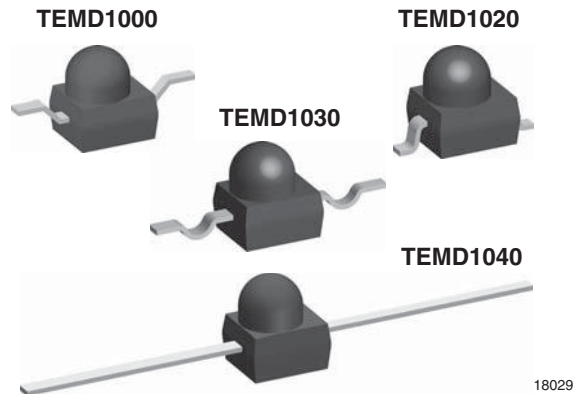


## Silicon PIN Photodiode, RoHS Compliant



### 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 mm<sup>2</sup>): 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
- Compliant to RoHS Directive 2002/95/EC and in accordance with WEEE 2002/96/EC


**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.

### 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	$I_{ra}$ ( $\mu$ A)	$\phi$ (deg)	$\lambda_{0.5}$ (nm)
TEMD1000	6.0 to 13.0	$\pm 15$	790 to 1050
TEMD1020	6.0 to 13.0	$\pm 15$	790 to 1050
TEMD1030	6.0 to 13.0	$\pm 15$	790 to 1050
TEMD1040	6.0 to 13.0	$\pm 15$	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 ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)

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	$^\circ\text{C}$



BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
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	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 870\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$	6.0	10	13.0	$\mu\text{A}$
	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$		12		$\mu\text{A}$
Temperature coefficient of $I_{ra}$	$V_R = 5\text{ V}$ , $\lambda = 870\text{ nm}$	$TK_{Ira}$		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		$\phi$		$\pm 15$		deg
Wavelength of peak sensitivity		$\lambda_p$		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

