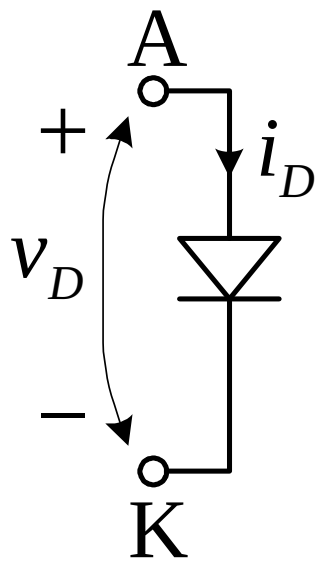
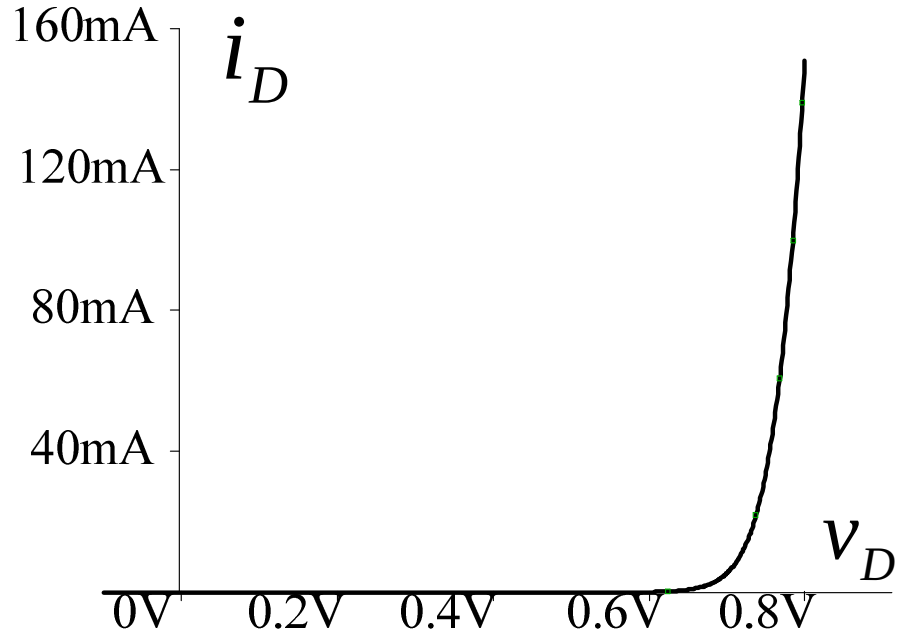
Diode

Poluprovodnička dioda (PN spoj)





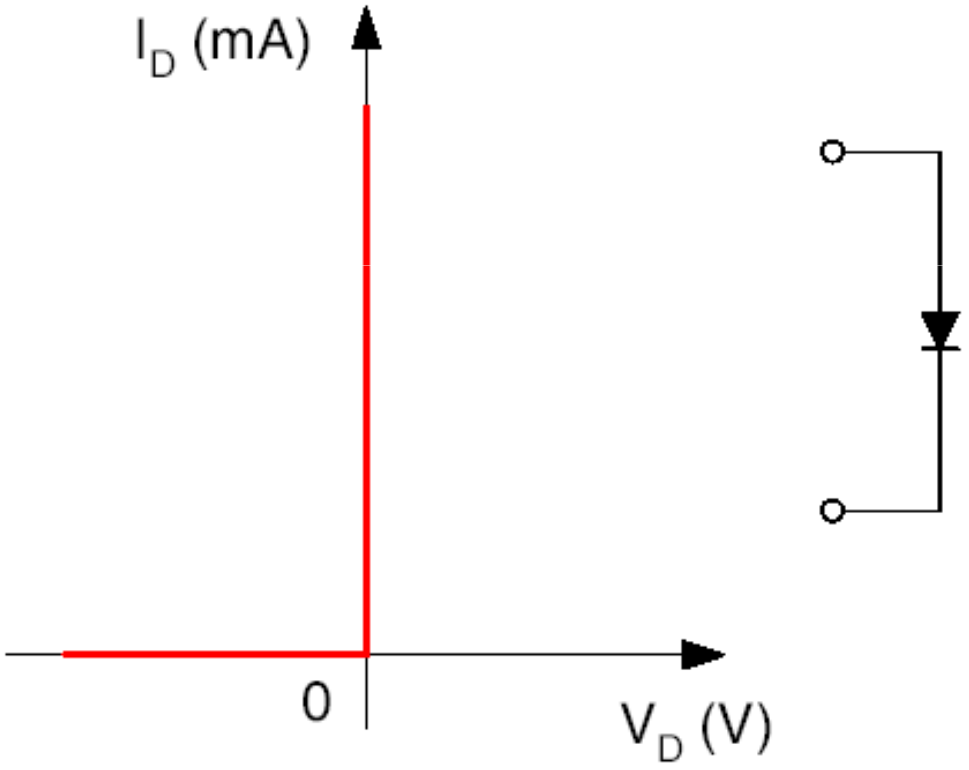
$$i_D = I_S\left(e^{v_D/V_T} - 1\right)$$

jednosmerna prenosna naponsko strujna karakteristika

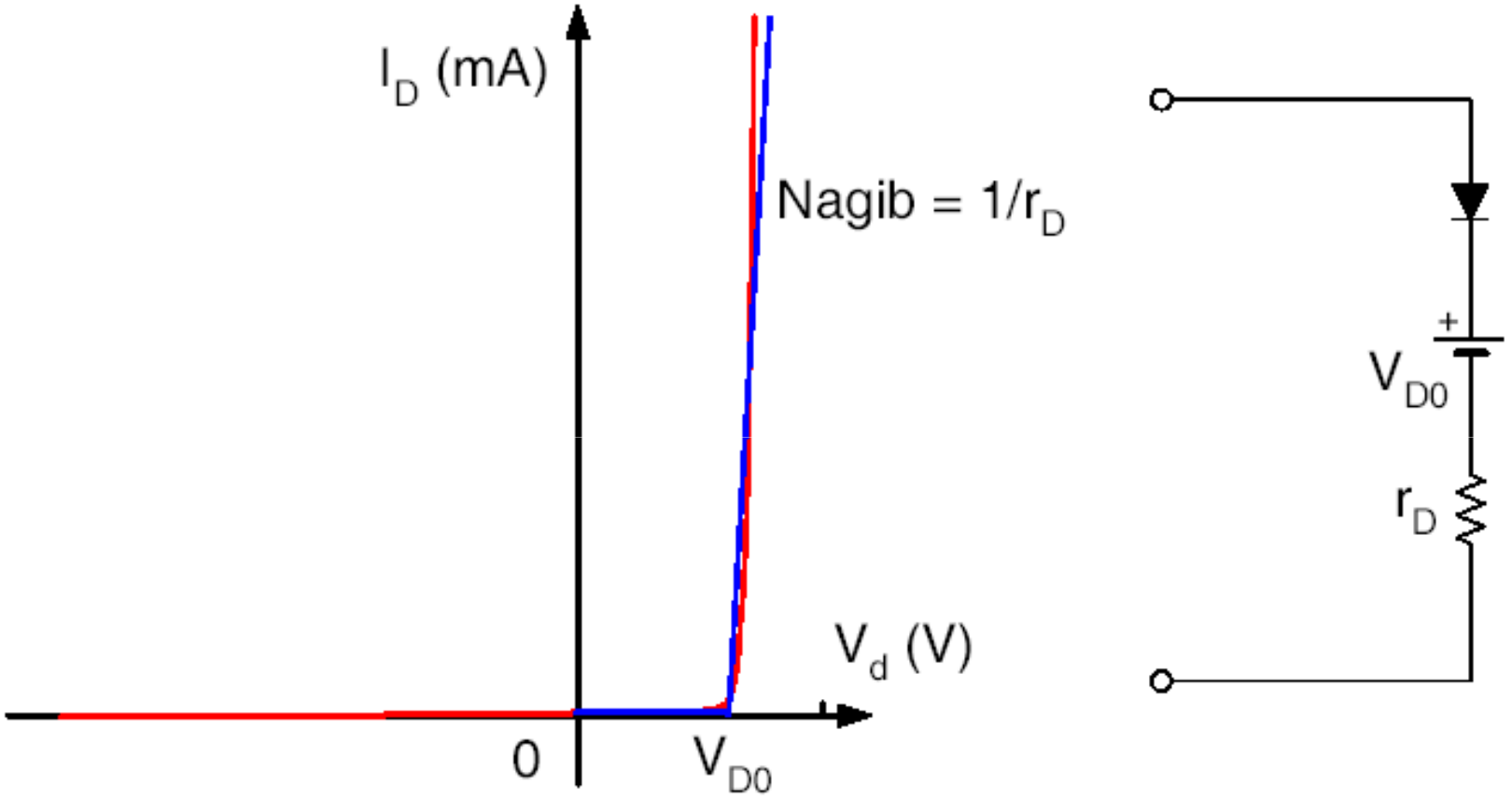
I_S inverzna struja zasićenja, Kod dioda za male snage ova struja je reda 10^{-15} A

