

microPRO™ RTP

Selective Laser Annealing System for Semiconductor Applications

The microPRO™ RTP, a new laser annealing system designed to enable several key process steps in semiconductor, power device and MEMS manufacturing, combines a state-of-the-art laser optic module with 3D-Micromac's modular semiconductor wafer manufacturing platform. It provides selective annealing with high repeatability and throughput in a versatile system.

The microPRO™ RTP features a line scan option for vertical selective annealing and a step-and-repeat spot option for horizontal selective annealing, as well as three optional laser wavelengths.

The microPRO™ RTP addresses a variety of applications, including:

- Giant magneto resistive (GMR) and tunneling magneto resistive (TMR) sensor manufacturing
- Ohmic contact formation in silicon carbide (SiC) power devices to improve resistance
- Dopant activation for insulated gate bipolar transistors (IGBTs), as well as activation of backside illuminated (BSI) CMOS image sensors and amorphous silicon (a-Si)



microPRO™ RTP - System Configuration



The microPRO™ RTP provides numerous advantages compared to existing annealing methods, including:

- High precision and repeatability in both X and Y directions
- High selectivity to different substrates and films, with multiple options for laser pulse length, energy and overlap to ensure no damage to the area surrounding the target site
- Very high energy homogeneity
- Precise process monitoring
- Flexibility to handle substrate diameters ranging from 50 mm up to 300 mm

	microPRO™ RTP for Giant Magneto Resistive (GMR) and Tunneling Magneto Resistive (TMR) Sensor Manufacturing	microPRO™ RTP for Ohmic Contact Formation (OCF) in Silicon Carbide (SiC) Power Devices
Wafer size	<ul style="list-style-type: none"> • Up to 300 mm (12") wafer size 	<ul style="list-style-type: none"> • Up to 150 mm (6") wafer size
Laser source	<ul style="list-style-type: none"> • NIR Laser for GMR/TMR sensor formation • Integrated laser power monitoring • Dimension of exposure area controlled by recipe 	<ul style="list-style-type: none"> • ns laser source • Wavelength: 355 nm • Integrated process monitoring
Magnet unit	<ul style="list-style-type: none"> • Recipe based programming of: <ul style="list-style-type: none"> • Magnetic field strength • Orientation of magnetic field 	<ul style="list-style-type: none"> • Not available
Positioning system	<ul style="list-style-type: none"> • High precision X/Y/Z stage • Rotation axis with vacuum chuck • X/Y accuracy: < 8 μm 	<ul style="list-style-type: none"> • High precision X/Y/Z stage • Rotation axis with vacuum chuck • X/Y accuracy: < 8 μm
Wafer chuck	<ul style="list-style-type: none"> • Vacuum hot chuck with lift pins (up to 200°C) • Temperature homogeneity ± 2°C 	<ul style="list-style-type: none"> • Vacuum chuck
Options	<ul style="list-style-type: none"> • Fully automated open cassette wafer handling • Wafer pre-aligner • ID reader for wafer and/or cassette • SEGS/GEM implementation • Fan filter unit 	<ul style="list-style-type: none"> • Inert gas chamber • Full-wafer exposure • Fully automated open cassette wafer handling • ID Reader for wafer and/or cassette • SECS/GEM implementation • Fan filter unit
Software microMMI	<ul style="list-style-type: none"> • Control of all components and parameters • Different user levels supported (administrator, supervisor, operator) • Interface for fab integration (SECS/GEM) 	<ul style="list-style-type: none"> • Control of all components and parameters • Different user levels supported (administrator, supervisor, operator) • Interface for fab integration (SECS/GEM)
Standards	<ul style="list-style-type: none"> • Compatible with common SEMI standards • Laser safety class 1 • Clean room class ISO 5 	<ul style="list-style-type: none"> • Compatible with common SEMI standards • Laser safety class 1 • Clean room class ISO 5
Consumables	<ul style="list-style-type: none"> • Cooling water, compressed air, electrical power, vacuum 	<ul style="list-style-type: none"> • Cooling water, compressed air, electrical power, vacuum
Machine dimensions	<ul style="list-style-type: none"> • 2716 x 1642 x 2308 mm³ (W x D x H) 	<ul style="list-style-type: none"> • 2000 x 1629 x 2155 mm³ (W x D x H), w/o load port

Changes in accordance to technical progress are reserved.