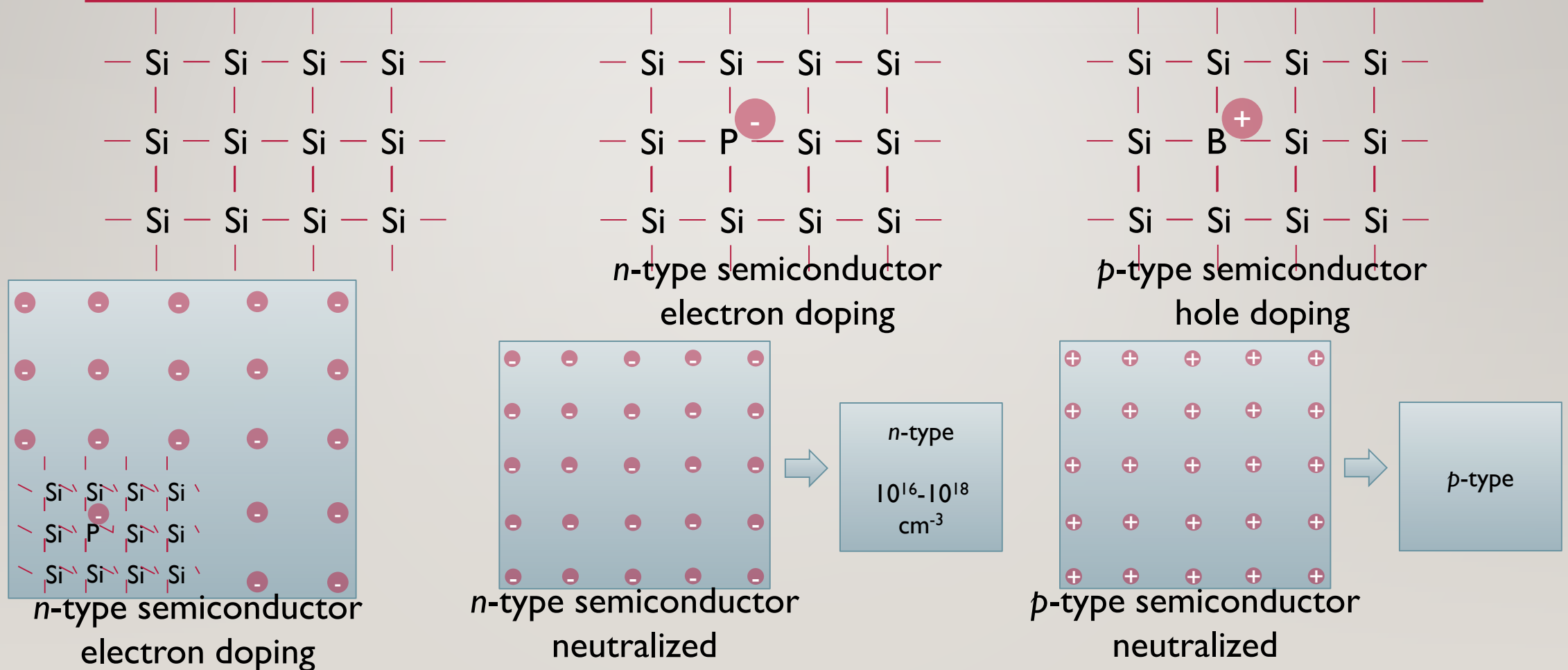


WEEK01 – COMPUTER HARDWARE

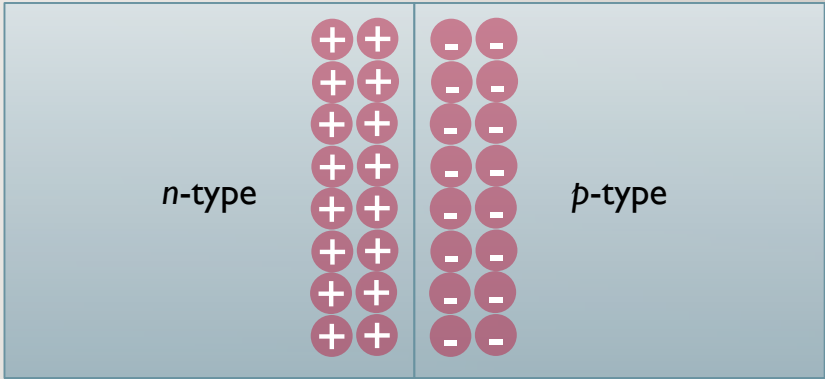
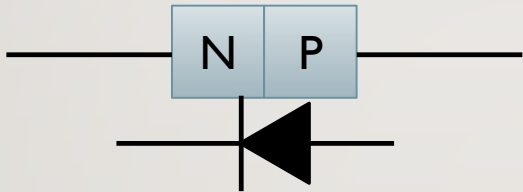
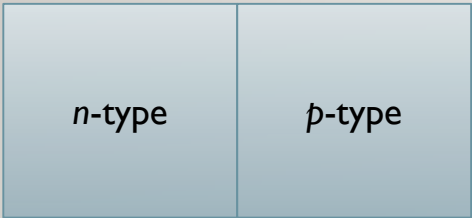
WEN-BIN JIAN

