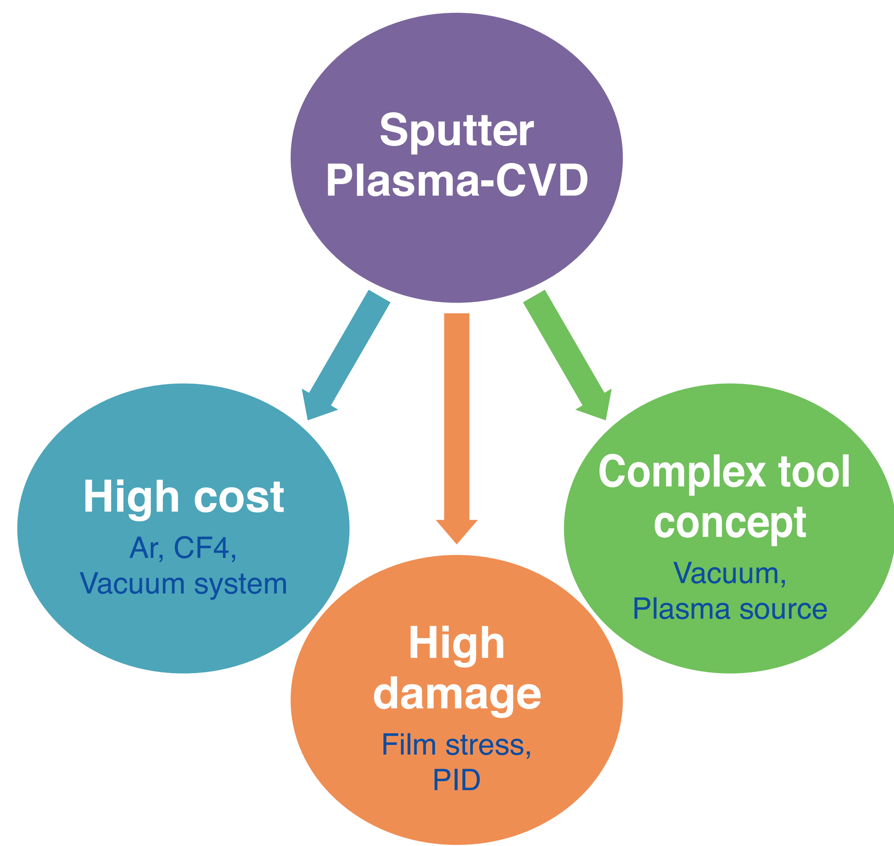
APCVD Application

Effectiveness of APCVD process

■ Concern of other deposition techniques



■ Advantage of APCVD process

1. Low cost
2. High productivity
3. Damage free
4. Low load of tool maintenance

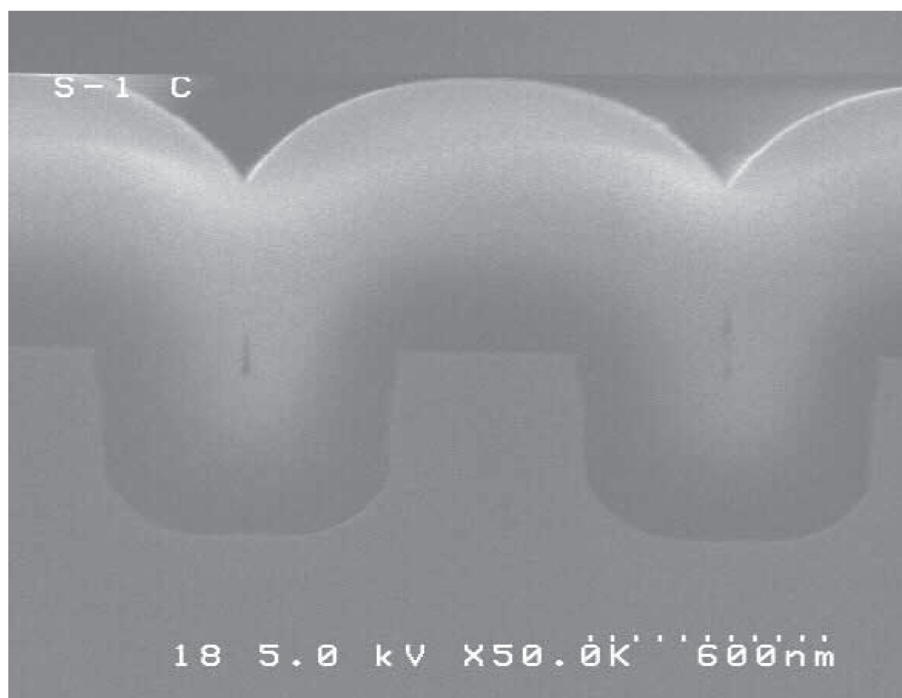
Features of Amaya APCVD system

Method	Film type	Gas chemical	Temp. (°C)	Features
SiH_4-O_2	USG PSG BSG BPSG	$SiH_4 + O_2$ $SiH_4 + PH_3 + O_2$ $SiH_4 + B_2H_6 + O_2$ $SiH_4 + PH_3 + B_2H_6 + O_2$	350 – 450	matured technology high film growth rate without of vacuum system & plasma source
