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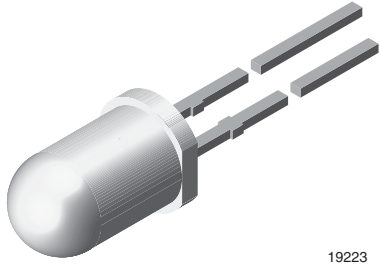
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## High Intensity LED, Ø 5 mm Untinted Non-Diffused Package



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 three colors
- TLH.5100 for cost effective design
- Medium viewing angle
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### 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: ± 9°

PARTS TABLE														
PART	COLOR	LUMINOUS INTENSITY (mcd)			at I <sub>F</sub> (mA)	WAVELENGTH (nm)			at I <sub>F</sub> (mA)	FORWARD VOLTAGE (V)			at I <sub>F</sub> (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
TLHK5100	Red	320	1400	-	20	626	630	639	10	-	2	2.6	20	AllInGaP on GaAs
TLHK5100-AS12Z	Red	320	1400	-	20	626	630	639	10	-	2	2.6	20	AllInGaP on GaAs
TLHE5100	Yellow	750	1800	-	20	581	588	594	10	-	2	2.6	20	AllInGaP on GaAs
TLHG5100	Green	240	450	-	20	562	-	575	10	-	2.4	3	20	GaP on GaP

ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) TLHK510., TLHE510., TLHG510.				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V <sub>R</sub>	6	V
DC forward current	T <sub>amb</sub> ≤ 65 °C	I <sub>F</sub>	30	mA
Surge forward current	t <sub>p</sub> ≤ 10 μs	I <sub>FSM</sub>	1	A
Power dissipation	T <sub>amb</sub> ≤ 65 °C	P <sub>V</sub>	100	mW
Junction temperature		T <sub>j</sub>	100	°C
Operating temperature range		T <sub>amb</sub>	-40 to +100	°C
Storage temperature range		T <sub>stg</sub>	-55 to +100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T <sub>sd</sub>	260	°C
Thermal resistance junction/ambient		R <sub>thJA</sub>	350	K/W

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLHK510., RED**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$I_F = 20\text{ mA}$	$I_V$	320	1400	-	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	$I_F = 10\text{ mA}$	$\phi$	-	$\pm 9$	-	deg
Forward voltage	$I_F = 20\text{ mA}$	$V_F$	-	2	2.6	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	5	-	-	V
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_j$	-	15	-	pF

**Note**(1) In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$ **OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLHE510., YELLOW**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$I_F = 20\text{ mA}$	$I_V$	750	1800	-	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	$I_F = 10\text{ mA}$	$\phi$	-	$\pm 9$	-	deg
Forward voltage	$I_F = 20\text{ mA}$	$V_F$	-	2	2.6	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	5	-	-	V
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_j$	-	15	-	pF

**Note**(1) In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$ **OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLHG510., GREEN**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$I_F = 20\text{ mA}$	$I_V$	240	450	-	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	$I_F = 10\text{ mA}$	$\phi$	-	$\pm 9$	-	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	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_j$	-	50	-	pF

**Note**(1) In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$





LUMINOUS INTENSITY CLASSIFICATION		
GROUP	LIGHT INTENSITY (mcd)	
STANDARD	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. 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.

COLOR CLASSIFICATION				
GROUP	DOM. WAVELENGTH (nm)			
	YELLOW		GREEN	
	MIN.	MAX.	MIN.	MAX.
0				
1	581	584		
2	583	586		
3	585	588	562	565
4	587	590	564	567
5	589	592	566	569
6	591	594	568	571
7			570	573
8			572	575

**Note**

- Wavelengths are tested at a current pulse duration of 25 ms.

