



Optan BL Series UVC LEDs

- Tight radiation pattern of 15°
- Precise peak wavelength bins from 250 nm – 275 nm
- Bounded low signal-to-noise ratio
- Robust, hermetic through hole package

<i>Version</i>	<i>Date</i>
1.0	February 9, 2024

Product Bins

Optan is binned by emission wavelength and optical power.

Part Number ¹	Peak Wavelength ²			Optical Output at 100 mA ²	
	Min	Typical	Max	Min	Max
250 Series					
OPTAN-250J-BL	245 nm	250 nm	255 nm	1.0 mW	3.0 mW
OPTAN-250K-BL	245 nm	250 nm	255 nm	3.0 mW	
255 Series					
OPTAN-255J-BL	250 nm	255 nm	260 nm	1.5 mW	4.0 mW
OPTAN-255K-BL	250 nm	255 nm	260 nm	4.0 mW	
260 Series					
OPTAN-260J-BL	255 nm	260 nm	265 nm	1.0 mW	5.0 mW
OPTAN-260K-BL	255 nm	260 nm	265 nm	5.0 mW	
275 Series³					
OPTAN-275J-BL	270 nm	275 nm	280 nm	1.0 mW	2.0 mW
OPTAN-275K-BL	270 nm	275 nm	280 nm	2.0 mW	3.0 mW
OPTAN-275L-BL	270 nm	275 nm	280 nm	3.0 mW	
280 Series (Discontinued)					
OPTAN-280K-BL	275 nm	280 nm	285 nm	2.0 mW	3.0 mW
OPTAN-280L-BL	275 nm	280 nm	285 nm	3.0 mW	

Notes

1. LEDs are produced with semiconductor technology that is subject to process variation, yielding a range of flux performance that is approximately Gaussian in nature. To provide customers with fine granularity within the overall flux distribution, Crystal IS separates LEDs into optical power bins
2. Parameter is measured using a 100 mA current pulse of < 1 s duration at an ambient temperature of 25 °C ± 5 °C with the LED inserted into an integrating sphere calibrated per Crystal IS' quality management system procedures.
3. Last time buy issued June 30, 2023

Specifications

LED Characteristics¹

Characteristic	Unit	Min	Typical	Max
Viewing Angle ²	degrees		15	
Full width at half maximum	nm		11	
Forward voltage at 100 mA ³	V			10
Thermal resistance, junction-to-case	°C/W		20	
Power dissipation at 100 mA	W			1.0

Notes

1. Test Condition: $T_A = 25\text{ °C}$
2. Viewing angle is the angle over which the output intensity is at least half the peak output intensity (FWHM).
3. Voltage tolerance is $\pm 5\%$

Absolute Maximum Ratings

Characteristic	Unit	Min	Max
Forward Current (continuous or CW)	mA		100
Reverse Voltage	V		-5
Operating Case Temperature Range	°C	-5	55
Storage Temperature	°C	-40	100
Junction Temperature ¹	°C		85

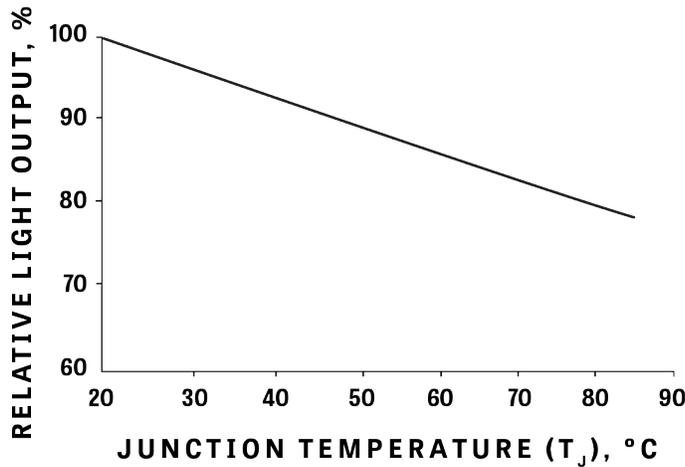
Notes

1. Junction temperature is calculated as $T_j = T_s + R_{th} \times W$ where T_s is the temperature of the solder point.

Derating Characteristics

Output Over Temperature

Output power is very sensitive to junction temperature, which is affected by both ambient temperature and the use of proper thermal management techniques. Lower junction temperatures will ensure the optimal performance and lifetime of the LED. This plot shows the change in optical power with increase in junction temperature.

