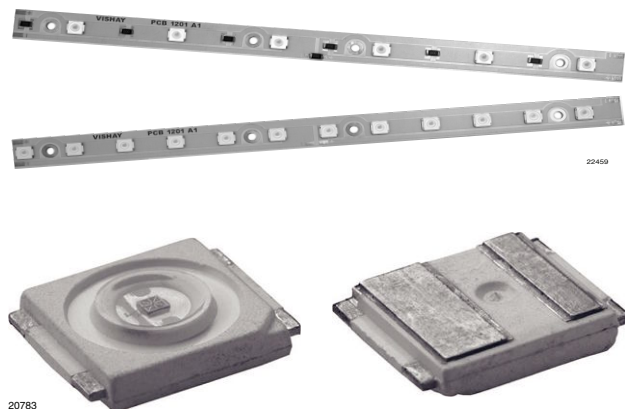




## High Brightness LED Power Module

**RoHS**  
COMPLIANT  
**GREEN**  
(5-2008)\*\*

### FEATURES

- Metal core PCB: Al > 1 thickness
- Single side/single layer PCB
- Shiny white surface
- 6 or 12 LEDs minimum 87.4 lm at 350 mA each
- Prepared to divide in half strips also, by cutting
- Conductive top layer: Cu (min. 18  $\mu$ m)
- Isolation layer prepreg (100  $\mu$ m)
- ESD withstand voltage: up to 2 kV according to JESD22-A114-B
- Color binning
- Compliant to RoHS Directive 2011/65/EU

### Note

\*\* Please see document "Vishay Material Category Policy":  
[www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### DESCRIPTION

VLPC1201A1, VLPC1201A1J and VLPC0601A1 are metal core based high brightness LED power modules assembled with 6 or 12 white LEDs. Color temperature range of 5000 K to 7000 K.

The VLPC1201A1J has 12 units in row, while the VLPC1201A1 can be divided in 2 strips 6 LEDs each by sawing or driven as 2 x 6 LEDs.

### APPLICATIONS

- Automotive internal lighting
- Internal lighting in buildings
- Tunnel lights
- Reading lamp, table lamp
- General lighting application

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: LED module
- Product series: power
- Angle of half intensity:  $\pm 60^\circ$

### PARTS TABLE

| PART        | COLOR      | LUMINOUS FLUX<br>(at $I_F = 350$ mA typ.) | COLOR TEMPERATURE<br>K | TECHNOLOGY |
|-------------|------------|-------------------------------------------|------------------------|------------|
| VLPC0601A1  | Cool white | $\Phi_V = 540$ lm                         | 5000 to 7000           | InGaN      |
| VLPC1201A1  | Cool white | $\Phi_V = 2 \times 540$ lm                | 5000 to 7000           | InGaN      |
| VLPC1201A1J | Cool white | $\Phi_V = 1080$ lm                        | 5000 to 7000           | InGaN      |

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified) VLPC0601A1, VLPC1201A1, VLPC1201A1J

| PARAMETER                                                | TEST CONDITION | PART        | SYMBOL    | VALUE        | UNIT             |
|----------------------------------------------------------|----------------|-------------|-----------|--------------|------------------|
| Forward current                                          |                |             | $I_F$     | 350          | mA               |
| Power dissipation                                        | Total          | VLPC0601A1  | $P_{tot}$ | 8.4          | W                |
|                                                          |                | VLPC1206A1  | $P_{tot}$ | 16.8         | W                |
|                                                          |                | VLPC1206A1J | $P_{tot}$ | 16.8         | 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 | $^\circ\text{C}$ |
| Decomposition temperature of PCB<br>(for cable assembly) | 3 x 10 s       |             | $T_D$     | 350          | $^\circ\text{C}$ |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC0601A1, COOL WHITE**

| PARAMETER                           | TEST CONDITION        | SYMBOL     | MIN. | TYP.  | MAX. | UNIT |
|-------------------------------------|-----------------------|------------|------|-------|------|------|
| Luminous flux total <sup>(1)</sup>  | $I_F = 350\text{ mA}$ | $\Phi_V$   | 480  | 540   | -    | lm   |
| Color temperature                   | $I_F = 350\text{ mA}$ | TK         | 5000 | -     | 7000 | K    |
| Forward voltage                     | $I_F = 350\text{ mA}$ | $V_F$      | 18   | 20    | 24   | V    |
| Temperature coefficient of $V_F$    | $I_F = 350\text{ mA}$ | $TC_{VF}$  | -    | - 18  | -    | mV/K |
| Temperature coefficient of $\Phi_V$ | $I_F = 350\text{ mA}$ | $TC\Phi_V$ | -    | - 0.4 | -    | %/K  |

**Notes**

- 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  $\pm 11\%$ .
- <sup>(1)</sup> Calculated based on single LED unit.

