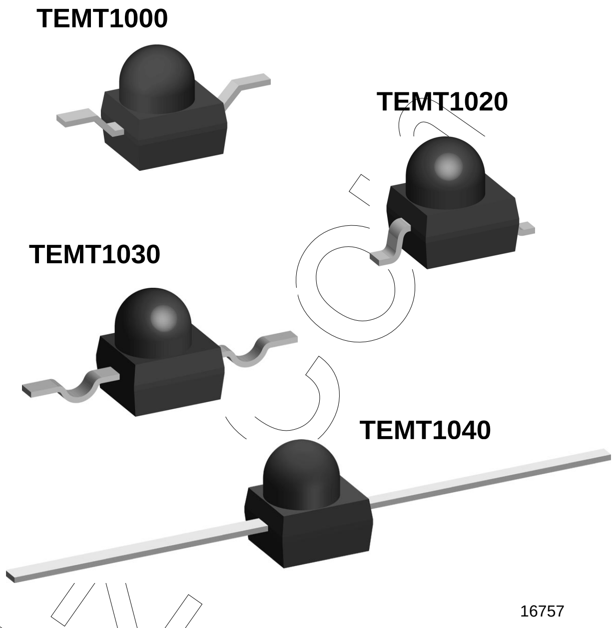
Silicon Phototransistor

Description

TEMT10.0 is a high speed and high sensitive silicon NPN epitaxial planar phototransistor in SMD package with dome lens. Due to its integrated Daylight filter the device is sensitive for IR radiation only.



Features

- High photo sensitivity
- Fast response times
- Angle of half sensitivity φ = ± 15°
- Daylight filter matched for 950nm
- Versatile terminal configurations
- Matched with IR Emitter TSML1... series

Applications

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

Absolute Maximum Ratings

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Value	Unit
Emitter Collector Voltage		V_{ECO}	5	V
Collector Current		I_C	50	mA
Peak Collector Current	$t_p/T = 0.5$, $t_p \leqq 10$ ms	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leqq 55$ °C	P_{tot}	100	mW
Junction Temperature		T_j	100	°C
Storage Temperature Range		T_{stg}	–40...+100	°C
Operating Temperature Range		T_{amb}	–40...+85	°C
Soldering Temperature	t ≦ 3 s, 2 mm from case	T_{sd}	260	°C
Thermal Resistance Junction/Ambient		R_{thJA}	400	K/W

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	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...980		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} = 5V	I_{ca}	2	7.0		mA

Typical Characteristics (T$_{amb}$ = 25°C unless otherwise specified)

