

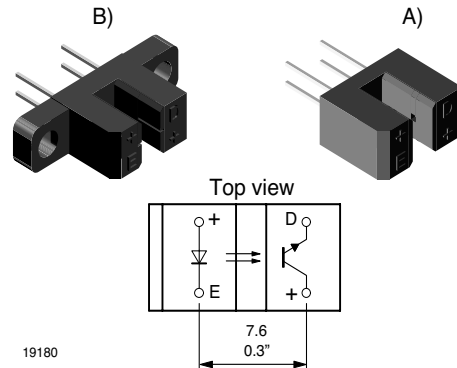
Transmissive Optical Sensor with Phototransistor Output

Description

The TCST1103/1202/1300/2103/2202/2300 are transmissive sensors that include an infrared emitter and phototransistor, located face-to-face on the optical axes in a leaded package which blocks visible light. These part numbers include options for aperture width and mounting flanges.

Features

- Package type: Leaded
- Detector type: Phototransistor
- Dimensions package A:
L 11.9 mm x W 6.3 mm x H 10.8 mm
- Dimensions package B:
L 24.5 mm x W 6.3 mm x H 10.8 mm
- Gap: 3.1 mm
- Typical output current under test: $I_C = 4 \text{ mA}$ (TCST1103/2103)
- Typical output current under test: $I_C = 2 \text{ mA}$ (TCST1202/2202)
- Typical output current under test: $I_C = 0.5 \text{ mA}$ (TCST1300/2300)



- Daylight blocking filter
- Emitter wavelength 950 nm
- Lead (Pb)-free soldering released
- Lead (Pb)-free component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Applications

- Optical switch
- Photo interrupter
- Counter
- Encoder

Order Instructions

Part Number	Remarks	Resolution, Aperture	Minimum Order Quantity
TCST1103	Without mounting flange ^{A)}	0.6 mm, 1 mm	1020 pcs, 85 pcs/tube
TCST1202	Without mounting flange ^{A)}	0.4 mm, 0.5 mm	1020 pcs, 85 pcs/tube
TCST1300	Without mounting flange ^{A)}	0.2 mm, 0.25 mm	1020 pcs, 85 pcs/tube
TCST2103	With mounting flange ^{B)}	0.6 mm, 1 mm	1020 pcs, 85 pcs/tube
TCST2202	With mounting flange ^{B)}	0.4 mm, 0.5 mm	1020 pcs, 85 pcs/tube
TCST2300	With mounting flange ^{B)}	0.2 mm, 0.25 mm	1020 pcs, 85 pcs/tube

Absolute Maximum Ratings

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

Coupler

Parameter	Test condition	Symbol	Value	Unit
Total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	P_{tot}	250	mW
Operating temperature range		T_{amb}	- 55 to + 85	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 55 to + 100	$^\circ\text{C}$
Soldering temperature	Distance to package: 2 mm; $t \leq 5 \text{ s}$	T_{sd}	260	$^\circ\text{C}$

Input (Emitter)

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V_R	6	V
Forward current		I_F	60	mA
Forward surge current	$t_p \leq 10 \mu s$	I_{FSM}	3	A
Power dissipation	$T_{amb} \leq 25^\circ C$	P_V	100	mW
Junction temperature		T_j	100	$^\circ C$

Output (Detector)

Parameter	Test condition	Symbol	Value	Unit
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	100	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10 ms$	I_{CM}	200	mA
Power dissipation	$T_{amb} \leq 25^\circ C$	P_V	150	mW
Junction temperature		T_j	100	$^\circ C$

Electrical Characteristics

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

Coupler

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Current Transfer Ratio	$V_{CE} = 5 V, I_F = 20 mA$	TCST1103, TCST2103	CTR	10	20		%
		TCST1202, TCST2202	CTR	5	10		%
		TCST1300, TCST2300	CTR	1.25	2.5		%
Collector current	$V_{CE} = 5 V, I_F = 20 mA$	TCST1103, TCST2103	I_C	2	4		mA
		TCST1202, TCST2202	I_C	1	2		mA
		TCST1300, TCST2300	I_C	0.25	0.5		mA
Collector emitter saturation voltage	$I_F = 20 mA, I_C = 1 mA$	TCST1103, TCST2103	V_{CEsat}			0.4	V
	$I_F = 20 mA, I_C = 0.5 mA$	TCST1202, TCST2202	V_{CEsat}			0.4	V
	$I_F = 20 mA, I_C = 0.1 mA$	TCST1300, TCST2300	V_{CEsat}			0.4	V
Resolution, path of the shutter crossing the radiant sensitive zone	$I_{Crel} = 10 to 90 \%$	TCST1103, TCST2103	s		0.6		mm
		TCST1202, TCST2202	s		0.4		mm
		TCST1300, TCST2300	s		0.2		mm

Input (Emitter)

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	$I_F = 60 mA$	V_F		1.25	1.6	V
Junction capacitance	$V_R = 0, f = 1 MHz$	C_j		50		pF