Xitanium 32W 0.7/0.75A 42V I 230V

PHILIPS

Philips Lighting

VERSION: SUPERSEDES:	**TECHNICAL SPECIFICATION** **Xitanium 32W 0.7/0.75A 42V I 230V**				**9290 014 10400**			
NAME: Luo Guangyi	DOC. ORIGIN DATE: 4-1-2015	UNIT MM	PROJ. EUROP	SHEETS: 15	SHEET 190 - 1	LANGUAGE: 10		**A4**

MACHINE & PRODUCT DOCUMENTATION LIGHTING

History

Revision	Date	Remarks
0.1	04-01-2015	First version

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1 System Specifications

1.1 System description

The Xitanium LED driver is designed to operate multiple parallel connected strings of 14 LEDs in series by means of current controlled output. The LED current has a fixed value and is not dimmable.

The driver is suitable for nominal 220V to 240V 50Hz/60Hz mains supply and is designed to be used for Class II luminaires and is intended for indoor use only. The electrical output is SELV isolated.

1.2 Overview

The LED driver is connected by external wiring to the LED module and mains according to Figure 1

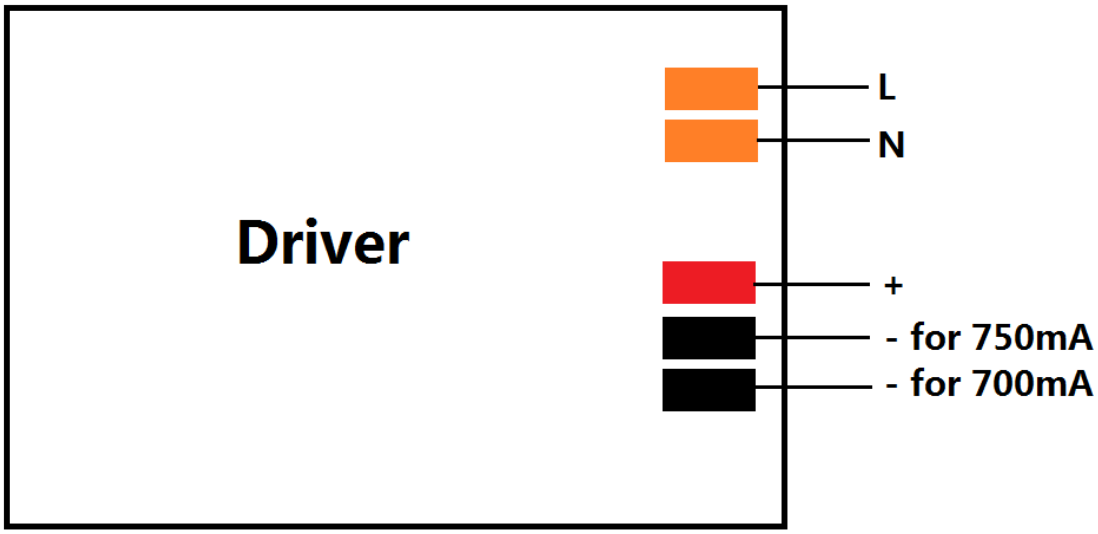


Figure 1: System overview

- + output directly drives the LEDs with - as return. No other series components or circuits should be used

1.3 Measurement conditions

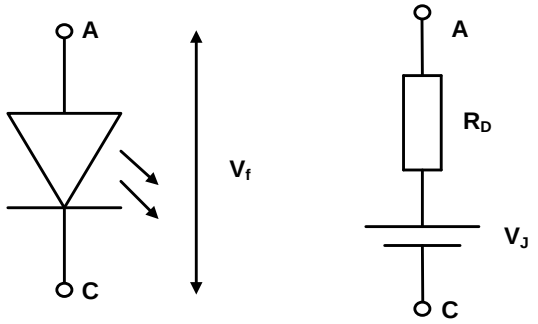
All properties are valid for nominal operating conditions within the input performance voltage range, output operating window and specified ambient temperature range, unless specified otherwise.

1.4 LED load specifications

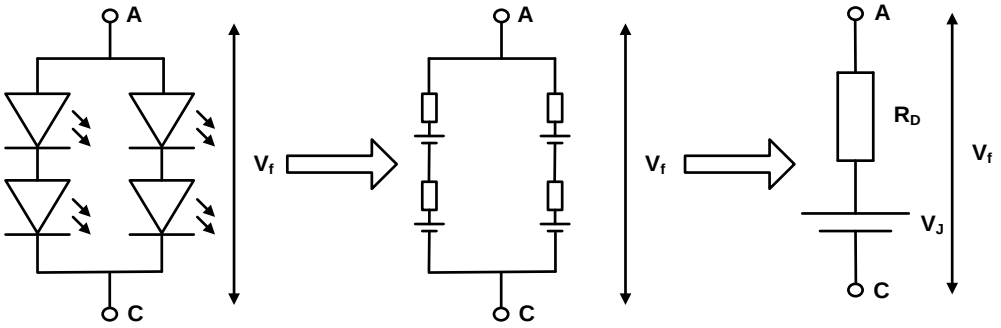
The LED (light emitting diode) is a semiconductor light source, which operates at DC current. Light will only be generated if the LED is biased in forward direction. The forward voltage depends on the LED design. Total load impedance for the driver depends on the LED impedance and the configuration of the LED load, series or parallel configuration influences the impedance.

