

Semi Design Presents..



N-MOS Fabrication Process

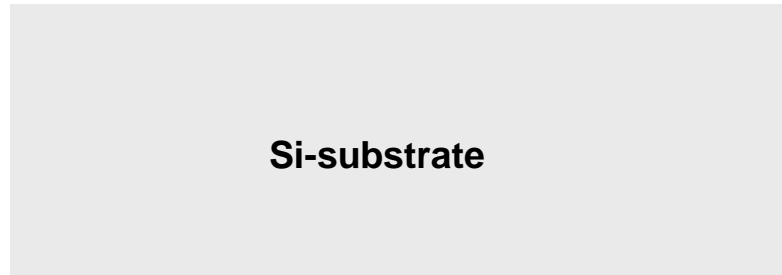


Fig. (1) Pure Si single crystal



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

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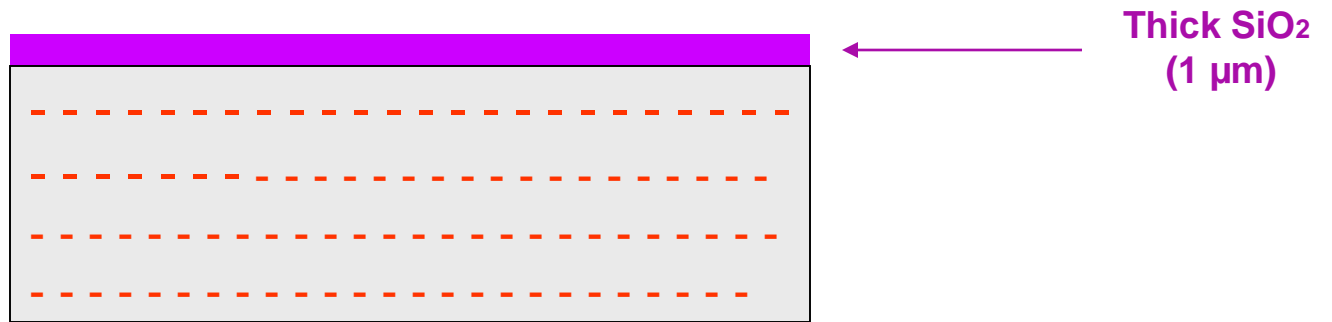


Fig. (3) SiO₂ Deposited over si surface

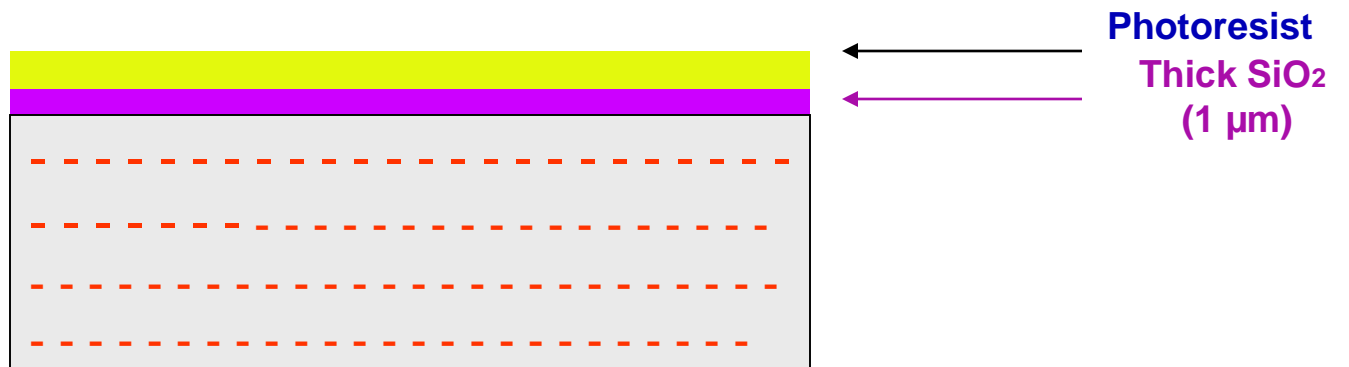
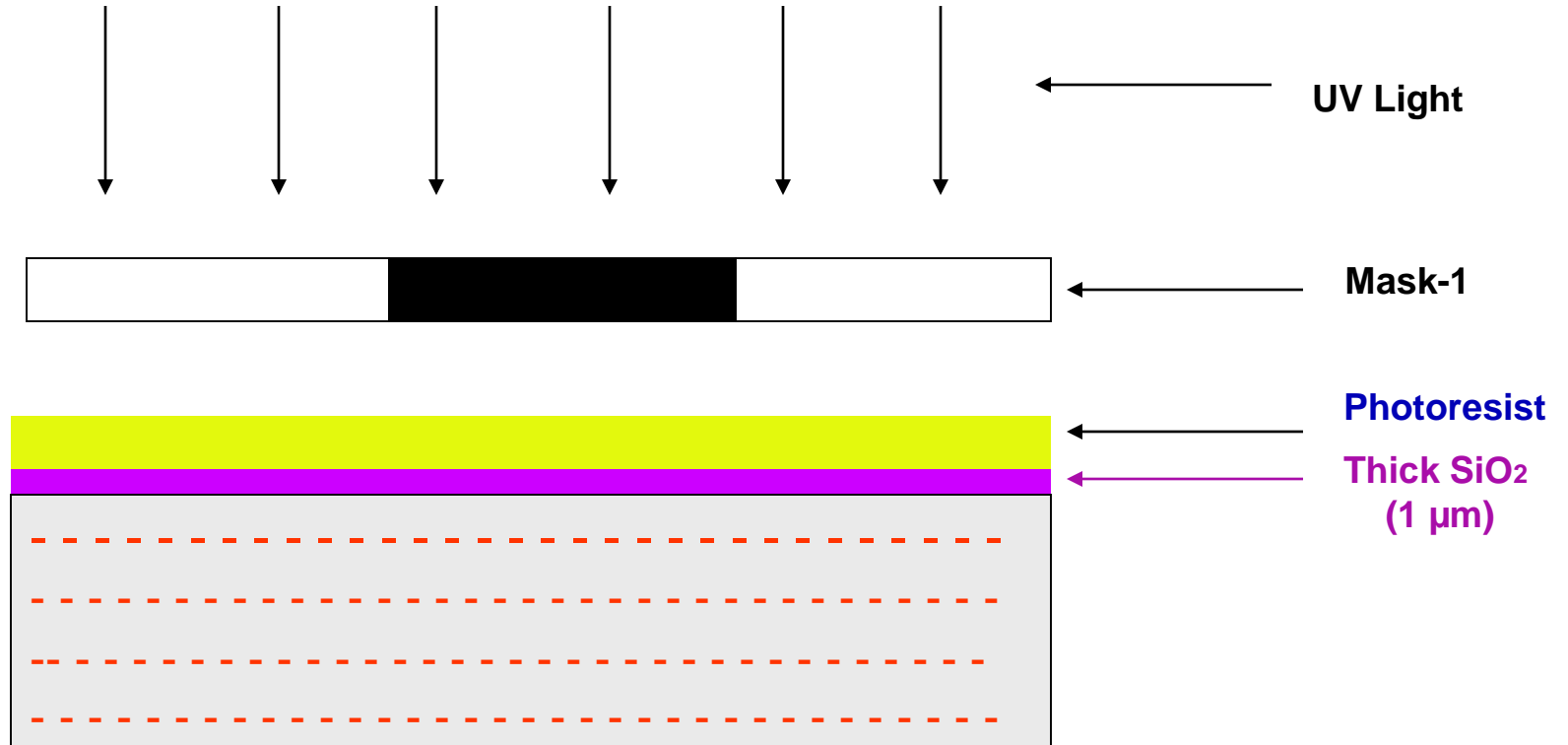


