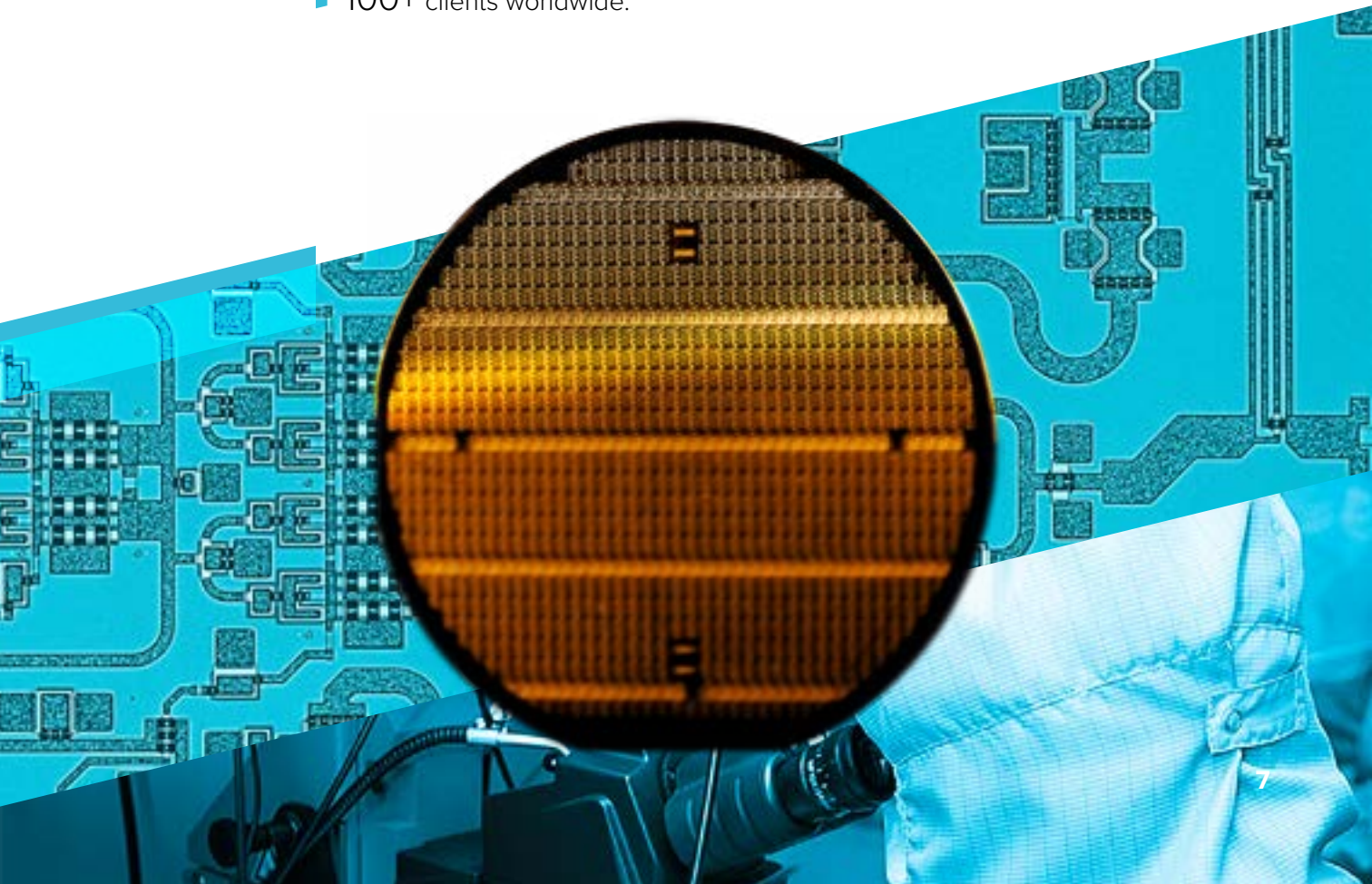


# Microelectronics

Micran provides a full cycle production of hybrid and monolithic integrated circuits for microwave and discrete semiconductor devices: heterostructure design, MIC development of technological processes, design, production and reliability tests.

- GaAs monolithic integrated circuits
  - Attenuators
  - Limiters
  - Switches
  - Phase shifters
  - Amplifiers
  - Mixers
  - Frequency multipliers
  - Power detectors
- GaAs discrete diodes

- 400+ wafers 100 mm per year.
- $\leq 50$  GHz frequency range.
- 100+ clients worldwide.



# MW electronics and modules

Micran offers a wide range of single- and multifunctional microwave modules in monolithic and hybrid-monolithic forms. On the basis of in-house electronic components and high-performance measurement systems Micran produces transmit-receive modules for active phased antenna arrays (AESA) of wide frequency range for ground, airborne and space-based radar stations.

