STEFFI-D AC

25°

50°

STEFFI-D

COB
5W | 10W

A qualified solution for downlights and spotlights.
No Driver is required!

Key features

Story

The LED module and light engine is named Steffi-D and it is a design for light fittings and luminaires aiming for various areas. It has been designed in order to meet the demands on high performance optical solutions in both light emitting and in colour rendering.

Steffi-D is a high-end design LED Engine with very low profile. It is designed around a 230VAC COB with high performance together with a 230VAC electronic design that is tested and approved according to IEC62031 at Intertek.

Available in CRI 80 and 90 for 230VAC in 2700K, 3000K and 4000K with viewing angle of 25 and 50 degrees.

Key features

- Made for mid-sized lightings with opalized cover.
- Even light distribution
- No need for a driver
- Integrated cover
- Simple integration

Content

Introduction 4
Short form Characteristics 5
Article number structure 6
Ordering data 7
Dimensions LED module 8
Mounting instructions 9
Wiring diagram 9
Parameters of the Lens system 10
Parameters of the light output 11
Binning structure graphical representation 12
Electro Optical data 13
Lifetime (Calculated) 14
Surge 16
Verification of Conformity 18
Precautions for use 19
ROHS Compliant ..... **Fel! Bokmärket är inte definierat.**

Introduction

Steffi-D 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	5W version	10W version
Power	5 W +/-10% ea.	10 W +/-10% ea.
Input voltage	230VAC	
Number of LED's	1 COB	
Colour Rendering Index	>Ra80, >Ra90	
Colour temperature	2700K, 3000K, 4000K	
Optics	25°, 50°	
MECHANICAL		
Module dimension with cover	44.7 mm diameter	
Weight		
Assembly holes	3 x 2 mm	
Wire connector	JST BHR-02(4.0)VS-1N or CviLux CP0402S0000	
ELECTRICAL		
Input voltage range	220-240V	
Input current	55 mA +/- 10% ea.	115 mA +/- 10% ea.
Peak inrush current	600mA	
Inrush current duration	< 35µs	
Power factor	PFC 0.97	
Total harmonic distortion	<15% THD	
Type of current	AC	
Surge protection	1kV	
Burst protection	2kV	
Over temp. protection	130°C	
Energy class		
PHOTOMETRICAL		
Flux nominal	550 lm	1000 lm
Efficiency		
SDCM (Mac Adam)	3	
Flicker percent	100%	
Flicker index		
ENVIRONMENTAL		
Temperature range	-40°C to 65°C (Absolute maximum temp Tc 65°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

Steffi-D AC.P.230.1.zyy-NN

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

Parameters vs. Article no

ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
Steffi-D AC.5.230.1.827-50	5	230	1	80	2700	50°
Steffi-D AC.5.230.1.830-50	5	230	1	80	3000	50°
Steffi-D AC.5.230.1.840-50	5	230	1	80	4000	50°
Steffi-D AC.10.230.1.827-50	10	230	1	80	2700	50°
Steffi-D AC.10.230.1.830-50	10	230	1	80	3000	50°
Steffi-D AC.10.230.1.840-50	10	230	1	80	4000	50°

ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
Steffi-D AC.5.230.1.927-50	5	230	1	90	2700	50°
Steffi-D AC.5.230.1.930-50	5	230	1	90	3000	50°
Steffi-D AC.5.230.1.940-50	5	230	1	90	4000	50°
Steffi-D AC.10.230.1.927-50	10	230	1	90	2700	50°
Steffi-D AC.10.230.1.930-50	10	230	1	90	3000	50°
Steffi-D AC.10.230.1.940-50	10	230	1	90	4000	50°

ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
Steffi-D AC.5.230.1.827-25	5	230	1	80	2700	25°
Steffi-D AC.5.230.1.830-25	5	230	1	80	3000	25°
Steffi-D AC.5.230.1.840-25	5	230	1	80	4000	25°
Steffi-D AC.10.230.1.827-25	10	230	1	80	2700	25°
Steffi-D AC.10.230.1.830-25	10	230	1	80	3000	25°
Steffi-D AC.10.230.1.840-25	10	230	1	80	4000	25°

ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
Steffi-D AC.5.230.1.927-25	5	230	1	90	2700	25°
Steffi-D AC.5.230.1.930-25	5	230	1	90	3000	25°
Steffi-D AC.5.230.1.940-25	5	230	1	90	4000	25°
Steffi-D AC.10.230.1.927-25	10	230	1	90	2700	25°
Steffi-D AC.10.230.1.930-25	10	230	1	90	3000	25°
Steffi-D AC.10.230.1.940-25	10	230	1	90	4000	25°

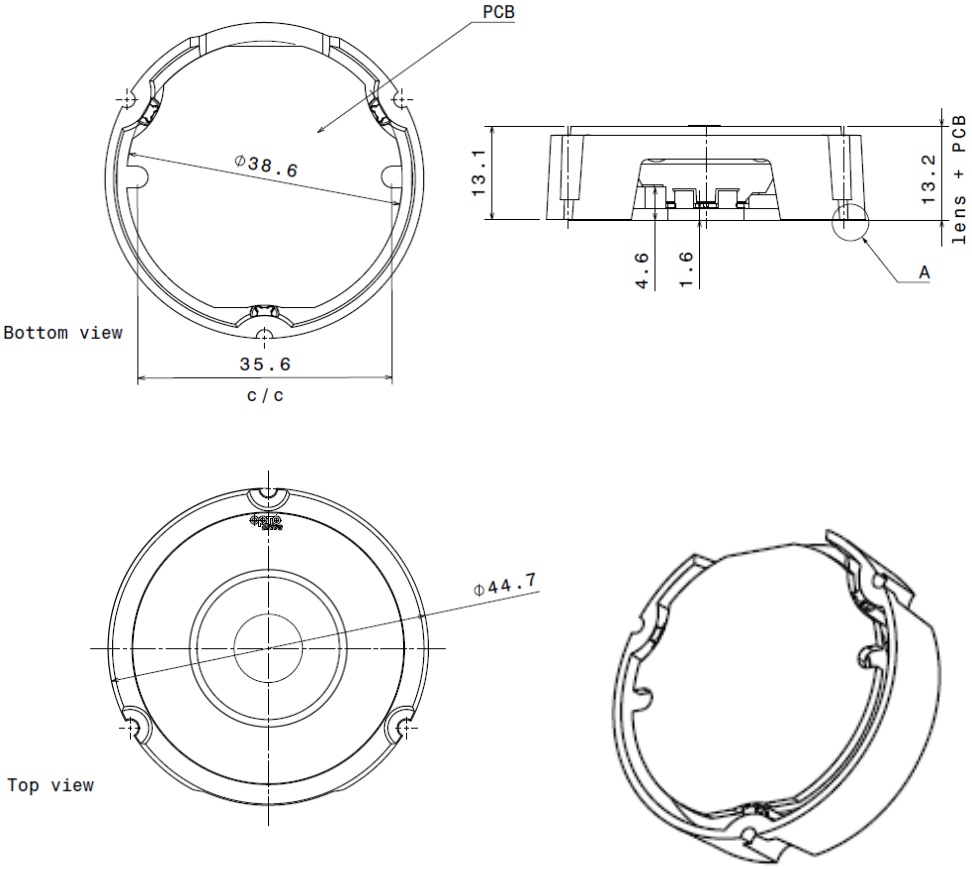
Ordering data

Steffi-D AC – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner box	120	35.6	22.7	9.6	1.5
Outer box	960	46.5	37.5	39.6	12.4

Dimensions LED module

Steffi-D LED Module



Mounting instructions

TBD

Wiring diagram

ARTICLE NUMBER	ARTICLE NAME	LENGTH
103817	Wire AC 220mm 2-pol	220mm

See separate wiring diagram documentation in Datasheet Accessories AC.

