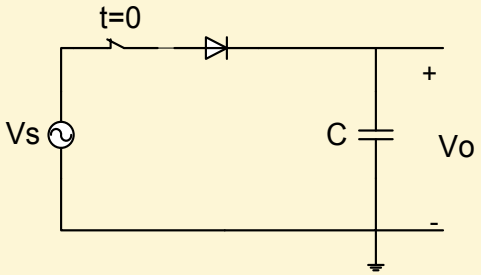
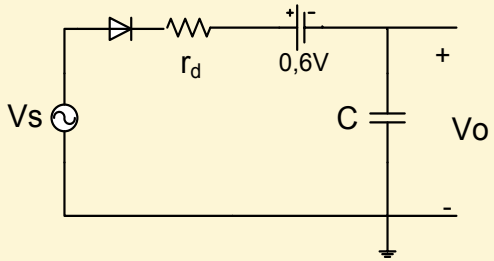
Circuito Rectificador de pico

Ideal

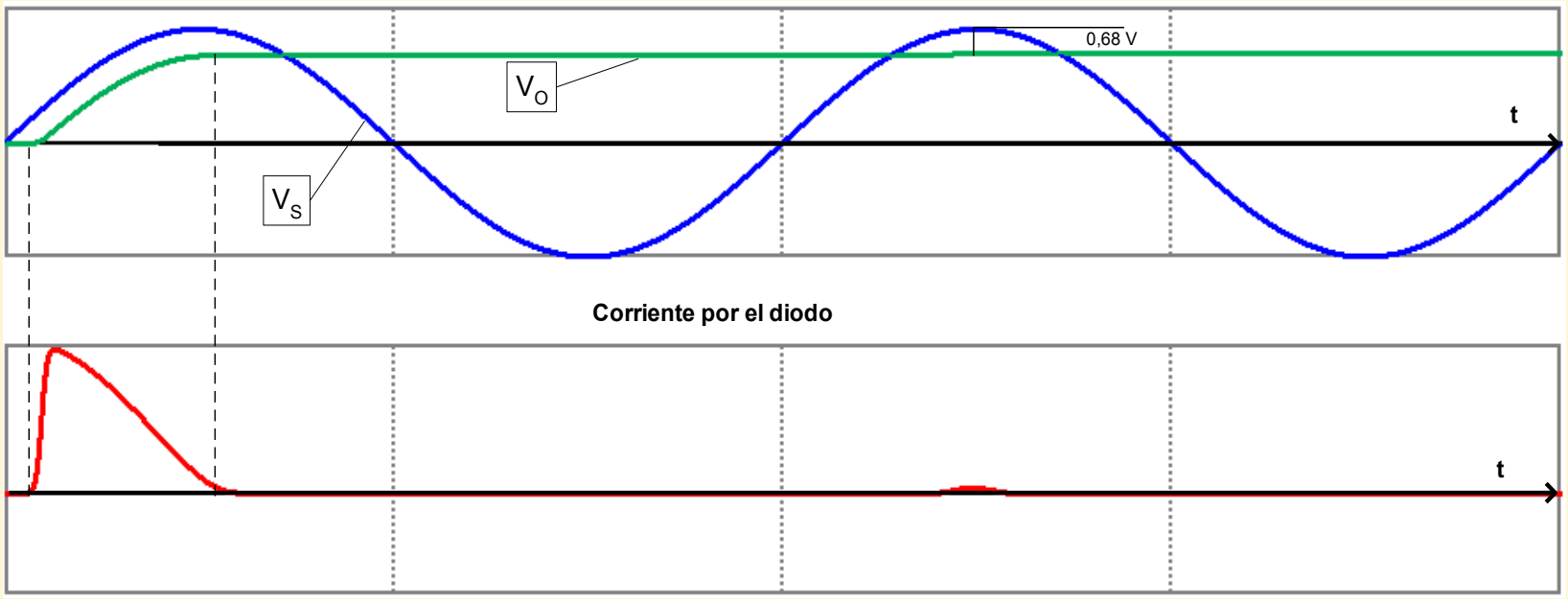


≡

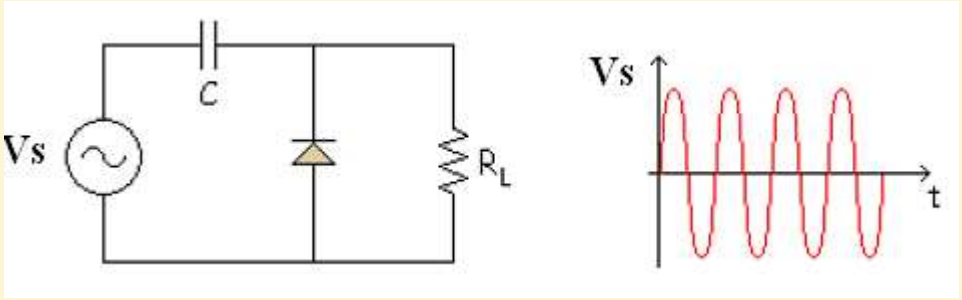
real

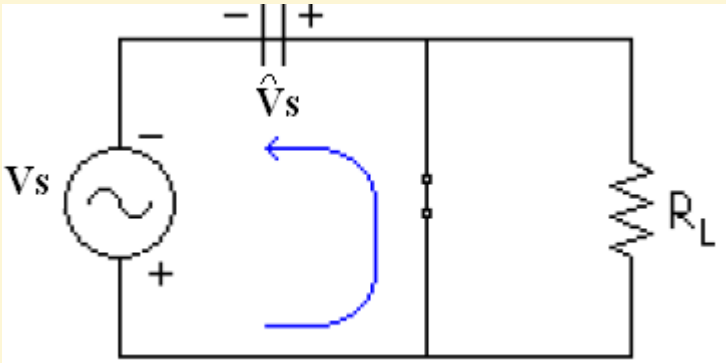


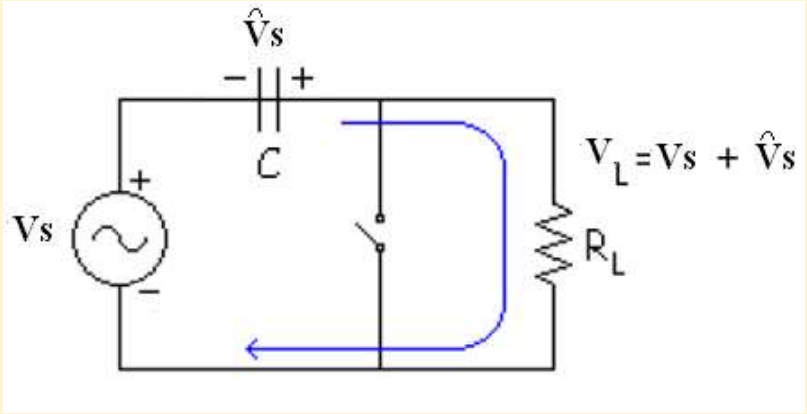
$$V_O = V_C = Vs - V_\gamma$$



Enclavador de nivel o fijador

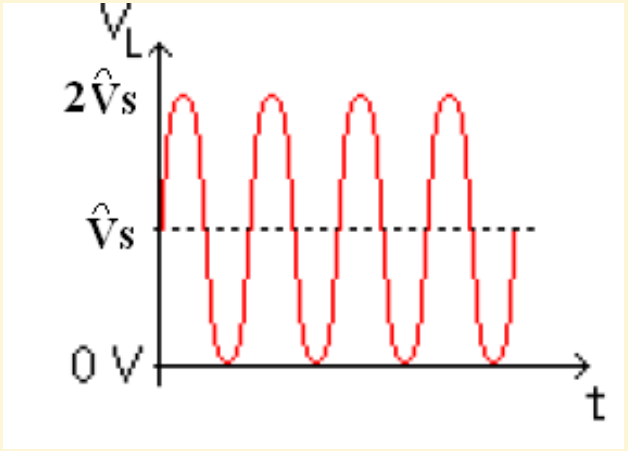




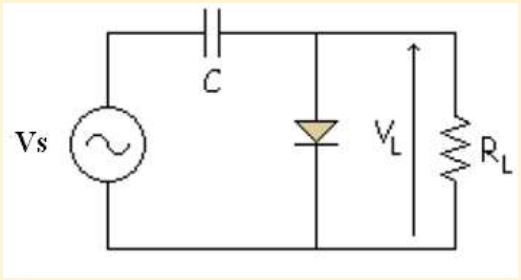


