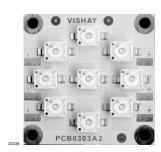


COMPLIANT

GREEN (5-2008)\*\*

# **High Brightness LED Power Module**





### **DESCRIPTION**

VLPC0303A2, and VLPW0303A2 are metal core based high brightness LED power modules assembled with 9 HB white LEDs. VLPC0303A2 is a cool white version in a color temperature range of 5000 K to 7000 K. VLPW0303A2 is warm white with a typical color temperature of 3500 K. Additional to the modules a suitable LED driver is available.

### PRODUCT GROUP AND PACKAGE DATA

Product group: LED Package: LED module Product series: power

Angle of half intensity: ± 80°

### **FEATURES**

- Metal core PCB: Al > 1 thickness
- Single side/single layer PCB
- Shiny white surface
- 9 LEDs, max. current per LED 1 A
- 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
- LM80 certified LEDs
- Compliant to RoHS Directive 2002/95/EC

#### Note

\*\* Please see document "Vishay Material Category Policy": www.vishav.com/doc?99902

#### **APPLICATIONS**

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

PARTS TABLE									
PART	COLOR	LUMINOUS FLUX (at I <sub>F</sub> = 700 mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY					
VLPC0303A2	Cool white	$\Phi_{V}$ = 1590 lm	5000 to 7000	InGaN					
VLPW0303A2	Warm white	$\Phi_{V} = 840 \text{ Im}$	3500 typ.	InGaN					

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25$ °C, unless otherwise specified) <b>VLPC0303A2</b> , <b>VLPW0303A2</b>									
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT					
Forward current	Per row	I <sub>F</sub>	700	mA					
Power dissipation	Total	P <sub>tot</sub>	25.2	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 ( $T_{amb} = 25  ^{\circ}C$ , unless otherwise specified) VLPC0303A2, COOL WHITE											
PARAMETER TEST CONDITION SYMBOL MIN. TYP. MAX. UNIT											
Luminous flux per row (1)	I <sub>F</sub> = 700 mA	$\Phi_{V}$	430	530	-	lm					
Luminous flux total (1)	$I_{board} = 3 \times 700 \text{ mA}$	$\Phi_{V}$	1290	1590	-	lm					
Color temperature	$I_F = 350 \text{ mA}$	TK	5000	-	7000	K					
Forward voltage per row	$I_F = 700 \text{ mA}$	V <sub>F</sub>	9	10	12	V					
Temperature coefficient of V <sub>F</sub> per row	I <sub>F</sub> = 350 mA	TC <sub>VF</sub>	-	- 10	-	mV/K					
Temperature coefficient of $\Phi_{V}$	Temperature coefficient of $\Phi_V$ I <sub>F</sub> = 350 mA TC $\Phi_V$ 0.4 - %/K										

### Notes

- Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.1 V. Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of ± 11 %.
- (1) Calculated based on single LED unit.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified) VLPW0303A2, WARM WHITE											
PARAMETER TEST CONDITION SYMBOL MIN. TYP. MAX. UNIT											
Luminous flux per row (1)	I <sub>F</sub> = 700 mA	$\Phi_{V}$	240	280	-	lm					
Luminous flux total (1)	$I_{board} = 3 \times 700 \text{ mA}$	$\Phi_{V}$	720	840	-	lm					
Color temperature	I <sub>F</sub> = 350 mA	TK	-	3500	-	K					
Forward voltage per row	I <sub>F</sub> = 700 mA	V <sub>F</sub>	9	10	12	V					
Temperature coefficient of $V_F$ per row $I_F = 350 \text{ mA}$ $TC_{VF}$ 10 - $mV/K$											
Temperature coefficient of $\Phi_{V}$	Temperature coefficient of $\Phi_V$										

#### **Notes**

- Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.1 V. Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of ± 11 %.
- (2) Calculated based on single LED unit.

### **COLOR RANGE AND COLOR BINNING**

VLPC3030A2: 5000 K to 7000 K group 6P to 7R

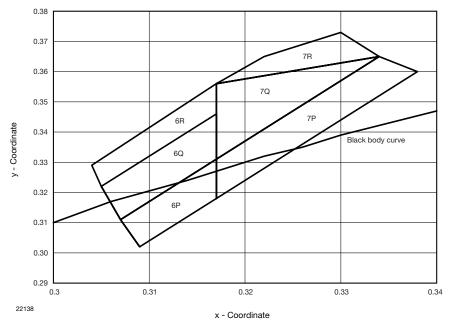


Fig. 1 - Chromaticity Coordinates of Colorgroups for Cool White

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# Vishay Semiconductors

CHROMATICITY COORDINATED GROUPS FOR COOL WHITE SMD LED											
GROUP	Х	Y		GROUP	Х	Y		GROUP	Х	Y	
	0.309	0.302		6Q -	0.307	0.311		6R	0.305	0.322	
6P	0.307	0.311			0.305	0.322			0.304	0.329	
OF	0.317	0.331			0.317	0.346			0.317	0.356	
	0.317	0.318			0.317	0.331			0.317	0.346	
	0.317	0.318			0.317	0.331			0.317	0.356	
7P	0.317	0.331		70	0.317	0.356		7R	0.322	0.365	
'P	0.334	0.365		7Q	0.334	0.365		//	0.330	0.373	
	0.338	0.360			0.317	0.331			0.334	0.365	

