



# UCP Series

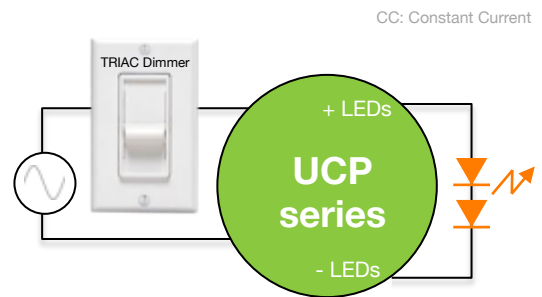
<b>UCP05</b>	<b>0-5 W</b>
<b>UCP10</b>	<b>9-10 W</b>
<b>UCP15</b>	<b>11-20 W</b>
<b>UCP20</b>	<b>11-20 W</b>

## Low Profile (16.5 mm) Under-Cabinet LED Driver

Input Voltage	Max. Output Power	Output Voltage	Output Current	Efficiency	Max. Case Temperature	THD	Power Factor	Dimming Method	Dimming Range	Startup Time
120 Vac nominal	17.3 W	11 to 36 Vdc	120 to 480 mA CC	up to 87% typical	90°C (measured at the hot spot)	≤ 20%	≥ 0.9	TRIAC & ELV	1 - 100% (% of Iout)	200 ms



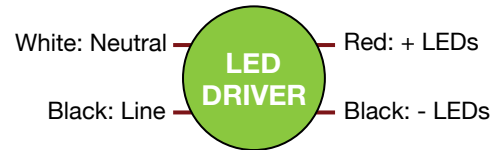
PLASTIC CASE:  
L 110 x W 27 x H 16.5 mm  
(L 4.33 x W 1.06 x H 0.65 in)



APPLICATION DIAGRAM

### FEATURES

- Low profile of 16.5 mm
- Compatible with industry standard TRIAC (forward-phase or leading-edge) / ELV (reverse-phase or trailing-edge)
- 1% to 100% dimmable output
- Very short startup time of 200 ms
- 120 Vac nominal input
- Protections: output open load, over-current and short-circuit (hiccup), and over-temperature with auto recovery
- Conducted and radiated EMI: compliant with FCC CFR Title 47 Part 15 Class B
- Complies with ENERGY STAR® luminaire specification and DLC (DesignLight Consortium®) technical requirements
- 90°C maximum case hot spot temperature
- Lifetime: > 66,000 hours at 70°C case temperature
- Worldwide safety approvals



WIRING DIAGRAM

### APPLICATIONS

- Undercabinet Lighting



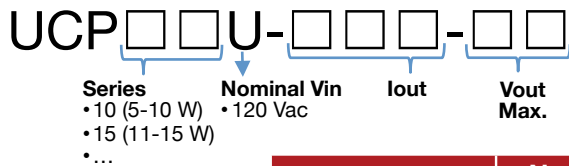


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## Low Profile (16.5 mm) Under-Cabinet LED Driver

### 1 - ORDERING INFORMATION - MODEL DESCRIPTION



ERP Part Number	Nominal Input Voltage (Vac)	Max Output Power (W)	Iout (mA)	Output Voltage Range (Vdc)	
				Min	Max
<b>UCP05: up to 5 W</b>					
UCP05U-120-36	120	4.3	120	28	36
<b>UCP10: &gt;5 to 10 W</b>					
UCP10U-350-16	120	5.6	350	11	16
UCP10U-240-36	120	8.6	240	28	36
<b>UCP15: &gt;10 to 15 W</b>					
UCP15U-350-30	120	10.5	350	24	30
UCP15U-360-36	120	13.0	360	28	36
<b>UCP20: &gt;15 to 20 W</b>					
UCP20U-480-36	120	17.3	480	28	36

**Notes:**

- For additional options of output current and output voltage, contact your sales representative or send an email to: [SaveEnergy@ERP-Power.com](mailto:SaveEnergy@ERP-Power.com)

