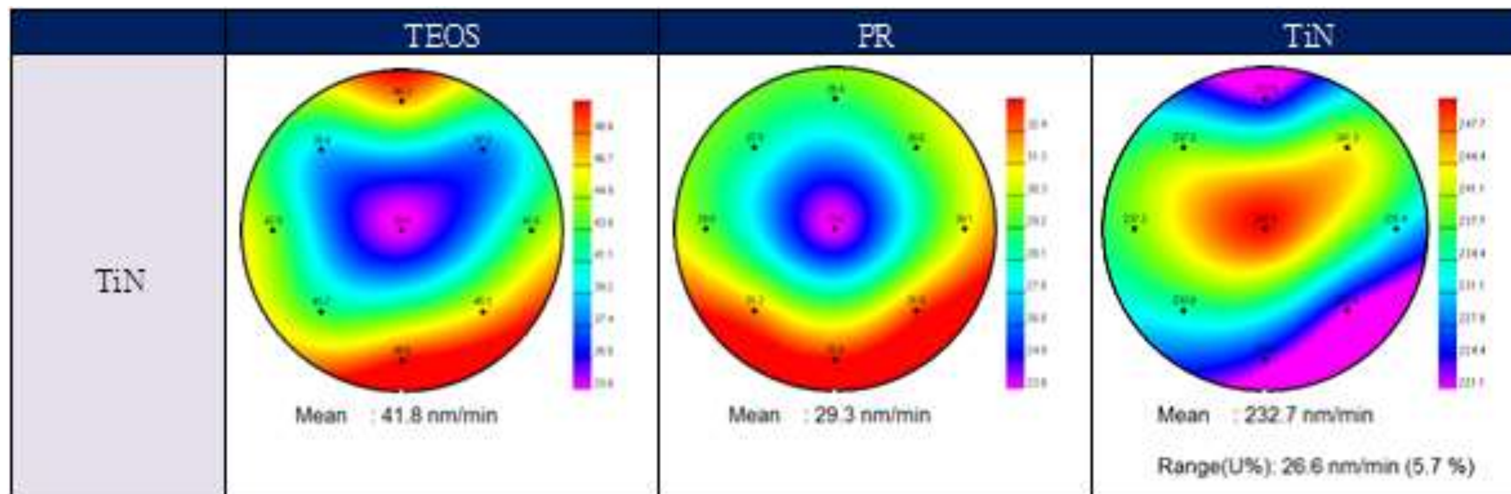
8 inch Back-End Lam Etcher

Stand Process

TCP Metal etching: Metal Film Stack etch

- TiN: 8mT/800TCP/120Bias/100BCL3/150CL2/12N2

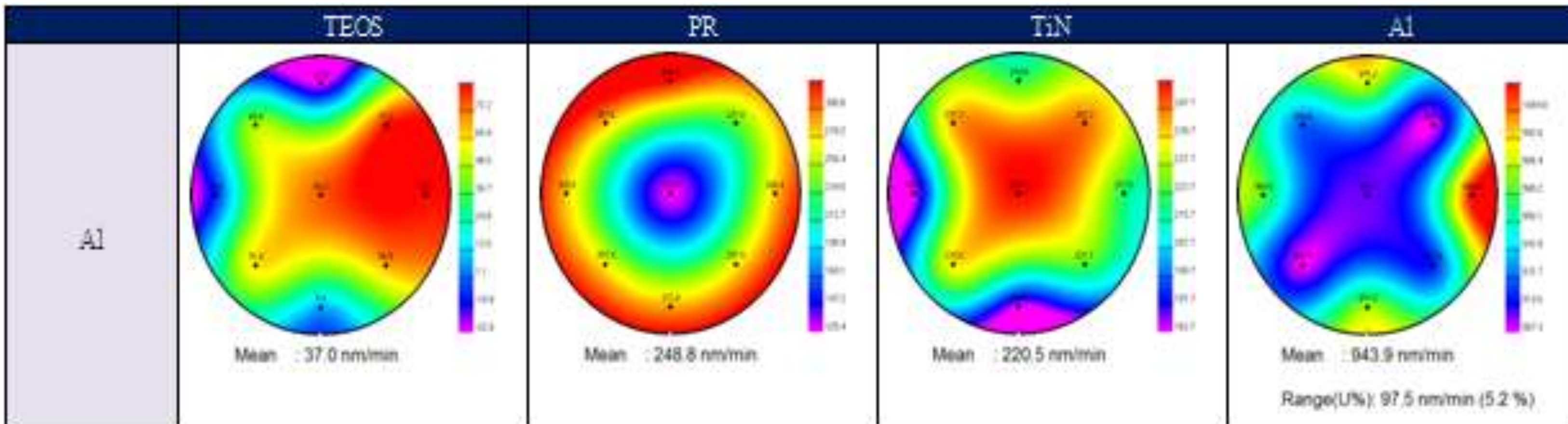
(Stack-A) TiN 2000A/TEOS 2000A/Si-Sub		
Item	Spec	Result
TiN ER	≧ 1000A/min	2327 A/min
Non-uniformity	≦ ±6% (WIW)	5.70%
	≦ ±8% (WTW)	6.50%
Selectivity	TiN/PR (I-line) ≧ 2.5:1	7.9
