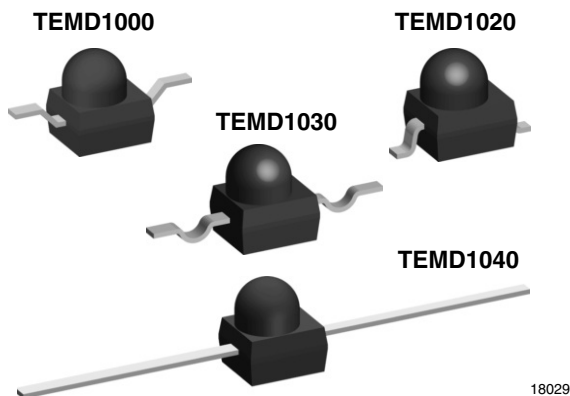


Silicon PIN Photodiode, RoHS Compliant



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 TSMF1000
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

APPLICATIONS

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

PRODUCT SUMMARY			
COMPONENT	I_{ra} (mA)	ϕ (deg)	$\lambda_{0.5}$ (nm)
TEMD1000	12	± 15	790 to 1050
TEMD1020	12	± 15	790 to 1050
TEMD1030	12	± 15	790 to 1050
TEMD1040	12	± 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				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	60	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_V	75	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 85	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5$ s	T_{sd}	< 260	$^\circ\text{C}$

Note

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



BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50 \text{ mA}$	V_F		1	1.3	V
Breakdown voltage	$I_R = 100 \text{ } \mu\text{A}, E = 0$	$V_{(BR)}$	60			V
Reverse dark current	$V_R = 10 \text{ V}, E = 0$	I_{ro}		1	10	nA
Diode capacitance	$V_R = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$	C_D		1.8		pF
Reverse light current	$E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}, V_R = 5 \text{ V}$	I_{ra}		10		μA
	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_R = 5 \text{ V}$	I_{ra}	5	12		μA
Temperature coefficient of I_{ra}	$V_R = 5 \text{ V}, \lambda = 870 \text{ nm}$	$TK_{I_{ra}}$		0.2		%/K
Absolute spectral sensitivity	$V_R = 5 \text{ V}, \lambda = 870 \text{ nm}$	$s(\lambda)$		0.60		A/W
	$V_R = 5 \text{ V}, \lambda = 950 \text{ nm}$	$s(\lambda)$		0.55		A/W
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ_p		940		nm
Range of spectral bandwidth		$\lambda_{0.5}$		790 to 1050		nm
Rise time	$V_R = 10 \text{ V}, R_L = 50 \text{ } \Omega, \lambda = 820 \text{ nm}$	t_r		4		ns
Fall time	$V_R = 10 \text{ V}, R_L = 50 \text{ } \Omega, \lambda = 820 \text{ nm}$	t_f		4		ns

