

## 295nm UVC LED

- **SMD - medium & high power**
- **Chip on Board (COB)**
- **3x3 and 4x4 Arrays - COB**
- **Light Bars (12x1)**
- **Applications Sets (LED, Heat Sink, Driver)**

 **Boston**Electronics

**[www.boselec.com](http://www.boselec.com)**

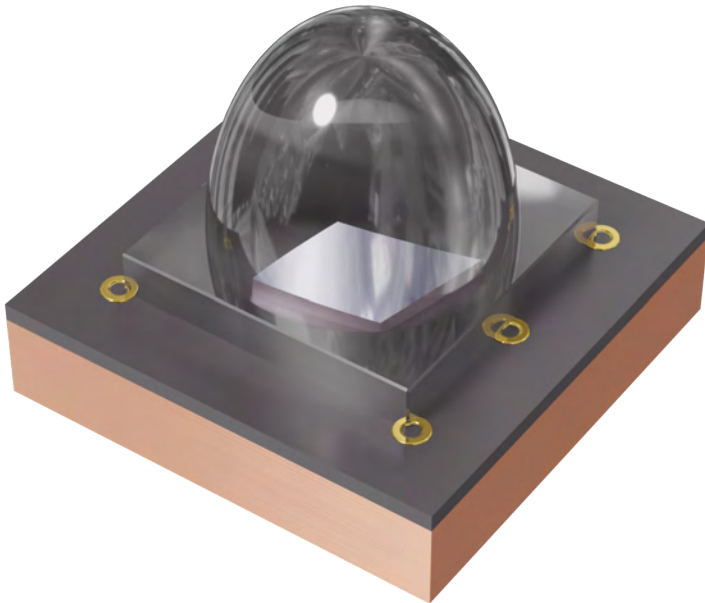
**[uv@boselec.com](mailto:uv@boselec.com)**

**[shop.boselec.com](http://shop.boselec.com)**

**617.566.3821**

## VS5252C48L3-295 Mid Power UVB LED SMD

**VS5252C48L3-295** is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of  $295 \pm 5\text{nm}$ . Each SMD is structured based on the patented 3-PAD LED Flip Chip and unique low temperature bonding technologies to further boost lighting efficiency and decrease the thermal resistance. The VS5252C48L3 series is packaged in a single-chip structure equipped with a  $30^\circ$  lens for mid power UV output.



### FEATURES & BENEFITS

- Optical output up to 115mW
- Dimensions: 5.2x5.2mm
- Equipped with  $30^\circ$  fused silica lens
- Ideal for mid power applications

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at  $0.9^\circ\text{C/W}$
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I<sub>F</sub> = 700mA

| Parameter                                       | Symbol               | Unit   | Min | Typical | Max |
|---|----------------------|--------|-----|---------|-----|
| Peak Wavelength                                 | $\lambda_p$          | nm     | 290 | 295     | 300 |
| Forward Voltage                                 | V <sub>F</sub>       | V      | 5.1 | 5.8     | 6.2 |
| Radiant Flux                                    | P <sub>O</sub>       | mW     | 80  | 95      | 115 |
| Full Width of Half Magnitude                    | $\Delta\lambda$      | nm     | -   | 12.3    | -   |
| Radiant Angle                                   | 2 $\Phi_{1/2}$       | Degree | -   | 30      | -   |
| Thermal Resistance,<br>Junction to Solder Joint | R <sub>th(J-S)</sub> | °C/W   | -   | 0.9     | -   |

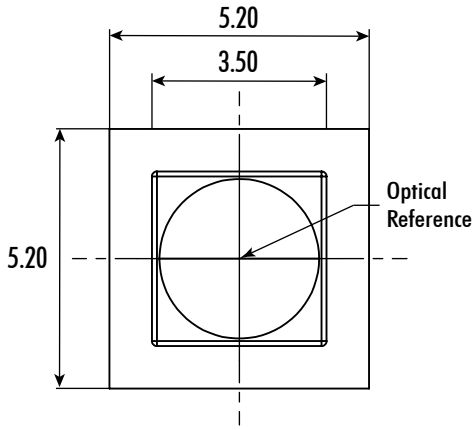
Absolute Maximum Ratings

| Parameter             | Symbol           | Unit | Value     |
|-----------------------|------------------|------|-----------|
| Forward Current       | I <sub>F</sub>   | mA   | 1000      |
| Reverse Voltage       | V <sub>R</sub>   | V    | 5         |
| Power                 | P <sub>D</sub>   | W    | 6.5       |
| Junction Temperature  | T <sub>J</sub>   | °C   | 120       |
| Operating Temperature | T <sub>OPR</sub> | °C   | -30 ~ 85  |
| Storage Temperature   | T <sub>STG</sub> | °C   | -40 ~ 105 |

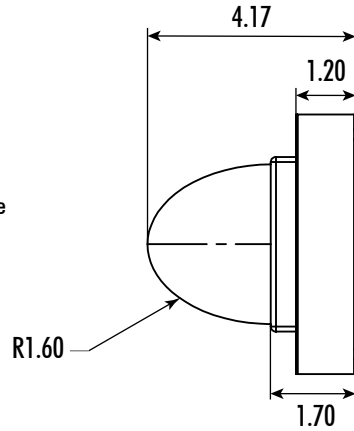
Reliability

| Test          | Condition     | Test Duration | Test Failed/Tested |
|---------------|---------------|---------------|--------------------|
| Thermal Shock | -45°C ~ 125°C | 2000 Cycles   | 0/10               |

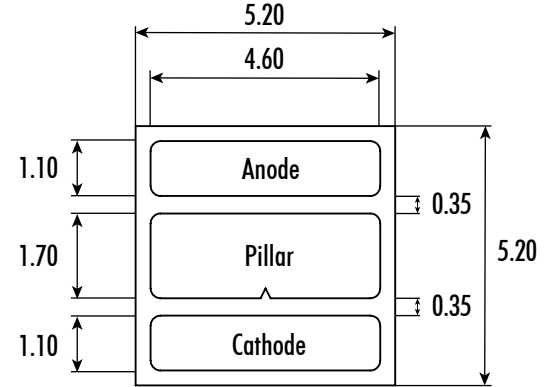
Mechanical Dimensions



Top View

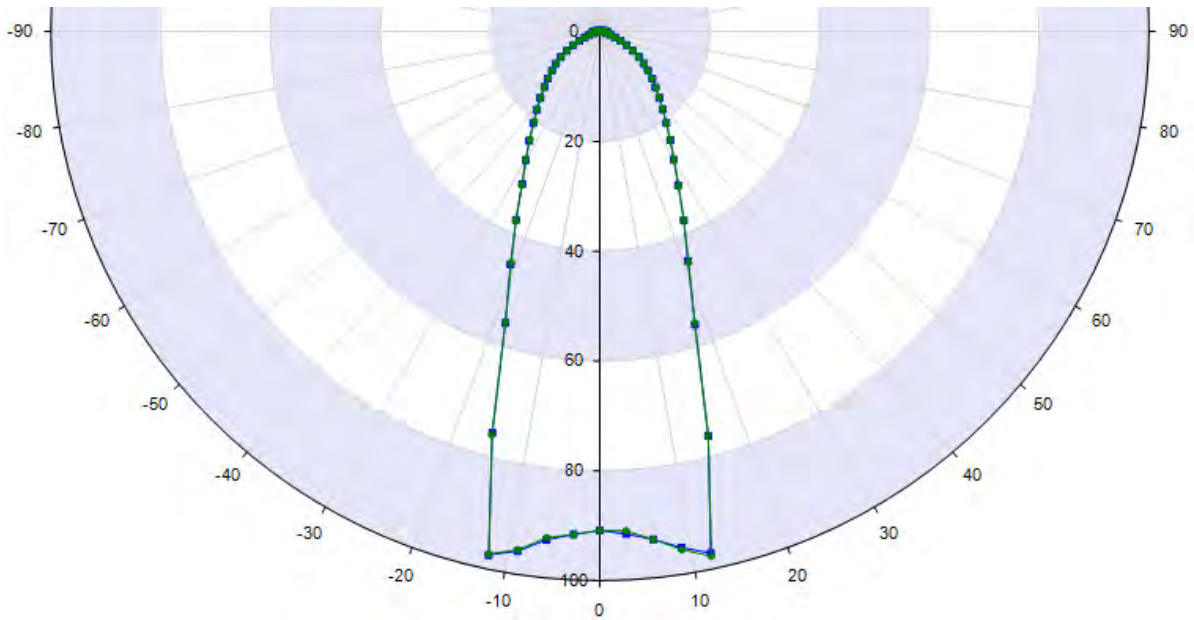


Side View

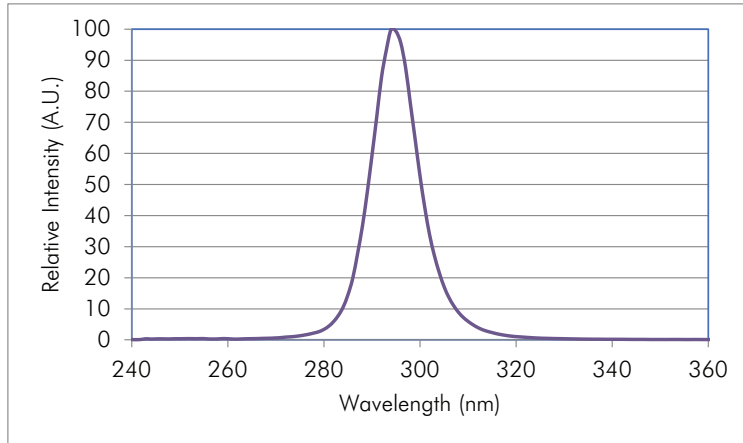


Bottom View

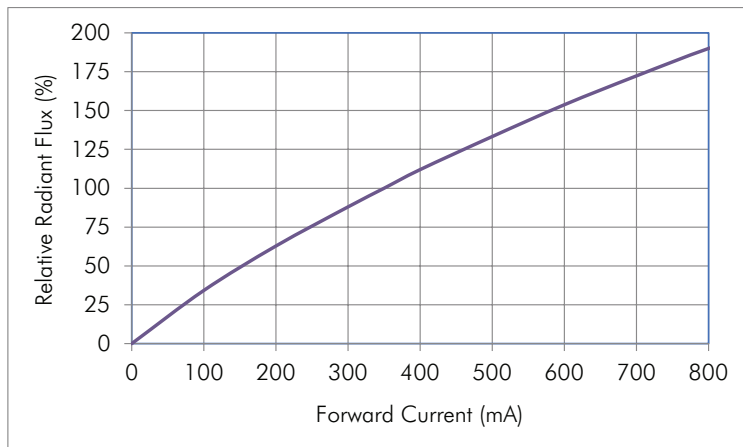
Radiation Pattern



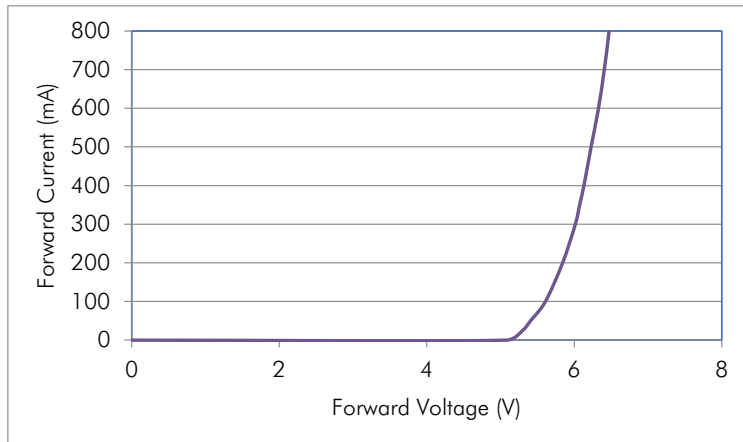
### Spectral Output



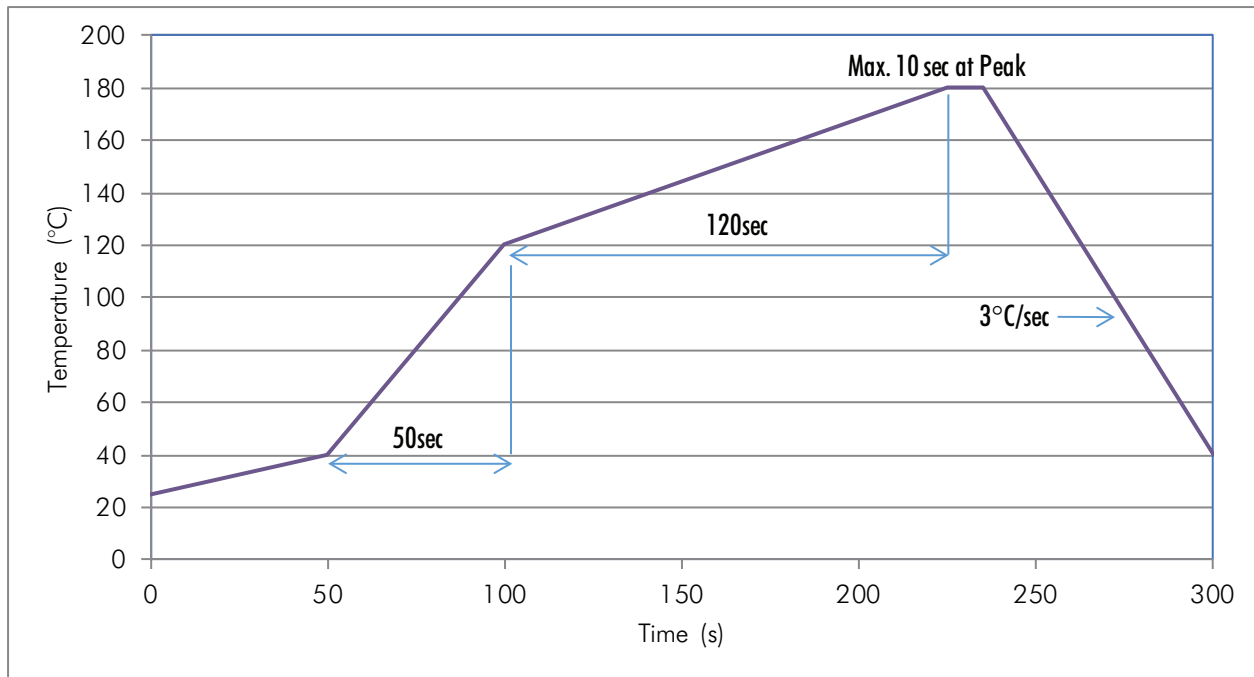
### Forward Current vs. Relative Radiant Flux



