ELIONIX

To: University of Pennsylvania

ELS-7500EX

Electron Beam Lithography System

On-site inspection report

Inspection Date： 2008/January/

Serial No. : H34 – 085

ELIONIX INC.

Director Engineering	Confirmation	Inspector

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	Inspection Item	Standard	Judgment
1	Secondary electron image	Photo confirming 2nm at ×160,000, Which accompanies Inspection Results	pass
2	Accelerating voltage	5〜50 kV	pass
3	Vacuum degree of specimen chamber	7×10^{-4} Pa or less	pass
4	Power failure	Valve lock, and power OFF Turbo molecular pump rotation falls and stops.	pass
5	Electron gun chamber vacuum deteriorated	Electron gun power supply OFF	pass
6	Specimen chamber vacuum deteriorated	Alarm buzzer, and isolation valve closed	pass
7	Low N_2 gas pressure	Alarm buzzer	pass
8	Low compressed air pressure	Alarm buzzer, and valve lock. Turbo molecular pump rotation falls and stops.	pass
9	Turbo molecular pump failure	Alarm buzzer, and valve lock.	pass

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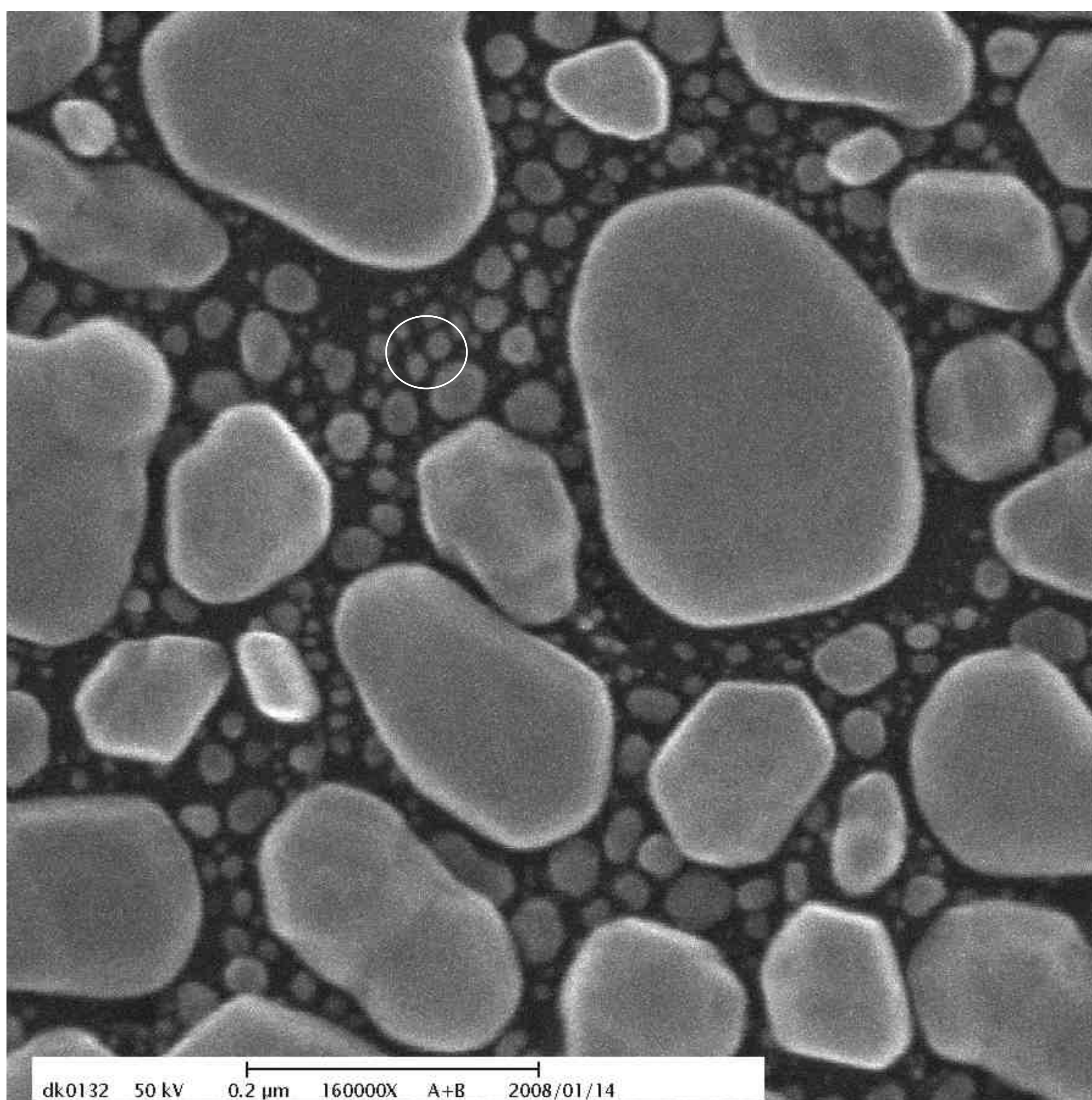
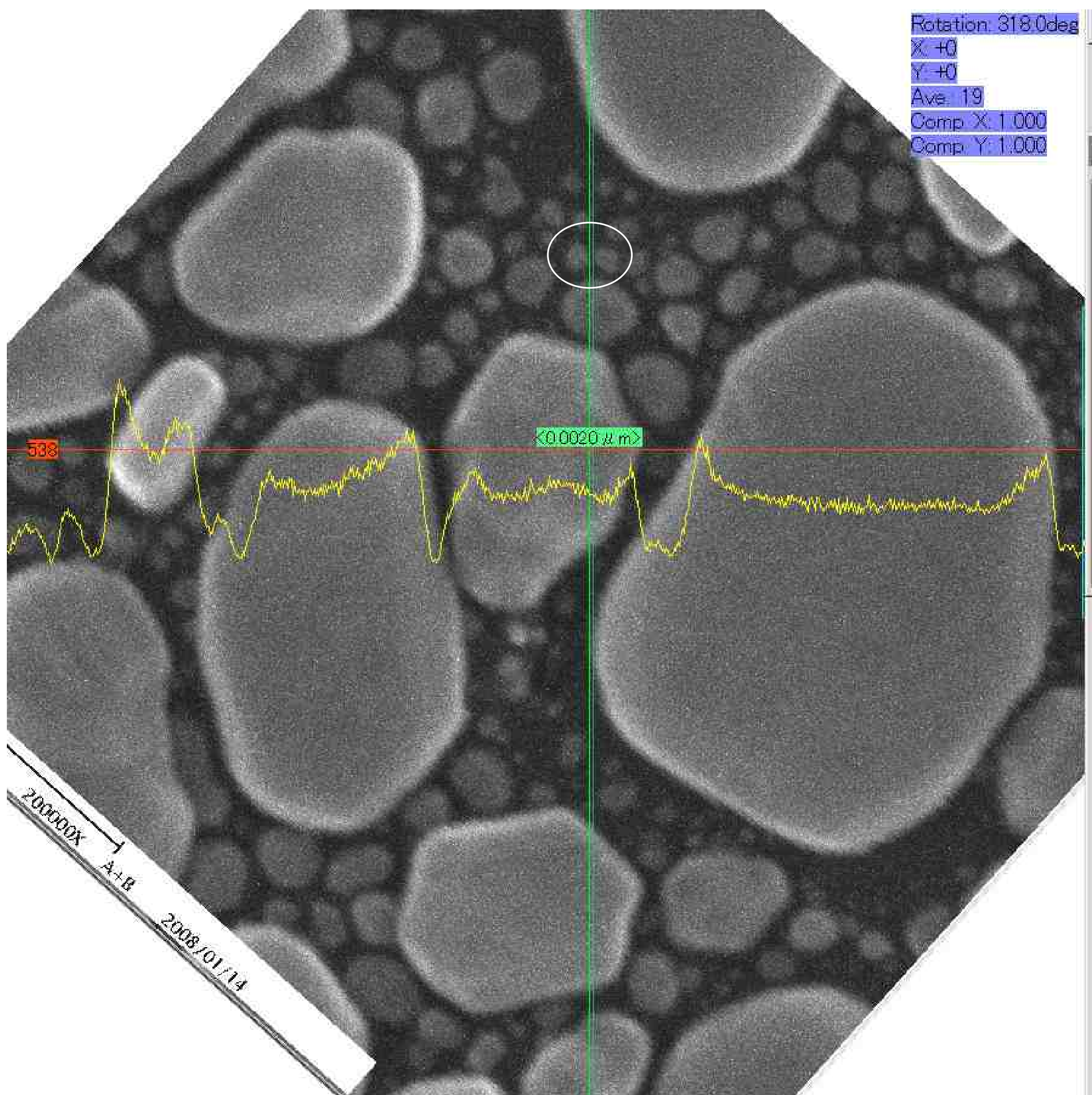
Secondary Electron Image

