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High Brightness LED Power Module



22454



22159

DESCRIPTION

The VLSL3112A2, VLSL3124A2 are metal core based high brightness LED power modules, assembled with 12 or 24 HB white LEDs. The color temperature is natural white. The typical color temperature is 4000 K. The modules are designed for flexible use due to the option for using special reflectors to adjust the emission characteristics.

PRODUCT GROUP AND PACKAGE DATA

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

FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12 or 24 LEDs minimum 71 lm at 350 mA per LED. Max. current per LED 1 A
- Conductive top layer: Cu (min. 18 μm)
- Isolation layer prepreg > 63 μm
- Standard solder mask material
- ESD withstand voltage: up to 2 kV according to JESD22-A114-B
- LM80 certified LEDs
- Compliant to RoHS Directive 2002/95/EC



APPLICATIONS

- Streetlight
- Internal lighting in buildings
- Tunnel lights
- General lighting application

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at $I_F = 700 \text{ mA typ.}$)	COLOR TEMPERATURE K	TECHNOLOGY
VLSL3112A2	Natural white	$\Phi_V = 1600 \text{ lm}$	typ. 4000	InGaN
VLSL3124A2	Natural white	$\Phi_V = 3200 \text{ lm}$	typ. 4000	InGaN

ABSOLUTE MAXIMUM RATINGS ($T_{\text{amb}} = 25^\circ\text{C}$, unless otherwise specified) VLSL3112A2, VLSL3124A2

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL3112A2	Total (max.)	P_{tot}	34.5	W
Power dissipation VLSL3124A2		P_{tot}	69	W
Junction temperature		T_j	120	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 85	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 85	$^\circ\text{C}$

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

OPTICAL AND ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VL3112A2, NATURAL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	650	800	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 2 \times 700\text{ mA}$	Φ_V	1300	1600	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	4000	-	K
Forward voltage per row	$I_F = 700\text{ mA}$	V_F	19	21	23	V
Class A ($V_{Fmax.} - V_{Fmin.}$) all rows ⁽³⁾	$I_F = 700\text{ mA}$	ΔV_F	-	-	0.9	V
Temperature coefficient of V_F per row	$I_F = 350\text{ mA}$	TC_{V_F}	-	- 20	-	mV/K
Temperature coefficient of Φ_V	$I_F = 350\text{ mA}$ (per row)	TC_{Φ_V}	-	- 0.4	-	%/K

Notes

- ⁽¹⁾ 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 $\pm 11\%$.
- ⁽²⁾ Calculated based on single LED unit.
- ⁽³⁾ 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 ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VL3124A2, NATURAL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	650	800	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 4 \times 700\text{ mA}$	Φ_V	2600	3200	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	4000	-	K
Forward voltage per row	$I_F = 700\text{ mA}$	V_F	19	21	23	V
Class A ($V_{Fmax.} - V_{Fmin.}$) all rows ⁽³⁾	$I_F = 700\text{ mA}$	ΔV_F	-	-	0.9	V
Temperature coefficient of V_F per row	$I_F = 350\text{ mA}$	TC_{V_F}	-	- 20	-	mV/K
Temperature coefficient of Φ_V	$I_F = 350\text{ mA}$ (per row)	TC_{Φ_V}	-	- 0.4	-	%/K

Notes

- ⁽¹⁾ 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 $\pm 11\%$.
- ⁽²⁾ Calculated based on single LED unit.
- ⁽³⁾ V_F classes are marked at the LED cluster and represent the technical classification only. The single groups cannot be specifically ordered.

LUMINOUS FLUX CLASSIFICATION FOR THE SINGLE LED AT 350 mA

GROUP	LUMINOUS FLUX Φ_V (mIm) CORRELATION TABLE	
	MIN.	MAX.
STANDARD		
KX	71 000	82 000
KY	82 000	97 000
KZ	97 000	112 000



