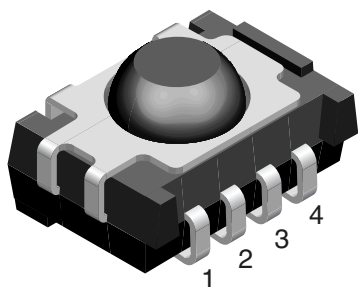


Silicon PIN Photodiode



16797

LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

VEMD8130 is a high speed and high sensitive PIN photodiode. It is a miniature surface-mount device (SMD) including the chip with a 2.2 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength between 870 nm and 950 nm.

FEATURES

- Package type: surface-mount
- Package form: top view and side view
- Dimensions (L x W x H in mm): 7.5 x 5.3 x 4.0
- Radiant sensitive area (in mm²): 2.2
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 45^\circ$
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

MECHANICAL DATA

1 = connection for shielding, 2 = cathode, 3 = anode, 4 = n.c.

ORDERING CODE

Taping:

VEMD81...TT - top view taped
VEMD81...TR - side view taped

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	ϕ (°)	$\lambda_{0.5}$ (nm)
VEMD8130	25	± 45	800 to 1050

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VEMD8130	Tape and reel	MOQ: 1190 pcs, 1190 pcs/reel	Top view
		MOQ: 1120 pcs, 1120 pcs/reel	Side view

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	60	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_V	215	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	-25 to +85	$^\circ\text{C}$
Storage temperature range		T_{stg}	-25 to +85	$^\circ\text{C}$
Soldering temperature	According to reflow solder profile Fig. 7	T_{sd}	260	$^\circ\text{C}$

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50\text{ mA}$	V_F	-	1	1.3	V
Breakdown voltage	$I_R = 100\text{ }\mu\text{A}$, $E = 0$	$V_{(BR)}$	60	-	-	V
Reverse dark current	$V_R = 10\text{ V}$, $E = 0$	I_{ro}	-	2	30	nA
Diode capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_D	-	18	-	pF
	$V_R = 3\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_D	-	7	40	pF
Reverse light current	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$	I_{ra}	20	25	-	μA
Angle of half sensitivity		ϕ	-	± 45	-	$^{\circ}$
Wavelength of peak sensitivity		λ_p	-	940	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	800 to 1050	-	nm
Rise time	$V_R = 5\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 870\text{ nm}$	t_r	-	625	-	ns
Fall time	$V_R = 5\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 870\text{ nm}$	t_f	-	670	-	ns

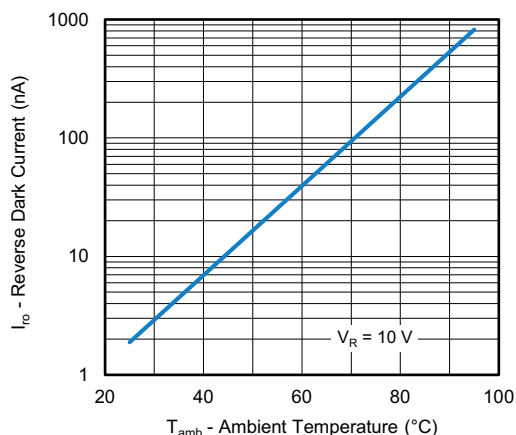
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

