LUMITRONIX®
High-Performance LED-Technologies & Solutions

CASE STUDIES – The success stories of our customers

LED product development and production by LUMITRONIX®

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LUMITRONIX® High-Performance LED-Technologies

Leading competence in LEDs

For years already LUMITRONIX® has been specialised in LEDs and LED products. We are a competent partner for the industry and provide a wide range of application knowledge from various fields.

As a manufacturer-neutral distributor LUMITRONIX® LED-Technik GmbH stands for quality and service in the fields of LEDs and LED solutions. In doing so, LUMITRONIX® does not restrict itself to trading, but also develops and produces many products in-house – Quality made in Germany.

We provide certified quality!

With LUMITRONIX® you have a partner you can rely on. Our quality management is certified in accordance with DIN EN ISO 9001 and involves all areas – from product development to customer service.

The well-being of its employees is an important concern for LUMITRONIX®. Our commitment to occupational and social safety regulations goes far beyond the statutory requirements.

LUMITRONIX® has an in-house test laboratory. All our products go through intensive testing and only products with the best price-performance-ratio and product characteristics make it into our portfolio. We put utmost emphasis on the quality and durability of our products.

At our test stations we perform internationally standardised comparison measurements and record luminous flux, light intensity, radiation angle, power-light-efficiency, wave length, colour temperature, spectral distribution, etc.

No module manufactured by us will leave our house without quality control.

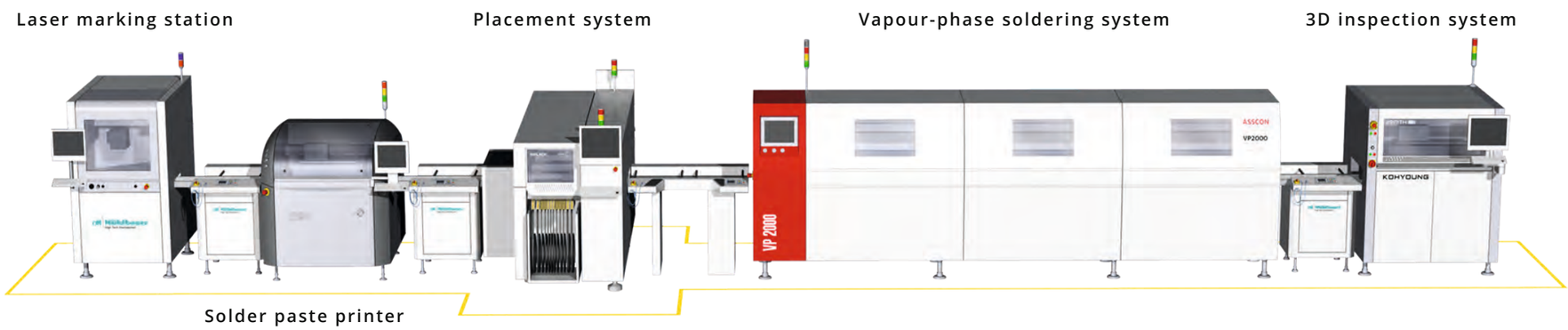
CASE STUDIES

Some case studies for successful LUMITRONIX® product developments - created exactly according to special customer guidelines and requirements – from page 6.

Development, Production and Distribution

All from one source

In our in-house assembly line, high performance automatic placement machines place large and small components in an extremely fast and precise way. The vapour-phase soldering machine improves by its extraordinarily gentle soldering process the thermal connection of component and PCB. Our new 3D in-line inspection system reliably recognizes components that are missing, incorrectly mounted, twisted or offset. The 4-way projection technology enables the best possible measurement coverage for high resolution.



Our development engineers design modules and control technology according to your requirements and matched to your applications such as luminaries, inspection machines, status displays, light modules for domestic appliances and many more.

The complete production process can be customised to your requirements and is to a large extent automated. Production lots can can be traced back accurately to the bin. Accurately to the Bin. This is of particular importance for industrial applications that continually require the same brightness, colour or voltage for a long period of time.

CASE STUDY

LUMITRONIX® LED modules for lighting extractor hoods when cooking

Enlightenment while cooking

BACKGROUND

Our client develops and produces extractor hoods and ventilation systems in Germany. Thanks to their high level of innovation, the extraction fans work more quietly, considerably more efficiently and in a significantly more energy-saving way. Another unique selling point is the oustanding design of the extractor fan – lighting plays an important role here.