### Forward Voltage vs. Forward Current



## Soldering Guidelines



## Recommended MCPCB

Violumas recommends the use of the Pillar MCPCB with Violumas LEDs for maximum performance and reliability. The data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB. Please consult the Violumas engineering team for further recommendations on MCPCB options.

## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

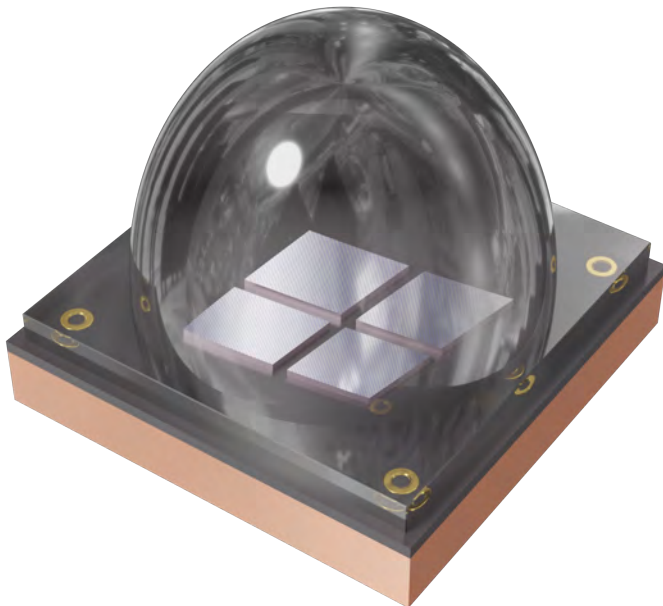
- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## VS7272C48L6-295 High Power UVB LED SMD

**VS7272C48L6-295** is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of  $295 \pm 5\text{nm}$ . Each SMD is structured based on the patented 3-PAD LED Flip Chip and unique low temperature bonding technologies to further boost lighting efficiency and decrease the thermal resistance. The VS7272C48L6 series is packaged in a single-chip structure equipped with a  $60^\circ$  lens for high power UV output.



### FEATURES & BENEFITS

- Optical output up to 400mW
- Dimensions: 7.2x7.2mm
- Equipped with  $60^\circ$  fused silica lens
- Ideal for high power applications

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at  $0.32^\circ\text{C/W}$
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime



Electro-Optical Characteristics at T=25°C and I<sub>F</sub> = 1400mA

| Parameter                                       | Symbol               | Unit   | Min  | Typical | Max  |
|---|----------------------|--------|------|---------|------|
| Peak Wavelength                                 | $\lambda_p$          | nm     | 290  | 295     | 300  |
| Forward Voltage                                 | V <sub>F</sub>       | V      | 10.2 | 11.5    | 12.5 |
| Radiant Flux                                    | P <sub>O</sub>       | mW     | 285  | 335     | 400  |
| Full Width of Half Magnitude                    | $\Delta\lambda$      | nm     | -    | 12.3    | -    |
| Radiant Angle                                   | 2 $\Phi_{1/2}$       | Degree | -    | 60      | -    |
| Thermal Resistance,<br>Junction to Solder Joint | R <sub>th(J-S)</sub> | °C/W   | -    | 0.32    | -    |

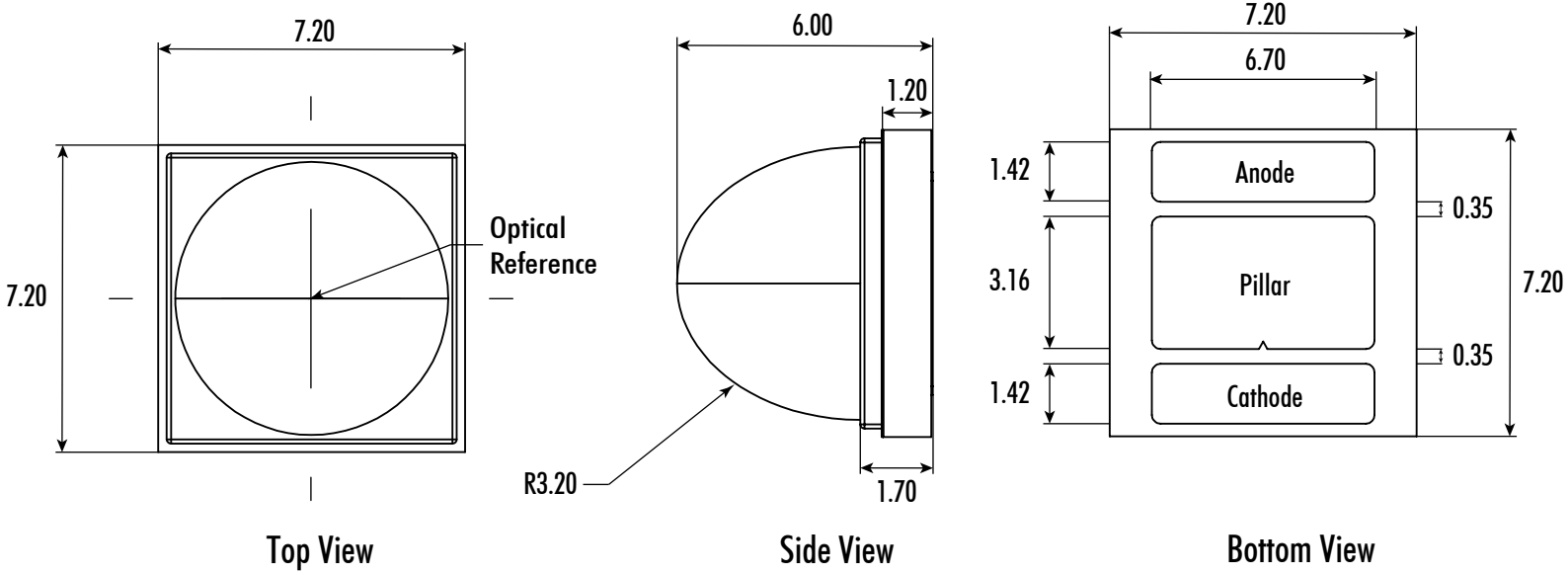
Absolute Maximum Ratings

| Parameter             | Symbol           | Unit | Value     |
|-----------------------|------------------|------|-----------|
| Forward Current       | I <sub>F</sub>   | mA   | 2000      |
| Reverse Voltage       | V <sub>R</sub>   | V    | 10        |
| Power                 | P <sub>D</sub>   | W    | 26        |
| Junction Temperature  | T <sub>J</sub>   | °C   | 120       |
| Operating Temperature | T <sub>OPR</sub> | °C   | -30 ~ 85  |
| Storage Temperature   | T <sub>STG</sub> | °C   | -40 ~ 105 |

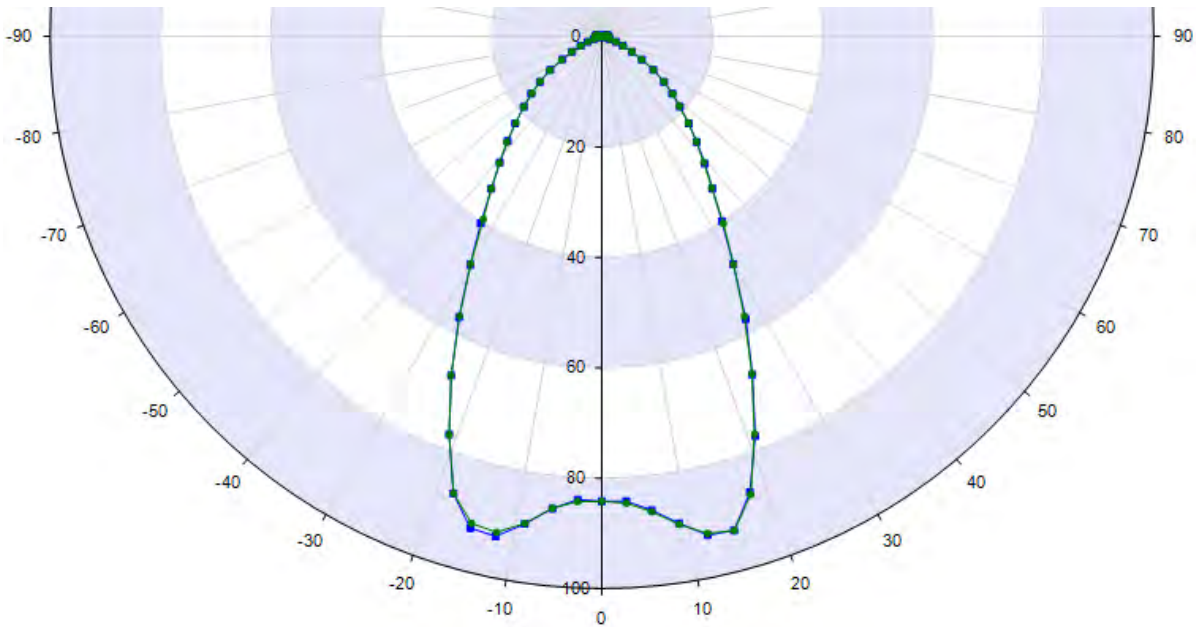
Reliability

| Test          | Condition     | Test Duration | Test Failed/Tested |
|---------------|---------------|---------------|--------------------|
| Thermal Shock | -45°C ~ 125°C | 2000 Cycles   | 0/10               |

