



# High Current Buck, Boost, Buck-Boost LED Driver

## General Description

VAS1351 is a PFM mode Buck, Boost, Buck-Boost LED driver with external power MOSFET. By adjusting external sense resistor, VAS1351 can deliver up to several amperes output current and suitable for high power LED array applications.

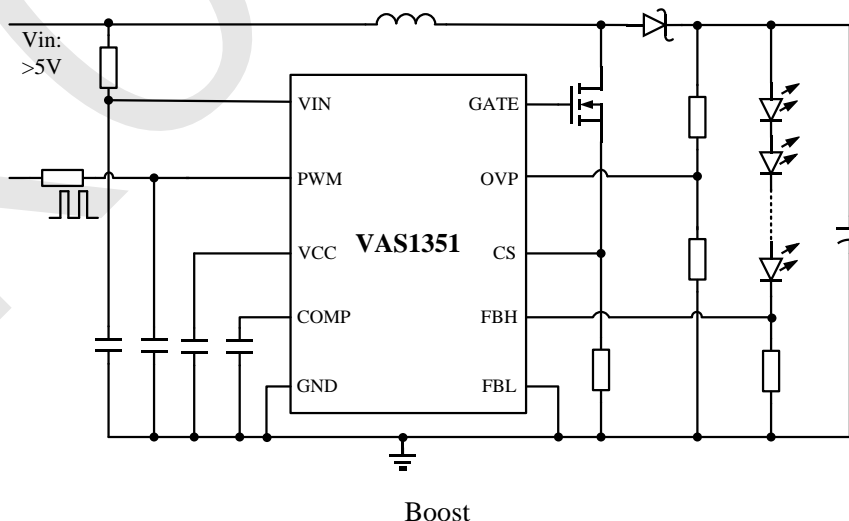
VAS1351 operates from a 3V to hundreds of voltages input range. Its overvoltage protection can avoid damage to circuit of open load and a dedicated control loop.

VAS1351 is available with MSOP10 package.

## Features

- 7V gate driver
- Compatible with Buck, Boost, Buck-Boost application
- Multiple protections
  - Output over voltage protection
  - Output over current protection
  - Over temperature protection
- Wide input range up to hundreds of voltages in system
- Analog and PWM dimming

## Typical Application Circuit



## Application

- Landscape lighting
- Street lamp
- Indoor LED lighting
- Automobile lamp

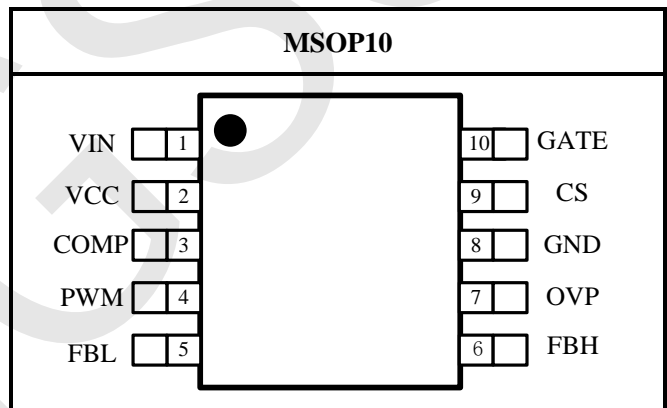
## Ordering Information

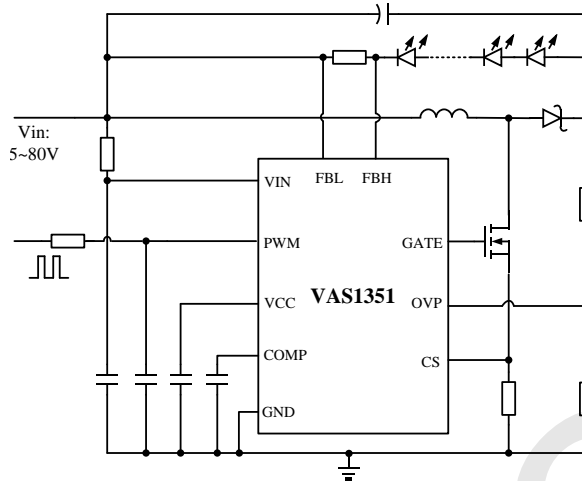
Order Number	Package Type	Temp. Range
VAS1351IF10E	MSOP10	-40 °C to 85°C