Vacc	:	50 kV
Magnification	:	×160,000
Objective aperture	:	0.06 mmφ
Beam current code	:	48396 / 65535
CL2 code	:	55000/ 65535
Beam current	:	20 pA

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Comp X: 1.000
Comp Y: 1.000
538
<0.0020 μm>
200000X
A+B
2008/01/14

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Drawing

(1) Line width 10nm

(2) 0.1 μm Line & Space

(3) Multi test pattern

(4) Field stitching

Judgment
pass

Options

- ■ Overlay
- ■ Circle pattern generator
- □ Raster scan
- ■ Spot
- ■ Fine step field size modulation
- □ Function pattern
- ■ DXF,GDSII data conversion

Judgment
pass

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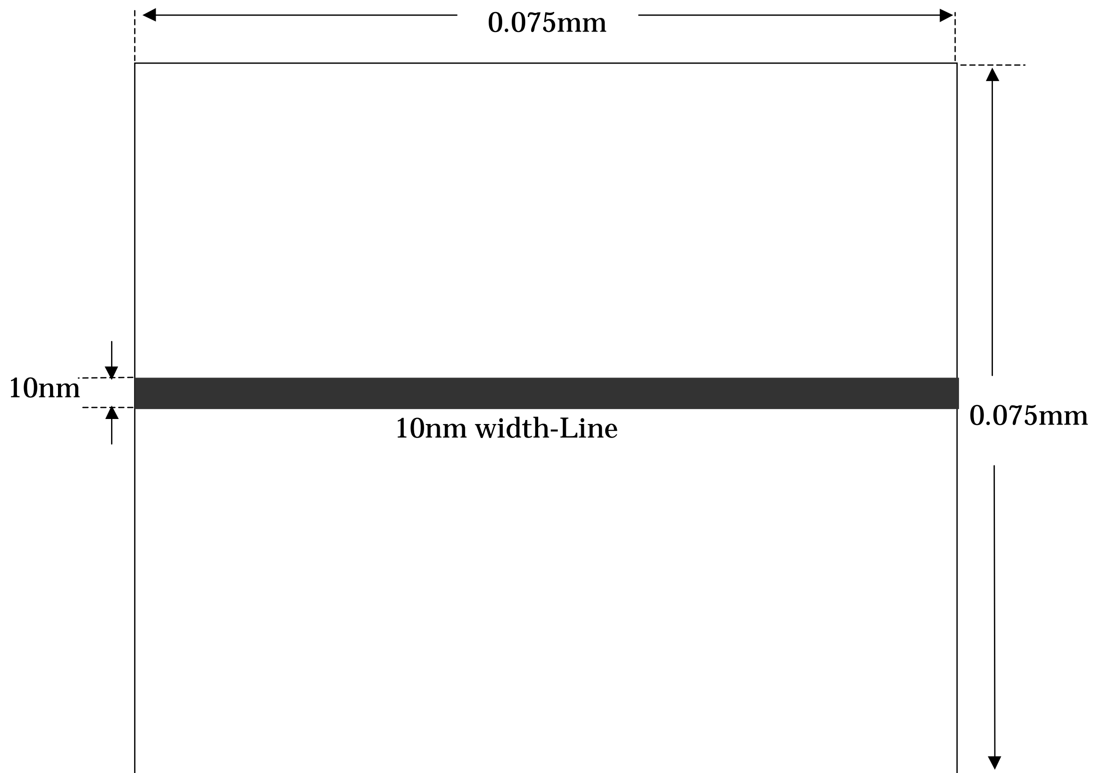
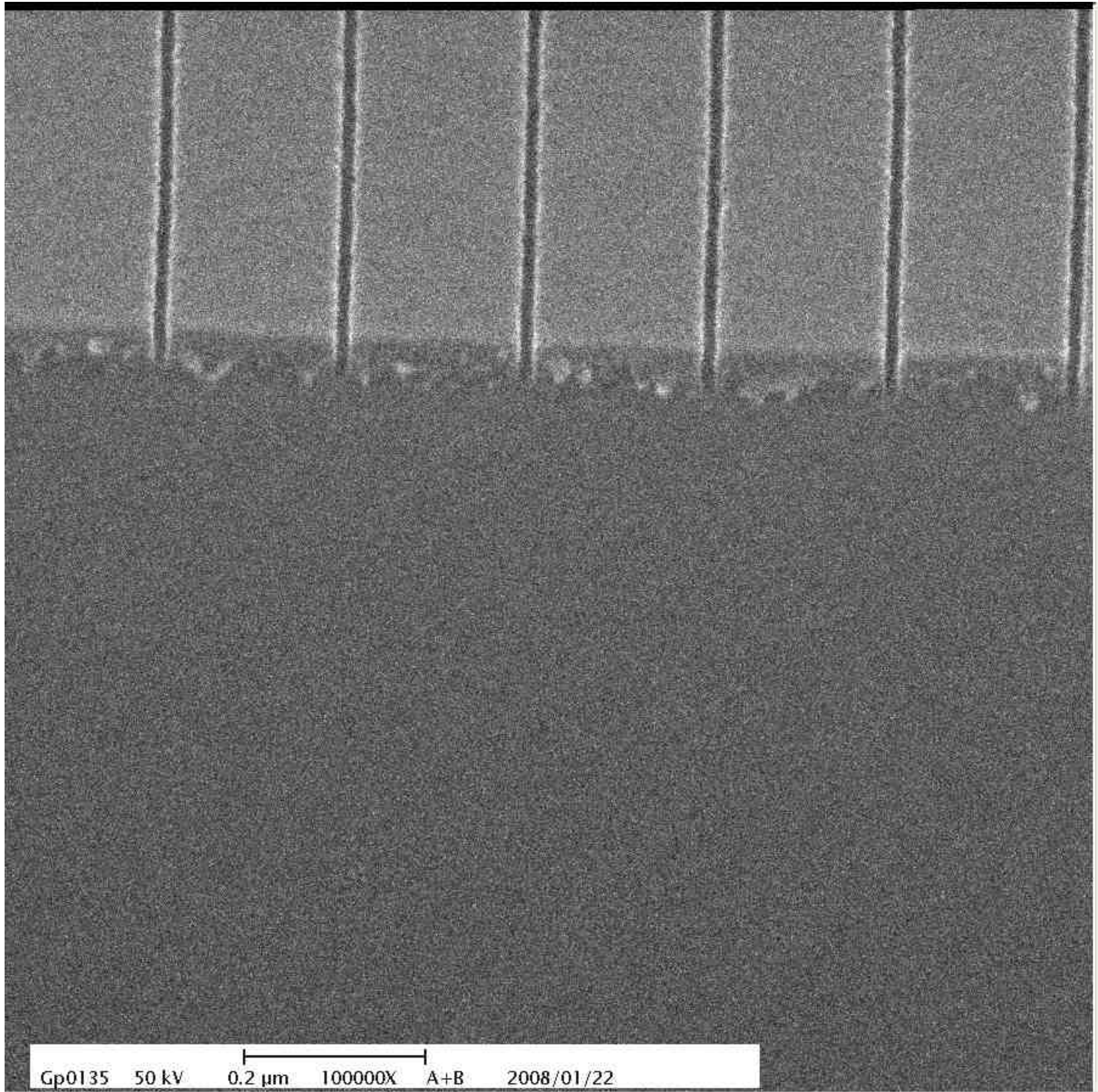
Line width 10nm