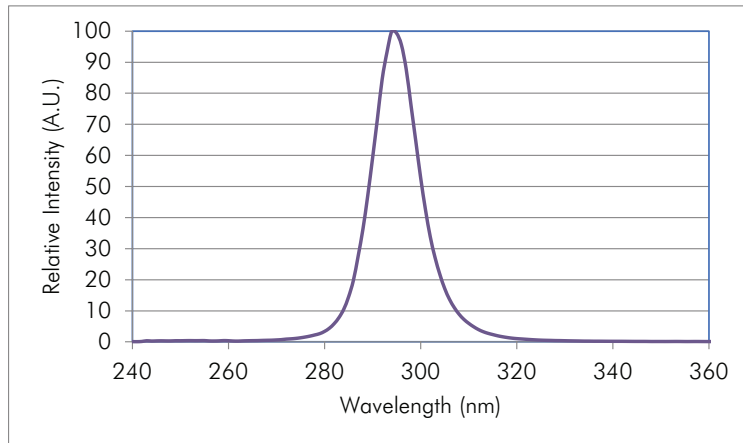
Mechanical Dimensions



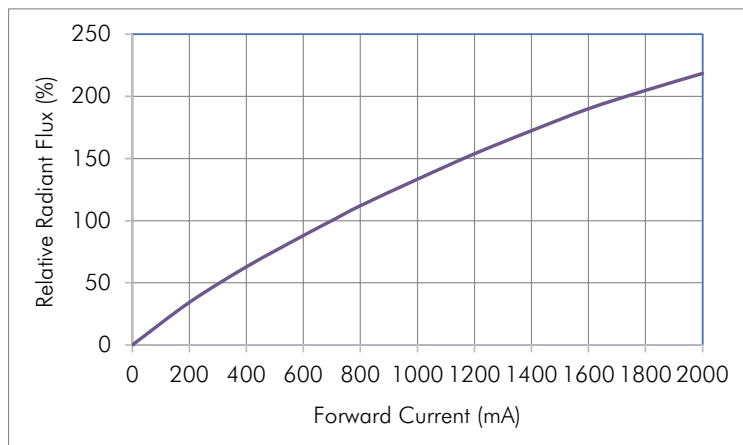
Radiation Pattern



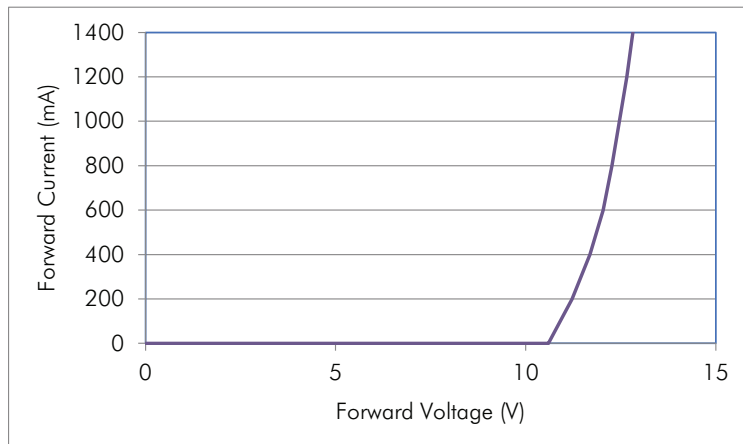
Spectral Output



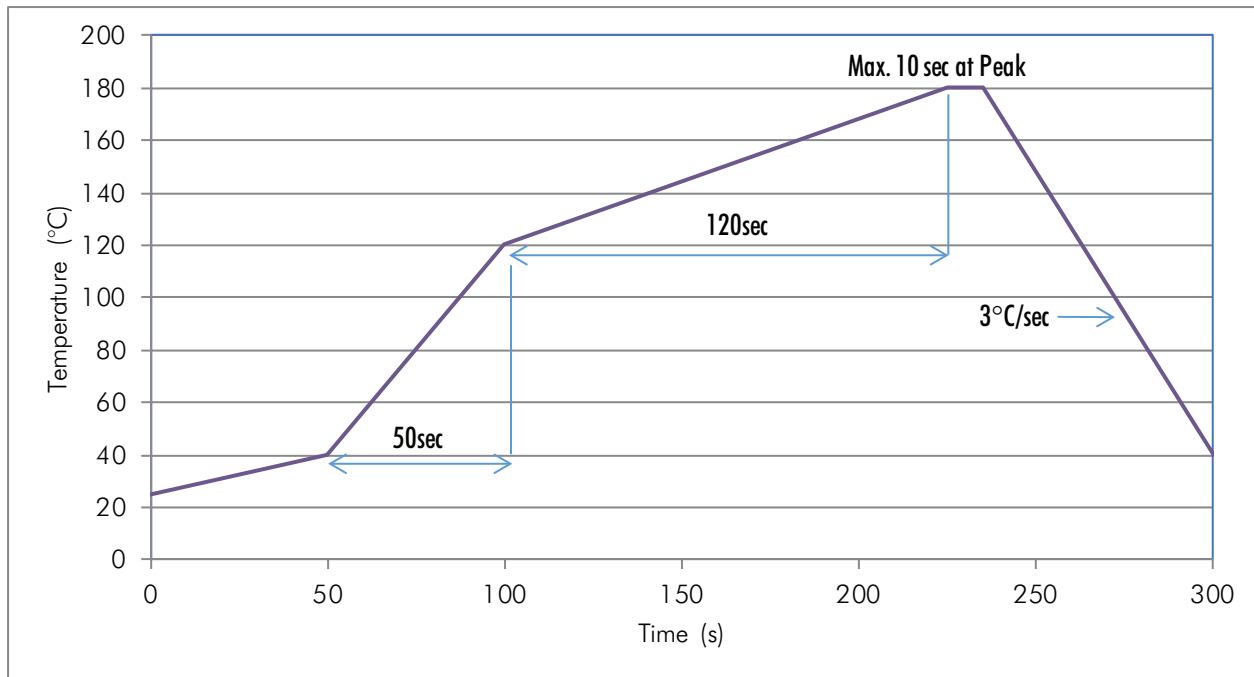
Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current



## Soldering Guidelines



## Recommended MCPCB

Violumas recommends the use of the Pillar MCPCB with Violumas LEDs for maximum performance and reliability. The data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB. Please consult the Violumas engineering team for further recommendations on MCPCB options.

## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

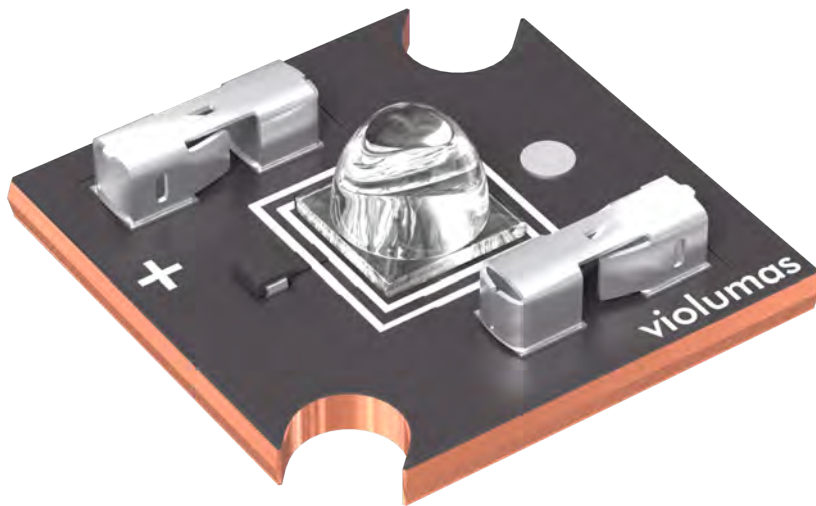
- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## VC1X1C48L3-295 Mid Power UVB LED COB

**VC1X1C48L3-295** is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of  $295 \pm 5\text{nm}$ . Each COB is structured based on the patented 3-PAD LED Flip Chip mounted directly onto the Super Pillar MCPCB to further boost output efficiency and decrease the thermal resistance. The VC1X1C48L3 series is ready for plug and play with no soldering required and is equipped with a  $30^\circ$  lens for mid power UV output.



### FEATURES & BENEFITS

- Dimensions: 15x15x4.27mm
- Ready for plug and play (solder-free)
- Equipped with  $30^\circ$  fused silica lens
- TVS built in for ESD protection

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at  $0.9^\circ\text{C/W}$
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I<sub>F</sub> = 700mA

| Parameter                                    | Symbol          | Unit   | Min | Typical | Max |
|--|-----------------|--------|-----|---------|-----|
| Peak Wavelength                              | $\lambda_p$     | nm     | 290 | 295     | 300 |
| Forward Voltage                              | $V_F$           | V      | 5.1 | 5.8     | 6.2 |
| Radiant Flux                                 | $P_O$           | mW     | 80  | 95      | 115 |
| Full Width of Half Magnitude                 | $\Delta\lambda$ | nm     | -   | 12.3    | -   |
| Radiant Angle                                | $2\Phi_{1/2}$   | Degree | -   | 30      | -   |
| Thermal Resistance, Junction to Solder Joint | $R_{th}(J-S)$   | °C/W   | -   | 0.9     | -   |

Absolute Maximum Ratings

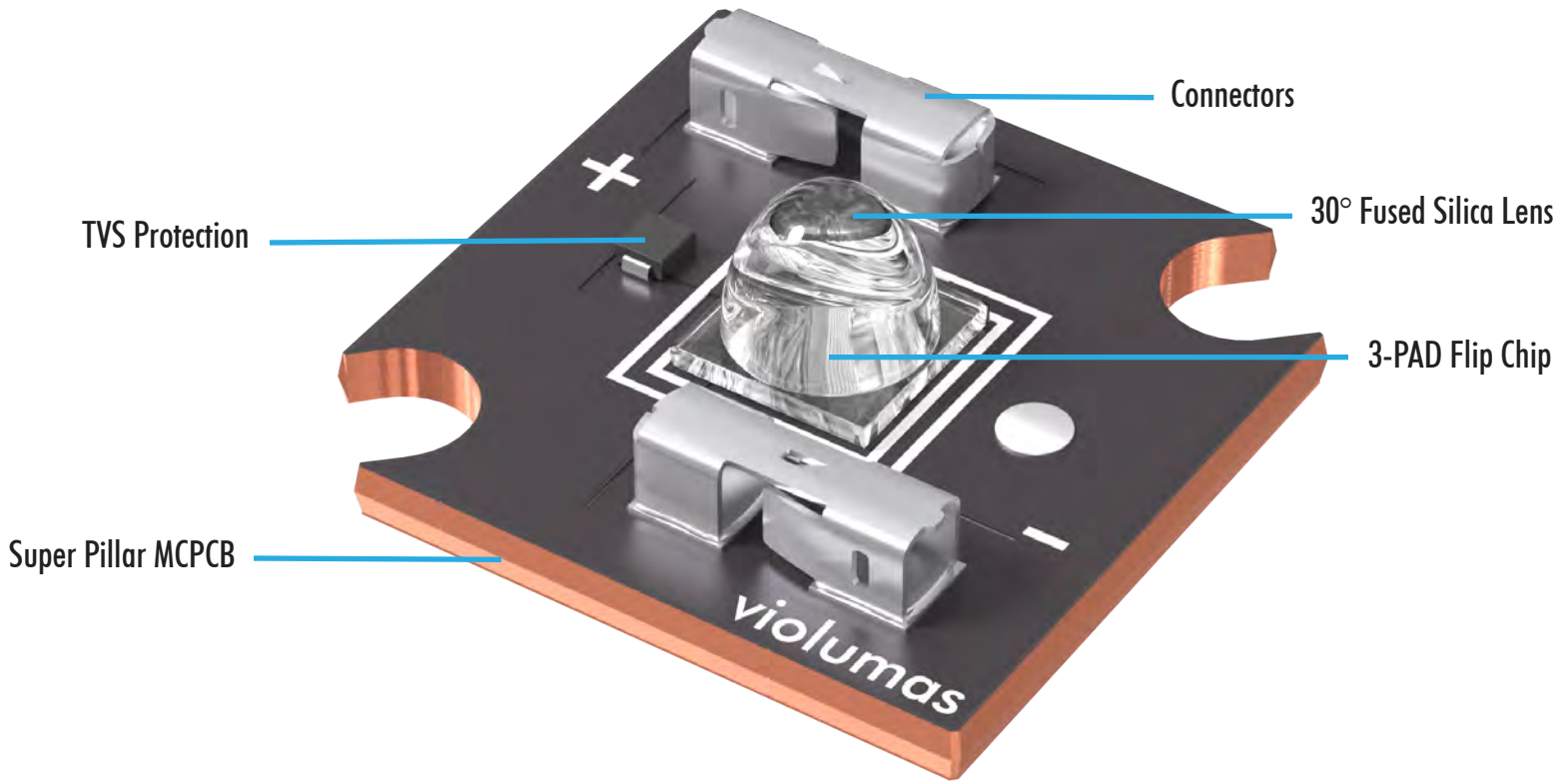
| Parameter             | Symbol    | Unit | Value     |
|-----------------------|-----------|------|-----------|
| Forward Current       | $I_F$     | mA   | 1000      |
| Reverse Voltage       | $V_R$     | V    | 5         |
| Power                 | $P_D$     | W    | 6.5       |
| Junction Temperature  | $T_J$     | °C   | 120       |
| Operating Temperature | $T_{OPR}$ | °C   | -30 ~ 85  |
| Storage Temperature   | $T_{STG}$ | °C   | -40 ~ 105 |

Reliability

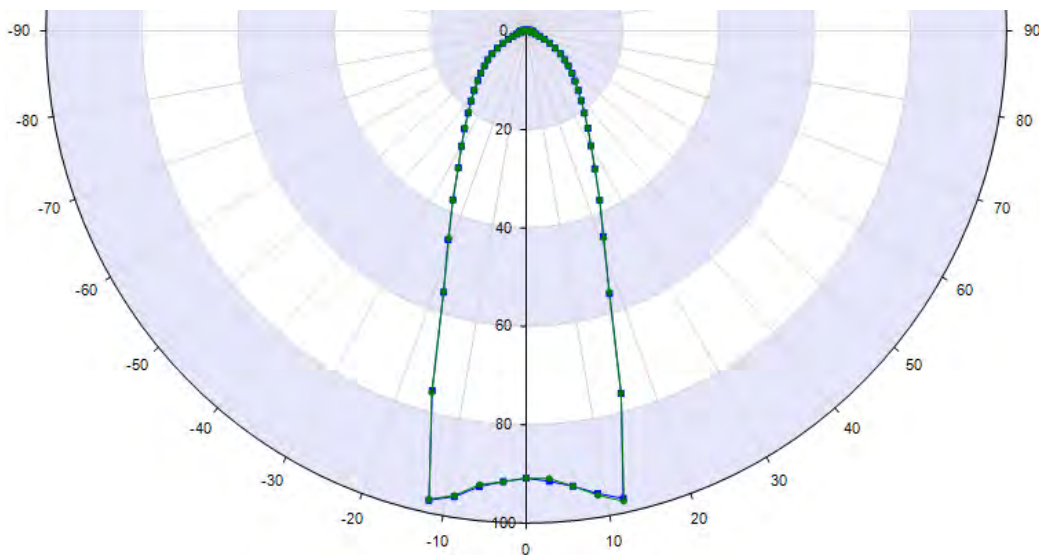
| Test          | Condition     | Test Duration | Test Failed/Tested |
|---------------|---------------|---------------|--------------------|
| Thermal Shock | -45°C ~ 125°C | 2000 Cycles   | 0/10               |

## Product Overview

COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.

