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ASML XT:1950Hi

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Resolution: 38nm

Overlay: 4 nm SMO
7 nm MMO

Laser Power: 60W

Throughput: 300mm wafers

148wph
(125 exp 30 mJ)

Product Description

ASML TWINSCAN XT:1950Hi

Configured for 300mm wafer size

Vintage: 2010

EQUIPMENT DETAILS:

Configuration. Description ASML — SCANNER — XT: 1950Hi — 193nm IMMERSION

System Identification:

Vendor: ASML

Model: XT1950Hi

Process: 193nm immersion lithography for 38nm resolution capability

Key Specifications

- 1.Resolution: 38nm Overlay: 4nm SMO / 7nm MMO
- 2.Throughput: 148wph (300mm with 125 exposures at 30 mJ)
- 3.Received & In-Service Sep/2010 Model # XT:1950Hi (300mm) Projection Lens
- 4.ZEISS Starlith 1950 with max NA of 1.35 or equivalent Illumination System
- 5.AERIAL XP Illumination System – P-Type Illuminator Alignment — Blue Align with Athena Narrow Marks Leveling
- 6.Focus and Field-by-Field Leveling Reticle Management
- 7.2 Load Ports Laser
- 8.CYMER XLR-560i 193nm 60W/6khz Laser with E95 bandwidth monitoring Environment
- 9.Class 1 Environment with Semi compliant MENV and FIMS assemblies Controls
- 10.UNIX/SUN Architecture

Product Description

ASML TWINSCAN XT:1950Hi

Standard Capabilities -1

- Focus Spot Monitoring
- Circuit Dependant Focus Edge Clearance
- CD-FEC – Dual E-Chucks (bonded SiSiC)
- Image Streaming – Lot Streaming and LS-MATCH2 (XT)
- Lot Overhead Reduction 1 and 2
- Productivity Enhancement Package PEP XT:1950Hi
- In-situ Metrology (ILIAS software and sensor module)
- LithoGuide ILIAS (SAMOS and PUPICOM)
- UNICOM XT – DoseMapper ArF
- QUASAR XL (15 slot)
- Reticle Shape Correction
- 2DE Grid Calibration
- TWINSCAN Overlay Package TOP XT:1950Hi Additional Options
- WATER COOLING FOR ELECTRONICS CABINET – CUSTOMIZED ILLUMINATION
- multiple DOEs – Integrated Reticle Library IRL-XP for H-SPEC systems
- Integrated Reticle Inspection System IRIS-XT
- Reticle Streaming – SpotLess G & H
- GridMapper TWINSCAN

Product Description

ASML TWINSCAN XT:1950Hi

Standard Capabilities -2

- FSM Flex Package for TWINSCAN
- Aux Port 300mm FOUP/25 Wafer
- SMASH XY Reticles – -40nm Defect – -Single Lot Tst Overlay Support Equipment
- Power Conditioner – 135 kVA Power Conditioning and Distribution Unit. TEAL model number PCDU-XT1900
- XCDA Gas Purification System Backup Purifier Canister: Optics Series, 10 MH, SS
- XCDA Gas Purification System Bypass Manifold: Manifold Three Valve 10M – Filter Housing – Cabinet, ESI VaporSorb EX2600 and Filter Set Standards and Compliance
- CE marked

S2 Compliant Manuals

Production Tool – Configuration – 1.1

Model: XT:1950Hi

Test completion date: 10 Sep 2010

Software release: 4.0

Actual software release: 4.5.0

Setting	DOE ID	NA	σ	Polarization
1 Standard DOE	12	1.35	$\sigma_{in} = 0.79$ $\sigma_{out} = 0.94$	X/Y or azimuthal
2 Standard DOE	12	1.10	$\sigma_{in} = 0.50$ $\sigma_{out} = 0.70$	X/Y or azimuthal
3 Standard DOE	12	1.20	$\sigma_{in} = 0.66$ $\sigma_{out} = 0.86$	X/Y or azimuthal
4 C Quad 30	105	1.35	$\sigma_{in} = 0.85$ $\sigma_{out} = 0.97$	X/Y or azimuthal

Note: Shaded settings and test specifications are for options.

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Parameter	Specification (absolute values)	FAT		SAT	
		Measured (Date)	Accept	Measured (Date)	Accept
SYSTEM ACCEPTANCE TESTS					
1 Imaging					
1.1 CD control after correction for reticle error and process contribution, 45 nm H & V, (pitch 90 nm) dense lines biased up to max. $\pm 10\%$ from nominal at best energy (3σ):					
Setting 1: Intrafield					
At best focus [nm]	≤ 2.5	1.0	Yes	FAT only	
At ± 75 nm off focus [nm]	≤ 4.0	1.2 (04-Sep)	Yes		
Setting 1: Full wafer					
At best focus [nm]	≤ 3.5	1.2 (04-Sep)	Yes	FAT only	

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Production Tool – Configuration – 1.2

1.2 CD control after correction for reticle error and process contribution, (only with C Quad 30, DOE 105 option). 40 nm H & V, (pitch 80 nm) dense lines biased up to max. ± 10% from nominal at best energy (3σ):					
<u>Setting 4: Intrafield</u>					
At best focus	[nm]	≤ 2.2	N.A.	Yes	FAT only
At ± 50 nm off focus	[nm]	≤ 3.5	N.A. (-)	Yes	
<u>Setting 4: Full wafer</u>					
At best focus	[nm]	≤ 3.2	N.A. (-)	Yes	FAT only