ACCEL. VOLT.	50	kV	EXT.VOLTAGE	3.9	kV
Emission CURR.	68	uA	CATHODE HEAT.	2.31	A
BEAM CURR.	18	pA	OL APERTURE	0.04	mmφ
FIELD SIZE	0.075	mm□	Dot Map	60000	dot
DOSE TIME	2.6	usec/dot	RESIST NAME	ZEP-520A	
SUBSTRATE	Si wafer		RESIST THIKNESS	0.08	μm
Development temp	room temp	℃	Development time	7	sec




Gp0135 50 kV 0.2 µm 100000X A+B 2008/01/22

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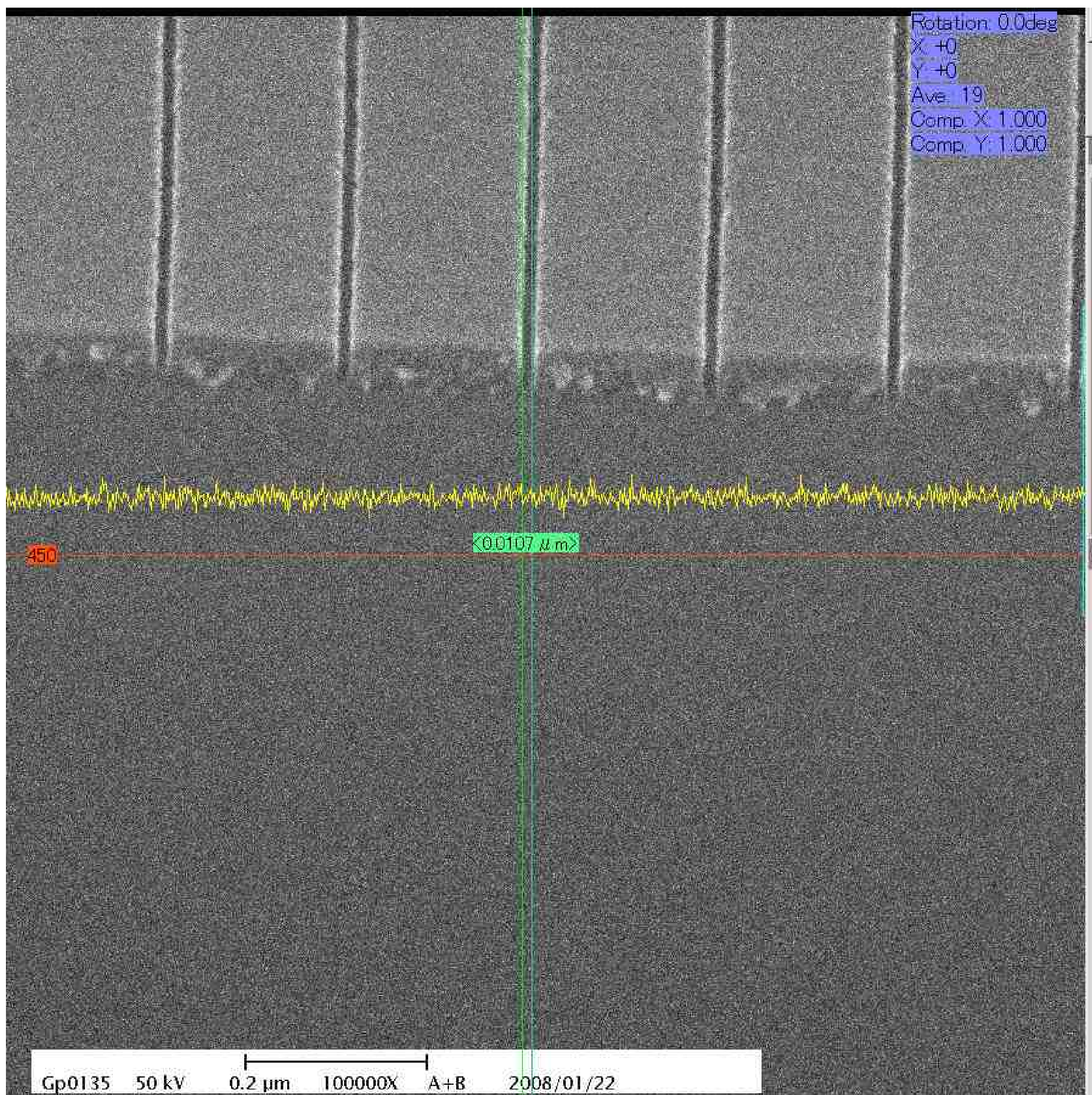

