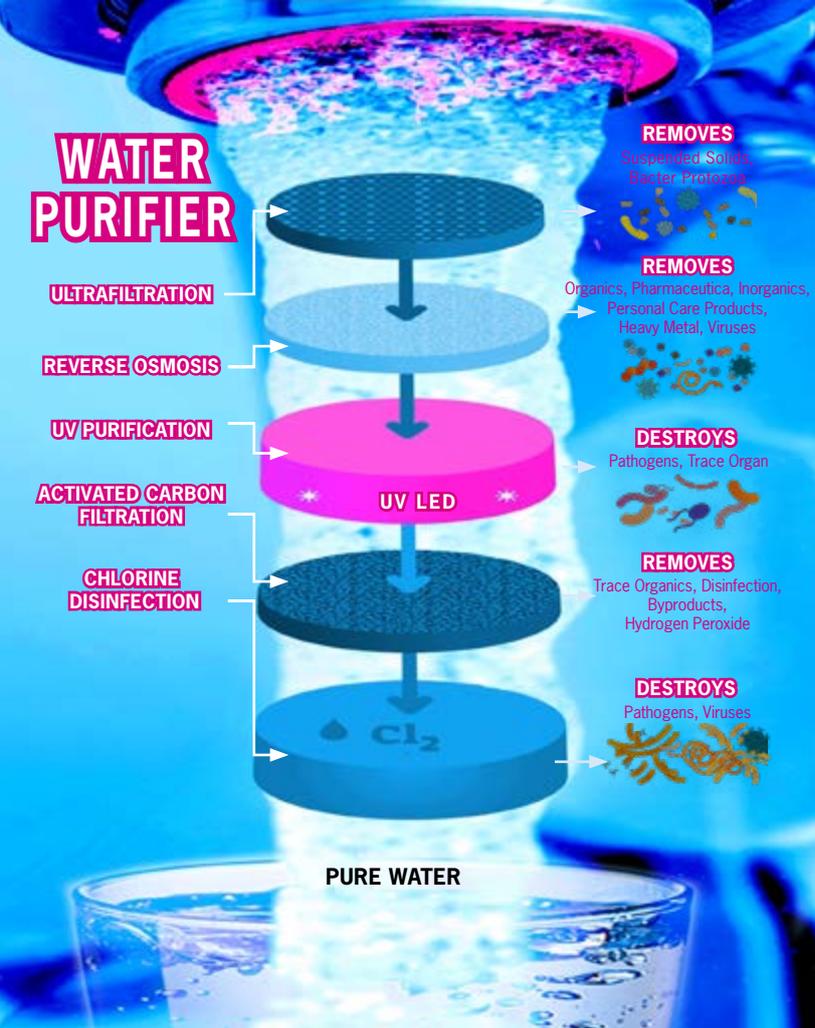


Water, Air and Surface Purification by UV LEDs

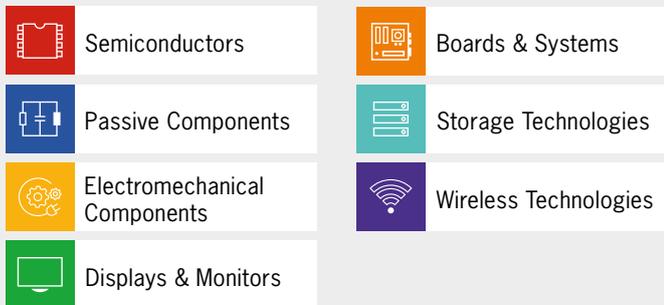




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Our Product Portfolio



Our Initiatives



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The integrated management system (IMS) encompasses quality control, information security, environmental protection, occupational health and safety.

Workflow of Sterilization and Technologies



UV-Led Design

Advantages of UV LED vs. Traditional Mercury Vapor Lamps

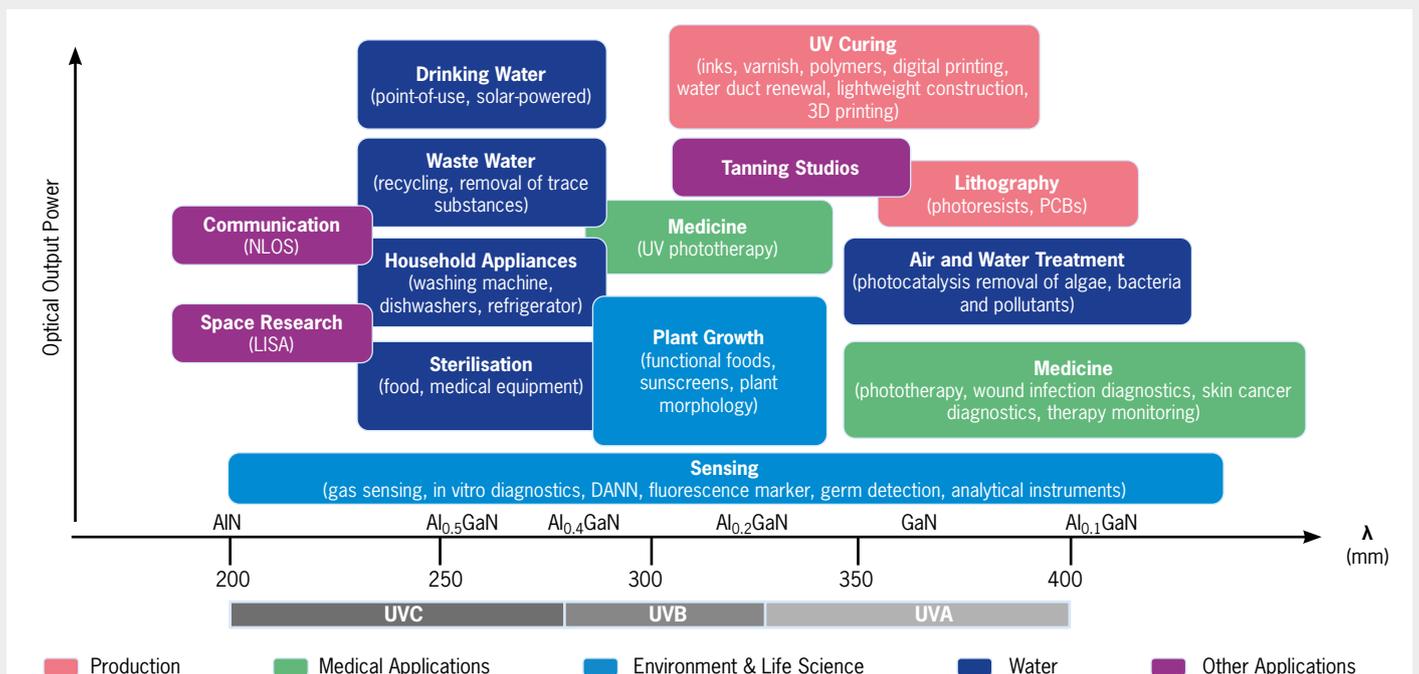
- Consistent UV spectral output for a given temperature
- Flexibility: broad range of wavelengths
- Package form: smaller and more robust, SMD available
- No degradation of intensity with toggling
- Contain no mercury, obviating need for disposal/recycling
- Energy efficient and infinite On/Off Switching battered, portable solutions with instant full light output
- Efficiency UVA-LED 30%

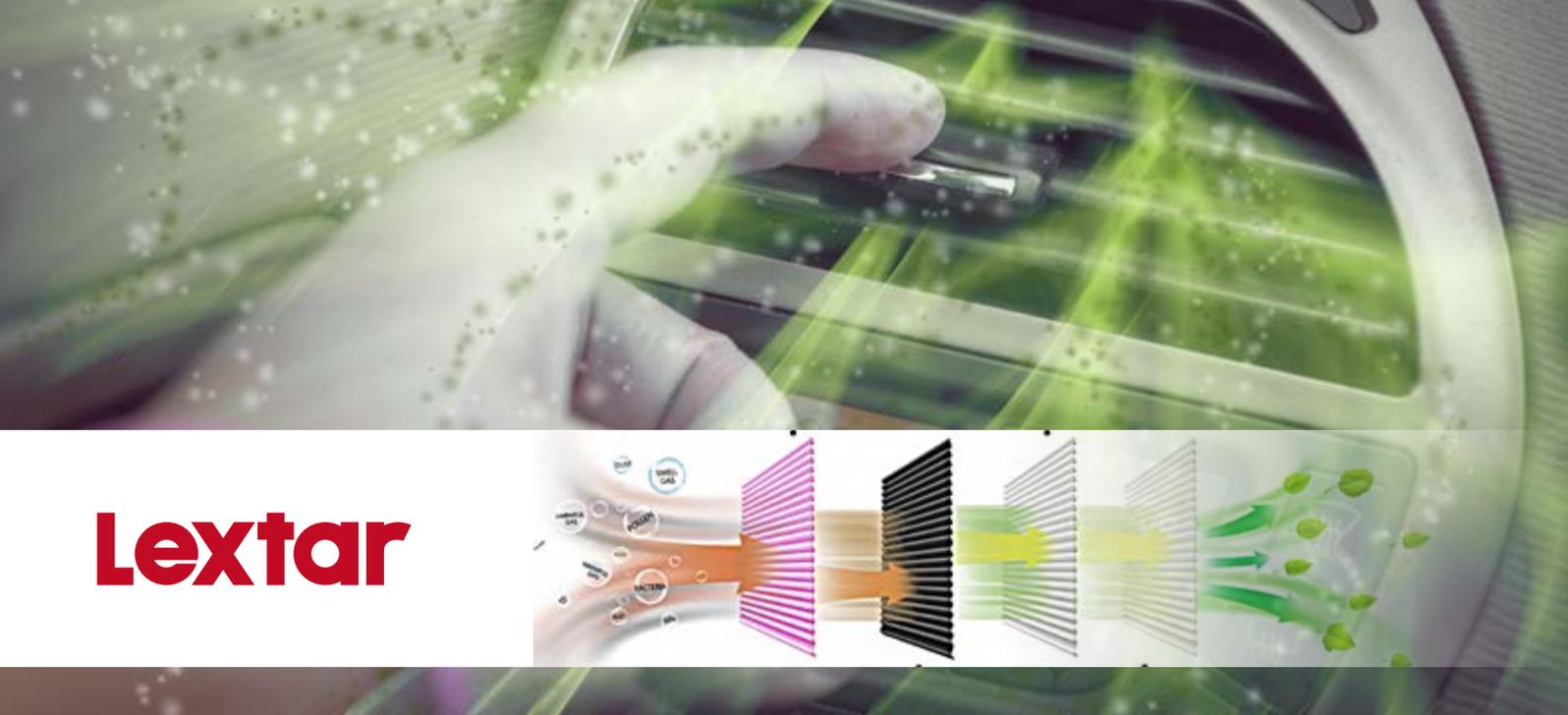
Key Applications

- Consumers (air conditioner, fridge, Toilet, air cleaner, Insect attracting lamps)
- Medicine (disinfection box, skin therapy, water quality sensor, cleaning robots)
- Industry (filling machine, water quality sensor, cloth, cartons, bottles, cans)
- Breeding, horticulture, fishery (conservation, photosynthesis, artificial light)
- Curing/drying (plastic coatings, 3D/ink printers, photoresist, nail, resin)

