violumas
High Power UV LED Solutions

365nm UVC LED

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

www.boselec.com
uv@boselec.com
shop.boselec.com
617.566.3821

365nm UVA LED

Contents

SMD

- medium power - 775 mW, 60 deg.
- high power - 2850 mW, 90 deg.

COB

- medium power
- high power
- 12 x 1 light bar

Driver Board

- UPS Driver

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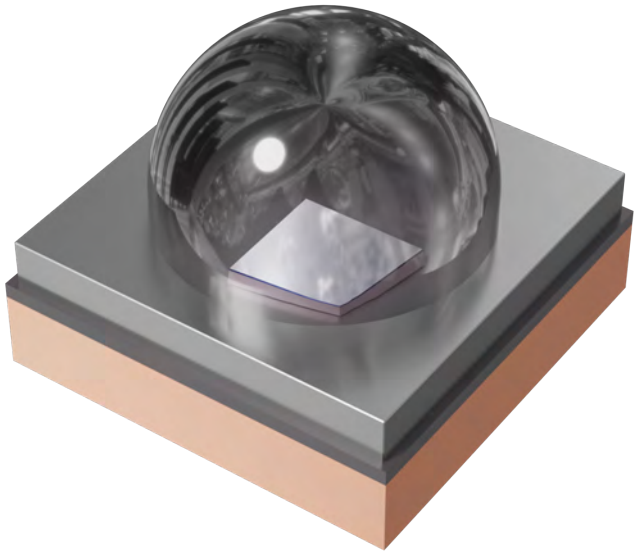
Data Sheet
Preliminary Document

VS5252C45L6-365 Mid Power UVA LED SMD

VS5252C45L6-365 is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of 365±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 VS5252C45L6 series is packaged in a single-chip structure equipped with a 60° lens for mid power UV output.



FEATURES & BENEFITS

- Optical output up to 800mW
- Dimensions: 5.2x5.2mm
- Equipped with 60° 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 I_F=700mA

Parameter	Symbol	Unit	Min	Typical	Max
Peak Wavelength	λ_P	nm	360	365	370
Forward Voltage	V_F	V	-	4.1	-
Radiant Flux	P_O	mW	750	775	800
Full Width of Half Magnitude	$\Delta\lambda$	nm	-	12	-
Radiant Angle	$2\Phi_{1/2}$	Degree	-	60	-
Thermal Resistance, Junction to Solder Joint	R_{th}(J-S)	°C/W	-	0.9	-

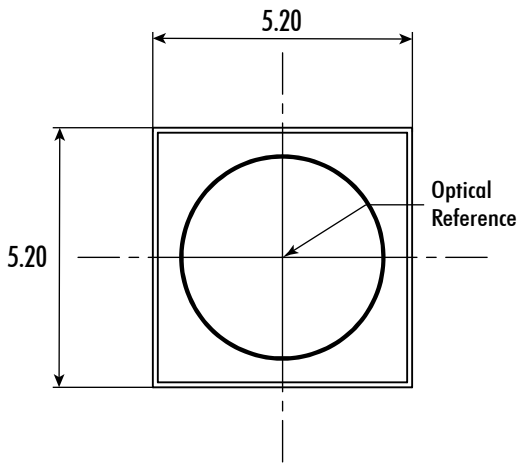
Absolute Maximum Ratings

Parameter	Symbol	Unit	Value
Forward Current	I_F	mA	1000
Reverse Voltage	V_R	V	5
Power	P_O	W	4.2
Junction Temperature	T_J	°C	115
Operating Temperature	T_{OPR}	°C	-30 ~ 80
Storage Temperature	T_{STG}	°C	-40 ~ 100

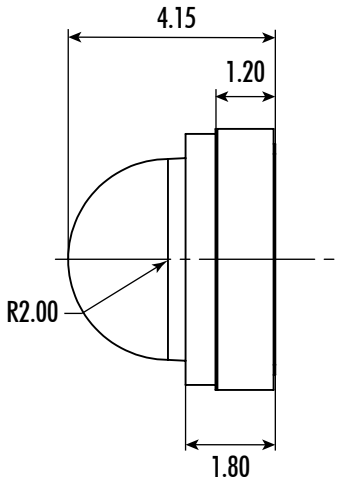
Reliability

Test	Condition	Test Duration	Test Failed/Tested
Operating Temperature	-45°C ~ 125°C	200 Cycles	0/10
Storage Temperature	I_F=350mA, T=25°C	1000 Hours	0/10

