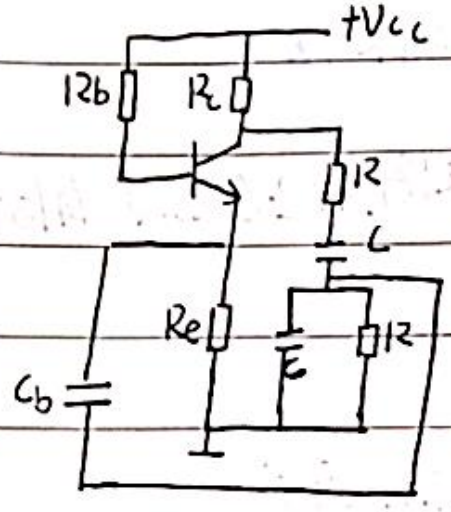
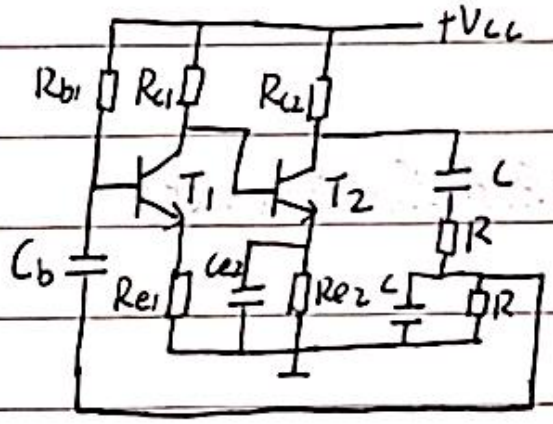
4.2 (a) 从基极注入，用瞬时极性法，C极输出负电，为负反馈不满足相位要求



改为从射极注入

(b) 从T_1射极注入，瞬时注入正电，T_1共基，集极输出正电；T_2共射，集极输出负电，为负反馈，不满足相位要求



改为从基极注入

(c) 从差分左端a注入，瞬时注入正电，V_{id}为正，V_o单端输出放大倍数为正，输出电压也为正，为正反馈，满足相位条件

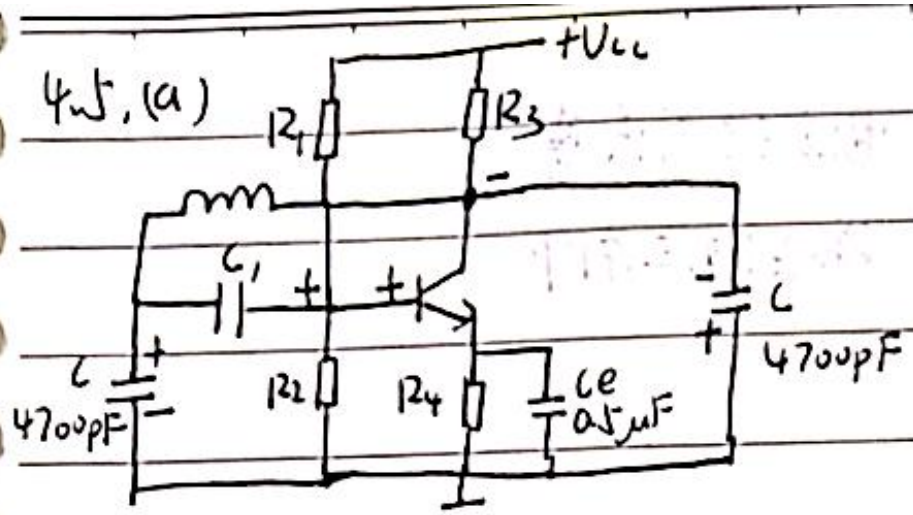
4.3.(1) $f_{min}=\frac{1}{2\pi RC_{max}}=159Hz$

$f_{max}=\frac{1}{2\pi RC_{min}}=1592Hz$

(2) $A=1+\frac{R_3}{R_2}\geq 3$ $R_2\leq\frac{R_3}{2}=5K\Omega$

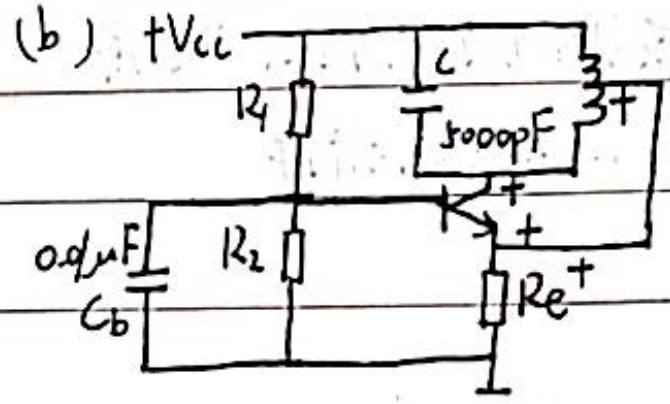
(3) 一开始不起振荡，后逐渐开始起振荡，有已了失波，再后逐渐失真，最后无波形了

