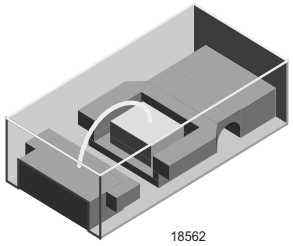
Low Current 0603 LED

Description

The new 0603 LED series have been designed in the smallest SMD package. This innovative 0603 LED technology opens the way to

- smaller products of higher performance
- more design in flexibility
- enhanced applications

The 0603 LED is an obvious solution for small-scale, high power products that are expected to work reliability in an arduous environment.



e3 Pb Pb-free

Features

- Smallest SMD package 0603 with exceptional brightness 1.6 mm x 0.8 mm x 0.6 mm (L x W x H)
- High reliability lead frame based
- Temperature range - 40 °C to + 100 °C
- Footprint compatible to 0603 chipled
- Wavelength 633 nm (red), 606 nm (orange), 587 nm (yellow)
- AlInGaP and InGaN technology
- Viewing angle: extremely wide 160 °
- Grouping parameter: luminous intensity, wavelength
- Available in 8 mm tape
- Lead-free device

Applications

Backlight keypads
Navigation systems
Cellular phone displays
Displays for industrial control systems
Automotive features
Miniaturized color effects
Traffic displays

Parts Table

Part	Color, Luminous Intensity
TLMS1000	Red, I_V = 4 mcd (typ.)
TLMO1000	Soft Orange, I_V = 8 mcd (typ.)
TLMY1000	Yellow, I_V = 6.5 mcd (typ.)

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified
TLMS1000 ,TLMO1000 ,TLMY1000

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V_R	12	V
DC Forward current	$T_{amb} \leq 95$ °C	I_F	15	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	0.1	A
Power dissipation	$T_{amb} \leq 95$ °C	P_V	40	mW
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	acc. Vishay spec	T_{sd}	260	°C
Thermal resistance junction/ ambient	mounted on PC board (pad size > 5 mm^2)	R_{thJA}	500	K/W

Optical and Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Red

TLMS1000

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity [2]	I_F = 2 mA	I_V	1.6	4		mcd
Dominant wavelength	I_F = 2 mA	λ_d	624	628	636	nm
Peak wavelength	I_F = 2 mA	λ_p		640		nm
Angle of half intensity	I_F = 2 mA	φ		± 80		deg
Forward voltage	I_F = 2 mA	V_F		1.8	2.6	V
Reverse voltage	I_R = 10 µA	V_R	6			V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		15		pF

[2] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Soft Orange

TLMO1000

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity [2]	I_F = 2 mA	I_V	3.2	7.5		mcd
Dominant wavelength	I_F = 2 mA	λ_d	600	605	609	nm
Peak wavelength	I_F = 2 mA	λ_p		610		nm
Angle of half intensity	I_F = 2 mA	φ		± 80		deg
Forward voltage	I_F = 2 mA	V_F		1.8	2.6	V
Reverse voltage	I_R = 10 µA	V_R	6			V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		15		pF

[2] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Yellow

TLMY1000

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity [2]	I_F = 2 mA	I_V	3.2	7.5		mcd
Dominant wavelength	I_F = 2 mA	λ_d	580	588	595	nm
Peak wavelength	I_F = 2 mA	λ_p		591		nm
Angle of half intensity	I_F = 2 mA	φ		± 80		deg
Forward voltage	I_F = 2 mA	V_F		1.8	2.6	V
Reverse voltage	I_R = 10 µA	V_R	6			V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		15		pF

[2] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Color Classification

Group	Dominant Wavelength (nm)			
	Yellow		Orange	
	min	max	min	max
1				
2	580	583	600	603
3	583	586	602	605
4	586	589	604	607
5	589	592	606	609
6	592	595		

Luminous Intensity Classification

Group	Luminous Intensity (mcd)	
	min	max
Ma	1.6	2.5
Mb	2	3.2
Na	2.5	4
Nb	3.2	5
Pa	4	6.3
Pb	5	8
Qa	6.3	10
Qb	8	12.5
Ra	10	16
Rb	12.5	20
Sa	16	25
Sb	20	32

