Subminiature Dual Channel Optical Sensor with Phototransistor Output

Description

This device has a compact construction where the emitting light source and the detector are located face to face on the same optical axes. The operating wavelength is 950 nm. The detector side incorporates 2 phototransistors. Distance of both channels is 0.8 mm.

Features

- Dual channel with 0.3 mm aperture
- Channel 1 to channel 2 distance 0.8 mm (optical center)
- Gap 2 mm
- Package height: 4 mm
- Surface Mountable Technology (SMD)
- Parts shipped taped and reeled 2000 pcs / reel
- Soldering method according to CECC00802 table 1, class B or C
- Option X01: High rel. devices for advanced applications

Application

- Accurate position sensor for steering wheel
- Detection for motion direction
- Detection of motor speed and direction where high reliability performance is required

Pin Connection

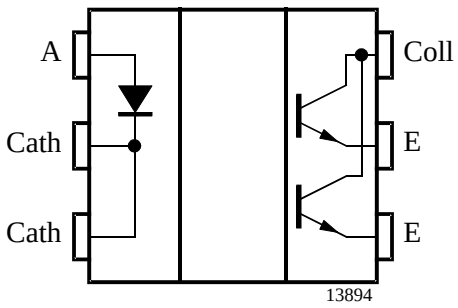


Figure 1.

Absolute Maximum Ratings

Input (Emitter)

Parameters	Test Conditions	Symbol	Value	Unit
Reverse voltage		V_R	5	V
Forward current		I_F	25	mA
Forward surge current	$t_p \leq 10$ µs	I_{FSM}	100	mA
Power dissipation	$T_{amb} \leq 25°C$	P_v	75	mW

Output (Detector)

Parameters	Test Conditions	Symbol	Value	Unit
Collector emitter voltage		V_{CE0}	70	V
Emitter collector voltage		V_{EC0}	7	V
Collector current		I_C	20	mA
Power dissipation	$T_{amb} \leq 25°C$	P_v	75	mW

Coupler

Parameters	Test Conditions	Symbol	Value	Unit
Total power dissipation	$T_{amb} \leq 25°C$	P_{tot}	150	mW
Ambient temperature range		T_{amb}	– 40 to+ 85	°C
Storage temperature range		T_{stg}	– 40 to + 100	°C
Soldering temperature	$t \leq 5$ s	T_{sd}	230	°C

Electrical Characteristics

T_{amb} = 25°C

Input (Emitter)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	I_F = 15 mA	V_F		1.2	1.5	V
Reverse current	V_R = 5 V	I_R			10	µA
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j		50		pF

Output (Detector)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector emitter voltage	I_C = 1 mA	V_{CE0}	70			V
Emitter collector voltage	I_E = 100 µA	V_{EC0}	7			V
Collector emitter cut-off current	V_{CE} = 25 V, I_F = 0, E = 0	I_{CE0}		10	100	nA

Coupler

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector current per channel	V_{CE} = 5 V, IF = 15 mA	I_C	300	500		µA
Collector/emitter saturation voltage	I_F = 15 mA, I_C = 0.05 mA	V_{CEsat}			0.4	V

Derating Diagram

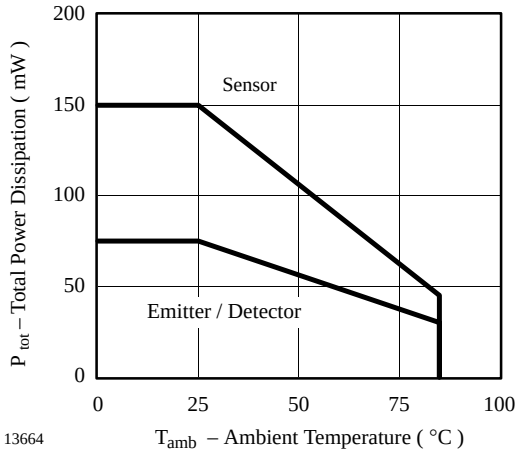


Figure 2. Total Power Dissipation vs. Ambient Temperature

Application Example

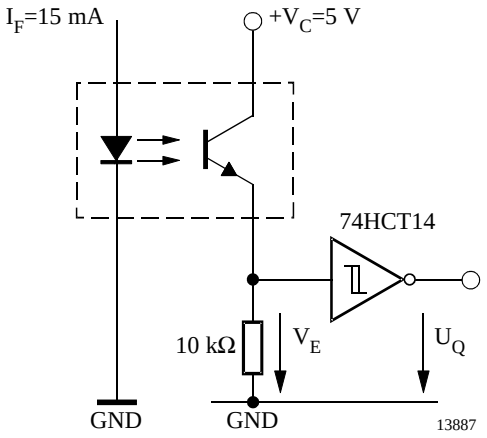


Figure 3.

