SKW Wafer Product List

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I. Available Wafers in 200mm and 300mm

- Please refer to the Document attached

II. Product literature on Patterned Wafers

- We will send the literature as Spec on Patterned Wafers later

III. Pricing

- Please refer to the Document attached
- Volume Discounts: Variable

IV. Do you have ability to customize blanket stacks and patterns?

- Yes
- However, time to customize depends upon our foundries' time schedule

V. Lead Times

- Typically 2 – 4 weeks for blanket film wafers
- Typically 2 – 6 weeks for patterned wafers

200mm Blanket Film Wafers with Price

Blanket Wafer Type
PVD Al_2O_3 Blanket Film Wafer (Si/ 1kA PVD Al_2O_3)
PVD AlN Blanket Film Wafer (Si/ 1kA SiO_2/ 1kA PVD AlN)
ALD Al_2O_3 Blanket Film Wafer (Si/ 200 – 300A ALD Al_2O_3)
ALD AlN Blanket Film Wafer (Si/ 1kA SiO_2/ 200 – 300A PVD AlN)
ALD AlON Blanket Film Wafer (Si/ 200 – 300A ALD AlON)
Thermal Oxide Blanket Film Wafer (Si/1µm SiO2)
TEOS Oxide Blanket Film Wafer #1 (Si/1.5µm TEOS)
TEOS Oxide Blanket Film Wafer #2 (Si/3-4µm TEOS)
TEOS Blanket Film Wafer With Particle Spec (Si/1µm TEOS, <200@0.2µm)
HDP Blanket Film Wafer (Si/1µm HDP)
Nitride Blanket Film Wafer (Si/2,000A LP CVD SiN)
Nitride Blanket Film Wafer (Si/1,000A SiO2/3,000A LP CVD SiN)
Nitride Blanket Film Wafer (Si/5,000A PE CVD SiN)
Nitride Blanket Film Wafer (Si/1,000A P-SiO2/5,000A PE CVD SiN)
PHPS SOD Blanket Film Wafer (Si/ 5kA PHPS SOD / Thermal Anneal)
W Blanket Film Wafer (Si/5,000A SiO2/150A IMP Ti/100A TiN/8,000A CVD W)
Ti Blanket Film Wafer (Si/5,000A Oxide/ PVD 2,000A Ti)

200mm Blanket Film Wafers with Price (cont'd)

Blanket Wafer Type
TiN Blanket Film Wafer (Si/5,000A Oxide/ PVD 2,000A TiN)
CVD TiN Blanket Film Wafer (Si/ 1kA SiO_2/ 500A ALD TiN)
ALD TiN Blanket Film Wafer (Si/ 1kA SiO_2/ 200 – 300A ALD TiN)
Ta Blanket Film Wafer (Si/5,000A Oxide/ PVD 2,000A Ta)
TaN Blanket Film Wafer (Si/5,000A Oxide/ PVD 2,000A TaN)
BD Blanket Film Wafer (Si/5,000A BD, k-value = 2.9 – 3.0)
CORAL Blanket Film Wafer (Si/5,000A CORAL, k-value=3.0)
Cu Seed Blanket Film Wafer (Si/5,000A SiO2/250A Ta/10,000A PVD Cu Layer)
BD/Ti + TiN Blanket Film Wafer (Si/5,000A BD/150A Ti + 100A TiN)
Oxide/Ti + TiN Blanket Film Wafer (Si/5,000A SiO2/150A Ti + 100A TiN)
Oxide/Ta + TaN Blanket Film Wafer (Si/5,000A SiO2/90A Ta + 60A TaN)
BD/Ta + TaN Blanket Film Wafer (Si/5,000A BD/90A Ta + 60A TaN)
PVD Co Blanket Film Wafer (Si/5kA oxide / 250A Ti / 2kA PVD Co)
CVD Co Blanket Film Wafer #1 (Si/ 2kA oxide/ 200A PVD Ta/ 1.4kA CVD Co)
CVD Co Blanket Film Wafer #2 (Si/ 2kA oxide/ 50A PVD Ta/ 1.4kA CVD Co)
Cu Blanket Film Wafer #1 (Si/5,000A SiO2/250A Ta/1,000A PVD Cu/15,000A ECD Cu)
Cu Blanket Film Wafer #2 (Cu "Filler Blanket Film Wafer") (Si/5,000A SiO2/250A Ta/1,000A PVD Cu/50,000A ECD Cu)

