



### Features

- >90% Efficiency
- 8V to 450V input range
- Constant-current LED driver
- Applications from a few mA to more than 1A Output
- LED string from one to hundreds of diodes
- PWM Low-Frequency Dimming via Enable pin
- Input Voltage Surge ratings up to 450V

### Description

The DP9910 is a PWM high-efficiency LED driver control IC. It allows efficient operation of High Brightness (HB) LEDs from voltage sources ranging from 8VDC up to 450VDC. The DP9910 controls an external MOSFET at fixed switching frequency up to 300 kHz. The frequency can be programmed using a single resistor. The LED string is driven at constant current rather than constant voltage, thus providing constant light output and enhanced reliability. The output current can be programmed between a few milliamps and up to more than 1.0A.

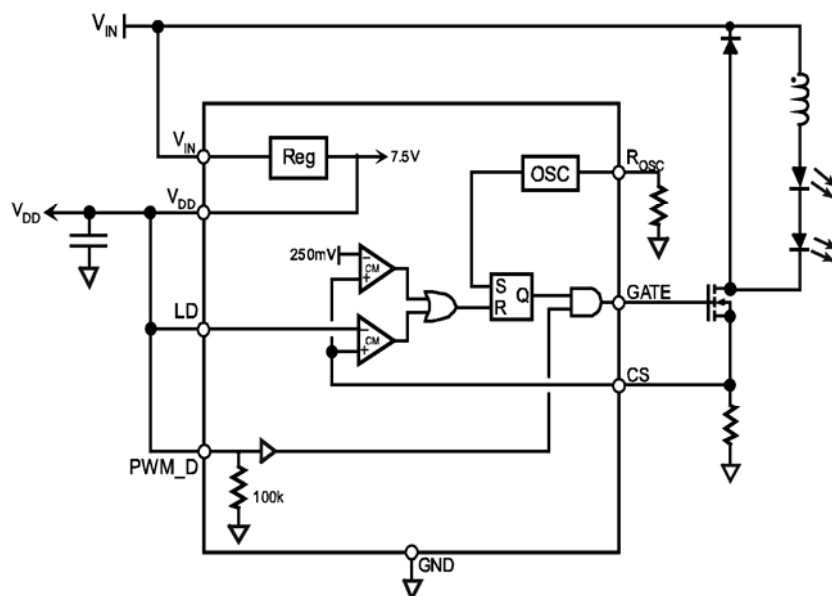
### Specifications (T<sub>A</sub> = 25°C unless noted otherwise)

Symbol	Description	Min	Typ	Max	Units	Conditions
V <sub>INDC</sub>	Input DC supply voltage range	8.0		450	V	DC input voltage
I <sub>INsd</sub>	Shut-Down mode supply current		0.5	1	mA	Pin PWM_D to GND, V <sub>IN</sub> = 8V
V <sub>DD</sub>	Internally regulated voltage	7.0	7.5	8.0	V	V <sub>IN</sub> = 8-450V, I <sub>DD(ext)</sub> = 0, pin Gate open
V <sub>DDmax</sub>	Maximal pin V <sub>DD</sub> voltage			13.5	V	When an external voltage applied to pin V <sub>DD</sub>
I <sub>DD(ext)</sub>	V <sub>DD</sub> current available for external circuitry <sup>1</sup>			1.0	mA	V <sub>IN</sub> = 8-100V
UVLO	V <sub>DD</sub> undervoltage lockout threshold	6.45	6.7	6.95	V	V <sub>IN</sub> rising
ΔUVLO	V <sub>DD</sub> undervoltage lockout hysteresis		500		mV	V <sub>IN</sub> falling
V <sub>EN(lo)</sub>	Pin PWM_D input low voltage			1.0	V	V <sub>IN</sub> = 8-450V
V <sub>EN(hi)</sub>	Pin PWM_D input high voltage	2.4			V	V <sub>IN</sub> = 8-450V
RLN	Pin PWM_D pull-down resistance	50	100	150	kΩ	V <sub>EN</sub> = 5V
V <sub>CS(hi)</sub>	Current sense pull-in threshold voltage	225	250	275	mV	@T <sub>A</sub> = -40°C to +85°C
V <sub>GATE(hi)</sub>	GATE high output voltage	V <sub>DD</sub> -0.3		V <sub>DD</sub>	V	I <sub>OUT</sub> = -10 mA
V <sub>GATE(lo)</sub>	GATE low output voltage	0		0.3	V	I <sub>OUT</sub> = 10 mA
fosc	Oscillator frequency	20 80	25 100	30 120	kHz	Rosc = 1.00 MΩ Rosc = 223 kΩ
D <sub>MAXht</sub>	Maximum Oscillator PWM Duty Cycle			100	%	F <sub>PWMhf</sub> = 25kHz, at GATE, CS to GND
V <sub>LD</sub>	Linear Dimming pin voltage range	0		250	mV	@T <sub>A</sub> = <85°C, V <sub>IN</sub> = 12V
T <sub>BLANK</sub>	Current sense blanking interval	150	215	280	ns	V <sub>CS</sub> = 0.55V <sub>LD</sub> , V <sub>LD</sub> = V <sub>DD</sub>
t <sub>DELAY</sub>	Delay from CS trip to GATE lo			300	ns	V <sub>IN</sub> = 12V, V <sub>LD</sub> = 0.15, V <sub>CS</sub> = 0 to 0.22V after T <sub>BLANK</sub>
t <sub>RISE</sub>	GATE output rise time <sup>2</sup>		30	50	ns	C <sub>GATE</sub> = 500pF, 10% to 90% V <sub>GATE</sub>
t <sub>FALL</sub>	GATE output fall time <sup>2</sup>		30	50	ns	C <sub>GATE</sub> = 500pF, 90% to 10% V <sub>GATE</sub>

note<sup>1</sup> Also limited by package power dissipation limit, whichever is lower



## Block Diagram & Typical Application



## Pin Description

1	VIN	RT	8
2	CS	LD	7
3	GND	VDD	6
4	GATE	PWMD	5

**8-Lead SO**  
(top view)