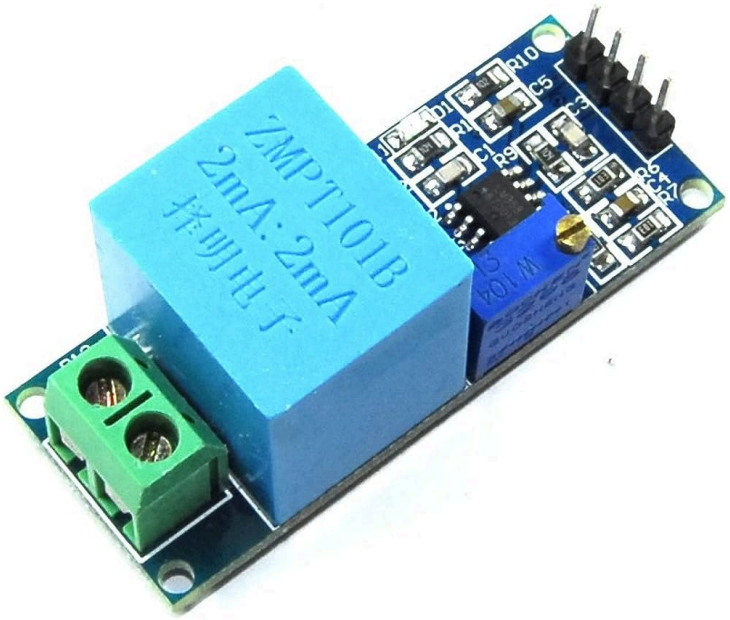


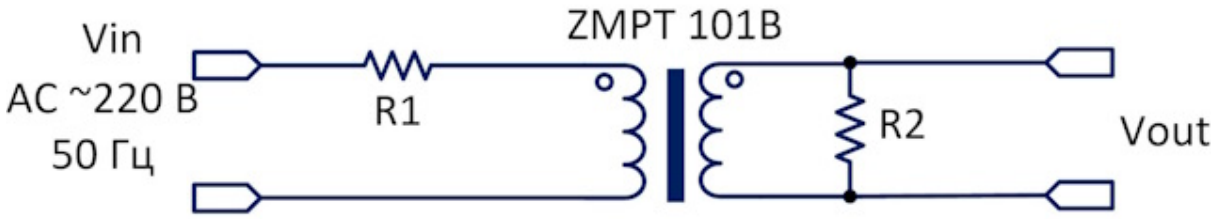
ZMPT101B is a precision AC voltage sensor. The sensor offers high accuracy and consistent performance for measuring voltages up to 250 V and power. The module also includes a multi-turn potentiometer for adjusting (calibrating) the ADC output signal.

This device can be used for measuring AC voltage and current, power, energy consumption, and overload current. It is widely used in household appliances, industrial applications, testing equipment, and relay protection.

Parameters of the ZMPT101B Module:

- Measurable input AC voltage: 0-1000 V.
- Maximum insulation breakdown voltage: 4000 V.
- Transformer transformation ratio: 1000:1000 (2 mA : 2 mA).
- Rated primary winding current of the transformer: 2 mA.
- Rated secondary winding current of the transformer: 2 mA.
- Transformer winding resistance: 100 ohms (at 20 °C).
- Transformer insulation resistance: over 100 MΩ.
- Linearity: 0.1%.
- Accuracy class: 0.2.
- Operating frequency: 50-60 Hz.
- Output signal: analog, from 0 to 5 V.
- Module dimensions: 49.5 x 19.4 mm.
- Operating temperature: -40 ~ +70 °C.

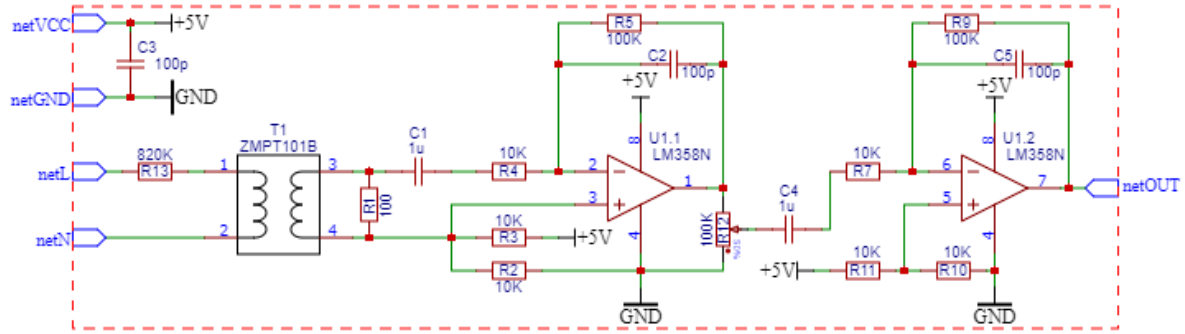
The connection diagram of the ZMPT101B transformer for measuring AC voltage is shown below.



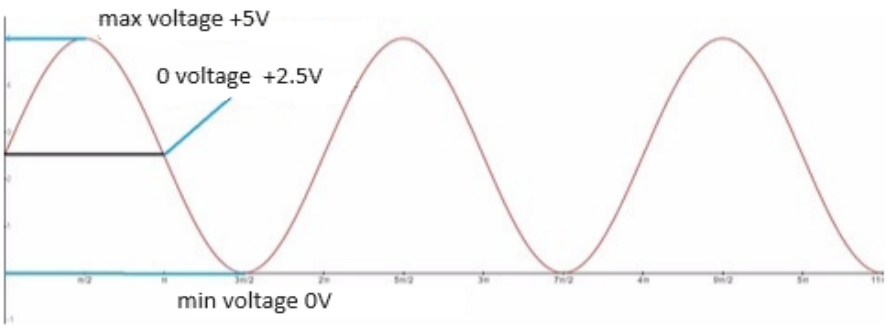
$$Vout = (Vin / R1) * R2$$

The input current (usually set to 1-2 mA) is adjusted by resistor **R1**, while resistor **R2** is connected in parallel to obtain the output voltage. The output voltage is determined by resistors **R1** and **R2**:
Vout = (Vin / R1) * R2.

The schematic of the ZMPT101B module is shown below.



The schematic includes two operational amplifiers that also function as active low-pass filters. Each filter has a gain of 10, resulting in a total gain of 100. The measured voltage at the output of transformer T1 will be 26.8 mV with an input of 220 V (determined by resistors R13 = 820 kΩ and R1 = 100 Ω). The amplified output voltage of the module will vary relative to a 2.5 V level, which corresponds to zero voltage.



The ZMPT101B module has the following pins:

- **VCC**: Power supply for the module, 5 V.
- **GND**: Ground (2 pins).
- **OUT**: Analog output of the module.

On the transformer side, the module has a connector for connecting to the 220 V measurement voltage.

The pinout of the voltage module is shown in the following image.