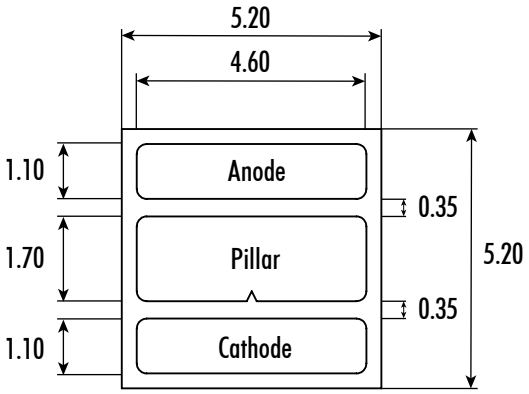
Mechanical Dimensions



Top View

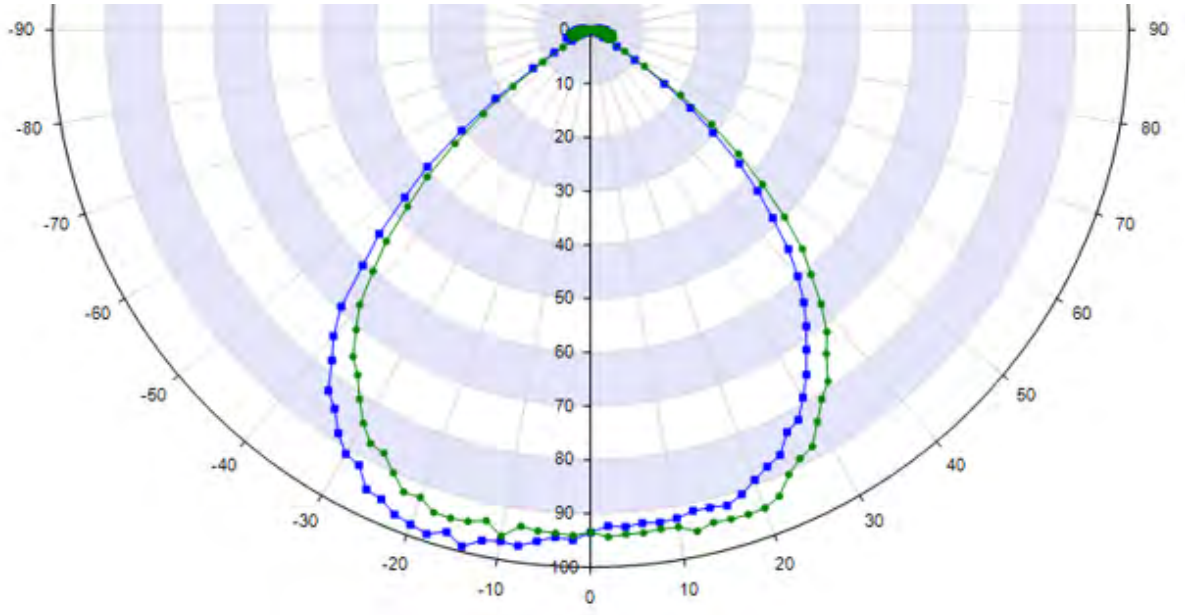


Side View

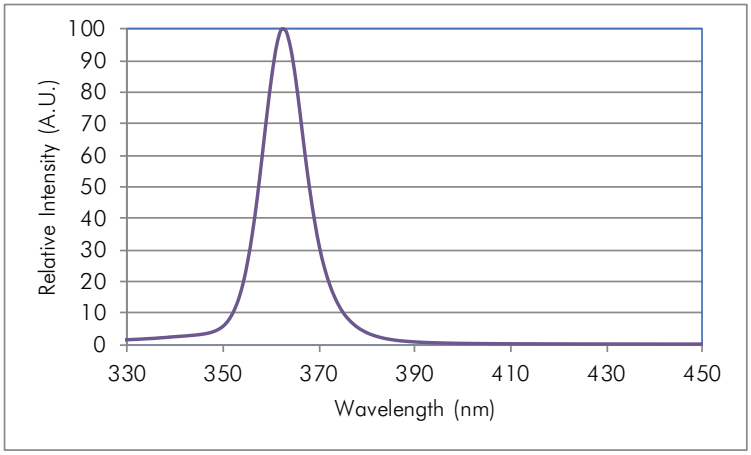


Bottom View

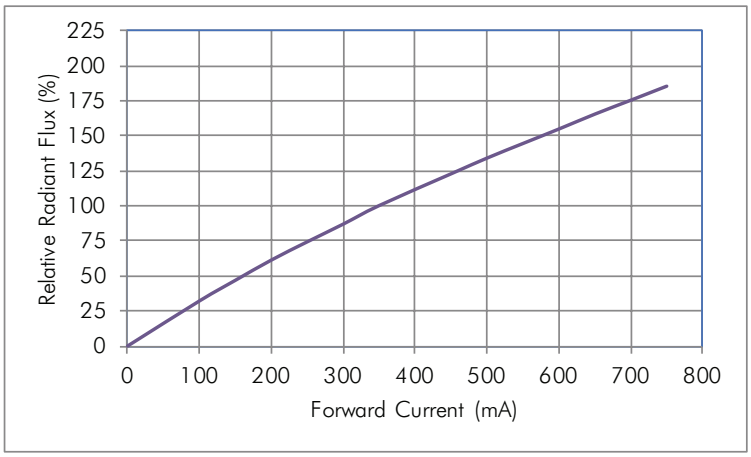
Radiation Pattern



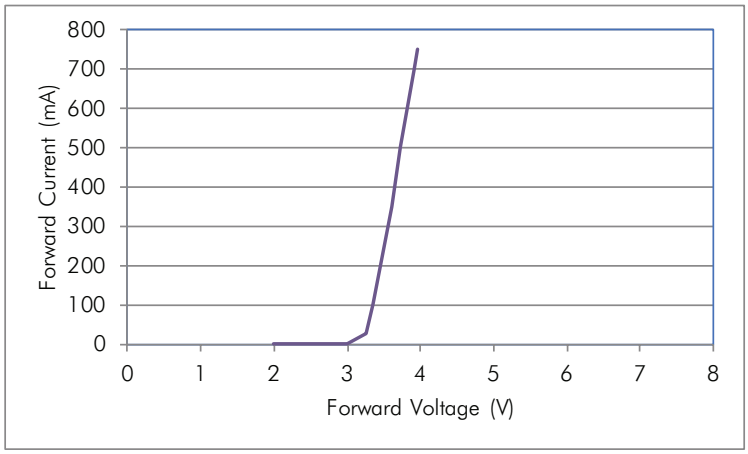
Spectral Output



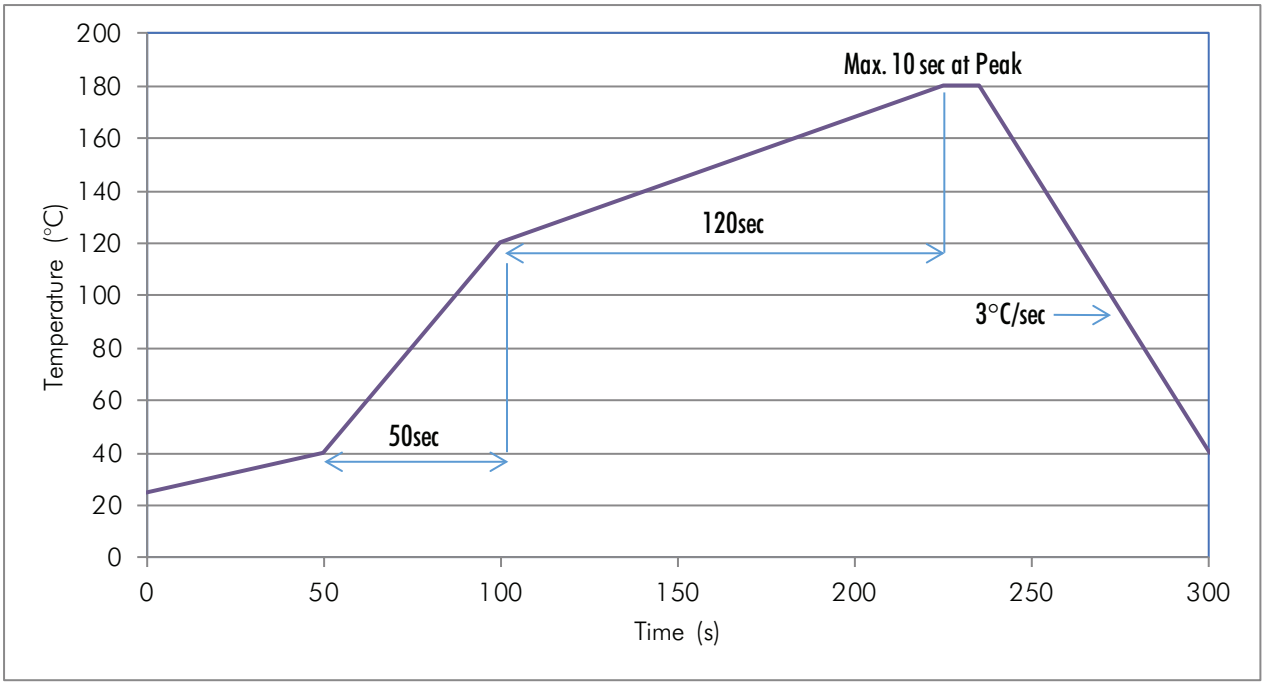
Forward Current vs. Relative Radiant Flux



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.

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

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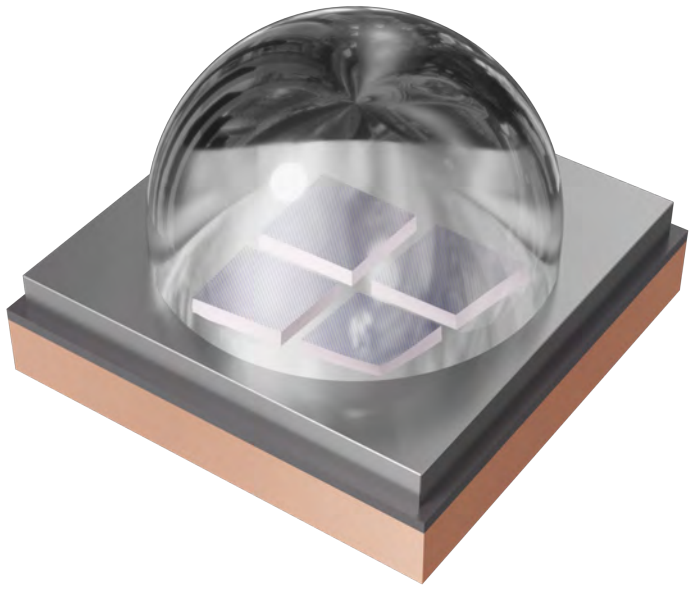
Data Sheet
Preliminary Document

VS7272C45L9-365 High Power UVA LED SMD

VS7272C45L9-365 is a UV LED Surface Mount Device (SMD) offering UV radiation at a peak wavelength of 365±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 VS7272C45L9 series is packaged in a single-chip structure equipped with a 90° lens for high power UV output.



