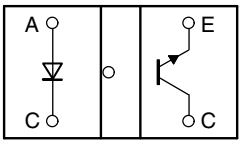
Transmissive Optical Sensor with Phototransistor Output

21833

Top view



19205_1

FEATURES

- Package type: leaded
- Detector type: phototransistor
- Dimensions (L x W x H in mm): 9.2 x 4.8 x 5.4
- Gap (in mm): 2.8
- Aperture (in mm): 0.5
- Typical output current under test: I_C = 2 mA
- Daylight blocking filter
- Emitter wavelength: 950 nm
- Lead (Pb)-free soldering released
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e2

RoHS COMPLIANT

DESCRIPTION

The TCST1230 is a transmissive sensor that includes an infrared emitter and phototransistor, located face-to-face on the optical axes in a leaded package which blocks visible light.

APPLICATIONS

- Optical switch
- Shaft encoder
- Detection of opaque material such as paper
- Detection of magnetic tapes

PRODUCT SUMMARY				
PART NUMBER	GAP WIDTH (mm)	APERTURE WIDTH (mm)	TYPICAL OUTPUT CURRENT UNDER TEST (1) (mA)	DAYLIGHT BLOCKING FILTER INTEGRATED
TCST1230	2.8	0.5	2	Yes

Note

- Conditions like in table basic characteristics/coupler

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	VOLUME (1)	REMARKS
TCST1230	Tube	MOQ: 4800 pcs, 60 pcs/tube	-

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
COUPLER				
Total power dissipation	$T_{amb} \leq 25$ °C	P_{tot}	250	mW
Ambient temperature range		T_{amb}	- 25 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	Distance to package 1.6 mm, t ≤ 5 s	T_{sd}	260	°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	$T_{amb} \leq 25$ °C	P_V	100	mW
Junction temperature		T_j	100	°C

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
OUTPUT (DETECTOR)				
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	100	mA
Power dissipation	$T_{amb} \leq 25$ °C	P_V	150	mW
Junction temperature		T_j	100	°C

ABSOLUTE MAXIMUM RATINGS

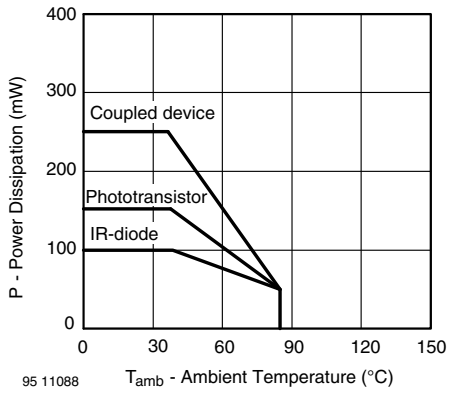


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
COUPLER						
Collector current	V_{CE} = 10 V, I_F = 20 mA	I_C	0.5		14	mA
Collector emitter saturation voltage	I_F = 20 mA, I_C = 0.2 mA	V_{CEsat}			0.4	V
INPUT (EMITTER)						
Forward voltage	I_F = 60 mA	V_F		1.25	1.5	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j		50		pF
OUTPUT (DETECTOR)						
Collector emitter voltage	I_C = 1 mA	V_{CEO}	70			V
Emitter collector voltage	I_E = 10 µA	V_{ECO}	7			V
Collector dark current	V_{CE} = 25 V, I_F = 0 A, E = 0 lx	I_{CEO}		10	100	nA
SWITCHING CHARACTERISTICS						
Turn-on time	I_C = 1 mA, V_{CE} = 5 V, R_L = 100 Ω (see figure 2)	t_{on}		15		µs
Turn-off time	I_C = 1 mA, V_{CE} = 5 V, R_L = 100 Ω (see figure 2)	t_{off}		10		µs

