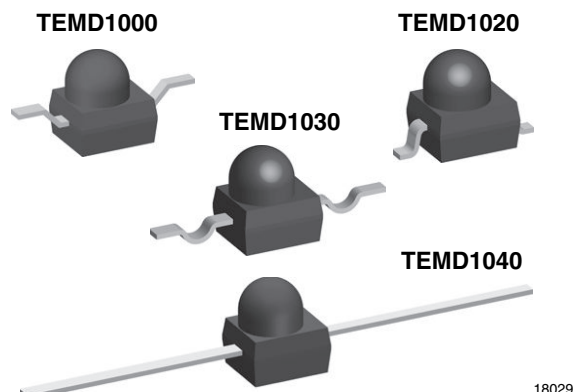


Silicon PIN Photodiode, RoHS-Compliant



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 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 www.vishay.com/doc?99912



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 transmission systems, e.g. in combination with TSMLxxxx series IR emitters

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	ϕ (°)	$\lambda_{0.5}$ (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 ($T_{amb} = 25^\circ\text{C}$, 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	μA
	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$	I_{ra}	-	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	-	$^{\circ}$
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

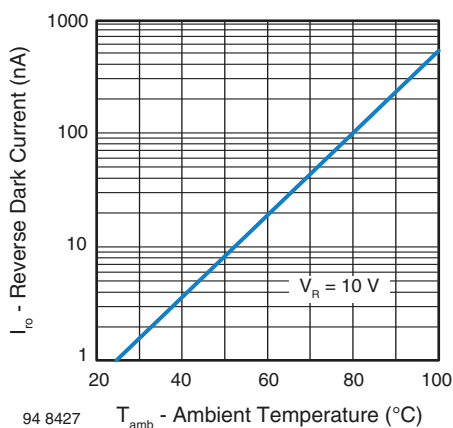
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Fig. 1 - Reverse Dark Current vs. Ambient Temperature