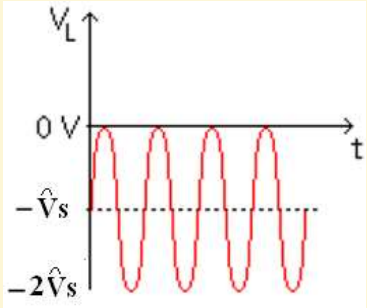
$\tau = R_L \cdot C \gg T$

T = Periodo de la onda de entrada

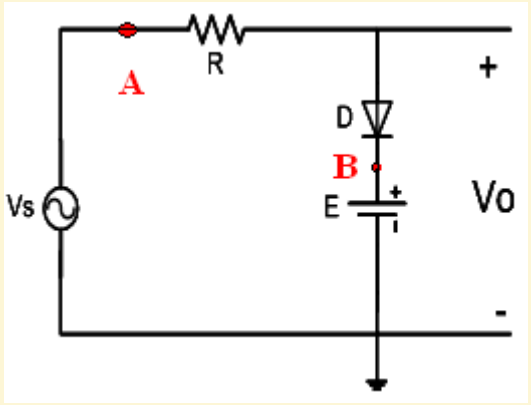


Enclavador picos positivos





Limitador de pico con diodo ideal

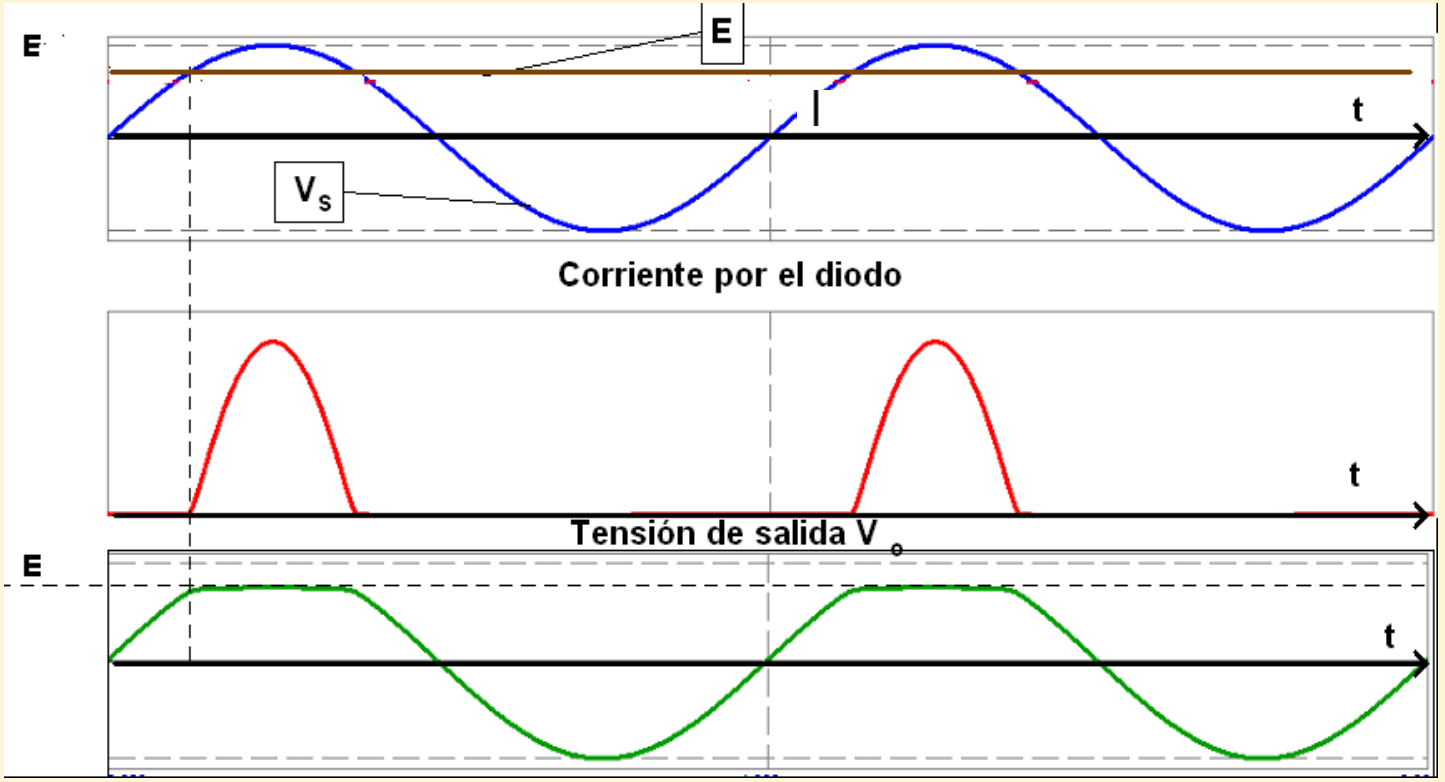


$$i = \frac{V_s - E}{R} \qquad P = I^2{}_{ef} R$$

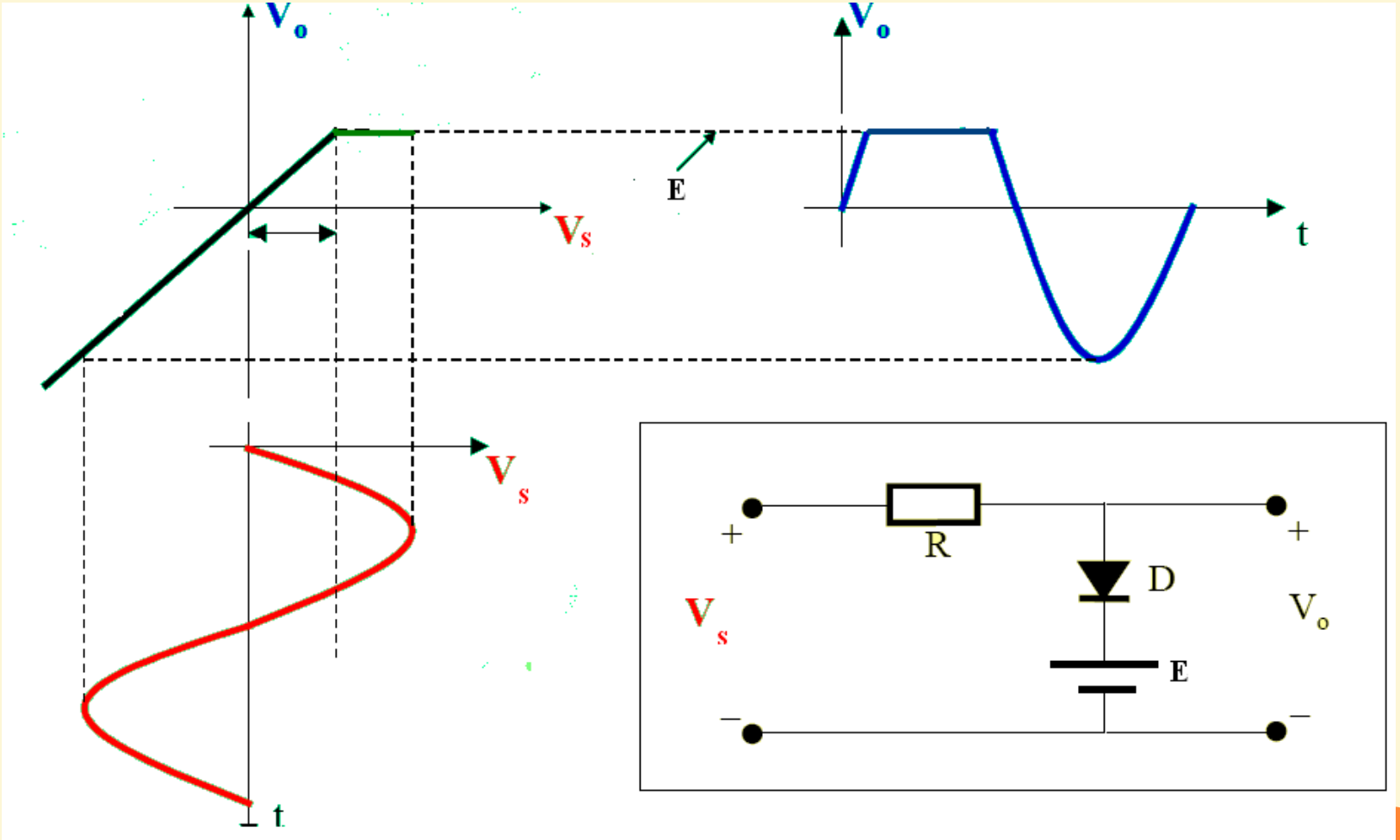
$$I^2{}_{ef} = \frac{1}{2\pi} \int_{\Theta_1}^{\Theta_2} i^2 d\omega t$$