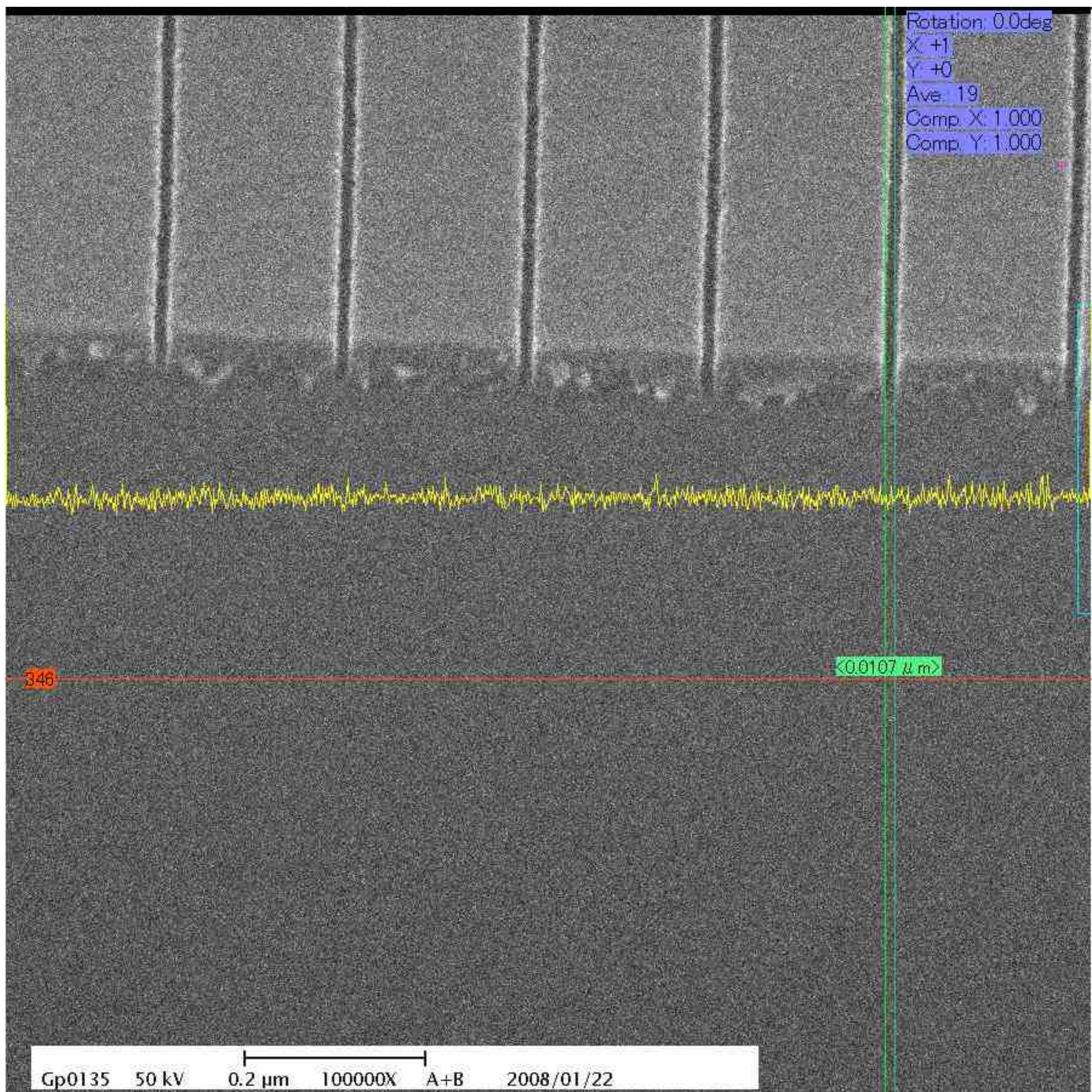

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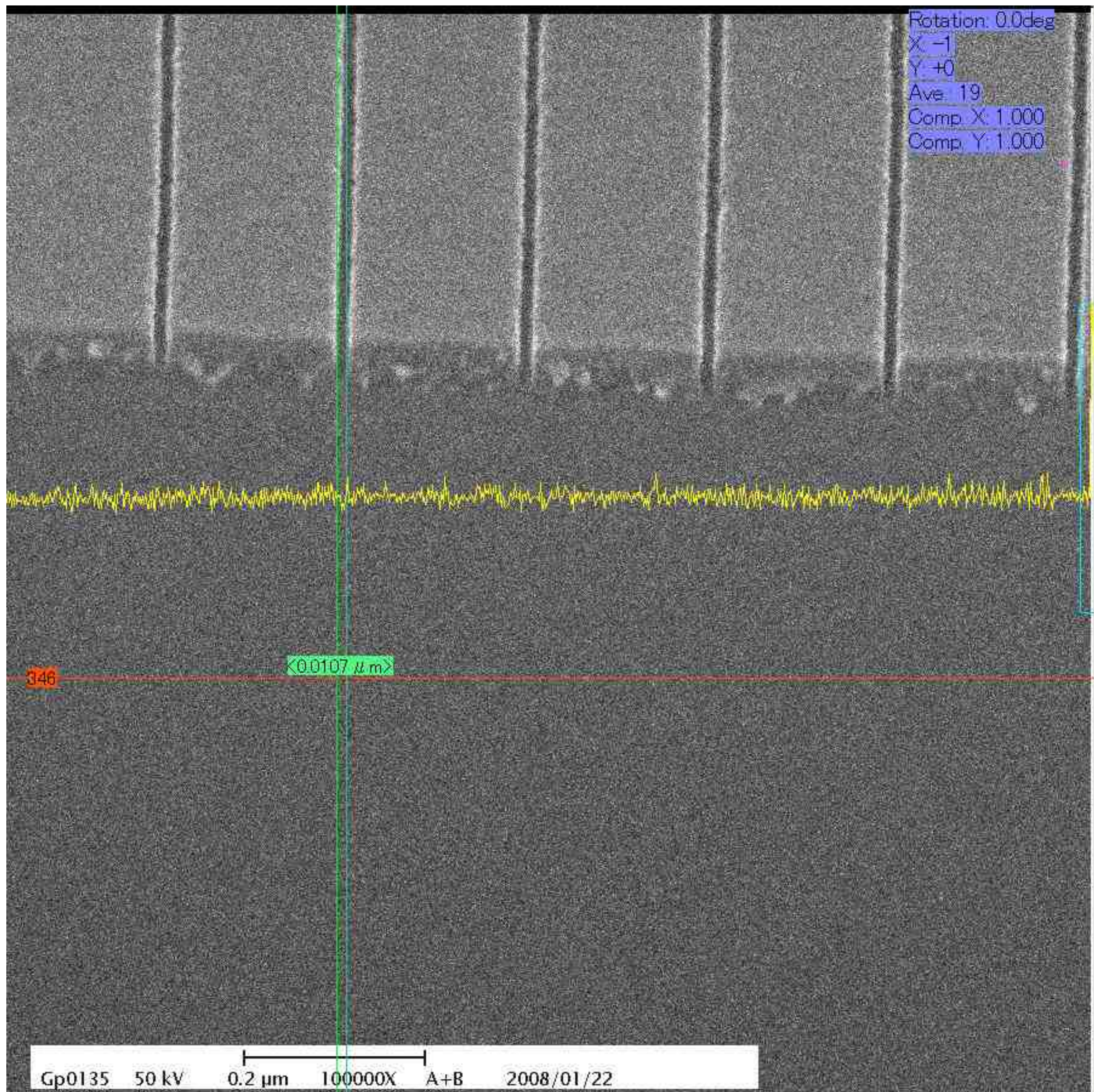
Comp. Y: 1.000
346
<0.0107 μm>
Gp0135 50 kV 0.2 μm 100000X A+B 2008/01/22



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Comp. X: 1.000
Comp. Y: 1.000
346
0.0107 μm
Gp0135 50 kV 0.2 μm 100000X A+B 2008/01/22

