

LED DRIVER SPECIFICATIONS

Customer's Part Number:

MOONS' Part Number:

469635000XXXX

Model:

MU150HxxxAQ_CP/AUX Series

P/N:

CUSTOMER'S APPROVAL STAMP

Please sign back after your approval. The specifications will come into force when we receive purchase order.

DWG.	CHK.	STANDARD	APPD.

Page 2 of 9

■ Features

- Input voltage: 108-305Vac
- Built-in active PFC function: 0.99 Typ.
- High efficiency: up to 93% Typ.
- Constant current/ 0-10V dimming/ clock dimming(CLK)/ PWM dimming/Dim to off
- Full power at 65%I_{max}~100%I_{max} (Constant power)
- High surge immunity, Line to Neutral: ±6kV; Line to Ground: ±6kV
- All-around protection OVP SCP OTP
- IP67 design for indoor or outdoor installations
- Suitable for used in dry/damp/wet locations

■ Specification

Model MU150HxxxAQ_CP/AUX		105	150
Input	Efficiency (120Vac)(Typ.) _{Note.1}	90.0%	89.0%
	Efficiency (230Vac)(Typ.) _{Note.1}	93.0%	92.0%
	Voltage Range (V) _{Note.2}	108 ~ 305Vac	
	Voltage Rated (V) _{Note.2}	120 ~ 277Vac	
	Frequency Range (Hz)	47~63	
	Power Factor	0.95 (Min.) at 120~277Vac, with 100% load; 0.90 (Min.) at 120~277Vac, with 80%~100% load	
	THD	15% (Max.) at 120~277Vac, with 80%~100% load; 20% (Max.) at 120Vac~277Vac, with 60%~100% load	
	AC Current (Max.)	1.6A at 120Vac input, 0.8A at 230Vac	
	Inrush Current (Max.)	65A at 230Vac input, 25℃, Cold Start (time wide=500uS, measured at 50% Ipeak,Not applicable for the inrush current to Noise Filter for less than 0.2ms)	
	Leakage Current (Max.)	0.75mA at 277Vac/60Hz	
Output	Rated Output Voltage (V)	214-142	150-100
	Output Voltage Range (V)	214-86	150-60
	Rated Current (mA)	700-1050	1000-1500
	Output Current Range (mA)	70-1050	100-1500
	Rated Power (W)	150 (Max.)	
	Output Current Setting Range	6.5%-100% of I _{o_max}	
	Constant Power Setting Range	65%-100% of I _{o_max}	
	Ripple Current (Typ.)	10% of I _{o_max} . ((PK-AV) /AV) with LED default mode and full load)	
	Current Tolerance	5%	
	Line Regulation	1%	
	Load Regulation	3%	
	Turn on delay Time	<1s, at 120Vac; <0.5s, at 230Vac	
	Aux Output Voltage (V)	11.4-12.6	
Aux Power	Aux Output Current (mA)	200 (Max.)	
		290	200
Protection	Over Voltage (V)(Typ.)	Protection type: Voltage limiting. Recovers automatically after fault condition is removed.	
	Short Circuit	Protection type: Constant current limiting. Recovers automatically after the short circuit is removed.	
	Over temperature	Protection type: Decrease output current. When tc reaches 100℃+/-10℃, the output current decrease to approximate 50% of rated value until tc drops below 90℃.	
Environment	Operating Temp.	-40~+70℃(Refer to 'Derating Curve')	
	Tc	90℃ max	
	Operating Humidity	20~95%RH	
	Storage Temp., Humidity	-40~+85℃, 10-95%RH	
	Temp. Coefficient	0.03%/℃ (0~50℃)	
	Vibration	10-500Hz, 5G 12min/cycle, period for 72min each along X、Y、Z axes	
Safety & EMC	Safety Standard	UL8750, UL1012, CSA C22.2 NO.107.1, EN61347-1, EN61347-2-13	
	Withstand Voltage	I/P-O/P:3.75kVac, I/P-FG:1.875kVac, O/P-FG:1.5kVac	
	Isolation Resistance	I/P-O/P:100M Ohms (500VDC/25℃/70%RH)	
	EMC Emission	FCC Part 15 Class B/ EN55015, EN61000-3-2 Class C, EN61000-3-3	
	EMC Immunity	EN61000-4-2,3,4,5,6,8,11, EN61000-4-5: Line to Neutral: ±6kV; Line to Ground: ±6kV; Neutral to Ground: ±6kV.	
Others	MTBF	300,000 Hours, measured at full load, 25℃ ambient temperature	
	Lifetime	50,000 Hours at Tc 75℃(Refer to"Life Time VS. Tcase (Ref.)")	
	Dimension	240 x 67.5 x 40 (mm) (LxWxH)	
	Weight (Typ.)	1.2kg	