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

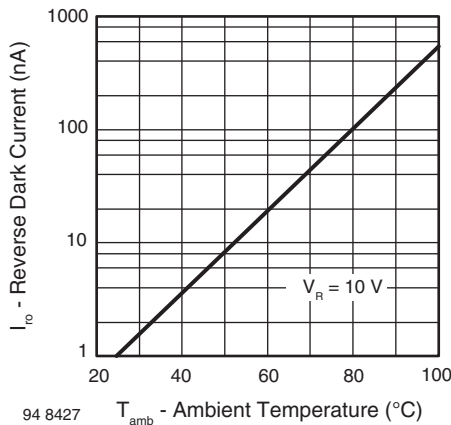


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

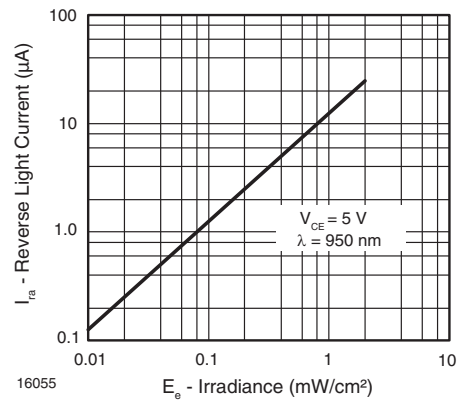


Fig. 3 - Reverse Light Current vs. Irradiance

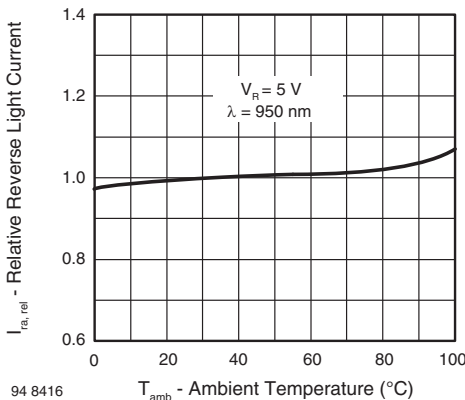


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

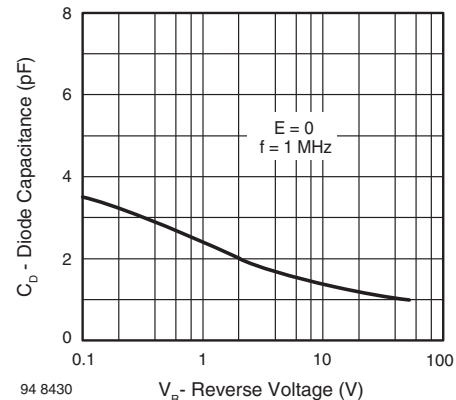


Fig. 4 - Diode Capacitance vs. Reverse Voltage

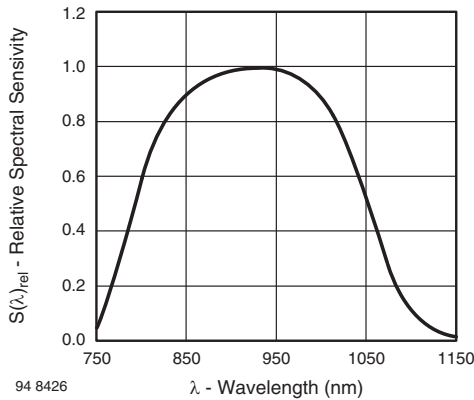


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

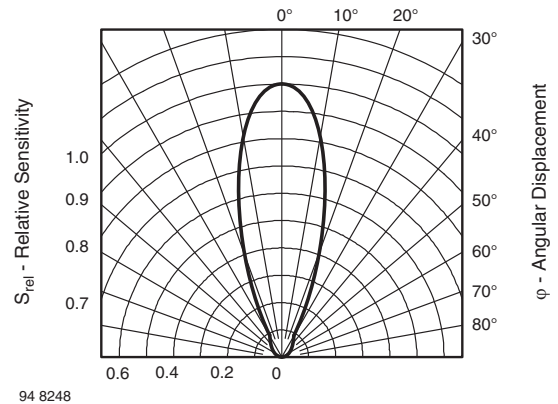


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

## 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

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

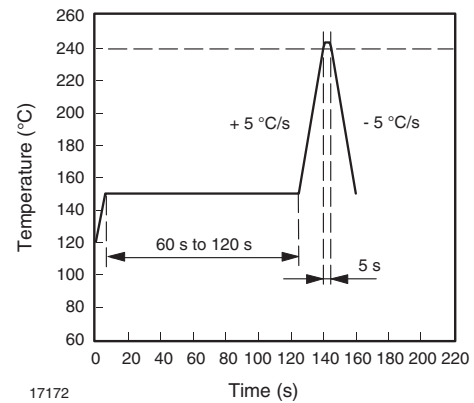
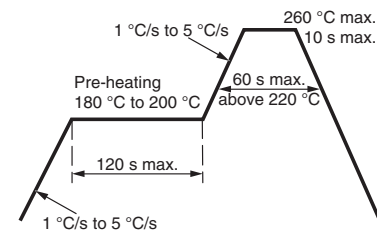


