310nm UVC LED

- SMD
  - low, medium & high power
- Chip on Board (COB)
- Light Bars (12x1)

Boston Electronics

www.boselec.com
uv@boselec.com
shop.boselec.com
617.566.3821
310 UVC LED

Contents

SMD
- low power - 37 mW, 130 deg.
- medium power - 62 mW, 30 deg.
- high power - 240 mW, 60 deg.

COB
- medium power
- high power
- 12 x 1 light bar
- low power also available

Driver Board
- UPS Driver
**WS3535C48LF-310 Low Power UVB LED SMD**

**WS3535C48LF-310** is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of $308\pm5$nm. The WS3535C48LF series is packaged in a single-chip structure equipped with a flat window lens for low power UV output. With its conventional pad structure and compact size, the WS3535C48LF series is suitable for applications requiring low UV output and energy consumption.

**FEATURES & BENEFITS**

- Optical output up to 42mW
- Dimensions: 3.5x3.5mm
- Equipped with 130° flat lens
- Ideal for low power applications
**Electro-Optical Characteristics at T=25°C and I_F =350mA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>(\lambda_y)</td>
<td>nm</td>
<td>303</td>
<td>308</td>
<td>313</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>(V_F)</td>
<td>V</td>
<td>-</td>
<td>5.7</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Flux</td>
<td>(P_o)</td>
<td>mW</td>
<td>32</td>
<td>37</td>
<td>42</td>
</tr>
<tr>
<td>Full Width of Half Magnitude</td>
<td>(\Delta\lambda)</td>
<td>nm</td>
<td>-</td>
<td>13.6</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Angle</td>
<td>(2\Phi_{1/2})</td>
<td>Degree</td>
<td>-</td>
<td>130</td>
<td>-</td>
</tr>
<tr>
<td>Thermal Resistance, Junction to Solder Joint</td>
<td>(R_{th}(J-S))</td>
<td>°C/W</td>
<td>-</td>
<td>9</td>
<td>-</td>
</tr>
</tbody>
</table>

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>(I_F)</td>
<td>mA</td>
<td>700</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>(V_R)</td>
<td>V</td>
<td>5</td>
</tr>
<tr>
<td>Power</td>
<td>(P_o)</td>
<td>W</td>
<td>4.5</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>(T_j)</td>
<td>°C</td>
<td>90</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>(T_{OPR})</td>
<td>°C</td>
<td>-30 ~ 85</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>(T_{STG})</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>
Mechanical Dimensions

Top View

Side View

Bottom View

Radiation Pattern
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.

Soldering Guidelines
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.
VS5252C48L3-310 Mid Power UVB LED SMD

VS5252C48L3-310 is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of 308±5nm. 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° lens for mid power UV output.

FEATURES & BENEFITS

• Optical output up to 78mW
• Dimensions: 5.2x5.2mm
• Equipped with 30° fused silica lens
• Ideal for mid power applications

THE VIOLUMAS DIFFERENCE

• 3-PAD flip chip structure
• Lowest thermal resistance at 0.9°C/W
• Minimal thermal decay with higher output
• Industry-leading reliability & lifetime
### Electro-Optical Characteristics at T=25°C and IF = 700mA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>$\lambda_p$</td>
<td>nm</td>
<td>303</td>
<td>308</td>
<td>313</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>$V_F$</td>
<td>V</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Flux</td>
<td>$P_O$</td>
<td>mW</td>
<td>46</td>
<td>62</td>
<td>78</td>
</tr>
<tr>
<td>Full Width of Half Magnitude</td>
<td>$\Delta \lambda$</td>
<td>nm</td>
<td>-</td>
<td>12.5</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Angle</td>
<td>$2\Phi_{1/2}$</td>
<td>Degree</td>
<td>-</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>Thermal Resistance, Junction to Solder Joint</td>
<td>$R_{th}(J-S)$</td>
<td>°C/W</td>
<td>-</td>
<td>0.9</td>
<td>-</td>
</tr>
</tbody>
</table>

### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>$I_F$</td>
<td>mA</td>
<td>1000</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>V</td>
<td>5</td>
</tr>
<tr>
<td>Power</td>
<td>$P_O$</td>
<td>W</td>
<td>6.5</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>$T_J$</td>
<td>°C</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{OPR}$</td>
<td>°C</td>
<td>-30 ~ 80</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{STG}$</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>

### Reliability

<table>
<thead>
<tr>
<th>Test</th>
<th>Condition</th>
<th>Test Duration</th>
<th>Test Failed/Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-45°C ~ 125°C</td>
<td>2000 Cycles</td>
<td>0/10</td>
</tr>
</tbody>
</table>
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.

