High Performance LED Flicker Attenuator

Features

- Flicker Attenuator
- Maximum output current 300mA, 600mA,
- Maximum output LED voltage up to 100V.
- Automatic regulated loading current
- Internal soft start
- Built-in open LED protection circuit
- Built-in short LED protection circuit with latch mode
- Built-in thermal protection circuit with latch mode

Application

- High Power LED Driver
- RGB Full Color Power LED driver
- Current stabilizer with AC/DC or DC/DC
- Others LED Lighting Applications
- General purpose constant current source

Description

The ZA85183/A is an automatic current ripple attenuator for high power LED applications. At ZA85183/A output terminal, one regulated current port is designed to provide a uniform and constant current sink for driving LEDs within a large range of VF variations. The maximum output current of ZA85183/A can be up to 300mA and 600mA, which gives users flexibility in controlling the light intensity of LEDs. ZA85183/A have built in over temperature protection function, it prevents from the device damage due to excessive power dissipation.

Ordering information

ZA8518 □ – □ □

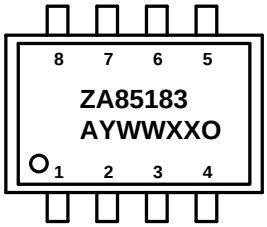
Pin count
5 : 5 pin
8 : 8 pin

Package Type
E : SOP8-EP
T : TO-252

Output Current
3 : 300mA
A : 600mA

Marking Information

SOP8-EP

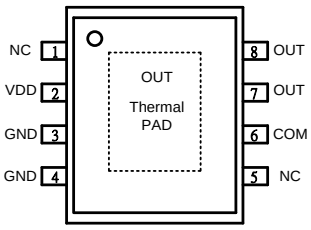


TO-252

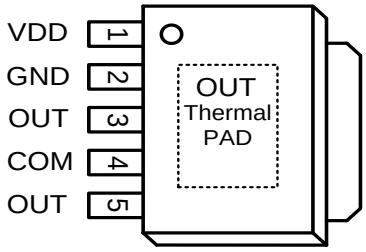
Line1 : ZA8518A : Device name
Line2 : AYWWXXO : tracking number

Pin Configuration (Top View)

SOP8-EP



TO-252



Absolute Maximum Ratings

Parameter	Value
Supply Voltage VDD	60V
COM	-0.3 to 6V
OUT	100V
Junction Temperature	150°C
Operating Ambient Temperature	-20°C ~85°C
Storage Temperature Range	-65°C ~150°C
SOP8-EP Package Thermal Resistance (junction to ambient)	85°C /W
TO-252 Package Thermal Resistance (junction to ambient)	110°C /W
Power Dissipation (SOP8-EP, at ambient temperature = 85℃)	400mW
Lead Temperature (All Pb free packages, soldering, 10 sec)	260°C
ESD voltage protection, machine model	200V
ESD voltage protection, human body model	2KV

