

Bicolor SMD LED PLCC-3



DESCRIPTION

These devices have been designed to meet the increasing demand for surface mounting technology.

The package of the VLMV3100 is the PLCC-3.

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

This SMD device consists of a red and green chip. So it is possible to choose the color in one device.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-3
- Product series: bicolor
- Angle of half intensity: ± 60°

FEATURES

- SMD LED with exceptional brightness
- Dualcolor
- Luminous intensity categorized
- · Compatible with automatic placement equipment
- EIA and ICE standard package



RoHS

- COMPLIANT • Compatible with IR reflow, vapor phase and wave HALOGEN FREE soldering processes according to CECC 00802 GREEN and J-STD-020 (5-2008)
- 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 $I_{Vmax}/I_{Vmin} \le 1.6$
- Preconditioning according to JEDEC[®] level 2a
- ESD-withstand voltage: Up to 2 kV according to JESD22-A114-B
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- 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)	TECHNOLOGY					
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMV3100-GS08	Red	2.8	12	-	10	612	620	625	10	-	2.0	3	20	GaAsP on GaP
VLMV3100-GS08	Green	2.8	14	-	10	562	571	575	10	-	2.1	3	20	GaP on GaP
VLMV3100-GS18	Red	2.8	12	-	10	612	620	625	10	-	2.0	3	20	GaAsP on GaP
VLMV3100-GS18	Green	2.8	14	-	10	562	571	575	10	-	2.1	3	20	GaP on GaP

VLMV3100



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ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) VLMV3100						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Reverse voltage per diode (1)	I _R = 10 μA	V _R	6	V		
DC forward current per diode	T _{amb} ≤ 74 °C	l _F	20	mA		
Surge forward current per diode	t _p ≤ 10 μs	I _{FSM}	0.34	А		
Power dissipation per diode		Pv	56	mW		
Junction temperature		Тj	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 to ambient	Mounted on PC board (pad size > 16 mm ²)	R _{thJA}	400	K/W		

Note

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

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMV3100. RED**

VLIVIVSIOU, RED						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	I _F = 10 mA	IV	2.8	12	-	mcd
Dominant wavelength	I _F = 10 mA	λ_d	612	620	625	nm
Peak wavelength	I _F = 10 mA	λ _p	-	635	-	nm
Angle of half intensity	I _F = 10 mA	φ	-	± 60	-	0
Forward voltage per diode	I _F = 20 mA	V _F	-	2.0	3	V
Reverse current per diode	V _R = 6 V	I _R	-	-	10	μA
Junction capacitance per diode	V _R = 0 V, f = 1 MHz	Cj	-	15	-	pF

Note

 $^{(1)}~$ In one packing unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMV3100, GREEN**

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PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	I _F = 10 mA	I _V	2.8	14	-	mcd
Dominant wavelength	I _F = 10 mA	λ_d	562	571	575	nm
Peak wavelength	I _F = 10 mA	λp	-	565	-	nm
Angle of half intensity	I _F = 10 mA	φ	-	± 60	-	0
Forward voltage per diode	I _F = 20 mA	V _F	-	2.1	3	V
Reverse current per diode	V _R = 6 V	I _R	-	-	10	μA
Junction capacitance per diode	V _R = 0 V, f = 1 MHz	Cj	-	15	-	pF

Note

 $^{(1)}$ In one packing unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$



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LUMINOUS INTENSITY CLASSIFICATION						
GROUP	LIGHT INTENSITY (mcd)					
STANDARD	OPTIONAL	MIN.	MAX.			
н	1	2.8	3.55			
	2	3.55	4.5			
J	1	4.5	5.6			
J	2	5.6	7.1			
к	1	7.1	9.0			
Γ.	2	9.0	11.2			
	1	11.2	14.0			
L	2	14.0	18.0			
м	1	18.0	22.4			
171	2	22.4	28.0			

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.

