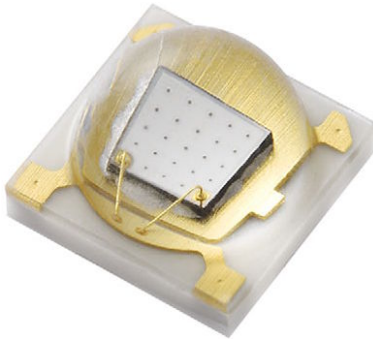


## UV SMD LED With Silicone Lens



### DESCRIPTION

The VLMU35A10-...-130 series is a ceramic based high power UV LED with silicone lens for long life time. The package size is 3.45 mm x 3.45 mm and the radiant power up to 2500 mW at 1000 mA in a wavelength range of 380 nm to 410 nm.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD ceramic high power
- Product series: high power UV LED
- Angle of half intensity:  $\pm 65^\circ$
- Lead-finishing: Au

### SAFETY ADVICES

UV LEDs emit highly concentrated, non visible UV light which can be harmful to the human eye. Do not expose the eyes or skin directly to the UV light. Wear appropriate protective gear when operating the LED. Keep out of the reach of children.

### FEATURES

- Ceramic SMT package with silicone lens
- Dimension (L x W x H) in mm: 3.45 x 3.45 x 2.1
- Forward current: up to 1000 mA
- Radiant power (typ.): 1450 mW at 700 mA
- Materials:
  - Die: InGaN
  - Resin: silicone (water clear)
  - Leads / terminations finish: gold plated (Au)
- Grouping parameters:
  - Forward voltage
  - Radiant power
  - Peak wavelength
- Reflow soldering method
- MSL 3 according to J-STD-020
- Packaging: 12 mm tape with 500 pieces per reel,  $\varnothing$  180 mm (7")
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- Industrial curing
- Photocatalytic purification
- Poster printing curing
- Counterfeit money detector
- Blood detector
- Nail curing
- Teeth curing

### PARTS TABLE

PART	COLOR	RADIANT POWER (mW)			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.		
VLMU35A10-385-130	UVA	1225	1440	1805	700	380	385	390	700	3.2	3.6	4.4	700	InGaN
VLMU35A10-395-130	UVA	1225	1450	1805	700	390	395	400	700	3.2	3.6	4.4	700	InGaN
VLMU35A10-405-130	UVA	1225	1480	1805	700	400	405	410	700	3.2	3.6	4.4	700	InGaN

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

#### VLMU35A10-395-130, VLMU35A10-405-130

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
DC forward current		$I_F$	1000	mA
Power dissipation		$P_V$	4.4	W
Electrostatic discharge	HBM: MIL-STD-883 C 3B	ESD	2000	V
Junction temperature		$T_j$	+105	$^\circ\text{C}$
Ambient temperature range		$T_{amb}$	-40 to +85	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to +100	$^\circ\text{C}$
Solder temperature		$T_{sol}$	260	$^\circ\text{C}$

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified)  
**VLMU35A10-395-130, VLMU35A10-405-130, UVA**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 700\text{ mA}$		$V_F$	3.2	3.6	4.4	V
Radiant power	$I_F = 700\text{ mA}$	VLMU35A10-385-130	$\Phi_e$	1225	1440	1805	mW
		VLMU35A10-395-130		1225	1450	1805	
		VLMU35A10-405-130		1225	1480	1805	
Ratio of radiant Intensity / radiant power	$I_F = 700\text{ mA}$		$I_e/\Phi_e$	-	0.28	-	sr-1
Peak wavelength	$I_F = 700\text{ mA}$	VLMU35A10-385-130	$\lambda_p$	380	385	390	nm
		VLMU35A10-395-130		390	395	400	
		VLMU35A10-405-130		400	405	410	
Angle of half intensity	$I_F = 700\text{ mA}$		$\phi$	-	$\pm 65$	-	$^{\circ}$
Thermal resistance junction to solder point	$I_F = 700\text{ mA}$		$R_{thJS}$	-	4.1	-	K/W

**Note**

- Tolerances:  $\pm 10\%$  for  $\Phi_e$ ,  $\pm 0.1\text{ V}$  for  $V_F$ ,  $\pm 3\text{ nm}$  for  $\lambda_p$

