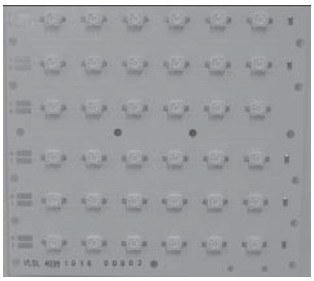
High Brightness LED Power Module



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 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 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: ± 80°

PARTS TABLE

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

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °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	°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) VLSL4112A, NATURAL WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row [2]	I_F = 700 mA	Φ_V	650	800	-	lm
Luminous flux total [2]	I_{board} = 2 x 700 mA	Φ_V	1300	1600	-	lm
Color temperature	I_F = 700 mA	TK	-	4000	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	23	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.

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] (T_{amb} = 25 °C, unless otherwise specified) VLSL4124A, NATURAL WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row [2]	I_F = 700 mA	Φ_V	650	800	-	lm
Luminous flux total [2]	I_{board} = 4 x 700 mA	Φ_V	2600	3200	-	lm
Color temperature	I_F = 700 mA	TK	-	4000	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	23	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.

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] (T_{amb} = 25 °C, unless otherwise specified) VLSL4136A, NATURAL WHITE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row [2]	I_F = 700 mA	Φ_V	650	800	-	lm
Luminous flux total [2]	I_{board} = 6 x 700 mA	Φ_V	3900	4800	-	lm
Color temperature	I_F = 700 mA	TK	-	4000	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	23	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.

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.**
KX	71 000	82 000
KY	82 000	97 000
KZ	97 000	112 000