donde $\Theta_1 \rightarrow \hat{V}_s sen\Theta = E$

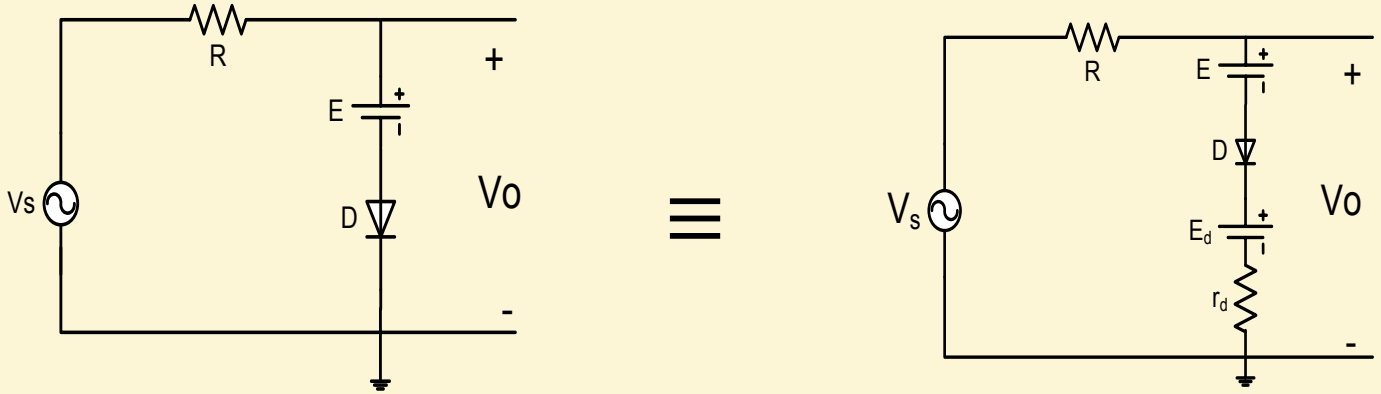
El diodo conduce cuando: $V_S > E$



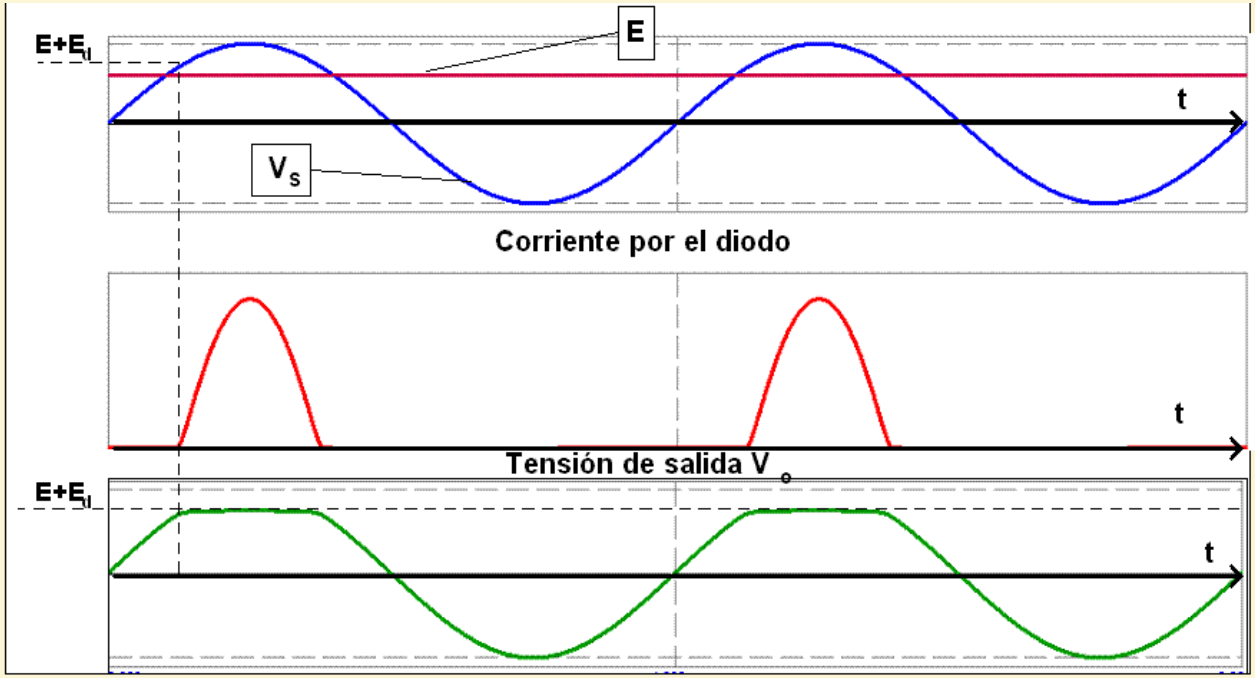
Función transferencia limitador ideal



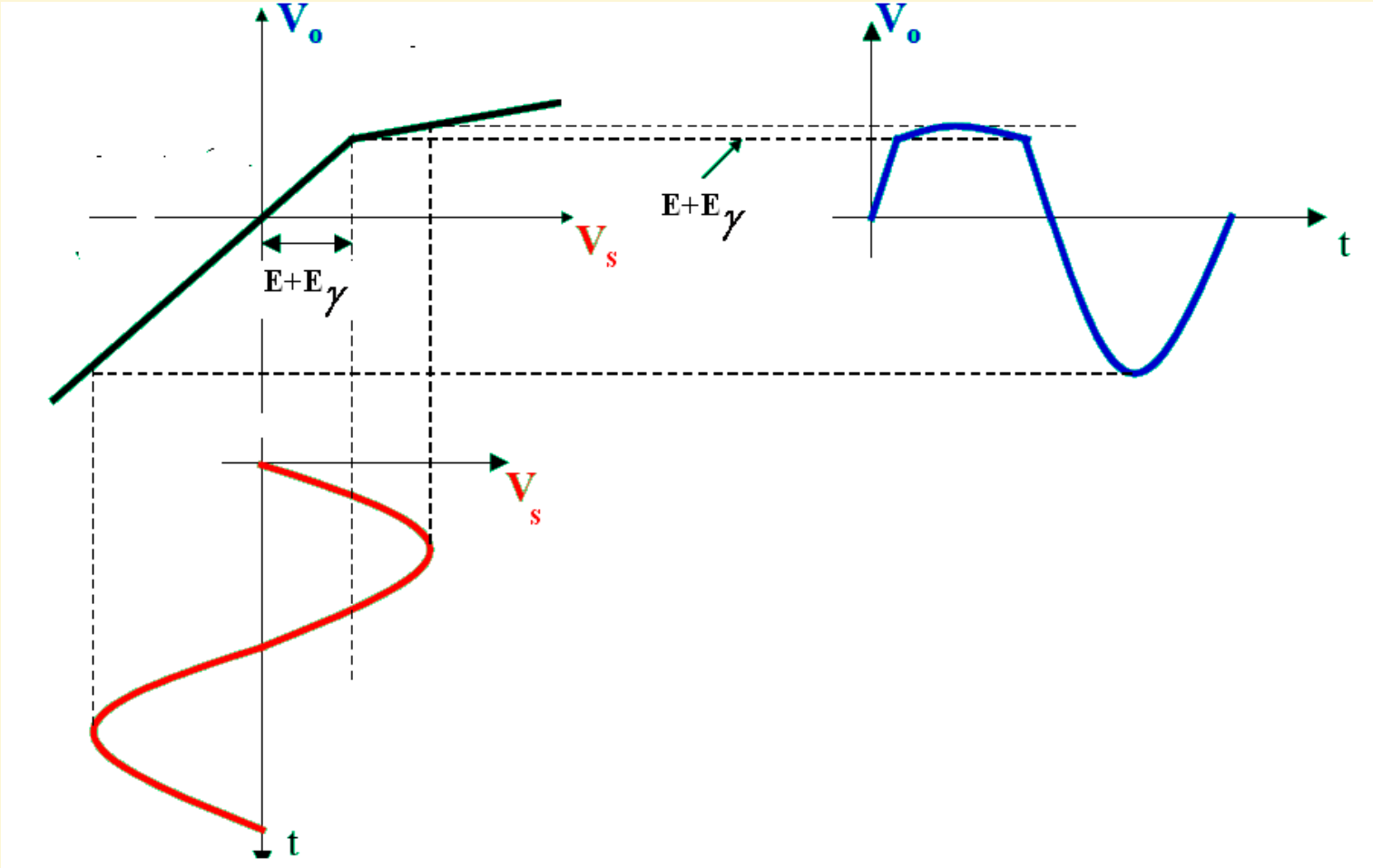
Limitador de pico con diodo real



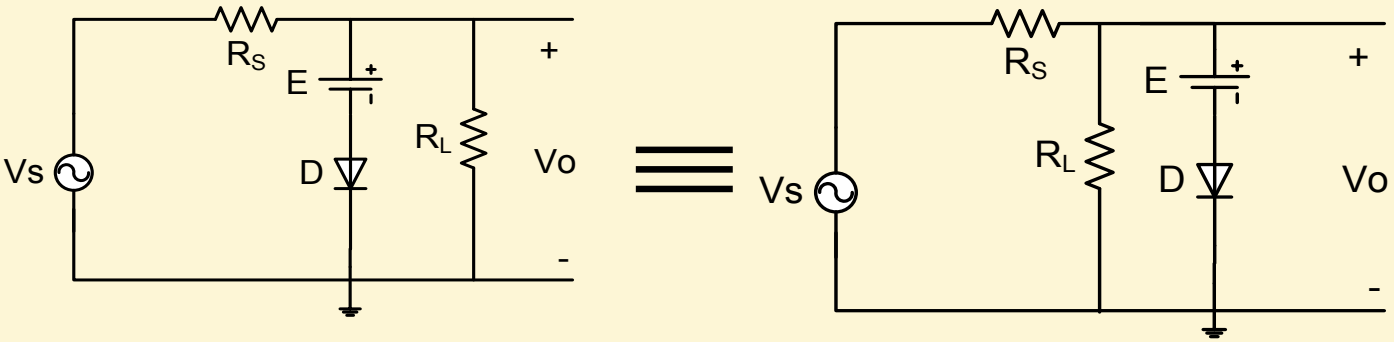
El diodo conduce cuando: $V_S > E + E_d$

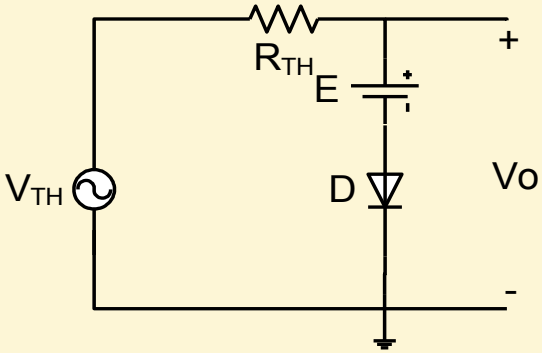


