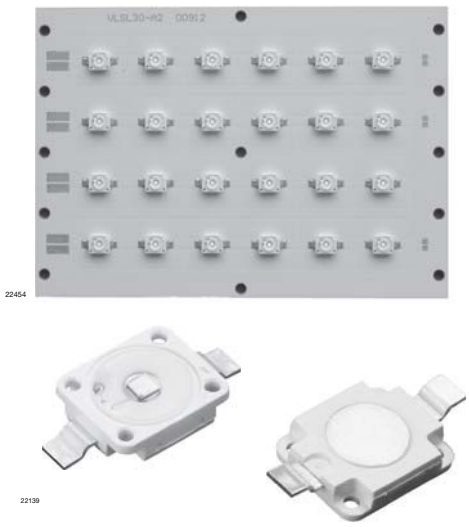
High Brightness LED Power Module



FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12 or 24 LEDs 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 VLSL3212A2, VLSL3224A2 are metal core based high brightness LED power modules, assembled with 12 or 24 HB white LEDs. The color temperature is warm white. The typical color temperature is 3500 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
VLSL3212A2	Warm white	Φ_V = 1500 lm	typ. 3500	InGaN
VLSL3224A2	Warm white	Φ_V = 3000 lm	typ. 3500	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLSL3212A2, VLSL3224A2

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL3212A2	Total (max.)	P_{tot}	34.5	W
Power dissipation VLSL3224A2		P_{tot}	69	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 (T_{amb} = 25 °C, unless otherwise specified) **VLSL3212A2, WARM WHITE**						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (1)	I_F = 700 mA	Φ_V	550	750	-	lm
Luminous flux total (1)	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 (2)	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

- 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 %.

(1) Calculated based on single LED unit.

(2) 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 (T_{amb} = 25 °C, unless otherwise specified) **VLSL3224A2, WARM WHITE**						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous flux per row (1)	I_F = 700 mA	Φ_V	550	750	-	lm
Luminous flux total (1)	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 (2)	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

- 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 %.

(1) Calculated based on single LED unit.

(2) V_F classes are marked at the LED cluster and represent the technical classification only. The single groups cannot be specifically ordered.

