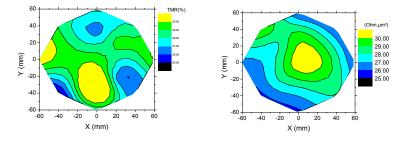
Batch Name	Date	
Comments	Responsible	

	PROCESS OVERVIEW	
	<ol> <li>MTJ stack deposition</li> <li>Cap Layer deposition – 30 nm Ta (Nordiko 3600)</li> </ol>	
	<ol> <li>Cap Layer deposition – 30 nm 1a (Nordiko 3600)</li> <li>1<sup>st</sup> Lithography DWL for BE</li> </ol>	
	a. PR coating	
	b. Exposure	
	c. Development	
	3. 1 <sup>st</sup> Etch by Ion Milling until substrate	
	4. PR Strip	
	5. 1 <sup>st</sup> Lithography E-beam for pillars (<100 nm)	
	a. E-beam resist coating	
	b. Exposure	
	c. Development	
	<ol> <li>2<sup>nd</sup> Etch by Ion Milling until 0.33 of MnIr (two-step)</li> </ol>	
	7. 300 nm SiO2 deposition by PECVD (Electrotech)	
	8. E-beam contrast layer deposition – 5 nm Ta (Nordiko 3600)	
	<ol> <li>2<sup>nd</sup> Lithography E-beam for Nano-vias (500 µm)</li> </ol>	
	a. PMMA coating	
	b. Exposure	
	c. Development	
	10. 3 <sup>rd</sup> Etch by Ion Milling for Ta removal (5 nm)	
	11. 1 <sup>st</sup> Reactive Ion Etching until top pillar	
	12. PMMA removal	
	13. 4 <sup>th</sup> Etch by Ion Milling for Ta removal (5 nm)	
	14. 2 <sup>nd</sup> Lithography DWL for Vias to pads	
	a. PR coating	
	b. Exposure c. Development	
	15. 2 <sup>nd</sup> Reactive Ion Etching until BE	$\overline{}$
	16. PR Strip	
=	17. 3 <sup>rd</sup> Lithography DWL for TE	
_	a. PR coating	
	b. Pre-development	
	c. Exposure	
	d. Development	
	18. 40 nm Ru deposition (Nordiko 3600)	
	19. 300 nm Al + 15 nm TiWN <sub>2</sub> deposition (Nordiko 7000)	
	20. Metal lift-off	
<b>↑</b>	TEMERENERS ENDER STORE FOR THE STORE IS TO BE THE STORE IS TO BE THE STORE IS THE STORE IS TO BE THE STORE IS T	
	Incorporate production and a second production of the second sec second second sec	

Step 0	Junction Stack	Date	
		Responsible	

Machine: Nordiko 3000

ID	Stack		Total thickness
TJ 1587	Si// AlOx/Ru 50/ AlOx 6/ CoFeB 3	832 Å 1132 Å (w/ cap layer)	
CIPT current in plane tunneling	TMR ≈ 30%	RxA ≈ 30 Ω.µm²	



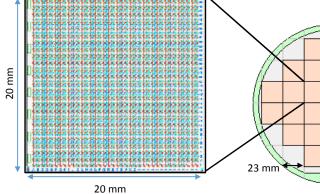
Step 1	Ta cap layer deposition	Date	
		Responsible	

Sample	Total to deposit	Total deposition Time	Observations
	30 nm Ta		

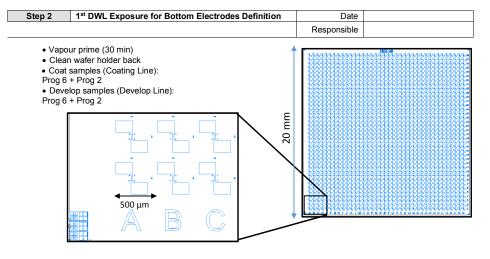
Machine:	Nordiko 3600	B.P.=7.5x10 <sup>-8</sup>
Process steps:		

Read Values	RF Power	V1	11	V2	12	Gas Flux	Working
Redu values	(W)	(V)	(mA)	(V)	(mA)	(sccm)	Pressure
Assist. Gun	123	986.6	119.9	270.0	1.6	4.1 Xe	(Torr) 1.8x10 <sup>-6</sup>
					· · ·	~	

