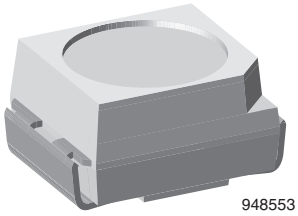
Standard SMD LED PLCC-2



948553

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°

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
- Luminous intensity ratio in one packaging unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- Preconditioning according to JEDEC level 2a
- ESD-withstand voltage: Up to 2 kV according to JESD22-A114-B
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

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 (mcd)			at I_F (mA)	WAVELENGTH (nm)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMD3100-GS08	Red	11.2	-	-	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD3100-GS18	Red	11.2	-	-	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD3101-GS08	Red	18	-	45	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD3101-GS18	Red	18	-	45	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD3105-GS08	Red	11.2	-	28	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD3105-GS18	Red	11.2	-	28	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD31L2N1-GS08	Red	14	-	35.5	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD31L2N1-GS18	Red	14	-	35.5	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD31L2P1-GS08	Red	14	-	56	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD31L2P1-GS18	Red	14	-	56	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD31M2P1-GS08	Red	22.4	-	56	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs
VLMD31M2P1-GS18	Red	22.4	-	56	10	-	648	-	10	-	1.8	2.2	20	GaAlAs on GaAs

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMD31..

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage (1)		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 mm²)	R_{thJA}	400	K/W

Note

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

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMD31.., RED

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	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) 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)

