Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Clean 1	**Estimated time=**	**61**	**minutes**				
1	Piranha	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	Use Diffusion CLean Bench	Use Proper PPE	
2	Dump Rinse			5			
3	BOE DIP	Bath Temp ~20oC	20:1 BOE	2	Use Diffusion CLean Bench	Use Proper PPE	
4	Dump Rinse			5			
5	Piranha	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	Use Diffusion CLean Bench	Use Proper PPE	
6	Dump Rinse			5			
7	BOE DIP	Bath Temp ~20oC	20:1 BOE	2	Use Diffusion CLean Bench	Use Proper PPE	
8	Dump Rinse			5			
9	RCA	Bath Temp 70oC	HCl:H2O2:H2O 1:1:6	10	Use Diffusion CLean Bench	Use Proper PPE	
10	Dump Rinse			5			
11	BOE DIP	Bath Temp ~20oC	20:1 BOE	2	Use Diffusion CLean Bench	Use Proper PPE	
12	Dump Rinse			5			
13	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
14	Take out Wafers	Turn off N2	Dot in, H out	0			

Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Screen Oxide	**Estimated time=**	**115**	**minutes**				
1	Load	900oC	N2:4SLM	10	Shiny side of wafer facing into furnace, every other slot, order, 2 dummies-5 device-2 dummies	Push Quartz boat until last wafer is past ceramic ring.	
2	Push	900oC	N2:4SLM	15	Use quartz rod		
3	Ramp	900oC to 1100oC	N2:4SLM	15	Cap on, Restrictor on, Door open		
4	Stabilize	1100oC	N2:4SLM	5	Cap on, Restrictor on, Door open		
5	Soak	1100oC	O2:10SLM	30	Cap on, Restrictor on, Door open restictor value close 1/3		
6	Purge	1100oC	N2:10SLM	10	Cap on, Restrictor on, Door open		
7	Pull	1100oC	N2:4SLM	20	Use quartz rod		
8	Cool	Room Temp	Transfer wafers to cool quartz boats	10	Turn of gas flows	Ramp furnace back down	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
PWELL Implant	**Estimated time=**	**15**	**minutes**				
1	Inspect	Blue color		10			

2	Implant (Inovian)	Species=B11	E=100keV	5	dose=8e13	Tilt=7	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Well Drive	**Estimated time=**	**1510**	**minutes**				
1	Load	900oC	N2:4SLM	10	Shiny side of wafer facing into furnace, every other slot, order, 2 dummies-5 device-2 dummies	Push Quartz boat until last wafer is past ceramic ring.	
2	Push	900oC	N2:4SLM	15	Use quartz rod		
3	Ramp	900oC to 1150oC	N2:4SLM	15	Cap on, Restrictor on, Door open		
4	Soak	1150oC	N2:4SLM	1440	Cap on, Restrictor on, Door open		
5	Pull	1150oC	N2:4SLM	20	Use quartz rod		
6	Cool	Room Temp	Transfer wafers to cool quartz boats	10	Turn of gas flows	Ramp furnace back down	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Pre OXIDE CLEAN	**Estimated time=**	**10**					
	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	Use Diffusion CLean Bench	Use Proper PPE		0
			5				0

Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Field Oxide	**Estimated time=**	**115**	**minutes**				
1	Load	900oC	N2:4SLM	10	Shiny side of wafer facing into furnace, every other slot, order, 2 dummies-5 device-2 dummies	Push Quartz boat until last wafer is past ceramic ring.	
2	Push	900oC	N2:4SLM	15	Use quartz rod		
3	Ramp	900oC to 1100oC	N2:4SLM	15	Cap on, Restrictor on, Door open		
4	Stabilize	1100oC	N2:4SLM	5	Cap on, Restrictor on, Door open		
5	Soak	1100oC	4SLM Wet	60	Cap on, Restrictor on, Door open, close restrictor valve 1/3	7mL HCL in 4L of DI at T=95°C Ensure N2 is flowing DI looks like is boiling due to N2 flow	
6	Purge	1100oC	N2:10SLM	10	Cap on, Restrictor on, Door open		
7	Pull	1100oC	N2:4SLM	20	Use quartz rod		
8	Cool	Room Temp	Transfer wafers to cool quartz boats	10	Turn of gas flows	Ramp furnace back down	
9	Inpsect	Measure Oxide Thickness	Should be over 4000A	10	Nanop SPec or Filmetrcs	5 points per wafer	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial

Mask 1 S/D PL	**Estimated time=**	**4.5**	**minutes**				
1	Singe	125oC	Air	1	Eric's Hotplate	Vacuum on	
2	Prime	3000 rmp	HMDS Prime	0.5	Use manual dispenser		
3	Spin PR	3000 rmp	Shipley	1	Use manual dispenser	Use automatic or Loral	
4	Pre-Bake	110oC	AIR	1			
5	Expose	XXmJ	Verify with dummy	?			
6	Post Expose Bake	110oC	AIR	1			
7	Develop	Room	Developer recipe	0.5		1.75% TMHA in DI (Use automatic developer or bucket)	
8	Hard Bake	120oC	AIR	1	hotplate	This is automatic if using the auto developer	
9	Inspect			10		Inspect wafers for alignment and quality. Redo if necessary (Error exceeds 4um)	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 1 S/D Etch	**Estimated time=**	**60**	**minutes**				
1	Measure Oxide thickness	Use Nano Spec	Use freshly BOE etched wafer to calibrate	10	Use thick setting on nano spec		
2	BOE ETCH	Bath Temp ~20oC	20:1 BOE	30	Use Etch Bench	Use Proper PPE	
3	Dump Rinse			5			
4	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
5	Take out Wafers	Turn off N2	Dot in, H out	0			
6	Measure Oxide thickness	Use Nano Spec	Use freshly BOE etched wafer to calibrate	10	Use thin setting on nano spec	Measuremeant must read below 20A, If not repeat etch for 5 minutes.	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial

P SOG Deposition	**Estimated time=**	**15.5**	**minutes**				
1	Piranha	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	Use Diffusion CLean Bench	Use Proper PPE	
2	Inpsect	Make sure PR is gone	Make sure fresh chemicals are used.				
3	Dump Rinse			5			
4	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
5	Take out Wafers	Turn off N2	Dot in, H out	0			
6	Spin on P-SOG	5X1020 phosphorus	RPM's = 3000 for 15 sec	0.5	Quantity SOG = 3 ml		
7	Bake	hotplate	110oC	1			
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	Operator
S/D Diffusion	**time=**	**125**	**minutes**				
1	Load	900oC	N2:4SLM, O2:2SLM	10	each wafer facing	ring. Face active sides of wafers together., at least	
2	Push	900oC	N2:4SLM, O2:2SLM	15	Use quartz rod		
3	Ramp	900oC to 1100oC	N2:4SLM, O2:2SLM	15	Restrictor on,		
4	Stabilize	1100oC	N2:4SLM, O2:2SLM	5	Restrictor on,		
5	Soak	1100oC	N2:4SLM, O2:2SLM	60	Restrictor on,		
6	Pull	1100oC	N2:4SLM, O2:2SLM	20	Use quartz rod		
7	Cool	Room Temp	cool quartz boats	10	Turn of gas flows	Ramp furnace back down	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
SOG STRIP	**Estimated time=**	**12**	**minutes**				
1	BOE DIP	Bath Temp ~20oC	20:1 BOE	2	Use Diffusion CLean Bench	Use Proper PPE	
2	Dump Rinse			5			
3	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
4	Take out Wafers	Turn off N2	Dot in, H out	0			