### 2 - INPUT SPECIFICATION

	Units	Minimum	Typical	Maximum	Notes
<b>Input Voltage Range (Vin)</b>	Vac	90	120	132	The rated output current is achieved at Vin ≥ 115 Vac.
<b>Input Frequency Range</b>	Hz	57	60	63	
<b>Power Factor (PF)</b>		0.9	≥ 0.9		At nominal input voltage and with nominal LED voltage
<b>Input Current</b>	A	-	-	0.2 A @ 120 Vac	
<b>Inrush Current</b>	A			10 A peak	At any point on the sine wave and 25°C
<b>Input Harmonics</b>	Complies with IEC6100-3-2 for Class C equipment				
<b>Total Harmonics Distortion (THD)</b>				20%	At nominal input voltage and nominal LED voltage Complies with DLC (DesignLight Consortium) technical requirements
<b>Efficiency</b>		-	up to 87%	-	Measured with nominal input voltage, a full sinusoidal wave form and without dimmer connected
<b>Isolation</b>	Non-isolated power supply				



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### 3 - OUTPUT SPECIFICATION

	Units	Minimum	Typical	Maximum	Notes
<b>Output Voltage (Vout)</b>	Vdc				See ordering information table
<b>Output Current (Iout)</b>	mA				<ul style="list-style-type: none"> <li>• See ordering information table</li> <li>• The rated output current is achieved at <math>V_{in} \geq 115</math> Vac.</li> </ul>
<b>Output Current Regulation</b>	%	-5	$\pm 2.5$	5	Measured over the output voltage operating range defined by the Vout Min and Vout Max of the ordering information table
<b>Output Current Overshoot</b>	%	-	-	25	The driver does not operate outside of the regulation requirements for more than 500 ms during power on with nominal LED load and without dimmer.
<b>Ripple Current</b>		< 85% of rated output current			<ul style="list-style-type: none"> <li>• Measured at nominal LED voltage and nominal input voltage without dimming.</li> <li>• Calculated in accordance with the IES Lighting Handbook, 9th edition.</li> </ul>
<b>Dimming Range</b>		1%		100%	
<b>Start-up Time</b>	ms		200		With nominal LED voltage and without dimmer attached
			300		With nominal LED voltage, with an approved dimmer attached (see list of approved dimmers in page 5) and at the full dimming conduction angle

### 4 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
<b>Operating Case Temperature (Ta)</b>	°C	0		+90	Case temperature measured at the hot spot
<b>Storage Temperature</b>	°C	-40		+85	
<b>Humidity</b>	%	5	-	95	Non-condensing
<b>Cooling</b>	Convection cooled				
<b>Acoustic Noise</b>	dBA			22	Measured at a distance of 1 foot (30 centimeters) without dimmer
<b>Mechanical Shock Protection</b>	per EN60068-2-27				
<b>Vibration Protection</b>	per EN60068-2-6 & EN60068-2-64				
<b>MTBF</b>	> 300,000 hours when operated at nominal input and output conditions, and at $T_a = 25^\circ\text{C}$				



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### 5 - EMC COMPLIANCE AND SAFETY APPROVALS

EMC Compliance		
<b>Conducted and Radiated EMI</b>	FCC CFR Title 47 Part 15 Class B at 120 Vac	
<b>Harmonic Current Emissions</b>	IEC61000-3-2	For Class C equipment
<b>Voltage Fluctuations &amp; Flicker</b>	IEC61000-3-3	
<b>Immunity Compliance</b>	<b>ESD (Electrostatic Discharge)</b>	IEC61000-4-2 6 kV contact discharge, 8 kV air discharge, level 3
	<b>RF Electromagnetic Field Susceptibility</b>	IEC61000-4-3 3V/m, 80 - 1000 MHz, 80% modulated at a distance of 3 meters
	<b>Electrical Fast Transient</b>	IEC61000-4-4 ± 2kV on AC power port for 1 minute, ±1kV on signal/control lines
	<b>Surge</b>	IEC61000-4-5 ± 1 kV line to line/± 2kV line to earth on AC power port, ±0.5 kV for outdoor cables
	<b>Conducted RF Disturbances</b>	IEC61000-4-6 3V, 0.15-80 MHz, 80% modulated
	<b>Voltage Dips</b>	IEC61000-4-11 >95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods
<b>Transient Protection</b>	<b>Ring Wave</b>	ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave
Safety Agency Approvals		
<b>UL</b>	UL8750 recognized	UL60950-1 recognized
<b>cUL</b>	CSA C22.2 60950-1	
<b>CE</b>	IEC61347-2-13 electronic control gear for LED Modules	

### 6 - PROTECTION FEATURES

#### Under-Voltage (Brownout)

The UCP series provides protection circuitry such that an application of an input voltage below the minimum stated in paragraph 1 (Input Specification) shall not cause damage to the driver.

