

# Electronic Circuits I – Laboratory 02

## Testing diodes in DC, and AC circuits

#	Student ID	Student Name	Grade (10)	Instructor signature
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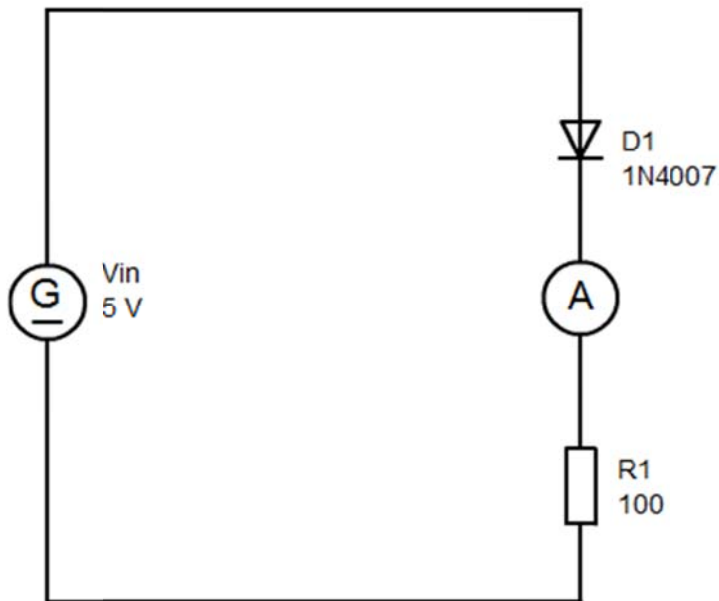
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## Part 1

### Objectives

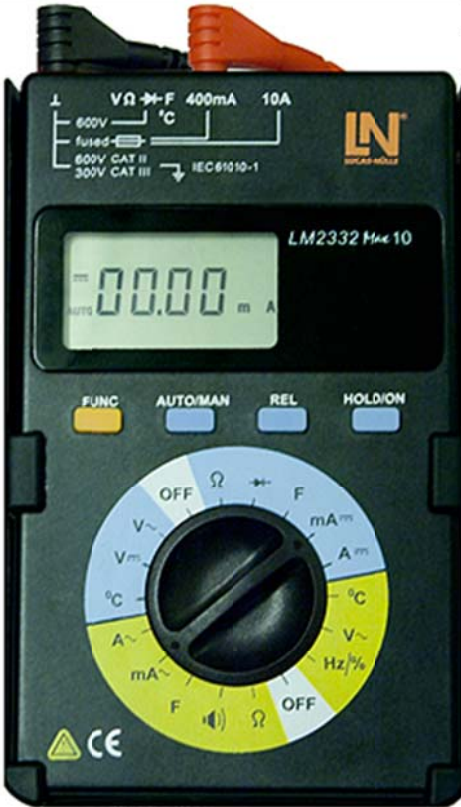

- Recording a voltage-current characteristic
- Determining breakdown voltage
- Forward and reverse-bias response of a diode

