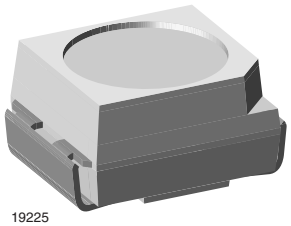
Power SMD LED PLCC-2



FEATURES

- Utilizing latest advanced AlInGaP technology
- Available in 8 mm tape
- Luminous intensity and color categorized per packing unit
- Luminous intensity ratio per packing unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- Thermal resistance R = 400 K/W
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- Preconditioning: acc. to JEDEC level 2a
- Compatible with reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- AEC-Q101 qualified
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)**

DESCRIPTION

The VLM.333.. series is an advanced modification of the Vishay VLM.31.. series. It is designed to incorporate larger chips, therefore, capable of withstanding a 50 mA drive current.

The package of the VLM.333.. is the PLCC-2.

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

PRODUCT GROUP AND PACKAGE DATA

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

APPLICATIONS

- Traffic signals and signs
- Interior and exterior lighting
- Dashboard illumination
- Indicator and backlighting purposes for audio, video, LCDs switches, symbols, illuminated advertising etc

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
VLMS333T2V2-GS08	Super red, I_V = (355 to 1120) mcd	AlInGaP on Si
VLMS333T2V2-GS18	Super red, I_V = (355 to 1120) mcd	AlInGaP on Si
VLMR333U1AA-GS08	Red, I_V = (450 to 1400) mcd	AlInGaP on Si
VLMR333U1AA-GS18	Red, I_V = (450 to 1400) mcd	AlInGaP on Si
VLMK333U2AB-GS08	Amber, I_V = (560 to 1800) mcd	AlInGaP on Si
VLMK333U2AB-GS18	Amber, I_V = (560 to 1800) mcd	AlInGaP on Si
VLMO333U2AB-GS08	Soft orange, I_V = (560 to 1800) mcd	AlInGaP on Si
VLMO333U2AB-GS18	Soft orange, I_V = (560 to 1800) mcd	AlInGaP on Si
VLMY333U1AA-GS08	Yellow, I_V = (450 to 1400) mcd	AlInGaP on Si
VLMY333U1AA-GS18	Yellow, I_V = (450 to 1400) mcd	AlInGaP on Si

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

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) **VLM.333..**				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage [1]	Short term application only	V_R	5	V
DC Forward current	$T_{amb} \leq 73$ °C (400 K/W)	I_F	50	mA
Power dissipation		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)	R_{thJA}	400	K/W

Note:
[1] Driving the LED in reverse direction is suitable for a short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMS333.., SUPER RED**							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMS333T2V2	I_V	355	550	1120	mcd
Luminous flux/luminous intensity			ϕ_V/I_V		3		mlm/mcd
Dominant wavelength	I_F = 20 mA		λ_d	626	630	639	nm
Peak wavelength	I_F = 20 mA		λ_p		639		nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 20 mA		$\Delta\lambda$		18		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F	1.8	2	2.6	V
Reverse current	V_R = 5 V		I_R		0.01	10	µA

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMR333.., RED**							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 20 mA	VLMR333U1AA	I_V	450	750	1400	mcd
Luminous flux/luminous intensity			ϕ_V/I_V		3		mlm/mcd
Dominant wavelength	I_F = 20 mA		λ_d	619	625	631	nm
Peak wavelength	I_F = 20 mA		λ_p		632		nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 20 mA		$\Delta\lambda$		18		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F	1.8	2	2.6	V
Reverse current	V_R = 5 V		I_R		0.01	10	µA

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMK333.., AMBER

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 20 mA	VLMK333U2AB	I_V	560	850	1800	mcd
Luminous flux/luminous intensity			ϕ_V/I_V		3		mlm/mcd
Dominant wavelength	I_F = 20 mA		λ_d	611	616	622	nm
Peak wavelength	I_F = 20 mA		λ_p		622		nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 20 mA		$\Delta\lambda$		18		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F	1.8	2.1	2.6	V
Reverse current	V_R = 5 V		I_R		0.01	10	µA

