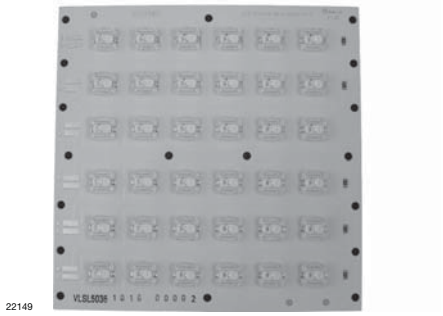
High Brightness LED Power Module



FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12, 24 or 36 LED's minimum 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
- 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 VLSL50xxA are metal core based high brightness LED power modules, assembled with 12, 24 or 36 HB white LEDs. The colour temperature is cool white in the typical range of 5000 K to 7000 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
VLSL5012A	Cool white	Φ_V = 1740 lm	5000 to 7000	InGaN
VLSL5024A	Cool white	Φ_V = 3480 lm	5000 to 7000	InGaN
VLSL5036A	Cool white	Φ_V = 5220 lm	5000 to 7000	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLSL5012A, VLSL5024A, VLSL5036A

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL5012A	Total (max.)	P_{tot}	35	W
Power dissipation VLSL5024A		P_{tot}	69	W
Power dissipation VLSL5036A		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)
VLSL5012A, COOL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row [2]	I_F = 700 mA	Φ_V	760	870	-	lm
Luminous flux total [2]	I_{board} = 2 x 700 mA	Φ_V	1520	1740	-	lm
Color temperature	I_F = 700 mA	TK	5000	-	7000	K
Forward voltage per row	I_F = 700 mA	V_F	19	20	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	I_F = 350 mA (per row)	$TC\Phi_V$	-	- 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)
VLSL5024A, COOL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row [2]	I_F = 700 mA	Φ_V	760	870	-	lm
Luminous flux total [2]	I_{board} = 4 x 700 mA	Φ_V	3040	3480	-	lm
Color temperature	I_F = 700 mA	TK	5000	-	7000	K
Forward voltage per row	I_F = 700 mA	V_F	19	20	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	I_F = 350 mA (per row)	$TC\Phi_V$	-	- 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)
VLSL5036A, COOL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row [2]	I_F = 700 mA	Φ_V	760	870	-	lm
Luminous flux total [2]	I_{board} = 6 x 700 mA	Φ_V	4560	5220	-	lm
Color temperature	I_F = 700 mA	TK	5000	-	7000	K
Forward voltage per row	I_F = 700 mA	V_F	19	20	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	I_F = 350 mA (per row)	$TC\Phi_V$	-	- 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

