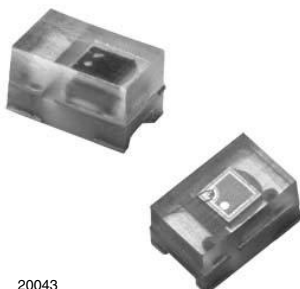


## Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released



20043

### DESCRIPTION

TEMT6200FX01 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a miniature transparent 0805 package for surface mounting. It is sensitive to visible light much like the human eye and has peak sensitivity at 550 nm.

### FEATURES

- Package type: surface mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- Product designed and qualified acc. AEC-Q101 for the automotive market
- High photo sensitivity
- Adapted to human eye responsivity
- Supression filter for near infrared radiation
- Angle of half sensitivity:  $\varphi = \pm 60^\circ$
- Floor life: 72 h, MSL 4, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- Automotive sensors
- Ambient light sensor for display backlight dimming in:
  - Mobile phones
  - Notebook computers
  - PDAs
  - Cameras
  - Dashboards

PRODUCT SUMMARY			
COMPONENT	$I_{PCE}$ ( $\mu A$ )	$\varphi$ (deg)	$\lambda_{0.5}$ (nm)
TEMT6200FX01	7.5 to 39	$\pm 60$	450 to 610

#### Note

Test condition see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMT6200FX01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel. Label with $I_{PCE}$ group on each reel. Specifications of group A/B/C see table "Type Dedicated Characteristics"	0805

#### Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		$V_{CEO}$	6	V
Emitter collector voltage		$V_{ECO}$	1.5	V
Collector current		$I_C$	20	mA
Power dissipation		$P_V$	100	mW
Junction temperature		$T_j$	100	$^\circ C$
Operating temperature range		$T_{amb}$	- 40 to + 100	$^\circ C$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^\circ C$
Soldering temperature	Acc. reflow profile fig. 9	$T_{sd}$	260	$^\circ C$
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	$R_{thJA}$	450	K/W

#### Note

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



Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released  
 Vishay Semiconductors

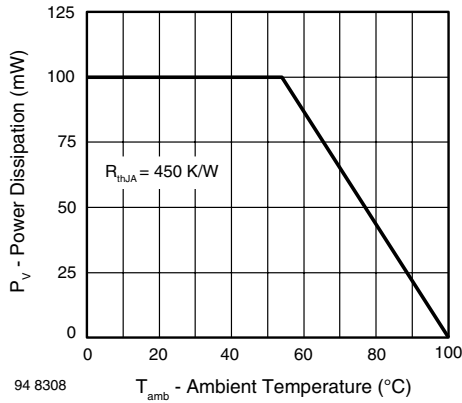


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b>						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	$I_C = 0.1 \text{ mA}$	$V_{CE0}$	6			V
Collector dark current	$V_{CE} = 5 \text{ V}, E = 0$	$I_{CEO}$		3	50	nA
Collector emitter capacitance	$V_{CE} = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$	$C_{CEO}$		16		pF
Photo current	$E_V = 20 \text{ lx}, \text{ CIE illuminant A}, V_{CE} = 5 \text{ V}$	$I_{PCE}$		4.6		$\mu\text{A}$
	$E_V = 100 \text{ lx}, \text{ CIE illuminant A}, V_{CE} = 5 \text{ V}$	$I_{PCE}$	7.5		39	$\mu\text{A}$
Temperature coefficient of $I_{PCE}$	CIE illuminant A	$TK_{IPCE}$		1.18		%/K
	LED, white	$TK_{IPCE}$		0.9		%/K
Angle of half sensitivity		$\phi$		$\pm 60$		deg
Wavelength of peak sensitivity		$\lambda_p$		550		nm
Range of spectral bandwidth		$\lambda_{0.5}$		450 to 610		nm
Collector emitter saturation voltage	$E_V = 20 \text{ lx}, 0.45 \mu\text{A}$	$V_{CEsat}$		0.1		V