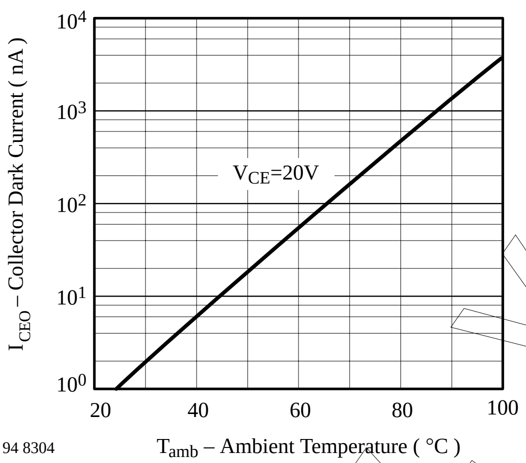


Figure 1. Collector Dark Current vs. Ambient Temperature

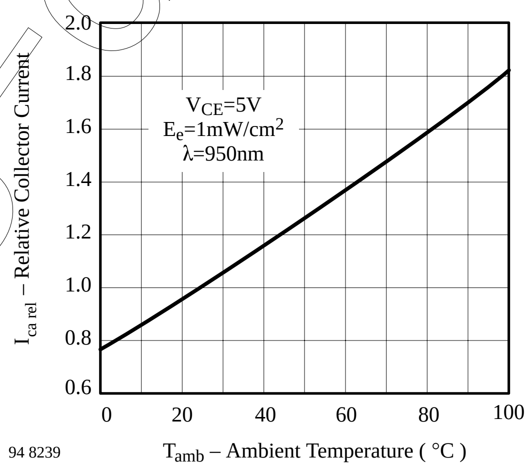


Figure 2. Relative Collector Current vs. Ambient Temperature