Typical Characteristics (T_{amb} = 25°C, unless otherwise specified)

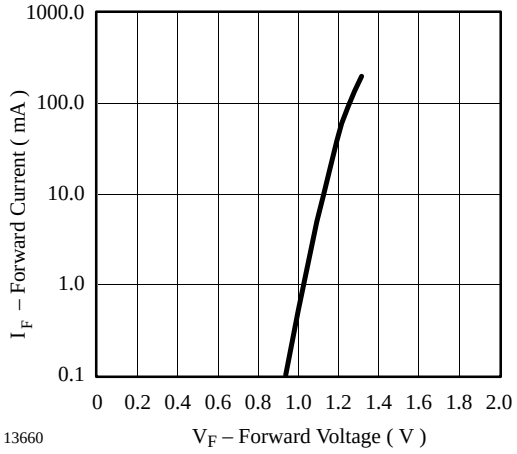


Figure 4. Forward Current vs. Forward Voltage

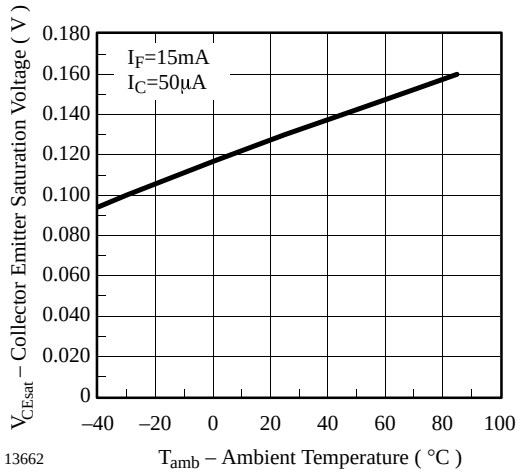


Figure 5. Collector Em. Sat. Voltage vs. Ambient Temperature

Typical Characteristics (T_{amb} = 25°C, unless otherwise specified)

