

NMOS Fabrication

N-MOS Fabrication Process



Fig. (1) Pure Si single crystal



Fig. (2) P-type impurity is lightly doped

N-MOS Fabrication Process

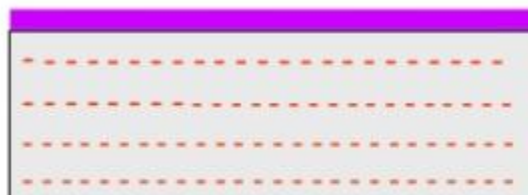


Fig. (3) SiO₂ Deposited over si surface

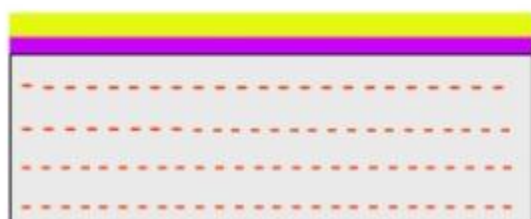


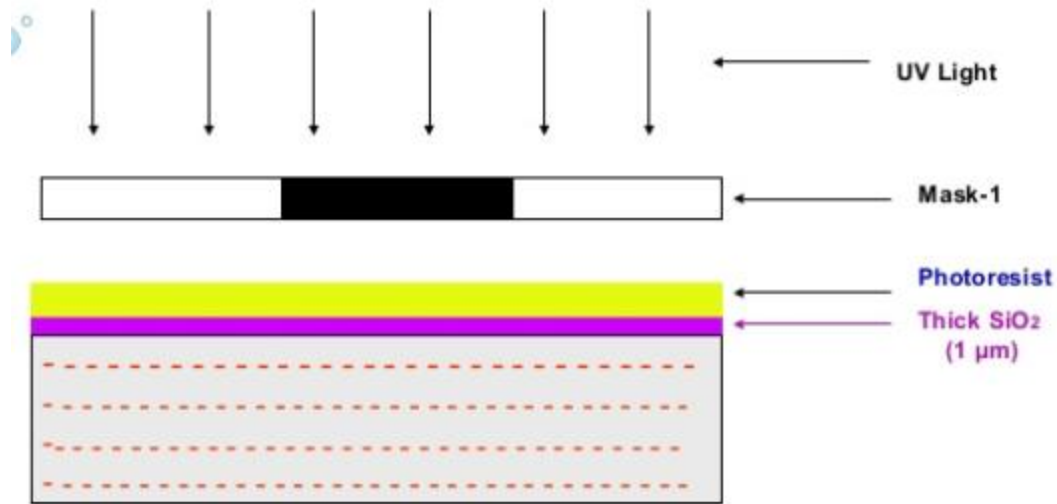
Fig. (4) Photoresist is deposited over SiO₂ layer

Thick SiO₂
(1 μm)

Photoresist
Thick SiO₂
(1 μm)

N-MOS Fabrication Process

Clip slide



Mask-1 is used to expose the SiO₂ where S, D and G is to be formed.

Fig. (5) Photoresist layer is exposed to UV Light through a mask

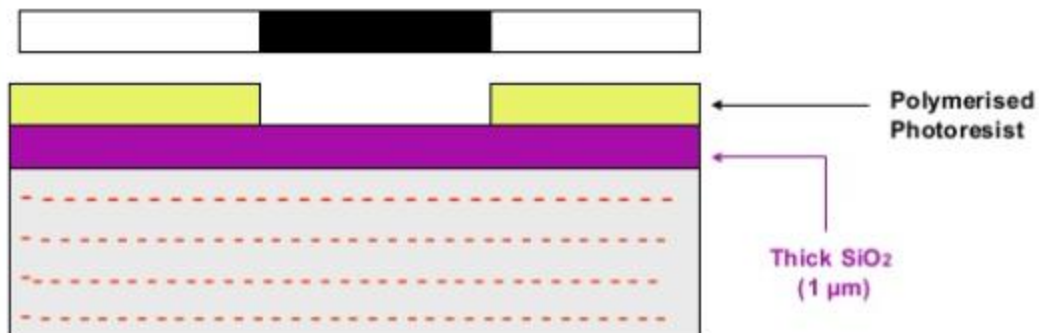


Fig. (6) Developer removes unpolymersed photoresist. It will cause no effect on Si surface

