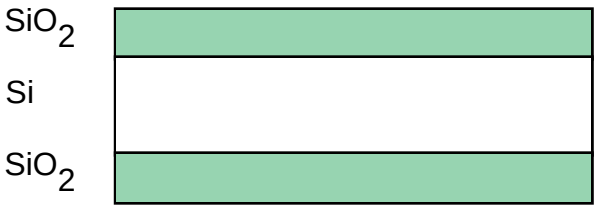
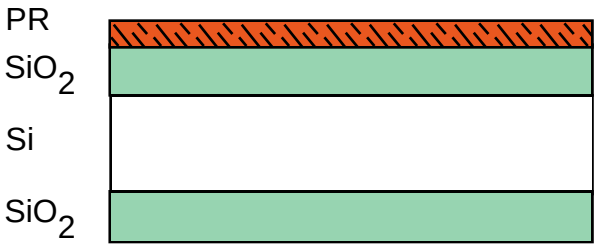
Silicon Wafer
Type ____ Orientation ____
Resistivity _____ Ω•cm Vendor _____
Cleaning:

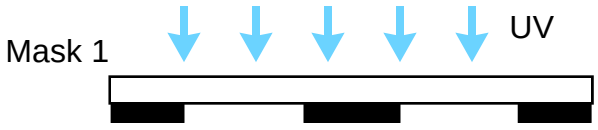


1.1 Diffusion masking and field oxide
Wet Oxidation
T = 1050 °C (actual: _____)
N_2 pre-oxidation time = 10 min. (_____)
Oxidation time = 2 hr. (_____)
N_2 post-oxidation time = 10 min. (____)
Thickness: _____



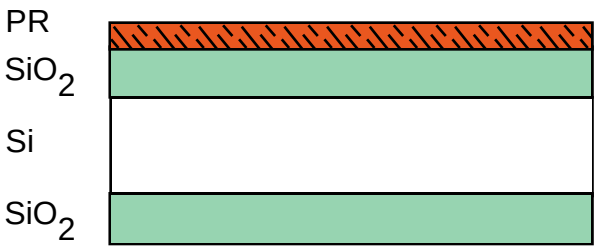
1.2 Photoresist coating
Shipley S1813 Microposit, positive PR

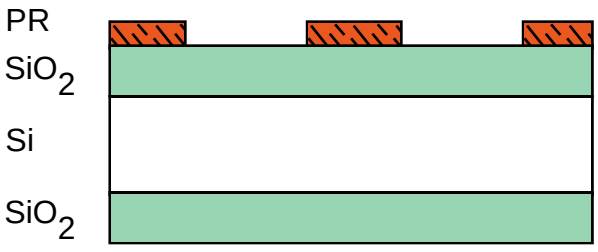
Apply HMDS for adhesion
Spin coat resist at 3000 rpm for 30 sec.
Soft bake on hot plate at 95 °C for 3 min.



1.3 Exposure
Mask 1: Source and drain diffusion

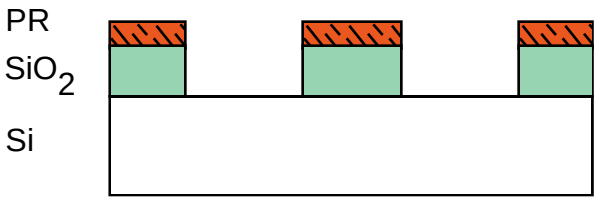
Expose for 90 sec.





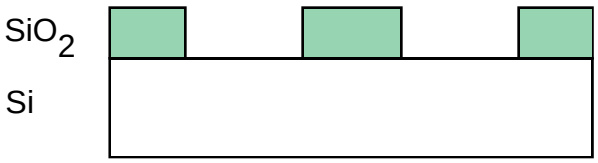
1.4 Photoresist developing
Shipley 352 developer

3 minutes development time
DI water rinse
Inspect to insure complete development
Hard bake at 120 °C for 3 min.



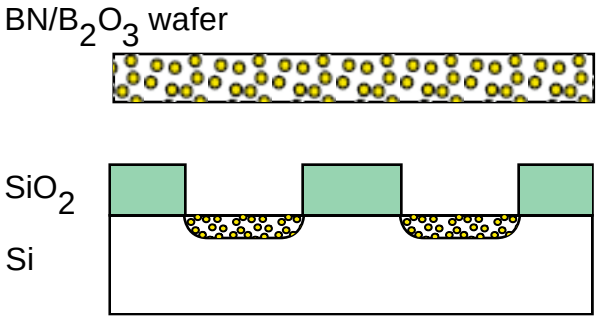
1.5 Oxide etch
Buffered oxide etch (BOE) 86 nm/min

