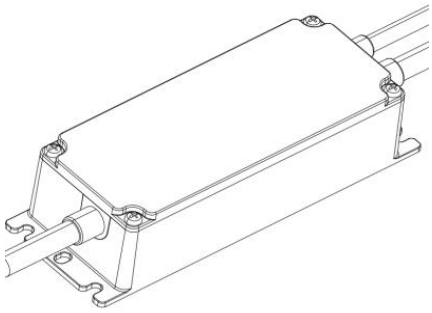
Features

- Programmable constant current and voltage output
- High efficiency: 88% typical @220Vac, full load
- High power factor: 0.98 typical. @ 220Vac, full load
- Isolated 0-10V/PWM/ Resistor Dimming
- With Lightning Protection & all-round protections
- 6kV/10kV surge capability



Description

This specification describes the performance characteristics of a 30W versatile power supply for LED Driver.
The output current of this series are programmable, and designed for 0-10V/PWM/Resistor dimming applications.

Model Name Definition

30	PHL	60	CV	-	XX	X	-	XXX
Rated Output Power	Series name	Maximum output voltage	Constant current and constant voltage output		Options: 1. D0 2. D1	Options: 1. U(UL Wire) 2. V(VDE&CCC Wire) 3. Blank(UL&VDE&CCC Wire)		Options

Specifications

Part Number	Max. Output Power	Programmable Current Range	Output Voltage Range	Efficiency typical@220VAC	Dimming	AUX power
30PHL60CV-D0	30W	0.29-0.71A	30-60V	88%	0-10V	12V 200mA
30PHL60CV-D1	30W	0.29-0.71A	30-60V	88%	1-10V	/

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Rated Input AC Voltage	100 Vac	-	277Vac	
Limit Input AC Voltage	90Vac	-	305Vac	
Input Frequency	47 Hz	50/60 Hz	63 Hz	
Leakage Current	-	-	0.75 mA	At 220Vac / 50Hz input , grounding effectively
Input AC Current	-	-	0.17A	Measured at full load and 220 Vac input.
Inrush Peak Current	-	-	60A	At 220Vac input, 25°C cold start. See Inrush Current Waveform for the details.
PF	0.95	-	-	At 220Vac, 80%-100% load, 25°C and 60Hz
THD	-	-	15%	At 220Vac, 80%-100% load, 25°C and 60Hz
Efficiency	87%	88%	-	Measured at 220Vac input、100% load and steady-state temperature in 25°C ambient

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Io set	-	5%Io set	At 25°C and full load condition
Total Output Current Ripple (pk-pk)	-	-	15%Io max	At 25°C and full load condition, 8kHz BW
Startup Overshoot Current	-	-	20%Io max	At 25°C and full load condition, 8kHz BW
No Load Output Voltage	-	-	75V	
Line Regulation	-	-	±3%	Measured at 25°C and full load
Load Regulation	-	-	±3%	At 25°C condition
Turn-on Delay Time	-	-	2.0 s	Measured at 220Vac input.
Temperature Coefficient of Io set	-0.03%/°C	-	0.03%/°C	Case temperature = 0°C ~Tc max
12V Auxiliary Output Voltage (30PHL60CV-D0)	11V	12 V	15 V	
12V Auxiliary Output Current (30PHL60CV-D0)	0 mA	-	200 mA	Return terminal is “Dim−”
OTP Tc	85°C	90°C	95°C	Output current will drop or shut down.
SCP				Hiccup mode, Auto recover
OPP				Auto recover
OCP				Auto recover

General Specifications

Parameter	Min.	Typ.	Max.	Notes
MTBF	234,000 Hours	-	-	Measured at 220Vac input, 80%Load and 25 ° C ambient temperature (MIL-HDBK-217F)
Lifetime	50,000 Hours	-	-	Measured at 220Vac input, 100%load and 75° C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40°C	-	+90°C	
Operating Case Temperature for Warranty Tc_w	-40°C	-	+80°C	
Operating Ambient Temperature Ta	-40°C	-	+70°C	
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 90%RH
IP Grade	IP67			
Dimensions Inches (L × W × H) Millimeters (L × W × H)	5.45×1.92×1.26 in 138.3×48.6×32.1mm			
Net Weight/pcs	-	420g	-	

