

Green-Mode PWM Controller with High-Voltage Start-Up Circuit

REV: 04b

General Description

The LD7575 is a current-mode PWM controller with excellent power-saving operation. It features a high-voltage current source to directly supply the startup current from bulk capacitor and further to provide a lossless startup circuit. The integrated functions such as the leading-edge blanking of the current sensing, internal slope compensation, and the small package provide the users a high efficiency, minimum external component counts, and low cost solution for AC/DC power applications.

Furthermore, the embedded over voltage protection, over load protection and the special green-mode control provide the solution for users to design a high performance power circuit easily. The LD7575 is offered in both SOP-8 and DIP-8 package.

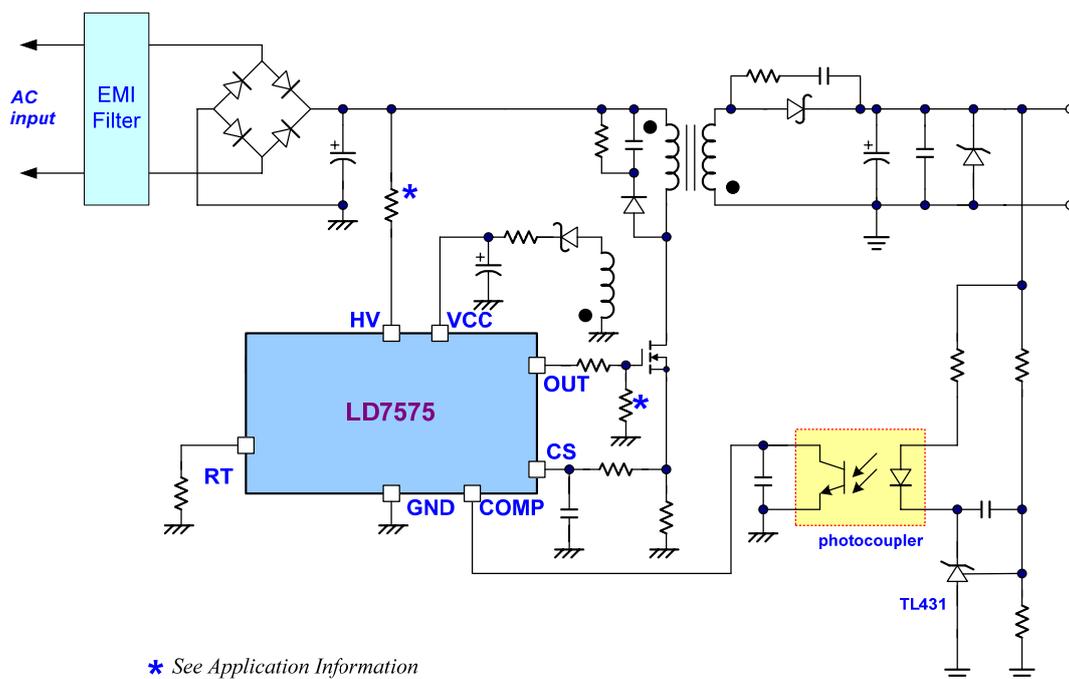
Features

- High-Voltage (500V) Startup Circuit
- Current Mode Control
- Non-Audible-Noise Green Mode Control
- UVLO (Under Voltage Lockout)
- LEB (Leading-Edge Blanking) on CS Pin
- Programmable Switching Frequency
- Internal Slope Compensation
- OVP (Over Voltage Protection) on Vcc
- OLP (Over Load Protection)
- 500mA Driving Capability

Applications

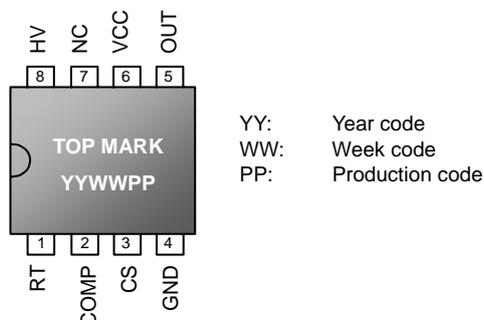
- Switching AC/DC Adapter and Battery Charger
- Open Frame Switching Power Supply
- LCD Monitor/TV Power

