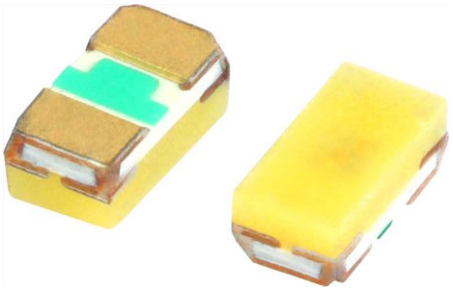
Ultrabright 0402 ChipLED



FEATURES

- High efficient InGaN technology
- Super thin ChipLED with exceptional brightness 1.0 mm x 0.5 mm x 0.35 mm (L x W x H)
- High reliability PCB based
- Temperature range + 30 °C to + 80 °C
- Chromaticity coordinate categorized according to CIE 1931 per packing unit
- Typical color temperature 7000 K
- EIA standard package
- Compatible to IR reflow soldering
- Available on 7" diameter reel
- Preconditioning: according to JEDEC level 2a
- ESD-sensitive device
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

GREEN (5-2008)

DESCRIPTION

The new 0402 ChipLED series have been designed in the smallest SMD package. This innovative 0402 ChipLED technology opens the way to

- smaller products of higher performance
- more design in flexibility
- enhanced applications

The 0402 LED is an obvious solution for small-scale products that are expected to work reliably in an arduous environment.

This package is filled with a mixture of epoxy and yellow converter.

This yellow converter converts the blue emission partially to yellow, which mixes the remaining blue to give white.

APPLICATIONS

- Telecommunication: indicator and backlighting in telephone and fax
- Backlighting for audio and video equipment
- Backlighting in office equipment
- Indoor and outdoor message boards
- Flat backlight for LCDs, switches and symbols

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD 0402 ChipLED
- Product series: standard
- Angle of half intensity: ± 65°

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I_F (mA)	COORDINATE (x, y)			FORWARD VOLTAGE (V)			TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
VLMW1500-GS08	White	45	-	180	5	-	0.294, 0.286	-	2.55	-	3.15	InGaN/ yellow converter

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMW1500

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
DC forward current	$T_{amb} \leq 25$ °C	I_F	20	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	0.1	A
Power dissipation		P_V	70	mW
Operating temperature range		T_{amb}	+ 30 to + 80	°C
Storage temperature range		T_{stg}	- 55 to + 105	°C
Thermal resistance junction/ambient		R_{thJA}	550	K/W

For technical questions, contact: LED@vishay.com

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OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMW1500, WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 5 mA	I_V	45	-	180	mcd
Chromatically coordinate x acc. to CIE 1931	I_F = 5 mA	x	-	0.294	-	
Chromatically coordinate y acc. to CIE 1931	I_F = 5 mA	y	-	0.286	-	
Angle of half intensity	I_F = 5 mA	φ	-	± 65	-	deg
Forward voltage	I_F = 5 mA	V_F	2.55	-	3.15	V
Reverse current (1)	V_R = 5 V	I_R	-	10	-	µA

Note

(1) Driving the LED in reverse direction is suitable for short term application

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LUMINOUS INTENSITY (mcd) at 5 mA	
	MIN.	MAX.
P	45	71
Q	71	112
R	112	180

Note

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 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 in any one reel.
  In order to ensure availability, single wavelength groups will not be orderable.

FORWARD VOLTAGE CLASSIFICATION

GROUP	FORWARD VOLTAGE (V)	
	MIN.	MAX.
V1	2.55	2.65
V2	2.65	2.75
V3	2.75	2.85
V4	2.85	2.95
V5	2.95	3.05
V6	3.05	3.15

Note

- Forward voltage is measured with a tolerance of ± 0.1 V.

CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED

	X	Y		X	Y
S1	0.274	0.226	S4	0.294	0.286
	0.274	0.258		0.294	0.319
	0.294	0.286		0.314	0.347
	0.294	0.254		0.314	0.315
S2	0.274	0.258	S5	0.314	0.282
	0.274	0.291		0.314	0.315
	0.294	0.319		0.334	0.343
	0.294	0.286		0.334	0.311
S3	0.294	0.254	S6	0.314	0.315
	0.294	0.286		0.314	0.347
	0.314	0.315		0.334	0.376
	0.314	0.282		0.334	0.343

Note

- Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ± 0.01.