Dimming Specifications

1. 0-10V Dimming(30PHL60CV-D0)

Parameter	Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin	-1 V	-	15 V	
Source Current on Vdim (+)Pin	90uA	100uA	110uA	
Dimming Output Range	-	10%Io set	Io set	80%Io max ≤ Io set ≤ 100%Io max
	-	8%Io max	Io set	Io set ＜80%Io max
Recommended Dimming Input Range	0V	-	10 V	Default 0-10V dimming mode.
Dim off Voltage	0.6 V	0.8 V	1.0V	
Dim on Voltage	0.8 V	1.0 V	1.2 V	
Dim off Resistance	5kΩ	8kΩ	10kΩ	
Dim on Resistance	7kΩ	10kΩ	12kΩ	
Hysteresis	-	0.2 V	-	
PWM_in High Level	9.5 V	10V	10.5 V	
PWM_in Low Level	-0.3 V	-	0.6 V	
PWM_in Frequency Range	500 Hz	-	3 KHz	
PWM_in Duty Cycle	1%	-	100%	
PWM Dimming off	6%	8%	10%	
PWM Dimming on	8%	10%	12%	

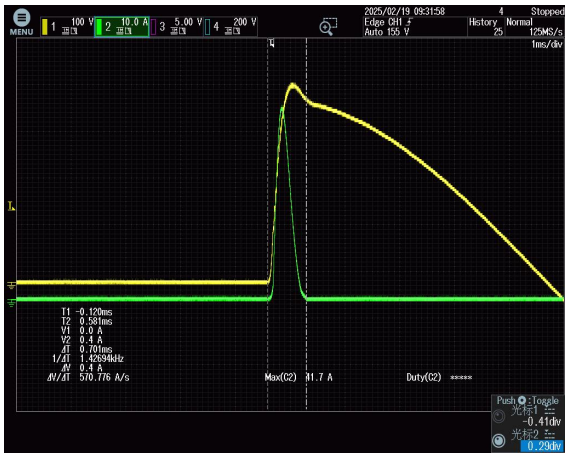
2. 1-10V Dimming(30PHL60CV-D1)

Parameter	Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin	-1 V	-	15 V	
Source Current on Vdim (+)Pin	90uA	100uA	110uA	
Dimming Output Range	-	10%Io set	Io set	80%Io max ≤ Io set ≤ 100%Io max
	-	8%Io max	Io set	Io set ＜80%Io max
Recommended Dimming Input Range	1V	-	10 V	Default 1-10V dimming mode.
PWM_in High Level	9.5 V	10V	10.5 V	
PWM_in Low Level	-0.3 V	-	0.6 V	
PWM_in Frequency Range	500 Hz	-	3 KHz	
PWM_in Duty Cycle	1%	-	100%	

Safety &EMC Compliance

Safety Category	Standard
UL/cUL	UL8750,CAN/CSA-C22.2 No. 250.13-12
Dielectric Strength(Hi-pot)	Primary to Secondary: 3200Vac 10mA max
	Primary to Earth: 1600Vac 10mA max.
	Secondary to Earth: 1600Vac 10mA max.
	Dimming to Output: 500Vac 10mA max.
Insulation Resistance	50Mohm min.@ primary to secondary add 500Vdc test voltage
Grounded Resistance	0.1Ω max. @ 25A, 1 minute
ENEC&CE	EN61347-1, EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB19510.1, GB19510.14
EMI Standards	Notes
EN55015	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.
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge, Criteria A
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS, Criteria A
EN 61000-4-4	Electrical Fast Transient / Burst-EFT: level 3, Criteria B
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 6kV, line to earth 10kV, Criteria B
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS, Criteria A
EN 61000-4-8	Power Frequency Magnetic Field Test, Criteria A
EN 61000-4-11	Voltage Dips Criteria B
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