REQUIREMENTS

- Efficient and long-lasting LEDs
- Use for stove and mood lighting
- High flexibility when using the LED modules
- Class A energy efficiency
- Visible colour deviations inadmissible

REALISATION

- Development of several LED modules of different lengths
- Homogeneous lighting area with narrow binning and a consistant LED gap
- The simplest combination thanks to plug connector
- Use of long life Nichia LEDs and production of the LED modules in the same place
- 5 year warranty, made in Germany

HIGHLIGHTS

In close collaboration with the client, we were able to develop a suitable lighting concept.

Lumitronix® is also advising the client on lighting concepts for extractor fans, which are being redeveloped.
An extractor fan is thus currently being made, which can set the colour temperature of the stove lighting continuously (tunable white).

TECHNICAL DATA

Ten different modules

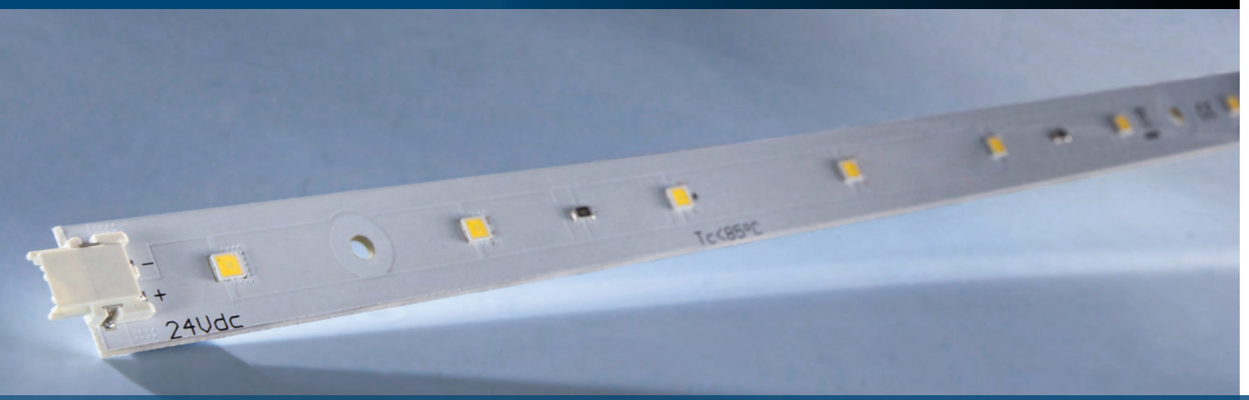
Techn. details exemplary for a module:

Dimensions	500 x 18 mm
PCB material	FR4
LED	49 x Nichia 157 Series
Input voltage	24 V
Typical power	6.5 W
Typical brightness	630 lm

CASE STUDY

LUMITRONIX® LED modules for aquarium lighting

Under water world in its best light



BACKGROUND

Our client is one of the market leaders for the manufacture of freshwater and saltwater aquariums as well as aquarium accessories. The product series has been constantly developing and modernising for 50 years.

A new and modern lighting concept was sought for entry-level aquariums, which would be characterised by its modernity and efficiency and which the manufacturer would present as highly modern.

REQUIREMENTS

- Aquariums need very specific lighting colours depending on their use.
- Aquariums have different lengths and sizes.
- Maximum of 24 V supply (higher voltage is not allowed for aquariums)
- Module with different light colours with LEDs from the same series (consistent footprint)
- Light flux expected by the client is 800 lm for the smallest aquarium size (2 modules)
- Very low price with 3 year warranty

REALISATION

- Close collaboration with the client, cost savings with the development of a consistent coupling module
- Supply using a 24 V power supply unit
- Desired brightness is thus surpassed
- A coupling was developed according to the requirements of fishkeeping, which enables the modules to be connected without any soldering.

HIGHLIGHTS

In terms of price, the Lumitronix® module is extremely attractive when compared to competiton from China.

The client feels that it is a big advantage that the module is developed and manufactured in Germany:
Due to the geographical closeness of the manufacturer, decisive impulses could be put forward on site in personal conversations, which immediately flowed into the development work and could be implemented directly.