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

VLSL3212A2, VLSL3224A2: typ. 3500 K; group 4O to 9Q

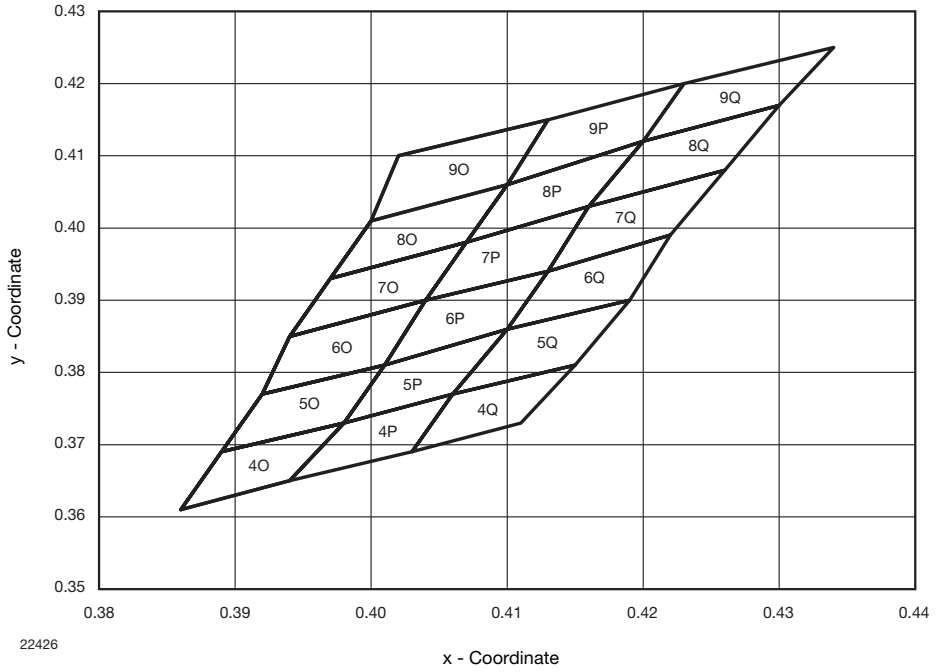
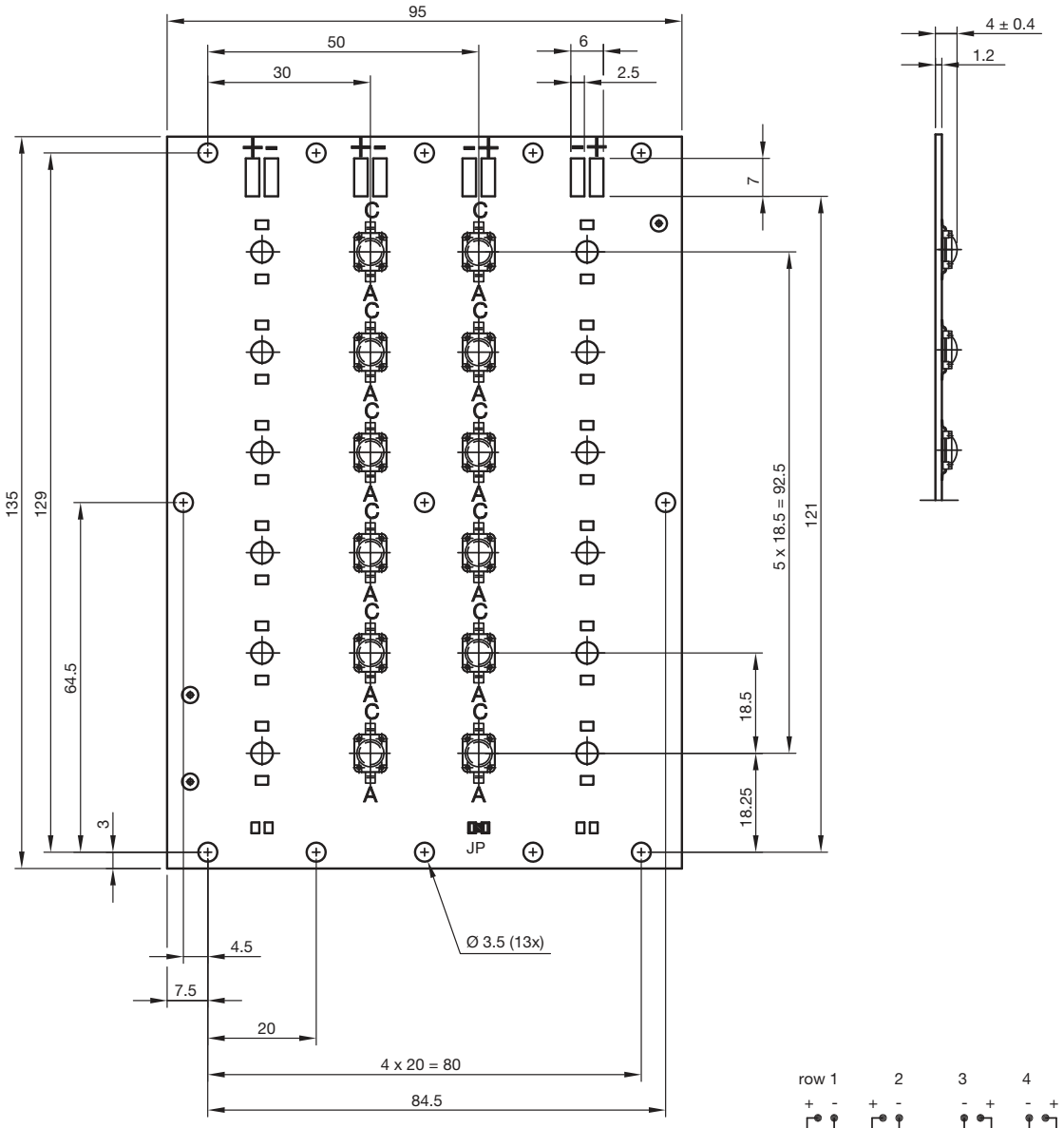


