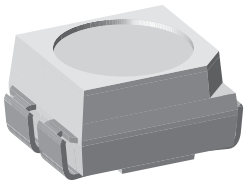
Bicolor SMD LED PLCC-4



19211

FEATURES

- SMD LED with exceptional brightness
- Multicolored
- Luminous intensity categorized
- EIA and ICE standard package
- Compatible with automatic placement equipment
- Suitable for IR reflow and TTW soldering
- 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 $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- JEDEC level 2a
- AEC-Q101 qualified

DESCRIPTION

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

The package of the VLMKE340. is the PLCC-4.

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 yellow chip. So it is possible to choose the color in one device.

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

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-4
- Product series: bicolor
- Angle of half intensity: ± 60°

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
VLMKE3400-GS08	Red/yellow, I_V > 56 mcd	AlInGaP on GaAs
VLMKE3400-GS18	Red/yellow, I_V > 56 mcd	AlInGaP on GaAs
VLMKE3401-GS08	Red/yellow, I_V > 71 mcd	AlInGaP on GaAs
VLMKE3401-GS18	Red/yellow, I_V > 71 mcd	AlInGaP on GaAs

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

ABSOLUTE MAXIMUM RATINGS [1] VLMKE340.				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage per diode [2]	I_R = 10 µA	V_R	6	V
DC forward current per diode	$T_{amb} \leq 80$ °C	I_F	30	mA
Surge forward current per diode	$t_p \leq 10$ µs	I_{FSM}	0.1	A
Power dissipation per diode		P_V	80	mW
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Thermal resistance junction/ ambient	Mounted on PC board (pad size > 16 mm^2)	R_{thJA}	560	K/W

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

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] VLMKE340., RED							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMKE3400	I_V	56		180	mcd
		VLMKE3401	I_V	71		140	mcd
Dominant wavelength	I_F = 20 mA		λ_d		630		nm
Peak wavelength	I_F = 20 mA		λ_p		643		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		1.9	2.6	V
Reverse voltage	I_R = 10 µA		V_R	6			V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

Note:
[1] T_{amb} = 25 °C, unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] VLMKE340., YELLOW							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMKE3400	I_V	90		280	mcd
		VLMKE3401	I_V	112		224	mcd
Dominant wavelength	I_F = 20 mA		λ_d	581	588	594	nm
Peak wavelength	I_F = 20 mA		λ_p		590		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2	2.6	V
Reverse voltage	I_R = 10 µA		V_R	6			V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

Note:
[1] T_{amb} = 25 °C, unless otherwise specified

LUMINOUS INTENSITY CLASSIFICATION AND GROUP COMBINATIONS [1] VLMKE34..						
		RED				
		P2 56...71 mcd	Q1 71...90 mcd	Q2 90...112 mcd	R1 112...140 mcd	R2 140...180 mcd
YELLOW	Q2 90...112 mcd	00	00	00	00	00
	R1 112...140 mcd	00	00 01	00 01	00 01	00
	R2 140...180 mcd	00	00 01	00 01	00 01	00
	S1 180...224 mcd	00	00 01	00 01	00 01	00
	S2 224...280 mcd	00	00	00	00	00

Note:
[1] Followed by 00 or 01.
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.

COLOR CLASSIFICATION		
GROUP	DOMINANT WAVELENGTH (nm)	
	YELLOW	
	MAX.	MAX.
1	581	584
2	583	586
3	585	588
4	587	590
5	589	592
6	591	594