SiH_4-O_3	USG PSG BSG BPSG	$SiH_4 + O_3 / O_2$ $SiH_4 + PH_3 + O_3 / O_2$ $SiH_4 + B_2H_6 + O_3 / O_2$ $SiH_4 + PH_3 + B_2H_6 + O_3 / O_2$	200 – 350	low temperature deposition low film stress suitable for MEMS, display, GaN, TSV & compound semiconductor process
TEOS-O_3	USG PSG BSG BPSG	TEOS + O_3 / O_2 TEOS + TMOP + O_3 / O_2 TEOS + TEB + O_3 / O_2 TEOS + TMOP + TEB + O_3 / O_2	350 – 450	safety gas source conformal step coverage

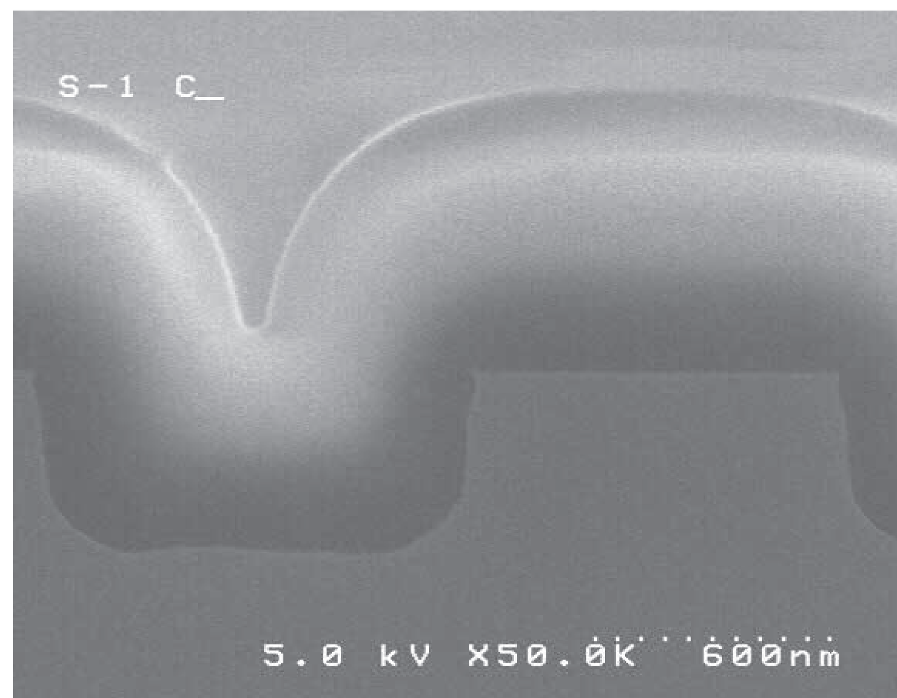
*TEOS : Tetraethoxysilane TEB : Triethylborate
TMOP : Trimethylphosphate

