

Features

- Leading Edge and Trailing Edge AC Dimmable
- Constant Current Output
- High Efficiency
- Active Power Factor Correction (Up to 0.96)
- All-Around Protection: SCP and Open Lamp Protection
- Class 2 Output



Description

The LLC-012SxxxRSP series operates from a 90 ~ 132 Vac input range. They are designed to be highly efficient and reliable. Features include dimming control with leading edge and trailing edge, open lamp, short circuit.

Models

Output Current	Input Voltage Range(1)	Output Voltage Range	Max. Output Power	Efficiency (2)	Power Factor (2)	Model Number
350 mA	90 ~ 132 Vac	17~34 Vdc	12 W	78%	0.96	LLC-012S035RSP
500 mA	90 ~ 132 Vac	12~24 Vdc	12 W	77%	0.96	LLC-012S050RSP
700 mA	90 ~ 132 Vac	9~17 Vdc	12 W	77%	0.96	LLC-012S070RSP

Notes: (1) UL, FCC certified input voltage range: 100-120Vac.

(2) Measured in 120 Vac input with full conduction angle at full load.

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 V	-	132 V	
Input Frequency	57 Hz	-	63 Hz	
Leakage Current	-	-	0.5 mA	At 120Vac, 60Hz input.
Input AC Current	-	-	0.18 A	Measured at full load and 120 Vac input.
Inrush Current	-	-	50 A	At 120Vac input, 25°C cold start, duration =200 us, 10%Ipk-10%Ipk.
Inrush Current(I ² t)	-	-	0.02 A ² s	
Power Factor	0.93	-	-	At 120Vac, 75%load-100%load(9~12W)
THD	-	-	20%	

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Io	-	5%Io	Full load condition at 120Vac
Output Current Overshoot / Undershoot	-	-	10%Io	Full load condition
No Load Voltage	-	-	120% Vomax	Vomax is the maximum operation output voltage.
Line Regulation	-	-	±2%	Input voltage from 110Vac to 132Vac
	-	-	±30%	Input voltage from 90Vac to 110Vac
Load Regulation	-	-	±3%	Input voltage from 110Vac to 132Vac
	-	-	±30%	Input voltage from 90Vac to 110Vac
Turn-on Delay Time	-	0.40 s	0.75 s	Measured at 120Vac input, 75%load-100%load
Dimming Range	10%Io	-	100%Io	
Temperature coefficient	-	-	0.03%/°C	Case temperature = 0°C ~Tc max

Note: All specifications are typical at 25°C unless otherwise stated.

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120Vac Input: Io = 350 mA Io = 500 mA Io = 700 mA	76% 75% 75%	78% 77% 77%	- - -	Measured at full load with full conduction angle and steady-state temperature in 25°C ambient.
No Load Power Dissipation	-	-	3 W	
MTBF	-	333,700 Hours	-	Measured at 120Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	80,200 Hours	-	Measured at 120Vac input, 80%Load and 60°C case temperature; See life time vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-20 °C	-	+90 °C	
Operating Case Temperature for Warranty Tc_w	-20 °C	-	+65 °C	Humidity: 10% RH to 90% RH.
Storage Temperature	-30 °C	-	+85 °C	Humidity: 5% RH to 90% RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	4.13 × 1.65 × 1.22 105 × 42 × 31			
Net Weight	-	165 g	-	

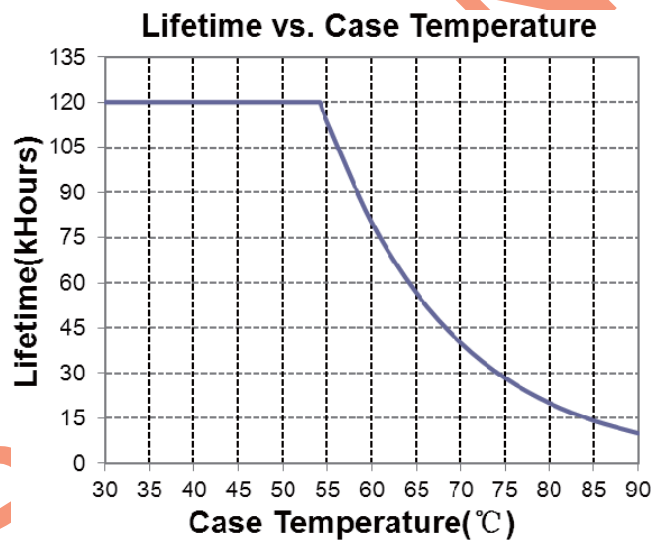
Note: All specifications are tested by YW-PWH01 and typical at 25°C unless otherwise stated.