Etch time = _____. Etch until de-wetting.
Inspect to ensure complete indow etch



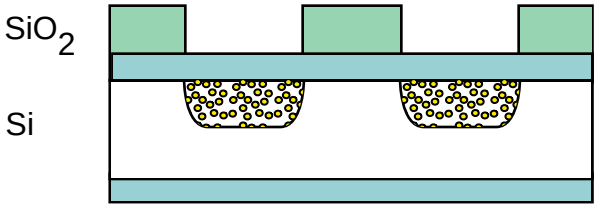
1.6 Resist stripping
Remove resist with acetone
Rinse off acetone with isopropanol
Rinse isopropyl alcohol with DI water

Inspect wafer



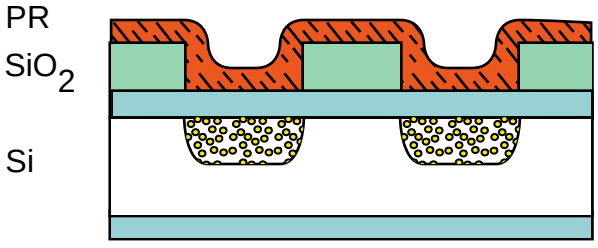
1.7 Dopant pre-deposition
BN planar diffusion source

1050 °C for 45 min. with N_2 flow
(should give approximately 10 Ω•cm)

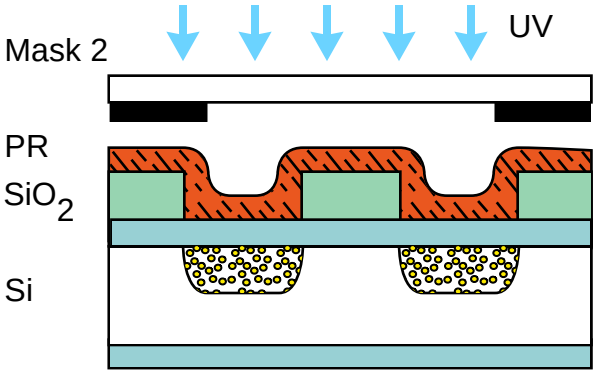


1.8 Dopant drive in
Dry oxidizing conditions

950 °C for 10 hours. with $N_2 + O_2$ flow



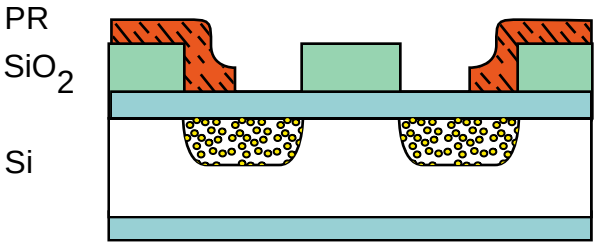
2.1 Photoresist coating
Shipley S1813 Microposit, positive PR
Apply HMDS for adhesion
Spin coat resist at 3000 rpm for 30 sec.
Soft bake on hot plate at 95 °C for 3 min.



2.2 Exposure

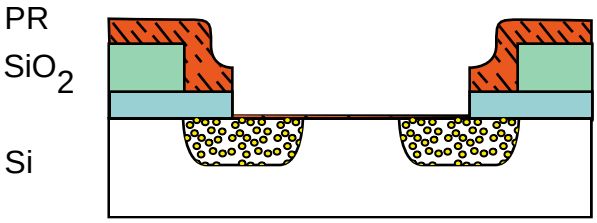
Mask 2: Gate oxide area definition

Expose for 90 sec.



2.3 Photoresist developing

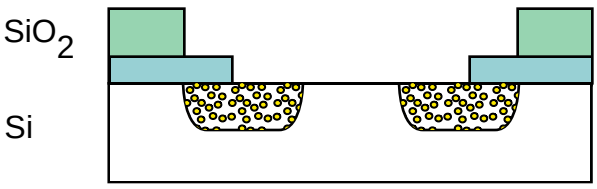
Shipley 352 developer
3 minutes development time
DI water rinse
Inspect to insure complete development
Hard bake at 120 °C for 3 min.



2.4 Oxide etch

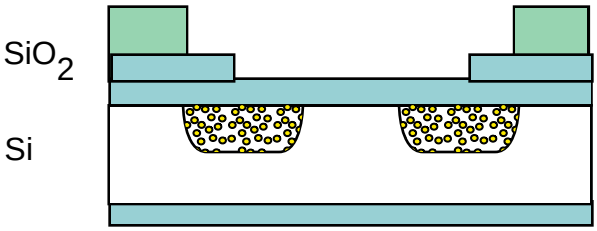
Buffered oxide etch (BOE) 86 nm/min

Etch time = _____. Etch until de-wetting.
Inspect to ensure complete window etch



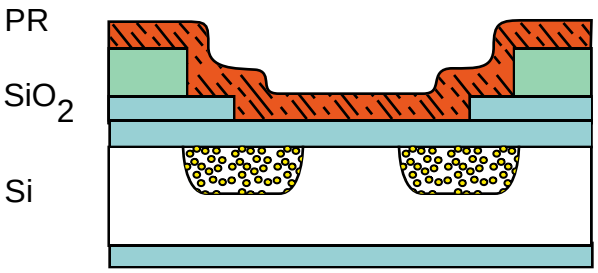
2.5 Resist stripping

Remove resist with acetone
Rinse off acetone with isopropanol
Rinse isopropyl alcohol with DI water
Inspect wafer



