UVC Emitting Diode in SMD Package



FEATURES

- Ceramic SMT package with quartz window
- Dimension (L x W x H) in mm: 3.45 x 3.45 x 1.68
- DC forward current: up to 200 mA
- Radiant power (typ.): 18.2 mW at 120 mA and 26 mW at 180 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

VLMU35CT2.-275-120 are ceramic based mid power UVC LEDs with quartz window for long life time. The package size is 3.45 mm x 3.45 mm x 1.68 mm and the radiant power typically 26 mW at 180 mA in a wavelength range of 270 nm to 280 nm.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD ceramic
- Product series: mid power UV LED
- Angle of half intensity: ± 60°
- Lead-finishing: Au

APPLICATIONS

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

SAFETY ADVICES

These LEDs emit very strong UV radiation during operation. Do not look directly into the LED light when in operation as UV radiation can harm your eyes. To prevent inadequate exposure, wear protective eyewear. If LEDs are embedded in devices, please indicate warning labels. Avoid exposure to skin or other tissue during operation. Keep out of the reach of children. Take appropriate precautions around pets and other living organisms to avoid UV exposure.

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.		
VLMU35CT20-275-120	Ultraviolet	20.5	26	-	180	270	274	280	180	5.0	6.3	7.0	180	AlGaN
VLMU35CT21-275-120	Ultraviolet	22.5	26	-	180	270	274	280	180	5.0	6.3	7.0	180	AlGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMU35CT20-275-120, VLMU35CT21-275-120

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
DC forward current		I_F	200	mA
Power dissipation		P_V	1.5	W
Reverse voltage		Not designed for reverse operation		
Electrostatic discharge	HBM: MIL-STD-883 C 3B	ESD	2000	V
Junction temperature		T_j	+105	°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

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OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMU35CT20-275-120, VLMU35CT21-275-120, ULTRAVIOLET**							
PARAMETER	**TEST CONDITION**	**PARTS**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 180 mA	VLMU35CT20-275-120	V_F	5.0	6.3	7.0	V
		VLMU35CT21-275-120		5.0	6.3	7.0	
Radiant power	I_F = 120 mA		ϕ_e	-	18.2	-	mW
	I_F = 180 mA	VLMU35CT20-275-120		20.5	26	-	
		VLMU35CT21-275-120		22.5	26	-	
Ratio of radiant intensity / radiant power	I_F = 180 mA		I_e/ϕ_e	-	0.29	-	sr^{-1}
Peak wavelength	I_F = 180 mA		λ_p	270	274	280	nm
Angle of half intensity	I_F = 180 mA		φ	-	± 60	-	°
Thermal resistance junction to solder-point	Soldered on 20 x 20 x 1.7 (in mm) Al MCPCB		R_{thJS}	-	17	-	K/W

Note

- Tolerances: ± 11 % for ϕ_e, ± 0.1 V for V_F, ± 3 nm for λ_p

RADIANT POWER CLASSIFICATION (I_F = 180 mA)					
GROUP	**φ_e (mW)**		**UNIT**	**CT20**	**CT21**
	MIN.	**MAX.**			
P3	20.5	22.5	mW	x	-
P4	22.5	24.5		x	x
P5	24.5	26.5		x	x
P6	26.5	28.5		x	x
P7	28.5	-		x	x

PEAK WAVELENGTH CLASSIFICATION (I_F = 180 mA)					
GROUP	**λ_p (nm)**		**UNIT**	**CT20**	**CT21**
	MIN.	**MAX.**			
W1	270	280	nm	x	x

FORWARD VOLTAGE CLASSIFICATION (I_F = 180 mA)					
GROUP	**V_F (V)**		**UNIT**	**CT20**	**CT21**
	MIN.	**MAX.**			
VZ	5.0	5.5	V	x	x
V0	5.5	6.0		x	x
V1	6.0	6.5		x	x
V2	6.5	7.0		x	x

