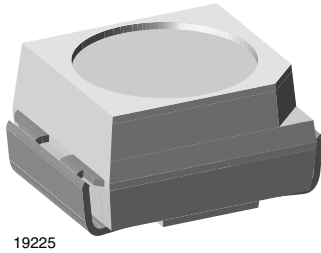




**THE DATASHEET OF
VLMW41S1T1-5K8L-08**



Standard SMD LED PLCC-2



19225

DESCRIPTION

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

The package of the VLMW41.. 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: standard
- Angle of half intensity: $\pm 60^\circ$

FEATURES

- High efficient InGaN technology
- Chromaticity coordinate categorized according to CIE1931 per packing unit
- Typical color temperature 5500 K
- EIA and ICE standard package
- Compatible with 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
- 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

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Camera flash light
- Signal and symbol luminaire
- Marker lights
- Interior and exterior automotive lighting: brake lights, turn lights, backlighting, side markers
- Indicator lighting

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. | | |
| VLMW41S1T1-5K8L-08 | White | 180 | 275 | 355 | 10 | - | 0.33, 0.33 | - | 10 | - | 3.3 | 4.2 | 10 | InGaN / TAG on sapphire |
| VLMW41S1T1-5K8L-18 | White | 180 | 275 | 355 | 10 | - | 0.33, 0.33 | - | 10 | - | 3.3 | 4.2 | 10 | InGaN / TAG on sapphire |
| VLMW41R1T1-5K8L-08 | White | 112 | 275 | 355 | 10 | - | 0.33, 0.33 | - | 10 | - | 3.3 | 4.2 | 10 | InGaN / TAG on sapphire |
| VLMW41R1T1-5K8L-18 | White | 112 | 275 | 355 | 10 | - | 0.33, 0.33 | - | 10 | - | 3.3 | 4.2 | 10 | InGaN / TAG on sapphire |
| VLMW41S1T2-7K8L-08 | White | 180 | 275 | 450 | 10 | - | 0.33, 0.33 | - | 10 | - | 3.3 | 4.2 | 10 | InGaN / TAG on sapphire |



| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | |
|--|--|------------|-------------|--------------------|
| VLMW41.. | | | | |
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| DC forward current | $T_{amb} \leq 80\text{ }^{\circ}\text{C}$ | I_F | 20 | mA |
| Surge forward current | $t_p \leq 10\text{ }\mu\text{s}$ | I_{FSM} | 0.1 | A |
| Power dissipation | | P_V | 84 | mW |
| Junction temperature | | T_j | 110 | $^{\circ}\text{C}$ |
| Storage temperature range | | T_{stg} | -40 to +100 | $^{\circ}\text{C}$ |
| Operating temperature range | | T_{amb} | -40 to +100 | $^{\circ}\text{C}$ |
| Thermal resistance junction to ambient | Mounted on PC board (pad size > 16 mm ²) | R_{thJA} | 360 | K/W |

| OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|----------------------|------------|-----------|------|----------|------|------------|
| VLMW41.., WHITE | | | | | | | |
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Luminous intensity | $I_F = 10\text{ mA}$ | VLMW41R1T1 | I_V | 112 | 275 | 355 | mcd |
| | | VLMW41S1T1 | I_V | 180 | 275 | 355 | mcd |
| | | VLMW41S1T2 | I_V | 180 | 275 | 450 | mcd |
| Chromatically coordinate x acc. to CIE 1931 | $I_F = 10\text{ mA}$ | VLMW41.. | x | - | 0.33 | - | |
| Chromatically coordinate y acc. to CIE 1931 | $I_F = 10\text{ mA}$ | VLMW41.. | y | - | 0.33 | - | |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | ϕ | - | ± 60 | - | $^{\circ}$ |
| Forward voltage | $I_F = 20\text{ mA}$ | | V_F | - | 3.3 | 4.2 | V |
| Temperature coefficient of V_F | $I_F = 10\text{ mA}$ | | TC_{VF} | - | -3 | - | mV/K |
| Temperature coefficient of I_V | $V_R = 5\text{ V}$ | | TC_{IV} | - | -0.4 | - | %/K |

