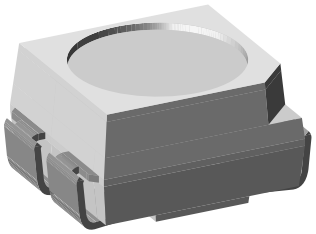
Bicolor SMD LED PLCC-4



19211

DESCRIPTION

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

The package of the VLMSY3420 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.

PRODUCT GROUP AND PACKAGE DATA

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

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 4
- 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

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

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.		
VLMSY3420-GS08	Red	224	-	900	50	-	630	-	50	-	2.1	2.6	50	AlInGaP on GaAs
VLMSY3420-GS08	Yellow	280	-	1120	50	581	588	594	50	-	2.1	2.6	50	AlInGaP on GaAs
VLMSY3420-GS18	Red	224	-	900	50	-	630	-	50	-	2.1	2.6	50	AlInGaP on GaAs
VLMSY3420-GS18	Yellow	280	-	1120	50	581	588	594	50	-	2.1	2.6	50	AlInGaP on GaAs

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

VLMSY3420

PARAMETER	TEST CONDITION		SYMBOL	VALUE	UNIT
Reverse voltage per diode (1)	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 mm²)	1 chip on	R_{thJA}	480	K/W
		2 chips on	R_{thJA}	650	K/W

Note

(1) Driving the LED in reverse direction is suitable for short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMSY3420, SUPER RED

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 50 mA	VLMSY3420	I_V	224	-	900	mcd
Dominant wavelength	I_F = 50 mA		λ_d	-	630	-	nm
Peak wavelength	I_F = 50 mA		λ_p	-	643	-	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 V, f = 1 MHz		C_j	-	15	-	pF

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMSY3420, YELLOW

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 50 mA	VLMSY3420	I_V	280	-	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 V, f = 1 MHz		C_j	-	15	-	pF

LUMINOUS INTENSITY CLASSIFICATION AND GROUP COMPINATIONS VLMSY3420

		RED					
		S2 224 mcd to 280 mcd	T1 280 mcd to 355 mcd	T2 355 mcd to 450 mcd	U1 450 mcd to 560 mcd	U2 560 mcd to 710 mcd	V1 710 mcd to 900 mcd
YELLOW	T1 280 mcd to 355 mcd	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420
	T2 355 mcd to 450 mcd	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420
	U1 450 mcd to 560 mcd	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420
	U2 560 mcd to 710 mcd	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420
	V1 710 mcd to 900 mcd	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420
	V2 900 mcd to 1120 mcd	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420	VLMSY3420

Note

- 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)

