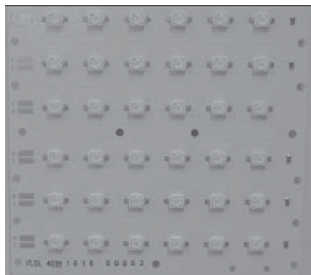


High Brightness LED Power Module



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 61 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 VLSL42xxA are metal core based high brightness LED power modules, assembled with 12, 24 or 36 HB white LEDs. The color temperature is typ. 3500 K warm white. 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
VLSL4212A	Warm white	$\Phi_V = 1500$ lm	3500 (typ.)	InGaN
VLSL4224A	Warm white	$\Phi_V = 3000$ lm	3500 (typ.)	InGaN
VLSL4236A	Warm white	$\Phi_V = 4500$ lm	3500 (typ.)	InGaN

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified) VLSL4212A, VLSL4224A, VLSL4236A

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL4212A	Total (max.)	P_{tot}	35	W
Power dissipation VLSL4224A		P_{tot}	69	W
Power dissipation VLSL4236A		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/299902

OPTICAL AND ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VL4212A, WARM WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	550	750	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 2 \times 700\text{ mA}$	Φ_V	1100	1500	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	3500	-	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_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	$I_F = 350\text{ mA}$	$TC\Phi_V$	-	- 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) VL4224A, WARM WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	550	750	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 4 \times 700\text{ mA}$	Φ_V	2200	3000	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	3500	-	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_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	$I_F = 350\text{ mA}$	$TC\Phi_V$	-	- 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) VL4236A, WARM WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	550	750	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 6 \times 700\text{ mA}$	Φ_V	3300	4500	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	-	3500	-	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_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	$I_F = 350\text{ mA}$	$TC\Phi_V$	-	- 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.



SPECIFICATION OF SINGLE LEDs USED FOR THE MODULES

LUMINOUS FLUX CLASSIFICATION FOR THE SINGLE LED AT 350 mA		
GROUP STANDARD	LUMINOUS FLUX Φ_V (mIm) CORRELATION TABLE	
	MIN.	MAX.
JZ	61 000	71 000
KX	71 000	82 000
KY	82 000	97 000
KZ	97 000	112 000

