# GST CMP BLANKET and TEST PATTERNED WAFERS

## MARCH 20, 2009

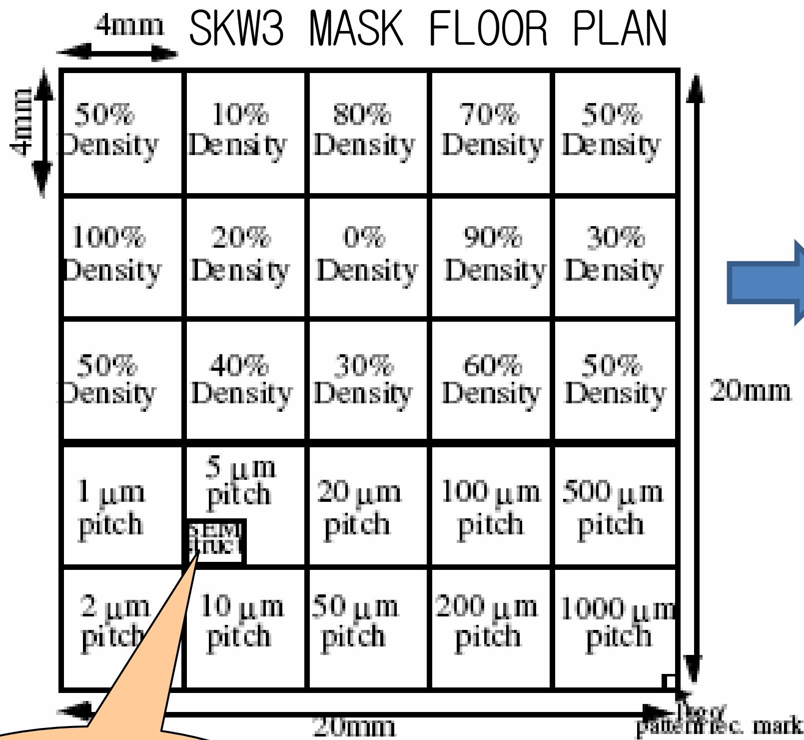
**PREPARED BY SOOKAP HAHN**
**PRESIDENT**
**SKW ASSOCIATES, INC.**
**2920 SCOTT BOULEVARD**
**SANTA CLARA, CA 95054**
**TEL: 408-919-0094**
**CELL: 650-799-3589**

# I. BLANKET FILM WAFER

- ✓ Both 200 & 300mm Wafers Are Available
- ✓ Method of GST Film Deposition: PVD (Magnetron Sputtering)
- ✓ Typical Film Stack: Si/1kA $SiO_2$/200-300Å TiN/2.5-3kA GST
- ✓ CVD Deposition Method is Available Upon Request
- ✓ Deposited Surface Roughness
  - ATM measurement after GST 2500Å Sputtering
  - Scan Area: 500 µm x 500 µm
  - RMS 9.54Å
  - Ra 7.37Å

# CHANGE IN MASK LAYOUT FROM SKW3 (REMOVAL OF SEM STRUCTURES)

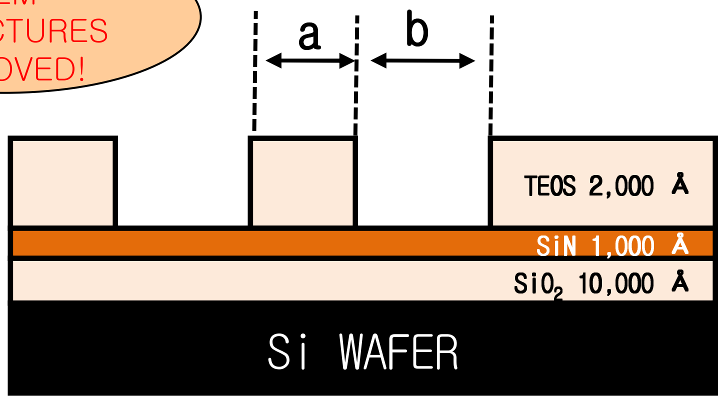
## SKW3 MASK FLOOR PLAN




SEM STRUCTURES REMOVED!