Group Name on Label

Luminous Intensity Group	Halfgroup	Wavelength	Forward Voltage
Q	b	4	1

One packing unit/tape contains only one classification group of luminous intensity, color and forward voltage

Only one single classification groups is not available

The given groups are not order codes, customer specific group combinations require marketing agreement

No color subgrouping for Super Red

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

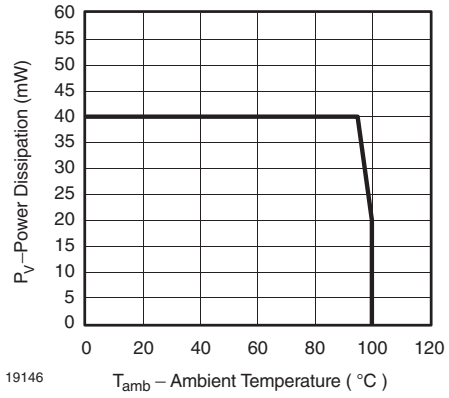


Figure 1. Power Dissipation vs. Ambient Temperature

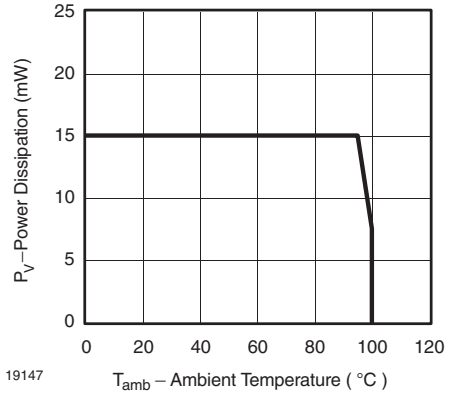


