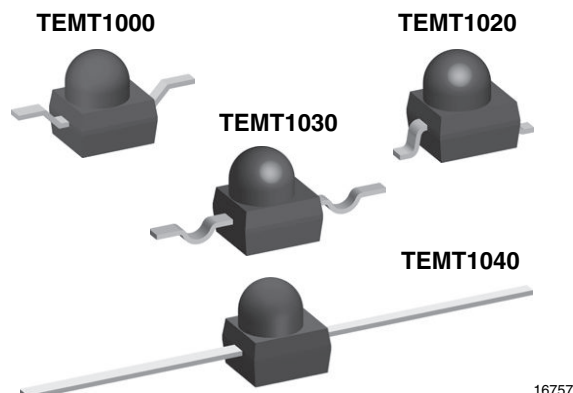


## Silicon NPN Phototransistor, RoHS-Compliant



### 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
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm IR 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](http://www.vishay.com/doc?99912)


RoHS  
COMPLIANT

### DESCRIPTION

TEMT1000 series are silicon NPN phototransistors with 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

- Detector in electronic control and drive circuits
- IR detector for daylight application
- Photo interrupters
- Counter
- Encoder

### PRODUCT SUMMARY

COMPONENT	$I_{ca}$ (mA)	$\phi$ (°)	$\lambda_{0.5}$ (nm)
TEMT1000	7	$\pm 15$	730 to 1000
TEMT1020	7	$\pm 15$	730 to 1000
TEMT1030	7	$\pm 15$	730 to 1000
TEMT1040	7	$\pm 15$	730 to 1000

#### Note

- Test conditions see table “Basic Characteristics”

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMT1000	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Reverse gullwing
TEMT1020	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Gullwing
TEMT1030	Tape and reel	MOQ: 1000 pcs, 1000 pcs/reel	Yoke
TEMT1040	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
Emitter collector voltage		$V_{ECO}$	5	V
Collector current		$I_C$	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10$ ms	$I_{CM}$	100	mA
Power dissipation	$T_{amb} \leq 55^\circ\text{C}$	$P_V$	100	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	$^\circ\text{C}$
Thermal resistance junction to ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	$R_{thJA}$	400	K/W

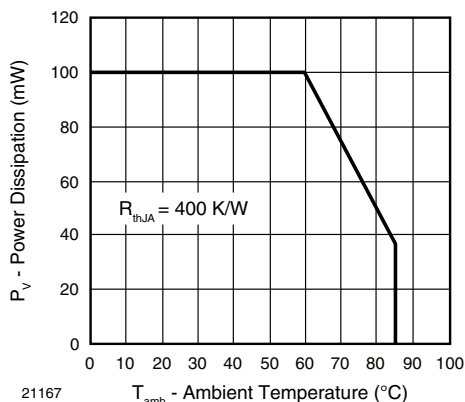


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter voltage	$I_C = 1 \text{ mA}$	$V_{CEO}$	70	-	-	V
Collector emitter dark current	$V_{CE} = 20 \text{ V}, E = 0$	$I_{CEO}$	-	1	200	nA
Collector emitter capacitance	$V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$	$C_{CEO}$	-	3	-	pF
Angle of half sensitivity		$\phi$	-	$\pm 15$	-	°
Wavelength of peak sensitivity		$\lambda_p$	-	880	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	730 to 1000	-	nm
Collector emitter saturation voltage	$E_o = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, I_C = 0.1 \text{ mA}$	$V_{CEsat}$	-	-	0.3	V
Turn-on time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	$t_{on}$	-	2.0	-	$\mu\text{s}$
Turn-off time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	$t_{off}$	-	2.3	-	$\mu\text{s}$
Cut-off frequency	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	$f_c$	-	180	-	kHz
Collector light current	$E_o = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	$I_{ca}$	2	7.0	-	mA