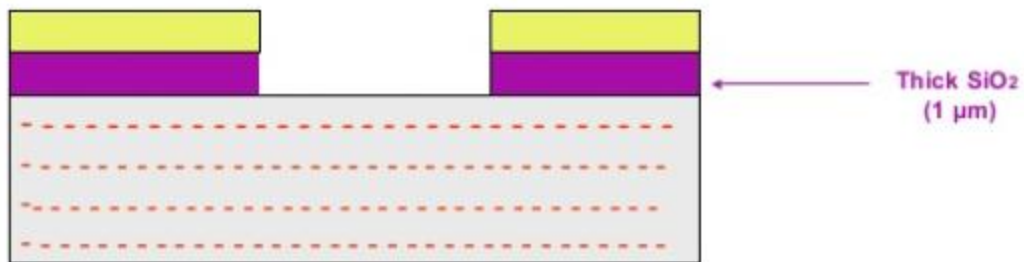


Fig. (7) Etching [HF acid is used] will remove SiO₂ layer which is in direct contact with etching solution

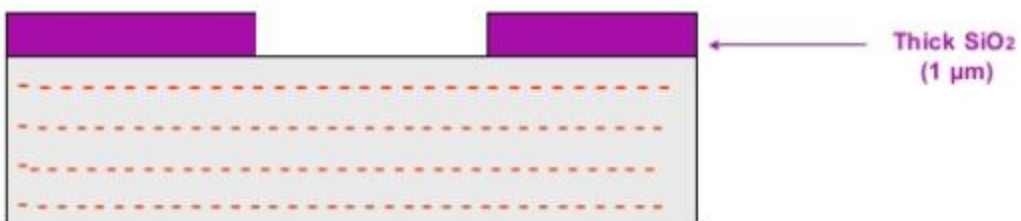


Fig. (7) unpolymerised photoresist is also etched away [using H₂SO₄]

