

## High Efficiency LED, Ø 5 mm Tinted Non-Diffused Package



19223

### DESCRIPTION

The TLH.52.. series was developed for standard applications like general indicating and lighting purposes.

It is housed in a 5 mm tinted non-diffused plastic package. The small viewing angle of these devices provides a high brightness.

Several selection types with different luminous intensities are offered. All LEDs are categorized in luminous intensity groups. The green and yellow LEDs are categorized additionally in wavelength groups.

That allows users to assemble LEDs with uniform appearance.

### FEATURES

- Choice of three bright colors
- Standard T-1<sup>3</sup>/<sub>4</sub> package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Small viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- TLH.52.. with stand-offs
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

- Status lights
- Off/on indicator
- Background illumination
- Readout lights
- Maintenance lights
- Legend light

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity: ± 14°

### PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
TLHR5200	Red, I <sub>V</sub> = 50 mcd (typ.)	GaAsP on GaP
TLHR5201	Red, I <sub>V</sub> = 60 mcd (typ.)	GaAsP on GaP
TLHR5205	Red, I <sub>V</sub> = 70 mcd (typ.)	GaAsP on GaP
TLHY5200	Yellow, I <sub>V</sub> = 50 mcd (typ.)	GaAsP on GaP
TLHG5200	Green, I <sub>V</sub> = 40 mcd (typ.)	GaP on GaP
TLHG5201	Green, I <sub>V</sub> = 45 mcd (typ.)	GaP on GaP
TLHG5201-AS12Z	Green, I <sub>V</sub> = 45 mcd (typ.)	GaP on GaP
TLHG5205	Green, I <sub>V</sub> = 50 mcd (typ.)	GaP on GaP
TLHG5205-AS21	Green, I <sub>V</sub> = 50 mcd (typ.)	GaP on GaP

ABSOLUTE MAXIMUM RATINGS <sup>1)</sup> TLHR520. TLHY520. , TLHG520.				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	6	V
DC Forward current	$T_{amb} \leq 65\text{ }^\circ\text{C}$	$I_F$	30	mA
Surge forward current	$t_p \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	1	A
Power dissipation	$T_{amb} \leq 65\text{ }^\circ\text{C}$	$P_V$	100	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	- 20 to + 100	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	- 55 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5\text{ s, } 2\text{ mm from body}$	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/ambient		$R_{thJA}$	350	K/W

Note:

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

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>1)</sup> TLHR520., RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 10\text{ mA}$	TLHR5200	$I_V$	10	50		mcd
		TLHR5201	$I_V$	16	60		mcd
		TLHR5205	$I_V$	25	70		mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	612		625	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		635		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 14$		deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$		2	3	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		$V_R$	6	15		V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$		$C_j$		50		pF

Note:

<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> TLHY520., YELLOW							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 10\text{ mA}$	TLHY5200	$I_V$	10	50		mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	581		594	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		585		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 14$		deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$		2.4	3	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		$V_R$	6	15		V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$		$C_j$		50		pF

Note:

<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> TLHG520., GREEN							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>2)</sup>	$I_F = 10 \text{ mA}$	TLHG5200	$I_V$	16	40		mcd
		TLHG5201	$I_V$	25	45		mcd
		TLHG5205	$I_V$	40	50		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	$I_F = 10 \text{ mA}$		$\phi$		$\pm 14$		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

Note:

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

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

## TYPICAL CHARACTERISTICS

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



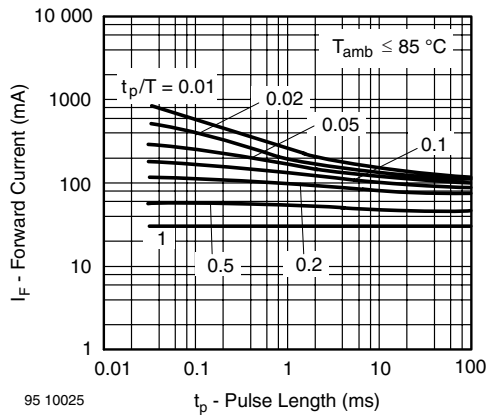
95 10046  $T_{amb}$  - Ambient Temperature ( $^\circ\text{C}$ )

