

## High Brightness LED Power Module



### FEATURES

- Metal core PCB: Al > 1 thickness
- Single side/single layer PCB
- Shiny white surface
- 6 or 12 LEDs, max. current per LED 1 A
- Prepared to divide in half strips also, by cutting
- Conductive top layer: Cu (min. 18  $\mu\text{m}$ )
- Isolation layer prepreg (100  $\mu\text{m}$ )
- ESD withstand voltage: Up to 2 kV according to JESD22-A114-B
- Color binning
- LM80 certified LEDs
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### DESCRIPTION

VLPC1201A2, VLPC1201A2J and VLPC0601A2 are metal core based high brightness LED power modules assembled with 6 or 12 white LED's. Color temperature range of 5000 K to 7000 K.

The VLPC1201A2J has 12 units in row, while the VLPC1201A2 can be divided in 2 strips 6 LED's each by sawing or driven as 2 x 6 LED's.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: LED module
- Product series: power
- Angle of half intensity:  $\pm 80^\circ$

### APPLICATIONS

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

### PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at $I_F = 700 \text{ mA typ.}$ )	COLOR TEMPERATURE K	TECHNOLOGY
VLPC0601A2	Cool white	$\Phi_V = 1050 \text{ lm}$	5000 to 7000	InGaN
VLPC1201A2	Cool white	$\Phi_V = 2 \times 1050 \text{ lm}$	5000 to 7000	InGaN
VLPC1201A2J	Cool white	$\Phi_V = 2100 \text{ lm}$	5000 to 7000	InGaN

### ABSOLUTE MAXIMUM RATINGS ( $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified) VLPC0601A2, VLPC1201A2, VLPC1201A2J

PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
Forward current			$I_F$	700	mA
Power dissipation	Total	VLPC0601A2	$P_{\text{tot}}$	16.1	W
		VLPC1201A2	$P_{\text{tot}}$	32.2	W
		VLPC1201A2J	$P_{\text{tot}}$	32.2	W
Junction temperature			$T_j$	120	$^\circ\text{C}$
Operating temperature range			$T_{\text{amb}}$	- 40 to + 85	$^\circ\text{C}$
Storage temperature range			$T_{\text{stg}}$	- 40 to + 85	$^\circ\text{C}$
Decomposition temperature of PCB (for cable assembly)	3 x 10 s		$T_D$	350	$^\circ\text{C}$

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC0601A2, COOL WHITE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux total <sup>(1)</sup>	$I_F = 700\text{ mA}$	$\Phi_V$	860	1050	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	5000	-	7000	K
Forward voltage	$I_F = 700\text{ mA}$	$V_F$	19	21	23	V
Temperature coefficient of $V_F$	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 21	-	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.

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC1201A2J, COOL WHITE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux total <sup>(1)</sup>	$I_F = 700\text{ mA}$	$\Phi_V$	1720	2100	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	5000	-	7000	K
Forward voltage	$I_F = 700\text{ mA}$	$V_F$	38	42	46	V
Temperature coefficient of $V_F$	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 40	-	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.

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC1201A2, COOL WHITE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux total <sup>(1)</sup>	$I_F = 700\text{ mA}$	$\Phi_V$	2 x 860	2 x 1050	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	5000	-	7000	K
Forward voltage per 6 LEDs	$I_F = 700\text{ mA}$	$V_F$	19	21	23	V
Temperature coefficient of $V_F$ per 6 LEDs	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 20	-	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.



