

Ultrabright LED, ø 5 mm Untinted Non-Diffused

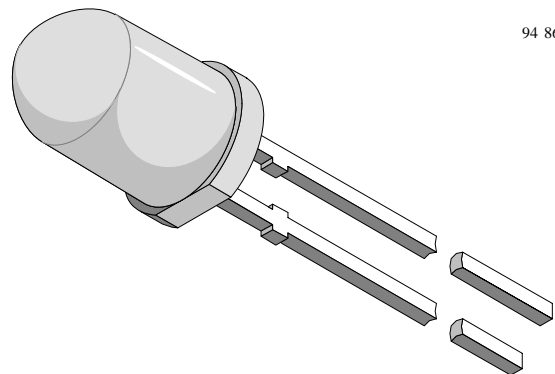
Color	Type	Technology	Angle of Half Intensity $\pm\varphi$
Red	TLCR51..	AllnGaP on GaAs	9°
Yellow	TLCY51..	AllnGaP on GaAs	9°
True Green	TLCTG51..	InGaN on SiC	9°
Blue	TLCB51..	InGaN on SiC	9°

Description

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

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

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



Features

- Untinted non diffused lens
- Utilizing ultrabright AllnGaP (AS) and InGaN technology
- High luminous intensity
- High operating temperature:
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

Applications

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

Absolute Maximum Ratings

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

TLCR51.. , TLCY51..

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

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

TLCTG51.. , TLCB51..

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

Optical and Electrical Characteristics

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

Red (TLCR51..)

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



Yellow (TLCY51..)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	$I_F = 50 \text{ mA}$	TLCY5100	I_V	3200	7500		mcd
Dominant wavelength	$I_F = 50 \text{ mA}$		λ_d	585	590	597	nm
Peak wavelength	$I_F = 50 \text{ mA}$		λ_p		593		nm
Spectral bandwidth at 50% $I_{rel \text{ max}}$	$I_F = 50 \text{ mA}$		$\Delta\lambda$		17		nm
Angle of half intensity	$I_F = 50 \text{ mA}$		ϕ		± 9		deg
Forward voltage	$I_F = 50 \text{ mA}$		V_F		2.1	2.7	V
Reverse voltage	$I_R = 10 \mu\text{A}$		V_R	5			V
Temperature coefficient of V_F	$I_F = 50 \text{ mA}$		TC_{V_F}		-3.5		mV/K
Temperature coefficient of λ_d	$I_F = 50 \text{ mA}$		TC_{λ_d}		0.1		nm/K

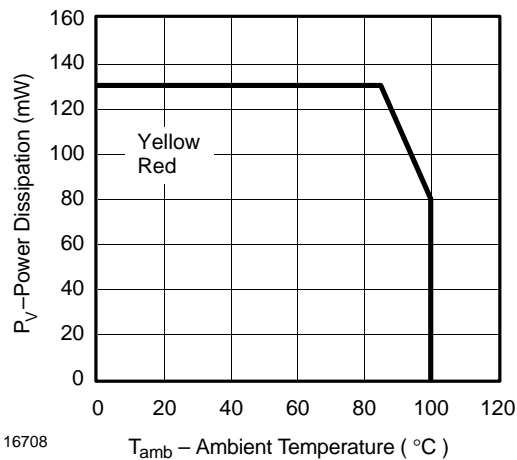
True Green (TLCTG51..)

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

Blue (TLCB51..)

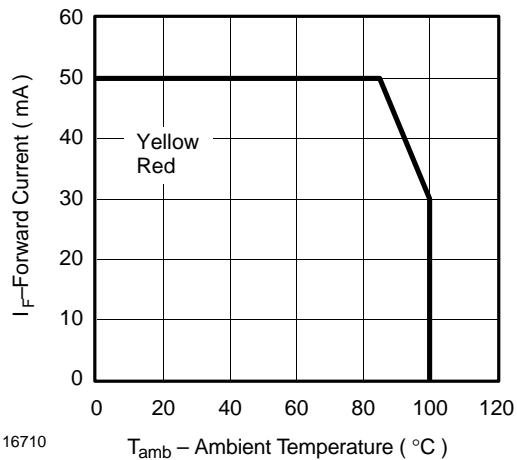
Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	$I_F = 30 \text{ mA}$	TLCB5100	I_V	575	1500		mcd
Dominant wavelength	$I_F = 30 \text{ mA}$		λ_d	462	470	476	nm
Peak wavelength	$I_F = 30 \text{ mA}$		λ_p		464		nm
Spectral bandwidth at 50% $I_{rel \text{ max}}$	$I_F = 30 \text{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

