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| --- |
| Objective |
| Batch name: |
| This is an example process flow to be used as a template. It should contain   * The objective of the process. * Substrates/samples used in the flow. Both actual samples to be processed (device wafers) and monitor samples for the different process steps * The Process flow main processes and steps * Recommended: Figures illustrating the sample before and after each main process step.   How to use this template (works only with the .dotx template file):   * Fill out the fields in the heading! * Add process steps in the following way:   1. Select a process step header and one or more detail steps. Make sure to select the whole line so that the marking extends beyond the table to the right.   2. Press <crtl> C to copy the part.   3. Select the step header where you want to insert the new step. Again make sure to select the whole line.   4. Press <ctrl> V to insert to new step. * The Content (TOC) on the last page is an option, but can give a nice overview for very long process flows. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Substrates | | | | | | | | | | |
| Substrate | Orient. | Size | | Doping/type | Polish | thickness | Box | Purpose | # | Sample ID |
| Silicon | <100> | | 4” | n (Phos.) | SSP | 525±25µm |  | Device wafers | 2 | S1-S2 |
| Silicon | <100> | | 4” | n (Phos.) | SSP | 525±25µm |  | Test wafers | 1 | T1 |

Comments: Number of wafers is for illustration only

|  |  |  |  |
| --- | --- | --- | --- |
| Figures | | | |
| Figure | Caption | Step | Figure |
|  | After SiO2 dep | 2.1 |  |
|  | After lithography | 3.5 |  |
|  | After BHF etch | 4.1 |  |
|  | After resist strip | 4.4 |  |
|  | After lithography | 5.8 |  |
|  | After metal deposition | 6.1 |  |
|  | After lift-off | 6.2 |  |

Comments:Click here to enter text.

|  |  |  |  |
| --- | --- | --- | --- |
| Step Heading | Equipment | Procedure | Comments |
| 1. Preparation | | | **All wafers** |
| * 1. Wafer selection | Wafer box | Take the wafers from the storage and put them in a wafer box. | Note the wafer IDs in the batch traveler |
| 1. SiO2 deposition | | | **All wafers** |
| * 1. SiO2 dry oxidation | Phosphor Drive-in (A3) | Place a test wafer in the center of the boat and place device wafers and eg. test wafers equally distributed on each side of the test wafer. No spacing between wafers.  Recipe: Dry1050, time:100min  Target thickness: 100±10nm | Measure oxide thickness on the filmtech and note the result in the furnace log |
| 1. Lithography – 1.5µm standard | | | **All wafers** |
| * 1. Surface treatment | HMDS oven | Load all wafers in oven for ~30 mins  Recipe: program 4 | Note time in logbook |
| * 1. Clean spinner | SSE spinner | Clean spinner nozzle and run the dummy wafers  Recipe: 1.5 4inch | 1-3 dummies  Note time in logbook |
| * 1. Coat wafers | SSE spinner | Coat the device wafers  1.5 m AZ5214e Novolac resist  Softbake on hotplate  Recipe: 1.5 4inch (Temp: 90°C, time:60 sec) | Resist thickness not checked  Note time in logbook |
| * 1. Exposure | Aligner-6inch | Align to flat. Hard contact  Recipe: xxxxxx  Exposure time: 3 sec  Mask: CONTACTS (dark field) | Note time in logbook |
| * 1. Develop | Developer bench | Develop in 351B for 60±10 sec | Note time in logbook |
| * 1. Rinse/dry | Wet bench/ Spin dryer | Rinse in DI water for 5 min (300±30 sec).  Spin dry |  |
| * 1. Inspection | Optical microscope | Check pattern and alignment marks |  |
| 1. SiO2 etch | | | **All wafers** |
| * 1. BHF etch | Buffered HF Clean | Etching rate: 75-80 nm/min  Time: 90 sec |  |
| * 1. Rinse/dry | Wet bench/ Spin dryer | Rinse in DI water for 5 min (300±30 sec).  Spin dry |  |
| * 1. Inspection | Optical microscope | Check pattern and alignment |  |
| * 1. Strip resist | Acetone | First 2-3 min in rough followed by 5 min in fine strip bath with US |  |
| * 1. Rinse/dry | Wet bench/ Spin dryer | Rinse in DI water for 5 min (300±30 sec).  Spin dry |  |
| * 1. Inspection | Dektak | Measure step height  Target: 100±10 nm |  |
| 1. Lithography – 2.2µm image reversal | | | **All wafers** |
| * 1. Surface treatment | HMDS oven | Load all wafers in oven for ~30 mins  Recipe: program 4 | Note time in logbook |
| * 1. Clean spinner | SSE spinner | Clean spinner nozzle and run the dummy wafers  Recipe: 2.2 4inch | 1-3 dummies  Note time in logbook |
| * 1. AZ5214 resist coating | SSE spinner | Coat the device wafers  2.2 m AZ5214e Novolac resist  Recipe: 2.2 4inch (Temp: 90°C, time:60 sec) | Resist thickness not checked  Note time in logbook |
| * 1. Exposure | Aligner-6inch | Align to alignment marks on wafer. Hard contact.  Recipe: XXXXX  Exposure time: 1.7 sec  Mask: METAL (clear field) | Note time in logbook |
| * 1. Reverse bake | SSE spinner | Temp: 110 °C  Time: 120 sec |  |
| * 1. Flood exposure | Aligner-6inch | Recipe: XXXXX  Exposure time: 15 sec  Mask: none | Note time in logbook |
| * 1. Transport of wafers | transport box | Load wafers into the Black or blue transport box | To avoid unwanted exposure from the white light |
| * 1. Develop | Developer  bench | Develop in 70±10 sec | Note time in logbook |
| * 1. Rinse/dry | Wet bench/ Spin dryer | Rinse in DI water for 5 min (300±30 sec).  Spin dry |  |
| * 1. Inspection | Optical microscope | Alignment check |  |
| 1. Aluminum pattern | | | **Only device wafers!!** |
| * 1. Aluminum deposition | Alcatel | Metal: Al  Thickness: 200 nm | Note time in logbook |
| * 1. Lift-off | Lift-off bench | Leave wafers in acetone for 2-3 min. Start the US for 10 min. Rotate wafers and start US for another 10 min. | Fill the bench with Acetone until carrier is covered. |
| * 1. Rinse/dry | Wet bench/ Spin dryer | Rinse in DI water for 5 min (300±30 sec).  Spin dry |  |
| * 1. Inspection | Optical microscope | Check for completeness |  |
| * 1. Inspection | Dektak | Measure heights and widths | Note on measurement sheet |
| 1. Linewidth measurement | | | **All wafers** |
| * 1. Optical inspection | Nikon ECLIPSE L200 | Measure linewidths | Note on measurement sheet |
| * 1. Electrical characterization | Probe station | Measure sheet resistance and line resistance and calculate linewidth from this | Note on measurement sheet |
| * 1. SEM inspection | SEM-Zeiss/Leo | Measure linewidths | Note on measurement sheet |

