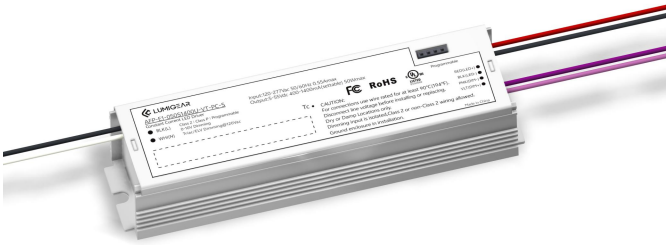
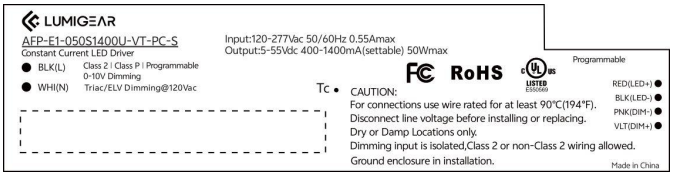
# AFP-E1-xxxSxxxxU-VT-PC-x

50w Programmable, 1% dimming, TRIAC+0~10V, Constant Current Series






## Features & Benefits

- Universal AC Input Voltage(120-277VAC)
- High Power Density Design, White aluminum sheet metal case
- Comply with phase cut dimming and isolated 0-10V dimming, dim down to true 1%
- Silicon potted for good thermal performance
- Suitable for indoor use
- Flicker free, excellent camera compatibility
- UL Class2, Class P
- Combination Wave 2kV, Ring Wave 2.5kV
- Operating temperature: -25℃~+55℃
- Comply with UL8750, IEEE1789

**Programmable feature:**

- Output current (1mA step)
- Dim to off, Min Dimming Level
- Programmable conduction angles with turn-on & turn-off for TRIAC & ELV
- Dimming curve: Selectable Linear / Logarithmic
- OTP mode: Foldback mode, Linear decrease mode
- Dimming fade time(Soft start)
- Over load protection

## Model List

| Model Name | Rated Input Voltage | Max Output Power (Total) | Output Current (Total) | Rated Output Voltage | Efficiency | Dimension |
|---|---|---|---|---|---|---|
| AFP-E1-050S1400U-VT-PC-S | 120-277VAC | 50W max. | 400-1400mA | 5-55VDC | 89% | 116.7*30.5*23.8mm/4.6*1.2*0.9 in. |

## Optional Function

Side feed and bottom feed

## Approvals

TRIAC 0/1-10 V c UL us LISTED CLASS P

## Model name code

| AFP-E1 | - | 050S | 1400 | U | – | VT | – | PC | - | X |
|---|---|---|---|---|---|---|---|---|---|---|
| ① | | ② | ③ | ④ | | ⑤ | | ⑥ | | ⑦ |

| | | |
|---|---|---|
| ① | Series | AFP Series |
| ② | Output power | Maximum output power: 50W |
| ③ | Output current(max) | Maximum output current: 1400mA |
| ④ | Input voltage | 120-277VAC |
| ⑤ | Dimming Control | Triac&0-10V |
| ⑥ | Programmable | USB-PC |
| ⑦ | Feed | S= side feed<br>B= bottom feed |

