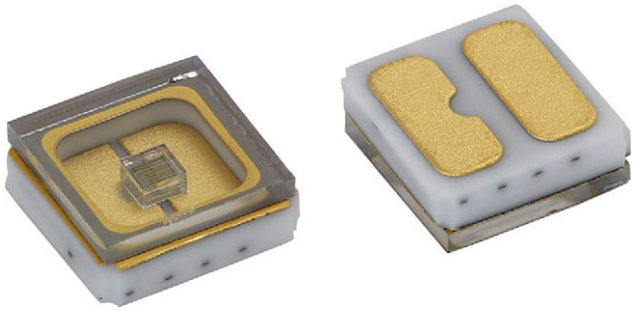
UVC Emitting Diode in SMD Package



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.): 12 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

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

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 12 mW at 100 mA in a wavelength range of 265 nm to 285 nm.

APPLICATIONS

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

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD ceramic
- Product series: standard power UV LED
- Angle of half intensity: ± 60°
- 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 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 (mA)	WAVELENGTH (nm)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMU35CM00-280-120	Ultraviolet	8	12	-	100	265	278	285	100	4	5	7	100	AlGaN

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 °C, unless otherwise specified) VLMU35CM..-280-120, ULTRAVIOLET						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 100 mA	V_F	4	5	7	V
Radiant power	I_F = 100 mA	ϕ_e	8	12	-	mW
Ratio of radiant intensity/radiant power	I_F = 100 mA	I_e/ϕ_e	-	0.28	-	sr^{-1}
Peak wavelength	I_F = 100 mA	λ_p	265	278	285	nm
Angle of half intensity	I_F = 100 mA	φ	-	± 60	-	°
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: ± 11 % for ϕ_e, ± 0.1 V for V_F, ± 3 nm for λ_p

RADIANT POWER CLASSIFICATION (I_F = 100 mA)			
GROUP	**MIN.**	**MAX.**	**UNIT**
X3	8	10	mW
X4	10	12	
X5	12	14	
X6	14	16	
X7	16	18	

PEAK WAVELENGTH CLASSIFICATION (I_F = 100 mA)			
GROUP	**MIN.**	**MAX.**	**UNIT**
W1	265	285	nm

FORWARD VOLTAGE CLASSIFICATION (I_F = 100 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 °C, unless otherwise specified)

