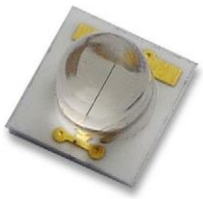
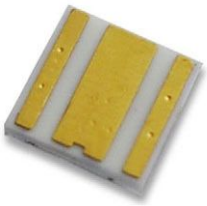
UV SMD LED with Silicone Lens





FEATURES

- Ceramic SMT package with silicone lens
- Dimension (L x W x H) in mm: 3.5 x 3.5 x 2.9
- Forward current: up to 700 mA
- Radiant power (typ.): 780 mW at 500 mA, 1037 mW at 700 mA
- Materials:
  - Die: InGaN
  - Resin: silicone (water clear)
  - Leads / terminations finish: gold plated (Au)
- Grouping parameters:
  - Radiant power
  - Peak wavelength
  - Forward voltage
- Reflow soldering method
- MSL2 according to J-STD-020
- Packaging: MOQ = 100 pieces; 12 mm tape with 100 pieces per reel, Ø 180 mm (7")
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

VLMU3500-...-060 series is a ceramic based high power UV LED with silicone lens for long life time. The package size is 3.5 mm x 3.5 mm and the radiant power up to 1250 mW at 700 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: ± 30°
- Lead-finishing: Au

SAFETY ADVICES

Depending on the mode of operation, these devices emit highly concentrated non visible ultraviolet 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”.

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.		
VLMU3500-385-060	Ultraviolet	620	780	940	500	380	385	390	500	2.8	3.4	4.0	500	InGaN
VLMU3500-395-060	Ultraviolet	620	780	940	500	390	395	400	500	2.8	3.4	4.0	500	InGaN
VLMU3500-405-060	Ultraviolet	620	780	940	500	400	405	410	500	2.8	3.4	4.0	500	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) **VLMU3500-...-060**				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
DC forward current		I_F	700	mA
Power dissipation		P_V	2.8	W
Electrostatic discharge	HBM: MIL-STD-883 C 3B	ESD	8000	V
Junction temperature		T_j	+125	°C
Operating temperature range		T_{amb}	-40 to +85	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Solder temperature		T_{sol}	260	°C
Thermal resistance - junction to solder point		R_{thJS}	8	°C/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMU3500-...-060, ULTRAVIOLET**							
PARAMETER	**TEST CONDITION**	**DEVICE TYPE**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 500 mA		V_F	2.8	3.4	4	V
Radiant power	I_F = 350 mA		ϕ_e	445	560	675	mW
	I_F = 500 mA			620	780	940	
	I_F = 700 mA			824	1037	1250	
Radiant intensity	I_F = 350 mA		I_e	-	395	-	mW/sr
	I_F = 500 mA			-	550	-	
	I_F = 700 mA			-	730	-	
Peak wavelength	I_F = 500 mA	VLMU3500-385-060	λ_p	380	385	390	nm
		VLMU3500-395-060		390	395	400	nm
		VLMU3500-405-060		400	405	410	nm
Angle of half intensity	I_F = 500 mA		φ	-	± 30	-	deg
Reverse current	V_R = 5 V		I_R	-	-	10	µA

Note

- Tolerances: ± 11 % for ϕ_e, ± 0.1 V for V_F, ± 1 nm for λ_p.

RADIANT POWER CLASSIFICATION (I_F = 500 mA)			
GROUP	**MIN.**	**MAX.**	**UNIT**
U062	620	660	mW
U066	660	700	
U070	700	740	
U074	740	780	
U078	780	820	
U082	820	860	
U086	860	900	
U090	900	940	

PEAK WAVELENGTH CLASSIFICATION (I_F = 500 mA)			
GROUP	**MIN.**	**MAX.**	**UNIT**
Q380	380	385	nm
Q385	385	390	
Q390	390	395	
Q395	395	400	
Q400	400	405	
Q405	405	410	

FORWARD VOLTAGE CLASSIFICATION (I_F = 500 mA)			
GROUP	**MIN.**	**MAX.**	**UNIT**
V2830	2.8	3.0	V
V3032	3.0	3.2	
V3234	3.2	3.4	
V3436	3.4	3.6	
V3638	3.6	3.8	
V3840	3.8	4.0	