- VLSL5012A, VLSL5024A, VLSL5036A: LED: VLMW92KYKZ6P7R

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

COLOR RANGE AND COLOR BINNING

VLSL5012A, VLSL5024A, VLSL5036A: 5000 K to 7000 K group 6P to7R

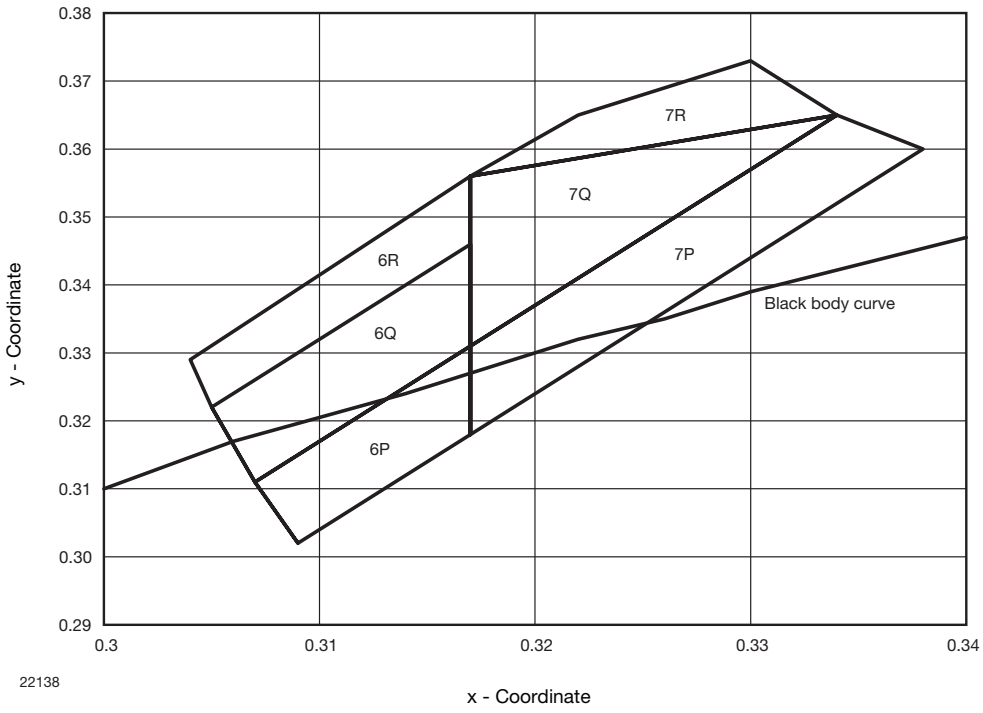
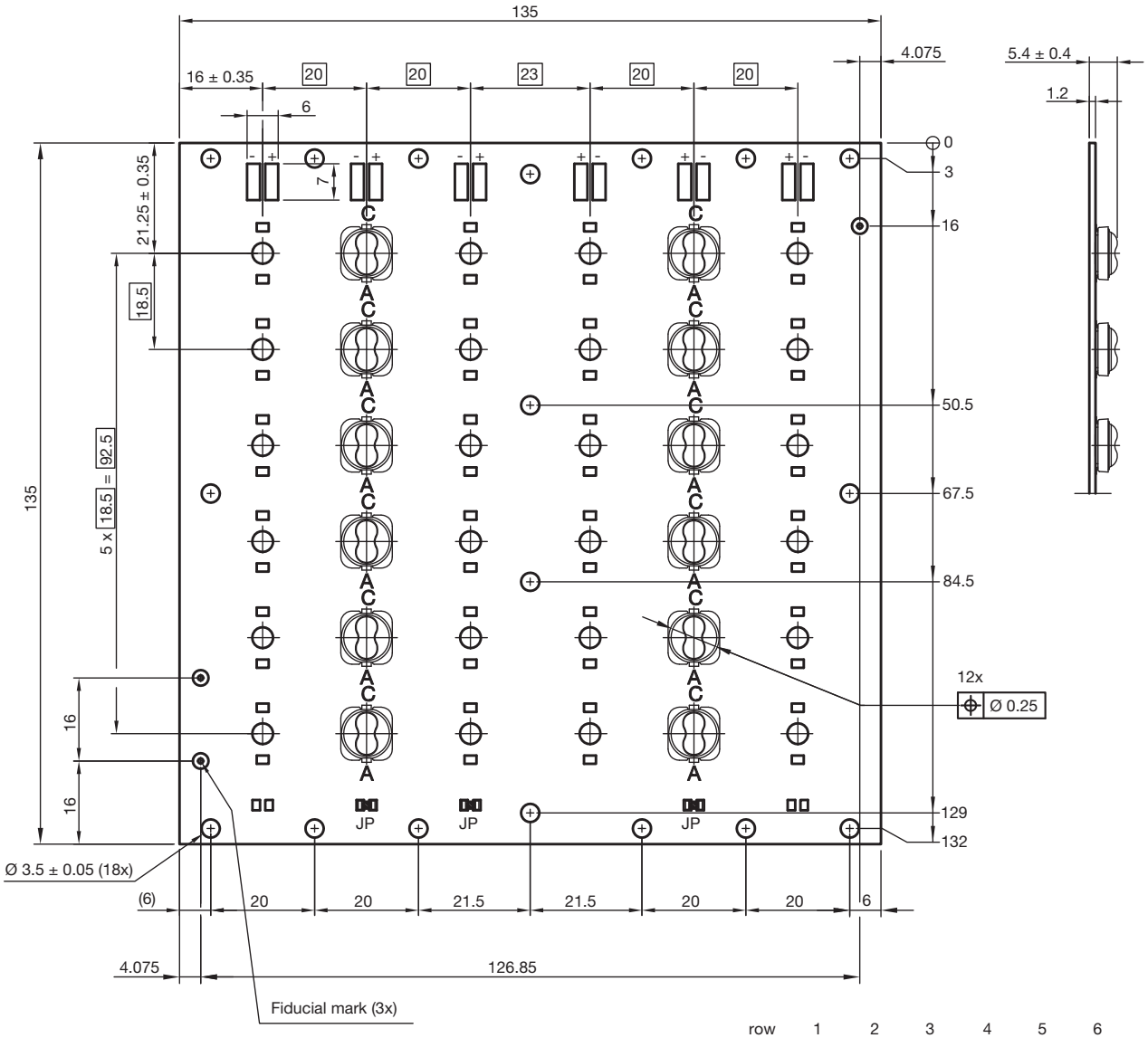


