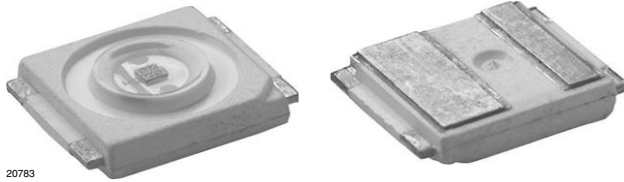
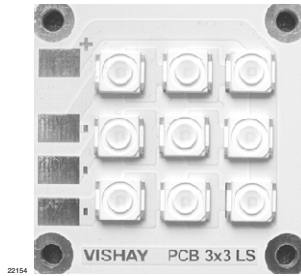




## High Brightness LED Power Module



### FEATURES

- Metal core PCB: Al > 1 thickness
- Single side/single layer PCB
- Shiny white surface
- 9 LEDs minimum 87 lm for cool white, 76 lm for natural white and 67 lm for warm white at 350 mA each
- Conductive top layer: Cu (min. 18 μm)
- Isolation layer prepreg (100 μm)
- ESD withstand voltage: up to 2 kV according to JESD22-A114-B
- Color binning
- Compliant to RoHS Directive 2002/95/EC



RoHS COMPLIANT GREEN (5-2008)\*\*

### Note

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### DESCRIPTION

VLPC0303A1, VLPN0303A1 and VLPW0303A1 are metal core based high brightness LED power modules assembled with 9 HB white LEDs. VLPC0303A1 is a cool white version in a color temperature range of 5000 K to 7000 K. VLPN0303A1 is natural white with a color temperature of 3800 K to 5000 K and VLPW0303A1 is warm white in a color temperature range 2850 K to 3500 K. Additional to the modules a suitable LED driver is available

### APPLICATIONS

- Automotive internal lighting
- Internal lighting in buildings
- Tunnel lights
- Reading lamp, table lamp
- General lighting application

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: LED module
- Product series: power
- Angle of half intensity: ± 60°

PARTS TABLE				
PART	COLOR	LUMINOUS FLUX (at I <sub>F</sub> = 350 mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY
VLPC0303A1	Cool white	Φ <sub>V</sub> = 810 lm	5000 to 7000	InGaN
VLPN0303A1	Natural white	Φ <sub>V</sub> = 720 lm	3800 to 5000	InGaN
VLPW0303A1	Warm white	Φ <sub>V</sub> = 660 lm	2850 to 3500	InGaN

ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) VLPC0303A1, VLPN0303A1, VLPW0303A1				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I <sub>F</sub>	350	mA
Power dissipation	Total	P <sub>tot</sub>	12.6	W
Junction temperature		T <sub>j</sub>	120	°C
Operating temperature range		T <sub>amb</sub>	- 40 to + 85	°C
Storage temperature range		T <sub>stg</sub>	- 40 to + 85	°C
Decomposition temperature of PCB (for cable assembly)	3 x 10 s	T <sub>D</sub>	350	°C

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC0303A1, COOL WHITE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row <sup>(1)</sup>	$I_F = 350\text{ mA}$	$\Phi_V$	240	270	-	lm
Luminous flux total <sup>(1)</sup>	$I_{board} = 3 \times 350\text{ mA}$	$\Phi_V$	720	810	-	lm
Color temperature	$I_F = 350\text{ mA}$	TK	5000	-	7000	K
Forward voltage per row	$I_F = 350\text{ mA}$	$V_F$	9	10	12	V
$(V_{Fmax.} - V_{Fmin.})$ all rows <sup>(2)</sup>	$I_F = 350\text{ mA}$	$\Delta V_F$	0	-	0.6	V
Temperature coefficient of $V_F$ per row	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 10	-	mV/K
Temperature coefficient of $\Phi_V$	$I_F = 350\text{ mA}$	$TC_{\Phi_V}$	-	- 0.4	-	%/K

**Notes**

- Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.1\text{ V}$ . Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ .
- <sup>(1)</sup> Calculated based on single LED unit.
- <sup>(2)</sup>  $V_F$  classes are marked at the LED cluster and represent the technical classification only. The single groups cannot be specifically ordered.

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPN0303A1, NATURAL WHITE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row <sup>(1)</sup>	$I_F = 350\text{ mA}$	$\Phi_V$	200	240	-	lm
Luminous flux total <sup>(1)</sup>	$I_{board} = 3 \times 350\text{ mA}$	$\Phi_V$	600	720	-	lm
Color temperature	$I_F = 350\text{ mA}$	TK	3800	-	5000	K
Forward voltage per row	$I_F = 350\text{ mA}$	$V_F$	9	10	12	V
$(V_{Fmax.} - V_{Fmin.})$ all rows <sup>(2)</sup>	$I_F = 350\text{ mA}$	$\Delta V_F$	0	-	0.6	V
Temperature coefficient of $V_F$ per row	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 10	-	mV/K
Temperature coefficient of $\Phi_V$	$I_F = 350\text{ mA}$	$TC_{\Phi_V}$	-	- 0.4	-	%/K

**Notes**

- Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.1\text{ V}$ . Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ .
- <sup>(1)</sup> Calculated based on single LED unit.
- <sup>(2)</sup>  $V_F$  classes are marked at the LED cluster and represent the technical classification only. The single groups cannot be specifically ordered.