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.
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.
VS7272C48L6-310 is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of 308±5nm. 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° lens for high power UV output.

FEATURES & BENEFITS

- Optical output up to 300mW
- Dimensions: 7.2x7.2mm
- Equipped with 60° fused silica lens
- Ideal for high power applications

THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at 0.32°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime
### Electro-Optical Characteristics at T=25°C and \( I_F = 1400 \text{mA} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>( \lambda_p )</td>
<td>nm</td>
<td>303</td>
<td>308</td>
<td>313</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>( V_F )</td>
<td>V</td>
<td>-</td>
<td>12.0</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Flux</td>
<td>( P_o )</td>
<td>mW</td>
<td>175</td>
<td>240</td>
<td>300</td>
</tr>
<tr>
<td>Full Width of Half Magnitude</td>
<td>( \Delta \lambda )</td>
<td>nm</td>
<td>-</td>
<td>12.5</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Angle</td>
<td>( 2\Phi_{1/2} )</td>
<td>Degree</td>
<td>-</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>Thermal Resistance, Junction to Solder Joint</td>
<td>( R_{th}(J-S) )</td>
<td>°C/W</td>
<td>-</td>
<td>0.32</td>
<td>-</td>
</tr>
</tbody>
</table>

### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>( I_F )</td>
<td>mA</td>
<td>2000</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>( V_R )</td>
<td>V</td>
<td>10</td>
</tr>
<tr>
<td>Power</td>
<td>( P_o )</td>
<td>W</td>
<td>26</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_j )</td>
<td>°C</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>( T_{OPR} )</td>
<td>°C</td>
<td>-30 ~ 80</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{STG} )</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>

### Reliability

<table>
<thead>
<tr>
<th>Test</th>
<th>Condition</th>
<th>Test Duration</th>
<th>Test Failed/Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-45°C ~ 125°C</td>
<td>2000 Cycles</td>
<td>0/10</td>
</tr>
</tbody>
</table>
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.
VC1X1C48L3-310 Mid Power UVB LED COB

VC1X1C48L3-310 is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of 308±5nm. 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° lens for mid power UV output.

FEATURES & BENEFITS

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

THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at 0.9°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime
**Electro-Optical Characteristics at T=25°C and I_F = 700mA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>(\lambda_p)</td>
<td>nm</td>
<td>303</td>
<td>308</td>
<td>313</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>(V_F)</td>
<td>V</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Flux</td>
<td>(P_o)</td>
<td>mW</td>
<td>46</td>
<td>62</td>
<td>78</td>
</tr>
<tr>
<td>Full Width of Half Magnitude</td>
<td>(\Delta \lambda)</td>
<td>nm</td>
<td>-</td>
<td>12.5</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Angle</td>
<td>(2\Phi_{1/2})</td>
<td>Degree</td>
<td>-</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>Thermal Resistance, Junction to Solder Joint</td>
<td>(R_{th}(J-S))</td>
<td>°C/W</td>
<td>-</td>
<td>0.9</td>
<td>-</td>
</tr>
</tbody>
</table>

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>(I_F)</td>
<td>mA</td>
<td>1000</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>(V_R)</td>
<td>V</td>
<td>5</td>
</tr>
<tr>
<td>Power</td>
<td>(P_o)</td>
<td>W</td>
<td>6.5</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>(T_j)</td>
<td>°C</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>(T_{OPR})</td>
<td>°C</td>
<td>-30 ~ 80</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>(T_{STG})</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>

**Reliability**

<table>
<thead>
<tr>
<th>Test</th>
<th>Condition</th>
<th>Test Duration</th>
<th>Test Failed/Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-45°C ~ 125°C</td>
<td>2000 Cycles</td>
<td>0/10</td>
</tr>
</tbody>
</table>
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.
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.

www.boselec.com  |  uv@boselec.com  |  shop.boselec.com  |  617.566.3821
VC2X2C48L6-310 High Power UVC LED COB

VC2X2C48L6-310 is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of 308±5nm. 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° lens for high power UV output.

