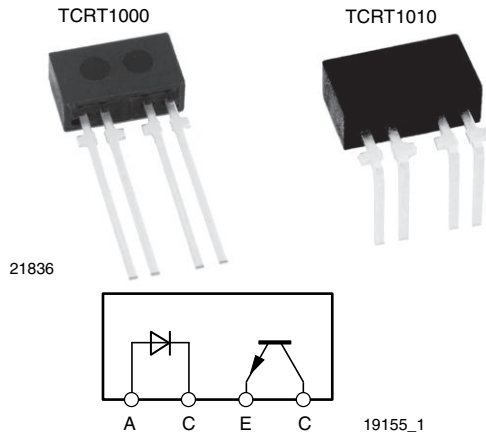


## Reflective Optical Sensor with Transistor Output



### FEATURES

- Package type: leaded
- Detector type: phototransistor
- Dimensions (L x W x H in mm): 7 x 4 x 2.5
- Peak operating distance: 1 mm
- Operating range within > 20 % relative collector current: 0.2 mm to 4 mm
- Typical output current under test:  $I_C = 0.5$  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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### DESCRIPTION

The TCRT1000 and TCRT1010 are reflective sensors which include an infrared emitter and phototransistor in a leaded package which blocks visible light.

### APPLICATIONS

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

### PRODUCT SUMMARY

PART NUMBER	DISTANCE FOR MAXIMUM CTR <sub>rel</sub> (1) (mm)	DISTANCE RANGE FOR RELATIVE $I_{out} > 20\%$ (mm)	TYPICAL OUTPUT CURRENT UNDER TEST (2) (mA)	DAYLIGHT BLOCKING FILTER INTEGRATED
TCRT1000	1	0.2 to 4	0.5	Yes
TCRT1010	1	0.2 to 4	0.5	Yes

#### Notes

(1) CTR: current transfere ratio,  $I_{out}/I_{in}$

(2) Conditions like in table basic characteristics/sensor

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	VOLUME (1)	REMARKS
TCRT1000	Bulk	MOQ: 1000 pcs, 1000 pcs/bulk	Straight leads
TCRT1010	Bulk	MOQ: 1000 pcs, 1000 pcs/bulk	Bent leads

#### Note

(1) MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25$ °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>SENSOR</b>				
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	2 mm distance to package, $t \leq 5$ s	$T_{sd}$	260	°C
<b>INPUT (EMITTER)</b>				
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	50	mA
Forward surge current	$t_p \leq 10$ $\mu$ s	$I_{FSM}$	3	A
Power dissipation	$T_{amb} \leq 25$ °C	$P_V$	100	mW
Junction temperature		$T_J$	100	°C



ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>OUTPUT (DETECTOR)</b>				
Collector emitter voltage		$V_{CEO}$	32	V
Emitter collector voltage		$V_{ECO}$	5	V
Collector current		$I_C$	50	mA
Power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	$P_V$	100	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

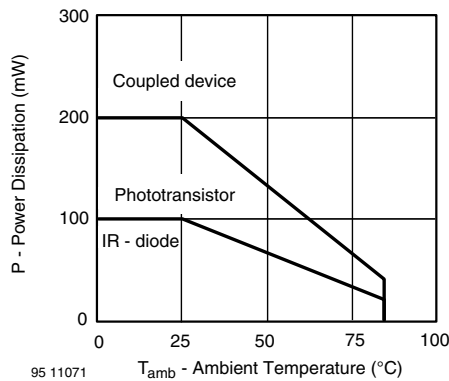


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>SENSOR</b>						
Collector current	$V_{CE} = 5\text{ V}$ , $I_F = 20\text{ mA}$ , $d = 1\text{ mm}$ (figure 2)	$I_C^{(1)}$	0.3	0.5		mA
Cross talk current	$V_{CE} = 5\text{ V}$ , $I_F = 20\text{ mA}$ , (figure 1)	$I_{CX}^{(2)}$			1	$\mu\text{A}$
Collector emitter saturation voltage	$I_F = 20\text{ mA}$ , $I_C = 0.1\text{ mA}$ , $d = 1\text{ mm}$ (figure 2)	$V_{CEsat}^{(1)}$			0.3	V
<b>INPUT (EMITTER)</b>						
Forward voltage	$I_F = 50\text{ mA}$	$V_F$		1.25	1.6	V
Radiant intensity	$I_F = 50\text{ mA}$ , $t_p = 20\text{ ms}$	$I_e$			7.5	mW/sr
Peak wavelength	$I_F = 100\text{ mA}$	$\lambda_P$	940			nm
Virtual source diameter	Method: 63 % encircled energy	$d$		1.2		mm
<b>OUTPUT (DETECTOR)</b>						
Collector emitter voltage	$I_C = 1\text{ mA}$	$V_{CEO}$	32			V
Emitter collector voltage	$I_E = 100\text{ }\mu\text{A}$	$V_{ECO}$	5			V
Collector dark current	$V_{CE} = 20\text{ V}$ , $I_F = 0\text{ A}$ , $E = 0\text{ lx}$	$I_{CEO}$			200	nA

**Notes**

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