1.5A 380KHz 32V Buck LED Constant Current Driver HM3106

Features

- Wide 5V to 32V Input Voltage Range
- Output Current Sense Voltage is 0.24V
- Minimum Drop Out 0.3V
- Fixed 380KHz Switching Frequency
- 1.5A Constant Output Current Capability
- Internal Optimize Power MOSFET
- Excellent line and load regulation
- High efficiency up to 96%
- TTL shutdown capability
- EN pin with hysteresis function
- Built in thermal shutdown function
- Built in current limit function
- SOIC-8 package

General Description

The HM3106 is a 380 KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 1.5A load with high efficiency, low ripple and excellent line and load regulation. Requiring a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 100%. An enable function, an over current protection function is built inside. An internal compensation block is built in to minimize external component count.

Applications

- MR16 LED Lamp
- LED Lighting

SOIC-8

Figure1. Package Type of HM3106

Pin Configurations

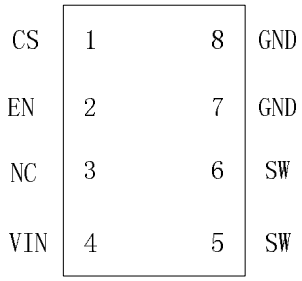

Figure2. Pin Configuration of HM3106 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	CS	Output constant current sense Pin (CS). The CS reference voltage is 0.24V.
2	EN	Enable Pin. Drive EN pin low to turn off the device, drive it high to turn it on.
3	NC	No connected.
4	VIN	Supply Voltage Input Pin. HM3106 operates from a 5V to 32V DC voltage.
5,6	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output.
7,8	GND	Ground Pin.

Function Block

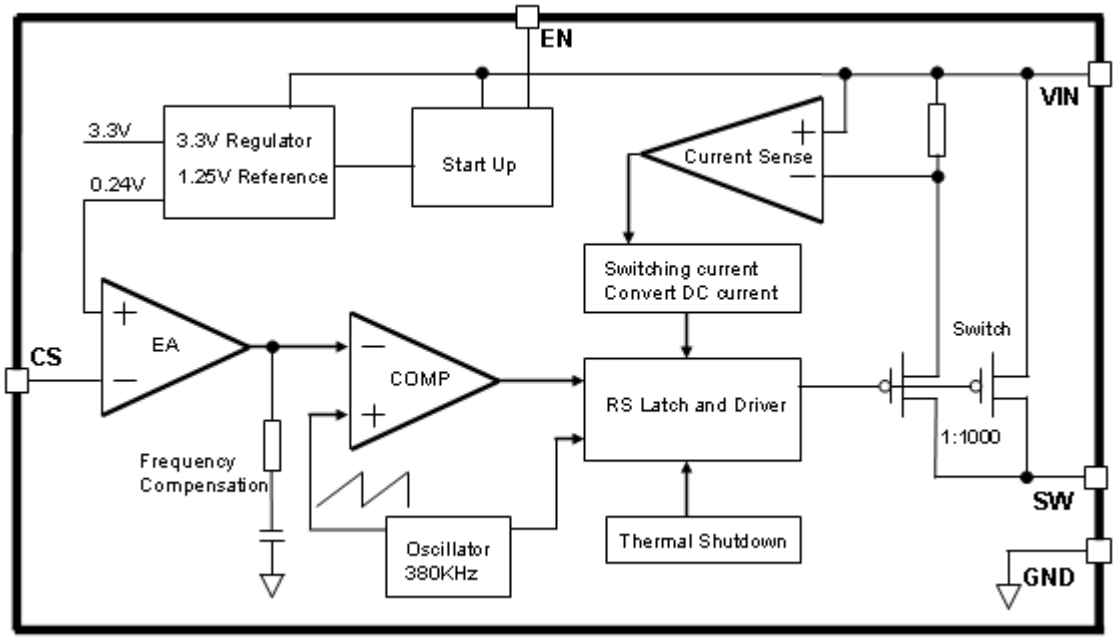

Figure3. Function Block Diagram of HM3106

Typical Application Circuit (MR16 LED Lamp)

