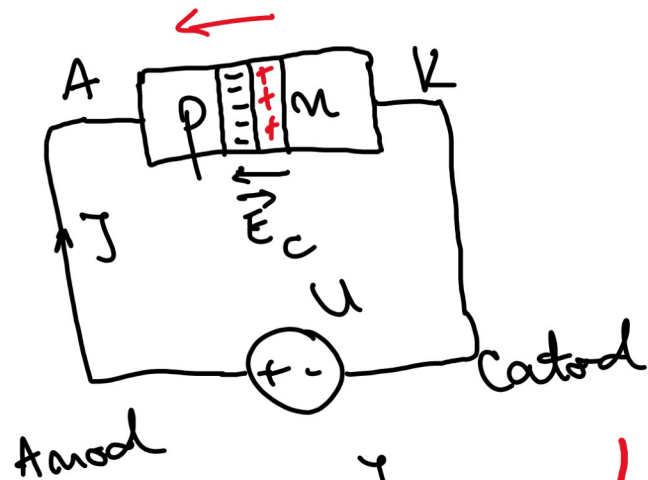


Laborator nr. 3 electronică I ;

Joncțiunea p-n:



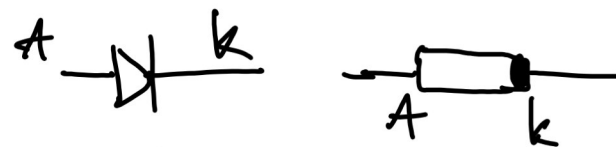
semiconductor de tip p (si-p)

golurile ca purtători majoritari

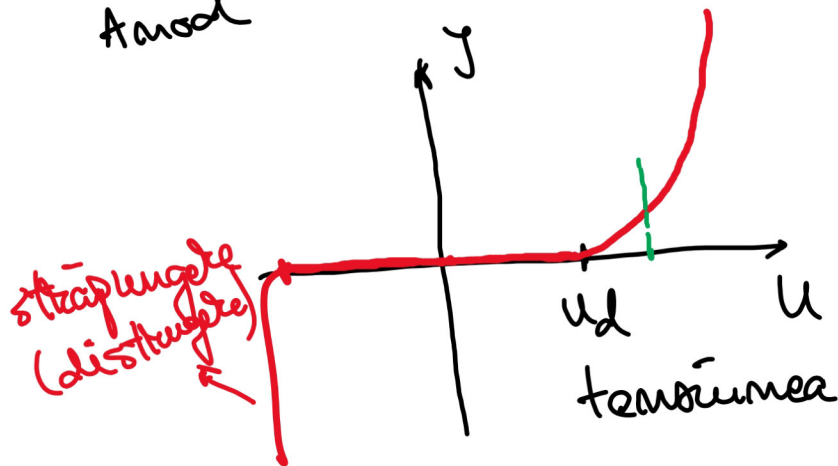
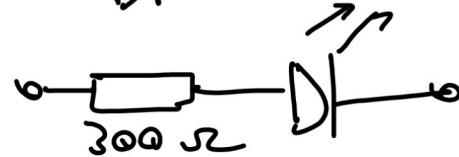
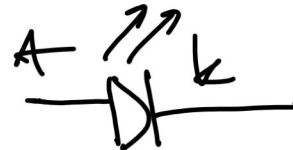
semiconductor de tip n (si-n)

electroni ca purtători majoritari

Diodă semic.