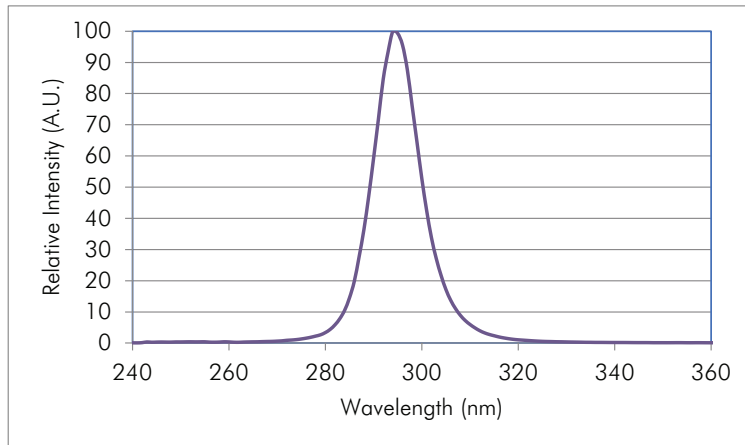


## Radiation Pattern

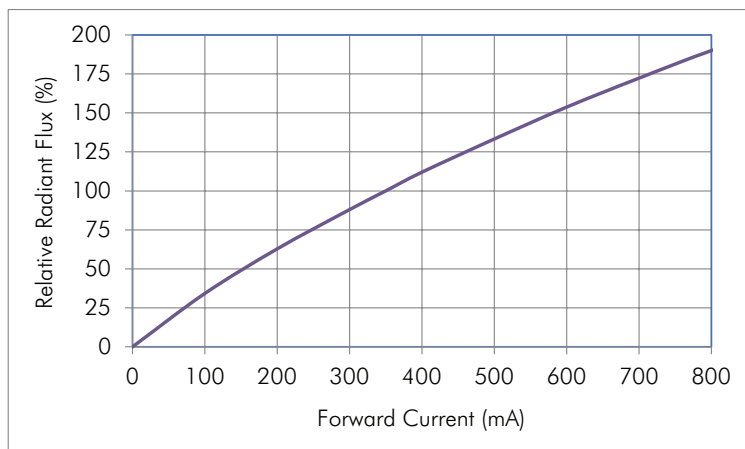




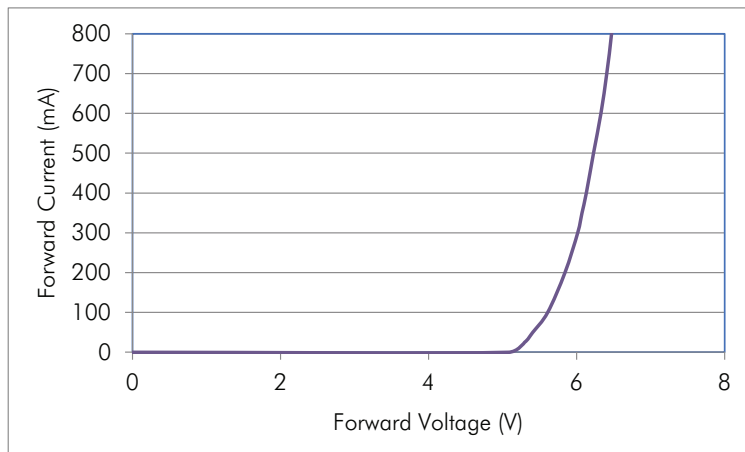
### Spectral Output



### Forward Current vs. Relative Radiant Flux



### Forward Voltage vs. Forward Current



## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

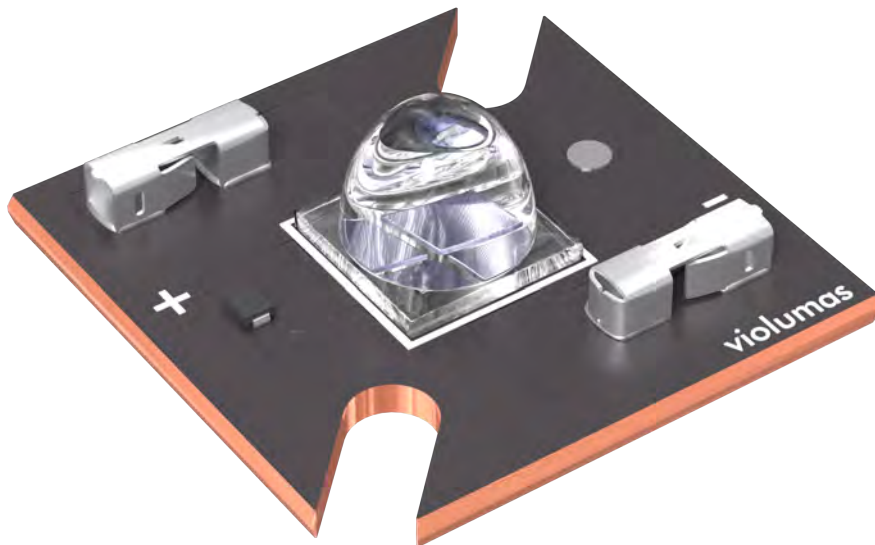
- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## VC2X2C48L6-295 High Power UVB LED COB

**VC2X2C48L6-295** is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of  $295 \pm 5\text{nm}$ . Each COB is structured based on the patented 3-PAD LED Flip Chip mounted directly onto the Super Pillar MCPCB to further boost output efficiency and decrease the thermal resistance. The VC2X2C48L6 series is ready for plug and play with no soldering required and is equipped with a  $60^\circ$  lens for high power UV output.



### FEATURES & BENEFITS

- Dimensions: 20x20x6.1 mm
- Ready for plug and play (solder-free)
- Equipped with  $60^\circ$  fused silica lens
- TVS built in for ESD protection

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at  $0.32^\circ\text{C/W}$
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I<sub>F</sub> = 1400mA

| Parameter                                       | Symbol               | Unit   | Min  | Typical | Max  |
|---|----------------------|--------|------|---------|------|
| Peak Wavelength                                 | $\lambda_p$          | nm     | 290  | 295     | 300  |
| Forward Voltage                                 | V <sub>F</sub>       | V      | 10.2 | 11.5    | 12.5 |
| Radiant Flux                                    | P <sub>O</sub>       | mW     | 285  | 335     | 400  |
| Full Width of Half Magnitude                    | $\Delta\lambda$      | nm     | -    | 12.3    | -    |
| Radiant Angle                                   | 2 $\Phi_{1/2}$       | Degree | -    | 60      | -    |
| Thermal Resistance,<br>Junction to Solder Joint | R <sub>th(J-S)</sub> | °C/W   | -    | 0.32    | -    |

Absolute Maximum Ratings

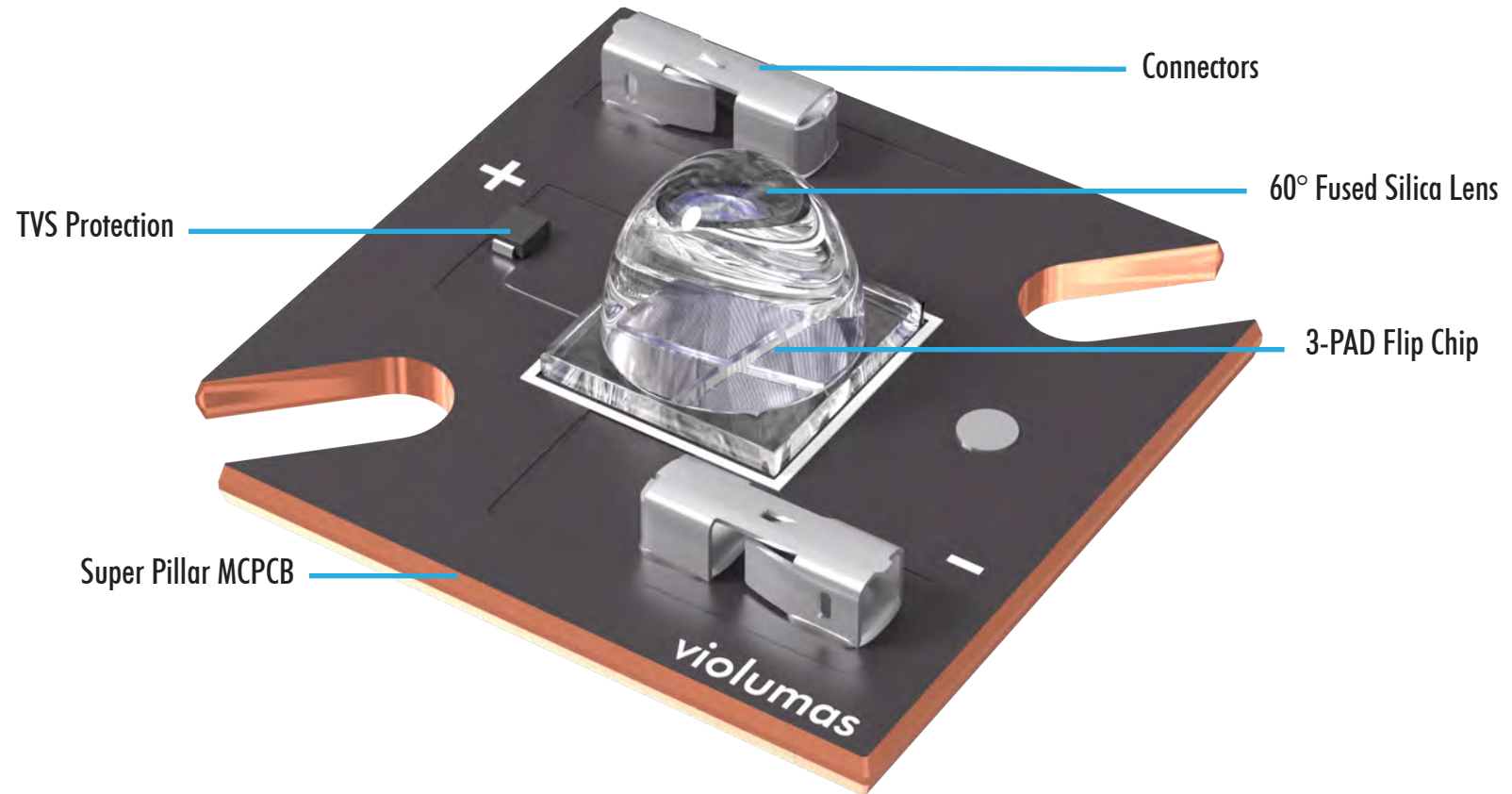
| Parameter             | Symbol           | Unit | Value     |
|-----------------------|------------------|------|-----------|
| Forward Current       | I <sub>F</sub>   | mA   | 2000      |
| Reverse Voltage       | V <sub>R</sub>   | V    | 10        |
| Power                 | P <sub>D</sub>   | W    | 26        |
| Junction Temperature  | T <sub>J</sub>   | °C   | 120       |
| Operating Temperature | T <sub>OPR</sub> | °C   | -30 ~ 85  |
| Storage Temperature   | T <sub>STG</sub> | °C   | -40 ~ 105 |

