

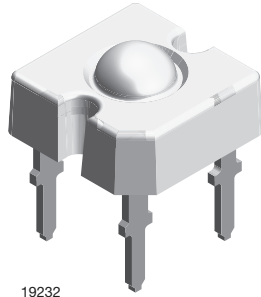


# THE DATASHEET OF TLWR8600





# TELUX LED



19232

## DESCRIPTION

The TELUX series is a clear, non diffused LED for applications where supreme luminous flux is required. It is designed in an industry standard 7.62 mm square package utilizing highly developed AlInGaP technology.

The supreme heat dissipation of TELUX allows applications at high ambient temperatures.

All packing units are binned for luminous flux, forward voltage, and color to achieve the most homogenous light appearance in application.

SAE and ECE color requirements for automobile application are available for color red.

## PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: TELUX
- Product series: power
- Angle of half intensity:  $\pm 30^\circ$

## FEATURES

- High luminous flux
- Supreme heat dissipation:  $R_{thJP}$  is 90 K/W
- High operating temperature:  $T_{amb} = -40^\circ\text{C}$  to  $+110^\circ\text{C}$
- Meets SAE and ECE color requirements for the automobile industry for color red
- Packed in tubes for automatic insertion
- Luminous flux, forward voltage, and color categorized for each tube
- Small mechanical tolerances allow precise usage of external reflectors or lightguides
- Compatible with wave solder processes according to CECC 00802 and J-STD-020
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## APPLICATIONS

- Exterior lighting
- Dashboard illumination
- Tail-, stop-, and turn signals of motor vehicles
- Replaces small incandescent lamps
- Traffic signals and signs

PARTS TABLE														
PART	COLOR	LUMINOUS FLUX (mIm)			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.		
TLWR8600	Red	2000	3700	-	70	611	616	634	70	1.83	2.2	2.67	70	AllnGaP on GaAs
TLWY8600	Yellow	2000	3200	-	70	585	591	597	70	1.83	2.1	2.67	70	AllnGaP on GaAs

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)				
TLWR8600, TLWY8600				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage <sup>(1)</sup>	$I_R = 100 \mu\text{A}$	$V_R$	10	V
DC forward current	$T_{amb} \leq 85^\circ\text{C}$	$I_F$	70	mA
Surge forward current	$t_p \leq 10 \mu\text{s}$	$I_{FSM}$	1	A
Power dissipation		$P_V$	187	mW
Junction temperature		$T_j$	125	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	-40 to +110	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to +110	$^\circ\text{C}$
Soldering temperature	$t \leq 5 \text{ s}$ , 1.5 mm from body preheat temperature $100^\circ\text{C} / 30 \text{ s}$	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction to ambient	With cathode heatsink of $70 \text{ mm}^2$	$R_{thJA}$	200	K/W
Thermal resistance junction to pin		$R_{thJP}$	90	K/W

### Note

<sup>(1)</sup> 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)  
**TLWR8600, RED**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Total flux	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	TLWR8600	$\phi_V$	2000	3700	-	mlm
Luminous intensity/total flux	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$		$I_V/\phi_V$	-	0.8	-	mcd/mlm
Dominant wavelength	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$		$\lambda_d$	611	616	634	nm
Peak wavelength	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$		$\lambda_p$	-	624	-	nm
Angle of half intensity	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$		$\phi$	-	$\pm 30$	-	$^{\circ}$
Total included angle	90 % of total flux captured		$\phi_{0.9V}$	-	75	-	$^{\circ}$
Forward voltage	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	TLWR8600	$V_F$	1.83	2.2	2.67	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		$V_R$	10	20	-	V
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$		$C_j$	-	17	-	pF

