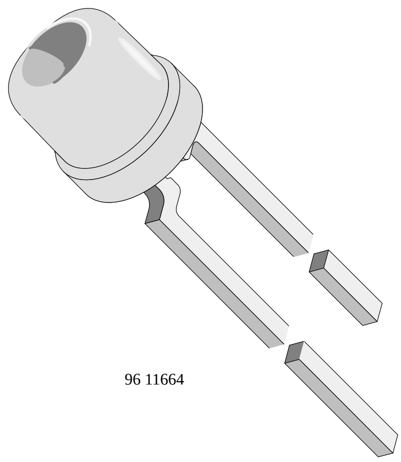
Backlighting LED in ø 3 mm Tinted Non-Diffused Package

Color	Type	Technology	Angle of Half Intensity ±φ
High efficiency red	TLVH4200	GaAsP on GaP	85°
Soft orange	TLVS4200	GaAsP on GaP	85°
Yellow	TLVY4200	GaAsP on GaP	85°
Green	TLVG4200	GaP on GaP	85°
Pure green	TLVP4200	GaP on GaP	85°

Description

The TLV.4200 series was developed for backlighting. Due to its special shape the spatial distribution of the radiation is qualified for backlighting.
To optimize the brightness of backlighting a custom–built reflector (with scattering) is required. Uniform illumination can be enhanced by covering the front of the reflector with diffusor material.
This is a flexible solution for backlighting different areas.



Features

- High light output
- Wide viewing angle
- Categorized for luminous flux
- Tinted clear package
- Low power dissipation
- Low self heating
- Rugged design
- High reliability

Applications

Backlighting of display panels, LCD displays,
symbols on switches, keyboards, graphic boards and measuring scales
Illumination of large areas e.g. dot matrix displays

Absolute Maximum Ratings

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

TLVH4200 ,TLVS4200 ,TLVY4200 ,TLVG4200 ,TLVP4200

Parameter	Test Conditions	Symbol	Value	Unit
Reverse voltage		V_R	6	V
DC forward current	$T_{amb} \leq 60°C$	I_F	30	mA
Surge forward current	$t_p \leqq 10\ \mu s$	I_{FSM}	1	A
Power dissipation	$T_{amb} \leq 60°C$	P_V	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	–20 to +100	°C
Storage temperature range		T_{stg}	–55 to +100	°C
Soldering temperature	$t \leqq 5$ s, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ambient		R_{thJA}	400	K/W

Optical and Electrical Characteristics

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

High efficiency red (**TLVH4200**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous flux	I_F = 15 mA		ϕ_V	10	25		mlm
Dominant wavelength	I_F = 10 mA		λ_d	612		625	nm
Peak wavelength	I_F = 10 mA		λ_p		635		nm
Angle of half intensity	I_F = 10 mA		φ		±85		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 μA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Soft orange (**TLVS4200**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous flux	I_F = 15 mA		ϕ_V	10	25		mlm
Dominant wavelength	I_F = 10 mA		λ_d	598		611	nm
Peak wavelength	I_F = 10 mA		λ_p		605		nm
Angle of half intensity	I_F = 10 mA		φ		±85		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 μA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Yellow (**TLVY4200**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous flux	I_F = 15 mA		ϕ_V	10	20		mlm
Dominant wavelength	I_F = 10 mA		λ_d	581		594	nm
Peak wavelength	I_F = 10 mA		λ_p		585		nm
Angle of half intensity	I_F = 10 mA		φ		±85		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 μA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Green (**TLVG4200**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous flux	I_F = 15 mA		ϕ_V	10	30		mlm
Dominant wavelength	I_F = 10 mA		λ_d	562		575	nm
Peak wavelength	I_F = 10 mA		λ_p		565		nm
Angle of half intensity	I_F = 10 mA		φ		±85		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 μA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Pure green (**TLVP4200**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous flux	I_F = 15 mA		ϕ_V	4	10		mlm
Dominant wavelength	I_F = 10 mA		λ_d	555		565	nm
Peak wavelength	I_F = 10 mA		λ_p		555		nm
Angle of half intensity	I_F = 10 mA		φ		±85		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 μA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Typical Characteristics (T$_{amb}$ = 25°C, unless otherwise specified)

