

LECTURE-13

Mask Design using AutoCAD

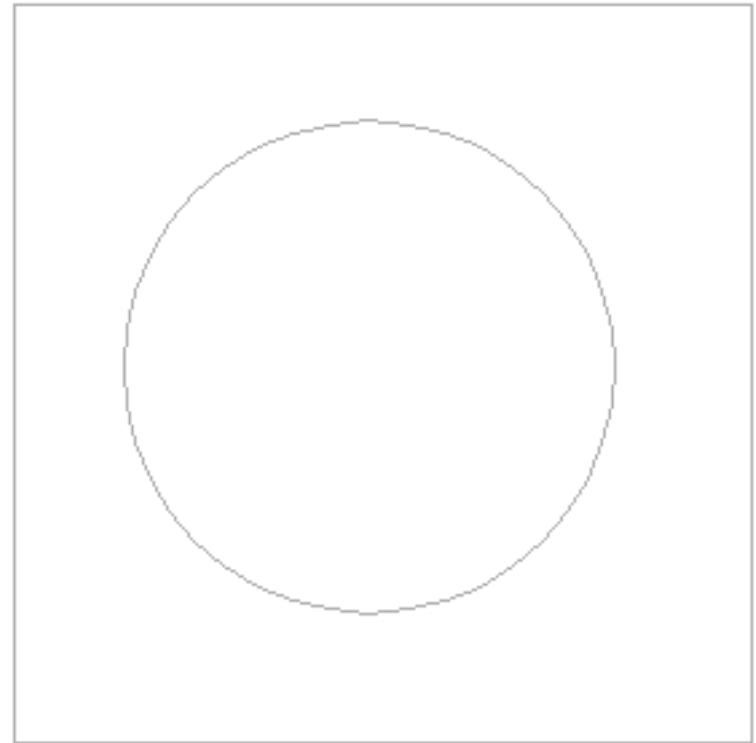
Mask Design Step

- Step 1: Set frame and wafer size dimension
- Step 2: Design alignment mark
- Step 3: Design source and drain mask (Mask 1) block and duplicate to the whole wafer.
- Step 4: Design gate mask (Mask 2) block and duplicate to the whole wafer. Then, inverse the alignment mark to change the polarity.

- Step 5: Design contact mask (Mask 3) block and duplicate to the whole wafer.
- Step 6: Design Metallization mask (Mask 4) block and duplicate to the whole mask.
- Step 7: Print on transparency film using high resolution printer.

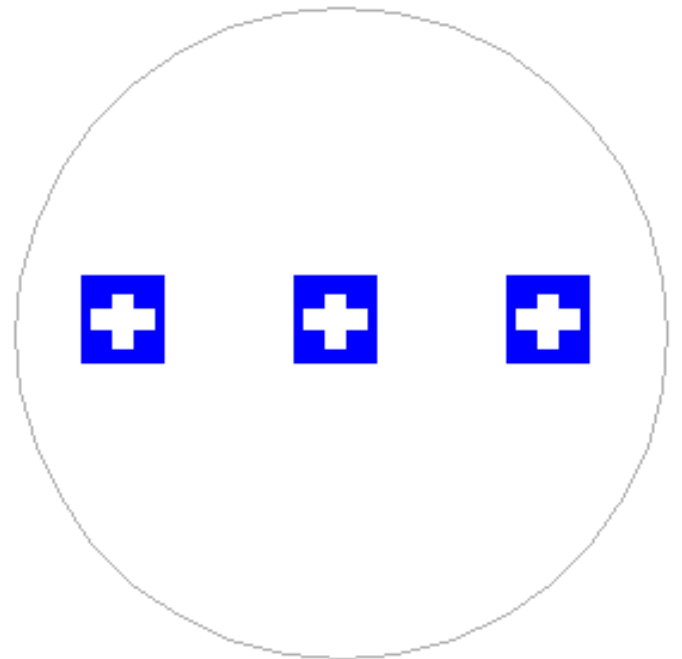
Step 1: Set frame and wafer size dimension

- The frame size is set to 20" x 12" (A4 paper size).
- The wafer diameter is set to 4" and the wafer block is set to 6" x 6".
- Then the design unit is set to millimeter or micron depend on the designer's convenience.



