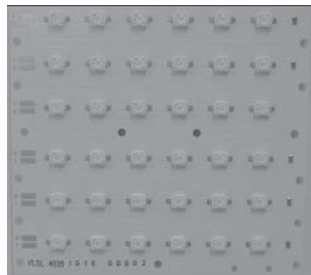


High Brightness LED Power Module



22140



22139



FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12, 24 or 36 LED's minimum 71 lm at 350 mA per LED. Max. current per LED 1 A
- Conductive top layer: Cu (min. 18 μ m)
- Isolation layer prepreg > 63 μ m
- 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



RoHS
COMPLIANT
GREEN
(5-2008)**

APPLICATIONS

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

DESCRIPTION

The VLSL41xxA are metal core based high brightness LED power modules, assembled with 12, 24 or 36 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: $\pm 80^\circ$

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at $I_F = 700$ mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY
VLSL4112A	Natural white	$\Phi_V = 1600$ lm	typ. 4000	InGaN
VLSL4124A	Natural white	$\Phi_V = 3200$ lm	typ. 4000	InGaN
VLSL4136A	Natural white	$\Phi_V = 4800$ lm	typ. 4000	InGaN

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified) VLSL4112A, VLSL4124A, VLSL4136A

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL4112A	Total (max.)	P_{tot}	35	W
Power dissipation VLSL4124A		P_{tot}	69	W
Power dissipation VLSL4136A		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/doc299902

OPTICAL AND ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VLSL4112A, 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
Temperature coefficient of V_F per row	$I_F = 350\text{ mA}$	TC_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	$I_F = 350\text{ mA}$	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.

OPTICAL AND ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VLSL4124A, 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
Temperature coefficient of V_F per row	$I_F = 350\text{ mA}$	TC_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	$I_F = 350\text{ mA}$	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.

OPTICAL AND ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VLSL4136A, 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⁾	$I_{board} = 6 \times 700\text{ mA}$	Φ_V	3900	4800	-	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
Temperature coefficient of V_F per row	$I_F = 350\text{ mA}$	TC_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	$I_F = 350\text{ mA}$	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.