Safety & EMC Compliance

Safety Category	Standard
UL/CUL	UL8750, UL1310 Class 2, CAN/CSA-C22.2 No. 223-M91 Class 2
EMI Standards	Notes
FCC Part 15 ⁽¹⁾	ANSI C63.4:2009 Class B
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation.

Note: (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

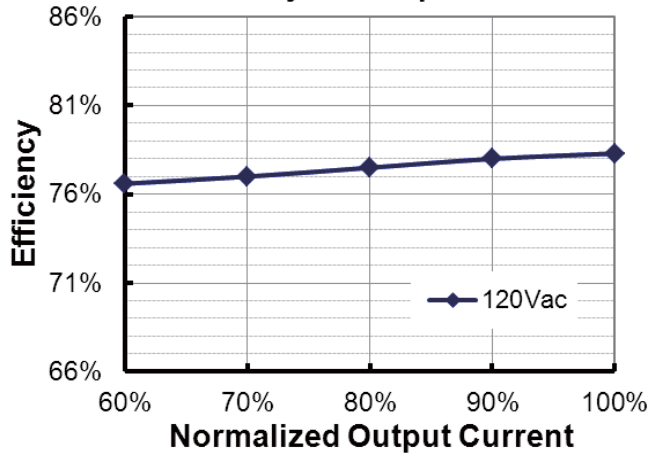
Lifetime vs. Case Temperature



Efficiency vs. Load

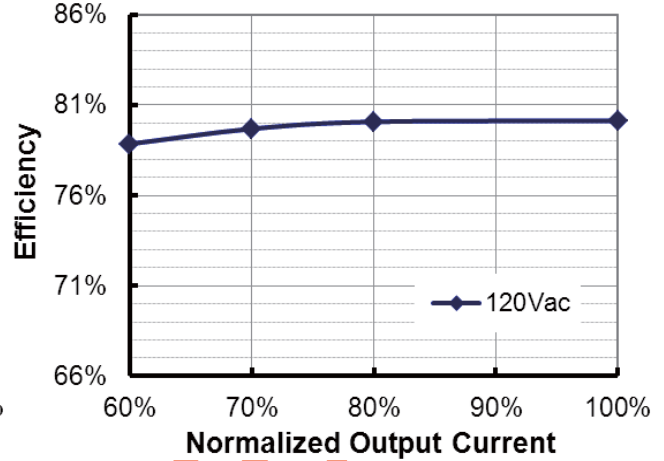
LLC-012S035RSP

Efficiency vs. Output Current



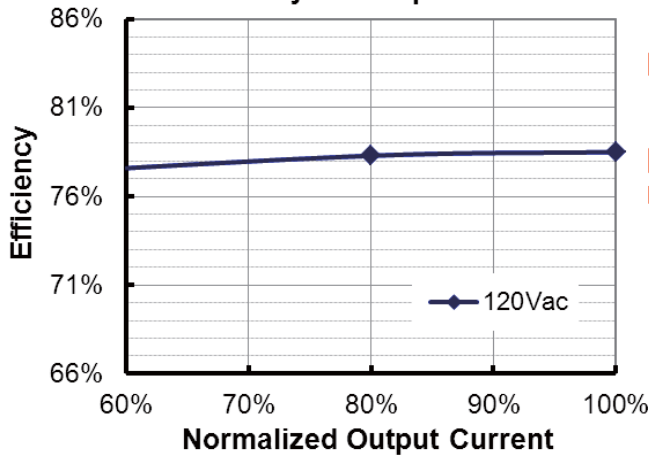
LLC-012S050RSP

Efficiency vs. Output Current



LLC-012S070RSP

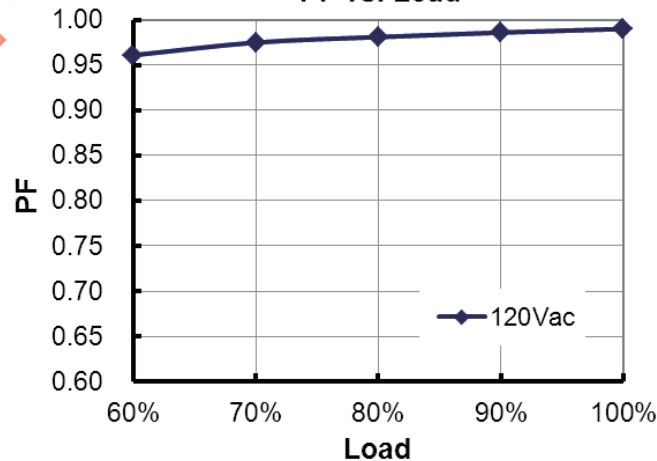
Efficiency vs. Output Current



ATTENTION

