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

EXPERIMENT E16: DIODE CLIPPING AND CLAMPING CIRCUITS

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

A. Datasheet and Equipment Verification Checklist

Item	Verification Requirement	✓
DC Power Supply	Output voltage verified at +2 V DC	
DC Power Supply	Output polarity verified	
Function Generator	Sinusoidal waveform selected	
Function Generator	Frequency set to 500 Hz	
Function Generator	Output amplitude set to 6 Vpk-pk	
Oscilloscope	Probe attenuation setting verified (1×/10×)	
Oscilloscope	CH1 and CH2 ground connections verified	
Multimeter	Correct measurement mode selected	
Breadboard	No damaged contacts or loose connections	
1N4007 Diode	Anode and cathode identified from datasheet/body marking	
1N4007 Diode	Maximum ratings verified from datasheet	
Resistor (10 kΩ)	Resistance value verified	
Capacitor (0.01 µF / 103)	Capacitance value verified	
Capacitor (0.01 µF)	Voltage rating suitable for the experiment	
Clipping Circuit	Wiring checked against Figure 1	
Clamping Circuit	Wiring checked against Figure 2	
Pre-Test Simulation	PSpice simulation completed before lab	

B. HIRARC Checklist

Hazard / Unsafe Condition	Potential Consequence	Control Measure	✓
Incorrect diode polarity	Incorrect clipping/clamping behaviour and invalid results	Verify anode and cathode before installation	
Reverse DC supply connection	Incorrect circuit operation or component stress	Verify supply polarity before energising	

Incorrect oscilloscope grounding	Measurement error or unintended short circuit	Verify CH1 and CH2 ground connections	
Excessive function-generator output	Component stress and waveform distortion	Verify amplitude and frequency settings before testing	
Incorrect capacitor connection	Incorrect clamping operation and invalid measurements	Verify capacitor value and connection before energising	
Short circuit on breadboard	Circuit malfunction and equipment damage	Inspect wiring before power ON	
Modifying circuit while energised	Component damage and measurement errors	Switch OFF all equipment before modifications	
Incorrect probe placement	Wrong voltage measurements	Verify CH1 and CH2 connections against schematic	
Damaged probes, wires or components	Inaccurate results and unreliable operation	Conduct visual inspection before use	
Incorrect data recording	Invalid comparison between simulation and measurement	Verify values before documentation	

C. Engineering Practice Verification

Requirement	✓
1N4007 datasheet consulted before construction	
Diode polarity verified before energisation	
Function generator settings verified before testing	
Oscilloscope configuration checked before measurement	
Pre-test simulation completed and available for comparison	
Circuit independently checked against schematic	
Simulation results compared with experimental results	
Waveform measurements verified using oscilloscope cursors	
Results recorded accurately and honestly	
Circuit modifications performed only with power OFF	

D. Student Declaration

I confirm that:
☐ The 1N4007 diode datasheet has been consulted.
☐ Diode polarity has been verified before energising the circuit.
☐ Function generator settings comply with laboratory requirements.

☐ Oscilloscope probe connections and grounding have been verified.
☐ Capacitor value and rating have been verified.
☐ Pre-test simulation has been completed.
☐ 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	Input Waveform (CH1) Simulation (PSpice)	Output Waveform (CH2) Measurement (Lab)
TEST 1: Diode Clipping Circuit (Figure 1)		
Max Voltage (V_{max})		
Min Voltage (V_{min})		
Peak-to-Peak Voltage (V_{pk-pk})		
TEST 1: Reversed Diode Polarity		
Max Voltage (V_{max})		
Min Voltage (V_{min})		
Peak-to-Peak Voltage (V_{pk-pk})		
TEST 1: Reversed DC Power Supply Polarity		
Max Voltage (V_{max})		
Min Voltage (V_{min})		
Peak-to-Peak Voltage (V_{pk-pk})		
TEST 2: Diode Clamping Circuit (Figure 2)		
Max Voltage (V_{max})		
Min Voltage (V_{min})		
Peak-to-Peak Voltage (V_{pk-pk})		
TEST 2: Reversed Diode Polarity		
Max Voltage (V_{max})		
Min Voltage (V_{min})		
Peak-to-Peak Voltage (V_{pk-pk})		
TEST 2: Reversed DC Power Supply Polarity		

Max Voltage (V_{max})		
Min Voltage (V_{min})		
Peak-to-Peak Voltage (V_{pk-pk})		

DISCUSSION:

CONCLUSION:

LAB LECTURER SIGNATURE : _____

DATE : _____

INSTRUCTOR SIGNATURE : _____

DATE : _____