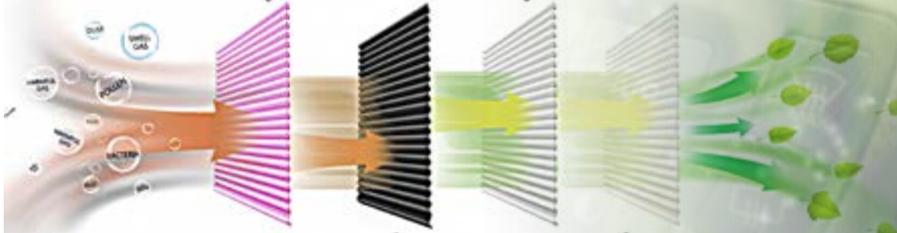
Passive Solutions	Active Solutions
Filters (Hepa, Activated Carbon, Ceramic ...) <ul style="list-style-type: none"> Based on the storage effect (the pollutants are only retained, but not destroyed) Maintenance needed 	Ozone Generator (Ionisator and Plasma Systems) <ul style="list-style-type: none"> Ozone is harmful for Human Health Hazardous Air Pollutants
Chemical Products (Chlorine...) <ul style="list-style-type: none"> Pathogen resistant Only for static situation (no flow) Produces Volatile Hydrocarbons (Chlorine Dioxide...) 	UV-Light (UV-LEDs and Traditional Mercury Vapor Lamps) <ul style="list-style-type: none"> No Volatile Hydrocarbons No Hazardous Air Pollutants Dangerous in open system (Human Body Radiation)

Ultraviolet Applications Depending of Wavelength





Lextar



Automotive UVC LED Disinfection Module Concepts

There exists Three main ways of transmission Covid 19: Droplet transmission, Aerosol transmission and Contact transmission. In the space of a car, Covid 19 survives longer and is more infectious. Generally Covid 19 survives up to 3 hours in the air, therefore it is very important, to have in car a air purifier system. The new Automotive UVC LED Disinfection module with the car air conditioning system, destroy the vital structure of various bacteria & viruses and Improve indoor air quality. The module does not affect the speed of the air through the filter element and consists of High UVC Energy matrix with UVC LED & reflectors (each UVC LED with 3 reflectors) and PM 2.5 particles filter.

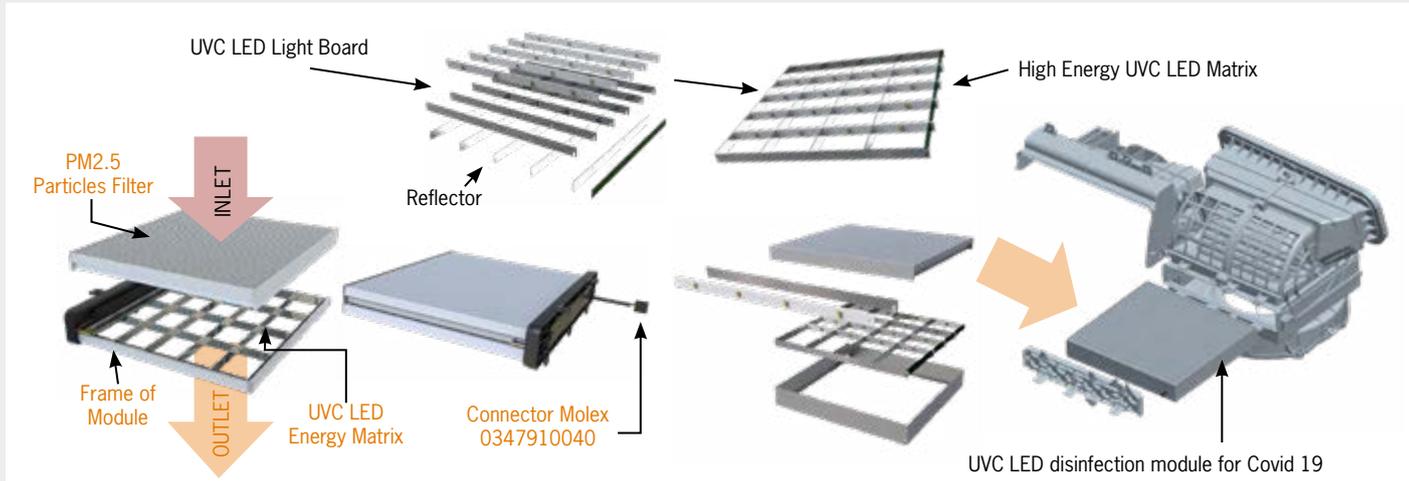
The module disposes of dual function: Nano scale filter for PM2.5 particles 99.53% ±10% removed. UVC LED disinfection module for Covid 19 sterilization rate 99%. This module is compatible with current filter design, plug & replace without modification and can be customized accordingly the costumer`s enquiries.

Features

- Each UVC LED with 3 reflectors
- High UVC Energy matrix with UVC LED and reflectors
- The module does not affect the speed of the air through the filter element

Benefits

- Combine with car air conditioning system
- Destroy the vital structure of various bacteria and viruses
- Improve indoor air quality



Technology	400-420nm Blue Lighting	UVC-LEDs
Features	400-420nm Blue Lighting	250-290nm
Disinfection Characteristic	Continuous Disinfection	Terminal Disinfection
Safety	Can be used safely	Safety Hazards
Disinfection Time	Slower Inactivation	Rapid Inactivation
Compatibility	More Materials Compatible	Polymer damage
Penetrability	Can Penetrate	Does not Penetrate
Escherichia Coli	Smaller than 1 Hour (99,9%)	24 Hours (99,9%)
Foods	Loss of Nutritional Characteristics	Does not Change the Properties
Environment	Produce Ozone (Toxic Gas)	Eliminate Toxic Gas



Swimming Pool

Hospital

Kitchen

Elevator

Bathroom

405 nm Light for Continuous Disinfection

Save Disinfection for Human body

400-420nm Blue Lighting is also able to be used for disinfection and infection control, this wavelength is causing oxidation damage and his successful inactivation is demonstrated for a wide range of organisms

Healthcare related infections (HAI) are the most frequent and serious complication in healthcare assistance. become very dangerous especially due to poor physical conditions of the patients. Pathogens(Virus, Bacteria, Fungi, Mould ...) can be found in rooms rooms (patients, operating and waiting), on diagnostic instruments etc.. 400-420nm Blue Lighting contributes to the safe healthcare practices, and prevents the transmission of infectious diseases in hospitals and in health-care facilities. At home, in offices, Schools and in common spaces(gyms, wellness centers and spas) the critical points where bacteria can be found are all the surfaces that come in contact with people's hands, pets, food, cleaning tools and vending machines. 400-420nm Blue Lighting reduces the bacteria

count, prevents the formation of biofilm, creates a safe environment, thus supporting the natural evolution of the immune system in adults and children. creates a safe environment by reducing the chances of acquiring infections, by sanitizing the ideal habitats for the proliferation of bacteria and fungi. sanitizes effectively the environments of animals and plants. In this way it contributes to reduce the use of antibiotics among animals and in animal products and it ensures a more rational use of chemical disinfectants. In Combination with a PHOTOCATALYSIS Filter (Titanium Dioxide TiO2 surface coating), he eliminates significantly the VOC (volatile organic Compounds) of the main external polluting sources (fossil fuel heating systems, vehicular traffic, industrial settlements, agriculture and livestock).

Lextar

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am

OSRAM

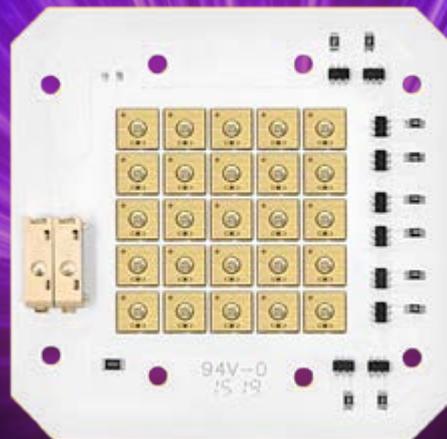
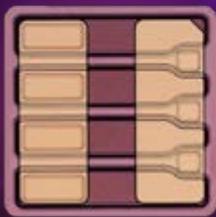
LASER COMPONENTS

