SVEA AC 42

SVEA AC

42-LED

12W

A qualified solution to replace and exceed CFL and CDM solutions in Downlights or ambient luminaires.

No driver is required!

Key features

Story

Designed for downlight and other places where the need is to create a good atmosphere for people to dwell in whether they take care of business or socialize.

These LED modules or Light engines for Downlights are designed with internal drivers and are therefore very easy to connect into applications with different dimming scenarios. The light output efficiency is the highest available on the market for these types of applications. Our latest design feature TOD (thin optical device) is integrated in the LED module for a bright and consistent light experience.

Key features

- High efficiency
- Optimized Uniformity
- Lens with Connector
- Architectural Lighting

Content

Introduction

Svea package

The same package is used for Downlight, Spotlight, Tasklight and Medical light fittings etc. The solution is developed to make it easy for the designers and engineers to choose from low to high power, from AC to DC and choose between a variety of lenses in the same luminaire or in similar design. In the design concept there are standard dimmers with the same snap-in connector (that fits the whole OptoDrive® concept) as well as several heat sink designs with worldwide distribution.

AC design

All driver and dimmer components are built-in.

The advantage with an AC driver that has been built-in is:

- Lifetime – Connected to a heat sink and therefore has a controlled environment
- Dimming – Dimming via standard trailing edge dimmers
- Small – No extra boxes
- Simple – Easily adapted into to the production line

Light output

Colour stability is important to ensure that the installation has a uniform light output. Parameters such as binning, lifetime and thermal control are vital for good results.

Dimming

Use the latest dimmers from standard manufacturers for LED and make sure that the dimmer has the capacity to manage the low load of the LEDs power consumption. In some cases the dimmer requires more than one LED module connected in order to work as expected due to the minimum load required for the dimmer to function properly.

Short form Characteristics

MODULE CHARACTERISTICS	12W version
Power	12W +/-10% ea.
Input voltage	230VAC
Number of LED's	42
Colour Rendering Index	>Ra80, >Ra90
Colour temperature	2700K, 3000K, 4000K
Optics	130°
MECHANICAL	
Module dimension with cover	Hexagonal 83 / 95.7 mm diameter
Weight	
Assembly holes	3 x 3.42 mm
Wire connector	CviLux CP04-03S0 or JST BH
ELECTRICAL	
Input voltage range	220-240V
Input current	55 mA +/-10% ea.
Peak inrush current	600mA
Inrush current duration	< 35µs
Power factor	PFC 0.98
Total harmonic distortion	<15% THD
Type of current	AC
Surge protection	
Burst protection	
Over temp. protection	130°C
Energy class	
PHOTOMETRICAL	
Flux nominal	1100lm
Efficiency	
SDCM (Mac Adam)	3
Flicker percent	100%
Flicker index	
ENVIRONMENTAL	
Temperature range	-40°C to 85°C (Absolute maximum temp Tc 85°C)
Relative Humidity	10-75%
Ambient air pressure	500-1060 HPa
LIFETIME	
Life length L70B10*	>50 000h

* Lifetime based on LM80 and interpolatation according to TM21 standard.

Article number structure SVEA

SVEA AC.P.230.42.ZYY-130

AC	AC= 230VAC, ED=External Driver required, ID=Internal Driver
P	Power (Watt)
V	Voltage: 230VAC
N	Amount of LEDs
Z	CRI: 8=Ra>80, 9=Ra>90
YY	CCT: 27 =2700K, 30 =3000K, 40 =4000K
NN	Viewing angle code

Article name and versions

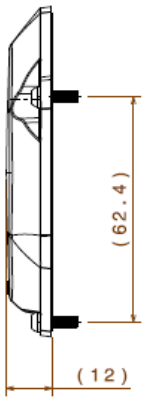
ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
Svea AC.12.230.42.827-130	12	230	42	>80	2700	130
Svea AC.12.230.42.830-130	12	230	42	>80	3000	130
Svea AC.12.230.42.840-130	12	230	42	>80	4000	130
Svea AC.12.230.42.927-130	12	230	42	>90	2700	130
Svea AC.12.230.42.930-130	12	230	42	>90	3000	130
Svea AC.12.230.42.940-130	12	230	42	>90	4000	130

