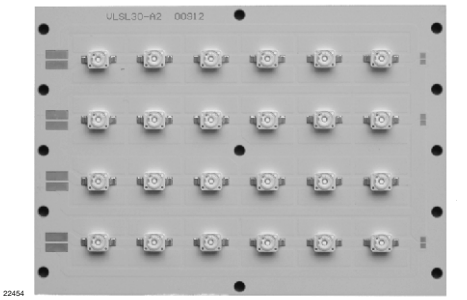
High Brightness LED Power Module



FEATURES

- Metal core PCB: Al > 0.75 thickness
- Single side/single layer PCB
- Shiny white surface
- 12 or 24 LEDs, 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)**

Note

** Please see document “Vishay Material Category Policy”: www.vishay.com/doc?99902

APPLICATIONS

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

DESCRIPTION

The VLSL3012A2, VLSL3024A2 are metal core based high brightness LED power modules, assembled with 12 or 24 HB white LEDs. The color temperature is cool 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: ± 80°

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (at I_F = 700 mA typ.)	COLOR TEMPERATURE K	TECHNOLOGY
VLSL3012A2	Cool white	Φ_V = 2100 lm	5000 to 7000	InGaN
VLSL3024A2	Cool white	Φ_V = 4200 lm	5000 to 7000	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLSL3012A2, VLSL3024A2

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current	Per row	I_F	750	mA
Power dissipation VLSL3012A2	Total (max.)	P_{tot}	34.5	W
Power dissipation VLSL3024A2		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

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLSL3012A2, COOL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row (1)	I_F = 700 mA	Φ_V	860	1050	-	lm
Luminous flux total (1)	I_{board} = 2 x 700 mA	Φ_V	1720	2100	-	lm
Color temperature	I_F = 700 mA	TK	5000	-	7000	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)
VLSL3024A2, COOL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux per row (2)	I_F = 700 mA	Φ_V	860	1050	-	lm
Luminous flux total (2)	I_{board} = 4 x 700 mA	Φ_V	3440	4200	-	lm
Color temperature	I_F = 700 mA	TK	5000	-	7000	K
Forward voltage per row	I_F = 700 mA	V_F	19	21	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

- 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.