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



16708

Figure 1. Power Dissipation vs. Ambient Temperature



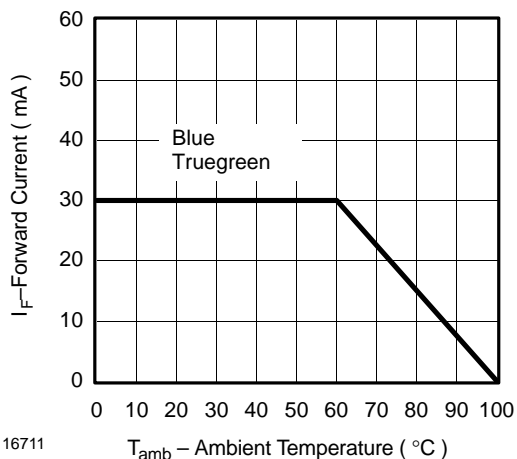
16710

Figure 4. Forward Current vs. Ambient Temperature



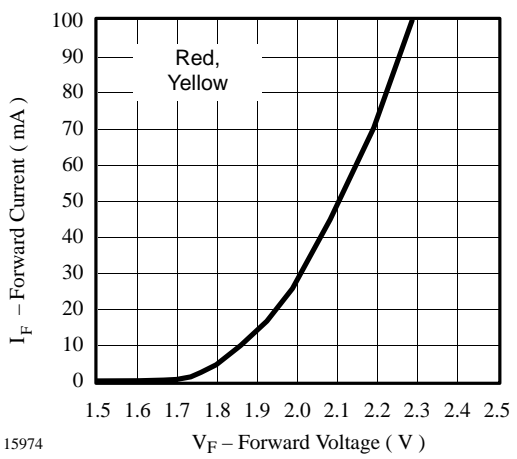
16709

Figure 2. Power Dissipation vs. Ambient Temperature



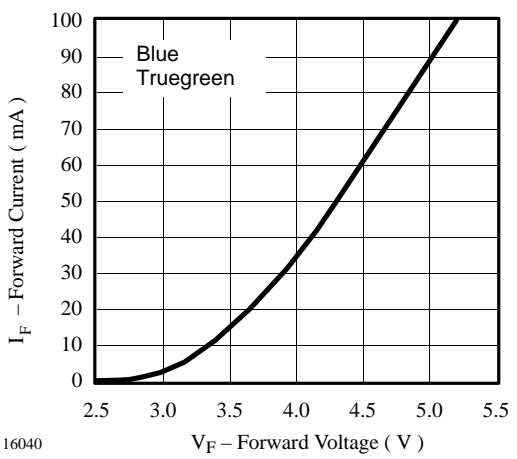
16711

Figure 5. Forward Current vs. Ambient Temperature



15974

Figure 3. Forward Current vs. Forward Voltage



16040

Figure 6. Forward Current vs. Forward Voltage

