LED Driver

USCO Pro

USCO PRO

Highlights & Features

- Wide range constant current design
- Universal AC input voltage from 110-277Vac
- High efficiency up to 95%
- Wide operating temperature range -40°C to +60°C
- With IP66/IP67 protection from most outdoor applications
- Build-in Active PFC and confirm to harmonic current IEC/EN 61000-3-2, Class C
- Adjustable constant current level through programmable tool
- Common mode 6kV/ differential mode 6kV surge immunity
- Suitable for Dry / Damp / Wet location
- 0-10V dimming available

Safety Standards

E336604

CB Certified for worldwide use

75W SELV

Dimensions (L x W x H):

USCO-075140GA USCO-100140GA	174 x 68 x 37 mm (6.85" x 2.68" x 1.46")
USCO-150140GC	220 x 68 x 37 mm (8.66"x 2.68"x 1.46")
USCO-200140GA USCO-250140GA	240 x 68 x 37 mm (9.45"x 2.68"x 1.46")
USCO-320210GA USCO-320280GA	240 x 100 x 38 mm (9.45" x 3.94"x 1.50")

General Description

Delta LED drivers come in different series to suit different application needs. The USCO Pro series features program output current level. All the models come in full corrosion resistance aluminum casing and major international safety certifications. USCO Pro series offers the capability to achieve different level of LED brightness via built-in 0-10V dimming function to meet various application and energy optimization needs. The products are designed and rigorously tested to work with various outdoor LED lighting conditions. Featuring high surge immunity (CM: 6kV, DM: 6kV) and complying to IP66/IP67 make Delta USCO Pro series an essential part of an energy efficient LED lighting power solution for both indoor and outdoor applications.

Model Information

USCO Pro LED Driver

Model Number	Input Voltage Range	Rated Output Voltage	Program Output Current	Constant Power Current
USCO-075140GA	110-277Vac Typical 99-305Vac Range	36-107Vdc	500-1400mA	700-1400mA
USCO-100140GA		47-143Vdc	600-1400mA	700-1400mA
USCO-150140GC		72-214Vdc	600-1400mA	700-1400mA
USCO-200140GA		75-190Vdc	600-1400mA	1050-1400mA
USCO-250140GA		90-238Vdc	600-1400mA	1050-1400mA
USCO-320210GA		90-225Vdc	700-2100mA	1400-2100mA
USCO-320280GA		60-152Vdc	1400-2800mA	2100-2800mA

Model Numbering

US	C	O	–	□□□	□□□	G	A
Safety Approval – UL, ENEC, CE	Constant current	Outdoor		Output Power 075:75W 100:100W/ 150:150W 200:200W 250:250W/ 320:320W	Max Output Current 140 – 1400mA 210 – 2100mA 280 – 2800mA	Programmable output current + 12V/50mA	Variable A – Delta Standard

All parameters are specified at 25°C ambient for all products unless otherwise indicated.

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USCO Pro

Specifications

Model Number	USCO-075140GA	USCO-100140GA	USCO-150140GC	USCO-200140GA	USCO-250140GA	USCO-320210GA	USCO-320280GA

Input Ratings / Characteristics

Normal Input Voltage		110-277Vac						
Input Voltage Range		99-305Vac						
Normal Input Frequency		50-60Hz						
Input Frequency Range		47-63Hz						
Max. Input Current	110Vac	0.8A	1.04A	1.67A	2.1A	2.9A	3.4A	3.4A
Efficiency [1]	120Vac	90%@0.7A	90.5%@0.7A	91.5%@0.7A	93%@1.05A	93.0%@1.05	92.5%@1.4A	92.0%@2.1A
	230Vac	92%@0.7A	92.5%@0.7A	93.0%@0.7A	94%@1.05A	94.5%@1.05	94.0%@1.4A	94.0%@2.1A
	277Vac	92%@0.7A	93.0%@0.7A	93.0%@0.7A	94%@1.05A	94.5%@1.05	94.5%@1.4A	94.5%@2.1A
Inrush Current (Apk / 50% - µS @ Cold Start)	120Vac	40A/250uS	40A/250uS	60A/250uS	120A/200uS	140A/150uS	90A/250uS	90A/250uS
	230Vac	65A/250uS	65A/250uS	110A/250uS	180A/200uS	280A/150uS	180A/250uS	180A/250uS
	277Vac	80A/250uS	80A/250uS	130A/250uS	220A/200uS	320A/150uS	220A/250uS	230A/250uS
Max. no. of LED Drivers circuit breaker at 230Vac	B16	8	8	5	4	2	3	3
	C16	14	12	8	6	4	5	5
Power Factor		> 0.98@110/120Vac,> 0.95 @ 230Vac,> 0.92 @ 277Vac&Full Load, > 0.90 @ 110/120/230Vac&> 50% Load(277Vac&> 70% Load)						
Total Harmonic Distortion		THD < 20% with load ≥ 50% at 110/120/230Vac input and load ≥ 75% at 277Vac input						
Leakage Current		< 0.7mA peak @ 277Vac						
Standby Power		0.5W @ Dim to off, 230Vac & 277Vac						
Input Over-Voltage		Can survive input over-voltage stress of 320VAC for 48 hours and 350Vac for 2 hours						

1) 100% Load (typical) and tested after 30 minutes warm up.

Output Ratings / Characteristics

Output Voltage Range	36-107Vdc	47-143Vdc	72-214Vdc	75-190Vdc	90-238Vdc	90-225Vdc	60-152Vdc
Max. No Load Output Voltage	120Vrms	150Vrms	250Vrms	230Vrms	250Vrms	250Vrms	180Vrms
Output Power Range	75W	100W	150W	200W	250W	320W	320W
Adjustable Output Current (AOC)	500-1400mA	600-1400mA	600-1400mA	600-1400mA	600-1400mA	700-2100mA	1400-2800mA
	With steps of 1mA, configurable via software						
Minimum Output Current	100mA (Min dim level) (280mA (Min dim level) for USCO-320280GA)						
Current Accuracy	± 5% (@ Typical output current range)						
Line Regulation	± 1% (@ 110-277Vac input)						
Load Regulation	± 3% (@ Min-Max output voltage)						
Output Current LF Ripple	5% (ripple = peak-average/average) at full load (<100Hz)						
Start-up Time	500ms max. @ 110-277Vac (full load)						
Hold-up Time	16ms typ. @ 110-277Vac (full load)						

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USCO Pro

Model Number	USCO-075140GA	USCO-100140GA	USCO-150140GC	USCO-200140GA	USCO-250140GA	USCO-320210GA	USCO-320280GA

Mechanical

Casing	Aluminum, Color : Natural				
Dimensions (L x W x H) [mm] [inch]	1740.0*68.0*37.0 **6.85*2.68*1.46**	220.0*68.0*37.0 8.66*2.68*1.46	240.0*68.0*37.0 9.45*2.68*1.46	240.0*100.0*38.0 9.45*3.94*1.50	
Unit Weight [kg]/ [lb]	0.85/ 1.87	1.10/ 2.42	1.20/ 2.65	1.85/ 4.07	
Cooling System	Convection				
Input Cable	Line: Brown, Neural: Blue, PE: Yellow/Green, Cable Length 300mm				
Output Cable	Positive: Brown, Negative: Blue, NTC/PRG: Black, Cable Length 300mm				
Dimming Cable	Dim(+): Violet, Dim(-): Gray, +12V: Black/White, Cable Length 300mm				
Noise (30cm distance)	Sound Pressure Level (SPL) < 24dBA				

Environment

Ambient Temperature	Operating	-40°C to +60°C		-40°C to +55°C	-40°C to +50°C
	Storage	-40°C to +85°C			
Maximum Case Temperature		+80°C	+85°C	+90°C	
Relative Humidity	Operating	10 to 90% RH (Non-Condensing)			
	Storage	5 to 95% RH (Non-Condensing)			
Environmental Locations		Dry / Damp / Wet			
IP		IP66/IP67			
Shock Test (Non-Operating)		IEC 60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions			
Vibration (Non-Operating)		IEC 60068-2-6, Random: 5Hz to 500Hz (2.09G); 20 min per axis for all X, Y, Z direction			

Protections

Over Voltage	120Vrms	150Vrms	250Vrms	230Vrms	250Vrms	250Vrms	180Vrms
	Auto-Recovery when the fault is removed						
Overload / Overcurrent	Reduce output current. Auto-Recovery when the fault is removed						
Short Circuit	Auto-Recovery when the fault is removed						
Over Temperature	Reduce output current. Auto-Recovery when the fault is removed						
Ingress Protection Classification	IP66/IP67						
Suitable for Luminaires Class	Class I. Insulation Class according to IEC 60598						

Reliability Data

Lifetime	50,000 hours at case temp. tc & full load. Refer to “Lifetime VS Case Temperature”						
Lifetime @ tc	+75°C	+75°C	+75°C	+85°C	+75°C	+85°C	+85°C

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Safety Standards / Directives

Electrical Safety	IEC 61347-1, IEC 61347-2-13 (independent) EN 61347-1, EN 61347-2-13 UL 8750, type “HL” & type “TL” UL 60950-1 and CSA C22.2 No. 60950-1 SELV for 75W				
CE		In conformance with EMC Directive and Low Voltage Directive			
Material and Parts		RoHS Directive 2011/65/EU Compliant			
Galvanic Isolation		Mains (Input)	Earth (Case)	Output/PROG	DIM ± & +12V
	Mains (Input)	N/A	1875V	3750V	3750V
	Earth (Case)	1875V	N/A	1875V	1875V
	Output/PROG	3750V	1875V	N/A	1875V
	DIM ± & +12V	3750V	1875V	1875V	N/A

EMC Compliance

Emissions (CE & RE)	Compliance to EN 55015 Class B; 47 CFR FCC Part 15, Subpart B, Class B	
Immunity	Compliance to EN 61547	
Electrostatic Discharge	IEC 61000-4-2	Air Discharge: 8kV Contact Discharge: 4kV Criteria A[1] or Criteria B[2]
Radiated Field	IEC 61000-4-3	Level 2 80MHz-1GHz, 3V/m with 1kHz Sine Wave / 80% Modulation Criteria A[1]
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 2:1KV, Criteria A[1] or Criteria B[2]
Surge	IEC 61000-4-5	Common Mode3): 6kV; Differential Mode4): 6kV, Criteria A1) or Criteria B2):
Conducted	IEC 61000-4-6	Level 2 150kHz-80MHz, 3Vrms :Criteria A1)
Power Frequency Magnetic Fields	IEC 61000-4-8	Level 2 3A/Meter : Criteria A1)
Voltage Dips	IEC 61000-4-11	100% dip; 0.5 cycle , Criteria A1) or Criteria B2) 30% dip; 10 cycle, Criteria A1) or Criteria B2)
Harmonic Current Emission	IEC 61000-3-2	Class C (230Vac @ ≥ 50% load)
Voltage Fluctuation & Flicker	IEC 61000-3-3	

1) Criteria A: Normal performance within the specification limits
2) Criteria B: Temporary degradation or loss of function, which is self-recoverable
3) Asymmetrical: Common mode (Line to earth)
4) Symmetrical: Differential mode (Line to line)

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Model Number	USCO-075140GA	USCO-100140GA	USCO-150140GC	USCO-200140GA	USCO-250140GA	USCO-320210GA	USCO-320280GA

0-10V Dimming Specification

Absolute Maximum Voltage	± 20V
Source Current	200μA ± 50μA
Dimming Input Range	1) 0-10V, 1.2V (± 0.1V) is 10% of Io_set or 100mA minimum, ≥ 8.5V is 100% of Io_set. 2) Lower than 1.1V (± 0.1V) → DIM to OFF is programmable. 0.1V Hysteresis. 3) Short is 0% (DIM to OFF) 4) Open is 100% 5) See 0-10V Dimming Curve
Dimming Current Tolerance	± 10% of maximum setting output current. Ex. Io_set: 1000mA, tolerance is ± 100mA.

