Water, Air and Surface Purification by UV LEDs

Best Fit for Smart, Integrated and Intelligent Disinfection Systems
Driver, Fan, Lens, Cooler, VOC, UV, TOF and PIR Sensors
Consult – Know-how. Built-in.
The Technical Competence from RUTRONIK
Worldwide and individual consulting on the spot: by competent sales staff, application engineers and product specialists.

The Delivery Service from RUTRONIK
Innovative and flexible solutions: from supply chain management to individual logistics systems.

The Product Portfolio from RUTRONIK
Wide product range of semiconductors, passive and electromechanical components, displays & monitors, boards & systems, storage and wireless technologies for optimum coverage of your needs.

Quality without Compromise from RUTRONIK
The integrated management system (IMS) encompasses quality control, information security, environmental protection, occupational health and safety.

Our Product Portfolio

- Semiconductors
- Passive Components
- Electromechanical Components
- Displays & Monitors
- Boards & Systems
- Storage Technologies
- Wireless Technologies

Our Initiatives

- RUTRONIK AUTOMOTIVE
- RUTRONIK EMBEDDED
- RUTRONIK POWER
- RUTRONIK SMART

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VLMU3520... Series and VLMU35C... Series

Stanley
Deep UV 265 nm - ZEUBE265 Devices

AMS Osram
Using Light to Fight Viruses

Lextar
UVC Module for Water, Air and Surface Purification

Murata
Pyroelectric Infrared Sensor and Lens of IRA-S Series

Panasonic
Passive Infrared Motion Sensors - PaPIRs

Ledil
Optics for UV Applications

AMS Osram
OPTOTRONIC LED Drivers

Recem
LED Drivers for Integrated Lighting

Infineon
DC/DC LED Driver ICs

Adda, Delta, Jamicon
Fan Portfolio

Assmann WSW
Thermal Management UV-LEDs

AMS Osram, Laser Components, Liteon, Rohm
Accessories for UV-LEDs: Sensors

Sensirion
VOC Sensor SGP40

RUTRONIK24
**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)

**Ultraviolet Applications Depending of Wavelength**

**Passive Solutions**
- Filters (Hepa, Activated Carbon, Ceramic ...)
- Based on the storage effect
  (the pollutants are only retained, but not destroyed)
- Maintenance needed

**Active Solutions**
- Ozone Generator (Ioniser and Plasma Systems)
- Ozone is harmful for Human Health
- Hazardous Air Pollutants

**Chemical Products**
- (Chlorine...)
- Pathogen resistant
- Only for static situation (no flow)
- Produces Volatile Hydrocarbons
  (Chlorine Dioxide...)

**UV-Light** (UV-LEDs and Traditional Mercury Vapor Lamps)
- No Volatile Hydrocarbons
- No Hazardous Air Pollutants
- Dangerous in open system (Human Body Radiation)
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
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.
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
- Deodoration
- Mold growth reduction

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Output Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKB-35</td>
<td>UVC LED, typ. 255 nm ±5 nm, 38 mW @ 350 mA &amp; 5.9 V, SMD3535, 120 ° Viewing Angle</td>
<td>38 mW</td>
</tr>
<tr>
<td>PKC-50</td>
<td>UVC LED, typ. 265 nm ±5 nm, 90 mW @ 500 mA &amp; 6.5 V, SMD3535, 120 ° Viewing Angle</td>
<td>90 mW</td>
</tr>
<tr>
<td>56060</td>
<td>UVC LED, typ. 272 nm +6/-7 nm, 100 mW @ 250 mA &amp; 6-7 V, SMD6060, 150 ° Viewing Angle</td>
<td>100 mW</td>
</tr>
<tr>
<td>PKD-50</td>
<td>UVC LED, typ. 275 nm ±5 nm, 100 mW @ 500 mA &amp; 6.4 V, SMD3535, 120 ° Viewing Angle</td>
<td>100 mW</td>
</tr>
<tr>
<td>PKE-50</td>
<td>UVC LED, typ. 295 nm ±5 nm, 100 mW @ 500 mA &amp; 6.4 V, SMD3535, 120 ° Viewing Angle</td>
<td>100 mW</td>
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<tr>
<td>PKF-50</td>
<td>UVC LED, typ. 308 nm ±5 nm, 100 mW @ 500 mA &amp; 6.4 V, SMD3535, 120 ° Viewing Angle</td>
<td>100 mW</td>
</tr>
<tr>
<td>252P S6060 UVC SMD LED array</td>
<td>2S2P SMD UVC LED Array, typ. 272 nm +6/-7 nm, 360mW @ 250 mA/Chip, Lensed LEDs 150 °</td>
<td>360mW</td>
</tr>
<tr>
<td>354P S6060 UVC SMD LED array</td>
<td>3S4P SMD UVC LED Array, typ. 272 nm +6/-7 nm, 1.2W @ 250 mA/Chip, Lensed LEDs 150 °</td>
<td>1.2W</td>
</tr>
<tr>
<td>555P S6060 UVC SMD LED array</td>
<td>5S5P SMD UVC LED Array, typ. 272 nm +6/-7 nm, 2W @ 250 mA/Chip, Lensed LEDs 150 °</td>
<td>2W</td>
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</table>
VLMU3520... Series and VLMU35C*2*... Series
Ceramic Based UVC LED Series with Higher Power and Narrower Binning