Función transferencia del limitador de pico con diodo real



Circuito limitador positivo con carga





$$R_{TH} = \frac{R_L.R}{R_L + R}$$

$$V_{TH} = V_S \frac{R_L}{R_L + R}$$

condición limite

$$Si \quad R_L \quad pequeña \rightarrow V_{TH} \quad dis\,\text{min}\,uye$$

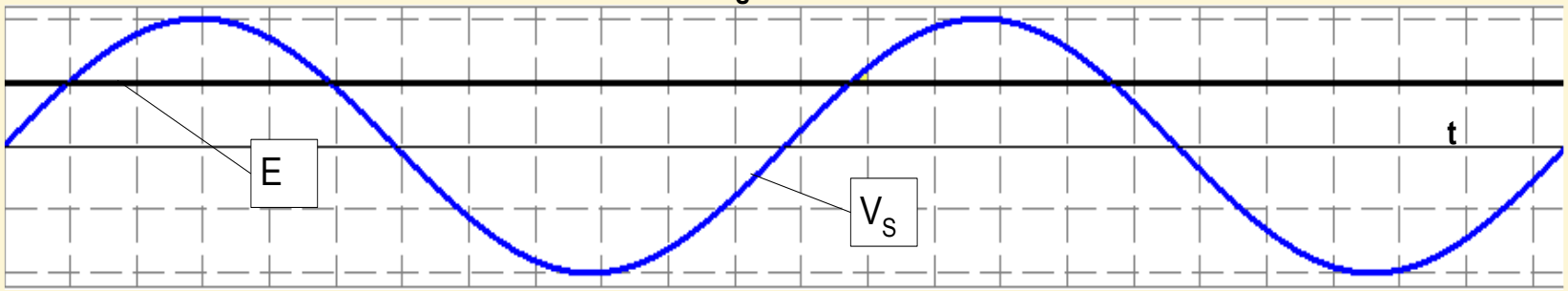
$$Si \quad R_L < R_{crítica} \quad el\ circuito\ no\ \text{lim}\ ita$$

