

Switched Mode Power Conversion

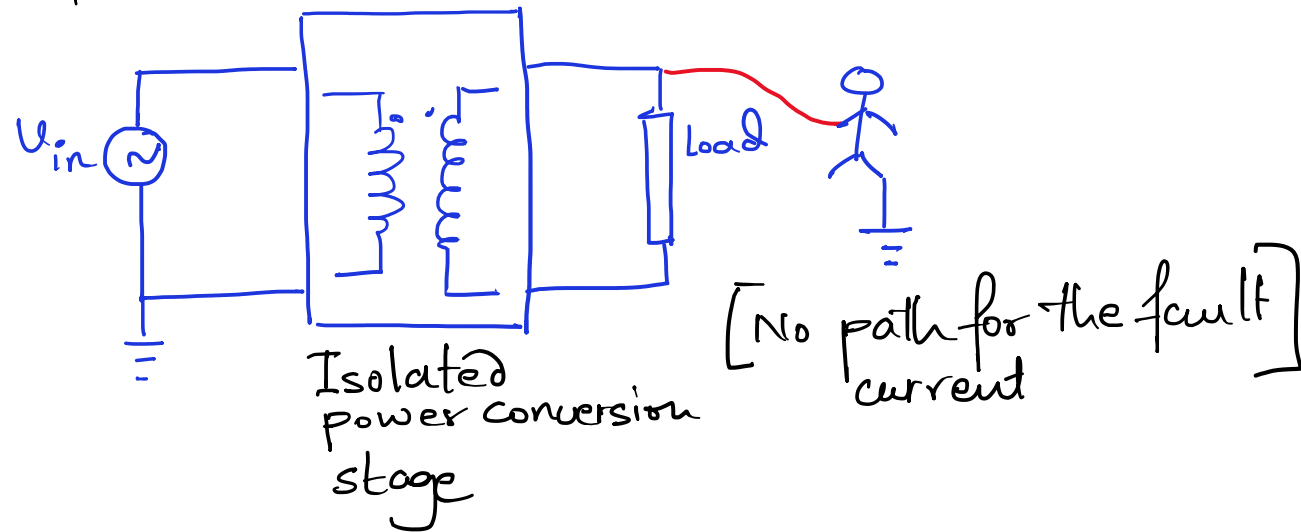
Semester II Academic Year 2025-26

Lecture 24

18th March 2026

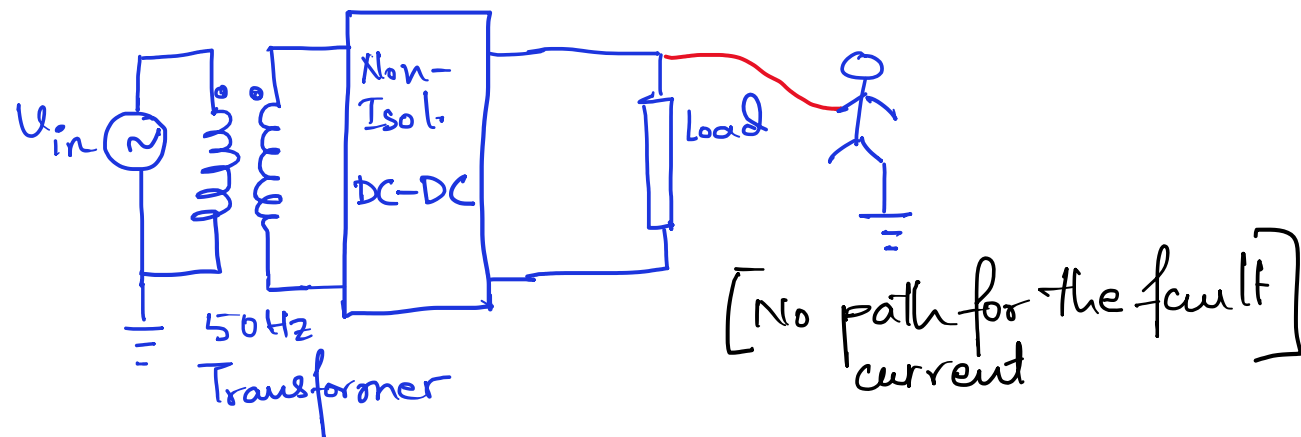
Isolated Converters

— Isolation between AC input supply and the output load side



Isolated Converters

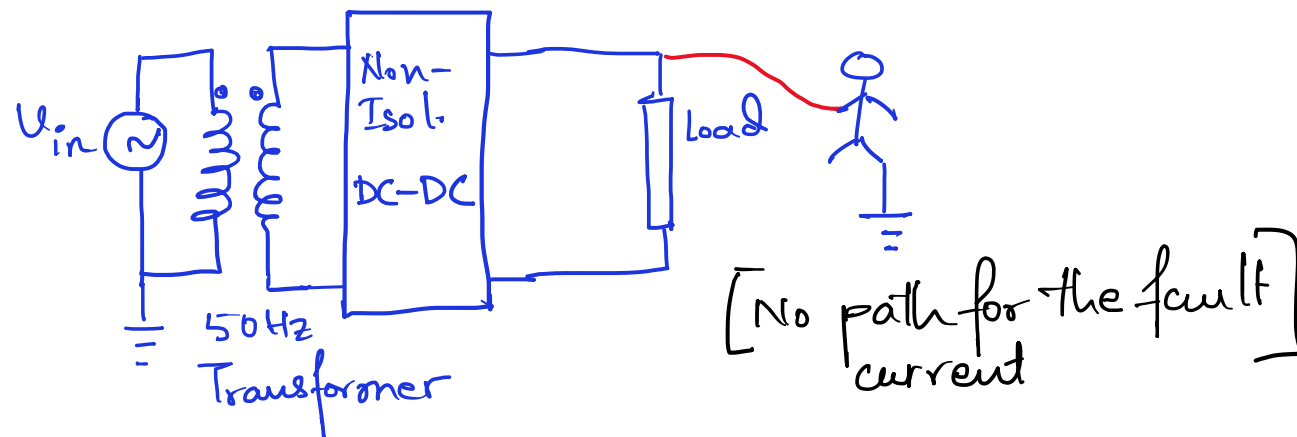
— Isolation between AC input supply and the output load side