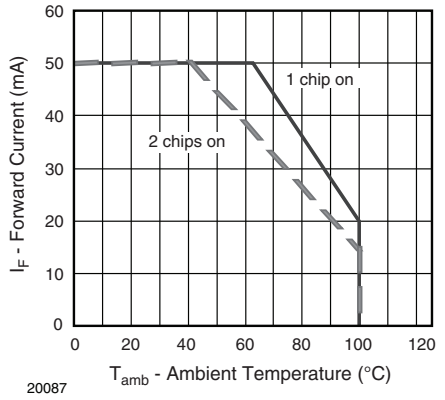


Fig. 1 - Forward Current vs. Ambient Temperature

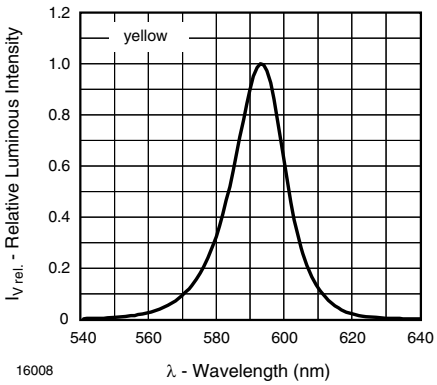


Fig. 4 - Relative Intensity vs. Wavelength

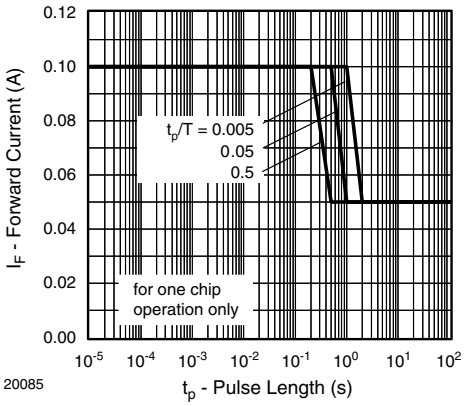


Fig. 2 - Forward Current vs. Pulse Duration

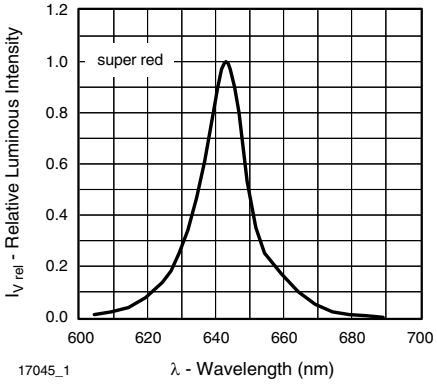


Fig. 5 - Relative Intensity vs. Wavelength

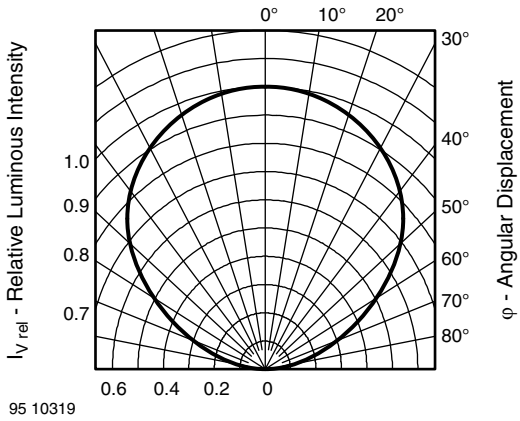


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

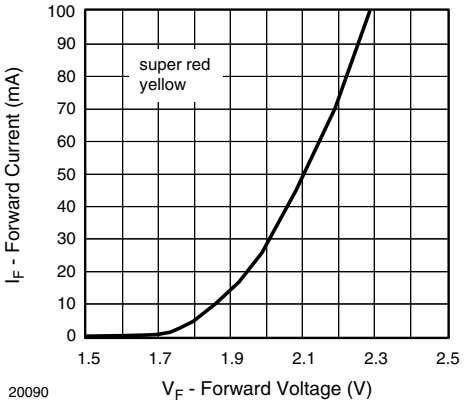


Fig. 6 - Relative Forward Voltage vs. Ambient Temperature

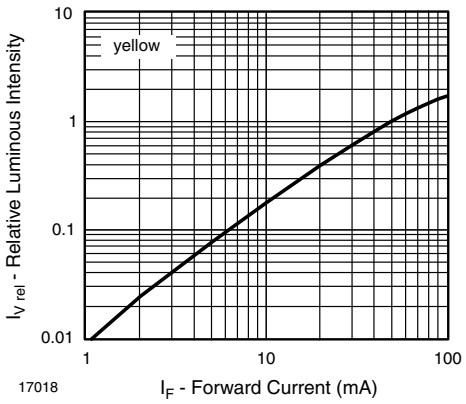


Fig. 7 - Relative Luminous Intensity vs. Forward Current

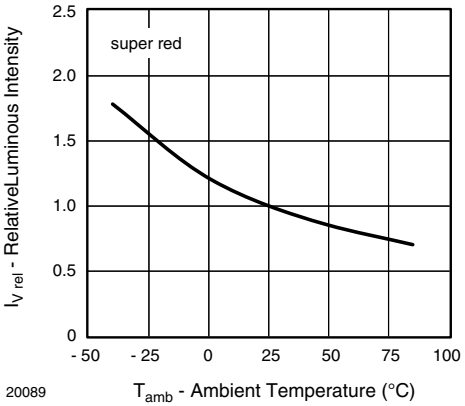


Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature

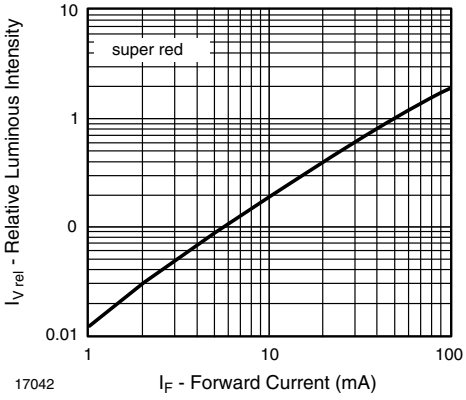


Fig. 8 - Relative Luminous Intensity vs. Forward Current

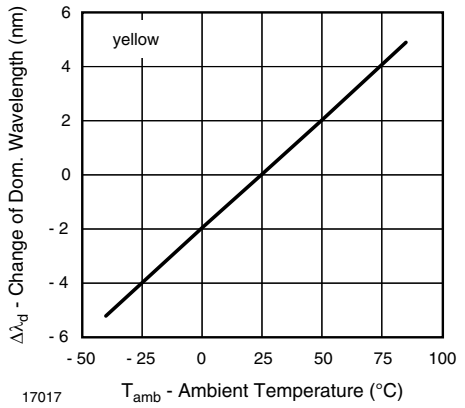


Fig. 11 - Relative Luminous Intensity vs. Ambient Temperature

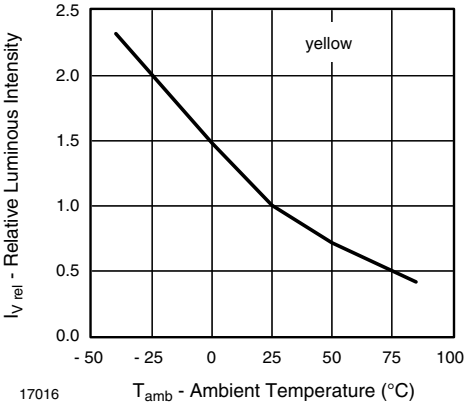


Fig. 9 - Relative Luminous Intensity vs. Ambient Temperature

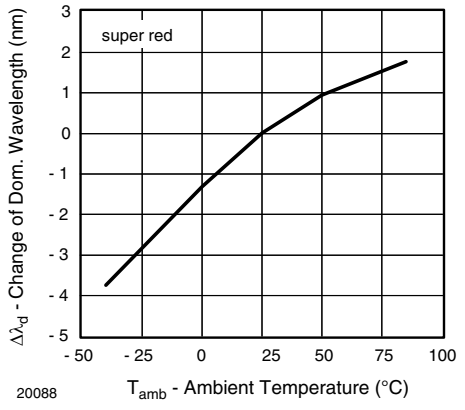


Fig. 12 - Change of Dominant Wavelength vs. Ambient Temperature

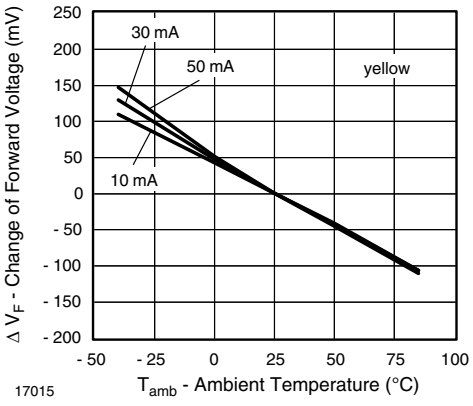


Fig. 13 - Change of Forward Voltage vs. Ambient Temperature

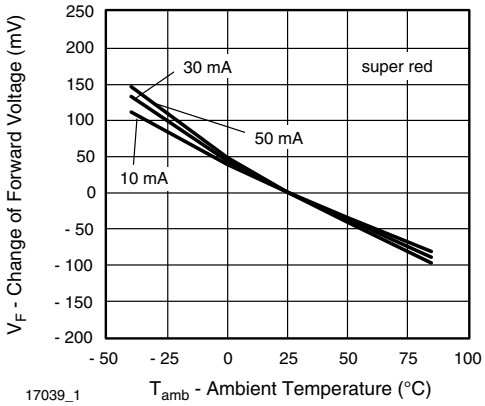
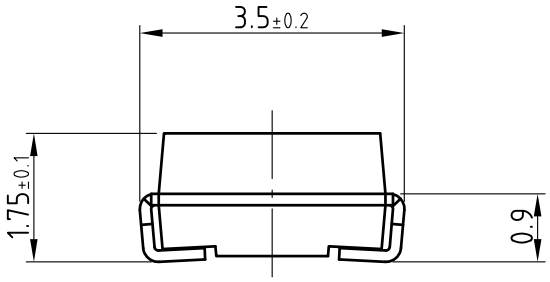
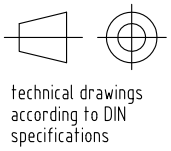
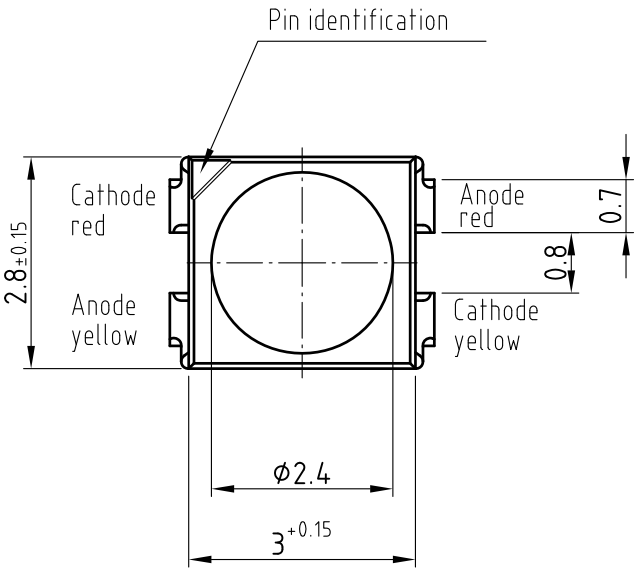