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMO333.., SOFT ORANGE

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 20 mA	VLMO333U2AB	I_V	560	950	1800	mcd
Luminous flux/luminous intensity			ϕ_V/I_V		3		mlm/mcd
Dominant wavelength	I_F = 20 mA		λ_d	600	605	611	nm
Peak wavelength	I_F = 20 mA		λ_p		611		nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 20 mA		$\Delta\lambda$		17		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F	1.8	2.1	2.6	V
Reverse current	V_R = 5 V		I_R		0.01	10	µA

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMY333.., YELLOW

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 20 mA	VLMY333U1AA	I_V	450	750	1400	mcd
Luminous flux/luminous intensity			ϕ_V/I_V		3		mlm/mcd
Dominant wavelength	I_F = 20 mA		λ_d	583	589	594	nm
Peak wavelength	I_F = 20 mA		λ_p		591		nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 20 mA		$\Delta\lambda$		17		nm
Angle of half intensity	I_F = 20 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F	1.8	2.15	2.6	V
Reverse current	V_R = 5 V		I_R		0.01	10	µA

COLOR CLASSIFICATION

GROUP	DOMINANT WAVELENGTH (nm)					
	AMBER		SOFT ORANGE		YELLOW	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
1	611	618				
2	614	622	600	603	583	586
3			602	605	585	588
4			604	607	587	590
5			606	609	589	592
6			608	611	591	594

Note:
Wavelengths are tested at a current pulse duration of 25 ms.

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LUMINOUS INTENSITY (mcd)		
STANDARD	OPTIONAL	MIN.	MAX.
T	2	355	450
U	1	450	560
	2	560	710
V	1	710	900
	2	900	1120
A	A	1120	1400
	B	1400	1800

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
VLMS333T2V2	LS T67F-T2V2-1-1
VLMR333U1AA	LR T67F-U1AA-1-1
VLMK333U2AB	LA T67F-U2AB-24-1
VLMO333U2AB	LO T67F-U2AB-24-1
VLMY333U1AA	LY T67F-U1AA-36-1