Fig. (4) Photoresist is deposited over SiO₂ layer

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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

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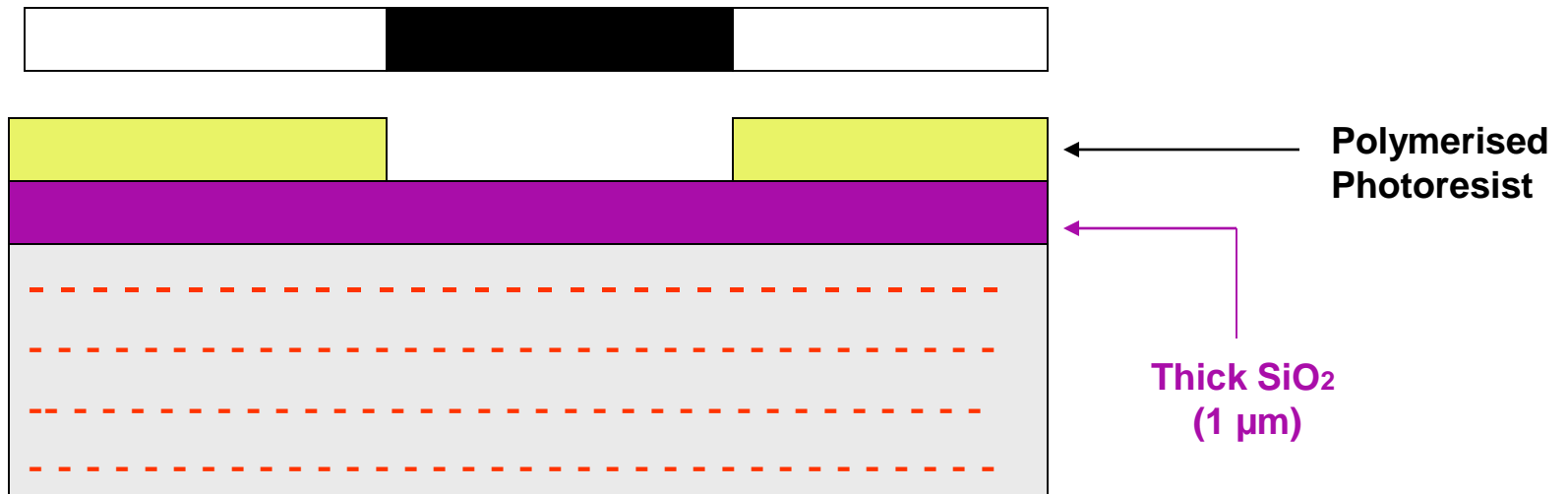


Fig. (6) Developer removes unpolymerised photoresist. It will cause no effect on Si surface

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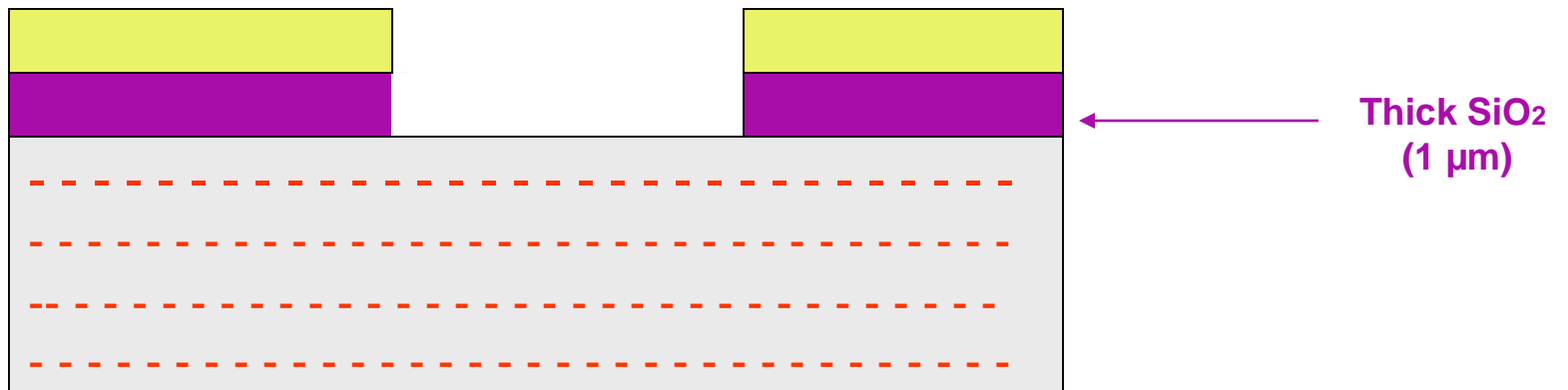
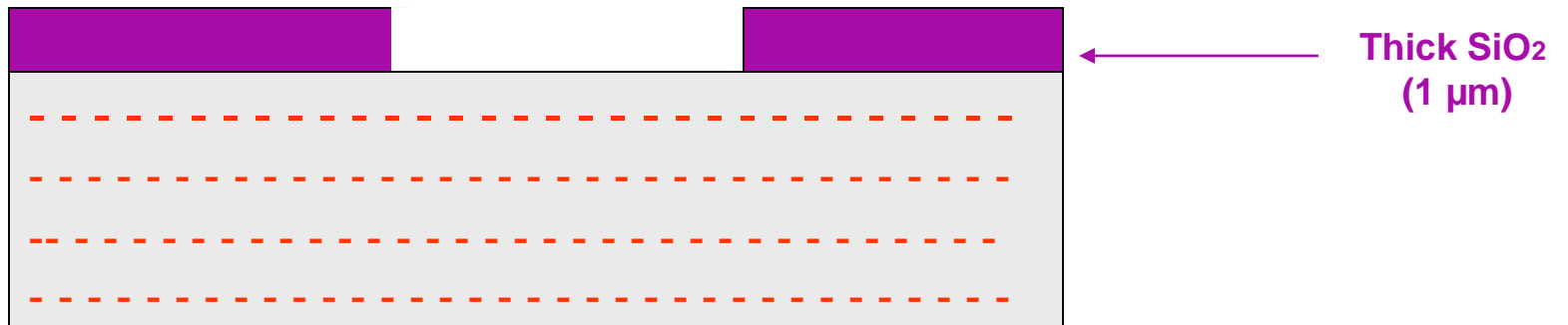


Fig. (7) Etching [HF acid is used] will remove SiO₂ layer which is in direct contact with etching solution

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

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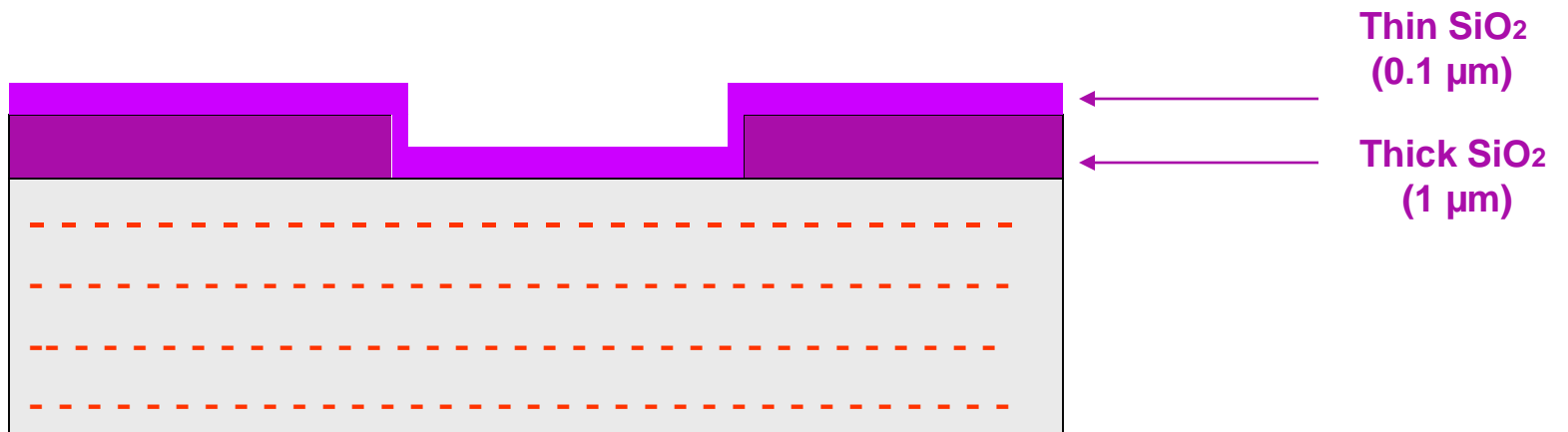


