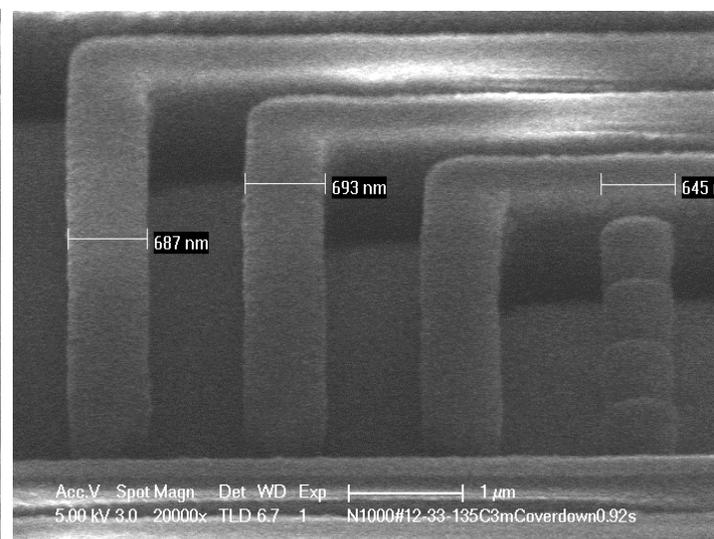
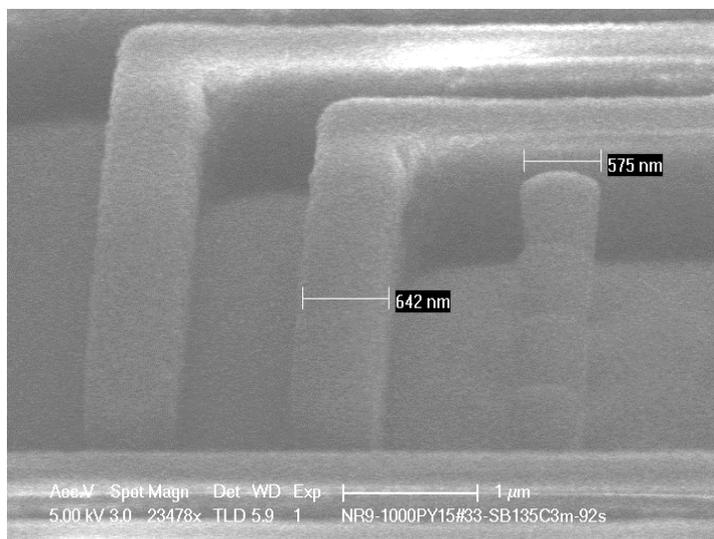
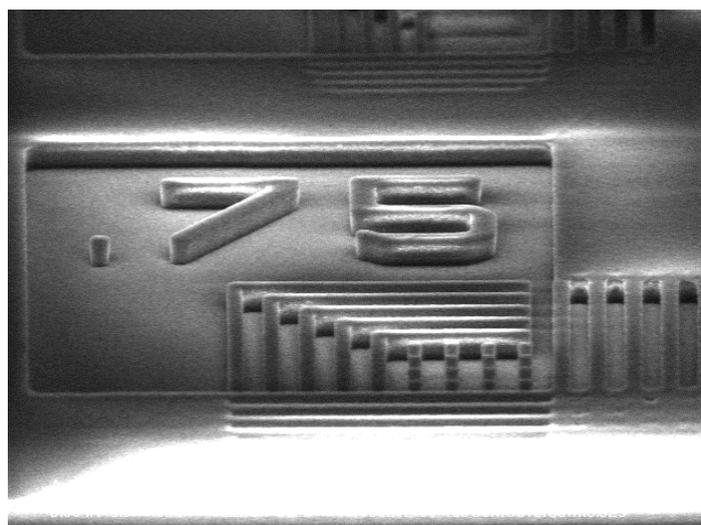
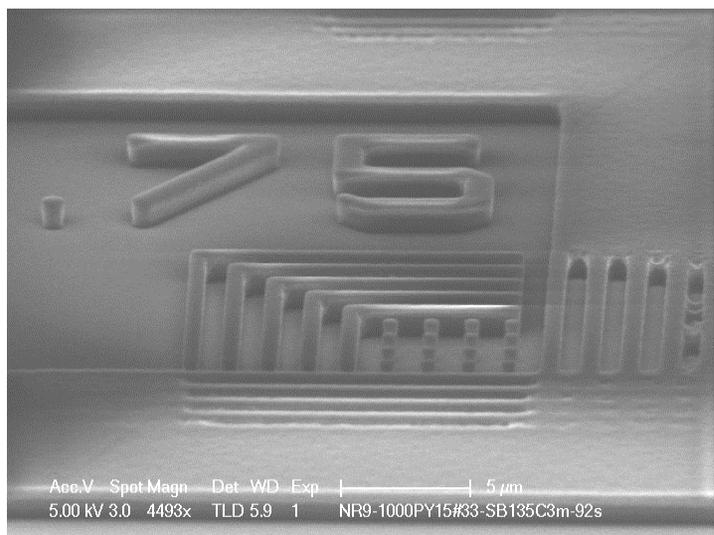


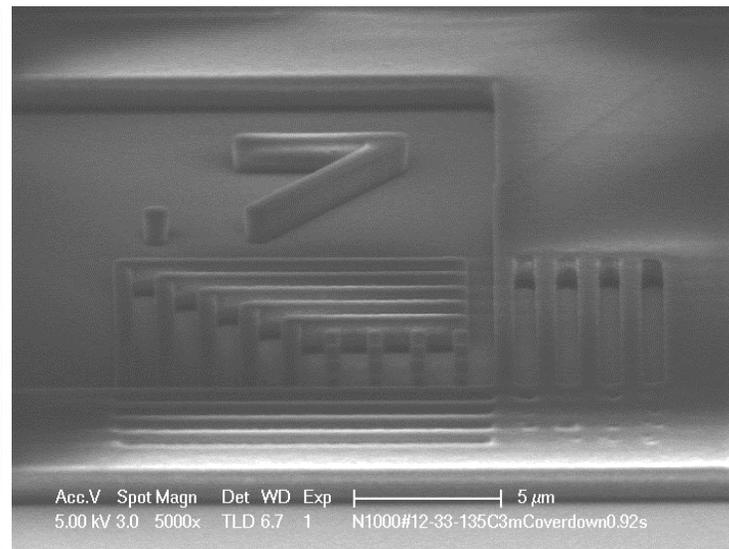
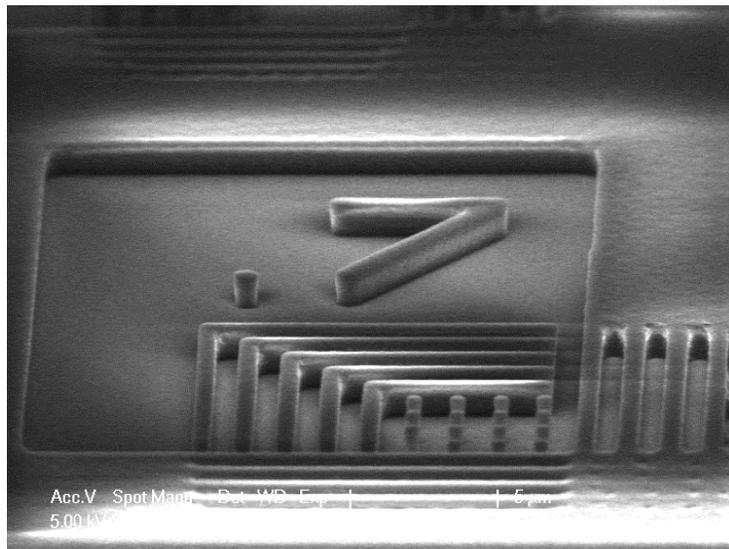
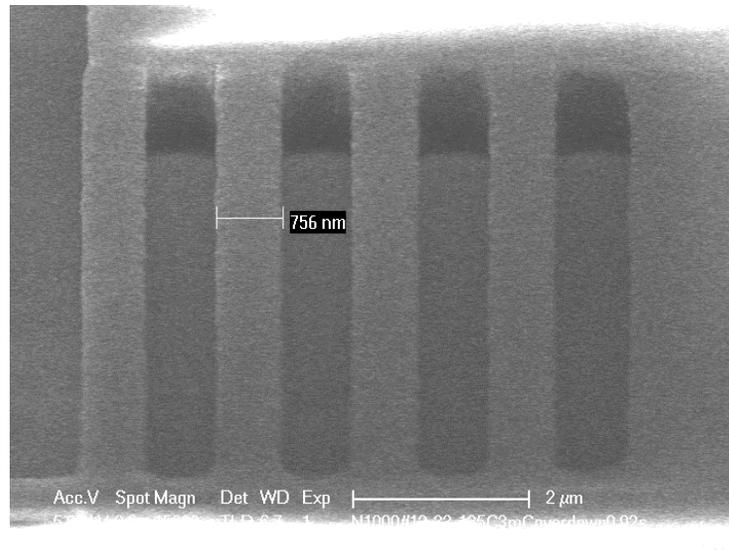
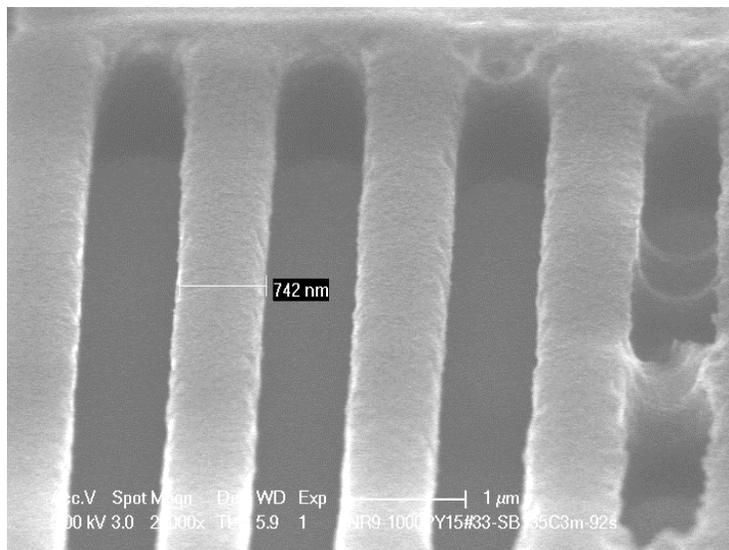
NR1000-PY Negative Resist Profile using Auto-Stepper-200 (Stepper#15) and Metal Lift-off

