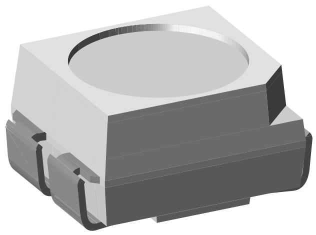
Power SMD LED PLCC-4



19210

DESCRIPTION

The VLM.32.. series is an advanced development in terms of heat dissipation.

The leadframe profile of this PLCC-4 SMD package is optimized to reduce the thermal resistance.

This allows higher drive current and doubles the light output compared to Vishay's high intensity SMD LED in PLCC-2 package.

PRODUCT GROUP AND PACKAGE DATA

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

FEATURES

- Available in 8 mm tape
- High brightness SMD LED
- Luminous intensity and color categorized per packing unit
- Luminous intensity ratio per packing unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- ESD-withstand voltage: Up to 2 kV according to JESD22-A114-B
- Suitable for all soldering methods according to CECC 00802 and J-STD-020
- Preconditioning according to JEDEC® level 2a
- Qualified according to JEDEC moisture sensitivity level 2a
- AEC-Q101 qualified
- Compatible with IR reflow solder processes according to CECC 00802 and J-STD-020C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

APPLICATIONS

- Interior and exterior lighting
- Indicator and backlighting purposes for audio, video, LCDs, switches, symbols, illuminated advertising etc.
- Illumination purpose, alternative to incandescent lamps
- 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.		
VLMR32ABBB-GS08	Red	1400	-	2800	50	620	-	630	50	2.0	2.2	2.8	50	AlInGaP on Si
VLMK32ABBB-GS08	Amber	1400	-	2850	50	610	-	621	50	1.85	-	3.03	50	AlInGaP on Si
VLMY32ABBB-GS08	Yellow	1400	-	2850	50	585	588	594	50	1.85	-	3.03	50	AlInGaP on Si

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) **VLMR32.., VLMK32.., VLMY32..**

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage (1)		V_R	5	V
Forward current		I_F	70	mA
Power dissipation		P_V	200	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-to-ambient	Mounted on PC board FR4	R_{thJA}	290	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) **VLMR32.., RED**						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity [(1)]	I_F = 50 mA	I_V	1400	-	2800	mcd
Dominant wavelength	I_F = 50 mA	λ_d	620	-	630	nm
Angle of half intensity	I_F = 50 mA	φ	-	± 60	-	°
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 50 mA	$\Delta\lambda$	-	20	-	nm
Forward voltage [(2)]	I_F = 50 mA	V_F	2.0	2.2	2.8	V
Reverse current	V_R = 5 V	I_R	-	0.01	10	μA

Notes

[(1)] In one package unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$

[(2)] Forward voltages are tested ata current pulse duration of 1 ms and a tolerance of ± 0.1 V

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMK32.., AMBER**						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity [(1)]	I_F = 50 mA	I_V	1400	-	2850	mcd
Dominant wavelength	I_F = 50 mA	λ_d	610	-	621	nm
Angle of half intensity	I_F = 50 mA	φ	-	± 60	-	°
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 50 mA	$\Delta\lambda$	-	18	-	nm
Forward voltage [(2)]	I_F = 50 mA	V_F	1.85	-	3.03	V
Reverse current	V_R = 5 V	I_R	-	0.01	10	μA

Notes

[(1)] In one package unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$

[(2)] Forward voltages are tested ata current pulse duration of 1 ms and a tolerance of ± 0.1 V

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMY32.., YELLOW**						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity [(1)]	I_F = 50 mA	I_V	1400	-	2850	mcd
Dominant wavelength	I_F = 50 mA	λ_d	585	588	594	nm
Angle of half intensity	I_F = 50 mA	φ	-	± 60	-	°
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 50 mA	$\Delta\lambda$	-	18	-	nm
Forward voltage [(2)]	I_F = 50 mA	V_F	1.85	-	3.03	V
Reverse current	V_R = 5 V	I_R	-	0.01	10	μA

