



OPTO- ELECTRONICS

- I LIGHTING LEDS (HP, MP, COB)
- I HORTICULTURE LEDS
- I LCD/OLED DISPLAYS
- I OPTOCOUPERS
- I UV & IR LEDS
- I LED DRIVERS
- I HEATSINKS, LENSES & CONNECTORS
- I CUSTOMIZED SOLUTIONS

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OPTOELECTRONICS SOLUTIONS

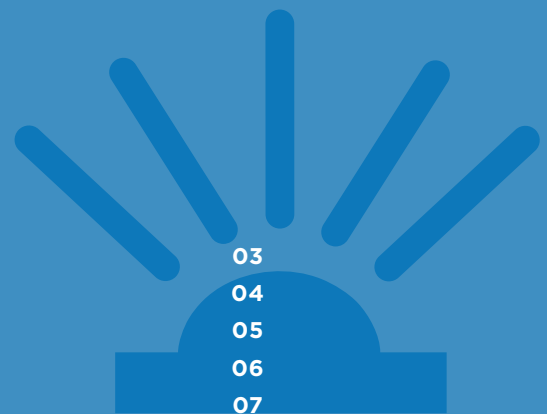
MICRODIS ELECTRONICS

with 30 years of experience in sales of electronic components, Microdis Electronics provides customers with deep knowledge and application support.

Wide portfolio of products, LED module design and production, professional advice and more than a decade of experience on the lighting and electronics market allows us to support our partners with solutions fitted exactly to their needs.

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LED LIGHTING

A MODERN WAY OF FIXTURE DESIGN

LED technology has changed the way we are looking at light and greatly improved not only the efficiency of it, but has also allowed to design fixtures and applications that were out of reach for conventional lighting. The economical and ecological aspects are accelerating the developments. The higher initial costs are balanced in a reasonable time with electricity costs savings. Today it is almost impossible to think about a new investment that is not lit with LED fixtures.

Microdis and our suppliers provide a technical expertise to help customers choose the best solution for their desired application.

We are living in an illuminated world, and the future is getting brighter and brighter.



Considerations when designing with LEDs










- | Flux required in the application
- | Efficacy of the luminaire (including driver and lens)
- | Luminaire or module spacing and layout
- | Light uniformity
- | Glare minimalization
- | Cooling of LEDs, including ventilation
- | Wiring access
- | Driver size and location
- | Dimming capabilities
- | Cost - less LEDs with higher driving current or higher efficacy

Future-proofing your design

The LED market is in constant development. Flux and, at the same time, efficacy are moving into levels not imaginable even 10 years ago. The parameters improve with each generation of the products, slower than in the past, but it is a regular growth.

Hence the standard form factors agreed by manufacturers. 5630, 3030, 3528 - the popular mid-power casings, and 3535, 7070 - in the high power region, are the best choice to have the best performance not only now, but also in the future.

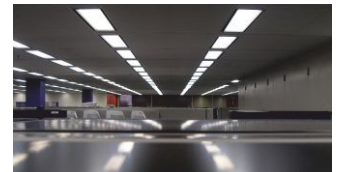
APPLICATION OVERVIEW

APPLICATION												
		Tube	Bulb	Candle Lamp	Panel light	Down light	Spot light	PAR lamp	Ceiling lamp	Street light	Projection	High bay
0.2W	EMC2016	●	●	●	●							
	EMC3020	●	●		●							
	EMC2835	●			●							
0.5W	EMC3020		●		●	●						
	EMC3014	●	●		●							
	PCT2835		●			●		●				
1W	EMC3020		●		●	●						
	EMC3030		●			●	●	●	●	●		
	Cube1616		●									
1-5W	Ceramic3535					●	●			●		●
4-6W	EMC5050			●		●	●	●		●	●	●
7-10W	EMC7070		●	●		●	●	●		●	●	●
5-15W	Ceramic5050						●				●	●
5-20W	EMC1A1A					●	●	●			●	●
20W+	HD COB					●	●				●	●

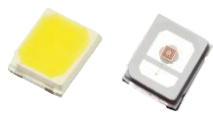
MID POWER LEDs

Mid power LEDs are the usual choice for home and office lighting where a high density of light is not required - because of the luminaire size, and efficacy together with light uniformity are crucial. An additional argument for the usage is cost - plastic cases are more economical than ceramic - like in the more powerful products.