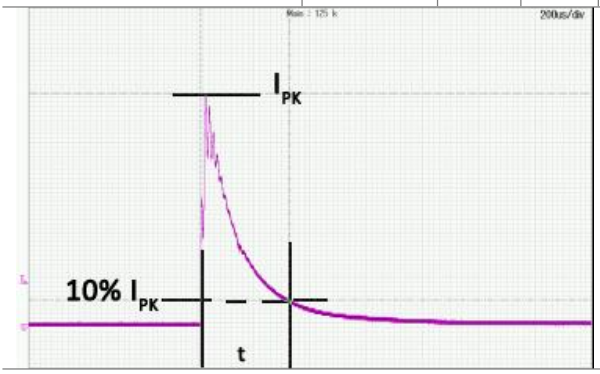


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sales@lumigear.com

# Specification:

| Parameters | Symbols | Test Conditions / Comment | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **INPUT** | | | | | | |
| Input Voltage | $V_{IN}$ | | 108 | | 305 | $V_{AC}$ |
| Rated Input Voltage | $V_{IN\ RATED}$ | | 120 | | 277 | $V_{AC}$ |
| | $V_{IN\ RATED_TRIAC}$ | Phase Cut Dimming | | 120 | | $V_{AC}$ |
| Input Frequency | $f_{line}$ | | 47 | 50/60 | 63 | Hz |
| Input Current | $I_{IN}$ | 050, Full Load, $V_{IN}$ = 120$V_{AC}$ | | | 0.55 | A |
| Inrush Current | $I_{INRUSH}$ | Meet NEMA 410 | | | | |
| Leakage Current | $I_{Leakage}$ | $V_{IN}$ = 277$V_{AC}$ 60Hz | | | 0.75 | mA |

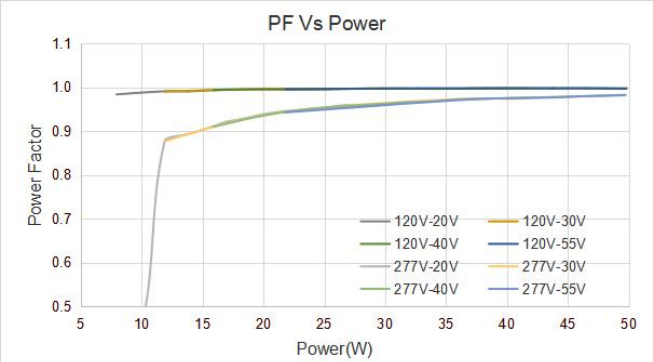
| Number of Drivers per MCB (Circuit Breaker) | MCB type | B10 | C10 | D10 | B13 | C13 | D13 | B16 | C16 | D16 | B20 | C20 | D20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 120$V_{AC}$ | 14 | 17 | 19 | 19 | 22 | 25 | 23 | 27 | 31 | 29 | 34 | 39 |
| | 230$V_{AC}$ | 8 | 14 | 29 | 11 | 19 | 38 | 14 | 23 | 47 | 17 | 29 | 58 |
| | 277$V_{AC}$ | 8 | 14 | 28 | 11 | 18 | 36 | 13 | 22 | 45 | 17 | 28 | 56 |

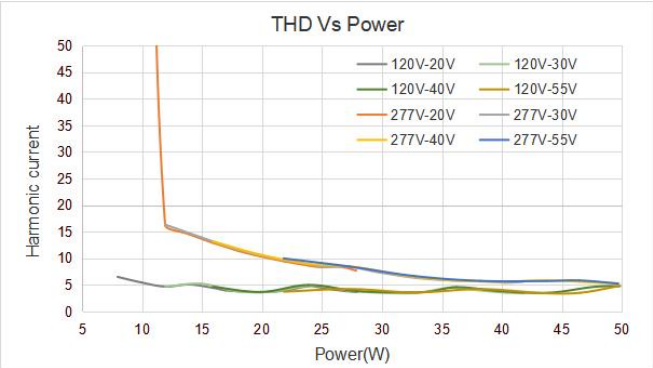



| Input Voltage | Inrush Current | t(us)10%-10% |
|---|---|---|
| 120$V_{AC}$ | 13.312A | 152 |
| 230$V_{AC}$ | 27.14 | 140 |
| 277$V_{AC}$ | 31.74 | 136 |