**COLOR RANGE AND COLOR BINNING**

VLPC0601A2; VLPC1201A2: 5000 K to 7000 K group 6P to 7R

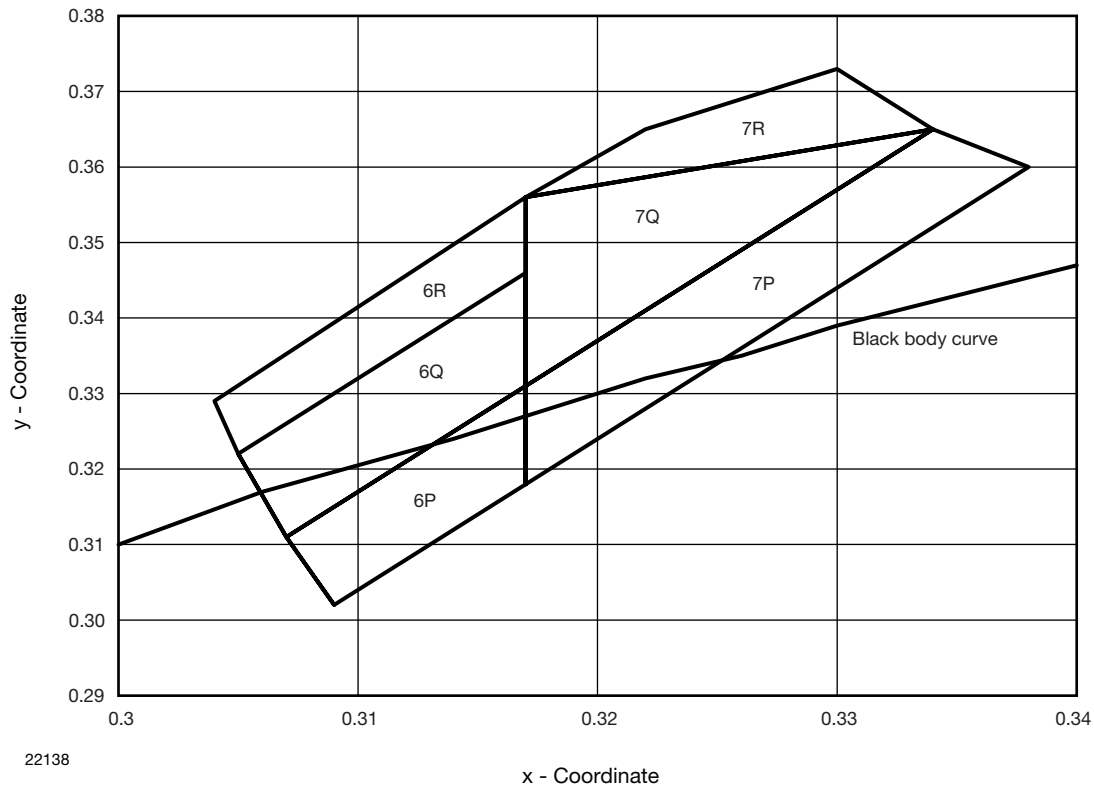
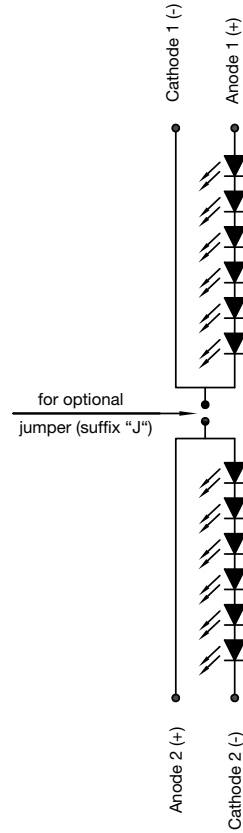
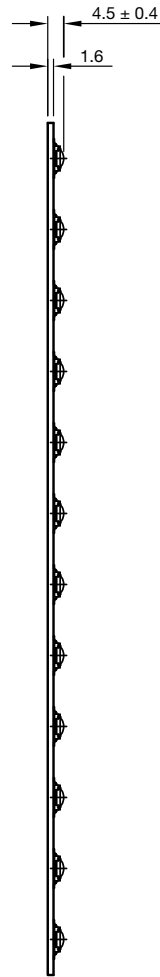
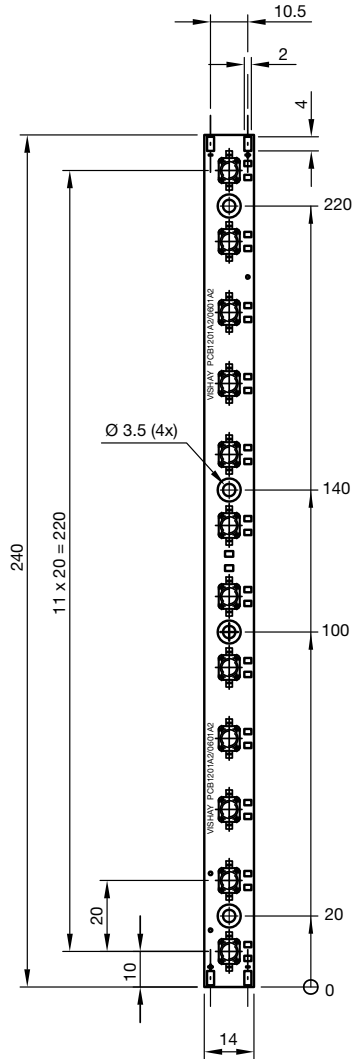


Fig. 1 - Chromaticity Coordinates of Colorgroups

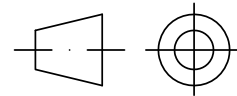
CHROMATICITY COORDINATED GROUPS FOR COOL WHITE SMD LED									
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y	
6P	0.309	0.302	6Q	0.307	0.311	6R	0.305	0.322	
	0.307	0.311		0.305	0.322		0.304	0.329	
	0.317	0.331		0.317	0.346		0.317	0.356	
	0.317	0.318		0.317	0.331		0.317	0.346	
7P	0.317	0.318	7Q	0.317	0.331	7R	0.317	0.356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



