DESCRIPTION

The RM1981 is a constant-current step-up converter specifically designed to drive white LEDs. The RM1981 can drive two, three, four or six LEDs in series from a Li-Ion cell. Series connection of the LEDs provides identical LED currents resulting in uniform brightness and eliminates the need for ballast resistors. The OLS pin is designed for detecting loose or open LED connections (OVP). When supplying a bias current of 20mA, the voltage drop across the sense resistor is only 0.25V to minimize power loss. The RM1981 is protected by current limit, OLS (OVP), thermal shutdown and under voltage lockout (UVLO).

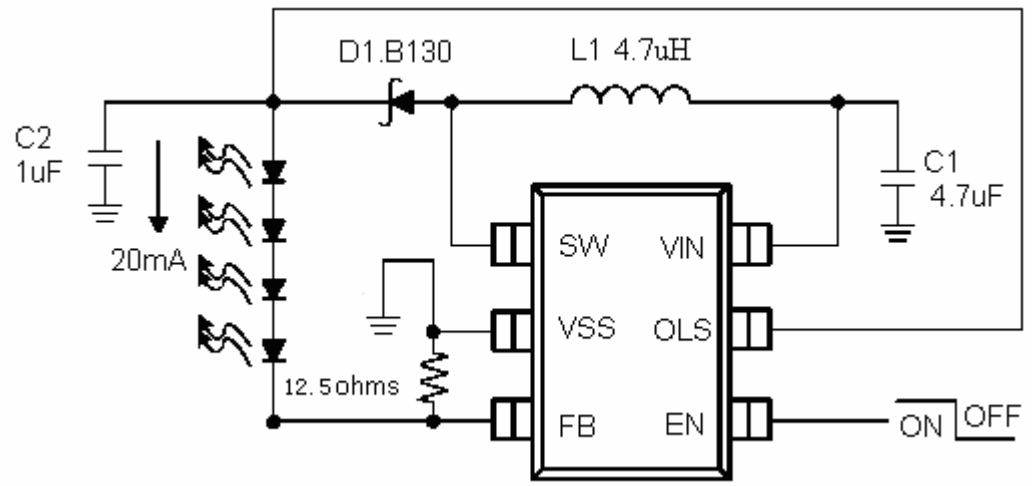
Applications

- Cellular Phones
- OLED MP3 Players
- LCD-TV
- CSTN LCD MP3 Players

FEATURES

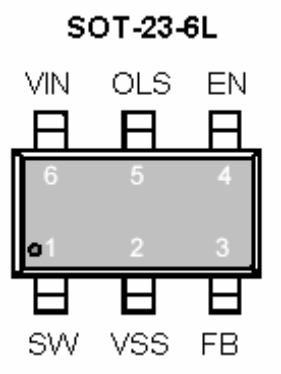
- Drives 4 String LEDs from 2.7V Supply
- Drives 6 String LEDs from 5.0V Supply
- High Efficiency: 90% Typical
- Fast 800KHz Switching Frequency
- 20V Internal Switch
- 20V Open Load Shutdown (OVP)
- UVLO
- Soft start
- Available Intensity Control Using EN Pin with PWM Signal
- SOT-23-6L Pb-Free Packaging

Typical Application Circuit



Note: In application circuit,if you select the inductor is winding inductor,the value should be more than 4.7uH .If you select the inductor is ceramic inductor,the value is more than 100 uH .

Pin Assignment



Pin Descriptions

PIN	SYMBOL	Description
1	SW	Switch Pin: Connect Inductor/diode here.
2	GND	GND Pin
3	FB	Feedback Pin. Reference voltage is 250mV.
4	EN	Enable Pin. Tie to 1.0V or higher to enable the device; 0.4V or less to Disable the device.
5	OLS	Open Load Shutdown Feedback Pin
6	VIN	Input Supply Pin. Must be locally bypassed.

Efficiency

WLED NO.	Vin(V)	Iin(mA)	Vout(V)	Iout(mA)	Pin(mW)	Pout(mW)	Efficiency(%)
2	4.20	36.50	6.43	20.40	153.30	131.17	85.57
3	4.20	53.60	9.49	20.40	225.12	193.60	86.00
4	4.20	73.00	12.63	20.40	306.60	257.65	84.04

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{IN}	V_{IN} Pin Voltage	0～10	V
V_{SW}	SW Voltage	20	V
V_{OLS}	OLS (OVP) Pin Voltage	0～V_{IN}	V
V_{FB}	Feedback Pin Voltage	0～V_{IN}	V
V_{EN}	EN Pin Voltage	0～20	V
$I_{SW,\ Peak}$	Switch Peak Current	400	mA
T_J	Maximum Junction Temperature	125	℃
T_{-LEAD}	Lead Temperature	300	℃
T_{OPR}	Operating Temperature Range	-40 to +85	℃
T_{STG}	Storage Temperature Range	-40 to +85	℃

Caution: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any condition.