I: Industry, -40~85°C  
10: Pin Number

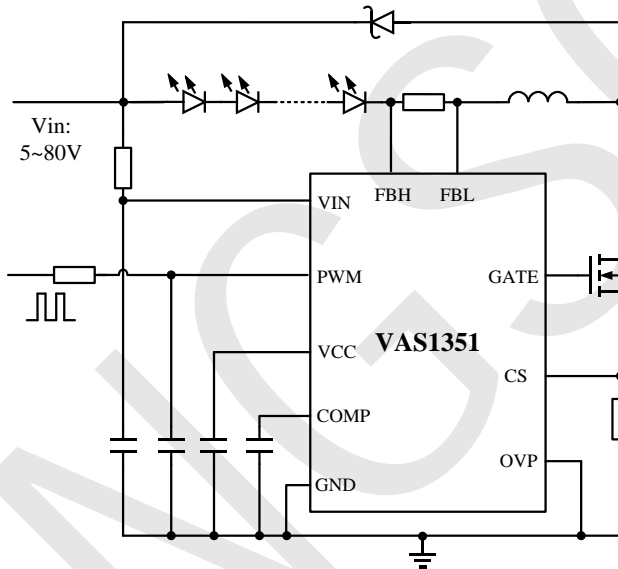
F: MSOP  
E: ROHS

## Pin Configuration

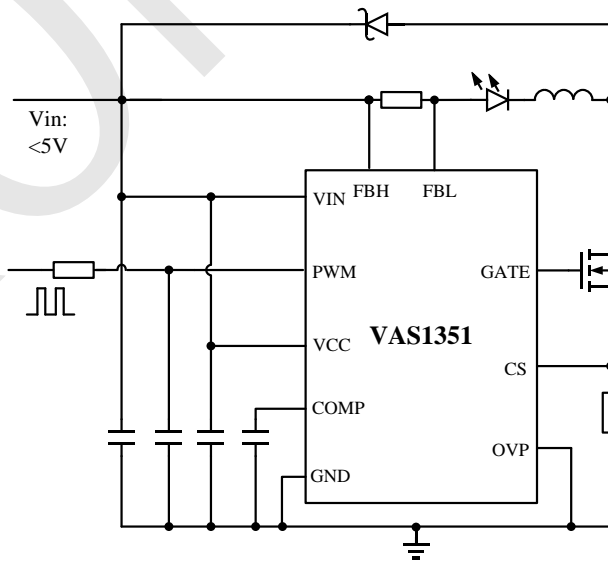




Buck-Boost



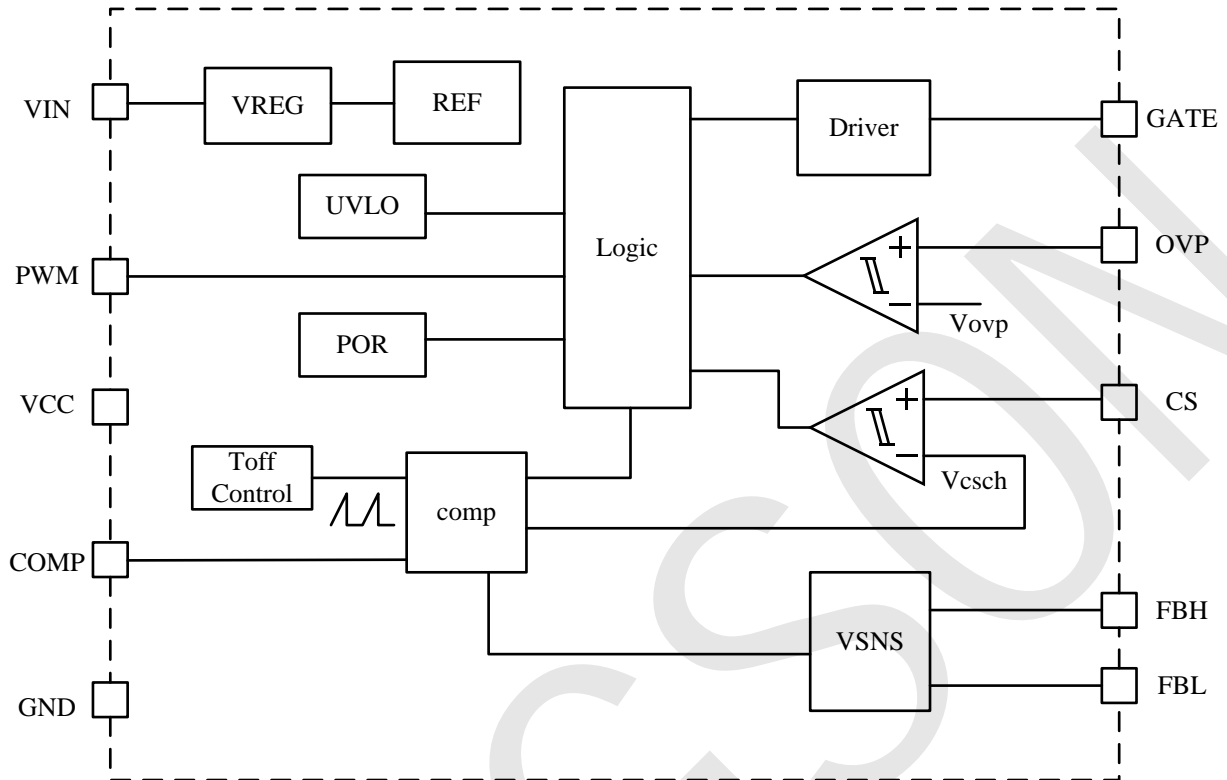
Buck (5~80V 输入)



Buck (3~5V 输入)



## Block Diagram



## PIN Description

PIN NO.	Name	Description
1	VIN	Power supply input, bypass a 1 $\mu$ F capacitor to GND
2	PWM	PWM and Analog dimming input
3	COMP	Connect a 10nF capacitor for loop compensation
4	VCC	Internal 7V LDO output, connect a 1 $\mu$ F capacitor to GND
5	FBL	Output current feedback pin
6	FBH	The output current sense pin
7	OVP	Oversvoltage protection detecting pin
8	GND	Ground
9	CS	The input peak current detecting pin
10	GATE	Gate Drive Output. Connect to the gate of an external N-MOSFET



## Absolute Maximum Ratings<sup>(Note1)</sup>

Parameters	Maximum Ratings
VIN, FBH, FBL to GND	-0.3V to 88V
CS, PWM, COMP, OVP to GND	-0.3V to 8V
VCC, Gate to GND	-0.3V to 10V
Operating temperature range	-40°C to +85°C
Junction temperature	-40°C to +150°C
Storage temperature range	-65°C to +150°C
ESD(HBM)	2000V

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. Electrical Characteristics state DC and AC electrical specifications under particular test conditions which guarantee specific performance limits. This assumes that the device is within the Operating Ratings. Specifications are not guaranteed for parameters where no limit is given, however, the typical value is a good indication of device performance.

