

Description

The U5 M series is a constant current, off-line programmable and IP20 rated LED driver that operates from 176~305Vac input with excellent power factor. The U5 M series supports timer dimming with three modes. The better thermal design and high efficiency enable the driver to operate with high reliability and extend product life. Overall protection is provided against lightning surge, output over voltage, short circuit and over temperature to ensure low failure rate.



Product Features

- Input voltage range: 176~305Vac;
- 3-in-1 dimmable: 0-10V/PWM (Dim-to-off optional), Timer dimming;
- Constant lumen output(CLO);
- 3 Timers dimming: Timing; Virtual Midnight; Self-Adaptive;
- Standby power consumption <0.5W;
- Suitable for luminaires with protection Class I and II;
- Surge protection: 4KV line-line, 6KV line-earth(Class I);
- Protections: Input UVP; Output SCP/OVP/OTP;
- IP20 design for indoor and outdoor applications ;
- Suitable for dry / damp / wet locations ;
- 5 years warranty.

Application

Street and urban lighting  
Industrial lighting,

Models

| Model Number | Input Voltage Range(Vac) | Max Output Power(W) | Output Voltage Range(Vdc) | Full Power Output Current Range(A) | Default Current(A) | Eff.(Typ.) | PF(Typ.) | THD |
|--------------|--------------------------|---------------------|---------------------------|------------------------------------|--------------------|------------|----------|-----|
| U5-040M060   | 176-305                  | 40                  | 24-60                     | 0.67~1.05                          | 0.70               | 89%        | 0.98     | 5%  |

NOTES:

- [1]. M means 0/1-10V/PWM dimming.  
[2]. All specifications are measured at 25

full load efficiency specification is measured at input voltage 230Vac, and the typical value

## Input Specifications

| Parameter                      | Min    | Typ.       | Max    | Notes                              |
|--------------------------------|--------|------------|--------|------------------------------------|
| Input Voltage                  | 176Vac | 220~240Vac | 305Vac |                                    |
| Input Frequency AC             | 47Hz   | 50/60Hz    | 63Hz   |                                    |
| Max Input Current              | -      | -          | 0.3A   | 176Vac&Full Load                   |
| Max Input Power                | -      | -          | 50W    | 176Vac&Full Load                   |
| Leakage Current                | -      | -          | 0.70mA | IEC 60598-1;240Vac/60Hz            |
| Inrush Current                 | -      | -          | 40A    | 230Vac&Full Load, Cold Start       |
| Standby Power Consumption      | -      | -          | 0.5W   | 230Vac&50Hz                        |
| Power Factor(PF)               | 0.96   | 0.98       | -      | 220-240Vac, 50-60Hz, 100% Load     |
| Power Factor(PF)               | 0.90   | 0.92       | -      | 220-240Vac, 50-60Hz, 60%-100% Load |
| Total Harmonic Distortion(THD) | -      | 5%         | 10%    | 220-240Vac, 50-60Hz, 100% Load     |
| Total Harmonic Distortion(THD) | -      | -          | 10%    | 220-240Vac, 50-60Hz, 60%-100% Load |
| MCB(B16)                       | -      | 8          | -      | 230Vac                             |

## Output Specifications

| Parameter                           | Min                  | Typ. | Max                  | Notes                                                                                       |
|-------------------------------------|----------------------|------|----------------------|---------------------------------------------------------------------------------------------|
| Output Voltage Range                | 24Vdc                | -    | 60Vdc                | The full power cannot be lower than 38Vdc                                                   |
| Open Circuit Voltage                | -                    | -    | 100Vdc               |                                                                                             |
| Output Current Range                | 0.11A                | -    | 1.05A                | Programmer adjustable current range                                                         |
| Full Power Current Range            | 0.67A                | -    | 1.05A                |                                                                                             |
| Current Accuracy                    | -5% I <sub>set</sub> | -    | +5% I <sub>set</sub> | Iset: 350mA~1050mA                                                                          |
| Total Output Current Ripple (pk-pk) | -                    | 5%   | 10%                  | 20MHz BW, full load& LED load, the ripple would be tiny different under different LED load. |
| Startup Overshoot Current           | -                    | 5%   | 10%                  | 220~240Vac &100% Load, load is LED                                                          |
| Line Regulation                     | -3%                  | -    | +3%                  | 25℃±10℃ ambient temperature, input voltage changes from 200Vac to 240Vac.                   |
| Load Regulation                     | -5%                  | -    | +5%                  | 25℃±10℃ ambient temperature, Input Voltage 230Vac, load changes from 60% to 100%.           |
| Turn-on Delay Time                  | -                    | -    | 1.0s                 | 230Vac                                                                                      |
| Output Pst <sup>LM</sup>            | -                    | -    | 0.03                 | Erp Standard                                                                                |
| Output SVM                          | -                    | -    | 0.03                 | Erp Standard                                                                                |