	TiN/TEOS ≧ 5:1	5.6



TCP Metal etching : Metal Film Stack etch

- Al-Si-Cu: 8mT/800TCP/120Bias/50BCL3/150CL2/14N2/5CH4

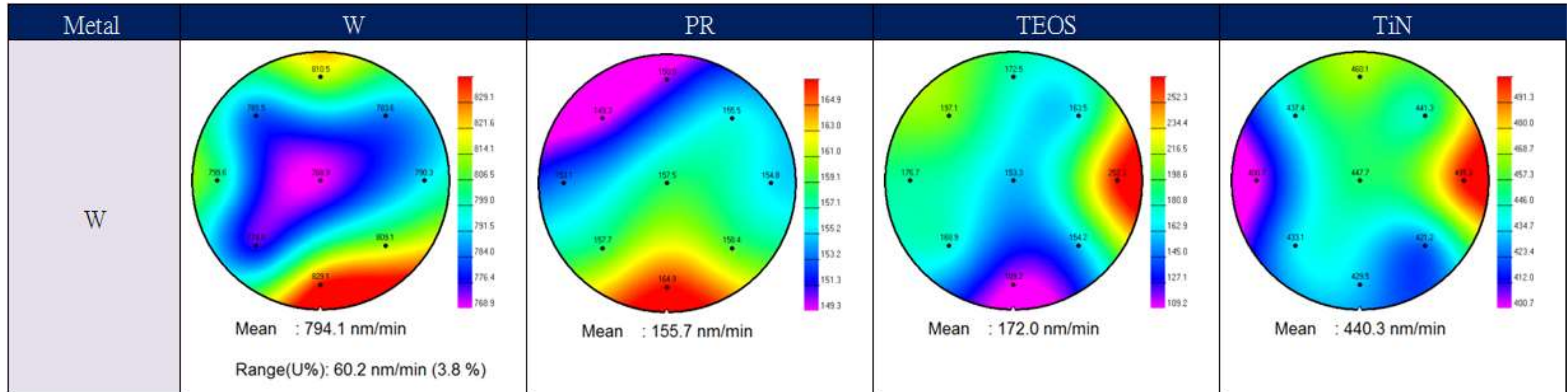
(Stack-B) Al-Si-Cu 5000A/TiN 400A/TEOS/Si-Sub		
Item	Spec	Result
Al-Si-Cu ER	≥ 2000A/min	9439 A/min
Non-uniformity	≤ ±6% (WIW)	5.20%
	≤ ±8% (WTW)	6.80%
Selectivity	Al-Si-Cu/PR (I-line) ≥ 2:1	25.5
	Al-Si-Cu、TiN/TEOS ≥ 3:1	5.96



