

All Signs Point to LEDs LED-Systems for Signage

SEE THE WORLD IN A NEW LIGHT

SYLVANIA





Exciting New Signage with LED-Systems

More than 2,000 customers in over 60 countries are using OSRAM SYLVANIA LEDs in their Signage and the numbers are continuously growing. OSRAM SYLVANIA LED modules give customers more creative and cost effective options for illuminating their signage.

Special LED Advantages



Long Life

LED modules offer noticeably longer life times when compared to conventional signage light sources, such as neon and fluorescent. Colored LED modules can reach a service life of up to 100,000 hours. The service life of an LED is rated at half the initial lumen output—not when the LED fails to illuminate.

Installation and Energy Cost Savings

OSRAM SYLVANIA LED modules and OPTOTRONIC® power supplies provide higher efficacy and up to 80% energy savings compared to neon. The flexible geometry of the LED modules allow for easy installation in standard and customized signage, providing additional cost savings for made-to-order signs.

Lower Maintenance Costs

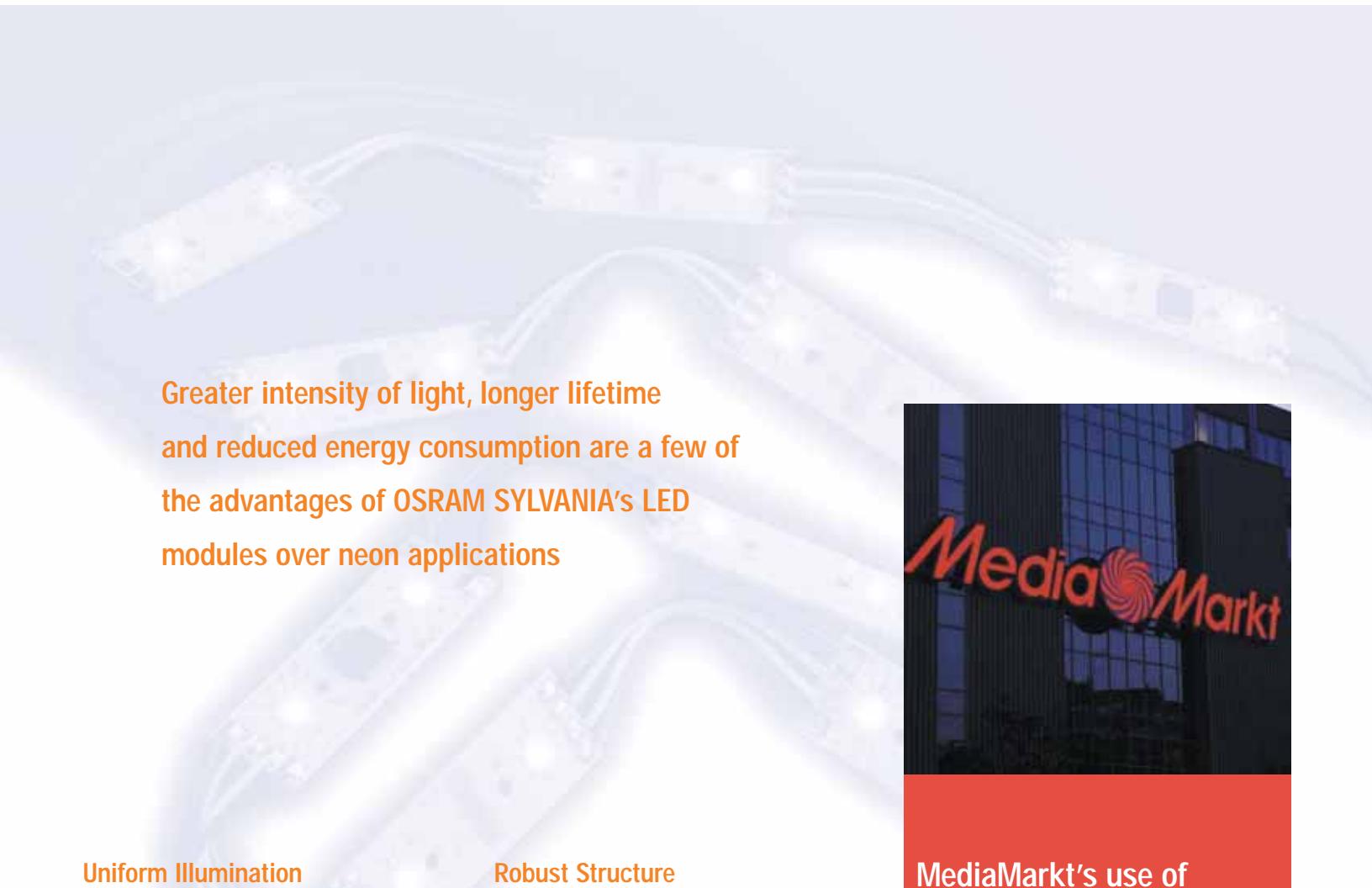
OSRAM SYLVANIA LED modules last up to five times longer than conventional light sources. This reduces or eliminates the ongoing maintenance costs and periodic relamping expenses.