## General Specifications

| Parameter                                 | Min                                             | Typ.       | Max    | Notes                                                                                                                                                                                            |
|-------------------------------------------|-------------------------------------------------|------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency@230Vac<br>Io=1.05A<br>Io=0.67A | 87%<br>88%                                      | 88%<br>89% | -<br>- | Measured at full load and 25°C ambient temperature                                                                                                                                               |
| Mean Time Between Failure                 | -                                               | 200Khours  | -      | 25°C±10°C ambient temperature, 230Vac, 80% load (MIL-HDBK-217F)                                                                                                                                  |
| Life Time                                 | -                                               | 65Khours   | -      | Tc=75°C, 230Vac&100% load,                                                                                                                                                                       |
| Operating Temperature                     | -40 °C                                          | -          | +55°C  | 230Vac&100% load                                                                                                                                                                                 |
| Operating Tc for Safety Tc_s              | -40 °C                                          | -          | +85°C  |                                                                                                                                                                                                  |
| Operating Tc for Warranty Tc_w            | -40 °C                                          | -          | +75°C  | 5 years warranty case temperature                                                                                                                                                                |
| Storage Temperature                       | -40 °C                                          | -          | +85 °C | Humidity: 5% to 50% RH No condensation                                                                                                                                                           |
| Altitude                                  | -60m                                            | -          | 4000m  |                                                                                                                                                                                                  |
| Input Under voltage Protection            | 130Vac                                          | 150Vac     | 170Vac | When the input voltage is lower than the protection voltage, the driver will turn off automatically. When the input voltage exceeds the recovery voltage, the driver will restart automatically. |
| Output over voltage Protection            | -                                               | -          | -      | self-recovery                                                                                                                                                                                    |
| Over Temp Protection                      | -                                               | 90°C       | -      | Tc; 230Vac&100% load;                                                                                                                                                                            |
| Short Circuit Protection                  | -                                               | -          | -      | self-recovery after 30 seconds                                                                                                                                                                   |
| Dimensions (L*W*H)mm                      | 132.5*77*40mm                                   |            |        |                                                                                                                                                                                                  |
| Net Weight                                | 250±50g/PCS                                     |            |        |                                                                                                                                                                                                  |
| Package (L*W*H)mm                         | 494*335*177mm; 30PCS/CTN, Gross Weight: 9±0.5kg |            |        |                                                                                                                                                                                                  |

## Dimming

| Parameter                     | Min                  | Typ.  | Max                   | Notes                                           |
|-------------------------------|----------------------|-------|-----------------------|-------------------------------------------------|
| Absolute Maximum Voltage      | -                    | 10V   | 15V                   | On the Vdim (+) Pin                             |
| Source Current on Vdim (+)Pin | -                    | 200uA | 400uA                 |                                                 |
| Dimming Range                 | 10% I <sub>set</sub> | -     | 100% I <sub>set</sub> | I <sub>set</sub> is set to the full power range |
| Suggest Dimming Input 0-10V   | 0V                   | -     | 10V                   |                                                 |
| Turn-on Voltage               | 0.7V                 | -     | 1.0V                  |                                                 |
| Turn-off Voltage              | 0.4V                 | -     | 0.7V                  |                                                 |
| PWM in High Level             | 9.7V                 | -     | 10.3V                 |                                                 |
| PWM in Low Level              | 0V                   | -     | 0.3V                  |                                                 |
| PWM in Frequency Range        | 300Hz                | -     | 2KHz                  |                                                 |
| PWM in Duty Cycle             | 1%                   | -     | 99%                   |                                                 |
| Turn-on Duty Cycle            | 7%                   | -     | 10%                   |                                                 |
| Turn-Off Duty Cycle           | 4%                   | -     | 7%                    |                                                 |
| Timer dimming                 | -                    | -     | -                     | 3 types, which is set by software               |
| Output lumen compensation     | -                    | -     | -                     | Constant lumen output function                  |
| Over Temperature Protection   | -                    | -     | -                     | Thermal Cut Off function optional               |

