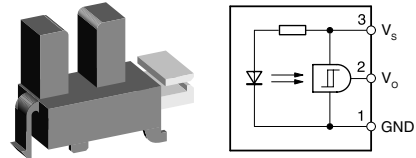


## Transmissive Optical Sensor with Schmitt-Trigger Logic Output

### 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.



20222

### 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

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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	$V_S = 5\text{ V}^{1)}$	$I_S$		15	30	mA
Low level supply current	$V_S = 5\text{ V}^{2)}$	$I_S$		15	30	mA
High level output voltage	$V_S = 5\text{ V}, R_L = 1\text{ k}\Omega^{1)}$	$V_{OH}$	4.5			V
Low level output voltage	$V_S = 5\text{ V}, I_{OL} = 16\text{ mA}^{2)}$	$V_{OL}$		0.18	0.35	V
Switching frequency	$V_S = 5\text{ V}, R_L = 47\text{ k}\Omega$	$f$			3	KHz

1) Infrared beam interrupted

2) Infrared beam not interrupted

**Note:** Operating conditions are stabilized after 100  $\mu\text{s}$  of supply voltage turn on.

### Switching Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Rise time	$V_S = 5\text{ V}, R_L = 1\text{ k}\Omega$ (see figure 1)	$t_r$		50.0		ns
Fall time	$V_S = 5\text{ V}, R_L = 1\text{ k}\Omega$ (see figure 1)	$t_f$		20.0		ns