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLWY8600, YELLOW**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Total flux	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	$\phi_V$	2000	3200	-	mlm
Luminous intensity/total flux	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	$I_V/\phi_V$	-	0.8	-	mcd/mlm
Dominant wavelength	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	$\lambda_d$	585	591	597	nm
Peak wavelength	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	$\lambda_p$	-	594	-	nm
Angle of half intensity	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	$\phi$	-	$\pm 30$	-	$^{\circ}$
Total included angle	90 % of total flux captured	$\phi_{0.9V}$	-	75	-	$^{\circ}$
Forward voltage	$I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$	$V_F$	1.83	2.1	2.67	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	$V_R$	10	15	-	V
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_j$	-	17	-	pF

**LUMINOUS FLUX CLASSIFICATION**

GROUP	LUMINOUS FLUX (mlm)	
	MIN.	MAX.
STANDARD		
D	2000	3000
E	2500	3600
F	3000	4200
G	3500	4800
H	4000	6100
I	5000	7300
K	6000	9700
L	7000	12 200

**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 tube (there will be no mixing of two groups on each tube).  
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 tube.  
In order to ensure availability, single wavelength groups will not be orderable

**COLOR CLASSIFICATION**

GROUP	DOM. WAVELENGTH (nm)			
	YELLOW		RED	
	MIN.	MAX.	MIN.	MAX.
0	585	588		
1	587	591	611	618
2	589	594	614	622
3	592	597	616	634

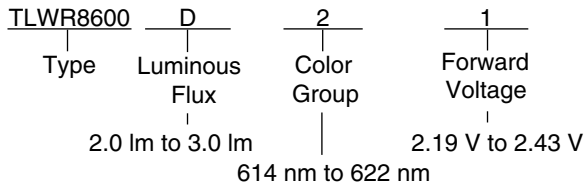
**Note**

- Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of  $\pm 1\text{ nm}$

FORWARD VOLTAGE CLASSIFICATION		
GROUP	FORWARD VOLTAGE (V)	
	MIN.	MAX.
Y	1.83	2.07
Z	1.95	2.19
0	2.07	2.31
1	2.19	2.43
2	2.31	2.55
3	2.43	2.67