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

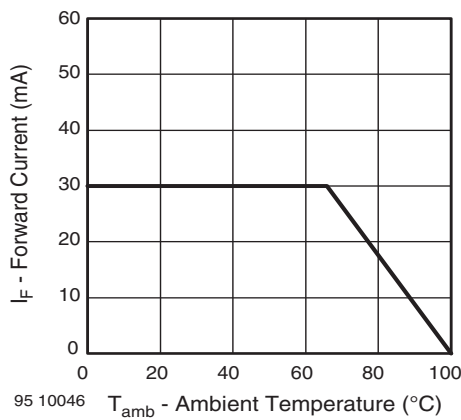


Fig. 1 - Forward Current vs. Ambient Temperature

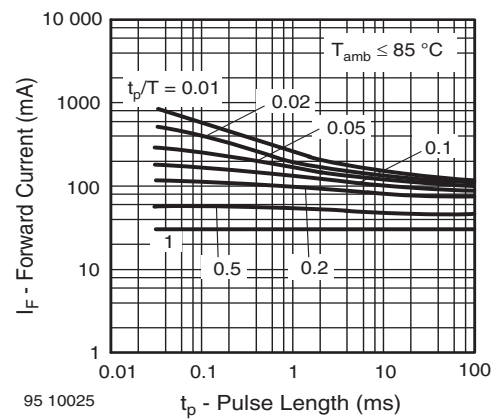


Fig. 2 - Forward Current vs. Pulse Length

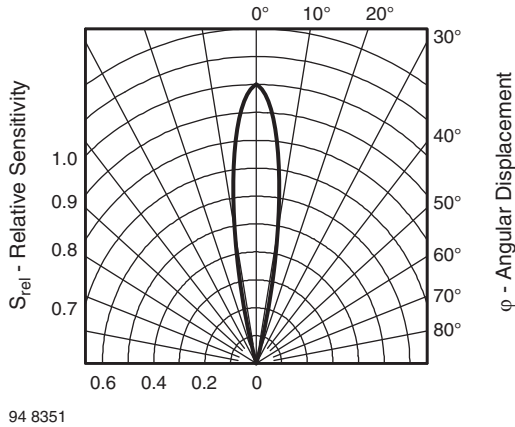


Fig. 3 - Relative Radiant Sensitivity vs. Angular Displacement

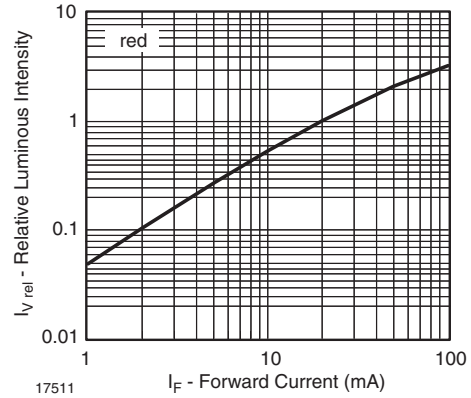


Fig. 6 - Relative Luminous Intensity vs. Forward Current

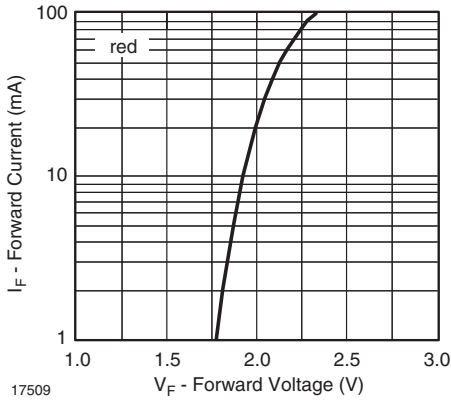


