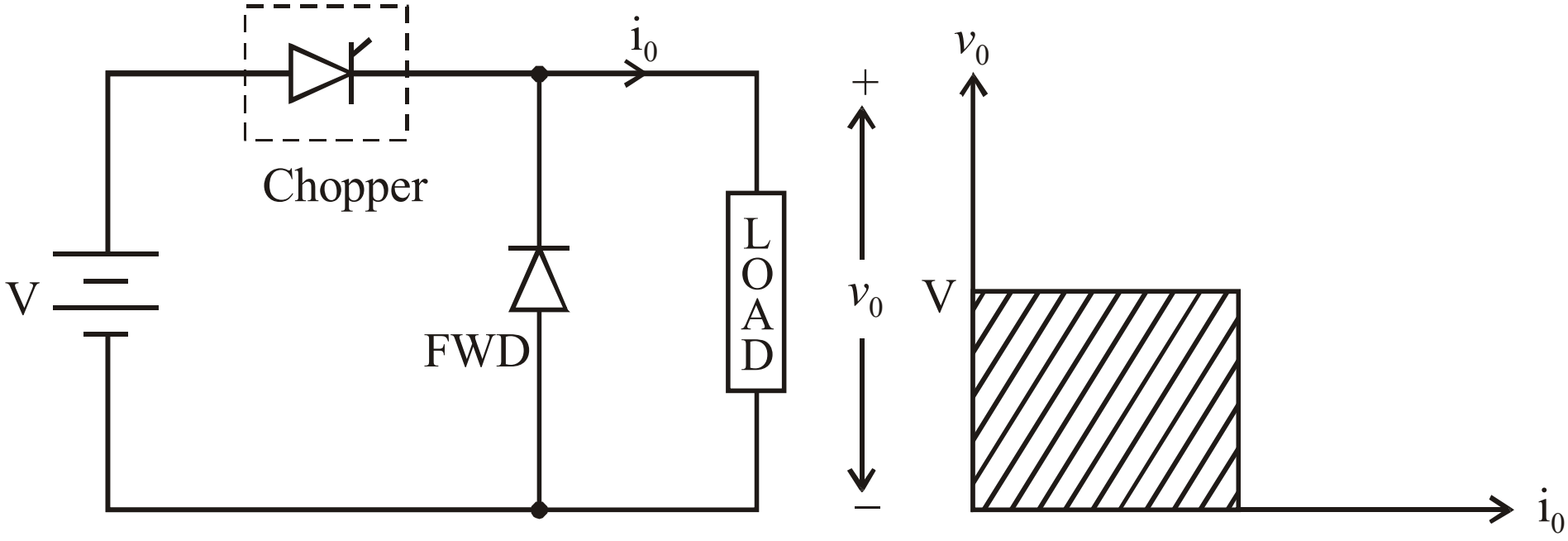
Classification Of Choppers

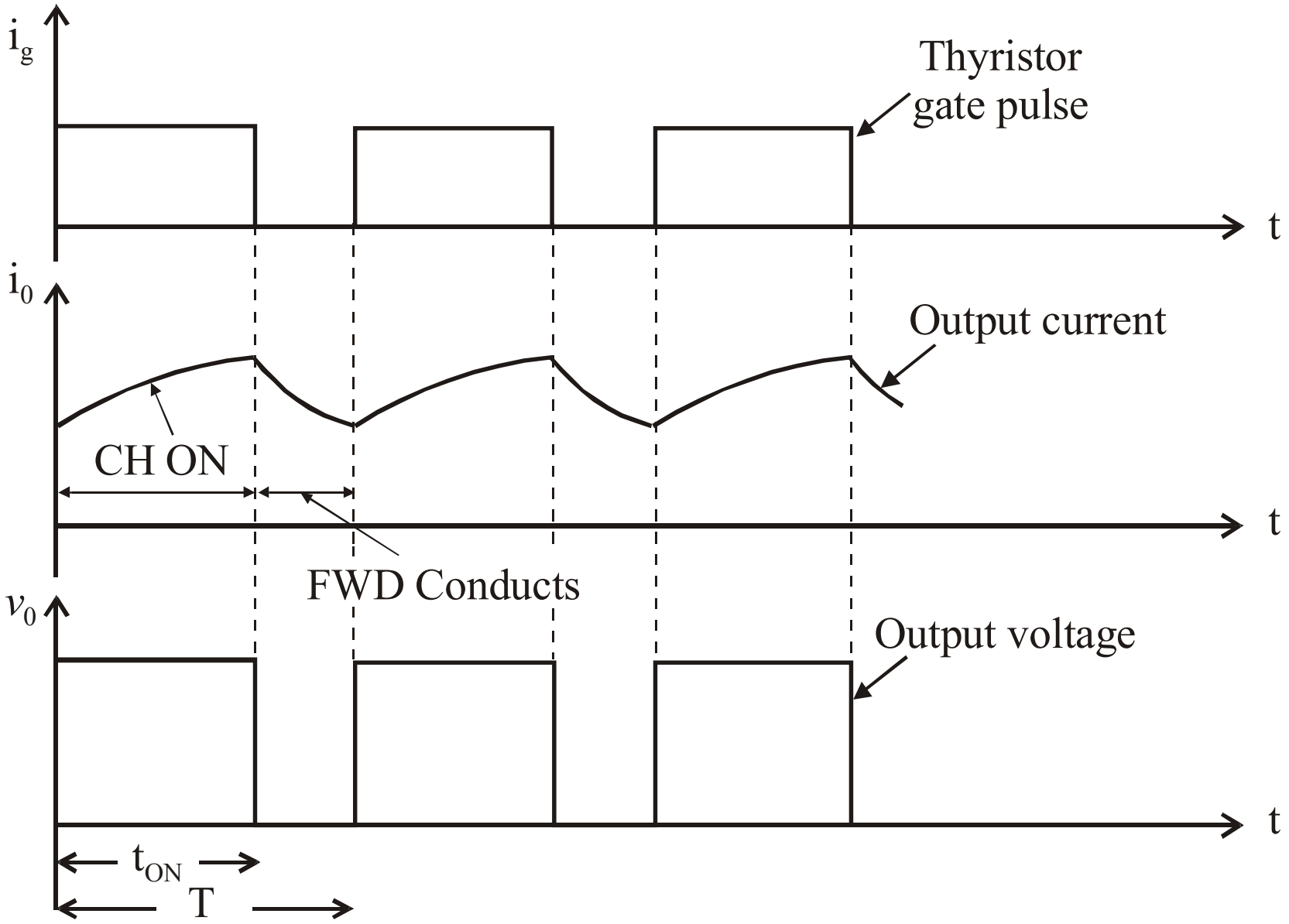
- Choppers are classified as
  - Class A Chopper
  - Class B Chopper
  - Class C Chopper
  - Class D Chopper
  - Class E Chopper

