# MU050HXXXAQ_CLK Series Intelligent-Outdoor

DWG NO. : MSSD-4453 A4

## ■ Features

- Input voltage range: 90~305Vac
- Built-in active PFC function: 0.99 Typ.
- High efficiency: 89% Typ.
- IP67 design for indoor or outdoor installations
- Surge protection: DM 4KV,CM 6KV
- Support Time-shared dimming function
- Compliance to worldwide safety regulations for lighting
- Suitable for dry/damp locations

IP67 Class 2 Note.3

## ■ Specification

| Model (MU050H**XXX**AQ_CLK) | | 035 | 045 | 070 | 105 | 140 | 175 | 210 | 245 | 280 | 315 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Input | Efficiency(120Vac)(Typ.)Note.1 | 90% | 90% | 89% | 89% | 88% | 88% | 87% | 87% | 86% | 84.0% |
| | Efficiency(230Vac)(Typ.)Note.1 | 91% | 91% | 90% | 90% | 89% | 89% | 88% | 88% | 87% | 86% |
| | Voltage Range (V)Note.2 | 90~305Vac,OR 127~ 430Vdc | | | | | | | | | |
| | Rated Voltage (V)Note.2 | 100~277Vac | | | | | | | | | |
| | Frequency Range (Hz) | 47~63 | | | | | | | | | |
| | Power Factor | 0.99(Typ) with 80%-100% load at 120Vac | | | | | | | | | |
| | | 0.97(Typ) with 80%~100% load at 230Vac | | | | | | | | | |
| | | 0.9(Min) with 80%~100% load at 277Vac | | | | | | | | | |
| | THD(Typ.) | 10% (Typ.), at 220Vac input, with 80%~100% load conditions | | | | | | | | | |
| | | 15% (Typ.), at 110/277Vac input, with 80%~100% load conditions | | | | | | | | | |
| | AC Current(Max.) | 0.7A at 100Vac input; 0.35A at 220Vac input | | | | | | | | | |
| | Inrush Current(Max.) | 50A at 230Vac input 25℃ Cold Start<br>( 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/50Hz input | | | | | | | | | |
| Output | Voltage Range (V) | 142 | 111 | 72 | 48 | 36 | 29 | 24 | 20 | 18 | 16 |
| | Rated Current(mA) | 350 | 450 | 700 | 1050 | 1400 | 1750 | 2100 | 2450 | 2800 | 3150 |
| | Rated Power (W) | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| | Ripple Current((PK-AV)/AV) | ≤30%,With LED mode full load. | | | | | | | | | |
| | Current Tolerance | 5% | | | | | | | | | |
| | Line Regulation | 3% | | | | | | | | | |
| | Load Regulation | 3% | | | | | | | | | |
| | Current ADJ. Range | - | | | | | | | | | |
| | Turn on Delay Time | <2s, at 120Vac; <1.5s, at 230Vac | | | | | | | | | |
| Protection | Over Voltage(V) | <170 | <133 | <95 | <60 | <50 | <40 | <34 | <28 | <26 | <25 |
| | | Protection type : Limit the output voltage , recovers automatically after fault condition is removed | | | | | | | | | |
| | Short Circuit | Hiccup mode, recovers automatically after fault condition is removed. | | | | | | | | | |
| | Over Temperature | When the Tc of PSU rise to 110℃(Typ.), the ouput current will decrease to less than 30% of rated current or shutdown.<br>The power supply should resume its normal operation when the inside temperature of PSU drop to normal temperature | | | | | | | | | |
| Environment | Operating Temp. | -40~+70℃ | | | | | | | | | |
| | Tc | 88.9℃ max for UL | | | | | | | | | |
| | 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,UL1310 Class 2,CSA-C22.2 No.223-M91,EN61347-1,EN61347-2-13,GB19510.1,GB19510.14" for Class 2 model,<br>"UL8750,UL1012,CSA-C22.2 NO. 107.1,EN61347-1,EN61347-2-13,GB19510.1,GB19510.14" for non-Class 2 model. | | | | | | | | | |
| | Withstand Voltage | I/P-O/P:3.75KVac, I/P-FG:1.875KV, O/P-FG:1.5KV | | | | | | | | | |
| | Isolation Resistance | I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500Vdc/25℃/70%RH | | | | | | | | | |
| | EMC Emission | EN55015/FCC Part 15 Class B, EN61000-3-2 Class C, EN61000-3-3 | | | | | | | | | |
| | EMC Immunity | EN61000-4-2,3,4,5,6,8,11, EN61547 ( Surge: L-N 4KV, L/N-Earth 6KV ) | | | | | | | | | |
| Others | MTBF | 300,000 hours, measured at full load, 25℃ ambient temperature MIL-HDBK-217F(25℃) | | | | | | | | | |
| | Life Time | 50,000 Hours at Tc 75℃(Refer to"Life Time VS. Tcase (Ref.)") | | | | | | | | | |
| | Dimension | 193 x 42.5 x 34.5 mm ( LxWxH ) | | | | | | | | | |
| | Weight(Typ.) | 0.55kg | | | | | | | | | |