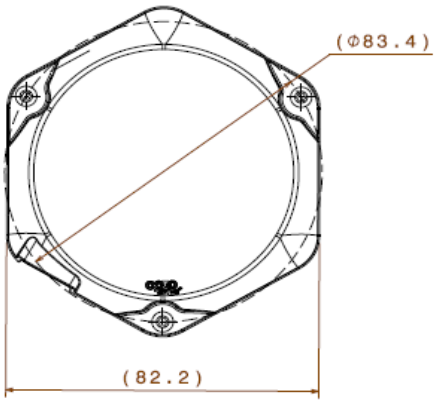
Ordering data

Svea AC – Packaging information

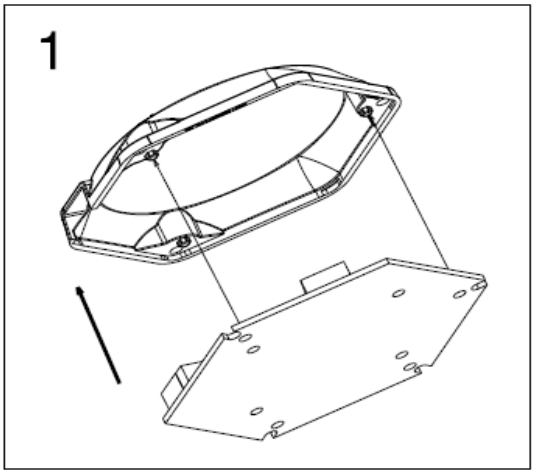
Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner box	64	35.6	22.7	9.6	
Outer box	320	46.5	37.5	39.6	21.54

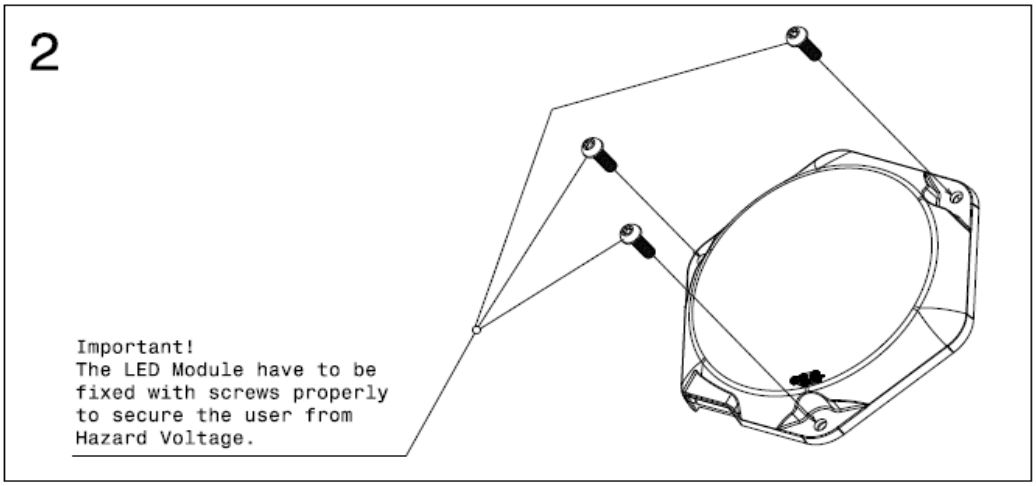
Dimensions LED Module





Mounting instructions





Wiring diagram

See separate wiring diagram documentation.