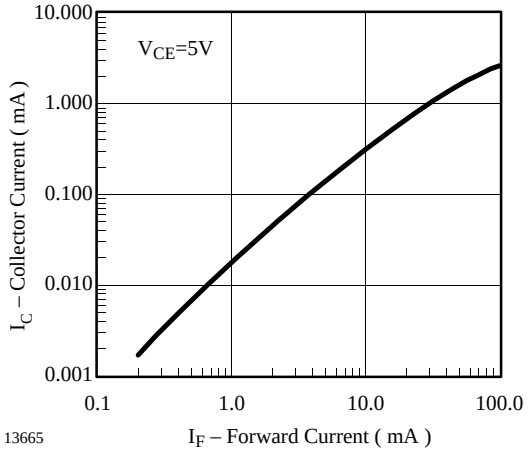


Figure 6. Collector Current vs. Forward Current

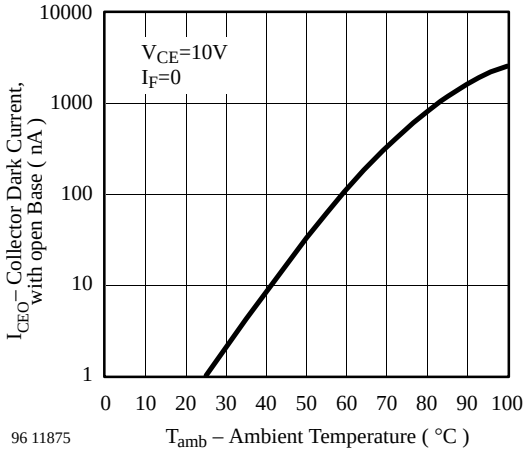


Figure 9. Collector Dark Current vs. Ambient Temperature

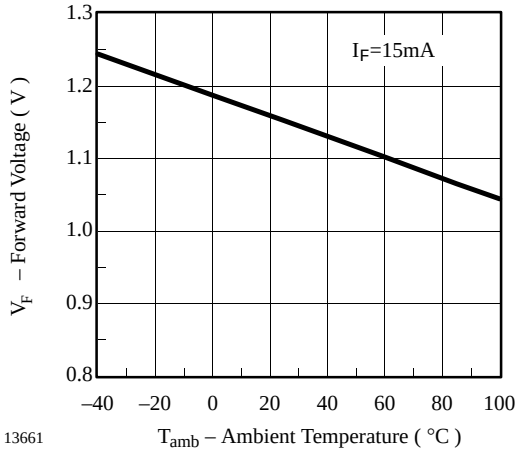


Figure 7. Forward Voltage vs. Ambient Temperature

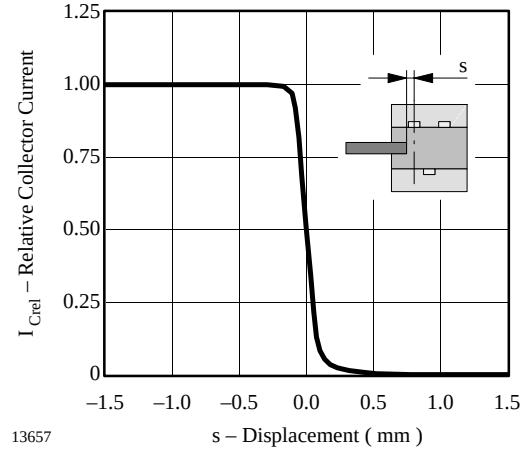


Figure 10. Rel. Collector Current vs. Distance

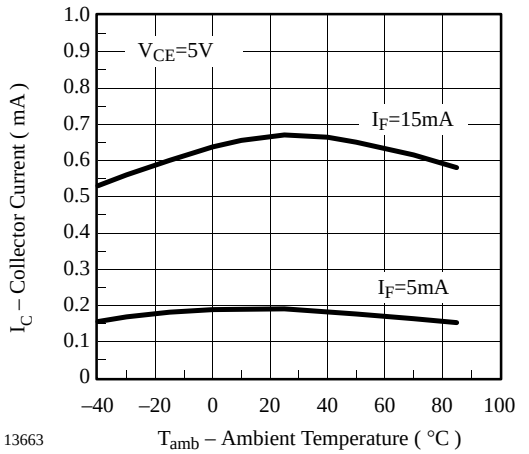
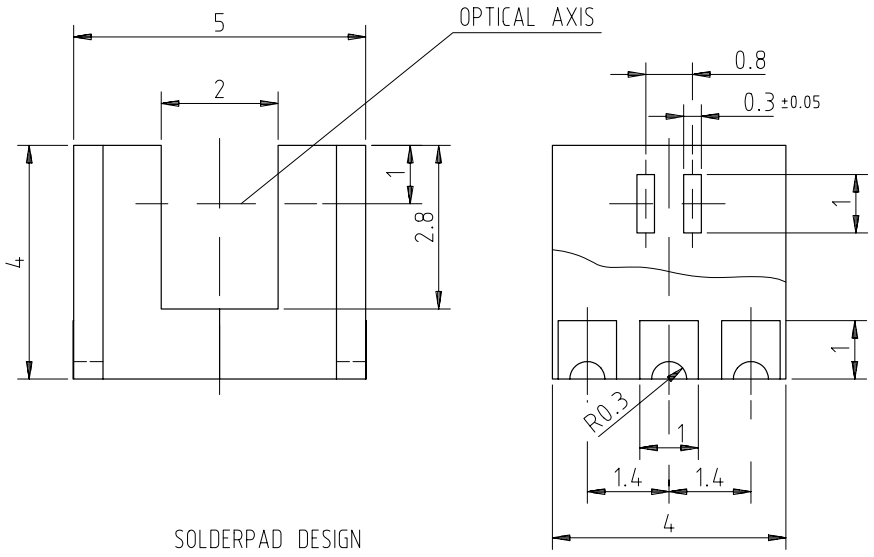
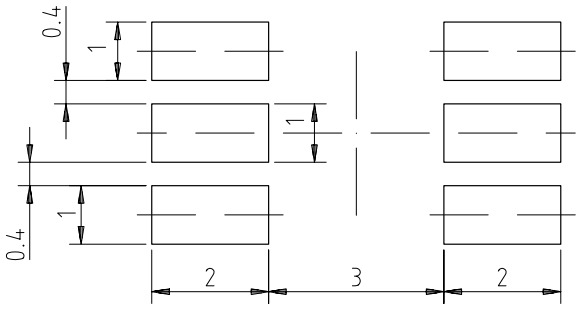


