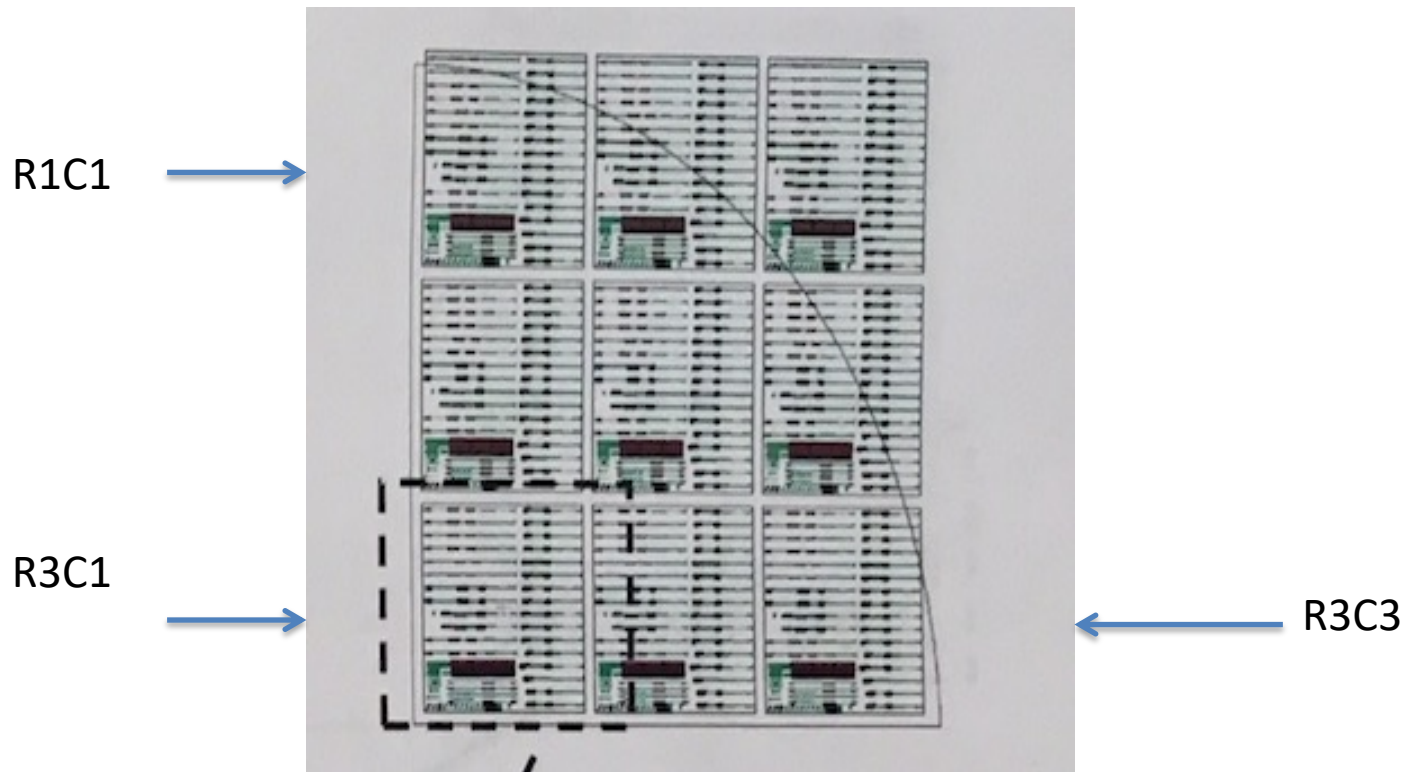


# Second layer on sample with BL orientation

1. Inspect the sample with BL orientation (make sure the first layer is there along with the alignment mark needed for a second lithography).
2. Load the sample on a wafer chuck (be consistent and repeatable with simple tasks as loading sample on chuck, turning vacuum on, loading chuck on stage, turning vacuum on).
3. Make sure sample is vacuumed to the chuck (not moving), and a wafer chuck is vacuumed to the stage (not moving).
4. Load the program for second lithography
5. Use the key "A" to bring left objective above R3C1
6. You are ready for the alignment step.

