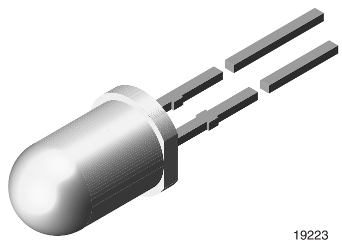
High Brightness LED, ∅ 5 mm Untinted Non-Diffused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DESCRIPTION

The VLC.51.. series is a clear, non diffused 5 mm LED for high end applications where supreme luminous intensity and a very small emission angle is required.

These lamps with clear untinted plastic case utilize the highly developed ultrabright AlInGaP technology.

The very small viewing angle of these devices provide a very high luminous intensity.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: power
- Angle of half intensity: ± 9°

FEATURES

- Untinted non diffused lens
- Utilizing ultrabright AlInGaP technology
- Very high luminous intensity
- Very small emission angle
- High operating temperature: T_j (chip junction temperature) up to 125 °C for AlInGaP devices
- Luminous intensity and color categorized for each packing unit
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- Automotive qualified AEC-Q101

APPLICATIONS

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

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
VLCS5130	Red, I_V > 7500 mcd (typ. 25 000 mcd)	AlInGaP on Si

ABSOLUTE MAXIMUM RATINGS[1)] VLCS5130

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage [2)]		V_R	5	V
DC Forward current	$T_{amb} \leq 85°C$	I_F	50	mA
Surge forward current	$t_p \leq 10\ \mu s$	I_{FSM}	0.1	A
Power dissipation		P_V	150	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

Note:
1) T_{amb} = 25 °C, unless otherwise specified
2) Driving the LED in reverse direction is suitable for short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS [1)] VLCS5130, RED

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity [2)]	I_F = 50 mA	VLCS5130	I_V	7500	25 000		mcd
Dominant wavelength [(3)]	I_F = 50 mA		λ_d	620	624	630	nm
Peak wavelength	I_F = 50 mA		λ_p		631		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 [4)]	I_F = 50 mA		V_F		2.2	3.0	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Temperature coefficient of V_F	I_F = 50 mA		TC_{VF}		- 2		mV/K
Temperature coefficient of λ_d	I_F = 50 mA		$TC\lambda_d$		0.05		nm/K

Note:
[1)] T_{amb} = 25 °C, unless otherwise specified
[2)] In one packing unit $I_{Vmax.}/I_{Vmin.} \leq 2.0$
[3)] Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of ± 1 nm
[4)] Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.05 V

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LIGHT INTENSITY (mcd)	
	MIN.	MAX.
MM	7500	15 000
NN	10 000	20 000
PP	13 500	27 000
QQ	18 000	36 000
RR	24 000	48 000
SS	32 000	64 000
TT	43 000	86 000
UU	57 500	115 000

Note:
Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 11 %.
The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel).
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 reel.
In order to ensure availability, single wavelength groups will not be orderable.

