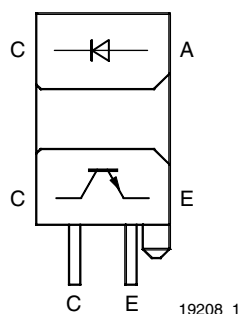




Transmissive Optical Sensor with Phototransistor Output



21834



DESCRIPTION

The TCST5250 is a transmissive sensor that includes an infrared emitter and a phototransistor, located face-to-face on the optical axes in a leaded package which blocks visible light.

FEATURES

- Package type: leaded
- Detector type: phototransistor
- Dimensions (L x W x H in mm): 14.3 x 6 x 9.5
- Gap (in mm): 2.7
- Aperture (in mm): 0.5
- Typical output current under test: $I_C = 1.5$ mA
- Daylight blocking filter
- Emitter wavelength: 950 nm
- Lead (Pb)-free soldering released
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS
COMPLIANT

APPLICATIONS

- Optical switch
- Shaft encoder

PRODUCT SUMMARY

PART NUMBER	GAP WIDTH (mm)	APERTURE WIDTH (mm)	TYPICAL OUTPUT CURRENT UNDER TEST ⁽¹⁾ (mA)	DAYLIGHT BLOCKING FILTER INTEGRATED
TCST5250	2.7	0.5	1.5	Yes

Note

⁽¹⁾ Conditions like in table basic characteristics/coupler

ORDERING INFORMATION

ORDERING CODE	PACKAGING	VOLUME ⁽¹⁾	REMARKS
TCST5250	Tube	MOQ: 4860 pcs, 30 pcs/tube	-

Note

⁽¹⁾ MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
COUPLER				
Total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_{tot}	250	mW
Ambient temperature range		T_{amb}	- 25 to + 85	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	Distance to package 1.6 mm, $t \leq 5$ s	T_{sd}	260	$^\circ\text{C}$
INPUT (EMITTER)				
Reverse voltage		V_R	6	V
Forward current		I_F	60	mA
Forward surge current	$t_p \leq 10$ μs	I_{FSM}	3	A
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_V	100	mW
Junction temperature		T_j	100	$^\circ\text{C}$
OUTPUT (DETECTOR)				
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	100	mA



ABSOLUTE MAXIMUM RATINGS ⁽¹⁾				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
OUTPUT (DETECTOR)				
Power dissipation	$T_{amb} \leq 25\text{ °C}$	P_V	150	mW
Junction temperature		T_J	100	°C

Note

⁽¹⁾ $T_{amb} = 25\text{ °C}$, unless otherwise specified

ABSOLUTE MAXIMUM RATINGS

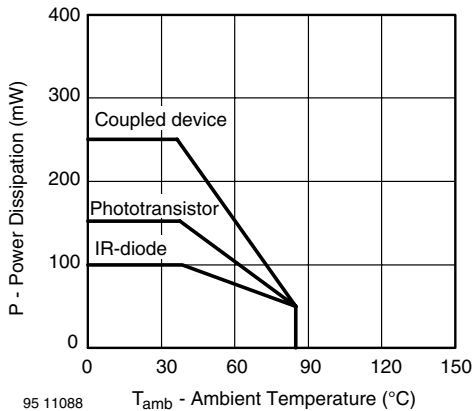


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ⁽¹⁾						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
COUPLER						
Collector current	$V_{CE} = 10\text{ V}$, $I_F = 20\text{ mA}$	I_C	0.5	1.5	15	mA
Collector emitter saturation voltage	$I_F = 20\text{ mA}$, $I_C = 0.2\text{ mA}$	V_{CEsat}			0.4	V
INPUT (EMITTER)						
Forward voltage	$I_F = 60\text{ mA}$	V_F		1.25	1.5	V
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_j		50		pF
OUTPUT (DETECTOR)						
Collector emitter voltage	$I_C = 1\text{ mA}$	V_{CEO}	70			V
Emitter collector voltage	$I_E = 10\text{ }\mu\text{A}$	V_{ECO}	7			V
Collector dark current	$V_{CE} = 25\text{ V}$, $I_F = 0\text{ A}$, $E = 0\text{ lx}$	I_{CEO}		10	100	nA
SWITCHING CHARACTERISTICS						
Turn-on time	$I_C = 1\text{ mA}$, $V_{CE} = 5\text{ V}$, $R_L = 100\text{ }\Omega$ (see figure 2)	t_{on}		15		μs
Turn-off time	$I_C = 1\text{ mA}$, $V_{CE} = 5\text{ V}$, $R_L = 100\text{ }\Omega$ (see figure 2)	t_{off}		10		μs