4-5. (a)



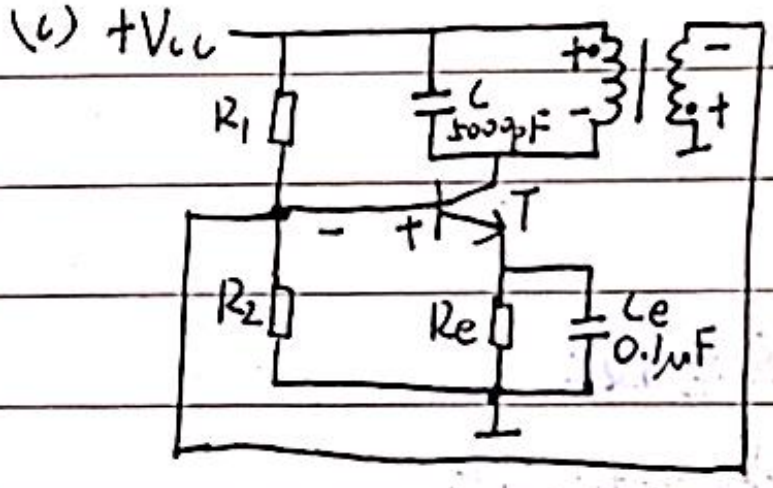
为电容三点式共射
且满足相位条件.

(b)

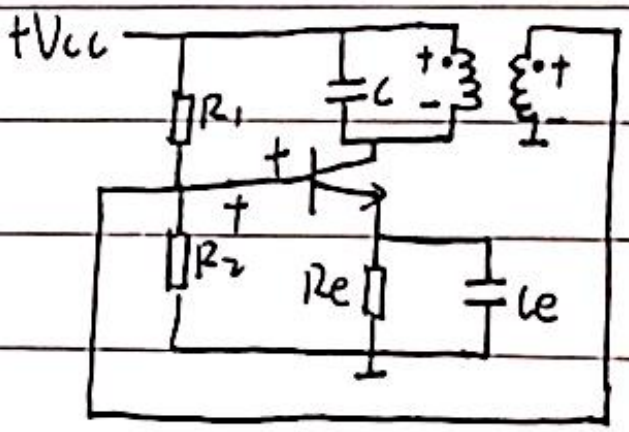


电感三点式共基
满足相位条件

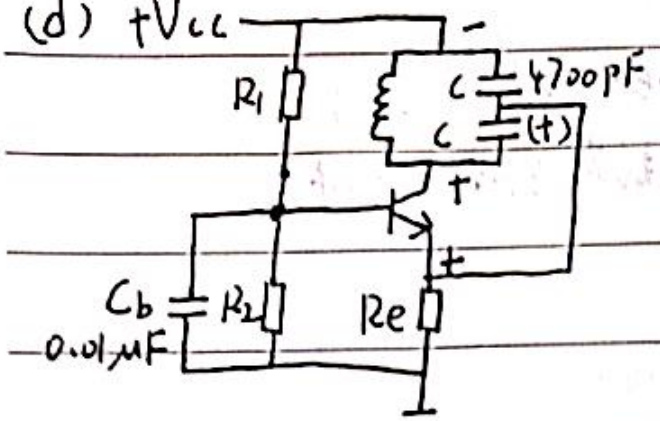
(c)



共射放大满足放大倍数
相位条件不满足



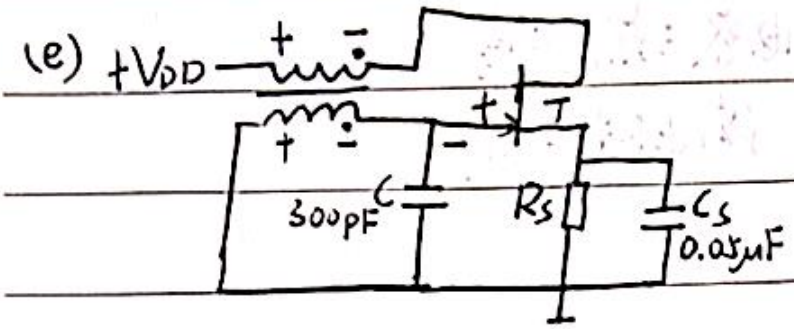
(d)



