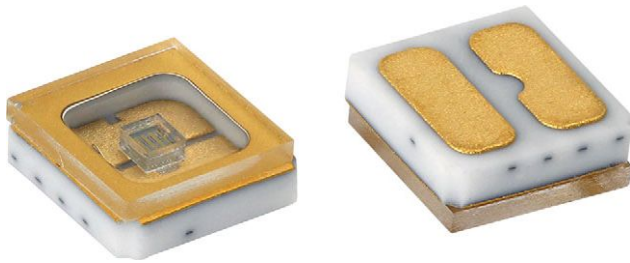


UVC Emitting Diode in SMD Package



DESCRIPTION

VLMU35CM..-280-120 is a ceramic based mid power UVC LED with quartz window for long life time. The package size is 3.5 mm x 3.5 mm x 1.2 mm and the radiant power typically 15 mW at 100 mA in a wavelength range of 265 nm to 285 nm.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD ceramic
- Product series: standard power UV LED
- Angle of half intensity: $\pm 60^\circ$
- Lead-finishing: Au

FEATURES

- Ceramic SMT package with quartz window
- Dimension (L x W x H) in mm: 3.5 x 3.5 x 1.2
- Forward current: up to 150 mA
- Radiant power (typ.): 15 mW at 100 mA
- Leads / terminations finish: gold plated (Au)
- Reflow soldering method
- MSL 3 according to J-STD-020
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Sterilization
- Medical application
- Sensing of gases, germs, DNA, ...

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 and skin. 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 | RADIANT POWER (mW) | | | at I _F | WAVELENGTH (nm) | | | at I _F | FORWARD VOLTAGE (V) | | | at I _F | TECHNOLOGY |
|--------------------|-------------|--------------------|------|------|-------------------|-----------------|------|------|-------------------|---------------------|------|------|-------------------|------------|
| | | MIN. | TYP. | MAX. | (mA) | MIN. | TYP. | MAX. | (mA) | MIN. | TYP. | MAX. | (mA) | |
| VLMU35CM00-280-120 | Ultraviolet | 8 | 15 | - | 100 | 265 | 278 | 285 | 100 | 4 | 5 | 7 | 100 | AlGaIn |

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) VLMU35CM..-280-120

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-----------------------------|-----------------------|------------------|------------------------------------|------|
| DC forward current | | I _F | 150 | mA |
| Power dissipation | | P _V | 0.86 | W |
| Reverse voltage | | | Not designed for reverse operation | |
| Electrostatic discharge | HBM: MIL-STD-883 C 3B | ESD | 2000 | V |
| Junction temperature | | T _j | +85 | °C |
| Operating temperature range | | T _{amb} | -40 to +80 | °C |
| Storage temperature range | | T _{stg} | -40 to +100 | °C |
| Solder temperature | | T _{sol} | 260 | °C |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)
VLMU35CM..-280-120, ULTRAVIOLET

| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|--------------|------|----------|------|------------------|
| Forward voltage | $I_F = 100\text{ mA}$ | V_F | 4 | 5 | 7 | V |
| Radiant power | $I_F = 100\text{ mA}$ | ϕ_e | 8 | 15 | - | mW |
| Ratio of radiant intensity/radiant power | $I_F = 100\text{ mA}$ | I_e/ϕ_e | - | 0.28 | - | sr^{-1} |
| Peak wavelength | $I_F = 100\text{ mA}$ | λ_p | 265 | 278 | 285 | nm |
| Angle of half intensity | $I_F = 100\text{ mA}$ | φ | - | ± 60 | - | $^{\circ}$ |
| Thermal resistance junction to solder pin | | R_{thJS} | - | 15 | - | K/W |
| Thermal resistance junction to ambient | Soldered on 20 x 20 x 1.7 (in mm) Al MCPCB | R_{thJA} | - | 30 | - | K/W |

Note

- Tolerances: $\pm 11\%$ for ϕ_e , $\pm 0.1\text{ V}$ for V_F , $\pm 3\text{ nm}$ for λ_p

