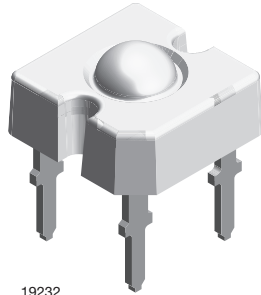


## TELUX LED



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: standard
- Angle of half intensity:  $\pm 30^\circ$

### FEATURES

- High luminous flux
- Supreme heat dissipation:  $R_{thJP}$  is 90 K/W
- High operating temperature:  
 $T_{amb} = -40\text{ }^\circ\text{C}$  to  $+110\text{ }^\circ\text{C}$
- 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)

 AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### 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. |               |                  |
| TLWR7600 | Red    | 1500                | 2800 | -    | 70            | 611             | 618  | 634  | 70            | 1.83                | 2.2  | 2.67 | 70            | AllInGaP on GaAs |
| TLWY7600 | Yellow | 1000                | 2800 | -    | 70            | 585             | 592  | 597  | 70            | 1.83                | 2.1  | 2.67 | 70            | AllInGaP on GaAs |

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

#### TLWR7600, TLWY7600

| PARAMETER                             | TEST CONDITION   | SYMBOL     | VALUE       | UNIT             |
|---------------------------------------|--|------------|-------------|------------------|
| Reverse voltage <sup>(1)</sup>        | $I_R = 100\text{ }\mu\text{A}$   | $V_R$      | 10          | V                |
| DC forward current                    | $T_{amb} \leq 85\text{ }^\circ\text{C}$  | $I_F$      | 70          | mA               |
| Surge forward current                 | $t_p \leq 10\text{ }\mu\text{s}$   | $I_{FSM}$  | 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 $100\text{ }^\circ\text{C} / 30\text{ s}$ | $T_{sd}$   | 260         | $^\circ\text{C}$ |
| Thermal resistance junction / ambient | With cathode heatsink of $70\text{ mm}^2$  | $R_{thJA}$ | 200         | K/W              |
| Thermal resistance junction / 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)  
**TLWR7600, RED**

| PARAMETER                                  | TEST CONDITION                                     | SYMBOL             | MIN. | TYP.     | MAX. | UNIT       |
|--|--|--------------------|------|----------|------|------------|
| Total flux                                 | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $\phi_V$           | 1500 | 2800     | -    | 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  | 618      | 634  | nm         |
| Peak wavelength                            | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $\lambda_p$        | -    | 626      | -    | nm         |
| Angle of half intensity                    | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $\varphi$          | -    | $\pm 30$ | -    | $^{\circ}$ |
| Total included angle                       | 90 % of total flux captured                        | $\varphi_{0.9V}$   | -    | 75       | -    | $^{\circ}$ |
| Forward voltage                            | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $V_F$              | 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         |
| Temperature coefficient of $\lambda_{dom}$ | $I_F = 50\text{ mA}$                               | $T_C\lambda_{dom}$ | -    | 0.05     | -    | nm/K       |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLWY7600, YELLOW**

| PARAMETER                                  | TEST CONDITION                                     | SYMBOL             | MIN. | TYP.     | MAX. | UNIT       |
|--|--|--------------------|------|----------|------|------------|
| Total flux                                 | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $\phi_V$           | 1000 | 2800     | -    | 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  | 592      | 597  | nm         |
| Peak wavelength                            | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $\lambda_p$        | -    | 595      | -    | nm         |
| Angle of half intensity                    | $I_F = 70\text{ mA}$ , $R_{thJA} = 200\text{ K/W}$ | $\varphi$          | -    | $\pm 30$ | -    | $^{\circ}$ |
| Total included angle                       | 90 % of total flux captured                        | $\varphi_{0.9V}$   | -    | 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                       | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$            | $C_j$              | -    | 32       | -    | pF         |
| Temperature coefficient of $\lambda_{dom}$ | $I_F = 50\text{ mA}$                               | $T_C\lambda_{dom}$ | -    | 0.1      | -    | nm/K       |

**LUMINOUS FLUX CLASSIFICATION**

| GROUP    | LUMINOUS FLUX (mlm) |      |
|----------|---------------------|------|
|          | MIN.                | MAX. |
| STANDARD |                     |      |
| B        | 1000                | 1800 |
| C        | 1500                | 2400 |
| D        | 2000                | 3000 |
| E        | 2500                | 3600 |
| F        | 3000                | 4200 |
| G        | 3500                | 4800 |
| H        | 4000                | 6100 |
| I        | 5000                | 7300 |

