

Features

- Wide input voltage range 9V~450V
- Internal 450V linear regulator (can be extended using external zener diodes)
- Very low operating current <2mA
- Internal 2% voltage reference
- 0% ~ 100% linear PWM signal
- Wide frequency range: 2KHz~13KHz
- Very few components for low cost solution
- +0.2A/-0.4A OUT drive
- Soft start

Applications

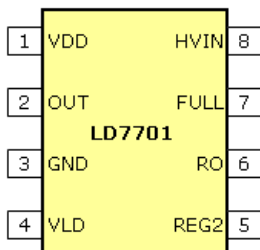
- Battery powered LED lamps
- Table light with dimming control

General Description

LD7701 is a wide ranged input voltage PWM generator embedded with regulators. It needs very few external components to build a consumer product. Its PWN control can be full range controlled within 0%~100%. LD7701 can be applied on a low cost, limited space dimming control product.

For high power applications, the IC also comprises a 0.2A source and 0.4A sink OUT driver. There is an internal 9 to 450V linear regulator which powers the IC. This makes it no longer necessary to separate power supply for the IC.

Package Pin Out



Ordering Information

Part No.	Package	Packing Options	
		Tube(TU)	Tape & Reel(TR)
LD7701	SOP-8	LD7701S1-TU	LD7701S1-TR

- Package material default is "Green" package.

Product Marking

LD8888	◇ Line 1 – "LD" is a fixed character
SSSSS...	8888: product name
●	◇ Line 2 – SSSSS...: lot number

Absolute Maximum Ratings

Parameter	Maximum	Unit
HVIN to GND	-0.5~+450	V
VDD to GND	-0.3~+13.5	V
OUT to GND	-0.3~VDD+0.3	V
All other pins to GND	-0.3~VDD+0.3	V
Continuous Power Dissipation (T _A = +25°C)		
8-Pin SOIC, de-rate 10.0mW/°C above +25°C	1000	mW
Junction to ambient thermal impedance	82	°C/W
Operating ambient temperature range	-40~+85	°C
Junction temperature	+125	°C
Storage temperature range	-65~+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

HVIN=24V, 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	HV _{IN}	DC input voltage	9 ^{*1}	–	450	V
Shut-down mode supply current	I _{INSD}	HVIN = 24V	–	1.0	1.5	mA
Internal Regulator						
Internally regulated voltage	V _{DD}	HVIN = 9~450V, IDD(ext) = 0	7.25	7.75	8.25	V
External voltage applied on VDD ^{*2}	V _{DD(ext)}	steady state external voltage	–	–	12	V
Reference						
REG2 pin voltage	V _{REG2}	REG2 to GND with 0.1μF; VDD = 7.75V	1.225	1.25	1.275	V
Line regulation of REG2 voltage	V _{REG2LINE}	REG2 to GND with 0.1μF; VDD = 7.25 – 12V	0	–	20	mV
Load regulation of REG2 voltage	V _{REG2LOAD}	REG2 to GND with 0.1μF	0	–	20	mV
OUT						
OUT short circuit current	I _{SOURCE}	V _{OUT} = 0V; V _{DD} = 7.75V	0.2	–	–	A
OUT sinking current	I _{SINK}	V _{OUT} = 7.75V; V _{DD} = 7.75V	0.4	–	–	A
OUT output rise time	T _{RISE}	C _{OUT} = 1nF; V _{DD} = 7.75V	–	50	85	ns
OUT output fall time	T _{FALL}	C _{OUT} = 1nF; V _{DD} = 7.75V	–	25	45	ns
Oscillator						
Oscillator frequency	f _{OSC1}	RO = 5MΩ	11.7	13	14.3	KHz
	f _{OSC2}	RO = 30MΩ	1.8	2	2.2	
Soft Start						
Current into VLD pin when pulled low	I _{VLD}	6.25KΩ between REG2 and VLD	–	–	200	μA
FULL cut off voltage	V _{FULL}	OUT go high	5.5	6.0	6.5	V

Notes:

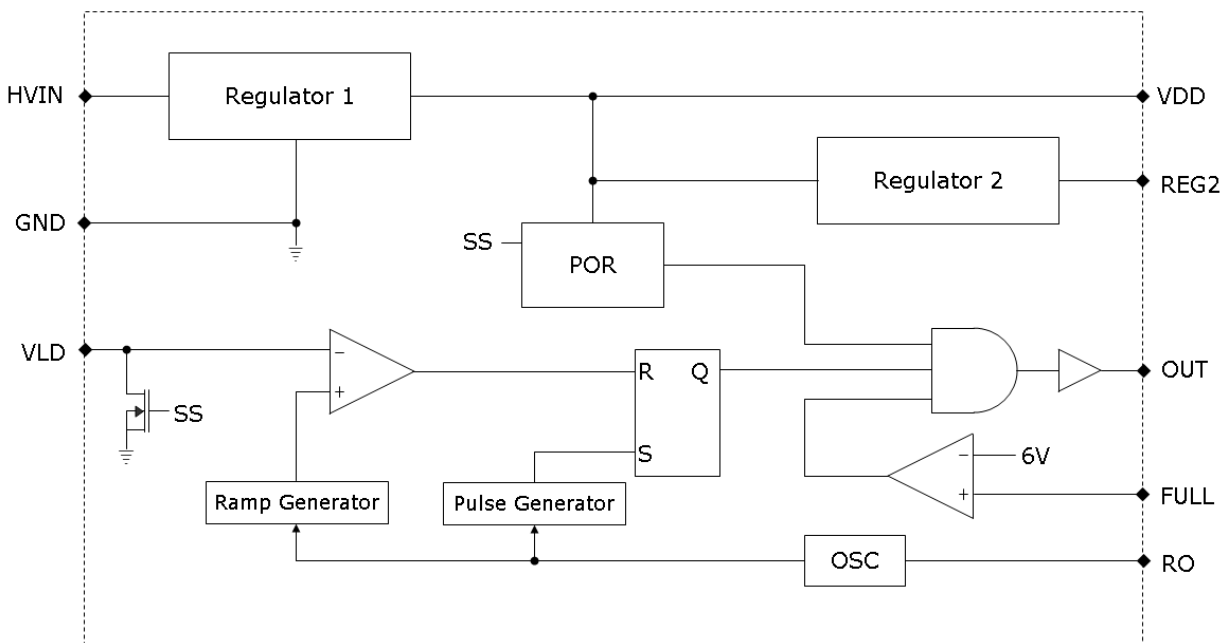
1. See application section for minimum input voltage

2. Parameters are not guaranteed to be within specifications if the external VDD voltage is greater than VDD(ext) or if VDD < 7.25V.

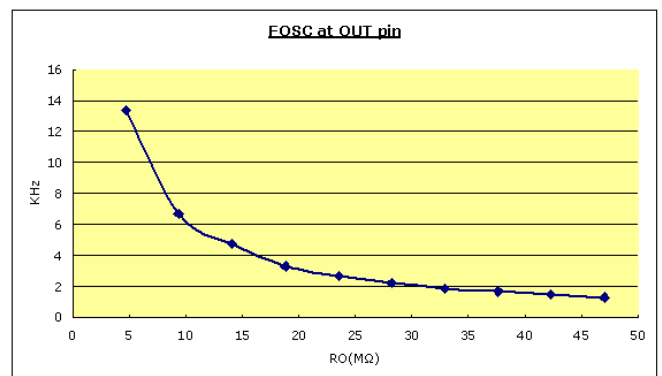
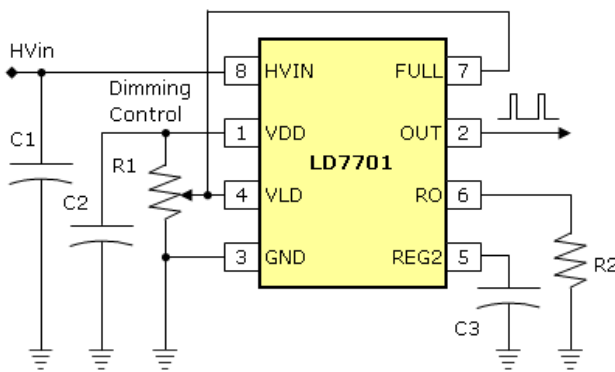
Pin Description

