

TCP 9400SE 技術資料

2014/04/18 update

● Process Baseline

Chamber Temp: 65°C

Electrode Temp: 65°C

Recipe:

Recipe name	Recipe	Remark
	10mt/10Cl ₂ /170HBr/6T/30"	particle test
202	10mt/200W _{tcp} /120W _{bot} /10Cl ₂ /170HBr/8T/300"	season
206	15mt/600W _{tcp} /75Cl ₂ /100SF ₆ /8T/300"	dry clean
207	15mt/700W _{tcp} /100Cl ₂ /100SF ₆ /8T/300"	quartz conditioning
602	5mt/250W _{tcp} /200W _{bot} /80Cl ₂ /8T/10"	B.T.
	12mt/310W _{tcp} /120W _{bot} /35Cl ₂ /125HBr/8T/EP	M.E.
	25mt/250W _{tcp} /150W _{bot} /150HBr/2O ₂ /8T/20"	O.E.
703	5mt/250W _{tcp} /200W _{bot} /80Cl ₂ /8T/10"	B.T.
	17mt/160W _{tcp} /33W _{bot} /22Cl ₂ /165HBr/1.5O ₂ /8T/EP	M.E.
	25mt/250W _{tcp} /33W _{bot} /150HBr/2O ₂ /8T/30"	O.E.
001	12mt/310W _{tcp} /120W _{bot} /35Cl ₂ /125HBr/8T/300"	E-beam zero mark
060	5mt/300W _{tcp} /50W _{bot} /100CF ₄ /8T/60"	oxide etch

● Baseline etching rate & uniformity

All the process baseline have to measure with patterned wafers.

Wafer structure: 8000 Å PR/ 4000 Å poly/ 1000 Å oxide.

- Poly-Si (undoped): E/R ~ 36 Å/s, Uniformity < ±5%.
- Thermal oxide: selectivity of poly-Si/oxide ~ 9.
- PR: selectivity of poly-Si/PR ~ 3.
- Profile angle > 87°, no micro-trench, no notch (as SEM photo showed).

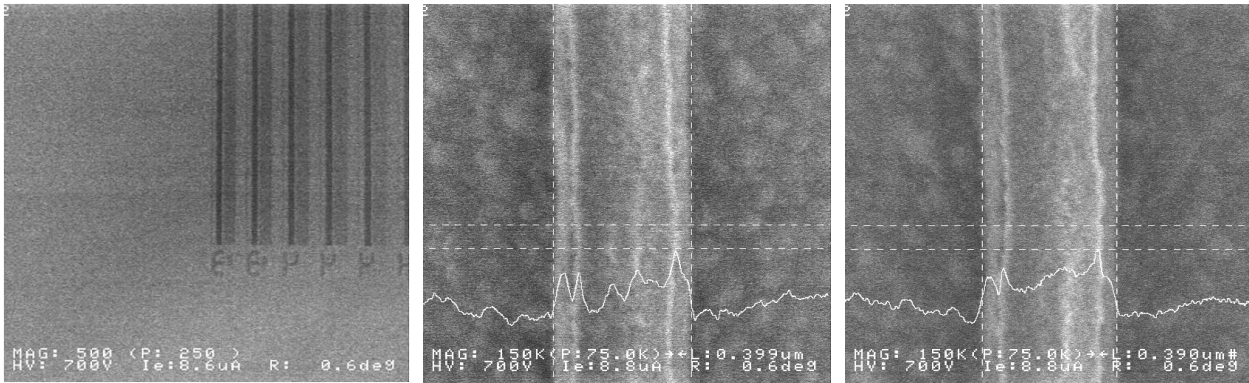
TCP9400 Recipe Performance

	Recipe	E.R.	Selectivity
BT	5mt/250W _{tcp} /200W _{bot} /80Cl ₂	56 Å/s (Poly) 8.5 Å/s (Oxide)	~ 6.6 (Poly/Oxide)
ME	12mt/310W _{tcp} /120W _{bot} /35Cl ₂ /125HBr/EP	36 Å/s (Poly) ~ 4 Å/s (Oxide)	~ 9 (Poly/Oxide) ~ 3 (Poly/PR)
OE	25mt/250W _{tcp} /150W _{bot} /150HBr/2O ₂	28 Å/s (Poly) 0.6 Å/s (Oxide)	~ 47 (Poly/Oxide)

*Include recipes: 402, 602, 603, 1000, 1500, 2000, 2500, 001.

*Database: Etch Bulk films and analysis from NK analyzer.

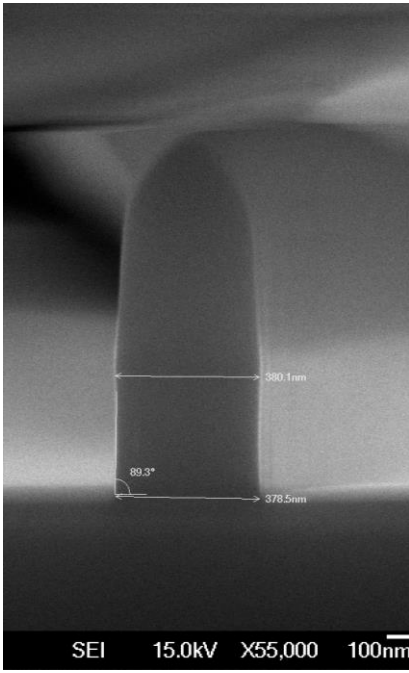
ADI for etching pattern



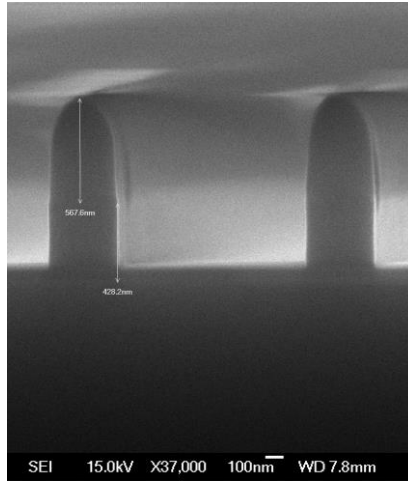
Etching Pattern

Iso line

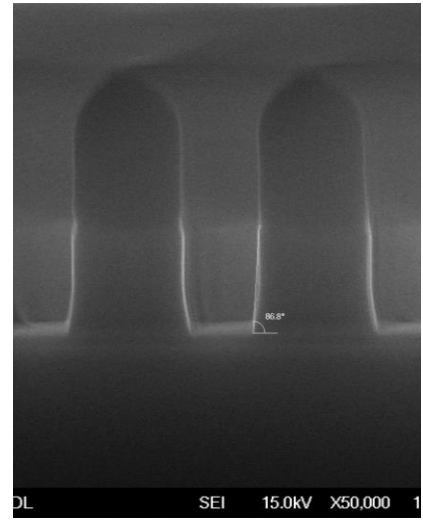
Dense lines



AEI for iso line



AEI for dense lines



AEI for dense lines

BT/ME/OE	Profile Angle	CD loss	Selectivity(PR)	Uniformity	Etch Depth
10 s/93 s/20 s	> 88° (Iso) > 86° (Dense)	< 3 %	3 : 1	< 3 %	~ 3600A