**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  |

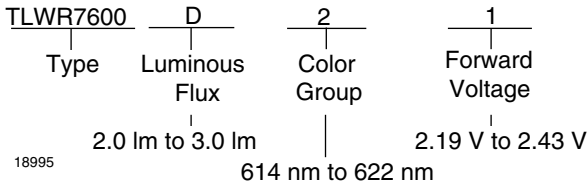
**Note**

- 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)

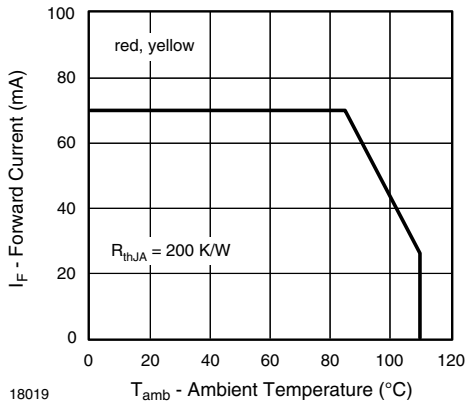


Fig. 1 - Forward Current vs. Ambient Temperature

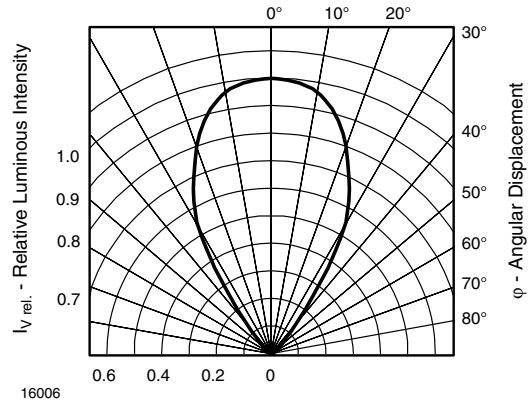


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

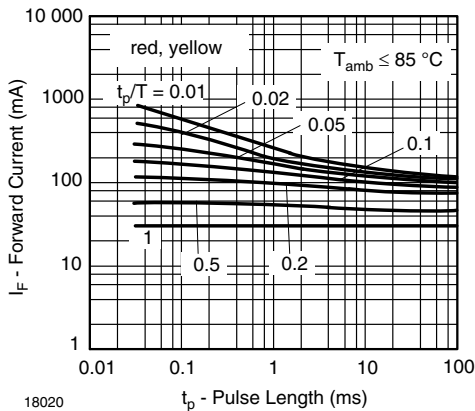


Fig. 2 - Forward Current vs. Pulse Length

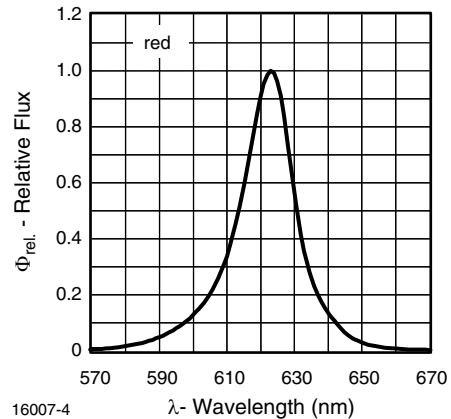