STANLEY

LITEON

EVERLIGHT

Part Number	Wavelength (nm)			Dimensions			Radiant Power (mW)			I _{FforΦe} (mA)	Forward Voltage, V _F		Angle of Half Intensity (± °)	Supplier
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		Typ.	Max.		
VLMU3100	400	405	410	3.2	2.8	1.9	5	6.8	8	20	3.2	3.8	60	Vishay
VLMU3500-405-060	400	405	410	3.5	3.5	2.9	620	780	940	500	3.4	4	30	Vishay
VLMU3500-405-060-L	400	405	410	3.5	3.5	2.9	620	780	940	500	3.4	4	30	Vishay
VLMU3500-405-120	400	405	410	3.5	3.5	2.9	620	780	940	500	3.4	4	60	Vishay
VLMU3500-405-120-L	400	405	410	3.5	3.5	2.9	620	780	940	500	3.4	4	60	Vishay
VLMU3520-405-060	400	405	410	3.5	3.5	2.9	740	900		500	3.6	4	30	Vishay
VLMU3520-405-120	400	405	410	3.5	3.5	2.9	780	930		500	3.6	4	60	Vishay
PU88S01 V0 (U0405)	400	405	410	3.45	3.45	2.1	550	900	1050	500	3.6	4.4	60	Lextar
PU35AH1 V0 405NM	400	405	410	3.3	3.3	2.48	910	1150	1460	700	3.55	4	60	Lextar
PU88S04 V0 (U0405)	400	405	410	3.45	3.45	2.1	510	600		350	3.4	3.5	60	Lextar
PU28AM2_405nm	400	405	410	3.5	2.8	1.65	200	200	240	150	3.4	3.6	60	Lextar
LZ1-00UB0R-00U8	400	405	410	4.4	4.4	2.7	18.5	21.5		700	6.3	7	36	Osram/Ledgingin
LZ1-10UB0R-00U8	400	405	410	19.9	19.9	4.45	1100	1260	1760	700	3.5	4.2	36	Osram/Ledgingin
NDU1104ESE-405-TR	400	405	410	3.5	3.5	2.9	620	780	940	500	3.4	4	60	Stanley
LTPL-C034UVG405	400	405	410	3.45	3.45	2.1	1225	1415	1805	700	3.6	4.4	60	Liteon
LTPL-C034UVG415	410	415	430	3.45	3.45	2.1	1225	1415	1805	700	3.6	4.4	60	Liteon
LTPL-C034UVE405	400	405	410	3.45	3.45	2.1	560	690	900	350	3.6	4.4	60	Liteon
ELUA20160GB-P0010Q53038020-VA1M	400	405	410	2.04	1.64	0.75	25	35	45	20	3.6	4.4	60	Everlight
ELUA45450G3-P9000U23241500-VD1M	400	405	410	4.5	4.5	4.5	900	1000	1600	1000	3.2	4.1	30	Everlight
ELUA35350GB-P0010U23240500-VD1M	400	405	410	3.5	3.5	2.5	1000	1250	1500	500	3.2	4.1	60	Everlight



UVB and Germicidal UVC LEDs

High Efficiency Against Microbes, Bacteria, and Viruses



Laser Components specializes in the UVB/UVC LEDs wavelength range 255-308nm. The LEDs at 265/272/275/295 and 308 nm offer an output power of 100 mW and more from a single die, the 255 nm LED offers 38 mW and soon even 65 mW, which is significantly higher performance than similar products by other manufacturers. The Germicidal LEDs (GLEDs) are available as single chip SMD LEDs, bare die and as preassembled arrays up to 2.2 Watt. Their main application area is sterilization and disinfection of air, water, and surface. Studies have also shown notable effect against the SARS-COV-2 virus. UVB wavelengths can be effectively used in UV curing, analytics, and dermatology.

Features SMD LED

- High performance components for customer flexibility
- UVC LEDs at typ. 255, 265, 272 and 275nm
- UVB LEDs at typ. 295nm and 308nm
- Single chip
- High power output 100mW/chip
- 5.7 – 7V operating voltage
- Diversity on chip sizes and output power
- Most output power per mm²
- Robust structure with more than 10kh L70 lifetime

Features Arrays

- Task-specific modules for maximum differentiation
- All advantages of 272nm SMD GLEDs on a board
- Small footprint
- High output with 360mW, 1.1W or 2.2W per array
- Array sizes: 1x4, 1x12, 5x5 with
- Fastest to market release design
- Low profile for ease of integration

Applications

- Water treatment
- Air disinfection
- Surface sterilization
- UV-curing
- Dermatology
- Deodorization
- Mold growth reduction

Part Number	Description	Output Power
PKB-35	UVC LED, typ. 255nm ±5nm, 38mW @ 350mA & 5.9V, SMD3535, 120° Viewing Angle	38mW
PKC-50	UVC LED, typ. 265nm ±5nm, 90mW @ 500mA & 6.5V, SMD3535, 120° Viewing Angle	90mW
S6060	UVC LED, typ. 272nm +6/-7nm, 100mW @ 250mA & 6-7V, SMD6060, 150° Viewing Angle	100mW
PKD-50	UVC LED, typ. 275nm ±5nm, 100mW @ 500mA & 6.4V, SMD3535, 120° Viewing Angle	100mW
PKE-50	UVC LED, typ. 295nm ±5nm, 100mW @ 500mA & 6.4V, SMD3535, 120° Viewing Angle	100mW
PKF-50	UVC LED, typ. 308nm ±5nm, 100mW @ 500mA & 6.4V, SMD3535, 120° Viewing Angle	100mW
2S2P-S6060 UVC SMD LED array	2S2P SMD UVC LED Array, typ. 272nm +6/-7nm, 360mW @ 250mA/Chip, Lensed LEDs 150°	360mW
3S4P-S6060 UVC SMD LED array	3S4P SMD UVC LED Array, typ. 272nm +6/-7nm, 1.2W @ 250mA/Chip, Lensed LEDs 150°	1.2W
5S5P-S6060 UVC SMD LED array	5S5P SMD UVC LED Array, typ. 272nm +6/-7nm, 2W @ 250mA/Chip, Lensed LEDs 150°	2W



VLMU3520... Series and VLMU35C*2*... Series

Ceramic Based UVC LED Series with Higher Power and Narrower Binning



The DNA of tech.™

Vishay introduces a family of ceramic-based, high power UVC LEDs with silicone and fused silica lenses. In combinations with suitable sensors, they show their full potential in hygienic applications. When designing sterilization applications with UVC LEDs, two limiting factors are the minimum radiant power and the maximum wavelength. Both specifications have been improved on an updated VLMU35C*20 version. In addition to this, a higher radiant power binning the VLMU35C*21 is now also available.

Benefits

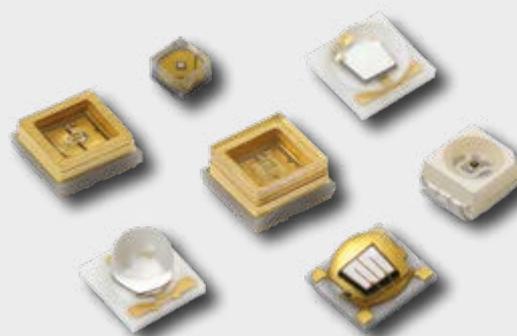
- Exceptionally long lifetime
- Compact surface-mount packages
- RoHS-compliant, halogen-free, and Vishay Green
- Compatible with reflow soldering processes
- Moisture sensitivity level of 3 in accordance with J-STD-020
- Emitters available from UV-A to UV-C
- UV-A: optical power up to 2 W
- UV-C: optical power up to 24 mW

Applications

- UV curing Nail salon, Dental, Printing
- Blood detection
- Photocatalytic purification
- Counterfeit currency detection
- Medical application
- Sterilization

Technology Comparison

Feature	UV LED	Mercury Lamp
Life cycle	25 k Hours	10 k Hours
Environmental	No heavy metals	Unfriendly
Security	Low-voltage, simple drive circuit	Shock sensitive
Energy	Low power consumption	Higher power consumption



VLMU35C*2* - Series

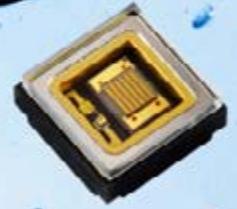
Part Number	Status	Color	Radiant Power (mW)			Wavelength (nm)			Forward Voltage (V)			AT IF _{spec} (mA)	Technology
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
VLMU35CB20-275-120	OLD	UVC	7	10	-	270	277	285	5.00	6.50	7.00	100	AlGaIn
VLMU35CB20-275-120	UPDATE		10	13.5	-	270	273	280	5.00	6.20	7.50	120	AlGaIn
VLMU35CB21-275-120	NEW		12	13.5	-	270	273	280	5.00	6.20	7.00	120	AlGaIn
VLMU35CT20-275-120	OLD		12.5	19	-	270	277	285	5.00	6.50	7.00	150	AlGaIn
VLMU35CT20-275-120	UPDATE		16.5	21.5	-	270	274	280	5.00	6.30	7.00	180	AlGaIn
VLMU35CT21-275-120	NEW		18.5	21.5	-	270	274	280	5.00	6.30	7.00	180	AlGaIn

Ceramic-based high power UVA LED series with silicone lens for long life time

Part Number	Package	Color	Radiant Power (mW)			Wavelength (nm)			Forward Voltage (V)			AT IF _{spec} (mA)	Technology
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
VLMU3520-385-060	SMD ceramic high power	Ultra-violet	740	900	-	380	385	390	3.2	3.6	4.0	500	InGaIn
VLMU3520-395-060			740	900	-	390	395	400	3.2	3.6	4.0	500	InGaIn
VLMU3520-405-060			740	900	-	400	405	410	3.2	3.6	4.0	500	InGaIn
VLMU3520-385-120			780	930	-	380	385	390	3.2	3.6	4.0	500	InGaIn
VLMU3520-395-120			780	930	-	390	395	400	3.2	3.6	4.0	500	InGaIn
VLMU3520-405-120			780	930	-	400	405	410	3.2	3.6	4.0	500	InGaIn

Deep-UV LED

The world's highest power output of 50 mW, emitting at 265 nm: ideal for water purifiers



Deep UV 265 nm – ZEUBE265 Devices Ideal for Water Purification



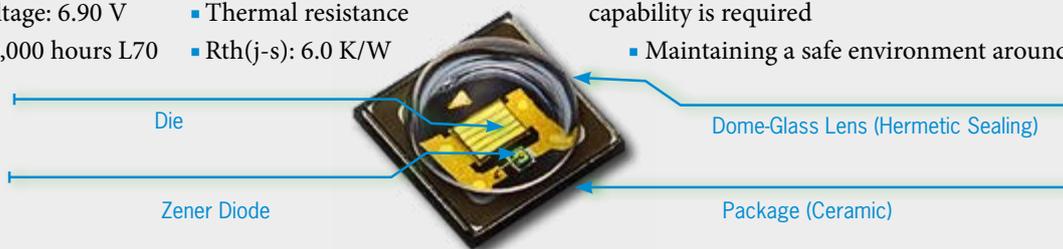
Stanley's 265 nm LED achieves a higher bactericidal effect than other wavelength LEDs. The AlN substrate makes it possible to reduce the density of dislocations up to 10,000 times in comparison to common UV-C LEDs. In addition the substrate drastically improves the permeability below 300 nm. This leads to a high output power of 50 mW. There is no noticeable decrease of efficiency as forward current and temperature rise..

