



SP1938

DC-DC Step-Up Converter for White LED

DESCRIPTION

The SP1938 is a step-up DC/DC converter for white LED driver with over voltage protection. The device can driver one to four LEDs in series from a single cell Lithium Ion battery.

Internal functions include current limiting; thermal shutdown; OVP and soft-start to prevent damage operate status. The SP1938 operates at 0.8MHz apply to Lithium-Ion powered systems. A low 95mV reference voltage minimizes power loss in the current setting resistor for better efficiency.

The SP1938 is available in small package SOT-23-6L.

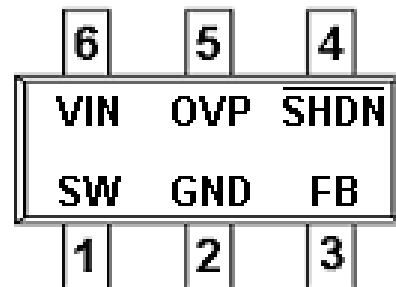
APPLICATIONS

- Battery Power Equipment
- Notebook Computers
- PDA
- Cellular Phone

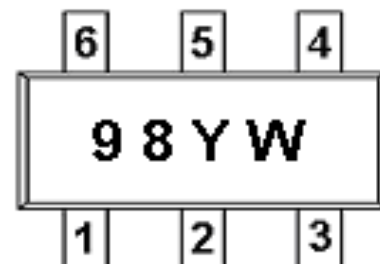
FEATURES

- Current Source with Over Voltage Protection
- Fast 0.8MHz Switching Frequency
- High Efficiency up to 87%
- Drives up to Four LEDs From 3.2V Supply
- Drives up to Six LEDs From a 5V Supply
- Low Quiescent Current
- Disconnects LEDs in Shutdown Mode
- Internal Over Temperature and Current Limiting ShutdownFunction
- Internal Soft-Start Circuit
- 26V Rugged Bipolar Switch
- ◆ Available in a Small SOT-23-6L Package

PIN CONFIGURATION(SOT-23-6L)



