

# **UL 8750 LED Controllers, Drivers & LED Lighting Units**

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LITE-UL 8750-1

Date: Jan. 2010



# Outline

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Overview Of LED Components

2

Component Types and CCN

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# LED Lighting Components

**An LED light source consists of one or more of the following component parts:**

**a) LED package, array, or module that converts electrical energy to light (400 – 700 nm) or UV radiation (180 – 400 nm) or infrared radiation (700 nm – 3000 nm), and heat,**

**c) Control (controller) circuitry that may switch, dim or otherwise control the electrical energy to the LEDs.**

**b) Power source that supplies the proper voltage and current to operate the LEDs,**

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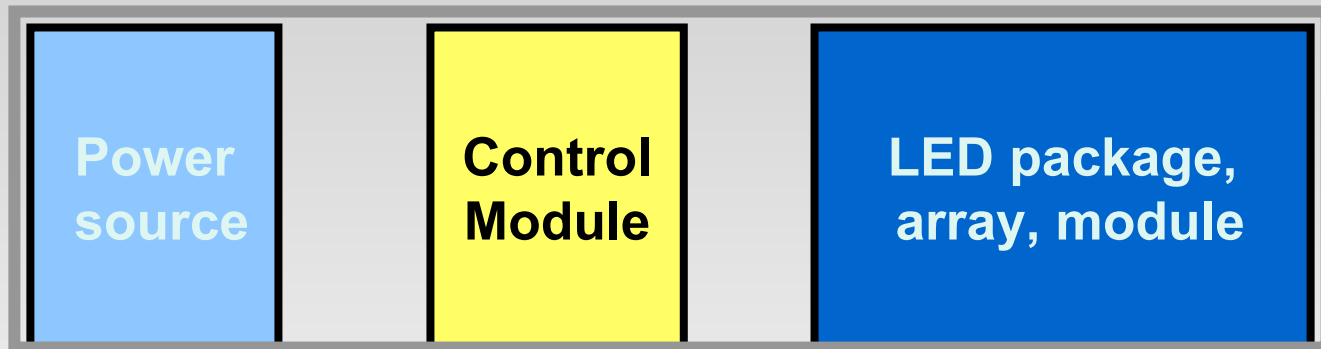
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# LED Lighting Components

## Complete LED Component System



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# COMPONENT DEFINITIONS



**LED PACKAGE** –An assembly of one or more LED die that contains wire bond connections, possibly with an optical element and thermal, mechanical, and electrical interfaces.



**LED ARRAY (LED MODULE)** – An assembly of one or more LED discrete electronic components on a printed circuit board, typically with optics and additional thermal, mechanical, and electrical interfaces.

# COMPONENT DEFINITIONS



**LED CONTROL MODULE (LED CONTROLLER) – Circuit module between the Power Source and LED Array or Module to limit voltage and current, dim, switch or otherwise control the electrical energy.**



**LED DRIVER – A power source that adjusts the voltage or current to LEDs, ranging in complexity from a resistor to a constant voltage or constant current power supply. Also referred to as Lamp Control Gear.**

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# LED Drivers and Power Supplies

## LED Driver

1. One CCN – FKSZ, FKSZ2
2. Generally Constant Current
3. Class 2 output or Other than Class 2
4. Standards—UL 1310, UL 1012, UL 60950 & UL 8750

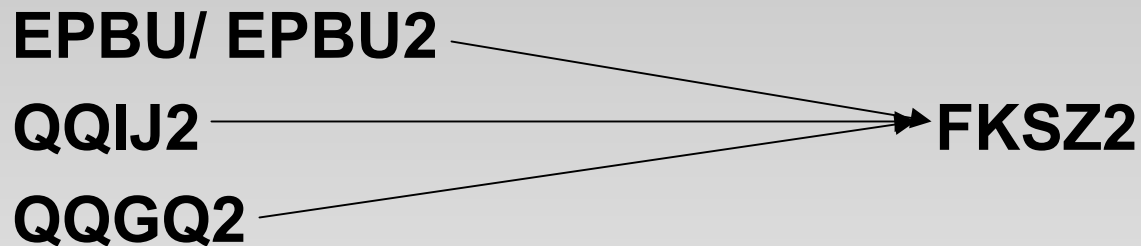
## Power Supply

1. Several CCNs
  - a) EPBU/ EPBU2
  - b) QQIJ2
  - c) QQGQ2
2. Generally Constant Voltage
3. Output dependent on CCN
4. Standards –
  - a) EPBU – UL 1310
  - b) QQIJ2 – UL 1310 or UL 1012
  - c) QQGQ2 – UL 60950



# Power Supplies $\Rightarrow$ LED Driver

**Power supply for LEDs is now being directed to the LED driver category across the board.**



**Additionally for CE where CB Scheme Report is needed, the LED Driver will be under QQGQ2 with a legacy report under FKSZ2**