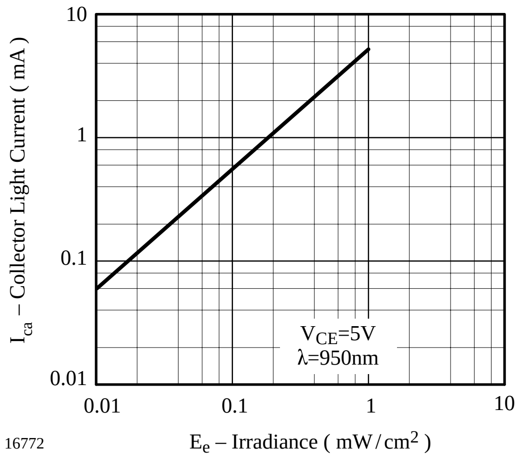


Figure 3. Collector Light Current vs. Irradiance

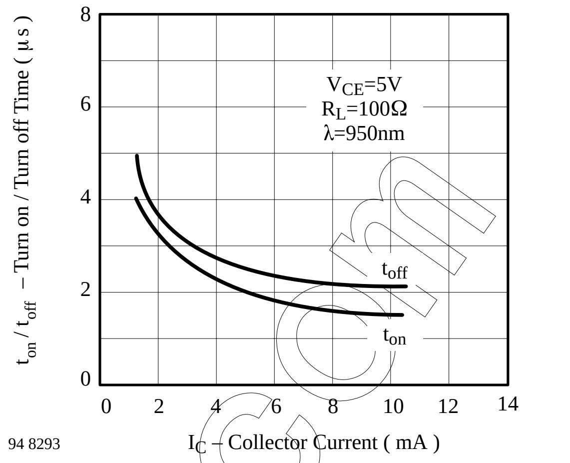


Figure 5. Turn On/Turn Off Time vs. Collector Current

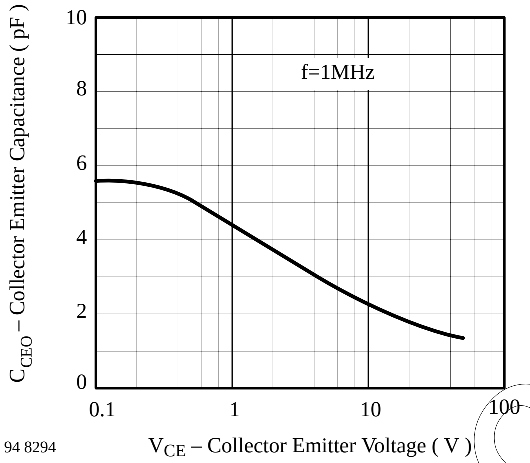