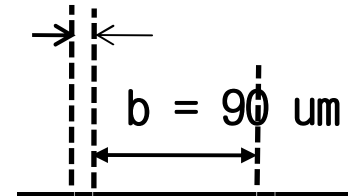
## PATTERN SIZE (LINE)

| a/b= 50/50 µm | 10/90 | 80/20 | 70/30 | 50/50 |
|---|---|---|---|---|
| No Pattern | 20/80 | No pattern | 90/10 | 30/70 |
| 50/50 | 40/60 | 30/70 | 60/40 | 50/50 |
| 0.5/ 0.5 | 2.5/ 2.5 | 10/10 | 50/50 | 250/ 250 |
| 1.0/ 1.0 | 5/5 | 25/25 | 100/ 100 | 500/ 500 |




CROSS SECTIONAL VIEW

a = 10 um

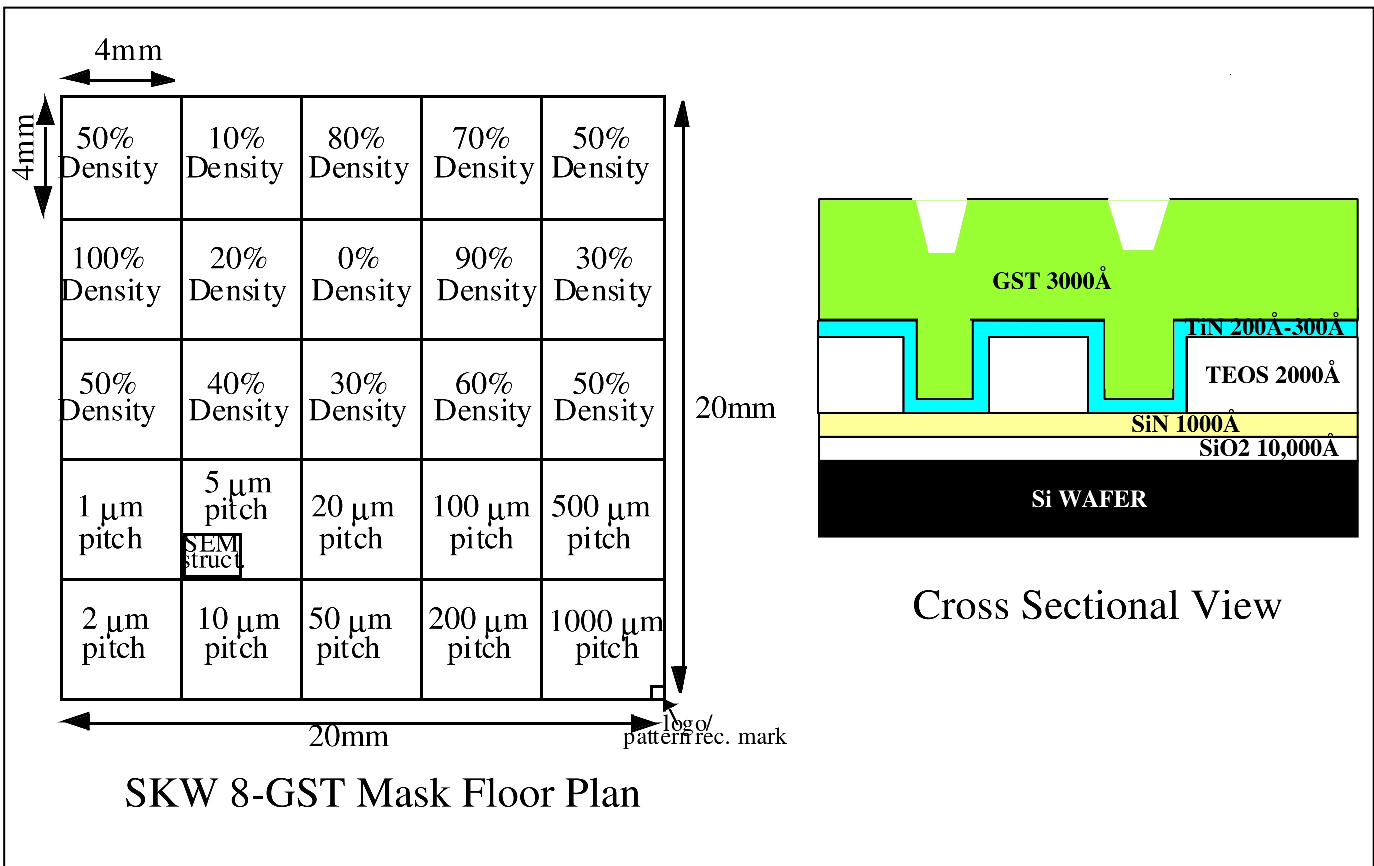



MONITORING PATTERN

*SKW Associates, Inc,*
2920 Scott Blvd.
Santa Clara, CA 95054
Phone (408) 919-0094
Fax (408) 919-0097
Email: skw@testwafer.com
http//www.testwafer.com

# SKW 8O-GST (200mm) Wafer Specifications

DATE: December 17, 2008




SKW 8-GST Mask Floor Plan

Cross Sectional View

## Specification for Patterning

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Center Die X Location | -10.000 mm | +/- 100 µm |
| Center Die Y Location | -10.000 mm | +/- 100 µm |
| Die Size: X | 20 mm | +/- 10 µm |
| Die Size: Y | 20 mm | +/- 10 µm |
| Die Spacing X/Y | 120 / 120 µm | +/- 10 µm |
| **Wafers must be patterned all the way to the edges of the wafer, i.e. no area anywhere on wafer unpatterned. (Under certain stepper operating conditions, 2mm edge exclusion is allowed.)** | | |

