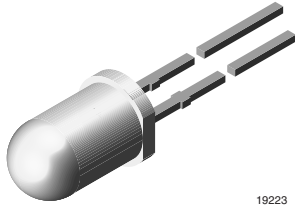


## High Intensity LED, Ø 5 mm Untinted Non-Diffused



19223

### DESCRIPTION

The TLH.51.. series is a clear, non diffused 5 mm LED for outdoor application.

These clear lamps utilize the highly developed technologies like AlInGaP and GaP.

The lens and the viewing angle is optimized to achieve best performance of light output and visibility.

### FEATURES

- Untinted non diffused lens
- Choice of four colors
- TLH.5100 for cost effective design
- Medium viewing angle
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

- Outdoor LED panels
- Central high mounted stop lights (CHMSL) for motor vehicles
- Instrumentation and front panel indicators
- Light guide design
- Traffic signals

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity:  $\pm 9^\circ$

### PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
TLHK5100	Red, $I_V > 320$ mcd	AllnGaP on GaAs
TLHE5100	Yellow, $I_V > 750$ mcd	AllnGaP on GaAs
TLHG5100	Green, $I_V > 240$ mcd	GaP on GaP

### ABSOLUTE MAXIMUM RATINGS <sup>1)</sup> TLHK51.. , TLHE51.. , TLHG51..

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	6	V
DC Forward current	$T_{amb} \leq 65^\circ\text{C}$	$I_F$	30	mA
Surge forward current	$t_p \leq 10 \mu\text{s}$	$I_{FSM}$	1	A
Power dissipation	$T_{amb} \leq 65^\circ\text{C}$	$P_V$	100	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	- 55 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5$ s, 2 mm from body	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/ ambient		$R_{thJA}$	350	K/W

Note:

<sup>1)</sup>  $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> TLHK510., RED						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 20 \text{ mA}$	$I_V$	320			mcd
Dominant wavelength	$I_F = 10 \text{ mA}$	$\lambda_d$	626	630	639	nm
Peak wavelength	$I_F = 10 \text{ mA}$	$\lambda_p$		643		nm
Angle of half intensity	$I_F = 10 \text{ mA}$	$\varphi$		$\pm 9$		deg
Forward voltage	$I_F = 20 \text{ mA}$	$V_F$		1.9	2.6	V
Reverse voltage	$I_R = 10 \mu\text{A}$	$V_R$	5			V
Junction capacitance	$V_R = 0, f = 1 \text{ MHz}$	$C_j$		15		pF

Notes:

<sup>1)</sup>  $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

<sup>2)</sup> In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> TLHE510., YELLOW						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 20 \text{ mA}$	$I_V$	750			mcd
Dominant wavelength	$I_F = 10 \text{ mA}$	$\lambda_d$	581	588	594	nm
Peak wavelength	$I_F = 10 \text{ mA}$	$\lambda_p$		590		nm
Angle of half intensity	$I_F = 10 \text{ mA}$	$\varphi$		$\pm 9$		deg
Forward voltage	$I_F = 20 \text{ mA}$	$V_F$		2	2.6	V
Reverse voltage	$I_R = 10 \mu\text{A}$	$V_R$	5			V
Junction capacitance	$V_R = 0, f = 1 \text{ MHz}$	$C_j$		15		pF

Notes:

<sup>1)</sup>  $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

<sup>2)</sup> In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> TLHG510., GREEN						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 20 \text{ mA}$	$I_V$	240			mcd
Dominant wavelength	$I_F = 10 \text{ mA}$	$\lambda_d$	562		575	nm
Peak wavelength	$I_F = 10 \text{ mA}$	$\lambda_p$		565		nm
Angle of half intensity	$I_F = 10 \text{ mA}$	$\varphi$		$\pm 9$		deg
Forward voltage	$I_F = 20 \text{ mA}$	$V_F$		2.4	3	V
Reverse voltage	$I_R = 10 \mu\text{A}$	$V_R$	6	15		V
Junction capacitance	$V_R = 0, f = 1 \text{ MHz}$	$C_j$		50		pF

Notes:

<sup>1)</sup>  $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

<sup>2)</sup> In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$

LUMINOUS INTENSITY CLASSIFICATION		
GROUP STANDARD	LUMINOUS INTENSITY (mcd)	
	MIN.	MAX.
Z	240	480
AA	320	640
BB	430	860
CC	575	1150
DD	750	1500
EE	1000	2000
FF	1350	2700
GG	1800	3600
HH	2400	4800
II	3200	6400
KK	4300	8600

**Note:**

Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ .

The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each bag (there will be no mixing of two groups on each bag).

In order to ensure availability, single brightness groups will not be orderable.

In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped in any one bag.

In order to ensure availability, single wavelength groups will not be orderable.

