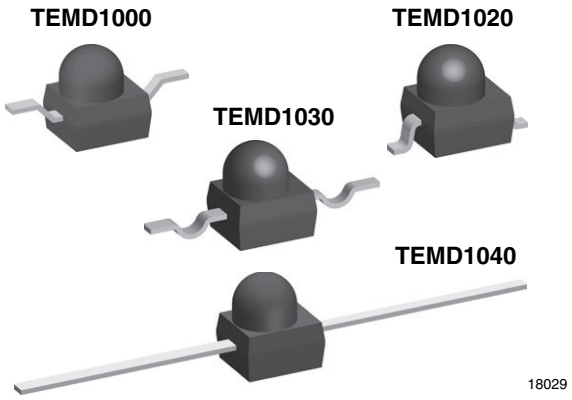
Silicon PIN Photodiode, RoHS-Compliant



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^2): 0.23
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 15°$
- 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

Pb-free

e3

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 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	60	V
Power dissipation	$T_{amb} \leq 25$ °C	P_V	75	mW
Junction temperature		T_j	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

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	C_D	-	1.8	-	pF
Reverse light current	E_e = 1 mW/cm², λ = 870 nm, V_R = 5 V	I_{ra}	6.0	10	13.0	µA
	E_e = 1 mW/cm², λ = 950 nm, V_R = 5 V	I_{ra}	-	12	-	µA
Temperature coefficient of I_{ra}	V_R = 5 V, λ = 870 nm,	TK_{Ira}	-	0.2	-	%/K
Absolute spectral sensitivity	V_R = 5 V, λ = 870 nm	s(λ)	-	0.60	-	A/W
	V_R = 5 V, λ = 950 nm	s(λ)	-	0.55	-	A/W
Angle of half sensitivity		φ	-	± 15	-	°
Wavelength of peak sensitivity		$λ_p$	-	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 V, R_L = 50 Ω, λ = 820 nm	t_f	-	4	-	ns

