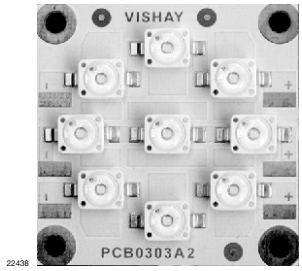
High Brightness LED Power Module



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

Pb-free
RoHS COMPLIANT
GREEN (5-2008)**

Note

** Please see document “Vishay Material Category Policy”: www.vishay.com/doc?99902

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.

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: ± 80°

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at I_F = 700 mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY
VLPC0303A2	Cool white	Φ_V = 1590 lm	5000 to 7000	InGaN
VLPW0303A2	Warm white	Φ_V = 840 lm	3500 typ.	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLPC0303A2, VLPW0303A2

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	700	mA
Power dissipation	Total	P_{tot}	25.2	W
Junction temperature		T_j	120	°C
Operating temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 85	°C
Decomposition temperature of PCB (for cable assembly)	3 x 10 s	T_D	350	°C

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OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) VLPC0303A2, COOL WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (1)	I_F = 700 mA	Φ_V	430	530	-	lm
Luminous flux total (1)	I_{board} = 3 x 700 mA	Φ_V	1290	1590	-	lm
Color temperature	I_F = 350 mA	TK	5000	-	7000	K
Forward voltage per row	I_F = 700 mA	V_F	9	10	12	V
Temperature coefficient of V_F per row	I_F = 350 mA	TC_{VF}	-	- 10	-	mV/K
Temperature coefficient of Φ_V	I_F = 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_{amb} = 25 °C, unless otherwise specified) VLPW0303A2, WARM WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (1)	I_F = 700 mA	Φ_V	240	280	-	lm
Luminous flux total (1)	I_{board} = 3 x 700 mA	Φ_V	720	840	-	lm
Color temperature	I_F = 350 mA	TK	-	3500	-	K
Forward voltage per row	I_F = 700 mA	V_F	9	10	12	V
Temperature coefficient of V_F per row	I_F = 350 mA	TC_{VF}	-	- 10	-	mV/K
Temperature coefficient of Φ_V	I_F = 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 %.

(2) Calculated based on single LED unit.

COLOR RANGE AND COLOR BINNING

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

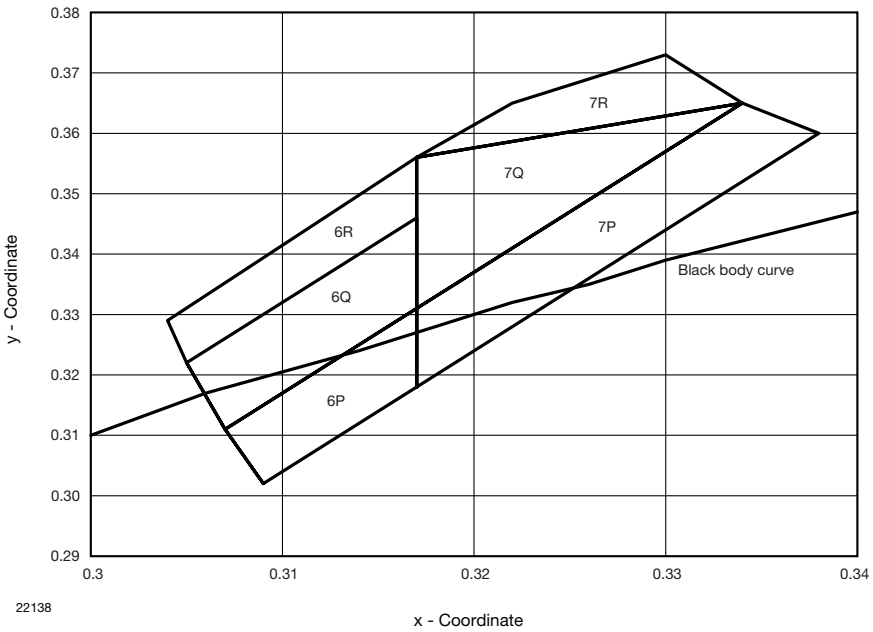

Fig. 1 - Chromaticity Coordinates of Colorgroups for Cool White

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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