Fig. 1 - Chromaticity Coordinates of Colorgroups

CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED

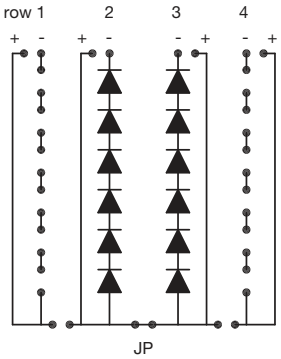
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y
4O	0.386	0.361	4P	0.394	0.365	4Q	0.403	0.369
	0.389	0.369		0.398	0.373		0.406	0.377
	0.398	0.373		0.406	0.377		0.415	0.381
	0.394	0.365		0.403	0.369		0.411	0.373
5O	0.389	0.369	5P	0.398	0.373	5Q	0.406	0.377
	0.392	0.377		0.401	0.381		0.410	0.386
	0.401	0.381		0.410	0.386		0.419	0.390
	0.398	0.373		0.406	0.377		0.415	0.381
6O	0.392	0.377	6P	0.401	0.381	6Q	0.410	0.386
	0.394	0.385		0.404	0.390		0.413	0.394
	0.404	0.390		0.413	0.394		0.422	0.399
	0.401	0.381		0.410	0.386		0.419	0.390
7O	0.394	0.385	7P	0.404	0.390	7Q	0.413	0.394
	0.397	0.393		0.407	0.398		0.416	0.403
	0.407	0.398		0.416	0.403		0.426	0.408
	0.404	0.390		0.413	0.394		0.422	0.399
8O	0.397	0.393	8P	0.407	0.398	8Q	0.416	0.403
	0.400	0.401		0.410	0.406		0.420	0.412
	0.410	0.406		0.420	0.412		0.430	0.417
	0.407	0.398		0.416	0.403		0.426	0.408
9O	0.400	0.401	9P	0.410	0.406	9Q	0.420	0.412
	0.402	0.410		0.413	0.415		0.423	0.420
	0.413	0.415		0.423	0.420		0.434	0.425
	0.410	0.406		0.420	0.412		0.430	0.417

PCB BASIC DESIGN VLSL3212A2 DIMENSIONS in millimeters



Not indicated tolerances ± 0.2

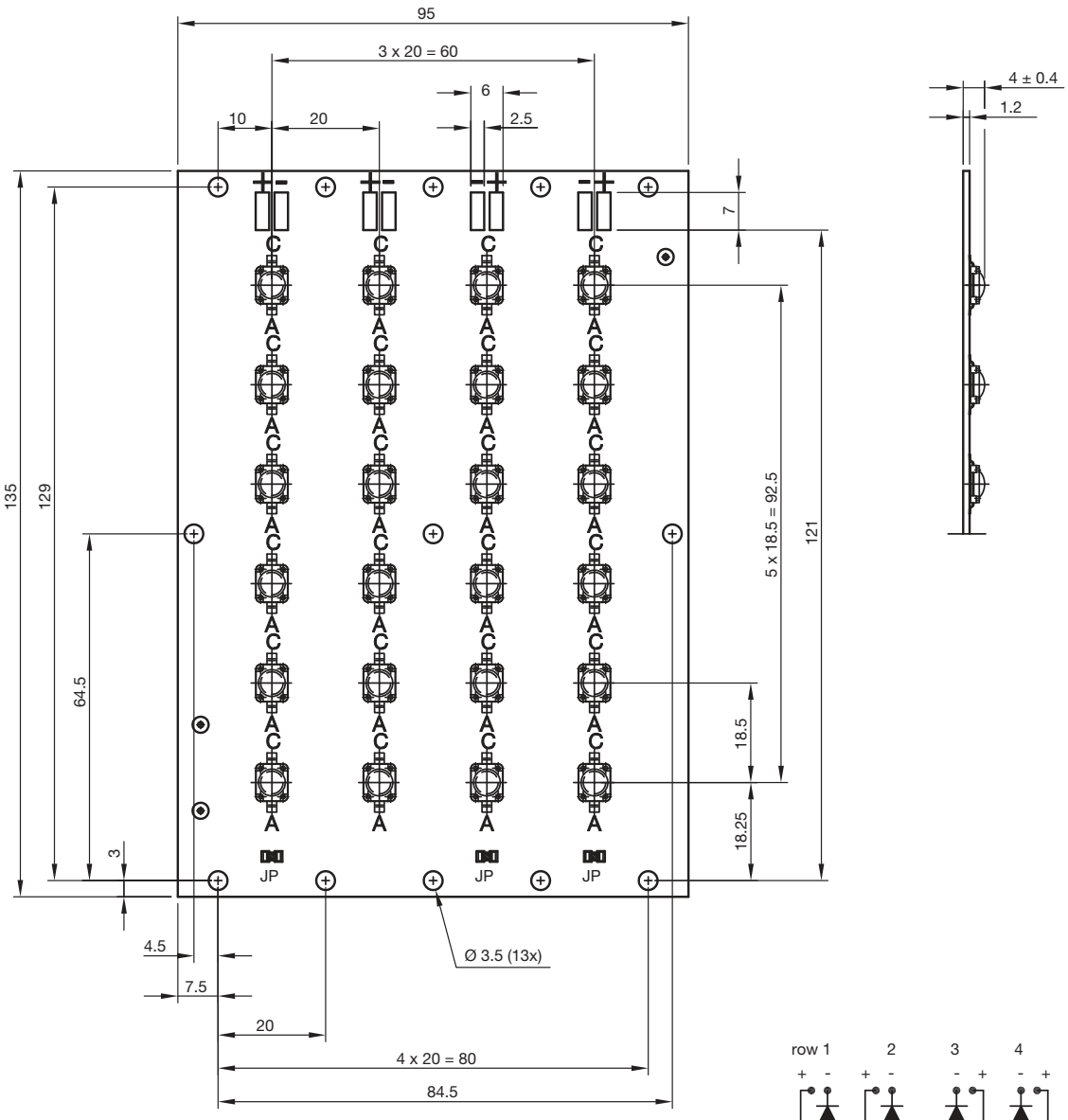
technical drawings
according to DIN
specifications