$$V = 2\sqrt{2}\pi f B_m A_{core}$$

Isolated Converters

— Isolation between AC input supply and the output load side



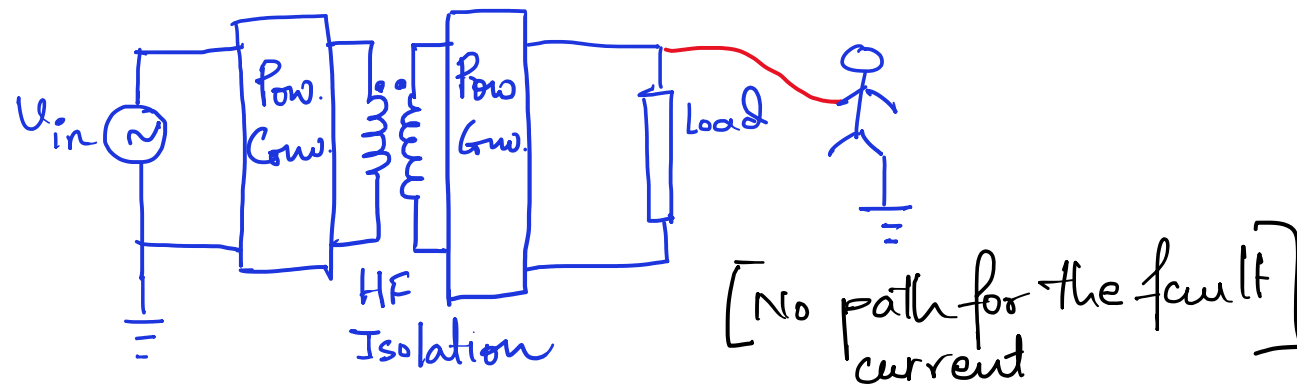
$$V = 2\sqrt{2}\pi f B_m A_{core}$$

[For a particular voltage rating and core material
 $f \uparrow$ — $A_{core} \downarrow$]

Reduction in isolation transf. size

Isolated Converters

— Isolation between AC input supply and the output load side



$$V = 2\sqrt{2}\pi f B_m A_{core}$$

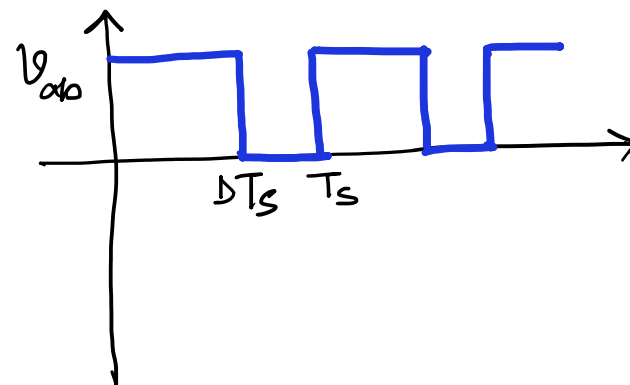
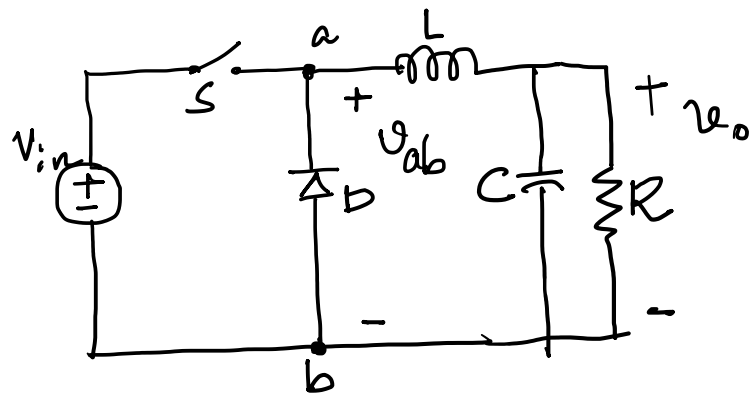
[For a particular voltage rating and core material]
 $f \uparrow$ — $A_{core} \downarrow$
Reduction in isolation transf. size