Article number	Article name	Length
102877	Wire AC 100	100 mm*
103527	Wire AC 220	220 mm*
101913	**Wire AC 450**	**450 mm**
103222	Wire AC 600	600 mm*

*Available on request

Parameters of the Lens system

The lens system is mounted and fixated onto the PCB with a double press-fit. The light parameters are according to the following:

Svea AC

Version	Viewing angle	FWHM angle
Svea AC	130°	±65°

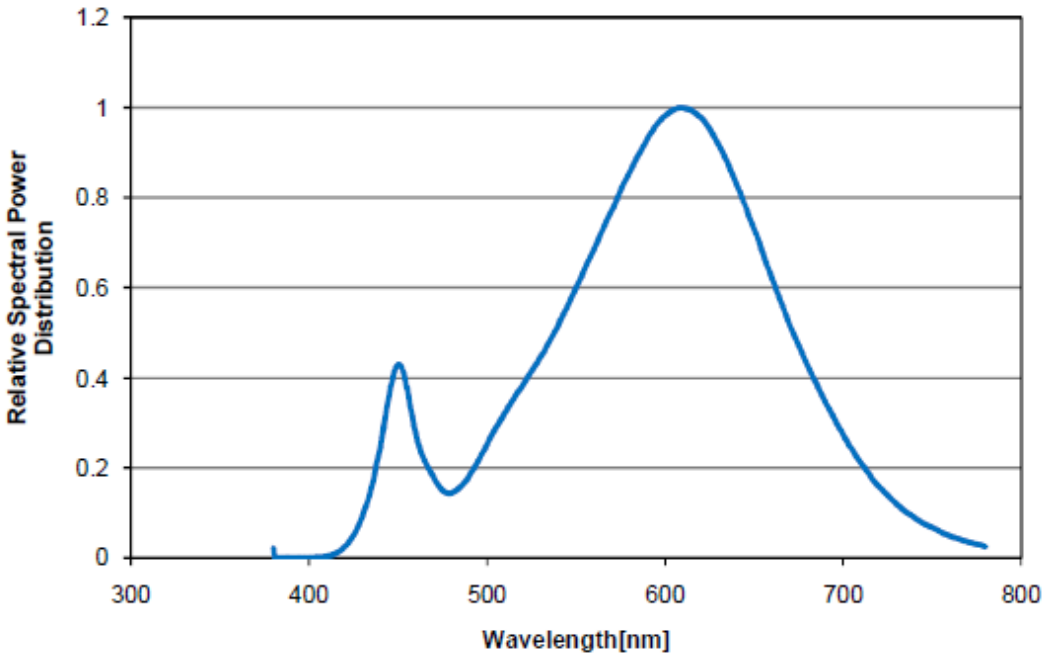
Photometrical

Svea AC 12W

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Luminous Flux		12W version		1100		lm
Correlated Colour Temperature	27*(2)	CCT		2700		K
	30*(2)	CCT		3000		K
	40*(2	CCT		4000		K
CRI		R_a	80	84	-	-
		R_a	90			

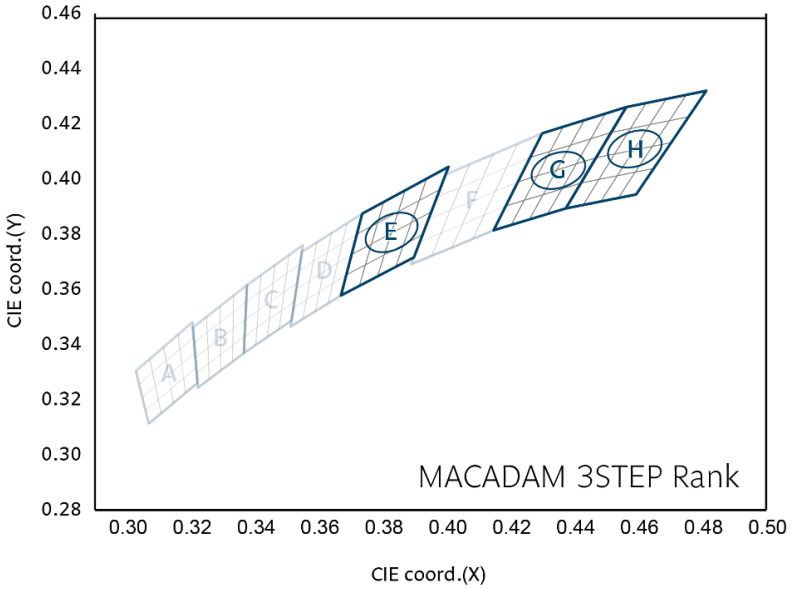
Electro-Optical characteristics LED module at I_F=xxmA, 230VAC, T_A=25ºC
(2)See detailed information in chapter" Binning structure graphical representation"

