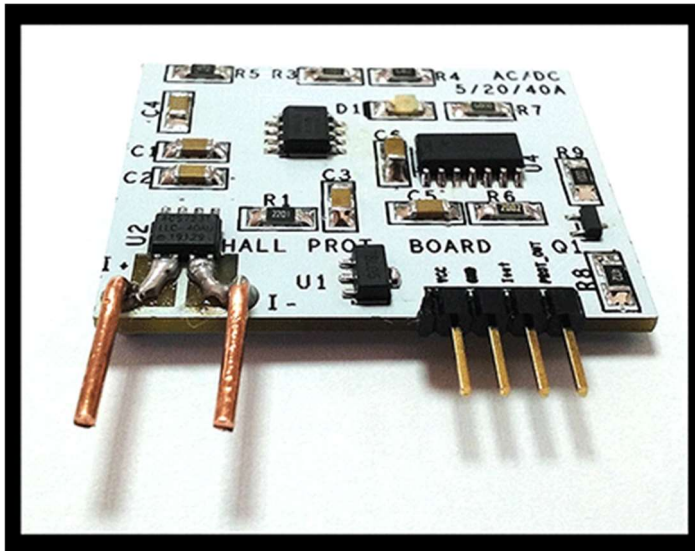


HALL CURRENT SENSOR

5/10/20/30/40



- **Supply voltage:** 5... 24V DC
- **Measuring range:** 0... 50A AC / DC
- **Bandwidth:** 80 kHz
- **Analog and digital outputs**
- **Programmable digital output, TTL / CMOS**
- **Isolation voltage:** 424 V DC / 297 V AC
- **Based on the Allegro ACS723 IC**
- **40mm x 32mm**

The module is based on the ACS723 chip from Allegro Microsystems. The measurement range depends on the chip used, so you can measure current in the following ranges:

RANGE	CHIP	SENSIBILITY	CURRENT
±5A	ACS723-05-AB-T	400 mV / A	AC / DC
0 – 10A	ACS723-10-AU-T	400 mV / A	DC
±10A	ACS723-10-AB-T	200 mV / A	AC / DC
0 – 20A	ACS723-20-AU-T	200 mV / A	DC
±20A	ACS723-20-AB-T	100 mV / A	AC / DC
0 – 40A	ACS723-40-AU-T	100 mV / A	DC
±40A	ACS723-40-AB-T	50 mV / A	AC / DC
±50A	ACS723-50-AB-T	40 mV / A	AC / DC