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

Technology Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>UV LED</th>
<th>Mercury Lamp</th>
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</thead>
<tbody>
<tr>
<td>Life cycle</td>
<td>25 k Hours</td>
<td>10 k Hours</td>
</tr>
<tr>
<td>Environmental</td>
<td>No heavy metals</td>
<td>Unfriendly</td>
</tr>
<tr>
<td>Security</td>
<td>Low voltage, simple drive circuit</td>
<td>Shock sensitive</td>
</tr>
<tr>
<td>Energy</td>
<td>Low power consumption</td>
<td>Higher power consumption</td>
</tr>
</tbody>
</table>

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

VLMU35C*2* - Series

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Status</th>
<th>Color</th>
<th>Radiant Power (mW)</th>
<th>Wavelength (nm)</th>
<th>Forward Voltage (V)</th>
<th>AT IF (mA)</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLMU35CB20-275-120</td>
<td>OLD</td>
<td>UVC</td>
<td>7</td>
<td>270-277</td>
<td>5.00-6.50</td>
<td>100</td>
<td>AlGaN</td>
</tr>
<tr>
<td>VLMU35CB20-275-120 UPDATE</td>
<td></td>
<td></td>
<td>10</td>
<td>270-273</td>
<td>5.00-6.00</td>
<td>120</td>
<td>AlGaN</td>
</tr>
<tr>
<td>VLMU35CB21-275-120</td>
<td>NEW</td>
<td>UVC</td>
<td>12</td>
<td>270-273</td>
<td>5.00-6.20</td>
<td>120</td>
<td>AlGaN</td>
</tr>
<tr>
<td>VLMU5CST20-275-120</td>
<td>OLD</td>
<td>UVC</td>
<td>12.5</td>
<td>270-277</td>
<td>5.00-6.50</td>
<td>150</td>
<td>AlGaN</td>
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<tr>
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<td>16.5</td>
<td>270-274</td>
<td>5.00-6.30</td>
<td>180</td>
<td>AlGaN</td>
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<tr>
<td>VLMU5CST21-275-120</td>
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<td>UVC</td>
<td>18.5</td>
<td>270-274</td>
<td>5.00-6.30</td>
<td>180</td>
<td>AlGaN</td>
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</table>

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
<th>Color</th>
<th>Radiant Power (mW)</th>
<th>Wavelength (nm)</th>
<th>Forward Voltage (V)</th>
<th>AT IF (mA)</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLMU3520-385-060</td>
<td>SMD</td>
<td>Ultra-violet</td>
<td>740</td>
<td>380-385</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
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<tr>
<td>VLMU3520-395-060</td>
<td></td>
<td></td>
<td>740</td>
<td>390-395</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
</tr>
<tr>
<td>VLMU3520-405-060</td>
<td></td>
<td></td>
<td>740</td>
<td>400</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
</tr>
<tr>
<td>VLMU3530-385-120</td>
<td>SMD</td>
<td>Ultra-violet</td>
<td>780</td>
<td>380-385</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
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<tr>
<td>VLMU3530-405-120</td>
<td></td>
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<td>780</td>
<td>390-395</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
</tr>
<tr>
<td>VLMU3530-395-120</td>
<td></td>
<td></td>
<td>780</td>
<td>400</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
</tr>
<tr>
<td>VLMU3530-405-120</td>
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<td>780</td>
<td>400</td>
<td>3.2-3.6</td>
<td>500</td>
<td>InGaN</td>
</tr>
</tbody>
</table>
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

