



# Quad Channel Transmissive Optical Sensor With Phototransistor Outputs for Absolute and Incremental Encoding



## DESCRIPTION

The TCUT1800X01 is a compact transmissive sensor that includes two infrared emitters and four phototransistor detectors, located face-to-face in a surface mount package.

## FEATURES

- Package type: surface-mount
- Detector type: phototransistor
- Dimensions (L x W x H in mm): 5.5 x 5.85 x 7
- AEC-Q101 qualified
- Gap (in mm): 3
- Aperture (in mm): 0.3
- Typical output current under test:  $I_C = 1.3 \text{ mA}$
- Emitter wavelength: 950 nm
- Lead (Pb)-free soldering released
- Moisture sensitivity level (MSL): 1
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE GRADE



RoHS COMPLIANT  
HALOGEN FREE  
GREEN (5-2008)

## APPLICATIONS

- Automotive optical sensors
- Accurate position sensor for encoder
- Sensor for motion, speed, and direction
- 4 bit transmissive sensor, that can detect up to 16 positions

PRODUCT SUMMARY				
PART NUMBER	GAP WIDTH (mm)	APERTURE WIDTH (mm)	TYPICAL OUTPUT CURRENT UNDER TEST <sup>(1)</sup> (mA)	DAYLIGHT BLOCKING FILTER INTEGRATED
TCUT1800X01	3	0.3	1.3	No

### Note

<sup>(1)</sup> Conditions like in table basic characteristics / coupler

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	VOLUME <sup>(1)</sup>	REMARKS
TCUT1800X01	Tape and reel	MOQ: 1100 pcs, 1100 pcs/reel	Drypack, MSL 1

### Note

<sup>(1)</sup> MOQ: minimum order quantity



<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>COUPLER</b>				
Junction temperature		$T_j$	110	$^{\circ}\text{C}$
Ambient temperature range		$T_{amb}$	-40 to +105	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	-40 to +125	$^{\circ}\text{C}$
Soldering temperature	In accordance with Fig. 16	$T_{sd}$	260	$^{\circ}\text{C}$
<b>INPUT (EMITTER)</b>				
Reverse voltage		$V_R$	5	V
Forward current	$T_{amb} \leq 95\text{ }^{\circ}\text{C}$	$I_F$	25	mA
Forward surge current	$t_p \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	200	mA
Total power dissipation	$T_{amb} \leq 95\text{ }^{\circ}\text{C}$	$P_V$	37.5	mW
<b>OUTPUT (DETECTOR)</b>				
Collector emitter voltage		$V_{CEO}$	20	V
Emitter collector voltage		$V_{ECO}$	7	V
Collector current		$I_C$	20	mA
Collector dark current	$T_{amb} = 85\text{ }^{\circ}\text{C}, V_{CE} = 5\text{ V}$	$I_{CEO}$	3.3	$\mu\text{A}$
Total power dissipation	$T_{amb} \leq 95\text{ }^{\circ}\text{C}$	$P_V$	37.5	mW

**ABSOLUTE MAXIMUM RATINGS**

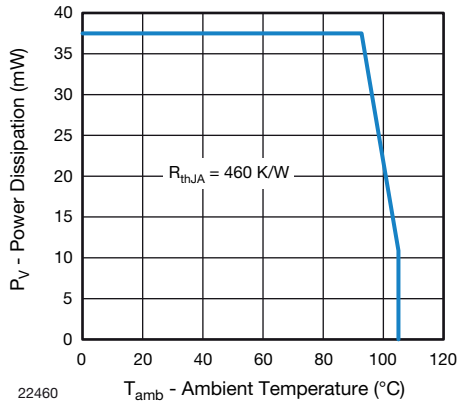


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

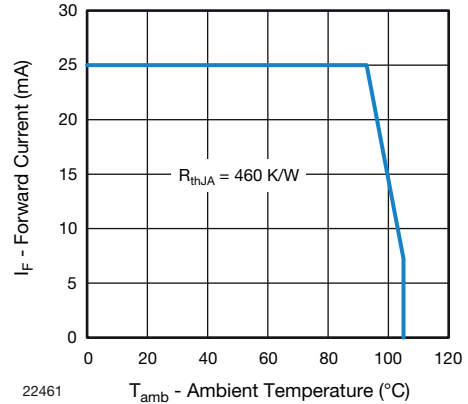


Fig. 2 - Forward Current Limit vs. Ambient Temperature