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

TYPICAL CHARACTERISTICS

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

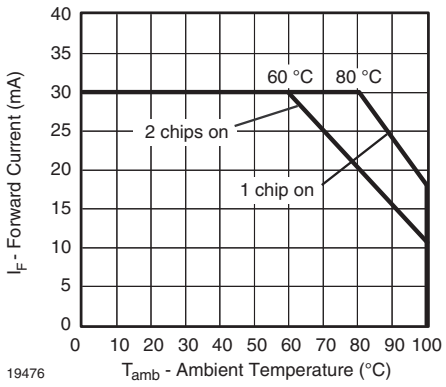


Figure 1. Forward Current vs. Ambient Temperature for InGaN

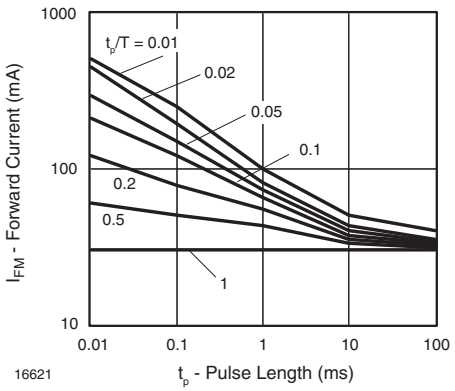


Figure 2. Forward Current vs. Pulse Duration

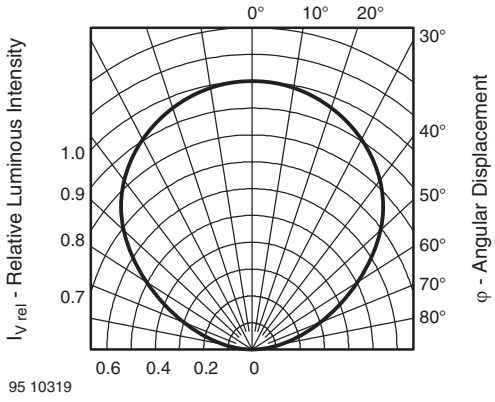


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

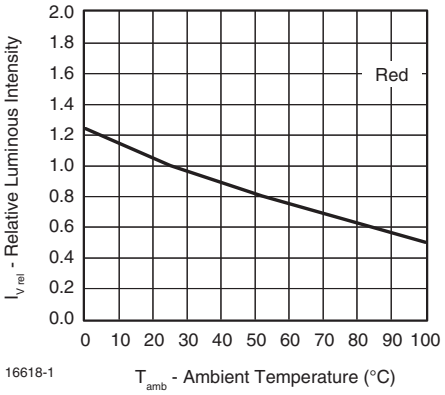


Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

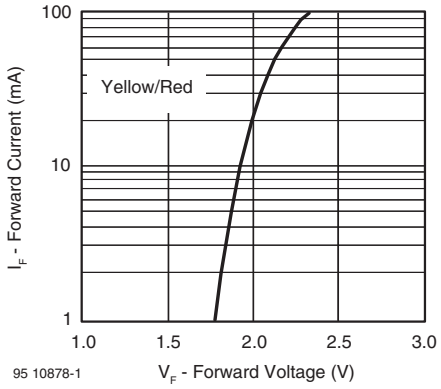


Figure 4. Forward Current vs. Forward Voltage

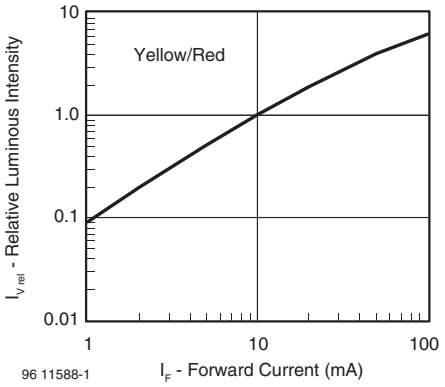


Figure 7. Relative Luminous Intensity vs. Forward Current

