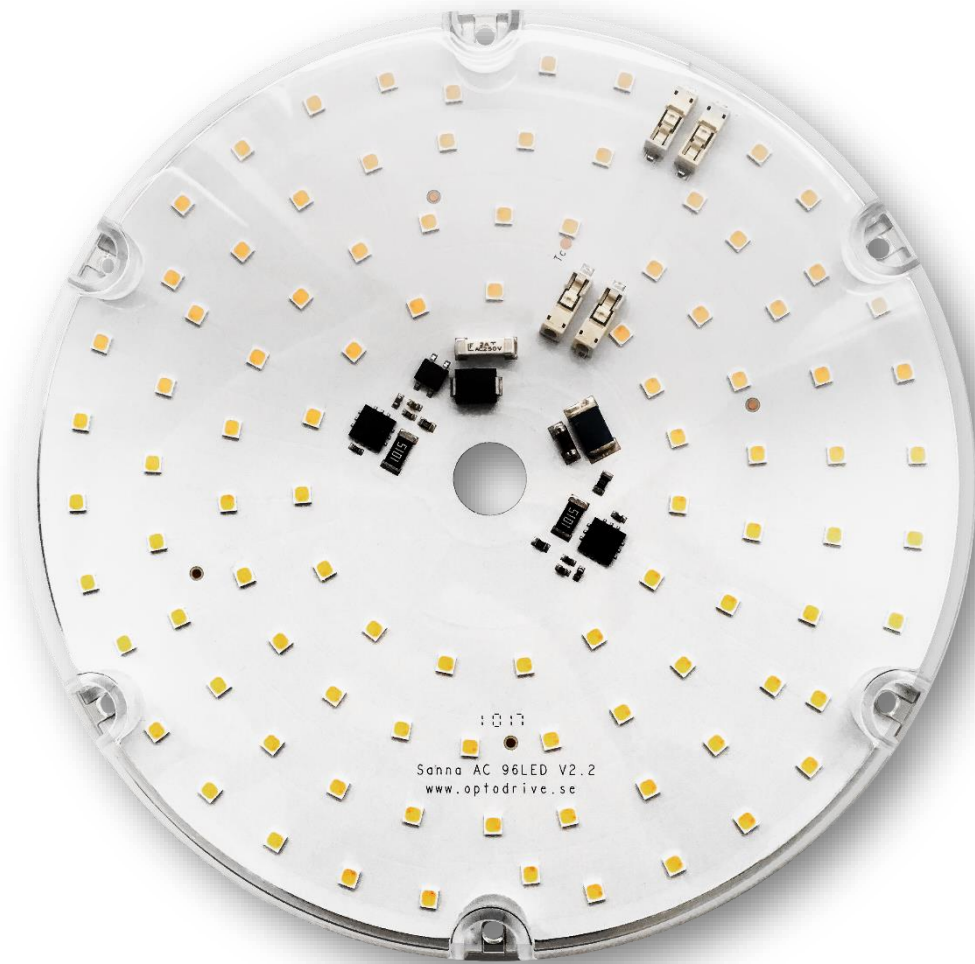




SANNA AC



SANNA AC

12W | 20W

Round LED-module for lightings with opalized glass.

No driver is required



Key features

The LED module is named SANNA and it is designed for mid-sized lightings with opalized glass. It can be used for ceiling lamps or wall lamps, as well as bigger pendulums.

The boundary between what is a luminaire and what is a system (of luminaires) is opened up. The control systems behind the luminaires are becoming increasingly complex and enable personal and intuitive lighting solutions. There are really no restrictions beyond how and in what way the light from these LED Modules can be controlled.

Key features

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





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Introduction

Sanna package

The solution is developed to make it easy for the designers and engineers, with double connectors for wires and a hole for center mounting it is well equipped for flexible and safe mounting.

If you want to dim with ordinary dimmers, they work exactly as they are, but if you want it more intelligent, a sugar-bite-sized unit called DimIn is fitted with the option of DALI, Casambi or another communication protocol.

