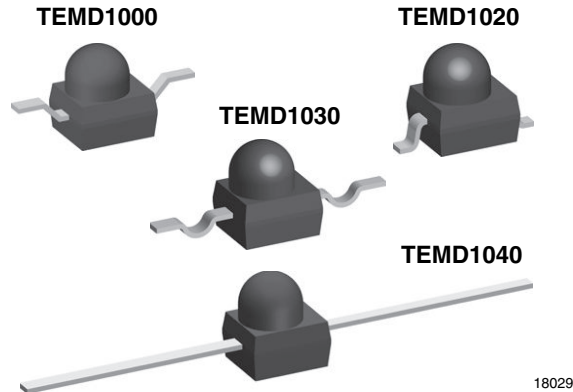




Silicon PIN Photodiode, RoHS-Compliant



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 (°) | λ _{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} ≤ 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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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)

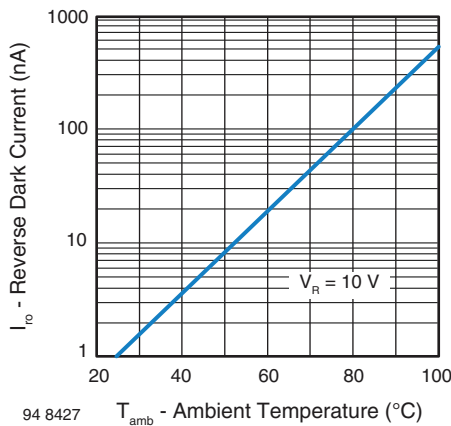


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

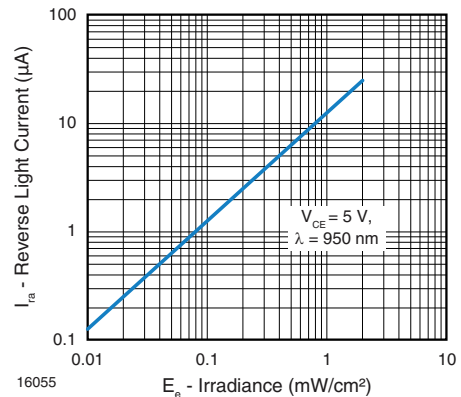


Fig. 3 - Reverse Light Current vs. Irradiance

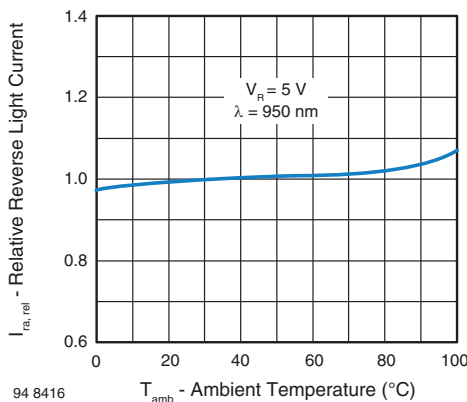