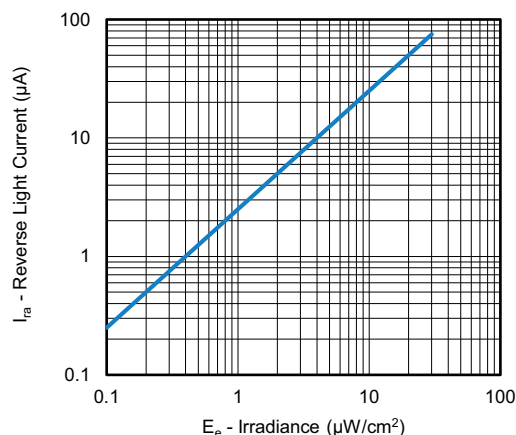


Fig. 3 - Reverse Light Current vs. Irradiance

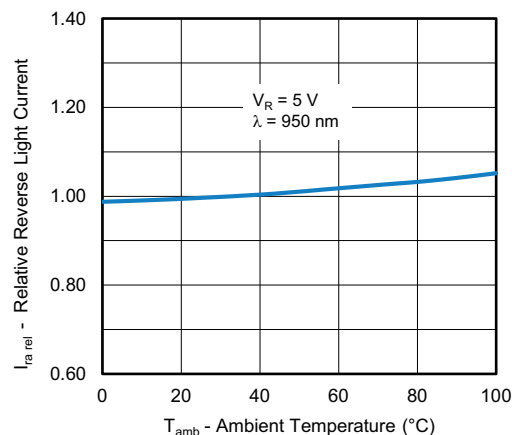


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

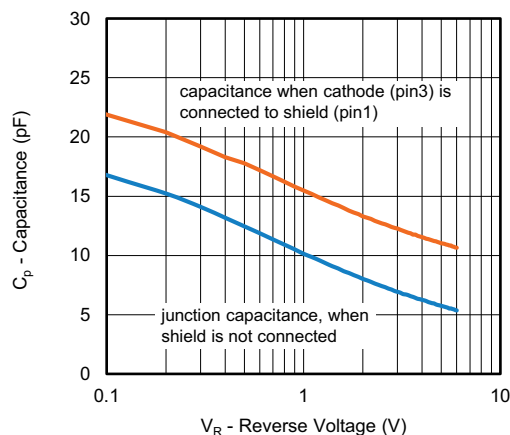


Fig. 4 - Diode Capacitance vs. Reverse Voltage

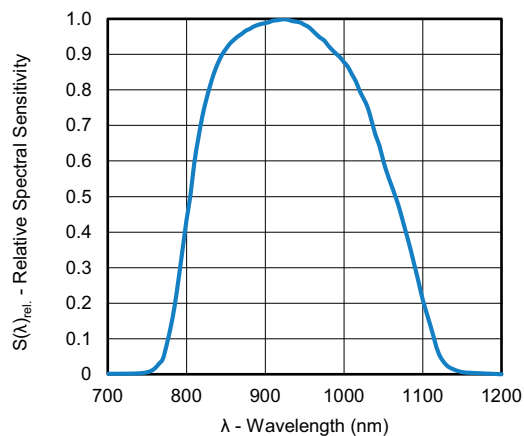


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

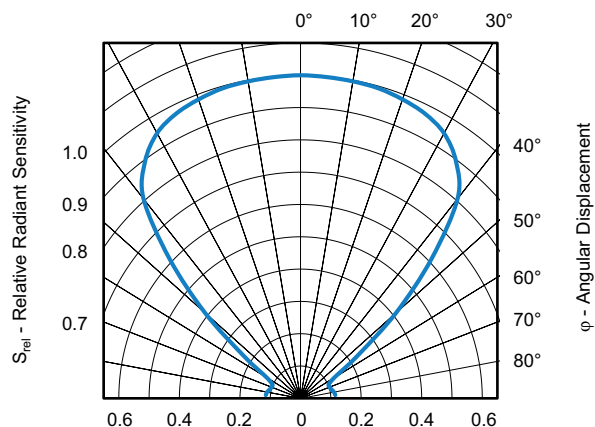
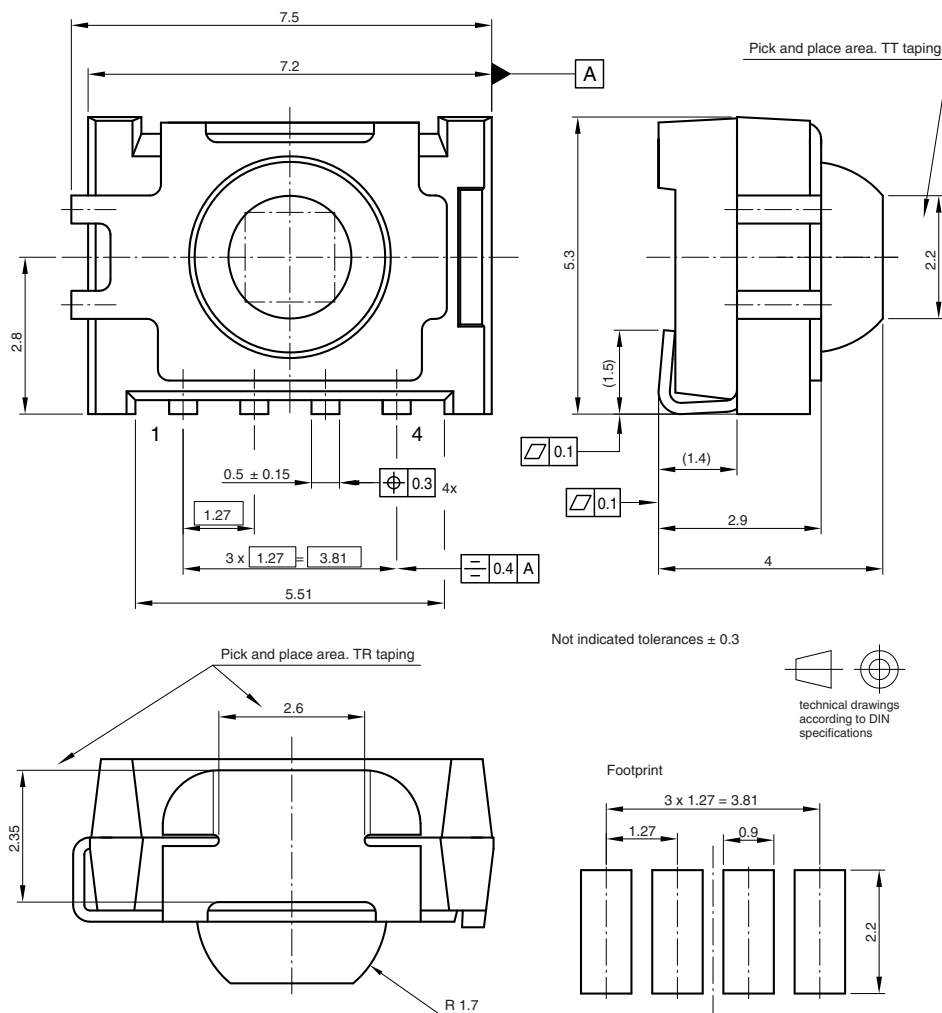