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

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

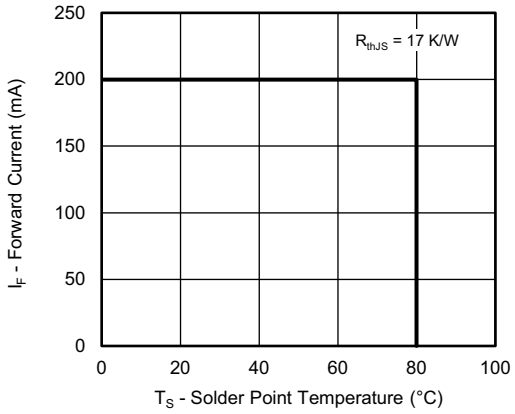

Fig. 1 - Maximum Forward Current vs. Solder Point Temperature

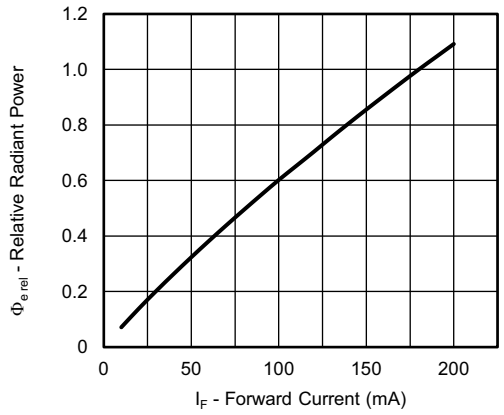

Fig. 2 - Relative Radiant Power vs. Forward Current

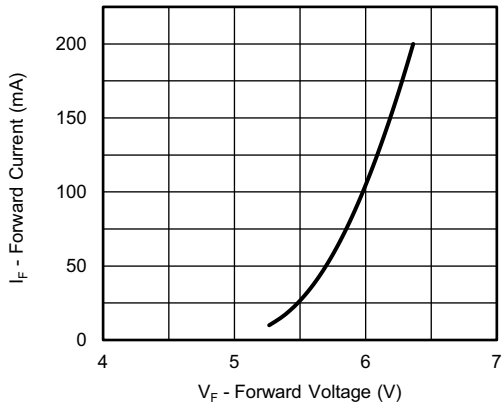

Fig. 3 - Forward Current vs. Forward Voltage

