

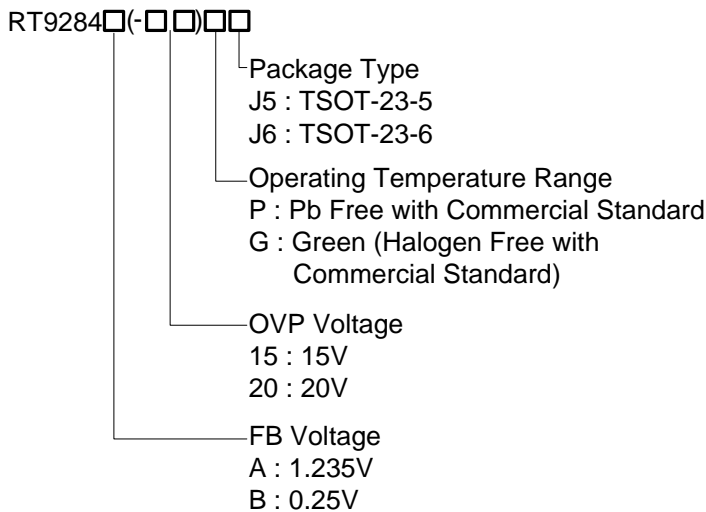
RT9284A/B

General Description

The RT9284A/B is a compact, high efficient and high integration LED driver. Internal 22V MOSFET can support 2 to 5 White LEDs for backlighting and camera flashing.

Highly integration and internal compensation network minimizes as 5 external component counts. Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency. Internal soft start function can reduce the inrush current. Tiny package type of TSOT-23-5 and TSOT-23-6 packages provide the best solution for PCB space saving and total BOM cost.

Ordering Information



Marking Information

For marking information, contact our sales representative directly or through a Richtek distributor located in your area, otherwise visit our website for detail.

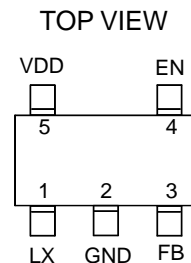
Features

- **V_{IN} Operating Range : 2.7V to 5.5V**
- **Maximum Output Voltage up to 20V**
- **Dimming with Zero-inrush and Wide Frequency Range of 100 to 100kHz**
- **Over Voltage Protection**
- **Output Current up to 100mA at V_{OUT} = 12V.**
- **Zero Shutdown Supply Current**
- **Minimize the External Component**
- **Small LC Filter**
- **Internal Soft Start**
- **RoHS Compliant and 100% Lead (Pb)-Free**

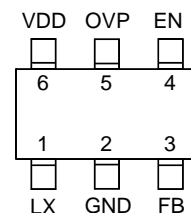
Applications

- Camera Flash White LED
- Mobile Phone, Smart Phone LED Backlight
- PDA LED Backlight
- Digital Still Camera
- Camcorder

Pin Configurations



TSOT-23-5



TSOT-23-6

Note : There is no pin1 indicator on top mark for TSOT-23-6 type, and pin 1 will be lower left pin when reading top mark from left to right.