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

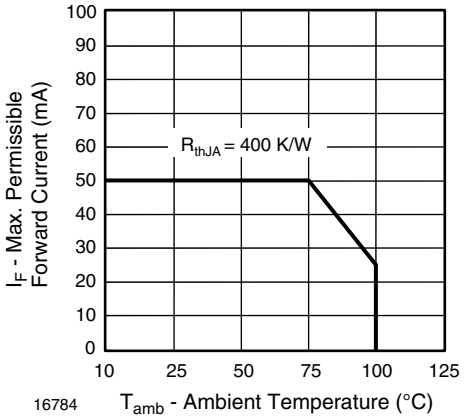


Figure 1. Max. Permissible Forward Current vs. Ambient Temperature

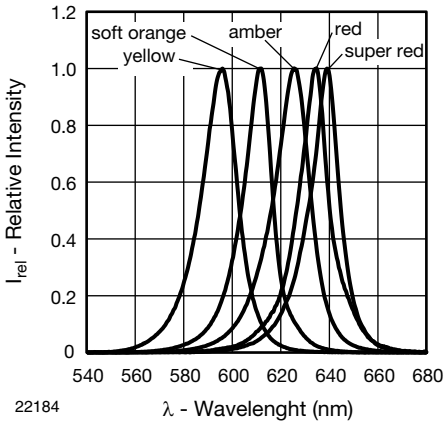


Figure 4. Relative Intensity vs. Wavelength

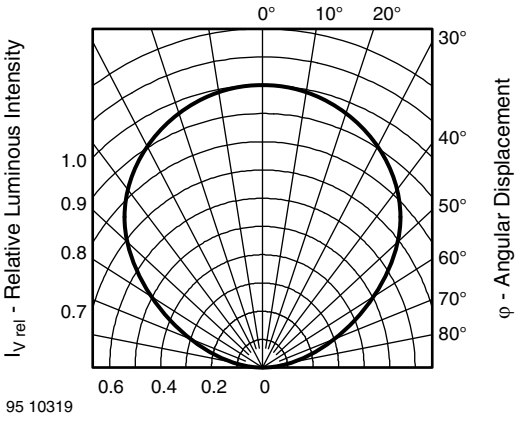


Figure 2. Rel. Luminous Intensity vs. Angular Displacement

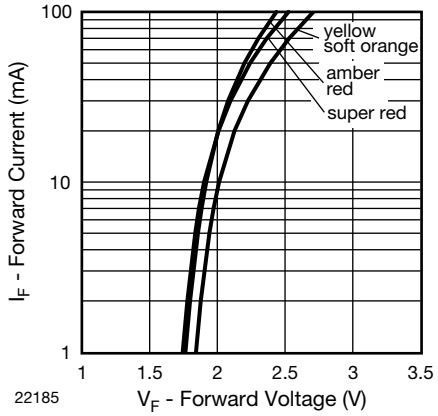


Figure 5. Forward Current vs. Forward Voltage

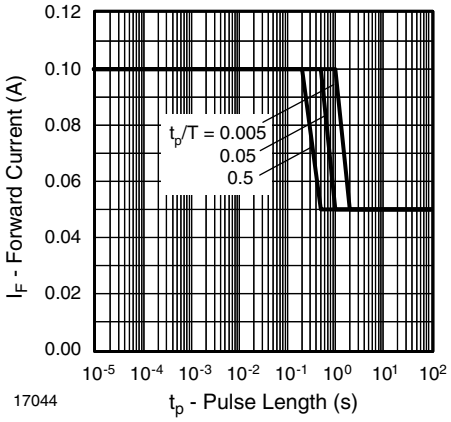


Figure 3. Forward Current vs. Pulse Length

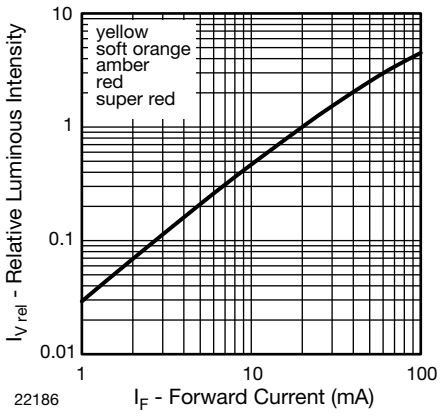


Figure 6. Relative Luminous Intensity vs. Forward Current

