

## Dome Lens SMD LED

VLD.1232R...



VLD.1232G...



### DESCRIPTION

The dome lens SMD LED series has been designed in a small untinted and clear molded package with lens for surface mounting as gullwing or reverse gullwing version. The VLD.1232... series is using recent ultrabright InGaN / sapphire chip technology with high luminous flux.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Product series: power
- Package: SMD dome lens
- Angle of half intensity:  $\pm 9^\circ$

### FEATURES

- Utilizing latest advanced InGaN technology
- Package type: surface-mount
- Package form: gullwing, reverse gullwing
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.8
- High luminous flux and luminous intensity
- 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
- Preconditioning according to JEDEC® level 2a
- Suitable for reflow soldering according to J-STD-020
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**HALOGEN FREE**  
**GREEN**  
(S-2008)

### APPLICATIONS

- Traffic signals and signs
- Interior and exterior lighting
- Smoke detectors
- Bio sensing
- Indicator and backlighting purposes for audio, video, LCDs switches, symbols, illuminated advertising etc.

### SAFETY ADVICES

Depending on the mode of operation, these devices emit highly concentrated blue light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 62471 "Photobiological Safety of Lamps and Lamp Systems".

### 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.		
VLDB1232G-08	Blue	1800	3500	-	20	458	465	472	20	2.6	3.0	3.4	20	InGaN on sapphire
VLDB1232R-08	Blue	1800	3500	-	20	458	465	472	20	2.6	3.0	3.4	20	InGaN on sapphire
VLDTG1232G-08	True green	7100	16 000	-	20	515	525	541	20	2.6	2.9	3.4	20	InGaN on sapphire
VLDTG1232R-08	True green	7100	16 000	-	20	515	525	541	20	2.6	2.9	3.4	20	InGaN on sapphire

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25 \text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLDB1232..., VLDTG1232...**

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage <sup>(1)</sup>	Short term application only	$V_R$	5	V
DC Forward current	$T_{amb} \leq 60 \text{ }^{\circ}\text{C}$	$I_F$	30	mA
Power dissipation		$P_V$	100	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	-40 to +100	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	-40 to +100	$^{\circ}\text{C}$
Thermal resistance junction-to-ambient	Mounted on PC board (pad size > 16 mm <sup>2</sup> )	$R_{thJA}$	400	K/W

**Note**

<sup>(1)</sup> Driving the LED in reverse direction is suitable for a short term application only

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25 \text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLDB1232G.., VLDB1232R.., BLUE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$I_F = 20 \text{ mA}$	$I_V$	1800	3500	-	mcd
Luminous flux/luminous intensity		$\phi_V/I_V$	-	0.35	-	mlm/mcd
Dominant wavelength <sup>(1)</sup>	$I_F = 20 \text{ mA}$	$\lambda_d$	458	465	472	nm
Radiant intensity	$I_F = 20 \text{ mA}$	$I_e$	-	62	-	mW/sr
Peak wavelength	$I_F = 20 \text{ mA}$	$\lambda_p$	-	460	-	nm
Spectral bandwidth at 50 % $I_{rel}$ max.	$I_F = 20 \text{ mA}$	$\Delta\lambda$	-	18	-	nm
Angle of half intensity	$I_F = 20 \text{ mA}$	$\phi$	-	$\pm 9$	-	$^{\circ}$
Forward voltage <sup>(1)</sup>	$I_F = 20 \text{ mA}$	$V_F$	2.6	3.0	3.4	V
Reverse current	$V_R = 5 \text{ V}$	$I_R$	-	0.01	10	$\mu\text{A}$

**Note**

<sup>(1)</sup> Tolerances:  $\pm 15 \text{ \%}$  for  $I_V$ ,  $\pm 0.1 \text{ V}$  for  $V_F$ ,  $\pm 1 \text{ nm}$  for  $\lambda_d$

