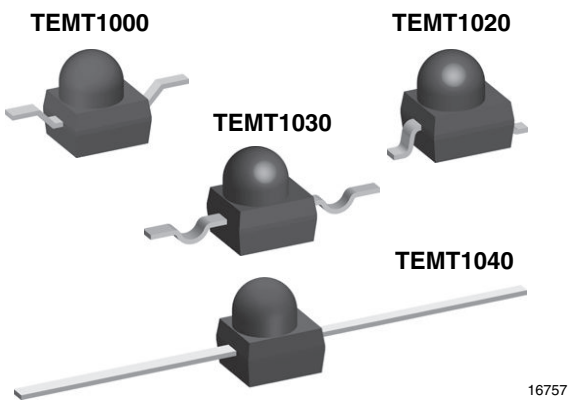
Silicon NPN Phototransistor, RoHS-Compliant



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: φ = ± 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

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)	φ (°)	$\lambda_{0.5}$ (nm)
TEMT1000	7	± 15	730 to 1000
TEMT1020	7	± 15	730 to 1000
TEMT1030	7	± 15	730 to 1000
TEMT1040	7	± 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 °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 °C	P_V	100	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
Thermal resistance junction to ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	R_{thJA}	400	K/W

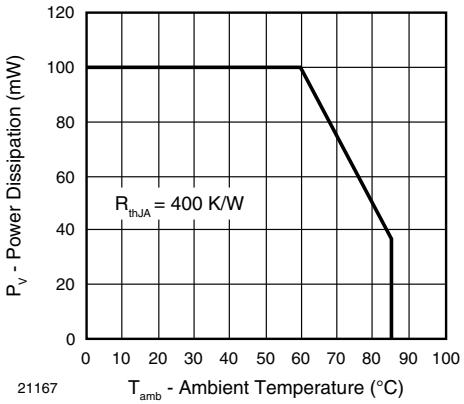


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Collector emitter voltage	I_C = 1 mA	V_{CEO}	70	-	-	V
Collector emitter dark current	V_{CE} = 20 V, E = 0	I_{CEO}	-	1	200	nA
Collector emitter capacitance	V_{CE} = 5 V, f = 1 MHz, E = 0	C_{CEO}	-	3	-	pF
Angle of half sensitivity		φ	-	± 15	-	°
Wavelength of peak sensitivity		λ_p	-	880	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	730 to 1000	-	nm
Collector emitter saturation voltage	E_e = 1 mW/cm², λ = 950 nm, I_C = 0.1 mA	V_{CEsat}	-	-	0.3	V
Turn-on time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{on}	-	2.0	-	µs
Turn-off time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{off}	-	2.3	-	µs
Cut-off frequency	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	f_c	-	180	-	kHz
Collector light current	E_e = 1 mW/cm², λ = 950 nm, V_{CE} = 5 V	I_{ca}	2	7.0	-	mA