RADIANT POWER CLASSIFICATION ($I_F = 100\text{ mA}$)

| GROUP | MIN. | MAX. | UNIT |
|-------|------|------|------|
| X3 | 8 | 10 | mW |
| X4 | 10 | 12 | |
| X5 | 12 | 14 | |
| X6 | 14 | 16 | |
| X7 | 16 | 18 | |
| X8 | 18 | 20 | |
| X9 | 20 | 22 | |

PEAK WAVELENGTH CLASSIFICATION ($I_F = 100\text{ mA}$)

| GROUP | MIN. | MAX. | UNIT |
|-------|------|------|------|
| W1 | 265 | 285 | nm |

FORWARD VOLTAGE CLASSIFICATION ($I_F = 100\text{ mA}$)

| GROUP | MIN. | MAX. | UNIT |
|-------|------|------|------|
| VX | 4 | 5 | V |
| VY | 5 | 6 | |
| V0 | 6 | 7 | |

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

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

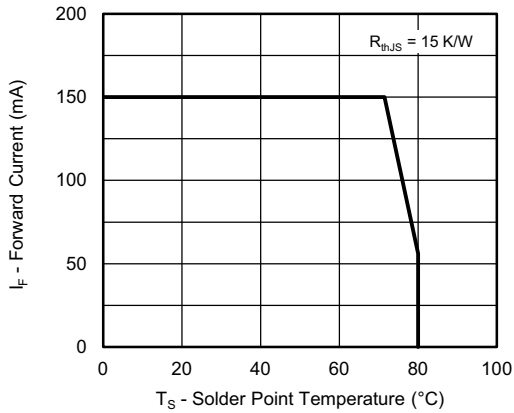


Fig. 1 - Maximum Forward Current vs. Solder Point Temperature

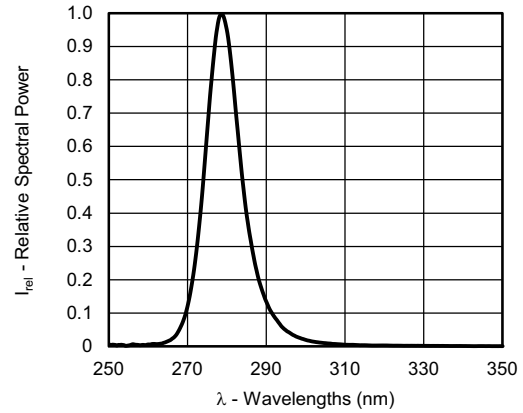


Fig. 4 - Relative Spectral Power vs. Wavelength

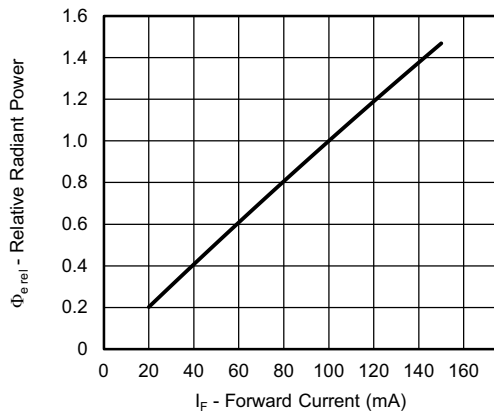


Fig. 2 - Relative Radiant Power vs. Forward Current

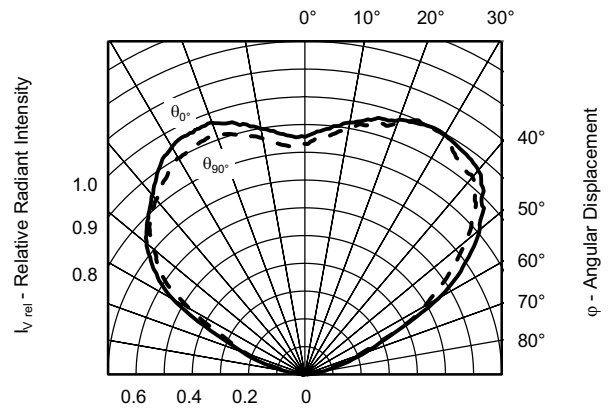


Fig. 5 - Relative Radiant Intensity vs. Angular Displacement

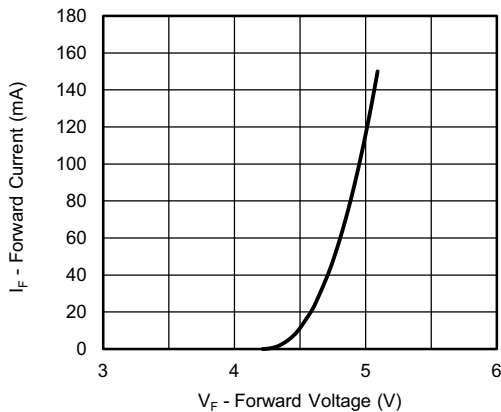


Fig. 3 - Forward Current vs. Forward Voltage

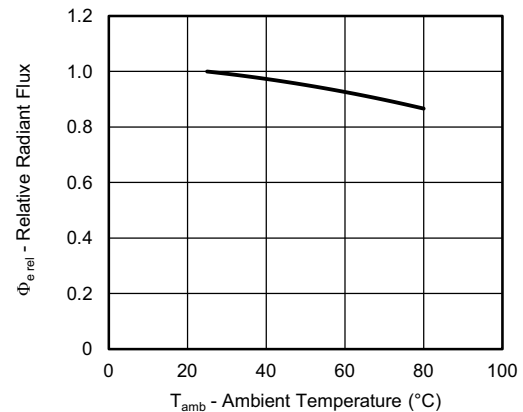
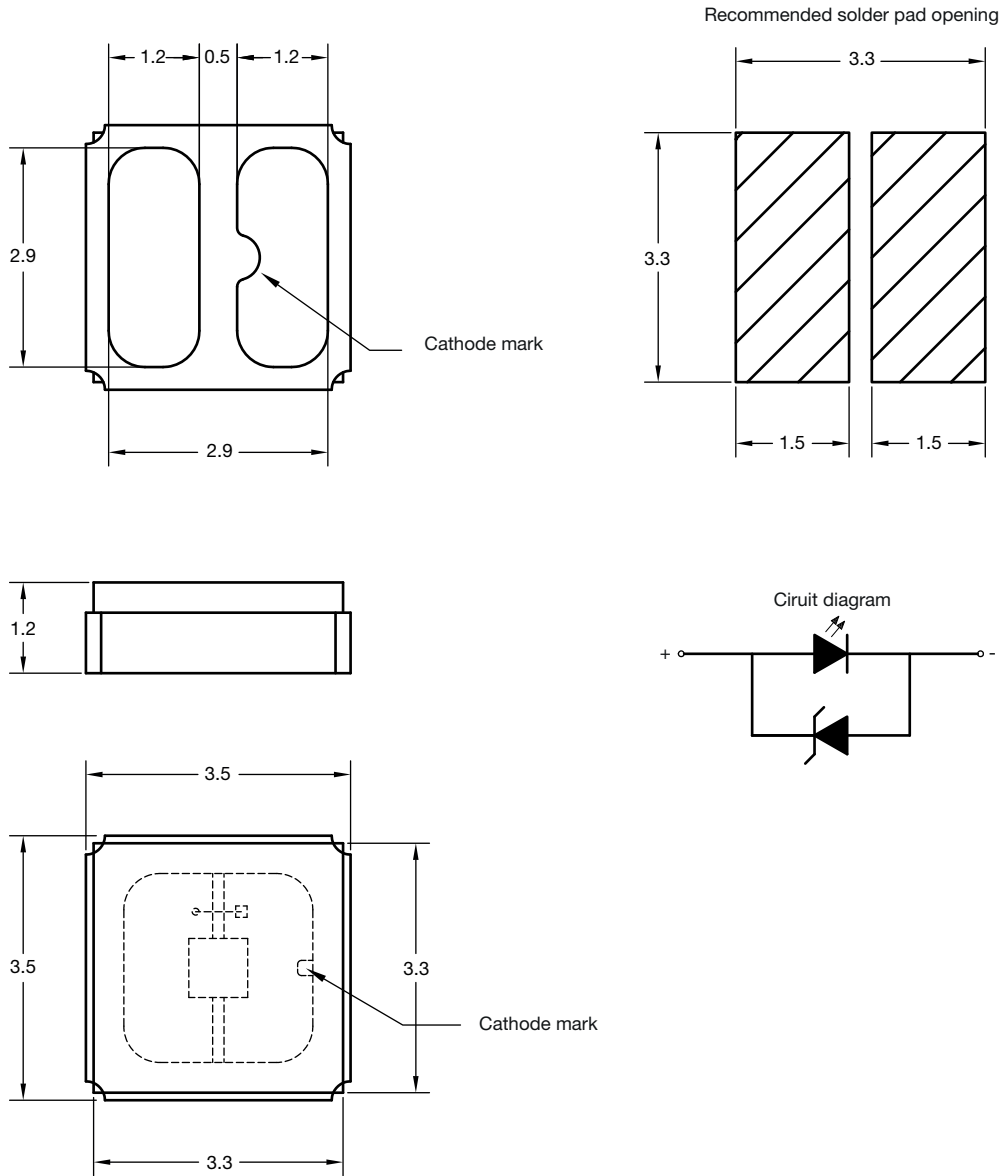