Notes

[(1)] In one package unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$

[(2)] Forward voltages are tested ata current pulse duration of 1 ms and a tolerance of ± 0.1 V

LUMINOUS INTENSITY CLASSIFICATION		
GROUP	**LUMINOUS INTENSITY (mcd)**	
	MIN.	**MAX.**
AB	1400	1800
BA	1800	2240
BB	2240	2850

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 in any one reel.
  In order to ensure availability, single wavelength groups will not be orderable

COLOR CLASSIFICATION				
GROUP	**YELLOW**		**AMBER**	
	DOMINANT WAVELENGTH (nm)			
	MIN.	**MAX.**	**MIN.**	**MAX.**
W	585	588	-	-
X	588	591	-	-
X	591	594	-	-
Y	-	-	610	615
Z	-	-	615	621

Note

- Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm

CROSSING TABLE	
VISHAY	**OSRAM**
VLMK32ABBB-GS08	LAE6SF-AABB
VLMY32ABBB-GS08	LYE6SF-AABB

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

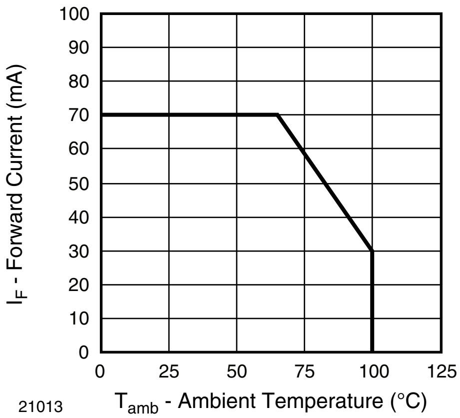


Fig. 1 - Forward Current vs. Ambient Temperature

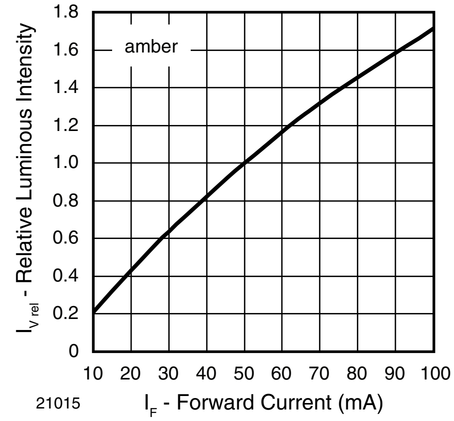


Fig. 4 - Relative Luminous Intensity vs. Forward Current

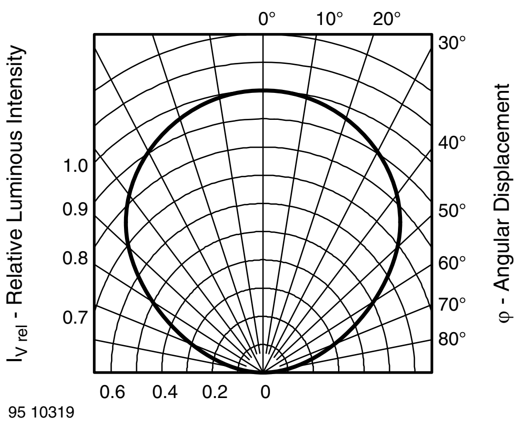


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