Note.1: Measured at full load and steady-state temperature in 25℃ ambient(Efficiency will be about 2% lower if measured immediately after startup);

Note.2: Derating may be needed under low input voltage, Please Refer to 'Derating Curve' ;

Note.3: All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ ambient temperature;

subject to change without notice

Page 3 of 9

SHANGHAI MOONS' AUTOMATION CONTROL CO., LTD.

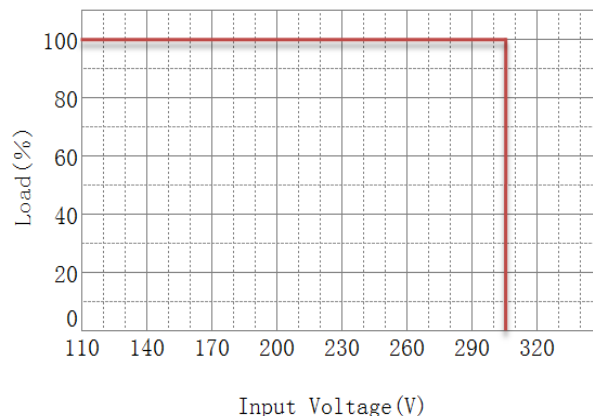
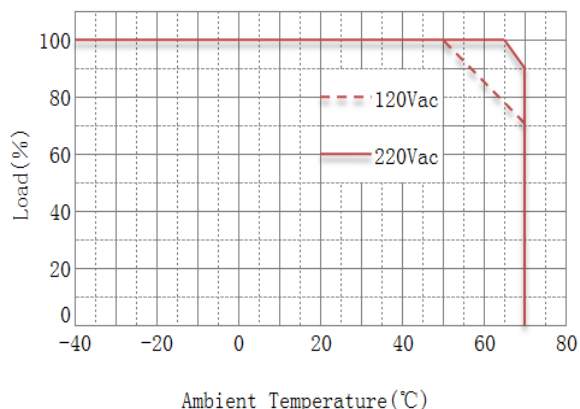
Add: No.168, Mingjia Road, Shanghai 201107, P.R.China