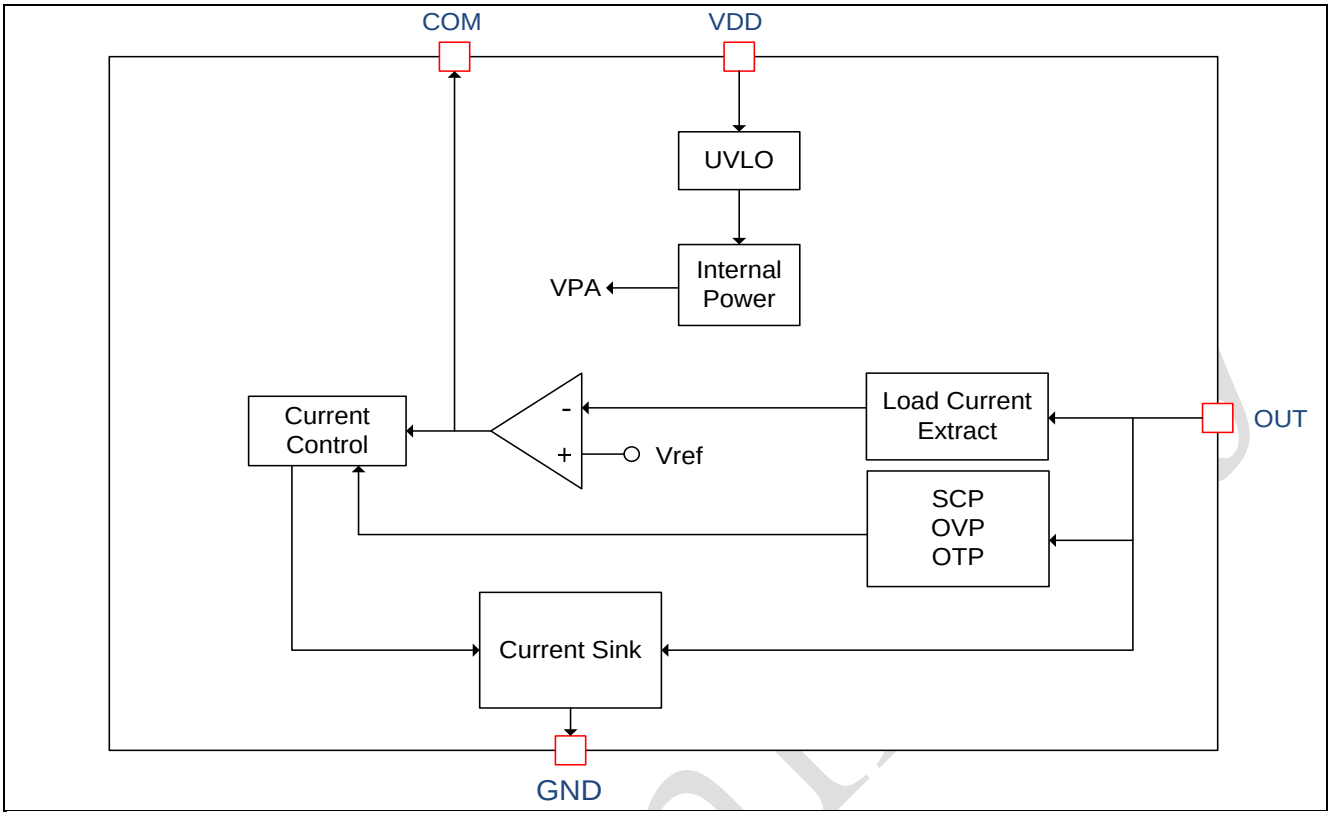
Pin Description

SOP8-EP	TO-252	Name	Function
2	1	VDD	Power Supply Pin
3, 4	2	GND	Ground Pin
6	4	COM	Feedback Compensation Network
7, 8	3, 5	OUT	Drain Pin of internal HV MOSFET

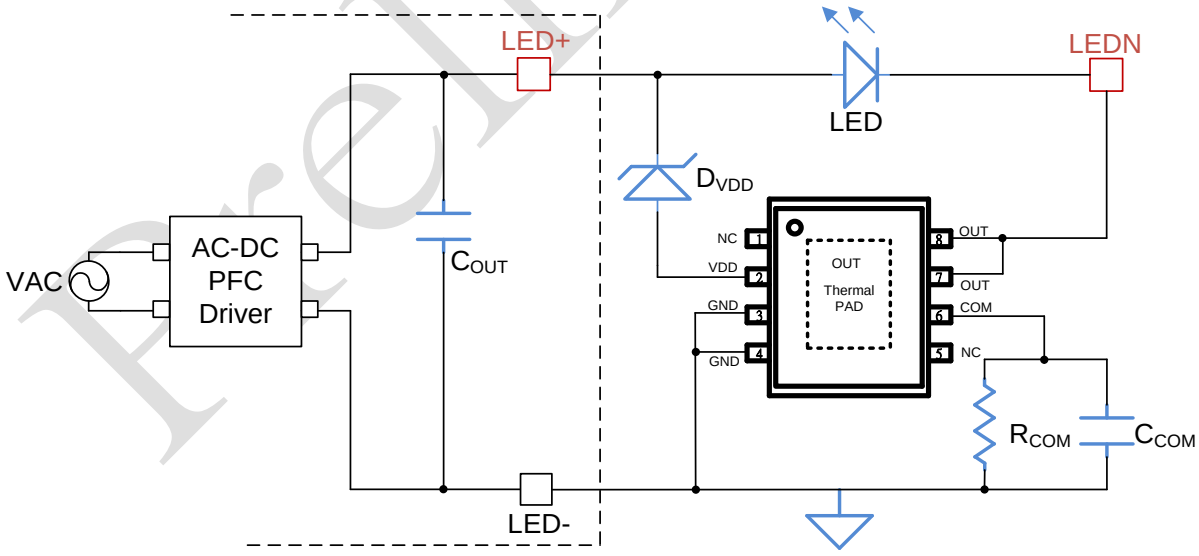
Recommended Operating Condition

Symbol	Parameter	Min/Max	Unit
VDD	Power Supply Pin	5 to 60	V
TA	Operating Ambient Temperature	-20 to 85	°C