## General Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| Power Factor | PF | 30-100% load, $V_{IN}$ = 120$V_{AC}$ | 0.9 | | | PF |
| | | 45-100% load, $V_{IN}$ = 277$V_{AC}$ | 0.9 | | | |
| Total Harmonic Distortion | THD | 30-100% load, $V_{IN}$ = 120$V_{AC}$ | | | 20 | % |
| | | 45-100% load, $V_{IN}$ = 277$V_{AC}$ | | | 20 | % |
| Turn On Delay Time | $T_{on_delay}$ | Cold Start, Without Dimmer | | | 0.5 | S |
| | | Cold Start, Through whole dimming range | | | 1.8 | S |
| | $\eta_{50W-120V}$ | 050, Full load, VIN = 120VAC, $I_{OUT}$=909mA, Steady state | 87 | 89 | | % |
| | $\eta_{50W-277V}$ | 050, Full load, VIN = 120VAC, $I_{OUT}$=909mA, Steady state | 87 | 89 | | % |



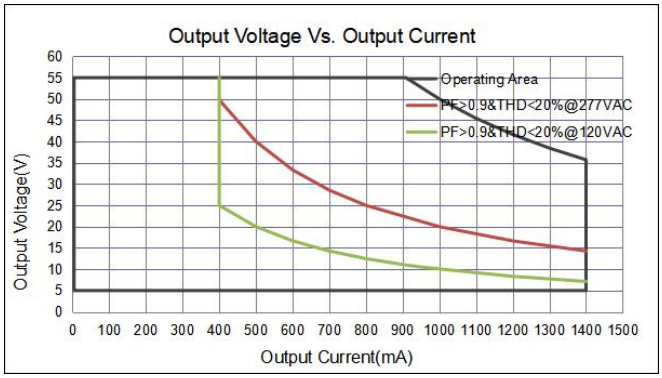







## OUTPUT

| | | | | | | |
|---|---|---|---|---|---|---|
| Output Current Tolerance | t | Programmable current | | | 5 | % |
| | | 050 | 5.0 | | 1400 | mA |
| Output Voltage | $V_{OUT}$ | | 5 | | 55 | V |
| Line Regulation | $V_{OUT-LINE}$ | | | | 1 | % |
| Load Regulation | $I_{OUT-LOAD}$ | | | | 5 | % |
| Ripple Current | $I_{OUT-RIPPLE}$ | Full Load, (Iomax-Iomin)/(Iomax+Iomin) | | | 10 | % |
| Output Current Overshoot | $I_{OVERSHOOT}$ | Turning Power ON | | | 10 | % |




## Programming

User can program the driver via programming port. Please contact Lumigear for details.

| | |
|---|---|
| Programming software | “LUMIGEAR Programming Tool” |
| Programming tool | “LUMIGEAR Toolbox” |
| Operation voltage | 5V |

| NO. | Item | Default Setting |
|---|---|---|
| 1 | Output current (1mA step) | See"Model list" for each model |
| 2 | Dim to off(0-10V) | Enable |
| 3 | Min Dimming Level | 1% |
| 4 | 0-10V Dimming curve: Linear / Logarithmic/customer dim curves | See "0~10V or Resistor Dimming" section |
| 5 | Over Temperature Protection: Foldback mode, Linear decrease mode | See "Protection" section |
| 6 | Over load protection | See "Protection" section |
| 7 | Fade time | 10mS |
| 8 | Conduction angles with turn-on & turn-off & full brightness for TRIAC & ELV | See"Triac Dimming" section |
| Programming Interface | PGT-USB-TPAC-A |  |
| Programming Cables | PGT-USB-M4P2 |  |