Figure 2. Power Dissipation vs. Ambient Temperature

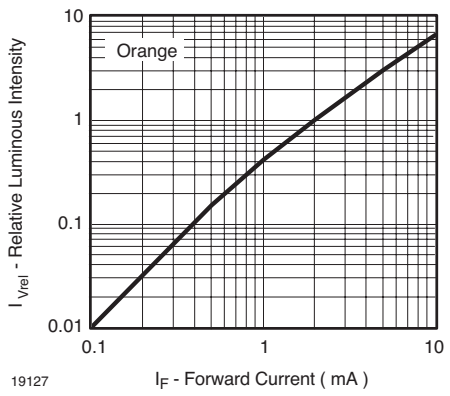


Figure 3. Relative Luminous Intensity vs. Forward Current

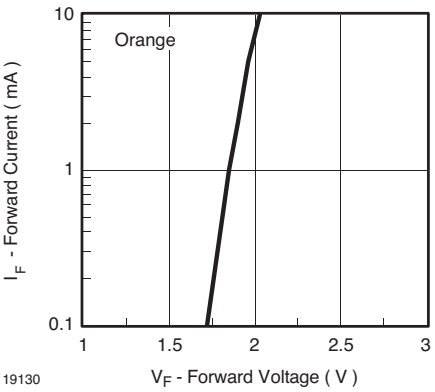


Figure 4. Forward Current vs. Forward Voltage

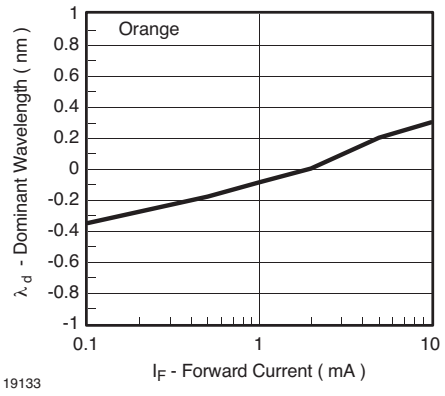


Figure 5. Dominant Wavelength vs. Forward Current

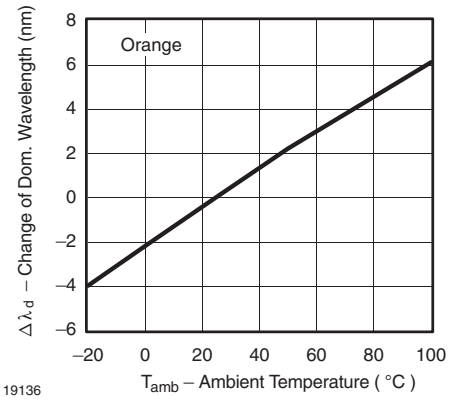


Figure 6. Change of Dominant Wavelength vs. Ambient Temperature

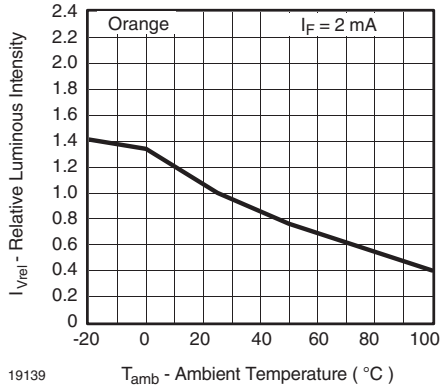


Figure 7. Relative Luminous Intensity vs. Amb. Temperature

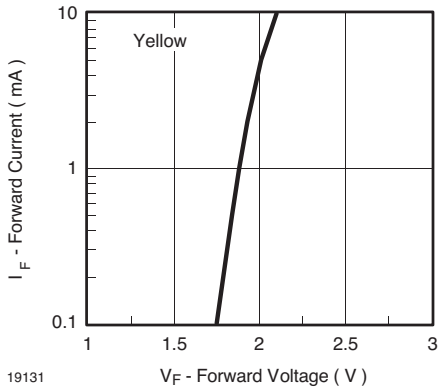