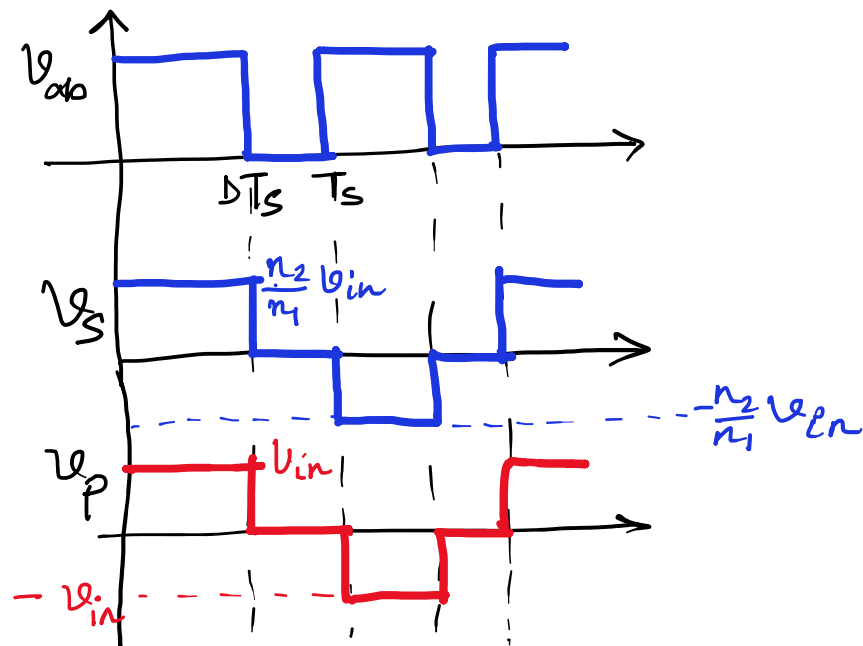
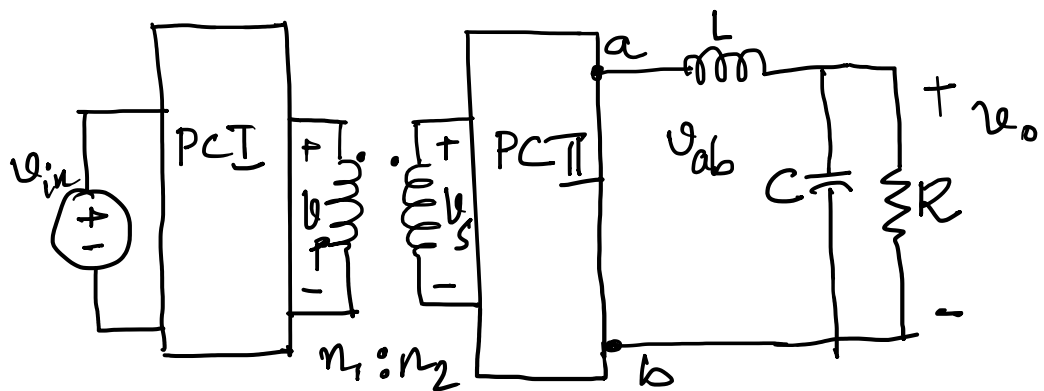
Isolated Converters

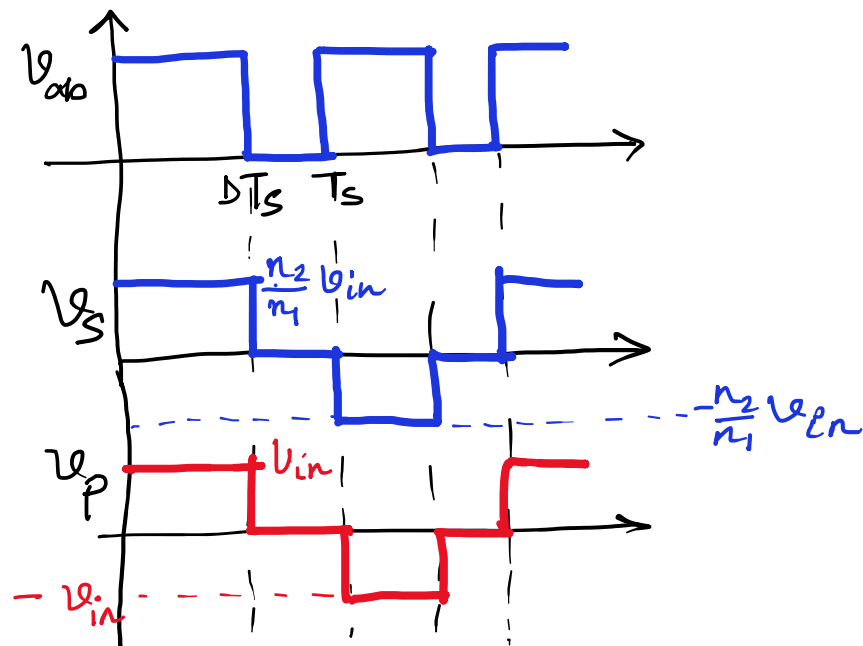
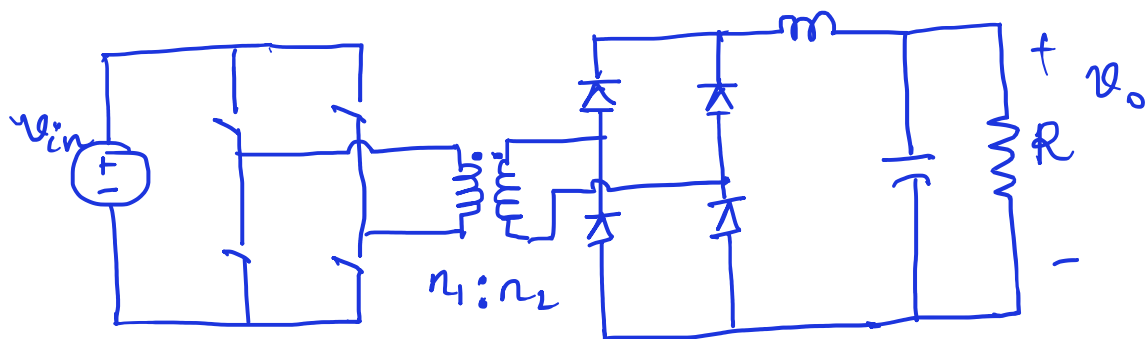
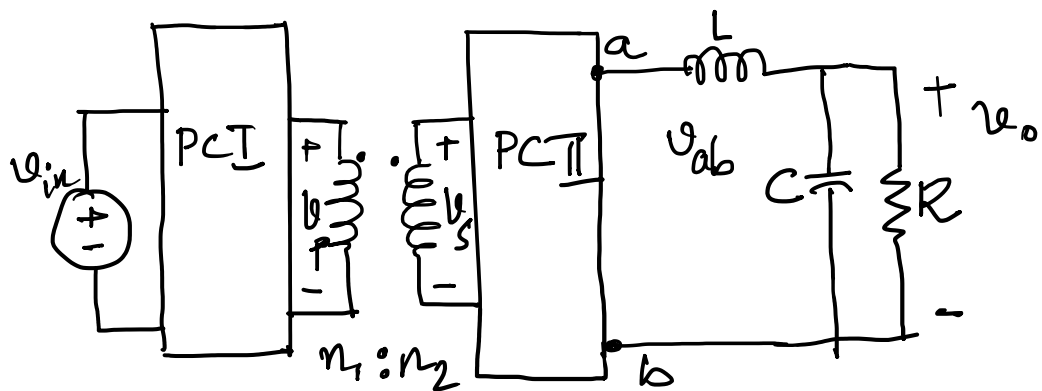
- Isolation between AC input supply and the output load side
- Achieving high step-up/step-down ratio between output and input