Fig. 4 - Relative Flux vs. Wavelength

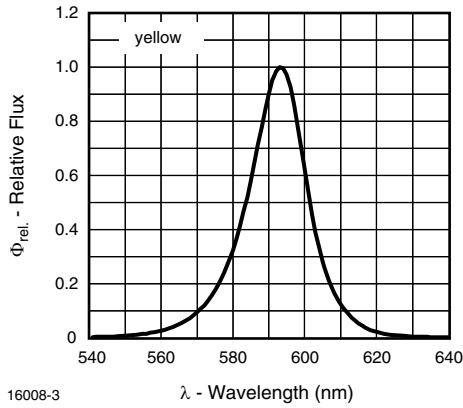


Fig. 5 - Relative Flux vs. Wavelength

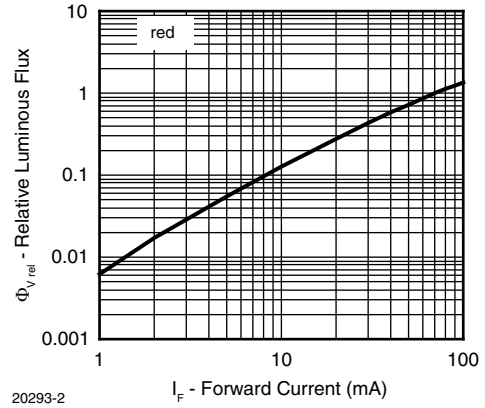


Fig. 8 - Relative Luminous Flux vs. Forward Current

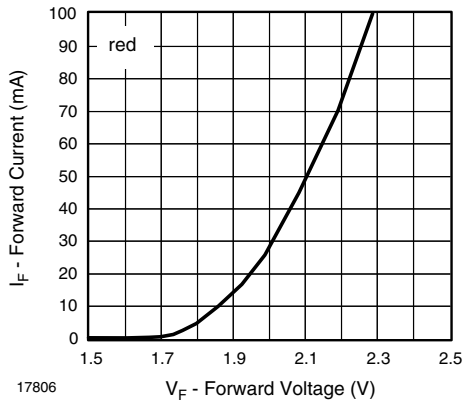


Fig. 6 - Forward Current vs. Forward Voltage

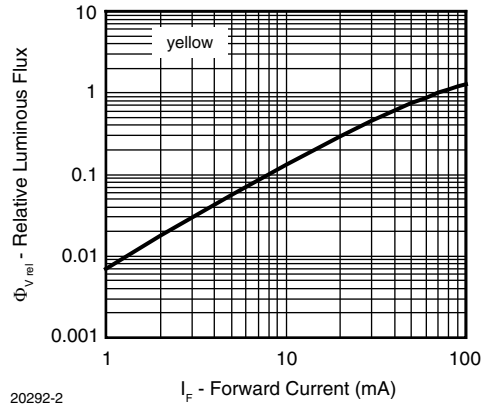


Fig. 9 - Relative Luminous Flux vs. Forward Current

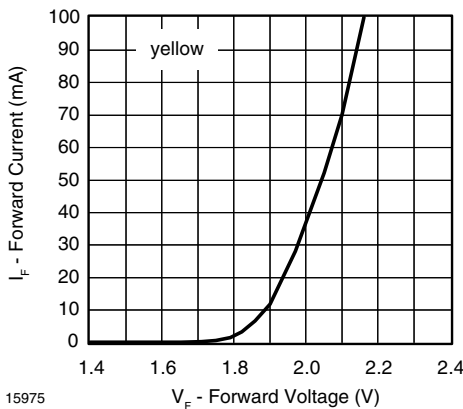


Fig. 7 - Forward Current vs. Forward Voltage

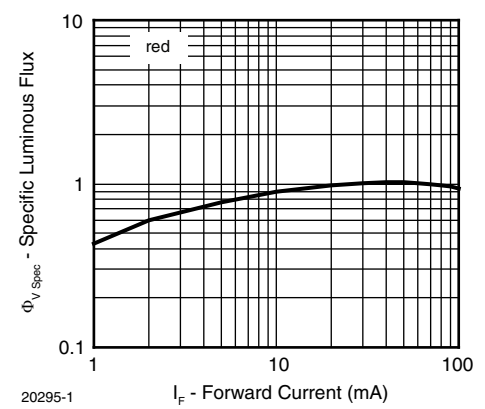