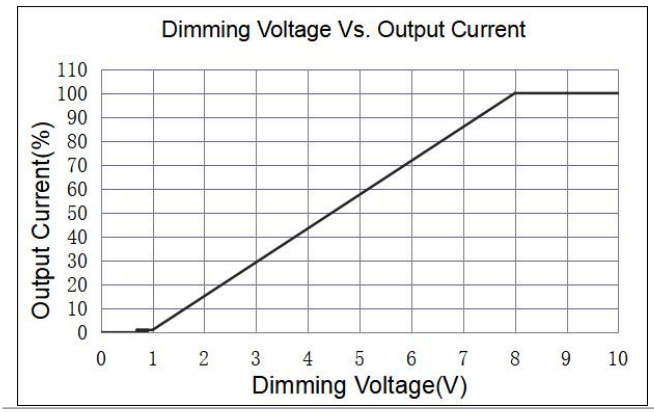
## 0~10V or Resistor Dimming

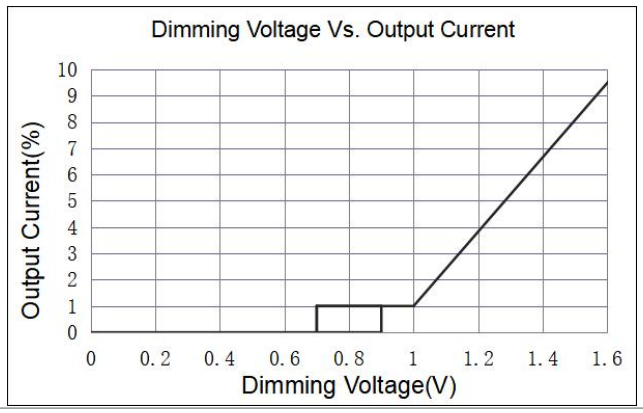
The 0~10V or resistor dimming can be used to dim the output current via a standard commercial wall dimmer (0~10$V_{DC}$) or an external control voltage source (0~10$V_{DC}$) or external resistor.

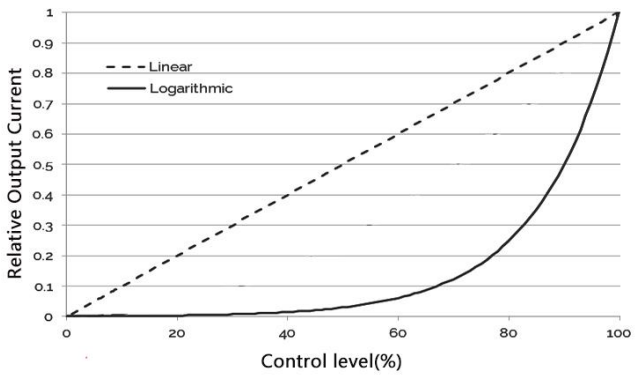
| Dimming Curve | Selectable: Linear / Logarithmic, Default setting is linear curve. please see "Dimming curve". | | | | | |
|---|---|---|---|---|---|---|
| Absolute Maximum Voltage on 0~10V Pin | $V_{DIM}$ | | | | 300 | $V_{AC}$ |
| Source Current on 0~10V Dimming Pin | $I_{DIM}$ | | | 200 | | uA |
| Dimming range | $D_{DIM}$ | | 1 | | 100 | $I_{SET}$% |
| Light On | $V_{DIM-on}$ | Programmable | | 0.9 | | V |
| Light Off | $V_{DIM-off}$ | Programmable | | 0.7 | | V |
| Clamp at Min.dimming level | $V_{DIM-Clamp}$ | Programmable | | 1 | | V |
| Dimming Voltage for Full Bright | $V_{DIM-MAX}$ | Programmable | | 8 | | V |
| Standby power | $P_{STANDBY}$ | Light Off, Vin=120VAC | | | 0.5 | W |

### Compatible Dimmers

| NO. | Item | Default Setting |
|---|---|---|
| 1 | Leviton | DS710 |
| 2 | Leviton | IP710 |
| 3 | Lutron | NTSTV-DV |
| 4 | Lutron | NFTV |
| 5 | Lutron | DVTV-WH |




## Triac Dimming

The unit is compatible with Leading-edge and Trailing-edge dimmers.

