

# Lab. nr 28

## Ram memory

**Goals:** Become acquainted with the principles of the ram memory operation.

### 1. Experiment

- 1.1 Analyse the circuit diagram given in Figure 1.
- 1.2 Redraw the circuit diagram adding correct pin numbers in IC 780101 (the same as in 7489) and IC 7416.
- 1.3. Connect 4 LED diodes with the 78101 inputs.
- 1.4 Write 16 words (each 4 bits long) into the memory according to the TA suggestion (for example Gray codes of the first 16 numbers)
- 1.5 Reconnect the 4 LED diodes for the reading of the numbers stored in the memory.
- 1.6 Read the stored numbers.
- 1.7 Fulfil the memory with 16 identical words.
- 1.8 Check the resistance of the memory against the controlled power supply voltage lowering in the region down to 2V. The effect of the voltage lowering observe after the power supply voltage turning buck to proper value (5V).
- 1.9 Draw the diagram showing the dependence of the number of losses on the minimal value of the power supply voltage applied for the time of about 1s.

### 2 Background

- 2.1 Basic knowledge about memories currently used In digital electronics.
- 2.2 Operation of the memory, signals like CS, WE and others.
- 2.3 3-state logic and OC (open collector) circuits.
- 2.4 Parameters of the IC 780101.

### Literature

- [1] P. Horowitz, W. Hill, *The Art of Electronics*.
- [2] T. C. Hayes, P. Horowitz, *Student Manual for The Art of Electronics*.
- [1] J. Pieńkos, J. Turczyński *Układy scalone TTL w systemach cyfrowych*.
- [2] D. Nährman *Elektronika łatwiejsza niż przypuszczasz*.

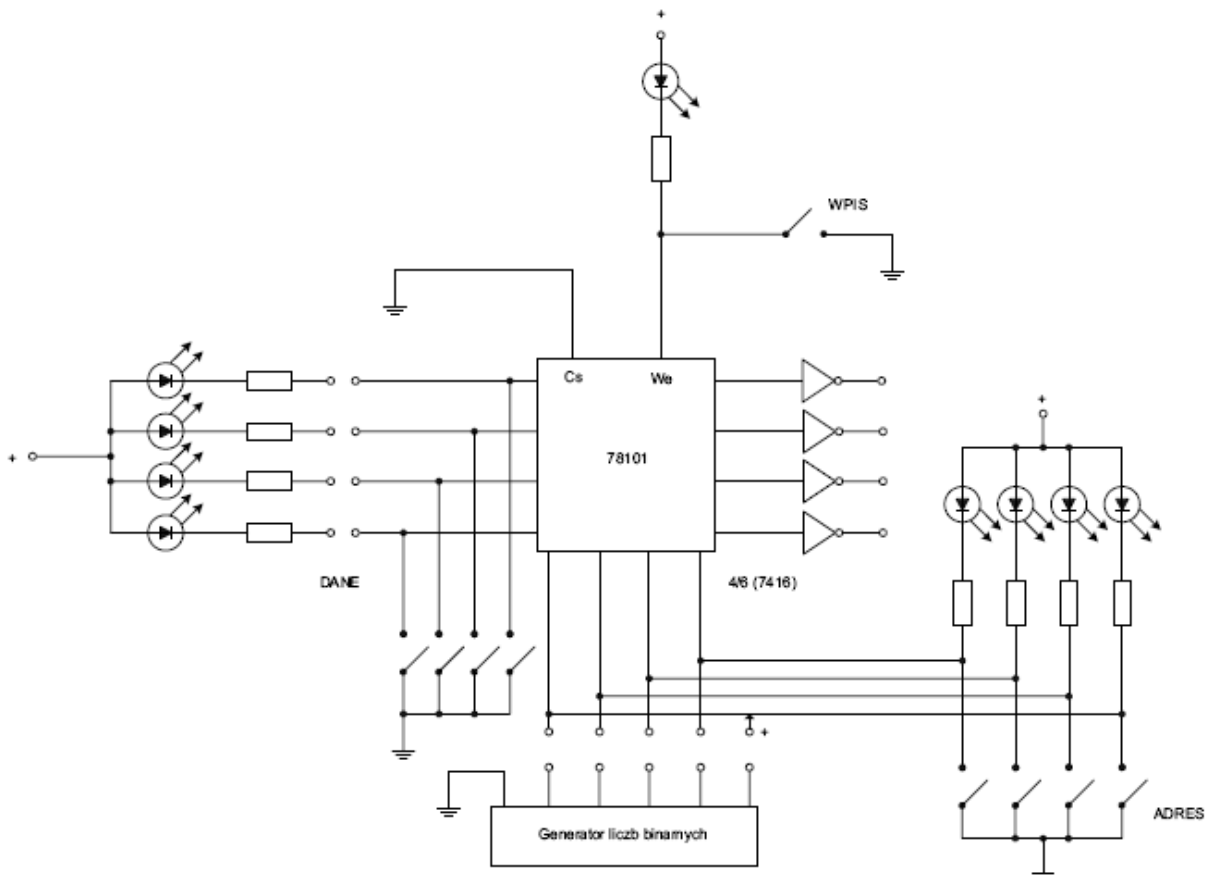


Fig. 1. Scheme of the circuit for writing and reading of the 780101 memory.