200mm Blanket Film Wafers with Price (cont'd)

Blanket Wafer Type
Cu Blanket Film Wafer #3 (Cu "Filler Blanket Film Wafer") (Si/5,000A SiO2/250A Ta/1,000A PVD Cu/10,000A ECD Cu)
Ru Blanket Film Wafers (Si/200A Ti/PVD 2,000A Ru)
ALD Ru Blanket Film Wafers #1 (Si/30A ALD Al_2O_3 /200A ALD Ru)
Ru Blanket Film Wafers #2 (Si/ 30A ALD Al_2O_3 /400A ALD Ru)
Al-0.5% Cu Blanket Film Wafer (Si/1,000A SiO2/150A Ti/250A TiN/10,000A Al-0.5% Cu)
Al-1% Si Blanket Film Wafer (Si/1,000A SiO2/150A Ti/250A TiN/10,000A Al-1% Cu)
PVD SiGe (50:50) Blanket Film Wafer (Si/ 2kA PVD SiGe (50:50)
PVD SiGe (50:50)/ Oxide Blanket Film wafer (Si/ 1kA Oxide / 2kA PVD SiGe (50:50))
PVD Ge Blanket Film Wafer (Si/2kA PVD Ge)
Ge Epi Blanket Film Wafer (Si/ 2kA Epi Ge)

200mm Blanket Film Wafers (cont'd)

Deposition Methods Used:

- BD, BPSG, BSG, PSG, CORAL, TEOS, SiN, HDP and SiON: CVD
- Al_2O_3, AlN, Co, Ti, TiN, Ta, AlON TaN, Ru: PVD, CVD, and ALD
- Co, Ru: CVD, and ALD
- Ge : Epitaxy
- GST: Magnetron Sputtering
- ECD Cu Layer: Cu Electroplating
- PHPS SOD

Wafer Product List (150mm and 200mm)

I. Patterned Wafer

Wafer Type	Mask	Features
Dielectric	SKW 1-1	150mm
	SKW 1	200mm
	SKW 7-2	200mm 8kA treneh depth 2um PETEOS
	SKW 7-2 HSH (2) <3D NAND FLASH MEMORY>	200mm 3um trench depth 4um PETEOS
	SKW 7-2 HSH (2) SiN STOP Layer <3D NAND FLASH MEMORY>	200mm 3um trench depth 4um PETEOS
	SKW7-2/ Oxide (1kA)/ 2.5kA CVD SiGe(50:50)	
	SKW7-2/ Oxide (1kA)/ 2.5kA CVD Ge	

Wafer Type	Mask	Features
STI	SKW 3-2	HDP CVD oxide film
	SKW 3-3	HDP CVD oxide film
	SKW 3-5	HDP CVD oxide film/ defectivity
	SKW 3-6	HDP CVD oxide film planarity & defectivity evaluation
	SKW 3-9 **new**	HDP CVD oxide film planarity
	SKW 3-9 new	PHPS SOD Oxide film planarity

Wafer Type	Mask	Features
W	SKW 5-2	
	SKW 5-3 (0.18)	Minimum feature size: 0.18um Single damascene structure
	SKW 5-3 (0.13) **new**	Minimum feature size: 0.13um Single damascene structure
	SKW 5-ICP-K **new**	Interconnect pattern, 90nm technology node
	SKW5-J085	Plug patterned, 90nm technology node