COLOR RANGE AND COLOR BINNING

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

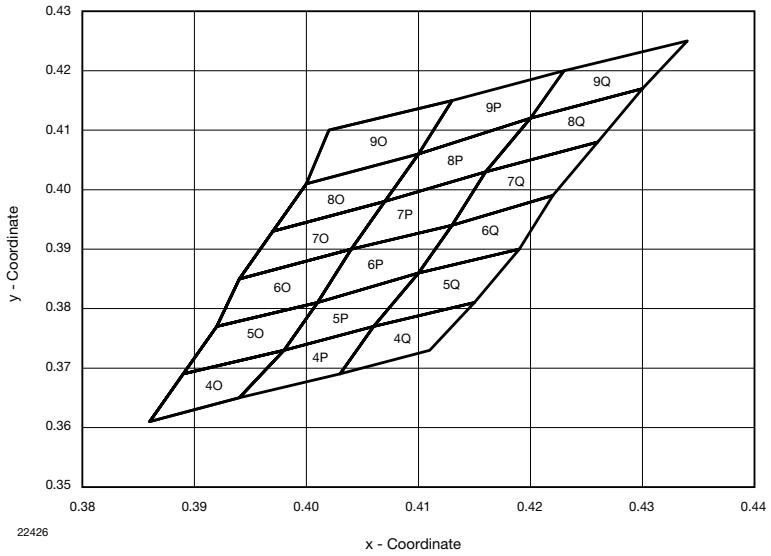

Fig. 2 - Chromaticity Coordinates of Colorgroups for Warm White

CHROMATICITY COORDINATED GROUPS FOR WARM WHITE SMD LED									
GROUP	X	Y		GROUP	X	Y		GROUP	X	Y
4O	0.386	0.361		4P	0.394	0.365		4Q	0.403	0.369
	0.389	0.369			0.398	0.373			0.406	0.377
	0.398	0.373			0.406	0.377			0.415	0.381
	0.394	0.365			0.403	0.369			0.411	0.373
5O	0.389	0.369		5P	0.398	0.373		5Q	0.406	0.377
	0.392	0.377			0.401	0.381			0.410	0.386
	0.401	0.381			0.410	0.386			0.419	0.390
	0.398	0.373			0.406	0.377			0.415	0.381
6O	0.392	0.377		6P	0.401	0.381		6Q	0.410	0.386
	0.394	0.385			0.404	0.390			0.413	0.394
	0.404	0.390			0.413	0.394			0.422	0.399
	0.401	0.381			0.410	0.386			0.419	0.390
7O	0.394	0.385		7P	0.404	0.390		7Q	0.413	0.394
	0.397	0.393			0.407	0.398			0.416	0.403
	0.407	0.398			0.416	0.403			0.426	0.408
	0.404	0.390			0.413	0.394			0.422	0.399
8O	0.397	0.393		8P	0.407	0.398		8Q	0.416	0.403
	0.400	0.401			0.410	0.406			0.420	0.412
	0.410	0.406			0.420	0.412			0.430	0.417
	0.407	0.398			0.416	0.403			0.426	0.408
9O	0.400	0.401		9P	0.410	0.406		9Q	0.420	0.412
	0.402	0.410			0.413	0.415			0.423	0.420
	0.413	0.415			0.423	0.420			0.434	0.425
	0.410	0.406			0.420	0.412			0.430	0.417

