

Vishay Semiconductors

## **High Brightness LED Power Module**





#### **DESCRIPTION**

The VLSL51xxA are metal core based high brightness LED power modules, assembled with 12, 24 or 36 HB white LEDs. The colour temperature is natural white. The typical color temperature is 4000 K. The LED's are designed with a clear silicone lens for a butterfly shaped radiation characteristic.

#### PRODUCT GROUP AND PACKAGE DATA

Product group: LEDPackage: LED moduleProduct series: power

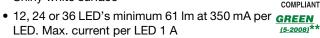
• Angle of half intensity: vertical: ± 35°, horizontal: ± 60°

#### **FEATURES**

• Metal core PCB: Al > 0.75 thickness



• Shiny white surface



- Conductive top layer: Cu (min. 18 μm)
- Isolation layer prepreg > 63 μm
- Luminous flux and colour binning
- 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 $I_F = 700$ mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY					
VLSL5112A	Natural white	$\Phi_{V}$ = 1500 lm	4000	InGaN					
VLSL5124A	Natural white	$\Phi_{V} = 3000 \text{ Im}$	4000	InGaN					
VLSL5136A	Natural white	$\Phi_{V} = 4500 \text{ Im}$	4000	InGaN					

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25$ °C, unless otherwise specified) VLSL5112A, VLSL5124A, VLSL5136A									
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT					
Forward current	Per row	I <sub>F</sub>	750	mA					
Power dissipation VLSL5112A		P <sub>tot</sub>	35	W					
Power dissipation VLSL5124A	Total (max.)	P <sub>tot</sub>	69	W					
Power dissipation VLSL5136A		P <sub>tot</sub>	104	W					
Junction temperature		Tj	120	°C					
Operating temperature range		T <sub>amb</sub>	- 40 to + 85	°C					
Storage temperature range		T <sub>stg</sub>	- 40 to + 85	°C					

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

Document Number: 83381 Rev. 1.1, 13-Apr-11 For technical questions, contact: LED@vishay.com

# **VLSL5112A, VLSL5124A, VLSL5136A**

# Vishay Semiconductors High Brightness LED Power Module



OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>(1)</sup> $(T_{amb} = 25  ^{\circ}C)$ , unless otherwise specified) VLSL5112A, NATURAL WHITE											
PARAMETER TEST CONDITION SYMBOL MIN. TYP. MAX. UNIT											
Luminous flux per row (2)	I <sub>F</sub> = 700 mA	Фу	550	750	-	lm					
Luminous flux total (2)	$I_{board} = 2 \times 700 \text{ mA}$	Фу	1100	1500	-	lm					
Color temperature	I <sub>F</sub> = 700 mA	TK	-	4000	-	K					
Forward voltage per row	I <sub>F</sub> = 700 mA	V <sub>F</sub>	19	20	23	V					
Temperature coefficient of V <sub>F</sub> per row	I <sub>F</sub> = 350 mA	TC <sub>VF</sub>	-	- 20	-	mV/K					
Temperature coefficient of $\Phi_V$ per row	I <sub>F</sub> = 350 mA	TCΦ <sub>V</sub>	-	- 0.4	-	%/K					

#### **Notes**

<sup>(2)</sup> Calculated based on single LED unit.

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>(1)</sup> (T <sub>amb</sub> = 25 °C, unless otherwise specified) VLSL5124A, NATURAL WHITE										
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT				
Luminous flux per row (2)	I <sub>F</sub> = 700 mA	$\Phi_{V}$	550	750	-	lm				
Luminous flux total (2)	$I_{board} = 4 \times 700 \text{ mA}$	Фу	2200	3000	-	lm				
Color temperature	I <sub>F</sub> = 700 mA	TK	-	4000	-	K				
Forward voltage per row	I <sub>F</sub> = 700 mA	V <sub>F</sub>	19	20	23	V				
Temperature coefficient of V <sub>F</sub> per row	I <sub>F</sub> = 350 mA	TC <sub>VF</sub>	-	- 20	-	mV/K				
Temperature coefficient of $\Phi_V$ per row $I_F = 350 \text{ mA}$ $TC\Phi_V$ 0.4 - %/K										

#### Notes

<sup>(2)</sup> Calculated based on single LED unit.