**TYPICAL CHARACTERISTICS**

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

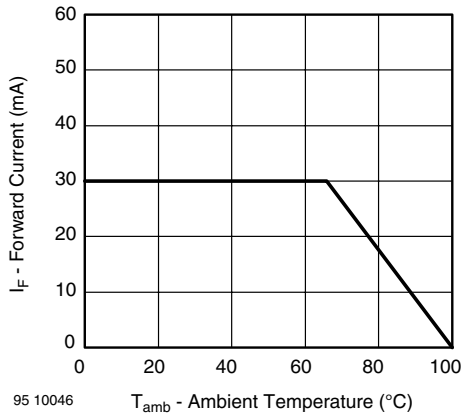


Figure 1. Forward Current vs. Ambient Temperature

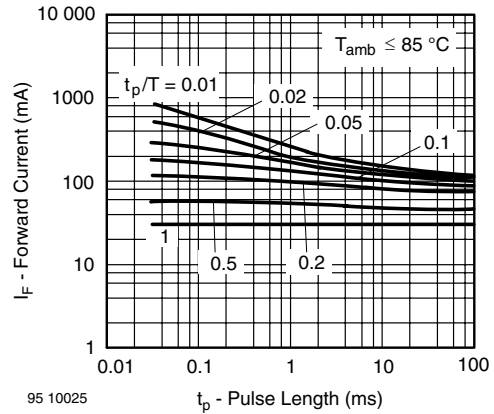


Figure 2. Forward Current vs. Pulse Length

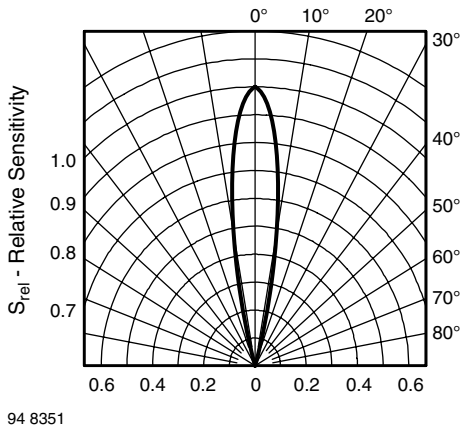


Figure 3. Relative Radiant Sensitivity vs. Angular Displacement

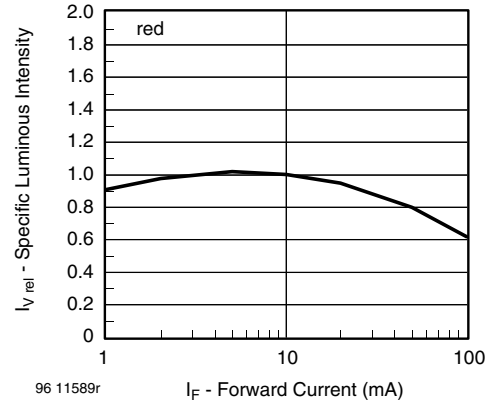


Figure 6. Specific Luminous Intensity vs. Forward Current

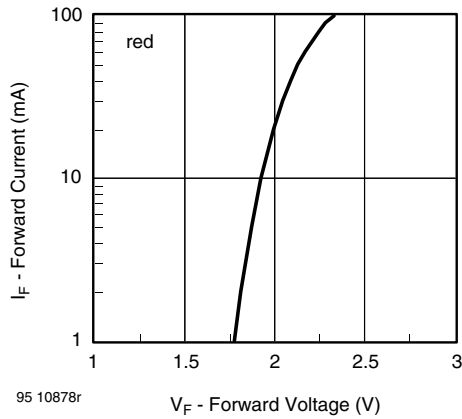


Figure 4. Forward Current vs. Forward Voltage

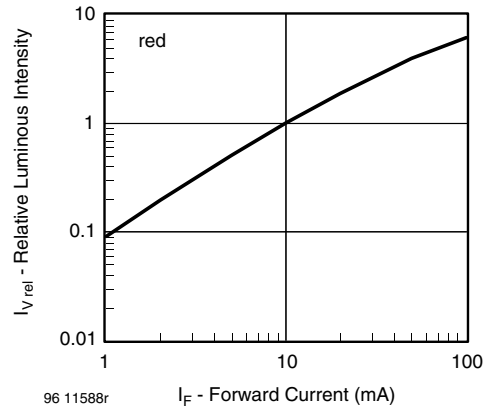


Figure 7. Relative Luminous Intensity vs. Forward Current

