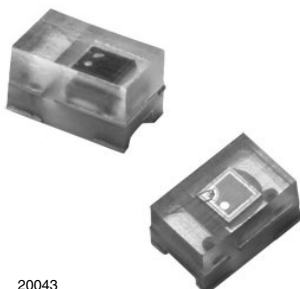


Ambient Light Sensor in 0805 Package, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released



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} (μA)	φ (deg)	$\lambda_{0.5}$ (nm)
TEMT6200FX01	7.5 to 39	± 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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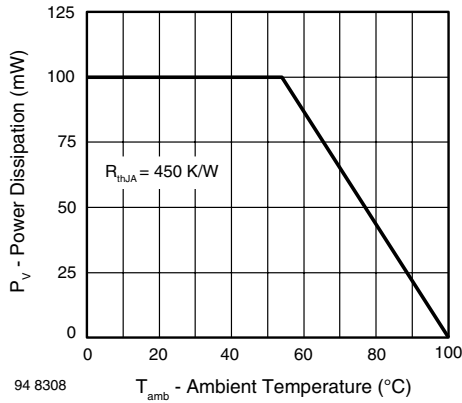


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
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		μA
	$E_V = 100 \text{ lx}, \text{ CIE illuminant A}, V_{CE} = 5 \text{ V}$	I_{PCE}	7.5		39	μA
Temperature coefficient of I_{PCE}	CIE illuminant A	TK_{IPCE}		1.18		%/K
	LED, white	TK_{IPCE}		0.9		%/K
Angle of half sensitivity		ϕ		± 60		deg
Wavelength of peak sensitivity		λ_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

TYPE DEDICATED CHARACTERISTICS						
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	μA
		TEMT6200FX01B	I_{PCE}	12	24	μA
		TEMT6200FX01C	I_{PCE}	19.5	39	μA