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

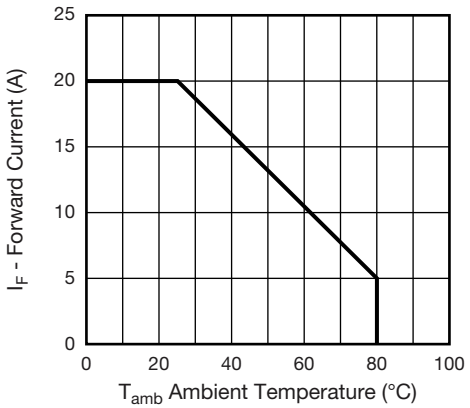

Fig. 1 - Forward Current vs. Ambient Temperature

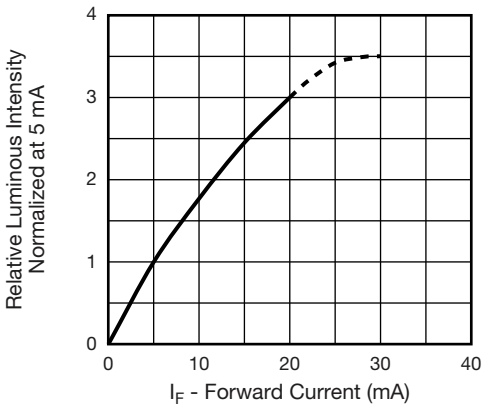

Fig. 4 - Relative Luminous Intensity vs. Forward Current

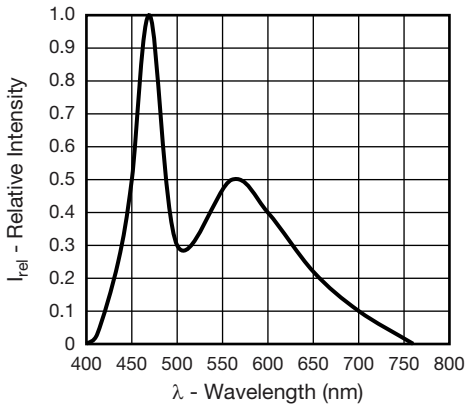

Fig. 2 - Relative Intensity vs. Wavelength

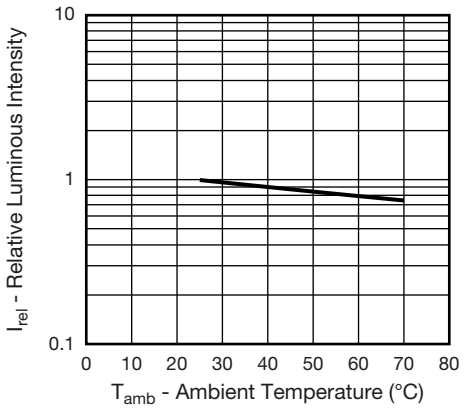

Fig. 5 - Rel. Luminous Intensity vs. Ambient Temperature

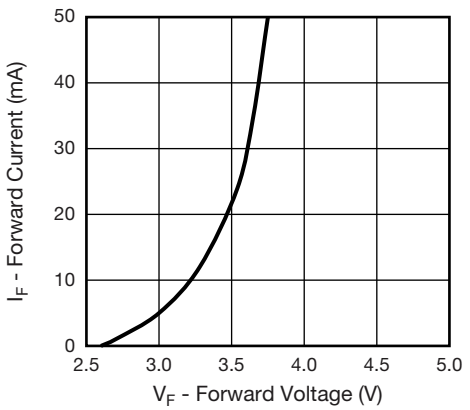

Fig. 3 - Forward Current vs. Forward Voltage