COLOR RANGE AND COLOR BINNING

VLSL3112A2, VLSL3124A2; typ. 4000 K; group 4L to 8N

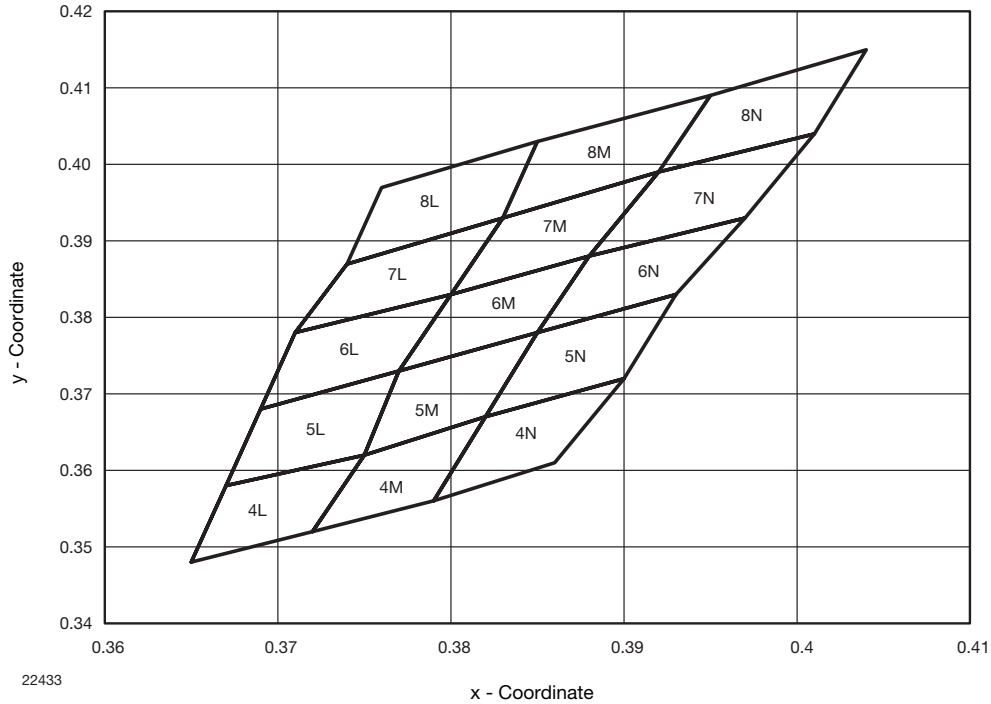


Fig. 1 - Chromaticity Coordinates of Colorgroups

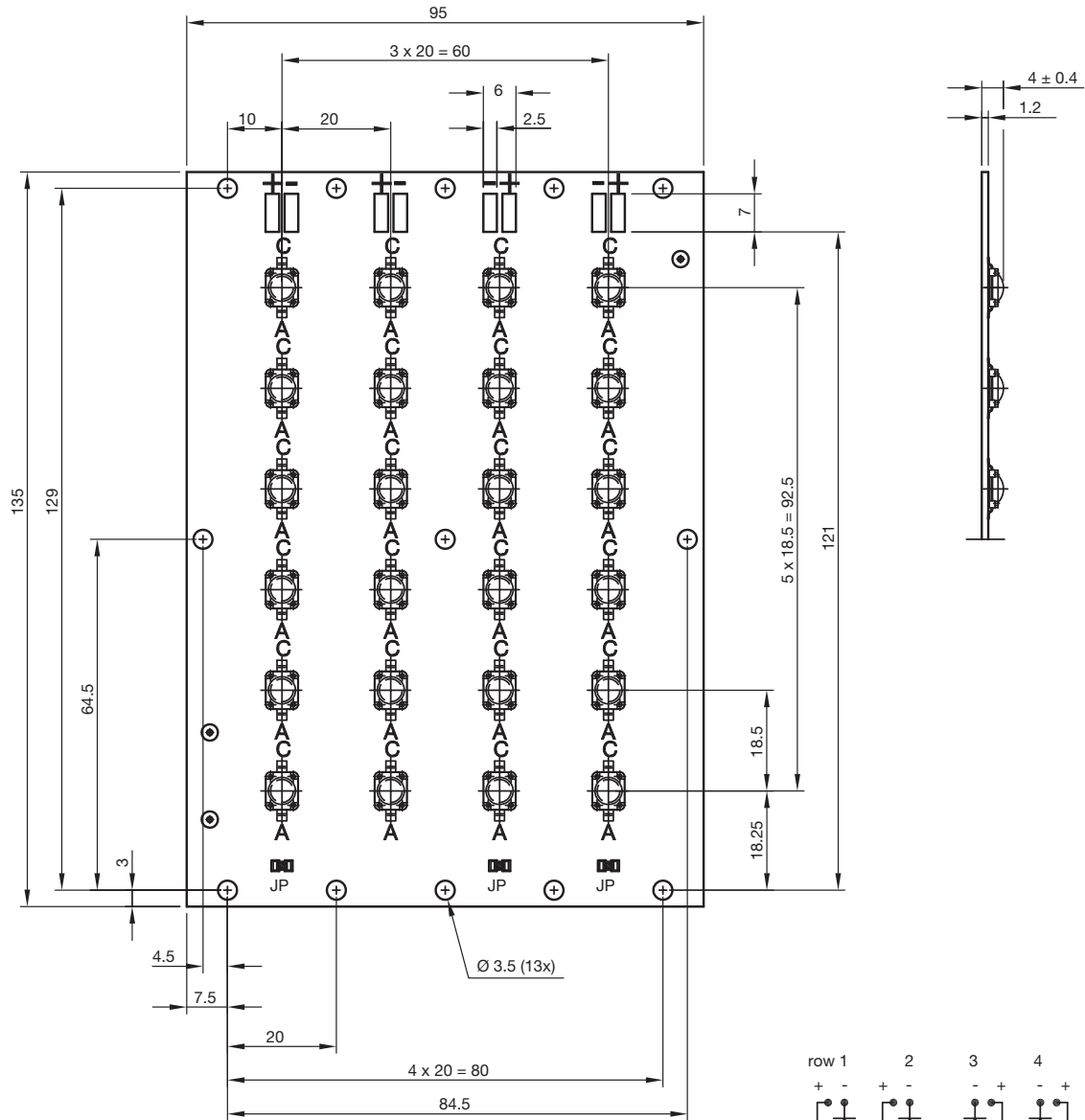
CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED									
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y	
4L	0.365	0.348	4M	0.372	0.352	4N	0.379	0.356	
	0.367	0.358		0.375	0.362		0.382	0.367	
	0.375	0.362		0.382	0.367		0.390	0.372	
	0.372	0.352		0.379	0.356		0.386	0.361	
5L	0.367	0.358		0.375	0.362		5N	0.382	0.367
	0.369	0.368	0.377	0.373	0.385	0.378			
	0.377	0.373	0.385	0.378	0.393	0.383			
	0.375	0.362	0.382	0.367	0.390	0.372			
6L	0.369	0.368	6M	0.377	0.373	6N	0.385	0.378	
	0.371	0.378		0.380	0.383		0.388	0.388	
	0.380	0.383		0.388	0.388		0.397	0.393	
	0.377	0.373		0.385	0.378		0.393	0.383	
7L	0.371	0.378	7M	0.380	0.383	7N	0.388	0.388	
	0.374	0.387		0.383	0.393		0.392	0.399	
	0.383	0.393		0.392	0.399		0.401	0.404	
	0.380	0.383		0.388	0.388		0.397	0.393	
8L	0.374	0.387	8M	0.383	0.393	8N	0.392	0.399	
	0.376	0.397		0.385	0.403		0.395	0.409	
	0.385	0.403		0.395	0.409		0.404	0.415	
	0.383	0.393		0.392	0.399		0.401	0.404	