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

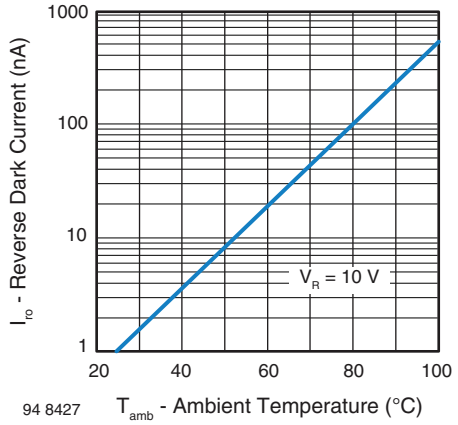


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

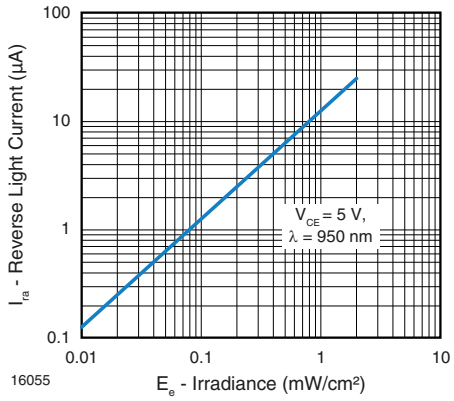


Fig. 3 - Reverse Light Current vs. Irradiance

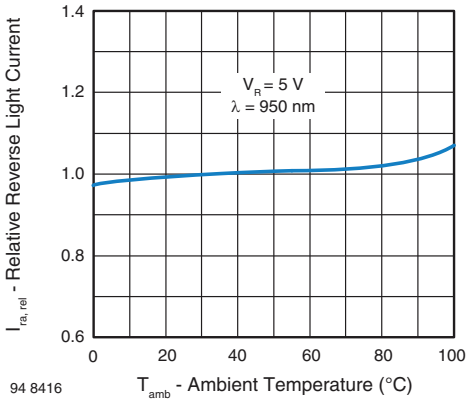


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

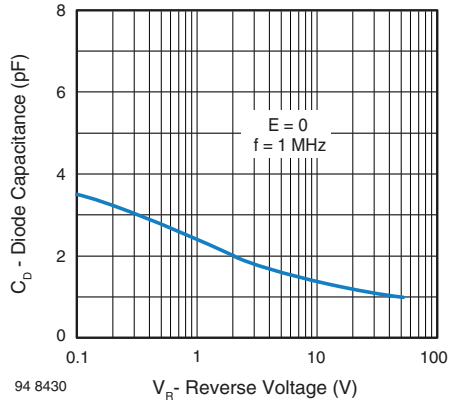


Fig. 4 - Diode Capacitance vs. Reverse Voltage

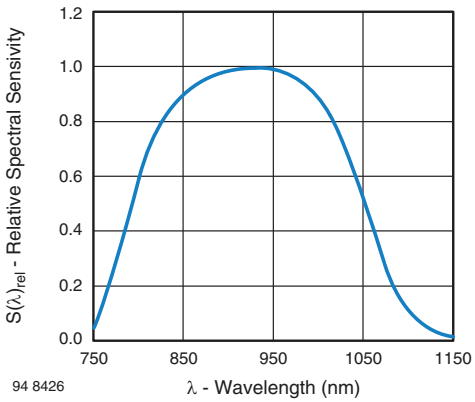


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

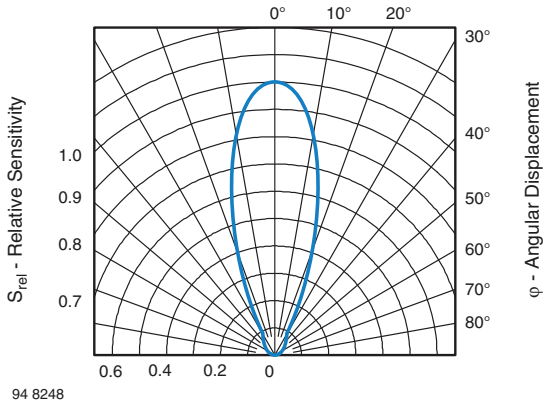


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

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

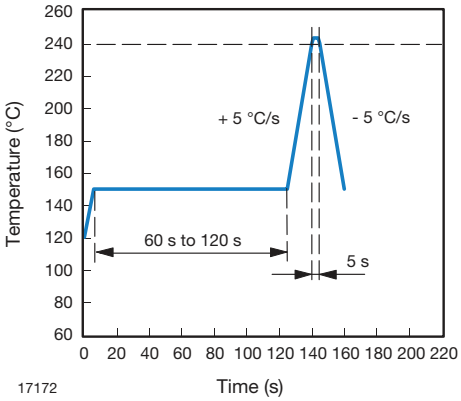


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

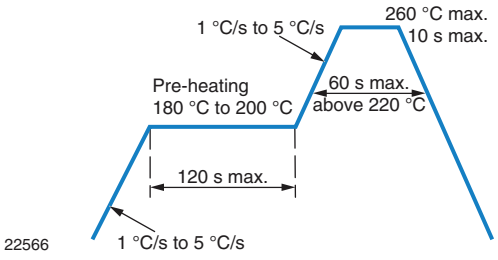
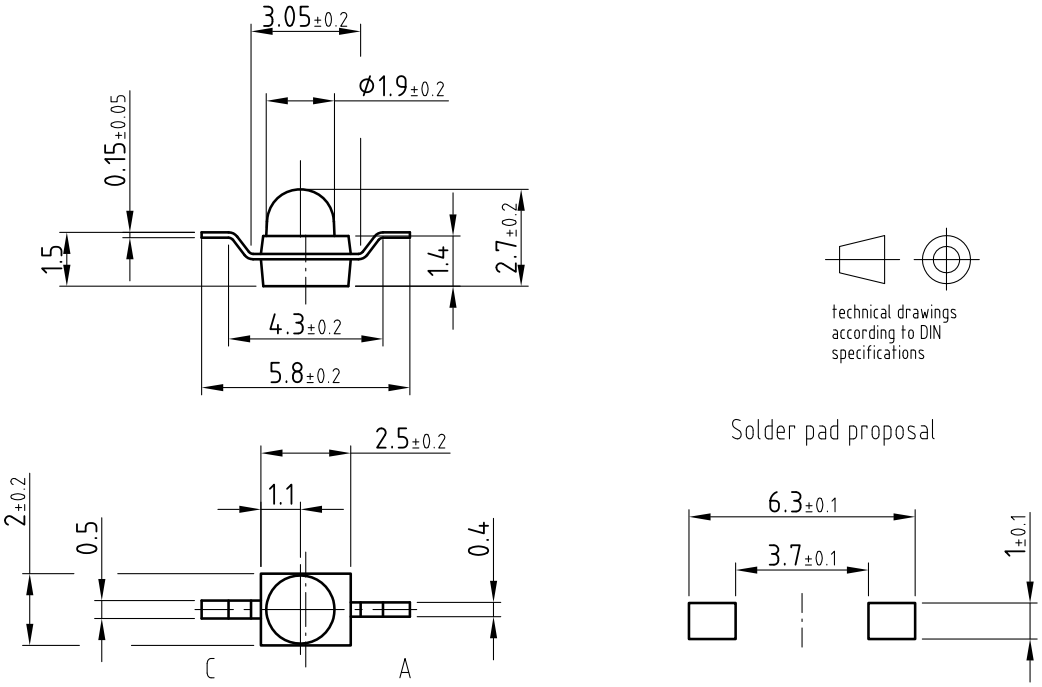


