

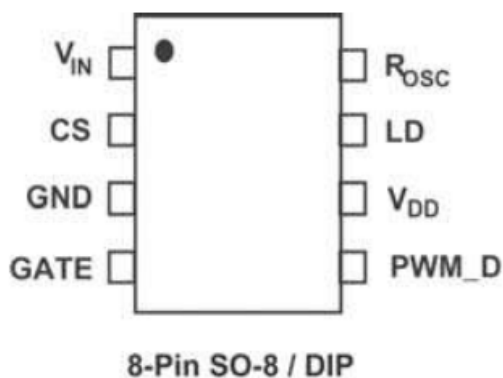
Features

- >90% efficiency
- 10V to 600V input range
- Constant-current LED driver
- Applications from a few mA to more than 1A output
- LED string from one to hundreds of diodes
- Linear and PWM dimming capability
- Input voltage surge ratings up to 600V

Applications

- DC/DC or AC/DC LED driver applications
- RGB backlighting LED driver
- Backlighting of flat panel displays
- General-purpose constant current source
- Signage and decorative LED lighting
- Automotive
- Chargers

Package Pin Out



General Description

The LD7101 is a PWM high-efficiency LED driver control IC. It allows efficient operation of high-brightness (HB) LEDs from voltage sources ranging from 10VDC up to 600VDC.

The LD7101 controls an external MOSFET at fixed switching frequencies up to 300 kHz. The frequency can be programmed using a single resistor.

The LED string is driven at a constant current rather than a constant voltage, thus providing a constant light output and an enhanced reliability. The output current can be programmed between a few milliamps and up to more than 1.0A.

The LD7101 uses a rugged high-voltage junction isolated process that can withstand an input voltage surge up to 600V. The output current to a LED string can be programmed to any value between zero and its maximum value by applying an external control voltage at the linear dimming control input of the LD7101.

The LD7101 provides a low-frequency 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.

Ordering Information

Part No.	Package	Packing Options	
		Tube (TU)	Tape & Reel (TR)
LD7101	SOP-8	LD7101S1-TU	LD7101S1-TR

- Package material default is "Green" package.

Product Marking

LD8888
SSSSS...

- ◇ Line 1 – "LD" is a fixed character
8888: product name
- ◇ Line 2 – SSSSS...: lot number

Absolute Maximum Ratings

Parameter	Maximum	Unit
V _{IN} to GND	-0.5 to +600	V
CS, LD, PWM_D, GATE to GND	-0.3 to V _{DD} +0.3	V
Operating Temperature range	-40 to +85	°C
Power dissipation T _A = +25°C DIP-8	900	mW
Power dissipation T _A = +25°C SOP-8	630	mW
Power dissipation de-rating DIP-8	9	mW/°C
Power dissipation de-rating SOP-8	6.3	mW/°C
Junction Temperature	125	°C
Storage Temperature	-65 to +150	°C

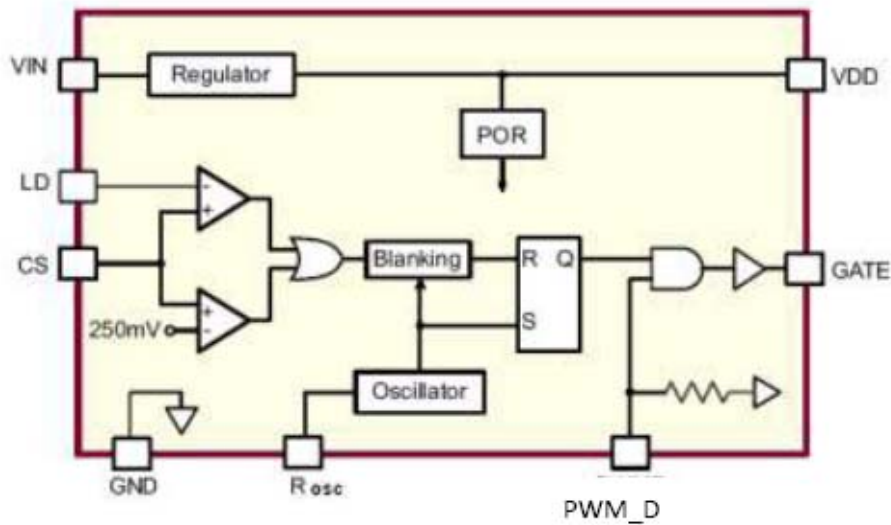
The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

