uebung_2.1.3

Student Group

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Task 2.1.3 Z-diode as voltage reference
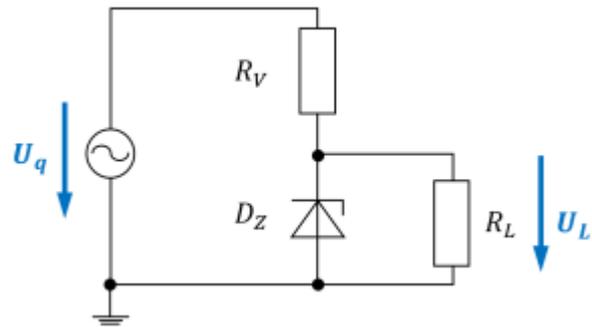
In a voltage reference circuit, a Z-diode enables - despite a fluctuating input voltage - an output voltage to be kept relatively constant. In the simplest case, a circuit as shown on the right can be used for this purpose. The following quantities are to be used for the task:

- Source voltage $U_S=7.0 ... 13.0V$ (e.g. via sinusoidal input voltage with $f = 50 Hz$),
- series resistor $R_V=1.0k\Omega$
- load resistor $R_L=10k\Omega$
- Z-diode D_Z as $BZX84C6V2$ ($U_Z = 6.2 V$)

An ideal (Z) diode would be assumed to hold the breakdown voltage U_Z at all reverse currents I_S.
This is to be checked for the real diode.

1. Model the circuit in Tina TI and insert a picture of the circuit.
2. Compare the progression of U_L to U_S. In particular, measure the maximum and minimum values of U_L.
3. Change the load resistance to $R_L=1.0k\Omega$ and perform the same comparison of U_L to U_S again.

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4. How can the difference be explained?

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