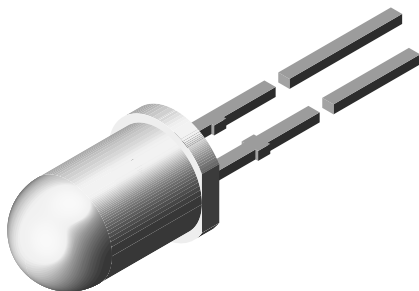


High Efficiency LED, Ø 5 mm Tinted Diffused Package



DESCRIPTION

The TLH.54.. series was developed for standard applications like general indicating and lighting purposes.

It is housed in a 5 mm tinted diffused plastic package. The wide viewing angle of these devices provides a high on-off contrast.

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

That allows users to assemble LEDs with uniform appearance.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity: $\pm 30^\circ$

FEATURES

- Choice of three bright colors
- Standard T-1 $\frac{3}{4}$ package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Wide viewing angle
- Luminous intensity categorized
- Yellow color categorized
- TLH.54.. with stand-offs
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

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

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.		
TLHR5400	Red	1.6	10	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR5400-AS12Z	Red	1.6	10	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR5401	Red	4	12	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR5405	Red	6.3	14	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR5405-KS21	Red	6.3	14	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR5405-KSZ	Red	6.3	14	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHY5400	Yellow	1.6	10	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY5401	Yellow	4	12	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY5405	Yellow	6.3	14	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
TLHR540., TLHY540.

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}	-40 to +100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-55 to +100	$^{\circ}\text{C}$
Soldering temperature	$t \leq 5\text{ s}$, 2 mm from body	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction to ambient		R_{thJA}	350	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
TLHR540., RED

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	$I_F = 10\text{ mA}$	TLHR5400	I_V	1.6	10	-	mcd
		TLHR5401	I_V	4	12	-	mcd
		TLHR5405	I_V	6.3	14	-	mcd
Dominant wavelength	$I_F = 10\text{ mA}$		λ_d	612	-	630	nm
Peak wavelength	$I_F = 10\text{ mA}$		λ_p	-	635	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		ϕ	-	± 30	-	$^{\circ}$
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	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$		C_j	-	50	-	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)
TLHY540., YELLOW

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	$I_F = 10\text{ mA}$	TLHY5400	I_V	1.6	10	-	mcd
		TLHY5401	I_V	4	12	-	mcd
		TLHY5405	I_V	6.3	14	-	mcd
Dominant wavelength	$I_F = 10\text{ mA}$		λ_d	581	-	594	nm
Peak wavelength	$I_F = 10\text{ mA}$		λ_p	-	585	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		ϕ	-	± 30	-	$^{\circ}$
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	LUMINOUS INTENSITY (mcd)	
STANDARD	MIN.	MAX.
M	1.6	3.2
N	2.5	5
P	4	8
Q	6.3	12.5
R	10	20
S	16	32
T	25	50
U	40	80
V	63	125
W	100	200
X	130	260
Y	180	360
Z	240	480

Note

- Luminous flux 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 in 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	DOM. WAVELENGTH (nm)	
	YELLOW	
	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

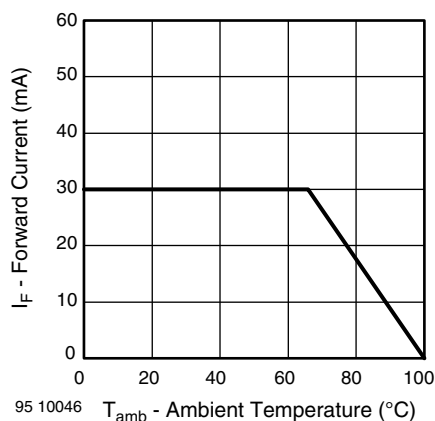
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Fig. 1 - Forward Current vs. Ambient Temperature