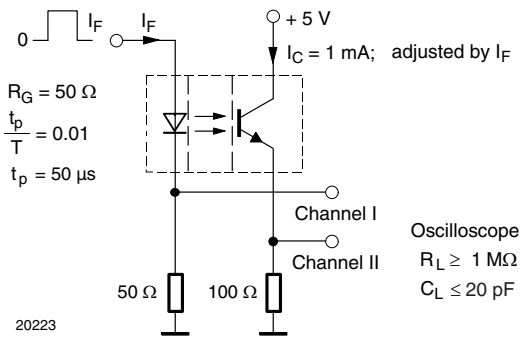


Fig. 2 - Test Circuit for t_{on} and t_{off}

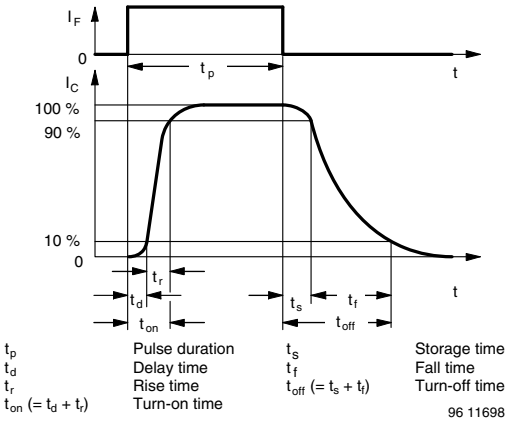


Fig. 3 - Switching Times

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

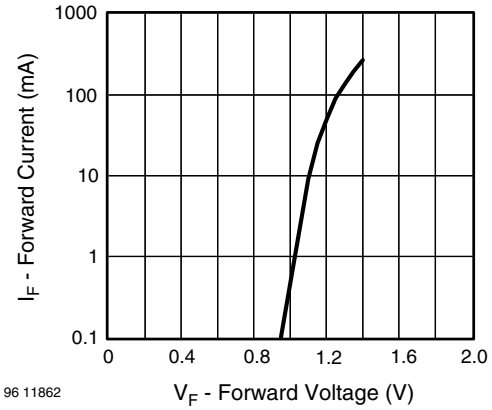


Fig. 4 - Forward Current vs. Forward Voltage

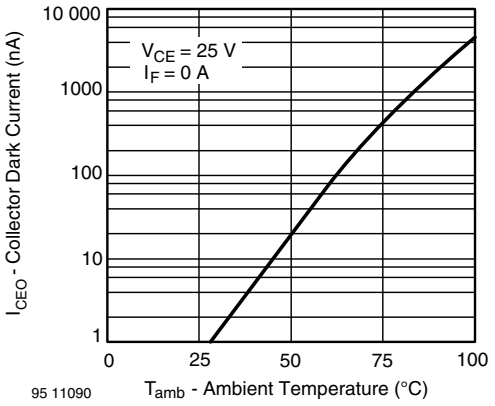


Fig. 6 - Collector Dark Current vs. Ambient Temperature

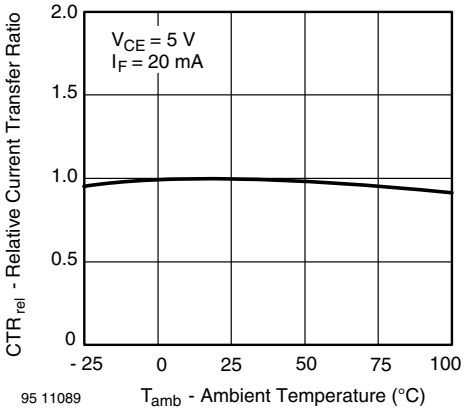


Fig. 5 - Relative Current Transfer Ratio vs. Ambient Temperature

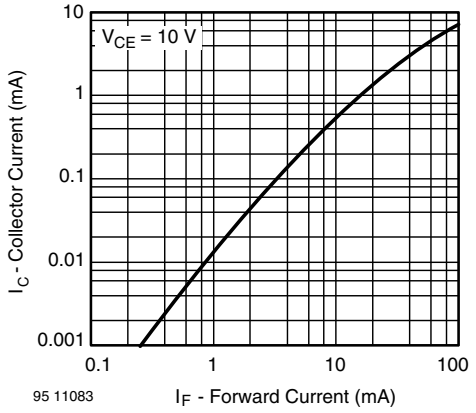


Fig. 7 - Collector Current vs. Forward Current

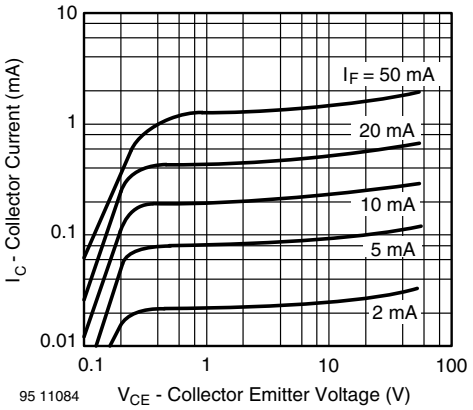


Fig. 8 - Collector Current vs. Collector Emitter Voltage