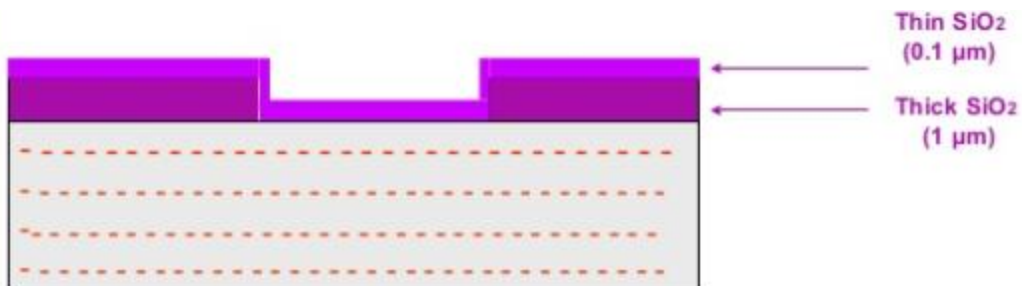


Fig. (8) A thin layer of SiO₂ grown over the entire chip surface

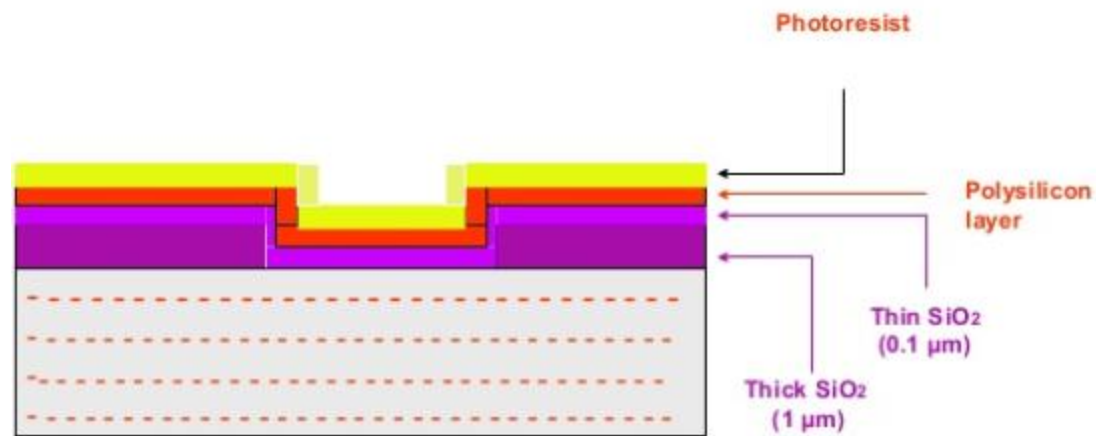
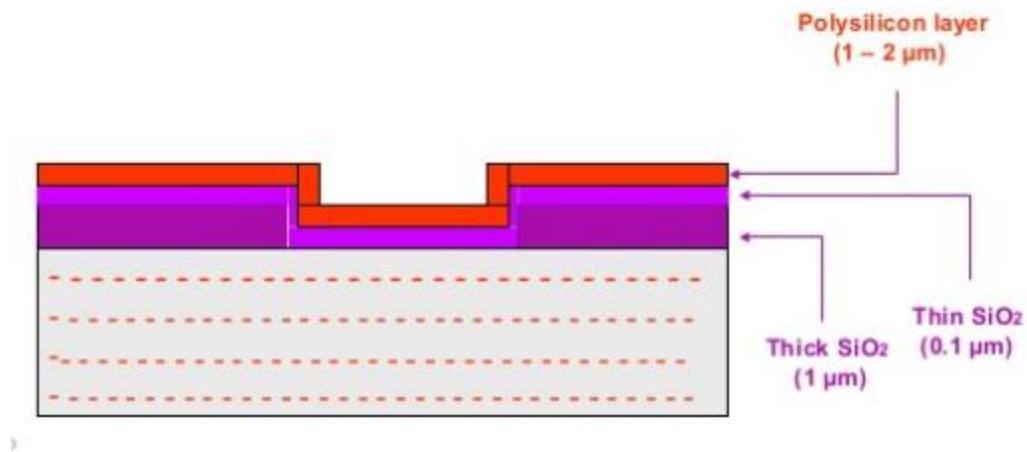


Fig. (10) A layer of photoresist is grown over polysilicon layer

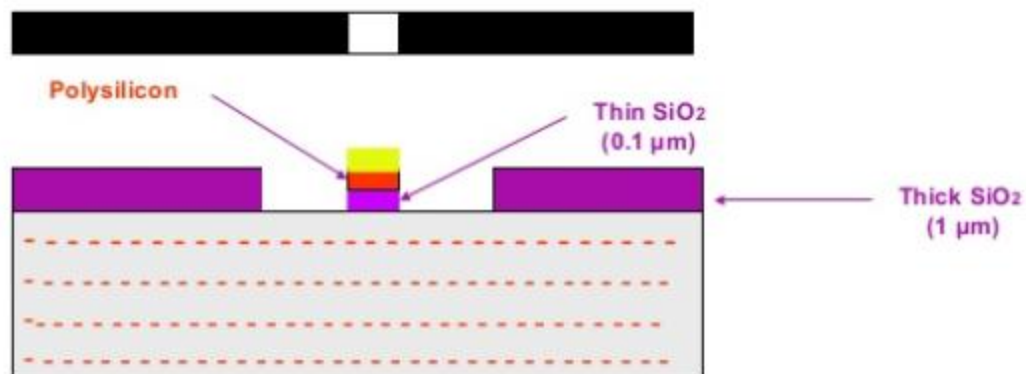


Fig. (12) Etching will remove that portion of Thin SiO₂ which is not exposed to UV light