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters


Drawing-No.: 6.544-5341.01-4

Issue: 8; 02.09.09

16776

ASSEMBLY INSTRUCTIONS

Reflow Soldering

- Reflow soldering must be done within 72 h while stored under a max. temperature of 30 °C, 60 % RH after opening the dry pack envelope
- Set the furnace temperatures for pre-heating and heating in accordance with the reflow temperature profile as shown in the diagram. Exercise extreme care to keep the maximum temperature below 260 °C. The temperature shown in the profile means the temperature at the device surface. Since there is a temperature difference between the component and the circuit board, it should be verified that the temperature of the device is accurately being measured
- Handling after reflow should be done only after the work surface has been cooled off

Manual Soldering

- Use a soldering iron of 25 W or less. Adjust the temperature of the soldering iron below 300 °C
- Finish soldering within 3 s
- Handle products only after the temperature has cooled off

TAPING DIMENSIONS VEMD8130TT in millimeters

VISHAY LEAD (Pb)-FREE REFLOW SOLDER PROFILE

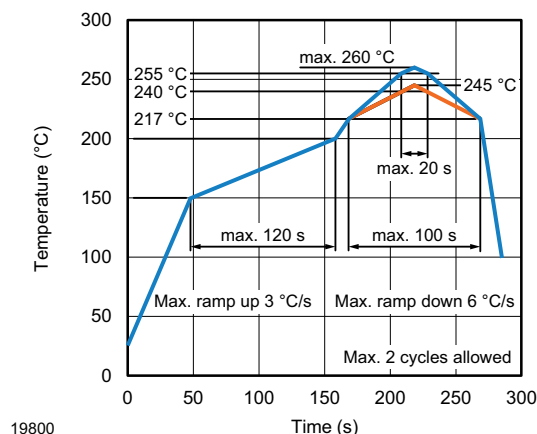
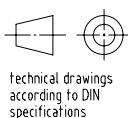
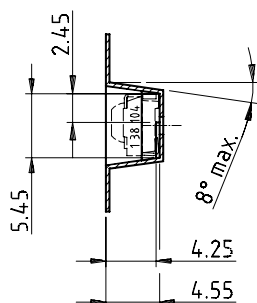


Fig. 7



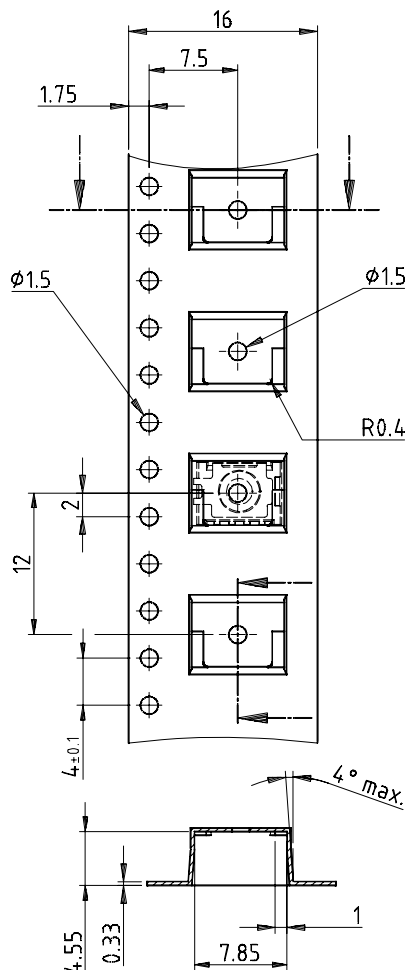
Technical drawings
according to DIN
specifications