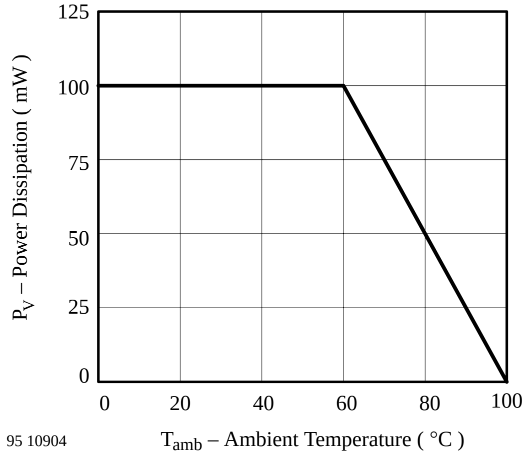


Figure 1 Power Dissipation vs. Ambient Temperature

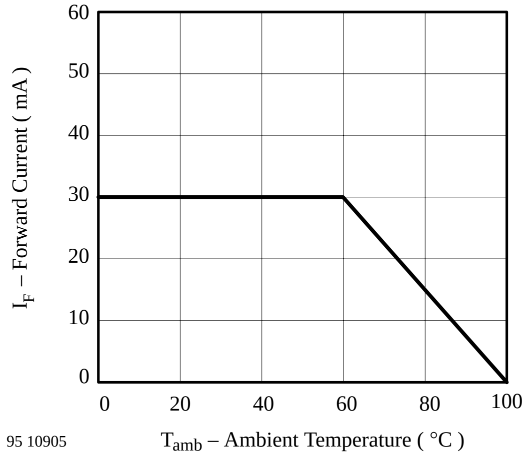


Figure 2 Forward Current vs. Ambient Temperature

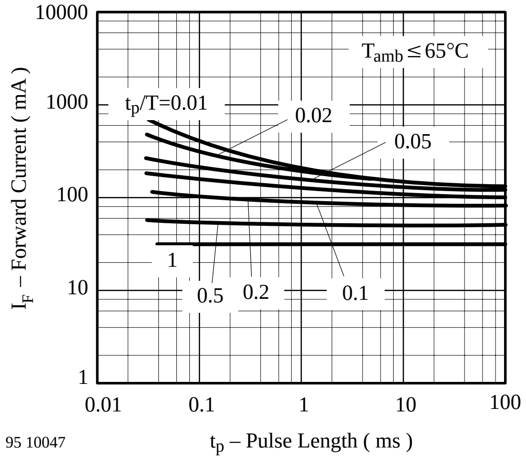


Figure 3 Forward Current vs. Pulse Length

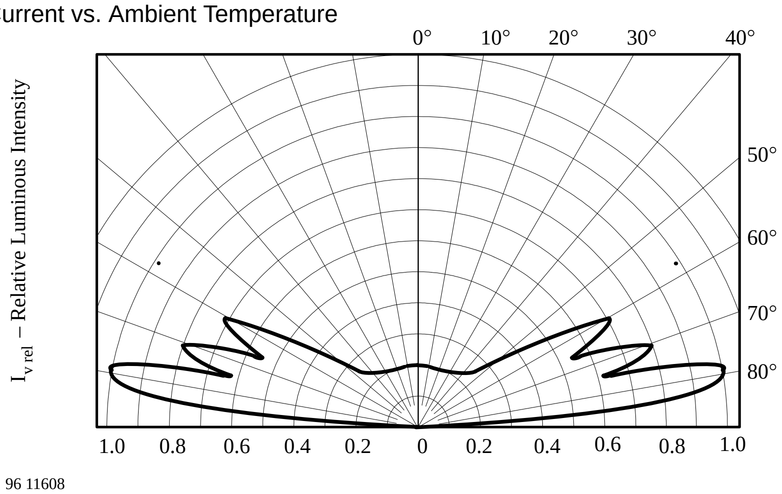


Figure 4 Rel. Luminous Intensity vs. Angular Displacement

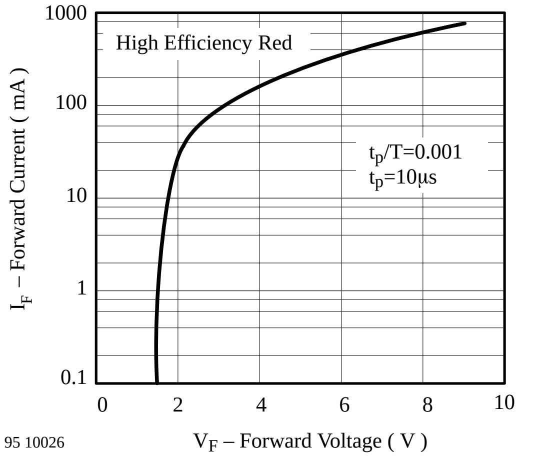


