IS31LT3363

MULTI STRINGS LED DRIVER WITH HIGH CONTRAST RATIO AND INDUCTOR AUDIBLE NOISE FREE

GENERAL DESCRIPTION

The IS31LT3363 provides a simple circuit for multi channel LED dimming solution. It saves two extra power stages for typical RGB application thereby reducing external circuitry while maintain a high efficiency. It has a built-in buck current regulator that provides excellent current tracking and dimming performance. The dimming range will be greater than 10,000:1 at 100Hz dimming frequency. PWM frequency can be set between 100Hz~20kHz. This dimming solution can be designed to be noise free making it an ideal choice for household and commercial lighting products.

For this application, user often needs a MCU and an interface part, IS31LT3363 integrates a LDO to provide 3.3V bias power for the external IC's.

An automatic current foldback function allows power savings when all the three LED strings turn off time is longer than 10ms. Open LED and over temperature protection ensures robust operation.

IS31LT3363 can operate over an input voltage to 36V. It comes in a thermally enhanced eTSSOP-16 package.

FEATURES

- Input voltage range from 6V to 36V
  - Support up to 1A LED string current
  - Up to 1MHz Switching Frequency
- Three series LED bypass FET switches supports up to 28V each LED string
- High efficiency (up to 97%)
- Internal 3.3V@10mA LDO output for MCU
- PWM Dimming frequency range 100Hz~20kHz
  - Direct PWM input for three channels
  - Up to 10,000:1 contrast ratio @ 100Hz
  - Current foldback as all switches off for 10ms
  - Audible noise free PWM dimming
- Analog dimming voltage range: 0.7V~2.5V
- OVP fault protection and reporting
- Inherent LED open-circuit/short-circuit protection
- Thermal shutdown protection
- Under voltage lockout (UVLO)

APPLICATIONS

- Dimming bulb and color dimming
- Automotive environment lighting
- Architectural LED lighting
- Outdoor building color lighting
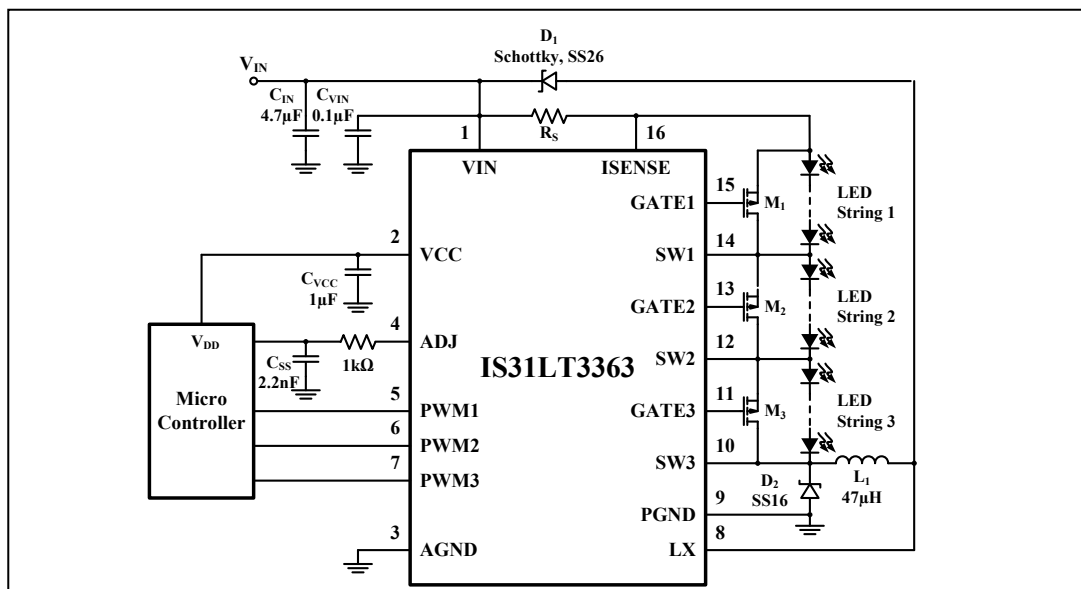- Stage light, RGB floodlight/wall washer
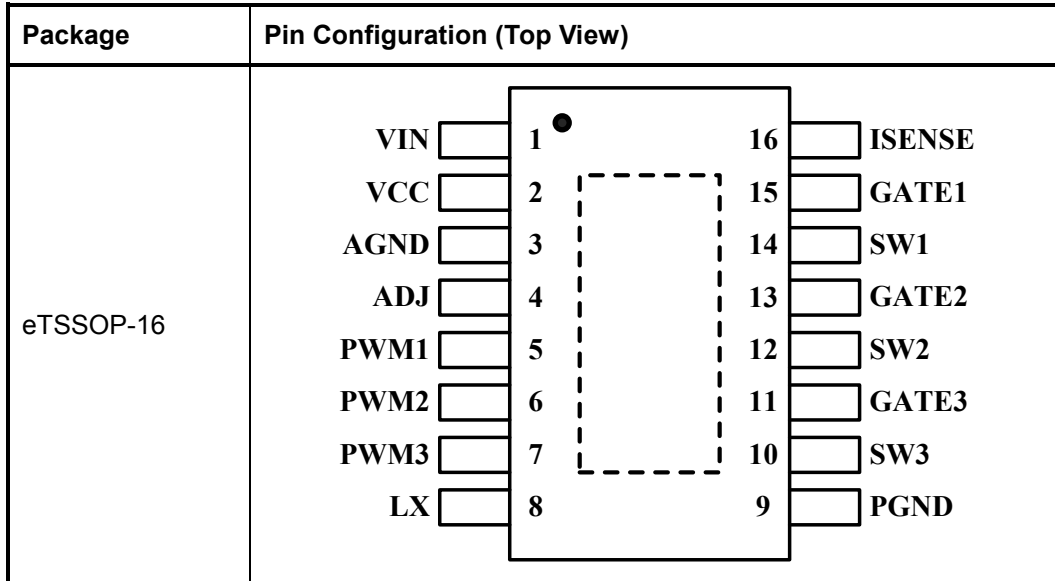
TYPICAL APPLICATION CIRCUIT