电容三点式共基

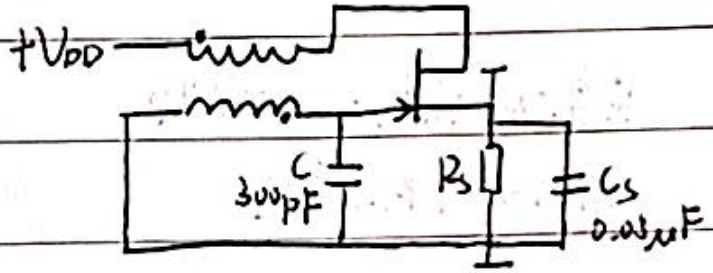
满足相位条件

(e)

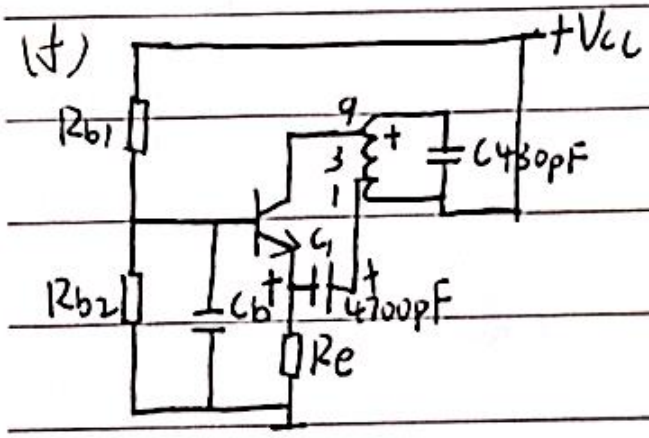


共漏放大，放大倍数为负

不满足相位条件



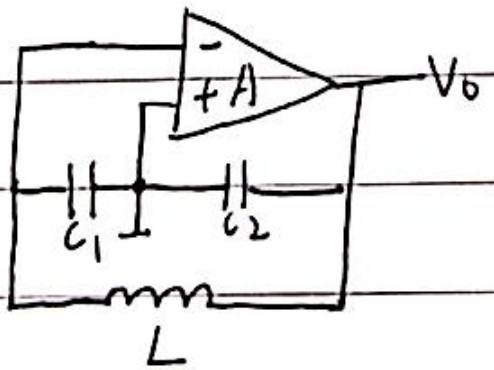
(f)



共基放大，

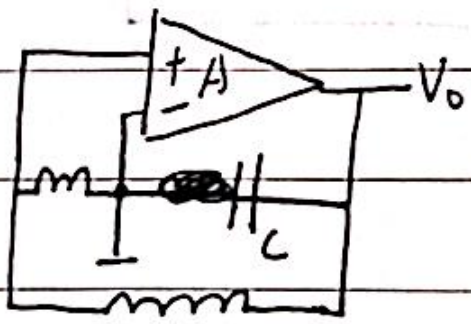
满足相位条件

4.6. (a)



上负下正

(b)

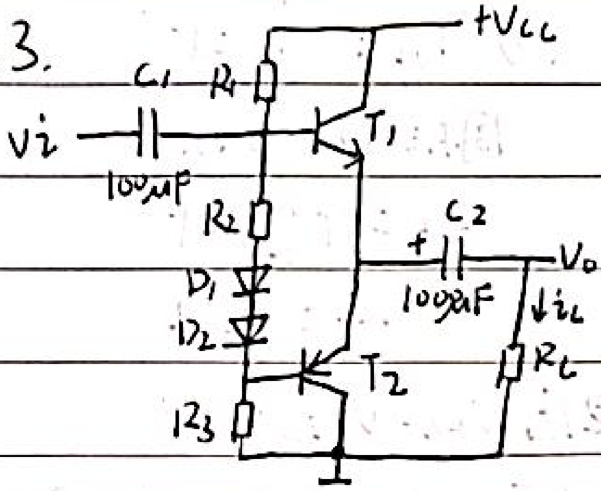


上正下负

3.2. 对OTL

$$P_{om}=\frac{V_{CC}^2}{8R_L}=9 \quad V_{CC}=24V$$

3.3.