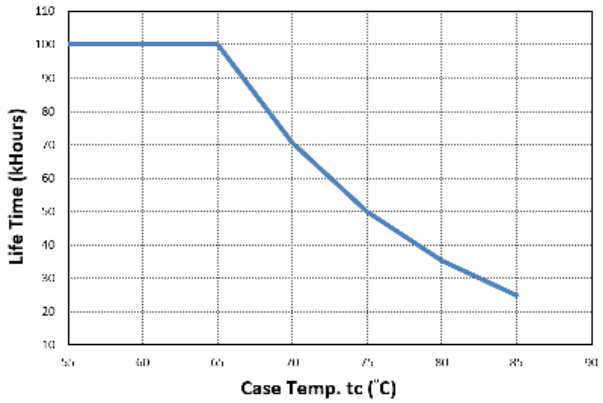
Default Settings of the Driver (can be changed with programmable tools)

Adjustable Output Current (AOC)		700mA	700mA	700mA	1050mA	1050mA	1400mA	2100mA
0-10V DIM		Enabled (DIM to OFF). Selectable for Min. Dim Level and Min. & Max. Dim Voltage though tools						
Smart Timer DIM		Disabled (Only one function will be enabled between 0-10V & Smart Time Dim)						
Module Temperature Protection (MTP)		Disabled. Settable though programmable tools						
Constant Lumen Output (CLO)		Disabled. Settable though programmable tools.						
End of Life indication (EOL)		Disabled. Settable though programmable tools						
Auxiliary Output Voltage	+12V Output Range	+12.6Vdc (10.8 – 13.86Vdc)						
	+12V Output Current	50mA						
	Maximum Output Power	0.6W						

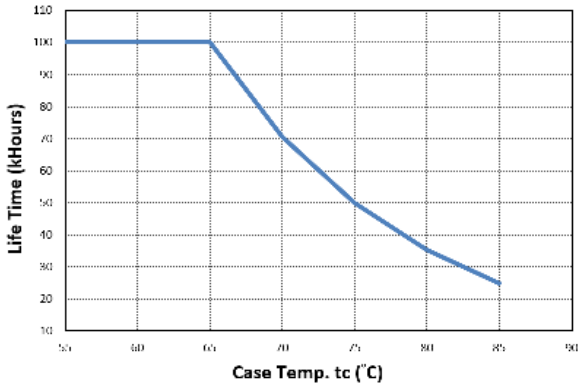
All parameters are specified at 25°C ambient for all products unless otherwise indicated.