Fig. 8 - Lead (Pb)-Free Reflow Solder Profile
According to J-STD-020

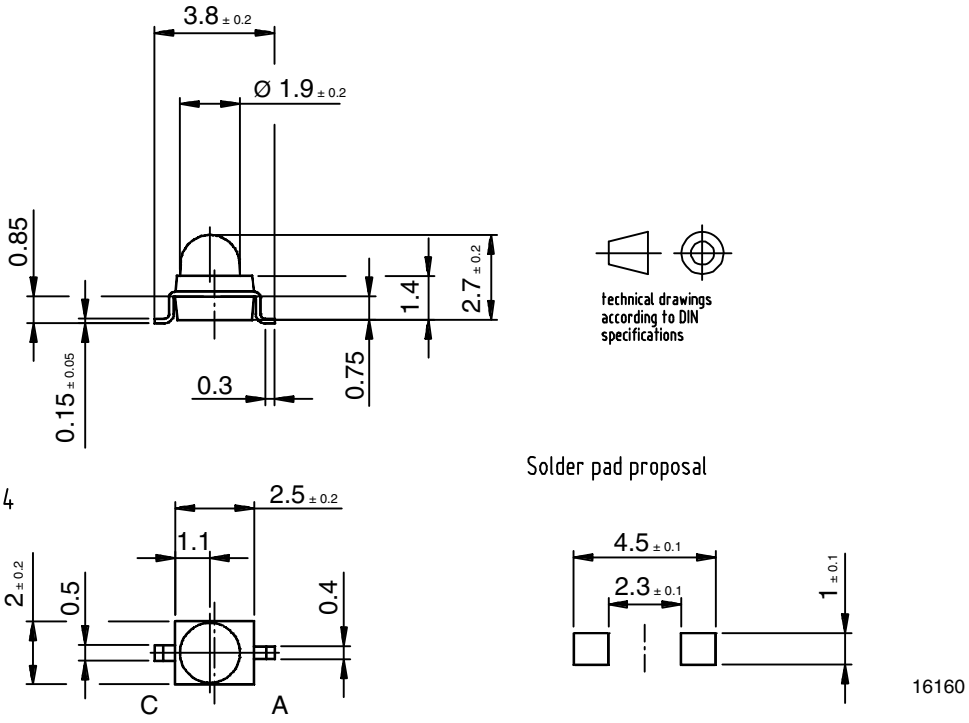
PACKAGE DIMENSIONS in millimeters: **TEMD1000**