$$V_T = kT / q = 25,7\,\text{mV@300 K}$$

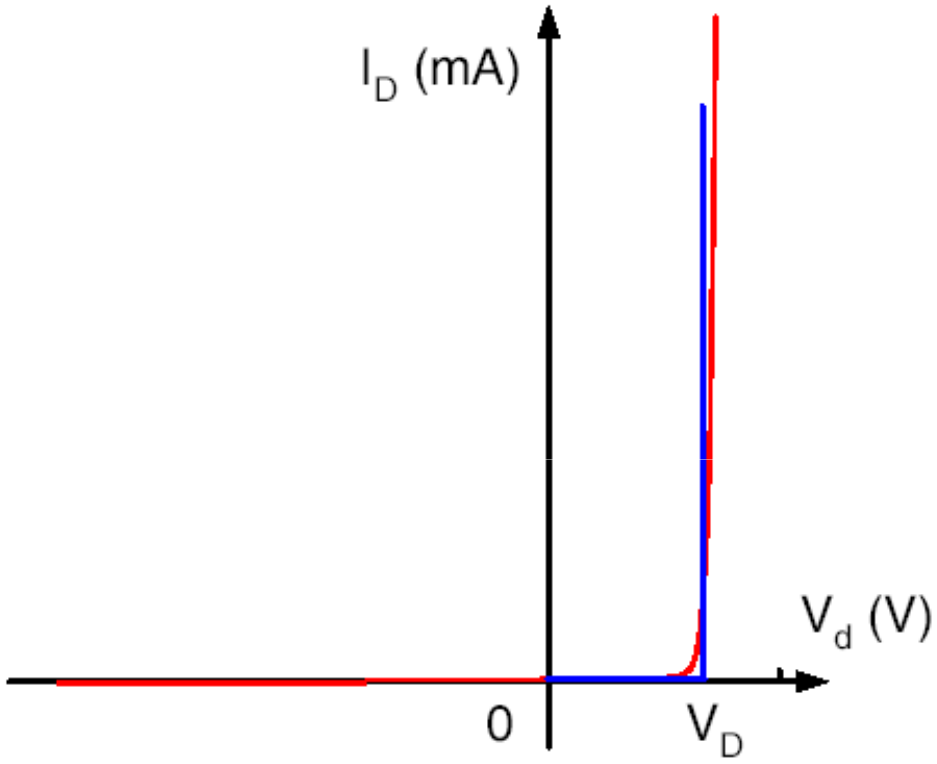
Statički modeli diode

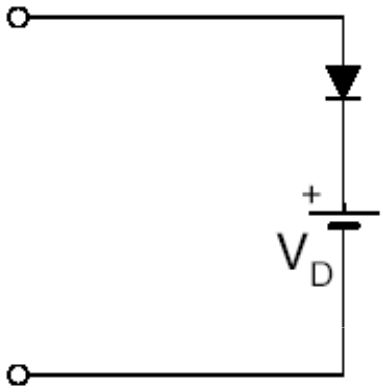


Idealna dioda



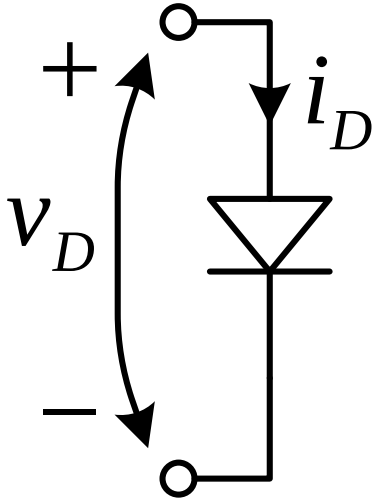
Izlomljeno-linearna aproksimacija

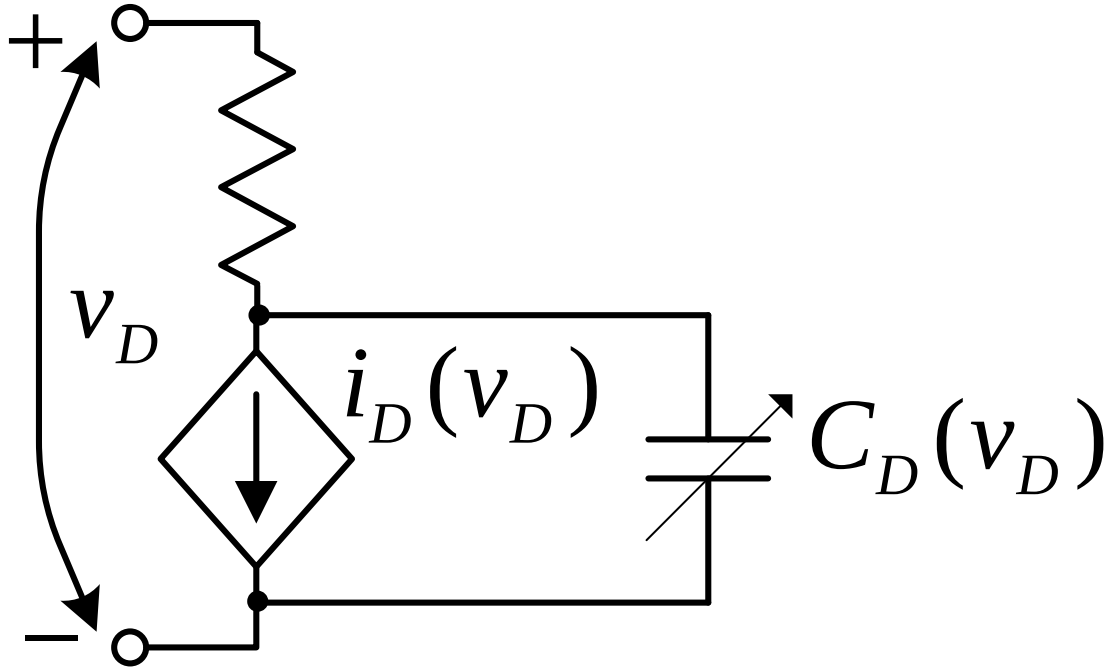




Aproksimacija sa konstantnim naponom

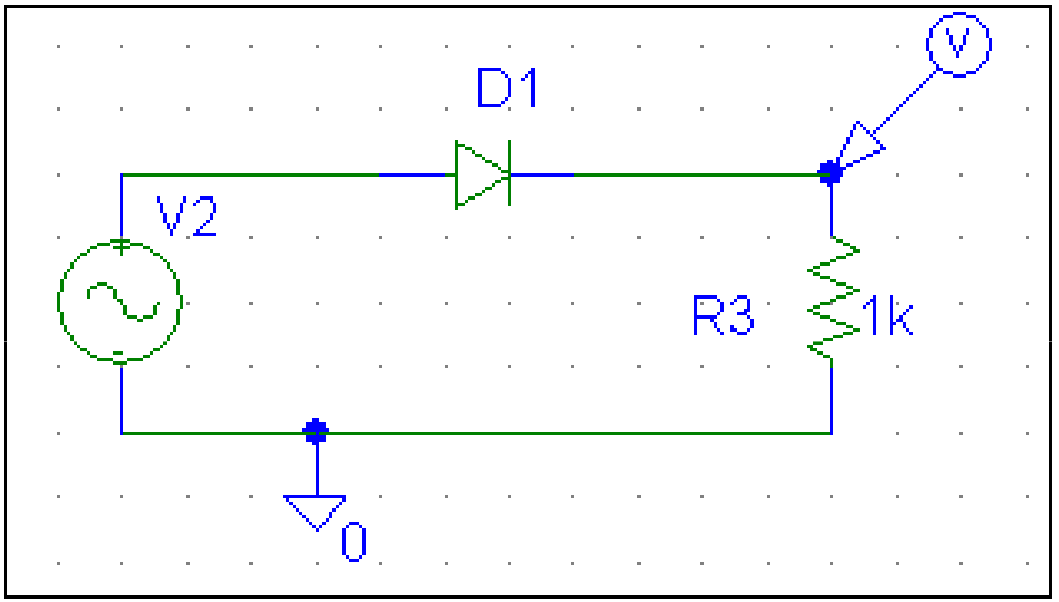