Note.1: Measured at full load and steady-state temperature in 25℃ ambient;
Note.2: Derating may be needed under low input voltage, Please Refer to 'Derating Curve'; Note.3: UL Class2 incompliant model "035", "045","070";
Note: All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ ambient temperature.



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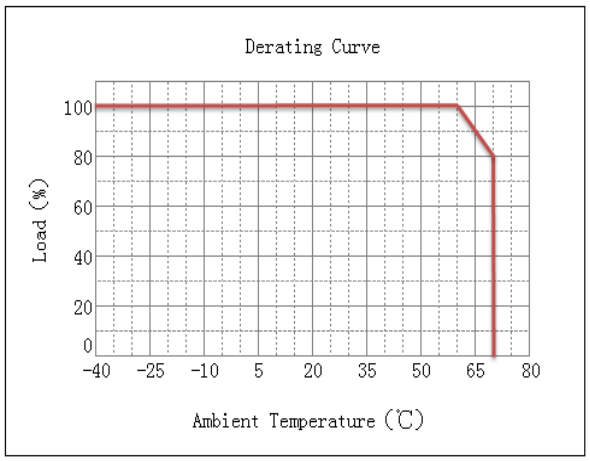
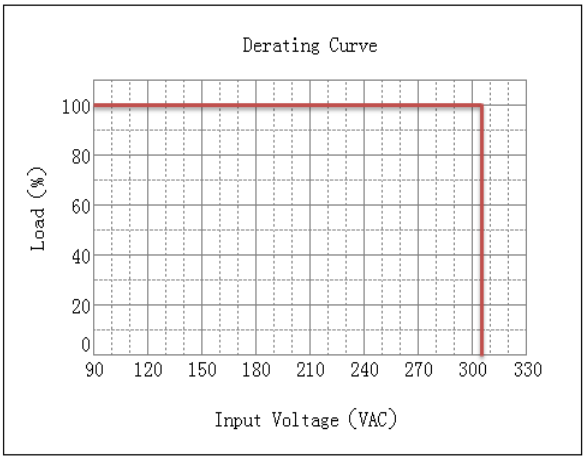
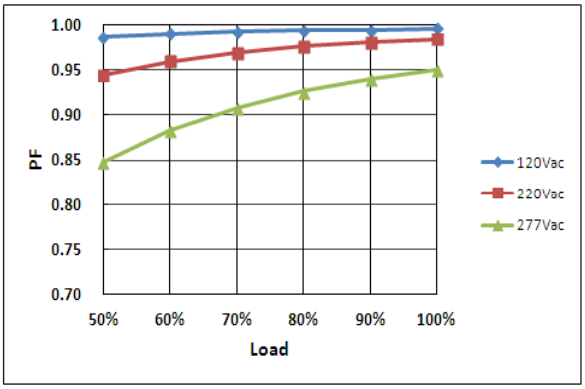
## ■ Test Curve