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

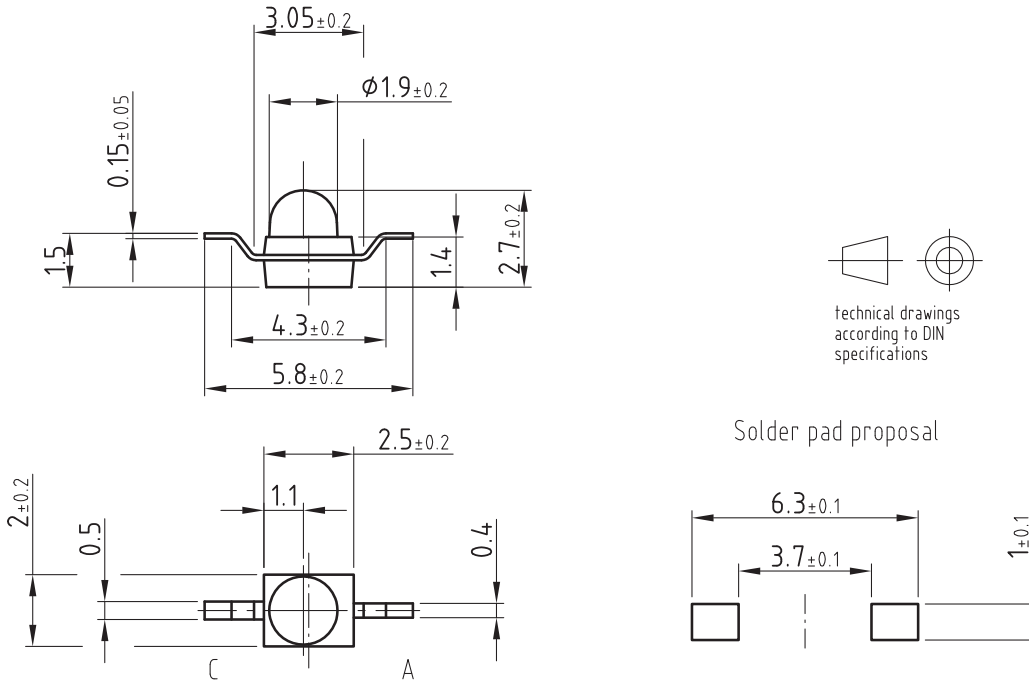


22566

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



## PACKAGE DIMENSIONS in millimeters: TEMD1000

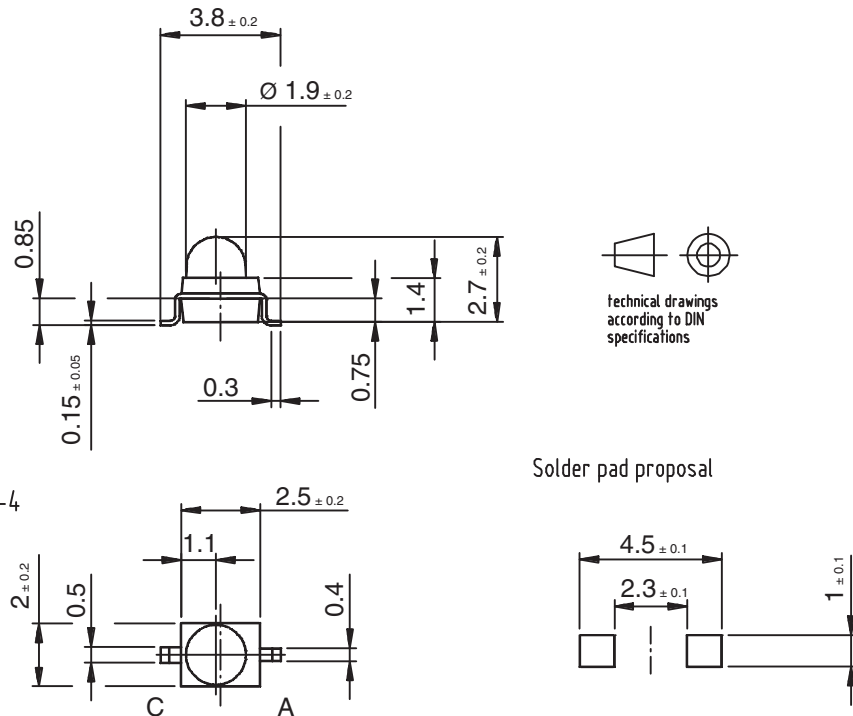


Drawing-No.: 6.544-5326.02-4

Issue: 3; 02.04.03

16159

## PACKAGE DIMENSIONS in millimeters: TEMD1020



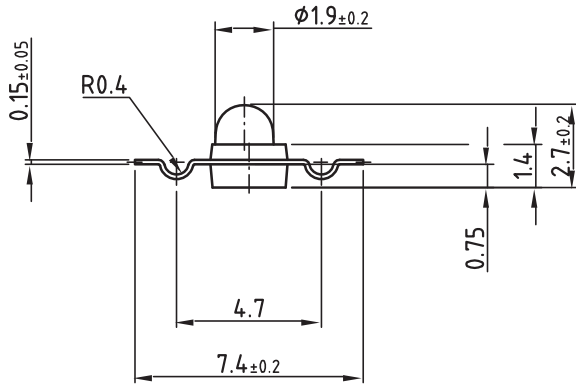
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Issue: 3; 02.04.03