Dinamički modeli

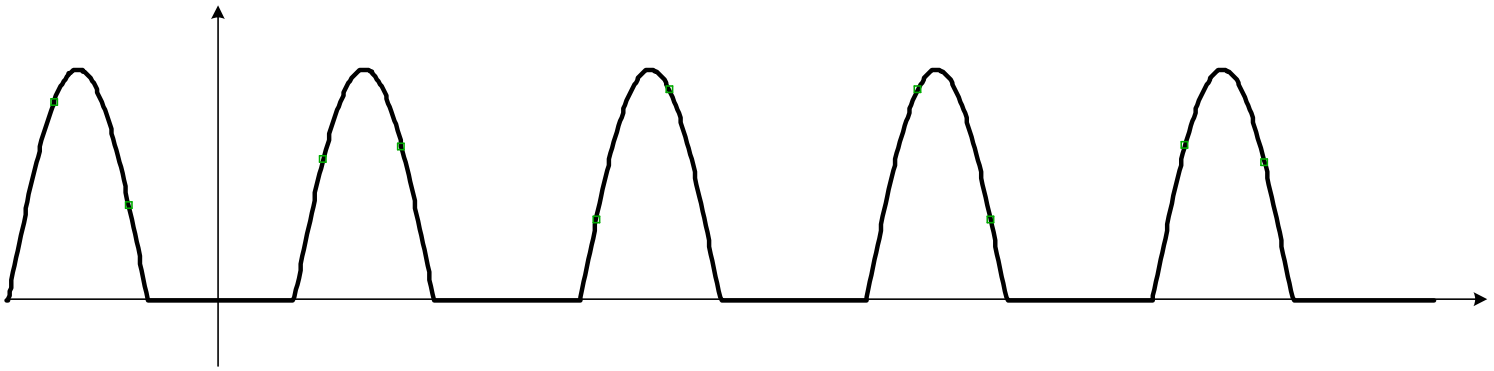




Primene diode

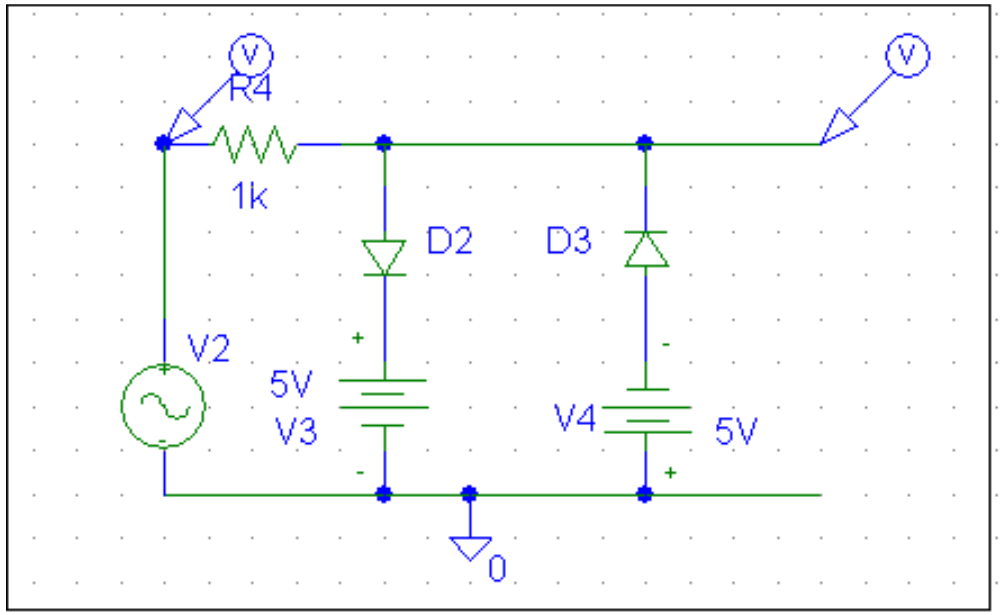
- Polutalasno ispravljanje

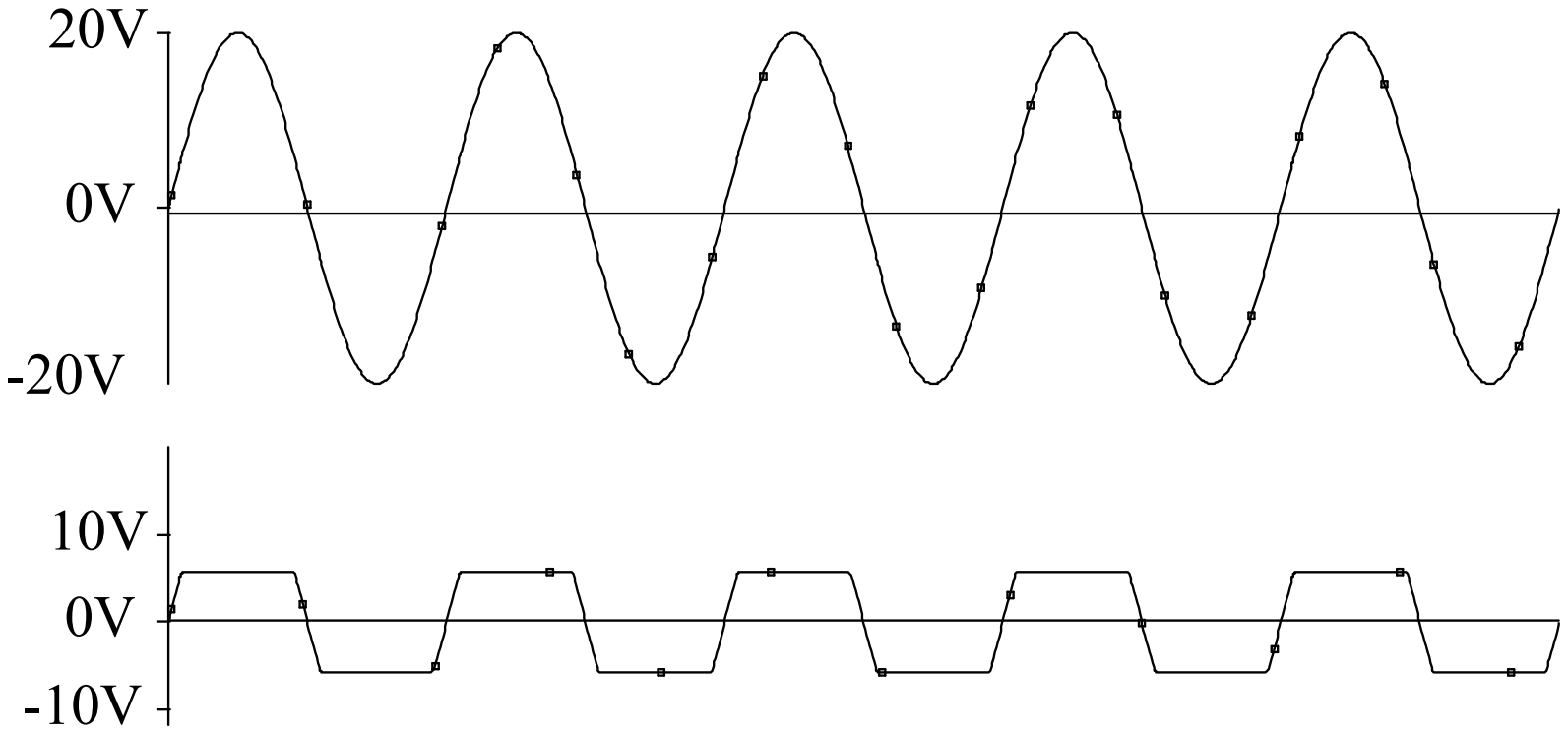




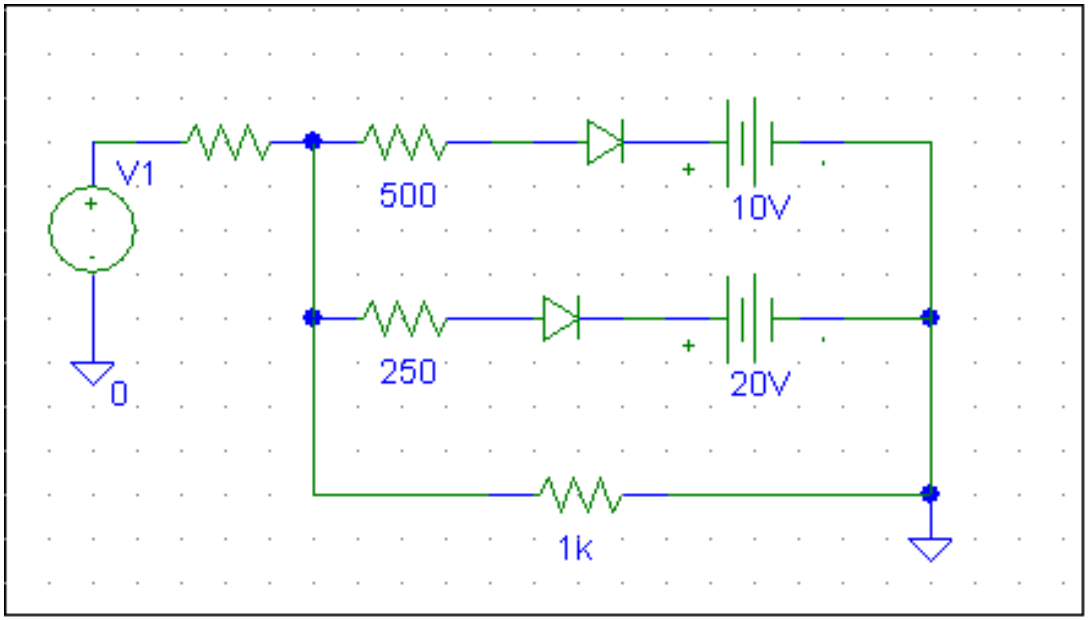
-Uobličavanje signala

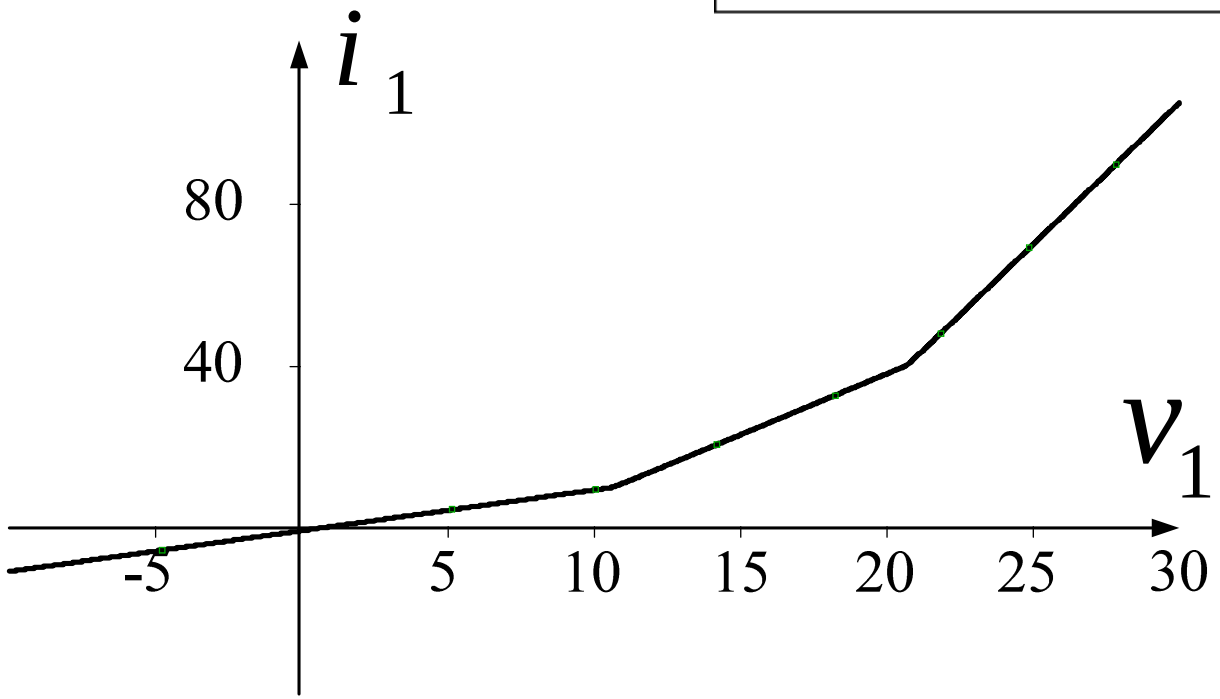
precizni dvostrani ograničavač





Nelinearna otpornost