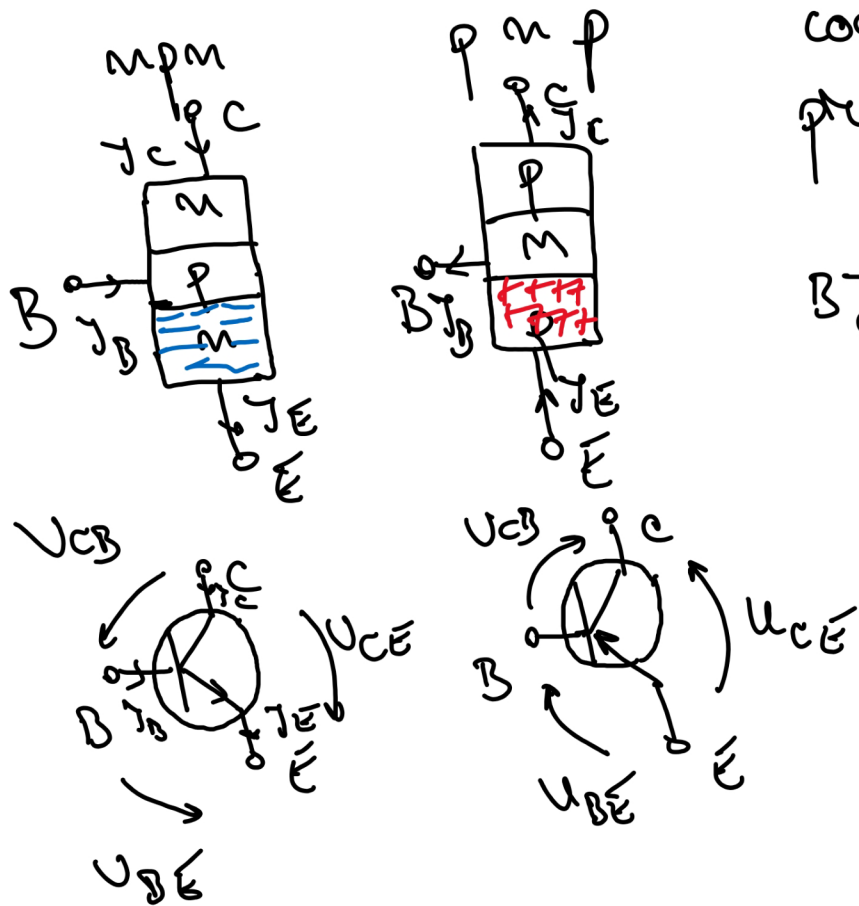
LED



tensiunea de deschidere

Transistorul bipolar: (TB, BJT) Bipolar Junction Transistor

controlăm un curent mare (I_c)
printr-un curent mic (I_B)



BJT - dispozitiv controlat

in curent

$$I_c \approx \beta \cdot I_B$$

mA

μA

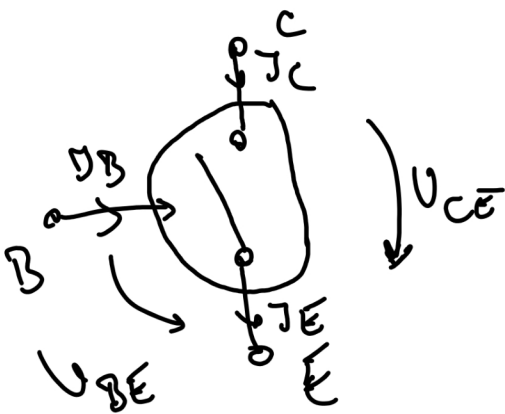
$\beta = 10 - 1000$
power BJT

small signal BJT

Regimuri de funcționare:

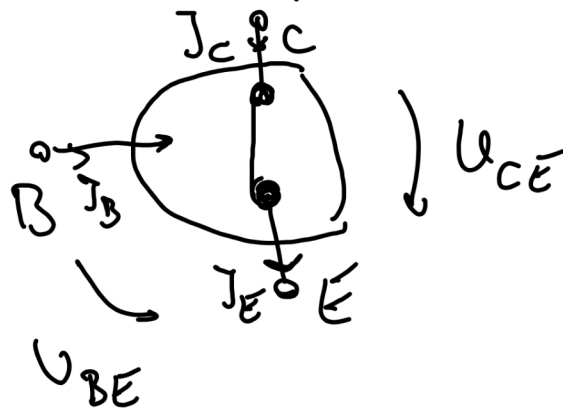
BLOCAT

$I_B \approx 0, U_{BE} < 0.7V$
 $U_{CE} \geq 0 (U_{CE} = E_c)$
 $I_c = 0$



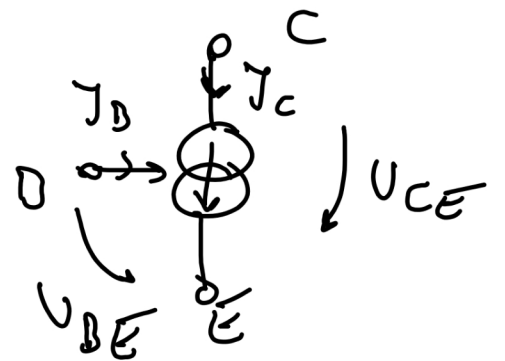
SATURAT

$U_{BE} \geq 0.7V$
 $I_c = \max$
 $I_c < I_B \cdot \beta$
 $U_{CE} \approx 0 - 0.2V$
(f. mic)

