

## LED DRIVER SPECIFICATIONS

Customer's Part Number: \_\_\_\_\_

MOONS' Part Number: \_\_\_\_\_

**4696350004917**

Model: \_\_\_\_\_

**MU320H150AQ\_CP**

P/N: \_\_\_\_\_

**-60℃ , 100V**

### CUSTOMER'S APPROVAL STAMP

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

| DWG. | CHK. | STANDARD | APPD. |
|------|------|----------|-------|
|      |      |          |       |

| Rev. | Date       | Contents                                                                                     | ECO NO.      | DWG | CHK | APPR |
|------|------------|----------------------------------------------------------------------------------------------|--------------|-----|-----|------|
| A0   | 2019/10/28 | New released                                                                                 |              | 冯振民 | 杨智  | 涂必林  |
| A1   | 2020/7/1   | 1. "Over Temperature" updated.<br>2. "AC Brown Out" added.<br>3. Mechanical outline updated. | ECO20-0743DE | 冯振民 | 杨智  | 涂必林  |
| A2   | 2024/9/14  | 1.Add EMC Immunity description                                                               |              | 张振伟 | 杨智  | 涂必林  |
|      |            |                                                                                              |              |     |     |      |

■ **Features**

- Input voltage: 90-305Vac
- Built-in active PFC function: 0.99 Typ.
- High efficiency: 94% Typ.
- Constant current/ 0-10V dimming/ clock dimming(CLK)/ PWM dimming
- Full power at 65%Iomax~100%Iomax (constant power)
- IP67 design for indoor or outdoor installations
- High surge immunity
- Compliance to worldwide safety regulations for lighting



■ **Specification**

**MU320H150AQ\_CP PN: -60℃ , 100V**

|              |                                             |                                                                                                                                                                    |
|--------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input        | Efficiency (120Vac)(Typ.) <sub>Note.1</sub> | 91.0%                                                                                                                                                              |
|              | Efficiency (230Vac)(Typ.) <sub>Note.1</sub> | 94.0%                                                                                                                                                              |
|              | Voltage Range (V) <sub>Note.2</sub>         | 90 ~ 305Vac, OR 127~ 430Vdc                                                                                                                                        |
|              | Voltage Rated (V) <sub>Note.2</sub>         | 100 ~ 240Vac                                                                                                                                                       |
|              | Frequency Range (Hz)                        | 47~63                                                                                                                                                              |
|              | Power Factor                                | 0.99 (Typ.) at 120Vac, 0.98 (Typ.) at 230Vac, 0.9 (Min.) at 277Vac, with 80%-100% load                                                                             |
|              | THD                                         | 8% (Typ.) at 120Vac input, 10% (Typ.) at 230Vac input, with 80%~100% load. 20% (Max.) with 50%~100% load, at 100Vac~277Vac                                         |
|              | AC Current (Max.)                           | 4.0A at 100Vac input, 1.7A at 230Vac                                                                                                                               |
|              | Inrush Current (Max.)                       | 70A 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)                    | 320-214                                                                                                                                                            |
|              | Output Voltage Range (V)                    | 320-128                                                                                                                                                            |
|              | Rated Current (mA)                          | 1000-1500                                                                                                                                                          |
|              | Output Current Range (mA)                   | 100-1500                                                                                                                                                           |
|              | Rated Power (W)                             | 320                                                                                                                                                                |
|              | Output Current Setting Range                | 6.5%-100% of Io_max                                                                                                                                                |
|              | Constant Power Setting Range                | 65%-100% of Io_max                                                                                                                                                 |
|              | Ripple Current (Typ.)                       | 10% of Io_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                                                                                                                                   |
| Protection   | Short Circuit                               | Protection type: Hiccup mode. Recovers automatically after short is removed.                                                                                       |
|              | Over Temperature                            | The output current decrease to approximate 50% of rated value. Return to normal after over temperature is removed.                                                 |
|              | AC Brown Out                                | Vin_on 75Vac typ., Vin_off 70Vac typ..                                                                                                                             |
| Environment  | Operating Temp.                             | -40~+70℃<br>( Refer to 'Derating Curve', -60℃ can start up within 40 seconds, the output current should be stablized within 5 minutes.)                            |
|              | Tc                                          | 90℃ max                                                                                                                                                            |
|              | Operating Humidity                          | 20~95%RH                                                                                                                                                           |
|              | Storage Temp., Humidity                     | -40~+85℃, 10-95%RH                                                                                                                                                 |
|              | Temp. Coefficient                           | 0.03%/℃ (0~50℃)                                                                                                                                                    |
| Safety & EMC | Vibration                                   | 10-500Hz, 5G 12min/cycle, period for 72min each along X、 Y、 Z axes                                                                                                 |
|              | Safety Standard                             | GB19510.1, GB19510.14, IEC61347-1, IEC61347-2-13                                                                                                                   |
|              | 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                                                                                                     |
| Others       | EMC Immunity                                | EN61000-4-2,3,4,5,6,8,EN61547;<br>EN61000-11 Criterion A at 230Vac input;<br>IEC61000-4-5 Criterion A at DM 2KV/CM 4KV and Criterion B at Surge L,N-FG 6KV,L-N 6KV |
|              | 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                                   | 251 x 90 x 44.5 (mm) (LxWxH)                                                                                                                                       |
|              | Weight (Typ.)                               | 1.8 kg                                                                                                                                                             |

