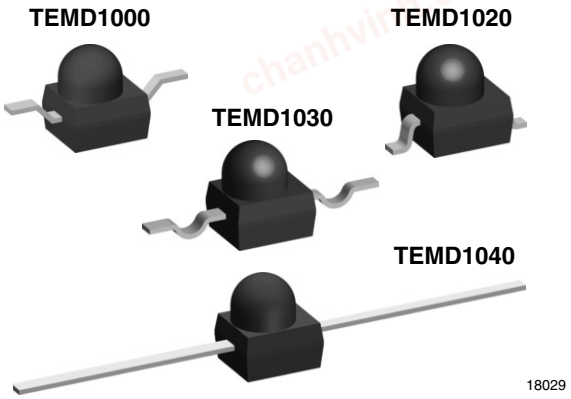
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TEMD1000, TEMD1020, TEMD1030, TEMD1040

Vishay Semiconductors

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 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

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 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	$T_{amb} \leq 25$ °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	$t \leq 5$ s	T_{sd}	< 260	°C

Note
T_{amb} = 25 °C, unless otherwise specified

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BASIC CHARACTERISTICS

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}		10		µA
	E_e = 1 mW/cm², λ = 950 nm, V_R = 5 V	I_{ra}	5	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		deg
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

Note

T_{amb} = 25 °C, unless otherwise specified

BASIC CHARACTERISTICS

T_{amb} = 25 °C, unless otherwise specified

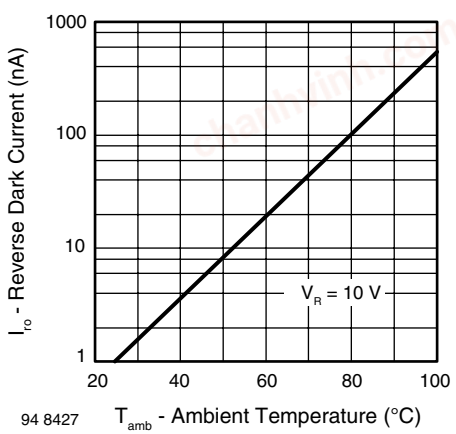


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

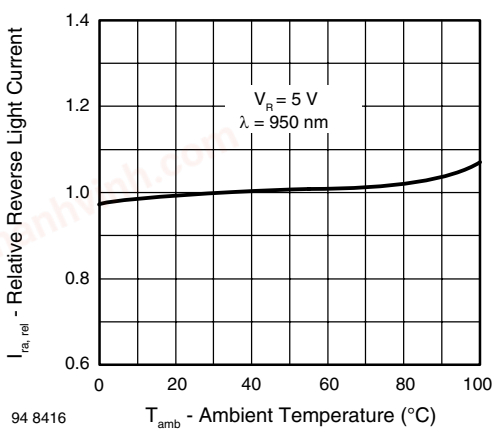


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

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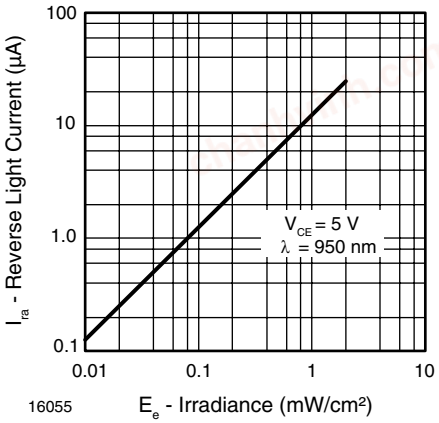