Figure 5 Forward Current vs. Forward Voltage

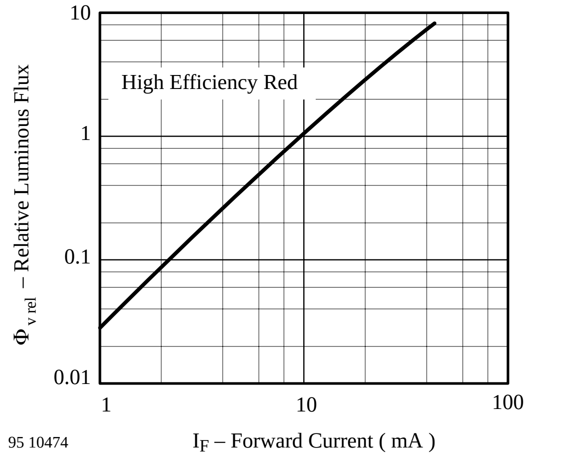


Figure 8 Relative Luminous Flux vs. Forward Current

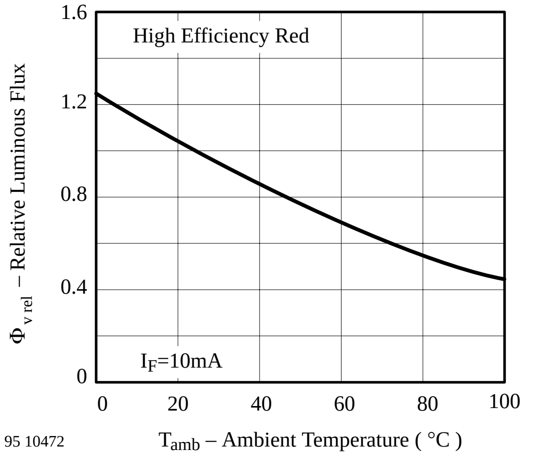


Figure 6 Rel. Luminous Flux vs. Ambient Temperature

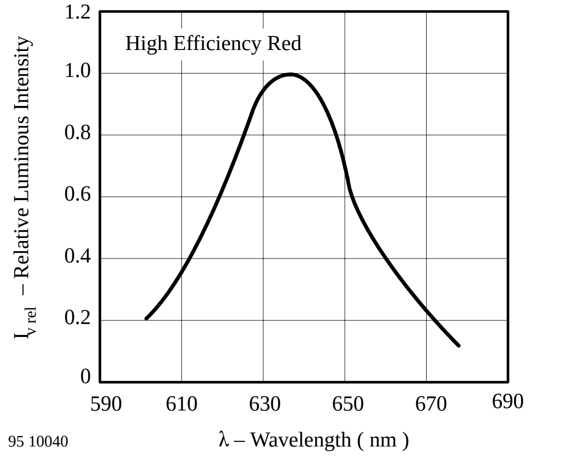


Figure 9 Relative Luminous Intensity vs. Wavelength

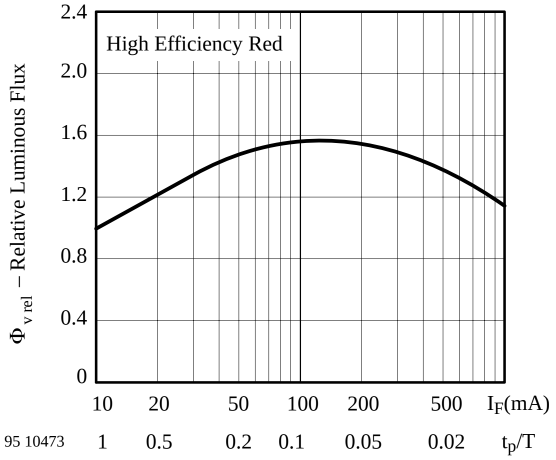


Figure 7 Rel. Luminous Flux vs.