Power Factor

PF vs. Load



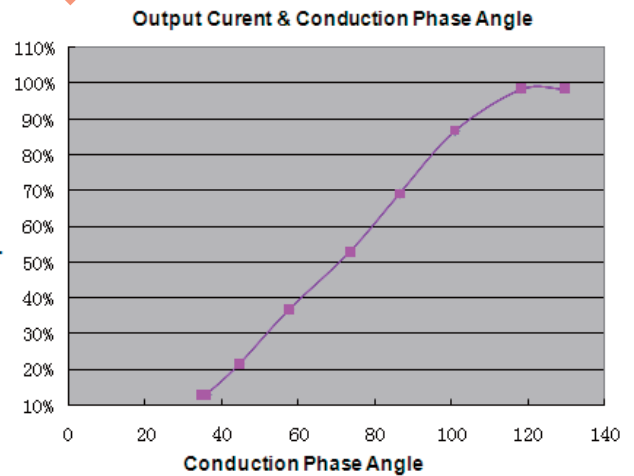
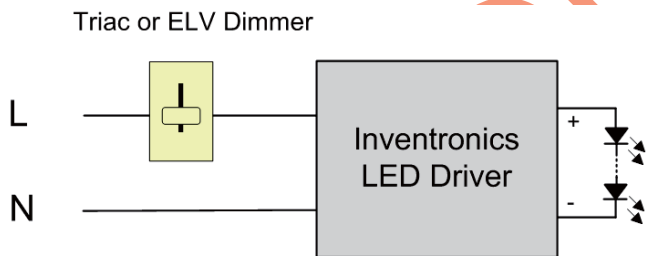
Protection Functions

Parameter	Min.	Typ.	Max.	Notes
Short Circuit Protection	Auto Recovery. The power supply shall return to normal operation after the fault condition is removed.			

Dimmer Recommendation

Manufacturer	Type	Applicable Voltage	Power Rating	Notes
LUTRON	SKYLARK CTCL-153PDH	120Vac	600W	
LUTRON	DIVA DVF-103P	120Vac	600W	
LUTRON	SKYLARK S-600P-WH	120Vac	600W	
LUTRON	SKYLARK CT-600PR-WH	120Vac	600W	
LUTRON	SKYLARK LX-103PL-WH	120Vac	1000W	
LUTRON	MAESTRO MA-1000-WH	120Vac	600W	
LEVITON	011-IPI06-1LZ	120Vac	600W	
LEVITON	011-IPI10-1LZ	120Vac	1000W	