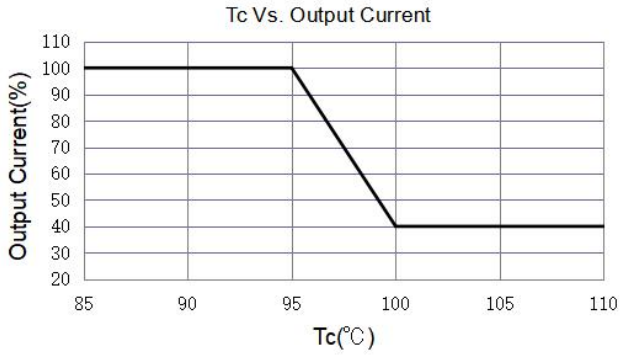
| | | | | | | |
|---|---|---|---|---|---|---|
| Input Voltage | $V_{IN-TRIAC\ DIM}$ | | | 120 | | $V_{AC}$ |
| Suggest Load Range | $P_{Suggest}$ | $V_{IN}$ = 120 $V_{AC}$ | 45 | | 100 | % |
| Conduction angles with turn-on & turn-off & full brightness for TRIAC & ELV | $V_{ON_TRIAC}$ | Turn-on | | 16 | | $V_{AC}$ |
| | $V_{OFF_TRIAC}$ | Turn-off | | 15 | | $V_{AC}$ |
| | $V_{MIN_TRIAC}$ | Light Minimum | | 30 | | $V_{AC}$ |
| | $V_{Full_TRIAC}$ | Light Maximum | | 110 | | $V_{AC}$ |

Compatible 0-10V Dimmers

| NO. | Manufacturer | System Type | Description |
|---|---|---|---|
| 1 | Lutron | Forward | Diva DVCL-153P |
| 2 | Lutron | Forward | Caseta PD-6WCL |
| 3 | Lutron | Reverse | Diva DVELV-300P |
| 4 | Leviton | Reverse | Illumatech IPE04 |
| 5 | Lutron | Forward | SCL-153P |
| 6 | Lutron | Forward | DVLV-600P |
| 7 | Leviton | Forward | 6613-P |
| 8 | Lutron | Forward | GLV-600 |

## Protection

| | | | | | | |
|---|---|---|---|---|---|---|
| Open Circuit Protection | $V_{OCP}$ | The unit will recover automatically after the fault condition is removed. | | 60 | | V |
| Over Temp. Protection | $T_{OTP}$ | Programmable<br>Current decrease linearly when hotspot greater than $T_{OTP}$, please see OTP curve | | 95 | | ℃ |
| | | 050, Programmable.<br>Output current will decrease when output power reach $P_{OLP}$ | 20 | | 50 | W |
| OLP tolerance | $t_{OLP}$ | | 100 | | 110 | % |
| Short Circuit Protection | The unit will recover automatically after the fault condition is removed. | | | | | |
| Output Reverse Polarity | Will not damage the LED driver but may damage the LED load. | | | | | |

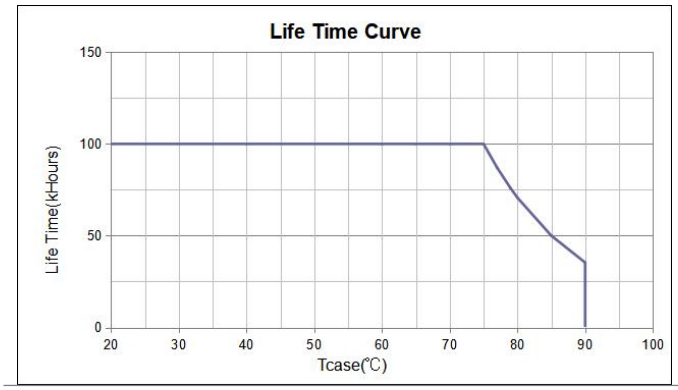



## Environment

| | | | | | | |
|---|---|---|---|---|---|---|
| Storage Temperature | $T_{Storage}$ | Humidity: 5% RH to 95% RH | -20 | - | +85 | ℃ |
| Ambient Operating Temperature | $T_a$ | | -25 | - | +55 | ℃ |
| Max. Case Temperature | $T_c$ | Hot spot on case | | | 90 | ℃ |
| Operating Relative Humidity | $H_a$ | Non-Condensing | 10 | | 90 | % |
| Acoustic Noise | | Measured from 1 meter, at 100% and min light output. | | | 24 | dBA |
| Cooling | Convection Cooling | | | | | |
| IP environmental rating | IP20 | | | | | |
| Environmental Rating | Dry and damp UL approved | | | | | |

