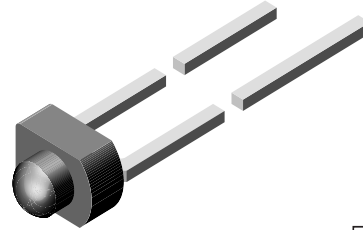


## Universal LED, $\varnothing$ 1.8 mm Tinted Diffused Miniplast Package

### Features

- Three colors
- For DC and pulse operation
- Luminous intensity categorized
- End-to-end stackable in centre-to-centre spacing of 0.1" (2.54 mm)
- Lead-free device



19229



### Applications

General indicating and lighting purposes

### Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity ( $\pm\phi$ )	Technology
TLUO2400	Red, $I_V > 1.6$ mcd	20 °	GaAsP on GaP
TLUO2401	Red, $I_V = (4 \text{ to } 20)$ mcd	20 °	GaAsP on GaP
TLUY2400	Yellow, $I_V > 1$ mcd	20 °	GaAsP on GaP
TLUY2401	Yellow, $I_V = (2.5 \text{ to } 12.5)$ mcd	20 °	GaAsP on GaP
TLUG2400	Green, $I_V > 1.6$ mcd	20 °	GaP on GaP
TLUG2401	Green, $I_V = (4 \text{ to } 20)$ mcd	20 °	GaP on GaP

### Absolute Maximum Ratings

$T_{amb} = 25$  °C, unless otherwise specified

TLUO240. , TLUY240. , TLUG240.

Parameter	Test condition	Part	Symbol	Value	Unit
Reverse voltage			$V_R$	6	V
DC Forward current		TLUO2400	$I_F$	30	mA
		TLUY2400	$I_F$	30	mA
		TLUG2400	$I_F$	30	mA
Surge forward current	$t_p \leq 10$ $\mu$ s		$I_{FSM}$	1	A
Power dissipation	$T_{amb} \leq 55$ °C	TLUO2400	$P_V$	100	mW
		TLUY2400	$P_V$	100	mW
		TLUG2400	$P_V$	100	mW
Junction temperature			$T_j$	100	°C
Operating temperature range			$T_{amb}$	- 40 to + 100	°C
Storage temperature range			$T_{stg}$	- 55 to + 100	°C
Soldering temperature	$t \leq 3$ s, 2 mm from body		$T_{sd}$	260	°C
	$t \leq 5$ s, 4 mm from body		$T_{sd}$	260	°C
Thermal resistance junction/ambient		TLUO2400	$R_{thJA}$	450	K/W
		TLUY2400	$R_{thJA}$	450	K/W
		TLUG2400	$R_{thJA}$	450	K/W

### Optical and Electrical Characteristics

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

#### Red

##### TLUO240.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10\text{ mA}$	TLUO2400	$I_V$	1.6	2		mcd
		TLUO2401	$I_V$	4	5	20	mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	612		625	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		630		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 20$		deg
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	$V_R = 0, f = 1\text{ MHz}$		$C_j$		50		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

#### Yellow

##### TLUY240.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10\text{ mA}$	TLUY2400	$I_V$	1	4		mcd
		TLUY2401	$I_V$	2.5	8	12.5	mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	581		594	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		585		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 20$		deg
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	$V_R = 0, f = 1\text{ MHz}$		$C_j$		50		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

#### Green

##### TLUG240.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity <sup>1)</sup>	$I_F = 10\text{ mA}$	TLUG2400	$I_V$	1.6	5		mcd
		TLUG2401	$I_V$	4	12	20	mcd
Dominant wavelength	$I_F = 10\text{ mA}$		$\lambda_d$	562		575	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$		565		nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$		$\pm 20$		deg
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	$V_R = 0, f = 1\text{ MHz}$		$C_j$		50		pF