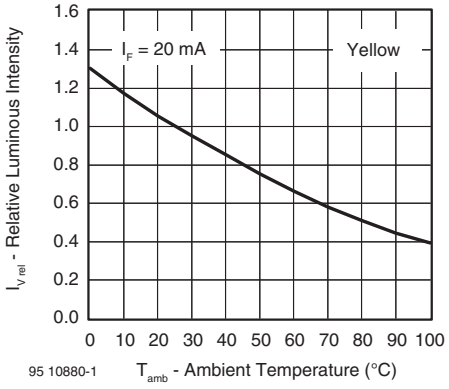


Figure 5. Rel. Luminous Intensity vs. Ambient Temperature

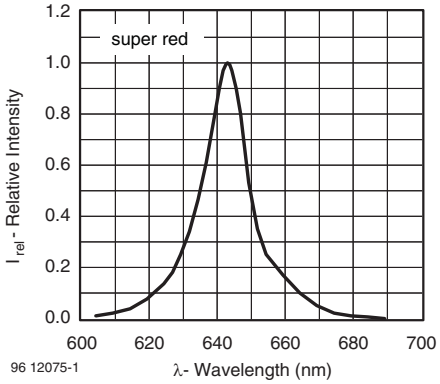


Figure 8. Relative Intensity vs. Wavelength

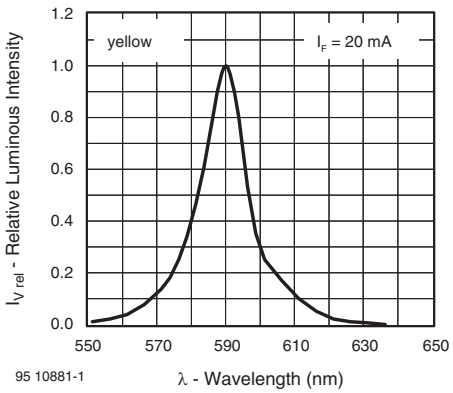


Figure 9. Relative Intensity vs. Wavelength

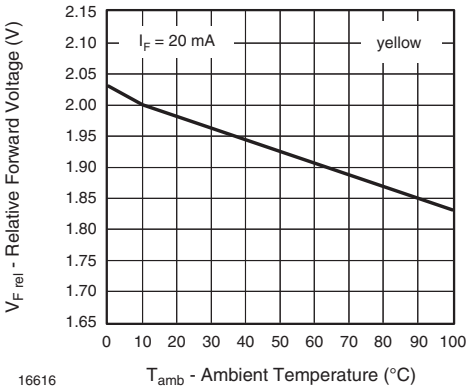


Figure 11. Relative Forward Voltage vs. Ambient Temperature

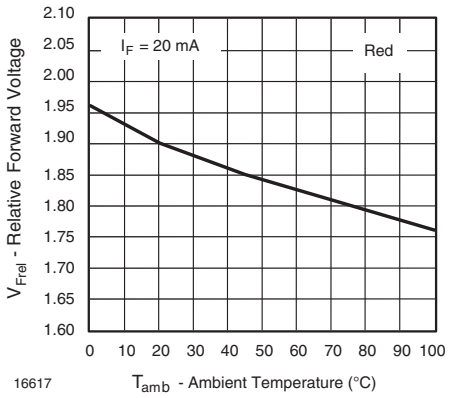
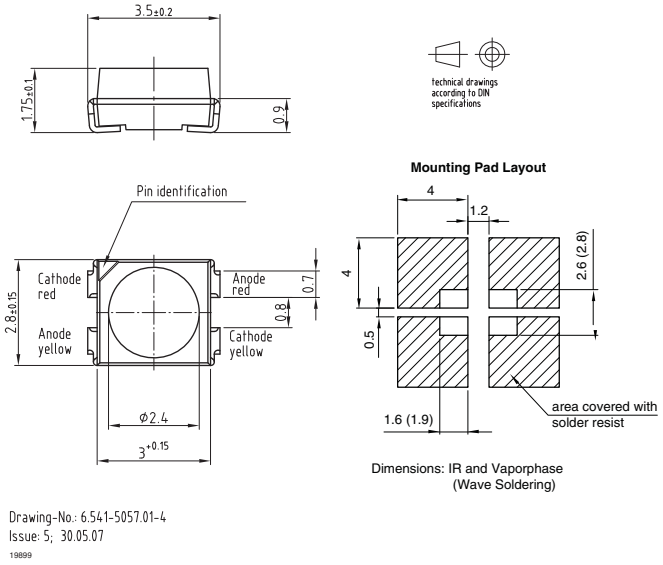


Figure 10. Relative Forward Voltage vs. Ambient Temperature

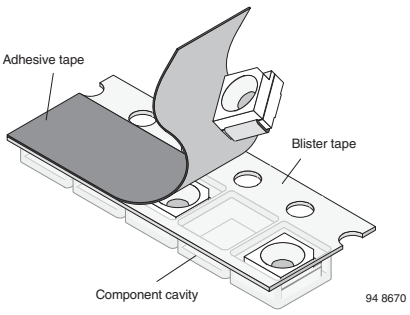
PACKAGE DIMENSIONS in millimeters



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...