FEATURES & BENEFITS

- Optical output up to 3100mW
- Dimensions: 7.2x7.2mm
- Equipped with 90° fused silica lens
- Ideal for high power applications

THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at 0.2°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I_F =1400mA

Parameter	Symbol	Unit	Min	Typical	Max
Peak Wavelength	λ_P	nm	360	365	370
Forward Voltage	V_F	V	-	8.2	-
Radiant Flux	P_O	mW	2600	2850	3100
Full Width of Half Magnitude	$\Delta\lambda$	nm	-	12	-
Radiant Angle	$2\Phi_{1/2}$	Degree	-	90	-
Thermal Resistance, Junction to Solder Joint	R_{th}(J-S)	°C/W	-	0.2	-

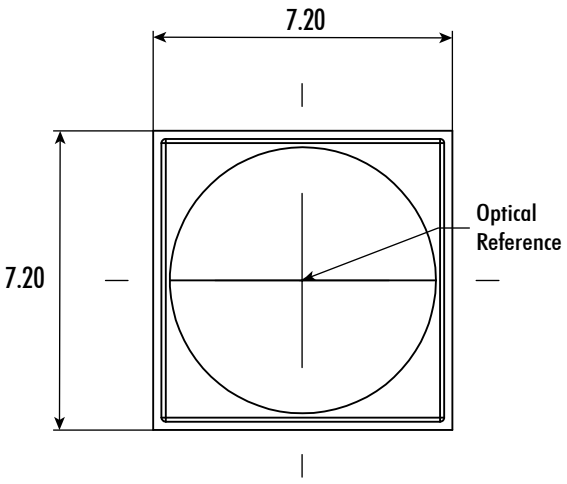
Absolute Maximum Ratings

Parameter	Symbol	Unit	Value
Forward Current	I_F	mA	2000
Reverse Voltage	V_R	V	10
Power	P_O	W	16.8
Junction Temperature	T_J	°C	115
Operating Temperature	T_{OPR}	°C	-30 ~ 80
Storage Temperature	T_{STG}	°C	-40 ~ 100

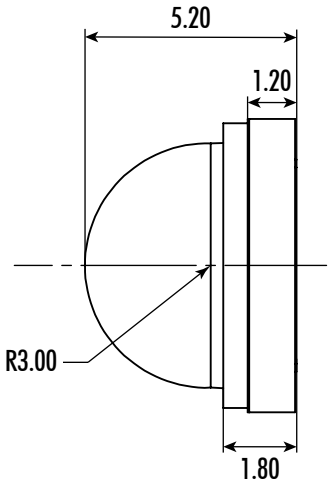
Reliability

Test	Condition	Test Duration	Test Failed/Tested
Operating Temperature	-45°C ~ 125°C	200 Cycles	0/10
Storage Temperature	I_F =350mA, T=25°C	1000 Hours	0/10