## 1. First layer for BL orientation

The first layer is already on a wafer piece (a quarter of 2" wafer). Layout will look like array of rows and columns as shown on a picture bellow (3rows, 3columns, total of 9 exposures (dies)). Second layer will be aligned to the first layer using a global alignment mark that is present in each of 9 dies.



## 2. Second Layer for BL Orientation (Quarter orientation A)

If not already done, press key "A" to bring L objective above R3C1.

Find a global alignment mark in R3C1 (use the keys (+/-x, +/-y) to drive around). Align a cross on L objective with the global alignment mark in R3C1.

Switch to R objective, and do your best job aligning. Keep switch between objectives until alignment looks good. Expose second layer.

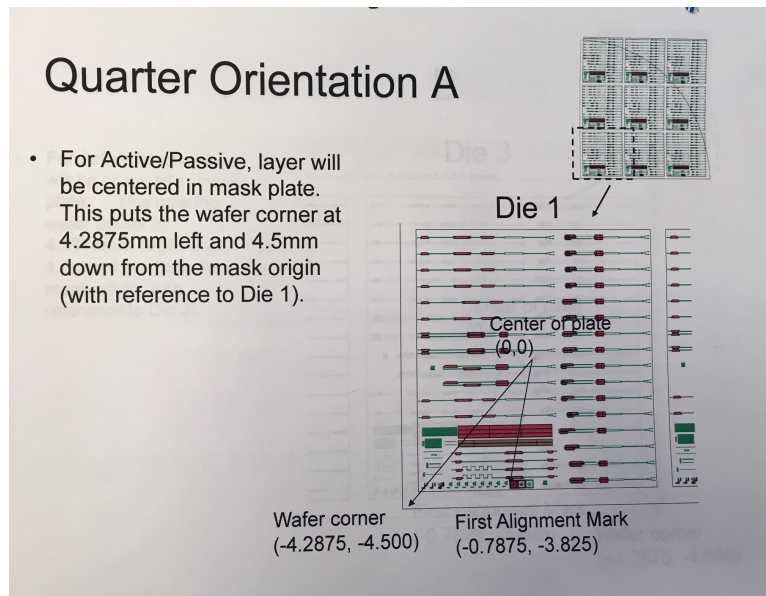
Programming for the single centered mask:

Pass shift is a distance from the center of the mask plate to the center of layer being exposed, which is in this case :  $x=0$ ,  $y=0$

Key offset is a distance from the center of alignment mark to the center of die, which is in this case (see the picture bellow):

$X = -0.7878$ ,  $Y = -3.8250$

Follow sign convention for the key offset (in SOP manual) and change the sign for key offset (for the alignment mark in lower left quadrant of die  $X = +$ ,  $Y = -$ )