- Microwave devices
- Amplifiers
- Bandpass filters
- Generators
- Low noise converters
- Modules of broadband radio-photonic fiber-optic communication lines
- Antenna devices
- Boards and modules of the power supply system

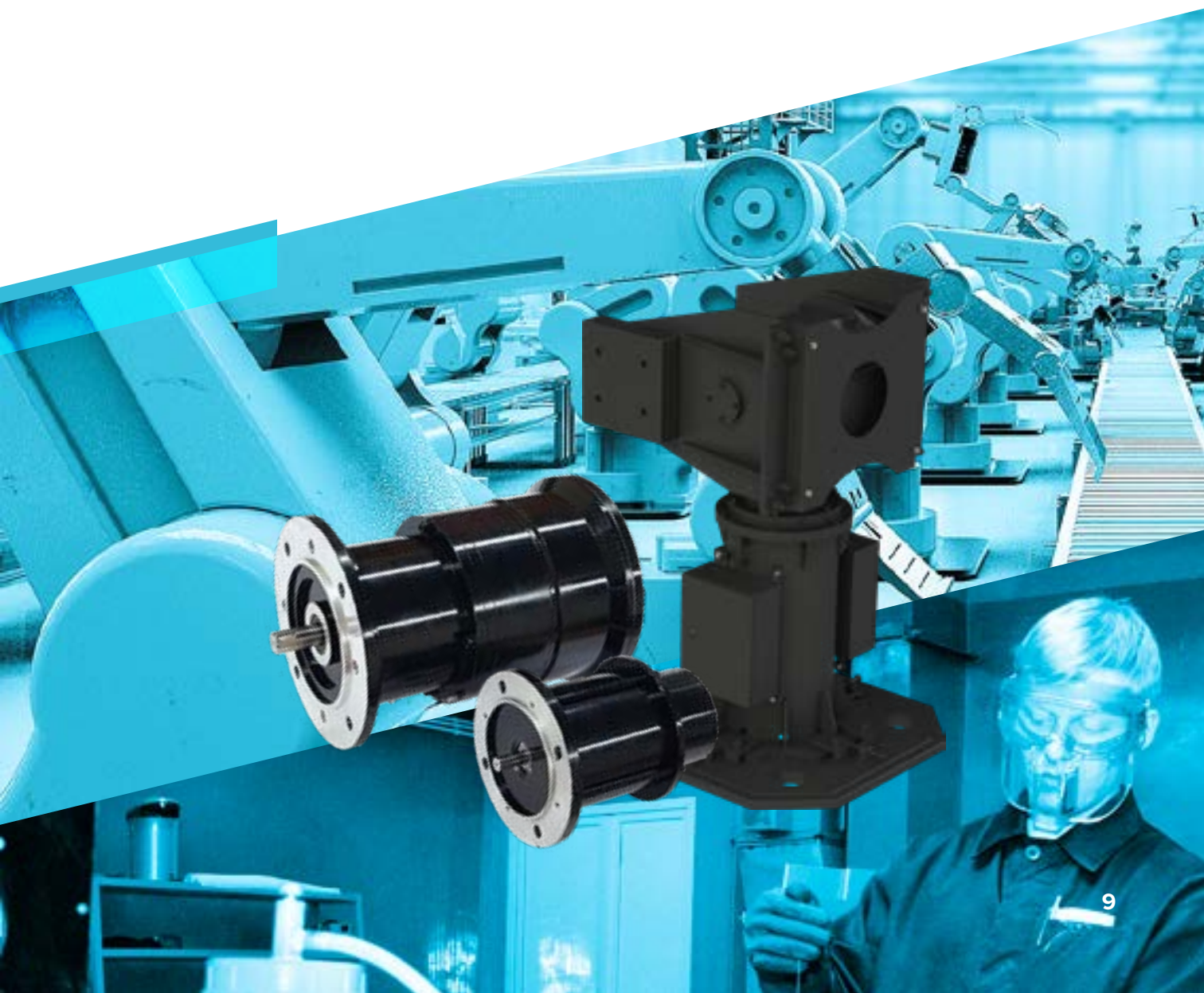




# Mechatronics and robotics

High reliability and precision accuracy, low noise and vibration level – Micran mechatronic and robotic systems make it possible to automate production and technological processes in various industries as efficiently as possible.

- Electric drives
- Mechatronic modules
- Brushless motor



# Industrial Internet of Things

Micran creates solutions that transform any company into a modern high-tech enterprise. Our latest development in the field of production digitalization is VERSA an Industrial IoT platform based on LPWAN network architecture aimed at monitoring, diagnosing and optimizing the running of plants of any industry.

- Overheating prevention system
- Vibration diagnostics system
- Temperature control system
- Pressure control system



# All-in-one solutions

Micran integrates security and communication systems into a single all-in-one solution based on mobile and fixed platforms. Our customers can be sure: all products were delivered in full factory readiness from one manufacturer, reducing the transaction costs connected with the choice of suppliers.