Figure 10. Forward Current vs. Forward Voltage

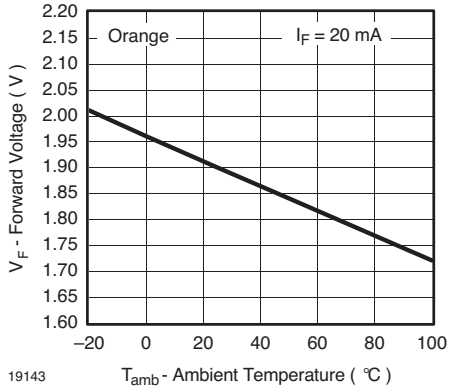


Figure 8. Forward Voltage vs. Ambient Temperature

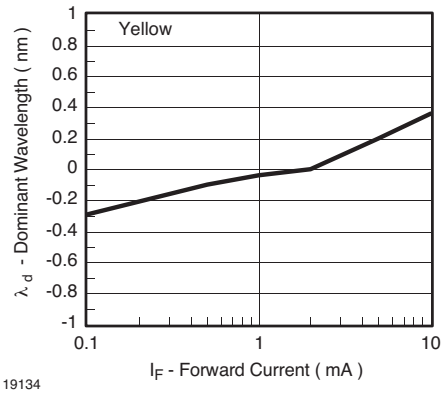


Figure 11. Dominant Wavelength vs. Forward Current

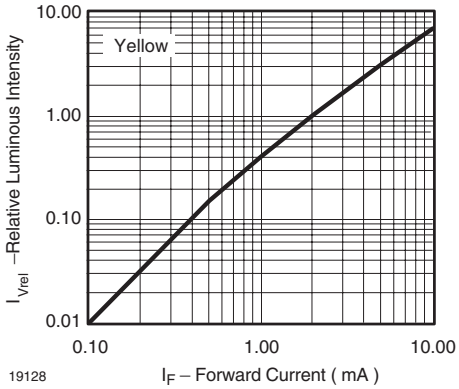


Figure 9. Relative Luminous Intensity vs. Forward Current

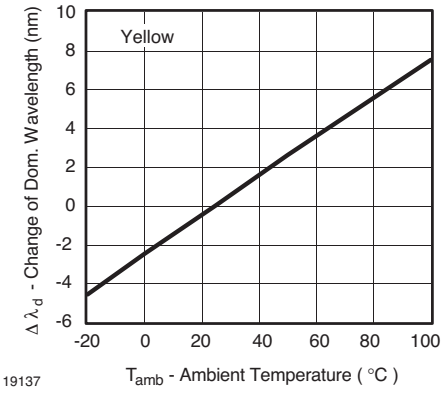


Figure 12. Change of Dominant Wavelength vs. Ambient Temperature

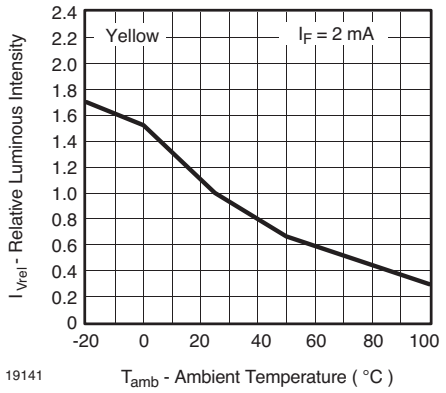


Figure 13. Relative Luminous Intensity vs. Amb. Temperature

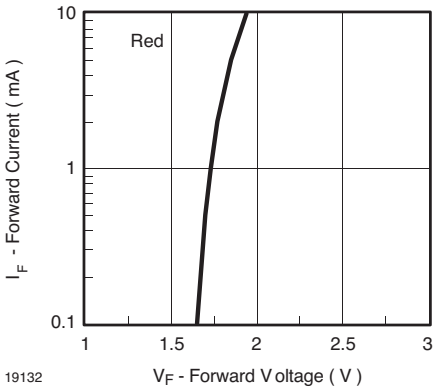


Figure 16. Forward Current vs. Forward Voltage