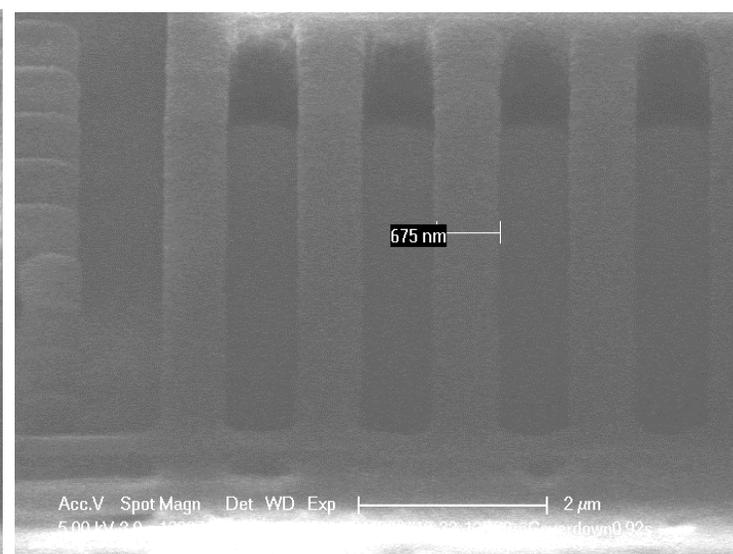
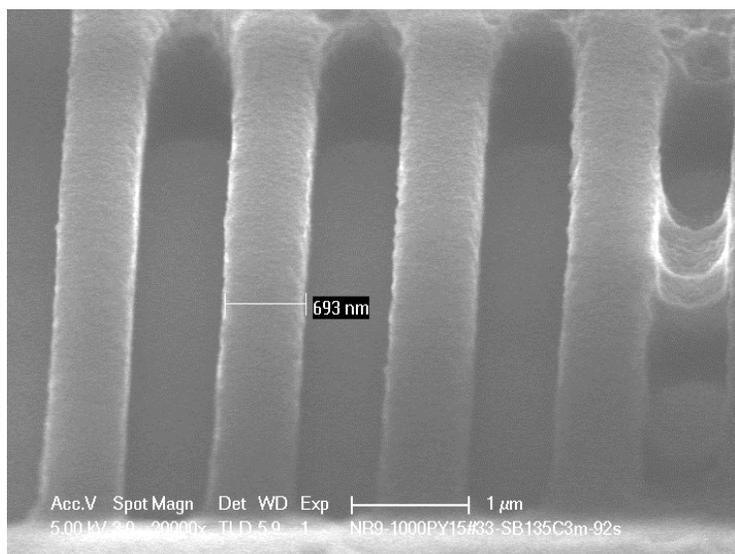
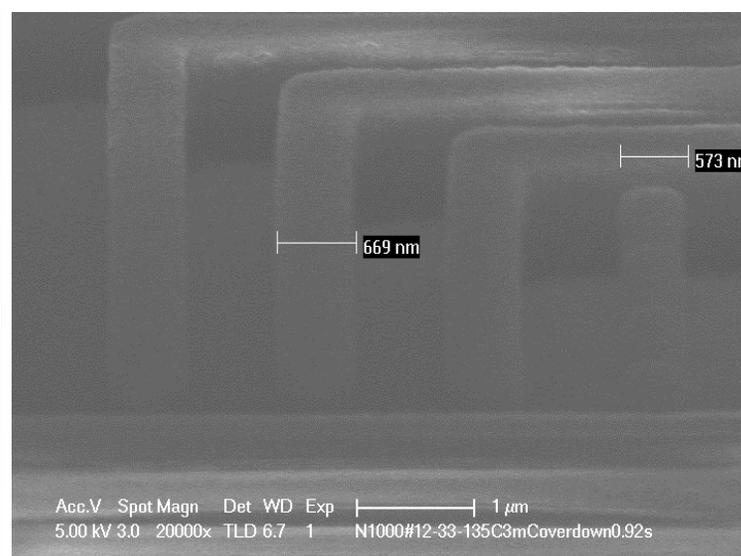
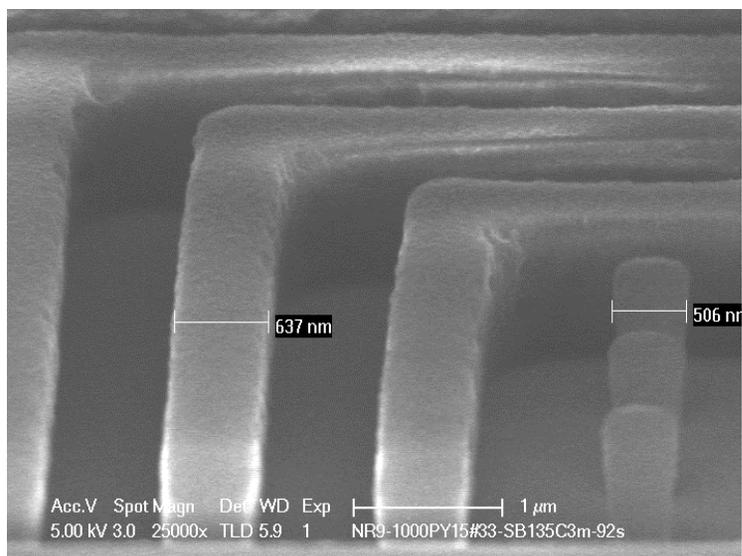
Experimental Procedure:

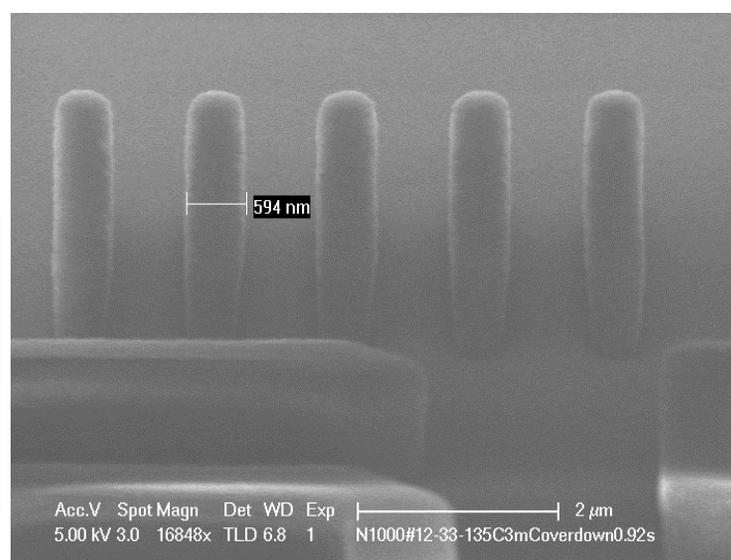
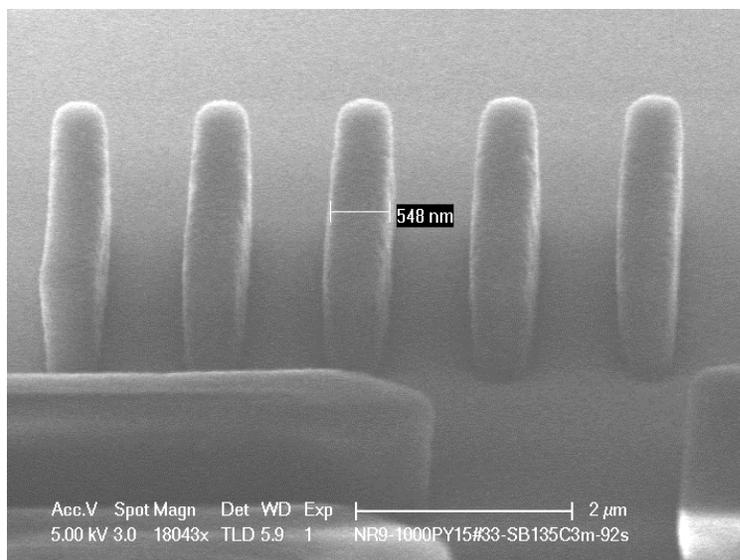
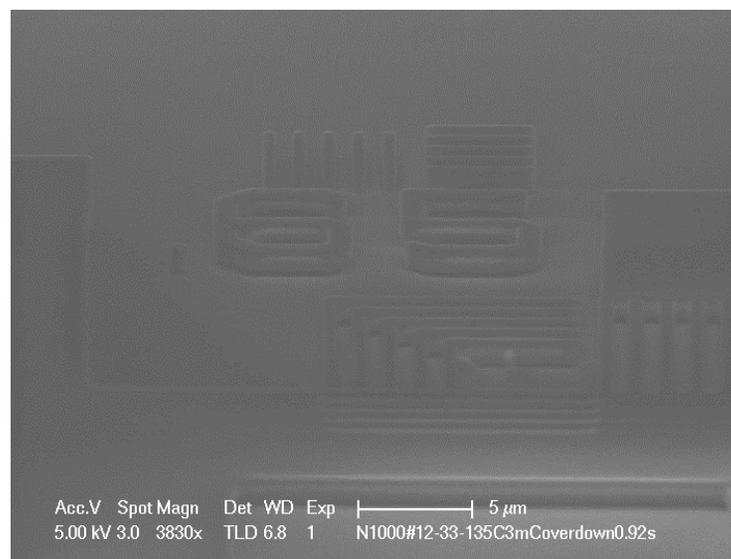
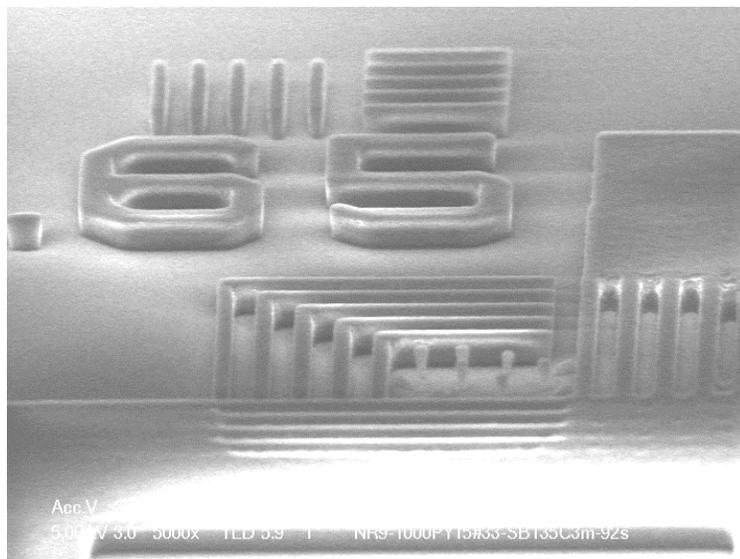
- 1) Cleaning a 4" wafer: in acetone (2') + methanol (1') in US, then, DI rinse; in BHF for 1 minute, then, DI rinse and N2 dry
- 2) Gasonics Oxygen treatment with recipe#3 for 2 minutes or PEII O2 100W
- 3) Doing the wafer dehydration at 135 C for 5 minutes.
- 4) Spinning-on HMDS: 3 krpm, 30 s.
- 5) Spinning-on NR9-1000PY: 3 krpm, 30 s.
- 6) Soft bake at 135 C using the hot plate installed in the bench, 180 seconds (with a lid down).
- 7) Exposing the resist using Auto-stepper-200 with Focus-offset=0 and Exposing-time from 0.60 to 0.95 s with a step=0.01 s (6x6 dies, separation of 10mm).
- 8) Post-exposing-bake at 115 C, 2 minutes (cover down).
- 9) Development in AZ726MIF developer for 20 s. (AZ300MIF also OK)
- 10) O2 plasma descum with 300mT/100W for 30 seconds.
- 11) Evaporating Ti/Pt/Au (100/300/2000 Å, the rate: 1/1.5/2 Å/s) onto the NR1000-PY resist patterned sample piece using E-beam#4.
- 12) Lift-off in 1165 stripe at 80 C for over-weekend (~66 hours), then, soaking in acetone and methanol, then, DI rinse and N2 dry.

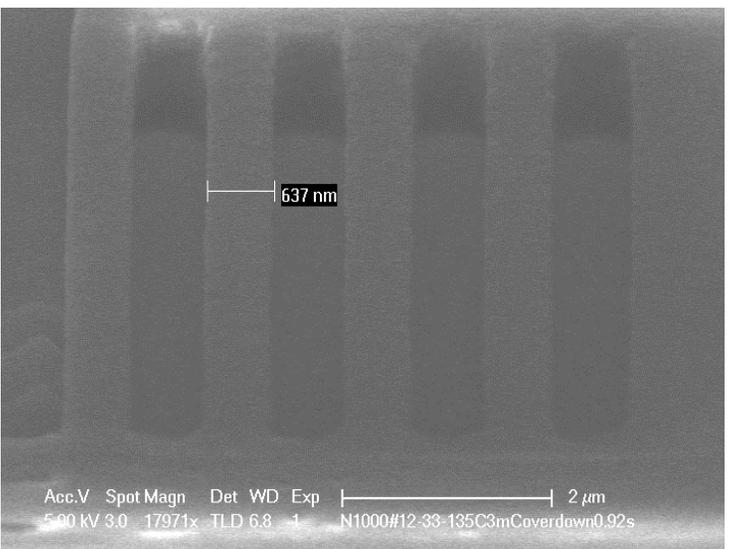
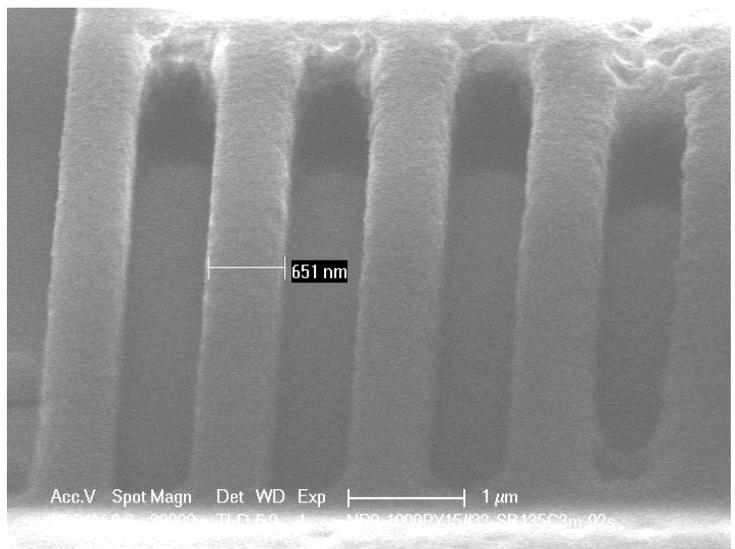
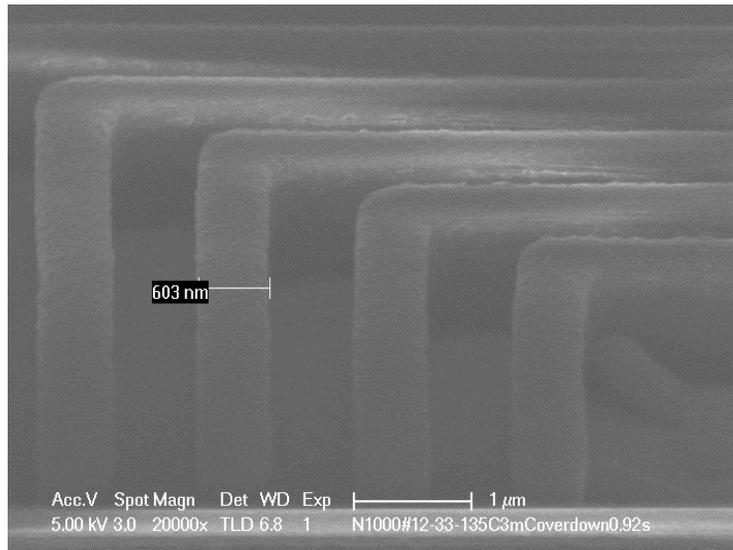
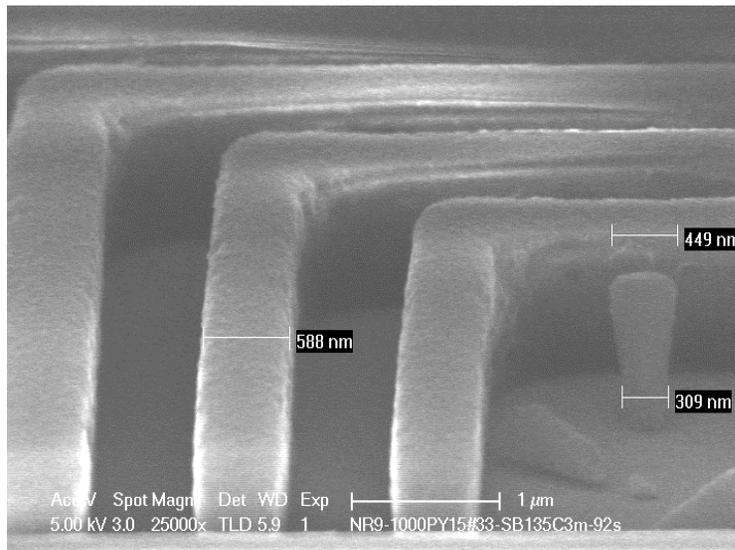
Figure 1. Left Column (wafer#15 on 10-17-2014): Soft bake at 135 C for 3 minutes (0.92 s); Right Column (wafer#12 on 6-19-2014): Soft bake at 135 C for 3 minutes and development using Developer RD6 (0.92 s).

