

Buck Converter Parameters

Cenk KILIÇ

$$V_{in} = 48 \text{ V.}$$

$$V_{out} = 12 \text{ V.}$$

$$L = 160 \text{ }\mu\text{H}$$

$$C = 70 \text{ }\mu\text{F}$$

$$R = 10 \text{ }\Omega$$

$$F_s = 30 \text{ kHz.}$$

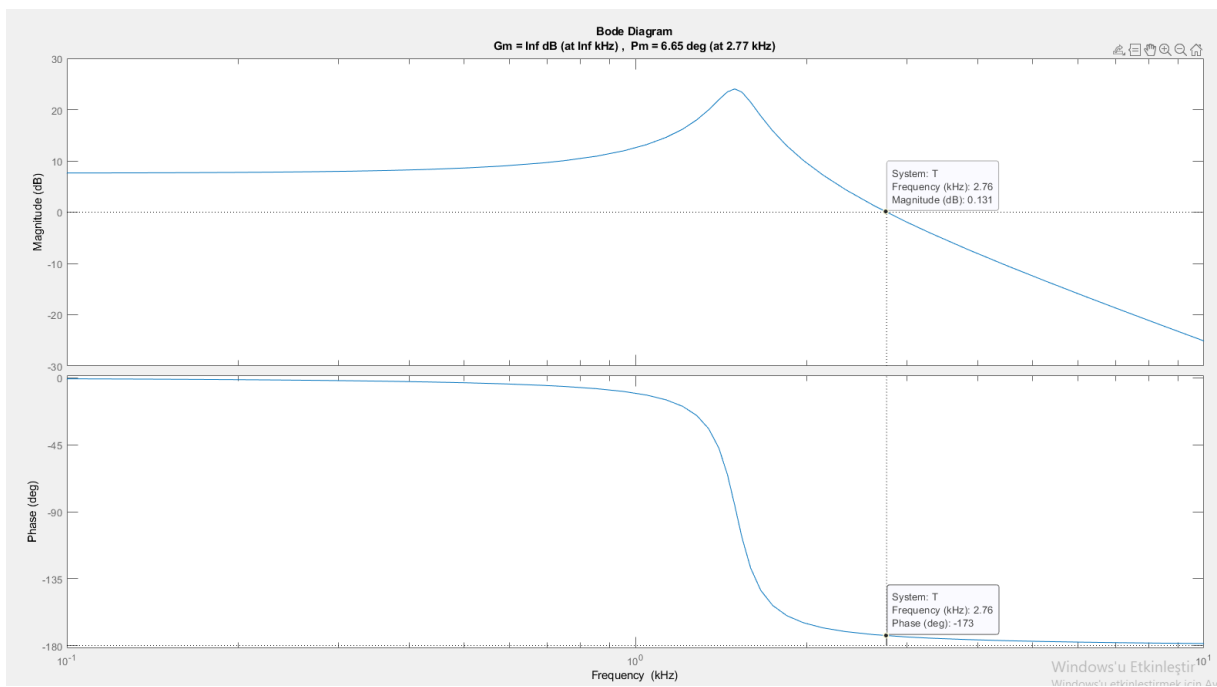
$$V_{ref} = 3 \text{ V.}$$

$$V_m = 4 \text{ V.}$$

$$V_{Ripple} = 0.01 \text{ V.}$$

$$\text{Sensor Gain} = 0.25$$

The converter works in CCM mode. ($I_L > 0$)

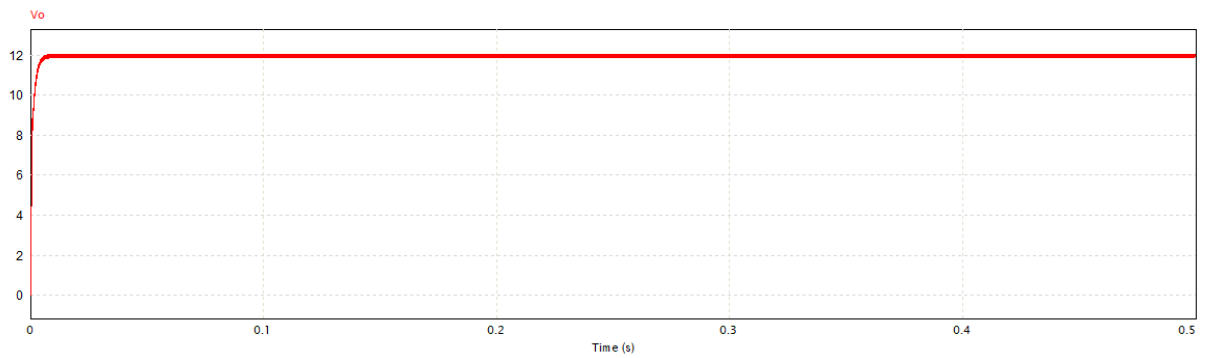


$f_c = 2.76 \text{ kHz.}$ (f_c have to be lower than $f_s/10$)

