

Homework 2.1.

Simulate the circuit shown in Fig.1. **BC847A should be used for BJT.**

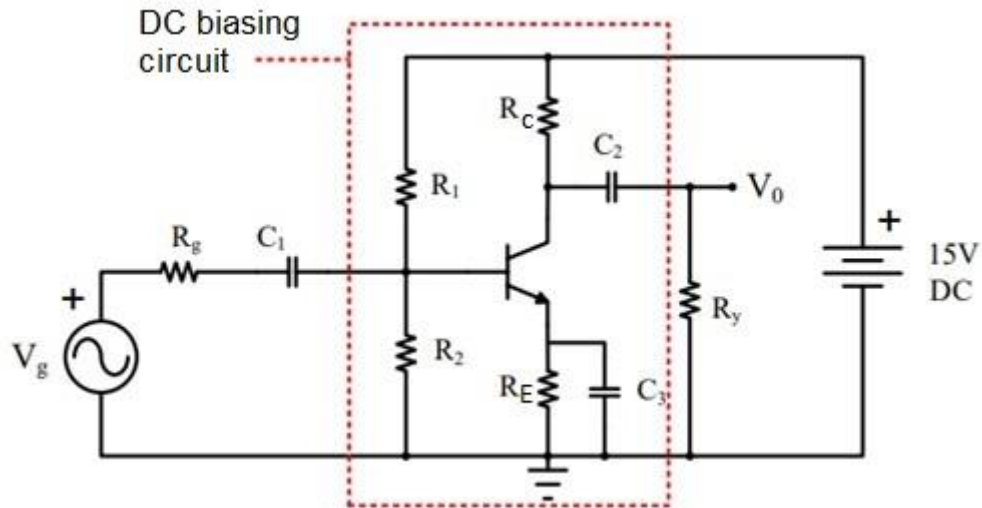


Figure 1. BJT Amplifier

Table 1. Values of components in circuit.

R_1	220 k Ω	R_g	10 k Ω
R_2	33 k Ω	R_y	12 k Ω
R_c	8.2 k Ω	$C_{1,2}$	4.7 μ F
R_E	1.2 k Ω	C_3	220 μ F

Table 2. Input Signal Parameter (V_g) for Homework 2.1.

Exp: 3.1 – V_g	
Type	Sine
Frequency	5 kHz
DC Offset	0V

Outputs:

1. Note the DC operating points.

Table 3. DC Operating Points.

	Theoretical Value	Measured Value
V_C		
V_B		
V_E		
I_C		

2. What is the V_g value at which clipping starts? Also, is there symmetrical clipping?
3. Plot the output voltage (V_o-t), input voltage (V_g-t) and (V_e-t). What is the voltage gain (V_o/V_g) ?
4. Remove the C_3 capacitor from circuit and repeat simulation. Plot the output voltage (V_o-t), input voltage (V_g-t) and (V_e-t). What is the voltage gain (V_o/V_g) ?
5. Explain the circuit and simulation results.

Homework 2.2.

Simulate the circuit shown in Fig.2. **BSP89 should be used for MOSFET.**

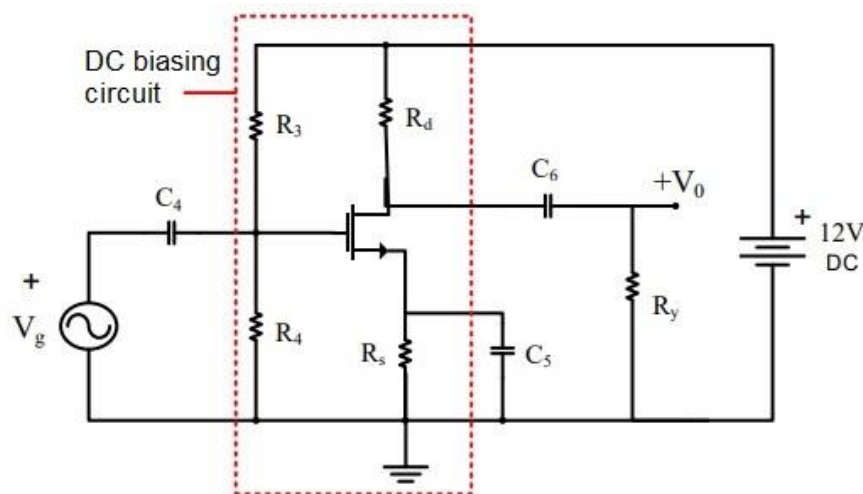


Figure 2. MOSFET Amplifier.

Table 4. Values of components in circuit.

R₃	820 k Ω	R_S	220 Ω
R₄	330 k Ω	R_Y	10 k Ω
R_d	1 k Ω	C_{4,5,6}	1 μ F

Table 5. Input Signal Parameter (V_g) for Homework 2.2.

Exp: 3.2 – V_g	
Type	Sine
Frequency	50 kHz
DC Offset	0V

Outputs:

1. Note the DC operating points.

Table 6. DC Operating Points.

	Theoretical Value	Measured Value
V_C		
V_B		
V_E		
I_C		

2. What is the V_g value at which clipping starts? Also, is there symmetrical clipping?
3. Plot the output voltage (**V_O-t**) and input voltage (**V_g -t**). What is the voltage gain (**V_O/V_g**) ?
4. Remove the C₅ capacitor from circuit and repeat simulation. Plot the output voltage (**V_O-t**) and input voltage (**V_g -t**). What is the voltage gain (**V_O/V_g**) ?
5. Explain the circuit and simulation results.

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