Reliability

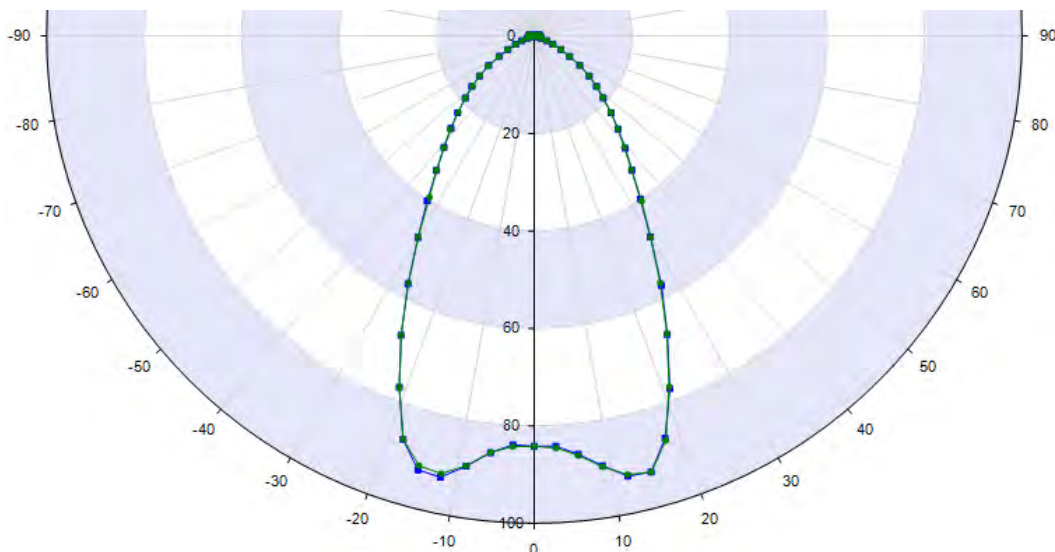
| Test          | Condition     | Test Duration | Test Failed/Tested |
|---------------|---------------|---------------|--------------------|
| Thermal Shock | -45°C ~ 125°C | 2000 Cycles   | 0/10               |

## Product Overview

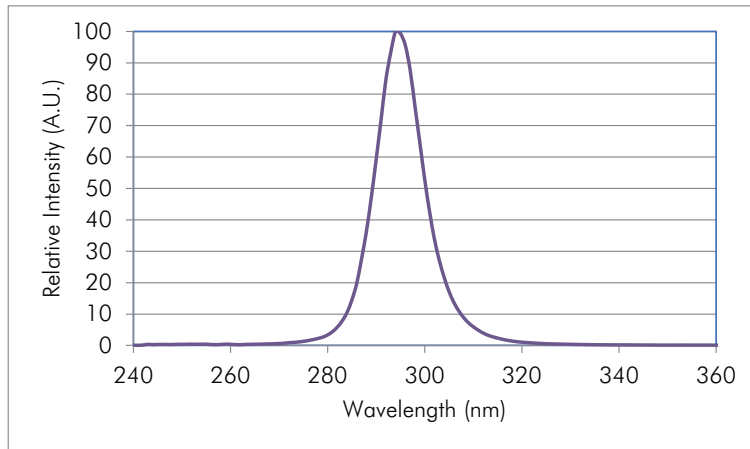
COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.



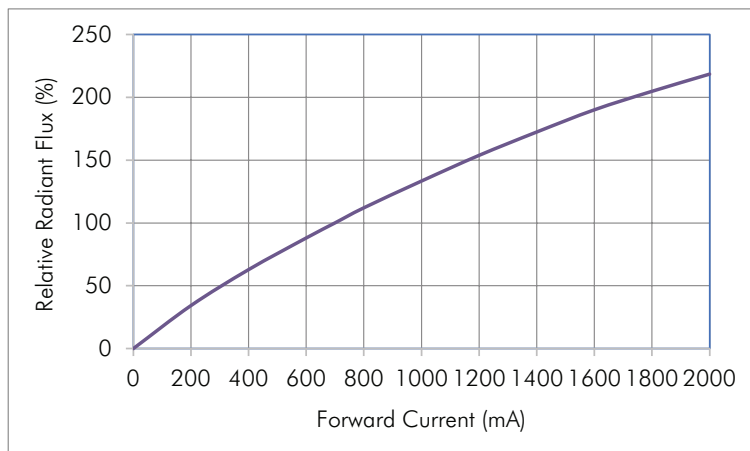
## Radiation Pattern



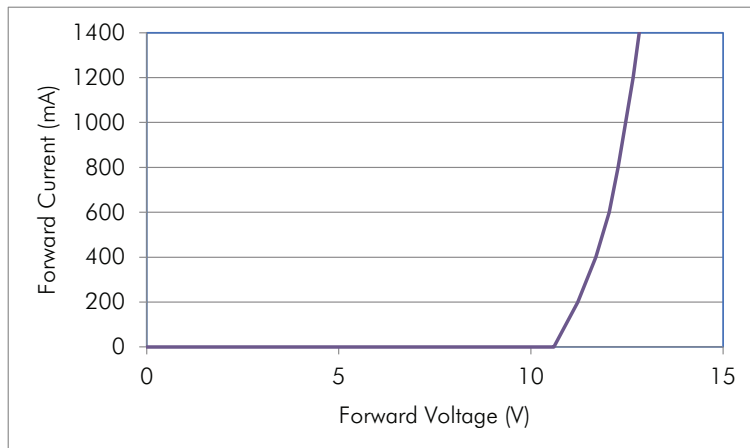
Spectral Output



Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current



## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

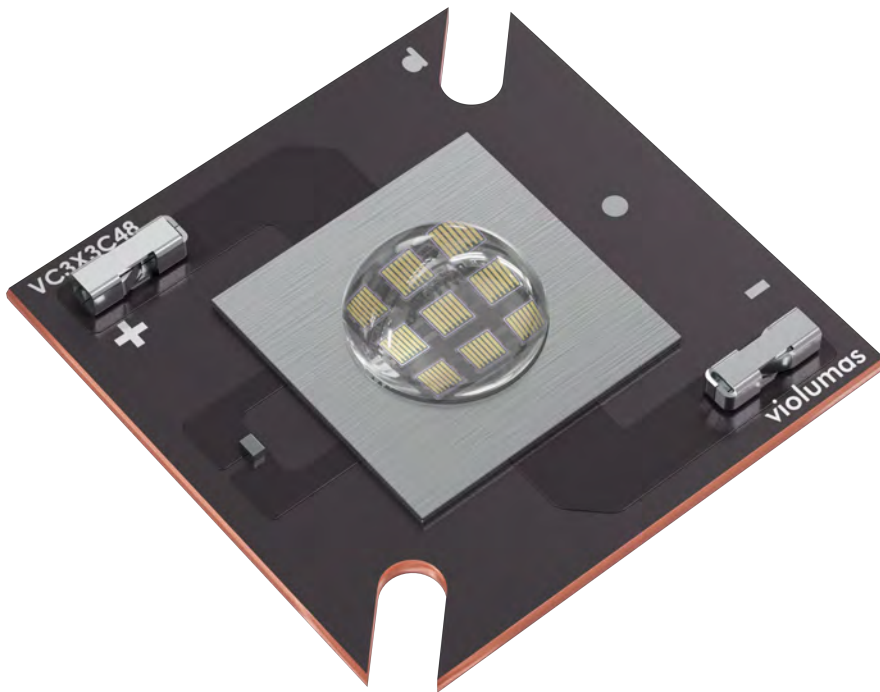
- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## VC3X3C48L9-295 3X3 UVB LED COB

**VC3X3C48L9-295** is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of  $295 \pm 5\text{nm}$ . Each COB is structured based on the patented 3-PAD LED Flip Chip mounted directly onto the Super Pillar MCPCB to further boost output efficiency and decrease the thermal resistance. The VC3X3C48L9 series is ready for plug and play with no soldering required and is equipped with a  $90^\circ$  lens for high power UV output.



### FEATURES & BENEFITS

- Dimensions: 30mm x 30mm x 6.15mm
- Ready for plug and play (solder-free)
- Equipped with  $90^\circ$  fused silica lens
- TVS built in for ESD protection

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at  $0.1^\circ\text{C/W}$
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime



Electro-Optical Characteristics at T=25°C and I<sub>F</sub> = 2100mA

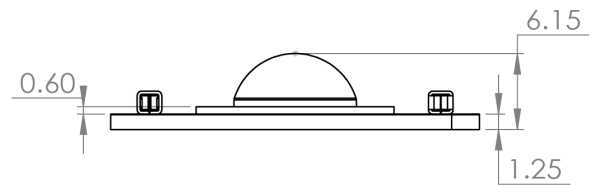
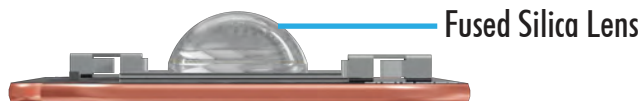
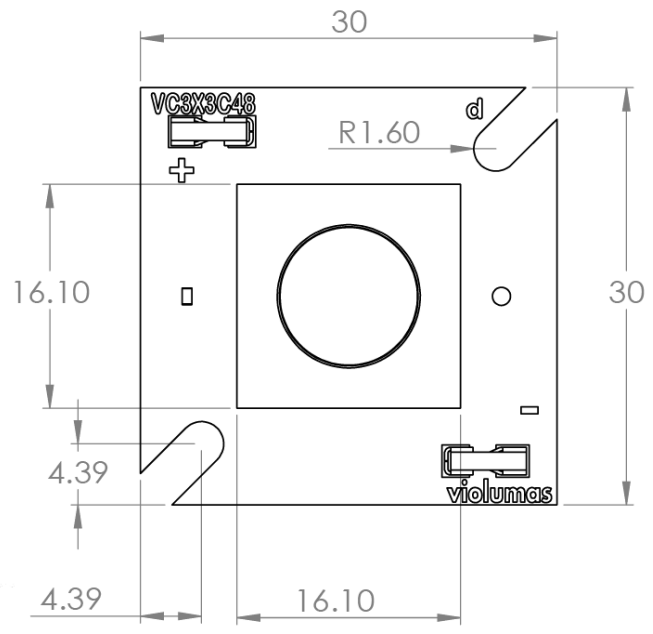
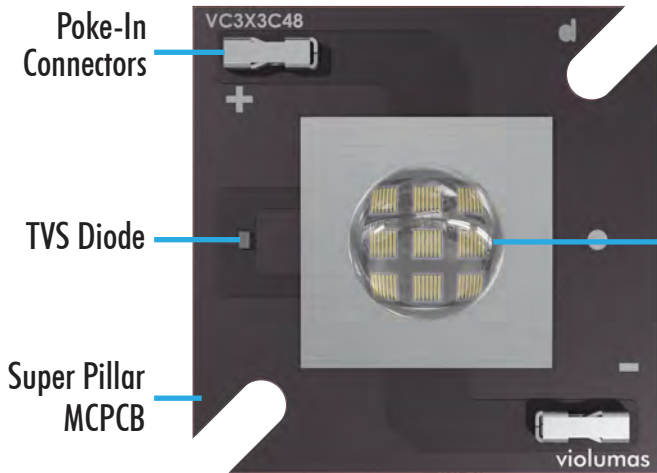
| Parameter                                       | Symbol               | Unit   | Min  | Typical | Max  |
|---|----------------------|--------|------|---------|------|
| Peak Wavelength                                 | $\lambda_p$          | nm     | 290  | 295     | 300  |
| Forward Voltage                                 | V <sub>F</sub>       | V      | 15.3 | 17.4    | 20.0 |
| Radiant Flux                                    | P <sub>O</sub>       | mW     | 600  | 720     | 880  |
| Full Width of Half Magnitude                    | $\Delta\lambda$      | nm     | -    | 12      | -    |
| Radiant Angle                                   | 2 $\Phi_{1/2}$       | Degree | -    | 90      | -    |
| Thermal Resistance,<br>Junction to Solder Joint | R <sub>th(J-S)</sub> | °C/W   | -    | 0.1     | -    |