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

16159

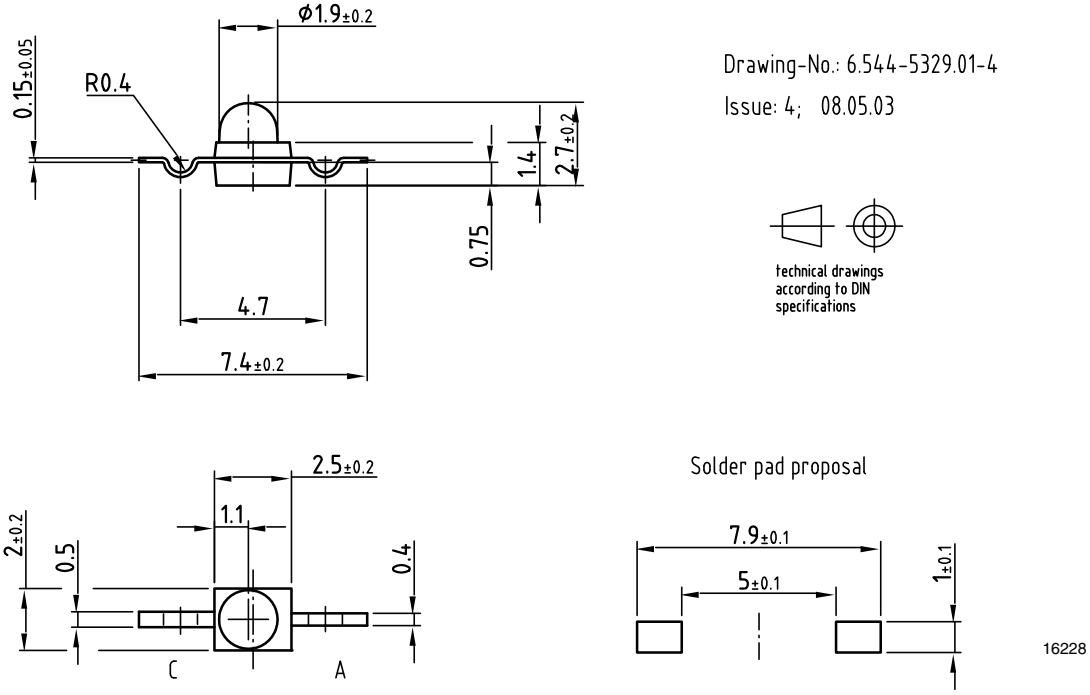
PACKAGE DIMENSIONS in millimeters: **TEMD1020**



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

16160

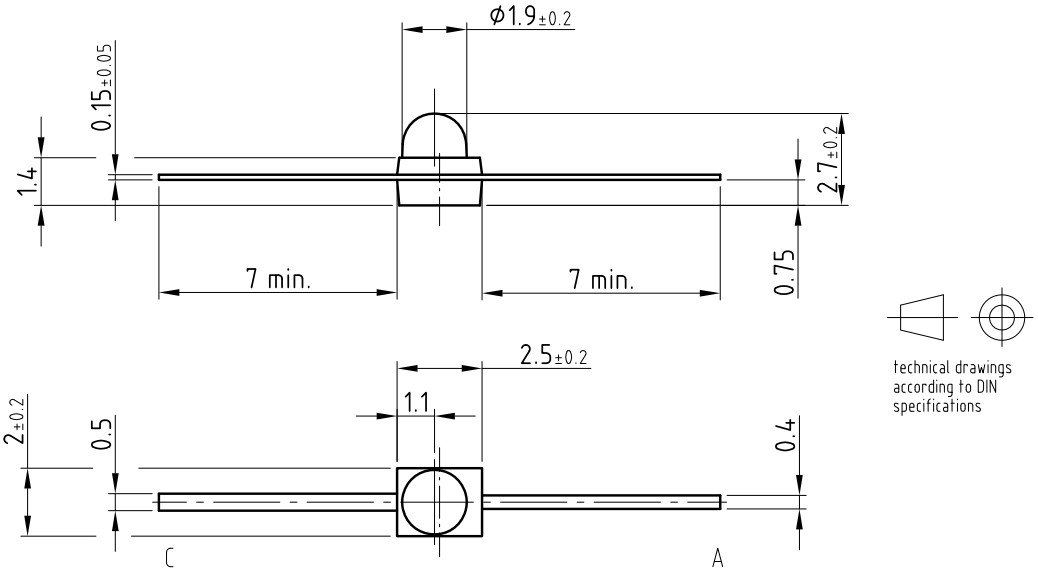
PACKAGE DIMENSIONS in millimeters: **TEMD1030**



Drawing-No.: 6.544-5329.01-4
Issue: 4; 08.05.03

technical drawings
according to DIN
specifications

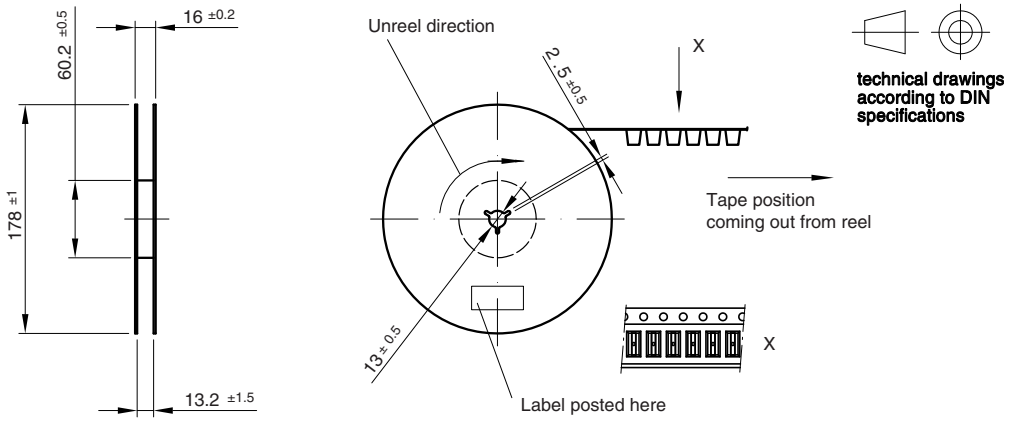
PACKAGE DIMENSIONS in millimeters: **TEMD1040**



