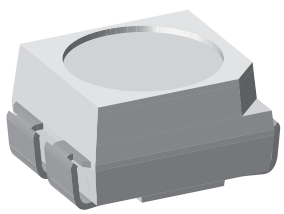
Bicolor SMD LED PLCC-4



19211

FEATURES

- SMD LED with exceptional brightness
- Multicolored
- Luminous intensity categorized
- EIA and ICE standard package
- Compatible with automatic placement equipment
- Compatible with IR reflow, vapor phase and wave soldering processes according to CECC 00802 and J-STD-020
- 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 $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- Preconditioning: according to JEDEC level 2a
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- AEC-Q101 qualified

AUTOMOTIVE GRADE
Pb-free
e3
RoHS COMPLIANT
GREEN (5-2008)**

DESCRIPTION

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

The package of the VLMRY3420 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 amber 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 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
VLMRY3420-GS08	Amber, I_V = (355 to 900) mcd Yellow, I_V = (560 to 1120) mcd	AlInGaP on GaAs
VLMRY3420-GS18	Amber, I_V = (355 to 900) mcd Yellow, I_V = (560 to 1120) mcd	AlInGaP on GaAs

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

ABSOLUTE MAXIMUM RATINGS 1) VLMRY3420

PARAMETER	TEST CONDITION		SYMBOL	VALUE	UNIT
Reverse voltage per diode 2)	I_R = 10 µA		V_R	5	V
DC forward current per diode	$T_{amb} \leq 65$ °C		I_F	50	mA
Surge forward current per diode			I_{FSM}	0.1	A
Power dissipation per diode			P_V	130	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}	480 650	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) VLMRY3420, AMBER

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 50 mA	VLMRY3420	I_V	355		900	mcd
Dominant wavelength	I_F = 50 mA		λ_d		617		nm
Peak wavelength	I_F = 50 mA		λ_p		624		nm
Angle of half intensity	I_F = 50 mA		φ		± 60		deg
Forward voltage	I_F = 50 mA		V_F		2.1	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) VLMRY3420, YELLOW

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 50 mA	VLMRY3420	I_V	560		1120	mcd
Dominant wavelength	I_F = 50 mA		λ_d	581	588	594	nm
Peak wavelength	I_F = 50 mA		λ_p		590		nm
Angle of half intensity	I_F = 50 mA		φ		± 60		deg
Forward voltage	I_F = 50 mA		V_F		2.1	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

CROSSING TABLE

VISHAY	OSRAM
VLMRY3420	LAYT67B

LUMINOUS INTENSITY CLASSIFICATION AND GROUP COMBINATIONS [1] VLMRY3420					
		RED			
		T2 355 to 450 mcd	U1 450 to 560 mcd	U2 560 to 710 mcd	V1 710 to 900 mcd
YELLOW	U2 560 to 710 mcd	VLMRY3420	VLMRY3420	VLMRY3420	VLMRY3420
	V1 710 to 900 mcd	VLMRY3420	VLMRY3420	VLMRY3420	VLMRY3420
	V2 900 to 1120 mcd	VLMRY3420	VLMRY3420	VLMRY3420	VLMRY3420

Note:
1) Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 11 %.

COLOR CLASSIFICATION		
GROUP	DOMINANT WAVELENGTH (nm)	
	YELLOW	
	MIN.	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