SiH_4 / O_2 USG step coverage

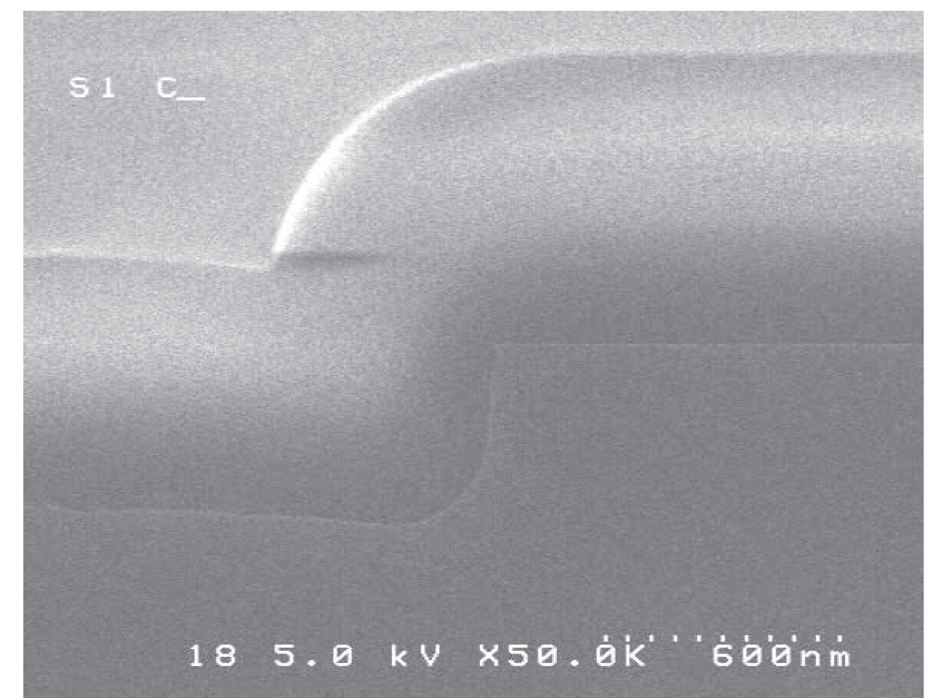
L/S : 0.6/0.6um aspect ratio : 1.0



L/S : 1.2/1.2um aspect ratio : 0.5