Colour Spectrum Warm White



CCT structure graphical representation

Binning structure graphical representation IEC 1976



* Note that the Blue boxes represent Energy Star Rank

Short form in diagram	Colour Code	CCT
H	27	2700K
G	30	3000K
E	40	4000K

Colour Rendering Index (CRI)

CRI Code	CRI (min) Ra
8	>80
9	>90

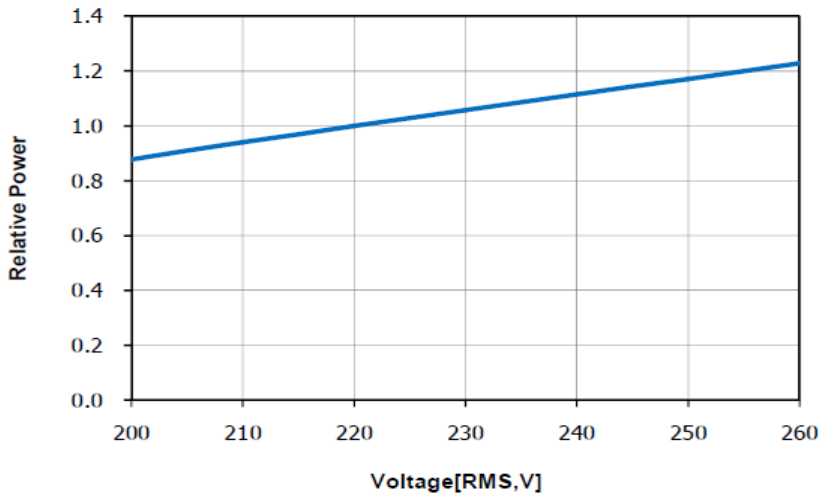
Short form letters for CCT (K)

Colour Code	CCT
27	2700K
30	3000K
40	4000K

Electro Optical data

Current vs. Voltage

With increasing voltage the light output and the heat increases.



Lifetime (Calculated)

Measurement points

When the measurement takes place you verify that the temperature on the marked measurement points is satisfying. Pending on the result you know what lifetime to expect from the module. This step will be implemented after the heat sink has been connected properly!

The lifetime is calculated at the maximum temperature recommended at the Tc (measuring point). It is important not to exceed this recommendation.

Below is the projected specification on light reduction on an aluminum base PCB. The copper needs to be minimum of 1 oz to obtain the lifetime calculation.

T_C(SURFACE TEMPERATURE)	TIME FOR 70% LIGHT-OUTPUT
25°C	55000Hr
65°C	40000Hr

Measurement Control

The recommended maximum value is 85°C on Tc or measuring point. If this value is exceeded we cannot guarantee the function and the lifetime of the product. The purpose of the measurement is to control the Junction (Tj) temperature of the LED and also in order to control the performance on the complete setup. By measuring the junction temperature (Tj) the average lifetime of the product is known.

The thermal connection is measured in temperature vs. Power.

Maximum Temperature

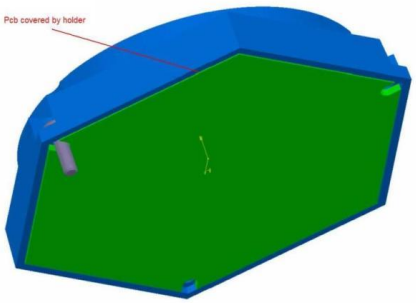
Secure the temperature in your application not to exceed 85°C. Read more in the section "Measurement control".