OPTICAL AND ELECTRICAL CHARACTERISTICS (1) $(T_{amb} = 25  ^{\circ}C)$ , unless otherwise specified) VLSL5136A, NATURAL WHITE									
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT			
Luminous flux per row (2)	I <sub>F</sub> = 700 mA	Фу	550	750	-	lm			
Luminous flux total (2)	$I_{board} = 6 \times 700 \text{ mA}$	Ф	3300	4500	-	lm			
Color temperature	I <sub>F</sub> = 700 mA	TK	-	4000	-	K			
Forward voltage per row	I <sub>F</sub> = 700 mA	V <sub>F</sub>	19	20	23	V			
Temperature coefficient of V <sub>F</sub> per row	I <sub>F</sub> = 350 mA	TC <sub>VF</sub>	-	- 20	-	mV/K			
Temperature coefficient of $\Phi_V$ per row	I <sub>F</sub> = 350 mA	ТСФ∨	-	- 0.4	-	%/K			

#### Notes

#### SPECIFICATION OF SINGLE LEDs USED FOR THE MODULES

LUMINOUS FLUX CLASSIFICATION FOR THE SINGLE LED								
GROUP	LUMINOUS FLUX Φ <sub>V</sub> (mlm) CORRELATION TABLE							
STANDARD	MIN.	MAX.						
JZ	61 000	71 000						
KX	71 000	82 000						
KY	82 000	97 000						

<sup>(1)</sup> 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 %.

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<sup>(2)</sup> Calculated based on single LED unit.



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

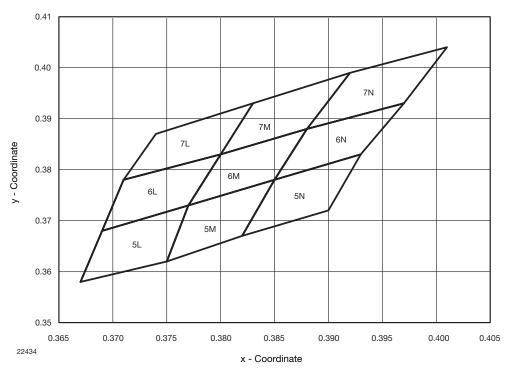


Fig. 1 - Chromaticity Coordinates of Colorgroups

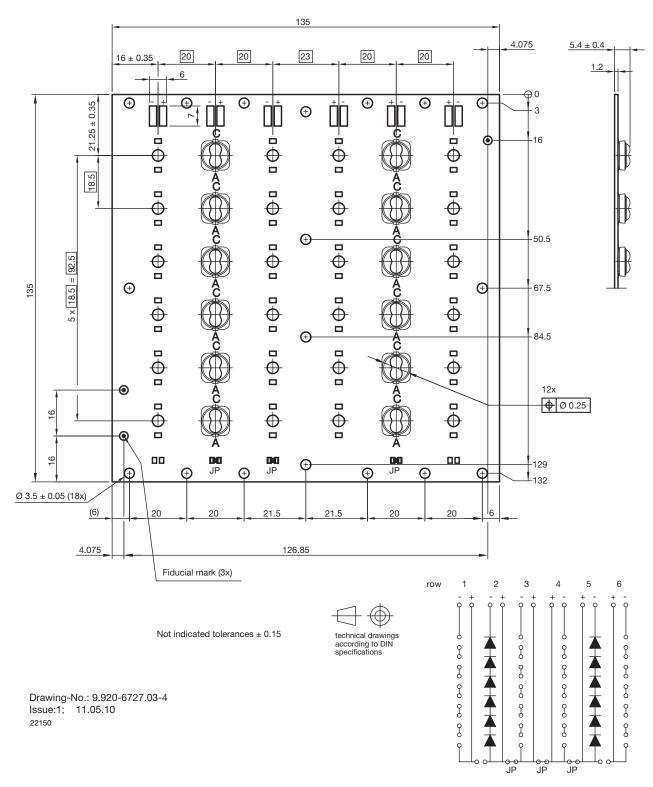
CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED										
GROUP	Х	Υ		GROUP	Х	Υ		GROUP	Х	Υ
5L	0.367	0.358			0.375	0.362			0.382	0.367
	0.369	0.368		5M	0.377	0.373		5N	0.385	0.378
3L	0.377	0.373		SIVI	0.385	0.378		SIN	0.393	0.383
	0.375	0.362			0.382	0.367			0.390	0.372
	0.369	0.368		6M	0.377	0.373		6N	0.385	0.378
6L	0.371	0.378			0.380	0.383			0.388	0.388
OL.	0.380	0.383		Olvi	0.388	0.388		OIN	0.397	0.393
	0.377	0.373			0.385	0.378			0.393	0.383
	0.371	0.378			0.380	0.383			0.388	0.388
7L	0.374	0.387		7M	0.383	0.393		7N	0.392	0.399
/ L	0.383	0.393		/ 101	0.392	0.399		/ IN	0.401	0.404
	0.380	0.383			0.388	0.388	]		0.397	0.393