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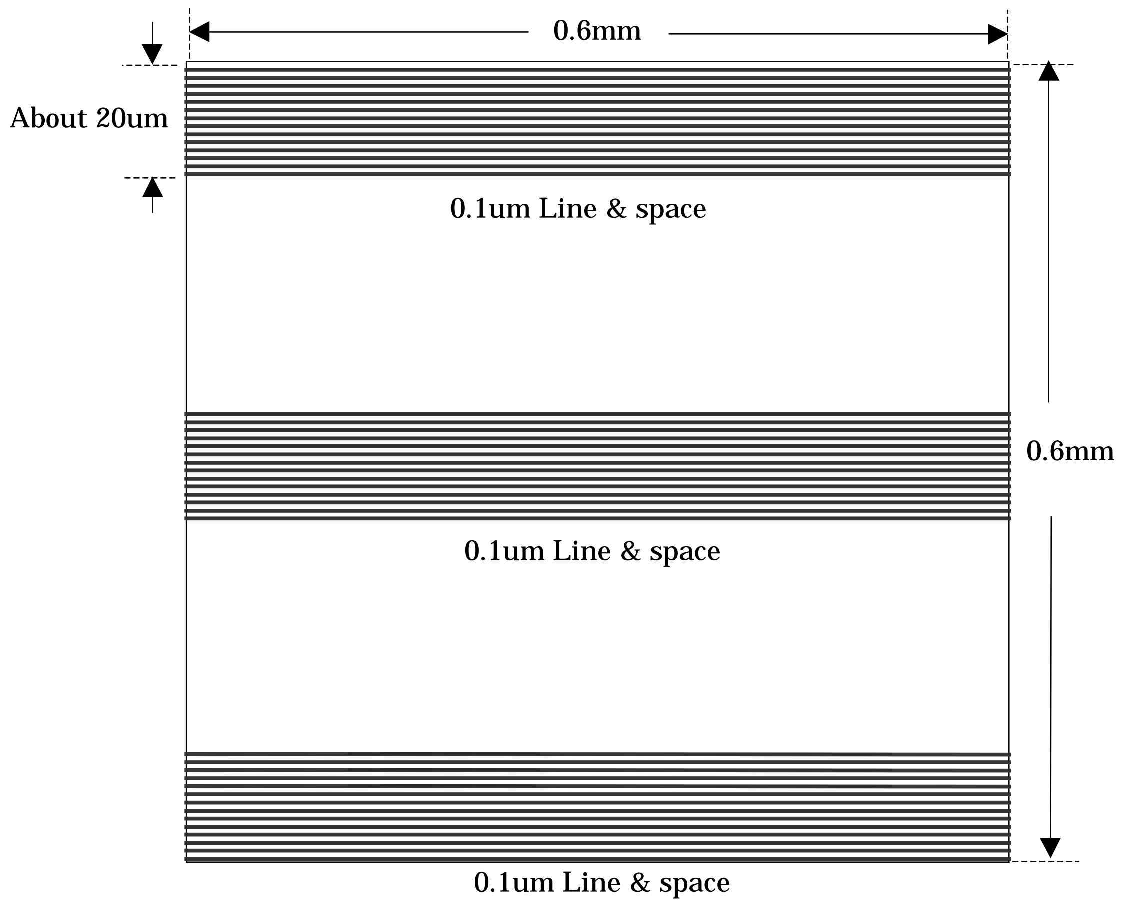
0.1 μm LINE & SPACE

ACCEL. VOLT.	50	kV	EXT.VOLTAGE	3.9	kV
Emission CURR.	68	uA	CATHODE HEAT.	2.31	A
BEAM CURR.	100	pA	OL APERTURE	0.03	mmφ
FIELD SIZE	0.6	mm□	Dot Map	60000	dot
DOSE TIME	0.9	usec/dot	RESIST NAME	ZEP-520A	
SUBSTRATE	Si wafer		RESIST THIKNESS	0.30	um
Development temp	room temp	℃	Development time	300	sec



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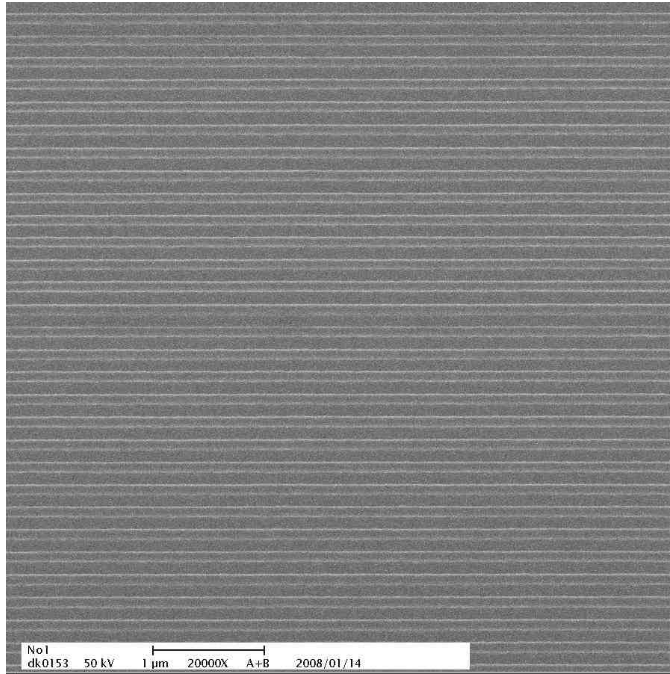