Fig. 3 - Reverse Light Current vs. Irradiance

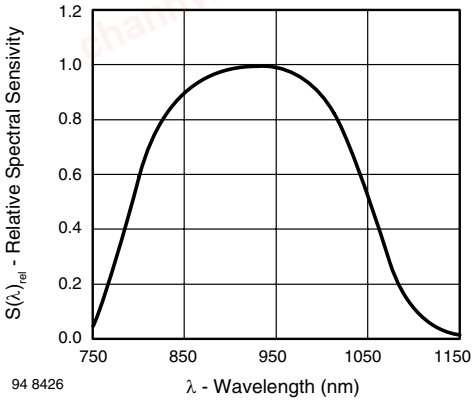


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

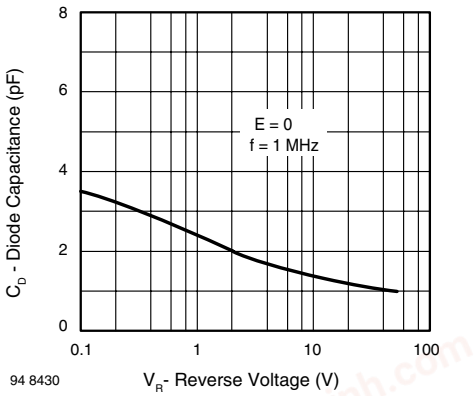


Fig. 4 - Diode Capacitance vs. Reverse Voltage

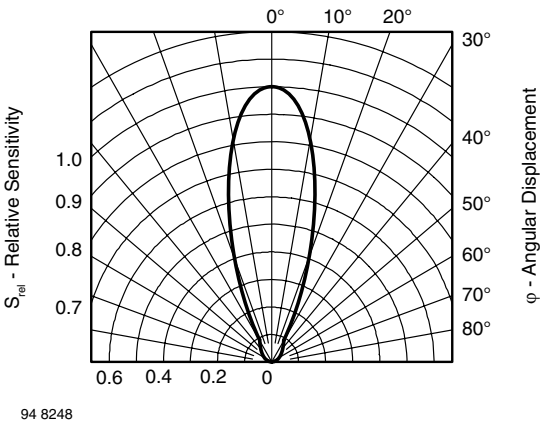


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

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

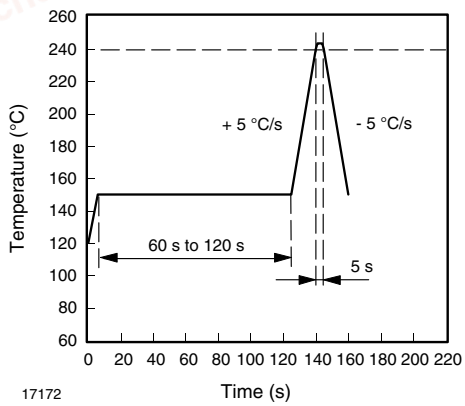
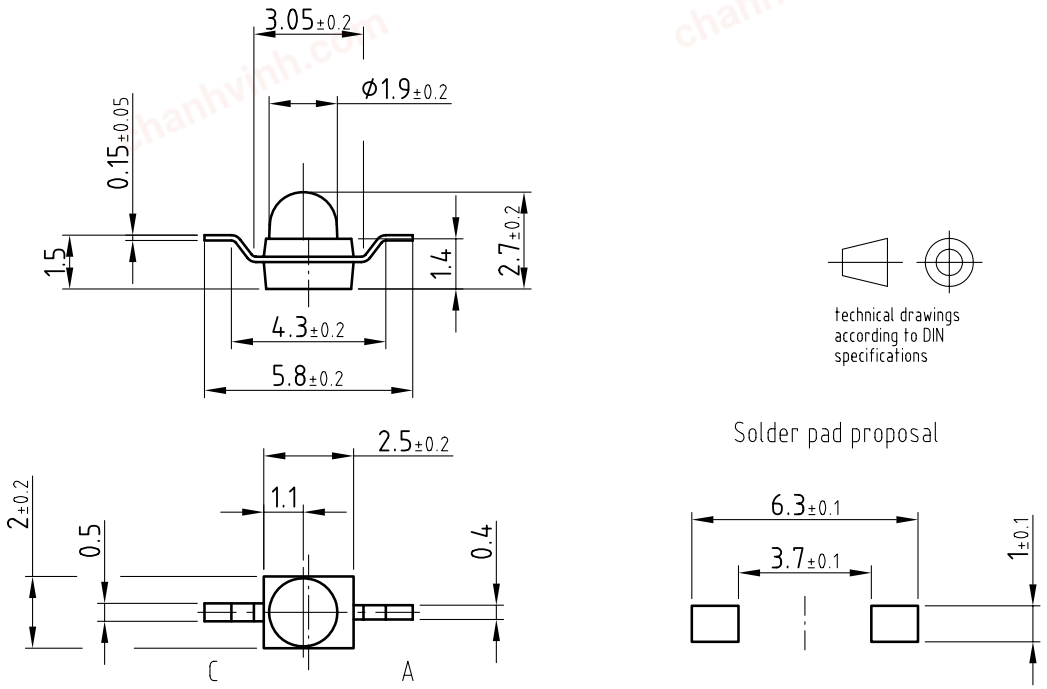