$$Si \quad R_L > R_{crítica} \quad el\ circuito\ \text{lim}\ ita$$

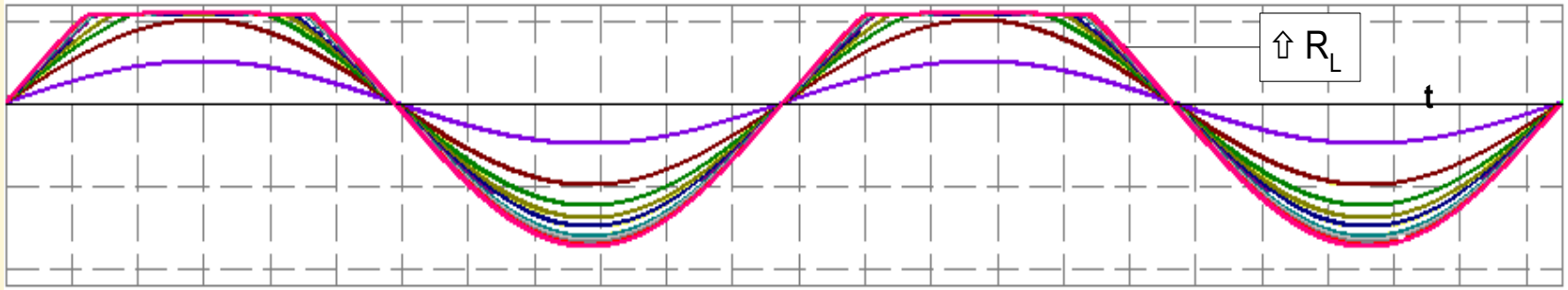
$$V_{TH} = E \Rightarrow \hat{V}_S \frac{R_L}{R_L + R} = E$$

$$\Rightarrow R_L = \frac{E.R}{\hat{V}_S - E} = R_{crítica}$$

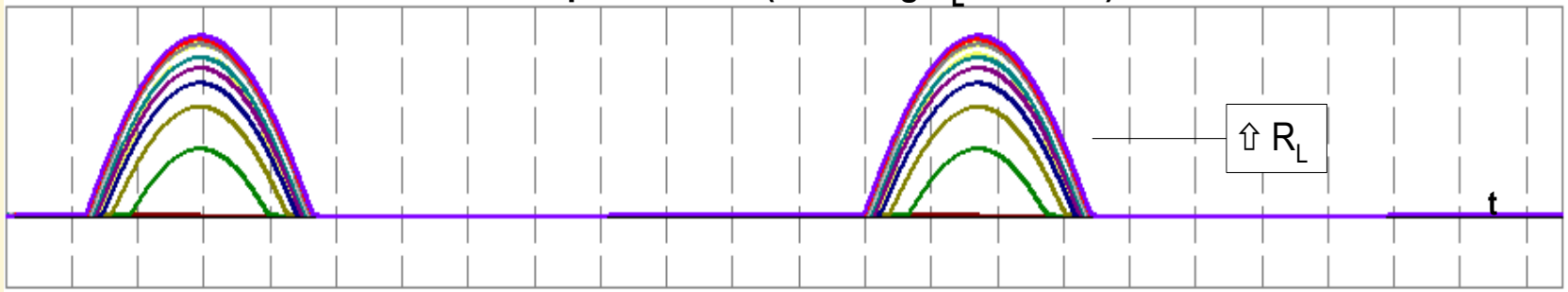
Tensión de entrada V_S y tensión de fuente E



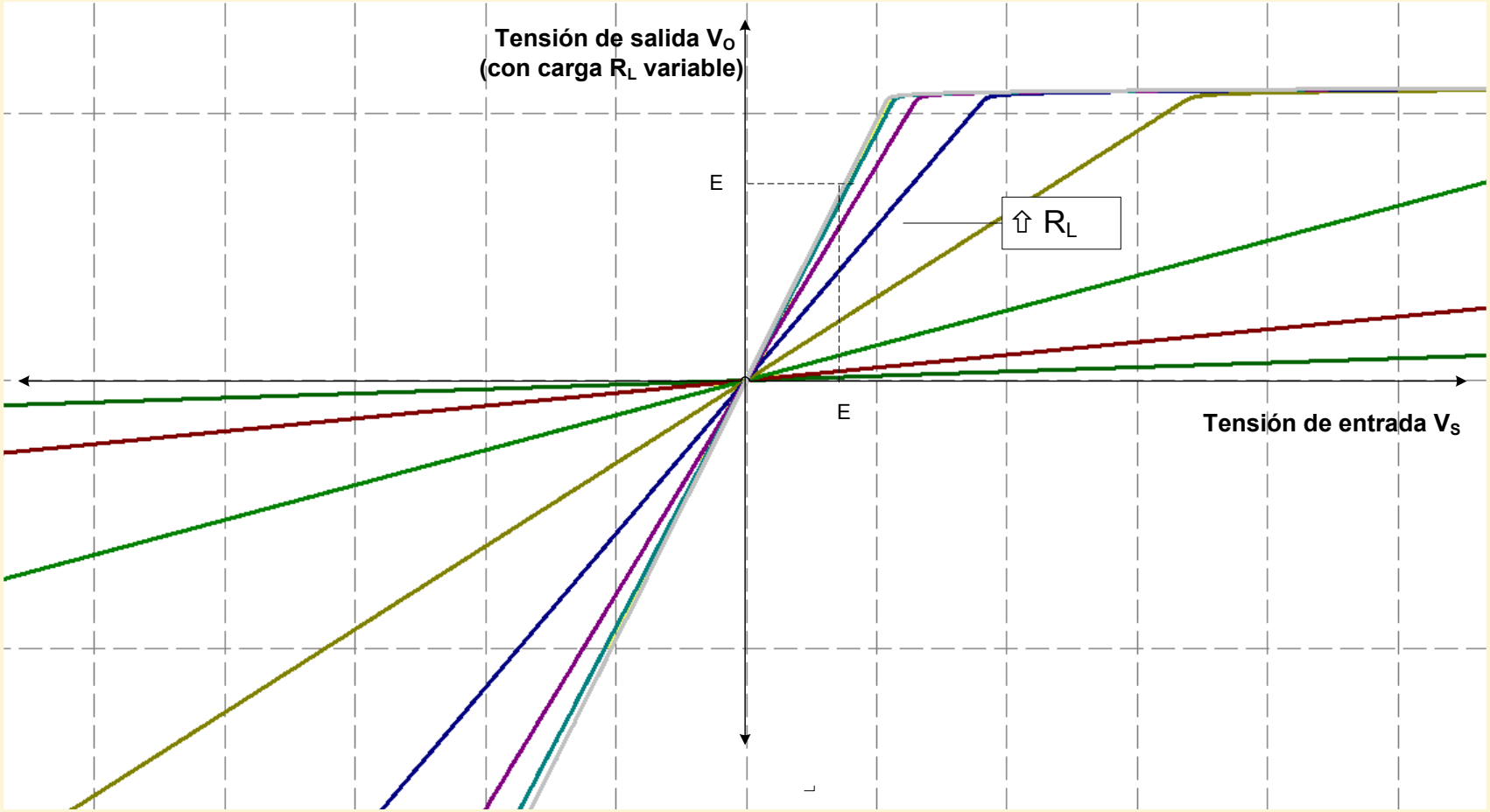
Tensión de salida V_0 (con carga R_L variable)



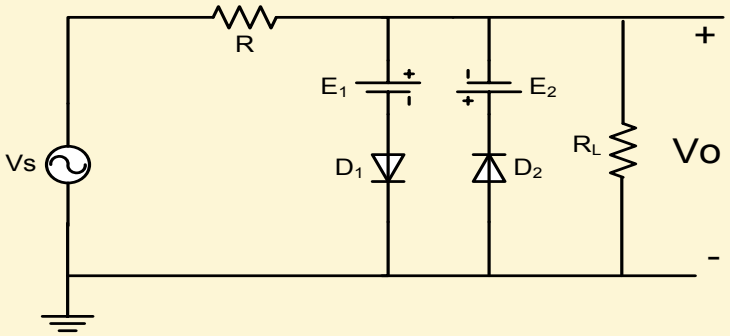
Corriente por el diodo(con carga $R_L$variable)