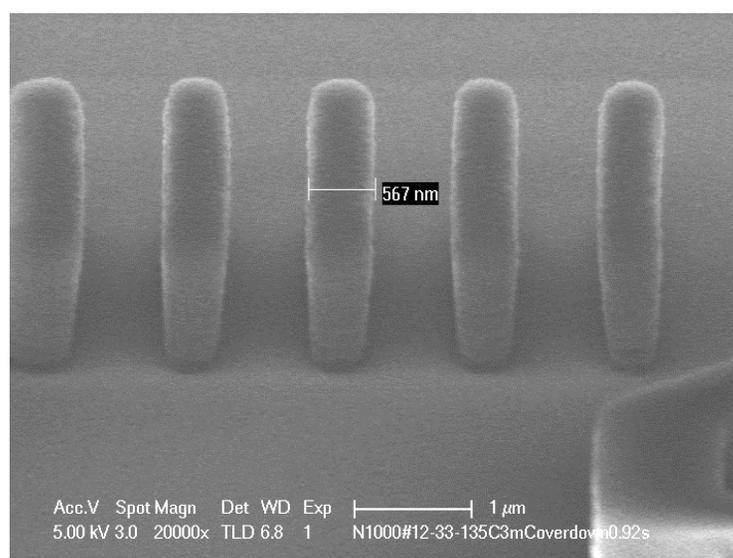
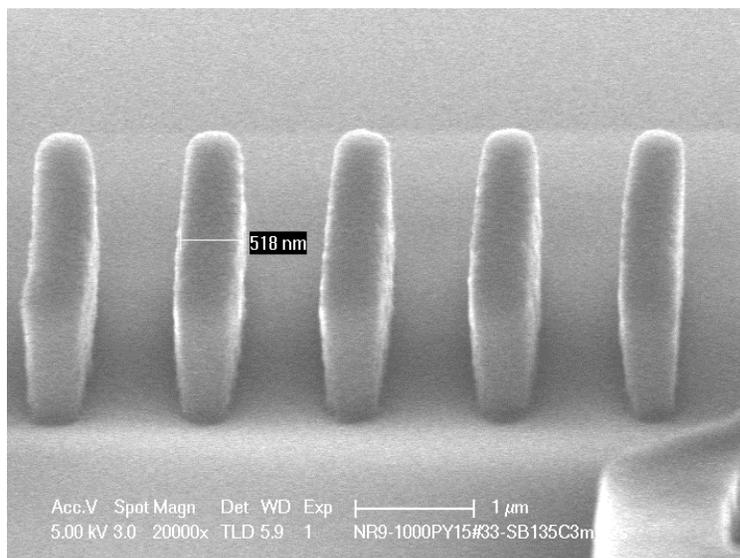
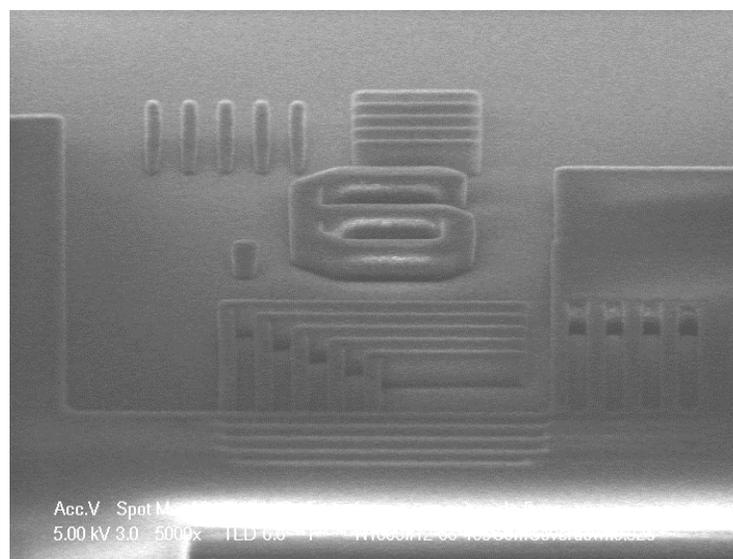
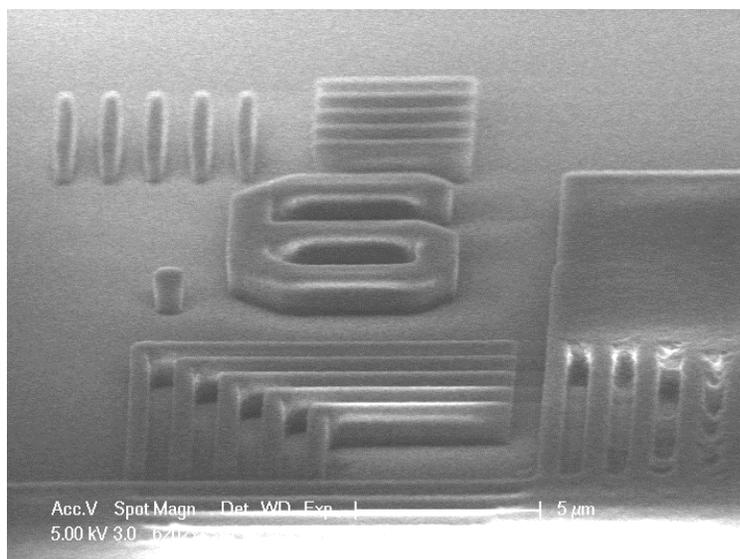