<sup>1)</sup> in one Packing Unit  $I_{Vmin}/I_{Vmax} \leq 0.5$

## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

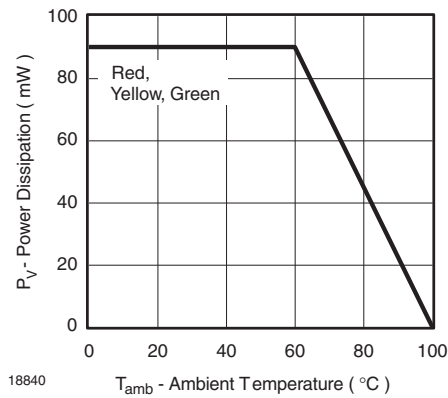


Figure 1. Power Dissipation vs. Ambient Temperature

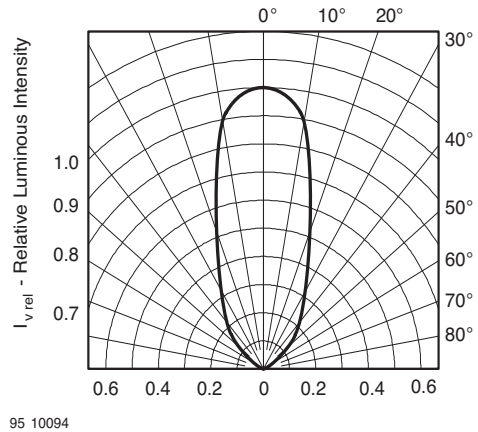


Figure 4. Rel. Luminous Intensity vs. Angular Displacement

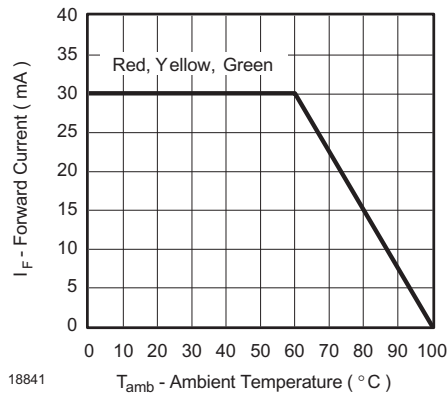


Figure 2. Forward Current vs. Ambient Temperature

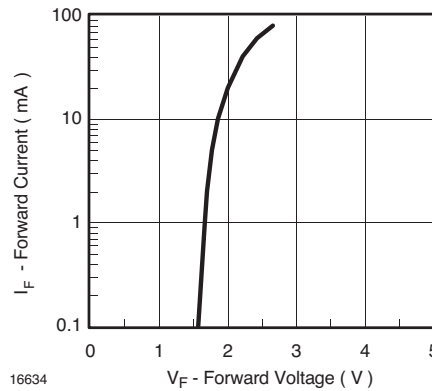


Figure 5. Forward Current vs. Forward Voltage

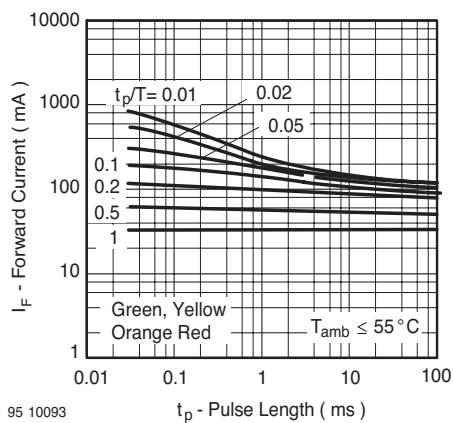