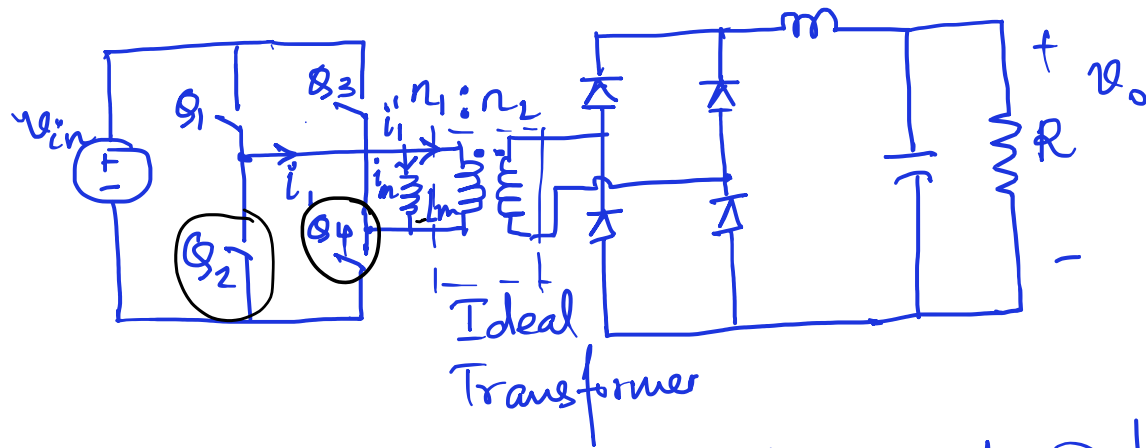
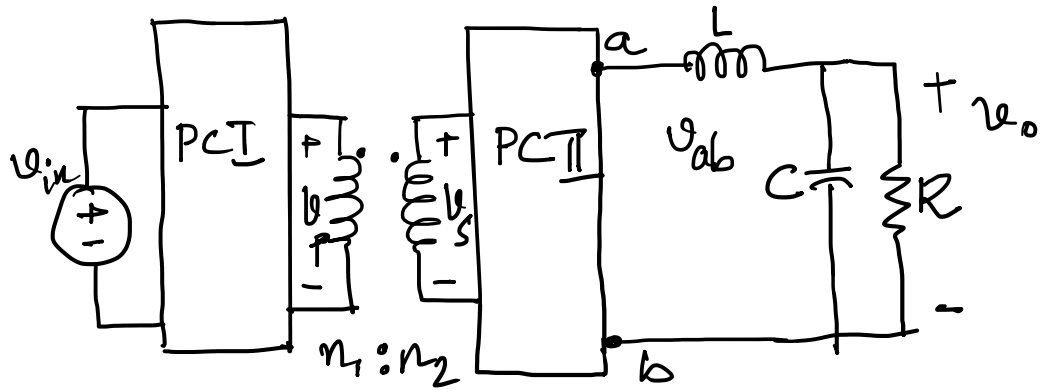
Isolated Converters