**Pass shift:  $X=0$ ,  $Y=0$**

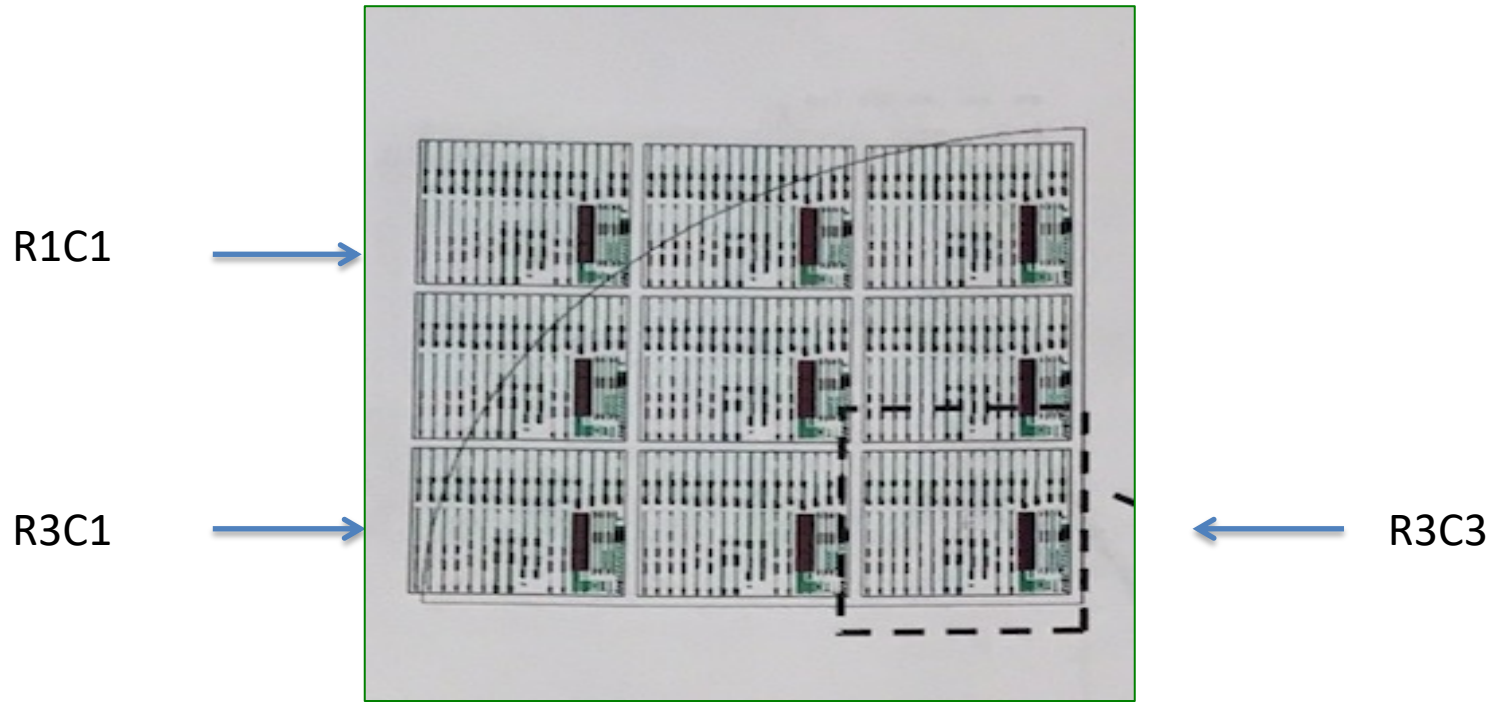
**Key offset:  $X=+0.7875$ ,  $Y=-3.8250$**

# Second layer on sample with BR orientation

1. Inspect the sample with BR orientation (make sure the first layer is there along with the alignment mark needed for a second lithography).
2. Load the sample on a wafer chuck (be consistent and repeatable with simple tasks as loading sample on chuck, turning vacuum on, loading chuck on stage, turning vacuum on).
3. Make sure sample is vacuumed to the chuck (not moving), and a wafer chuck is vacuumed to the stage (not moving).
4. Load the program for second lithography
5. DO NOT use the key "A" for this orientation. R objective should already be above R3C3
6. You are ready for the alignment step.

## 1. First layer for BR orientation

The first layer is already on a wafer piece (a quarter of 2" wafer). Layout will look like array of rows and columns as shown on a picture bellow (3rows, 3columns, total of 9 exposures (dies)). Second layer will be aligned to the first layer using a global alignment mark that is present in each of 9 dies.



## 2. Second Layer for BR Orientation (Quarter Orientation B)

Find a global alignment mark in R3C3 (use the keys (+/-x, +/-y) to drive around). Align a cross on R objective with the global alignment mark in R3C3.

Switch to L objective, and do your best job aligning. Keep switch between objectives until alignment looks good. Expose second layer.