Fig. 10 - Specific Luminous Flux vs. Forward Current

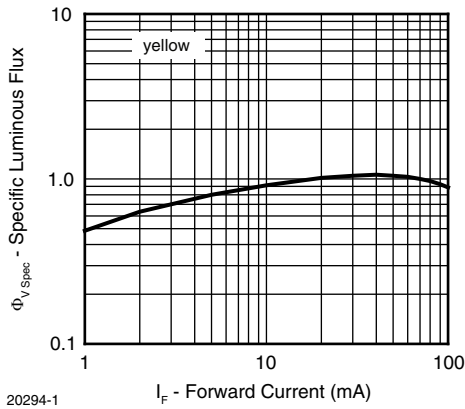


Fig. 11 - Specific Luminous Flux vs. Forward Current

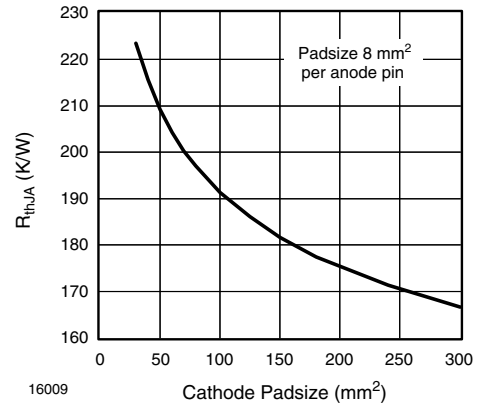


Fig. 14 - Thermal Resistance Junction Ambient vs. Cathode Padsize

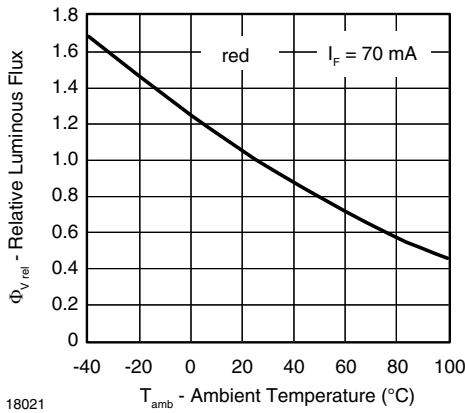


Fig. 12 - Relative Luminous Flux vs. Ambient Temperature

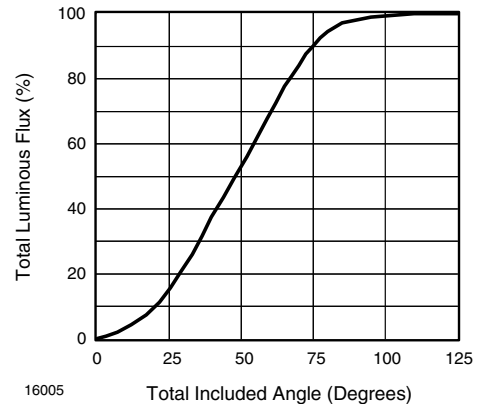


Fig. 15 - Percentage Total Luminous Flux vs. Total Included Angle for 90° Emission Angle

