

Inolux Surface Mount High Power Ultraviolet LED IN-K2PUV

| | | | | |
|--|-------------------|----------------|----------------|----------------|
| Official Product | Product: IN-K2PUV | | | Data Sheet No. |
| Tentative Product | ***** | | | IN-K2PUV |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | | April 19, 2014 | Version of 1.0 | Page 1/12 |

| | |
|--|-----------|
| DISCLAIMER..... | 3 |
| LABEL SPECIFICATIONS..... | 4 |
| RADIOMETRIC POWER AND FORWARD VOLTAGE..... | 5 |
| PRODUCT CHARACTERISTICS..... | 6 |
| ABSOLUTE MAXIMUM RATINGS..... | 6 |
| ELECTRO-OPTICAL CHARACTERISTICS..... | 6 |
| PACKAGE OUTLINE DIMENSION..... | 7 |
| RECOMMENDED SOLDERING PATTERN FOR REFLOW SOLDERING..... | 7 |
| CHARACTERISTIC CURVES..... | 8 |
| THERMAL DESIGN..... | 9 |
| PACKING INFORMATION..... | 11 |
| REVISION HISTORY..... | 12 |

| | | | | |
|--|-------------------|----------------|----------------|----------------|
| Official Product | Product: IN-K2PUV | | | Data Sheet No. |
| Tentative Product | ***** | | | IN-K2PUV |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | | April 19, 2014 | Version of 1.0 | Page 2/12 |

DISCLAIMER

INOLUX reserves the right to make changes without further notice to any products herein to improve reliability, function or design. INOLUX does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights, nor the rights of others.

LIFE SUPPORT POLICY

INOLUX's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of INOLUX or INOLUX Technologies. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

| | | | |
|--|-------------------|----------------|-----------|
| Official Product | Product: IN-K2PUV | Data Sheet No. | |
| Tentative Product | ***** | IN-K2PUV | |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 | Page 3/12 |

Label Specifications

INOLUX P/N:

I N - K 2 P U V - X X X X

| Series Name | Substrate / Emitting Color | Customer Code |
|----------------------------|----------------------------|-------------------------------|
| IN-K2 Inolux K2 package | K2 UV@390-420nm | XXXX Customer Product Code |

Lot No.:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------------|----------|--|---|--|--------------------|----------|--------------|----------|----------|
| E | 1 | A | 1 | A | 2 | 2 | L | 1 | 2 |
| Code 1 2 | | Code 3 | Code 4 | Code 5 | Code 6 | Code 7 | Code 8 | Code 9 | Code 10 |
| | | Mfg. Year | Mfg. Month | Mfg. Date | Consecutive number | | Special code | | |
| Internal Tracing Code | | 2010-A 2011-B 2012-C 2013-D . . | 1:Jan. 2:Feb. ... A:Oct. B:Nov. C:Dec. | 1:A 2:B 3:C ... 26:Z 27:7 28:8 29:9 30:3 31:4 | 01~ZZ | | 000~ZZZ | | |

| | | |
|--|-------------------|----------------|
| Official Product | Product: IN-K2PUV | Data Sheet No. |
| Tentative Product | ***** | IN-K2PUV |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 |
| | | Page 4/12 |

Radiometric Power and Forward Voltage

(T_j =25 °C)

| Part Number | Color | Performance at Test Current 700mA | | | |
|-------------|-------|-----------------------------------|-----|----------------|-----|
| | | Min. Radiometric Power (mW) | | V _f | |
| | | Min | Max | Min | Max |
| IN-K2PUV | UV | 340 | 440 | 3.0 | 4.3 |

| Part Number | Color | Performance at Test Current 350mA | | | |
|-------------|-------|-----------------------------------|-----|----------------|-----|
| | | Min. Radiometric Power (mW) | | V _f | |
| | | Min | Max | Min | Max |
| IN-K2PUV | UV | 200 | 260 | 2.8 | 4.0 |

Note:

1. Radiometric Power is measured with an accuracy of ±10%
2. The forward voltage is measured with an accuracy of ±0.1V

| | | | |
|--|-------------------|----------------|-----------|
| Official Product | Product: IN-K2PUV | Data Sheet No. | |
| Tentative Product | ***** | IN-K2PUV | |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 | Page 5/12 |