Step 2: Alignment Mark design

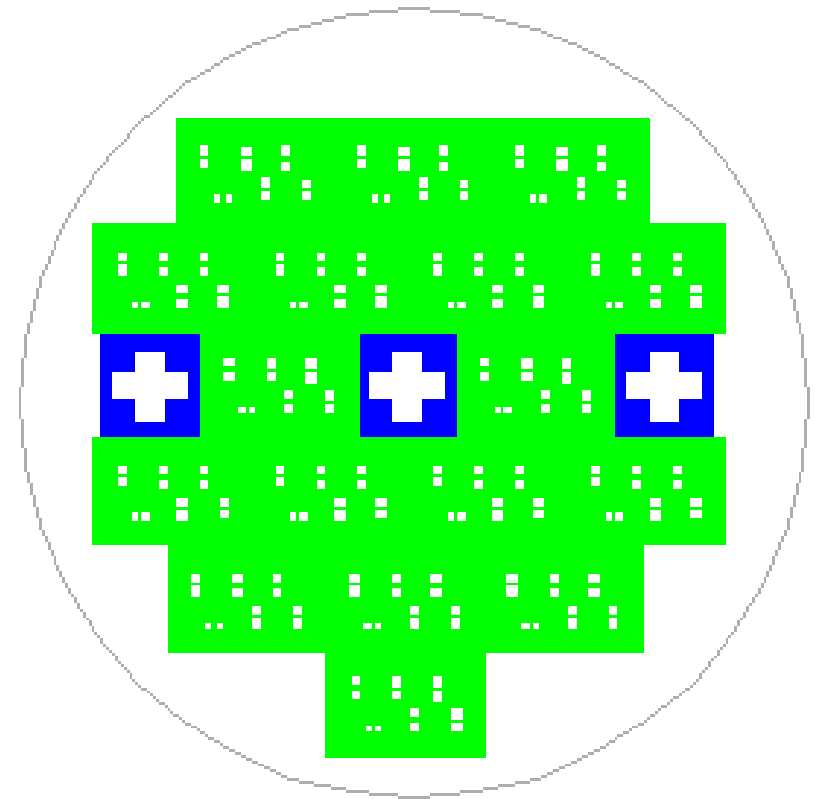
- Alignment mark is used to align wafer between layer to layer during the fabrication process.
- First, design the alignment block.
- Then, design the cross and insert it inside the block.






 alignment marker

Step 3: Design source and drain mask

- First, design the mask block.
- Then, design the source and drain region which is uncovered and designed with desired dimension.
- At this mask, the polarity of the alignment block is reversed. The cross is open and the block is opaque.



-  alignment marker
-  mask
-  (uncovered) source and drain region

Step 4: Design gate mask

- The red block is the gate mask, it is drawn before the white area.
- The white area on the red layer is the gate region.
- Maintain the mask design



