Reverse Gullwing SMD LED Red



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-020C
- Available in 12 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 $I_{Vmax.}/I_{Vmin.} > 1.6$
- Preconditioning according to JEDEC® level 2
- 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)

DESCRIPTION

This device has been designed to meet the increasing demand for AlInGaP technology.

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

LED is mounted top down and emits through the PCB.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD reverse gullwing
- 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 (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.		
VLRK31R1S2-GS08	Red	112	-	285	20	620	630	635	20	-	2.1	2.3	20	AlInGaP on GaAs
VLRK31Q1R2-GS08	Red	71	-	180	20	620	630	635	20	-	2.1	2.3	20	AlInGaP on GaAs

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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLRK31R1S2, VLRK31Q1R2

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage (1)		V_R	5	V
DC forward current	$T_{amb} \leq 85$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	1	A
Power dissipation		P_V	75	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-to-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)
VLRK31R1S2, VLRK31Q1R2, YELLOW

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	I_F = 20 mA	VLRK31R1S2	I_V	112	-	285	mcd
		VLRK31Q1R2	I_V	71	-	180	mcd
Dominant wavelength (3)	I_F = 20 mA		λ_d	620	630	635	nm
Peak wavelength	I_F = 20 mA		λ_p	-	643	-	nm
Angle of half intensity	I_F = 20 mA		φ	-	± 60	-	°
Forward voltage (2)	I_F = 20 mA		V_F	-	2.1	2.3	V
Reverse voltage	I_R = 10 µA		V_R	5	-	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz		C_j	-	15	-	pF

Notes

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

(2) Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.05 V

(3) Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LUMINOUS INTENSITY I_V (mcd)		
STANDARD	OPTIONAL	MIN.	MAX.
Q	1	71	90
	2	90	112
R	1	112	140
	2	140	180
S	1	180	224
	2	224	285

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

CROSSING TABLE

VISHAY	OSRAM
VLRK31R1S2	LST776-R1S2
VLRK31Q1R2	LST776-Q1R2

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TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

