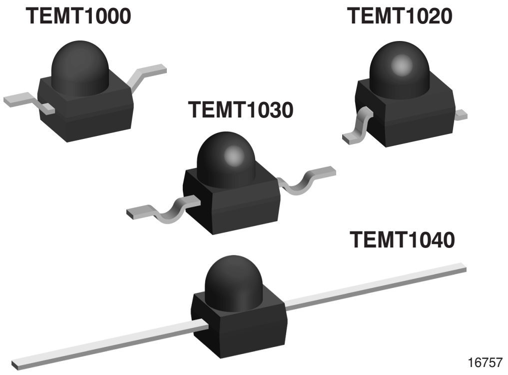
Silicon Phototransistor

Description

TEMT1000 series are high speed and high sensitive silicon NPN epitaxial planar phototransistors in SMD package with dome lens. Due to integrated Daylight filter devices are sensitive for IR radiation only.



Features

- High photo sensitivity
- Fast response times
- Angle of half sensitivity φ = ± 15°
- Daylight filter matched to IR Emitters (λ = 870 nm to 950 nm)
- Versatile terminal configurations
- Matched IR Emitter series: TSML1000

Applications

Detector in electronic control and drive circuits
IR Detector for Daylight application
Photo interrupters
Counter
Encoder

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
Peak Collector Current	$t_p/T = 0.5$, $t_p \le 10$ ms	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \le 55$ °C	P_{tot}	100	mW
Junction Temperature		T_j	100	°C
Storage Temperature Range		T_{stg}	- 40 to + 100	°C
Operating Temperature Range		T_{amb}	- 40 to + 85	°C
Soldering Temperature	$t \le 5$ s	T_{sd}	<260	°C
Thermal Resistance Junction/Ambient		R_{thJA}	400	K/W

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 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		deg
Wavelength of Peak Sensitivity		λ_p		950		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		750 to 980		nm
Collector Emitter Saturation Voltage	E_e = 1 mW/cm^2, 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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
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/cm^2, λ = 950 nm, V_{CE} = 5V	I_{ca}	2	7.0		mA

Typical Characteristics (T_{amb} = 25 °C unless otherwise specified)

