

ES50-1H24V-WS

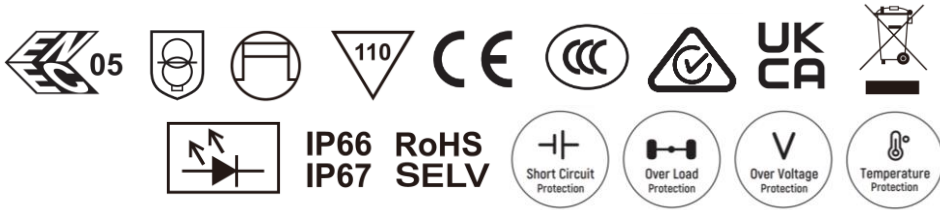
Product Feature

- Input voltage range: 176-305Vac.
- Isolated constant voltage design.
- Built-in active PFC function.
- No-Load Power < 0.5 W.
- SELV Output
- All-around protection: IUVP, SCP, OLP, OVP, OTP.
- Input surge protection: Differential mode: 4kV, Common mode: 6kV.
- IP66 + IP67 design for indoor and outdoor applications.
- Suitable for dry / damp / wet locations.
- 5-year warranty.



Application

Architectural lighting, Decorative lighting, Advertising light box.



Models

Model Number	Input Voltage Range	Max. Output Power	Output Voltage	Output Current Range	Efficiency [Typ.]	PF [Typ.]	THD [Typ.]
ES50-1H24V-WS	176-305Vac	50W	24Vdc	0-2.10A	89%	0.95	10%

Note:
1. All specifications are measured at 25°C ambient temperature, input voltage 220Vac, and the typical value tested by full load.

Technical Parameters

Parameter		Min.	Typ.	Max.	Remark
Input	Rated Input AC Voltage	-	220-240Vac	-	
	Input AC Voltage Range	176Vac	-	305Vac	Reference derating curve
	Frequency Range	47Hz	50/60Hz	63Hz	
	Input AC Current	-	-	0.32A	At 220Vac input and 100% load
	Input AC Power	-	-	65W	At 220Vac input and 100% load
	Leakage Current	-	-	0.70mA	IEC 60598-1; 240Vac/ 60Hz
	Inrush Current	-	-	45A	At 230Vac input and 100% load, 25°C Cold Start
	No-load Power	-	-	0.5W	At 230Vac input
	Power Factor	0.90	0.95	-	At 230Vac, 50-60Hz, 50%-100% load
	THD	-	10%	20%	At 230Vac, 50-60Hz, 50%-100% load
Output	Output Voltage Range	22.8V	24V	25V	±5%
	Open Circuit Voltage	-	-	25V	At 100% load, 20 MHz BW
	Total Output Voltage Ripple(Pk-Avg)	-15%	-	+15%	At 100% load, 20 MHz BW
	Output Current Range	-	-	2.10A	
	Efficiency	87%	89%	-	Measured at 100% load
	Startup Overshoot Voltage	-	-	5%	At 100% load
	Line Regulation	-1%	-	+1%	At 100% load
	Load Regulation	-3%	-	+3%	Input Voltage 230Vac, load changes from 70% to 100%.
	Turn-on Delay Time	-	-	1.0s	At 230Vac input and 100% load
	Dynamic Response deviation	-2.0V	-	+2.0V	R/S: 1 A/μs, 25% ~ 100% load.
	Dynamic Response settling time	-	-	5ms	

Parameter		Min.	Typ.	Max.	Remark
Other Characteristics	Operating Case Temperature For safety (Tc)	-40°C	25°C	+90°C	
	Operating Ambient Temperature For safety (Ta)	-40°C	25°C	+60°C	At 220-240VAC input
	Operating Case Temperature For warranty (Tc)	-40°C	25°C	+75°C	Humidity: 10% RH to 95% RH
	Storage Temperature (Ta)	-40°C	25°C	+85°C	Humidity: 5% RH to 95% RH
	Altitude	-65m	-	4000m	
	Temperature Coefficient	-0.06%/°C	-	+0.06%/°C	Tc:0 °C~90°C
	Under Voltage Protection	140VAC	150VAC	170VAC	Self-recovery
	Over load Protection	120%load	-	150%load	Self-recovery
	Short Circuit Protection	-	-	-	Self-recovery, short circuit without damage
	Lifetime (Tc≤75°C)	≥50,000 hours			At 220Vac100% load, please refer to lifetime vs. case temperature curve
	MTBF	200, 000 hours			At 220Vac80% load, Ta=25 °C (MIL-HDBK-217F)
	Warranty	5 years			Tc ≤ 75°C
	Net Weight	330g			
	Dimension	152mm*40.8mm*30mm			L x W x H

Note: All the parameters above are tested Ta 25°C and LED load, unless specified.