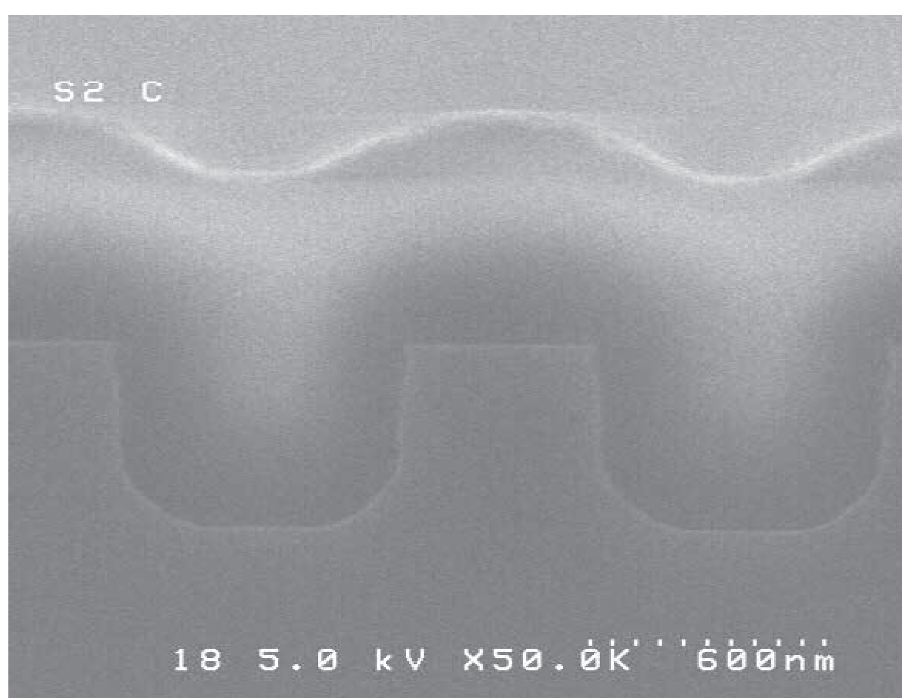
L/S : 2.0/2.0um aspect ratio : 0.3



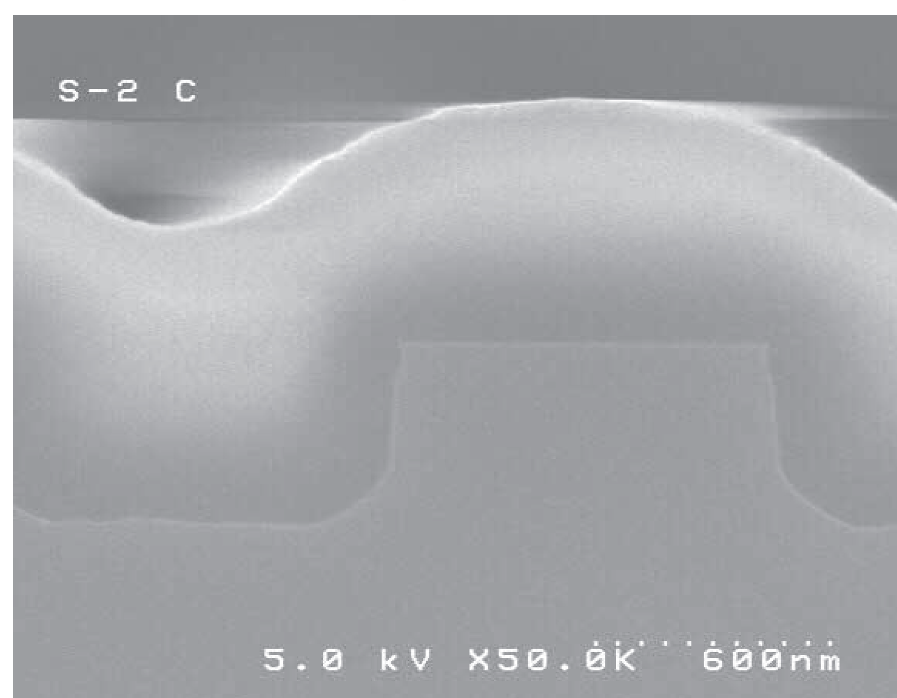
depo.temp : 400°C O_2 / SiH_4 ratio : 12:1