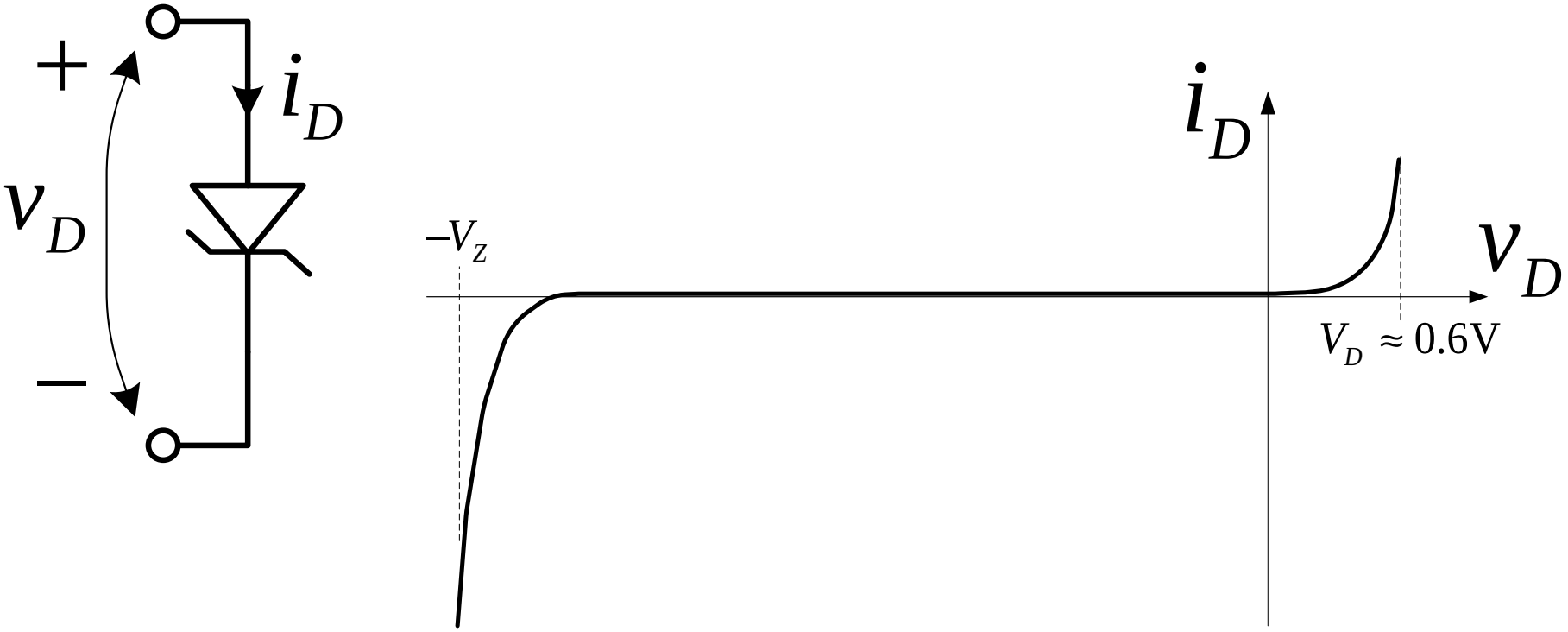


Karakteristike diode

Symbol	Parameter		Value	Unit
I_{FRM}	Repetive Peak Forward Current	$t_p \leq 10\mu s$	30	A
$I_{F\ (AV)}$	Average Forward Current*	$T_a = 70°C$ $\delta = 0.5$	1	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	30	A
P	Power Dissipation*	Ta = 70°C	1.33	W
T_{stg} T_j	Storage and Junction Temperature Range		- 40 to +150 - 40 to + 150	°C