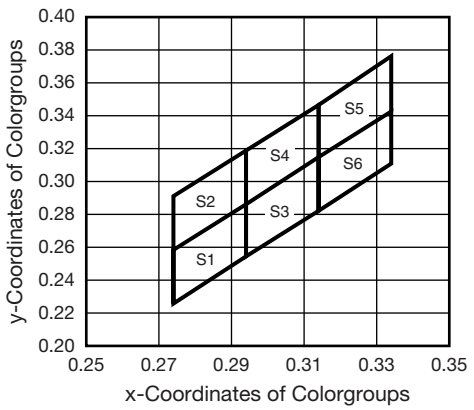

Fig. 6 - Coordinates of Colorgroups

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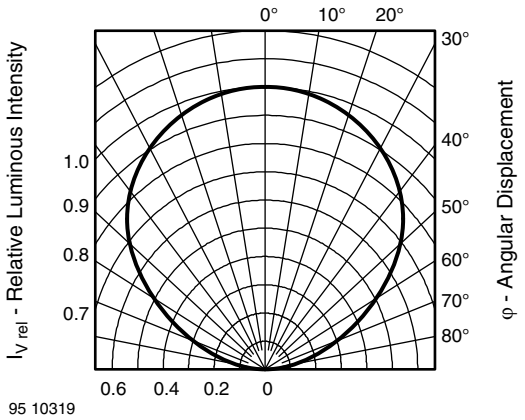
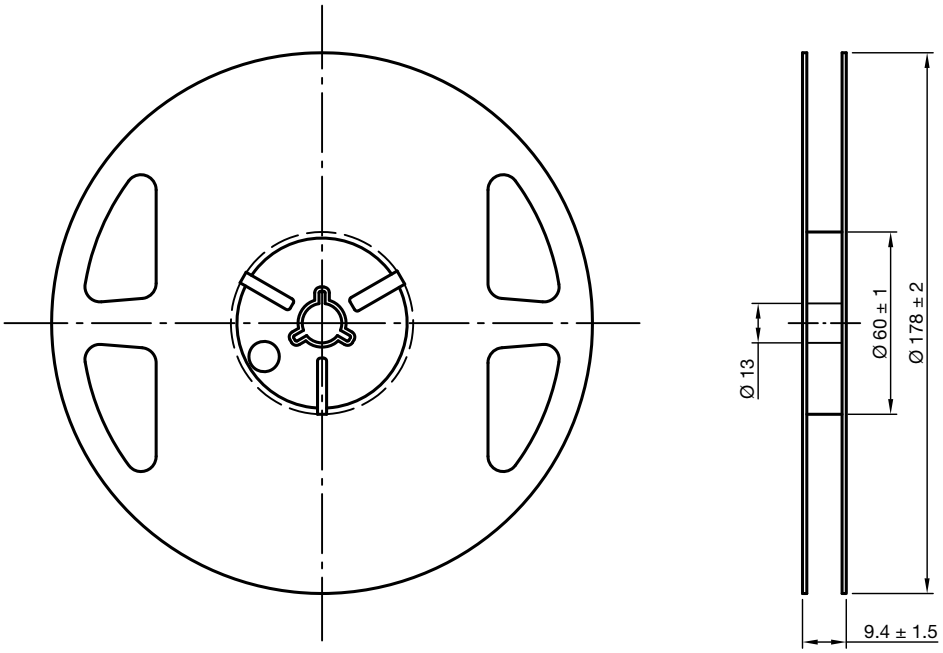


Fig. 7 - Relative Luminous Intensity vs. Angular Displacement

REEL DIMENSIONS in millimeters



Drawing-No.: 9.800-5122.01-4
Issue: 2; 03.11.11
22611

technical drawings
according to DIN
specifications

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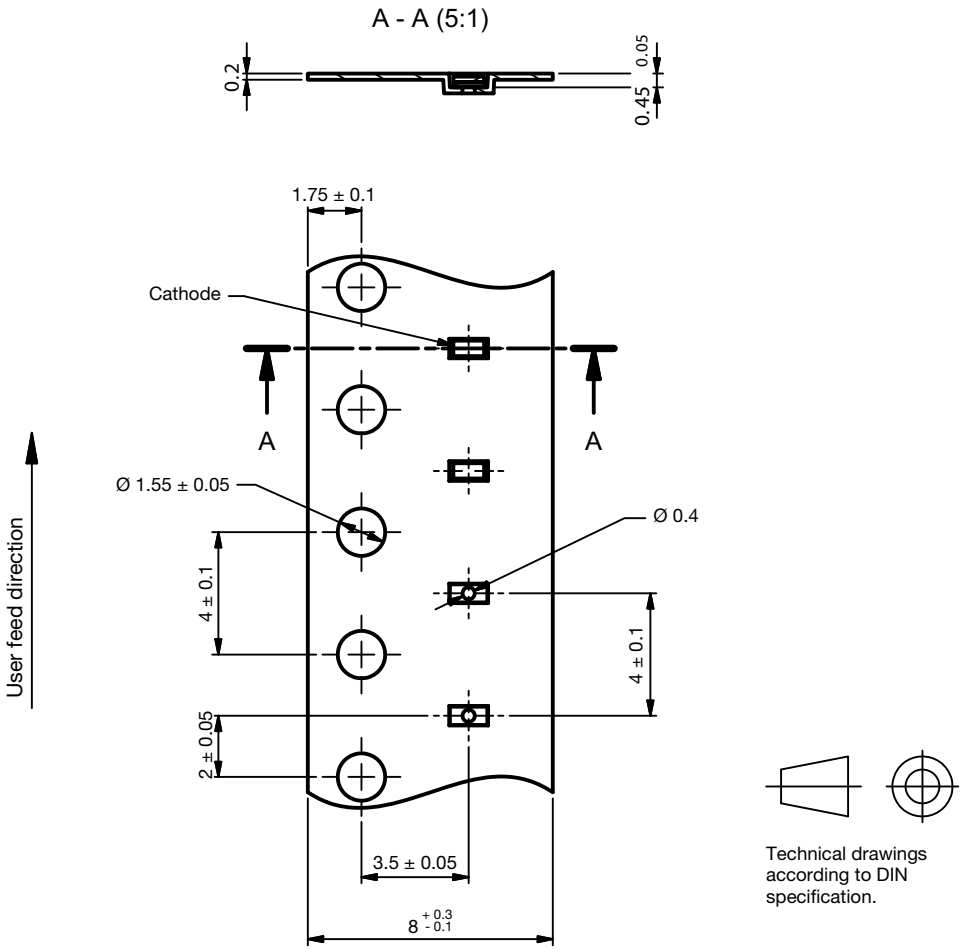
TAPE DIMENSIONS in millimeters



