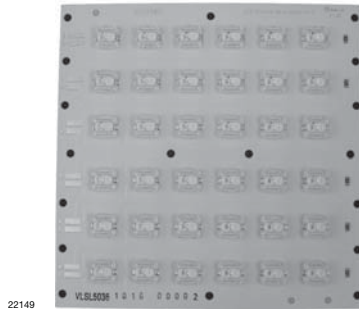


## High Brightness LED Power Module



### 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: LED
- Package: LED module
- Product series: power
- Angle of half intensity: vertical:  $\pm 35^\circ$ , horizontal:  $\pm 60^\circ$

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	$\Phi_V = 3000$ lm	4000	InGaN
VLSL5136A	Natural white	$\Phi_V = 4500$ lm	4000	InGaN

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified) VLSL5112A, VLSL5124A, VLSL5136A				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	$I_F$	750	mA
Power dissipation VLSL5112A	Total (max.)	$P_{tot}$	35	W
Power dissipation VLSL5124A		$P_{tot}$	69	W
Power dissipation VLSL5136A		$P_{tot}$	104	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](http://www.vishay.com/doc?99902)

### FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12, 24 or 36 LED's minimum 61 lm at 350 mA per LED. Max. current per LED 1 A
- Conductive top layer: Cu (min. 18  $\mu\text{m}$ )
- Isolation layer prepreg > 63  $\mu\text{m}$
- 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



RoHS  
COMPLIANT  
**GREEN**  
(5-2008)\*\*

### APPLICATIONS

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

### OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>(1)</sup> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) VLSL5112A, NATURAL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row <sup>(2)</sup>	$I_F = 700\text{ mA}$	$\Phi_V$	550	750	-	lm
Luminous flux total <sup>(2)</sup>	$I_{board} = 2 \times 700\text{ mA}$	$\Phi_V$	1100	1500	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	4000	-	K
Forward voltage per row	$I_F = 700\text{ mA}$	$V_F$	19	20	23	V
Temperature coefficient of $V_F$ per row	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 20	-	mV/K
Temperature coefficient of $\Phi_V$ per row	$I_F = 350\text{ mA}$	$TC_{\Phi_V}$	-	- 0.4	-	%/K

#### Notes

- <sup>(1)</sup> 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>(2)</sup> Calculated based on single LED unit.

### OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>(1)</sup> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) VLSL5124A, NATURAL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row <sup>(2)</sup>	$I_F = 700\text{ mA}$	$\Phi_V$	550	750	-	lm
Luminous flux total <sup>(2)</sup>	$I_{board} = 4 \times 700\text{ mA}$	$\Phi_V$	2200	3000	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	4000	-	K
Forward voltage per row	$I_F = 700\text{ mA}$	$V_F$	19	20	23	V
Temperature coefficient of $V_F$ per row	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 20	-	mV/K
Temperature coefficient of $\Phi_V$ per row	$I_F = 350\text{ mA}$	$TC_{\Phi_V}$	-	- 0.4	-	%/K

#### Notes

- <sup>(1)</sup> 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>(2)</sup> Calculated based on single LED unit.

### OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>(1)</sup> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) VLSL5136A, NATURAL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row <sup>(2)</sup>	$I_F = 700\text{ mA}$	$\Phi_V$	550	750	-	lm
Luminous flux total <sup>(2)</sup>	$I_{board} = 6 \times 700\text{ mA}$	$\Phi_V$	3300	4500	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	4000	-	K
Forward voltage per row	$I_F = 700\text{ mA}$	$V_F$	19	20	23	V
Temperature coefficient of $V_F$ per row	$I_F = 350\text{ mA}$	$TC_{V_F}$	-	- 20	-	mV/K
Temperature coefficient of $\Phi_V$ per row	$I_F = 350\text{ mA}$	$TC_{\Phi_V}$	-	- 0.4	-	%/K

#### Notes

- <sup>(1)</sup> 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>(2)</sup> Calculated based on single LED unit.