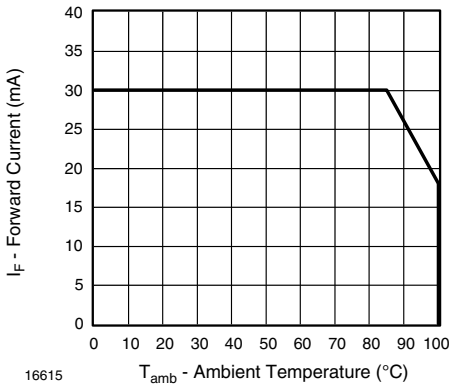


Fig. 1 - Forward Current vs. Ambient Temperature

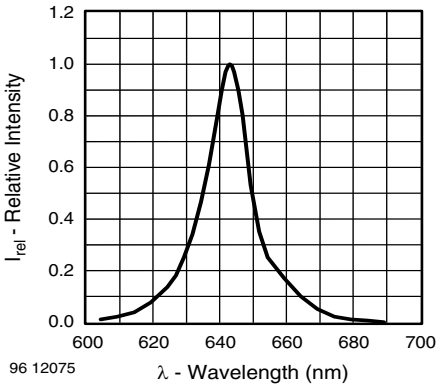


Fig. 4 - Relative Intensity vs. Wavelength

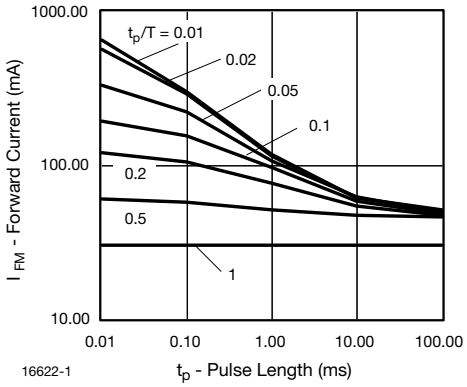


Fig. 2 - Forward Current vs. Pulse Length

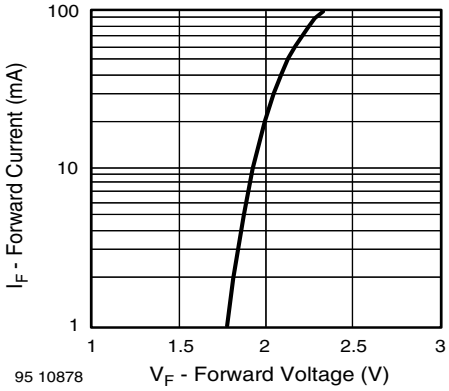


Fig. 5 - Forward Current vs. Forward Voltage

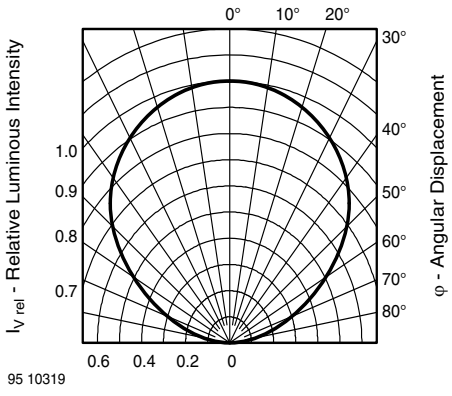


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

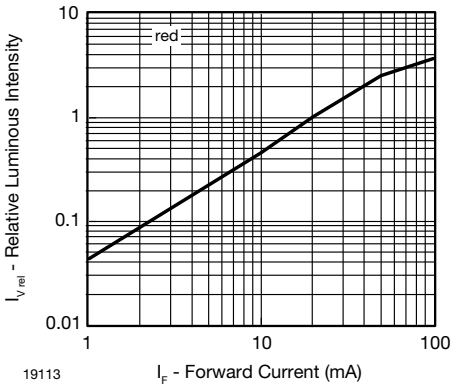


Fig. 6 - Relative Luminous Intensity vs. Forward Current

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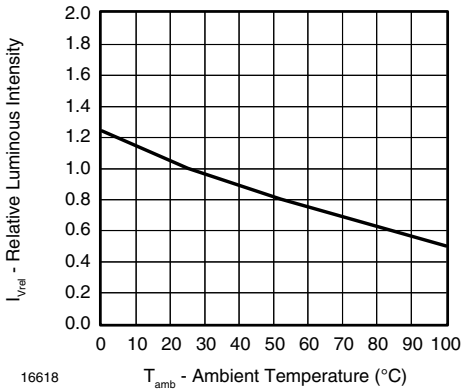


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

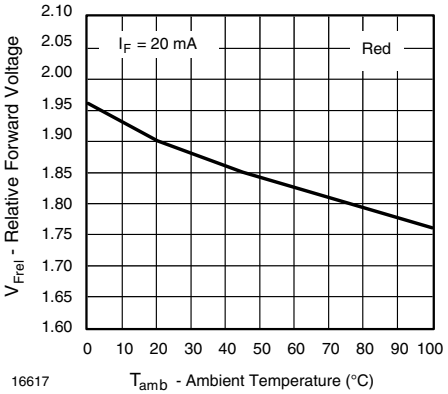
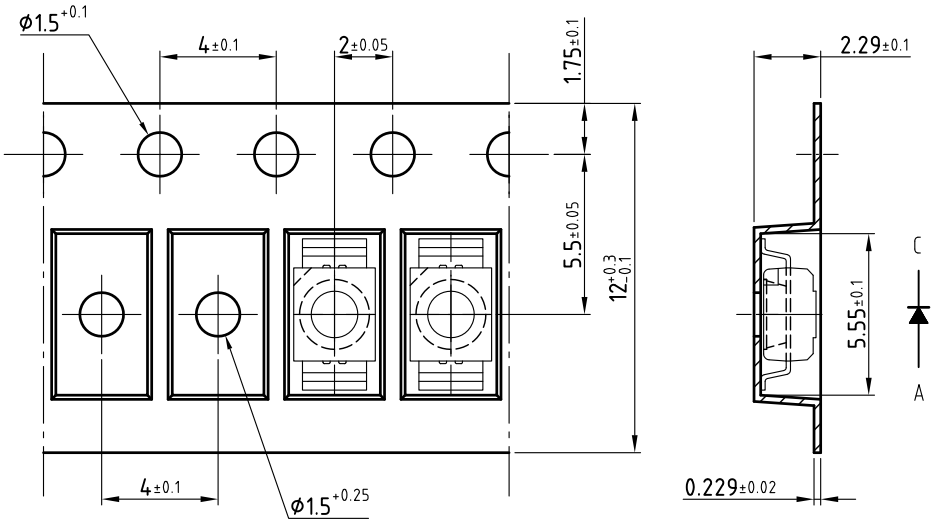


