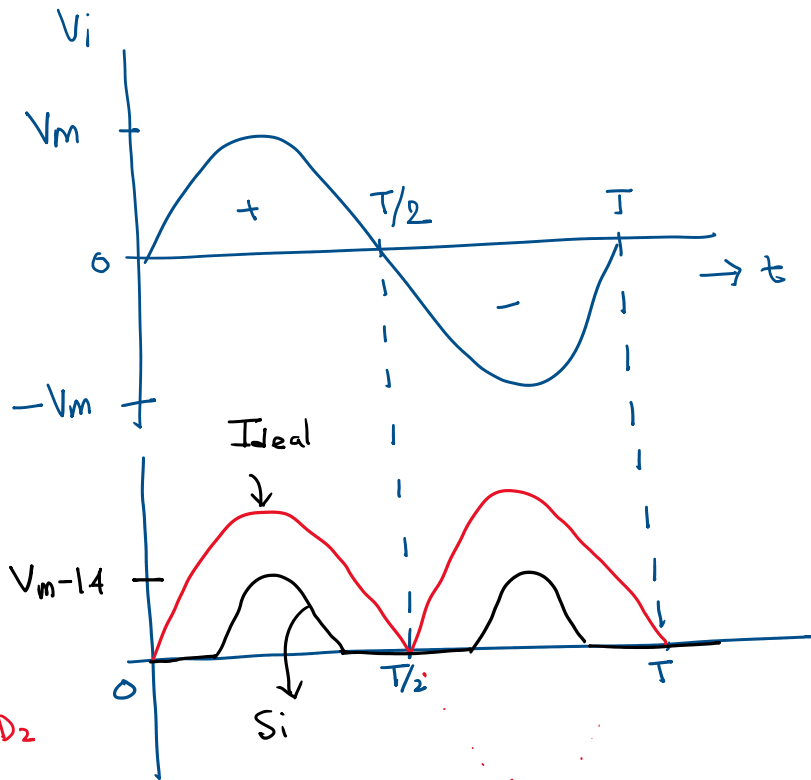# □ F.W. Bridge Rectifier
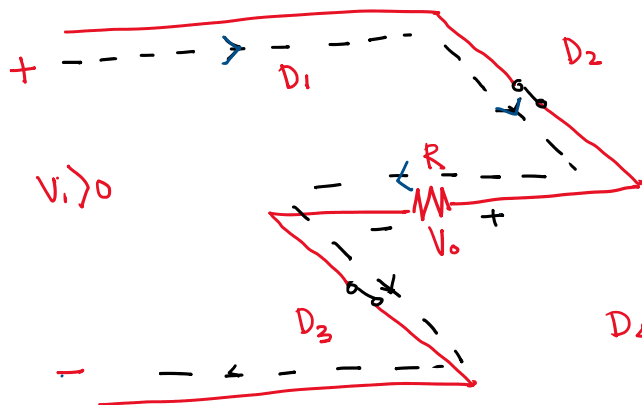
Idea diode, $V_p = 0V$ [F.B]