Fig. 1 - Chromaticity Coordinates of Colorgroups

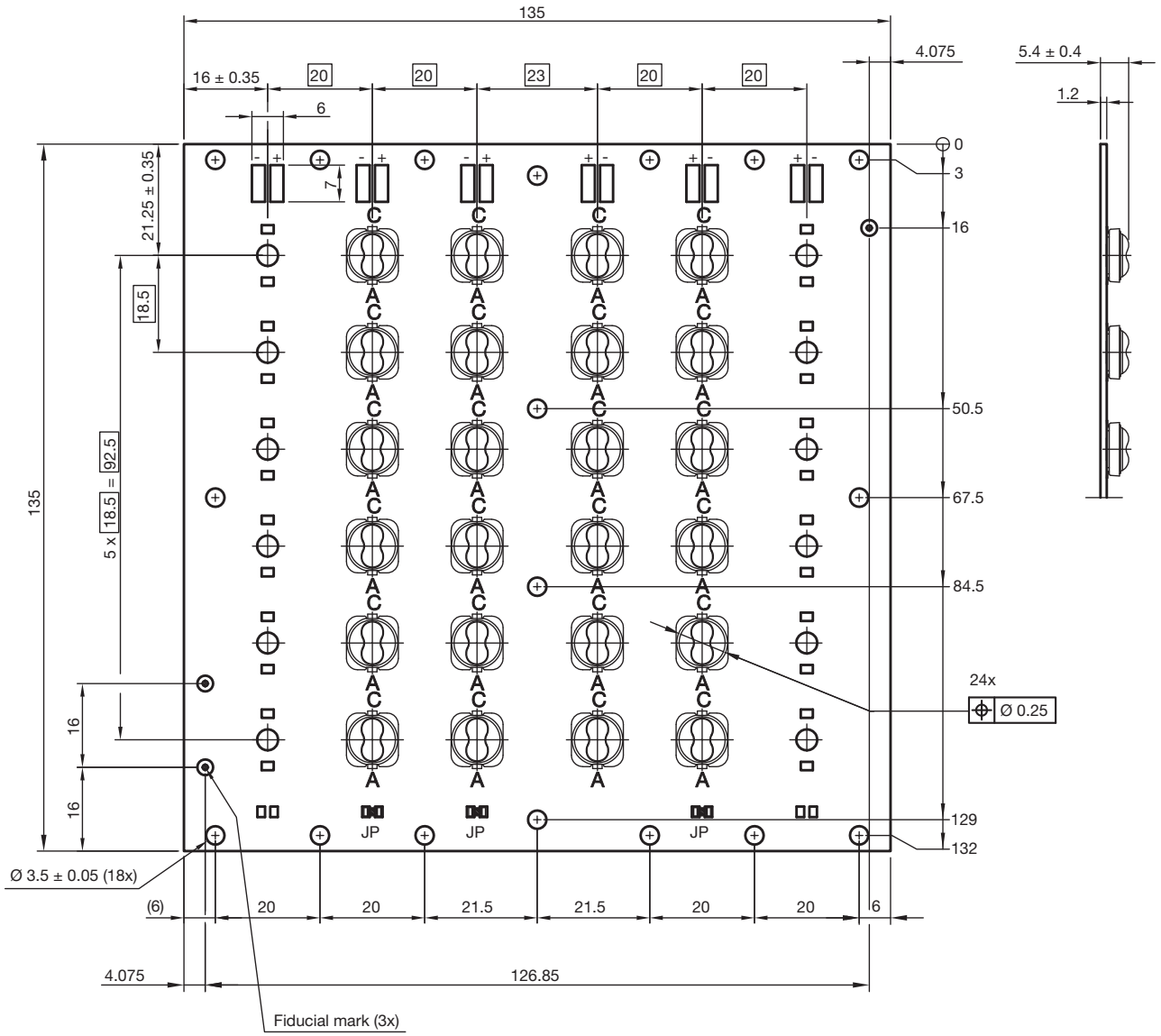
PCB BASIC DESIGN VLSL5012A Dimensions in millimeters