Fig. (8) A thin layer of SiO₂ grown over the entire chip surface

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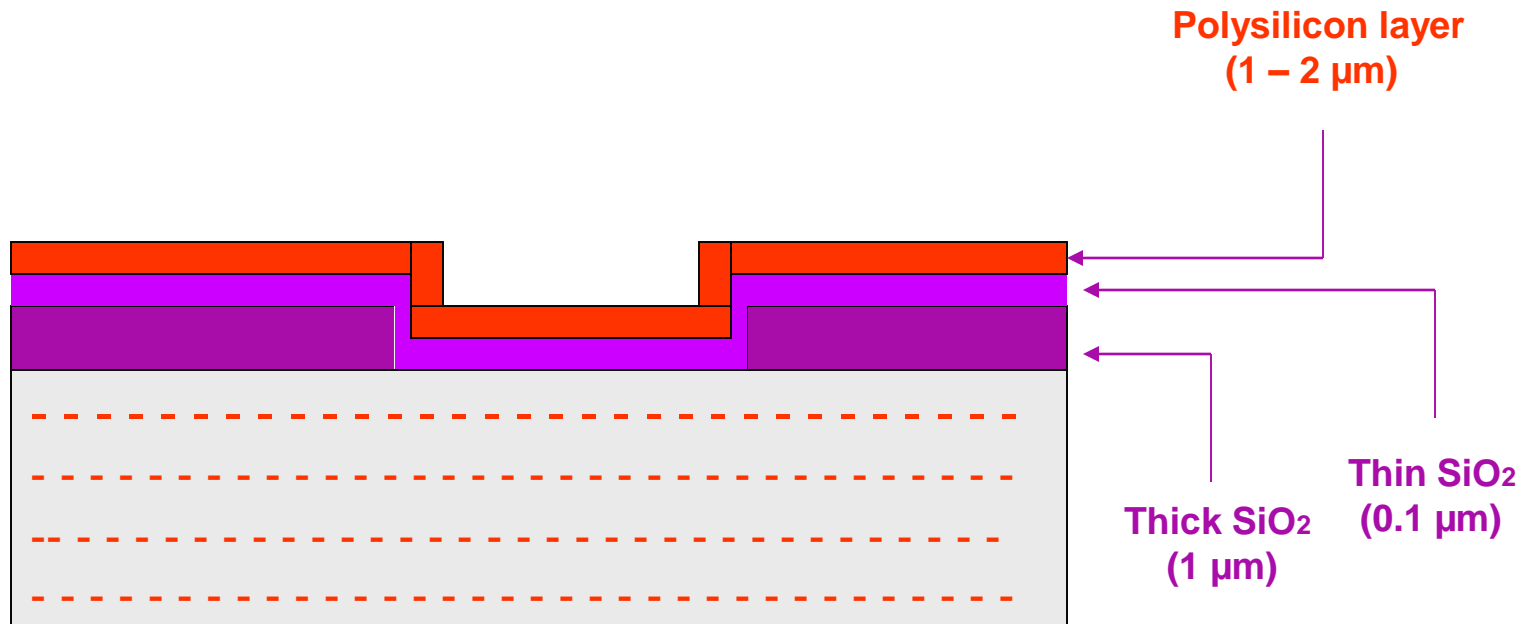


Fig. (9) A thin layer of polysilicon is grown over the entire chip surface to form GATE

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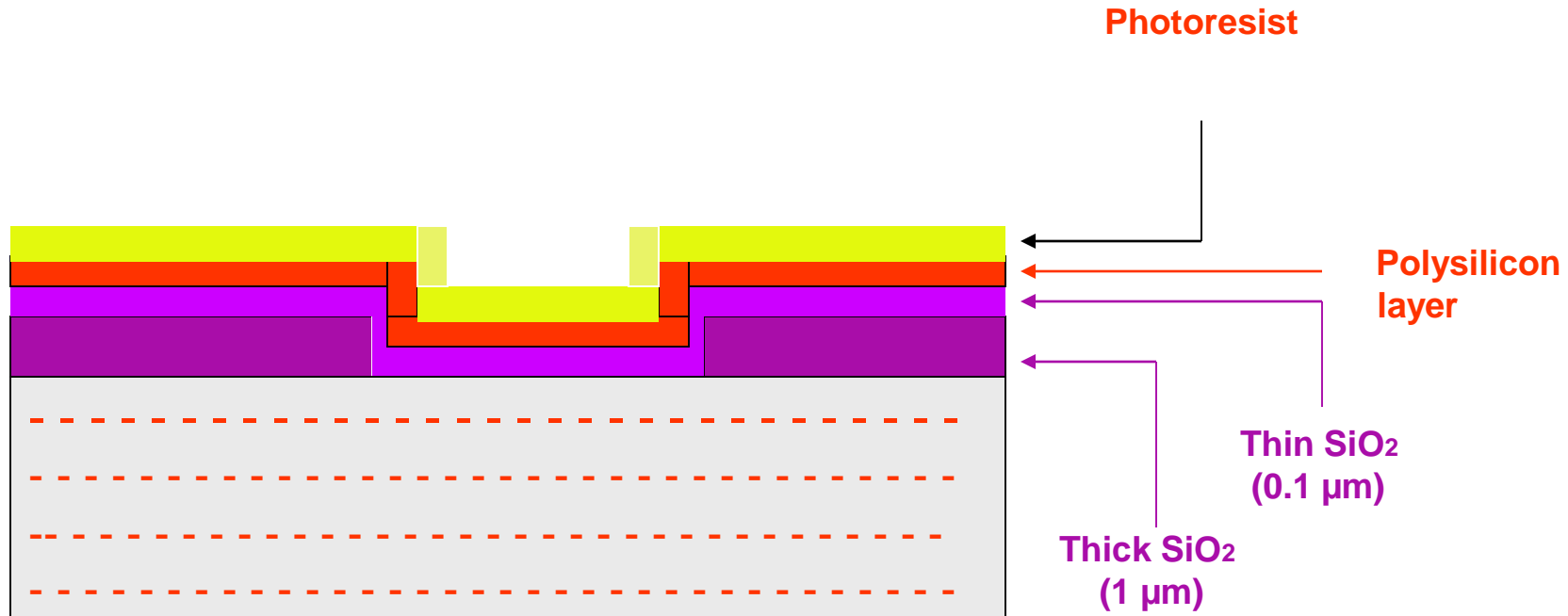