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC1201A1J, COOL WHITE**

| PARAMETER                           | TEST CONDITION        | SYMBOL     | MIN. | TYP.  | MAX. | UNIT |
|-------------------------------------|-----------------------|------------|------|-------|------|------|
| Luminous flux total <sup>(1)</sup>  | $I_F = 350\text{ mA}$ | $\Phi_V$   | 960  | 1080  | -    | lm   |
| Color temperature                   | $I_F = 350\text{ mA}$ | TK         | 5000 | -     | 7000 | K    |
| Forward voltage                     | $I_F = 350\text{ mA}$ | $V_F$      | 36   | 40    | 44   | V    |
| Temperature coefficient of $V_F$    | $I_F = 350\text{ mA}$ | $TC_{VF}$  | -    | - 36  | -    | mV/K |
| Temperature coefficient of $\Phi_V$ | $I_F = 350\text{ mA}$ | $TC\Phi_V$ | -    | - 0.4 | -    | %/K  |

**Notes**

- 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  $\pm 11\%$ .
- <sup>(1)</sup> Calculated based on single LED unit.

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLPC1201A1, COOL WHITE**

| PARAMETER                                   | TEST CONDITION        | SYMBOL     | MIN.    | TYP.    | MAX. | UNIT |
|---------------------------------------------|-----------------------|------------|---------|---------|------|------|
| Luminous flux total <sup>(1)</sup>          | $I_F = 350\text{ mA}$ | $\Phi_V$   | 2 x 480 | 2 x 540 | -    | lm   |
| Color temperature                           | $I_F = 350\text{ mA}$ | TK         | 5000    | -       | 7000 | K    |
| Forward voltage per 6 LEDs                  | $I_F = 350\text{ mA}$ | $V_F$      | 18      | 20      | 24   | V    |
| Temperature coefficient of $V_F$ per 6 LEDs | $I_F = 350\text{ mA}$ | $TC_{VF}$  | -       | - 18    | -    | mV/K |
| Temperature coefficient of $\Phi_V$         | $I_F = 350\text{ mA}$ | $TC\Phi_V$ | -       | - 0.4   | -    | %/K  |

**Notes**

- 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  $\pm 11\%$ .
- <sup>(1)</sup> Calculated based on single LED unit.