Fig. 4 - Forward Current vs. Forward Voltage

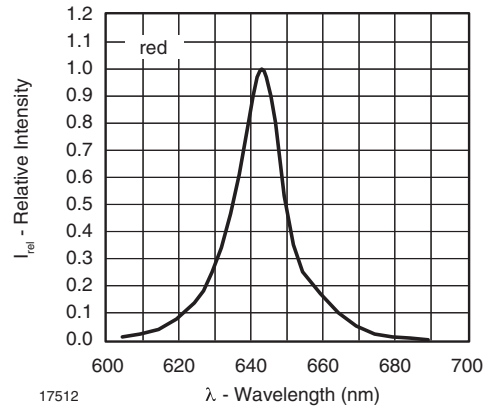


Fig. 7 - Relative Intensity vs. Wavelength

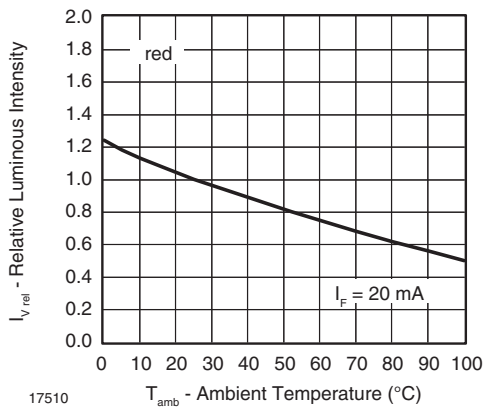


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

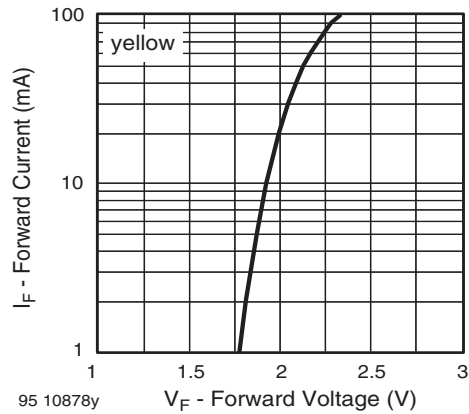


Fig. 8 - Forward Current vs. Forward Voltage

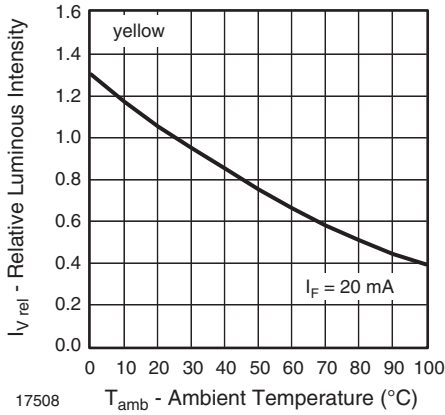


Fig. 9 - Relative Luminous Intensity vs. Ambient Temperature

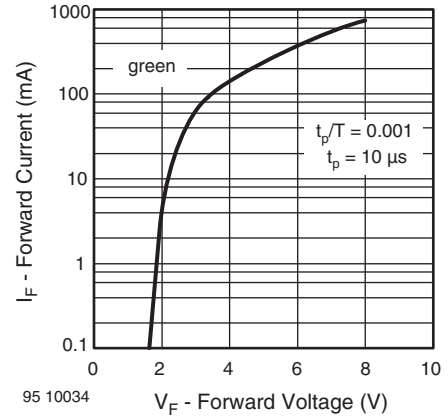


Fig. 12 - Forward Current vs. Forward Voltage