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

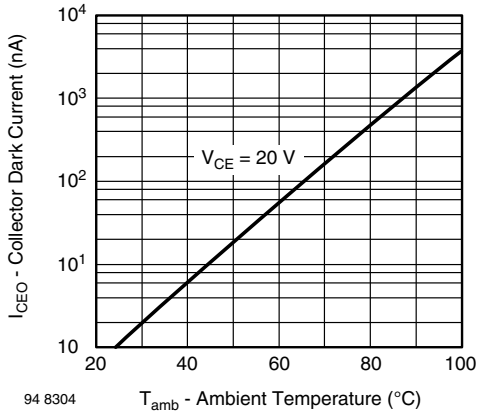


Fig. 2 - Collector Dark Current vs. Ambient Temperature

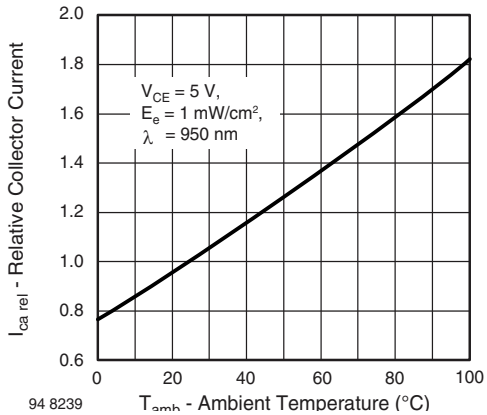


Fig. 3 - Relative Collector Current vs. Ambient Temperature

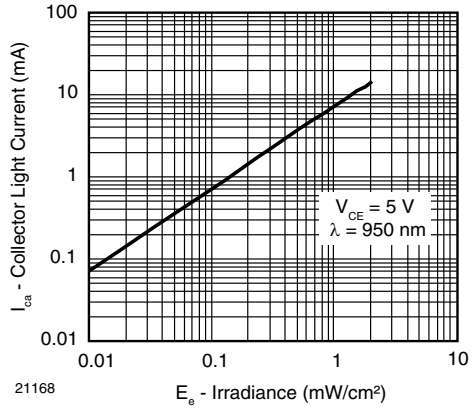


Fig. 4 - Collector Light Current vs. Irradiance

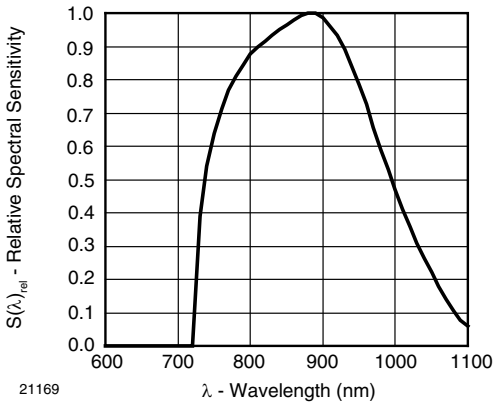


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

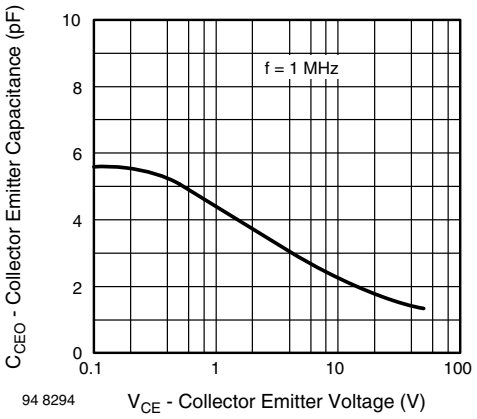


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

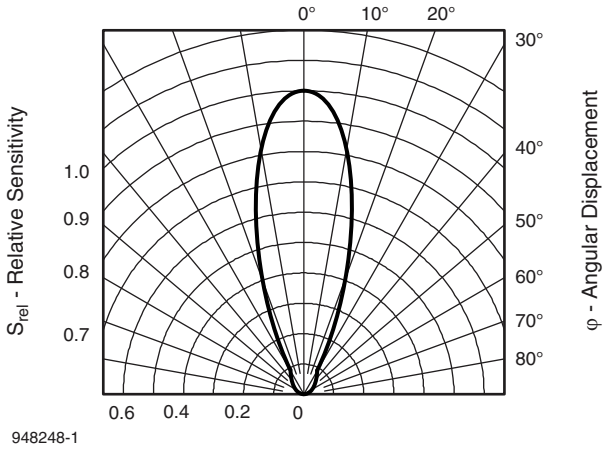


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

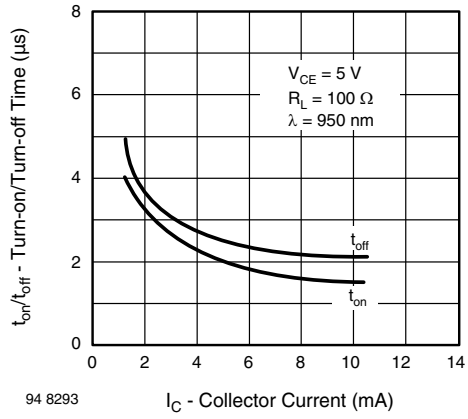


Fig. 6 - Turn-on/Turn-off Time vs. Collector Current

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 ± 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