Electrical Characteristics

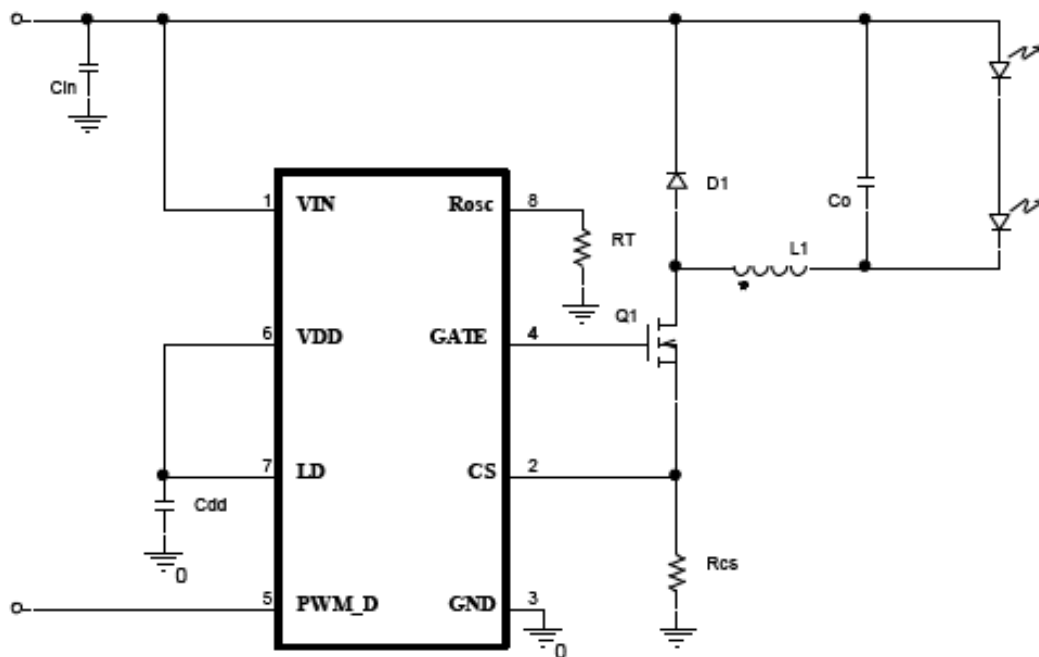
T_A=25°C unless specified, otherwise minimum and maximum values are guaranteed by production testing requirements.

