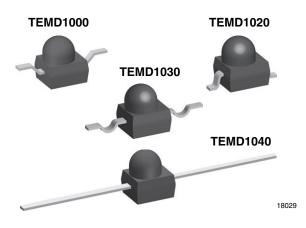
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TEMD1000, TEMD1020, TEMD1030, TEMD1040

Vishay Semiconductors

Silicon PIN Photodiode, RoHS-Compliant



DESCRIPTION

TEMD1000 series are PIN photodiodes with high speed and high radiant sensitivity in black, surface-mount plastic packages with lens and daylight blocking filter. Filter bandwidth is matched with 870 nm to 950 nm IR emitters.

FEATURES

- · Package type: surface-mount
- Package form: GW, RGW, yoke, axial
- Dimensions (L x W x H in mm): 2.5 x 2 x 2.7
- Radiant sensitive area (in mm²): 0.23
- · High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 15^{\circ}$
- Package matches with IR emitter series TSML1000
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

- · High speed detector for infrared radiation
- Infrared remote control and free air data transmission systems, e.g. in combination with TSMLxxxx series IR emitters

PRODUCT SUMMARY				
COMPONENT	I _{ra} (μΑ)	φ (°)	λ _{0.5} (nm)	
TEMD1000	10	± 15	790 to 1050	
TEMD1020	10	± 15	790 to 1050	
TEMD1030	10	± 15	790 to 1050	
TEMD1040	10	± 15	790 to 1050	

Note

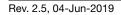
Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TEMD1000	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Reverse gullwing	
TEMD1020	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Gullwing	
TEMD1030	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Yoke	
TEMD1040	Bulk	MOQ: 1000 pcs, 1000 pcs/bulk	Axial leads	

Note

• MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V _R	60	V
Power dissipation	T _{amb} ≤ 25 °C	Pv	75	mW
Junction temperature		Tj	100	°C
Operating temperature range		T _{amb}	-40 to +85	°C
Storage temperature range		T _{stg}	-40 to +100	°C
Soldering temperature	t ≤ 5 s	T _{sd}	< 260	°C



1 For technical questions, contact: <u>detectortechsupport@vishay.com</u> Document Number: 81564



RoHS

COMPLIANT

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BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 50 mA	V _F	-	1	1.3	V
Breakdown voltage	I _R = 100 μA, E = 0	V _(BR)	60	-	-	V
Reverse dark current	V _R = 10 V, E = 0	I _{ro}	-	1	10	nA
Diode capacitance	$V_{R} = 5 V, f = 1 MHz, E = 0$	CD	-	1.8	-	pF
Devenes light summert	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 870 \text{ nm}$, $V_R = 5 \text{ V}$	I _{ra}	6.0	10	13.0	μA
Reverse light current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_R = 5 \text{ V}$	I _{ra}	-	12	-	μA
Temperature coefficient of Ira	$V_R = 5 V, \lambda = 870 nm,$	TK _{lra}	-	0.2	-	%/K
Absolute spectral sensitivity	$V_R = 5 V$, $\lambda = 870 nm$	s(λ)	-	0.60	-	A/W
	$V_{R} = 5 V, \lambda = 950 nm$	s(λ)	-	0.55	-	A/W
Angle of half sensitivity		φ	-	± 15	-	0
Wavelength of peak sensitivity		λρ	-	940	-	nm
Range of spectral bandwidth		λ _{0.5}	-	790 to 1050	-	nm
Rise time	V_R = 10 V, R_L = 50 Ω , λ = 820 nm	t _r	-	4	-	ns
Fall time	$V_R = 10 \text{ V}, R_L = 50 \Omega, \lambda = 820 \text{nm}$	t _f	-	4	-	ns

