Reflective Optical Sensor with Transistor Output

Marking area

21835

E ▽ D

Top view

19158_1
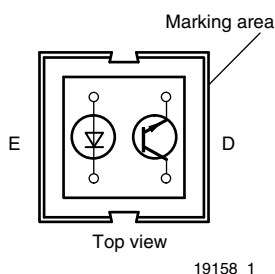
FEATURES

- Package type: leaded
- Detector type: phototransistor
- Dimensions (L x W x H in mm): 7 x 7 x 6
- Peak operating distance: < 0.5 mm
- Operating range within > 20 % relative collector current: 0 mm to 5 mm
- Typical output current under test: I_C = 1 mA
- Emitter wavelength: 950 nm
- Daylight blocking filter
- Lead (Pb)-free soldering released
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb
Pb-free

e4

RoHS
COMPLIANT

APPLICATIONS

- Optoelectronic scanning and switching devices i.e., index sensing, coded disk scanning etc. (optoelectronic encoder assemblies).

DESCRIPTION

The CNY70 is a reflective sensor that includes an infrared emitter and phototransistor in a leaded package which blocks visible light.

PRODUCT SUMMARY				
PART NUMBER	DISTANCE FOR MAXIMUM CTR$_{rel}$ [1] (mm)	DISTANCE RANGE FOR RELATIVE I$_{out}$ > 20 % (mm)	TYPICAL OUTPUT CURRENT UNDER TEST [2] (mA)	DAYLIGHT BLOCKING FILTER INTEGRATED
CNY70	0	0 to 5	1	Yes

Notes
[1] CTR: current transfere ratio, I_{out}/I_{in}
[2] Conditions like in table basic charactristics/sensors

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	VOLUME [1]	REMARKS
CNY70	Tube	MOQ: 4000 pcs, 80 pcs/tube	-

Note
[1] 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}	200	mW
Ambient temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	Distance to case 2 mm, t £ 5 s	T_{sd}	260	°C
INPUT (EMITTER)				
Reverse voltage		V_R	5	V
Forward current		I_F	50	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}	32	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	50	mA
Power dissipation	T_{amb} ≤ 25 °C	P_V	100	mW
Junction temperature		T_j	100	°C

ABSOLUTE MAXIMUM RATINGS

95 11071

Fig. 1 - Power Dissipation 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} = 5 V, I_F = 20 mA, d = 0.3 mm (figure 1)	I_C [2]	0.3	1.0		mA
Cross talk current	V_{CE} = 5 V, I_F = 20 mA, (figure 2)	I_{CX} [3]			600	nA
Collector emitter saturation voltage	I_F = 20 mA, I_C = 0.1 mA, d = 0.3 mm (figure 1)	V_{CEsat} [2]			0.3	V
INPUT (EMITTER)						
Forward voltage	I_F = 50 mA	V_F		1.25	1.6	V
Radiant intensity	I_F = 50 mA, t_p = 20 ms	I_e			7.5	mW/sr
Peak wavelength	I_F = 100 mA	λ_P	940			nm
Virtual source diameter	Method: 63 % encircled energy	d		1.2		mm
OUTPUT (DETECTOR)						
Collector emitter voltage	I_C = 1 mA	V_{CEO}	32			V
Emitter collector voltage	I_E = 100 µA	V_{ECO}	5			V
Collector dark current	V_{CE} = 20 V, I_F = 0 A, E = 0 lx	I_{CEO}			200	nA

Notes

[1] Measured with the "Kodak neutral test card", white side with 90 % diffuse reflectance
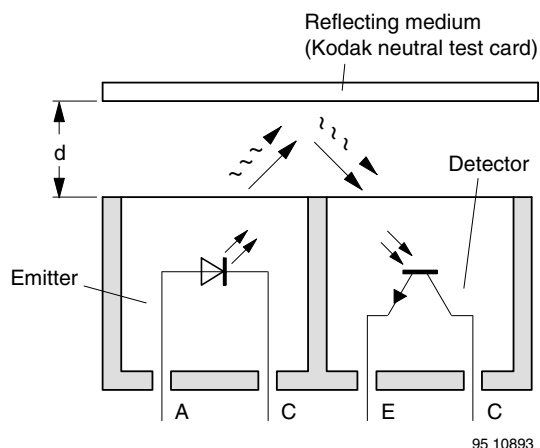
[2] Measured without reflecting medium

