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 $I_{Vmax}/I_{Vmin} > 1.6$
- Lead (Pb)-free device
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- Preconditioning acc. to JEDEC level 2a
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- Qualified according Vishay automotive requirement

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	TECHNOLOGY
VLRK31R1S2-GS08	Red, I_V = (112 to 285) mcd	AlInGaP on GaAs
VLRK31R1S2-GS18	Red, I_V = (112 to 285) mcd	AlInGaP on GaAs
VLRK31Q1R2-GS08	Red, I_V = (71 to 180) mcd	AlInGaP on GaAs
VLRK31Q1R2-GS18	Red, I_V = (71 to 180) mcd	AlInGaP on GaAs
VLRK31R1R2-GS08	Red, I_V = (112 to 180) mcd	AlInGaP on GaAs
VLRK31R1R2-GS18	Red, I_V = (112 to 180) mcd	AlInGaP on GaAs
VLRK31Q2R1-GS08	Red, I_V = (90 to 140) mcd	AlInGaP on GaAs
VLRK31Q2R1-GS18	Red, I_V = (90 to 140) mcd	AlInGaP on GaAs

ABSOLUTE MAXIMUM RATINGS [1] VLRK31..				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage [2]		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/ ambient	mounted on PC board (pad size > 16 mm^2)	R_{thJA}	400	K/W

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

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] VLRK31.., RED							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity [2]	I_F = 20 mA	VLRK31R1S2	I_V	112		285	mcd
		VLRK31Q1R2	I_V	71		180	mcd
		VLRK31R1R2	I_V	112		180	mcd
		VLRK31Q2R1	I_V	90		140	mcd
Dominant wavelength [4]	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		deg
Forward voltage [3]	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, f = 1 MHz		C_j		15		pF

Note:
[1] T_{amb} = 25 °C, unless otherwise specified
[2] In one packing unit $I_{Vmax}/I_{Vmin} > 1.6$
[3] Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.05 V
[4] Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm

LUMINOUS INTENSITY CLASSIFICATION			
GROUP	**LIGHT INTENSITY (MCD)**		
STANDARD	**OPTIONAL**	**MIN.**	**MAX.**
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 on 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
VLRK31R1R2	LST776-R1R2
VLRK31Q2R1	LST776-Q2R1