Note

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

BASIC CHARACTERISTICS

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

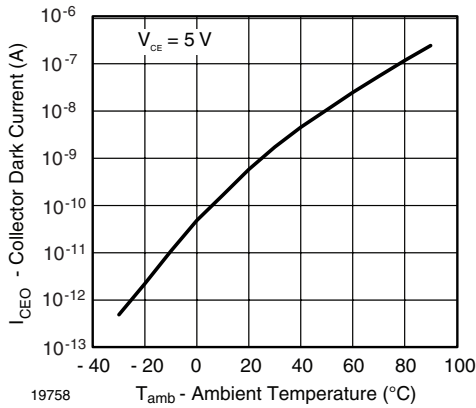


Fig. 2 - Collector Dark Current vs. Ambient Temperature

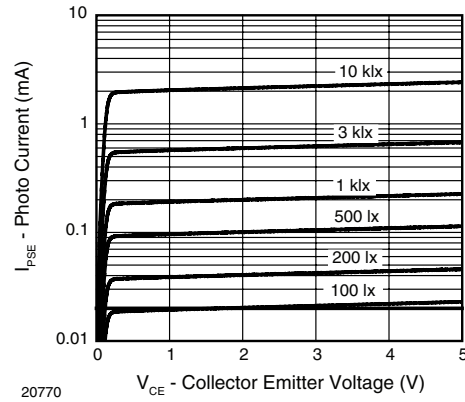


Fig. 5 - Photo Current vs. Collector Emitter Voltage

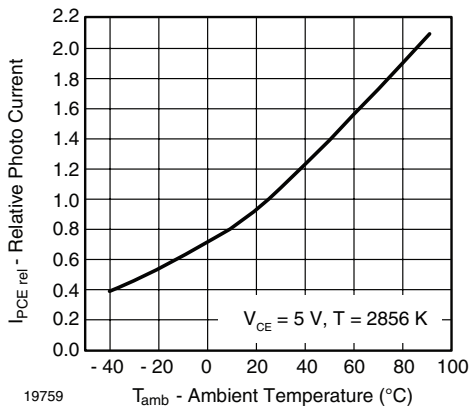


Fig. 3 - Relative Photo Current vs. Ambient Temperature

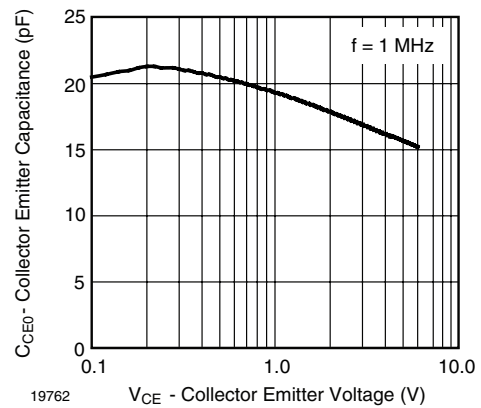


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

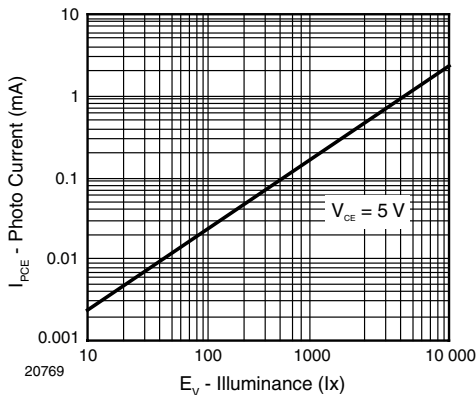


Fig. 4 - Photo Current vs. Illuminance

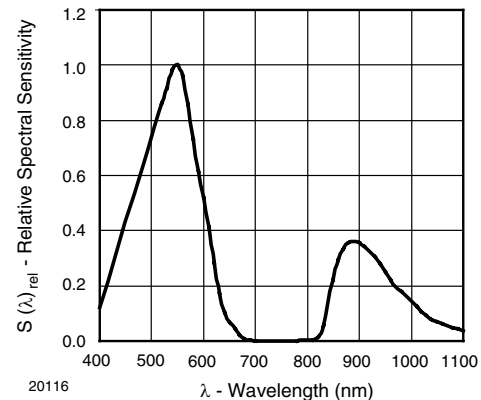


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

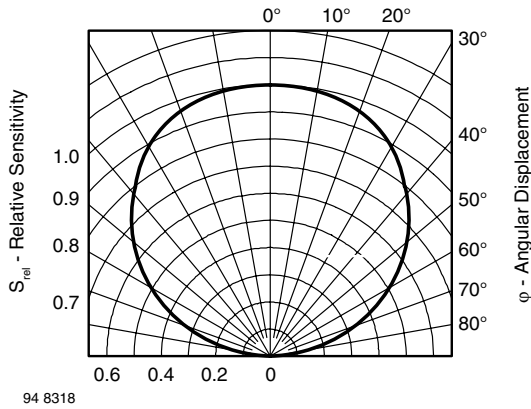


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE

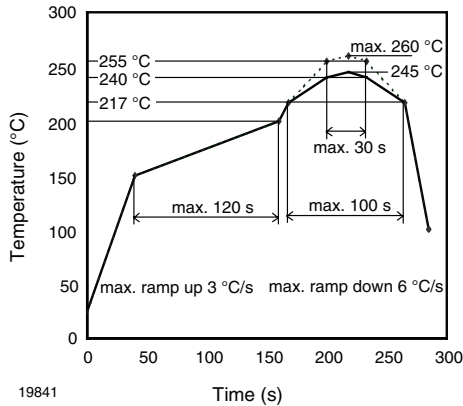


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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

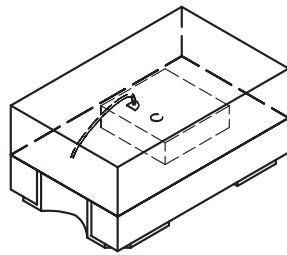
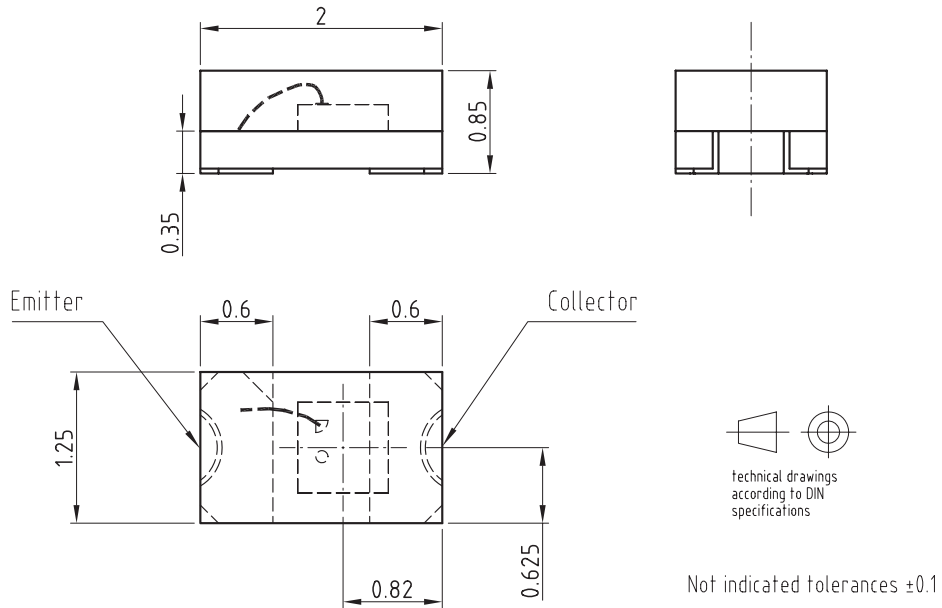
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at $40\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $RH < 5\%$.