## SPECIFICATION OF SINGLE LEDs USED FOR THE MODULES

### LUMINOUS FLUX CLASSIFICATION FOR THE SINGLE LED

GROUP	LUMINOUS FLUX $\Phi_V$ (mIm) CORRELATION TABLE	
	MIN.	MAX.
STANDARD		
JZ	61 000	71 000
KX	71 000	82 000
KY	82 000	97 000



**COLOR RANGE AND COLOR BINNING**

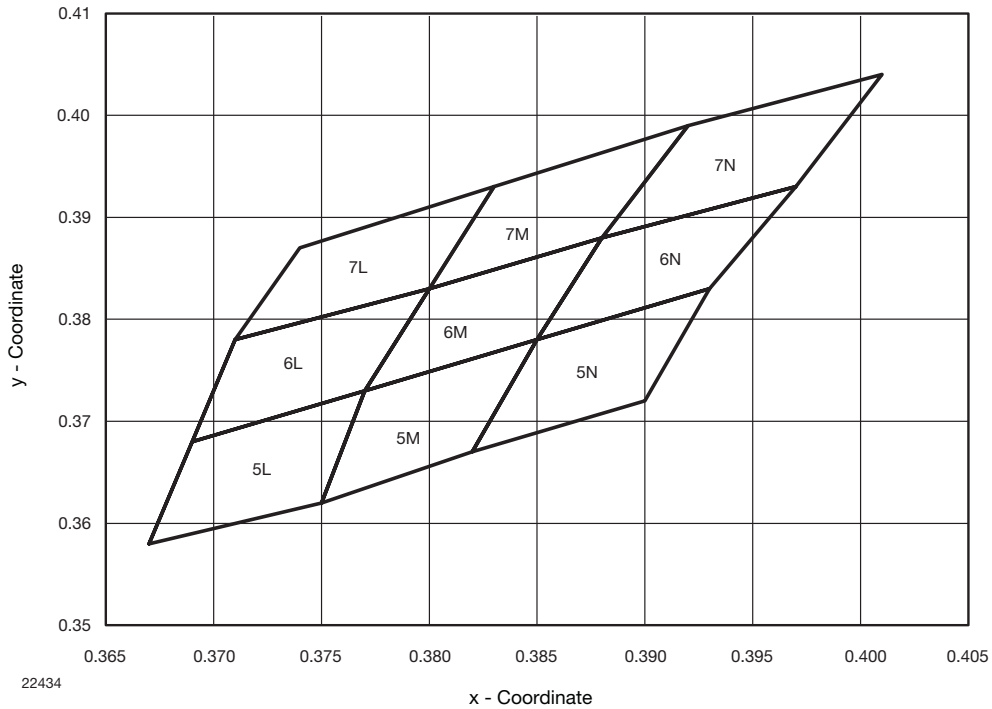


Fig. 1 - Chromaticity Coordinates of Colorgroups

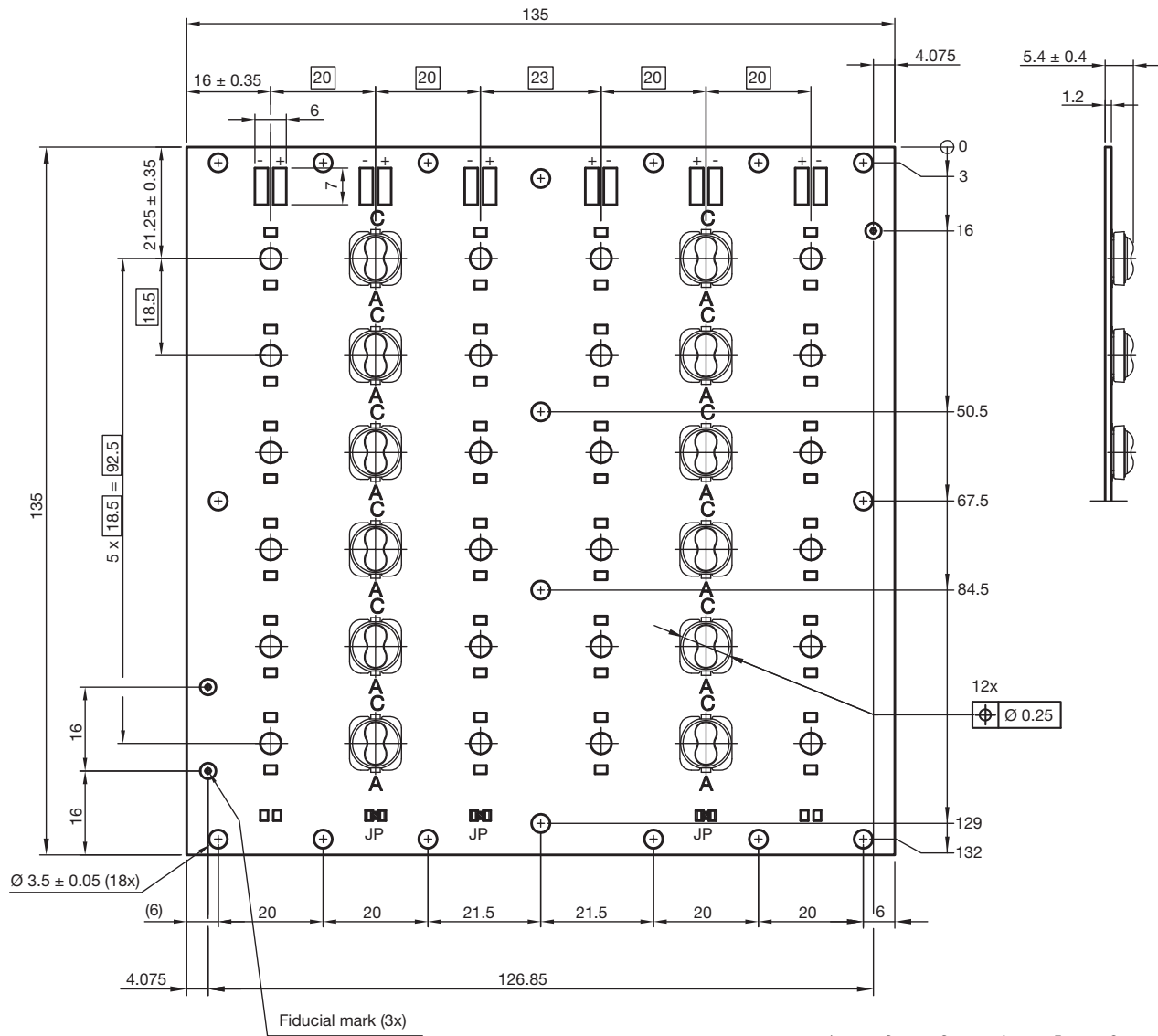
CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED									
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y	
5L	0.367	0.358	5M	0.375	0.362	5N	0.382	0.367	
	0.369	0.368		0.377	0.373		0.385	0.378	
	0.377	0.373		0.385	0.378		0.393	0.383	
	0.375	0.362		0.382	0.367		0.390	0.372	
6L	0.369	0.368		0.377	0.373		6N	0.385	0.378
	0.371	0.378	6M	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
	0.374	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		

# VLSL5112A, VLSL5124A, VLSL5136A

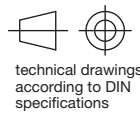
Vishay Semiconductors High Brightness LED Power Module



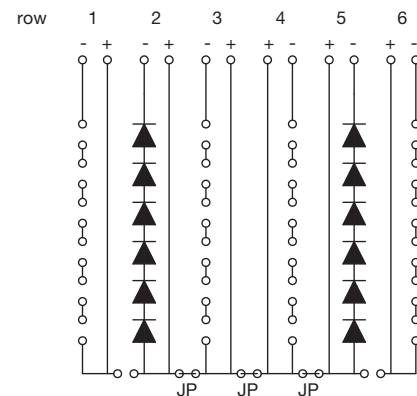
## PCB BASIC DESIGN VLSL5112A Dimensions in millimeters