**Note**

- Voltages are tested at a current pulse duration of 1 ms



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

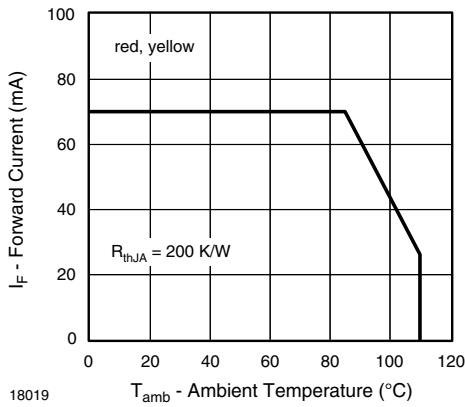


Fig. 1 - Forward Current vs. Ambient Temperature

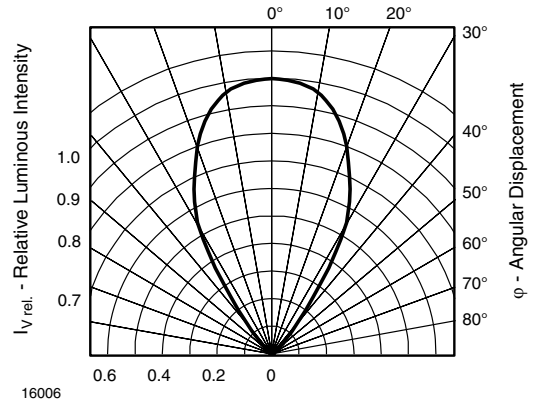


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

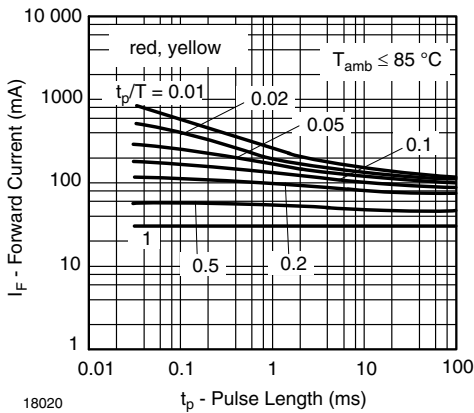


Fig. 2 - Forward Current vs. Pulse Length

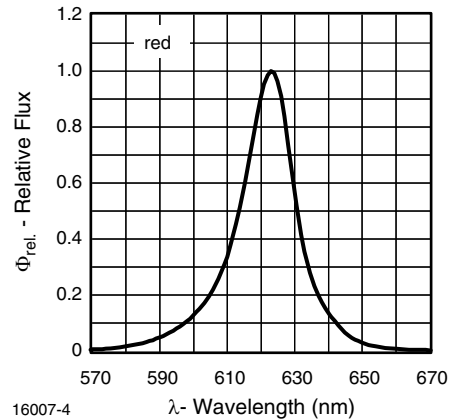


Fig. 4 - Relative Flux vs. Wavelength

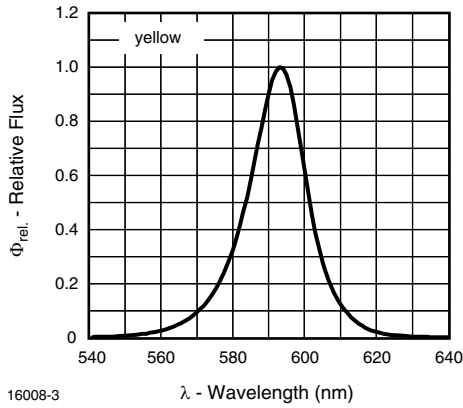


Fig. 5 - Relative Flux vs. Wavelength

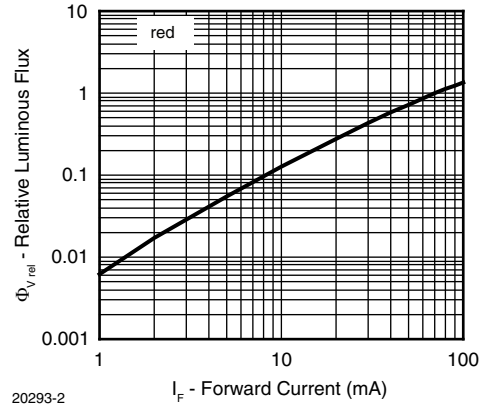


Fig. 8 - Relative Luminous Flux vs. Forward Current

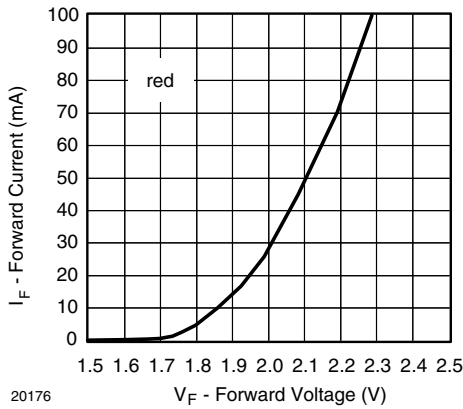


Fig. 6 - Forward Current vs. Forward Voltage