Fig. 6 - Relative Radiant Flux vs. Ambient Temperature

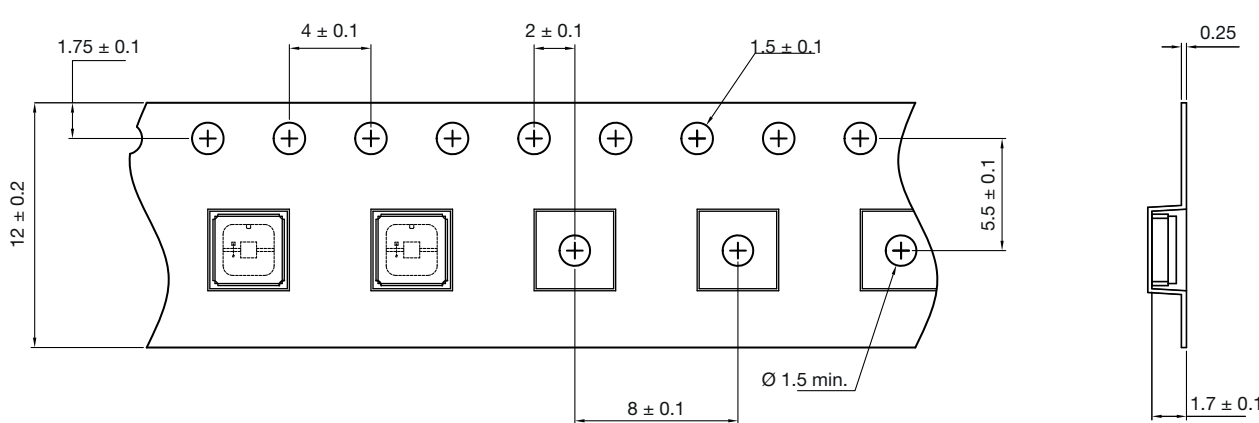
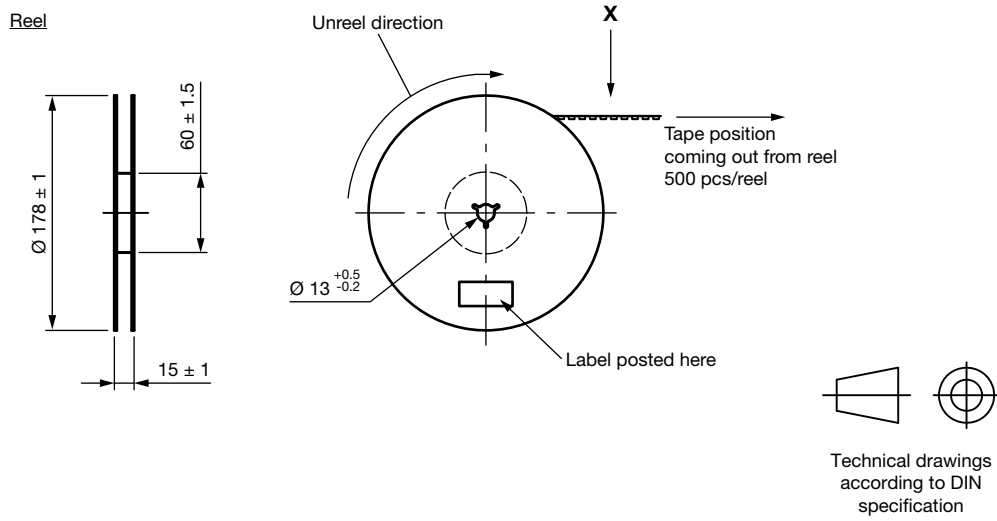