SPECIFICATION OF SINGLE LEDs USED FOR THE MODULES

LUMINOUS FLUX CLASSIFICATION FOR THE SINGLE LED AT 350 mA

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



COLOR RANGE AND COLOR BINNING

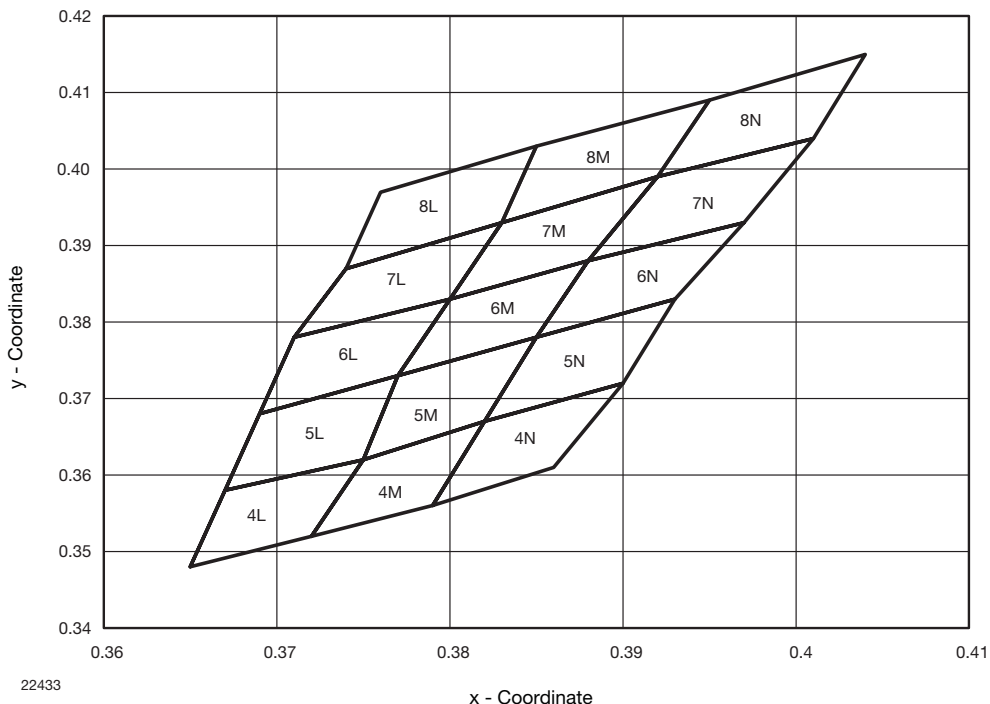


Fig. 1 - Chromaticity Coordinates of Colorgroups

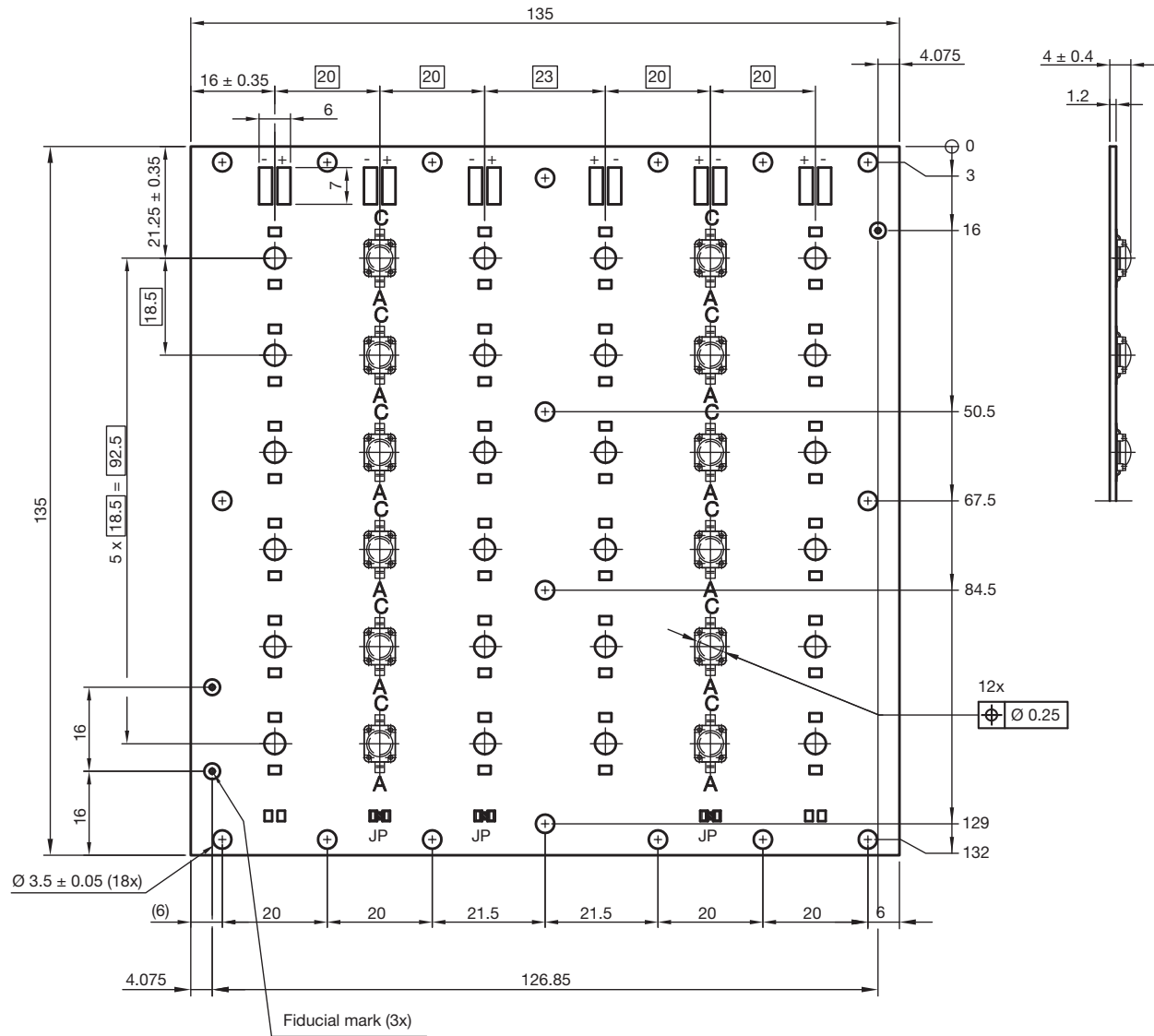
CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED											
GROUP	X	Y		GROUP	X	Y		GROUP	X	Y	
4L	0.365	0.348		4M	0.372	0.352		4N	0.379	0.356	
	0.367	0.358			0.375	0.362			0.382	0.367	
	0.375	0.362			0.382	0.367			0.390	0.372	
	0.372	0.352			0.379	0.356			0.386	0.361	
5L	0.367	0.358			0.375	0.362		5N	0.382	0.367	
	0.369	0.368		5M	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	