The general simplified equivalent circuit consists of a dynamic resistance in series with a voltage source and is depicted in the figure below:

- V_f = Total LED forward voltage
- R_d = dynamic resistance of the LED
- V_J = LED junction voltage
- A = Anode
- C = Cathode



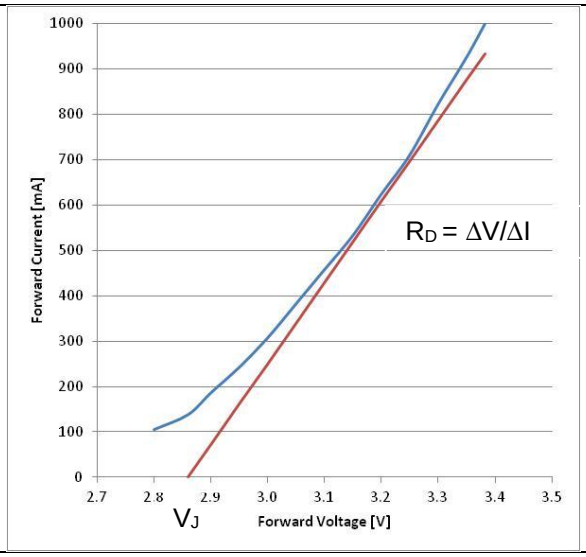
CertaDrive drivers allow multiple strings of series and parallel connected LEDs to be connected to the output of the driver. These strings can also be described with the same equivalent circuit as depicted below.

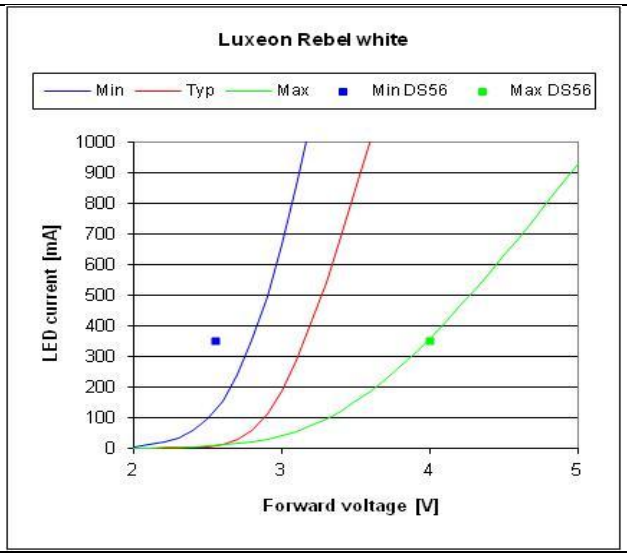


The typical and minimum/maximum forward voltage Vf can be found in the LED datasheet, but the dynamic resistance can usually only be derived from the typical V/I curve in the datasheet. Some typical values are given in the table below:

LED	Vf			R_D	V_J
	min	typ	max	@700mA	@700mA
Luxeon Rebel Royal Bleu		3.1		0.45	2.78
Luxeon Rebel ES Royal Bleu	2.5	3	3.5	0.31	2.78
Cree XP-E		3.15		0.56	2.75

The dynamic resistance is calculated with a tangent line which touches the LED curve at a specific current (e.g. 700mA). The dynamic resistance depends on the current at which the LEDs are operated and the variation on the total forward voltage of the specific LED. This is shown in the figures below.





The driver operating window is specified with a minimum and maximum forward current, minimum and maximum forward voltage, minimum and maximum dynamic resistance and a minimum and maximum power. LED loads which fall within this window can be connected to this driver.

One LED loads is specified as reference for the LED driver:

- CoB, e.g.

1.5 Electrical Connections

1.5.1 Mains Input and dim interface

X1	Signal	Description	Notes
X1-1	L	Line	Orange
X1-2	N	Neutral	Orange

Connector type: WAGO 250
Wire Type: Solid wire 0.75…1.5 mm2
Wire strip length: 8…9mm

1.5.2 LED module output connections

X2 Connector	Signal	Description	Notes
X2-1	+	LED output positive	Red
X2-2	-	LED output negative for 750mA	Black
X2-3	-	LED output negative for 700mA	Black

Note 3: Cable length for EMI compliance: 60cm.