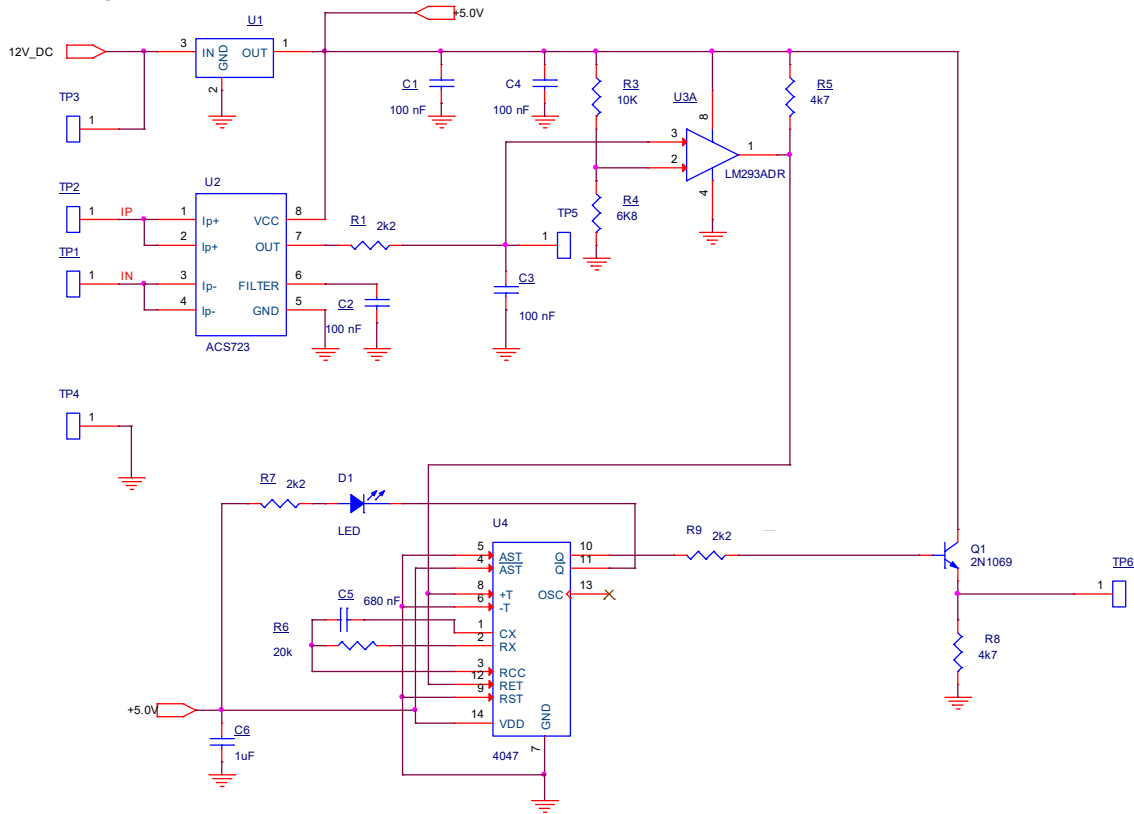


Fig.1. Electronic circuit of the measurement and protection module.

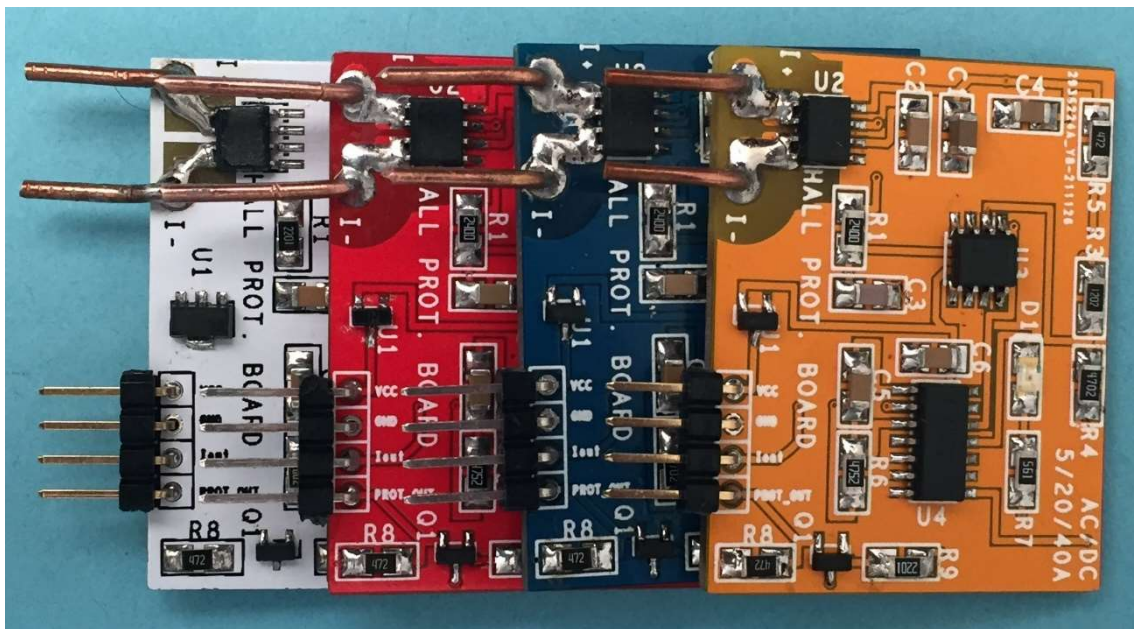


Fig.2. Board in different colors.

The ACS723 chip bases its operation on the Hall effect. Its electronic measurement circuit is totally isolated from the current being measured, as long as the potential difference does not exceed 424V.

Its analog output signal varies linearly as a function of the magnitude and polarity of the current flowing between its I + and I- pins. More details can be found in its datasheet.

The comparator U3 allows programming the trip current of the digital protection output, modifying the voltage in the divider formed by R3 and R4.

The monostable multivibrator U4 guarantees a constant minimum time of the protection signal, which depends on the components C5 and R6, and can be calculated by the formula:

$$T_{min} \approx 2.48 \times R6 \times C5$$

Where: the time in seconds, the resistance in Ohms and the capacitance in Farads.

It is important to note that the presence of the multivibrator is only noticed when the duration of the input pulse is less than the time T_{min} , for longer times, the output signal will always be activated.

This minimum time is of vital importance to guarantee safe protection of the power semiconductors in most converters.

The red LED D1 indicates the status of the protection digital output.

The oscillogram shows the response of the module with a DC chip to the flow of a sinusoidal test current.