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

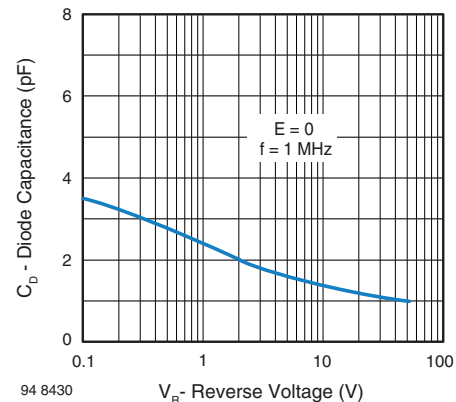


Fig. 4 - Diode Capacitance vs. Reverse Voltage

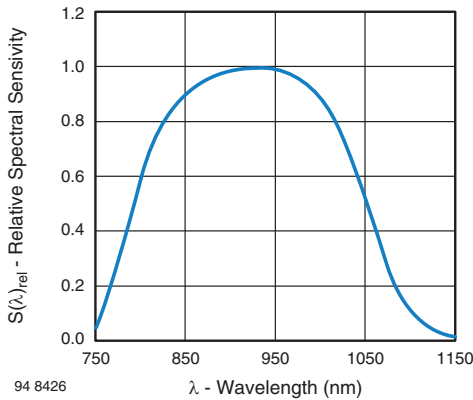


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

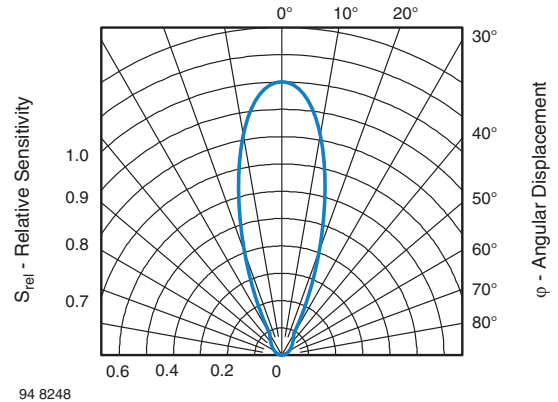


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

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

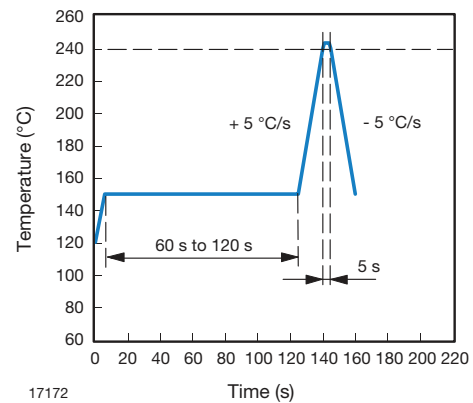


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

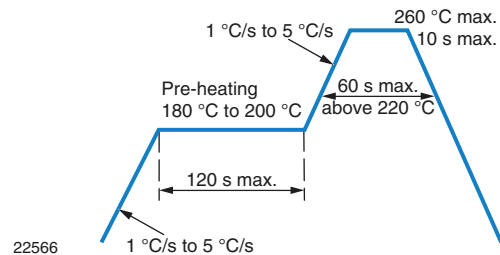
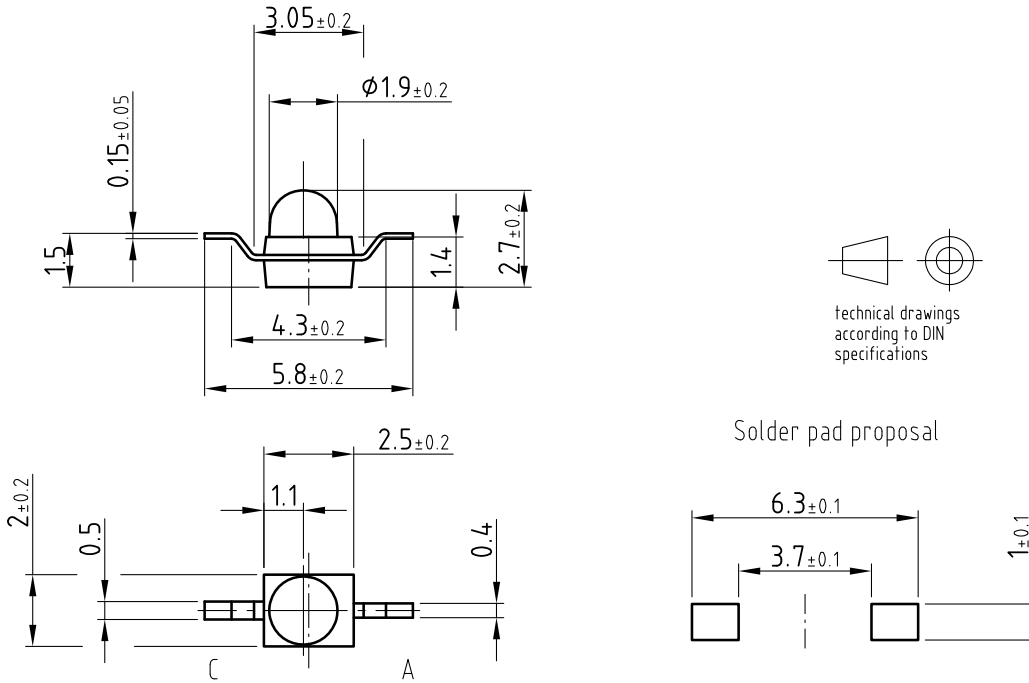