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:

Version	Viewing angle	FWHM angle
Steffi-D AC.P.230.1.ZYY-50	50°	±20°
Steffi-D AC.P.230.1.ZYY-25*	25°	

*Versions that are under development

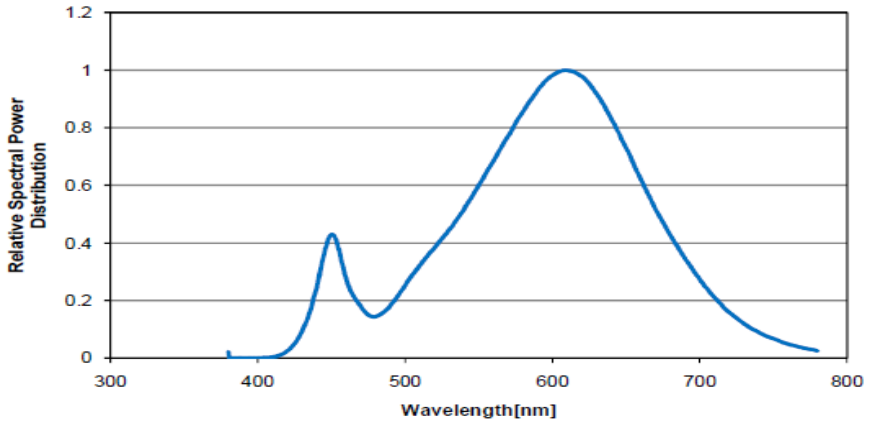
Parameters of the light output

Steffi-D AC

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Luminous Flux	5W version	W		500		lm
	10W version	W		1000		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	94		
Power		Po		5		
		Po		10		

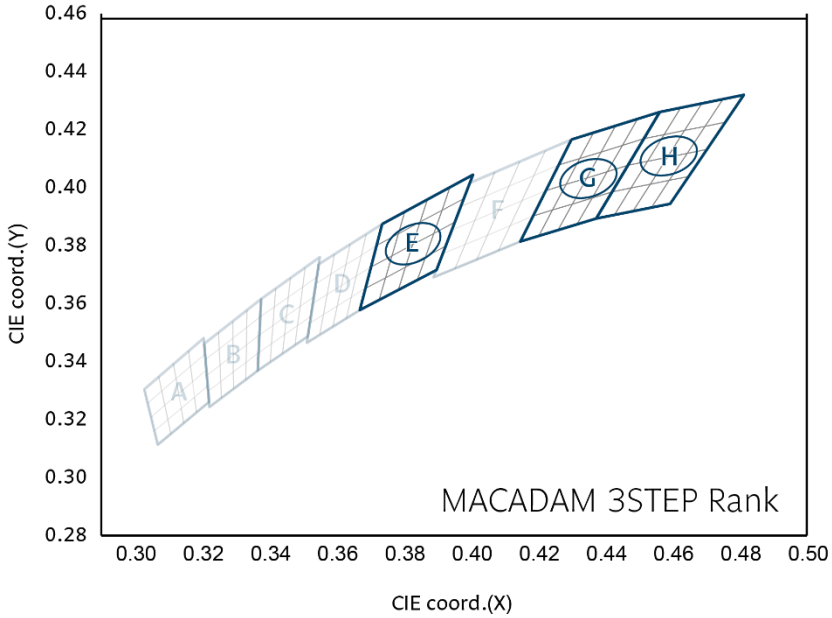
Electro-Optical characteristics LED module at 230VAC, T_A=25ºC
(2)See detailed information in chapter" Binning structure graphical representation"