The light-engine is a round LED-light engine for pendants with a centered hole for wires. Wires are easily inserted into poke-in connectors. DALI and Casambi and other Eco-Systems of communications can easily be integrated. All IoT LED Modules have an electrical insulated heat PAD mounted to be able to manage Class II light fitting installations.

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.



Short form Characteristics

MECHANICAL	12W version	20W version
Module dimension with cover	158.5 mm diameter	
Weight	TBD	
Assembly holes	6 x M3	
Wire connector	Poke in	

ELECTRICAL	12W	20W	
Power	12W	20W	
Input voltage	230VAC		
Input voltage range	220-240VAC		
Power factor	0.80	0.80	
Total harmonic distortion	<15%		
Type of current	AC		
Peak inrush current	< 600mA		
Inrush current duration	< 35µs		
Surge protection	1500V		
Fast transient burst	2000V		
Over temp. protection	150°C		
Energy class	CRI80 3000K	E	E
	CRI90 3000K	E	E

PHOTOMETRICAL	12W version	20W version
Flux nominal	1320lm	2400lm
Efficiency	>110lm/W	>110lm/W
Number of LED's	90	
Rendering index	>Ra80 >Ra90*	
SDCM (Mac Adam)	3	
SVM	0.5	
PstLM	0.6	
Spread angle lens	130°	
Colour temperatures	2700K, 3000K, 4000K	

ENVIRONMENTAL	12W version	20W version
Temperature range	-40°C to 65°C (Absolute maximum temp Tc 65°C)	
Relative Humidity	10-75%	
Ambient air pressure	500-1060 hPa	

LIFE LENGHT	12W version	20W version
Life length L70B10	>50 000h	

*Specifications are valid for >Ra90.



Article number structure

Sanna158 AC.P.230.96.8yy-NN.FF.IOT

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 2760=CCT changeable
NN	Viewing angle code
FF	Flickerfree to meet EPREL 2021
IOT	Possibility to connect Casambi and DALI, still fully dimmable from mains

Article name and versions

ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
SANNA AC.12.230.96.927-130.FF.IOT	12	230	90	90	2700	130°
SANNA AC.12.230.96.930-130.FF.IOT	12	230	90	90	3000	130°
SANNA AC.12.230.96.940-130.FF.IOT	12	230	90	90	4000	130°
SANNA AC.20.230.96.927-130.FF.IOT	20	230	90	90	2700	130°
SANNA AC.20.230.96.930-130.FF.IOT	20	230	90	90	3000	130°
SANNA AC.20.230.96.940-130.FF.IOT	20	230	90	90	4000	130°