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

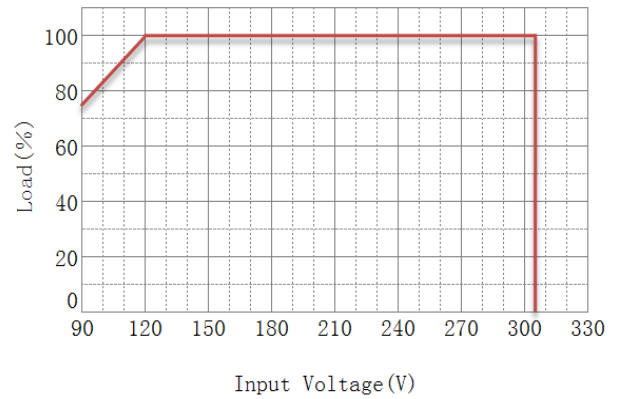
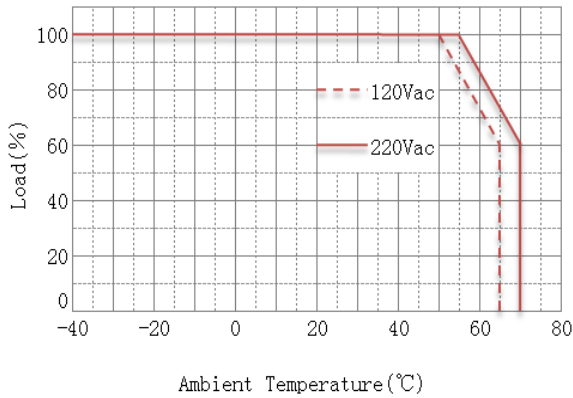
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**SHANGHAI MOONS' AUTOMATION CONTROL CO., LTD.**

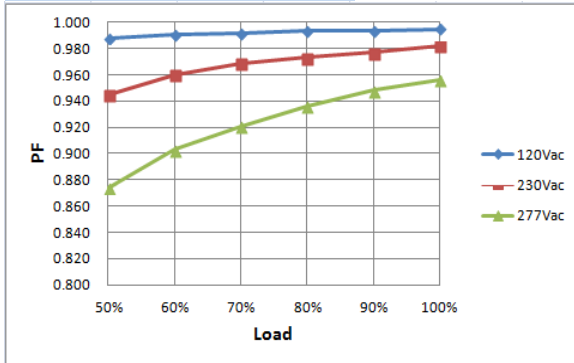
Add: No.168, Mingjia Road, Shanghai 201107, P.R.China