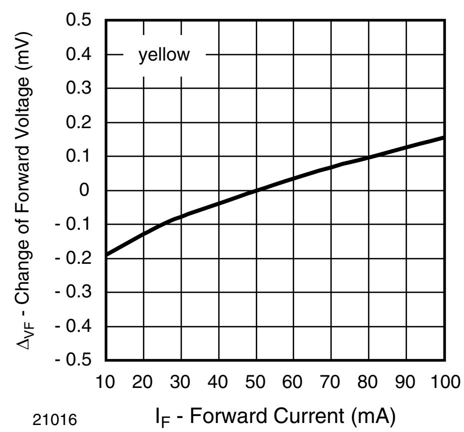


Fig. 5 - Change of Forward Voltage vs. Forward Current

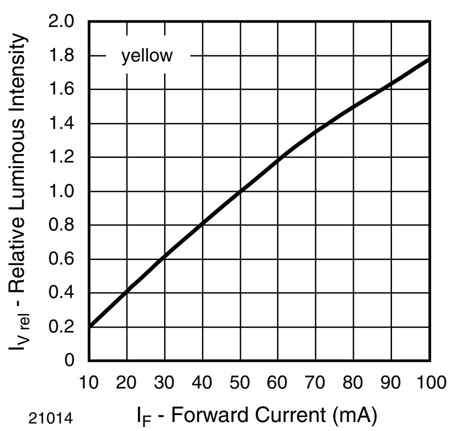


Fig. 3 - Relative Luminous Intensity vs. Forward Current

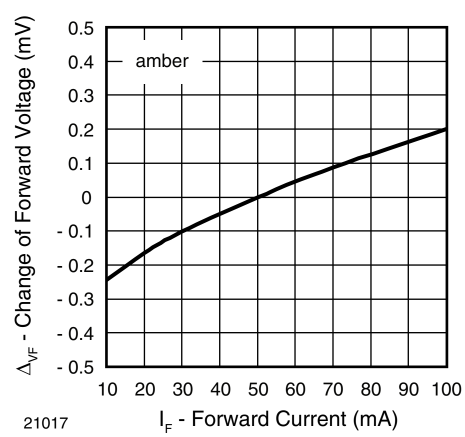


Fig. 6 - Change of Forward Voltage vs. Forward Current

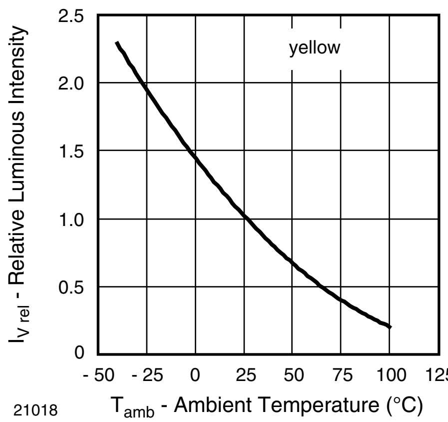


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

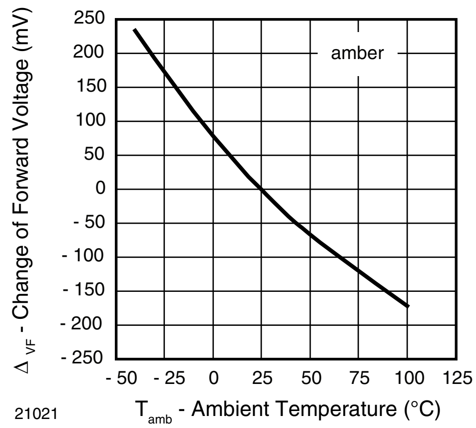


Fig. 10 - Change of Forward Voltage vs. Ambient Temperature

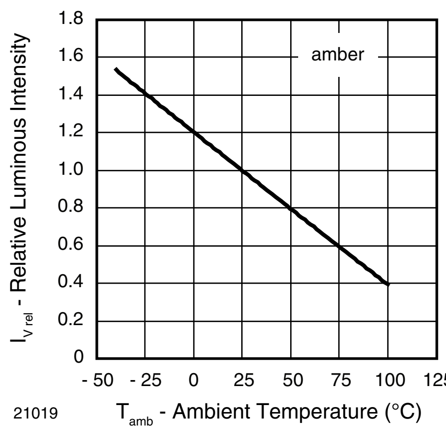