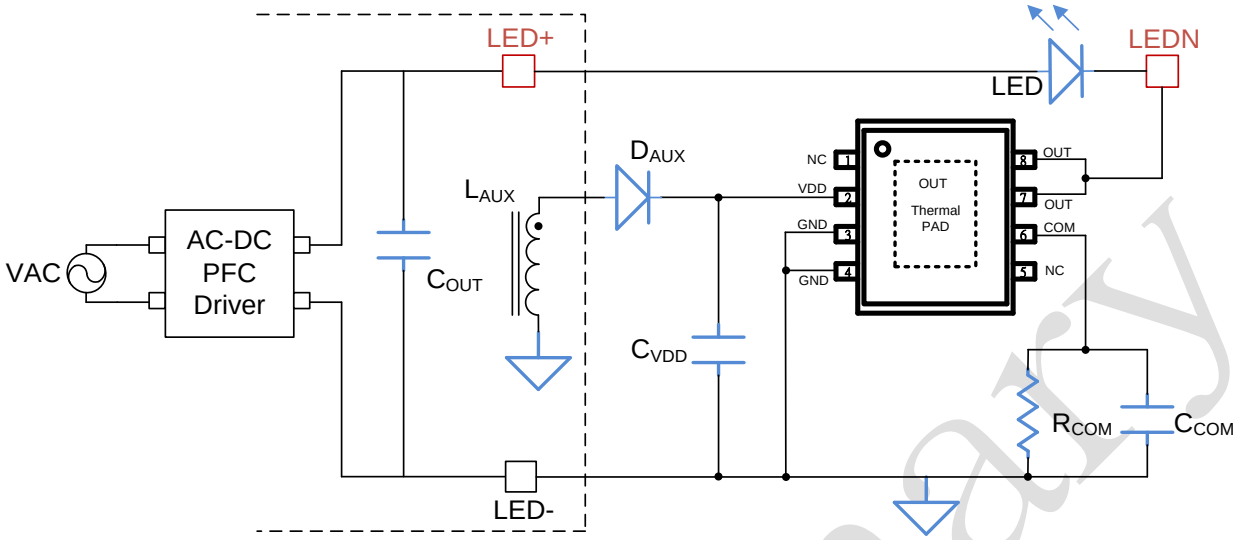
Function Block



Application Circuit (1)



Application Circuit (2)



Electrical Characteristics (VCC = 15.0V & TA = +25°C, unless otherwise specified.)

DC ELECTRICAL CHARACTERISTICS					
Parameter	**Test Conditions**	**Min**	**Typ**	**Max**	**Units**
SUPPLY VOLTAGE					
Supply Current Consumption	ZA85183	--	0.5	--	mA
	ZA8518A	--	0.7	--	mA
Standby Current	Com = 2.5V	--	0.3	--	mA
Supply Voltage		--	--	60	V
UVLO(on)		--	5	--	V
UVLO(off)		--	3	--	V
VOLTAGE FEEDBACK					
Amplifier source current	0.6V < VCOM	--	12	--	uA
OUTPUT CURRENT					
ZA85183-E8 (SOP8)		300	--	--	mA
ZA8518A-T5(TO-252)		600	--	--	mA
OUT Pin					
Vout breakdown voltage	BVdss Vgs=0	100	--	--	V
PROTECTION					
Thermal Protection Temperature		--	155	--	°C
Short-circuit protection VDD release voltage	VDD	--	3	--	V

Application Information

Operation

ZA85183/A is an adaptive linear current regulator to eliminate low frequency current ripple targeting at LED lighting applications.
It is applied as a current ripple filter to the output of a LED driver, especially single stage LED driver. It is adaptive for wide output speculation, the output voltage is ranging from 5V to 100V, and also can be operated in parallel to support higher LED current.
ZA85183/A provides reliable protections such as Short LED Protection (SLP) with latch mode, Open LED Protection (OLP) with auto-recovery and Over Temperature Protection (OTP) with auto-recovery.