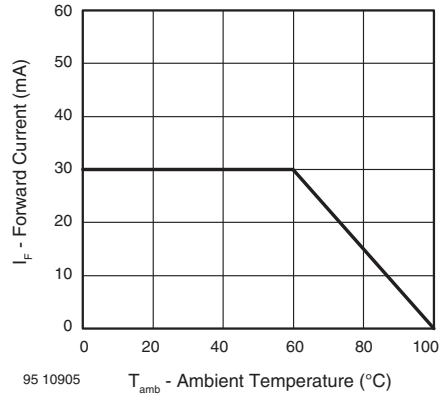


Fig. 1 - Maximum Permissible Forward Current vs. Ambient Temperature

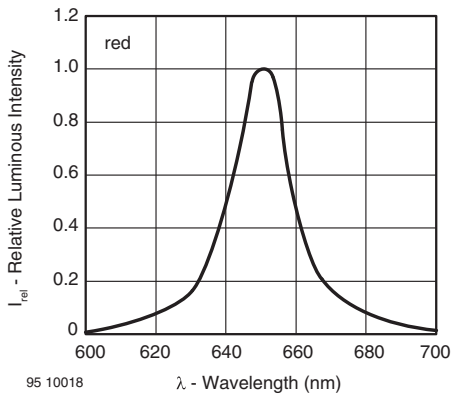


Fig. 4 - Relative Luminous Intensity vs. Wavelength

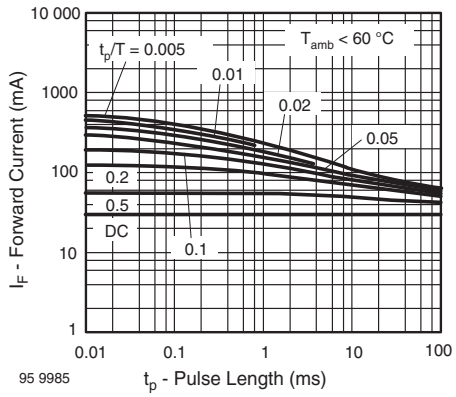


Fig. 2 - Permissible Pulse Forward Current vs. Pulse Length

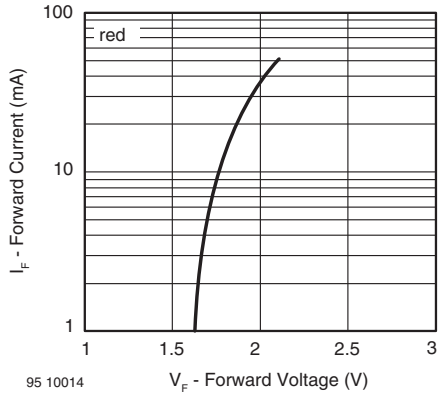


Fig. 5 - Forward Current vs. Forward Voltage

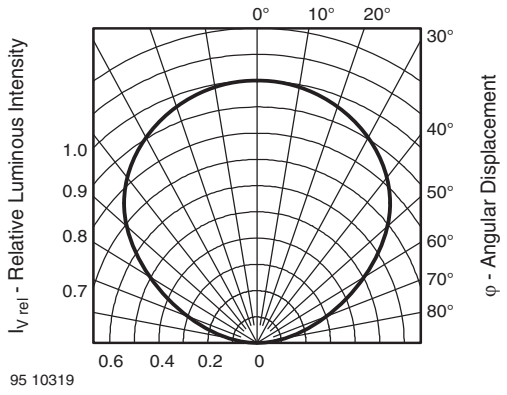


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

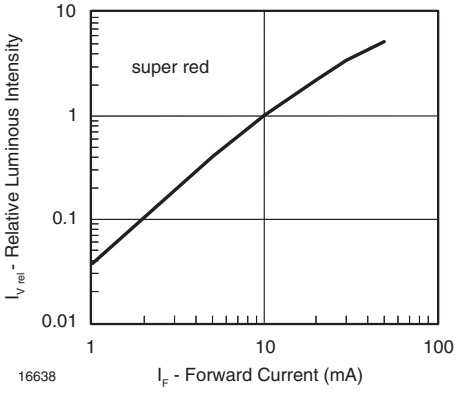


Fig. 6 - Relative Luminous Intensity vs. Forward Current

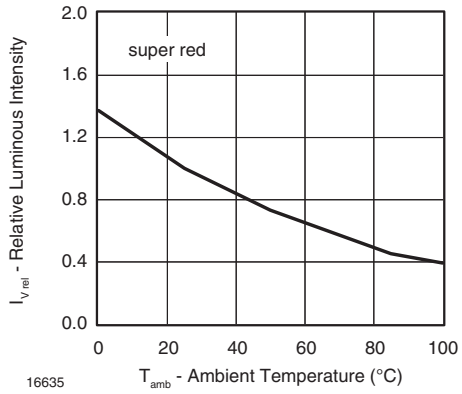


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

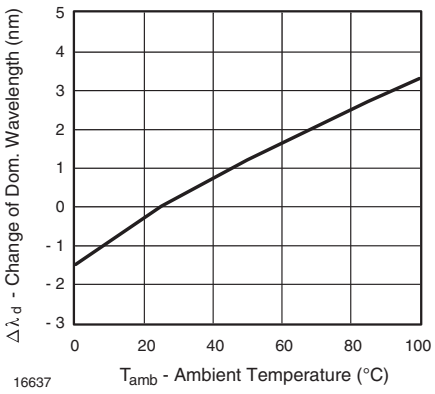


Fig. 8 - Change of Dominant Wavelength vs. Ambient Temperature

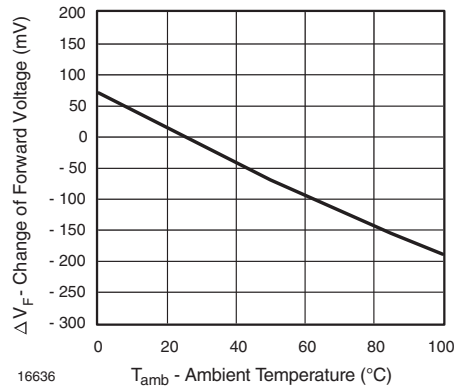
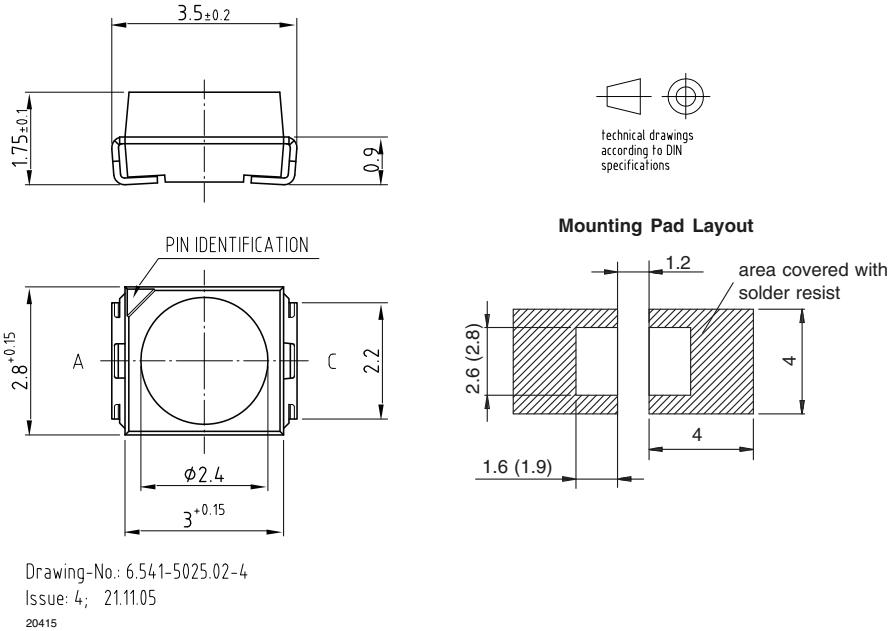