Fig. 8 - Relative Luminous Intensity vs. Ambient Temperature

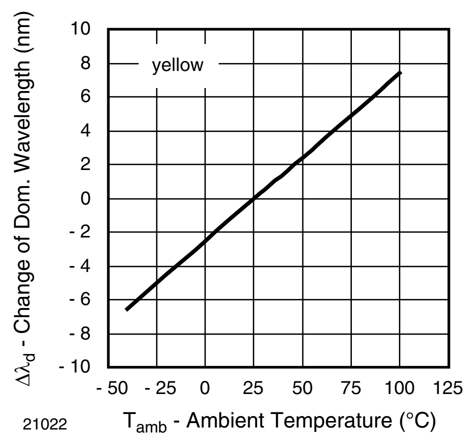


Fig. 11 - Change of Dominant Wavelength vs. Ambient Temperature

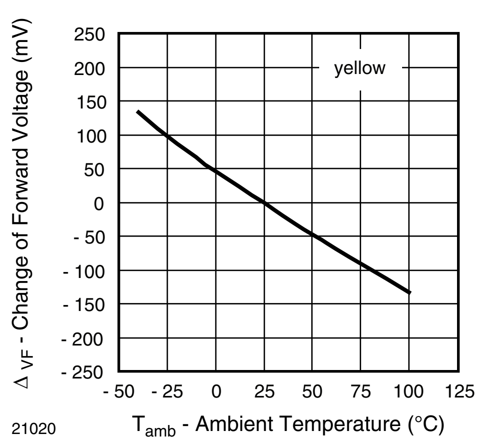


Fig. 9 - Change of Forward Voltage vs. Ambient Temperature

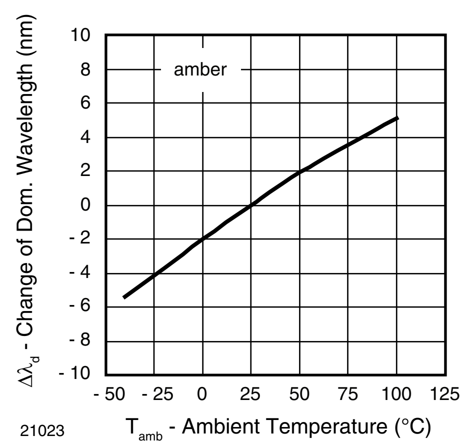


Fig. 12 - Change of Dominant Wavelength vs. Ambient Temperature

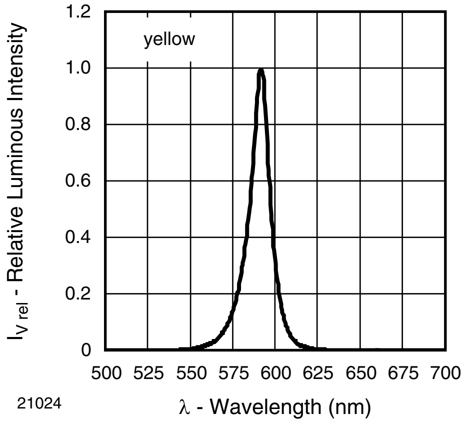


Fig. 13 - Relative Intensity vs. Wavelength

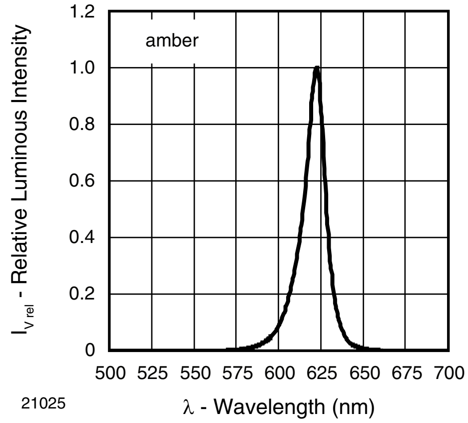
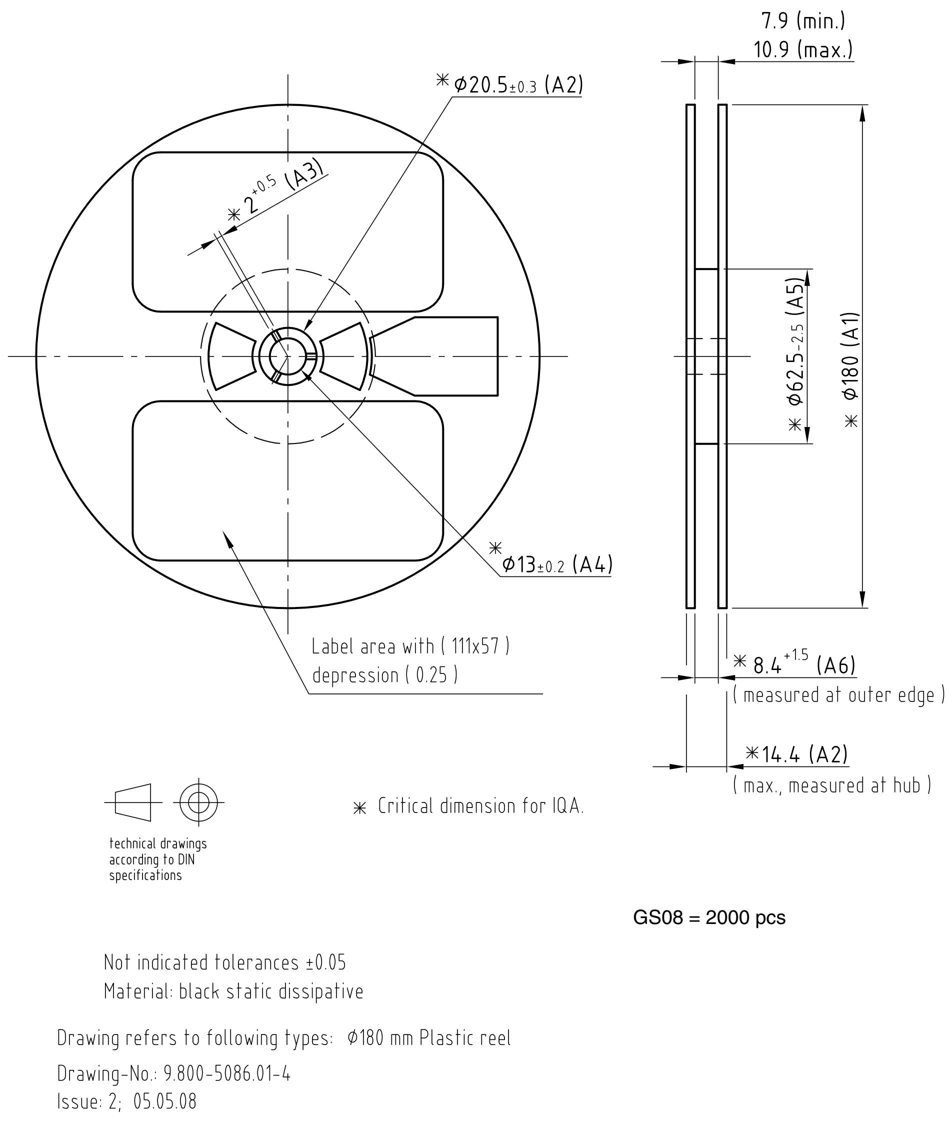