# **VLSL5112A, VLSL5124A, VLSL5136A**

# Vishay Semiconductors High Brightness LED Power Module



#### PCB BASIC DESIGN VLSL5112A Dimensions in millimeters

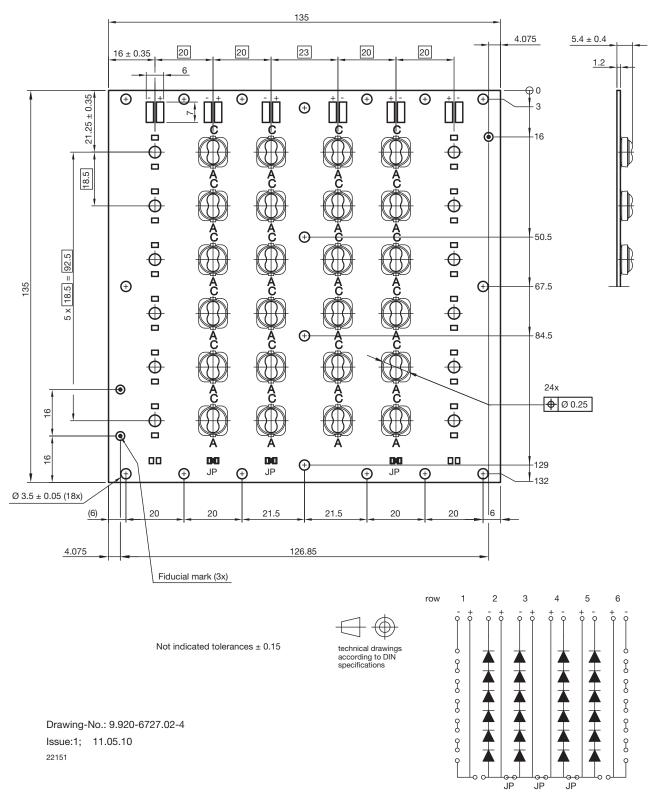


Assembled with all jumpers. Jumpers can be removed according driver design



# High Brightness LED Power Module Vishay Semiconductors

#### PCB BASIC DESIGN VLSL5124A Dimensions in millimeters



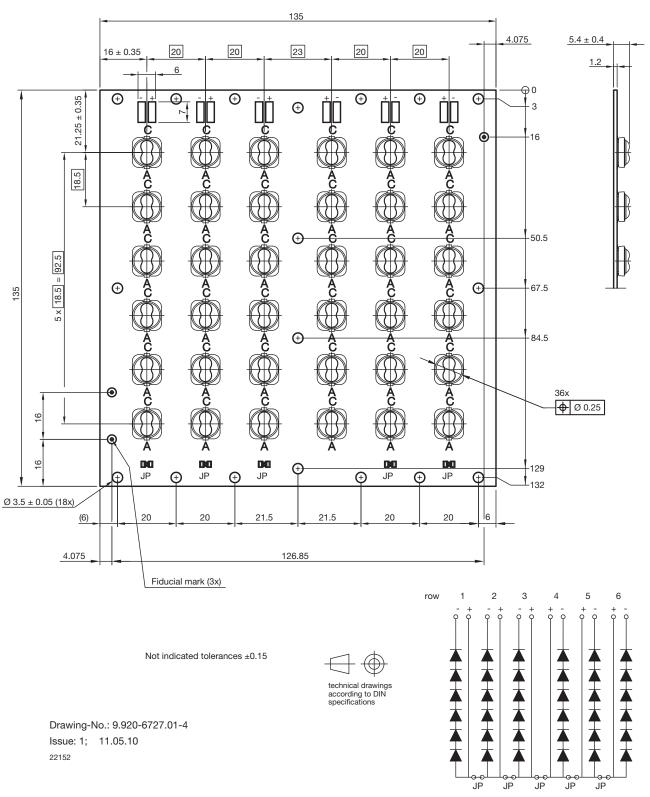
Assembled with all jumpers. Jumpers can be removed according driver design

# **VLSL5112A, VLSL5124A, VLSL5136A**

# Vishay Semiconductors High Brightness LED Power Module



#### PCB BASIC DESIGN VLSL5136A Dimensions in millimeters



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





# High Brightness LED Power Module Vishay Semiconductors

#### **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 ± 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  $\mu$ m), immersion plated
- Assembled with 12, 24 or 36 LED's.
  LED position accuracy ± 0.125 mm from middle axis, horizontal tilt max. 2°

#### **EMISSION CHARACTERISTIC**

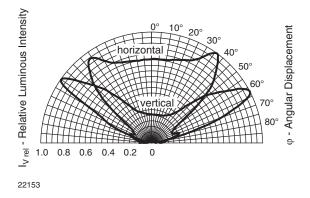
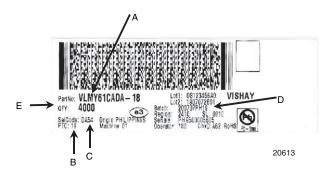


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

#### **BAR CODE PRODUCT LABEL**



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



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