DEPARTMENT OF ELECTROPHYSICS, NATIONAL CHIAO TUNG UNIVERSITY

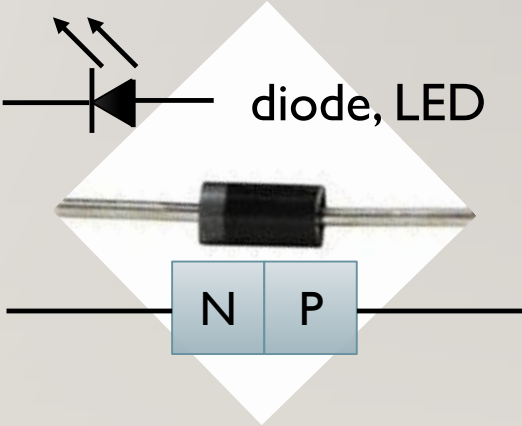
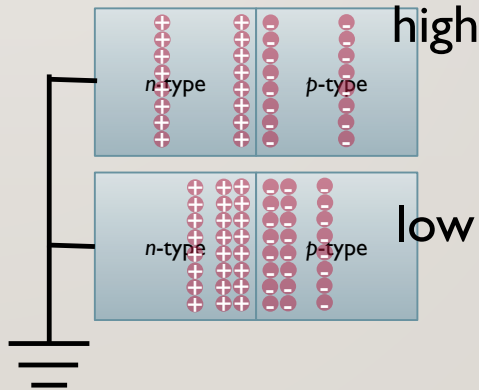
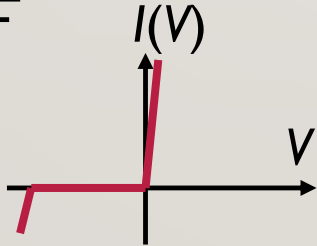
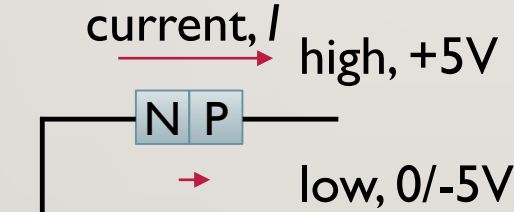
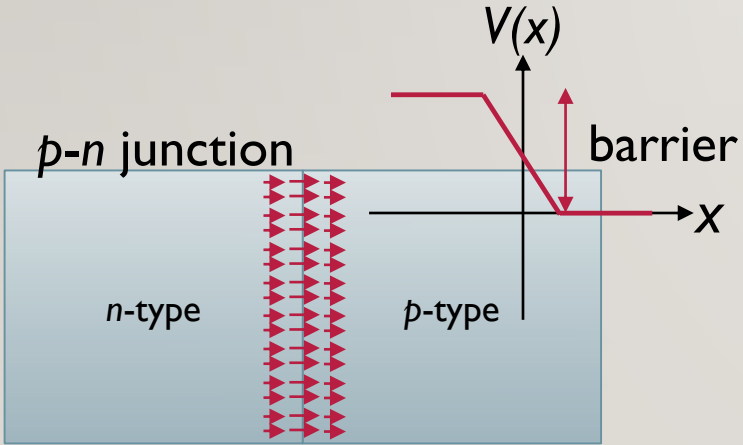
N-TYPE/P-TYPE SEMICONDUCTORS, DOPING



