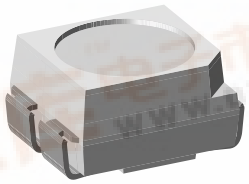
Bicolor SMD LED



19211

FEATURES

- SMD LED with exceptional brightness
- Multicolored
- Luminous intensity categorized
- EIA and ICE standard package
- Compatible with automatic placement equipment
- Compatible with IR reflow, vapor phase and wave soldering processes according to CECC 00802 and J-STD-020C
- 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 $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- Lead (Pb)-free device
- Preconditioning: according to JEDEC level 2a
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B

DESCRIPTION

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

The package of the VLMKG3400 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 green chip. So it is possible to choose the color in one device.

APPLICATIONS

- Automotive: dashboards, switches and optical indicators
- Telecommunication: indicator and backlighting in telephone and fax
- 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
VLMKG3400-GS08	Super red, I_V = (56 to 140) mcd Green, I_V = (35.5 to 90) mcd	AlInGaP on GaAs
VLMKG3400-GS18	Super red, I_V = (56 to 140) mcd Green, I_V = (35.5 to 90) mcd	AlInGaP on GaAs

ABSOLUTE MAXIMUM RATINGS [1] VLMKG3400					
PARAMETER	**TEST CONDITION**		**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage per diode [2]	I_R = 10 µA		V_R	5	V
DC Forward current per diode	$T_{amb} \leq 80$ °C	1 chip on	I_F	30	mA
Surge forward current per diode			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)	1 chip on 2 chips on	R_{thJA}	560 780	K/W

Note:
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] VLMKG3400, SUPERRED							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMKG3400	I_V	56		140	mcd
Dominant wavelength	I_F = 20 mA		λ_d	627	633	639	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 current	V_R = 5 V,		I_R			10	µA
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] VLMKG3400, GREEN							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMKG3400	I_V	35.5		90	mcd
Dominant wavelength	I_F = 20 mA		λ_d	564	570	575	nm
Peak wavelength	I_F = 20 mA		λ_p		572		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2.0	2.6	V
Reverse current	V_R = 5 V		I_R			10	µA
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

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

CROSSING TABLE	
VISHAY	**OSRAM**
VLMKG3400	LSGT676

LUMINOUS INTENSITY CLASSIFICATION AND GROUP COMBINATIONS, VLMKG3400					
		SUPER RED			
		P2 56 to 71 mcd	Q1 71 to 90 mcd	Q2 90 to 112 mcd	R1 112 to 140 mcd
GREEN	N2 35.5 to 45 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400
	P1 45 to 56 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400
	P2 56 to 71 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400
	Q1 71 to 90 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400

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 in any one reel. In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION		
GROUP	DOMINANT WAVELENGTH (nm)	
	GREEN	
	MIN.	MAX.
4	564	567
5	566	569
6	568	571
7	570	573
8	572	575

Note:
Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm.