- Isolation between AC input supply and the output load side
- Achieving high step-up/step-down ratio between output and input
- Multiple power ports can be interfaced

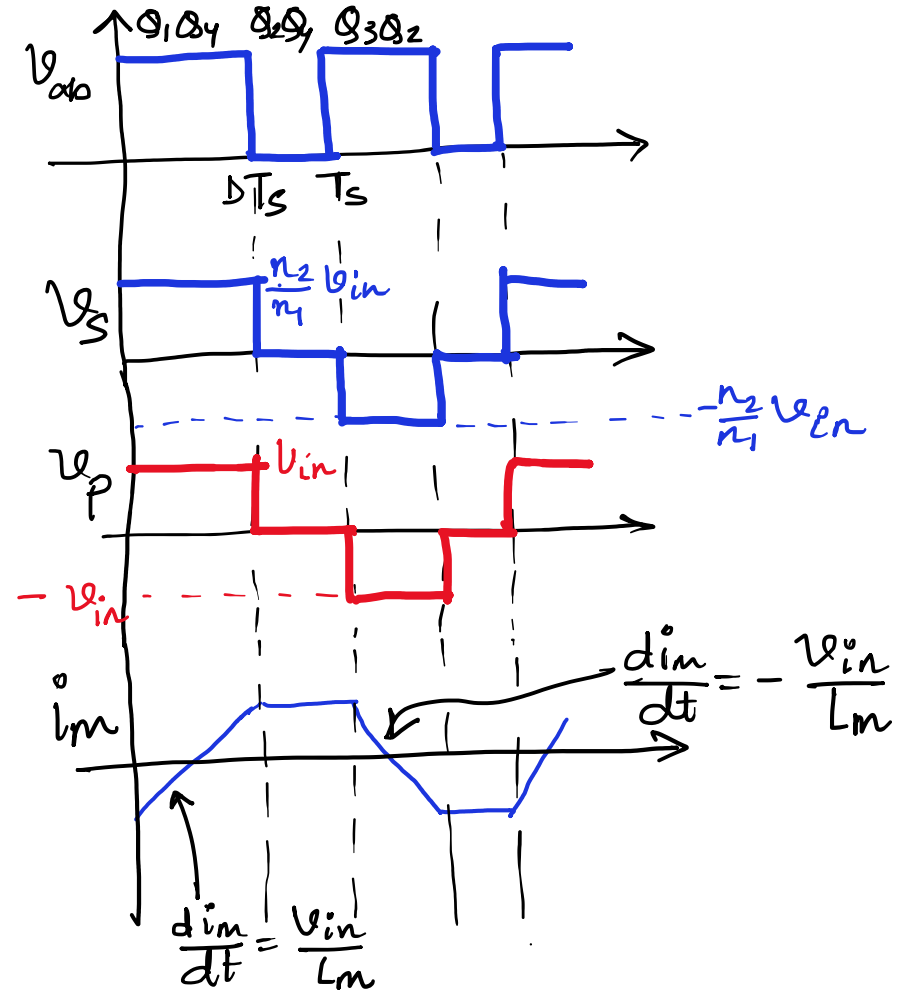


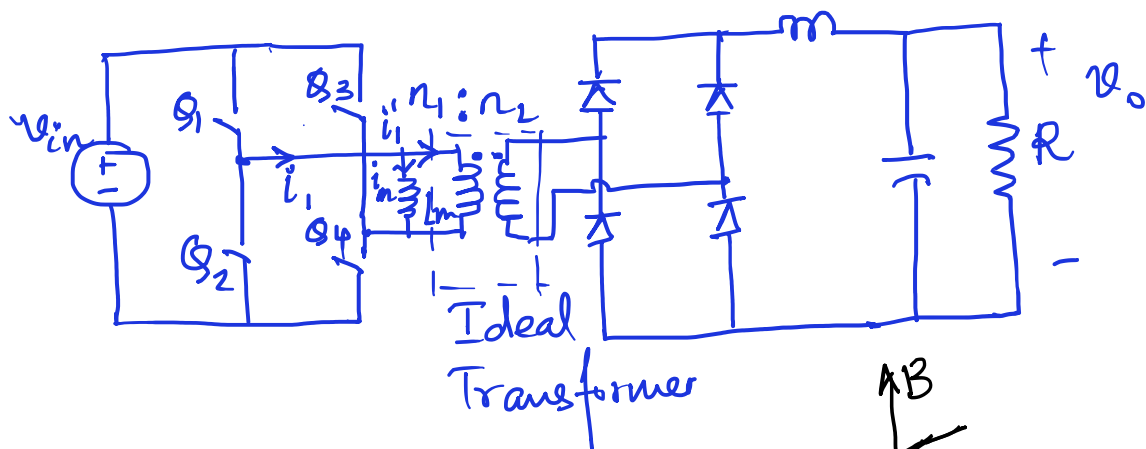
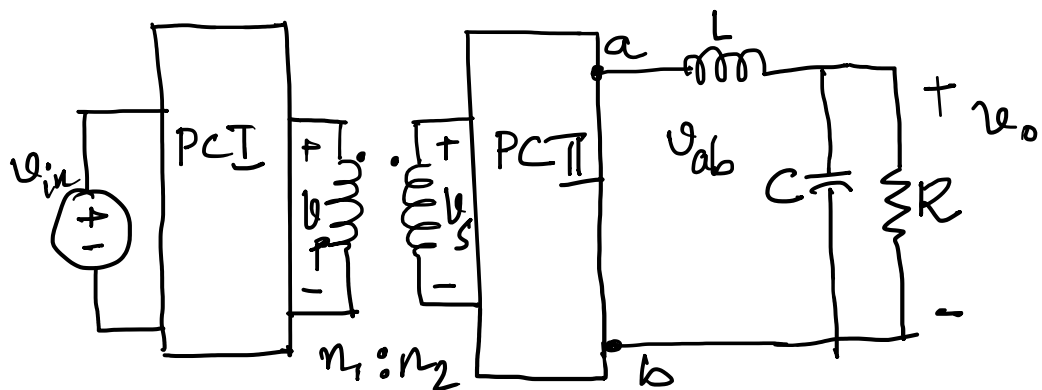