Tel: +86 (0)21 52634688 Website: www.moons.com.cn

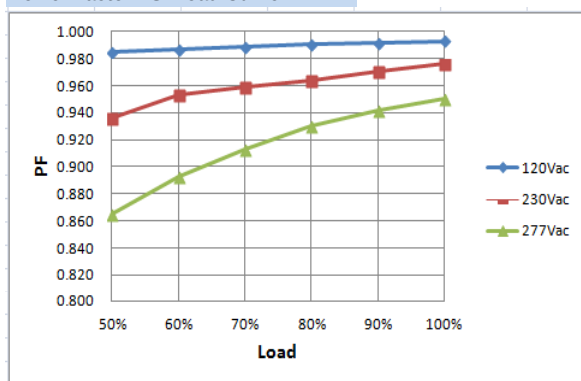
■ Dimming Specification

MU150HxxxAQ_CP/AUX Series				
Dimming Parameter	12Vdc Output Voltage Range (V)	11.4 (Min.)	12	12.6 (Max.)
	12Vdc Output Current (mA)	-	100 (Typ.)	200 (Max.)
	0~10V/DIM+ Voltage	Absolute maximum voltage: -10V (Min.)~20V (Max.)		
	0~10V/DIM+ Short Current	280uA~450uA (DIM(+)=0)		
	Dimming Output Setting Range	65%-100% of Io_max		
	Dimming Output Range	10%-100% of Io_set		
	Dimming Function	Default dimming mode is 0-10V. Other dimming ways like PWM/ CLK dimming can be set by software configuration.		
0-10V Dimming	Recommended Dimming Input	0-10V		
	Dim off Voltage	0.88V (Min.)	0.93V	0.98V (Max.)
	Dim on Voltage	1.25V (Min.)	1.35V	1.45V (Max.)
	Hysteresis	0.42V		
	Default	Input≤0.93V, dimming off; 0.93V≤input ≤1V, output current 10%; input ≥8.5V, output current 100%		