**Note**

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

<b>TYPE DEDICATED CHARACTERISTICS</b>						
PARAMETER	TEST CONDITION	SELECTION TYPE	SYMBOL	MIN.	MAX.	UNIT
Photo current	$E_V = 100 \text{ lx}, \text{ CIE illuminant A}, V_{CE} = 5 \text{ V}$	TEMT6200FX01A	$I_{PCE}$	7.5	15	$\mu\text{A}$
		TEMT6200FX01B	$I_{PCE}$	12	24	$\mu\text{A}$
		TEMT6200FX01C	$I_{PCE}$	19.5	39	$\mu\text{A}$

**Note**

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

Vishay Semiconductors Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released

## BASIC CHARACTERISTICS

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

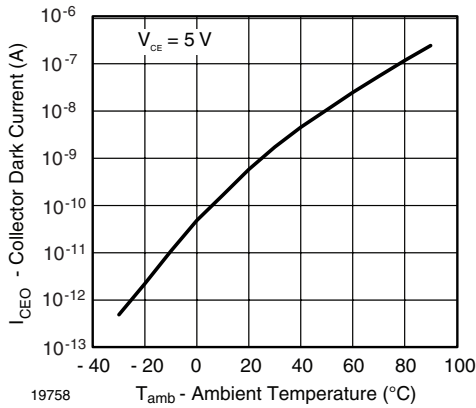


Fig. 2 - Collector Dark Current vs. Ambient Temperature

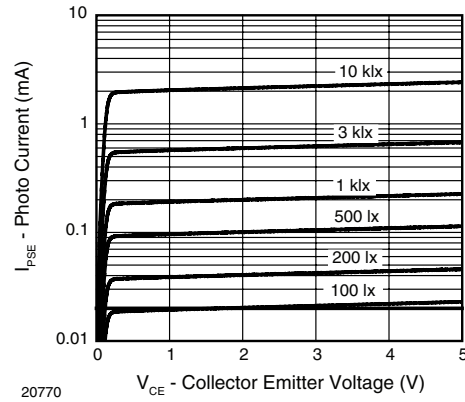


Fig. 5 - Photo Current vs. Collector Emitter Voltage

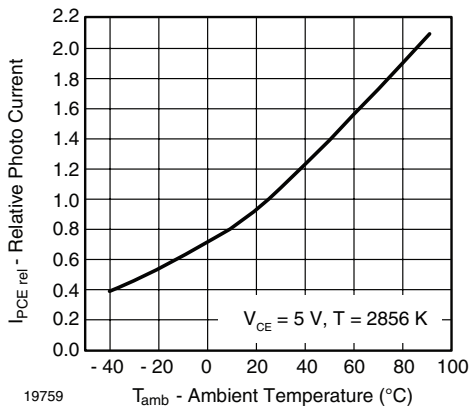


Fig. 3 - Relative Photo Current vs. Ambient Temperature