Note

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

BASIC CHARACTERISTICS

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

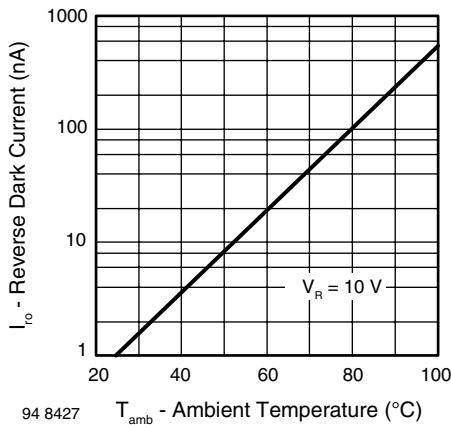


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

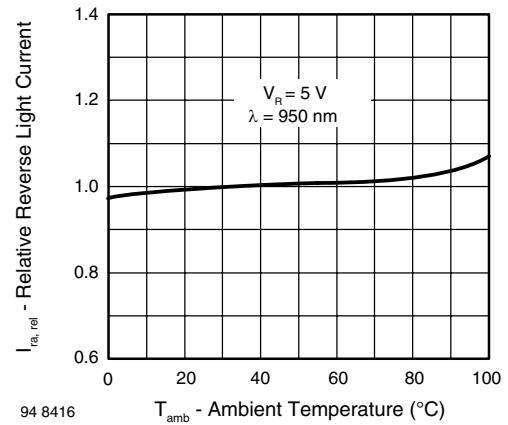


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

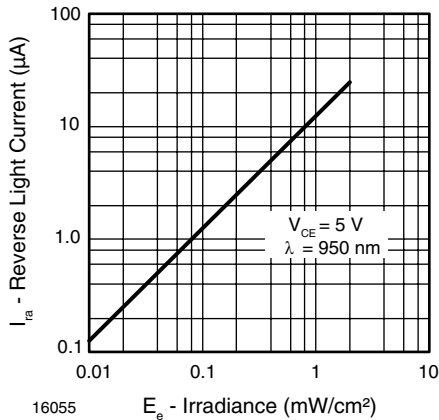


Fig. 3 - Reverse Light Current vs. Irradiance

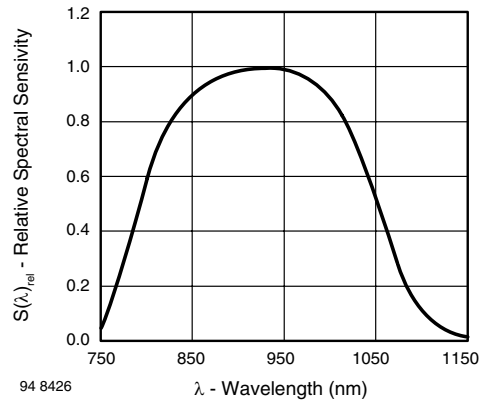


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

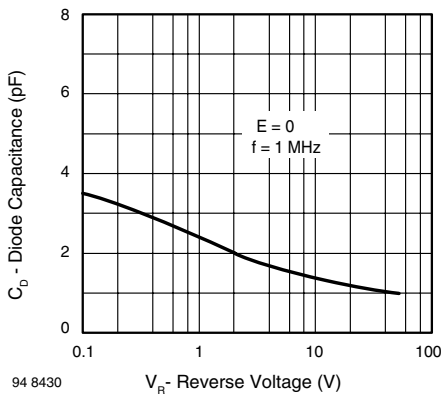


Fig. 4 - Diode Capacitance vs. Reverse Voltage

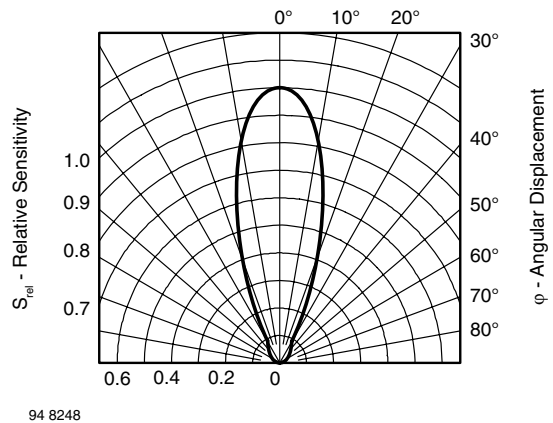


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

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

2.1 Storage temperature and rel. humidity conditions are: 5 °C to 35 °C, R.H. 60 %.

2.2 Floor life must not exceed 168 h, acc. 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.

2.3 If opened more than one week in an atmosphere 5 °C to 35 °C, R.H. 60 %, devices should be treated at 60 °C ± 5 °C for 15 h.

2.4 If humidity indicator in the package shows pink color (normal blue), then devices should be treated with the same conditions as 2.3.

