日期： /

DC-DC

① 使用

in +   出变   out +

in -   out -

② 结构

L298N
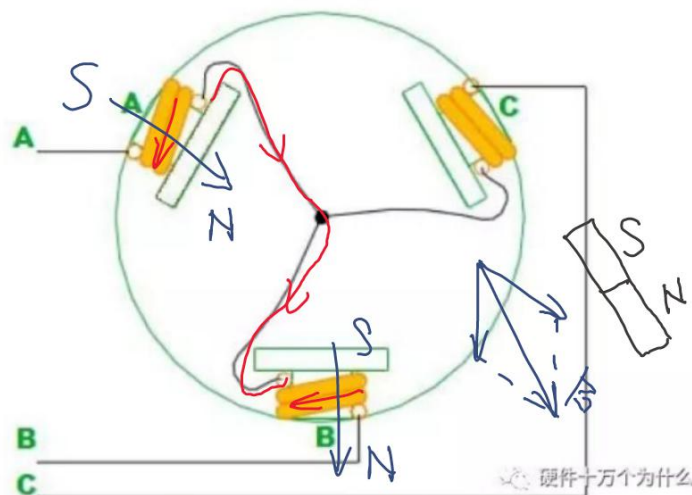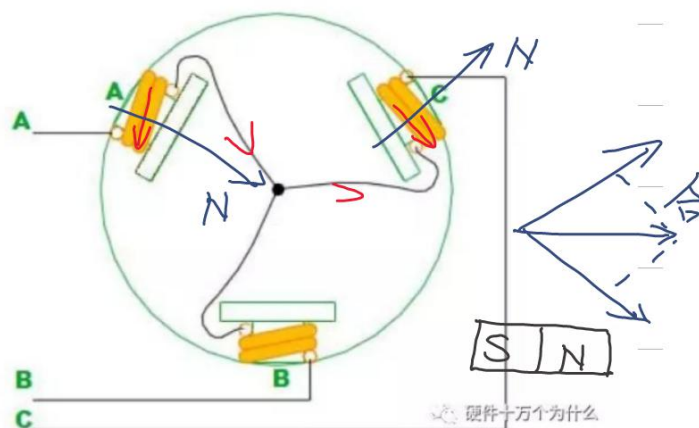
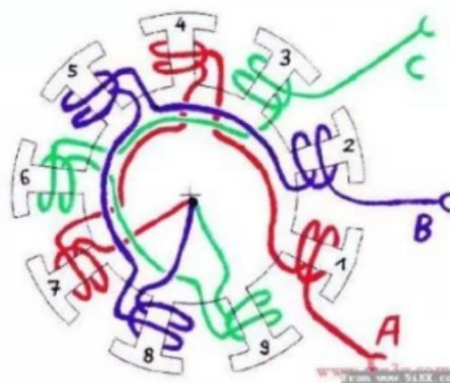无刷电机　　AB、AC、BC、BA、CA、CB
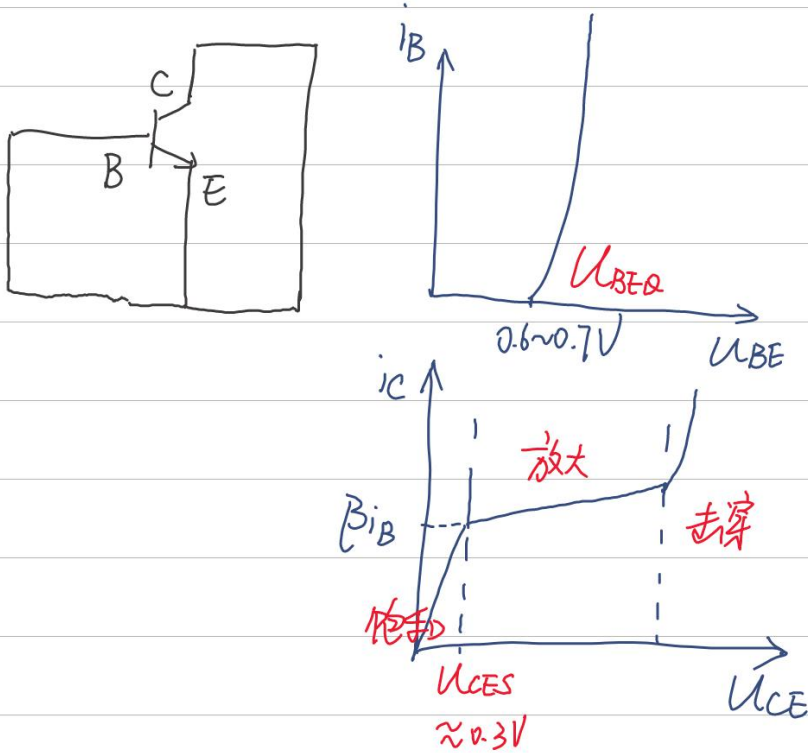
A→B