VL4112A, VL4124A, VL4136A

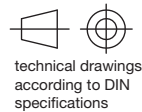
Vishay Semiconductors High Brightness LED Power Module



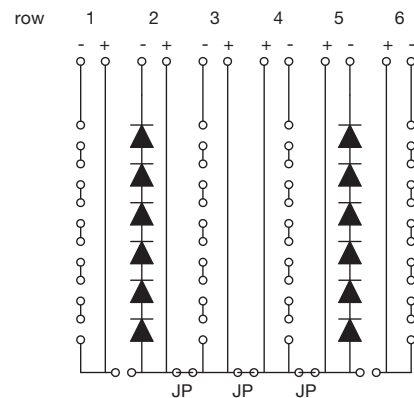
PCB BASIC DESIGN VL4112A Dimensions in millimeters



Not indicated tolerances ± 0.15

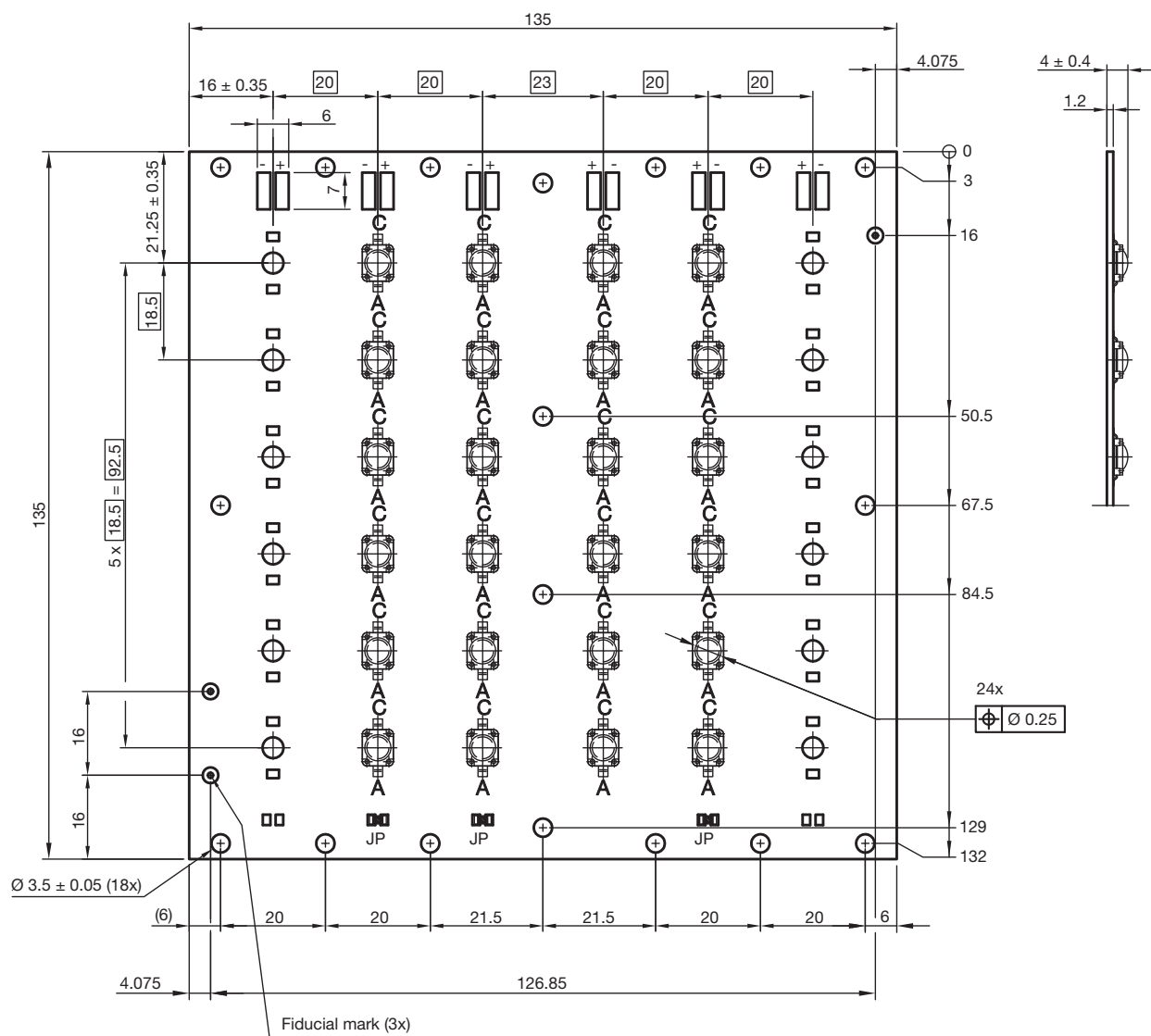


Drawing-No.: 9.920-6726.03-4
Issue:1; 11.05.10
22137

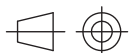