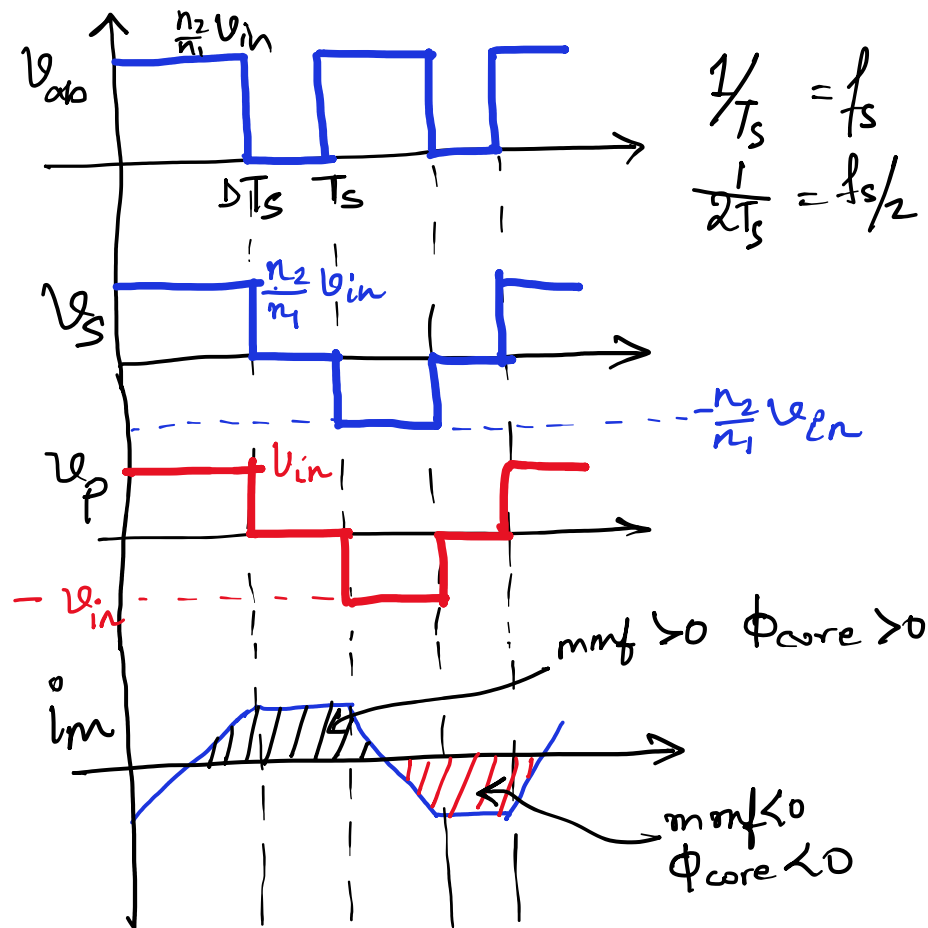
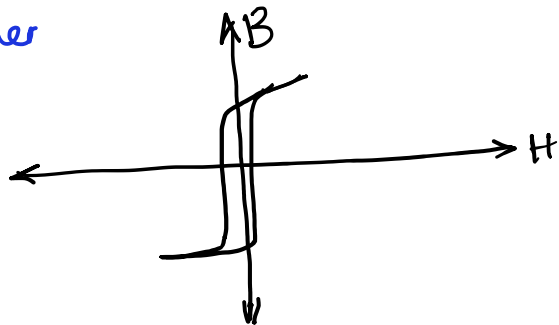


L_m = Magnetizing inductance referred to primary
 $i_m \ll i_1$ [under loading]