PART MARKING

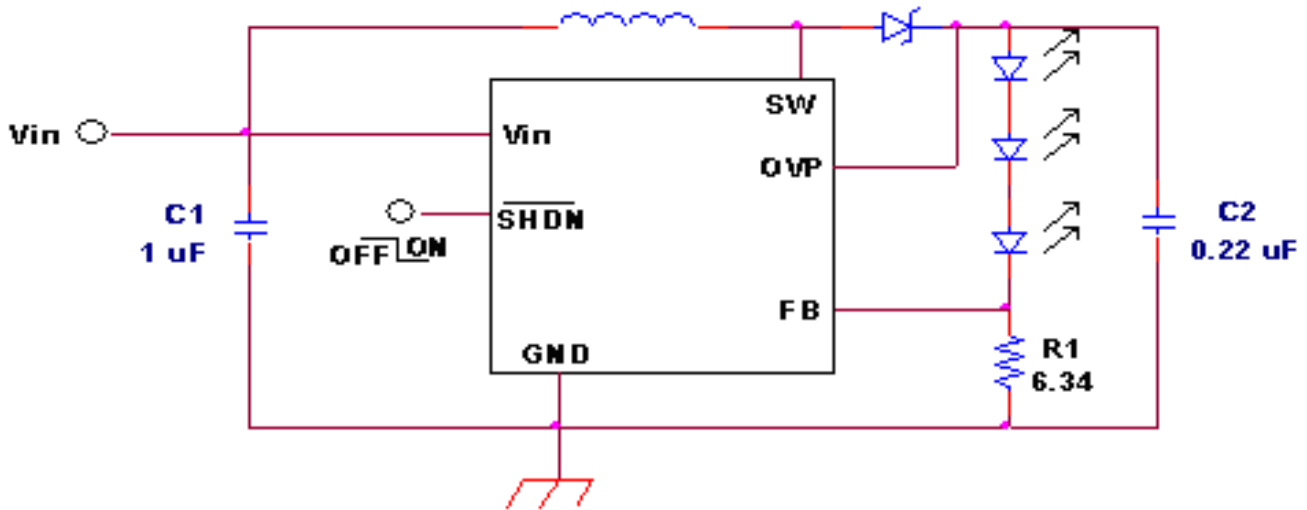


Y : Year Code
W : Week Code



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TYPICAL APPLICATION CIRCUIT



PIN DESCRIPTION

Pin	Symbol	Description
1	SW	Connect inductor/diode here
2	GND	Ground Pin
3	FB	Connect cathode of lowest LED and resistor here
4	SHDN	Combined active low enable and PWM control pin for LED dimming
5	OVP	Over voltage Protection and Connect to the output capacitor of the Converter
6	VIN	Supply Voltage Input

ORDERING INFORMATION

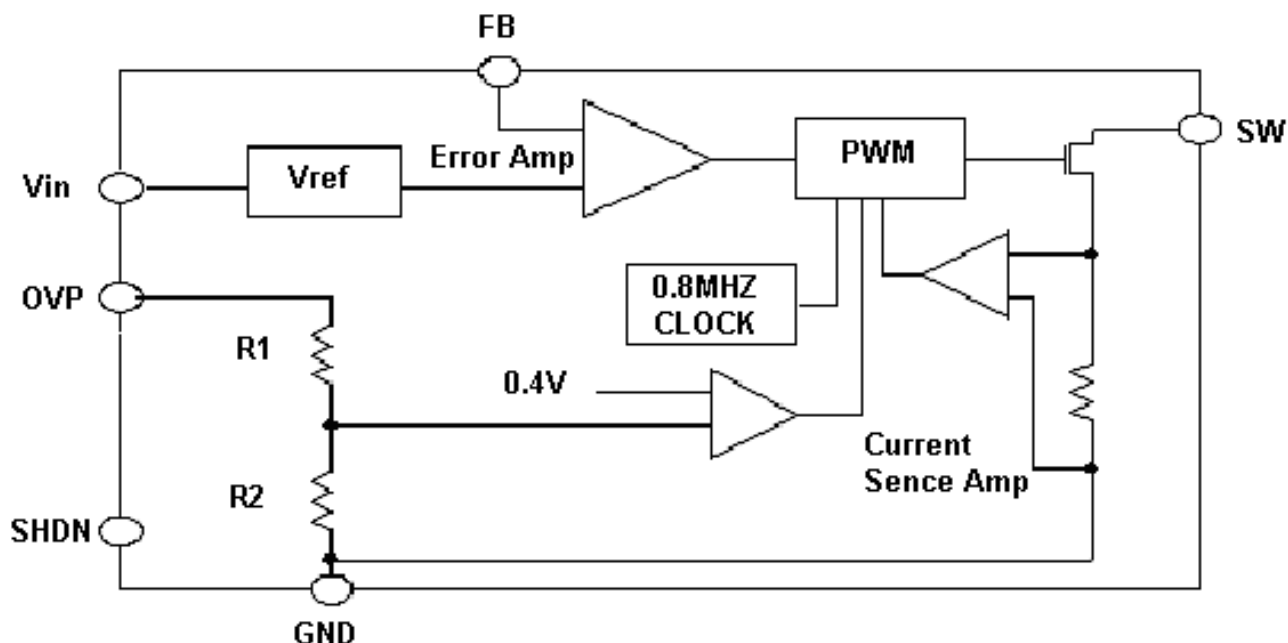
Part Number	Package	Part Marking
SP1938S26RGB	SOT-23-6L	98

- ※ Week Code : A ~ Z (1 ~ 26) ; a ~ z (27 ~ 52)
- ※ SP1938S26RGB : Tape Reel ; Pb – Free ; Halogen -Free



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BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

($T_A=25^{\circ}\text{C}$ Unless otherwise specified)

Parameter	Symbol	Value	Unit
DC Supply Voltage	V_{IN}	10	V
SW Voltage	V_{SW}	26	V
FB Voltage	V_{FB}	10	V
SHDN Voltage	V_{SHDN}	10	V
Operating Temperature	T_{OPR}	-40~85	$^{\circ}\text{C}$
Maximum Junction Temperature	$T_{J(Max)}$	125	$^{\circ}\text{C}$
Storage Temperature	T_S	-65~150	$^{\circ}\text{C}$

The IC has a protection circuit against static electricity. Do not apply high static electricity or high voltage that exceeds the performance of the protection circuit to the IC.