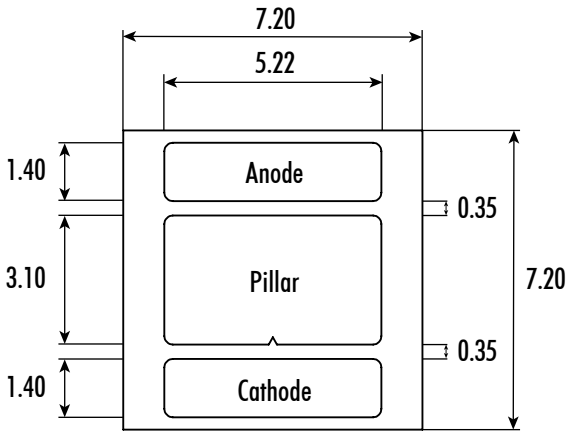
Mechanical Dimensions



Top View

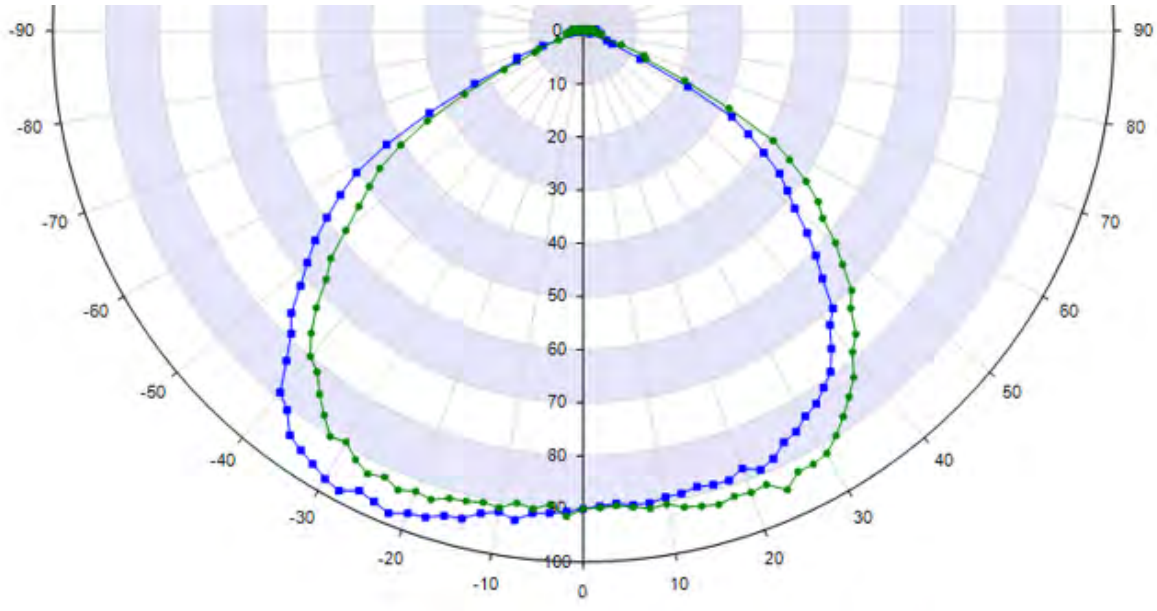


Side View

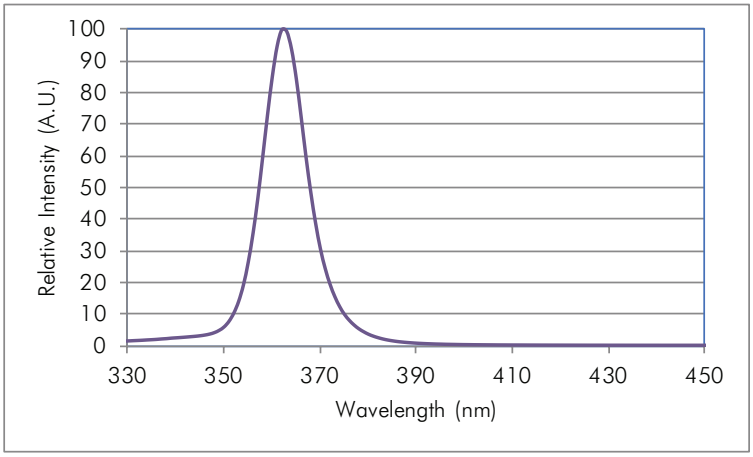


Bottom View

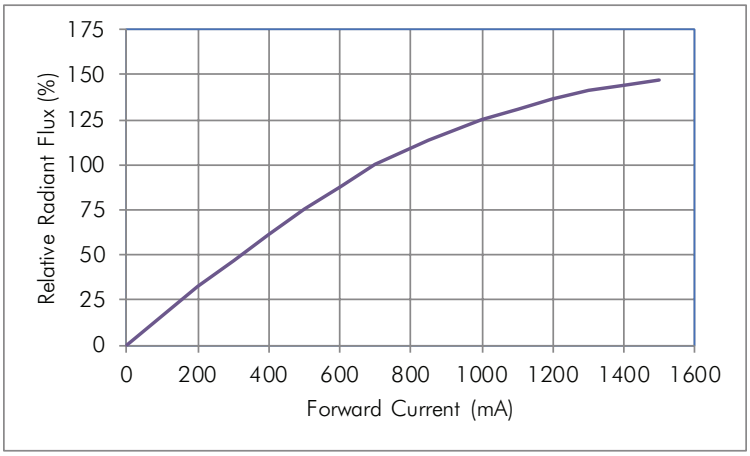
Radiation Pattern



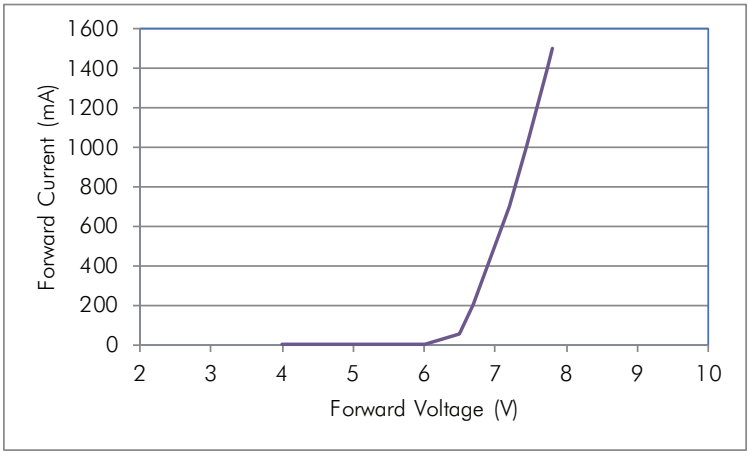
Spectral Output



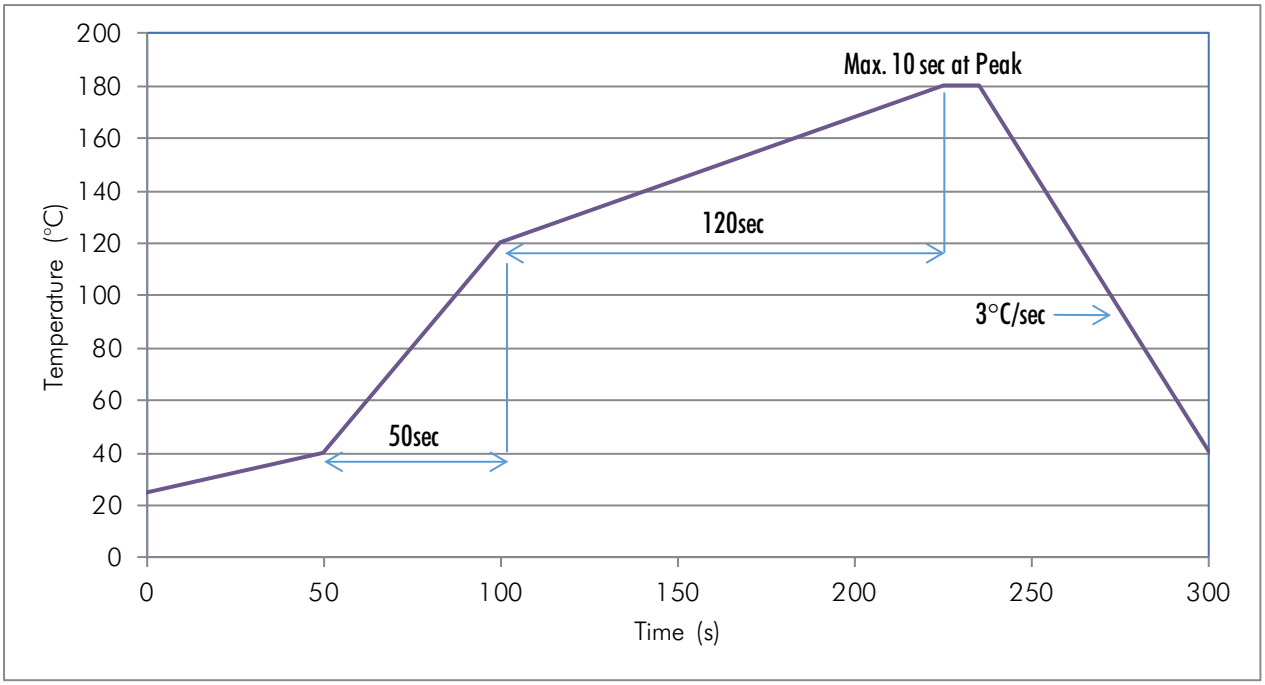
Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current



Soldering Guidelines



Recommended MCPCB

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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.

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.

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High Power UV LED Solutions

Data Sheet
Preliminary Document

VC1X1C45L6-365 Mid Power UVA LED COB

VC1X1C45L6-365 is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of 365±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 VC1X1C45L6 series is ready for plug and play with no soldering required and is equipped with a 60° lens for mid power UV output.

FEATURES & BENEFITS

- Dimensions: 15x15x3.0mm
- 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 0.9°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I_F=700mA

Parameter	Symbol	Unit	Min	Typical	Max
Peak Wavelength	λ_P	nm	360	365	370
Forward Voltage	V_F	V	-	4.1	-
Radiant Flux	P_O	mW	750	775	800
Full Width of Half Magnitude	$\Delta\lambda$	nm	-	12	-
Radiant Angle	$2\Phi_{1/2}$	Degree	-	60	-
Thermal Resistance, Junction to Solder Joint	R_{th}(J-S)	°C/W	-	0.9	-