For technical questions, contact: sensorstechsupport@vishay.com

Fig. 2 - Test Condition

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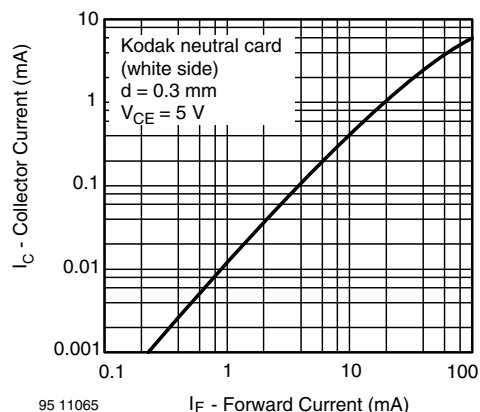

Fig. 3 - Forward Current vs. Forward Voltage

Fig. 5 - Collector Current vs. Forward Current

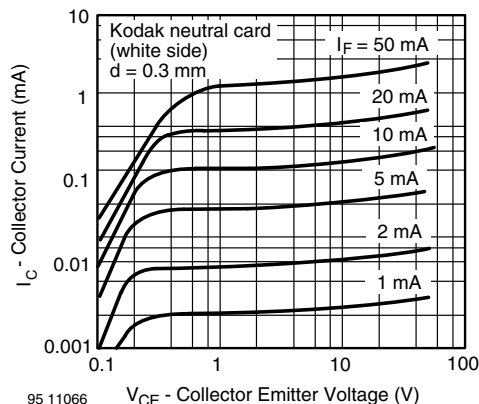Fig. 4 - Relative Current Transfer Ratio vs. Ambient Temperature

Fig. 6 - Collector Current vs. Collector Emitter Voltage

96 11914

Fig. 7 - Current Transfer Ratio vs. Forward Current

95 11069

Fig. 9 - Collector Current vs. Distance

96 12001

Fig. 8 - Current Transfer Ratio vs. Collector Emitter Voltage

95 11063

Fig. 10 - Relative Radiant Intensity/Collector Current vs. Angular Displacement
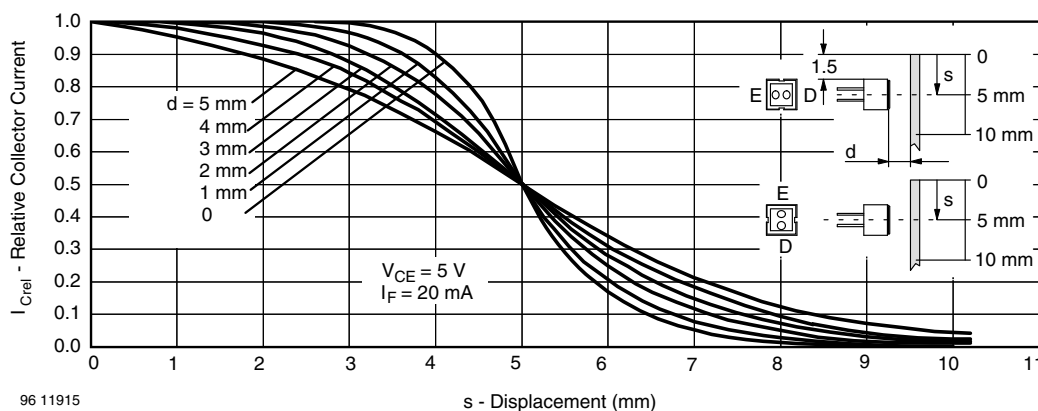

96 11915

Fig. 11 - Relative Collector Current vs. Displacement

PACKAGE DIMENSIONS in millimeters

weight: ca. 0.70g

technical drawings according to DIN specifications

Drawing-No.: 6.544-5062.01-4
Issue: 6; 03.05.06
95 11345

TUBE DIMENSIONS in millimeters

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

Drawing-No.: 9.700-5097.01-4
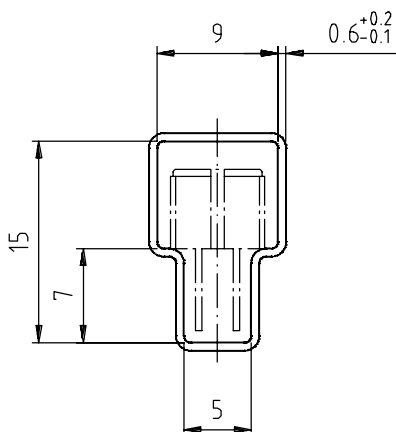Issue: 1; 25.02.00
20291