Absolute Maximum Ratings

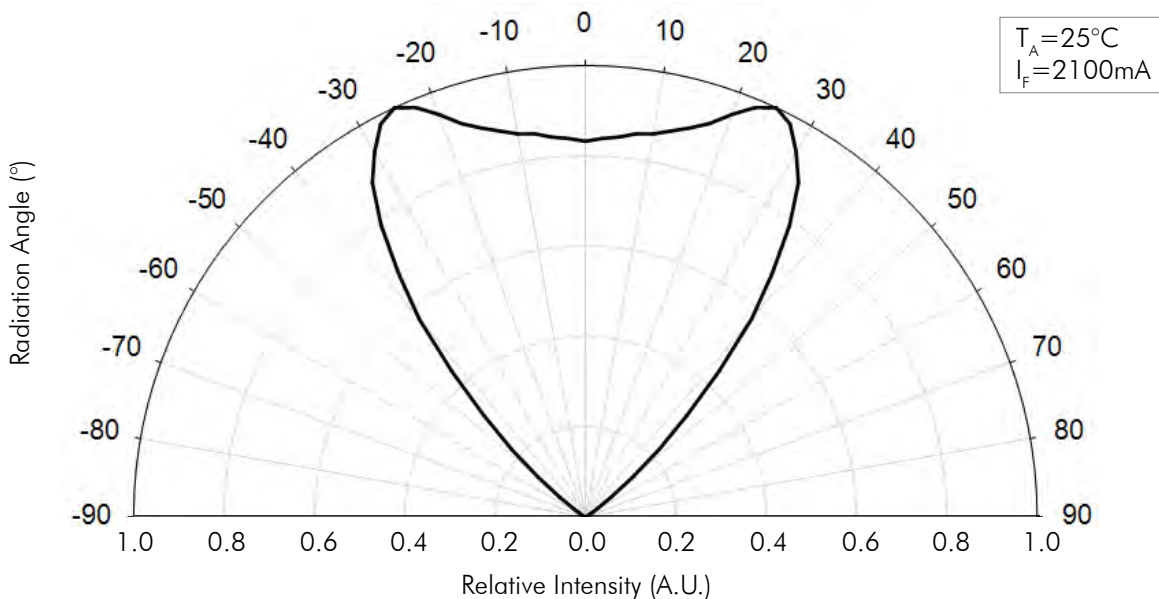
| Parameter             | Symbol           | Unit | Value    |
|-----------------------|------------------|------|----------|
| Forward Current       | I <sub>F</sub>   | mA   | 3000     |
| Reverse Voltage       | V <sub>R</sub>   | V    | 15       |
| Power                 | P <sub>D</sub>   | W    | 58.5     |
| Junction Temperature  | T <sub>J</sub>   | °C   | 90       |
| Operating Temperature | T <sub>OPR</sub> | °C   | -30 ~ 85 |
| Storage Temperature   | T <sub>STG</sub> | °C   | -40 ~ 85 |

Product Overview

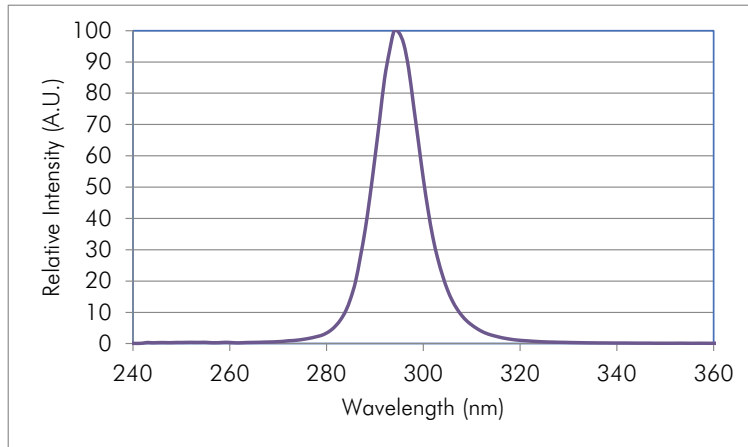
COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.



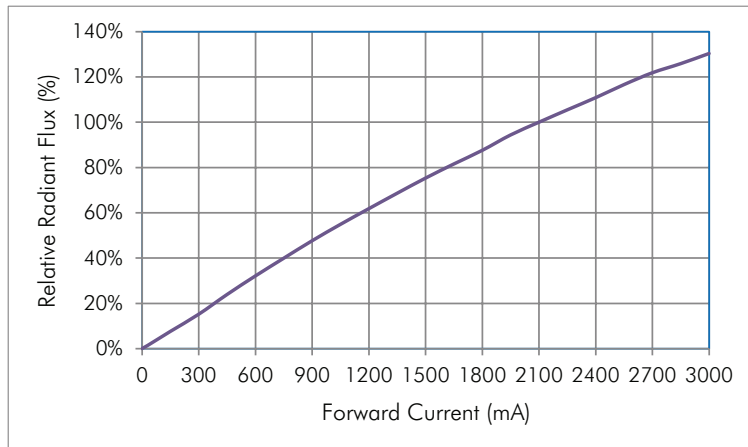
Radiation Pattern



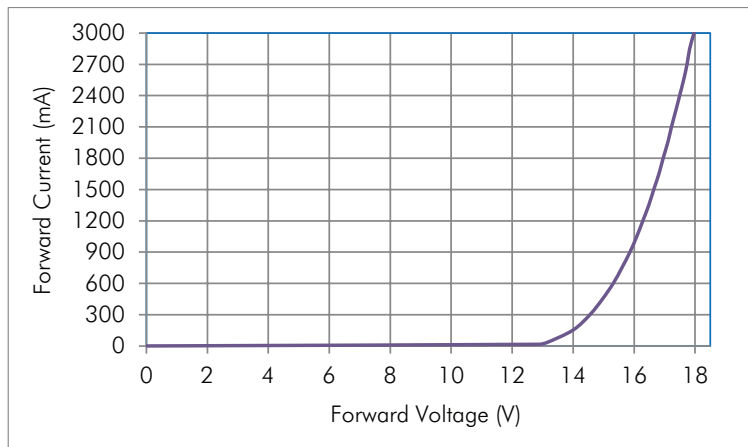
Spectral Output



Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current



## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

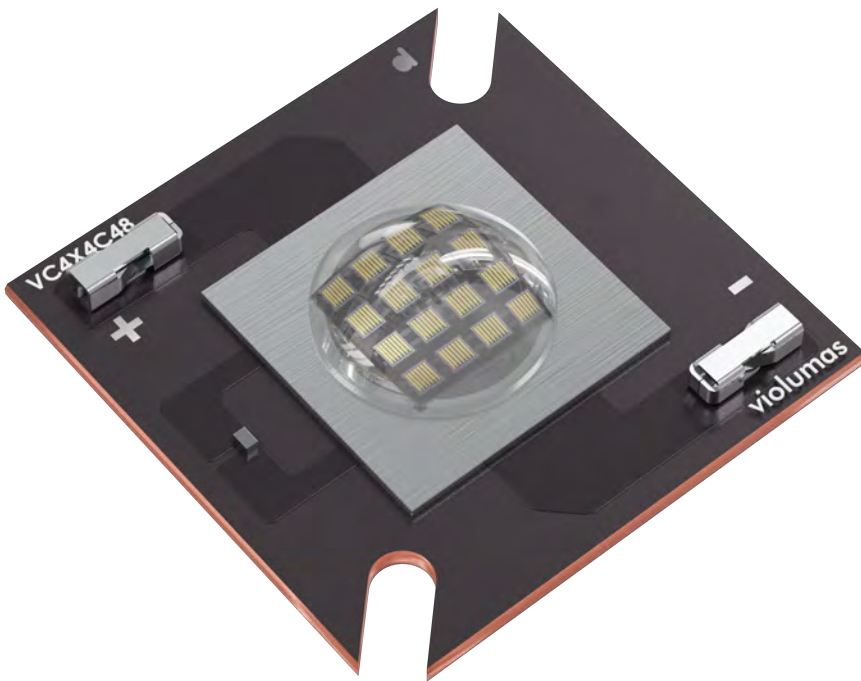
- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## VC4X4C48L9-295 4X4 UVB LED COB

**VC4X4C48L9-295** is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of  $295 \pm 5\text{nm}$ . Each COB is structured based on the patented 3-PAD LED Flip Chip mounted directly onto the Super Pillar MCPCB to further boost output efficiency and decrease the thermal resistance. The VC4X4C48L9 series is ready for plug and play with no soldering required and is equipped with a  $90^\circ$  lens for high power UV output.



### FEATURES & BENEFITS

- Dimensions: 30mm x 30mm x 5.45mm
- Ready for plug and play (solder-free)
- Equipped with  $90^\circ$  fused silica lens
- TVS built in for ESD protection

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at  $0.06^\circ\text{C/W}$
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I<sub>F</sub> = 2800mA

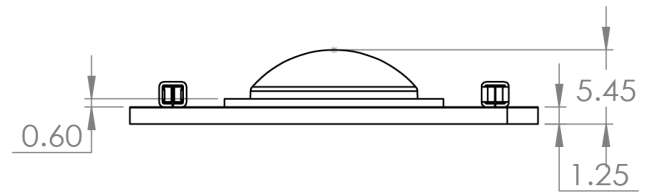
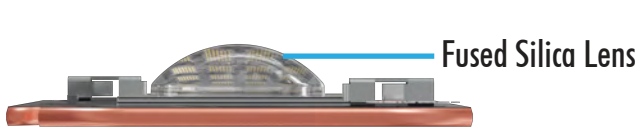
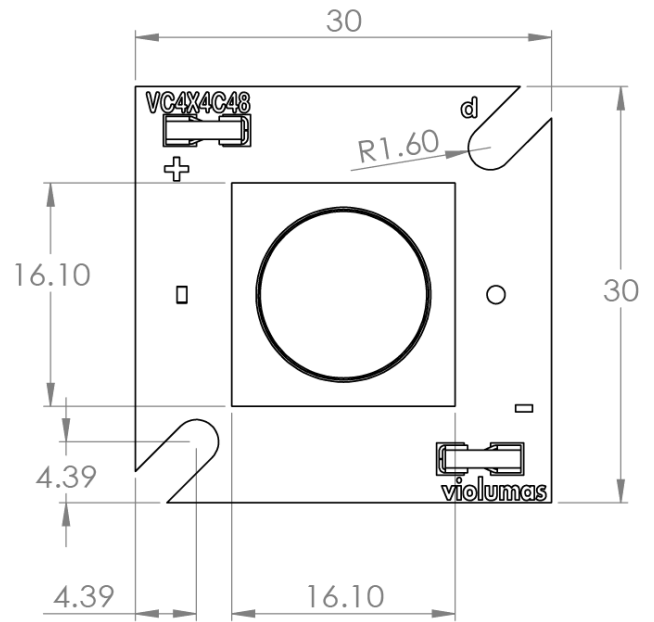
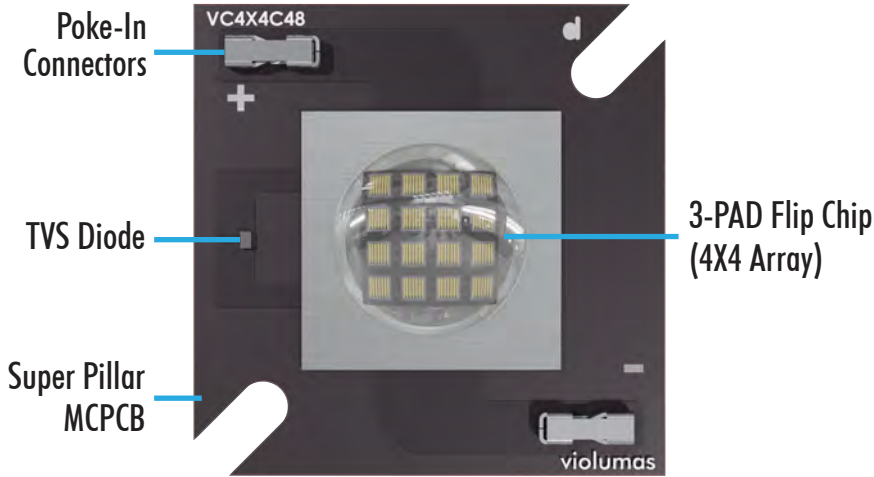
| Parameter                                       | Symbol               | Unit   | Min  | Typical | Max  |
|---|----------------------|--------|------|---------|------|
| Peak Wavelength                                 | $\lambda_p$          | nm     | 290  | 295     | 300  |
| Forward Voltage                                 | V <sub>F</sub>       | V      | 20.4 | 23.2    | 26.8 |
| Radiant Flux                                    | P <sub>O</sub>       | mW     | 1020 | 1280    | 1570 |
| Full Width of Half Magnitude                    | $\Delta\lambda$      | nm     | -    | 12      | -    |
| Radiant Angle                                   | 2 $\Phi_{1/2}$       | Degree | -    | 90      | -    |
| Thermal Resistance,<br>Junction to Solder Joint | R <sub>th(J-S)</sub> | °C/W   | -    | 0.06    | -    |