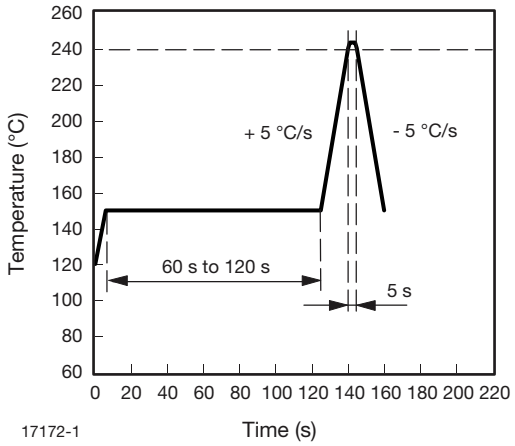


Fig. 9 - Lead Tin (SnPb) Reflow Solder Profile

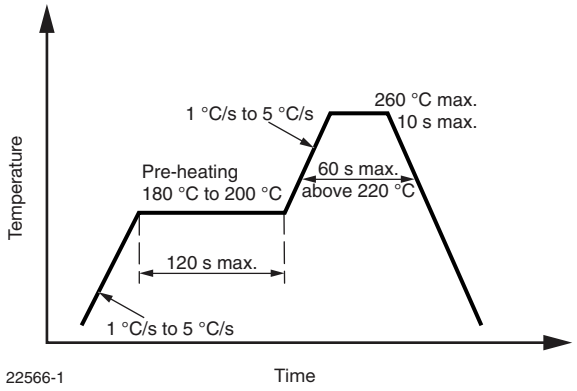
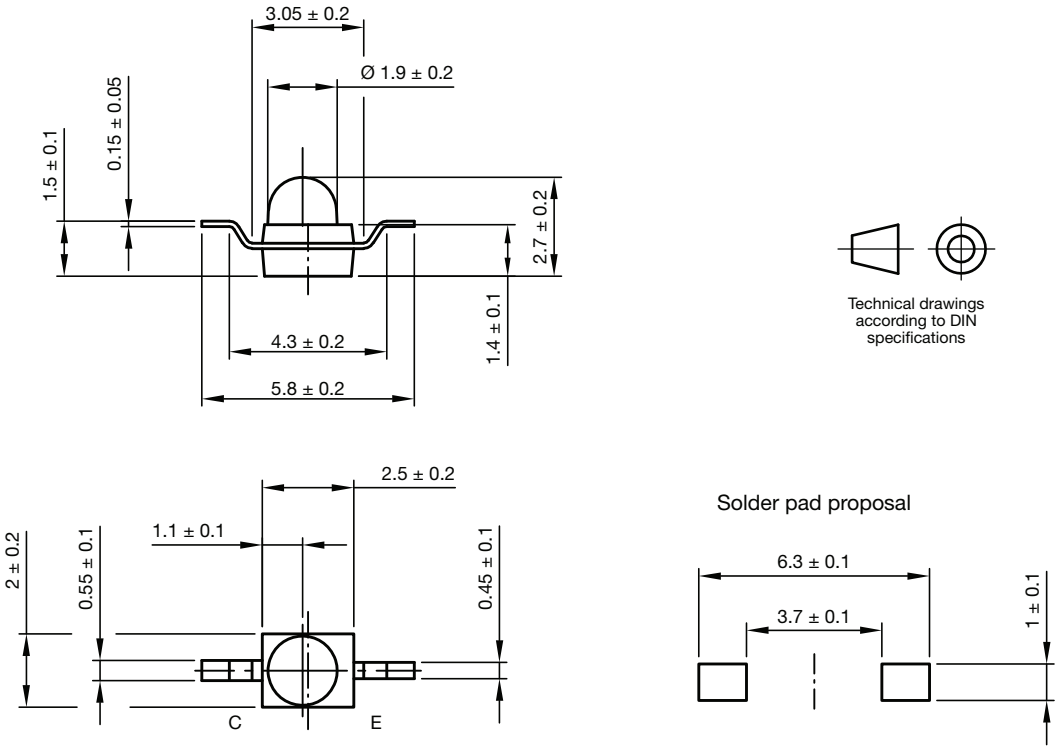