Product Characteristics

Absolute Maximum Ratings

(T_j =25 °C)

| Parameter | Rating |
|---------------------------|--|
| DC Forward Current (mA) | 350~700mA |
| LED Junction Temperature | 150°C |
| LED Operating Temperature | -40°C ~ 110°C |
| Storage Temperature | -40°C ~ 110°C |
| Soldering Temperature | Max. 260°C / Max. 10 sec. (JEDEC 020c) |
| ESD Sensitivity | 2,000V HBM (JESD-22A-114-B) |
| Preconditioning | Acc. to JEDEC Level 2 |

Notes:

1. Never operate the LEDs in reverse bias.
2. Do not drive at rated current for more than 5 seconds without proper thermal management.
3. When the LEDs are illuminating, operating current should be decided after considering the packages maximum temperature.
4. Caution: These devices emit high intensity UV/NUV light. Necessary precautions must be taken during operation. Do not look directly into the light or look through the optical system when in operation. Protective eyewear should be worn at all times during operation.
5. Lens discoloration may occur with prolonged exposure to UV/NUV light. Lens material will need to be tested for UV/NUV light compatibility and durability.

Electro-Optical Characteristics

(T_j 25 °C)

| Part Number | Color | Peak Wavelength (λ _p) | | 2θ _{1/2} | Temperature Coefficient of Vf (mV/°C) | Thermal Resistance Junction to Pad |
|-------------|-------|-----------------------------------|-----|-------------------|---------------------------------------|------------------------------------|
| | | Min | Max | | ΔVf / ΔT _J | (°C/W) R _{θJ-L} |
| IN-K2PUV | UV | 390 | 420 | 120 | -3 | 10 |

Notes:

1. The peak/dominant wavelength is measured with an accuracy of ±1nm.

| | | | |
|--|-------------------|----------------|-----------|
| Official Product | Product: IN-K2PUV | Data Sheet No. | |
| Tentative Product | ***** | IN-K2PUV | |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 | Page 6/12 |

Package Outline Dimension
Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.13

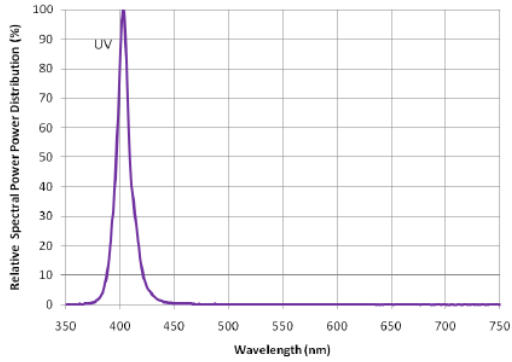
| Outline Dimension | Solder Pattern |
|---|--|
| <p>Technical drawings of the LED package showing outline dimensions and soldering pattern details. The drawings include a top view of the package with dimensions: $2 \times 1.15 \pm 0.20$, $2 \times 1.50 \pm 0.20$, $R4.00 \pm 0.20$, 1.50 ± 0.20, 3.63 ± 0.20, $R2.99 \pm 0.20$, 5.60 ± 0.20, 2.90 ± 0.20, 5.3 ± 0.3, 0.12 ± 0.20, 11.80 ± 0.30, 0.20 ± 0.20, 14.60 ± 0.30, and 1.05 ± 0.20. Labels include 'Anode', 'Die heatsink', 'Protection device', 'Body', and 'Lead'. A second top view shows dimensions 3.63 ± 0.20 and $R2.99 \pm 0.20$ with 'Anode' labels. A side view shows the package profile with dimensions 5.3 ± 0.3, 0.12 ± 0.20, 11.80 ± 0.30, 0.20 ± 0.20, 14.60 ± 0.30, and 1.05 ± 0.20. The soldering pattern diagrams show a copper layer (pink) and electrical connection (dotted pink) for the top view, and a solder mask (green grid) and solder paste (green square) for the bottom view. Dimensions for the soldering pattern include 1.15, 1.5, 10, 15, 1.7, 15.4, 9.6, 4.8, 2.1, $\phi 6.2$, and $\phi 6.6$.</p> | <p>Soldering pattern diagrams for the LED package. The top diagram shows the copper layer (pink) and electrical connection (dotted pink) with dimensions 1.15, 1.5, 10, 15, and 1.7. The bottom diagram shows the solder mask (green grid) and solder paste (green square) with dimensions 15.4, 9.6, 4.8, 2.1, $\phi 6.2$, and $\phi 6.6$.</p> |
| <p>Soldering terminals may shift in the x, y direction.</p> | <p>Unit: mm</p> |

| | | | |
|--|-------------------|----------------|-----------|
| Official Product | Product: IN-K2PUV | Data Sheet No. | |
| Tentative Product | ***** | IN-K2PUV | |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 | Page 7/12 |

