

60PHL Series Specification

60PHL系列规格书

V1.6

2024/3/2

Powerland Signatures					Customer Approval Signature
Prepared	Checked		Approved	Marketing	
	ME	RD Manager			

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Powerland Technology Inc.

南京博兰得电子科技有限公司

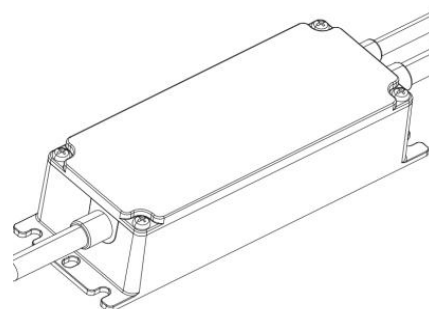
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Features

- Programmable constant current and voltage output
- High efficiency: 90% 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 60W 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

60	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 3. DA	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
60PHL60CV-D0	60W	0.57-1.43A	30-60V	90%	0-10V	12V 200mA
60PHL60CV-D1	60W	0.57-1.43A	30-60V	90%	1-10V	/
60PHL60CV-DA	60W	0.57-1.43A	30-60V	90%	DALI	24V 125mA
60PHL100CV-D0	60W	0.34-0.86A	42-100V	90%	0-10V	12V 200mA
60PHL100CV-D1	60W	0.34-0.86A	42-100V	90%	1-10V	/
60PHL100CV-DA	60W	0.34-0.86A	42-100V	90%	DALI	24V 125mA

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Rated Input AC Voltage	100 Vac	-	277Vac	
Limit Input AC Voltage	90Vac	-	305Vac	
Input Frequency	47Hz	50/60 Hz	63 Hz	
Leakage Current	-	-	0.75 mA	At 220Vac / 50Hz input , grounding effectively
Input AC Current	-	-	0.35A	Measured at full load and 220 Vac input.
Inrush Current	-	-	60A	At 220Vac input, 25°C cold start.
PF	0.95	-	-	At 220Vac, 80%-100% Load

THD	-	-	15%	At 220Vac, 80%-100% Load
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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, ≤200Hz BW
Startup Overshoot Current	-	-	10%Io max	At 25°C and full load condition, ≤200Hz BW
No Load Output Voltage	-	-	75V	Only for 60PHL60CV
Line Regulation	-	-	±3%	Measured at full load
Load Regulation	-	-	±3%	
Turn-on Delay Time	-	-	2.0 s	Measured at 220Vac input.
Temperature Coefficient of Io set	-0.05%/°C	-	0.05%/°C	Case temperature = 0°C ~Tc max
12V Auxiliary Output Voltage (60PHL60CV-D0/60PHL100CV-D0)	11V	12 V	15 V	
12V Auxiliary Output Source Current (60PHL60CV-D0/60PHL100CV-D0)	0 mA	-	200 mA	Return terminal is "Dim-"
24V Auxiliary Output Voltage (60PHL60CV-DA/60PHL100CV-DA)	21.6V	24V	26.4V	
24V Auxiliary Output Source Current (60PHL60CV-DA/60PHL100CV-DA)	0 mA	-	125mA	Return terminal is "Dim-"
OTP Tc	85°C	90°C	95°C	Output current will drop to 50% lowest, 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, 80%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	At 220-277Vac input
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 90%RH
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(60PHL60CV-D0/60PHL100CV-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	
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%	-	98%	
PWM Dimming off	6%	8%	10%	
PWM Dimming on	8%	10%	12%	

2. 1-10V Dimming(60PHL60CV-D1/60PHL100CV-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%	-	98%	