Note

⁽¹⁾ $T_{amb} = 25\text{ °C}$, unless otherwise specified

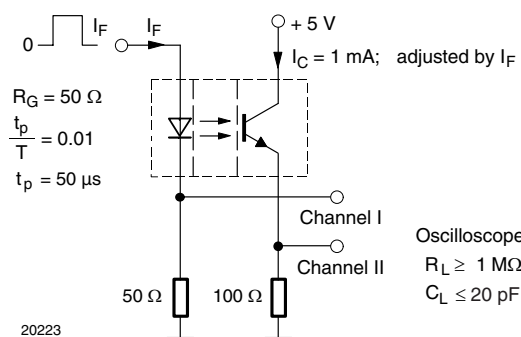
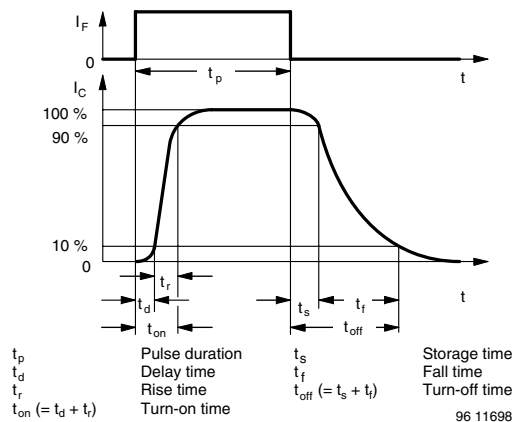
Fig. 2 - Test Circuit for t_{on} and t_{off} 

Fig. 3 - Switching Times

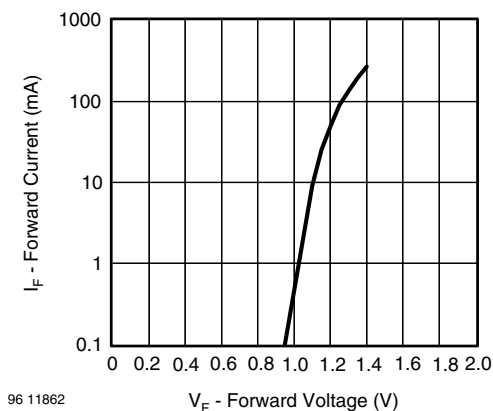
BASIC CHARACTERISTICS $T_{amb} = 25^\circ\text{C}$, unless otherwise specified