## COLOR RANGE AND COLOR BINNING

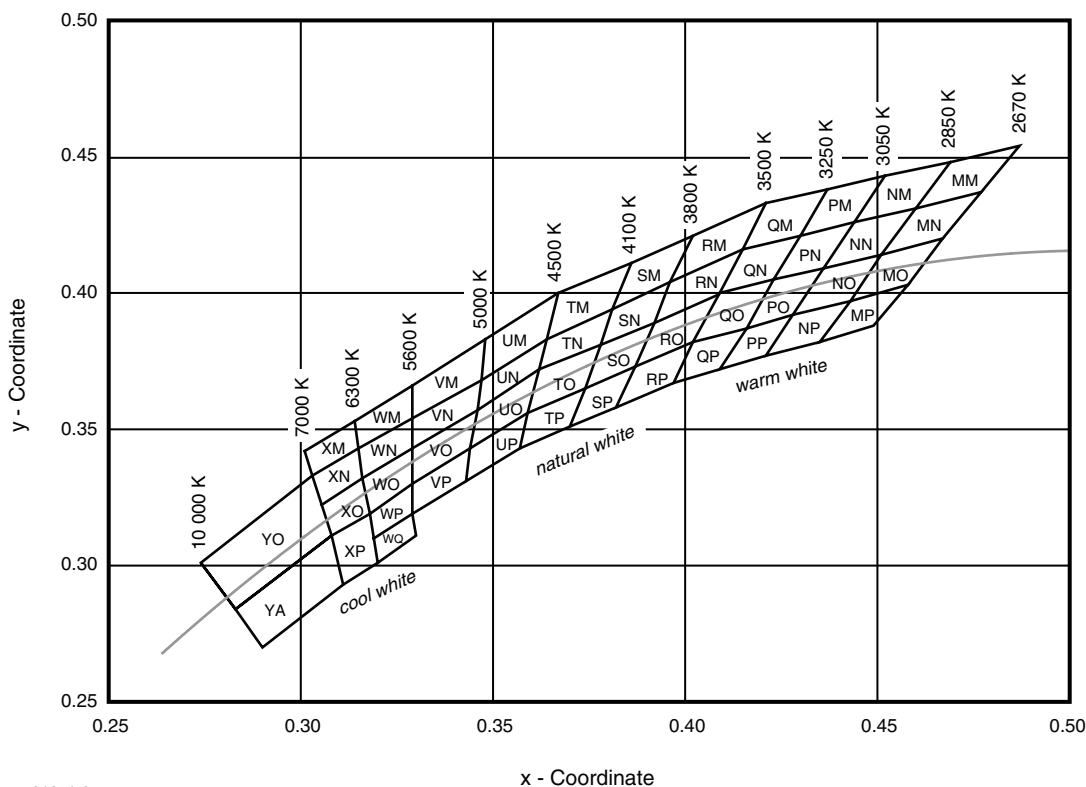
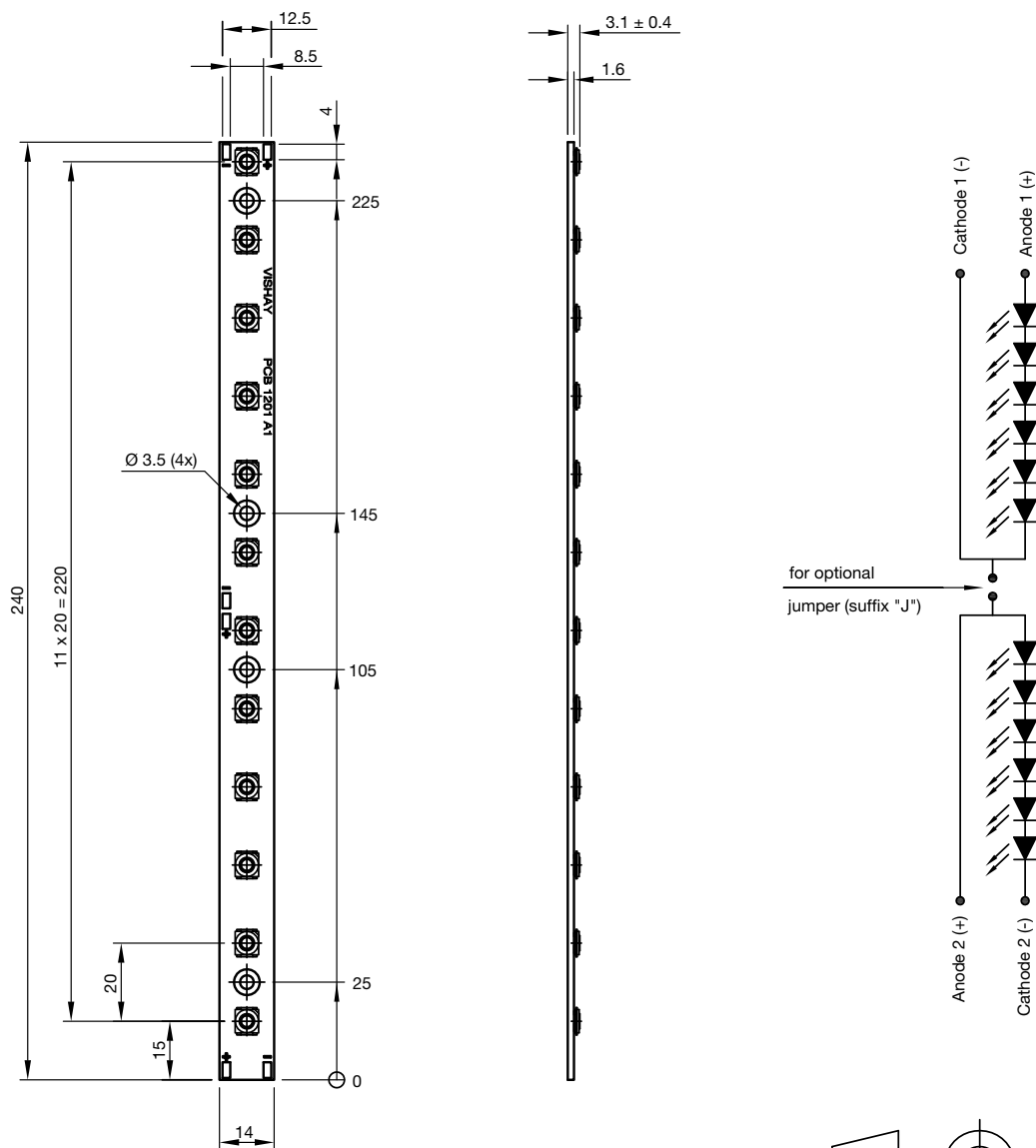