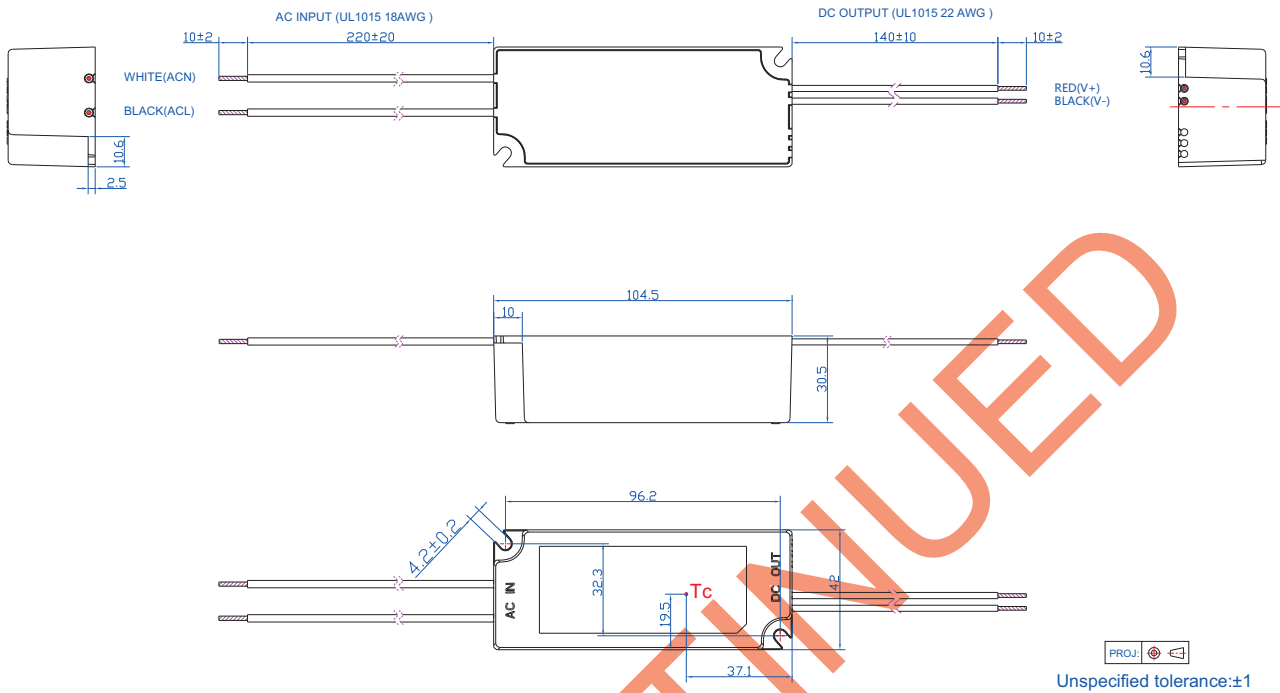
TRIAC Dimming Control



Implementation: Dimming with Triac or ELV Dimmer

Parameter	Min.	Typ.	Max.	Notes
Dimming Range	10%lo	-	100%lo	Measured at 120 Vac input.
Conduction Angle	30°	-	180°	Measured at 120 Vac input.

Mechanical Outline



RoHS Compliance

Our products comply with the European Directive 2011/65/EC, calling for the elimination of lead and other hazardous substances from electronic products.

Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2012-05-22	A	Datasheet Release	/	/
		Derating Curve	/	50°C 100% load, 70°C 80% load
		PF, Efficiency Curve	/	Updated
2012-07-10	B	Life time Curve	/	Updated
2012-7-18	C	Max Case Temperature	/	Added
2012-8-27	D	Min PF	/	Added
		MAX THD	/	Added
		Temperature coefficient	/	Added
		Storage Temperature	-20 °C	-30 °C
2014-03-26	E	Mechanical Outline	/	Updated
2017-01-06	F	Turn-on Delay Time at 120Vac	Max.=1.0s	Max.=0.75s
		Lifetime	72,000Hours	80,200Hours
		Operating Case Temperature for Warranty Tc_w	/	Added
		Net Weight	152 g	165 g
		Environmental Specifications	/	Deleted
		Note of EMI Standard	/	Added
		Derating Curve	/	Deleted