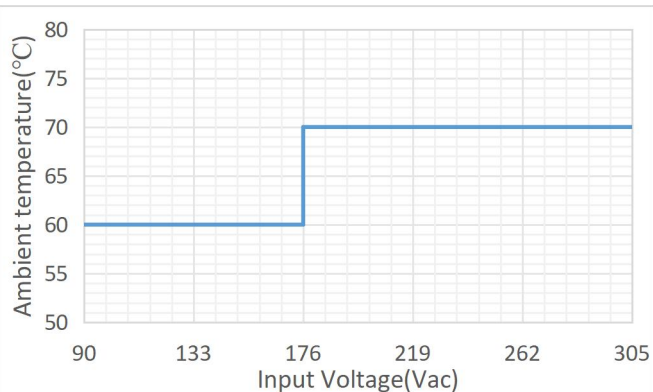
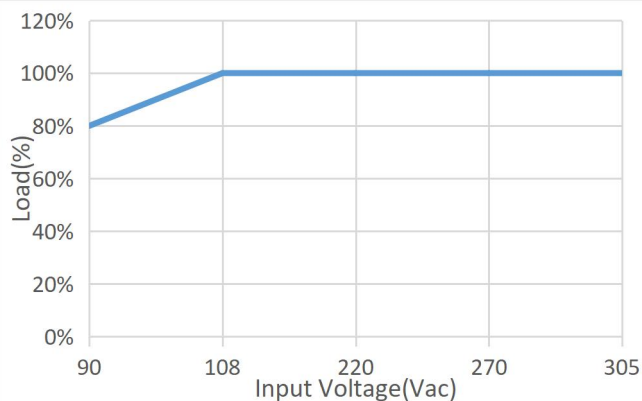
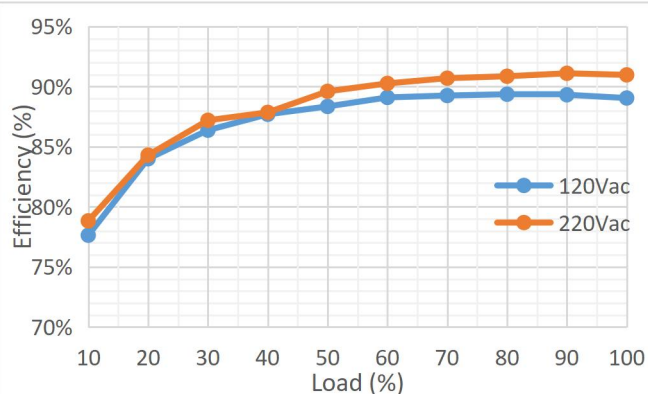
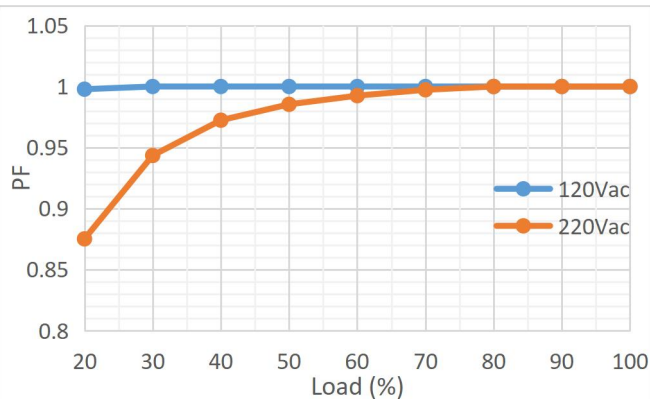
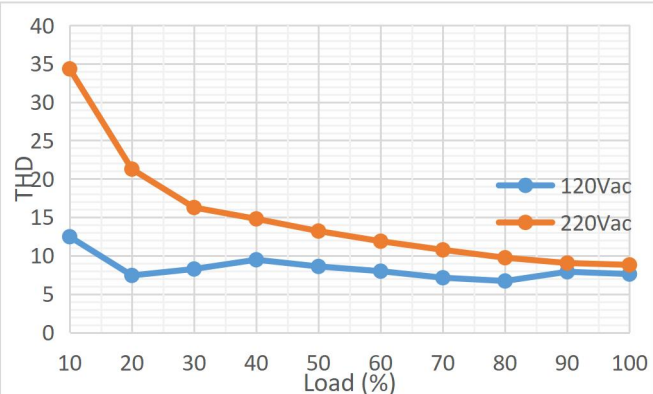
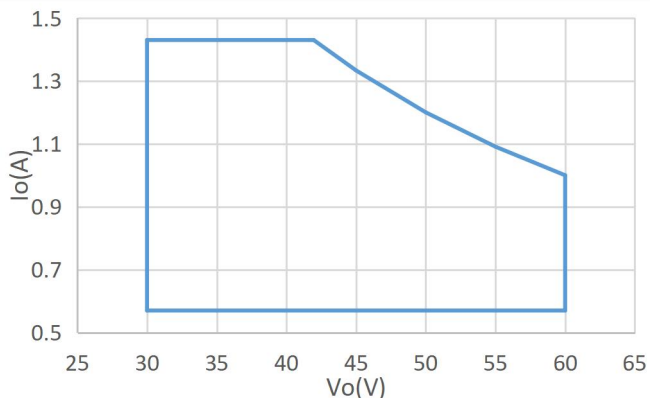
3. DALI Dimming(60PHL60CV-DA/60PHL100CV-DA)