## Others

| | | | | | | |
|---|---|---|---|---|---|---|
| Life Time | $T_{Life}$ | Full Load, 85℃ case temperature, | 50 | | | kHrs |
| MTBF | $T_{MTBF}$ | Full Load, 25℃ ambient temperature | 200 | | | kHrs |
| Net Weight | $W_{NET}$ | | | 145 | | g |
| Flicker | PST | NEMA 77 | | | 0.7 | |
| | SVM | NEMA 77 | | | 1 | |
| | IEEE 1789(No Risk/Low Risk), CEC title 24 | | | | | |
| Warranty | 5 Years Warranty at $T_c$ ≤85℃ | | | | | |

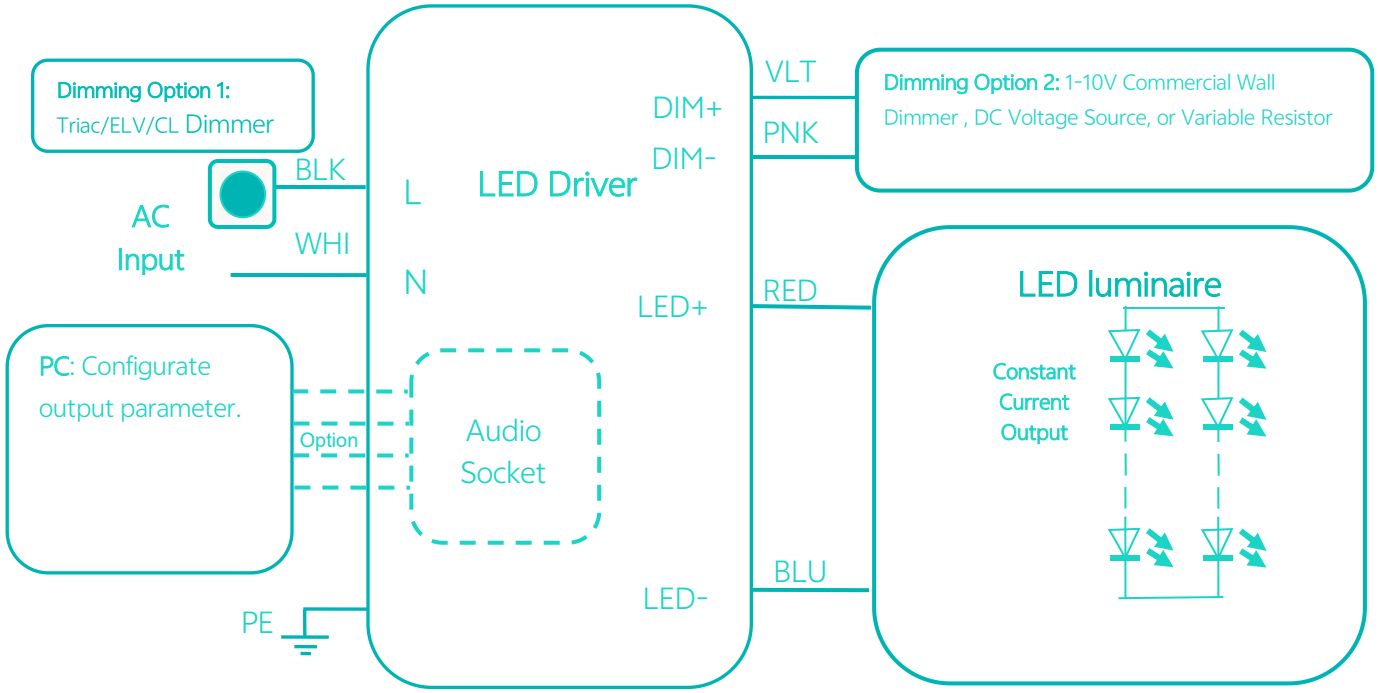



## Safety Compliance

| | | |
|---|---|---|
| CUL/UL | UL8750, CAN/CSA-C22.2 No. 250.13 | |
| Isolation | 2xU+1KV: Input - Output | |
| | 2xU+1KV: Input - 0-10V/Control | |
| | 500Vc: Output - 0-10V/Control | |
| | 500V: Output/0-10V/Control- Enclosure | |
| **EMC Requirements** | **Standard** | **Conditions** |
| EMI Emissions | FCC Title 47 Part 15 | Class B at $120V_{AC}$, Class A at $277V_{AC}$ |
| EMS Immunity Compliance | IEC 61000-4-2 | ±8kV air Discharge, ±6kV Contact Discharge |