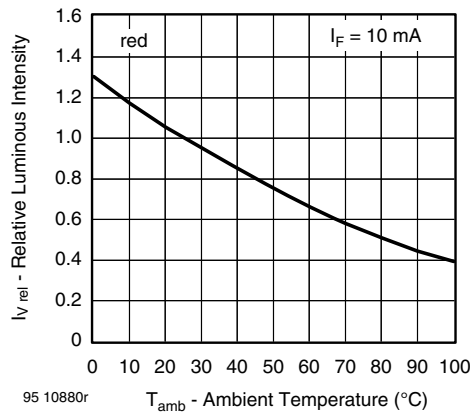


Figure 5. Rel. Luminous Intensity vs. Ambient Temperature

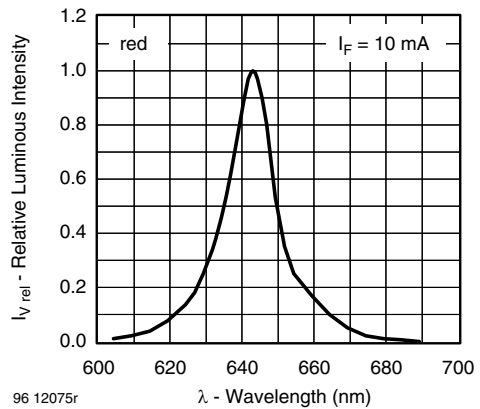


Figure 8. Relative Intensity vs. Wavelength

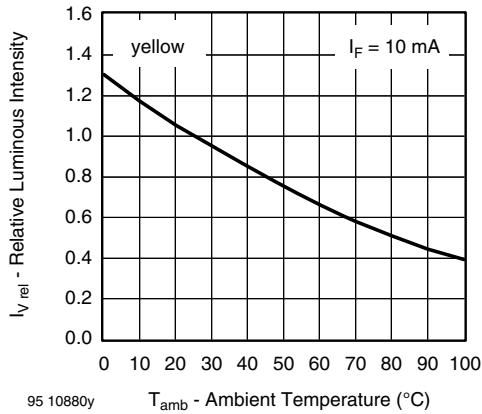


Figure 9. Rel. Luminous Intensity vs. Ambient Temperature

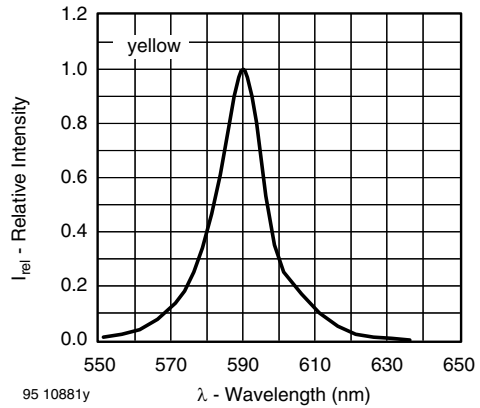


Figure 12. Relative Intensity vs. Wavelength

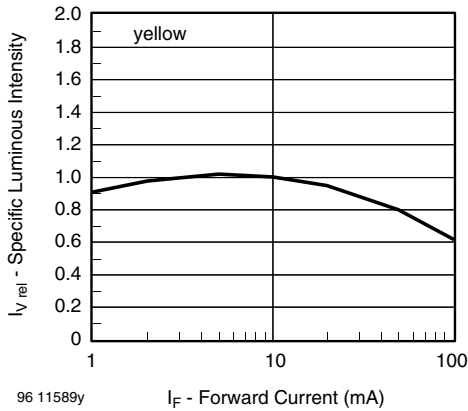


Figure 10. Specific Luminous Intensity vs. Forward Current

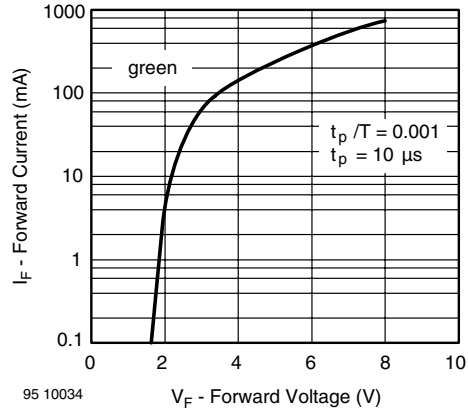


Figure 13. Forward Current vs. Forward Voltage

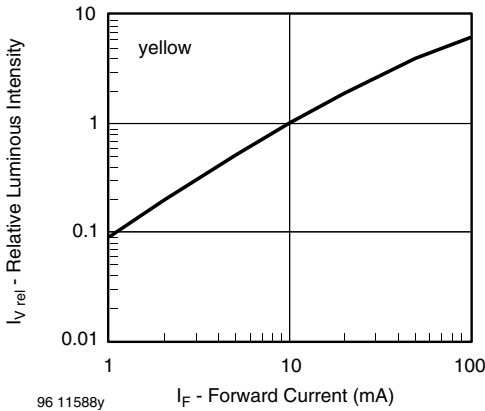