TYPICAL CHARACTERISTICS

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

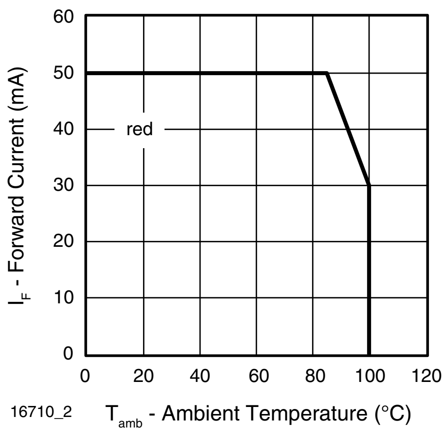


Figure 1. Max. Permissible Forward Current vs. Ambient Temperature

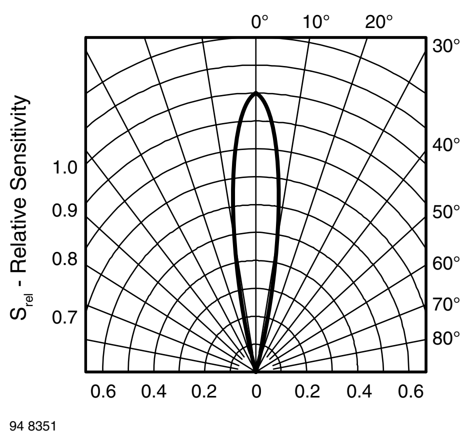


Figure 2. Relative Intensity vs. Angular Displacement

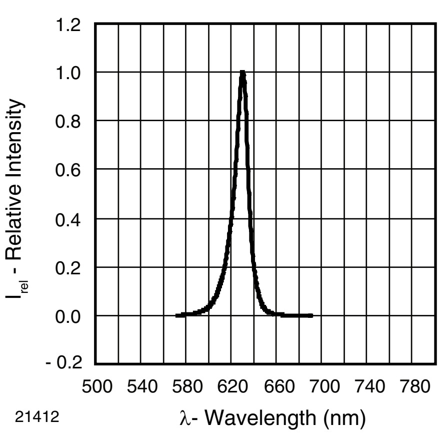


Figure 3. Relative Intensity vs. Wavelength

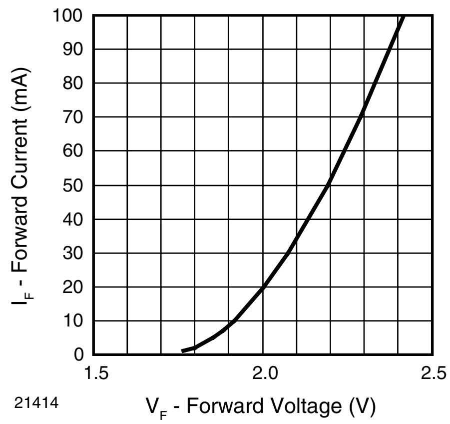


Figure 4. Forward Current vs. Forward Voltage

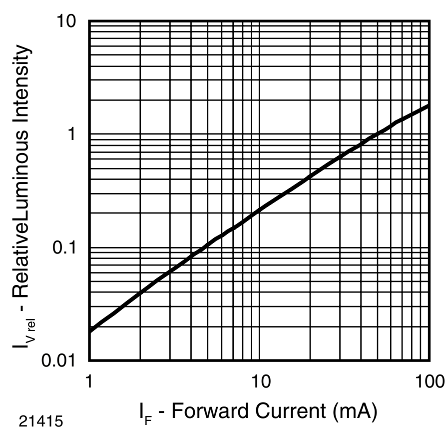


Figure 5. Relative Luminous Intensity vs. Forward Current

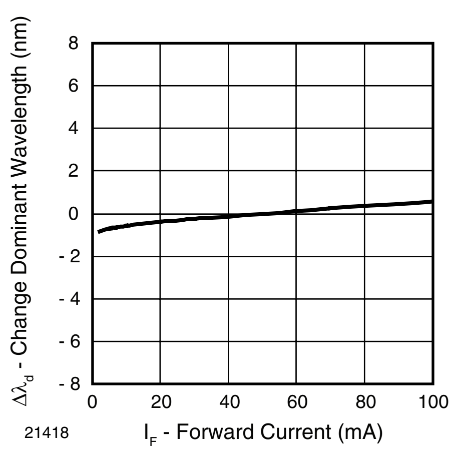