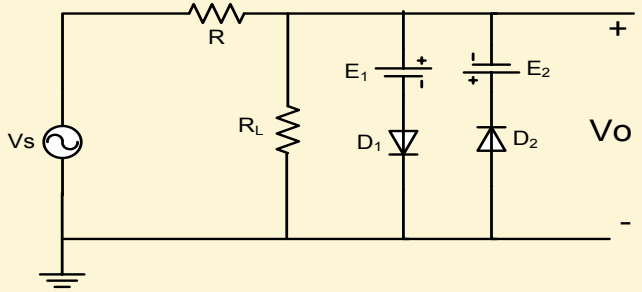


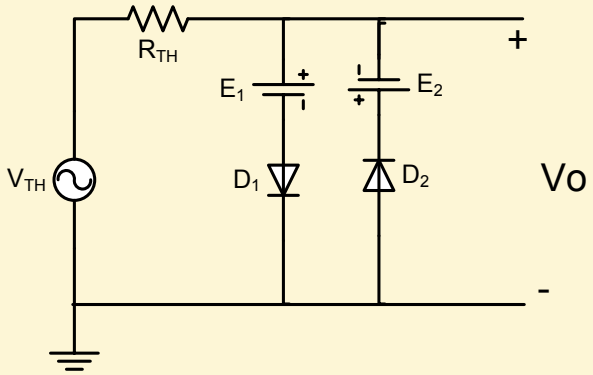
Función Transferencia con R_L variable



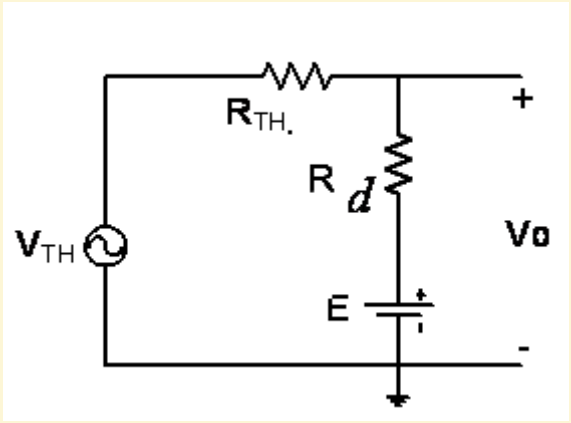
Limitador de picos positivos y negativos con carga R_L considerando R_d







Tomando recorte del ciclo +



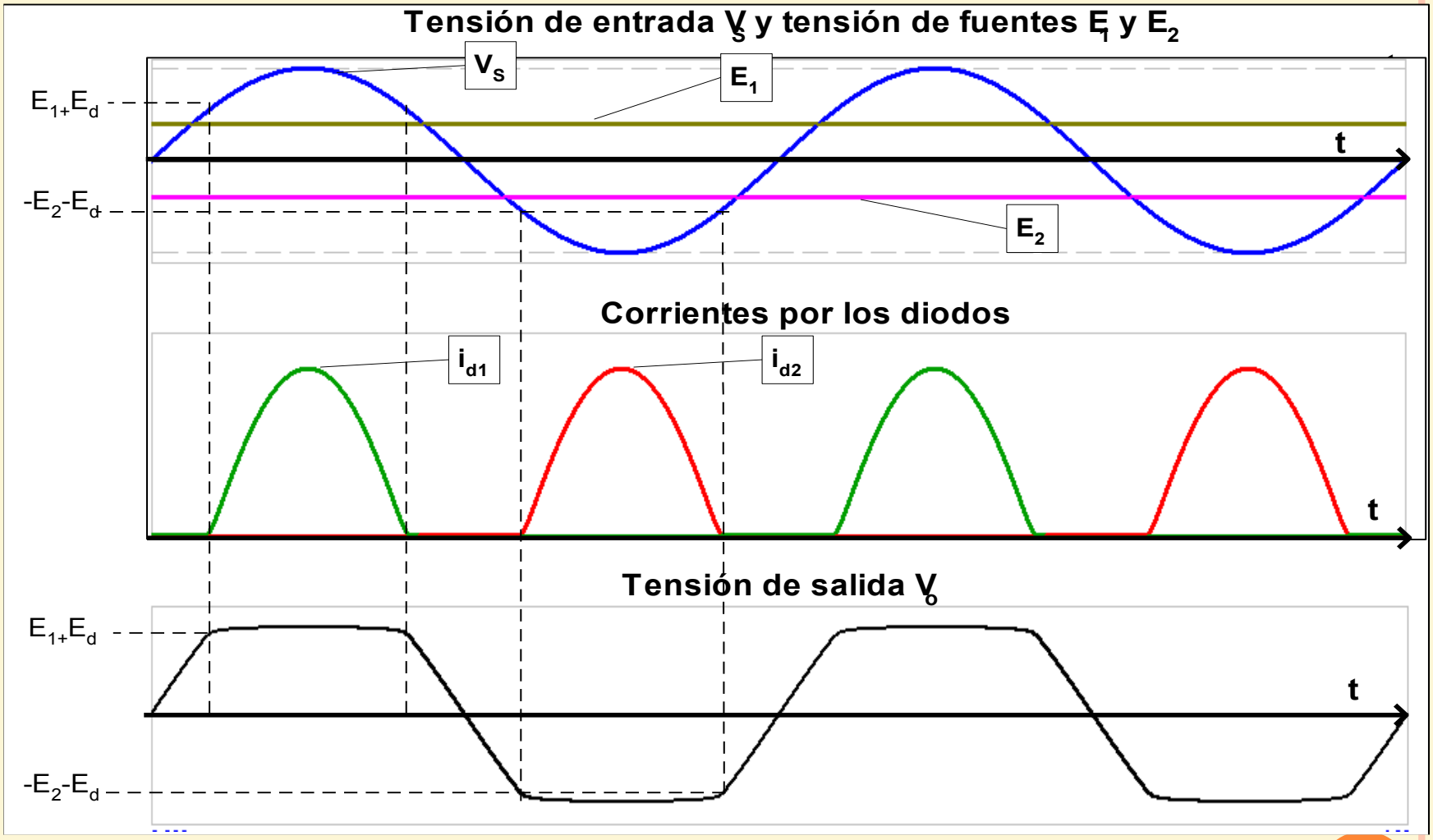
$$V_{TH} < E_1 \longrightarrow V_0 = V_{TH}$$ No conduce diodo