Forw. Current/Duty Cycle

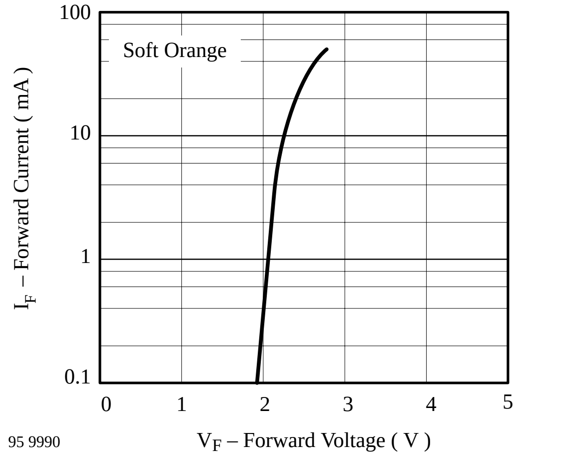


Figure 10 Forward Current vs. Forward Voltage

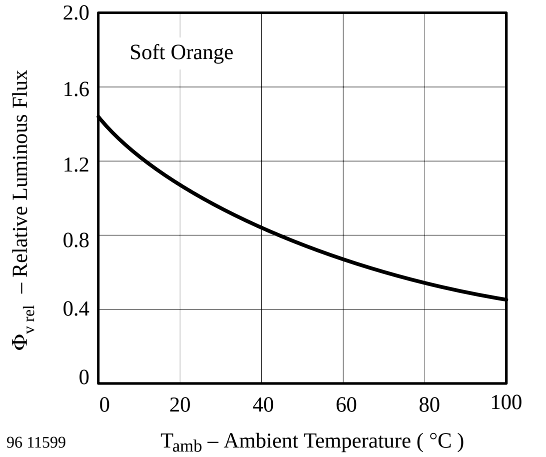


Figure 11 Rel. Luminous Flux vs. Ambient Temperature

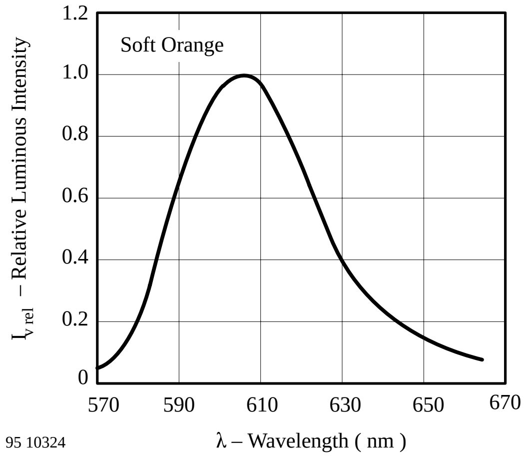


Figure 14 Relative Luminous Intensity vs. Wavelength

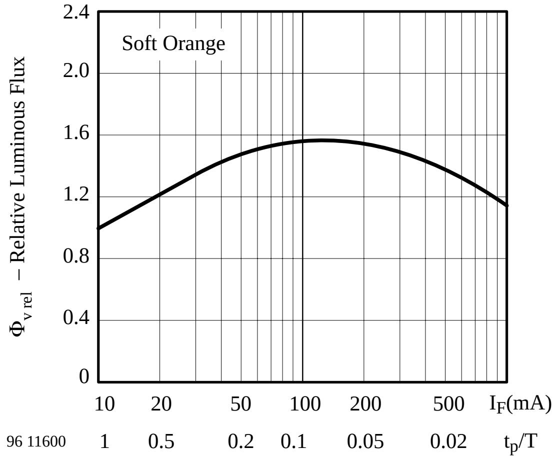


Figure 12 Rel. Luminous Flux vs. Forw. Current/Duty Cycle

