BM2586 5.5A 同步整流 COOL DC-DC

Features

- Wide 7V to 38V Input Voltage Range
- Output Adjustable from 1.0V to 20V
- Maximum Duty Cycle 90%
- Minimum Drop Out 0.5V
- Fixed 165KHz Switching Frequency
- 5.5A Constant Output Current Capability
- Synchronous Rectification
- High efficiency up to 96%
- Excellent line and load regulation
- Soft start, small start surge current
- Built in OVLO and UVLO function
- Built in thermal shutdown function
- Built in current limit function
- Built in output short protection function
- Package in E-SOP8

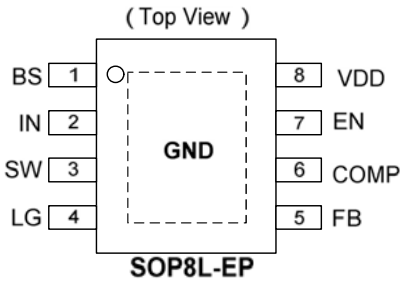
Applications

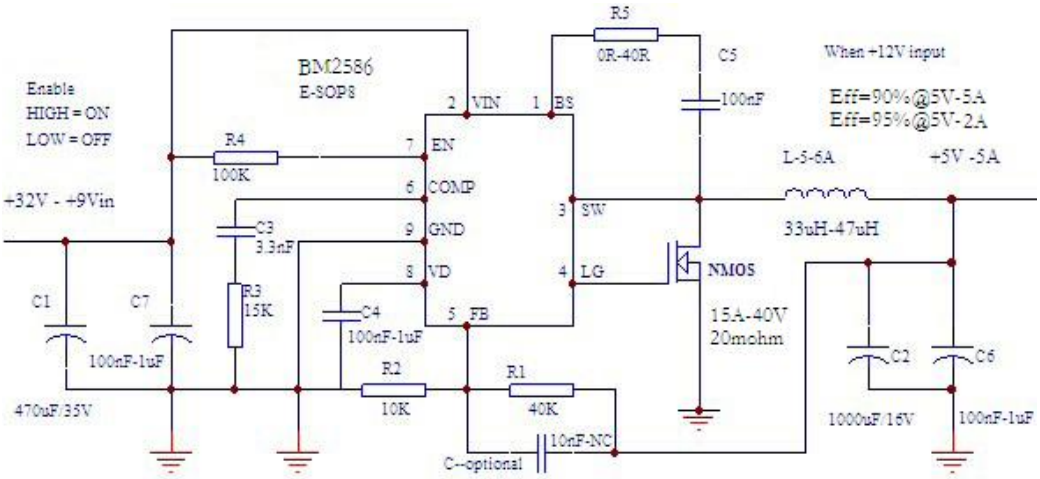
- LCD Monitor and LCD TV
- Car charger
- Car electronics.
- ADSL Modem
- Telecom / Networking Equipment

General Description

The BM2586 is a 165KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 5.5A load with high efficiency, low ripple and excellent line and load regulation. Requiring a minimum number of external components, the regulator is really cool DC-DC with 96% very high-efficiency,which thanks to syc rectification.

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. When short protection function happens, the operation frequency will be reduced from 180KHz to 70KHz. An internal compensation block is built in to minimize external component count.



