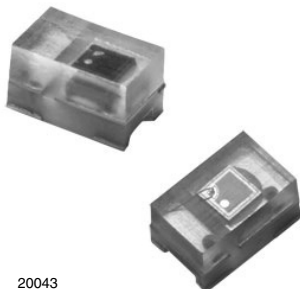


## Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released



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



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 Vishay Semiconductors

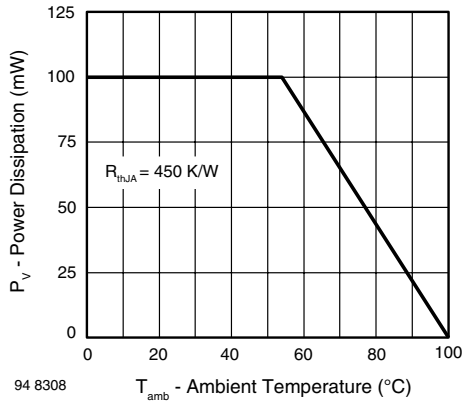


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

<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	$V_{CE} = 5 \text{ V}, E = 0$	$I_{CE0}$		3	50	nA
Collector emitter capacitance	$V_{CE} = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$	$C_{CE0}$		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

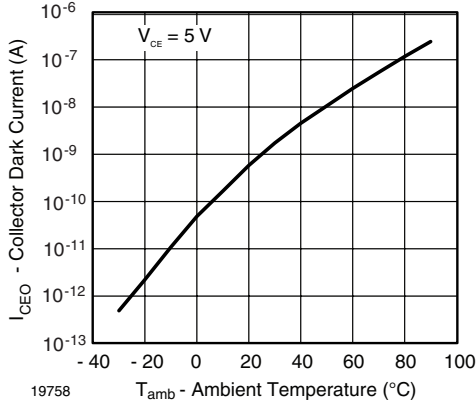


Fig. 2 - Collector Dark Current vs. Ambient Temperature

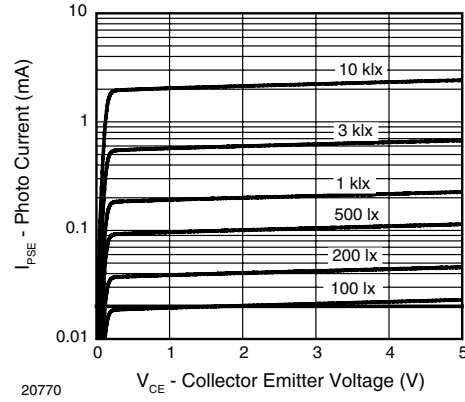


Fig. 5 - Photo Current vs. Collector Emitter Voltage

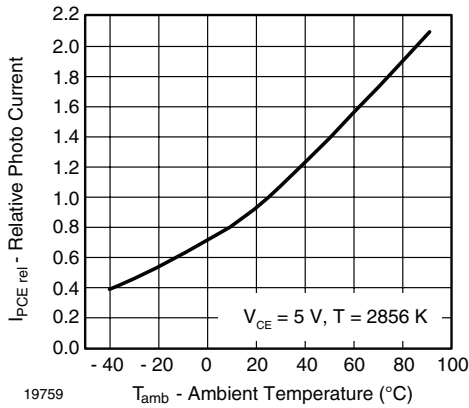