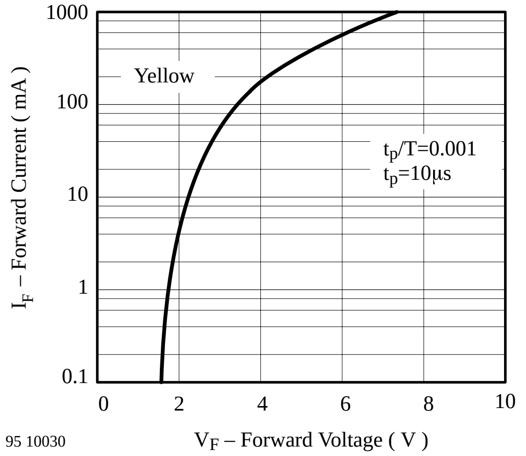


Figure 15 Rel. Luminous Flux vs. Ambient Temperature

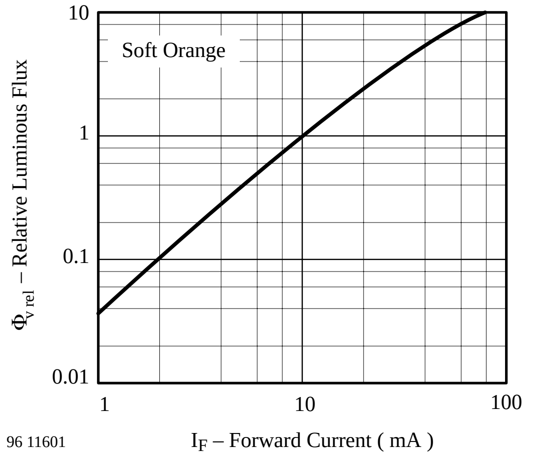


Figure 13 Relative Luminous Flux vs. Forward Current

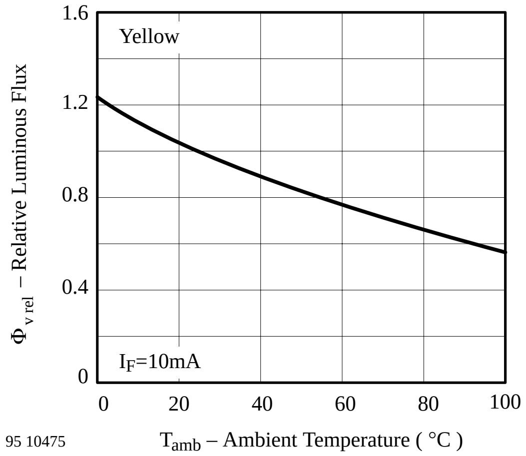


Figure 16 Rel. Luminous Flux vs. Ambient Temperature

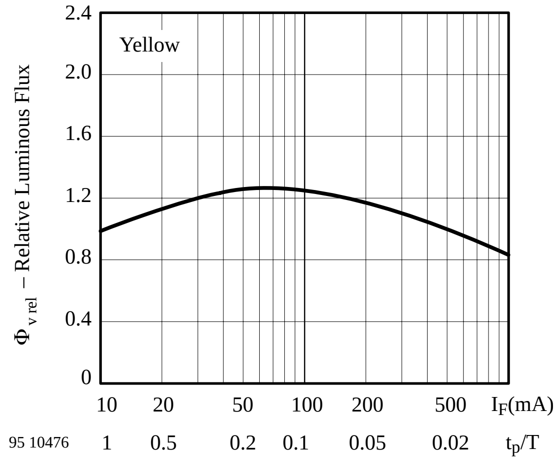


Figure 17 Rel. Luminous Flux vs. Forw. Current/Duty Cycle

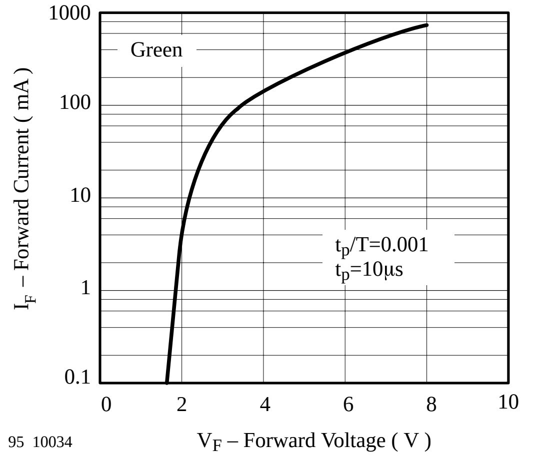