Fig. 1 - Chromaticity Coordinates of Colorgroups

| CHROMATICITY COORDINATED GROUPS FOR COOL WHITE SMD LED |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| GROUP                                                  | X     | Y     | GROUP | X     | Y     | GROUP | X     | Y     | GROUP | X     | Y     | GROUP | X     | Y     |
| XM                                                     | 0.301 | 0.342 | XN    | 0.303 | 0.333 | XO    | 0.305 | 0.322 | XP    | 0.308 | 0.311 | -     | -     | -     |
|                                                        | 0.314 | 0.353 |       | 0.315 | 0.343 |       | 0.316 | 0.332 |       | 0.318 | 0.319 |       | -     | -     |
|                                                        | 0.315 | 0.343 |       | 0.316 | 0.332 |       | 0.318 | 0.319 |       | 0.320 | 0.301 |       | -     | -     |
|                                                        | 0.303 | 0.333 |       | 0.305 | 0.322 |       | 0.308 | 0.311 |       | 0.311 | 0.293 |       | -     | -     |
| WM                                                     | 0.314 | 0.353 | WN    | 0.315 | 0.343 | WO    | 0.316 | 0.332 | WP    | 0.318 | 0.319 | WQ    | 0.319 | 0.310 |
|                                                        | 0.329 | 0.366 |       | 0.329 | 0.354 |       | 0.329 | 0.343 |       | 0.329 | 0.330 |       | 0.329 | 0.319 |
|                                                        | 0.329 | 0.354 |       | 0.329 | 0.343 |       | 0.329 | 0.330 |       | 0.329 | 0.319 |       | 0.330 | 0.311 |
|                                                        | 0.315 | 0.343 |       | 0.316 | 0.332 |       | 0.318 | 0.319 |       | 0.319 | 0.310 |       | 0.320 | 0.301 |
| VM                                                     | 0.329 | 0.366 | VN    | 0.329 | 0.354 | VO    | 0.329 | 0.343 | VP    | 0.329 | 0.330 | -     | -     | -     |
|                                                        | 0.348 | 0.383 |       | 0.347 | 0.368 |       | 0.346 | 0.357 |       | 0.344 | 0.343 |       | -     | -     |
|                                                        | 0.347 | 0.368 |       | 0.346 | 0.357 |       | 0.344 | 0.343 |       | 0.343 | 0.331 |       | -     | -     |
|                                                        | 0.329 | 0.354 |       | 0.329 | 0.343 |       | 0.329 | 0.330 |       | 0.329 | 0.319 |       | -     | -     |