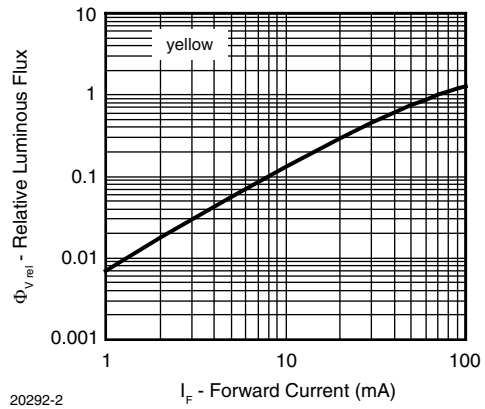


Fig. 9 - Relative Luminous Flux vs. Forward Current

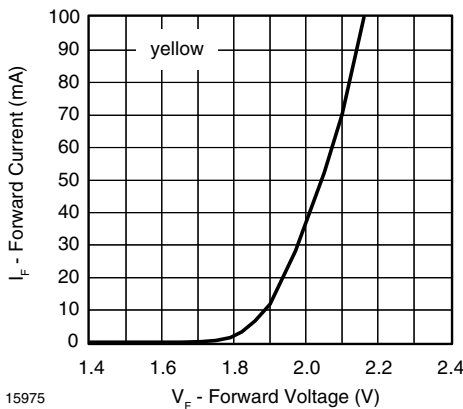


Fig. 7 - Forward Current vs. Forward Voltage

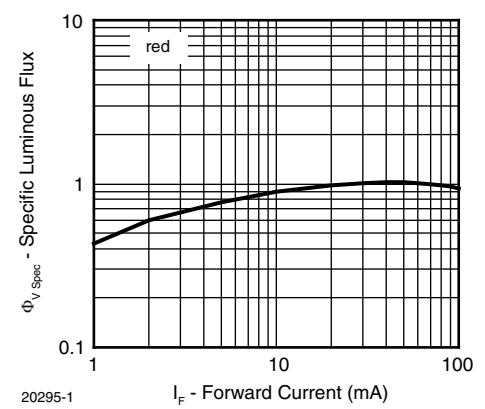


Fig. 10 - Specific Luminous Flux vs. Forward Current

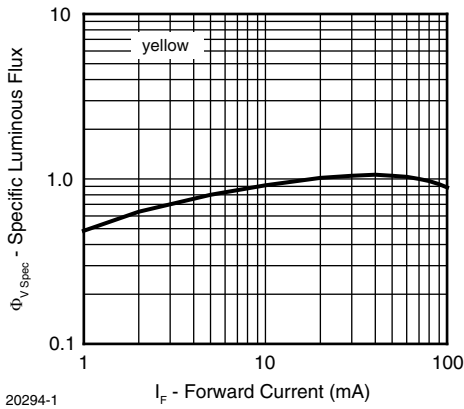


Fig. 11 - Specific Luminous Flux vs. Forward Current

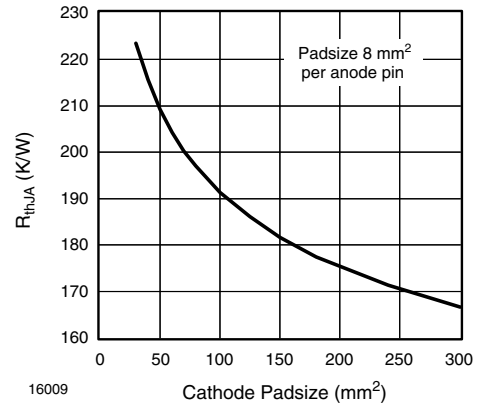


Fig. 14 - Thermal Resistance Junction Ambient vs. Cathode Pads Size

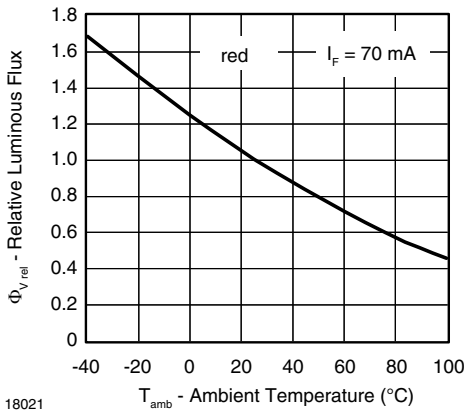


Fig. 12 - Relative Luminous Flux vs. Ambient Temperature

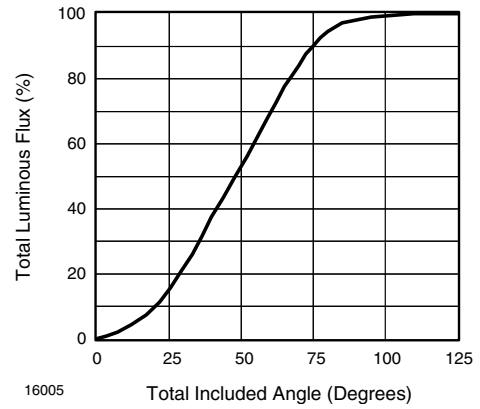


Fig. 15 - Percentage Total Luminous Flux vs. Total Included Angle for 90° Emission Angle