Figure 20 Forward Current vs. Forward Voltage

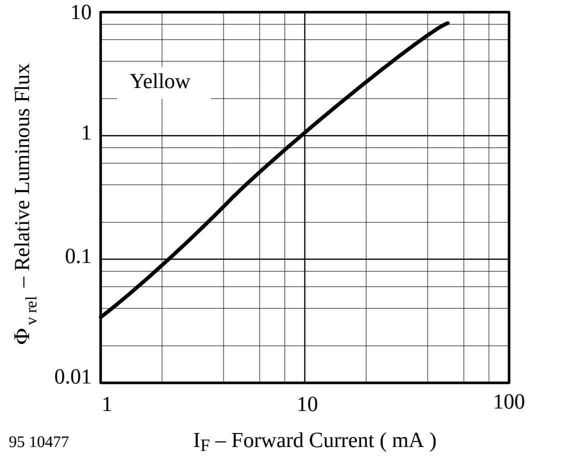


Figure 18 Relative Luminous Flux vs. Forward Current

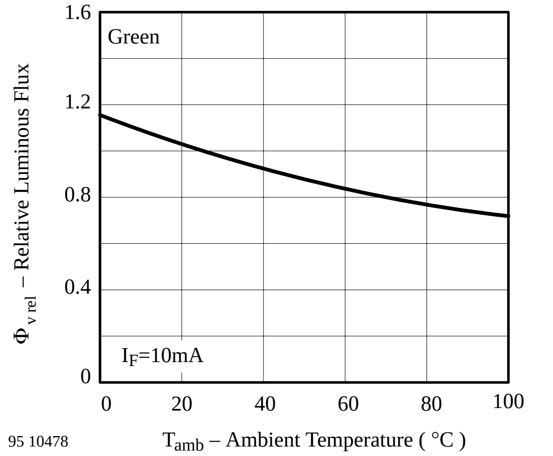


Figure 21 Rel. Luminous Flux vs. Ambient Temperature

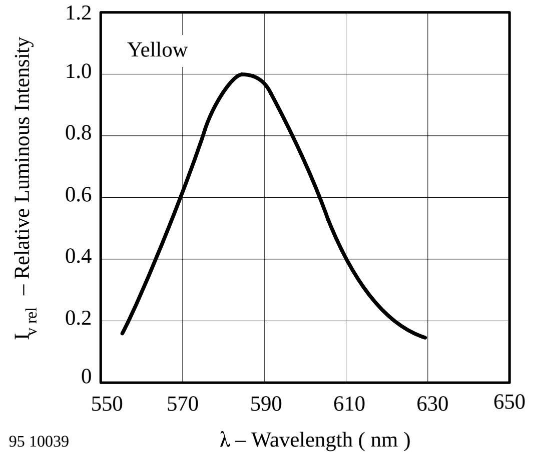


Figure 19 Relative Luminous Intensity vs. Wavelength

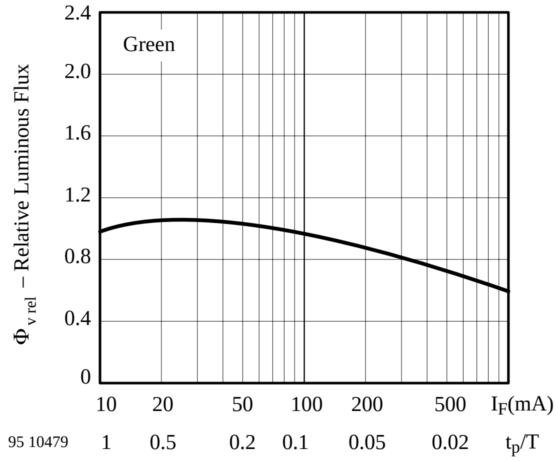


Figure 22 Rel. Luminous Flux vs. Forw. Current/Duty Cycle