### Derating Curve

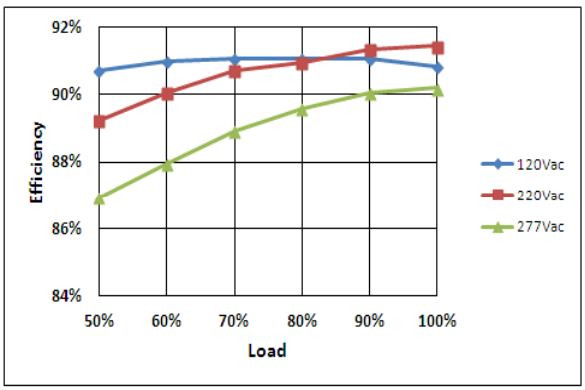


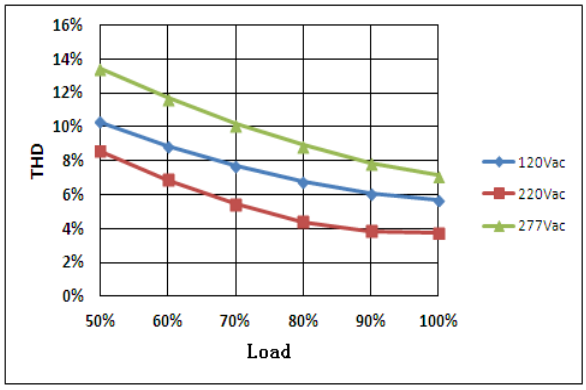

### Power Factor Curve



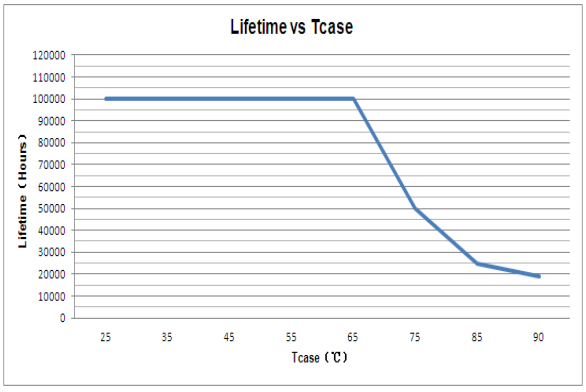

### Efficiency VS. Load Curve(Model:350mA)




### THD Curve(Ref)




### Lifetime vs. Case Temperature



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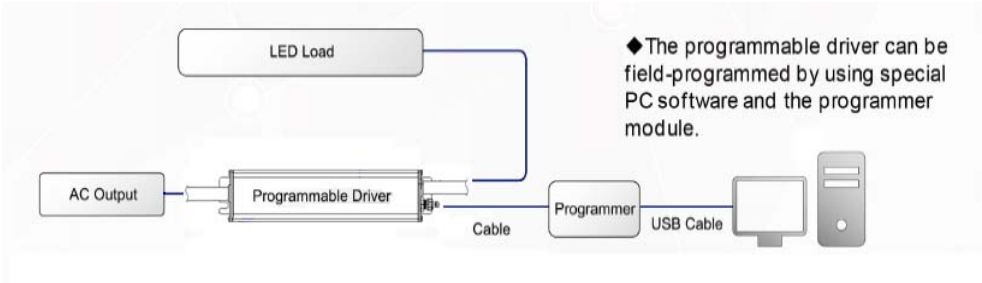
## ■ Instruction

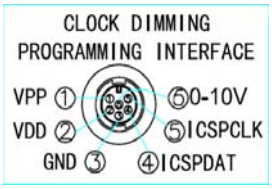
### 1.Field Programmable Topology




### 2.Dimming Interface Description

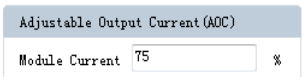
Pin description

| Pin | Name | Value | Description |
|---|---|---|---|
| 1 | VPP | 4.5V~5.5V | Programming model enable（编程模式使能） |
| 2 | VDD | 4.5V~5.5V | DC supply input（DC供电输入） |
| 3 | GND | 0V | DC Ground（DC地） |
| 4 | ICSPDAT | 4.5V~5.5V | Programming data（编程数据接口） |
| 5 | ICSPCLK | 4.5V~5.5V | Programming clock（编程时钟接口） |
| 6 | 0-10V | 0~10.5V | 0-10Vdc dimming signal |



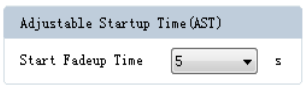

### 3.Dimming Software Function Instruction

■ Adjustable Output Current(AOC)



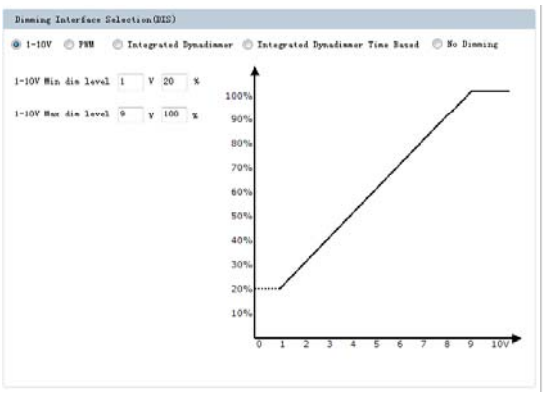

Users can set the rated current between 20%~100% by 1% per step.