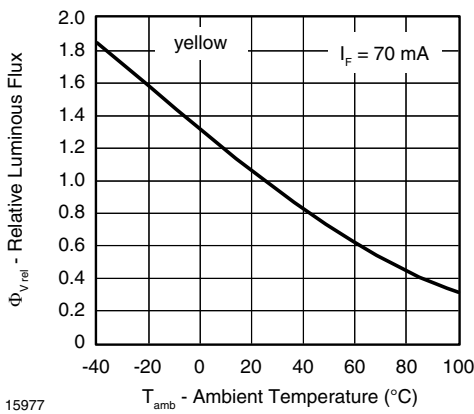
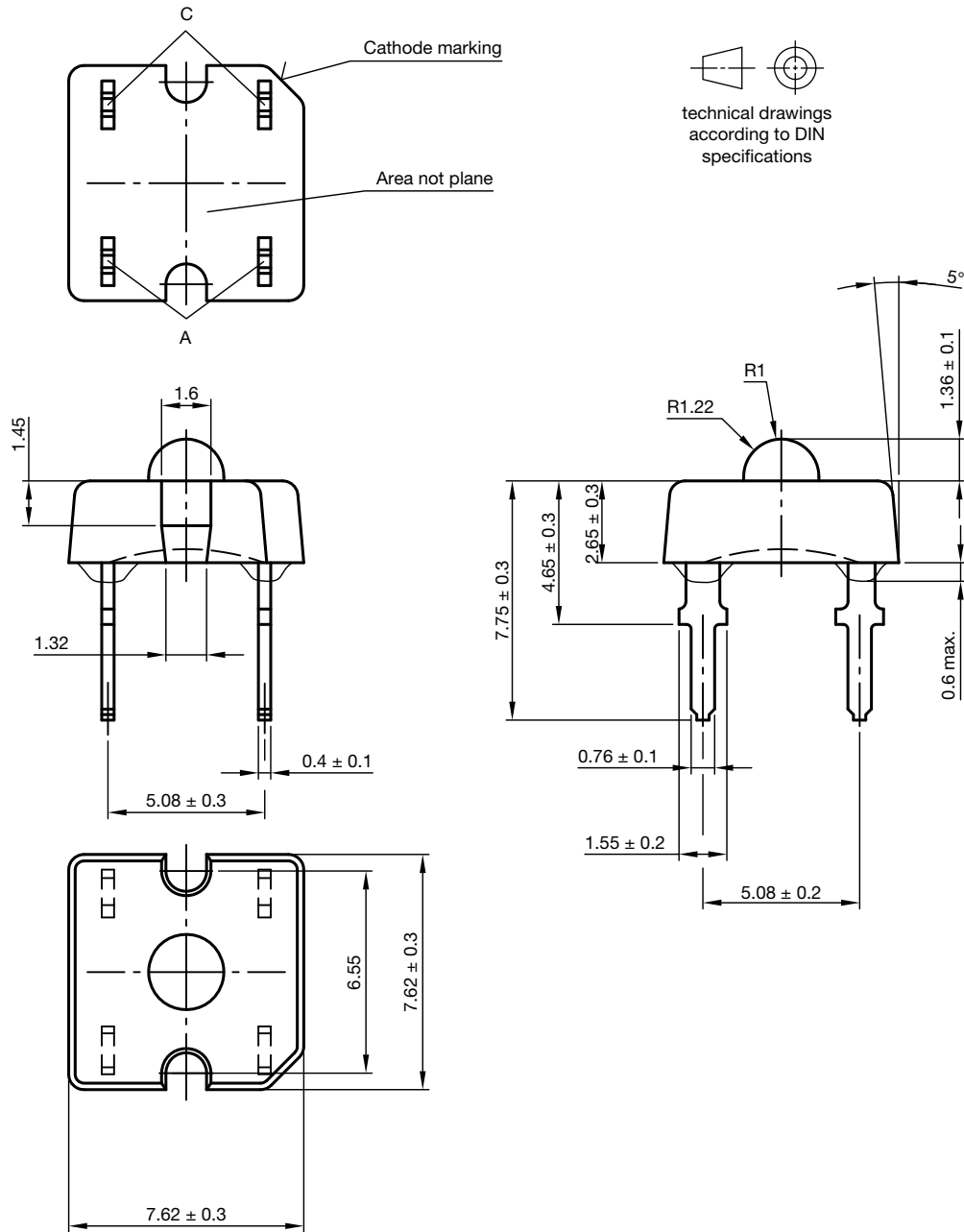