## Safety Specification

| Parameter                          | Min       | Typ.    | Max | Notes                                                    |
|------------------------------------|-----------|---------|-----|----------------------------------------------------------|
| Dielectric Strength(Input-Output)  | -         | 3000Vac | -   | 60s, Current not exceeding 5mA                           |
| Dielectric Strength(Input-Ground)  | -         | 3000Vac | -   | 60s, Current not exceeding 5mA                           |
| Dielectric Strength(Output-Ground) | -         | 500Vac  | -   | 60s, Current not exceeding 5mA                           |
| Dielectric Strength(Input-Dimming) | -         | 3000Vac | -   | 60s, Current not exceeding 5mA                           |
| Dielectric Strength(Dim-Ground)    | -         | 500Vac  | -   | 60s, Current not exceeding 5mA                           |
| Insulation Resistance              | 10MΩ(Min) |         |     | Input-Output, Input-PE, Output-PE, 500Vdc/60s/25°C/70%RH |

## Safety Compliance

| Safety Category | Standards                        | Approved | Notes |
|-----------------|----------------------------------|----------|-------|
| CCC             | GB19510.1,GB19510.14             |          |       |
| CE              | EN61347-1, EN61347-2-13, EN62493 | √        |       |
| ENEC            | EN61347-1, EN61347-2-13, EN62384 | √        |       |
| CB              | IEC61347-1, IEC61347-2-13        | √        |       |
| BIS             | IS 15885(PART 2/SEC 13)          |          |       |
| UL              | UL 8750                          |          |       |
| CUL             | CSA C22.2 No.250.13              |          |       |
| KC              | K61347-1, K61347-2-13            |          |       |
| PSE             | J61347-1, J61347-2-13            |          |       |
| SAA             | AS/NZS IEC 61347.2.13            |          |       |
| SAA             | AS/NZS 61347.1                   |          |       |

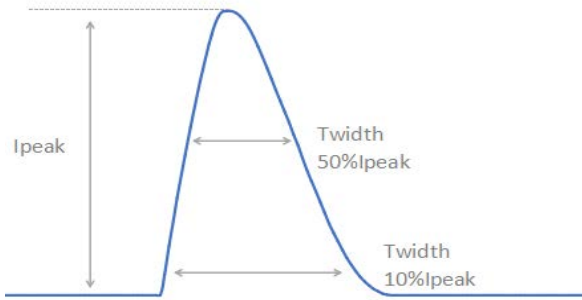
## EMC Compliance

| EMC Category         | Standards                  | Approved | Notes |
|----------------------|----------------------------|----------|-------|
| CCC                  | GB/T 17743, GB 17625.1     |          |       |
| CE                   | EN 55015                   | √        |       |
| CE                   | EN 61000-3-2, EN 61000-3-3 | √        |       |
| CE                   | EN61000-4-2,3,4,5,6,11     | √        |       |
| CE                   | EN 61547                   | √        |       |
| KC                   | K61547                     |          |       |
| KC                   | K00015                     |          |       |
| PSE                  | J55015                     |          |       |
| FCC                  | FCC part 15                |          |       |
| Surge Shock Immunity |                            |          |       |
| Ringing Wave         |                            |          |       |

## RoHS

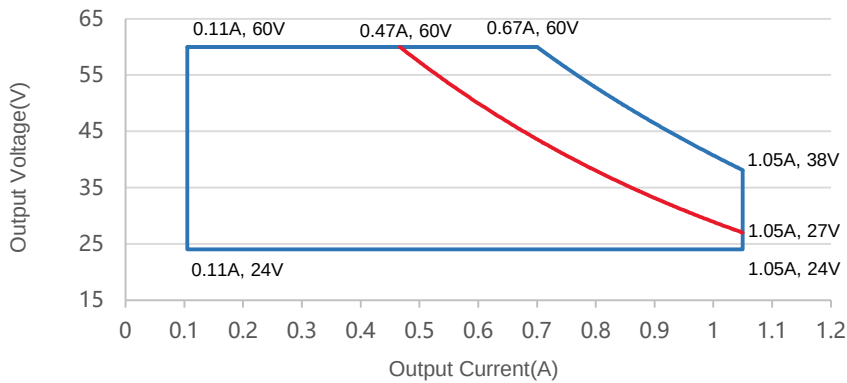
Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU.