Fig. (10) A layer of photoresist is grown over polysilicon layer

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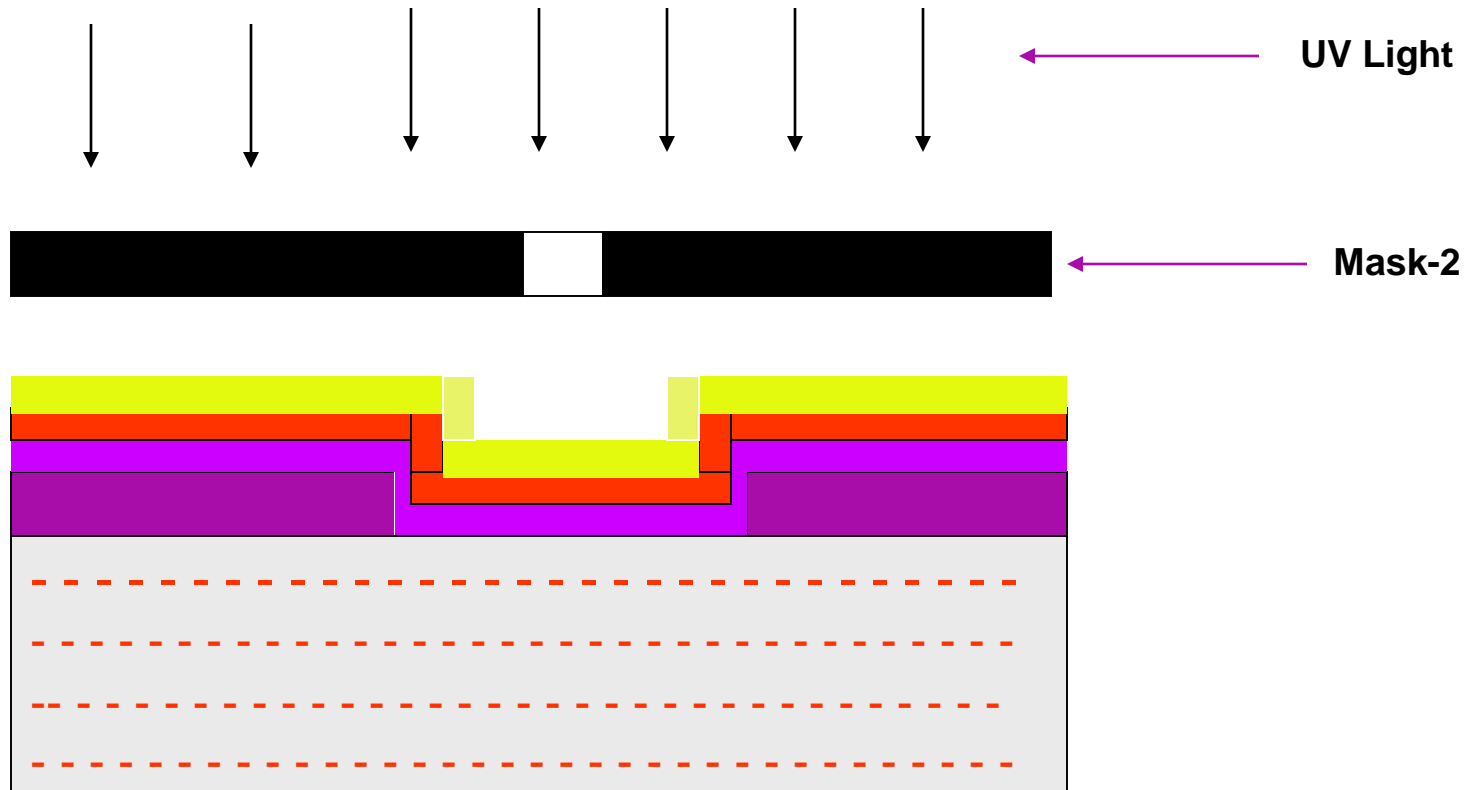


Fig. (11) Photoresist is exposed to UV Light

Mask-2 is used to deposit Polysilicon to form gate.

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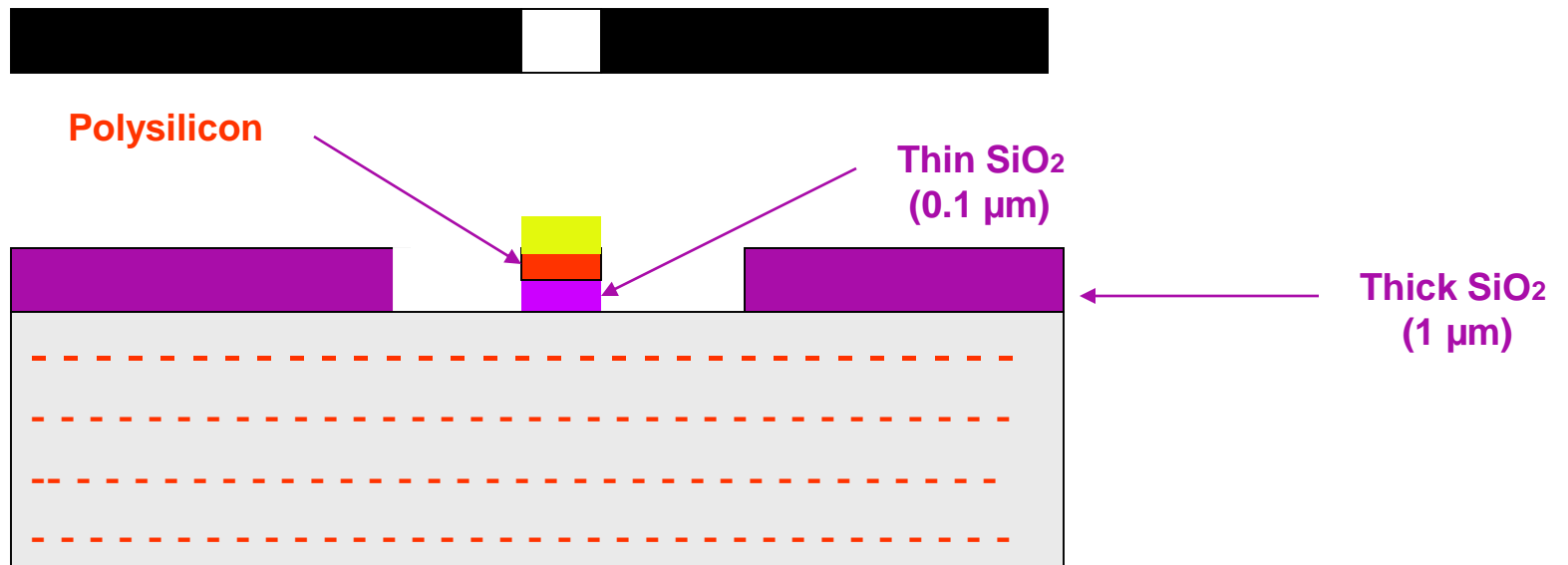


Fig. (12) Etching will remove that portion of Thin SiO₂ which is not exposed to UV light

