3el Proximity Switch
PSW2

Features:

- non-contact infrared switch
- long range sensitivity
- increased sunlight rejection
- high power output
- low current consumption
- wide input voltage range

Description:

PSW2 is a microcontroller based interface circuit for non-contact reflective object sensors. It can adopt various reflective sensors as input devices. The sensor drive signal is modulated to improve direct sunlight rejection. The circuit allows accurate sensing distance adjustment and can switch various resistive, inductive and capacitive loads on output. The output is also protected against short circuits, thermal overloads and electrostatic discharges.

The interface board has dedicated soldering pads allowing to directly connect reflective sensors (ANODE, CATHODE, EMITTER, COLLECTOR), supply voltage and output signal.

The power supply has built in reverse polarity protection diode and a 400W transient voltage suppressor. The circuit allows input voltages up to 40V.

The output signal is derived directly from the positive pole of the input power through a high side HS Power MOSFET switch. Therefore care must be taken for supply voltages over 24V!

The circuit sensitivity can be adjusted by turning a trimmer potentiometer setting up the maximum desired distance the sensor can achieve. The hysteresis between the ON and OFF states can be approximated from the performance graphs.

Applications:

- non-contact reflective object sensor
- assembly line automation
- machine automation
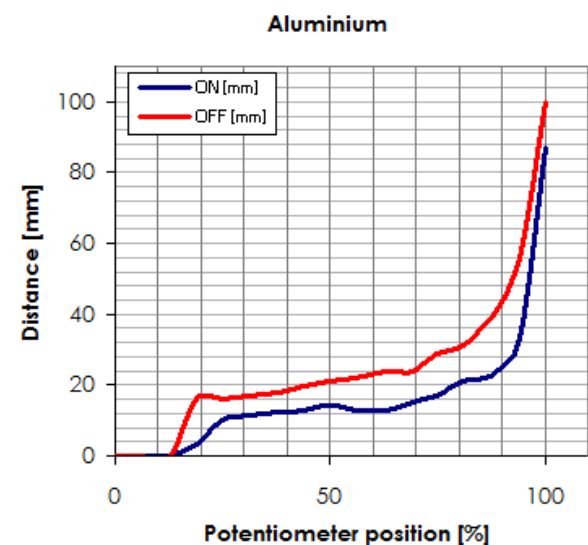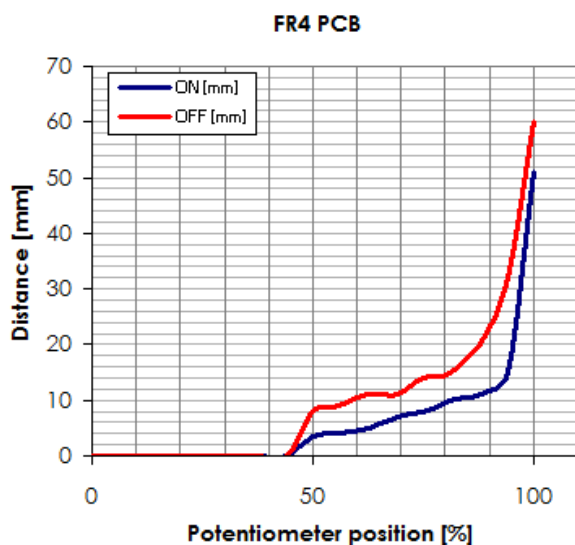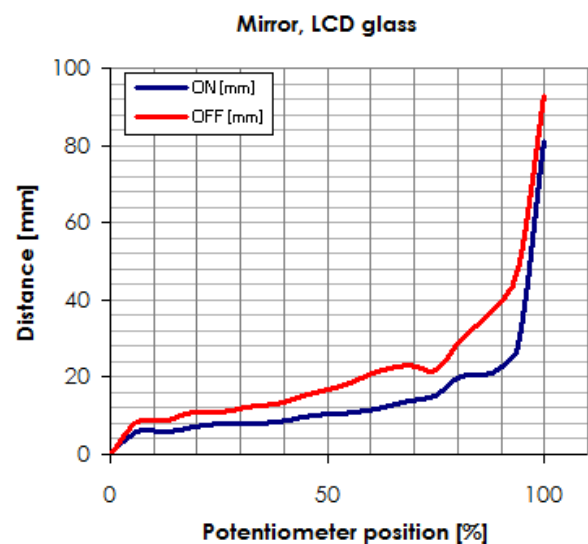- equipment security
- end of travel sensor

Electrical characteristics:

Supply voltage range:	5V … 40V
Nominal input voltage:	24V
Nominal operating voltage of the output switch	34V
Output overvoltage protection:	41V
Output ON-state resistance:	300mΩ
Output nominal load current:	400mA
Operating temperature range:	-40°C … 125°C
Power consumption:	$98mW_{[OFF]} - 137mW_{[ON]}$

Typical performance graphs:

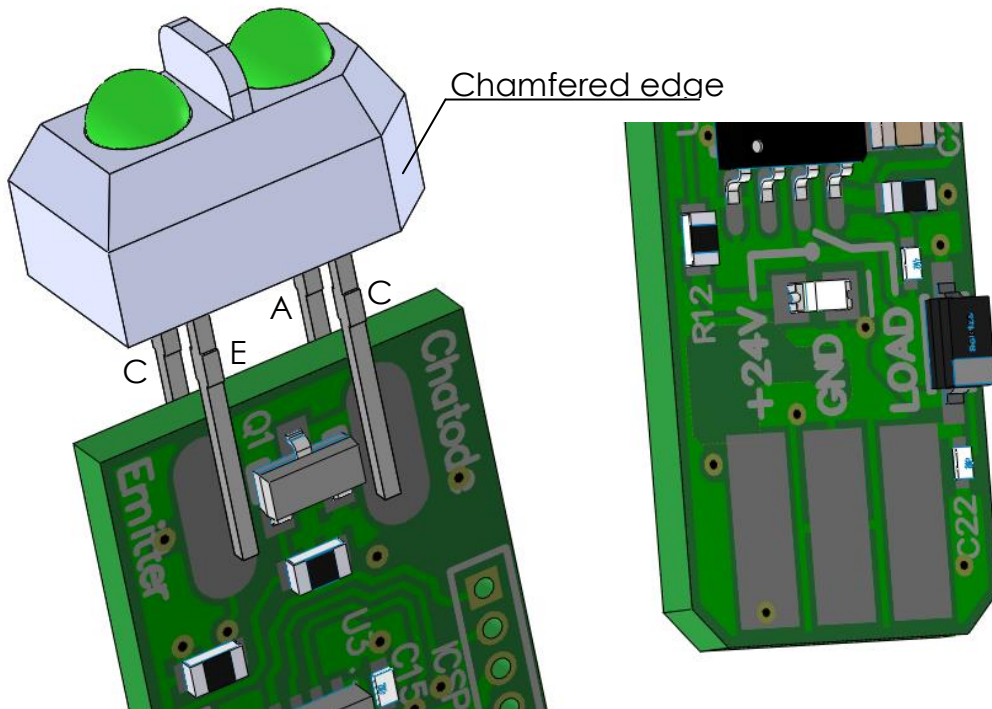All measurements were made indoor, in normal daylight condition.

Green matte PCB

Mirror, LCD glass

FR4 PCB

Aluminium

Application example – electronic details:

Prior using the PSW2 a [TCRT5000](#) reflective optical sensor should be mounted on the exposed pads of the PCB keeping the order of the optical sensor pinouts.