Drawing-No.: 9.700-5388.01-4
Issue: 1; 20.03.12

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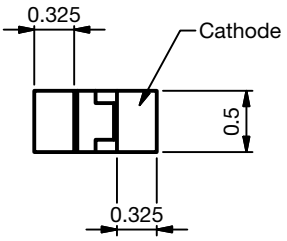
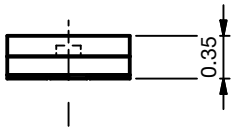
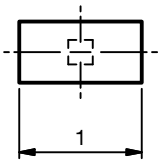
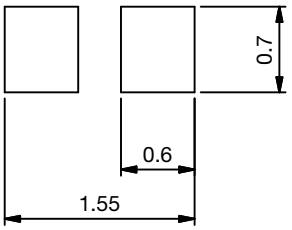
PACKAGE DIMENSIONS in millimeters

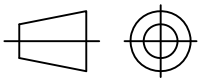




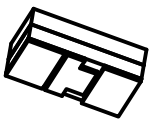


Recommended solder pad footprint





Technical drawings according to DIN specification



Not indicated tolerances ± 0.2

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Issue: 1; 20.03.12

SOLDERING PROFILE

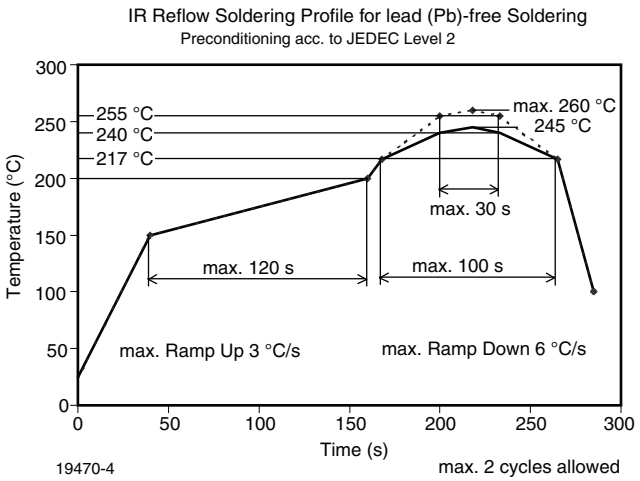

Fig. 8 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020C)

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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

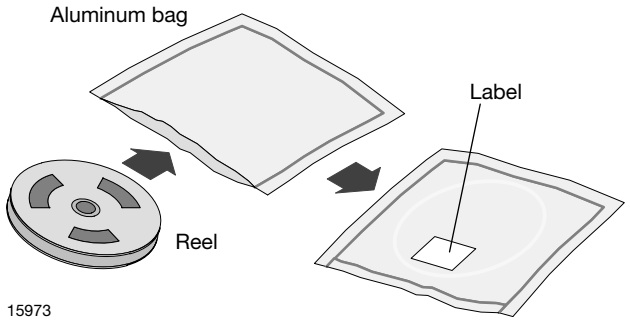
J) Lead (Pb)-free symbol

K) Halogen-free symbol

L) 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)

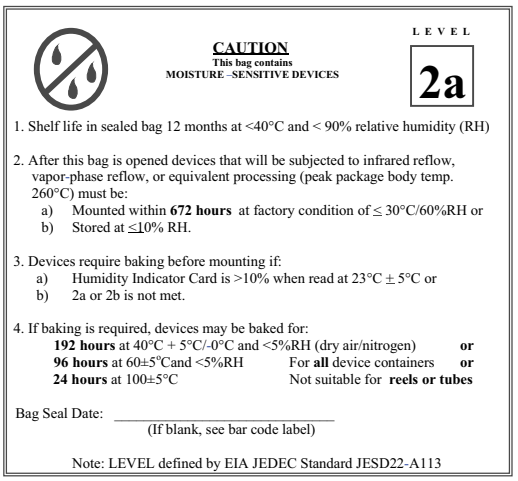
or

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. 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.

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