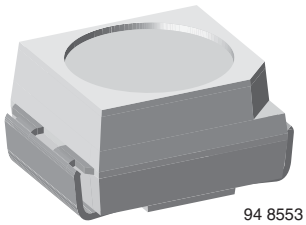
Standard SMD LED PLCC-2


94 8553

FEATURES

- SMD LED with exceptional brightness
- Luminous intensity categorized
- Compatible with automatic placement equipment
- EIA and ICE standard package
- Compatible with IR reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: excellent for coupling to light pipes and backlighting
- Low power consumption
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Luminous intensity ratio in one packaging unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- Preconditioning: acc. to JEDEC level 2a
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- AEC-Q101 qualified

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)**

DESCRIPTION

This device has been designed for applications requiring narrow brightness and color selection.

The package of this device is the PLCC-2.

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-2
- Product series: standard
- Angle of half intensity: ± 60°

APPLICATIONS

- Automotive: backlighting in dashboards and switches
- Telecommunication: indicator and backlighting in telephone and fax
- Indicator and backlight for audio and video equipment
- Indicator and backlight in office equipment
- Flat backlight for LCDs, switches and symbols
- General use

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
VLMD3100-GS08	Red, I_V > 11.2 mcd	GaAlAs on GaAs
VLMD3100-GS18	Red, I_V > 11.2 mcd	GaAlAs on GaAs
VLMD3101-GS08	Red, I_V = (18 to 45) mcd	GaAlAs on GaAs
VLMD3101-GS18	Red, I_V = (18 to 45) mcd	GaAlAs on GaAs
VLMD3105-GS08	Red, I_V = (11.2 to 28) mcd	GaAlAs on GaAs
VLMD3105-GS18	Red, I_V = (11.2 to 28) mcd	GaAlAs on GaAs
VLMD31L2N1-GS08	Red, I_V = (14 to 35.5) mcd	GaAlAs on GaAs
VLMD31L2N1-GS18	Red, I_V = (14 to 35.5) mcd	GaAlAs on GaAs
VLMD31L2P1-GS08	Red, I_V = (14 to 56) mcd	GaAlAs on GaAs
VLMD31L2P1-GS18	Red, I_V = (14 to 56) mcd	GaAlAs on GaAs
VLMD31M2P1-GS08	Red, I_V = (22.4 to 56) mcd	GaAlAs on GaAs
VLMD31M2P1-GS18	Red, I_V = (22.4 to 56) mcd	GaAlAs on GaAs

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

ABSOLUTE MAXIMUM RATINGS [1] VLMD31..				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage [2]		V_R	6	V
DC forward current	$T_{amb} \leq 60$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	0.5	A
Power dissipation		P_V	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	t ≤ 5 s	T_{sd}	260	°C
Thermal resistance junction/ambient	Mounted on PC board (pad size > 16 mm^2)	R_{thJA}	400	K/W

Note:
[1] T_{amb} = 25 °C, unless otherwise specified
[2] Driving LED in reverse direction is suitable for short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] VLMD31.., RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity [2]	I_F = 10 mA	VLMD3100	I_V	11.2			mcd
		VLMD3101	I_V	18		45	mcd
		VLMD3105	I_V	11.2		28	mcd
		VLMD31L2N1	I_V	14		35.5	mcd
		VLMD31L2P1	I_V	14		56	mcd
		VLMD31M2P1	I_V	22.4		56	mcd
Dominant wavelength	I_F = 10 mA		λ_d		648		nm
Peak wavelength	I_F = 10 mA		λ_p		650		nm
Angle of half intensity	I_F = 10 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		1.8	2.2	V
Reverse voltage	I_R = 10 µA		V_R	6			V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		7		pF
Temperature coefficient of V_F	I_F = 20 mA		TC_{VF}		- 1.8		mV/K
Temperature coefficient of λ_d	I_F = 10 mA		$TC\lambda_d$		0.05		nm/K

Note:
[1] T_{amb} = 25 °C, unless otherwise specified
[2] In one packing unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$

LUMINOUS INTENSITY CLASSIFICATION			
GROUP	LIGHT INTENSITY (mcd)		
STANDARD	OPTIONAL	MIN.	MAX.
J	1	4.5	5.6
	2	5.6	7.1
K	1	7.1	9
	2	9	11.2
L	1	11.2	14
	2	14	18
M	1	18	22.4
	2	22.4	28
N	1	28	35.5
	2	35.5	45
P	1	45	56

Note:
Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 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.