0

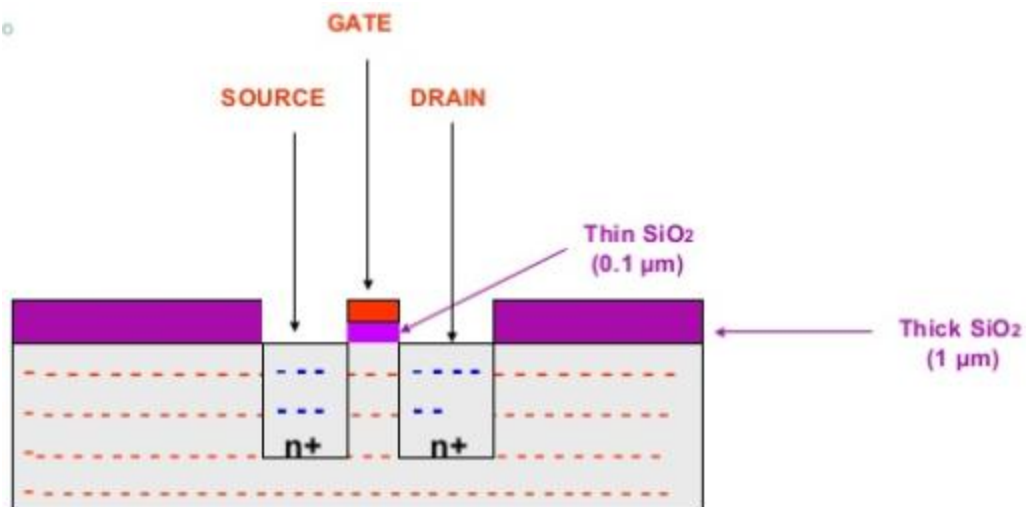


Fig. (14) n⁺ Doping to form SOURCE and DRAIN

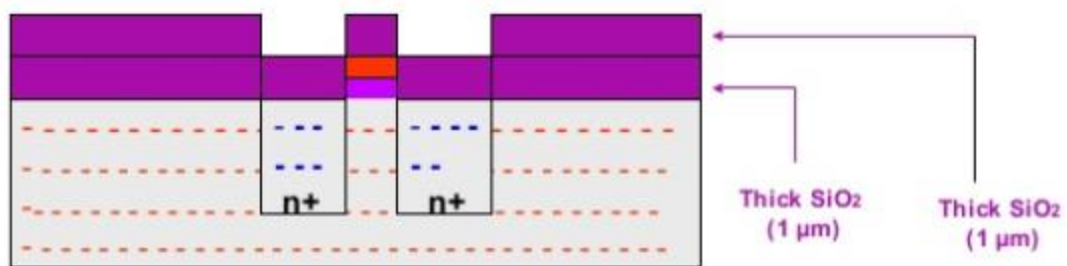
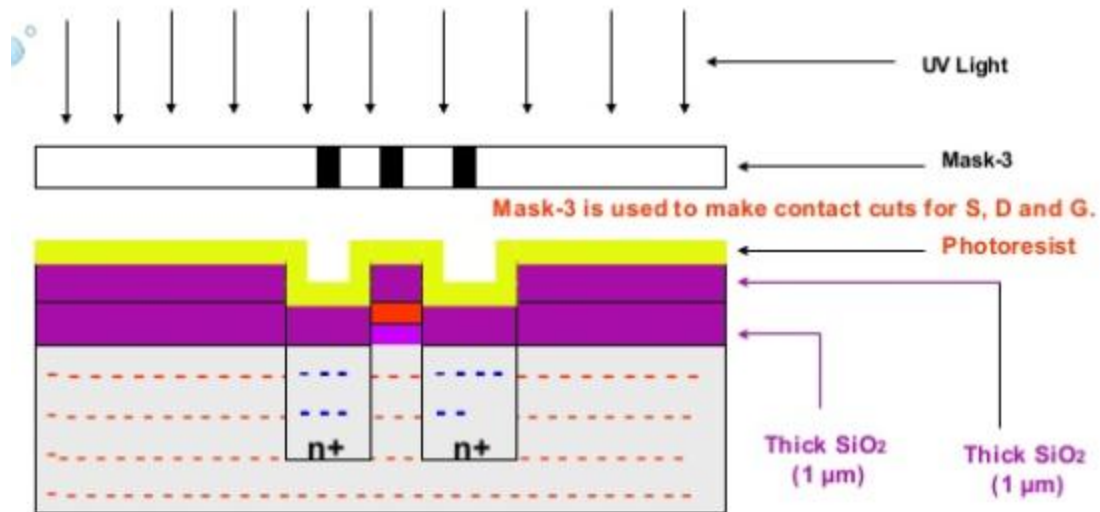
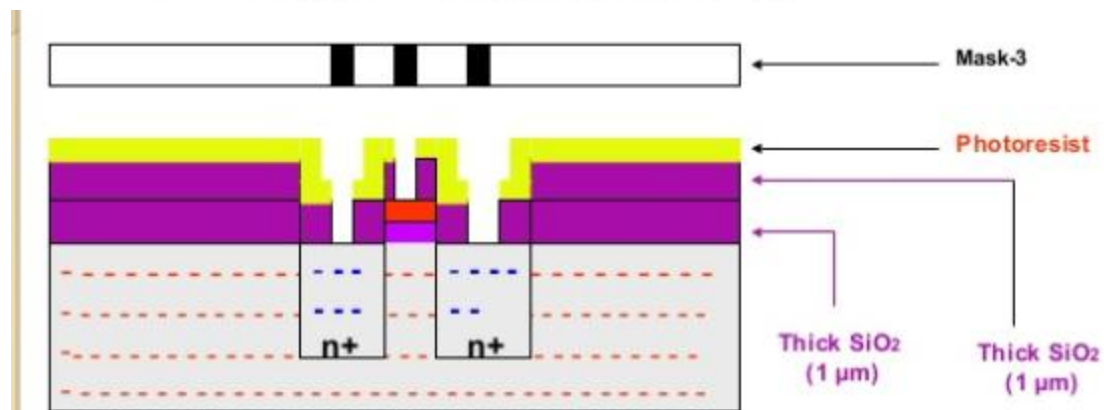