#### Short Circuit

The UCP series is protected against short-circuit such that a short from any output to return shall not result in a fire hazard or shock hazard. The driver shall hiccup as a result of a short circuit or over current fault. Removal of the fault will return the driver to within normal operation. The driver shall recover, with no damage, from a short across the output for an indefinite period of time.

#### Internal Over temperature Protection

The UCP series incorporates circuitry that prevents internal damage due to an over temperature condition. An over temperature condition may be a result of an excessive ambient temperature or as a result of an internal failure. When the over temperature condition is removed, the driver shall automatically recover.

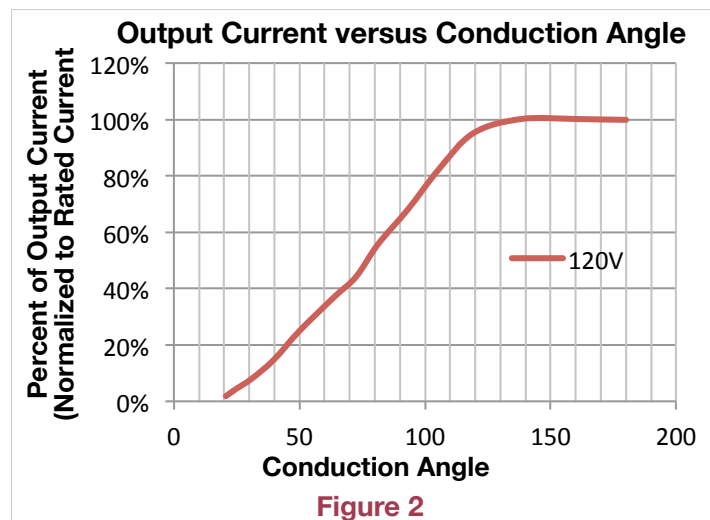
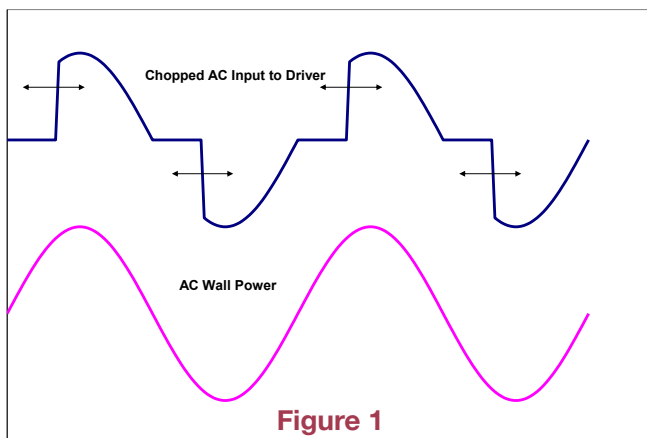
#### Output Open Load

When the LED load is removed, the output voltage of the UCP series is limited to 1.3 times the maximum output voltage of each model.

## Low Profile (16.5 mm) Under-Cabinet LED Driver

### 7 - DIMMING

Dimming of the driver is possible with standard TRIAC-based incandescent dimmers that chop the AC voltage as shown in Figure 1, or with ELV dimmers. During the rapid rise time of the AC voltage when the dimmer turns on, the driver does not generate any voltage or current oscillations, and inrush current is controlled. During the on-time of the AC input, the driver regulates the output current based upon the conduction angle (see figure 2). The RMS value of the driver output current is proportional to the on-time of the AC input voltage. When operating with an incandescent dimmer, the RMS output current varies depending upon the conduction angle and RMS value of the applied AC input voltage. Figure 2 shows the typical output current versus conduction angle at nominal input voltage.