TYPICAL CHARACTERISTICS

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

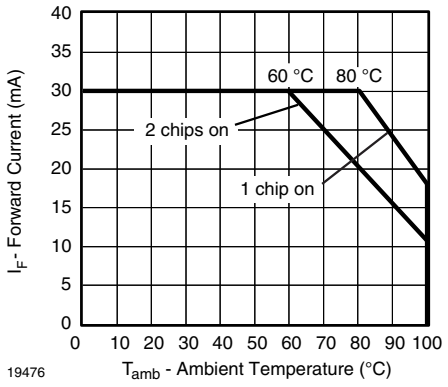


Figure 1. Forward Current vs. Ambient Temperature

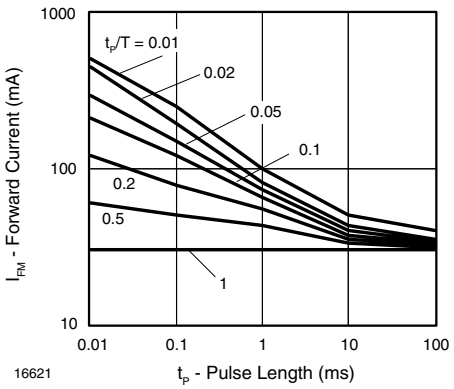


Figure 2. Forward Current vs. Pulse Duration

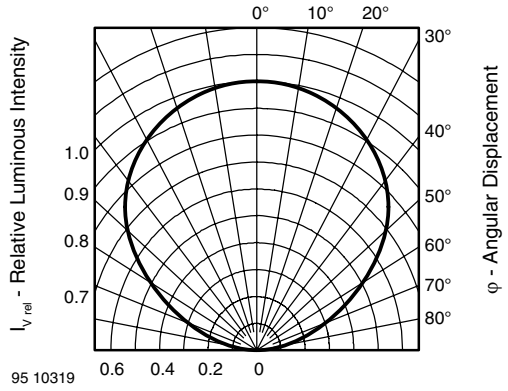


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

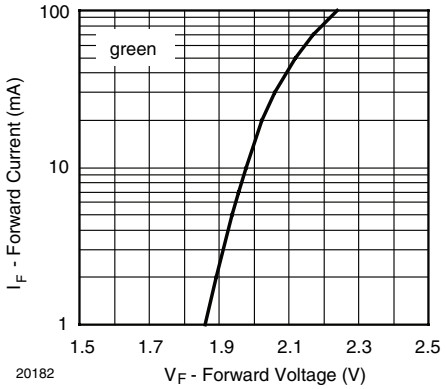


Figure 6. Relative Forward Voltage vs. Ambient Temperature

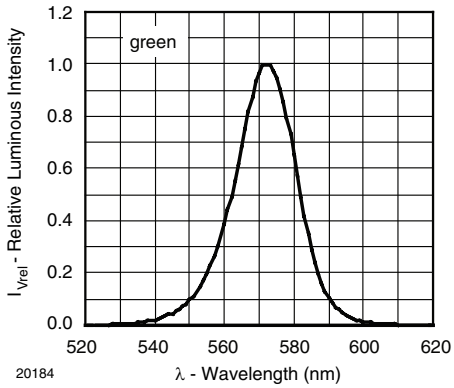


Figure 4. Relative Intensity vs. Wavelength

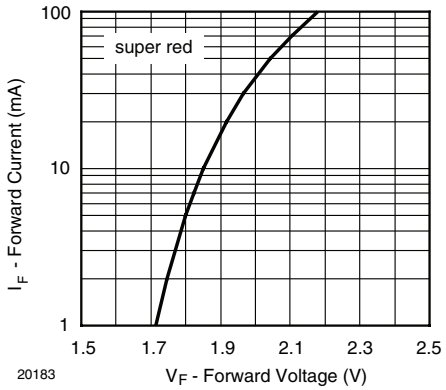