Figure 8. Collector Current vs. Ambient Temperature

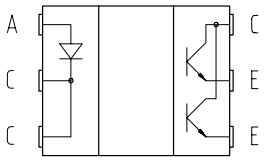
Dimensions in mm



SOLDERPAD DESIGN



PIN CONNECTION
TOP VIEW



All dimensions in mm
Not indicated tolerances ±0.15

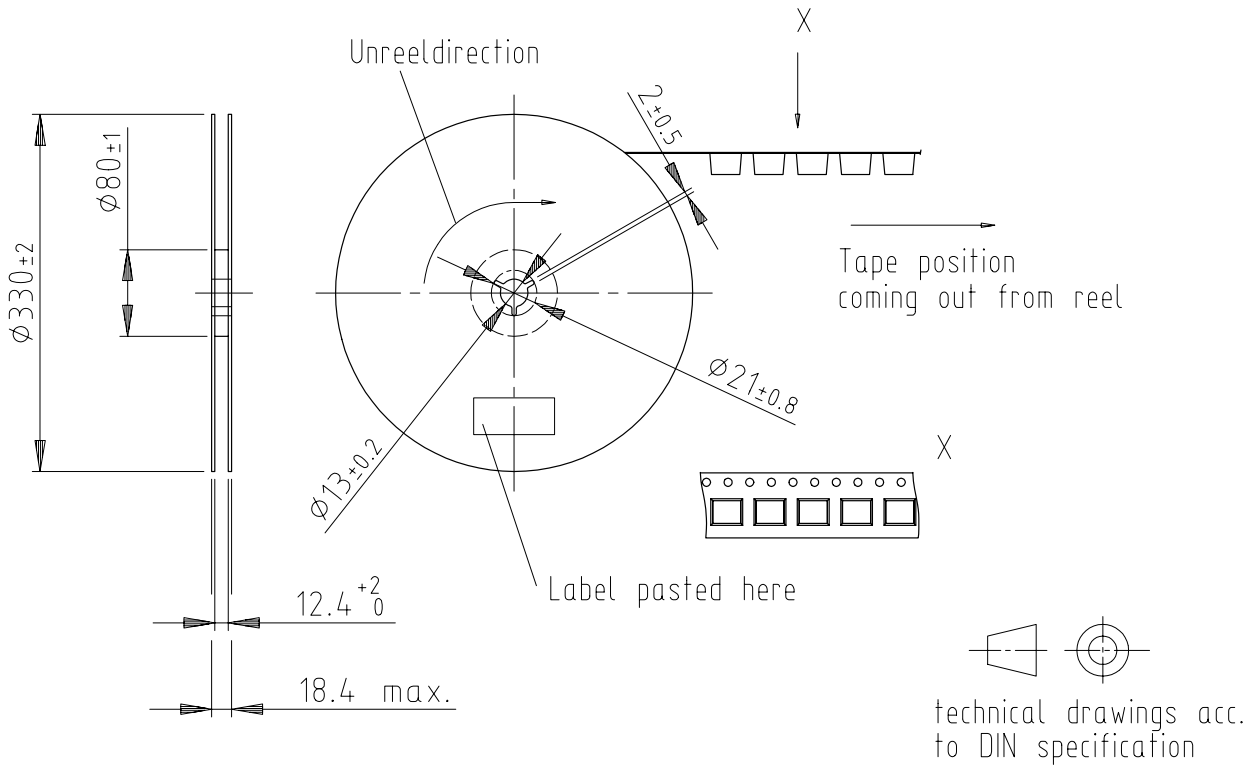
technical drawings
according to DIN
specifications