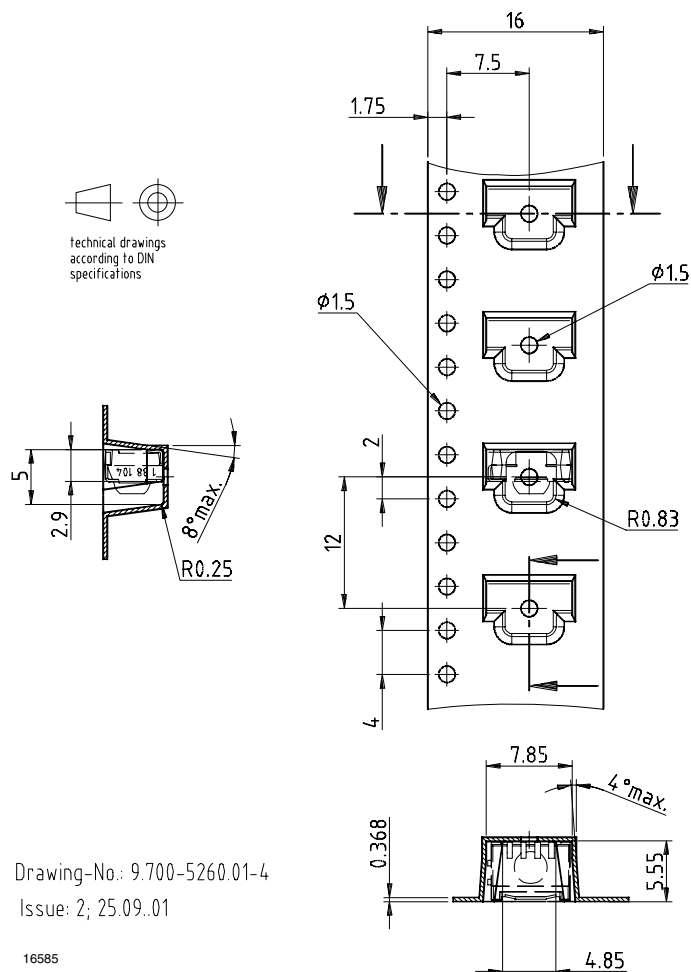
Drawing-No.: 9.700-5259.01-4

Issue: 1; 05.09.01

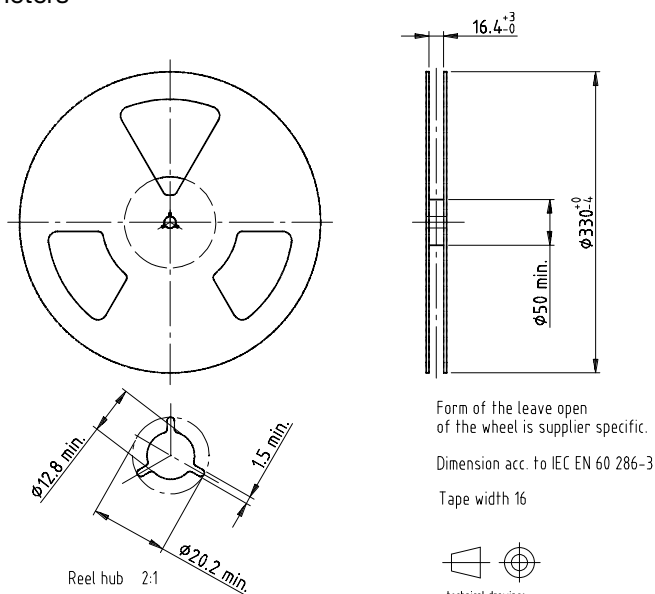
16584



TAPING DIMENSIONS VEMD8130TR in millimeters



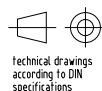
REEL DIMENSIONS in millimeters



Form of the leave open
of the wheel is supplier specific.