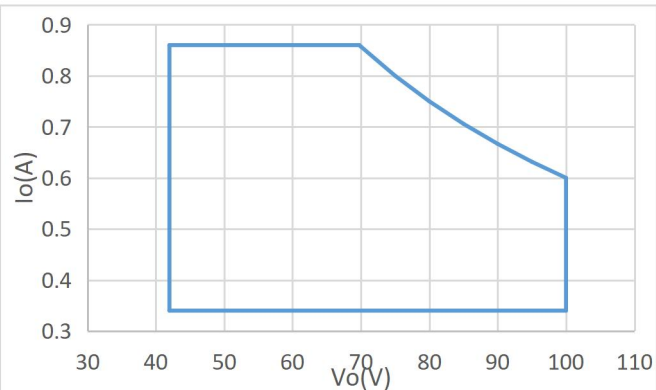
Parameter	Min.	Typ.	Max.	Notes
DA+, DA- High Level	9.5V	16V	22.5V	
DA+, DA- Low Level	-6.5V	0V	6.5V	
DA+, DA- Current	0mA	-	2mA	
Dimming Output Range 10%-100%	10%Io set	-	Io set	

Safety & EMC Compliance

Safety Category	Standard
UL/CUL	UL8750,CAN/CSA-C22.2 No. 250.13-12
Dielectric Strength(Hi-pot)	Primary to Secondary: 3750Vac 10mA max
	Primary to Earth: 1600Vac 10mA max.
	Secondary to Earth: 1600Vac 10mA max.
	Dimming to Secondary: 1600Vac 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 (Except 60PHL60CV-DA/60PHL100CV-DA)	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

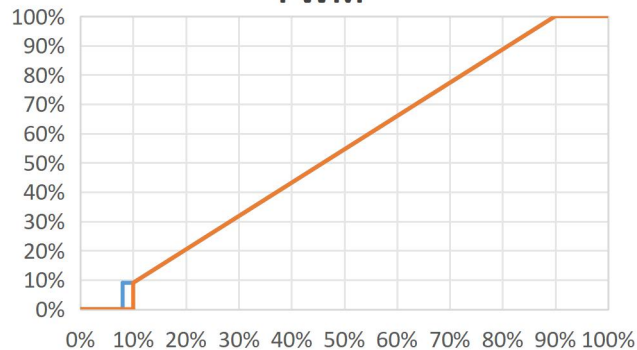
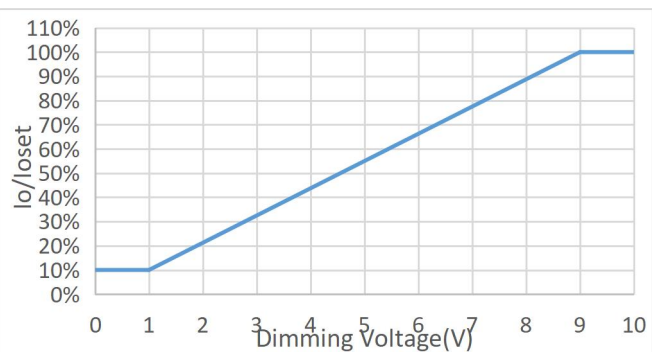
Performance Curve