Typical Application



Pin Configuration

SOP-8 & DIP-8 (TOP VIEW)



Ordering Information

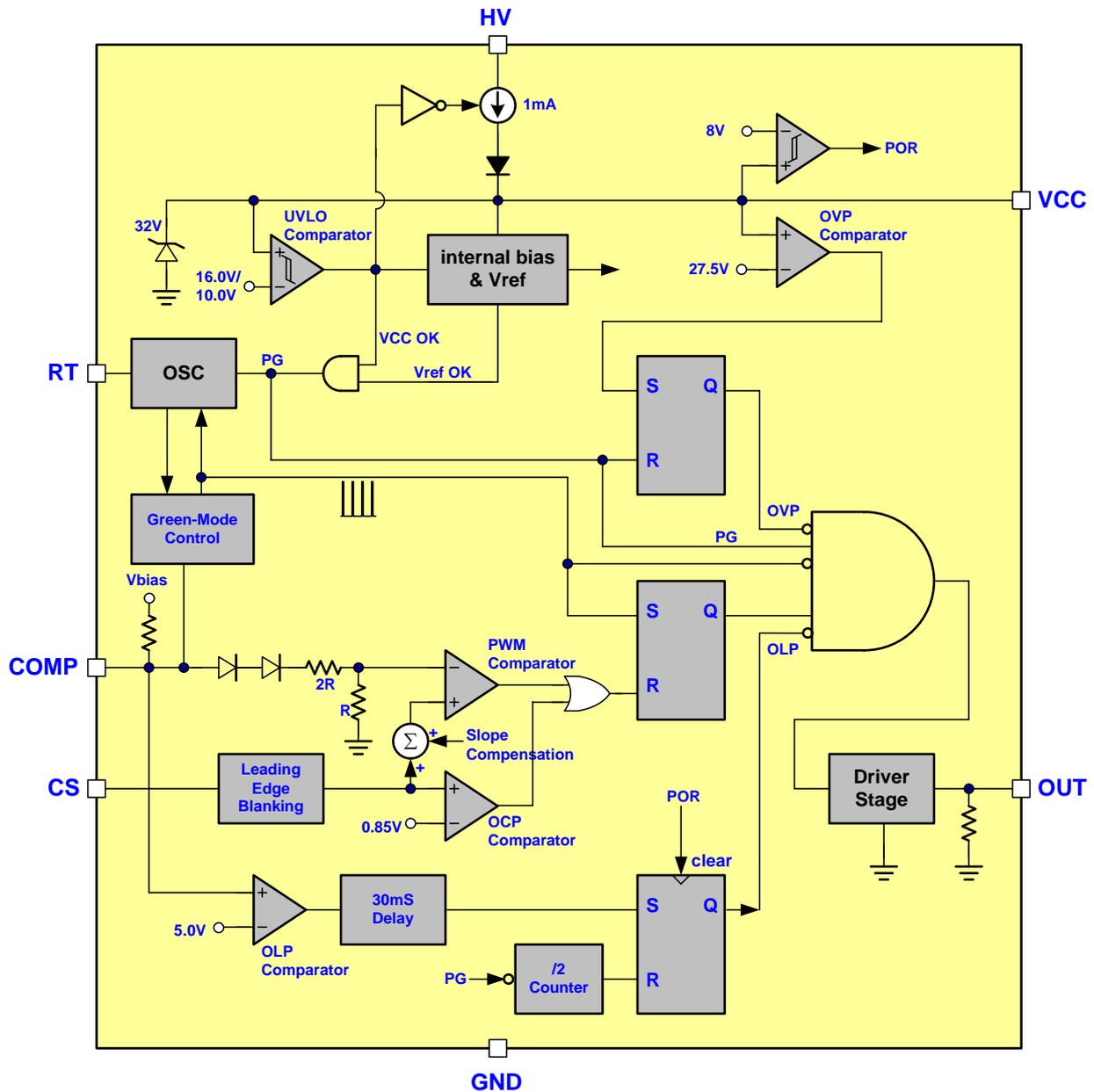
Part number	Package		Top Mark	Shipping
LD7575 PS	SOP-8	PB Free	LD7575PS	2500 /tape & reel
LD7575 GS	SOP-8	Green Package	LD7575GS	2500 /tape & reel
LD7575 PN	DIP-8	PB Free	LD7575PN	3600 /tube /Carton

The LD7575 is ROHS compliant/ Green Package.