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

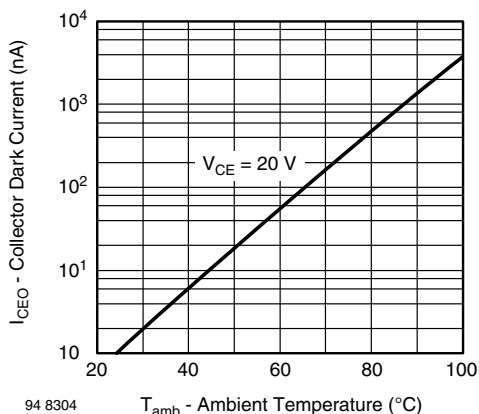


Fig. 2 - Collector Dark Current vs. Ambient Temperature

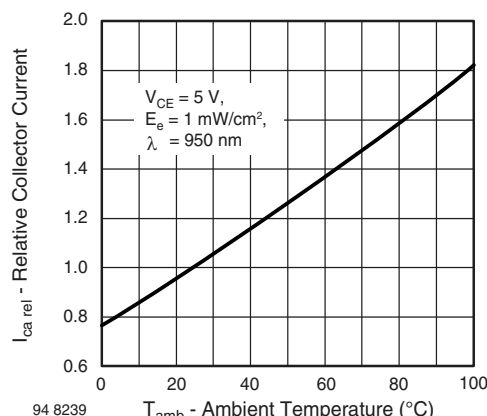


Fig. 3 - Relative Collector Current vs. Ambient Temperature

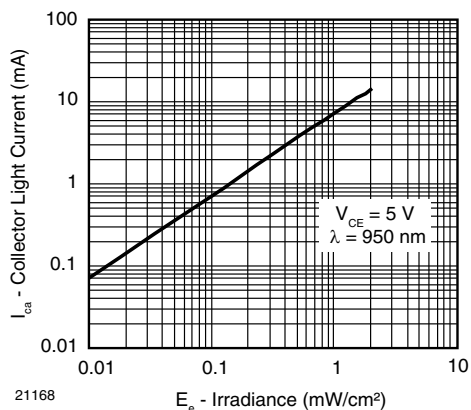


Fig. 4 - Collector Light Current vs. Irradiance

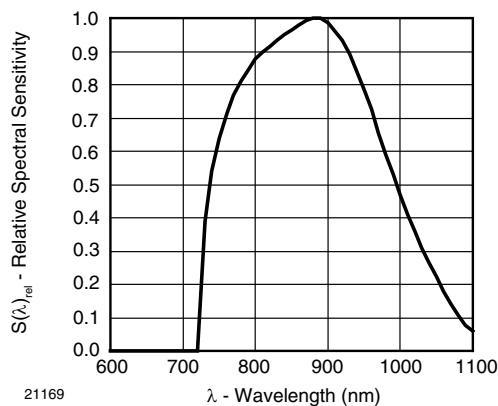


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

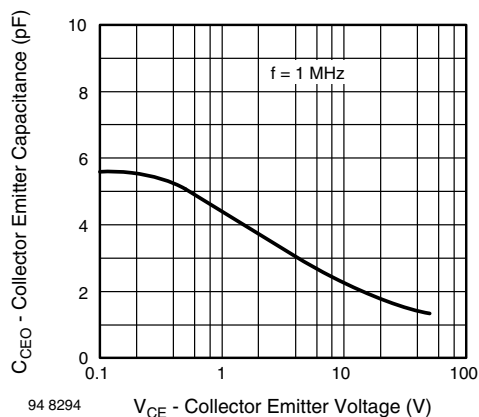


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