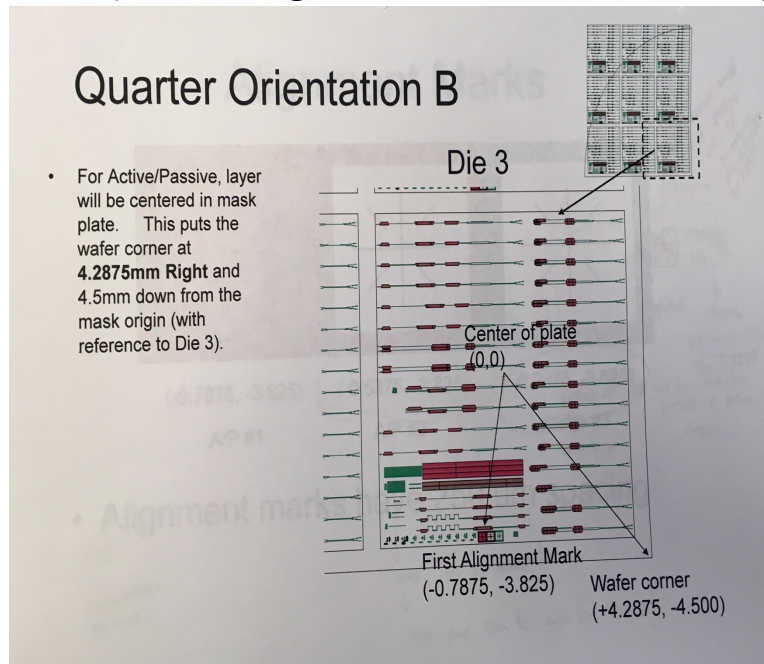
Programming for the single centered mask:

Pass shift is a distance from the center of the mask plate to the center of layer being exposed, which is in this case :  $x=0$ ,  $y=0$

Key offset is a distance from the center of alignment mark to the center of die, which is in this case (see the picture bellow):

$X = -0.7878$ ,  $Y = -3.8250$

Follow sign convention for the key offset (in SOP manual) and change the sign for key offset (for the alignment mark in lower left quadrant of die  $X = +$ ,  $Y = -$ )



**Pass shift:  $X=0$ ,  $Y=0$**

**Key offset:  $X=+0.7875$ ,  $Y=-3.8250$**



# Second layer- for single centered mask

## Aligning to BL orientation

Find first alignment mark( global) in R3C1

Align as you would normally align **BL orientation**

Key offset :  $X=+0.7875$ ,  $Y=-3.8250$

Pass shift:  $X=0$ ,  $Y=0$

## Aligning to BR orientation

Find first alignment mark( global) in R3C3

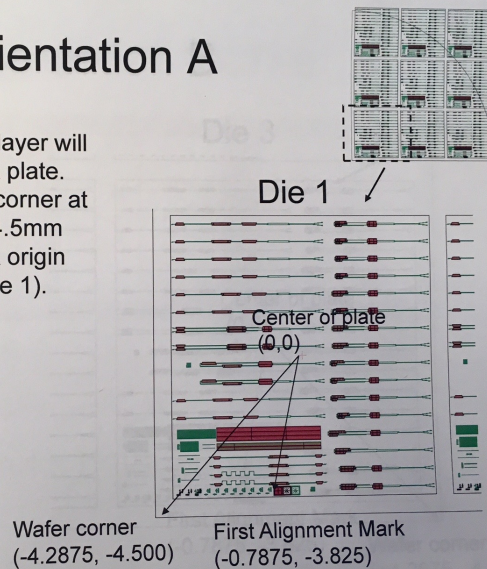
Align as you would normally align **BR orientation**

Key offset :  $X=+0.7875$ ,  $Y=-3.8250$

Pass shift:  $X=0$ ,  $Y=0$

## Quarter Orientation A

- For Active/Passive, layer will be centered in mask plate. This puts the wafer corner at 4.2875mm left and 4.5mm down from the mask origin (with reference to Die 1).



## Quarter Orientation B

- For Active/Passive, layer will be centered in mask plate. This puts the wafer corner at 4.2875mm Right and 4.5mm down from the mask origin (with reference to Die 3).