Ready for the next Step: \_\_\_\_\_



11.9 mm



Machine:	DWL	-				
Map: Wafer_20mmdies		Mask:	nanoMTJ_20mm_L	_1		
Nr. Dies	28	1 <sup>st</sup> Cro [from (0;0) map]	mm of	( <b>168;54</b> ) um (19946;54) um (168;19946) um (19946;19946) um	1 <sup>st</sup> Die (D <sub>y</sub> )	11900 um from flat notch
Focus	-20	Energy	80		1 <sup>st</sup> Die (D <sub>x</sub> )	23000 um from wafer border

$\leq$	Optical Inspection	Comments

Ready for the next Step: \_

Responsible		
	Done	

Clean etching holder with acetone before etching + back of sample to remove unwanted PR that can cause PR to burn. Be careful with the acetone not to go on top of the sample

Sample	Total to etch (1st)	Total etching Time	Observations
	60 degrees		Etch all 1132 Å height until susbtrate + 10% overetch Clean border of wafer with acetone carefully for full etch check (resistance)

Machine:	Nordiko 3600	B.P.= 7.5x10 <sup>-8</sup>
Batch recipe:		
Wafer Recipe:		
Process steps:		

Read Values	RF Power	V1	l1	V2	l2	Gas Flux	Working
	(W)	(V)	(mA)	(V)	(mA)	(sccm)	Pressure
Assist. Gun	191	723.8	104.4	344.3	3.2	11.2 Ar	(Torr) 1.38x10 <sup>-4</sup>

(Check with multimeter) Ready for the next Step:

Step 4	PR removing			Date	
				Responsible	
Start @:		End @:	Tot	al Time:	

End @:

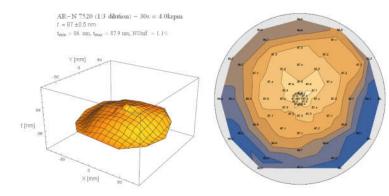
Ready for the next Step: \_

(if stack has CuN donot use microstrip, only acetone without temperature)

> Date Responsible

Step 5 1<sup>st</sup> Lithography E-beam for pillars definition (< 100 nm)

- 120s pre-bake at 110°C (Manual-Program 2, Develop Line)
- Fill syringe with AR-N 7520 (1:3 dilution) (≈5 mL for each wafer)
- Purge manually
- Coat samples (Automatic, Coating Line)
- 30s spin at 4 krpm (Prog 2) + 60s soft-bake at 85°C (Prog 2)
- Run a dummy wafer before wafer sample
- Run wafer sample
- Clean syringe and coat lines with N<sub>2</sub> (Manual-Program 9, Coating Line)



Check list for e-beam exposure:

- Load wafer sample on the 150mm wafer holder;
- Set 20 kV acceleration voltage // 10 µm Apperture size // Z=17 mm// WD≈7.2 mm •
- Wafer sample surface level •
- Choose 6" wafermap layout and adjust perimeter and deskew marks ٠
- Map: multilvlmisalig.csf, choose layers: automatic marks (61), pillar exposure (04) and nonius . exposure ER (03)
- Focus, adjust stigmation, aperture alignment and write field alignment (500 μm). Focus again
- 3-Point Alignment with die map. Write field alignment and focus again •
- Set parameters for exposure (Area dose: 300 µC/cm<sup>2</sup> (factor: 0.4); Dot dose: 0.005 pC (factor: 8) • (for ø55-65 nm)
- Set Control Focus by Stage and start exposure

Note: Do not expose dot on 1st line of each die from (column A-E, K-O, etc... [in each 5 elements])

Machine Raith 150

Read Values	Current	Area dose	A. step	A. Dwell	Beam speed	Dot dose	D. Dwell
	(pA)	(uC/cm <sup>2</sup> )	size (nm)	Time (us)	(mm/s)	(pC)	Time (ms)
E-beam		300				0.005	

Develop wafer sample:

<

- 120s pre-bake at 85°C (Manual-Program 4, Coating Line)
- Cool sample manually
- 70s develop using developer for 80nm thick resist (2:1 dilution with H₂O) (Manual-Program 1, Developing Line). Pour developer when it stops rotating (≈50mL is enough)

Step 6	2 <sup>nd</sup> Etch by Ion Milling until 0.33 of MnIr (2 steps)	Date	
		Responsible	