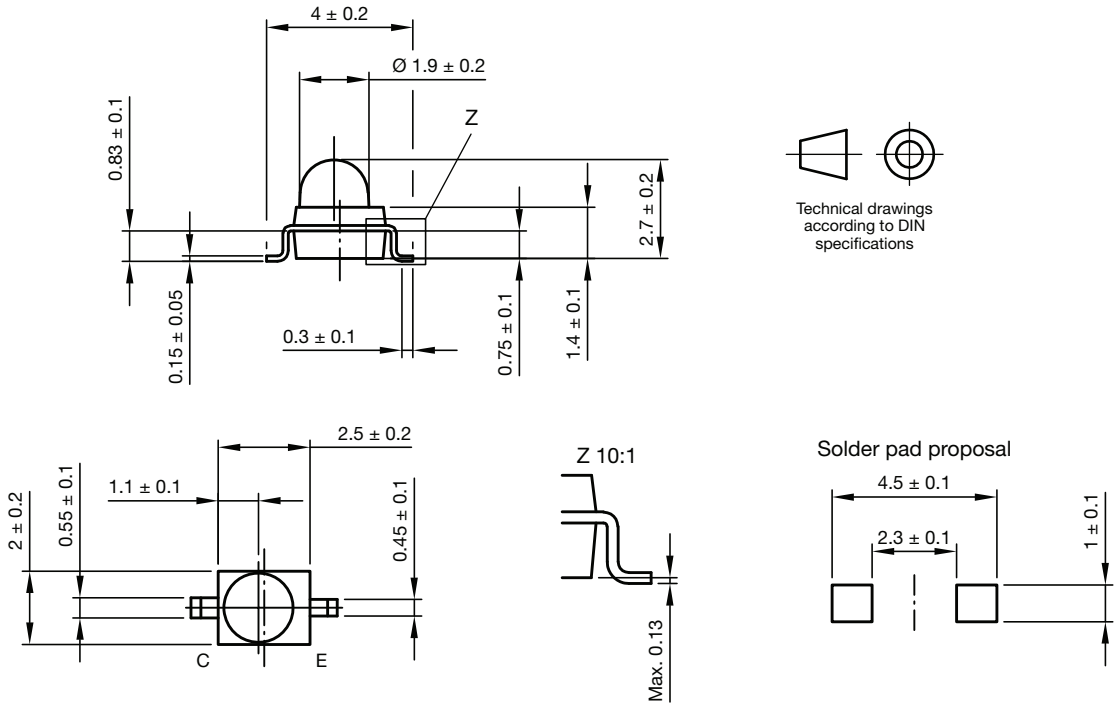
Fig. 10 - Lead (Pb)-Free Reflow Solder Profile acc. J-STD-020

PACKAGE DIMENSIONS in millimeters: **TEMT1000**



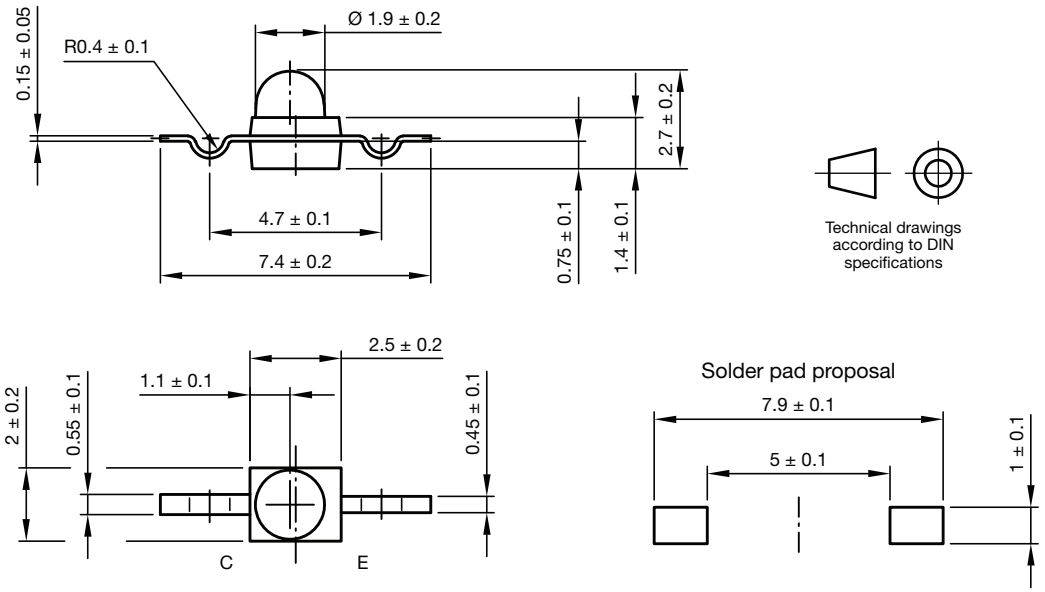
Drawing-No.: 6.544-5326.01-4
Issue: 5; 04.08.2021

