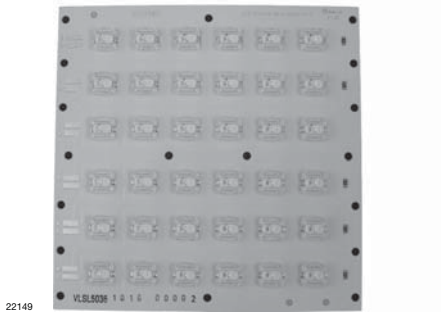
High Brightness LED Power Module



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
- 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

Pb-free RoHS COMPLIANT GREEN (5-2008)**

APPLICATIONS

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

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: ± 35°, horizontal: ± 60°

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at I_F = 700 mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY
VLSL5112A	Natural white	Φ_V = 1500 lm	4000	InGaN
VLSL5124A	Natural white	Φ_V = 3000 lm	4000	InGaN
VLSL5136A	Natural white	Φ_V = 4500 lm	4000	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °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	°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) VLSL5112A, NATURAL 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	-	4000	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	20	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) VLSL5124A, NATURAL 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	-	4000	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	20	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) VLSL5136A, NATURAL 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	-	4000	-	K
Forward voltage per row	I_F = 700 mA	V_F	19	20	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		
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

COLOR RANGE AND COLOR BINNING

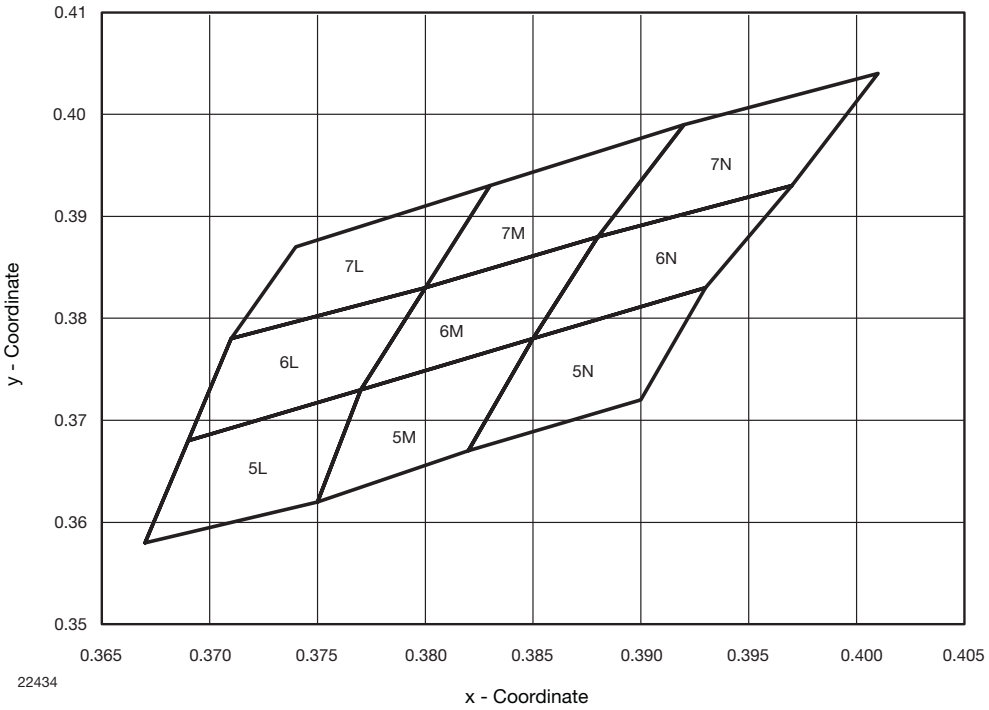
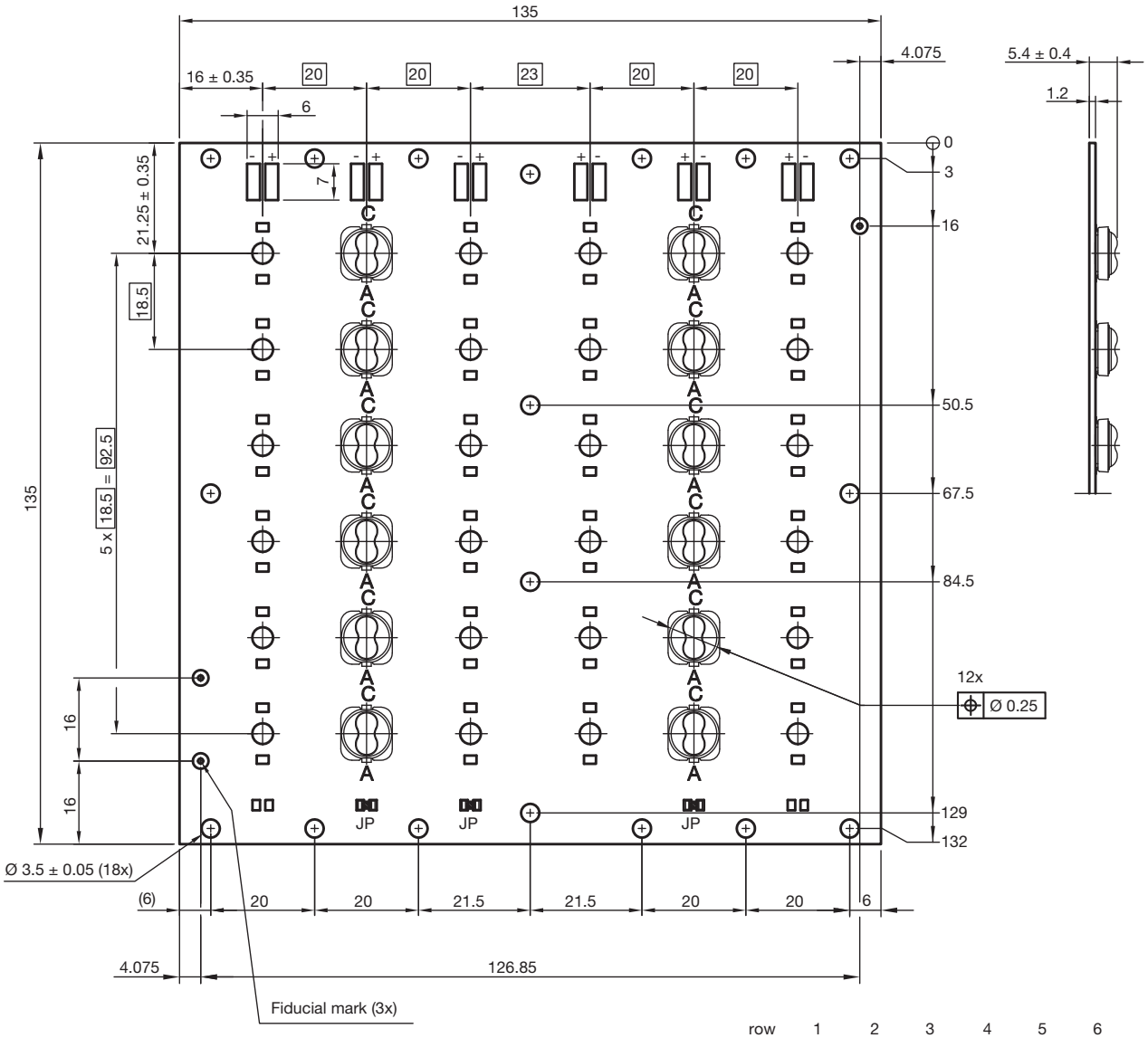