Figure 7. Relative Forward Voltage vs. Ambient Temperature

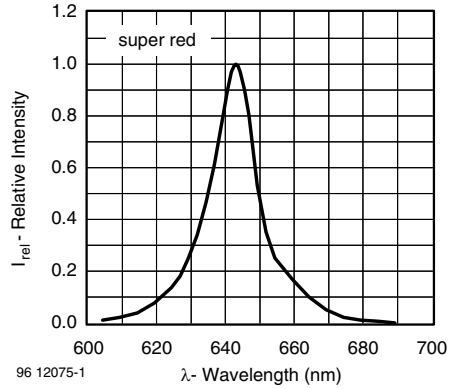


Figure 5. Relative Intensity vs. Wavelength

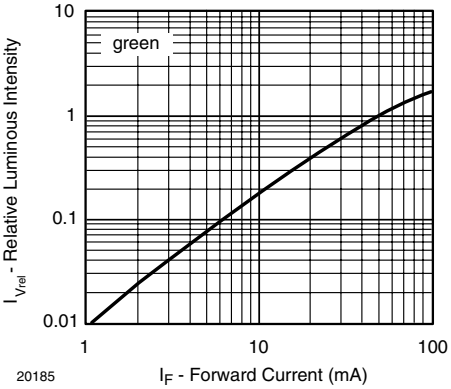


Figure 8. Relative Luminous Intensity vs. Forward Current

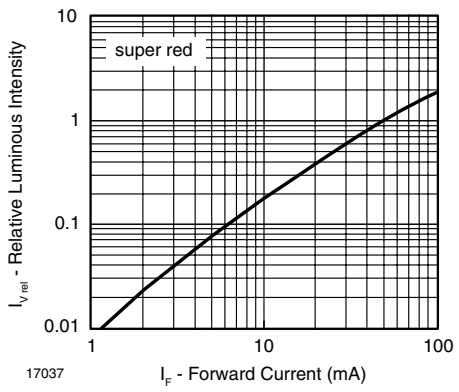


Figure 9. Relative Luminous Intensity vs. Forward Current

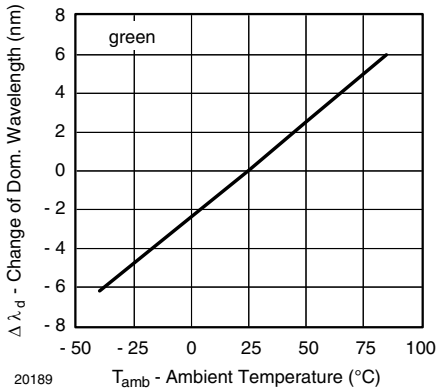


Figure 12. Change of Dominant Wavelength vs. Ambient Temperature

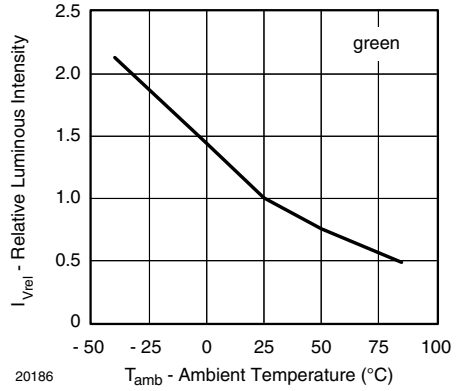


Figure 10. Rel. Luminous Intensity vs. Ambient Temperature

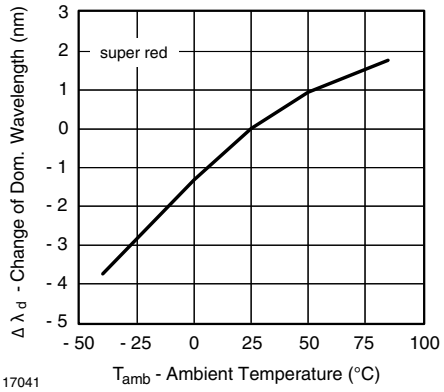


Figure 13. Change of Dominant Wavelength vs. Ambient Temperature