COLOR RANGE AND COLOR BINNING

VLSL4212A, VLSL4224A, VLSL4236A; color groups

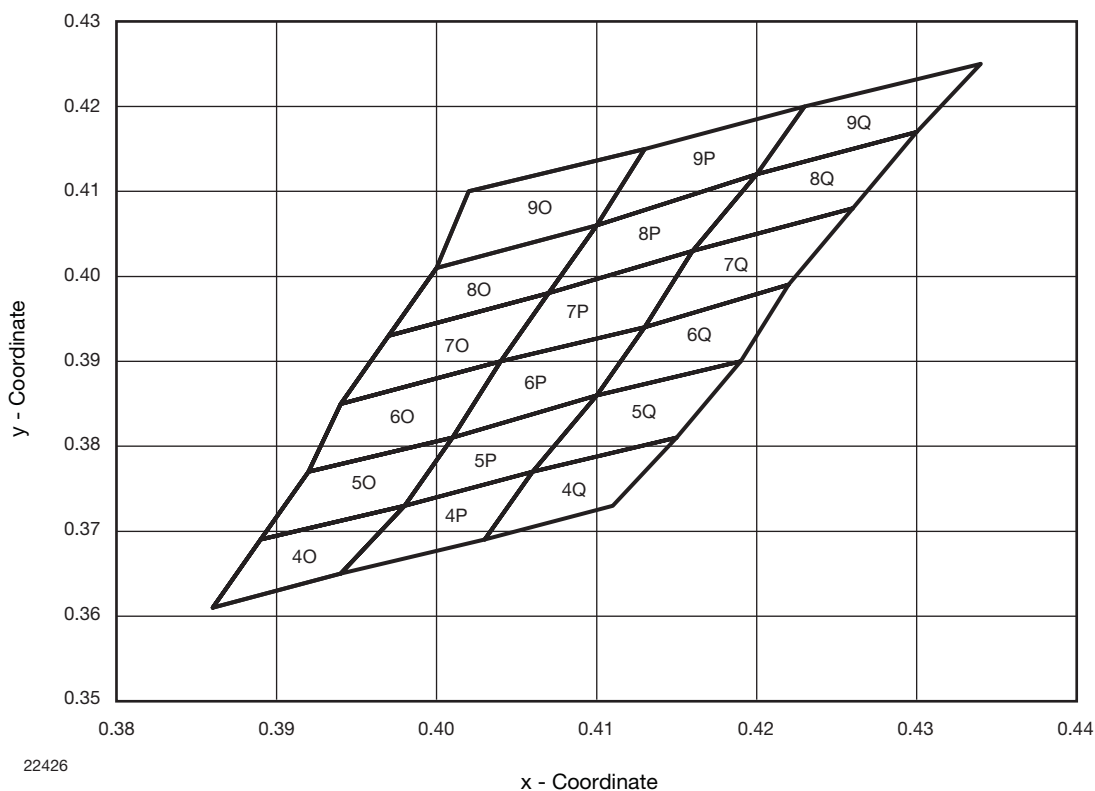
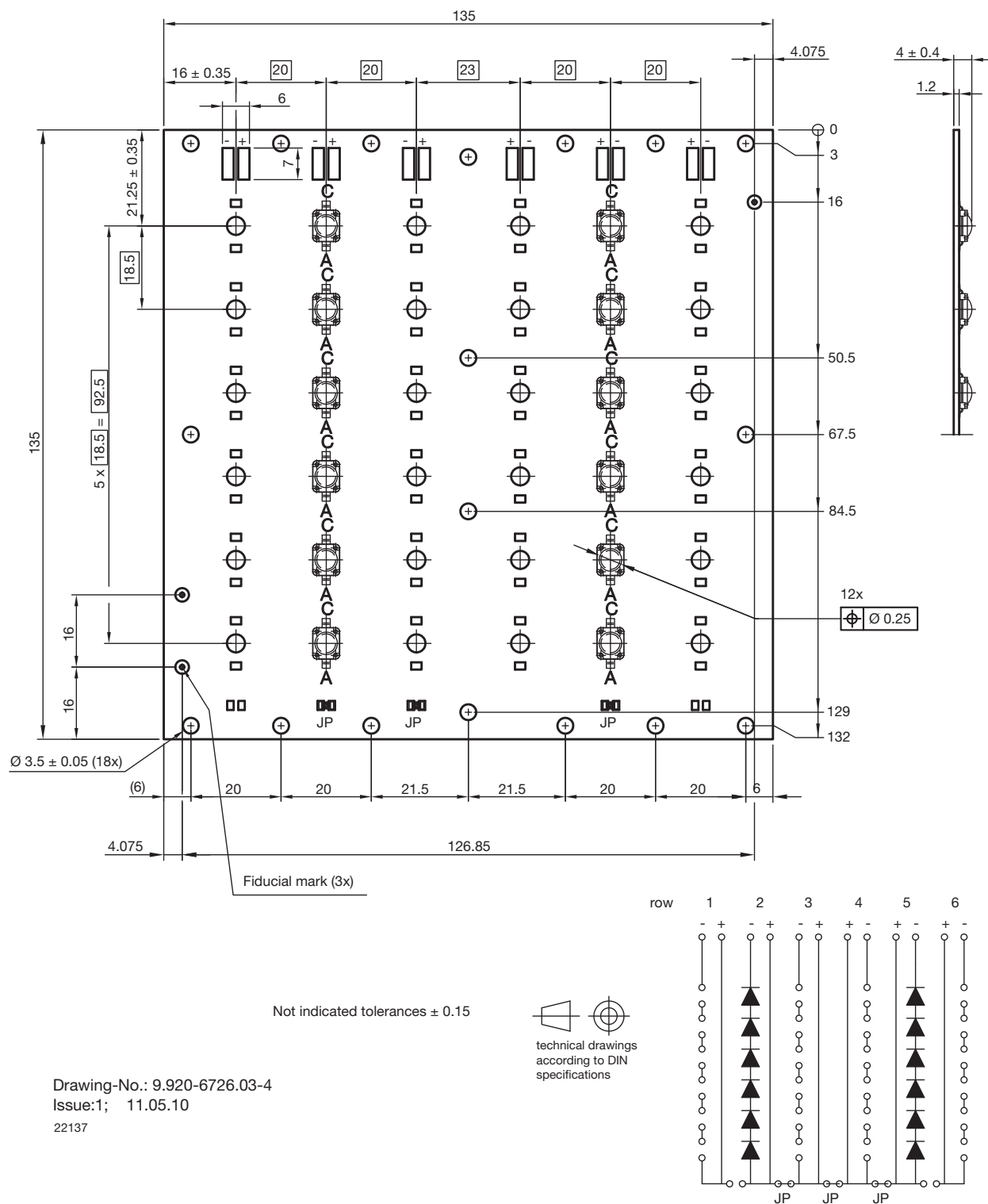