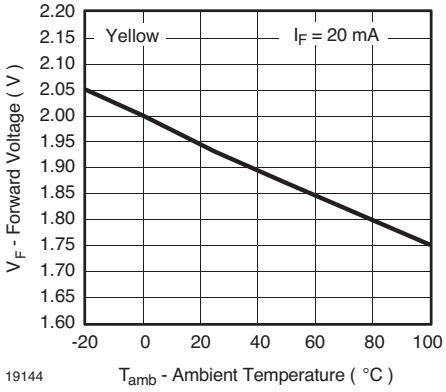


Figure 14. Forward Voltage vs. Ambient Temperature

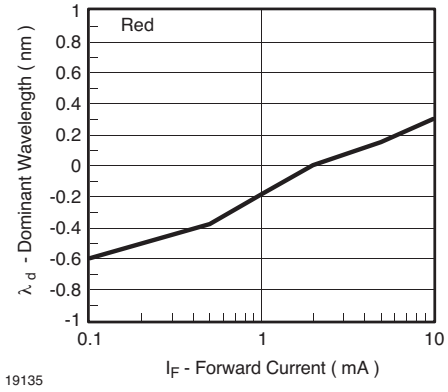


Figure 17. Dominant Wavelength vs. Forward Current

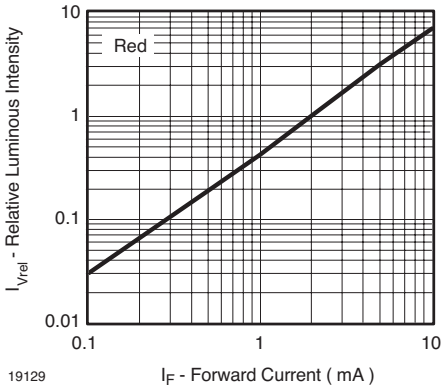


Figure 15. Relative Luminous Intensity vs. Forward Current

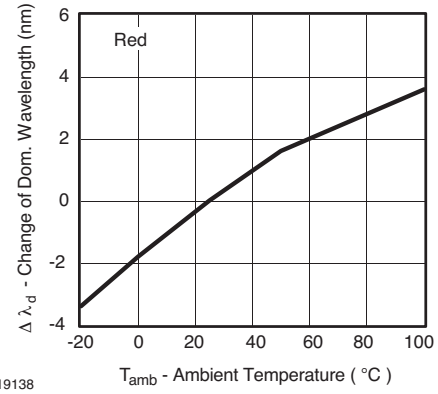


Figure 18. Change of Dominant Wavelength vs. Ambient Temperature

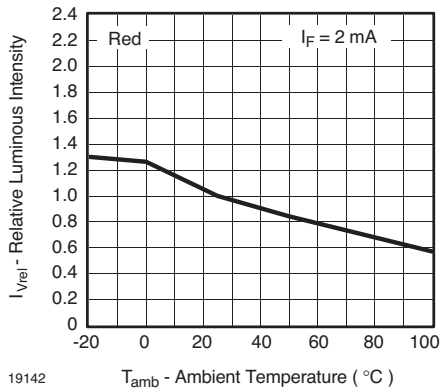


Figure 19. Relative Luminous Intensity vs. Amb. Temperature

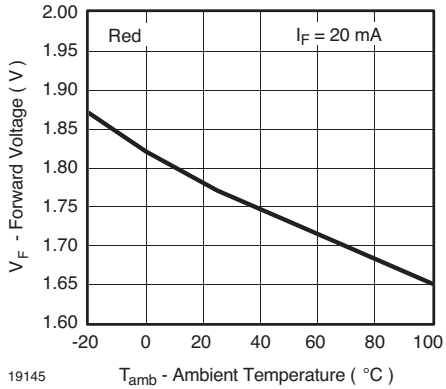
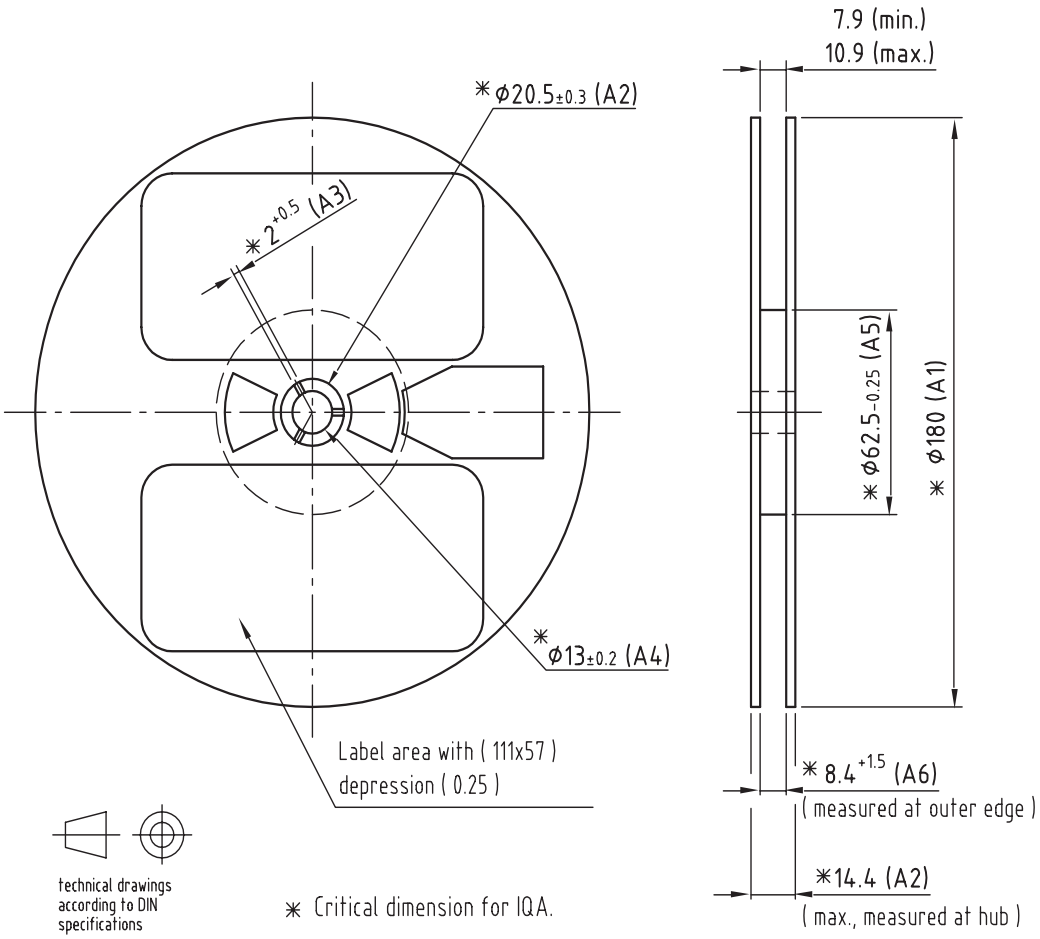


