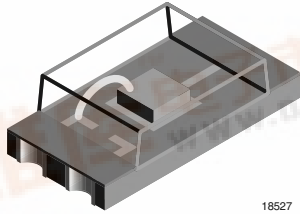




TEM6000X01

Vishay Semiconductors

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



FEATURES

- Package type: surface mount
- Package form: 1206
- Dimensions (L x W x H in mm): 4 x 2 x 1.05
- Product designed and qualified acc. AEC-Q101 for the automotive market
- High photo sensitivity
- Adapted to human eye responsivity
- 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

DESCRIPTION

TEM6000X01 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a miniature transparent 1206 package for surface mounting. It is sensitive to visible light much like the human eye and has peak sensitivity at 570 nm.

APPLICATIONS

Ambient light sensor for control of display backlight dimming in LCD displays and keypad backlighting of mobile devices and in industrial on/off-lighting operation.

- Automotive sensors
- Mobile phones
- Notebook computers
- PDA's
- Cameras
- Dashboards

PRODUCT SUMMARY

COMPONENT	I_{PCE} (μA)	φ (deg)	$\lambda_{0.5}$ (nm)
TEM6000X01	50	± 60	440 to 800

Note

Test condition see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEM6000X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	1206

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



TEMT6000X01



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ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	Acc. reflow solder profile fig. 8	T_{sd}	260	°C
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	R_{thJA}	450	K/W

Note

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

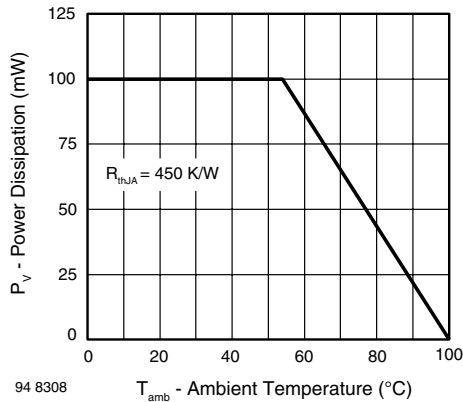


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	$I_C = 0.1\text{ mA}$	V_{CEO}	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
Collector light current	$E_V = 20\text{ lx}, \text{CIE illuminant A}, V_{CE} = 5\text{ V}$	I_{PCE}	3.5	10	16	μA
	$E_V = 100\text{ lx}, \text{CIE illuminant A}, V_{CE} = 5\text{ V}$	I_{PCE}		50		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		570		nm
Range of spectral bandwidth		$\lambda_{0.5}$		440 to 800		nm
Collector emitter saturation voltage	$E_V = 20\text{ lx}, \text{CIE illuminant A}, I_{PCE} = 1.2\text{ μA}$	V_{CEsat}		0.1		V