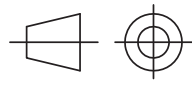
VLSL3112A2, VLSL3124A2

High Brightness LED Power Module Vishay Semiconductors

PCB BASIC DESIGN VLSL3124A2 DIMENSIONS in millimeters

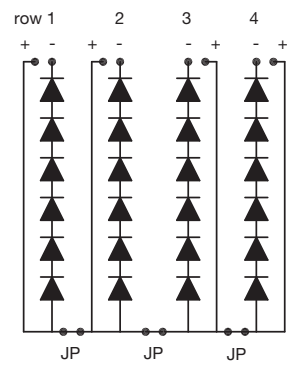


Not indicated tolerances ± 0.2



technical drawings according to DIN specifications

Drawing-No.: 9.920-6751.01-4
Issue: 2; 02.11.10
22455



Assembled with all jumpers. Jumpers can be removed according driver design

PCB CHARACTERISTICS

- Metal core PCB with typical Al thickness of 800 μm
- Prepreg thickness typical 127 μm
- Conductive pattern Cu typical 25 μm
- Total board thickness: 1 mm \pm 15 %
- Warpage max. 0.75 % of board dimension
- Solder resist on top side
- Shiny white surface
- Galvanic of solder pads pure matte Sn (\geq 0.8 μm), immersion plated
- Assembled with 12 or 24 VLMW91xxx LEDs. LED position accuracy \pm 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

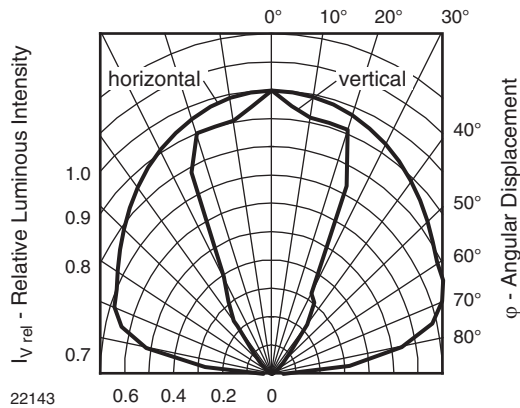


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

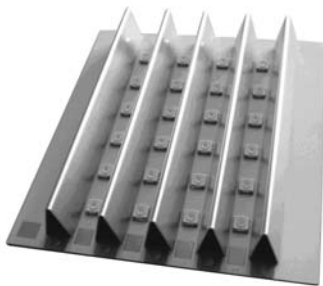
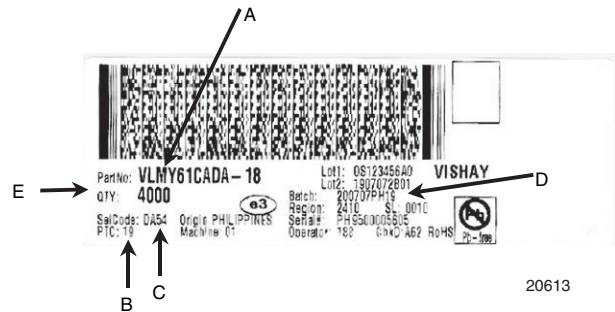


Fig. 3 - Sample Board with Reflectors (for Info only)

BAR CODE PRODUCT LABEL (example)



- A. Type of component
- B. Manufacturing plant
- C. SEL - selection code (bin):
e.g.: code for V_F class (A, B, C)
- D. Batch:
200707 = year 2007, week 07
PH19 = plant code
- E. Total quantity



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