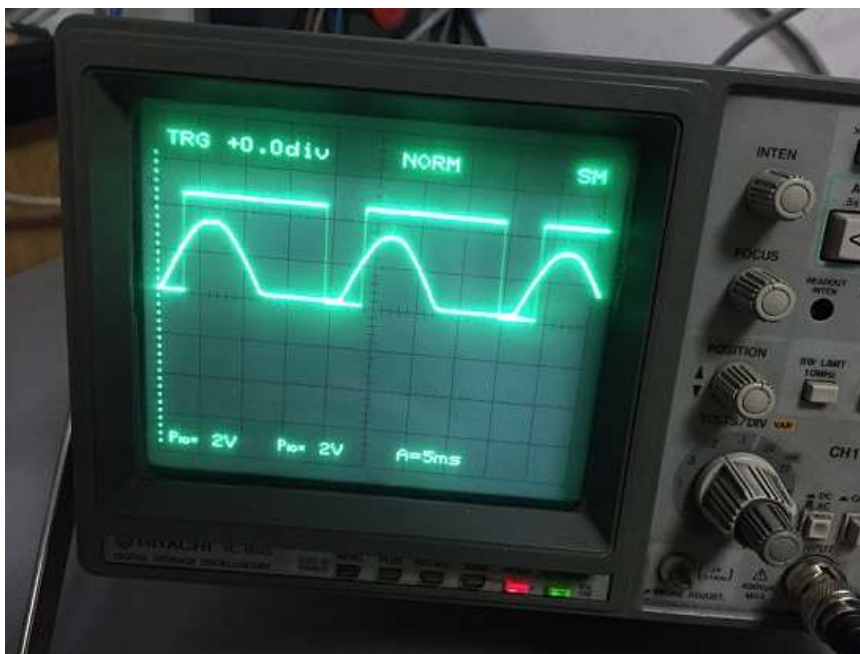


Fig.3. Output signals Oscillogram.

The protection signal passes through the emitter repeater (Q1), which guarantees an output current value of up to 100 mA, allowing the activation of up to six optocouplers.

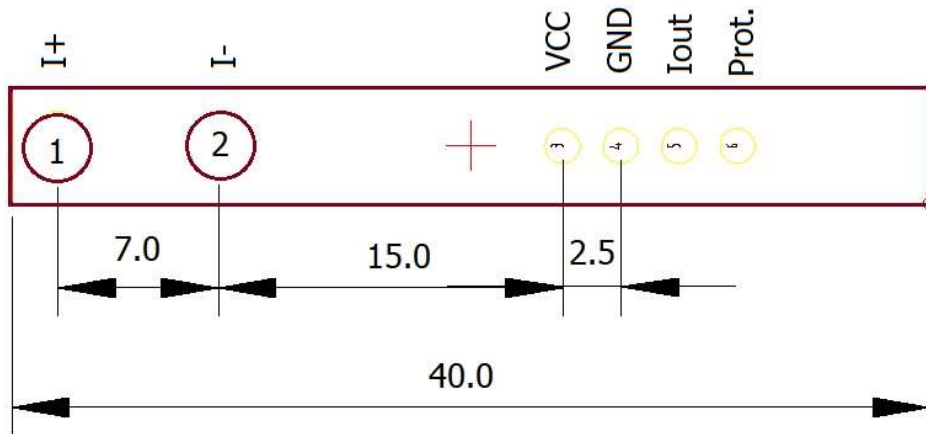


Fig.4. Footprint.

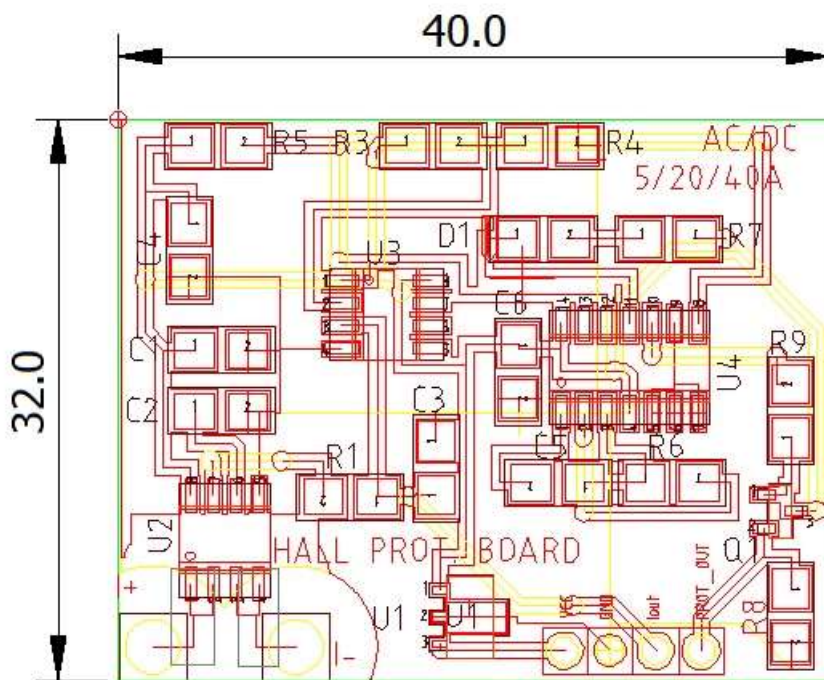


Fig.5. Module dimensions.