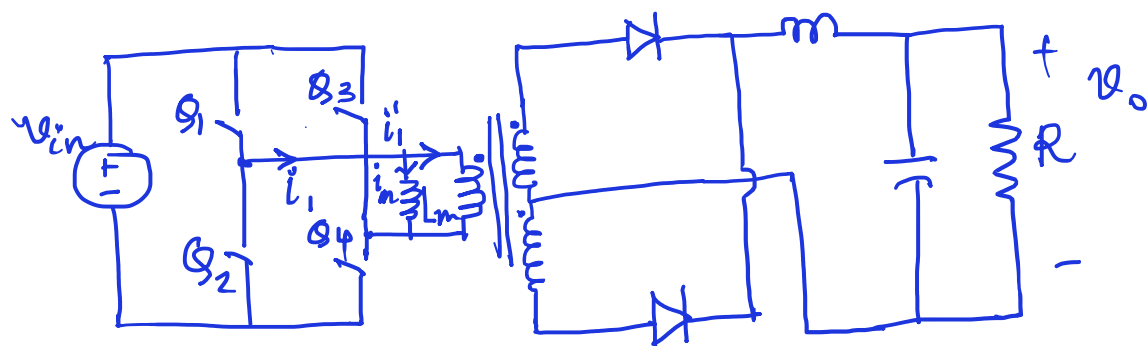
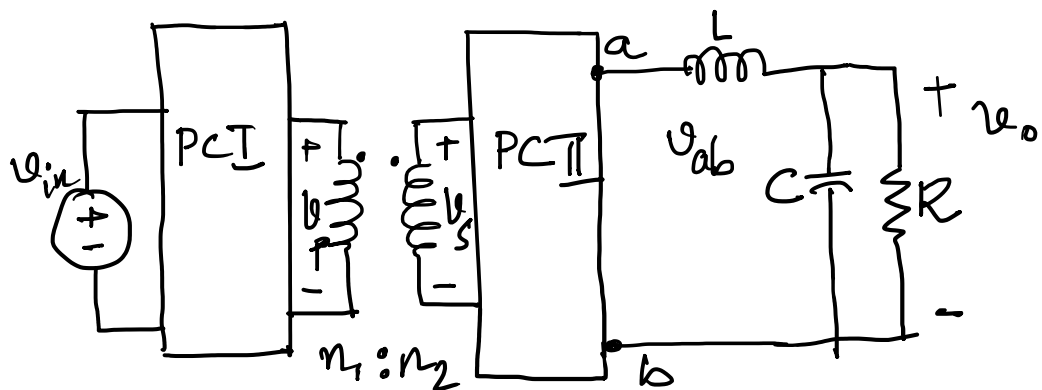