UVA - 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Mid-Power type</th>
<th>Units</th>
</tr>
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<tbody>
<tr>
<td>Part No.</td>
<td>NDU1104ESE series</td>
<td></td>
</tr>
<tr>
<td>Wavelength (λ)</td>
<td></td>
<td>nm</td>
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<tr>
<td>Light Output (P)</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Forward Voltage (V)</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Spatial Distribution</td>
<td></td>
<td>deg.</td>
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<tr>
<td>Thermal Resistance (Rth)</td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>Max Forward Current (IF)</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Junction Temperature (Tj)</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
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<td>°C</td>
</tr>
<tr>
<td>Size</td>
<td>LxWxH</td>
<td>mm</td>
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<tr>
<td>365</td>
<td>385</td>
<td>395</td>
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<tr>
<td>950</td>
<td>1,100</td>
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<tr>
<td>3.6</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>201/2</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10 to 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40 to 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5x3.5x2.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All the functions can be applied in several different fields for various purposes.
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.

**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

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

**OSLON UV Series**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Type</td>
<td>Low Power Output</td>
<td>Mid Power Output</td>
<td>Mid Power Output</td>
</tr>
<tr>
<td>Shape</td>
<td></td>
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</tr>
<tr>
<td>Radiant flux (mW)</td>
<td>4.7</td>
<td>13.5</td>
<td>42</td>
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<tr>
<td>Peak wavelength (nm)</td>
<td>275</td>
<td>275</td>
<td>275</td>
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<tr>
<td>Emission Angle (°)</td>
<td>120</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Voltage (V)</td>
<td>6.0</td>
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<td>5.7</td>
</tr>
<tr>
<td>Binning Current (mA)</td>
<td>30</td>
<td>100</td>
<td>350</td>
</tr>
<tr>
<td>Max. Current (mA)</td>
<td>40</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>Wall Plug Efficiency (%)</td>
<td>2.6</td>
<td>2.1</td>
<td>2.1</td>
</tr>
</tbody>
</table>
UVC LED 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.

<table>
<thead>
<tr>
<th>Model</th>
<th>LBM1101</th>
<th>LBM3502</th>
<th>LBM1801</th>
<th>LBM1802</th>
<th>LBM3501</th>
<th>LBM4201</th>
<th>LBM6301</th>
<th>LBM3601</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Static</td>
<td>Static</td>
<td>Static</td>
<td>Static</td>
<td>Static</td>
<td>Static</td>
<td>Static</td>
<td>Static</td>
</tr>
<tr>
<td>Static Tank Size/ Dynamic Flow Rate</td>
<td>1-2 L</td>
<td>1.5 L</td>
<td>1-10 L</td>
<td>1-10 L</td>
<td>0.2 L/min</td>
<td>1-2.5 L/min</td>
<td>6-8 L/min</td>
<td>2-10 L/min</td>
</tr>
<tr>
<td>Dimension</td>
<td>Φ11.3 x 8 mm</td>
<td>Φ18 x 27 mm</td>
<td>Φ25 x 122 mm</td>
<td>Φ35 x 12 mm</td>
<td>Φ35 x 100 mm</td>
<td>Φ42 x 128 mm</td>
<td>Φ63 x 145 mm</td>
<td>Φ36 x 110 mm</td>
</tr>
<tr>
<td>Applications</td>
<td>Water dispenser tank</td>
<td>Dehumidifier water tank</td>
<td>Fish tank</td>
<td>Tumbler</td>
<td>Water purifier waterway</td>
<td>Water dispenser waterway</td>
<td>Smart toilet</td>
<td>Coffee machine</td>
</tr>
<tr>
<td>Disinfection Efficiency (E. coli)</td>
<td>&gt;Log3 (99.9%)</td>
<td>&gt;Log3 (99.9%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### 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