Fig. 13 - Relative Luminous Flux vs. Ambient Temperature



PACKAGE DIMENSIONS in millimeters

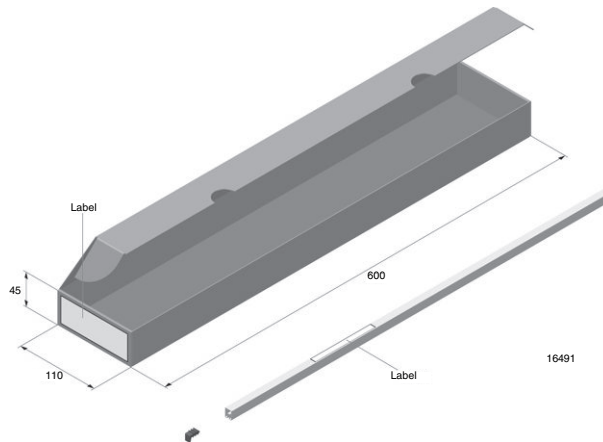


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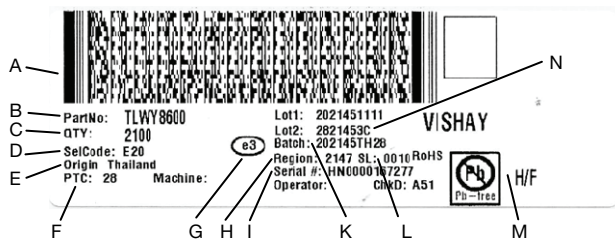
Issue: 4; 25.07.14



FAN FOLD BOX DIMENSIONS in millimeters

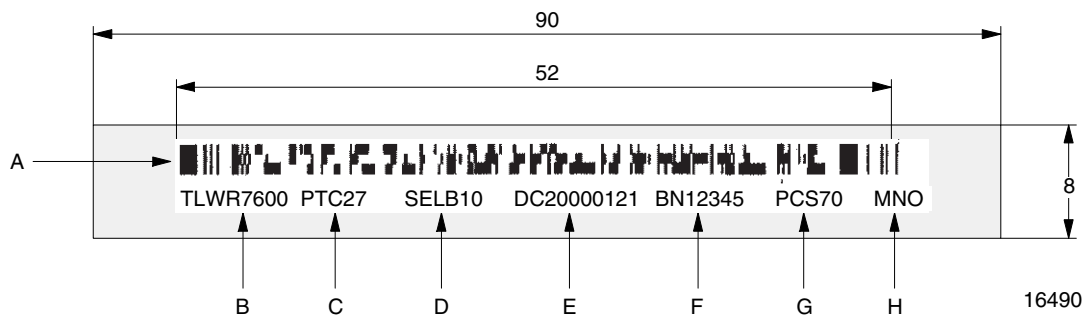


LABEL OF FAN FOLD BOX (example)