VDD Pin

When the voltage of VDD Pin rise to UVLO (on), ZA85183/A begins to work; and the start-up time is very fast. It can reduce the total start-up time of the power module. The operation voltage is from 5V to 60V.

Dimming Control

ZA85183/A can support dimming control of the front-driver. It does easily correspond to the variation of the system load.

Loading Setting

ZA85183 can automatically detect the output current of front-driver and support to drive up to 300mA, ZA8518A can support up to 600mA. The system is also at constant current mode.

C_{COM} Selection

Using C_{COM} to reduce output current ripple. The suggested value is larger than 4.7uF, the larger Cap can reduce current ripple more and make the system feedback slow.

Out Pin

ZA85183/A is built-in 100V MOSFET, so OUT pin must be lower than 100v. The break down voltage limit should be applied under all the operating condition (especially in the condition of LED opened or Shorted).

Over Temperature Protection

However, the maximum junction temperature ratings should not be exceeded under normal load conditions. The thermal protection circuit of ZA85183/A prevents from the device damage due to excessive power dissipation.
When the temperature is higher than 155 ℃, the ZA85183/A will turn off output current until system restart.

Short circuit protection

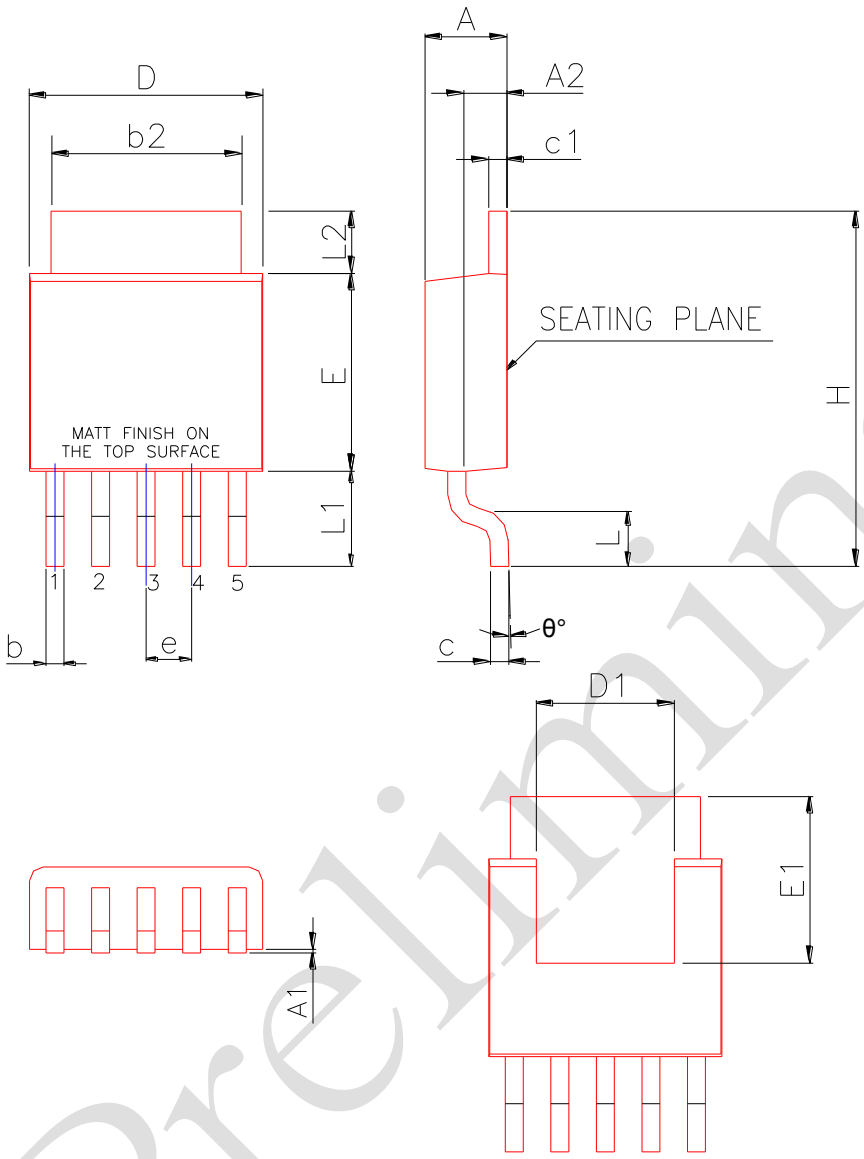
ZA85183/A has short circuit protection, when LED is shorted, Out pin exceeds short circuit threshold, ZA85183/A shuts down inside MOSFET, and enters latch mode. The system will restart and exit latch mode if VDD be lower than UVLO(off) and then higher than UVLO(on) again.