Figure 3. Forward Current vs. Pulse Length

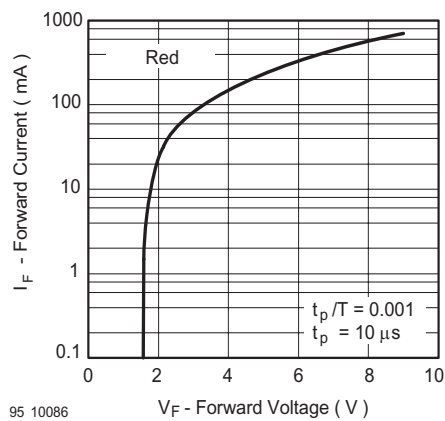


Figure 6. Forward Current vs. Forward Voltage

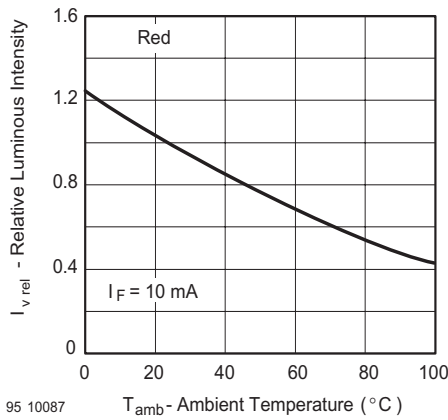


Figure 7. Rel. Luminous Intensity vs. Ambient Temperature

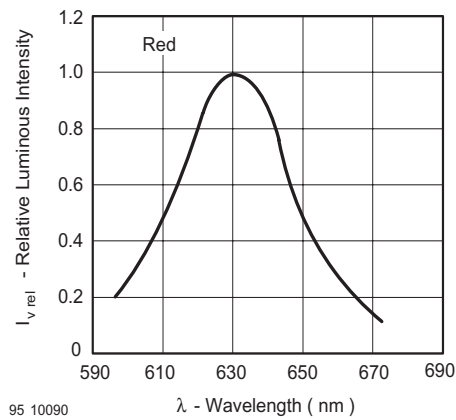


Figure 10. Relative Intensity vs. Wavelength

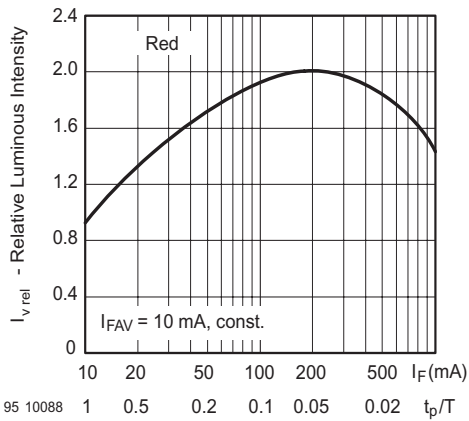


Figure 8. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

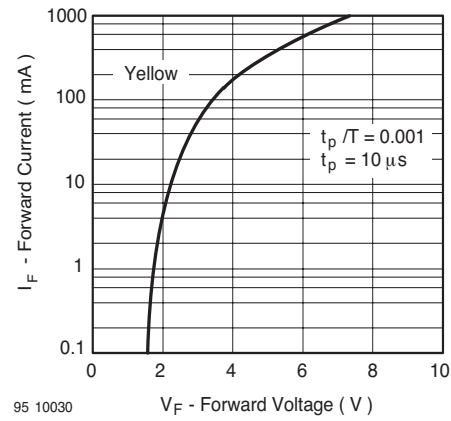


Figure 11. Forward Current vs. Forward Voltage

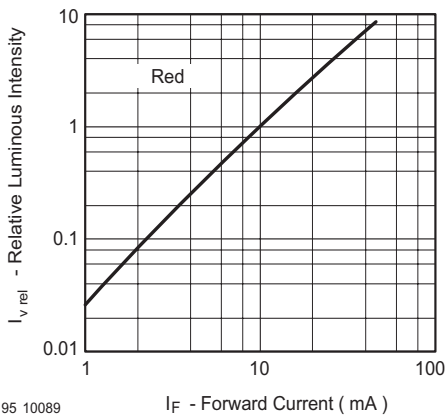