Fig. 8 - Forward Voltage vs. Ambient Temperature

TAPING DIMENSIONS in millimeters

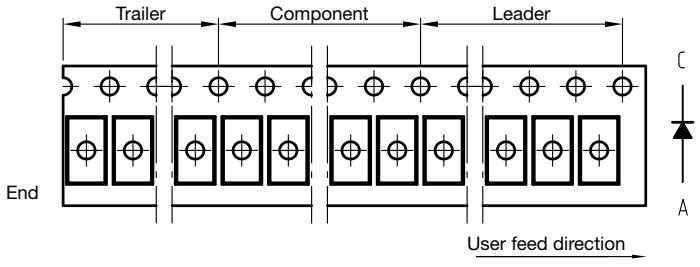
Taping and orientation

GS08: reels come in quantity of 2000 units, reel diameters are 180 mm
GS18: reels come in quantity of 8000 units, reel diameters are 330 mm



200 mm min. for Ø 180 reel
200 mm min. for Ø 330 reel

480 mm min. for Ø 180 reel
960 mm min. for Ø 330 reel



Drawing-No.: 9.700-5322.01-4
Issue: 1; 12.09.07

20858

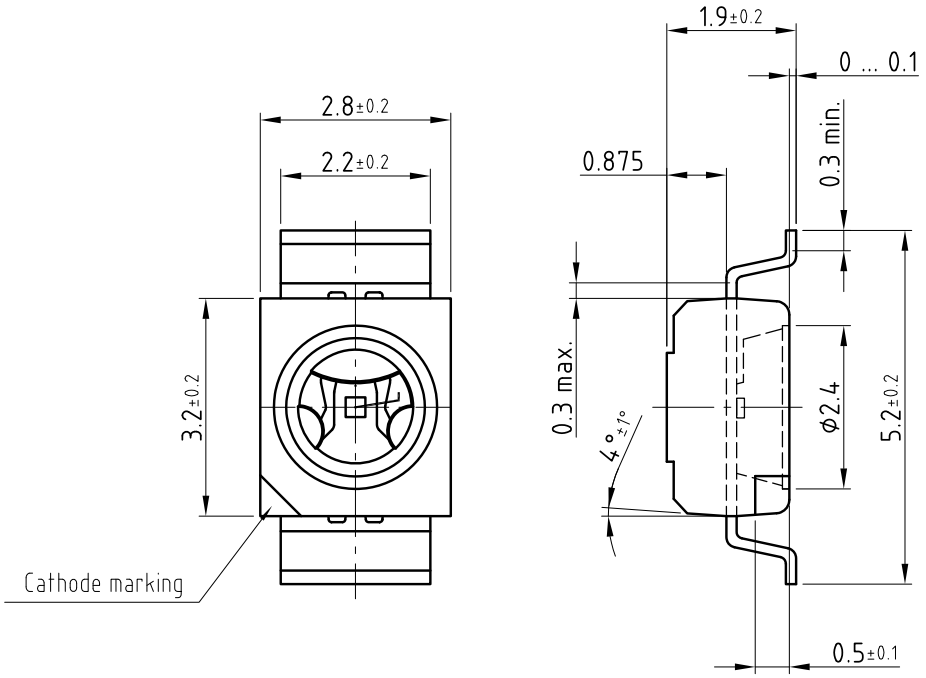
Technical drawings according to DIN specifications