Lifetime VS Case Temperature

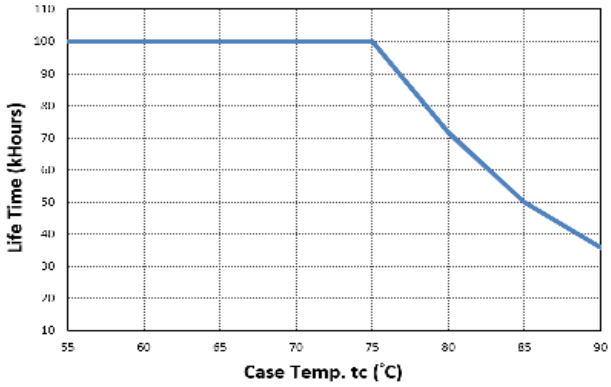
USCO-100140GA



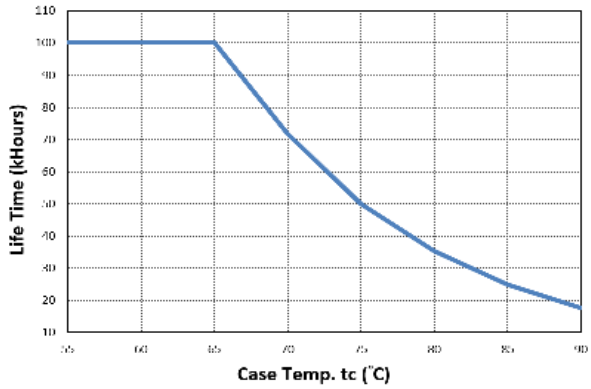
USCO-150140GC



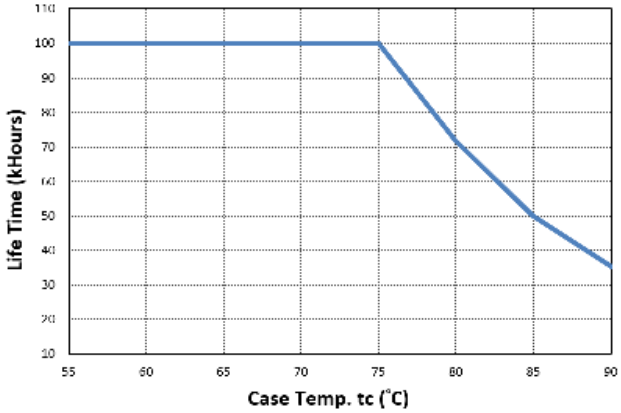
USCO-200140GA



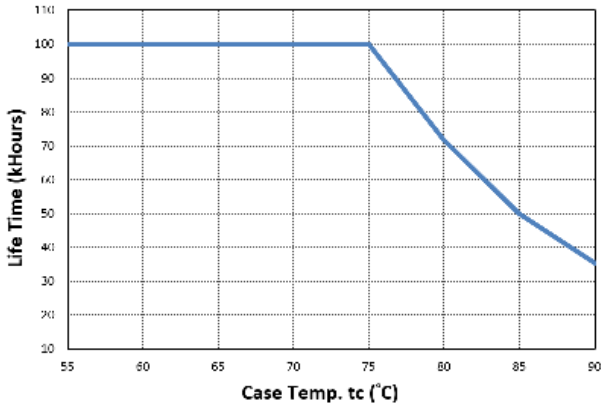
USCO-250140GA



USCO-320210GA



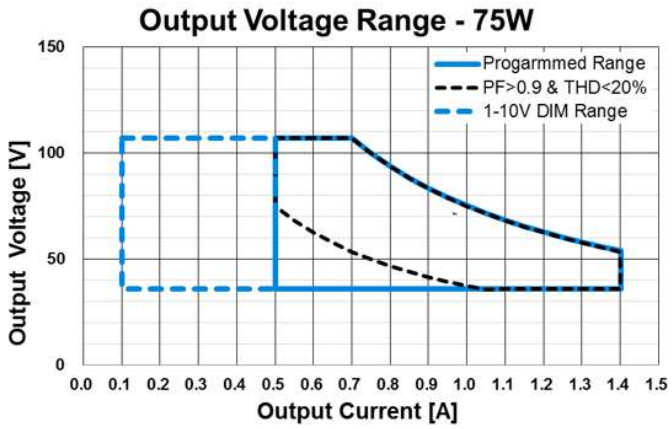
USCO-320280GA

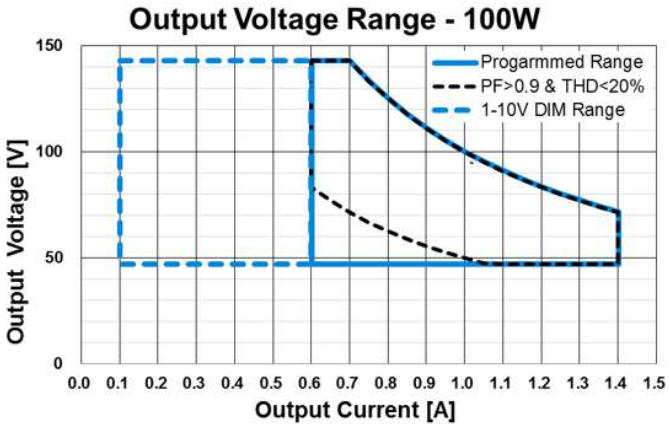


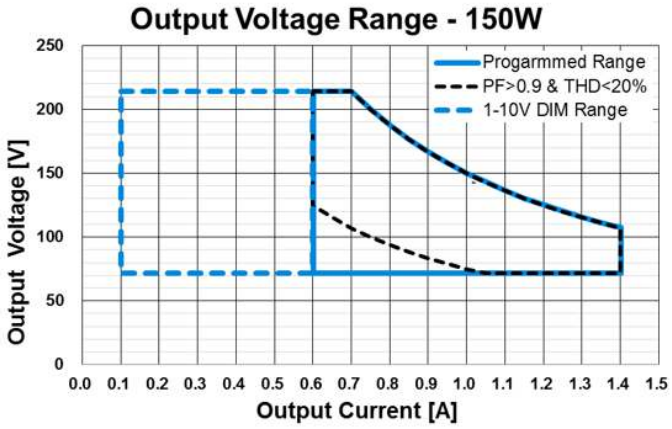
LED Driver

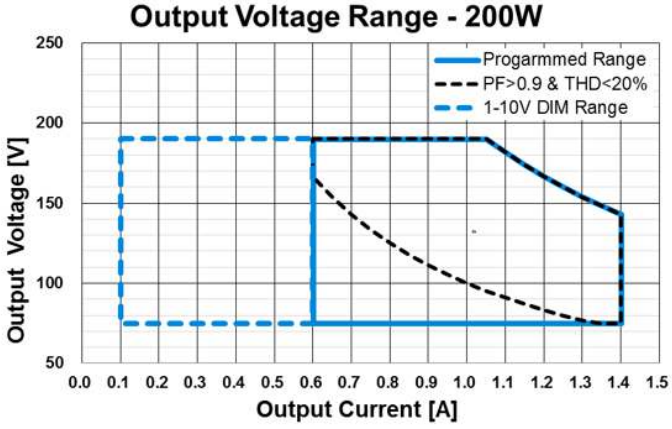
USCO Pro

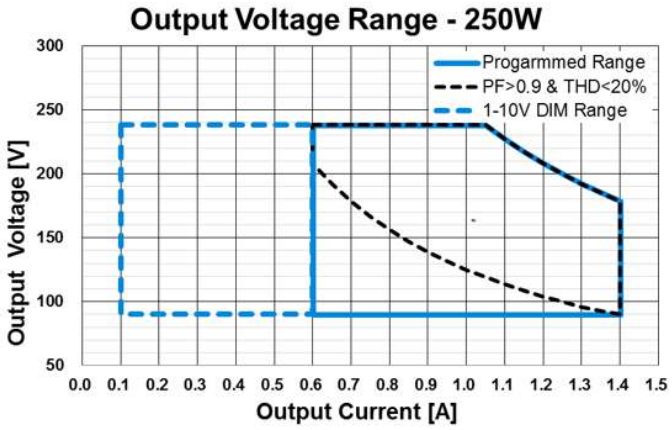
Operation Window for programing

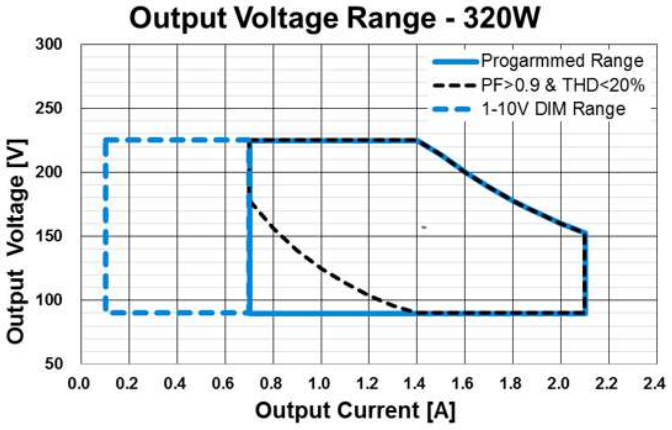












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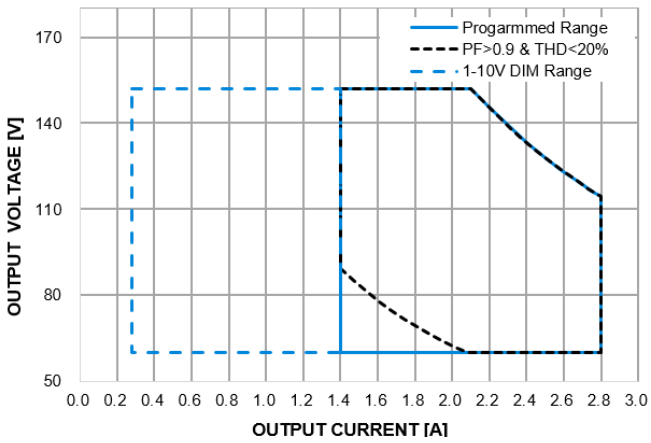
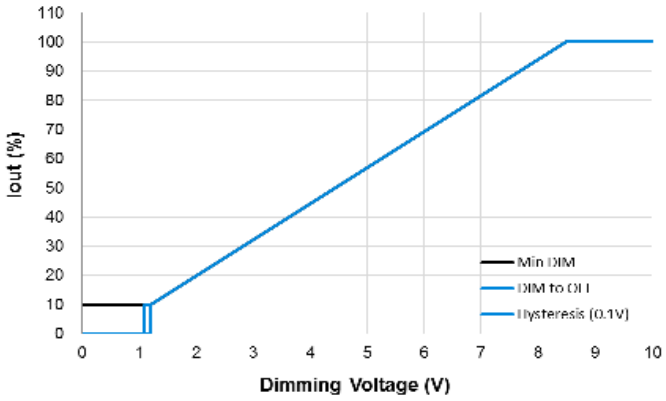
LED Driver
USCO Pro

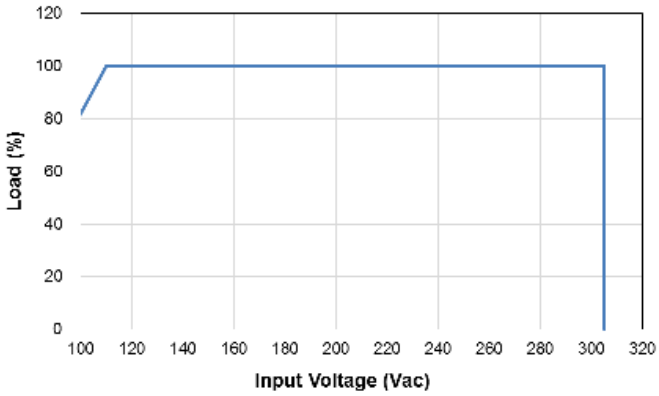
OUTPUT VOLTAGE RANGE - 320W



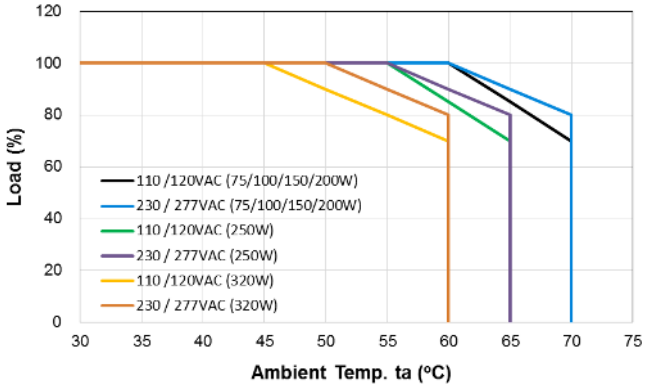
DIMMING CURVE



OUTPUT LOAD VS INPUT VOLTAGE



OUTPUT LOAD VS AMBIENT TEMPERATURE



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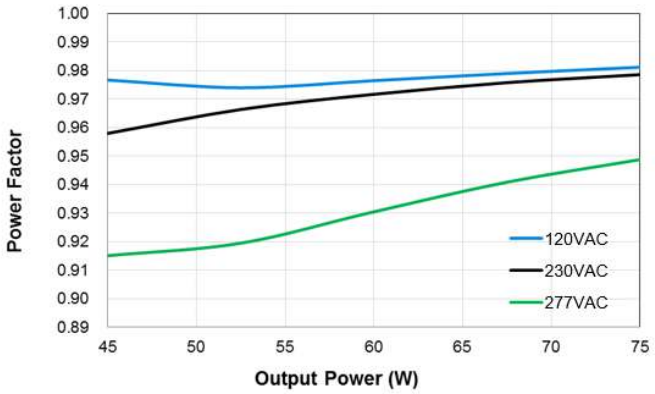
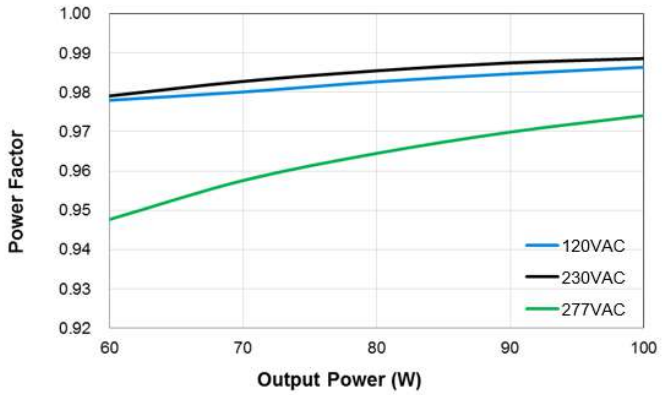
LED Driver
USCO Pro