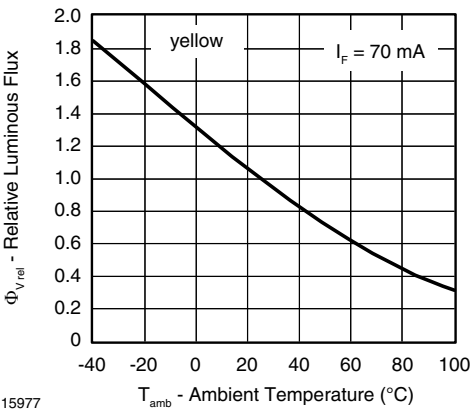
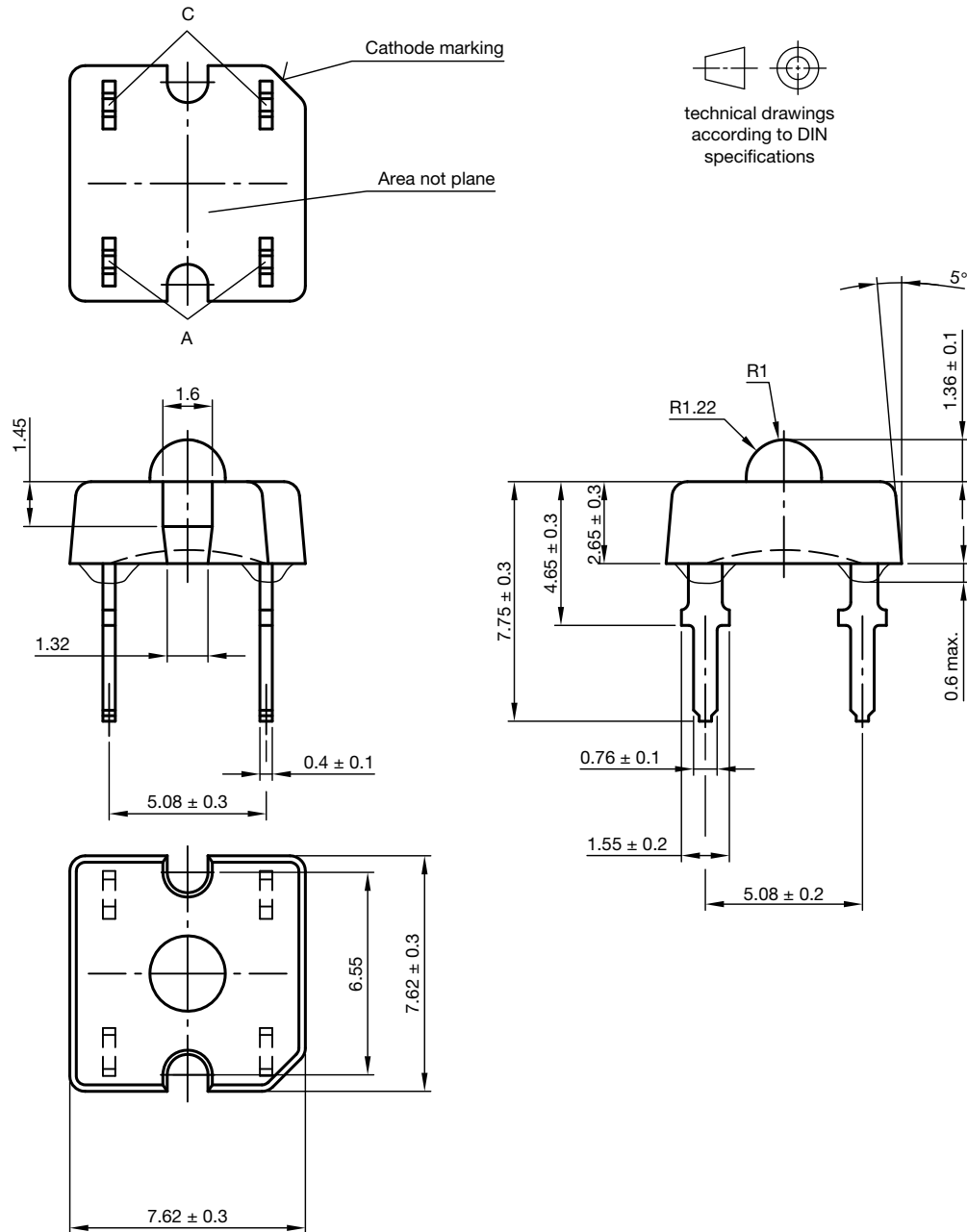