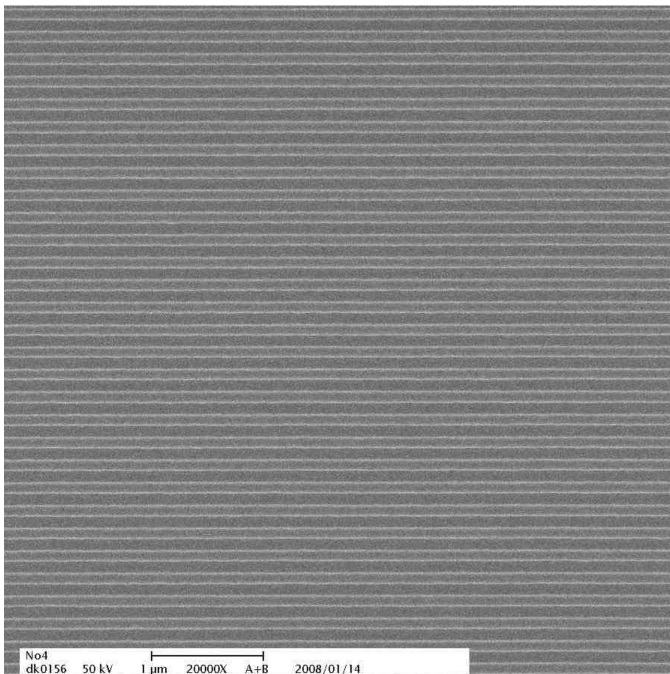

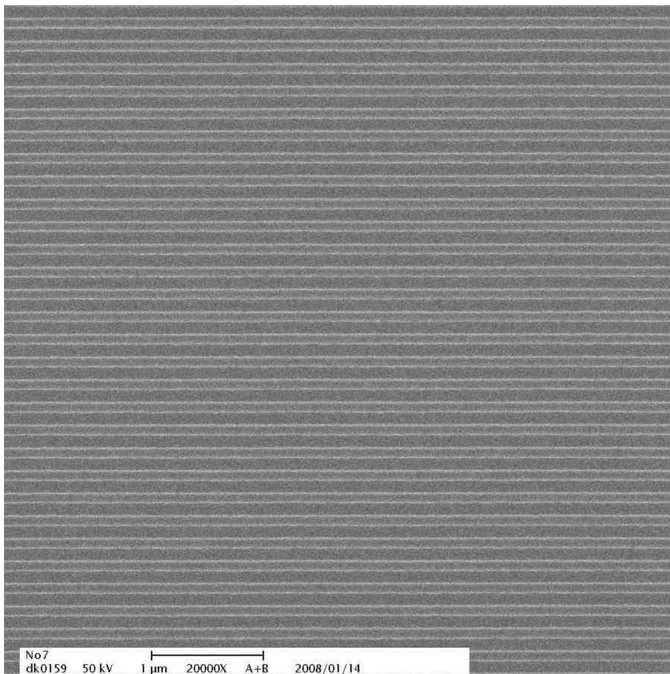

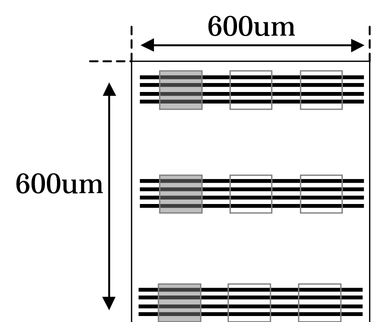

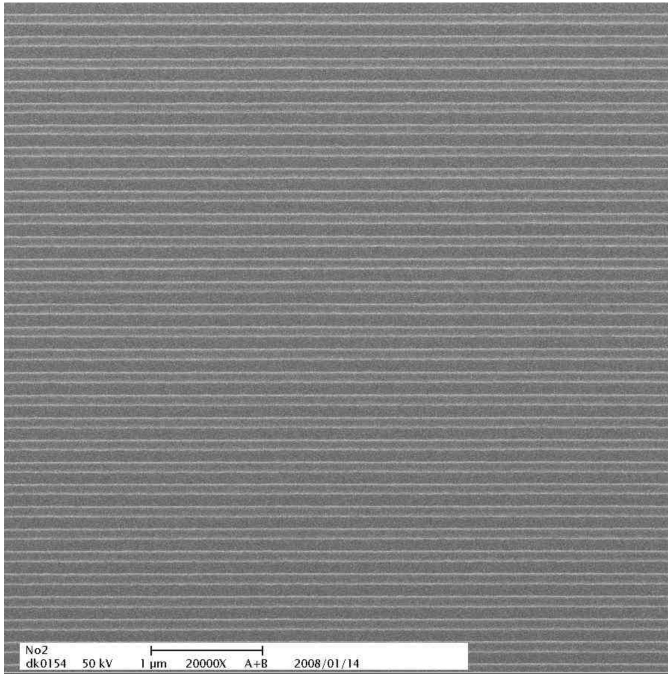
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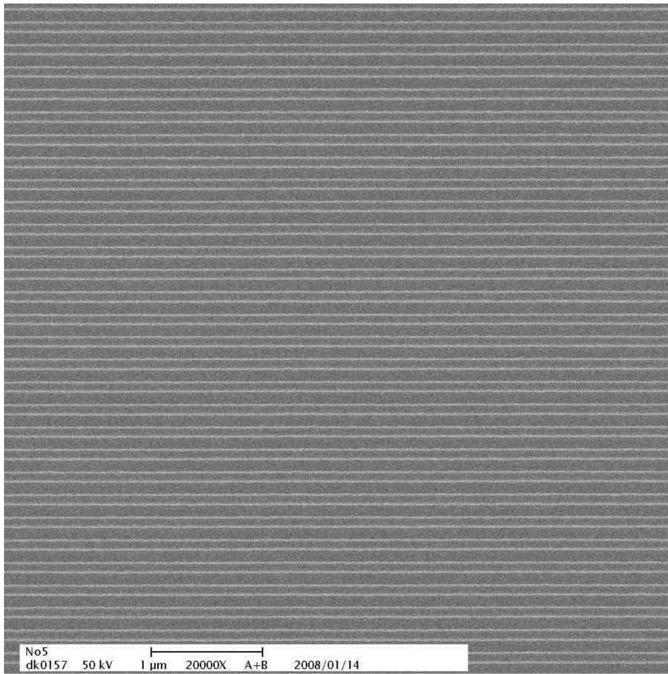
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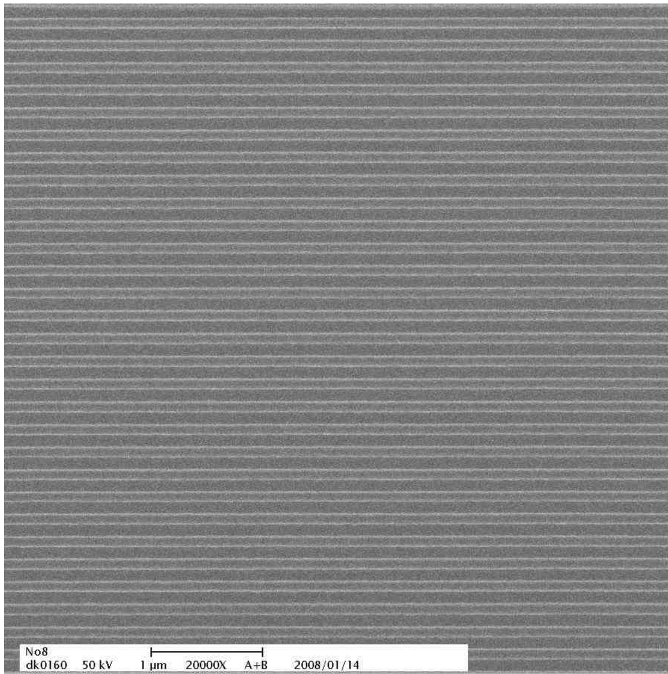
dk0157 50 kV 1 µm 20000X A+B 2008/01/14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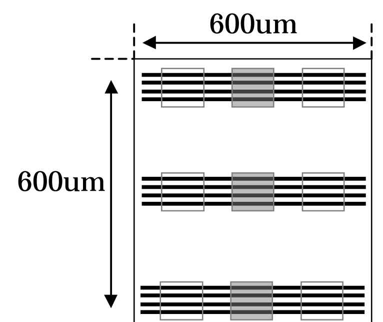
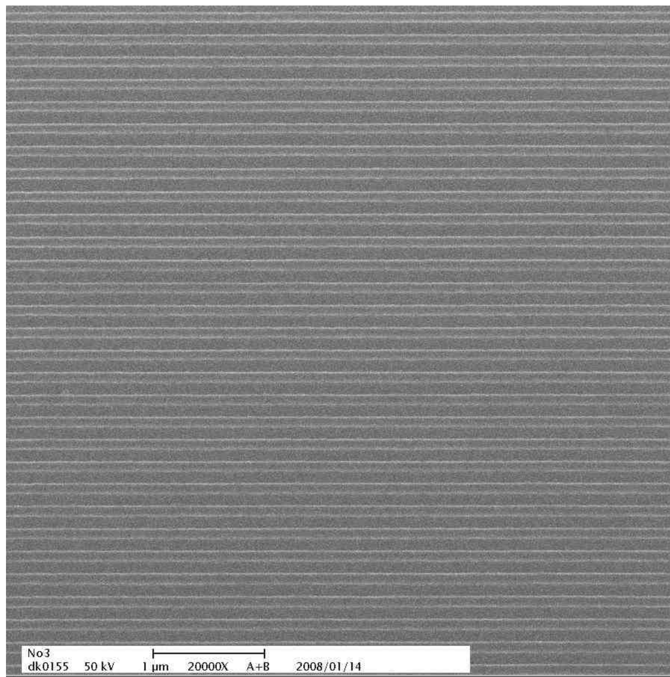