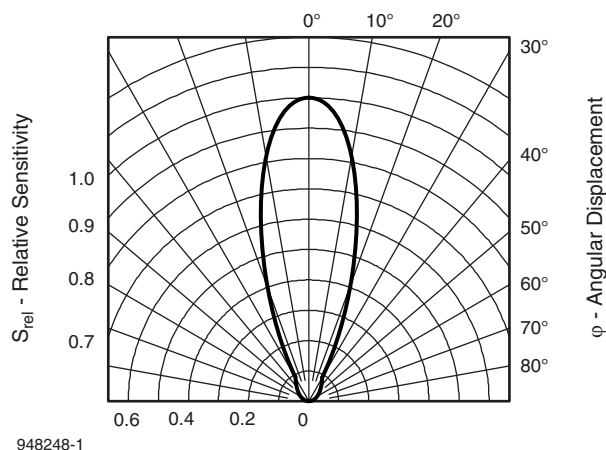


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

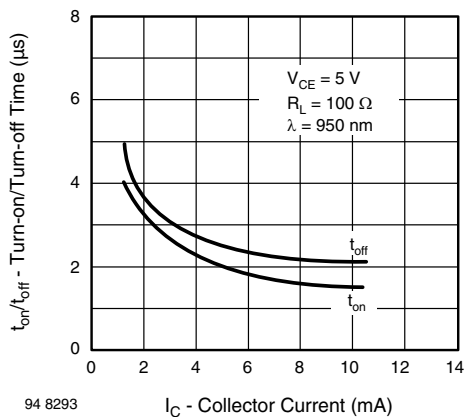


Fig. 6 - Turn-on/Turn-off Time vs. Collector Current



## 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  $\pm$  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

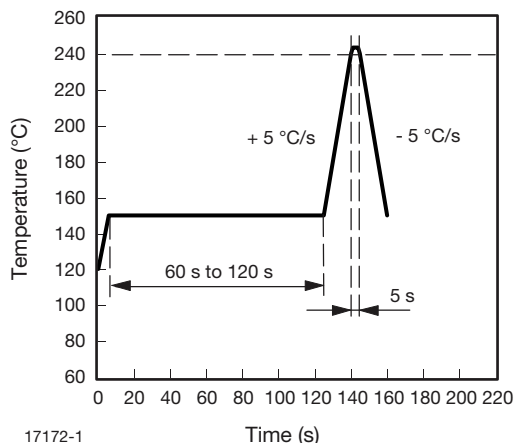


Fig. 9 - Lead Tin (SnPb) Reflow Solder Profile

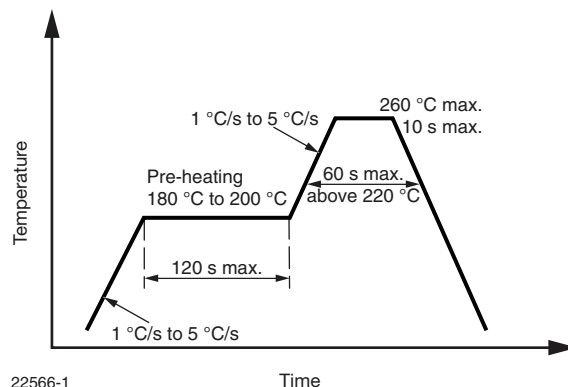
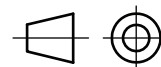
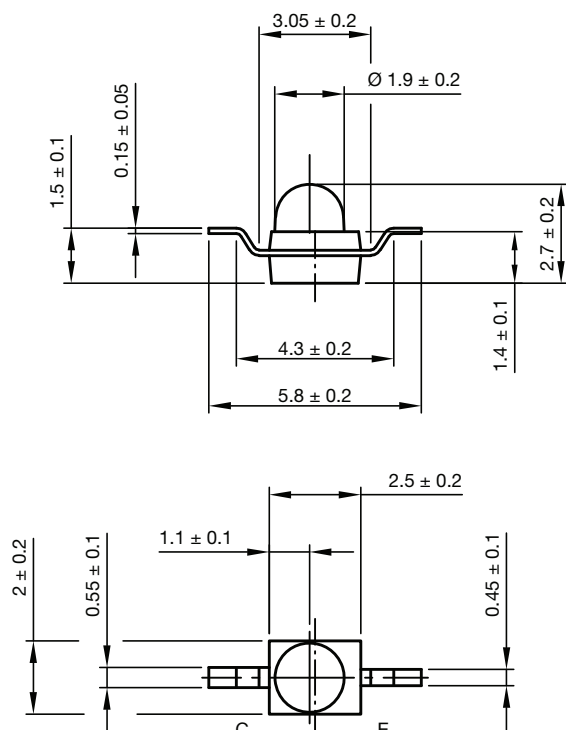