Thermal information

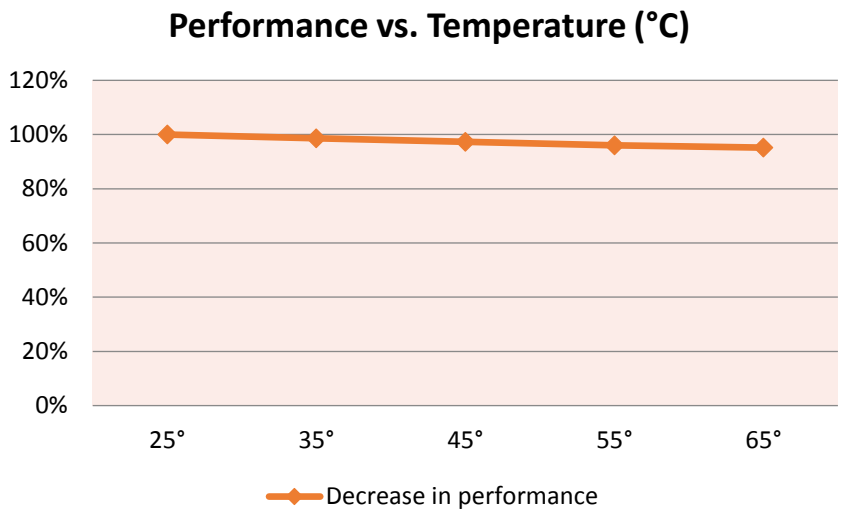
The thermal area (green) should be properly connected to an even and fine surface of a heat sink. Without this arrangement the unit will be overheated and will not be able to survive.

Maximum Temperature

Secure the temperature in your application not to exceed 65°C. Read more in the section “Measurement control”.



Temperature Characteristics

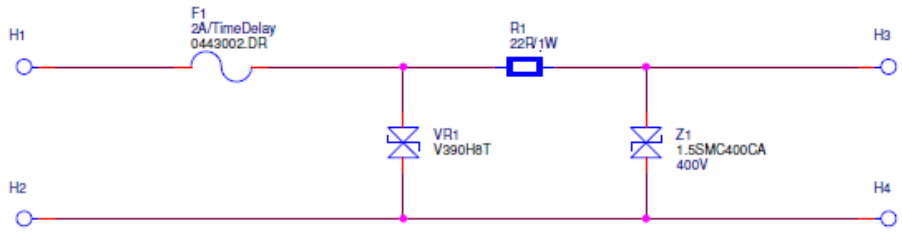


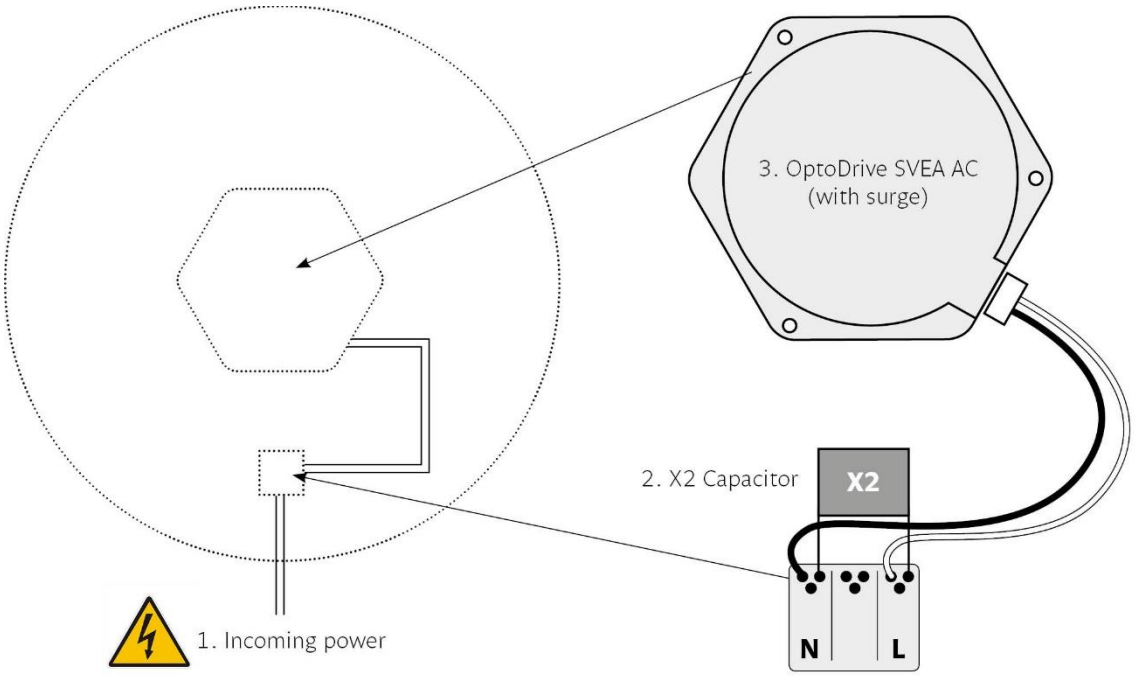
Consider the thermal capabilities of where the LED module is to be fitted. The temperature is an important factor for light output as well as for long time light output degradation.