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

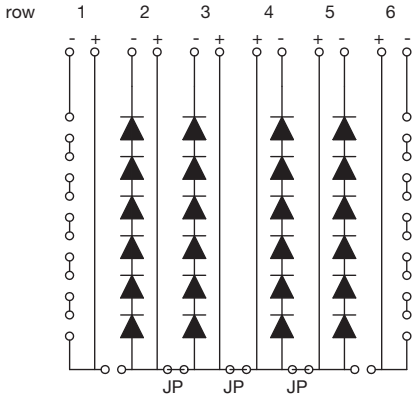
Assembled with all jumpers. Jumpers can be removed according driver design

PCB BASIC DESIGN VLSL5024A Dimensions in millimeters



Not indicated tolerances ± 0.15

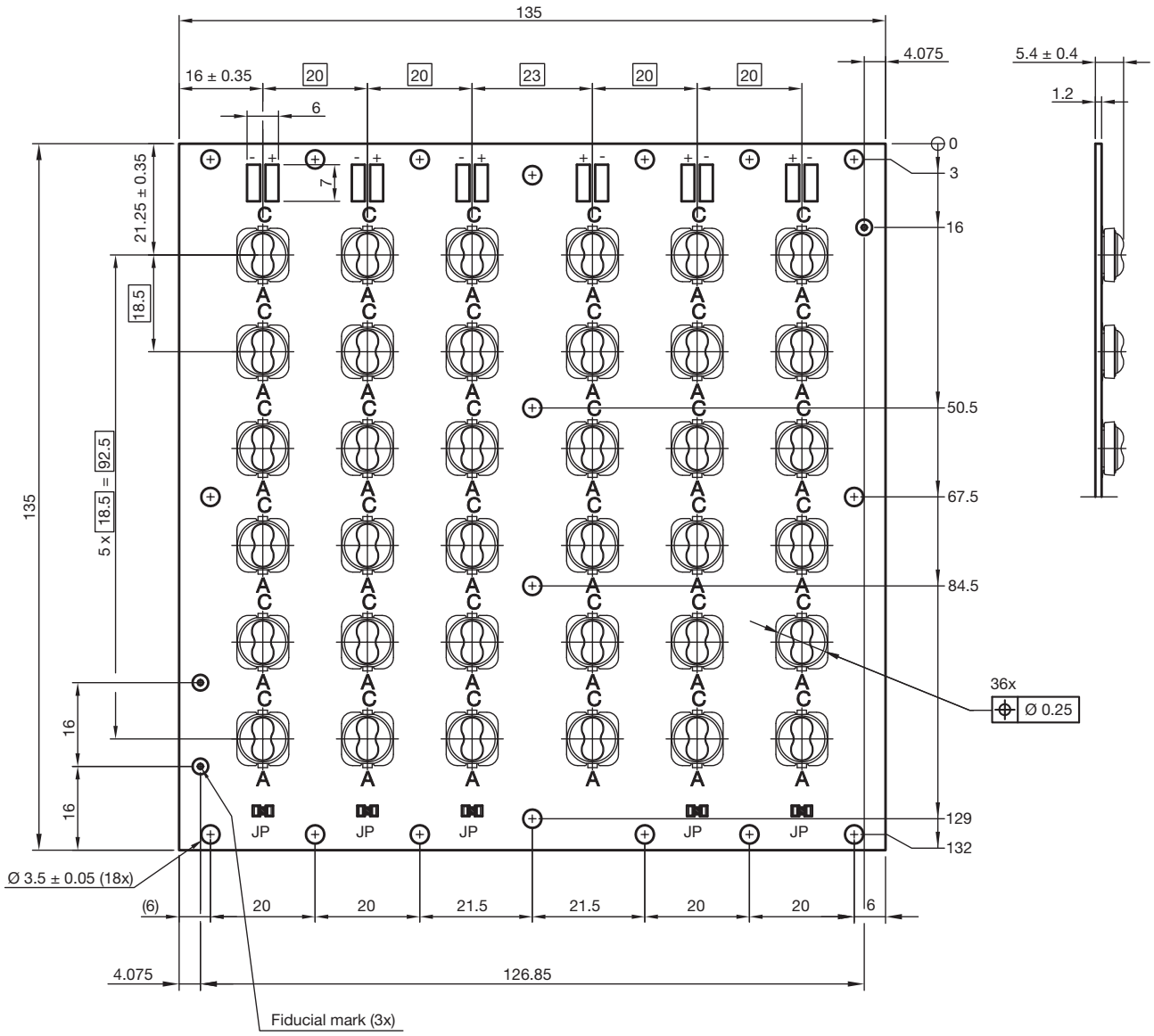
technical drawings according to DIN specifications