Packaging and Ordering Information

PART NUMBER	MOQ [1]	PCS PER TUBE	TUBE SPEC. (FIGURE)	CONSTITUENTS (FORMS)
CNY70	4000	80	1	28
TCPT1300X01	2000	Reel	[2]	29
TCRT1000	1000	Bulk	-	26
TCRT1010	1000	Bulk	-	26
TCRT5000	4500	50	2	27
TCRT5000L	2400	48	3	27
TCST1030	5200	65	5	24
TCST1030L	2600	65	6	24
TCST1103	1020	85	4	24
TCST1202	1020	85	4	24
TCST1230	4800	60	7	24
TCST1300	1020	85	4	24
TCST2103	1020	85	4	24
TCST2202	1020	85	4	24
TCST2300	1020	85	4	24
TCST5250	4860	30	8	24
TCUT1300X01	2000	Reel	[2]	29
TCZT8020-PAER	2500	Bulk	-	22

Notes

[1] MOQ: minimum order quantity

[2] Please refer to datasheets

TUBE SPECIFICATION FIGURES

9

$0.6^{+0.2}_{-0.1}$

15

7

5

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

Drawing-No.: 9.700-5097.01-4
Issue: 1; 25.02.00

15198

Fig. 1

Drawing-No.: 9.700-5139.01-4
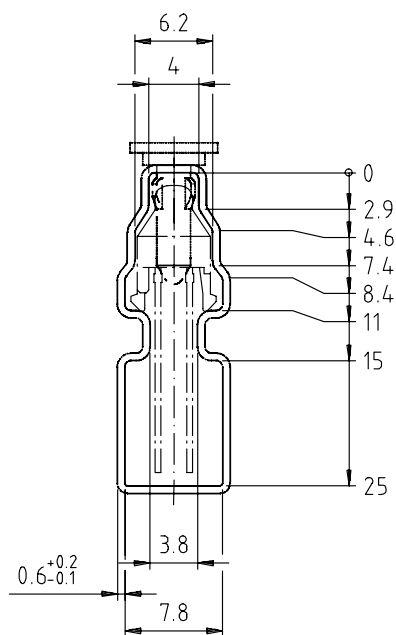Issue: 1; 10.05.00
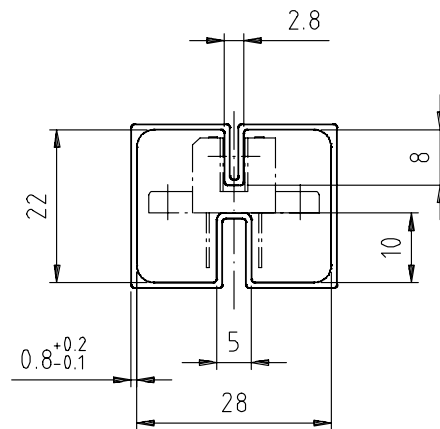
Drawing refers to following types: TCRT 5000

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

15210

Fig. 2

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

Drawing-No.: 9.700-5178.01-4
Issue: 1; 25.02.00

15201

Fig. 3

2.8

22

8

10

5

28

$0.8^{+0.2}_{-0.1}$

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

Drawing-No.: 9.700-5100.01-4
Issue: 1; 25.02.00

15199

Fig. 4

$0.6^{+0.2}_{-0.1}$

5.3

0.5

7.95

13.15

1

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

1.8

0.9
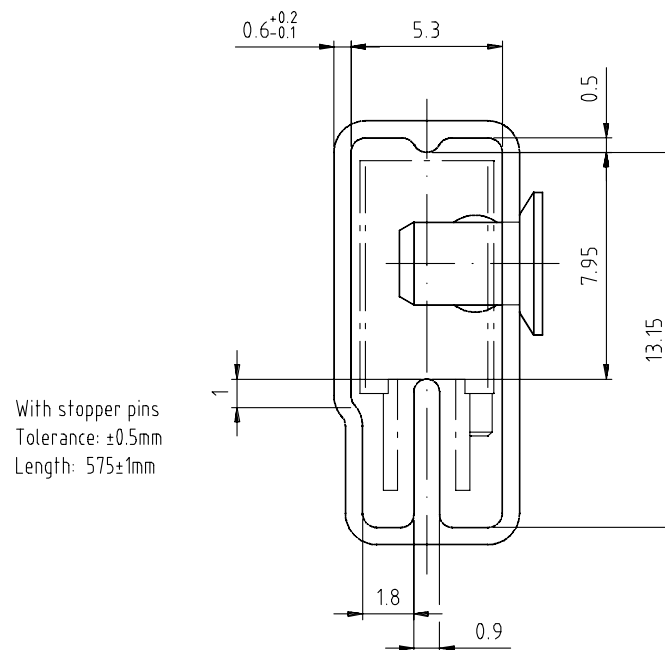
Drawing-No.: 9.700-5140.01-4
Issue: 1; 25.02.00