TYPICAL CHARACTERISTICS (Tamb = 25 °C, unless otherwise

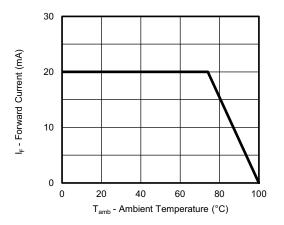


Fig. 1 - Forward Current vs. Ambient Temperature

wis	e spe	cified)
(mA)	1000	=t _p /T = 0.005
l _F - Forward Current (mA)	100	
l _F - Forwa	10	

0.01 0 1 1 10 100 t_p - Pulse Length (ms)

Fig. 2 - Pulse Forward Current vs. Pulse Duration

COLOR CLASSIFICATION

COLOR CLASSIFICATION						
GREEN						
DOM. WAVELENGTH (nm)						
MIN.	MAX.					
562	565					
564	567					
566	569					
568	571					
570	573					
572	575					
	GRI DOM. WAVEI MIN. 562 564 566 568 568 570					

Note

Wavelengths are tested at a current pulse duration of 25 ms.

1



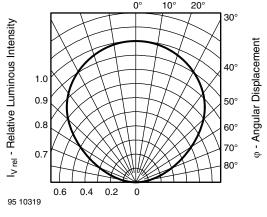


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

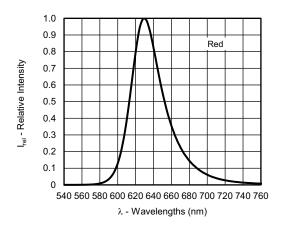


Fig. 4 - Relative Intensity vs. Wavelength

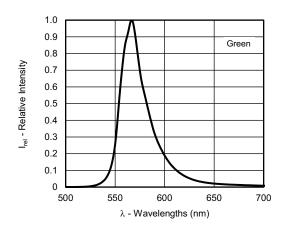


Fig. 5 - Relative Intensity vs. Wavelength

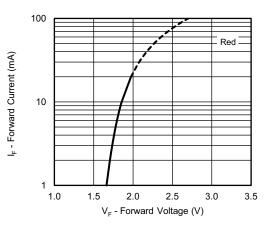


Fig. 6 - Forward Current vs. Forward Voltage

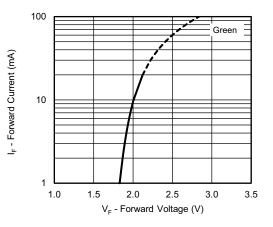


Fig. 7 - Forward Current vs. Forward Voltage

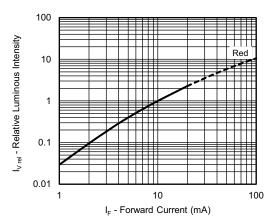


Fig. 8 - Relative Luminous Intensity vs. Forward Current

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4 For technical questions, contact: <u>LED@vishay.com</u>

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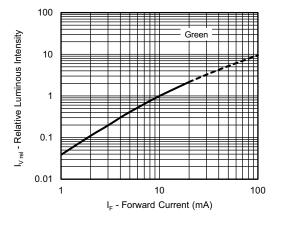


Fig. 9 - Relative Luminous Intensity vs. Forward Current

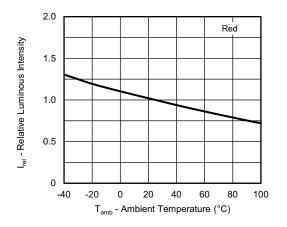


Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature

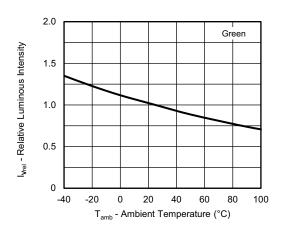


Fig. 11 - Relative Luminous Intensity vs. Ambient Temperature

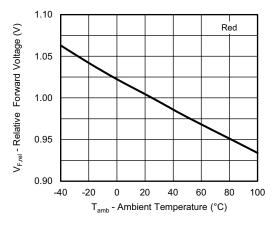


Fig. 12 - Relative Forward Voltage vs. Ambient Temperature

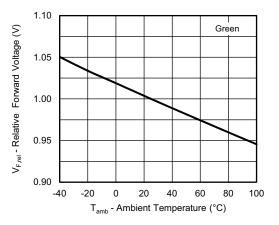


Fig. 13 - Relative Forward Voltage vs. Ambient Temperature

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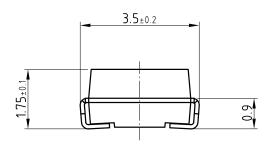
5