Not indicated tolerances ± 0.15



Drawing-No.: 9.920-6727.03-4  
 Issue:1; 11.05.10  
 22150



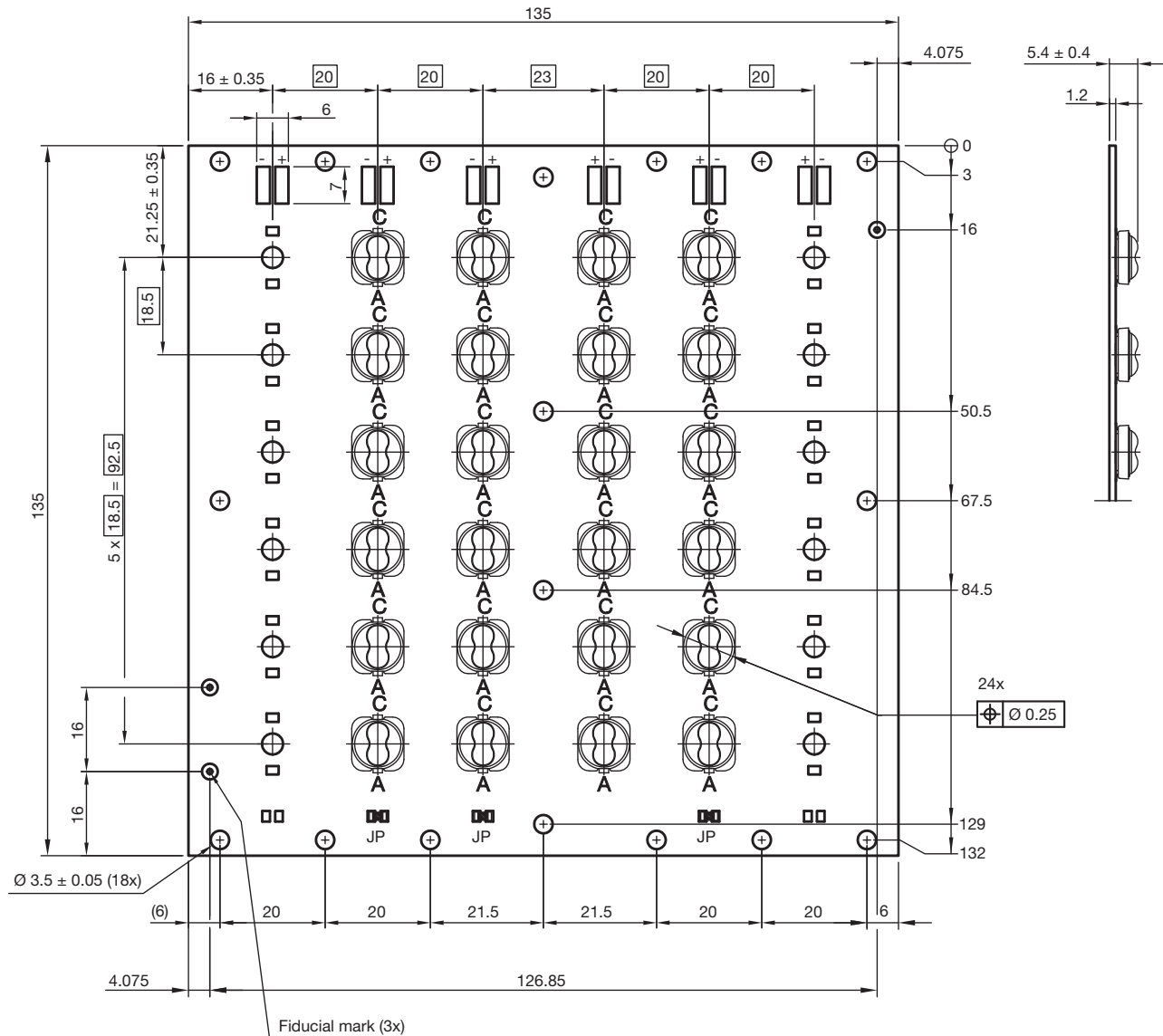
Assembled with all jumpers. Jumpers can be removed according driver design