## Electrical Characteristics

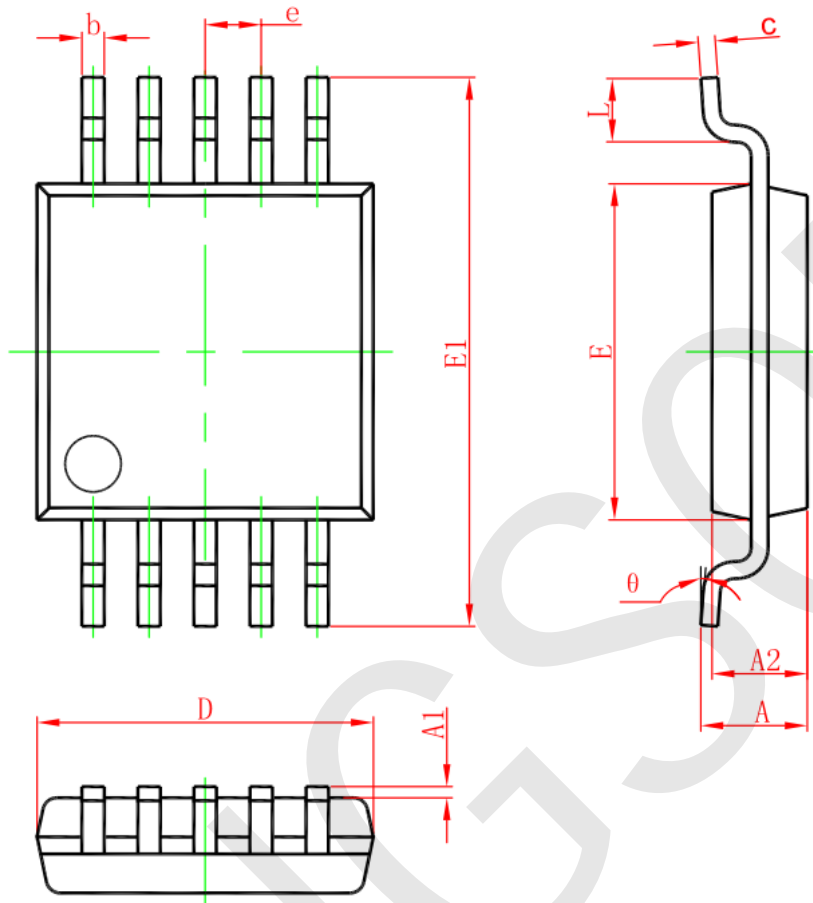
Typical case<sup>(Note2)</sup>: VIN=12V, TA=25°C(unless otherwise specified)

Symbol	Parameter	Condition	Spec			Unit
			Min.	Typ.	Max.	
V <sub>INDC</sub>	Input Voltage Range		3		80	V
VCC	LDO output voltage			7		V
UVLO	Under voltage Lockout	VCC Rising		4.5	5	V
ΔUVLO	UVLO Hysteresis			0.2		V
I <sub>Q</sub>	Quiescent Current	VIN=12V		400	800	μA
V <sub>CSTH</sub>	Input Peak Current Threshold	PWM connect to VCC		250		mV
T <sub>BLANK</sub>	Input Current Blanking Time	V <sub>CS</sub> =V <sub>CSTH</sub> +50mV		200		nS
T <sub>OFF</sub>	Minimum Constant Off time			2		μS
V <sub>PWM_L</sub>	PWM Input Voltage Threshold Low				0.5	V
V <sub>PWM_H</sub>	PWM Input Voltage Threshold High		2.5			V
T <sub>SD</sub>	OTP Threshold			160		°C
T <sub>SD_HYS</sub>	OTP Hysteresis			20		°C
V <sub>FBTH</sub>	Output Current Feedback Threshold, Voltage Measured between FBH and FBL pin		0.19	0.2	0.21	V
V <sub>OVP_TH</sub>	Over Voltage Protection Threshold		0.95	1	1.05	V
V <sub>OVP_HYS</sub>				0.2		V

Note 2: Production testing of the device is performed at 25°C. Functional operation of the device and parameters specified over other temperature range, are guaranteed by design, characterization and process control.



### Package Information (MSOP10)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.180	0.280	0.007	0.011
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.50(BSC)		0.020(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
$\theta$	0°	6°	0°	6°