### Circuit diagram

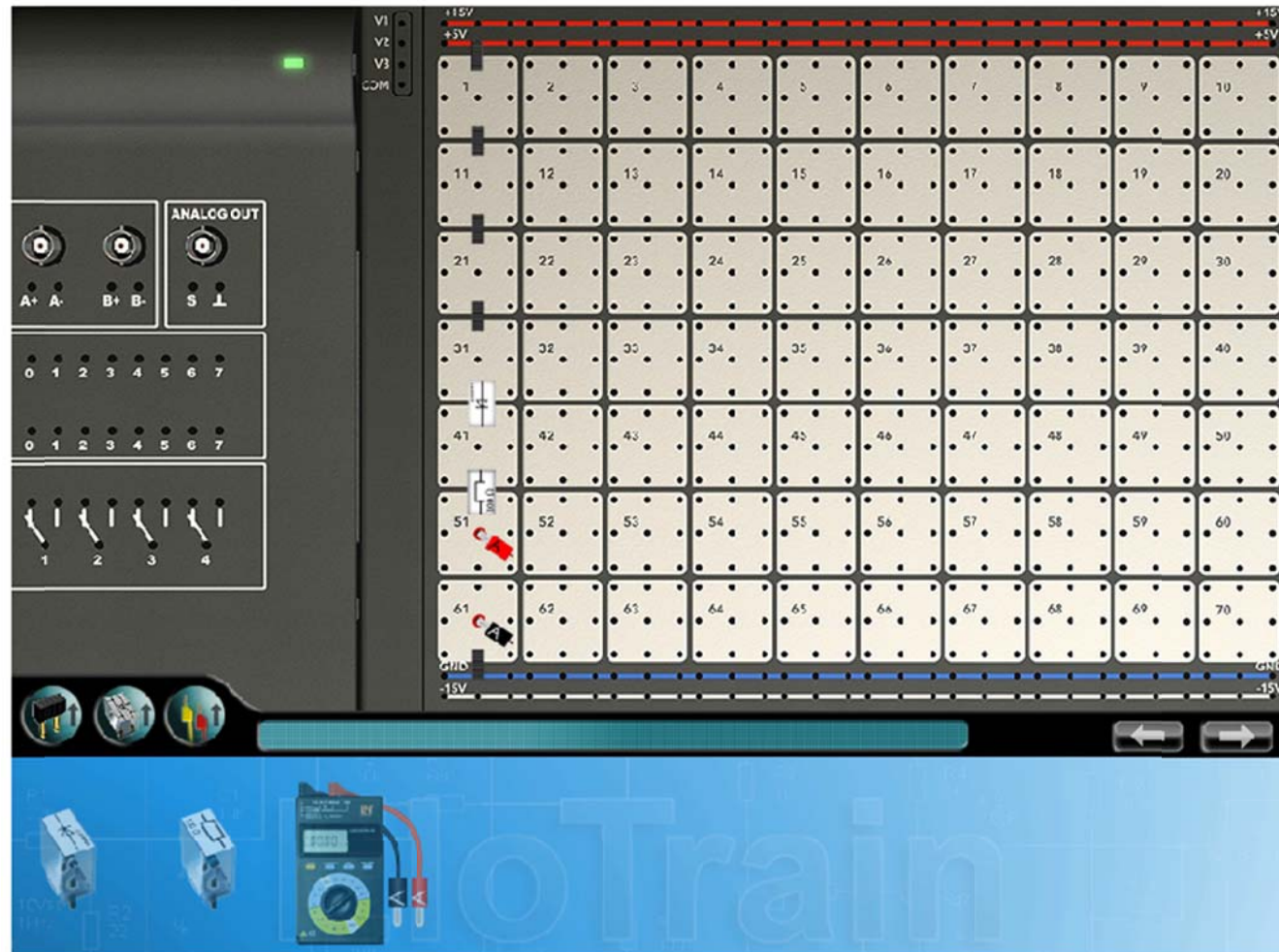


## Equipment

The following equipment is needed for this experiment and should be configured as shown:

Equipment	Settings	
	Black lead	Ground
	Red lead	400 mA input
	Selector knob	mA =
		Plug the red and black leads into the sockets indicated.

## Experiment set-up



## Experiment procedure and exercises

What current flows through the diode in the forward-bias direction?

$I_{\text{forward}}$ (mA)	
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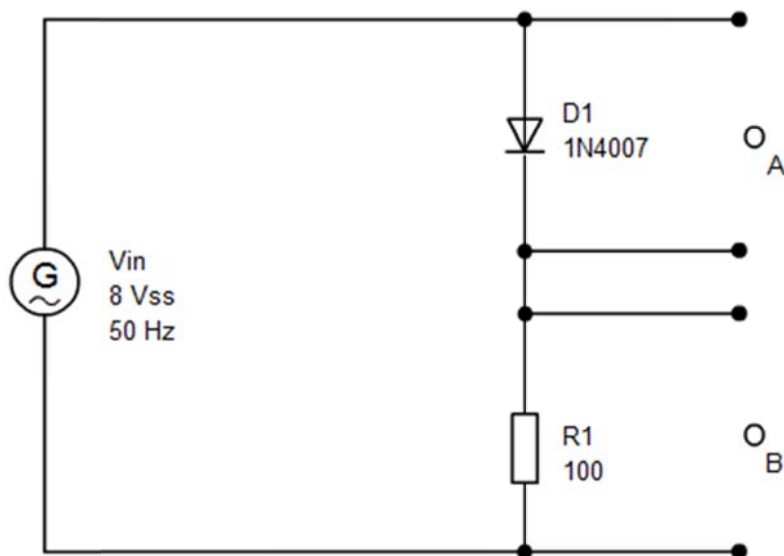
Now use the diode in the reverse-bias direction. What is the current now?