TYPICAL CHARACTERISTICS

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

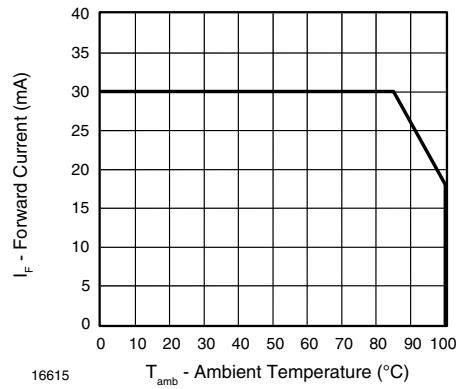


Figure 1. Forward Current vs. Ambient Temperature

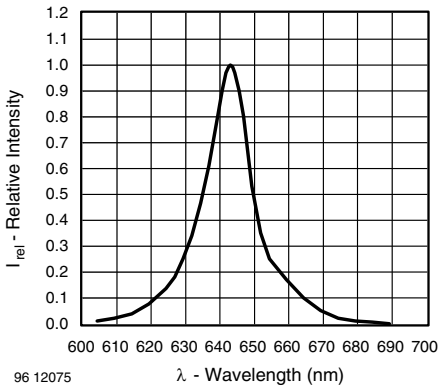


Figure 4. Relative Intensity vs. Wavelength

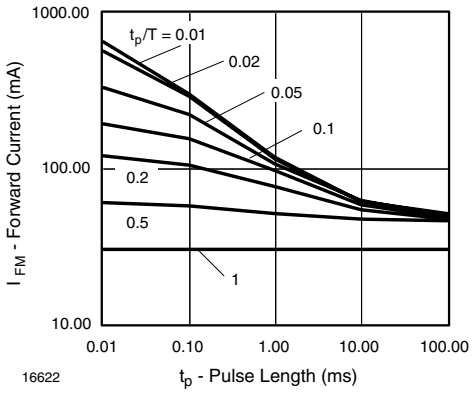


Figure 2. Forward Current vs. Pulse Length

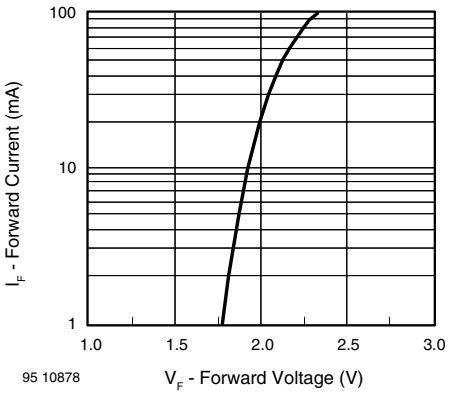


Figure 5. Forward Current vs. Forward Voltage

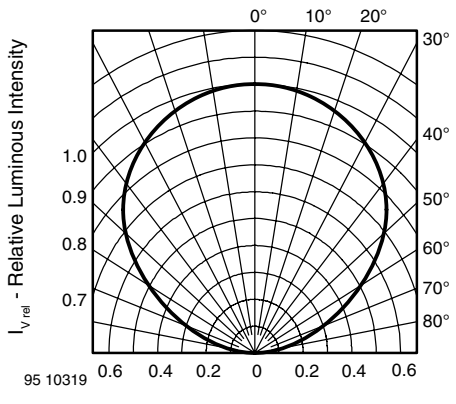