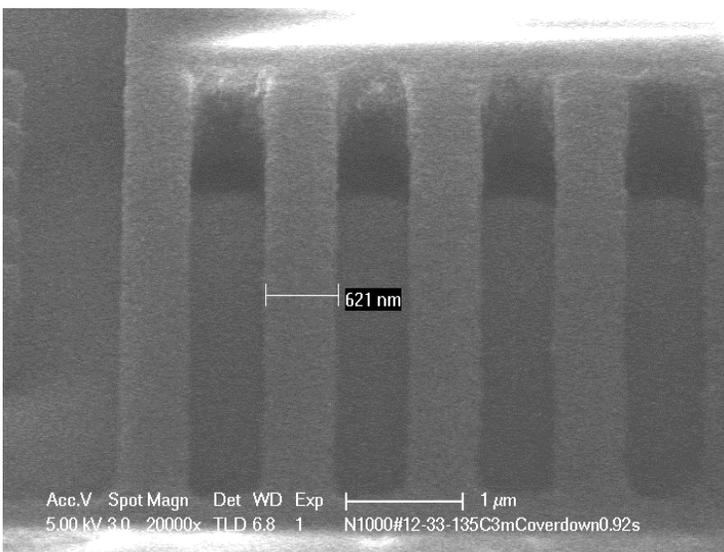
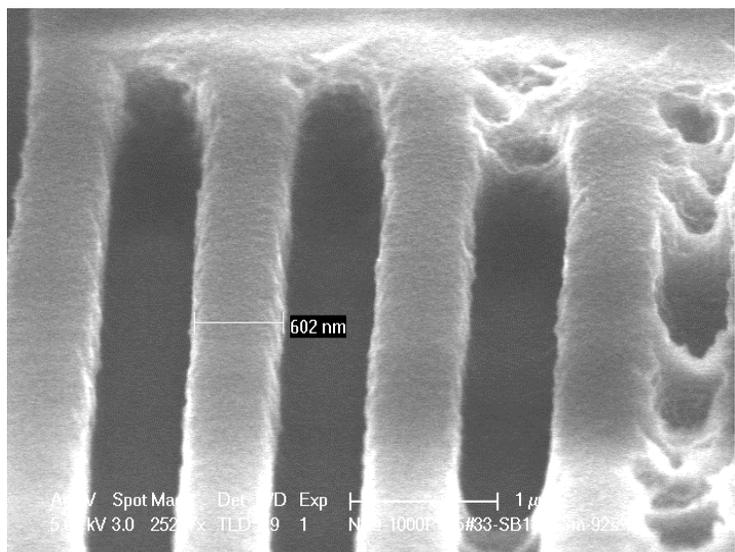
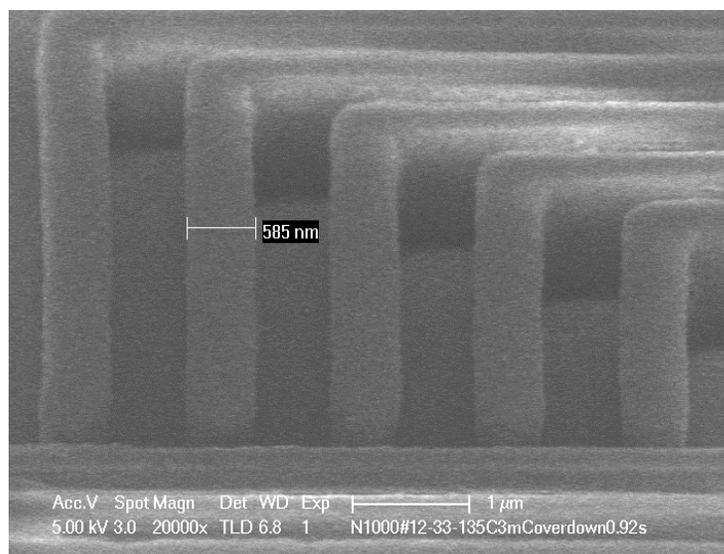
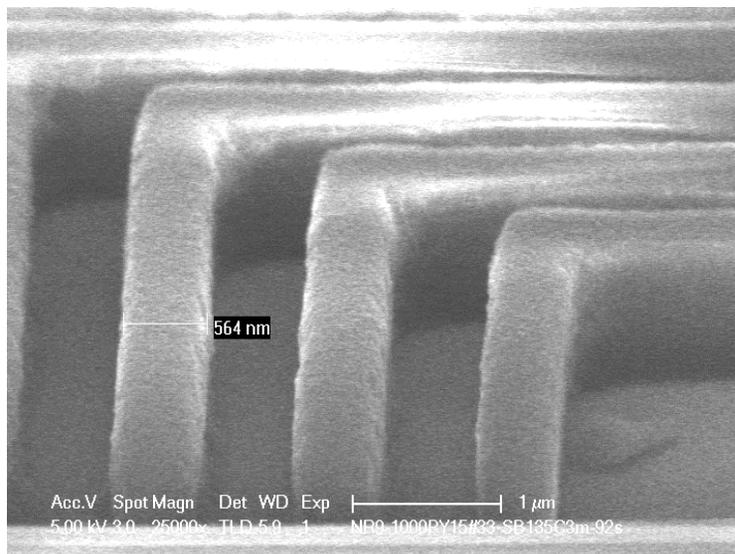


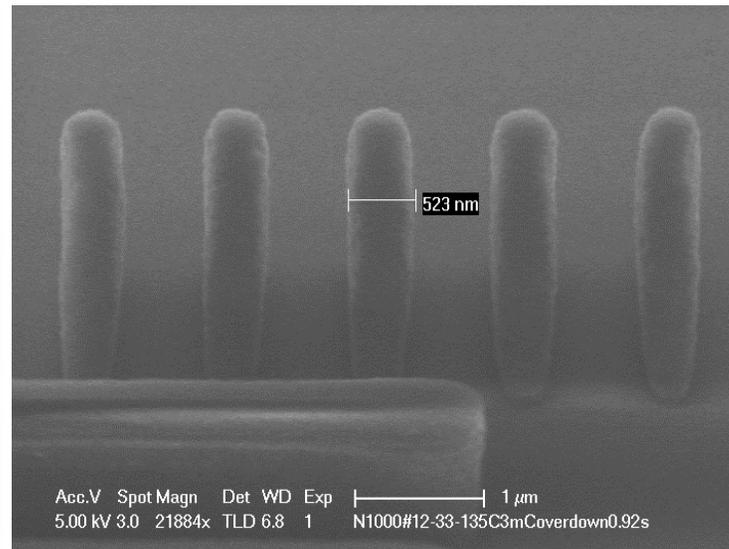
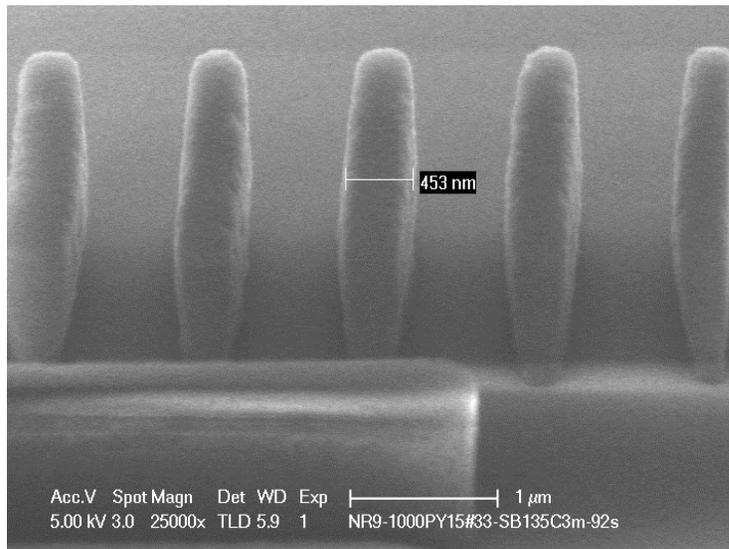
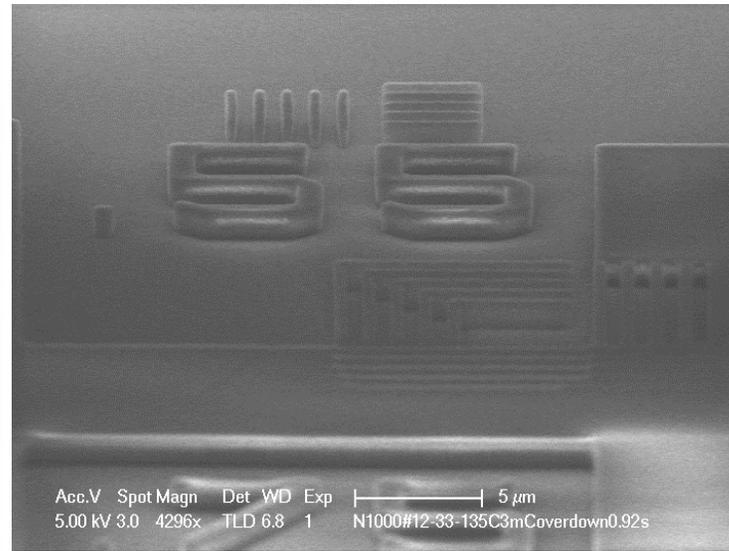
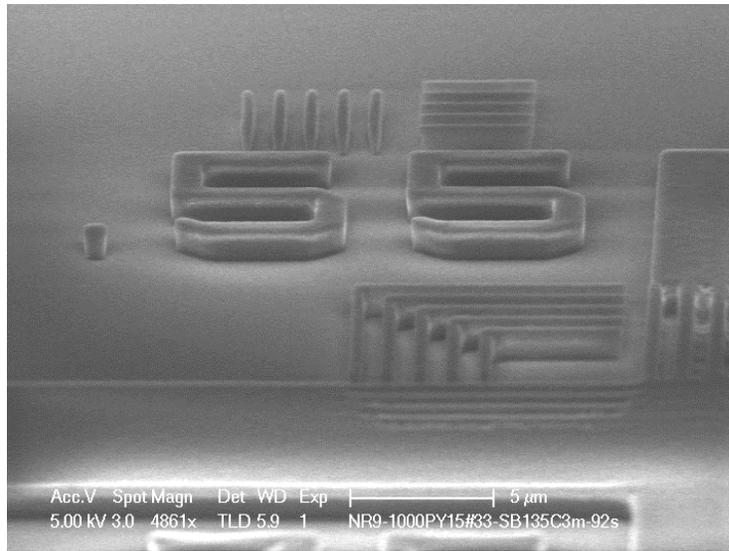