Clean etching holder with acetone before etching + back of sample to remove unwanted PR that can cause PR to burn. Be careful with the acetone not to go on top of the sample

Sample	Total to etch (1st)	Total etching Time	Observations
	60 degrees (until AlOx barrier)		Etch 486 Å until barrier (60 degrees) + 136 Å until 0.33 of MnIr (30 degrees)
	30 degrees (until 0.66 of MnIr)		Use calibration glass sample with stack until AlOx to check etch until barrier
			(glass// CoFeB 30/ Ru 150/ Ta 300)

Machine:	Nordiko 3600	B.P.= 7.5x10 <sup>-8</sup>
Batch recipe:		
Wafer Recipe:		
Process steps:		

Read Values	RF Power (W)	V1 (V)	l1 (mA)	V2 (V)	12 (mA)	Gas Flux	Working Pressure
	191	723.8	(IIIA) 104.4	344.3	(IIIA) 3.2	(sccm) 11.2 Ar	(Torr)
Assist. Gun							1.38x10-4

Step 7	Oxide Deposition	Date	
		Responsible	

	Done
Use of calibration sample (Si substrate) Si substrate w/ pen line)	
Ink line on top of the sample	

sit:	3000 A (nominal value)		Total deposition time:		15s
Electrot	ech				
essure )	P before plasma (mT)	P working (mT)	Turbo Pump freq. (Hz)	Gas flux (sccm)	Power - Fwd/Ref (W)
7				125 SiH4	
				2500 NO2	
Comments Cover with ink the edges of each dies to protect alignment marks and borders of the dies from oxi (to be easier to SEM the samples on e-beam). Only remove ink after Ta deposition. Cover the bottom of some dies (1 <sup>st</sup> elements line in a die) to be possible to SEM pillars at the end the process. Only remove ink after Ta deposition. Cover with ink a line on the borders of the wafer. Remove ink after oxide deposition. Measure on profilometer oxide deposited.					
	Electrot essure ) 7 Cover v (to be e Cover t the pro- Cover v profilon	Electrotech essure P before plasma (mT) Cover with ink the edges of (to be easier to SEM the s Cover the bottom of some the process. Only remove Cover with ink a line on th profilometer oxide deposit	Electrotech essure P before plasma P working (mT) Cover with ink the edges of each dies tr (to be easier to SEM the samples on e- Cover the bottom of some dies (1 <sup>st</sup> eler the process. Only remove ink after Ta c Cover with ink a line on the borders of t profilometer oxide deposited.	Electrotech         essure       P before plasma       P working       Turbo Pump freq.         (mT)       (mT)       (H2)         7       (mT)       (H2)         Cover with ink the edges of each dies to protect alignment (to be easier to SEM the samples on e-beam). Only remove Cover the bottom of some dies (1 <sup>st</sup> elements line in a die) to the process. Only remove ink after Ta deposition.         Cover with ink a line on the borders of the wafer. Remove i	Electrotech       Control of the provided pr

Step 8	5nm Ta deposition	Date	
		Responsible	

	to deposit	Sample
5 nm Ta	5 nm Ta	

Machine:	Nordiko 3600	B.P.= 7.5x10 <sup>-8</sup>
Process steps:		

	Read Values	RF Power	V1	11	V2	12	Gas Flux	Working
	Reau values	(W)	(V)	(mA)	(V)	(mA)	(sccm)	Pressure
-	Assist. Gun	123	986.6	119.9	270.0	1.6	4.1 Xe	(Torr) 1.8x10 <sup>-6</sup>

Ready for the next Step: \_\_\_\_

Step 9	2 <sup>nd</sup> Lithography E-beam for nano-vias definition (500 nm)	Date	
		Responsible	
• 120s r	pre-bake at 110°C (Manual-Program 2, Develop Line)		

- 120s pre-bake at 110°C (Manual-Program 2, Develop Line)
- Coat samples (Manual, Coating Line)

30s spin at 3 krpm (Prog 3) + 4 min soft-bake at 160°C (hot plate)

Check list for e-beam exposure:

- Load wafer sample on the 150mm wafer holder;
- Set 10 kV acceleration voltage // 10 µm Apperture size // Z=17 mm// WD≈7.2 mm
- Wafer sample surface level
- Choose 6" wafermap layout and adjust perimeter and deskew marks
- Map: multilvlmisalig.csf, choose layers: automatic marks (61), pmma holes (05) and nonius exposure PMMA (06)
- Focus, adjust stigmation, aperture alignment and write field alignment (500 μm). Focus again
- 3-Point Alignment with die map. Write field alignment and focus again
- Set parameters for exposure (Area dose: 100 µC/cm<sup>2</sup> (factor: 1.3 for nonius and 1.5 for holes)
- Set Control Focus by Stage and start exposure

Machine:	Raith 150				
Read Values	Current	Area dose	A. step	A. Dwell	Beam speed
Reau values	(pA)	(uC/cm <sup>2</sup> )	size (nm)	Time (us)	(mm/s)
E-beam		100			

• 80s develop using AR 600-55 (MIBK). Use IPA as stopper for developing process

Step 10 3rd Etch by Ion Milling for Ta removal (5 nm)	Date		-
	Responsible		
		Done	

Clean etching holder with acetone before etching + back of sample to remove unwanted PR that can cause PR to burn. Be careful with the acetone not to go on top of the sample

Sample	Total to etch (1st)	Total etching Time	Observations
	60 degrees (for 5 nm Ta removal		Etch enough for 5 nm Ta removal

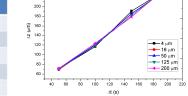
Machine:	Nordiko 3600	B.P.= 7.5x10 <sup>-8</sup>
Batch recipe:		
Wafer Recipe:		
Process steps:		

	Read Values	RF Power (W)	V1 (V)	l1 (mA)	V2 (V)	l2 (mA)	Gas Flux (sccm)	Working Pressure
≤	Assist. Gun	191	723.8	104.4	344.3	3.2	11.2 Ar	(Torr) 1.38x10 <sup>-4</sup>

Step 11	1 <sup>st</sup> Reactive Ion Etching until top pillar	Date	
		Responsible	

	Machine	Rainbow	Lam 4500	]				
_	Recipe	Low pow	ver no O2					
_	Read Values	RF Power (W)	Ar flow (sccm)	CF4 flow (sccm)	Pressure (mTorr)	Wap	Clamp	
_		100	200	100	140		1.3	
_	Notes	Etch the Si		y to the meas th for different				and to the etch

	Δz (nm)						
Hole (µm)	∆t=50s	∆t=100s	∆t=150s	∆t=200s			
4	72.4	118.3	174.1	239.3			
16	72.5	116.0	170.9	234.2			
50	70.2	117.0	171.8	235.5			
125	71.1	117.8	171.3	233.6			
200	73.6	117.4	171.6	234.5			



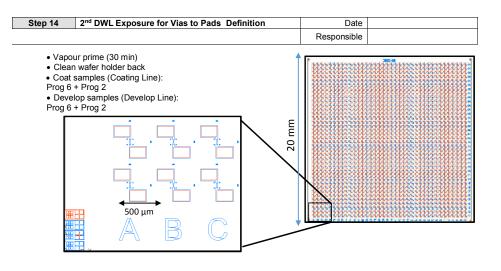
240 220 -

Step 12	PMMA removal	Date	
		Responsible	
	<b>F</b> 10		
Start @:	End @:	Temperature	60°C
	F	Remover: AR 300-72	
Step 13	4 <sup>th</sup> Etch by Ion Milling for Ta removal (5 nm)	Date	
Step 13	4 <sup>th</sup> Etch by Ion Milling for Ta removal (5 nm)	Date Responsible	

Sample	Total to etch (1st)	Total etching Time	Observations
	60 degrees (for 5 nm Ta removal		Etch enough for 5 nm Ta removal

Machine:	Nordiko 3600	B.P.= 7.5x10 <sup>-8</sup>
Batch recipe:		
Wafer Recipe:		
Process steps:		

Read Val	les	RF Power (W)	V1 (V)	11 (mA)	V2 (V)	12 (mA)	Gas Flux (sccm)	Working Pressure
Assist. G	un	191	723.8	104.4	344.3	3.2	11.2 Ar	(Torr) 1.38x10 <sup>-4</sup>



Etch depth for different RIE etch step on SiO2 (PECVD)