Absolute Maximum Ratings

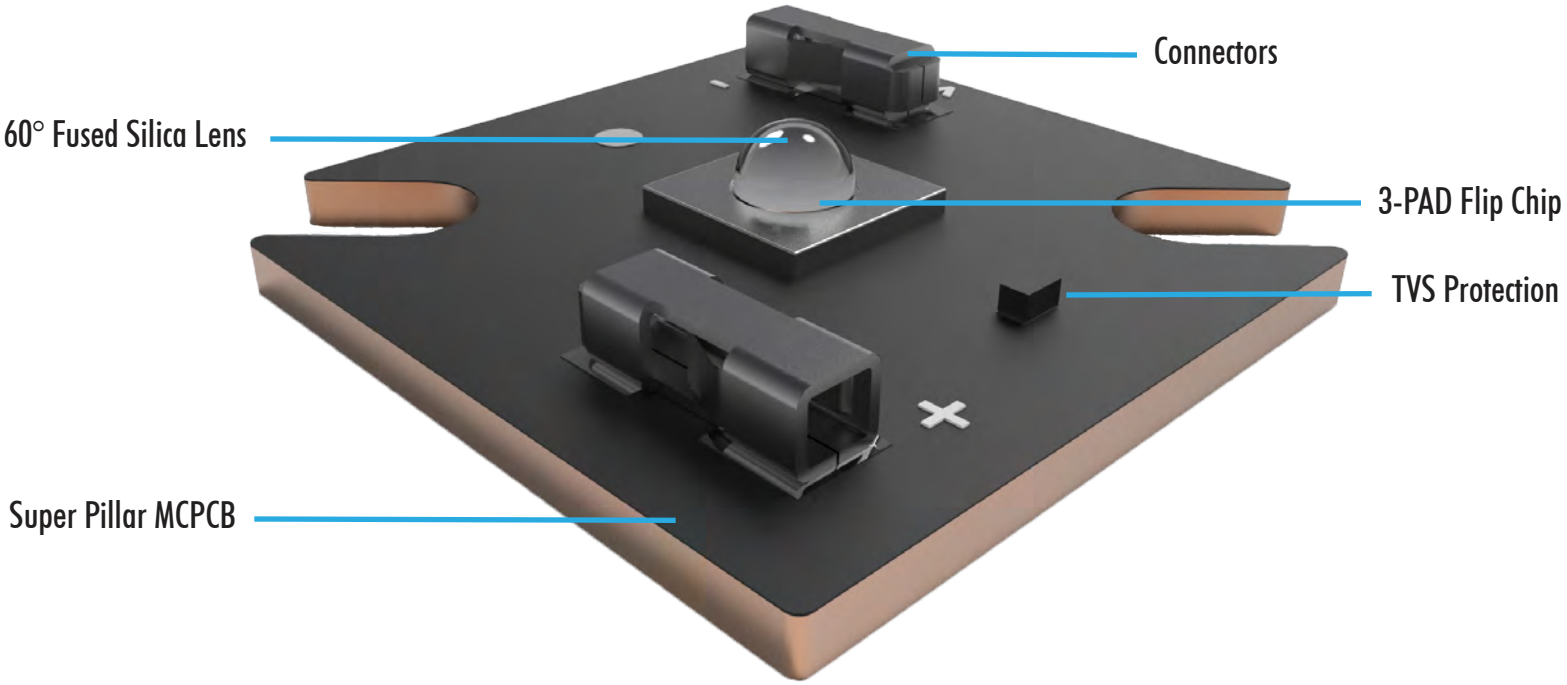
Parameter	Symbol	Unit	Value
Forward Current	I_F	mA	1000
Reverse Voltage	V_R	V	5
Power	P_O	W	4
Junction Temperature	T_J	°C	115
Operating Temperature	T_{OPR}	°C	-30 ~ 80
Storage Temperature	T_{STG}	°C	-40 ~ 100

Reliability

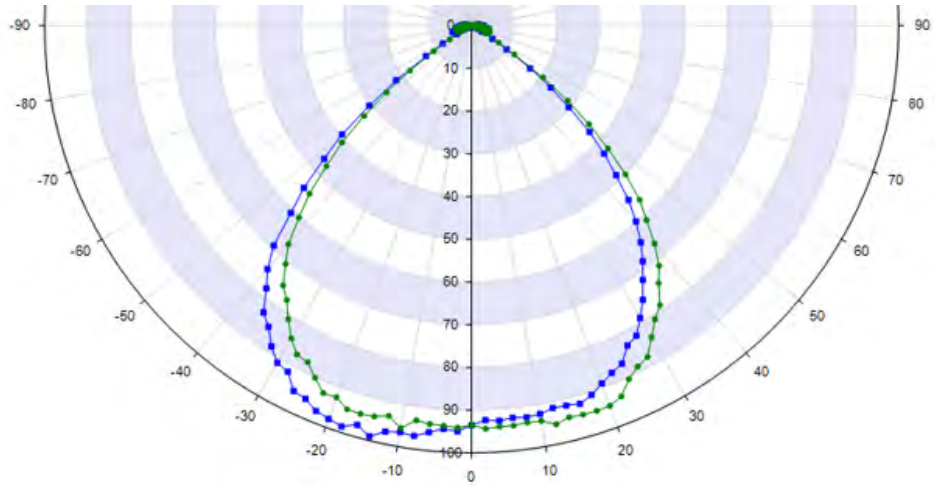
Test	Condition	Test Duration	Test Failed/Tested
Operating Temperature	-45°C ~ 125°C	200 Cycles	0/10
Storage Temperature	I_F=350mA, T=25°C	1000 Hours	0/10

Product Overview

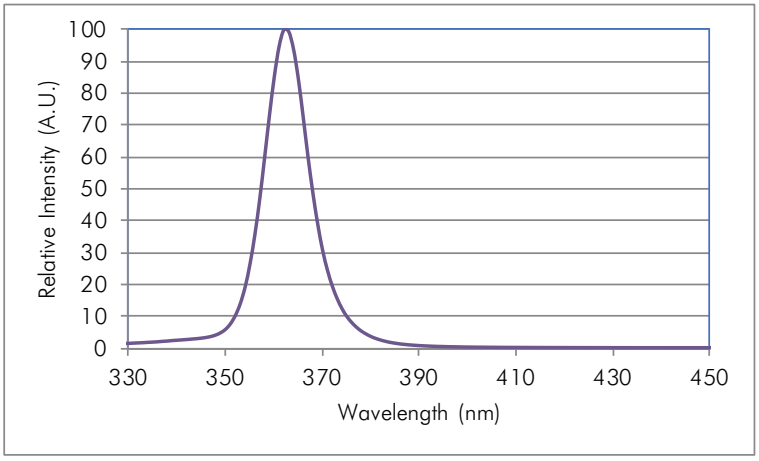
COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.



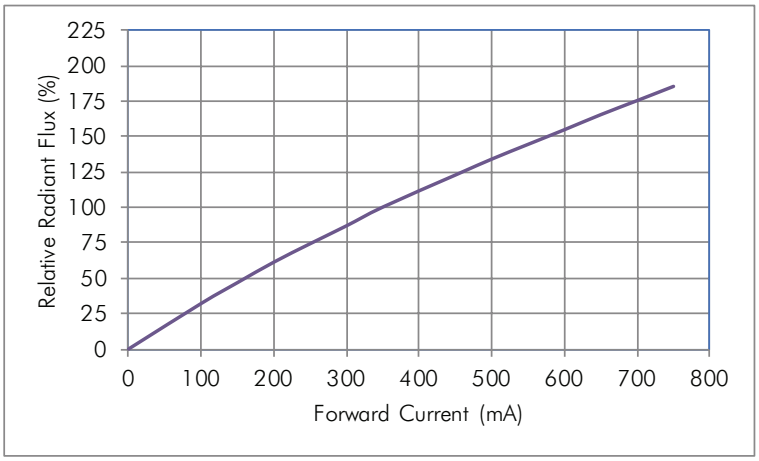
Radiation Pattern



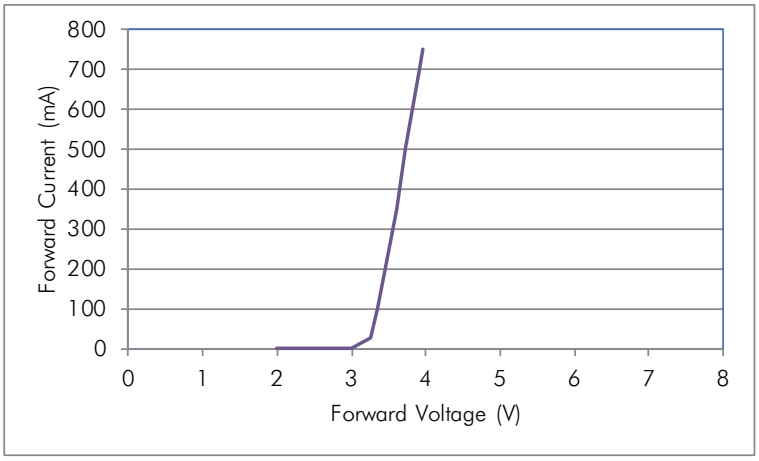
Spectral Output



Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current



Handling & Usage Precautions

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- 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.

