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VLSL4236A

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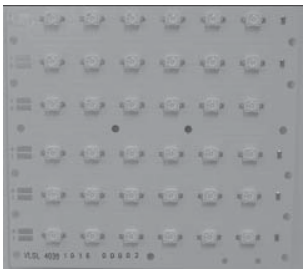
High Brightness LED Power Module



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 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

Pb-free
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: ± 80°

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at I_F = 700 mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY
VLSL4212A	Warm white	Φ_V = 1500 lm	3500 (typ.)	InGaN
VLSL4224A	Warm white	Φ_V = 3000 lm	3500 (typ.)	InGaN
VLSL4236A	Warm white	Φ_V = 4500 lm	3500 (typ.)	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °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	°C
Operating temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 85	°C

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

OPTICAL AND ELECTRICAL CHARACTERISTICS (1) (T_{amb} = 25 °C, unless otherwise specified) VLSL4212A, WARM WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (2)	I_F = 700 mA	Φ_V	550	750	-	lm
Luminous flux total (2)	I_{board} = 2 x 700 mA	Φ_V	1100	1500	-	lm
Color temperature	I_F = 700 mA	TK	-	3500	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	23	V
Class A ($V_{Fmax.}$ - $V_{Fmin.}$) all rows (3)	I_F = 700 mA	ΔV_F	-	-	0.9	V
Temperature coefficient of V_F per row	I_F = 350 mA	TC_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	I_F = 350 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 ± 0.1 V. Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of ± 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 °C, unless otherwise specified) VLSL4224A, WARM WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (2)	I_F = 700 mA	Φ_V	550	750	-	lm
Luminous flux total (2)	I_{board} = 4 x 700 mA	Φ_V	2200	3000	-	lm
Color temperature	I_F = 700 mA	TK	-	3500	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	23	V
Class A ($V_{Fmax.}$ - $V_{Fmin.}$) all rows (3)	I_F = 700 mA	ΔV_F	-	-	0.9	V
Temperature coefficient of V_F per row	I_F = 350 mA	TC_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	I_F = 350 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 ± 0.1 V. Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of ± 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 °C, unless otherwise specified) VLSL4236A, WARM WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (2)	I_F = 700 mA	Φ_V	550	750	-	lm
Luminous flux total (2)	I_{board} = 6 x 700 mA	Φ_V	3300	4500	-	lm
Color temperature	I_F = 700 mA	TK	-	3500	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	23	V
Class A ($V_{Fmax.}$ - $V_{Fmin.}$) all rows (3)	I_F = 700 mA	ΔV_F	-	-	0.9	V
Temperature coefficient of V_F per row	I_F = 350 mA	TC_{VF}	-	- 20	-	mV/K
Temperature coefficient of Φ_V per row	I_F = 350 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 ± 0.1 V. Luminous flux is measured at a current pulse duration of 25 ms and an accuracy of ± 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	LUMINOUS FLUX Φ_V (mlm) CORRELATION TABLE	
STANDARD	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