Fig. 1 - Chromaticity Coordinates of Colorgroups

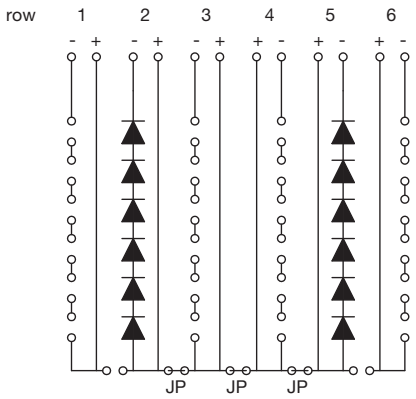
CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED								
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y
5L	0.367	0.358	5M	0.375	0.362	5N	0.382	0.367
	0.369	0.368		0.377	0.373		0.385	0.378
	0.377	0.373		0.385	0.378		0.393	0.383
	0.375	0.362		0.382	0.367		0.390	0.372
6L	0.369	0.368	6M	0.377	0.373	6N	0.385	0.378
	0.371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

PCB BASIC DESIGN VLSL5112A Dimensions in millimeters



Not indicated tolerances ± 0.15

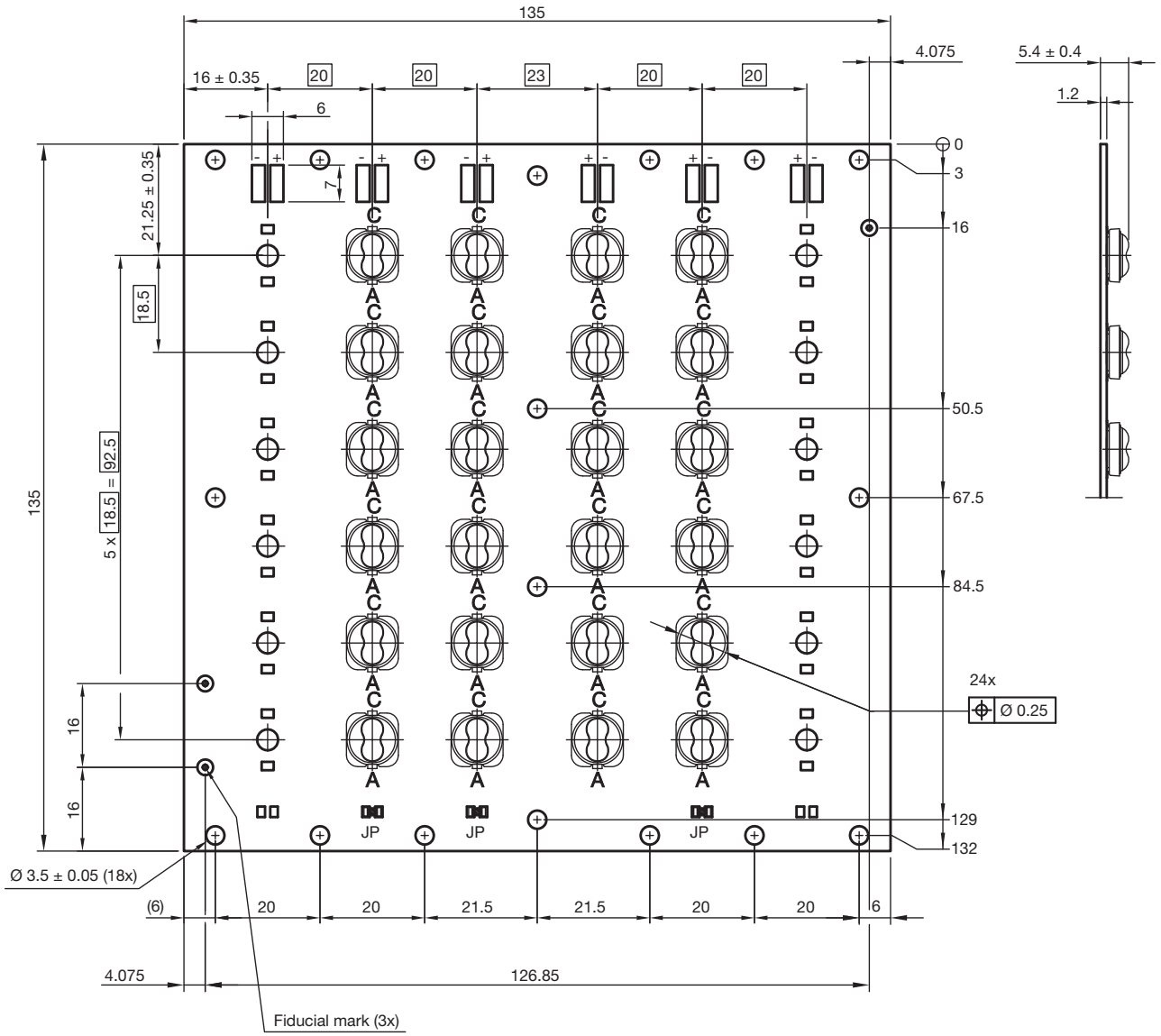
technical drawings according to DIN specifications