Safety and EMI/EMS Standards

Safety Certification	Standard	Status	Remark
UL/cUL	UL8750, CSA C22.2 No.250.13		
CB	IEC61347-1, IEC61347-2-13	√	
CE	EN 61347-1, EN 61347-2-13, EN62493	√	
ENEC	EN 61347-1, EN 61347-2-13, EN IEC 62384	√	
CCC	GB/T 19510.213, GB/T 19510.1	√	
SAA	AS/NZS 61347.1, AS/NZS61347.2.13	√	
BIS	IS15885:2012 Part 2 Sec 13	√	

EMC Category	Standard	Status	Remark
FCC	FCC Part15: Subpart A ANSI 63.4:2014		
CE	EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61547	√	
CE	EN61000-4-2,3,4,5,6,11	√	
CCC	GB/T 17743, GB 17625.1	√	
Surge	GB/T 17626.5 EN61000-4-5 AC power line: line to line 4kV, line to earth 6kV.	√	Class A
Ring Wave	ANSI/C82 .77-5-2017		Criterion B

Safety Test Items

Safety Test Items	Technical Indicators		Remark
Insulation Requirements	UL Insulation Requirements	CE/ENEC/CCC Insulation Requirements	
Input-Case	-	2U+1000Vac	Basic insulation
Input-Output	-	4U+2000Vac	Reinforced insulation
Output-Case	-	500Vac	Basic insulation
Insulation Resistance	≥10MΩ		Input-Dim, Test voltage: 500Vdc
Ground Resistance	≤0.1Ω		25A/1min

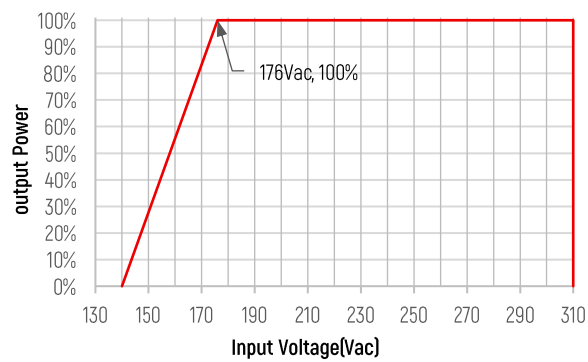
Note:

1. LED Driver itself complies with EMC standard. However, LED Driver 's EMC should be re-checked when integrated into lighting systems due to unexpected interference of components.