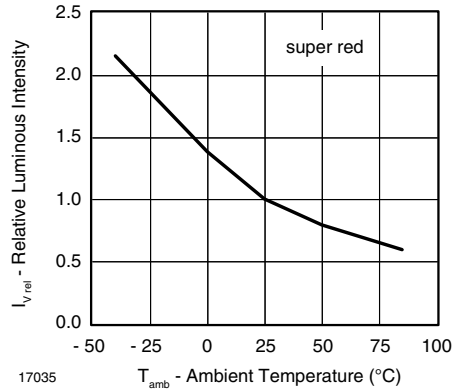


Figure 11. Rel. Luminous Intensity vs. Ambient Temperature

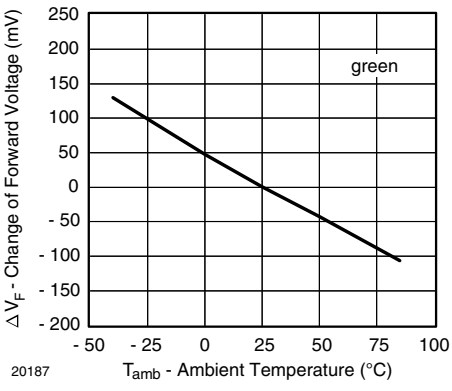


Figure 14. Change of Forward Voltage vs. Ambient Temperature

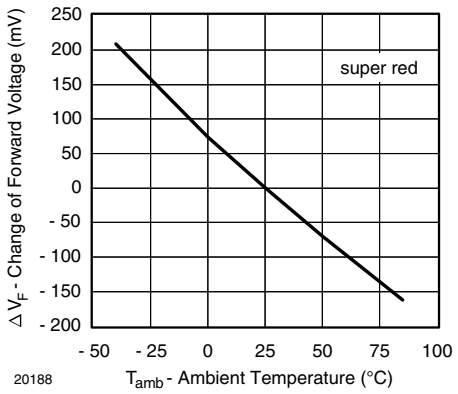
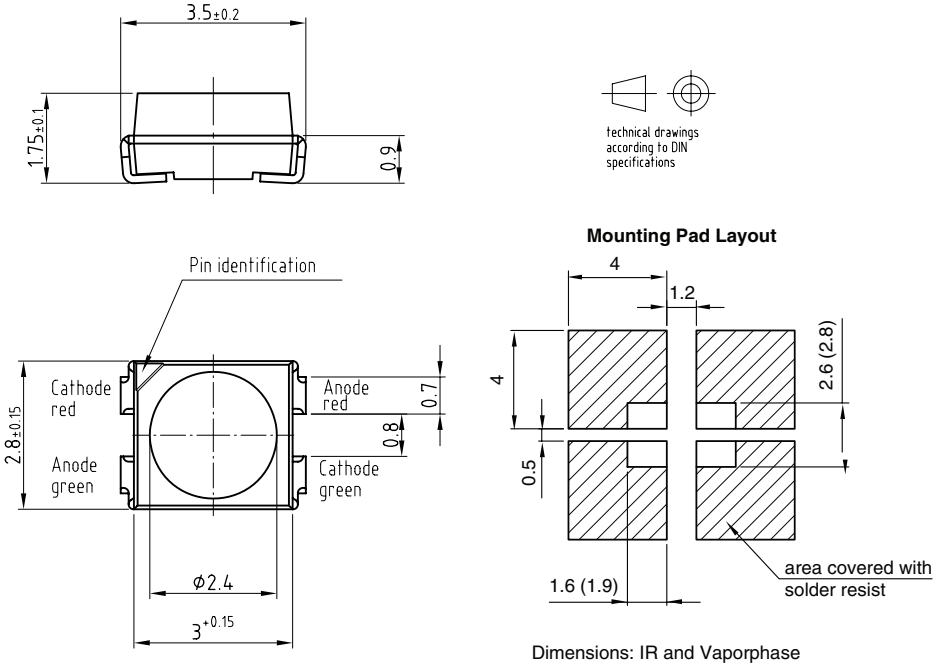


Figure 15. Change of Forward Voltage vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



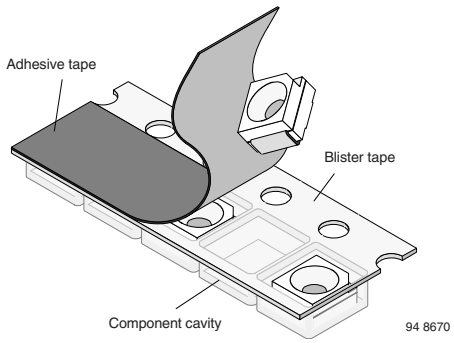
Dimensions: IR and Vaporphase
(Wave Soldering)

Drawing-No.: 6.541-5057.02-4
Issue: 2; 30.05.07
20190

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...