Fig. 10 - Lead (Pb)-Free Reflow Solder Profile acc. J-STD-020

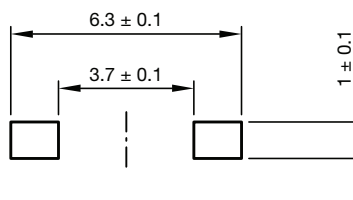


## PACKAGE DIMENSIONS in millimeters: TEMT1000



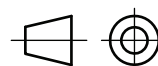
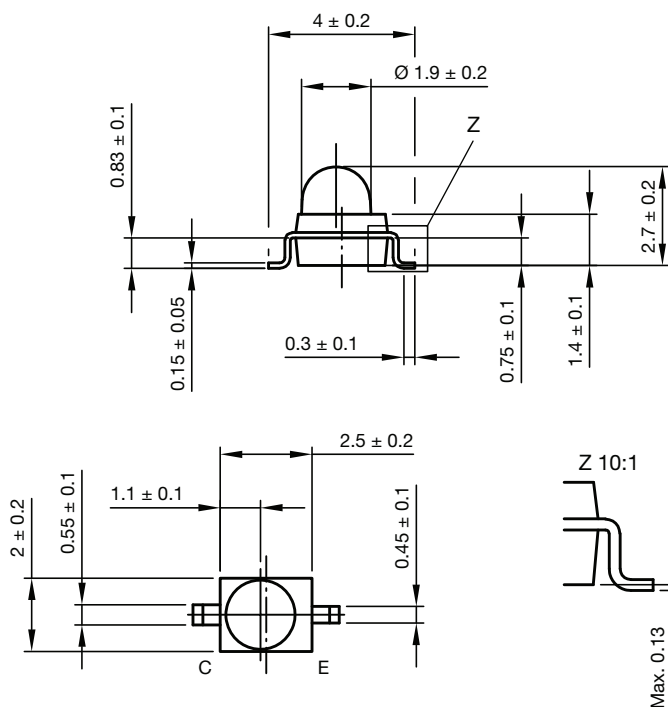
Technical drawings  
according to DIN  
specifications

### Solder pad proposal



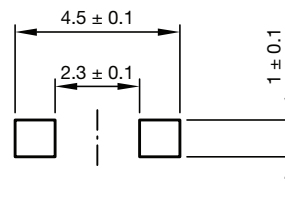
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Issue: 5; 04.08.2021

## PACKAGE DIMENSIONS in millimeters: TEMT1020



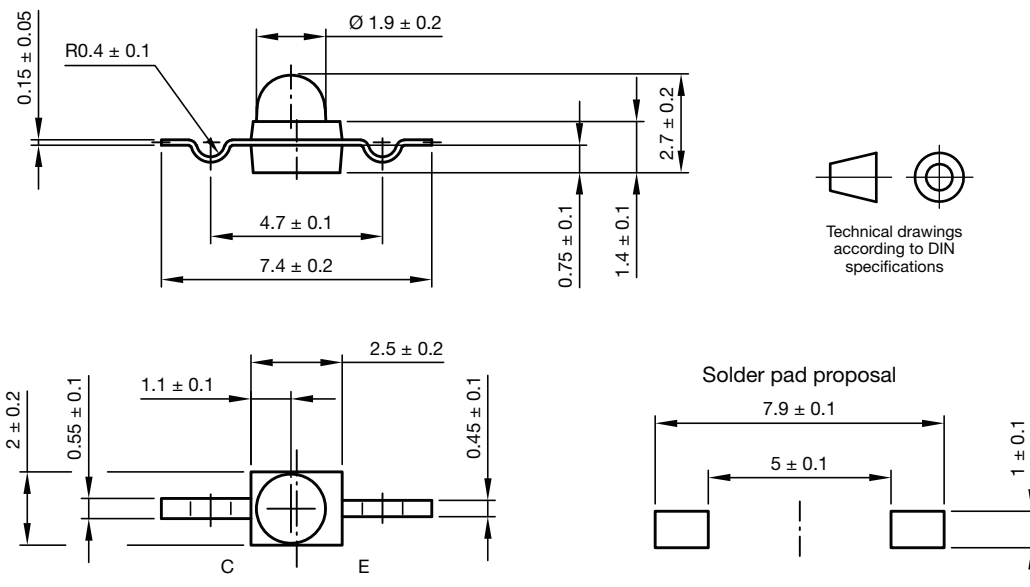
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according to DIN  
specifications

