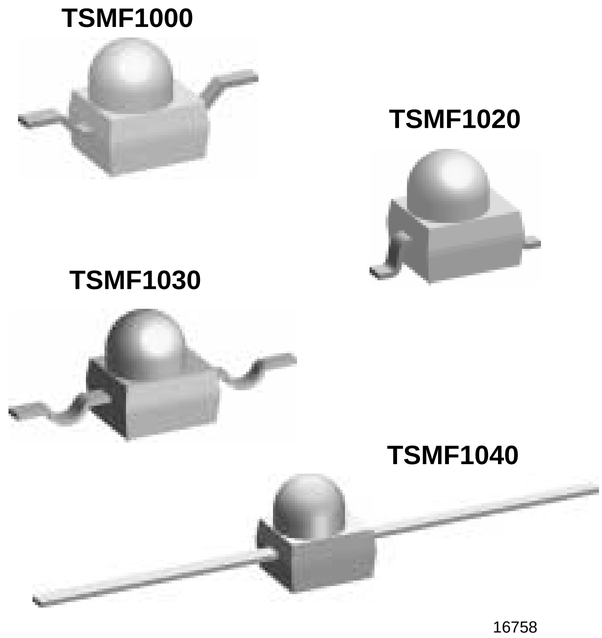
High Speed IR Emitting Diode in SMD Package

Description

TSMF1000 series are high speed infrared emitting diodes in GaAlAs/GaAs/GaAlAs double hetero technology molded in clear SMD package with dome lens.
DH chip technology represents best performance for speed, radiant power, forward voltage and longterm reliability.



Features

- High speed
- Extra high radiant power
- Low forward voltage
- Suitable for high pulse current operation
- Angle of half intensity $\varphi = \pm 17^{\circ}$
- Peak wavelength λ_p = 870 nm
- Longterm reliability
- Matched with PIN Photodiode TEMD1000
- Versatile terminal configurations

Applications

IrDA compatible data transmission
Miniature light barrier
For control and drive circuits
Photointerrupters
Incremental sensors

Absolute Maximum Ratings

$T_{amb} = 25^{\circ}C$

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V_R	5	V
Forward Current		I_F	100	mA
Peak Forward Current	$t_p/T = 0.5$, $t_p = 100\ \mu s$	I_{FM}	200	mA
Surge Forward Current	$t_p = 100\ \mu s$	I_{FSM}	0.8	A
Power Dissipation		P_V	190	mW
Junction Temperature		T_j	100	°C
Operating Temperature Range		T_{amb}	–40...+85	°C
Storage Temperature Range		T_{stg}	–40...+100	°C
Soldering Temperature	t ≦ 5sec, 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
Forward Voltage	I_F = 20 mA	V_F		1.3	1.5	V
	I_F = 1 A, t_p = 100 μs	V_F		2.4		V
Temp. Coefficient of V_F	I_F = 1.0mA	TK_{VF}		–1.7		mV/K
Reverse Current	V_R = 5 V	I_R			10	μA
Junction Capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		160		pF
Radiant Intensity	I_F = 20 mA	I_e	2.5	5		mW/sr
	I_F = 100 mA, t_p = 100 μs			25		
Radiant Power	I_F = 100 mA, t_p = 20 ms	ϕ_e		35		mW
Temp. Coefficient of ϕ_e	I_F = 20 mA	$TK_{\phi e}$		–0.6		%/K
Angle of Half Intensity		φ		±17		deg
Peak Wavelength	I_F = 20 mA	λ_p		870		nm
Spectral Bandwidth	I_F = 20 mA	$\Delta\lambda$		40		nm
Temp. Coefficient of λ_p	I_F = 20 mA	$TK_{\lambda p}$		0.2		nm/K
Rise Time	I_F = 20 mA	t_r		30		ns
Fall Time	I_F = 20 mA	t_f		30		ns