15202

Fig. 5

5.3

0.7$^{+0.2}_{-0.1}$

11.2

9.7

28.25

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

Drawing-No.: 9.700-5205.01-4
Issue: 1; 25.02.00

15196

Fig. 6

10.2

0.6±0.1

10.5

6.4

10.5

1.5

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

2.8   1.9   2.8

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

15195

Fig. 7

K 720 P
TCST 5250

K 721 P

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

With stopper pins
Tolerance: ±0.5mm
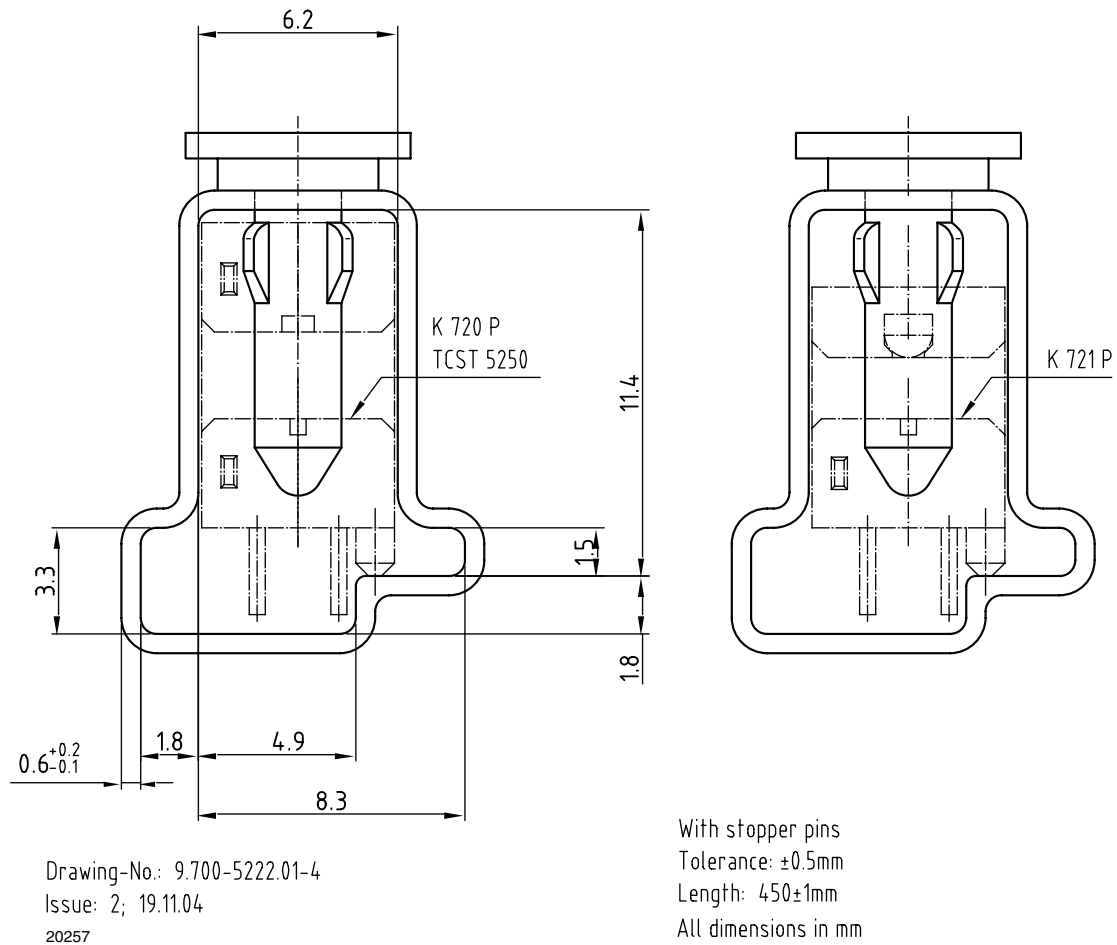Length: 450±1mm
All dimensions in mm

Fig. 8

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