Production Tool – Configuration – 1.3 – 1.6

Parameter	Specification (absolute values)	FAT		SAT	
		Measured (Date)	Accept	Measured (Date)	Accept
1.3 CD control after correction for reticle error and process contribution, 40 nm H & V isolated lines biased up to max. $\pm 10\%$ from nominal at best energy (3σ): <u>Setting 2: Intrafield</u> At best focus [nm] ≤ 1.8 At ± 50 nm off focus [nm] ≤ 3.0 <u>Setting 2: Full wafer</u> At best focus [nm] ≤ 3.0		0.5 1.8 (04-Sep)	Yes Yes	FAT only	
1.4 HV bias measured as a range across the slit: Setting 2, 40 nm ISO [nm] ≤ 1.0		0.6 (04-Sep)	Yes	FAT only	
1.5 Chuck to chuck mean CD difference, Setting 2, 40 nm ISO [nm] ≤ 0.8		0.2 (05-Sep)	Yes	FAT only	
1.6 Proximity bias range, 5 pitch test, uniformity in slit, @ 50 nm lines Pitch 1: 1.3 , 1.6 , 2 , 3 , 6 Setting 3 [nm] ≤ 2.0		0.9 (04-Sep)	Yes	FAT only	

Production Tool – Configuration - 2

Parameter		Specification (absolute values)	FAT		SAT		
			Measured (Date)	Accept	Measured (Date)	Accept	
2 Overlay performance							
2.1	Stage repeatability*	[nm]	≤ 2.5	1.1 (04-Sep)	Yes	1.2 (27-Oct)	Yes
2.2	Stage grid verification*	[nm]	≤ 4.0	3.2 (04-Sep)	Yes	3.7 (3-Nov)	Yes
2.3	Dedicated chuck overlay* Setting 1	[nm]	≤ 3.5	3.3 (06-Sep)	Yes	3.4 (30-Oct)	Yes
2.4	Single machine overlay – 3 day*						

Production Tool – Configuration – 4.1 – 5.5

Setting	DOE ID	NA	σ	Polarization
1 Standard DOE	12	1.35	$\sigma_{in} = 0.79$ $\sigma_{out} = 0.94$	X/Y or azimuthal
2 Standard DOE	12	1.10	$\sigma_{in} = 0.50$ $\sigma_{out} = 0.70$	X/Y or azimuthal
3 Standard DOE	12	1.20	$\sigma_{in} = 0.66$ $\sigma_{out} = 0.86$	X/Y or azimuthal
4 C Quad 30	105	1.35	$\sigma_{in} = 0.85$ $\sigma_{out} = 0.97$	X/Y or azimuthal

Parameter	Specification (absolute values)	FAT		SAT	
		Measured (Date)	Accept	Measured (Date)	Accept
4 Intensity**					
4.1 Slit integrated power, 11 scans in 26 mm Setting 1 [mW/cm]	$\geq 1830^{**}$	1935 (01-Sep)	Yes	1959 (24-OCT)	Yes
5 Projection lens					
5.1 Aberrations RMS Z5 – Z37 [nm]	≤ 1.2	1.0 (04-Sep)	Yes	0.75 (29-Oct)	Yes
5.2 Aberrations RMS spherical [nm]	≤ 0.7	0.6 (04-Sep)	Yes	0.32 (29-Oct)	Yes
5.3 Aberrations RMS coma [nm]	≤ 0.6	0.3 (04-Sep)	Yes	0.37 (29-Oct)	Yes
5.4 Aberrations RMS astigmatism [nm]	≤ 0.6	0.4 (04-Sep)	Yes	0.29 (29-Oct)	Yes
5.5 Aberrations RMS 3-foil [nm]	≤ 0.7	0.6 (04-Sep)	Yes	0.37 (29-Oct)	Yes

Production Tool – Configuration – 5.6 – 5.11

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Production Tool – Configuration - 6

Parameter		Specification (absolute values)	FAT		SAT	
			Measured (Date)	Accept	Measured (Date)	Accept
6 Dose control						
6.1	Dose system performance Setting 1 [%]	≤ 0.9	0.5 (05-Sep)	Yes	0.7 (31-Oct)	Yes
6.2	Integrated slit uniformity 11 scans in 26 mm Setting 1 [%]	≤ 0.25	0.06 (01-Sep)	Yes	0.135 (31-Oct)	Yes
6.3	Integrated scan uniformity Setting 1 [%]	≤ 0.2	0.1 (05-Sep)	Yes	0.04 (31-Oct)	Yes

Production Tool – Configuration – 6.4 – 7.2

6.4	Dose reproducibility and accuracy at doses $\geq 5.0 \text{ mJ/cm}^2 \leq 100 \text{ mJ/cm}^2$ Dose repeatability Setting 1	[%]	≤ 0.2	0.1 (05-Sep)	Yes	0.1 (31-Oct)	Yes
6.5	Dose accuracy Setting 1	[%]	± 0.7	0.4 (05-Sep)	Yes	0.46 (31-Oct)	Yes
6.6	Dose matching	[%]	≤ 2.0	SAT only		SKIP ()	Yes
6.7	Dose stability, 3-day	[%]	≤ 0.25	0.02 (06-Sep)	Yes	0.11 (03-Nov)	Yes
7 Polarization quality							
7.1	Intensity in the Preferred State (IPS) Setting 1	[%]	≥ 93	100 (26-Jul)	Yes	FAT only	
7.2	IPS Variation Setting 1	[%]	≤ 2.5	0.4 (26-Jul)	Yes	FAT only	