Typical Specifications (Ta=25 °C, If = 400 mA)

- Wavelength: 265 nm
- Output power: 50 mW
- Forward voltage: 6.90 V
- Lifetime: 10,000 hours L70 (Tj=70 °C)
- Light distribution: 120°
- Thermal resistance
- Rth(j-s): 6.0 K/W

UV germicidal irradiation: No chemicals, no odor residue

- Sterilizing objects that people may touch or put in their mouth
- Sterilizing food, medicines, etc., for which a high sterilizing capability is required
- Maintaining a safe environment around children and pets



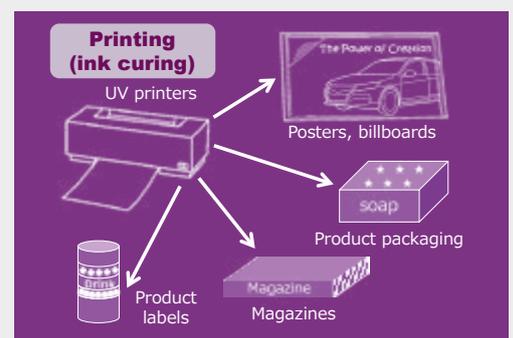
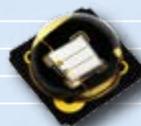
UV-A – NDU1104ESE

High reliability and low thermal resistance LED adopting an AlN substrate and anti-UV silicone resin. Thanks to its low thermal resistance characteristics, it achieved an even higher quality than other companies' products.

Features

- High output and high heat dissipation
- Product variations
- Distribution angle: 115/130
- Narrow spectral width: 10 nm
- Single peak wavelength: 365/385/395/405 nm

Type		Mid-Power type				Units
Part No.		NDU1104ESE series				
Wavelength	λ_p	365	385	395	405	nm
Light Output	P_o	950	1,100	1,100	1,100	mW
Forward Voltage	V_F	3.6	3.4	3.4	3.4	V
Spatial Distribution	$2\theta_{1/2}$	130				deg.
Thermal Resistance	$R_{th(j-s)}$	3.0				°C/W
Max Forward Current	I_F	700				mA
Junction Temperature	T_j	90				°C
Operating Temperature	T_{opr}	-10 to 85				°C
Storage Temperature	T_{stg}	-40 to 100				°C
Size	$L \times W \times H$	3.5 × 3.5 × 2.05				mm





Using Light to Fight Viruses

Disinfection and Purification with UV-C LEDs



Imagine a world in which light makes your everyday life healthier, safer and more pleasant. With UV-C solutions powered by ams OSRAM, this vision becomes reality. Light for making our world healthier and improve human well-being is part of our mission. Today like never before current global developments have raised the attention on topics of disinfection and sterilization. Be that at work, at home or on the move, people everywhere are confronted with a new reality and awareness for health and safety.

Today UV-C mercury vapor lamps are used to provide clean water, and surfaces. With UV-C LED solutions - their small and durable design, as well as their mercury free nature, we can extend the use of UV-C Radiation to completely new application areas and overcome obstacles which are currently limiting the broad deployment of UV-C radiation.

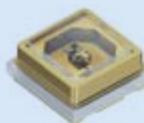
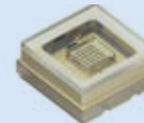
Applications

- UV-C Air Disinfection
- UV-C Surface Disinfection
- UV-C Water Disinfection
- Smoke/Dust/Particle Sensing
- Curing applications
- Treatment in the chemical industry

Benefits

- UV-C LEDs are environmentally friendly. In comparison to mercury lamps, UV-C LEDs do not contain mercury.
- Purification and disinfection without the use of chemicals
- Flexible design: Due to their small footprint and DC operating feature, they allow for flexible and compact designs.
- Durability: Compared to mercury lamps, UV-C LEDs are much more robust to mechanical influences as they do not contain fragile glass components.
- Operation: UV-C LEDs instantly provide full optical output when turned on and stop immediately when switched off. Making cycling at high frequency possible. No pre-heating necessary

OSLON UV Series

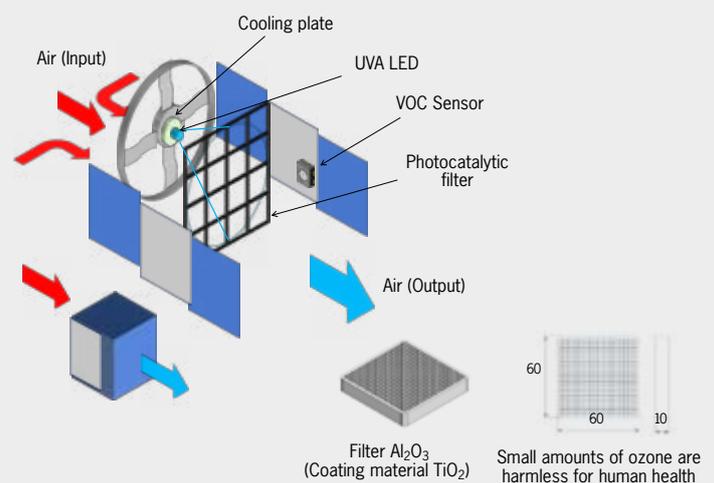
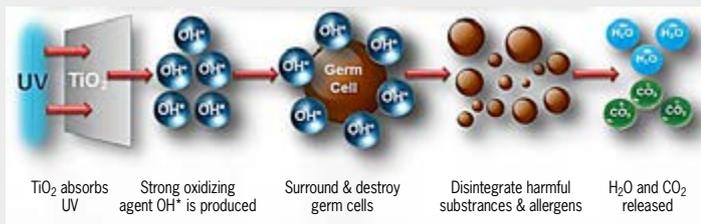
Series		OSLON® UV 3636 SU CULBN1.VC	OSLON® UV 3636 SU CULCN1.VC	OSLON® UV 3636 SU CULDN1.VC
Type		Low Power Output	Mid Power Output	
Shape				
Radiant flux	(mW)	4.7	13.5	42
Peak wavelength	(nm)	275	275	275
Emission Angle	(°)	120	120	120
Voltage	(V)	6.0	5.7	5.7
Binning Current	(mA)	30	100	350
Max. Current	(mA)	40	150	500
Wall Plug Efficiency	(%)	2.6	2.1	2.1



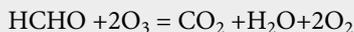
UVC Module for Water, Air and Surface Purification by UV-LED Best Fit for Smart, Integrated and Intelligent Disinfection Systems (VOC, UV and PIR sensors)

UVC LED sterilization and disinfection modules can be used in application in the fields of water purification, surface sterilization, and air sterilization. Due to the current epidemic situation, a variety of UV LED sterilization modules for air sterilization are popular, which can be adapted to sterilize air in different applications. The compact size of UVC LED sterilization function module for air purification equipment and air-conditioning equipment and other compact products, makes it easy to integrate with the customer terminal equipment. And its special concentrating design can gather the ultraviolet rays radiated by the LED inside the equipment. It improves the efficacy of UVC, and at same time it resolves leakage of ultraviolet rays to safety problem.

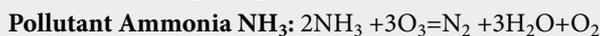
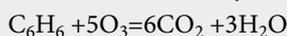
Definition and Principle of Operation of Odor Eliminator via Photocatalysis Filter and UVA LED (365 nm)



Pollutant in building industry formaldehyde HCHO:



Pollutant benzene/hydrocarbon C_6H_6 :



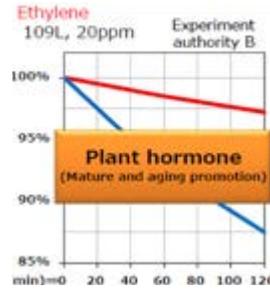
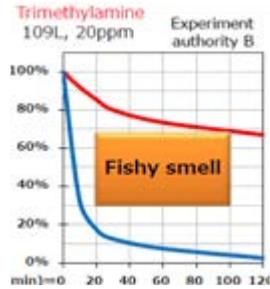
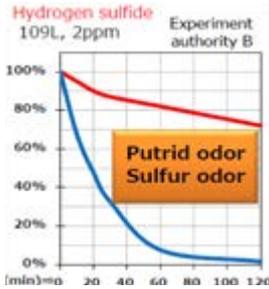
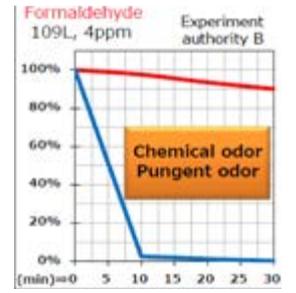
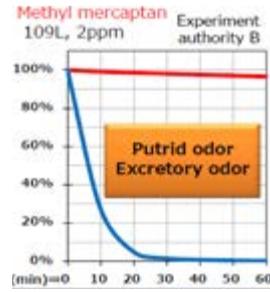
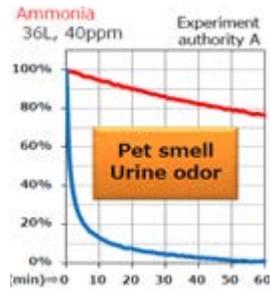
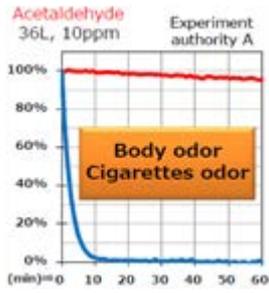
UVC LED Module Products List for Water Purification

Model	LBM1101	LBM3502	LBM1801	LBM1802	LBM3501	LBM4201	LBM6301	LBM3601
Appearance								
Type	Static				Dynamic			
Static Tank Size/Dynamic Flow Rate	1-2L	1-5L	1-10L	1-10L	0.2-1L/min	1-2.5L/min	6-8L/min	2-10L/min
Dimension	Φ11.3 x 8mm	Φ35 x 27mm	Φ18 x 162mm	Φ25 x 12mm	Φ35 x 100mm	Φ42 x 128mm	Φ63 x 145mm	Φ36 x 110mm
Applications	<ul style="list-style-type: none"> Water dispenser tank Dehumidifier water tank 		<ul style="list-style-type: none"> Fish tank Tumbler 		<ul style="list-style-type: none"> Water purifier waterway Water dispenser waterway 		<ul style="list-style-type: none"> Smart toilet Coffee machine 	
Disinfection Efficiency (E. coli)	>Log3 (99.9%)				>Log3 (99.9%)			