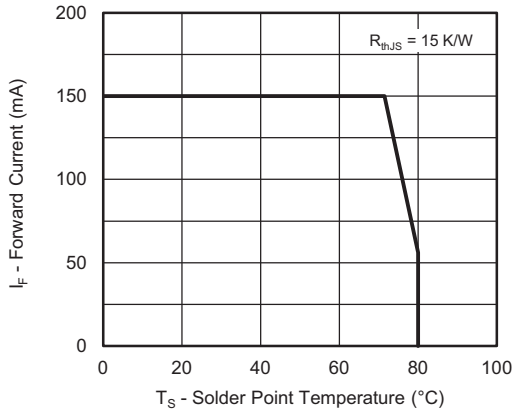


Fig. 1 - Maximum Forward Current vs. Solder Point Temperature

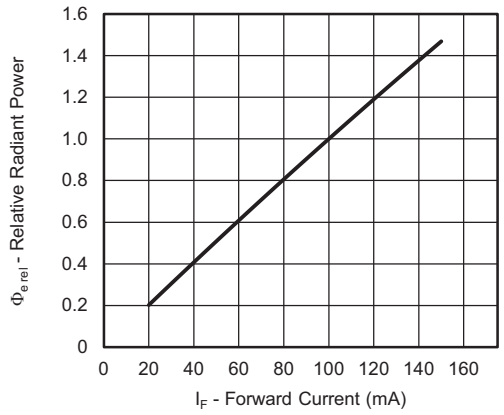


Fig. 2 - Relative Radiant Power vs. Forward Current

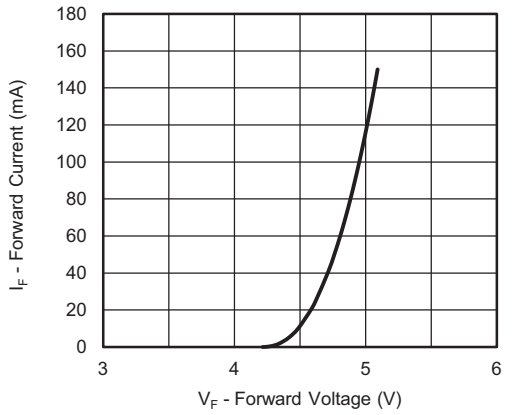


Fig. 3 - Forward Current vs. Forward Voltage

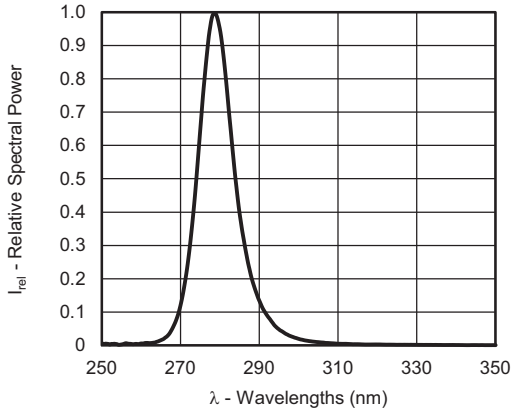


Fig. 4 - Relative Spectral Power vs. Wavelength

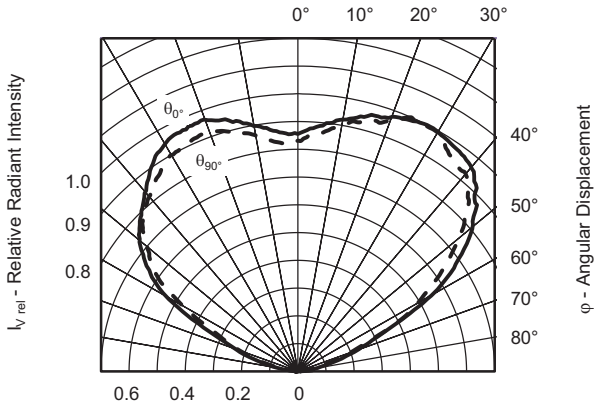


Fig. 5 - Relative Radiant Intensity vs. Angular Displacement

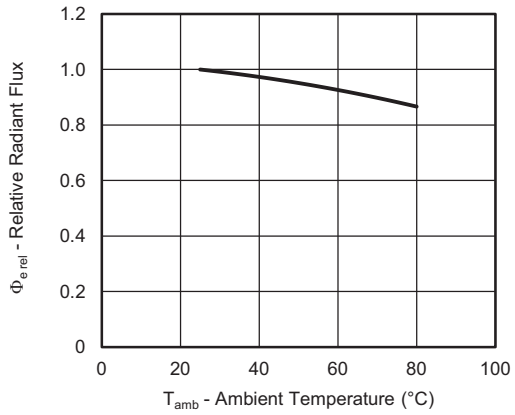
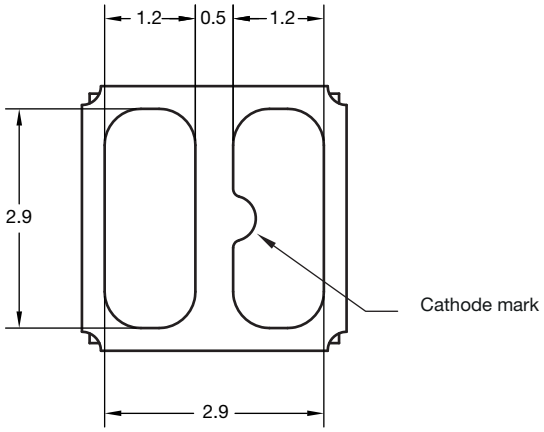
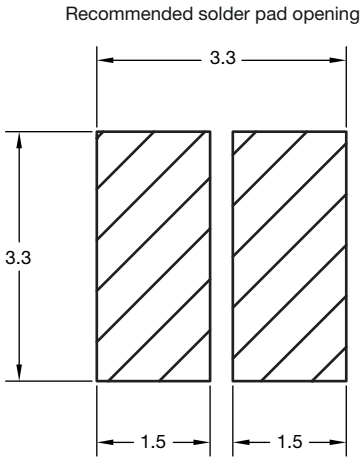
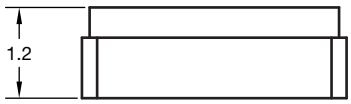