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25 \text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLDTG1232G.., VLDTG1232R.., TRUE GREEN**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$I_F = 20 \text{ mA}$	$I_V$	7100	16 000	-	mcd
Luminous flux/luminous intensity		$\phi_V/I_V$	-	0.35	-	mlm/mcd
Dominant wavelength <sup>(1)</sup>	$I_F = 20 \text{ mA}$	$\lambda_d$	515	525	541	nm
Radiant intensity	$I_F = 20 \text{ mA}$	$I_e$	-	37	-	mW/sr
Peak wavelength	$I_F = 20 \text{ mA}$	$\lambda_p$	-	519	-	nm
Spectral bandwidth at 50 % $I_{rel}$ max.	$I_F = 20 \text{ mA}$	$\Delta\lambda$	-	28	-	nm
Angle of half intensity	$I_F = 20 \text{ mA}$	$\phi$	-	$\pm 9$	-	$^{\circ}$
Forward voltage <sup>(1)</sup>	$I_F = 20 \text{ mA}$	$V_F$	2.6	2.9	3.4	V
Reverse current	$V_R = 5 \text{ V}$	$I_R$	-	0.01	10	$\mu\text{A}$

**Note**

<sup>(1)</sup> Tolerances:  $\pm 15 \text{ \%}$  for  $I_V$ ,  $\pm 0.1 \text{ V}$  for  $V_F$ ,  $\pm 1 \text{ nm}$  for  $\lambda_d$

COLOR CLASSIFICATION					
GROUP	DOMINANT WAVELENGTH (nm)				
	BLUE		TRUE GREEN		
	MIN.	MAX.	MIN.	MAX.	
2	458	464	-	-	
3	462	468	515	523	
4	466	472	521	529	
5	-	-	527	535	
6	-	-	533	541	

**Note**

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

LUMINOUS INTENSITY CLASSIFICATION - BLUE			
GROUP	LUMINOUS INTENSITY (mcd)		
STANDARD	MIN.	MAX.	
BA	1800	2240	
BB	2240	2800	
CA	2800	3550	
CB	3550	4500	
DA	4500	5600	
DB	5600	7100	

LUMINOUS INTENSITY CLASSIFICATION - TRUE GREEN			
GROUP	LUMINOUS INTENSITY (mcd)		
STANDARD	MIN.	MAX.	
EA	7100	9000	
EB	9000	11 200	
FA	11 200	14 000	
FB	14 000	18 000	
GA	18 000	22 400	
GB	22 400	28 000	

**Note**

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of  $\pm 15$  %.
- 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.

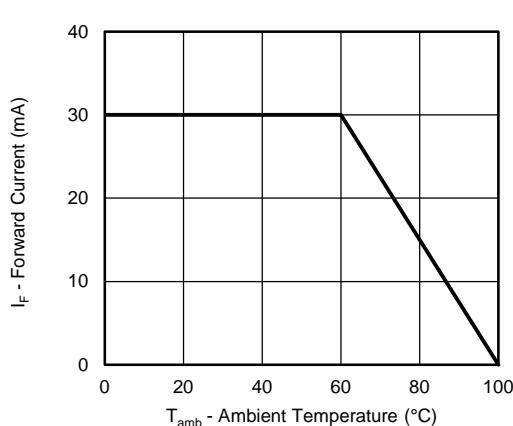
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25$  °C, unless otherwise specified)