Note

- Not designed for reverse operation

| LUMINOUS INTENSITY CLASSIFICATION | | | |
|--|--------------------------|------|------|
| GROUP | LUMINOUS INTENSITY (mcd) | | |
| | OPTIONAL | MIN. | MAX. |
| R | 1 | 112 | 140 |
| | 2 | 140 | 180 |
| S | 1 | 180 | 224 |
| | 2 | 224 | 280 |
| T | 1 | 280 | 355 |
| | 2 | 355 | 450 |

| CROSSING TABLE | |
|-----------------------|----------|
| VISHAY | OSRAM |
| VLMW41.. | LWT67C.. |

Note

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of $\pm 11\%$.
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

| 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

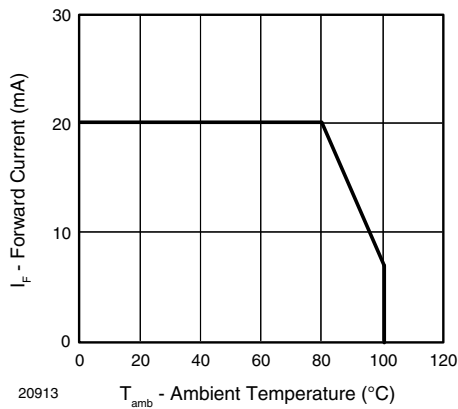
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

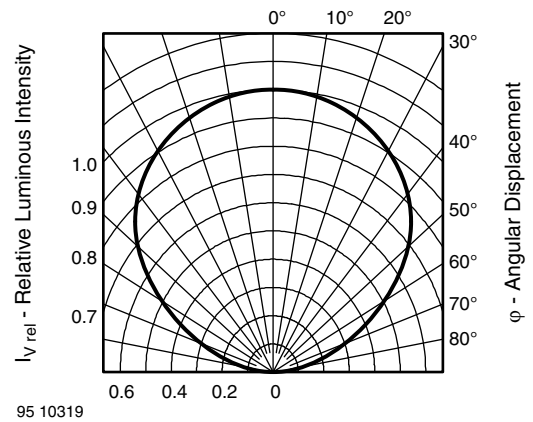
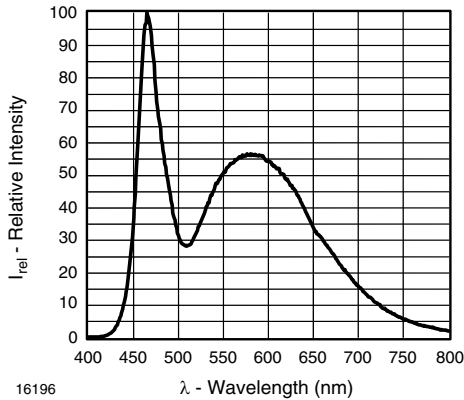
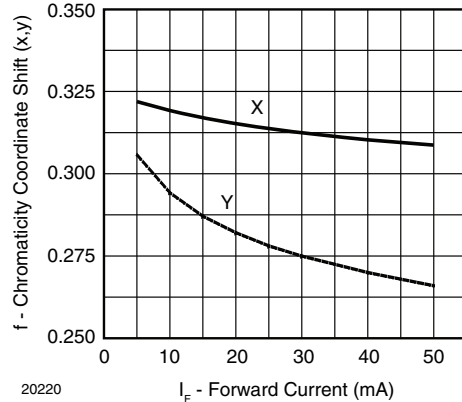


