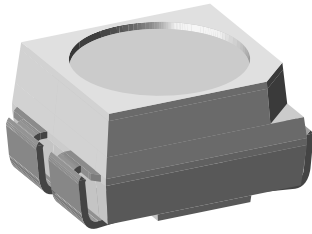


Power SMD LED PLCC-4



19210_1

DESCRIPTION

The VLMW322.. white LED is an advanced product in terms of heat dissipation.

The leadframe profile of this PLCC-4 SMD package is optimized to reduce the thermal resistance.

This allows higher drive current and doubles the light output compared to Vishay's high intensity SMD LED in PLCC-2 standard package.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-4
- Product series: power
- Angle of half intensity: $\pm 60^\circ$

FEATURES

- 3 cathode pins, 1 anode pin
- High efficient InGaN technology
- Long life time, due to silicone casting
- Angle of half intensity $\varphi = \pm 60^\circ$
- Available in 8 mm tape
- Luminous intensity and color categorized per packing unit
- Luminous intensity ratio per packing unit $I_{Vmax}/I_{Vmin.} \leq 1.6$
- ESD-withstand voltage: Up to 2 kV (HBM) according to JESD22-A114-B
- Preconditioning: According to JEDEC level 2a
- Compatible with IR-reflow, vapor phase, and wave soldering processes according to CECC 00802 and J-STD-020
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- Camera flash light
- Signals, signs, and symbol luminaire
- Marker lights
- Interior and exterior automotive lighting (brake lights, turn lights, backlighting, side markers)
- Indicator lighting
- General and architectural lighting
- Backlighting (advertising, displays, LCDs, switches, ...)

PARTS TABLE

| PART | COLOR | LUMINOUS INTENSITY (mcd) | | | at I _F (mA) | COORDINATE (x, y) | | | at I _F (mA) | FORWARD VOLTAGE (V) | | | at I _F (mA) | TECHNOLOGY |
|--------------------|-------|--------------------------|------|------|------------------------|-------------------|------------|------|------------------------|---------------------|------|------|------------------------|--------------|
| | | MIN. | TYP. | MAX. | | MIN. | TYP. | MAX. | | MIN. | TYP. | MAX. | | |
| VLMW322ABBB5K8L-08 | White | 1400 | 2200 | 2850 | 30 | - | 0.33, 0.33 | - | 30 | 2.9 | 3.4 | 4 | 30 | InGaN on SiC |
| VLMW322BACA5K8L-08 | White | 1800 | 2800 | 3550 | 30 | - | 0.33, 0.33 | - | 30 | 2.9 | 3.4 | 4 | 50 | InGaN on SiC |

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

VLMW322..

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|---|-------------------|---------------|------|
| Reverse voltage ⁽¹⁾ | | V _R | 5 | V |
| DC forward current | T _{amb} ≤ 60 °C | I _F | 50 | mA |
| Surge forward current | t _p ≤ 10 μs | I _{FSM} | 0.3 | A |
| Power dissipation | | P _V | 200 | mW |
| Junction temperature | | T _j | 125 | °C |
| Operating temperature range | | T _{amb} | - 40 to + 110 | °C |
| Storage temperature range | | T _{stg} | - 40 to + 110 | °C |
| Thermal resistance junction/ambient | Mounted on PC board (pad design see page 6) | R _{thJA} | 300 | K/W |

Note

⁽¹⁾ Driving the LED in reverse direction is suitable for a short term application



OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
VLMW322.., WHITE

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|-------------------------------|-----------------|-----------|------|----------|------|--------------|
| Luminous intensity | $I_F = 30\text{ mA}$ | VLMW322ABBB5K8L | I_V | 1400 | 2200 | 2850 | mcd |
| | | VLMW322BACA5K8L | I_V | 1800 | 2800 | 3550 | mcd |
| Luminous flux | $I_F = 30\text{ mA}$ | VLMW322ABBB5K8L | ϕ_V | - | 7000 | - | mlm |
| | | VLMW322BACA5K8L | ϕ_V | - | 8900 | - | mlm |
| Chromaticity coordinate x, y acc. to CIE 1931 | $I_F = 30\text{ mA}$ | | x | - | 0.33 | - | |
| | | | y | - | 0.33 | - | |
| Angle of half intensity | $I_F = 30\text{ mA}$ | | ϕ | - | ± 60 | - | deg |
| Forward voltage | $I_F = 30\text{ mA}$ | | V_F | 2.9 | 3.4 | 4 | V |
| Reverse voltage | $I_R = 10\text{ }\mu\text{A}$ | | V_R | 5 | - | - | V |
| Temperature coefficient of V_F | $I_F = 30\text{ mA}$ | | TC_{VF} | - | - 3.6 | - | mV/K |
| Temperature coefficient of I_V | $I_F = 30\text{ mA}$ | | TC_{IV} | - | - 0.5 | - | %/K |
| Temperature coefficient of x | $I_F = 30\text{ mA}$ | | TC_x | - | - 0.0002 | - | $\Delta x/K$ |
| Temperature coefficient of y | $I_F = 30\text{ mA}$ | | TC_y | - | - 0.0003 | - | $\Delta y/K$ |