PACKAGE DIMENSIONS in millimeters: **TEMT1020**



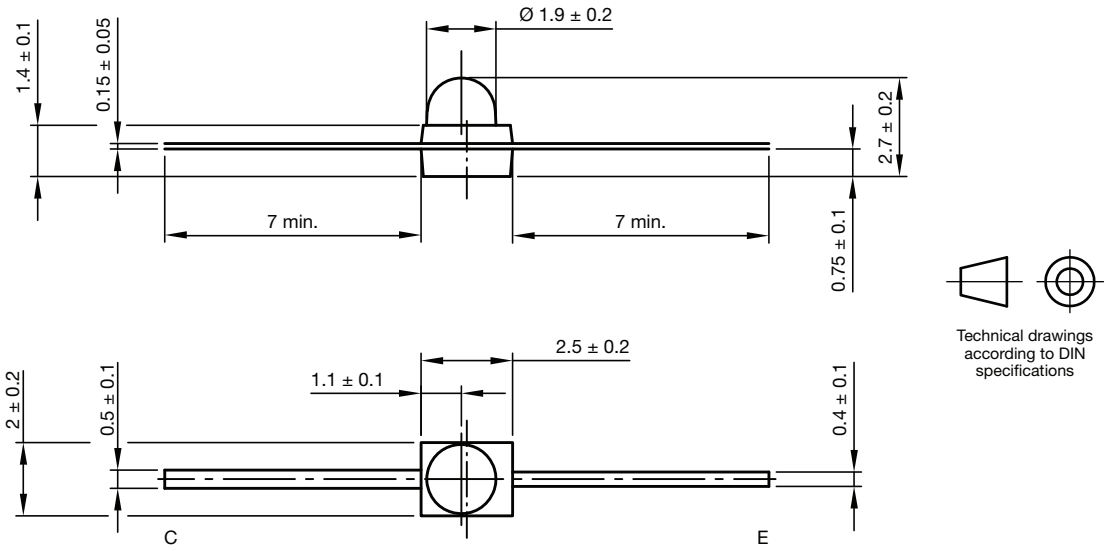
Drawing-No.: 6.544-5325.01-4
Issue: 6; 04.08.2021

PACKAGE DIMENSIONS in millimeters: **TEMT1030**



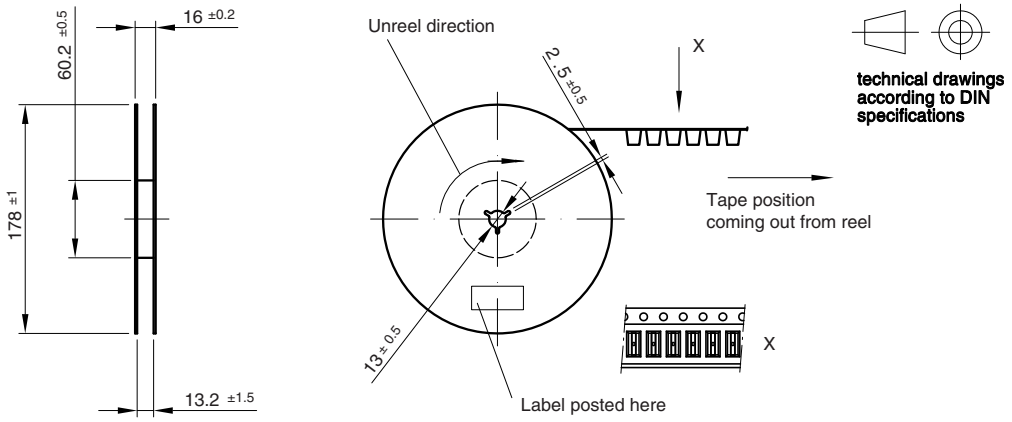
Drawing-No.: 6.544-5329.02-4
Issue: 4; 04.08.2021