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Typical Application Circuit

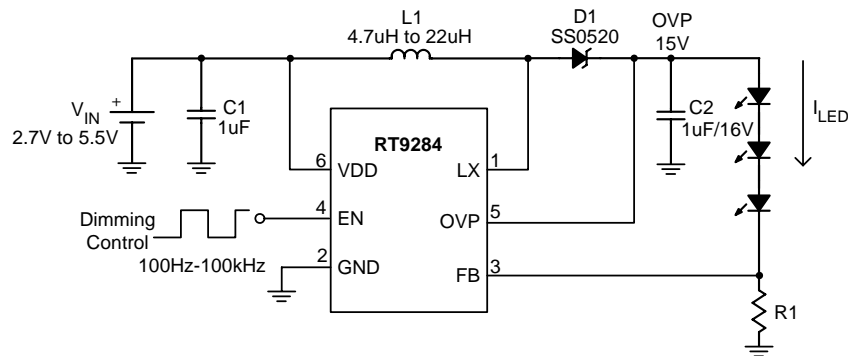


Figure 1. Application for Driving 3 Series WLEDs

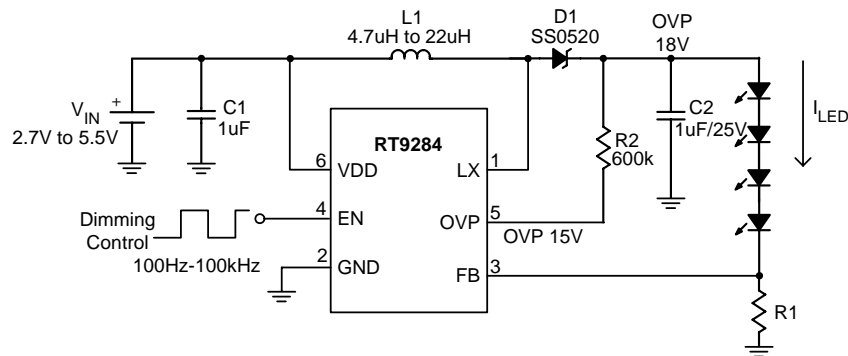


Figure 2. Application for Driving 4 Series WLEDs

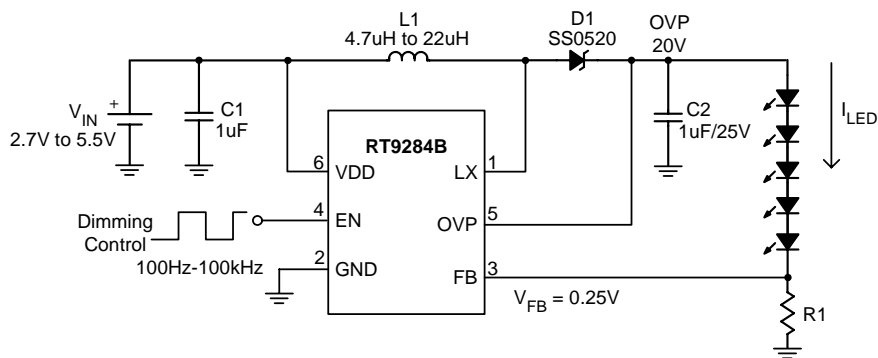


Figure 3. Application for Driving 5 Series WLEDs

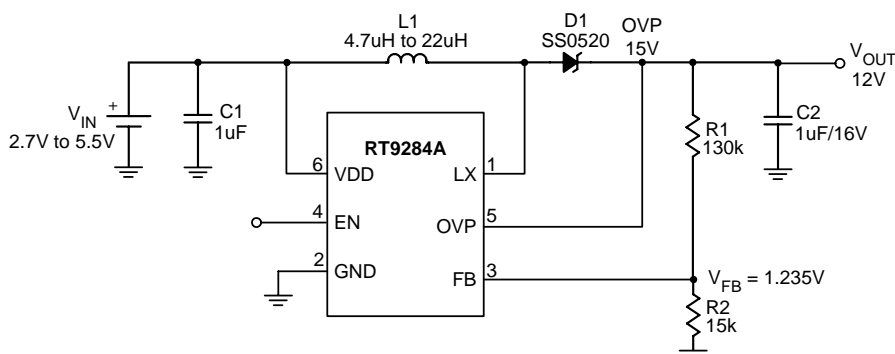


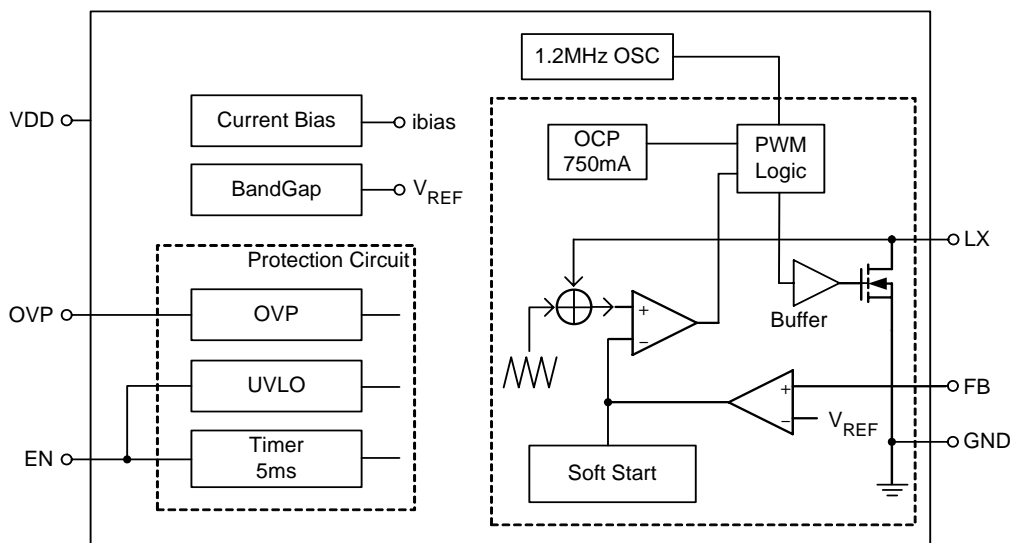
Figure 4. Application for Constant Output Voltage