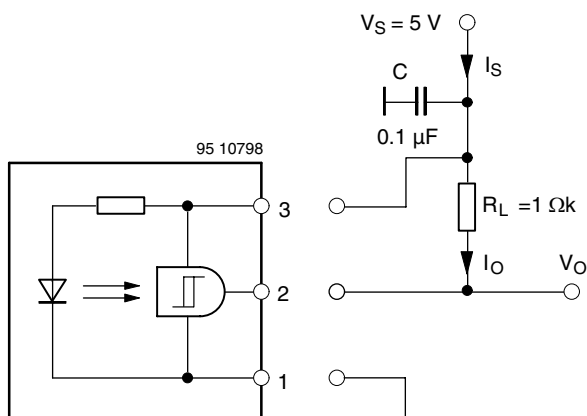


Figure 1. Test circuit and pin connection

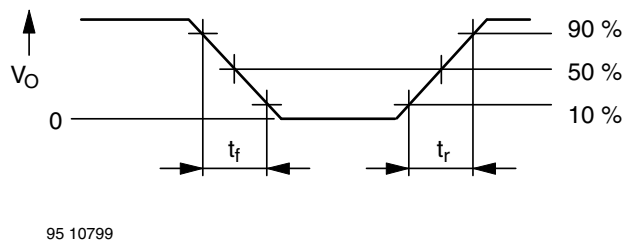


Figure 2. Pulse diagram

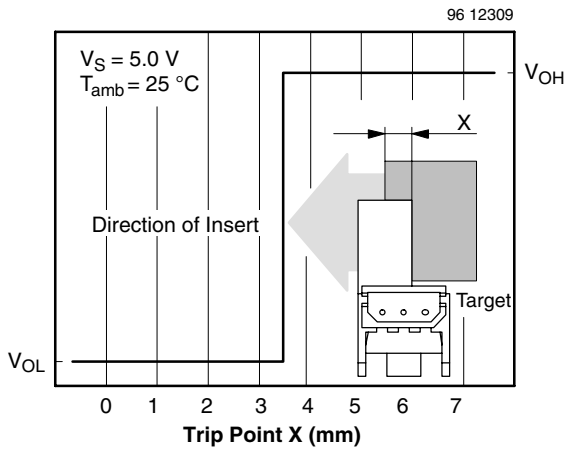


Figure 3. Trip point characteristic

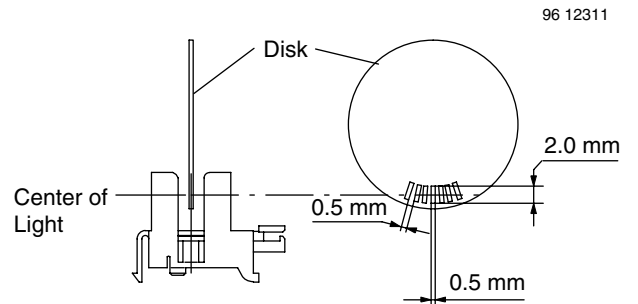


Figure 4. Frequency response

## Typical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

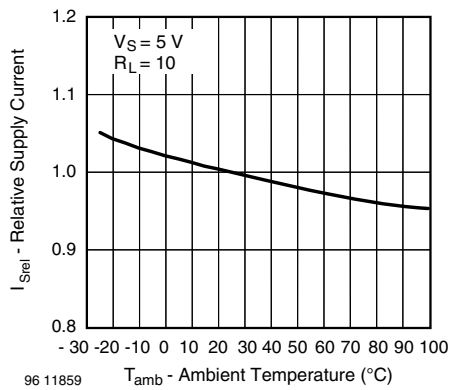


Figure 5. Rel. Supply Current vs. Ambient Temperature

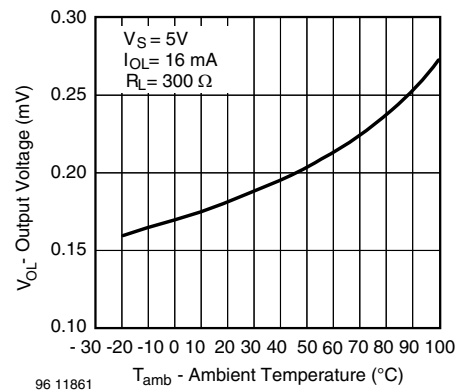


Figure 7. Output Voltage vs. Ambient Temperature

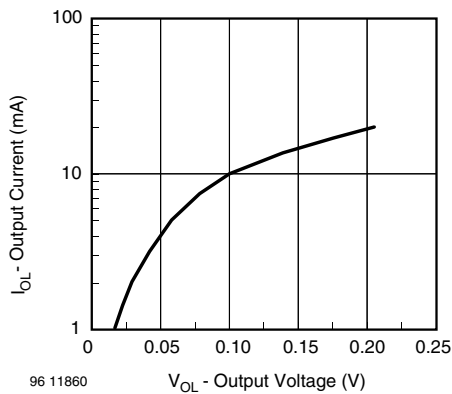
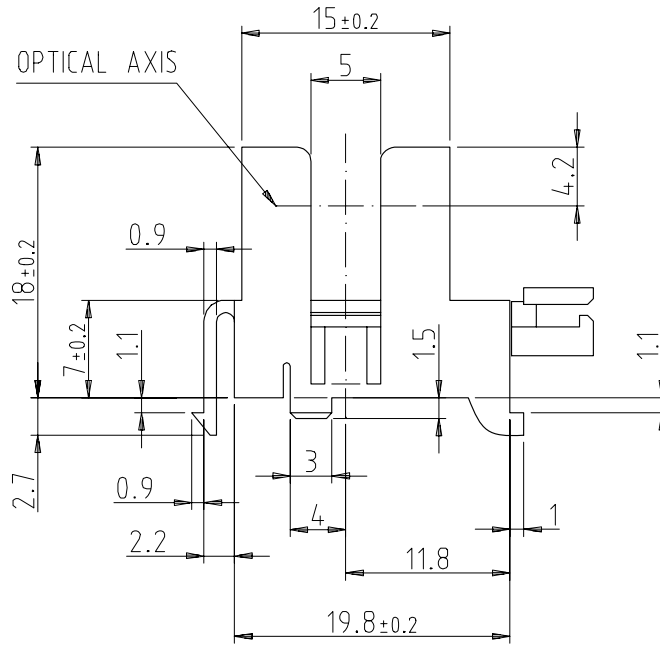
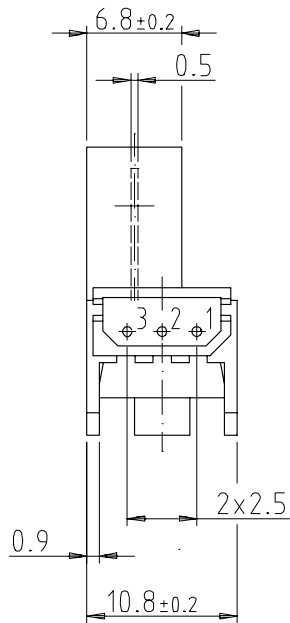
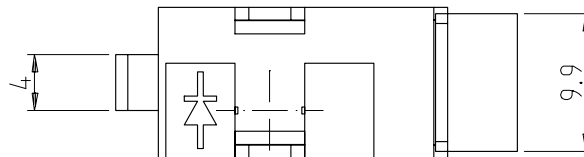


Figure 6. Output Current vs. Output Voltage

## Package Dimensions in mm

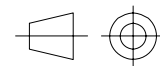


- 1 = GND
- 2 =  $V_O$
- 3 =  $V_S$



weight: ca. 1.01g

96 12101



technical drawings  
according to DIN  
specifications



## **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.

We reserve the right to make changes to improve technical design and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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