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

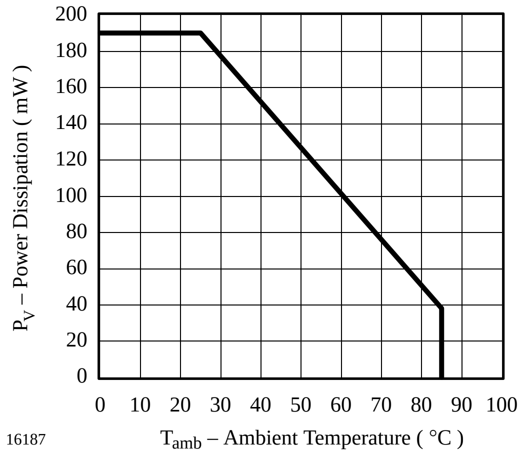


Figure 1. Power Dissipation vs. Ambient Temperature

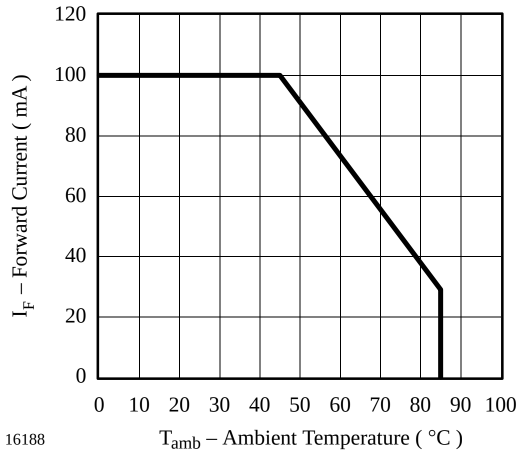


Figure 2. Forward Current vs. Ambient Temperature

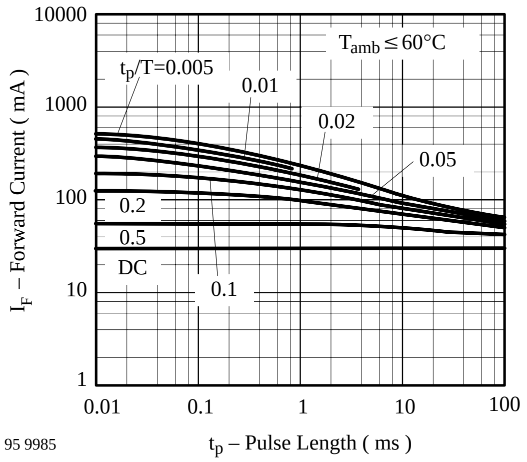


Figure 3. Pulse Forward Current vs. Pulse Duration

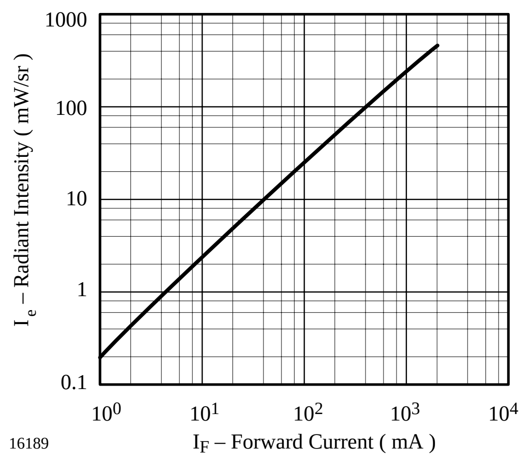


Figure 6. Radiant Intensity vs. Forward Current

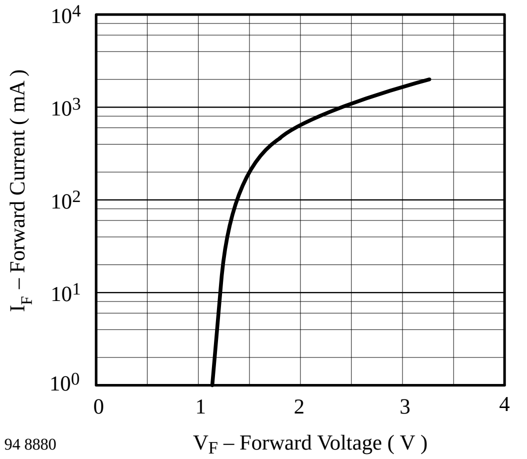


Figure 4. Forward Current vs. Forward Voltage