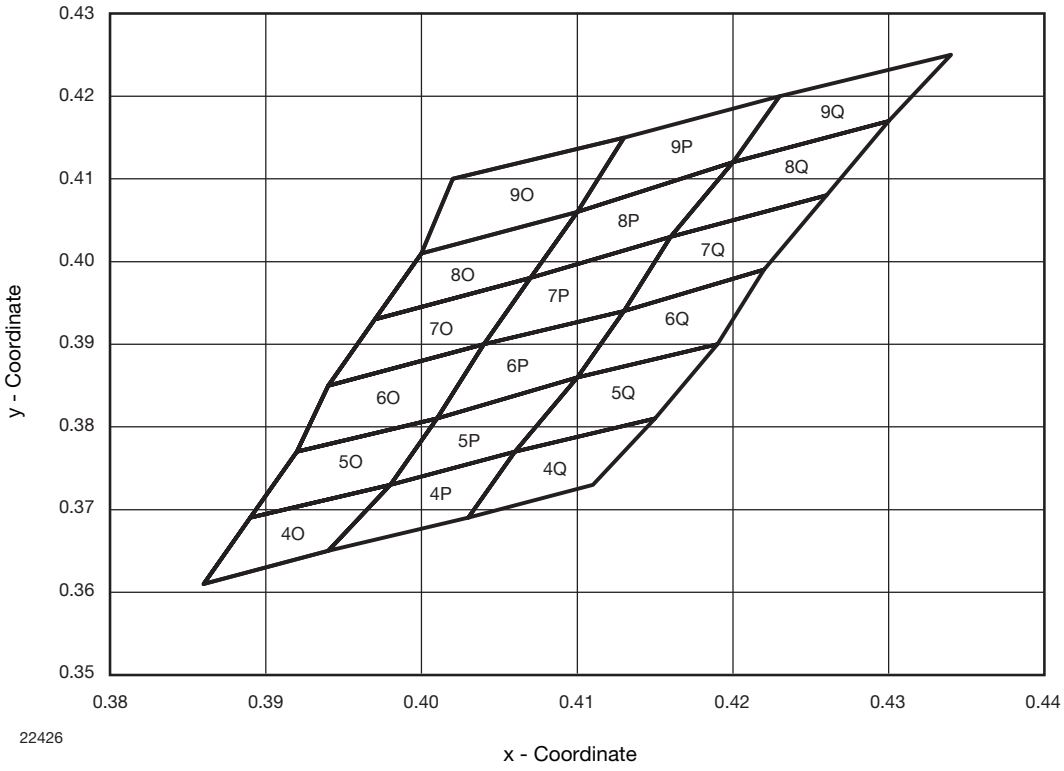


Fig. 1 - Chromaticity Coordinates of Colorgroups

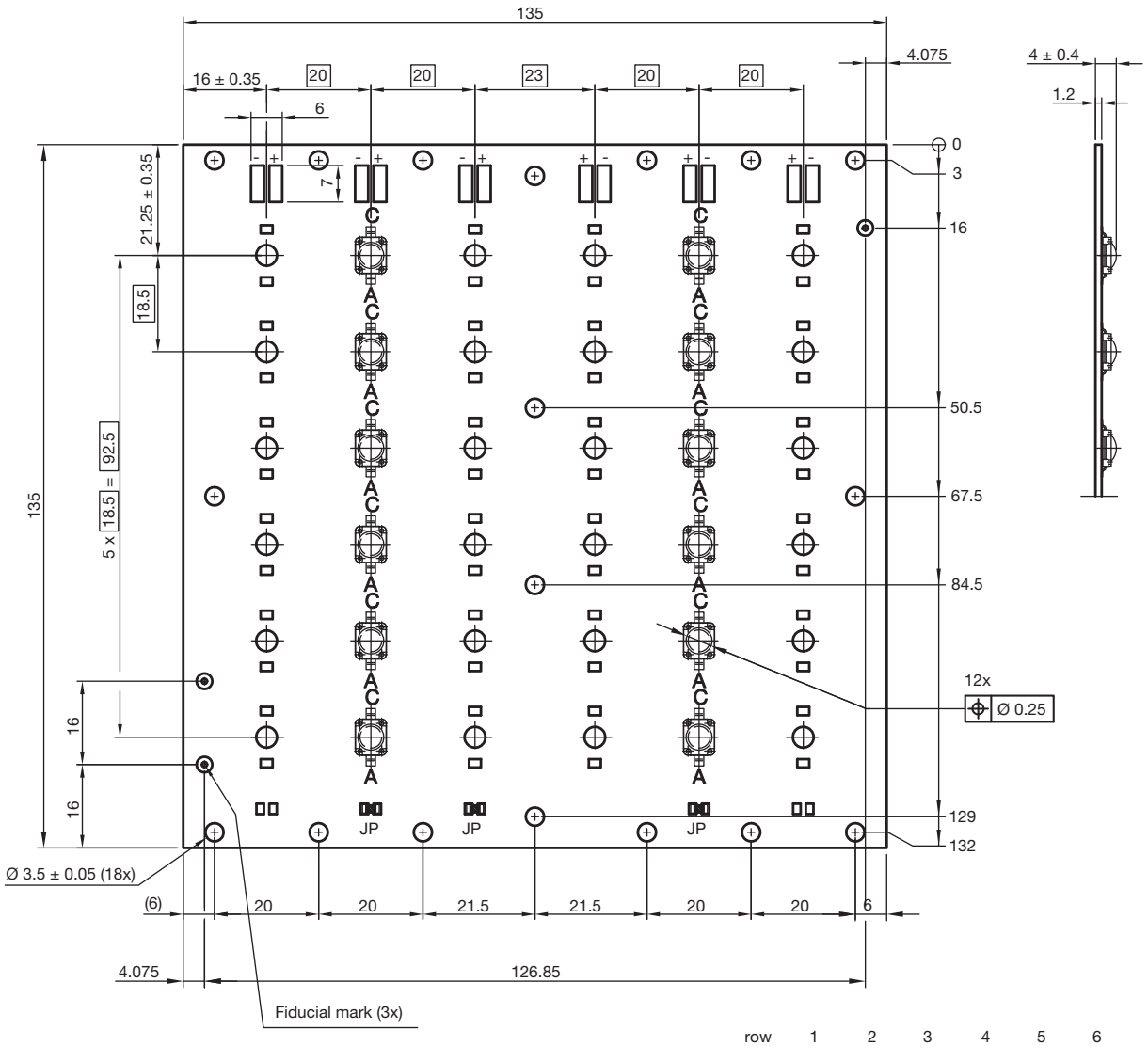
CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED

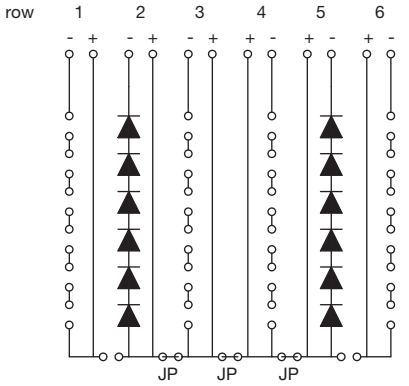
GROUP	X	Y
4O	0.386	0.361
	0.389	0.369
	0.398	0.373
	0.394	0.365
5O	0.389	0.369
	0.392	0.377
	0.401	0.381
	0.398	0.373
6O	0.392	0.377
	0.394	0.385
	0.404	0.390
	0.401	0.381
7O	0.394	0.385
	0.397	0.393
	0.407	0.398
	0.404	0.390
8O	0.397	0.393
	0.400	0.401
	0.410	0.406
	0.407	0.398
9O	0.400	0.401
	0.402	0.410
	0.413	0.415
	0.410	0.406

GROUP	X	Y
4P	0.394	0.365
	0.398	0.373
	0.406	0.377
	0.403	0.369
5P	0.398	0.373
	0.401	0.381
	0.410	0.386
	0.406	0.377
6P	0.401	0.381
	0.404	0.390
	0.413	0.394
	0.410	0.386
7P	0.404	0.390
	0.407	0.398
	0.416	0.403
	0.413	0.394
8P	0.407	0.398
	0.410	0.406
	0.420	0.412
	0.416	0.403
9P	0.410	0.406
	0.413	0.415
	0.423	0.420
	0.420	0.412

GROUP	X	Y
4Q	0.403	0.369
	0.406	0.377
	0.415	0.381
	0.411	0.373
5Q	0.406	0.377
	0.410	0.386
	0.419	0.390
	0.415	0.381
6Q	0.410	0.386
	0.413	0.394
	0.422	0.399
	0.419	0.390
7Q	0.413	0.394
	0.416	0.403
	0.426	0.408
	0.422	0.399
8Q	0.416	0.403
	0.420	0.412
	0.430	0.417
	0.426	0.408
9Q	0.420	0.412
	0.423	0.420
	0.434	0.425
	0.430	0.417