V_i
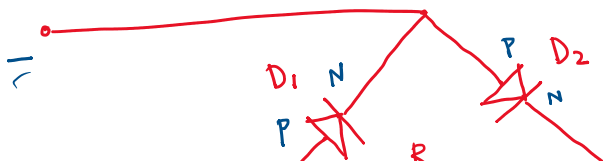
V_m

$+$ $T/2$ T

0 $\rightarrow t$

$-$

$-V_m$

Ideal

$0 < t < T/2$, $V_0 > 0$ $V_m - 14$

Si

D_1 & $D_4 \rightarrow R.B$
D_2 & $D_3 \rightarrow F.B$

D_1 R D_2
V_i V_0
D_3 D_4

$+$ D_1 D_2
$V_i > 0$ R V_0
D_3 D_4
$-$

$+$ D_1 D_2
$V_i > 0$ R V_0 $+$
D_3 D_4
$-$

$+ V_i - V_0 = 0$

$\Rightarrow \boxed{V_0 = V_i}$

D_1 N   P D_2
P   N
R

$V_i < 0$

D_1 N

P

R

V_o

P

D_3 N

N

N

D_4

P

+

$V_i < 0$

D_1

D_2

R

V_o

D_3

D_4

+
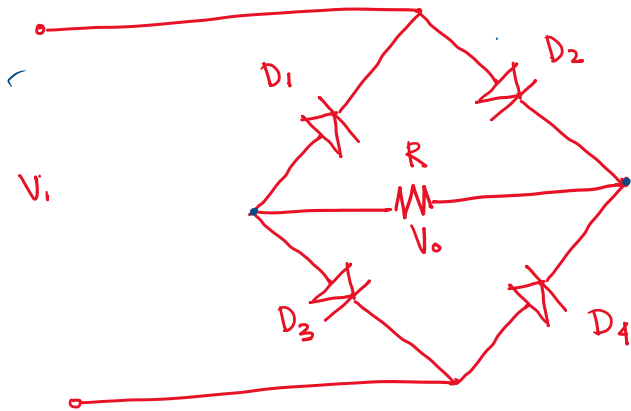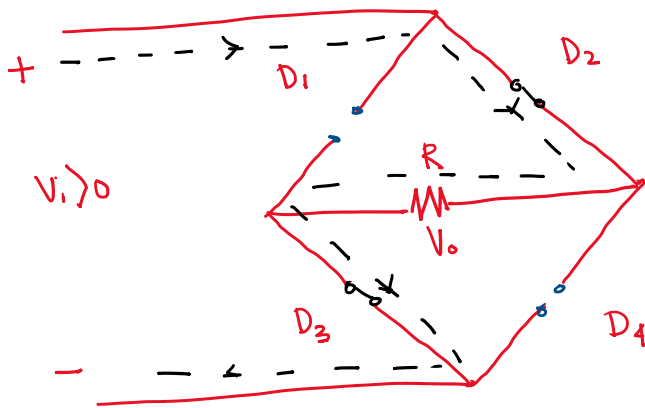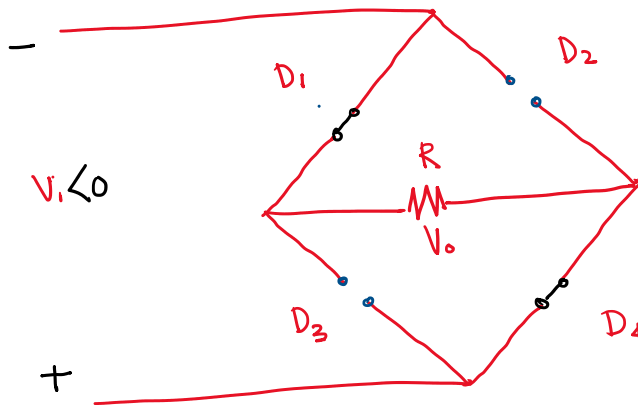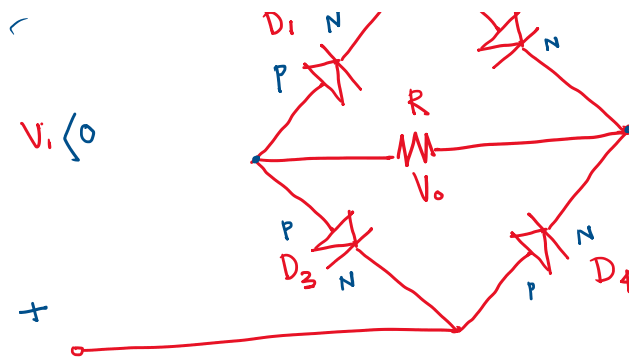
$T/2 < t < T, \ V_i < 0$

$D_2 \ \& \ D_3 \to R.B$

$D_1 \ \& \ D_4 \to F.B$

1. Magnitude
2. Sign $(+/-)$

$V_i < 0$

D_1

D_2

R

V_o

$V_i < 0$

D_3

D_4

+
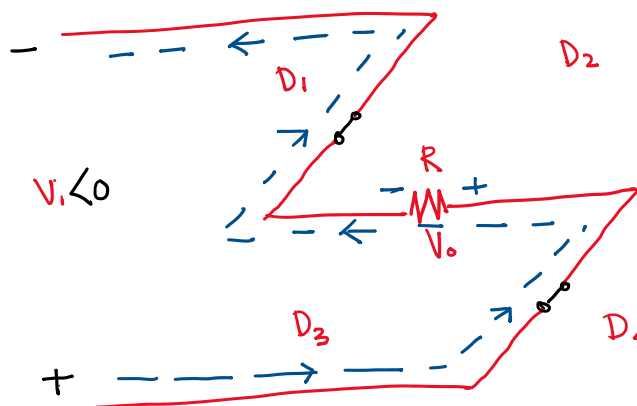
$-V_i + V_o = 0$
$\Rightarrow V_o = V_i$

$-V_i + V_o = 0$

$\Rightarrow \boxed{V_o = V_i} \to$ Magnitude

If we assume that V_i is unknown, therefore we consider that V_i is $+ve$ $(V_i > 0)$,
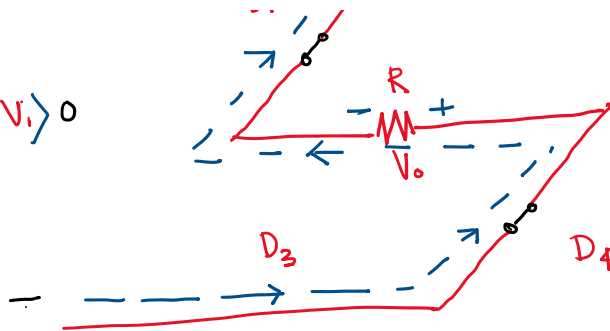
+

D_1

D_2

R

$+V_i + V_o = 0$
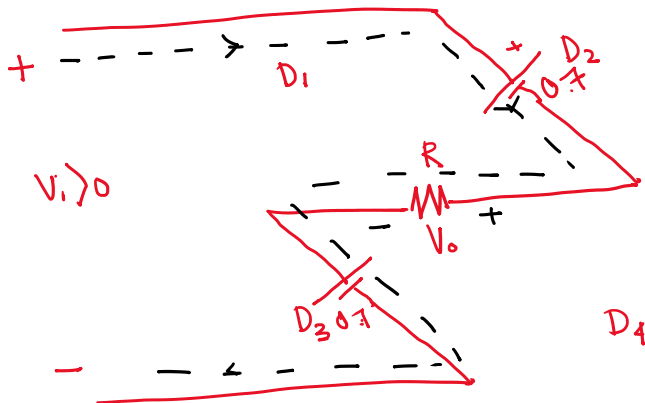
$\Rightarrow \boxed{V_o = -V_i}$

$V_o (max) = -(-V_m) = V_m$

$V_i > 0$

R

$+$

V_0

D_3

D_4

$$\Rightarrow \boxed{V_0 = -V_i}$$

$V_0(max) = -(-V_m) = V_m$

$V_i(max) = -V_m$

$+$ D_1 $+$ D_2

0.7

$V_i > 0$

R

$+$

V_0

D_3 0.7

D_4

$-$

$V_i - 0.7 - V_0 - 0.7 = 0$

$$\Rightarrow V_0 = V_i - 1.4$$