FEATURES & BENEFITS

• Dimensions: 20x20x6.1mm
• 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 0.32°C/W
• Minimal thermal decay with higher output
• Industry-leading reliability & lifetime
Electro-Optical Characteristics at $T = 25^\circ C$ and $I_F = 1400\,\text{mA}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength</td>
<td>$\lambda_p$</td>
<td>nm</td>
<td>303</td>
<td>308</td>
<td>313</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>$V_F$</td>
<td>V</td>
<td>-</td>
<td>12.0</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Flux</td>
<td>$P_O$</td>
<td>mW</td>
<td>175</td>
<td>240</td>
<td>300</td>
</tr>
<tr>
<td>Full Width of Half Magnitude</td>
<td>$\Delta \lambda$</td>
<td>nm</td>
<td>-</td>
<td>12.5</td>
<td>-</td>
</tr>
<tr>
<td>Radiant Angle</td>
<td>$2\Phi_{1/2}$</td>
<td>Degree</td>
<td>-</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>Thermal Resistance, Junction to Solder Joint</td>
<td>$R_{th}(J-S)$</td>
<td>°C/W</td>
<td>-</td>
<td>0.32</td>
<td>-</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>$I_F$</td>
<td>mA</td>
<td>2000</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>V</td>
<td>10</td>
</tr>
<tr>
<td>Power</td>
<td>$P_O$</td>
<td>W</td>
<td>26</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>$T_J$</td>
<td>°C</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{OPR}$</td>
<td>°C</td>
<td>-30 ~ 80</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{STG}$</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>

Reliability

<table>
<thead>
<tr>
<th>Test</th>
<th>Condition</th>
<th>Test Duration</th>
<th>Test Failed/Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-45°C ~ 125°C</td>
<td>2000 Cycles</td>
<td>0/10</td>
</tr>
</tbody>
</table>
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.
High Power UVB LED COB

**Spectral Output**

![Spectral Output Graph](image)

**Forward Current vs. Relative Radiant Flux**

![Forward Current vs. Relative Radiant Flux Graph](image)

**Forward Voltage vs. Forward Current**

![Forward Voltage vs. Forward Current Graph](image)

www.boselec.com  |  uv@boselec.com  |  shop.boselec.com  |  617.566.3821
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.
VC12X1C45/48  UV LED Light Bar COB

VC12X1C45/48 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 VC12X1C45/48 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°C and I_F = 700mA)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Wavelength</th>
<th>Typ. Output</th>
<th>Forward Voltage</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC12X1C45L6-405</td>
<td>405nm</td>
<td>12W</td>
<td>43.5V</td>
<td>30.5W</td>
</tr>
<tr>
<td>VC12X1C45L6-395</td>
<td>395nm</td>
<td>13W</td>
<td>43.5V</td>
<td>30.2W</td>
</tr>
<tr>
<td>VC12X1C45L6-385</td>
<td>385nm</td>
<td>12W</td>
<td>43.5V</td>
<td>30.2W</td>
</tr>
<tr>
<td>VC12X1C45L6-375</td>
<td>375nm</td>
<td>9W</td>
<td>43.5V</td>
<td>30.2W</td>
</tr>
<tr>
<td>VC12X1C45L6-365</td>
<td>365nm</td>
<td>6W</td>
<td>46.8V</td>
<td>30.8W</td>
</tr>
</tbody>
</table>

### Absolute Maximum Ratings for UVA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>I_F</td>
<td>mA</td>
<td>1000</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>V_R</td>
<td>V</td>
<td>60</td>
</tr>
<tr>
<td>Power</td>
<td>P_O</td>
<td>W</td>
<td>48</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>T_J</td>
<td>°C</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>T_OPR</td>
<td>°C</td>
<td>-30 ~ 80</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_STG</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>

### Reliability

<table>
<thead>
<tr>
<th>Test</th>
<th>Condition</th>
<th>Test Duration</th>
<th>Test Failed/Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-45°C ~ 125°C</td>
<td>2000 Cycles</td>
<td>0/10</td>
</tr>
</tbody>
</table>
**Electro-Optical Characteristics for UVC (T=25°C and I_f =1400mA)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Wavelength</th>
<th>Typ. Output</th>
<th>Forward Voltage</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC12X1C48L6-310</td>
<td>310nm</td>
<td>0.7W</td>
<td>35.4V</td>
<td>49.6W</td>
</tr>
<tr>
<td>VC12X1C48L6-275</td>
<td>275nm</td>
<td>1W</td>
<td>37.8V</td>
<td>52.9W</td>
</tr>
<tr>
<td>VC12X1C48L6-265</td>
<td>265nm</td>
<td>0.8W</td>
<td>38.4V</td>
<td>53.8W</td>
</tr>
</tbody>
</table>

**Absolute Maximum Ratings for UVC**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current</td>
<td>I_f</td>
<td>mA</td>
<td>2000</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>V_r</td>
<td>V</td>
<td>30</td>
</tr>
<tr>
<td>Power</td>
<td>P_o</td>
<td>W</td>
<td>84</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>T_J</td>
<td>°C</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>T_OPR</td>
<td>°C</td>
<td>-30 ~ 80</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_STG</td>
<td>°C</td>
<td>-40 ~ 100</td>
</tr>
</tbody>
</table>

**Reliability**

<table>
<thead>
<tr>
<th>Test</th>
<th>Condition</th>
<th>Test Duration</th>
<th>Test Failed/Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Shock</td>
<td>-45°C ~ 125°C</td>
<td>2000 Cycles</td>
<td>0/10</td>
</tr>
</tbody>
</table>
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.

