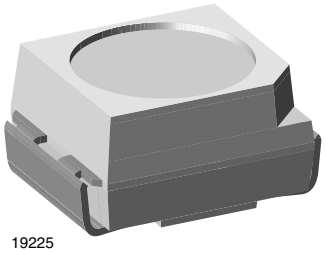
Power SMD LED PLCC-2



19225

DESCRIPTION

This device has been designed to meet the increasing demand for white SMD LED.

The package of the VLMW33.. is the PLCC-2.

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled with a mixture of epoxy and TAG phosphor.

The TAG phosphor converts the blue emission partially to yellow, which mixes with the remaining blue to give white.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-2
- Product series: power
- Angle of half intensity: ± 60°

FEATURES

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

- High efficient InGaN technology
- Chromaticity coordinate categorized according to CIE1931 per packing unit
- Typical color temperature 5500 K
- ESD-withstand voltage: up to 1 kV according to JESD22-A114-B
- EIA and ICE standard package
- Compatible with IR-reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020
- Available in 8 mm tape reel
- Preconditioning according to JEDEC® level 2a
- 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
- Backlighting for audio and video equipment
- Backlighting in office equipment
- Indoor and outdoor message boards
- Flat backlight for LCDs, switches, and symbols
- Illumination purposes, alternative to incandescent lamps
- General use

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I_F (mA)	COORDINATE (x, y)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMW33S2V1-5K8L-08	White	224	635	900	20	-	0.33, 0.33	-	20	-	3.7	4.2	20	InGaN / TAG on SiC
VLMW33U2AA-5K8L-08	White	560	650	1400	20	-	0.33, 0.33	-	20	-	3.7	4.2	20	InGaN / TAG on SiC
VLMW33U2AA-5K8L-18	White	560	650	1400	20	-	0.33, 0.33	-	20	-	3.7	4.2	20	InGaN / TAG on SiC

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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) **VLMW33..**				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage (1)		V_R	5	V
DC forward current	$T_{amb} \leq 70$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	0.1	A
Power dissipation		P_V	127	mW
Junction temperature		T_j	110	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Operating temperature range		T_{amb}	-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 the LED in reverse direction is suitable for short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMW33.., WHITE**							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMW33S2V1	I_V	224	635	900	mcd
		VLMW33U2AA	I_V	560	650	1400	mcd
Chromaticity coordinate x acc. to CIE 1931	I_F = 20 mA	VLMW33..	x	-	0.33	-	
Chromaticity coordinate y acc. to CIE 1931	I_F = 20 mA	VLMW33..	y	-	0.33	-	
Angle of half intensity	I_F = 20 mA		φ	-	± 60	-	°
Forward voltage	I_F = 20 mA		V_F	-	3.7	4.2	V
Reverse voltage	I_R = 10 µA		V_R	5	-	-	V
Temperature coefficient of V_F	I_F = 20 mA		TC_{VF}	-	-4	-	mV/K
Temperature coefficient of I_V	I_F = 20 mA		TC_{IV}	-	-0.5	-	%/K

LUMINOUS INTENSITY CLASSIFICATION			
GROUP	**LIGHT INTENSITY (mcd)**		
STANDARD	**OPTIONAL**	**MIN.**	**MAX.**
S	1	180	224
	2	224	280
T	1	280	355
	2	355	450
U	1	450	560
	2	560	710
V	1	710	900
	2	900	1120
AA	1	1120	1400

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**
VLMW33S2V1	LWT67C-S2V1

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CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED						
	X	Y			X	Y
5L	0.291	0.268		7L	0.330	0.330
	0.285	0.279			0.330	0.347
	0.307	0.312			0.347	0.371
	0.310	0.297			0.345	0.352
5K	0.296	0.259		7K	0.330	0.310
	0.291	0.268			0.330	0.330
	0.310	0.297			0.338	0.342
	0.313	0.284			0.352	0.344
6L	0.310	0.297		8L	0.345	0.352
	0.307	0.312			0.347	0.371
	0.330	0.347			0.367	0.401
	0.330	0.330			0.364	0.380
6K	0.313	0.284		8K	0.352	0.344
	0.310	0.297			0.338	0.342
	0.330	0.330			0.364	0.380
	0.330	0.310			0.360	0.357