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

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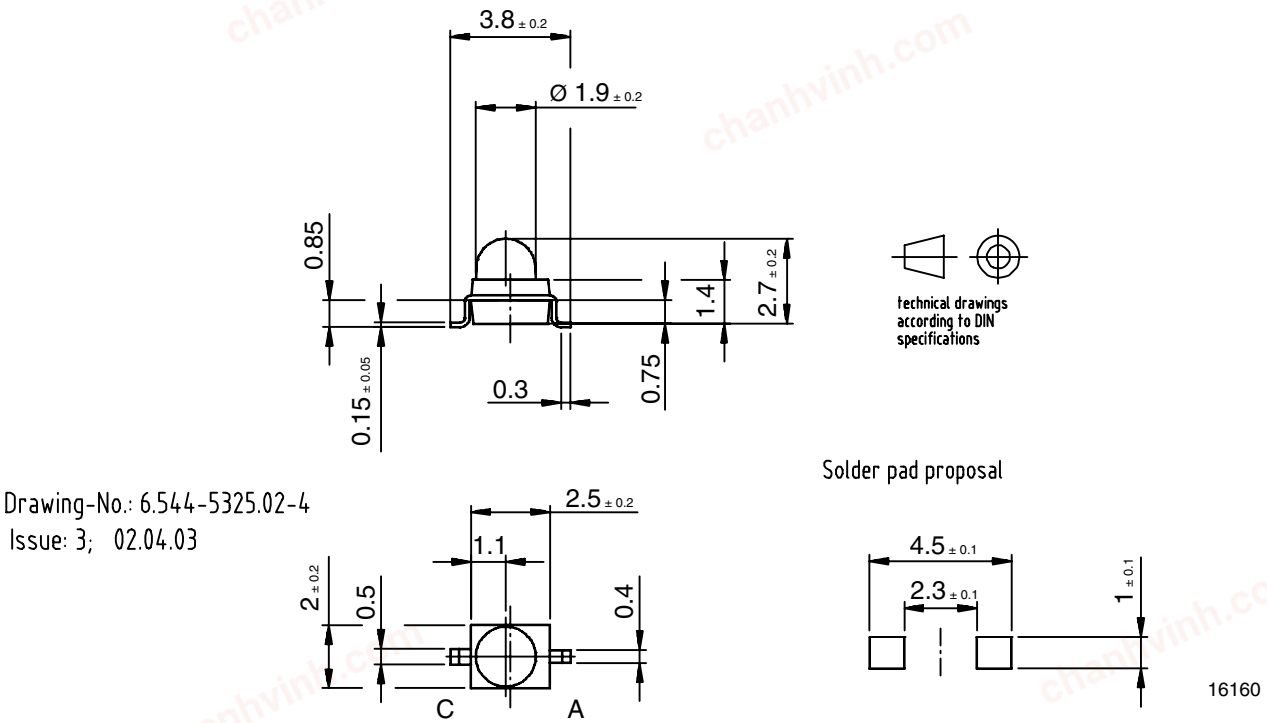
PACKAGE DIMENSIONS in millimeters: TEMD1000