List of Test Results by Target Components

— UVA + Photocatalysts

— Natural attenuation



Deodorization effect has been confirmed for various components

Experiment authority A:
Kanagawa Institute of Industrial Science and Technology (KISTEC)

Experiment authority B:
Japan Food Research Laboratories

UVA LED Package

Printing Curing

- >400mW/cm²
- Ultra high radiant intensity
- Focus light

PCB Curing/Exposure

- 250-400mW/cm²
- Ultra high radiant intensity
- Focus light/ Collimated Light

Lower Power Curing

- wide angle
- High performance/ low Cost

Lifetime: L70 > 20000 hrs | L50 > 50000 hrs



Photo Catalyst

LBS0601 (60x60x12.5mm)

LBS1001 (100x100x12.5mm)

LBS1002 (100x40x8mm)

LBS1401 (148x145x12.5mm)

LBS1801 (80x110x12.5mm)

UVA solutions for static & flow type air purifier

Customized UVA light and photo catalyst

UVC LED Package

High Power/Air Disinfection

- Ultra high radiant intensity
- High flow rate (> 2L/min)

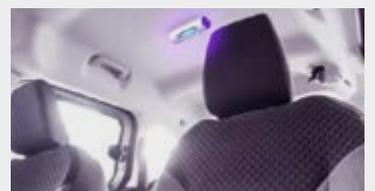
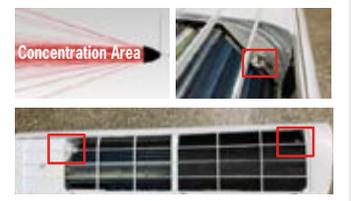
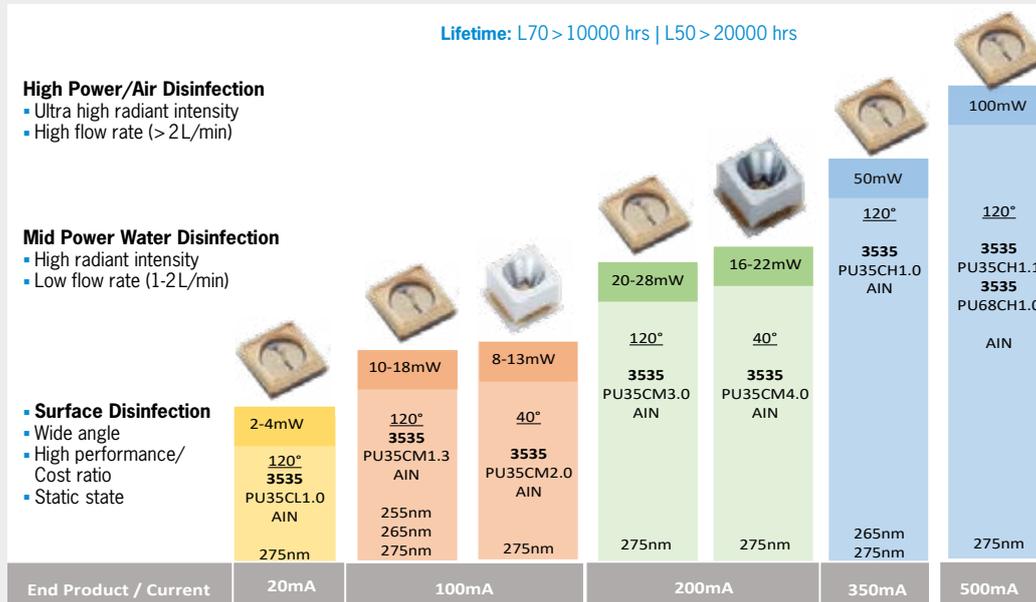
Mid Power Water Disinfection

- High radiant intensity
- Low flow rate (1-2L/min)

Surface Disinfection

- Wide angle
- High performance/ Cost ratio
- Static state

Lifetime: L70 > 10000 hrs | L50 > 20000 hrs



Kettle





Pyroelectric Infrared Sensor and Lens of IRA-S Series

IRA-S210ST01 IML-0685, IML-0688

IRA series offers pyroelectric infrared sensor that deliver high sensitivity and reliable performance made possible by Murata's ceramic technology. Used mainly in security equipment. Combining performance with low costs, the IRA-S series makes it easier to use pyroelectric infrared sensor in security application and general consumer equipment.

Key Features

- **Functionality:** Conversion of a signal generated by temperature change into a corresponding electric current.
- **Low power**
- **IRA-S series covers different target detection areas**

Key Benefits

- **Compact design**
- **Energy efficiency**
- **Module comprising ambient light sensor, proximity sensor and signal processing IC**
- **Desing-in capable**

Lens IML Series

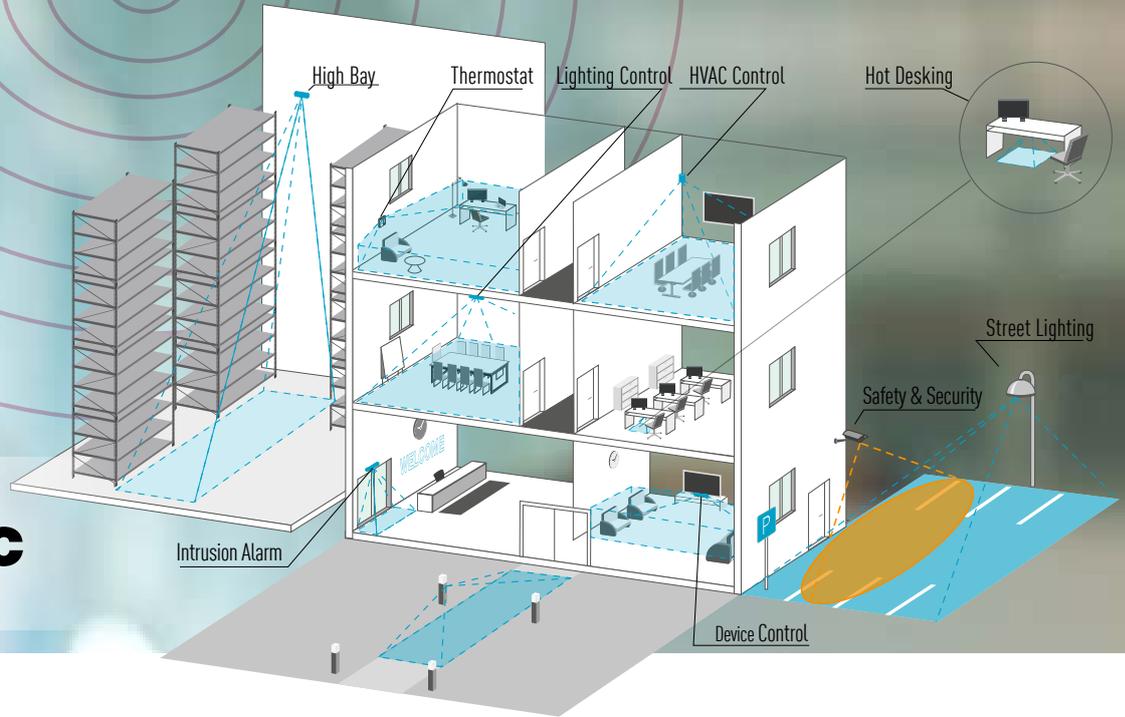
IML series offer Fresnel lens for Murata pyro-electric infrared sensors. These are classified as a product for lead type sensors. Please choose the suitable lens for target detective area.

Key Applications

- Security systems
- Motion Sensor
- Lighting automation

Part Number	Status	Field of View	Electrode	Shape	Responsivity (typ.)	Optical Filter	Operating Temp. Range	Storage Temp. Range
IRA-S200ST01A01	In Production (Recommended)	theta1=theta2=45deg.	(2.0x1.0mm)x2	Lead	4.6mV	5micro meter Long Pass	-40 to 70 °C	-40 to 85 °C
IRA-S210ST01		theta1=theta2=45deg.	(2.0x1.0mm)x2	Lead	4.6mV			
IRA-S220ST01A01		theta1=theta2=45deg.	(2.0x1.0mm)x2	Lead	4.6mV			
IRA-S230ST01		theta1=theta2=45deg.	(2.0x1.0mm)x2	Lead	4.6mV			
IRA-S400ST01A01		theta1=38deg.,theta2=45deg.	(2.3(gap0.3)x1.0mm)x2	Lead	7.0mV			
IRA-S410ST01		theta1=38deg.,theta2=45deg.	(2.3(gap0.3)x1.0mm)x2	Lead	7.0mV			
IRA-S500ST01A01		theta1=theta2=44deg.	(1.0x1.0mm)x4	Lead	3.3mV			
IRA-S510ST01		theta1=theta2=44deg.	(1.0x1.0mm)x4	Lead	3.3mV			
IRS-B210ST01-R1	Discontinued	theta1=50deg.,theta2=70deg.	(1.2x0.85mm)x2	SMD	3.6mV	3micro meter Long Pass		
IRS-B345ST03-R1		theta1=70deg.,theta2=50deg.	(0.8x0.7mm)x4	SMD	3.6mV			

Panasonic



Passive Infrared Motion Sensors – PaPIRs

Extremely Small and Powerful

Passive or pyroelectric infrared (PIR) sensors are thermal detectors and suitable as motion sensors. They react to a change in infrared heat radiation in the environment, e.g. by a moving person (or object). The latest Panasonic PIR generation, the EKM family, comprises two mechanically identical series: the EKMB (1 μ A, 2 μ A and 6 μ A; digital output) and the EKMC series (170 μ A; digital and analog output). The best PIR motion sensors convince with their simple plug-and-play concept, and are extremely small and powerful. The product portfolio offers solutions for almost all applications.

Explore the EKM family with the EKMB (1,2,6 μ A) and EKMC (170 μ A) Series

Aesthetic integration – Flat Square Type	Wide Area & Ultra Slight Motion Detection	Low Profile Type, small and powerful	High Density Long Distance Type, the smallest long range sensor	Standard Detection Type, the bestseller
With its flat and square lens, the pyroelectric passive infrared motion sensor allows an aesthetically pleasing product design.	Passive Pyroelectric Infrared motion sensors EKMB/EKMC with small 14mm lens for detection in large areas or small objects and movements	The Low Profile Type, small and powerful! For maximum detection distances up to 5m and typical ceiling installation heights up to 3m.	The smallest long range sensor offers 128 detection zones. The digital standard sensitivity type is specified up to 12m, while the high sensitivity type, with lower thresholds is specified up to 17m.	The Standard Detection Type, the bestseller! The unobtrusive, flat lens serves detection distances up to 5m and typical ceiling installation heights up to 3m.
				