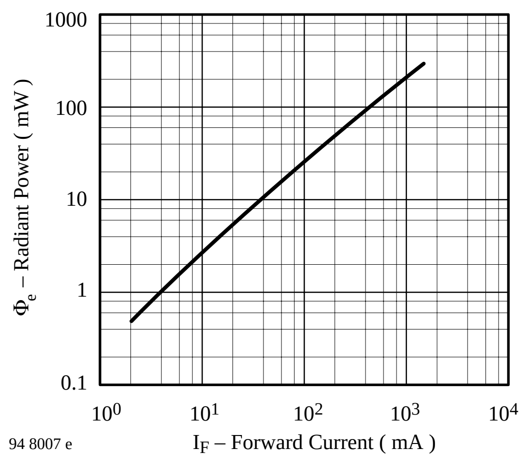


Figure 7. Radiant Power vs. Forward Current

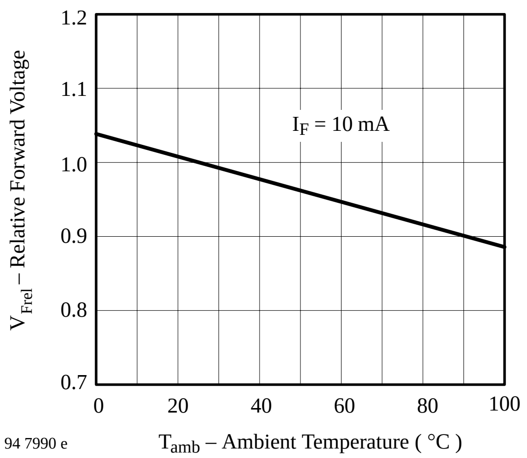


Figure 5. Relative Forward Voltage vs. Ambient Temperature

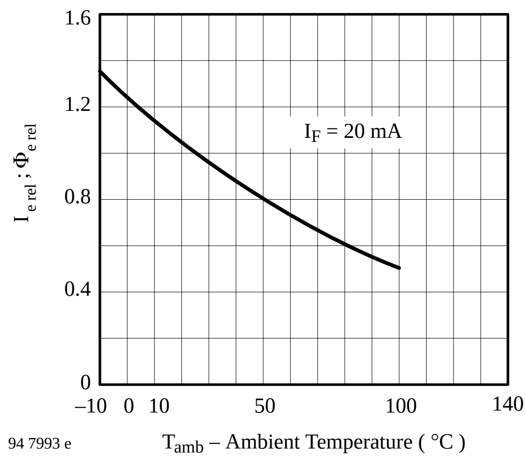


Figure 8. Rel. Radiant Intensity\Power vs. Ambient Temperature

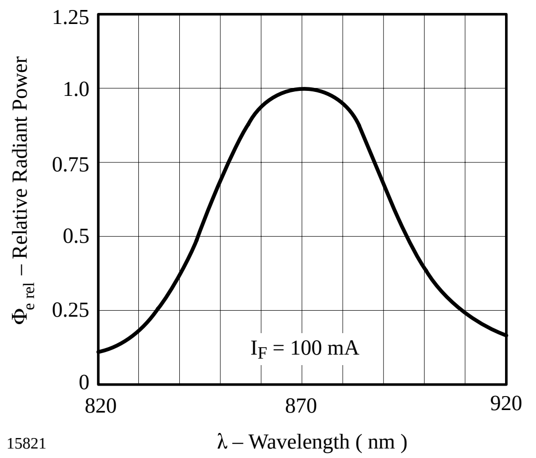


Figure 9. Relative Radiant Power vs. Wavelength

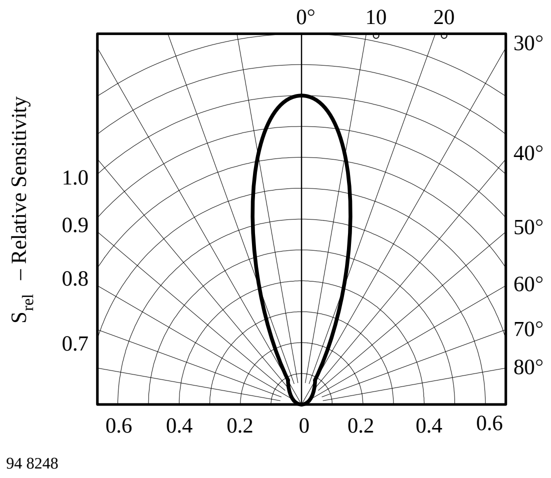
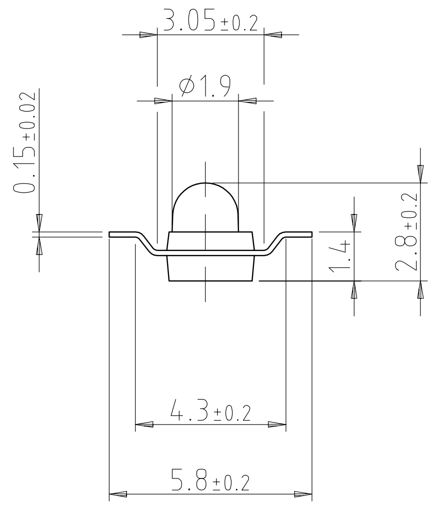
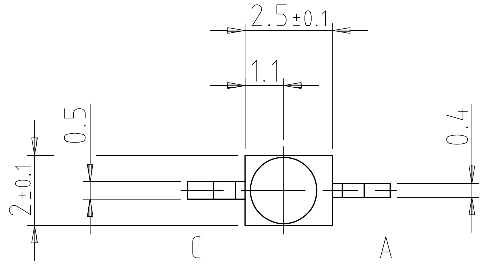