Figure 9. Relative Luminous Intensity vs. Forward Current

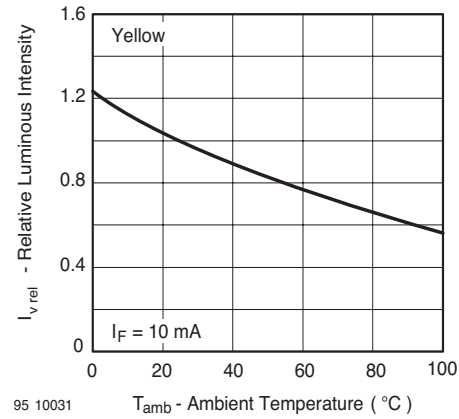


Figure 12. Rel. Luminous Intensity vs. Ambient Temperature

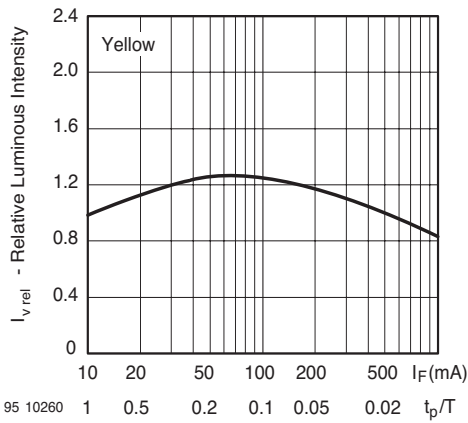


Figure 13. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

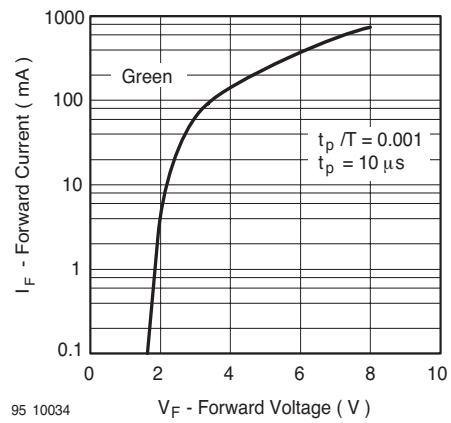


Figure 16. Forward Current vs. Forward Voltage

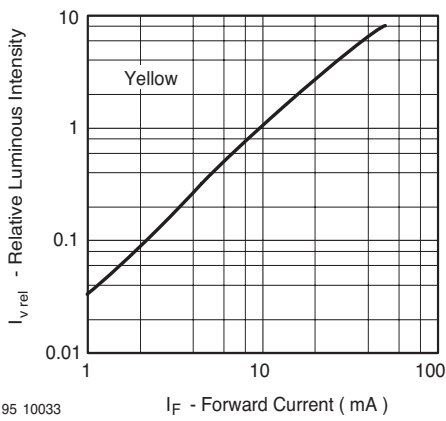


Figure 14. Relative Luminous Intensity vs. Forward Current

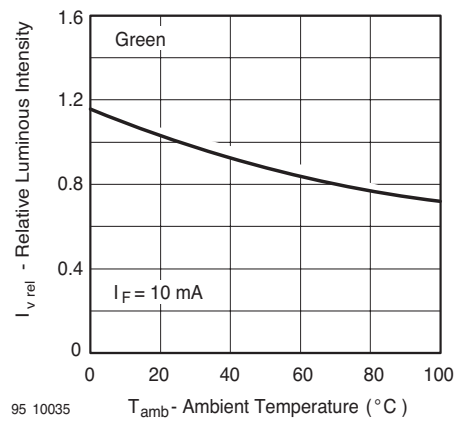


Figure 17. Rel. Luminous Intensity vs. Ambient Temperature

