

TECHNOLOGISCHES DURCHLAUFPROTOKOLL

Sample name: i3MS_V1

Process Name: E111 + 950 PMMA A4

 Date of start: *11.2.2019*

Date of completion:

Substrate: (4" wafer patterned as in Step I - cut to 10 x 10 mm² chips)

Material: prime FZ Si - undoped, 2 side polished

Orientation: 100

 Resistivity [Ω cm]: 10k - 1000k

 Thickness [μ m]: 252 \pm 10

Ordered from MicroChemicals (Art. # WFA40525100X1719SNN1)

	Process step	Date	Ini- tials	Signature	Remarks
STEP I:	large parts of CPW and DC antennas				
Resist	spin LOL 2000 30s at 4000 rpm bake 5 min at 140°C	16.08.2018	KS		
Resist	spin S1813 30s at 4000 rpm bake 2 min at 115°C	16.08.2018	KS		
Litho- graphy	MA6 soft contact, 3 sec exposure, mask: CPW+2DC	16.08.2018	KS		
Develop- ment	10 sec MF319	16.08.2018	KS		
Depo- sition	5 nm Ti / 100 nm Au	21.08.2018	BS		
Lift off	remover 1165 at 60°C (ultrasonic only after at least 10 min, best even in fresh remover)	23.08.2018	KS		
	4" wafer cut to 10 x 10 mm² chips - handled by Frau Schnabel - available in clean room				
STEP II:	magnetic structures				
Resist	EL 11 spinned 60s at 3000 rpm, no gyrset bake 5 min at 180°C → ~585 nm thick	<i>11.2.2019</i>			
Resist	950 PMMA A4 spinned 60s at 3000 rpm, no gyrset bake 5 min at 180°C → ~248 nm thick	<i>11.2.2019</i>			

	Process step	Date	Ini- tials	Signature	Remarks
EBL	machine: <i>eline</i> design: <i>GDSII \ i3MS \ i3MS-V1_</i> <i>skp1-NiFe.gds</i> layers: <i>2,61</i> aperture 10 kV, 10 μm , <i>19</i> mm; 17.6 <i>27.6</i> pA; 200 μm WF; 10 nm steps; area dose 100 $\mu\text{C}/\mu\text{m}^2$ → <i>2.76</i> mm/s	11.2.19		<i>KJS</i>	
Develop- ment	30 sec IPA:DI (3:7) stopper 30 sec IPA	12.2.19		<i>KJS</i>	
Depo- sition	50 nm Ni ₈₀ Fe ₂₀ / <i>5</i> nm Al	12.2.19		<i>P. Scheu</i>	
Lift off	acetone (with/without pipette)	14.2.19		<i>KJS</i>	
STEP III:	small parts of antennas				
Resist	EL 11 spinned 60s at 3000 rpm, no gyrset bake 5 min at 180°C → ~585 nm thick	14.2.19		<i>KJS</i>	
Resist	950 PMMA A4 spinned 60s at 3000 rpm, no gyrset bake 5 min at 180°C → ~248 nm thick	14.2.19		<i>KJS</i>	
EBL	machine: <i>eline</i> design: <i>GDSII \ i3MS \ i3MS-V1_</i> <i>step2 - antennas.gds</i> layers: <i>3,61</i> aperture 10 kV, 10 μm , <i>19</i> mm; 17.6 <i>27.6</i> pA; 200 μm WF; 10 nm steps; area dose 100 $\mu\text{C}/\mu\text{m}^2$ → <i>9.5</i> mm/s	14.2.19		<i>KJS</i>	I choose 20 μm aperture because 10 μm would've taken way too long! Now ~ 10.5 h exposure Stopped exposure at <u>G11</u>
Develop- ment	30 sec IPA:DI (3:7) stopper 30 sec IPA	14.2.19		<i>KJS</i>	
Depo- sition	5 nm Cr / 150 nm Au	19.2.19		<i>P. Scheu</i>	zu bedampfende Seite liegt unten, hat schon Au Kontakte drauf
Lift off	acetone (with/without ultrasonic)	27.2.19	TH	<i>T. Hecker</i>	