Pin Descriptions

PIN	NAME	FUNCTION
1	RT	This pin will program the switching frequency, to connect a resistor with ground to set the switching frequency.
2	COMP	Voltage feedback pin (same as the COMP pin in UC384X), By connecting a photo-coupler to close the control loop and achieve the regulation.
3	CS	Current sense pin, connect to sense the MOSFET current
4	GND	Ground
5	OUT	Gate drive output to drive the external MOSFET
6	VCC	Supply voltage pin
7	NC	Unconnected Pin
8	HV	Connect this pin to positive terminal of bulk capacitor to provide the startup current for the controller. When Vcc voltage trips the UVLO(on), this HV loop will be off to save the power loss on the startup circuit.

Block Diagram



Absolute Maximum Ratings

Supply Voltage VCC.....	30V
High-Voltage Pin, HV.....	-0.3V~500V
COMP, RT, CS.....	-0.3 ~7V
Junction Temperature.....	150°C
Operating Ambient Temperature.....	-40°C to 85°C
Storage Temperature Range.....	-65°C to 150°C
Package Thermal Resistance (SOP-8).....	160°C/W
Package Thermal Resistance (DIP-8).....	100°C/W
Power Dissipation (SOP-8, at Ambient Temperature = 85°C).....	400mW
Power Dissipation (DIP-8, at Ambient Temperature = 85°C).....	650mW
Lead temperature (Soldering, 10sec).....	260°C
ESD Voltage Protection, Human Body Model (except HV Pin).....	3KV
ESD Voltage Protection, Machine Model.....	200V
Gate Output Current.....	500mA

Caution:

Stresses beyond the ratings specified in “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Recommended Operating Conditions

Item	Min.	Max.	Unit
Supply Voltage Vcc	11	25	V
Vcc Capacitor	10	47	μF
Switching Frequency	50	130	KHz

Electrical Characteristics

 (T_A = +25°C unless otherwise stated, V_{CC}=15.0V)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
High-Voltage Supply (HV Pin)					
High-Voltage Current Source	V _{CC} < UVLO(on), HV=500V	0.5	1.0	1.5	mA
Off-State Leakage Current	V _{CC} > UVLO(off), HV=500V			35	μA
Supply Voltage (Vcc Pin)					
Startup Current				100	μA
Operating Current (with 1nF load on OUT pin)	V _{COMP} =0V		2.0	3.0	mA
	V _{COMP} =3V		2.5	4.0	mA
	Protection tripped (OLP, OVP)		0.5		mA
UVLO (off)		9.0	10.0	11.0	V
UVLO (on)		15.0	16.0	17.0	V
OVP Level		25.0	27.5	30.0	V
Voltage Feedback (Comp Pin)					
Short Circuit Current	V _{COMP} =0V		1.5	2.2	mA
Open Loop Voltage	COMP pin open		6.0		V
Green Mode Threshold VCOMP			2.35		V
Current Sensing (CS Pin)					
Maximum Input Voltage		0.80	0.85	0.90	V
Leading Edge Blanking Time			350		nS
Input impedance		1			MΩ
Delay to Output			100		nS
Oscillator (RT pin)					
Frequency	RT=100KΩ	60.0	65.0	70.0	KHz
Green Mode Frequency	F _s =65.0KHz		20		KHz
Temp. Stability	(-40°C ~105°C)			3	%
Voltage Stability	(V _{CC} =11V-25V)			1	%
Gate Drive Output (OUT Pin)					
Output Low Level	V _{CC} =15V, I _o =20mA			1	V
Output High Level	V _{CC} =15V, I _o =20mA	9			V
Rising Time	Load Capacitance=1000pF		50	160	nS
Falling Time	Load Capacitance=1000pF		30	60	nS
OLP (Over Load Protection)					
OLP Trip Level			5.0		V
OLP Delay Time (note)	F _s =65KHz		30		mS

Note: The OLP delay time is proportional to the period of switching cycle. So that, the lower RT value will set the higher switching frequency and the shorter OLP delay time.