

## Ambient Light Sensor in 0805 Package



### 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
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Suppression filter for near infrared radiation
- Angle of half sensitivity:  $\phi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- 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 sensors
- Ambient light sensor for display backlight dimming in:
  - Mobile phones
  - Notebook computers
  - PDAs
  - Cameras
  - Dashboards

### PRODUCT SUMMARY

COMPONENT	$I_{PCE}$ ( $\mu A$ )	$\phi$ (deg)	$\lambda_{0.5}$ (nm)
TEMT6200FX01	23	$\pm 60$	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 ( $T_{amb} = 25^\circ C$ , unless otherwise specified)

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



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	$I_C = 0.1\text{ mA}$	$V_{CEO}$	6			V
Collector dark current	$V_{CE} = 5\text{ V}$ , $E = 0\text{ lx}$	$I_{CEO}$		3	50	nA
Collector emitter capacitance	$V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0\text{ lx}$	$C_{CEO}$		16		pF
Photo current	$E_V = 20\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$	$I_{PCE}$		4.6		$\mu\text{A}$
	$E_V = 100\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$	$I_{PCE}$	7.5	23	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	$E_V = 20\text{ lx}$ , $0.45\text{ }\mu\text{A}$	$V_{CEsat}$		0.1		V

<b>TYPE DEDICATED CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	BINNED GROUP	SYMBOL	MIN.	MAX.	UNIT
Photo current	$E_V = 100\text{ lx}$ , CIE illuminant A, $V_{CEtZ51} = 5\text{ V}$	A	$I_{PCE}$	7.5	15	$\mu\text{A}$
		B	$I_{PCE}$	12	24	$\mu\text{A}$
		C	$I_{PCE}$	19.5	39	$\mu\text{A}$

**Note**

- Each 3000 piece packing unit will contain a single group. The label on the bag will indicate which binned group is in the bag. A specific group cannot be ordered. Production shipments containing multiple bags will likely include multiple groups. Please design accordingly.

