



## 40W Single Output AC Dimmable LED Power Supply

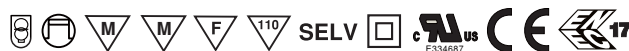
## PLM-40 series



### ■ Features :

- Universal AC input / Full range (up to 295VAC)
- Three-step analog dimming
- Built-in active PFC function
- Constant current design
- Protections: Short circuit / Over temperature
- Cooling by free air convection
- Fully isolated plastic case
- Class II power unit, no FG
- Suitable for indoor LED lighting applications
- 100% full load burn-in test
- No load power consumption <0.5W
- Low cost
- High reliability
- 2 years warranty

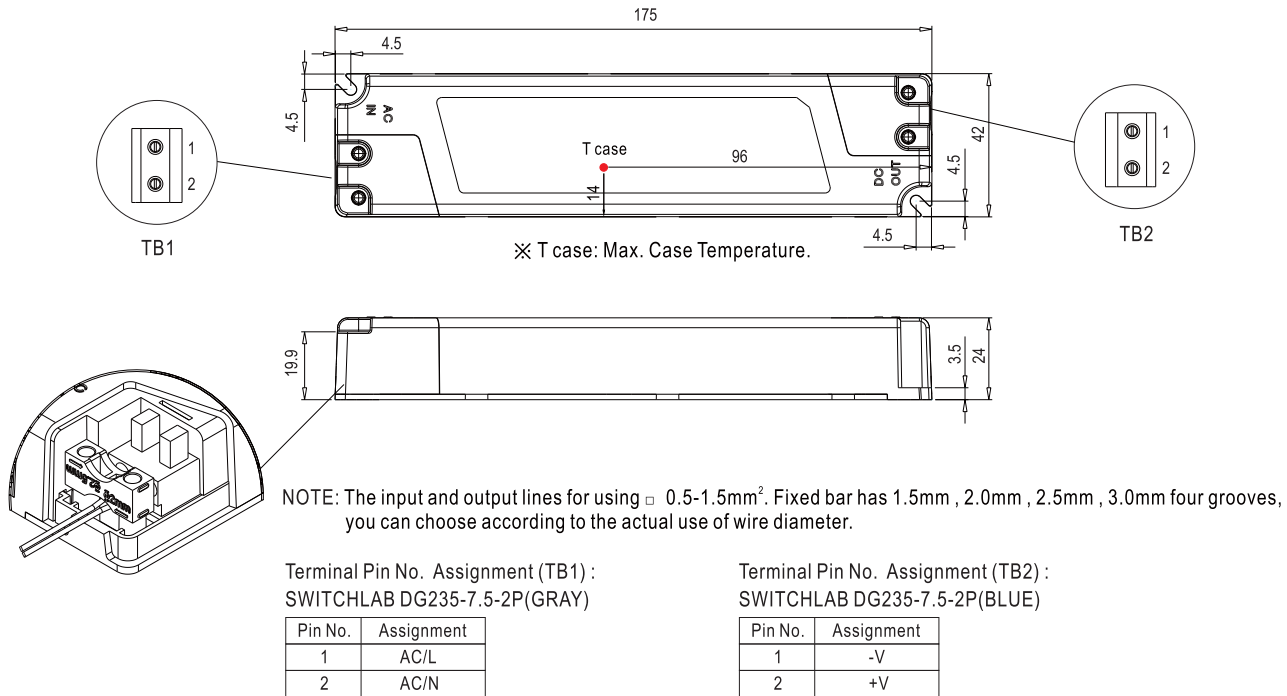
### SPECIFICATION



| MODEL           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | PLM-40-350                                                                                                           | PLM-40-500   | PLM-40-700 | PLM-40-1050 | PLM-40-1400 | PLM-40-1750 |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------|------------|-------------|-------------|-------------|
| OUTPUT          | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 350mA                                                                                                                | 500mA        | 700mA      | 1050mA      | 1400mA      | 1750mA      |
|                 | OPERATING VOLTAGE RANGE Note.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 53 ~ 105V                                                                                                            | 40 ~ 80V     | 29 ~ 57V   | 19 ~ 38V    | 15 ~ 29V    | 12 ~ 23V    |
|                 | CURRENT ACCURACY Note.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ±5.0%                                                                                                                |              |            |             |             |             |
|                 | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 36.75W                                                                                                               | 40W          | 38.5W      | 39.9W       | 40.6W       | 40.25W      |
|                 | RIPPLE & NOISE (max.) Note.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10Vp-p                                                                                                               | 8Vp-p        | 6Vp-p      | 4Vp-p       | 3Vp-p       | 2.5Vp-p     |
|                 | NO LOAD OUTPUT VOLTAGE (max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 115V                                                                                                                 | 86V          | 63V        | 43V         | 34V         | 27V         |
| SETUP TIME      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 500ms / 115VAC, 230VAC at full load                                                                                  |              |            |             |             |             |
| INPUT           | VOLTAGE RANGE Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 110 ~ 295VAC                                                                                                         | 156 ~ 416VDC |            |             |             |             |
|                 | FREQUENCY RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 47 ~ 63Hz                                                                                                            |              |            |             |             |             |
|                 | POWER FACTOR (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PF ≥ 0.97/115VAC, PF ≥ 0.95/230VAC, PF>0.9/277VAC(at full load)(Please refer to "Power Factor Characteristic" curve) |              |            |             |             |             |
|                 | TOTAL HARMONIC DISTORTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | THD< 20% when output loading≥60% at 115VAC/230VAC input and output loading≥75% at 277VAC input                       |              |            |             |             |             |
|                 | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 88%                                                                                                                  | 88%          | 87%        | 87%         | 86%         | 86%         |
|                 | AC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.5A/115VAC 0.3A/230VAC 0.25A/277VAC                                                                                 |              |            |             |             |             |
|                 | INRUSH CURRENT(Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | COLD START 15A(twidth=75μs measured at 50% Ipeak) at 230VAC                                                          |              |            |             |             |             |