| LUMINOUS INTENSITY CLASSIFICATION | | |
|-----------------------------------|-----------------------|------|
| GROUP STANDARD | LIGHT INTENSITY (mcd) | |
| | MIN. | MAX. |
| AB | 1400 | 1800 |
| BA | 1800 | 2240 |
| BB | 2240 | 2850 |
| CA | 2850 | 3550 |

Note

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of $\pm 11\%$.
 The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel).
 In order to ensure availability, single brightness groups will not be orderable.
 In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped on any one reel.
 In order to ensure availability, single wavelength groups will not be orderable.

CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED

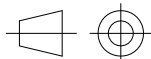
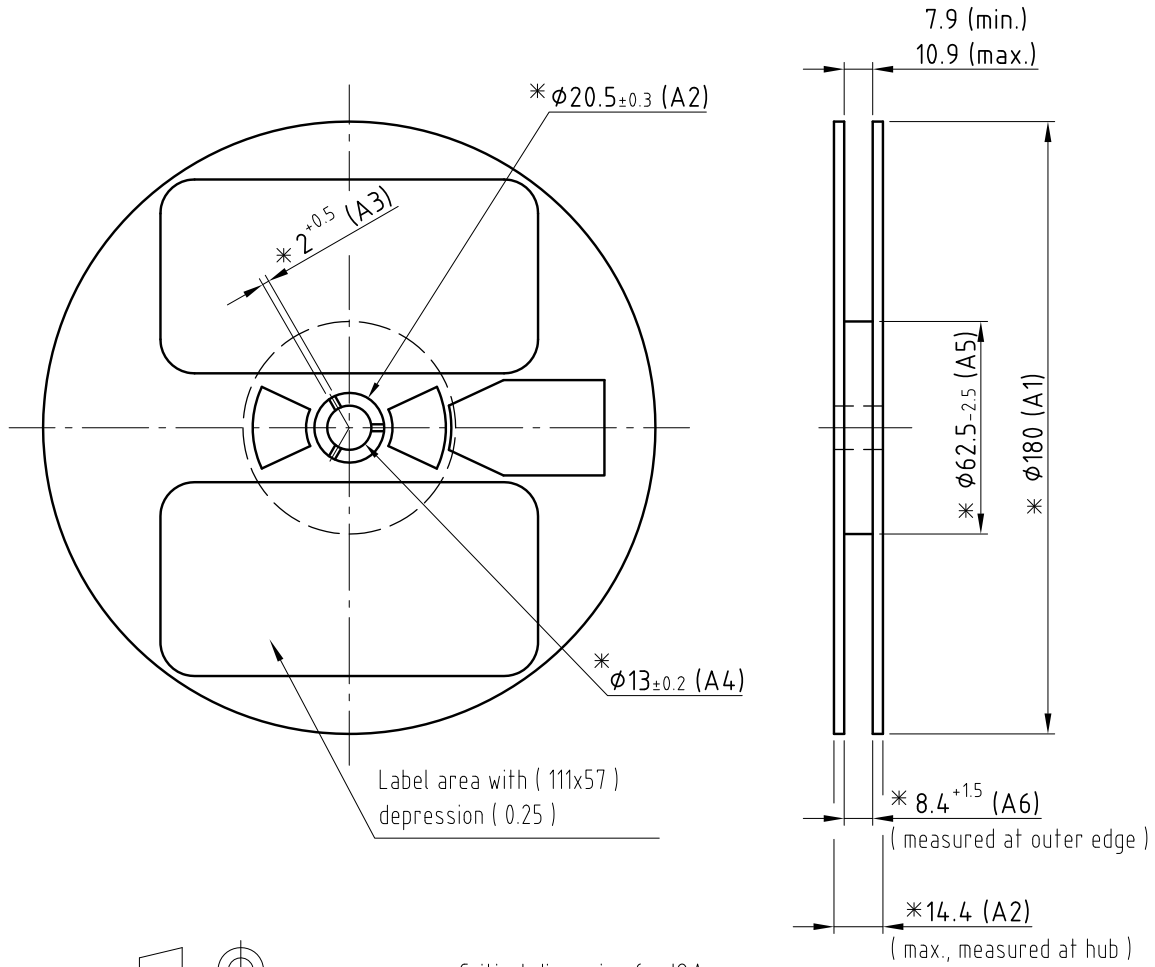
| | X | Y | | X | Y |
|----|-------|-------|----|-------|-------|
| 5L | 0.291 | 0.268 | 7L | 0.330 | 0.330 |
| | 0.285 | 0.279 | | 0.330 | 0.347 |
| | 0.307 | 0.312 | | 0.347 | 0.371 |
| | 0.310 | 0.297 | | 0.345 | 0.352 |
| 5K | 0.296 | 0.259 | 7K | 0.330 | 0.310 |
| | 0.291 | 0.268 | | 0.330 | 0.330 |
| | 0.310 | 0.297 | | 0.338 | 0.342 |
| | 0.313 | 0.284 | | 0.352 | 0.344 |
| 6L | 0.310 | 0.297 | 8L | 0.345 | 0.352 |
| | 0.307 | 0.312 | | 0.347 | 0.371 |
| | 0.330 | 0.347 | | 0.367 | 0.401 |
| | 0.330 | 0.330 | | 0.364 | 0.380 |
| 6K | 0.313 | 0.284 | 8K | 0.352 | 0.344 |
| | 0.310 | 0.297 | | 0.338 | 0.342 |
| | 0.330 | 0.330 | | 0.364 | 0.380 |
| | 0.330 | 0.310 | | 0.360 | 0.357 |