2.6 Gate oxide

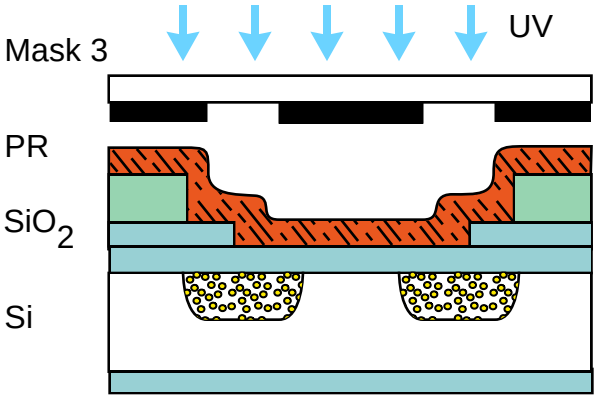
Dry Oxidation
T = 1000 °C (actual: _____)
N_2 pre-oxidation time = 10 min. (_____)
Oxidation time = 40 min. (_____)
N_2 post-oxidation time = 10 min. (____)
Thickness: _____



3.1 Photoresist coating

Shipley S1813 Microposit, positive PR

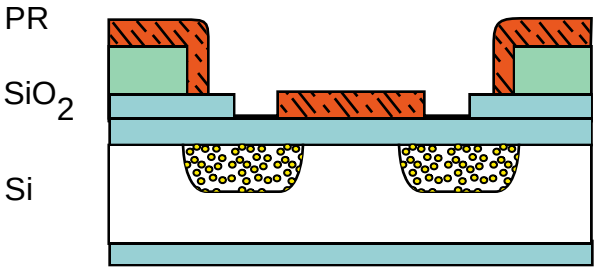
Apply HMDS for adhesion
Spin coat resist at 3000 rpm for 30 sec.
Soft bake on hot plate at 95 °C for 3 min.



3.2 Exposure

Mask 3: Contact via definition

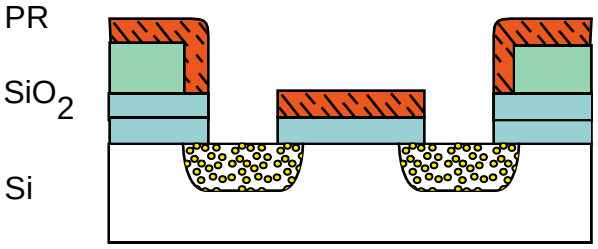
Expose for 90 sec.



3.3 Photoresist developing

Shipley 352 developer

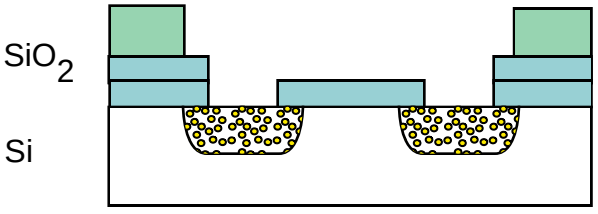
3 minutes development
DI water rinse
Inspect to insure complete development
Hard bake at 120 °C for 3 min.



3.4 Oxide etch

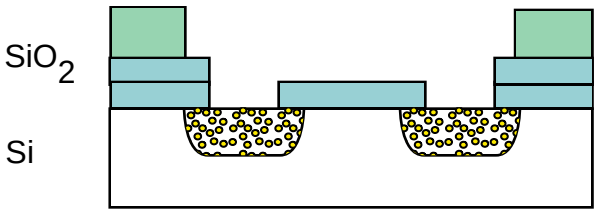
Buffered oxide etch (BOE) 86 nm/min

Etch time = _____. Etch until de-wetting.
Inspect to ensure complete indow etch



3.5 Resist stripping

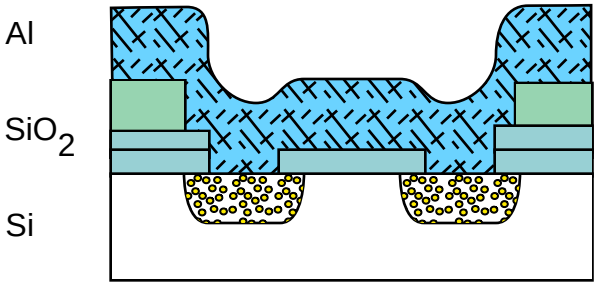
Remove resist with acetone
Rinse off acetone with isopropanol
Rinse isopropyl alcohol with DI water
Inspect wafer



3.6 Oxide etch

Light etch to clear contact holes before alluminum deposition.