■ Adjustable Startup Time(AST)



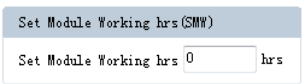

At power ON, the fast fade-up of light can be unpleasant in certain applications. To avoid such a situation, the driver fade-up time at start-up can be programmed to a value among 1s、2s、5s、10s、20s 、40s. The default start fade up time is 1s.

■ 0-10V



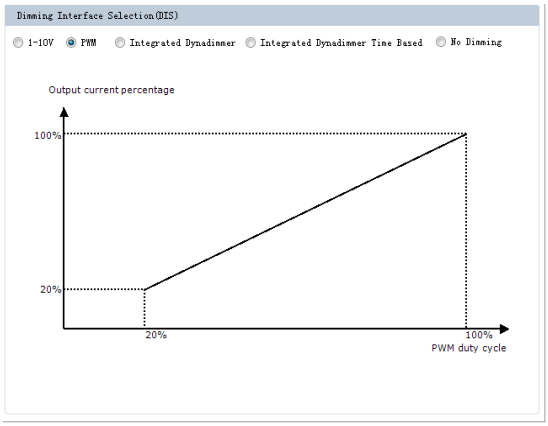

Allow users to set the max and min output current and corresponding output voltage to clarify the 1-10V dimming curve.

■ Set Module Working Hrs




Used to reset the working hour counting in the microcontroller of the driver and collaborate with CLO.

■ PWM



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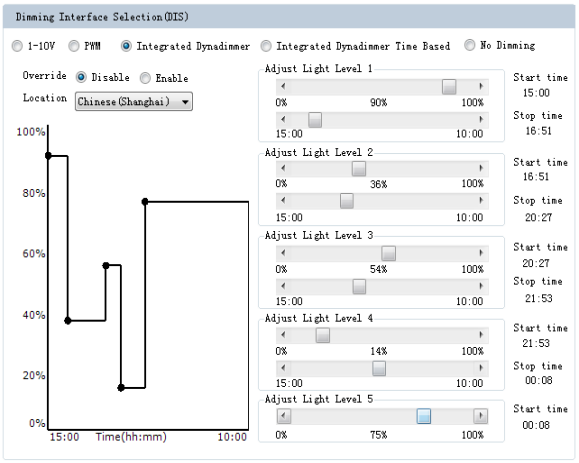
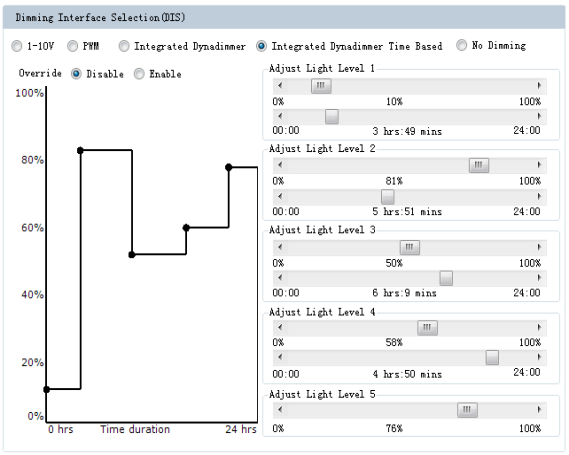
## ■ Instruction

### ■ Integrated Dynadimmer



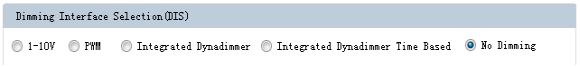

Using Integrated Dynadimmer, users can set 5 light levels and associated time frames. The driver does not have a real time clock. Instead it calculates a “virtual clock time,” determined by the duration of operation of the driver in the night. After 3 valid “ON-times,” the driver will be able to calculate the virtual clock time. A valid ON-time is defined as the time for which driver operates continuously for ⩾ 4 hours and ⩽ 24 hours. After learning driver ON-time for 3 consecutive days, the dim profile takes effect from the 4th day onwards.
With flexibility in setting time and light levels, the user can configure the driver for specific locations and applications, and the light level may be reduced during non-peak hours.