Fig. 1 - Maximum Permissible Forward Current vs.  
Ambient Temperature

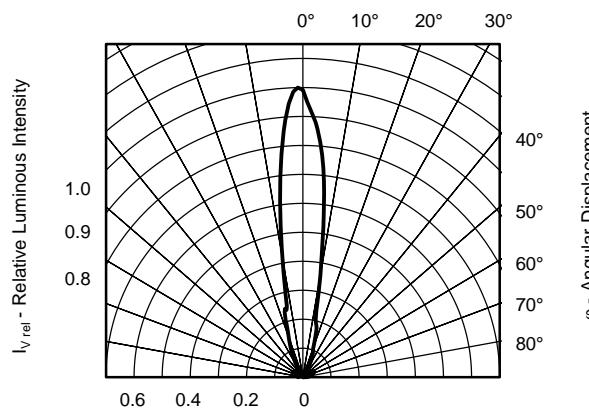


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

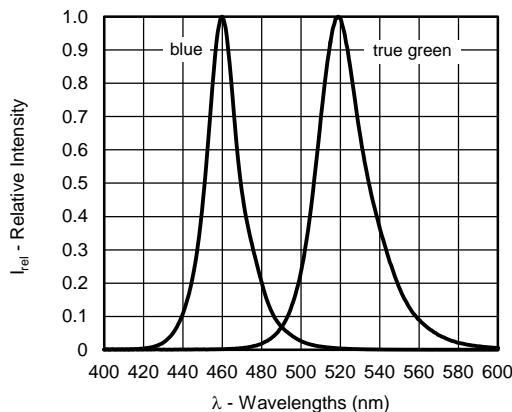


Fig. 3 - Relative Intensity vs. Wavelength

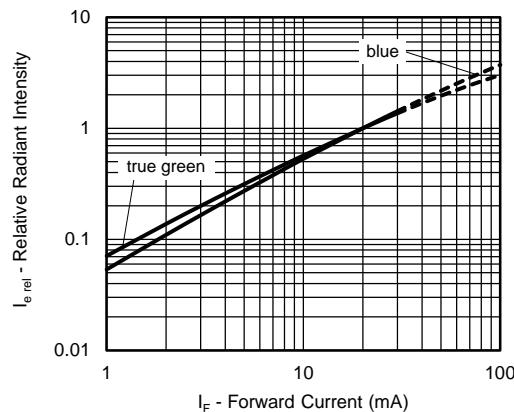