2P vs 3P Light Bar Intensity Comparison

When driving at higher currents for extended periods of time, Violumas 3-PAD LEDs exhibit less thermal decay, allowing for more UV intensity than conventional LEDs at the same driving current.

The specialized chip architecture works with the Pillar MCPCB to redirect the heat away from the module, minimizing the need for large heat sinks.
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.
Features

- Easy to use
- Low cost
- Simple, flexible control using dedicated software
- Adjustable voltage to the light source
- CW or pulsed operation—MHz to DC
- Nanosecond to seconds repetition rate
- Current and voltage monitor
- powered from USB (<0.5A) or DC supply

The Boston Electronics Universal Photon Source (UPS) Driver delivers! It is a flexible, compact, low cost, configurable board, including power supply, that drives a wide range of light sources. The driver can control pulsed and CW sources, which makes it suitable for driving ultraviolet (UV), visible and infrared (IR) sources, light emitting diodes (LEDs) and lasers over a frequency range of MHz to DC.

Control is provided by easy to use PC software. The last used drive parameters are stored in the non-volatile EEPROM memory; thus, the configuration is remembered. The UPS Driver is equipped with voltage and current monitors, trigger output, power and communication inputs and anode/cathode connections for the sources.

The UPS Driver is compatible with UV, visible and IR sources, LEDs and lasers.
UPS Driver Specifications

Electrical parameters:

- Power supply: - USB from computer or +5 ... +6 V, connected to the DC Jack connector
- Average power delivered to connected source
  - max. 1.5W, for the power supply from USB
  - max. 10W, for the power supply connected to the DC Jack connector
- Adjustable output voltage supply, in the range 0.5 – 25V, 4095 steps
- Maximum current: 10 A (tested with QCL at 20 V and 100 ns pulse width)
- Monitor for the supply voltage source (ADC)
- Master clock period / frequency:
  - main clock period / frequency
    - output signal max. period / min. frequency
    - 25 ns / 20 MHz: 1.638 ms / 610 Hz
    - 50 ns / 10 MHz: 3.27 ms / 305 Hz
    - 100 ns / 5 MHz: 6.55 ms / 152 Hz
    - 200 ns / 2.5 MHz: 13.1 ms / 76.3 Hz
    - 1600 ns / 0.312 MHz: 104 ms / 9.54 Hz
    - 6.4 μs / 78 kHz: 420 ms / 2.38 Hz
    - 25.6 μs / 19.5 kHz: 1.677 s / 0.594 Hz
- Pulse repetition period - adjustable in the range 1 ... 65535 times the period of the master clock
- Pulse duration - adjustable in the range 1 ... 65535 times the period of the master clock
  - if pulse duration is higher than the period, source stays on – CW operation
- Driving signal rise / fall times < 3 ns.
- Pulse jitter: 6 ns pp
- Trigger output starts 50 ns before the IR pulse
  - adjustable duration time in the range 1 ... 65535 times the period of the master clock
- Power supply monitor
- Source average current monitor - time constant 100 ms
- All parameters have their equivalent – minimum/maximum to provide for safe operation
- Anode of the source is connected to ground, cathode below ground potential

Software

- The UPS Driver is configured using PC software, or text protocols.

Connections:

- trigger output—SMA connector
  - output impedance 50 Ω
  - standard LVTL: logic 0 - 0 V, logic 1 – 3.3 V @ Hi-imp, 1.65 V @ 50 Ω
- output current monitor—SMA connector
  - DC offset ~ 100 mV @ 50 Ω
  - current sensitivity 0.1 V/A @ 50 Ω / can be modified
  - 100 MHz BW
- output voltage monitor—SMA connector
  - DC offset ~ 100 mV @ 50 Ω
  - voltage sensitivity 50mV/V @ 50 Ω / can be modified
  - 100 MHz bandwidth
- micro-USB connector
  - communication with PC, virtual COM port
  - power supply, if current consumption of the driver does not exceed 0.5 A (USB 2.0 standard)
- DC power jack 2.5/5.5
  - power supply, if driver requires more than 0.5A (USB 2.0 standard), or if the PC is not used (configuration is restored from the memory)

Size:

- PCB dimensions 60x50x15mm (width×height×depth), including connectors