Fig. 8 - Lead (Pb)-Free Reflow Solder Profile According to J-STD-020



PACKAGE DIMENSIONS in millimeters: TEMD1000

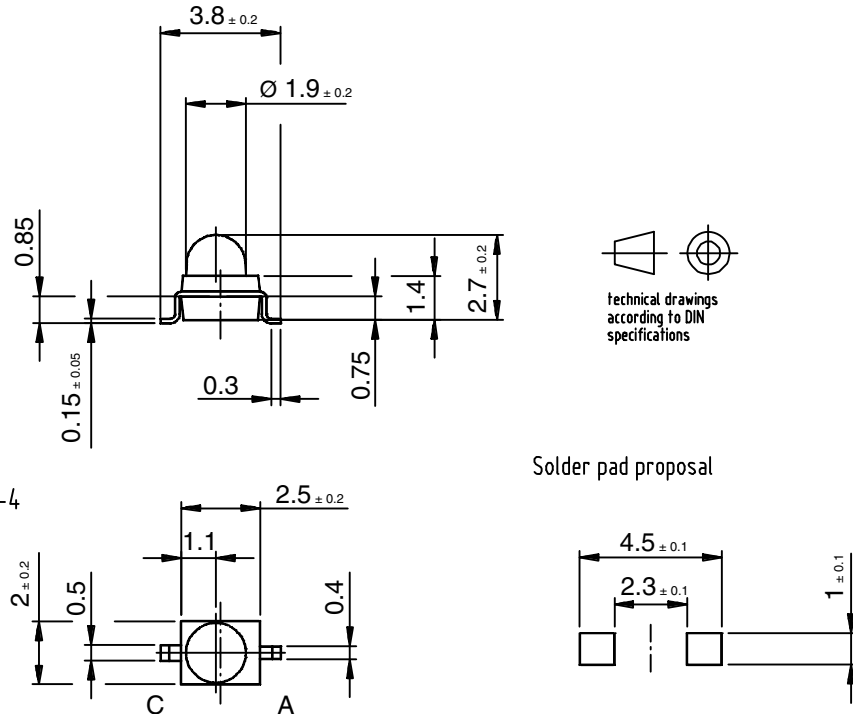


Drawing-No.: 6.544-5326.02-4

Issue: 3; 02.04.03

16159

PACKAGE DIMENSIONS in millimeters: TEMD1020



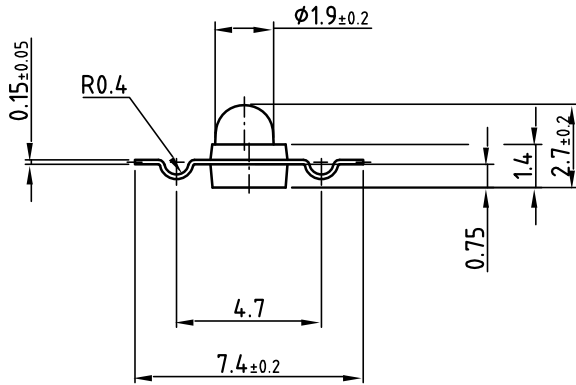
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Issue: 3; 02.04.03