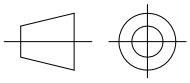
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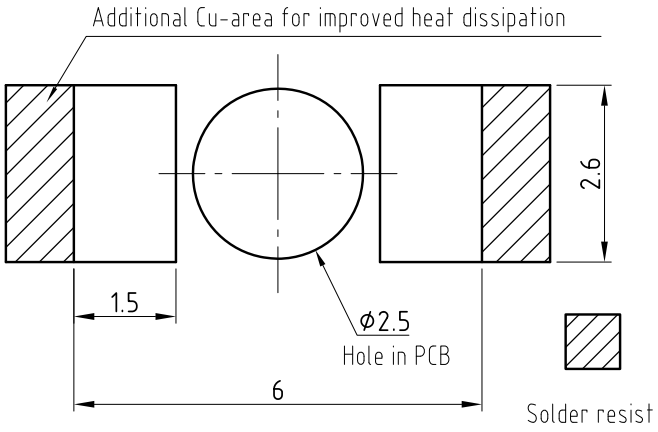
PACKAGE DIMENSIONS in millimeters





technical drawings
according to DIN
specifications

Recommended solder pad



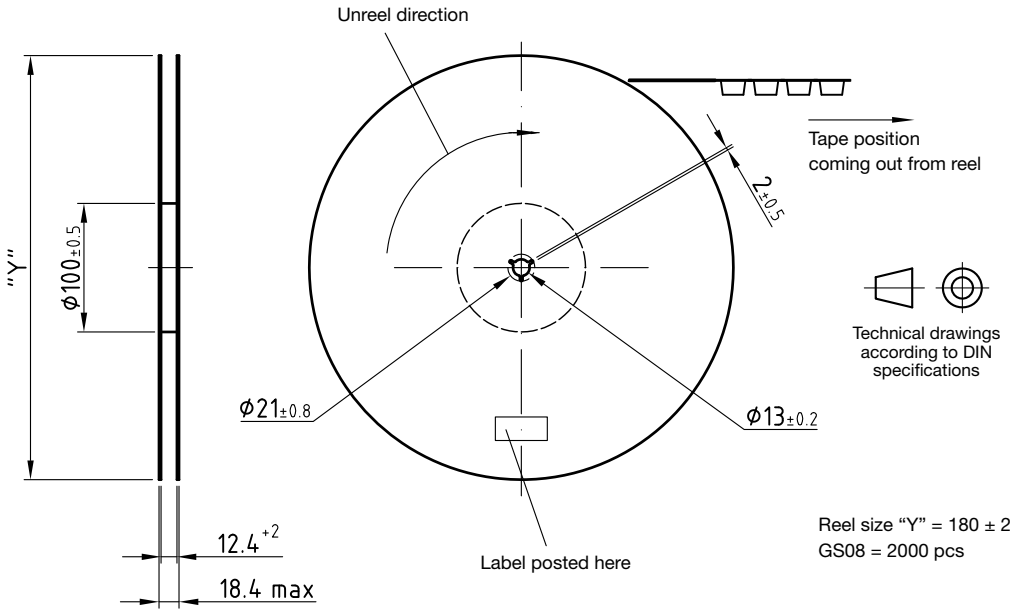
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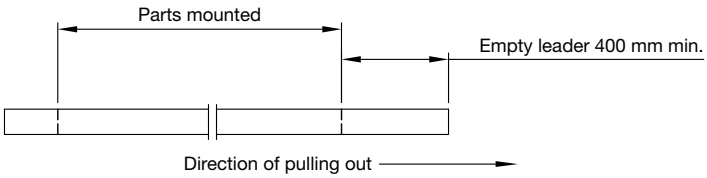
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REEL DIMENSIONS in millimeters

