PPM438-220

UVC LED Purple Planet Mods

PRELIMINARY SPECIFICATIONS

Elphoton

INNOVATE HUMAN LIFE

CONTENTS

1. Description

- The Elphoton UV sterilization Lamp.
- The PPM438-220 is a high-performance UVC LED sterilization lamp designed for surface, air, and small-space disinfection.
- It features an integrated Driver-on-Board (DOB) architecture that accepts AC220V input and internally regulates a 12V DC supply to drive the LED array, ensuring reliable optical output and fast startup performance.

◆ Features

- Built-in AC-to-DC driver circuit (DOB) supplying regulated 12V DC to the LEDs.
- Instant-on capability with nanosecond-level startup and no delay.
- Dual-wavelength LED array: 12 high-intensity UVC LEDs (270–280 nm) and 4 UVA LEDs to broaden the germicidal spectrum.
- Robust thermal design using a 435×20 mm aluminum-core PCB for effective heat dissipation.
- Aerospace-grade anodized aluminum housing and quartz glass cover for maximum UV transmission and mechanical durability.

◆ Application

- Sterilization of surfaces, equipment housings, and air enclosures.
- Integration into compact disinfection chambers or HVAC duct systems.
- Point-of-use water treatment modules requiring targeted UV sterilization.

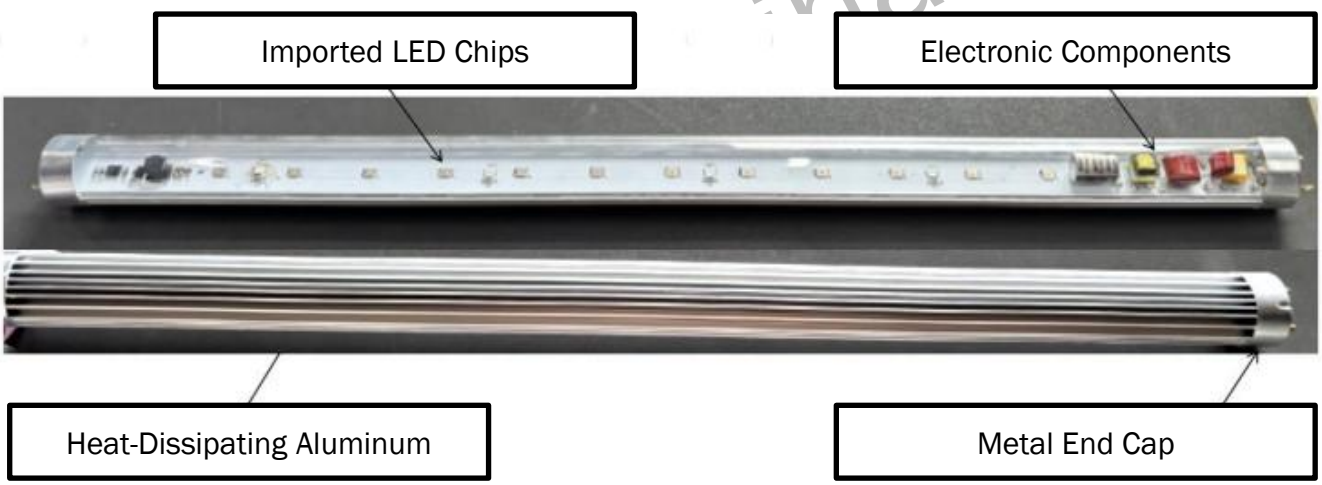
2. Product information

- Lamp type
  - ✓ UVC LED double-ended tube lamp (T8 form factor)
- Lamp size:
  - ✓ Diameter × Length = 25 mm × 438 mm (excluding pins)
  - ✓ Overall length including pins: 472 mm
- Lamp Material:
  - ✓ Housing: Aluminum alloy (aviation-grade)
  - ✓ Cover: Quartz glass
- PCB Specification
  - ✓ Dimensions: 435 mm × 20 mm × 1.2 mm
  - ✓ Material: Single-sided aluminum-based PCB
- LED Configuration
  - ✓ 12 × 3535 UVC LEDs (270–280 nm), connected in series
  - ✓ 4 × 2835 UVA LEDs (typ. 365–400 nm), connected in series
  - ✓ Other components: Constant-voltage IC, resistors, capacitors, Zener diodes
- Drive Mode
  - ✓ AC220V input with internal constant-voltage DC12V LED drive