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement



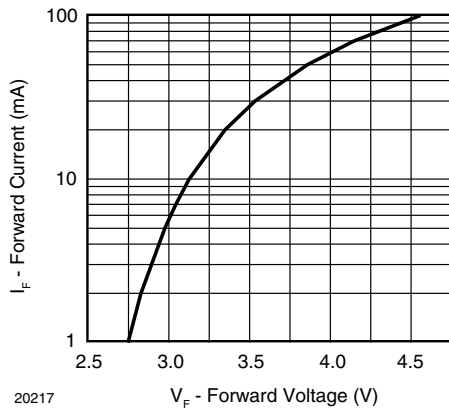
16196

Fig. 3 - Relative Intensity vs. Wavelength



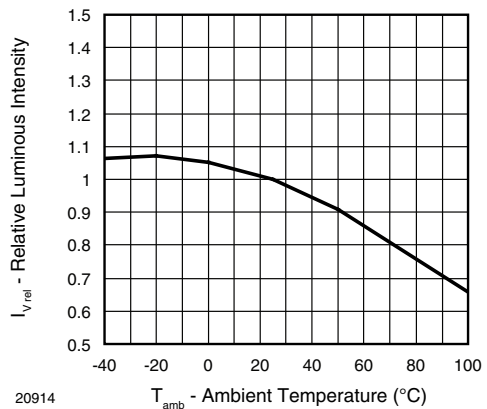
20220

Fig. 6 - Chromaticity Coordinate Shift vs. Forward Current



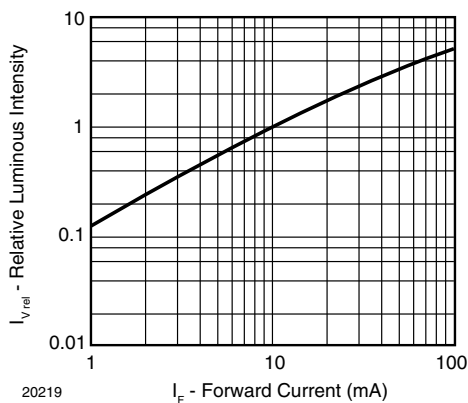
20217

Fig. 4 - Forward Current vs. Forward Voltage



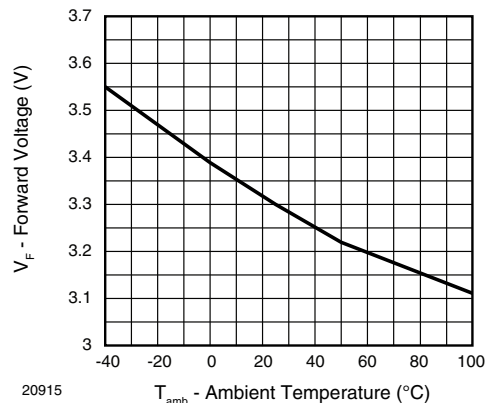
20914

Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature



20219

Fig. 5 - Relative Luminous Intensity vs. Forward Current



20915

Fig. 8 - Forward Voltage vs. Ambient Temperature

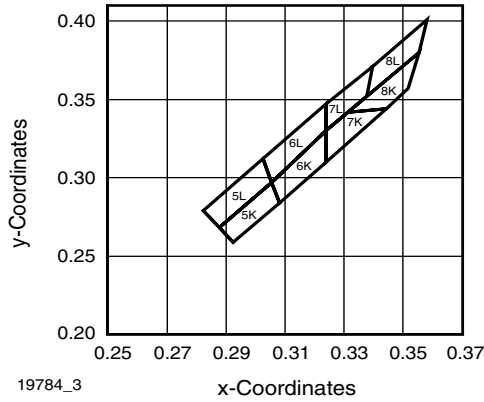
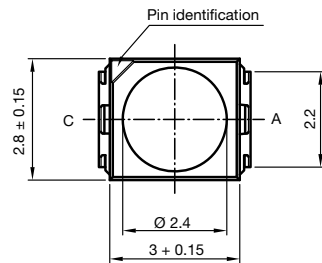
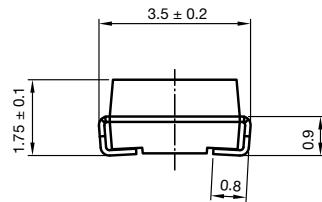


Fig. 9 - Coordinates of Colorgroups

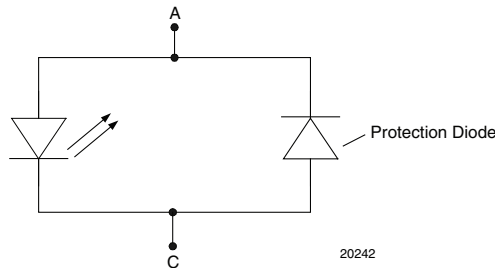
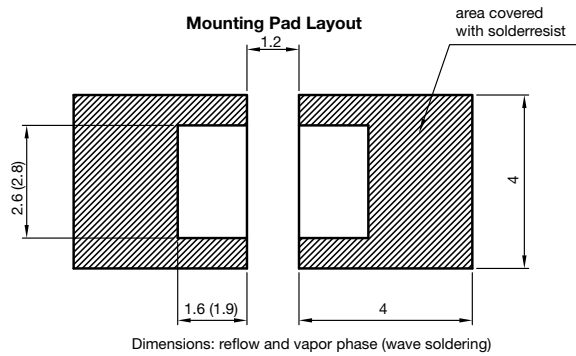
PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications

Dimensions in mm

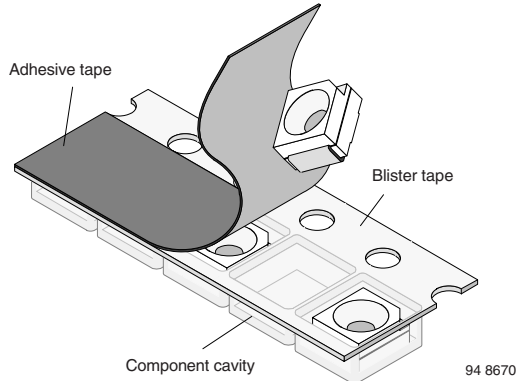
Drawing-No.: 6.541-5089.01-4
Issue: 2; 23.09.13



METHOD OF TAPING / POLARITY AND TAPE AND REEL

SMD LED (VLM.3.../.4... - 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.



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

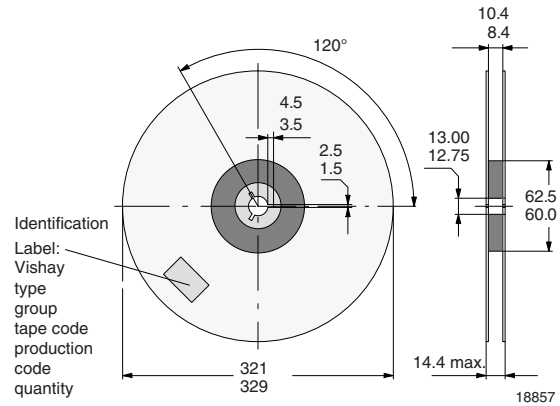


Fig. 12 - Reel Dimensions - GS18

TAPING OF VLM.3.../.4...

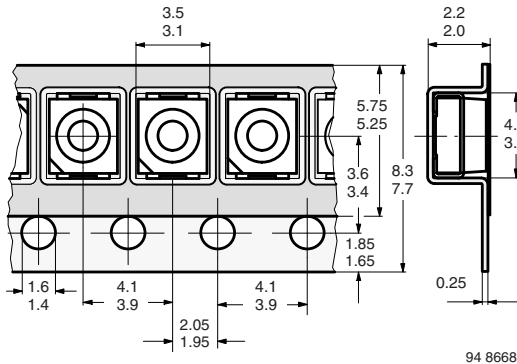


Fig. 10 - Tape Dimensions in mm for PLCC-2

SOLDERING PROFILE

IR Reflow Soldering Profile for Lead (Pb)-free Soldering
Preconditioning acc. to JEDEC level 2a

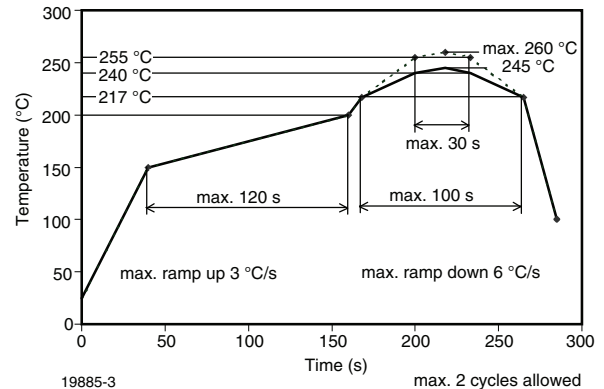


Fig. 13 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020)