Assembled with all jumpers. Jumpers can be removed according driver design

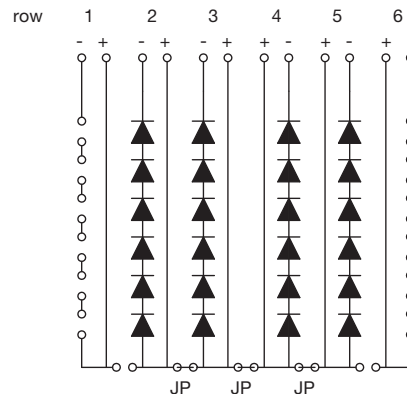
PCB BASIC DESIGN VL4124A Dimensions in millimeters



Not indicated tolerances ± 0.15



technical drawings
according to DIN
specifications



Drawing-No.: 9.920-6726.02-4

Issue:1; 11.05.10

22136

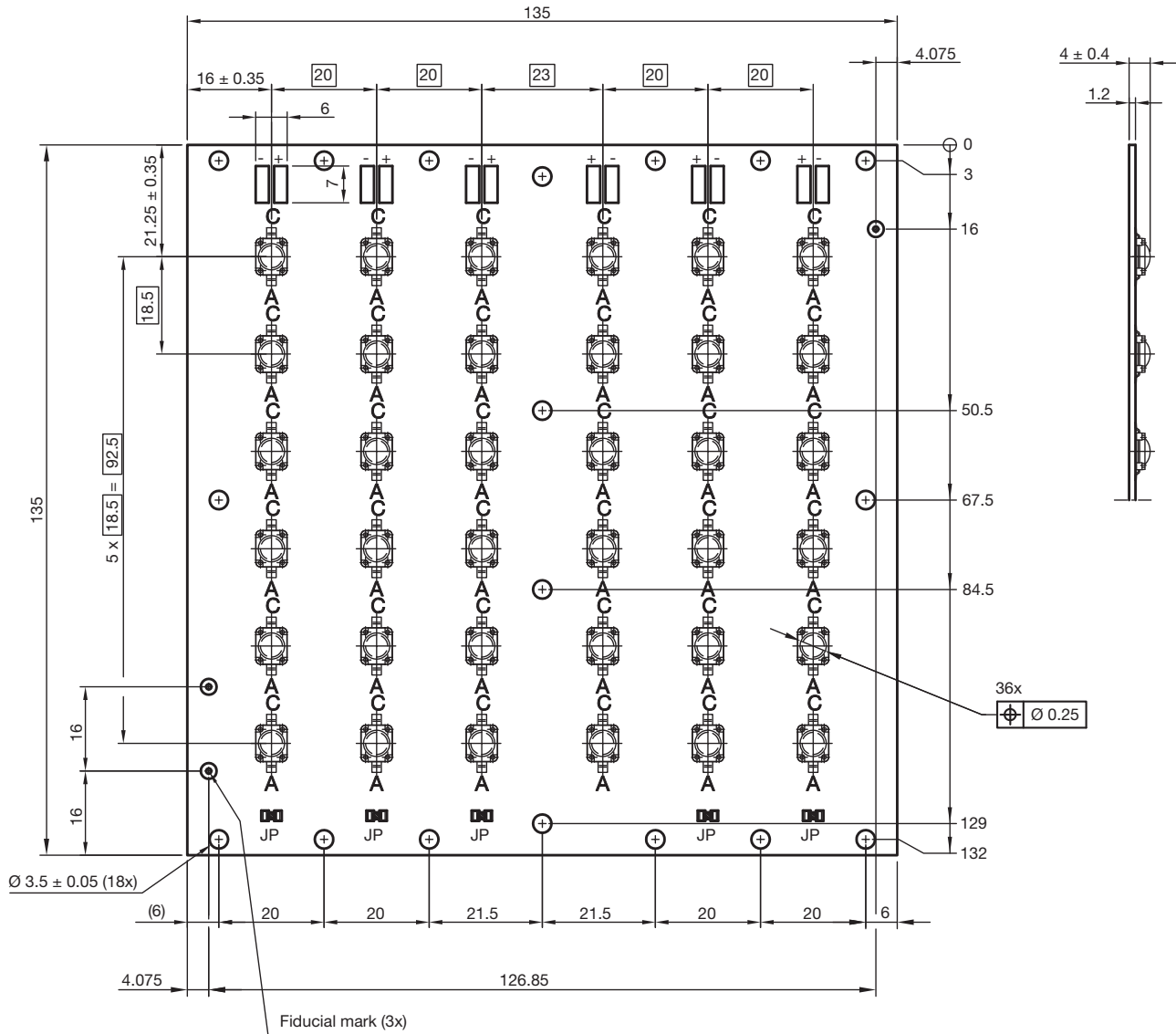
Assembled with all jumpers. Jumpers can be removed according driver design