TEOS / O_3 USG step coverage

L/S : 0.6/0.6um aspect ratio : 1.0

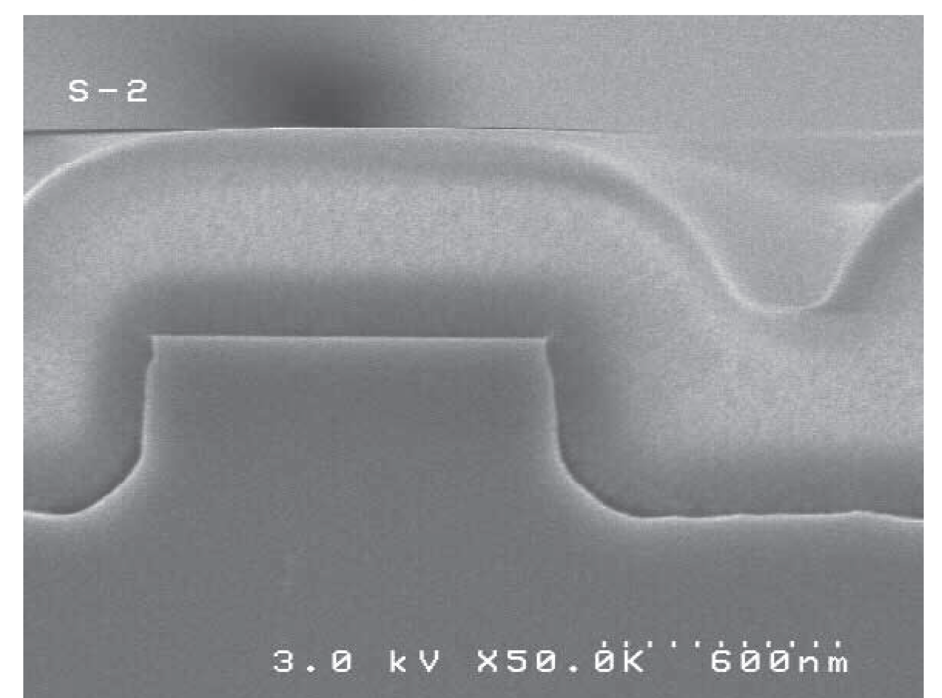


L/S : 1.2/1.2um aspect ratio : 0.5



depo.temp : 400°C TEOS / O_3 ratio : 8:1

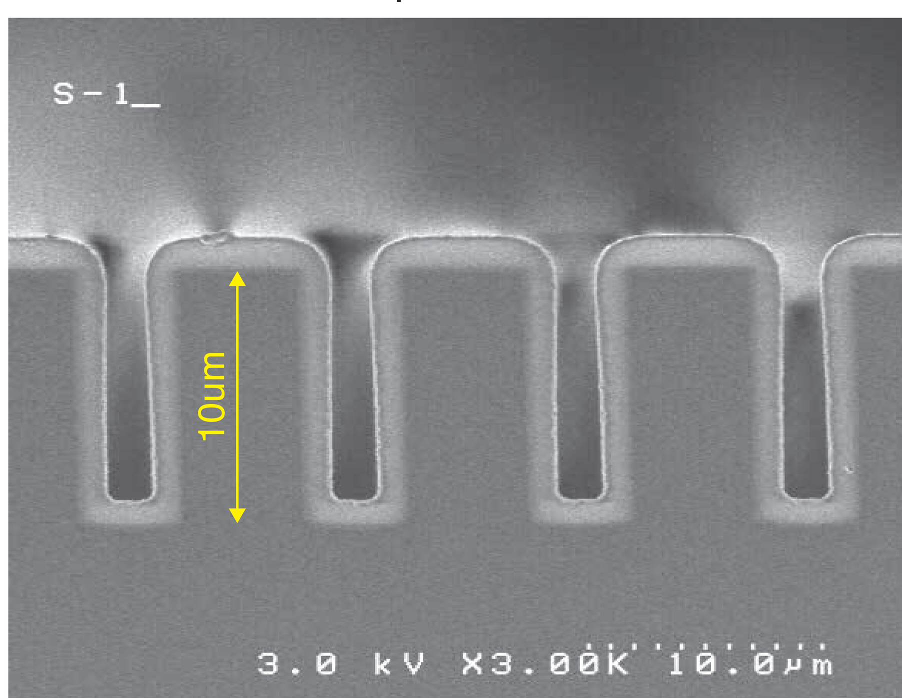
L/S : 1.2/1.2um aspect ratio : 0.5



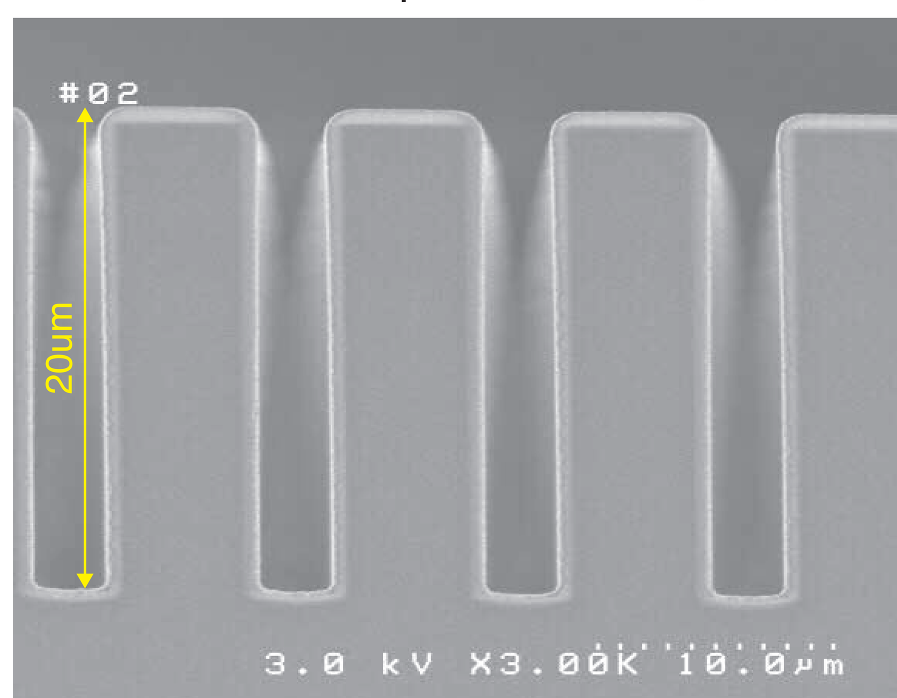
depo.temp : 300°C O_3 / TEOS ratio : 8:1