Connector type: WAGO 250
Wire Type: Solid wire 0.75…1.5 mm2
Wire strip length: 8…9mm

1.6 Electrical Specifications

1.6.1 Mains Input

Symbol	Parameter	Condition	Values			Unit
			Min	Typ	Max	
Input Voltage						
V_{in}	AC Input Voltage	Nominal range	220		240	Vac
f	Mains frequency	Nominal range	50		60	Hz
$V_{in,perf}$	AC Input Voltage, performance range	Full spec compliance within performance range	202		254	Vac
f_{perf}	AC Input frequency, performance range	Full spec compliance within performance range	47.5		63	Hz
$V_{in,safety}$	AC Input Voltage, safety range	Safe operation is guaranteed within safety range, performance not specified Note 3	198		264	Vac
f_{safety}	Input frequency, safety range	Safe operation is guaranteed within safety range, performance not specified	45		66	Hz
Input Power						
P_{in}	Input Power	For 700mA output			35.2	W
		For 750mA output			37.5	W
η	Efficiency	@full output, Note 2	84	85		%
Input Current						
I_{in_AC}	Input Current AC	220Vac / 50Hz @ maximum output For 700mA output			0.167	A
		220Vac / 50Hz @ maximum output For 700mA output			0.178	A
PF	Power Factor	Within input performance range and output operating area	0.9			
THD	Total Harmonic Distortion	Within input performance range and output operating area		15		%
$I_{in,pkmax}$	Inrush Current	Note 4			17	Apk
	Mains current pulse time half peak			250		us
	Recommended drivers per circuit breaker	MCB 16A type B			28	

Note 2: Efficiency will be measured after the driver has thermally stabilized.

Note 3: Ballast is able to withstand low and high mains voltages during limited periods of time.

Low mains voltage:

With continuous low AC voltage (<198V) ballast lifetime can be adversely affected. The ballast will not fail at under voltage for a maximum of 48 hours at minimum operating AC voltage and maximum ballast ambient temperature.

High mains voltage:

High mains voltage does stress the ballast and will adversely affect the ballast lifetime.
Maximum 264V...280V during 48 hours.

Note 4: Test conditions according IEC60555: V_{mains}= 230V
F_{mains} = 50Hz
$Z_{mains} = R_{mains} + L_{mains}$
R_{mains} = 0.4Ohm
L_{mains} = 0.8 mH

1.6.2 LED module output

Symbol	Parameter	Condition	Values			Unit
			Min	Typ	Max	
IDC Output						
I_{DC}	Full output current			700		mA
				750		mA
	Output current tolerance	Tolerance@230V input and 42V output	-8		+8	%
		Line regulation	-8		+8	%
		Load regulation	-8		+8	%
I_{DCpk}	Output Ripple current	Peak to average value (Total) (I_{DCpk} - I_{DC})/I_{DC} Measured with reference load			15	%
		Peak to average value (<3kHz) (I_{DCpk} - I_{DC})/I_{DC} Measured with reference load			4	%
I_{DCpk}	Output peak current	During startup only, hot wiring not specified			1.1	A
V_{DC}	Output Voltage range	Performance range	32	36	42	V
$V_{DC,max}$	Output Voltage	No load			60	V
R_D	Dynamic resistance	Per board	Tbd			Ω
P_{DC}	Output Power range	Full output power range For 700mA	23	26	30	W
		Full output power range For 750mA	24	27	32	W
ISO	Output isolation level		SELV			
Startup time						
t_{st}	Startup time	Note 1			500	ms
t_{sd}	Shutdown time	Note 2			1000	ms

Note 1: Startup time is defined as the time it takes between mains power on until IDC > IDC_{min} with reference load

Note 2: After turning AC off, the time it takes between mains power on until I_{DC} will be from 95%→5%.

1.7 Audible Noise

Our audible noise measurements are executed according to 'ISO 3741:1999 Acoustics - Determination of sound power levels of noise sources using sound pressure - Precision methods for reverberation rooms'

Symbol	Parameter	Condition	Values			Unit
			Min	Typ	Max	
Audible noise driver						
	Audible noise level	Nominal input and output.			20	dB (A)

2 Abnormal Conditions

Abnormal Operation	Specification
Driver ambient temperature above T_{amb_max}	Impairment of driver lifetime and possible damage to driver.
Wrong LED module connected	No damage to driver. LED module life may be affected
Short circuit of output	Protected, automatic restart
Wrong insertion of output cables (mix-up/reversal)	Not protected, driver may fail
Open load	Protected, automatic restart
Too long output cable	EMI possibly too high
Hot wiring	Not protected, LED module may fail.