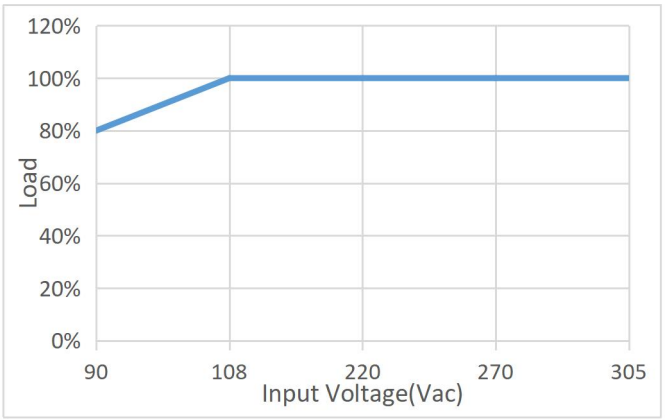
Inrush Current（@Full load and cold start）



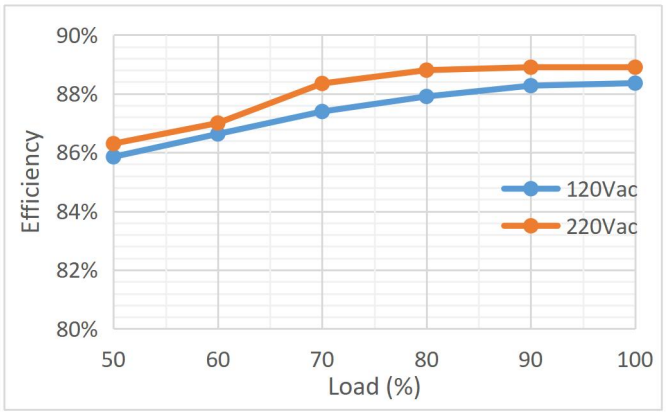
Vin(Vac)	Fin(Hz)	Ipeak(A)	T duration(us)
120	47	13.7	661
220	50	33.3	701
277	63	41.7	701