COLOR RANGE AND COLOR BINNING

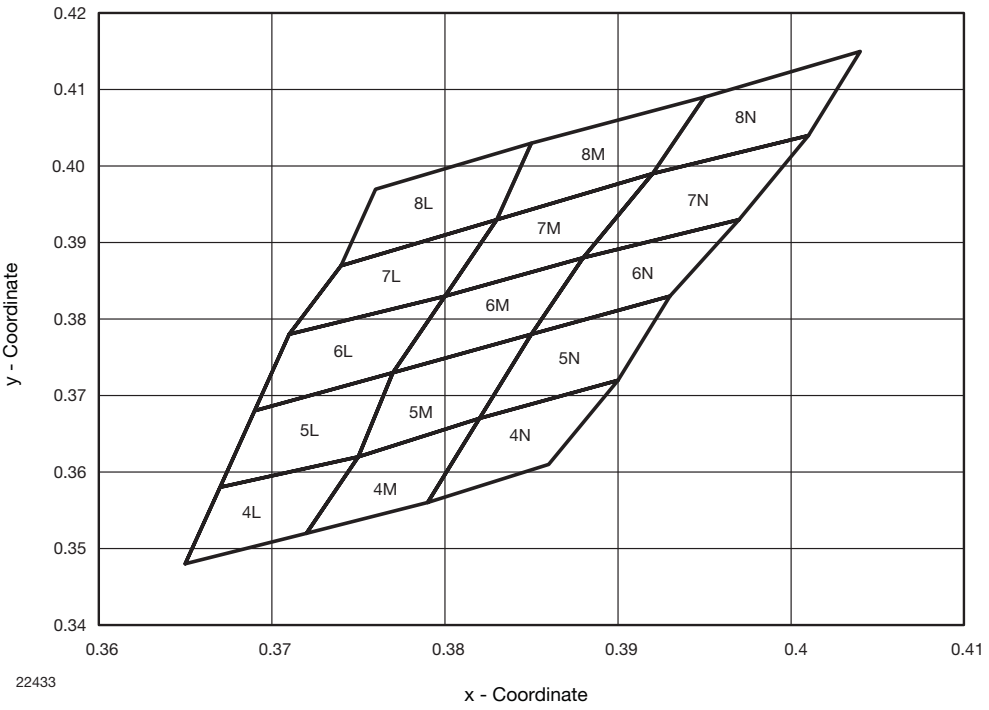