Conduce el diodo para $V_{TH} > E_1$

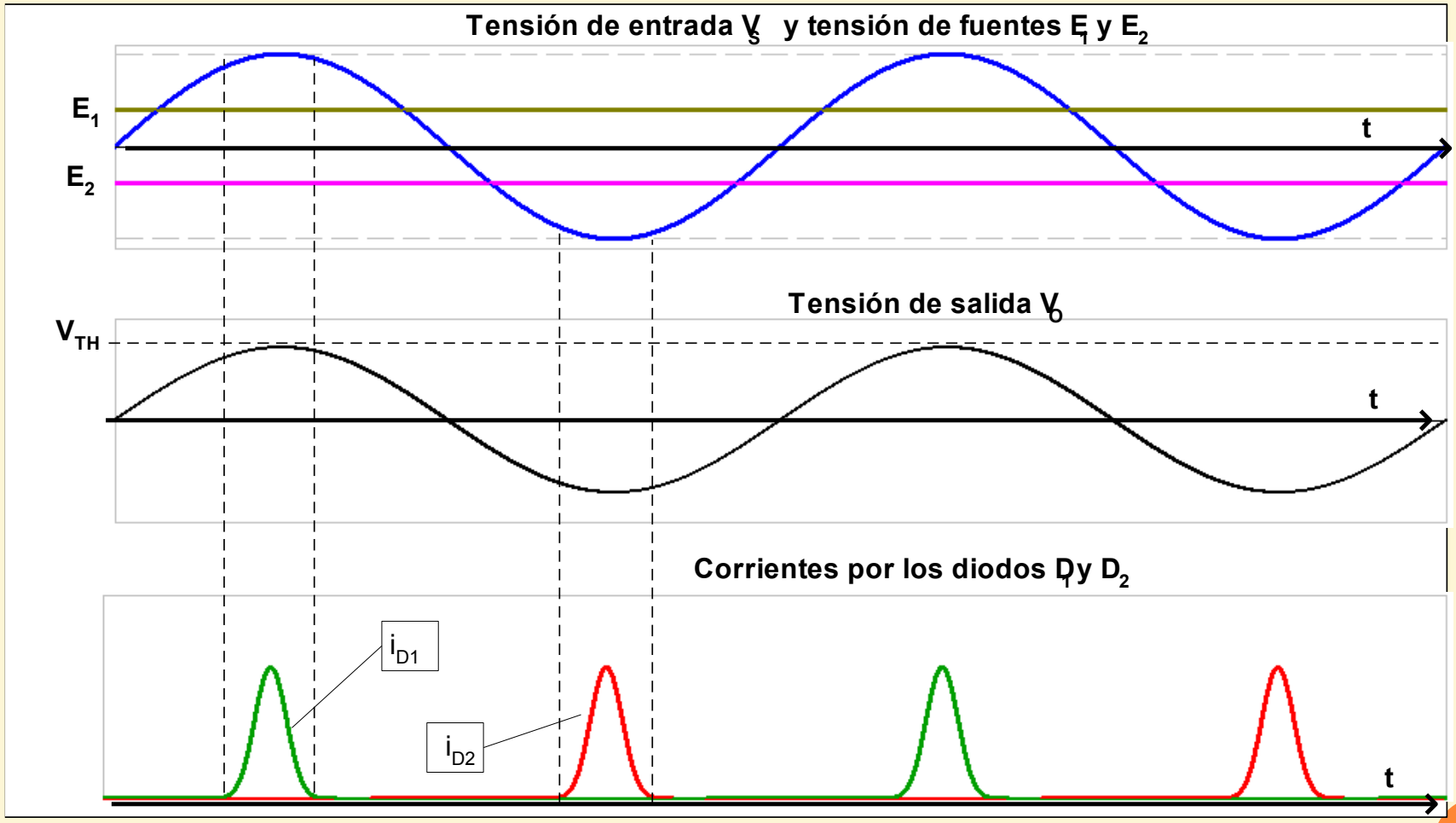
Por superposición $$V_0 = V_{TH}\frac{R_d}{R_{TH} + R_d} + E_1\frac{R_{TH}}{R_{TH} + R_d}$$

Funcionamiento optimo para R_{TH} >>Rd ya que de esta forma el 1º termino sera muy pequeño y el 2º sera aproximadamente E_1, que es lo que deseamos obtener

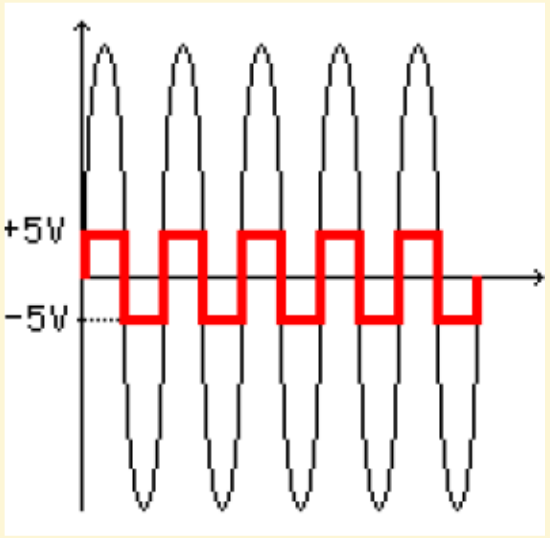
Funcionamiento correcto

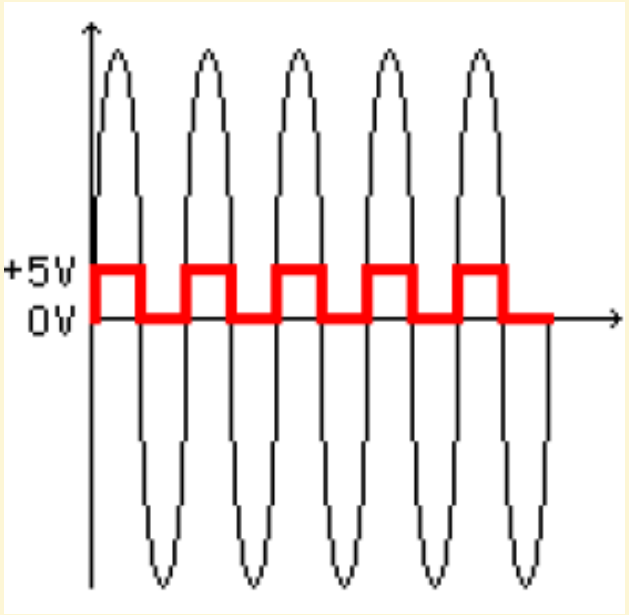


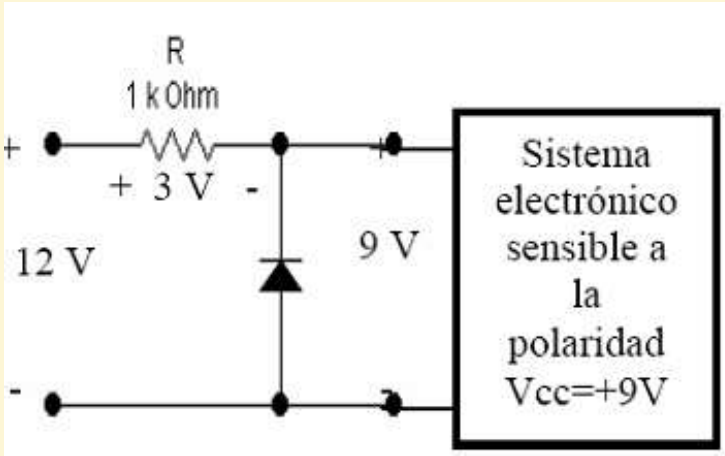
Si no se cumple que $R_{TH} \rangle\rangle Rd$ entonces los diodos no conducen o conducen durante muy poco tiempo. En este caso $V_O = V_{TH}$