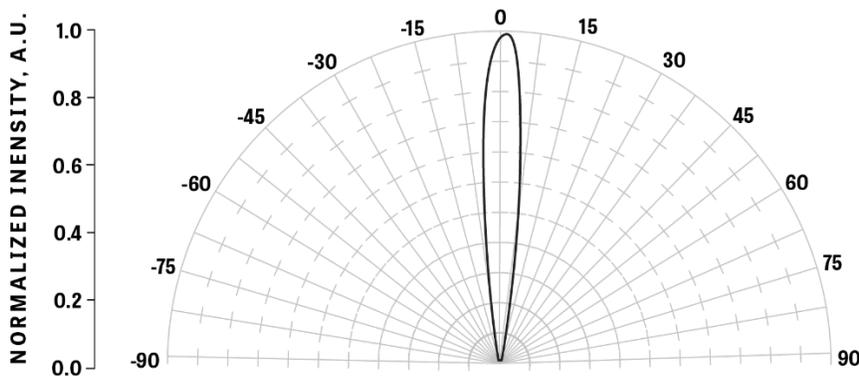


Test Conditions: I (Pulsed Mode) = 100 mA

Optical Characteristics

Radiation Pattern

Optan BL LEDs have a typical viewing angle of 15°.

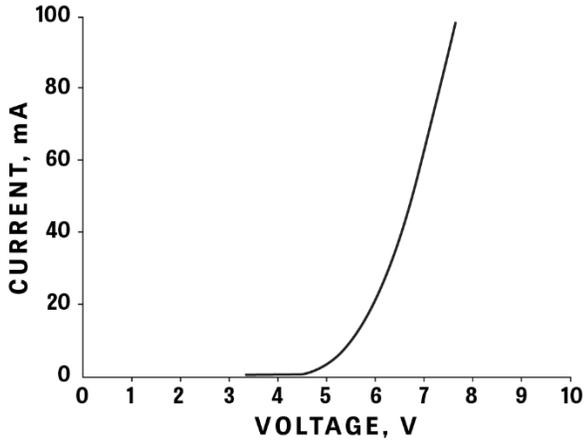


Test Conditions: I (CW) = 100 mA, CW = Continuous Wave Mode

Electrical & Temperature Characteristics

Electrical Characteristics

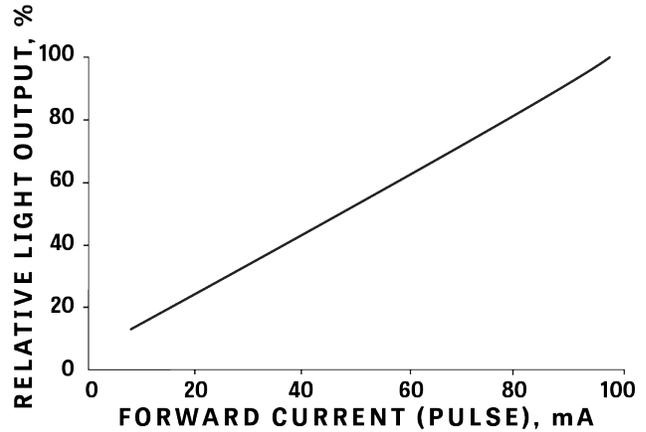
The maximum forward voltage is 10 V at an operating current of 100 mA.



Test Conditions: I (Pulsed Mode) = 1 to 100 mA
Case Temperature (T_c) = 25 °C

Light Output Over Current

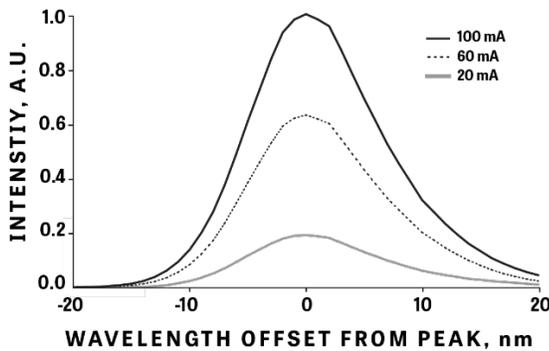
Typical variation in light output with forward current, normalized to light output at 100 mA.