PCB BASIC DESIGN VLSL4212A Dimensions in millimeters





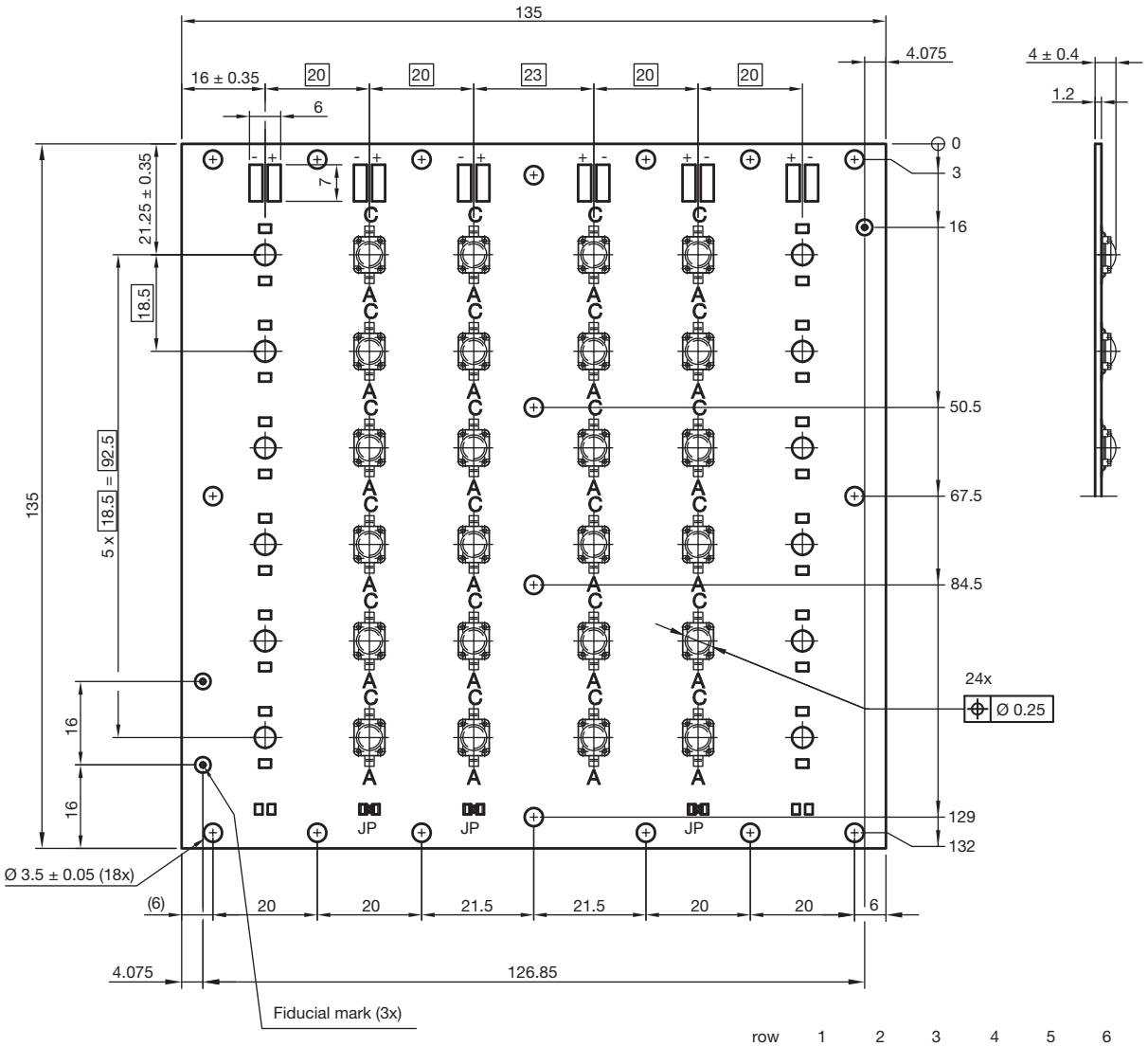
Not indicated tolerances ± 0.15

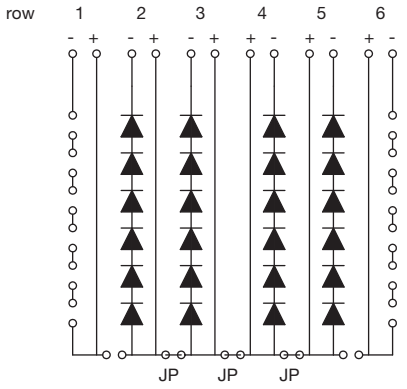
technical drawings according to DIN specifications

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 VLSL4224A Dimensions in millimeters