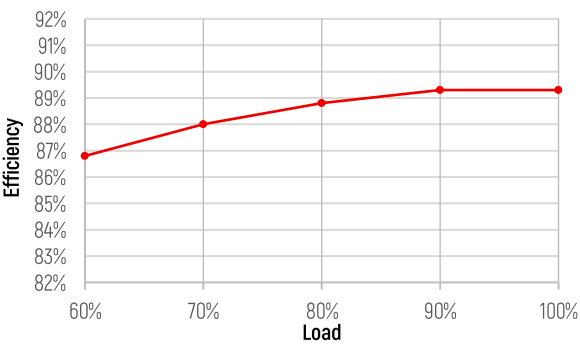
RoHS

Our products comply with RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

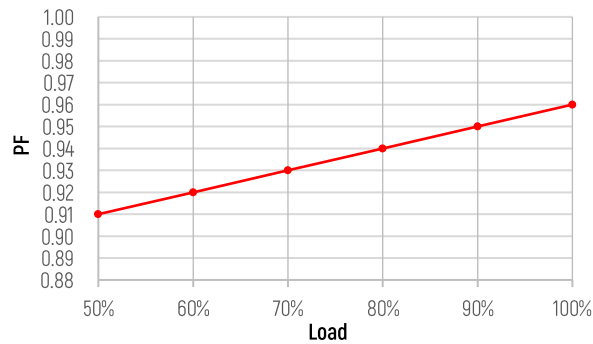
Derating



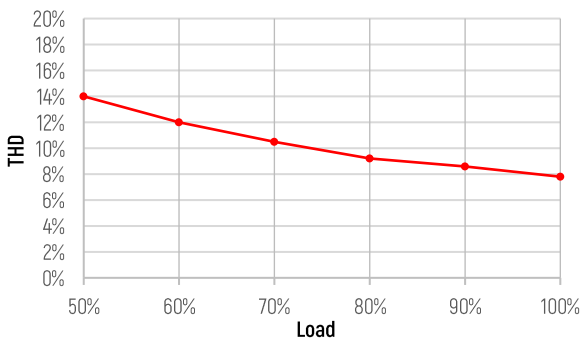
Efficiency vs. Load



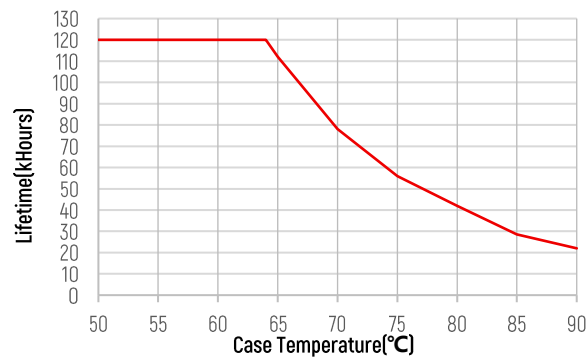
PF vs. Load



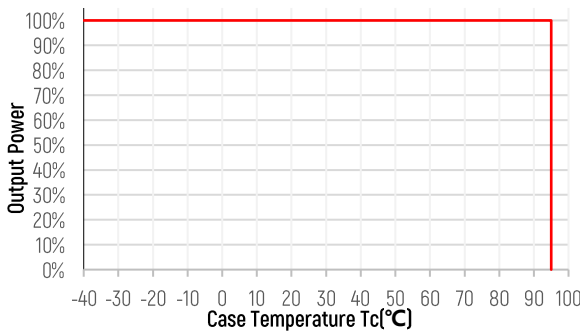
THD vs. Load



Lifetime vs. Case Temperature(Tc)

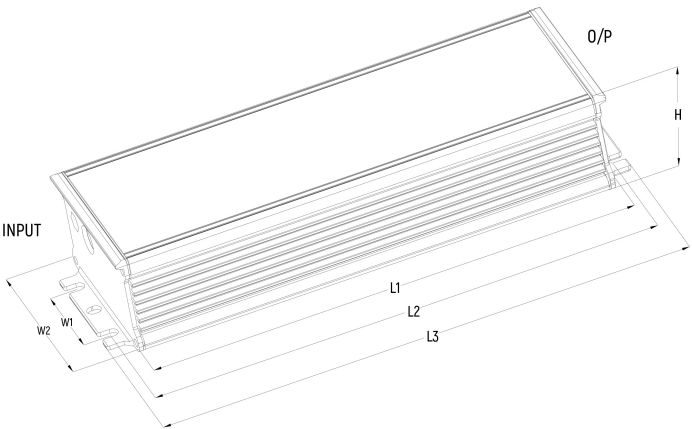


Output Power vs. Case Temperature(Tc)

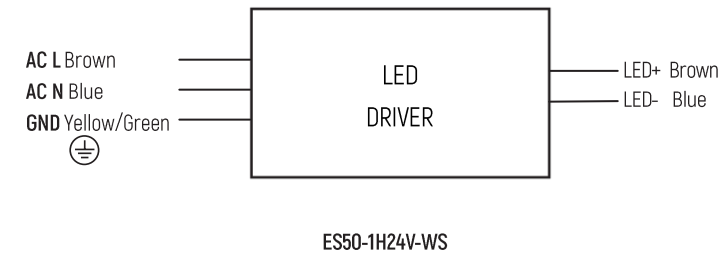


Dimension: mm (Inch)

Name Description	Standard Code	mm(In.)
Case Length	L3	152.0(5.984)
Case Width	W2	40.8(1.606)
Case Height	H	30.0(1.181)
Overall Length	L1	125.6(4.944)
Mounting Hole Length	L2	136.0(5.354)
Mounting Hole Width	W1	7.5(0.295)