| | IEC 61000-4-5 or ANSI/IEEE C62.41-2002 | ± 2kV Common and Differential Mode, test at 2 Ω, 5 strikes/1minute interval (40 total strikes) |
| | ANSI/IEEE C62.41.1-2002 | 2.5kV Ring Wave, test at 30Ω 7 Strikes/1 minute interval, Common and Differential mode, 56 total strikes |
| | IEC 61000-4-11 | >95% dip, 5 period; 30% dip, 25 periods; 95% reduction, 250 periods |
| | IEC 61000-4-4 | ± 2kV Direct couple to Line input, 5kHz repitition rate, 15mS duration, 300mS period. 7 coupling paths, 1 minute per path (14 total combinations) |

Note: Unless otherwise specified, all the above parameters are measured at ambient temperature of 25℃ and rated voltage.

## Typical Application




## Packaging

| Driver Quantity (pcs) | Layer | Weight (kg) | Outer dimensions of Carton L x W x H (mm) |
|---|---|---|---|
| TBD | TBD | TBD | TBD |



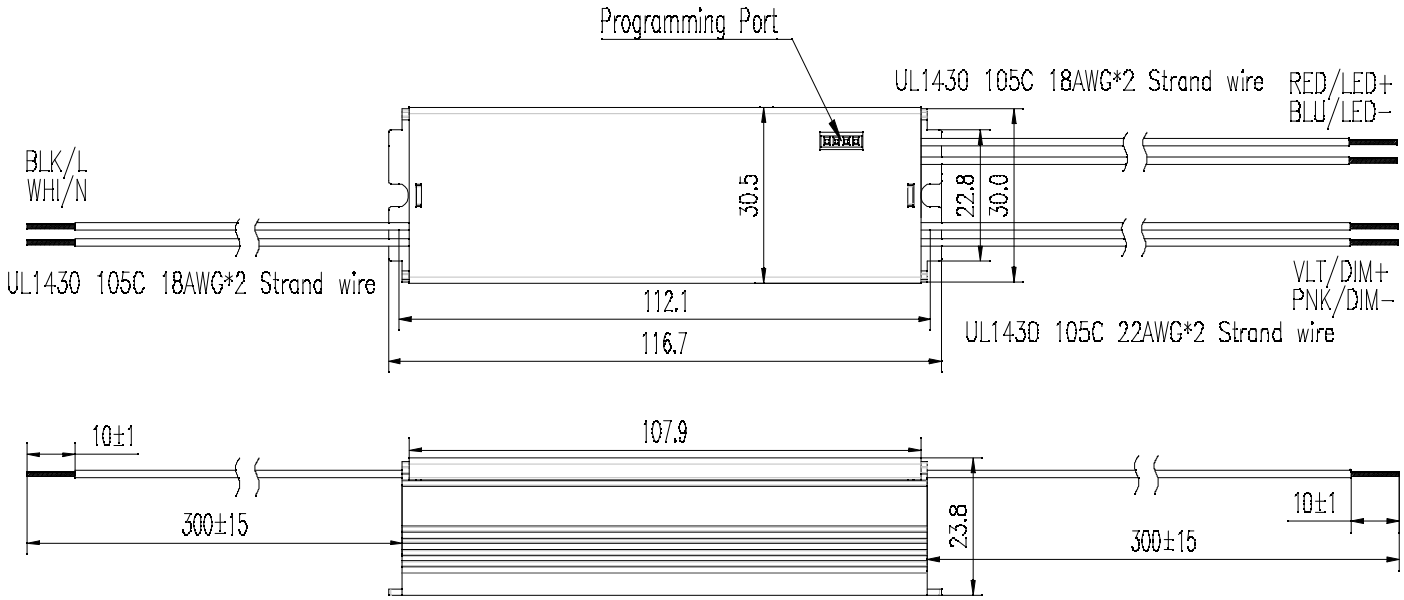
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## Mechanical Drawing: (116.7*30.5*23.8mm/4.6*1.2*0.9 in.)