Wide Operating Temperature Range

LED modules are specified to operate in a wide temperature range of -40°F to 185°F. This means continuous operation even at low temperatures without starting problems. LED's cold start ability allows for instant on and flicker-free operation without specially designed circuitry.

Vivid Colors

The Spectral outputs of LEDs contain only one wavelength. The result is deeper and more saturated colors without the use of filters. OSRAM SYLVANIA LED modules provide excellent color and brightness compared to neon.



**Greater intensity of light, longer lifetime
and reduced energy consumption are a few of
the advantages of OSRAM SYLVANIA's LED
modules over neon applications**

Uniform Illumination

With their compact size and the wide viewing angle of the LED modules, the LED system can be installed in narrow, shallow and small signage applications. Using these modules can eliminate the shadowing effect and hot spots that can appear on the face of a sign. Plus, the sign will continue to have uniform illumination as the LED ages unlike signs using neon.

System Competence

When used with OPTOTRONIC power supplies, OSRAM SYLVANIA LED modules form a complete system solution, allowing lighting designers to create highly effective and safe lighting designs.

Low Voltage Operation

OSRAM SYLVANIA LED modules operate at safe low voltages of <24Vdc. The isolation of the power line in the OPTOTRONIC power supplies guarantees safe operation as well as a simplified installation.

Robust Structure

The construction of the LED modules has no fragile filaments or glass that can shatter while being shipped or installed. However, with neon there is significantly more breakage when shipping the lamps or sign.

Easy Installation

OSRAM SYLVANIA provides LED modules with self-adhesive backing and/or mounting holes that make for easy installation. Connectors are also available for our LINEARlight Rigid Modules eliminating the need to solder wires.



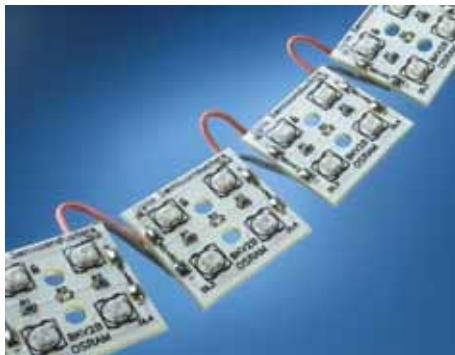
MediaMarkt's use of OSRAM SYLVANIA LED Modules:

Since 2001, MediaMarkt Saturn has used LED modules from OSRAM in Europe in place of neon. The longer lifetime, low energy consumption and the maintenance free operation of the LED modules have made OSRAM the leading supplier for MediaMarkt Saturn.