Figure 20. Forward Voltage vs. Ambient Temperature

Reel Dimensions

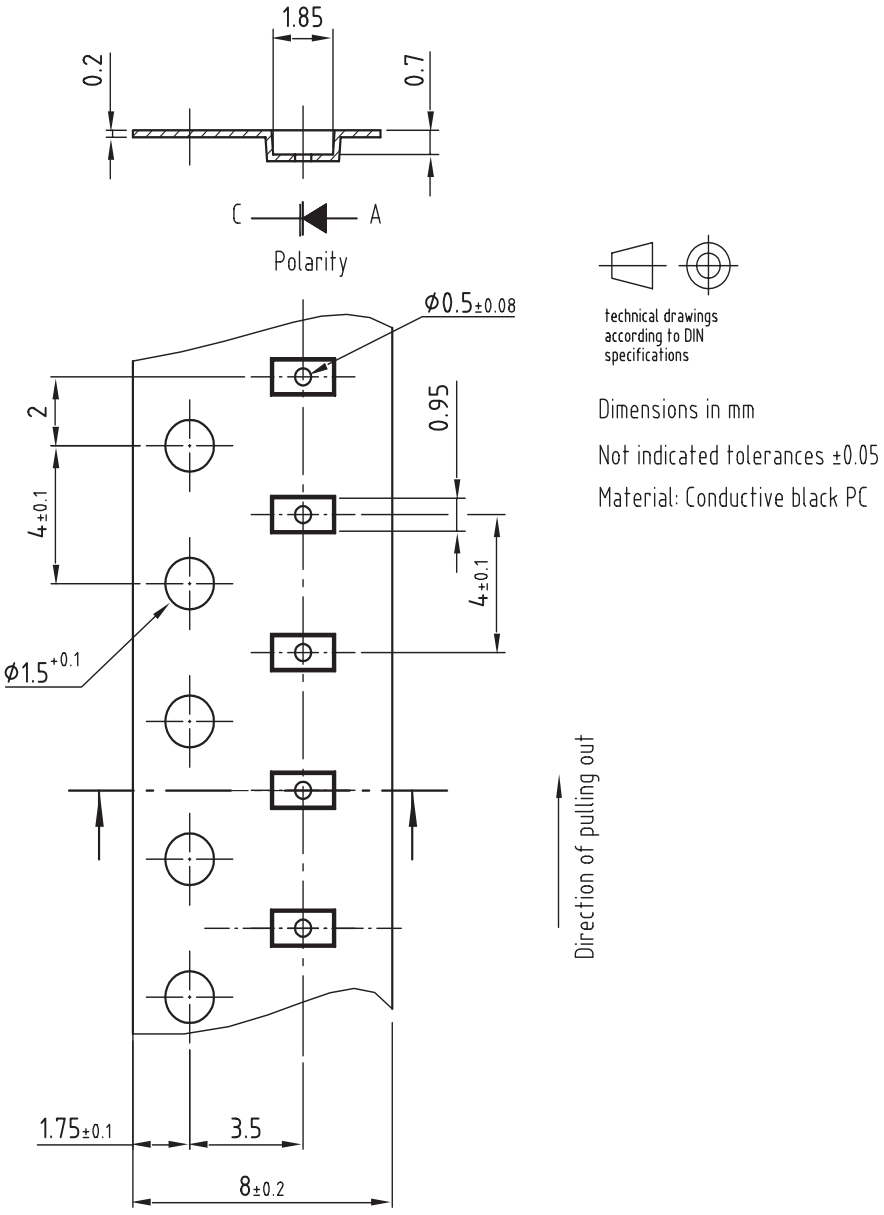


Drawing-No.: 9.800-5086.01-4
Issue: 1; 29.04.04

Not indicated tolerances ±0.05
Material: black static dissipative

19043

Tape Dimensions



technical drawings according to DIN specifications

Dimensions in mm

Not indicated tolerances ±0.05