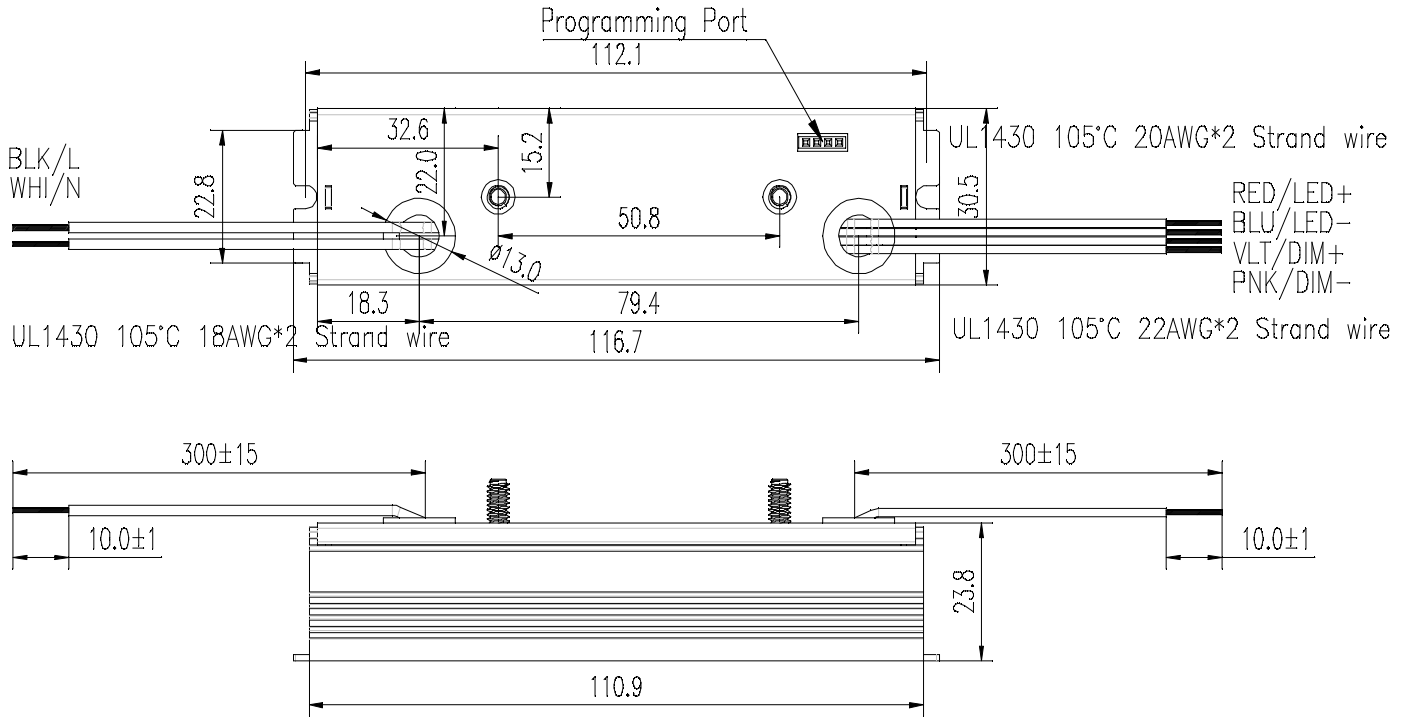
Dimensions(Unit:mm)

Default tolerance:±1mm

S TYPE:




B TYPE:






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