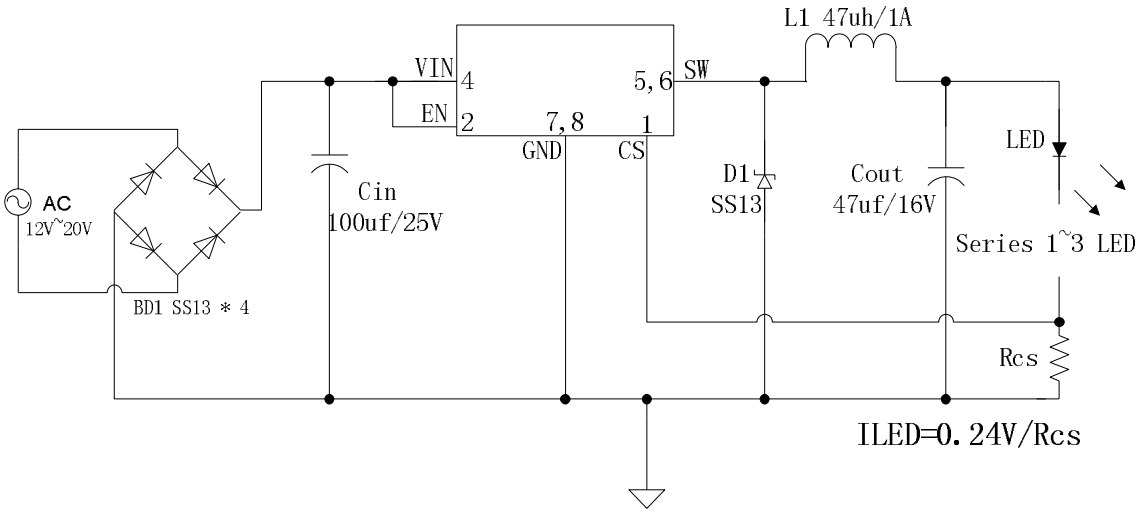

Figure4. HM3106 Typical Application Circuit (MR16 LED Lamp)