### Solder pad proposal



Drawing-No.: 6.544-5325.01-4  
Issue: 6; 04.08.2021

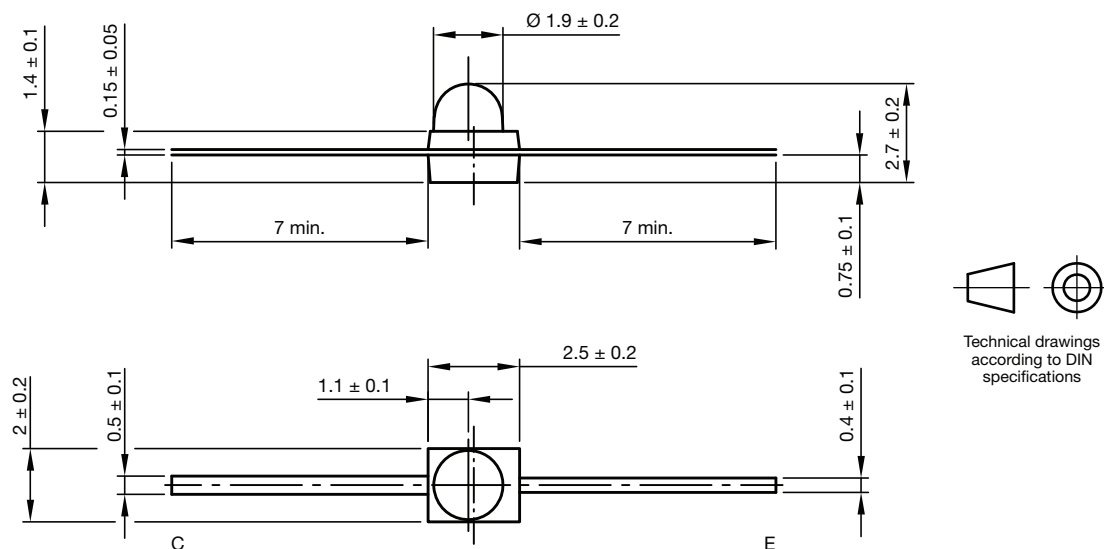
## PACKAGE DIMENSIONS in millimeters: TEMT1030



Drawing-No.: 6.544-5329.02-4

Issue: 4; 04.08.2021

## PACKAGE DIMENSIONS in millimeters: TEMT1040

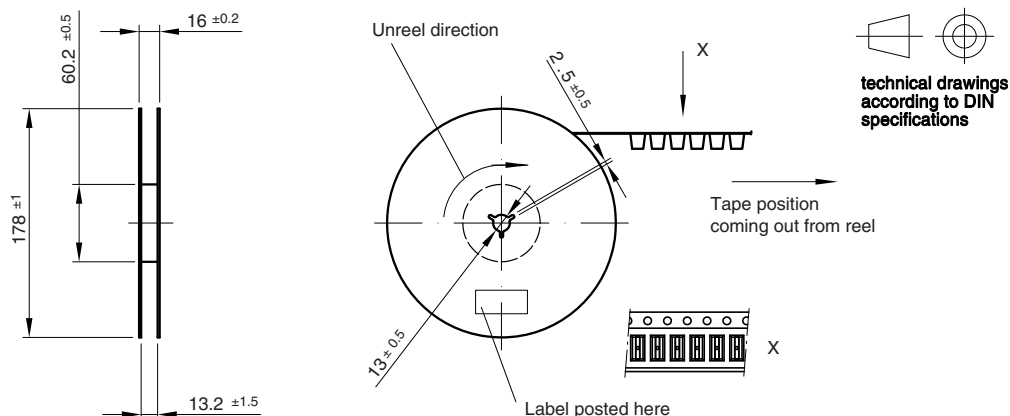


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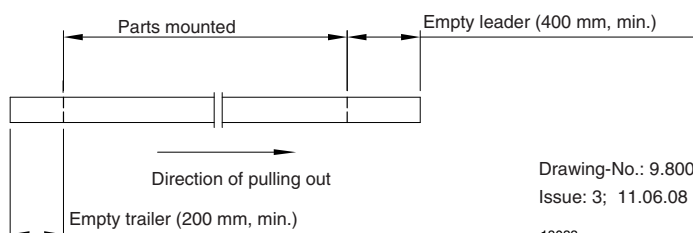
Issue: 3; 04.08.2021