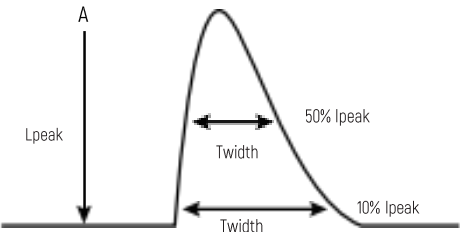
Wiring Diagram



Input: CCC+VDE H05RN-F 3C*1.0 mm² Length=300±20mm

Output: CCC+VDE H05RN-F 2C*1.0 mm² Length =250±20mm

Inrush Current

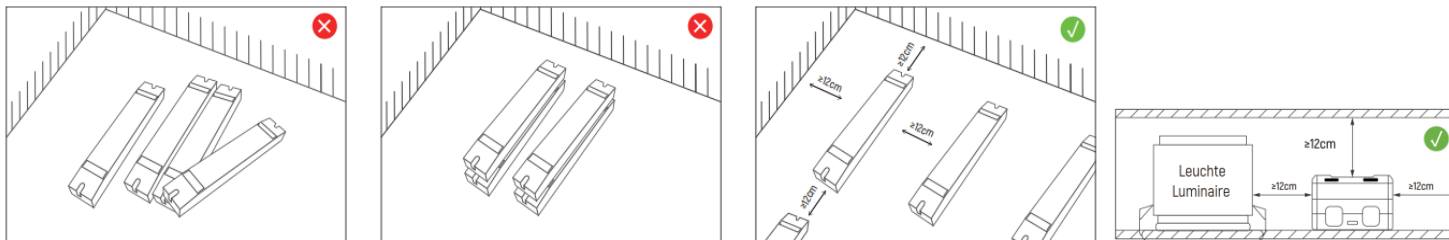


Max. quantity of drivers per miniature circuit breaker

	230Vac input	Condition
Inrush Current Ipeak	45A	
Inrush Current Twidht	124us	50%-50% Ipeak
Inrush Current Twidht	300us	10%-10% Ipeak

MCB	230Vac	MCB	230Vac
B10	16pcs	C10	28pcs
B13	20pcs	C13	32pcs
B16	26pcs	C16	45pcs
B20	32pcs	C20	54pcs
		D16	65pcs

Installation Precautions



The product is used flat. Please do not stack the products. The distance between two products should be $\geq 12\text{cm}$ so as not to affect heat dissipation and the lifespan of the products.

Cautions

This product must be installed and adjusted by a qualified professional.		
1	Confirmation of installation conditions	• Waterproof and Protection: Install in a suitable location according to the waterproof and protection requirements of the power supply. Products without waterproof function should be protected from direct sunlight and rain. When installing outdoors, please use a waterproof box for protection. • Heat dissipation requirements: The drive power supply should avoid exposure to high temperature environments. Please ensure that the working environment temperature is within the recommended range. To ensure proper heat dissipation of the drive power supply, a well ventilated area should be selected for installation. Good heat dissipation conditions can help extend product lifespan.
2	Power check	• Before use, check the product parameters and confirm that the output voltage and current of the LED power supply meet the requirements
3	Safe wiring	• Use cables that meet the specifications to ensure that the cross-section of the wire matches the requirements of the driving power supply. Solid cables typically measuring $0.75\text{-}2.5\text{ mm}^2$, (Please refer to the silk screen printing or wiring diagram in the instruction manual for specific wire diameter requirements). • If the power supply (metal casing) is installed on a grounded lighting component or equipment, the power supply needs to be grounded. • Indication that the controlgear relies upon the luminaire enclosure for protection against accidental contact with hazardous live parts.
4	Wiring confirmation	• Before power on debugging, ensure that the wiring is secure and avoid poor contact to prevent unstable current or equipment damage.
5	Repair suggestions	• If the product malfunctions, please do not repair it without authorization. If you have any questions, please contact the supplier or sales team for assistance.

※ The contents of this manual are updated without prior notice. If the function of the product you are using is inconsistent with the instructions, the function of the product shall prevail. Please contact us if you have any questions.

Marking Explanation

Marking	Explanation
	This product is Independent LED Driver.
SELV /	This product is a safety isolated LED Driver and complies with SELV output standards. It also features short-circuit protection functionality.

Warranty Agreement

1. Warranty periods from the date of delivery : 5 years.
2. Free repair or replacement services for quality problems are provided within warranty periods.

Warranty exclusions below:

The following situations are not covered by the free warranty or replacement service:

1. Exceeding the warranty period.
2. Damage caused by human factors such as high voltage, overload, and improper operation.
3. The appearance of the product is severely damaged or deformed.
4. Normal wear and tear or aging during regular product use.
5. Damage caused by natural disasters or force majeure factors.
6. The quality inspection label of the product is damaged (QC PASS).
7. No contract or valid invoice proof signed with EUCHIPS has been provided.

