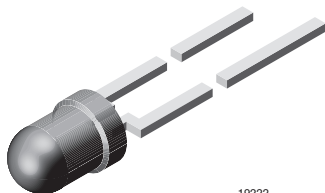


High Intensity LED in Ø 3 mm Tinted Diffused Package



19222

DESCRIPTION

These devices have been designed to meet the increasing demand for AlInGaP technology general indicating and lighting purposes.

They are housed in a 3 mm diffused plastic package. The wide viewing angle of these devices provides a high brightness.

All packing units are categorized in luminous intensity groups. That allows users to assemble LEDs with uniform appearance.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: low current
- Angle of half intensity: $\pm 30^\circ$

FEATURES

- AlInGaP technology
- Standard Ø 3 mm (T-1) package
- Small mechanical tolerances
- Wide viewing angle
- Very high intensity
- Low power consumption
- Specified at $I_F = 2$ mA
- Luminous intensity categorized
- ESD-withstand voltage: Up to 2 kV HBM according to JESD22-A114-B
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- Status lights
- Off/On indicator
- Background illumination
- Readout lights
- Maintenance lights
- Legend light
- Low power DC circuits

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I_F (mA)	WAVELENGTH (nm)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
TLLK4401	Super red	6.3	17	32	2	626	630	639	2	1.6	1.8	2.2	2	AlInGaP on GaAs
TLLK4401-MSZ	Super red	6.3	17	32	2	626	630	639	2	1.6	1.8	2.2	2	AlInGaP on GaAs
TLLE4401	Yellow	6.3	17	32	2	581	589	594	2	1.6	1.8	2.2	2	AlInGaP on GaAs
TLLE4401-MSZ	Yellow	6.3	17	32	2	581	589	594	2	1.6	1.8	2.2	2	AlInGaP on GaAs

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

TLLK4401, TLLE4401

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage ⁽¹⁾		V_R	5	V
DC forward current	$T_{amb} \leq 60^\circ\text{C}$	I_F	30	mA
Surge forward current	$t_p \leq 10 \mu\text{s}$	I_{FSM}	0.1	A
Power dissipation	$T_{amb} \leq 60^\circ\text{C}$	P_V	80	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}	400	K/W

Note

⁽¹⁾ Driving the LED in reverse direction is suitable for a short term application

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
TLLK4401, SUPER RED

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	$I_F = 2\text{ mA}$	I_V	6.3	17	32	mcd
Dominant wavelength	$I_F = 2\text{ mA}$	λ_d	626	630	639	nm
Peak wavelength	$I_F = 2\text{ mA}$	λ_p	-	643	-	nm
Angle of half intensity	$I_F = 2\text{ mA}$	φ	-	± 30	-	deg
Forward voltage	$I_F = 2\text{ mA}$	V_F	1.6	1.8	2.2	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)
TLLE4401, YELLOW

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	$I_F = 2\text{ mA}$	I_V	6.3	17	32	mcd
Dominant wavelength	$I_F = 2\text{ mA}$	λ_d	581	589	594	nm
Peak wavelength	$I_F = 2\text{ mA}$	λ_p	-	591	-	nm
Angle of half intensity	$I_F = 2\text{ mA}$	φ	-	± 30	-	deg
Forward voltage	$I_F = 2\text{ mA}$	V_F	1.6	1.8	2.2	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 $I_{Vmin}/I_{Vmax} \leq 0.5$.**LUMINOUS INTENSITY CLASSIFICATION**

GROUP	LIGHT INTENSITY (mcd)	
	MIN.	MAX.
Q	6.3	12.5
R	10	20
S	16	32

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 on any one bag.
In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION

GROUP	YELLOW	
	DOM. WAVELENGTH (nm)	
	MIN.	MAX.
1	581	584
2	583	586
3	585	588
4	587	590
5	589	592
6	591	594

Note

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

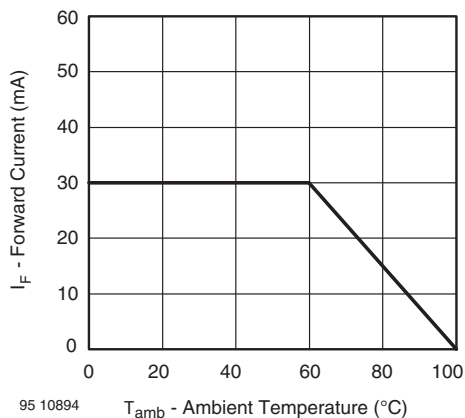
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

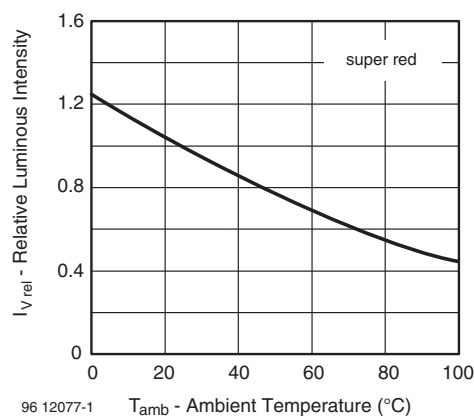


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

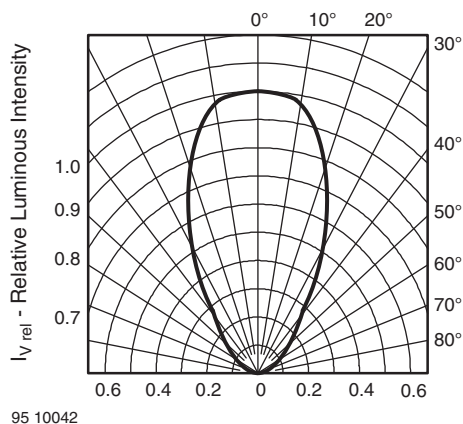


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

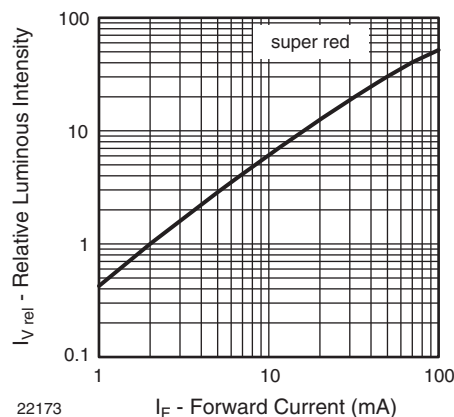