LED Systems for Signage

BACKlight Modules

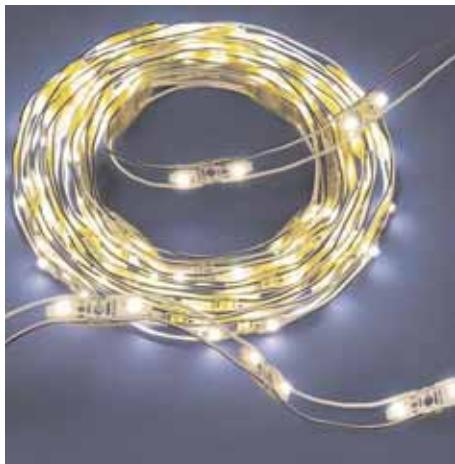
BACKlight LED modules are ideally suited to fit the typical contours and curves used in advertising space and channel letters. Currently, there are two versions of BACKlight available: BACKlight and BACKlight Second Generation (B2G). They provide uniform illumination of diffusing materials (e.g. Plexiglas or translucent foils) used in signage.



BACKlight

- Each module has eight movable coupons
- Mounting holes for easy installation by screw or snap on connectors
- Provides uniform illumination due to the 120 degree viewing angle per LED
- Can be easily cut for custom lengths

- Minimal heat generation
- Conformally coated to protect against moisture, condensation and dripping water
- Long service life of up to 100,000 hours
- Listed in the UL Sign Accessory Manual (SAM)
- Available as a complete system with matching OPTOTRONIC 10.5V power supplies



BACKlight 2G

- 1 reel consists of 2 modules that measure 15.75 feet in a chain-like structure
- Each module consists of 60 single circuit boards linked with 2 LEDs each
- Contain flexible wires for easy installation
- Conformally coated to protect against moisture, condensation and dripping water
- Minimal heat generation
- Long service life of up to 100K hours
- Provides uniform illumination due to the 120 degree viewing angle per LED

- Can be easily cut for custom lengths
- Self-adhesive backing and mounting-holes on the circuit board allow for easy mounting
- Listed in the UL Sign Accessory Manual (SAM)
- Available as a complete system with matching OPTOTRONIC 10.5V power supplies
- Perfect for installation in narrow letters

** A 4 LED per circuit board version will soon be available.*

Performance Standards for BACKlight B2G

| Characteristic | Test Description | Standard |
|----------------|-------------------------------|--|
| Physical | Salt Mist | MIL STD 883E Test 1009.8 |
| | Dropping Water | IEC 60529 |
| | Vibration | IEC 60068-2-6 |
| | Tensile Strength | IEC 60068-2-21 Test Ua1 |
| | Mechanical Shock | MIL STD 883E Test 2002.3 |
| Environmental | Thermal Shock | JESD22-A106B |
| | Power/Temperature Cycling | JESD22-A105C |
| | Humidity | EN 61347-2-11 Clause 11 |
| | Temp. Humidity Bias | JESD22-A101 85°C / 85% RH, 1000 hours |
| Electrical | Electrical Strength | EN 61347-2-11 Clause 12 |
| | EMC Interference & Immunity | EN55015 & EN61547 |
| | ESD, Electro Static Discharge | EN 65147 |



Comparison of BACKlight Modules

| Feature | BACKlight | BACKlight 2G |
|----------------------------|------------------|------------------|
| Maximum Length | 1.8 ft. | 31.5 ft. |
| Power Supply 10Vdc | Yes | Yes |
| Flexible Wire Interconnect | Yes | Yes |
| Movable Coupons | Yes | Yes |
| Mounting Tape | No | Yes |
| Conformally Coated | Yes | Yes |
| Listed in UL SAM | Yes | Yes |
| Service Life | Up to 100K hours | Up to 100K hours |
| LEDs per Foot | 17 | 8 |
| LEDs per Circuit Board | 4 | 2 |
| Narrow Profile | 1.2" | <0.5" |

LINEARlight FLEX Modules:

The LINEARlight FLEX modules offer exciting new possibilities for general illumination applications and for optimal solutions requiring precise backlighting of complex contours. They also provide an alternative choice for linear applications such as cove lighting, refrigeration cases, display shelves and pathway marking.