Note

- Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ± 0.01

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

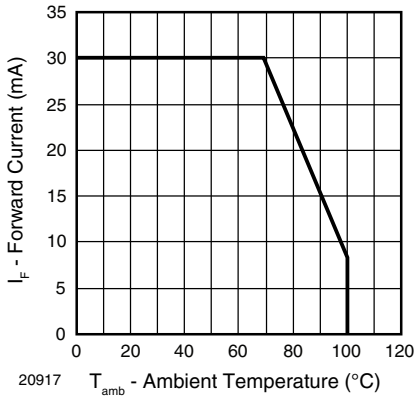


Fig. 1 - Forward Current vs. Ambient Temperature

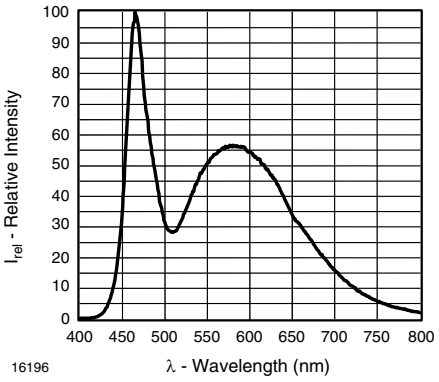


Fig. 3 - Relative Intensity vs. Wavelength

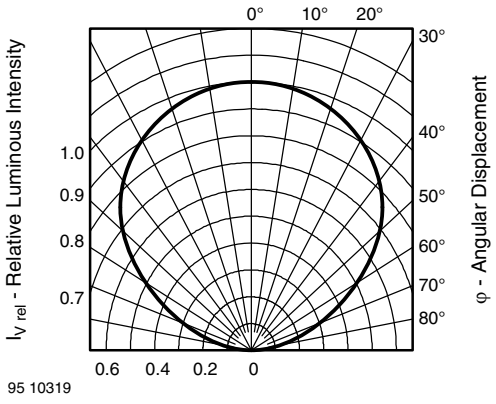


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

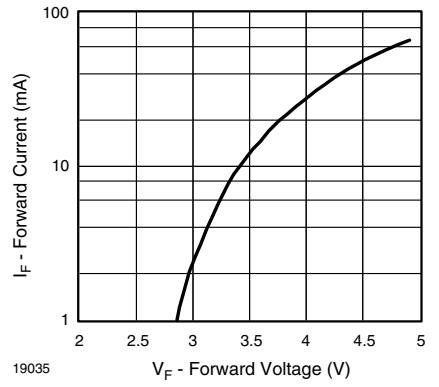


Fig. 4 - Forward Current vs. Forward Voltage

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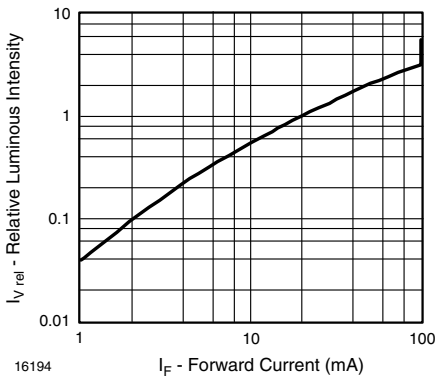