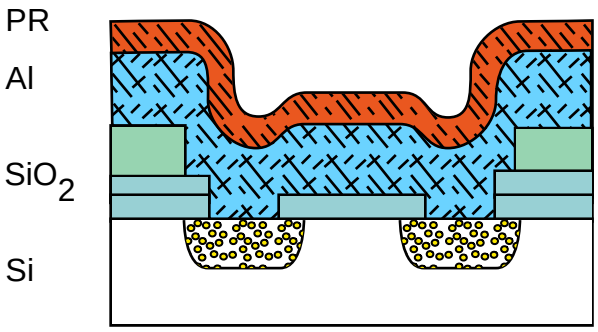
Buffered oxide etch (BOE) 86 nm/min
Etch time = _____. Etch until de-wetting.



3.7 Aluminum coating

Electron beam evaporation

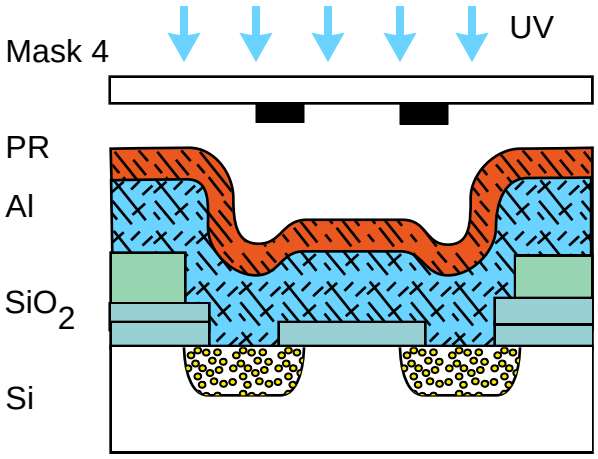
0.5 to 1.0 µm
Actual thickness: _____



4.1 Photoresist coating

Negative PR

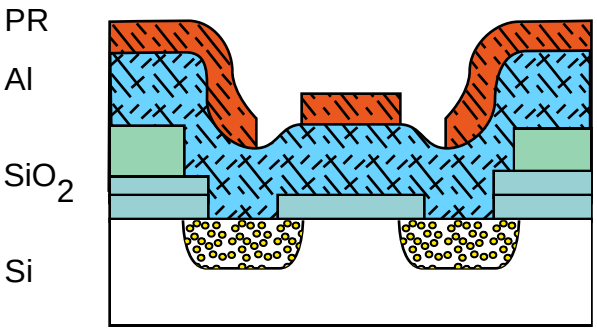
Spin coat resist at 3000 rpm for 30 sec.
Soft bake on hot plate at 95 °C for 3 min.



4.2 Exposure

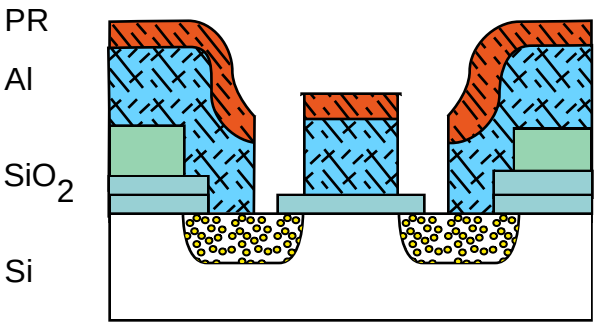
Mask 4: Metal patterning

Expose for 90 sec.



4.3 Photoresist developing
Negative photoresist developer

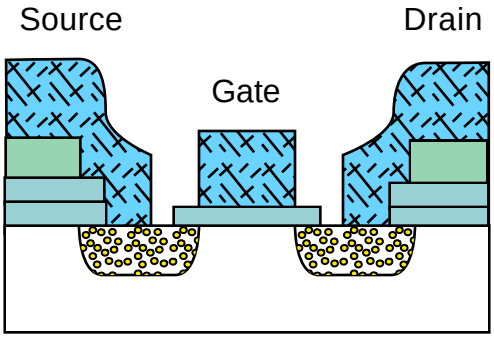
On spinner 600 rpm
Xylene 30 sec.
n-butyl acetate 40 sec.
Inspect to insure complete development



4.4 Aluminum etch
Aluminum etchant

At 80 °C on hot plate
for 1 min. or until pattern is clear

Inspect sample



4.5 Resist stripping
EKC 712 D photoresist remover

Rinse with acetone
Rinse off acetone with isopropanol
Rinse isopropyl alcohol with DI water

Inspect wafer