## **COLOR RANGE AND COLOR BINNING**

VLPW3030A2: typ. 3500 K group 4O to 9Q

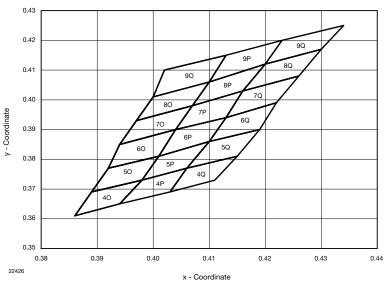
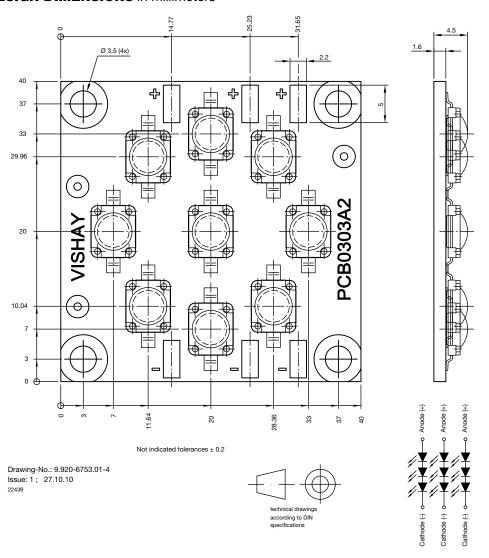


Fig. 2 - Chromaticity Coordinates of Colorgroups for Warm White

CHROM	ATICITY (	COORDINA	ATED G	ROUPS F	OR WARM	/ WHITE	SMD LE	D		
GROUP	Х	Υ		GROUP	Х	Υ		GROUP	Х	Υ
	0.386	0.361		4P	0.394	0.365	1 [		0.403	0.369
40	0.389	0.369			0.398	0.373			0.406	0.377
40	0.398	0.373		46	0.406	0.377			0.415	0.381
	0.394	0.365			0.403	0.369			0.403 0.406	0.373
	0.389	0.369			0.398	0.373			0.406	0.377
50	0.392	0.377		5P	0.401	0.381		50	0.410	0.386
50	0.401	0.381		58	0.410	0.386		6Q -	0.419	0.390
	0.398	0.373			0.406	0.377			0.415	0.381
	0.392	0.377			0.401	0.381	Ī		0.410	0.386
60	0.394	0.385		6P	0.404	0.390	1	6Q	0.413	0.394
60	0.404	0.390			0.413	0.394			0.422	0.399
	0.401	0.381			0.410	0.386	1		0.419	0.390
	0.394	0.385			0.404	0.390	Ī		0.413	0.394
70	0.397	0.393		7P	0.407	0.398		70	0.416	0.403
70	0.407	0.398		/ P	0.416	0.403	1	6Q 7Q 8Q	0.426	0.408
	0.404	0.390			0.413	0.394	1		0.422	0.399
	0.397	0.393			0.407	0.398	Ī		0.416	0.403
80	0.400	0.401		8P	0.410	0.406		8Q	0.420	0.412
80	0.410	0.406		00	0.420	0.412			0.430	0.417
	0.407	0.398	1		0.416	0.403	1		0.426	0.408
	0.400	0.401	1		0.410	0.406	1		0.420	0.412
00	0.402	0.410	1	0.0	0.413	0.415		00	0.423	0.420
90	0.413	0.415		9P	0.423	0.420	1	9Q	0.434	0.425
	0.410	0.406			0.420	0.412	]		0.430	0.417

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### **PCB BASIC DESIGN DIMENSIONS** in millimeters



## **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**

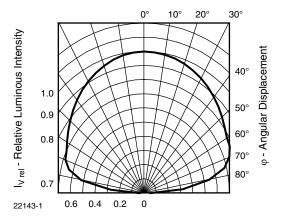
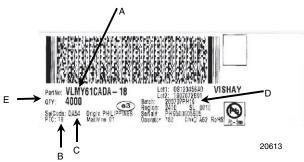


Fig. 3 - Rel. Luminous Intensity vs. Angular Displacement



### **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



# **Legal Disclaimer Notice**

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