Fig. 4 - Forward Current vs. Forward Voltage

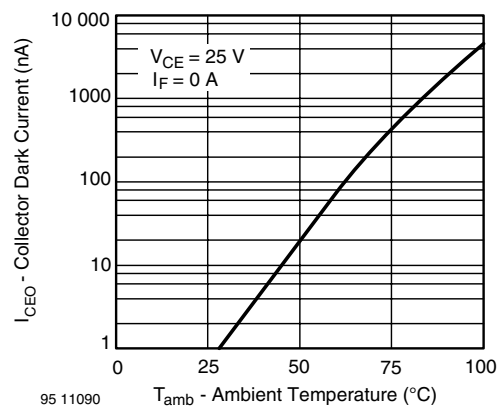


Fig. 6 - Collector Dark Current vs. Ambient Temperature

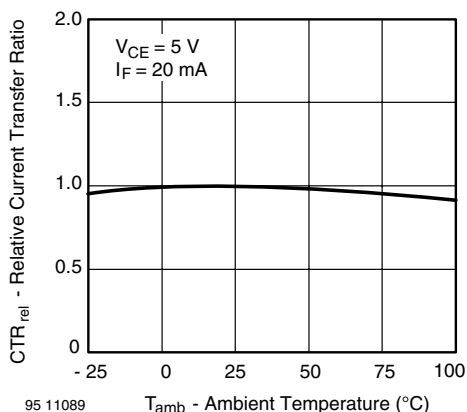


Fig. 5 - Relative Current Transfer Ratio vs. Ambient Temperature

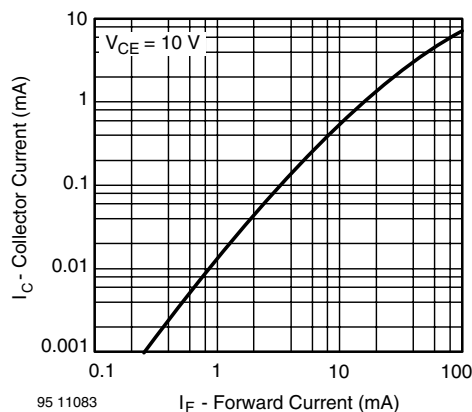


Fig. 7 - Collector Current vs. Forward Current

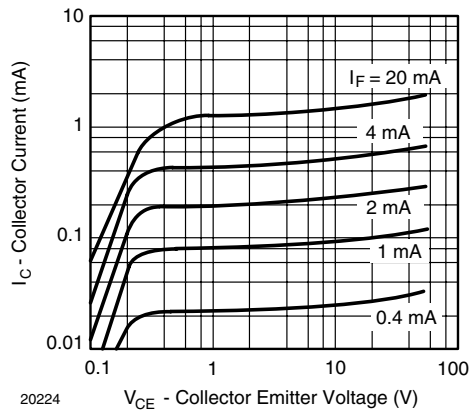


Fig. 8 - Collector Current vs. Collector Emitter Voltage

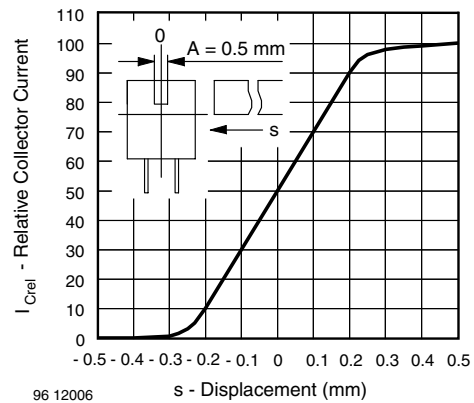


Fig. 11 - Relative Collector Current vs. Displacement

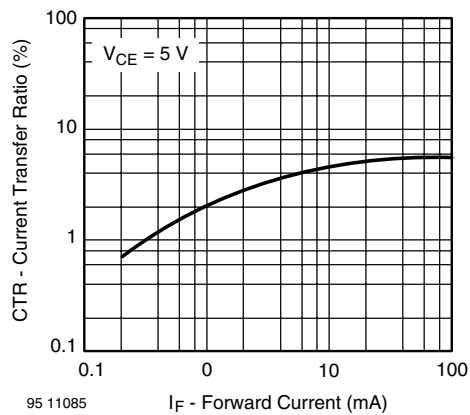


Fig. 9 - Current Transfer Ratio vs. Forward Current

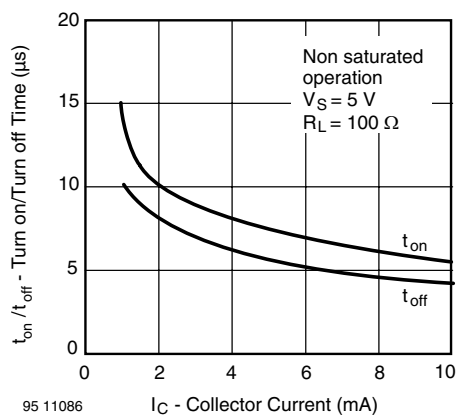


Fig. 10 - Turn-on/Turn-off Time vs. Collector Current



Vishay Semiconductors

Technical drawing of a cathodic protection anode assembly, showing dimensions and components.

