varian VIISion 80 / VIISion 200

High Current Ion Implantation Systems

SYSTEM SPECIFICATIONS

Energy Range

VIISion 80	2 - 80 keV
VIISion 200	2 - 200 keV

Maximum Beam Current in End Station (mA, 0° to +7°)

System	Energy (keV)	B (mA)	BF_2 (mA)	P (mA)	As (mA)
VIISion 80 and VIISion 200 (Drift)	5	1.5	-	-	-
	10	6	4	6	6
	20	7	7	10	10
	30	7	8	14	14
	40	9	9	20	20
	50	10	9	25	25
	60	10	9	25	25
	70	10	9	25	25
	80	10	9	25	25
VIISion 200 (Accel)	100	10	9	25	18
	120	10	9	25	25
	200	10	9	25	25
Multiple Charged ++	≥80	0.7	-	4	-

Beam Current Stability ±10% after warmup; 10 µA minimum; ≤10 glitches/hour

Dopant Species $^{11}B^+$, $^{49}BF_2^+$, $^{75}As^+$, $^{31}P^+$

Implant Dose Accuracy

Specification Range	5E11 - 5E16	
Energy	VIISion 80	10 - 80 keV
	VIISion 200	10 - 200 keV
Uniformity	1σ ≤0.5% (for 7° tilt angle)	
Repeatability	1σ ≤0.7% (for 7° tilt angle)	

Throughput

200mm	150mm	
200	220	(mechanical limit, 6 scans, 7° tilt, 1D beam profiler, wafers per hour)

Wafers per Disc 13 18

Wafer Breakage ≤1:40,000

Wafer Tilt continuous range from + 7° to - 7°, automatic, recipe controlled

Wafer Twist 0° - 360°, ±2° , automatic, recipe controlled

Wafer Cooling

VIISion 200:	≤100°C @ 3000 Watts
VIISion 80:	≤ 80°C @ 2000 Watts

Particulate Control ≤0.15 particles ≥0.2 µm added per cm^2 (mean value)