Fig. 14 - Change of Forward Voltage vs. Ambient Temperature

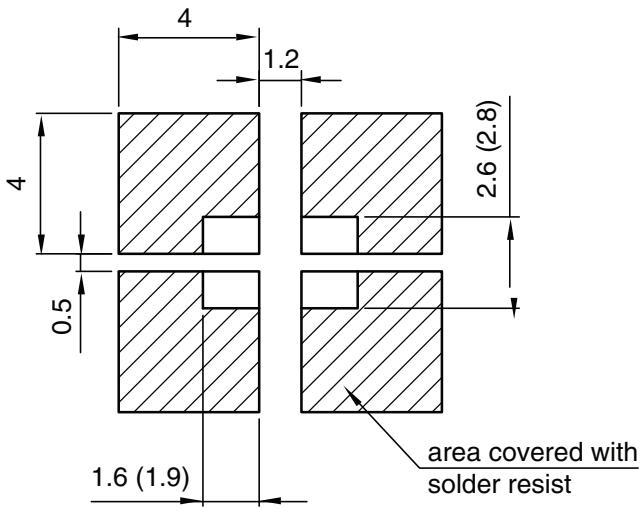
PACKAGE DIMENSIONS in millimeters







Mounting Pad Layout



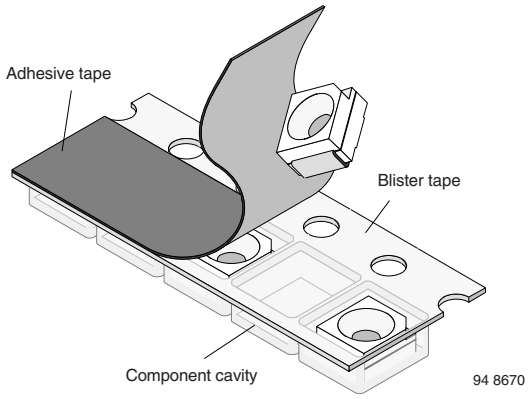
Dimensions: IR and Vaporphase
(Wave Soldering)

Drawing-No.: 6.541-5057.01-4
Issue: 5; 30.05.07
19899

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...