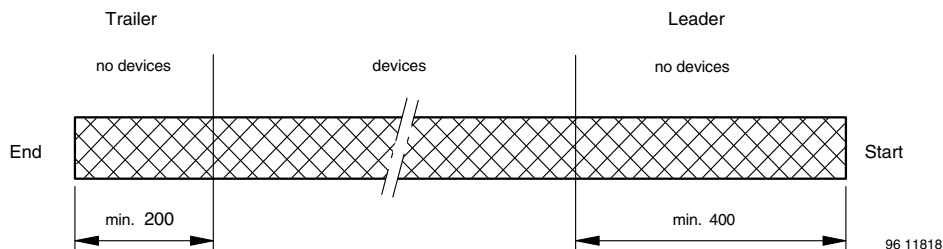
Dimension acc. to IEC EN 60 286-3

Tape width 16



Drawing-No.: 9.800-5052.V2-4
Issue: 1: 07.05.02

16734

LEADER AND TRAILER DIMENSIONS in millimeters

COVER TAPE PEEL STRENGTH

According to DIN EN 60286-3

0.1 N to 1.3 N

300 mm/min. $\pm$ 10 mm/min.

165° to 180° peel angle

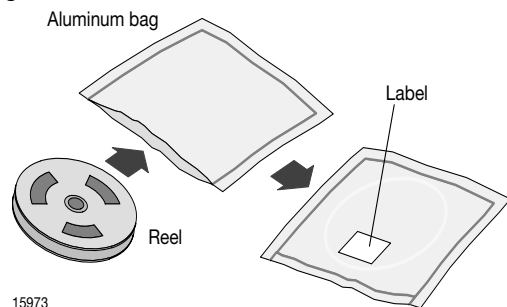
LABEL
Standard bar code labels for finished goods

The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

VISHAY SEMICONDUCTOR GMBH STANDARD BAR CODE PRODUCT LABEL (finished goods)		
PLAIN WRITING	ABBREVIATION	LENGTH
Item-description	-	18
Item-number	INO	8
Selection-code	SEL	3
LOT-/serial-number	BATCH	10
Data-code	COD	3 (YWW)
Plant-code	PTC	2
Quantity	QTY	8
Accepted by	ACC	-
Packed by	PCK	-
Mixed code indicator	MIXED CODE	-
Origin	xxxxxxx+	Company logo
LONG BAR CODE TOP	TYPE	LENGTH
Item-number	N	8
Plant-code	N	2
Sequence-number	X	3
Quantity	N	8
Total length	-	21
SHORT BAR CODE BOTTOM	TYPE	LENGTH
Selection-code	X	3
Data-code	N	3
Batch-number	X	10
Filter	-	1
Total length	-	17

**DRY PACKING**

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



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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 125 °C + 5 °C not suitable for reel or tubes.

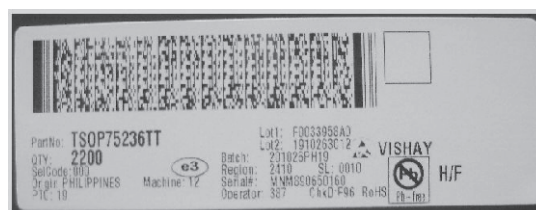
An EIA JEDEC® standard JESD22-A112 level 4 label is included on all dry bags.

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.

BAR CODE PRODUCT LABEL (example)

22178

	CAUTION This bag contains MOISTURE-SENSITIVE DEVICES	LEVEL 4					
	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. 220°C) must be: 2a. Mounted within 72 hours at factory condition of ≤ 30°C/60%RH or 2b. Stored at ≤20% RH. 3. Devices require baking before mounting if: Humidity Indicator Card is >20% when read at 23°C ± 5°C or 2a or 2b is not met. 4. If baking is required, devices may be baked for: <table border="0"> <tr> <td>192 hours at 40°C + 5°C/-0°C and <5%RH (dry air/nitrogen)</td> <td>or</td> </tr> <tr> <td>96 hours at 60±5°C and <5%RH</td> <td>For all device containers</td> </tr> <tr> <td>24 hours at 125±5°C</td> <td>Not suitable for reels or tubes</td> </tr> </table> Bag Seal Date: _____ (If blank, see bar code label) Note: LEVEL defined by EIA JEDEC Standard JESD22-A112		192 hours at 40°C + 5°C/-0°C and <5%RH (dry air/nitrogen)	or	96 hours at 60±5°C and <5%RH	For all device containers	24 hours at 125±5°C
192 hours at 40°C + 5°C/-0°C and <5%RH (dry air/nitrogen)	or						
96 hours at 60±5°C and <5%RH	For all device containers						
24 hours at 125±5°C	Not suitable for reels or tubes						

16943

Example of JESD22-A112 level 4 label



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