Derating Curve



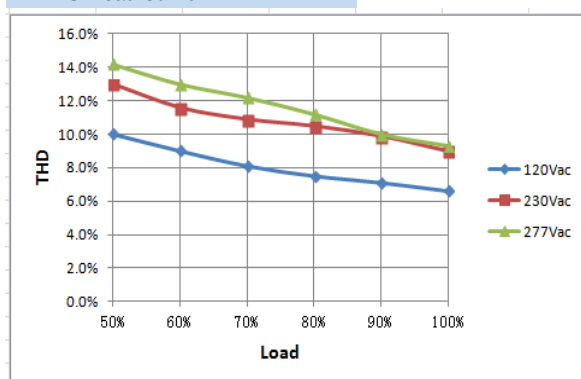
Power Factor VS. Load Curve



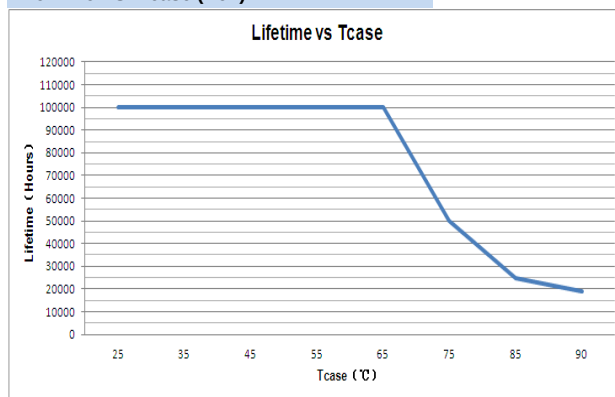
Efficiency VS. Load Curve

TBD

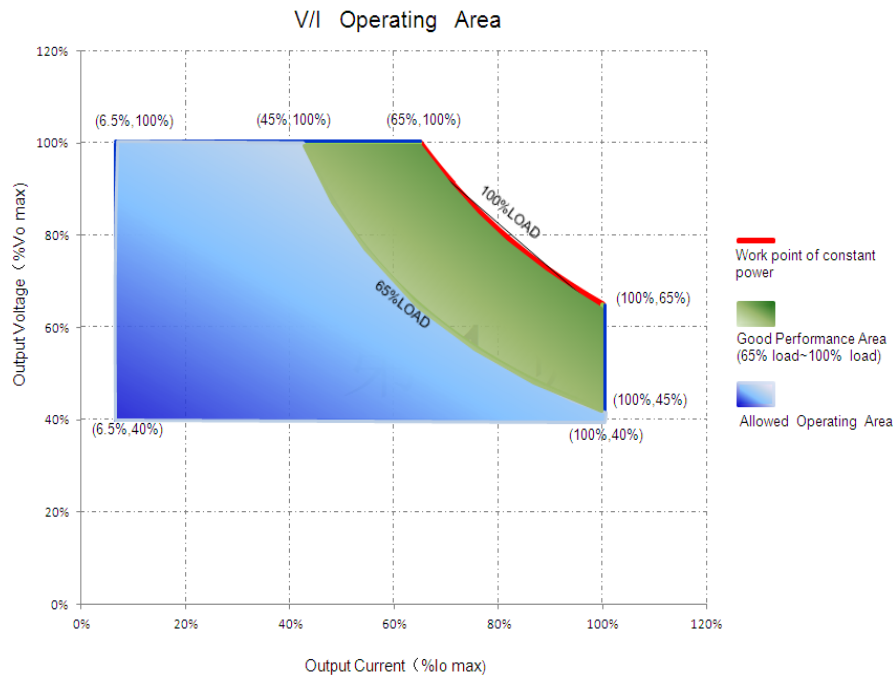
THD VS. Load Curve



Life Time VS. Tcase (Ref.)

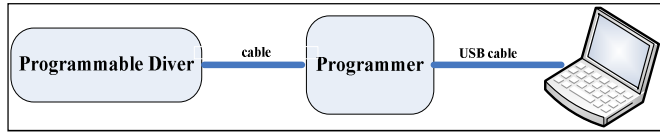


V/I Curve



■ Instruction

1.Field Programmable Topology



The programmable driver can be programmed by using special PC software and the programmer module.

2.Dimming Interface Description

Pin description

Pin	Destination	Value	Description	Wire Color
1	12V	11.4V-12.6V	Passive dimmers power supply	Yellow
2	Dim+/Program	0-10V	Dimming/Programming input	Purple
3	Dim-	0V	DC Ground	Gray

3.Dimming Software Function Instruction

■ Adjustable Output Current(AOC)

Adjustable Output Current(AOC)

Module Current mA

Max Current mA Power W

Users can set the rated current between 7%*Max Current and 100%*Max Current.

■ Adjustable Startup Time(AST)

Adjustable Startup Time(AST)

Start Fadeup Time s

Set driver's "Start Fadeup Time". It means how much time the driver costs to achieve the "Module Current" that the user set. The valid value is 0s, 1s, 2s, 5s, 10s, 20s, 40s.

■ Fade Time(FT)

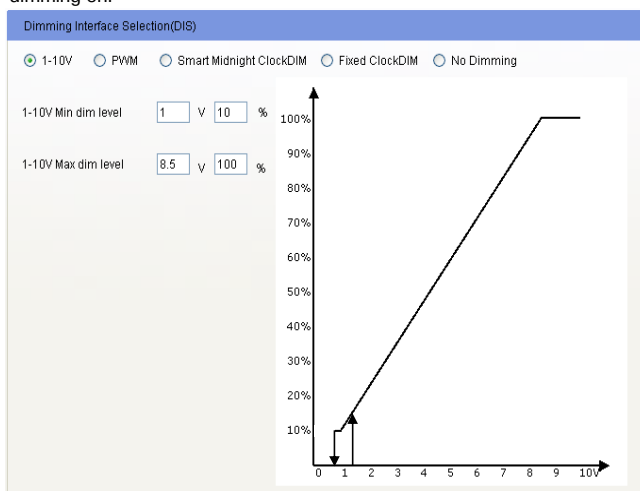
Fade Time(FT)

Fadeup Time s

Set driver's "Fadeup Time". This function is available in the Smart Midnight ClockDIM and Fixed ClockDIM mode; It means how much time the driver costs to achieve another dimming level from previous dimming level. The valid value is 0s, 1s, 2s, 5s, 10s, 20s, 40s.