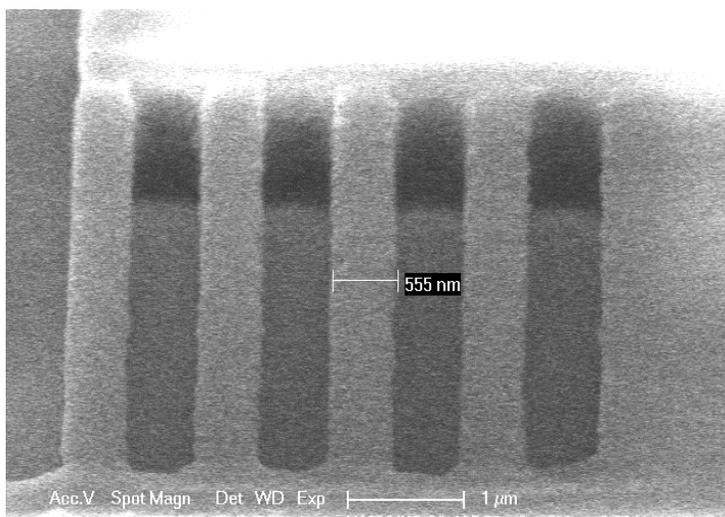
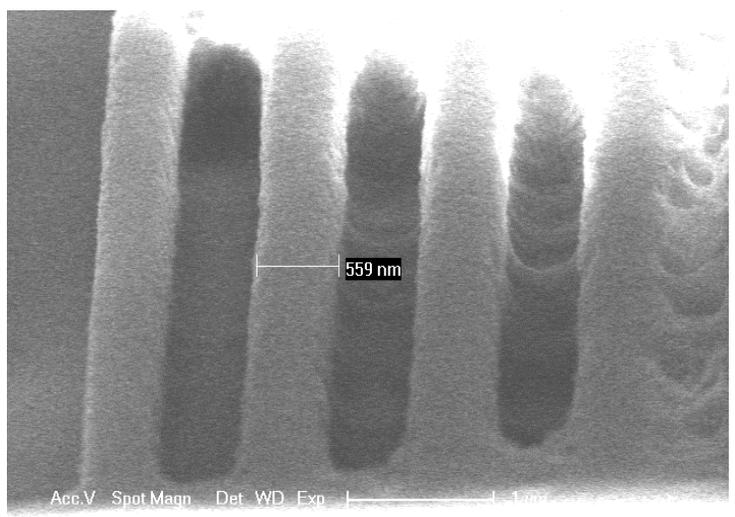
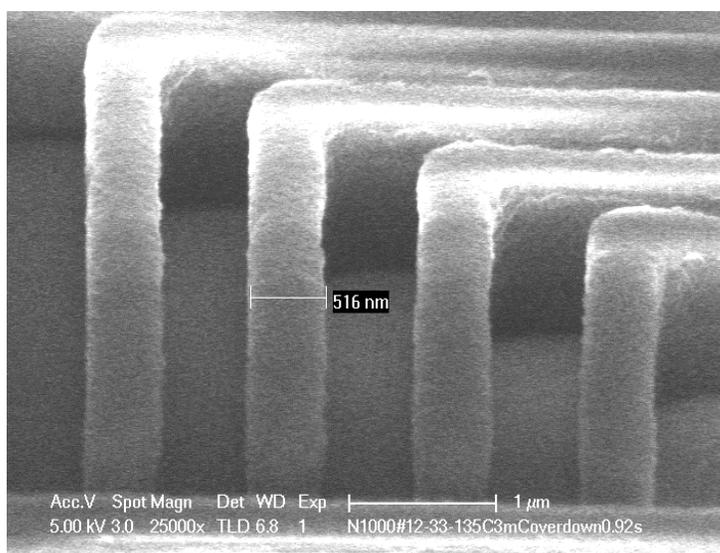
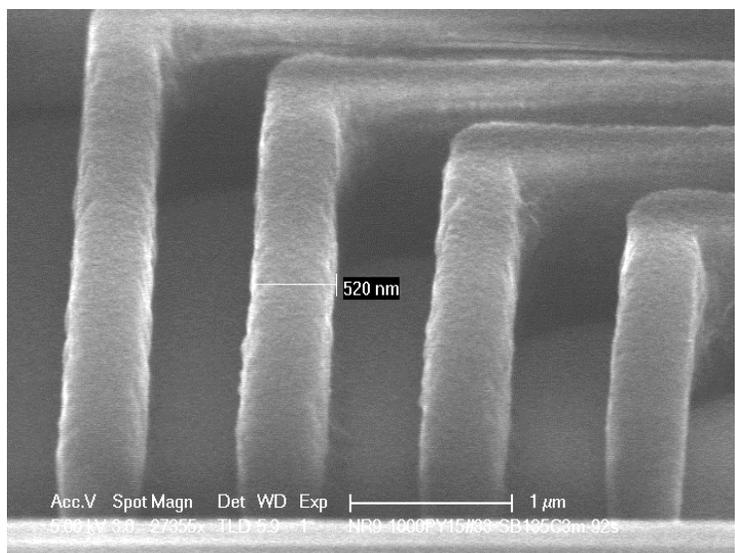


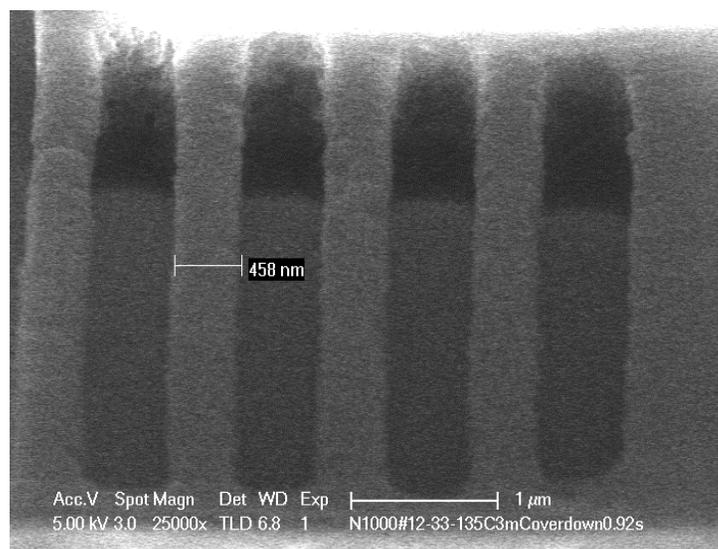
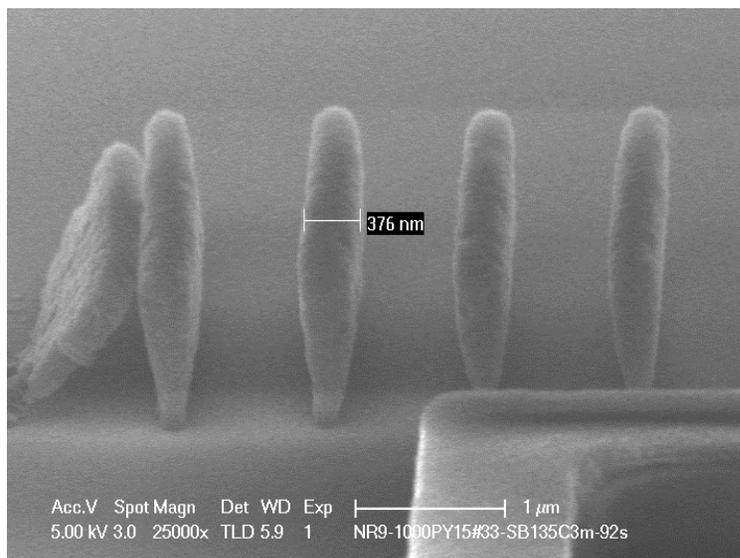
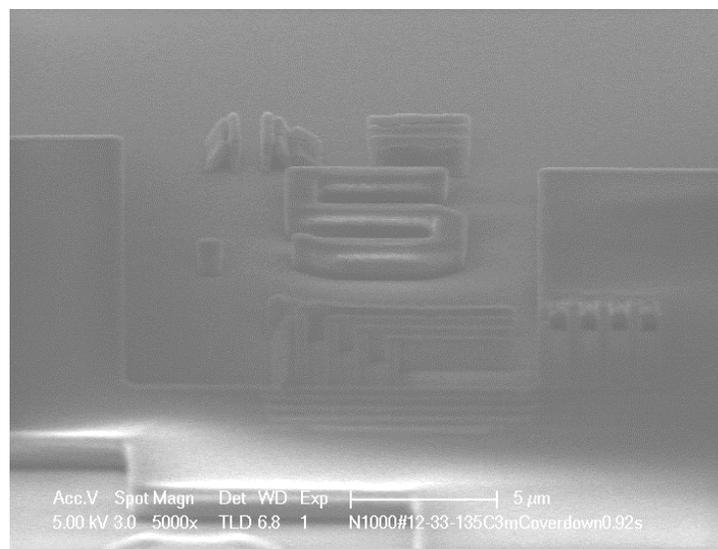
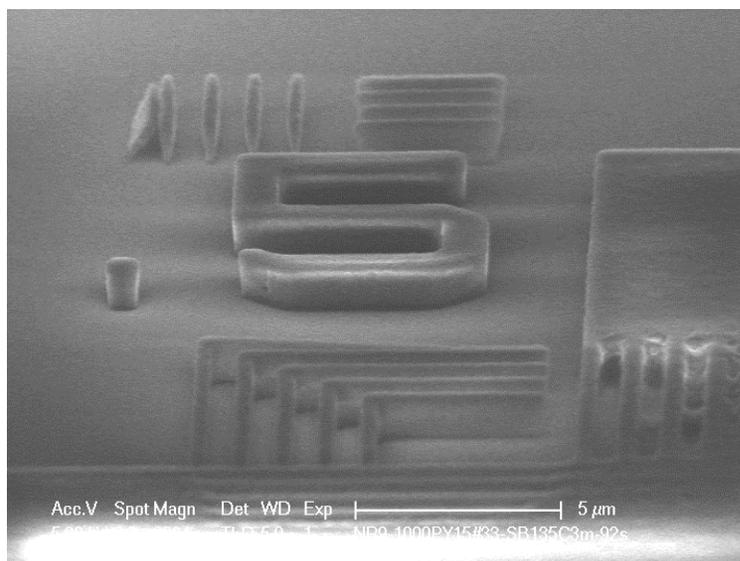