## REEL DIMENSIONS in millimeters



Leader and trailer tape:

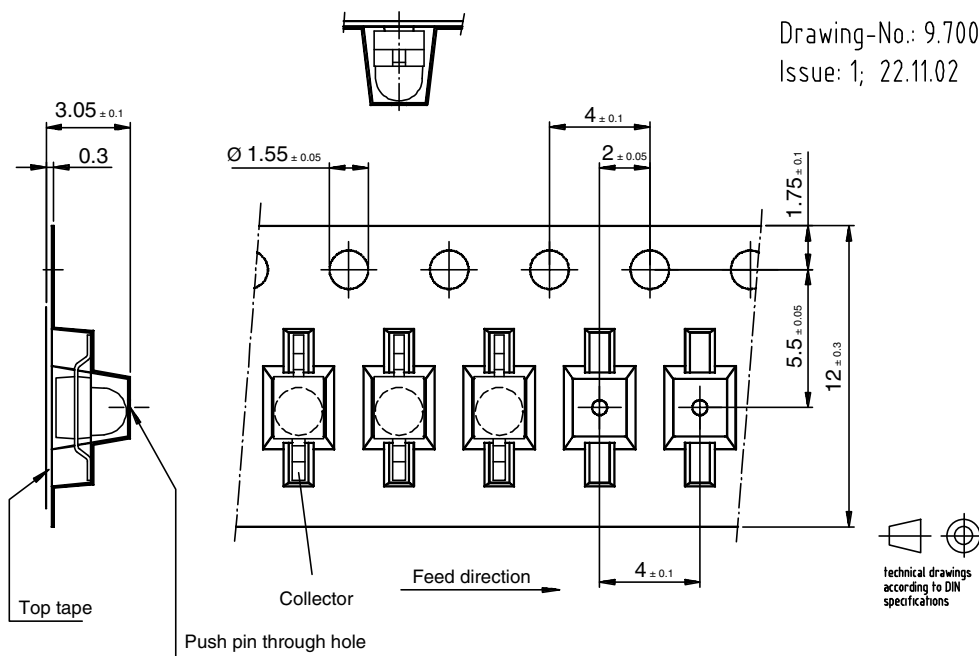


Drawing-No.: 9.800-5080.01-4

Issue: 3; 11.06.08

18033

## TAPING DIMENSIONS in millimeters: TEMT1000

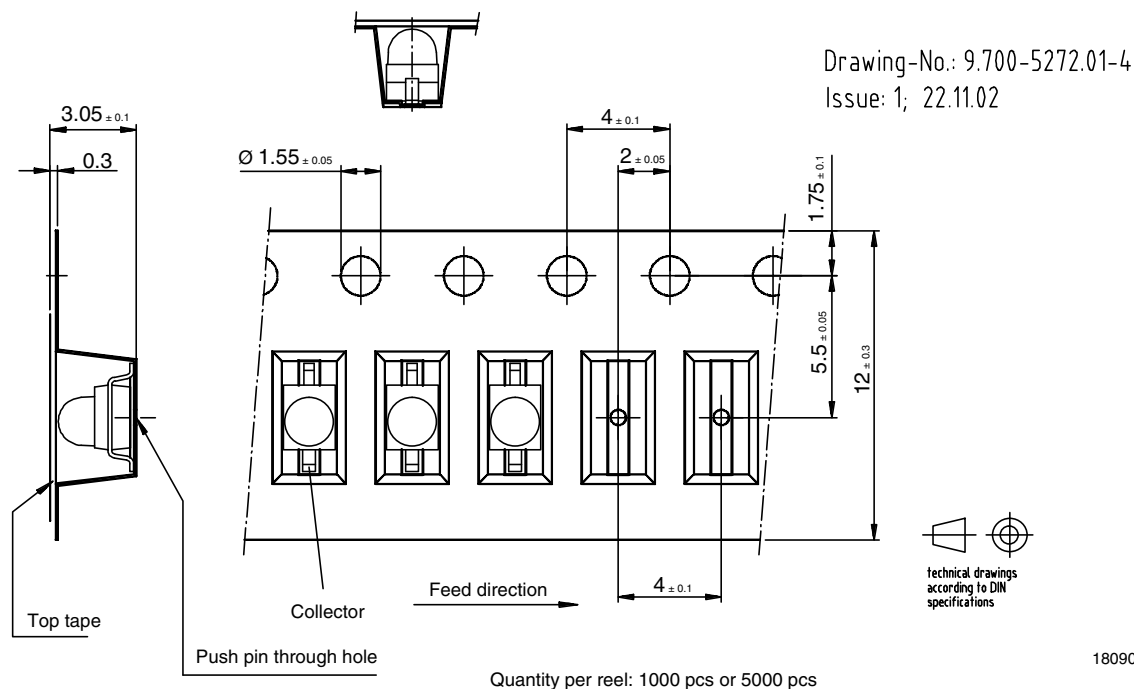