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: U074Q385V3436

- U074: ϕ_e, range 740 mW to 780 mW
- Q385: λ_p, range 385 nm to 390 nm
- V3436: V_F, range 3.4 V to 3.6 V

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

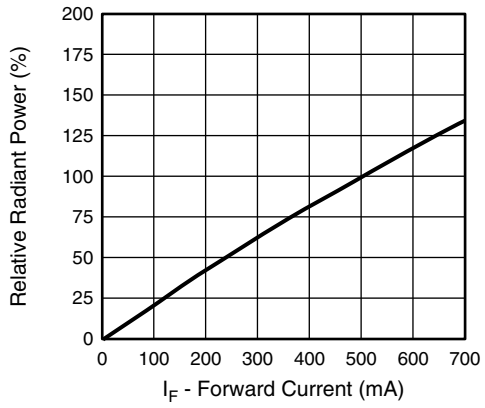


Fig. 1 - Relative Radiant Power vs. Forward Current

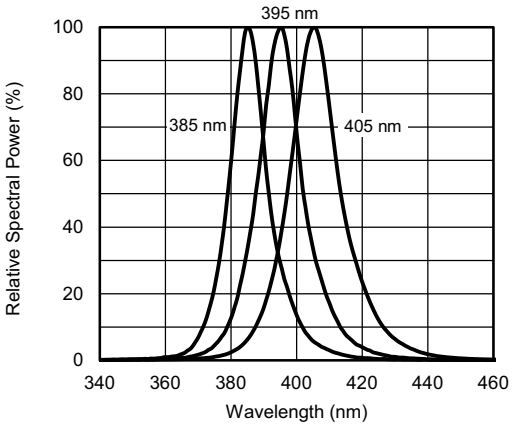


Fig. 3 - Relative Spectral Power vs. Wavelength

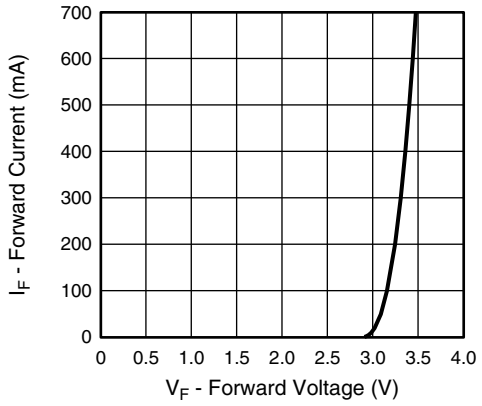


Fig. 2 - Forward Current vs. Forward Voltage