Wafer Type	Mask	Features
Poly-Si	SKW 3AS	200 mm amorphous Si
	SKW 3DPS	200 mm doped poly
	SKW 3PS	200 mm undoped poly
	SKW 3PN	200 mm undoped poly over nitride
	SKW 3PS AU **new**	200 mm undoped poly
	SKW 3PS AI **new**	200 mm in-situ P-doped poly
	SKW 3PN AU **new**	200 mm undoped poly over nitride
	SKW 3PN AI **new**	200 mm in-situ P-doped poly over SiN

Wafer Type	Mask	Features
Cu	SKW 6-3MC TEOS (0.18)	
	SKW 6-3 ML BD (0.18)	
	SKW 6-3 ML TEOS (0.18)	
	MIT 854 Cu/TEOS (0.18) **new**	
	MIT 854 Cu/BD (0.18) **new**	
	MIT 854 Cu/BD/TEOS (0.18) **new**	
	SKW 6-3 BD (0.13) **new**	90nm technology node
	SKW 6-3 BD (0.13-0.18) **new**	
	SKW 6-3 TEOS (0.13) **new**	90nm technology node
	SKW 6-3 TEOS (0.13-0.18) **new**	
	SKW 6-3 BD/SiON(0.13) **new**	90nm technology node
	SKW 6-3 BD/SiON (0.13-0.18) **new**	90nm technology node
	SKW 6-5 BD **new**	90nm technology node
	SKW 6-5 TEOS **new**	90nm technology node
	SKW 6-5 BD/SiON **new**	90nm technology node
	SKW 6-6 TEOS **new**	90 nm technology node
	SKW 6-6 Cu/BD (2600Å BD) **new**	90 nm technology node
	SKW 6-6 Cu/BD (3300Å BD) **new**	90 nm technology node
	SKW 6-6 Cu/BD/TEOS **new**	90 nm technology node
	SKW 6-6 Cu/BD/SiON **new**	90 nm technology node

Wafer Type	Mask	Features
Co	SKW6-3.18	2kA CVD Co fill
	SKW5-JO85	2kA CVD Co fill

Wafer Type	Mask	Features
GST	SKW8O-GST **new**	
	SKW8N-GST **new**	

Wafer Type	Mask	Features
Al	SKW Al-0.5% Cu	
	SKW Al-1% Si	

300mm Blanket Film Wafers

Blanket Wafer Type
ALD Al_2O_3 Blanket Film (ALD Al_2O_3 film thickness : 200A - 300A)
ALD AlN Blanket film wafer (ALD AlN film thickness : 200A – 300A)
ALN AON Blanket film wafer (ALD AlON film thickness : 200A – 300A)
BPSG Blanket Film Wafer (BPSG Thickness: 5,000A – 10,000A)
PVD Al_2O_3 (PVD Al_2O_3 film thickness : 1,000A)
PVD AlN (PVD AlN film thickness : 1,000A)
BSG Blanket Film Wafer (BSG Thickness: 5,000A – 10,000A)
PSG Blanket Film Wafer (PSG Thickness: 5,000A – 10,000A)
Thermal Oxide Blanket Film Wafer (Oxide Thickness: 1 µm)
TEOS Oxide Blanket Film Wafer #1 (TEOS Thickness: 20,000A)
TEOS Oxide Blanket Film Wafer #2 (TEOS Thickness: 30,000A – 40,000A)
Particle Grade TEOS Blanket Film Wafer (Si/10,000A TEOS)
HARP CVD Oxide Blanket Film (HARP CVD Oxide Thickness: 1 µm)
eHARP CVD Blanket Film Wafer(eHARP Film Thickness: 7,000A – 10,000A)
HDP CVD Oxide Blanket Film (HDP CVD Oxide Thickness: 8,000A)
Nitride Blanket Film Wafer (Si/2,000A LP SiN)
Nitride Blanket Film Wafer (Si/1,000A SiO2/3,000A LP SiN)
Nitride Blanket Film Wafer (Si/5,000A PECVD SiN)
Nitride Blanket Film Wafer (Si/1,000A P-SiO2/PECVD 5,000A SiN)
W Blanket Film Wafer (Si/2,000A Oxide/300A TiN/7,000A CVD W)