The most popular form factors are 2835 and 3030 in various power options, with 5630 being the still used legacy size.



COST EFFICIENT MID POWER 3528



	Current / Voltage	Flux (white)	CCT range / colour	Note
2835 0.2W	60mA/3.1V	17-22 lm	2725-6650K / B	High CRI available
2835 0.5W	150mA/3.1V	56-77 lm	2580-7040K / Y,R,G,B	Best price ratio
2835 1W HV	120mA/6.4V	85-90 lm	2870-3220K & 6020-7040K	Economical BOM
2835 1W colour	350mA/2.4V	36 lm	Y, R	High colour flux

Various power options available for design flexibility, the best efficacy or the lowest cost does not always have to be the only choice. CCT range from 2580K to 7040K. CRI 80 & 90 versions available in selected products.

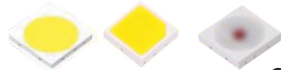
SIZE & PERFORMANCE MID POWER 2016



	Current / Voltage	Flux (white)	CCT range / colour	Note
2016 0.18W	60mA/3.0V	22-26 lm	2580-7040K	High CRI & 5-step
2016 0.29W	30mA/9.5V	32-35 lm	2870-7040K	5-step & 6-step
2016 0.37W	60mA/6.1V	43-48 lm	2580-7040K	5-step & 7-step
2016 colour 0.1W	40mA/2.1V,3.0V	5, 5, 10, 2 lm	Y, R, G, B	For special applic.

The legacy package with stable CCT production. Used in linear lighting, where the rectangular shape is a benefit. CCT range from 2580K to 7040K. colour versions available.

MID POWER 3030



	Current / Voltage	Flux (white)	CCT range / colour	Note
EMC3030 0.7W	120mA/6.0V	88-117 lm	2580-7040K	High CRI & 5-step
EMC3030 1W	350mA/3.0V	125-140 lm	2580-7040K	5-step
EMC3030 1W HV	60mA/18V	122-134 lm	2580-7040K	5-step, simple BOM
EMC3030 1.25W HV	25mA/50V	139-148 lm	2580-7040K	5-step, simple BOM
EMC3030 1W colour	350mA/2.2V,3V,3V	44, 74, 19 lm	R, G, B	For special applic.

The 3030 is a package that was developed to be an alternative for power LEDs. A 1W chip in a plastic casing equals low cost where such power is enough. The 3030 comes in two possibilities: a high flux version - reaching appx. 140lm from one LED, or a high efficacy version. CCT range from 2580K to 7040K. CRI 80, 90 and CRI 70 (for outdoor) versions available in selected products. Bin selection already included in part numbers.

Microdis Electronics offers the full portfolio of Brightteks' mid-power LEDs. That includes the most popular parts shown above, but also white and **coloured (Red, Green, Blue)** LEDs in 3020 and 3030 form factor also with primary lenses.

HIGH POWER LEDs

Applications



Area Light



Flashlight



Street Light



Tunnel

High power LEDs are currently mainly used for applications where a large amount of flux is needed from a small area, so high light density, and where beam control is very important. These include streetlighting, industrial low and high bays, flood lights and miniaturized light sources - like personal flashlights.

The most popular industry standard is a 3535 form factor, with lenses available for virtually any use case. Working with high power parts comes with a cost - the overall efficacy is lower than in mid power LEDs, and it is extremely important to provide proper heat management, as the temperatures may easily reach levels that affect lifetime and colour shifts. Passive heatsinks with guaranteed air movement are a bare minimum, and in specific cases active cooling may be needed.

HIGH PERFORMANCE 3535 1-3W



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	Current / Voltage	Flux (white)	CCT range / colour	Note
3535 flip-chip	350mA/3.0V	80-110 lm	1400-3045K	Low CCT for mood
3535 flip-chip	350mA/3.0V	130-140 lm	3710-5310K	CRI 70
3535 flip-chip	350mA/3.0V	130-140 lm	5710-6530K	CRI 70, economical
3535 colour	350mA/2.1V,2.4V,3.4V	60, 55, 110, 40 lm	Y, R, G, B	For special applic.