Electrical Characteristics

(V_{IN} = 3.7V, T_A = 25°C unless otherwise specified)

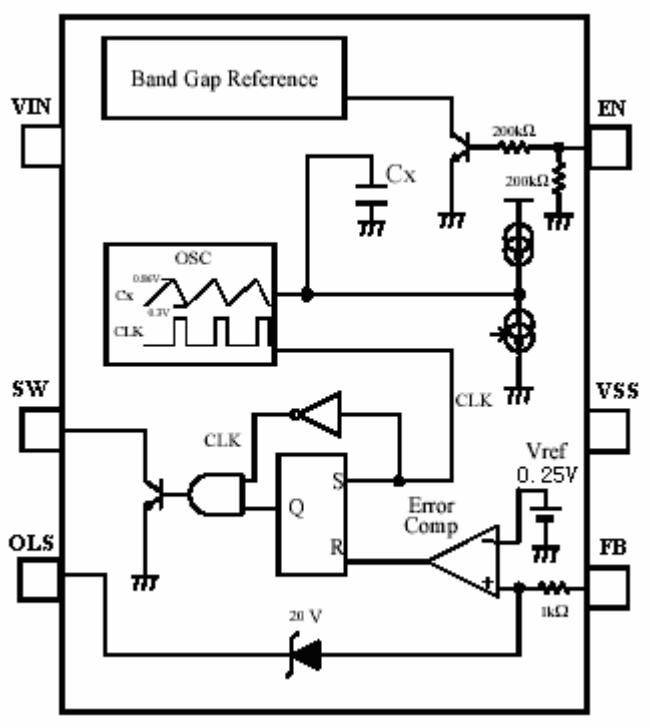
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
System Supply Input						
Operation voltage Range	V_{IN}		2.4		10.0	V
Under Voltage Lock Out	V_{IN}			2.2		V
Supply Current	I_{IN}	FB＞0.3V, Switch Off			2	mA
Shut Down Current	I_{IN}	V_{EN} < 0.4V		0.01		uA
Line Regulation		V_{IN} : 3.0~4.3V		3		%
Oscillator						
Operation Frequency	F_{OSC}		0.6	0.8	1.0	MHz
Maximum Duty Cycle			85			%
Dimming Frequency			100		100K	Hz
Reference Voltage						
Feedback Voltage			225	250	275	mV
Protection						
OVP Threshold	V_{OVP}	for 5 WLEDs application		20		V
OVP Sink Current					0.5	mA
Shut Down Voltage	V_{EN}				0.5	V
Enable Voltage	V_{EN}			1.2		V

Note 1. Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

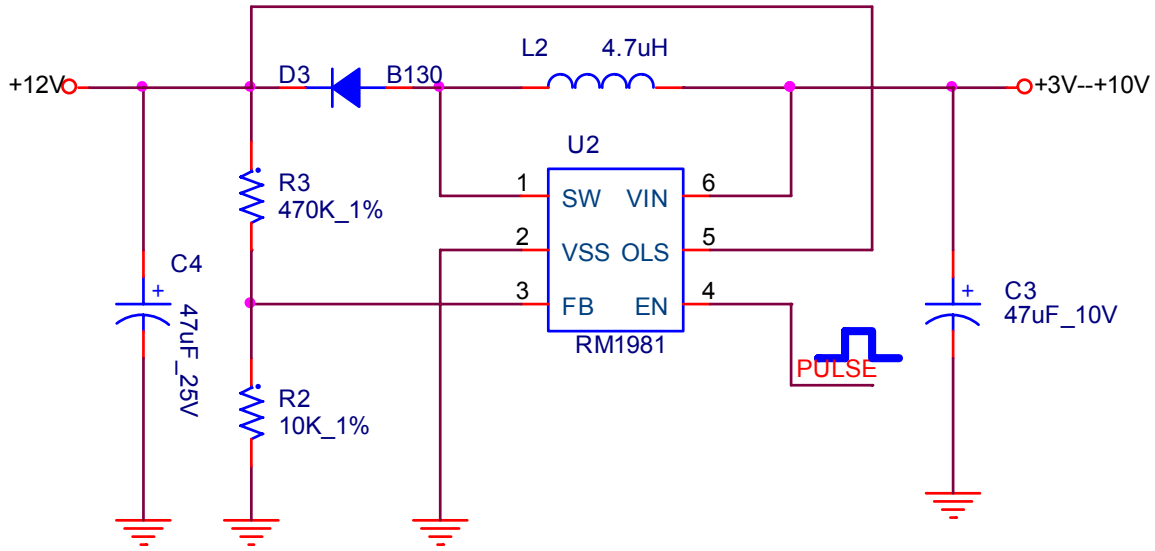
Note 2. The device is not guaranteed to function outside its operating conditions.

Note 3. θ_{JA} is measured in the natural convection at T_A = 25°C on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

BLOCK DIAGRAM



Application information-Boost Circuit



Package Information

SOT-23-6 (Unit: mm)