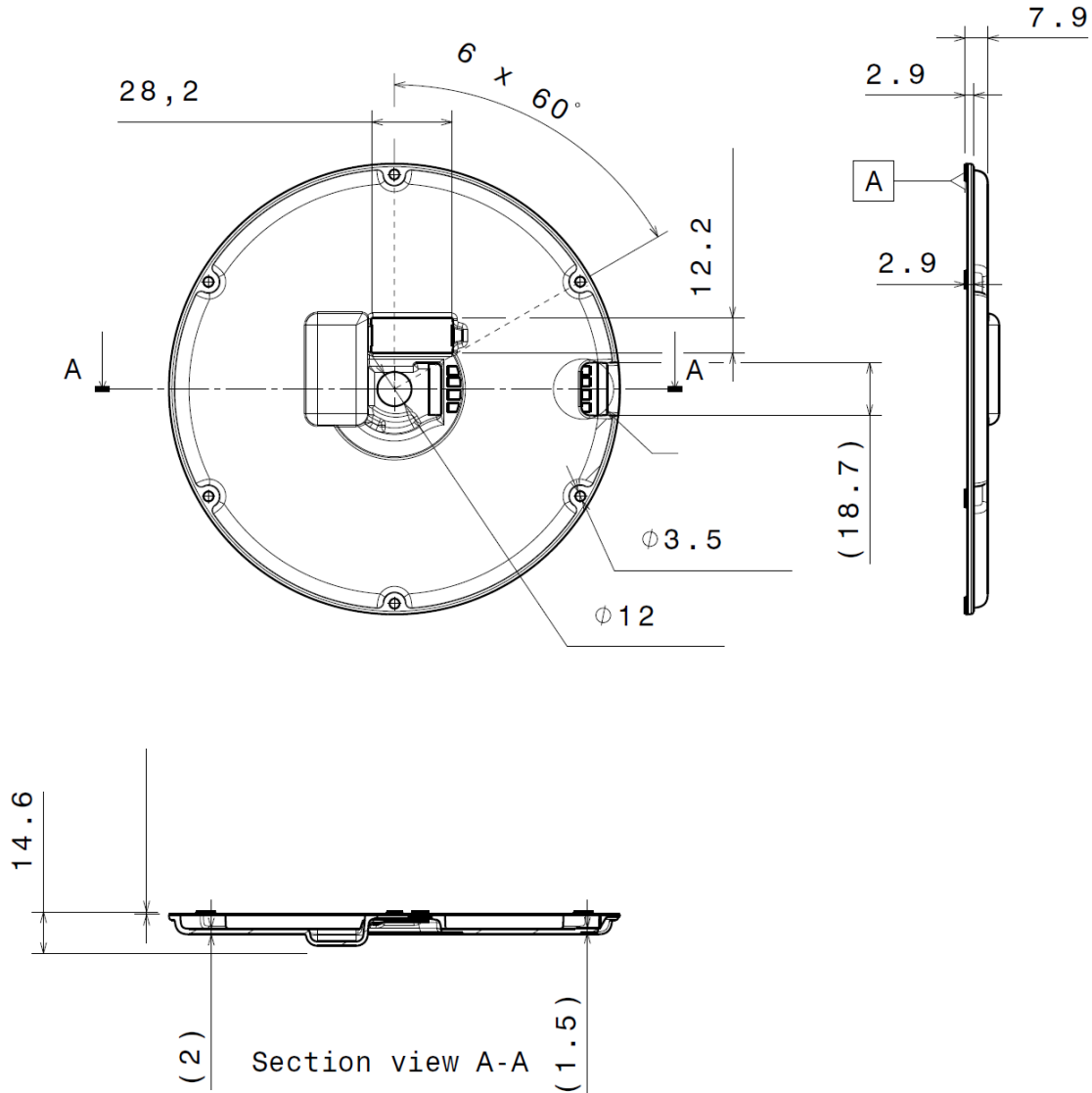
Ordering data

Sanna AC – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner box	8	35.6	22.7	9.6	
Outer box	64	46.5	37.5	39.6	12.4

