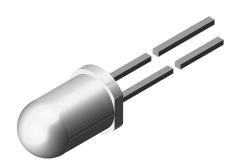


# High Efficiency LED in Ø 5 mm Tinted Diffused Package



### **DESCRIPTION**

The TLH.640. 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: ± 30°

### **FEATURES**

- · Choice of two bright colors
- Standard T-1¾ package
- Small mechanical tolerances
- · Suitable for DC and high peak current
- · Wide viewing angle
- · Luminous intensity categorized
- Yellow color categorized
- TLH.640. without stand-offs
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>





# RoHS

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 <sub>F</sub>	WAVELENGTH (nm)		at I <sub>F</sub>	FORWARD VOLTAGE (V)		at I <sub>F</sub>	TECHNOLOGY			
		MIN.	TYP.	MAX.	(mA)	MIN.	TYP.	MAX	(mA)	MIN.	TYP.	MAX.	(IIIA)	
TLHR6400	Red	1.6	10	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR6400-CS12Z	Red	1.6	10	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR6401	Red	4	12	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR6405	Red	6.3	14	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHR6405-ASZ	Red	6.3	14	-	10	612	-	630	10	-	2	3	20	GaAsP on GaP
TLHY6400	Yellow	1.6	10	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6405	Yellow	6.3	14	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6405-ASZ	Yellow	6.3	14	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP



ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) TLHR640., TLHY640.							
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	А			
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	$t \le 5$ s, 2 mm from body	T <sub>sd</sub>	260	°C			
Thermal resistance junction to ambient		R <sub>thJA</sub>	350	K/W			

OPTICAL AND ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25$ °C, unless otherwise specified) TLHR640., RED								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
		TLHR6400	l <sub>V</sub>	1.6	10	-	mcd	
Luminous intensity (1)	$I_F = 10 \text{ mA}$	TLHR6401	l <sub>V</sub>	4	12	-	mcd	
		TLHR6405	l <sub>V</sub>	6.3	14	-	mcd	
Dominant wavelength	I <sub>F</sub> = 10 mA		$\lambda_{d}$	612	-	630	nm	
Peak wavelength	I <sub>F</sub> = 10 mA		$\lambda_{p}$	-	635	-	nm	
Angle of half intensity	I <sub>F</sub> = 10 mA		φ	-	± 30	-	۰	
Forward voltage	I <sub>F</sub> = 20 mA		V <sub>F</sub>	-	2	3	V	
Reverse voltage	I <sub>R</sub> = 10 μA		$V_R$	6	15	-	V	
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz		C <sub>j</sub>	-	50	-	pF	

# Note

 $<sup>^{(1)}~</sup>$  In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$ 

OPTICAL AND ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified) TLHY640., YELLOW								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Luminous intensity (1)	I <sub>E</sub> = 10 mA	TLHY6400	I <sub>V</sub>	1.6	10	-	mcd	
	IF = 10 IIIA	TLHY6405	I <sub>V</sub>	6.3	14	-	mcd	
Dominant wavelength	I <sub>F</sub> = 10 mA		$\lambda_{d}$	581	-	594	nm	
Peak wavelength	I <sub>F</sub> = 10 mA		$\lambda_{p}$	-	585	-	nm	
Angle of half intensity	I <sub>F</sub> = 10 mA		φ	=	± 30	-	0	
Forward voltage	I <sub>F</sub> = 20 mA		$V_{F}$	-	2.4	3	V	
Reverse voltage	I <sub>R</sub> = 10 μA		$V_R$	6	15	-	V	
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz		C <sub>j</sub>	-	50	-	pF	

