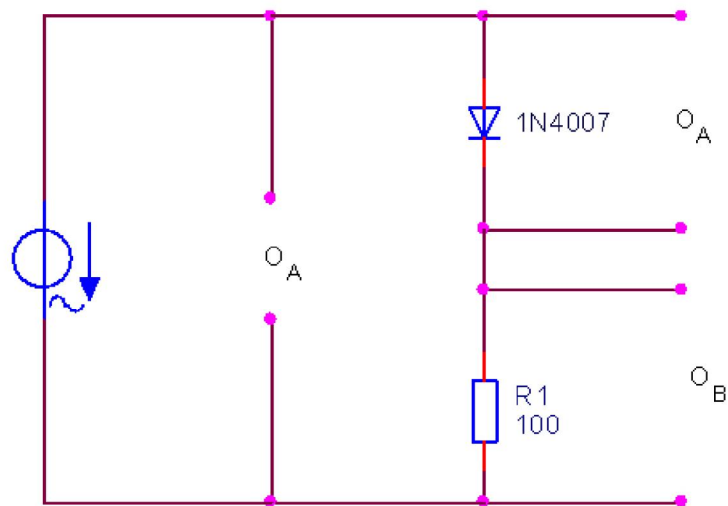


(1) Characteristics

The following circuit diagram is used in this experiment:



Components





The following components are needed for this experiment:

Parts	Id no.	Designation
2	SO5126-5M	Cables
12	SO5124-6F	Bridges, small
1	PS4121-2N	R 100
1	PS4122-7C	Diode 1N4007



Cable connections

The following cable connections are used in this experiment:

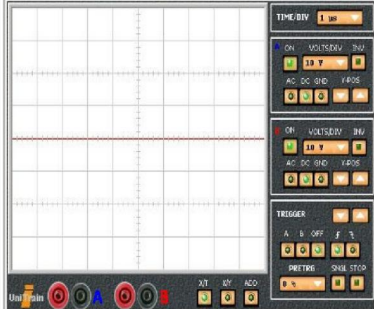
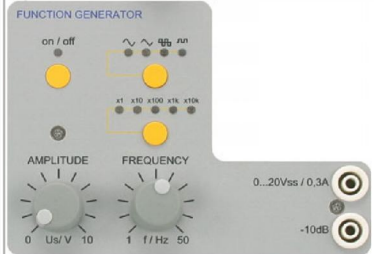
Designation	Symbol	Equipment	Sockets
FG		FUNCTION GENERATOR	0...20V _{ss} / 0,3A 
GND		MULTI POWER SUPPLY 60VA / 500KHz	

Connect the specified sockets with the plug terminals designated in the layout diagram.



Equipment

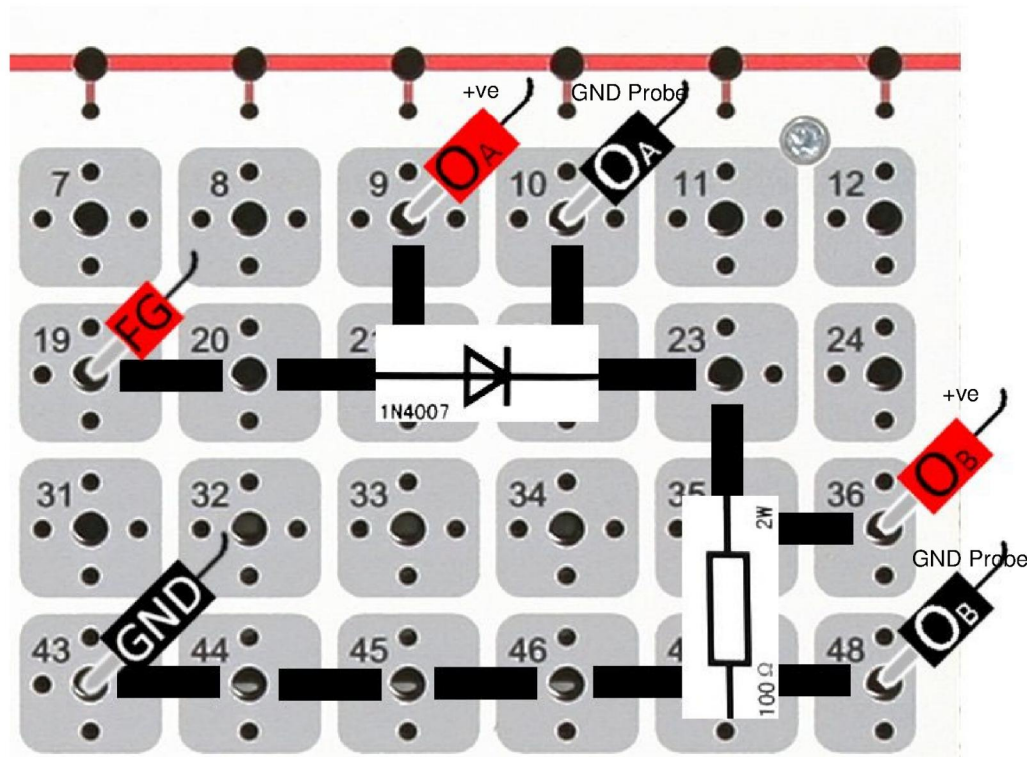
The following equipment is needed in this experiment including the corresponding settings:

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>norm</td> <td>norm</td> </tr> <tr> <td>y-pos</td> <td>0</td> <td>0</td> </tr> <tr> <td>Time base</td> <td colspan="2">2 msec/DIV</td> </tr> <tr> <td>Modus</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	norm	norm	y-pos	0	0	Time base	2 msec/DIV		Modus	X/T		Trigger channel	A		Trigger edge	pos	
		Channel A	Channel B																									
	Sensitivity	1 V/DIV	1 V/DIV																									
	Coupling	DC	DC																									
	Polarity	norm	norm																									
	y-pos	0	0																									
	Time base	2 msec/DIV																										
	Modus	X/T																										
	Trigger channel	A																										
	Trigger edge	pos																										
	Curve shape	sinusoidal																										
	Amplitude	4V																										
	Frequency factor	x1																										
	Frequency	50Hz																										



Experiment set-up

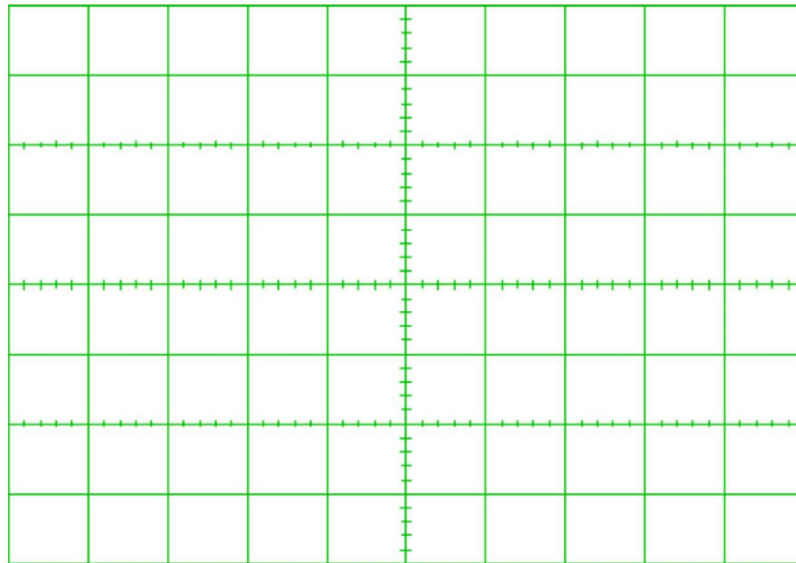
Please set up the experiment now as a testing station in the upper right corner of the patch panel.



Experiment procedure and exercises

After completing the experiment the user is able to:

- recognise the oscilloscope trace of a diode.
 - read the reversing voltage
 - measure the characteristic of a diode
- 💡 Connect the AC power supply to the locations designated ~ in the experiment set-up. On the function generator set the output voltage to a value of approx. 4 V. Connect the measurement terminals of the oscilloscope to the prescribed positions and set the instrument to the parameters specified above. Record the oscilloscope trace in the diagram.



How high is the breakdown voltage of the diode?

$U_{\text{break}} =$ _____ V

You can identify the breakdown voltage by the severed half-wave on channel A of the oscilloscope. To attain a better reading of the the voltage value set the input sensitivity of channel A briefly to 0.5 V/div.

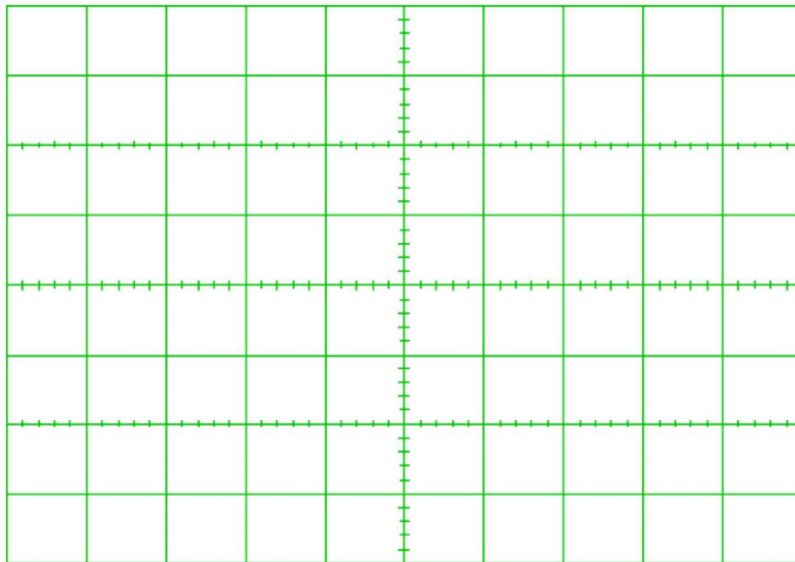


💡 Exchange the 100 ohm resistor for a 330 ohm resistor. How does the reversing voltage respond now?