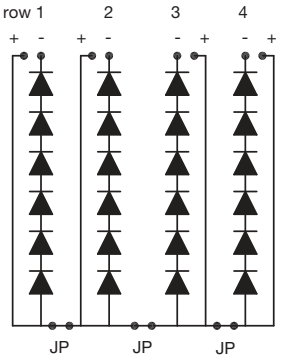


Drawing-No.: 9.920-6752.01-4
Issue: 2; 02.11.10
22456

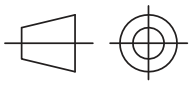
Assembled with all jumpers. Jumpers can be removed according driver design

PCB BASIC DESIGN VLSL3224A2 DIMENSIONS in millimeters





Not indicated tolerances ± 0.2



technical drawings
according to DIN
specifications

Drawing-No.: 9.920-6751.01-4
Issue: 2; 02.11.10
22455

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 or 24 VLMW91xxx LEDs. LED position accuracy ± 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

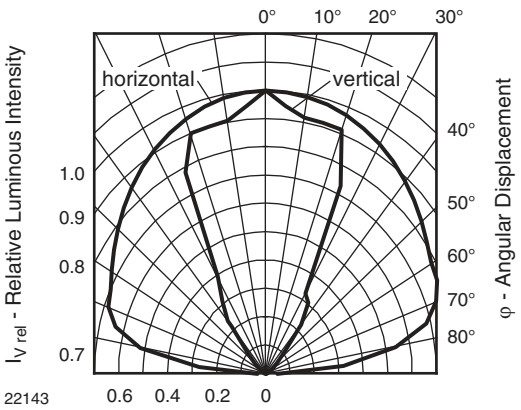


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

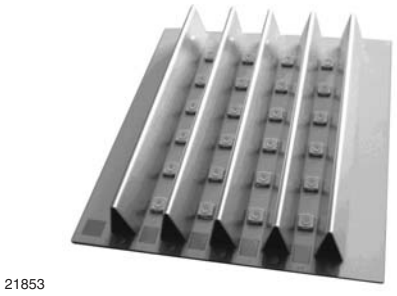
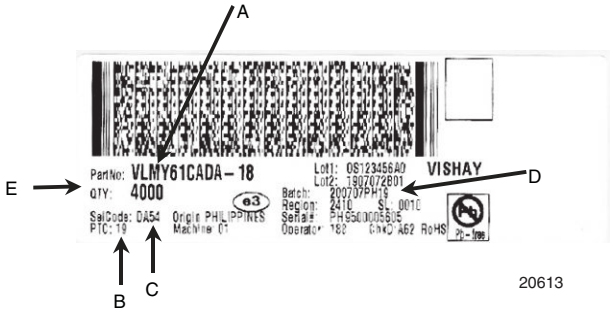


Fig. 3 - Sample Board with Reflectors (for Info only)

BAR CODE PRODUCT LABEL (example)



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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