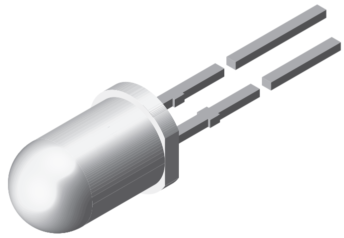
Ultrabright LED, ∅ 5 mm Untinted Non-Diffused

Description

The TLC.51.. series is a clear, non diffused 5 mm LED for high end applications where supreme luminous intensity required.

These lamps with clear untinted plastic case utilize the highly developed ultrabright AlInGaP (AS) and InGaN technologies.

The lens and the viewing angle is optimized to achieve best performance of light output and visibility.



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Features

- Untinted non diffused lens
- Utilizing ultrabright AllnGaP (AS) and InGaN technology
- High luminous intensity
- High operating tempreature: T_j (chip junction temperature) up to 125 °C for AllnGaP devices
- Luminous intensity and color categorized for each packing unit
- ESD-withstand voltage: 2 kV acc. to MIL STD 883 D, Method 3015.7 for AllnGaP, 1 kV for InGaN
- Lead-free device

Pb
Pb-free
e2

Applications

Interior and exterior lighting
Outdoor LED panels
Instrumentation and front panel indicators
Central high mounted stop lights (CHMSL) for motor vehicles
Replaces incandescent lamps
Traffic signals
Light guide design

Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLCR5100	Red, I_V > 11000 mcd (typ.)	9 °	AllnGaP on GaAs
TLCY5100	Yellow, I_V > 7500 mcd (typ.)	9 °	AllnGaP on GaAs
TLCY5101	Yellow, I_V > 5750 mcd to 20000 mcd	9 °	AllnGaP on GaAs
TLCTG5100	True green, I_V > 5000 mcd (typ.)	9 °	InGaN on SiC
TLCB5100	Blue, I_V > 1500 mcd (typ.)	9 °	InGaN on SiC

Absolute Maximum Ratings

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

TLCR5100 , TLCY5100

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V_R	5	V
DC Forward current	$T_{amb} \leq 85$ °C	I_F	50	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	1	A
Power dissipation	$T_{amb} \leq 85$ °C	P_V	135	mW
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ ambient		R_{thJA}	300	K/W

TLCTG5100 , TLCB5100

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V_R	5	V
DC Forward current	$T_{amb} \leq 60$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	0.1	A
Power dissipation	$T_{amb} \leq 60$ °C	P_V	135	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ ambient		R_{thJA}	300	K/W

Optical and Electrical Characteristics

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

Red

TLCR5100

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1)]	I_F = 50 mA	TLCR5100	I_V	4300	11000		mcd
Dominant wavelength	I_F = 50 mA		λ_d	611	616	622	nm
Peak wavelength	I_F = 50 mA		λ_p		622		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 50 mA		$\Delta\lambda$		18		nm
Angle of half intensity	I_F = 50 mA		φ		± 9		deg
Forward voltage	I_F = 50 mA		V_F		2.1	2.7	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Temperature coefficient of V_F	I_F = 50 mA		TC_{VF}		- 3.5		mV/K
Temperature coefficient of λ_d	I_F = 50 mA		$TC\lambda_d$		0.05		nm/K

[1)] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 2.0$

Yellow

TLCY5100

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 50 mA	TLCY5100	I_V	3200	7500		mcd
		TLCY5101	I_V	6900		16000	mcd
Dominant wavelength	I_F = 50 mA		λ_d	585	590	597	nm
Peak wavelength	I_F = 50 mA		λ_p		593		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 50 mA		$\Delta\lambda$		17		nm
Angle of half intensity	I_F = 50 mA		φ		± 9		deg
Forward voltage	I_F = 50 mA		V_F		2.1	2.7	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Temperature coefficient of V_F	I_F = 50 mA		TC_{VF}		- 3.5		mV/K
Temperature coefficient of λ_d	I_F = 50 mA		$TC\lambda_d$		0.1		nm/K

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 2.0$

True green

TLCTG5100

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 30 mA	TLCTG5100	I_V	1800	5000		mcd
Dominant wavelength	I_F = 30 mA		λ_d	515	525	535	nm
Peak wavelength	I_F = 30 mA		λ_p		520		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 30 mA		$\Delta\lambda$		37		nm
Angle of half intensity	I_F = 30 mA		φ		± 9		deg
Forward voltage	I_F = 30 mA		V_F		3.9	4.5	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Temperature coefficient of V_F	I_F = 30 mA		TC_{VF}		- 4.5		mV/K
Temperature coefficient of λ_d	I_F = 30 mA		$TC\lambda_d$		0.02		nm/K