三相两极

A→C

每一次转6°

三相九绕组之极

3 pole pairs

9 coils

(a) 电机定子与转子结构

(b) 绕组联结方式（摘自 51MX 论坛）

日期: /

双极结型 transistor 电流控制

场效应 transistor 电压控制

i_B

U_{BEQ}

$0.6\sim0.7V$

U_{BE}

i_C

放大

βi_B

击穿

饱和

U_{CES}

$\approx 0.3V$

U_{CE}

等效模型

截止 $\Rightarrow$

饱合 $\Rightarrow$

放大 ⟹

I_C

I_B

b

βI_B

I_E

直流 or 大信号

b

I_B

0.6V

U_{BE}

I_C

βI_B

e

微变 = 模]
0.6V
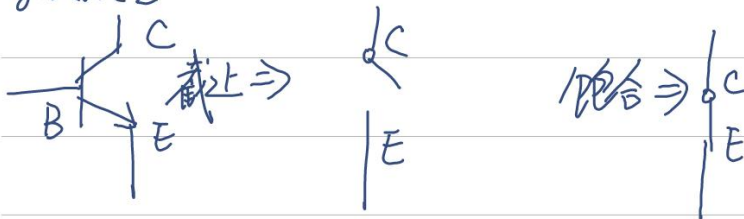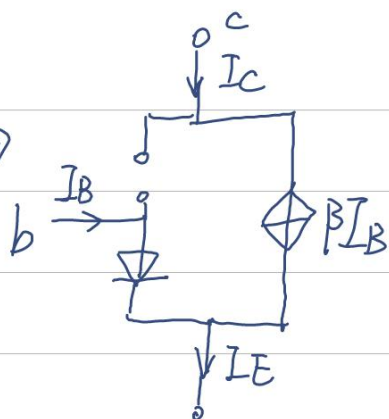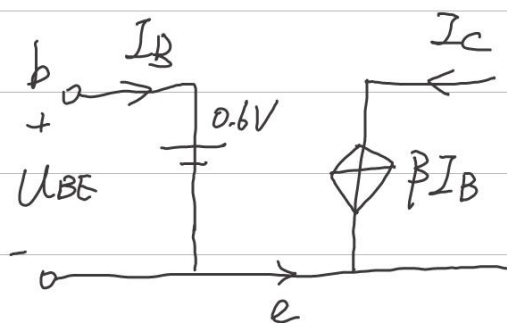
日期：　　　/