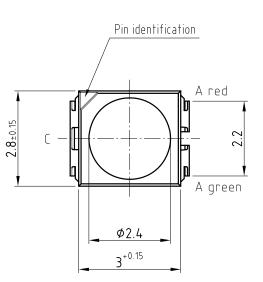
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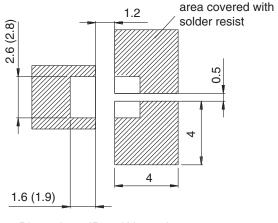
PACKAGE DIMENSIONS in millimeters





technical drawings according to DIN specifications

Mounting Pad Layout



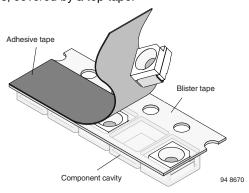
Dimensions: IR and Vaporphase (Wave Soldering)

Drawing-No.: 6.541-5068.01-4 Issue: 2; 30.05.07

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...

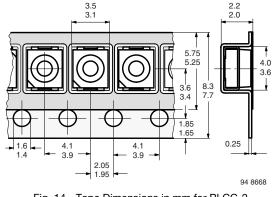


Fig. 14 - Tape Dimensions in mm for PLCC-2

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

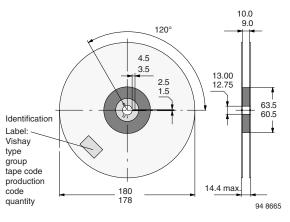


Fig. 15 - Reel Dimensions - GS08

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

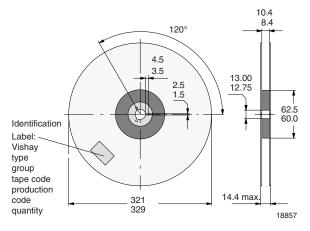


Fig. 16 - Reel Dimensions - GS18

SOLDERING PROFILE

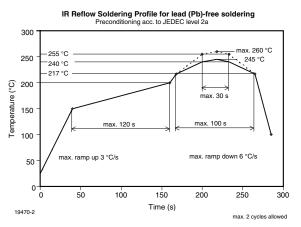


Fig. 17 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

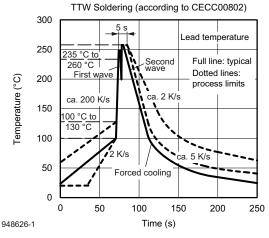
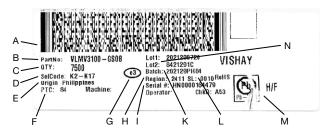


Fig. 18 - Double Wave Soldering of Opto Devices (all Packages)

7



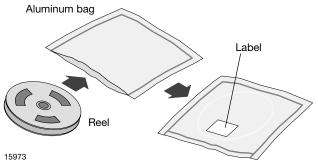
BAR CODE PRODUCT LABEL (example)



- A. 2D barcode
- B. Part No: Vishay part number
- C. QTY: quantity
- D. SelCode: selection bin code
- E. Country of origin
- F. PTC: production plant code
- G. Termination finish
- H. Region code
- I. Serial#: serial number
- K. Batch Number: year, week, country code, plant code
- L. SL: storage location
- M.Environmental Symbols: RoHS, lead (Pb)-free, halogen free
- N. Lot numbers

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.

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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 \leq 60 % RH max.

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

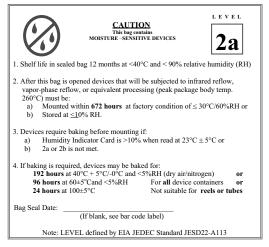
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

192 h at 40 $^\circ\text{C}$ + 5 $^\circ\text{C}$ / - 0 $^\circ\text{C}$ and < 5 % RH (dry air / nitrogen) or

96 h at 60 $^{\circ}\text{C}$ + 5 $^{\circ}\text{C}$ 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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