## Line Width Variation (measured on 10 µm, 90 µm structures)

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 10 µm, 90 µm | +/- 0.1 µm |
| Within-Lot (Wafer-to-Wafer) | | +/- 0.1 µm |
| Within-Wafer | | +/- 0.1 µm |
| Within-Die | | +/- 0.1 µm |

## Pad Oxide Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 10,000 Å | +/- 5% |
| Within-Lot (Wafer-to-Wafer) | | +/- 5% |
| Within-Wafer | | +/- 3% |
| Within-Die | | +/- 3% |

## SiN Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 1000 Å | +/- 10% |
| Within-Lot (Wafer-to-Wafer) | | +/- 10% |
| Within-Wafer | | +/- 5% |
| Within-Die | | +/- 5% |

## PETEOS Oxide Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 2000 Å | +/- 10% |
| Within-Lot (Wafer-to-Wafer) | | +/- 10% |
| Within-Wafer | | +/- 5% |
| Within-Die | | +/- 5% |

## PVD TiN Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 200 Å | +/- 10% |
| Within-Lot (Wafer-to-Wafer) | | +/- 10% |
| Within-Wafer | | +/- 5% |
| Within-Die | | +/- 5% |

## GST Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 3000 Å | +/- 5% |
| Within-Lot (Wafer-to-Wafer) | | +/- 5% |
| Within-Wafer | | +/- 3% |
| Within-Die | | +/- 3% |

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# SKW 8N-GST (200mm) Wafer Specifications

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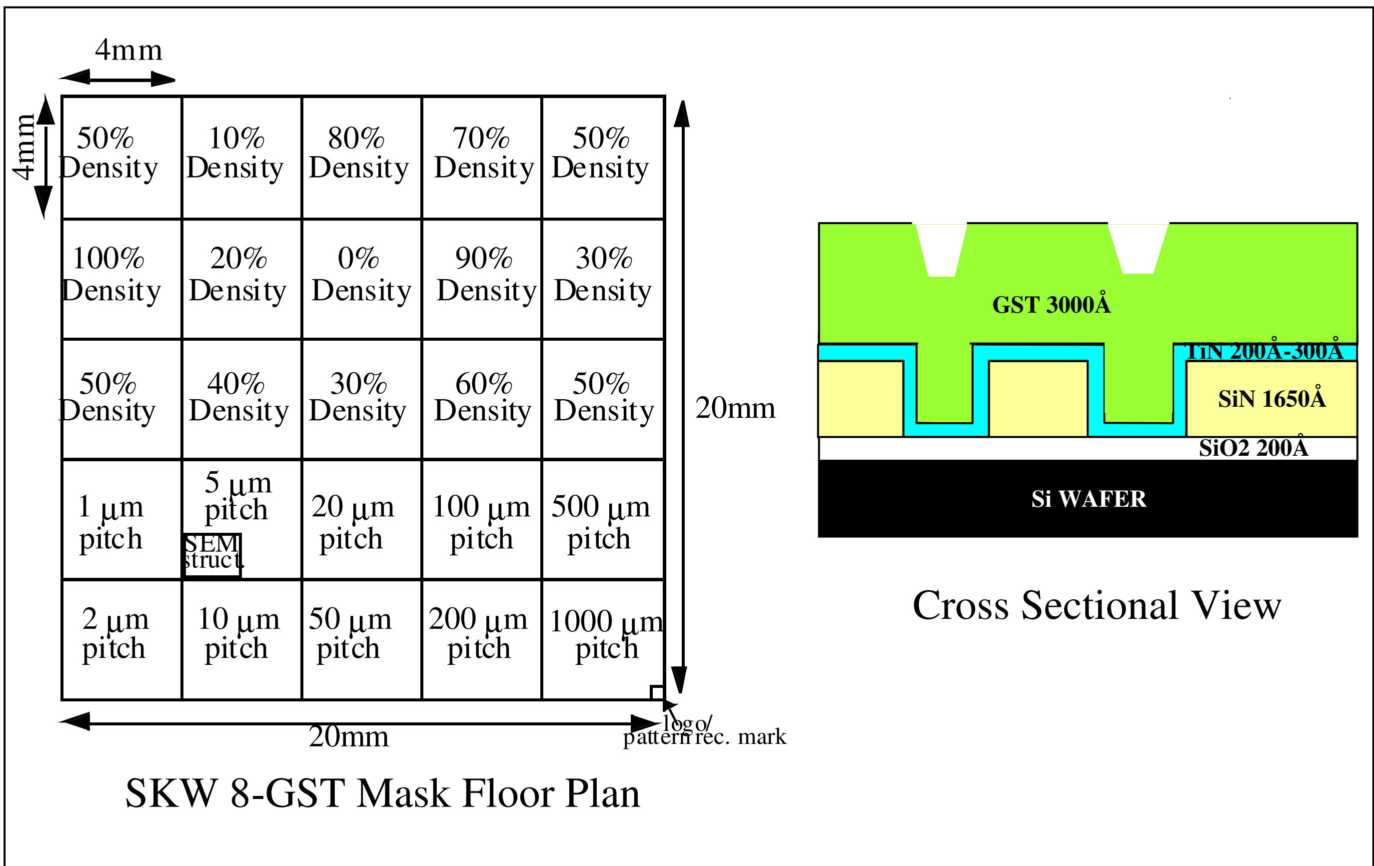