| LEAKAGE CURRENT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <0.5mA / 240VAC                                                                                                      |              |            |             |             |             |
| PROTECTION      | SHORT CIRCUIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Hiccup mode, recovers automatically after fault condition is removed.                                                |              |            |             |             |             |
|                 | OVER TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 115℃ ±5℃ (TSW1)<br>Protection type : Hiccup mode, recovers automatically after temperature goes down.                |              |            |             |             |             |
| ENVIRONMENT     | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -30 ~ +45℃ (Refer to "Derating Curve")                                                                               |              |            |             |             |             |
|                 | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20 ~ 95% RH non-condensing                                                                                           |              |            |             |             |             |
|                 | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -40 ~ +80℃, 10 ~ 95% RH                                                                                              |              |            |             |             |             |
|                 | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ±0.03%/℃ (0 ~ 50℃)                                                                                                   |              |            |             |             |             |
|                 | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10 ~ 500Hz, 2G 12min./1cycle, period for 72min. each along X, Y, Z axes                                              |              |            |             |             |             |
| SAFETY & EMC    | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | UI8750, CSA C22.2 No. 250.13-12, ENEC EN61347-1, EN61347-2-13, EN62384 approved                                      |              |            |             |             |             |
|                 | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | I/P-O/P:3.75KVAC                                                                                                     |              |            |             |             |             |
|                 | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH                                                                            |              |            |             |             |             |
|                 | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Compliance to EN55015, EN61000-3-2 Class C (≥50% load) ; EN61000-3-3                                                 |              |            |             |             |             |
|                 | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547, light industry level, criteria B (Surge 2KV)                        |              |            |             |             |             |
| OTHERS          | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 822.7Khrs min. MIL-HDBK-217F (25℃)                                                                                   |              |            |             |             |             |
|                 | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 175*42*24mm (L*W*H)                                                                                                  |              |            |             |             |             |
|                 | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.175Kg; 60pcs/11.5kg/0.68CUFT                                                                                       |              |            |             |             |             |
| NOTE            | 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.<br>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.<br>3. Please see "AC input voltage drop vs. output current characteristics" table.<br>4. Derating may be needed under low input voltage, please check the static characteristic for more details.<br>5. Constant current operation region is within 50% ~100% rated output voltage. This is the suitable operation region for LED related applications, but please reconfirm special electrical requirements for some specific system design.<br>6. The power supply is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.<br>7. Direct connecting to LEDs is suggested, but is not suitable for using additional drivers. |                                                                                                                      |              |            |             |             |             |

