

MA6 Top Side Alignment SOP

Start

1. Reserve time in iLab Calendar (BRK Lithography Core). Enable MA6 in iLab Kiosk (BRK Lithography Core) prior to use.
- 2. Before turning on power, SHAKE BOTH JOYSTICKS for theta and xy and make sure that they are on neutral position.**
- 3. If mask holder is not installed on machine, place the mask holder back into machine.**
4. Shortly turn the POWER SWITCH on the front panel control clockwise into ON position and release. Machine initializes.
5. Press the flashing LOAD key on keyboard as DISPLAY directs.
6. Select MA6 in machine configuration using Y ARROW key and press ENTER. (BA6 is used for bond alignment only)

Adjust Parameters

7. Edit parameter: Press EDIT PARAMETER key to edit the parameters such as exposure time, alignment gap, expose mode, HC wait time (only for hard contact), WEC-type, and WEC offset. Change all necessary value by pressing Y button and move another parameter by pressing X button. Confirm by pressing EDIT PARAMETER key again.

Load Mask

8. Unlock the mask holder by pressing CHANGE MASK key (keyboard). You have to take out the mask holder, flip it 180° and put it on the tray left. If a mask is loaded, press ENTER to toggle the mask vacuum off, retract the mechanical mask clamp and remove the mask.
9. Load mask and fix it: Place the mask onto the mask holder against the stop pins. Toggle the mask vacuum on by pressing the ENTER key. Activate the mechanical mask clamp by pressing on the leaf spring.
10. Slide the mask holder back into the machine and clamp it: Flip the mask holder 180° back and move it into the machine. Lock the mask holder by pressing CHANGE MASK key again.

Load Wafer

11. Pull out transport slide and load wafer: LOAD key The machine instructs: "pull slide and load substrate onto chuck". Pull out the transport slide

- completely. Insert the proper chuck and place the wafer against the pre-alignment pins. Confirm with ENTER key. Now the wafer is hold by vacuum.
12. Move slide in: ENTER key The machine instructs: "move slide into machine and confirm with ENTER"
 13. Wedge error compensation WEC starts automatically after the last action is completed. The wafer is adjusted parallel to the mask and moves to the alignment gap. The microscope moves down to start the alignment.

First Mask Exposure

If you do not need to align mask, adjust STAGE position value X=0, Y=0 and THETA=0 using XY arrow key (keyboard) and THETA joystick. Please do not use XY joystick. Then, go to STEP 26.

Microscope Alignment

14. Toggle BSA MICROSCOPE key (keyboard) off. Turn the SPLITFIELD switch (front panel) to RIGHT. You may select LEFT/RIGHT objective lens view by using SPLITFIELD switch on TSA microscope. You may choose to see with only EYEPIECES, EYEPIECES/MONITOR and MONITOR by push and pulling TSA BEAM SPLITTER
15. ILLUMINATION to TSA Turn ILLUMINATION switch (front panel) to TSA. Adjust light intensity by rotating "TSA" knob (front panel). Separate intensity selection for the left/ right objective is possible with the aperture located at the left/right microscope front.
16. Select TSA by pressing STG/TSA/BSA button on keyboard around XY joystick. You may confirm that TSA is selected in display.
17. Adjust microscope to the mask alignment marks using XY arrow key (keyboard). Please do not use XY joystick. Move the left/right objective to the left/right mask alignment mark by the OBJECTIVE X-SEPARATION knobs (on TSA microscope).
18. Please adjust the position of TOP SUBSTRATE LEFT/RIGHT (front panel) regulators into the middle. Each knob can be rotated for 5 full turns. Please adjust the position of BOTTOM SUBSTRATE LEFT/RIGHT (front panel) regulators into the middle, too.
19. Coarse focus is possible by using the TSA ZMOVEMENT knob placed behind the TSA microscope. Make secure the TOP/BOTTOM key LED (keyboard) is

on, which means TOP selected and focusing on the pattern on MASK plane. Adjust the fine focus separately using the TOP SUBSTRATE LEFT/RIGHT (front panel) regulators.

Wafer Alignment

20. Select STG by pressing STG/TSA/BSA button on keyboard and confirm on display.
21. Make sure the TOP/BOTTOM key LED (keyboard) is off, which means BOTTOM selected and focusing on the pattern on wafer plane.
22. Focus on the wafer plane. Adjust the left/right microscope image with the BOTTOM SUBSTRATE LEFT/RIGHT (front panel) regulator.
23. Adjust the fine focus separately using the BOTTOM SUBSTRATE LEFT/RIGHT (front panel) regulators.
24. Align alignment mark between mask and wafer using XY arrow key (keyboard) and THETA joystick.
25. Alignment check: Depending on your requirements, an alignment check could be helpful using the SEP keys (keyboard), ALIGN CONT/EXP key (keyboard) or the ALIGNMENT CHECK key (keyboard).

Exposure

26. Make sure the exposure time is correct value. Make sure that correct channel is selected in UV power supply under the table. For positive photoresist, CI2 needs to be selected (18.5mW/cm² at 405nm). For negative photoresist, CI1 needs to be selected (7mW/cm² at 365nm). After use any of them, please put back CI2.
27. By pressing Exposure key (keyboard) the wafer will move into exposure position and exposure takes place. Please do not watch UV light. If possible, check whether the intensity value is correct or not.
28. Please wait until the wafer chuck moves down for unload the exposed wafer. Once wafer is unloaded, please pull out transport slide to unload your wafer.

End

29. If you have more wafers, you can go back to step 13, and continue to align your wafers.

30.If you do not have more wafers, hit the CHANGE MASK key (keyboard) and the mask holder will be released. Pull the mask holder out, flip it by 180° and store it on the tray to your left. Hit ENTER to switch the mask vacuum off. Retract the mechanical clamping and remove the mask.

31.You must slide the mask holder back into the machine and clamp it: Flip the mask holder 180° back and move it into the machine. Lock the mask holder by pressing CHANGE MASK key again. Display show that loss of vacuum error, just because there is no mask. But, it is fine.

32.Shortly turn the POWER SWITCH off the front panel control counter-clockwise into OFF position and release before disabling iLab.

33.Disable MA6 in iLab

Tip

1. Anytime, you may unload your wafer by pressing UNLOAD key (keyboard)
2. Anytime, you may move TSA microscope up/down by pressing F1 and ENTER keys (keyboard)
3. After pressing STG/TSA/BSA button, please make sure whether correct mode is selected in DISPLAY. If it is not changed properly, press STG/TSA/BSA button again with 1-second interval.
4. If microscope or stage keeps moving, press STG/TSA/BSA button with 1-second interval, until it stops.