Note

- Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ± 0.01 .



REEL DIMENSIONS in millimeters



technical drawings according to DIN specifications

* Critical dimension for IQA.

GS08 = 2000 pcs

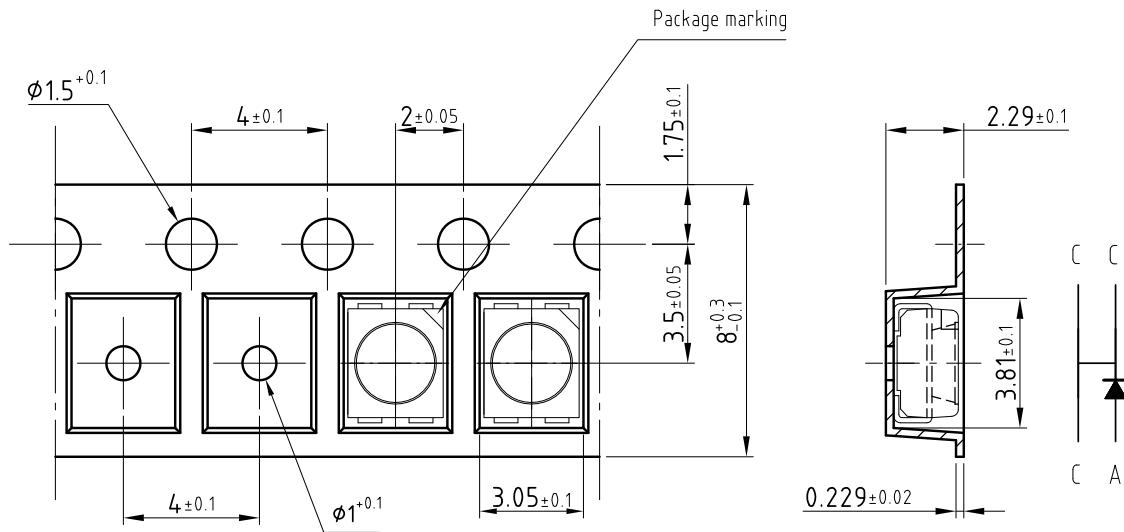
Not indicated tolerances ± 0.05
Material: black static dissipative

Drawing refers to following types: $\phi 180$ mm Plastic reel
Drawing-No.: 9.800-5086.01-4
Issue: 2; 05.05.08
20983