### ■ Integrated Dynadimmer Time Based



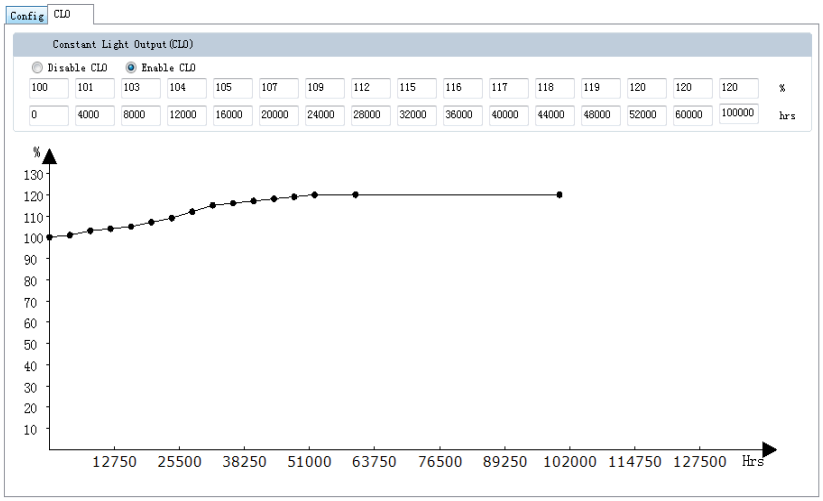

Allow users to separate 24hrs into 5 sections and corresponding output current.

### ■ No Dimming




The driver will be in constant output mode.

### ■ Constant Light Output(CLO)




The CLO feature of the driver enables OEMs to create solutions with LEDs that deliver constant lumens through the life of the product. Based on the type of LEDs used, heat sinking and driver current, OEMs can estimate the depreciation of light output for specific LEDs and this information can be entered into the driver using the 16 point CLO interface. The driver counts the number of “LED module working hours.” As shown in the following figure, each data point represents the LED module working hours threshold and the corresponding driver CLO percentage. The driver will increase current based on this input to enable CLO.



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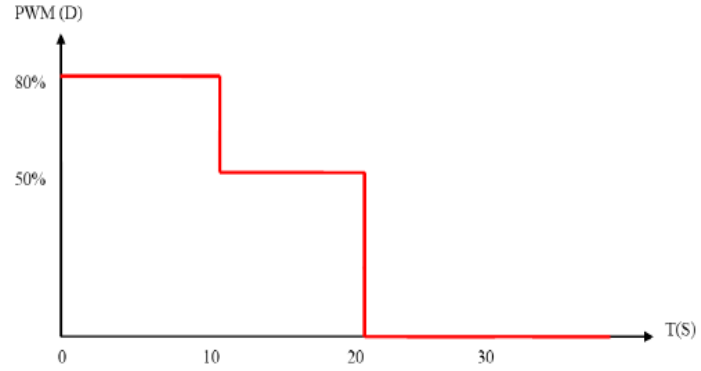
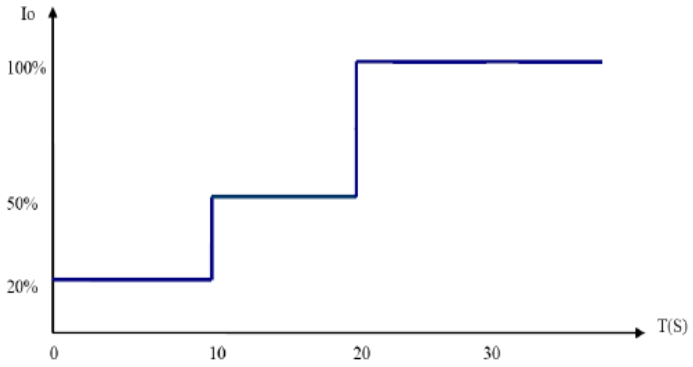
## ■ Instruction

