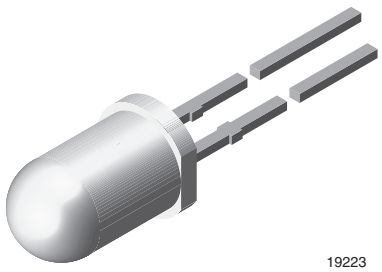
High Brightness LED, Ø 5 mm Untinted Non-Diffused Package



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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
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

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 (mcd)			at I_F (mA)	WAVELENGTH (nm)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLCS5130	Red	7500	25 000	-	50	620	624	630	50	-	2.2	3.0	50	AlInGaP on Si

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLCS5130

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage (1)		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}	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) Driving the LED in reverse direction is suitable for short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLCS5130, RED

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	I_F = 50 mA	VLCS5130	I_V	7500	25 000	-	mcd
Dominant wavelength (2)	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 (3)	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

Notes

(1) In one packing unit $I_{Vmax.}/I_{Vmin.} \leq 2.0$

(2) Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of ± 1 nm

(3) 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)

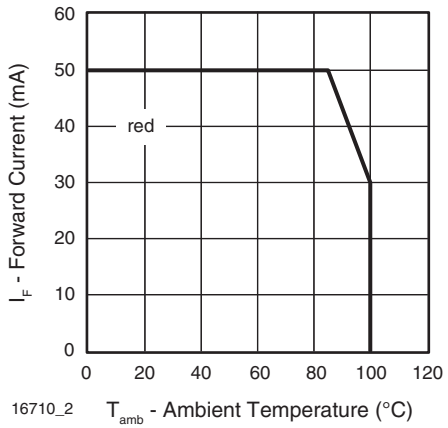


Fig. 1 - Maximum Permissible Forward Current vs. Ambient Temperature

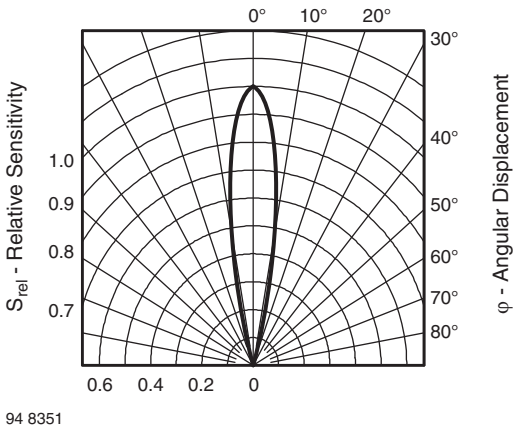


Fig. 2 - Relative Intensity vs. Angular Displacement

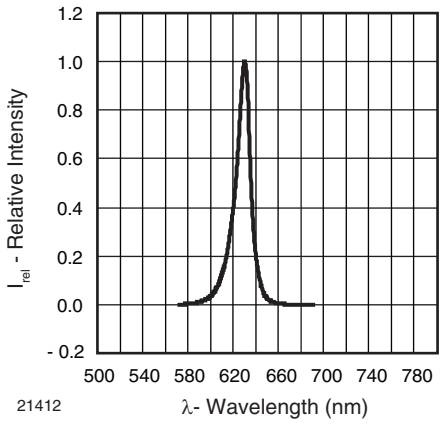


Fig. 3 - Relative Intensity vs. Wavelength

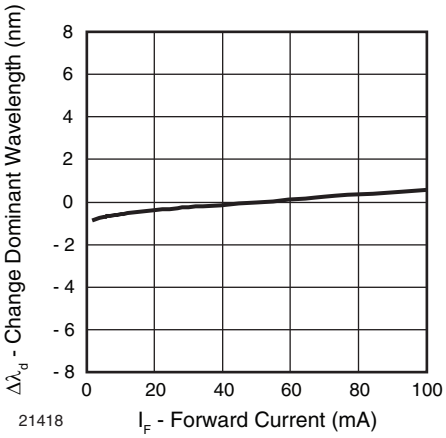


Fig. 6 - Change of Dominant Wavelength vs. Forward Current

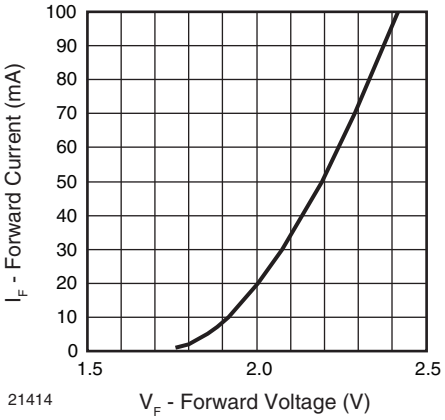


Fig. 4 - Forward Current vs. Forward Voltage

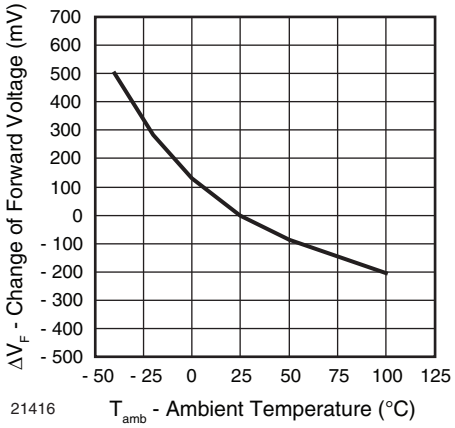


Fig. 7 - Change of Forward Votage vs. Ambient Temperature

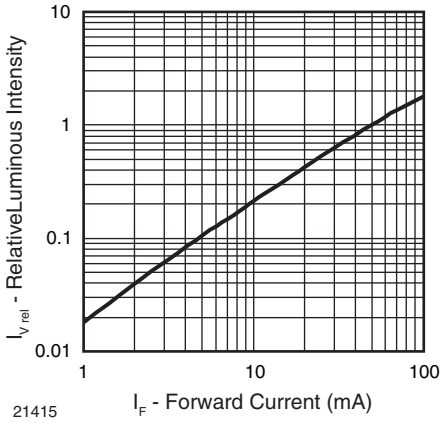


Fig. 5 - Relative Luminous Intensity vs. Forward Current

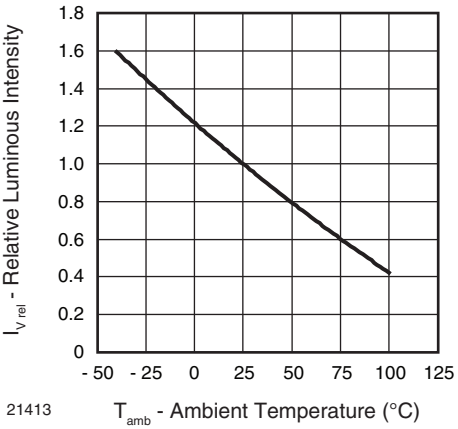


Fig. 8 - Relative Luminous Intensity vs. Ambient Temperature

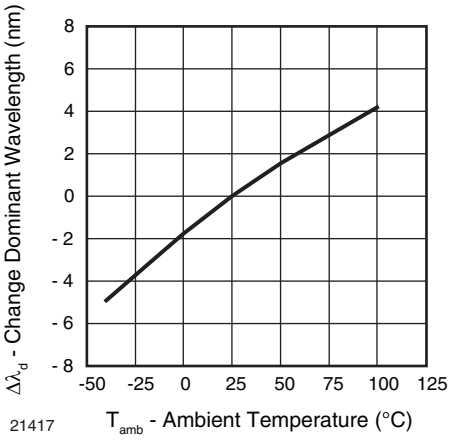
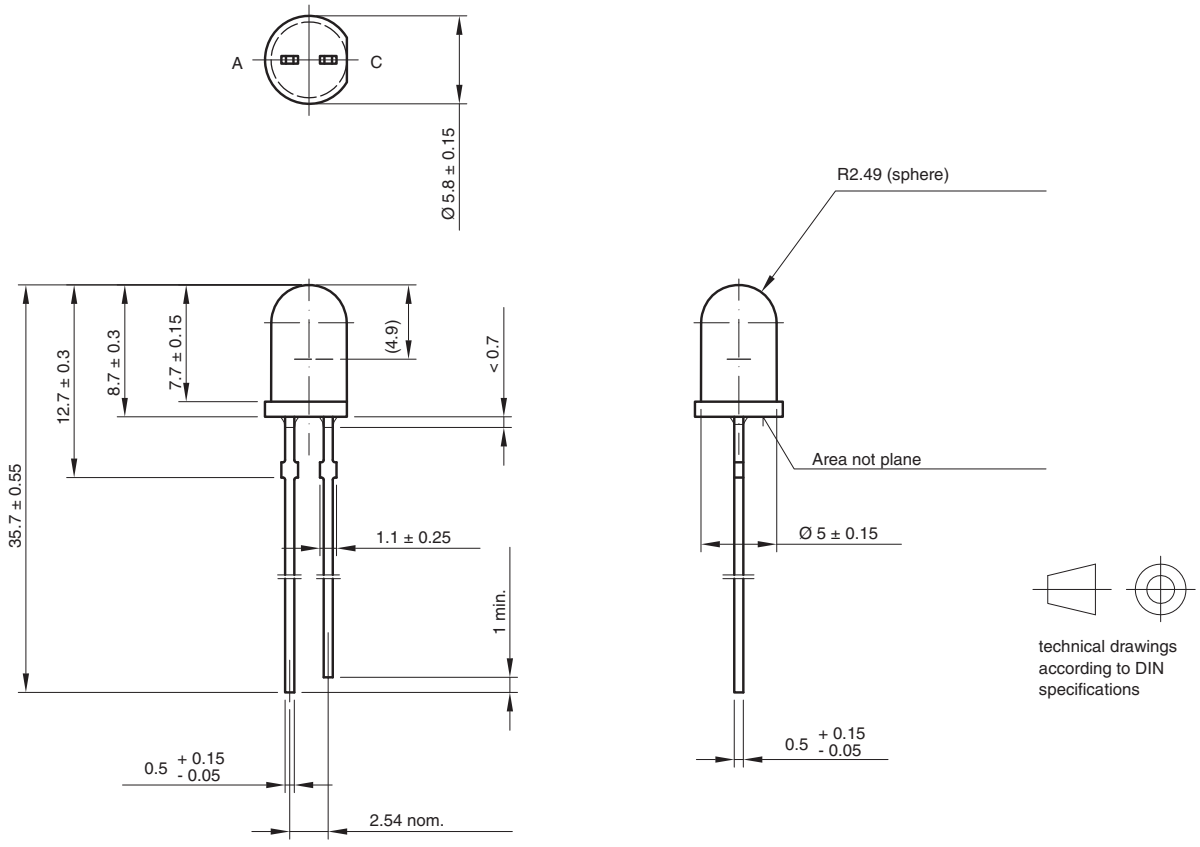


Fig. 9 - Change of Dominant Wavelength vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



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