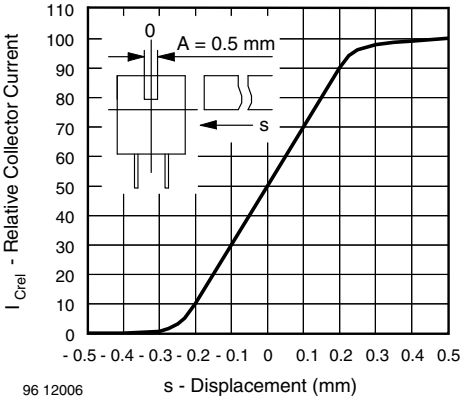


Fig. 11 - Relative Collector Current vs. Displacement

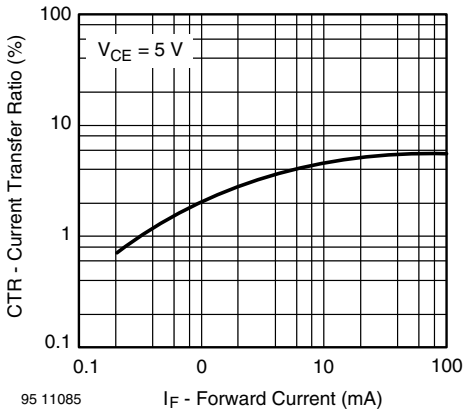


Fig. 9 - Current Transfer Ratio vs. Forward Current

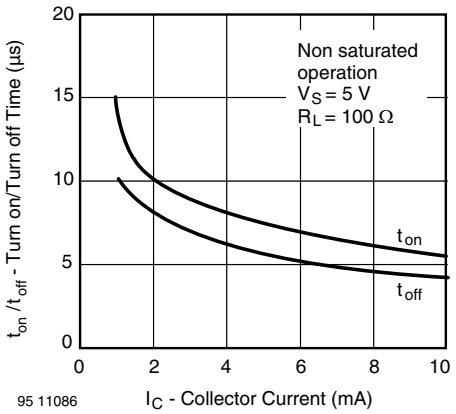
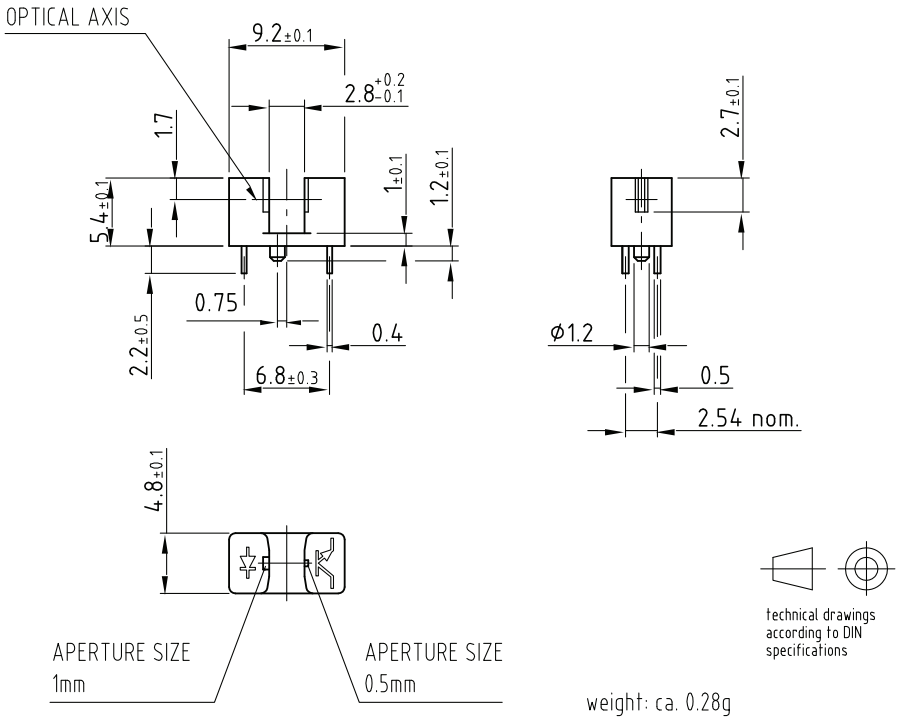


Fig. 10 - Turn-on/Turn-off Time vs. Collector Current

PACKAGE DIMENSIONS in millimeters



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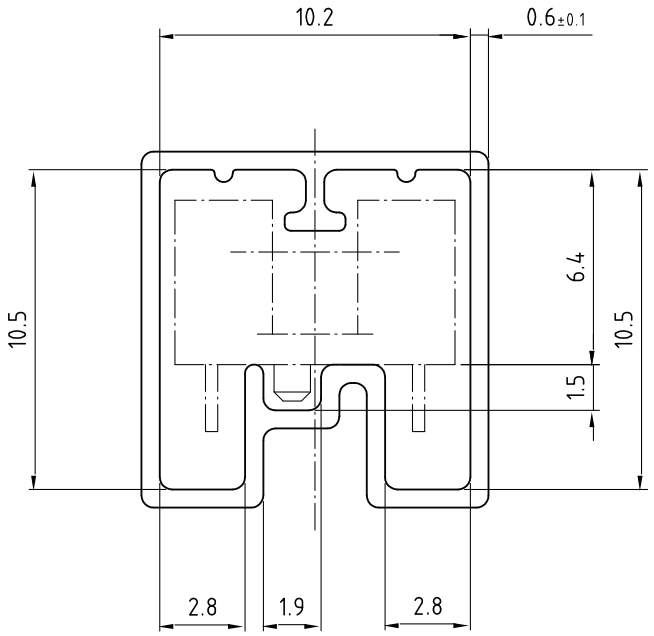
Issue: 5; 30.01.06
96 12083

TUBE DIMENSIONS in millimeters



Drawing-No.: 9.700-5245.01-4
Issue: 1; 25.02.00
20256

With rubber stopper
Tolerance: ±0.5mm
Length: 575±1mm

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