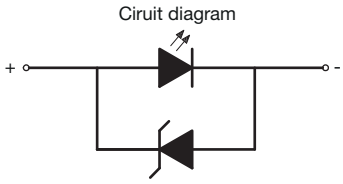
Fig. 6 - Relative Radiant Flux vs. Ambient Temperature

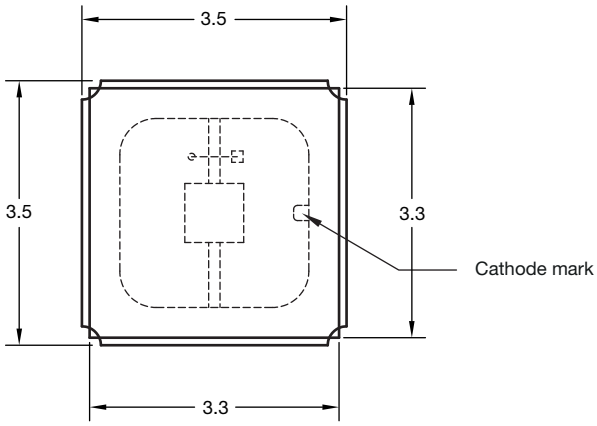
PACKAGE DIMENSIONS in millimeters



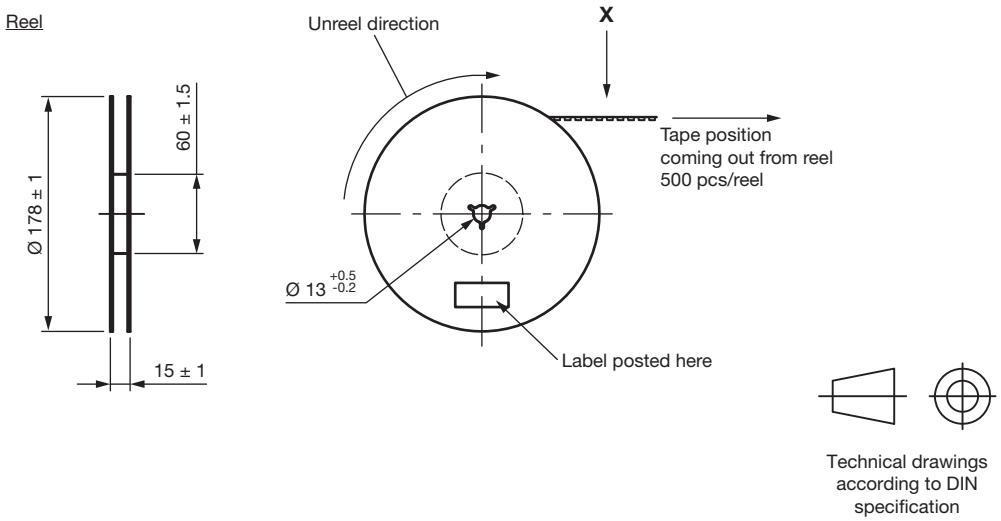




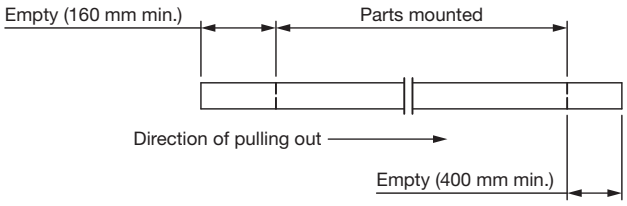


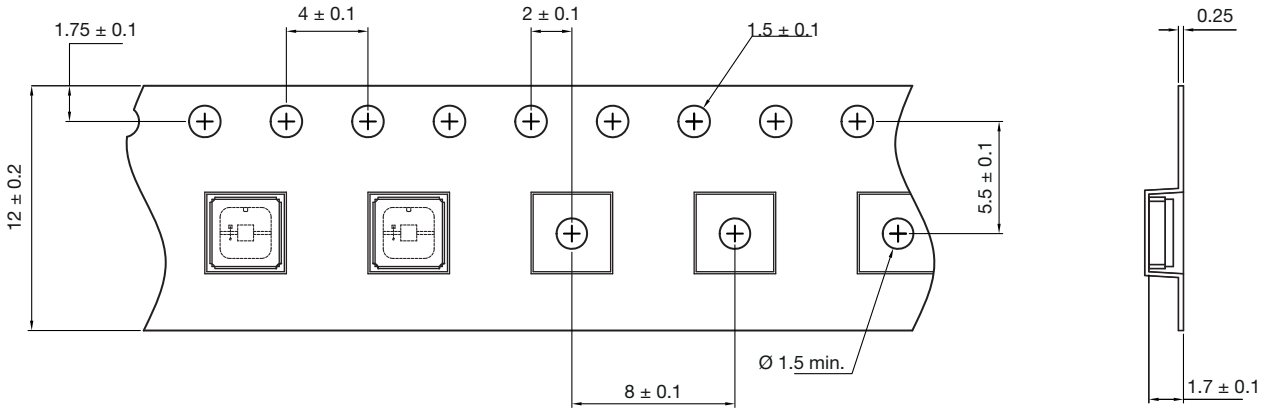


TAPE AND REEL DIMENSIONS in millimeters



Leader and trailer tape





SOLDERING PROFILE

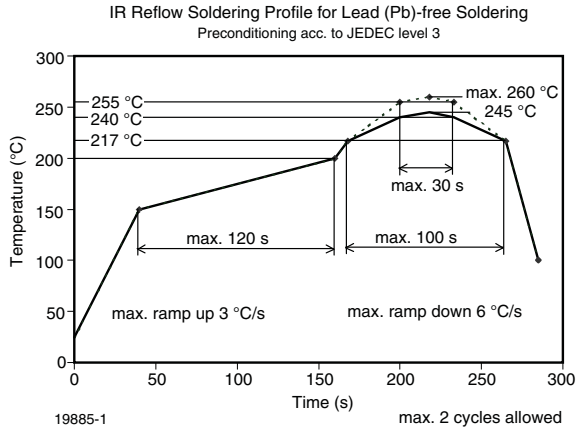
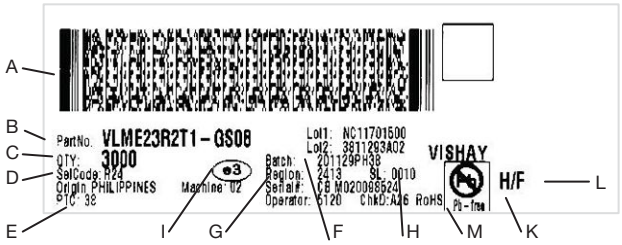