CROSSING TABLE	
VISHAY	OSRAM
VLMD31L2N1	LHT674-L2N1
VLMD31L2P1	LHT674-L2P1
VLMD31M2P1	LHT674-M2P1

TYPICAL CHARACTERISTICS

T_{amb} = 25 °C, unless otherwise specified

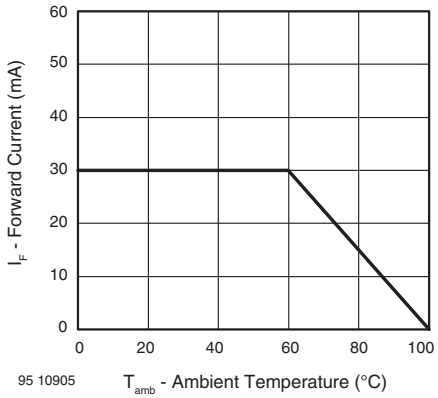


Figure 1. Max. Permissible Forward Current vs. Ambient Temperature

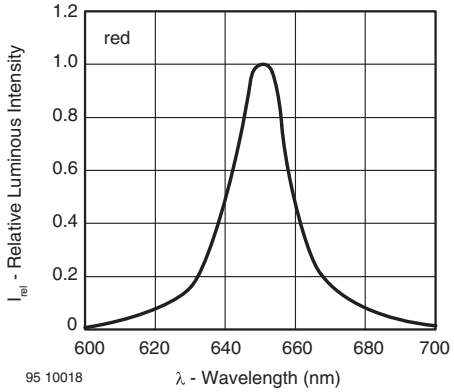


Figure 4. Relative Luminous Intensity vs. Wavelength

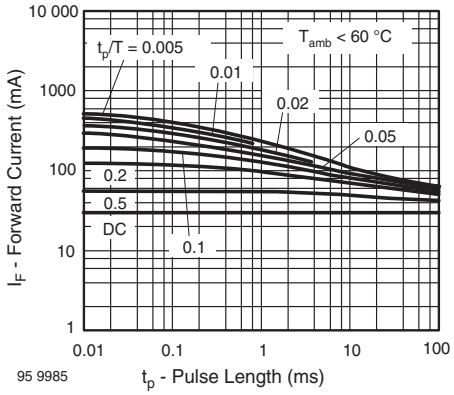


Figure 2. Permissible Pulse Forward Current vs. Pulse Length

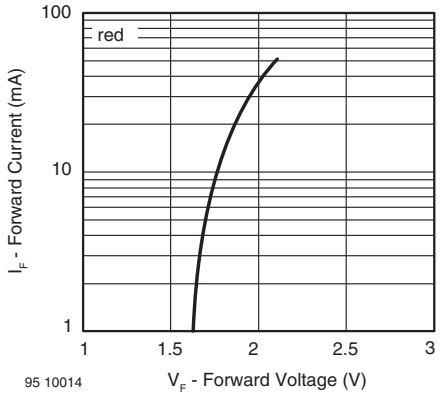


