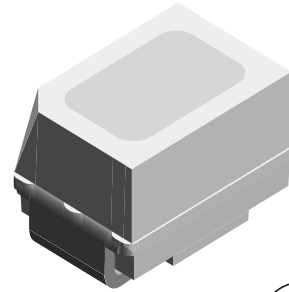


## Low Current MiniLED

### Description

The new low current MiniLED Series have been designed in a small white SMT package. The feature of the device is the very small package 2.3 mm x 1.3 mm x 1.4 mm and the low forward current. The MiniLED is an obvious solution for small-scale, high-power products that are expected to work reliably in an arduous environment. This is often the case in automotive and industrial application.



19226



### Features

- SMD LEDs with exceptional brightness
- Luminous intensity categorized
- Compatible with automatic placement equipment
- IR reflow soldering
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: Excellent for coupling to light pipes and backlighting
- Low power consumption
- Luminous intensity ratio in one packing unit  
 $I_{Vmax}/I_{Vmin} \leq 2.0$ , optional  $\leq 1.6$
- Lead-free device

### Applications

Automotive: Backlighting in dashboards and switches  
 Telecommunication: Indicator and backlighting in telephone and fax  
 Indicator and backlight for audio and video equipment  
 Indicator and backlight in office equipment  
 Flat backlight for LCDs, switches and symbols

### Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity ( $\pm\phi$ )	Technology
TLMS2000	Red, $I_V = 4.5$ mcd (typ.)	60 °	AllInGaP on GaAs
TLMO2000	Orange, $I_V = 9.0$ mcd (typ.)	60 °	AllInGaP on GaAs
TLMY2000	Yellow, $I_V = 7.1$ mcd (typ.)	60 °	AllInGaP on GaAs

### Absolute Maximum Ratings

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

TLMS200. , TLMO200. , TLMY200.

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		$V_R$	5	V
DC Forward current	$T_{amb} \leq 100$ °C	$I_F$	15	mA
Surge forward current	$t_p \leq 10$ $\mu$ s	$I_{FSM}$	0.1	A
Power dissipation	$T_{amb} \leq 100$ °C	$P_V$	40	mW
Junction temperature		$T_j$	125	°C
Operating temperature range		$T_{amb}$	- 40 to + 100	°C

Parameter	Test condition	Symbol	Value	Unit
Storage temperature range		$T_{stg}$	- 40 to + 100	°C
Soldering temperature	according to IPC 9501	$T_{sd}$	245	°C
Thermal resistance junction/ambient	mounted on PC board (pad size > 5 mm <sup>2</sup> )	$R_{thJA}$	580	K/W

## Optical and Electrical Characteristics

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

### Red

#### TLMS200.

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 2\text{ mA}$	$I_V$	2	4.5		mcd
Dominant wavelength	$I_F = 2\text{ mA}$	$\lambda_d$		630		nm
Peak wavelength	$I_F = 2\text{ mA}$	$\lambda_p$		643		nm
Angle of half intensity	$I_F = 2\text{ mA}$	$\phi$		± 60		deg
Forward voltage	$I_F = 2\text{ mA}$	$V_F$		1.8	2.2	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	5			V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	$C_j$		15		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmax}/I_{Vmin} \leq 2.0$

### Orange

#### TLMO200.

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 2\text{ mA}$	$I_V$	4	9		mcd
Dominant wavelength	$I_F = 2\text{ mA}$	$\lambda_d$	598	605	611	nm
Peak wavelength	$I_F = 2\text{ mA}$	$\lambda_p$		610		nm
Angle of half intensity	$I_F = 2\text{ mA}$	$\phi$		± 60		deg
Forward voltage	$I_F = 2\text{ mA}$	$V_F$		1.8	2.2	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	5			V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	$C_j$		15		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmax}/I_{Vmin} \leq 2.0$

### Yellow

#### TLMY200.

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 2\text{ mA}$	$I_V$	3.2	7.1		mcd
Dominant wavelength	$I_F = 2\text{ mA}$	$\lambda_d$	581	588	594	nm
Peak wavelength	$I_F = 2\text{ mA}$	$\lambda_p$		590		nm
Angle of half intensity	$I_F = 2\text{ mA}$	$\phi$		± 60		deg
Forward voltage	$I_F = 2\text{ mA}$	$V_F$		1.8	2.2	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	5			V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	$C_j$		15		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmax}/I_{Vmin} \leq 2.0$

## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

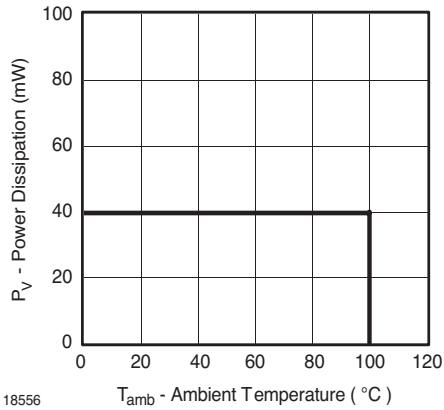


Figure 1. Power Dissipation vs. Ambient Temperature

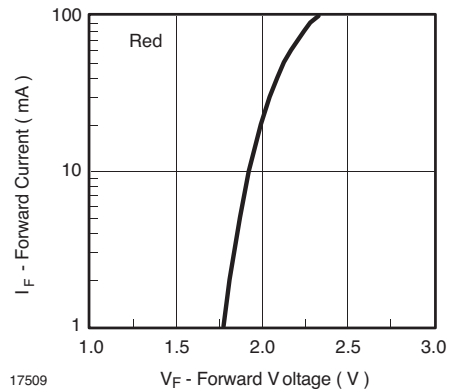


Figure 4. Forward Current vs. Forward Voltage

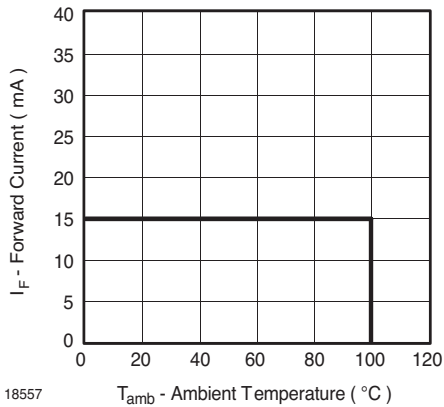


Figure 2. Forward Current vs. Ambient Temperature

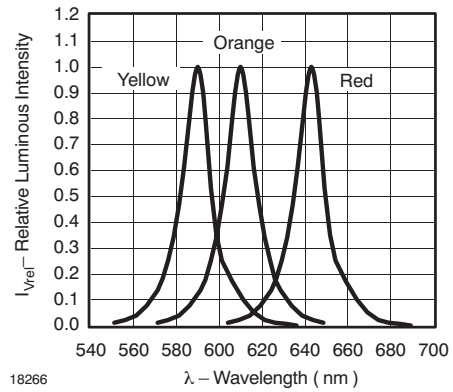


Figure 5. Relative Intensity vs. Wavelength

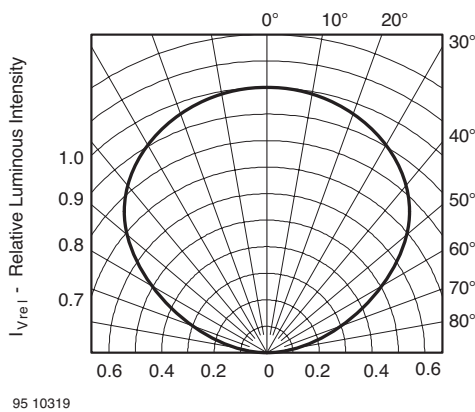


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

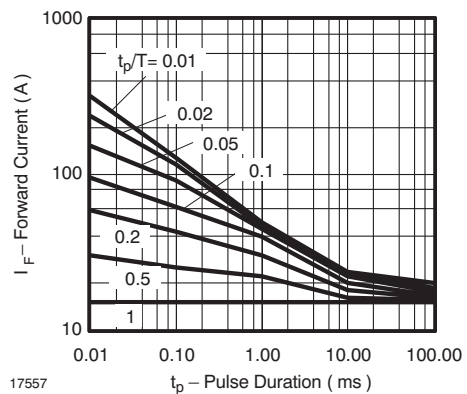


Figure 6. Forward Current vs. Pulse Length