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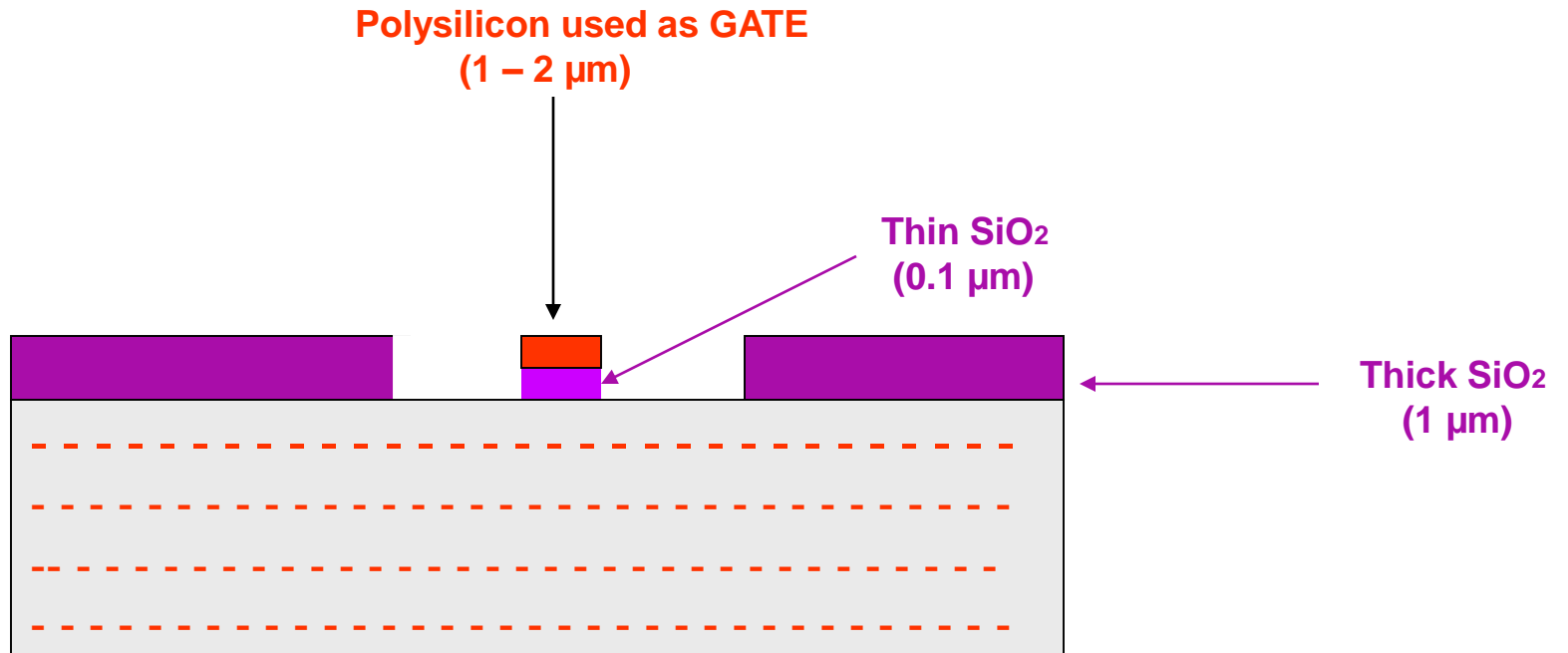


Fig. (13) Polymerised photoresist is also stripped away

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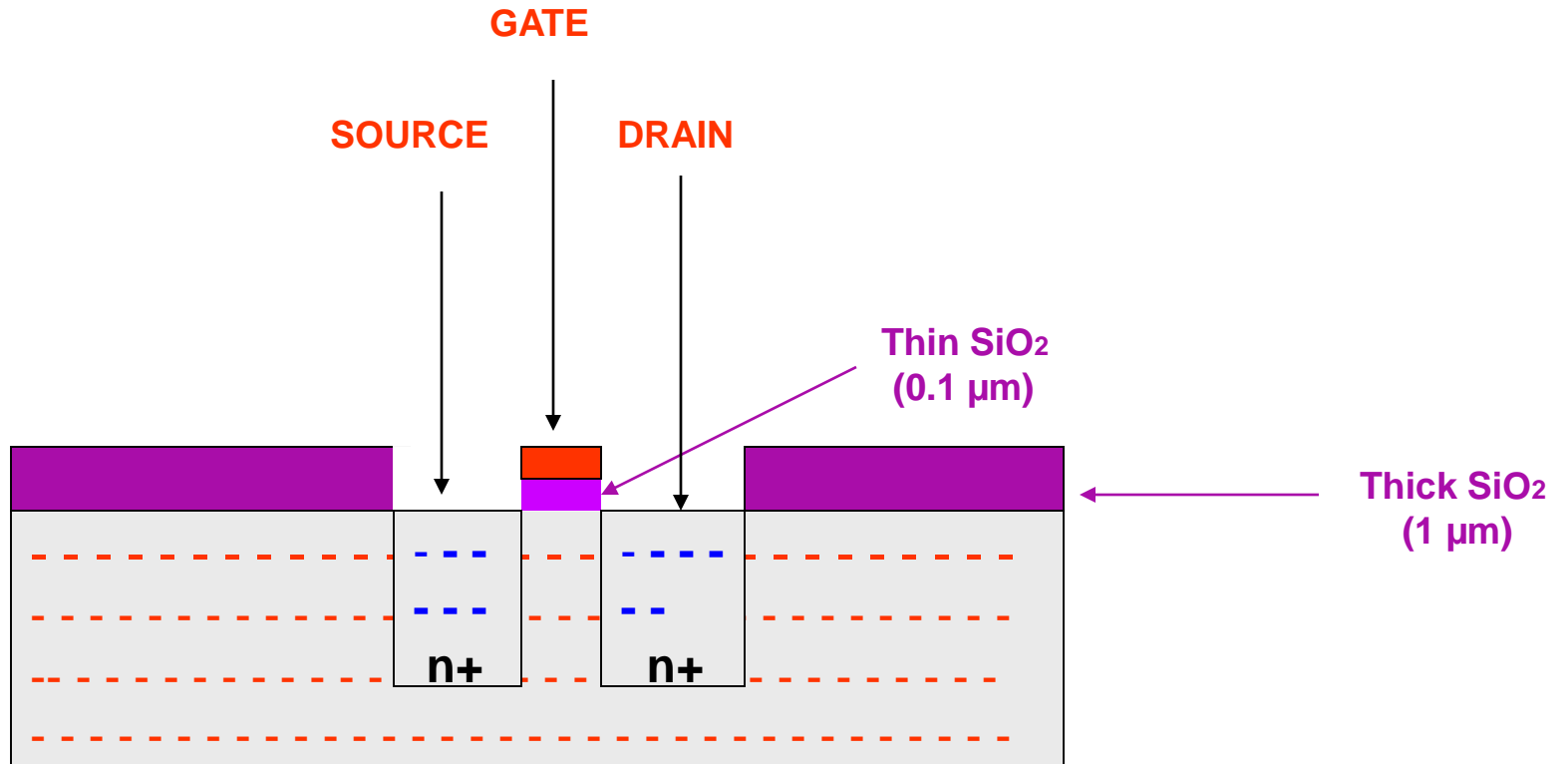


Fig. (14) n^+ Doping to form SOURCE and DRAIN

N-MOS Fabrication Process

Step - Metallization

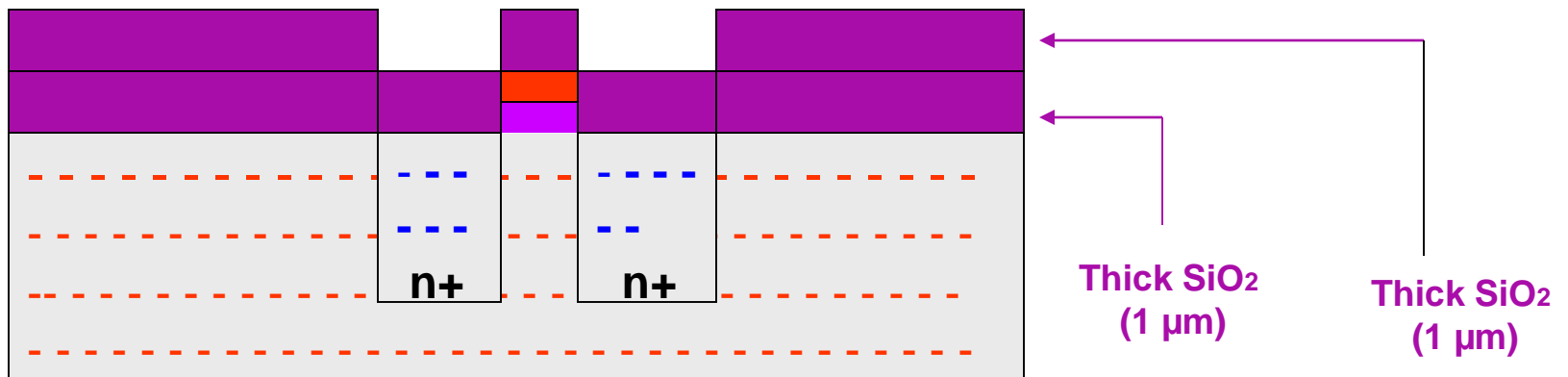


Fig. (15) A thick layer of SiO₂ (1 μm) is again grown.