■ 1-10V

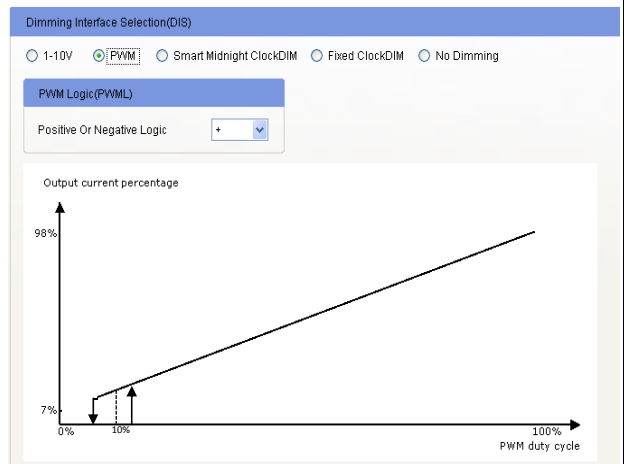
Allow users to set the max and min output current and corresponding output voltage to clarify the 1-10V dimming curve. Input a 0-10V signal from 2nd pin of the dimming interface. Default: input $\leq 1V$, output current 10%; input $\geq 8.5V$, output current 100%. Input $\leq 0.93V$, dimming off. Input $\geq 1.35V$, dimming on.



■ PWM

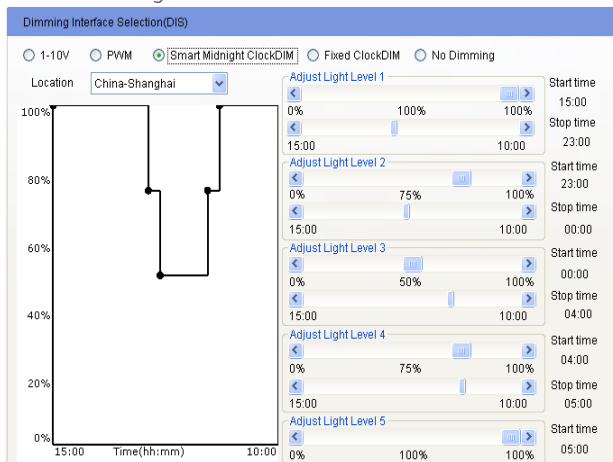
Input a PWM signal from the 2nd pin(Dim+/Program) of the dimming interface to change the output current. User can set "Positive Logic" or "Negative Logic" of the PWM signal. PWM duty cycle: 1%~99%(it has both positive and negative logics), frequency: 500Hz~5kHz, 3V~10V is high, -0.3V~0.8V is low.

Default: PWM $\leq 9\%$, Dimming off, PWM $\geq 14\%$, Dimming on.