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.
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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.

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Data Sheet
Preliminary Document

VC2X2C45L9-365 High Power UVA LED COB

VC2X2C45L9-365 is a UV LED Chip on Board (COB) module offering UV radiation at a peak wavelength of 365±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 VC2X2C45L9 series is ready for plug and play with no soldering required and is equipped with a 90° lens for high power UV output.

FEATURES & BENEFITS

- Dimensions: 20x20x4.9mm
- Ready for plug and play (solder-free)
- Equipped with 90° fused silica lens
- TVS built in for ESD protection

THE VIOLUMAS DIFFERENCE

- 3-PAD flip chip structure
- Lowest thermal resistance at 0.2°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime

Electro-Optical Characteristics at T=25°C and I_F =1400mA

Parameter	Symbol	Unit	Min	Typical	Max
Peak Wavelength	λ_P	nm	360	365	370
Forward Voltage	V_F	V	-	8.2	-
Radiant Flux	P_O	mW	2600	2850	3100
Full Width of Half Magnitude	$\Delta\lambda$	nm	-	12	-
Radiant Angle	$2\Phi_{1/2}$	Degree	-	90	-
Thermal Resistance, Junction to Solder Joint	R_{th}(J-S)	°C/W	-	0.2	-

Absolute Maximum Ratings

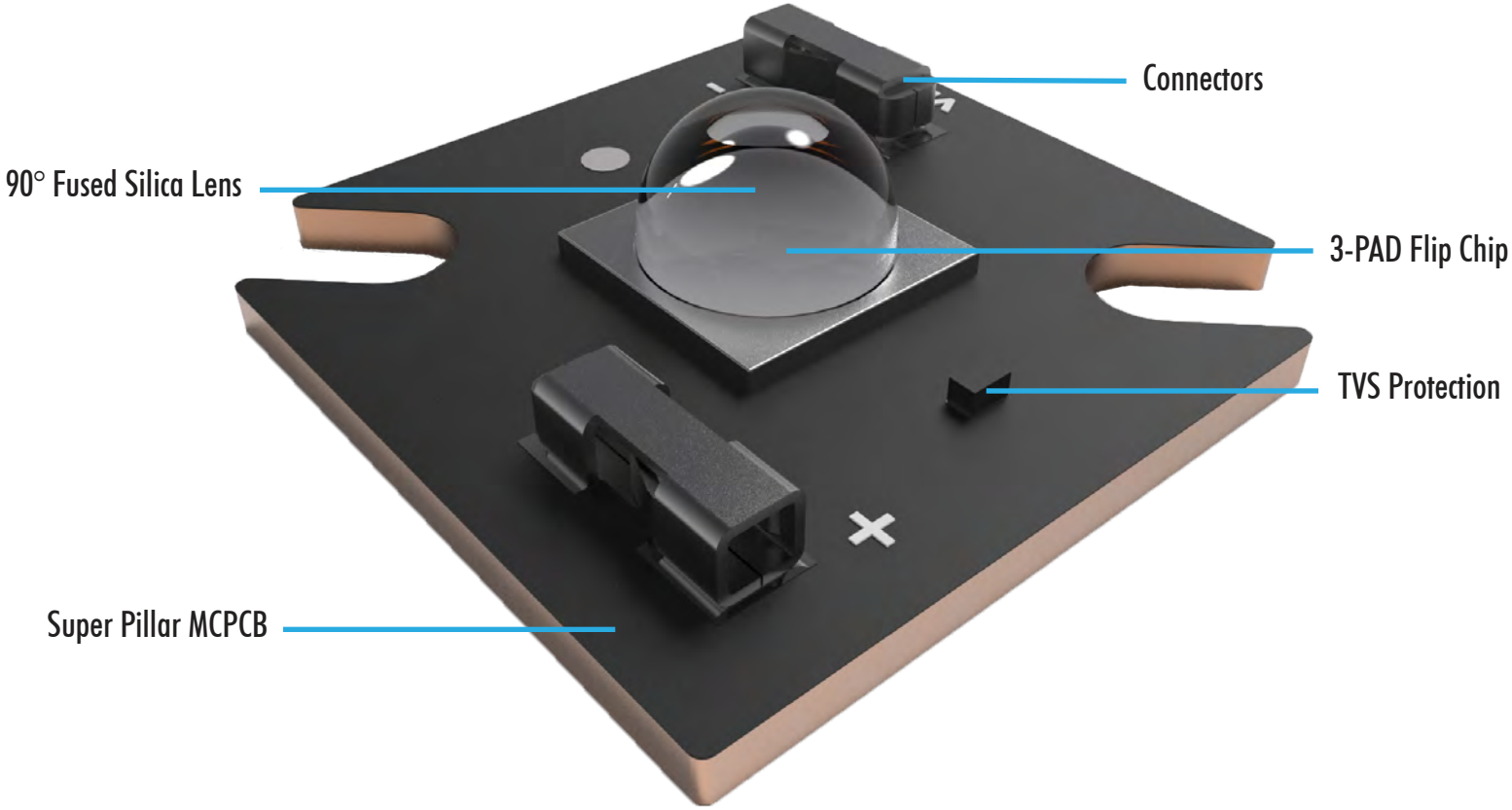
Parameter	Symbol	Unit	Value
Forward Current	I_F	mA	2000
Reverse Voltage	V_R	V	10
Power	P_O	W	16.8
Junction Temperature	T_J	°C	115
Operating Temperature	T_{OPR}	°C	-30 ~ 80
Storage Temperature	T_{STG}	°C	-40 ~ 100

Reliability

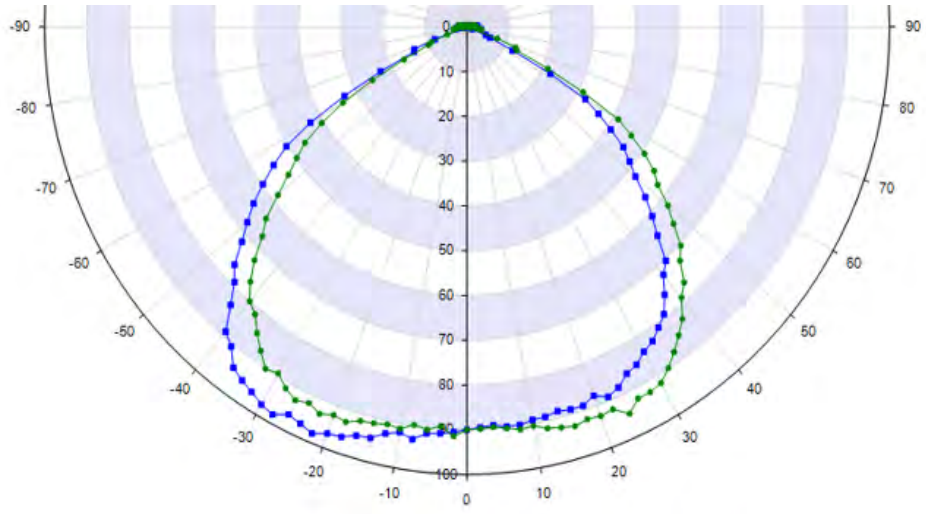
Test	Condition	Test Duration	Test Failed/Tested
Operating Temperature	-45°C ~ 125°C	200 Cycles	0/10
Storage Temperature	I_F =350mA, T=25°C	1000 Hours	0/10