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPW0303A1, WARM WHITE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row <sup>(1)</sup>	$I_F = 350\text{ mA}$	$\Phi_V$	180	220	-	lm
Luminous flux total <sup>(1)</sup>	$I_{board} = 3 \times 350\text{ mA}$	$\Phi_V$	540	660	-	lm
Color temperature	$I_F = 350\text{ mA}$	TK	2850	-	3500	K
Forward voltage per row	$I_F = 350\text{ mA}$	$V_F$	9	10	12	V
$(V_{Fmax.} - V_{Fmin.})$ all rows <sup>(2)</sup>	$I_F = 350\text{ mA}$	$\Delta V_F$	0	-	0.6	V
Temperature coefficient of $V_F$ per row	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 10	-	mV/K
Temperature coefficient of $\Phi_V$	$I_F = 350\text{ mA}$	$TC_{\Phi_V}$	-	- 0.4	-	%/K

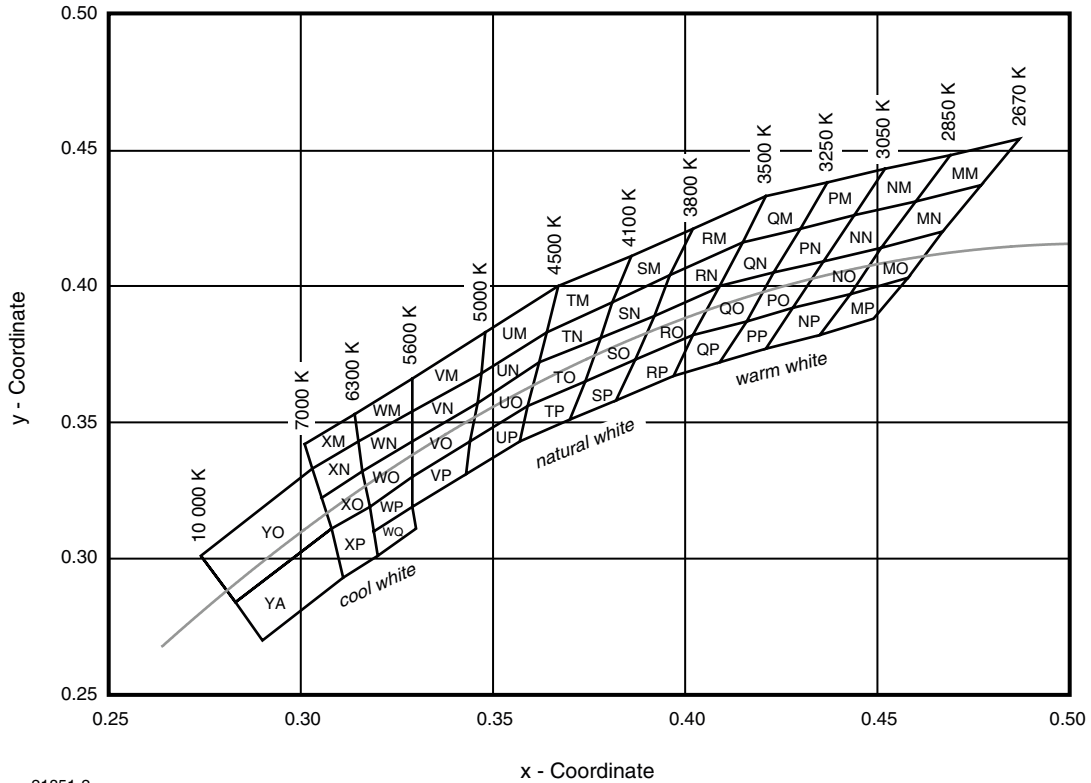
**Notes**

- Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.1\text{ V}$ . Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ .
- <sup>(1)</sup> Calculated based on single LED unit.
- <sup>(2)</sup>  $V_F$  classes are marked at the LED cluster and represent the technical classification only. The single groups cannot be specifically ordered.