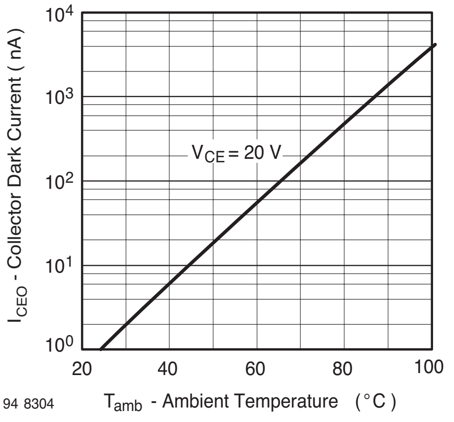


Figure 1. Collector Dark Current vs. Ambient Temperature

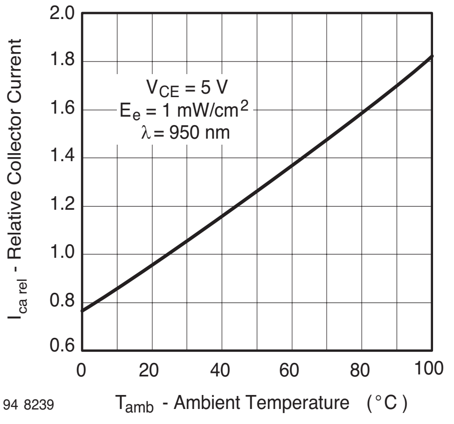


Figure 2. Relative Collector Current vs. Ambient Temperature

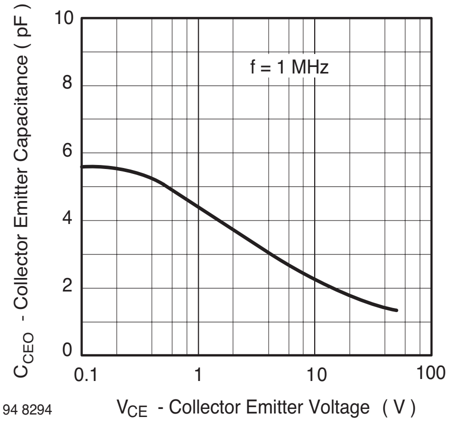