- 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

EXAMPLE FOR TELUX TUBE LABEL DIMENSIONS in millimeters

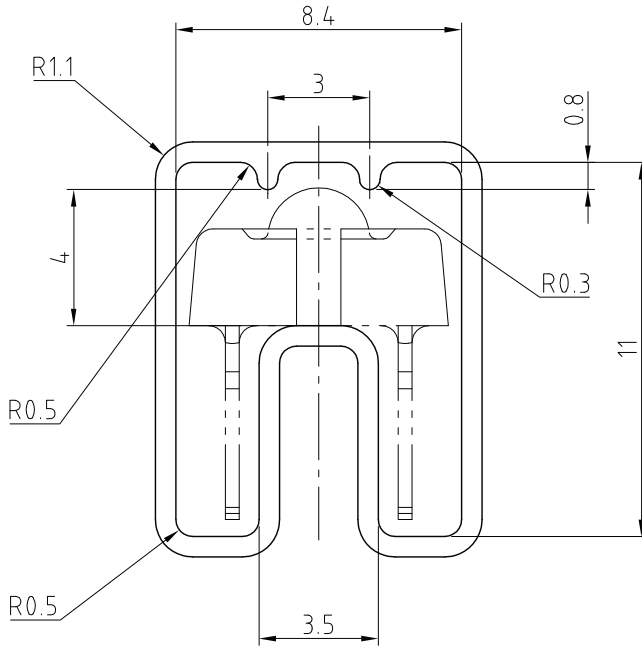


- A. Bar code
- B. Type of component
- C. Manufacturing plant
- D. SEL - selection code (bin):
  - digit 1 - code for luminous flux group
  - digit 2 - code for dominant wavelength group
  - digit 3 - code for forward voltage group
- E. Date code
- f. Batch: no.
- g. Total quantity
- h. Company code

**TUBE WITH BAR CODE LABEL DIMENSIONS** in millimeters

"X"

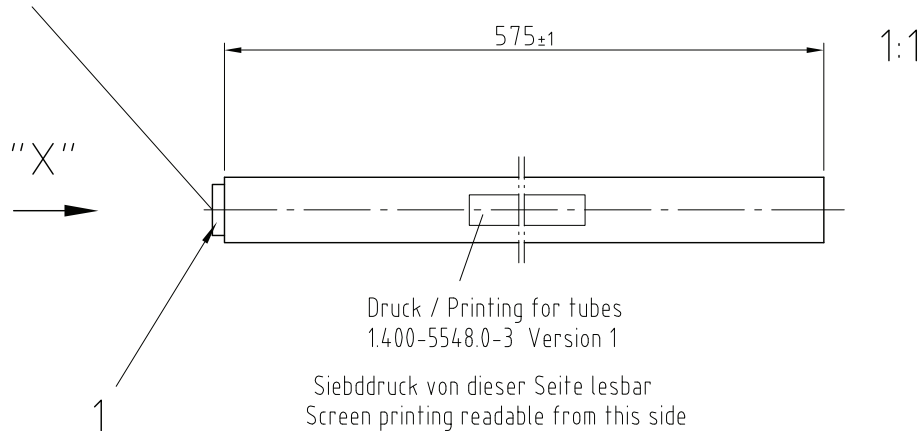
90° gedreht / 90° turned



Wanddicke/wall thickness: 0.6±0.1  
 Geradheit/Straightness 2  
 Schnittwinkel/cut 90° ±1°

Geprüft nach/approved to: LV 5145

Bestücken mit 1 Stopper / equip with 1 stopper



Druck / Printing for tubes  
 1.400-5548.0-3 Version 1

Siebdruck von dieser Seite lesbar  
 Screen printing readable from this side

Drawing-No.: 9.700-5223.0-4  
 Rev. 2; Date: 23.08.99  
 20438

Drawing Proportions not Scaled



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