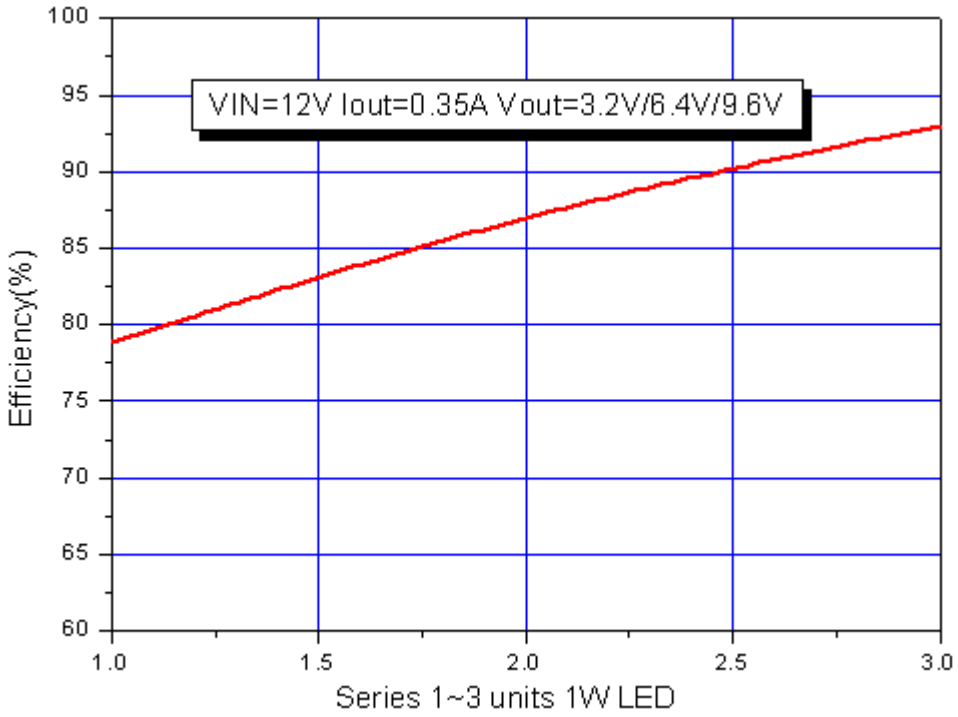

Figure5. HM3106 Typical Application Circuit Efficiency

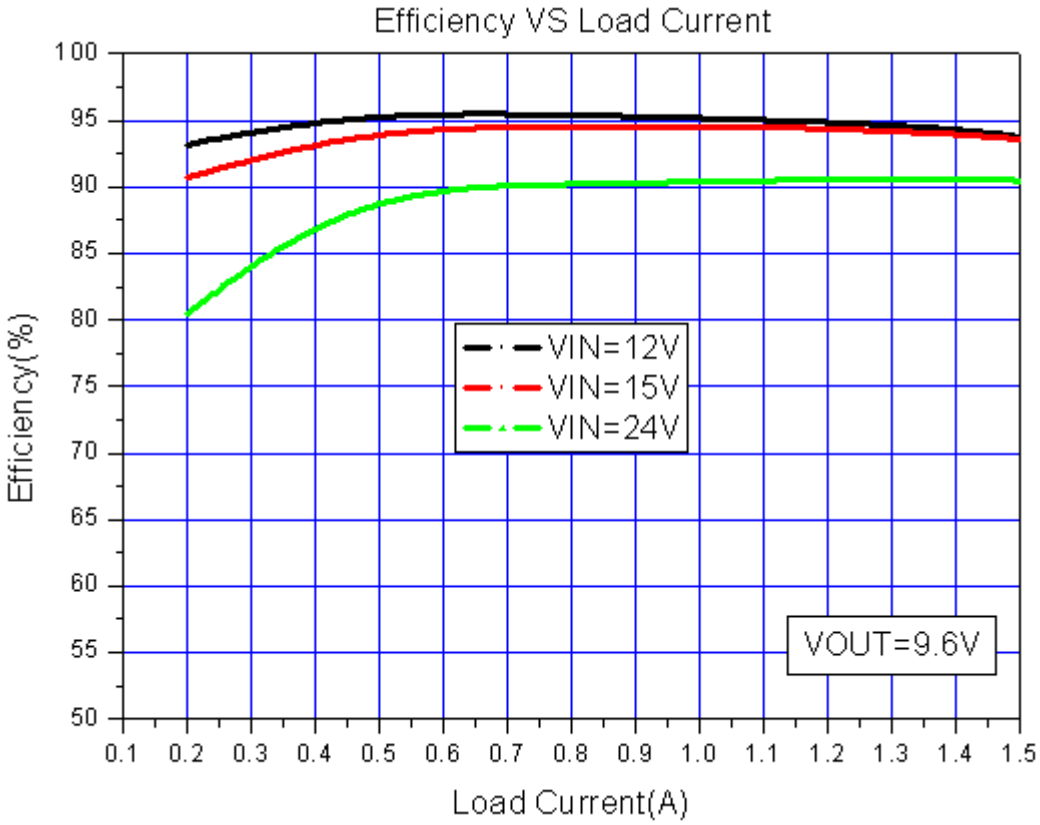

Figure6. HM3106 Efficiency VS Load current & Input voltage

Ordering Information

Order Information	Marking ID	Package Type	Packing Type Supplied As
HM3106	HM3106	SOIC-8	2500 Units on Tape & Reel

Absolute Maximum Ratings（Note1）

Parameter	Symbol	Value	Unit
Input Voltage	Vin	-0.3 to 36	V
CS Pin Voltage	V_{CS}	-0.3 to Vin	V
EN Pin Voltage	VEN	-0.3 to Vin	V
SW Pin Voltage	V_{SW}	-0.3 to Vin	V
Power Dissipation	P_D	Internally limited	mW
Thermal Resistance (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	100	ºC/W
Operating Junction Temperature	T_J	-40 to 125	ºC
Storage Temperature	T_{STG}	-65 to 150	ºC
Lead Temperature (Soldering, 10 sec)	T_{LEAD}	260	ºC
ESD (HBM)		3000	V

Note1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

HM3106 Electrical Characteristics

T_a = 25℃;unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure4						
VCS	Current Sense Voltage	Vin = 8V to 32V, Vout=5V Iload=0.3A	0.228	0.24	0.252	V
Efficiency	ŋ	Vin=12V ,Vout=9.6V Iout=1A	-	96	-	%

Electrical Characteristics (DC Parameters)

Vin = 12V, GND=0V, Vin & GND parallel connect a 220uf/25V capacitor; Iout=500mA, T_a = 25℃; the others floating unless otherwise specified, system parameters reference figure4.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	Vin		5		32	V
Shutdown Supply Current	I_{STBY}	V_{EN}=0V		60	200	uA
Quiescent Supply Current	I_q	V_{EN} =2V, V_{FB} =Vin		2.5	5	mA
Oscillator Frequency	Fosc		304	380	456	KHz
EN Pin Threshold	V_{EN}	High (Regulator ON) Low (Regulator OFF)		1.7 1.1		V
Output Power PMOS	$R_{DS(ON)}$	V_{FB}=0V I_{SW}=1A		150	250	mohm

Schottky Diode Selection Table

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)				
			20V	30V	40V	50V	60V
1A		√	1N5817	1N5818	1N5819		
	√		SS12	SS13	SS14	SS15	SS16
3A		√	1N5820	1N5821	1N5822		
		√	MBR320	MBR330	MBR340	MBR350	MBR360
	√		SK32	SK33	SK34	SK35	SK36
	√			30WQ03	30WQ04	30WQ05	
		√		31DQ03	31DQ04	31DQ05	
		√	SR302	SR303	SR304	SR305	SR306

Package Information

SOP8 Package Mechanical Dimensions