Figure 3. Collector Emitter Capacitance vs. Collector Emitter Voltage

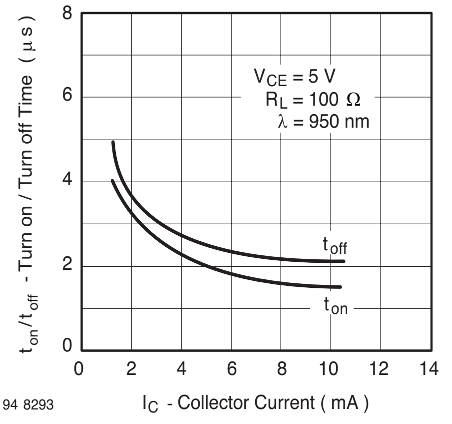


Figure 4. Turn On/Turn Off Time vs. Collector Current

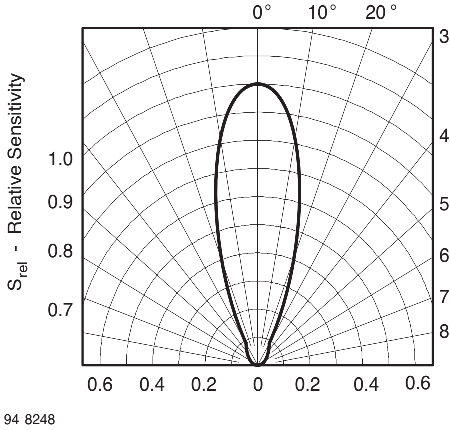
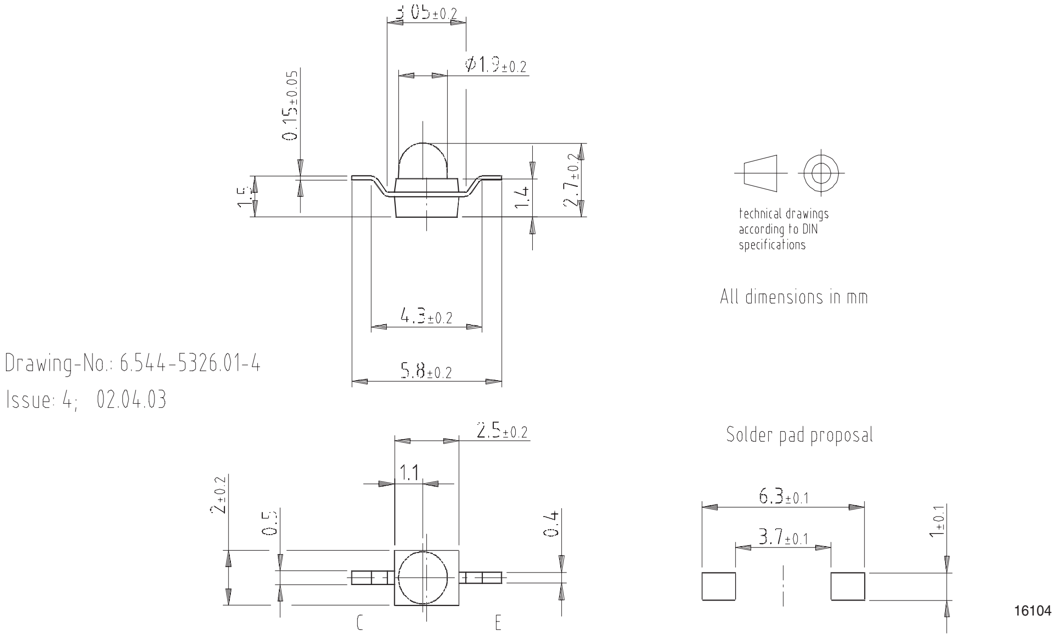
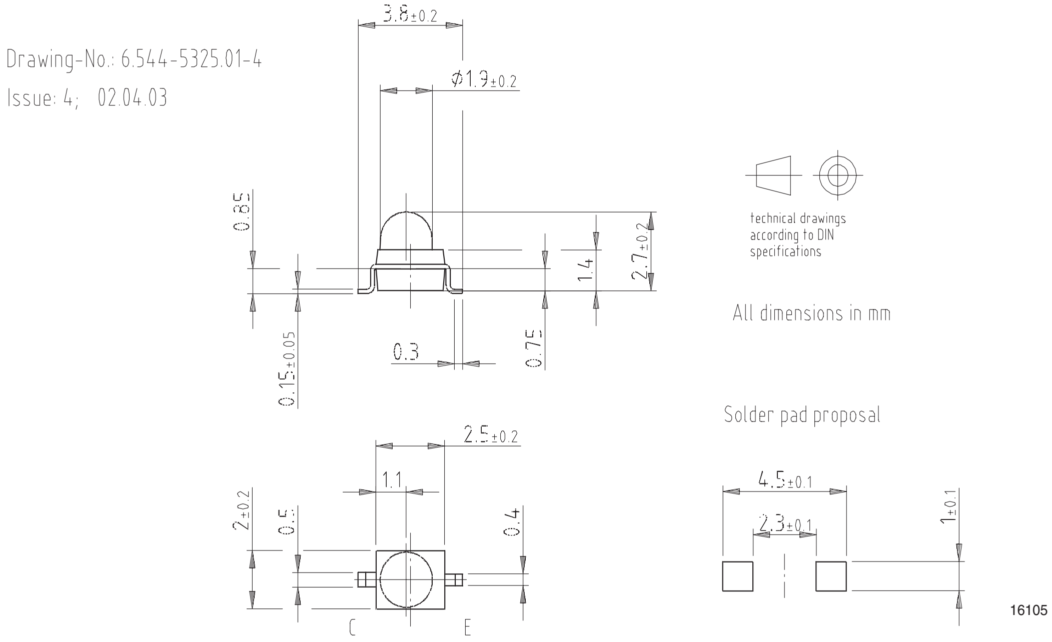