**RADIANT POWER CLASSIFICATION** ( $I_F = 700\text{ mA}$ )

GROUP	MIN.	MAX.	UNIT
ST	1225	1325	mW
TU	1325	1430	
UV	1430	1545	
VW	1545	1670	
WX	1670	1805	

**PEAK WAVELENGTH CLASSIFICATION** ( $I_F = 700\text{ mA}$ )

GROUP	MIN.	MAX.	UNIT
P3R	380	385	nm
P3S	385	390	
P3T	390	395	
P3U	395	400	
P4A	400	405	
P4B	405	410	

**FORWARD VOLTAGE CLASSIFICATION** ( $I_F = 700\text{ mA}$ )

GROUP	MIN.	MAX.	UNIT
V1	3.2	3.6	V
V2	3.6	4.0	
V3	4.0	4.4	

**Note**

- In order to ensure availability, single groups for radiant intensity, wavelength, and forward voltage will not be orderable. Only one group for radiant intensity, wavelength, and forward voltage will be shipped in any one reel.



## MARKING EXAMPLE FOR SELECTION CODE ON LABEL

Selection code: UV-P3U-V2

- UV range: 1430 mW to 1545 mW
- P3U range: 395 nm to 400 nm
- V2 range: 3.6 V to 4.0 V

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