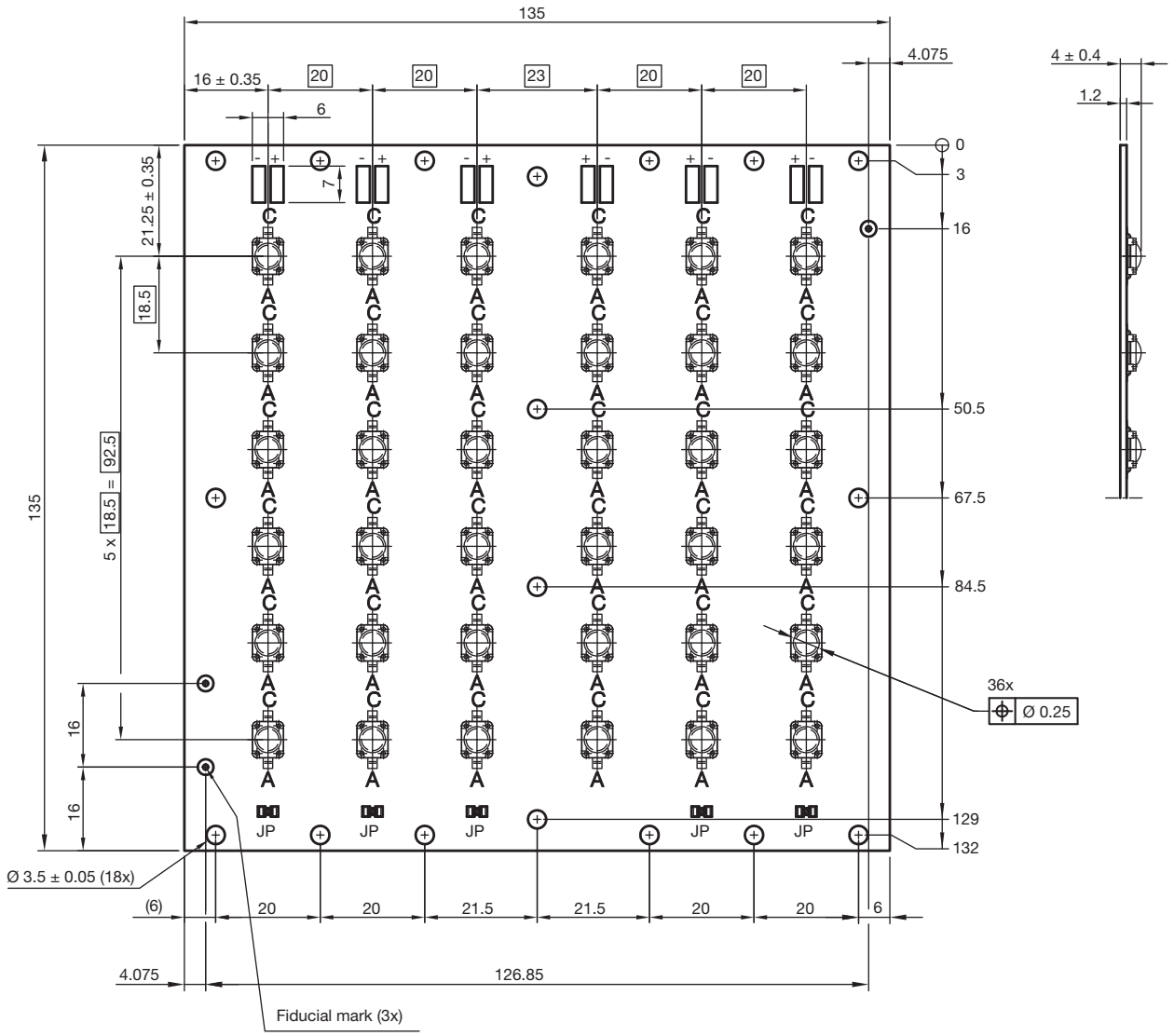
Not indicated tolerances ± 0.15

technical drawings according to DIN specifications

Drawing-No.: 9.920-6726.02-4
Issue:1; 11.05.10
22136

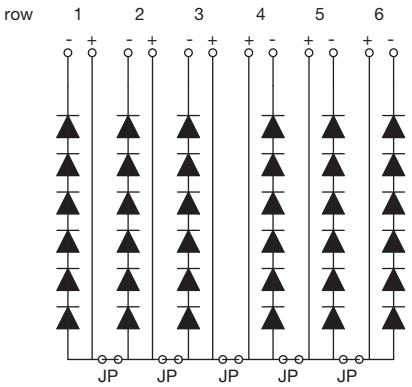
Assembled with all jumpers. Jumpers can be removed according driver design

PCB BASIC DESIGN VLSL4236A 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

VLSL4212A, VLSL4224A, VLSL4236A

Vishay Semiconductors High Brightness LED Power Module

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 (≥ 0.8 µm), immersion plated