**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

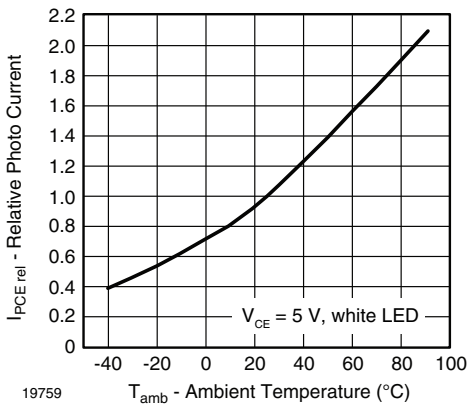


Fig. 3 - Relative Photo Current vs. Ambient Temperature

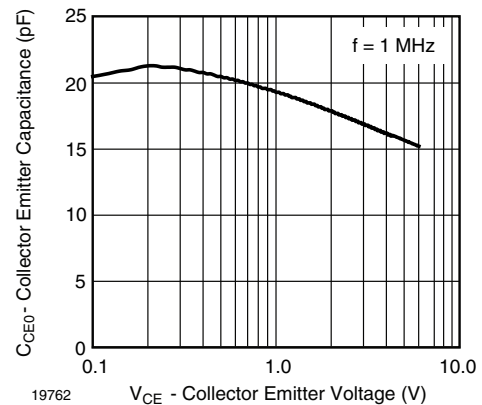


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

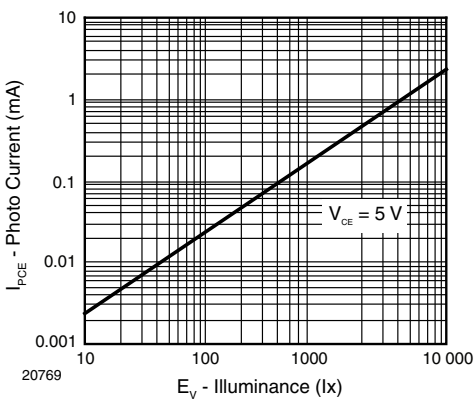


Fig. 4 - Photo Current vs. Illuminance

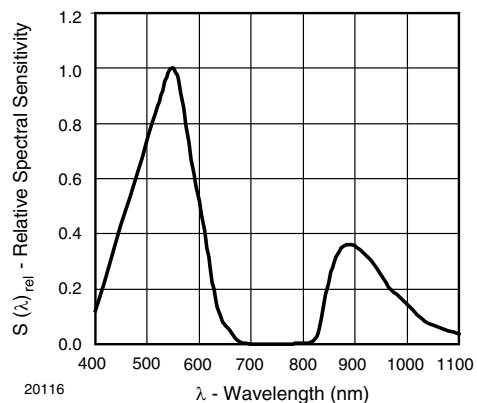


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

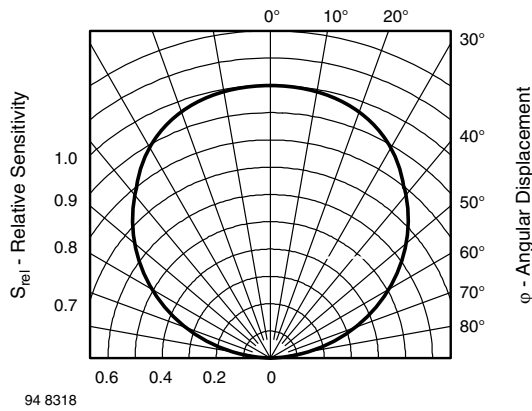


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

**REFLOW SOLDER PROFILE**

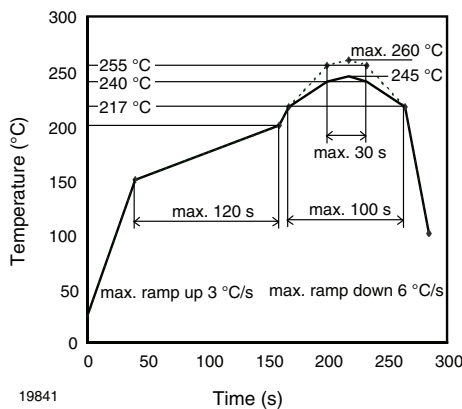


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

**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**

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

Floor life: 168 h

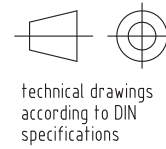
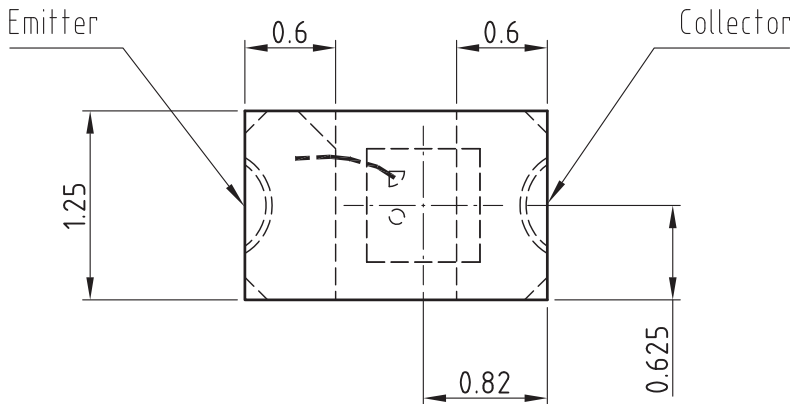
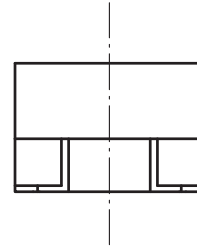
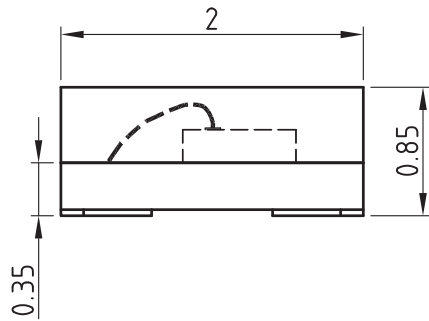
Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ ,  $RH < 60\%$

**DRYING**

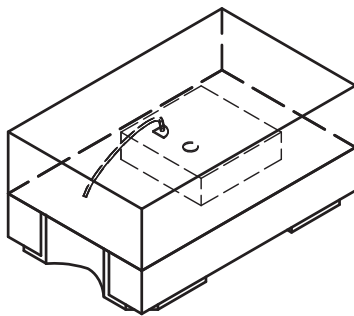
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+  $5\text{ }^{\circ}\text{C}$ ),  $RH < 5\%$ .