## PCB BASIC DESIGN DIMENSIONS in millimeters



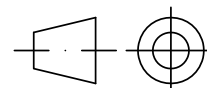
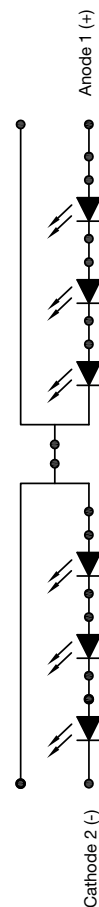
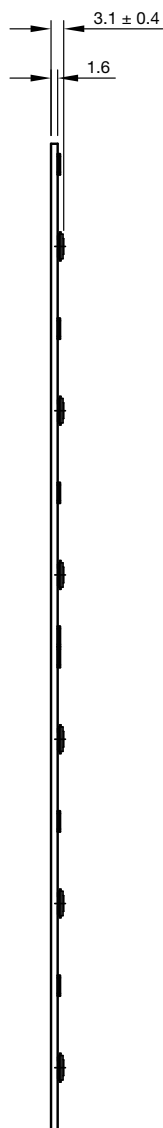
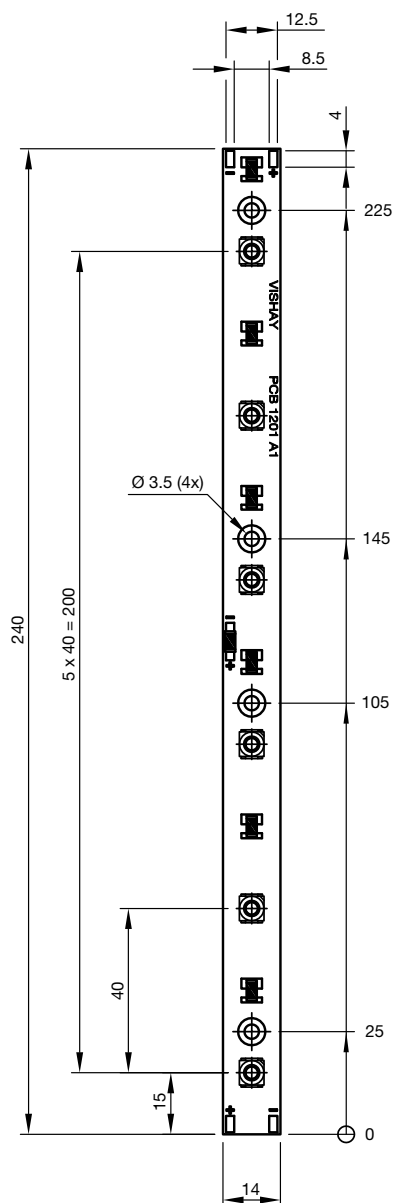
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Issue: 1 ; 15.11.10  
22457

Not indicated tolerances  $\pm 0.2$

technical drawings  
according to DIN  
specifications



## PCB BASIC DESIGN DIMENSIONS in millimeters



technical drawings  
according to DIN  
specifications

Drawing-No.: 9.920-6758.01-4  
Issue: 1 ; 15.11.10  
22458

Not indicated tolerances ± 0.2



## PCB CHARACTERISTICS

- Metal core PCB: Al (minimum 1000  $\mu\text{m}$  - thickness)
- Prepreg minimum 63  $\mu\text{m}$
- Conductive pattern Cu minimum 18  $\mu\text{m}$
- Free of burrs
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition
- Solder resist on top side
- Shiny white surface (glossy-white Taiyo-PSR 2000)
- Galvanic of solder pads and backside pure matte Sn (0.8  $\mu\text{m}$  to 1.2  $\mu\text{m}$ )
- Assembled with 6 or 12 high brightness power LEDs. LED position accuracy  $\pm 0.3$

## EMISSION CHARACTERISTIC

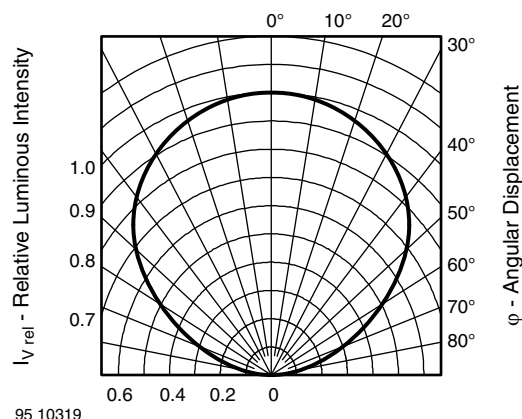
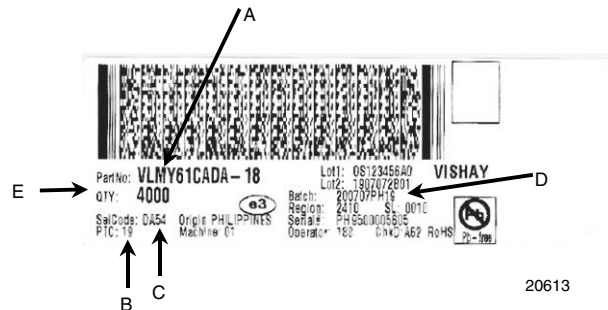


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

## BAR CODE PRODUCT LABEL



- A. Type of component
- B. Manufacturing plant
- C. SEL - selection code (bin):  
X = color group
- D. Batch:  
200707 = year 2007, week 07  
PH19 = plant code
- E. Total quantity

### Note

- 24 PCB's per box, minimum order quantity 24



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