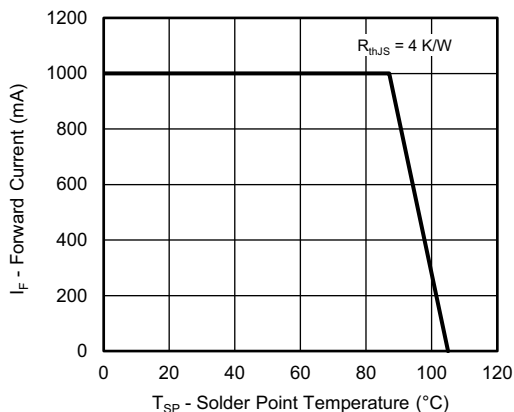


Fig. 1 - Maximum Forward Current vs. Ambient Temperature

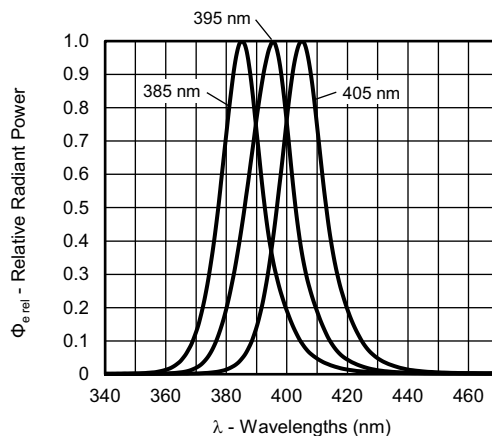


Fig. 3 - Relative Radiant Power vs. Wavelength

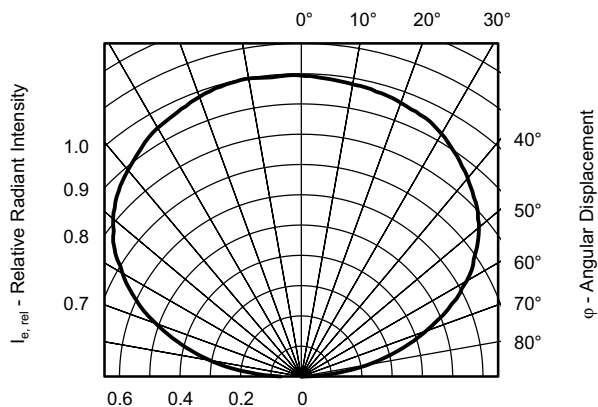


Fig. 2 - Relative Radiant Intensity vs. Angular Displacement

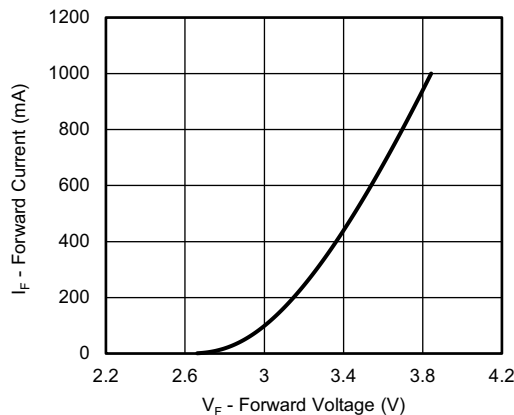


Fig. 4 - Forward Current vs. Forward Voltage

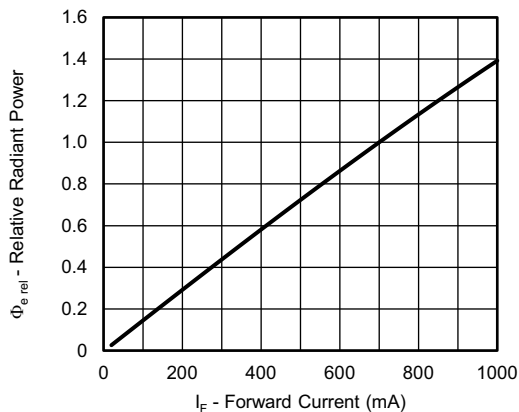


Fig. 5 - Relative Radiant Power vs. Forward Current

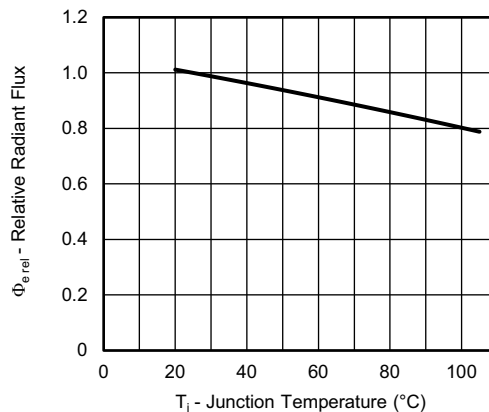
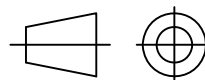
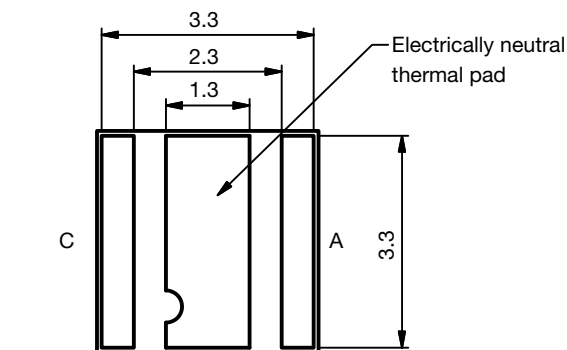


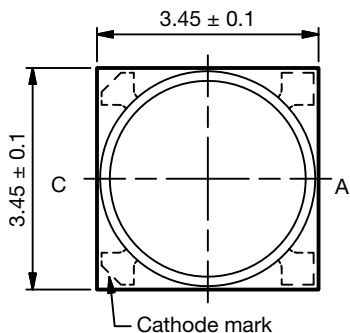
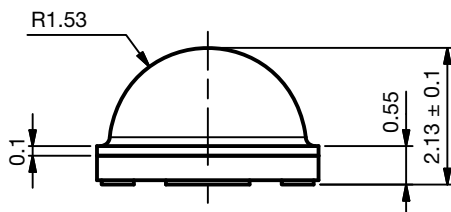
Fig. 6 - Relative Radiant Flux vs. Ambient Temperature

### PACKAGE DIMENSIONS in millimeters



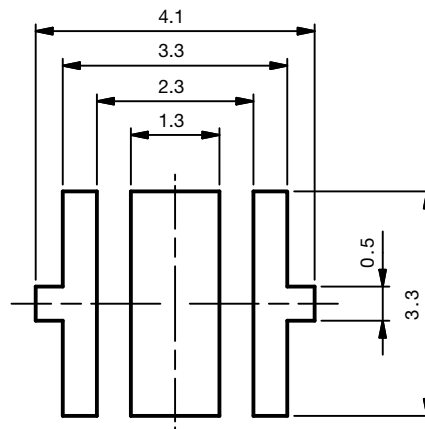
Technical drawings  
according to DIN  
specification.