TAPING DIMENSIONS in millimeters

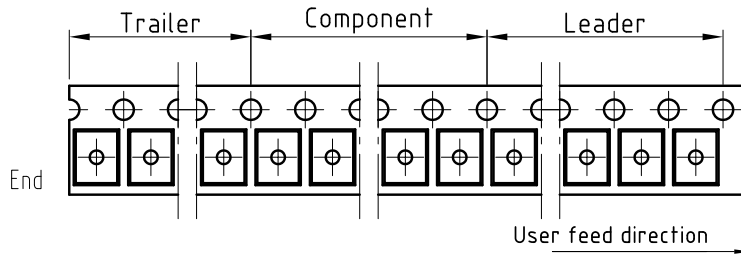
Taping and orientation

Reels come in quantity of 2000 units.



200mm min. for $\phi 180$ reel

480mm min. for $\phi 180$ reel



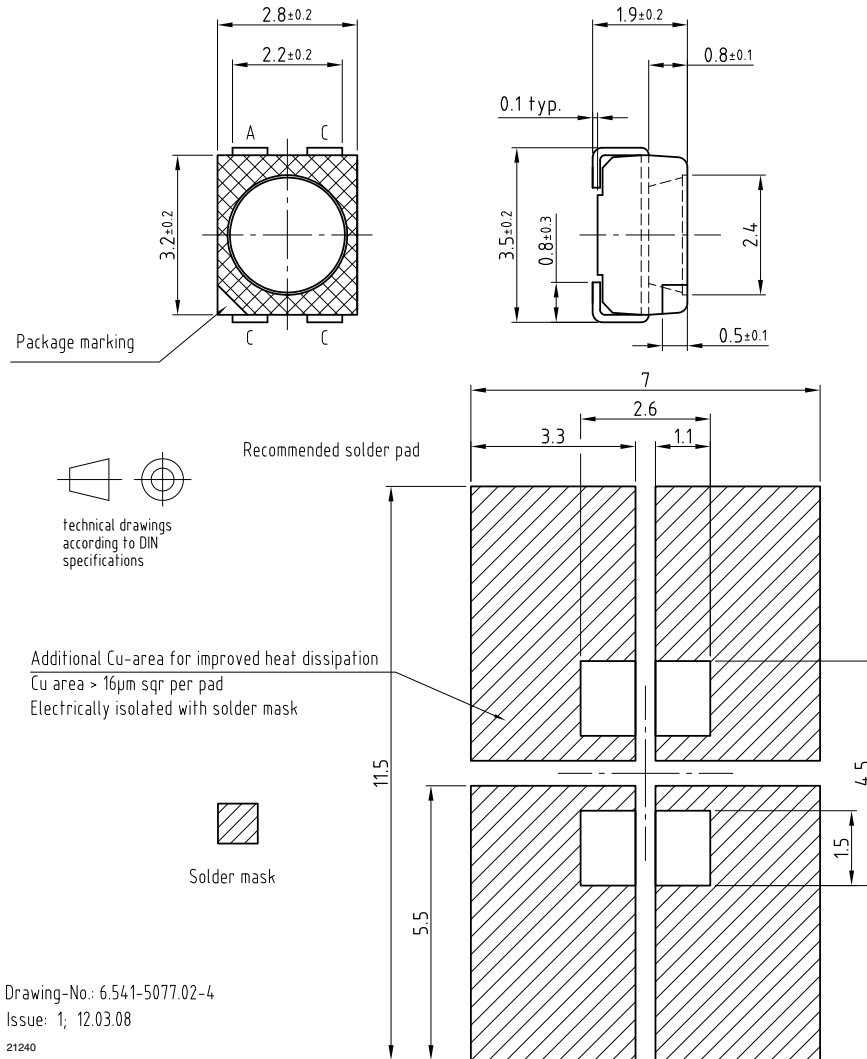
technical drawings
according to DIN
specifications

Drawing-No: 9.700-5334.02-4

Issue: 2; 07.04.08

21241

OPTIONAL PAD DESIGN DIMENSIONS in millimeters
(Reflow-Soldering), $R_{thJA} = 290$ K/W



