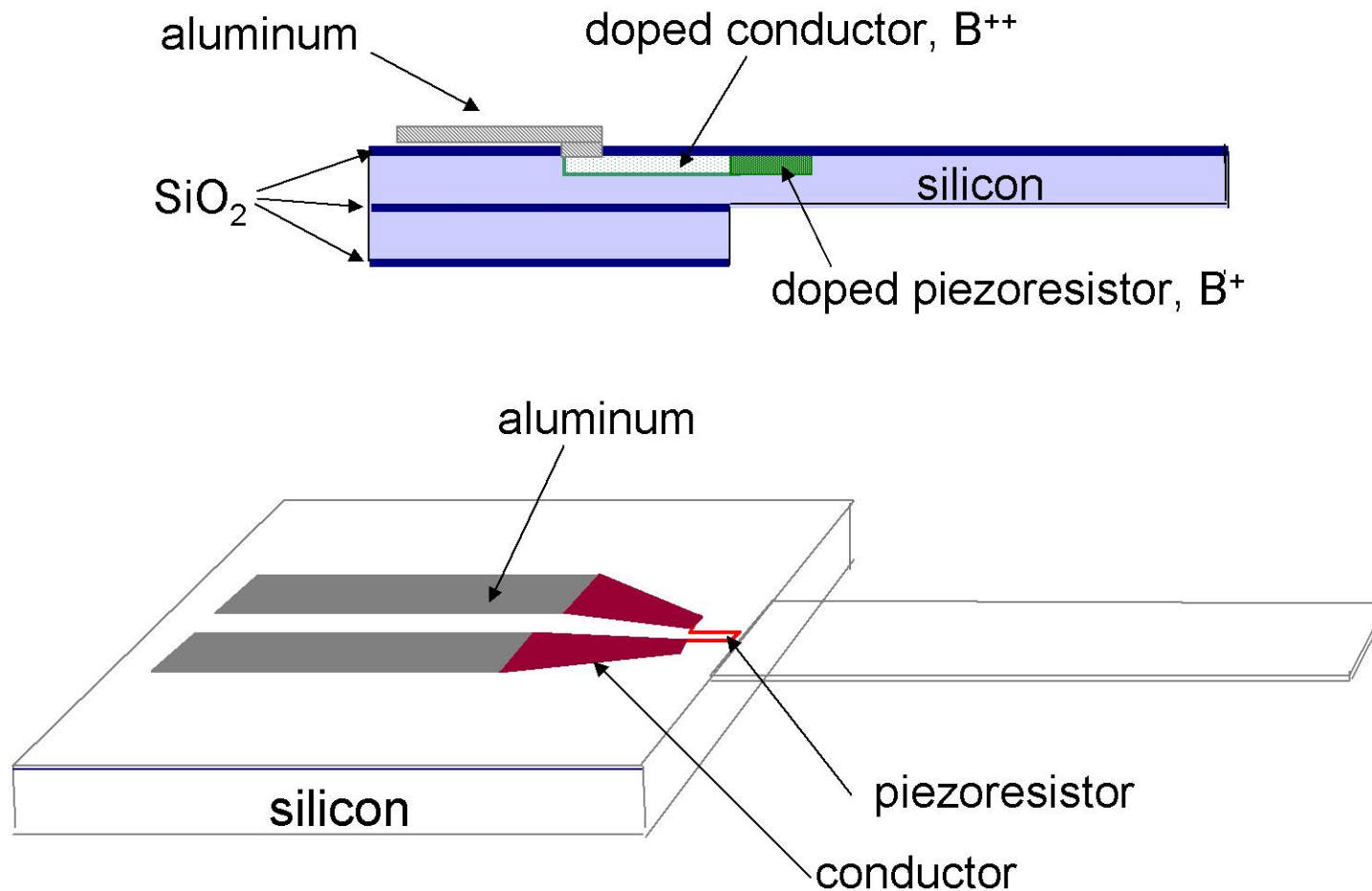


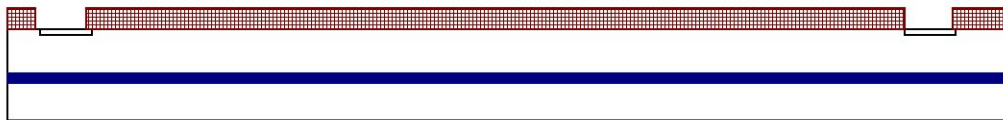
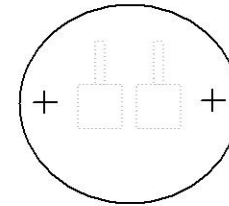
Fab. Example: Piezoelectric Force Sensor (1)



7 mask process

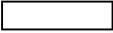
Fab. Example: Piezoelectric Force Sensor (2)

Processing: alignment



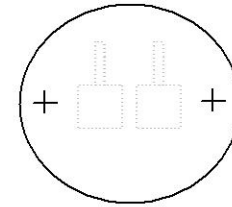
Pattern resist and light Si etch (3000 angstroms) to define alignment patterns [Steps 1-3]

KEY:

	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

Fab. Example: Piezoelectric Force Sensor (3)

Processing: protective oxide

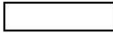
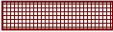