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

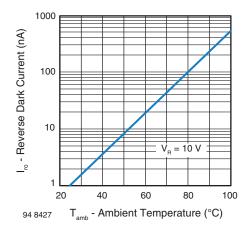


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

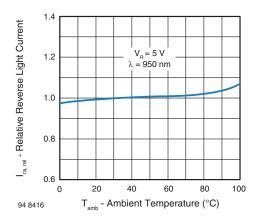


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

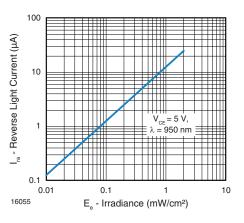


Fig. 3 - Reverse Light Current vs. Irradiance

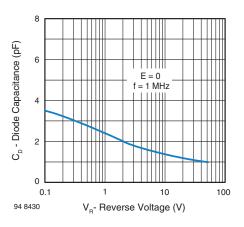


Fig. 4 - Diode Capacitance vs. Reverse Voltage

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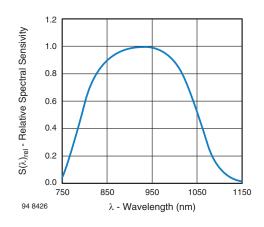


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

PRECAUTIONS FOR USE

1. Over-Current Proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (burn out will happen).

2. Storage

- \bullet Storage temperature and rel. humidity conditions are: 5 °C to 35 °C, R.H. 60 %
- Floor life must not exceed 168 h, according to JEDEC[®] level 3, J-STD-020.

Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp proof box with desiccant.

Considering tape life, we suggest to use products within one year from production date

- If opened more than one week in an atmosphere 5 °C to 35 °C, R.H. 60 %, devices should be treated at 60 °C \pm 5 °C for 15 h
- If humidity indicator in the package shows pink color (normal blue), then devices should be treated with the same conditions as 2.3

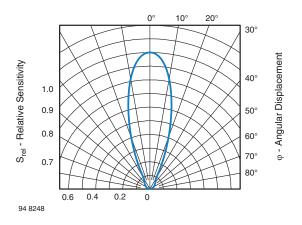


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE

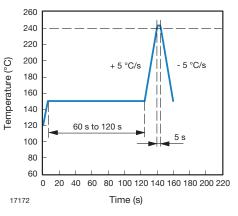


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

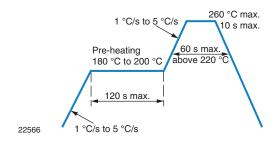


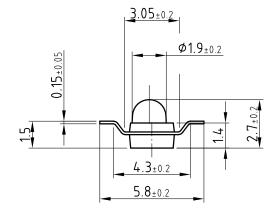
Fig. 8 - Lead (Pb)-Free Reflow Solder Profile According to J-STD-020

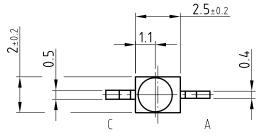


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PACKAGE DIMENSIONS in millimeters: TEMD1000

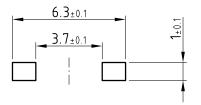




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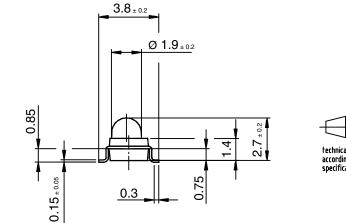
technical drawings according to DIN specifications

Solder pad proposal

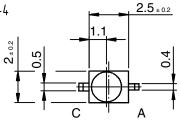


Drawing-No.: 6.544-5326.02-4 Issue: 3; 02.04.03

PACKAGE DIMENSIONS in millimeters: TEMD1020

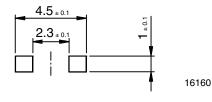


Drawing-No.: 6.544-5325.02-4 Issue: 3; 02.04.03



technical drawings according to DIN specifications

Solder pad proposal



Rev. 2.5, 04-Jun-2019

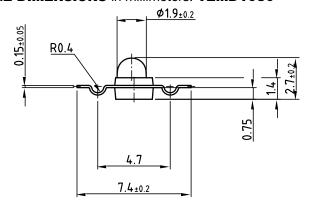
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PACKAGE DIMENSIONS in millimeters: TEMD1030