600um
600um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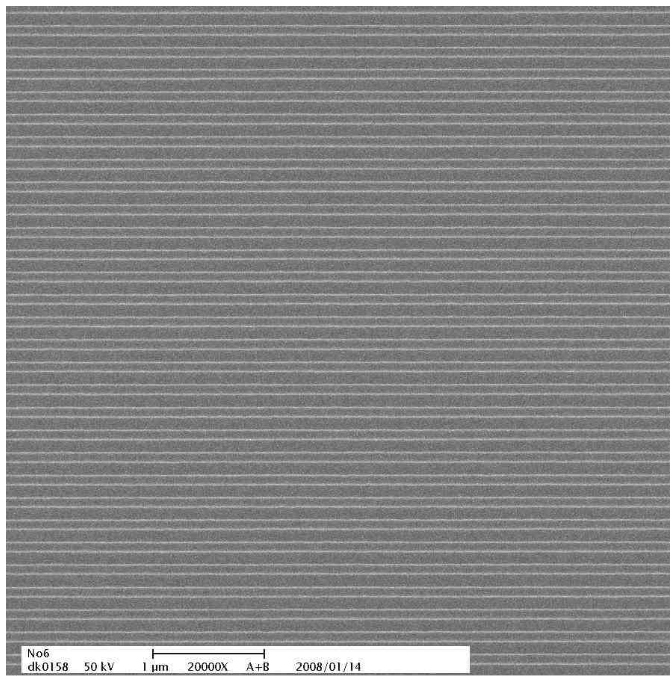
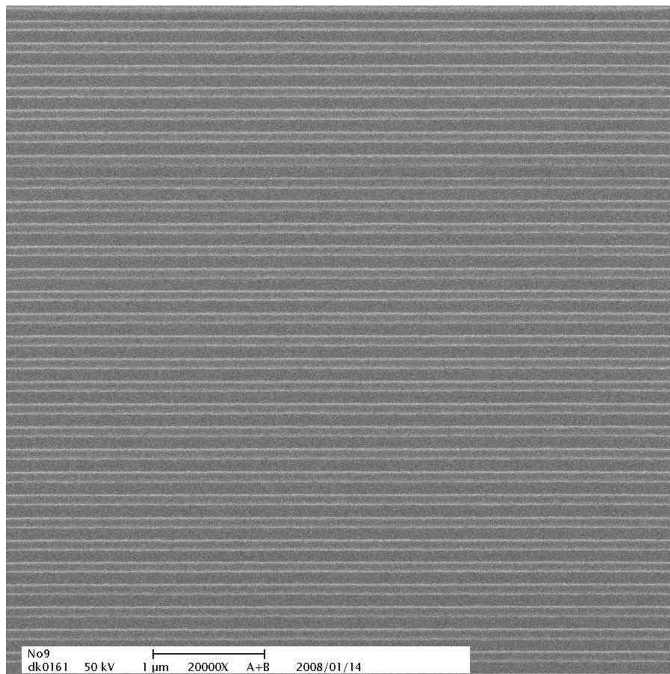

No6
dk0158 50 kV 1 µm 20000X A+B 2008/01/14


No9
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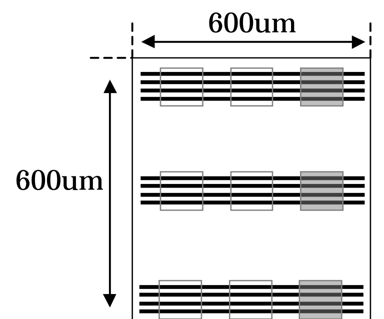
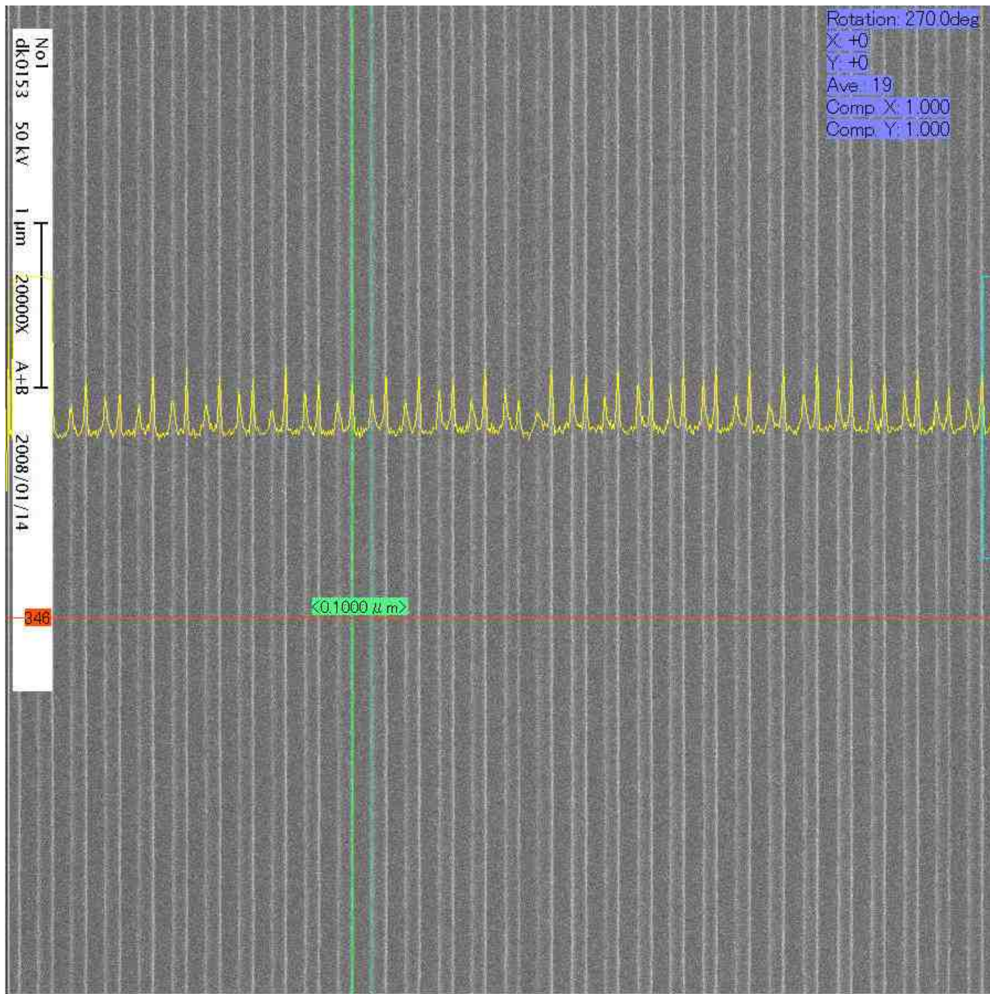

