

## Descriptions

The DW8520 is ideally suited for buck converter topology LED driver IC.

It includes an 9V~16V linear regulator which allows it to work from a wide range of input voltages without the need for an external low voltage supply.

The DW8520 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.

The DW8520 is available in a thermally enhanced 8 pin SOIC package.

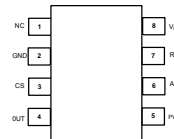
## Ordering Information

Device	Marking	Package	Operating Temp
DW8520	DW8520 YWW	8 SOIC	-35°C ~ +85°C

## Features

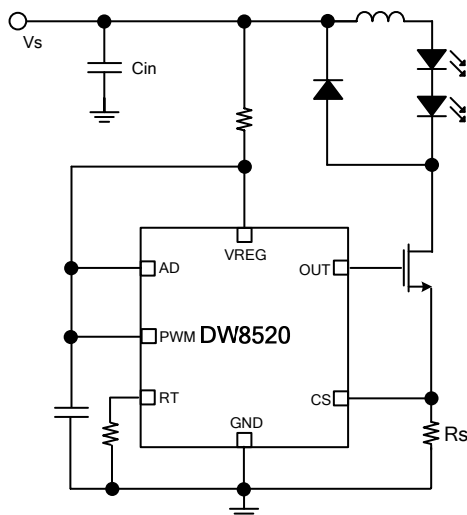
- Buck converter topology LED drivers
- Internal zener regulator
- Constant frequency or constant off-time operation
- Linear and PWM dimming capability
- Open loop peak current controller
- High efficiency up to 90%
- Power down to 1mA maximum
- Thermally enhanced 8-lead SOIC package

## Package Information

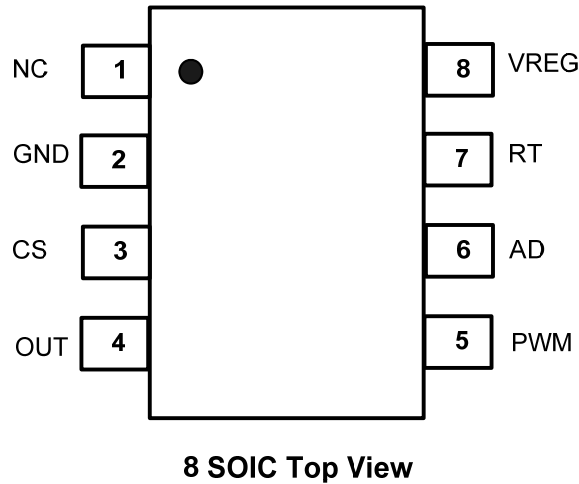


Package	Size
8 SOIC	4.9 x 6.0 x 1.4 (mm)

## Typical Application Circuit



**Pin Connection**



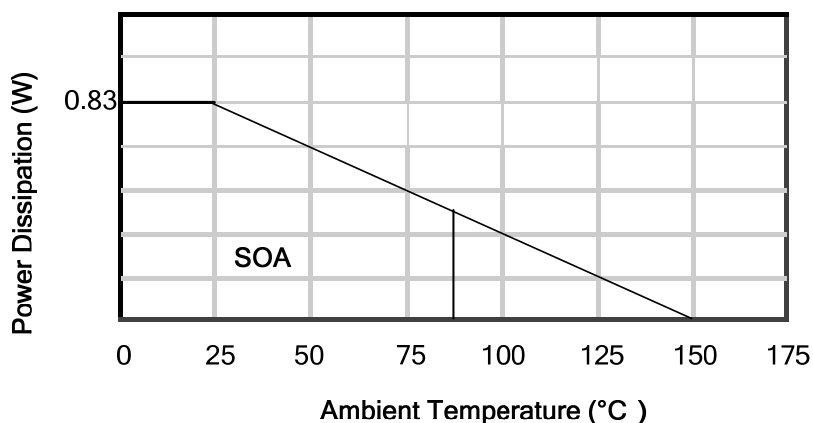
**Pin Description**

Pin No.	Symbol	I/O	Description
1	NC	-	No connection
2	GND	-	Ground
3	CS	I	Current sense Pin. The Maximum current is sensed by a resistor and the resulting voltage is applied to this pin
4	OUT	O	This is the output gate driver for external MOSFET
5	PWM	I	PWM Dimming control Pin, Active high operates the device, If PWM function not used the pin must connect to VREG, When open the pin, The device disable by internal pull down resistor
6	AD	I	This pin sets the analog dimming (0~1.5V)
7	RT	I	This pin sets the oscillator frequency.
8	VREG	-	This is input supply for all internal circuits

