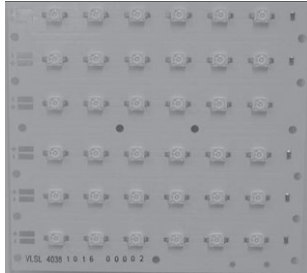


High Brightness LED Power Module



22140



22139

DESCRIPTION

The VLSL40xxA are metal core based high brightness LED power modules, assembled with 12, 24 or 36 HB white LEDs. The color temperature is cold white in the typical range of 5000 K to 7000 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: $\pm 80^\circ$

FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12, 24 or 36 LED's minimum 82 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
- Compliant to RoHS directive 2002/95/EC
- ESD withstand voltage: up to 2 kV according to JESD22-A114-B



APPLICATIONS

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

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at $I_F = 700 \text{ mA typ.}$)	COLOR TEMPERATURE K	TECHNOLOGY
VLSL4012A	Cold white	$\Phi_V = 1740 \text{ lm}$	5000 to 7000	InGaN
VLSL4024A	Cold white	$\Phi_V = 3480 \text{ lm}$	5000 to 7000	InGaN
VLSL4036A	Cold white	$\Phi_V = 5220 \text{ lm}$	5000 to 7000	InGaN

ABSOLUTE MAXIMUM RATINGS ($T_{\text{amb}} = 25^\circ\text{C}$, unless otherwise specified) VLSL4012A, VLSL4024A, VLSL4036A

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL4012A	Total (max.)	P_{tot}	35	W
Power dissipation VLSL4024A		P_{tot}	69	W
Power dissipation VLSL4036A		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?99902

OPTICAL AND ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VLSL4012A, COLD WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	760	870	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 2 \times 700\text{ mA}$	Φ_V	1520	1740	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	5000	-	7000	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_{V_F}	-	- 20	-	mV/K
Temperature coefficient of Φ_V	$I_F = 350\text{ mA}$ (per row)	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.
 (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) VLSL4024A, COLD WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	760	870	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 4 \times 700\text{ mA}$	Φ_V	3040	3480	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	5000	-	7000	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_{V_F}	-	- 20	-	mV/K
Temperature coefficient of Φ_V	$I_F = 350\text{ mA}$ (per row)	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.
 (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) VLSL4036A, COLD WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row ⁽²⁾	$I_F = 700\text{ mA}$	Φ_V	760	870	-	lm
Luminous flux total ⁽²⁾	$I_{board} = 6 \times 700\text{ mA}$	Φ_V	4560	5220	-	lm
Color temperature	$I_F = 700\text{ mA}$	TK	5000	-	7000	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_{V_F}	-	- 20	-	mV/K
Temperature coefficient of Φ_V	$I_F = 350\text{ mA}$ (per row)	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.
 (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

- VLSL4012A, VLSL4024A, VLSL4036A: LED: VLMW91KYKZ6P7R

LUMINOUS FLUX CLASSIFICATION FOR THE SINGLE LED		
GROUP STANDARD	LUMINOUS FLUX Φ_V (mlm) CORRELATION TABLE	
	MIN.	MAX.
KY	82 000	97 000
KZ	97 000	112 000