Figure 5. Forward Current vs. Forward Voltage

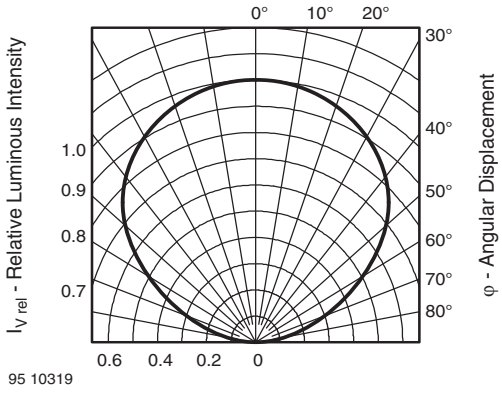


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

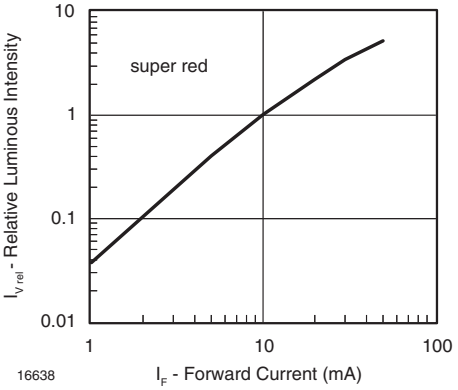


Figure 6. Relative Luminous Intensity vs. Forward Current

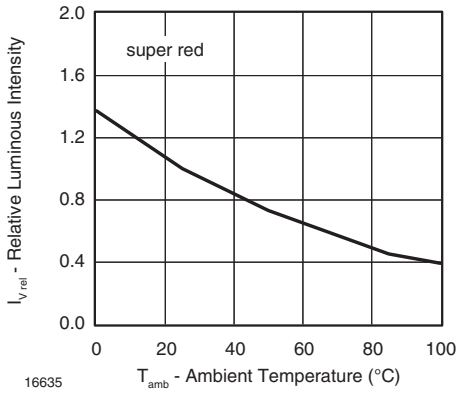


Figure 7. Rel. Luminous Intensity vs. Ambient Temperature

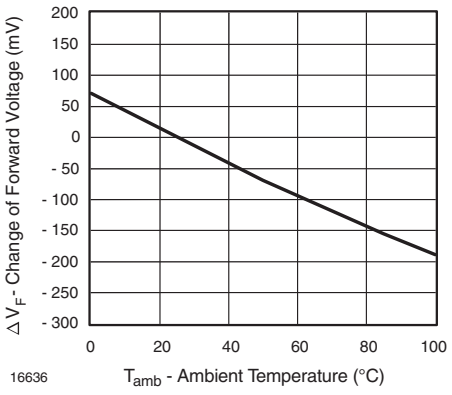


Figure 9. Change of Forward Voltage vs. Ambient Temperature

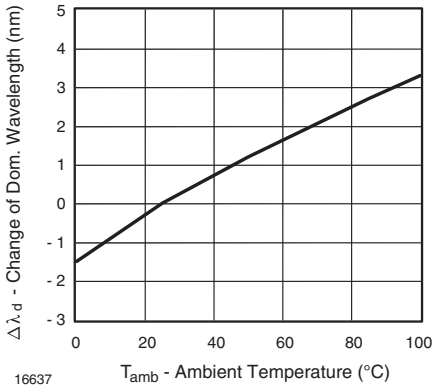
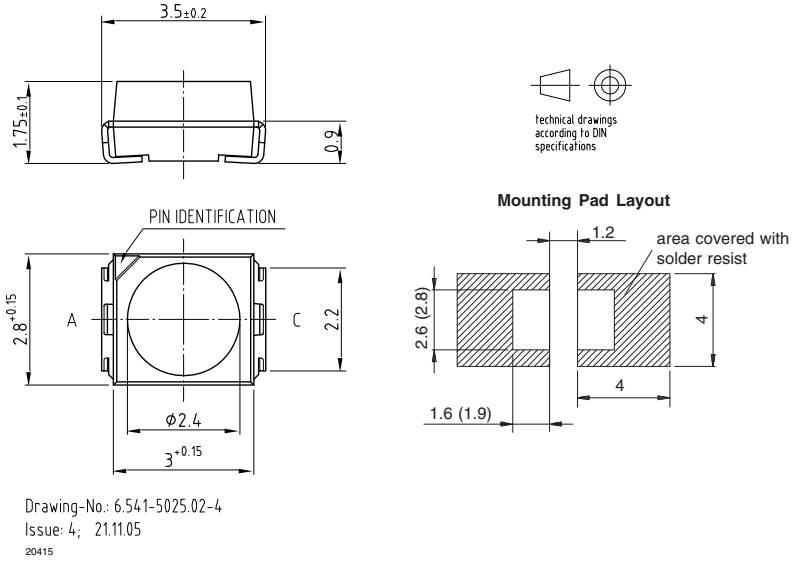