## Inrush Current



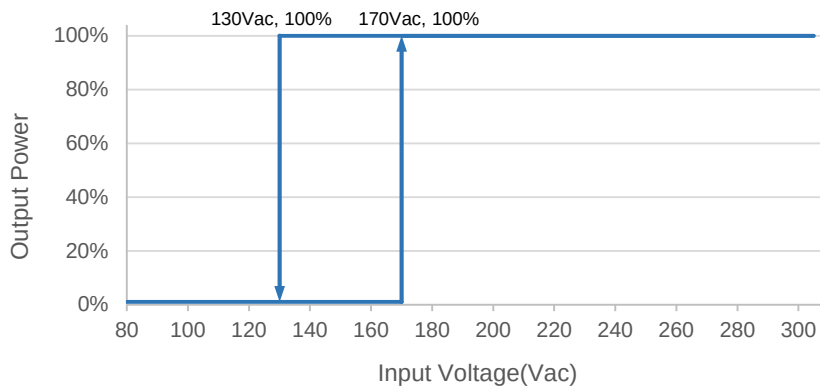
| $V_{in}$ | $I_{peak}$ | $T(@10\% \text{ of } I_{peak})$ | $T(@50\% \text{ of } I_{peak})$ |
|----------|------------|---------------------------------|---------------------------------|
| 230Vac   | 40A        | 482uS                           | 138uS                           |