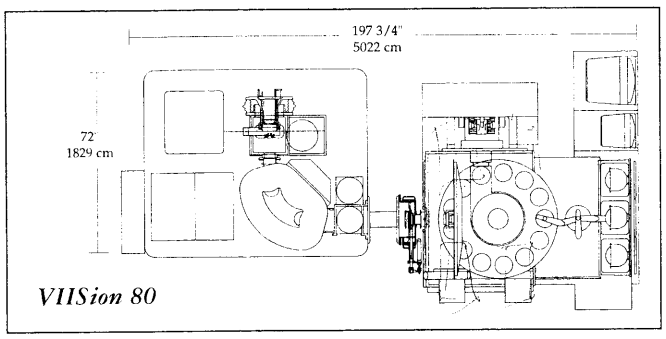
VIISion 80 and VIISion 200

High Current Ion Implantation System

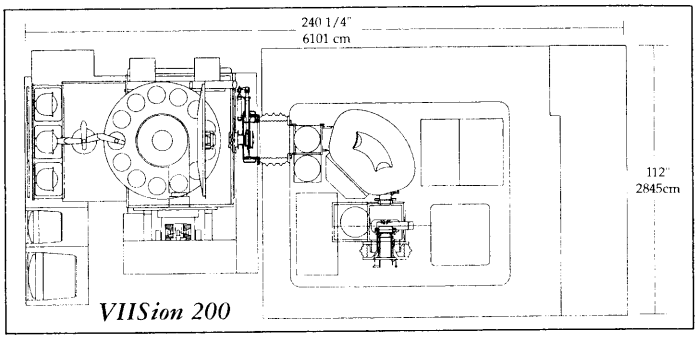
BASIC SYSTEM CONFIGURATION	
Wafer Handling	• Horizontal loading wafer security system • Finger and fence wafer sites • Silicon-coated implant disc (specify 150 mm or 200mm) • Three 25-wafer capacity highly polished loadlocks • Dummy wafer loading with 7 wafers in each loadlock • Color monitor and camera for viewing wafer handling
Ion Source and Gas Box	• One dual-filament tungsten Bernas ion source (converted to vaporizer source if vaporizer kit option selected) • 80 kV extraction energy • 1500 psi gas box for three 4X process gas bottles, one 4X carrier gas bottle, and one 4X purge gas bottle
Beamline	• Variable, rotating mass slits • +7° to -7° automatic implant tilt angle • Magnetically suppressed Faraday • Plasma flood gun • One-dimensional ion beam profiler
Control Electronics and System Software	• 68030 computer with 240 MB hard drive, combination 3 1/2" floppy (1.44MB)/floptical (21 MB) drive • One 19" high resolution color touch screen interface • Color ink jet printer • Three-light signal tower • Auto setup and tuning, production scheduling, and system diagnostics
Vacuum System	• 4 CTI 250F end station cryopumps with 2 compressors remoted up to 40 feet • 1 Varian V250 loadlock turbopump • 1 Varian ICE beamline turbopump • 1 Pfeiffer source turbopump • • 1 Ebara dry mechanical pump source/terminal A07V (remoted on VIISion 80 only) • 1 Ebara dry mechanical pump end station (remoted) A255
System Enclosure	• Highly polished stainless steel cleanroom interface • Full peripheral radiation shielding, including lead flooring, lead shielding at critical enclosure areas • Hinged enclosure doors with safety interlocks (VIISion 200 only)
Training and Documentation	Enrollment of 1 student in the following training classes: • VIISion Operation 5 days • VIISion Maintenance 5 days • VIISion Electronics 13 days • Two sets of cleanroom-compatible operating manuals and drawing books
Testing and Installation	• 24-Hour uptime preshipment testing • Final acceptance testing • Installation

VIISion 80/VIISion 200
Facilities Requirements

ISO 9001 REGISTERED



VIISion 80



VIISion 200

	Facilities Requirement	*VIISion 80*	*VIISion 200*
Size & Weight	Total Installed Weight	23,972 lbs. 10,871 kG	37,287 lbs. 16,910 kG
	Outside Dimensions	197.8"L x 101.5"W x 104.6" H 5022mm x 2580mm x 2656mm	240 1/4"L x 112"W x 115"H 6101mm x 2845mm x 2920mm
Water	Inlet Pressure	40 - 100 PSIG 276 - 689 KPaG	40 - 100 PSIG 276 - 689 KPaG
	Flow	15 GPM 57 Liters/min	15 GPM 57 Liters/min
	Inlet Temperature, max	60° - 68°F 16° - 20°C	60° - 68°F 16° - 20°C
N_2 (Dry Nitrogen)	Pressure, min-max	50 - 100 PSIG 345 - 689 KPaG	50 - 100 PSIG 345 - 689 KPaG
	Flow	9 SCFM avg, 24 SCFM peak 250 l/min avg, 680 l/min peak	10 SCFM avg, 25 SCFM peak 283 l/min avg., 708 l/min peak
Compressed Air	Pressure, min-max	90 - 100 PSIG 621 - 689 KPaG	90 - 100 PSIG 621 - 689 KPaG
	Flow	4 SCFM avg, 12 SCFM peak 113 l/min avg, 340 peak	4 SCFM avg, 12 SCFM peak 113 l/min avg, 340 peak
Ventilation Air	Gas Box Exhaust	600 SCFM 17,000 l/min	600 SCFM 17,000 l/min
	Ion Source Exhaust	390 SCMF 11,000 l/min	390 SCMF 11,000 l/min
	Chamber Module Cryopump Exhaust	6 SCMF (peak per pump) 170 l/min	6 SCMF (peak per pump) 170 l/min
Heat Dissipation	To Water	58,000 BTU/Hr 17kW/hr (standby), 29 kW/hr (ready), 30 kW/hr (full power)	58,000 BTU/Hr 17kW/hr (standby), 29 kW/hr (ready), 30 kW/hr (full power)
	To Air	68,000 BTU/hr 20 kW/hr max	68,000 BTU/hr 20 kW/hr max
Operating Environment	Temperature, Air	60° - 73° F 15° - 23° C	60°- 73° F 15°- 23° C
Electrical	Electrical Requirements	208 VAC, 3-phase, 5-wire, 50/60 Hz; Full Load 45 kVA, Ready 35 kVA, Standby 15 kVA	208 VAC, 3-phase, 5-wire, 50/60 Hz; Full Load 55 kVA, Ready 45 kVA, Standby 25 kVA

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