Class A Chopper

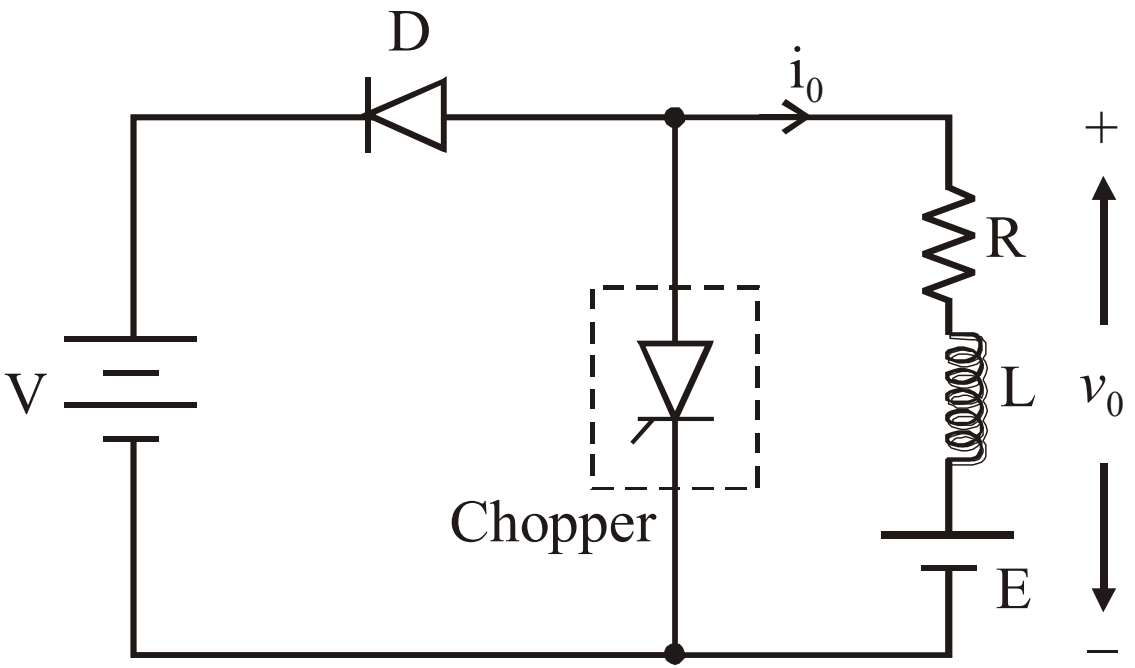


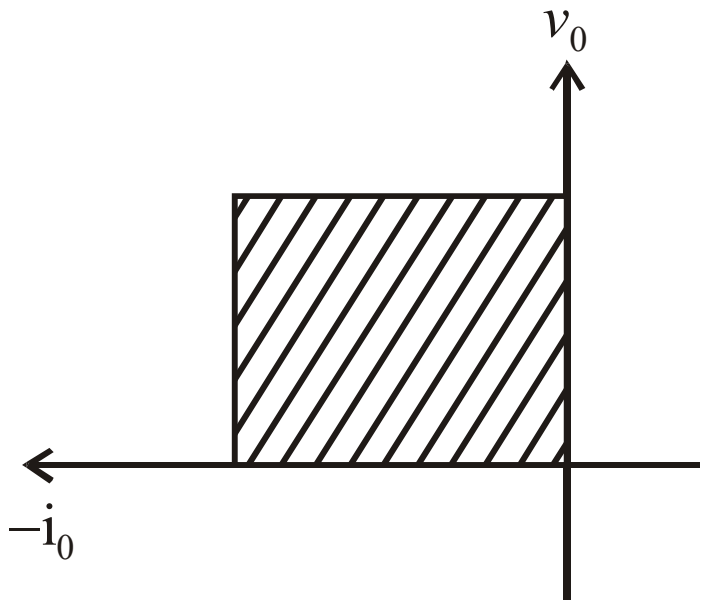
- When chopper is *ON,* supply voltage *V* is connected across the load.
- When chopper is OFF, $v_O = 0$ and the load current continues to flow in the same direction through the FWD.
- The average values of output voltage and current are always positive.
- *Class A Chopper* is a first quadrant chopper .

- *Class A Chopper* is a step-down chopper in which power always flows form source to load.
- It is used to control the speed of dc motor.
- The output current equations obtained in step down chopper with *R-L* load can be used to study the performance of *Class A Chopper.*


i_g
Thyristor
gate pulse
t
i_0
Output current
CH ON
t
FWD Conducts
v_0
Output voltage
t
t_{ON}
T