## PCB BASIC DESIGN DIMENSIONS in millimeters



Not indicated tolerances ± 0.2

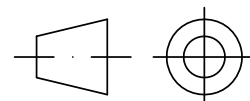
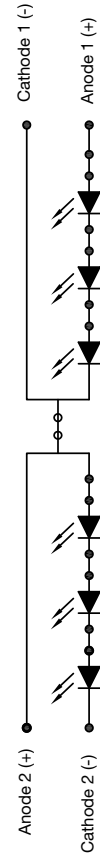
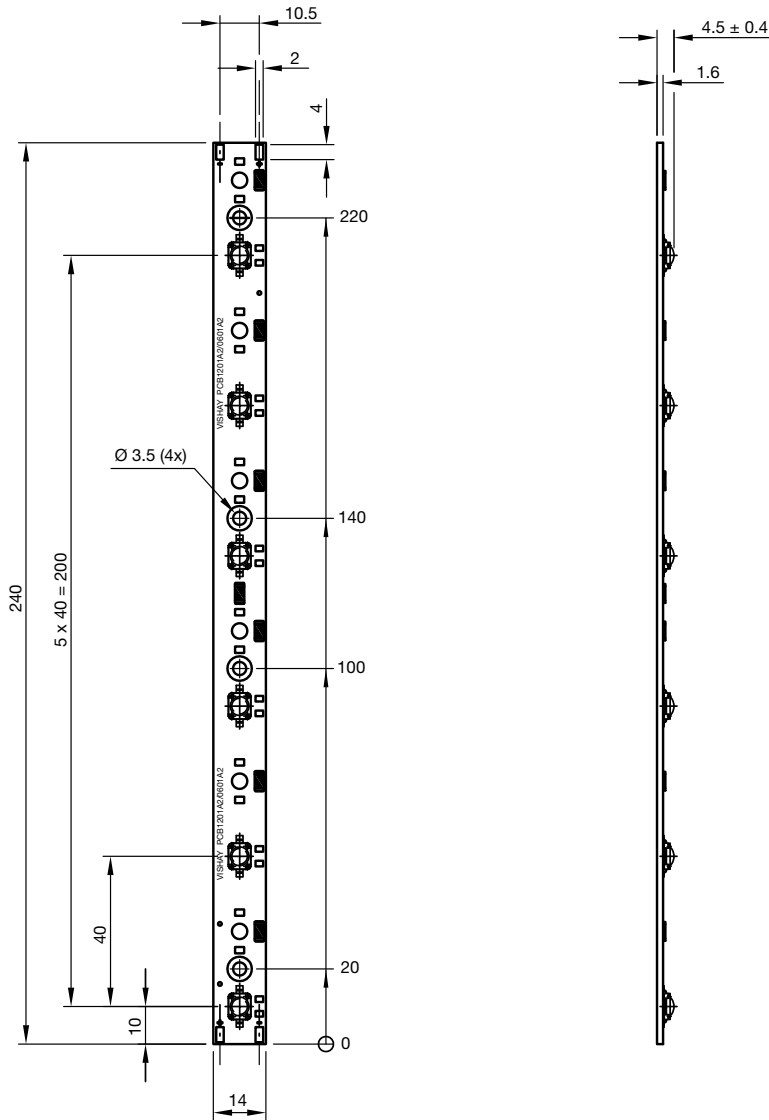


technical drawings according to DIN specifications

Drawing-No.: 9.920-6754.01-4  
Issue: 1 ; 02.11.10  
22435



## PCB BASIC DESIGN DIMENSIONS in millimeters



technical drawings according to DIN specifications

Not indicated tolerances ± 0.2

Drawing-No.: 9.920-6756.01-4  
Issue: 1 ; 02.11.10  
22436

**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 6 or 12 high brightness power LEDs. LED position accuracy ± 0.3

**EMISSION CHARACTERISTIC**

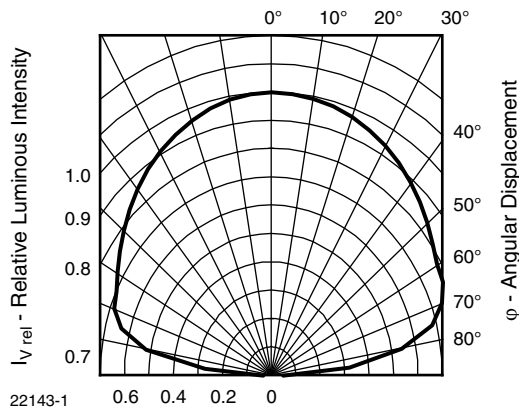
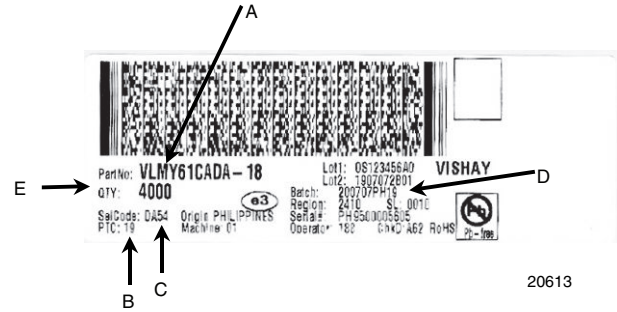


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

**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**

- 32 PCB's per box, minimum order quantity 32



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