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ELECTRICAL CHARACTERISTICS

($T_A=25^{\circ}\text{C}$, $V_{\text{IN}}=3\text{V}$, $V_{\text{SHDN}}=3\text{V}$, Unless otherwise specified)

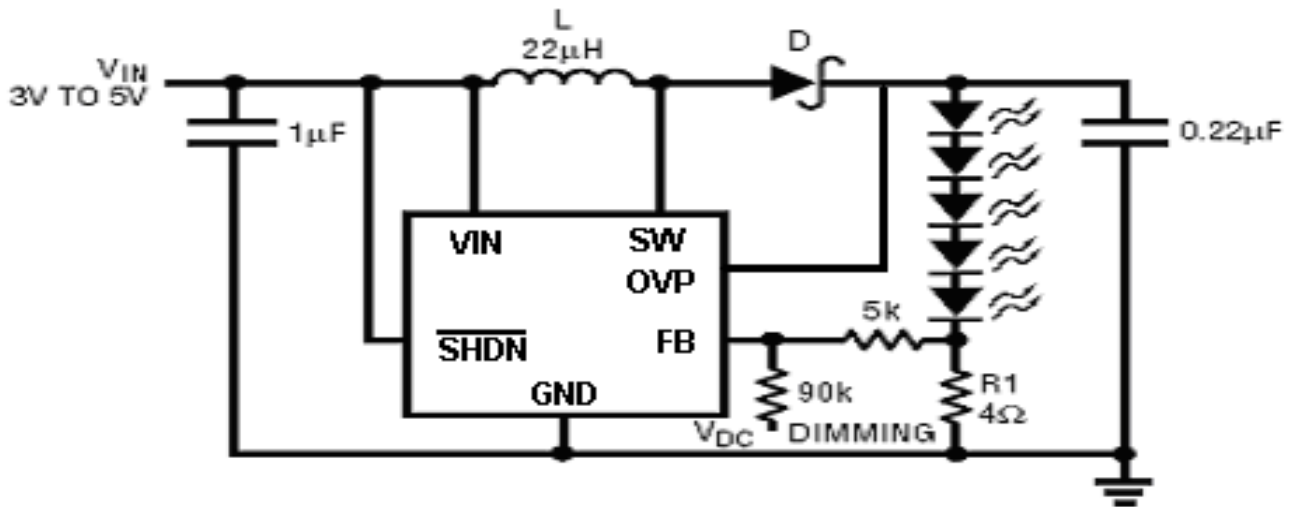
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Voltage		2.5		9	V
Feedback Voltage	$I_{\text{sw}}=100\text{mA}$, Duty Cycle = 66%	86		110	mV
FB Pin Bias Current				150	nA
Supply Current			2.8	3.5	mA
	$V_{\text{SHDN}} = 0\text{V}$		0.05	1.0	μA
Switching Frequency		0.8	1.2	1.6	MHz
Maximum Duty Cycle			85		%
Switch Current Limit			320		mA
Switch Leakage Current	$V_{\text{sw}}=5\text{V}$		0.01	5	μA
Switch Saturation Voltage	$I_{\text{sw}} = 200\text{mA}$		150		mV
SHDN Voltage High		1.5			V
SHDN Voltage Low				0.4	V
SHDN Pin Current			90		μA
Over Voltage Protection	V_{OUT} rising	18.4			V



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APPLICATION CIRCUIT

Li-Ion to Five White LEDs





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