N-MOS Fabrication Process

Step - Metallization

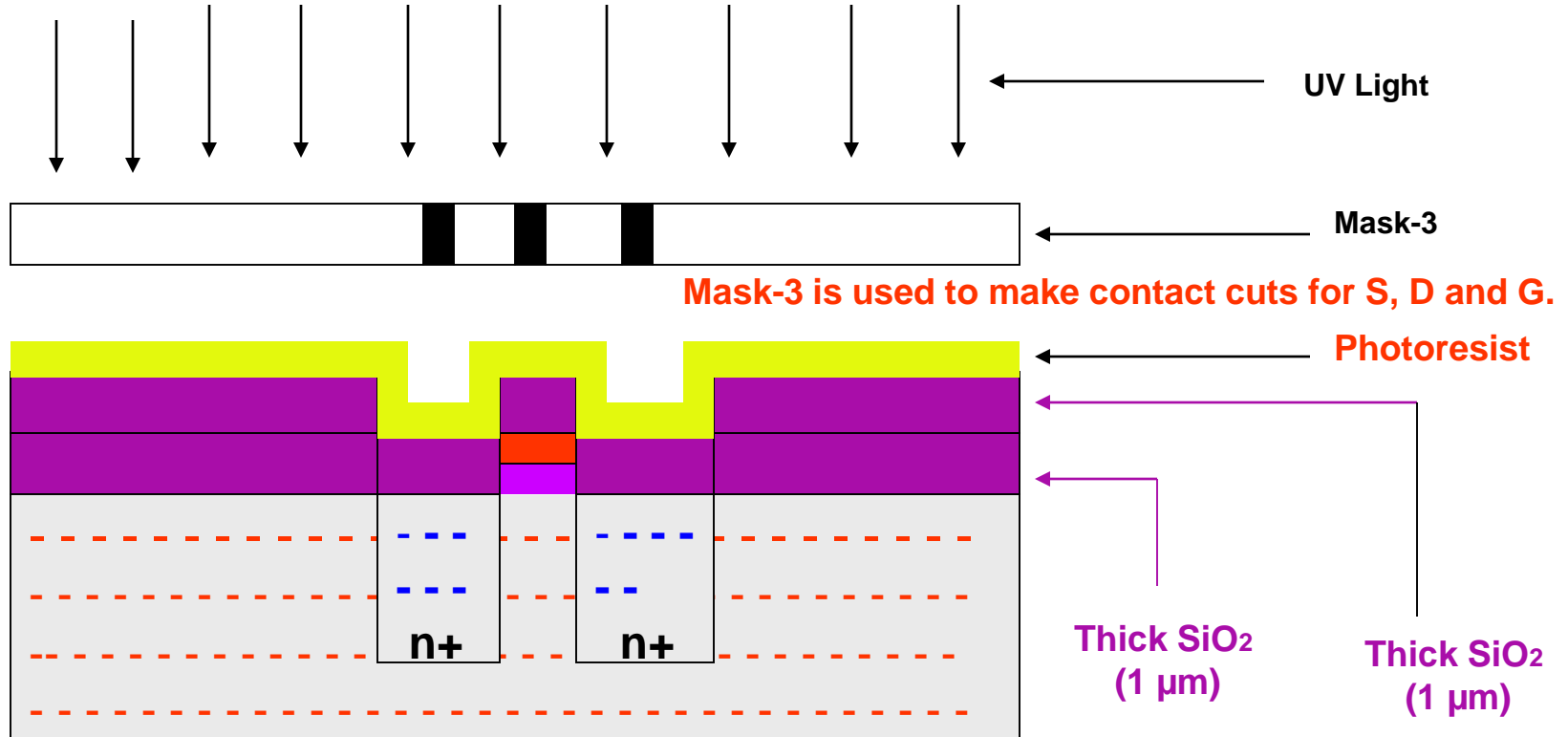


Fig. (16) Photoresist is grown over thick SiO₂. Selected areas of the poly GATE and SOURCE and DRAIN are exposed where contact cuts are to be made

N-MOS Fabrication Process

Step - Metallization

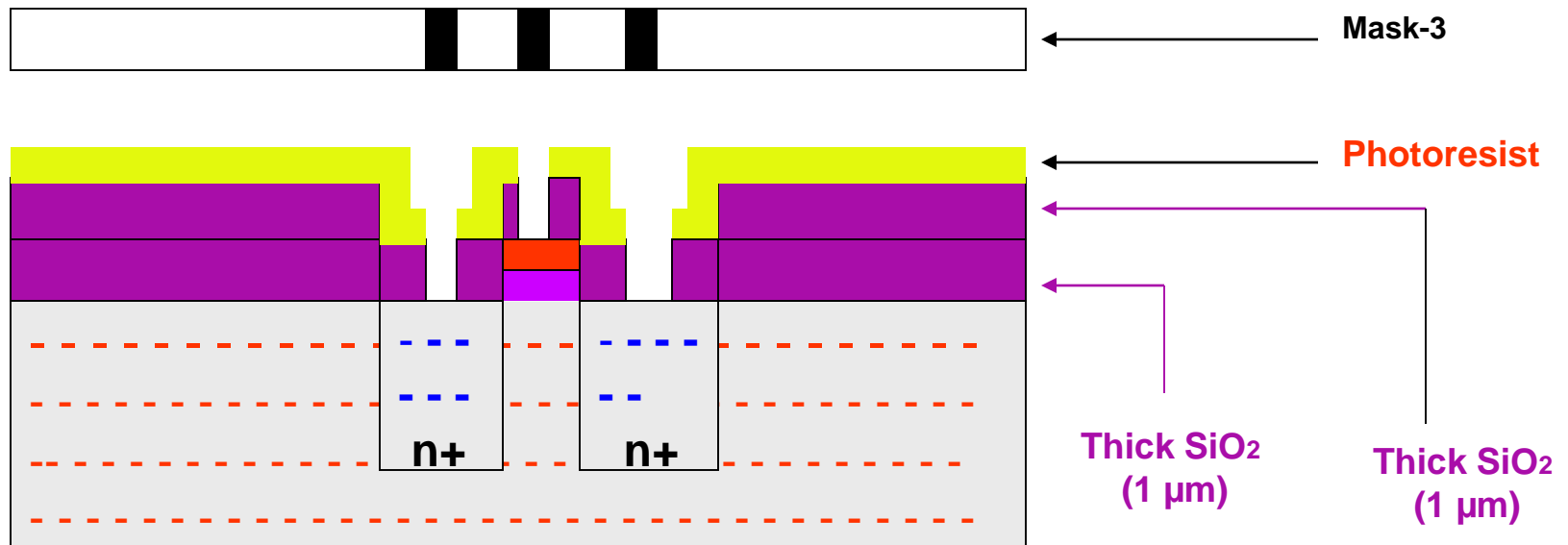


Fig. (17) The region of photoresist which is not exposed by UV light will become soft. This unpolymerised photoresist and SiO₂ below it are etched away.