Power Factor VS Output Power

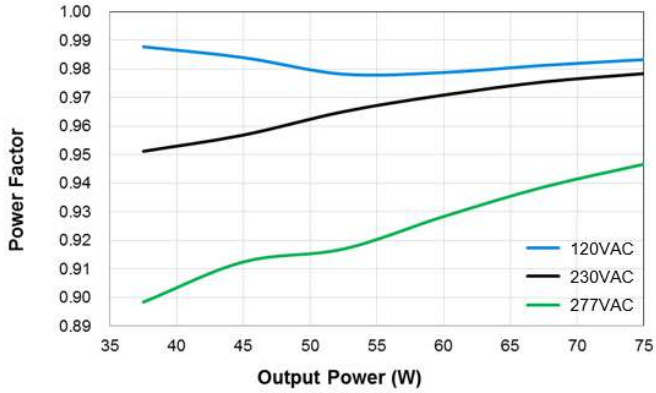
USCO-075140GA – 1400mA



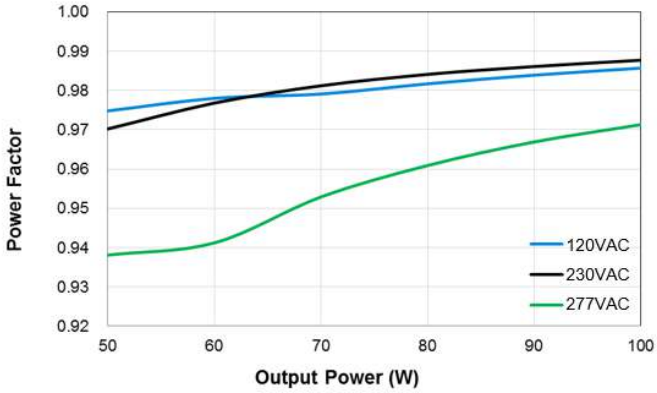
USCO-100140GA – 1400mA



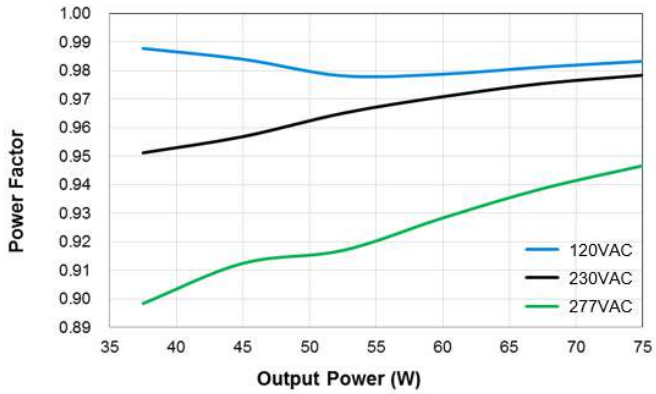
USCO-075140GA – 1050mA



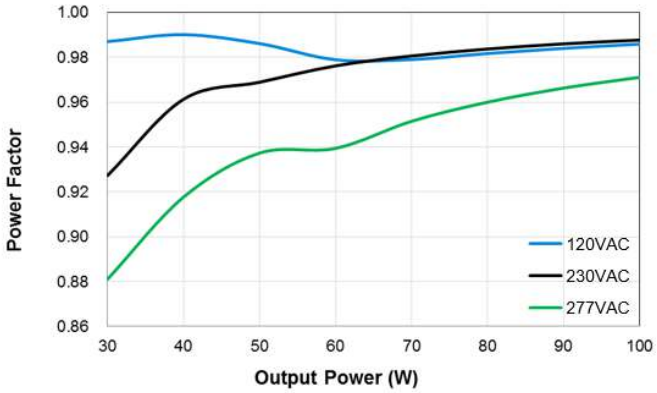
USCO-100140GA – 1050mA



USCO-075140GA – 700mA



USCO-100140GA – 700mA



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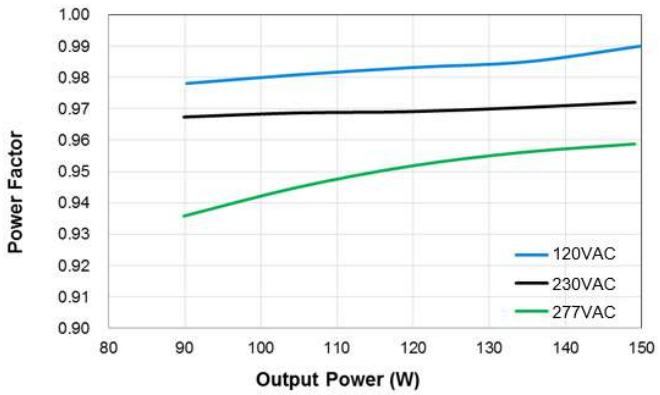
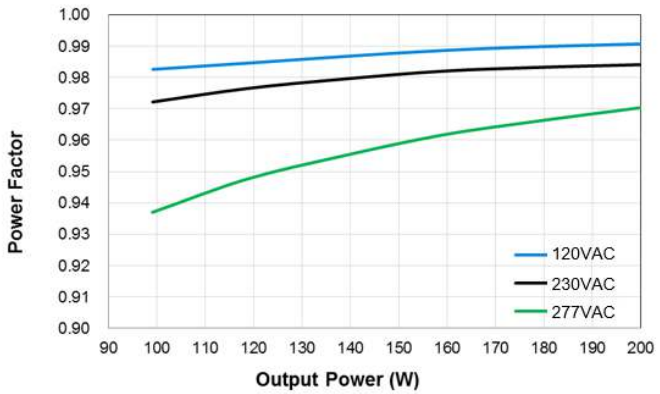
Power Factor VS Output Power

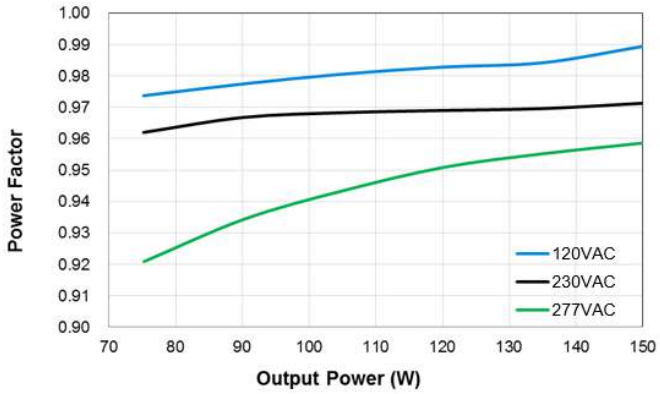
USCO-150140GC – 1400mA



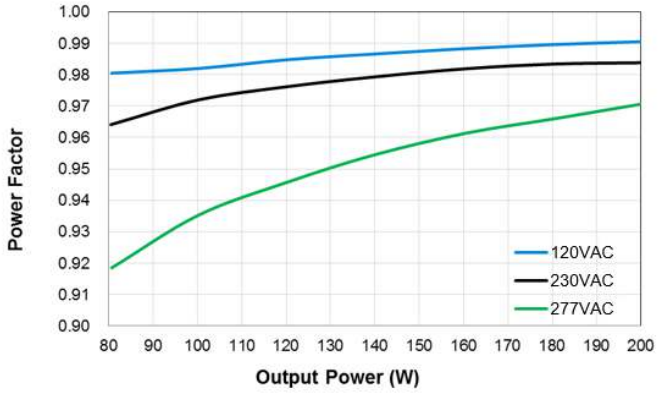
USCO-200140GC – 1400mA



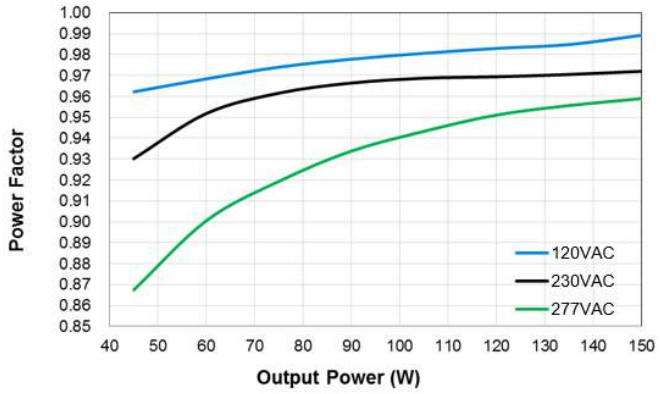
USCO-150140GC – 1050mA



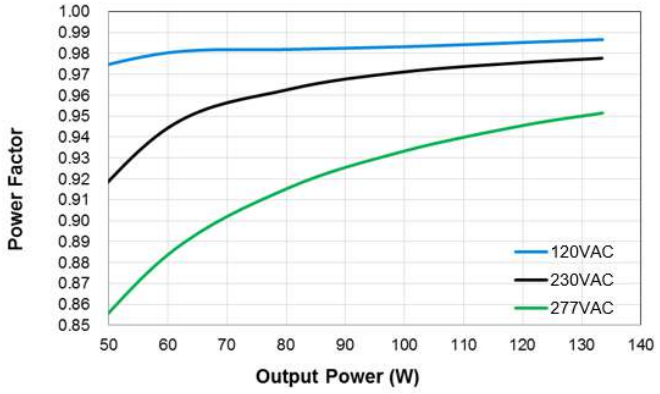
USCO-200140GA – 1050mA



USCO-150140GC – 700mA



USCO-200140GC – 700mA



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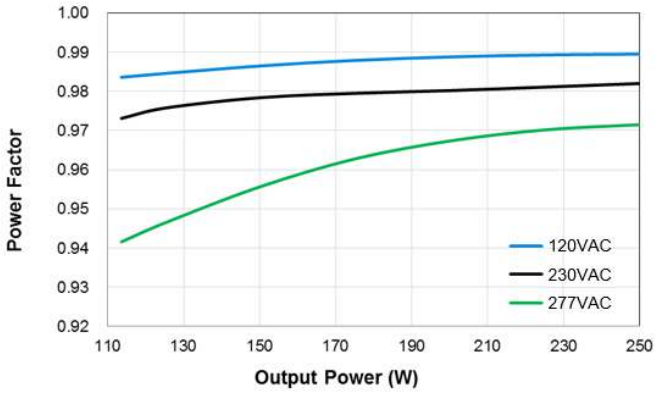
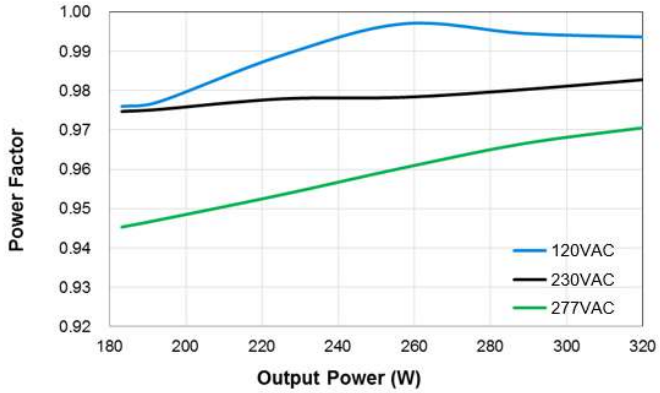
Power Factor VS Output Power