Figure 1 Typical Application Circuit

Note: The capacitor, C_{VIN}, can't be removed. And it should be placed as close as possible to the VIN and GND pins, otherwise the operation might be abnormal.

PIN CONFIGURATION

Package	Pin Configuration (Top View)
eTSSOP-16	VIN — 1 · · · 16 — ISENSE VCC — 2 · · · 15 — GATE1 AGND — 3 · · · 14 — SW1 ADJ — 4 · · · 13 — GATE2 PWM1 — 5 · · · 12 — SW2 PWM2 — 6 · · · 11 — GATE3 PWM3 — 7 · · · 10 — SW3 LX — 8 · · · 9 — PGND

PIN DESCRIPTION

No.	Pin	Description
1	VIN	Input voltage (6V ~ 36V).
2	VCC	3.3V LDO output for the external circuit.
3	AGND	Analog portion ground.
4	ADJ	Brightness control for Inductor current: - Leave floating for normal operation. (V_{ADJ} = V_{REF} = 2.5V giving nominal average output current I_{OUT_NOM} =0.1/R_S) - Drive to voltage below 0.6V to turn off output current - Drive with DC voltage (0.7V<V_{ADJ} <2.5V) to adjust output current from 0 to 100% of I_{OUT_NOM} - Drive with PWM signal to adjust output current. - When driving the ADJ pin above 2.5V, the current will be clamped to 100% brightness automatically. OVP protection fault condition reporting and reset pin.
5	PWM1	LED string 1 PWM dimming input signal. Internally pulled down by a 50kΩ resister to ground.
6	PWM2	LED string 2 PWM dimming input signal. Internally pulled down by a 50kΩ resister to ground.
7	PMW3	LED string 3 PWM dimming input signal. Internally pulled down by a 50kΩ resister to ground.
8	LX	Switch node for high side buck regulator.
9	PGND	Power ground.
10	SW3	Bypass switch node for string 3.
11	GATE3	Gate drive for PMOS 3.
12	SW2	Bypass switch node for string 2.
13	GATE2	Gate drive for PMOS 2.
14	SW1	Bypass switch node for string 1.
15	GATE1	Gate drive for PMOS 1.
16	ISENSE	Connect resistor R_S from this pin to VIN to define current.