STUDENT LAB SAFETY, HIRARC, DATASHEET VERIFICATION CHECKLIST, AND BRIEF REPORT SUBMISSION

EXPERIMENT E6: COMMON BASE AMPLIFIER

STUDENT NAME : _____
MATRIC NO. : _____
GROUP : _____
DATE : _____

A. Datasheet and Equipment Verification Checklist

Item	Verification Requirement	✓
DC Power Supply	Output voltage verified at +15 V DC	
DC Power Supply	Output polarity verified	
Function Generator	Sine-wave output selected	
Function Generator	Frequency set to 1 kHz	
Oscilloscope	Probe attenuation setting verified (1×/10×)	
Oscilloscope	Ground connection verified	
Multimeter	Correct measurement mode selected	
Breadboard	No damaged contacts or loose connections	
BC547 Transistor	Device type verified (NPN) from datasheet	
BC547 Transistor	Pin configuration (C-B-E) verified from datasheet	
BC547 Transistor	Maximum ratings checked against operating conditions	
Capacitors (10 µF)	Capacitance values verified	
Capacitors (10 µF)	Voltage ratings exceed 15 V DC	
Capacitors (10 µF)	Polarity verified before insertion	
Variable Resistor (1 kΩ)	Resistance range verified	
Resistors	Resistance values verified	
Circuit Wiring	Circuit checked against Figure 1 before energising	

B. HIRARC Checklist

Hazard / Unsafe Condition	Potential Consequence	Control Measure	✓
Incorrect BC547 orientation	Transistor damage or amplifier malfunction	Verify pin configuration using datasheet before insertion	
Incorrect VCC connection	Component damage	Verify polarity and voltage before energising	
Reversed electrolytic capacitor polarity	Capacitor overheating or failure	Check capacitor polarity markings before connection	

Excessive input signal amplitude	Signal clipping and incorrect measurements	Verify function-generator settings before testing	
Incorrect oscilloscope grounding	Measurement errors or unintended short circuit	Verify probe ground before connection	
Short circuit on breadboard	Component overheating or equipment damage	Inspect wiring before power ON	
Incorrect resistor values	Improper biasing and amplifier operation	Verify resistor values before assembly	
Adjusting circuit while power is ON	Component damage and measurement errors	Switch OFF power before modifying circuit	
Damaged probes, wires or components	Unreliable results and equipment malfunction	Perform visual inspection before use	
Incorrect recording of measurements	Invalid gain and impedance calculations	Verify readings before reporting	

C. Engineering Practice Verification

Requirement	✓
BC547 datasheet consulted before circuit construction	
Transistor pin configuration verified from datasheet	
Capacitor polarity and voltage ratings verified	
Power-supply settings checked before energisation	
Oscilloscope and multimeter configured correctly	
Circuit independently cross-checked against schematic	
DC bias voltages verified before AC measurements	
Measured values compared with theoretical expectations	
Results recorded accurately and honestly	
Circuit modifications performed only with power OFF	

D. Student Declaration

I confirm that:
☐ The BC547 datasheet has been consulted.
☐ Transistor pin configuration has been verified.
☐ Capacitor polarity and voltage ratings have been verified.
☐ Resistor and variable-resistor values have been checked.
☐ Function generator and oscilloscope settings comply with laboratory requirements.
☐ Circuit connections have been verified against the laboratory schematic.
☐ Hazards have been identified and appropriate control measures implemented.
☐ No damaged equipment or components are being used.

☐ Demonstrator approval has been obtained before energising the circuit.

Student Signature : _____

Date : _____

E. Experiment Data Results and Discussion

In Lab TASK

TASK 1

EXPERIMENT STEP DC LEVEL CALCULATION & BIASING	**MEASURED**	**CALCULATED**
DC POWER SUPPLY (V_{CC})		
BASE VOLTAGE (V_B)		
COLLECTOR VOLTAGE (V_C)		
EMITTER VOLTAGE (V_E)		

AC Signal Measurements & Gains	**Calculated**	**Measured**
Output Voltage (V_O)		
Measured Input Voltage (V_i')		
Calculated Input Voltage (V_i)		
Voltage Gain (A_V)		

TASK 2

Input & Output Current and Impedance	**Theoretical**	**Measured**	**% Error**
Output Voltage (V_O)			
Calculated Input Voltage (V_i)			
Voltage across R_2			
Input Current (I_i)			

Output Current (I_o)			
Current Gain (A_i)			
Power Gain (A_p)			
Input Impedance (R_i)			

DISCUSSION:

CONCLUSION:

LAB LECTURER
SIGNATURE : _____

DATE : _____

INSTRUCTOR
SIGNATURE : _____

DATE : _____