3 Environmental conditions

3.1 General

Symbol	Parameter	Condition	Values			Unit
			Min	Typ	Max	
Environment operational						
T_{amb}	Ambient temperature	Performance range	0		50	°C
		Guaranteed startup	0		50	
T_{c_max}	Case Temperature				75	°C
T_{c_life}	Case Temperature	Case temperature at which the lifetime is guaranteed			65	°C
H_{op}	Relative humidity	Non condensing	10		90	%
P_{air}	Air pressure		600			hPa
Environment storage						
T_{st}	Ambient temperature		-25		85	°C
H_{st}	Relative humidity	Non condensing	5		95	%
P_{air}	Air pressure		290			hPa

3.2 Sustainability

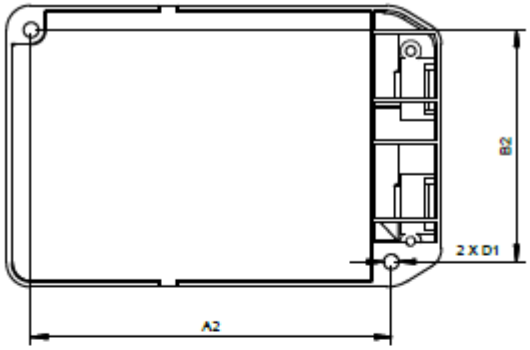
Parameter	Requirement
RoHS	All components and materials used in the driver must be RoHS compliant
Banned substances	Philips requirement CSO-BP01-2010-01

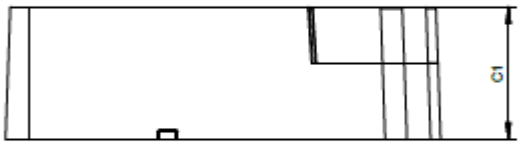
RSL.pdf

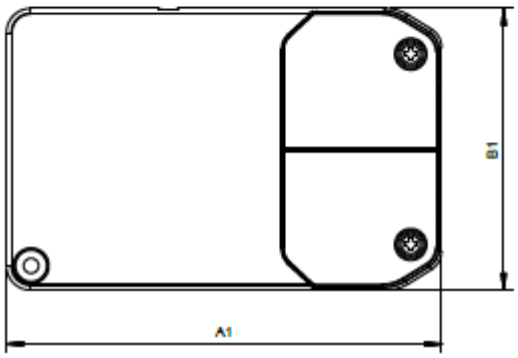
4 Mechanical Dimensions

Parameter	Description	Value			Unit
		min	typ	max	
Dimensions	L		105		mm
	W		68		mm
	H		32		mm
Housing	Cover	Grey plastic			
	Bottom	Grey plastic			
	IP rating Note 1	20			
Fixing					
Weight					Gr

Note 1: Indoor use only







Specification item	Value	Unit
Length (A1)	105	mm
Width (B1)	68	mm
Height (C1)	32	mm
Fixing hole diameter (D1)	3.6	mm
Fixing hole distance (A2)	87	mm
Fixing hole distance (B2)	56	mm

5 Reliability

5.1 Reliability

Parameter	Requirement
Rated lifetime	50000hrs / 10% failures @ T_{c_life}
MTTF	500000 hrs
Failure rate	0.2% per 1000hrs
Switching	1 cycles per day
Operating hours	12hrs per day, 3000hrs. per year

5.2 Standards

The driver is designed to meet these standards when mounted in the reference fixture. The final approbation must be verified in the application.

Standard	Description
Generated disturbances and EMI	
EN 55015/CISPR15	Conducted EMI, 9kHz-30MHz
EN 55015/CISPR15	Radiated EMI, 30MHz-300MHz
IEC / EN 61000-3-2	Limits for harmonic current emissions
IEC / EN 61000-3-3	Electromagnetic Compatibility – Limitation of voltage fluctuation and flicker in low voltage supply systems for equipment rated up to 16A
Immunity	
EN / IEC 61547	Equipment for general lighting purposes – EMC immunity requirements
IEC / EN 61000-4-2	Electrostatic Discharge
IEC / EN 61000-4-3	Radiated radio frequency, electromagnetic field immunity
IEC / EN 61000-4-4	Electrical fast transient/burst immunity
IEC / EN 61000-4-5	Surge immunity
IEC / EN 61000-4-6	Conducted disturbances induced by RF fields
IEC / EN 61000-4-11	Voltage dips, short interrupts, voltage variations
Performance	
IEC 62384	Lamp control gear: DC or AC supplied electronic control gear for LED modules - Performance requirements
Safety standards	
IEC 61347-1	Lamp control gear Part 1: General and safety requirements
IEC 61347-2-13	Lamp control gear Part 2: LED Particular requirements for d.c. or a.c. supplied electronic control gears for LED modules

6 Marking

6.1 Required approbation and marking

Standard	Description
	CE
	ENEC
	C-Tick
	CCC
SELV	Selv
	Double square
	Independent controlgear
	Safety isolating transformer
	F-mark

6.2 Label information

Label to be added