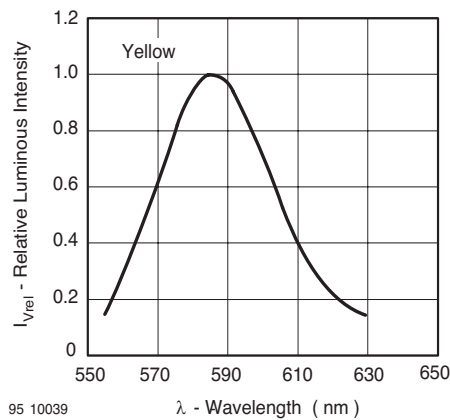


Figure 15. Relative Intensity vs. Wavelength

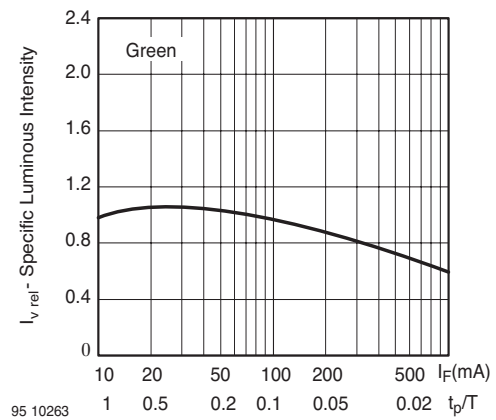


Figure 18. Specific Luminous Intensity vs. Forward Current

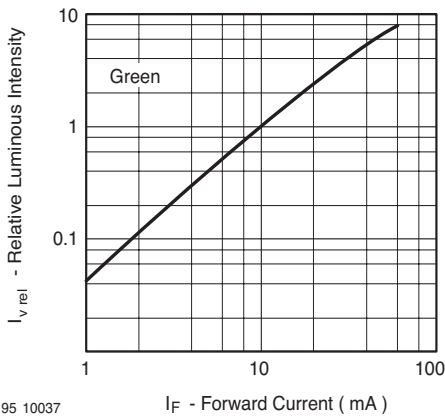


Figure 19. Relative Luminous Intensity vs. Forward Current

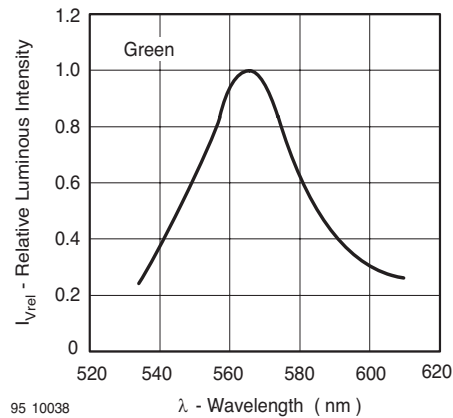
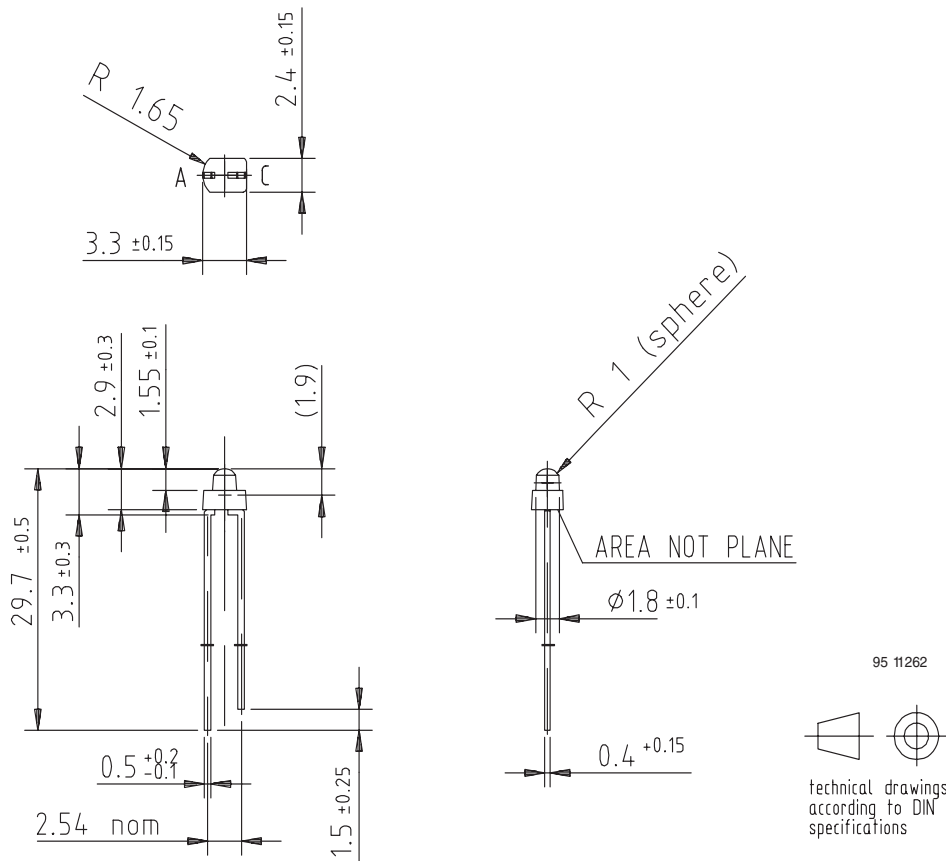


Figure 20. Relative Intensity vs. Wavelength

## Package Dimensions in mm





## **Ozone Depleting Substances Policy Statement**

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423