Parallel operation application

When the output current of LED power module is higher than the ZA85183/A output capability, Multiple ZA85183/A could be used to operate in parallel to support higher LED current.

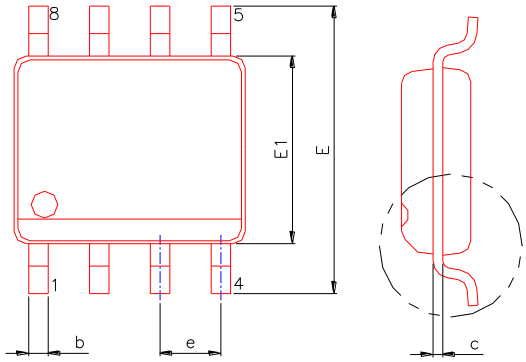
Package Information

TO-252(5L) PACKAGE OUTLINE DIMENSIONS



SYMBOLS	DIMENSIONS IN MILLIMETER	
	MIN.	MAX.
A	2.18	2.39
A1	0.00	0.13
A2	1.02	1.27
b	0.51 TYP.	
b2	5.21	5.46
c	0.46	0.58
c1	0.46	0.58
E	5.33	5.59
E1	4.57	–
D	6.35	6.73
D1	3.81	–
e	1.27 BSC.	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF.	
L2	1.27	2.03
θ	0°	4°

SOP8-EP(8L) PACKAGE OUTLINE DIMENSIONS

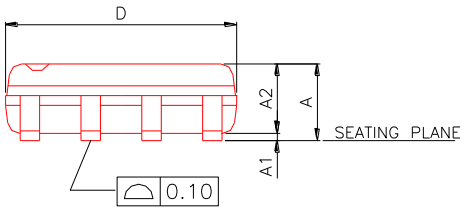


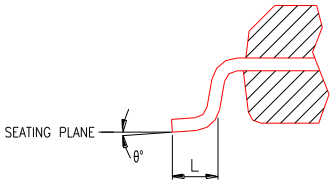
SYMBOLS	STANDARD(MM)		THERMAL(MM)	
	MIN.	MAX.	MIN.	MAX.
A	–	1.75	–	1.70
A1	0.10	0.25	0.00	0.15
A2	1.25	–	1.25	–
b	0.31	0.51	0.31	0.51
c	0.10	0.25	0.10	0.25
D	4.90 BSC		4.90 BSC	
E	6.00 BSC		6.00 BSC	
E1	3.90 BSC		3.90 BSC	
e	1.27 BSC		1.27 BSC	
L	0.40	1.27	0.40	1.27
θ°	0°	8°	0°	8°

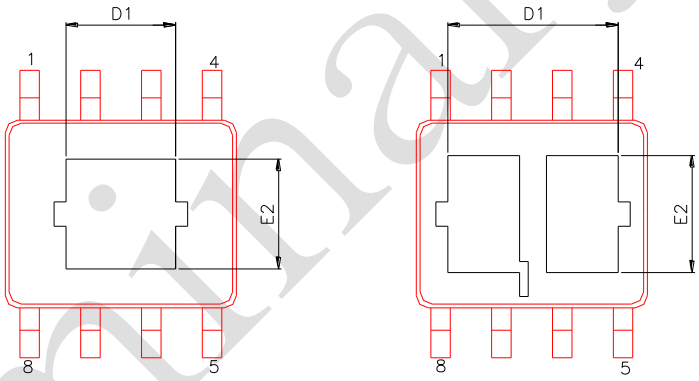
THERMALLY ENHANCED DIMENSIONS(SHOWN IN MM)

5 L/F PAD SIZE	E2		D1	
	MIN.	MAX.	MIN.	MAX.
90 X 90	1.94	2.29	1.94	2.29
95 X 130	2.05	2.41	2.81	3.30
96 X 65(DUAL PAD)	1.78	2.44	2.90	3.56

5. AS THE LEAD FRAME PAD SIZE CHANGE, THE DIMENSIONS "D1" & "E2" ARE VARIATION.







(THERMAL VARIATIONS ONLY)