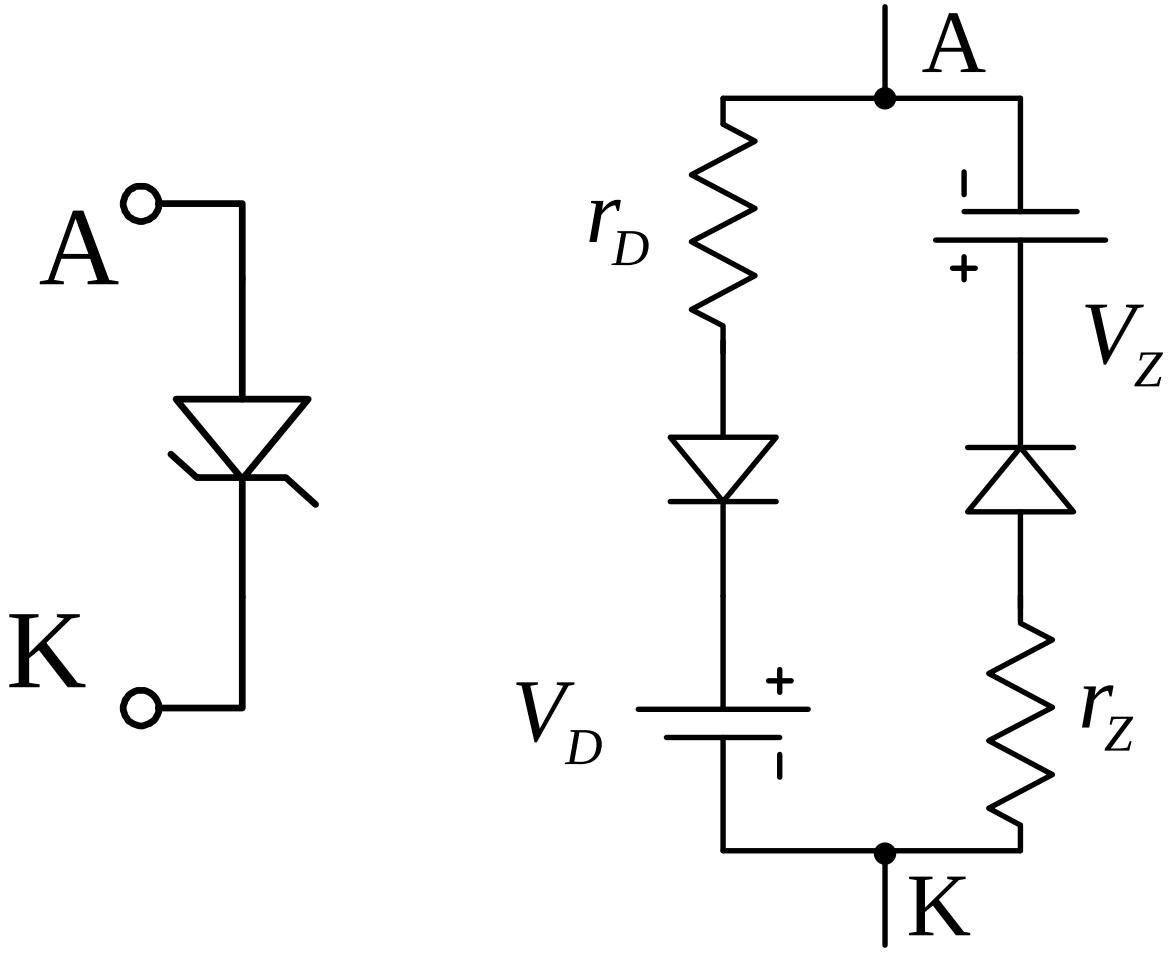
Symbol	Parameter		BYT 01-			Unit
			200	300	400	
V_{RRM}	Repetitive Peak Reverse Voltage		200	300	400	V
V_{RSM}	Non Repetitive Peak Reverse Voltage		220	330	440	V
I_R	$T_j = 25°C$	$V_R = V_{RRM}$			20	µA
	$T_j = 100°C$				0.5	mA
V_F	$T_j = 25°C$	$I_F = 1A$			1.5	V
	$T_j = 100°C$				1.4	