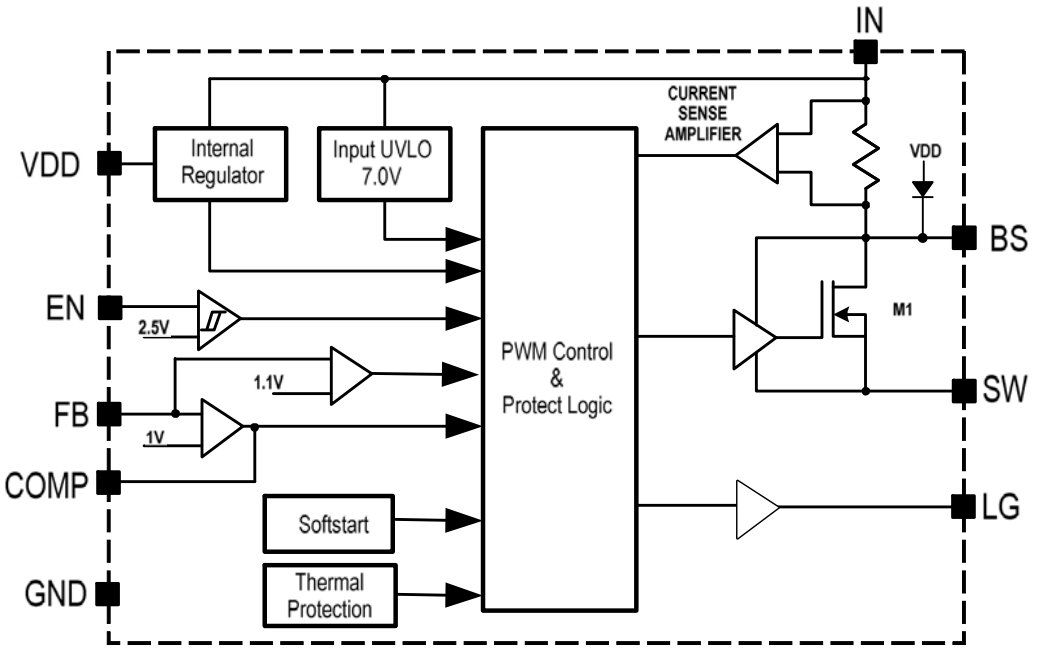


R5 可以短路掉,R5 可以选 0-100 欧电阻,是为了消除重负载产生的 PWM 方波上的尖峰,有利于 EMI 的通过因为电流大,同步整流的下管 NMOS 外置,能提供更大的电流输出,更小的 Rdson 更高效率.

PIN DESCRIPTION

Name	Description
BS	Boot-Strap Pin. Supply high side gate driver. Decouple this pin to SW pin with 0.1uF ceramic cap.
IN	Power Input pin. Bypass IN to GND with a suitably large capacitor to eliminate noise on the input to the IC.
SW	Power Switching Output. SW is the switching node that supplies power to the output. Connect the output LC filter from SW to the output load.
LG	Gate drive for external low side N-MOSFET..
PAD	Ground (Connect to GND).
FB	Feedback Input. FB senses the output voltage to regulate that voltage. Drive FB with a resistive voltage divider from the output voltage.
COMP	Compensation Node. COMP is used to compensate the regulation control loop. Connect a series RC network from COMP to GND to compensate the regulation control loop.
EN	Enable control. Pull high to turn on. Do not float.
VD	Internal regulator pin,decouple this pin with a 0.1-10uF to ground.

BLOCK DIAGRAM



同步整流上管内置,下管外挂

Ordering Information

Package	Temperature Range	Part Number	FACT	voltage
		Lead Free	Lead Free	
		BM2586	ESOP8	

Absolute Maximum Ratings（Note1）

Parameter	Symbol	Value	Unit
Input Voltage	Vin	-0.3 to 40V	V
Feedback Pin Voltage	V_{FB}	-0.3 to +6V	V
Boost Pin Voltage	V	-0.3 to Vin	V
others pins	V	-0.3 to +6V	V
Power Dissipation	P_D	Internally limited	mW
Thermal Resistance (ESOP8) (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	40	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)		2000	V

APPLICATION NOTES:

独特的输入欠压与输入过压锁定功能，这是多数台湾与国产的 IC 是没有的.
NMOS 的选择,如果是<25V 以下输入,选择耐压 40V 的 NMOS; 如果>+25V 输入,选择 60V 耐压的 NMOS,通常选择 SOP8 或 TO252 封装的 MOS,导通电阻越小越好.

VIN	<28V	<35V
Inductor	47uH	33uH

$$V_{OUT}= V_{FB} \times \frac{R1+R2}{R2}$$

For example, V_{FB} =1.00V for a 5.0V output voltage, R2 is 10kΩ, and R1 is 40kΩ.

因为应用中输出电流大,选电感时,确保耐电流要有足够的余量,IC 底部的 PAD 一定要接大面积地 GND. Please make sure the inductor can load 5A continuously, and the metal pad under chip must be connected to ground.