Surge

Surge

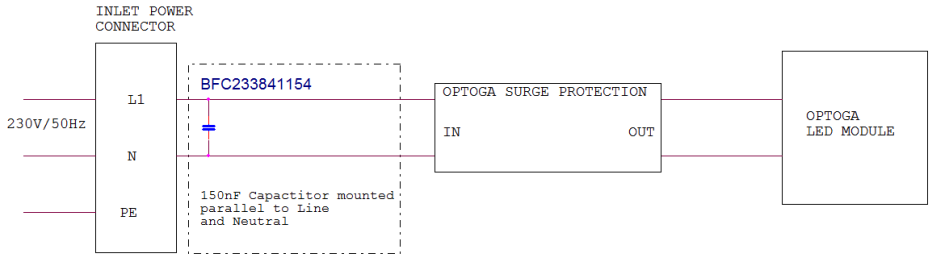
This document specifies how to connect Optodrive AC modules to achieve long life installation both with Surge, Burst and other problematic installation questions:

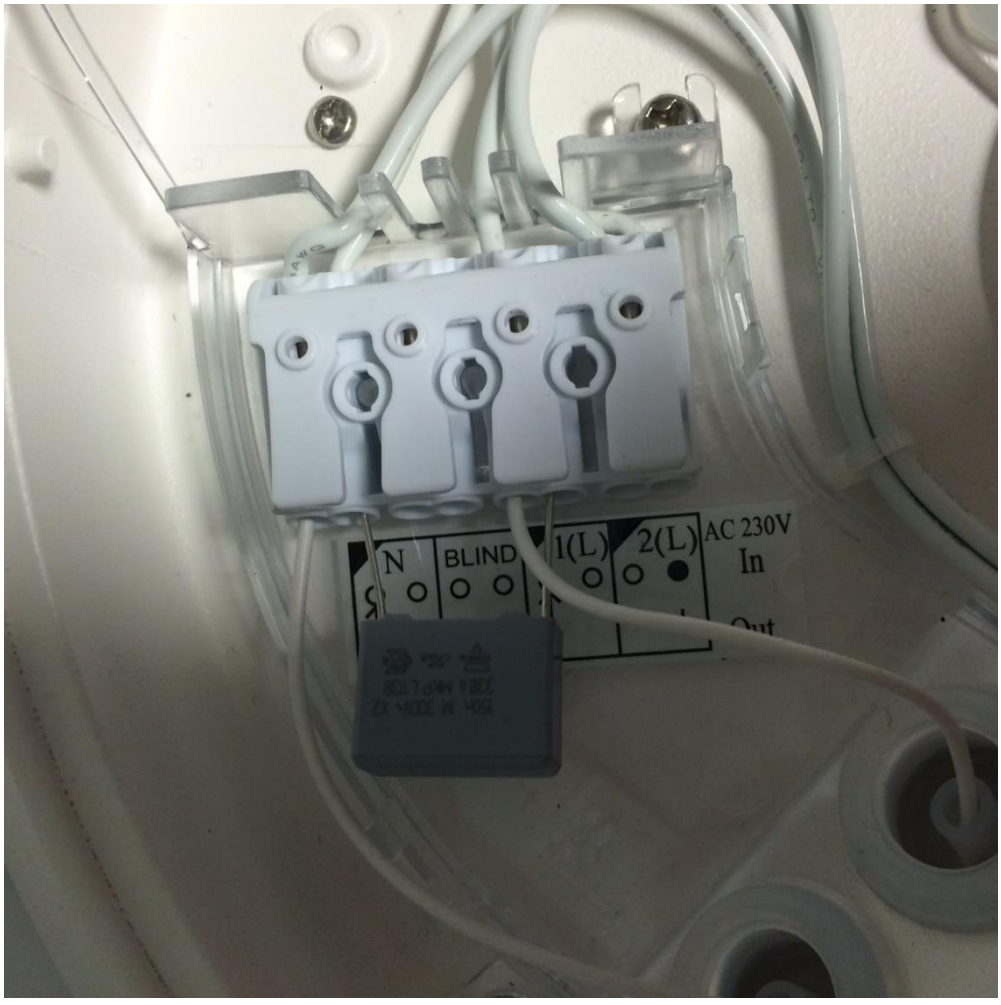




The installation set up requires an X2 Capacitor parallel to L1 and N to handle the fast and high voltage transients generated by the magnetic ballast.

Set-up





X2 capacitor mounted parallel to L1 and Neutral before Surge protection box

Test that have been made

Tests that are made

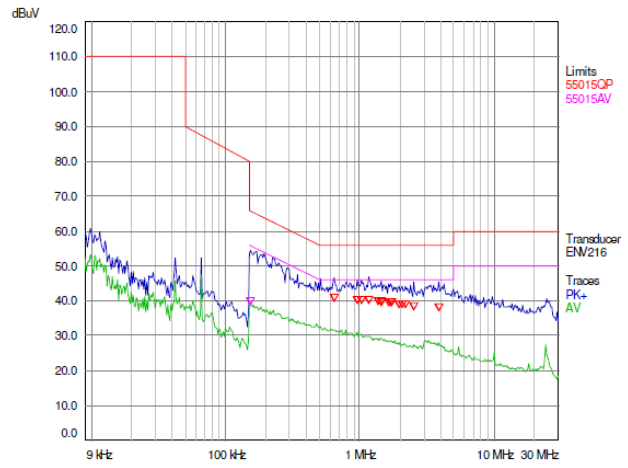
- Fast Transient Burst test IEC 61547
  - The LED module passed the test for fast transient burst
  - The module is also tested with higher voltage than stated in IEC standard and it shows that the module withstand up to +/-2kV.

Table 6 – Fast transients – Test levels at input and output a.c. power ports

Characteristics	Test levels
Test level	±1 kV (peak)
Rise time/hold time	5/50 ns
Repetition frequency	5 kHz

- EMC IEC55015
  - The LED module passed the test for EMC

Pre-measurement Graph



- Surge Protection IEC 61000-4-5

1. The LED module passed the test at 1250V Surge

   Continues testing

   The test is ongoing from Optoga side with a set up that makes on/off 30 times per minute. This is made with magnetic ballast without filtering capacitor to simulate old fluorescent tube installations.

2. Conclusion

The test that has been made gives us a clear indication that the LED module will be working according to a required standards. The X2 capacitor has to be mounted separately. The LED module will have an improved security and robustness for Surge and fast transients bursts.

3. Change Log

VERSION	DATE ISSUED	CHANGED
1.0	2015-02-09	Initial start-up SL
1.1	2015-02-10	Reviewed by PLI
1.2	2015-02-14	Updated the comments SL

Verification of Conformity

The module are tested at Intertek Semco according to IEC 62031.

Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
SURGE	IEC 61000-4-5	1 kv
Fast transient BURST	IEC 61547	2 kv
SAFETY	IEC 62031:2008	
Photo Biological Safety	IEC 62471:2008	
Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
ESD*	IEC 61000-4-2	8 kv Air discharge 4 kv Contact discharge

** Please consult the document ESD standards on Optodrive ED, ID and AC*

Production Setup

Production in accordance with IPC-6012-B and IPC-A-600G class 2

The LED Module is in accordance to EU Directive 2002/95/EC (ROHS)

The bare PCB is isolation tested with 3000VDC/10mA for 10 seconds

PCB Material Setup

In all questions regarding the bare PCB please use “Material Data sheet Optodrive” as a guideline.

Light fitting routine tests

According to EN/IEC 60598-1 should the routine test be performed as a dielectric strength test or insulation test. Only the insulation test of 500Vdc should be performed according to standard, 1s with min 2MΩ.

No dielectric tests are allowed to be performed on OptoDrive LED Modules.

Precautions for use

- This device should not be used in any type of fluids such as water, oil, organic solvent etc.
- When cleaning is required, use only water together with mild soap on the outside of the lens. Cleaning inside of the LED module is strictly prohibited.
- The appearance and specifications of the product may be modified for improvement without notice.
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- Opening of the LED module is prohibited due to risk of EMC, dust, grease and other exposures that will damage it.
- The LED Module should always be mounted to a proper heat sink before it's connected with its proper leads.

Handling in regards to static electricity

- The Optodrive products have integrated circuits (IC) on board that may be damaged if exposed to static electricity. Please handle the products only while using equipment that prevents static electricity. Do not handle them without having ESD protection.
- The Optodrive products are not be installed into the end product without proper ESD protection.
- Optodrive LED Modules meet IEC61547:2009 and IEC61000-4-2. We recommend the light fixture manufacturer to take the mentioned standards under consideration.

Storage before use

- Use only properly rated test equipment and tools for the rated voltage and current of the product being tested.
- It is strongly suggested to wear rubber insulated gloves and rubber bottom shoes while handling the product.
- Do not wear any conductive items (such as jewelry) which could accidentally contact electric circuits.
- Faults, lightning, or switching transients can cause voltage surges in excess of the normal ratings.
- Internal component failure can cause excessive voltages.
- Stored or residual electricity in long wire could be hazardous.

ROHS II Compliant

All our LED modules meet the Restrictions of Hazardous Substances (RoHS II)!

There has been a growing consensus that Lead Free Systems should increase for the safety of our environment. It is a very serious problem that lead and other harmful materials are being used in commercial and industrial products, causing more and more environmental problems. This has led to regulations such as RoHS (Restriction of the use of certain Hazardous Substances) from the EU and the Japan Ministry of Trade and Industry (MITI). All LED module makers providing products to these countries should comply with these restrictions. In order to meet the RoHS II regulation, Optoga is strictly implementing a ban on lead and other hazardous materials in its products. This is in compliance with our responsibilities as good corporate citizens.

Design for Environment:

According to the EU-directive 2011/65/EU (RoHS II) the following substances must not be used in this product

- Lead (Pb) alloys
- Mercury (Hg)
- Cadmium (Cd)
- Chromium (6+) compounds
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

Do you want to know more about benefits of OptoDrive LED?

Read more about OptoDrive at www.optoga.com.
You can contact us via info@optoga.com.
You can also call us on +46 (0)589 490 950.

Optoga AB
Optoga was founded in November 2004 in Arboga, Sweden and has many years of experience in electronics design. The company developes and supplies LEDs and LED-module solutions for the lighting industry, vehicle manufacturers and electronics companies.

With the OptoDrive LED-module, Optoga has taken the initiative to replace strip lights, incandescent and halogen bulbs with LED-based sources.

Köpingsvägen 4 • SE-732 31 Arboga • SWEDEN
Tel +46 (0) 589 490 950
info@optoga.com • www.optoga.com