<table>
<thead>
<tr>
<th>End Product / Current</th>
<th>20mA</th>
<th>350mA</th>
<th>500mA</th>
<th>1000mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UVA LED Package</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### UVC LED Package

**High Power/ Air Disinfection**
- Ultra high radiant intensity
- High flow rate (> 2 L/min)

**Mid Power Water Disinfection**
- High radiant intensity
- Low flow rate (1-2 L/min)

**Surface Disinfection**
- Wide angle
- High performance/ Cost ratio
- Static state

**Lifetime**: L70 > 10000 hrs | L50 > 20000 hrs

<table>
<thead>
<tr>
<th>End Product / Current</th>
<th>20mA</th>
<th>100mA</th>
<th>200mA</th>
<th>350mA</th>
<th>500mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UVC LED Package</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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
- Design-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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Status</th>
<th>Field of View</th>
<th>Electrode</th>
<th>Shape</th>
<th>Responsivity (typ.)</th>
<th>Optical Filter</th>
<th>Operating Temp. Range</th>
<th>Storage Temp. Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRA-6200ST01A01</td>
<td>In Production (Recommended)</td>
<td>theta1=theta2=45deg.</td>
<td>(2.0x1.0mm)x2</td>
<td>Lead</td>
<td>4.6mV</td>
<td>5 micro meter</td>
<td>-40 to 70 °C</td>
<td>-40 to 85 °C</td>
</tr>
<tr>
<td>IRA-6210ST01</td>
<td></td>
<td>theta1=theta2=45deg.</td>
<td>(2.0x1.0mm)x2</td>
<td>Lead</td>
<td>4.6mV</td>
<td>5 micro meter</td>
<td>-40 to 70 °C</td>
<td>-40 to 85 °C</td>
</tr>
<tr>
<td>IRA-6220ST01A01</td>
<td></td>
<td>theta1=theta2=45deg.</td>
<td>(2.0x1.0mm)x2</td>
<td>Lead</td>
<td>4.6mV</td>
<td>5 micro meter</td>
<td>-40 to 70 °C</td>
<td>-40 to 85 °C</td>
</tr>
<tr>
<td>IRA-6230ST01</td>
<td></td>
<td>theta1=theta2=45deg.</td>
<td>(2.0x1.0mm)x2</td>
<td>Lead</td>
<td>4.6mV</td>
<td>5 micro meter</td>
<td>-40 to 70 °C</td>
<td>-40 to 85 °C</td>
</tr>
<tr>
<td>IRS-B210ST01-R1</td>
<td>Discontinued</td>
<td>theta1=50deg..theta2=70deg.</td>
<td>(1.2x0.85mm)x2</td>
<td>SMD</td>
<td>3.6mV</td>
<td>3 micro meter</td>
<td>-40 to 70 °C</td>
<td>-40 to 85 °C</td>
</tr>
<tr>
<td>IRS-B345ST03-R1</td>
<td></td>
<td>theta1=70deg..theta2=50deg.</td>
<td>(0.8x0.7mm)x2</td>
<td>SMD</td>
<td>3.6mV</td>
<td>3 micro meter</td>
<td>-40 to 70 °C</td>
<td>-40 to 85 °C</td>
</tr>
</tbody>
</table>
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 μA, 2 μA and 6 μA; digital output) and the EKMC series (170 μA; 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 μA) and EKMC (170 μA) Series

<table>
<thead>
<tr>
<th>Aesthetic integration - Flat Square Type</th>
<th>Wide Area &amp; Ultra Slight Motion Detection</th>
<th>Low Profile Type, small and powerful</th>
<th>High Density Long Distance Type, the smallest long range sensor</th>
<th>Standard Detection Type, the bestseller</th>
</tr>
</thead>
<tbody>
<tr>
<td>With its flat and square lens, the pyroelectric passive infrared motion sensor allows an aesthetically pleasing product design.</td>
<td>Passive Pyroelectric Infrared motion sensors EKMB/EKMC with small 14mm lens for detection in large areas or small objects and movements</td>
<td>The Low Profile Type, small and powerful! For maximum detection distances up to 5m and typical ceiling installation heights up to 3m.</td>
<td>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.</td>
<td>The Standard Detection Type, the bestseller! The unobtrusive, flat lens serves detection distances up to 5m and typical ceiling installation heights up to 3m.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wall Installation (corner) Type, the powerful room monitoring sensor</th>
<th>Long Distance Detection Type, the powerful mid-bay sensor!</th>
<th>Slight Motion Detection Type, the powerful indoor sensor</th>
<th>Standard and Slight Motion Detection Type</th>
<th>Horizontally Wide Detection Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>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.</td>
<td>The Slight Motion Detection Type, the powerful indoor sensor. For typical ceiling installation height of up to 3m.</td>
<td>The Standard and Slight Motion Detection Type, has two zones optimized for different movement patterns. For typical ceiling installation height of up to 3m.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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, degeneration.

