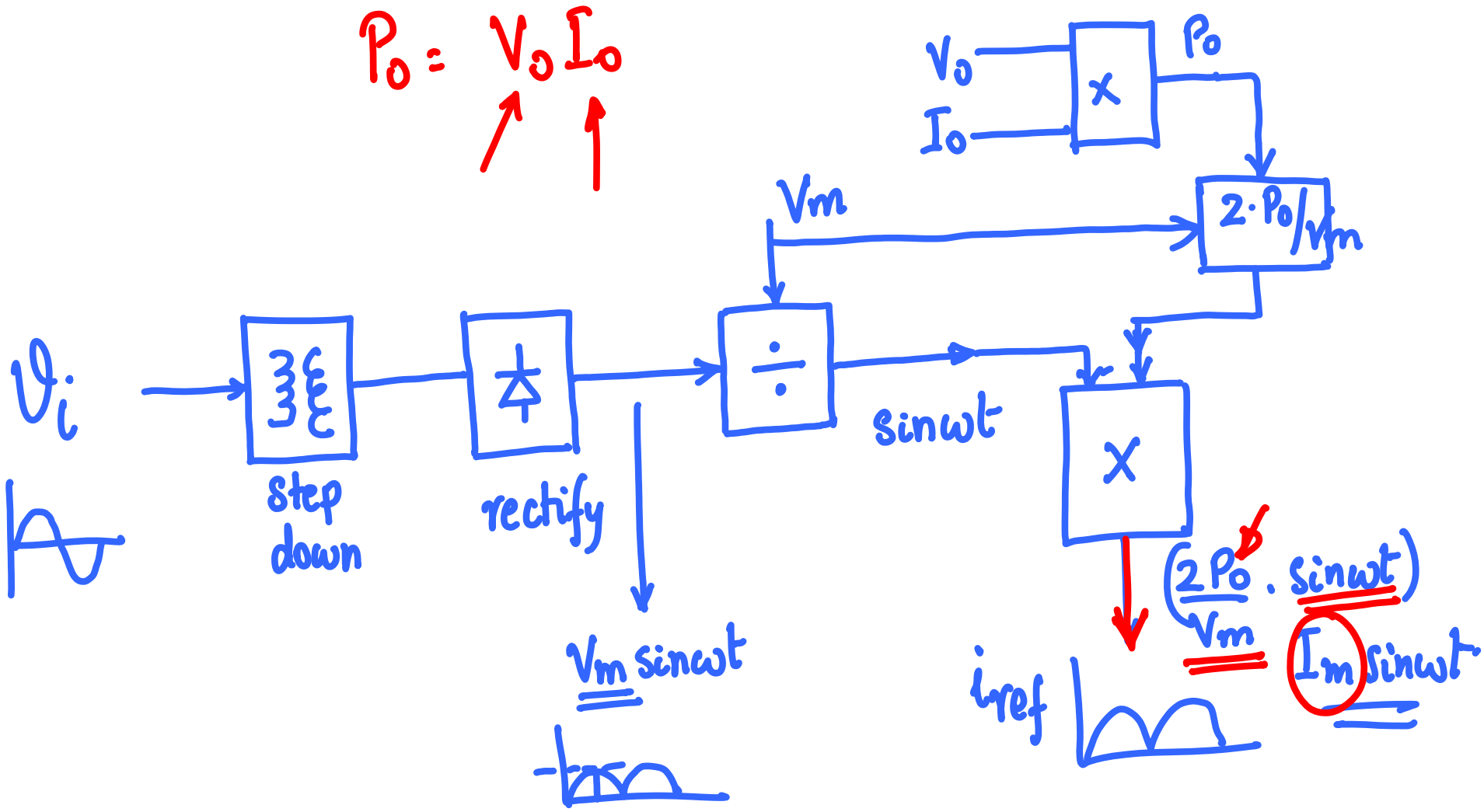
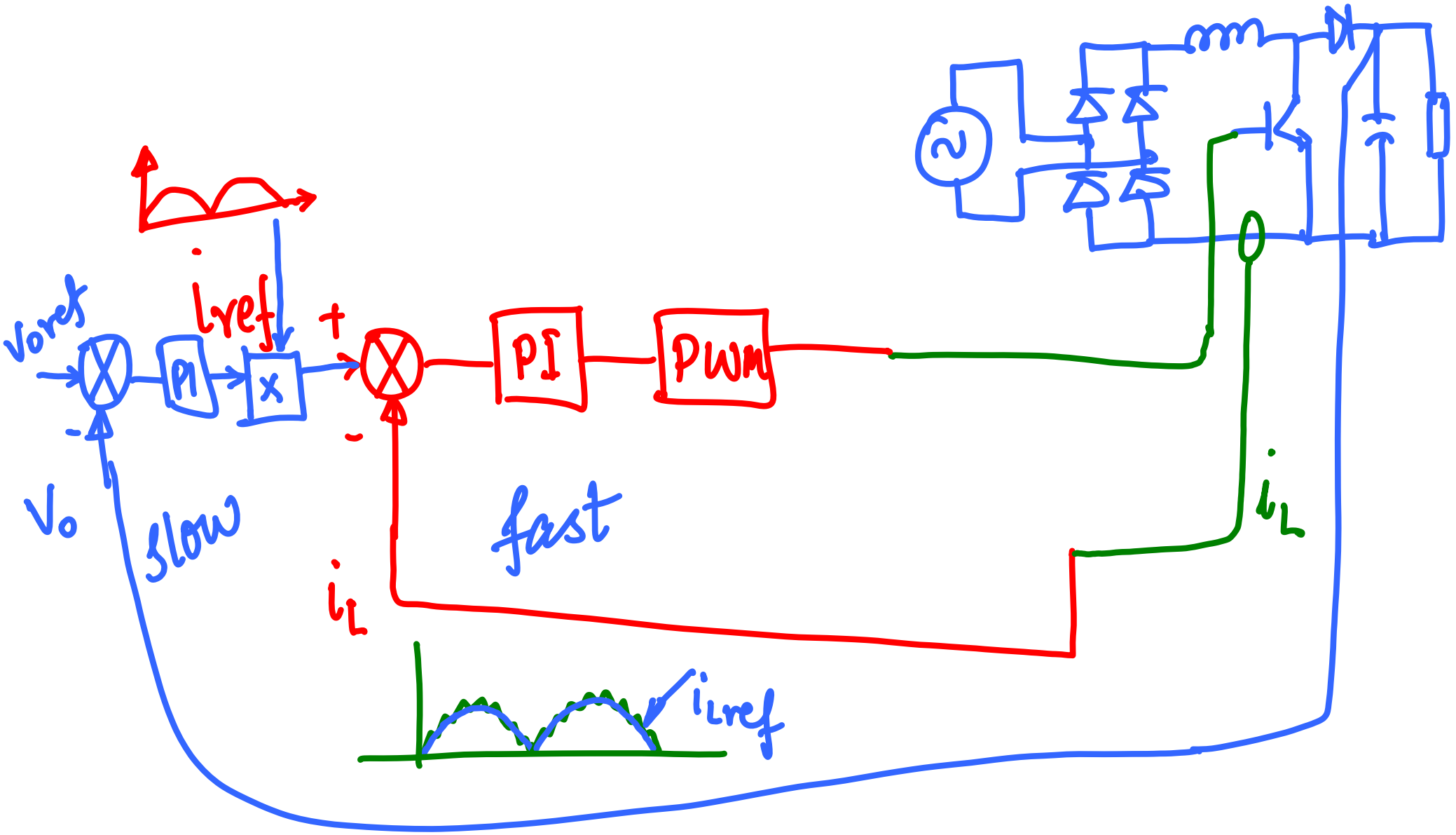
$$I_{rms} = \frac{\sqrt{2} \cdot P_o}{V_m}$$

