

# WaferRepair™ M450

Fuse Processing System



**“Total solution” system technology to process extremely tight-pitch fuse structures for exceptional yield enhancement on semiconductor devices, including 90nm and 70nm technology.**

- High-yield process control capability: ultra stable, ultra-fine energy setting for accuracy, range, and resolution – a critical laser redundancy process requirement for today’s and the next generation of ultra fine pitch links
- Patented high-speed positioning system optimizes throughput and enables a 70,000 links/second processing rate
- Precise  $<0.150\mu\text{m}$  ( $|\text{mean}| + 3\sigma$ ) system accuracy
- Minimum laser spot size of  $1.4\mu\text{m}$



## Driving the Laser Fuse Process Technology Advances

The *WaferRepair™ M450* is based on the most advanced platform available for laser fuse processing. Using *ShapedPulse™*, it processes the widest range of link materials and fuse structures at 70,000 links/second. It combines precise beam positioning, <math><0.150\mu\text{m}</math> (1mean + 3 $\sigma$ ) system accuracy, laser spot sizes down to 1.4 $\mu\text{m}$ , 300mm wafer support, and a host of additional innovations to maximize yield.

## Verified Quality

Superior process quality is ensured via the system's fully integrated, high resolution

metallurgical grade microscope. Intuitive software tools let you pinpoint links of interest and capture excellent quality images for production floor monitoring.

## High Throughput Link Processing

*GSI Group* has developed technologies for processing the latest fuse materials without damage to adjacent links or surrounding material, including low-k dielectrics. Innovative energy management technology provides ultra stable energy density and ultra fine energy settings for Pico Joule energy resolution to deliver the industry's smallest spot size while enabling cuts at a 70,000Hz rate.

## Worldwide Support

Throughout the semiconductor world, our applications engineers and materials scientists continue to develop new solutions in step with semiconductor process advancements. Our service technicians are trained in every aspect of maintenance and troubleshooting, and parts are stocked locally in North America, Japan, Taiwan, Korea, Europe, and China.

## Specifications

### Standard Laser:

- Wavelength: 1.064 $\mu\text{m}$
- Type: DPL
- Maximum repetition rate: 70,000Hz
- Pulse width: 12 +/- 2ns
- Max. pulse energy: 1 $\mu\text{J}$  (adjustable to 3 $\mu\text{J}$ ) via acousto-optic modulator
- Polarization: Software programmable on a per-product basis
- Spot size: 1.4 to 3.5 $\mu\text{m}$ , selectable

### ShapedPulse™ Laser:

- Wavelength: 1.065 $\mu\text{m}$
- Type: Fiber
- Maximum repetition rate: 70,000Hz
- Pulse width: 5 to 21ns, selectable
- Max. pulse energy: 1 $\mu\text{J}$  (adjustable to 2.5 $\mu\text{J}$ ) via acousto-optic modulator
- Polarization: Software programmable on a per-product basis
- Spot size: 1.5 to 3.7 $\mu\text{m}$ , programmable

### System Performance:

- Accuracy: <math><0.150\mu\text{m}</math> (1mean + 3 $\sigma$ )
- Type: Patented air-bearing stage
- Field size: 36mm x 36mm over 300mm range
- Working distance: ~ 6.5mm
- Chuck type: Waflle
- Link inspection: Metallurgical grade microscope, 10,000 X range of magnification

### Wafer Handler:

- 200mm/300mm: 2 open cassettes @ 25 wafers/cassette
- 300mm: 2 FOUP or FOSB @ 25 wafers per FOUP/FOSB
- Custom wafer handling (optional)
- Wafer sensing: Presence, absence, cross-slotted, double-slotted, protruding

- Wafer ID: Reader for top side and bottom side OCR, 2-D matrix and barcode recognition. Fully-integrated camera, processor, lighting and communications unit meets the following standards: SEMI T7, M1.15, M12, M13, M1.15 and SEMI T1-93

### Workstation:

- Computer: SUNFire with Flat Panel Display
- Operating system: UNIX
- Networking: Ethernet, TCP/IP, FTP and NFS protocols, RS232
- User environment: MAX 10.1

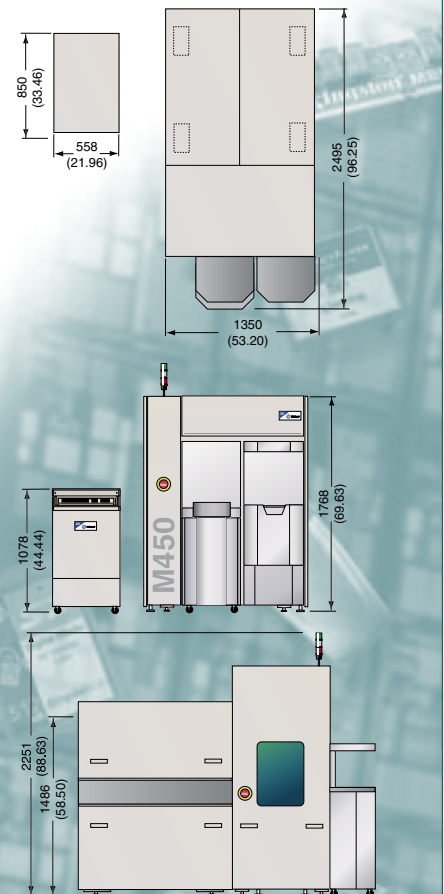
### Physical:

- Environment: 23°C  $\pm$  5°C, 30% - 70% relative humidity
- System unit
  - dimensions: 1283mm x 1276mm x 1486mm (50.5" x 50.25" x 58.5") [WxDxH]
  - weight: 1360kg (3000 lbs)
  - power: 2KVA, 200/208/220-240 selectable
  - air: 690 - 827 KPa @ 425 SLPM (100-120 psi @ 15 SCFM)
  - vacuum: Internally generated
- Wafer handler
  - dimensions: 1350mm x 1219mm x 2251mm (53.2" x 48" x 88.9") [WxDxH]
  - weight: 681kg (1500 lbs)
- Console
  - dimensions: 558mm x 850mm x 1078mm (22" x 33.5" x 44") [WxDxH]
  - weight: 136kg (300 lbs)

### Standards:

- CE Mark
- SEMI S8-1000, S2-0200
- CDRH

Dimensions in mm (inches)



Specifications are subject to change. Please consult Product Center for complete details.  
The classification of the WaferRepair M450 is Class 1/1.

[www.gsig.com/systems](http://www.gsig.com/systems)



Product Center  
60 Fordham Road  
Wilmington, MA 01887  
USA  
TEL: +1 (978) 661-4300  
FAX: +1 (978) 988-8798

For sales information, visit our web site or contact your local sales office.