LEGACY K1 PACKAGE



	Current / Voltage	Flux (white)	CCT range / colour	Note
K1 package	700mA/3.2V	150 lm	1900-3800K	Tube or reel
K1 package	700mA/3.2V	170 lm	3800-5000K	Tube or reel
K1 package	700mA/3.2V	220 lm	5000-10000K	Tube or reel
K1 package colour	350mA/2.2V, 3.4V	50, 50, 75, 25 lm	A, R, G, B	For special applic.

HIGH PERFORMANCE EMC5050, EMC7070, EMC1A1A



	Current / Voltage	Flux (white)	CCT range / colour	Note
EMC5050 3.6W	200mA/18.0V	460-500 lm	2580-7040K	5-step, 7-step
EMC5050 5.2W	200mA/26.0V	580-680 lm	2580-7040K	5-step, 7-step
EMC7070 7.5W	200mA/38.0V	870-950 lm	2580-7040K	5-step
EMC7070 10.5W	280mA/38.0V	1160-1300 lm	2580-7040K	5-step
EMC1A1A 15W	400mA/37.0V	1680-1920 lm	2580-5310K	5-step, 100x100mm
EMC1A1A 20W	540mA/37.0V	2200-2600 lm	2580-5310K	5-step, 100x100mm

INTERESTING PRODUCT - 1W DUAL WHITE



	Current / Voltage	Flux (white)	CCT range / colour	Note
2034 1W	2x150mA/3.0V	75/70 lm	6020-7040K/2580-2870K	Smooth CCT change

MULTICOLOUR LEDs

RGB and Dual colour products are used in many applications, requiring a wide selection of form factors to fit any need. Brightteks' portfolio allows designers to choose not only from most popular sizes, but also very advanced 0404 or 0606 RGB products. The quad-colour LEDs allow for the best colour mix for most applications.



Dual colour LEDs



Tri colour LEDs



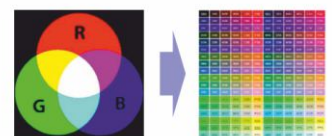
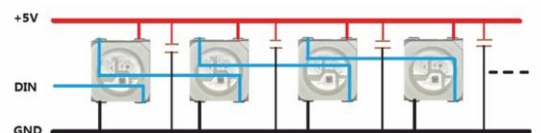
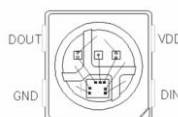
Quad colour LEDs (WRGB)



INTERESTING PRODUCT - RGB with IC

For simplifying of circuit designs the LED manufacturers have developed RGB products with integrated IC, which allow for very precise driving of each channel via digital signals. High saturation of the colours catches the eye immediately. The typical applications are displays, gaming and automotive.

Available form factors:



FUNCTIONAL LIGHTING

HORTICULTURE



HORTICULTURE SOLUTIONS

EMC2835 - 0.2W



Applications:
LED tube
Small application



EMC2835 - 0.2W



Applications:
Vertical lighting system
Hanging lighting system



EMC2835 - 0.2W



Applications:
High power ceiling lamp
High bay



Plants, as everything, can be grown traditionally and can be grown effectively. For many years greenhouses have been using specialized light to increase their annual capacities - by artificially extending the daylight periods. Not until recently the cost of LED solutions was too high against the traditional HPS & MH tubes. Yet the energy saving diodes are gaining more and more traction, because the energy required by a industrial greenhouse is huge, and in many cases a power station supplying it cannot provide any more.