TEMT6200FX01



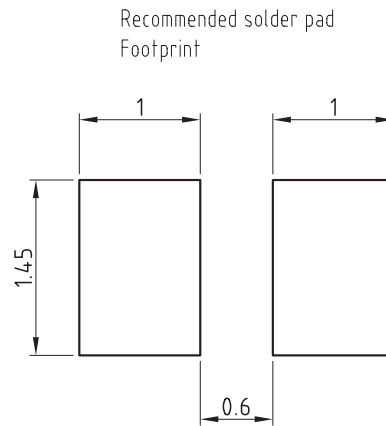
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PACKAGE DIMENSIONS in millimeters



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

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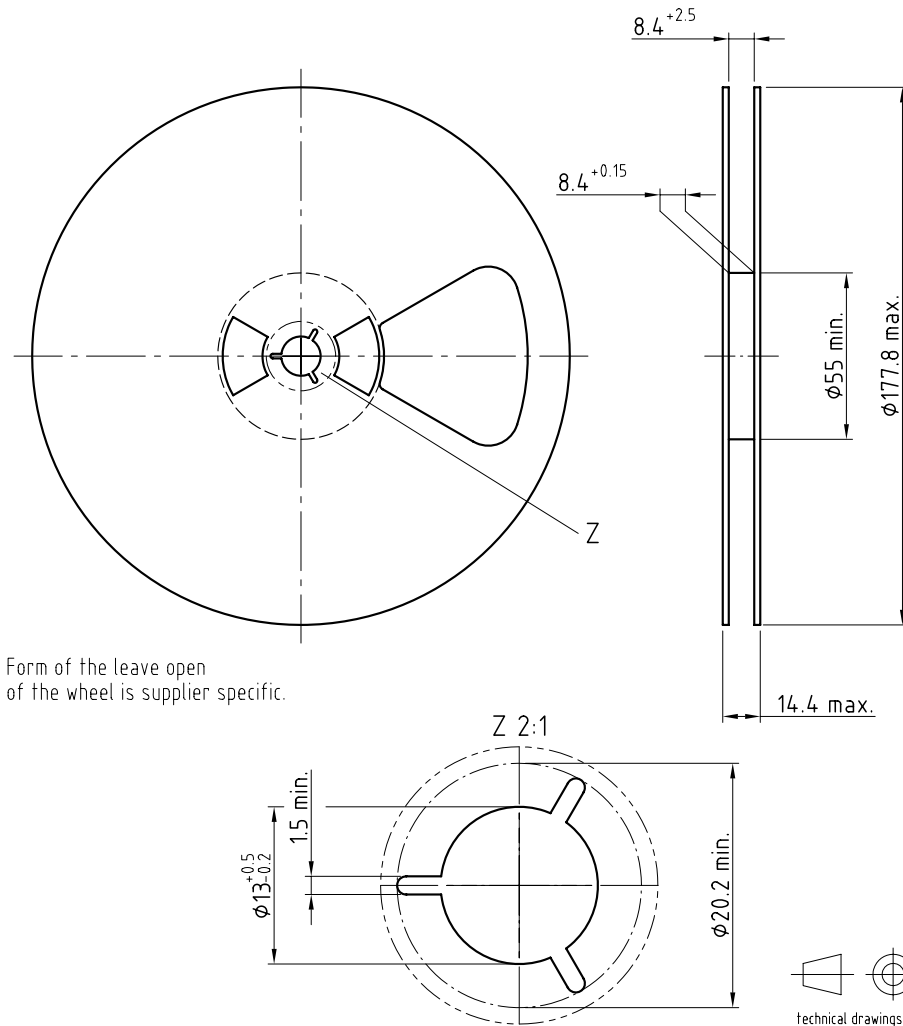


TEMT6200FX01



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REEL DIMENSIONS in millimeters



Drawing-No.: 9.800-5096.01-4

Issue: 1; 05.05.08

20875



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