### Absolute Maximum Ratings

Characteristics	Symbol	Value	Unit
$V_{REG}$ , to GND	-	17	V
CS, AD, PWM, OUT, RT	-	-0.3 to ( $V_{REG}+0.3V$ )	V
Operating Temperature	$T_{OPR}$	-35 ~ 85	°C
Storage Temperature	$T_{STG}$	-55 ~ 150	°C

### Power Dissipation Curve



### Recommended Operation Conditions

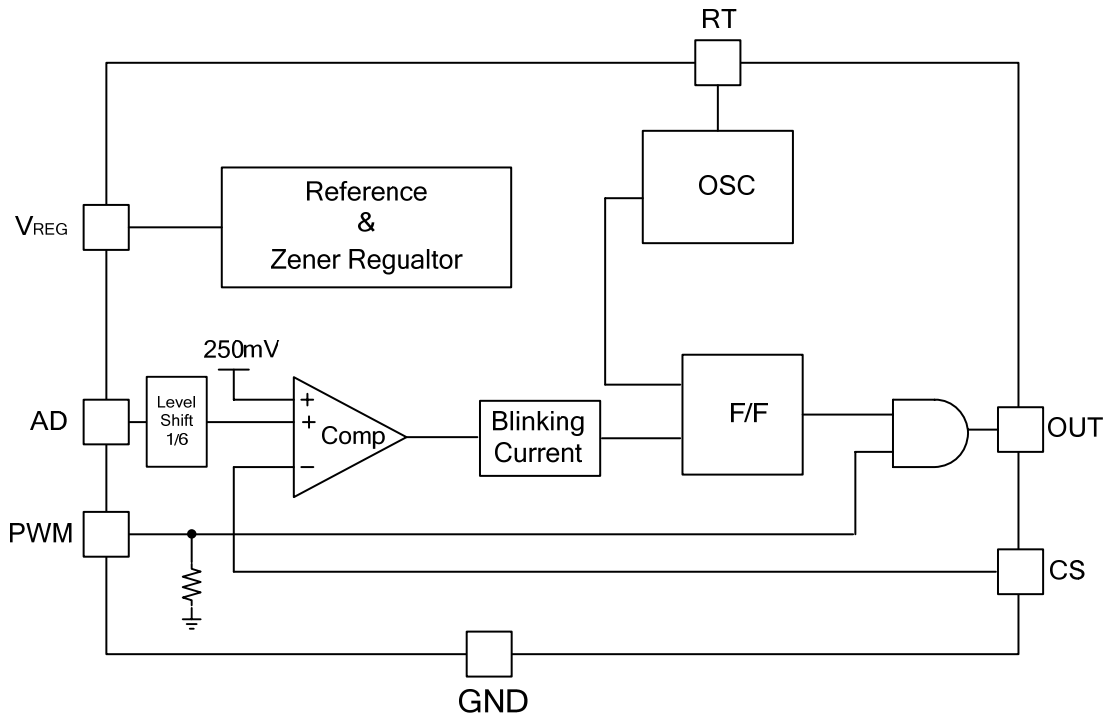
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Input Voltage Range	$V_{REG}$	9	-	16	V
Operating Ambient Temperature Range	-	-35	25	85	°C

## Electrical Characteristics

( $V_{REG}=14V$ , unless otherwise noted. Typical values are at  $T_A=+25^\circ C$ .)