COLOR RANGE AND COLOR BINNING

VLSL4012A, VLSL4024A, VLSL4036A: 5000 K to 7000 K group 6P to7R

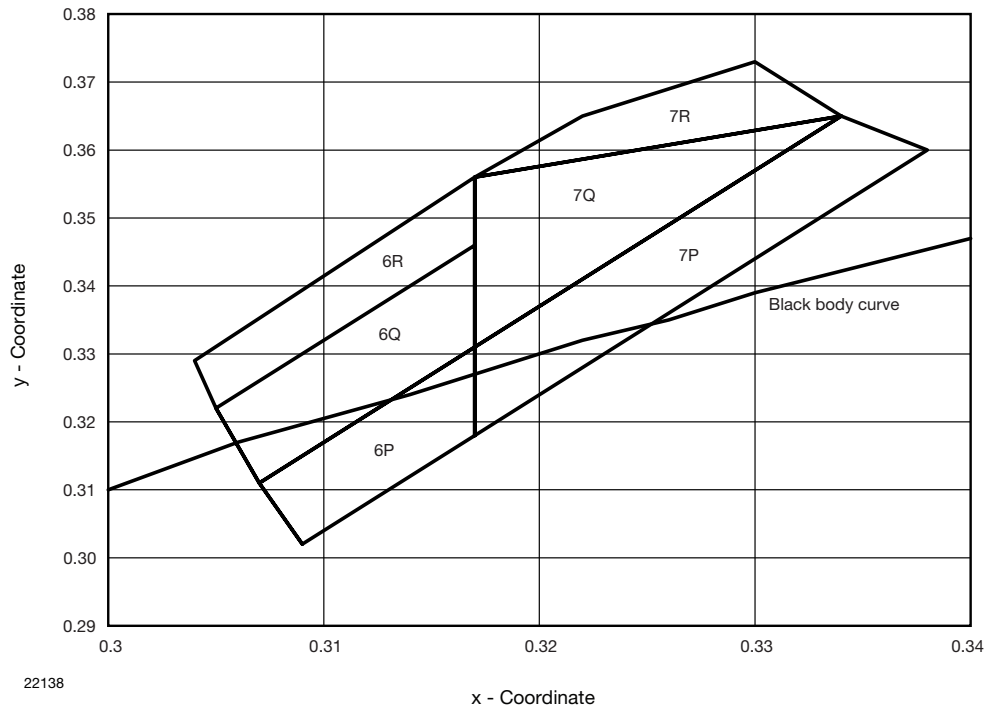


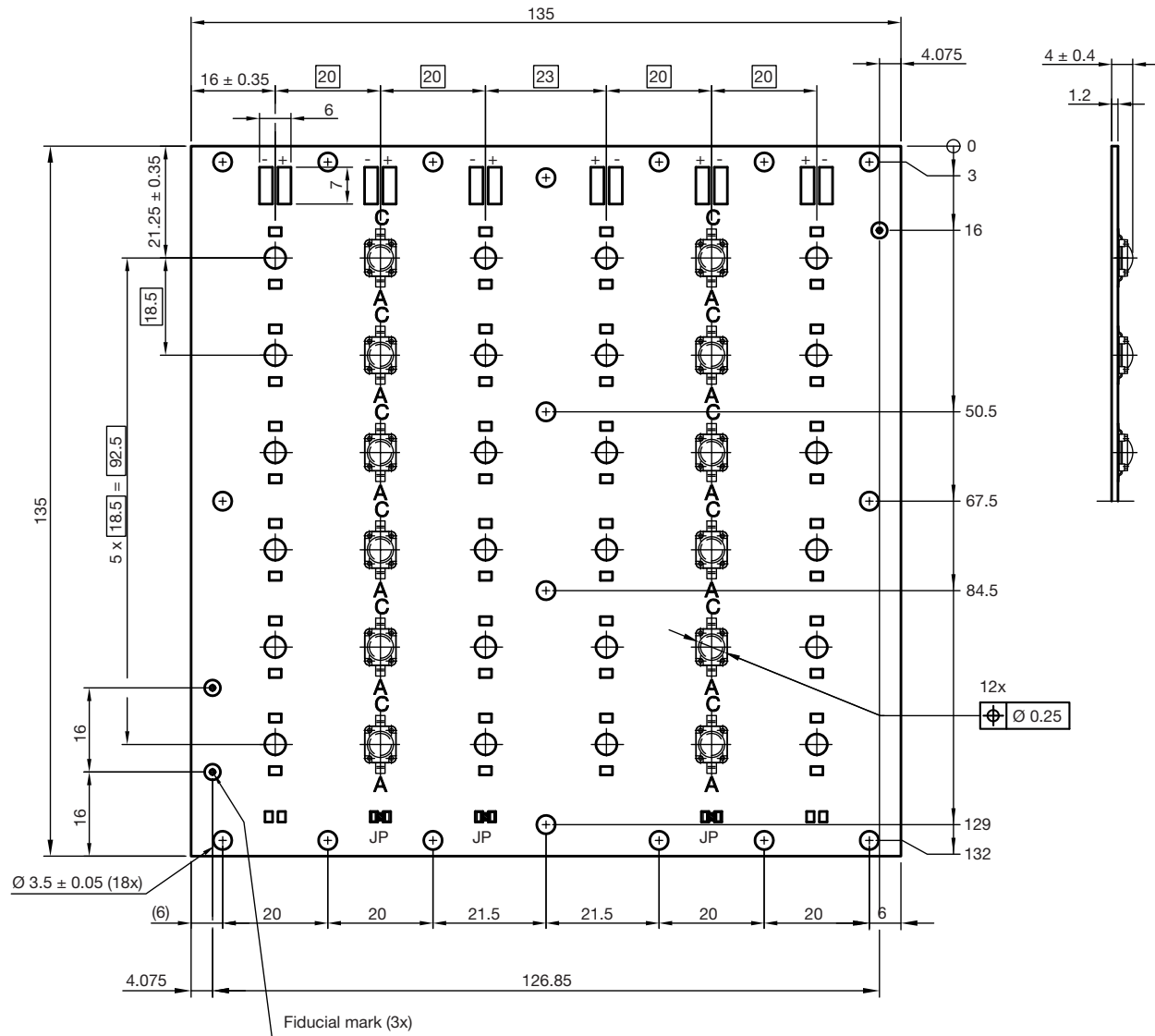
Fig. 1 - Chromaticity Coordinates of Colorgroups