Figure 4. Collector Emitter Capacitance vs. Collector Emitter Voltage

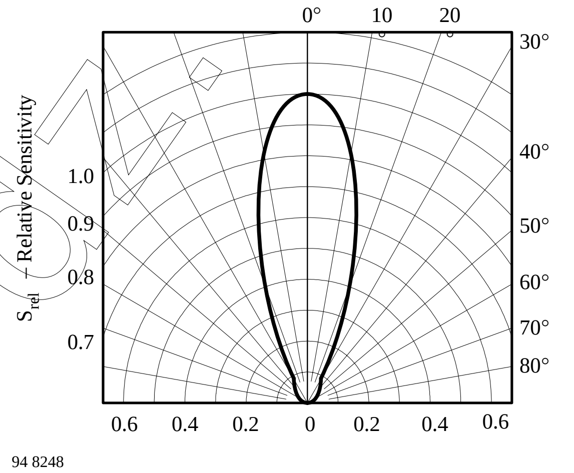
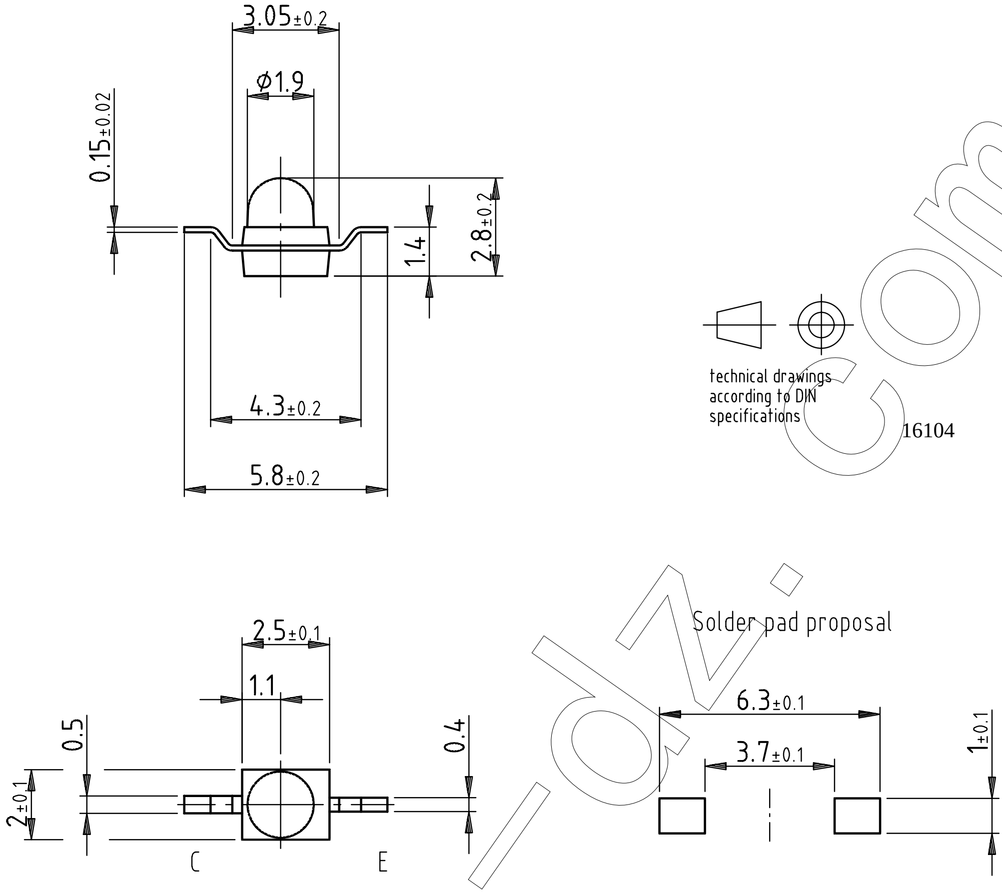
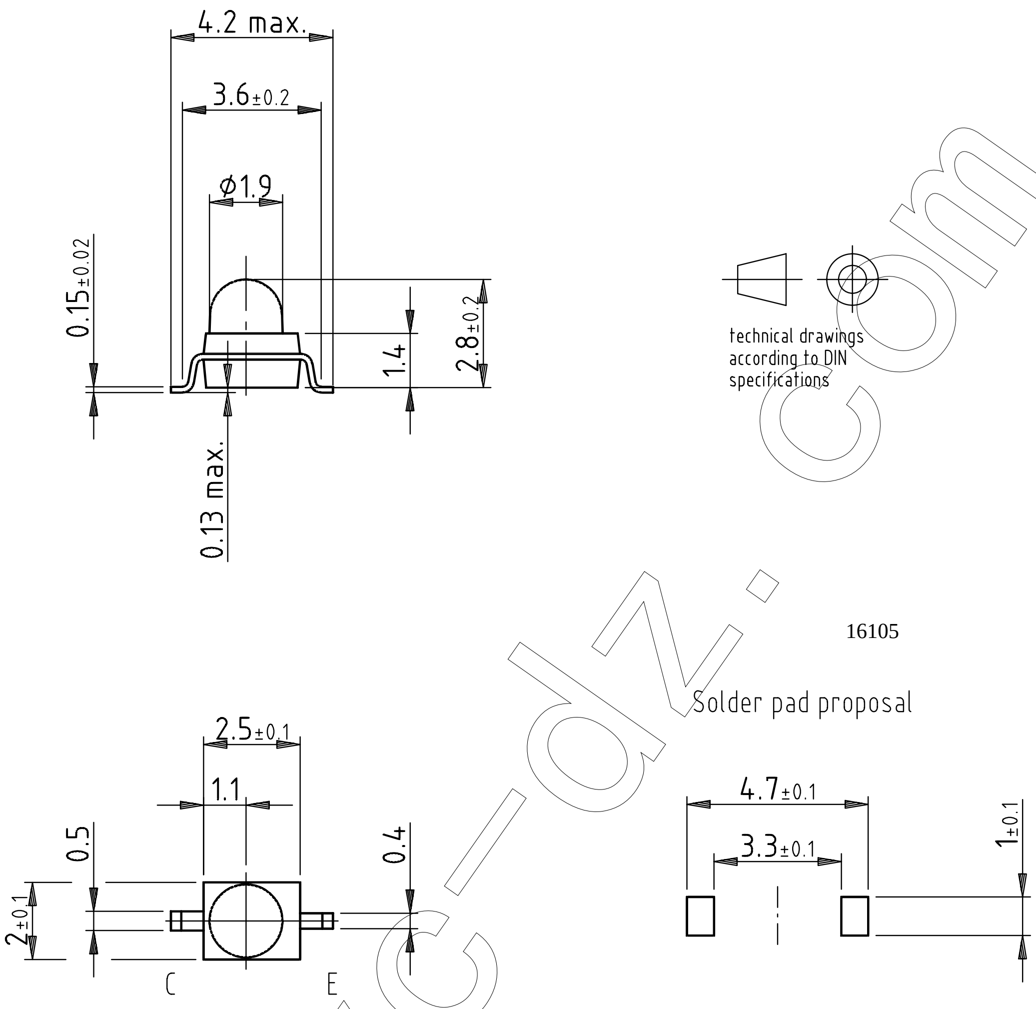