Fig. 5 - Relative Luminous Intensity vs. Forward Current

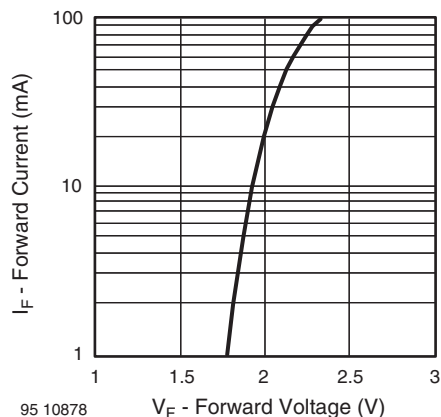


Fig. 3 - Forward Current vs. Forward Voltage

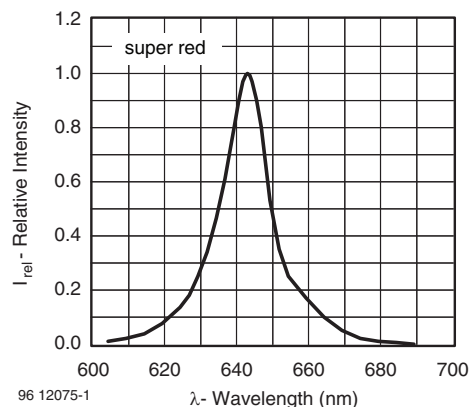


Fig. 6 - Relative Intensity vs. Wavelength

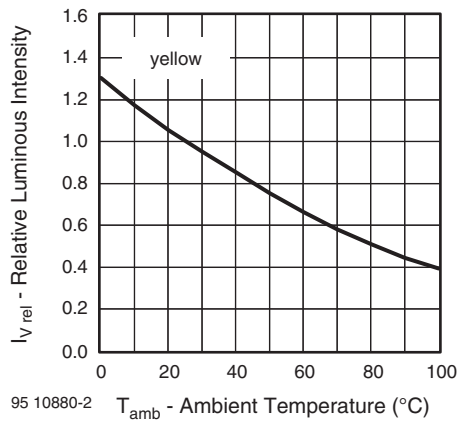


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

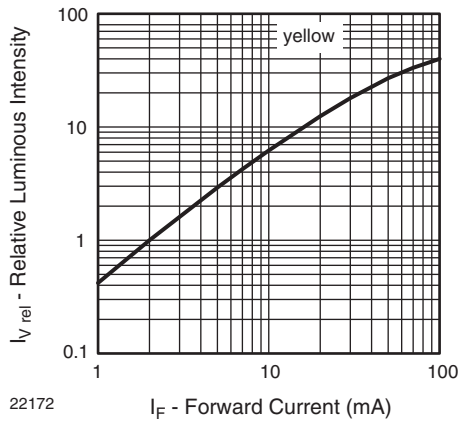


Fig. 8 - Relative Luminous Intensity vs. Forward Current

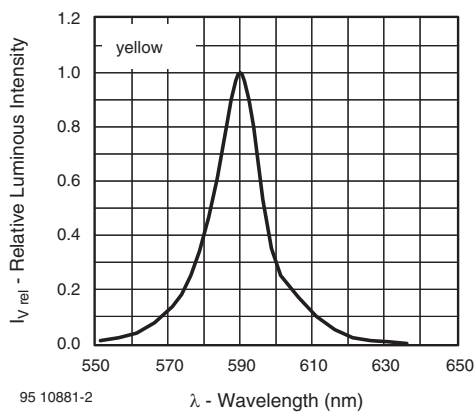
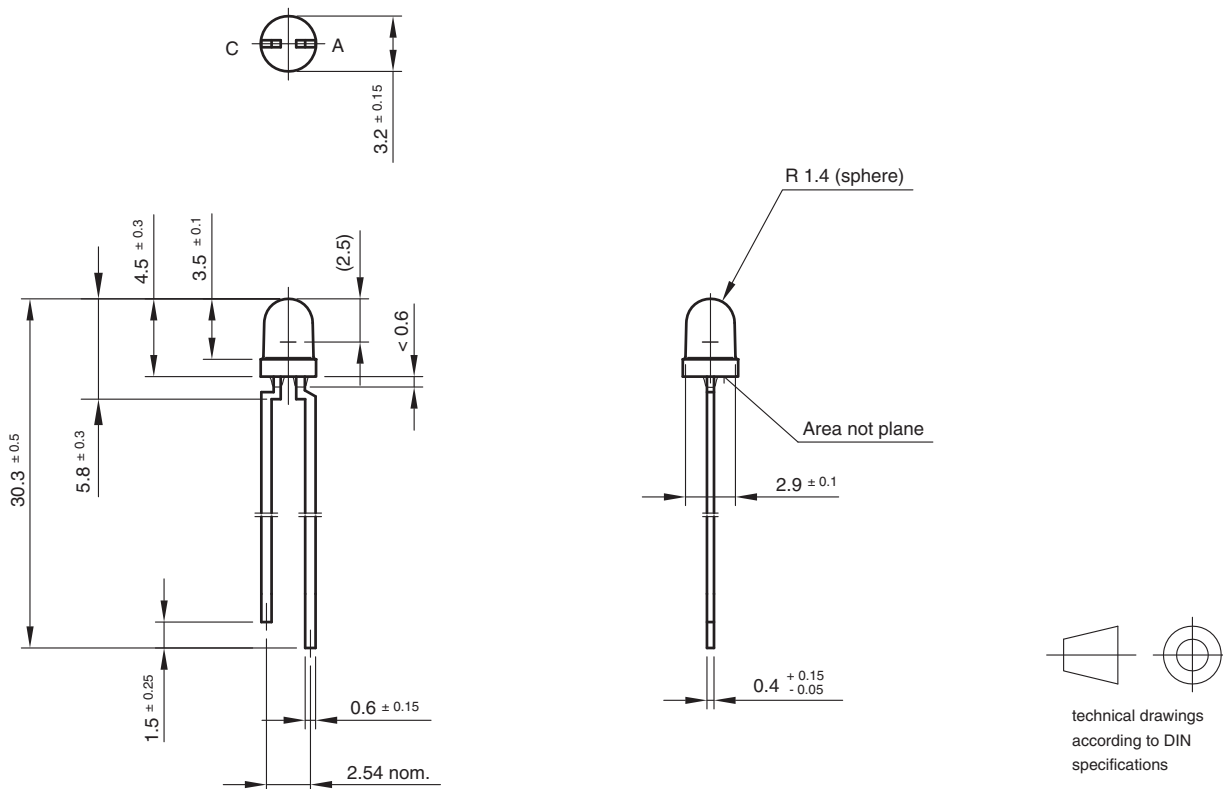