Absolute Maximum Ratings

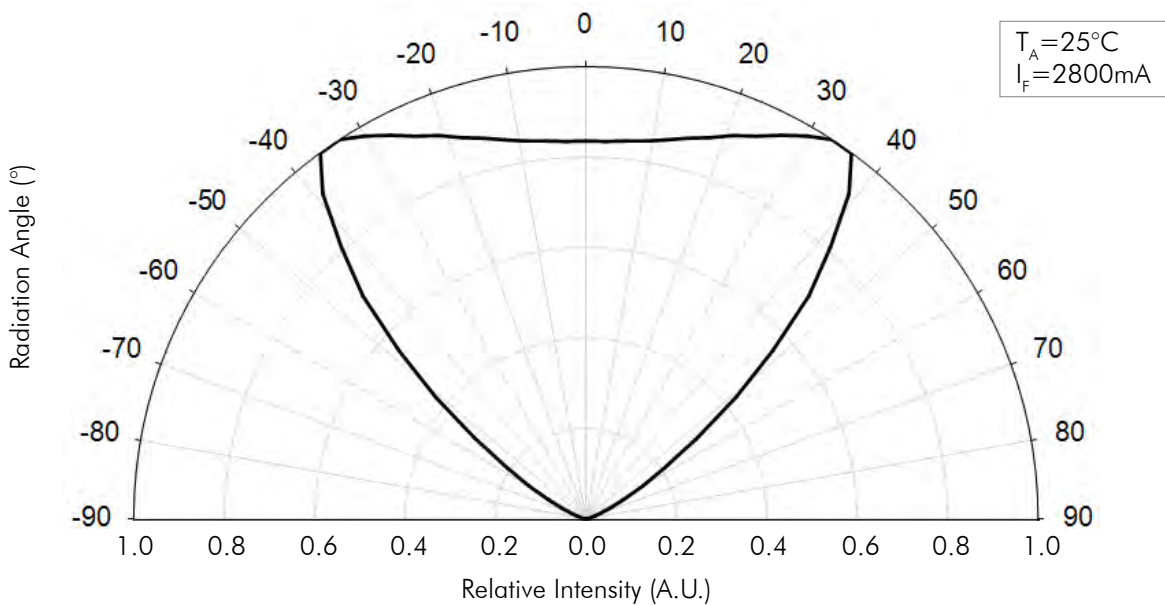
| Parameter             | Symbol           | Unit | Value    |
|-----------------------|------------------|------|----------|
| Forward Current       | I <sub>F</sub>   | mA   | 4000     |
| Reverse Voltage       | V <sub>R</sub>   | V    | 20       |
| Power                 | P <sub>D</sub>   | W    | 104      |
| Junction Temperature  | T <sub>J</sub>   | °C   | 90       |
| Operating Temperature | T <sub>OPR</sub> | °C   | -30 ~ 85 |
| Storage Temperature   | T <sub>STG</sub> | °C   | -40 ~ 85 |

## Product Overview

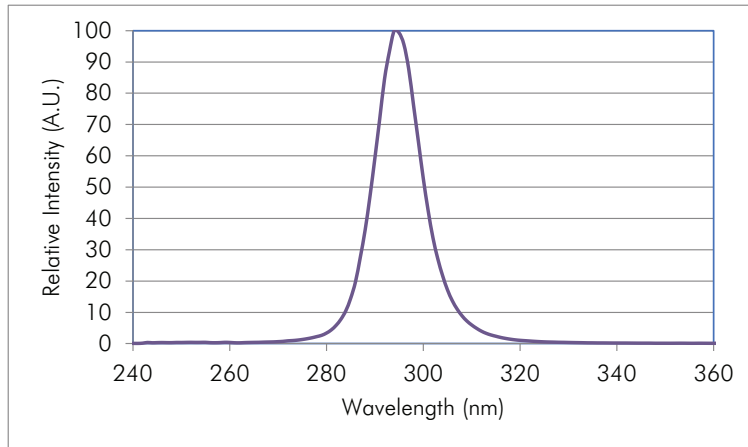
COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.



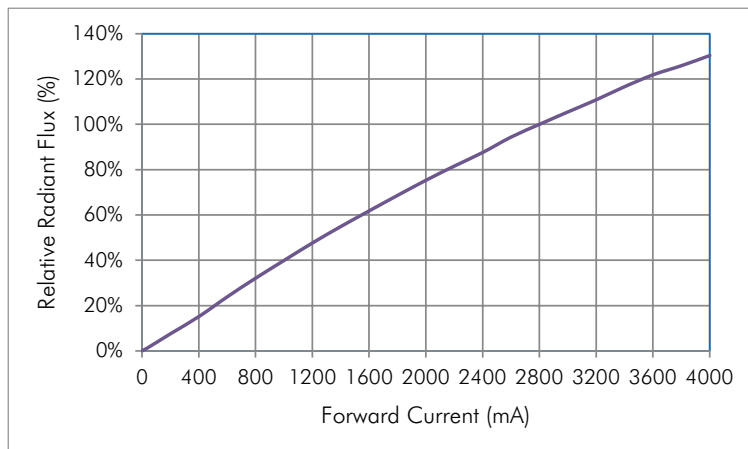
## Radiation Pattern



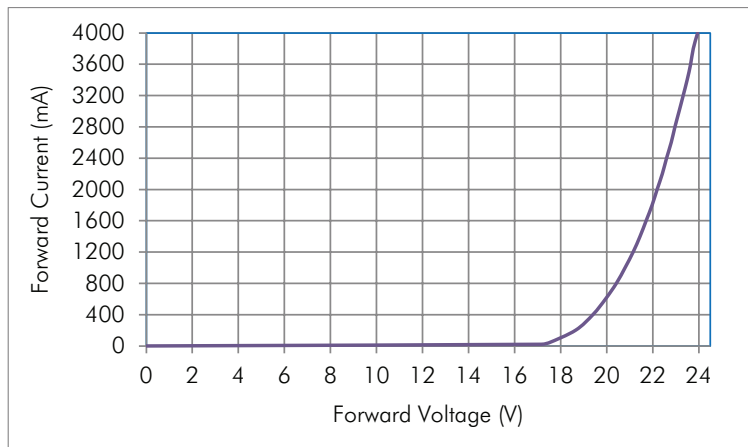
Spectral Output



Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current





## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## VC12X1 Series 12-LED Light Bar COB

**VC12X1 Series** is UV LED Light Bar Chip on Board (COB) module with 12 chips bonded in a linear structure. Each COB is structured based on the patented 3-PAD LED Flip Chip mounted directly onto the Super Pillar MCPCB to further boost output efficiency and decrease the thermal resistance. The VC12X1 Series is ready for plug and play with no soldering required and is equipped with a 60° lens.

### FEATURES & BENEFITS

- Dimensions: 304mm x 20mm
- Ready for plug and play (solder-free)
- Equipped with 60° fused silica lens
- TVS built in for ESD protection

### THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at 0.075°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime



Electro-Optical Characteristics for UVA ( $T=25^{\circ}\text{C}$  and  $I_F=700\text{mA}$ )

| Part Number     | Wavelength | Typ. Output | Forward Voltage | Power Consumption |
|-----------------|------------|-------------|-----------------|-------------------|
| VC12X1C45L6-405 | 405nm      | 12W         | 43.5V           | 30.5W             |
| VC12X1C45L6-395 | 395nm      | 13W         | 43.5V           | 30.2W             |
| VC12X1C45L6-385 | 385nm      | 12W         | 43.5V           | 30.2W             |
| VC12X1C45L6-375 | 375nm      | 9W          | 43.5V           | 30.2W             |
| VC12X1C45L6-365 | 365nm      | 6W          | 46.8V           | 30.8W             |

Absolute Maximum Ratings for UVA

| Parameter             | Symbol    | Unit               | Value     |
|-----------------------|-----------|--------------------|-----------|
| Forward Current       | $I_F$     | mA                 | 1000      |
| Reverse Voltage       | $V_R$     | V                  | 60        |
| Power                 | $P_D$     | W                  | 48        |
| Junction Temperature  | $T_J$     | $^{\circ}\text{C}$ | 120       |
| Operating Temperature | $T_{OPR}$ | $^{\circ}\text{C}$ | -30 ~ 85  |
| Storage Temperature   | $T_{STG}$ | $^{\circ}\text{C}$ | -40 ~ 105 |

Reliability

| Test          | Condition                                      | Test Duration | Test Failed/Tested |
|---------------|--|---------------|--------------------|
| Thermal Shock | $-45^{\circ}\text{C} \sim 125^{\circ}\text{C}$ | 2000 Cycles   | 0/10               |

Electro-Optical Characteristics for UVB & UVC (T=25°C and I<sub>F</sub> = 1400mA)

| Part Number     | Wavelength | Typ. Output | Forward Voltage | Power Consumption |
|-----------------|------------|-------------|-----------------|-------------------|
| VC12X1C48L6-310 | 310nm      | 1.33W       | 36.0V           | 50.4W             |
| VC12X1C48L6-295 | 295nm      | 1.1W        | 35.0V           | 49.0W             |
| VC12X1C48L6-275 | 275nm      | 1W          | 37.8V           | 52.9W             |
| VC12X1C48L6-265 | 265nm      | 0.8W        | 38.4V           | 53.8W             |

Absolute Maximum Ratings for UVB & UVC

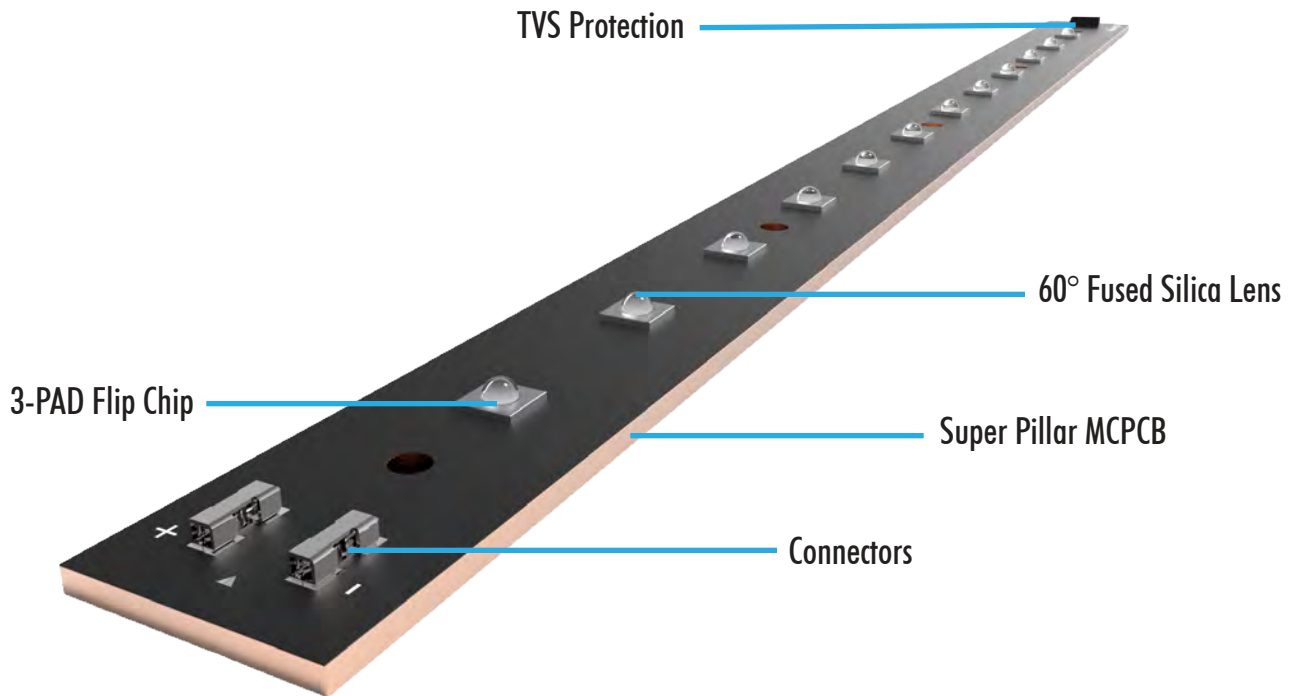
| Parameter             | Symbol           | Unit | Value     |
|-----------------------|------------------|------|-----------|
| Forward Current       | I <sub>F</sub>   | mA   | 2000      |
| Reverse Voltage       | V <sub>R</sub>   | V    | 30        |
| Power                 | P <sub>D</sub>   | W    | 84        |
| Junction Temperature  | T <sub>J</sub>   | °C   | 120       |
| Operating Temperature | T <sub>OPR</sub> | °C   | -30 ~ 85  |
| Storage Temperature   | T <sub>STG</sub> | °C   | -40 ~ 105 |

Reliability

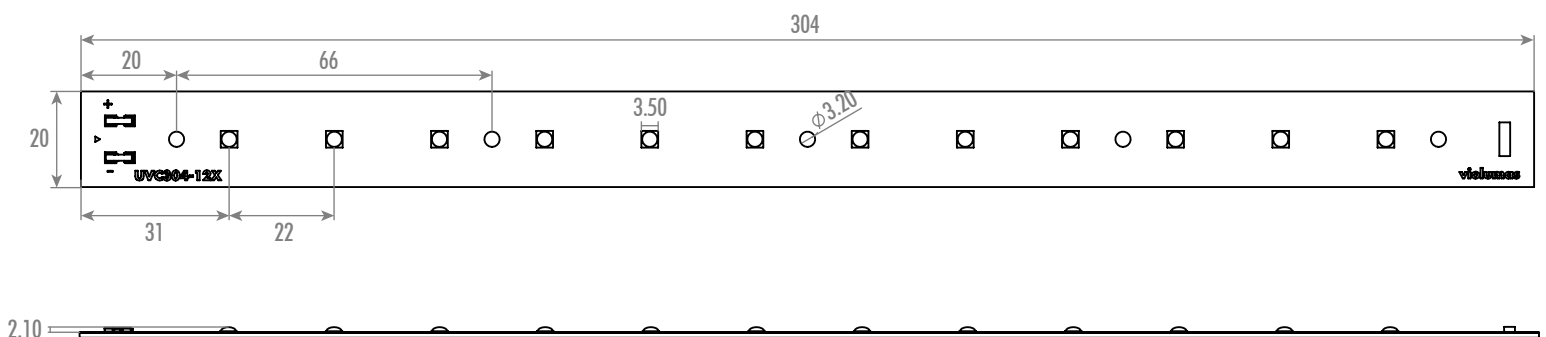
| Test          | Condition     | Test Duration | Test Failed/Tested |
|---------------|---------------|---------------|--------------------|
| Thermal Shock | -45°C ~ 125°C | 2000 Cycles   | 0/10               |

Product Overview

COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.