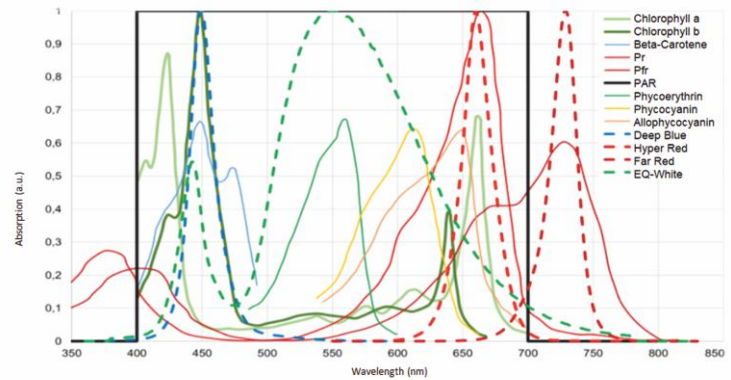
LED lights may be the only way to extend a greenhouse area, and are a sure way to lower the electricity bills. It is not the only advantage however - a specialized horticulture fixture is using more than one type of LED - it can change its light output and spectrum by simply using a programmable driving system, providing to the plants what is exactly needed at that time.

In horticulture it is a standard that the equipment has to work in harsh conditions. Humidity and gas emitted from the fertilizer and anti-bug sprays can be very harmful to a LED.

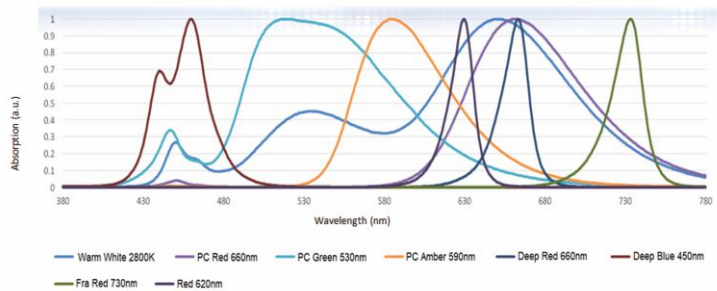
Depending on the spectrum of the light it can be used for faster growing, or bigger green yield. Photoperiod is the time that the plants are illuminated, and they recognize this illumination - hence the need for this wavelength - far red. The rest, deep red and royal blue, stimulate photosynthesis - the process of storing energy by the plants, and using that energy to increase in size. The visible white spectrum is adding green content to the organism.



Absorption spectrum of plants



LED Spectrum Solutions



SPECIAL APPLICATIONS

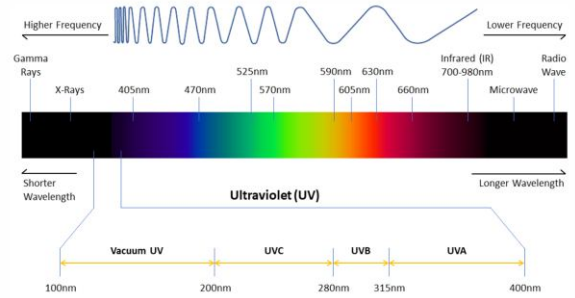
UV & IR LEDS

UV LEDS

The development of LED technology enables its use in many applications that were unreachable before. The fast growth of LED UV lighting is mainly driven by the need to find environmentally friendly methods of producing UV light - the current market is dominated by mercury lamps.

The spectrum of UV can be broken down to 3 general areas: UV-A, UV-B and UV-C. Each of which is used in very specific applications.

The UV-A is currently the most commonly used range (~315-420nm), found in counterfeit detectors, simple curing, sensing and disinfection - the last applications are also taking advantage of the UV-B (~280-315nm). The final area - the UV-C (200-280nm) can be used in air purification systems - not only simple disinfection.

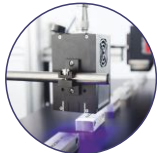


UV Applications	
UVA	Hardening of the polymer or printer ink, gas measurement, nitrogen factor measurement, insect traps, lighting, optical sensing, image tone measurement ID to identify counterfeit, white light source, curing, photocatalyst air purification.
UVB	UV-curable optical treatment, optical sensors, image tone measurements, crime analysis, protein analysis, DNA identification, drug development, plant growth.
UVC	Sterilization, ozone detection, clear surface water pollution, protein analysis, DNA identification, drug development, optical sensors, image tone measurement.