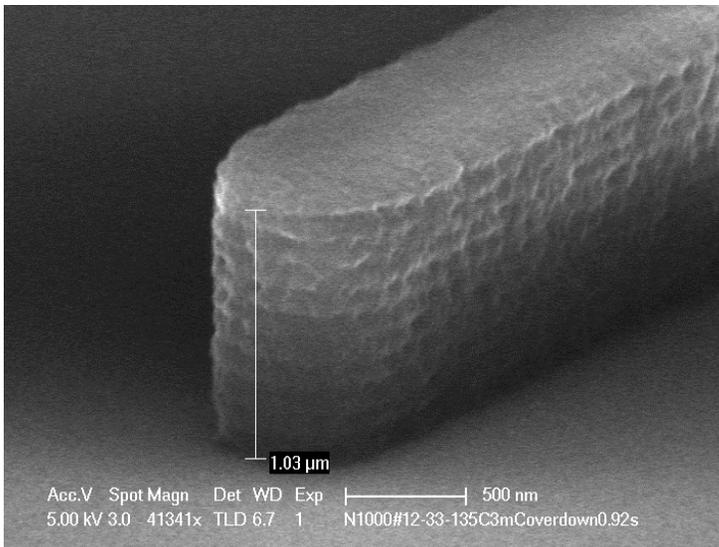
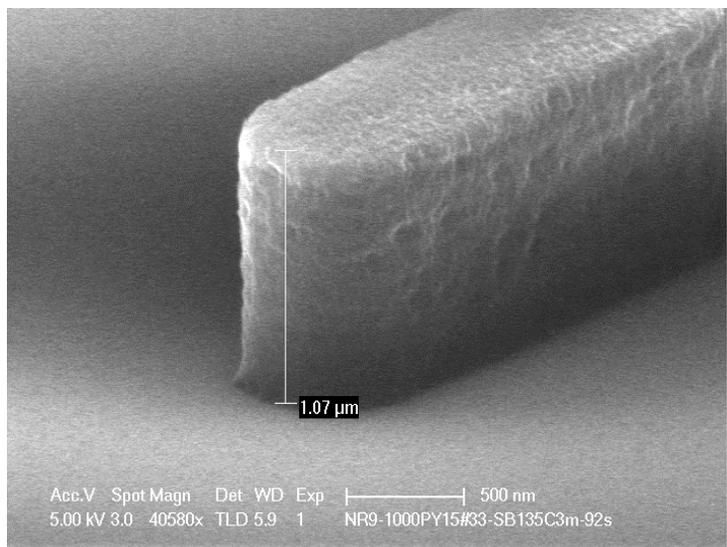
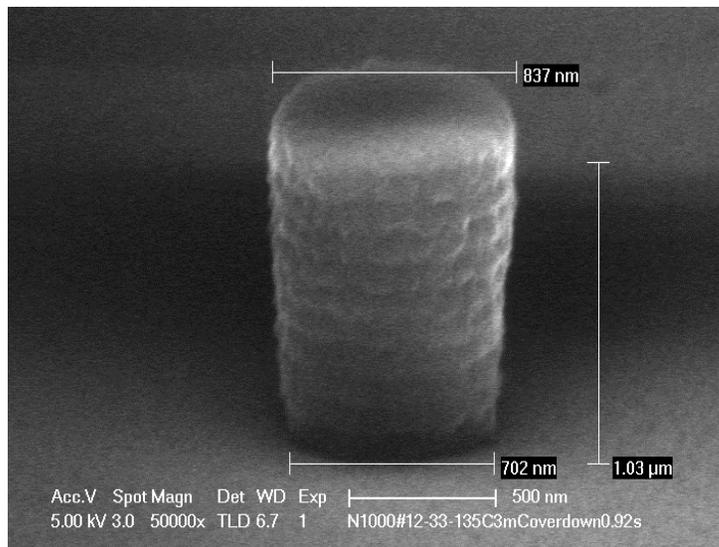
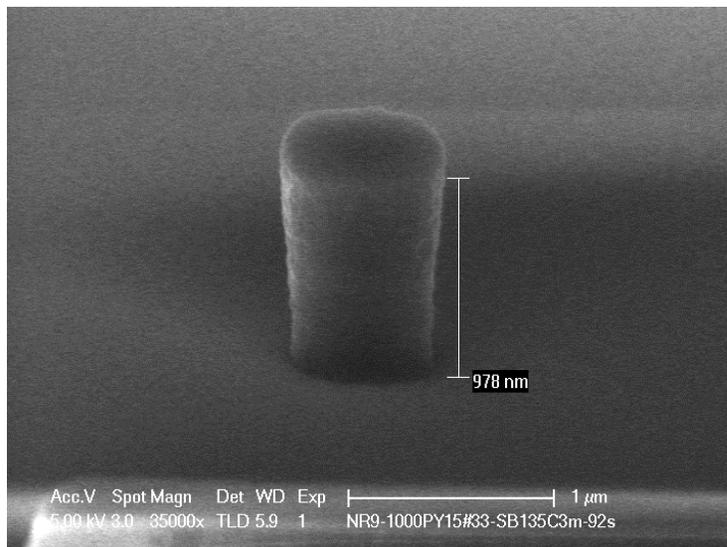
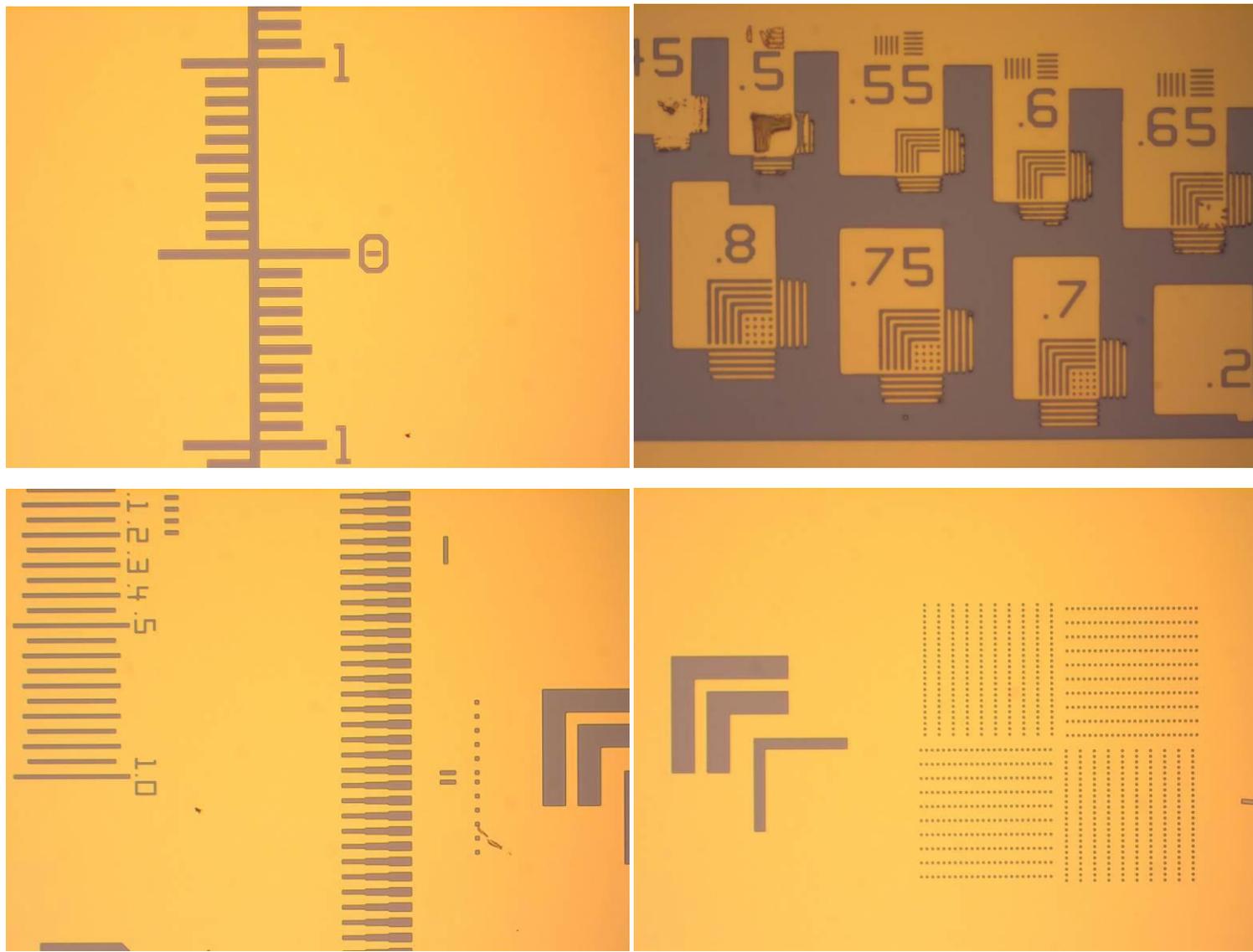


Figure 2. Microscopic pictures after the metal (Ti/Pt/Au: 100/300/2000 Å) lift-off in 1165 stripe at 80 C over weekend (~66 hours; completely lift off).