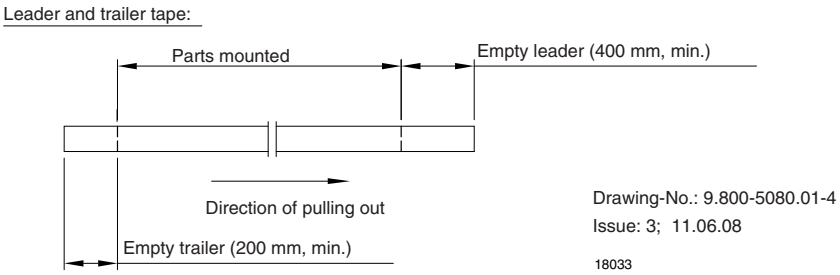
PACKAGE DIMENSIONS in millimeters: **TEMT1040**



Drawing-No.: 6.544-5339.01-4
Issue: 3; 04.08.2021

REEL DIMENSIONS in millimeters

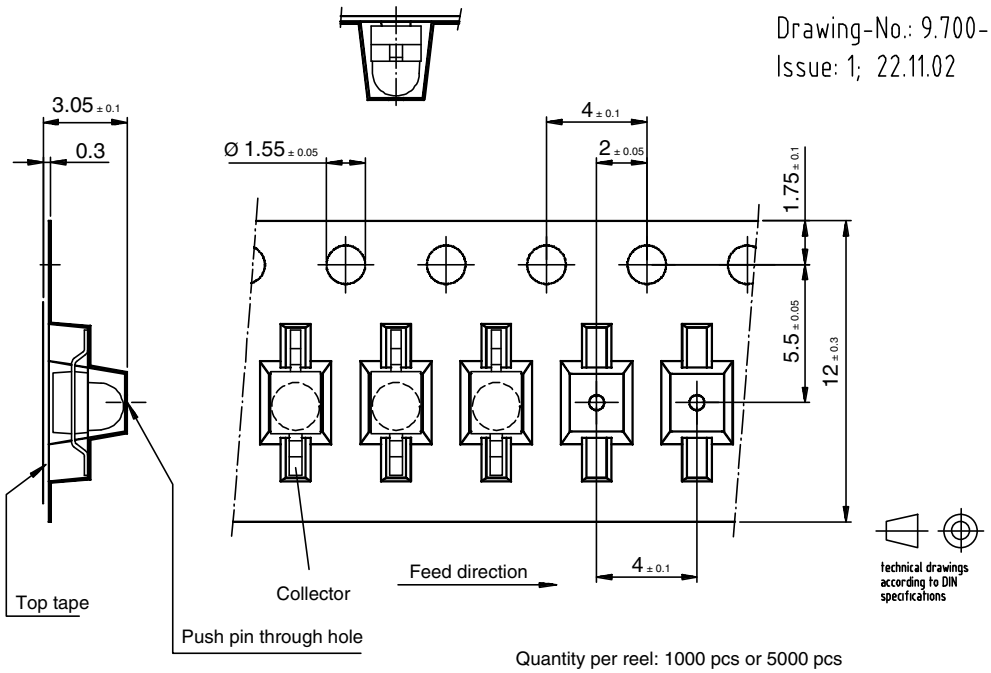




Drawing-No.: 9.800-5080.01-4
Issue: 3; 11.06.08

18033

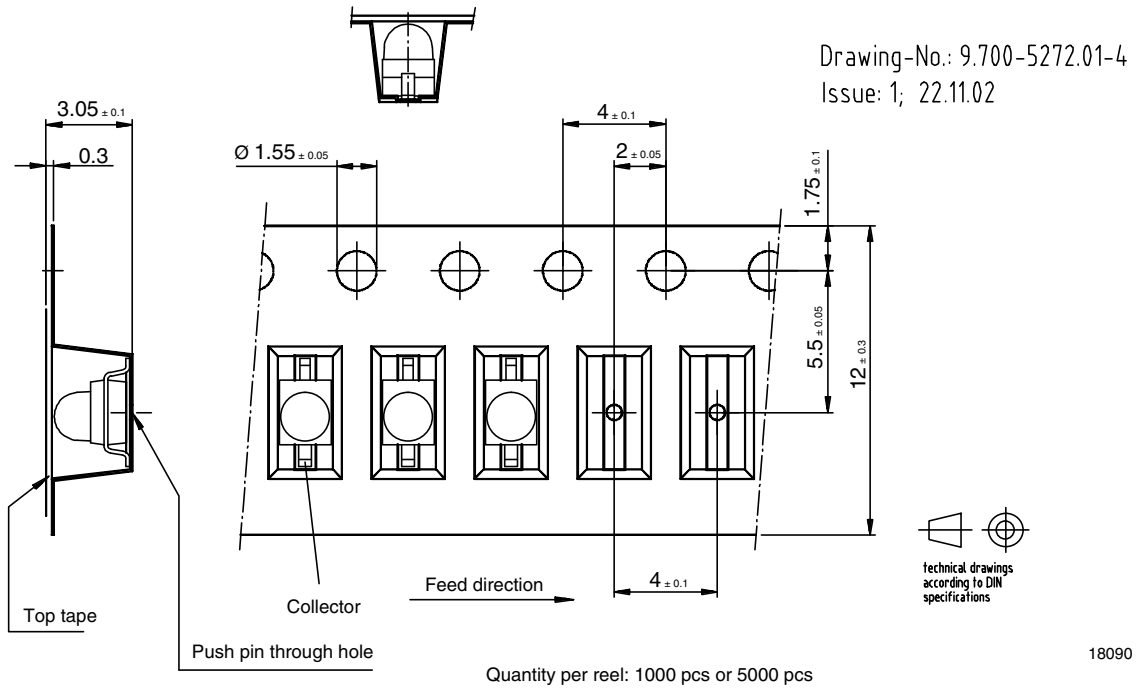
TAPING DIMENSIONS in millimeters: **TEMT1000**