Applications - consumer and industrial: detection, curing & disinfection



UV money detector



Curing



Swimming pool



Elevator



Bathroom



Kitchen

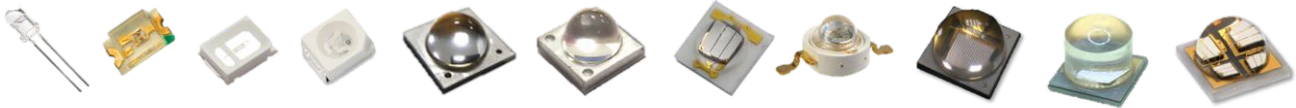


Hospital

AVAILABLE UV WAVELENGTHS



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Wavelength	Available packages	Power
270-285nm	3535, 3939, 3939 Flat, 6868, 6868 Flat	0.13-2.6W
365-370nm	3535, 3939, 3939 Flat, 5252, 6868, 6868 Flat, 9090	1.65-30.0W
380-390nm	3535, 3939, 3939 Flat, 5252, 5252 60deg, 6868, 6868 Flat, 9090	1-30W
390-400nm	0603, 3020, 3528, 3535, 3939, 3939 Flat, 5252 60deg, 6868, 9090, K1	0.07-30W
400-410nm	0603, 2835, 3020, 3528, 3535, 3939, 5252, K1	0.06-7.25W
410-420nm	3528+Lens, 3535, 5252, THT Lamp	0.06-4W
420-430nm	3535	1-2W

IR LEDS

On the other side of the spectrum is the infrared area. Used commonly for remote controls, sensors, machine vision, detectors and of course night vision. High power products may be used for defrosting.

Brighteks' infrared LED portfolio consists of various form factor and power versions. Starting from THT (3 mm & 5 mm), SMD low power chips (0602, 0805, 1206) through the standard mid power casings (3020, 3030, 3528) and ending with ceramic high power 3535, also with black surface or with rectangular 16:9 light pattern.



INTERESTING PRODUCT - VCSEL

Vertical Cavity Surface Emitting Laser

Narrow angle and straight directivity, applicable to long distances. Very efficient optoelectronic transformation. High power allows to penetrate even thick fog and enhance monitor lighting even in bad weather. Applicable for long distance cameras f.e. road toll registration plate scanners.

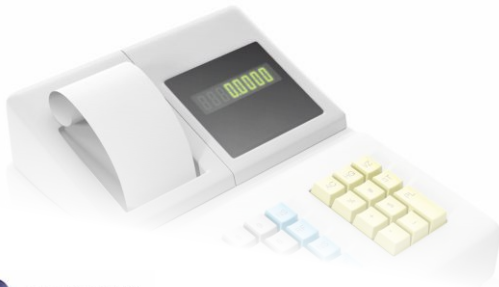
Product	Optical power [mW]	Beam angle [°]	Wavelength [nm]
3535BS VCSEL	700	15	850



BRIGHTTEK
BRIGHTTEK (EUROPE) LIMITED



LCD, TFT AND OLED DISPLAYS

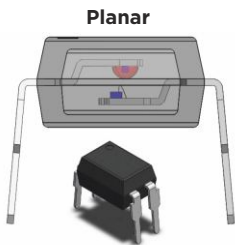


Displays are an essential part of many applications. Their functionalities reflect on the whole device - if they look well, if they are readable, if the colour is correct, if the information shown is undeniably understandable - these are just a few questions a designer must ask them self when choosing a display for the device. Fortunately with Brightteks' portfolio there are enough options to choose just the right one to fit the application needs.

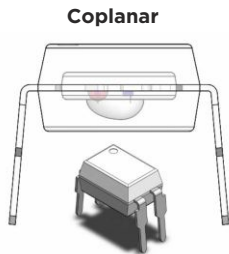


	Types	Technology
Character	up to 4 lines, up to 40 characters per line, monocolour	LCD, OLED
Graphic	from 96x8 dots, up to 320x240 dots, monocolour	LCD, OLED
TFT Full colour	1.5'-15', 320x240 pixels up to 1024x768 pixels	TFT, OLED, Touch
OLED switch	64x48 monocolour, 96x64 colour	OLED

OPTOCOUPLERS & PHOTOELECTRONICS



Planar



Coplanar

Protection of sensitive electronic devices from high voltages that may occur on interfaces can be easily done by using an optocoupler. The component transfers signals by using light, effectively isolating any input from extreme conditions. Robust double moulded coplanar structure in a thinner case allows better CMR performance and hi-pot stability. Photodiodes, phototransistors and photointerrupters in SMD and THT packages are also available.