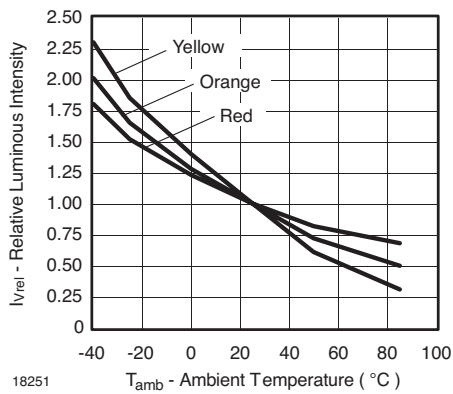


Figure 7. Rel. Luminous Intensity vs. Ambient Temperature

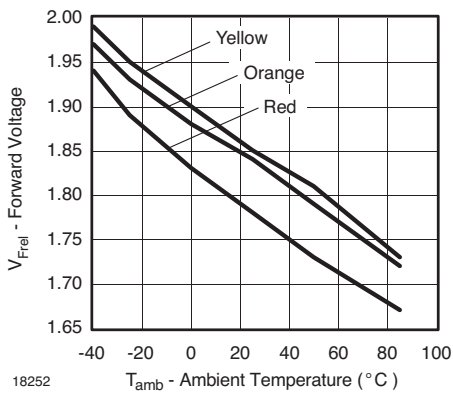
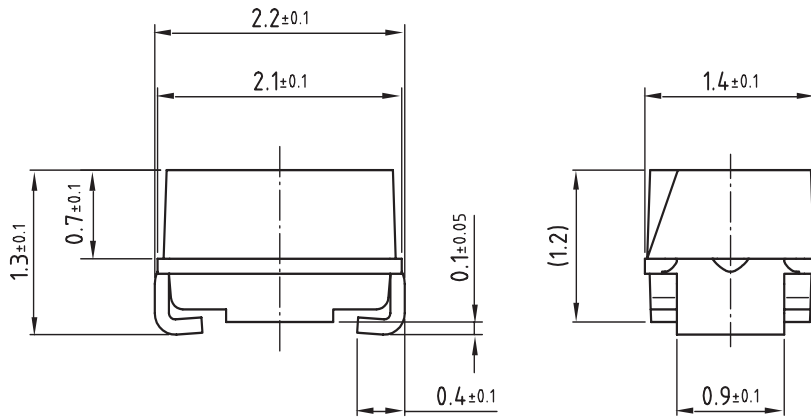
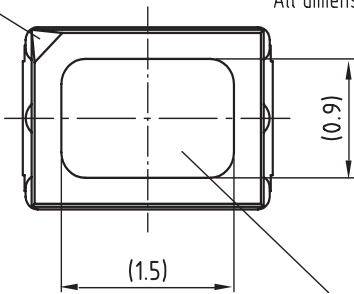


Figure 8. Forward Voltage vs. Ambient Temperature

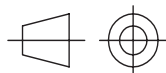
## Package Dimensions in mm



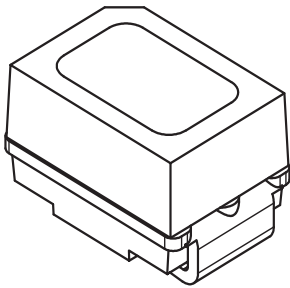
Cathode mark  
 Not indicated tolerances  $\pm 0.2$   
 All dimensions in mm



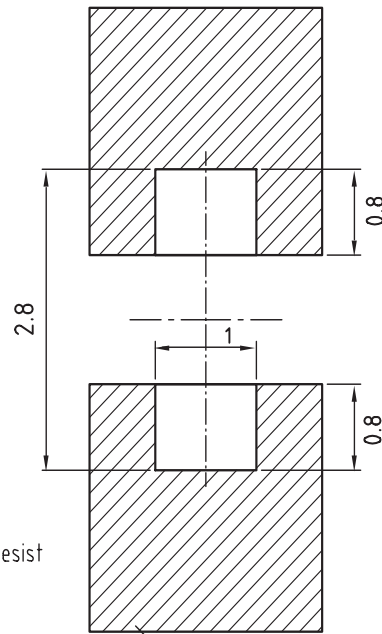
Area not flat



technical drawings according to DIN specifications



Proposed pad layout (for reference only)