Colour Spectrum



Binning 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

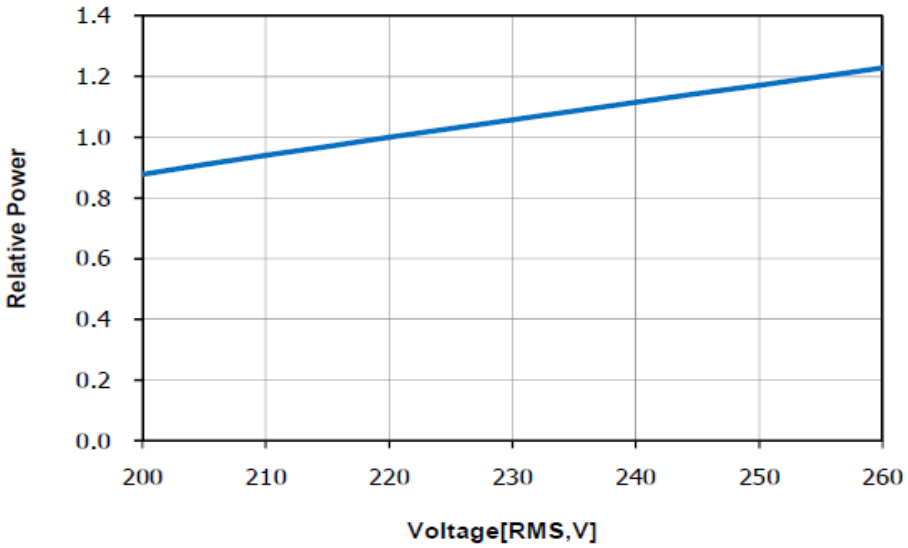
Short form letters for CCT (K)

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

Electro Optical data

Current vs. Voltage

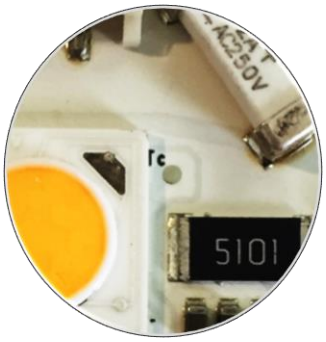
With increasing voltage the light output and the heat increases.



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.

Projected lifetime based on TM-21

The power load used with the LED module is according to the “lumen maintenance projection”. It is a LM80 projected lifetime based on discreet LEDs tested in the stated temperature environment at a 30mA power load.

	55°C	65°C	75°C	85°C
L70B10	>50 000h	>50 000h	>50 000h	>50 000h
L80B10	>50 000h	>50 000h	>50 000h	>50 000h
L90B10	44 000h	44 000h	44 000h	44 000h

Measurement Control

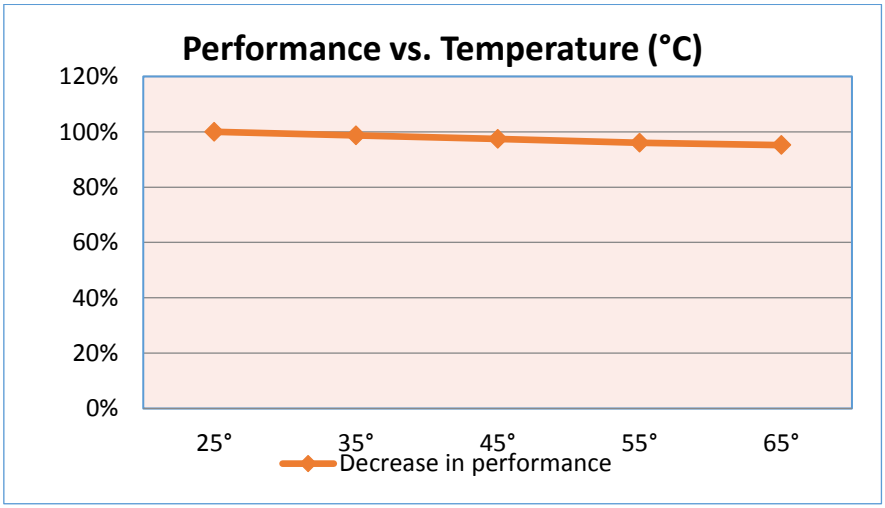
The recommended maximum value is 65°C on Tc or measuring point. If this value is exceeded we cannot guarantee the function and the lifetime of the product. The purpose of the measurement is to control the Junction (Tj) temperature of the LED and also in order to control the performance on the complete 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 65°C. Read more in the section "Measurement control".