Not indicated tolerances  $\pm 0.2$



Drawing-No.: 6.541-5112.01-4  
Issue: prel; 27.01.16

Recommended solder pad footprint



Not indicated tolerances  $\pm 0.13$

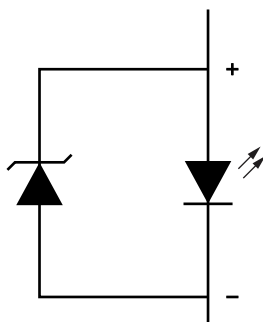
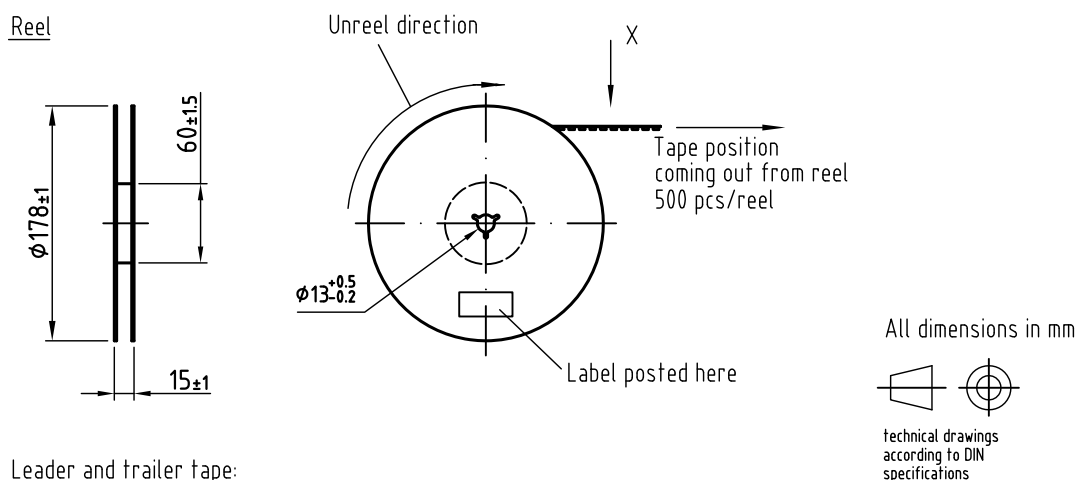
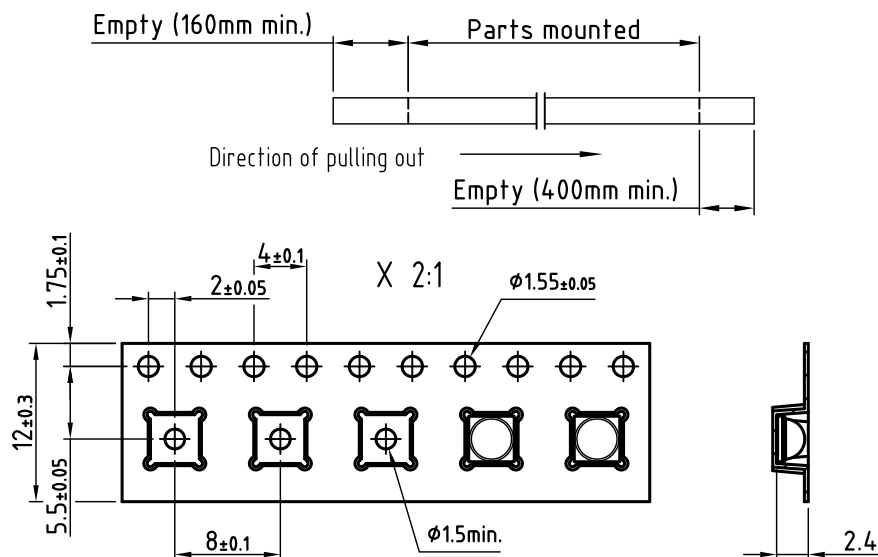
**WIRING**


Fig. 7 - Wiring Diagram

**TAPE AND REEL DIMENSIONS** in millimeters


Leader and trailer tape:



Drawing refers to following types: VLMU351...  
Reel dimensions and tape

Drawing-No.: 9.800-5139.01-4  
Issue: prel; 02.03.16

## HANDLING RECOMMENDATIONS

In order to achieve excellent lifetime, the package of these UV-LEDs consists of a ceramic substrate in combination with a UV stable silicone as lens material. Compared to standard materials silicone is generally softer and it tends more to attract dust:

- Minimize the level of dirt and dust particles in contact with the LED
- Small amounts of particles on the LEDs, although noticeable from a cosmetic point of view, do not affect the performance in terms of brightness, reliability and quality
- If cleaning is required, a short rinsing with isopropyl alcohol, not longer than 15 seconds, is recommended. Do not use ultrasonic cleaning, it may damage the LED
- Do not apply mechanical stress on the silicone lens
- Avoid any piercing of the silicone lens by sharp objects
- It is recommended to use a suitable pick and place tool for the removal of the LED from blister tape without applying stress to the lens. The recess of the pick-up needle has to be larger than the silicone lens
- For manual handling using tweezers make sure that the LED will be touched carefully at the sidewall of the ceramic substrate, but not at the silicone lens