PACKAGE DIMENSIONS in millimeters





TAPE AND REEL DIMENSIONS in millimeters



SOLDERING PROFILE

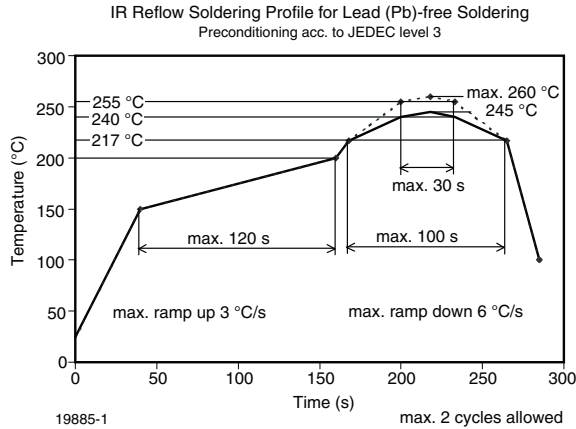
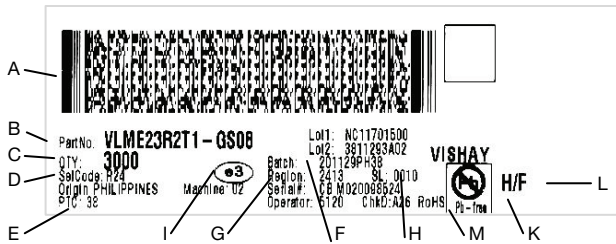


Fig. 7 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020C)

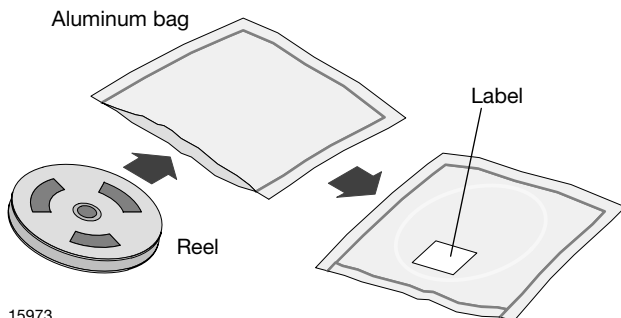
BAR CODE PRODUCT LABEL (example only)



- 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.



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:

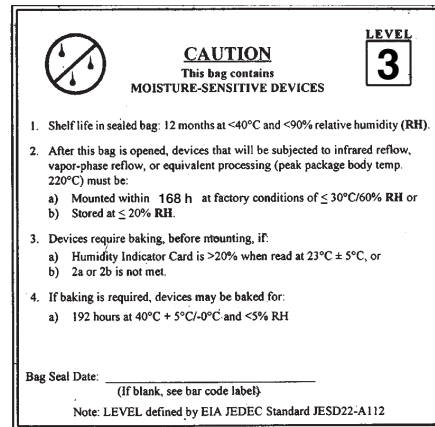
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 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
- 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 3 label is included on all dry bags.



17028-2

Example of JESD22-A112 level 3 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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