Contents

[1 Preparation 3](#_Toc317851017)

[1.1 Wafer selection 3](#_Toc317851018)

[2 SiO2 deposition 3](#_Toc317851019)

[2.1 SiO2 dry oxidation 3](#_Toc317851020)

[3 Lithography – 1.5µm standard 3](#_Toc317851021)

[3.1 Surface treatment 3](#_Toc317851022)

[3.2 Clean spinner 3](#_Toc317851023)

[3.3 Coat wafers 3](#_Toc317851024)

[3.4 Exposure 3](#_Toc317851025)

[3.5 Develop 3](#_Toc317851026)

[3.6 Rinse/dry 3](#_Toc317851027)

[3.7 Inspection 3](#_Toc317851028)

[4 SiO2 etch 3](#_Toc317851029)

[4.1 BHF etch 3](#_Toc317851030)

[4.2 Rinse/dry 3](#_Toc317851031)

[4.3 Inspection 3](#_Toc317851032)

[4.4 Strip resist 3](#_Toc317851033)

[4.5 Rinse/dry 3](#_Toc317851034)

[4.6 Inspection 3](#_Toc317851035)

[5 Lithography – 2.2µm image reversal 3](#_Toc317851036)

[5.1 Surface treatment 3](#_Toc317851037)

[5.2 Clean spinner 3](#_Toc317851038)

[5.3 AZ5214 resist coating 3](#_Toc317851039)

[5.4 Exposure 4](#_Toc317851040)

[5.5 Reverse bake 4](#_Toc317851041)

[5.6 Flood exposure 4](#_Toc317851042)

[5.7 Transport of wafers 4](#_Toc317851043)

[5.8 Develop 4](#_Toc317851044)

[5.9 Rinse/dry 4](#_Toc317851045)

[5.10 Inspection 4](#_Toc317851046)

[6 Aluminum pattern 4](#_Toc317851047)

[6.1 Aluminum deposition 4](#_Toc317851048)

[6.2 Lift-off 4](#_Toc317851049)

[6.3 Rinse/dry 4](#_Toc317851050)

[6.4 Inspection 4](#_Toc317851051)

[6.5 Inspection 4](#_Toc317851052)

[7 Linewidth measurement 4](#_Toc317851053)

[7.1 Optical inspection 4](#_Toc317851054)

[7.2 Electrical characterization 4](#_Toc317851055)

[7.3 SEM inspection 4](#_Toc317851056)