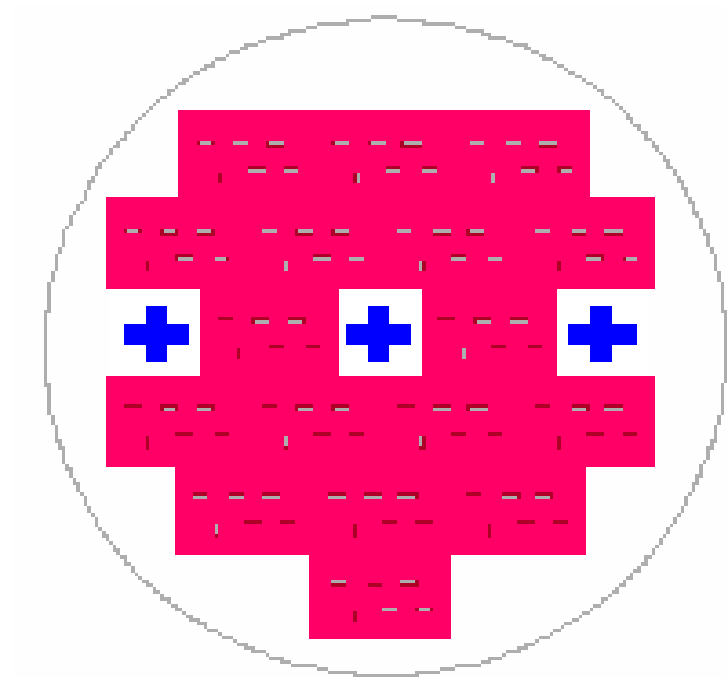
alignment mark



mask

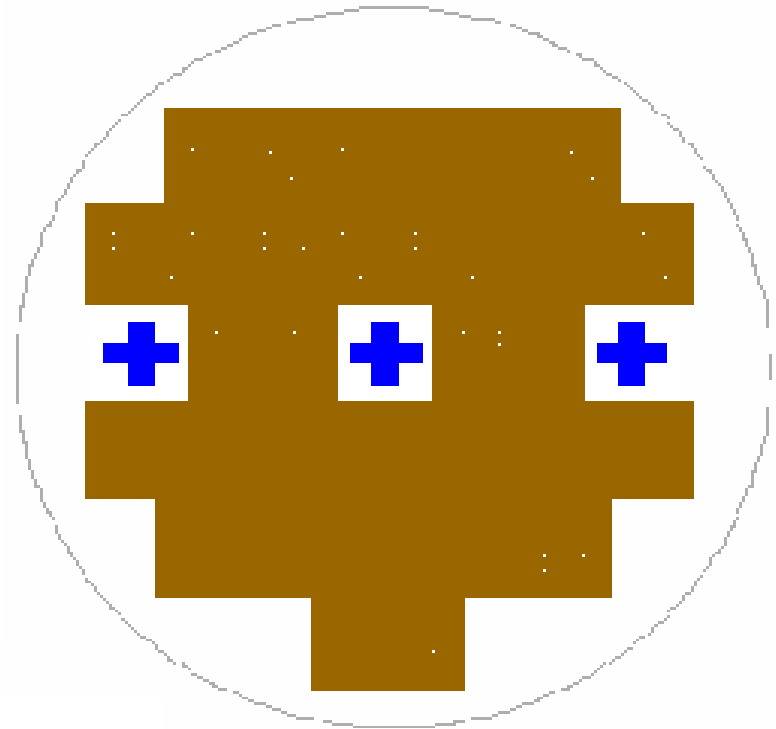


uncovered gate region



Step 5: Design contact mask

- The brown block is the gate mask.
- The white rectangle is the contact region.
- Maintain the mask design



alignment marker



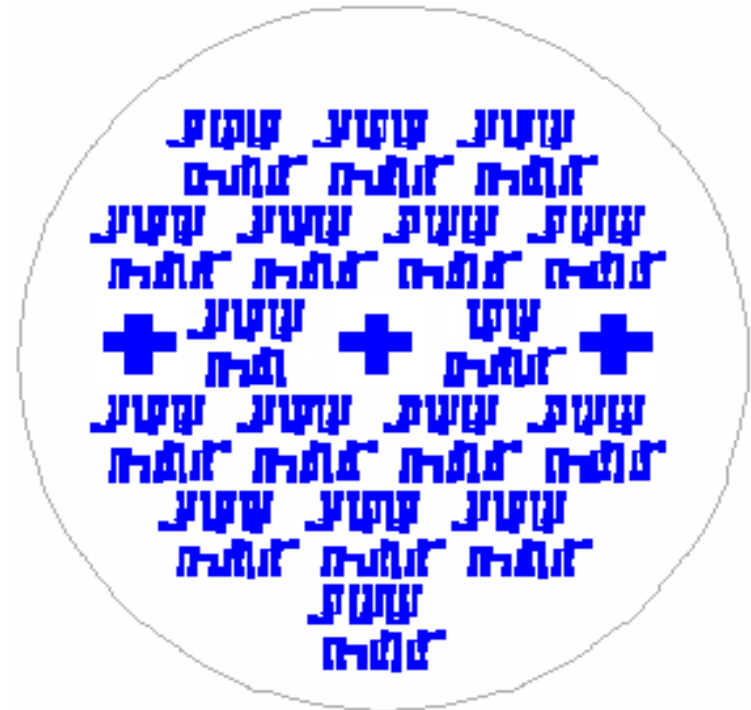
mask



(uncovered) contact region

Step 6: Design metallization mask

- The Metallization mask is used for routing purposes.
- The unprotected region will be etched away whereby the exposed Aluminum area will be removed.
- Maintain the mask design



 alignment marker

 Mask to protect Aluminum