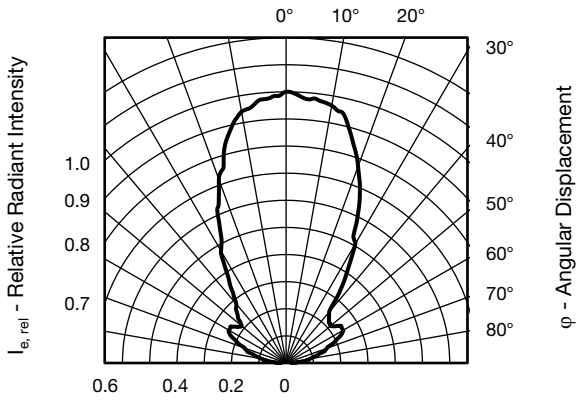


Fig. 4 - Relative Intensity vs. Angular Displacement

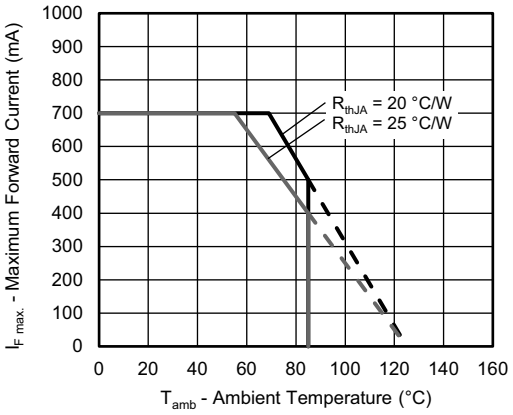


Fig. 5 - Maximum Forward Current vs. Ambient Temperature

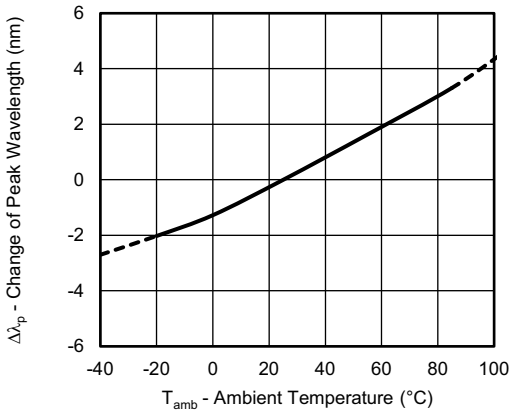


Fig. 7 - Change of Peak Wavelength vs. Ambient Temperature

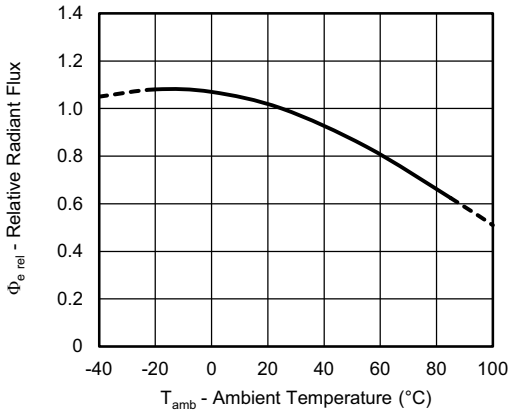


Fig. 6 - Relative Radiant Flux vs. Ambient Temperature

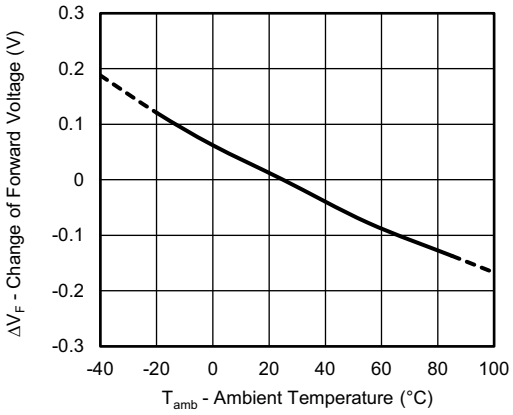
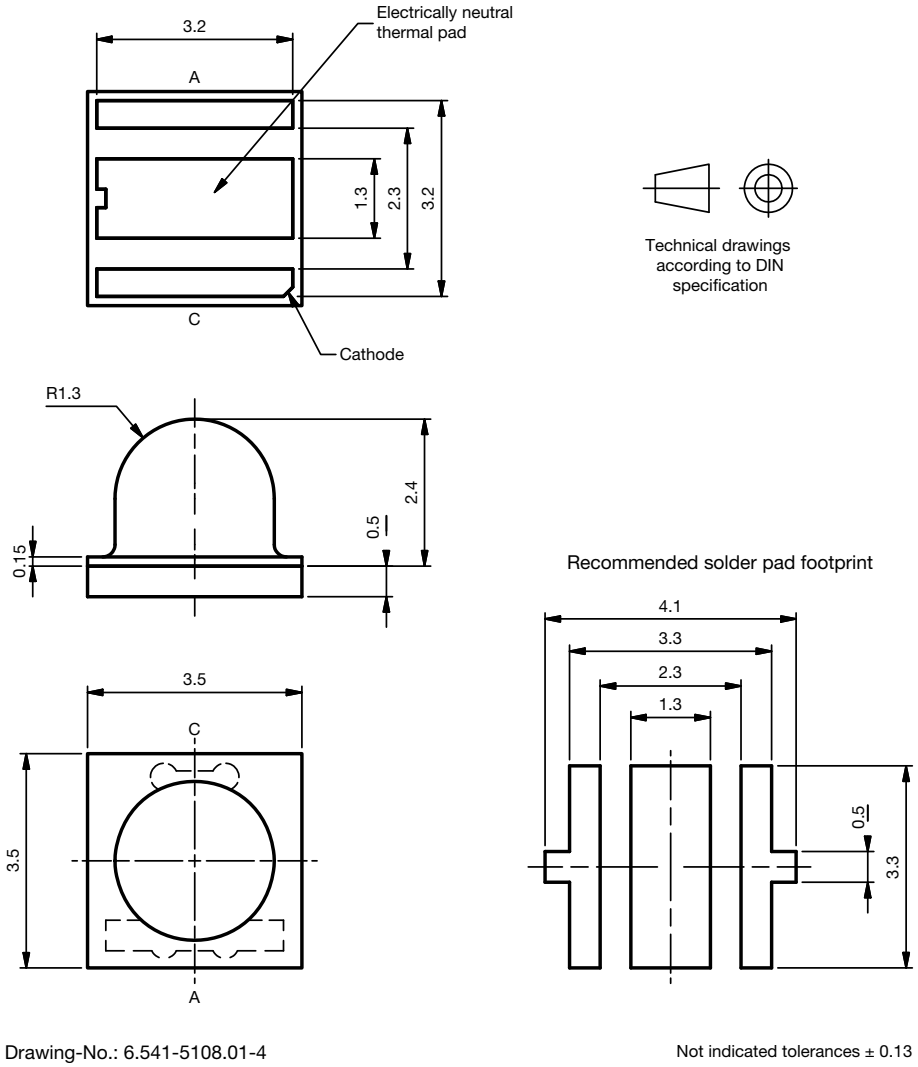