Performance Curve

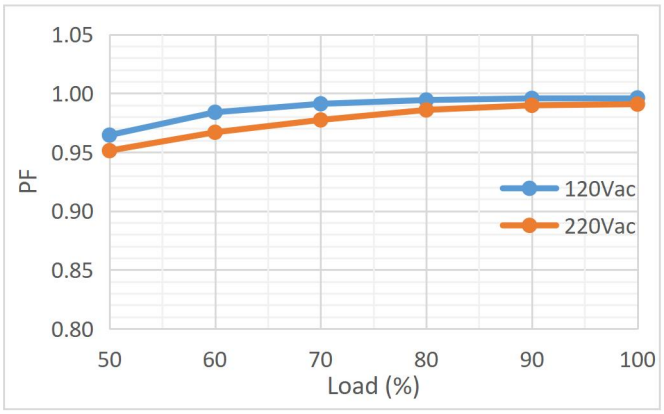
Input Voltage Derating Curve



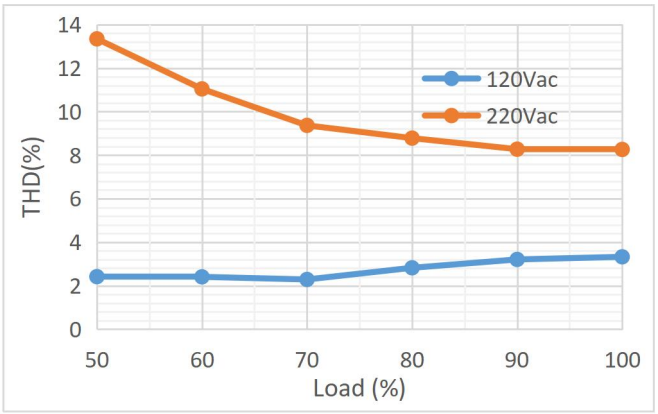
Efficiency Vs Different Loads



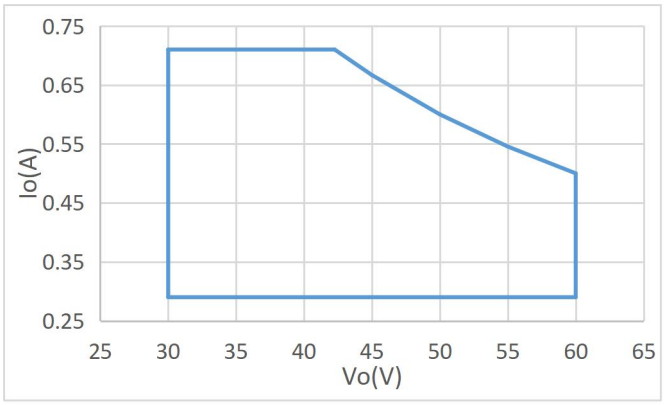
Power Factor Vs Different Loads



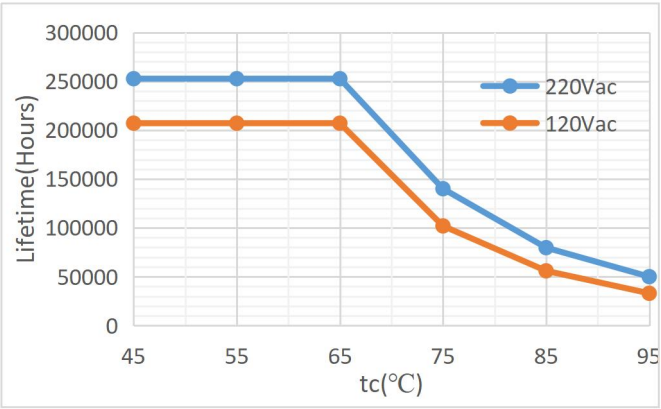
Total Harmonics Vs Different Loads



I/V Operating Area

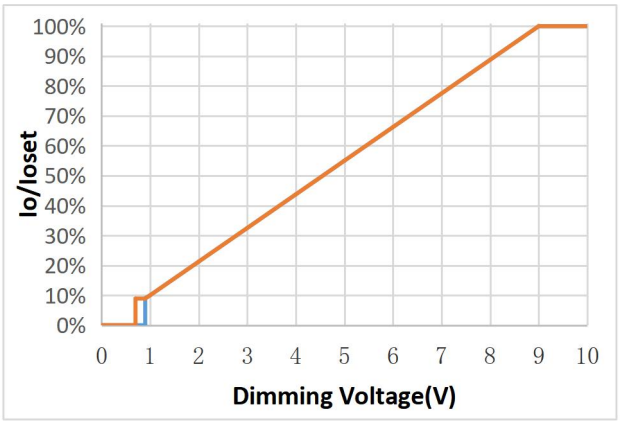