VLSL4012A, VLSL4024A, VLSL4036A

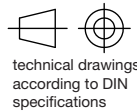
Vishay Semiconductors High Brightness LED Power Module



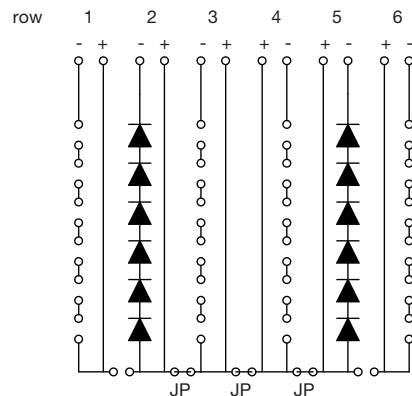
PCB BASIC DESIGN VLSL4012A Dimensions in millimeters



Not indicated tolerances ± 0.15



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



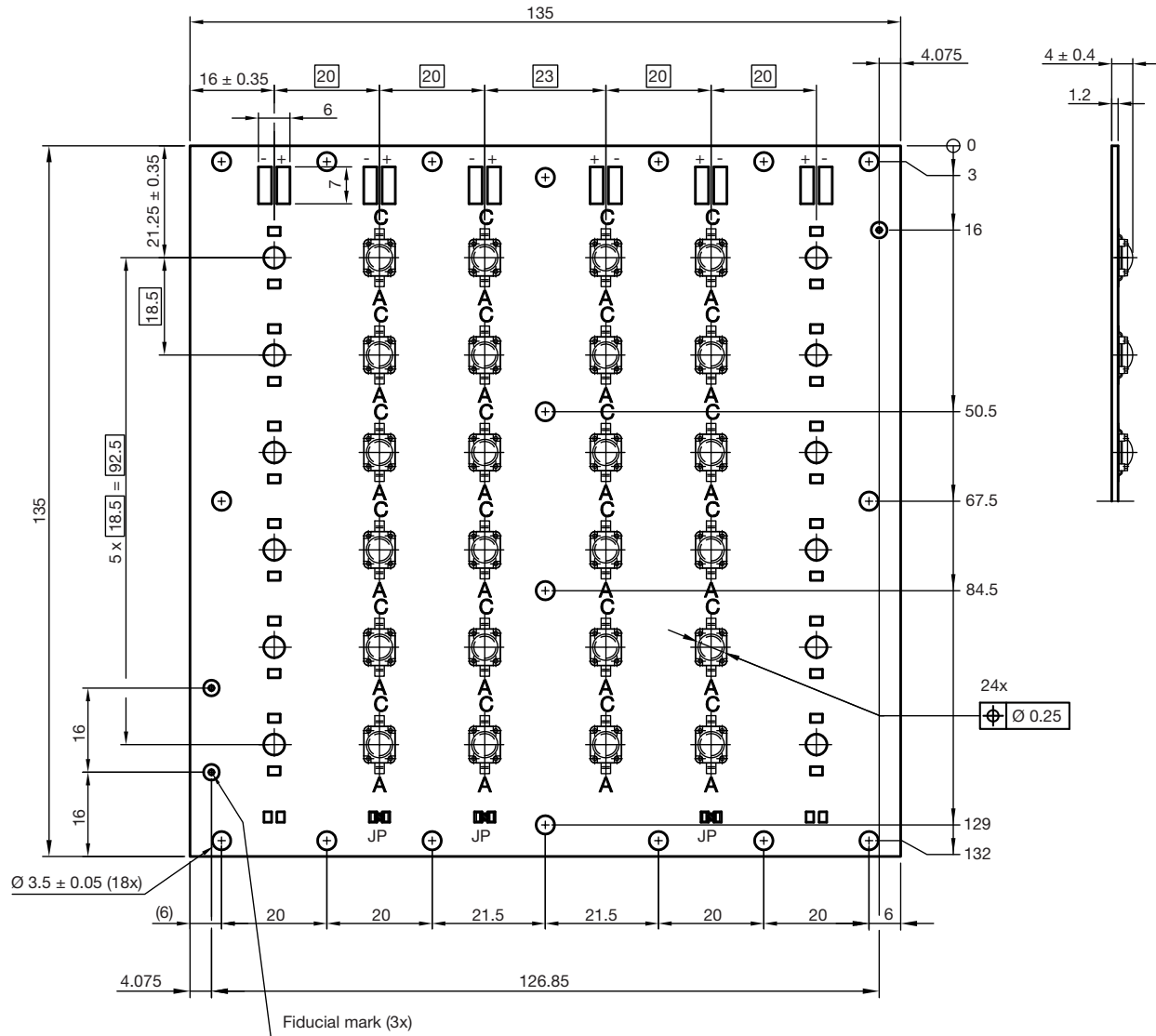
Assembled with all jumpers. Jumpers can be removed according driver design