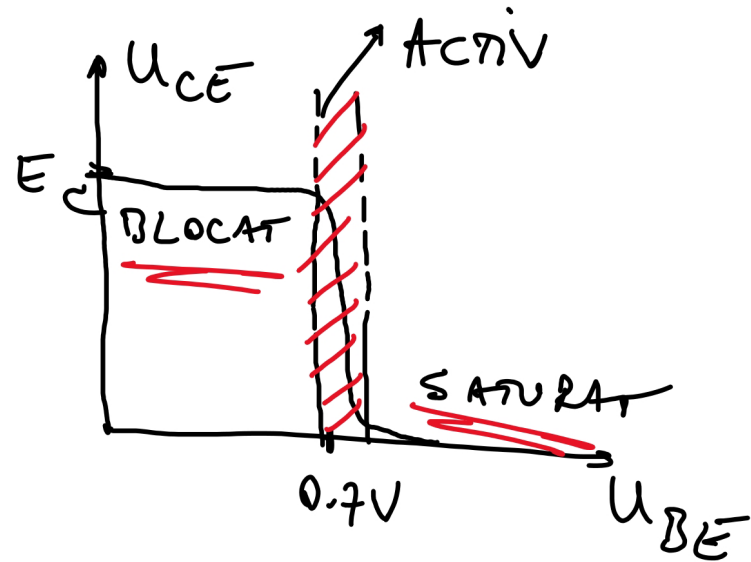
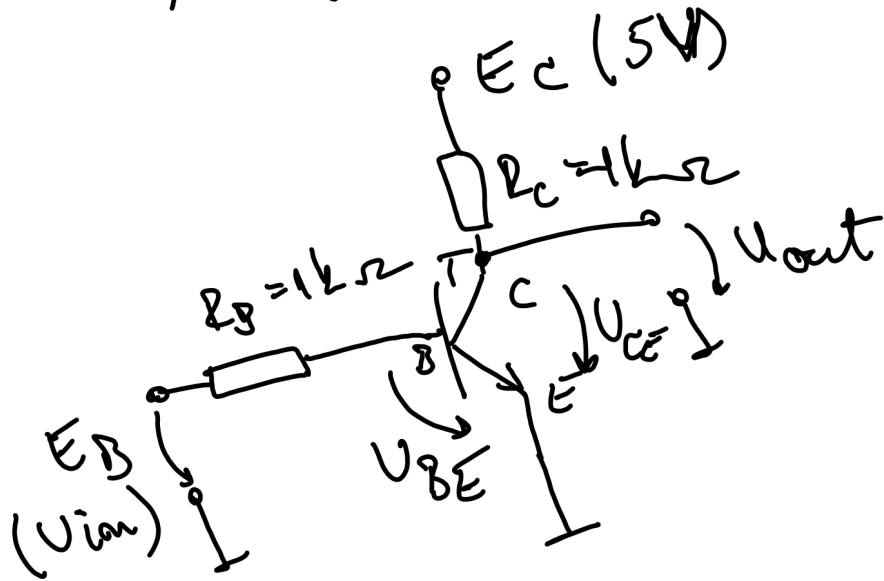


ACTIV

$U_{CE} > 0$
 $U_{BE} \approx 0.7V$
 $I_c \approx \beta \cdot I_B$



Porti logice elementare cu BJT (TB)



TTL - Transistor Transistor Logic

INPUT:

0: 0 - 0.8 V

1: 2 - 5 V

OUTPUT:

0: 0 - 0.5 V

1: 2.7 - 5 V

Alimentare: 4.95 - 5.25 V

U_{in}	U_{out}	stare T
0V	5V	Blocat
5V	0V	Saturat

IN	OUT
0	1
1	0

» NOT

Transistorul cu efect de câmp de tip MOS

- dispozitiv controlat în tensiune

$$V_{GS} \rightarrow I_D$$

$$V_{DD} \rightarrow 5 - 18V$$

CMOS

IN

$$0 : 0 - 1.5V$$

$$1 : 3.5 - 5V$$

OUT

$$0 : 0 - 0.05V$$

$$1 : 4.95 - 5V$$