Figure 6. Relative Radiant Sensitivity vs. Angular Displacement

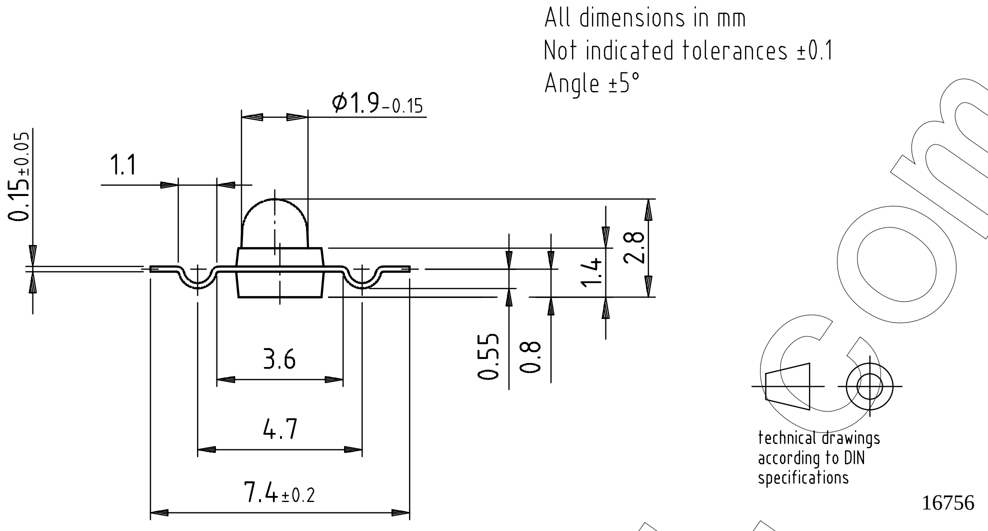
Dimensions in mm of TEMT1000

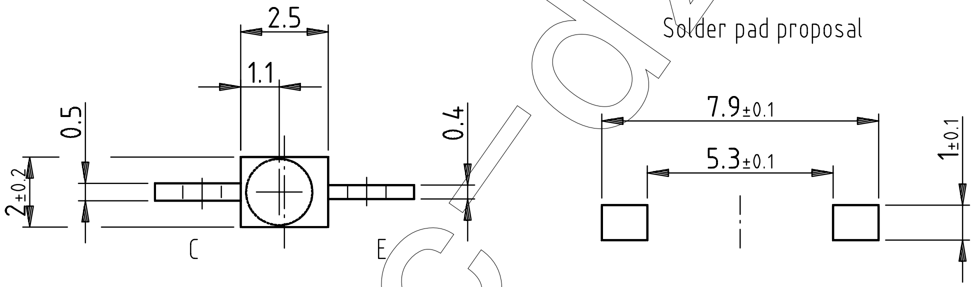


Dimensions in mm of TEMT1020

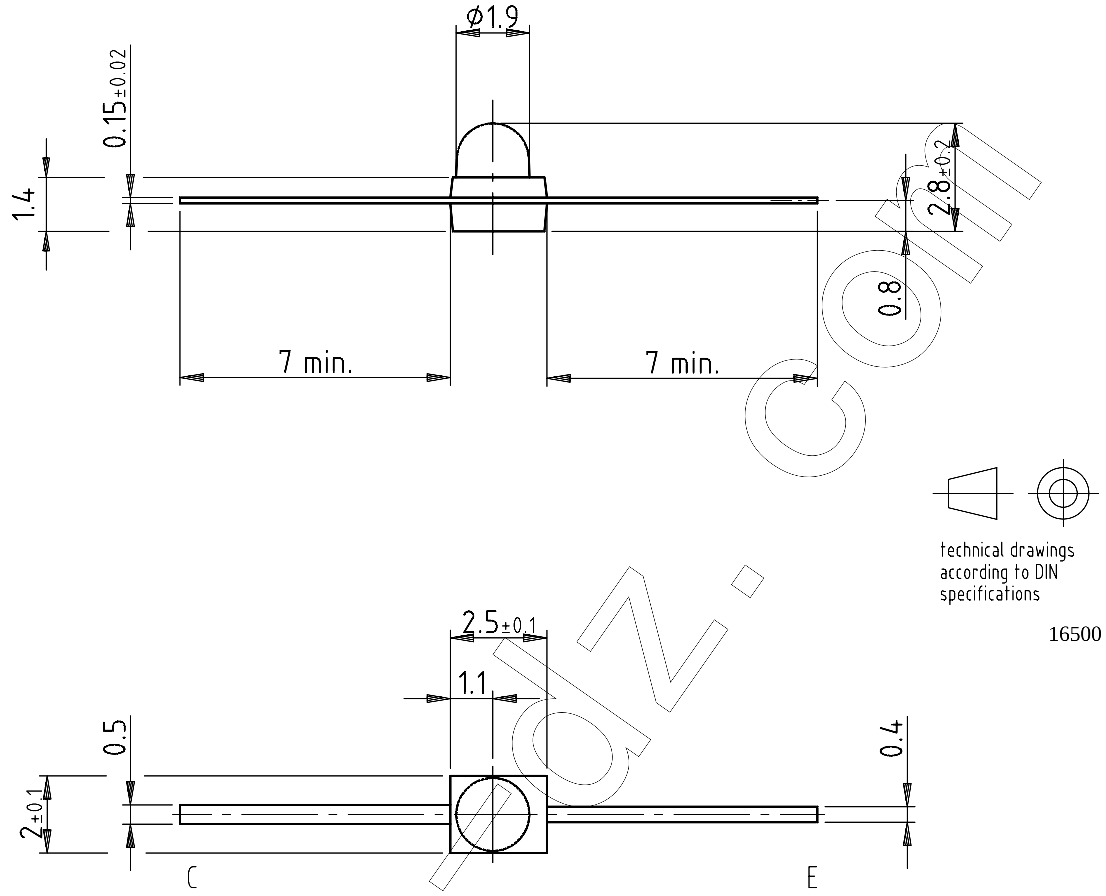


Dimensions in mm of TEMT1030





Dimensions in mm of TEMT1040



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 operating systems 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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