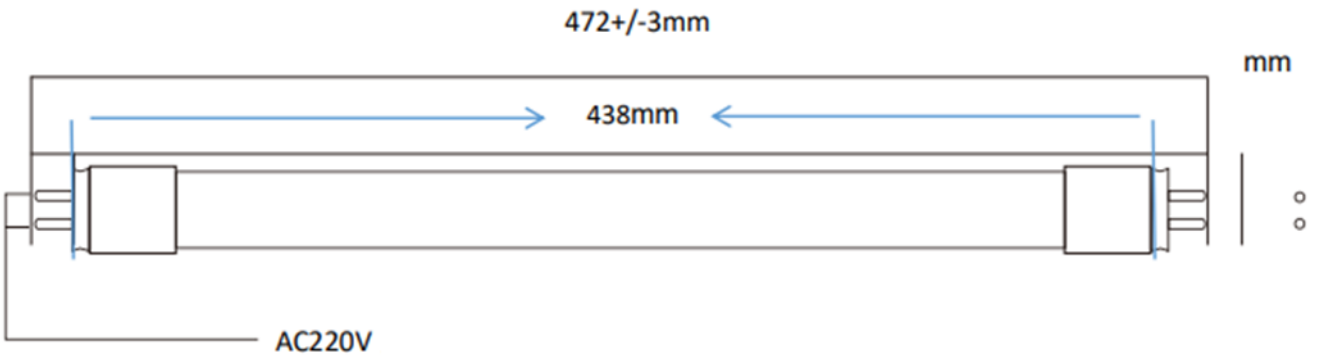
3. Outline Dimensions and Physical Structure

Item	Value	Conditions / Note
Lamp Body Length	438 mm	Excluding pins
Overall Length	472 ± 3 mm	Including pins
Outer Diameter	25 mm	Quartz tube
PCB Dimensions	435 × 20 × 1.2 mm	Aluminum-core PCB

