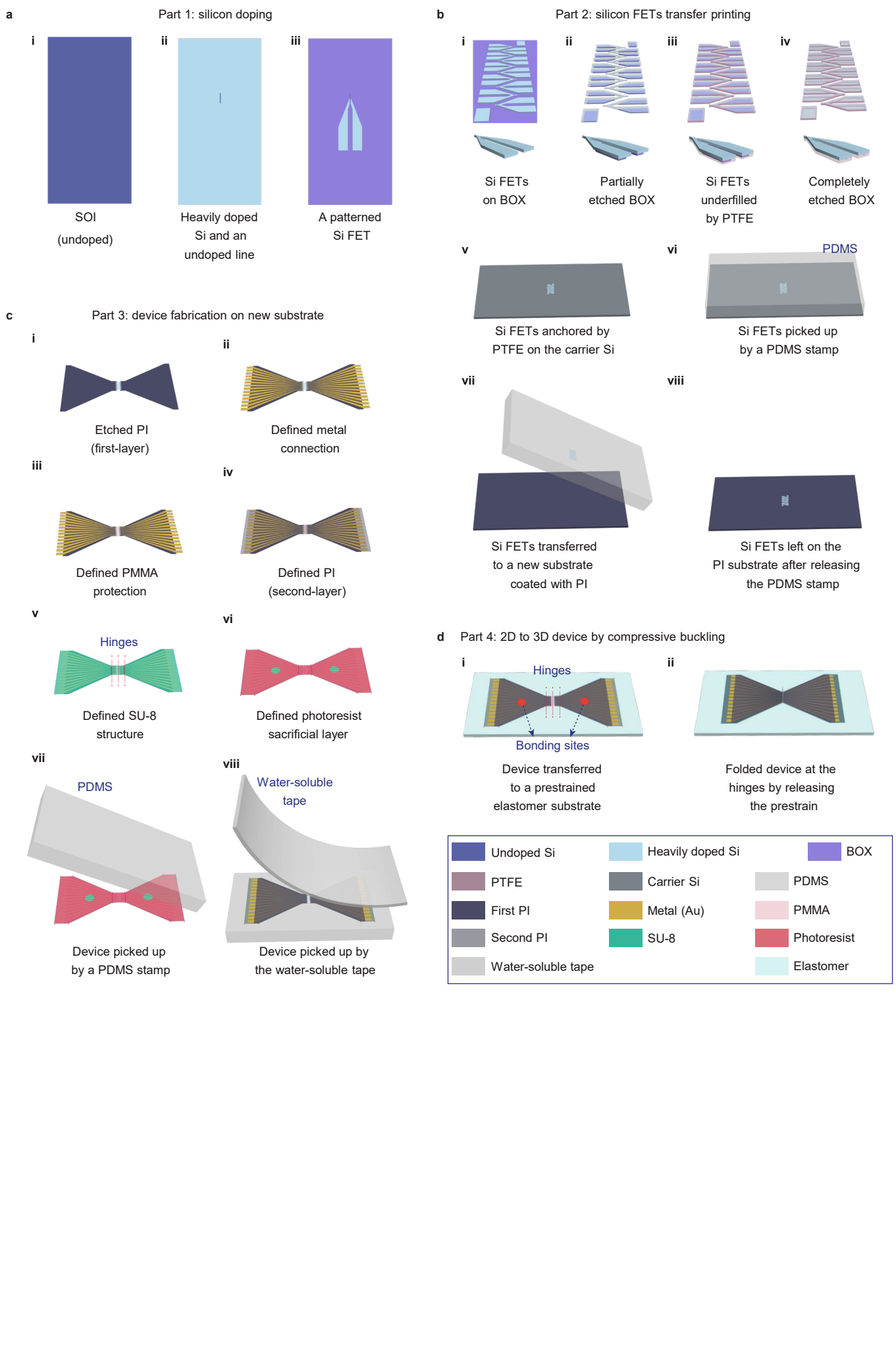
a
Part 1: silicon doping
i
SOI
(undoped)
ii
Heavily doped
Si and an
undoped line
iii
A patterned
Si FET
b
Part 2: silicon FETs transfer printing
i
Si FETs
on BOX
ii
Partially
etched BOX
iii
Si FETs
underfilled
by PTFE
iv
Completely
etched BOX
v
Si FETs anchored by
PTFE on the carrier Si
vi
PDMS
Si FETs picked up
by a PDMS stamp
vii
Si FETs transferred
to a new substrate
coated with PI
viii
Si FETs left on the
PI substrate after releasing
the PDMS stamp
c
Part 3: device fabrication on new substrate
i
Etched PI
(first-layer)
ii
Defined metal
connection
iii
Defined PMMA
protection
iv
Defined PI
(second-layer)
v
Hinges
Defined SU-8
structure
vi
Defined photoresist
sacrificial layer
vii
PDMS
Device picked up
by a PDMS stamp
viii
Water-soluble
tape
Device picked up by
the water-soluble tape
d
Part 4: 2D to 3D device by compressive buckling
i
Hinges
Bonding sites
Device transferred
to a prestrained
elastomer substrate
ii
Folded device at the
hinges by releasing
the prestrain
Undoped Si
Heavily doped Si
BOX
PTFE
Carrier Si
PDMS
First PI
Metal (Au)
PMMA
Second PI
SU-8
Photoresist
Water-soluble tape
Elastomer