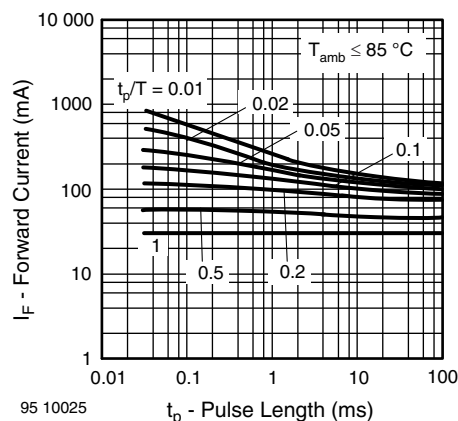


Fig. 2 - Forward Current vs. Pulse Length

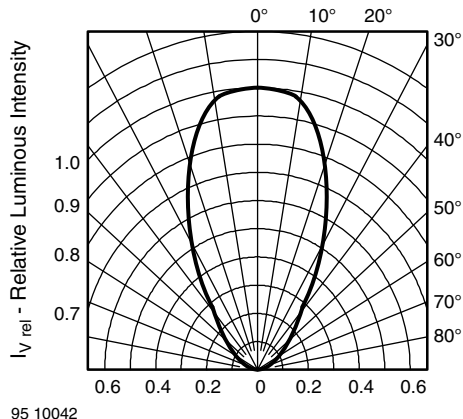


Fig. 3 - Rel. Luminous Intensity vs. Angular Displacement

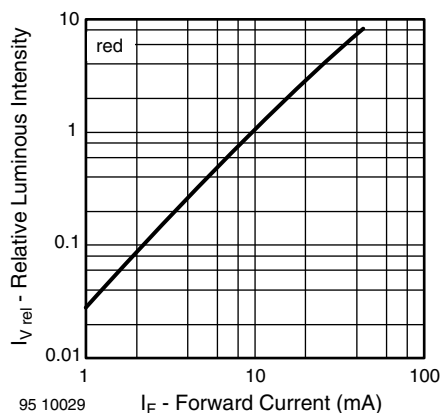


Fig. 6 - Relative Luminous Intensity vs. Forward Current

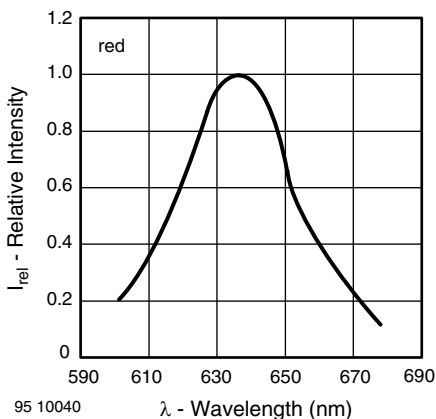


Fig. 4 - Relative Intensity vs. Wavelength

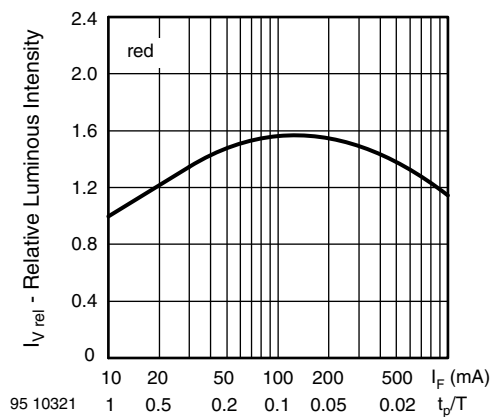


