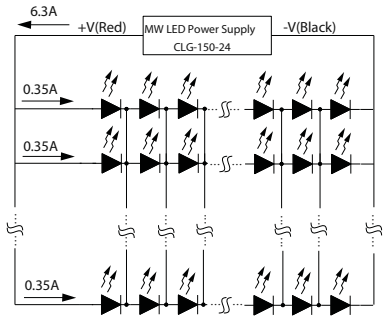
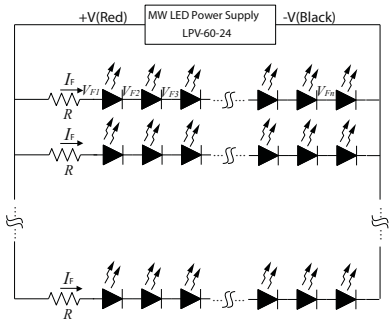
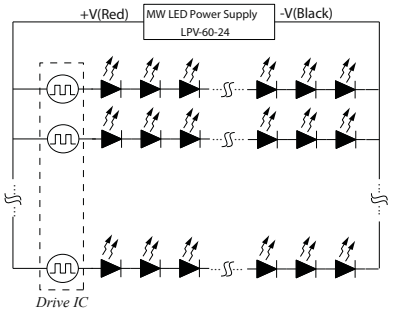
SAMLEX AMERICA

# HOW TO CHOOSE A SUITABLE LED POWER SUPPLY?

- Decide a suitable wattage level, including safety margin.
- Verify your design of LED driving circuit: direct drive by PSU [choose a constant current (C.C.) mode LED power supply] or add additional driving IC to get a more precise constant current level [choose a constant voltage (C.V.) or constant current (C.C.) mode LED power supply].
- Verify whether the application need PFC function.
- Verify location of assembly and the required level against dust and humidity for the LED power supply (enclosure style and IP level).
- Verify the required safety certificates.
- Need to adjust the output voltage and/or output current or need the dimming function ?

## Suggested System Design

| Setting | Circuit diagram | Description | Advantage & Disadvantage |
|---|---|---|---|
| Use C.C. mode power supply<br><br>No need ballast resistor and LED driver IC |  <br>For 1W LED, $V_F$=3.2V, $I_F$=0.35A<br>Parallel connection:<br>6.3A / 0.35A=18<br>18 branches need to connect in parallel | Using Mean W ell power supply as the constant current source and feed the LED arrays directly. | Advantage:<br>The cost and complexity are the lowest to LED manufacturers. Just need to consider about characteristics of the LED.<br><br>Disadvantage:<br>Driving curr ent for each branch may be unbalance |
| | Constant current region of CLG-150-24:<br>12~24V, so the LED series connection should be 4 to 7. | Since PF>0.9 only for 75% of rated load or higher, the recommnaded series connection is 6 or 7. | |
| Use C.V. or C.C. mode power supply<br><br>Add ballast resistor to balance every branch |  | $R=[V-(V_{F1}+V_{F2}+...+V_{Fn})]/I_F$<br>Note:<br>$V$ : Rated output voltage of LED power supply<br>$V_F$: LED's forward voltage<br>$I_F$ : LED's forward current<br><br>Example:<br>Using LPV-60-24(24V/2.5A) to drive a LED array which 6 LEDs connected in series in each branch and 4 branches connected in parallel<br>$R$= [24-(6x3)]/(2.5/4)=10Ω | Advantage:<br>• Low cost<br>• Simple<br><br>Disadvantage:<br>• Brightness of LED is uneven<br>• Poor efficiency |
| Use C.V . or C.C. mode power supply<br><br>Driver IC is used as a constant current source (without ballast resistor) |  | PWM constant current source will regulate forward current to achieve even current at each branch | Advantage:<br>• High efficiency<br>• Perfect curr ent balance to each branch<br>• Longer lifetime for LEDs<br><br>Disadvantage:<br>• Highest cost<br>• High complexity<br>• EMC problem at lighting equipment side |