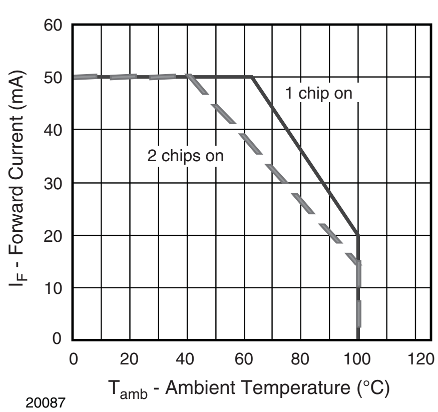


Figure 1. Forward Current vs. Ambient Temperature

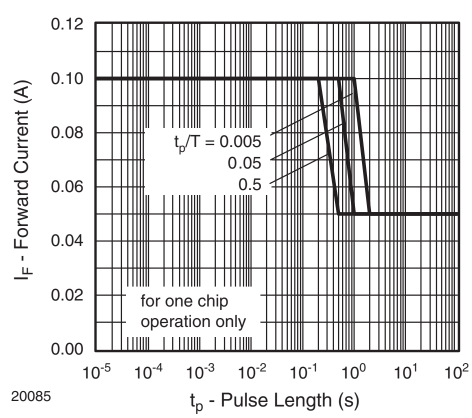


Figure 2. Forward Current vs. Pulse Duration

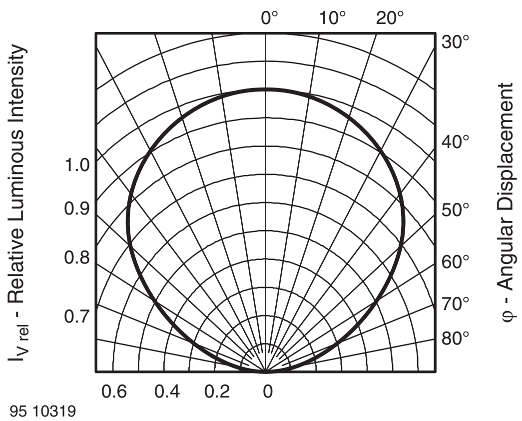


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

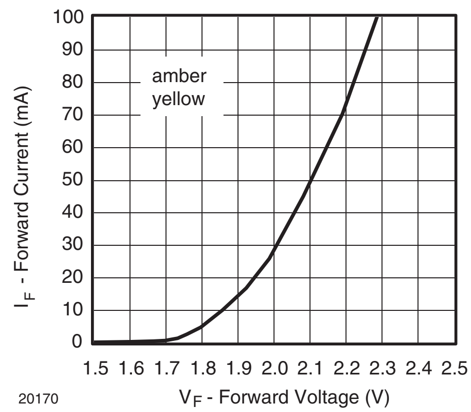


Figure 6. Relative Forward Voltage vs. Ambient Temperature

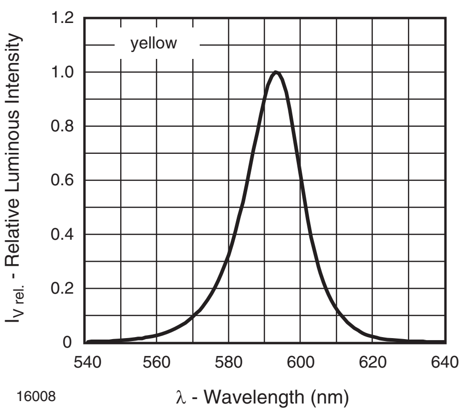


Figure 4. Relative Intensity vs. Wavelength