Quantity per reel: 1000 pcs or 5000 pcs

18089

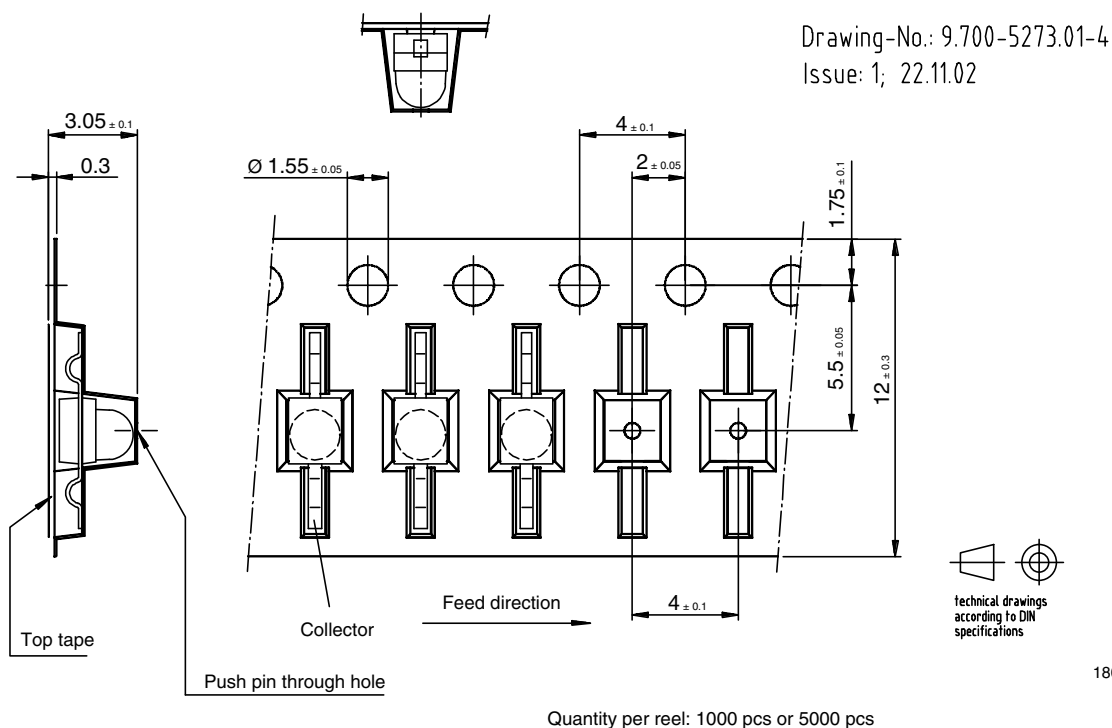


## TAPING DIMENSIONS in millimeters: TEMT1020



18090

## TAPING DIMENSIONS in millimeters: TEMT1030



18091





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