Fig. 6 - Relative Radiant Intensity vs. Forward Current

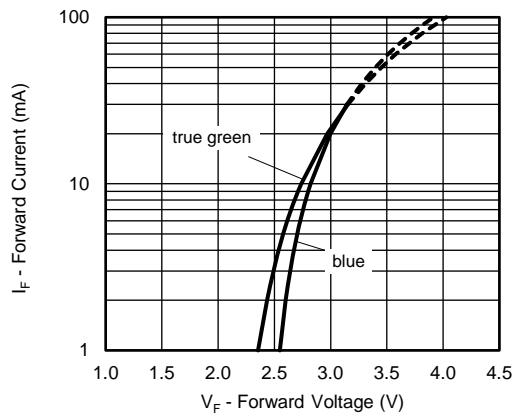


Fig. 4 - Forward Current vs. Forward Voltage

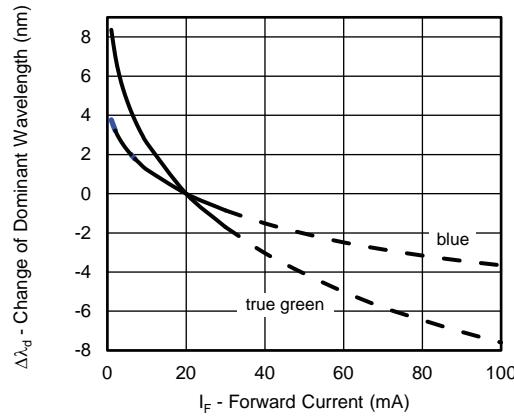


Fig. 7 - Change of Dominant Wavelength vs. Forward Current

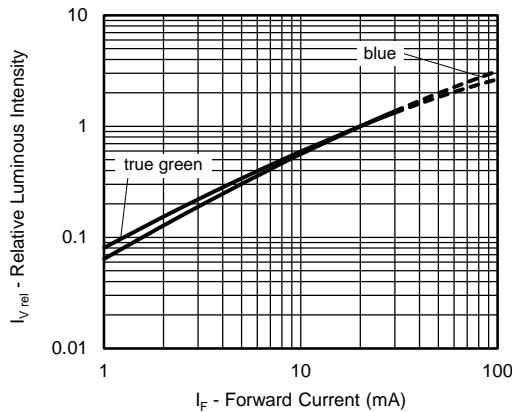


Fig. 5 - Relative Luminous Intensity vs. Forward Current