# LED Driver Versus LED controller

## LED Driver

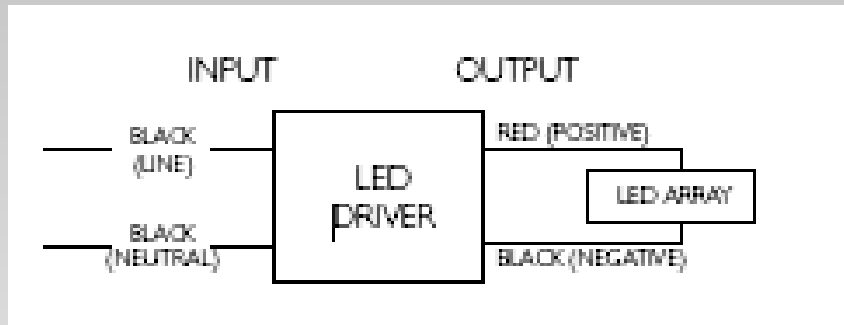
1. AC branch circuit supply on input and AC or DC output
2. Output connected to LED Load or LED Controller

## LED Controller

1. Wired between LED Driver and LED Loads
2. Low voltage input with generally constant current output.
3. Frequently for RGB 350 and 700 ma.



# LED Drivers



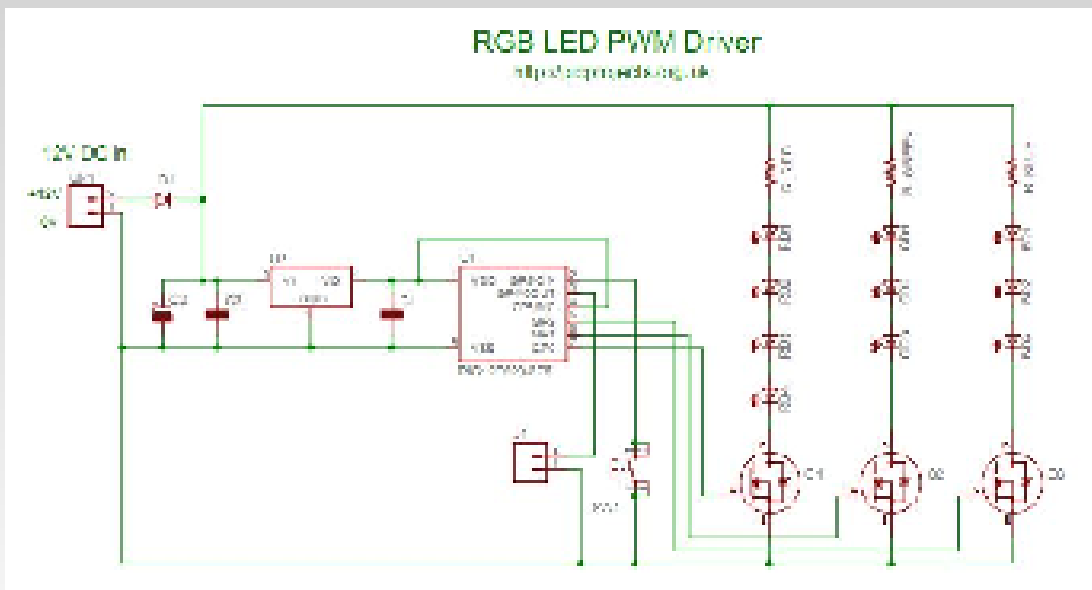
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# LED Controllers, OOQA2



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# LED Controllers, OOQA2



## EXAMPLE CONTROLLER

- 1. Auto adaptable for LED lights with voltage from DC5-24V.**
- 2. Channel RGB full color control, maximum outputs 6A per Channel.**
- 3. Modes of color skipping, color gradual changes , with color depth maximum 256 levels per RGB.**

# LED Drivers Listing Versus Recognition

## Listing – FKSZ ( See next Slide for FKSZ2)

- 1. Stand alone Power Supply with full enclosure**
- 2. Remote from end product.**
- 3. Provided with means for connect to a branch circuit supply such as follows:**
  - a. Power supply cord connected**
  - b. Conduit connection means and wiring compartment.**
- 4. Must comply with all of the requirements in UL 8750, including markings.**



# Listed LED Drivers, FKSZ

**Fixed Type  
with JBox**



**Through-cord/  
Cord connected  
Type**



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# LED Drivers Listing Versus Recognition

## Recognition – FKSZ2

**All that do not comply with scope of Listing.**

**Recognition if any of the following are true.**

1. Exposed leads, terminals on input.
2. Other than class 2 output and exposed leads or terminals
3. No conduit connection means
4. No wiring compartment



# Recognized LED Drivers, FKSZ2

**Factory Install  
Only with  
Terminals**



**Factory Install  
Only with  
Leads**



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# Led Component Categories

**FKSZ2 – Factory only Drivers for Light-emitting Diode (LED) Arrays, Modules, and Controllers**

**FKSZ – Stand alone LED Driver**

**OOQA2 – Factory only Light-emitting Diode (LED) Arrays, Modules, and Controllers**



# Questions

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