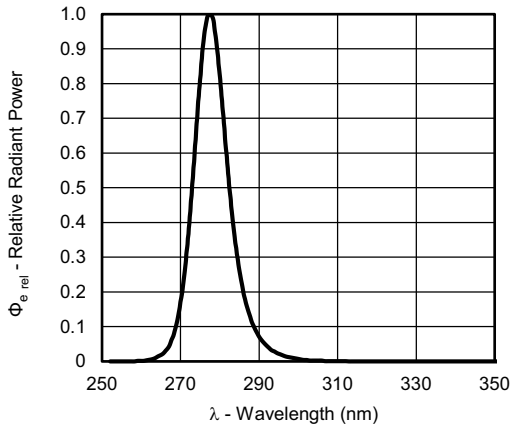

Fig. 4 - Relative Radiant Power vs. Wavelength

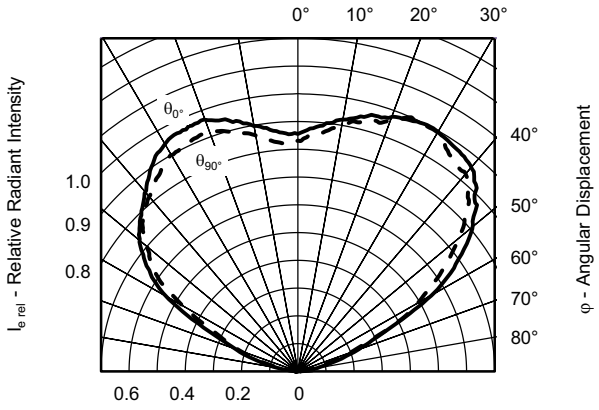

Fig. 5 - Relative Radiant Intensity vs. Angular Displacement

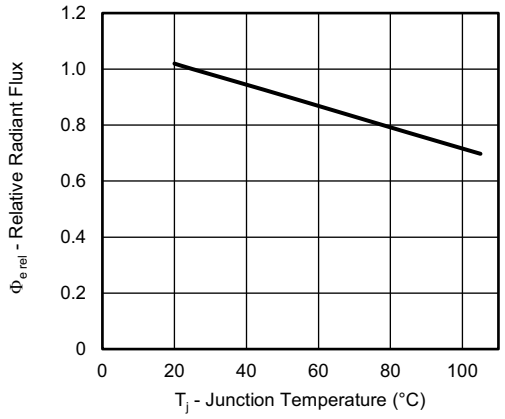

Fig. 6 - Relative Radiant Power vs. Junction Temperature

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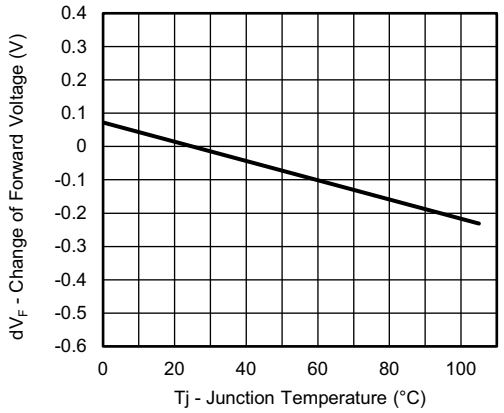
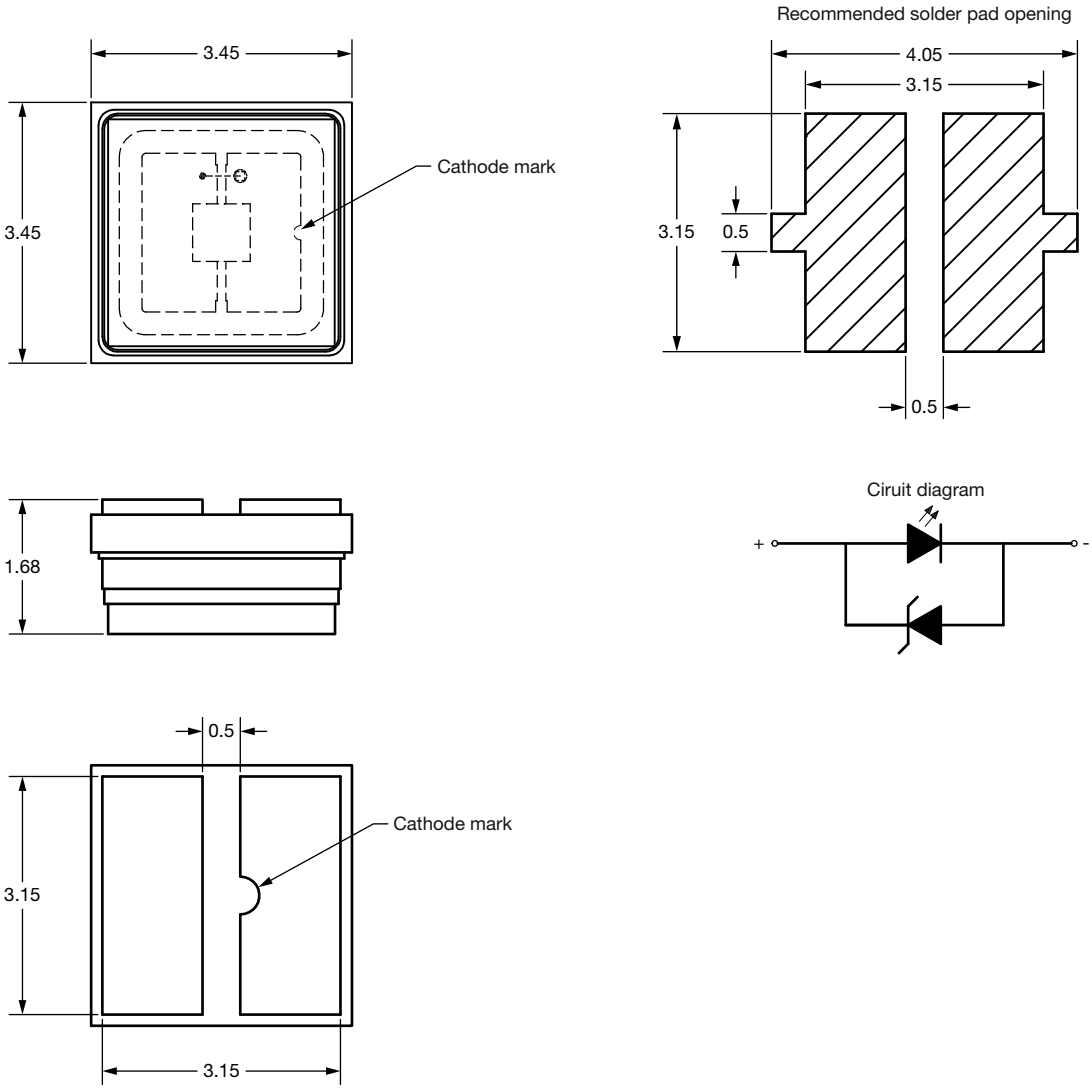