Fig. 13 - Relative Luminous Flux vs. Ambient Temperature



## PACKAGE DIMENSIONS in millimeters

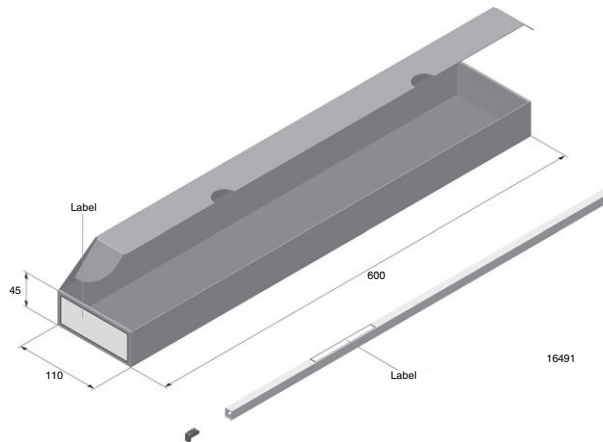


Drawing-No.: 6.544-5321.02-4

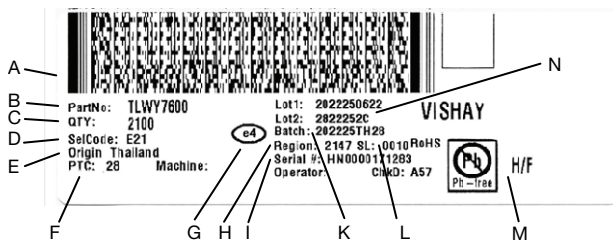
Issue: 4; 25.07.14



FAN FOLD BOX DIMENSIONS in millimeters

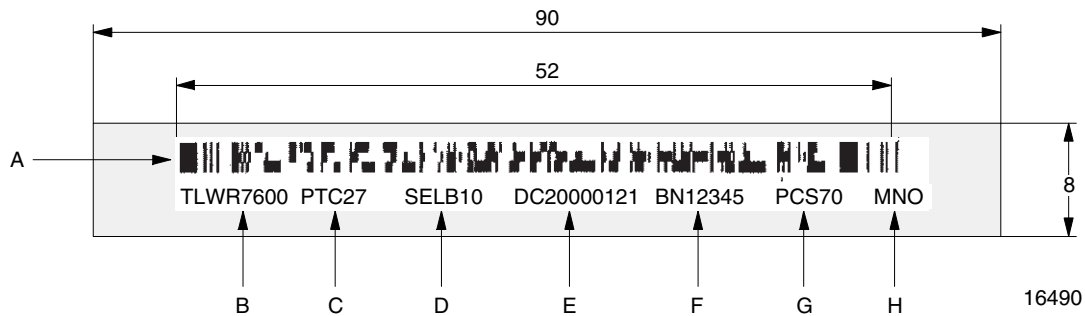


LABEL OF FAN FOLD BOX (example)



- 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

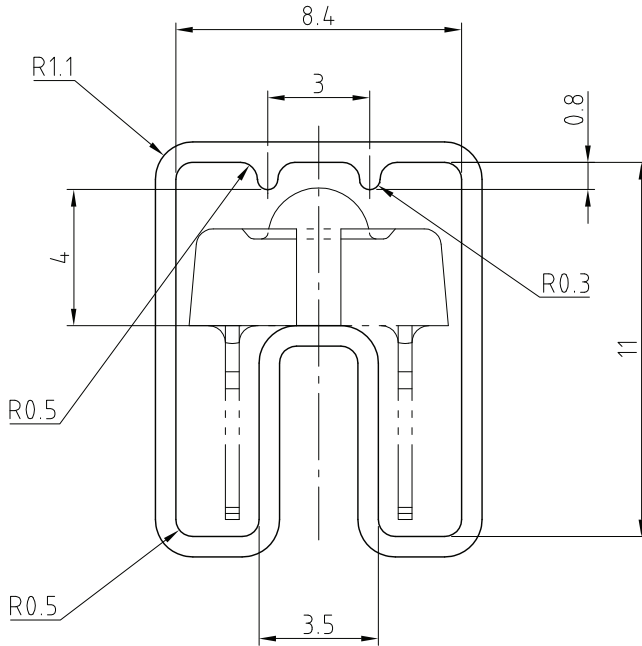


- A. Bar code
- B. Type of component
- C. Manufacturing plant
- D. SEL - selection code (bin):
  - digit 1 - code for luminous flux group
  - digit 2 - code for dominant wavelength group
  - digit 3 - code for forward voltage group
- E. Date code
- F. Batch: no.
- G. Total quantity
- H. Company code

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

"X"

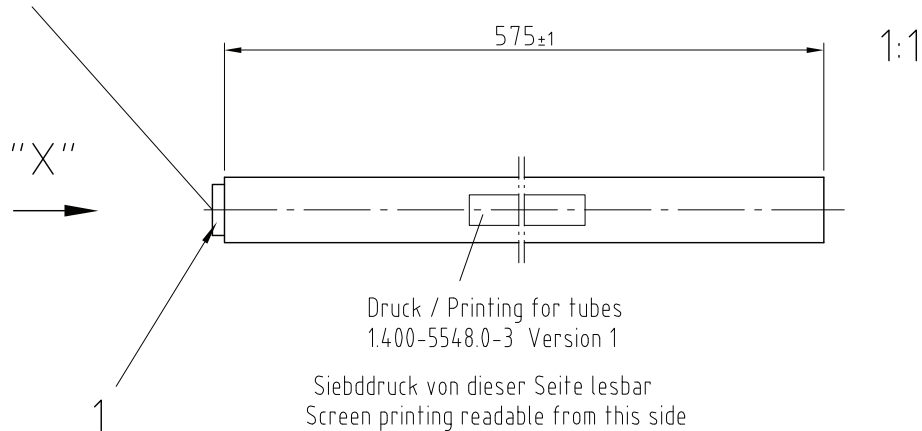
90° gedreht / 90° turned



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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