Life Vs Case Temperature

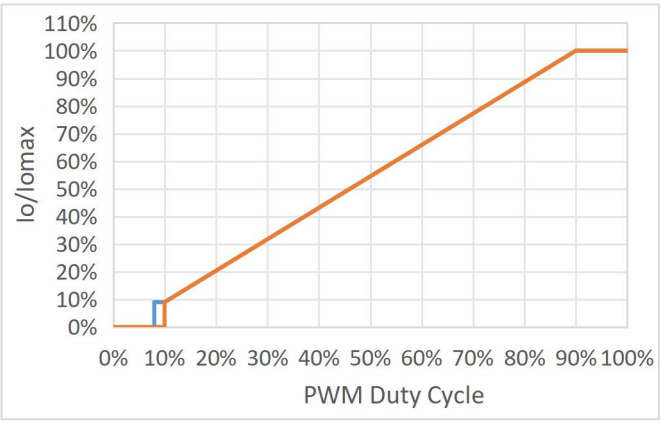


Dimming Curve

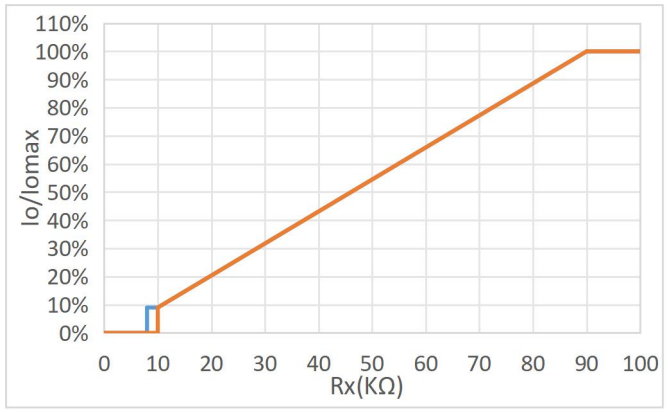
30HPL60CV-D0 Io/Ir vs Vdim



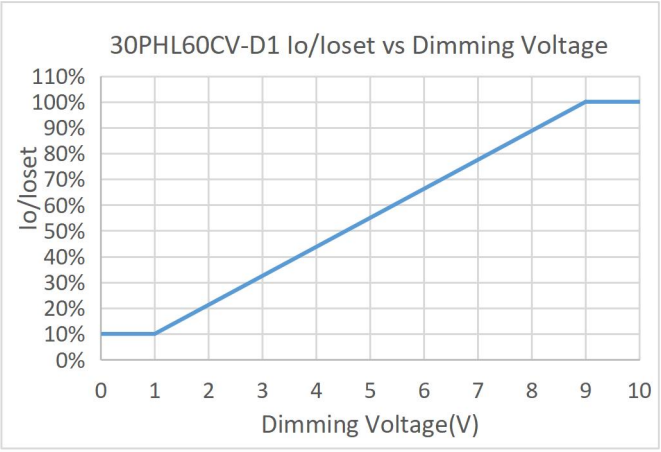
30HPL60CV-D0 Io/Iomax vs PWM Duty Cycle



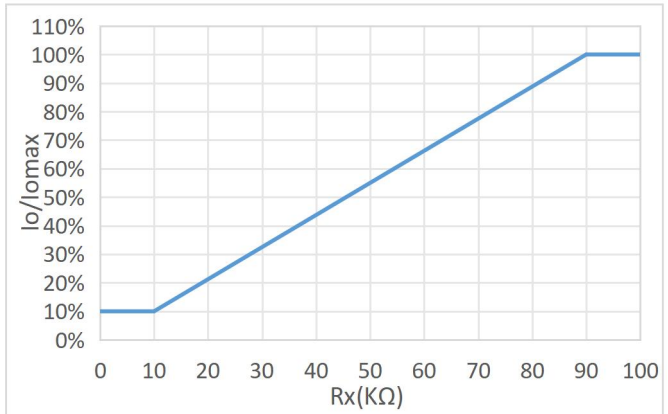
30PHL60CV-D0 Io/Iomax vs Rx



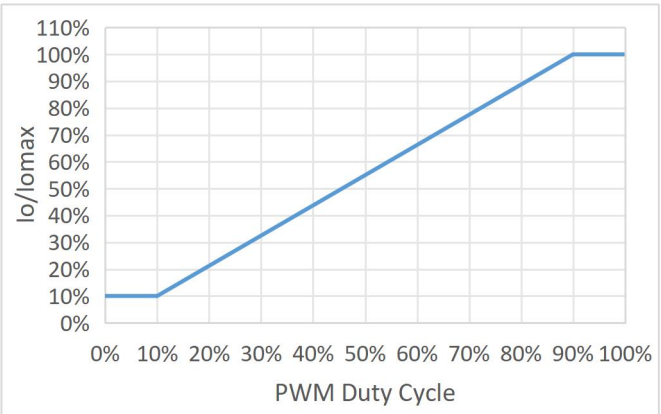
30PHL60CV-D1 Io/Ioset vs Dimming Voltage