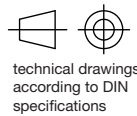
VLSL4012A, VLSL4024A, VLSL4036A

High Brightness LED Power Module Vishay Semiconductors

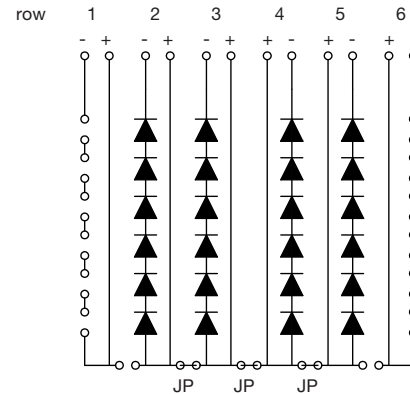
PCB BASIC DESIGN VLSL4024A Dimensions in millimeters



Not indicated tolerances ± 0.15



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



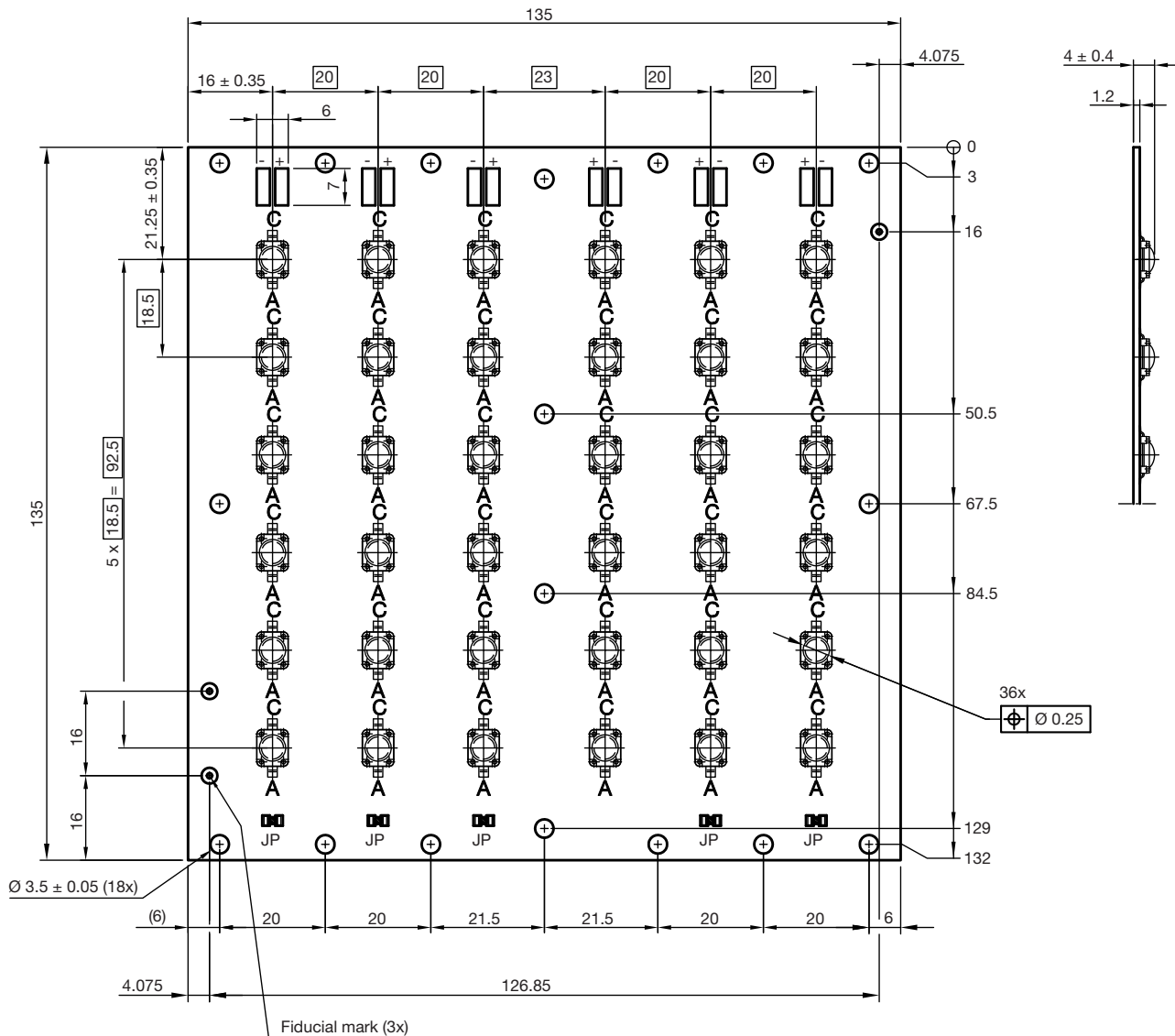
Assembled with all jumpers. Jumpers can be removed according driver design