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

16159

PACKAGE DIMENSIONS in millimeters: TEMD1020

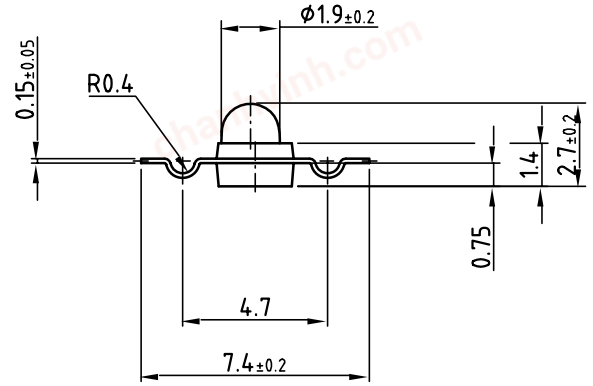


Drawing-No.: 6.544-5325.02-4
Issue: 3; 02.04.03

16160

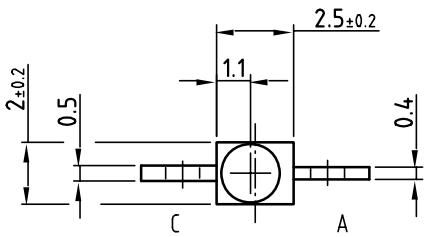
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PACKAGE DIMENSIONS in millimeters: TEMD1030

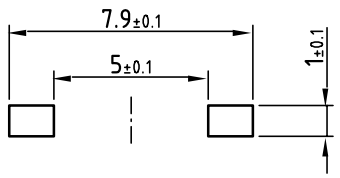


Drawing-No.: 6.544-5329.01-4
Issue: 4; 08.05.03

technical drawings according to DIN specifications

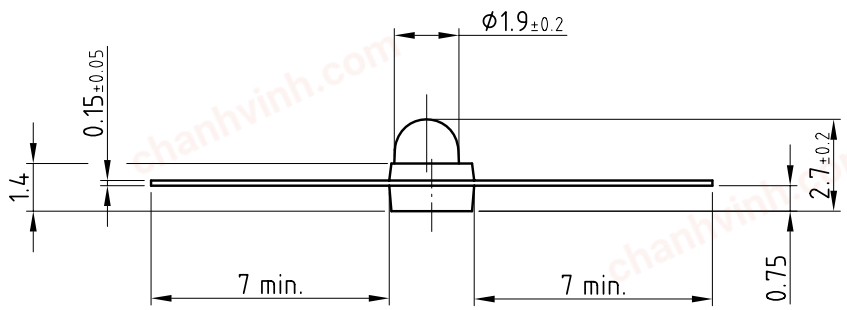


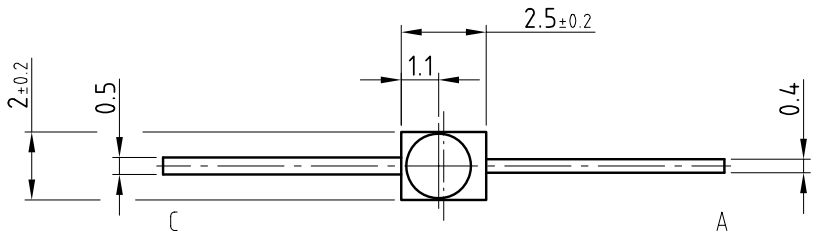
Solder pad proposal



16228

PACKAGE DIMENSIONS in millimeters: TEMD1040





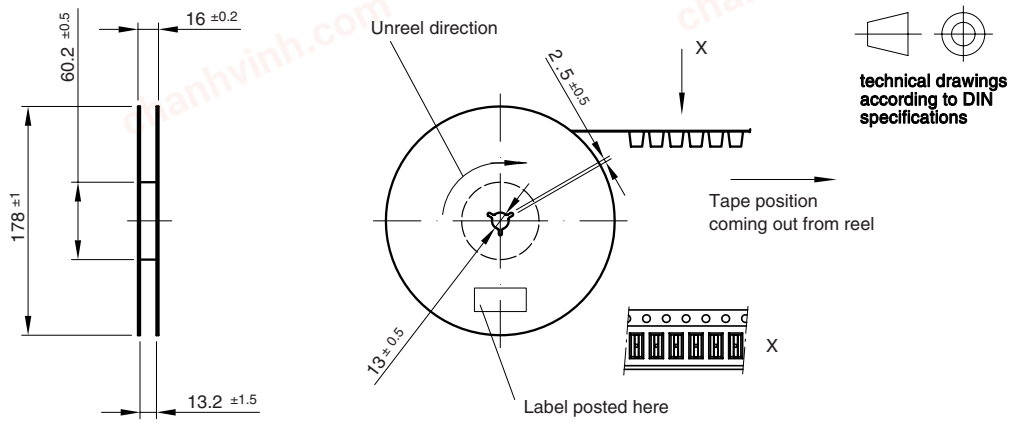
technical drawings according to DIN specifications