- Mobile solutions
- Fixed solutions



# Services

## Customized R&D work

- Adaptation of current solutions to customer requirements.
- Integrated design of systems and solutions.
- Carrying out preliminary projects, R&Ds in the following areas:
  - telecommunications and data transmission systems;
  - T&M equipment of the microwave path;
  - radar systems and microwave modules;
  - sensors;
  - robotic and mechatronic systems;
  - IIoT components and solutions;
  - control systems;
  - power supply systems;
  - automation systems.

## Contract manufacturing

- Manufacturing of monolithic integrated circuits.
- Project support within our own PDK (DRC).
- Photomasks production.
- Microwave module manufacturing by hybrid-integral technology.
- Thin-film board manufacturing.
- Metalworking.
- Electrochemical processing.
- Printed circuit board installation.

## Microwave Microelectronics Design Center

- MMIC Development based on in-house active and passive elements using QPIN, QSBD and QZBD technologies with design rules 0.25 and 0.5 pHEMT.
- Customized MMIC development based on technological processes of foreign manufacturers.



**Assistance in creating technical specifications**



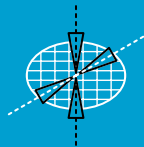
**Modeling**



**Topology drawing**



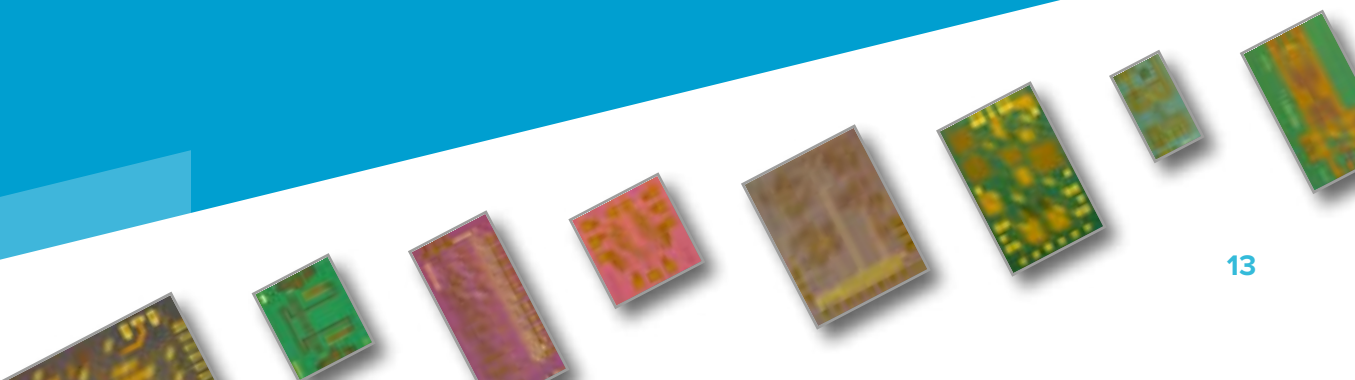
**Electromagnetic topology analysis**



**Test and measurement**



**Technical support**



# Our team is our strength

With decades of innovation under our belt, Micran is committed to inspiring and preparing the next generation of leaders and decision makers with knowledge and skills required for the modern radioelectronic industry. Our company actively support and engage with schools and universities, offering careers guidance, scholarships, jobs and help to make sure the student's education is always relevant for reality.



## HIGH SCHOOL

- Physical-technical Lyceum of Tomsk
- Specialized department for engineer training



## University

- Tomsk State University of Control Systems and Radioelectronics
- Specialized department "Microwave Radioelectronics"



## MICRAN, JSC

- Research and Study Center "MW Radioelectronics"
- Research and Study Center "Nanotechnologies"
- Research and Study Center "Materials and Technologies of Space Application"
- Research Institute of Electric Communication Systems (NII SES)



**38**

average age of employees

**120+**

sportsmen

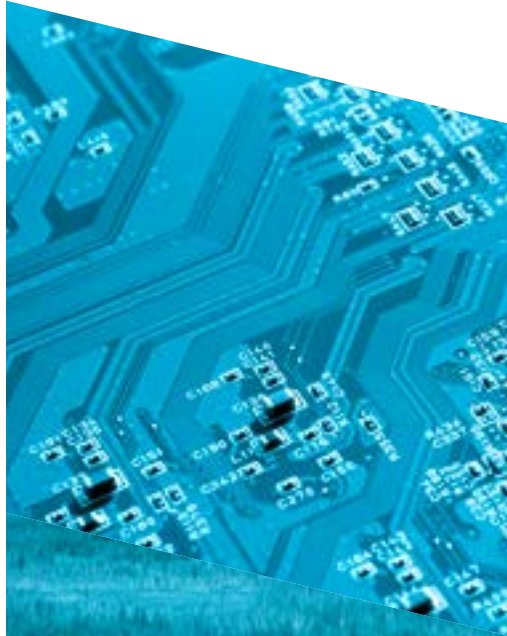
**1 000+**

children

**40 %**

employees speak English





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