Fig. 9 - Change of Forward Voltage vs. Ambient Temperature

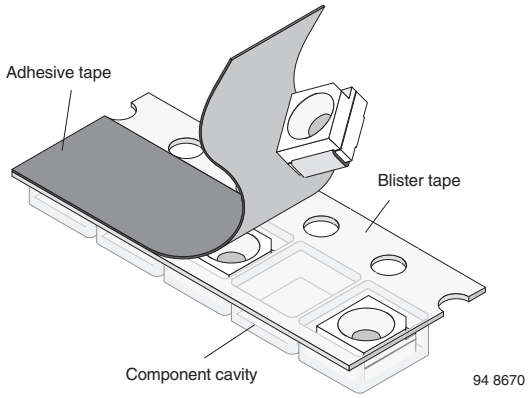
PACKAGE DIMENSIONS in millimeters



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 VLM.3..

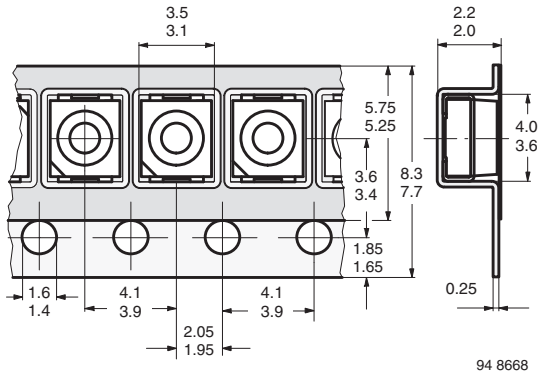


Fig. 10 - Tape Dimensions in mm for PLCC-2

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

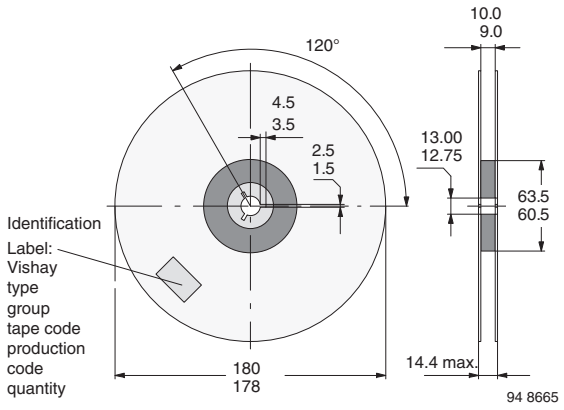


Fig. 11 - Reel Dimensions - GS08

REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDS, TAPE OPTION GS18 (= 8000 PCS) PREFFERED