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

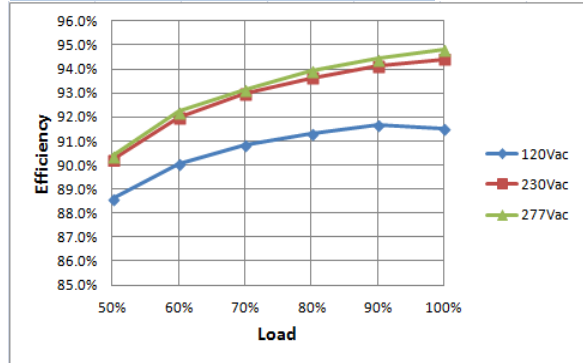
Derating Curve



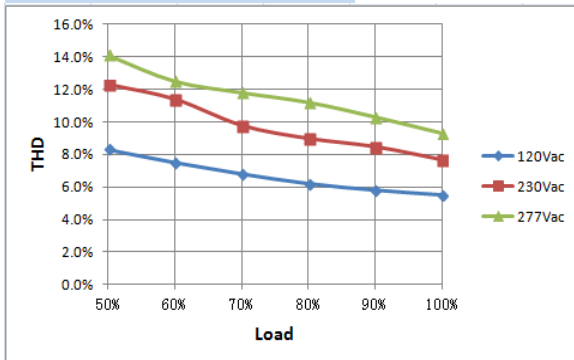
Power Factor VS. Load Curve



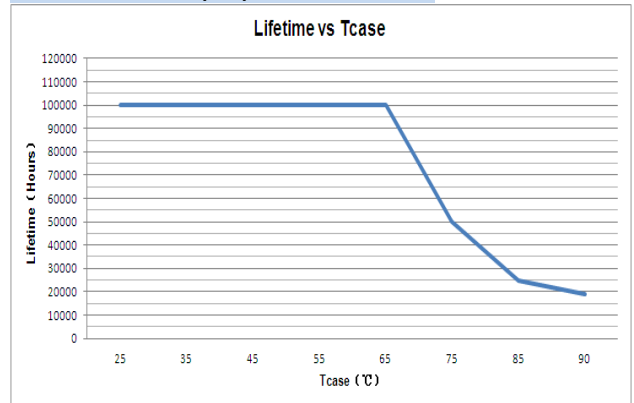
Efficiency VS. Load Curve (1300mA for Ref.)



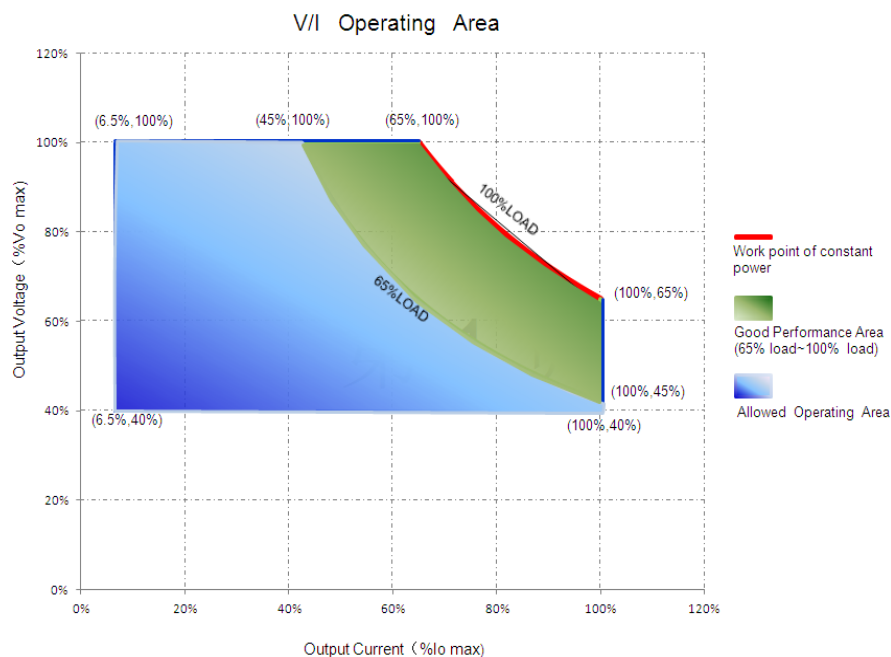
THD VS. Load Curve



Life Time VS. Tcase (Ref.)