## Output Voltage vs. Output Current

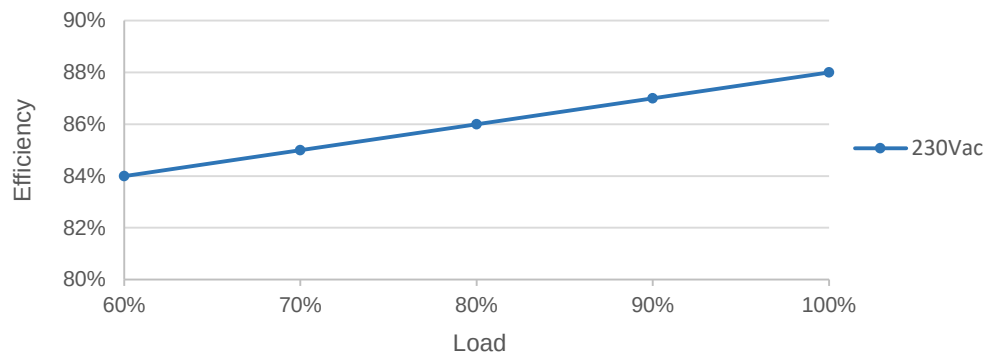


Red curve: good performance area

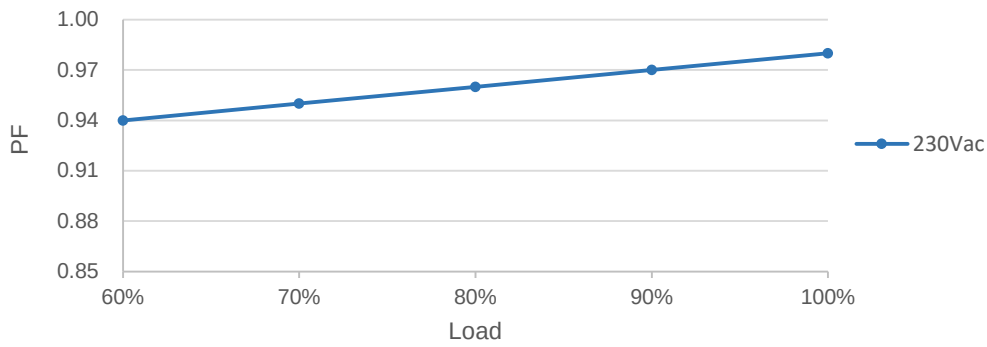
## Output Power vs. Input Voltage



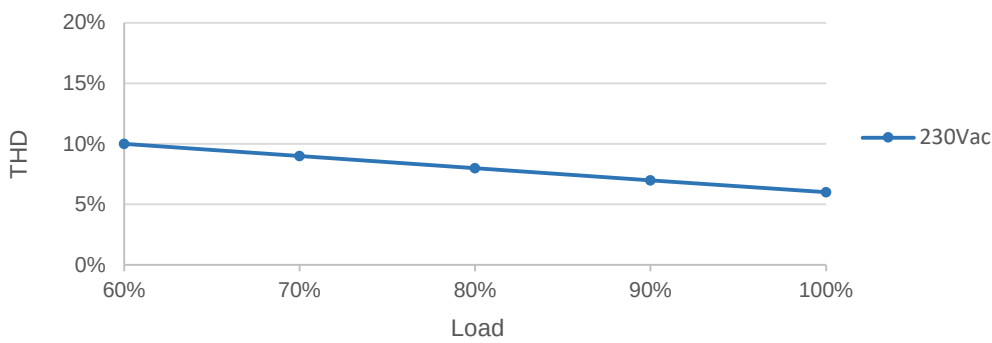
## Efficiency vs. load



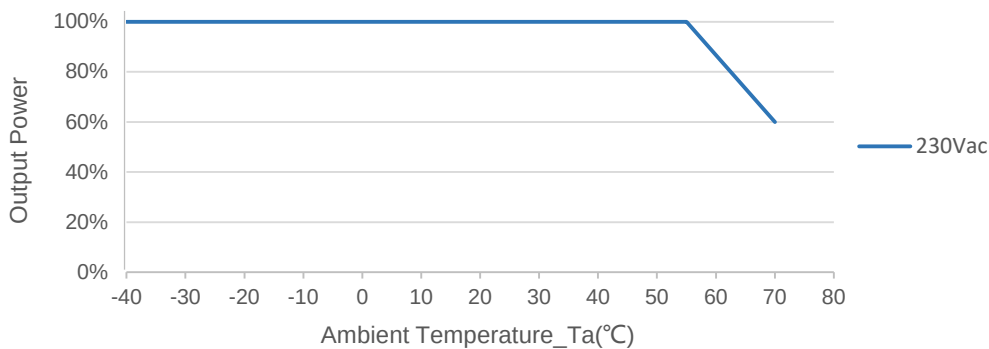
## PF vs. Load



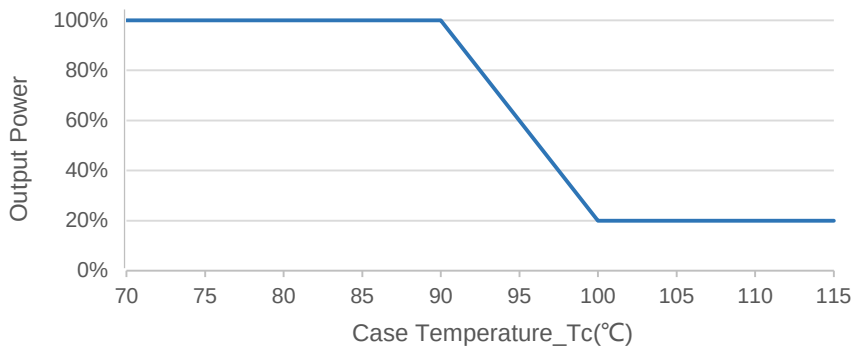
## THD vs. Load



## Output Power vs. Ambient Temperature



## Over Temperature Protection Curve

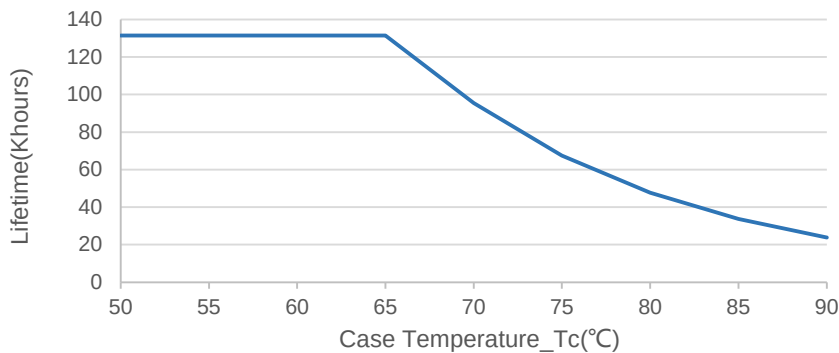


### Notes:

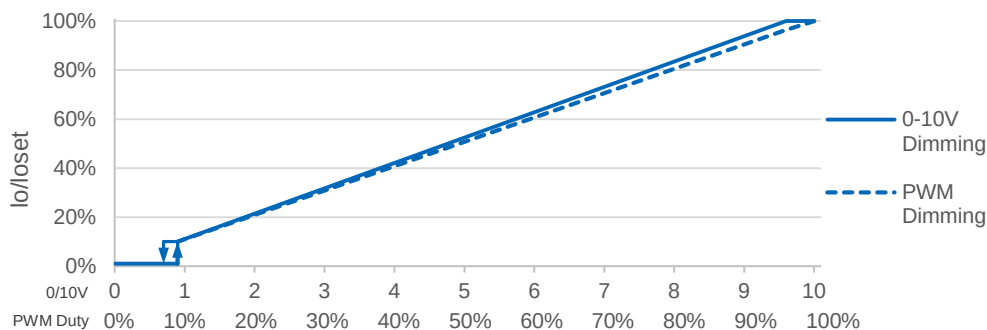
Customers can set the start derating temperature and end derating temperature. This curve is the default factory protection curve, When the temperature rises to the

normal operating temperature, the drive will resume output.

### Lifetime vs. Case Temperature



### 0-10V/PWM Dimming



Note:

Afterglow may appear after switching off dimming due to the difference of lamp panel. Thus, lighting fixture grounding test is suggested.