VL4112A, VL4124A, VL4136A

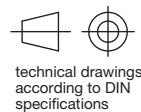
Vishay Semiconductors High Brightness LED Power Module



PCB BASIC DESIGN VL4136A Dimensions in millimeters



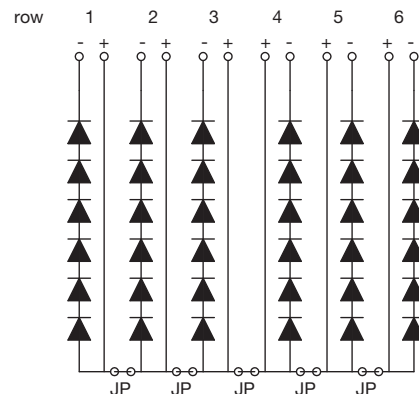
Not indicated tolerances ± 0.15



Drawing-No.: 9.920-6726.01-4

Issue: 1; 11.05.10

22135



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 ($\geq 0.8 \mu\text{m}$), immersion plated
- Assembled with 12, 24 or 36 LED's.
LED position accuracy $\pm 0.125 \text{ mm}$ from middle axis,
horizontal tilt max. 2°

EMISSION CHARACTERISTIC

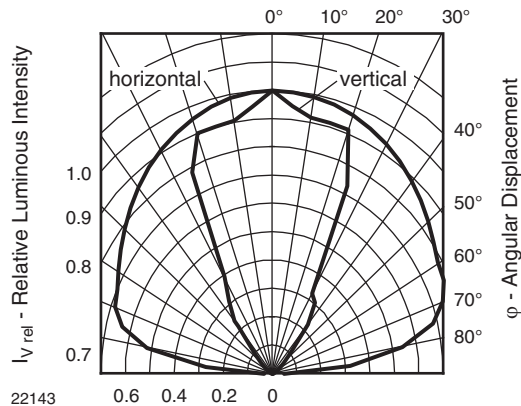
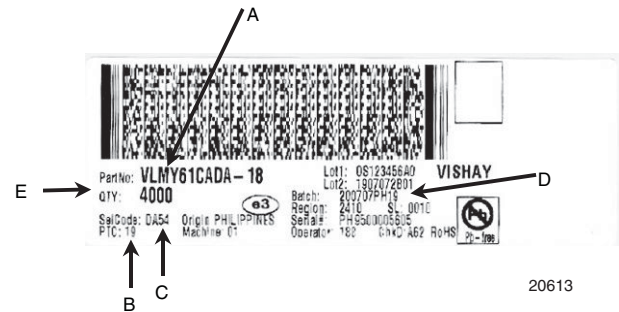


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement



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

BAR CODE PRODUCT LABEL



- 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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