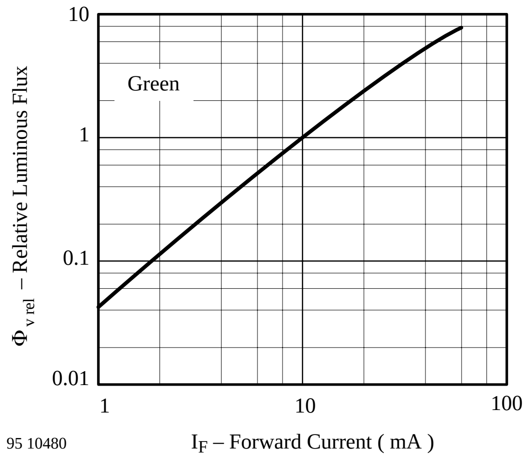


Figure 23 Relative Luminous Flux vs. Forward Current

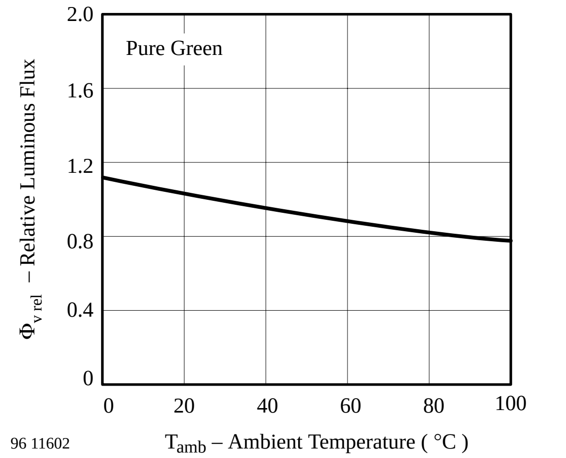


Figure 26 Rel. Luminous Flux vs. Ambient Temperature

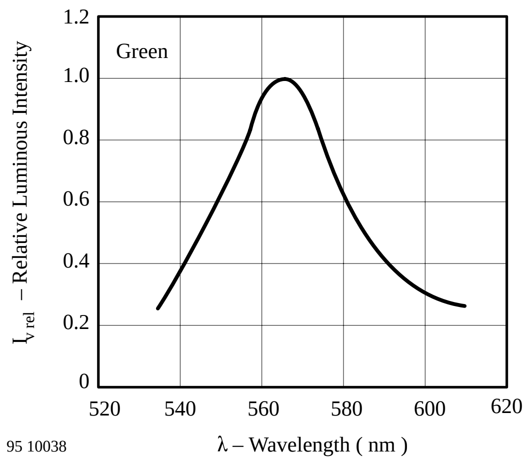


Figure 24 Relative Luminous Intensity vs. Wavelength

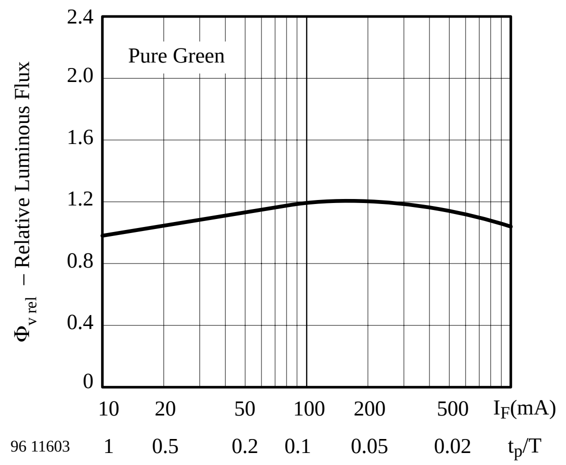


Figure 27 Rel. Luminous Flux vs.
Forw. Current/Duty Cycle