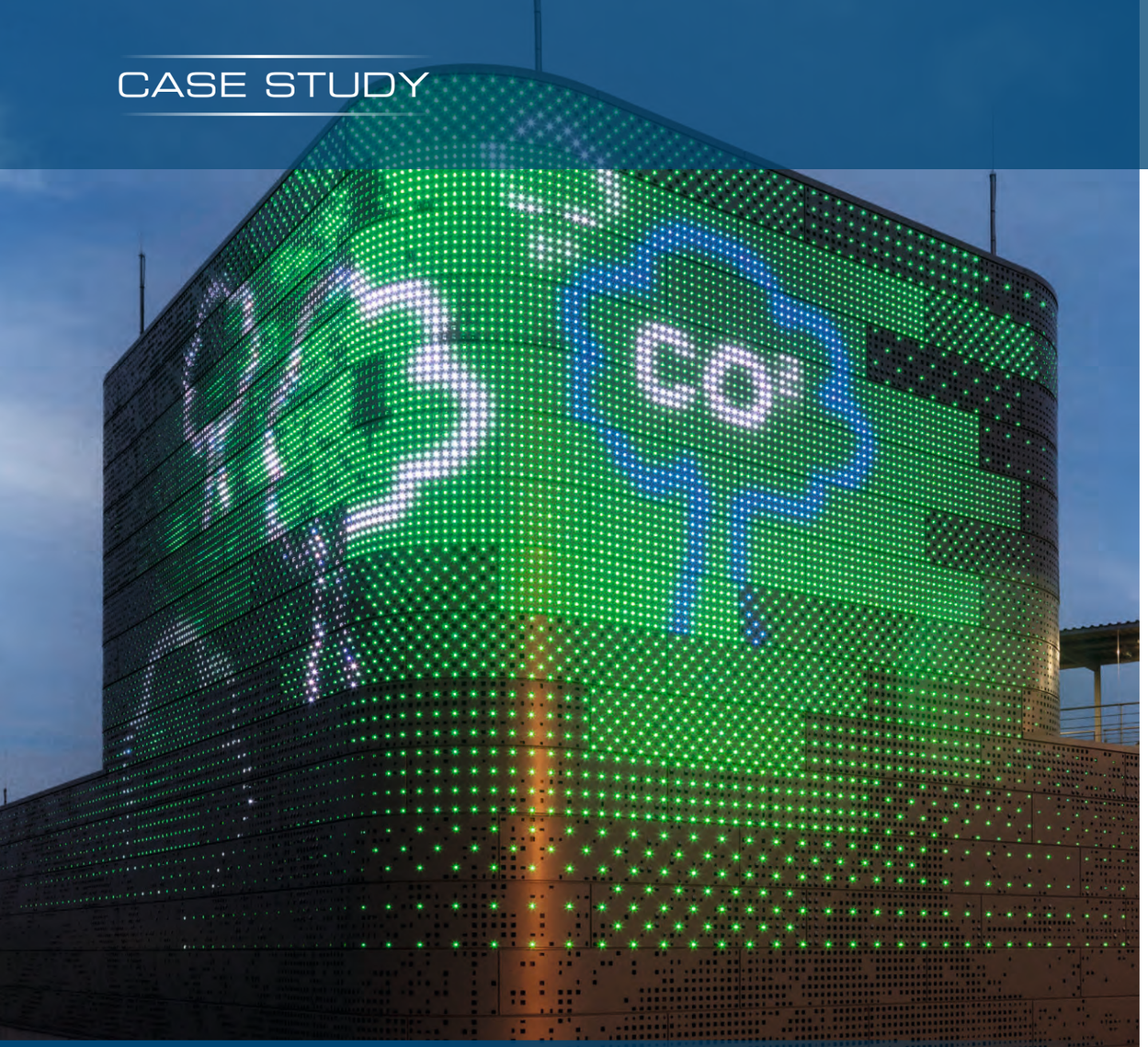
High variability thanks to the possibility of attaching LEDs of different light colours to the boards at no extra cost.

TECHNICAL DATA

Dimensions	240 x 15 x 2.2 mm
Connector	Molex
Angle of radiation	120°
LED	7 x Nichia 757 Series
Operation/power	24 V / 3.6 W
Luminous colour	6500 K Ansi
Luminous flux	420 lm
Efficiency	116.66 lm/W

Production of 140,000 modules a year

CASE STUDY



RGBW LED Dots for light sculpture and media facades

Architecture illumination

BACKGROUND

The client is already using LED dots in its X-LED product.The individually controllable LED dots are connected with a specially developed five-core ribbon cable.
These are attached to nodes in nets, between ropes or on other supports. In this way, they form an illuminated screen of any size for two- and three-dimensional multimedia presentations.
Integrated processors in each luminaire ensure the necessary flexibility for dynamic image transitions and image transitions and colour uniformity.
Images, animations and videos are transferred directly to the system via standardised interfaces.
Special software allows real-time video rendering and the programming, the programming of interactive, creative lighting designs.