Figure 1. Forward Current vs. Ambient Temperature



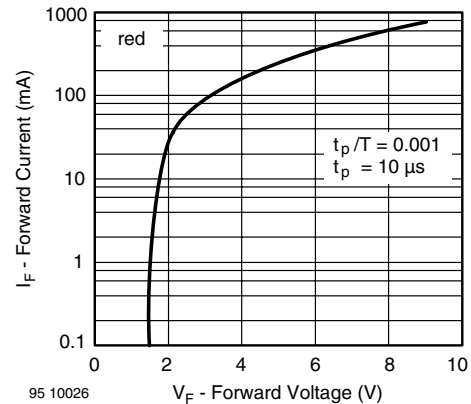
95 10044

Figure 3. Rel. Luminous Intensity vs. Angular Displacement



95 10025

Figure 2. Forward Current vs. Pulse Length



95 10026

Figure 4. Forward Current vs. Forward Voltage



Figure 5. Rel. Luminous Intensity vs. Ambient Temperature



Figure 8. Relative Intensity vs. Wavelength



Figure 6. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle



Figure 9. Forward Current vs. Forward Voltage



Figure 7. Relative Luminous Intensity vs. Forward Current



Figure 10. Rel. Luminous Intensity vs. Ambient Temperature



Figure 11. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle



Figure 14. Forward Current vs. Forward Voltage



Figure 12. Relative Luminous Intensity vs. Forward Current



Figure 15. Rel. Luminous Intensity vs. Ambient Temperature

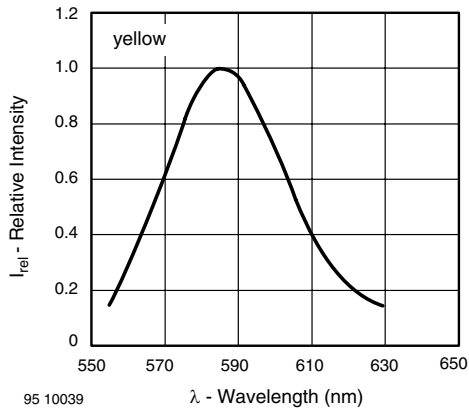


Figure 13. Relative Intensity vs. Wavelength

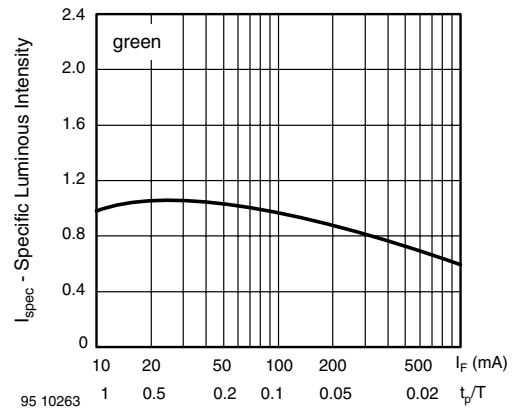


Figure 16. Specific Luminous Intensity vs. Forward Current



Figure 17. Relative Luminous Intensity vs. Forward Current



Figure 18. Relative Intensity vs. Wavelength

**PACKAGE DIMENSIONS** in millimeters



6.544-5258.01-4  
 Issue: 5; 19.05.09  
 96 12119

**REEL**



Figure 19. Reel Dimensions

AS12 = cathode leaves tape first  
AS21 = anode leaves tape first

**AMMOPACK**



Figure 21. Tape Direction

Note:  
AS12Z and AS21Z still valid for already existing types BUT NOT FOR NEW DESIGN

**TAPE**



Figure 20. LED in Tape

## TAPE DIMENSIONS



Quantity per:	Reel (Mat.-no. 1764)
	1000

94 8172

Option	Dim. "H" $\pm 0.5$ mm
AS	17.3





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