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

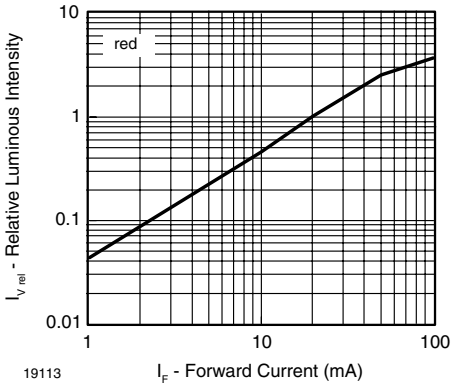


Figure 6. Relative Luminous Intensity vs. Forward Current

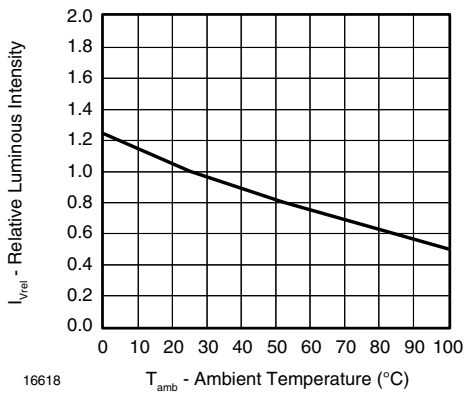


Figure 7. Rel. Luminous Intensity vs. Ambient Temperature

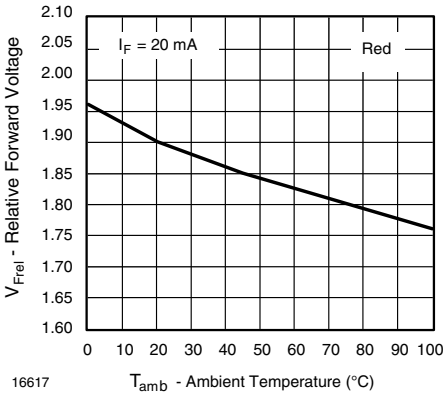
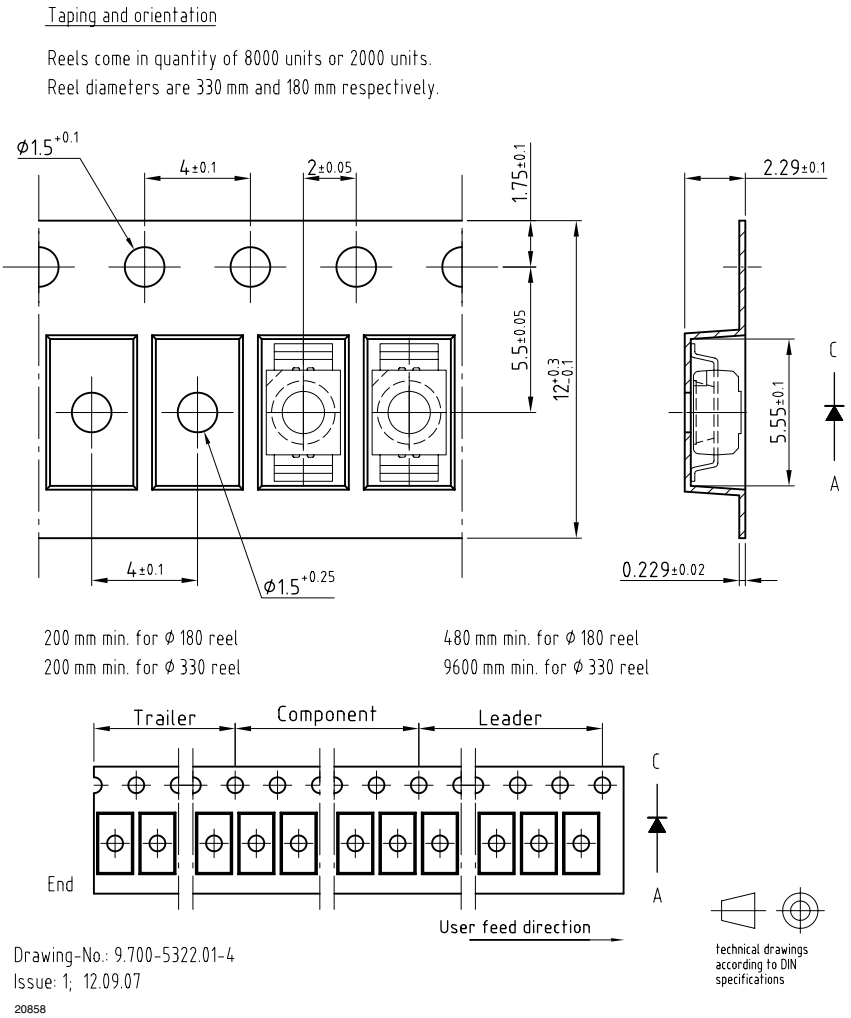
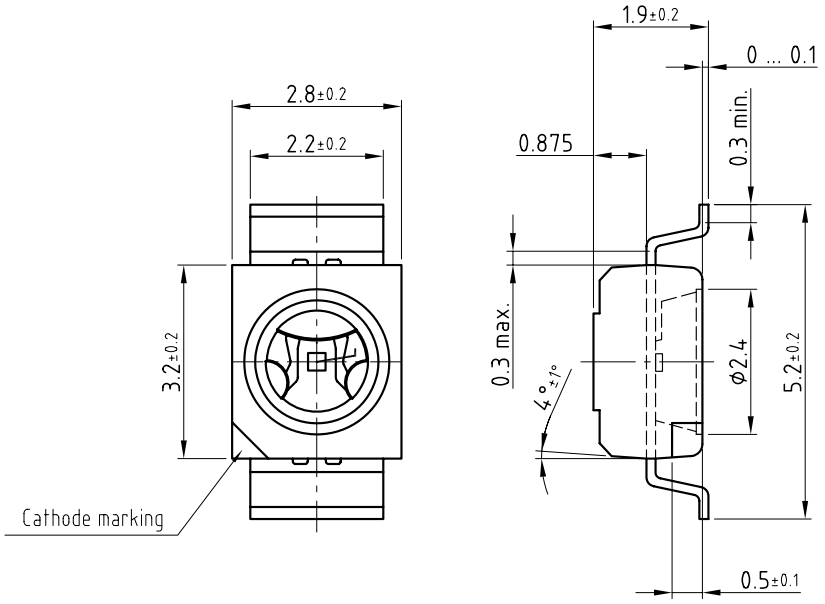


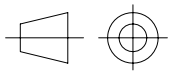
Figure 8. Forward Voltage vs. Ambient Temperature