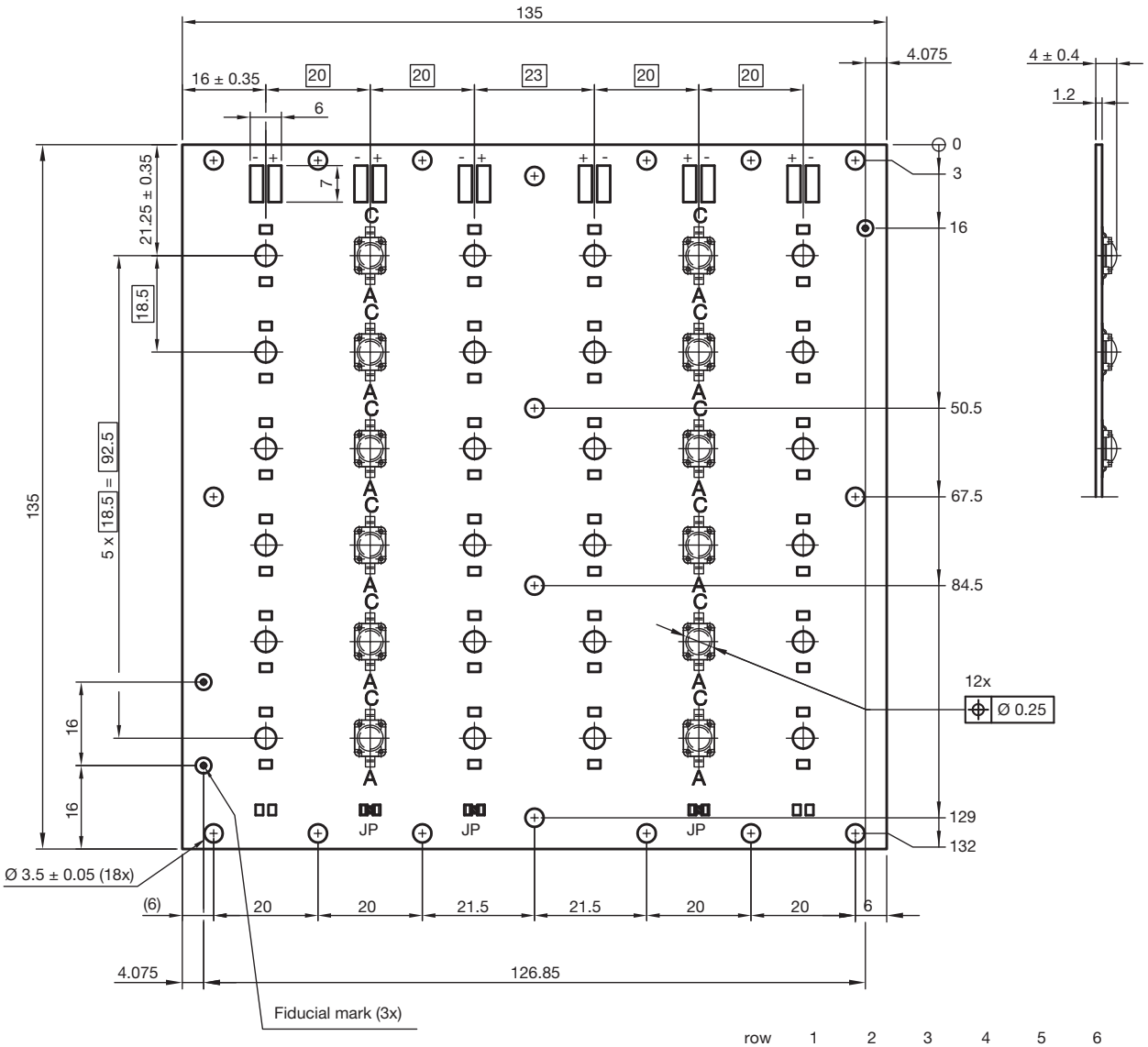
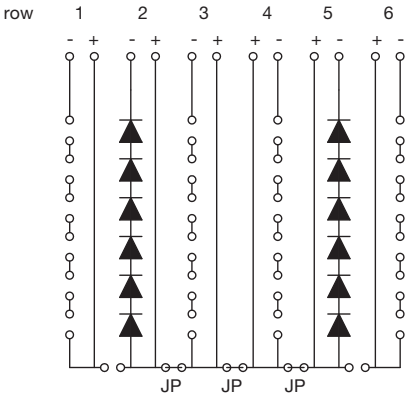