16160

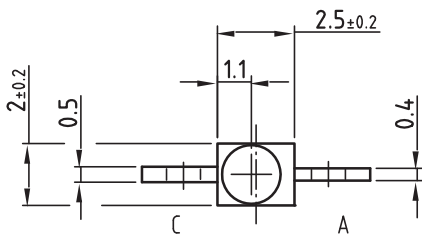
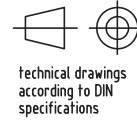


## PACKAGE DIMENSIONS in millimeters: TEMD1030

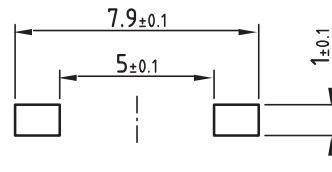


Drawing-No.: 6.544-5329.01-4

Issue: 4; 08.05.03

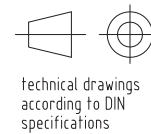
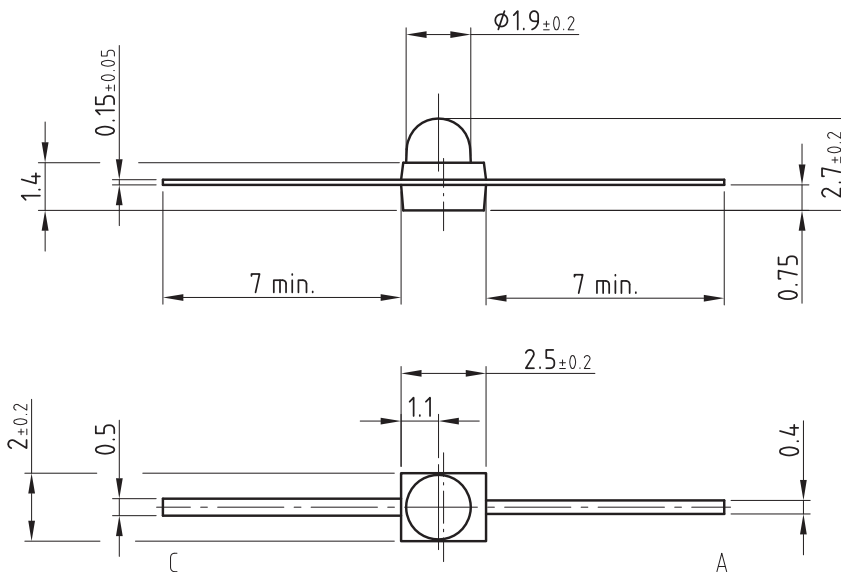


Solder pad proposal



16228

## PACKAGE DIMENSIONS in millimeters: TEMD1040



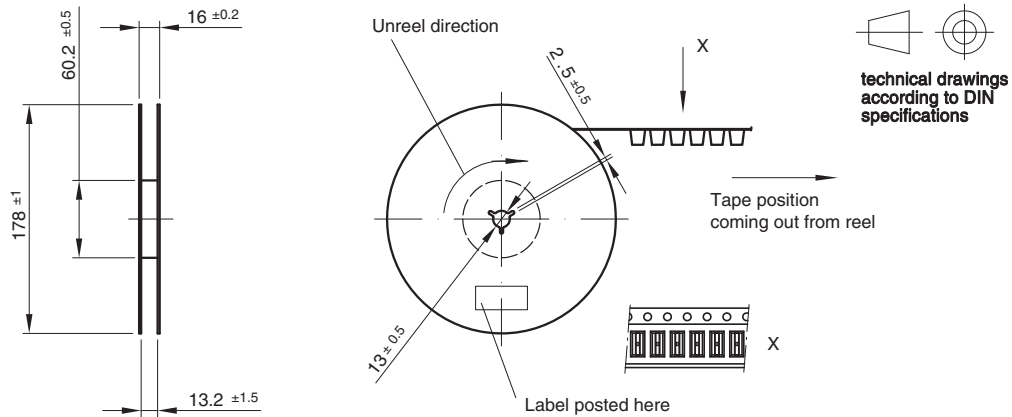
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Issue: 3; 02.04.03