Fig. 3 - Relative Photo Current vs. Ambient Temperature

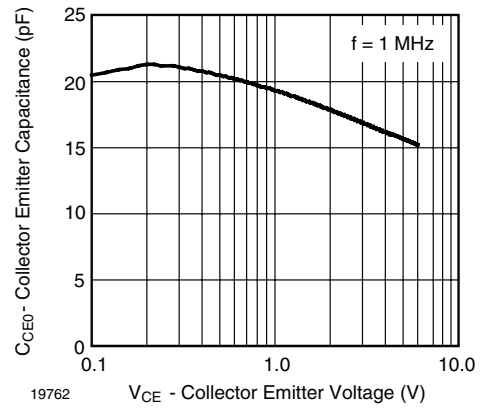


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

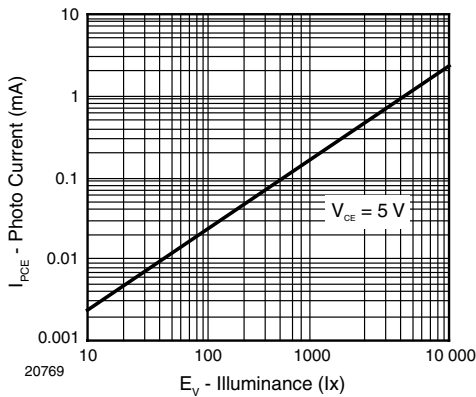


Fig. 4 - Photo Current vs. Illuminance

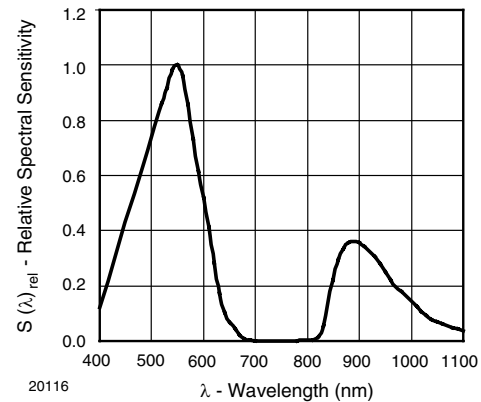


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

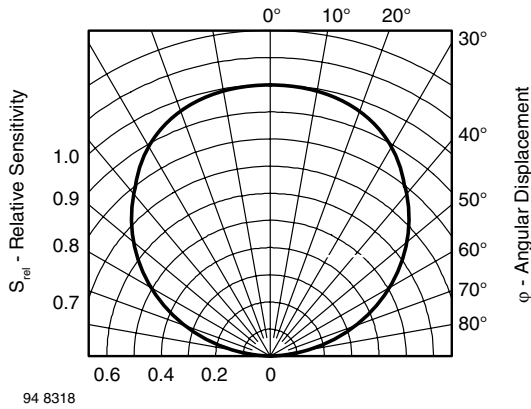


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

### REFLOW SOLDER PROFILE

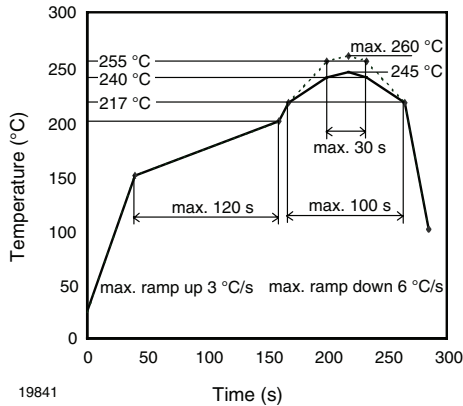


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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

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

### DRYING

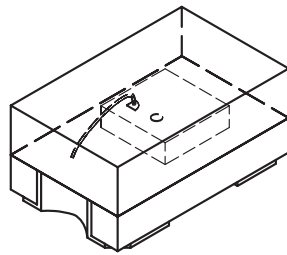
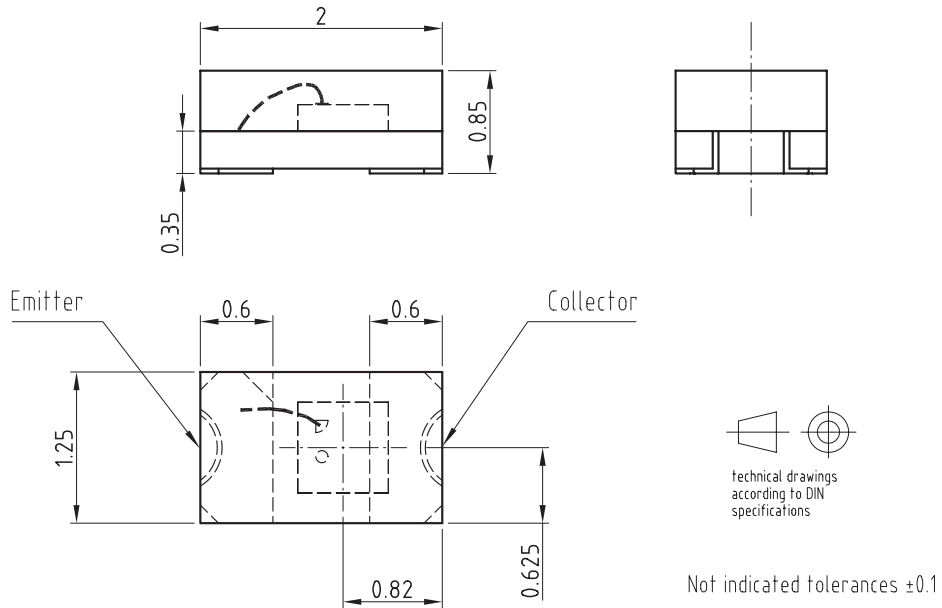
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+  $5\text{ }^{\circ}\text{C}$ ),  $\text{RH} < 5\%$ .