COLOR RANGE AND COLOR BINNING

VLSL3012A2, VLSL3024A2: 5000 K to 7000 K group 6P to7R

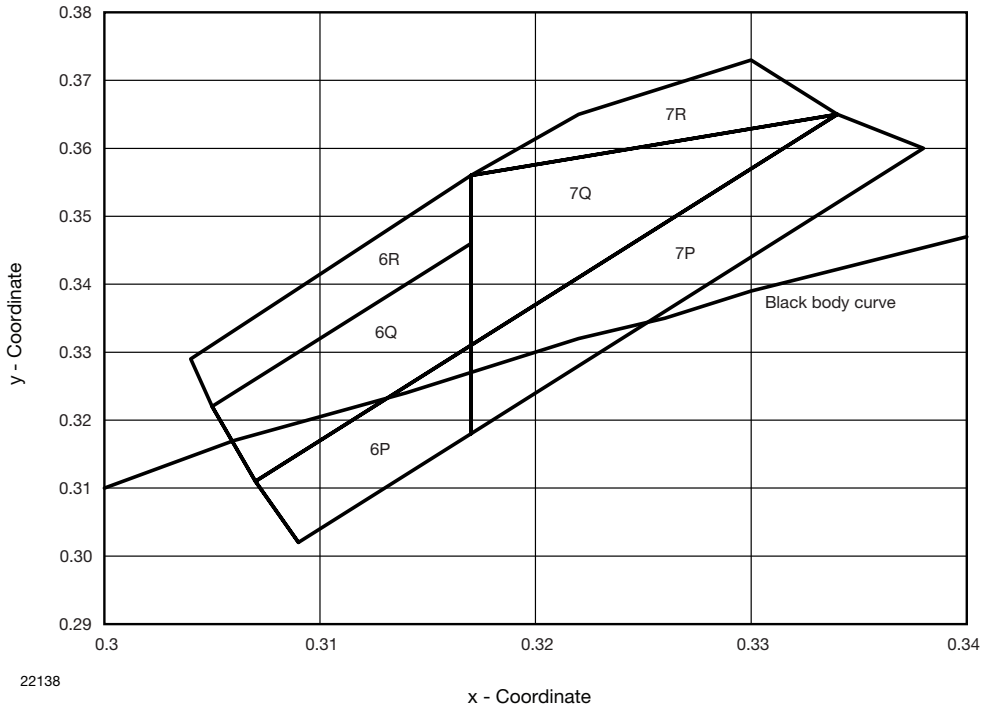
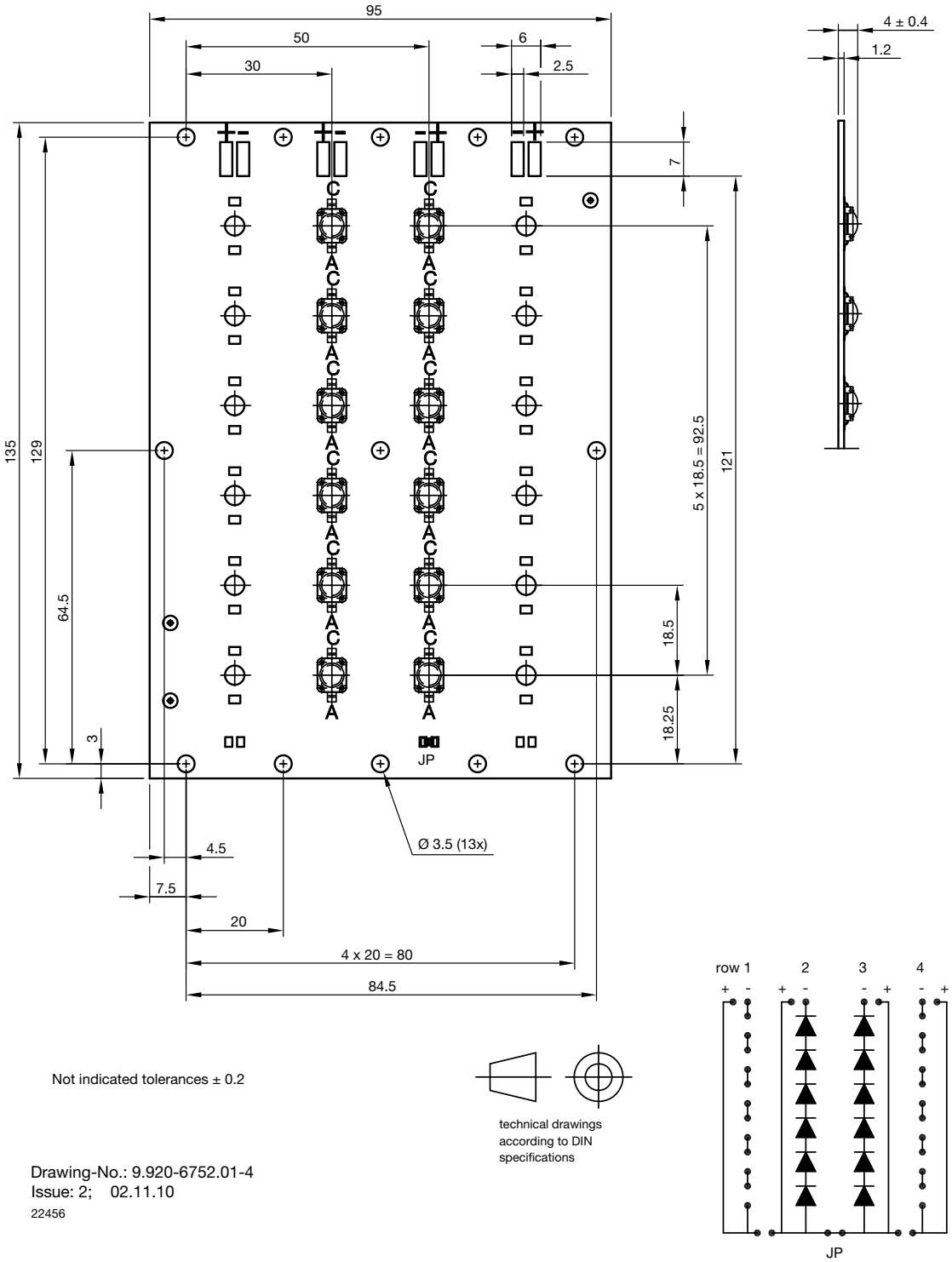


Fig. 1 - Chromaticity Coordinates of Colorgroups

CHROMATICITY COORDINATED GROUPS FOR COOL WHITE SMD LED									
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y
6P	0.309	0.302	6Q	0.307	0.311	6R	0.305	0.322
	0.307	0.311		0.305	0.322		0.304	0.329
	0.317	0.331		0.317	0.346		0.317	0.356
	0.317	0.318		0.317	0.331		0.317	0.346
7P	0.317	0.318	7Q	0.317	0.331	7R	0.317	0.356
	0.317	0.331		0.317	0.356		0.322	0.365
	0.334	0.365		0.334	0.365		0.330	0.373
	0.338	0.360		0.317	0.331		0.334	0.365