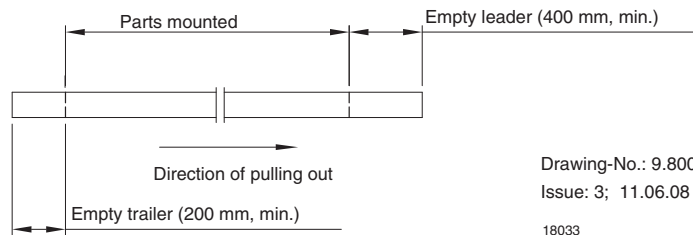
16760



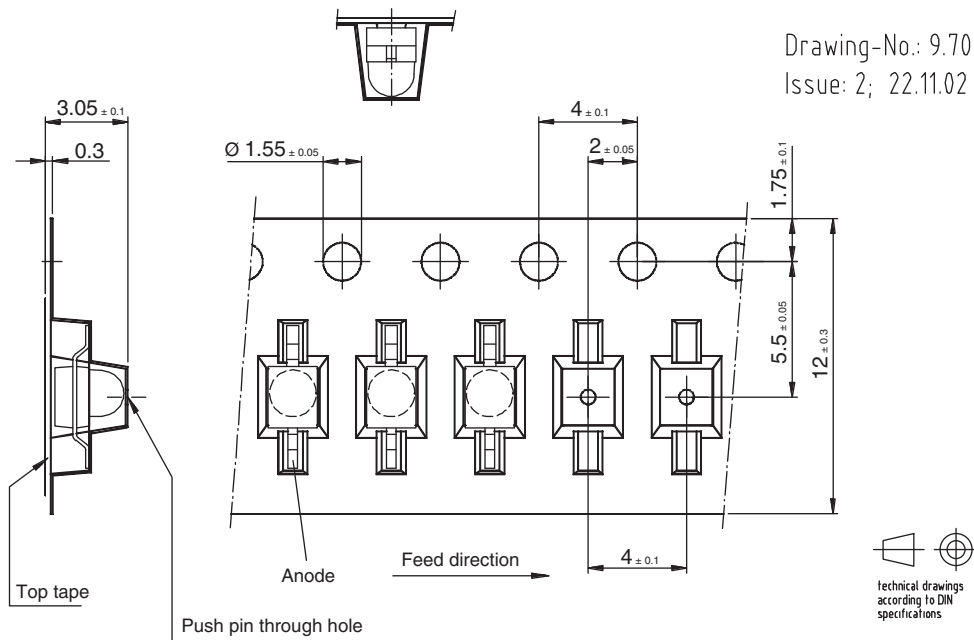
## REEL DIMENSIONS in millimeters



Leader and trailer tape:



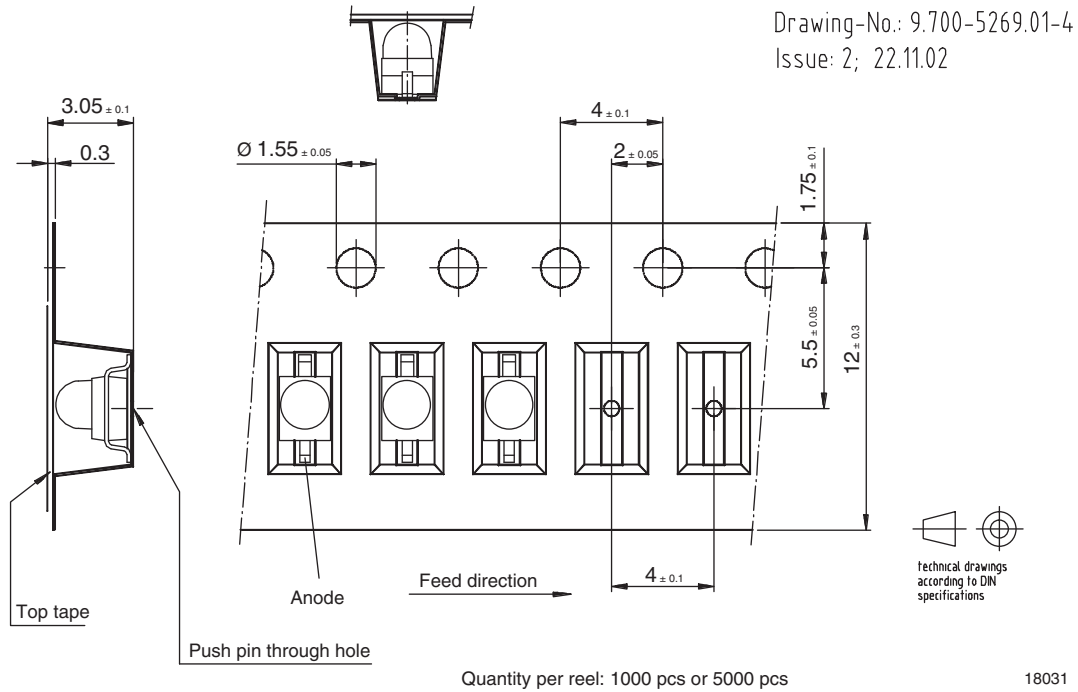
## TAPING DIMENSIONS in millimeters: TEMD1000



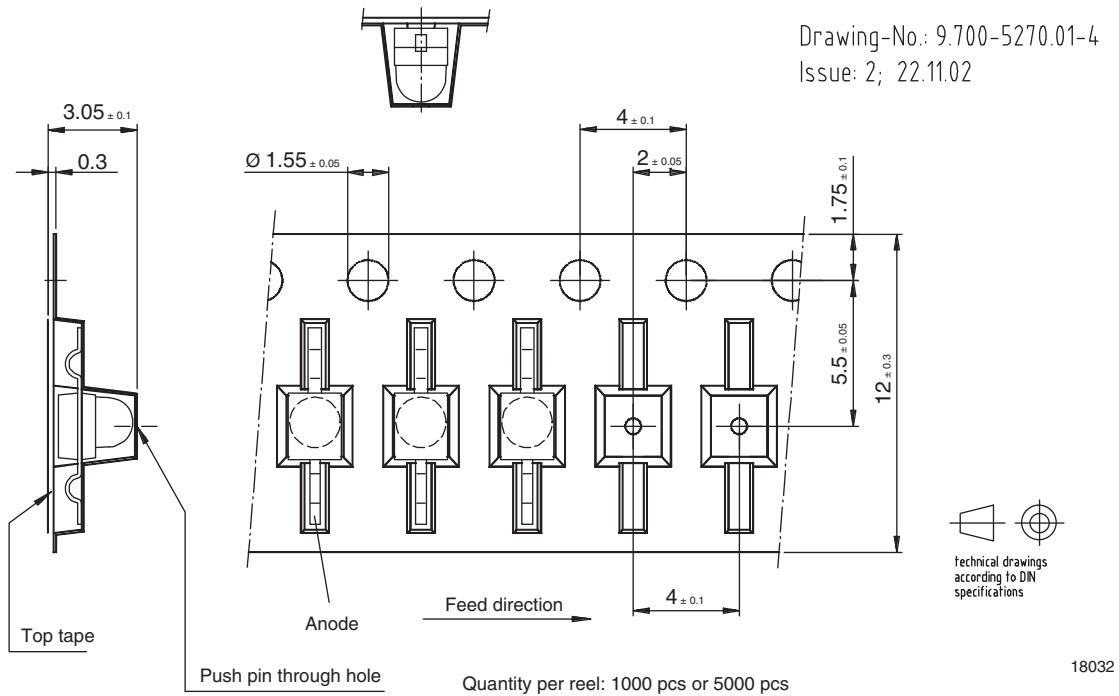
Drawing-No.: 9.700-5268.01-4  
Issue: 2; 22.11.02



## TAPING DIMENSIONS in millimeters: TEMD1020



## TAPING DIMENSIONS in millimeters: TEMD1030





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