Note

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BASIC CHARACTERISTICS

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

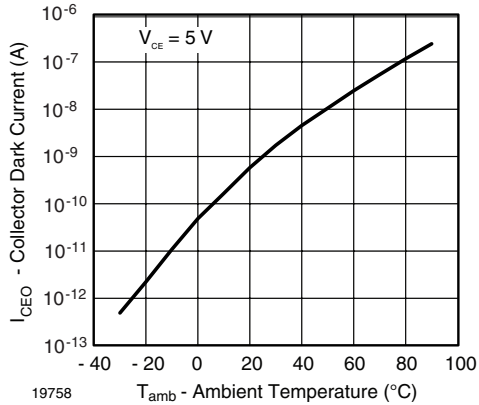


Fig. 2 - Collector Dark Current vs. Ambient Temperature

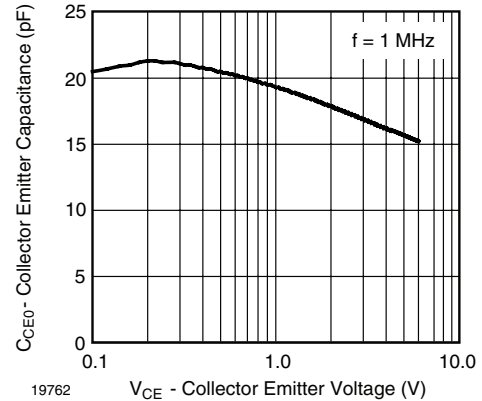


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

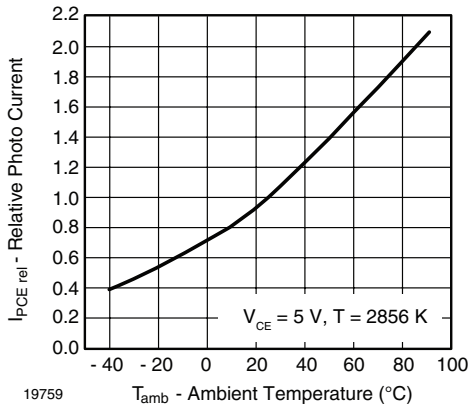


Fig. 3 - Relative Photo Current vs. Ambient Temperature

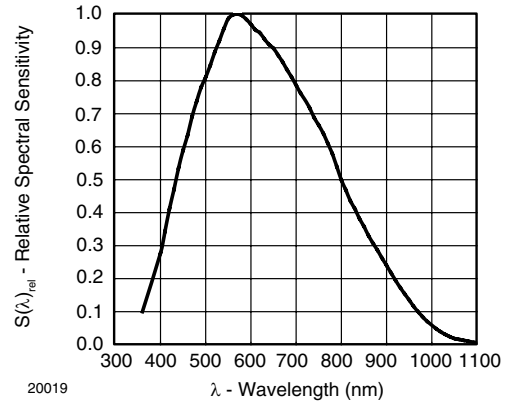


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

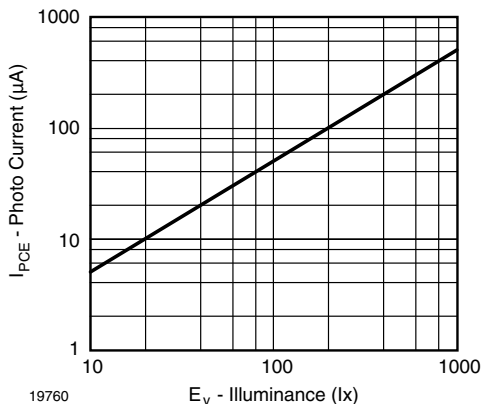


Fig. 4 - Photo Current vs. Illuminance

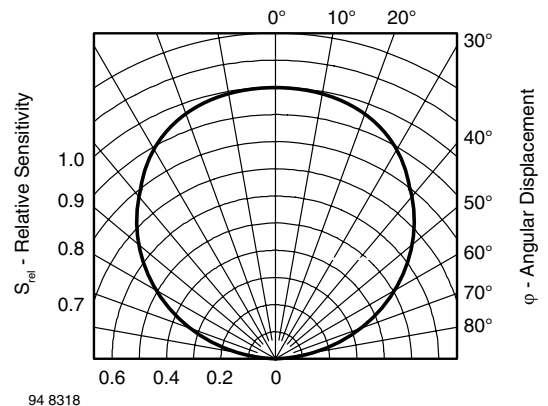


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

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REFLOW SOLDER PROFILE

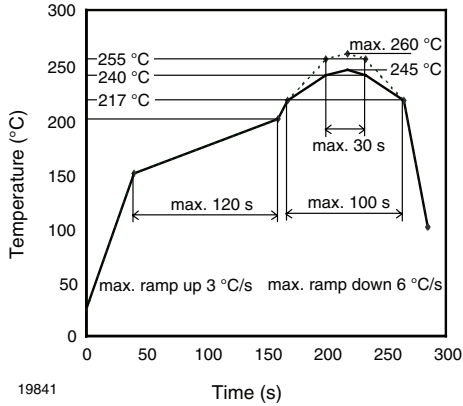


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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.

