RDT Equipment & Capabilities Statement

RDT has expanded its advanced manufacturing infrastructure with the addition of a Class-100 cleanroom equipped for 200mm VLSI wafer processing. This expansion, located in Manhattan, Kansas, includes state-of-the-art semiconductor chip manufacturing, electronics assembly lab for integrated system builds, and high-pressure crystal growth furnaces for advanced material synthesis. These upgrades support vertically integrated production capabilities, enabling high-volume semiconductor fabrication, precision device assembly, and next-generation materials development for RDT's advanced semiconductor technologies.

Processing Capabilities

Wafer Sizes	Materials
76mm, 100mm, 150mm, 200mm	Si, SiC, GaN, InP, GaAs, CdTe, CdZnTe, Sapphire

Design, Simulation, Modeling

Software	Capabilities
Silvaco TCAD	Atlas and Athena Device and Process Modeling
Monte Carlo Simulation	Radiation Transport and Interaction
CAD Drawing	Part Design and Modeling

Crystal Ingot Growth, Slicing, and Polishing

Equipment	Capabilities
High Pressure Bridgeman Furnaces	CdTe, CdZnTe, InP, GaAs, laser optics materials
Vertical Accelerated Crucible Rotation Furnaces	CdZnTe, Scintillator
Diamond Wire Saw	Ingot Slicing
Auto Disco DFP8140 Polisher and single Logitech	Wafer Polishing
Disco DAD3241 Dicing Saws	Wafer die singulation and beveling up to 200mm

Photolithography

Equipment	Capabilities
Spin and Spray Coat and Develop	Photoresist, polyimide, epoxy, and adhesive coating and developing
Suss MABA8 Gen. 4: Proximity and Contact Aligner, UV LED	• Down to ~1µm resolution • Nano-imprint Lithography • Top and backside alignment capability

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	• Up to 200mm dia. wafer
HMDS Vapor Prime Oven	HMDS vacuum oven for photoresist adhesion promotor application
Dry Film Photoresist Laminator	35 micron dry-film lamination on substrates
UV light Box and Macro Feature Mask Exposer	PCB level feature photolithography

Furnaces/Ovens

Equipment	Capabilities
Horizontal Furnace (4 tubes, 200 mm compatible)	Thermal oxidation (steam, dry), thermal anneal B doping and P doping (solid source)
Rapid thermal anneal system	Anneal temperatures up to 1000˚C
Hi-temp Atmospheric Tube Furnace (100mm)	Anneal temperature up to 1400C
Hi-temp Vac oven	500C and 1200C at rough vacuum
Cleanroom Bake Ovens	Up to 600C Atmospheric with N2 purge

Material Deposition

Equipment	Capabilities
Ebeam and Thermal Evaporator	Au, Al, Pt, Ta, W, Cr, Zr, Au, Ni, Cu, Fe, Ti, Ag, Ge, MgF2, Mo, MoOx, Pd, Ru, V, Pd, Al2O3, BaF2, C, Co, SiO2, +others
Sputter System	Ni, NiV, ZnO, ITO, Au, Ru, TiW, TaSi, Ni, Al 1% Si, Mo, Ti, Cu, Al, SiO2, Ta, TaOx, TiOx, TiNx, others
Spin/Dip Coat	Spin on Glass, Spin on Dopant
Parylene Coater: SCS 2010 LABCOTER 2	Parylene N, C, D

Etch and Wet Processing

Equipment	Capabilities
Ashers	Barrel and downstream capability with options for O2 and N2
XeF2 Etcher	MEMS Release Fluorine etcher
Acid and Base cleaning and etching wet stations	BOE, HF, H2SO4, H2O2, aluminum etch, tri-etch, piranha, ferric chloride, Au etch, SC1, SC2, KOH, nitric, aqua regia, +others upon request
Solvent Cleaning Wet Stations	Acetone, isopropanol, methanol, PR strip

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Metrology/Inspection

Equipment	Capabilities
SEM, XRF	~0.5 um resolution, materials composition XRF
Film Characterization	Film thickness measurement tools (non-contact spectroscopic reflectometry), 4 point probe
Probe Station: Electronic Measurements	IV/CV curve tracing, HV-IV to 20KVDC

Other

Equipment	Capabilities
Dry Room Facility	<0.5% RH environment for water-reactive and hydroscopic materials handling
Solder Reflow Oven	LPKF ProtoFlow w/N2 purge
Electronics Assembly	PCB parts assembly and Testing
Radiation Sources	Gamma-ray, X-ray, neutron, alpha, beta, Access to Nuclear Research Reactor (high dose damage)
Radiation Detectors and spectrometers	Gamma-ray, neutron
Bruker AXS: D8 DISCOVER & D2 CRYSO	X-ray Diffraction System material crystallinity & quality characterization
Quartz Ampoule Sealing	Seal quartz ampoules under vac or gas
EMI Mini Mills	Bead Mill to make nanomaterials
K&S Wirebonders	Wedge Al Wire Bonding, Ball Bonding

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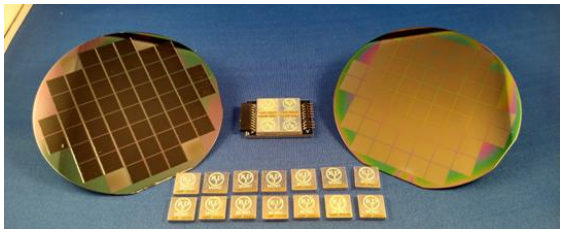

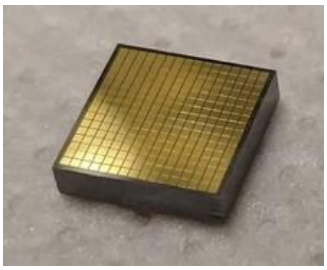

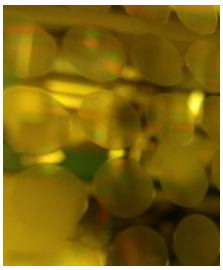

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