Figure 10. Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm of TSMF1000





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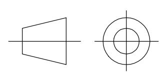
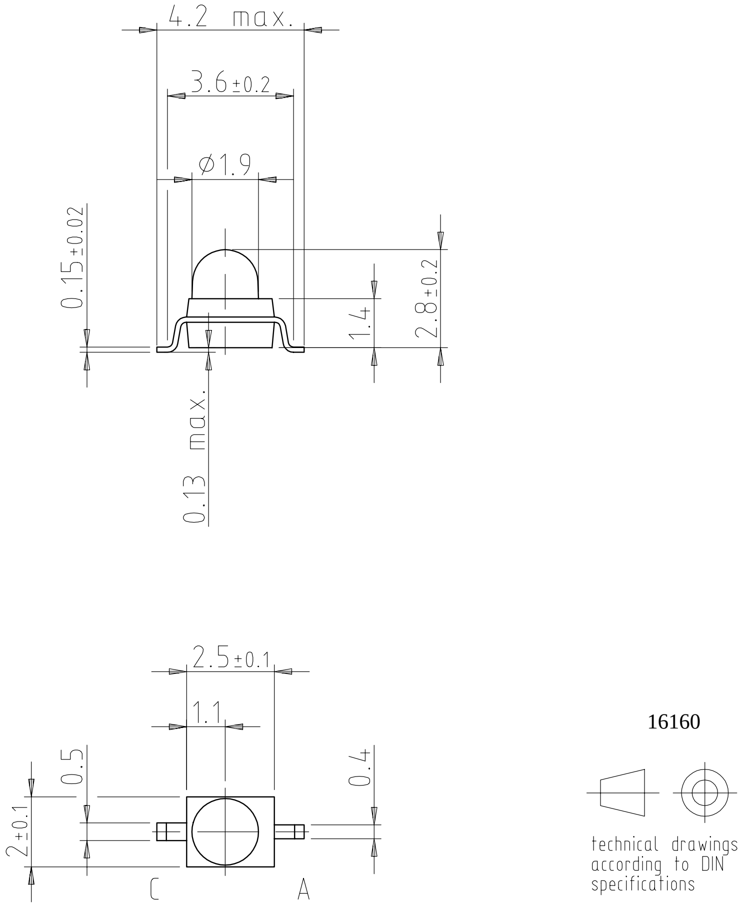
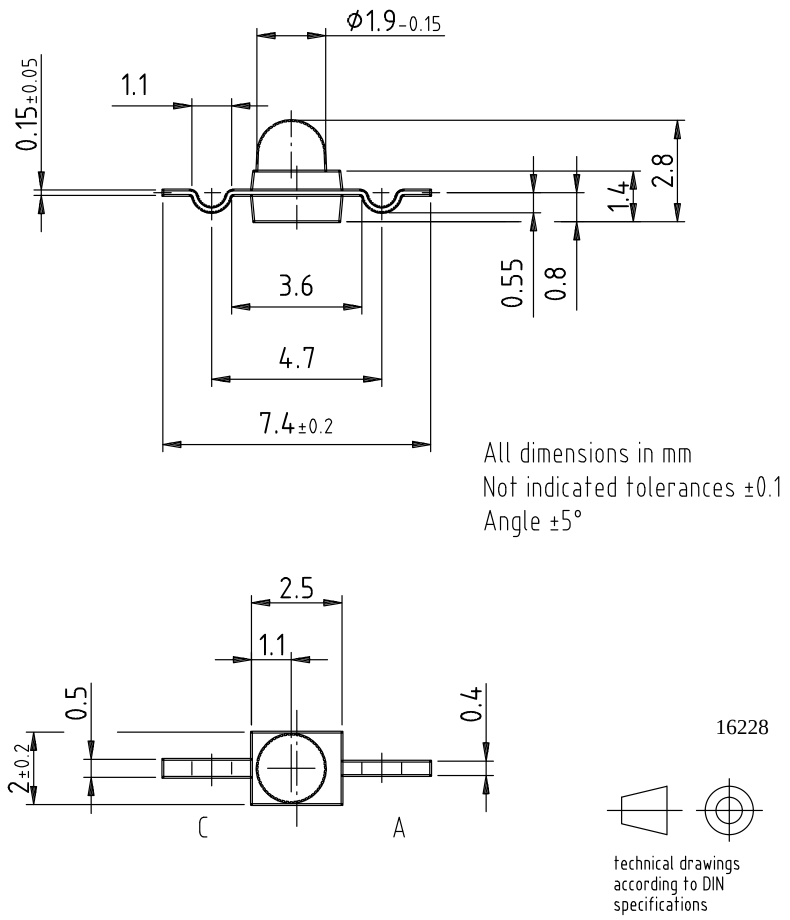