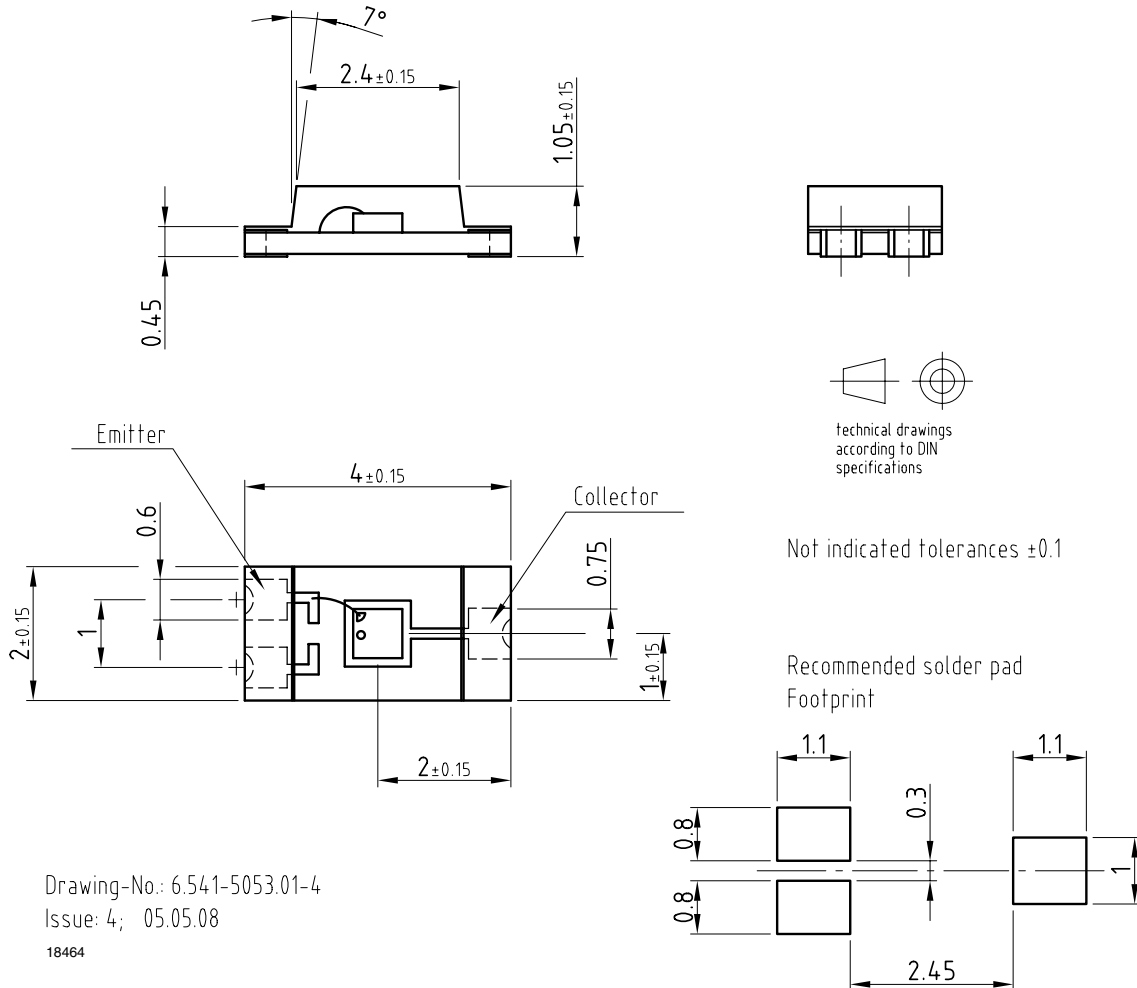
FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:
 Moisture sensitivity: level 4
 Floor life: 72 h
 Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or recommended conditions:
 192 h at $40\text{ °C} (+ 5\text{ °C})$, $RH < 5\%$
 or
 96 h at $60\text{ °C} (+ 5\text{ °C})$, $RH < 5\%$.