weight: ca. 0.15 g

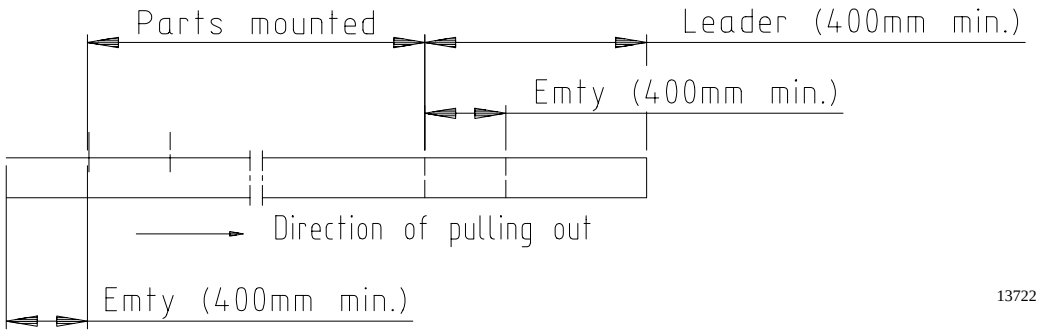
12898

Reel Dimensions

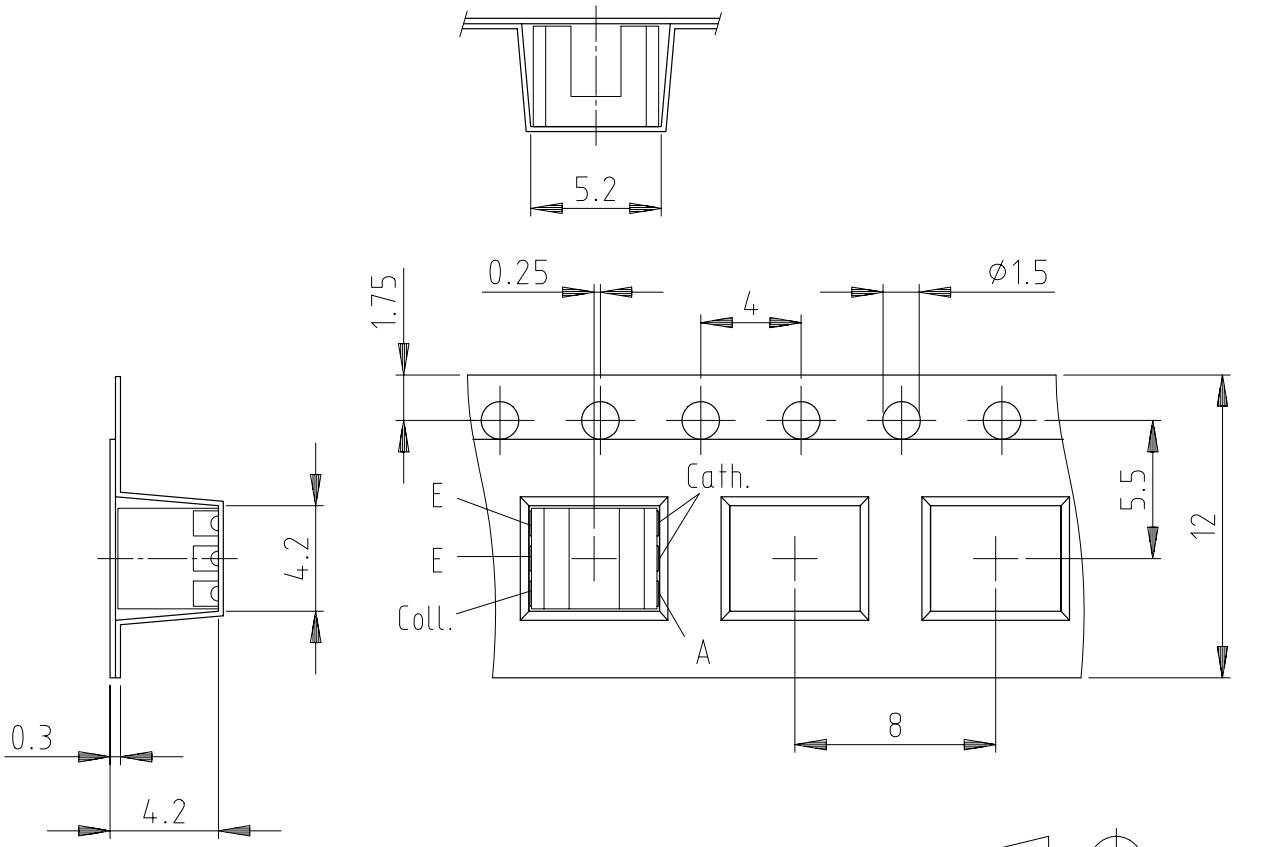
Reel-dimension and shape:



Leader and trailer tape:



Tape Dimensions



Quantity per reel: 2000 pcs.

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.

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