Fig. 1 - Chromaticity Coordinates of Colorgroups

CHROMATICITY COORDINATED GROUPS FOR 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		

PCB BASIC DESIGN VLSL4212A Dimensions in millimeters



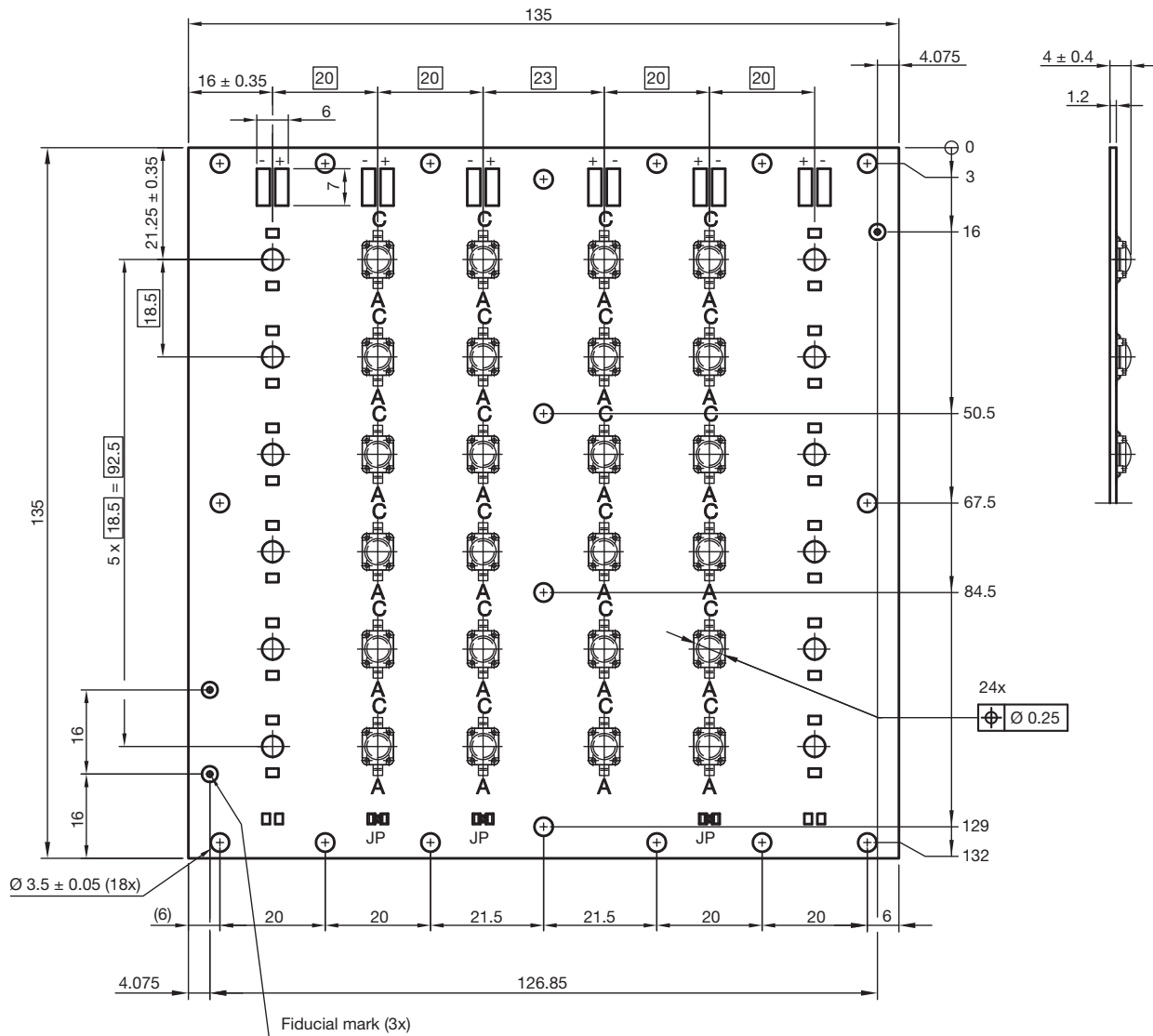
Assembled with all jumpers. Jumpers can be removed according driver design