Fig. 8 - Change of Forward Voltage vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.541-5108.01-4
Issue: 2; 07.03.16

Not indicated tolerances ± 0.13

WIRING

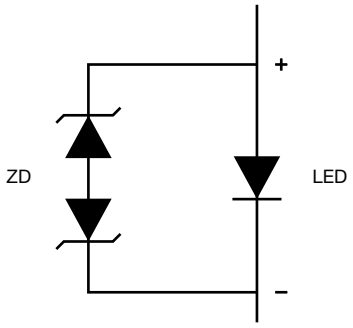
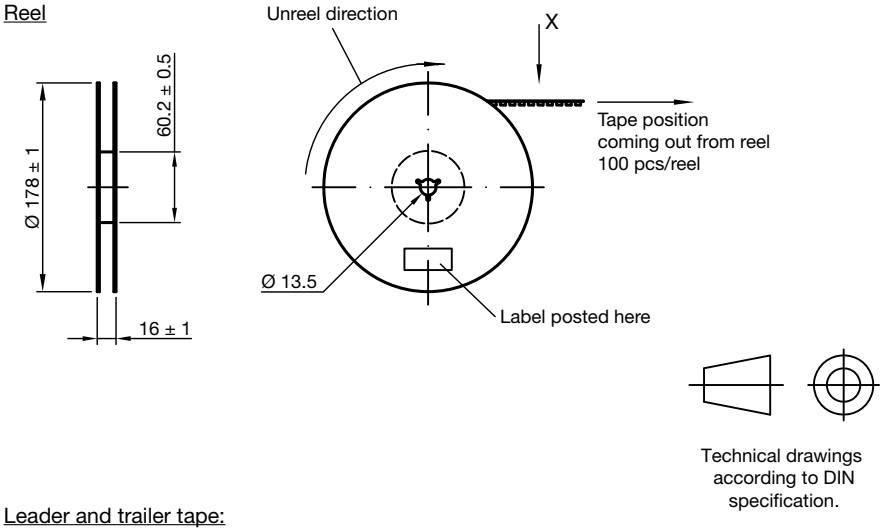
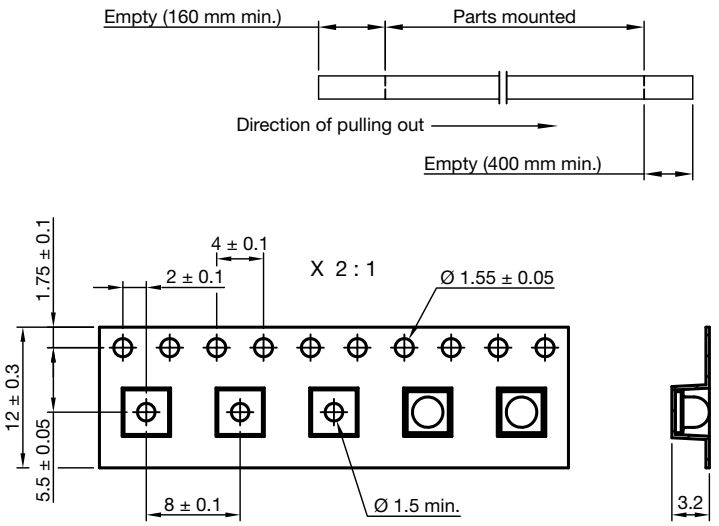