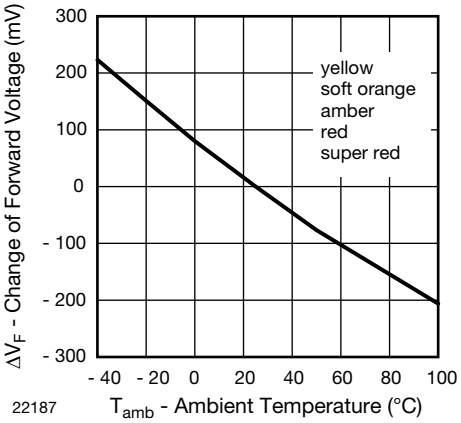


Figure 7. Change of Forward Voltage vs. Ambient Temperature

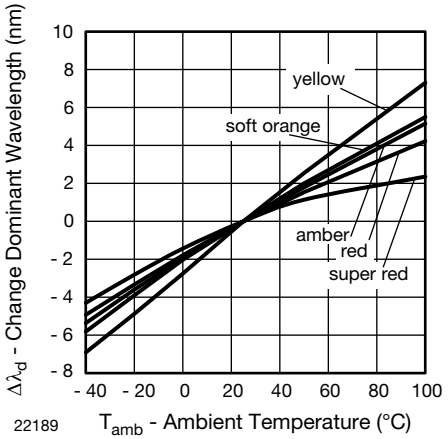


Figure 9. Change of Dominant Wavelength vs. Ambient Temperature

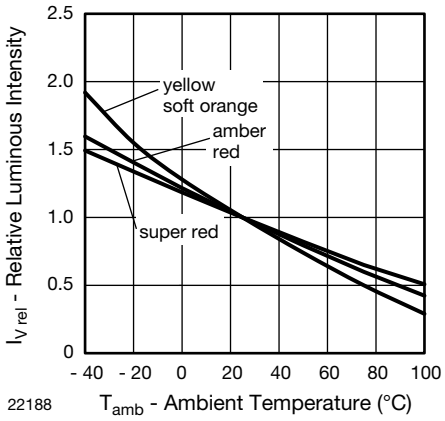
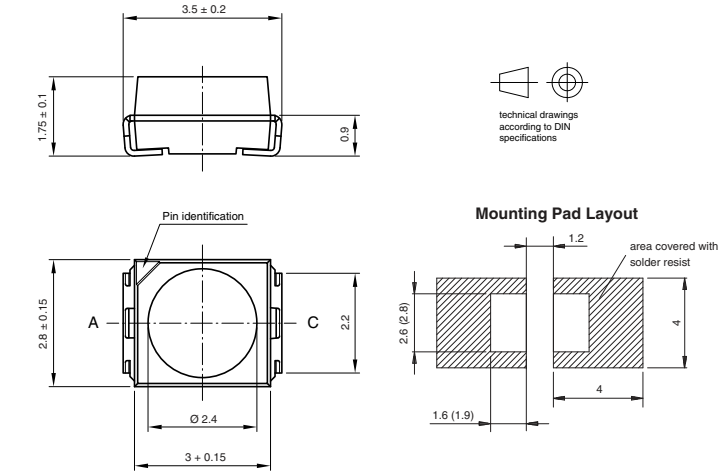


Figure 8. Relative Luminous Intensity vs. Amb. Temperature

PACKAGE DIMENSIONS in millimeters

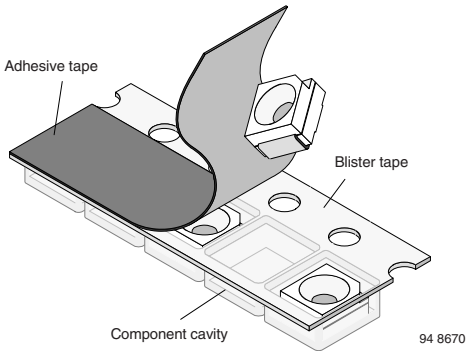


Drawing-No.: 6.541-5067.02-4
Issue: 4; 19.07.10
20767

METHOD OF TAPING/POLARITY AND TAPE AND REEL

SMD LED (VLMx333.. - 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 VLMx333..