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 2.0$

Blue

TLCB5100

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 30 mA	TLCB5100	I_V	575	1500		mcd
Dominant wavelength	I_F = 30 mA		λ_d	462	470	476	nm
Peak wavelength	I_F = 30 mA		λ_p		464		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 30 mA		$\Delta\lambda$		25		nm
Angle of half intensity	I_F = 30 mA		φ		± 9		deg
Forward voltage	I_F = 30 mA		V_F		3.9	4.5	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Temperature coefficient of V_F	I_F = 30 mA		TC_{VF}		- 5.0		mV/K
Temperature coefficient of λ_d	I_F = 30 mA		$TC\lambda_d$		0.02		nm/K

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 2.0$

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

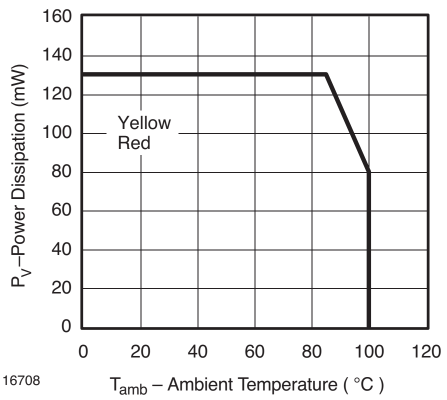


Figure 1. Power Dissipation vs. Ambient Temperature

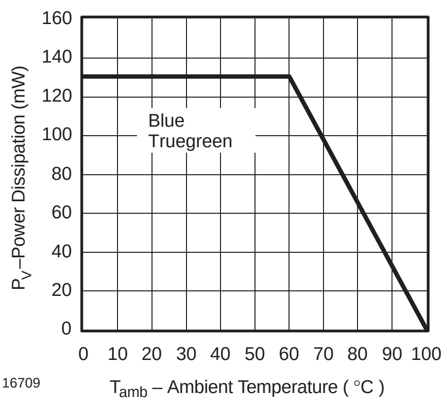


Figure 2. Power Dissipation vs. Ambient Temperature

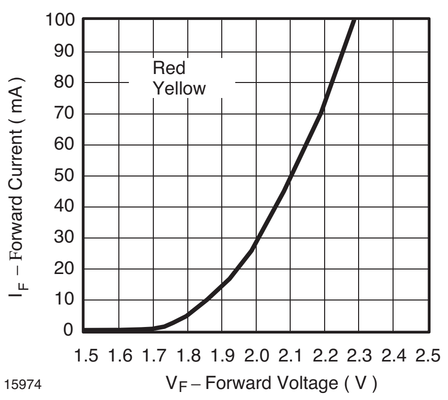


Figure 3. Forward Current vs. Forward Voltage

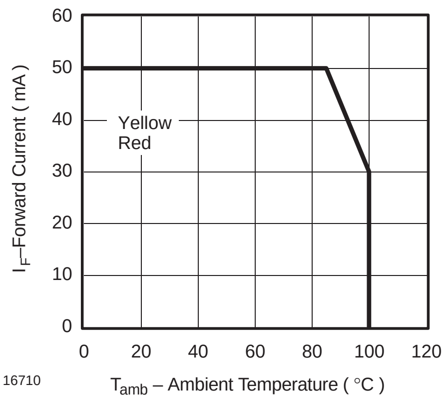


Figure 4. Forward Current vs. Ambient Temperature

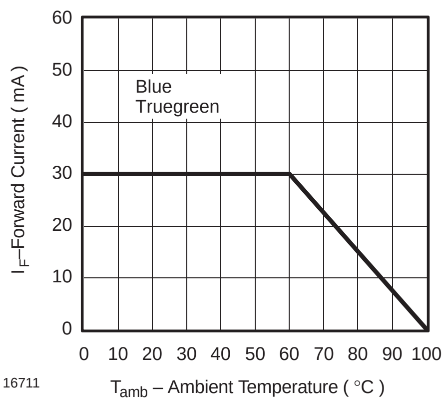


Figure 5. Forward Current vs. Ambient Temperature

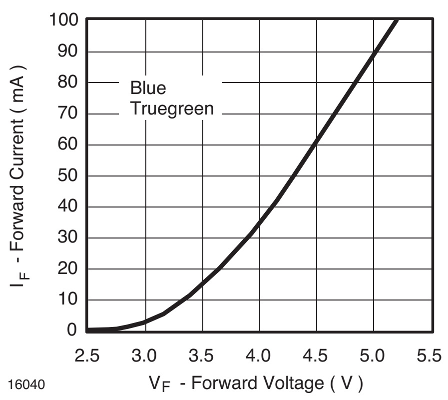


Figure 6. Forward Current vs. Forward Voltage

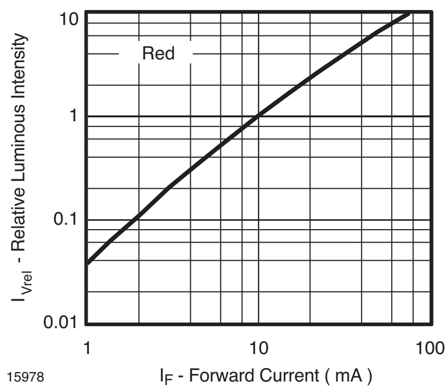


Figure 7. Relative Luminous Flux vs. Forward Current

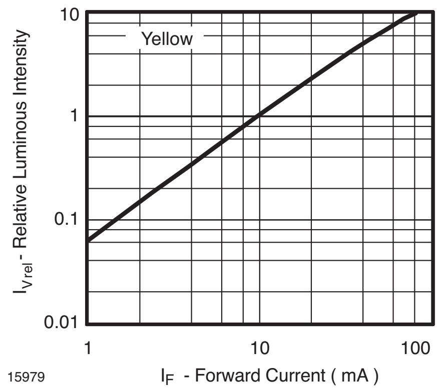


Figure 10. Relative Luminous Flux vs. Forward Current