VLSSL4212A, VLSSL4224A, VLSSL4236A

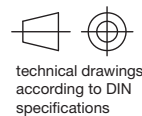
Vishay Semiconductors High Brightness LED Power Module



PCB BASIC DESIGN VLSSL4224A Dimensions in millimeters



Not indicated tolerances ± 0.15

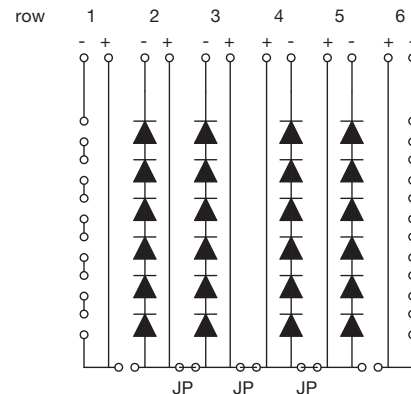


technical drawings
according to DIN
specifications

Drawing-No.: 9.920-6726.02-4

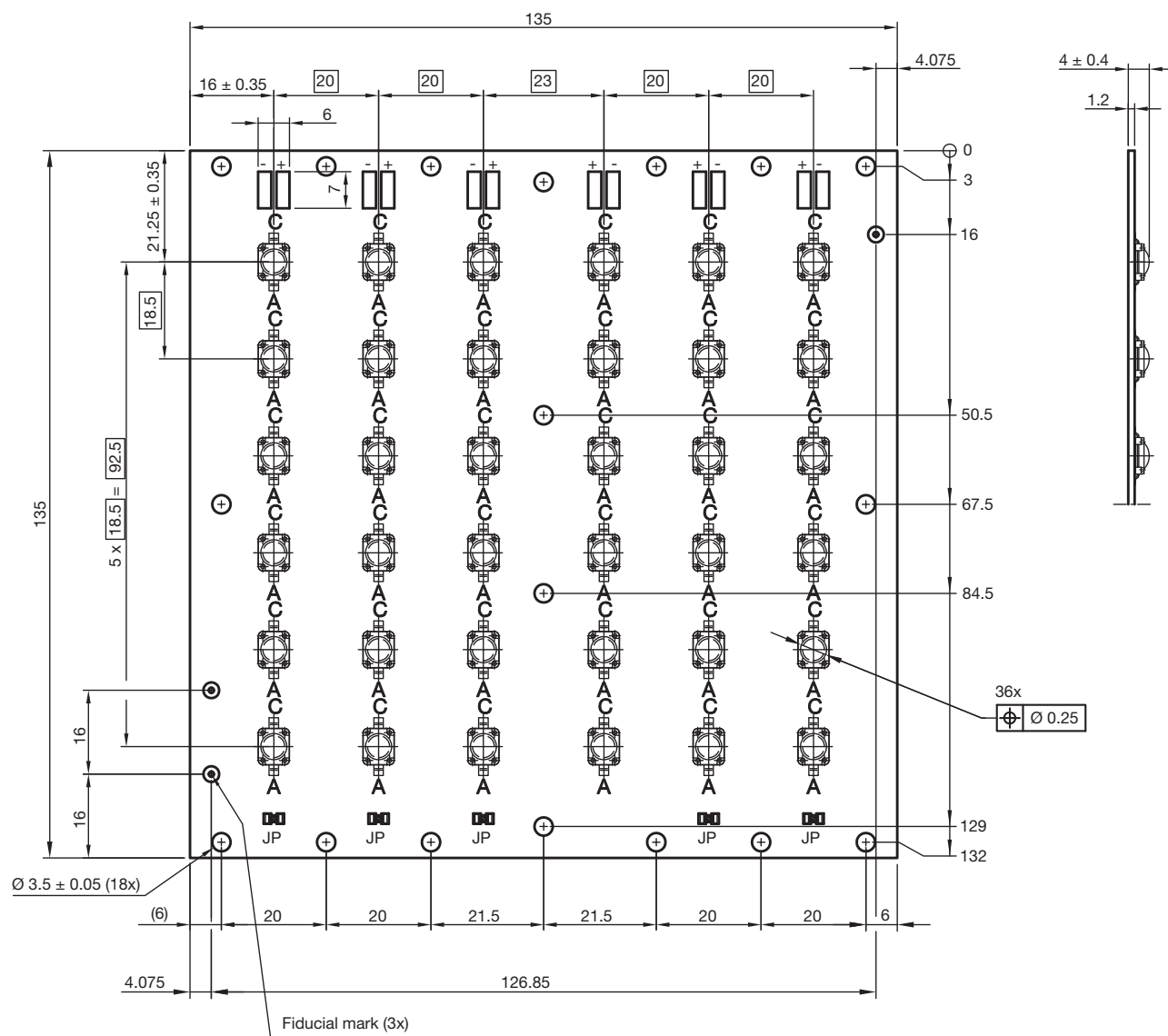
Issue:1; 11.05.10

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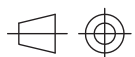


Assembled with all jumpers. Jumpers can be removed according driver design

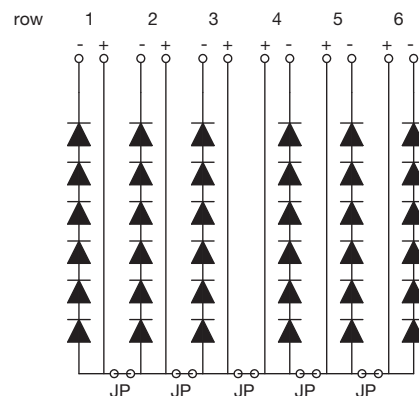
PCB BASIC DESIGN VL4236A Dimensions in millimeters