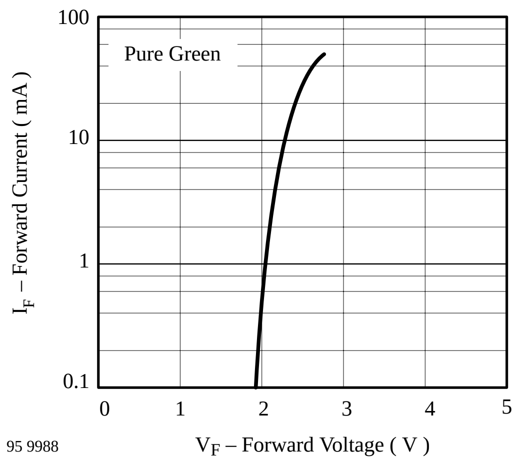


Figure 25 Forward Current vs. Forward Voltage

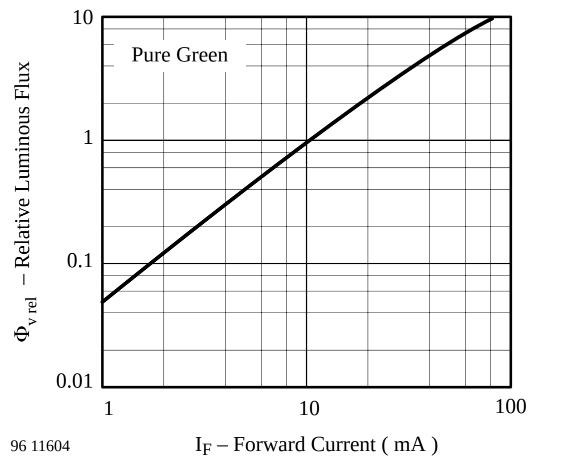


Figure 28 Relative Luminous Flux vs. Forward Current

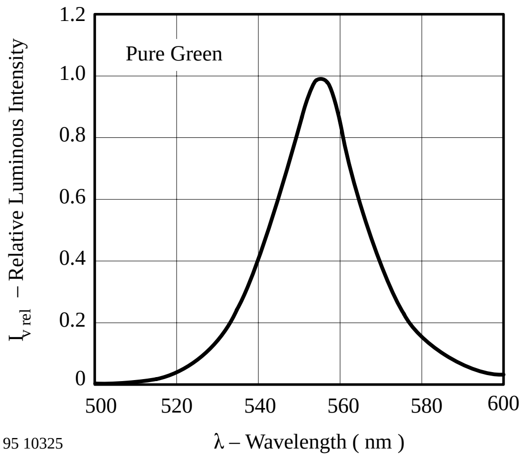
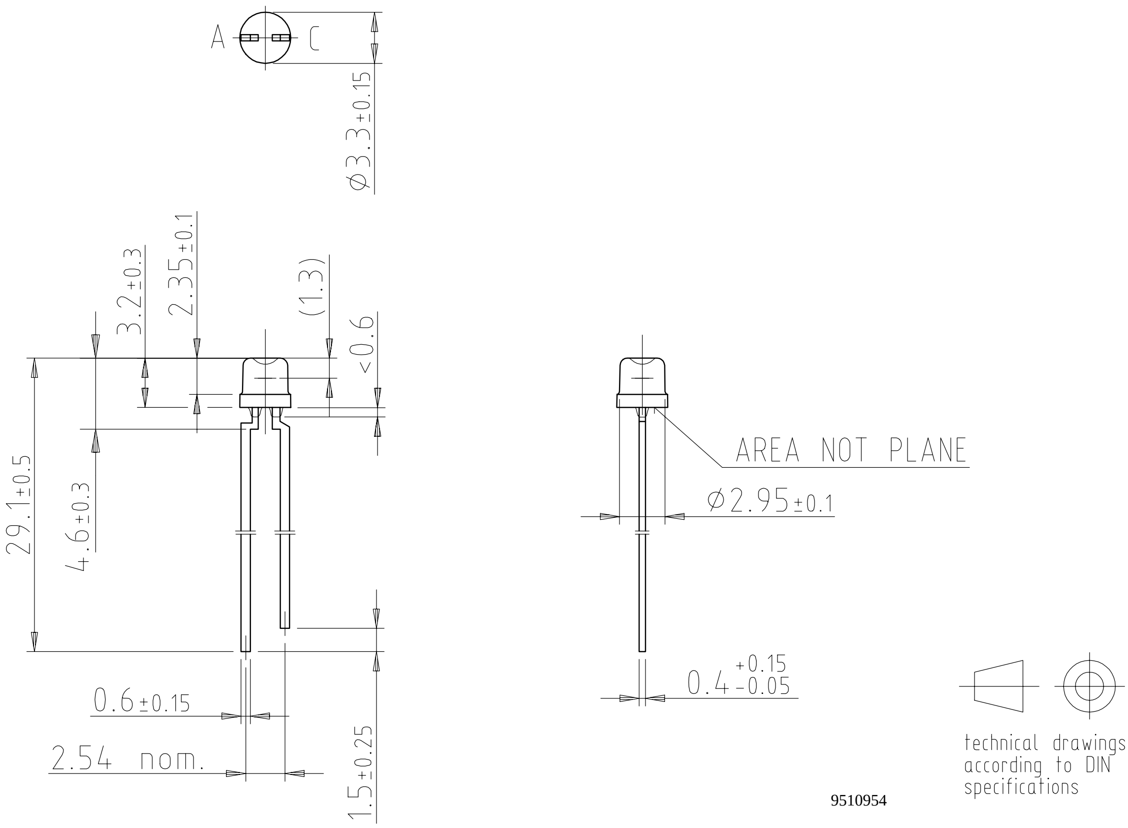


Figure 29 Relative Luminous Intensity vs. Wavelength

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.

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