300mm Blanket Film Wafers (cont'd)

Blanket Wafer Type
PVD Co Blanket Film wafer (300mm Si/ 5kA SiO_2/250A PVD Ti/2kA PVD Co)
PVD CO Blanket Film Wafer (300mm Si/1kA SiO_2/~40A PVD TaN/200A – 400A CVD Co)
Cu Blanket Film Wafer #1 (Si/2,000A Oxide/250A Ta/1,000A Cu Seed Layer/2 µm ECD Cu Layer)
Cu Blanket Film Wafer #2 (Si/2,000A Oxide/250A Ta/1,000A Cu Seed Layer/4 µm ECD Cu Layer)
Ti Blanket Film Wafer (Si/1,000A Oxide/2,000A PVD Ti)
TiN Blanket Film Wafer (Si/1,000A Oxide/2,000A PVD TiN)
TiN Blanket Film Wafer (Si/1kA Oxide/ 450A CVD TiN)
TiN Blanket Film Wafers (Si/1kA Oxide / 200A – 400A ALD TiN)
Ta Blanket Film Wafer (Si/1,000A Oxide/2,000A Ta)
TaN Blanket Film Wafer (Si/1,000A Oxide/2,000A TaN)
BDI (Black Diamond) Blanket Film Wafer (Si/5,000A BDI)
BDIIx Blanket Film Wafer (Si/5,000A BDIIx)
BD III Blanket Film Wafer (Si/ 3,300A BDIII)
SiC Blanket Film Wafer (Si/1,000A Oxide/2,000A SiC)
Ru Blanket Film Wafer #1 (Si/ 5kA oxide/ 250A Ta/ 2kA PVD Ru)
Ru Blanket Film Wafer #2 (Si/ ~30A ALD Al_2O_3/ 200A ALD Ru)
Ru Blanket Film Wafer #3 (Si/ ~30A ALD Al_2O_3/ 400A ALD Ru)
Ru Blanket Film Wafer #4 (Si/ ~30A ALD Al_2O_3/ 600A ALD Ru)

* All the 300mm Si substrates are: P-type (100) test grade, 1-100 ohm-cm, particle level <50@0.2 µm

300mm Blanket Film Wafers (cont'd)

Blanket Wafer Type
ZrO2 Blanket Film Wafer (Si/100A – 200A ALD ZrO2)
HfO_2 Blanket Film Wafer (Si/ 100A – 200A ALD HfO_2
SiGe (50:50) Blanket Film Wafer (Si/ 2kA PVD SiGe (50:50) layer)
Ge Blanket Film Wafer (Si/ PVD 1kA Ge)

300mm Blanket Film Wafers (cont'd)

** Deposition Methods Used for 300mm Blanket Film Wafers

- TiN, AlN, Al_2O_3, AlON, Ge, SiGe(50:50), ALD, CVD, and PVD
- Ti, TiN, Ta, TaN and Cu Seed Layer: PVD
- W Layer, Co, BPSG, BSG, PSG, and Ru: CVD and PVD
- ECD Cu Layer: Electroplating
- SiC, BDI and BDIIx and BDIII: CVD
- ZrO2 and HfO_2 : ALD and PVD

Wafer Product List (300mm)

I. Patterned Wafer

Wafer Type	Mask	Features
ILD	SKW 7-2	PETEOS oxide film, (2um) Step height 8kA
	SKW7-2 HSH (2)	PETEOS oxide film, (4um) Step height 3µm (3D FLASH MEMORY OXIDE CMP PROCESS)
	SKW7-2 HSH (2) Nitride Stop Layer	PETEOS oxide film, (4um) Step height 3µm 1kA SiN (3D FLASH MEMORY OXIDE CMP PROCESS)