Mechanical Dimensions



Please contact the Violumas team at [info@violumas.com](mailto:info@violumas.com) for additional information regarding performance curves, irradiance maps, and suitable heatsinks/drivers for this product.

## Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

## Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

## Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

## Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

## Static Electricity Precautions

- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

## Disclaimers

Violumas is not responsible for any damages that result from inaccurate use of the recommended guidelines. The information compiled in this document is a result of careful review of reference materials and reliable sources. Violumas does not make any claims regarding warranty or guarantee. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Disassembling Violumas products without consent is prohibited. No part of these documents may be reproduced in any form without prior written permission from Violumas. Please note that the data presented in this document is measured from the use of exclusive Flip Chip Opto patented products - the 3-PAD LED Flip Chip and the Pillar MCPCB.

## UV LED Application Set

### Plug-and-Play:

- COB UV LED
- Heatsink Kit
- Driver Kit

Violumas COB LED



Violumas Heatsink Kit



Heatsink (x1), Mounting Screws (x2), Thermal Pad (x2)

Violumas Driver Kit with LED Wire & Connector - 110V or 220V



Negative/Black Wire (x1), Positive/Red Wire (x1), 2-Terminal Connectors (x2)

Photos are provided for reference only and may not be accurate of the exact items received.

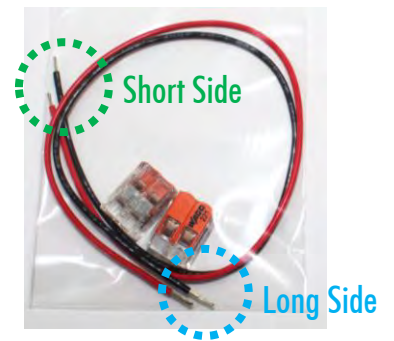
# UV LED Application Set

## Step 1: Mounting the COB LED onto the Heatsink

- If there is a protective film on the backside of the LED, please remove the film. Inspect the contact surfaces and ensure the contact surfaces of the LED backside and the heatsink are smooth. If surfaces are not smooth, high resolution sandpaper polish is recommended. Gently clean the surfaces with alcohol.
- Place the thermal pad on the coupling area where the LED is to be mounted onto the heatsink.
- Tighten down the LED onto the heatsink surface via provided screws. Do not over torque the screws.

### Violumas LED Wire & Connector Kit:

- Each wire is pre-stripped for plug-and-play connections.
- One end of each wire is stripped approximately 5mm (**short side**). The short side should be inserted into the COB LED.
- One end of each wire is stripped approximately 10mm (**long side**). The long side should be coupled with the driver kit wires.



## Step 2: Connecting Wires to the COB LED

- Insert the short side of the "-" wire into the "-" COB connector.
- Insert the short side of the "+" wire into the "+" COB connector.
- Please insert the wire end fully into the appropriate COB connector (positive to positive, negative to negative). The connection should be tight even with a weak pull on the ends of the wires. Soldering is not required.

## Step 3: Connecting Wires to the Driver Kit

- Couple the long side of the "-" wire to the "-" wire of the driver kit using the provided connector.
- Couple the long side of the "+" wire to the "+" wire of the driver kit using the provided connector.
- For coupling wires with the provided connector, please insert the wire end fully into an unoccupied terminal and snap the connector shut. The connection should be tight even with a weak pull on the 2 ends of the wires. Please ensure positive and negative wires are connected appropriately (positive to positive, negative to negative).

## Notes for Operation

- Please ensure the driver kit is off before making any wire connections.
- Please connect the driver kit to a separate power strip (not provided) with an ON/OFF switch. Please utilize the power strip switch to turn the driver kit on and off. Directly plugging the driver kit into a wall outlet is not recommended.
- If the driver kit includes a dimmer dial, please ensure the dimmer dial is set to the lowest position before turning the power on.



# UV LED Application Set

## Disclaimer

Violumas is not responsible for any damages that may result from inaccurate use of the recommended products. Violumas does not make any claims regarding warranty or guarantee of these products. It is recommended that each customer consults the Violumas engineering team before engaging Violumas products in extreme applications where the failure of the LED and damage to human health may be possible. Each user assumes full responsibility for determining the suitability of the use of Violumas products in various applications. Operating Violumas LEDs incorrectly or with an unsuitable driver may result in immediate failure and Violumas will not be responsible for replacement.

## Precautions

### Handling & Usage Precautions

- Exhibit extreme care when handling LEDs. Do not touch the LED with bare hands as doing so may contaminate and affect the optical characteristics of the LED. When using tweezers, do not apply excessive force, especially to the glass lens. Do not drop the LED as doing so may cause product damage.
- Ensure that electrostatic discharge specifications are followed. Static electricity and surge voltages may cause product damage. Proper electrostatic discharge protection equipment, working machinery, and protected mounting equipment are recommended.
- Do not expose the LEDs to volatile organic compounds as well as hazardous, acidic, and corrosive substances during storage and operation to avoid product damage.
- Do not apply excess mechanical force and vibration while handling the product.
- Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Ensure that the PCB is suitable for the product and be wary of LED placement and possible PCB warpage.
- To avoid fault issues, do not couple any electrical wires to the metal substrate of the MCPCB or COB. If any electrical wires from the power source have contact with the MCPCB's metal base under power ON conditions, permanent damage may occur due to inner arcing within the 3-PAD LED structure.

### Storage Precautions

- Perform soldering as soon as the moisture-proof packaging is opened.
- After the storage duration has exceeded the recommended time, products may need to be baked before soldering.
- Store all products in a controlled environment under 30° C free of dust. Do not expose the product to sudden changes in temperature, high humidity levels, and condensation.
- Please consult the Violumas engineering team for further information on storage precautions.

### Eye Safety Precautions

- Avoid exposure to UV light during LED operation. Do not look directly into the UV light during LED operation. Do not look directly into the UV light during optical measurements even through optical instruments. Protect the body, skin, and eyes with UV protective equipment.
- Attach warning labels on all products and systems that use UV LEDs.

### Cleaning Precautions

- Do not use brushes or organic solvents for cleaning the LEDs.
- Perform electrical and optical measurements before and after cleaning to ensure optimal performance.

### Static Electricity Precautions

- Ensure that equipment and machinery are properly grounded.
- Anti-electrostatic attire (wristbands, gloves, footwear, etc.) is recommended.
- Damage inspection is recommended while performing characteristics inspection of LEDs.

**UV LED Application Sets**Purchase on web store: <https://shop.boselec.com/collections/uv-led>

| <u>Set Part Number</u> | <u>UV LED</u>  | <u>Heat Sink</u> | <u>Driver Kit</u>   |
|------------------------|----------------|------------------|---------------------|
| <b>265 nm LED</b>      |                |                  |                     |
| SET-265-MED-110V       | VC1X1C48L3-265 | 30.1.006770      | PS-700A6W-ND-110V   |
| SET-265-MED-220V       | VC1X1C48L3-265 | 30.1.006770      | PS-700A6W-ND-220V   |
| SET-265-HI-110V        | VC2X2C48L6-265 | 30.1.006846      | PS-1400A25W-ND-110V |
| SET-265-HI-220V        | VC2X2C48L6-265 | 30.1.006846      | request             |
| <b>275 nm LED</b>      |                |                  |                     |
| SET-275-MED-110V       | VC1X1C48L3-275 | 30.1.006770      | PS-700A6W-ND-110V   |
| SET-275-MED-220V       | VC1X1C48L3-275 | 30.1.006770      | PS-700A6W-ND-220V   |
| SET-275-HI-110V        | VC2X2C48L6-275 | 30.1.006846      | PS-1400A25W-ND-110V |
| SET-275-HI-220V        | VC2X2C48L6-275 | 30.1.006846      | request             |
| <b>295 nm LED</b>      |                |                  |                     |
| SET-295-MED-110V       | VC1X1C48L3-295 | 30.1.006770      | PS-700A6W-ND-110V   |
| SET-295-MED-220V       | VC1X1C48L3-295 | 30.1.006770      | PS-700A6W-ND-220V   |
| SET-295-HI-110V        | VC2X2C48L6-295 | 30.1.006846      | PS-1400A20W-ND-110V |
| SET-295-HI-220V        | VC2X2C48L6-295 | 30.1.006846      | PS-1400A20W-ND-220V |
| <b>310 nm LED</b>      |                |                  |                     |
| SET-310-MED-110V       | VC1X1C48L3-310 | 30.1.006770      | PS-700A6W-ND-110V   |
| SET-310-MED-220V       | VC1X1C48L3-310 | 30.1.006770      | PS-700A6W-ND-220V   |
| SET-310-HI-110V        | VC2X2C48L6-310 | 30.1.006846      | PS-1400A25W-ND-110V |
| SET-310-HI-220V        | VC2X2C48L6-310 | 30.1.006846      | request             |
| <b>325 nm LED</b>      |                |                  |                     |
| SET-325-MED-110V       | WC1X1C40L3-325 | 30.1.006770      | PS-350A3W-ND        |
| SET-325-MED-220V       | WC1X1C40L3-325 | 30.1.006770      | PS-350A3W-ND        |
| <b>340 nm LED</b>      |                |                  |                     |
| SET-325-MED-110V       | WC1X1C40L3-340 | 30.1.006770      | PS-350A3W-ND        |
| SET-340-MED-220V       | WC1X1C40L3-340 | 30.1.006770      | PS-350A3W-ND        |
| <b>365 nm LED</b>      |                |                  |                     |
| SET-365-MED-110V       | VC1X1C45L6-365 | 30.1.006770      | PS-700A3W-ND        |
| SET-365-MED-220V       | VC1X1C45L6-365 | 30.1.006770      | PS-700A3W-ND        |
| SET-365-HI-110V        | VC2X2C45L9-365 | 30.1.006846      | PS-1400A16W-ND      |
| SET-365-HI-220V        | VC2X2C45L9-365 | 30.1.006846      | request             |
| <b>375 nm LED</b>      |                |                  |                     |
| SET-375-MED-110V       | VC1X1C45L6-375 | 30.1.006770      | PS-700A3W-ND        |
| SET-375-MED-220V       | VC1X1C45L6-375 | 30.1.006770      | PS-700A3W-ND        |
| SET-375-HI-110V        | VC2X2C45L9-375 | 30.1.006846      | PS-1400A16W-ND      |
| SET-375-HI-220V        | VC2X2C45L9-375 | 30.1.006846      | request             |
| <b>385 nm LED</b>      |                |                  |                     |
| SET-385-MED-110V       | VC1X1C45L6-385 | 30.1.006770      | PS-700A3W-ND        |
| SET-385-MED-220V       | VC1X1C45L6-385 | 30.1.006770      | PS-700A3W-ND        |
| SET-385-HI-110V        | VC2X2C45L9-385 | 30.1.006846      | PS-1400A16W-ND      |
| SET-385-HI-220V        | VC2X2C45L9-385 | 30.1.006846      | request             |
| <b>395 nm LED</b>      |                |                  |                     |
| SET-395-MED-110V       | VC1X1C45L6-395 | 30.1.006770      | PS-700A3W-ND        |
| SET-395-MED-220V       | VC1X1C45L6-395 | 30.1.006770      | PS-700A3W-ND        |
| SET-395-HI-110V        | VC2X2C45L9-395 | 30.1.006846      | PS-1400A16W-ND      |
| SET-395-HI-220V        | VC2X2C45L9-395 | 30.1.006846      | request             |
| <b>405 nm LED</b>      |                |                  |                     |
| SET-405-MED-110V       | VC1X1C45L6-405 | 30.1.006770      | PS-700A3W-ND        |
| SET-405-MED-220V       | VC1X1C45L6-405 | 30.1.006770      | PS-700A3W-ND        |
| SET-405-HI-110V        | VC2X2C45L9-405 | 30.1.006846      | PS-1400A16W-ND      |
| SET-405-HI-220V        | VC2X2C45L9-405 | 30.1.006846      | request             |