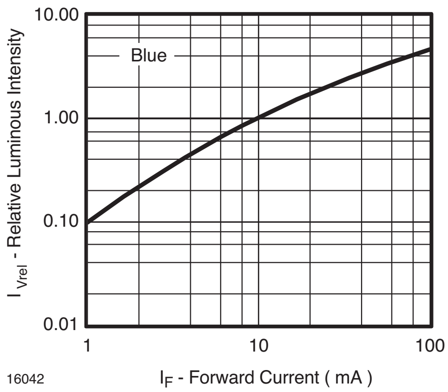


Figure 8. Relative Luminous Flux vs. Forward Current

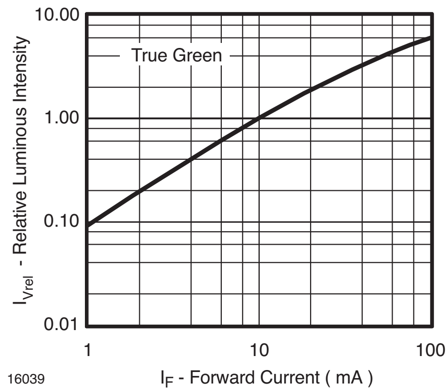


Figure 11. Relative Luminous Flux vs. Forward Current

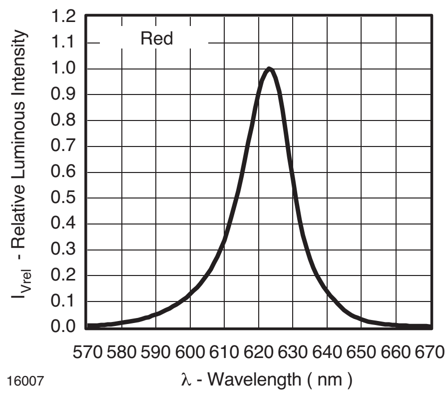


Figure 9. Relative Intensity vs. Wavelength

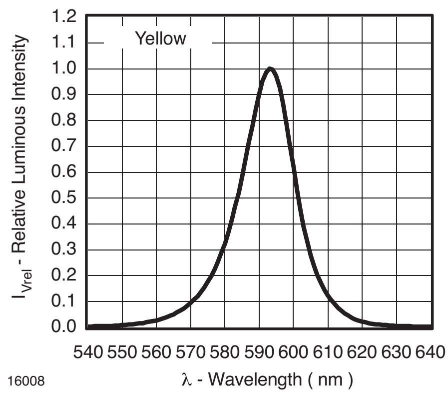


Figure 12. Relative Intensity vs. Wavelength

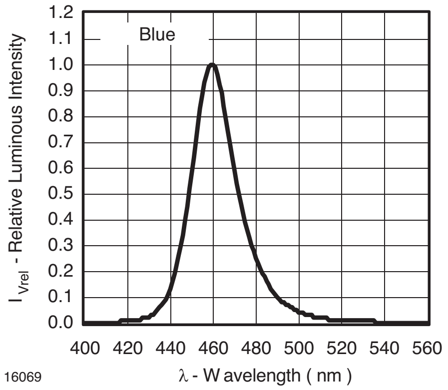


Figure 13. Relative Intensity vs. Wavelength

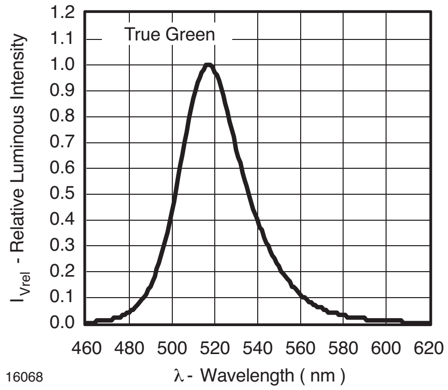
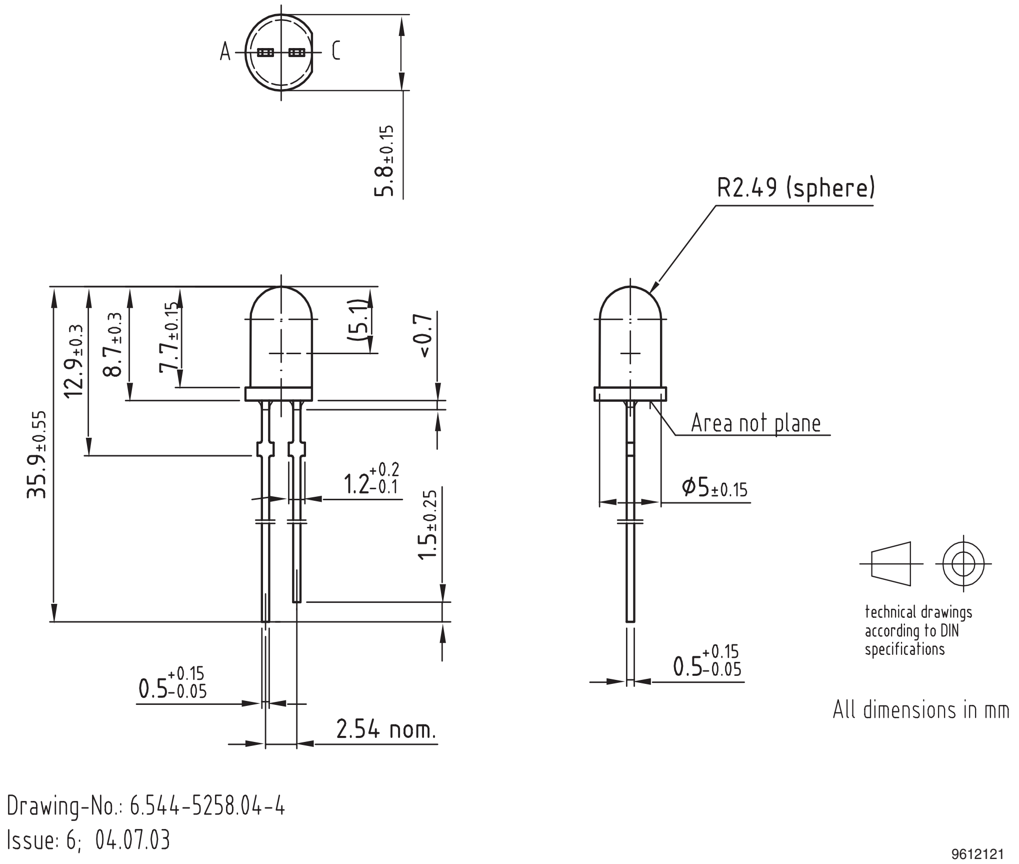


Figure 14. Relative Intensity vs. Wavelength

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 operatingsystems 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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