Wafer Type	Mask	Features
STI	SKW 3-2	HDP CVD oxide film
	SKW 3-2R HDP	HDP CVD oxide film
	SKW 3-2R HARP	HARP CVD oxide film
	SEMATECH 764	HDP CVD oxide film
	SKW 3-5	HDP CVD oxide film/ defectivity
	SKW 3-6	HDP CVD oxide film planarity & defectivity evaluation
	SKW 3-9 (HDP) **new**	HDP CVD oxide film planarity & defectivity evaluation
	SKW 3-9 (HARP) **new**	HARP film planarity & defectivity evaluation

Wafer Type	Mask	Features
Poly Si	SKW 3PS AU **new**	300 mm undoped poly
	SKW 3PS AI **new**	300 mm in-situ P-doped poly
	SKW 3PN AU **new**	300 mm undoped poly over nitride
	SKW 3PN AI **new**	300 mm in-situ P-doped poly over SiN

Wafer Type	Mask	Features
W	SKW 5-3.13 **new**	Interconnect pattern, 90nm technology node
	SKW 5-ATR-35I **new**	Interconnect pattern, 65nm technology node
	SKW 5-ATR-35P **new**	Plug pattern 65nm technology node
	SKW5-3.18	Interconnect pattern, 180nm technology node

Wafer Type	Mask	Features
Cu * k-value of BDI is 2.9 while that for BDIIx is ~2.4	SKW 6-3.18 Cu/TEOS	Minimum feature: 0.18um
	SKW 6-3.18 Cu/BDI	Minimum feature: 0.18um
	SKW 6-3.18 Cu/BDI/TEOS	Minimum feature: 0.18um
	SKW6-3.18 Cu/TEOS-60A PVD TaN/ 90A CVD Co	
	SKW6-3.18 Cu/TEOS-60A PVD TaN/ 90A CVD Ru	
	SKW6-3.18_TEOS (Ta_PVDCo) **	14 nm technology node PVD Barrier Metal
	SKW6-3.18_TEOS_CVDCo **	14 nm technology node CVD Barrier Metal
	SKW6-3.18_BDIIx_CVDCo (TEOS Cap Layer) **	14 nm Technology node CVD Barrier Metal Plus low-k film layer
	SKW6-3.18_TEOS (Ta_PVDRu) **	14 nm technology node PVD Barrier Metal
	SKW6-3.18_TEOS_CVDRu **	14 nm technology node CVD Barrier Metal
	SKW6-3.18_BDIIx_CVDRu (TEOS Cap Layer) **	14 nm Technology node CVD Barrier Metal Plus low-k film layer
	SKW 6-3.13 Cu/TEOS **new**	Minimum feature: 0.13um 90nm technology node
	SKW 6-3.13 Cu/BDI **new**	Minimum feature: 0.13um 90nm technology node
	SKW 6-3.13 Cu/BDI/SiON **new**	Minimum feature: 0.13um 90nm technology node
	SKW 6-3.13 Cu/BDI/TEOS **new**	Minimum feature: 0.13um 90nm technology node

** Advanced Hot New Product

Wafer Type	Mask	Features
TSV	SKW6 TSVATEC 2Cu – 5 x 50 ***	5µm Via Size, 50µm Via Depth
	SKW6 TSVATEC 2Si – 5 x 50 ***	5µm Via Size, 50µm Via Depth
	SKW6 TSVATEC 2Cu – 5 x 60 ***	5µm Via Size, 60µm Via Depth
	SKW6 TSVATEC 2Si – 5 x 60 ***	5µm Via Size, 60µm Via Depth
	SKW6 TSVATEC 2Cu – 10 x 100	10µm Via Size, 100µm Via Depth
	SKW6 TSVATEC 2Si – 10 x 100	10µm Via Size, 100µm Via Depth

*** Advanced Hot New Product