Fig. 7 - Relative Luminous Intensity vs. Forward Current / Duty Cycle

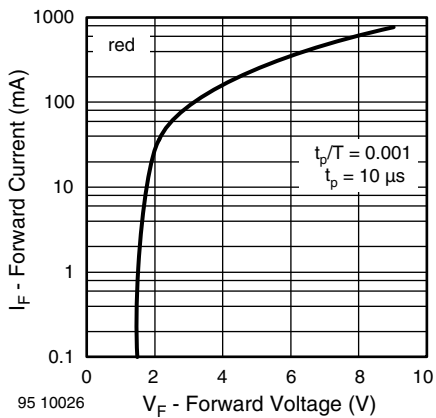


Fig. 5 - Forward Current vs. Forward Voltage

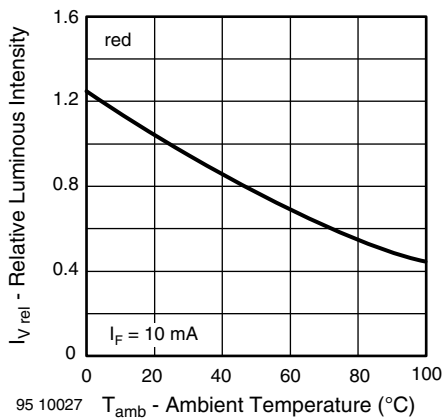


Fig. 8 - Relative Luminous Intensity vs. Ambient Temperature

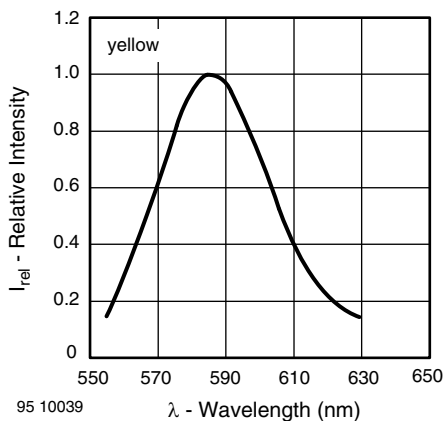


Fig. 9 - Relative Intensity vs. Wavelength

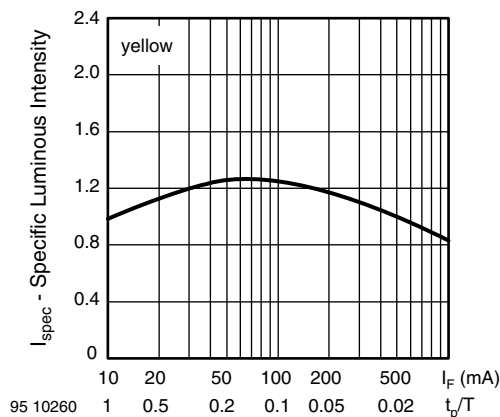