Fig. 9 - Wiring Diagram

TAPE AND REEL DIMENSIONS in millimeters



Leader and trailer tape:



Drawing-No.: 9.800-5131.01-4
Issue: prel; 17.11.15

SOLDERING PROFILE

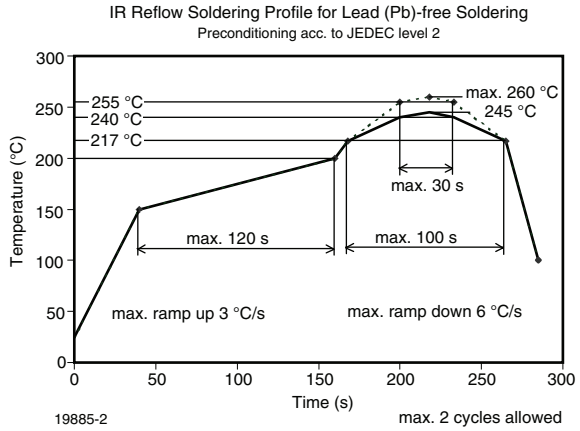
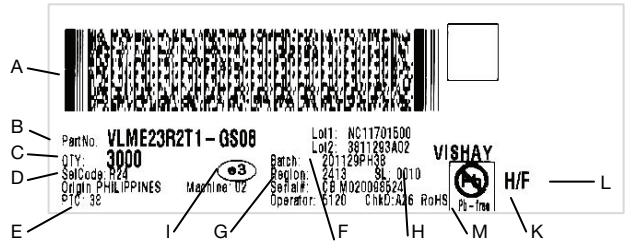


Fig. 10 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

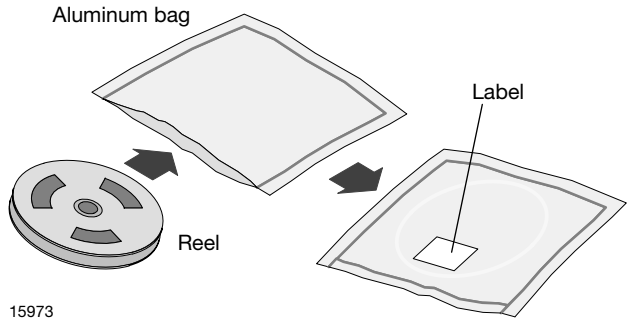
BAR CODE PRODUCT LABEL (example only)



a. 2D barcode
b. Vishay part number
c. Quantity
d. SEL = selection code (binning)
e. 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.



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:

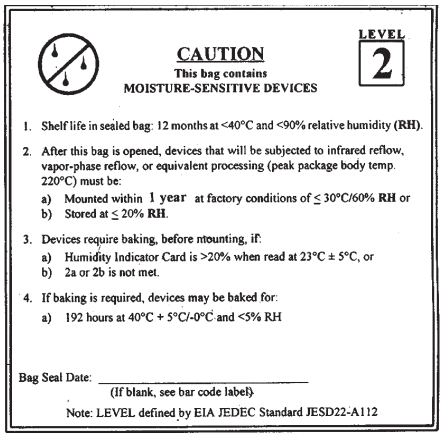
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 1 year 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
24 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 2 label is included on all dry bags.



Example of JESD22-A112 level 2 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 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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