SKW 8-GST Mask Floor Plan

Cross Sectional View

## Specification for Patterning

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Center Die X Location | -10.000 mm | +/- 100 µm |
| Center Die Y Location | -10.000 mm | +/- 100 µm |
| Die Size: X | 20 mm | +/- 10 µm |
| Die Size: Y | 20 mm | +/- 10 µm |
| Die Spacing X/Y | 120 / 120 µm | +/- 10 µm |
| **Wafers must be patterned all the way to the edges of the wafer, i.e. no area anywhere on wafer unpatterned. (Under certain stepper operating conditions, 2mm edge exclusion is allowed.)** | | |

## Line Width Variation (measured on 10 µm, 90 µm structures)

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 10 µm, 90 µm | +/- 0.1 µm |
| Within-Lot (Wafer-to-Wafer) | | +/- 0.1 µm |
| Within-Wafer | | +/- 0.1 µm |
| Within-Die | | +/- 0.1 µm |

## Pad Oxide Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 200 Å | +/- 5% |
| Within-Lot (Wafer-to-Wafer) | | +/- 5% |
| Within-Wafer | | +/- 3% |
| Within-Die | | +/- 3% |

## SiN Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 1650 Å | +/- 10% |
| Within-Lot (Wafer-to-Wafer) | | +/- 10% |
| Within-Wafer | | +/- 5% |
| Within-Die | | +/- 5% |

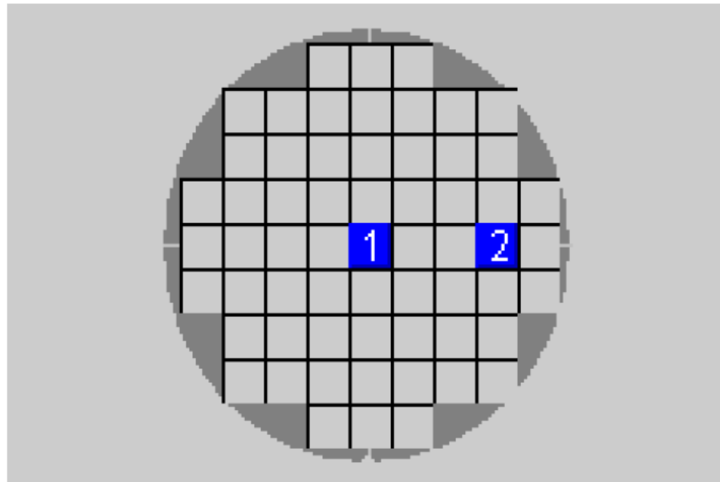
## PVD TiN Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 200 Å | +/- 10% |
| Within-Lot (Wafer-to-Wafer) | | +/- 10% |
| Within-Wafer | | +/- 5% |
| Within-Die | | +/- 5% |

## GST Film Thickness

| PARAMETER | NOMINAL | TOLERANCE |
|---|---|---|
| Lot-to-Lot | 3000 Å | +/- 5% |
| Within-Lot (Wafer-to-Wafer) | | +/- 5% |
| Within-Wafer | | +/- 3% |
| Within-Die | | +/- 3% |

# SKW8-GST Dishing Characterization Location Maps




DIE LOCATIONS

| | | | | |
|---|---|---|---|---|
| 50/50 | 10/90 | 80/20 | 70/30 | 50/50 |
| No Pattern | 20/80 | No pattern | 90/10 | 30/70 |
| 50/50 | 40/60 | 30/70 | 60/40 | 50/50 |
| 0.5/0.5 (1) | 2.5/2.5 | 10/10 (4) | 50/50 (5) | 250/250 |
| 1.0/1.0 (2) | 5/5 (3) | 25/25 | 100/100 (6) | 500/500 |

SITE LOCATIONS