- DIP4:**
- | TRIAC Random Phase
 - | TRIAC Zero Cross
 - | Transistor
 - | Schmitt Trigger



- DIP4:**
- | Transistor
 - | Darlington Transistor
 - | TRIAC Random Phase
 - | TRIAC Zero Cross

- LSOP4/5**
- | High Speed Logic Gate
 - | High Speed Transistor
 - | Gate Driver



- LSOP4/5**
- | Transistor
 - | High Speed Transistor
 - | TRIAC
 - | IGBT Gate Driver

- SOP4:**
- | SSR Random Phase
 - | Photo TRIAC
 - | Power TRIAC



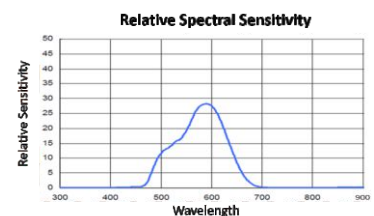
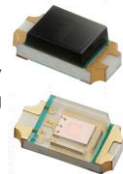
- SOP4:**
- | Transistor
 - | Darlington Transistor
 - | TRIAC Random Phase
 - | TRIAC Zero Cross



- SOP5:**
- | High Speed Logic Gate
 - | IGBT Gate Driver
 - | High Speed Transistor

INTERESTING PRODUCT - AMBIENT LIGHT SENSOR

Light sensors with an analog output allow for a precise measurement of the ambient light in the surrounding area. With the response that is close to the eye of a human, good linear relationship of the signal to illuminance, and very high accuracy it is possible to design devices effectively reading and reacting to any changes. Illuminance range: 1-10-100-100 lux



DESIGN SUPPORT

LED MODULES & CUSTOMIZED SOLUTIONS

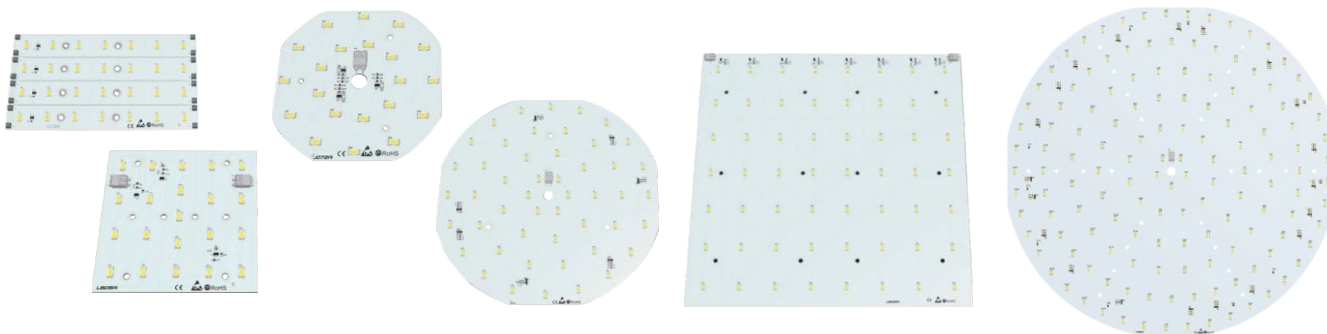
A wide selection of off-the-shelf LED modules, based on most popular diodes - including 2835, providing high efficiency and CV or CC power supply options. The modules are available in 2700-6500K colours and standard shapes - square, round and linear. Sizes reach up to 44cm in diameter (round) and 30cm edge length (square). The efficacy can reach more than 190lm/W (when LEDs are driven with 60mA).

Other available options:

- | Dynamic White modules - with LEDs with two CCT (3000K and 5600K) for smooth colour adjustment
- | 230V modules - for easy plug in
- | RGB and RGBW modules - for colour effects
- | Power LED modules - with 1-5W LEDs for more flux
- | CSP based modules

Microdis Electronics also provides custom designed LED lighting solutions. The idea is all the customer has to have. Our team of engineers will put that idea into a real product.