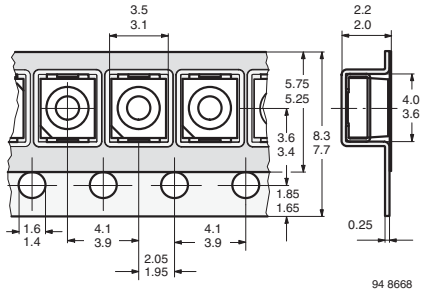


Figure 12. Tape Dimensions in mm for PLCC-2

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

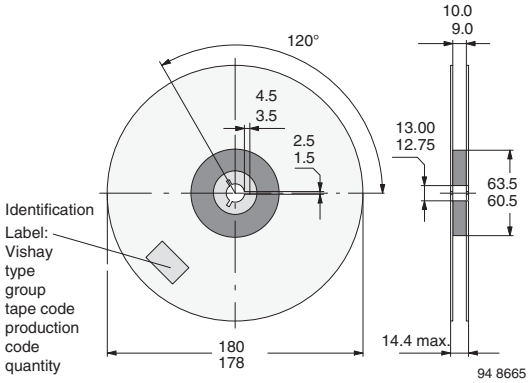


Figure 13. Reel Dimensions - GS08

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

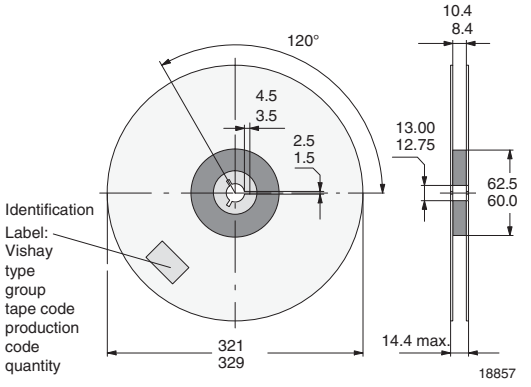


Figure 14. Reel Dimensions - GS18

SOLDERING PROFILE

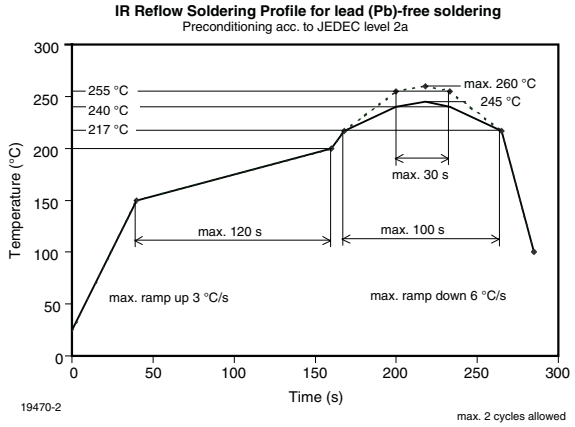


Figure 15. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

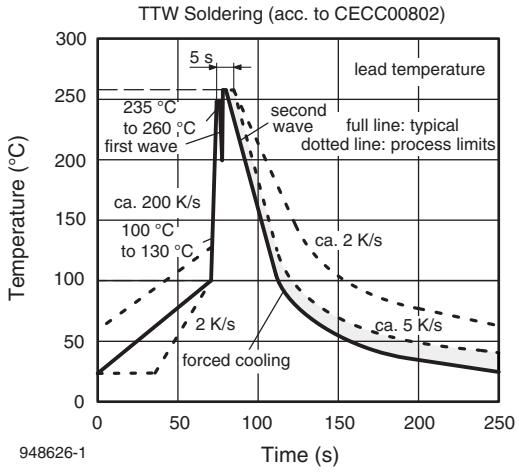
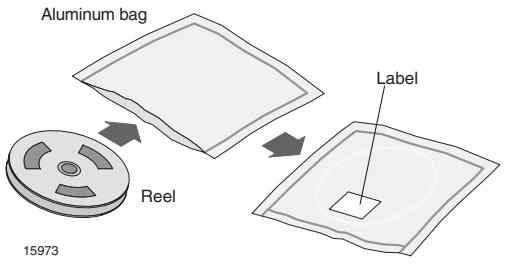


Figure 16. Double Wave Soldering of Opto Devices (all Packages)

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.

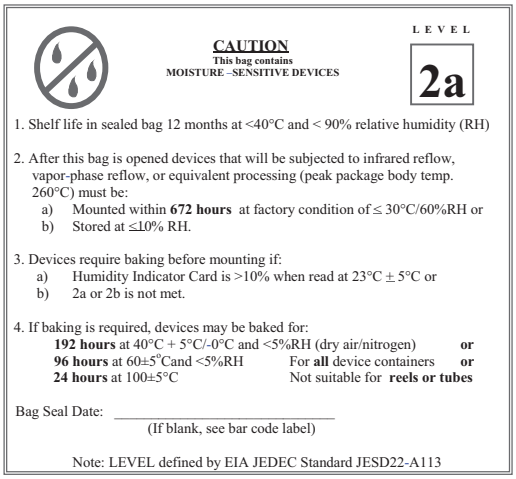
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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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