TCP Metal etching : Metal Film Stack etch

- W: 30mT/ 1000TCP/ 80Wb/ 300SF6/ 40O2/ 50Ar/ 8THe/ (ESC 30’C)

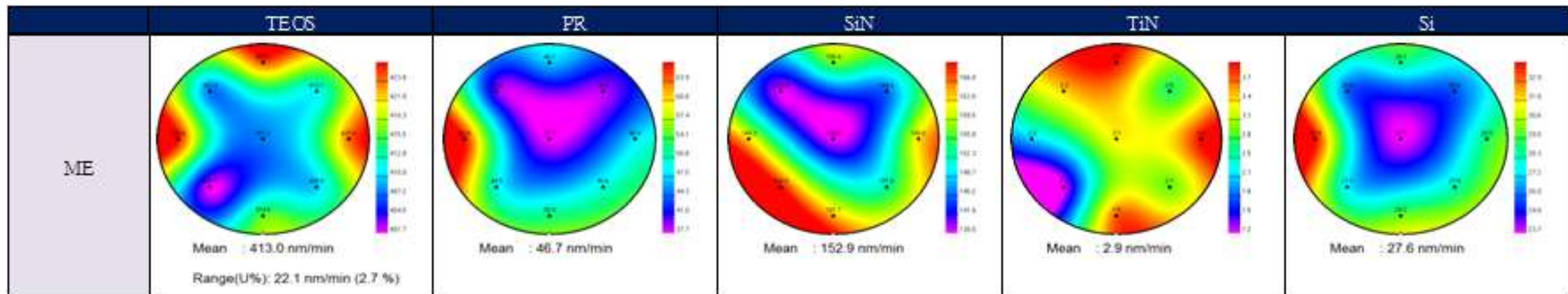
(Stack-C) W 5000A/TiN 400A/TEOS/Si-Sub		
Item	Spec	Result
W ER	≧ 2000A/min	7941 A/min
Non-uniformity	≦ ±6% (WIW)	3.80%
	≦ ±8% (WTW)	5.50%
Selectivity	W/PR (I-line) ≧ 2:1	5.1
	W、TiN/TEOS ≧ 2.5:1	4.6



CCP Dielectric etching : Oxide Contact Film Stack

TEOS: 40mT/900(2)/1200(27)/30C4F8/230Ar/20O2/18CH2F2/50CW/ (50LET/140UET)

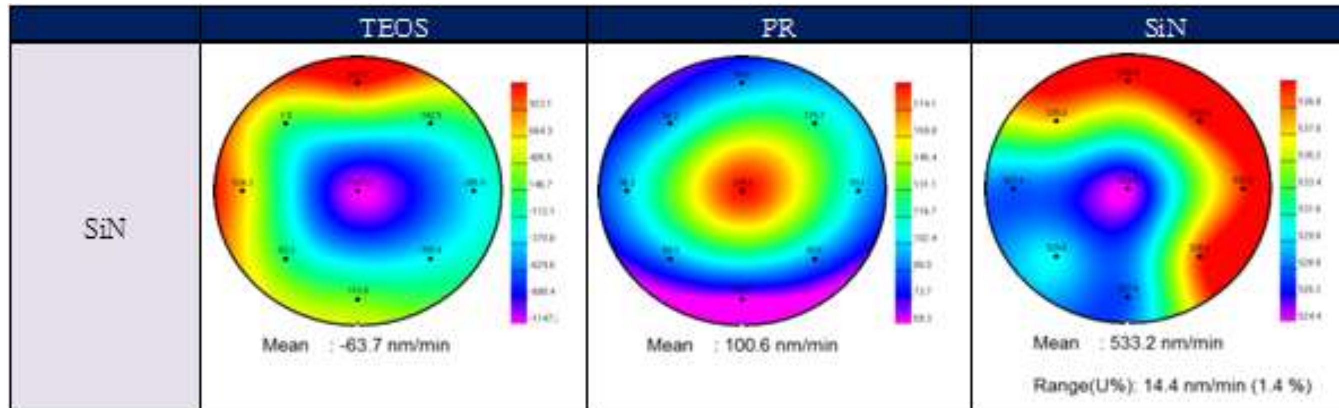
ME Step: TEOS 5000A/Si-sub		
Item	Spec	Result
TEOS etch rate	≥ 2000A/min	4130 A/min
Non-uniformity	≦ ±5% for (WIW)	2.7%
	≦ ±5% for (WTW)	4.1%
Selectivity	TEOS/PR (I-line) ≥ 5:1	8.8
	TEOS/SiN ≧ 2:1	2.7
	TEOS/TiN ≧ 4:1	147
	TEOS/Si ≧ 4:1	15