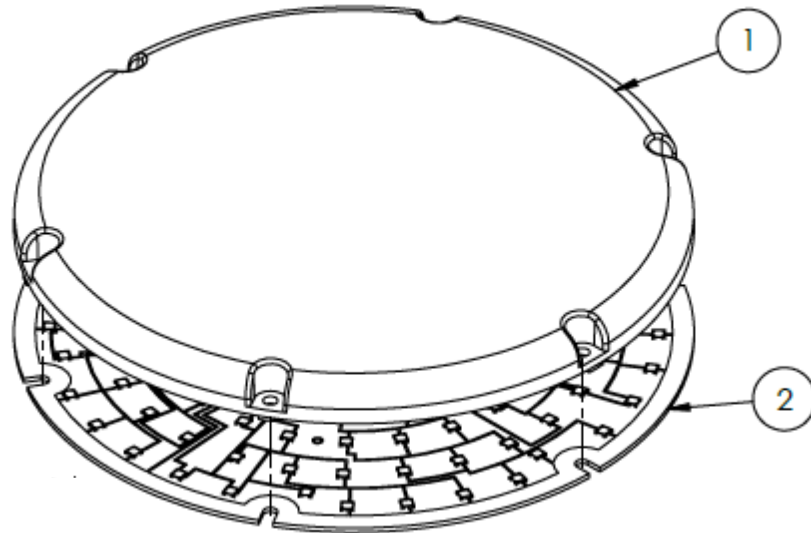
Dimensions

LED-module



Mounting and de-mounting instructions

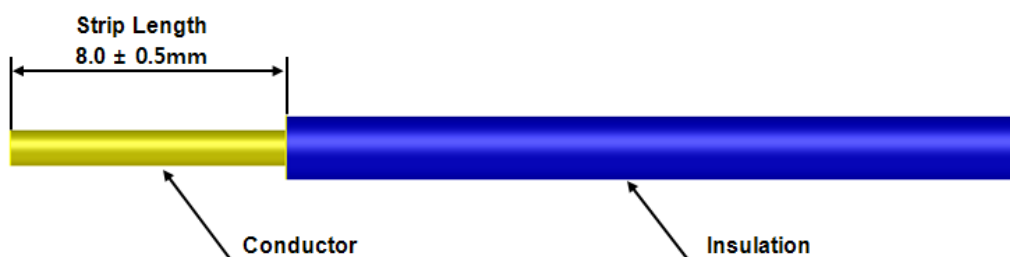
The LED module is to be fixated with screws before the wire connection is made. Never connect or disconnect the LED module with the power ON. Read the information under "Precautions for use" before handling the device.



1. Sanna cover
2. Sanna PCB

Wiring

Type of wire	AWG	mm ²
Stranded	22-20	0.32-0.5mm ²
Solid	24-18	0.51-1.02Ø (0.2-0.8mm ²)
Insulation diameter	Max 2.1 mm	





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
SANNA COVER IOT	130°	±65°



Photometrical

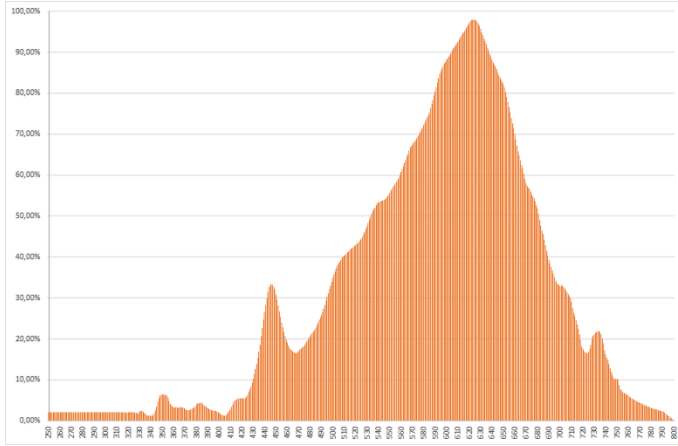
Flux

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Luminous Flux	12W	Φ_v		1350		lm
	20W			2250		lm
Correlated Colour Temperature	27*(2)	CCT		2700		K
	30*(2)	CCT		3000		K
	40*(2)	CCT		4000		K
CRI		R_a	80	85	-	-
		R_a	90	94	-	-
Power		P_o		12	12	W
		P_o		20	20	W