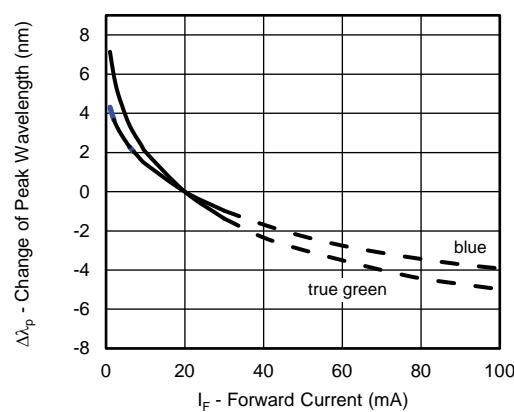


Fig. 8 - Change of Peak Wavelength vs. Forward Current

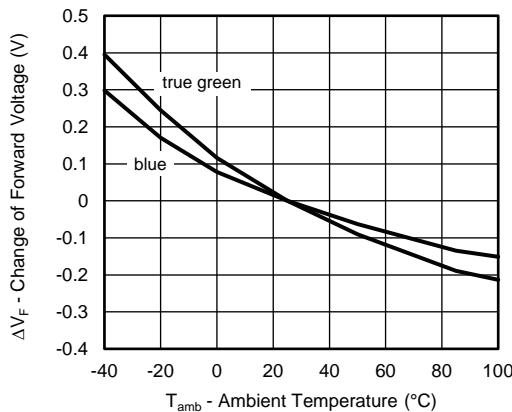


Fig. 9 - Change of Forward Voltage vs. Ambient Temperature

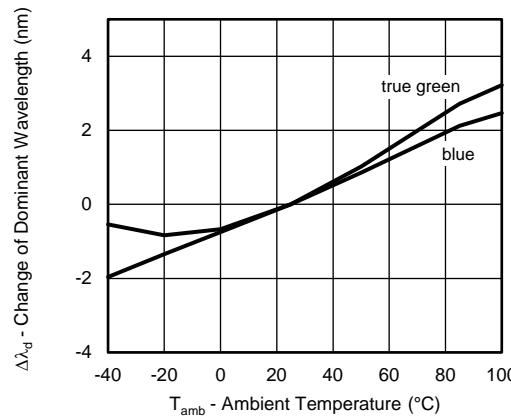


Fig. 12 - Change of Dominant Wavelength vs. Ambient Temperature