### Off-line Programming

User-friendly connection of programming without necessary to power on device(suitable for X6, X6S, X6I, X6E, U5M Series).

Programming mode 1



Visual Intelligent Programming

1. Set the output parameters through the control signal line 0-3.3V/0-5V/0-9V/0-10V optional.
2. Timer dimming. Set the timer control function, support up to 7 segments;
3. Set output CLO;
4. Read the recorded system parameters; Record the working time working temperature, and software version information of the LED driver.
5. Configure the driving parameters. After setting is completed, then click the configured parameters to complete programming.
6. Download it to the offline programmer.

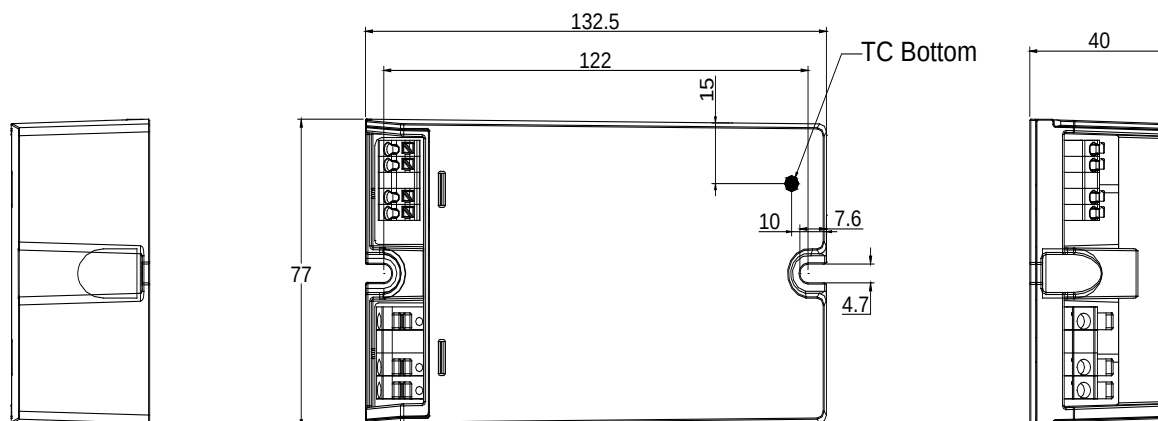
Programming mode 2



Instructions of one touch programmer:

1. Open the software interface and download the program to the offline programmer;
2. Connect the dimming wire with the programmer, press the programmer button, the programmer will give you a subtle reminder "( Beep )" to tell you the installation completed.