TAPING DIMENSIONS in millimeters



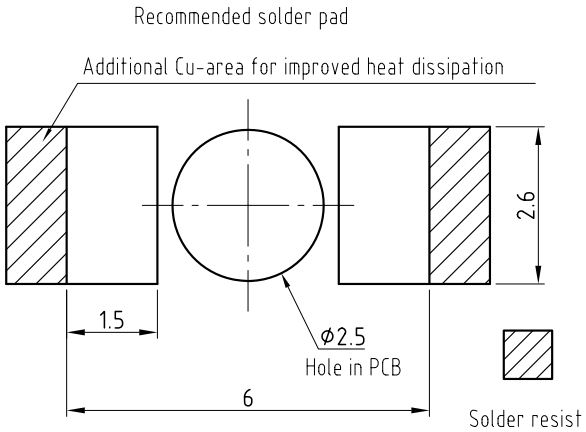
PACKAGE DIMENSIONS in millimeters



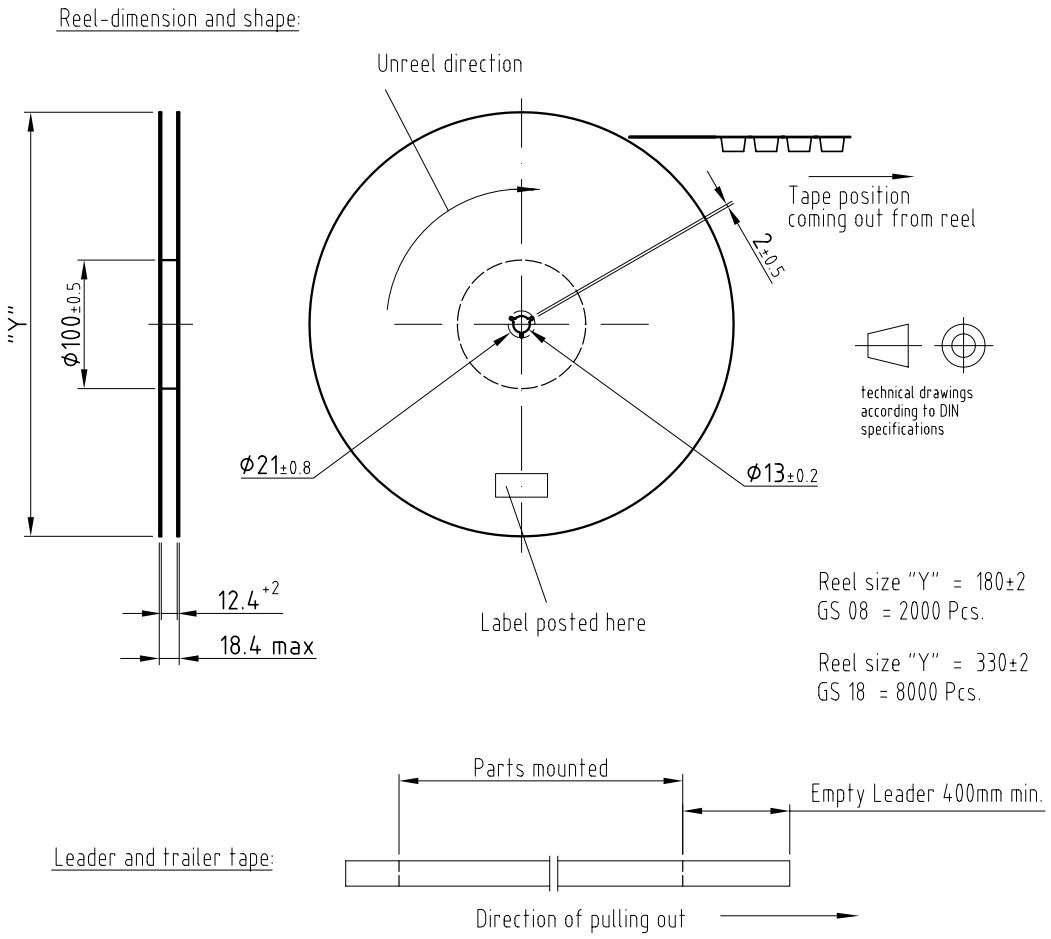


technical drawings
according to DIN
specifications

Drawing-No.: 6.541-5073.01-4
Issue: 1; 21.08.07
20859



REEL DIMENSIONS in millimeters



Drawing-No.: 9.800-5099.01-4
Issue: 2; 22.02.08
21067

SOLDERING PROFILE

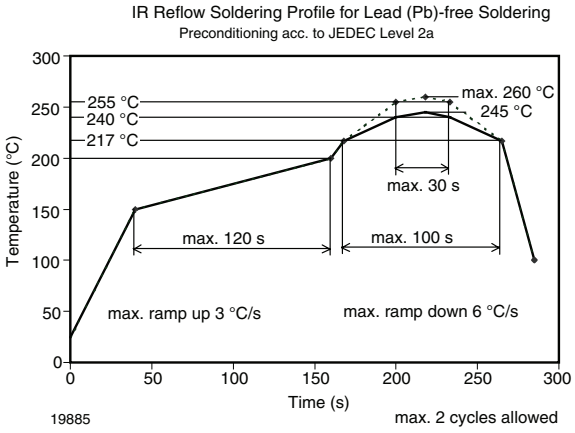


Figure 9. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

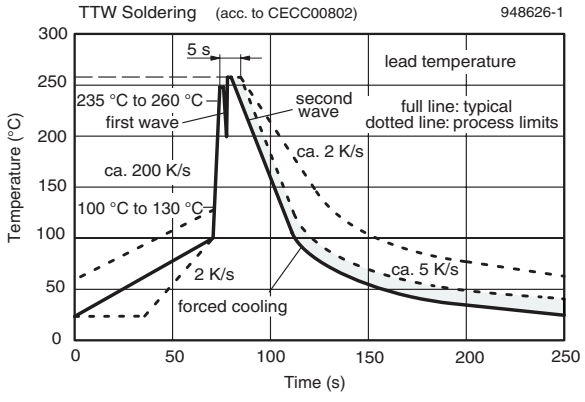
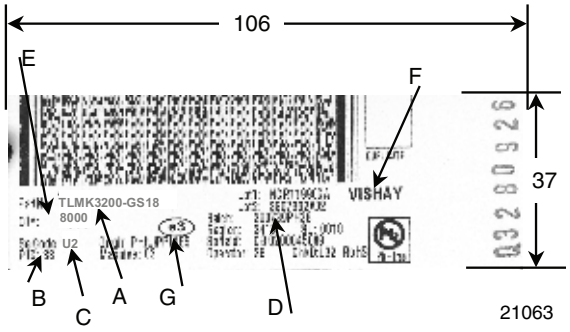


Figure 10. Double Wave Soldering of Opto Devices (all Packages)