Our offer includes LED strips, custom designed LED lamps, waterproof LED lighting for bathtubs or showers, including a capacitive touchpanel, and many others.



INTERESTING PRODUCT - LED DRIVER

TSCR4xxCX6 - Linear CC Regulated LED Driver designed for driving LEDs in strings and will reduce current at increasing temperatures to self-protect. Operating as a series linear CCR for LED string current control, it can be used in multiple applications, as long as the maximum supply voltage to the device is <40V. TSCR4xx-series of LED drivers are CMOS based, which allows for much better performance than the bipolar products offered by competition.

Features:

- | Linear Constant Current Regulator:
 - TSCR40xCX6: High-Side Control
 - TSCR42xCX6: Low-Side Control
- | Output current, highly accurate
 - TSCR400CX6: 0.1mA
 - TSCR402CX6: 20mA
 - TSCR42xCX6: 10mA
- | Lower quiescent current
- | Precise voltage drop controlled by internal CMOS circuit
- | Adjustable Output Current with External Resistor
 - TSCR40xCX6: up to 65mA
 - TSCR42xCX6: up to 300mA
- | Good negative temperature coefficient of -0.07 %/°C
- | Enhanced Reliability
 - Highly integrating a transistor, diodes and resistors to simplify the system by reducing the component count and increase overall reliability



SOT-26

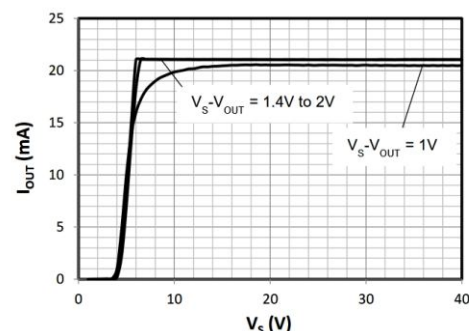
TSCR400/402CX6:

- 1. GND
- 2. OUT
- 3. OUT
- 4. V_S
- 5. OUT
- 6. R_{EXT}

TSCR420/421CX6:

- 1. EN
- 2. OUT
- 3. OUT
- 4. GND
- 5. OUT
- 6. R_{EXT}

Current stability over input voltage range (TSCR402CX6)



System calculation tools available on Taiwan Semiconductor website.

LED DRIVERS



Taiwan Semiconductors Lighting IC portfolio enables module designers to provide driving solutions on-board of their products. Flyback, Buck, Boost or Linear topologies make the circuits fitting to all applications. Superb parameters - High PFC and low THD, competitive BOM, dimming capabilities - the customers can make their choice and build a solution that meets all of their expectations.

Currents up to 700 mA, and powers up to 25W - or depending on external N-MOS - and 230V solutions.

SOP-8, SOP-14, SOT-26 or TO-252 packages.

Taiwan Semiconductor offers also a wide selection of Planar or Super-Junction MOSFET transistors for power management.

HEATSINKS



LEDs, with their high performance and long life, are growing exponentially in popularity. This tendency is even enhanced by the increasing efficiency and falling prices. However, to make the best possible use of all the benefits offered by LEDs, efficient thermal management is indispensable.

To meet this requirement, Fischer Elektronik has developed a special product range: heatsinks for LED applications. In addition to a number of star-type heatsinks with different diameters and contours, it comprises, among other things, pin heatsinks, miniature cooling aggregates and case elements for accommodating LED line modules. Modified heatsink variants and versions specially adapted to customized LED applications are manufactured according to customers' specifications using advanced CNC machining centres or through extrusion. The LEDs are fastened using double-sided, thermally conductive adhesive, screw fastening or solderable surface coatings.

LENSES



Wide portfolio of lenses suitable for mid or high power LEDs and COBs. Single, as well as multilenses, are available, fitting most applications: streetlights, office and linear luminaires, industrial and architectural lighting, also IR and UV dedicated products.

Special silicone materials allow production of elastic optical systems with high transmittance and no yellowing in time.

CONNECTORS



White Lite is aimed at LED strip applications perfectly aligning centre lines of horizontal mating printed circuit boards. Available in both SMT or through hole with 2-6 contacts as a two piece or as a through hole single piece solution with an innovative U-shaped connector design.