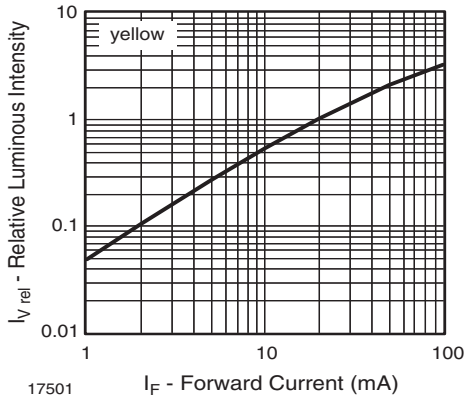


Fig. 10 - Relative Luminous Intensity vs. Forward Current

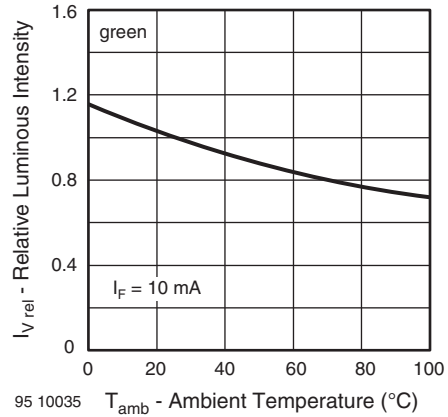


Fig. 13 - Relative Luminous Intensity vs. Ambient Temperature

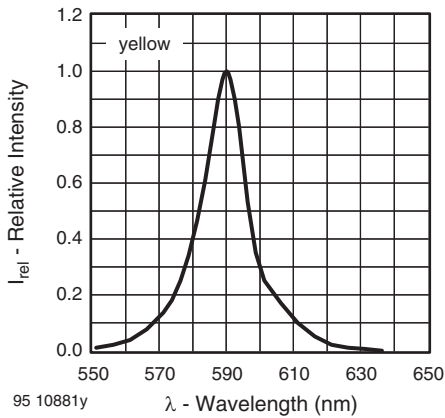


Fig. 11 - Relative Intensity vs. Wavelength

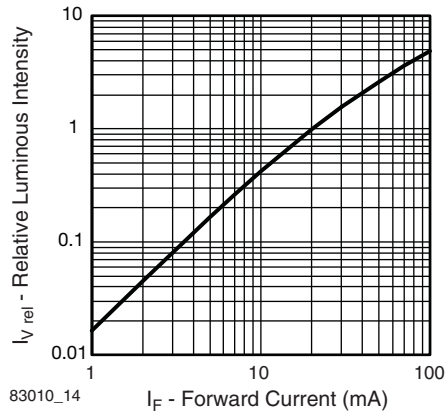


Fig. 14 - Relative Luminous Intensity vs. Forward Current

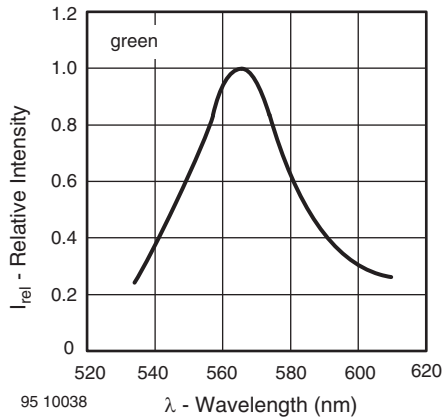
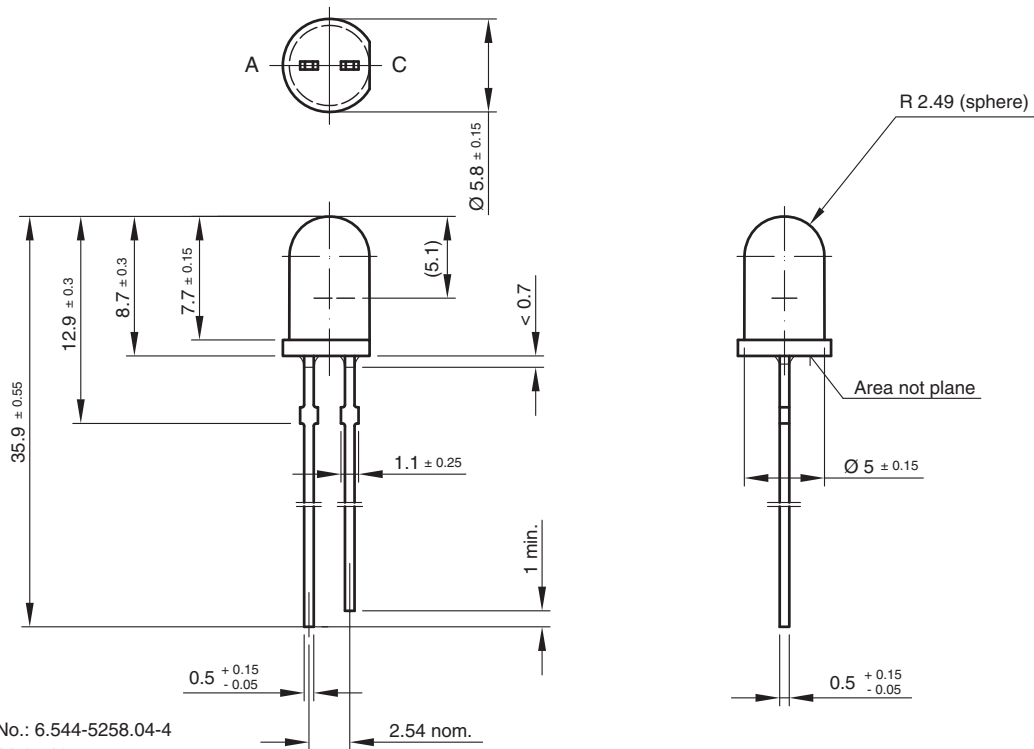