Fig. 14 - Relative Intensity vs. Wavelength

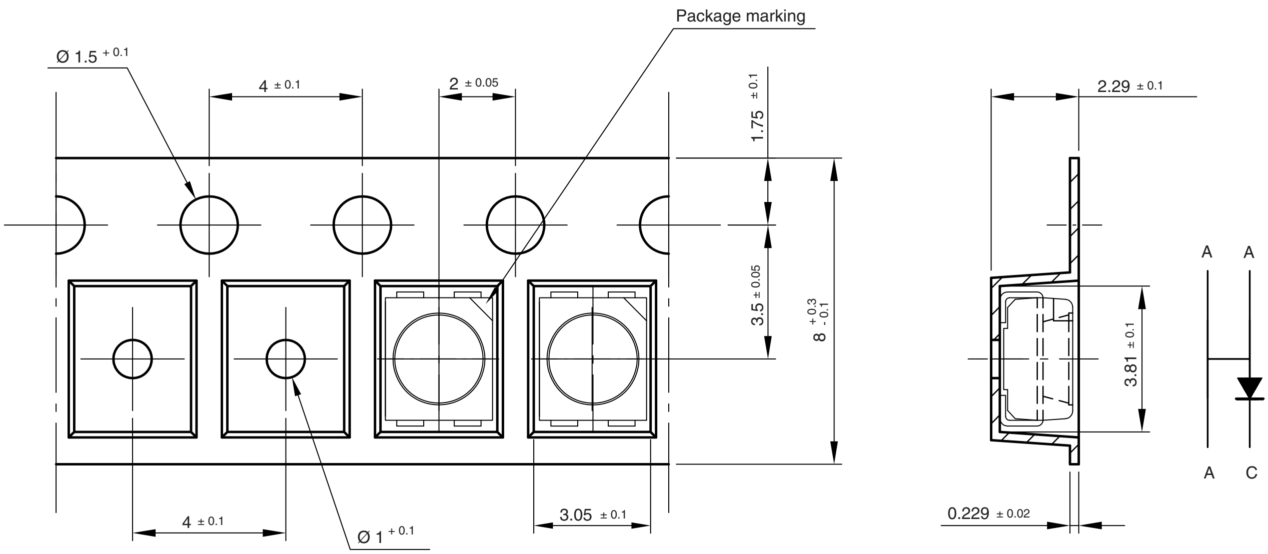
REEL DIMENSIONS in millimeters

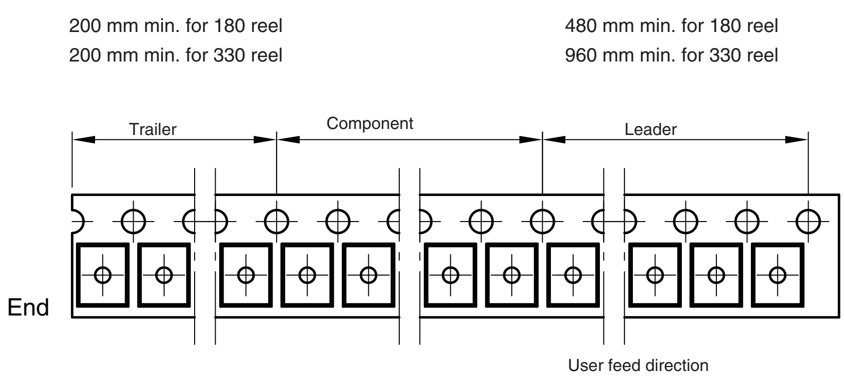


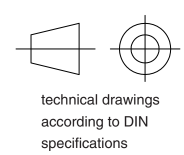
TAPE DIMENSIONS in millimeters

Taping and orientation

180 reel come in quantity of 2000 units