N-MOS Fabrication Process

Step - Metallization

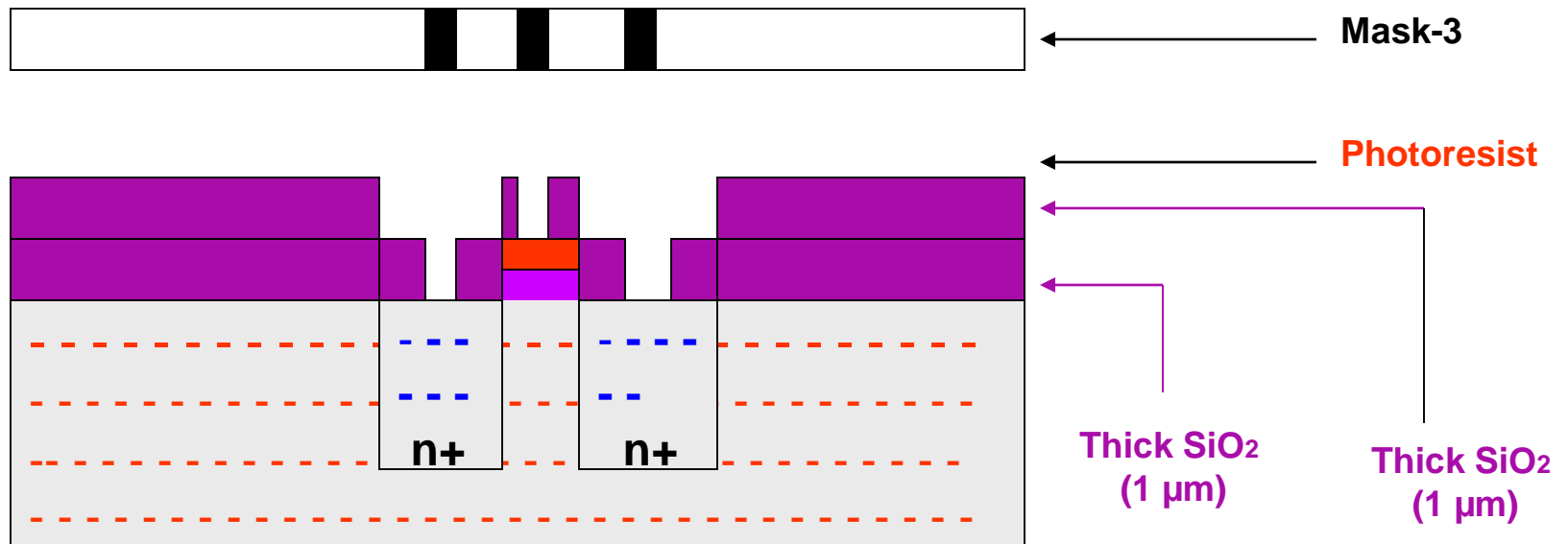


Fig. (18) The contact cuts are formed for S, D and G (hardened photoresist is stripped away).

N-MOS Fabrication Process

Step - Metallization

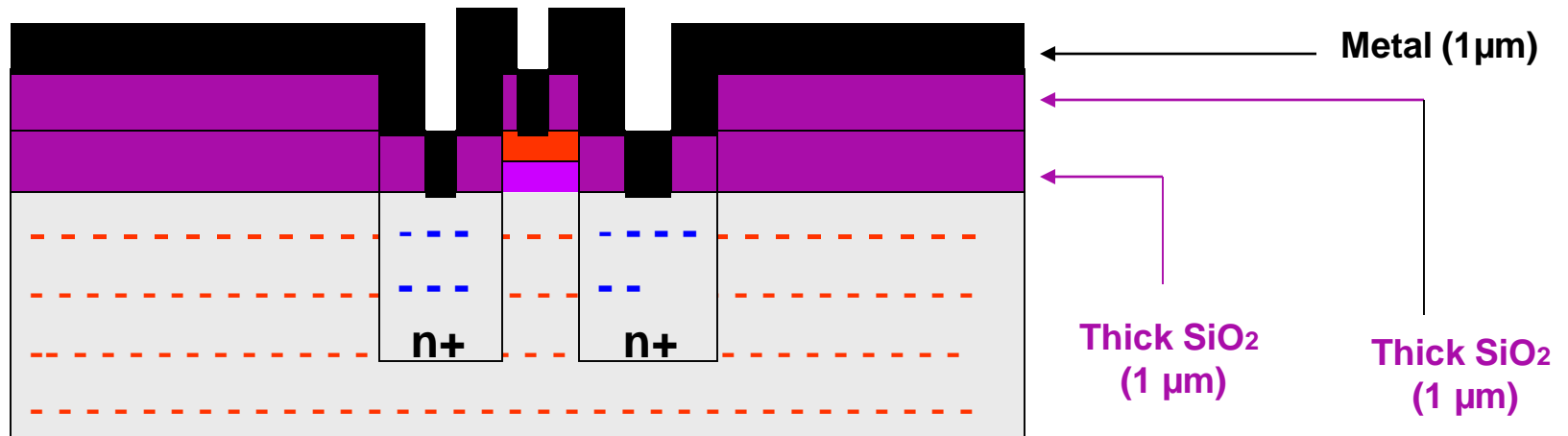


Fig. (19) Metal (aluminium) is deposited over the surface of whole chip (1 μm thickness).