Figure 11. Relative Luminous Intensity vs. Forward Current

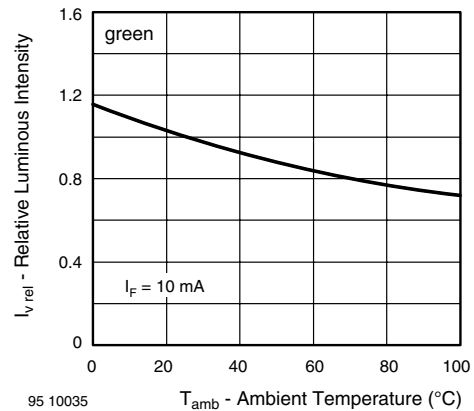


Figure 14. Rel. Luminous Intensity vs. Ambient Temperature

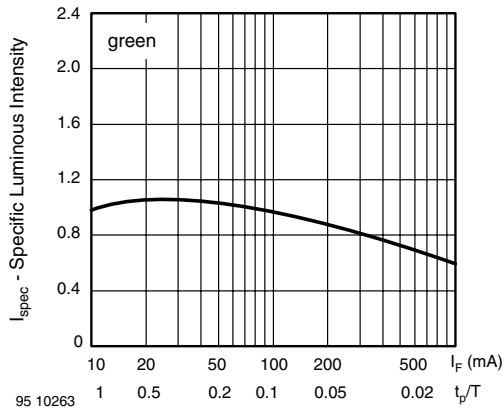


Figure 15. Specific Luminous Intensity vs. Forward Current

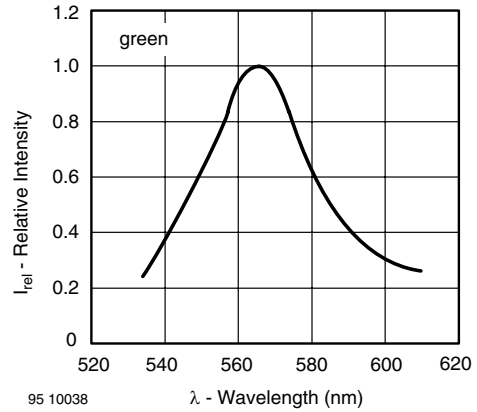


Figure 17. Relative Intensity vs. Wavelength

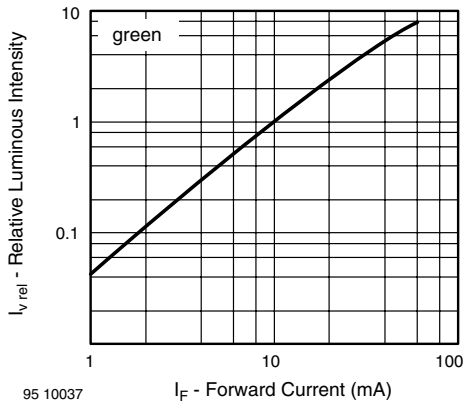
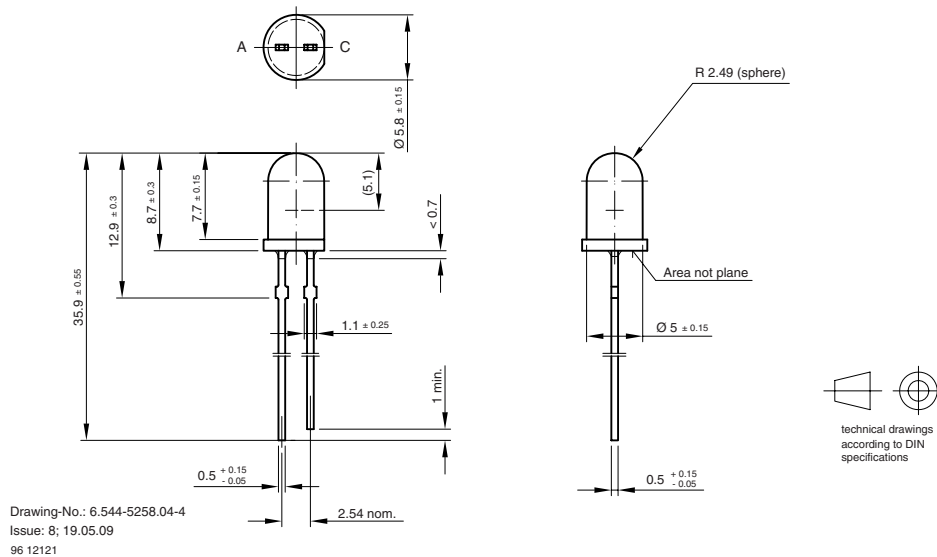


Figure 16. Relative Luminous Intensity vs. Forward Current

**PACKAGE DIMENSIONS** in millimeters





## Disclaimer

All product specifications and data are subject to change without notice.

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