Fig. 7 - Change of Forward Voltage vs. Junction Temperature

PACKAGE DIMENSIONS in millimeters



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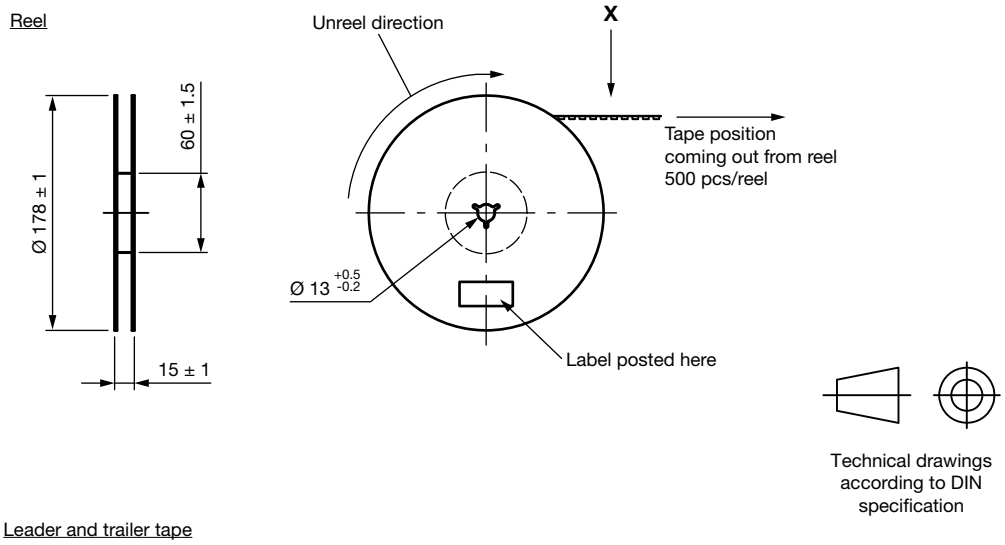
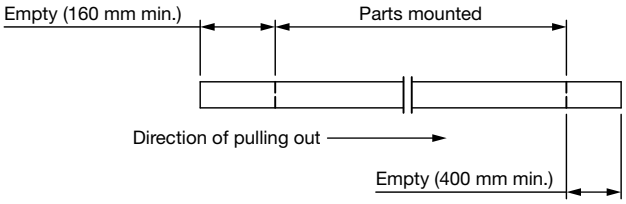
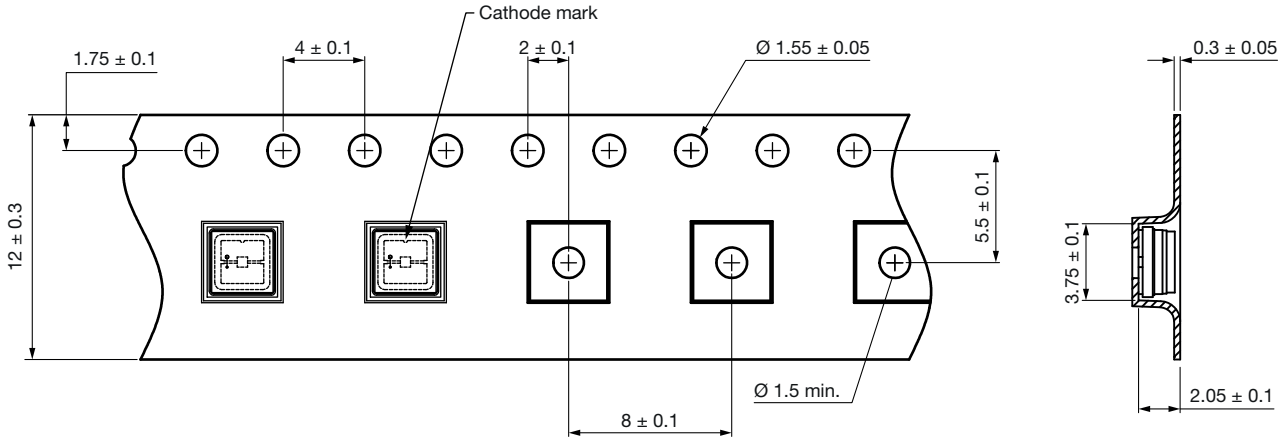
TAPE AND REEL DIMENSIONS in millimeters