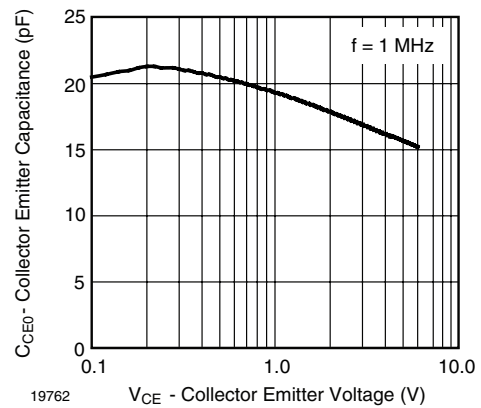


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

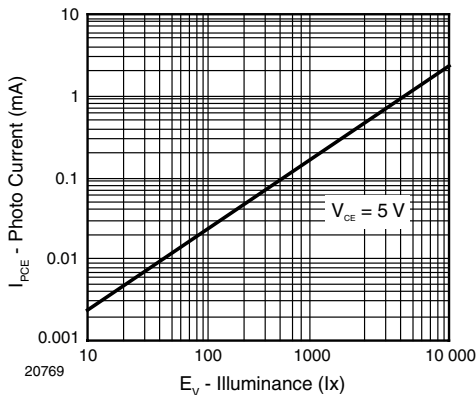


Fig. 4 - Photo Current vs. Illuminance

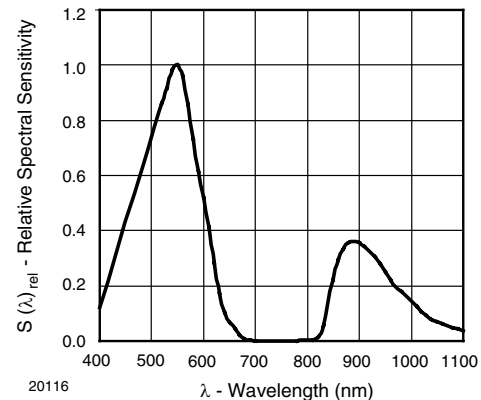


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

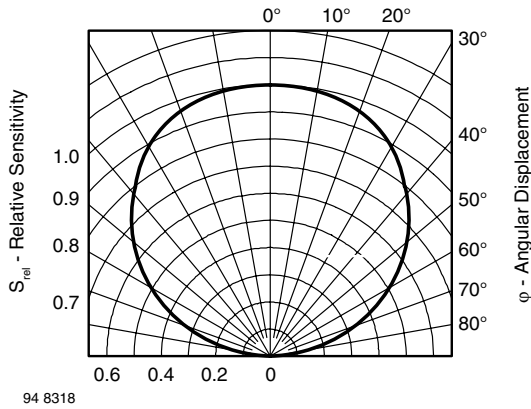


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

### REFLOW SOLDER PROFILE

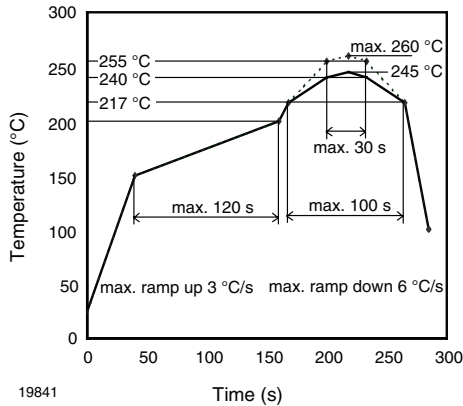


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

### DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

### FLOOR LIFE

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 72 h

Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ ,  $RH < 60\%$

Moisture sensitivity level 4, acc. to J-STD-020.

### DRYING

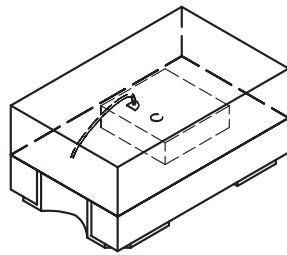
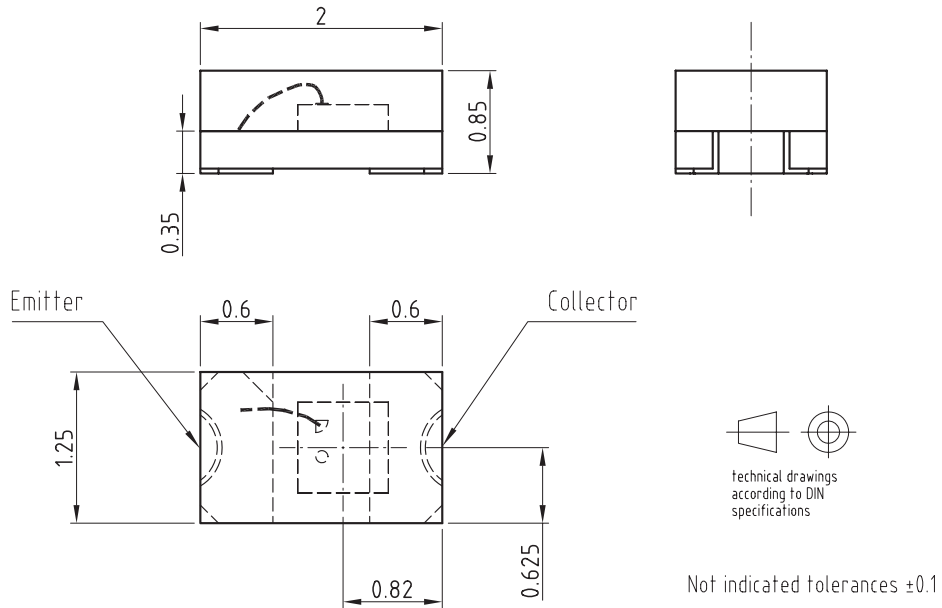
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+  $5\text{ }^{\circ}\text{C}$ ),  $RH < 5\%$ .