RT9284A/B

Pin Description

Pin No.		Pin Name	Pin Function
TSOT-23-5	TSOT-23-6		
1	1	LX	Switch Pin. Connect this Pin to inductor and catch diode. Minimize the track area to reduce EMI.
2	2	GND	Ground Pin
3	3	FB	Feedback Reference Voltage Pin. Series connect a resistor between WLED and ground as a current sense. Sense the current feedback voltage to set the current rating.
4	4	EN	Chip Enable (Active High). Voltage sensing input to trigger the function of over voltage protection. Note that this pin is high impedance. There should be a pull low 100kΩ resistor connected to GND when the control signal is floating.
--	5	OVP	Over Voltage Protection Pin. Voltage sensing input to trigger the function of over voltage protection. Leave it unconnected to disable this function.
5	6	VDD	Supply Input Voltage Pin. Bypass 1uF capacitor to GND to reduce the input noise.

Function Block Diagram



RT9284A/B

Absolute Maximum Ratings (Note 1)

- Supply Input Voltage ----- -0.3V to 7V
- LX Input Voltage ----- -0.3V to 22V
- OVP Voltage ----- -0.3V to 22V
- The Other Pins ----- -0.3V to 6V
- Power Dissipation, P_D @ T_A = 25°C
 - TSOT-23-5 ----- 0.455W
 - TSOT-23-6 ----- 0.455W
- Package Thermal Resistance (Note 4)
 - TSOT-23-5, θ_{JA} ----- 220°C/W
 - TSOT-23-6, θ_{JA} ----- 220°C/W
- Lead Temperature (Soldering, 10 sec.) ----- 260°C
- Junction Temperature ----- 150°C
- Storage Temperature Range ----- -65°C to 150°C
- ESD Susceptibility (Note 2)
 - HBM (Human Body Mode) ----- 2kV
 - MM (Machine Mode) ----- 200V

Recommended Operating Conditions (Note 3)

- Supply Input Voltage ----- 2.7V to 5.5V
- Junction Temperature Range ----- -40°C to 125°C
- Ambient Temperature Range ----- -40°C to 85°C

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 _{DD}		2.7	--	5.5	V
Under Voltage Lock Out	V _{DD}		1.8	2.2	2.5	V
Quiescent Current	I _{DD}	FB = 1.5V, No switch	50	300	1000	uA
Supply Current	I _{DD}	FB = 0V, Switch	0.1	2	3	mA
Shut Down Current	I _{DD}	V _{EN} < 0.4V	--	--	1	uA
Line Regulation		V _{IN} : 3.0~4.3V	--	3	--	%
Oscillator						
Operation Frequency	f _{OSC}		0.9	1.2	1.5	MHz
Maximum Duty Cycle			85	--	--	%
Dimming Frequency			100	--	100k	Hz
Reference Voltage						
Feedback Voltage (Note 5)	RT9284A		1.173	1.235	1.296	V
	RT9284B		0.237	0.25	0.263	V

To be continued

RT9284A/B

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
MOSFET						
On Resistance of MOSFET	$R_{DS(ON)}$		--	0.75	--	Ω
Protection						
OVP Threshold	V_{OVP}	for 2,3,4 WLEDs application	14	15	16	V
		for 5 WLED application	19	20	21	V
OVP Sink Current			--	5	--	μA
OCP			--	750	--	mA
Shut Down Voltage	V_{EN}		--	--	0.4	V
Enable Voltage	V_{EN}		1.5	--	--	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. Devices are ESD sensitive. Handling precaution recommended.

Note 3. The device is not guaranteed to function outside its operating conditions.

Note 4. θ_{JA} is measured in the natural convection at $T_A = 25^\circ C$ on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

Note 5. Floating the OVP pin to disable OVP function.