16160

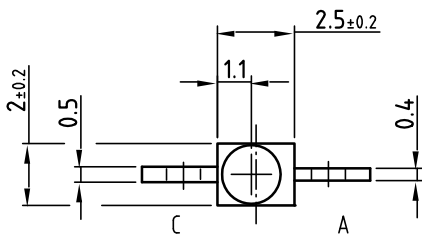
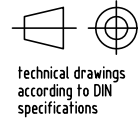


PACKAGE DIMENSIONS in millimeters: TEMD1030

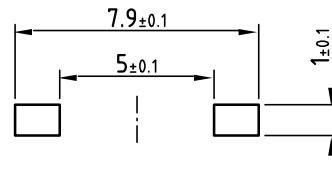


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Issue: 4; 08.05.03

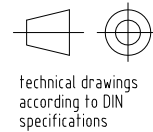
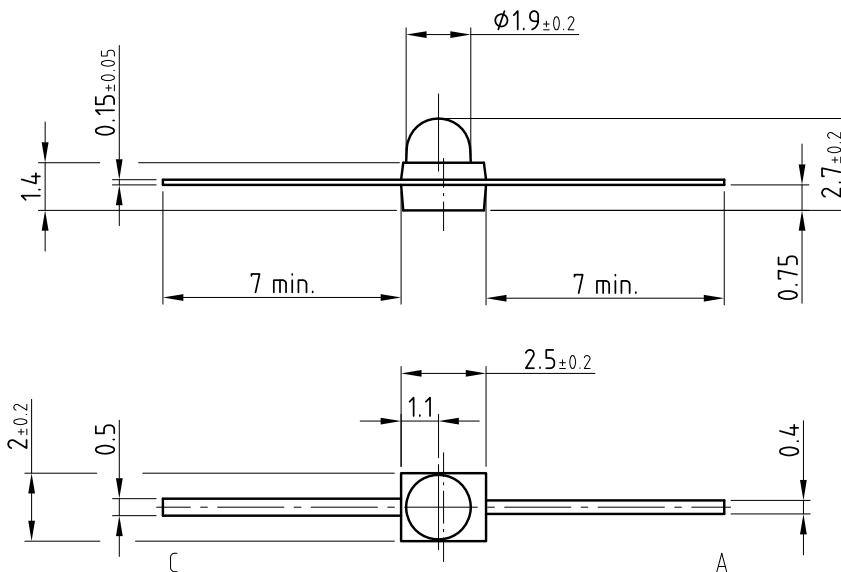


Solder pad proposal



16228

PACKAGE DIMENSIONS in millimeters: TEMD1040



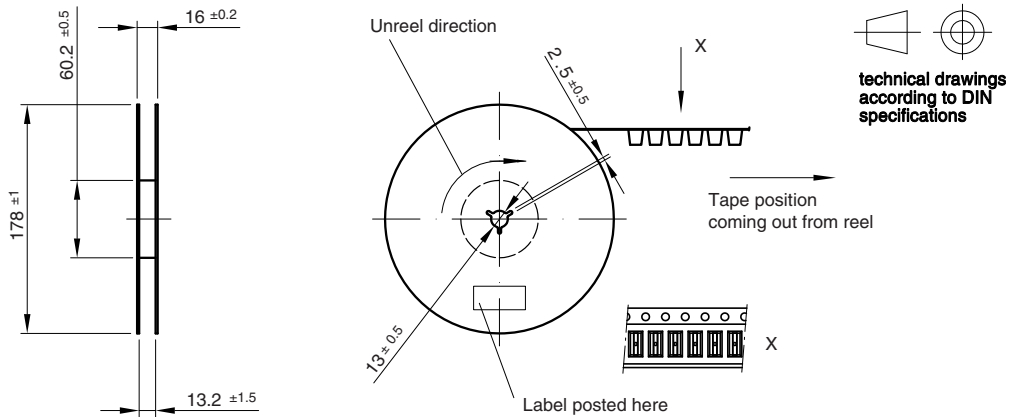
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Issue: 3; 02.04.03