Fig. 12 - Relative Luminous Intensity vs. Forward Current / Duty Cycle

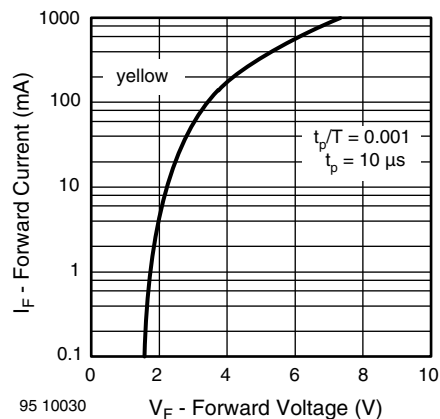


Fig. 10 - Forward Current vs. Forward Voltage

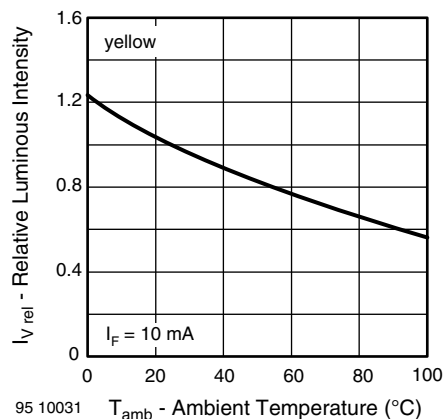


Fig. 13 - Relative Luminous Intensity vs. Ambient Temperature

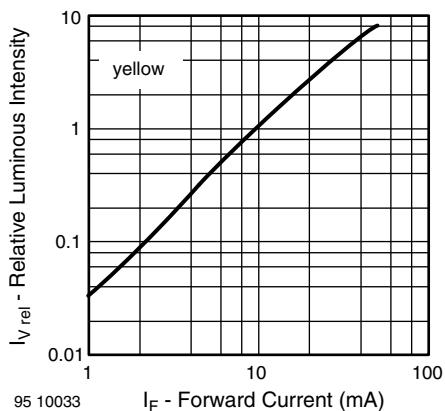
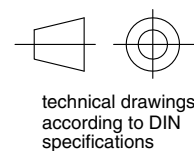
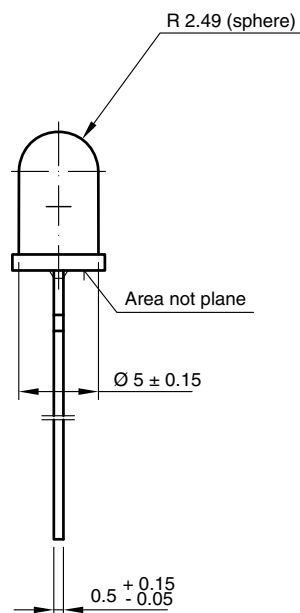
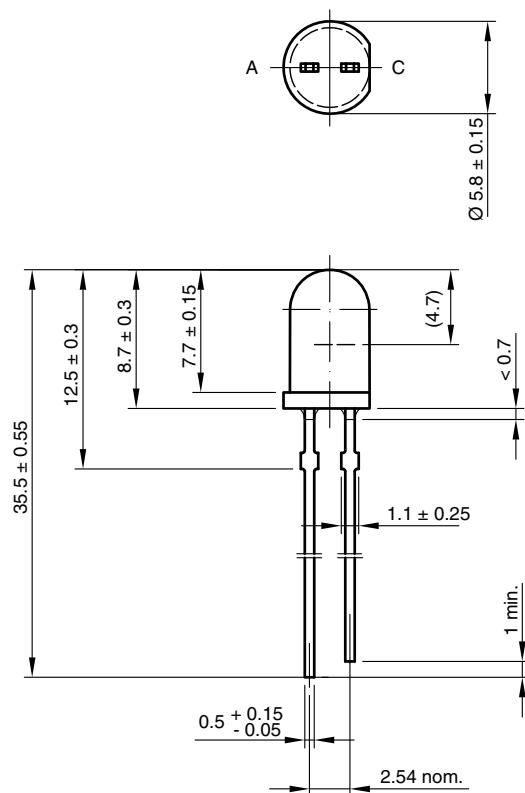