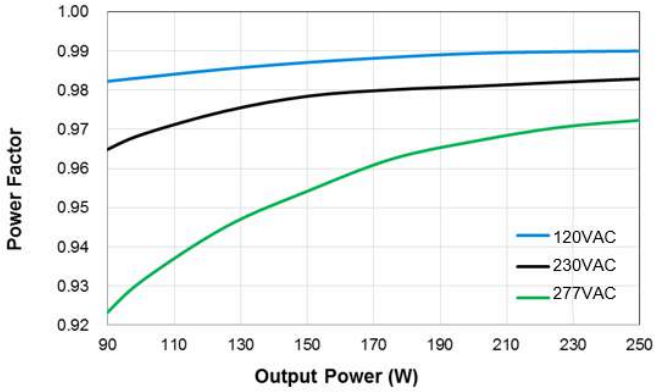
USCO-250140GC – 1400mA



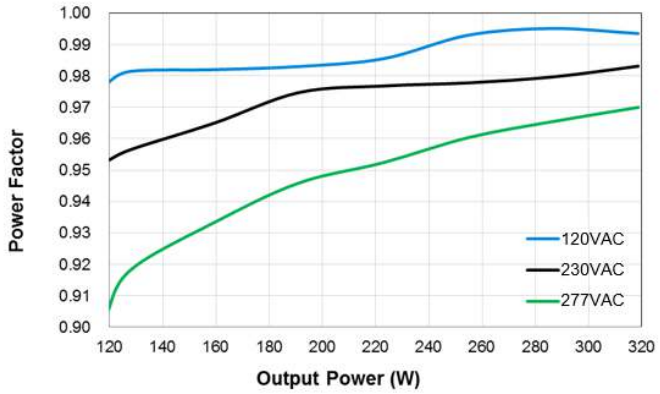
USCO-320210GA – 2100mA



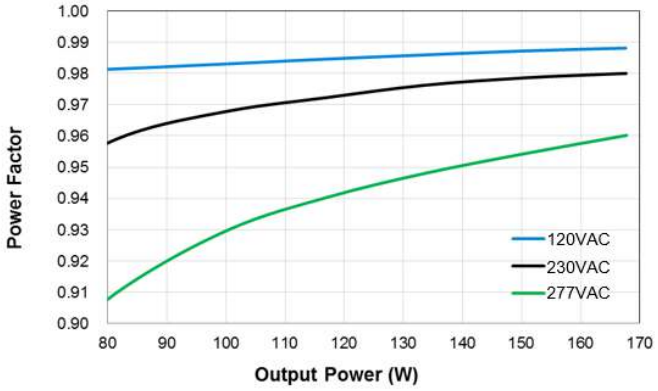
USCO-250140GC – 1050mA



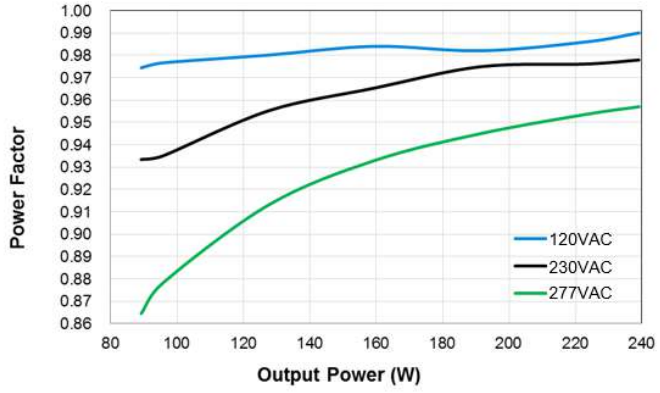
USCO-320210GA – 1400mA



USCO-250140GC – 700mA



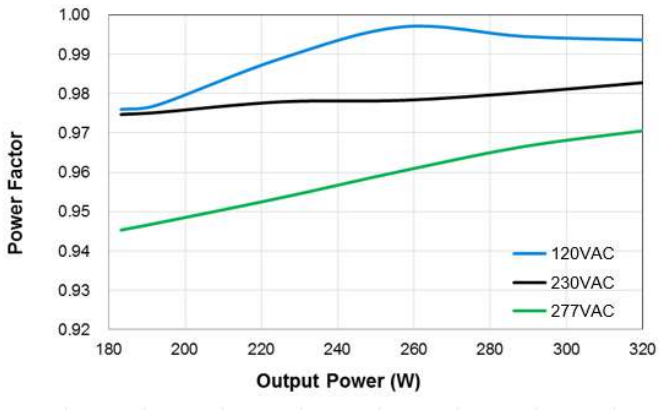
USCO-320210GA – 1050mA



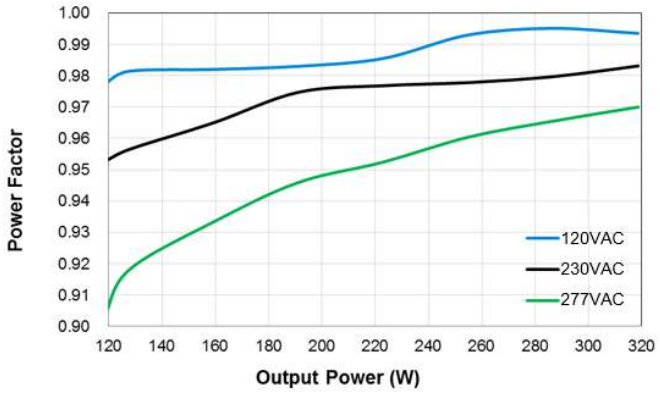
All parameters are specified at 25°C ambient for all products unless otherwise indicated.

Power Factor VS Output Power

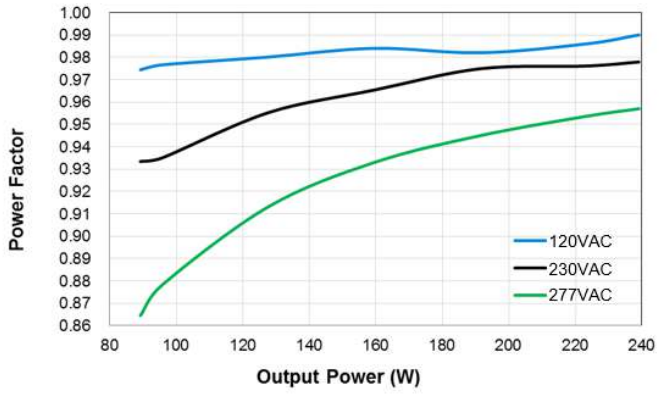
USCO-320280GA – 2800mA



USCO-320280GA – 2100mA



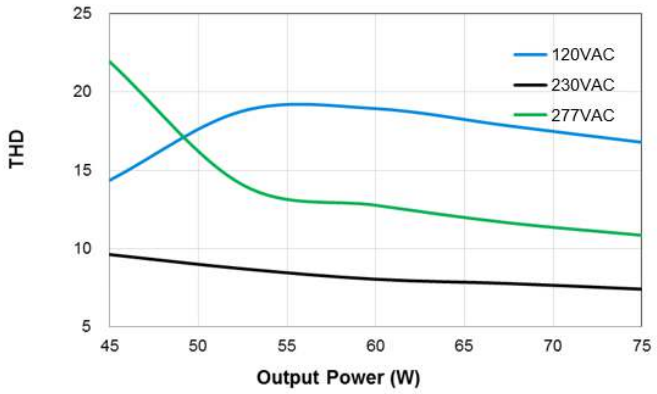
USCO-320280GA – 1600mA



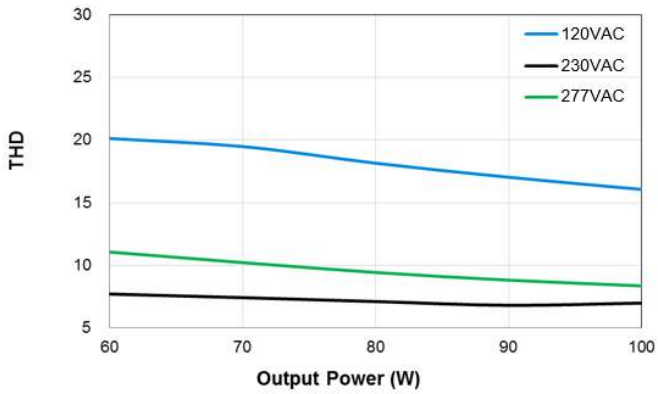
LED Driver
USCO Pro

Total Harmonic Distortion VS Output Power

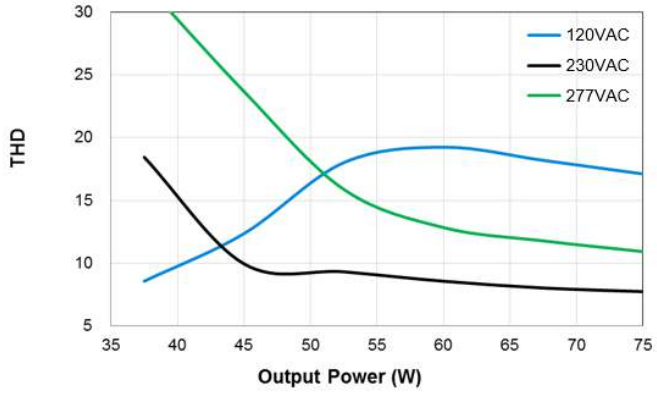
USCO-075140GA – 1400mA



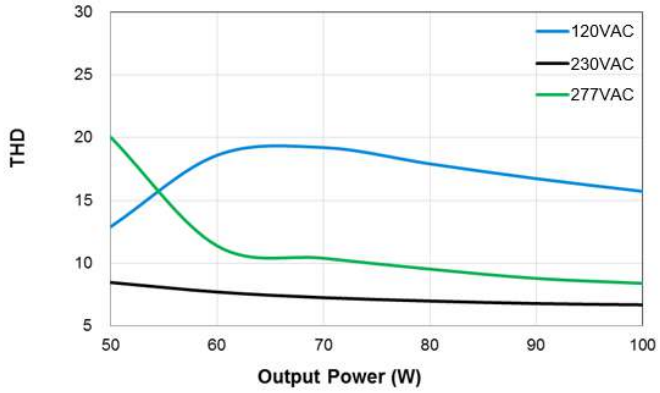
USCO-100140GA – 1400mA



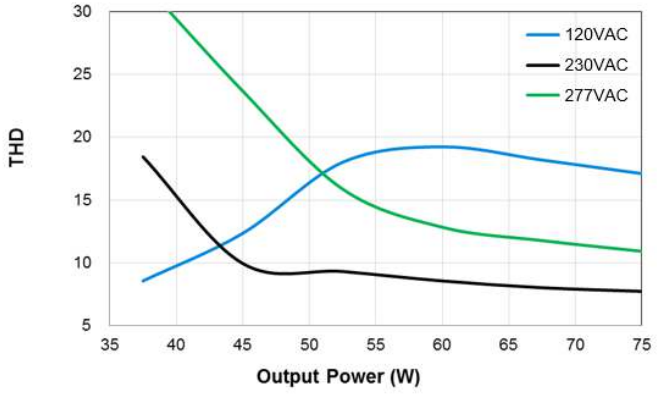
USCO-075140GA – 1050mA



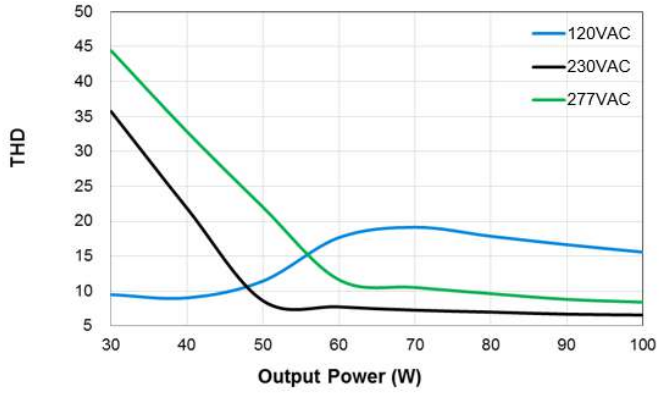
USCO-100140GA – 1050mA



USCO-075140GA – 700mA



USCO-100140GA – 700mA



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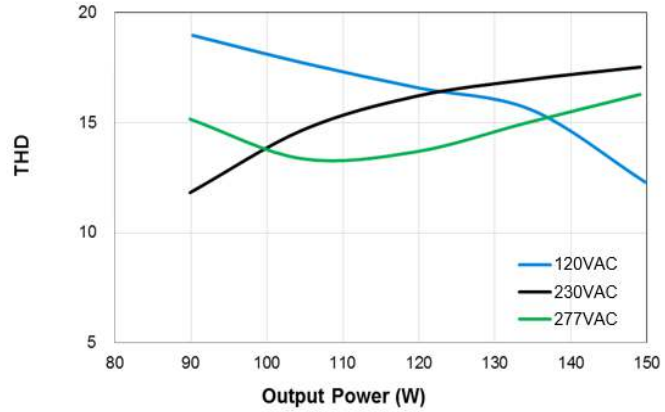
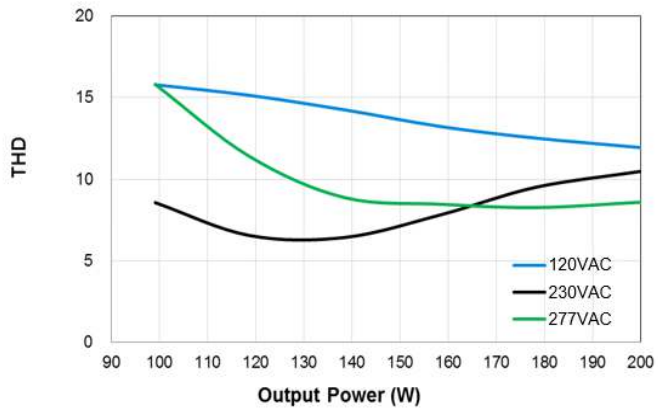
Total Harmonic Distortion VS Output Power