TEOS / O_3 USG step coverage

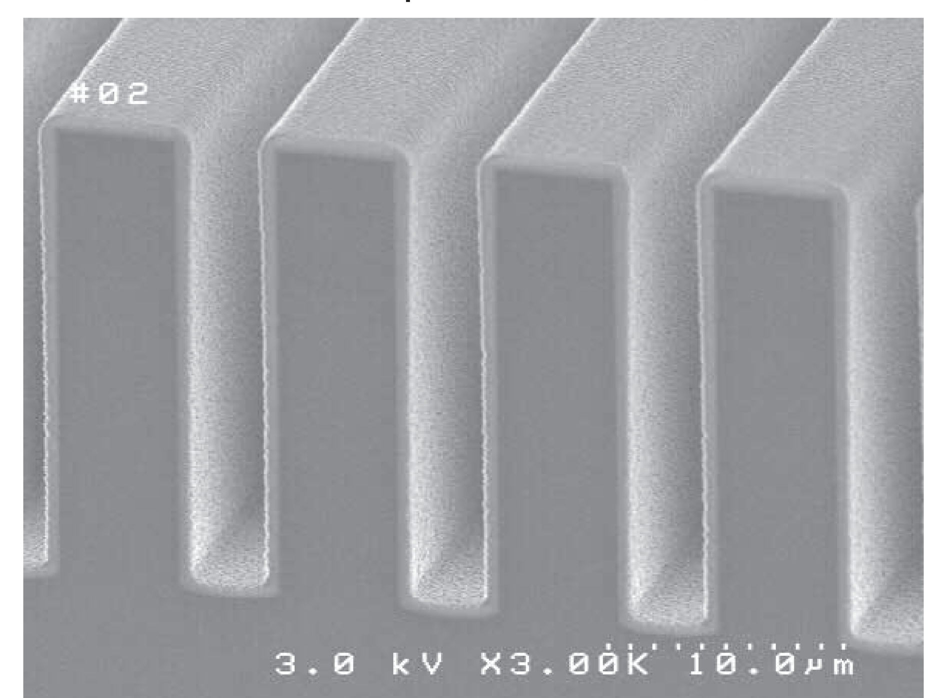
L/S : 6.0/4.0um aspect ratio : 2.5



L/S : 6.0/4.0um aspect ratio : 5 (high aspect ratio)



L/S : 6.0/4.0um aspect ratio : 5 (high aspect ratio)



depo.temp : 400°C O_3 / TEOS ratio : 8:1

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