- It remains approximately constant.
- The reversing voltage is tripled.
- The reversing voltage is reduced to one third.

💡 As previously conduct the measurement with the higher sensitivity of channel A.

💡 Now set the oscilloscope to the X/Y display modus. Record the characteristic in the diagram.

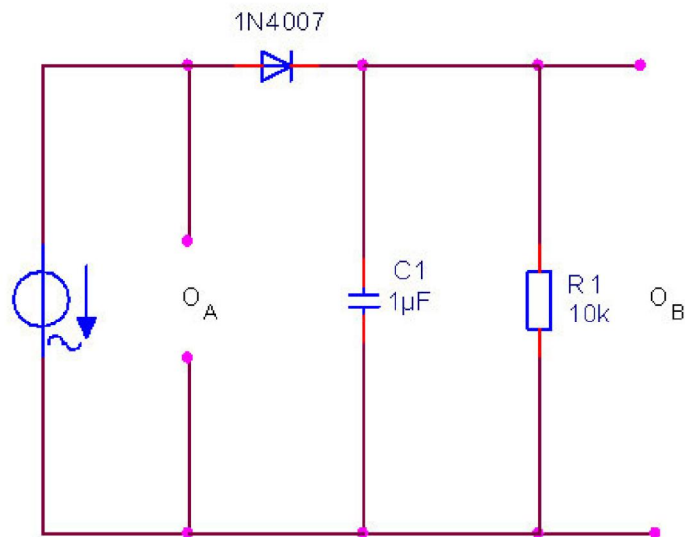




(2) Half-wave rectifier

Circuit diagram

The following circuit diagram is used for this experiment:



Components

The following components are needed for this experiment:

Parts	Id no.	Designation
2	SO5126-5M	Cable
10	SO5124-6F	Bridge, small
1	PS4121-3Q	R 10k
1	PS4122-2E	C 1µ
1	PS4122-7C	Diode 1N4007



Cable connections

The following cable connections are used in these experiments:

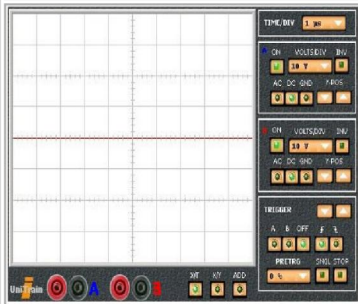
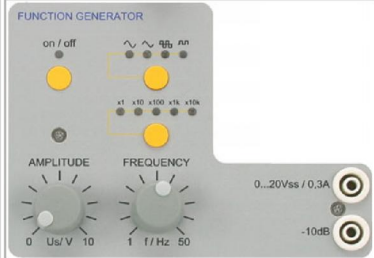
Designation	Symbol	Equipment	Socket
FG		FUNCTION GENERATOR	
GND		MULTI POWER SUPPLY 60VA / 500KHz	

Connect the specified sockets to the plug-in position designated as such on the layout diagram.



Equipment

The following equipment are needed with their corresponding settings for the experiment:

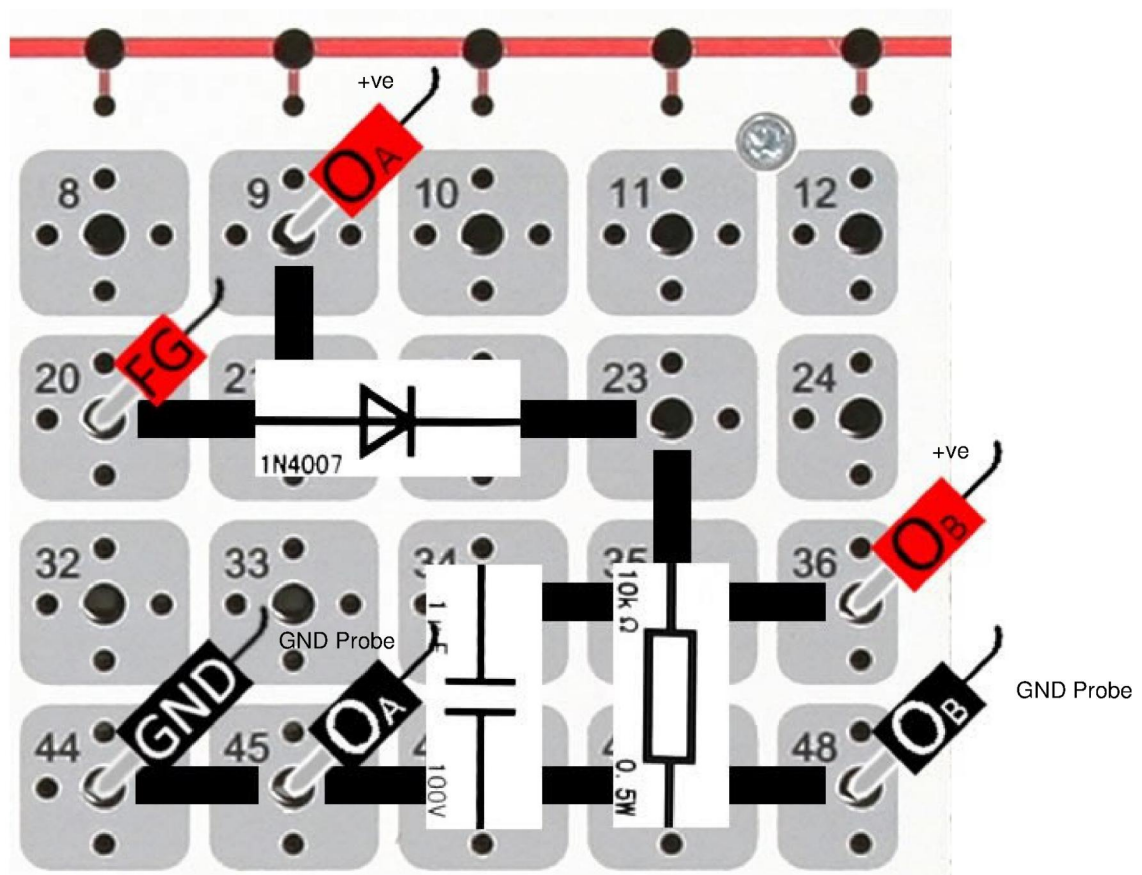
Equipment	Settings		
		Channel A	Channel B
	Sensitivity	1 V/DIV	1 V/DIV
	Coupling	DC	DC
	Polarity	norm	norm
	y-pos	0	0
	Time base	5 msec/DIV	
	Mode	X/T	
	Trigger channel	A	
	Trigger edge	positive	
		Curve shape	sinusoidal
Amplitude		5 V	
Frequency factor		x1	
Frequency		50 Hz	



Experiment setup

Please set up the experiment as a testing station in the upper right hand corner of the patch panel. Begin with the following:

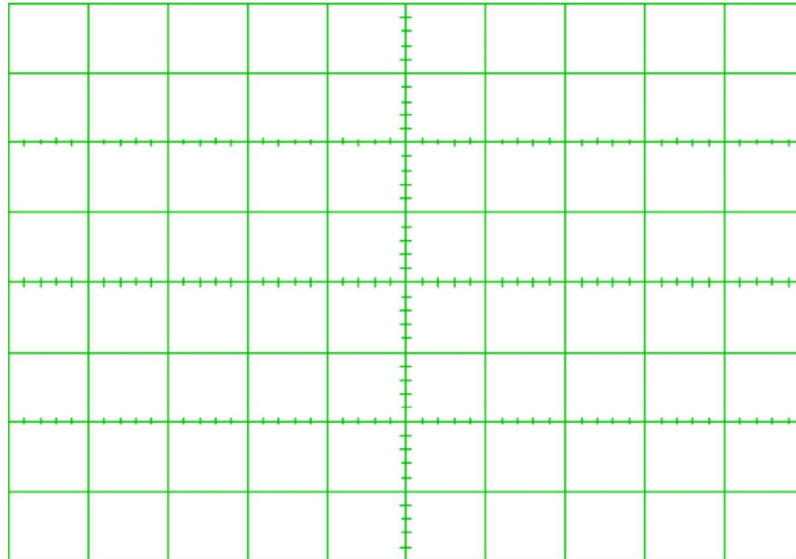
- Bridging plugs
- Electronic components
- Measuring instruments and cables





Experiment procedure and exercises

💡 Set the oscilloscope as specified above. Enter the oscilloscope trace below.



❓ How high is the maximum voltage at the resistor?

$U_{pp} =$ _____ V

💡 Set the oscilloscope so that you can take an optional reading from the oscilloscope. If needed reduce the time base setting so that the positive half-wave is positioned in the middle of the oscillogram.



🔗 Which of the following statements are correct? The ripple...

- becomes lower as the load increases.
- becomes higher as the frequency increases.
- always remains the same.
- becomes lower as the load decreases.
- becomes higher as the frequency decreases.

💡 Do not forget
the results
that you
obtained
above!