Leader and trailer tape





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SOLDERING PROFILE

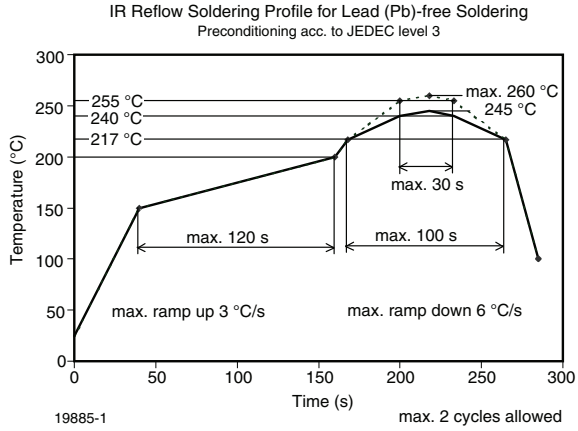
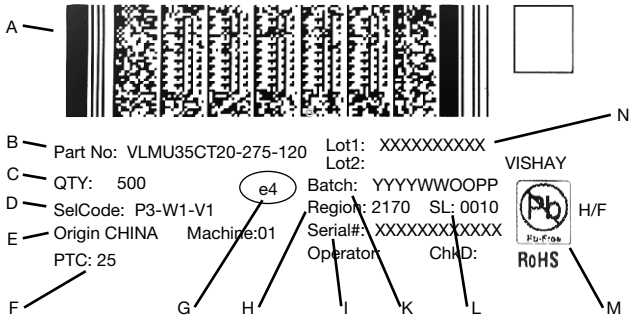


Fig. 8 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020C)

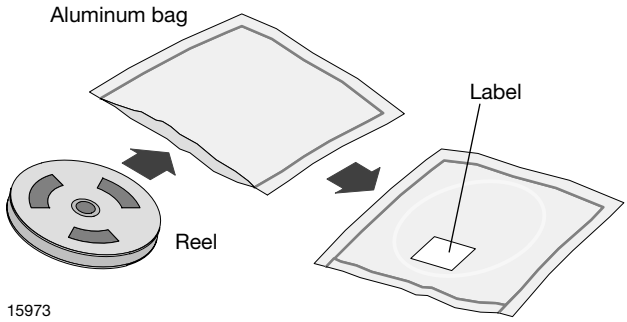
BAR CODE PRODUCT LABEL (example only)



A. 2D barcode
B. Part No: Vishay part number
C. QTY: quantity
d. SelCode: selection bin code: I_V-λ_p-V_F
E. Country of origin
F. PTC: production plant code
G. Termination finish
H. Region code
I. Serial#: serial number
K. Batch number: year, week, country code, plant code
L. SL: sales location
M. Environmental symbols:
RoHS, lead (Pb)-free, halogen-free
N. 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 ≤ 60 % RH max.

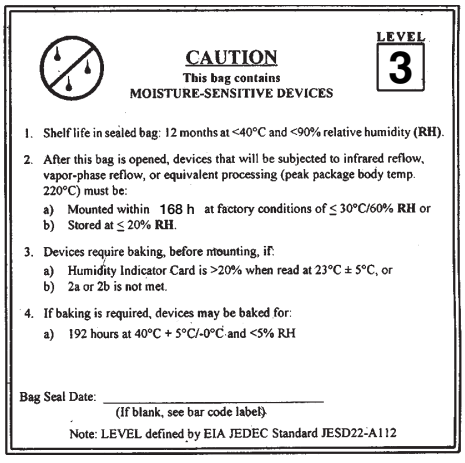
After more than 168 h under these conditions moisture content will be too high for reflow soldering.

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

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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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