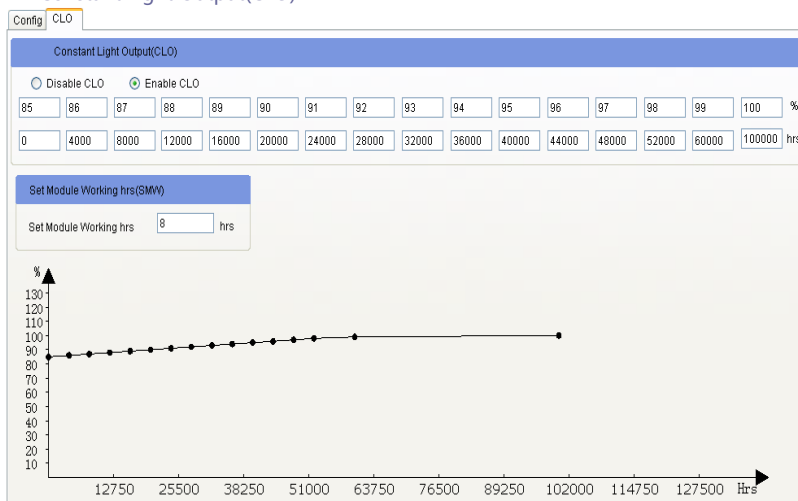
■ Instruction

■ Smart Midnight ClockDIM

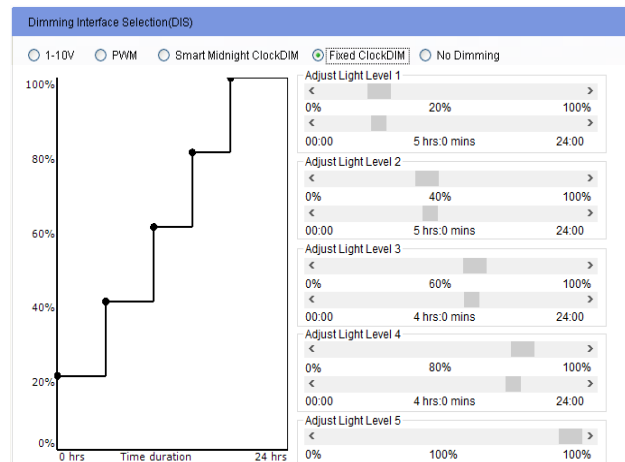


Smart Midnight ClockDIM allows dimming to predefined light levels based on the nightly operating time. With flexibility in setting time and light levels, the user can configure the driver for specific locations and application needs. Using Integrated Dynadimmer, it is possible to set up to 5 dim levels and time intervals. The driver does not have a real time clock. Instead it runs a virtual clock, determined by the length of nightly operating hours. After 3 ON-OFF cycles, the driver will calculate the virtual clock time. A valid ON-time is defined as a period during which the driver operates continuously for ≥ 4 hours to ≤ 24 hours. For example, if the requirement in summer is: 23:00-00:00: 75%, 00:00-04:00: 50%, 04:00-05:00: 75% (other time 100% or Off). The driver should be powered on for 7h, so it can calculate the virtual clock time as 22:00. Then we can set the dimming plan: 22:00-23:00: 100%, 23:00-00:00: 75%, 00:00-04:00: 50%, 04:00-05:00: 75%. From summer to winter, the valid ON-time changes day by day. The driver should be powered on for 17h in winter, and it also can calculate the virtual clock time as 17:00. Then the dimming plan is 17:00-23:00: 100%, 23:00-00:00: 75%, 00:00-04:00: 50%, 04:00-05:00: 75%, 05:00-10:00: 100%. From the above, if we set the dimming plan as shown in the picture, after repeating the driver ON-time for 3 consecutive days, the dimming plan takes effect from the 4th day onwards. Each day the driver powered on, it has a different start time according to the virtual clock time. So the driver can satisfy different requirements for different seasons.

■ Constant Light Output(CLO)



■ Fixed ClockDIM



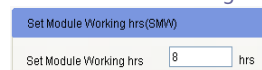
Allow users to separate 24hrs into 5 sections and corresponding output current.

■ No Dimming



The driver will be in constant output mode.

■ Set Module Working hrs(SMW)



User can check how much time the driver works through this function.

Traditional light sources suffer from depreciation in light output over time. This applies to LED light sources as well. The CLO feature enables LED solutions to deliver constant lumen output through the life of the light engine. Based on the type of LEDs used, heat sinking and driver current, it is possible to estimate the depreciation of light output for specific LEDs and this information can be entered into the driver. The driver counts the number of light source working hours and will increase output current based on this input to enable CLO.

When the CLO feature is enabled, the driver nominal output current will be defined by the CLO percentage as shown by the equation below:

$$\text{Driver target nominal output current} = \text{CLO percentage} \times \text{AOC}$$
 For example, in the CLO profile shown in Figure, between 52,000-60,000 working hours, the CLO percentage is set at 98%. Assuming the nominal AOC is set to 500mA, the driver output current with CLO enabled will be $0.98 \times 500 = 490 \text{ mA}$.
 The CLO percentage can be set to a value between 85%-100%, in increments of 1%. The LED module working hours can be set at any value between (0-100,000 hours).