Quantity per reel: 1000 pcs or 5000 pcs

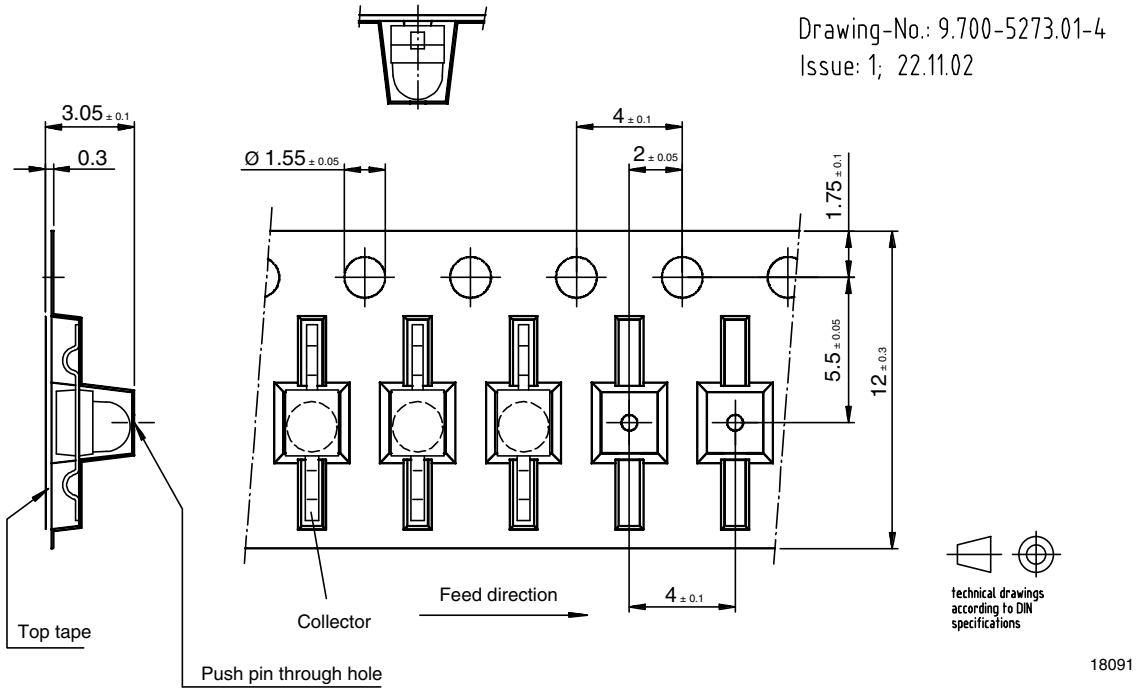
18089

TAPING DIMENSIONS in millimeters: **TEMT1020**



Quantity per reel: 1000 pcs or 5000 pcs

TAPING DIMENSIONS in millimeters: **TEMT1030**



Quantity per reel: 1000 pcs or 5000 pcs

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