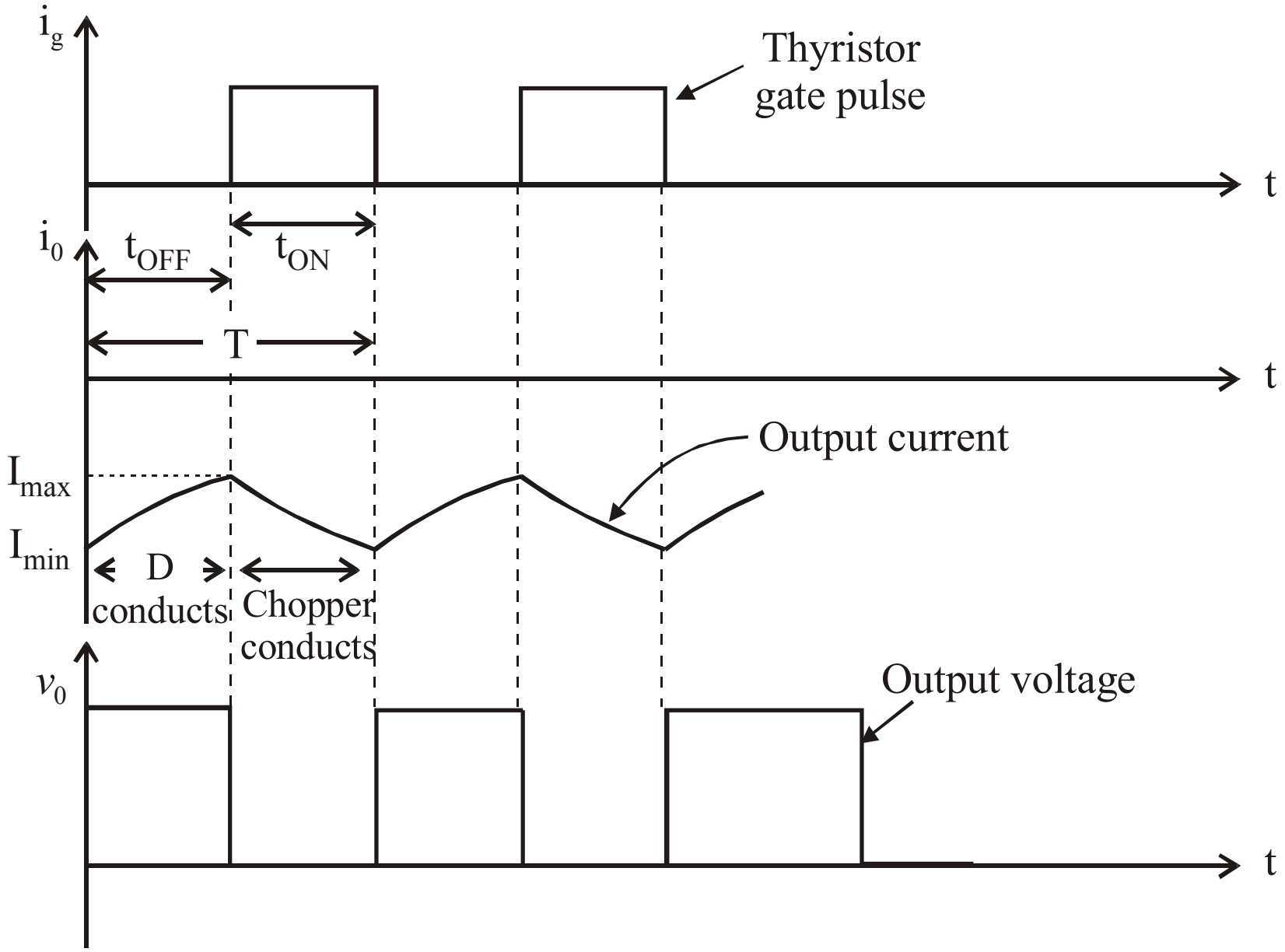
Class B Chopper





- When chopper is ON, *E* drives a current through *L* and R in a direction opposite to that shown in figure.
- During the ON period of the chopper, the inductance *L* stores energy.
- When Chopper is OFF, diode *D* conducts, and part of the energy stored in inductor *L* is returned to the supply.

- Average output voltage is positive.
- Average output current is negative.
- Therefore C*lass B Chopper* operates in second quadrant.
- In this chopper, power flows from load to source.
- *Class B Chopper* is used for regenerative braking of dc motor.
- *Class B Chopper* is a step-up chopper.


i_g
Thyristor
gate pulse
t
i_0
t_{OFF}
t_{ON}
T
t
Output current
I_{max}
I_{min}
D
conducts
Chopper
conducts
v_0
Output voltage
t