Product Overview

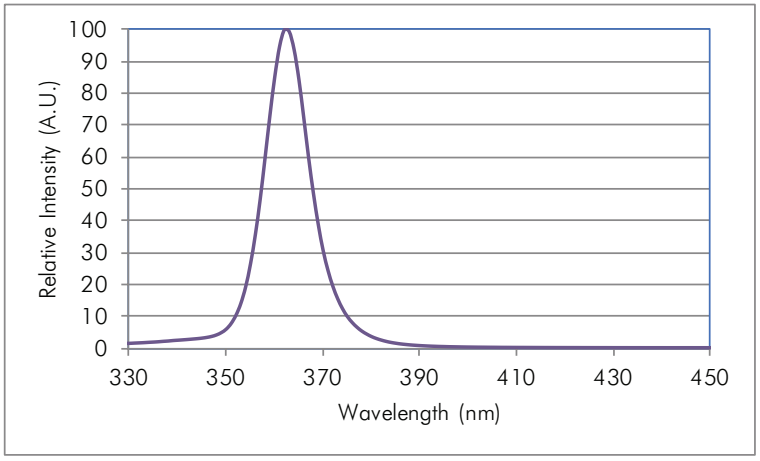
COB modules are ready for plug and play with no soldering required. All Violumas COBs are equipped with connectors for direct wiring and TVS protection against ESD and voltage issues.



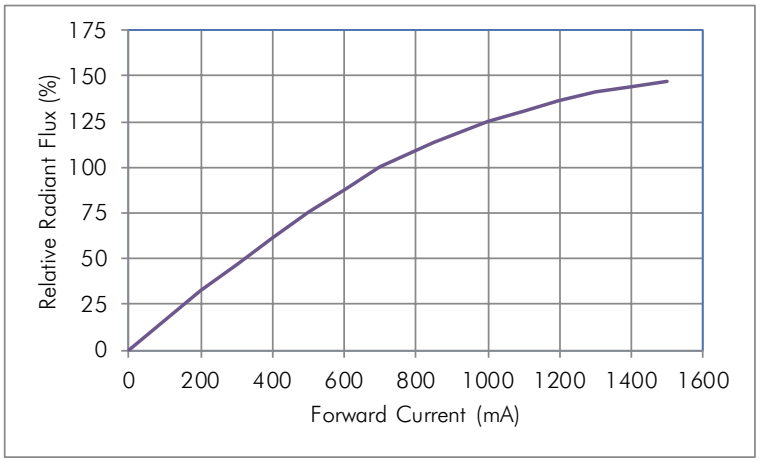
Radiation Pattern



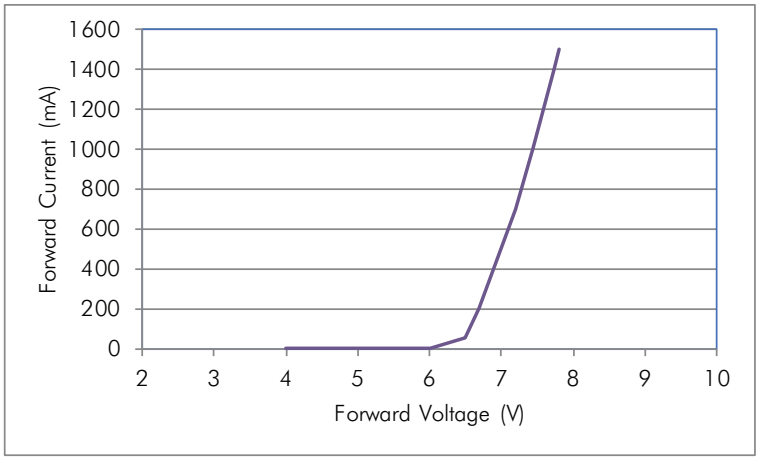
Spectral Output



Forward Current vs. Relative Radiant Flux



Forward Voltage vs. Forward Current



Handling & Usage Precautions

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- 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.

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

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violumas
High Power UV LED Solutions

Data Sheet
Preliminary Document

VC12X1C45/48 UV LED Light Bar COB

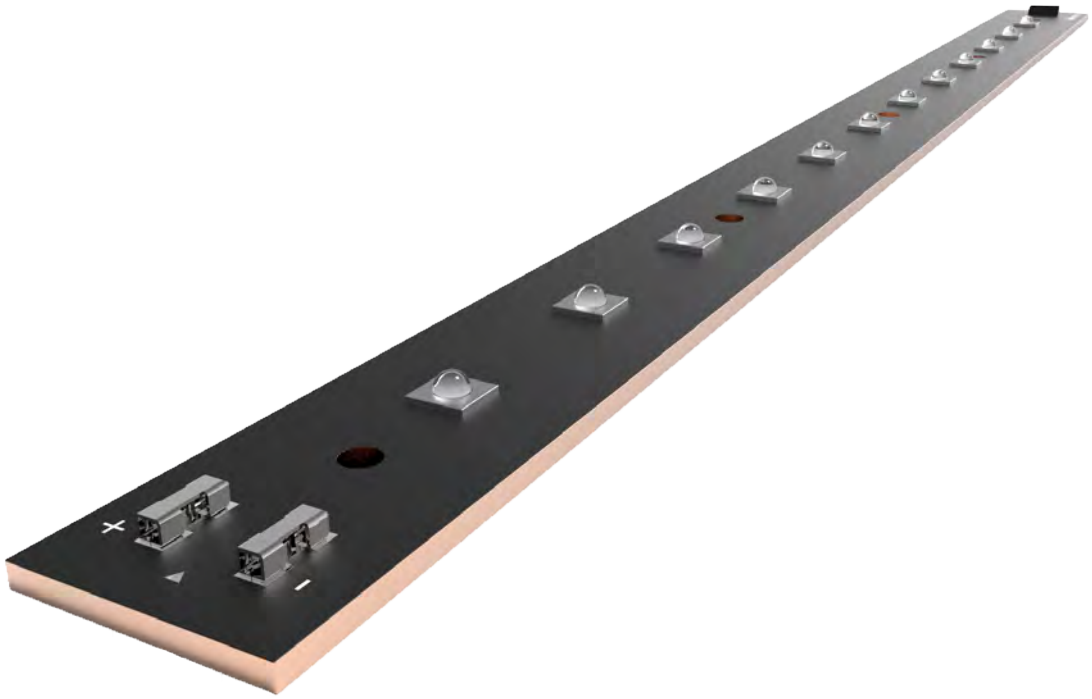
VC12X1C45/48 is UV LED Light Bar Chip on Board (COB) module with 12 chips bonded in a linear structure. Each COB is structured based on the patented 3-PAD LED Flip Chip mounted directly onto the Super Pillar MCPCB to further boost output efficiency and decrease the thermal resistance. The VC12X1C45/48 series is ready for plug and play with no soldering required and is equipped with a 60° lens.