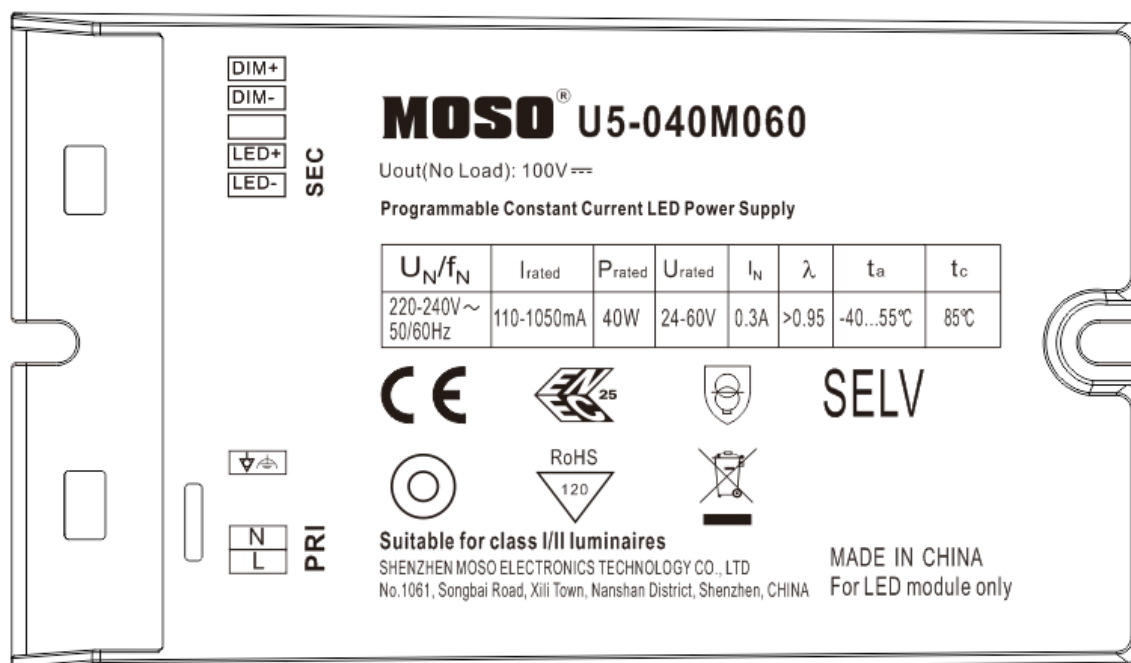
## Mechanical Outline



## Connections

|               |                                                                               |                                              |
|---------------|-------------------------------------------------------------------------------|----------------------------------------------|
| Input (L,N,G) | Wire Cross-section 0.5 mm <sup>2</sup> - 2.5 mm <sup>2</sup> /20 AWG - 16 AWG | Push-in at 45°angle, solid and stranded wire |
| Output        | Wire Cross-section 0.2 mm <sup>2</sup> - 1.5 mm <sup>2</sup> /22 AWG - 16 AWG | Push-in at 45°angle, solid and stranded wire |
| Dimming       | Wire Cross-section 0.2 mm <sup>2</sup> - 1.5 mm <sup>2</sup> /22 AWG - 16 AWG | Push-in at 45°angle, solid and stranded wire |

## Label





Version

|     |               |            |
|-----|---------------|------------|
| A.2 | First release | 2024-08-24 |
| B.2 | ECL202412027  | 2024-12-07 |
| C.2 | ECL202509036  | 2025-09-30 |
|     |               |            |
|     |               |            |
|     |               |            |

## Specification for Approval

Product Name: 40W Class I/II LED Driver

Product Model: U5-040M060

Rev : C.2

Address: XiLiSongbai Road 1061, Nanshan District, Shenzhen City, Guangdong, China

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Web Site: <http://www.mosopower.com>

| Prepared By | Checked By | Approved By |
|-------------|------------|-------------|
|             |            |             |

## Specification for Approval

Product Name: 40W Class I/II LED Driver

Product Model: U5-040M060

Rev: C.2

| CUSTOMER AUTHORIZED SIGNATURE                                                   |            |             |
|---------------------------------------------------------------------------------|------------|-------------|
| Tested By                                                                       | Checked By | Approved By |
|                                                                                 |            |             |
| (Company seal)Return one copy to MOSO with approved signature and company seal. |            |             |

Address:XiLiSongbai Road 1061, Nanshan District, Shenzhen City, Guangdong, China

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| Prepared By | Checked By | Approved By |
|-------------|------------|-------------|
|             |            |             |