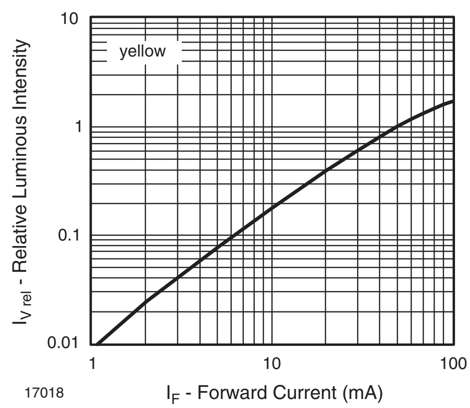


Figure 7. Relative Luminous Intensity vs. Forward Current

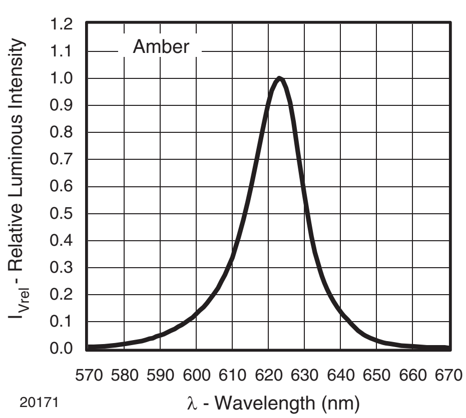


Figure 5. Relative Intensity vs. Wavelength

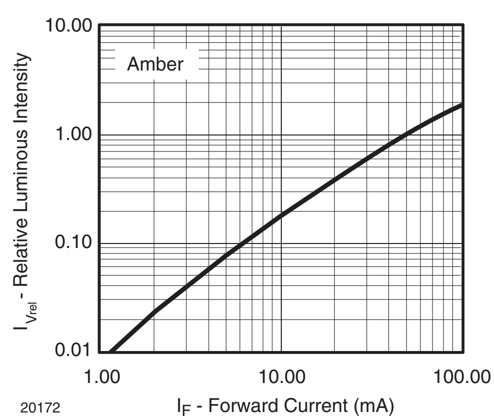


Figure 8. Relative Luminous Intensity vs. Forward Current

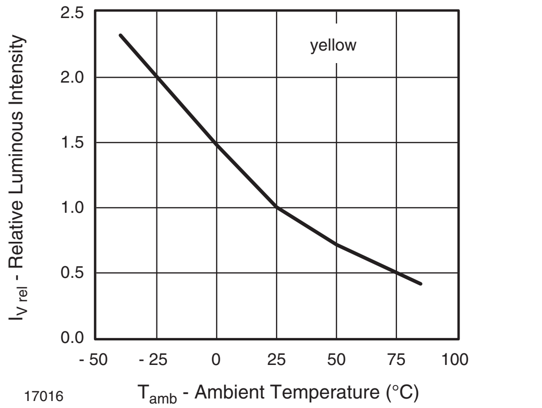


Figure 9. Rel. Luminous Intensity vs. Ambient Temperature

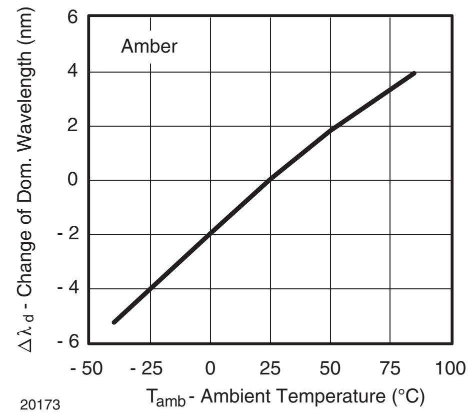