FEATURES & BENEFITS

- Dimensions: 304mm x20mm
- 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 0.11°C/W
- Minimal thermal decay with higher output
- Industry-leading reliability & lifetime



Electro-Optical Characteristics for UVA (T=25°C and I_F =700mA)

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_O	W	48.0
Junction Temperature	T_J	°C	115
Operating Temperature	T_{OPR}	°C	-30 ~ 80
Storage Temperature	T_{STG}	°C	-40 ~ 100

Reliability

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

Electro-Optical Characteristics for UVC (T=25°C and I_F =1400mA)

Part Number	Wavelength	Typ. Output	Forward Voltage	Power Consumption
VC12X1C48L6-310	310nm	0.6W	36.0V	50.4W
VC12X1C48L6-275	275nm	0.6W	39.6V	55.4W
VC12X1C48L6-265	265nm	0.5W	38.4V	53.8W

Absolute Maximum Ratings for UVB & UVC

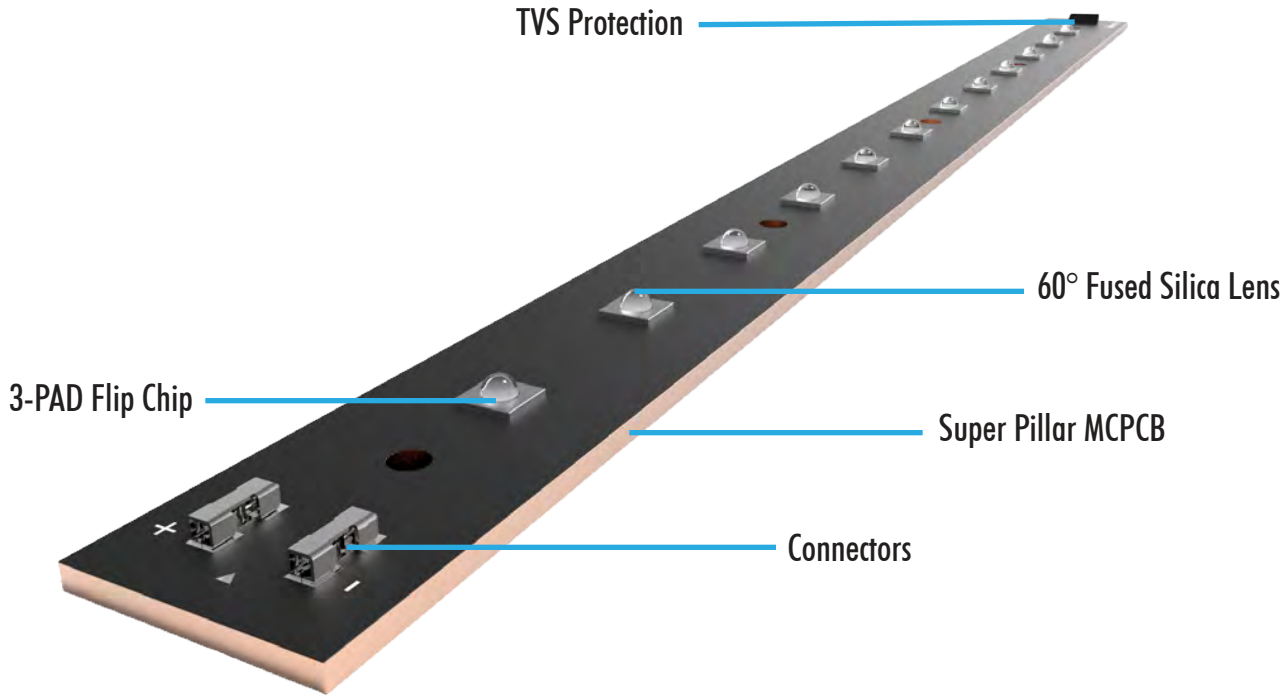
Parameter	Symbol	Unit	Value
Forward Current	I_F	mA	2000
Reverse Voltage	V_R	V	30
Power	P_O	W	84
Junction Temperature	T_J	°C	115
Operating Temperature	T_{OPR}	°C	-30 ~ 80
Storage Temperature	T_{STG}	°C	-40 ~ 100

Reliability

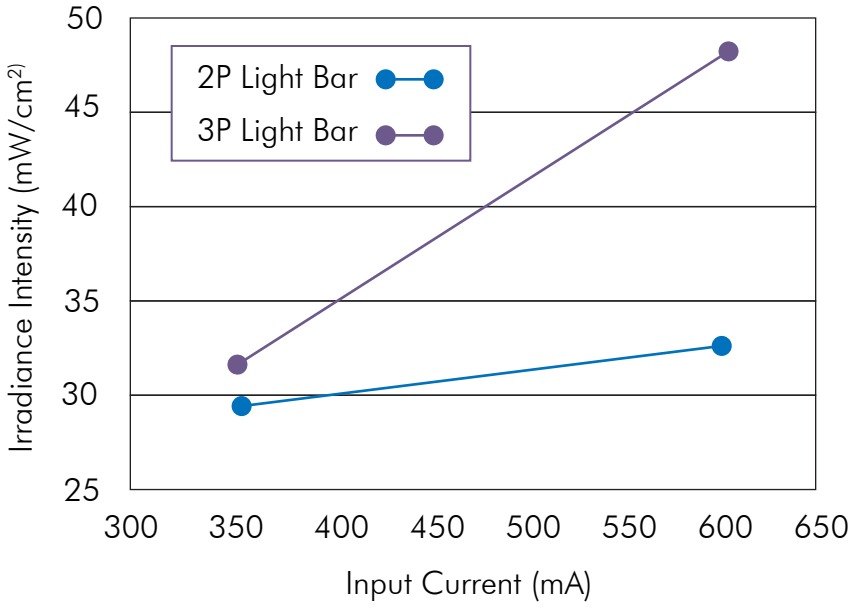
Test	Condition	Test Duration	Test Failed/Tested
Thermal Shock	-45°C ~ 125°C	2000 Cycles	0/10

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.



2P vs 3P Light Bar Intensity Comparison



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

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

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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

UPS Driver™

Universal Photon Source (UPS) Driver Board

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.

BostonElectronics

boselec@boselec.com | www.boselec.com | 617-566-3821

UPS Driver Specifications

Developed with, and manufactered by:

VIGO SYSTEM

Electrical parameters:

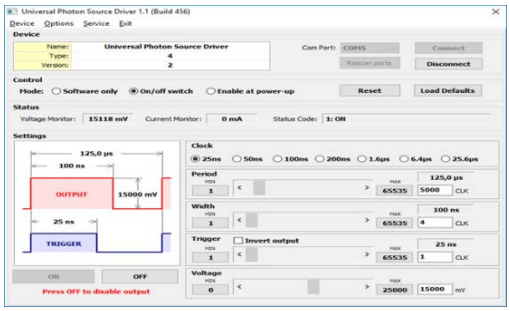
- Power supply: - USB from computer **or** +5 ... +6 V, connected to the DC Jack connector
- Average power deliveerd to connected source
  - ◊ max. 1.5W, for the power supply from USB
  - ◊ max. 10W, for the power supply connected to the DC Jack connector
- Adjustable output voltage supply, in the range 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

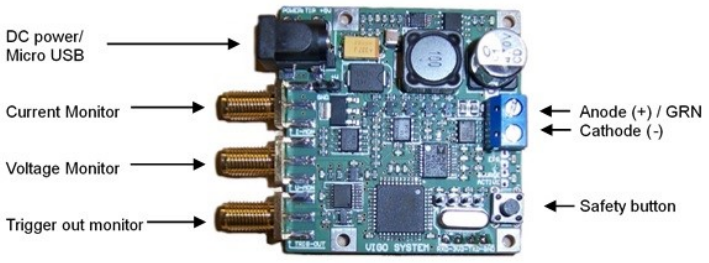
Software

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



Connections:

- trigger output—SMA connector
  - ◊ output impedance 50 Ω
  - ◊ standard LVTTL: 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

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