# TEMT6200FX01

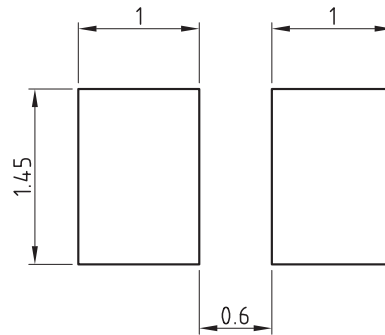


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## PACKAGE DIMENSIONS in millimeters



Recommended solder pad Footprint



Drawing-No.: 6.541-5063.01-4

Issue: 3; 23.02.07

19757

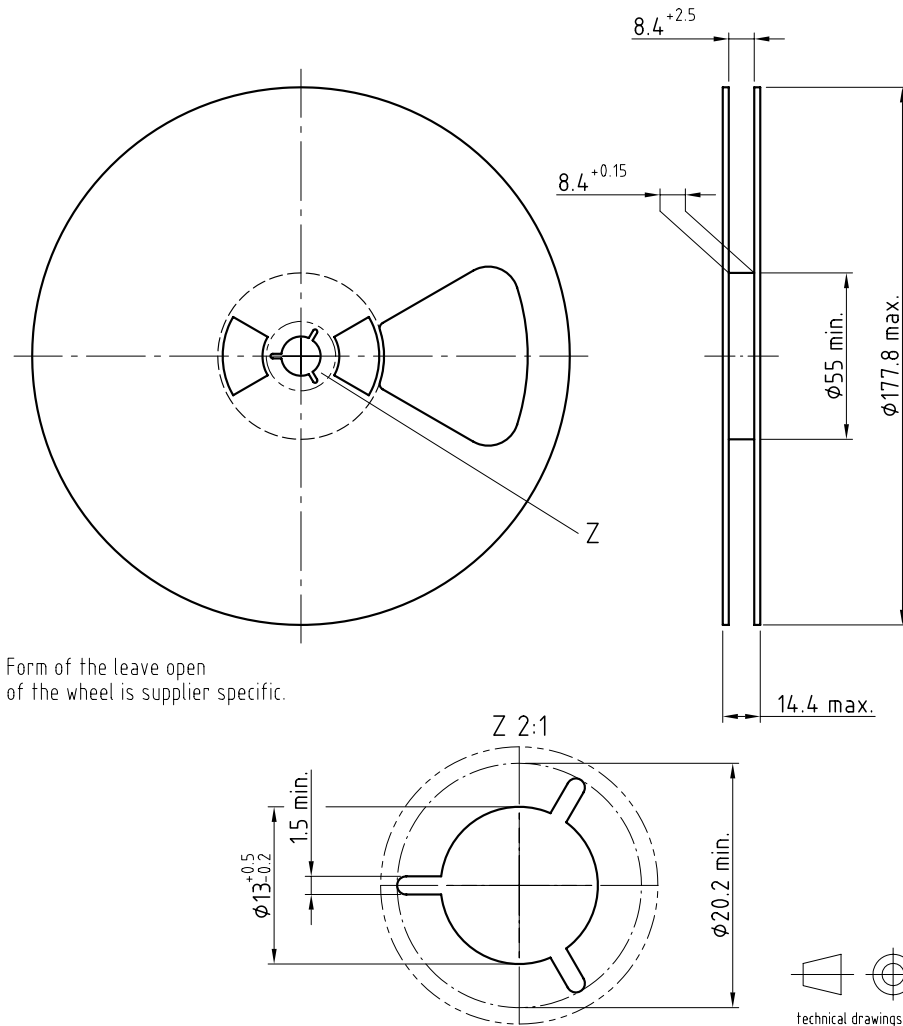


# TEMT6200FX01



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**REEL DIMENSIONS** in millimeters



Drawing-No.: 9.800-5096.01-4

Issue: 1; 05.05.08

20875



## Disclaimer

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