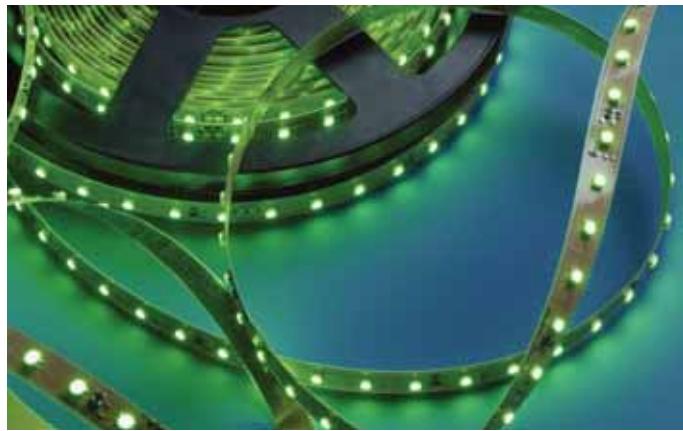
There are currently two versions of the LINEARlight FLEX modules, TOPLED and SIDELED. The TOPLED module offers direct lighting that emits from the top of the module. The SIDELED module emits light from the side that is best suited for illuminating signage with indirect lighting. The end result is an attractive gleam of light that is seen around the contour of the sign, usually referred to as the "Corona-Effect" or Halo lighting.

LINEARlight FLEX TOPLED®

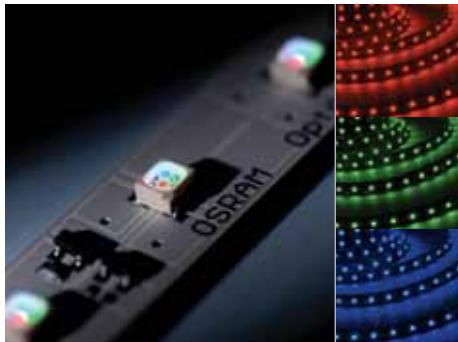
- Available on 27.5 ft. long reels
- Each reel consists of 600 LEDs
- Minimal heat generation
- Self-adhesive backing for easy installation
- Smaller sections can be made when cutting the marked position on the module
- Smallest unit can be 5.5 inches
- 120 degree viewing angle
- Optimal operation with OPTOTRONIC 24V power supplies
- Available in green, blue, yellow, red and white (4700K, 5400K, 6500K)

LINEARlight FLEX SIDELED

- 120 degree viewing angle
- Available on 13.8 ft. reels
- Minimal heat generation
- Self-adhesive backing for easy installation
- Each reel consists of 300 LEDs
- Smaller sections can be made when cutting the marked position on the module
- Smallest unit can be 2.2 inches
- Optimal operation with OPTOTRONIC 10.5V power supplies
- Available in green, blue, yellow, red and white



LINEARlight FLEX Colormix Module



LINEARlight Colormix LED modules provide dynamic control of colored illumination. Each LED contains a red, green and blue chip in one package that can be controlled by the OPTOTRONIC OT RGB DIM and OT RGB Sequencer modules to yield an infinite choice of colors, including white. The unique method of color mixing within each LED, achieves better color consistency and uniformity than combining separate, colored LEDs.

These dynamic features enable the systems to be used in a wide range of large-scale applications, including edge lighting of transparent and diffusing materials, illuminating facades, cove lighting and signage.



LINEARlight FLEX Colormix

- Flexible circuit board with self-adhesive backing
- Available on 13.1 ft. reels
- Dynamic colored control
- Each reel consists of 200 LEDs
- Smaller sections can be made when cutting the marked position on the module
- Smallest unit can be 8 inches
- Optimal operation with OPTOTRONIC 24 power supplies
- Minimal heat generation
- 120 degree viewing angle

DRAGONchain® Module

The DRAGONchain LED module uses OSRAM Golden DRAGON™ LEDs. This new versatile system packages hi-flux LED light sources in an extremely flat module enabling you to design smaller, sleeker signs. The DRAGONchain LED module is ideally suited for bright-white signage applications.