Test Conditions: Case Temperature (T_c) = 25 °C

Spectral Characteristics over Current

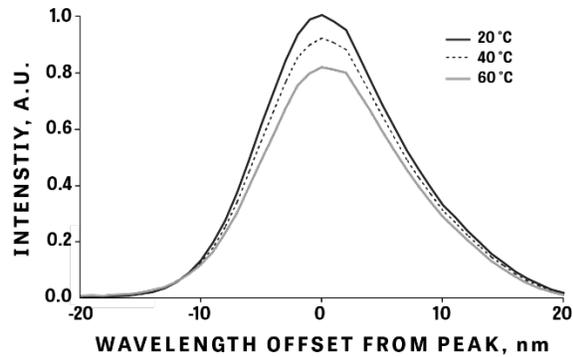
The plot shows the stability of the spectral characteristics with a change in current. No shift is typically observed in the peak wavelength with a change in the drive current from 20 mA to 100 mA.



Test Conditions: Case Temperature (T_c) = 25 °C

Spectral Characteristics over Temperature

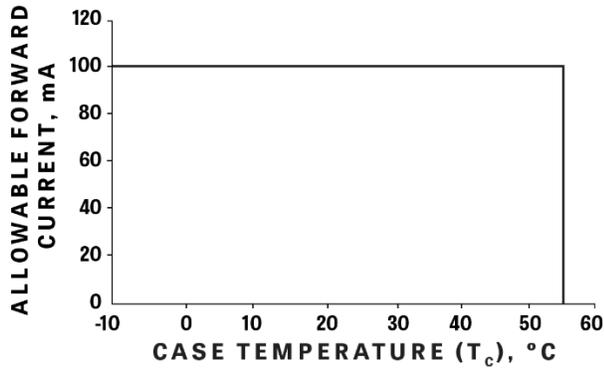
The plot shows the stability of the spectral characteristics with a change in temperature. No shift is typically observed in the peak wavelength with a change in case temperature from 20 °C to 60 °C.



Test Conditions: I (Pulsed Mode) = 100 mA

Recommended Operation

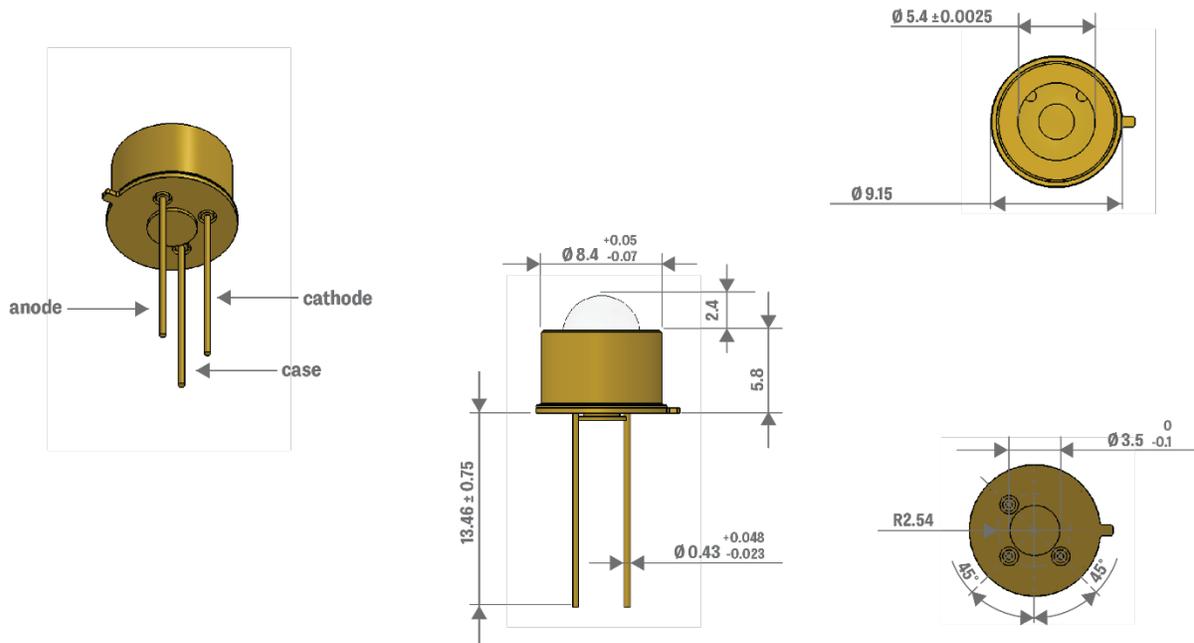
Crystal IS LEDs should be operated at currents below 100 mA and mounted on a heat sink to keep the case temperature below 55 °C. Please refer to the Crystal IS thermal management note AN010 for heat sink recommendations. Circuits should be designed for constant current.



Test Conditions: Continuous Wave Mode (CW)

Mechanical Dimensions

The Optan package is comprised of a header with a copper slug and a Kovar cap that is welded to the header to provide the hermetic sealing. The cap contains a fused silica ball lens which provides the nominal viewing angle of 15°.