Fig. 5 - Relative Luminous Intensity vs. Forward Current

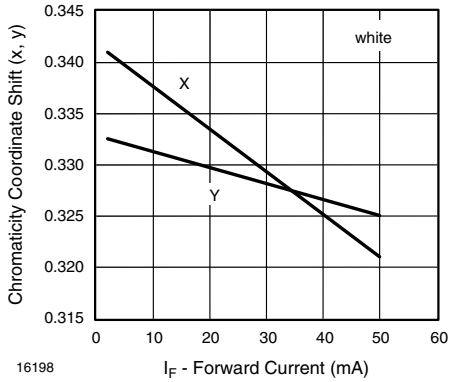


Fig. 8 - Chromaticity Coordinate Shift vs. Forward Current

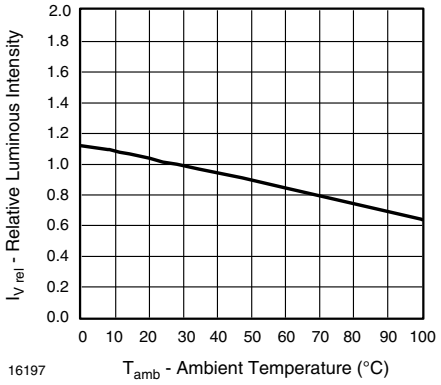


Fig. 6 - Relative Luminous Intensity vs. Ambient Temperature

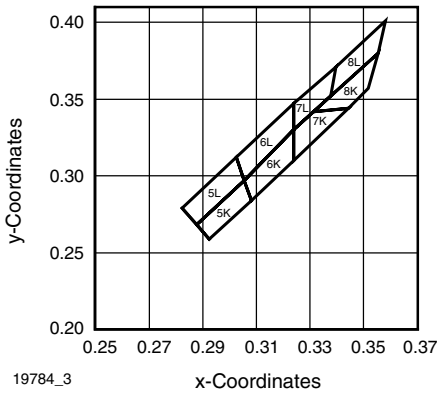


Fig. 9 - Coordinates of Colorgroups

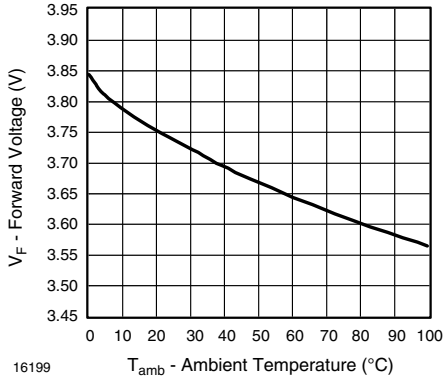
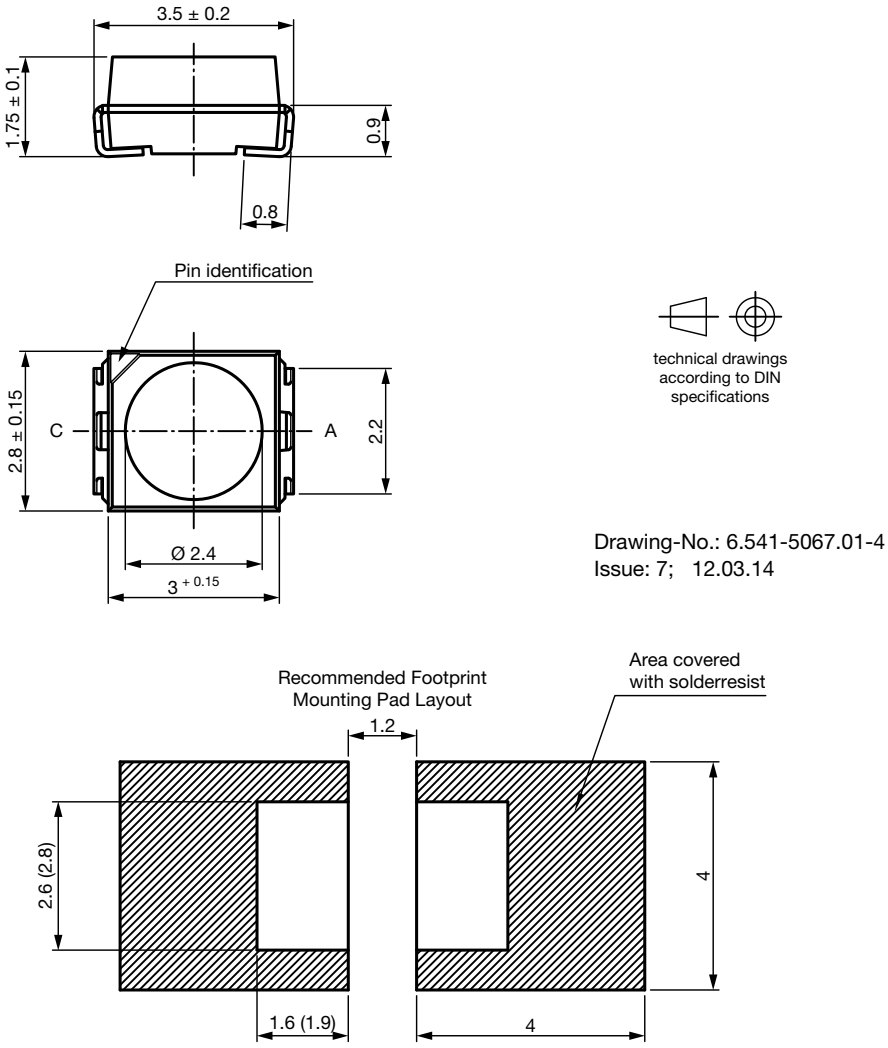