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Input						
Input DC supply voltage range	V _{INDC}	DC input voltage	10.0	–	600	V
Shut-down mode supply current	I _{INSD}	Pin PWM_D to GND, V _{IN} = 8V	0.5	–	1	mA
Regulator						
Internally regulated voltage	V _{DD}	V _{IN} = 10 to 600V, I _{DD(ext)} =0, pin Gate open	7.0	7.5	8.0	V
Load regulation of V _{DD}	ΔV _{DDLOAD}	I _{DDEXT} = 0 to 1.0mA, 500pF at GATE; R _{OSC} = 226kΩ, PWM_D = V _{DD}	0	–	100	mV
Maximal pin V _{DD} voltage	V _{DDMAX}	When an external voltage is applied			10.0	V
V _{DD} current available for external circuitry	I _{DDEXT}	V _{IN} =10 to 100V			0.7	mA
V _{DD} under voltage lockout threshold	UVLO	V _{IN} rising	6.45	6.7	6.95	mV
V _{DD} under voltage lockout hysteresis	ΔUVLO	V _{IN} falling	–	500	–	mV
PWMD (Digital Dimming)						
Pin PWM_D input low voltage	V _{EN(lo)}	V _{IN} = 10 to 450V	–	–	0.8	V
Pin PWM_D input high voltage	V _{EN(hi)}	V _{IN} = 10 to 450V	2.0	–	–	V
Pin PWM_D pull-down resistance	R _{EN}	V _{EN} = 5V	50	100	150	KΩ
Current Sense Comparator						
Current sense pull-in threshold voltage	V _{CS(hi)}	–	225	250	275	mV
GATE						
GATE high output voltage	V _{GATE(hi)}	I _{OUT} = 10mA	V _{DD} -0.3	–	V _{DD}	V
GATE low output voltage	V _{GATE(lo)}	I _{OUT} = -10mA	0	–	0.3	V
GATE output rise time	t _{RISE}	C _{GATE} = 500pF, V _{DD} = 7.5V	30	–	50	nS
GATE output fall time	t _{FALL}	C _{GATE} = 500pF, V _{DD} = 7.5V	30	–	50	nS
Oscillator						
Oscillator frequency	f _{OSC}	R _{OSC} = 1.00MΩ	20	25	30	KHz
		R _{OSC} = 226KΩ	80	100	120	
Maximum Oscillator PWM Duty Cycle	D _{MAXhf}	F _{PWM hf} = 25kHz, at GATE, CS to GND	–	100%	–	
Pin LD (Linear Dimming) voltage range	V _{LD}	T _A = <85 C, V _{IN} = 12V	0	–	250	mV
Current sense blanking interval	T _{BLANK}	V _{CS} = 0.55V _{LD} , V _{LD} = V _{DD}	150	215	280	nS
Delay from CS to GATE lo	t _{DELAY}	V _{IN} = 12V, V _{LD} = 0.15, V _{CS} = 0 to 0.22V after T _{BLANK}	–	–	300	nS

Block Diagram

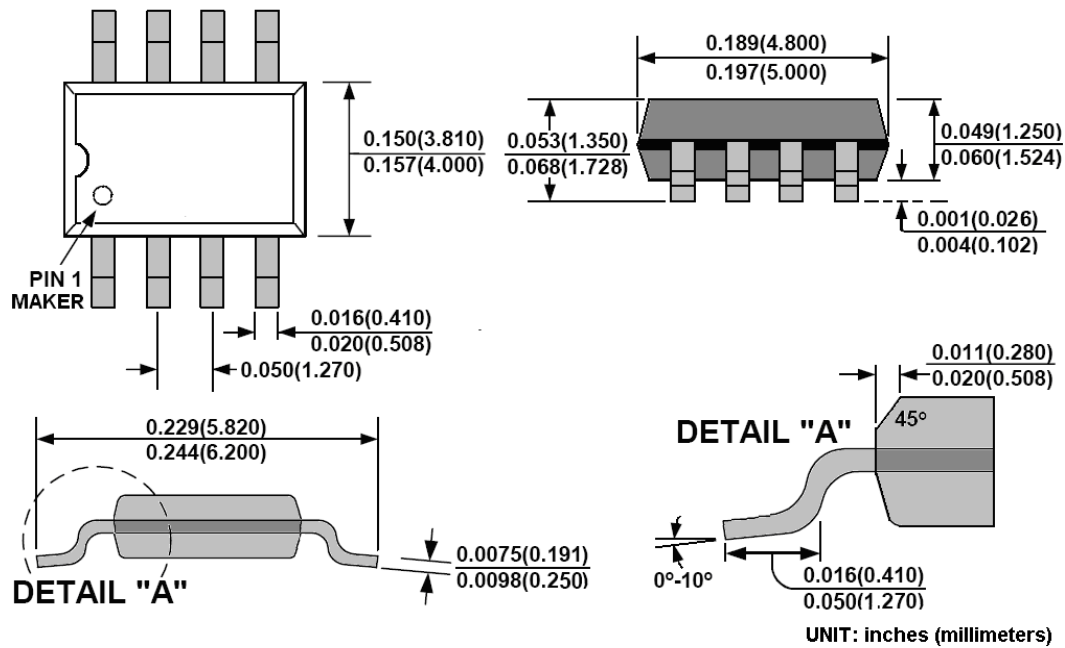


Typical Application Circuit



Package Outline

SOP8:

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