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

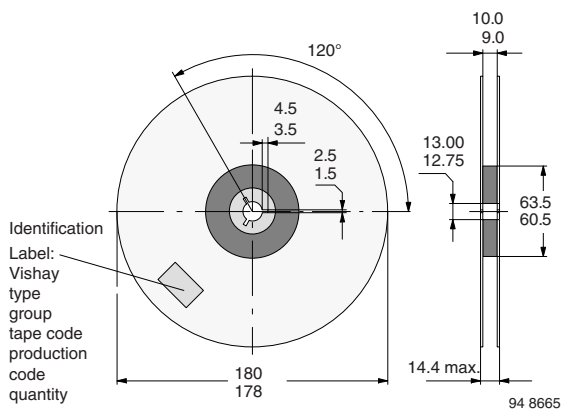


Fig. 11 - Reel Dimensions - GS08

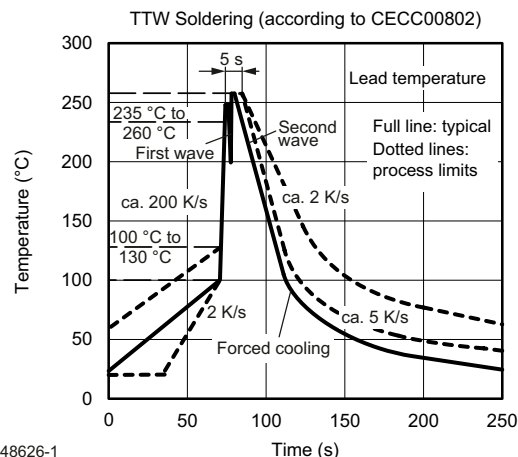
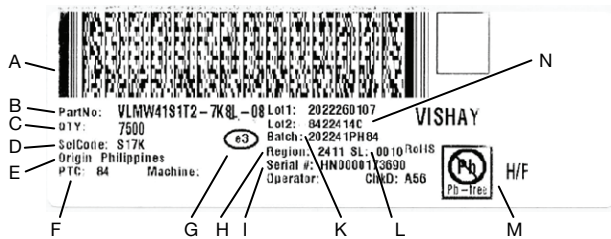


Fig. 14 - Double Wave Soldering of Opto Devices (all packages)

| PACKING INFORMATION | | | |
|---------------------|-----------------|---------------|--------------------|
| PART | PIECES PER REEL | REELS PER BOX | MOQ ⁽¹⁾ |
| VLMW41xxxx-xxxx-08 | 1500 | 5 | 7500 |
| VLMW41xxxx-xxxx-18 | 8000 | 1 | 8000 |

Note

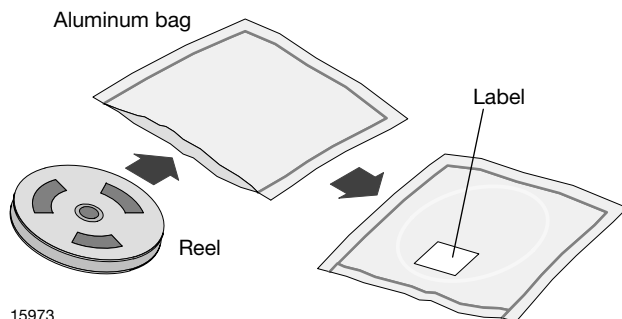
⁽¹⁾ MOQ = minimum order quantity

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.



15973

FINAL PACKING

The sealed reel is packed into a cardboard box. A secondary cardboard box is used for shipping purposes.

RECOMMENDED METHOD OF STORAGE

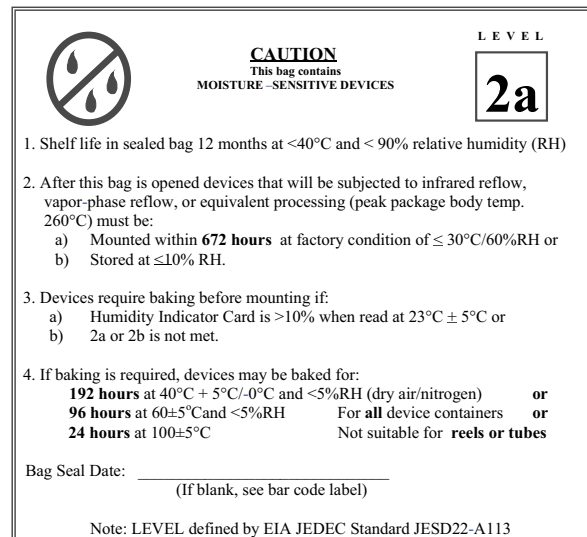
Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- 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

19786



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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