Strip resist

Grow protective screening
oxide ~250 angstroms

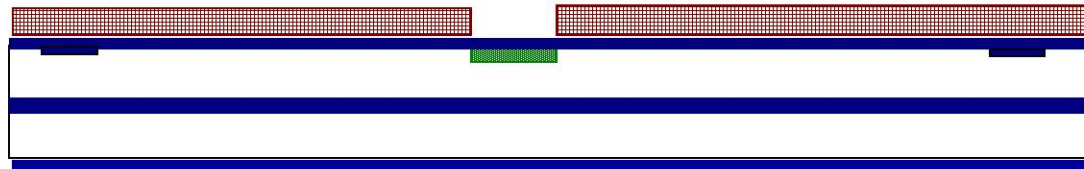
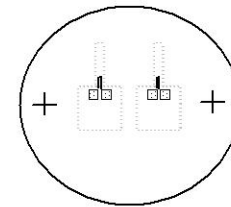
[Steps 4-5]

KEY:

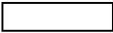
	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

Fab. Example: Piezoelectric Force Sensor (4)

Processing: piezoresistors



KEY:

	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

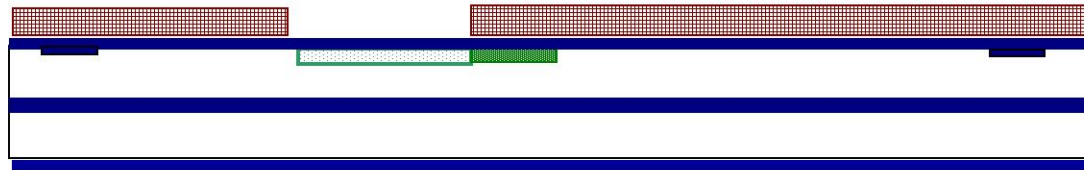
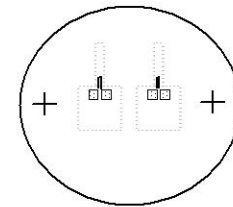
Pattern resist

50 keV boron implant for piezoresistors, dose = 10^{16} ions/cm²

[Steps 6-7, resist strip not shown]

Fab. Example: Piezoelectric Force Sensor (5)

Processing: conductors



KEY:

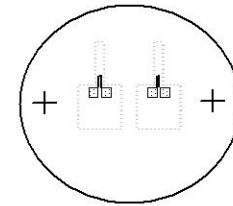
	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

Pattern resist

50 keV boron implant for piezoresistors, dose varies from wafer to wafer
[Steps 9-10, resist strip not shown]

Fab. Example: Piezoelectric Force Sensor (6)

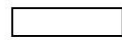
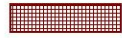
Processing: oxide/anneal



Strip damaged oxide
[Step 12]

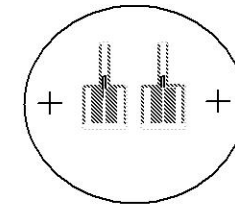
Wet Oxidation 900C,
~2500A, 2 μm depth,
[Steps 13-15]

KEY:

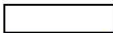
	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

Fab. Example: Piezoelectric Force Sensor (7)

Processing: contacts



KEY:

	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

Open oxide [Steps 16-17]

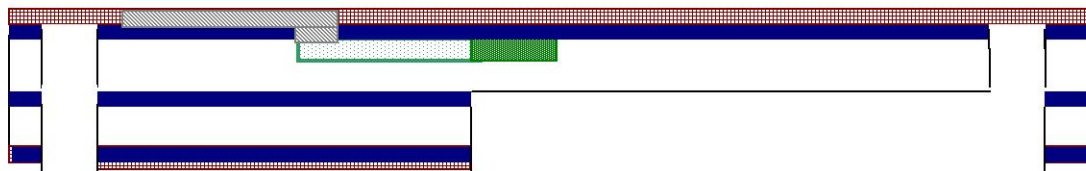
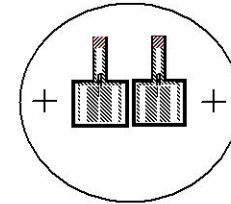
Strip Resist [Step 18]

Sputter 0.5 μm Aluminum
[Steps 19-20]

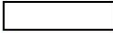
Pattern and etch Al [Steps
21-24]

Fab. Example: Piezoelectric Force Sensor (8)

Processing: DRIE



KEY:

	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)

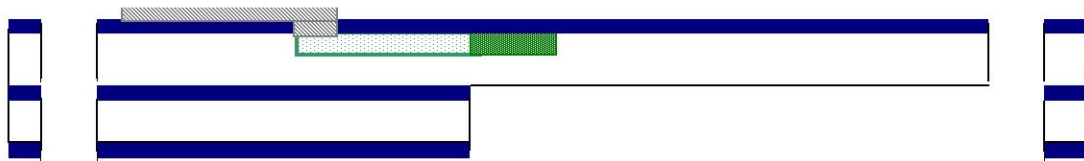
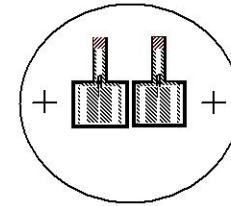
Frontside Etch- 1.6 μm resist [Step 25], open oxide [Step 26], etch Si to buried oxide [Step 27], strip resist [Steps 28-29], 1.6 μm resist frontside protect [Step 30]

Backside Etch-, 10 μm resist [Step 31], etch Si to buried oxide [Step 32], wet etch oxide [Step 33]

[Steps 34-36 not shown]

Fab. Example: Piezoelectric Force Sensor (9)

Processing: final device



KEY:

	Silicon
	Oxide
	Resist
	Piezoresistor doping
	Conductor doping
	Interconnect Metallization (Al)