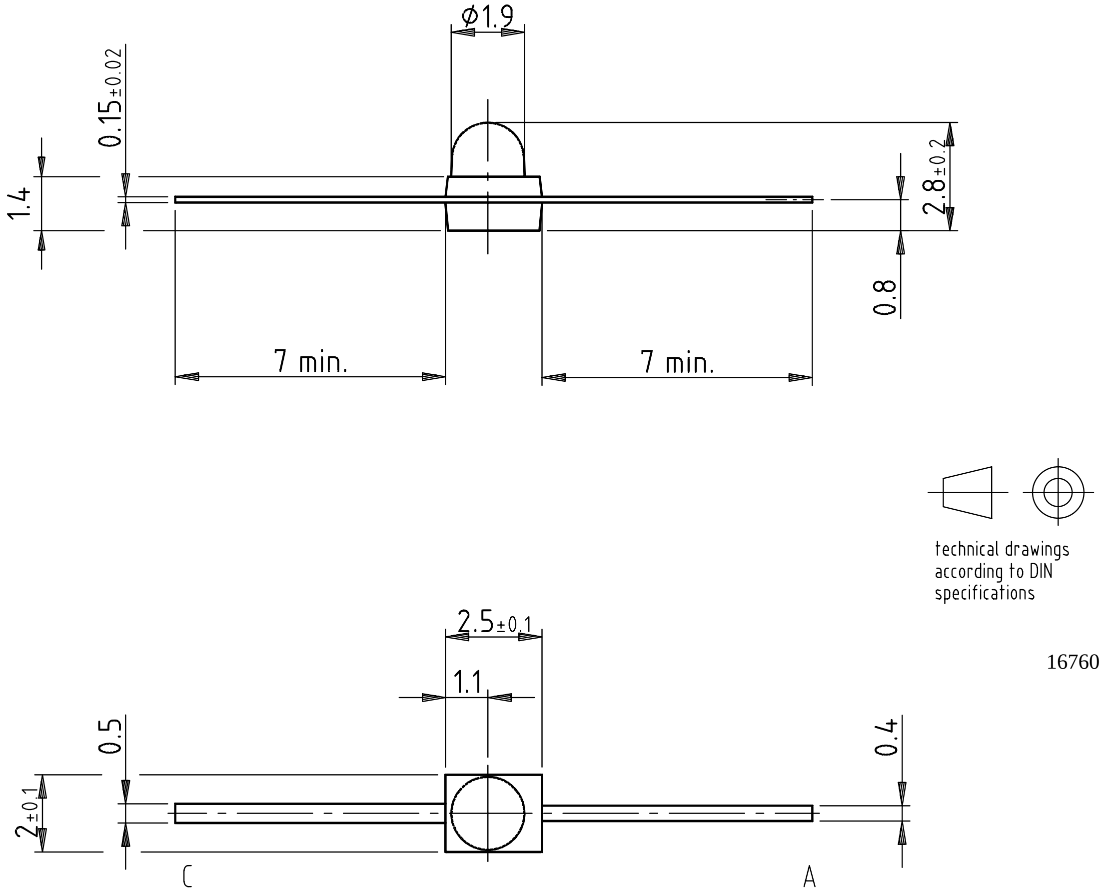
Dimensions in mm of TSMF1020



Dimensions in mm of TSMF1030



Dimensions in mm of TSMF1040



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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