Wall Installation (corner) Type, the powerful room monitoring sensor	Long Distance Detection Type, the powerful mid-bay sensor!	Slight Motion Detection Type, the powerful indoor sensor	Standard and Slight Motion Detection Type	Horizontally Wide Detection Type
The Wall Installation (corner) Type, can monitor a whole room up to 12m when installed in the corner at a typical installation height of 2.5m - 3m.	The Long Distance Detection Type, the powerful mid-bay sensor! For maximum detection distances up to 12m and typical ceiling installation heights up to 7m.	The Slight Motion Detection Type, the powerful indoor sensor. For typical ceiling installation height of up to 3m.	The Standard and Slight Motion Detection Type, has two zones optimized for different movement patterns. For typical ceiling installation height of up to 3m.	The Horizontally Wide Detection Type with a patented special lens for improved radial sensitivity, a maximum horizontally field of view of 150° and a detection distance up to 5m.
				

STELLA
Large, ultra slim
UV cluster solution



UV-A UV-B UV-C

ZORYA
~340° omni-
directional lens



UV-A UV-B UV-C

ALISE
Cost efficient and versatile
reflector system for UV

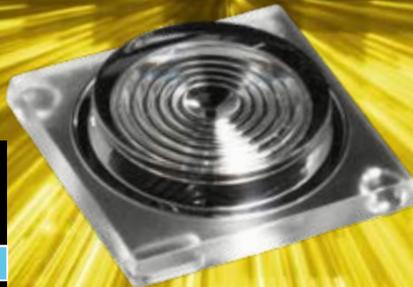


UV-A UV-B UV-C

VIOLETTA

Single silicone lens specifically
for UV-C applications

UV-A UV-B UV-C



VIOLET

The first standard silicone optic
in the world designed specifi-
cally for UV-C applications

UV-A UV-B UV-C



LEDiL

Optics for UV Applications Optics for UVA-, UVB- and UVC-Leds

LEDiL was the first company to offer injection moulding optics designed and tested for UV-C, making the lenses vastly superior when compared to other silicone solutions on the market. Lenses such as VIOLET, use a special silicone grade that has a very high transmission of UV-C wavelengths and can be used for complex lens designs with easy to achieve ingress protection. LEDiL aluminium reflectors are also highly reflective at all UV wavelengths making them especially suitable for UV-C LED clusters.

Benefits

The tiny amount of light UV-C LEDs produce can be focused more effectively with the help of the right optics. This can lead to increased radiation output on the desired area and reduce the time needed for exposure while maintaining the same dosage. Using different LED clusters with compatible lenses makes luminaire power output easily scalable for different purposes.

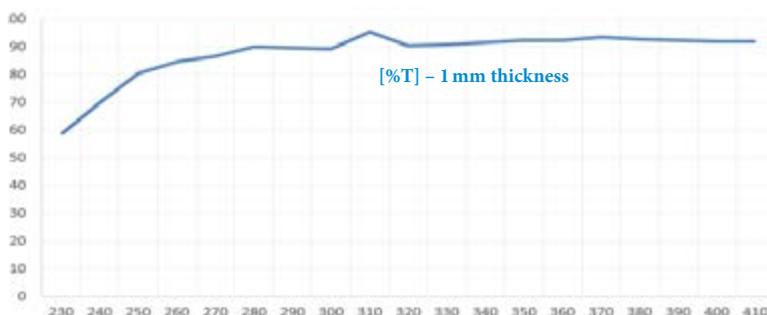
Applications

Printing, curing, lithography, sensing medical, breeding, horticulture, fishery, insect attracting lamps, sterilisation, degermination.

LEDiL Materials for UV Optics

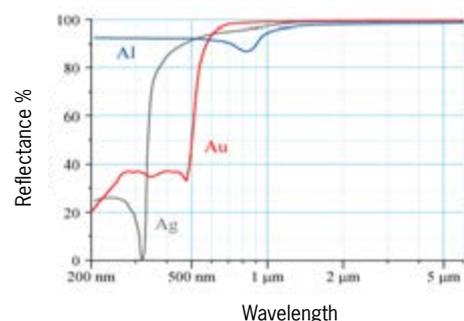
LEDiL Silicone

- High transmission in UV wavelengths, including UV C
- Suitable for complex optical lens designs
- Easy to achieve ingress protection



Aluminium

- Cost effective option
- For UV LED clusters
- Highly reflective in all UV wavelengths





Constant Voltage – Indoor



Constant Voltage – Outdoor



Programming Tools & Accessories



Constant Current – Outdoor



Constant Current Linear – Indoor



Constant Current Compact – Indoor



OPTOTRONIC LED Drivers

Light is Universal



OSRAM offers a comprehensive portfolio of OPTOTRONIC LED drivers suitable for practically any application in the area of LED lighting: SELV and „non-isolated“, compact and linear, constant current and constant voltage, indoor and outdoor.

Compact OPTOTRONIC LED Drivers

- 1...100 % amplitude dimming of LED DALI drivers with 10-50 W
- Compact LED drivers, 4 current settings selectable via DIP switch

Linear OPTOTRONIC LED Drivers

- 1...100 % amplitude dimmed, non-isolated DALI driver
- 11 mm ultraflat, non-isolated DALI driver, also with 1...100 % amplitude dimming
- Linear LED drivers with current settings selectable via DIP switch

OPTOTRONIC LED Drivers for Outdoor Applications

- ON/OFF driver: 100/150/200 W OT...P5 for independent mounting, street and urban lighting, industry
- High surge protection up to 6 kV
- Adjustable and wide output current range
- High IP rating (IP65)
- Long lifetime of up to 100,000 h

LED Driver Types

- Compact constant current LED drivers
- Linear constant current LED drivers
- Constant current LED drivers for outdoor applications
- Constant voltage LED drivers (24 V/12 V)

OSRAM Tuner4TRONIC

The comprehensive tool chain for the entire life cycle of your luminaires. Tuner4TRONIC is a powerful, digital end-to-end solution for development, production and maintenance.

- Software suite for OEM use to configure all programmable OPTOTRONIC®, QUICKTRONIC® and POWERTRONIC® drivers in the luminaire manufacturing process.
- Best suited for programming in luminaire manufacturing
- For quick manual as well as automatic programming
- Works with DALI magic and OT Programmer hardware or NFC
- Easily enables pre-parameterization, also when using the pre-parameterization service from OSRAM



RECOM

LED Drivers for Integrated Lighting



RECOM's constant current (CC) and constant voltage (CV) low profile LED drivers have been designed for cost-sensitive applications. Screw terminal or wired versions make them ideal for built-in or independent power supplies for LED lighting. Advances in LED chip technology mean that low power supplies are sufficient for many LED illumination applications such as spotlights, reading lights and display lighting. These low cost series meet the growing demand for compact driver, while the low profile solutions meet the needs of the high brightness LED lighting market. RECOM LED drivers are ENEC, UL8750 and CE certified, with special versions also EAC (Russia), PSE (Japan) or RCM (Australia) certified.

RACD03 (-PSE) and RACD04 Series

The RACD03 (-PSE)/04 can drive one to four high brightness LEDs with 350 mA, 500 mA or 700 mA constant current for accent lighting. The RACV04 has 12 V or 24 V CV outputs for strip lighting. These series contain a built-in EMC input filter for universal input voltages and meet EN61347, EN55015 and FCC18A without any additional external components. The LED drivers are designed to provide a long, trouble-free life and are rated at >20,000 hours, equivalent to eight hours daily operation up to seven years.



Features

- Universal AC input voltage (90 to 264 V_{AC})
- Low standby consumption (ErP conform)
- 3kVAC double insulated isolation
- Wired or screw terminal connections
- IP64 rated (RACD03)
- Both compact and low profile packages available

RACD-LP Series

A low profile design (≤ 13 mm) allows them to be invisibly built into furniture, discreetly mounted under shelves or integrated in space-restricted applications. Their SELV outputs are suitable for both independent and built-in power-supply LED luminaires. They are available with 6W, 12 W or 20 W output power.



Features

- Constant current outputs of 350 or 700 mA
- Constant voltage outputs of 12 V or 24 V
- 230 VAC input
- Low standby consumption (ErP conform)
- Isolation: 3 kVAC double insulated
- Screw terminal connections with cable clamps

Typ. Applications

- Integrated LED lighting
- Accent lighting
- Strip lighting
- Recessed lighting systems
- Furniture, cove & cabinet lighting



DC/DC LED Driver ICs

For Keeping the Current at UV-LEDs Reliably under Control



Infineon's BCR linear LED driver ICs are the best choice for driving LED strings supplied by a DC voltage source. The BCR regulators are suitable for driving currents from 10mA to 250mA. That is why they are the best solution for low- and mid-power LEDs. For high-power LEDs, the linear constant current LED controller ICs in combination with an external power stage allow for the greatest design flexibility.

Features

- Supply voltage 8V to 80 V
- Integrated HS MOSFET switch, up to 1.5 A average output current
- Efficiency up to 97 %
- LED current precision $\pm 3\%$
- Up to 2 MHz switching frequency
- Low typical $R_{DS(on)}$ of 275 m Ω
- Soft-start to protect primary side
- External shunt resistor connected to GND to set LED target current
- Low power shutdown pin
- Overtemperature protection, UVLO

Supplier	Description	Adjustable current range	Voltage drop	Breakdown voltage	Protections	Package total power dissipation	Dimming	Qualification	Size
BCR401W BCR402W	Linear LED driver IC	10 – 60 mA	1.2V	18V	Negative thermal coefficient	500mW	Ext. Digital transistor required, bus voltage	AEC Qualified	SOT-343
BCR401U BCR402U BCR405U		10 – 65 mA	1.4V	40V		750mW			PWM dimming via enable pin, bus voltage
BCR420U BCR320U		10 – 250 mA	1.4V	25V / 40V		1000mW	SC-74		
BCR450	Linear LED controller IC	50 mA – 1 A	0.5V	27V	Thermal shut down at 120 °C	Depends on transistor	PWM dimming via EN pin	Industrial	SC-74
BCR430U BCR431U	Linear LED driver IC	20 – 100 mA 8 – 37 mA	0.135V at 50 mA 0.345V at pin V_{drop}	42V	Smart temperature controlling circuit	600mW	PWM dimming via R_{set} pin, bus voltage		SOT-23-6
BCR601	Linear LED controller IC	Bipolar or NMOS transistor up to xA	0.345V at pin V_{drop}						60V
BCR602			Depending on V_{in} , system configurable	OTP	Analog down to 3% and PWM dimming down to 1 %	SOT-23-6			





Fan Portfolio

Best Fit for Project Odor Killer and Germ Contamination Applications



DC Fan



Key Features

- Bearing: Dual Ball, Sleeve, Ball
- Rated Voltage: 5 – 48V
- Air Flow: 0.2 – 290 CFM
- Speed: 900 – 26500 R.P.M
- Lifetime: 50K - 100K hours
- Size: 25 x 25 – 172 x 51 mm

Key Applications

- Interior Vehicle
- Small portable devised

Key Benefits

- Compact design
- Longevity (Dual Ball Bearing)
- Wide range of sizes

Why should I buy this product?