Fig. 9 - Relative Luminous Intensity vs. Wavelength

PACKAGE DIMENSIONS in millimeters


Drawing-No.: 6.544-5264.01-4

Issue: 2; 23.04.98

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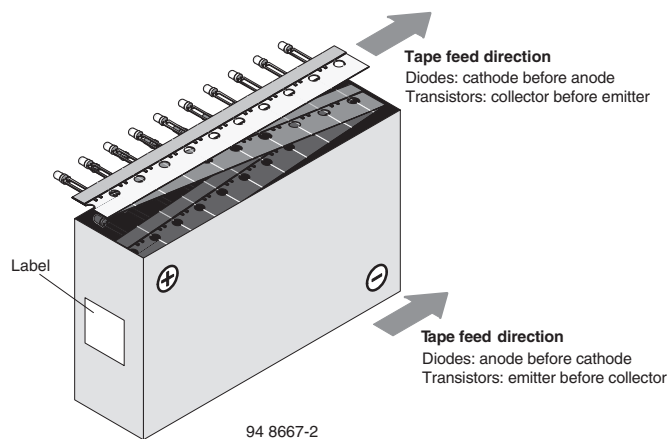
AMMOPACK


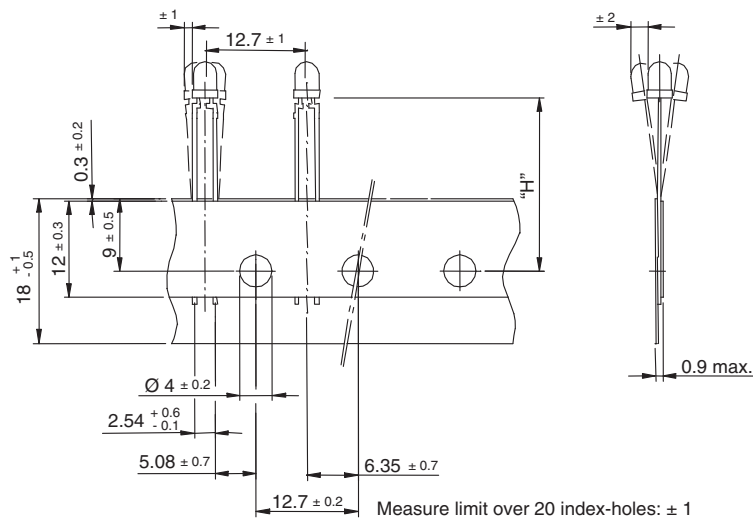
Fig. 10 - Tape Direction

Note

- The new nomenclature for ammpack is 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



Quantity per:	Reel (Mat. - No. 1764)
	2000

94 8171

Option	Dim. "H" ± 0.5 mm
MS	25.5



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