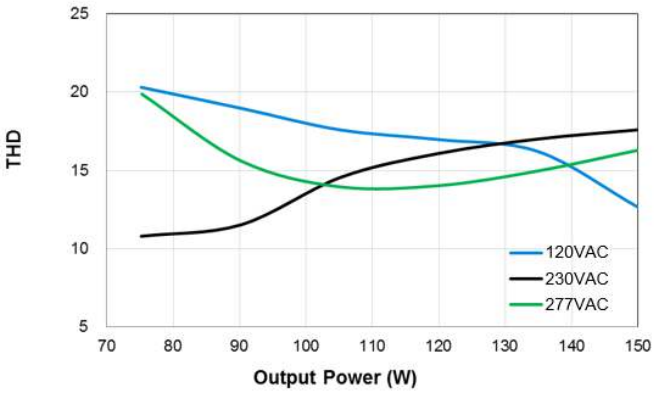
USCO-150140GC – 1400mA



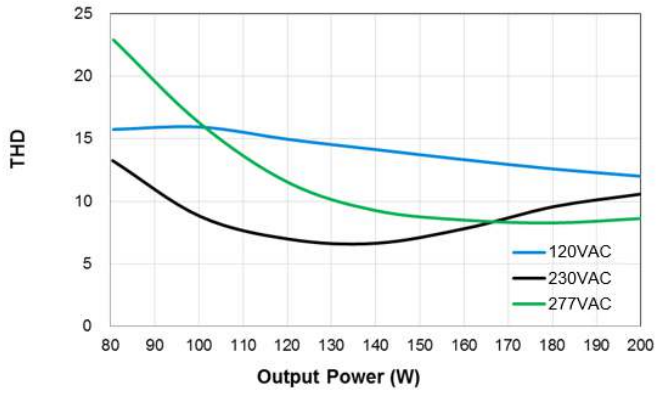
USCO-200140GA – 1400mA



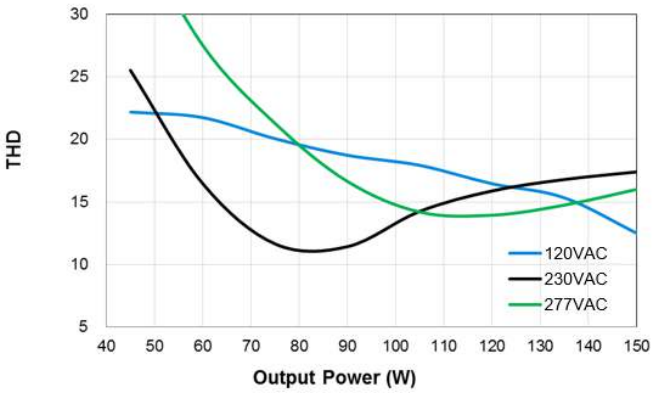
USCO-150140GC – 1050mA



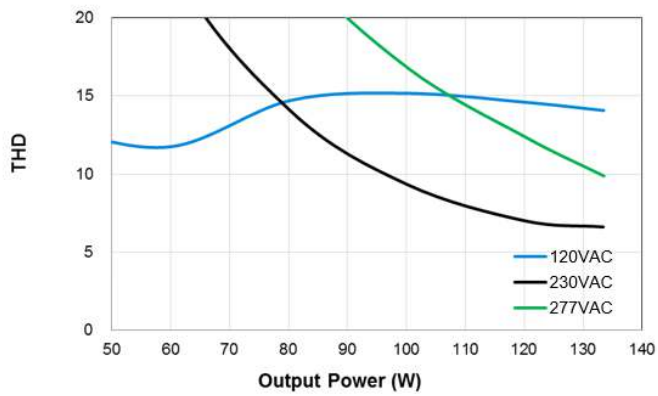
USCO-200140GA – 1050mA



USCO-150140GC – 700mA

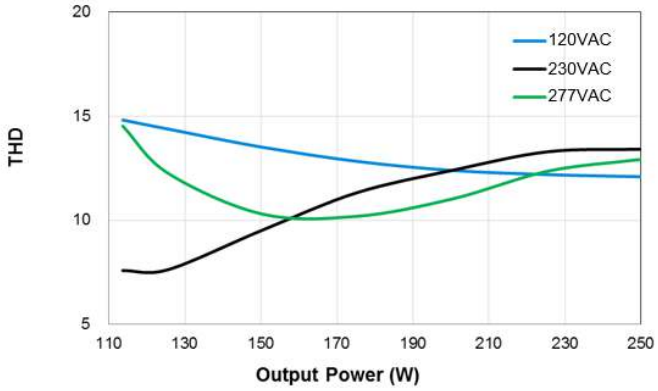


USCO-200140GA – 700mA

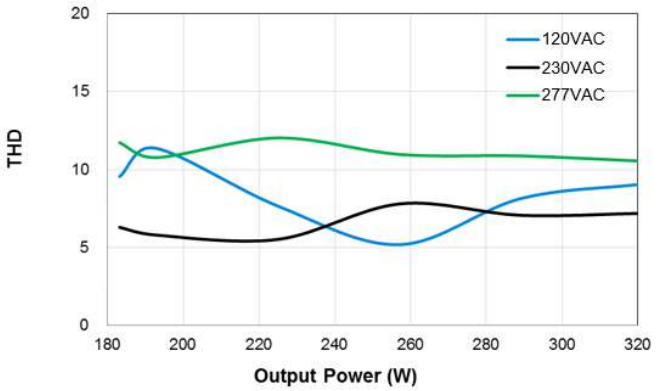


Total Harmonic Distortion VS Output Power

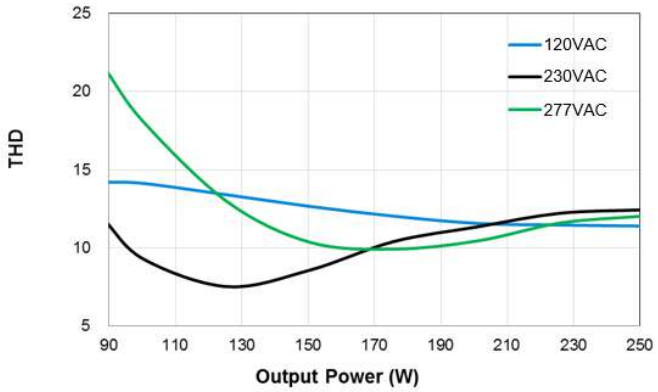
USCO-250140GA– 1400mA



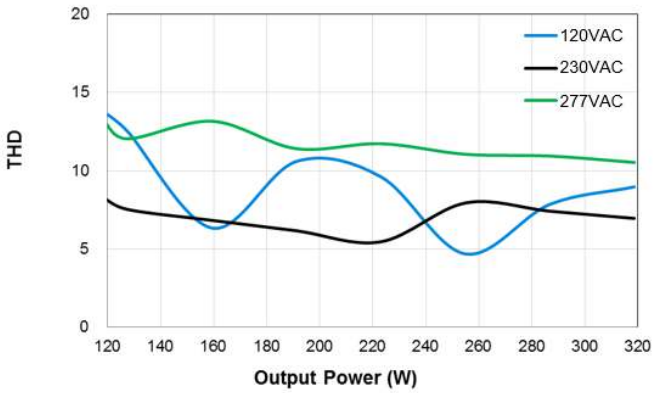
USCO-320210GA – 2100mA



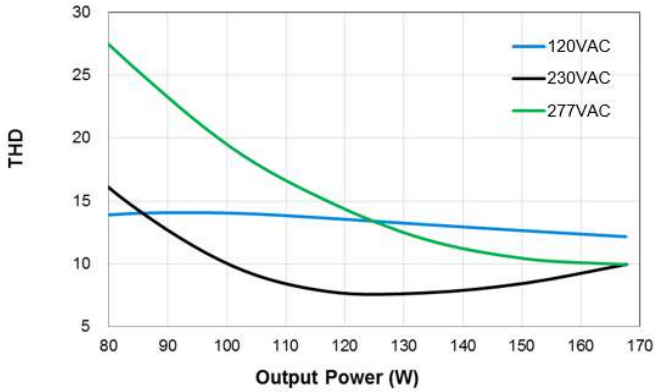
USCO-250140GA – 1050mA



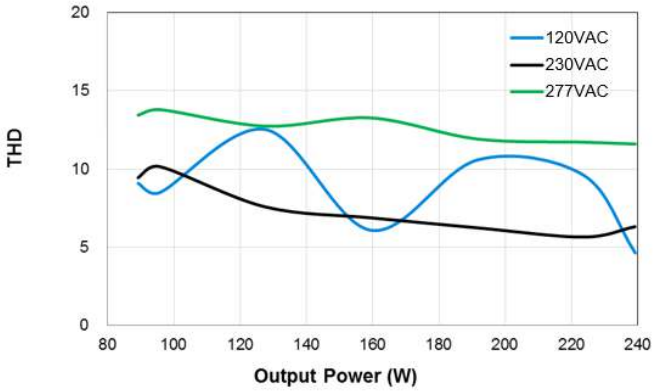
USCO-320210GA – 1400mA



USCO-250140GA – 700mA