REQUIREMENTS

The requirement was to develop an RGB(W)-LED dot that has a higher luminous intensity, a longer life cycle and is correspondingly future-proof.

REALISATION

The result was a new LED dot in two versions.
The Premium version is operated via a switching regulator with 24 V, the luminous intensity could be increased to > 55 cd (2.1 watts).

The Medium version is operated with 12 V without a switching regulator and achieves a luminous intensity of > 20 cd (1.2 watts).

HIGHLIGHTS

- The LED dot is supplied by LUMITORNIX as a complete item.
- The LED board is produced in-house.
- LUMITRONIX assembles the housing (sourced from a partner) and circuit board, and the silicone encapsulation to protect the LED dot from the weather.
- A set consisting of an upper part (housing with electronics encapsulated), a lower part for contacting the ribbon cable and silicone sealing rings for sealing the ribbon cable against the housing is supplied.

TECHNICAL DATA

Dimensions	30 x 30 x 15 mm
PCB material	FR4
LEDs	Medium: 2 x RGB(W) Premium: 4x RGB(W)
Input voltage (constant voltage)	Medium: 12 V Premium: 24 V
Life circle	> 50.000 h
Dimable	DMX
IP Protection	≥ IP65, in combination with ribbon cable

CASE STUDY

LUMITRONIX® LED modules for wind power plant

High power for the way up

BACKGROUND

The client is the leading manufacturer of wind power plants in Germany and was looking for a new and technically high quality path lighting system for its plants. The lighting system was to be brought in on all levels of the tower and thus make maintenance and control work on the plant as easy as possible - at the same time using as little power as possible.

REQUIREMENTS

- Construction of the module for a very broad input voltage range of 12 - 36 V DC/AC
- Ensuring a working life of 50,000 hours/ operation of 20 years
- Full traceability on the construction level
- The highest EMV stability for electronics
- Resistance of the mechanics against outside influences ('vibration and shock' or aggressive atmospheric conditions like salt spray)
- Low manufacturing costs

REALISATION

- Development of a module according to the specification
- EMV-suitable design despite unfavourable environmental conditions, particularly excellent claim for the protection of the construction group against electromagnetic disturbances
- 1.5 mm thick and thermally optimised PCB FR4 material with 20 selected high power LEDs: Brightness of 1015 lumes, colour temperature of 6500 Kelvin, CRI value of at least 80 and cheap manufacture

NORMS & GUIDELINES

Electrical

DIN EN 60598-1: Lights – part 1: General requirements and tests

DIN EN 55015: Critical values and measuring methods for radio interference of electrical lighting equipment and similar electronic devices

IN EN 61547: Equipment for general lighting purposes - EMV stability

Mechanical

DIN EN 60529: Protection with casing

DIN EN 60068-2-6: Environmental influences, parts 2-6: Test methods - testing Fc: Oscillation (sinusoidal)

DIN EN 61373: Railway applications, operational material for rail vehicles, oscillation and shock tests

DIN EN 60068-2-11: Environmental tests, part 2: Tests, Testing Ka: Salt spray

DIN EN 60068-2-27: Environmental tests, part 2: Tests, Testing Ea and guidelines: Shock

DIN EN 60068-2-29: Environmental tests, part 2: Tests, Testing Ea and guidelines: Continuous shock

TECHNICAL DATA

Dimensions	70 x 50 mm
PCB material	FR4 (two-part)
LED	20 x Nichia 757 Series
Input voltage	24 V constant voltage
Typical power	12 W
Luminous flux	1015 lm
Efficiency	88.45 lm/W (incl. covering)

Production of 60,000 modules a year

CASE STUDY

LUMITRONIX® LED modules for rail vehicle lighting

A bright move

BACKGROUND

The client is a specialist for object and special lighting and they produce in Germany.
The company has been constructing and manufacturing rail vehicle lighting, among other things, for domestic and international use for over 50 years. The assignment was to conceive an LED module, which would be implemented as ceiling lighting on a tram.

REQUIREMENTS

- The module must fulfil special guidelines for use in rail vehicles and for electromagnetic compatibility.
- Constant brightness at a variable input voltage range of 12 V - 33 V DC.
- Module with at least 200 lumes and desired lighting strength through focussing.
- High product security and long operational life should be aimed for as maintenance work in the area of application has high costs.