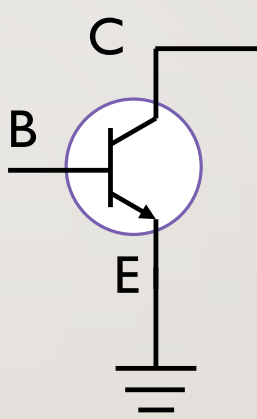
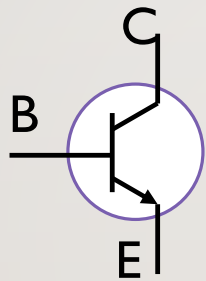
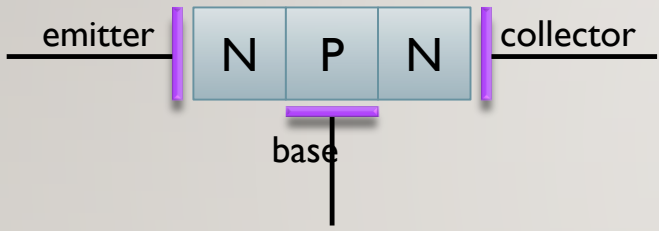
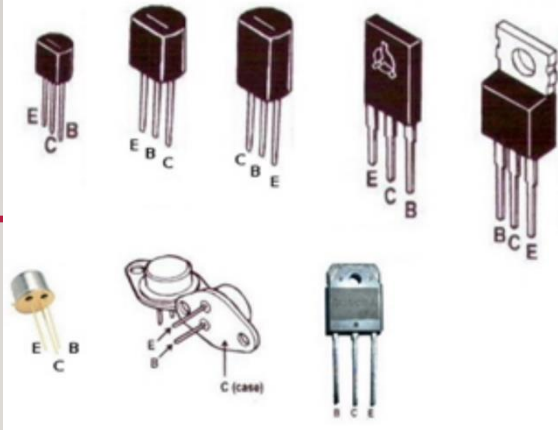
SEMICONDUCTORS - DIODES



Voltages: high, low, ground

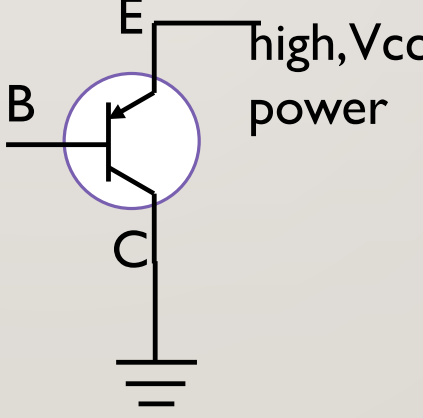
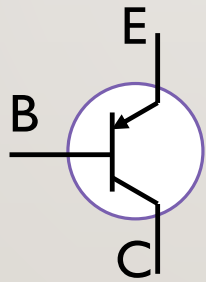
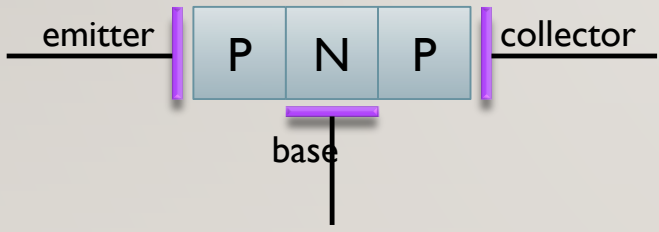


CONVENTIONAL TRANSISTORS – BIPOLAR JUNCTION TRANSISTORS (BJT)



high, Vcc
power

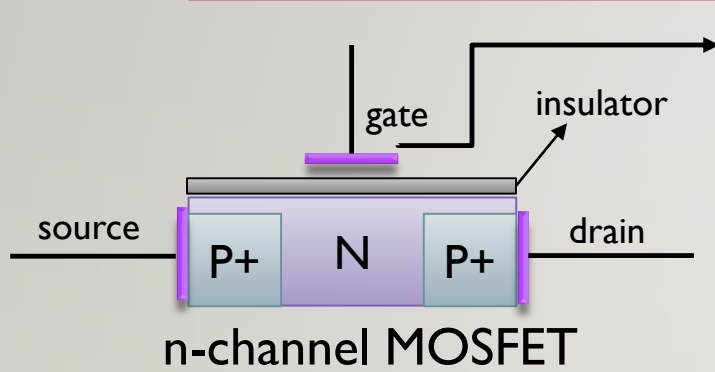
B: high, pass
B: low, stop
controlled by the BE resistance