# Note

 $<sup>^{(1)}~</sup>$  In one packing unit  $I_{Vmin.}/I_{Vmax.} \leq 0.5$ 

# **TYPICAL CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

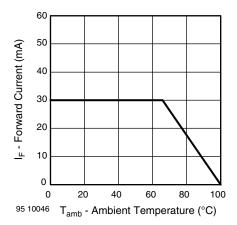


Fig. 1 - Forward Current vs. Ambient Temperature

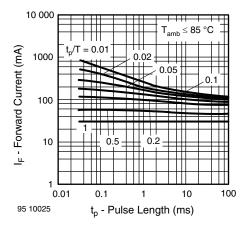


Fig. 2 - Forward Current vs. Pulse Length

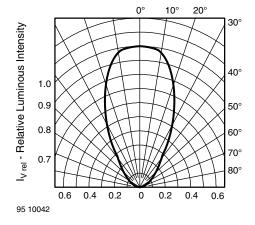


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

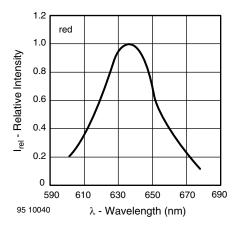


Fig. 4 - Relative Intensity vs. Wavelength

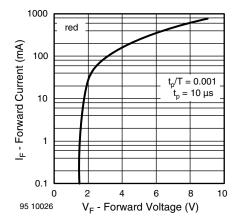


Fig. 5 - Forward Current vs. Forward Voltage

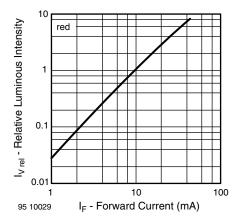


Fig. 6 - Relative Luminous Intensity vs. Forward Current



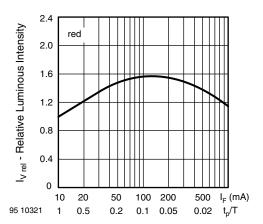


Fig. 7 - Relative Luminous Intensity vs. Forward Current / Duty Cycle

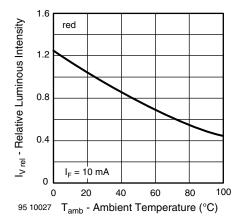


Fig. 8 - Relative Luminous Intensity vs. Ambient Temperature

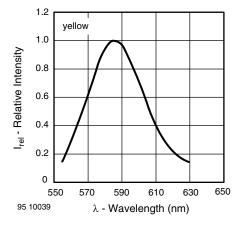


Fig. 9 - Relative Intensity vs. Wavelength

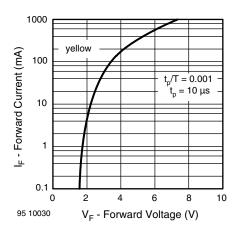


Fig. 10 - Forward Current vs. Forward Voltage

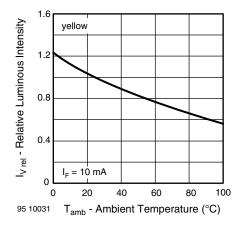


Fig. 11 - Relative Luminous Intensity vs. Ambient Temperature

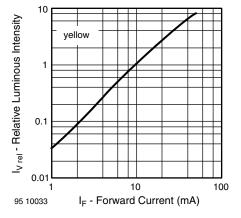


Fig. 12 - Relative Luminous Intensity vs. Forward Current



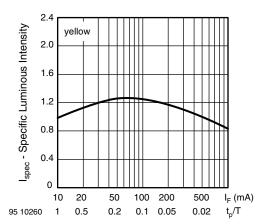
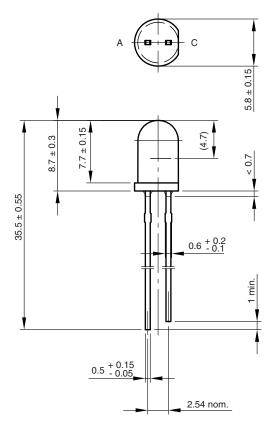
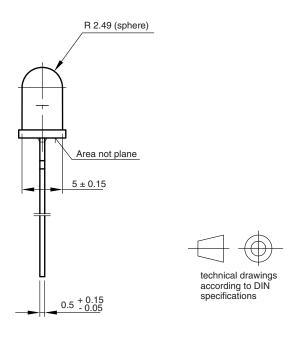


Fig. 13 - Relative Luminous Intensity vs. Forward Current / Duty Cycle

## **PACKAGE DIMENSIONS** in millimeters



6.544-5259.02-4 Issue: 8; 19.05.09 95 10917



## REEL

# 355 52 max. Identification label: Vishay/type/group/tape code/production code/quantity 948641

Fig. 14 - Reel Dimensions

# **TAPE**

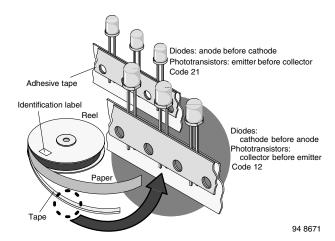


Fig. 15 - LED in Tape

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

## **AMMOPACK**

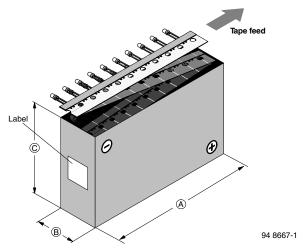
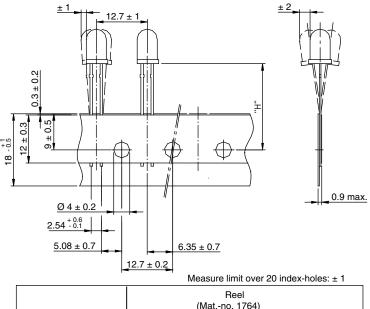


Fig. 16 - Tape Direction

### Note

• The new nomenclature for ammopack 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



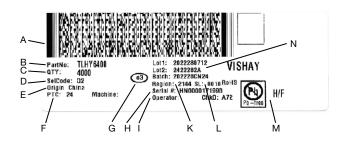
Quantity per:	Reel (Matno. 1764)				
Quantity per.	1000				

94 8172

Option	Dim. "H" ± 0.5 mm
AS	17.3
CS	22.0
MS	25.5

PACKING INFORMATION							
PART	BULK	TAPE AND REEL	AMMOPACK				
TLHx640x	4000	-	-				
TLHx640x-xxxx	-	5 x 1000	-				
TLHx640x-xxxxZ	-	-	5 x 1000				

# **LABEL OF FAN FOLD BOX** (example)



- A. 2D barcode
- B. Part No: Vishay part number
- C. QTY: quantity
- D. SelCode: selection bin code
- E. Country of origin
- F. PTC: production plant code
- G. Termination finish
- H. Region code
- I. Serial#: serial number
- K. Batch number: year, week, country code, plant code
- L. SL: storage location
- M. Environmental symbols: RoHS, lead (Pb)-free, halogen-free
- N. Lot numbers



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Vishay

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