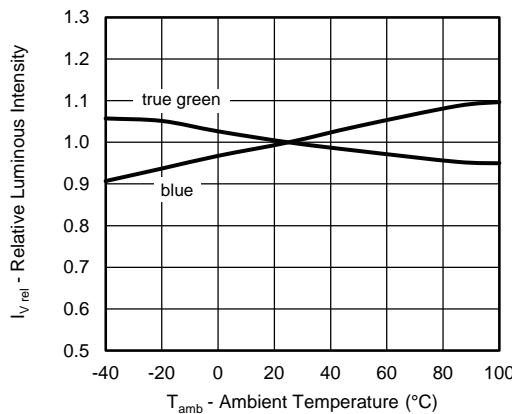


Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature

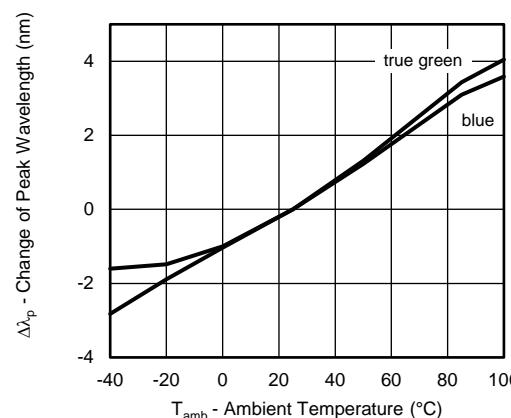


Fig. 13 - Change of Peak Wavelength vs. Ambient Temperature

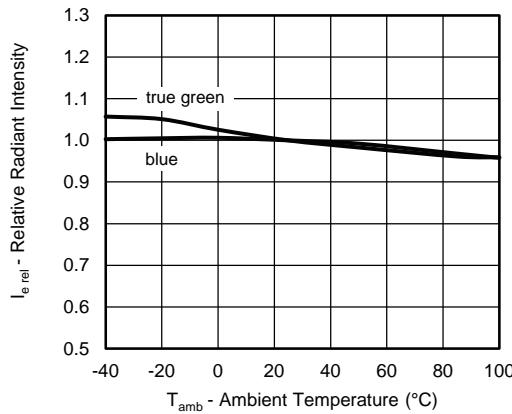
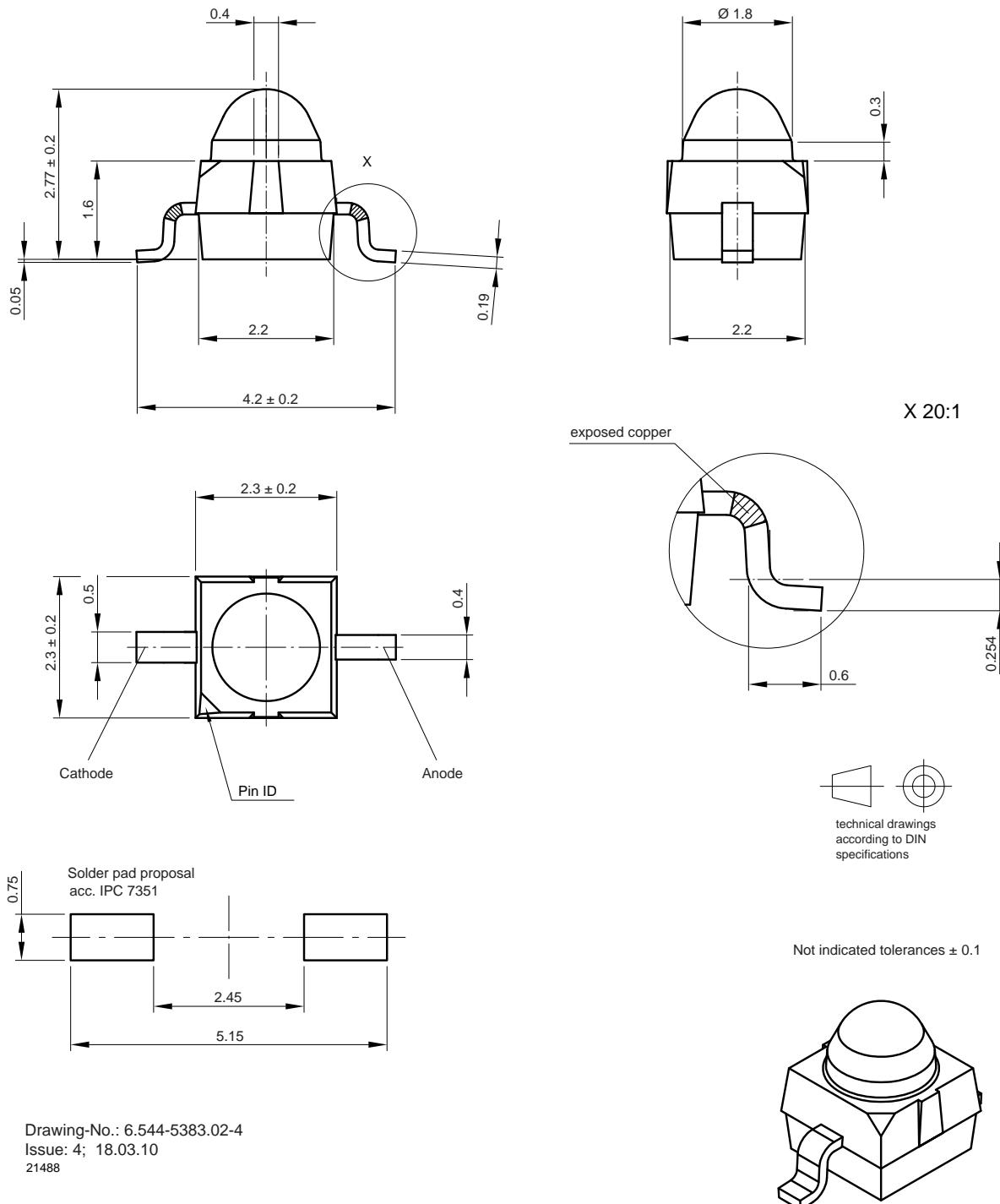
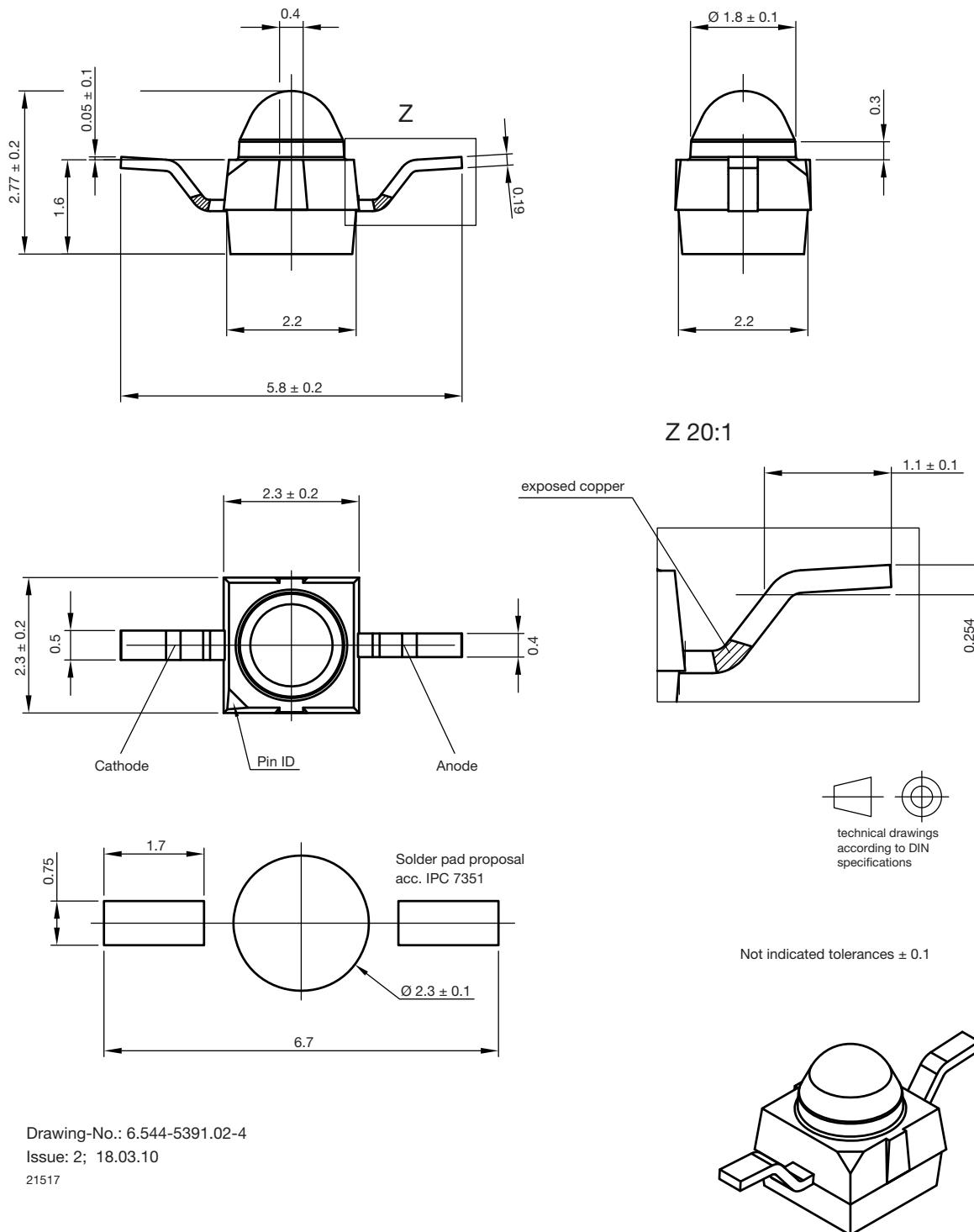