Proboj diode, Zener dioda



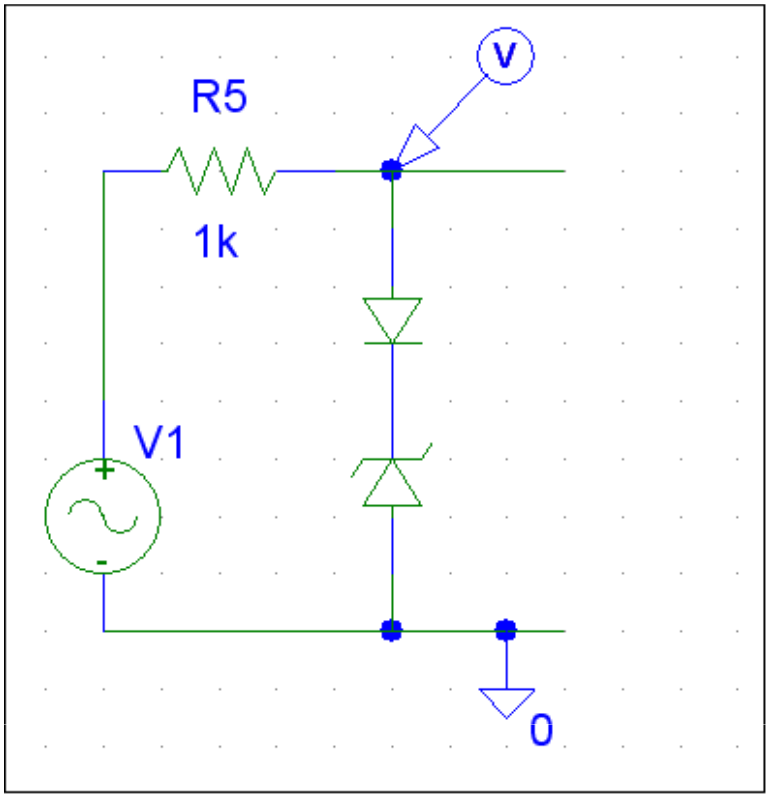
V_Z – karakteristika zener diode

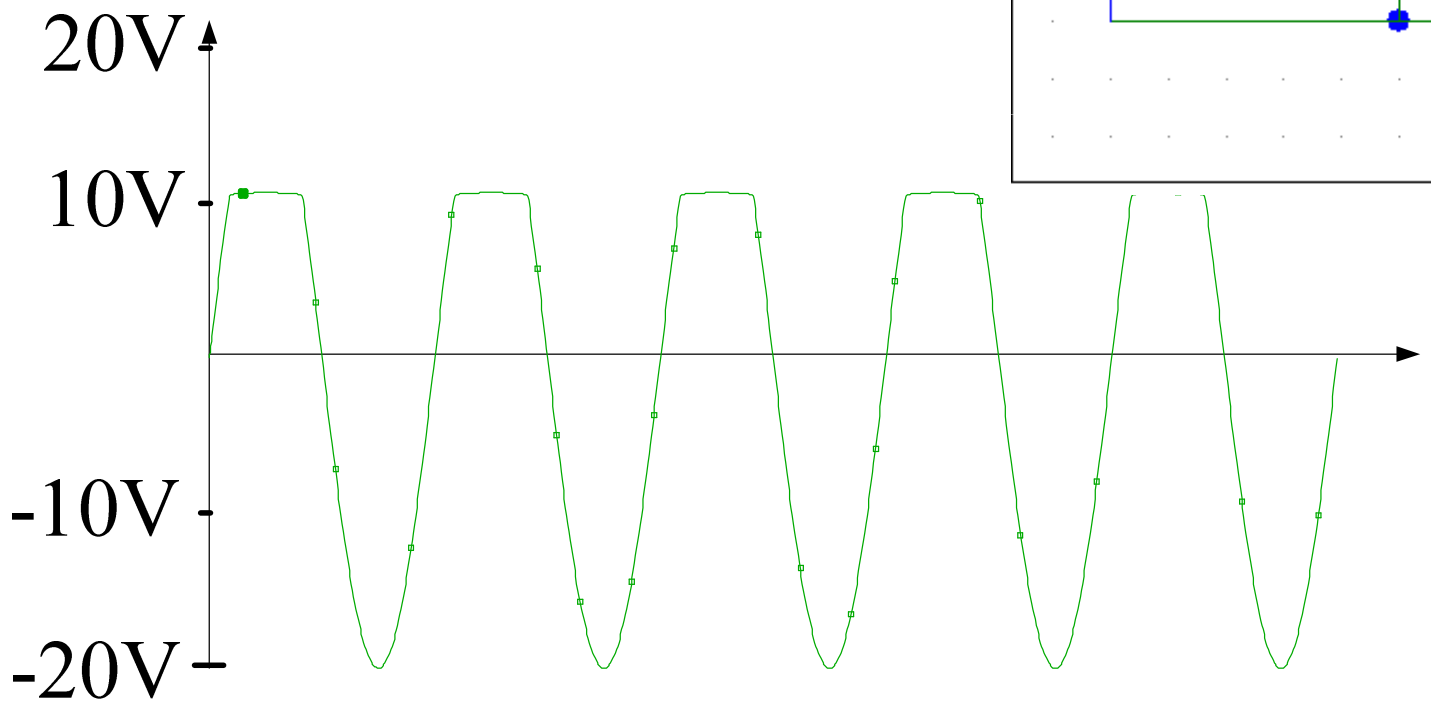
Statički model (aproksimativni)