$$I_m = \sqrt{2} \cdot I_{rms} = \frac{\sqrt{2} \cdot \sqrt{2} \cdot P_o}{V_m} = \frac{2 P_o}{V_m}$$

$$i_{ref} = I_m \sin \omega t = \left(\frac{2 P_o}{V_m}\right) \cdot \left(\frac{v_i}{V_m}\right)$$


$P_o = V_o I_o$
V_o
I_o
x
P_o
V_m
$2 \cdot P_o / V_m$
ϑ_i
step down
rectify
÷
sinωt
x
$V_m \sin\omega t$
$\frac{2P_o}{V_m} \cdot \sin\omega t$
$I_m \sin\omega t$
i_{ref}

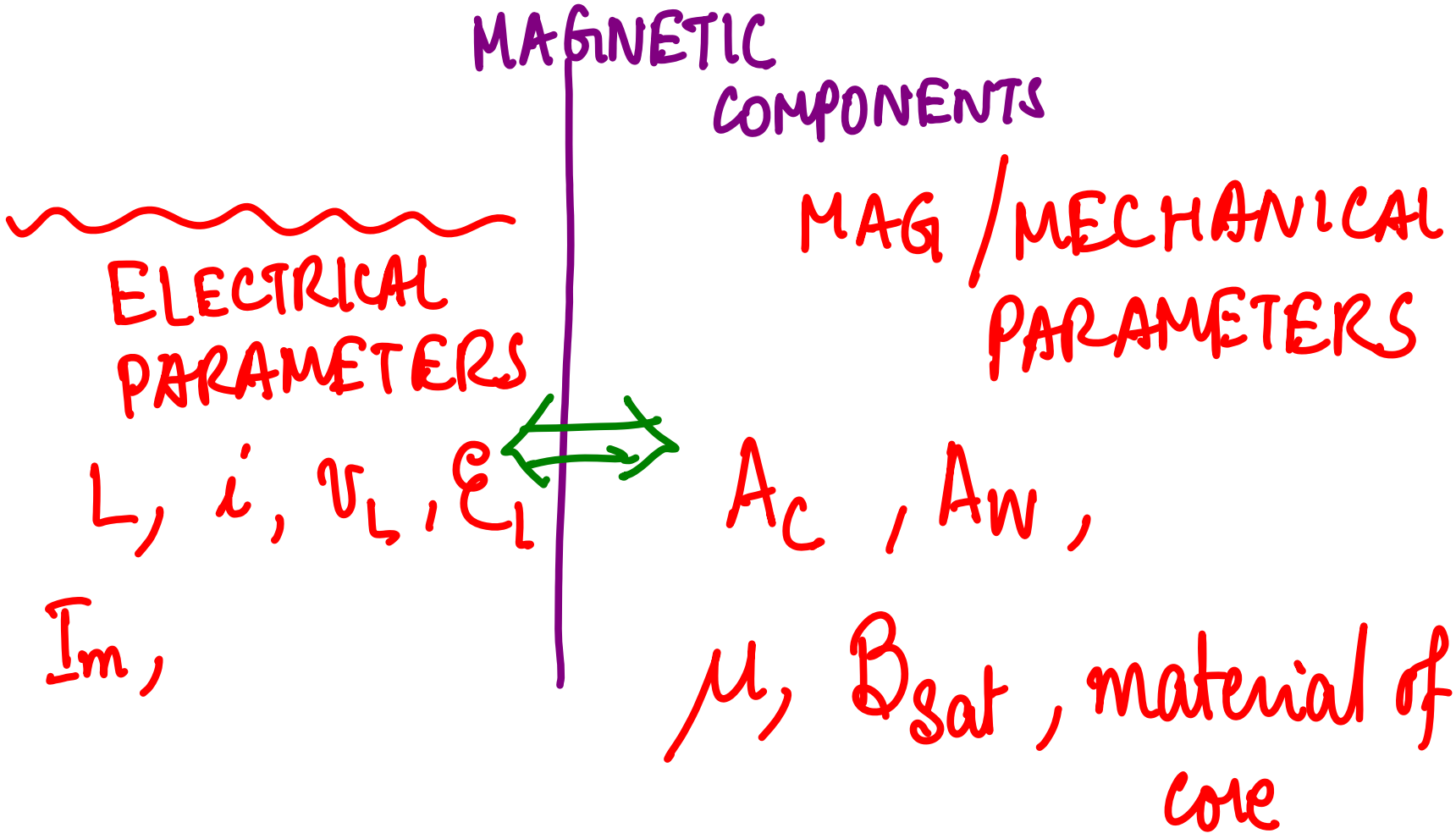

Voref
Iref
+
-
PI
x
PI
PWM
-
Vo
slow
fast
iL
iL
iLref

DESIGN OF DC-DC CONVERTER

1. Design / Rate the power circuit & components.
2. Design the controller ✓
3. Thermal design
4. Reliability Design.

Functional Design of Power components

1. Power Semiconductor switch
   MOSFET, IGBT, DIODES
2. Capacitor
3. Magnetic components
   - Inductor
   - Transformer


MAGNETIC COMPONENTS
ELECTRICAL PARAMETERS
MAG / MECHANICAL PARAMETERS
L, i, v_L, e_L
A_c, A_w,
Im,
μ, B_{sat}, material of core