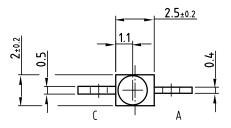
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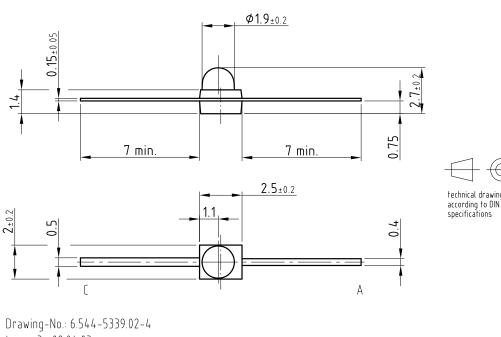
Solder pad proposal

7.9±0.1

5±0.1



PACKAGE DIMENSIONS in millimeters: TEMD1040



technical drawings

l±0.1

16228

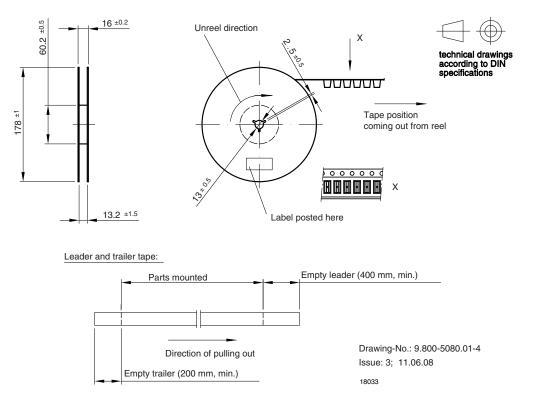
Issue: 3; 02.04.03 16760



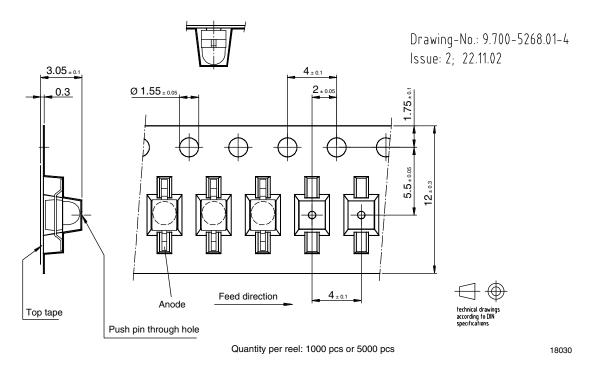
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REEL DIMENSIONS in millimeters



TAPING DIMENSIONS in millimeters: TEMD1000

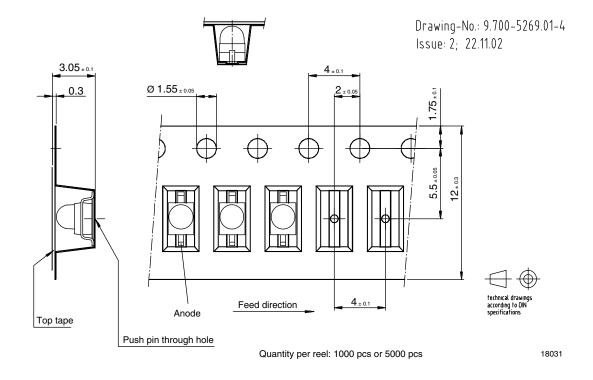


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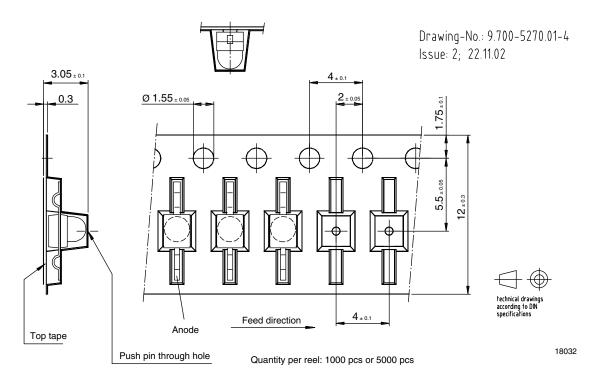


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TAPING DIMENSIONS in millimeters: TEMD1020



TAPING DIMENSIONS in millimeters: TEMD1030



7

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