## SOLDERING PROFILE

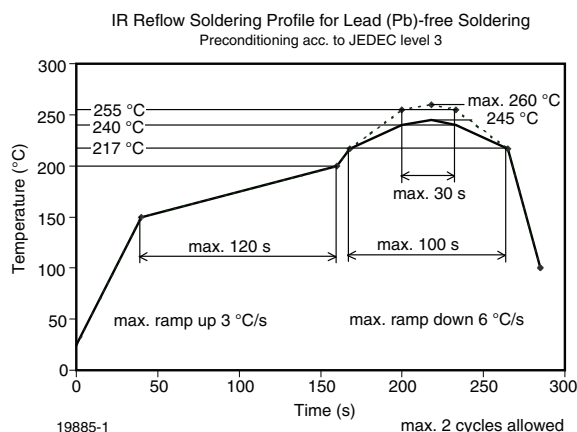
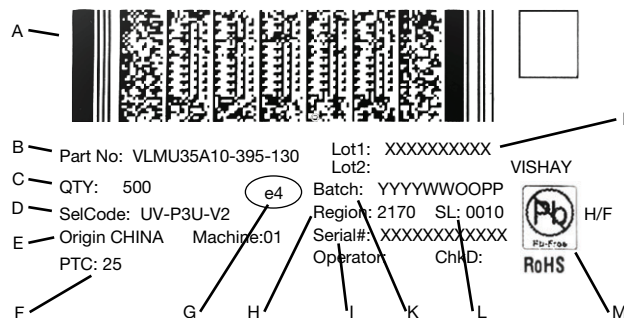


Fig. 8 - Vishay Lead (Pb)-free Reflow Soldering Profile  
(acc. to J-STD-020C)

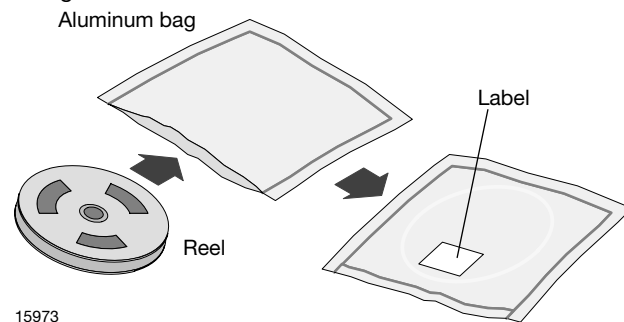
## BAR CODE PRODUCT LABEL (example only)



- 2D barcode
- Part No: Vishay part number
- QTY: quantity
- SelCode: selection bin code
- Country of origin
- PTC: production plant code
- Termination finish
- Region code
- Serial#: serial number
- Batch number: year, week, country code, plant code
- SL: sales location
- Environmental symbols:  
RoHS, lead (Pb)-free, halogen-free
- Lot numbers

## 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  $\leq 60\%$  RH max.

After more than 168 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 3 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.

	<b>CAUTION</b> This bag contains MOISTURE-SENSITIVE DEVICES	<b>LEVEL</b> <b>3</b>
<ol style="list-style-type: none"><li>1. Shelf life in sealed bag: 12 months at <math>&lt; 40^{\circ}\text{C}</math> and <math>&lt; 90\%</math> relative humidity (RH).</li><li>2. After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing (peak package body temp. <math>220^{\circ}\text{C}</math>) must be:<ol style="list-style-type: none"><li>a) Mounted within 168 h at factory conditions of <math>\leq 30^{\circ}\text{C}/60\%</math> RH or</li><li>b) Stored at <math>\leq 20\%</math> RH.</li></ol></li><li>3. Devices require baking, before mounting, if:<ol style="list-style-type: none"><li>a) Humidity Indicator Card is <math>&gt; 20\%</math> when read at <math>23^{\circ}\text{C} \pm 5^{\circ}\text{C}</math>, or</li><li>b) 2a or 2b is not met.</li></ol></li><li>4. If baking is required, devices may be baked for:<ol style="list-style-type: none"><li>a) 192 hours at <math>40^{\circ}\text{C} + 5^{\circ}\text{C}/-0^{\circ}\text{C}</math> and <math>&lt; 5\%</math> RH</li></ol></li></ol>		
Bag Seal Date: _____ (If blank, see bar code label)		
Note: LEVEL defined by EIA JEDEC Standard JESD22-A112		

17028-2

Example of JESD22-A112 level 3 label



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