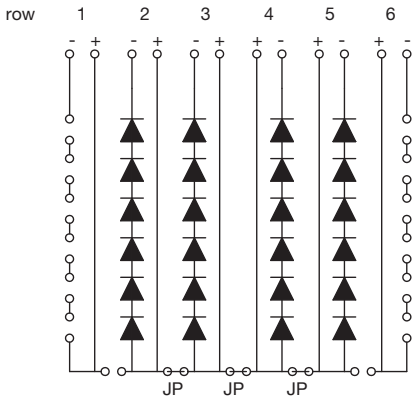


Drawing-No.: 9.920-6727.03-4
Issue:1; 11.05.10
22150

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

PCB BASIC DESIGN VLSL5124A Dimensions in millimeters





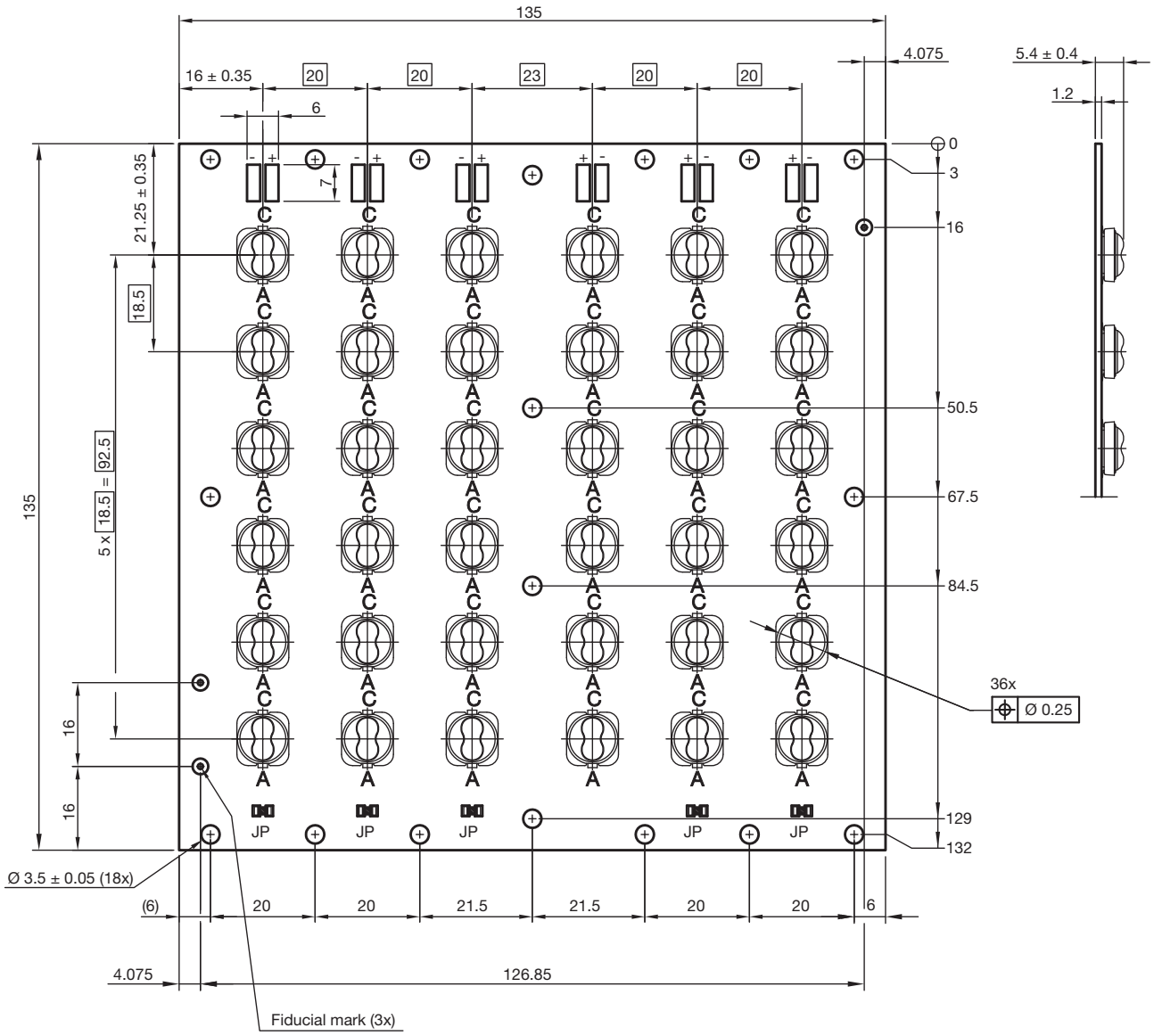
Not indicated tolerances ± 0.15

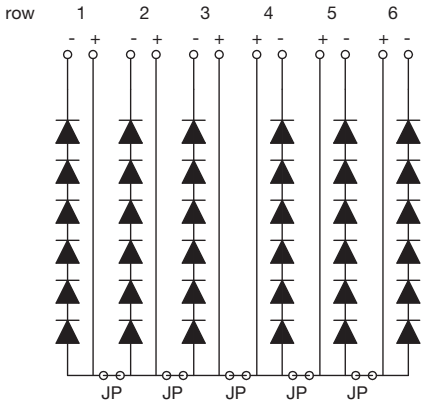
technical drawings according to DIN specifications

Drawing-No.: 9.920-6727.02-4
Issue:1; 11.05.10
22151

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