Fig. 1 - Chromaticity Coordinates of Colorgroups

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	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	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

PCB BASIC DESIGN VLSL4112A Dimensions in millimeters





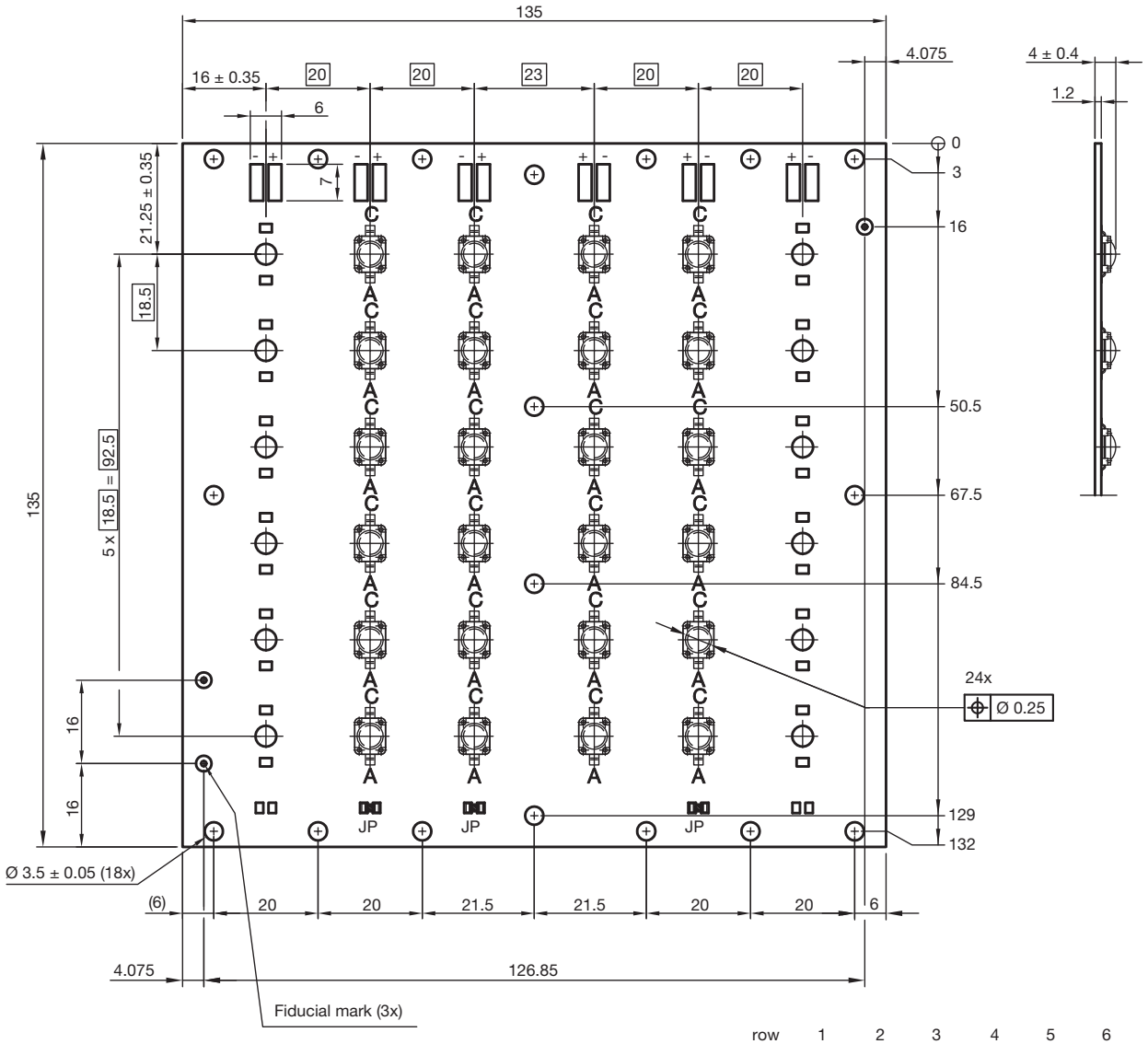
Not indicated tolerances ± 0.15

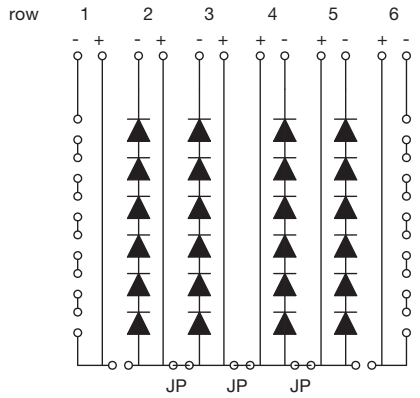
technical drawings according to DIN specifications

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 VLSL4124A Dimensions in millimeters