Application of BJT

① Pulse Generator
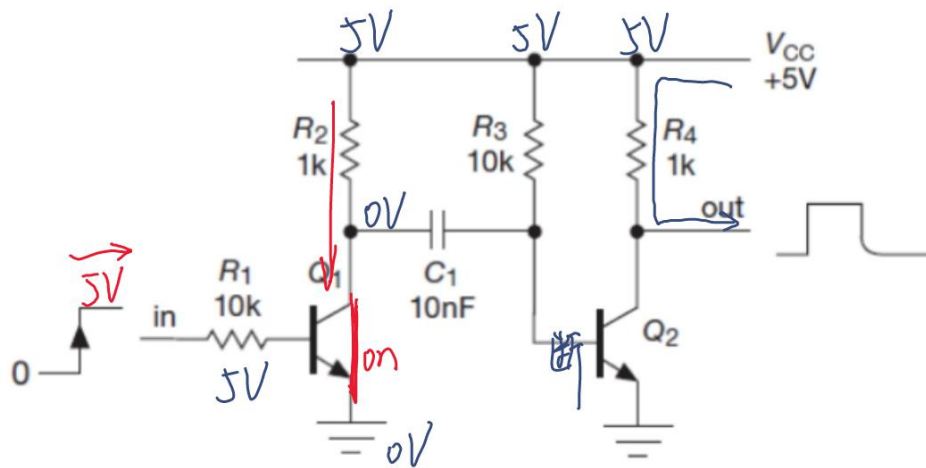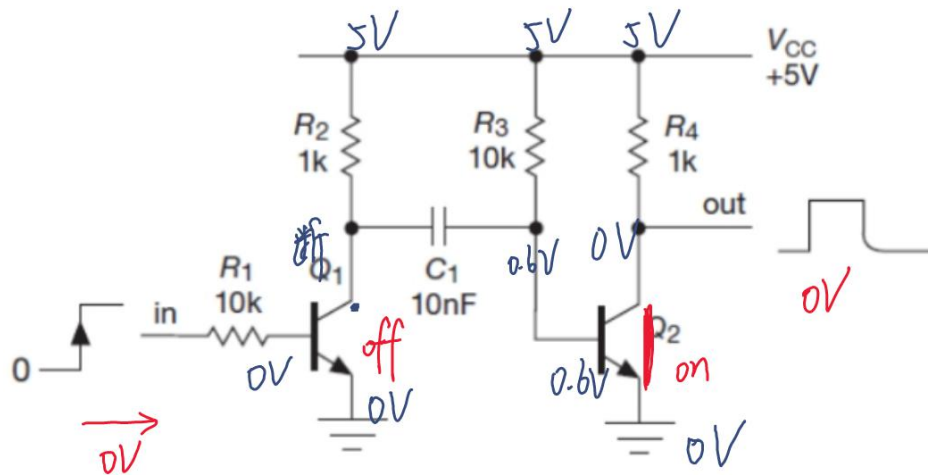
Emitter Follower and Impedance