Not indicated tolerances ± 0.15



technical drawings
according to DIN
specifications



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 μm), immersion plated
- Assembled with 12, 24 or 36 VLMW91xxx LED's. LED position accuracy $\pm$ 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

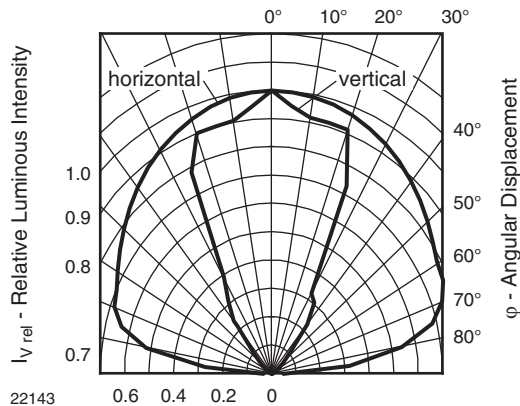


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

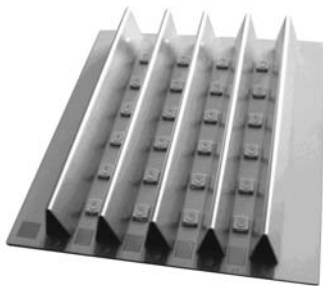
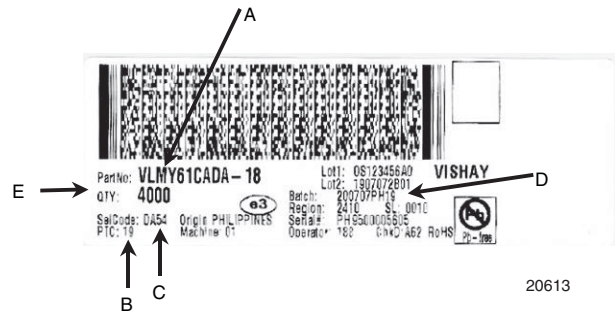


Fig. 3 - Sample Board with Reflectors (for Info only)

BAR CODE PRODUCT LABEL



- 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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