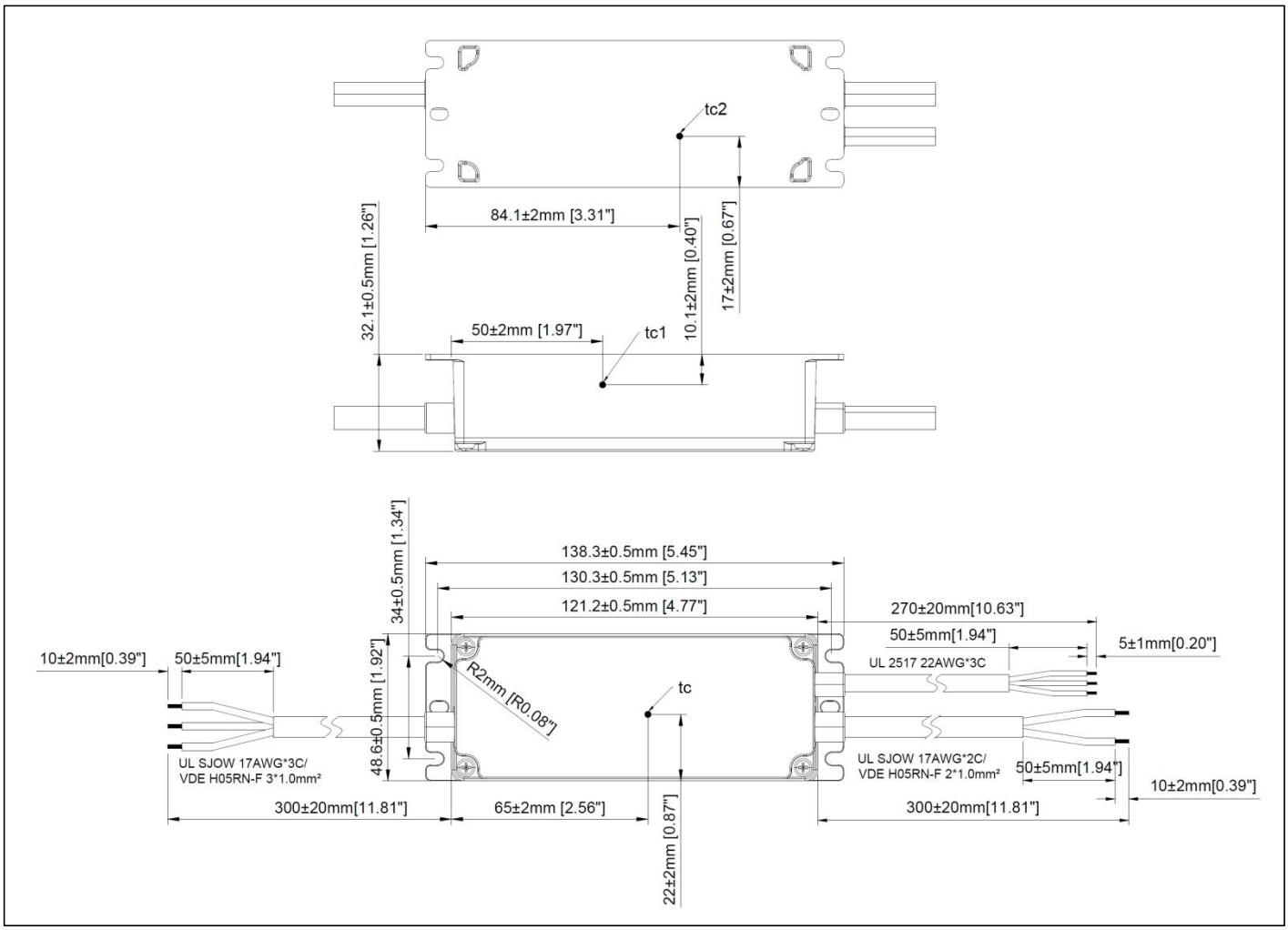
30PHL60CV-D1 Io/Iomax vs Rx



30PHL60CV-D1 Io/Iomax vs PWM Duty Cycle



Mechanical Drawing



Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2023/3/10	V1.0			
2023/9/16	V1.1	Update Mechanical Drawing		
2023/9/28	V1.2	Update Mechanical Drawing		Update the installation size
2023/10/26	V1.3	Update Mechanical Drawing		Update the size and add tc
		Operating Ambient Temperature Ta	MAX:50°C	MAX:70°C
2023/12/27	V1.4	Inrush Current	MAX: 125A	MAX: 60A
		Add Net Weight		
		Update Mechanical Drawing		
		No Load Output Voltage	MAX: 66V	MAX: 75V
2024/1/9	V1.5	Dielectric Strength(Hi-pot)	Primary to Secondary:3000Vac / 10mAMax	Primary to Secondary: 3750Vac 10mA max
			Primary to Earth: 1500Vac 10mA max.	Primary to Earth: 1600Vac 10mA max.

			Secondary to Earth: 500Vac 10mA max.	Secondary to Earth: 1600Vac 10mA max.
			Dimming to Secondary: 1500Vac 10mA max.	Dimming to Secondary: 1600Vac 10mA max.
		Update Model Name Definition		
		Safety Category		Add ENEC/CE/CB/CCC
		Input Frequency	Min：45Hz	Min：47Hz
2025/2/25	V1.6	Input Specifications	Inrush Current	Inrush Peak Current
		PF/THD		Add 25°C and 60Hz
		Input Specifications		Add efficiency
		Delete 30PHL60CV-DA		