Figure 5. Relative Radiant Sensitivity vs. Angular Displacement

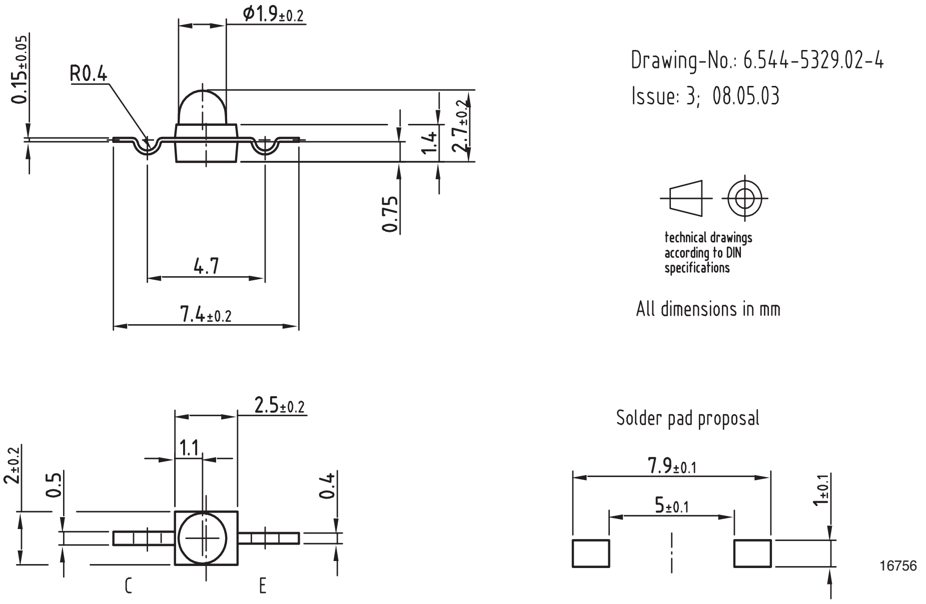
Package Dimensions in mm
TEMT1000



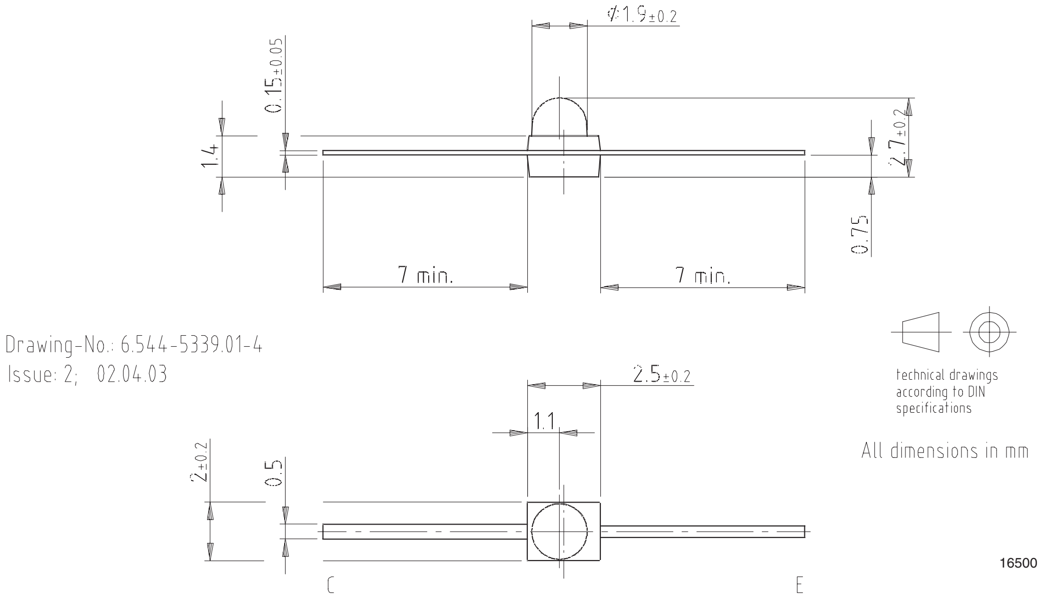
Package Dimensions in mm
TEMT1020



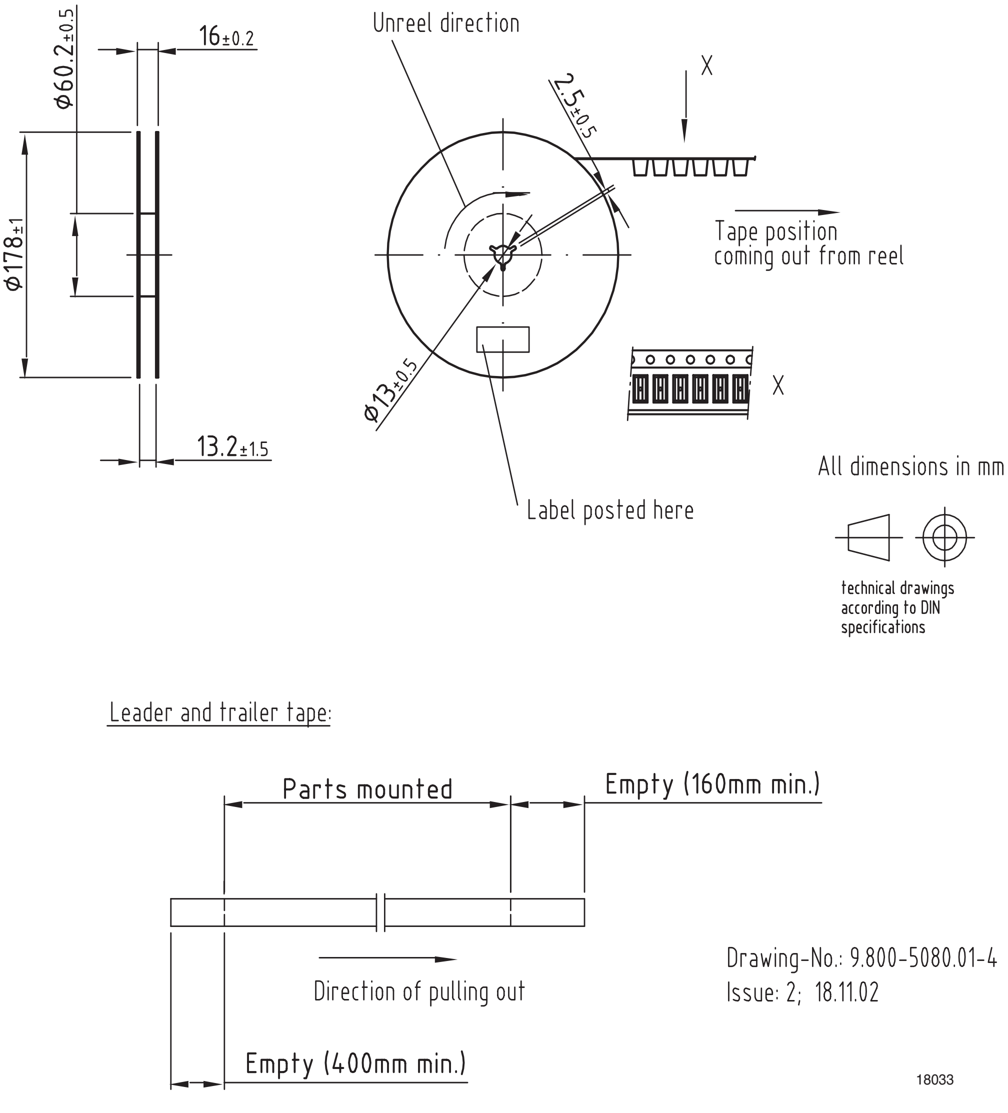
Package Dimensions in mm
TEMT1030



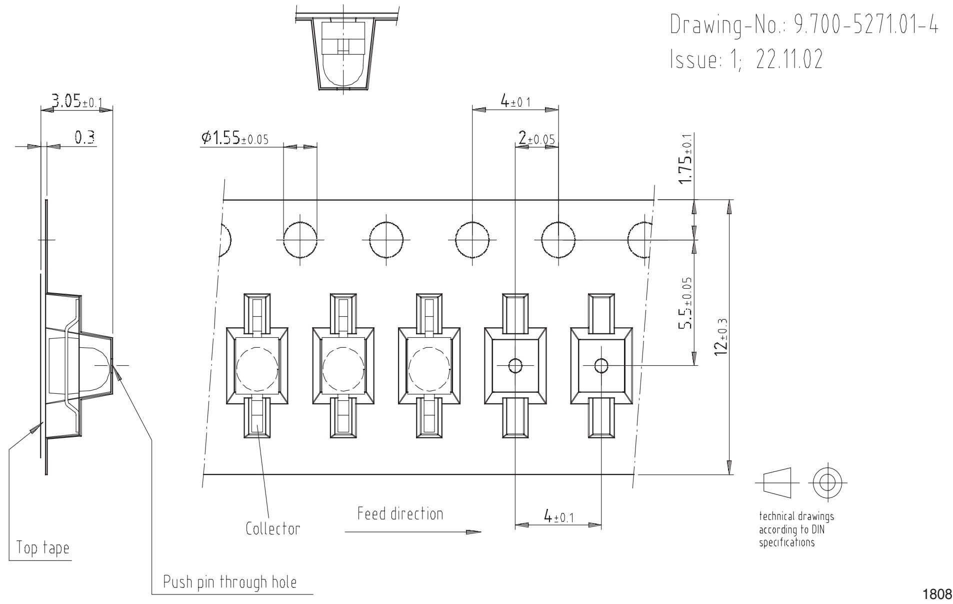