Characteristic Curves

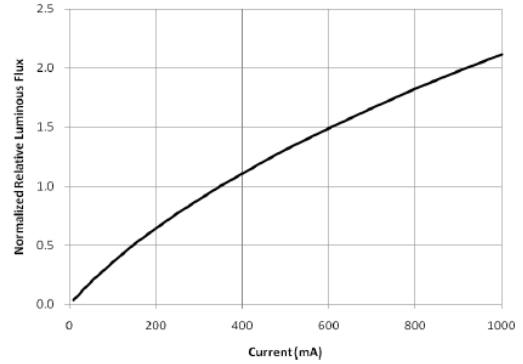
Relative Spectral Power Distribution, Ta=25 °C

UV



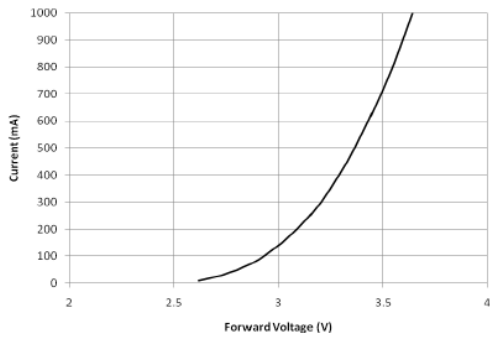
Typical Forward L-I Characteristics

UV



Typical Forward I-V Characteristics

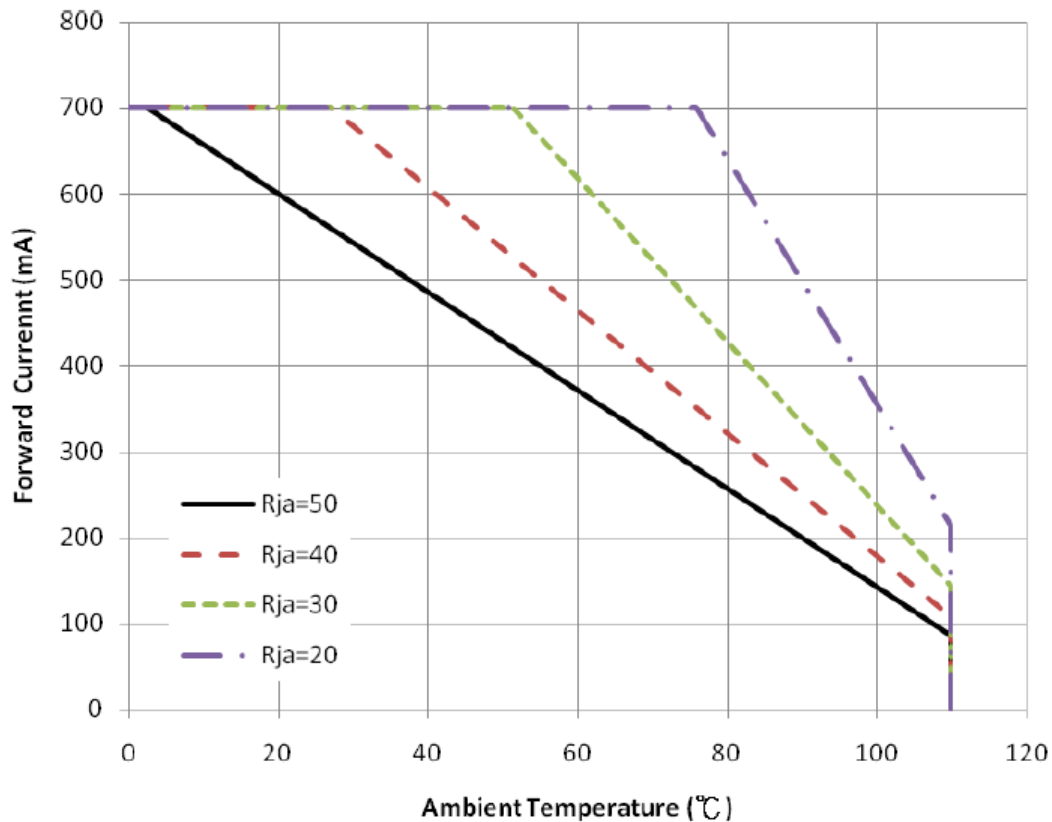
UV



| | | |
|--|-------------------|----------------|
| Official Product | Product: IN-K2PUV | Data Sheet No. |
| Tentative Product | ***** | IN-K2PUV |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 |
| | | Page 8/12 |

Thermal Design

Thermal design of the end product is important. The thermal resistance between the junction and the solder point (R_{ΘJ-S}) and the end product should be designed to minimize the thermal resistance from the solder point to ambient in order to optimize the emitter life and optical characteristics. The maximum operation current is determined by the plot of Allowable Forward Current vs. Ambient Temperature.