Figure 8. Change of Dominant Wavelength vs. Ambient Temperature

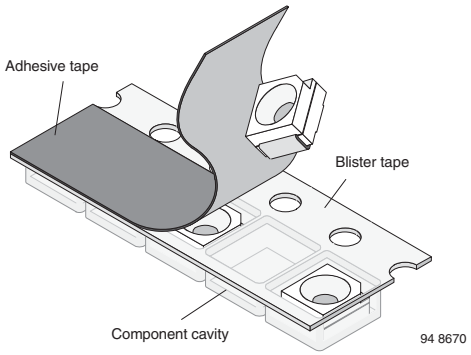
PACKAGE DIMENSIONS in millimeters



METHOD OF TAPING/POLARITY AND TAPE AND REEL

SMD LED (VLM.3-SERIES)

Vishay's LEDs in SMD packages are available in an antistatic 8 mm blister tape (in accordance with DIN IEC 40 (CO) 564) for automatic component insertion. The blister tape is a plastic strip with impressed component cavities, covered by a top tape.



TAPING OF VLMD31..

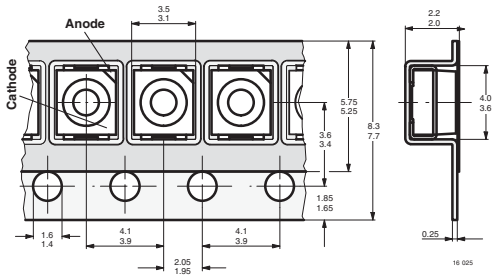


Figure 10. Tape Dimensions in mm for PLCC-2

REEL PACKAGE DIMENSION IN MILLIMETER FOR SMD LEDS, TAPE OPTION GS08 (= 1500 PCS.)