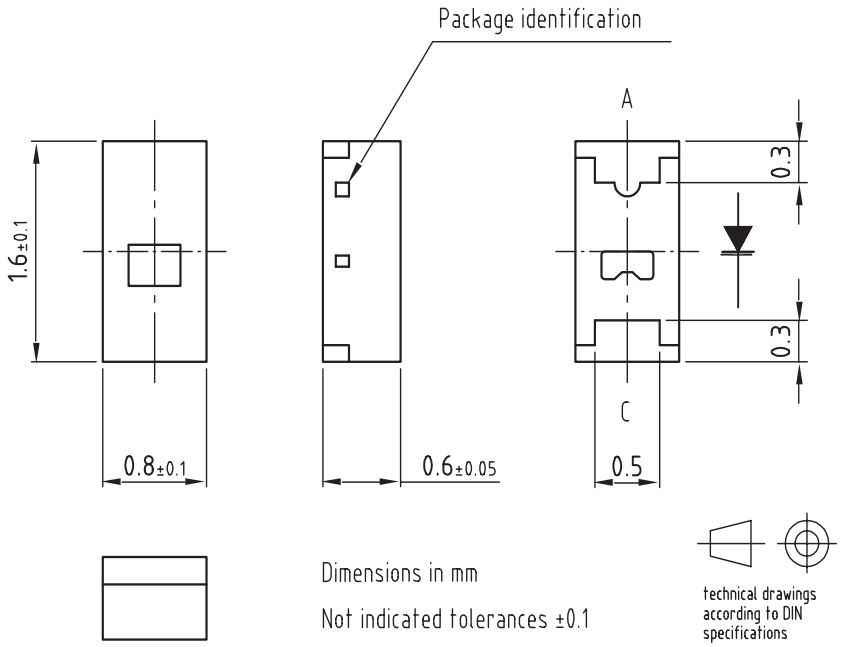
Material: Conductive black PC

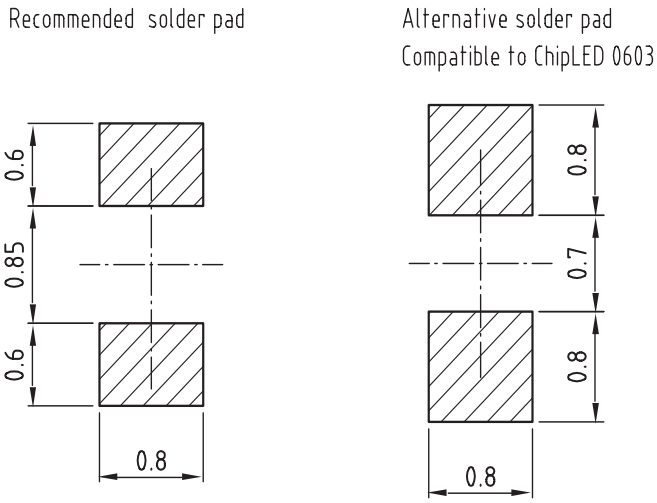
Drawing-No.: 9.700-5290.01-4

Issue: 1; 29.04.04

19044

Package Dimensions in mm





Drawing-No.: 6.541-5056.01-4
Issue: 1; 23.06.04

18561

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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423