REFLOW SOLDER PROFILE

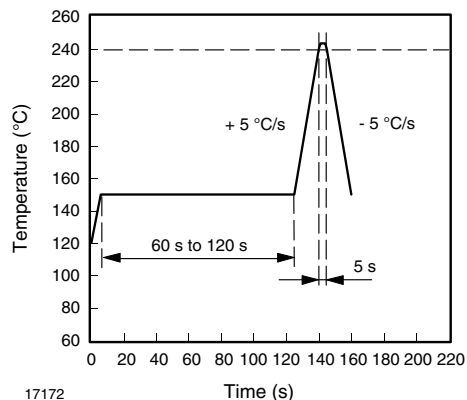


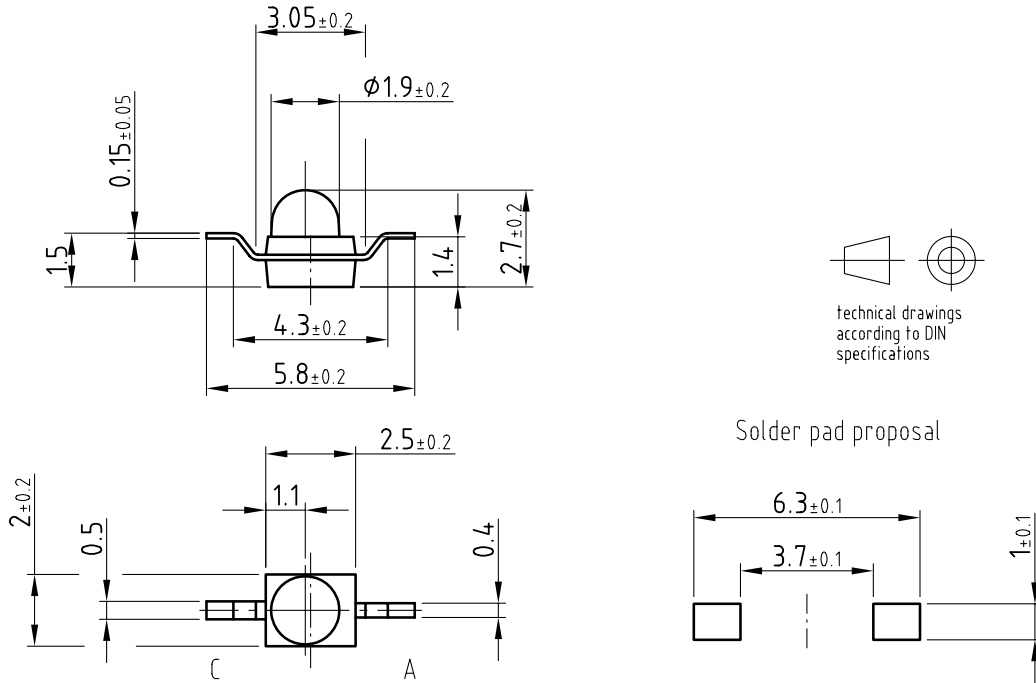
Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile



TEMD1000, TEMD1020, TEMD1030, TEMD1040

Silicon PIN Photodiode, RoHS Compliant Vishay Semiconductors

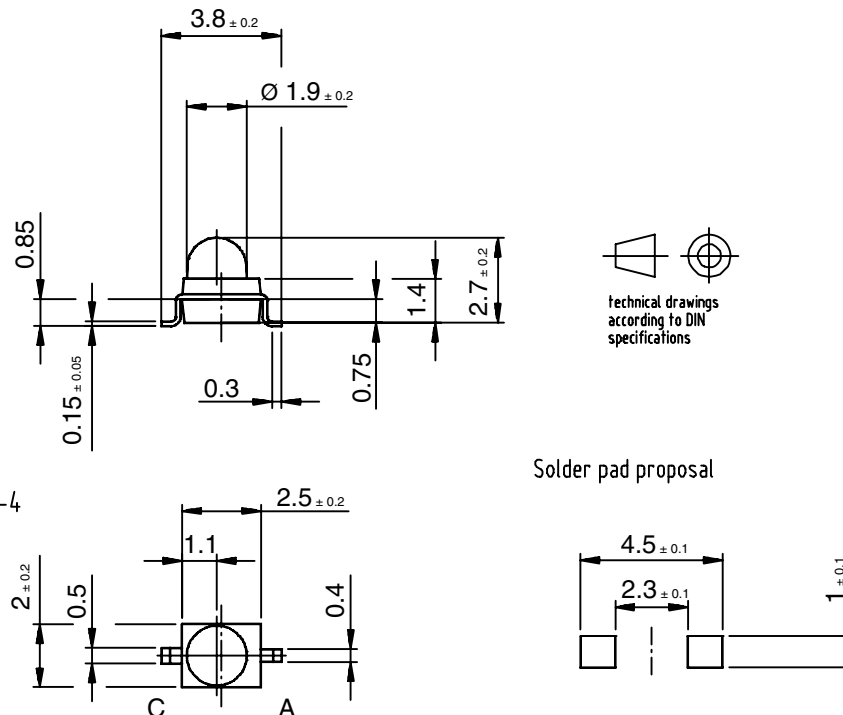
PACKAGE DIMENSIONS in millimeters: TEMD1000