PCB BASIC DESIGN VLSL5136A Dimensions in millimeters





Not indicated tolerances ±0.15

technical drawings according to DIN specifications

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 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

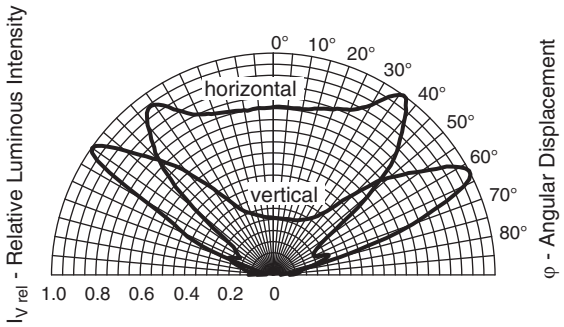
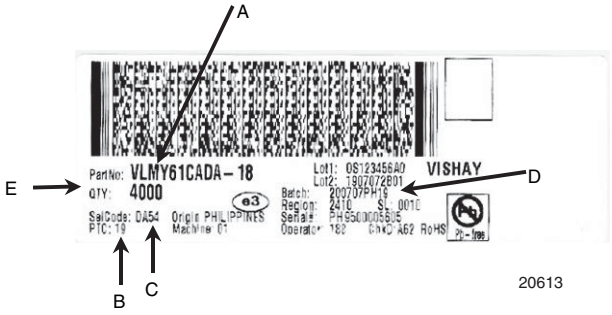


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

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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