Top View Dimensions:

- Overall length: 13.05 ± 0.1
- Overall width: 9.5
- Mounting hole diameter: $\phi 1.2(2x) \pm 0.1$
- Mounting hole spacing: 2.54 ± 0.3
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4

Side View Dimensions:

- Overall height: 6.1
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4

Detail View Dimensions:

- Overall length: 6
- Overall width: 1 ± 0.1
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4

Other Dimensions:

- Marking area: $(0.7 \times 45^\circ)$
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4
- Mounting hole diameter: $\phi 0.9$
- Mounting hole offset: 1.4

Components:

- Cath. (Cathode)
- Coll. (Collector)

Recommended installation holes for reference only (component side)

Not indicated tolerances ± 0.2

Drawing-No.: 6.550-5198.01-4

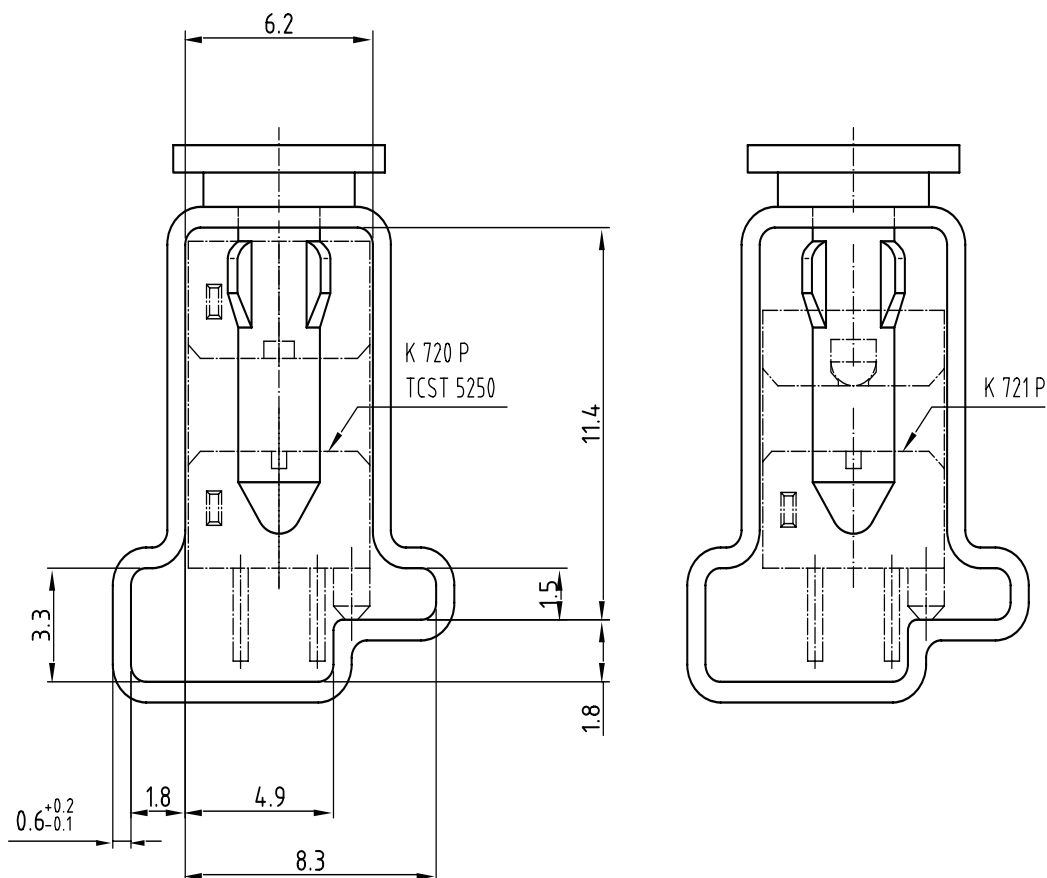
Issue: 3; 06.06.00

15192

Technical drawings according to DIN specifications



TUBE DIMENSIONS in millimeters



Drawing-No.: 9.700-5222.01-4
Issue: 2; 19.11.04
20257

With stopper pins
Tolerance: $\pm 0.5\text{mm}$
Length: $450 \pm 1\text{mm}$
All dimensions in mm



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