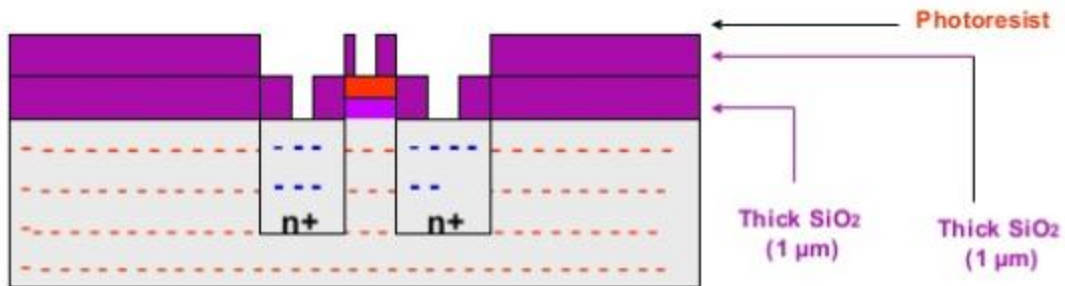
Fig. (15) A thick layer of SiO₂ (1 μm) is again grown.



Photoresist is grown over thick SiO₂. Selected areas of the poly GATE and SOURCE and DRAIN are exposed where contact cuts are to be made



(17) The region of photoresist which is not exposed by UV light will become soft. This unpolymersed photoresist and SiO₂ below it are etched away.



8) The contact cuts are formed for S, D and G (hardened photoresist is stripped away).

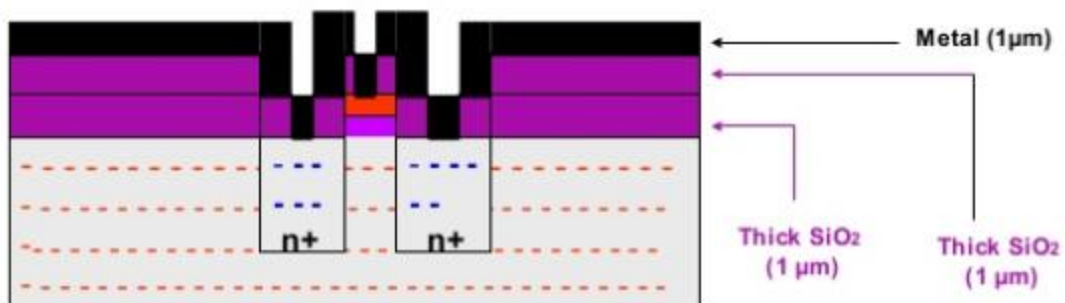


Fig. (19) Metal (aluminium) is deposited over the surface of whole chip (1 μm thickness).