Input Voltage Vs Ambient temperature

Input Voltage Derating Curve

60PHL60CV Efficiency Vs Different Loads

60PHL60CV Power Factor Vs Different Loads

60PHL60CV Total Harmonics Vs Different Loads

60PHL60CV I/V Operating Area


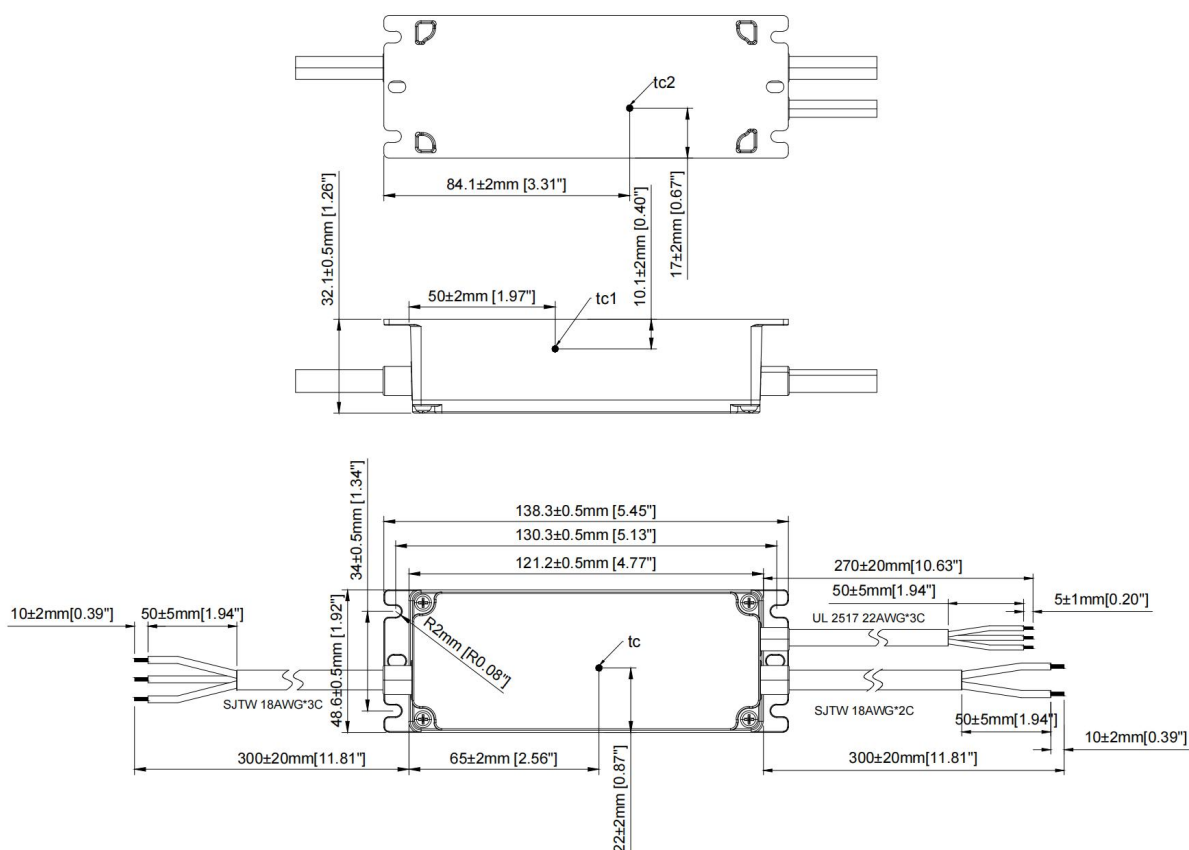
60PHL100CV I/V Operating Area


Dimming Curve

60PHL60CV-D0/60PHL100CV-D0 I_o/I_r vs V_{dim}
0-10V

60PHL60CV-D0/60PHL100CV-D0 I_o/I_r vs V_{dim}
PWM

60PHL60CV-D1/60PHL100CV-D1 I_o/I_{set} vs
Dimming Voltage


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	Add Input Voltage Vs Ambient temperature		
		No Load Output Voltage	MAX: 66V	MAX: 75V
		Add Net Weight		
		Update Mechanical Drawing		
		Add Inrush Current		
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	Dimming to Secondary: 1600Vac 10mA

			max.	max.
		Update Model Name Definition		
		Safety Category		Add ENEC/CE/CB/CCC
		Input Frequency	Min: 45Hz	Min: 47Hz
2024/3/2	V1.6	Update Dimming Curve : 0-10V/PWM		
		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%
		Total Output Current Ripple (pk-pk)	Note: At full load condition, 20 MHz BW	Note: At 25° C and full load condition, ≤200Hz BW
		Startup Overshoot Current	Note: At full load condition	Note: At 25° C and full load condition, ≤200Hz BW