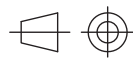
# VLSL5112A, VLSL5124A, VLSL5136A

High Brightness LED Power Module Vishay Semiconductors

## PCB BASIC DESIGN VLSL5124A Dimensions in millimeters



Not indicated tolerances ± 0.15

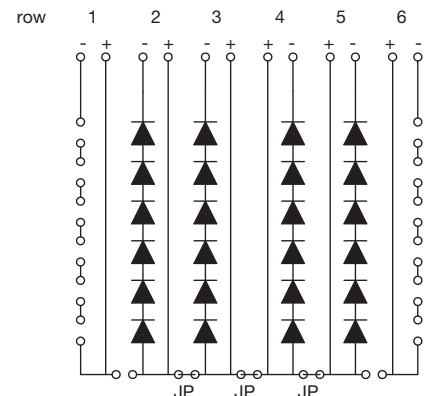


technical drawings according to DIN specifications

Drawing-No.: 9.920-6727.02-4

Issue:1; 11.05.10

22151



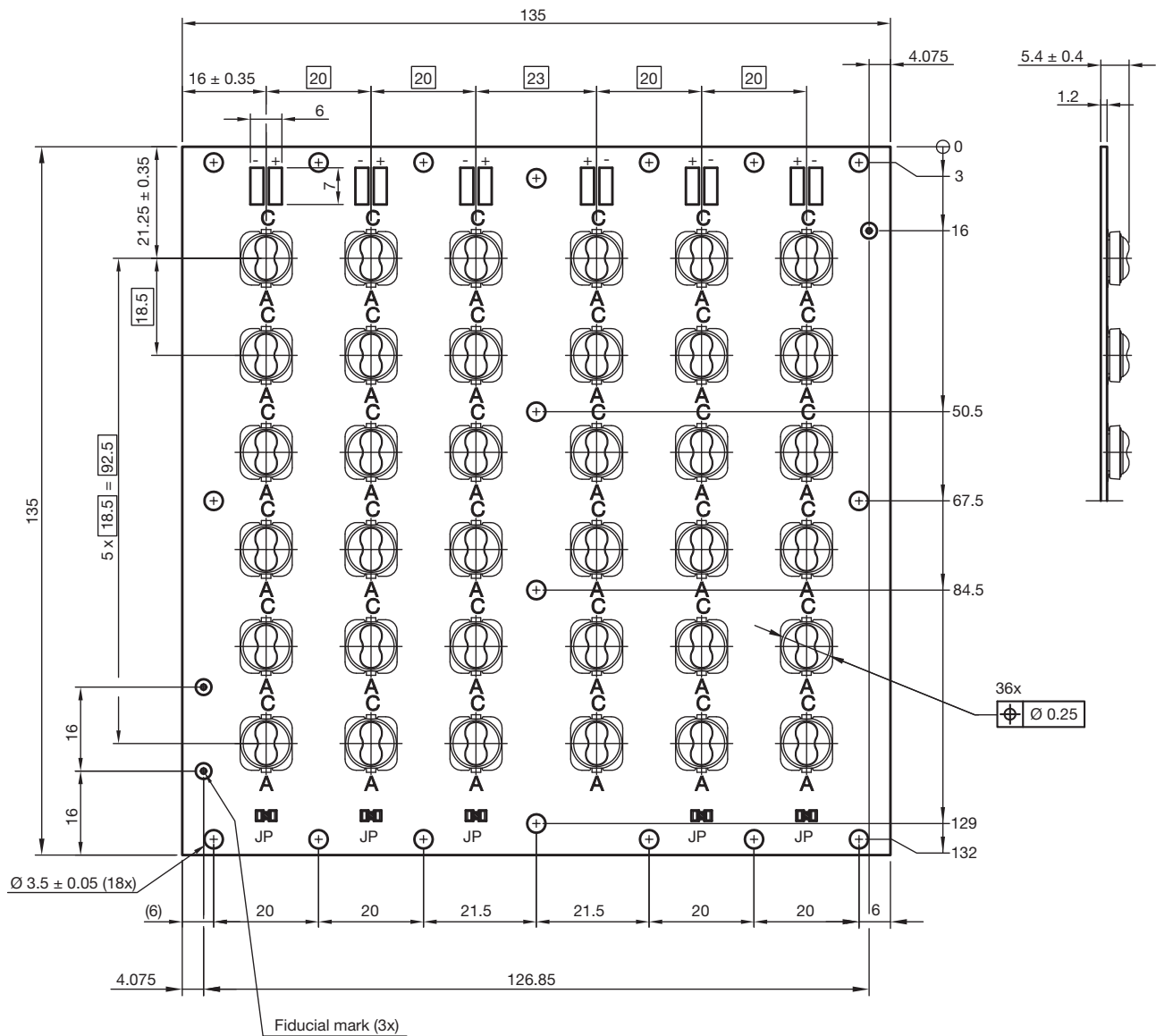
Assembled with all jumpers. Jumpers can be removed according driver design

