283x
Ultra Broadband Brightfield Patterned Wafer Inspection System

1. INTRODUCTION

KLA-Tencor 283x Product Description: The 283x is the new generation Ultra Broadband DUV/UV Brightfield Patterned Wafer Inspection system offered by KLA-Tencor. Designed for use on critical Etch, CMP and Photo layers, the 283x is a swathing based inspection station, providing industry leading sensitivity to physical defects at production level throughput and

production worthy reliability and stability. The 283x provides groundbreaking High-Brightness PowerBroadband illumination, industry exclusive Broadband Directional E-Field control, High NA optics and industry unique passive optics modes, enabling widest pixel/mode combinations, array, random and mixed mode inspection modes, improved coordinate accuracy and support for the XP upgrade. In addition, the tool has several algorithms for defect binning and classification including iDO, Rules Based Binning (RBB), and is ready for Design-Based Binning (DBB), through the XP upgrade. The 283x is based on the KLA-Tencor WIN platform, and incorporates the same basic UI and recipe set-up as the eS3x and Darkfield inspection stations. In addition, common algorithms from previous 28xx systems are included with the 283x such as MDAT, RBMT, Optics Selector, OSTS, Multi Lot Sensitivity Tuner, Auto Care Area for Array, EECI, and Partial Edge Die.

2. SYSTEM CONFIGURATION AND OPTIONS

System Configuration	Standard	Option
Windows 2003 Server Based Operating System	X	
Modular Inspection Station	X	
Modular Handler	X	
300 mm (12”)		
Dual FIMS		X
6.4 GPPS Image Computer	X	
Broadband Directional E-field (HEF, VEF)	X	
Pixels (0.23, 0.20, 0.16, 0.12, 0.09 & 0.08 μm)	X	
Small Pixels (0.065 & 0.050 μm)	2835	2830
Array, Random and Mixed Modes	X	
Flexible Illumination Wavelength Bands (260-450nm)		
Broadband Illumination		
Broadband DUV, Blueband DUV, GHI Lines, GH Lines, HI Lines	X	
Narrowband Illumination		
Deepband DUV, Midband DUV, I-Line, G-Line	X	
Advanced Imaging Modes		
High Performance Edge Contract (HPEC), Varied Illumination Bright field (VIB) & Edge Contrast Plus (ECP)	X	
Logic Imaging Modes	2835	
Memory Imaging Modes	2830	
Multi-Die Auto Threshold (MDAT)	X	
Low Contact Chuck	X	
Integrated ULPA Filter	X	
Data Transfer		

USB	X	
CD/DVD R/W	X	
Ethernet	X	
Wafer Pre-Aligner	X	
Network Communication	X	
User Interface	X	
In-Line Defect Organizer	X	
High Resolution Review Camera & Optics	X	
Defect Clustering and Review Sampling	X	
Partial Edge Die Inspection	X	
Seismic Restraint	X	
KLA-Tencor Defect Standard Calibration Wafer	X	
Operations/Users Manual - Clean Room (1)	X	
Training		
Training credits to be used towards 2 Operation/Applications courses and 2 Equipment Maintenance courses	X	

System Configuration and Options Continued

System Configuration	Standard	Option
Power Line Conditioner		X
Remote Power EMO		X
HSMS		X
GEM/SECS Automation Interface		X
SEMI E84 PIO for AGV, PGV, & OHT Interface		X
E84 PIO Hardware		X
Basic Automation Package – E39, E87, E90 (Carrier Management/Wafer Tracking)		X
Advanced Automation Package – E40, E94 (Process Job/Control Job Management)		X
Carrier I.D. Readers		X
Wafer I.D. (wafer top or bottom)		X
E116 Equipment Performance Tracking		X
Signal Light Tower		X
Inserts for 200mm Conversion		
Entegris F300		X
Asyst 9700		X
iDM		X
SatServer Option (iDO setup and Simulators)		X
YMS Options		
Klarity		X
XP Full Option (Design Aware + Offline Setup w/ GDS2CA)		X
XP Design Aware		X
XP Offline Setup w/ GDS2CA		X

† 283x System Specifications[1]

System Configuration	Specification

283x Inspection Performance			
BF Sensitivity (DSW Wafer)	**Pixel Size (µm)**	**Array (µm)**	**Random (µm)**
	0.23	0.105	0.160
	0.20	0.085	0.140
	0.16	0.070	0.095
	0.12	0.060	0.075
	0.09	0.050	0.065
	0.08	0.048	0.063
	0.065	0.04	0.058
	0.05	0.035	0.053