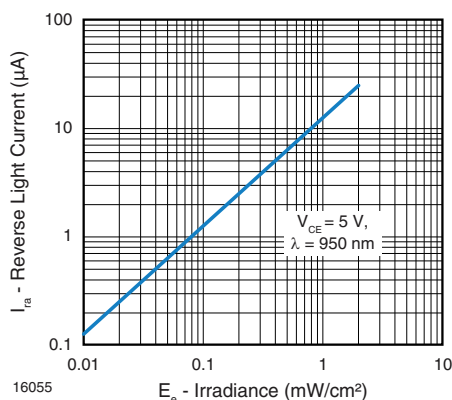


Fig. 3 - Reverse Light Current vs. Irradiance

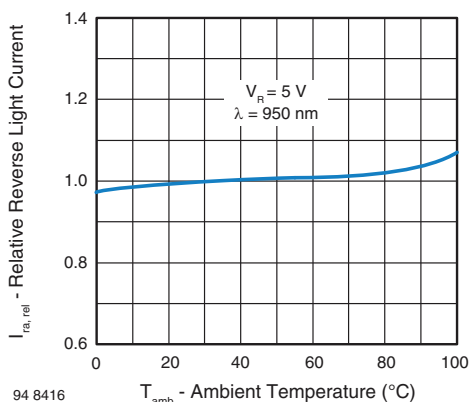


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

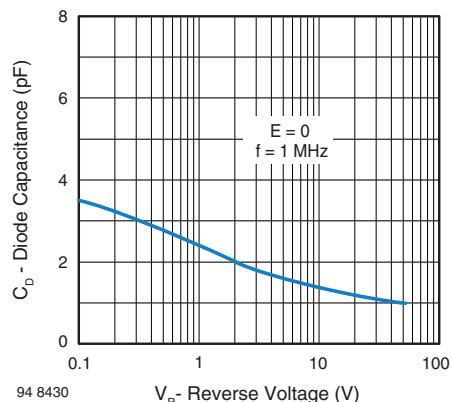


Fig. 4 - Diode Capacitance vs. Reverse Voltage

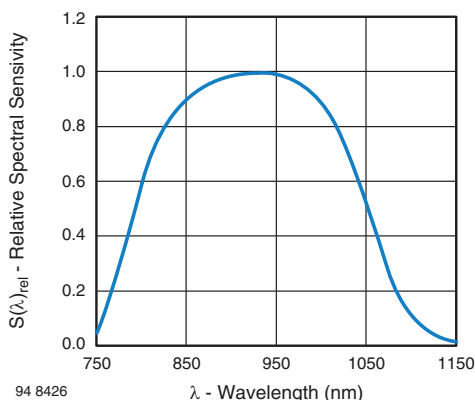


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

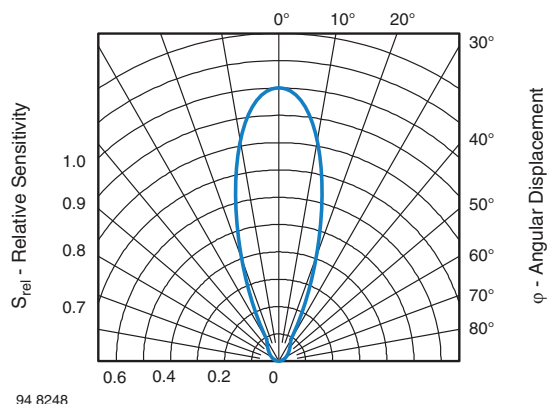


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

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, 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 ± 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

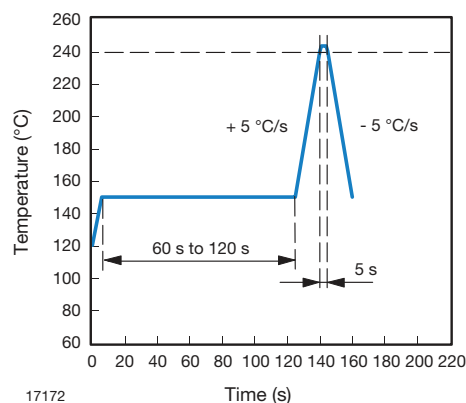


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

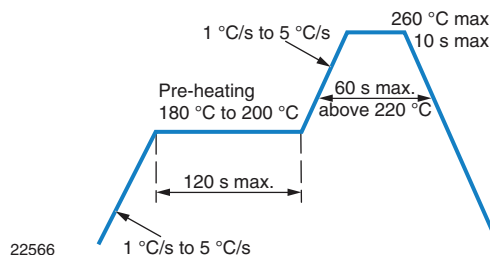
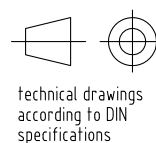
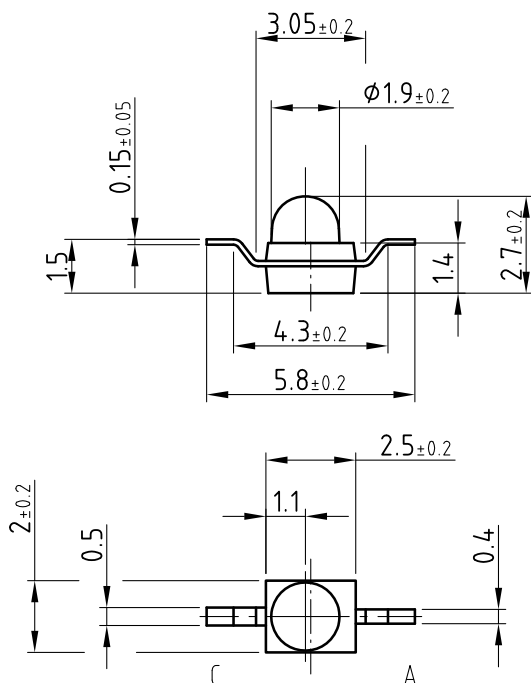


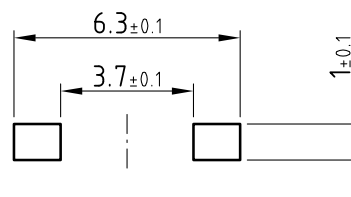
Fig. 8 - Lead (Pb)-Free Reflow Solder Profile According to J-STD-020



PACKAGE DIMENSIONS in millimeters: TEMD1000



Solder pad proposal

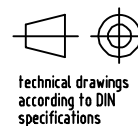
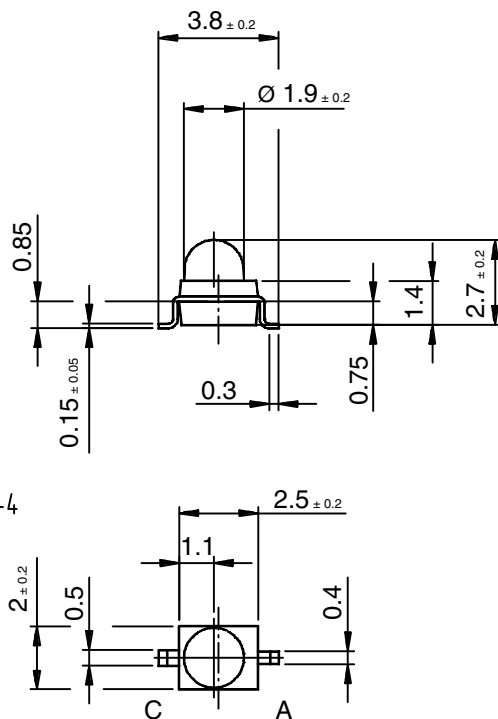