PCB BASIC DESIGN VLSL3012A2 DIMENSIONS in millimeters



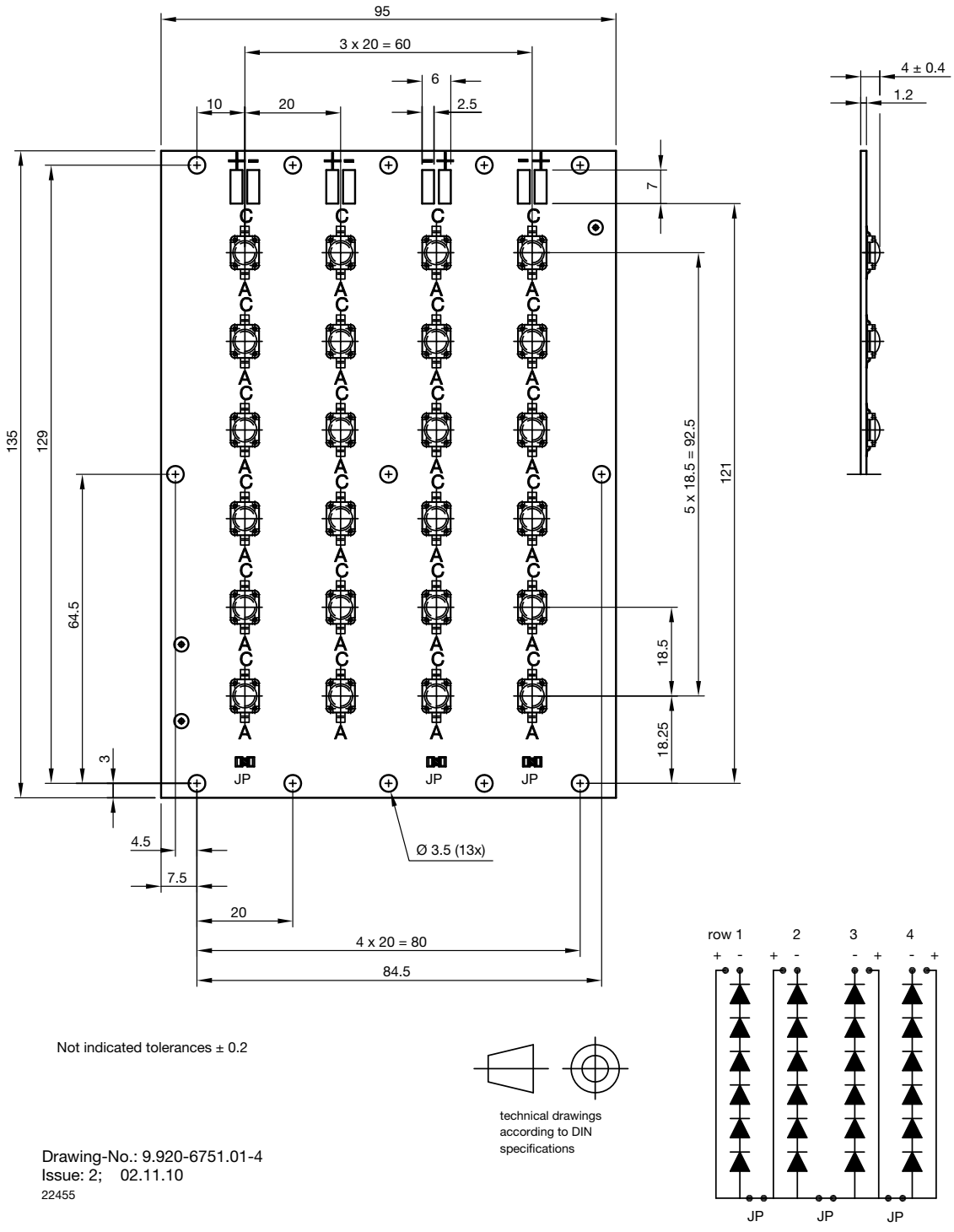
Not indicated tolerances ± 0.2

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 VLSL3024A2 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 high brightness power LEDs. LED position accuracy ± 0.125 mm from middle axis, horizontal tilt max. 2°

EMISSION CHARACTERISTIC

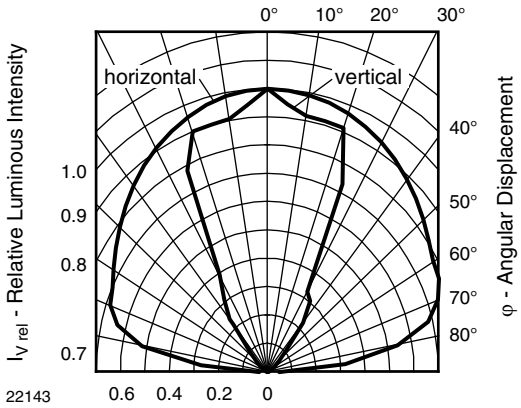
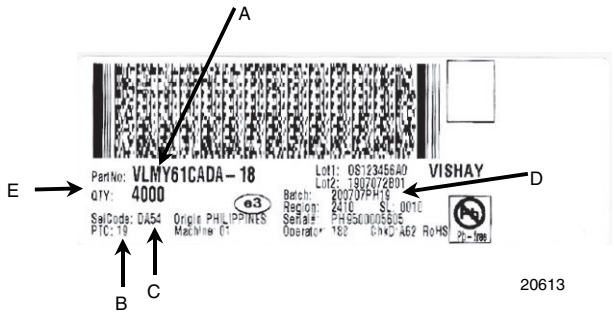


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

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

BAR CODE PRODUCT LABEL



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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