※Remedies: Repair or replacement is the only remedy provided by EUCHIPS to the customer, and EUCHIPS shall not be liable for incidental damages arising from repair or replacement, unless within the scope of applicable law.

※Adjustment of Warranty Terms: EUCHIPS reserves the right to modify or adjust the warranty terms, which shall be published in writing.

Revision history

Change date	Version	Item	From	To
2025.10	V0.1	Initiation Version		

ES50-1H24V-WS

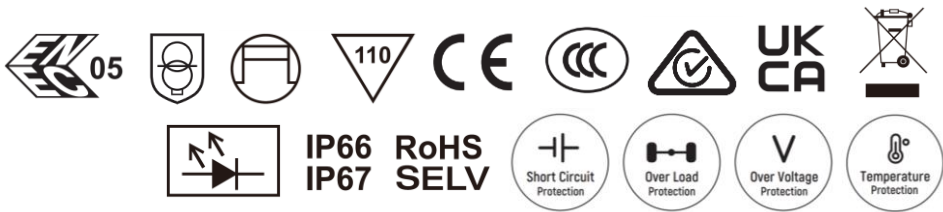
产品特性

- 输入电压范围：176-305Vac.
- 隔离恒压输出
- PFC>0.95（230VAC输入，满载）
- 空载功耗 < 0.5 W
- SELV 输出
- 全方位保护：输入欠压、输出短路、过载、过压、过温保护
- 防雷等级：差模4kV，共模6kV
- 防护等级：IP66 + IP67
- 适应干燥、潮湿、湿润的场所
- 5年质保



应用描述

适用于景观照明、装饰照明和标识照明等。



型号列表

产品型号	输入电压范围	最大输出功率	输出电压	输出电流范围	效率	功率因数PF	总谐波失真THD
ES50-1H24V-WS	176-305Vac	50W	24Vdc	0-2.10A	89%	0.95	10%

注：测试条件：220Vac输入，100%负载，25°C环境温度条件下所测典型值。

技术参数

参数		最小值	典型值	最大值	备注
输入	额定输入电压	-	220-240Vac	-	
	输入电压范围	176Vac	-	305Vac	参考降额曲线
	频率范围	47Hz	50/60Hz	63Hz	
	输入电流	-	-	0.32A	220Vac, 100%负载
	输入功率	-	-	65W	220Vac, 100%负载
	漏电流	-	-	0.70mA	IEC 60598-1; 240Vac/ 60Hz
	浪涌电流	-	-	45A	230Vac, 100%负载, 25°C冷机启动
	空载功耗	-	-	0.5W	230Vac
	功率因数PF	0.90	0.95	-	230Vac, 50-60Hz, 50%-100%负载
	总谐波失真THD	-	10%	20%	230Vac, 50-60Hz, 50%-100%负载
输出	输出电压	22.8V	24V	25V	±5%
	空载电压	-	-	25V	
	输出电压纹波(Pk-Avg)	-15%	-	+15%	100%负载, 20 MHz BW
	输出电流范围	-	-	2.10A	
	效率	87%	89%		100%负载
	启动过冲电压	-	-	5%	100%负载
	线性调整率	-1%	-	+1%	100%负载
	负载调整率	-3%	-	+3%	输入电压230Vac, 负载从70%变至100%
	开机启动时间	-	-	1.0s	230Vac, 100%负载
	动态响应偏差	-2.0V	-	+2.0V	R/S: 1 A/μs, 25% ~ 100% 负载
	动态响应时间	-	-	5ms	

参数		最小值	典型值	最大值	备注
其他参数	安规壳温(Tc)	-40°C	25°C	+90°C	
	工作温度(Ta)	-40°C	25°C	+60°C	220-240VAC
	质保壳温(Tc)	-40°C	25°C	+75°C	10%-95%相对湿度
	存储温度(Ta)	-40°C	25°C	+85°C	5%-95%相对湿度
	海拔高度	-65m	-	4000m	
	温度系数	-0.06%/°C	-	+0.06%/°C	壳温: 0 °C-90°C
	输入欠压保护	140VAC	150VAC	170VAC	自恢复
	过载保护	120% load	-	150% load	自恢复
	短路保护	-	-	-	自恢复, 短路无损伤
	寿命时间 (Tc≤75°C)	≥50,000 小时			220Vac, 100% 负载, 请参考寿命vs.壳温曲线
	平均无故障时间MTBF	200,000 小时			220Vac, 80% 负载, 环境温度25 °C (MIL-HDBK-217F)
	质保	5 年			壳温≤75°C
	净重	330g			
	尺寸	152mm*40.8mm*30mm			L x W x H