330 reel come in quantity of 8000 units

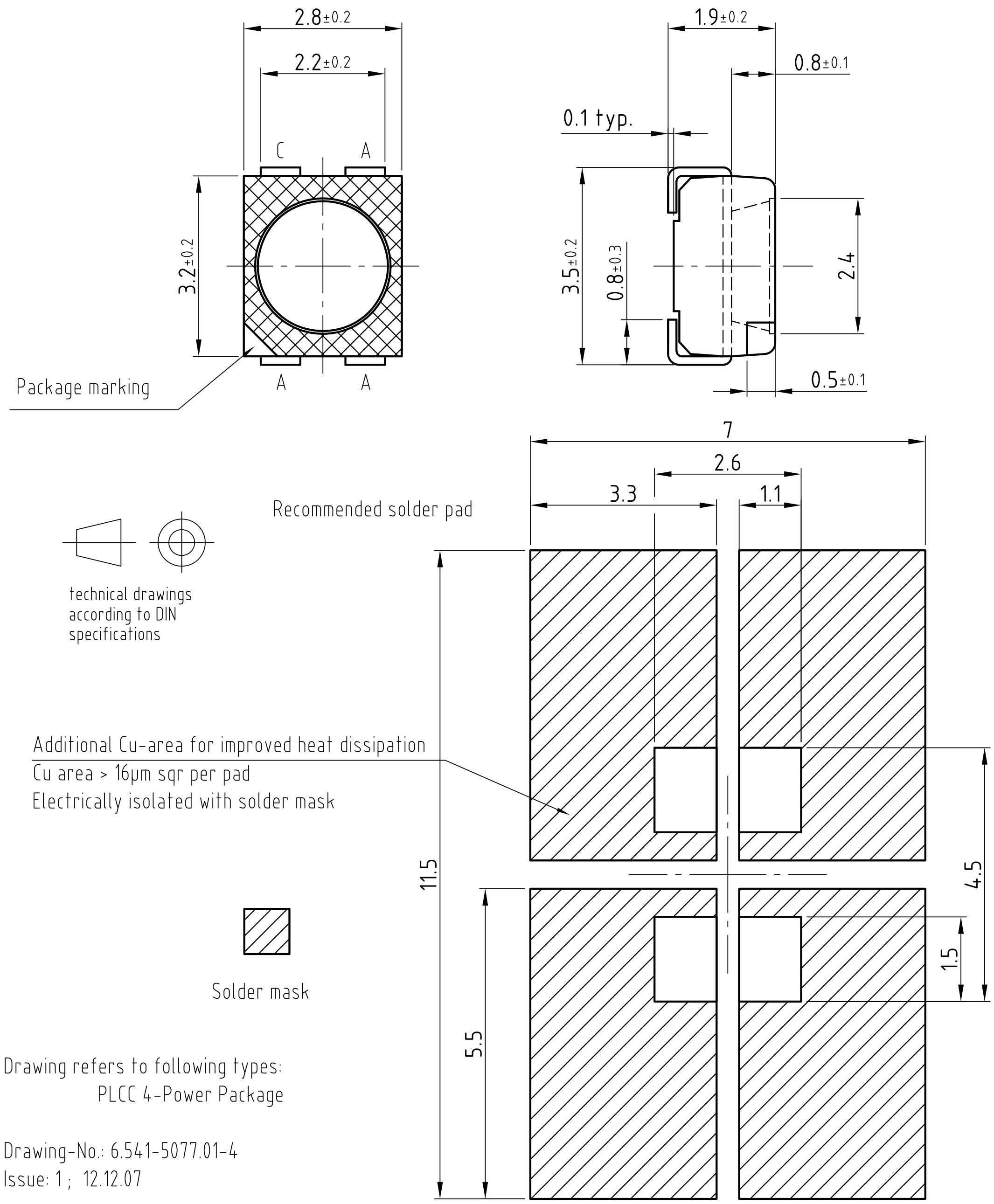






Drawing-No.: 9.700-5334.01-4
Issue: 3; 27.11.08
21066

PACKAGE/SOLDERING PADS DIMENSIONS in millimeters



20982

SOLDERING PROFILE

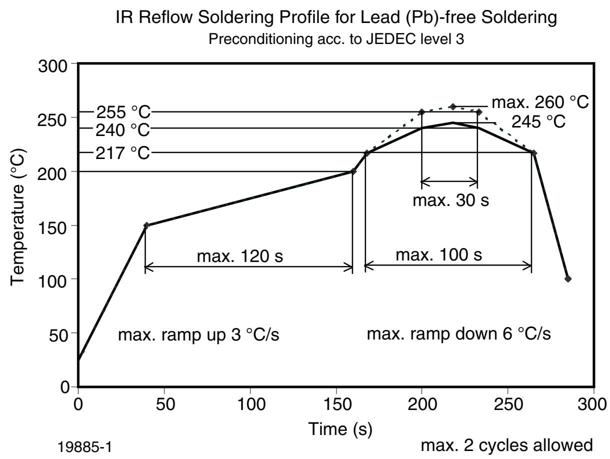


Fig. 15 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020B)