Figure 12. Change of Dominant Wavelength vs. Ambient Temperature

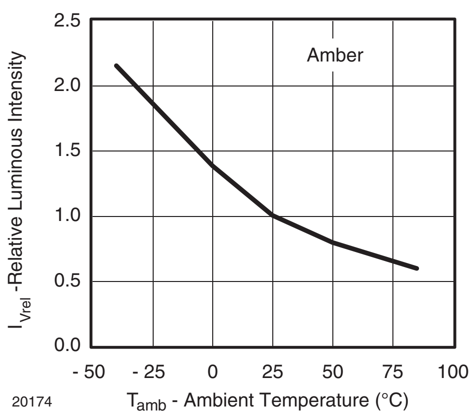


Figure 10. Rel. Luminous Intensity vs. Ambient Temperature

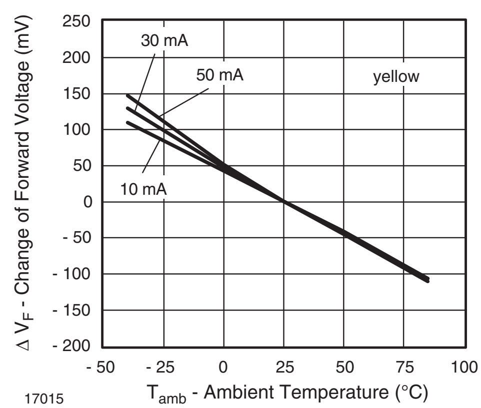


Figure 13. Change of Forward Voltage vs. Ambient Temperature

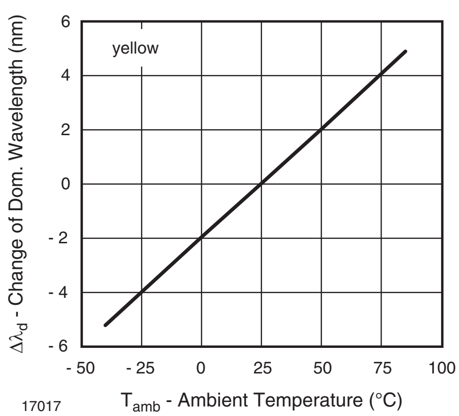


Figure 11. Change of Dominant Wavelength vs. Ambient Temperature

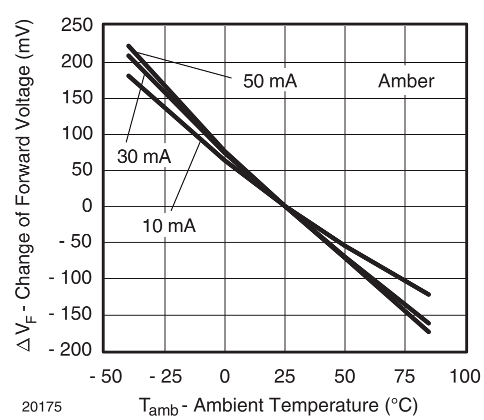
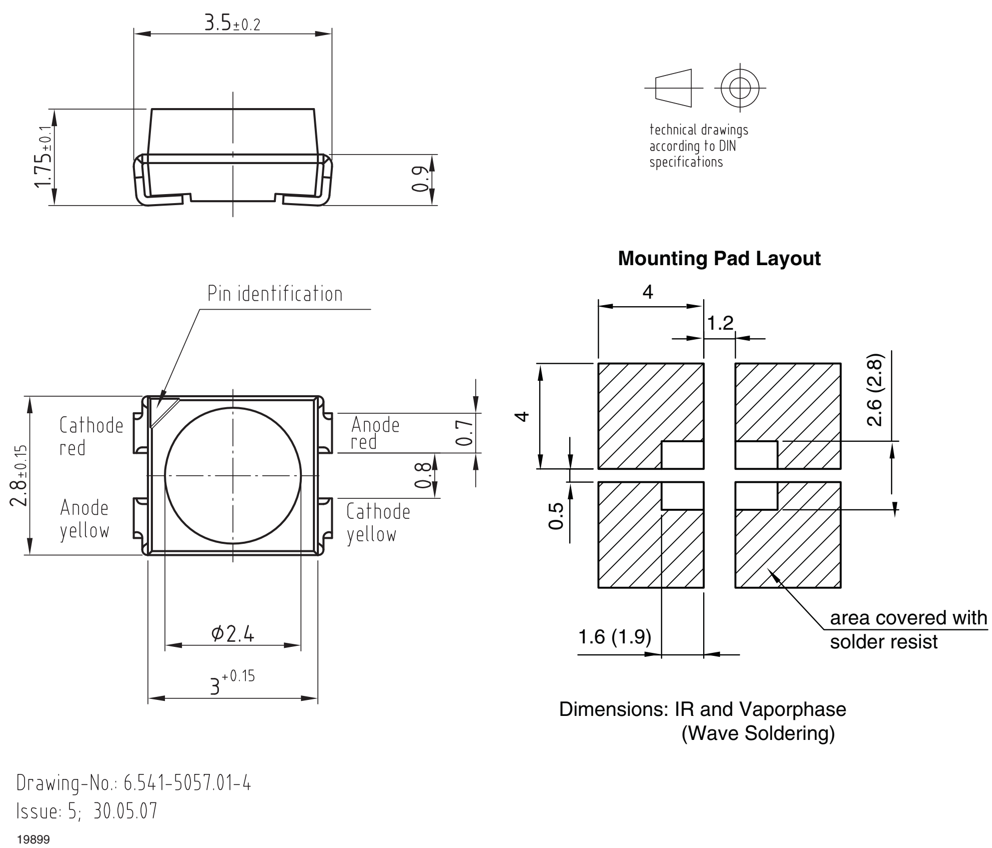