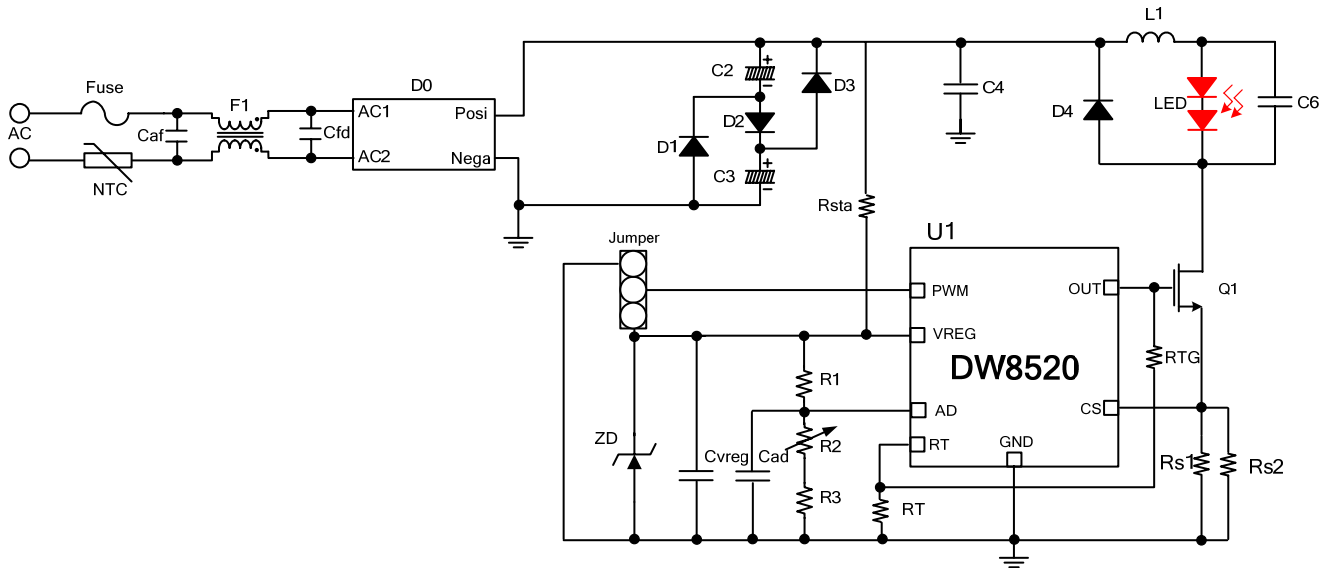
Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Supply Voltage	$V_{IN}$	-	9	-	16	V
Shutdown Current	$I_{SD}$	PWM=0V, $V_{REG}=7V$	-	0.5	1	mA
Internally Regulated Voltage	$V_{CC}$	-	4.25	4.5	4.75	V
Reference voltage	VRT	$V_{REG}=12V$	1.178	1.24	1.34	V
Voltage Level shift ratio in AD Pin	$\alpha_{AD}$	$V_{REG}=12V$	-	6	-	
<b>Zener Regulator</b>						
Zener Regulation Voltage	$V_{REG}$	$I_{REG}=1mA$	9.0	9.5	10.0	V
Maximum Compliance Current	$I_{REG\ max}$			15		mA
Line Regulation of $V_{REG}$	$V_{REG\ line}$	$V_{REG}=9V\sim 16V$ , $I_{CC}=0V$ PWM= $V_{REG}$		0.04		%/V
Load Regulation of $V_{REG}$	$V_{REG\ load}$	$I_{CC}=0\sim 1mA$ , PWM= $V_{REG}$		0.04		%/mA
$V_{REG}$ under voltage Lockout Threshold	UVLO	$V_{REG}$ rising	-	TBD	-	V
$\Delta V_{REG}$ under voltage Lockout Threshold	$\Delta UVLO$	$V_{REG}$ falling	-	TBD	-	mV
<b>PWM Dimming</b>						
Pin PWM Input Low Voltage	$V_{EN(L)}$	$V_{REG}=9V$ to 16V	-	-	1.0	V
Pin PWM Input High Voltage	$V_{EN(H)}$	$V_{REG}=9V$ to 16V	2.4	-	-	V
Pin PWM Pull-down Resistance	$R_{EN}$	$V_{PWM}=5.0V$	50	100	150	K $\Omega$
<b>Current sense Comparator</b>						
Current Sense Pull-in Threshold Voltage	$V_{CS,TH}$	$-35^\circ C < T_A < +85^\circ C$	225	250	275	mV
		$T_A < +125^\circ C$	213	250	287	mV
Offset Voltage for $V_{CON}$ Comparator	$V_{OFFSET}$	-	-12	-	12	mV
Current Sense Blanking Interval	$T_{BLANK}$	-	150	215	280	ns
Delay to Output	$T_{DELAY}$	AD= $V_{REG}$ $V_{CS}=V_{CS,TH}+50mV$ after $T_{BLANK}$	-	80	150	ns
<b>Oscillator</b>						
Oscillator Frequency	$f_{OSC}$	$R_T=232k\Omega$	-	100	-	KHz
		$R_T=84k\Omega$	-	230	-	
<b>Gate Driver</b>						
Gate Sourcing Current	$I_{SOURCE}$	$V_{GATE}=0V$	0.165	-	-	A
Gate Sinking Current	$I_{SINK}$	$V_{GATE}=V_{REG}$	0.165	-	-	A
Gate output rise time	$t_{RISE}$	$C_{GATE}=500pF$	-	30	-	ns
Gate output fall time	$t_{FALL}$	$C_{GATE}=500pF$	-	30	-	ns

**Block Diagram**



**Application Information**

**Typical Application guide**



**Package Dimension**

8 SOIC Package (4.9x6.0mm)

(Unit : mm)