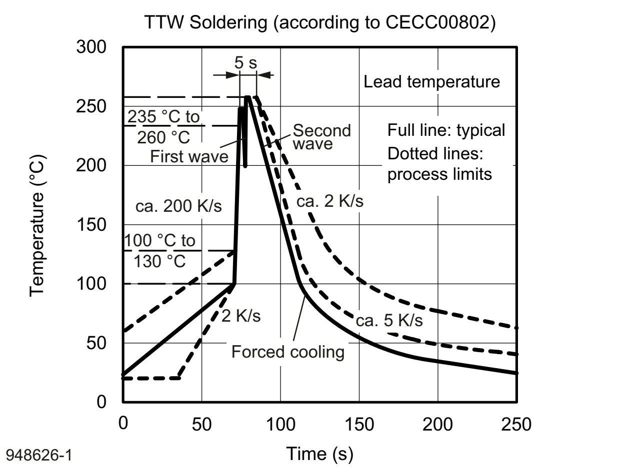
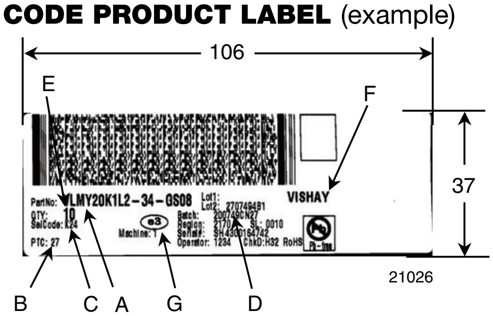


Fig. 16 - Double Wave Soldering of Opto Devices (all Packages)

BAR CODE PRODUCT LABEL (example)



A. Type of component

B. PTC = manufacturing plant

C. SEL - selection code (bin)

e.g.:K2= code for luminous intgensity group

4= code for color group

D. Batch/date code

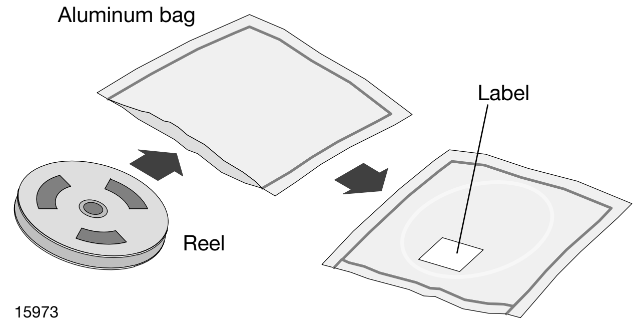
E. Total quantity

F. Company code

G. Code for lead (Pb)-free classification (e3)

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:

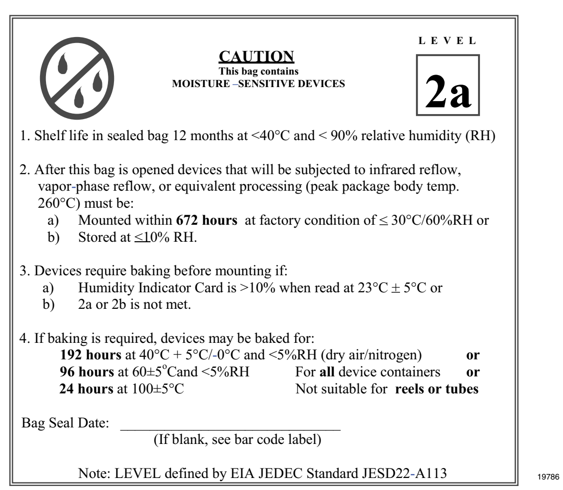
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

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.



CAUTION
This bag contains
MOISTURE –SENSITIVE DEVICES

LEVEL
2a

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. 260°C) must be:
   a) Mounted within **672 hours** at factory condition of ≤ 30°C/60%RH or
   b) Stored at ≤10% RH.

3. Devices require baking before mounting if:
   a) Humidity Indicator Card is >10% when read at 23°C ± 5°C or
   b) 2a or 2b is not met.

4. If baking is required, devices may be baked for:
   192 hours at 40°C + 5°C/-0°C and <5%RH (dry air/nitrogen) **or**
   96 hours at 60±5°Cand <5%RH For **all** device containers **or**
   24 hours at 100±5°C Not suitable for **reels or tubes**

Bag Seal Date: ____________
(If blank, see bar code label)

Note: LEVEL defined by EIA JEDEC Standard JESD22-A113

19786

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. Electro-static sensitive devices warning labels are on the packaging.

VISHAY SEMICONDUCTORS STANDARD BAR CODE LABEL

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

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.