Fig. 7 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

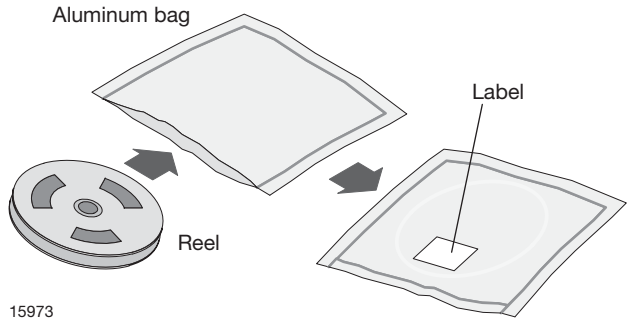
BAR CODE PRODUCT LABEL (example only)



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:

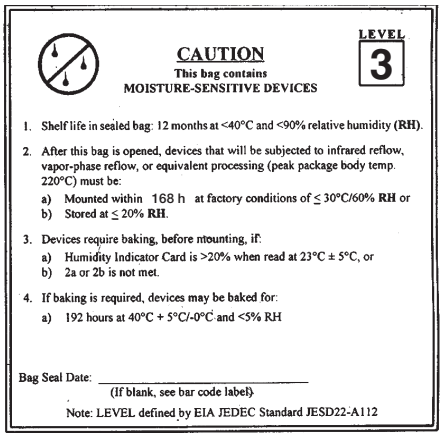
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 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.



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.

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.

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.