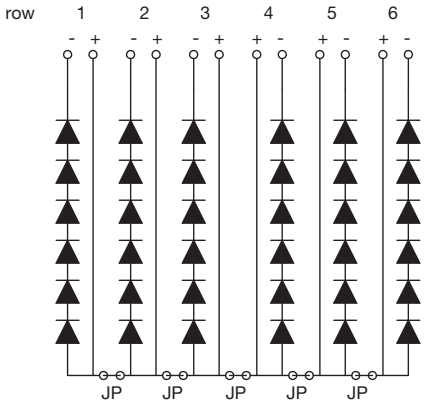


Drawing-No.: 9.920-6727.02-4
Issue:1; 11.05.10
22151

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

PCB BASIC DESIGN VLSL5036A 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 VLMW92xxx LED's. LED position accuracy ± 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

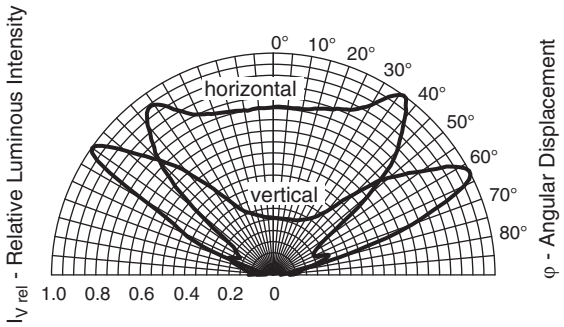
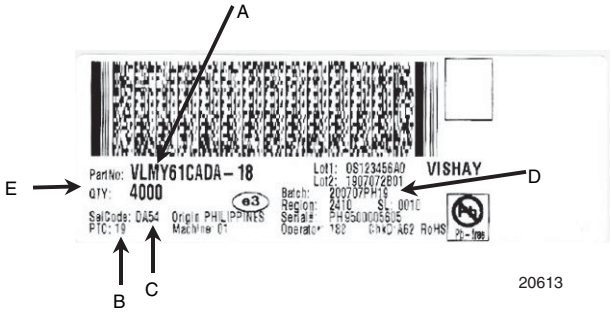


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

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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