注：除非另有说明，以上所有参数均在环境温度25°C及LED负载条件下测试。

安全规范和电磁兼容标准

安全规范	标准	认证状况	备注
UL/cUL	UL8750, CSA C22.2 No.250.13		
CB	IEC61347-1, IEC61347-2-13	√	
CE	EN 61347-1, EN 61347-2-13, EN62493	√	
ENEC	EN 61347-1, EN 61347-2-13, EN IEC 62384	√	
CCC	GB/T 19510.213, GB/T 19510.1	√	
SAA	AS/NZS 61347.1, AS/NZS61347.2.13	√	
BIS	IS15885:2012 Part 2 Sec 13	√	

电磁兼容	标准	认证状况	备注
FCC	FCC Part15: Subpart A ANSI 63.4:2014		
CE	EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61547	√	
CE	EN61000-4-2,3,4,5,6,11	√	
CCC	GB/T 17743, GB 17625.1	√	
Surge	GB/T 17626.5 EN61000-4-5 差模L / N 4kV, 共模L&N / GND 6kV.	√	Class A
Ring Wave	ANSI/C82 .77-5-2017		Criterion B

安全测试项目

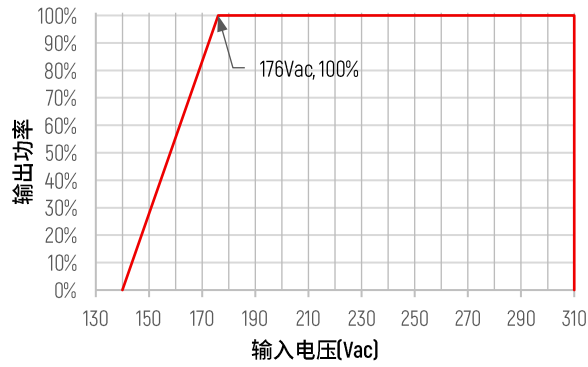
安全测试项目	技术指标		备注
绝缘要求	UL 绝缘要求	CE/ENEC/CCC 绝缘要求	
输入对地/外壳	-	2U+1000Vac	基本绝缘
输入对输出端	-	4U+2000Vac	加强绝缘
输出对地/外壳	-	500Vac	基本绝缘
绝缘电阻	≥10MΩ		输入对输出端, 测试电压: 500Vdc
接地电阻	≤0.1Ω		25A/1分钟