All dimensions are in millimeters. Unless otherwise noted, all dimensions have a tolerance of ± 0.05 mm. Dimensions are design values.

Recommended Soldering Guidelines

- The pitch of the LED lead should match the pitch of the mounting holes on the PCB during component placement.
- The tip of the soldering iron should never touch the lens.
- Recommended soldering pattern is illustrated in Figure 1. In addition, please ensure that the central copper slug in the header is thermally connected to the board with thermal paste or grease. A heat sink should be used to keep the case temperature of the LED below 55 °C at a forward current of 100 mA. Refer to the Crystal IS thermal management note AN010 for heat sink recommendations.
- After soldering, avoid applying external force, stress, and excessive vibration until the product has returned to ambient temperature.

Recommended Solder Conditions

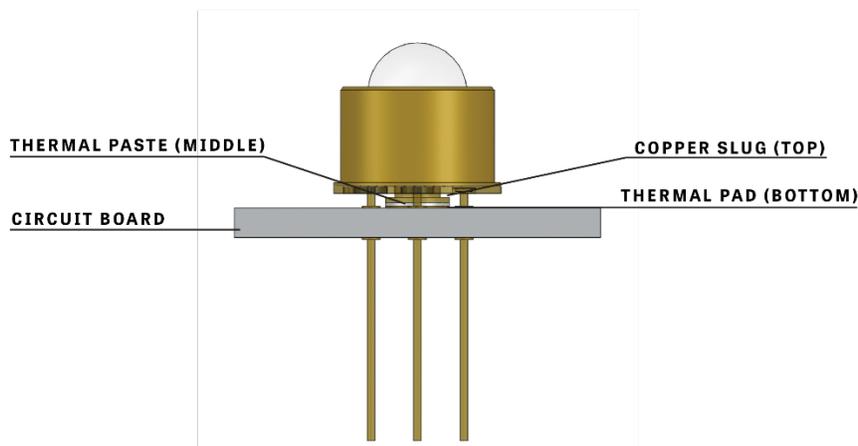
Distance between melted solder sides to bottom of LED should be 3 mm or longer.

Parameter	Dip Soldering (lead free solder)	Hand Soldering (lead free solder)
Pre-heat	90 °C max. (backside of PCB)	
Pre-heat time	60 seconds max.	
Temperature	260° C max. (solder bath)	300° C max.
Soldering time	5 seconds max.	3 seconds max.

Recommended Cleaning

- Cleaning with isopropyl alcohol is recommended.
- Propanol and ethyl alcohol may also be used.
- DO NOT use ultrasonic cleaners with Crystal IS LEDs.
- DO NOT use acetone or trichloroethylene to clean Crystal IS LEDs.

Problems with LEDs such as reduction in light output, opens, or shorts can be prevented as long as the LEDs are soldered under these conditions.



Important Usage Notes

ESD Sensitivity

- **CAUTION: LEDs are ESD (electrostatic discharge) sensitive**
- Static electricity and surge voltages seriously damage UV LEDs and can result in product failure
- Ensure that tools, jigs and machines being used are properly grounded
- LED mounting equipment should include protection against voltage surge
- Use proper ESD protection, including grounded wrist straps, ESD footwear and clothes

Thermal Management

- Excess heat will negatively impact the performance and lifetime of the LED
- A metal-core or metal base PCB is recommended.
- When assembling arrays of LEDs, ensure that your calculations properly account for the size of heatsink required for proper thermal dissipation

Storage Conditions

- Product should be stored in a controlled dust-free environment
- To avoid condensation, LEDs should be stored in an environment with minimal fluctuations in temperature and humidity

Safety

- During operation, the LED emits high intensity ultraviolet (UV) light, which is harmful to skin and eyes.
- UV light is hazardous to skin and may cause cancer.
- Avoid exposure to UV light when LED is operational.
- Precautions must be taken to avoid looking directly at the UV light without the use of UV light protective glasses.
- Do not look directly at the front of the LED or at the LED's lens when LED is operational.
- Attach warning labels on products/systems that use UV LEDs.

Certifications

ROHS COMPLIANCE

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

REACH

This product and associated materials, packing materials and associated production processes are in compliance with Regulation (EC) No 1907/2006 - Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and its latest revised version, Commission Regulation (EU) 2022/586.

To access the compliance declarations associated with this product, please visit:

<https://www.cisuvc.com/company/quality-documents/>

Disclaimer

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