Fig. 11 - Relative Radiant Intensity vs. Ambient Temperature

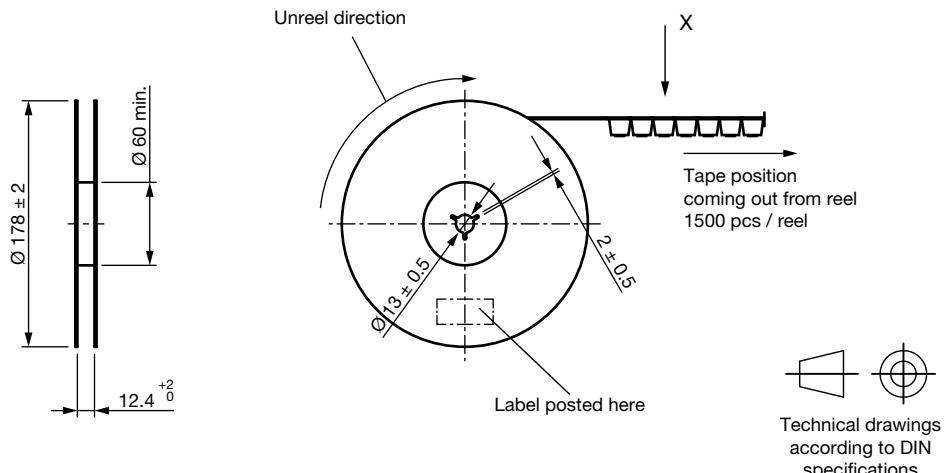
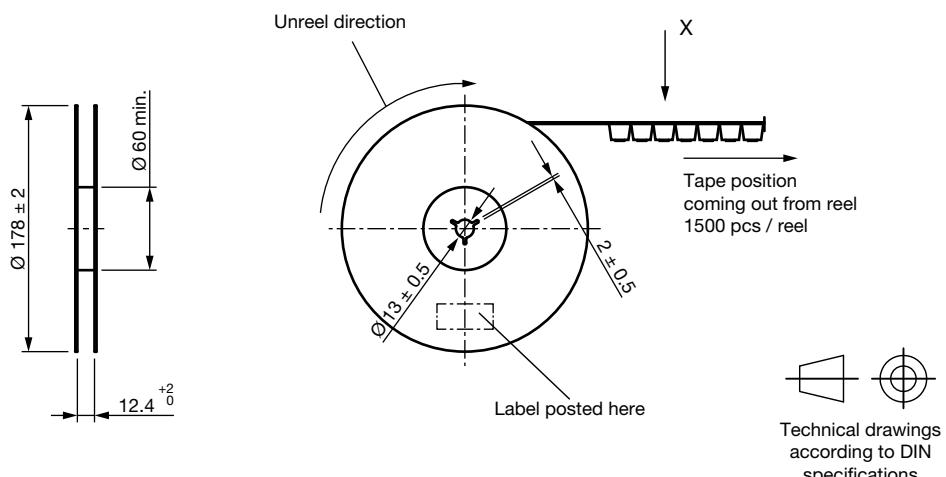
**PACKAGE DIMENSIONS** in millimeters: **VLD.1232G..** (gullwing)


**PACKAGE DIMENSIONS** in millimeters: **VLD.1232R..** (reverse gullwing)


Drawing-No.: 6.544-5391.02-4

Issue: 2; 18.03.10

21517

**TAPING AND REEL DIMENSIONS** in millimeters: **VLD.1232G** (gullwing)

**TAPING AND REEL DIMENSIONS** in millimeters: **VLD.1232R** (reverse gullwing)

**COVER TAPE PEEL STRENGTH**

According to DIN EN 60286-3

0.1 N to 1.3 N

300  $\pm$  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.