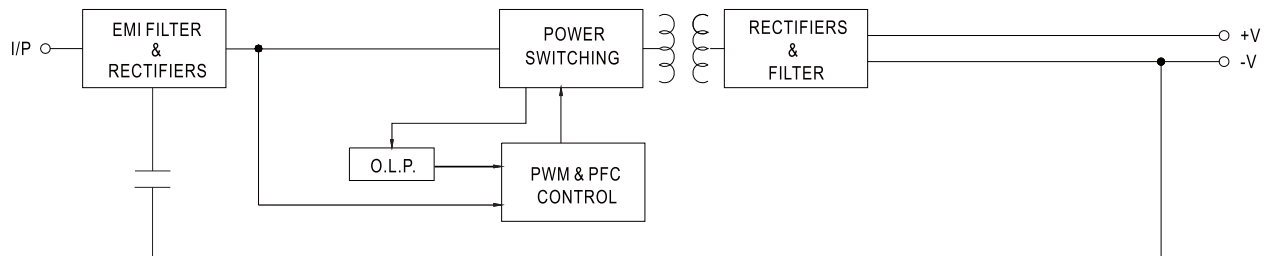
## Mechanical Specification

Case No. PLM-40 Unit: mm

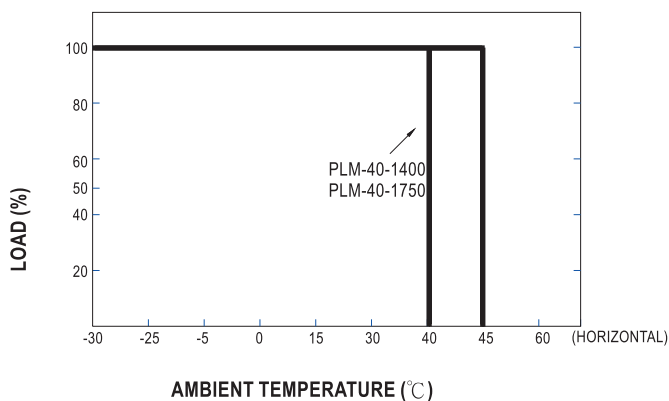


## Block Diagram

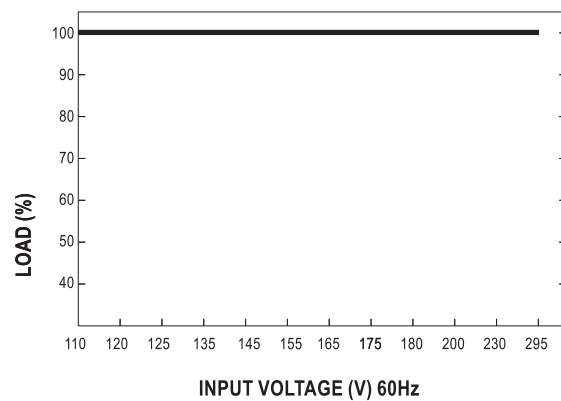
fosc : 67KHz



## Derating Curve

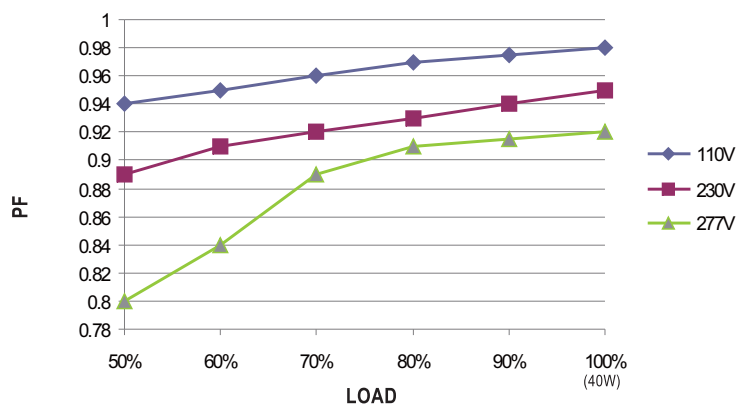


## Static Characteristics



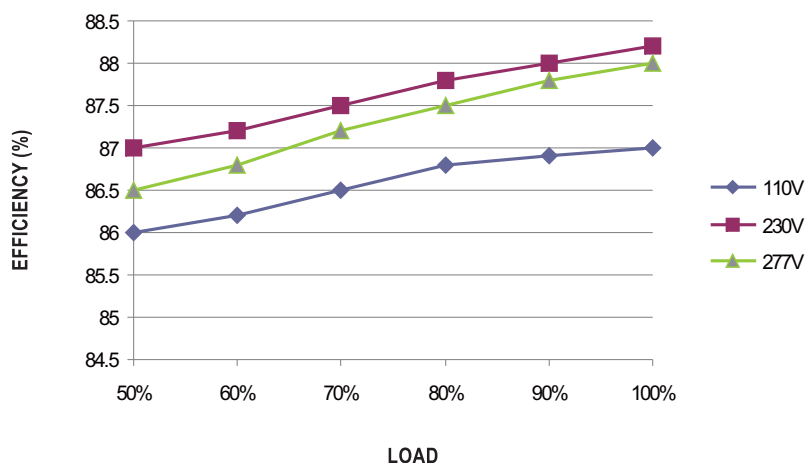
### Power Factor Characteristic

#### Constant Current Mode



### EFFICIENCY vs LOAD (PLM-40-350)

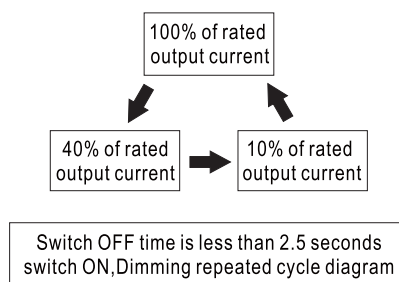
PLM-40 series possess superior working efficiency that up to 88% can be reached in field applications.



### Three-step analog dimming

3-level analog dimming control using a wall switch

| three-step analog dimming   | STEP 1         | STEP 2                                                     | STEP 3                                                     |
|-----------------------------|----------------|------------------------------------------------------------|------------------------------------------------------------|
|                             | Switch turn ON | Switch turn OFF<br>Less than 2.5 seconds<br>Switch turn ON | Switch turn OFF<br>Less than 2.5 seconds<br>Switch turn ON |
| percentage of rated current | 100%           | 40%                                                        | 10%                                                        |



NOTE: if the OFF time is longer than 2.5 seconds, once switch on again, PLM-40 will provide 100% of rated output current

### AC input voltage drop vs. output current characteristics

|               |      |      |     |     |
|---------------|------|------|-----|-----|
| AC input drop | 10%  | 8%   | 5%  | 3%  |
| Io drop       | <18% | <13% | <8% | <6% |

NOTE: Output current will return to the rated value within 50ms