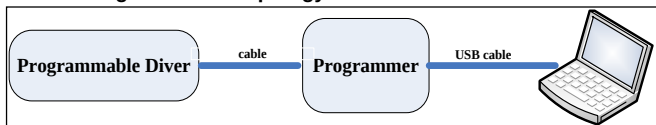
V/I Curve



Note: Output current setting range with constant power 65%Io max~100%Io max.

## ■ Instruction

### 1.Field Programmable Topology

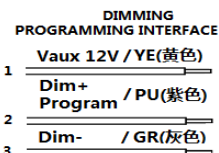


The programmable driver can be programmed by using special PC software and the programmer module.

### 2.Dimming Interface Description

Pin description

| Pin | Destination  | Value       | Description                  |
|-----|--------------|-------------|------------------------------|
| 1   | Vaux 12V     | 10.8V-13.2V | Passive dimmers power supply |
| 2   | Dim+/Program | 0-10V       | Dimming/Programming input    |
| 3   | Dim-         | 0V          | DC Ground                    |



### 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)

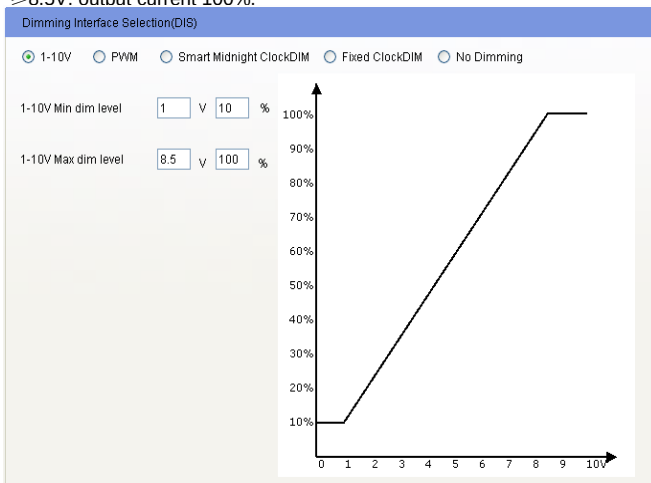
Fade Time(FT)

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.

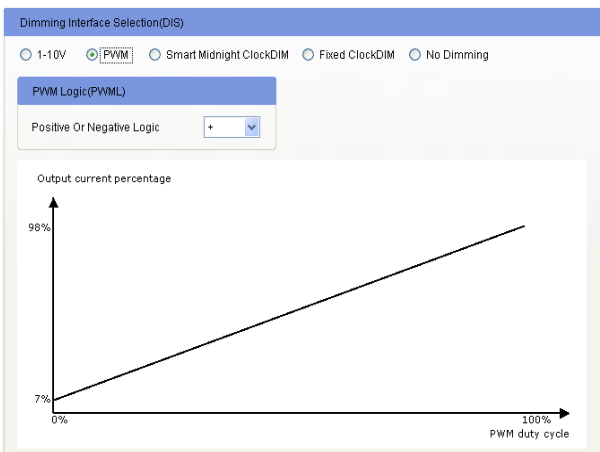
#### ■ 1-10V

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 ≤1V, output current 10%; input ≥8.5V, output current 100%.



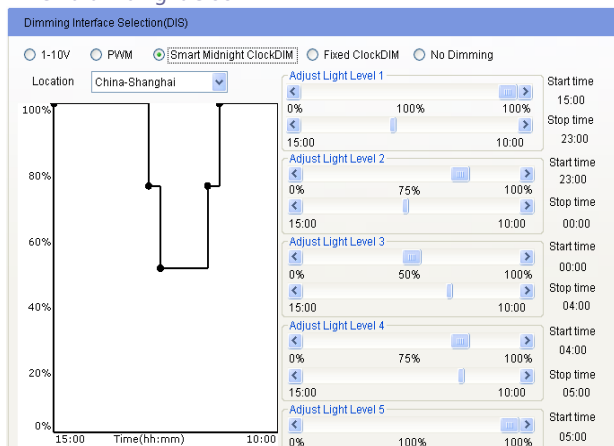
#### ■ PWM

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 circle: 1%~99%(it has both positive and negative logics), frequency: 500Hz~5kHz, 3V~10V is high, 0.3V~0.8V is low.