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Issue: 3; 02.04.03

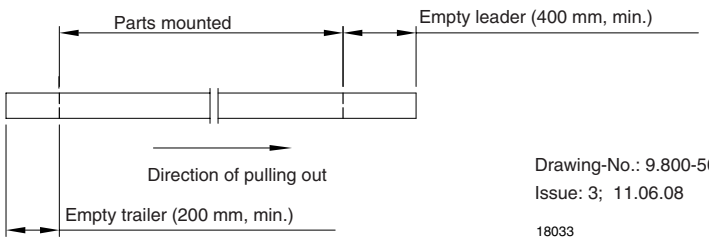
16760

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REEL DIMENSIONS in millimeters



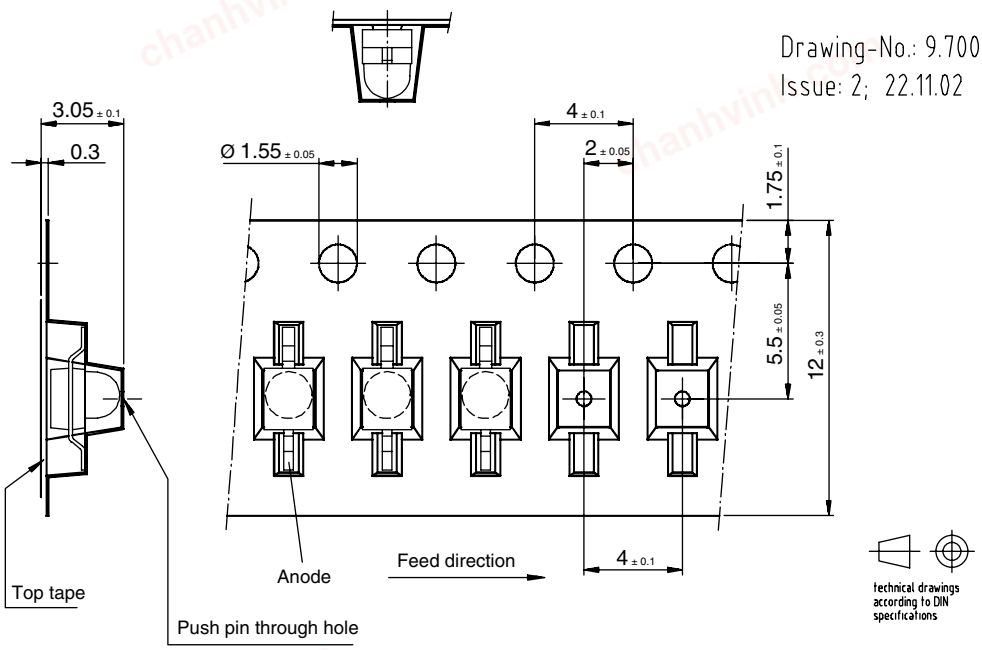
Leader and trailer tape:



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

18033

TAPING DIMENSIONS in millimeters: TEMD1000

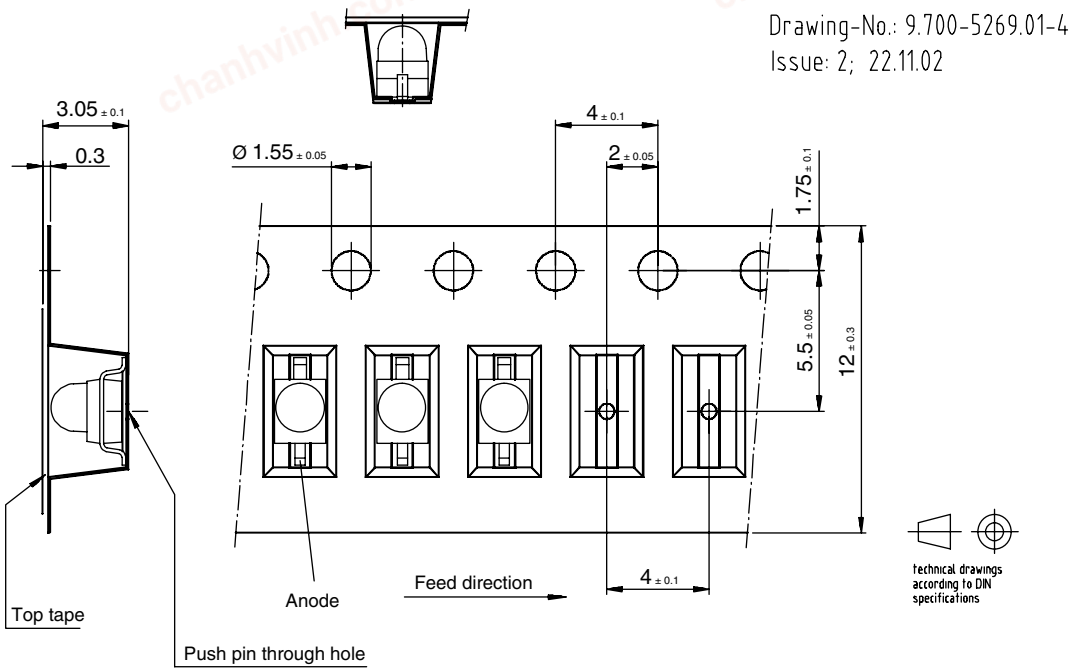


Quantity per reel: 1000 pcs or 5000 pcs

18030

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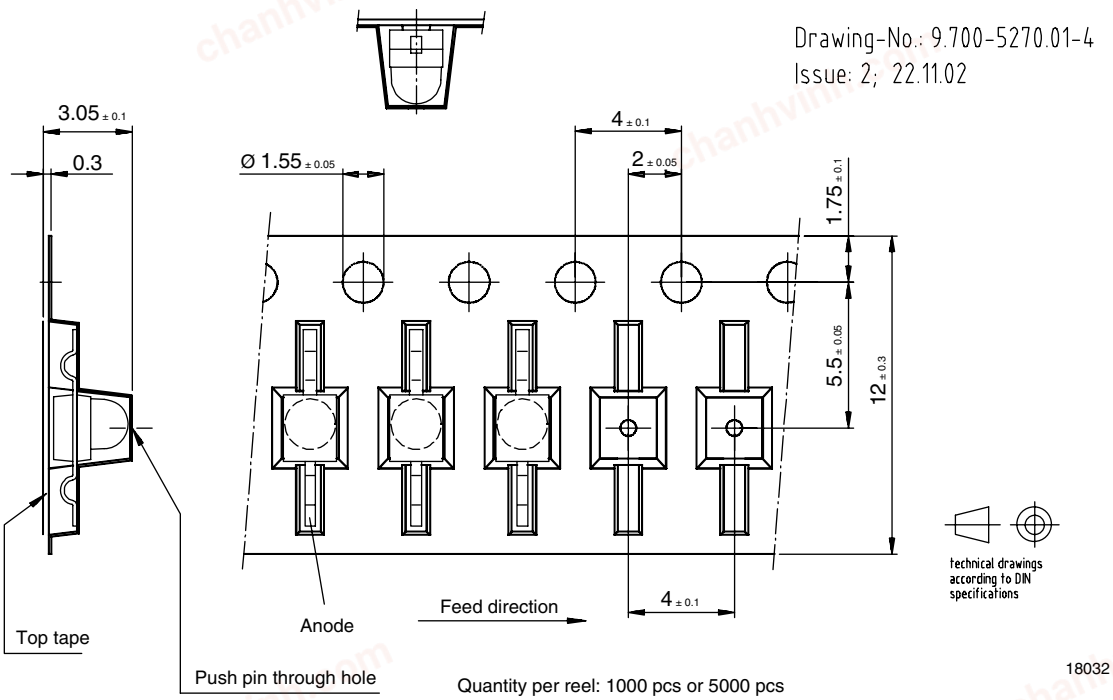
TAPING DIMENSIONS in millimeters: TEMD1020



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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