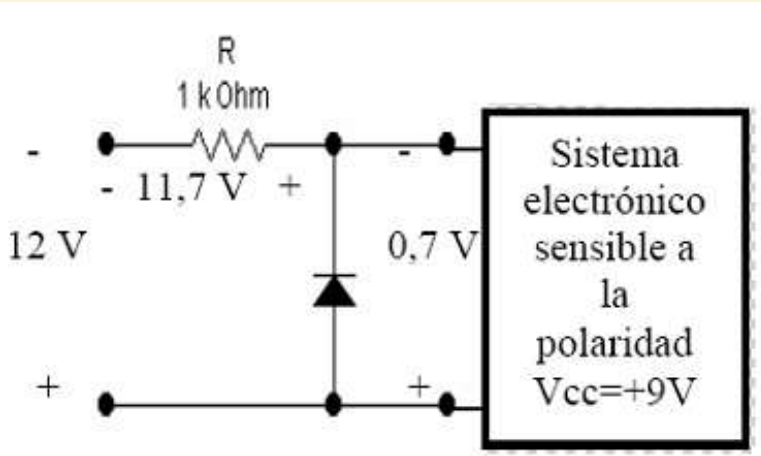


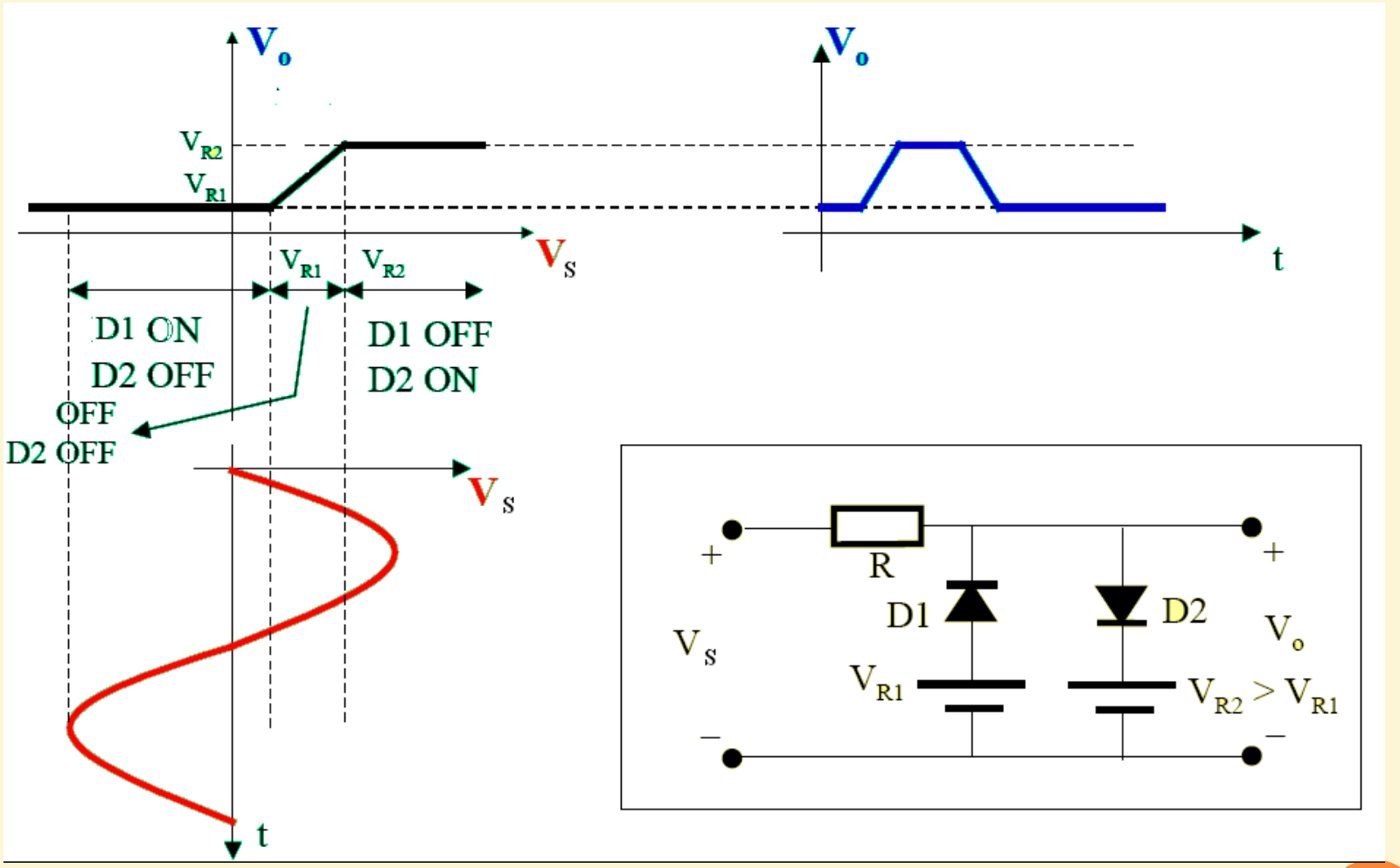
Ej. de aplicaciones

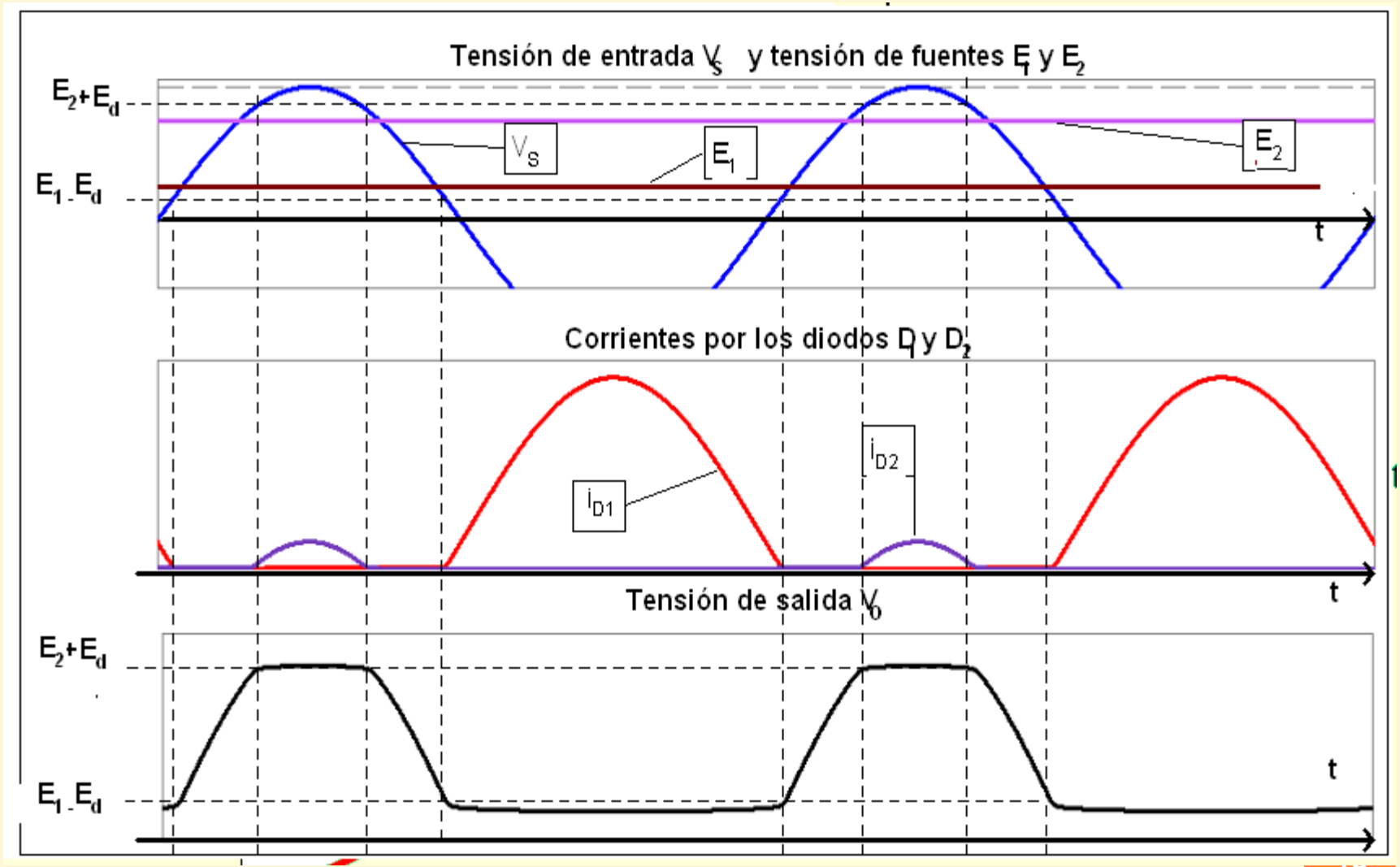









V0
VR2
VR1
Vs
VR1
VR2
D1 ON
D2 OFF
D1 OFF
D2 ON
OFF
D2 OFF
Vs
t
V0
t
+
R
+
D1
D2
Vs
Vo
VR1
VR2 > VR1
–
–


Tensión de entrada V_S y tensión de fuentes E_1 y E_2
E_2+E_d
E_1-E_d
V_S
E_1
E_2
t
Corrientes por los diodos D_1 y D_2
i_{D1}
i_{D2}
t
Tensión de salida V_0
E_2+E_d
E_1-E_d
t