DRAGONchain

- Available in a 9-foot chain with 18 metal core circuit boards
- Each board consists of two 6500K DRAGON LEDs – total of 36 LEDs per chain
- 120 degree viewing angle to provide uniform illumination
- Wire interconnects allow flexible mounting
- Listed in the UL Sign Accessory Manual (SAM)
- Conformally coated to protect against moisture and condensation (IP22)
- Each board contains screw holes for mounting and for easy installation
- No ultraviolet or infrared radiation
- Service life of up to 50,000 hours when temperature at the Tc point is maintained at 40°C
- Chain can be subdivided every three boards totaling 1.5 ft. (0.46m)
- Extremely low profile (<5mm)

OPTOTRONIC Power Supplies

Continuing with its tradition of providing complete systems, OSRAM SYLVANIA also offers matching power supplies and dimming modules for optimal operation of their LED modules. A complete line of 10.5V and 24V power supplies is available. By providing the entire system, we make the process of using LEDs for lighting convenient and easy.

OPTOTRONIC LED power supply products are covered by our LED system warranty; a comprehensive LED module and power supply system warranty. For additional details, please refer to our LED warranty bulletin.





LED Module Ordering and Specification Information

| Item Number | Ordering Abbreviation | Color | Watts | Volts | Current (Amps) | Number of LEDs | Number of LEDs per ft | Luminous Flux (lm) | Lumens per ft |
|----------------------------------|-------------------------------------|-------------|-------|-------|----------------|----------------|-----------------------|--------------------|---------------|
| BACKlight | | | | | | | | | |
| 70081 | BACKLITE/633/OS/LM03A/S1 | Super Red | 4.2 | 10.5 | 0.40 | 32 | 18 | 54 | 30 |
| 70011 | BACKLITE/615/OS/LM03A/A1 | Amber | 4.2 | 10.5 | 0.40 | 32 | 18 | 54 | 30 |
| 70071 | BACKLITE/610/OS/LM03A/01 | Orange | 4.2 | 10.5 | 0.40 | 32 | 18 | 86 | 48 |
| 70012 | BACKLITE/587/OS/LM03A/Y1 | Yellow | 4.2 | 10.5 | 0.40 | 32 | 18 | 69 | 38 |
| 70013 | BACKLITE/525/OS/LM03A/T2 | Green | 4.2 | 10.5 | 0.40 | 32 | 18 | 57 | 32 |
| 70014 | BACKLITE/470/OS/LM03A/B1 | Blue | 4.2 | 10.5 | 0.40 | 32 | 18 | 9 | 5 |
| 70045 | BACKLITE/OS/LM03A/W1 | White | 3.4 | 10.5 | 0.32 | 32 | 18 | 29 | 16 |
| 70102 | BACKLITE/OS/LM03A/W2-854 | White-5400K | 5.3 | 10.5 | 0.50 | 32 | 18 | 69 | 38 |
| 70103 | BACKLITE/OS/LM03A/W2-865 | White-6500K | 5.3 | 10.5 | 0.50 | 32 | 18 | 69 | 38 |