Fig. 7 - Forward Voltage vs. Ambient Temperature

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PACKAGE DIMENSIONS in millimeters



PACKING INFORMATION			
PART	**PIECES PER REEL**	**REELS PER BOX**	**MOQ (1)**
VLMW33xx-xxxx-08	1500	5	7500
VLMW33xx-xxxx-18	8000	1	8000

Note

(1) MOQ = minumum order quantity

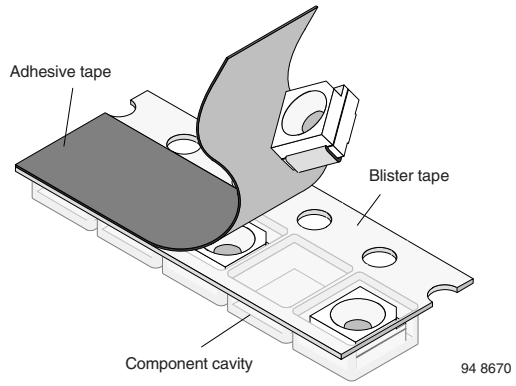
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METHOD OF TAPING / POLARITY AND TAPE AND REEL

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...

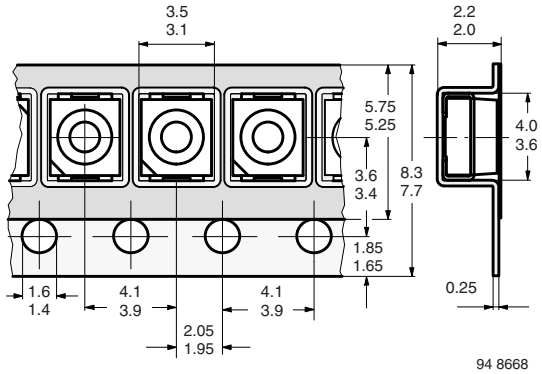


Fig. 10 - Tape Dimensions in mm for PLCC-2

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

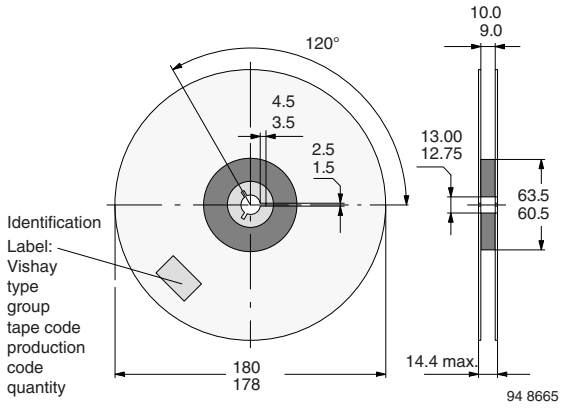


Fig. 11 - Reel Dimensions - GS08

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

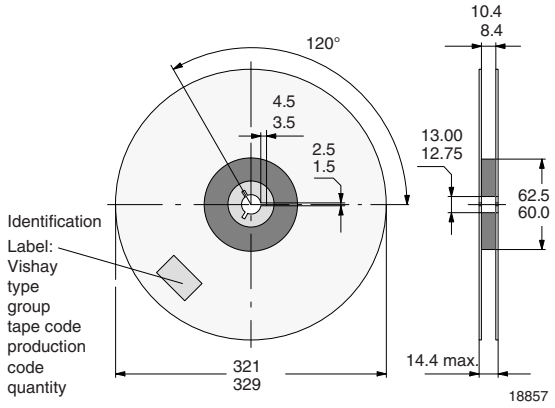


Fig. 12 - Reel Dimensions - GS18