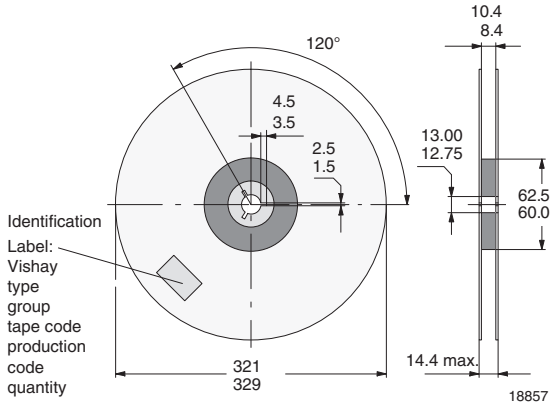


Fig. 12 - Reel Dimensions - GS18

SOLDERING PROFILE

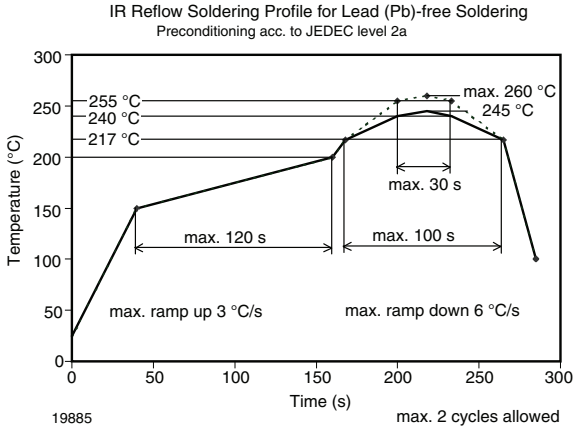


Fig. 13 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

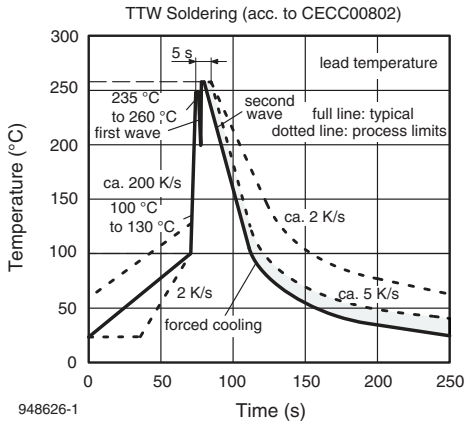
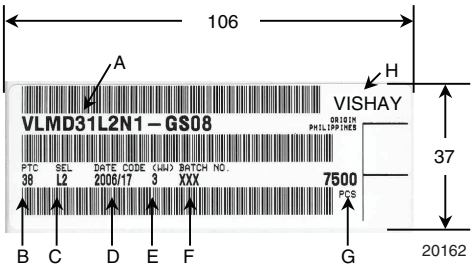


Fig. 14 - Double Wave Soldering of Opto Devices (all Packages)

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)

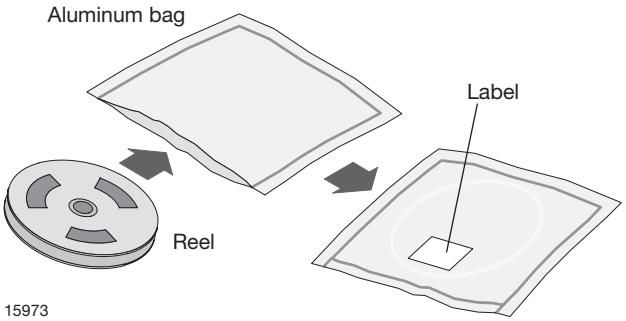
F) Batch no.

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:

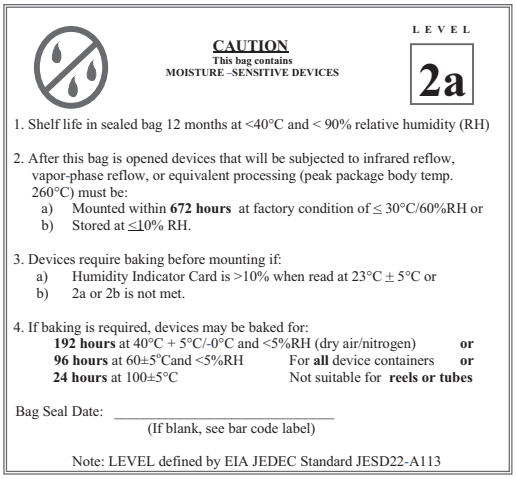
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

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.



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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