| BACKlight 2G | | | | | | | | | |
| 70143 | BACKlight2G/633/BL02ST/S1 | Super Red | 38 | 10.5 | 3.60 | 240 | 8 | 490 | 16 |
| 70149 | BACKlight2G/617/BL02ST/A1 | Amber | 38 | 10.5 | 3.60 | 240 | 8 | 780 | 25 |
| 70147 | BACKlight2G/606/BL02ST/01* | Orange | 38 | 10.5 | 3.60 | 240 | 8 | 980 | 31 |
| 70145 | BACKlight2G/587/BL02ST/Y1* | Yellow | 38 | 10.5 | 3.60 | 240 | 8 | 980 | 31 |
| 70146 | BACKlight2G/525/BL02ST/T2* | Green | 32 | 10.5 | 3.00 | 240 | 8 | 430 | 14 |
| 70148 | BACKlight2G/470/BL02ST/B1* | Blue | 32 | 10.5 | 3.00 | 240 | 8 | 100 | 3 |
| 70144 | BACKlight2G/BL02ST/W2-865 | White-6500K | 38 | 10.5 | 3.60 | 240 | 8 | 520 | 17 |
| LINEARlight FLEX TOPLED | | | | | | | | | |
| 70061 | LINEARFLEXTOP/587/OS/LM10A/Y1 | Yellow | 72 | 24 | 3 | 600 | 22 | 1290 | 47 |
| 70062 | LINEARFLEXTOP/617/OS/LM10A/A | Amber | 72 | 24 | 3 | 600 | 22 | 930 | 34 |
| 70063 | LINEARFLEXTOP/525/OS/LM10A/T1 | Green | 72 | 24 | 3 | 600 | 22 | 675 | 25 |
| 70064 | LINEARFLEXTOP/470/OS/LM10A/B1 | Blue | 72 | 24 | 3 | 600 | 22 | 170 | 6 |
| 70065 | LINEARFLEXTOP/OS/LM10A/W | White | 57.6 | 24 | 2.4 | 600 | 22 | 540 | 20 |
| 70105 | LINEARFLEXTOP/OS/LM10A/HOW2-847 | White-4700K | 86.4 | 24 | 3.6 | 600 | 22 | 1290 | 47 |
| 70089 | LINEARFLEXTOP/OS/LM10A/HOW2-854 | White-5400K | 86.4 | 24 | 3.6 | 600 | 22 | 1290 | 47 |
| 70104 | LINEARFLEXTOP/OS/LM10A/HOW2-865 | White-6500K | 86.4 | 24 | 3.6 | 600 | 22 | 1290 | 47 |
| LINEARlight FLEX SIDELED | | | | | | | | | |
| 70066 | LINEARFLEXSIDE/615/OS/LM11A/A | Amber | 15.75 | 10.5 | 1.5 | 300 | 22 | 117 | 8 |
| 70067 | LINEARFLEXSIDE/587/OS/LM11A/Y1 | Yellow | 23.63 | 10.5 | 2.225 | 300 | 22 | 405 | 29 |
| 70068 | LINEARFLEXSIDE/525/OS/LM11A/T | Green | 31.5 | 10.5 | 3 | 300 | 22 | 147 | 11 |
| 70069 | LINEARFLEXSIDE/470/OS/LM11A/B | Blue | 31.5 | 10.5 | 3 | 300 | 22 | 37 | 3 |
| 70070 | LINEARFLEXSIDE/OS/LM11A/W | White | 31.5 | 10.5 | 3 | 300 | 22 | 405 | 29 |
| LINEARlight FLEX COLORMIX | | | | | | | | | |
| 70082 | LINEARFLEXTOP/COLORMIX-OS-LM10L-RGB | | 54 | 24 | 2.25 | 200 | 15 | 603 | 46 |
| DRAGONchain | | | | | | | | | |
| 70129 | DRAGONchain/OS/DS36/W2-865 | White-6500K | 51 | 24 | 2.10 | 36 | 4 | 900 | 100 |

All information relates to the entire module. Data reflects statistical mean values.

Actual data may differ depending on variances in the manufacturing process.

* New product. Please contact OSRAM SYLVANIA for availability.