- Assembled with 12, 24 or 36 VLMW91xxx LED's. LED position accuracy ± 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

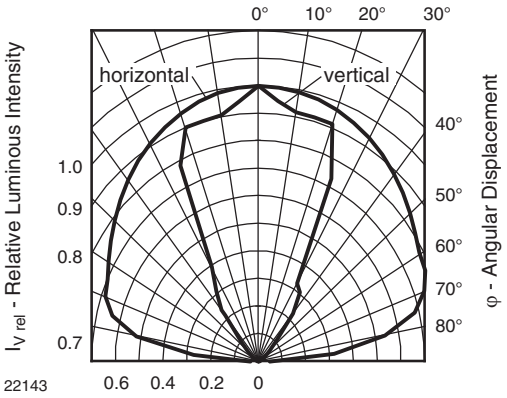


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

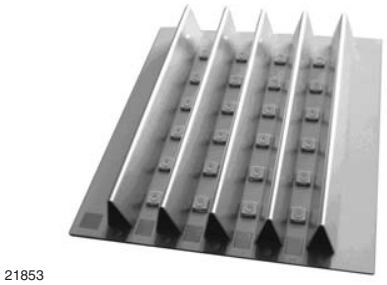
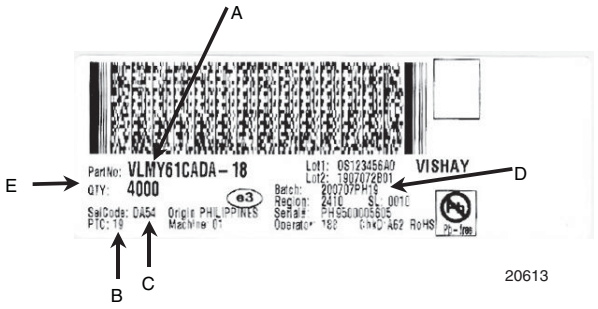


Fig. 3 - Sample Board with Reflectors (for Info only)

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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