 $\leq$ 

Machine: DWL Map: Wafer_	20mmdies Mas	k nanoMT I	_20mm_L2				Map:		NL /afer_20mmd	ies Mask.	nanoMTJ_2	)mm I 3			
viap. vvalei_		(168;54) u					Map.				(168;54) um				
Nr. Dies 28 [	1 <sup>st</sup> Cross [from (0;0) mm ( map]	(10046-64)	) um Տ) um	1 <sup>st</sup> Die (D <sub>y</sub> )	11900 um from notch	flat	N	. Dies 28	[from (0	Cross (0) mm of ap]	(19946;54) u (168;19946) u (19946;19946)	n m	1 <sup>st</sup> Die (D <sub>y</sub> )	11900 um fror notch	m flat
Focus -20 Er	nergy 80			1 <sup>st</sup> Die (D <sub>x</sub> )	23000 um froi wafer border		Focu	s -20	Energy	90			1 <sup>st</sup> Die (D <sub>x</sub> )	23000 um fr wafer bord	
Optical Inspection			Co	omments				Optical Inspection				Com	ments		
				Ready for the r	next Step:		l					Re	eady for the ne	xt Step:	_
Step 15 2 <sup>nd</sup> Rea	ctive Ion Etchi	ng until PE			Date		Sta	n 49 - 40 m	m Du lover e	lanaaitian				Date	
Step 15 2 Rea	clive ion Etchi	ng unui BE		Res	ponsible		Sle	p18 40 n	m Ru layer c	eposition			Respo		
					P								Respu		
	Rainbow Lam 4						Г	Sample	Total to dep	osit 1	otal depositio	n Time   Oh	servations		
	Low power no Power Ar		flow Press	sure Wap	Clama		-	20	40 nm						
Read Values		flow CF4 t cm) (scc			Clamp		L		-						
	100 2	00 10	00 14	0	1.3		Γ	Machine	: Nordik	o 3600				B.P.=	
Et	ch the SiO2 acr	ordingly to the	measureme	nt values of the	oxide deposited and	d to the etch		Process							
Notes				tch steps (table				steps	:						
										)/4	14	1/0	10	Cas Flux	\ <b>\</b> /~~l·
<u>_</u>								Read Values	RF Power (W)		11 (mA)	V2 (V)	l2 (mA)	Gas Flux (sccm)	
									RF Power (W)	V1 (V)	l1 (mA)		l2 (mA)	Gas Flux (sccm)	Press
	oving (Lift-off	)			Date			Read Values Assist. Gun				(V)	(mA)	(sccm)	Press
	oving (Lift-off	)		Res	Date ponsible							(V)		(sccm)	Press
	loving (Lift-off	)			ponsible		Sti	Assist. Gun	(W)	(V)	(mA)	(V)	(mA)	(sccm) xt Step:	Press
		) End @:		Res Total Lift-Of	ponsible		Str	Assist. Gun		(V)	(mA)	(V)	(mA)	(sccm)	Worki Press (Tor
Step 16 PR rem				Total Lift-Of	ponsible ff Time:	re)	Ste	Assist. Gun	(W)	(V)	(mA)	(V)	(mA)	(sccm) xt Step:	Press
Step 16 PR rem				Total Lift-Of	ponsible ff Time: lometer for rabbit ear	rs)	Ste	Assist. Gun	(W)	(V)	(mA)	(V)	(mA)	(sccm) xt Step:	Press
Step 16 PR rem		End @:		Total Lift-Of (check on profi Ready for the r	ff Time: lometer for rabbit ear next Step: Date	rs)	St	Assist. Gun	(W)	(V)	(mA)	(V) Re	(mA)	(sccm) xt Step:	Press (Tor
Step 16 PR rem		End @:		Total Lift-Of (check on profi Ready for the r	ff Time:	rs)	St	Assist. Gun	(W)	Deposition mod.2	(mA)	(V) Re	(mA) eady for the new Response	(sccm) xt Step: Date pnsible p=3mTorr, 50 sc	Press (Tor
Step 16     PR rem       Start @:	xposure for Th	End @:		Total Lift-Of (check on profi Ready for the r	ff Time: lometer for rabbit ear next Step: Date	rs)	Str	Assist. Gun	(W)	mod.2 - mod.4 -	(mA)	(V) 	(mA) eady for the ne Respondence P=60W/40W, P=2 kW, 3mTe	(sccm) xt Step:	Press (Tor
Step 16     PR rem       Start @:	xposure for TE min) er back	End @:		Total Lift-Of (check on profi Ready for the r	ff Time: lometer for rabbit ear next Step: Date	rs)	St	Assist. Gun	(W)	mod.2 - mod.4 -	(mA)	(V) 	(mA) eady for the ne Respondence P=60W/40W, P=2 kW, 3mTe	(sccm) xt Step: Date onsible p=3mTorr, 50 scc orr, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line):	End @:		Total Lift-Of (check on profi Ready for the r	ff Time: lometer for rabbit ear next Step: Date	rs)	Str	Assist. Gun	(W)	mod.2 - mod.4 -	- f.9 (1' soft - f.1 (3000A f.19 (150A	(V) Re sputter etch) Al, 80'') TiWN <sub>2</sub> , 27'')	(mA) eady