5	Measure Oxide Thickness	Do not meaure in S/D holes	Just Measure the Fieild Oxide	0	Just Make sure SOG is gone from Field Area	You can etch down to 4000A and be ok.	0
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 2 Gate PL	**Estimated time=**	**16**	**minutes**				
1	Singe	125oC	Air	1	Eric's Hotplate	Vacuum on	
2	Prime	3000 rmp	HMDS Prime	0.5	Use manual dispenser		
3	Spin PR	3000 rmp	Shipley	1	Use manual dispenser	Use automatic or Loral	
4	Pre-Bake	110oC	AIR	1			
5	Expose	XXmJ	Verify with dummy	?			
6	Post Expose Bake	110oC	AIR	1			
7	Develop	Room	Developer recipe	0.5		1.75% TMHA in DI (Use automatic developer or bucket)	
8	Hard Bake	120oC	AIR	1	hotplate	This is automatic if using the auto developer	
9	Inspect			10		Inspect wafers for alignment and quality. Redo if necessary (Error exceeds 4um)	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 2 Gate Etch	**Estimated time=**	**60**	**minutes**				
1	Measure Oxide thickness	Use Nano Spec	Use freshly BOE etched wafer to calibrate	10	Use thick setting on nano spec		
2	BOE ETCH	Bath Temp ~20oC	20:1 BOE	30	Use Etch Bench	Use Proper PPE	
3	Dump Rinse			5			
4	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
5	Take out Wafers	Turn off N2	Dot in, H out	0			

6	Measure Oxide thickness	Use Nano Spec	Use freshly BOE etched wafer to calibrate	10	Use thin setting on nano spec	Measuremeant must read below 20A, If not repeat etch for 5 minutes.	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Gate Clean	**Estimated time=**	**55**	**minutes**				
1	Piranha	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	Use Etch Bench	Use Proper PPE	
2	Dump Rinse			5	Make sure PR is removed		
3	BOE DIP	Bath Temp ~20oC	20:1 BOE	5 sec max	Use Difusion CLean Bench	Use Proper PPE	
4	Dump Rinse			5			
5	Piranha	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	0	Use Proper PPE	
6	Dump Rinse			5	Make sure PR is removed		
7	BOE DIP	Bath Temp ~20oC	20:1 BOE	5 sec max	Use Difusion CLean Bench	Use Proper PPE	
8	Dump Rinse			5			
9	RCA	Bath Temp 70oC	HCl:H2O2:H2O 1:1:6	10	Use Diffusion CLean Bench	Use Proper PPE	
10	Dump Rinse			5			
11	BOE DIP	Bath Temp ~20oC	20:1 BOE	5 sec max	Use Diffusion CLean Bench	Use Proper PPE	
12	Dump Rinse			5			
13	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
14	Take out Wafers	Turn off N2	Dot in, H out	0			

Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Gate Oxide	**Estimated time=**	**165**	**minutes**				
1	Load	700oC	N2:4SLM	10	Shiny side of wafer facing into furnace, every other slot, order, 2 dummies-5 device-2 dummies	Push Quartz boat until last wafer is past ceramic ring.	
2	Push	700oC	N2:4SLM	15	Use quartz rod		
3	Ramp	700oC to 900oC	N2:4SLM	15	Cap on, Restrictor on, Door open		
4	Stabilize	900oC	N2:4SLM	5	Cap on, Restrictor on, Door open	Make sure funrace was properly cleaned day before (wet ox with 150ml HCl into 3L DI)	
5	Soak	900oC	02:10SLM	35	Cap on, Restrictor on, Door open, restrictor valve closed 1/3		
6	Post Oxide Anneal	900oC	N2:10SLM	45	Cap on, Restrictor on, Door open		
7	Pull	900oC	N2:4SLM	20	Use quartz rod		
8	Cool	Room Temp	Transfer wafers to cool quartz boats	10	Turn of gas flows	Ramp furnace back down	
9	Inpsect	Measure Gate Oxide Thickness	Should be around 500A	10	Nanop SPec	5 points per wafer	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial

