

## Universal High Brightness LED Driver

### FEATURES

- Switch mode controller for single switch LED drivers
- Open loop peak current controller
- Internal 15V to 500V linear regulator
- Constant frequency or constant off-time operation
- Linear and PWM dimming capability
- Requires few external components for operation
- Over current protection
- Maximum power supply voltage up to 20V

### TYPICAL APPLICATIONS

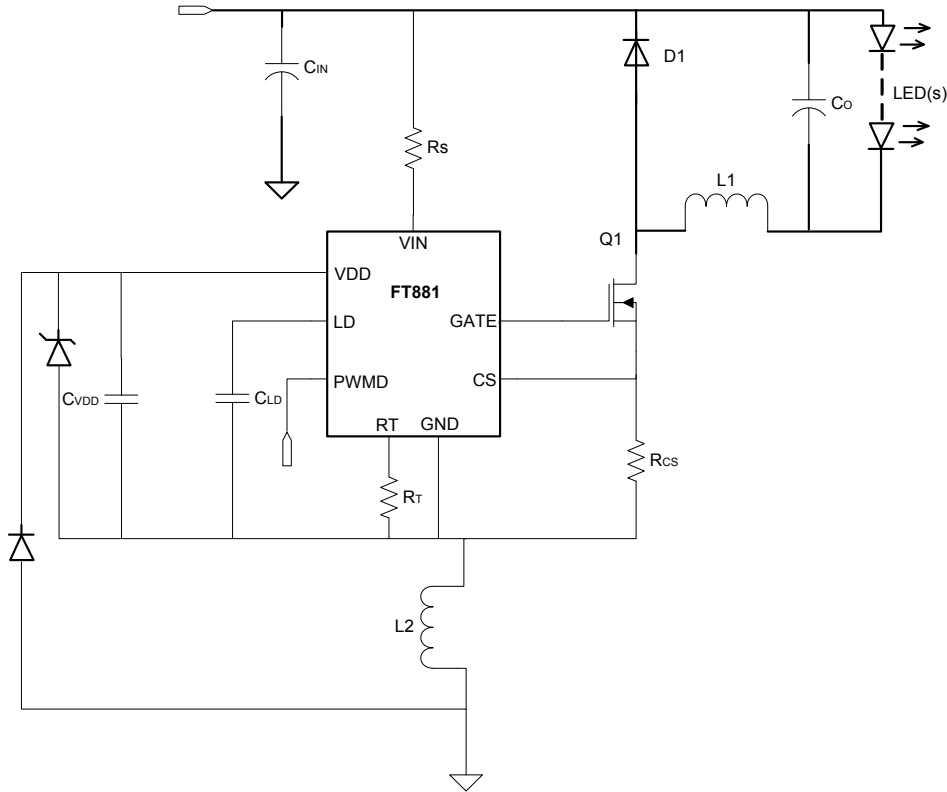
- DC/DC or AC/DC LED Driver Applications
- RGB Backlighting LED Driver
- Back Lighting of Flat Panel Displays
- General Purpose Constant Current Source
- Signage and Decorative LED Lighting
- Chargers

### DESCRIPTION

The FT881 is an open loop current mode control LED driver IC. The FT881 can be programmed to operate in either a constant frequency or constant off-time mode. It includes a 15-500V linear regulator which allows it to work from a wide range of input voltages without the need for an external low voltage supply. The FT881 includes a PWM dimming input that can accept an external control signal with a duty ratio of 0-100% and a frequency of up to a few kilohertz. It also includes a 0-250mV linear dimming input which can be used for linear dimming of the LED current and over temperature protection is easy to be implemented via this pin.

The FT881 is ideally suited for buck LED drivers. Since the FT881 operates in open loop current mode control, the controller achieves good output current regulation without the need for any loop compensation. PWM dimming response is limited only by the rate of rise and fall of the inductor current, enabling very fast rise and fall times. The FT881 requires only three external components (apart from the power stage) to produce a controlled LED current making it an ideal solution for low cost LED drivers.

**TYPICAL APPLICATION CIRCUIT**



**Figure 1: Typical Application Circuit**

**ABSOLUTE MAXIMUM RATINGS**

VIN to GND .....	-0.3V to +500V
CS to GND .....	-0.3V to +6V
GATE to GND.....	-0.3V to +25V
PWMD to GND .....	-0.3V to +6V
VDD to GND.....	-0.3V to +25V
LD to GND.....	-0.3V to +6V
RT to GND.....	-0.3V to +25V
Operating Temperature Range .....	-40°C to +125°C
Junction Temperature.....	-40°C to +150°C
Storage Temperature Range .....	-60°C to +150°C

**Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.**

**PIN CONFIGURATION**

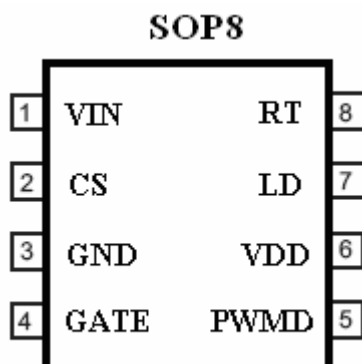


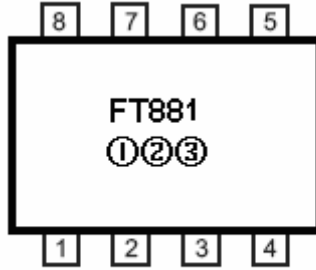
Figure 2: Pin Configuration (Top View)

**TERMINAL FUNCTIONS**

Pin	Name	Description
1	VIN	This pin is the input of a 15V-500V linear regulator.
2	CS	This pin is the current sense pin used to sense the FET current by means of an external sense resistor. When this pin exceeds the lower of either the internal 250mV or 10 percents of the voltage at the LD pin, the gate output goes low. When this pin is higher then 350mV, the IC will be latch until UVLO.
3	GND	Ground
4	GATE	Gate driver output to drive the external MOSEFET
5	PWMD	This is the PWM dimming input of the IC. When this pin is pulled to GND, the gate driver is turned off. When the pin is pulled high, the gate driver operates normally. Internal 100KΩ resistor pulls it up to 5V.
6	VDD	This is the power supply pin for all internal circuits. It must be bypassed with a low ESR capacitor to GND.
7	LD	This pin is the linear dimming input and sets the current sense threshold as long as the voltage at the pin is less than 2.5V (typ). When this pin is lower then 0.5V, Gate will be pull down, until its voltage raise to 1V.
8	RT	This pin sets the oscillator frequency. When a resistor is connected between RT and GND, the FT881 operates in constant frequency mode. When the resistor is connected between RT and GATE, the IC operates in constant off-time mode.

Table 1

**MARKING RULING**



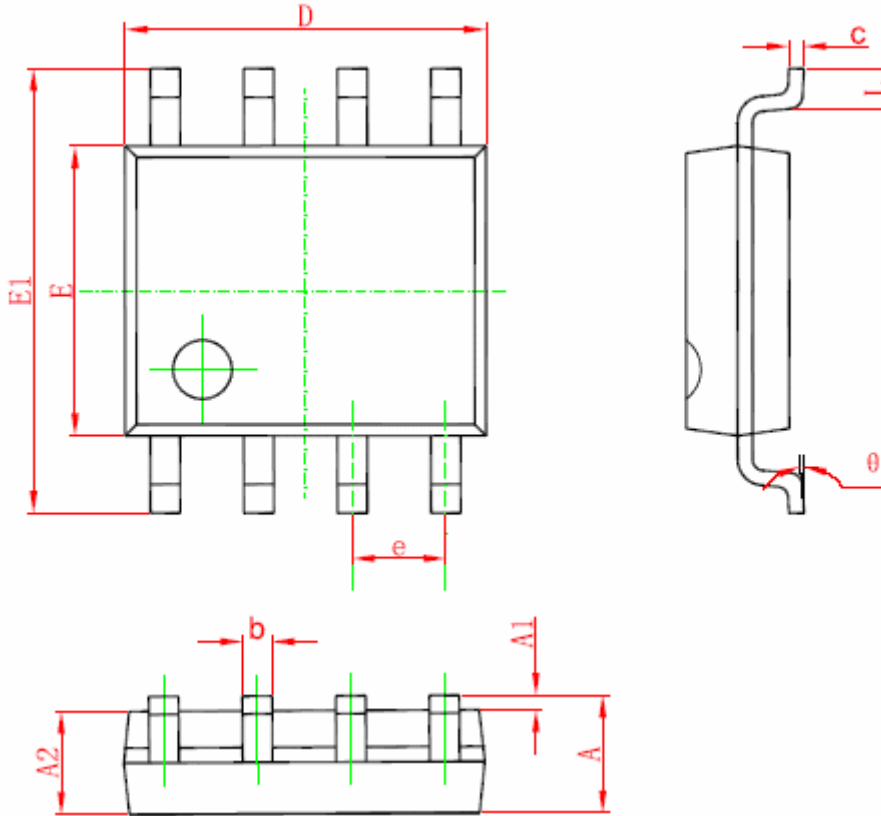
**TOP VIEW**

**Figure 3**

①②③ for internal reference

**PACKAGE INFORMATION**

SOP8 Package



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

## **APPENDIX A: REVISION HISTORY**

### **Version A0:**

Original data sheet for the FT881.

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