



# 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



ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>COUPLER</b>				
Junction temperature		T <sub>j</sub>	110	°C
Ambient temperature range		T <sub>amb</sub>	-40 to +105	°C
Storage temperature range		T <sub>stg</sub>	-40 to +125	°C
Soldering temperature	In accordance with Fig. 16	T <sub>sd</sub>	260	°C
<b>INPUT (EMITTER)</b>				
Reverse voltage		V <sub>R</sub>	5	V
Forward current	T <sub>amb</sub> ≤ 95 °C	I <sub>F</sub>	25	mA
Forward surge current	t <sub>p</sub> ≤ 10 μs	I <sub>FSM</sub>	200	mA
Total power dissipation	T <sub>amb</sub> ≤ 95 °C	P <sub>V</sub>	37.5	mW
<b>OUTPUT (DETECTOR)</b>				
Collector emitter voltage		V <sub>CEO</sub>	20	V
Emitter collector voltage		V <sub>ECO</sub>	7	V
Collector current		I <sub>C</sub>	20	mA
Collector dark current	T <sub>amb</sub> = 85 °C, V <sub>CE</sub> = 5 V	I <sub>CEO</sub>	3.3	μA
Total power dissipation	T <sub>amb</sub> ≤ 95 °C	P <sub>V</sub>	37.5	mW

ABSOLUTE MAXIMUM RATINGS

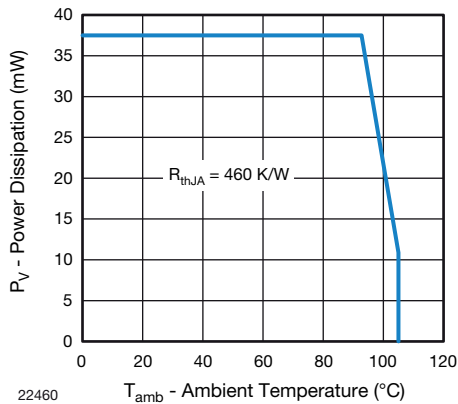


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

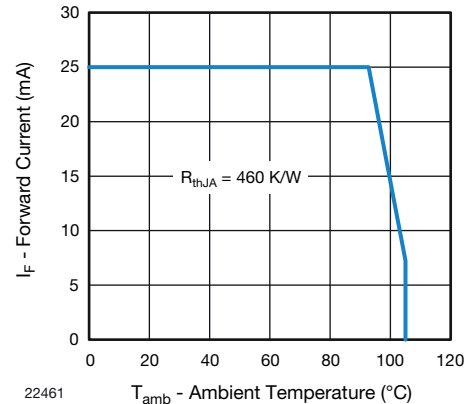


Fig. 2 - Forward Current Limit vs. Ambient Temperature