Mask 3 Conact PL	**Estimated time=**	**16**	**minutes**				
1	Singe	125oC	Air	1	Eric's Hotplate	Vacuum on	
2	Prime	3000 rmp	HMDS Prime	0.5	Use manual dispenser		
3	Spin PR	3000 rmp	Shipley	1	Use manual dispenser	Use automatic or Loral	
4	Pre-Bake	110oC	AIR	1			
5	Expose	XXmJ	Verify with dummy	?			
6	Post Expose Bake	110oC	AIR	1			
7	Develop	Room	Developer recipe	0.5		1.75% TMHA in DI (Use automatic developer or bucket)	
8	Hard Bake	120oC	AIR	1	hotplate	This is automatic if using the auto developer	
9	Inspect			10		Inspect wafers for alignment and quality. Redo if necessary (Error exceeds 4um)	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 3 Contact Etch	**Estimated time=**	**60**	**minutes**				
1	Measure Oxide thickness	Use Nano Spec	Use freshly BOE etched wafer to calibrate	10	Use thick setting on nano spec		
2	BOE ETCH	Bath Temp ~20oC	20:1 BOE	30	Use Etch Bench	Use Proper PPE	
3	Dump Rinse			5			
4	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
5	Take out Wafers	Turn off N2	Dot in, H out	0			
6	Measure Oxide thickness	Use Nano Spec	Use freshly BOE etched wafer to calibrate	10	Use thin setting on nano spec	Measuremeant must read below 20A, If not repeat etch for 5 minutes.	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial

Mask 3 PR Strip	**Estimated time=**	**20**	**minutes**				
1	Piranha	Bath Temp 110oC	H2SO4 (75%) + H2O2 (25%)	5	Use Etch Bench	Use Proper PPE	
2	Dump Rinse			5	Make sure PR is removed		
3	BOE DIP	Bath Temp ~20oC	20:1 BOE	5 sec max	Use Difusion CLean Bench	Use Proper PPE	
4	Dump Rinse			5			
5	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
6	Take out Wafers	Turn off N2	Dot in, H out	0			
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Metalize	**Estimated time=**	**122.5**	**minutes**				
1	Evaporate 1	Follow Proceedure		60			
2	Evaporate 2	Follow Proceedure		60			
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 4 Metal PL	**Estimated time=**	**4.5**	**minutes**				
1	Singe	125oC	Air	1	Eric's Hotplate	Vacuum on	
2	Prime	3000 rmp	HMDS Prime	0.5	Use manual dispenser		
3	Spin PR	3000 rmp	Shipley	1	Use manual dispenser	Use automatic or Loral	
4	Pre-Bake	110oC	AIR	1			
5	Expose	XXmJ	Verify with dummy	?			
6	Post Expose Bake	110oC	AIR	1			

7	Develop	Room	Developer recipe	0.5		1.75% TMHA in DI (Use automatic developer or bucket)	
8	Hard Bake	120oC	AIR	1	hotplate	This is automatic if using the auto developer	
9	Inspect			10		Inspect wafers for alignment and quality. Redo if necessary (Error exceeds 4um)	
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 4 Metal Etch	**Estimated time=**	**15**	**minutes**				
1	AL Etch	Bath Temp 60oC	AL Etch FRESH ETCH	5	Use Etch CLean Bench	Use Proper PPE	
2	Dump Rinse			5			
3	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
4	Take out Wafers	Turn off N2	Dot in, H out	0			
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Mask 4 PR Strip	**Estimated time=**	**20**	**minutes**				
1	Stripper	Bath Temp 60oC	microstrip 2001 Stripper	10	Stripper Bench	Use Proper PPE	
2	Dump Rinse			5	Make sure PR is removed		
3	Spin Rinse Dry	Turn on N2		5	Use correct SRD		
4	Take out Wafers	Turn off N2	Dot in, H out	0			
Step	Step Name	Process Detail 1	Process Detail 2	Time	Process Detail 3	Process Detail 4	DATE & Operator intial
Anneal	**Estimated time=**	**56**	**minutes**				
1	Load	450oC	90N2:10H2	5	every other slot	Push Quartz boat until last wafer is past ceramic ring.	

2	Push	450oC	90N2:10H3	6	Use quartz rod		
3	Soak	450oC	90N2:10H4	30	Cap on,		
4	Pull	450oC	90N2:10H5	5	Use quartz rod		
5	Cool	Room Temp	Transfer wafers to cool quartz boats	10	Turn of gas flows		