PACKAGE DIMENSIONS in millimeters



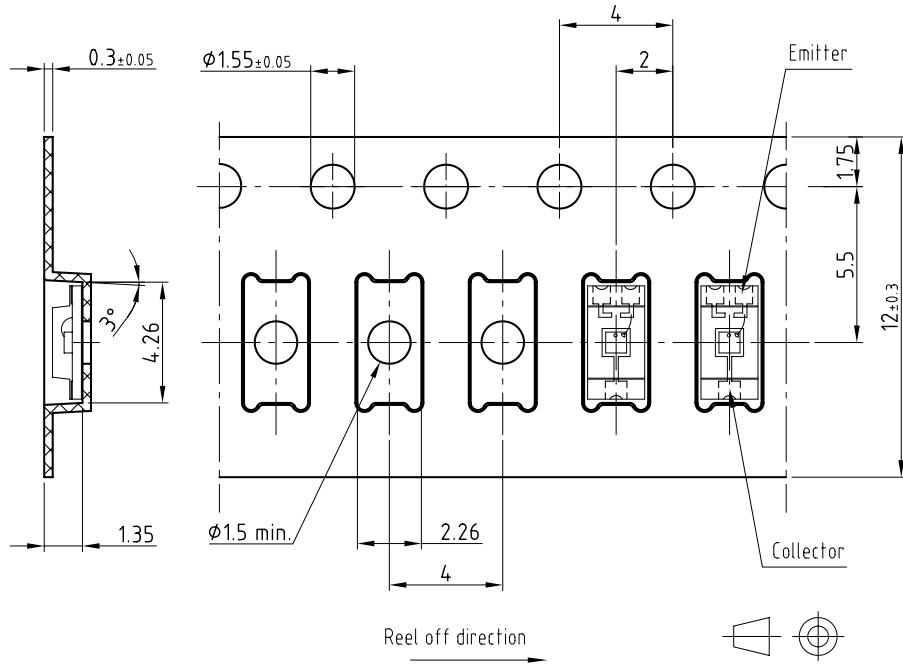
Drawing-No.: 6.541-5053.01-4
 Issue: 4; 05.05.08
 18464



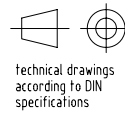
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BLISTER TAPE DIMENSIONS in millimeters



Drawing-No.: 9.700-5329.01-4
Issue: 1; 05.05.08
20876

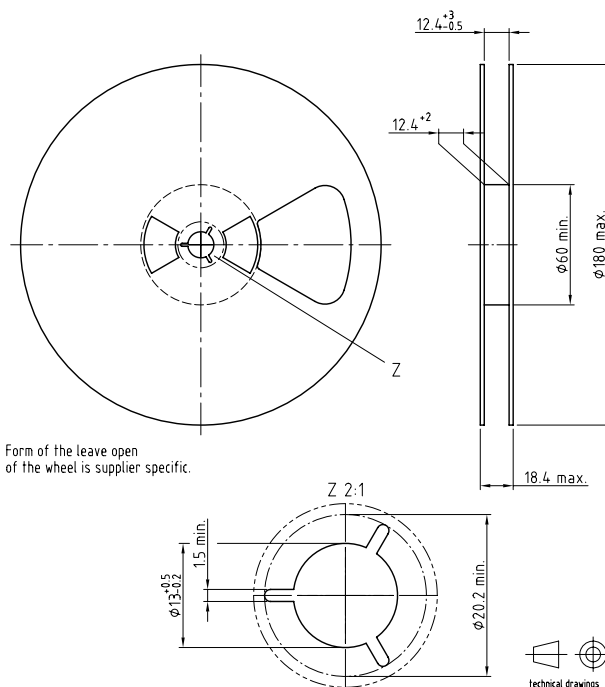


technical drawings
according to DIN
specifications

Not indicated tolerances ± 0.1

REEL DIMENSIONS in millimeters

Volume: 3000 pcs/reel



Drawing-No.: 9.800-5097.01-4
Issue: 1; 05.05.08
20874



technical drawings
according to DIN
specifications



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