Power Supply Ordering and Specification Information

| Item Number | Description | Nominal Input Voltage (VAC) | Nominal Input Current (A) | Output Voltage (VDC) | Min. Output Power (W) | Max. Output Power (W) | Max. Line Ripple (V) | Remote Mounting (ft) | Compatible with OT 9 DIM | Compatible with OT DIM | Compatible with OT RGB Controls | Location Rating |
|--|-------------------|-----------------------------|---------------------------|-----------------------|------------------------------|-----------------------|----------------------|-------------------------------------|--------------------------|------------------------|---------------------------------|-----------------|
| 10.5V OPTOTRONIC Power Supplies | | | | | | | | | | | | |
| 51500 | OT6/100-240/10COS | 100-240 | 0.150@120V 0.050@240V | 10.5±0.5 | 0.2 | 6 | ±0.4V | 26 | No | Yes | Yes | Dry |
| 51505 | OT25/120/10 | 120 | 0.26@120V | 10.5±1.0 | 3 | 25 | ±1.1V | 10 | No | No | No | Dry |
| 51508 | OT50/120/10 | 120 | 0.52@120V | 10.5±1.0 | 10 | 50 | ±1.1V | 8 | No | No | No | Dry&Damp |
| 51509 | OT50/120-277/10E | 120-277 | 0.51@120V 0.22@277V | 10.8-11.5 | 0.6 | 50 | ±0.5V | 32 | Yes | Yes | Yes | Dry&Damp |
| 51506 | OT25/120/10CORD | 120 | 0.42@120V | 10.5+/-0.5 | 0.5 | 25 | ±0.5V | 58 | Yes | Yes | Yes | Dry&Damp |
| 24V OPTOTRONIC Power Supplies | | | | | | | | | | | | |
| 51501 | OT6/100-240/24COS | 100-240 | 0.150@120V 0.050@240V | 24.0±0.5 | 0.2 | 6 | ±0.4V | 26 | No | Yes | Yes | Dry |
| 51512 | OT20/120-240/24S | 120-240 | 0.35@120V 0.23@240V | 24.0±0.5 | 0.9 | 20 | ±0.2V | 32 | Yes | Yes | Yes | Dry |
| 51513 | OT75/120/24 | 120 | 1.2@120V | 24.0±0.5 | 10 | 75 | ±1.0V | 30 | Yes | No | Yes | Dry&Damp |
| 51514 | OT75/120-277/24E | 120-277 | 0.75@120V 0.35@277V | 23.5-25V | 0.9 | 75 | ±0.5 | 32 | Yes | Yes | Yes | Dry&Damp |
| Item Number | Description | Nominal Input Voltage (VDC) | Max. Input Current (A) | Control Voltage (VDC) | Output Power per Channel (W) | Max. Output Power (W) | Max. Power Loss (W) | Max. Output Current per Channel (A) | Location Rating | | | |
| OPTOTRONIC RGB Control Modules | | | | | | | | | | | | |
| 51517 | OT RGB 3CH DIM | 10.5/24 | 6 | 0-10 | 0-20/0-48 | 60/140 | 3 | 2 | Dry | | | |
| 51518 | OT RGB SEQUENCER | 10.5/24 | 6 | 0-10 | 0-20/0-48 | 60/140 | 3 | 2 | Dry | | | |



SYLVANIA Lighting Services

SYLVANIA Lighting Services (SLS), a subsidiary of OSRAM SYLVANIA, is the industry leader in lighting service and maintenance. Headquartered in Danvers, MA, SLS has 33 branch locations across the U.S., with

additional sites in Canada and Puerto Rico. We complete over 28,000 service actions a month with our extensive network of over 500 service technicians and 500 vehicles.



At SLS, our goal is to provide businesses with a single point of contact for all their lighting needs. We offer turnkey lighting programs for interior, exterior and sign lighting systems. Well-lit signs are essential to enhancing your company's image and ensuring customer and employee safety. With our nationwide fleet of service vehicles, we can meet your sign lighting needs

anytime and anywhere. And with specially designed bucket trucks that reach heights of over 50 feet, we can handle any outdoor lighting installation quickly and safely.

Since 1968, SLS has been providing customers with the highest quality lighting maintenance programs in the industry. Call Sylvania Lighting Services at **1-800-323-0572**. We will make your business shine!

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Fax: 1-800-562-4674

Industrial & Commercial

Phone: 1-800-255-5042
Fax: 1-800-255-5043

Consumer Products

Phone: 1-800-842-7010
Fax: 1-800-842-7011

Display/Optic

Phone: 1-888-677-2627
Fax: 1-800-762-7192

**For SYLVANIA LIGHTING
SERVICES:**

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Automotive/Miniature

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