Primene zener diode

-ograničenje napona

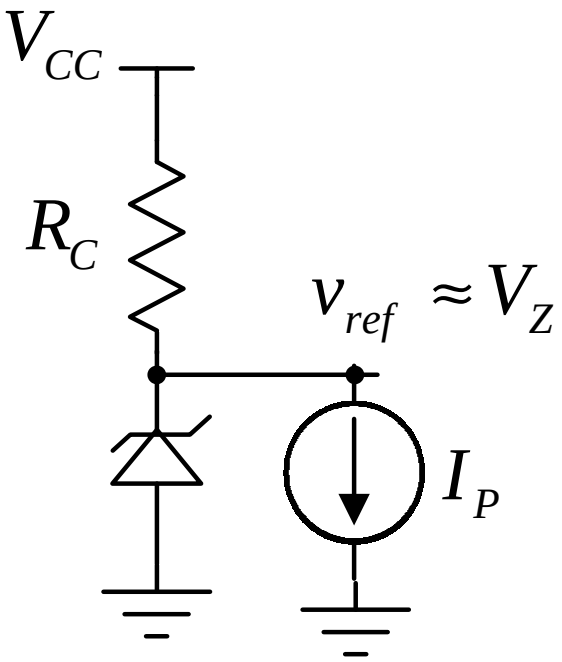




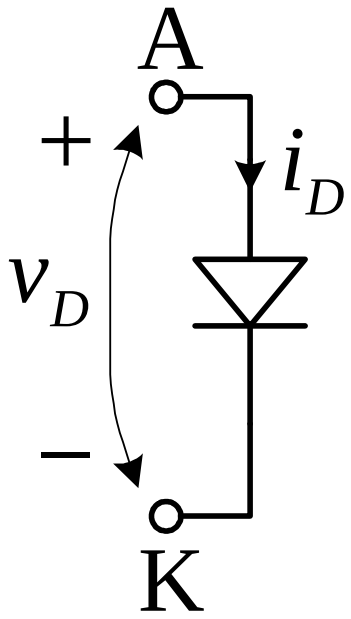
-Naponske reference

$$v_{ref} \approx V_Z, \quad V_{CC} - R_C I_P > V_Z$$

$$v_{ref} = V_{CC} - R_C I_P, \quad 0 < V_{CC} - R_C I_P < V_Z$$

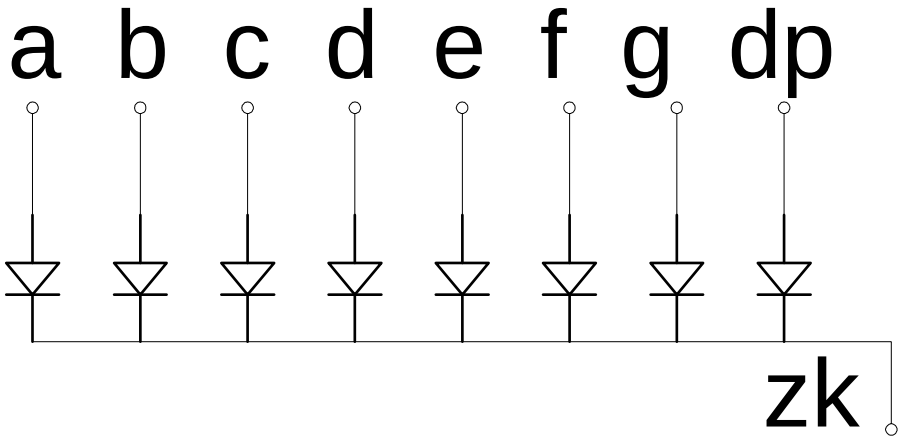


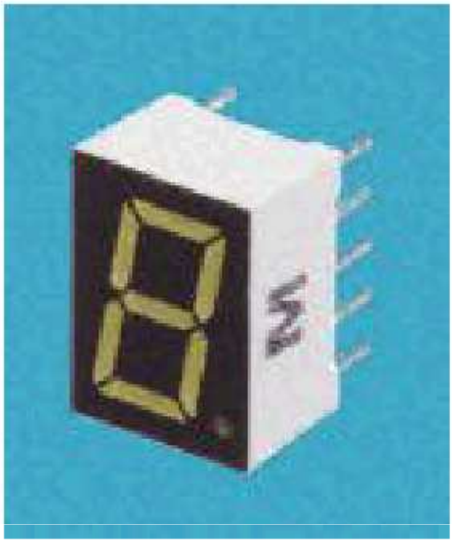
Led diode

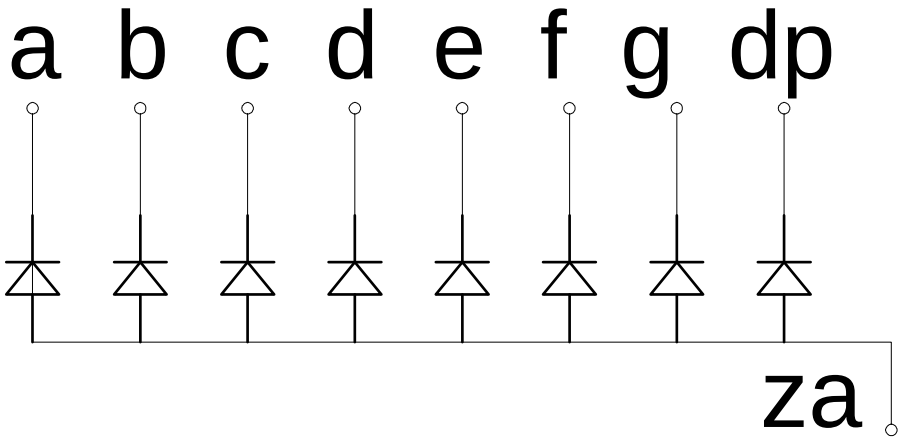


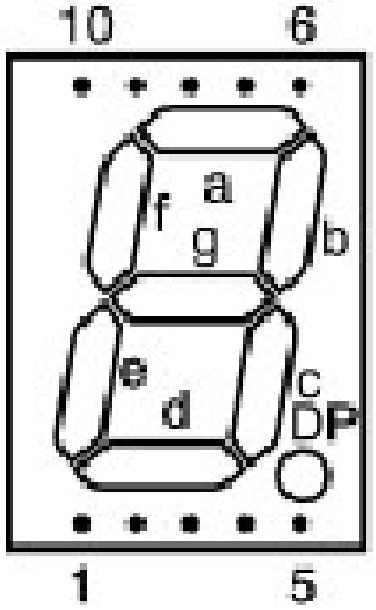
- Standard 10mA
- Low current 1-2mA
- High efficiency
- v_D oko 1.4V

7 segmentni led displeji

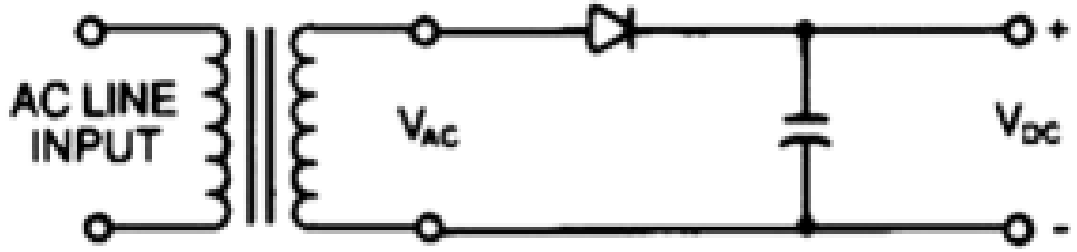


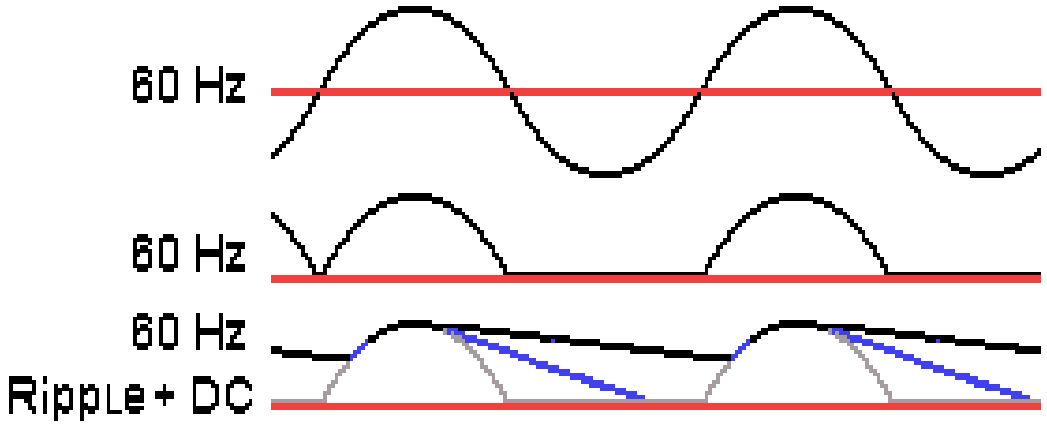




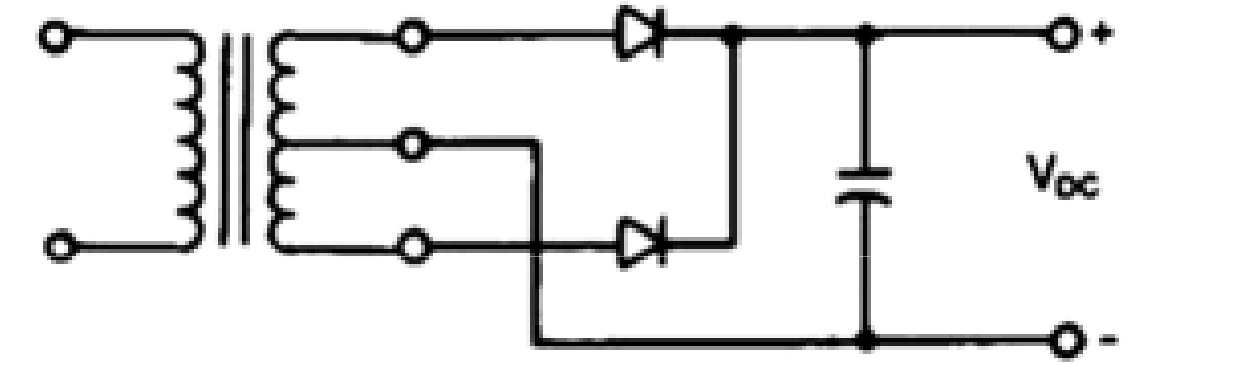


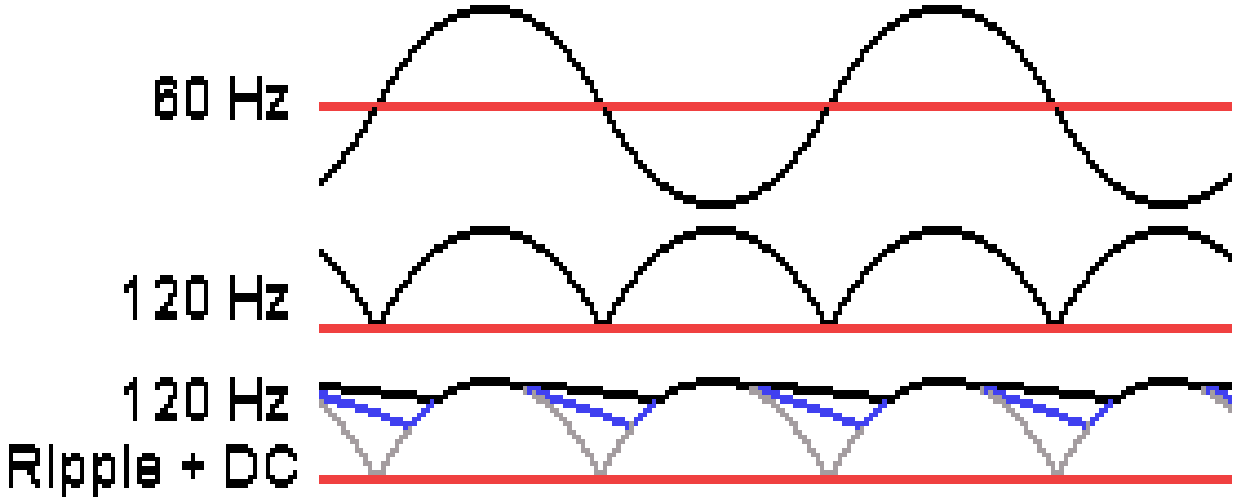
Jednostrani (polutalasni)usmerač sa prostim kapacitivnim filterom