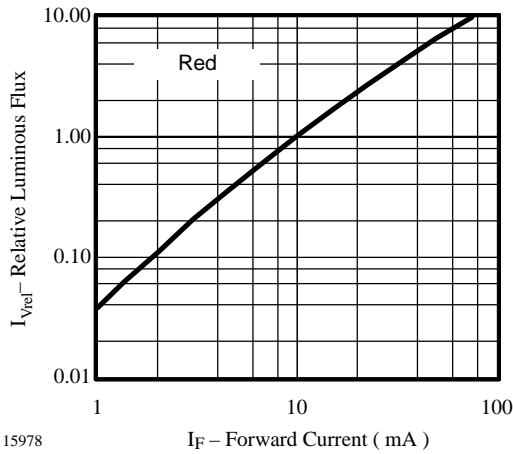


Figure 7. Relative Luminous Intensity vs. Forward Current

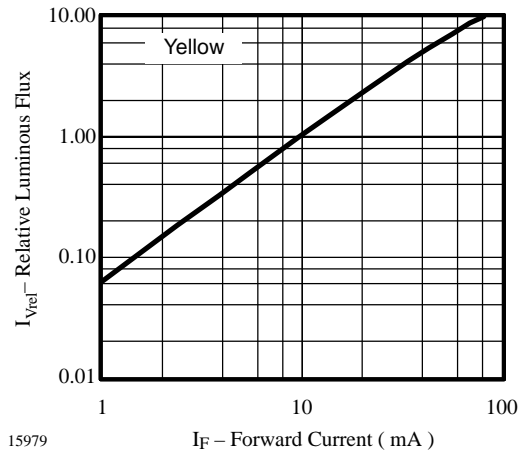


Figure 10. Relative Luminous Intensity vs. Forward Current

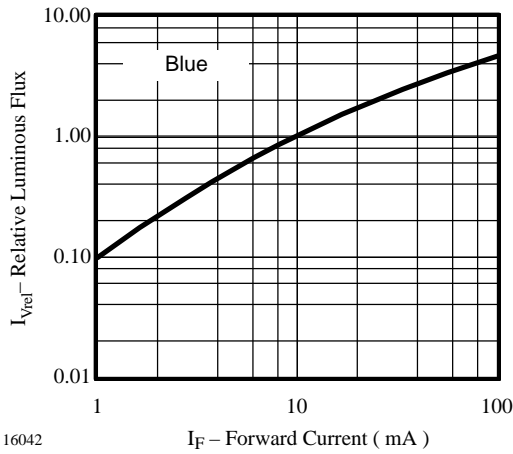


Figure 8. Relative Luminous Intensity vs. Forward Current

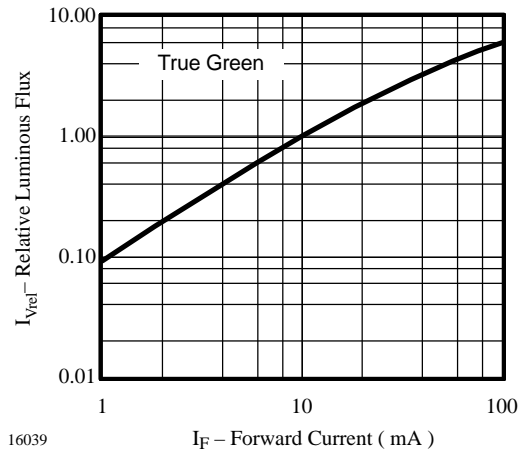


Figure 11. Relative Luminous Intensity vs. Forward Current

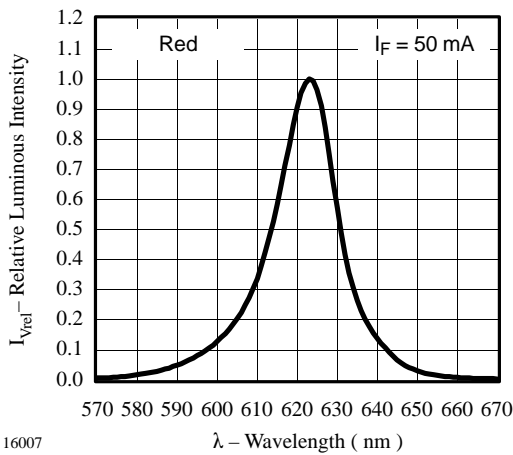


Figure 9. Relative Luminous Intensity vs. Wavelength