注：
1. 电源满足EMC标准，电源作为灯具系统一部分，需结合灯具整套系统进行EMC相关确认。

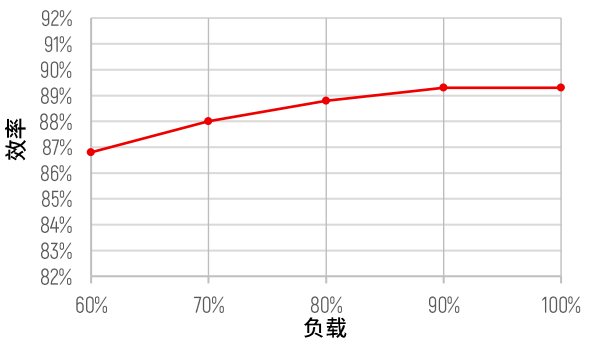
RoHS

本公司产品符合欧盟 RoHS指令2011/65/EU及其最新修订指令(EU)2015/863。

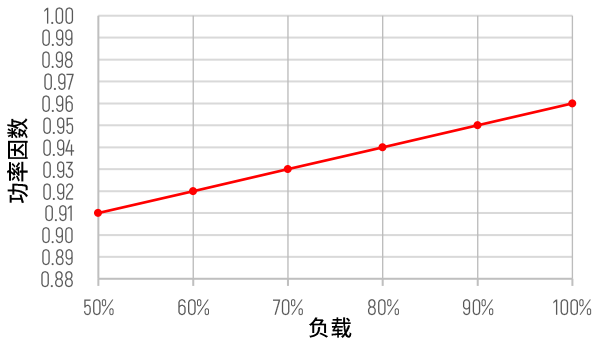
降额曲线



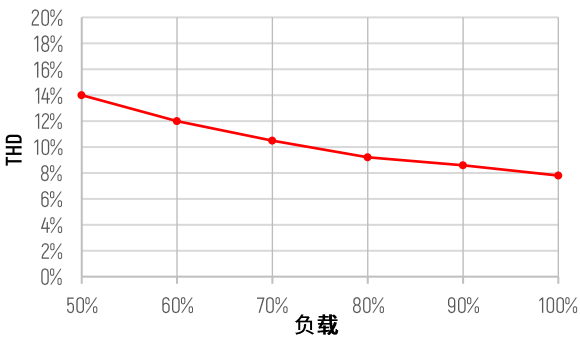
效率 vs. 负载



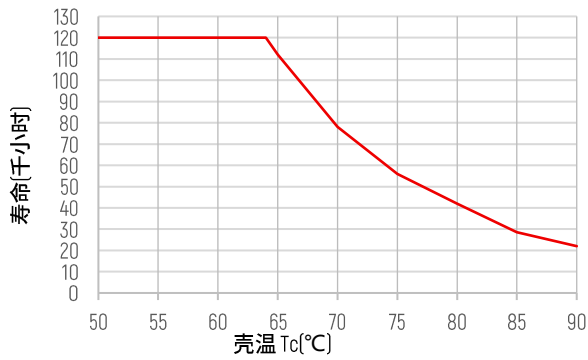
PF vs. 负载



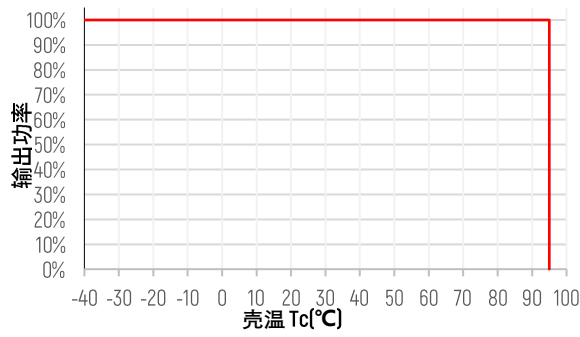
THD vs. 负载



寿命 vs. 壳温

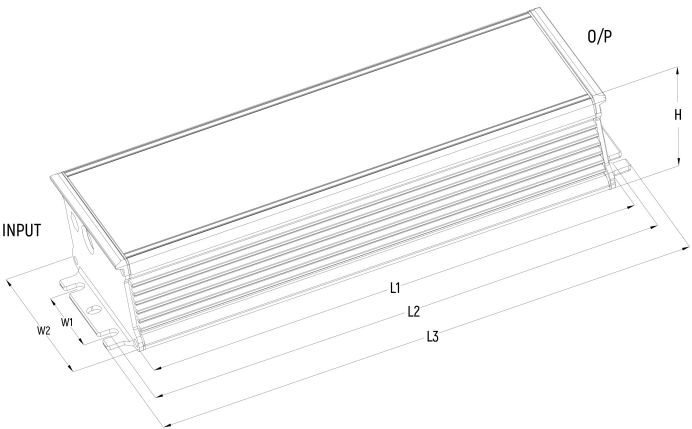


输出功率 vs. 壳温



结构尺寸特性：mm (Inch)

名称描述	标准代号	mm(In.)
外壳长度	L3	152.0(5.984)
外壳宽度	W2	40.8(1.606)
外壳高度	H	30.0(1.181)
整体长度	L1	125.6(4.944)
安装孔长度	L2	136.0(5.354)
安装孔宽度	W1	7.5(0.295)