SOLDERING PROFILE

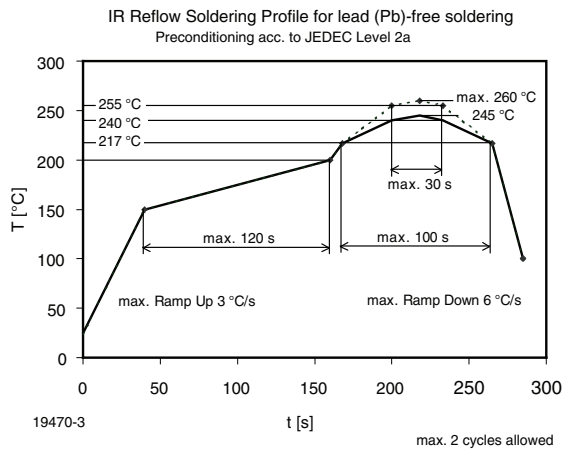


Fig. 7 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

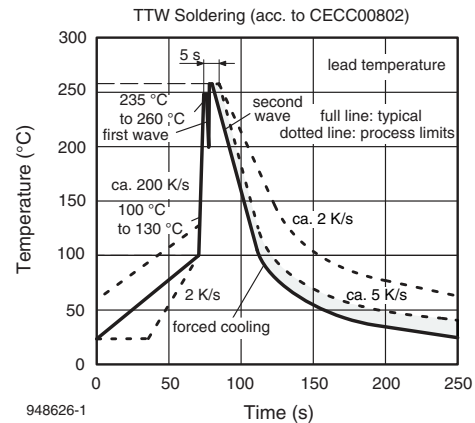
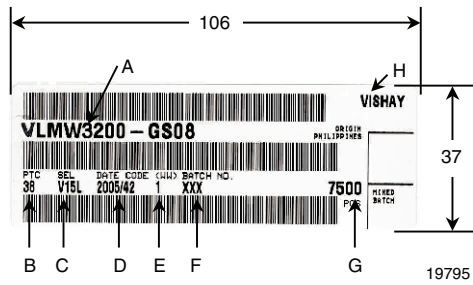


Fig. 8 - Double Wave Soldering of Opto Devices (all Packages)

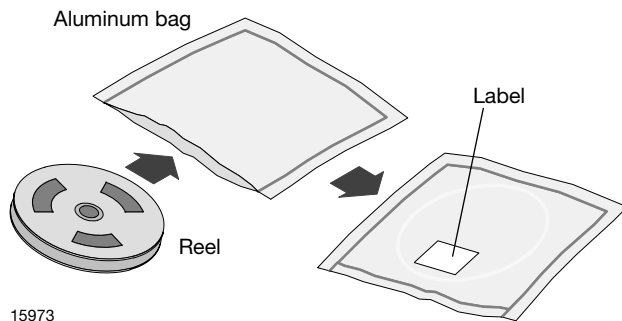
BAR CODE PRODUCT LABEL (example)



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):
e.g.: V1 = code for luminous intensity group
5L = code for chrom. coordinate group
- D) Date code year/week
- E) Day code (e. g. 1: Monday)
- F) Batch no.
- G) Total quantity
- H) Company code

DRY PACKING

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



FINAL PACKING

The sealed reel is packed into a cardboard box. A secondary cardboard box is used for shipping purposes.

RECOMMENDED METHOD OF STORAGE

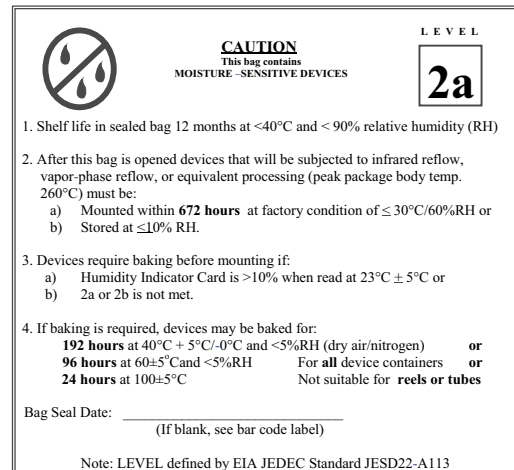
Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 672 h under these conditions moisture content will be too high for reflow soldering.

In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:
192 h at 40 °C + 5 °C/- 0 °C and < 5 % RH (dry air/nitrogen) or
96 h at 60 °C + 5 °C and < 5 % RH for all device containers or
24 h at 100 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC standard JESD22-A112 level 2a label is included on all dry bags.



Example of JESD22-A112 level 2a label

ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electro-static sensitive devices warning labels are on the packaging.



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