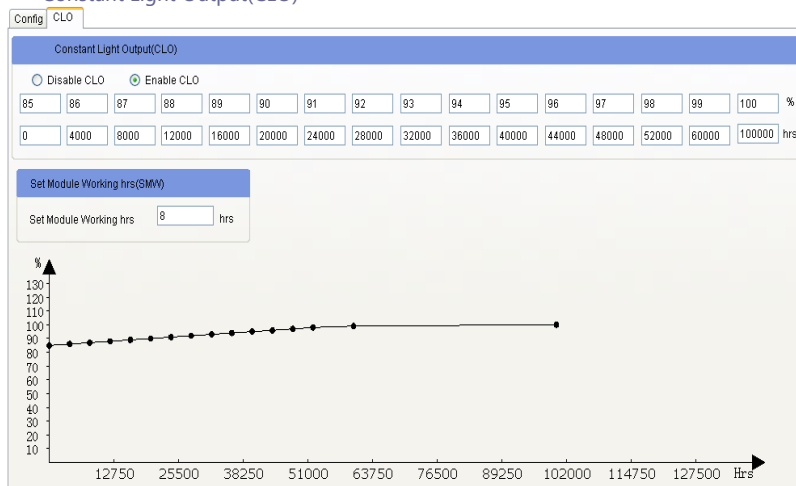
## ■ Instruction

### ■ Smart Midnight ClockDIM

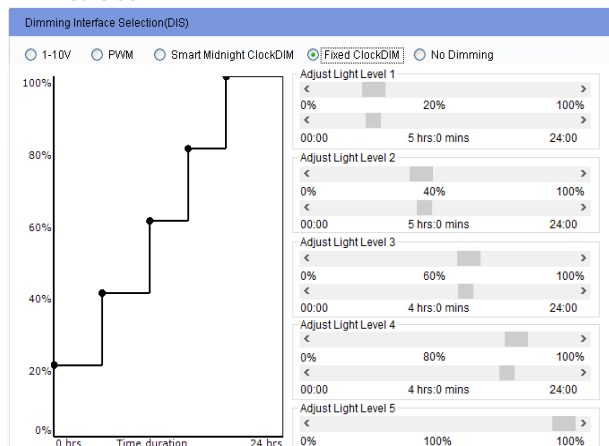


Smart Midnight ClockDIM allows dimming to predefined light levels based on the nightly operating time. With flexibility in setting time and light levels, the user can configure the driver for specific locations and application needs. Using Integrated Dynadimmer, it is possible to set up to 5 dim levels 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  $\geq 4$  hours to  $\leq 24$  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

### ■ Constant Light Output(CLO)



### ■ Fixed ClockDIM



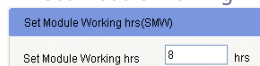
Allow users to separate 24hrs into 5 sections and corresponding output current.

### ■ 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: Driver target nominal output current = CLO percentage \* 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  $0.98 \times 500 = 490$  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.

## ■ Dimming Plan

### ■ Module Current=1400mA

#### Adjustable Output Current(AOC)

Module Current  mA

Max Current  mA Power  W

### ■ Adjustable Startup Time(AST)

#### Adjustable Startup Time(AST)

Start Fadeup Time  s

### ■ 1-10V dimming

#### Dimming Interface Selection(DIS)

☒ 1-10V ☐ PWM ☐ Smart Midnight ClockDIM ☐ Fixed ClockDIM ☐ No Dimming

1-10V Min dim level  V  %

1-10V Max dim level  V  %