**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

---

**Reflectance %**

![Graph showing reflectance % across different wavelengths for LEDiL Silicone and Aluminium](chart.png)
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
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 VAC)
- Low standby consumption (ErP conform)
- 3kVAC double insulated isolation
- Wired or screw terminal connections
- IP64 rated (RACD03)
- Both compact and low profile packages available

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

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
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 ± 3%
- Up to 2 MHz switching frequency
- Low typical $R_{DS(on)}$ of 275 mΩ
- Soft-start to protect primary side
- External shunt resistor connected to GND to set LED target current
- Low power shutdown pin
- Overtemperature protection, UVLO

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Description</th>
<th>Adjustable current range</th>
<th>Voltage drop</th>
<th>Breakdown voltage</th>
<th>Protections</th>
<th>Package total power dissipation</th>
<th>Dimming</th>
<th>Qualification</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCR401W</td>
<td>Linear LED driver IC</td>
<td>10 – 60 mA</td>
<td>1.2 V</td>
<td>18 V</td>
<td>Negative thermal coefficient</td>
<td>500 mW</td>
<td>Ext. Digital transistor required, bus voltage</td>
<td>AEC Qualified</td>
<td>SOT-343</td>
</tr>
<tr>
<td>BCR402W</td>
<td>Linear LED driver IC</td>
<td>10 – 65 mA</td>
<td>1.4 V</td>
<td>40 V</td>
<td></td>
<td>750 mW</td>
<td></td>
<td>SC-74</td>
<td></td>
</tr>
<tr>
<td>BCR401U</td>
<td>Linear LED driver IC</td>
<td>10 – 250 mA</td>
<td>1.4 V</td>
<td>25 V / 40 V</td>
<td></td>
<td>1000 mW</td>
<td>PWM dimming via enable pin, bus voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCR402U</td>
<td>Linear LED driver IC</td>
<td>10 – 250 mA</td>
<td>1.4 V</td>
<td>25 V / 40 V</td>
<td></td>
<td>1000 mW</td>
<td>PWM dimming via enable pin, bus voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCR450</td>
<td>Linear LED controller IC</td>
<td>50 mA – 1 A</td>
<td>0.5 V</td>
<td>27 V</td>
<td>Thermal shut down at 120 °C</td>
<td>Depends on transistor</td>
<td>PWM dimming via EN pin</td>
<td>Industrial</td>
<td>SC-74</td>
</tr>
<tr>
<td>BCR430U</td>
<td>Linear LED driver IC</td>
<td>20 – 100 mA</td>
<td>0.135 V at 50 mA</td>
<td>42 V</td>
<td>Smart temperature controlling circuit</td>
<td>600mW</td>
<td>PWM dimming via $R_{ON}$ pin, bus voltage</td>
<td>SOT-23-6</td>
<td></td>
</tr>
<tr>
<td>BCR431U</td>
<td>Linear LED driver IC</td>
<td>8 – 37 mA</td>
<td>0.345 V at pin $V_{th}$</td>
<td>42 V</td>
<td></td>
<td>600mW</td>
<td>PWM dimming via $R_{ON}$ pin, bus voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCR601</td>
<td>Linear LED controller IC</td>
<td>Bipolar or NMOS transistor up to x A</td>
<td>0.345 V at pin $V_{th}$</td>
<td>60 V</td>
<td>Voltage feedback to primary side, DVP, OTP, Hotplug</td>
<td>360 mW</td>
<td>Analog down to 3 % and PWM dimming down to 1 %</td>
<td>Analog down to 3 % and PWM dimming down to 1 %</td>
<td>SC-74</td>
</tr>
<tr>
<td>BCR602</td>
<td>Linear LED controller IC</td>
<td>Bipolar or NMOS transistor up to x A</td>
<td>0.345 V at pin $V_{th}$</td>
<td>60 V</td>
<td></td>
<td>360 mW</td>
<td></td>
<td>DSO-8</td>
<td></td>
</tr>
</tbody>
</table>