## SOLDERING PROFILE

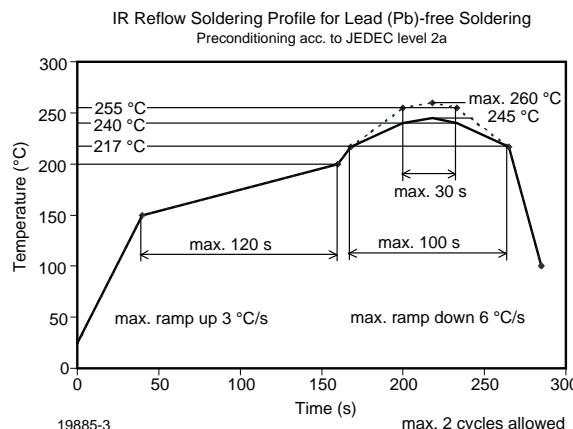
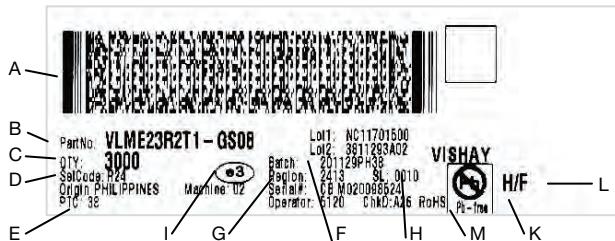


Fig. 14 - Vishay Lead (Pb)-free Reflow Soldering Profile  
(according to J-STD-020)

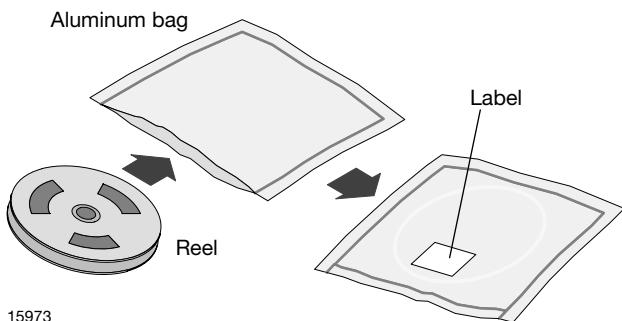
## BAR CODE PRODUCT LABEL (example)



- A. 2D barcode
- B. PartNo = Vishay part number
- C. QTY = Quantity
- D. SelCode = selection code (binning)
- E. PTC = Code of manufacturing plant
- F. Batch = date code: year / week / plant code
- G. Region code
- H. SL = sales location
- I. Terminations finishing
- K. Lead (Pb)-free symbol
- L. Halogen-free symbol
- M. RoHS symbol

## 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.

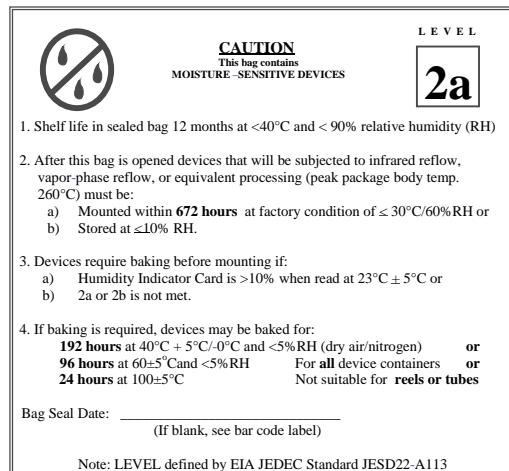
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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

## 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 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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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.