U-shaped connectors are an economical option and allow connections where access from above the PCB is the only option. U-Shaped connectors can be either soldered direct to the PCB or plugged into vertical PCB sockets.

LCP insulators are natural coloured to reduce light absorption not only providing better aesthetics but also a resistance to high process temperatures.

Engineered to be the perfect choice for LED strip light applications.

WIRE TRAP CONNECTORS 2.40 & 4.00MM PITCH

BL300 2.40mm pitch, height of 3.60mm (max) with a footprint of 7.90mm x 7.60mm in three circuits. Cables with stranded conductors in 22 & 24 AWG.

BJ302 4.00mm pitch, height of 4.50mm (max) with a footprint of 11.8mm x 11.45mm in three circuits. Solid conductors in 18 to 24 AWG and stranded conductors in 20 to 22 AWG.

WHITE LITE BOARD TO BOARD 4.00MM PITCH - PLANAR MATING

BJ300 & 301 are two position surface mount board to board connectors perfect for LED strip light applications. Mated connector height is 2.6mm, with a total mated footprint of 8.80mm (width) x 11.00mm (depth).

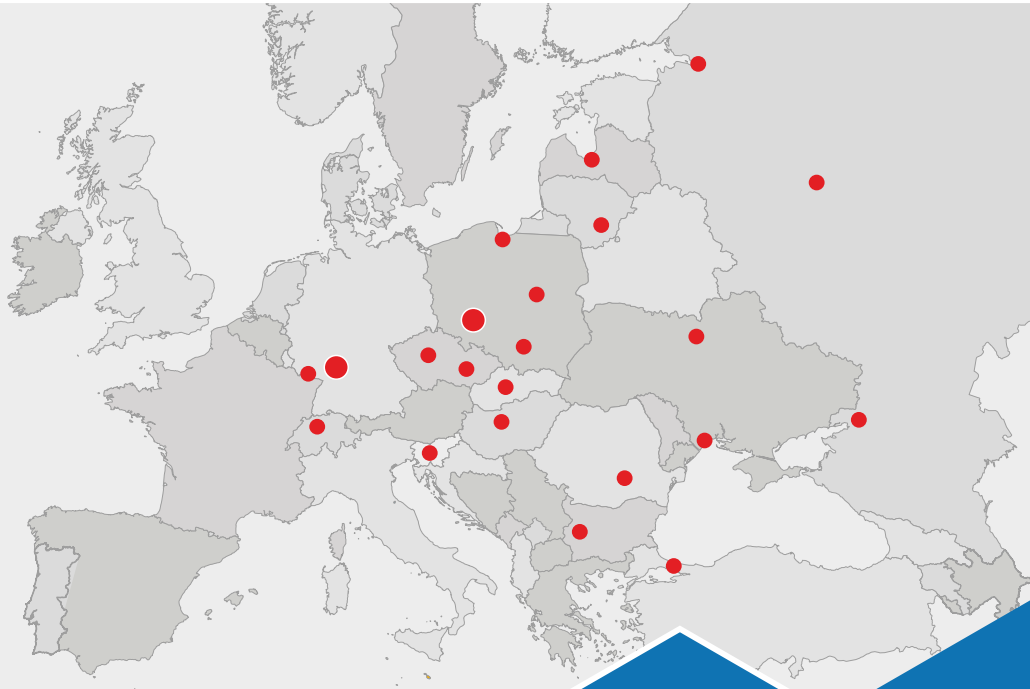
WHITE LITE BOARD TO BOARD 2.54MM PITCH - PLANAR MATING

The BG300-306 range are LED light strip connectors both surface mount and through hole. Post and box style connectors offer mating combinations of header and socket. One piece U-Shaped connectors BG304 & 305 may be hard soldered to your PCB or mated to BG306 single row sockets.

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Currently the Microdis Group employs over 100 people, with a large number of electronic engineers, mostly involved in sales and application support.

As a company with an extensive experience in the distribution of electronic components, and a purchasing center in Germany for many years, we are able to offer almost any product from a wide variety of electronic components. We offer also the production of cable harnesses and programming of crystal oscillators for a customised frequency.

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