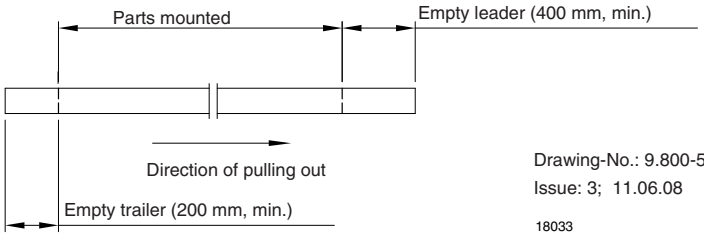
technical drawings
according to DIN
specifications

Drawing-No.: 6.544-5339.02-4
Issue: 3; 02.04.03
16760

REEL DIMENSIONS in millimeters



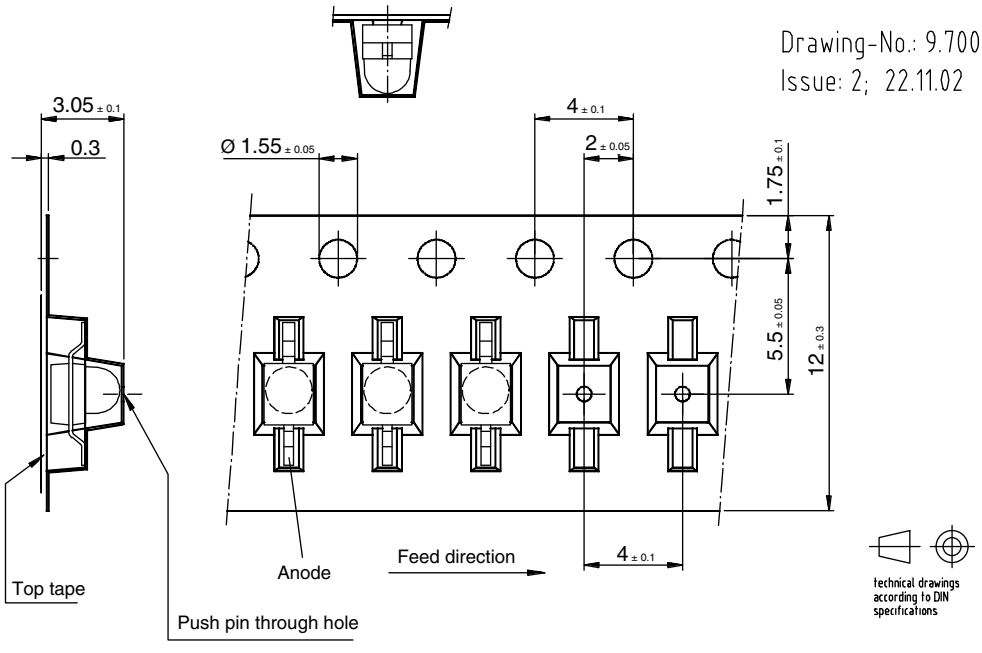
Leader and trailer tape:



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

18033

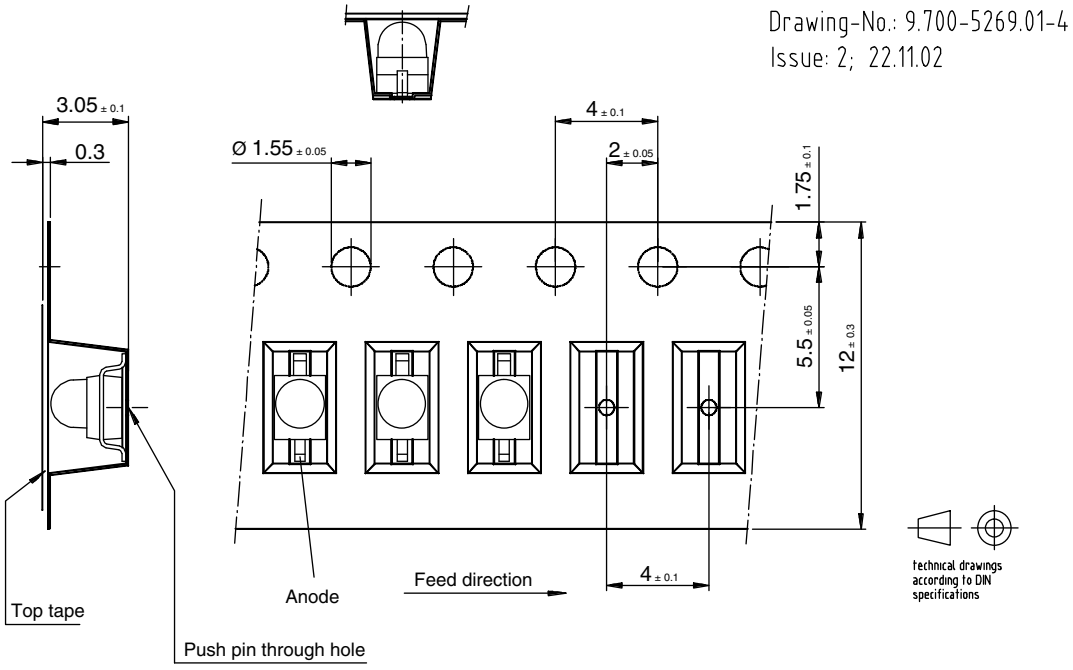
TAPING DIMENSIONS in millimeters: **TEMD1000**



Quantity per reel: 1000 pcs or 5000 pcs

18030

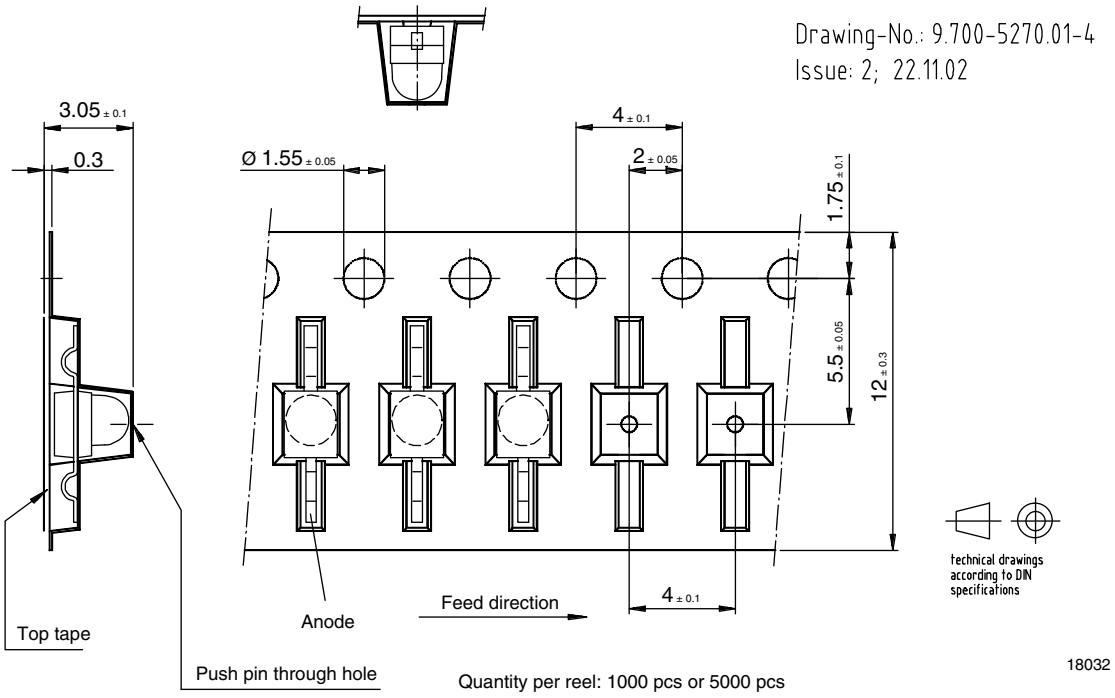
TAPING DIMENSIONS in millimeters: **TEMD1020**



Quantity per reel: 1000 pcs or 5000 pcs

18031

TAPING DIMENSIONS in millimeters: TEMD1030



Quantity per reel: 1000 pcs or 5000 pcs

18032

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