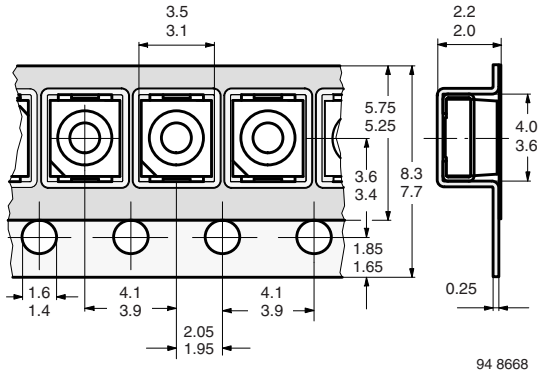


Fig. 15 - Tape Dimensions in mm for PLCC-2

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

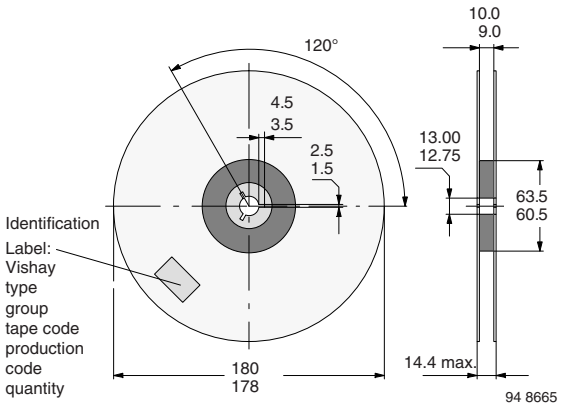


Fig. 16 - Reel Dimensions - GS08

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

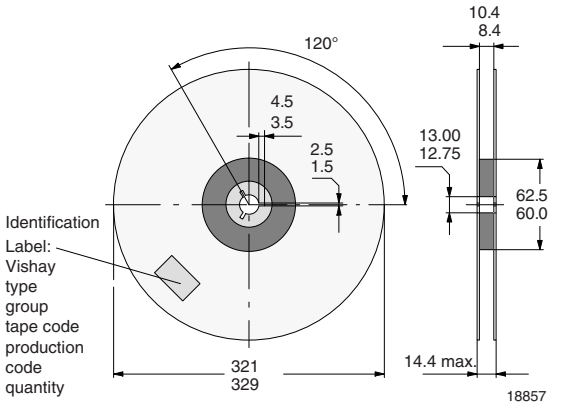


Fig. 17 - Reel Dimensions - GS18

SOLDERING PROFILE

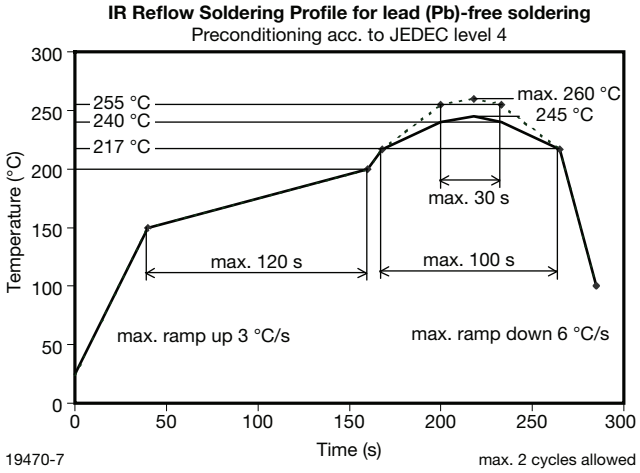


Fig. 18 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

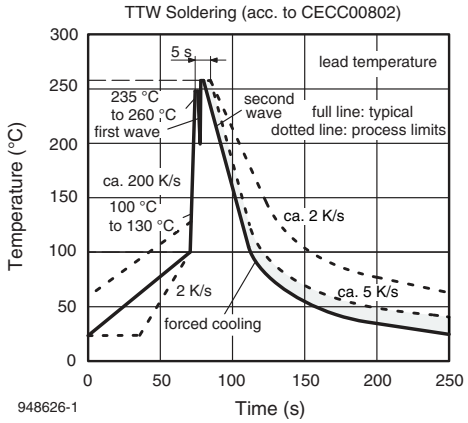
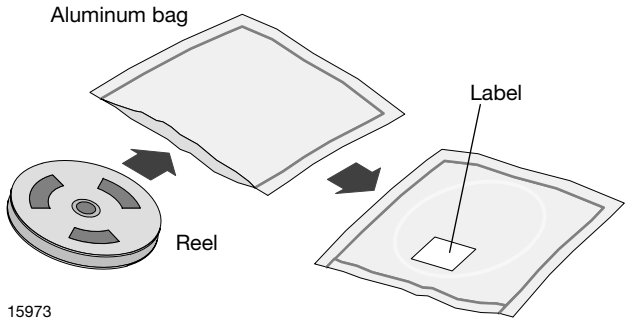


Fig. 19 - Double Wave Soldering of Opto Devices (all Packages)

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 aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

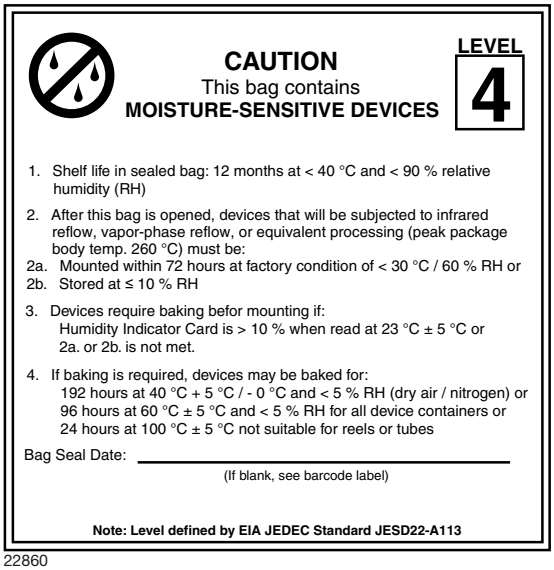
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 72 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 4 label is included on all dry bags.



Example of JESD22-A112 level 4 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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