(1) 应为12V，调R_1、R_3即可

(2) 交越失真说明静态电流过小。调大R_2，以得更多电压

(3) 如果开路

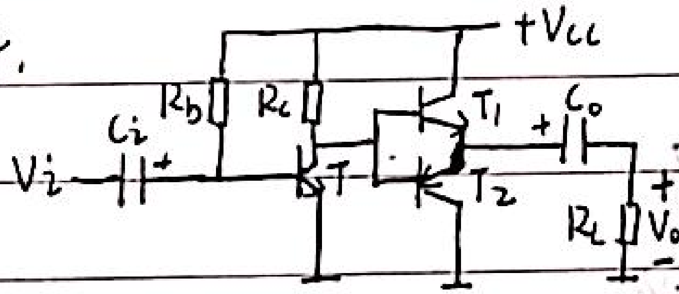
$$I_{B1}=I_{B2}=\frac{V_{CC}-2V_{BE}}{R_1+R_3}=3.58mA$$

$$I_{C1}=I_{C2}=\beta I_B=179mA$$

$$P_C=I_C\cdot V_{CE}=I_C\times\frac{V_{CC}}{2}=895mW>P_{CM}$$

功率管烧坏

3.4.



(1) [illegible]

由OTL输入信号时需同时输入一个 $\frac{V_{CC}}{2}$，$V_{CEQ}=\frac{V_{CC}}{2}=15V$

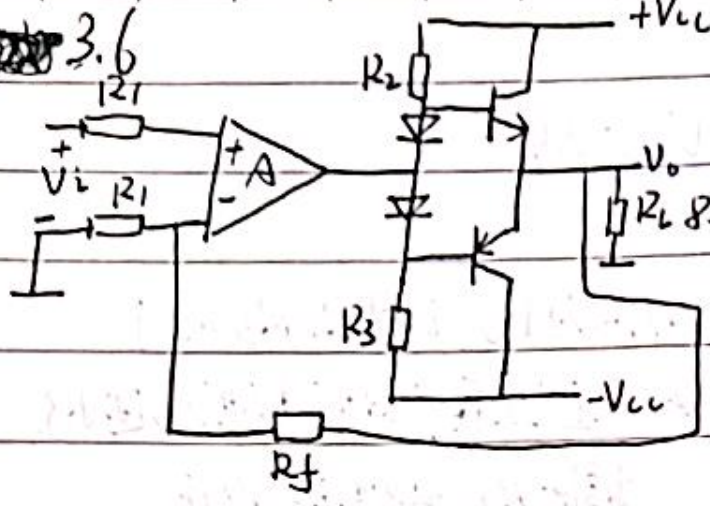
$$I_{CQ}=\frac{V_{CC}-V_{CEQ}}{R_C}=10mA$$

(2) $$P_{om}=\frac{(\frac{V_{CC}}{2}-V_{CES})^2}{2R_L}=9W$$

$$P_E=\frac{V_{CC}\times(\frac{V_{CC}}{2}-V_{CES})}{\pi R_L}=\frac{45}{\pi}W$$

$$\eta=\frac{P_{om}}{P_E}=\frac{\pi}{5}\approx 62.8\%$$

3.6



(1) 提高输入电阻，稳定电压 为串联 为电压 为电压串联负反馈

(2) $A_{vf} = \frac{V_o}{V_i} = 50$

同相比例放大

$A_{vf} = 1 + \frac{R_f}{R_1} = 50$

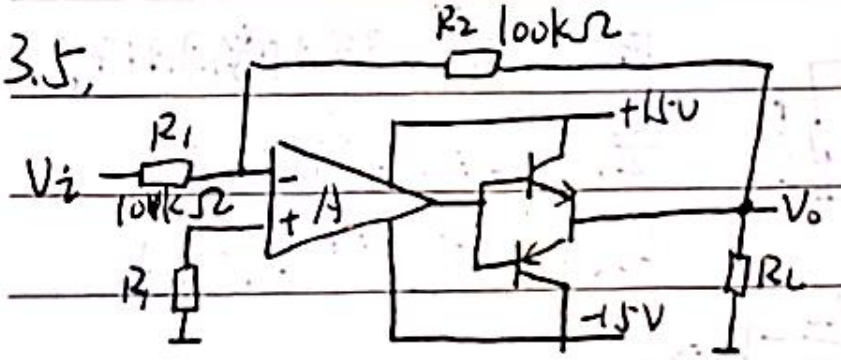
$R_f = 49k\Omega$

(3) 由饱和压降决定时：输出电压 $V_{cc} - V_{CES} = 14V$

由运放输出决定时：输出电压 $13 - 0.7 + 0.7 = 13V$

$$P_{om} = \frac{13^2}{2R_L} = 10.56W$$

3.5



(1) $A_{vf} = -\frac{R_2}{R_1} = -10$

(2) $V_{om} = 10 - 0.7 = 9.3V$

$$P_{om} = \frac{V_{om}^2}{2R_L} = 5.41W$$

(3) $P_E = \frac{2V_{cc}V_{om}}{\pi R_L} = 11.1W$ $P_{T1} = P_{T2} = \frac{1}{2}(P_E - P_{om})$

$= 2.845W$

$\eta = \frac{P_{ow}}{P_E} = 48.7\%$