$$\Delta I_E = \Delta V_B / R$$
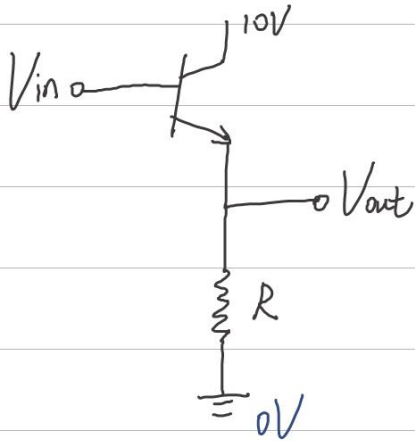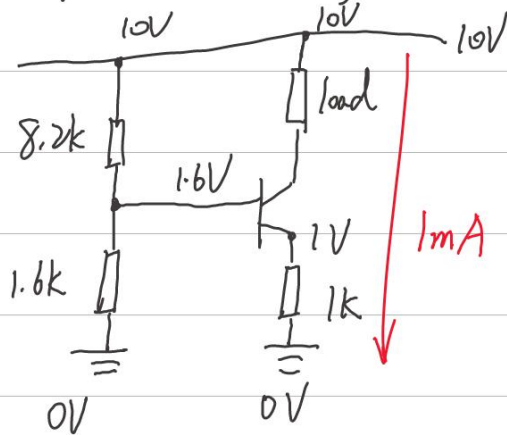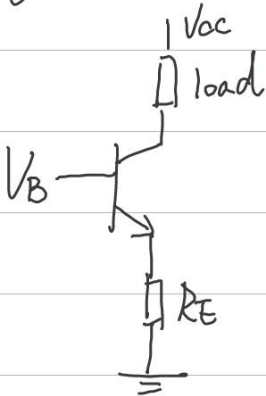
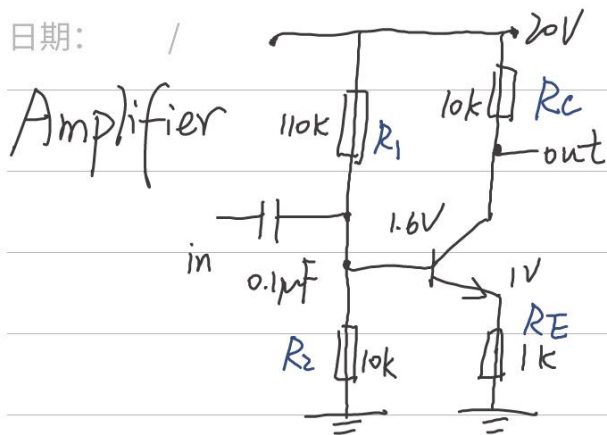$$\Delta I_B = \frac{1}{\beta+1} \Delta I_E = \frac{\Delta V_B}{(\beta+1)R}$$

$$Z_{in} = (\beta+1) Z_{load}$$

$$Z_{out} = \frac{Z_{source}}{\beta+1}$$

Current Source 为 load 提及稳定电流源

V_B

V_{cc}

load

R_E

10V   10V   10V

8.2k

1.6V

1.6k

load

1V   1mA

1k

0V   0V

Amplifier

110k R_1

10k R_C

20V

out

in 0.1μF 1.6V

R_2 10k

1V

R_E 1k

$$C \geq \frac{1}{2\pi f(R_1 \| R_2)}$$

$$V_C = -i_C R_C = -U_B(R_C/R_E)$$

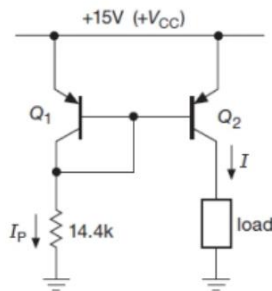$$gain = V_{out}/V_{in} = -R_C/R_E$$

Current Mirror and Amplifier

+15V (+V_{CC})

Q_1 Q_2

I

I_P 14.4k   load

Figure 2.58. Programming current-mirror current.

+V_{CC}

R_C R_C

output

input 1   input 2
(+) Q_1 Q_2 (−)
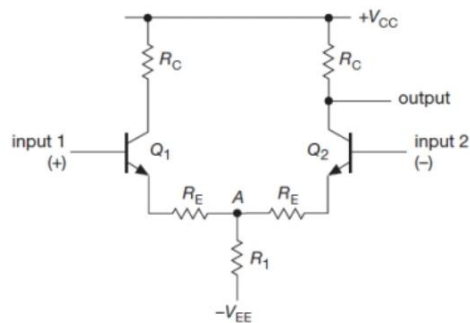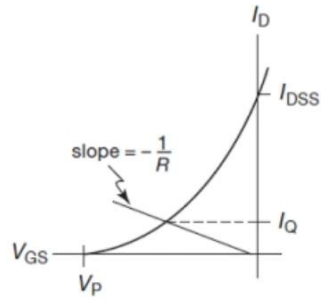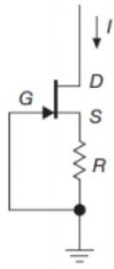
R_E A R_E

R_1

−V_{EE}

Figure 2.63. Classic transistor differential amplifier.

Application of FET

Current Sink

Amplifier

Depletion Type