VLSL4012A, VLSL4024A, VLSL4036A

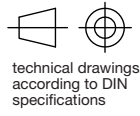


Vishay Semiconductors High Brightness LED Power Module

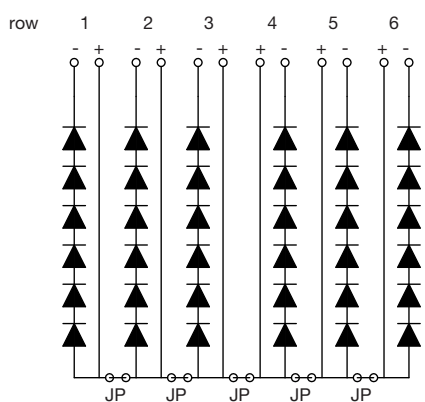
PCB BASIC DESIGN VLSL4036A Dimensions in millimeters



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 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

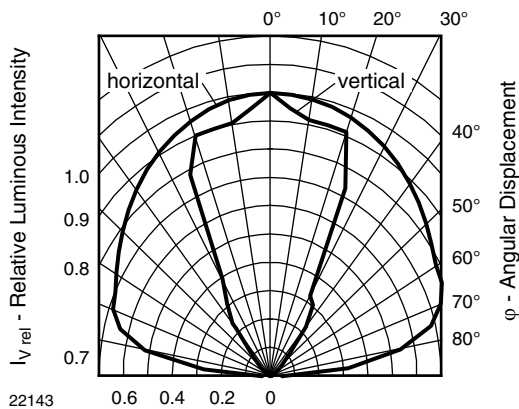


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

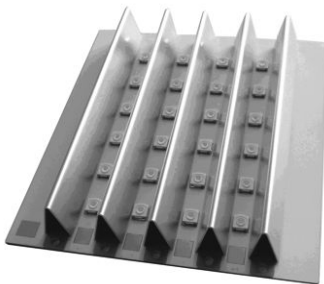
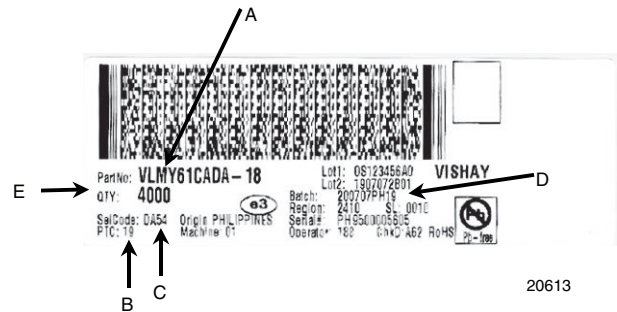


Fig. 3 - Sample Board with reflectors (for info only)

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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