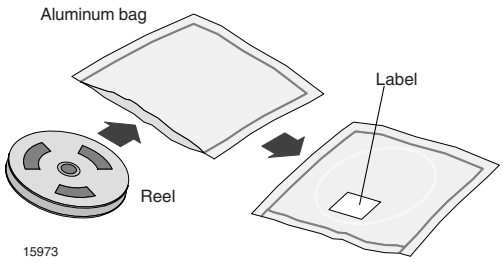
LABEL OF FAN FOLD BOX EXAMPLE:



A) Type of component
B) PTC = manufacturing plant
C) SEL - selection code (bin):
e.g.: U2 = code for luminous intensity group
D) Batch/date code
E) Total quantity
F) Company code
G) Code for lead (Pb)-free classification (e3)

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.

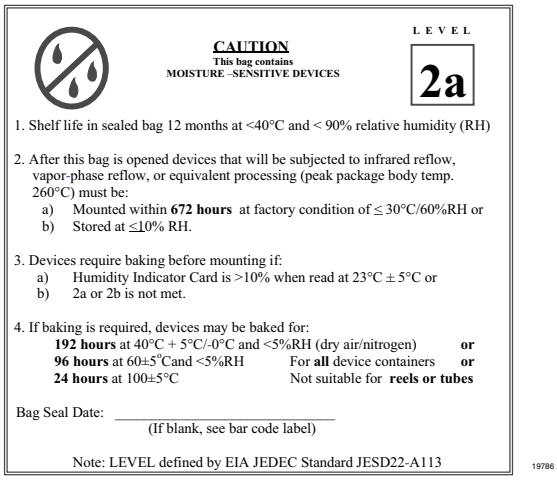
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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.

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

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