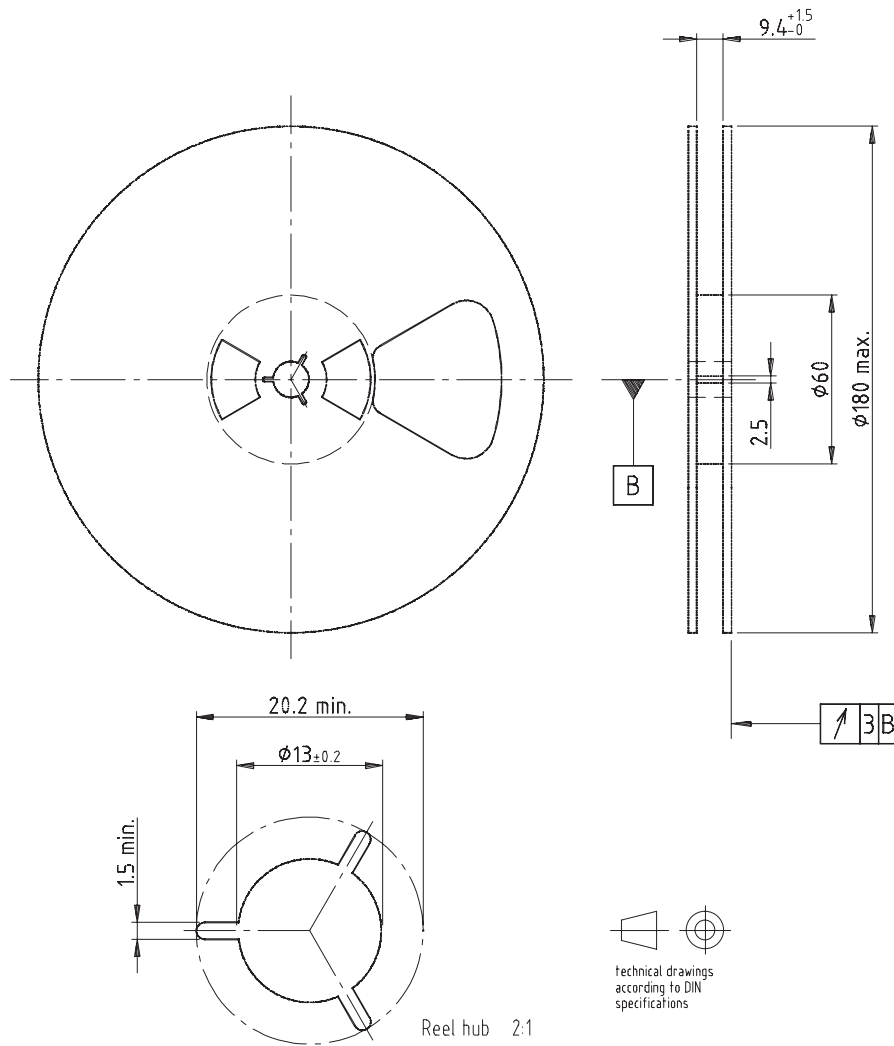
Solder resist

Cu-area > 5mm<sup>2</sup>

16892

Drawing-No.: 6.541-5052.01-4  
 Issue: 3; 22.04.03

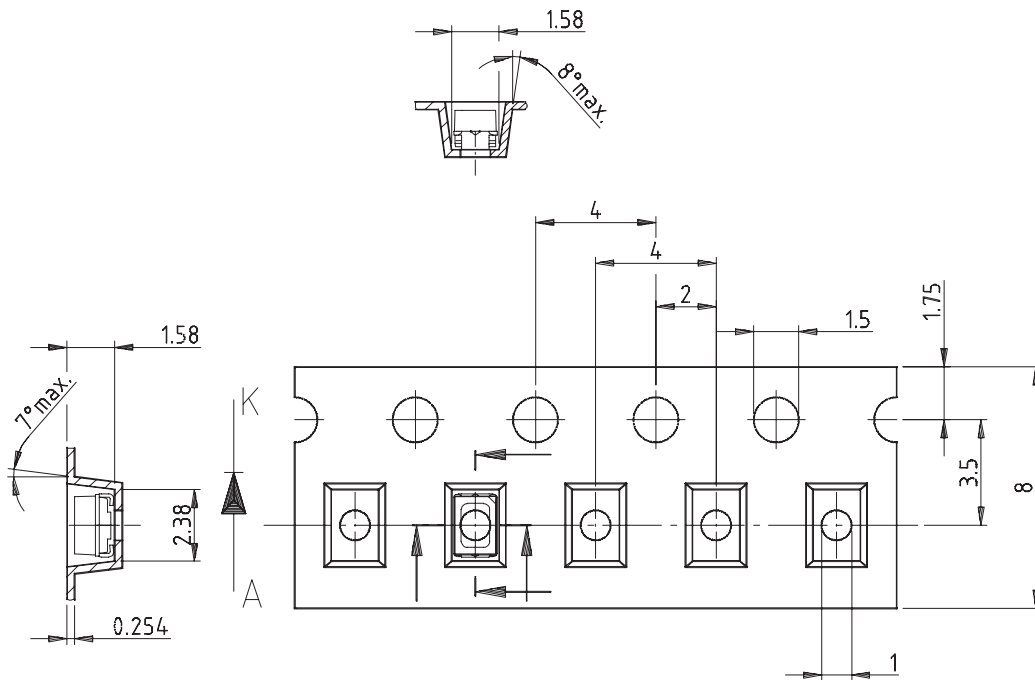
## Reel Dimensions



Drawing-No.: 9.800-5051.V5-4  
Issue: 1; 25.07.02

16938

## Tape Dimensions



Drawing-No.: 9.700-5266.01-4

Issue: 1; 05.06.02

16939

## Leader and Trailer

GS08 = 3000 pcs