### 8 - COMPATIBLE DIMMERS & DIMMING RANGE

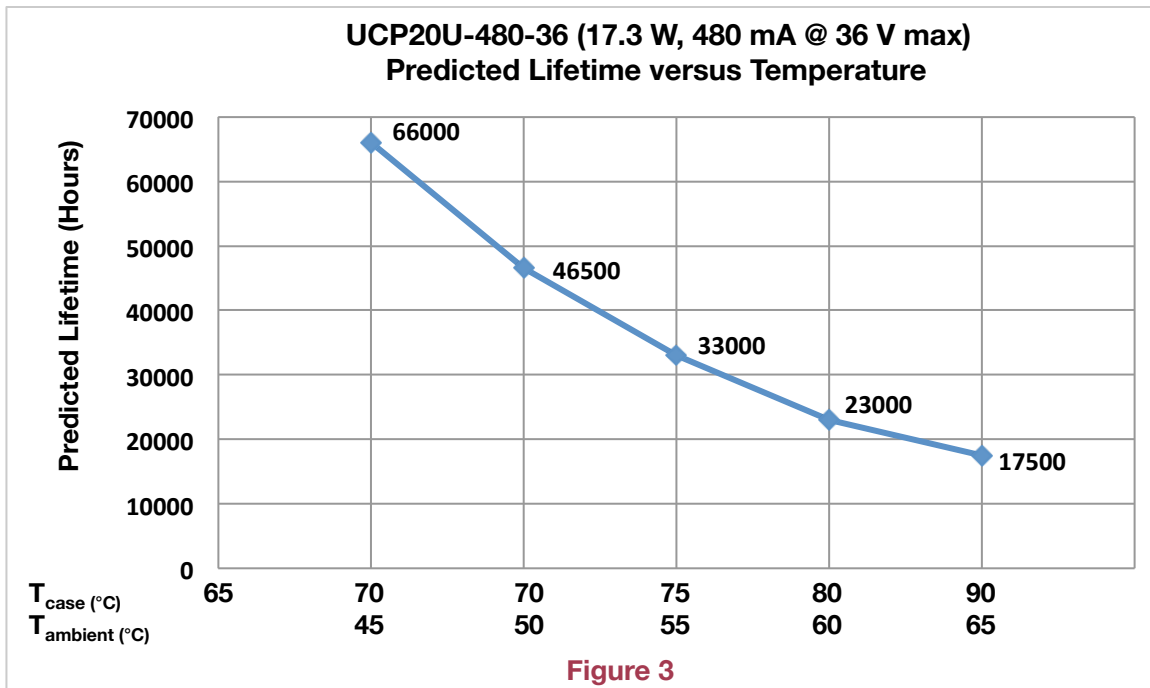
- Lutron MAELV-600 (Maestro CL)
- Lutron SCL-153P (Skylark CL)
- Lutron DVWCL-153P (Diva CL)
- Lutron Diva DVELV-303P
- Lutron Skylark SELV-300P
- Lutron Maestro MAELV-600
- Leviton Illumatech IPE04-1L

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### 9 - PREDICTED LIFETIME VERSUS CASE AND AMBIENT TEMPERATURE

Lifetime is defined by the measurement of the temperatures of all the electrolytic capacitors whose failure would affect light output under the nominal LED load and worst case AC line voltage. The graphs in figure 1/1-bis are determined by the electrolytic capacitor with the shortest lifetime, among all electrolytic capacitors. They represent a worst case scenario in which the LED driver is powered 24 hours/day, 7 days/week. The lifetime of an electrolytic capacitor is measured when any of the following changes in performance are observed:

- 1) Capacitance changes more than 20% of initial value
- 2) Dissipation Factor ( $\tan \delta$ ): 150% or less of initial specified value
- 3) Equivalent Series Resistance (ESR): 150% or less of initial specified value
- 4) Leakage current: less of initial specified value