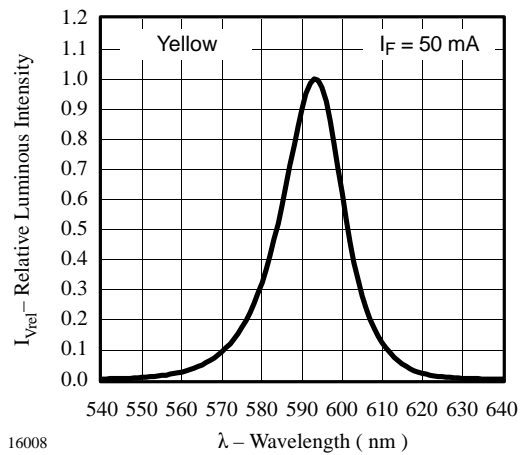


Figure 12. Relative Luminous Intensity vs. Wavelength

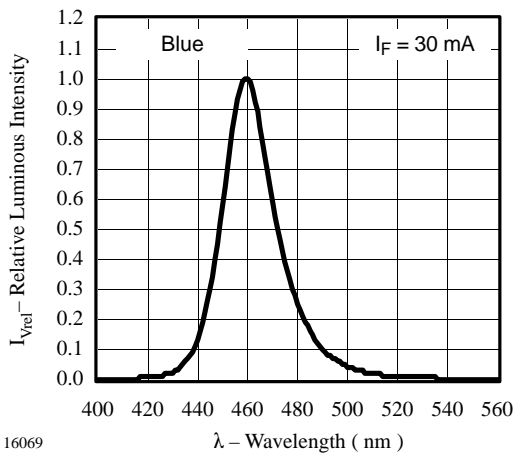


Figure 13. Relative Luminous Intensity vs. Wavelength

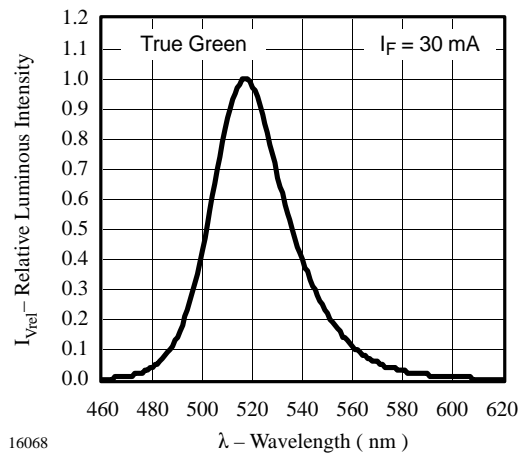
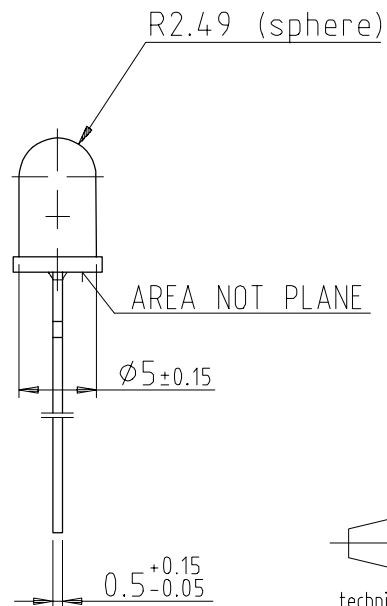
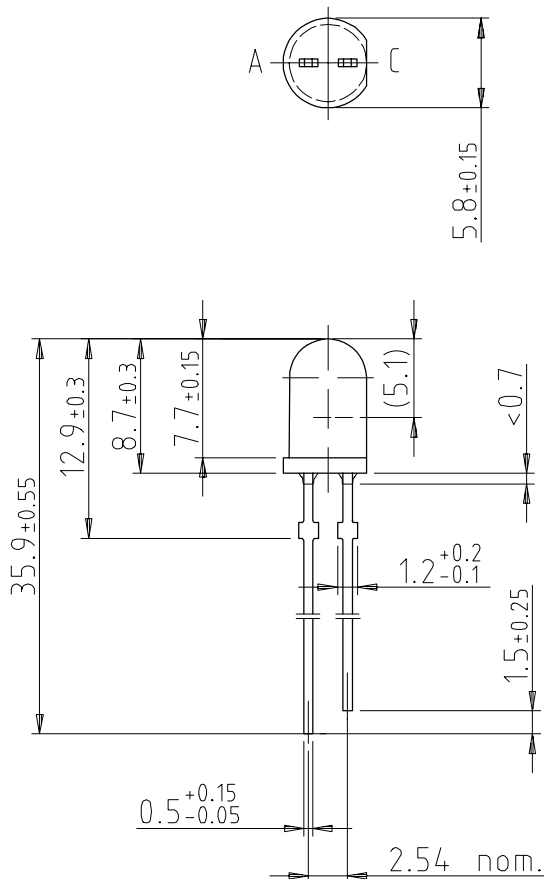


Figure 14. Relative Luminous Intensity vs. Wavelength

Dimensions in mm



96 12121

 technical drawings according to DIN specifications



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