Drawing-No.: 6.544-5326.02-4

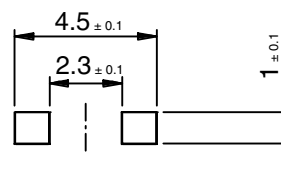
Issue: 3; 02.04.03

16159

PACKAGE DIMENSIONS in millimeters: TEMD1020



Solder pad proposal

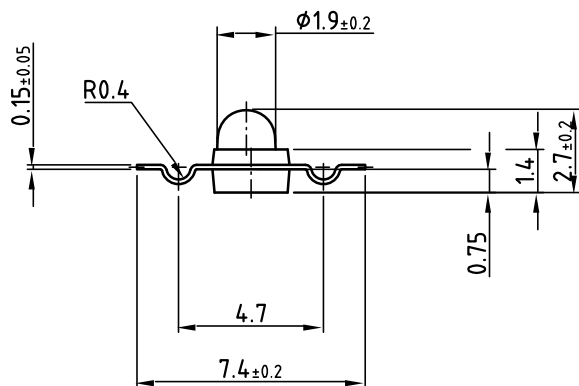


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Issue: 3; 02.04.03

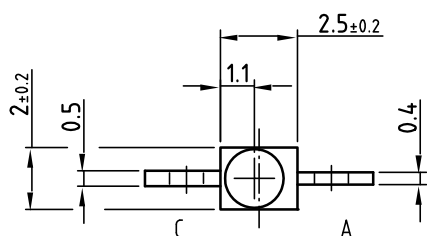
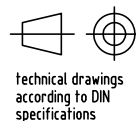
16160

PACKAGE DIMENSIONS in millimeters: TEMD1030

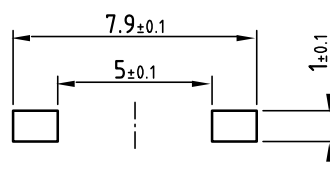


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Issue: 4; 08.05.03

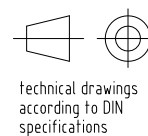
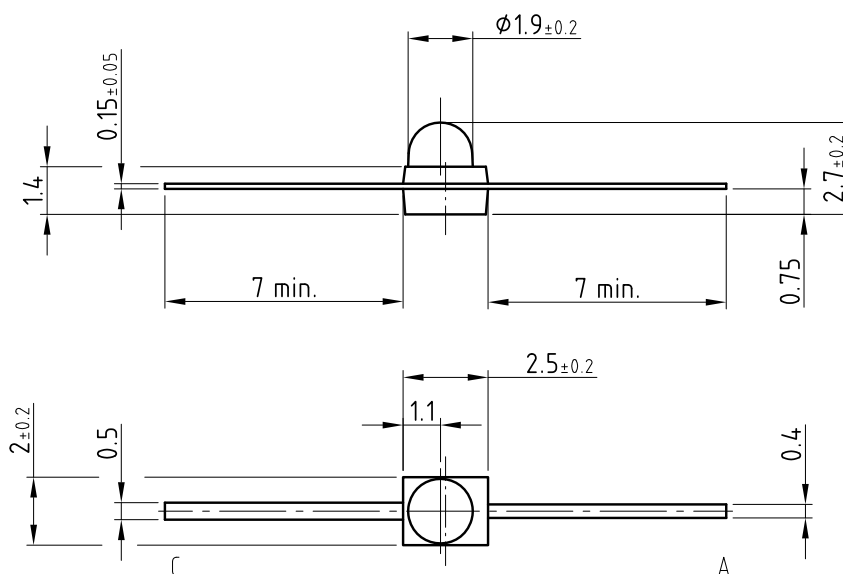