# VLSL5112A, VLSL5124A, VLSL5136A

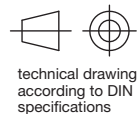
Vishay Semiconductors High Brightness LED Power Module



## PCB BASIC DESIGN VLSL5136A Dimensions in millimeters



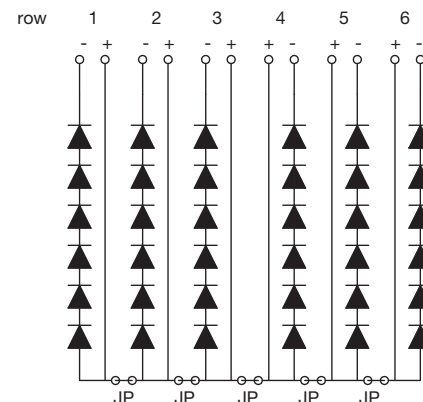
Not indicated tolerances ±0.15



Drawing-No.: 9.920-6727.01-4

Issue: 1; 11.05.10

22152

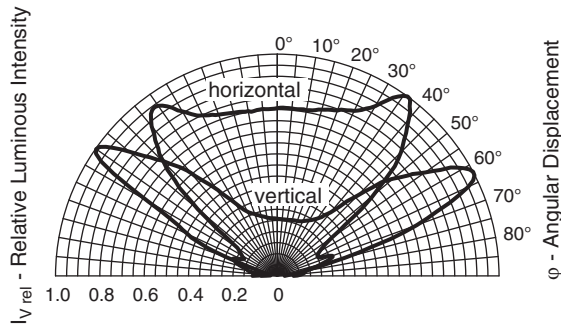


Assembled with all jumpers. Jumpers can be removed according driver design

### PCB CHARACTERISTICS

- Metal core PCB with typical Al thickness of 800  $\mu\text{m}$
- Prepreg thickness typical 127  $\mu\text{m}$
- Conductive pattern Cu typical 25  $\mu\text{m}$
- 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  $\mu\text{m}$ ), immersion plated
- Assembled with 12, 24 or 36 LED's.  
LED position accuracy  $\pm$  0.125 mm from middle axis,  
horizontal tilt max. 2°

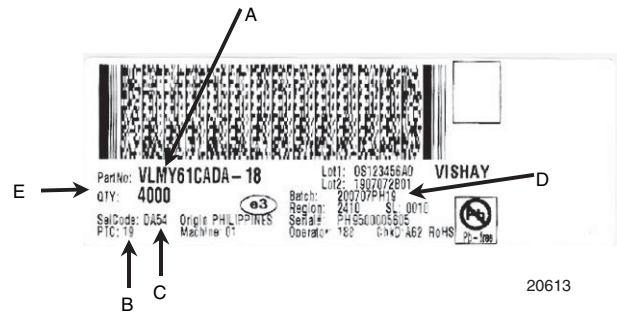
### EMISSION CHARACTERISTIC



22153

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

### BAR CODE PRODUCT LABEL



20613

- 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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