- IP protection according to the requirement
- PWM, speedometer according to the requirement
- Specification according to customer requirements (connector, cable length)
- Good price-performance ratio

AC Fan



Key Features

- Bearing: Longlife Ball
- Rated Voltage: 110 – 240 VAC
- Lifetime: 50K – 70K hours
- Size: 60 – 250 mm

Key Applications

- Indoor

Key Benefits

- Compact design
- Longevity (Dual Ball Bearing)
- Wide range of sizes

Why should I buy this product?

- IP protection according to the requirement
- PWM, speedometer according to the requirement
- Specification according to customer requirements (connector, cable length)
- Good price-performance ratio

Axial EC



Key Features

- Bearing: Ball
- Rated Voltage
 - Single phase 200 – 277 VAC
 - Three phase 380 – 480 VAC
- Lifetime: 50K – 70 K hours
- Size: 170 – 910 mm

Key Applications

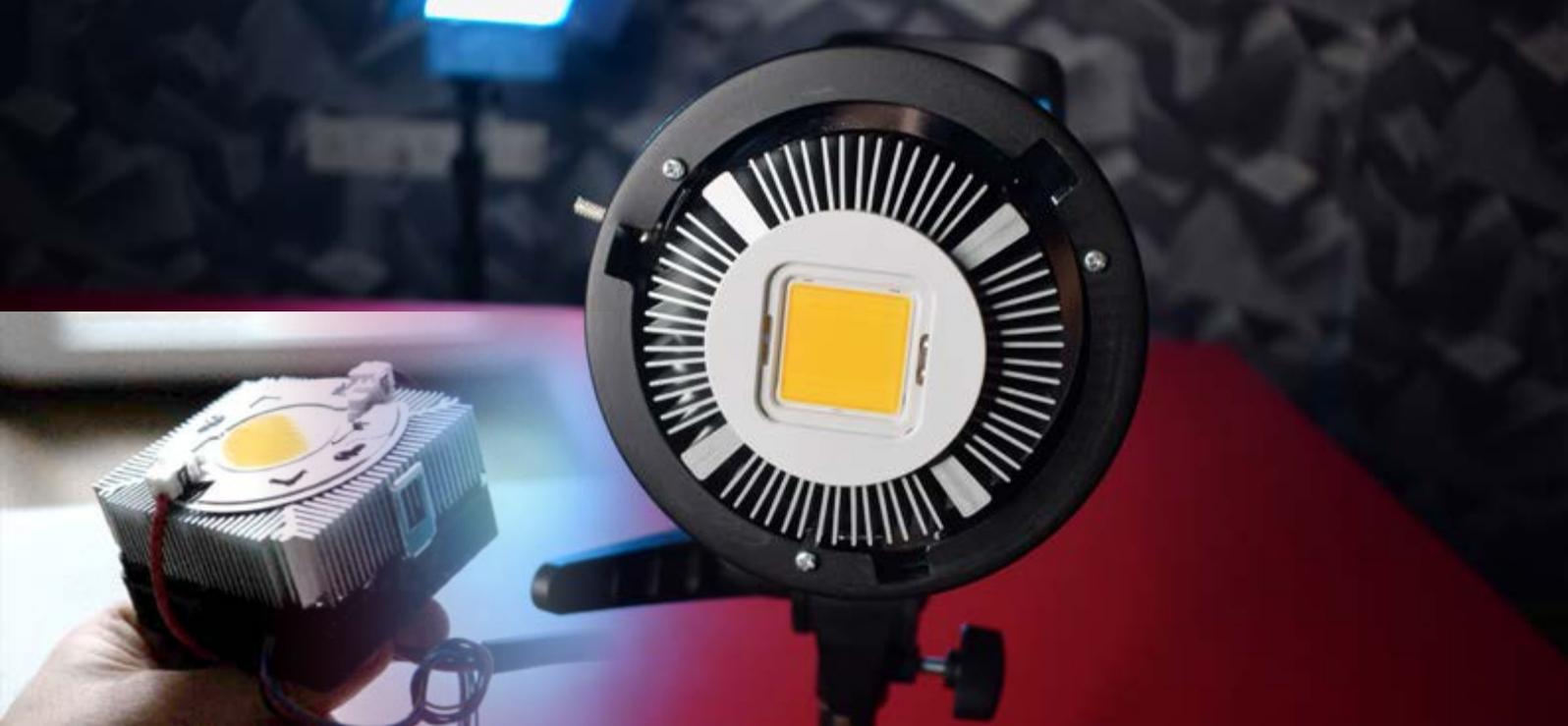
- Indoor

Key Benefits

- Brushless DC motor fan driven by applying AC source
- PWM or voltage speed control
- High reliability/ Long Life motor with multi-protection function

Why should I buy this product?

- Efficiency of BLCD motor is higher than AC motor: by 30-50%, depending on type of AC motor
- Efficiency by BLCD motor with PWM speed control is higher than AC motor with transformer or inverter speed control: by approximately 40%
- Delta EC Fan offers approxi-mate double the efficiency comparing to the traditional AC Fan



Thermal Management UV-LEDs

Disinfection and Purification with UV-C LEDs



Profile Heat Sinks UV A / B / C



Key Features & Benefits

- High power dissipation
- Convection possibility must be available
- Complex applications

Stamped Heat Sinks UV A / (B)



Key Features & Benefits

- Low power dissipation
- Less reradiation
- Limited space for heat sinks

Pin Heat Sinks UV A / B



Key Features & Benefits

- Medium power dissipation
- Convection possibility
- Simple application

Air Cooling UV A / B / C



Key Features & Benefits

- High power dissipation
- For poor free natural convection
- Limited space for heat sinks

Cold Plates UV A / B / C



Key Features & Benefits

- Very high-power dissipation
- Specific applications (e.g. industrial requirements or disinfection)

Cooling solutions can only be selected on the base of the final application. Successful cooling solutions for UV-LEDs always will be customized according to the specific application. The choice of the cooling solution depends on the heat to be dissipated, the size and number of LEDs used.

Most Important Factors

LED Features	Application	Cooling Solution	Advantages	Disadvantages
<ul style="list-style-type: none"> • Size • Quantity • Single / Array • Power Type • Thermal conditions • Operating temperature 	<ul style="list-style-type: none"> • Case / housing • Temperature requirements • Air flow within application • Space requirements • Special requirements 	Passive <ul style="list-style-type: none"> • Profile heat sinks • Pin heat sinks • Stamped heat sinks 	<ul style="list-style-type: none"> • High cooling capacity • Noiseless • No vibrations / shocks • No additional maintenance • Good for customization 	<ul style="list-style-type: none"> • More space needed within application
		Active <ul style="list-style-type: none"> • Fans • Liquid cold plates 	<ul style="list-style-type: none"> • Very high cooling capacity • High efficiency • Small space requirements • Integration into existing cooling solutions 	<ul style="list-style-type: none"> • Additional maintenance • Noise & dust possible • Vibrations or shocks possible

UV Sensors

AS7331: UV Sensor Chip



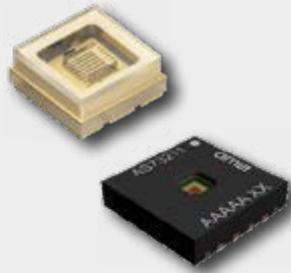
The AS 7331 enables the detection of microorganism concentration and the optimization of disinfection due to dose adjustment according to water purity. Regarding the water quality in washing machines, the optimization of washing cycle and detergent dose adjustment is made possible.

Features & Benefits

- Interference filter technology
- UVA/B/C filter characteristic (238nm - 415nm)
- 250M:1 dynamic range (16...24 Bit ADC) with a sensitivity up to 2.1m counts/($\mu\text{W}/\text{cm}^2$)
- Temp. range from -40 up to 125°C, Temp. compensation on chip
- Radiation measurements (reflection, transmission) from low radiation to bright radiation conditions
- Fast/high accurate radiation and fluorescence detection
- Usability in harsh environments

Applications

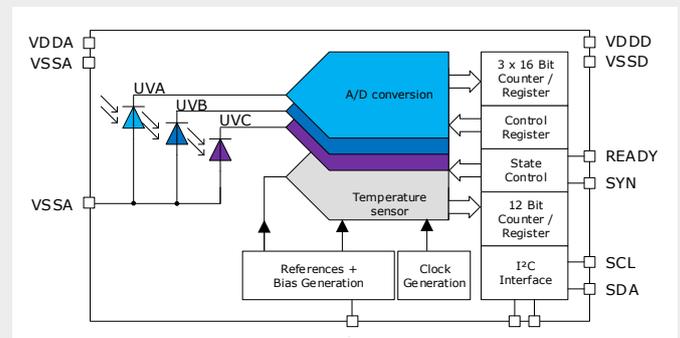
- Target applications
- Water purifiers
- Water purification systems
- Washing machines
- Dishwashers



Features

- EVK platform for use case evaluations and developments
- USB interface, housing
- EEPROM on sensor board
- Optical adapter (0/45°) for light metering & reflective measurem.
- Easy prototyping of optical stacks
- Evaluation software GUI for sensor configuration, spectral data acquisition, visualization, export and post processing

Functional Blockdiagram



Detectors for UV Radiation Monitoring

Given the potential health hazard UV radiation poses, these SiC UV photodiodes are indispensable for monitoring your application.