BM2586 Electrical Characteristics

T_a = 25℃;unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure4						
VFB	Feedback Voltage	Vin = 5V to 25V, Vout=5V Iload=0.5A to 5A	0.98	1.0	1.02	V
Efficiency	ŋ	Vin=12V ,Vout=5V Iout=1.0A	-	96	-	%

Electrical Characteristics (DC Parameters)

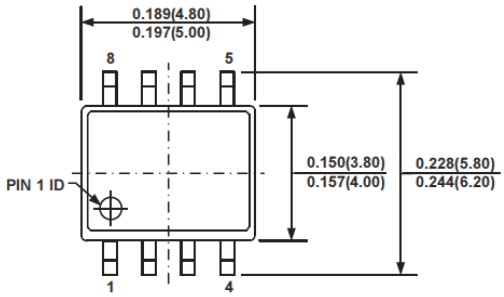
Vin = 12V, GND=0V, Vin & GND parallel connect a 220uf/50V capacitor; Iout=500mA, T_a = 25℃; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	Vin		7		38	V
Soft start				3ms		
Quiescent Supply Current	I_q	V_{FB} =Vin		0.7	1.5	mA
Oscillator Frequency	Fosc		140	165	190	Khz
Switch Current Limit	I_L	V_{FB} =0		6.0		A
EN Threshold EN Hysteresis				2.5 0.25		V V
UVLO OVLO		输入欠压保护 输入过压保护	7 40			V V
Max. Duty Cycle	D_{MAX}	V_{FB}=0V	90			%

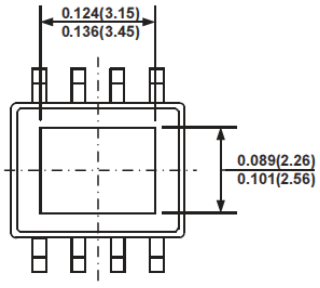
RECTIFY 整流	开关反应 speed	热消耗 heat power	MAX 效率 EFF
异步 SCHOKKY 二极管(10A/40V)	slow	0.5V*5A=2.5W	不能真正做到 92%以上
同步下管 NMOS(20mohm)	fast	5A*5A*0.02=0.5W	能做到 92%以上

PACKAGE OUTLINE

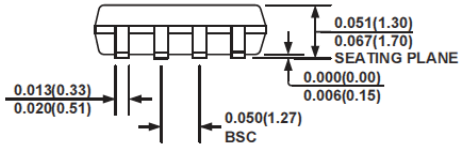
SOIC8-EP PACKAGE OUTLINE AND DIMENSIONS



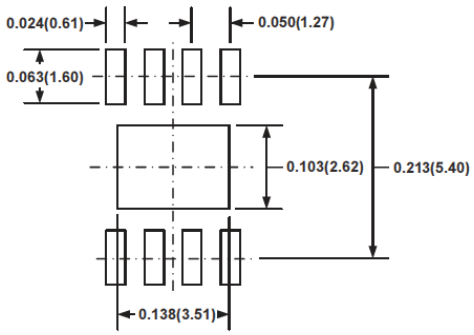
TOP VIEW



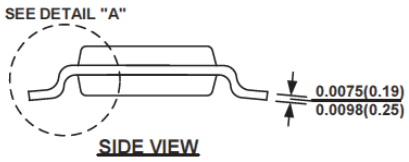
BOTTOM VIEW



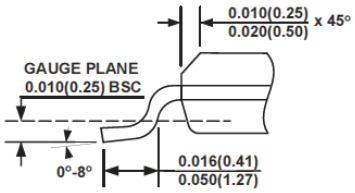
FRONT VIEW



RECOMMENDED LAND PATTERN



SIDE VIEW



DETAIL "A"

NOTE:

1) CONTROL DIMENSION IS IN INCHES. DIMENSION IN BRACKET IS IN MILLIMETERS.
2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
3) PACKAGE WIDTH DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS.
4) LEAD COPLANARITY (BOTTOM OF LEADS AFTER FORMING) SHALL BE 0.004" INCHES MAX.
5) DRAWING CONFORMS TO JEDEC MS-012, VARIATION BA.
6) DRAWING IS NOT TO SCALE.