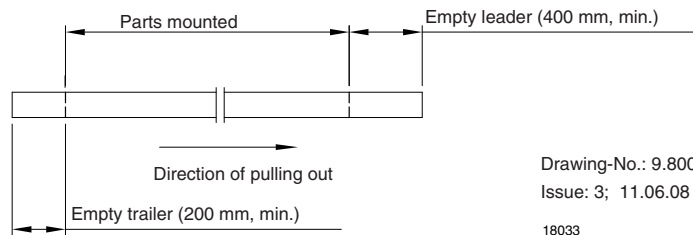
16760



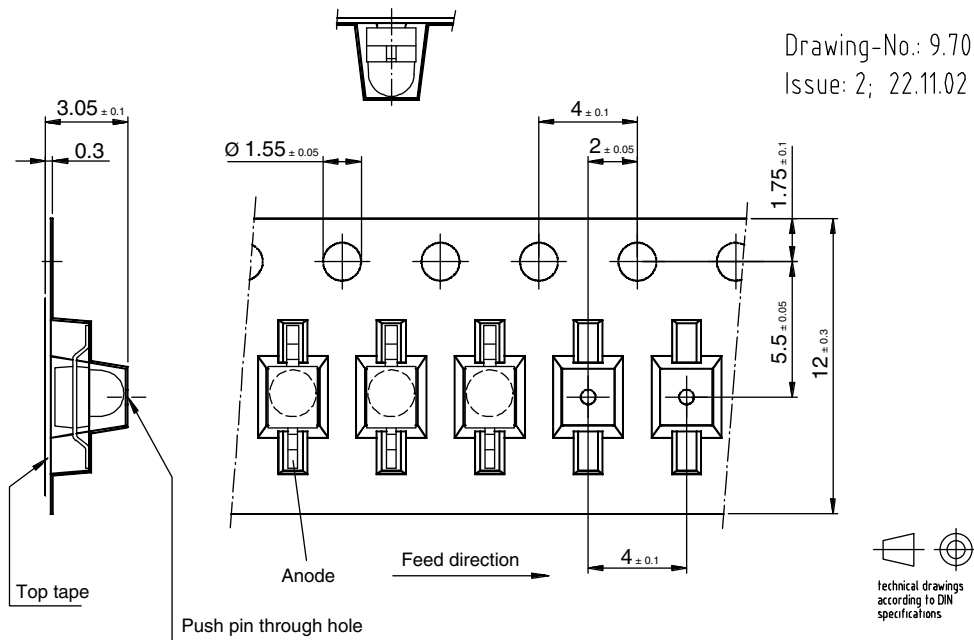
REEL DIMENSIONS in millimeters



Leader and trailer tape:



TAPING DIMENSIONS in millimeters: TEMD1000

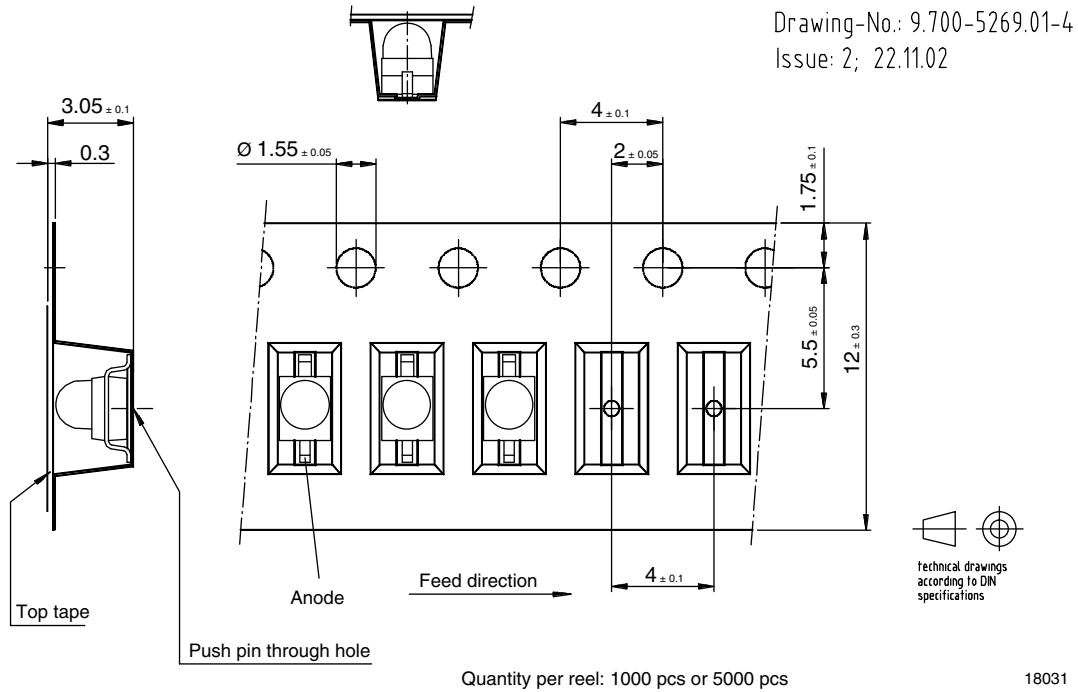


Quantity per reel: 1000 pcs or 5000 pcs

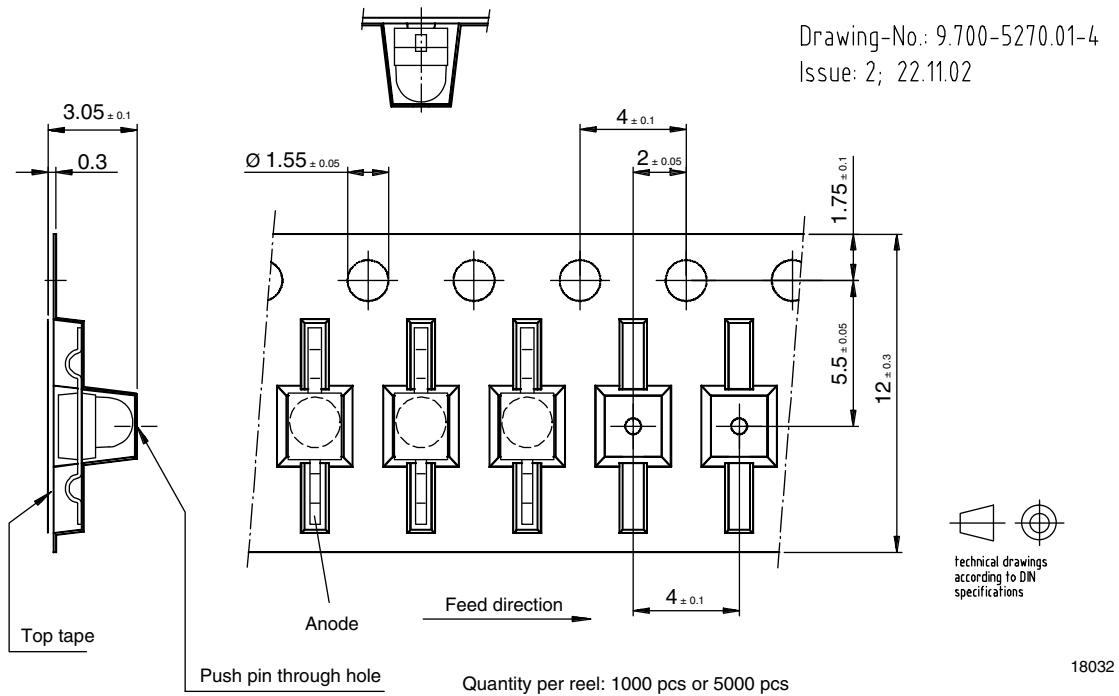
18030



TAPING DIMENSIONS in millimeters: TEMD1020



TAPING DIMENSIONS in millimeters: TEMD1030





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