Benefits

- Solar blind: No reaction to visible light
- Large wavelength range: UVA, UVB, and UVC
- Robust: Radiation doses of up to 1,000 W/m²; temperatures from cold space to hot oven (250 °C)
- Ultra-sensitive: Hybrid versions with large dynamic range of up to 0.26 $\mu\text{W}/\text{cm}^2$



LTR-390UV-01: Optical UV Sensor



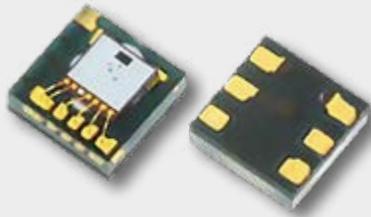
The LTR-390UV-01 is an ambient light sensor (ALS) and a ultraviolet light sensor (UVS) in a single miniature 2x2mm chip led SMD package. It provides a linear ALS response over a wide dynamic range of 1:18,000,000. The sensor has a programmable interrupt with hysteresis to response to events, removing the need to poll the sensor for a reading and improving system efficiency. This CMOS design and factory-set one time trimming capability ensure minimal sensor-to-sensor variations for ease of manufacturability to the end customer.

Features & Benefits

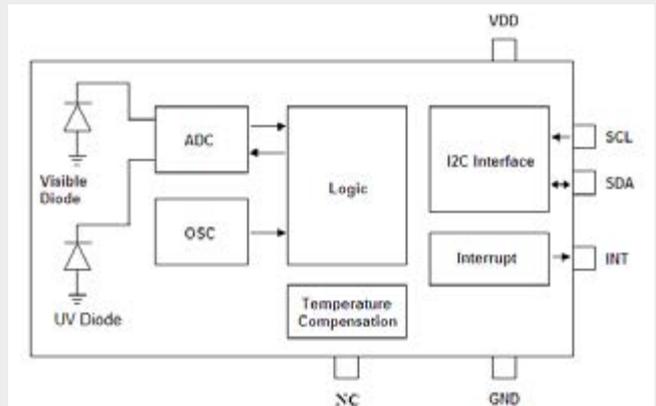
- I²C interface capable of Standard mode @100kHz or fast mode @400kHz communication; 1.8V logic compatible.
- Low power consumption with sleep mode capability.
- UVS/ALS Features: 13 to 20 bits effective resolution; Close to human eye spectral response; Automatic rejection for 50Hz/60Hz lighting flicker.

Applications

- Effectively protecting people from sunburns, cancer or eye damage.
- Brightness and color control of display panels in mobile, computing and consumer device.



Functional Block Diagram



LTR-390UV-01 contains 2 integrated photodiodes (ALS/UVS) for respective photocurrent measurements.

The photodiode currents are converted to digital values by ADCs. The sensor also includes some peripheral circuits such as an internal oscillator and voltage reference.

ML8511A: UV Sensor with Voltage Output



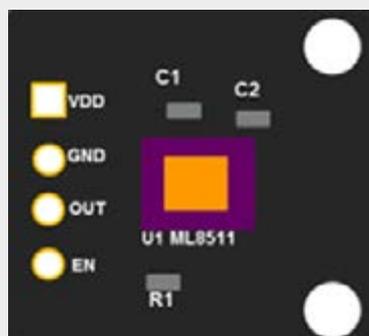
The ML8511A is a UV sensor, which is suitable for acquiring UV intensity indoors or outdoors.

The ML8511A is equipped with an internal amplifier, which converts photo-current to voltage depending on the UV intensity. This unique feature offers an easy interface to external circuits such as ADC. In the power down mode, typical standby current is 0.1µA, thus enabling a longer battery life.

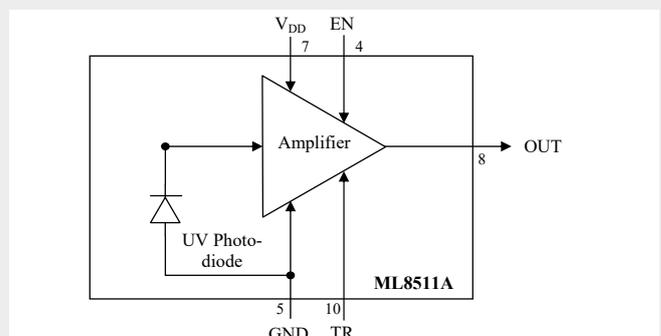
Features

- Photodiode sensitive to UV-A and UV-B
- Embedded operational AMP
- Analog voltage output
- Low supply current (300µA typ.) and low standby current (0.1µA typ.)
- Small and thin surface mount package (4.0mm x 3.7mm x 0.73mm, 12-pin ceramic QFN)

Board Layout



Block Diagram



Pin	Symbol	I/O	Function
7	VDD	PW	Supply voltage. Decouple this pin to ground with 0.1 µF cap.
5	GND	PW	Ground
4	EN	I	Active high enable pin. (High: Active mode, Low: Standby mode)
8	OUT	O	Output (Low in power down or standby mode)
10	TR	I/O	Internal ref. voltage. Decouple this pin to ground with 1 nF cap.

Applications

- Smart phone
- Smart watch
- Wearable healthcare device
- Weather station
- Bicycle navigation
- Accessory



VOC Sensor SGP40

Air Quality Sensor (Particulate Matter)



The SGP40 is an integrated CMOSens® sensor system on a single chip based on a metal-oxide sensor. By relying on Sensirion's proven MOXSens® Technology, the sensor's unmatched robustness against contamination by siloxanes results in outstanding long-term stability in terms of sensitivity and response time. Pushing the sensing material and micro-hotplate technology to the next level, the SGP40 offers a drastic reduction in power consumption, making it suitable for battery-driven applications as well. Sensirion's industry-leading production processes guarantee high reproducibility and reliability and help enabling accurate measurements of Volatile Organic Compounds (VOC) to improve IAQ and your quality of life. The VOC Index indicates to what extent the indoor air quality has deteriorated or improved compared to the sensor's average VOC environment. This information can be used, e.g., for gradually controlling the fan of an air treatment device or to provide users with feedback on their daily activity profile.

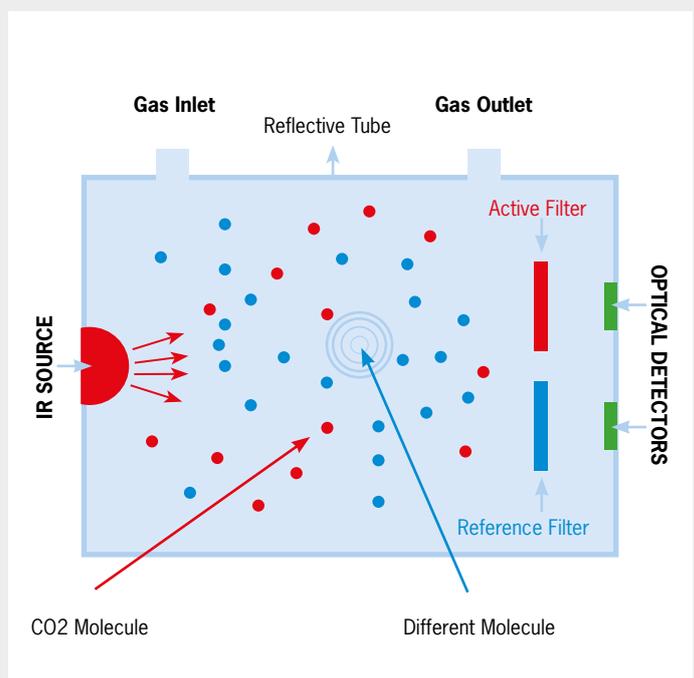
Features

- Complete sensor solution for detecting VOC events with a simple interface, powerful VOC Algorithm, easy integration of driver package and on-chip humidity compensation
- Proven performance improved shown by low device-to-device variation under field or lab conditions in the 2nd generation and fast start-up behavior
- Reliable and accurate long-term user experience with robust and reliable hardware, stable and repeatable signal output over lifetime, smart adaptation to any indoor environment and an excellent longevity of > 10 years

Electrical Specifications

Supply Voltage Range		1.7 - 3.6 V
Idle Current		34 µA
Current consumption during operation	at 1.8 V	3.5 mA
	at 3.3 V	2.6 mA
Interface		I ² C

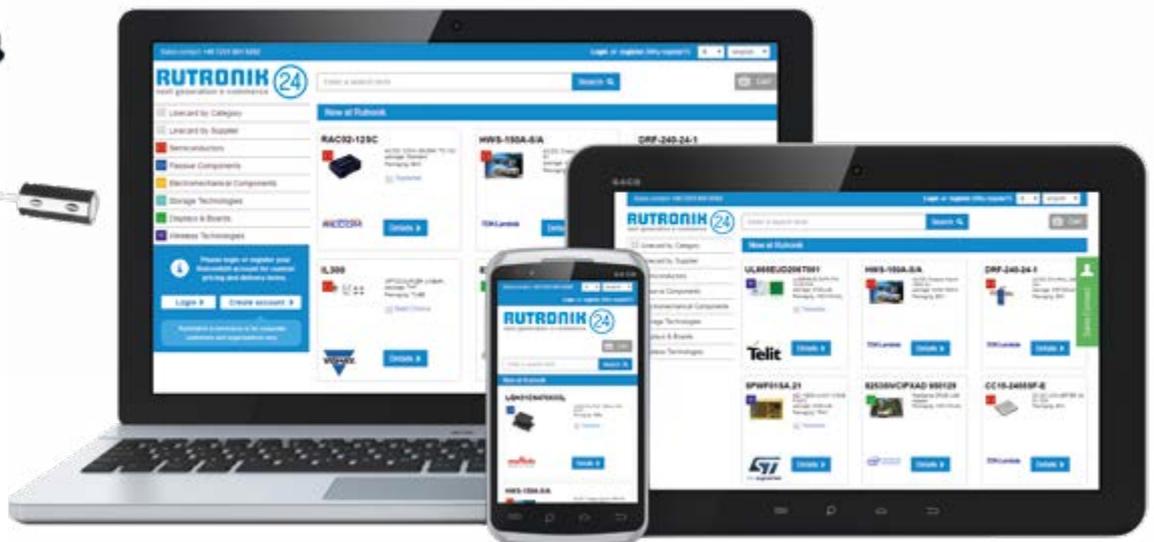
CO₂ VOC Sensor NDIR Measuring Principle



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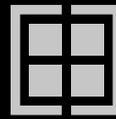


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