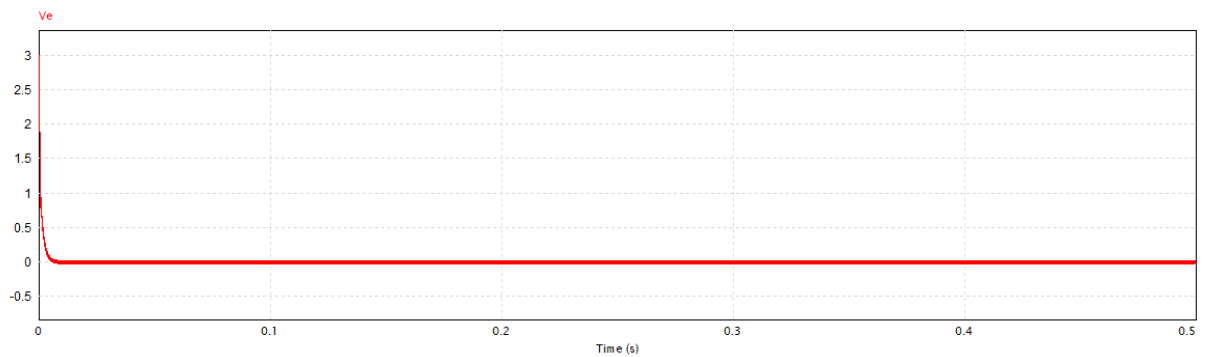
phase margin = -173

Outputs

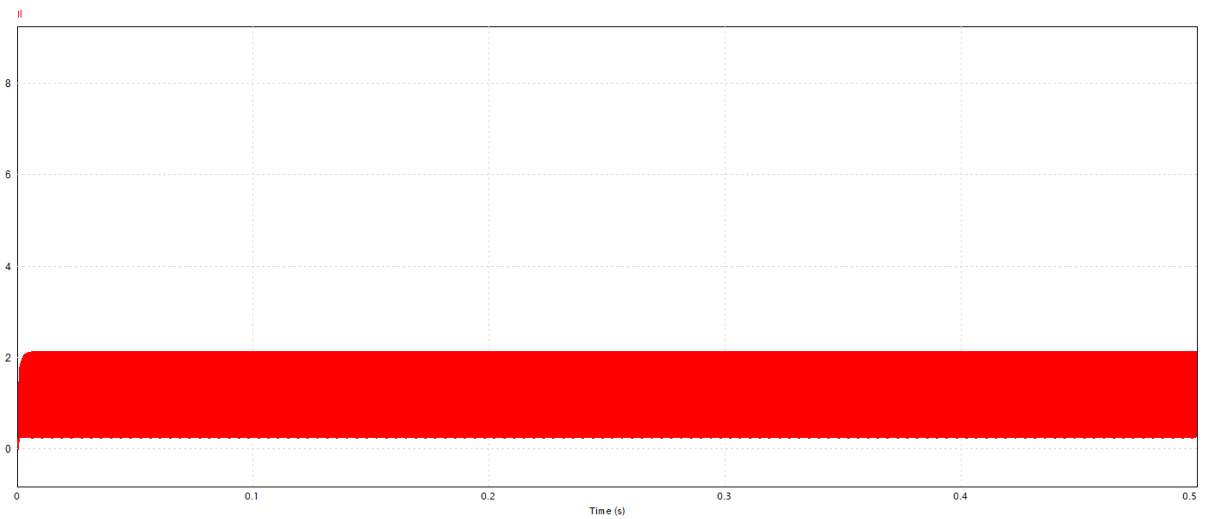
V_o



V_{error}



I_L



References :

Fundamentals of Power Electronics, Erickson, Robert W., Maksimovic, Dragan

Dynamics Control of Power Converters, Ege University / EEE, Assoc. Prof. Dr. Mutlu Boztepe