The power and output pads are situated on the opposite end of the PCB (+24V, GND, LOAD). A pin header or individual wires can be soldered on these pads.
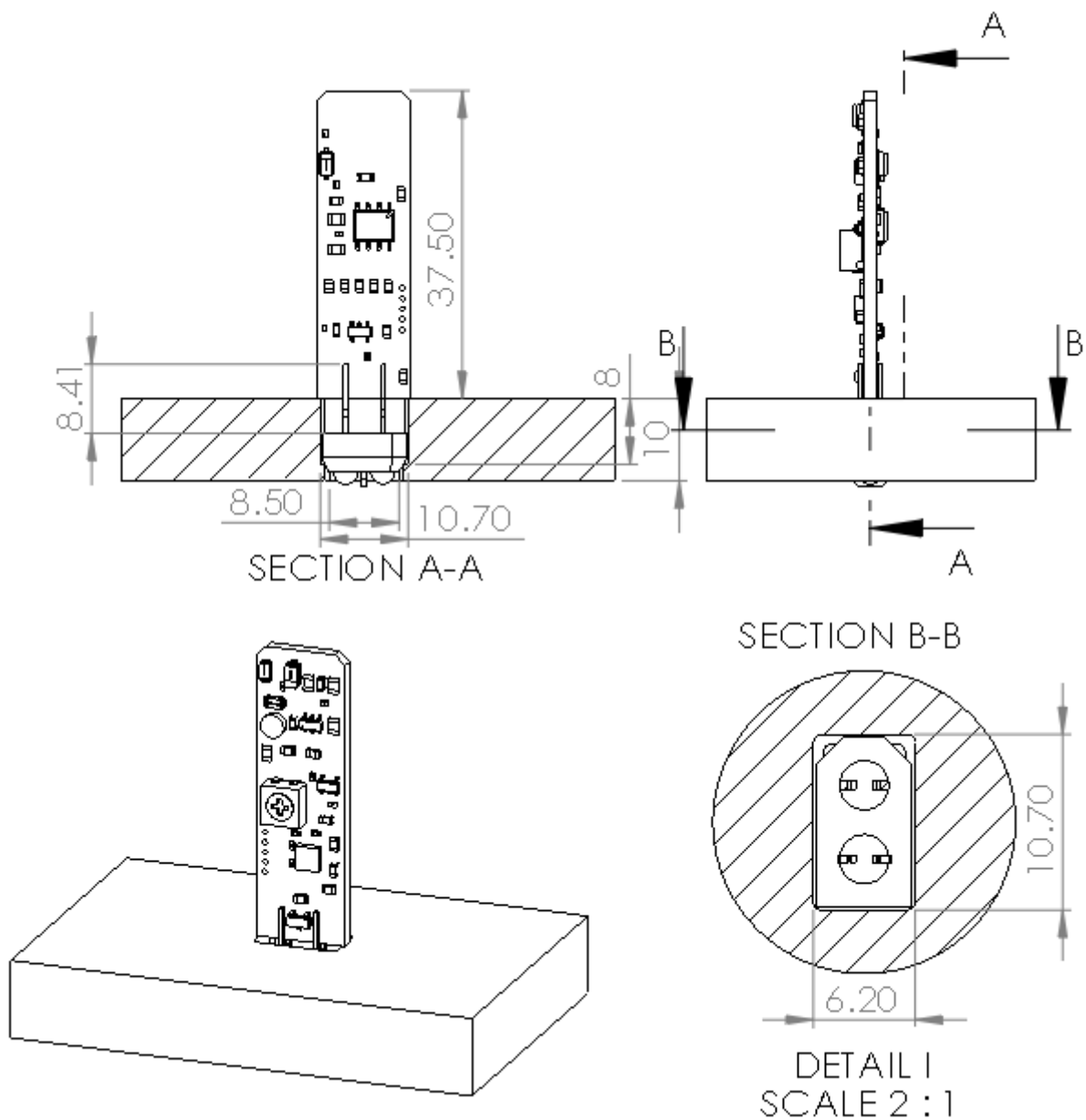
Schematic example:
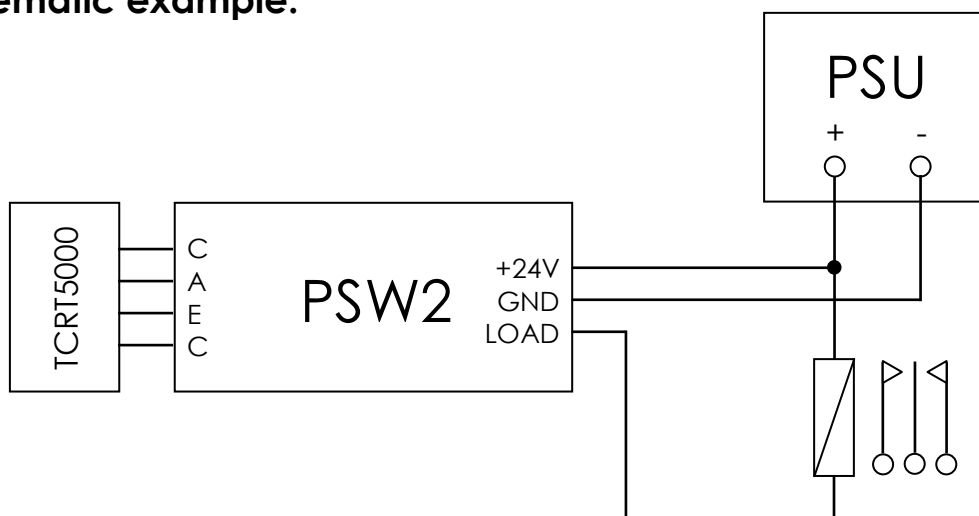
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Application example – mechanical details:

For a 10mm base material, using TCRT5000 reflective optical sensor, the sensor pins should be trimmed to ~8.5mm measured from the bottom surface of the sensor body. The cavity made in the base material should measure 10.70 x 6.20mm. Prior to soldering the PCB on the sensor pins the optical sensor body should be fixed in the cavity with hot glue.

SECTION A-A

SECTION B-B

DETAIL I
SCALE 2 : 1

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Mechanical drawings:

Top side view

Bottom side view

DETAIL view

Contacts DETAIL
Bottom Side

3D view