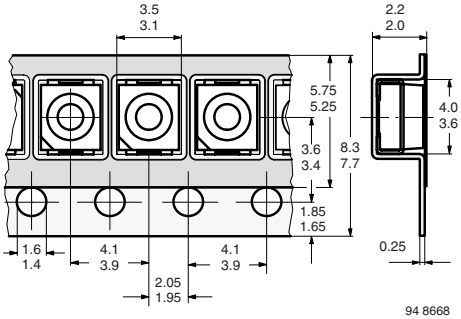


Figure 16. Tape Dimensions in mm for PLCC-2

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

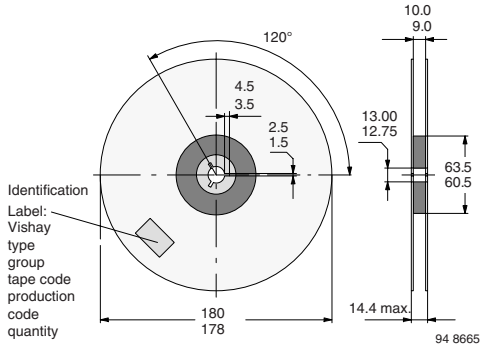


Figure 17. Reel Dimensions - GS08

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

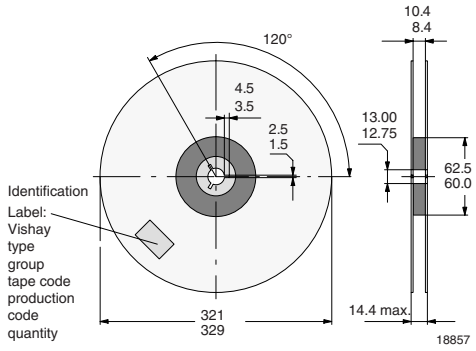


Figure 18. Reel Dimensions - GS18

SOLDERING PROFILE

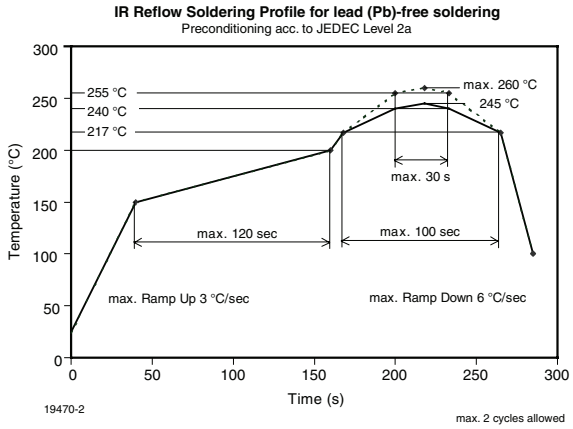


Figure 19. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

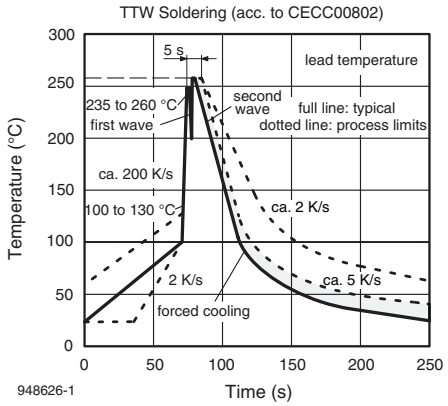
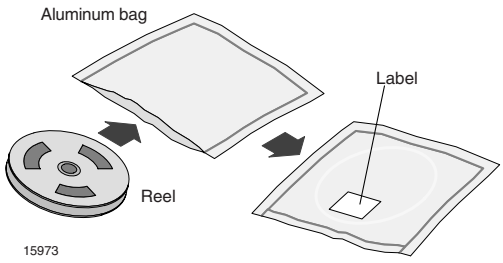


Figure 20. Double Wave Soldering of Opto Devices (all Packages)

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 aluminium 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.

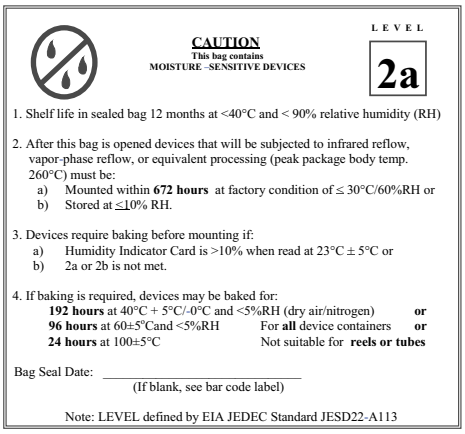
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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.

Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively.
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA.
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.