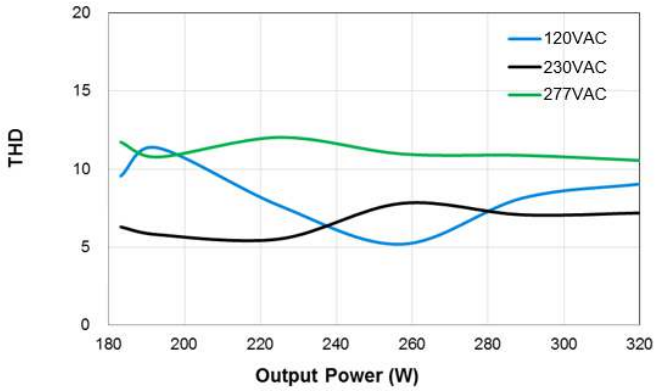


USCO-320210GA – 1050mA

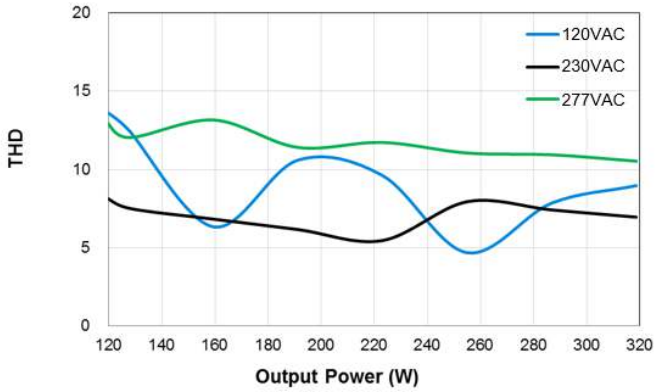


Total Harmonic Distortion VS Output Power

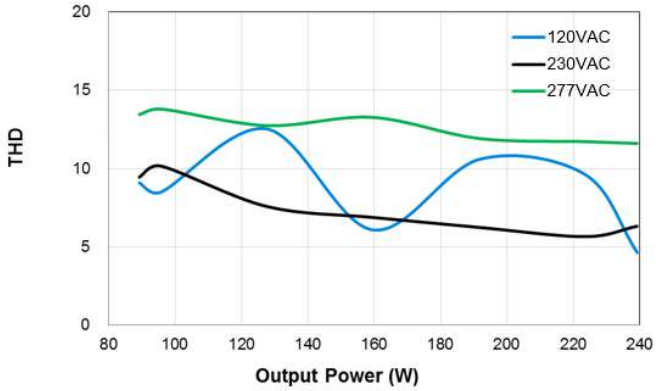
USCO-320280GA – 2800mA



USCO-320280GA – 2100mA



USCO-320280GA – 1600mA

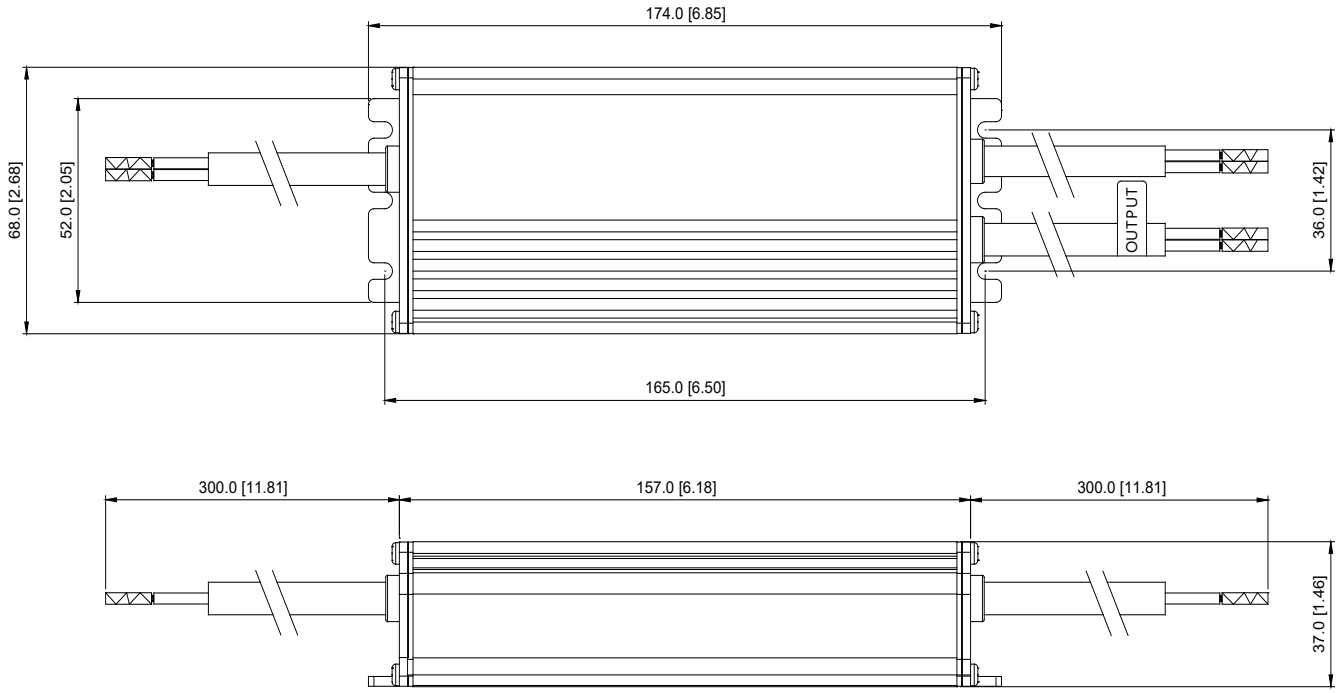


LED Driver
USCO Pro

Dimensions

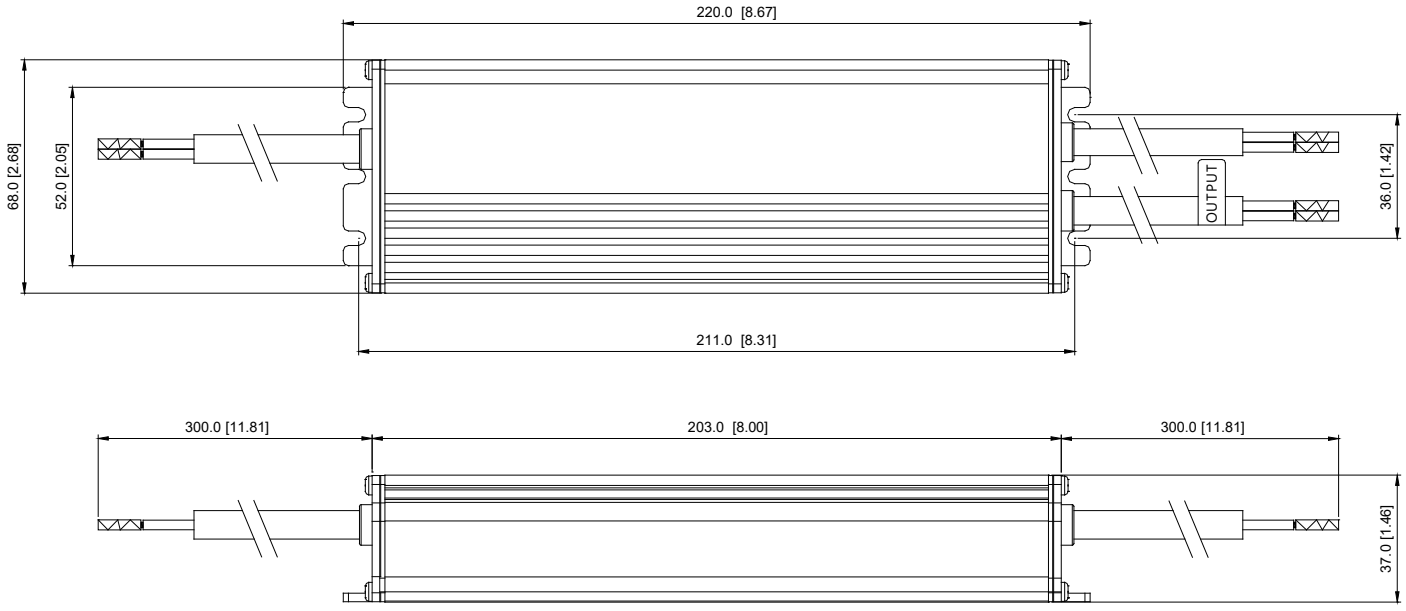
USCO-075140GA & USCO-100140GA

L x W x H: 174 x 68 x 37 mm (6.85 x 2.68 x 1.46 inch)



USCO-150140GC

L x W x H: 220 x 68 x 37 mm (8.66 x 2.68 x 1.46 inch)



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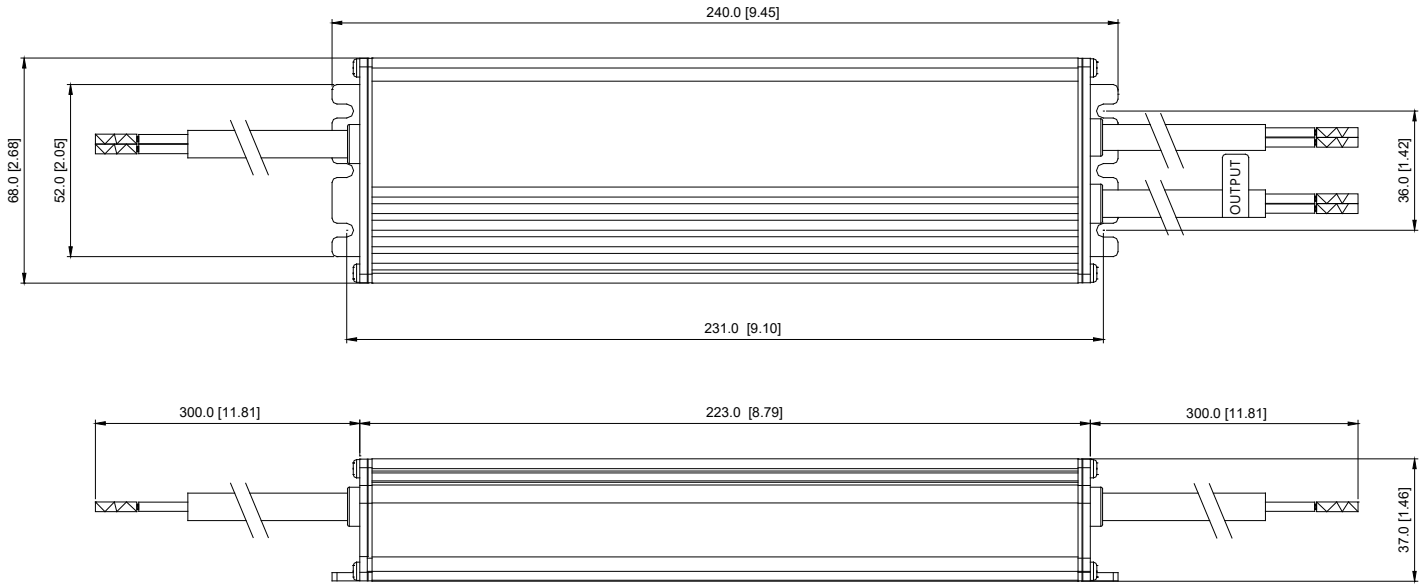
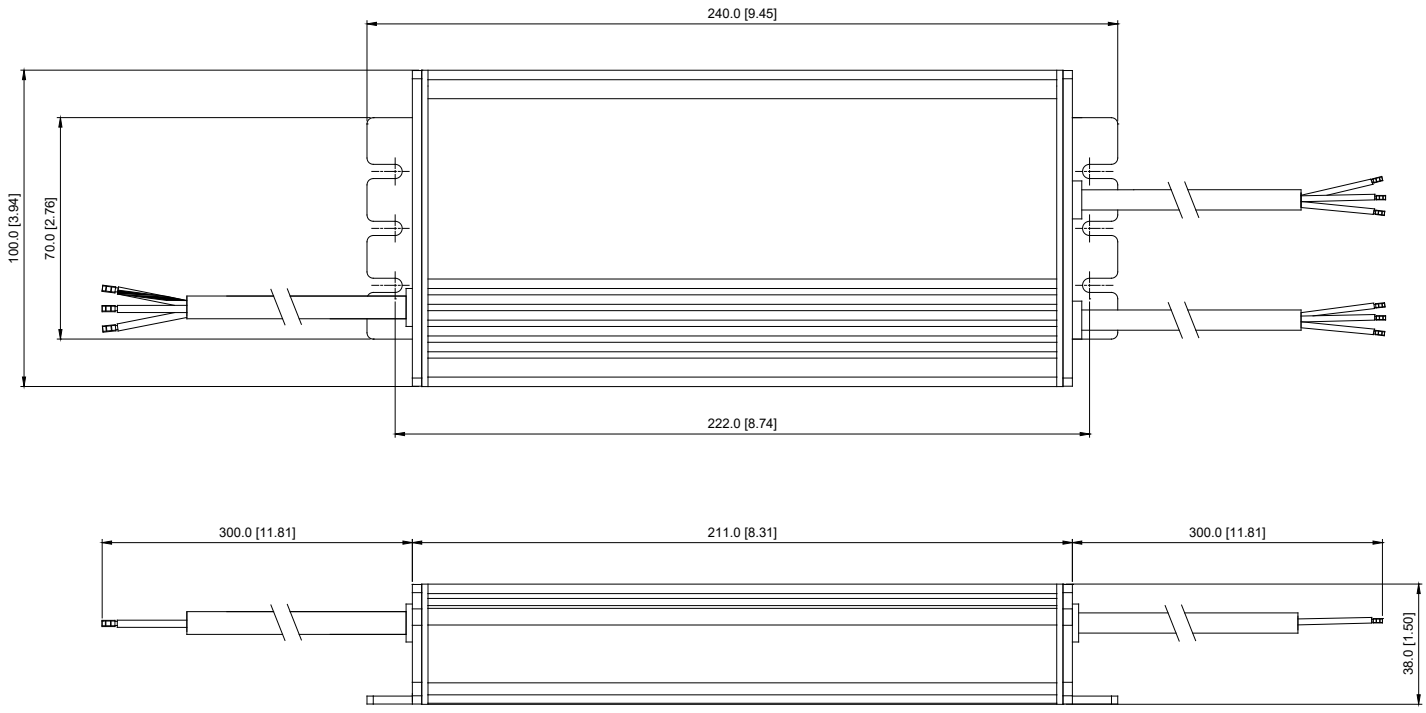
USCO-200140GA & USCO-250140GA