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

16159

PACKAGE DIMENSIONS in millimeters: TEMD1020



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

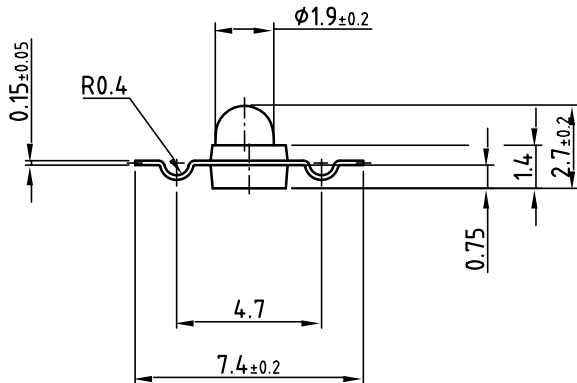
16160

TEMD1000, TEMD1020, TEMD1030, TEMD1040

Vishay Semiconductors Silicon PIN Photodiode, RoHS Compliant

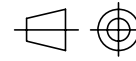


PACKAGE DIMENSIONS in millimeters: TEMD1030

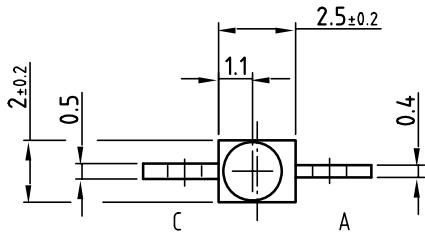


Drawing-No.: 6.544-5329.01-4

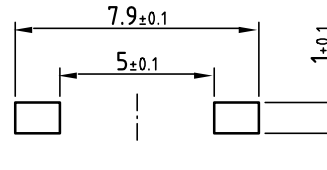
Issue: 4; 08.05.03



technical drawings
according to DIN
specifications

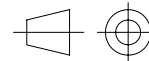
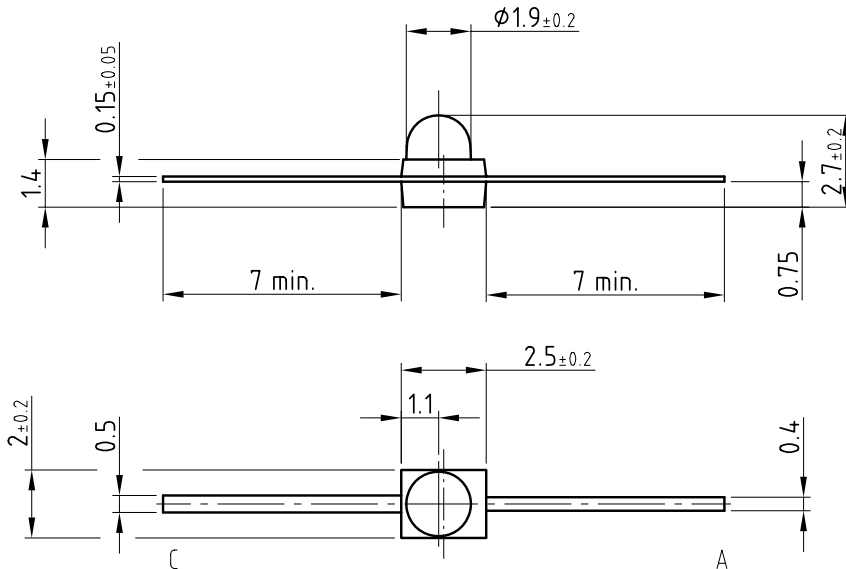