600um
600um



No1
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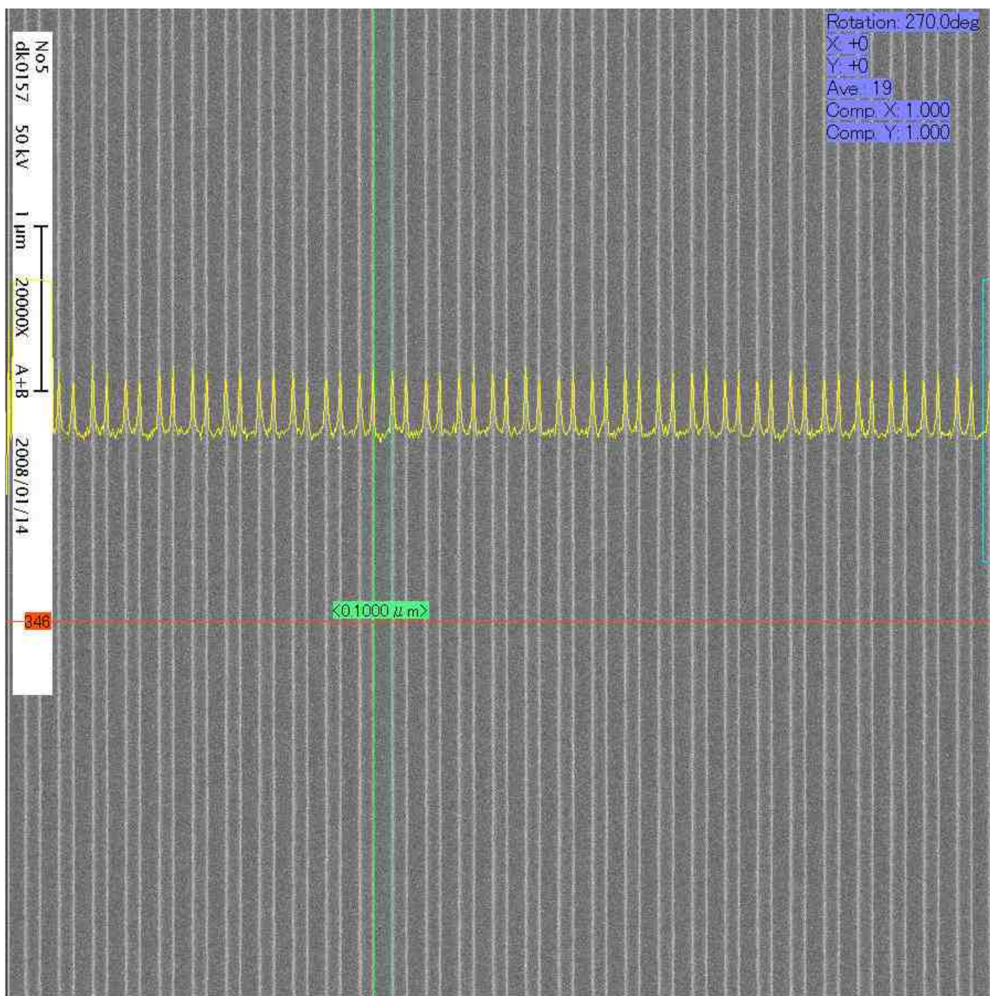
Comp. Y: 1.000
346
0.1000 μm



No5
dk0157 50 kV 1 μm 20000X A+B 2008/01/14
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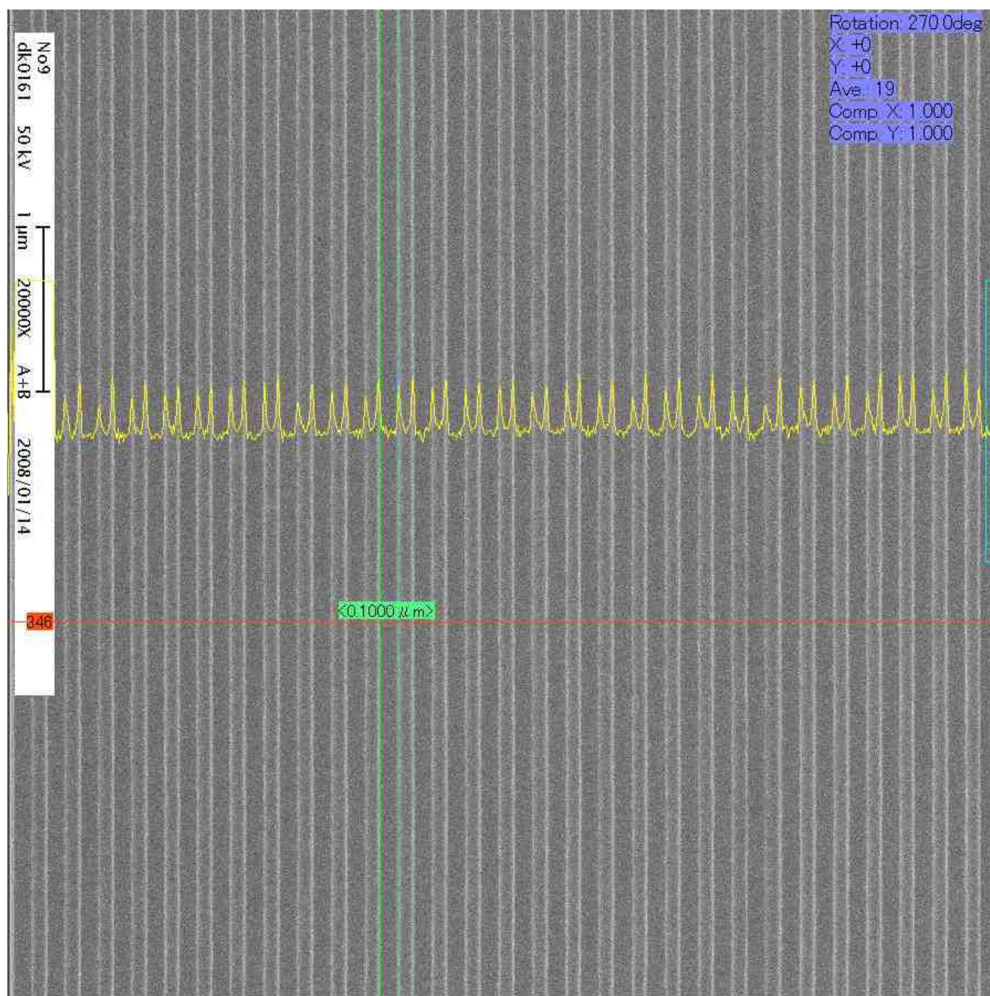
Comp. X: 1.000
Comp. Y: 1.000
346
0.1000 μm



No9
dk0161 50 kV 1 μm 20000X A+B 2008/01/14
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Comp. X: 1.000
Comp. Y: 1.000
<0.1000 μm>
346