Fig. 15 - Relative Intensity vs. Wavelength

**PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.544-5258.04-4  
 Issue: 9; 23.07.10  
 96 12121



**AMMOPACK**

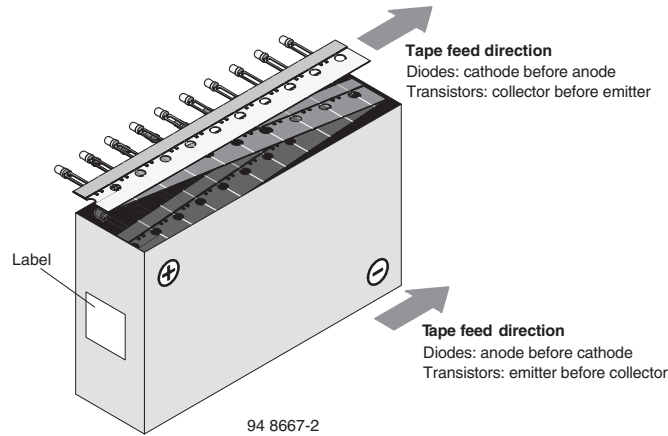
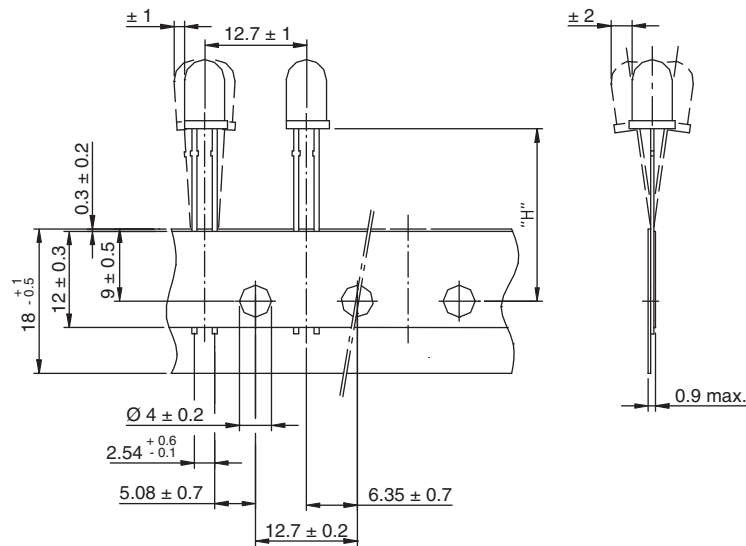


Fig. 16 - Tape Direction

**Note**

- The new nomenclature for ammpack is e.g. ASZ only, without suffix for the LED orientation. The carton box has to be turned to the desired position: "+" for anode first, or "-" for cathode first. AS12Z and AS21Z are still valid for already existing types, BUT NOT FOR NEW DESIGN.

**TAPE DIMENSIONS** in millimeters



Measure limit over 20 index-holes: ± 1

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

94 8172

OPTION	DIMENSION "H" ± 0.5 mm	DIMENSION "X" ± 0.5 mm
AS	17.3	-





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