for the ne Respondence P=60W/40W, P=2 kW, 3mTe	(sccm) xt Step: Date onsible p=3mTorr, 50 scc orr, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line):	End @:		Total Lift-Of (check on profi Ready for the r	ff Time: lometer for rabbit ear next Step: Date	rs)		Assist. Gun	(W)	(V)	- f.9 (1' soft - f.1 (3000A f.19 (150A	(V) 	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3m	(sccm) xt Step: Date onsible p=3mTorr, 50 scc orr, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date	rs)		Assist. Gun	(W)	(V)	- f.9 (1' soft - f.9 (1' soft - f.1 (30004 f.19 (150A Readings	(V) Re sputter etch) Al, 80'') TiWN2, 27"') – Module 2	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3m	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar iTorr, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line):	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date	IS)	St	Assist. Gun	(W)	(V)	- f.9 (1' soft - f.9 (1' soft - f.1 (30004 f.19 (150A Readings	(V) Re sputter etch) Al, 80'') TiWN2, 27"') – Module 2	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3m	(sccm) xt Step: Date p=3mTorr, 50 sc orr, 50 sccm Ar iTorr, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profi Ready for the r	ff Time: lometer for rabbit ear next Step: Date	(21	St	Assist. Gun	(W)	(V)	(mA) - f.9 (1' soft - f.1 (3000A f.19 (150A Readings Power2 Readings	(V) Re sputter etch) Al, 80'') TiWN2, 27"') – Module 2	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3mT X Pres	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar artor, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date	(a)	Str	Assist. Gun	(W)	(V)	(mA) - f.9 (1' soft - f.1 (3000A f.19 (150A Readings Power2 Readings	(V) Re sputter etch) Al, 80'') TiWN2, 27'') – Module 2 Gas flu – Module 4	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3m	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar artor, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date	rs)	St	Assist. Gun	(W) Ontact Leads Nordiko 7000 ad) - Powe	(V)	(mA) - f.9 (1' soft - f.1 (3000A f.19 (150A Readings Power2 Readings	(V) Re sputter etch) Al, 80'') TiWN2, 27'') – Module 2 Gas flu – Module 4	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3mT X Pres	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar artor, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date	IS)	St	Assist. Gun	(W)	(V)	n (mA)	(V) Re sputter etch) Al, 80'') TiWN2, 27'') – Module 2 Gas flu  - Module 4 rent	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3mT X Pres	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar artor, 50 sccm Ar	Press (Tor
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date	rs)		Assist. Gun	(W) (W) (W) (W) (W) (W) (W) (W)	(V)	n (mA)	<pre>(V) (V) Re Re Substrate of the second s</pre>	(mA) erady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3m x Pres Gas flux	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar artor, 50 sccm Ar	Press (Tor 
Step 16     PR rem       Start @:	Exposure for TE min) er back bating Line): (Develop Line)	End @:		Total Lift-Of (check on profil Ready for the r Resp	ff Time: lometer for rabbit ear next Step: Date		St	Assist. Gun	(W)	(V)	n (mA)	<pre>(V) (V) Re Re Substrate of the second s</pre>	(mA) eady for the ne: Respond P=60W/40W, P=2 kW, 3mT P=0.5 kW, 3mT X Pres	(sccm) xt Step: Date p=3mTorr, 50 scc orr, 50 sccm Ar artor, 50 sccm Ar	Press (Tor

Step 20	PR removing (Lift-off)	Date	
		Responsible	

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Start @:		End @:	Total Lift-Off Time:	

Ready for the next Step: \_\_\_\_\_