Figure 14. Change of Forward Voltage vs. Ambient Temperature

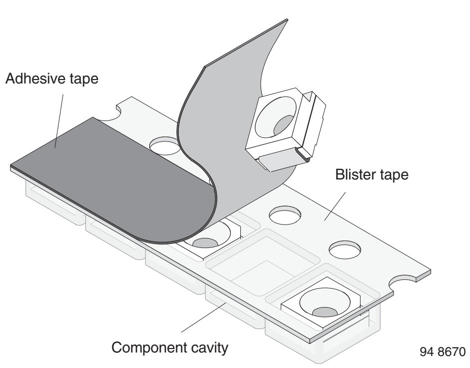
PACKAGE DIMENSIONS in millimeters



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...

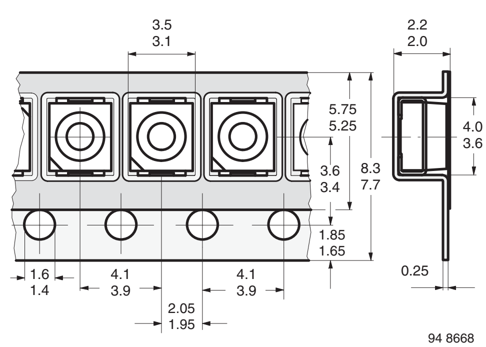


Figure 15. Tape Dimensions in mm for PLCC-2

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

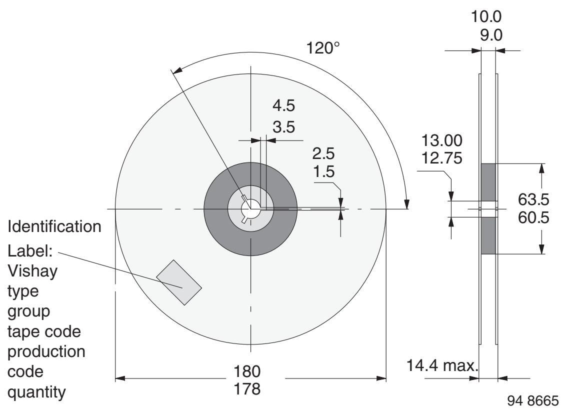


Figure 16. Reel Dimensions - GS08

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

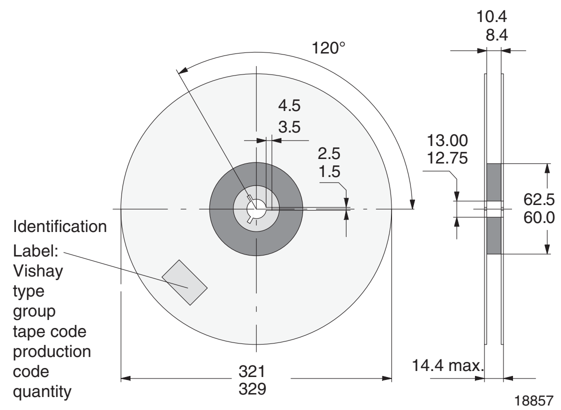


Figure 17. Reel Dimensions - GS18

SOLDERING PROFILE

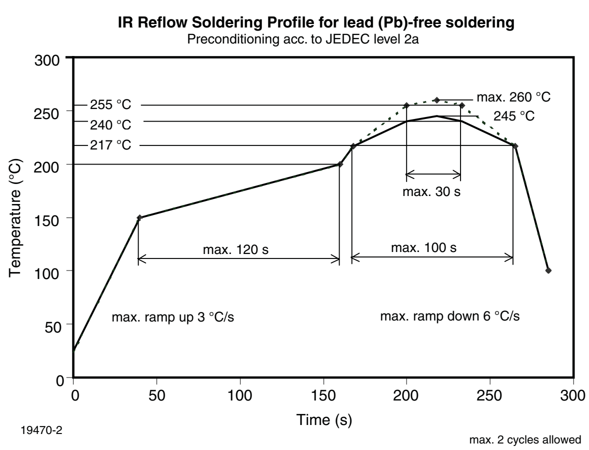


Figure 18. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

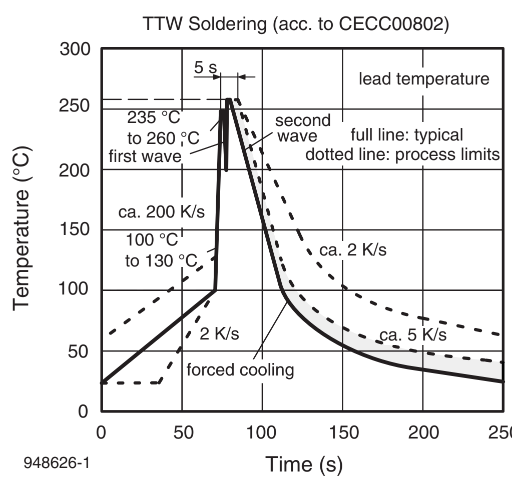
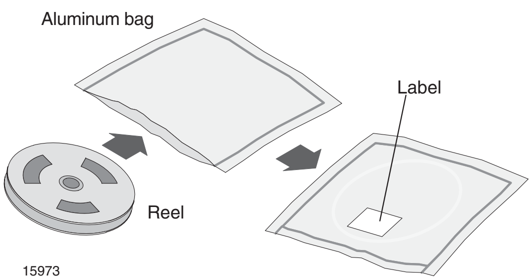


Figure 19. Double Wave Soldering of Opto Devices (all Packages)

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.

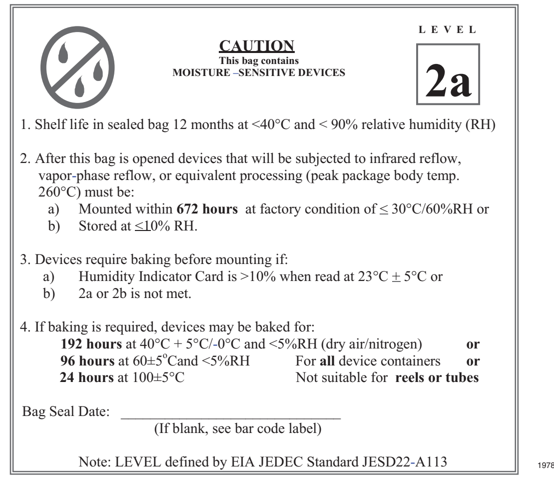
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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.



CAUTION
This bag contains
MOISTURE –SENSITIVE DEVICES

LEVEL
2a

1. Shelf life in sealed bag 12 months at <40°C and < 90% relative humidity (RH)

2. After this bag is opened devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing (peak package body temp. 260°C) must be:
   a) Mounted within **672 hours** at factory condition of ≤ 30°C/60%RH or
   b) Stored at ≤10% RH.

3. Devices require baking before mounting if:
   a) Humidity Indicator Card is >10% when read at 23°C ± 5°C or
   b) 2a or 2b is not met.

4. If baking is required, devices may be baked for:
   192 hours at 40°C + 5°C/-0°C and <5%RH (dry air/nitrogen) **or**
   96 hours at 60±5°Cand <5%RH For **all** device containers **or**
   24 hours at 100±5°C Not suitable for **reels or tubes**

Bag Seal Date: ______________
(If blank, see bar code label)

Note: LEVEL defined by EIA JEDEC Standard JESD22-A113

19786

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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