Solder pad proposal



16228

PACKAGE DIMENSIONS in millimeters: TEMD1040



technical drawings
according to DIN
specifications

Drawing-No.: 6.544-5339.02-4

Issue: 3; 02.04.03

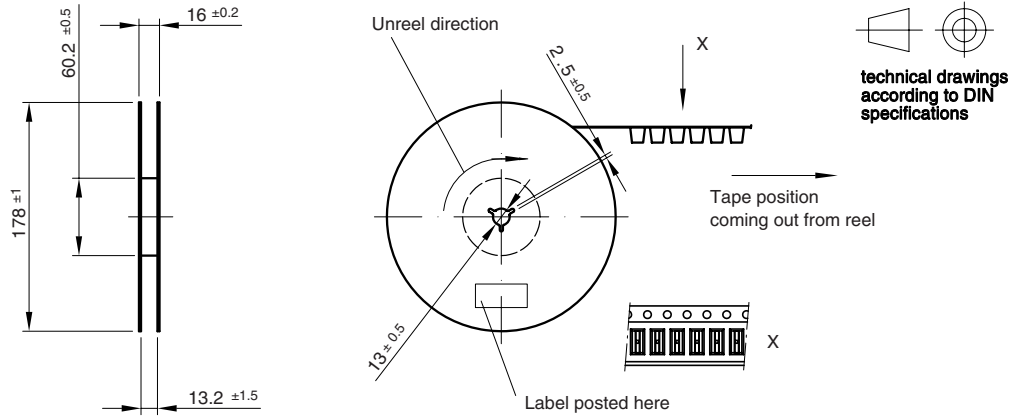
16760



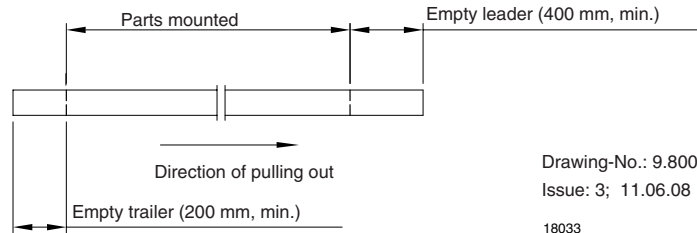
TEMD1000, TEMD1020, TEMD1030, TEMD1040

Silicon PIN Photodiode, RoHS Compliant Vishay Semiconductors

REEL DIMENSIONS in millimeters



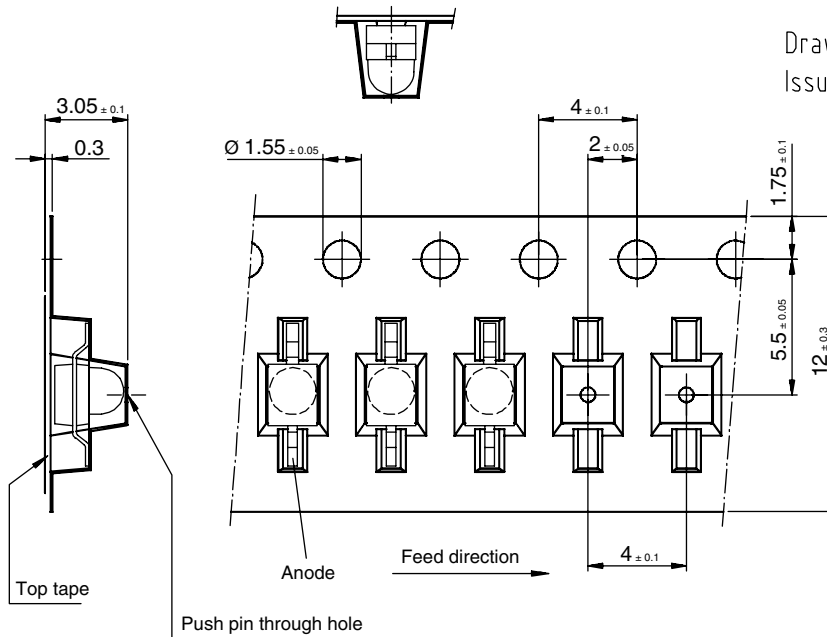
Leader and trailer tape:



Drawing-No.: 9.800-5080.01-4
Issue: 3; 11.06.08

18033

TAPING DIMENSIONS in millimeters: TEMD1000



Drawing-No.: 9.700-5268.01-4
Issue: 2; 22.11.02

Quantity per reel: 1000 pcs or 5000 pcs

18030

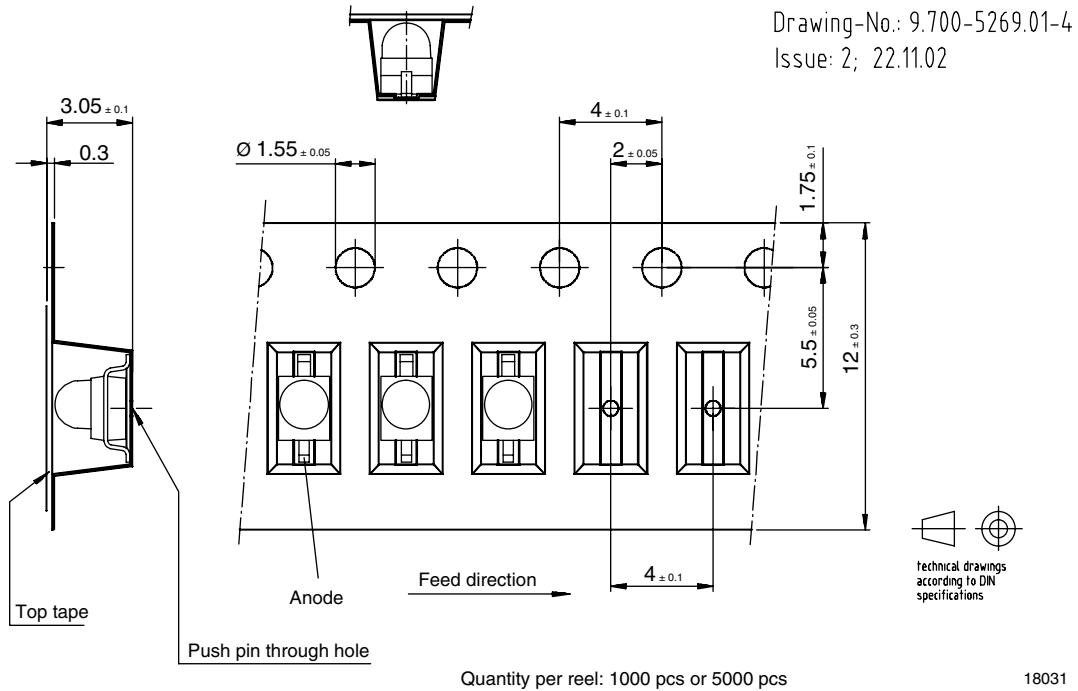
TEMD1000, TEMD1020, TEMD1030, TEMD1040

Vishay Semiconductors

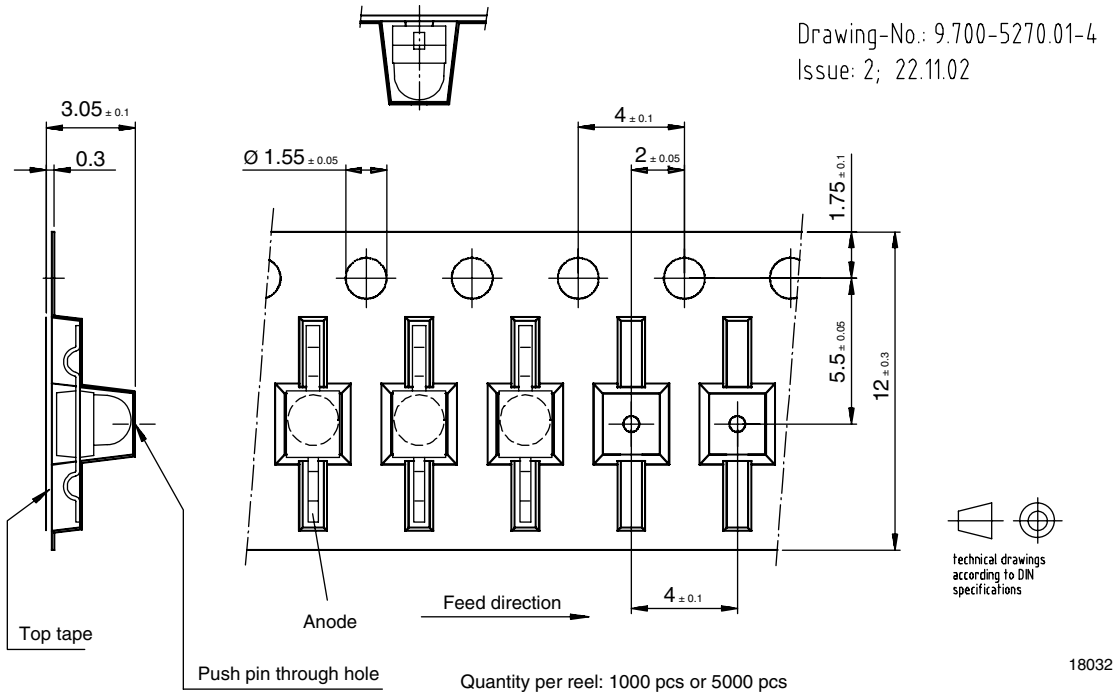
Silicon PIN Photodiode, RoHS Compliant



TAPING DIMENSIONS in millimeters: TEMD1020



TAPING DIMENSIONS in millimeters: TEMD1030





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.