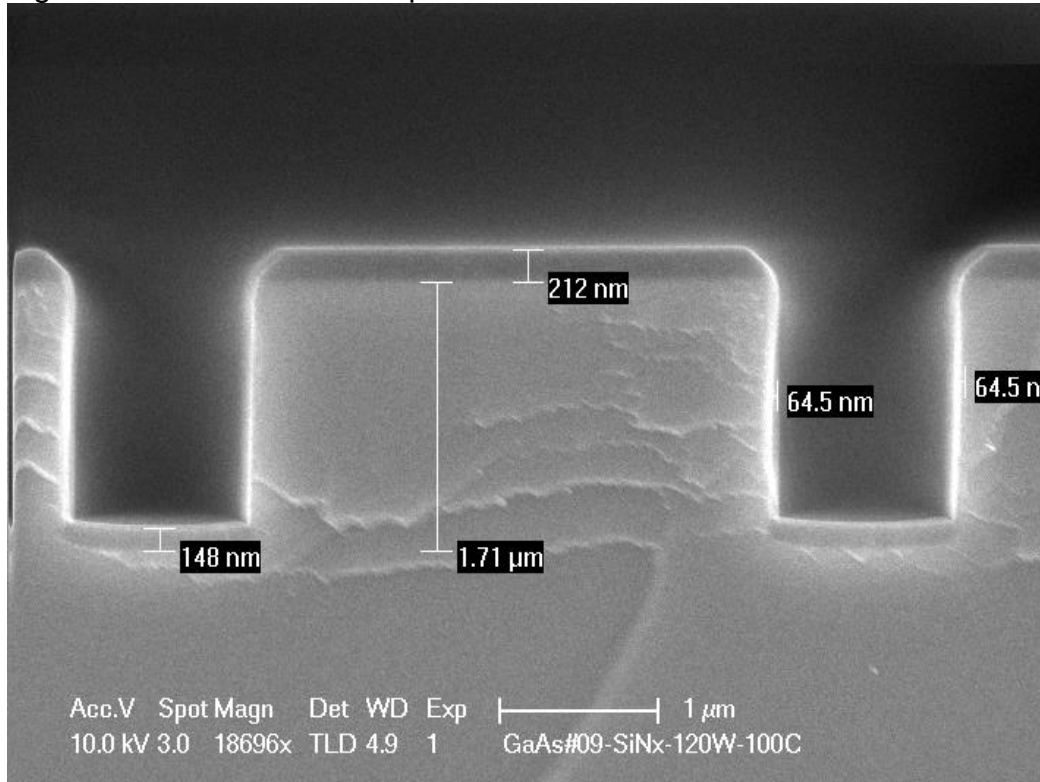


Film Properties of Low-Stress SiN_x deposited at the chuck temperatures of 50, 100 and 250°C using Unaxis ICP PM3 deposition tool with pressure=15 mT, bias/ICP powers=120/400 W, and SiH₄(100%)/He/N₂: (a) 9.0/400/4 sccm (at 50°C); (b) 9.0/400/4 sccm (at 100°C); (c) 8.6/400/4 sccm (at 250°C).

Low-Stress SiN _x Film (120W Bias Power, No Ar), Grown using Unaxis ICP PM3 Deposition Tool, Characterizations				
	50°C(ICP)	100°C(ICP)	250°C(ICP)	250°C(PECVD)
Refractive Index	~2	~2	~2	~2
Deposition Rate (nm/min.)	28.9	28	26.7	10
Buffered HF Etch Rate (nm/min.)	24	22.5	9.9	36
Film Stress (~200 nm in Thickness) (MPa)	-87	-97	-133	260

Note: a positive sign means a tensile stress, whereas a negative sign means a compressive stress.

Figure 1 Low-stress SiN_x deposited at 100°C onto an etched GaAs Structure.



Pin-hole Testing Result

Low-Stress SiN_x Film, deposited at 100 C with 15mT, 120/400W, SiH₄/N₂/He flow-rate=8.4/4/400sccm, and deposition time=600s.

Film thickness and refractive index are 2465Å and 2.11, respectively. Film stress is ~-97MPa.

Pin-Hole Result (In KOH@90C, 10minutes): a few of pin-holes found (see Figure 2 below).

Figure 2 (a), (b), (c), and (d) Microscopic pictures show the low-stress SiN_x film, deposited at 100 C with 15mT, 120/400W, SiH₄/N₂/He flow-rate=8.4/4/400sccm, and time=600s, after soaking in KOH at 90 C for 10 minutes.