Reel dimensions and shape



Leader and trailer tape



Drawing-No.: 9.800-5099.01-4
Issue: 2; 22.02.08

SOLDERING PROFILE

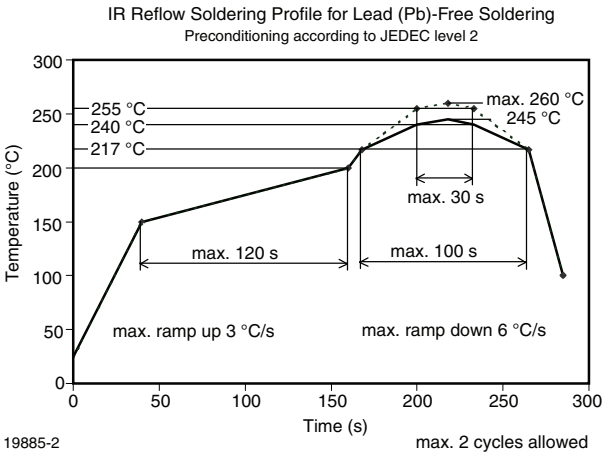


Fig. 9 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020C)

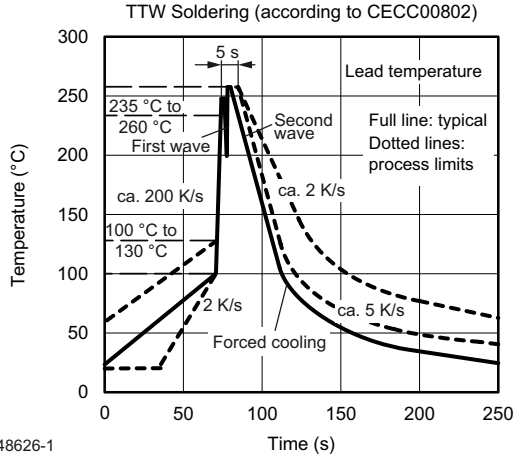
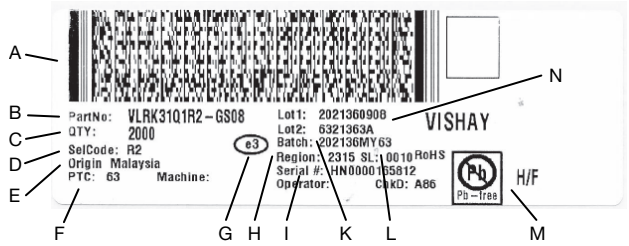


Fig. 10 - Double Wave Soldering of Opto Devices (all Packages)

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LABEL OF FAN FOLD BOX (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

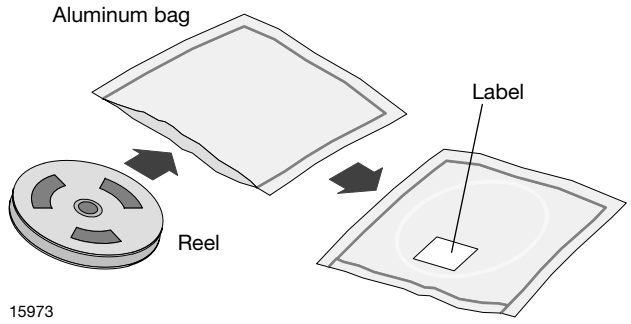
L. SL: storage location

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.



15973

FINAL PACKING

A cardboard outer 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.

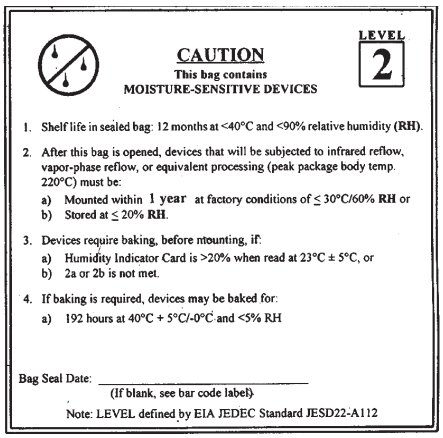
After more than one year under these conditions moisture content will be too high for reflow soldering. In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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 2 label is included on all dry bags.

BAR CODE



17028

Example of JESD22-A112 Level 2 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. Electrostatic 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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