L x W x H: 240 x 68 x 37 mm (9.45 x 2.68 x 1.46 inch)



USCO-320210GA& USCO-320280GA

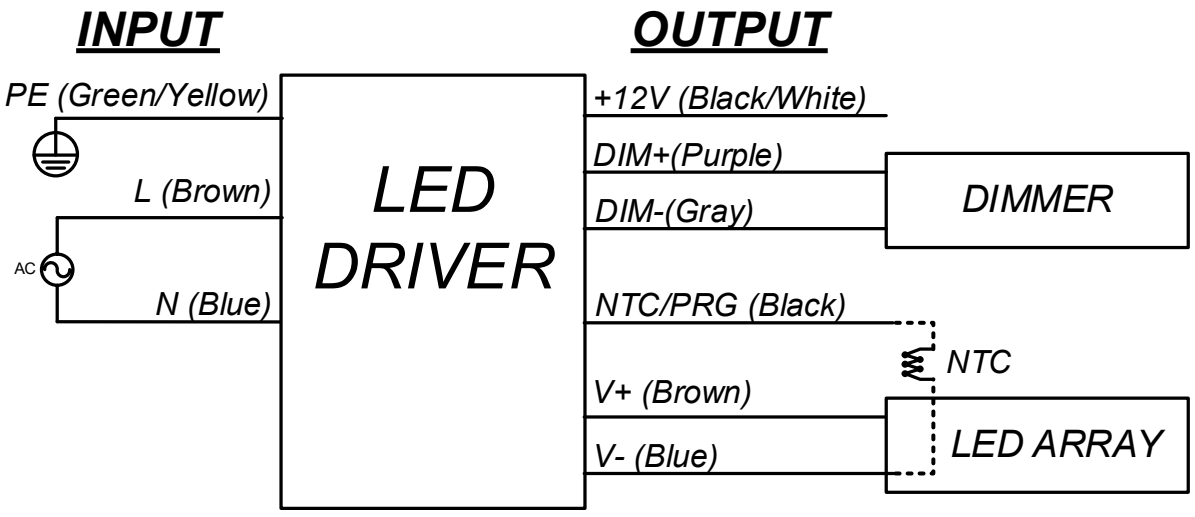
L x W x H: 240 x 100 x 38 mm (9.45 x 3.94 x 1.50 inch)



Wiring Connection

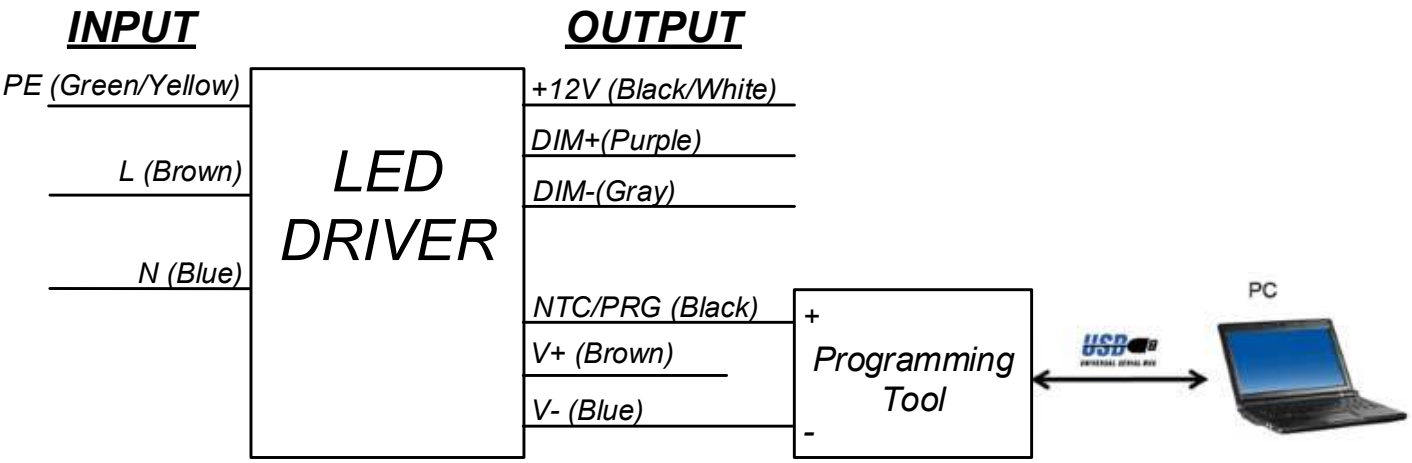
- **Module Temperature Protection (MTP)**

The LEDs are thermally protected by the driver's NTC (Negative Temperature Coefficient resistor) interface, which ensures the output current will be reduced when a critical temperature is reached. Connect an NTC on the LED module to the LED driver associated wires as shown in the wiring diagram below.



- **Programming Setup**

Programming doesn't require powering up input voltage or connecting the LED Module to the driver



Assembly & Installation

The device is not recommended to be placed on low thermal conductive surfaces. For example, plastics.

Base Mounting (Horizontal)

Fig. 2 Recommended Mounting Orientation

Safety Instructions

- ALWAYS switch mains of input power OFF before connecting and disconnecting the input voltage to the device. If mains are not turned OFF, there is risk of explosion / severe damage.
- To guarantee sufficient convection cooling, keep a distance of 50mm above and lateral distance to other units.
- DO NOT insert any objects into the device.
- When the PE terminal is not connected, the device must be installed on a metal plate with PE connection.
- The current rating for the output cable must be rated higher than or equal to the output current of the power supply. Please refer to the product specifications.
- For device with dimming function, always ensure the dimming control is working properly. “Dimming 0-10V” shall be insulated from AC mains by reinforced insulation.

Functions

- Start-up Time

The time required for the output voltage to reach 90% of its set value, after the input voltage is applied.

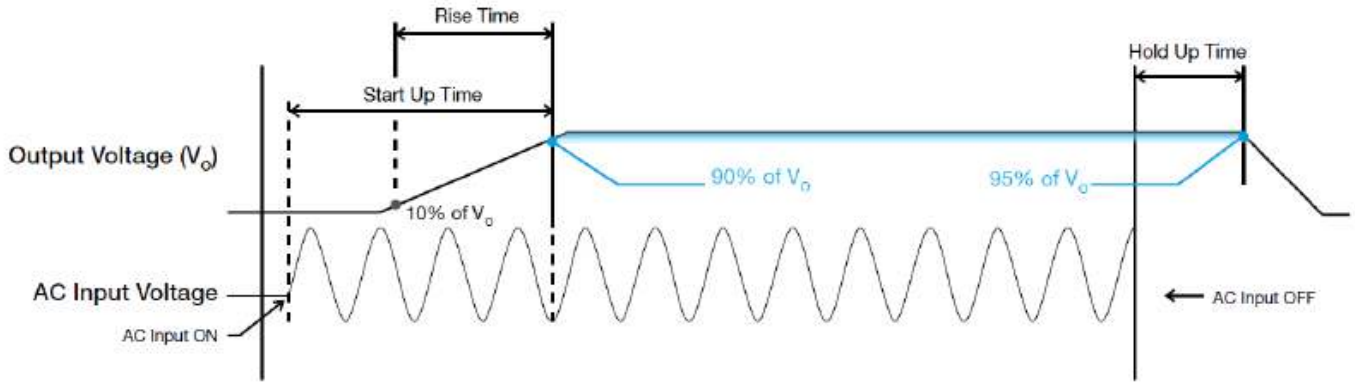
- Rise Time

The time required for the output voltage to change from 10% to 90% of its set value.

- Hold-up Time

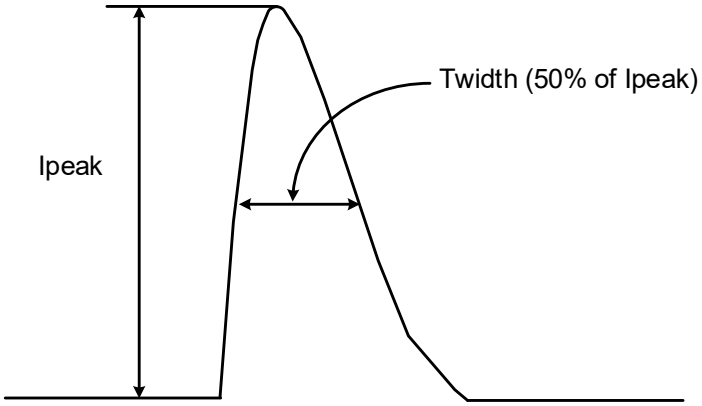
Hold up time is the time when the AC input collapses and output voltage retains regulation for a certain period of time. The time required for the output to reach 95% of its set value, after the input voltage is removed.

Graph illustrating the Start-up Time, Rise Time, and Hold-up Time



Inrush Current

Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



Others

Warranty Policy

Please reach out our Warranty Policy should you require any further clarification.