Figure 6. Change of Dominant Wavelength vs. Forward Current

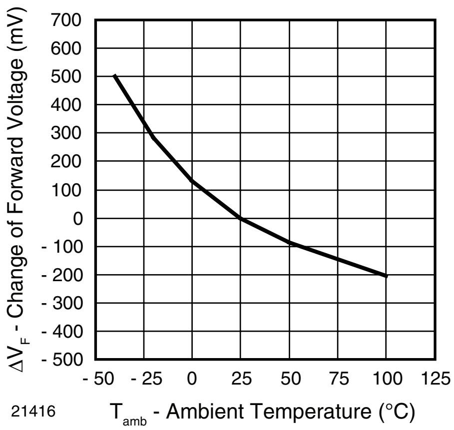


Figure 7. Change of Forward Voltage vs. Ambient Temperature

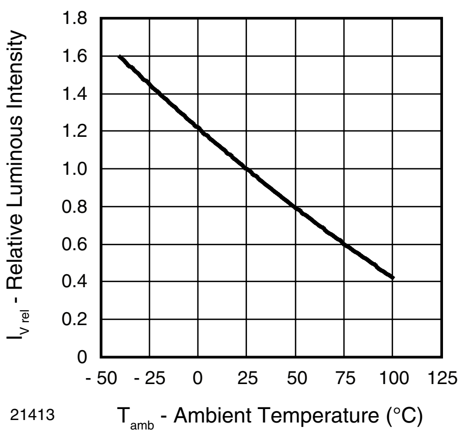


Figure 8. Relative Luminous Intensity vs. Ambient Temperature

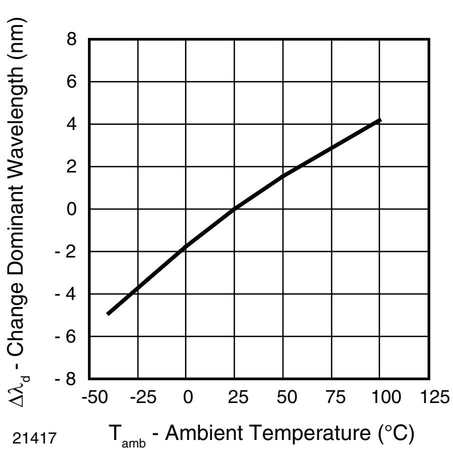
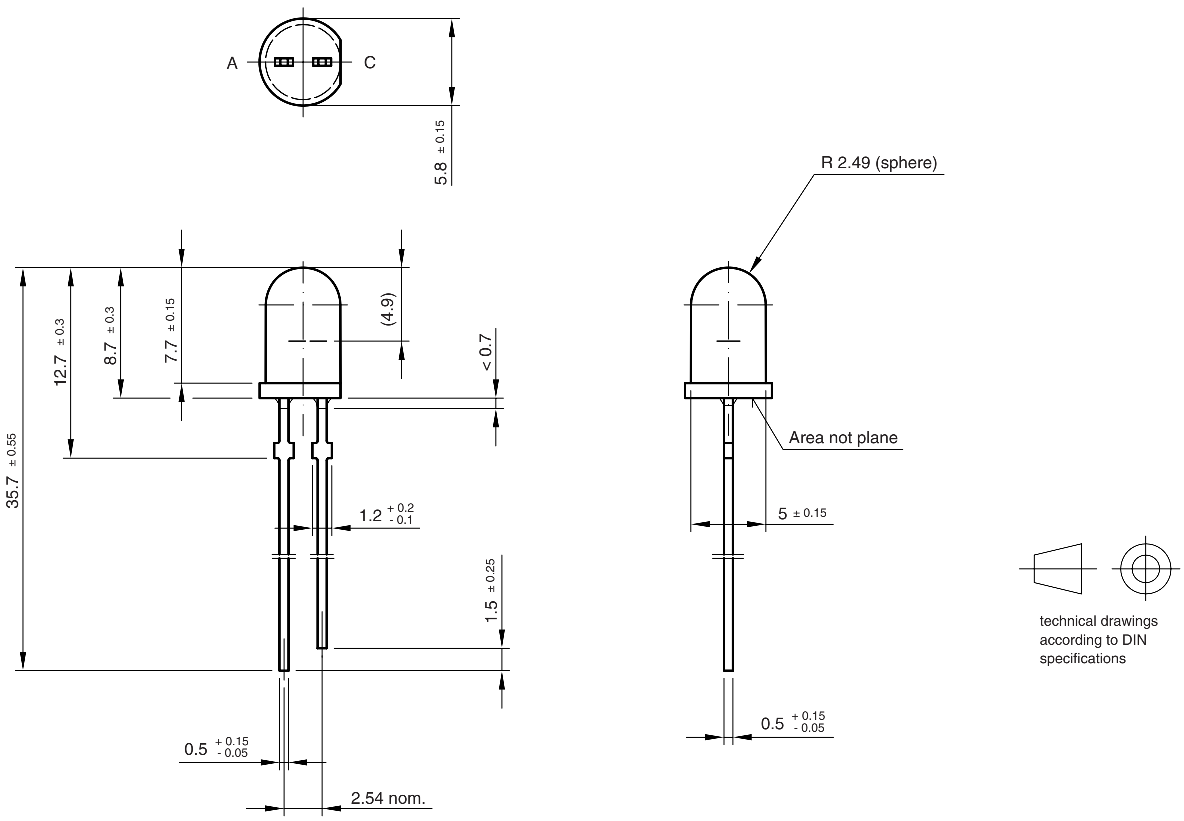


Figure 9. Change of Dominant Wavelength vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



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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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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