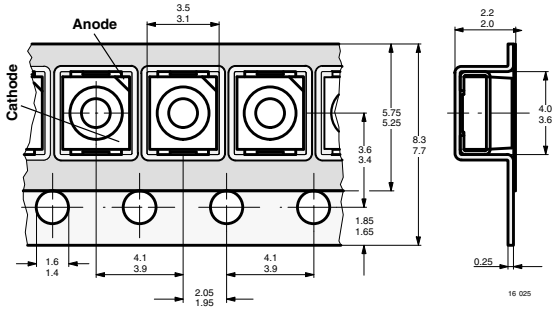


Figure 10. Tape Dimensions in mm for PLCC-2

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

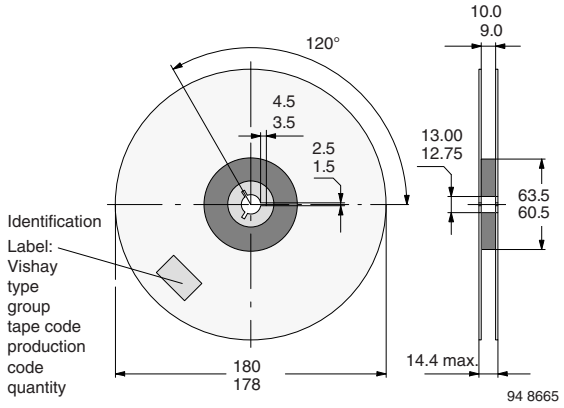


Figure 11. Reel Dimensions - GS08

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

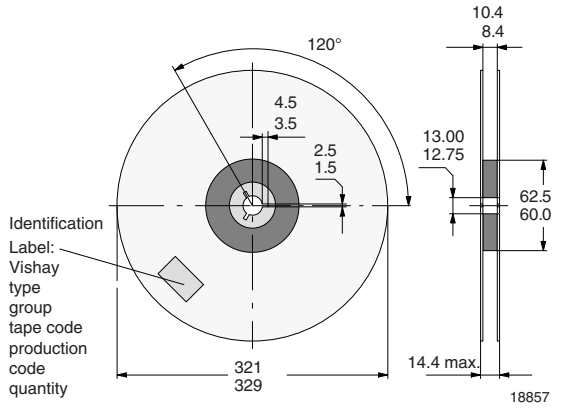


Figure 12. Reel Dimensions - GS18

SOLDERING PROFILE

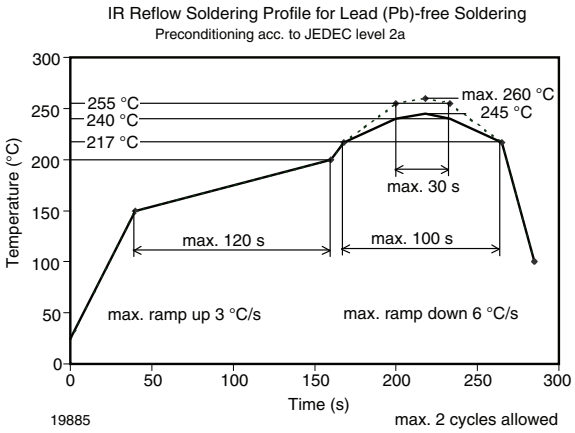


Figure 13. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

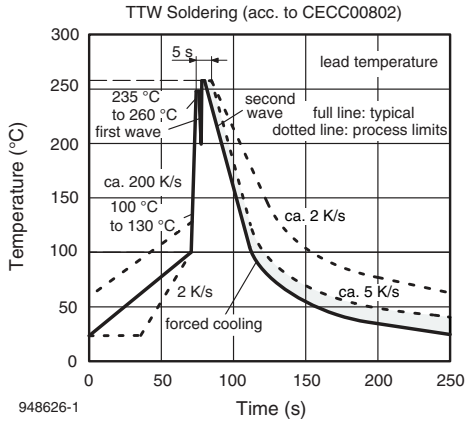
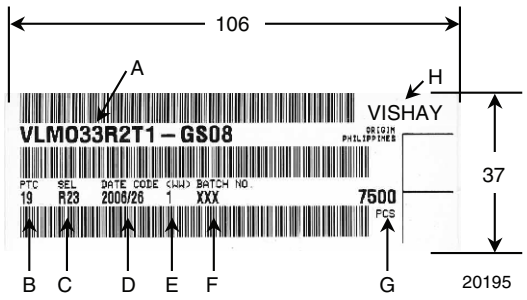


Figure 14. Double Wave Soldering of Opto Devices (all Packages)

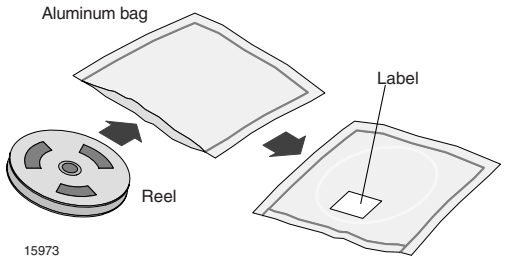
BAR CODE PRODUCT LABEL EXAMPLE:

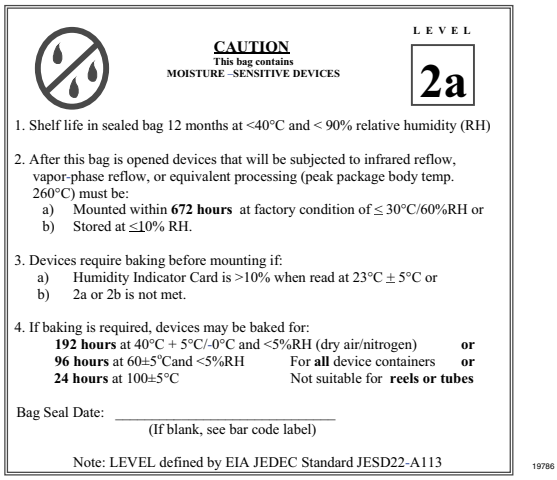


A) Type of component
B) Manufacturing plant
C) SEL - selection code (bin):
e.g.: R2 = code for luminous intensity group
3 = code for color group
D Date code year/week
E) Day code (e.g. 1: Monday)
F) Batch no.
G) Total quantity
H) Company code

DRY PACKING

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





Example of JESD22-A112 Level 2a Label

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.

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.

Disclaimer

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Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.