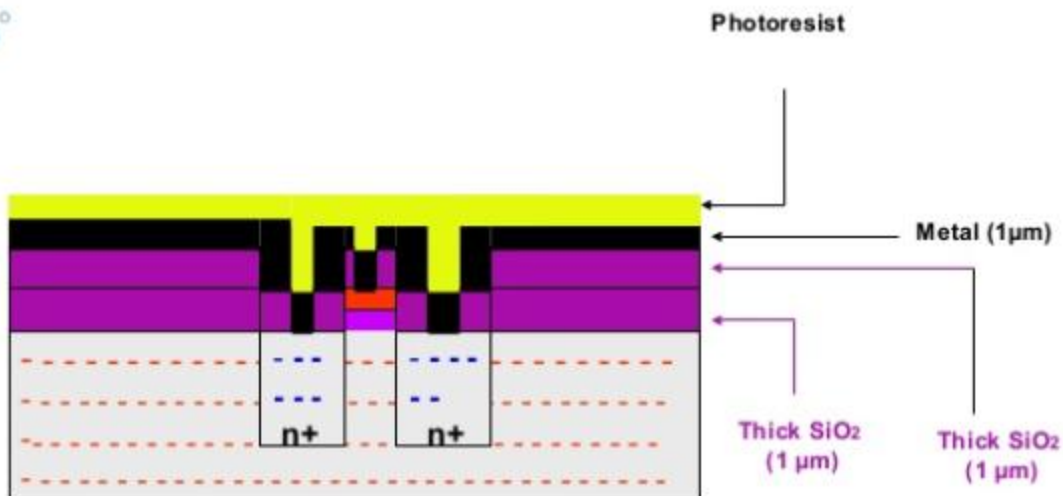


Fig. (20) Photoresist is deposited over the metal.

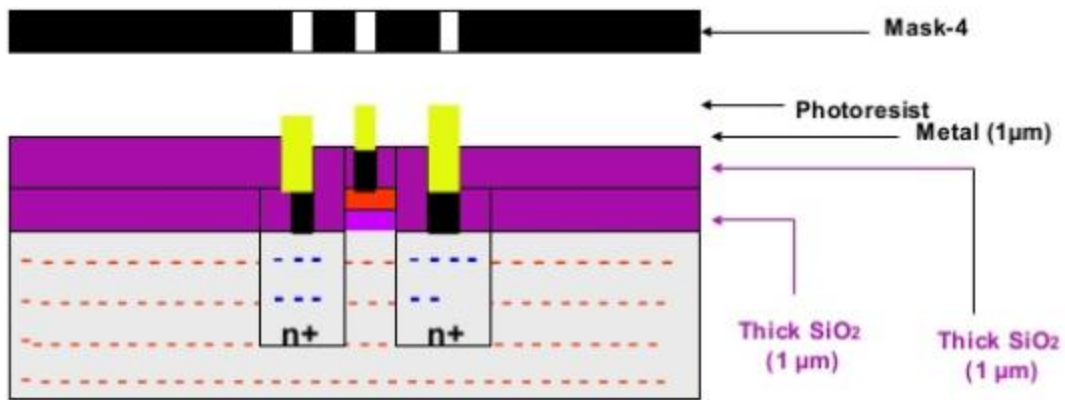


Fig. (22) Photoresist and metal which is not exposed to UV light are etched away.

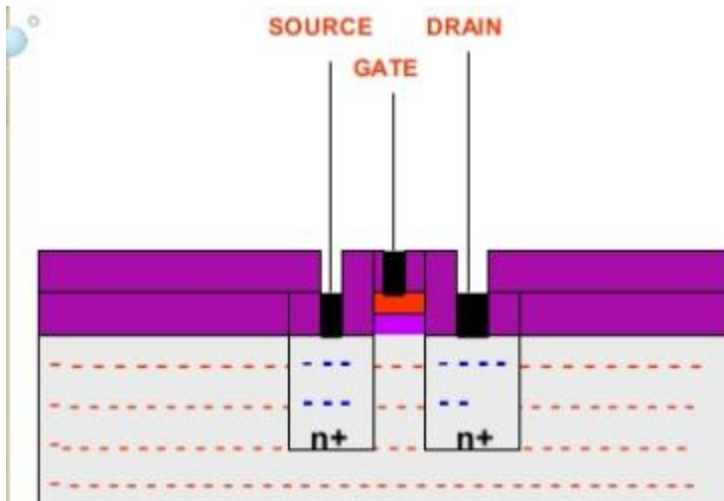


Fig. (23) Final n-MOS Transistor