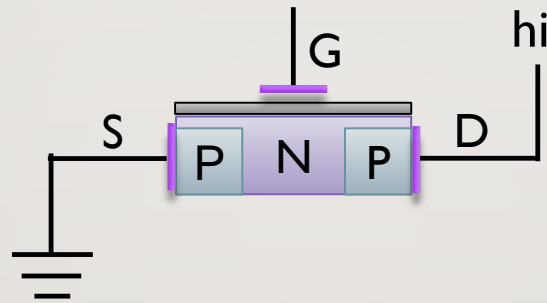
high, Vcc
power

B: high, stop
B: low, pass
controlled by the BE resistance

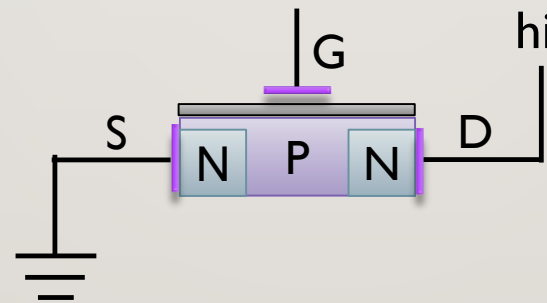
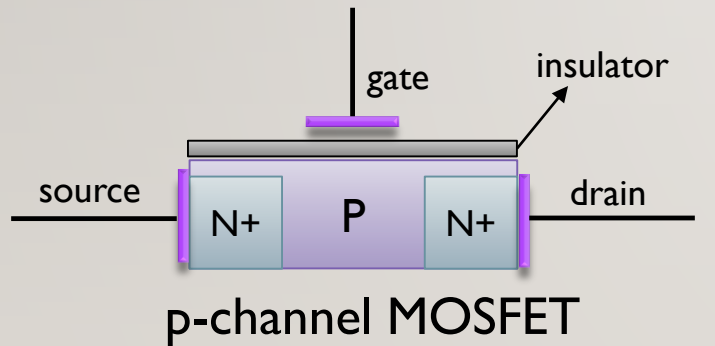
MODERN TRANSISTORS – MOSFET



controlled by electric field

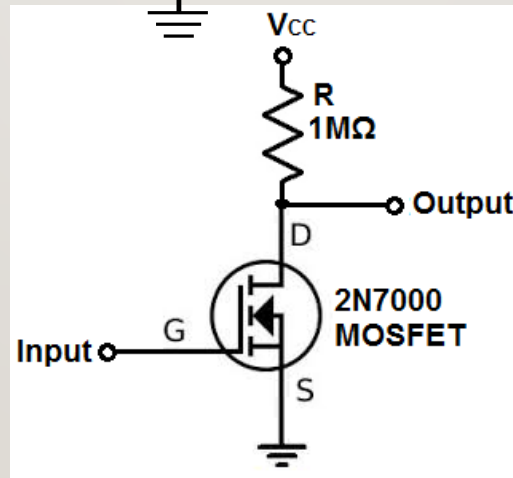
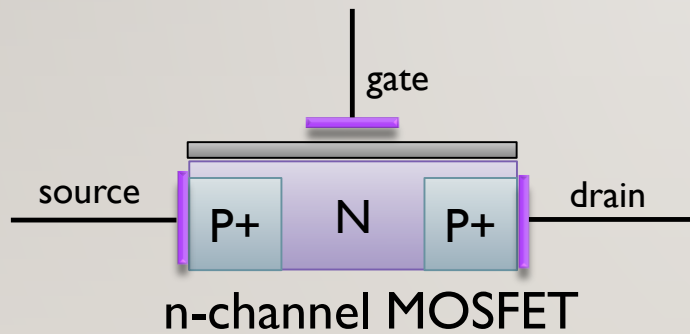
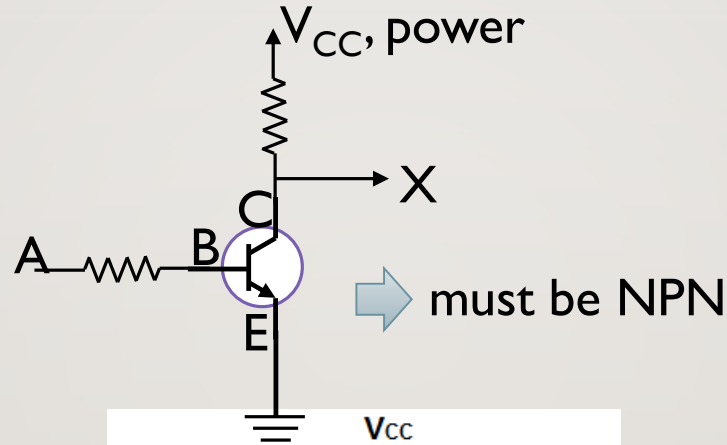
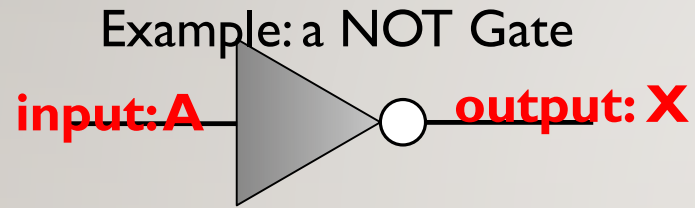


V_G high: pass
 V_G low, negative: stop
 V_G used to control the SD carrier concentration, resistance



V_G high: stop
 V_G low, negative: pass
 V_G used to control the SD carrier concentration, resistance

LOGIC GATES



	State 1	State 2
V_{CC}	+5V	+5V
V_E, V_S	0V, ground	0V
V_B, V_G	+5V	0V
V_C, V_D	0V	5V

A	X
0	1
1	0