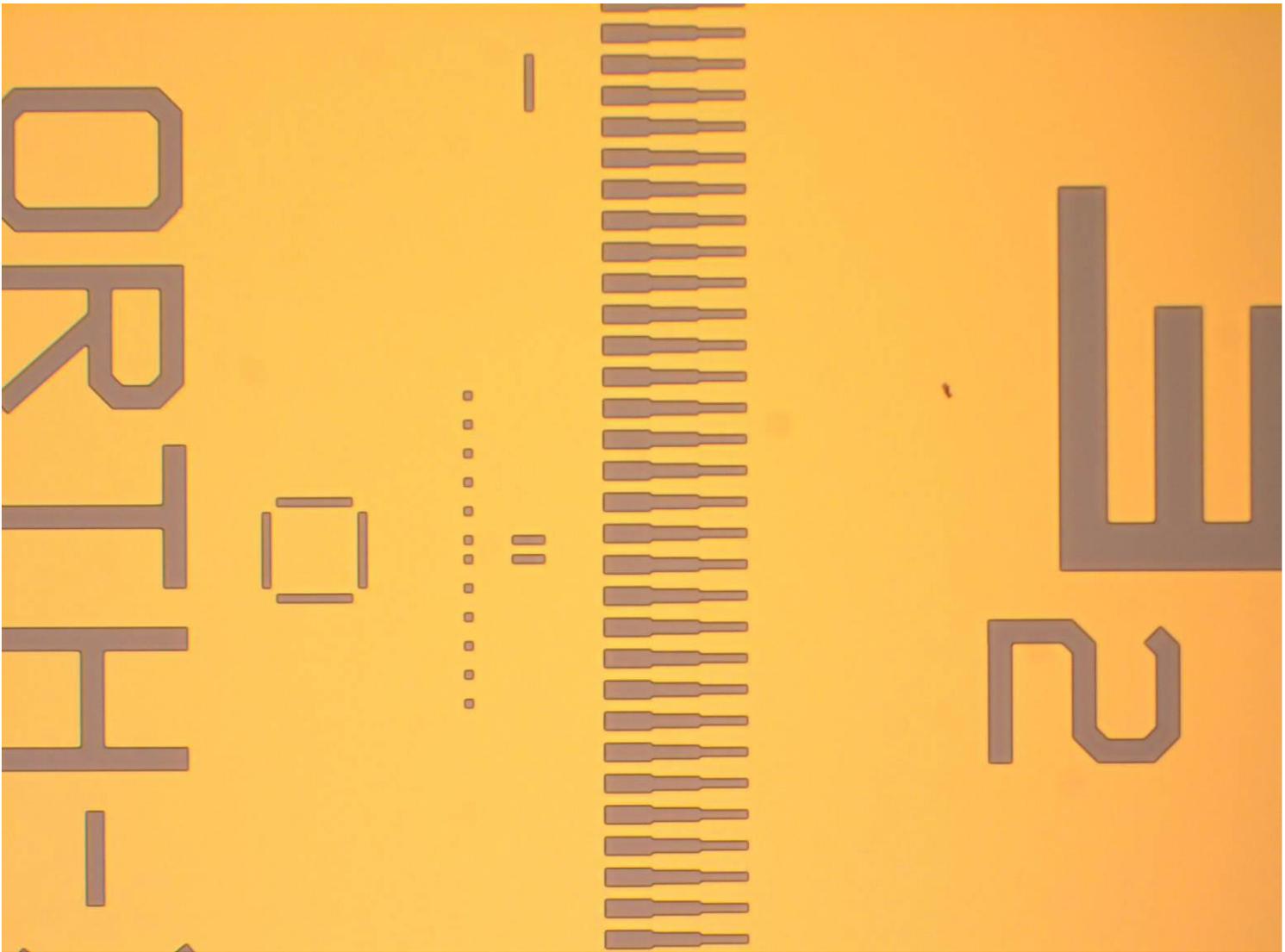


Figure 3. Microscopic pictures after the metal (Ti/Pt/Au: 100/300/2000 Å) lift-off in 1165 stripe at 80 C for ~6.5 hours (mostly lift-off), then, in Acetone (2') and Methanol (1') in ultrasonic bath (completely lift-off).

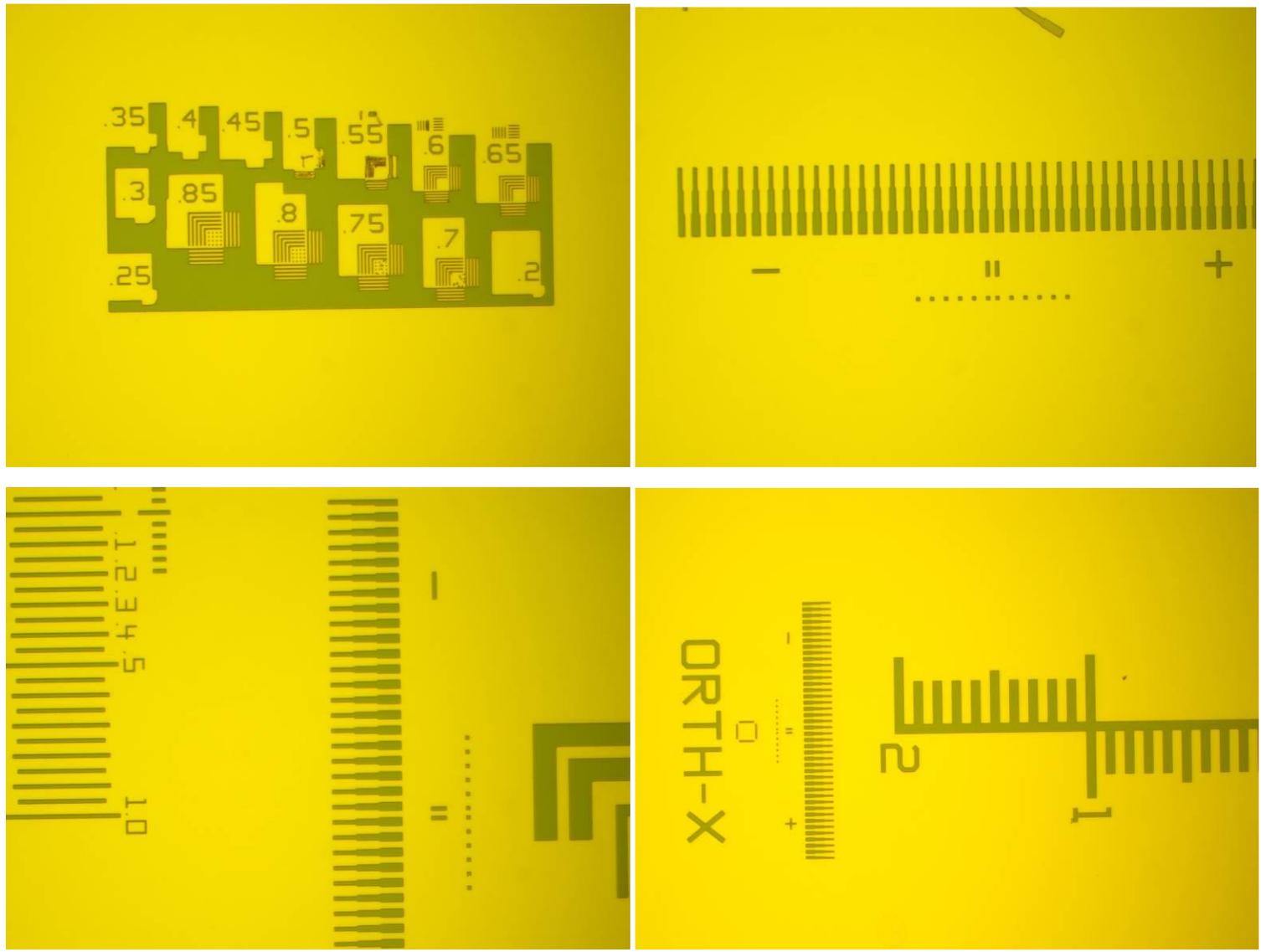




Figure 4. Microscopic pictures after the metal (Ti/Pt/Au: 100/300/2000 Å) lift-off in RR5 resist rempver at 80 C for 5 hours (not lift-off), then, in Acetone (2') and Methanol (1') in ultrasonic bath (only partially lift-off).