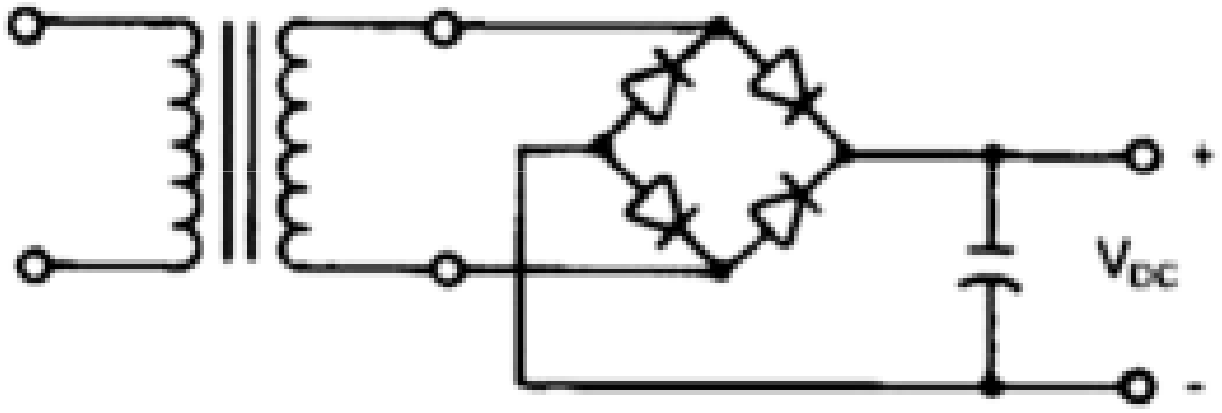


Dvostrani usmerač sa srednjim izvodom

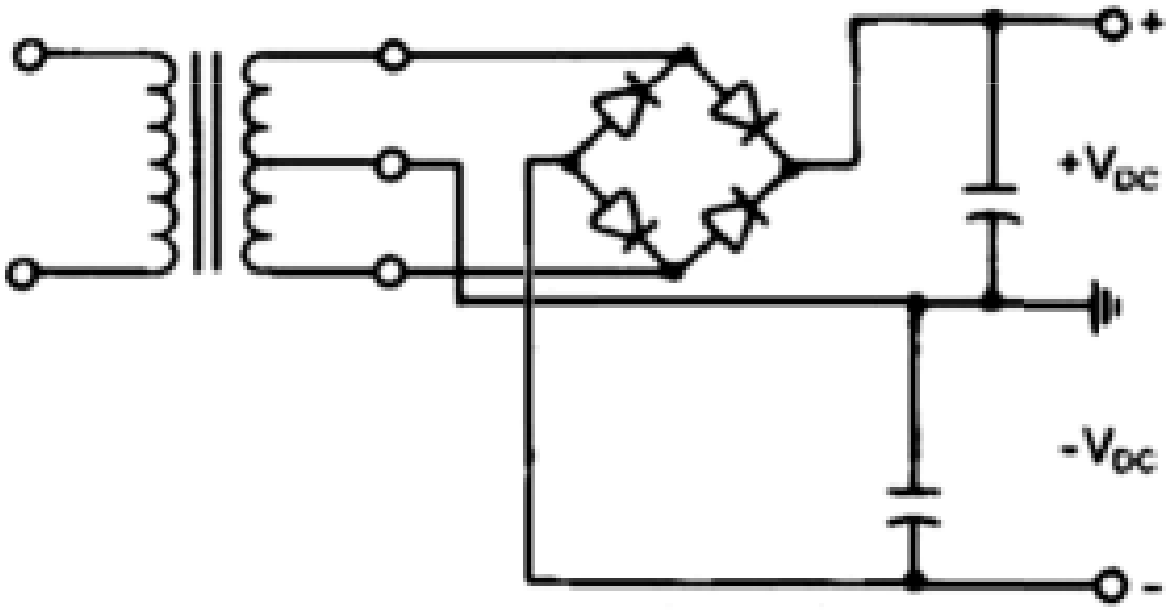
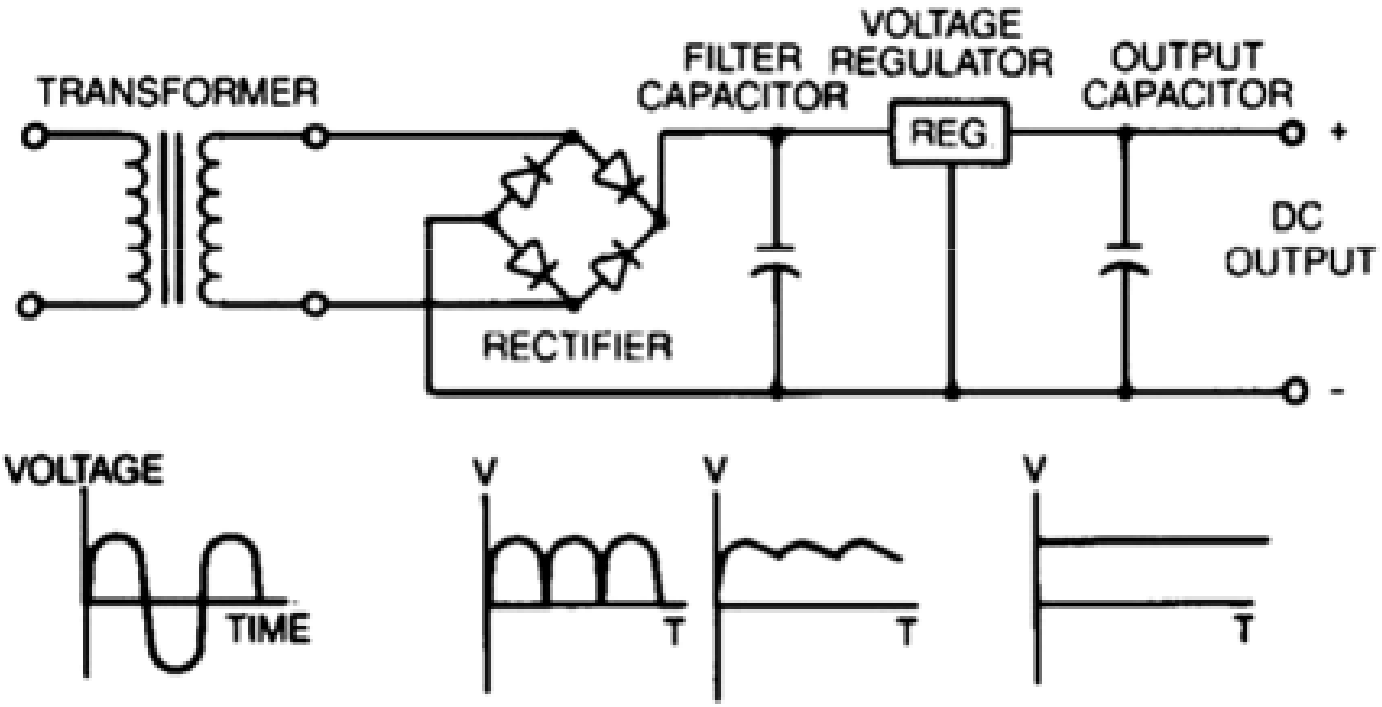




Dvostrani usmerač sa gretzovim mostom



Dvostrani usmerač sa srednjim izvodom za pozitivan i negativan napon



Naponska stabilizacija