System Performance Specification			
Throughput	**Pixel Size (µm)**	**Scan Rate (sec/cm^2)**	
		Array	**Random**
	0.05	8.06	8.06
	0.065	4.91	4.95
	0.08	3.35	3.40
	0.09	2.71	2.77
	0.12	1.65	1.71
	0.16	1.05	1.11
	0.20	0.76	0.82
	0.23	0.66	0.72
Maximum number of die per row	The 283x, operating with v10.6 software supports a maximum of 200 die per row, based on 1.5mm minimum die x dimension, 300mm wafer		
Die Size	1.5mm to 40mm on a side		
Edge Exclusion	3mm		
False Defect Rate	< 1.5% for production worthy recipes.		
Defect Location Accuracy	± 1.0 um radius		
Care Area Border Limits	X=1.5um Y=1.5um		
Backside Contamination	< 9.5 Defects/cm^2/wafer pass Defect Size ≥ 0.12 µm		
Frontside Contamination	< 0.01 Defects/cm^2/wafer pass Defect Size ≥ 0.1 µm		
Cleanliness	Dynamic ISO Class 1 in Dual FIMS handler		
Repeatability	95% for production worthy recipes		
DSW Matching	90%		
Product Wafer Matching	Please refer to separate Product Wafer Matching Specification and Methodology Documents.		

System Configuration	Specification

Reliability Performance Specification	
SEMI Guideline	The definitions of all reliability specifications are based on SEMI E10-0699.
Uptime	≥ 95%
MTBF (HW Rep + Adj)	≥ 400 hours (1st 6 months from release, ≥ 500hrs after 6 months)
MTBA (SW)	≥ 50 hours (1st 6 months from release, ≥ 100hrs after 6 months)
MTTR	≤ 12 hours (1st 6 months from release, ≤ 8hrs after 6 months)

Safety Specification	
SEMI S2-0703	283x is third party certified compliant with SEMI S2-0703 Environmental, Health and Safety Guidelines for Semiconductor Manufacturing Equipment
SEMI S8-1103	283x is third party certified compliant with SEMI S8-1103 Safety Guidelines for Ergonomics Engineering of Semiconductor Manufacturing Equipment
SEMI S14	283x is third party certified compliant with SEMI S14 -1103 Safety Guideline for Fire Risk Assessment and Mitigation
CE Mark	283x is compliant with European Union CE Mark requirements
NFPA 79	283x is third party certified compliant with NFPA79 safety standard
Seismic Restraint Kit	Standard with tool

System Configuration	Specification

Quality Control	
ISO9002	The 283x manufacturing process is ISO 9002 registered
Software CMM	283x SW is currently Level 3 certification

General System Configuration/Capabilities	
Wafer Size and Thickness	200mm/8inch (M1.9-0699 & M1.10-0699) & 300mm/12inch (M1.15-0600) wafer size and thickness for silicon wafers conforming to SEMI Standard (M1-0600) dimensions
Cassette Boat/FOUP Compatibility	Various cassettes and FOUPs are compatible. Contact WIN Division representative for compatibility
Exterior Panel/Skins	Standard skins for 283x are painted with KLA-Tencor cool white paint
Software Version	Standard SW configuration for all 283x tools is currently v10.6, a Windows 2003 Server based GUI

Facility Interface and Installation (Reference Site-Prep Manual for Full Details)		
System Dimensions	**System Configuration**	**Dimension (H, W, L) in meters**
	Inspection Station	2.328, 1.251, 1.876
	Dual Open Handler	1.915, 1.332, 0.874
	Dual FIMS Handler	1.872, 1.519, 1.217
	Auxiliary Rack	2.275, 1.295, 1.267
	Customer Interface	1.678, 1.036, 0.757
	Power Line Conditioner	1.095, 0.616, 0.616
	* Dimensions do not include required service clearance referenced in SPM.	
Electrical Input	208 VAC 3 phase WYE nominal With Power Line Conditioner: 208, 240, 380, 416, or 480 VAC	
System CDA	Please reference SPM	
Optics CDA	Please reference SPM	
Nitrogen	Please reference SPM	
Vacuum	Please reference SPM	
Vibration Pad Specifications	Please reference SPM	
Network	1 RJ45 10/100Base T network drop for 283x system, 1 for Satellite or Impact ADC Manager, 1 for ILM product. 1 shielded cable w/ 25 pin female DSUB connector for optional	