SOLDERING PROFILE

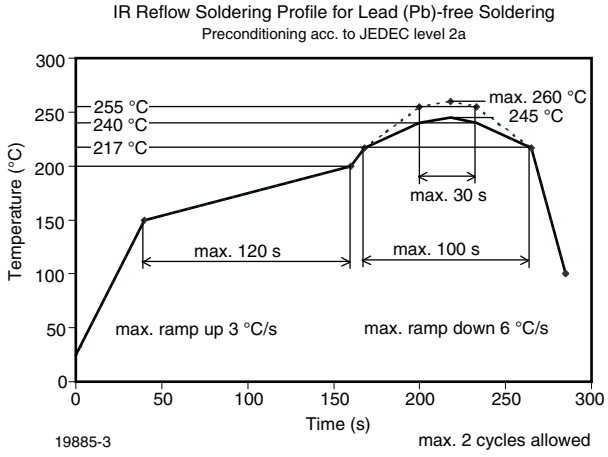


Fig. 13 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020)

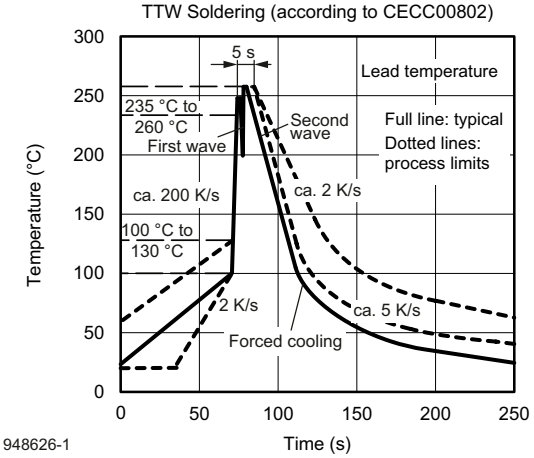
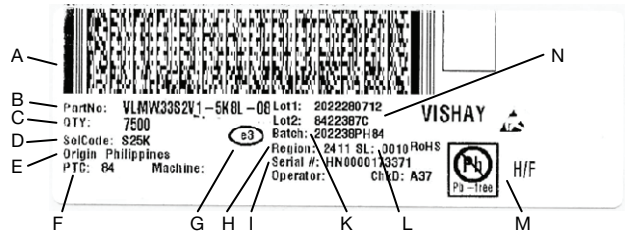


Fig. 14 - Double Wave Soldering of Opto Devices (all packages)

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BAR CODE PRODUCT LABEL (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

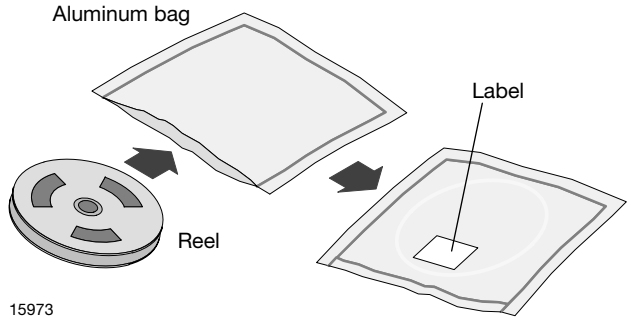
L. SL: storage location

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.



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:

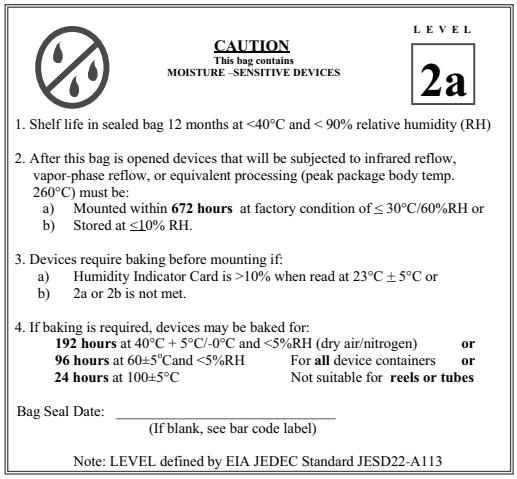
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

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. 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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