REALISATION

- In close collaboration with the client, a corresponding LED module was developed.
- Aluminium boards for optimal heat dissipation.
- Polycarbonate meets the high material requirements completely.
- Easy processing thanks to packing and connector cables.
- Desired brightness exceeded with 250 lumes thanks to three Nichia LEDs with long operational lives.

ADVANTAGES

- LUMITRONIX® carried out all of the necessary tests and measurements in house.
- Original development according to all of the client's wishes and requirements
- Highest product quality and flexibility due to original manufacture
- LUMITRONIX® is a distributor for lots of noteworthy lense manufacturers.

NORMS & GUIDELINES

DIN EN 50155:2007: Railway applications

DIN EN 55015:2009: Critical values and measuring methods for radio interference of electrical lighting equipment and similar electronic devices

DIN EN 61000-2-4:2002: Environmental condition compatibility level for low frequency conducted disturbance variables in industry systems

DIN EN 61547:2010-03: Equipment for general lighting purposes EMV stability requirement

TECHNICAL DATA

Diameter	44 mm
PCB material	Aluminium
Angle of radiation	54°
LED	3 x Nichia 219 Series
Visual material	Polycarbonate
Luminous flux/ colour temperature	250 lm / 3000 K Ansi
Input voltage	12-33 V DC
Max. power	3.6 W

Production of 17,000 modules a year

CASE STUDY

2-in-one UV curing and worklight luminaire for Swarovski

Workflow optimised

BACKGROUND

Swarovski stands out as a manufacturer of various high quality products, including crystal figures and jewelry.
Some of these products require the manual bonding of crystals.

A specially developed adhesive is used to securely combine the components by curing using UV light. They used two separate lighting systems: UV light required for the curing process and an additional working light to optimise visibility.

REQUIREMENTS

- Combination of work light and UV light in one luminaire
- High-quality workmanship with a long service life
- Easy positioning and distance adjustment to the target object
- Adjustable irradiation duration and intensity directly on the lamp head
- Operation via lamp head and foot switch
- Customised software adaptation to the customers production processes

REALISATION

- Combination of Nichia UV LEDs and white LEDs on a 4-channel LED board
- Individual luminaire design made of aluminium
- Measuring tape and holder for distance measurement on the luminaire
- Integration of push-buttons and foot switches
- Flexible articulated arm and handles on the luminaire head for convenient positioning
- Development of a customised, freely programmable control and controller board

HIGHLIGHTS

- Luminaire design made of aluminium with flexible articulated arm and handles on the luminaire head
- Freely programmable control unit and controller board
- 4-channel LED board with a combination of Nichia UV LEDs and white LEDs
- Space-saving, cost-cutting and easy to operate

TECHNICAL DATA

UV curing luminaire

Dimensions	198 mm x 325 mm x 155 mm
Optics	33 silicone optics for optimum light distribution
LEDs	33 Nichia LEDs / 4 channels
Input voltage	36 - 48 V
Max. Power	120 W
Beam angle	approx. 60°
Luminous flux	can be readjusted using software

CASE STUDY

Full spectrum LED module and control unit for greenhouse cabinet

Spring in the kitchen

BACKGROUND

The Plantcube from Munich-based company Agrilution provides the perfect climate for herbs, salads and microgreens all year round. The seed-bars, which have already been ideally prepared with seeds, are automatically supplied with water and optimum light. Individual parameters are stored in the cloud for each type of plant - a kind of guide for optimum growth and maximum nutrition and flavour.
LED modules with the complete colour spectrum and a coordinated control system always provide the right light mix of peak wavelengths and the right intensity.

REQUIREMENTS

- Full spectrum LED module for optimum light all year round for perfect growth and maximum nutrients and flavors
- App-based control unit that ensures the right mix of peak wavelengths for the seeded plant.

REALISATION

- Violet lighted LED module equipped with 12 LEDs:
- Red light for good germination and growth
- Blue light to support photosynthesis
- Control module for control via Agrilution app translates the specific information from the cloud for each plant species into electrical signals and passes these on to the LED modules, which then provide the ideal lighting.

HIGHLIGHTS

Control board for transmitting the required parameters for the plant from the cloud and the LED module developed and manufactured by LUMITRONIX

The LED modules developed for the Plantcube reproduce the entire color spectrum. For example, the “Far Red” at the extreme end of the spectrum, which is invisible to the human eye, ensures good germination, flower formation and accelerates growth.