接线图

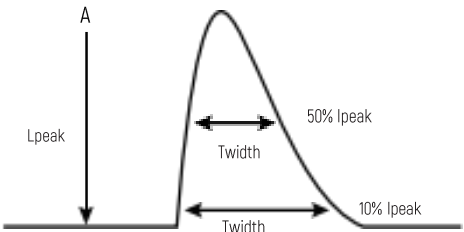


ES50-1H24V-WS

输入线：CCC+VDE H05RN-F 3C*1.0 mm² 长度 =300±20mm

输出线：CCC+VDE H05RN-F 2C*1.0 mm² 长度 =250±20mm

浪涌电流

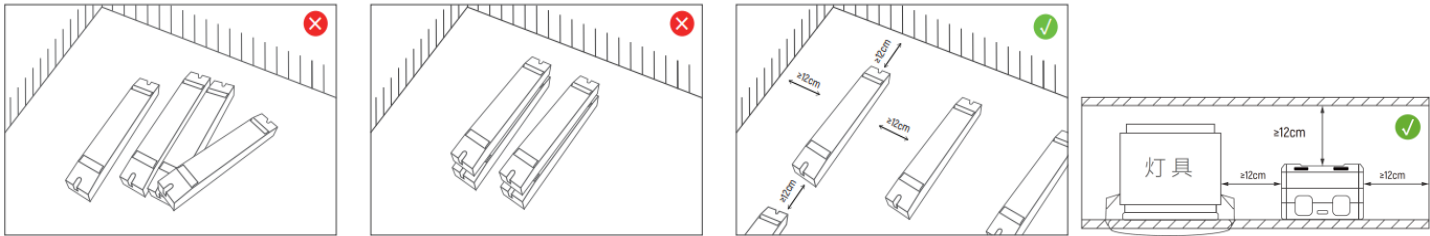


微型断路器最大可带电源数量

	230Vac 输入	测试条件
浪涌电流 Ipeak	45A	
浪涌电流 Twidth	124us	50%-50% Ipeak
浪涌电流 Twidth	300us	10%-10% Ipeak

MCB	230Vac 带电源数量	MCB	230Vac 带电源数量
B10	16pcs	C10	28pcs
B13	20pcs	C13	32pcs
B16	26pcs	C16	45pcs
B20	32pcs	C20	54pcs
		D16	65pcs

安装规范要求



产品为平放使用，请勿将产品堆叠摆放，产品与产品间隔距离应≥12cm，避免影响产品散热和使用寿命。

注意事项

本产品应由具备专业资格的人员进行调试与安装。		
1	安装条件确认	· 防水与防护： 根据电源的防护要求，选择合适的位置安装。无防水功能的产品应避免日晒雨淋，户外安装时请使用防水箱保护 · 散热要求： 驱动电源应避免暴露在高温环境中。请确保工作环境温度在推荐范围内。为确保驱动电源正常散热，安装时应选择通风良好的地方。良好的散热条件有助于延长产品寿命。
2	电源检查	·使用前，检查产品参数，确认LED电源的输出电压、电流符合要求
3	安全接线	·需使用符合规格的线缆，确保导线的截面与驱动电源要求匹配。通常为 0.75-2.5 mm ² 的实心线缆，（请参阅丝印或说明书接线图）。 ·若电源(金属外壳)安装在已接地的灯具部件或设备上，需要对电源进行接地处理。 ·该控制装置依赖灯具外壳进行防护，以防止意外触及危险带电部件。
4	接线确认	·通电调试前，确保接线牢固，避免接触不良，以防电流不稳或设备损坏。
5	维修建议	·如产品发生故障，请勿私自维修。如有疑问，请联系供应商或销售处理。

※本说明书如有更新，恕不另行通知。如产品功能与说明书不符，以实际产品为准。

标识说明

标识	说明
	本产品为独立式LED驱动器。
	本产品为安全隔离型 LED 驱动器，输出符合SELV（安全特低电压）标准，并具备短路保护功能。

保修条例

- 1. 保修期：自产品出厂之日起，享有 5 年保修期。
- 2. 保修服务：在保修期内，如因产品质量问题，欧切斯将提供免费修理或更换服务。

非保修条例

以下情况不在免费保修或更换服务范围内：

- 1. 超出保修期。
- 2. 由于过高电压、超负载、操作不当等人为原因造成的损坏。
- 3. 产品外观严重损坏或变形。
- 4. 产品正常使用过程中产生的磨损或老化。
- 5. 自然灾害或不可抗力因素造成的损坏。
- 6. 产品的质量检验标签损坏（QC PASS）。
- 7. 未提供与欧切斯签订的合同或有效发票凭证。

※补救措施：修理或更换是欧切斯对客户的最唯一补救方式，且欧切斯不承担因修理或更换产生的附带损害赔偿 responsibility，除非在适用法律范围内。

※保修条款的调整：欧切斯保留修改或调整保修条款的权利，并以书面形式发布为准。

版本历史

修改时间	版本	项目描述	修改前	修改后
2025.10	V0.1	初始版本		