$I_{\text{reverse}}$ (mA)	
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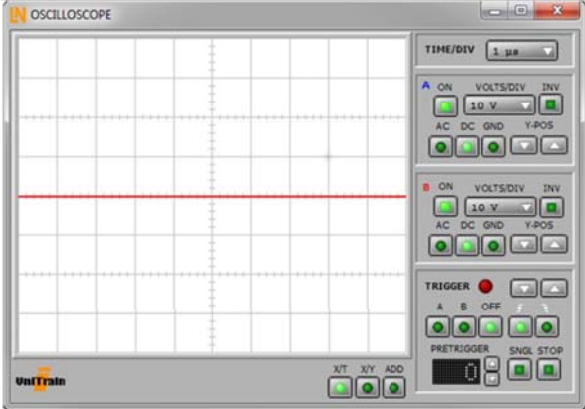
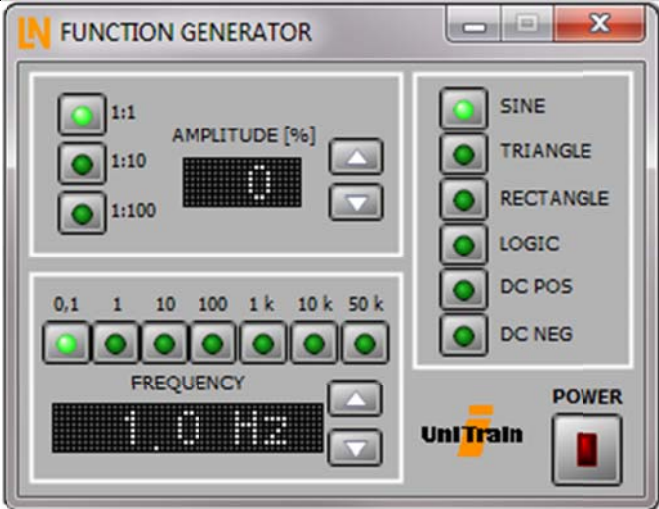
### Part 2

#### Circuit diagram

This experiment is based on the following circuit:

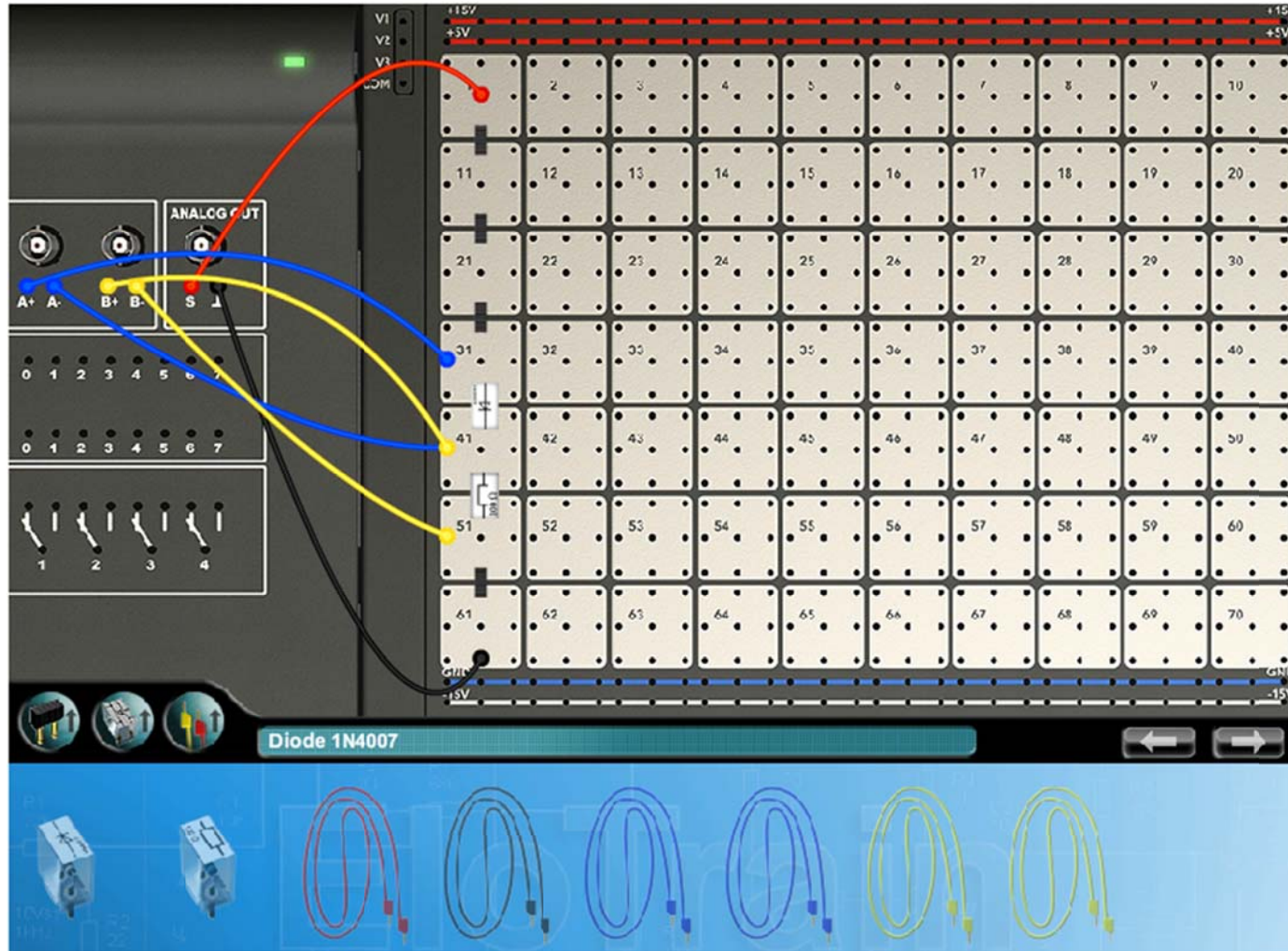


## Equipment

Equipment	Settings																												
		<table border="1"> <thead> <tr> <th></th> <th>Channel A</th> <th>Channel B</th> </tr> </thead> <tbody> <tr> <td>Sensitivity</td> <td>1 V/div</td> <td>1 V/div</td> </tr> <tr> <td>Coupling</td> <td>DC</td> <td>DC</td> </tr> <tr> <td>Polarity</td> <td>Normal</td> <td>Normal</td> </tr> <tr> <td>Y position</td> <td>0</td> <td>0</td> </tr> <tr> <td>Time base</td> <td colspan="2">2 ms/div</td> </tr> <tr> <td>Mode</td> <td colspan="2">X/T</td> </tr> <tr> <td>Trigger channel</td> <td colspan="2">A</td> </tr> <tr> <td>Trigger edge</td> <td colspan="2">Pos</td> </tr> </tbody> </table>		Channel A	Channel B	Sensitivity	1 V/div	1 V/div	Coupling	DC	DC	Polarity	Normal	Normal	Y position	0	0	Time base	2 ms/div		Mode	X/T		Trigger channel	A		Trigger edge	Pos	
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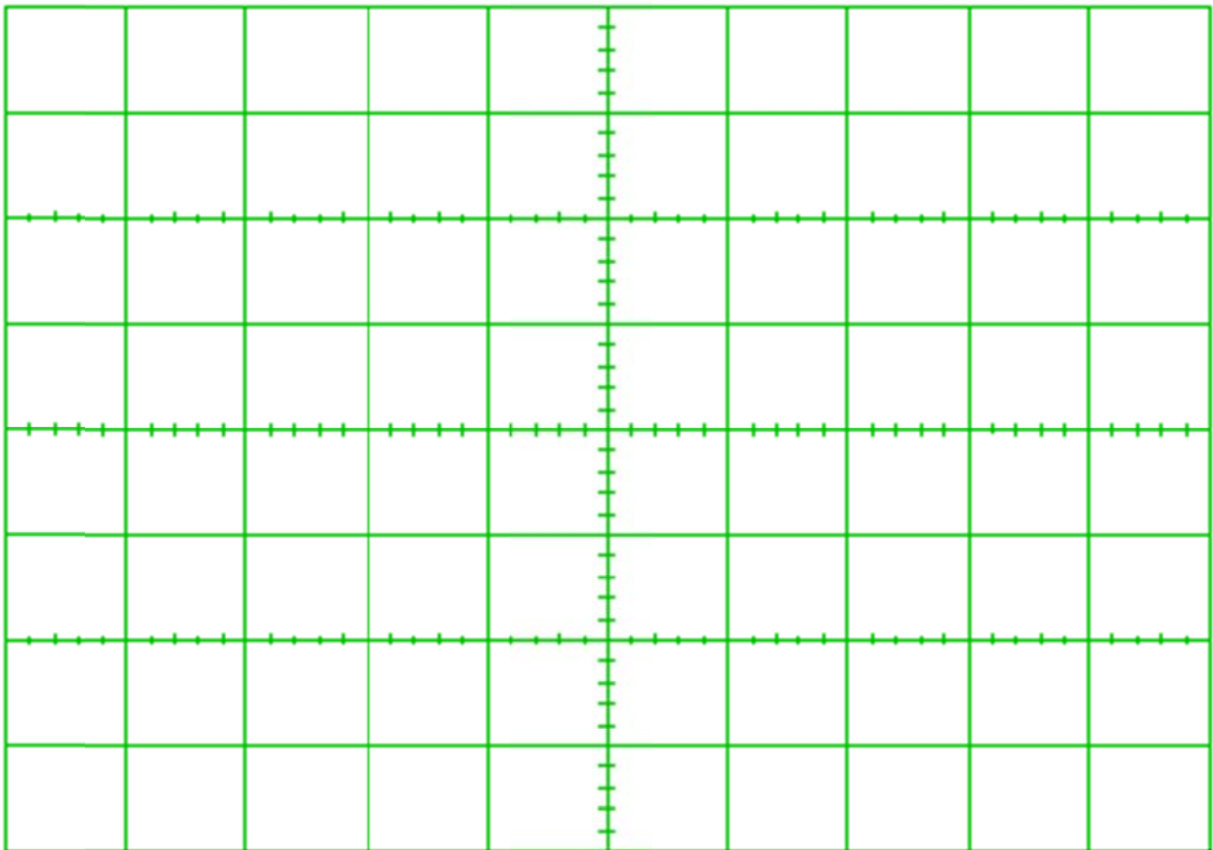


## Experiment set-up



## Experiment procedure and exercises

Connect the AC power supply to the terminals labelled ~ in the set-up illustration. Set a value of approximately 4 V<sub>p</sub> for the peak voltage at the output of the function generator. Connect the measuring input of the oscilloscope to the indicated positions and enter the parameters as shown above. To begin with, only switch on channel A of the oscilloscope. Copy the oscilloscope trace into the diagram provided.





What is the breakdown voltage of the diode?

$V_{\text{break}}$ (V)	
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Swap out the 100-ohm resistor for one of 330 ohms. How does this change the reverse-bias voltage?

<input type="checkbox"/>	It remains roughly constant.
<input type="checkbox"/>	The reverse-bias voltage is three times higher.
<input type="checkbox"/>	The reverse-bias voltage is a third of what it was.

Now switch the oscilloscope to X/Y mode and turn on channel B as well.