The junction temperature can be correlated to the thermal resistance between the junction and ambient (R_{ja}) by the following equation.

$$T_j = T_a + R_{ja} * W$$

T_j: LED junction temperature

T_a: Ambient temperature

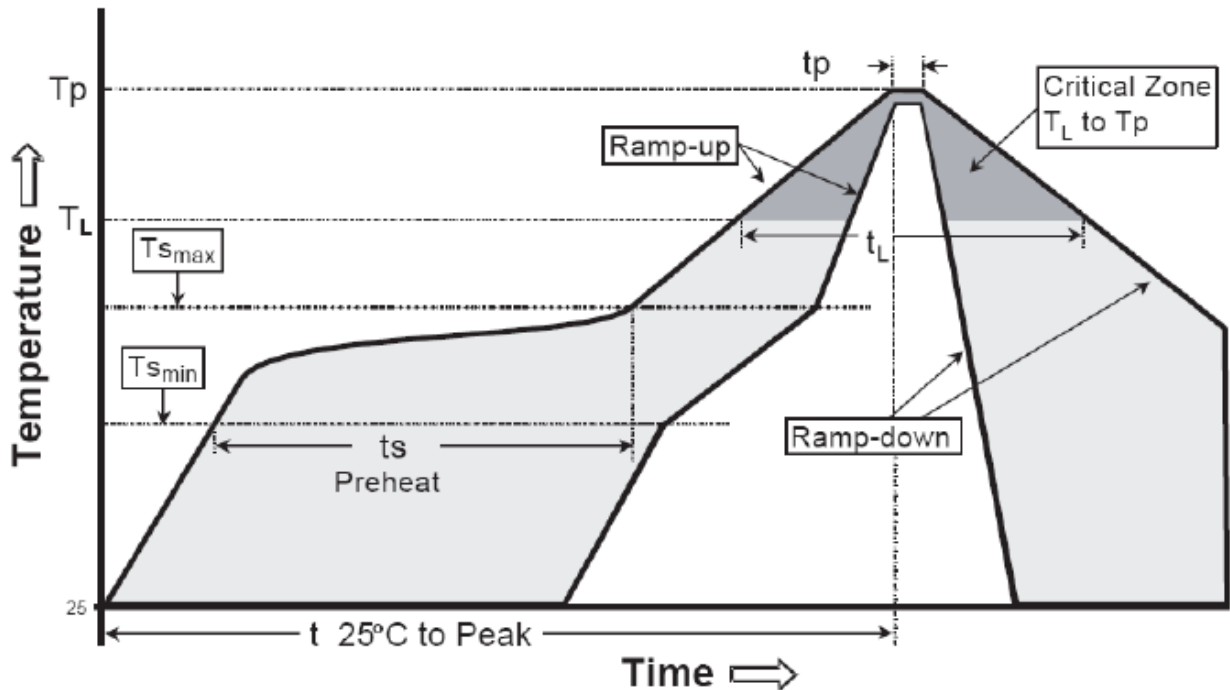
R_{ja}: Thermal resistance between the junction and ambient

W: Input power (I_F*V_F)

| | | | |
|--|-------------------|----------------|-----------|
| Official Product | Product: IN-K2PUV | Data Sheet No. | |
| Tentative Product | ***** | IN-K2PUV | |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 | Page 9/12 |

Reflow Soldering

The LEDs can be soldered using the parameter listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest possible temperature is preferred for the LEDs.