CCP Dielectric etching : Oxide Contact Film Stack

SiN: 250mT/800(2)/450Ar/35O2/80CHF3/15CH3F/50CW/(20LET/140UET)

SiN 5000A/TEOS 2000A/Si-sub		
Item	Spec	Result
SiN etch rate	≧ 2000A/min	5332 A/min
Non-uniformity	≦ ±5% (WIW)	1.40%
	≦ ±5% (WTW)	4.60%
Selectivity	SiN/PR (I-line) ≥ 5:1	5.3
	SiN/TEOS ≧ 4:1	∞

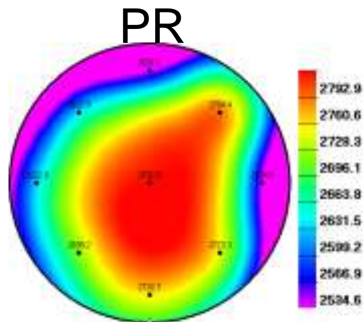


PR strip: P.R strip Base Line E/R Test Result

Strip recipe :750mT/1500W/100N_2/1000O_2

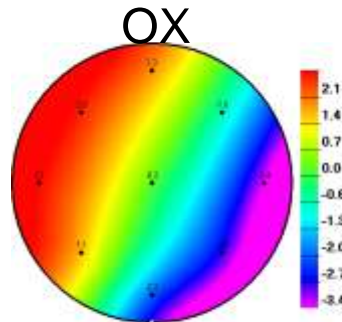
PR7000A/ Si-sub		
Item	Spec	Result
PR ER	≧ 5000Å/min	26706 Å/min
Non-uniformity	≦ ±8% (WIW)	4.80%
	≦ ±8% (WTW)	2%
Seletivity	PR (I-line)/SiN ≧50:1	∞
	PR (I-line)/TiN ≧50:1	66765
	PR (I-line)/TEOS ≧50:1	∞

PR



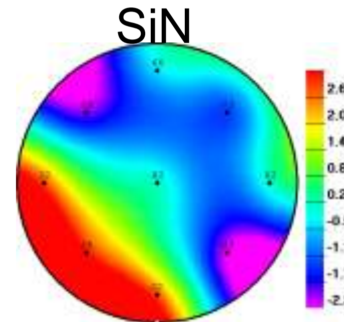
Mean : 2670.6 nm
3-sigma: 283.8 nm (10.6 %)
Range(U%): 258.3 nm (4.8 %

OX



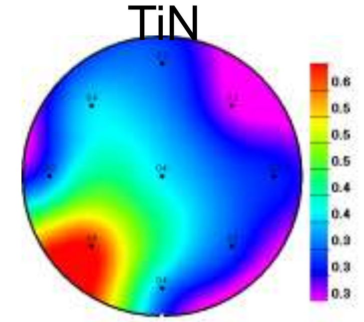
Mean : -0.3 nm
3-sigma: 6.4 nm
Range(U%): 5.5 nm (804.7 %

SiN



Mean : 0.1 nm
3-sigma: 5.6 nm
Range(U%): 4.8 nm (4533.1 %

TiN



Mean : 0.4 nm
3-sigma: 0.2 nm (68.4 %)
Range(U%): 0.3 nm (40.6 %)