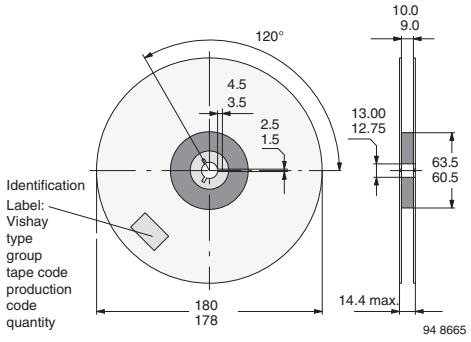


Figure 11. Reel Dimensions - GS08

REEL PACKAGE DIMENSION IN MILLIMETER FOR SMD LEDS, TAPE OPTION GS18 (= 8000 PCS.) PREFERRED

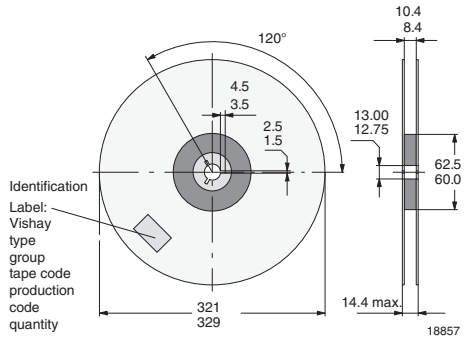


Figure 12. Reel Dimensions - GS18

SOLDERING PROFILE

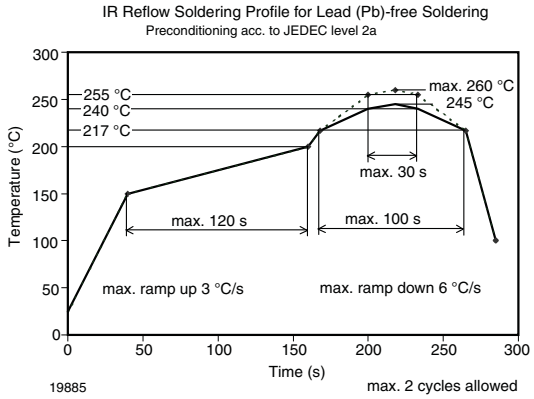


Figure 13. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

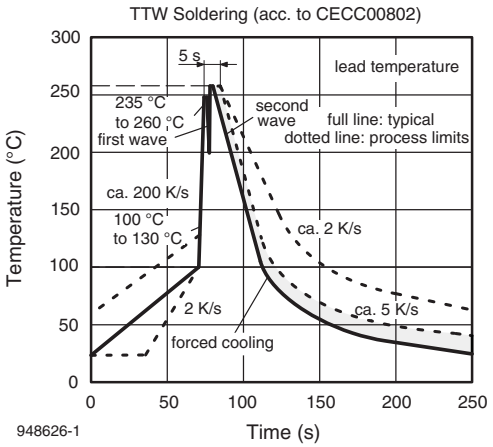
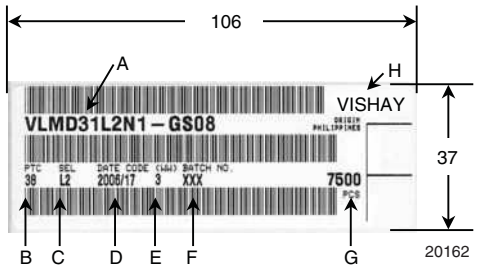


Figure 14. Double Wave Soldering of Opto Devices (all Packages)

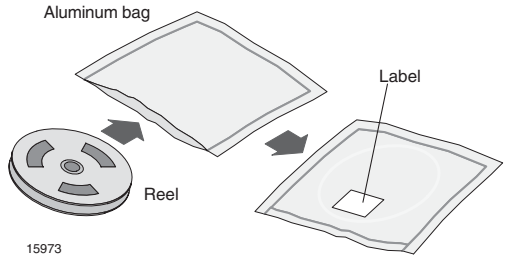
BAR CODE PRODUCT LABEL



A) Type of component
B) Manufacturing plant
C) SEL - selection code (bin):
e.g.: L2 = code for luminous intensity group
D) Date code year/week
E) Day code (e.g. 3: Wednesday)
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.

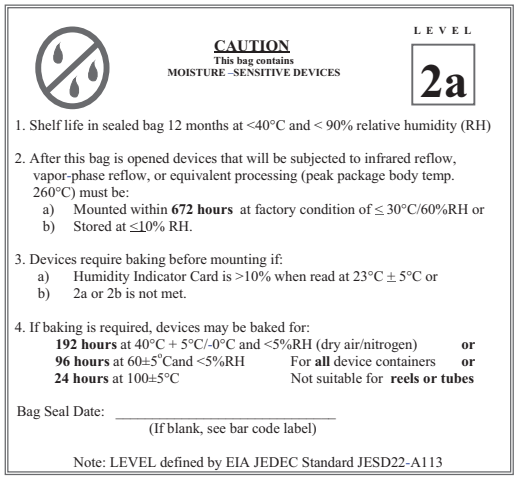
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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.


CAUTION
This bag contains
MOISTURE –SENSITIVE DEVICES

LEVEL
2a

1. Shelf life in sealed bag 12 months at <40°C and < 90% relative humidity (RH)

2. After this bag is opened devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing (peak package body temp. 260°C) must be:
   a) Mounted within **672 hours** at factory condition of ≤ 30°C/60%RH or
   b) Stored at ≤10% RH.

3. Devices require baking before mounting if:
   a) Humidity Indicator Card is >10% when read at 23°C ± 5°C or
   b) 2a or 2b is not met.

4. If baking is required, devices may be baked for:
   192 hours at 40°C + 5°C/-0°C and <5%RH (dry air/nitrogen) **or**
   96 hours at 60±5°Cand <5%RH For **all** device containers **or**
   24 hours at 100±5°C Not suitable for **reels or tubes**

Bag Seal Date: _____
(If blank, see bar code label)

Note: LEVEL defined by EIA JEDEC Standard JESD22-A113

19786

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.

VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.

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