#### Notes:

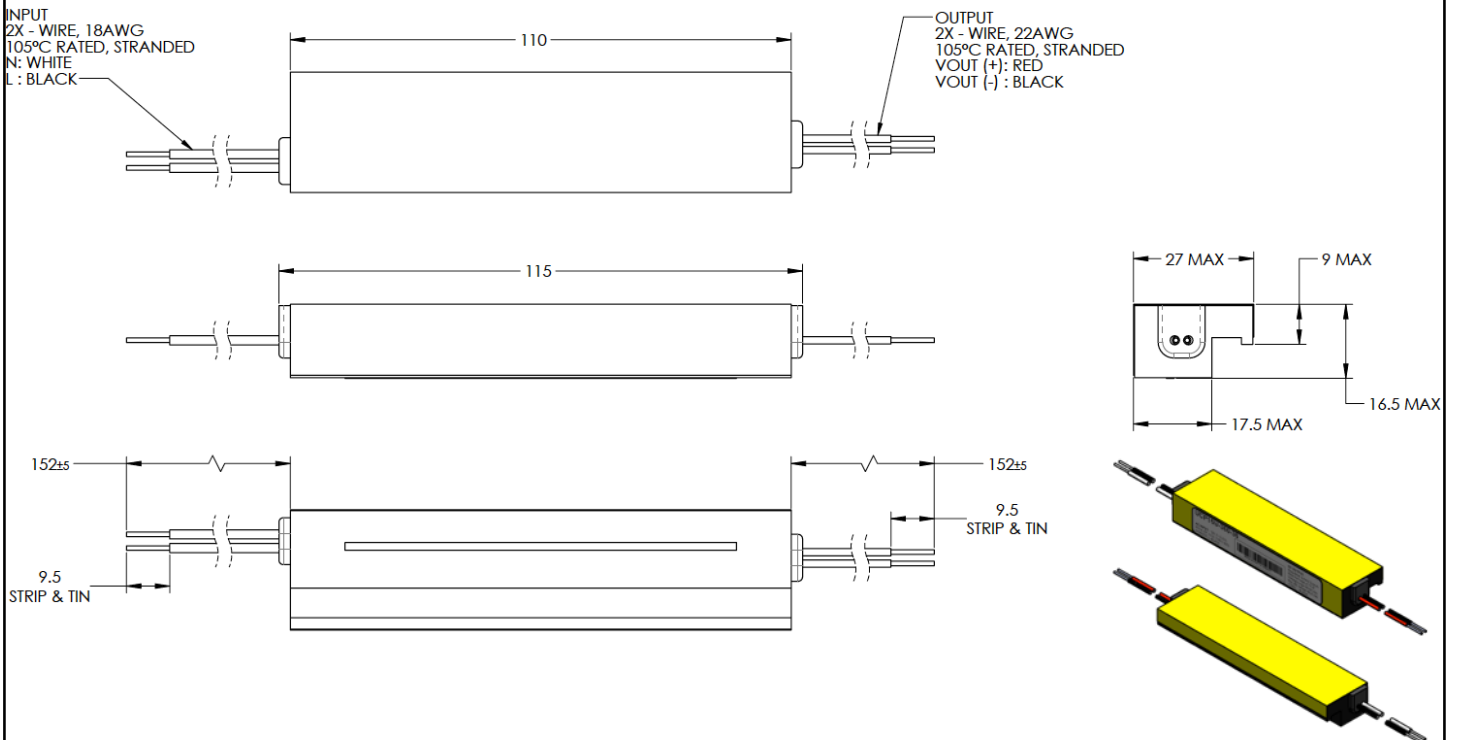
- The ambient temperature  $T_{ambient}$  and the differential between  $T_{ambient}$  and  $T_{case}$  mentioned in the above graphs are relevant only as long as both the driver and the light fixture are exposed to the same ambient room temperature. If the LED driver is used in an enclosure or covered by insulation material, then the ambient room temperature is no longer valid. In this situation, please refer only to the case temperature  $T_{case}$ .
- It should be noted the graph "Lifetime vs. Ambient Temperature" may have an error induced in the final application if the mounting has restricted convection flow around the case. For applications where this is evident, the actual case temperature measured at the  $T_c$  point in the application should be used for reliability calculations.

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### 10 - MECHANICAL DETAILS

- Packaging Options:** Plastic case
- Ingress Protection:** IP20
- Flammability Rating:** UL94 V-0
- I/O Connections:** Flying leads, 18 AWG on AC input wires, 22 AWG on DC output wires, 152 mm (6 in), 105°C rated, stranded, stripped by approximately 9.5 mm and tinned. All the wires, on both input and output, have a 300 V insulation rating.

### 11 - OUTLINE DRAWINGS



All dimensions are in mm

**Figure 4**



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### 12 - LABELING

The UCP15U-350-30 is used as an example to illustrate a typical label.



### UCP15U-350-30

**AC INPUT:** 120 V~ 0.2A,  
60 Hz, PF ≥ 0.9, THD ≤ 20%  
N-WHITE, L-BLACK



**DC OUTPUT:**  
Regulated current 350mA  
Maximum power 10.5 W  
Voltage range 24-30 Vdc  
No load voltage 39 Vdc  
+ RED, - BLACK

Side Face

Figure 5

**USA Headquarters**  
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Moorpark, CA 93021, USA

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