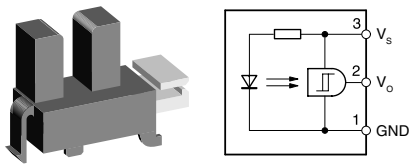
Transmissive Optical Sensor with Schmitt-Trigger Logic Output

Description

The TCYS5201 is a transmissive sensor that includes an infrared emitter and a Photo Schmitt-Trigger with digital output interface, located face-to-face on the optical axes. The package blocks visible light and includes mounting clips and a three pin connector.



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Features

- Package type:
  connector, 3 pin Molex 5267-NA series
  order number: 22-03-5035
- Detector type: Photo Schmitt-Trigger
- Dimensions:
  L 19.8 mm x W 9.9 mm x H 18 mm
- Gap: 5 mm
- Aperture: 0.5 mm
- Typical output current under test: I_C = 16 mA
- Output voltage level is LOW, if IR beam is not interrupted
- Output device TTL compliant, open collector
- Daylight blocking filter
- Emitter wavelength: 950 nm
- Lead (Pb)-free soldering released
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC
- Minimum order quantity: 400 pcs, 400 pcs/bulk

Applications

- Detection of opaque materials, documents etc.
- Paper position sensor in copy machines
- Position sensor for shaft encoders

Handling Precaution

Connect a capacitor with more than 100 nF between V_S and ground in order to stabilize power supply voltage!

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Supply voltage		V_S	16	V
Output voltage		V_O	30	V
Low level output current		I_{OL}	20	mA
Operation temperature range		T_{amb}	- 25 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Supply voltage range		V_S	4.5		5.5	V
High level supply current	V_S = 5 V [1]	I_S		15	30	mA
Low level supply current	V_S = 5 V [2]	I_S		15	30	mA
High level output voltage	V_S = 5 V, R_L = 1 kΩ [1]	V_{OH}	4.5			V
Low level output voltage	V_S = 5 V, I_{OL} = 16 mA [2]	V_{OL}		0.18	0.35	V
Switching frequency	V_S = 5 V, R_L = 47 kΩ	f			3	KHz

[1] Infrared beam interrupted

[2] Infrared beam not interrupted

Note: Operating conditions are stabilized after 100 µs of supply voltage turn on.

Switching Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Rise time	V_S = 5 V, R_L = 1 kΩ (see figure 1)	t_r		50.0		ns
Fall time	V_S = 5 V, R_L = 1 kΩ (see figure 1)	t_f		20.0		ns