		Total Output Current Ripple (pk-pk)	At 25°C and full load condition, ≤ 200Hz BW	At 25°C and full load condition, 8kHz BW
		Startup Overshoot Current	Max：10%Io max；Note：At 25°C and full load condition, ≤200Hz BW	Max：20%Io max；Note：At 25°C and full load condition, 8kHz BW
		Line Regulation/Load Regulation		Add 25° C
		Temperature Coefficient of Io set	±0.05%/°C	±0.03%/°C
		OTP Tc	Output current will drop to 50% lowest, or shut down.	Output current will drop or shut down.
		Lifetime	Measured at 220Vac input, 80% load and 75° C case temperature; See lifetime vs. Tc curve for the details	Measured at 220Vac input, 100% load and 75° C case temperature; See lifetime vs. Tc curve for the details
		Add IP Grade		
		Dimming Output Range	Min：10%Io set Min：8%Io max	Typ：10%Io set Typ：8%Io max
		PWM_in Duty Cycle	Max：98%	Max：100%
		Update Mechanical Drawing		
		Dielectric Strength(Hi-pot)	Primary to Secondary: 3750Vac 10mA max	Primary to Secondary: 3200Vac 10mA max
			Dimming to Secondary: 1600Vac 10mA max.	Dimming to Output: 500Vac 10mA max.
		Add Dim off Resistance/Dim on Resistance/Inrush Current		
		Dim off Voltage	0.3-0.5-0.8	0.6-0.8-1.0
		Dim on Voltage	0.5-0.7-1	0.8-1.0-1.2
		PWM Dimming off	3%-5%-8%	6%-8%-10%
		PWM Dimming on	5%-7%-9%	8%-10%-12%
		Update EFF/PF/THD/Dimming Curve		
		Add lifetime curve		