Solder pad proposal



16228

PACKAGE DIMENSIONS in millimeters: TEMD1040



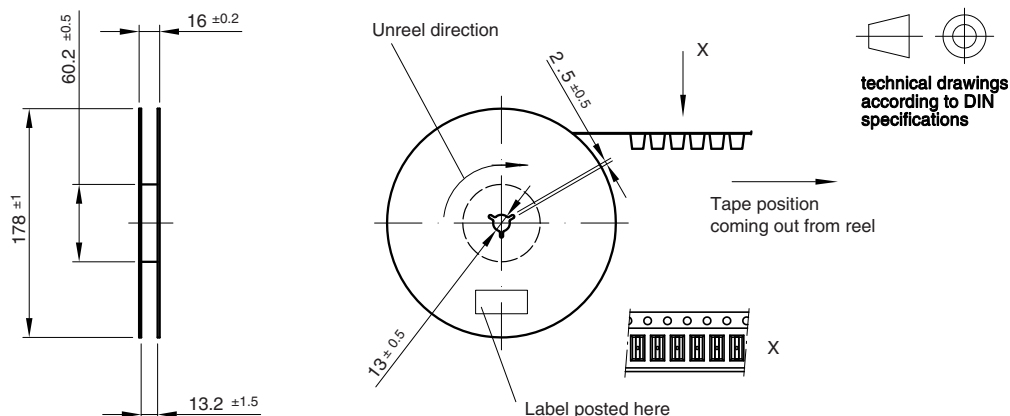
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Issue: 3; 02.04.03

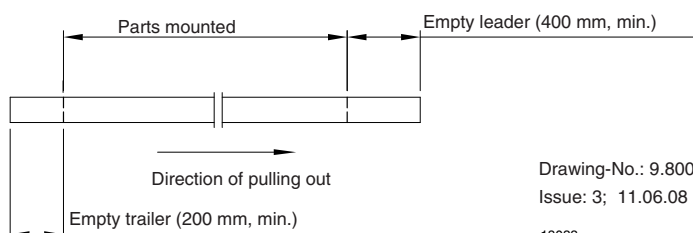
16760



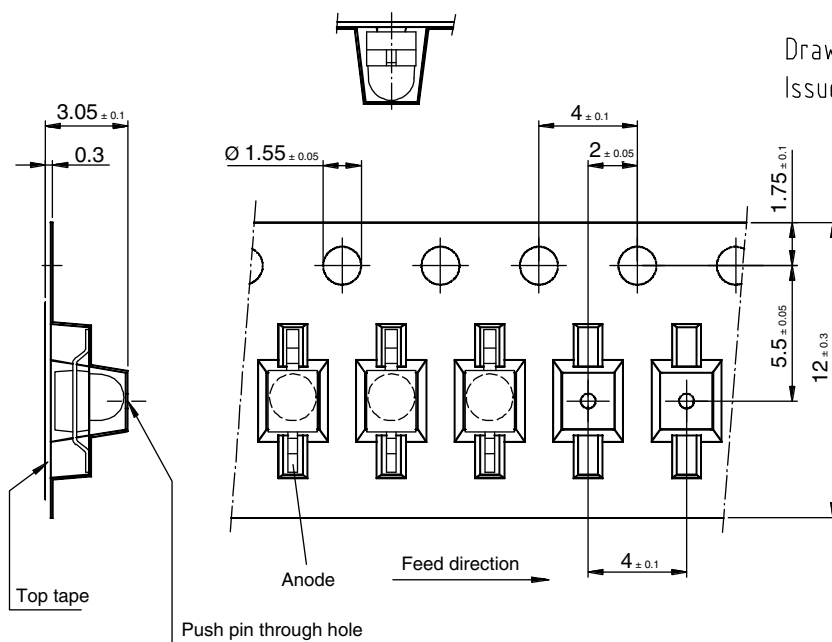
REEL DIMENSIONS in millimeters



Leader and trailer tape:



TAPING DIMENSIONS in millimeters: TEMD1000



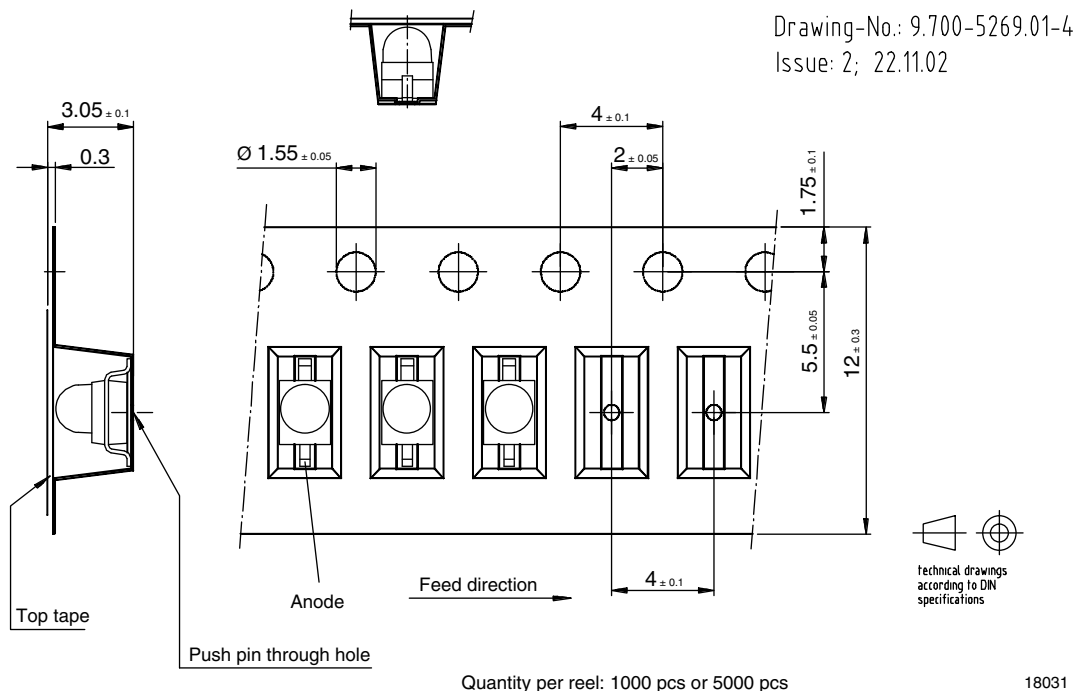
Drawing-No.: 9.700-5268.01-4
Issue: 2; 22.11.02

Quantity per reel: 1000 pcs or 5000 pcs

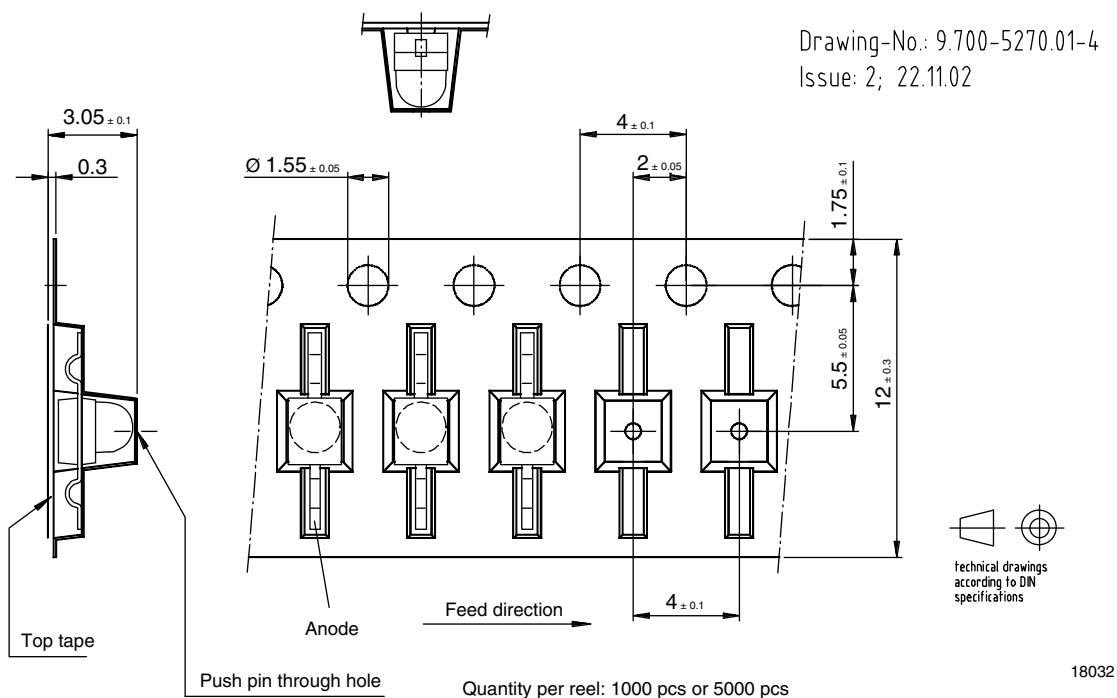
18030



TAPING DIMENSIONS in millimeters: TEMD1020



TAPING DIMENSIONS in millimeters: TEMD1030





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