TECHNICAL DATA

Dimensions	106 x 28mm
PCB material	Aluminium
LEDs	4 peak wavelengths: - Hyper Red (660nm) - Far Red (730nm) - Deep Blue (450nm) - White (5700K)
Beam angle	150°

CASE STUDY

LUMITRONIX® LED modules for WMF automatic coffee machines

Signaling device for coffee pleasure

BACKGROUND

WMF develops and produces automatic coffee machines „Made in Germany“.
The high-quality machines are equipped with the latest machine technology. This creates taste sensations and moments of surprise.

The innovative lighting solution is also an important design feature, which creates a high recognition value and gives the products a modern look.

REQUIREMENTS

- Use of efficient and colour intensive RGB LEDs
- Ambient and signal lighting
- Complete traceability at the component level
- No visible colour deviations

REALISATION

- Development of two RGB LED modules of different lengths
- Using durable and high-quality Osram RGB LEDs and producing the LED strips in-house
- No visible colour deviations thanks to special binning

HIGHLIGHTS

- LED modules „Made in Germany“
- Easy and personal coordination due to the proximity, especially during the development process.
- Individual advice on LED and component selection

TECHNICAL DATA

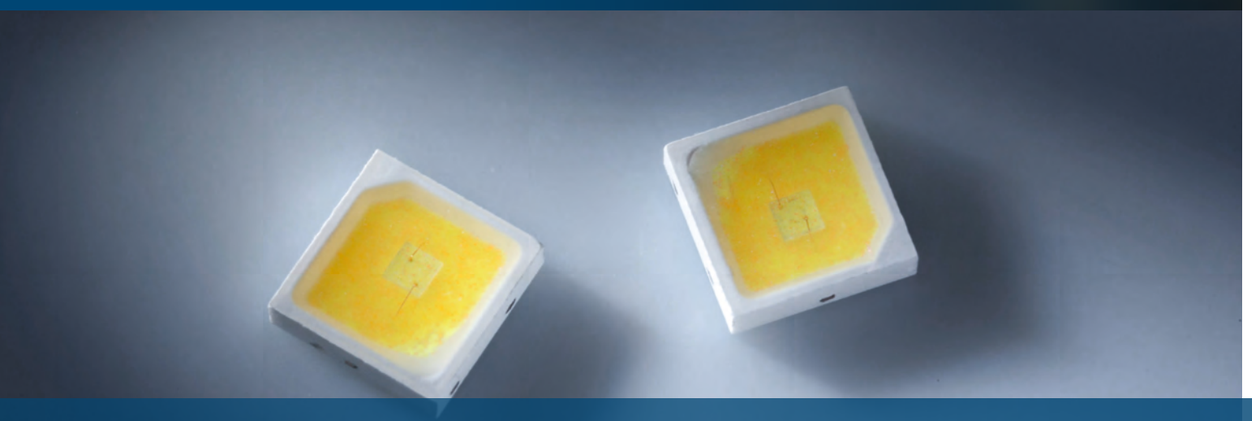
Dimensions	173 x 19 mm
PCB material	FR4
LEDs	Osram
Operation	Linear current control
Luminous flux	30 lm (red), 35 lm (green), 10 lm (blue)

Production of 30,000 modules a year

CASE STUDY

LUMITRONIX® LED components for surface luminaires

Lighting for motion pictures



BACKGROUND

Our customer is a company from the film and media industry that develops professional equipment for film sets and television studios. It is a medium-sized company that is market-leading in all areas and can be included among the so-called “hidden champions” in Germany.

A white LED that must meet very special requirements was needed for the present project – a lighting system for the film and tv industry.

These requirements are a key element for our customer to be able to set themselves apart from the competition. The lighting system uses the white LED in combination with a blue, green and red LED.

REQUIREMENTS

- Very narrow selection of colour location (comparable with 3-step MacAdam) above the Planck curve
- Stable binning in the forward bias and brightness
- Maximum forward bias of 3.0 V
- Long-term availability and reliability

REALISATION

- Evaluation of mid-power LEDs of various manufacturers
- Implementation of requirements in cooperation with the manufacturer and customer
- Establishment of a project with special production to assure the extraordinary binning requirements for the customer
- Project support with comprehensive advice by Lumitronix® from the very beginning
- Long-term assurance of availability and binning requirements by Lumitronix®

HIGHLIGHTS

Through close cooperation with Nichia as official distributor, LUMITRONIX® made it possible to produce a special LED with a very narrow colour range for the customer by Nichia.

TECHNICAL DATA

Manufacturer	Nichia
LED Series	757
CRI value	80+
Power range	MidPower
Colour temperature	3000 K

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