Package Dimensions in mm
TEMT1040



Reel Dimensions



Taping TEMT1000



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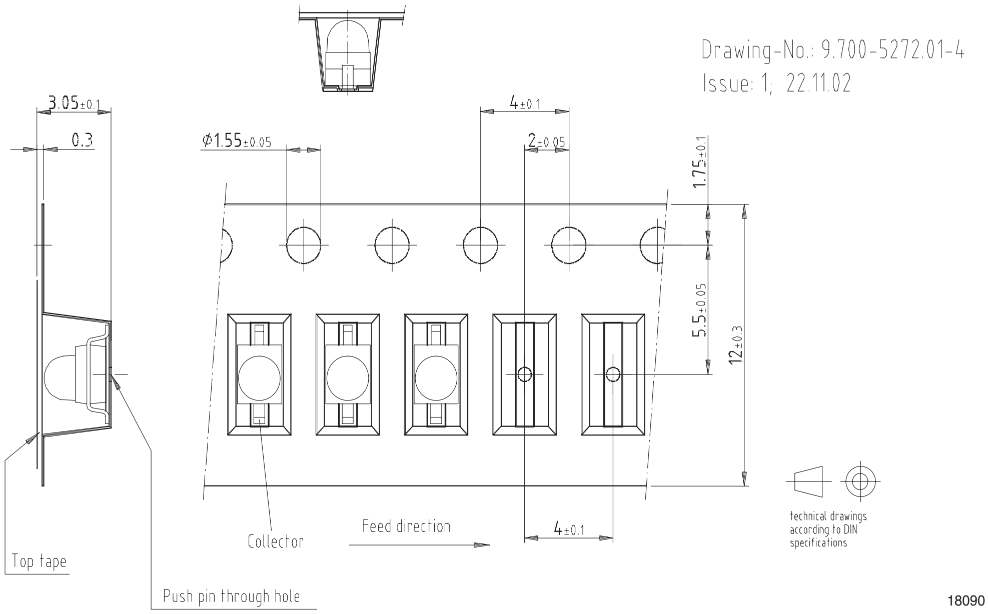
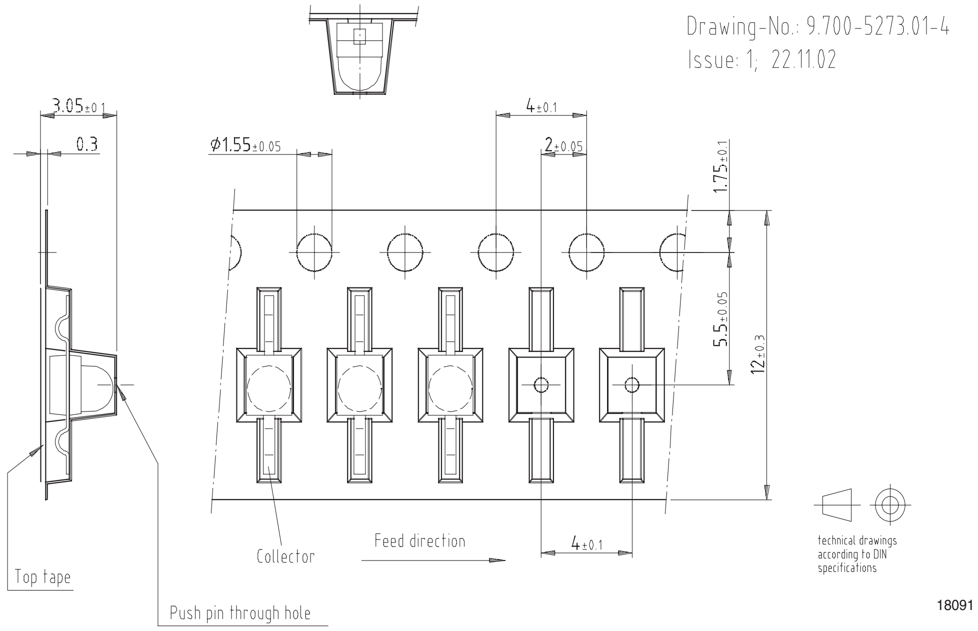
Taping TEMT1020



18090

Taping TEMT1030



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.

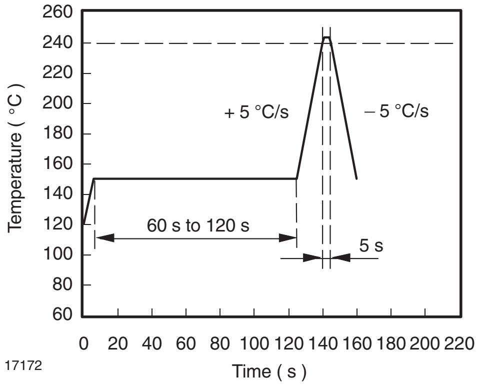
Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp proof box with desiccant.

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 hrs.

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



Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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