Pin #	Name	Description
1	VDD	This is a power supply pin for all internal circuits. It must be bypassed with a low ESR capacitor to GND (at least 0.1uF).
2	OUT	This pin is the PWM output signal.
3	GND	Ground return for all circuits. This pin must be connected to the return path from the input.
4	VLD	This pin provides the adjustment of PWM pulse width.
5	REG2	This pin provides 2% accurate reference voltage. It must be bypassed with at least a 10nF - 0.22uF capacitor to GND.
6	RO	This pin sets the frequency by an external resistor between RO and GND.
7	FULL	This pin provides voltage to the comparator. When the voltage at this pin exceeds 6V, the OUT will be turned off.
8	HVIN	This pin is the input of a 450V high voltage regulator.

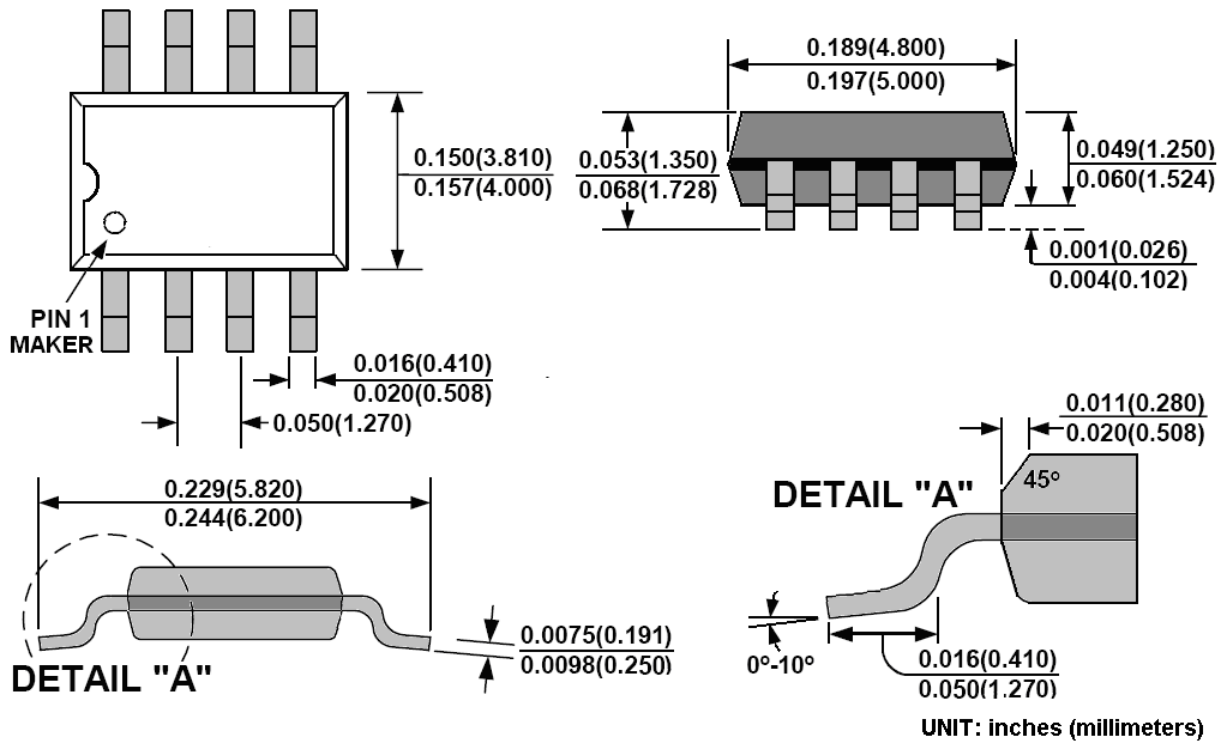
Functional Block Diagram



Typical Application Circuit



Package Outline



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