# TEMT6200FX01



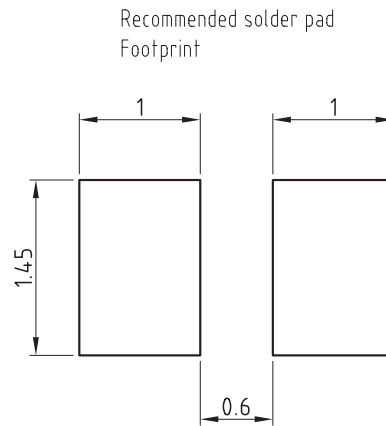
Vishay Semiconductors Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released

## PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.541-5063.01-4  
Issue: 3; 23.02.07

19757



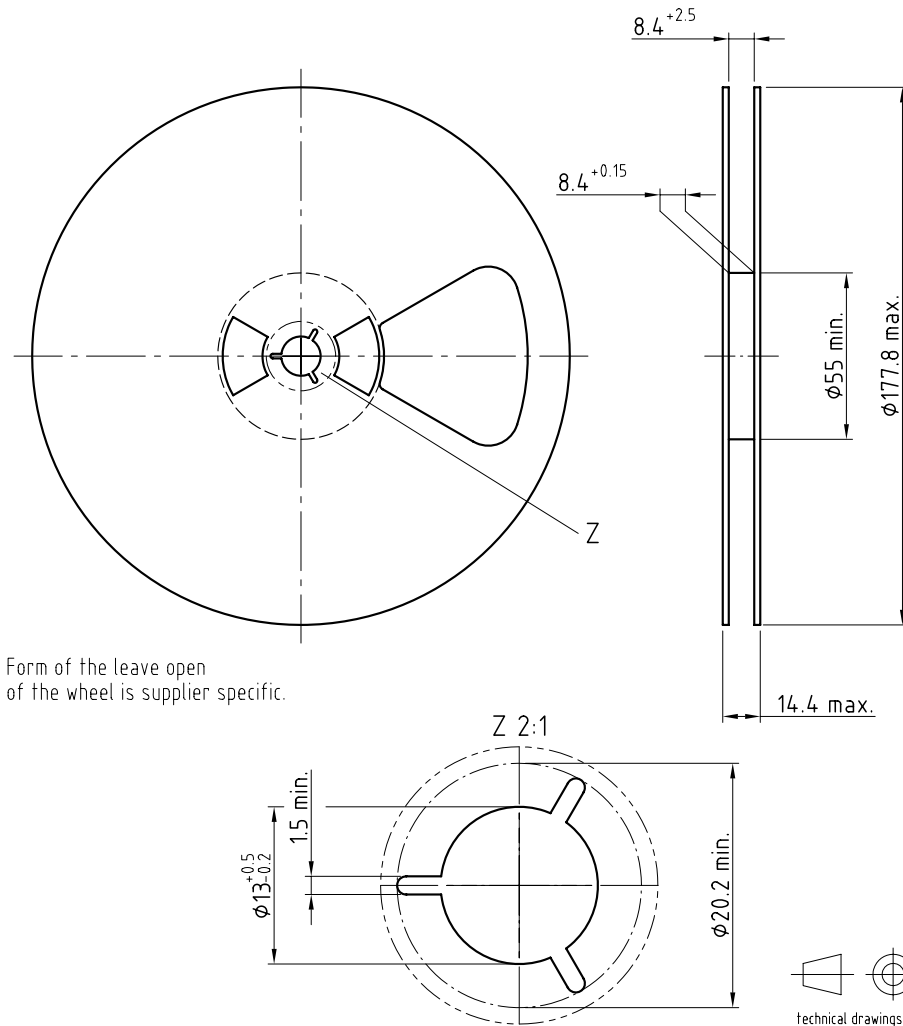


# TEMT6200FX01



Vishay Semiconductors Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released

**REEL DIMENSIONS** in millimeters



Drawing-No.: 9.800-5096.01-4

Issue: 1; 05.05.08

20875



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.