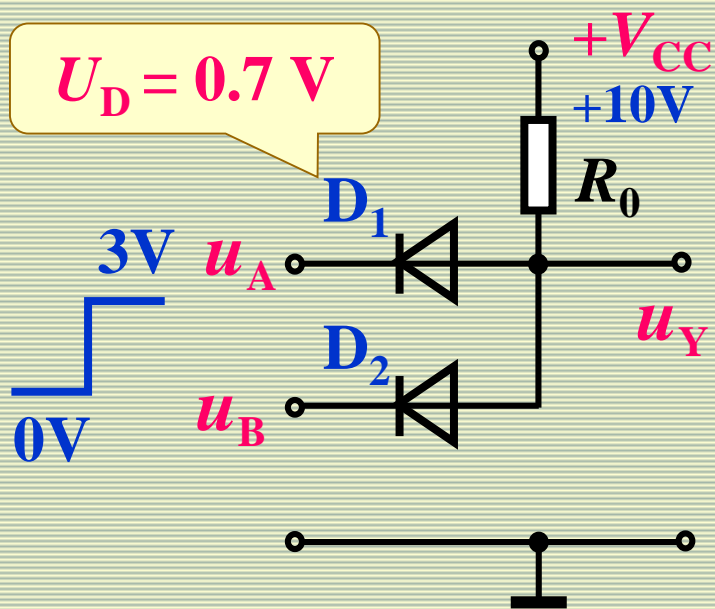


2.2 分立元器件门电路

2.2.1 二极管与门和或门

一、二极管与门 P88



电压关系

U_A	U_B	U_Y
0	0	0.7
0	3	0.7
3	0	0.7
3	3	3.7

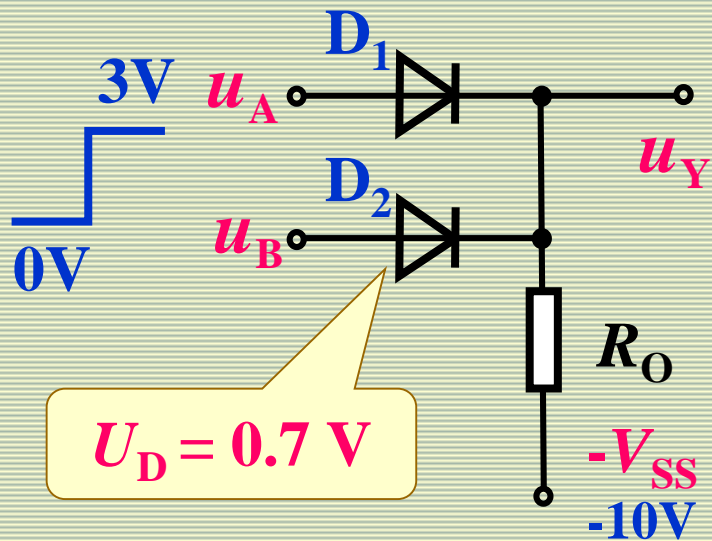
列真值表

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

$$Y = AB$$

设定变量；状态赋值

二、二极管或门



真值表

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

Annotations: -0.7V points to the output '0' row; 2.3V points to the output '1' row.

$$Y = A + B$$



2.2.2 三极管非门（反相器）

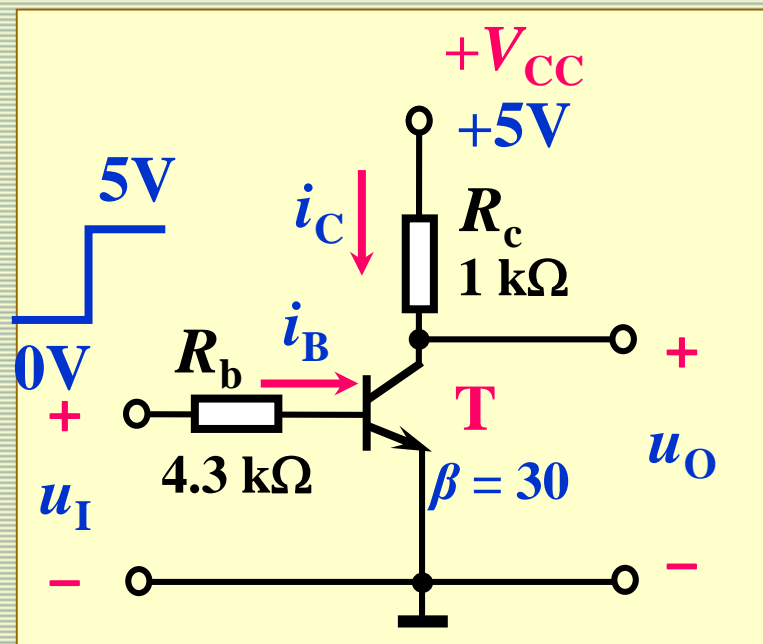
一、半导体三极管非门

1. $u_I = U_{IL} = 0V$ **T截止**

$$u_O = U_{OH} = V_{CC} = 5V$$

2. $u_I = U_{IH} = 5V$ **T饱和导通**

$$u_O = U_{OL} = U_{CES} \leq 0.3V$$



真值表

A	Y
0	1
1	0

函数式

$$Y = \bar{A}$$



二、MOS 三极管非门

1. $u_I = U_{IL} = 0V$

$$u_{GS} = 0V < U_{TN}$$

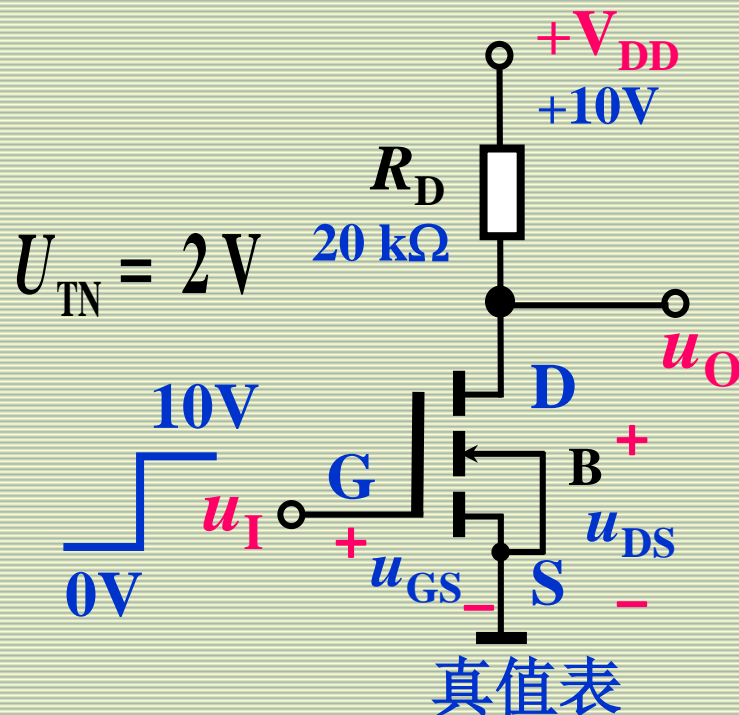
MOS管截止

$$u_O = U_{OH} = V_{DD} = 10V$$

2. $u_I = 10V > U_{TN}$

MOS 管导通 (在可变电阻区)

$$u_O = U_{OL} = \frac{R_{ON}}{R_{ON} + R_D} \cdot V_{DD} \approx 0V$$



真值表

A	Y
0	1
1	0

故 $Y = \bar{A}$