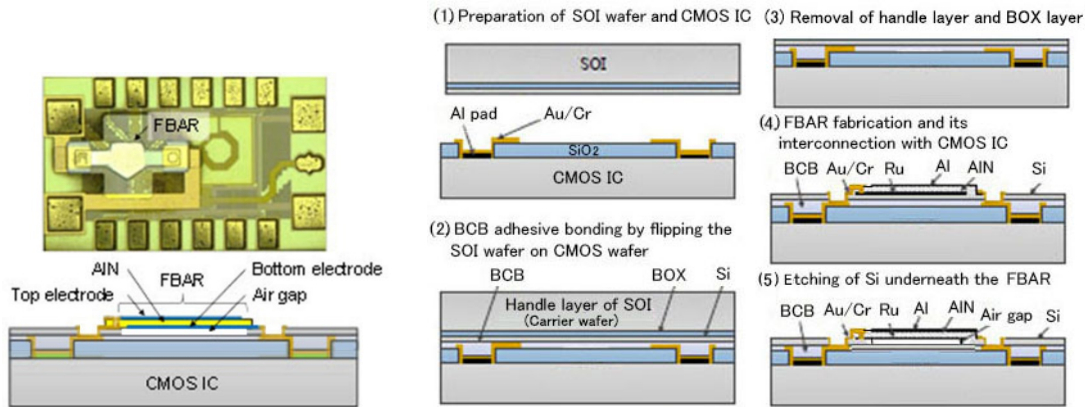
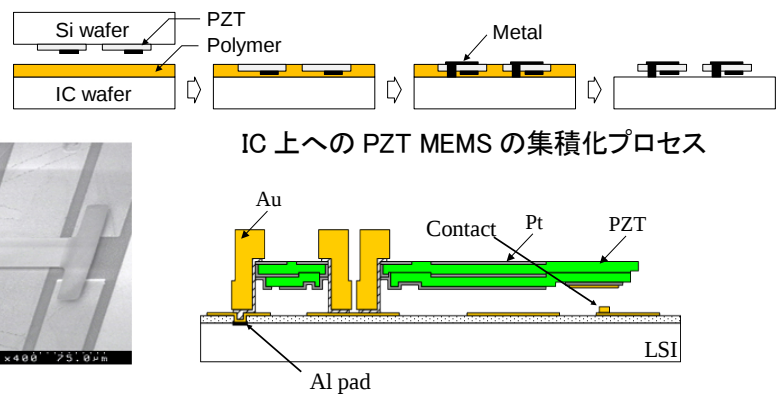
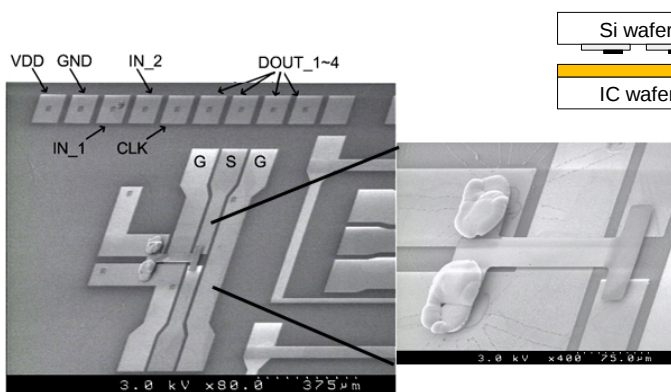


3 RF MEMS

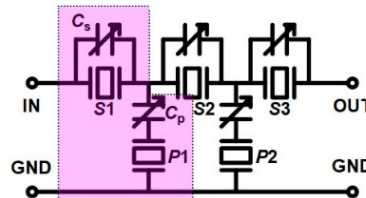
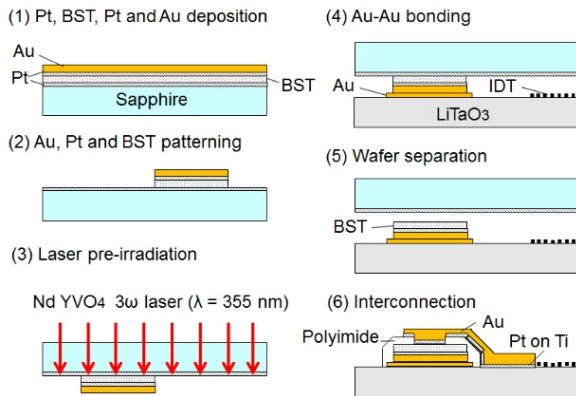


FBAR (film bulk acoustic resonator) on LSI (Kochhar et. al, 2012 IEEE Internl. Ultrasonic Symp. (2012) 1047)



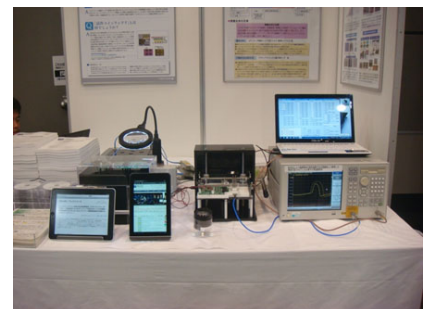
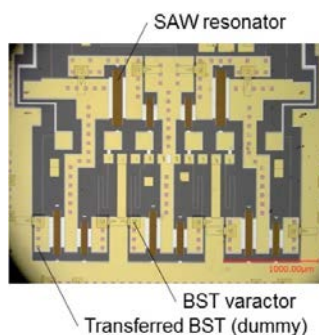
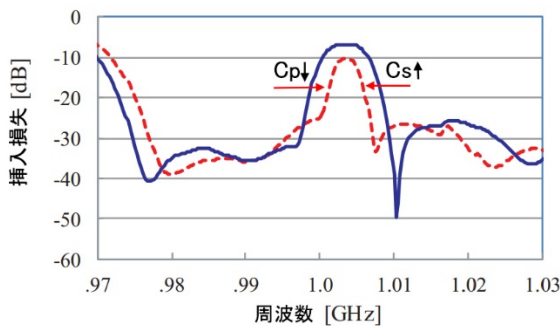
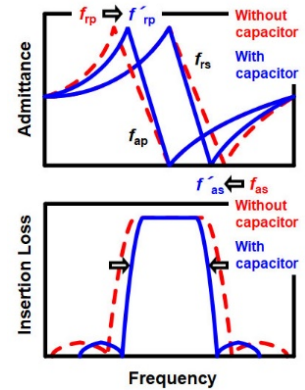
PZT MEMS switch fabricated on $0.35\ \mu\text{m}$ CMOS LSI (Matsuo *et al.*, IEEE MEMS 2012, pp. 1153–1156)

Cross sectional view of PZT MEMS switch



$$f'_{rp} = f_{rp} \sqrt{1 + \frac{C_{1p}}{C_{0p} + C_p}}$$

$$f'_{as} = f_{rs} \sqrt{1 + \frac{C_{1s}}{C_{0s} + C_s}}$$



Tunable bandwidth filter fabricated by selective transfer of ferroelectric variable capacitor on SAW device (H.Hirano et.al, J. of Micromech. Microeng., 23, 2 (2013) 025005(9pp))