Temperature Characteristics

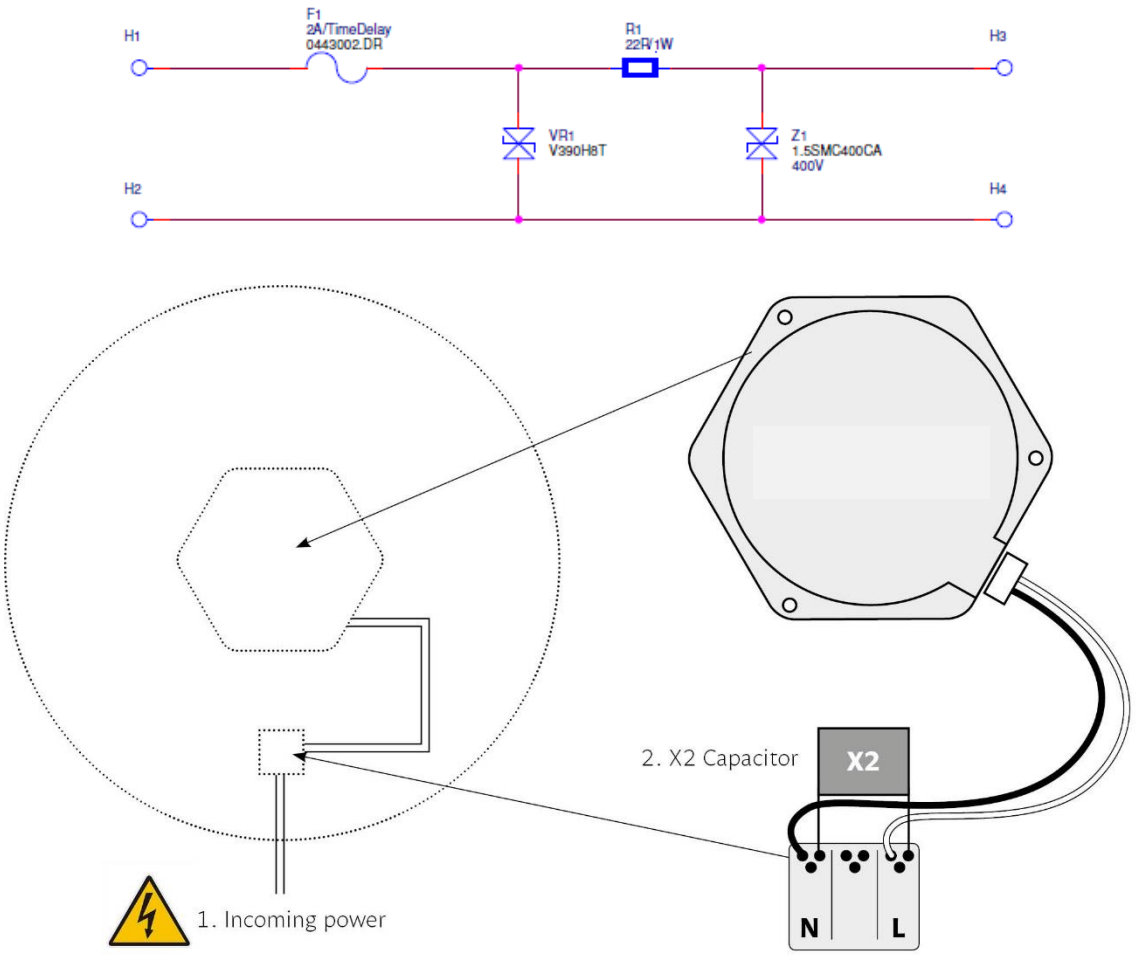


Consider the thermal capabilities of where the LED module is to be fitted. The temperature is an important factor for light output as well as for long time light output degradation.