**Default MCU PWM curve:**




**Default output current curve:**



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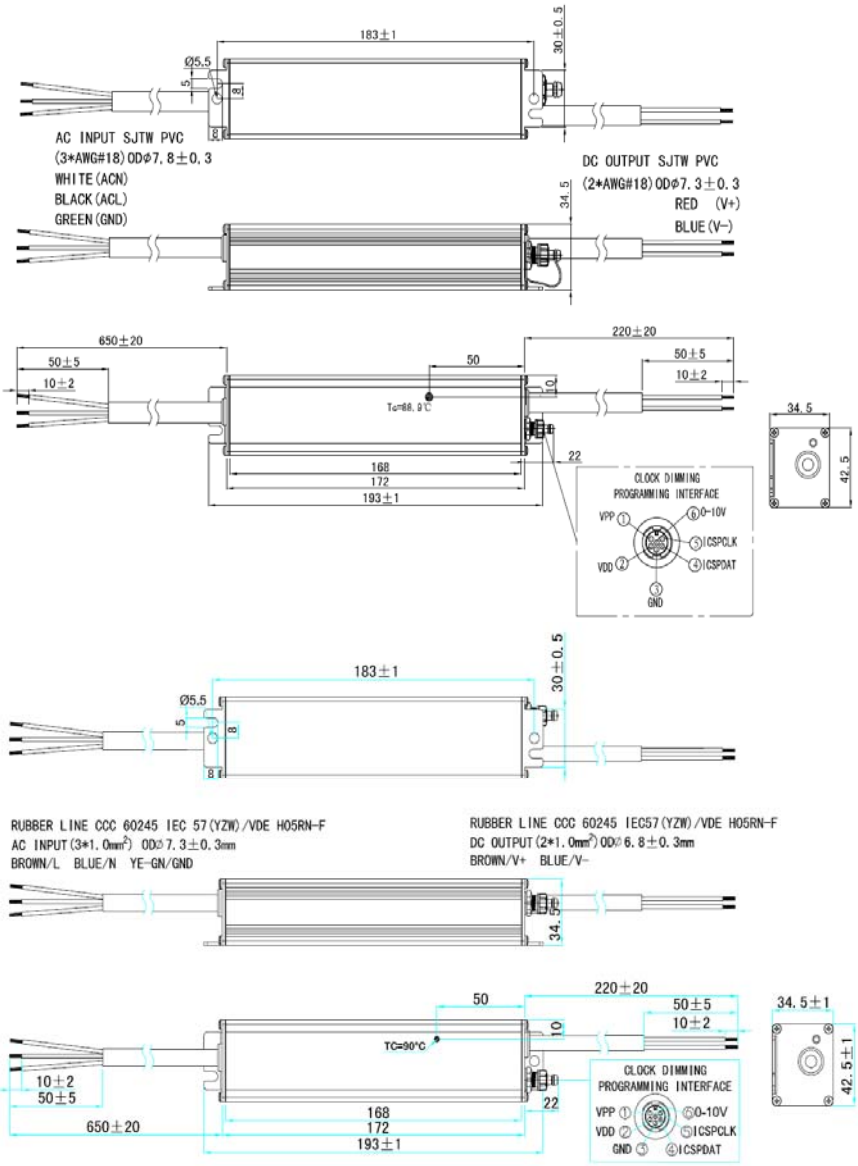
## ■ Mechanical Specification

1.Dimensions(Unit:mm)




RoHS Compliance:
Our products comply with the European Directive 2002/95/EC, calling for the elimination of lead and other hazardous substances from electronic products.

2.Terminal wire Type

| Products | AC Input | | | DC output | | |
|---|---|---|---|---|---|---|
| | Wire Type | Assignment | Description | Wire Type | Assignment | Description |
| UL apporval | UL SJTW PVC | BLACK/L | 3*AWG#18 | UL SJTW PVC | RED/+ | 2*AWG#18 |
| | | WHITE/N | | | BLUE/- | |
| | | GREEN/GND | | | | |
| CCC apporval | RUBBER CCC+VDE 60245 IEC57 YZW/H05RN-F | BROWN/L | 3*1.0mm² ODΦ 7.3± 0.3mm | RUBBER CCC+VDE 60245 IEC57 YZW/H05RN-F | Brown/+ | 2*1.0mm² ODΦ 6.8± 0.3mm |
| | | BLUE/N | | | Blue/- | |
| | | YE-GN/GND | | | | |



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