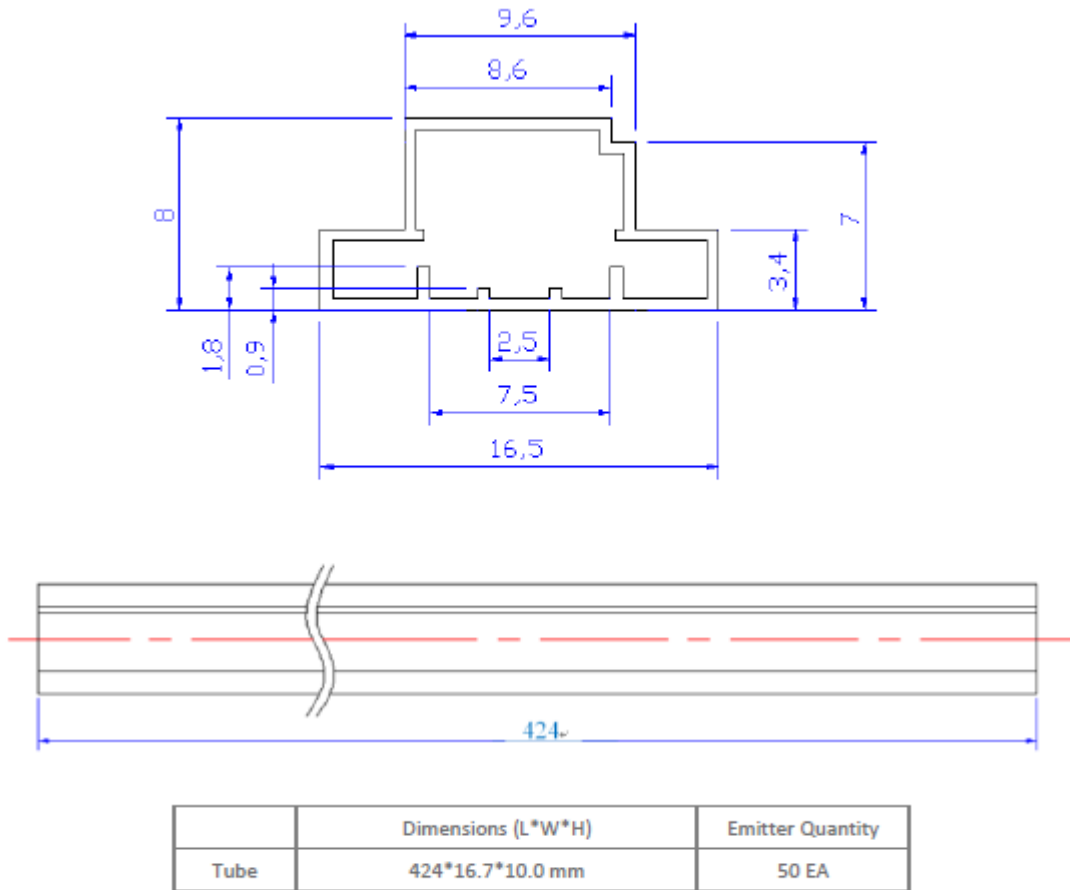


| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|--|-------------------------|------------------|
| Average Ramp-up Rate (Ts _{max} to Tp) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| - Temperature Min(Ts _{min}) | 100°C | 150°C |
| - Temperature Max(Ts _{max}) | 150°C | 200°C |
| - Time(ts _{min} to ts _{max}) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| - Temperature(T _l) | 183°C | 217°C |
| - Time(t _l) | 60-150 seconds | 60-150 seconds |
| Peak/classification Temperature(T _p) | 215°C | 240°C |
| Time within 5°C of actual Peak Temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp-Down Rate | 6°C/second max. | 6°C/second max. |
| Time 25°C to Peak Temperature | 6 minutes max. | 8 minutes max. |

| | | |
|--|-------------------|----------------|
| Official Product | Product: IN-K2PUV | Data Sheet No. |
| Tentative Product | ***** | IN-K2PUV |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 |
| | | Page 10/12 |

Packing Information

The carrier tape is conformal to EIA-481D



Note : All Dimensions are in millimeter

| | | |
|--|-------------------|----------------|
| Official Product | Product: IN-K2PUV | Data Sheet No. |
| Tentative Product | ***** | IN-K2PUV |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 |
| | | Page 11/12 |

Revision History

| Changes since last revision | Page | Version No. | Revision Date |
|-----------------------------|------|-------------|---------------|
| Initial release | | 1.0 | 04-19-2014 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|--|-------------------|----------------|------------|
| Official Product | Product: IN-K2PUV | Data Sheet No. | |
| Tentative Product | ***** | IN-K2PUV | |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | April 19, 2014 | Version of 1.0 | Page 12/12 |