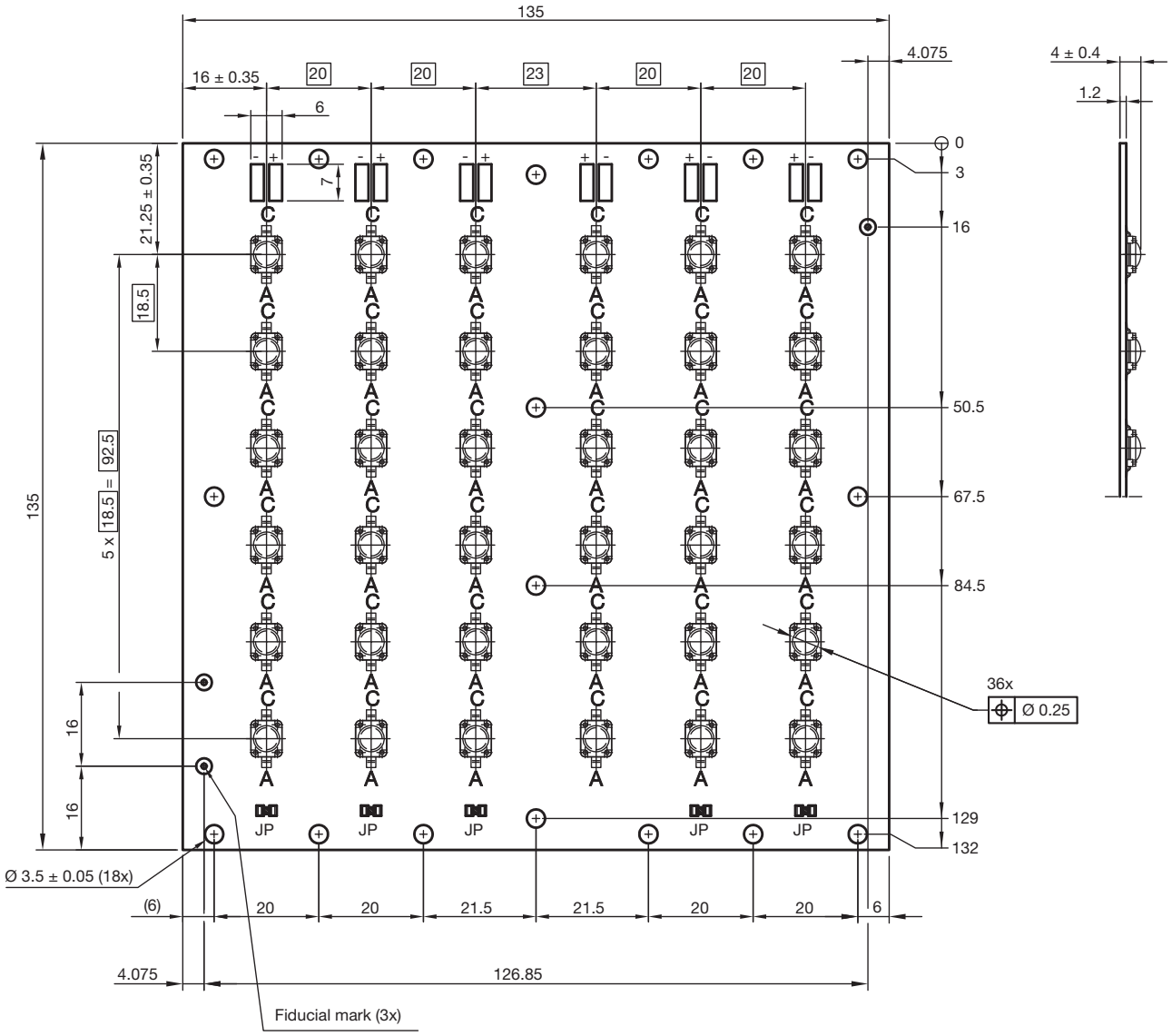
Not indicated tolerances ± 0.15

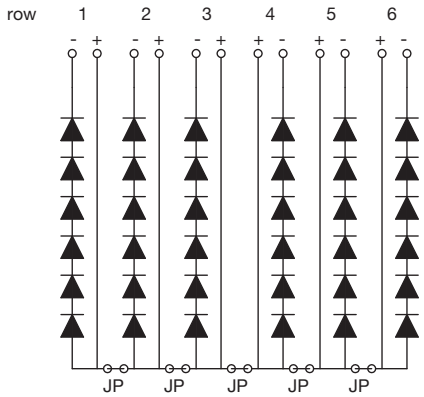
technical drawings according to DIN specifications

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 VLSL4136A 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 ± 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 LED's.
  LED position accuracy ± 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

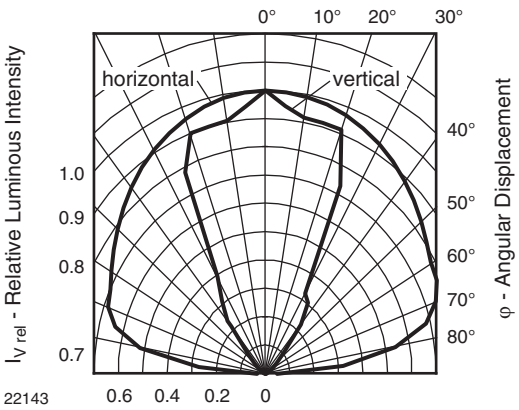
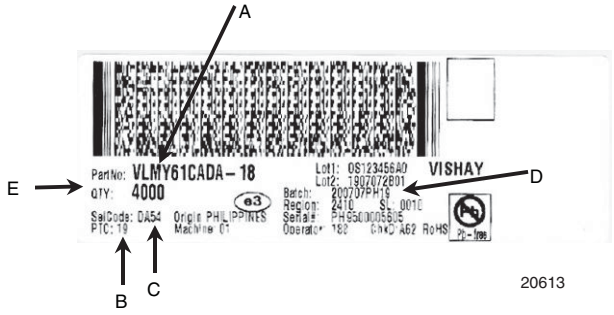


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

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

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.