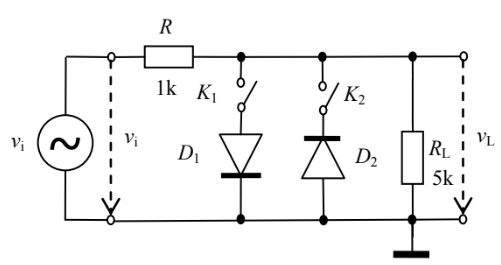
**THE DIODE CLIPPER**

* ***Theoretical Summary***

A diode clipper is used to limit the input AC voltage by flattening the peaks of the waveform. The 2 diodes used in concordance with the load resistances ‘clip’ the voltage peaks in the respective half of the waveform depending on the diodes orientation.



* ***Components***

1. *Vi – Sinusoidal AC Voltage Source*

* provides voltage for the circuit

1. *D1 , D2 – Diodes*

* limit current flow in each direction of the AC current ( positive/negative )

1. *K1, K2 – Switches*

* for opening/closing the circuits made with D1 and D2 for different cases

1. *R - Resistor*
2. *RL – Load Resistor*

* ***Values***
* R = 1kΩ
* RL = 510kΩ
* K1, K2 – cases:

1. No Diodes – K1 = 0; K2 = 0
2. Symmetric – K1 = 1; K2 = 1
3. Asymmetric superior – K1 = 1; K2 = 0
4. Asymmetric inferior – K1 = 0; K2 = 1

* ***Experimental Procedure***
* make the circuit above
* For the 4 cases: No diodes, symmetric, asymmetric superior, asymmetric inferior:
* using an oscilloscope it is measured the input and output waveforms, v1(t) and vL(t)
* the maximum values of the output signal are determined
* ***Measurements – taken from screenshots of oscilloscope (lab 3.3)***

* **Case I – No Diodes**

* **Case II – Symmetric (D1 ON, D2 ON)**
* **Case III – Asymmetric Superior (D1 ON, D2 OFF)**
* **Case IV – Asymmetric Inferior (D1 OFF, D2 ON)**

|  |  |
| --- | --- |
| ***NO DIODES*** | ***SYMMETRIC*** |
| ***ASYMMETRIC – SUPERIOR*** | ***ASYMMETRIC – INFERIOR*** |

* ***Calculations***

* **Case I – No Diodes**

* **Case II – Symmetric (D1 ON, D2 ON)**

* **Case III – Asymmetric Superior (D1 ON, D2 OFF)**

* **Case IV – Asymmetric Inferior (D1 OFF, D2 ON)**
* ***Simulations***

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| --- |
| ***NO DIODES*** |
| ***SYMMETRIC*** |

|  |
| --- |
| ***ASYMMETRIC - SUPERIOR*** |
| ***ASYMMETRIC - INFERIOR*** |