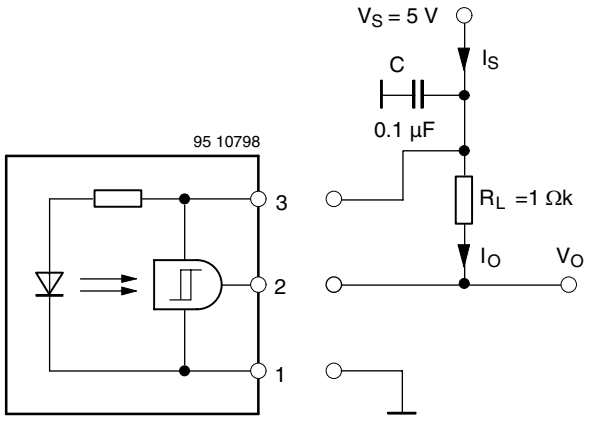


Figure 1. Test circuit and pin connection

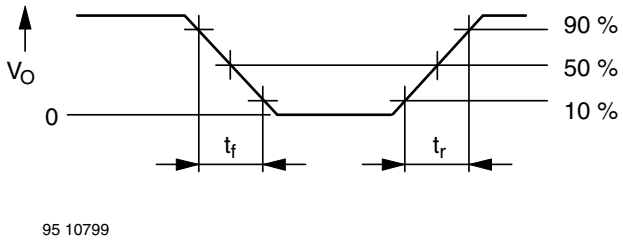


Figure 2. Pulse diagram

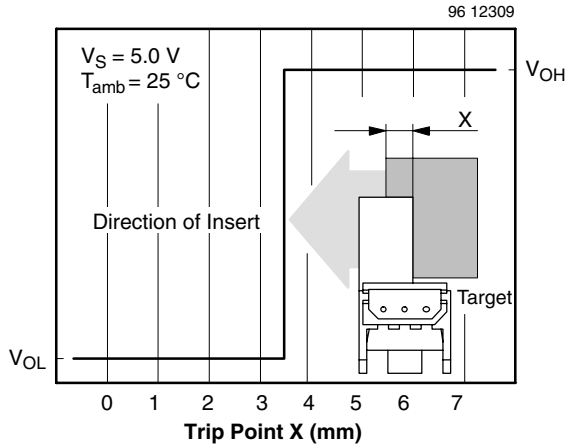


Figure 3. Trip point characteristic

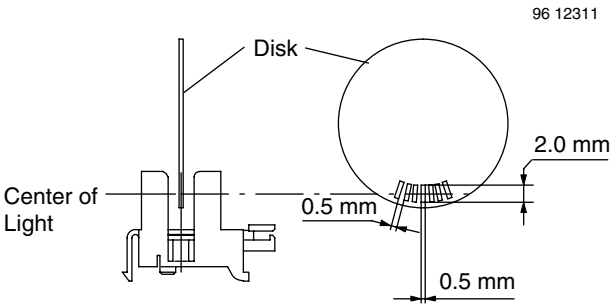


Figure 4. Frequency response

Typical Characteristics

T_{amb} = 25 °C, unless otherwise specified

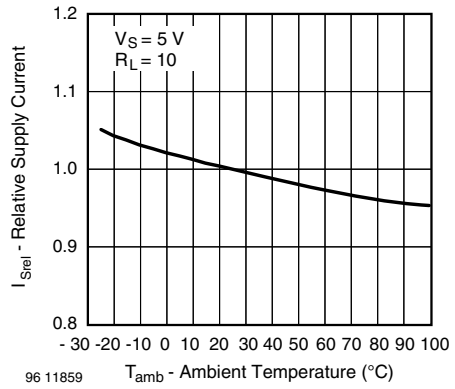


Figure 5. Rel. Supply Current vs. Ambient Temperature

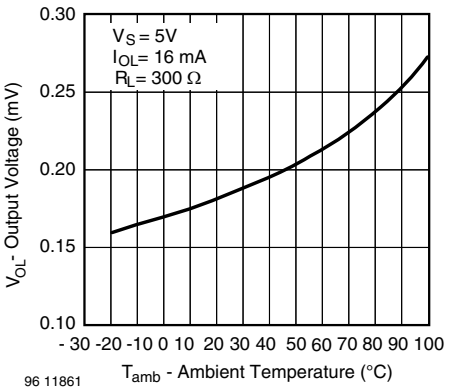


Figure 7. Output Voltage vs. Ambient Temperature

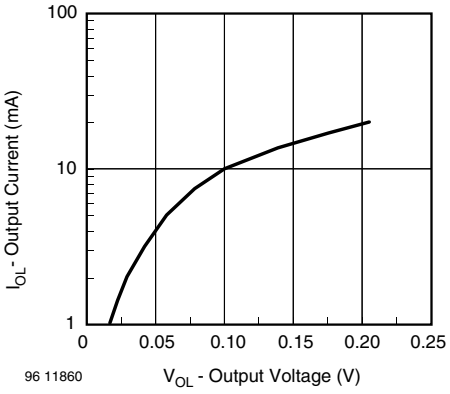
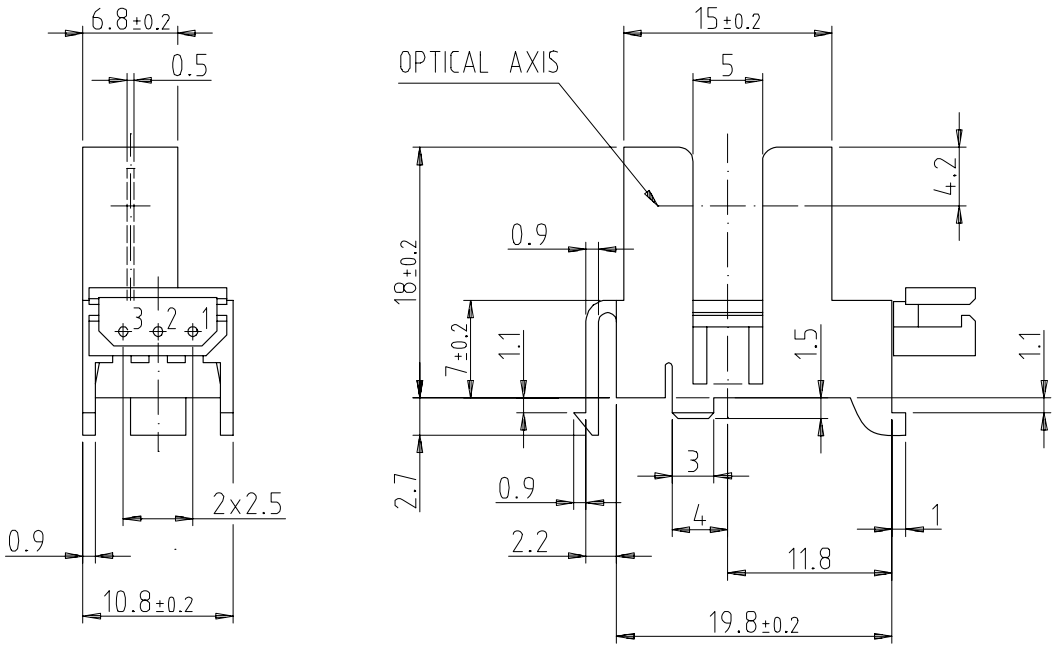
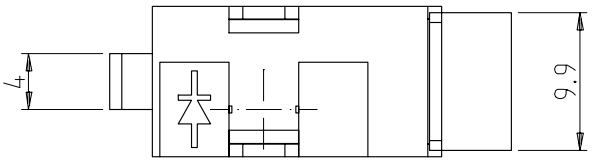


Figure 6. Output Current vs. Output Voltage

Package Dimensions in mm



1 = GND
2 = V_O
3 = V_S



weight: ca. 1.01g

technical drawings according to DIN specifications

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Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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