*Note: The table above provides a summary of the specifications and features of the different models of the BCR series. The specific model name, description, adjustable current range, voltage drop, breakdown voltage, protections, package total power dissipation, dimming, qualification, and size are listed for each model.*
Fan Portfolio
Best Fit for Project Odor Killer and Germ Contamination Applications

### DC Fan
- **Key Features**
  - Bearing: Dual Ball, Sleeve, Ball
  - Rated Voltage: 5 – 48 V
  - Air Flow: 0.2 – 290 CFM
  - Speed: 900 – 26500 R.P.M
  - Lifetime: 50 K – 100 K hours
  - Size: 25 x 25 – 172 x 51 mm
- **Key Applications**
  - Interior Vehicle
  - Small portable device
- **Key Benefits**
  - Compact design
  - Longevity (Dual Ball Bearing)
  - Wide range of sizes

### AC Fan
- **Key Features**
  - Bearing: Longlife Ball
  - Rated Voltage: 110 – 240 VAC
  - Lifetime: 50 K – 70 K hours
  - Size: 60 – 250 mm
- **Key Applications**
  - Indoor
- **Key Benefits**
  - Compact design
  - Longevity (Dual Ball Bearing)
  - Wide range of sizes

### 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?
- **DC Fan**
  - 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**
  - 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**
  - 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 approximate double the efficiency comparing to the traditional AC Fan
Thermal Management UV-LEDs
Disinfection and Purification with UV-C LEDs

Key Features & Benefits
- High power dissipation
- Convection possibility must be available
- Complex applications

Key Features & Benefits
- Low power dissipation
- Less reradiation
- Limited space for heat sinks

Key Features & Benefits
- Medium power dissipation
- Convection possibility
- Simple application

Key Features & Benefits
- High power dissipation
- For poor free natural convection
- Limited space for heat sinks

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

<table>
<thead>
<tr>
<th>LED Features</th>
<th>Application</th>
<th>Cooling Solution</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Case / housing</td>
<td>Passive</td>
<td>- Profile heat sinks</td>
<td>- More space needed within application</td>
</tr>
<tr>
<td>Quantity</td>
<td>Temperature requirements</td>
<td></td>
<td>- Pin heat sinks</td>
<td></td>
</tr>
<tr>
<td>Single / Array</td>
<td>Air flow within application</td>
<td></td>
<td>- Stamped heat sinks</td>
<td></td>
</tr>
<tr>
<td>Power Type</td>
<td>Space requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal conditions</td>
<td>Special requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Active
- Fans
- Liquid cold plates
- Very high cooling capacity
- High efficiency
- Small space requirements
- Integration into existing cooling solutions
- 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/(µW/cm²)
- 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

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

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

Functional Block diagram

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 µW/cm²
**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-pled SMD package. It provides a linear ALS response over a wide dynamic range of 1:18,000,000. The sensor has a program-mable interrupt with hysteresis to response to events, removing the need to poll the sensor for a reading and improving sys-tem efficiency. This CMOS design and factory-set one time trimming capability ensure minimal sensor-to-sensor varia-tions 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 stand-by current (0.1μA typ.)
- Small and thin surface mount package (4.0mm x 3.7mm x 0.73mm, 12-pin ceramic QFN)

**Applications**

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

**Block Diagram**

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage Range</td>
<td>1.7 - 3.6 V</td>
</tr>
<tr>
<td>Idle Current</td>
<td>34 μA</td>
</tr>
<tr>
<td>Current consumption during operation</td>
<td></td>
</tr>
<tr>
<td>at 1.8 V</td>
<td>3.5 mA</td>
</tr>
<tr>
<td>at 3.3 V</td>
<td>2.6 mA</td>
</tr>
<tr>
<td>Interface</td>
<td>I2C</td>
</tr>
</tbody>
</table>
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