Surge

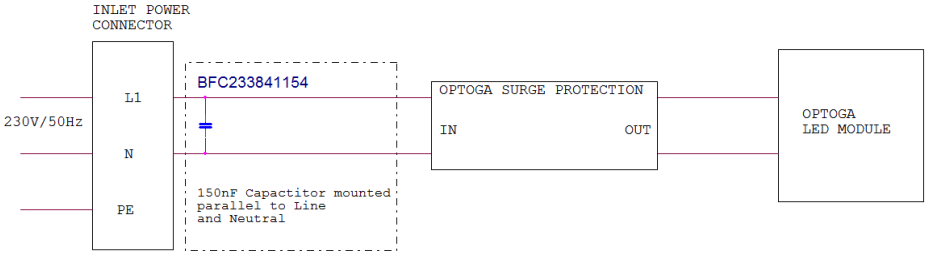
Surge

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



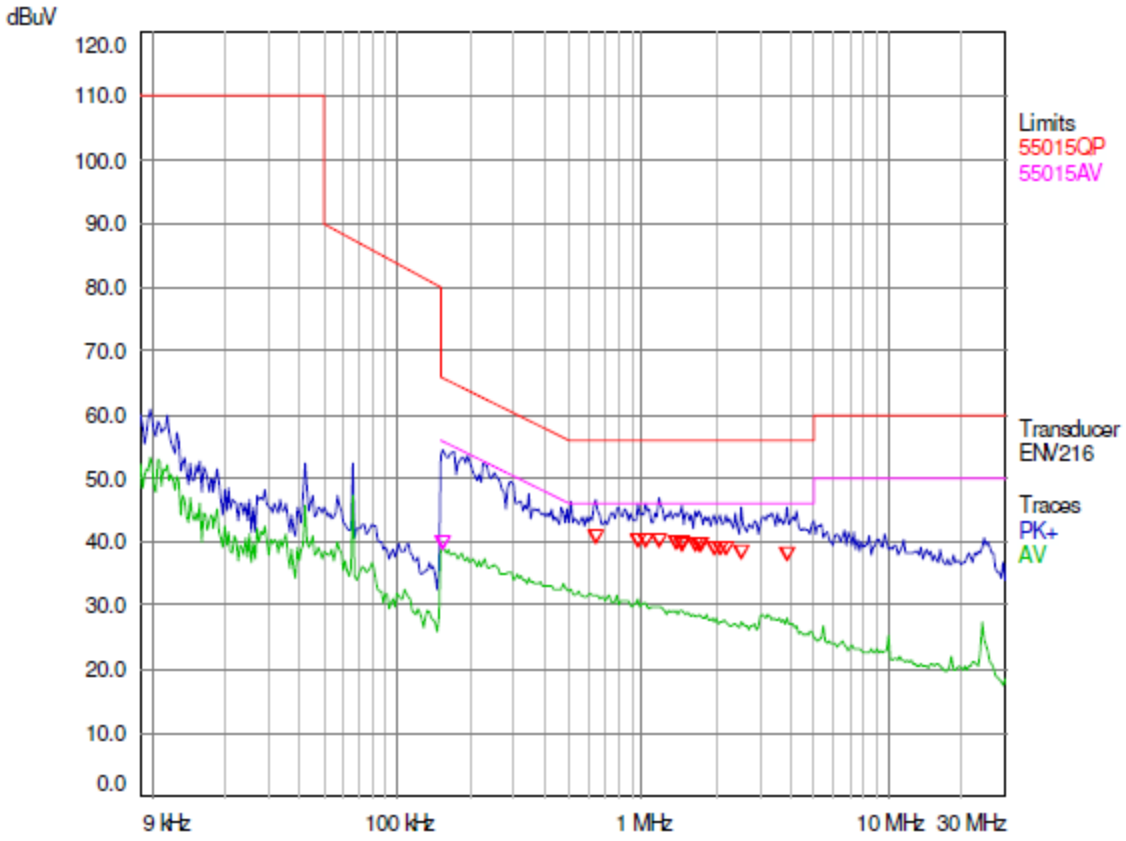
The installation set up requires an X2 Capacitor parallel to L1 and N to handle the fast and high voltage transients generated by the magnetic ballast.

Set-up



EMC

Pre-measurement Graph



Verification of Conformity

The module are under testing 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 fittning

Light fitting standard according to EN/IEC-60598-1 production control specifications function test. The insulation test of 500Vdc should be performed 1s with min 2MΩ. No dielectric test should be performed.

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.

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)

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

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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.

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