N-MOS Fabrication Process

Step - Metallization

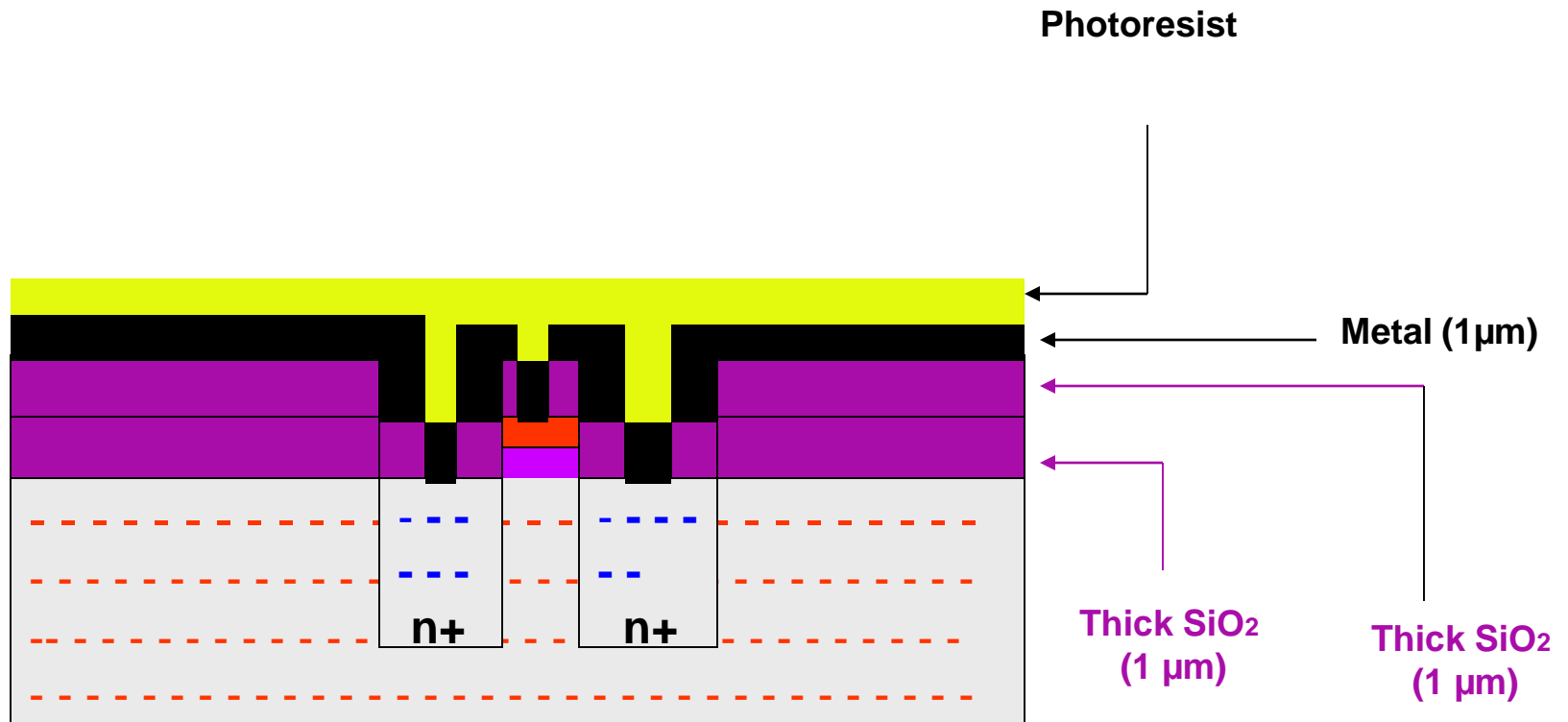
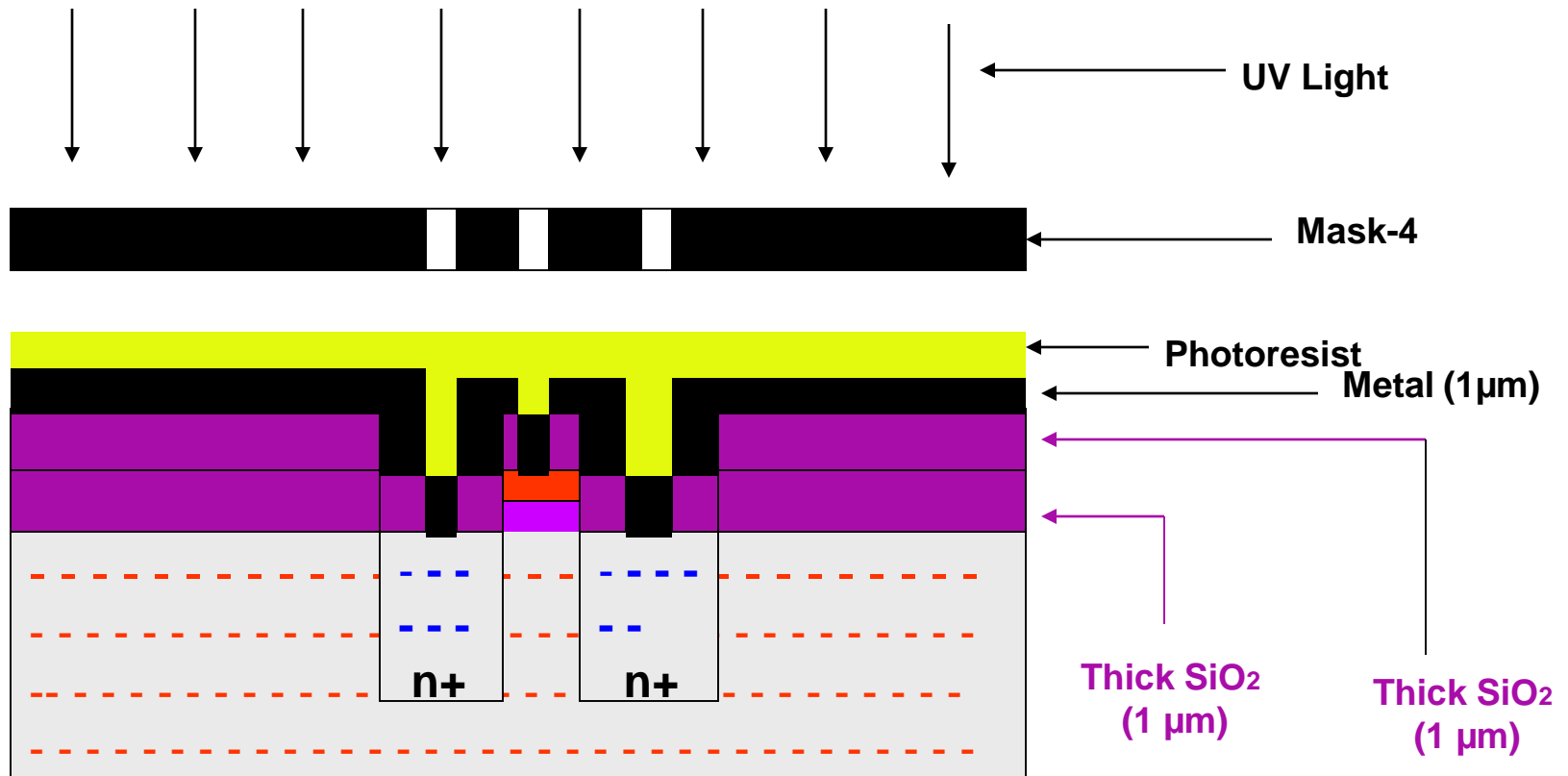


Fig. (20) Photoresist is deposited over the metal.

N-MOS Fabrication Process

Step - Metallization



Mask-4 is used to deposit metal in contact cuts of S, D and G.

Fig. (21) UV Light is passed through Mask-4 (with a aim of removing all metal other than metal in contact-cuts).

N-MOS Fabrication Process

Step - Metallization

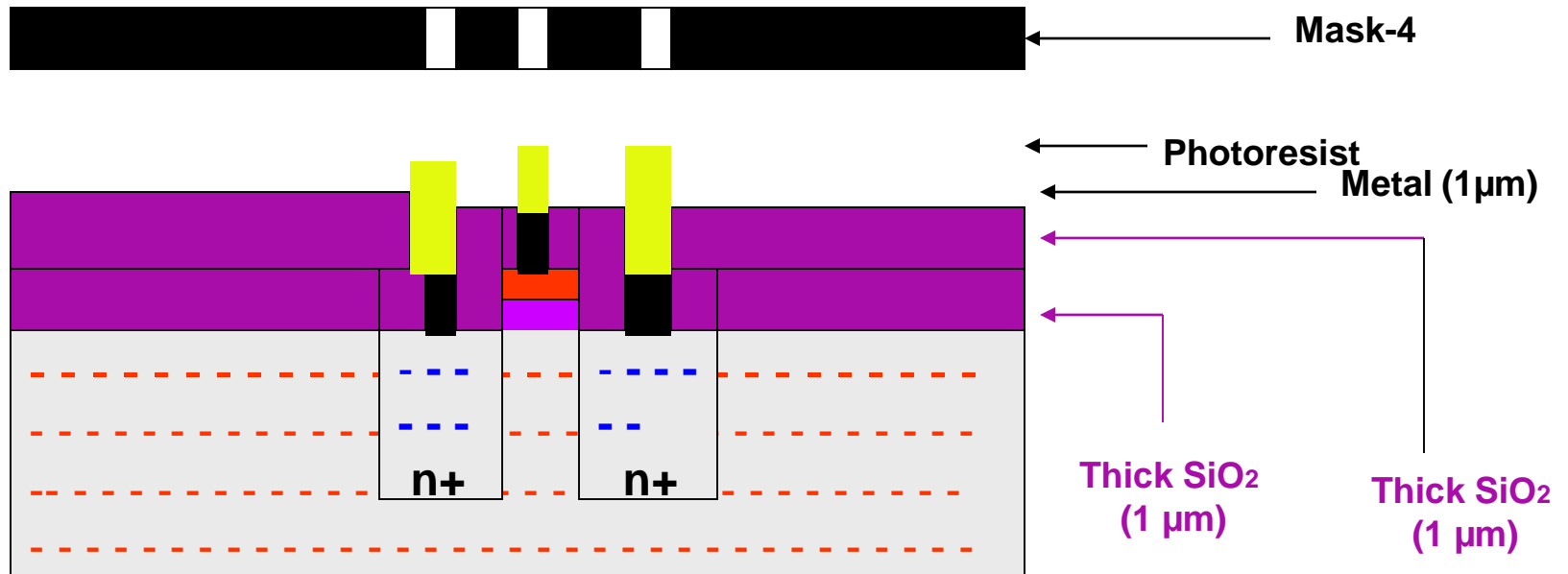


Fig. (22) Photoresist and metal which is not exposed to UV light are etched away.