◆ Actual Product Images

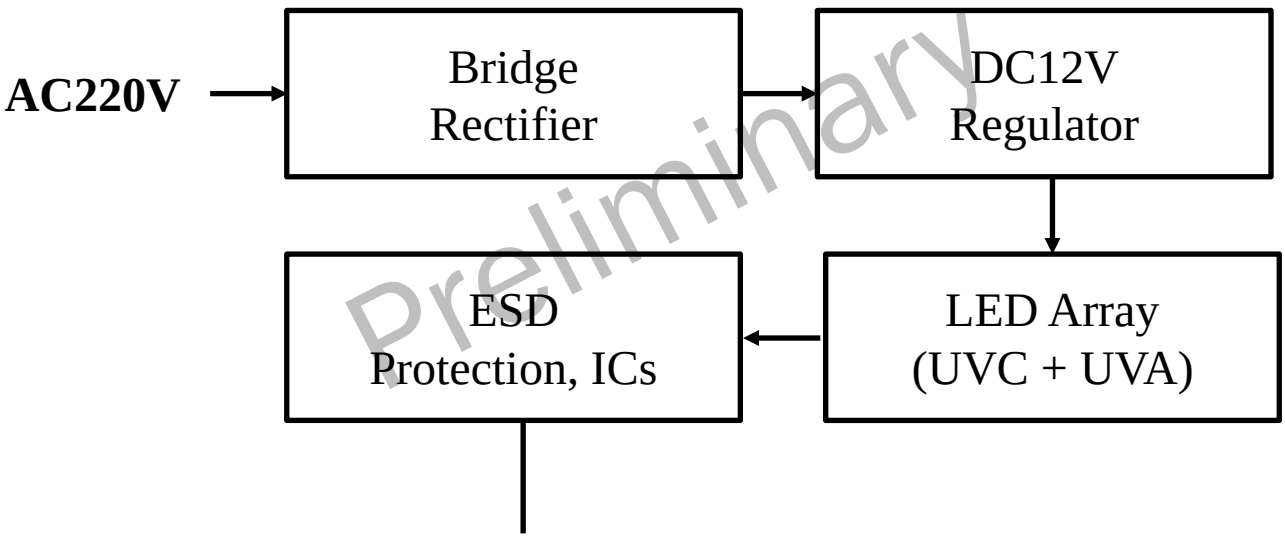


◆ Outline Dimensions & Lighting Configuration



4. Internal Drive Architecture Overview

- The PPM438-220 utilizes a built-in high-voltage AC-to-DC converter based on bridge rectification and MT7714 controller IC.
- The regulated output (DC12V) drives a series-connected array of 3535 UVC LEDs and 2835 UVA LEDs.
- The driver includes ESD protection, current regulation, and EMI filtering components to ensure stable optical performance and safe operation.



This diagram illustrates the internal power architecture of the PPM438-220 lamp. AC220V input is rectified and regulated through an onboard driver circuit to supply constant-voltage DC power to the LED array, which includes both UVC and UVA emitters.

5. Electro Optical Characteristics

Item	Value	Conditions / Note
Rated Input Voltage	AC220	Fixed input voltage
UVC Radiant Flux (Φe)	500 - 650 mW	Measured under rated AC220V operation
Peak Wavelength (UVC, WLP1)	270 - 280nm	Measured under rated AC220V operation
Peak Wavelength (UVA, WLP2)	365 - 400nm *(typical)*	Based on standard 2835 UVA LED type used

- The product operates with AC220V input.
- The internal LED array is driven by a constant-voltage DC12V circuit, but all optical characteristics were measured under full product operation at AC220V.

6. Sterilization Performance

- E. coli inactivation.
  - ✓ ≥ 99.99% reduction after 8-minute exposure at 30 cm distance
- Natural microbial inhibition.
  - ✓ Microbial colony count maintained below 50 cfu/mL over 200 hours with 8 min/hour exposure at 30 cm

7. Reliability & Environmental Conditions

Item	Value	Conditions / Note
LED Lifetime (L70)	≥ 10,000 hours	At rated AC220V
Operating Temperature	–30°C to +60°C	Ambient
Storage Temperature	–30°C to +60°C	Non-operating

Note

* UVA wavelength not officially specified.

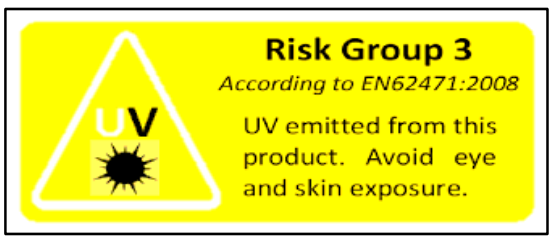
- Typical range (365–400 nm) is based on standard 2835 UVA LED characteristics.

8. Handling Precautions

- Do not subject the lamp to impact, vibration, or excessive pressure. The quartz structure is fragile.
- Power is supplied internally via regulated DC12V. Observe polarity when connecting directly to driver terminals.
- Avoid continuous operation in sealed, high-temperature environments.
- The product is ESD-sensitive. Proper grounding and anti-static measures are required during handling and installation.
- Keep the quartz surface clean. Organic residues may absorb UVC and significantly degrade performance. Use IPA or alcohol-based agents for cleaning.
- Do not expose the lamp to high humidity or direct moisture. Apply waterproof sealing where necessary.

9. Safety Warning

- This product emits deep ultraviolet (UVC) radiation when powered on.
- Direct exposure to UVC light can cause serious injury to skin and eyes.
- Do not look directly at the light source under any circumstances.
- Ensure that appropriate shielding, interlocks, or protective measures are applied during operation.
- UVC radiation is invisible. Do not assume the lamp is safe when it appears off.
- Keep the product away from children or unauthorized personnel during use.



10. Revision Sheet

Revision	Date	Page	Description	Remark
Rev.1.0	25.07.25	-	Preliminary edition	