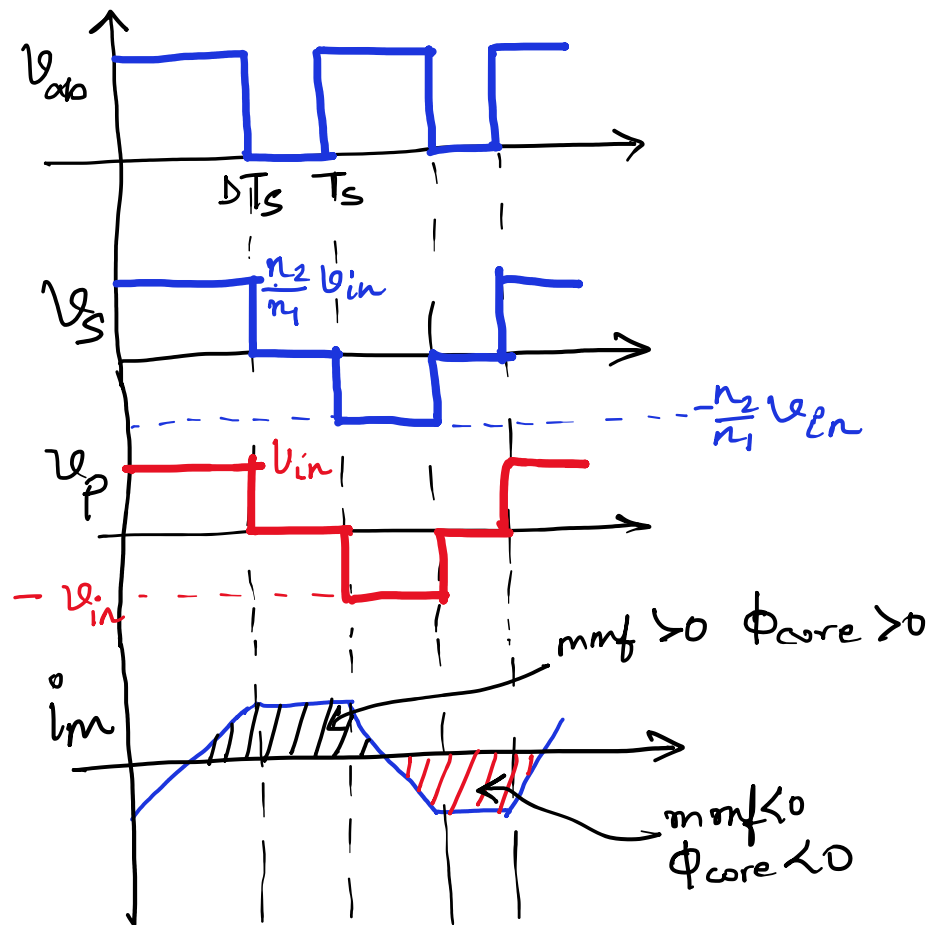
$$V_o = \frac{n_2}{n_1} D V_{in}$$



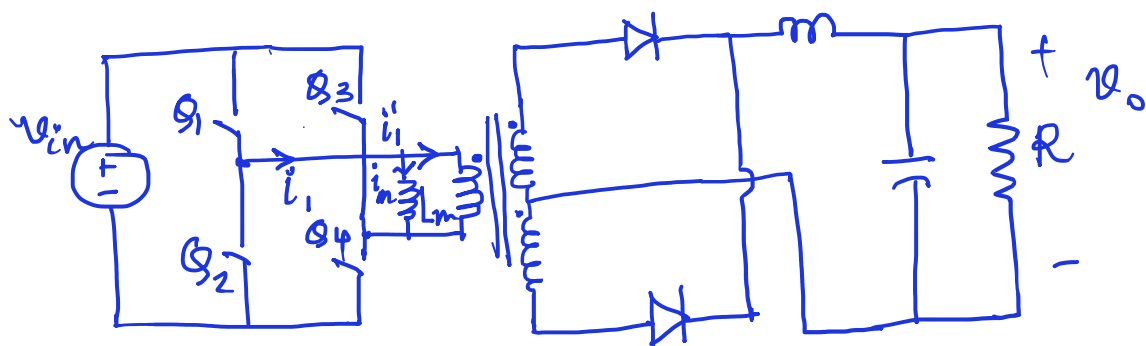
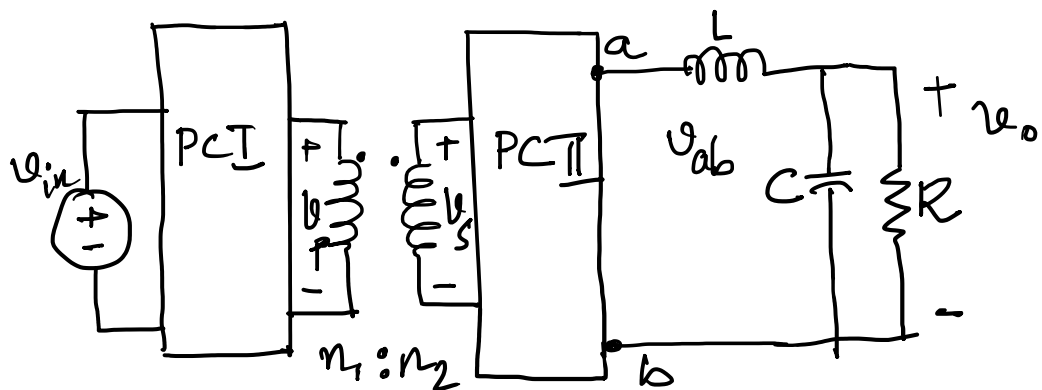
[No energy storage]
Transformers



Full bridge isolated buck

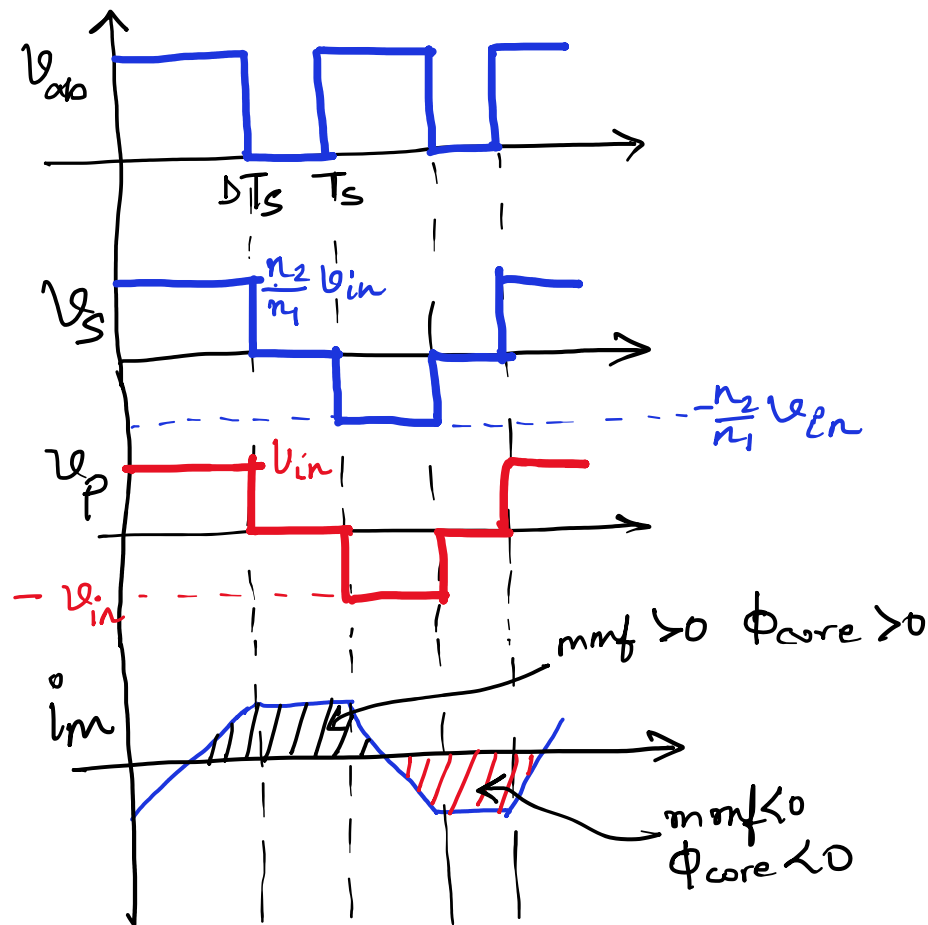


[No energy storage]
Transformers



Full bridge isolated buck

Can the flux reset be done without using active switching?



[No energy storage]
Transformers