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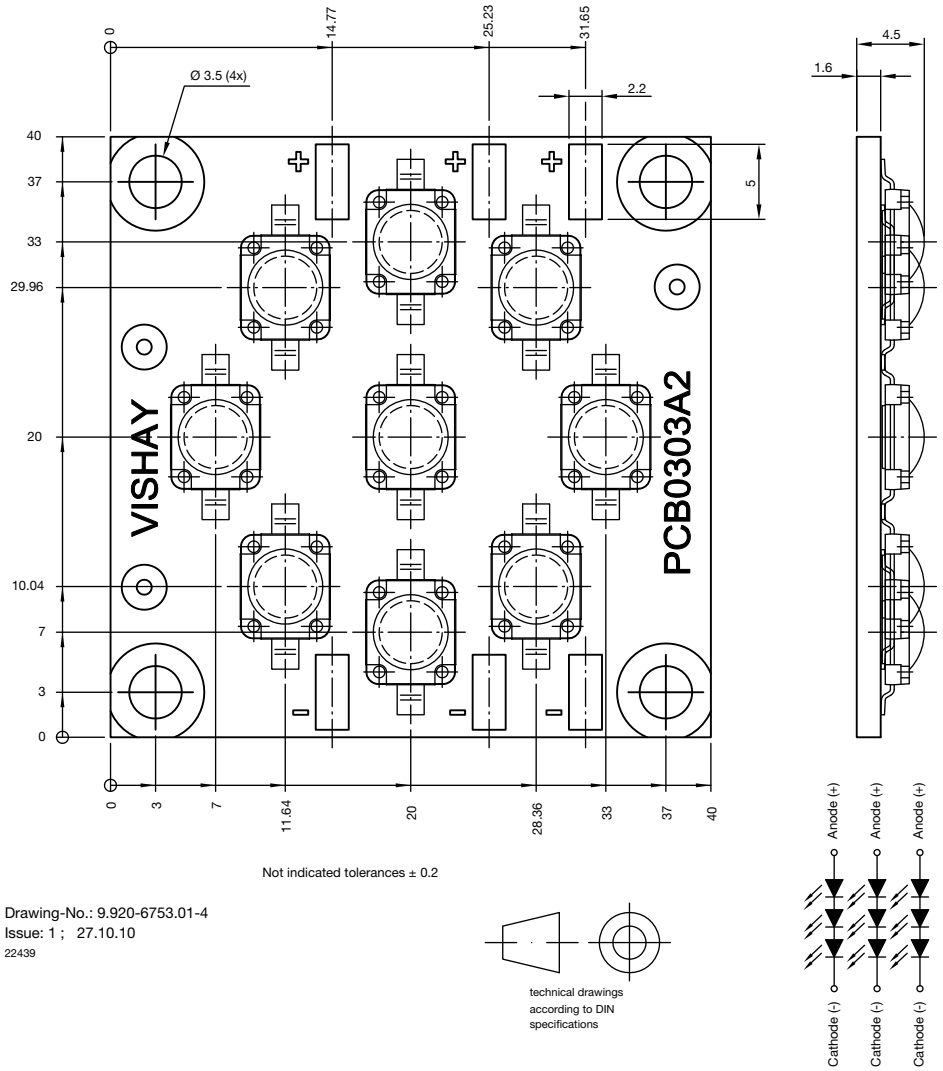
PCB BASIC DESIGN DIMENSIONS in millimeters



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

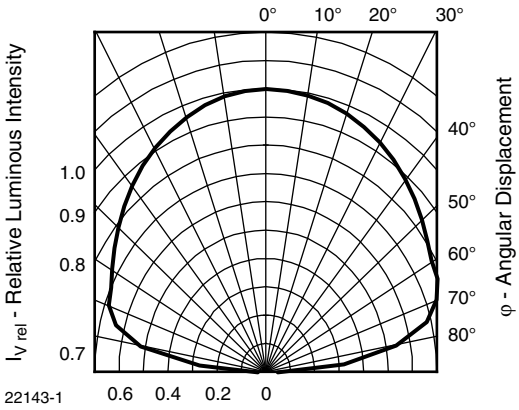


Fig. 3 - Rel. Luminous Intensity vs. Angular Displacement

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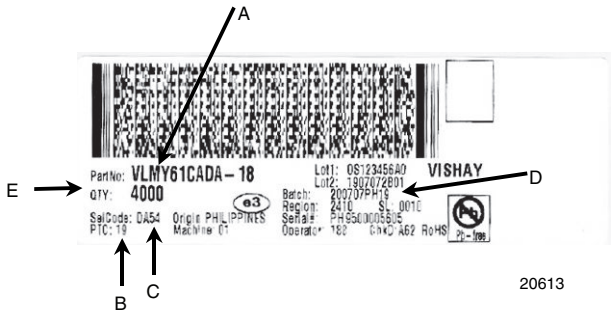
BAR CODE PRODUCT LABEL



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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