## COLOR RANGE AND COLOR BINNING

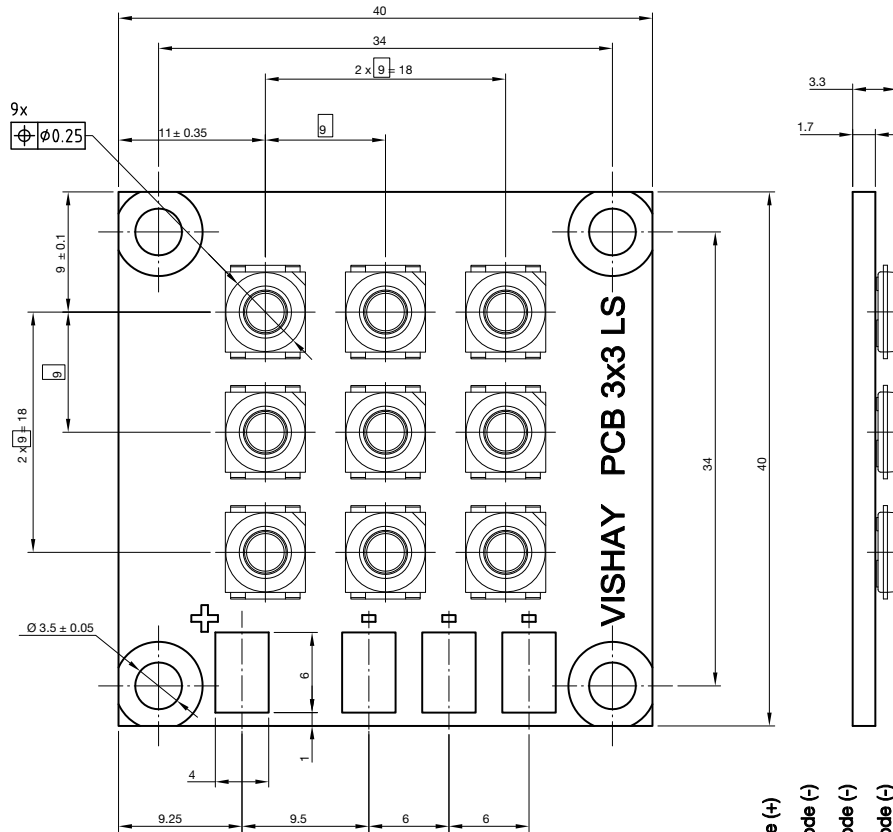
VLPC3030A1: 5000 K to 7000 K group X to V



21851-2

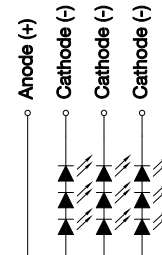
Fig. 1 - Chromaticity Coordinates of Colorgroups

**PCB BASIC DESIGN DIMENSIONS** in millimeters



Drawing-No.: 9.920-6729.01-4  
 Issue: 1; 02.06.10  
 Dimensions in mm  
 Not indicated tolerances ± 0.15  
 22155

technical drawings according to DIN specifications



**PCB CHARACTERISTICS**

- Metal core PCB: Al (minimum 1000 µm - thickness)
- Prepreg minimum 63 µm
- Conductive pattern Cu minimum 18 µm
- Free of burrs
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition
- Solder resist on top side
- Shiny white surface (glossy-white Taiyo-PSR 2000)
- Galvanic of solder pads and backside pure matte Sn (0.8 µm to 1.2 µm)
- Assembled with 9 high brightness power LEDs. LED position accuracy ± 0.3

**EMISSION CHARACTERISTIC**

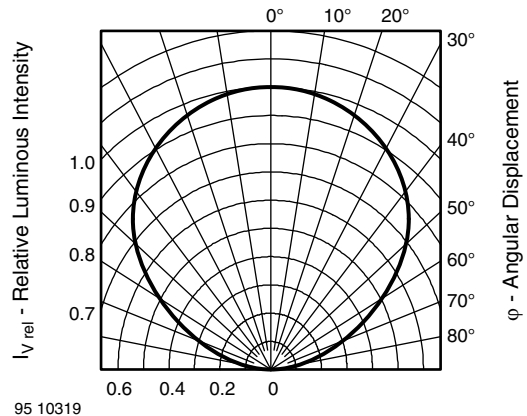
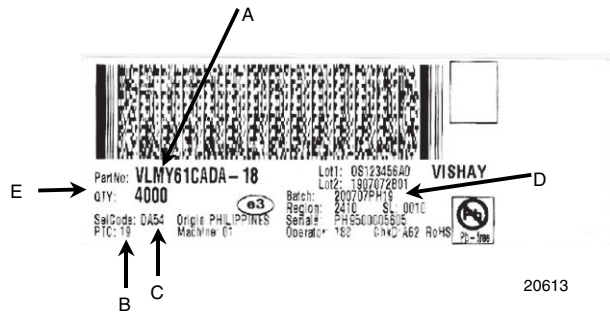


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement



BAR CODE PRODUCT LABEL



- A. Type of component
- B. Manufacturing plant
- C. SEL - selection code (bin):  
X = color group
- D. Batch:  
200707 = year 2007, week 07  
PH19 = plant code
- E. Total quantity

Note

- 48 PCB's per box, minimum order quantity 48



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