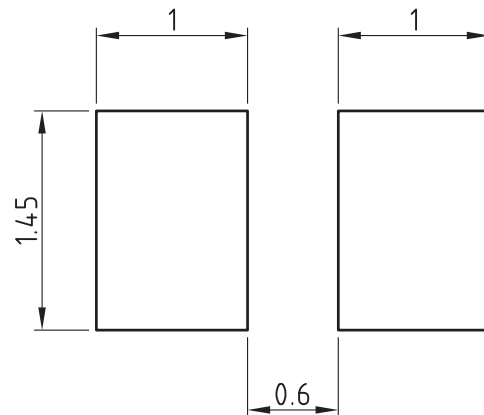
PACKAGE DIMENSIONS in millimeters



Not indicated tolerances ±0.1



Recommended solder pad Footprint



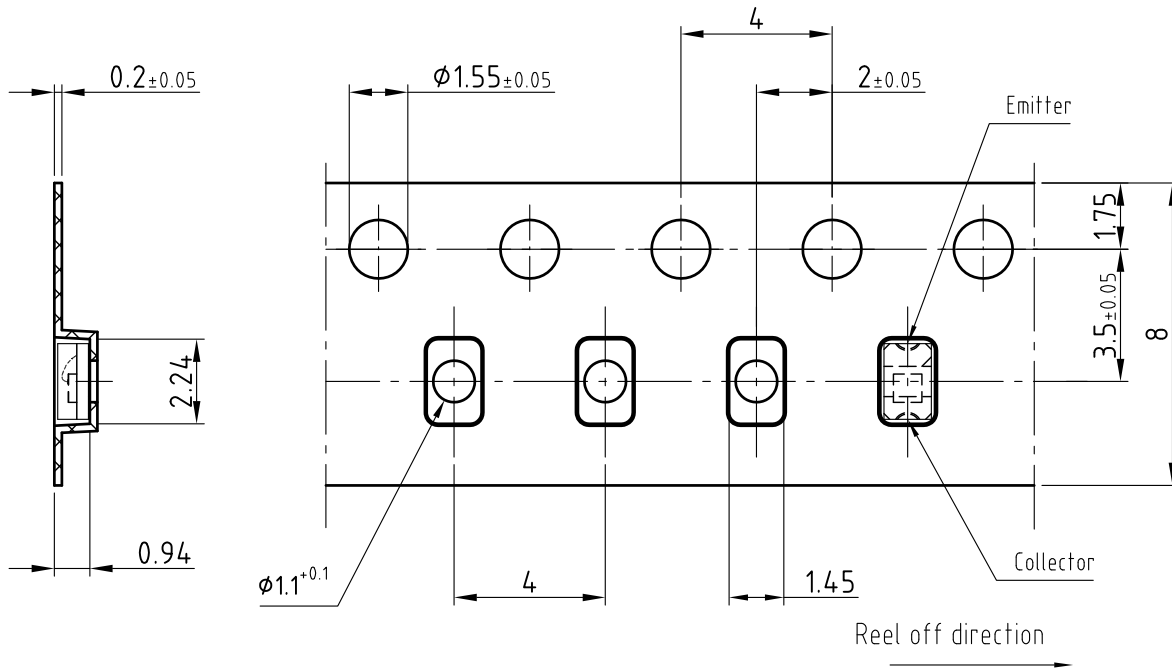
Drawing-No.: 6.541-5063.01-4

Issue: 3; 23.02.07

19757



### BLISTER TAPE DIMENSIONS in millimeters



Drawing-No.: 9.700-5310.01-4  
 Issue: 2; 14.08.07  
 20690

Not indicated tolerances  $\pm 0.1$   
 Quantity per reel: 3000 pcs

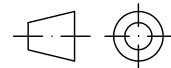
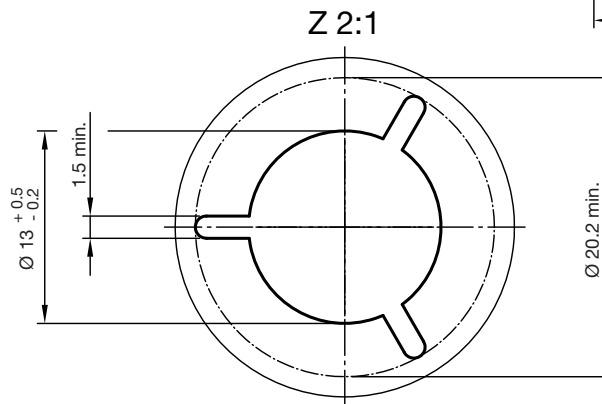
technical drawings  
 according to DIN  
 specifications



REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.



technical drawings according to DIN specifications

Drawing-No.: 9.800-5096.01-4

Issue: 2; 26.04.10

20875



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