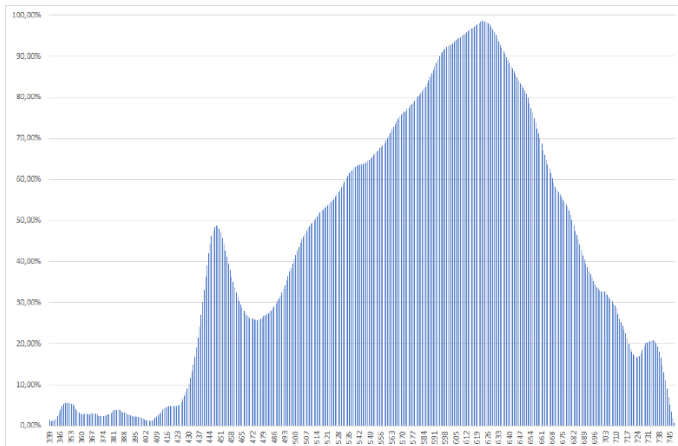


Colour Spectrum

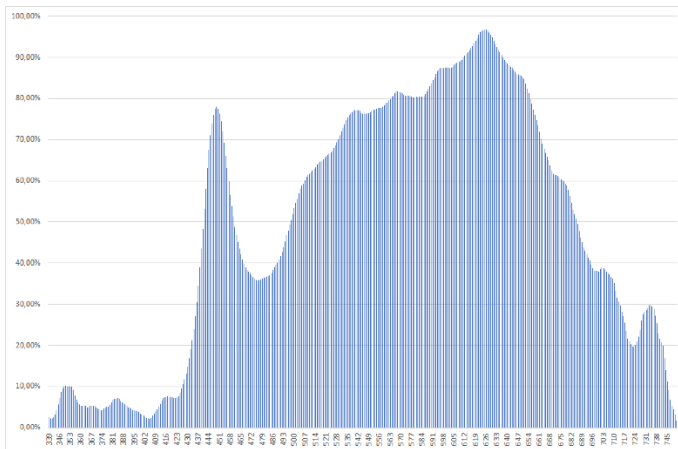
2700K



3000K

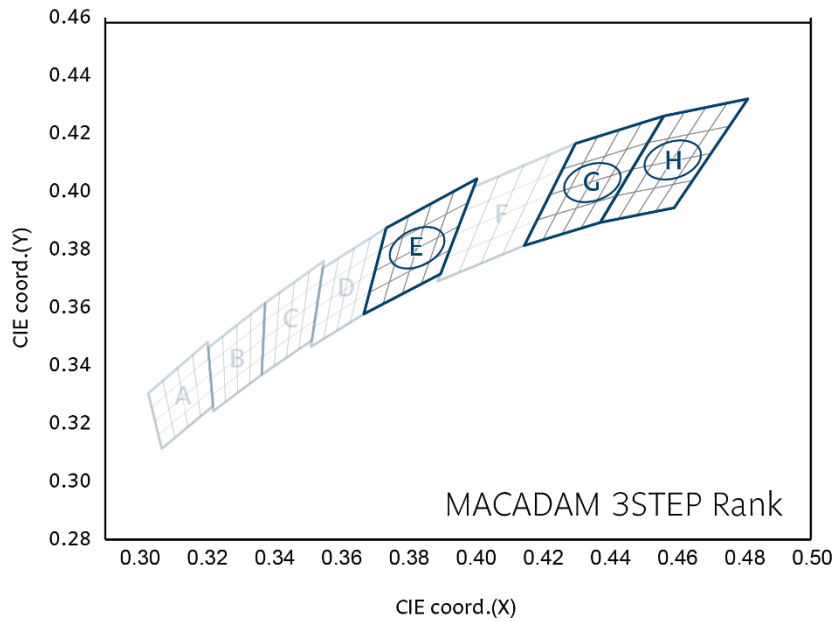


4000K



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

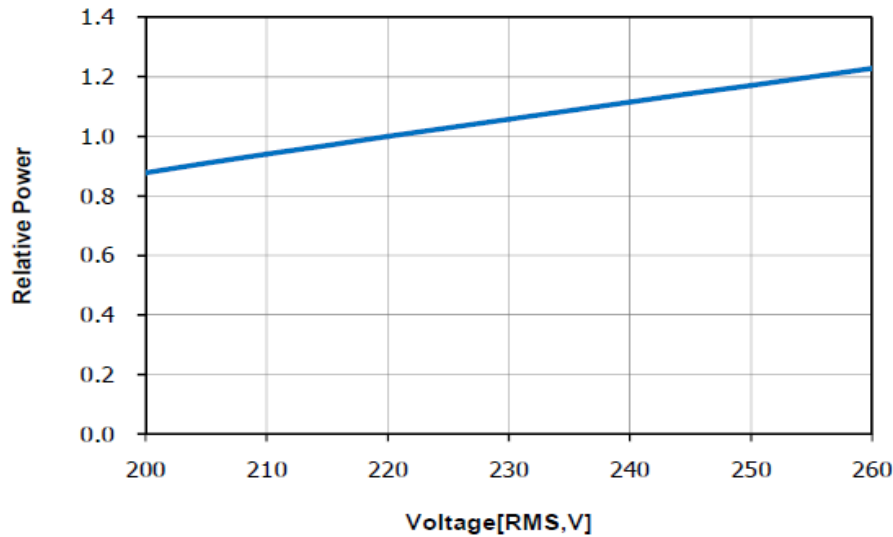
Short form letters for CCT (K)

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

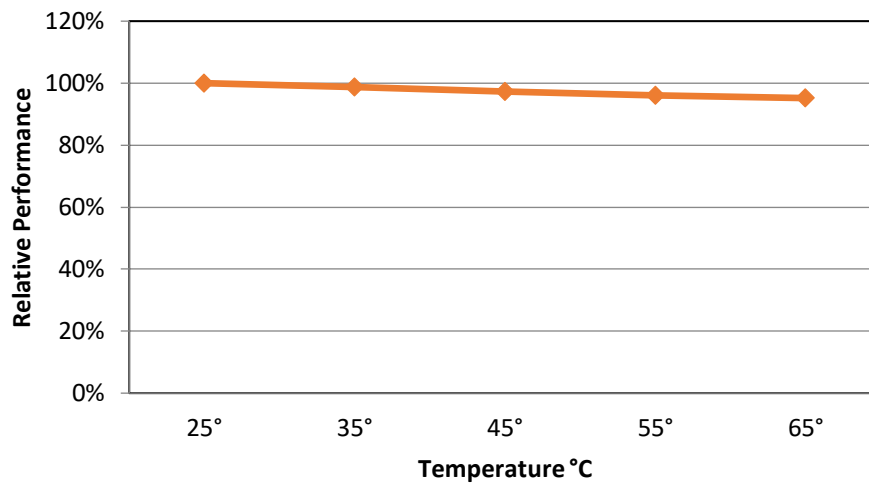
Electrical Optical Data

Current vs. Voltage

With increasing voltage the light output and the heat increases.



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.

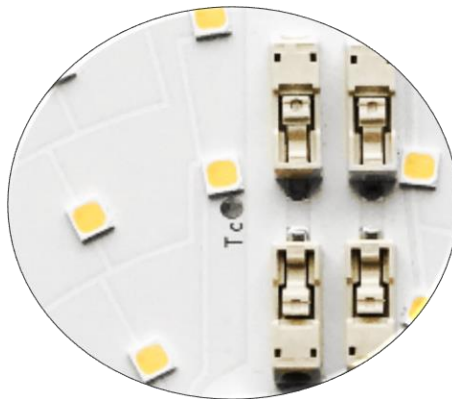
Lifetime (Calculated)

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.

Tc(Surface temperature)	Time for 70% light-output (L70B10)
65°C	>50 000 Hr



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.

Maximum Temperature

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



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	>47 000h	>38 000h	>33 000h
L90B10	28 000h	24 000h	20 000h	18 000h



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	
EMC	IEC 61000-3-2:2006	
EMC	IEC 61000-3-3:2008	
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 III Compliant

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

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 III 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 (RoHS III) the following substances must not be used in this product

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Chromium VI (Cr⁶⁺)
- Polybrominated biphenyls PBB
- Polybrominated diphenyl ethers PBDE
- Bis(2-ethylhexyl) phthalate DEPH
- Butyl benzyl phthalate BBP
- Dibutyl phthalate DBP
- Diisobutyl phthalate DIBP

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

Read more about OptoDrive at www.optoga.com.

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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 develops 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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