Fig. 11 - Relative Luminous Intensity vs. Forward Current



PACKAGE DIMENSIONS in millimeters



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Issue: 7; 23.07.10
95 10916

REEL

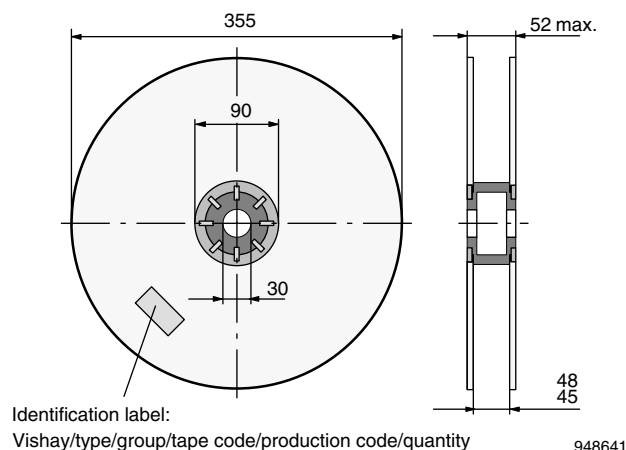


Fig. 14 - Reel Dimensions

AS12 = cathode leaves tape first

AS21 = anode leaves tape first

TAPE

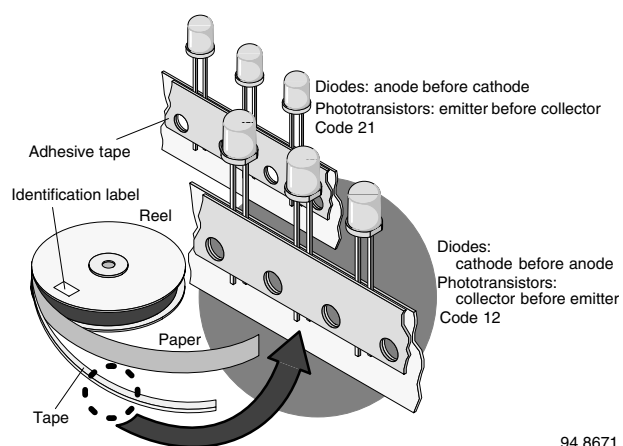
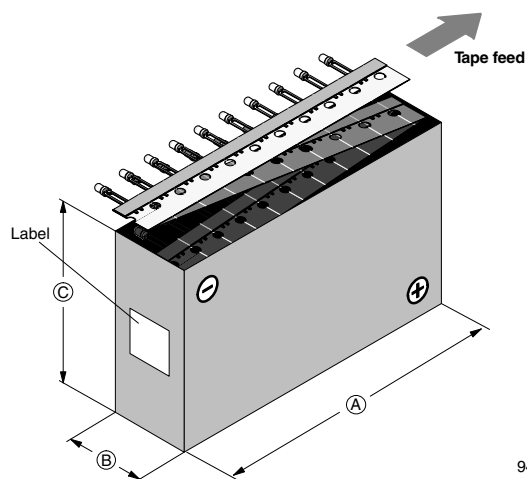


Fig. 15 - LED in Tape

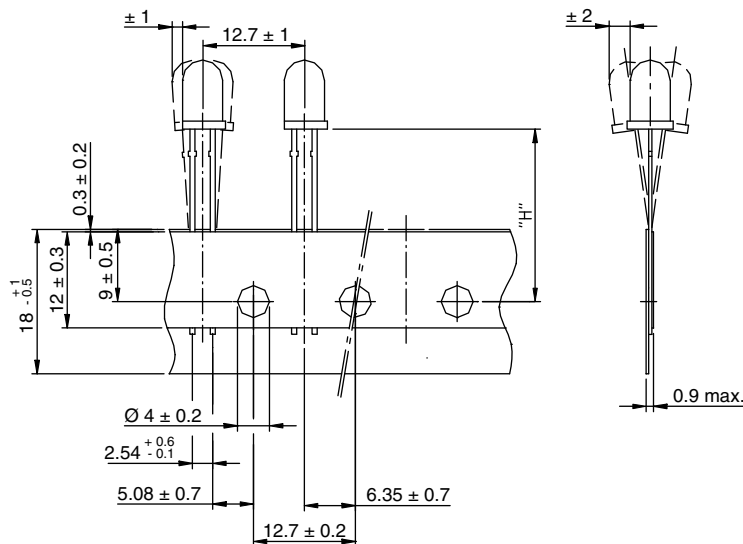
AMMOPACK


94 8667-1

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	Dim. "H" ± 0.5 mm	Dim. "X" ± 0.5 mm
AS	17.3	-
KS	19.7	-

PACKING INFORMATION

PART	BULK	TAPE AND REEL	AMMOPACK
TLHx540x	4000	-	-
TLHx540x-xxxx	-	5 x 1000	-
TLHx540x-xxxxZ	-	-	5 x 1000
TLHx540x-xSZ	-	-	5 x 1000



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